

21 November 2023

Our Ref: 2998 - St Gabriels
Your Ref: 135278/FO/2022

Dear Sir/Madam,

RE: St Gabriels – Discharge of Drainage Condition 13

We have been commissioned by our client (McLaren) to discharge **Planning Condition 13** associated with the Planning Permission reference 135278/FO/2022.

This specific pre-commencement condition states:

Notwithstanding details submitted, prior to commencement of development (excluding demolition) a scheme for surface water drainage works in accordance with Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacements national standards and details shall be submitted to and approved in writing by the City Council as Local Planning Authority. The approved drainage system shall be implemented in accordance with the approved detailed design, prior to the use of the building commencing.

In order to avoid/discharge the above drainage condition the following additional information has to be provided:

- 1. A finalised drainage layout showing all components, outfalls, levels and connectivity, including connectivity to the public sewer and compliance with easements where applicable;*
- 2. Hydraulic calculation of the proposed drainage system consistent with the finalised drainage layout; including evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during a 1 in 100 year rainfall event with allowance for 45% climate change in any part of a building;*
- 3. Assessment of overland flow routes for extreme events that is diverted away from buildings (including basements). Overland flow routes need to be designed to convey the flood water in a safe manner in the event of a blockage or exceedance of the proposed drainage system capacity including inlet structures. A layout with overland flow routes needs to be presented with appreciation of these overland flow routes with regards to the properties on site and adjacent properties off site.*
- 4. Construction details of flow control and SuDS elements.*

The submitted information is in line with the submitted planning application documents “Flood Risk Assessment and Drainage Strategy (September 2022)” as submitted and approved.

For convenience, we have addressed each element of this condition below:

1. Drainage Layouts

Please find included within **Appendix A**, both surface and foul water detailed drainage layouts. These layouts provide all components, outfalls, levels and connectivity to the public combined sewer located to the north of the site. As per the planning consent, we have agreement with United Utilities to connect foul and surface water to this combined sewer.

2. Hydraulic Calculations

Please find included within **Appendix B**, our surface water MicroDrainage Calculations, these demonstrate that the system has been designed with no flooding for the 1:100 year + 45% climate change event in line with our planning approval.

The surface water discharge rate of 25.0 l/s is achieved via two flow controls, as agreed at planning approval, following agreement from the LLFA and United Utilities.

3. Overland Flow Routes

Please find included within **Appendix C**, our overland flow route assessment based on the proposed site levels strategy produced by the landscape architect, which ties into existing site levels especially around the site boundary and retained buildings on site. The plan demonstrates that overland flow routes are predominantly routed away from building thresholds, and where possible towards landscaping areas around the development site.

4. Construction Drainage Details

Please find included in **Appendix A** our drainage construction details including SuDS elements.

Further to the submission material submitted, we received the following response back from the FRM team at MCC on the 7th November 2023. Their comments are below and our response is provided.

LLFA Comment 1:

A finalised drainage layout showing all components, outfalls, levels and connectivity, including connectivity to the public sewer and compliance with easements where applicable; - To assist our reviewing process. It would be useful to the LLFA if the developer can provide an engineering drawing with cover levels, invert levels, and pipe references on one drainage drawing please.

Easements for the closest points to the existing combined should be provided within a separate drawing. If agreement with United Utilities is required due to the proposed easements, this should be provided now.

The attenuation tank dimensions, and min cover level need to be provided on the engineering layout, per structure (attenuation tank 1, 2, and 3)

MHT Response 1: We have updated the surface water layout as requested to show all information on the single drawing.

UU drainage approval and easement no objection letters provided in **Appendix D**.

LLFA Comment 2:

Hydraulic calculation of the proposed drainage system consistent with the finalised drainage layout; including evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during a 1 in 100 year rainfall event with allowance for 45% climate change in any part of a building; - The following nodes are not included within the hydraulic model: SWMH03, 04, 05, 06, 10, 11 (network 1). SWMH 24, 22, 23, 21, 19, 16, 15, 14 (network 2). The modelled nodes must also accurately reflect proposed cover level and invert levels, to provide an accurate assessment of the proposed drainage arrangements.

During a 1:100years + 45% cc event, the MicroDrainage indicates SWMH06 is discharging 17.5l/s. This is 1.5l/s above the approved rate.

MHT Response 2: MD model has been updated to suit the layout, the indicated discharge rate has been rectified. Refer to **Appendix B**.

LLFA Comment 3:

Construction details of flow control and SuDS elements. - Level of cover needs to be provided per tank.

FWMH26 appears to be situated directly above attenuation tank 2, can the developer please provide a engineering section to review any potential clashes, and ensure appropriate easement.

The developer should also provide a section of foundations and tank structures per each tank to review.

Easements from proposed development footprint and boundary must be provided. SuDS features must be appropriately positioned away from proposed buildings. The developer will need to confirm the current attenuation tank easements from proposed building. Good practice is typically 2.5-meters easement from existing boundaries, 5-meters from any building, to enable future maintenance access. This must be reflected in the approved layout.

MHT Response 3:

The proposed level of cover is provided for each tank on the GA. i.e. top of tank and cover provided. There is no clash the foul water drain run.

We are not at a stage where bespoke tank details can be provided in proximity to structures, the tanks have been positioned based on available space externally and as far as we can be away from building structures. We cannot provide a 2.5 or 5.0m easement around each tank as there would simply not be enough space to locate the attenuation tanks. If the tanks needed to be replaced then temporary works and propping will be required to facilitate any potential tank excavation. We note easements are preferable but we are very constrained in achieving the required attenuation volumes, with site constraints such as proposed utilities.

Any attenuation used will be design to manufacturers requirements and have a BBA certification outlining their approval to the required standards in terms of loading and creep.

Yours sincerely



Gurdeep Bansal
Associate Director



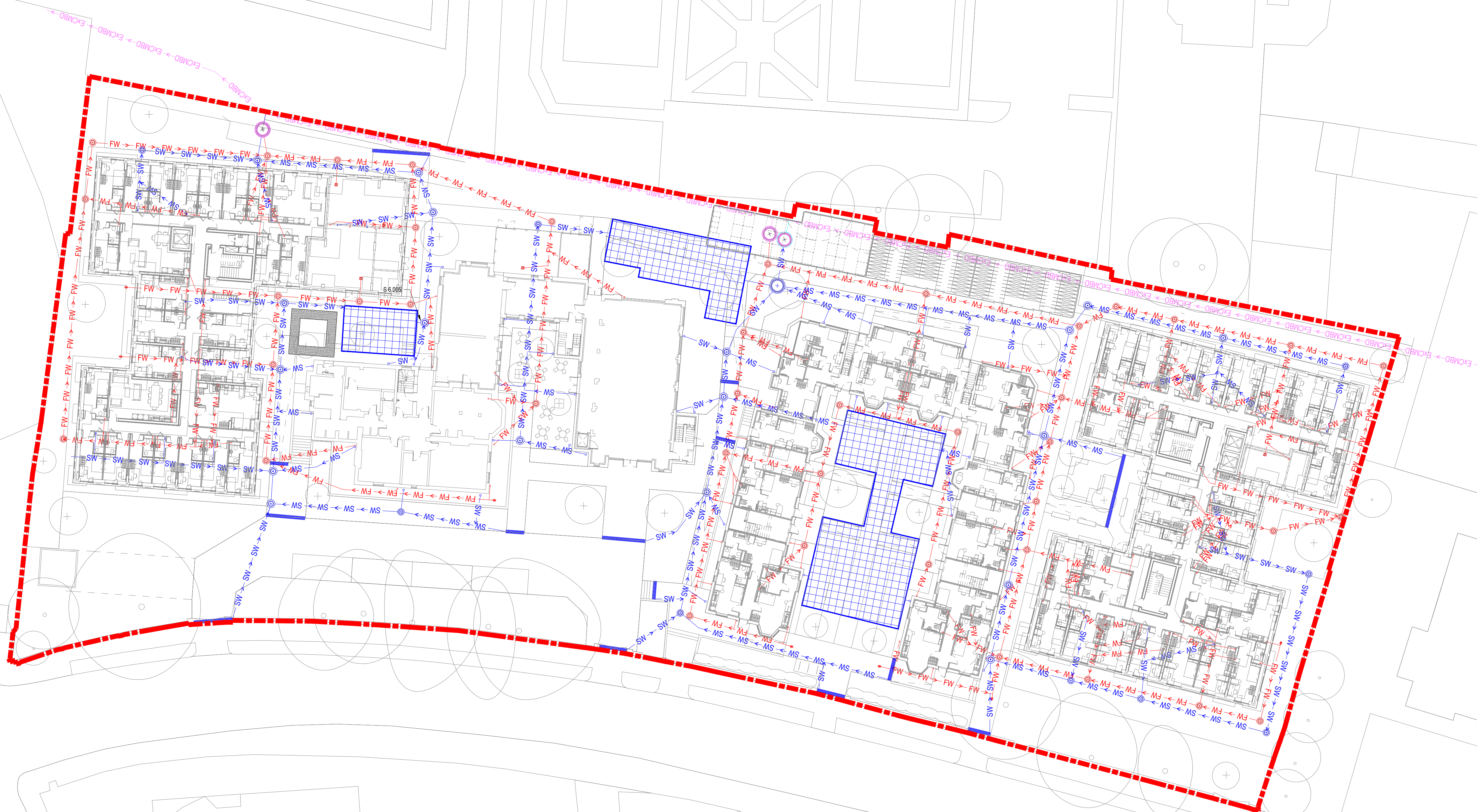
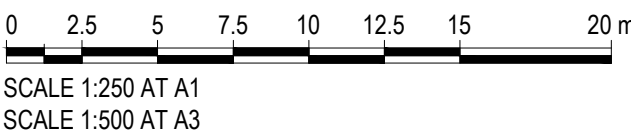
Meinhardt (UK) Ltd, 10 Aldersgate Street, London, EC1A 4HJ
TEL: 020 7831 7969

Appendix A – Drainage Drawings



OUTSTANDING RISKS:

1. FINAL DESIGN SUBJECT TO RECEIPT OF FROZEN ARCHITECTURAL LAYOUTS
2. FINAL DESIGN SUBJECT TO RECEIPT OF FROZEN MEP LAYOUTS
3. EXISTING DRAINAGE FROM BUILDINGS TO BE RETAINED TO BE RE-USED WHERE POSSIBLE. SUBJECT TO CONDITION AND PROPOSED EXTERNAL LEVELS.
4. ALL DRAINAGE CAST INTO OR PASSING THROUGH STRUCTURE TO BE CAST IRON.
5. FINAL DRAINAGE DESIGN SUBJECT TO RECEIPT OF FINALISED MEP FLOW RATES. PIPE DIAMETERS WHERE NOT SHOWN ASSUMED TO BE 1000.



REVISED PLANNING ISSUE

REV	DESCRIPTION	BY	DATE
P01	STAGE 3 ISSUE FOR INFORMATION	JD	05.06.23
P02	REVISED STAGE 3 ISSUE	JD	11.07.23
P03	REVISED STAGE 3 ISSUE	JD	04.08.23
P04	REVISED PLANNING ISSUE	JD	21.11.23

NOTES:

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING IS FOR STAGE 3 INFORMATION ONLY.
4. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.
5. THIS DRAWING IS BASED ON:
 - SIMPSON HAUGH ARCHITECTURAL DRAWING - 10349-SHP-Z0-A-G100-PL-00-001 P08 PROPOSED GROUND FLOOR PLAN - RECEIVED 29.06.23
 - SIMPSON HAUGH SETTING OUT DRAWINGS 10349-SHP-Z3/4-A-G260-PL-00-001 RECEIVED 03.11.23
 - RE-FORM LANDSCAPING PLAN - 0919-RFM-XX-00-DR-L-0006-P01-LANDSCAPE WORKING DRAWING RECEIVED 14.06.23
 - LANDSCAPE LEVELS PLAN - 0919-RFM-XX-00-M2-L-0001-P01-LANDSCAPE WORKING DRAWING RECEIVED 23.05.21
 - CHORD ABOVE GROUND DRAINAGE DRAWINGS RECEIVED 29.06.23
 - UNITED UTILITIES SEWER RECORDS DATED SEPTEMBER 2021
 - LASER SURVEYS LTD CCTV SURVEY DRAWING - LAYERSERV0001116 REV A RECEIVED 22.02.22

KEY:

- SITE BOUNDARY
- SW → SW PROPOSED SURFACE WATER SEWER
- ExSW → ExSW EXISTING SURFACE WATER SEWER
- FW → FW PROPOSED FOUL WATER SEWER
- ExFW → ExFW EXISTING FOUL WATER SEWER
- CD → CD PROPOSED COMBINED DRAINAGE
- ExCD → ExCD EXISTING COMBINED DRAINAGE
- PROPOSED SURFACE WATER MANHOLE
- PROPOSED FOUL WATER MANHOLE
- ⊕ SUB STACK / SOIL VENT PIPE
- ⊕ RAINWATER PIPE
- CD CHANNEL DRAIN
- PROPOSED BELOW GROUND SURFACE WATER ATTENUATION TANK
- G PROPOSED FOUL GULLY
- RE PROPOSED RODDING EYE

CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS

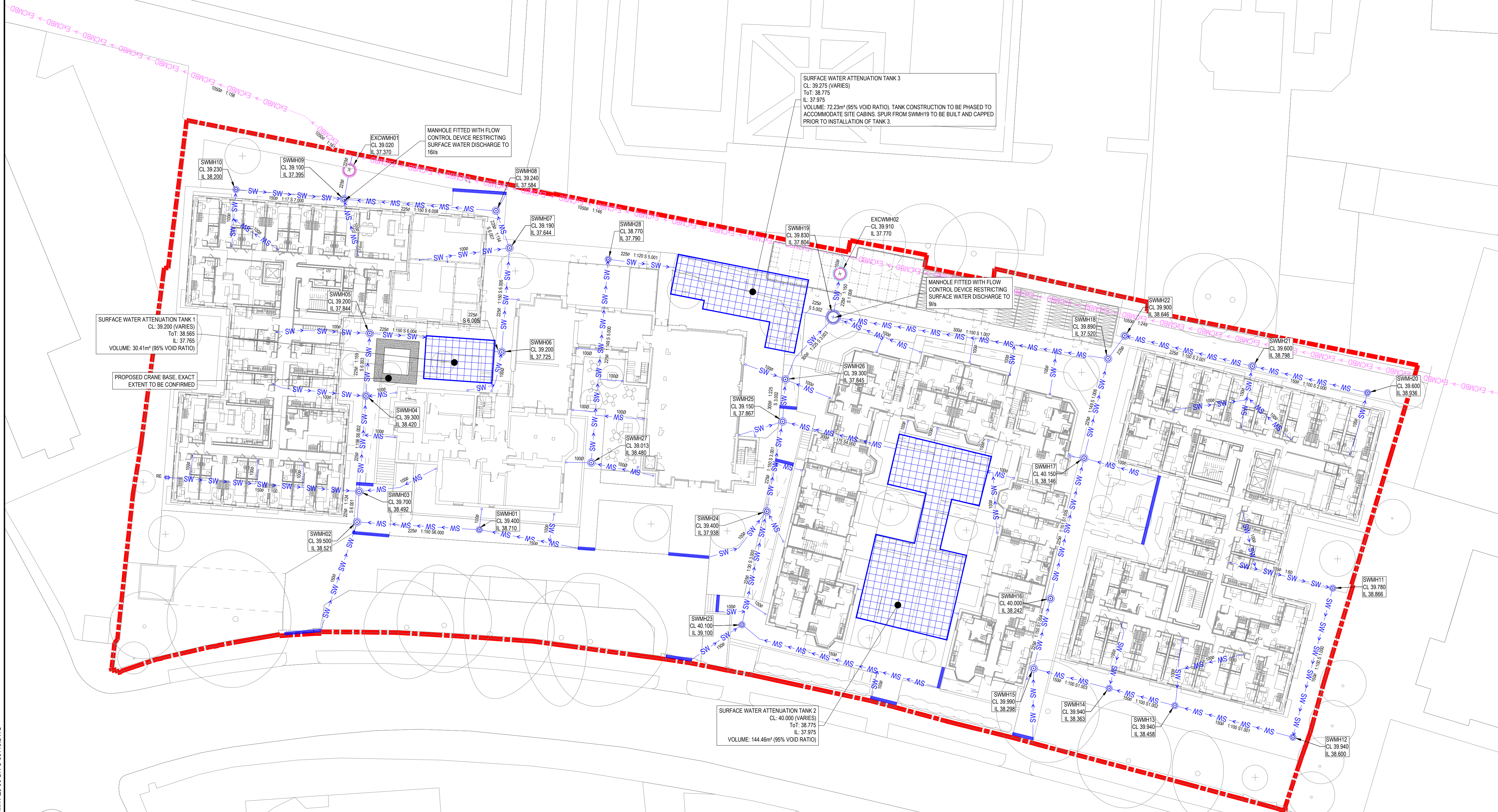


PROJECT ST GABRIEL'S 1 OXFORD PLACE MANCHESTER M14 5RP			
CLIENT MCLAREN			
TITLE PROPOSED BELOW GROUND DRAINAGE COMBINED LAYOUT			
DISCIPLINE CIVIL	SCALE 1:250		
DRAWN JD	DESIGNED JD	CHECKED GB	APPROVED GB
DRAWING No 2998-MHT-XX-XX-DR-C-00100			ISSUE P04



OUTSTANDING RISKS:

1. FINAL DESIGN SUBJECT TO RECEIPT OF FROZEN ARCHITECTURAL LAYOUTS
2. FINAL DESIGN SUBJECT TO RECEIPT OF FROZEN MEP LAYOUTS
3. EXISTING DRAINAGE FROM BUILDINGS TO BE RETAINED TO BE RE-USED WHERE POSSIBLE. SUBJECT TO CONDITION AND PROPOSED EXTERNAL LEVELS.
4. ALL DRAINAGE CAST INTO OR PASSING THROUGH STRUCTURE TO BE CAST IRON.
5. FINAL DRAINAGE DESIGN SUBJECT TO RECEIPT OF FINALISED MEP FLOW RATES. PIPE DIAMETERS WHERE NOT SHOWN ASSUMED TO BE 1000.



REVISED PLANNING ISSUE

REV	DESCRIPTION	BY	DATE
P01	STAGE 3 ISSUE FOR INFORMATION	JD	05.06.23
P02	REVISED STAGE 3 ISSUE	JD	11.07.23
P03	REVISED STAGE 3 ISSUE	JD	04.08.23
P04	REVISED PLANNING ISSUE	JD	21.11.23

NOTES:

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING IS FOR STAGE 3 INFORMATION ONLY.
4. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.
5. THIS DRAWING IS BASED ON:
 - SIMPSON HAUGH ARCHITECTURAL DRAWING - 10349-SHP-Z0-A-G100-PL-00-001 P08 PROPOSED GROUND FLOOR PLAN - RECEIVED 29.06.23
 - SIMPSON HAUGH SETTING OUT DRAWINGS 10349-SHP-Z3/4-A-G260-PL-00-001 RECEIVED 03.11.23
 - RE-FORM LANDSCAPING PLAN - 0919-RFM-XX-00-DR-L-0006-P01-LANDSCAPE WORKING DRAWING RECEIVED 14.06.23
 - LANDSCAPE LEVELS PLAN - 0919-RFM-XX-00-M2-L-0001-P01-LANDSCAPE WORKING DRAWING RECEIVED 23.05.21
 - CHORD ABOVE GROUND DRAINAGE DRAWINGS RECEIVED 23.05.23
 - UNITED UTILITIES SEWER RECORDS DATED SEPTEMBER 2021
 - LASER SURVEYS LTD CCTV SURVEY DRAWING - LAYERSERV0001116 REV A RECEIVED 22.02.22

KEY:

- SITE BOUNDARY
- SW → SW PROPOSED SURFACE WATER SEWER
- CMBD → CMBD PROPOSED COMBINED DRAINAGE
- EXCMBD → EXCMBD EXISTING COMBINED DRAINAGE
- EXSW → EXSW EXISTING SURFACE WATER DRAINAGE
- PROPOSED SURFACE WATER MANHOLE
- RAINWATER PIPE
- CD CHANNEL DRAIN
- PROPOSED BELOW GROUND SURFACE WATER ATTENUATION TANK
- EXISTING COMBINED WATER MANHOLE

CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS



PROJECT
**ST GABRIEL'S
1 OXFORD PLACE
MANCHESTER
M14 5RP**

CLIENT
MCLAREN

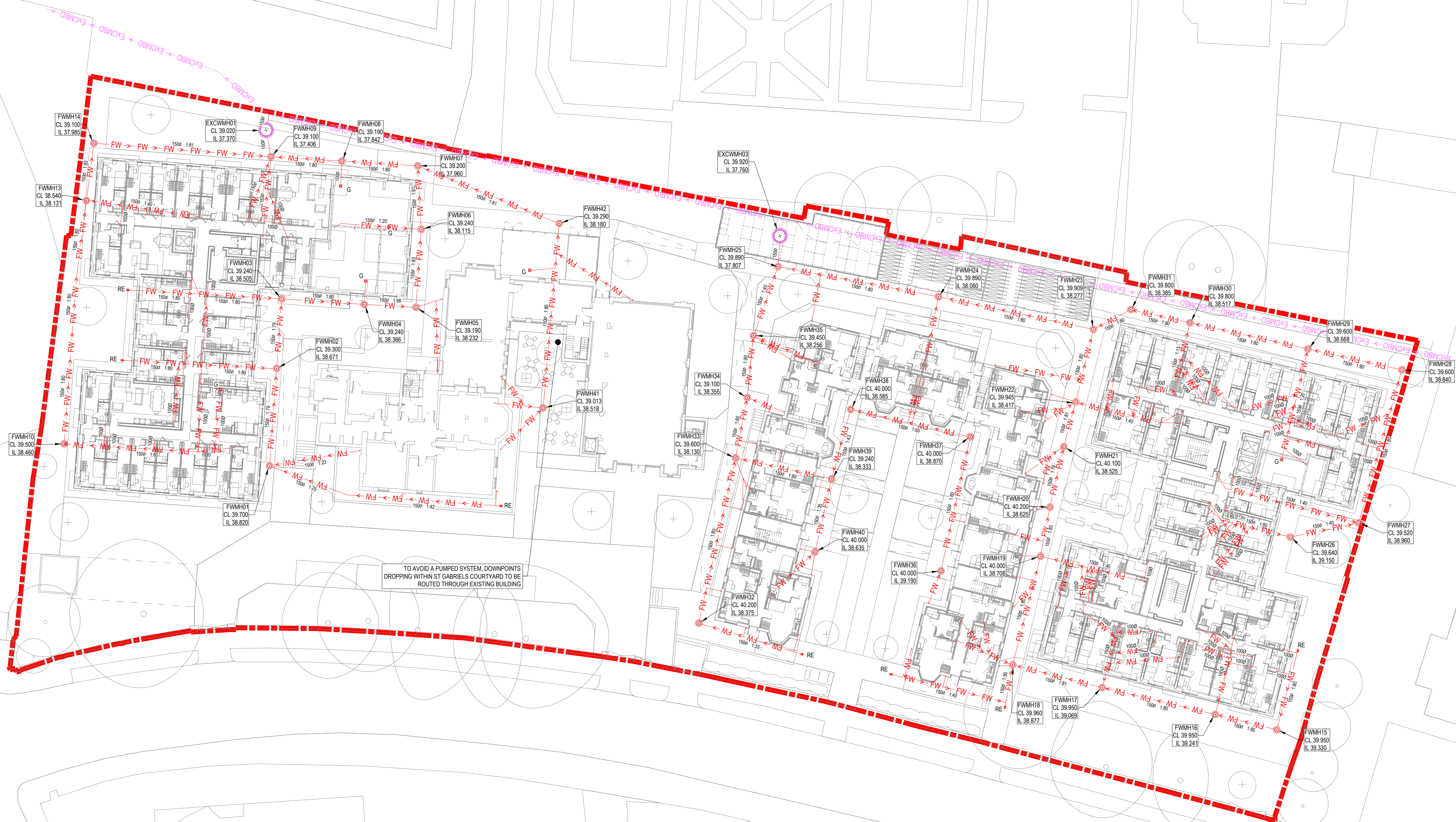
TITLE
**PROPOSED BELOW GROUND DRAINAGE
SURFACE WATER LAYOUT**

DISCIPLINE	SCALE
CIVIL	1:250
DRAWN	DESIGNED
JD	JD
CHECKED	APPROVED
GB	GB
DRAWING No	ISSUE
2998-MHT-XX-XX-DR-C-00110	P04



OUTSTANDING RISKS:

1. FINAL DESIGN SUBJECT TO RECEIPT OF FROZEN ARCHITECTURAL LAYOUTS
2. FINAL DESIGN SUBJECT TO RECEIPT OF FROZEN MEP LAYOUTS
3. EXISTING DRAINAGE FROM BUILDINGS TO BE RETAINED TO BE RE-USED WHERE POSSIBLE. SUBJECT TO CONDITION AND PROPOSED EXTERNAL LEVELS.
4. ALL DRAINAGE CAST INTO OR PASSING THROUGH STRUCTURE TO BE CAST IRON.
5. FINAL DRAINAGE DESIGN SUBJECT TO RECEIPT OF FINALISED MEP FLOW RATES. PIPE DIAMETERS WHERE NOT SHOWN ASSUMED TO BE 1000.



REVISED PLANNING ISSUE

REV	DESCRIPTION	BY	DATE
P01	STAGE 3 ISSUE FOR INFORMATION	JD	02.06.23
P02	REVISED STAGE 3 ISSUE	JD	11.07.23
P03	REVISED STAGE 3 ISSUE	JD	04.08.23
P04	REVISED PLANNING ISSUE	JD	21.11.23

NOTES:

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING IS FOR STAGE 3 INFORMATION ONLY.
4. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.
5. THIS DRAWING IS BASED ON:
 - SIMPSON HAUGH ARCHITECTURAL DRAWING - 10349-SHP-Z0-A-G100-PL-00-001 P08 PROPOSED GROUND FLOOR PLAN - RECEIVED 29.06.23
 - SIMPSON HAUGH SETTING OUT DRAWINGS 10349-SHP-Z3/4-A-G260-PL-00-001 RECEIVED 03.11.23
 - RE-FORM LANDSCAPING PLAN - 0919-RFM-XX-00-DR-L-0006-P01-LANDSCAPE WORKING DRAWING RECEIVED 14.06.23
 - LANDSCAPE LEVELS PLAN - 0919-RFM-XX-00-M2-L-0001-P01-LANDSCAPE WORKING DRAWING RECEIVED 23.05.21
 - CHORD ABOVE GROUND DRAINAGE DRAWINGS RECEIVED 23.06.23
 - UNITED UTILITIES SEWER RECORDS DATED SEPTEMBER 2021
 - LASER SURVEYS LTD CCTV SURVEY DRAWING - LAYERSERV0001116 REV A RECEIVED 22.02.22

KEY:

- SITE BOUNDARY
- FW → FW → PROPOSED FOUL WATER SEWER
- CMBD → CMBD → PROPOSED COMBINED DRAINAGE
- EXCMBD → EXCMBD → EXISTING COMBINED DRAINAGE
- PROPOSED FOUL WATER MANHOLE
- + SUB STACK / SOIL VENT PIPE
- ExFW → ExFW → EXISTING FOUL WATER DRAINAGE
- G PROPOSED GULLY
- RE PROPOSED RODDING EYE
- FWRM → FWRM → PROPOSED FOUL WATER RISING MAIN

CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS

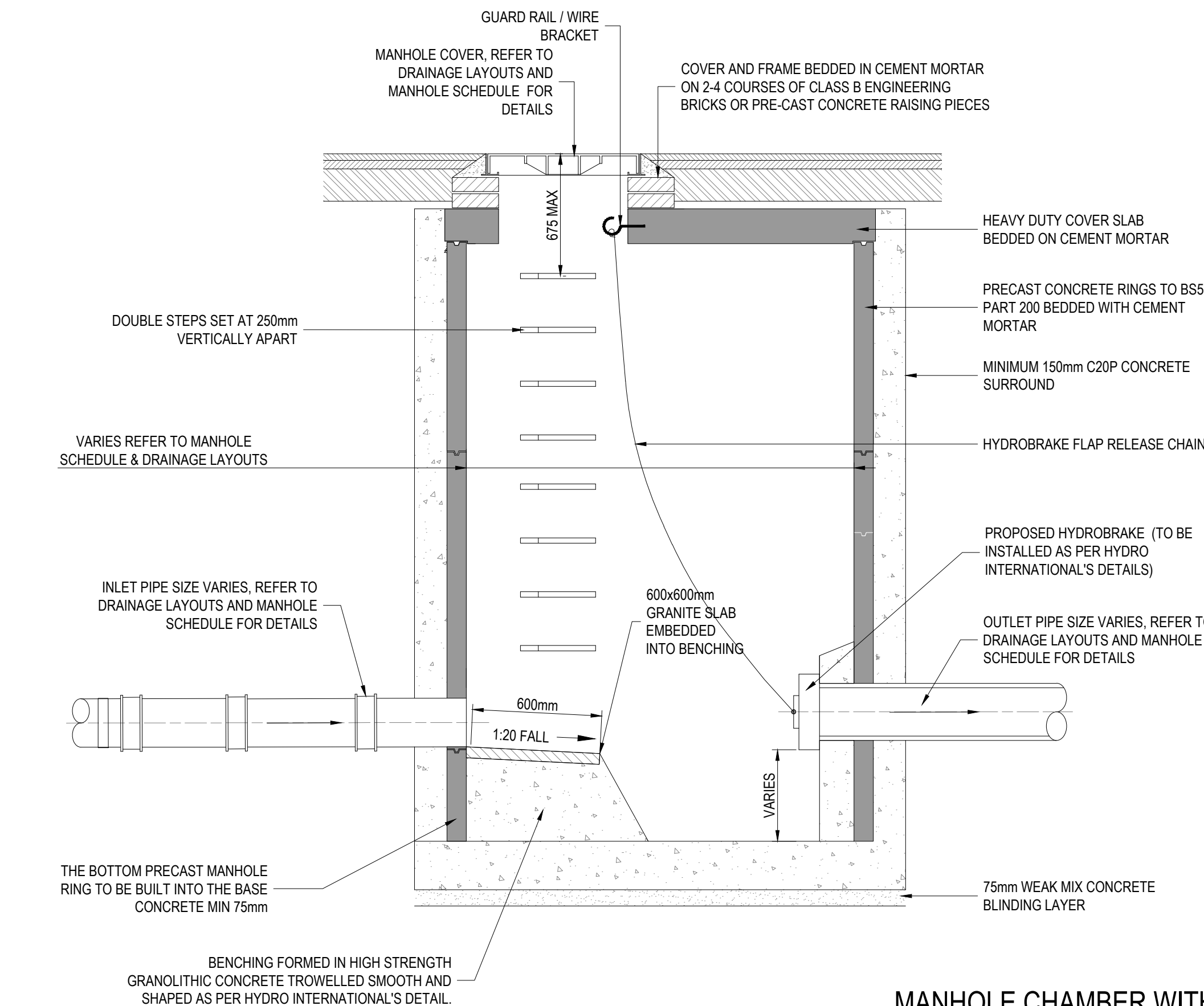


PROJECT
**ST GABRIEL'S
1 OXFORD PLACE
MANCHESTER
M14 5RP**

CLIENT
MCLAREN

TITLE
**PROPOSED BELOW GROUND DRAINAGE
FOUL WATER LAYOUT**

DISCIPLINE	SCALE
CIVIL	1:250
DRAWN	DESIGNED
JD	JD
CHECKED	APPROVED
GB	GB
DRAWING No	ISSUE
2998-MHT-XX-XX-DR-C-00120	P04



1:3 CEMENT / SAND MORTAR HAUNCHING TO MANHOLE COVER AND FRAME

OPENING TO BE LOCATED CENTRALLY OVER 900mm SHAFT AND OFFSET APPROXIMATELY 200mm FOR 1200mm DIAMETER SHAFT WITH RUNGS/LADDER.

2-4 COURSES OF CLASS B ENGINEERING BRICKS, CONCRETE BLOCKS OR PRECAST CONCRETE COVER FRAME SEATING RINGS. OVERSAIL CORRELLING WHERE NECESSARY SHOULD NOT EXCEED 30mm PER COURSE

MINIMUM CLEAR OPENING REFER TO MANHOLE SCHEDULE

LIFTING EYES IN CONCRETE RINGS TO BE POINTED

150mm THICK IN-SITU CONCRETE TO BE GEN3 (DESIGNED TO BRE SPECIAL DIGEST 1 CONCRETE IN AGGRESSIVE GROUND)

HIGH-STRENGTH CONCRETE TOPPING TO BE BROUGHT UP TO A DENSE, SMOOTH FACE, NEATLY SHAPED AND FINISHED TO ALL BRANCH CONNECTIONS (MINIMUM THICKNESS 20mm)

CONSTRUCTION JOINT

INVERTS TO BE FORMED USING CHANNEL PIECES

REFER TO TABLE 1

CHAMBER HEIGHT (NOT LESS THAN 900mm)

THE BOTTOM PRECAST SECTION TO BE BUILT INTO BASE CONCRETE MINIMUM 75mm.

BENCHING SLOPE TO BE 1:10 TO 1:30.

DISTANCE BETWEEN TOP OF PIPE AND UNDERSIDE OF PRECAST SECTION TO BE MINIMUM 50mm TO MAXIMUM 300mm.

225mm TO BARREL OF PIPE

JOINT TO BE AS CLOSE AS POSSIBLE TO FACE OF MANHOLE TO PERMIT SATISFACTORY JOINT AND SUBSEQUENT MOVEMENT

600mm LONG ROCKER PIPE FOR DIAMETERS LESS THAN 600mm.

PIPE JOINT WITH CHANNEL TO BE LOCATED MINIMUM 100mm INSIDE FACE OF MANHOLE.

MINIMUM WIDTH OF BENCHING TO BE 225mm

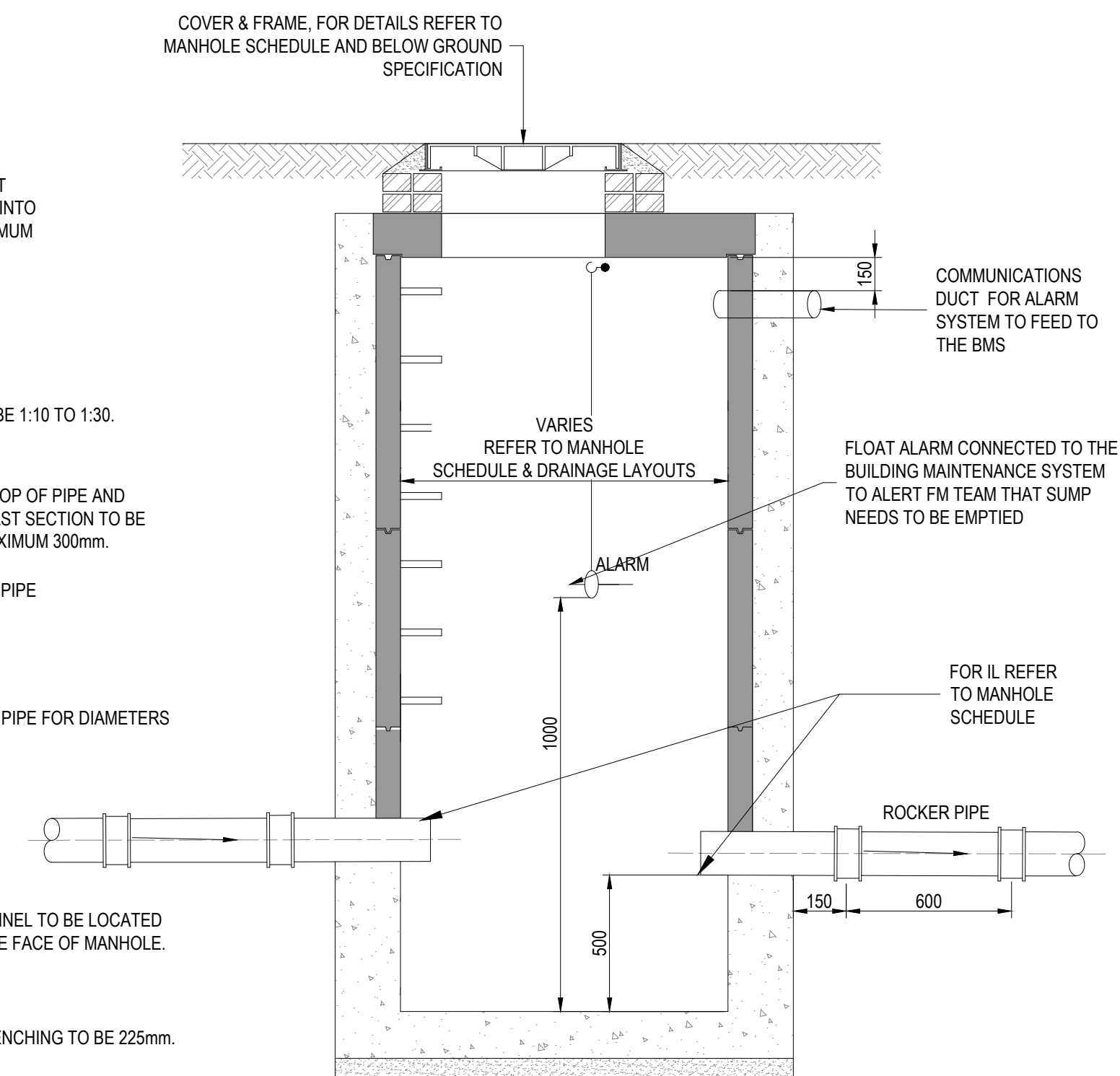
MINIMUM WIDTH OF BENCHING FOR LANDING AREA TO BE 500mm

Diagram illustrating the orientation of inlet and outlet holes for the hydro-brake assembly. The assembly is circular, and the orientation of the inlet and outlet holes can be varied to suit the site. The diagram shows two main flow paths: one labeled "FLOW" at 180° and another labeled "FLOW" at 0°.

Key components and labels include:

- HYDROBRAKE CHAMBER FOR DIAMETER REFER TO MANHOLE SCHEDULE**: Points to the central circular chamber.
- HYDRO-BRAKE FLOW CONTROL WITH PIVOTING BY-PASS DOOR (SUPPLIED BY HYDRO INTERNATIONAL)**: Points to the flow control mechanism on the right side.

MANHOLE DEPTH	PIPE Ø	INTERNAL DIAMETER OF MANHOLE
< 1.5m	≤ 150	1000Ø
	225 - 300	1200Ø
	300 - 700	1500Ø
	≥ 700	THE LARGER OF 1800Ø OR (DN+450)
>1.5m	100 - 375	1200Ø
	375 - 700	1500Ø
	≥ 700	THE LARGER OF 1800Ø OR (DN+775)



CATCHPIT

[illegible]

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING IS FOR STAGE 3 INFORMATION PURPOSES.
4. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.

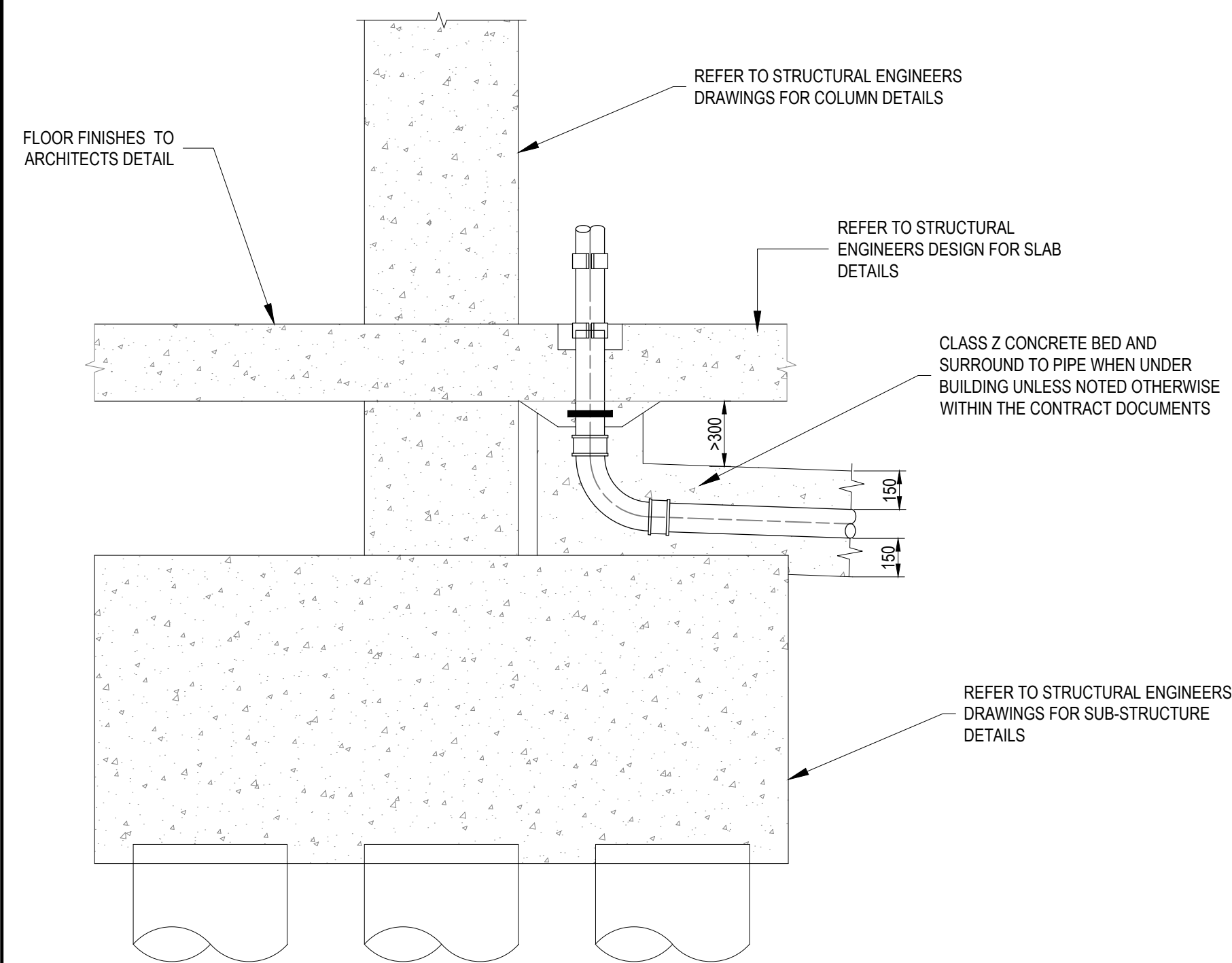
CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS



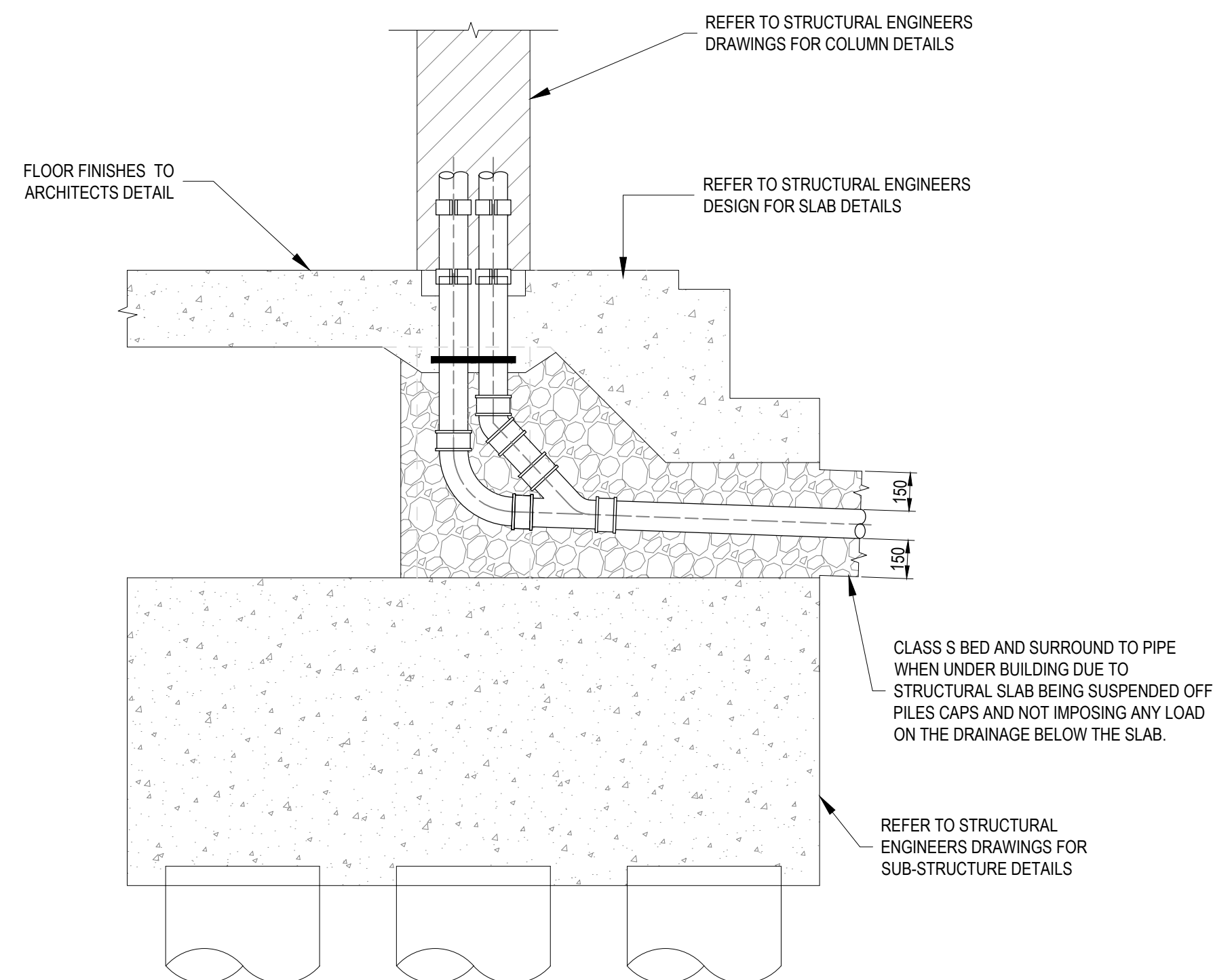
CLIENT
MCLAREN

TITLE
PROPOSED BELOW GROUND DRAINAGE STANDARD DETAILS SHEET 1

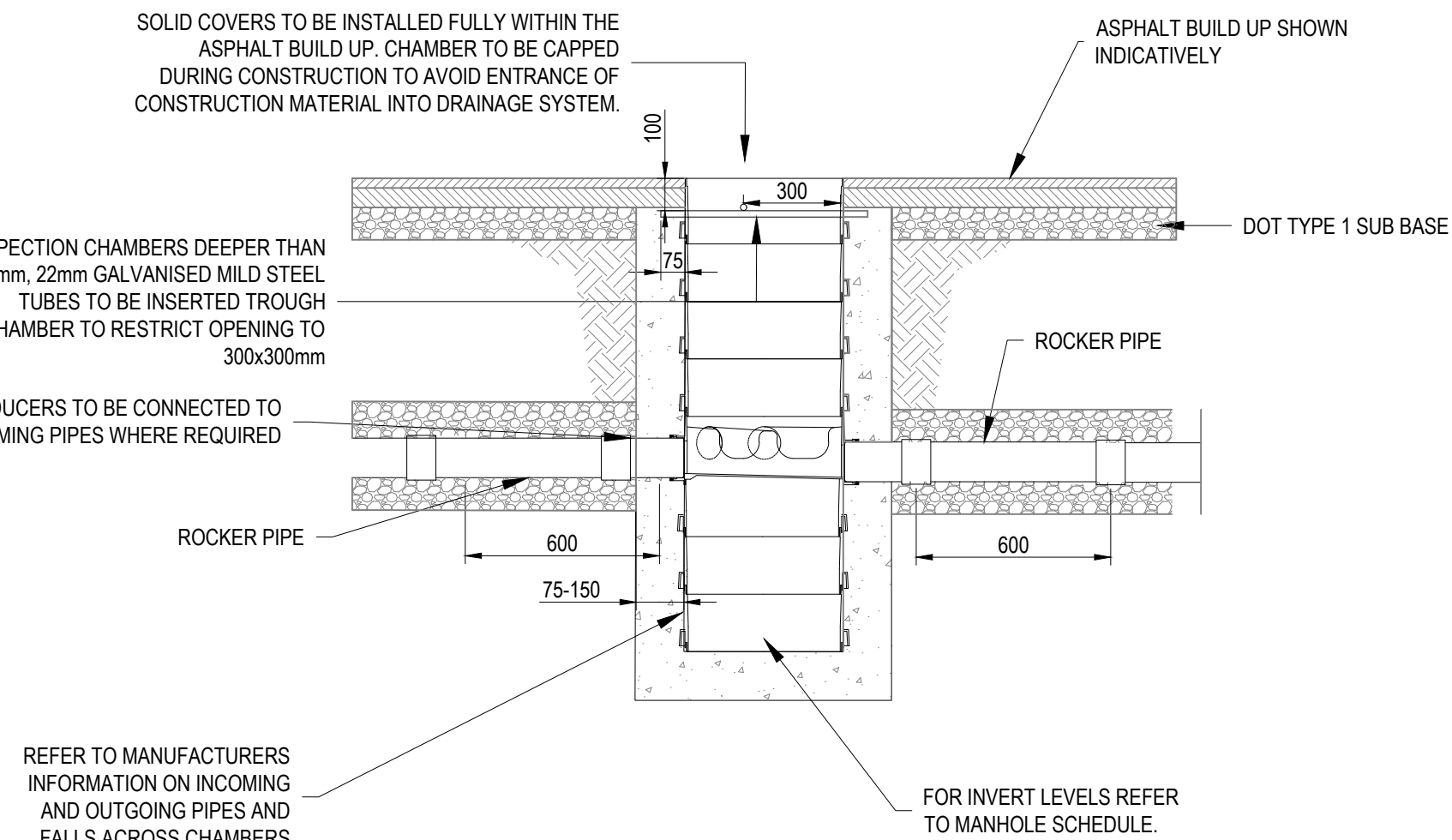
DISCIPLINE CIVIL			SCALE 1:20
DRAWN JD	DESIGNED JD	CHECKED GB	APPROVED GB
DRAWING No 2998-MHT-Z0-XX-DR-C-00200			ISSUE P03



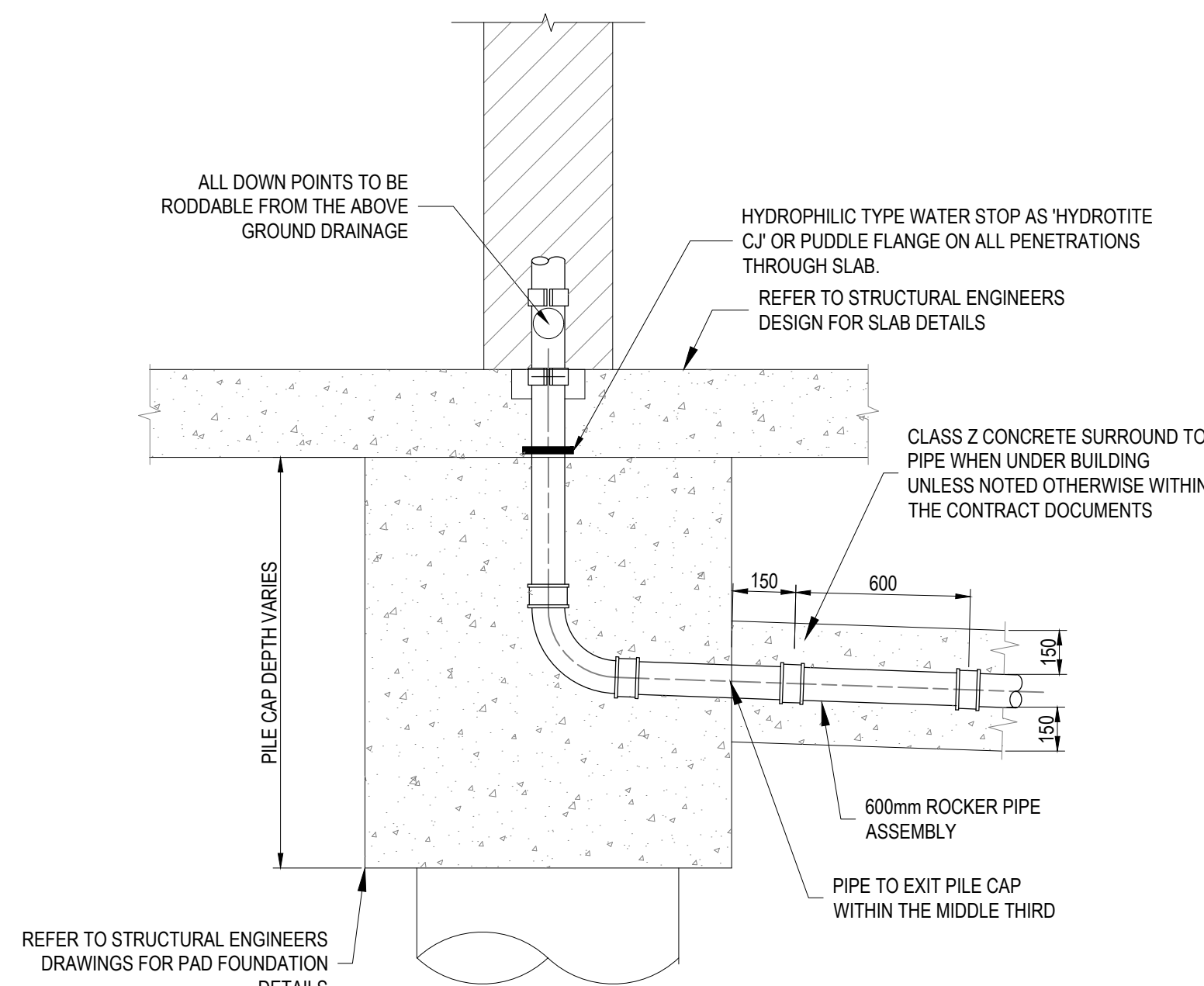
TYPICAL DRAIN POINT WITH DROPPED PILE CAP



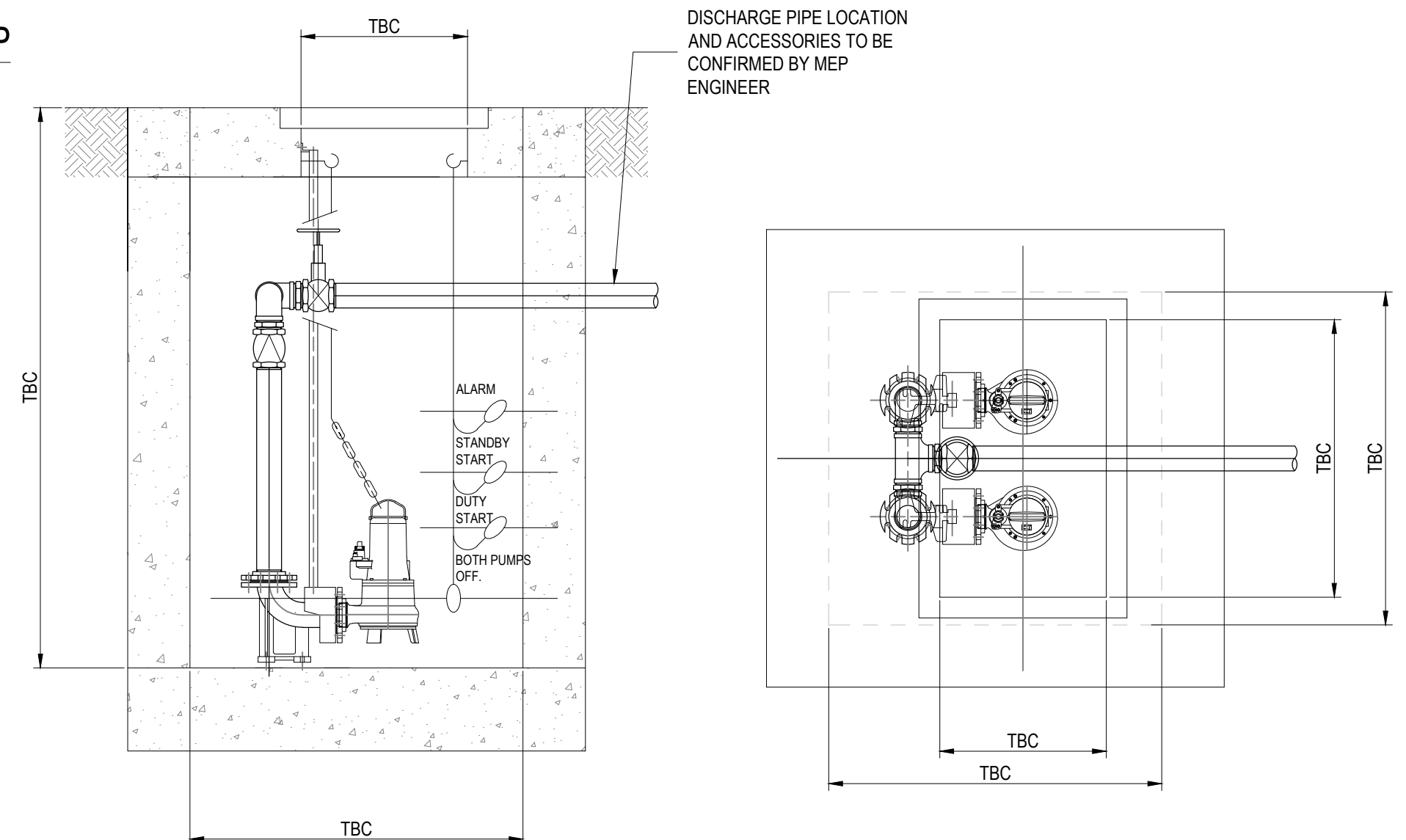
TYPICAL DOUBLE DRAIN POINT DETAIL
(WITH DROPPED PILE CAP)



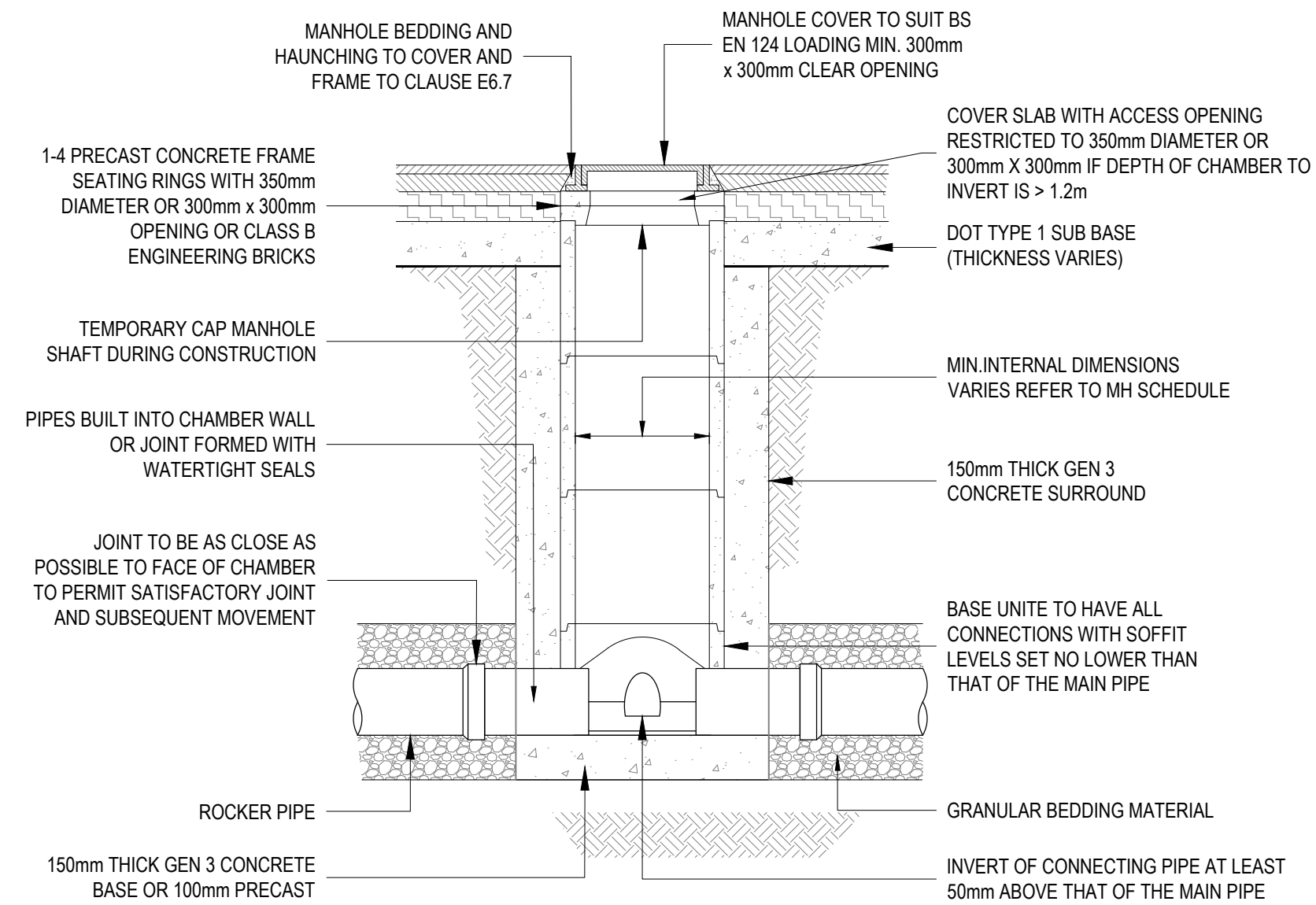
450Ø / 600Ø POLYPROPYLENE INSPECTION CHAMBER WITH SILT TRAP



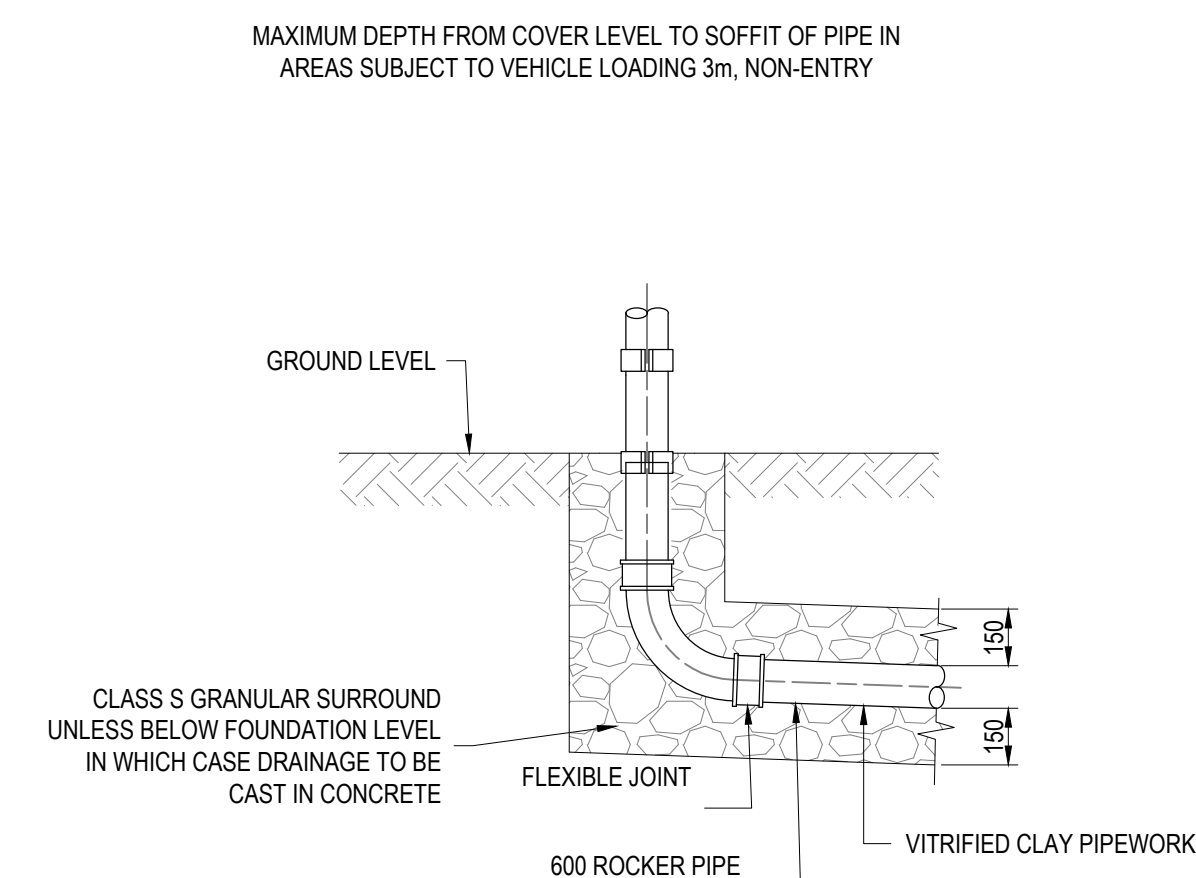
TYPICAL DRAIN POINT
STARTING WITHIN PILE CAP



TYPICAL PUMP DETAIL CONCRETE CHAMBER



EXTERNAL INSPECTION CHAMBER DETAIL -TYPE 3
(RIGID MATERIAL DETAIL)



TYPICAL EXTERNAL RAIN WATER
PIPE

[illegible]

NOTES:

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING IS FOR STAGE 3 INFORMATION PURPOSES.
4. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.

CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS
--



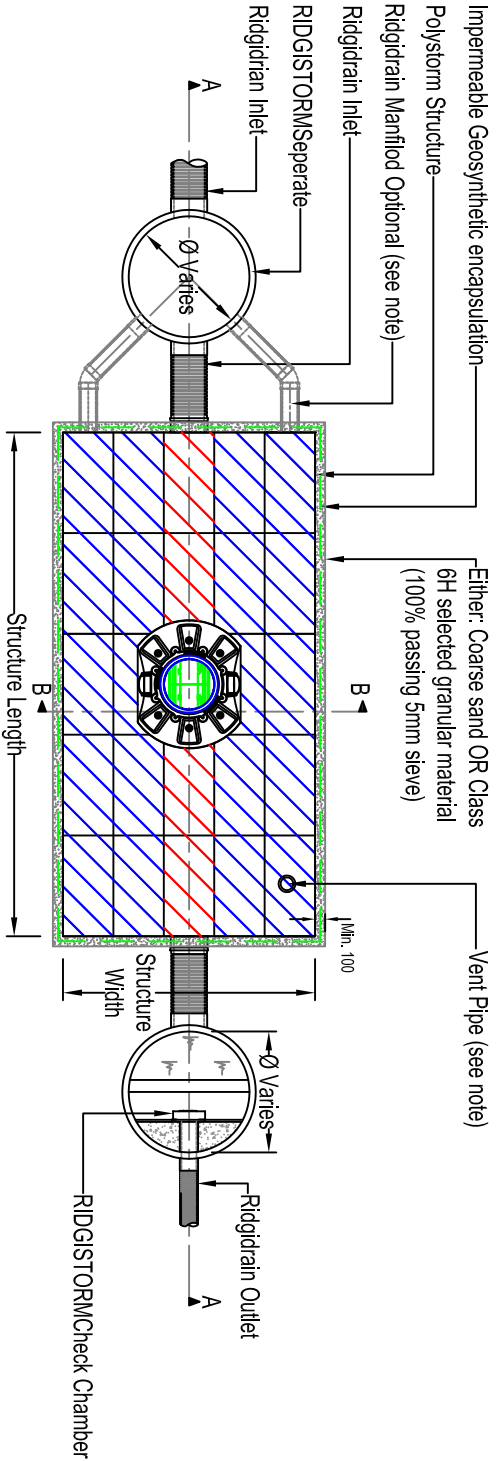
10 Aldersgate Street, London EC1A 4JU
Telephone: +44 (0)20 7831 7969
www.meinhardt.co.uk

PROJECT
ST GABRIEL'S
1 OXFORD PLACE
MANCHESTER
M14 5RP

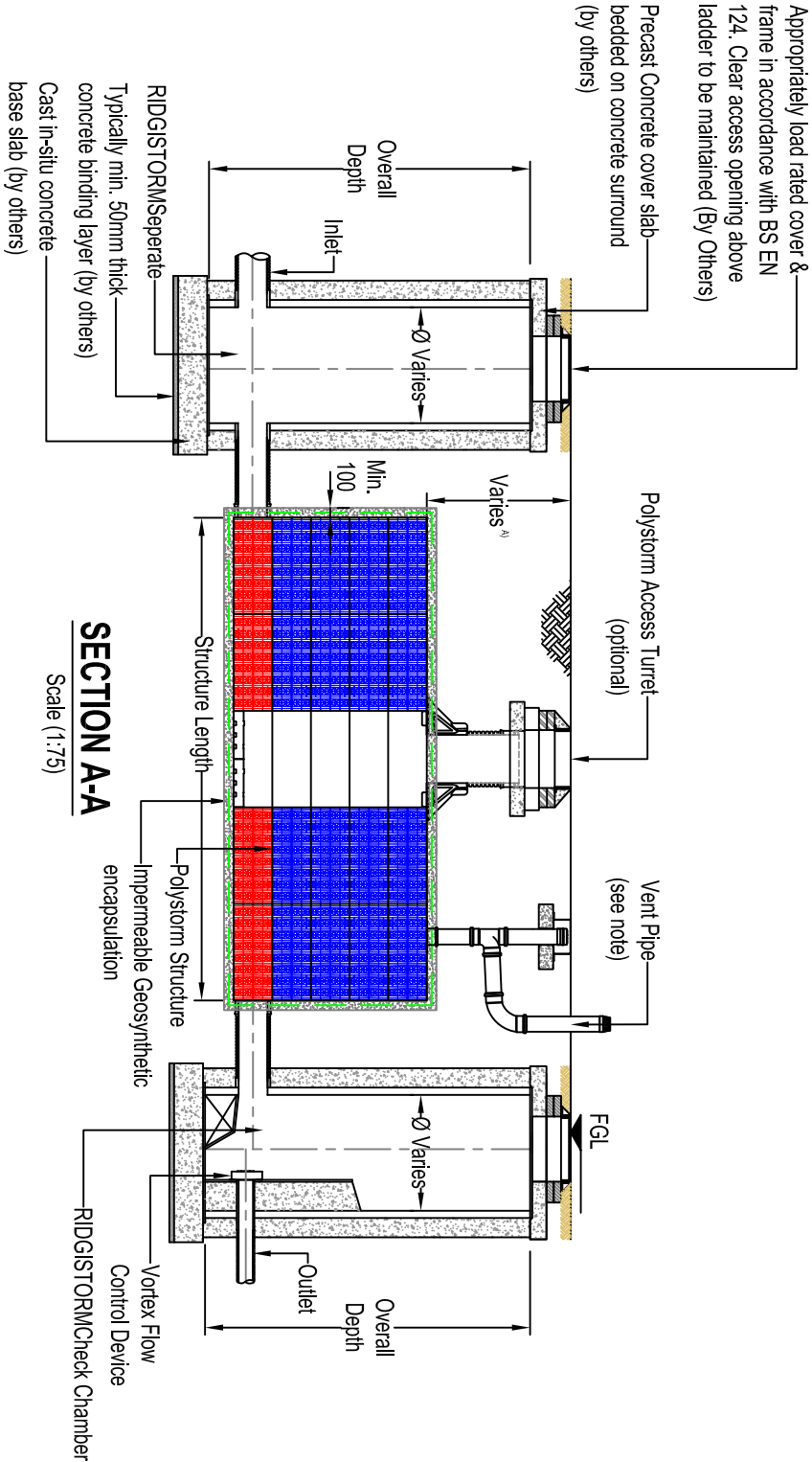
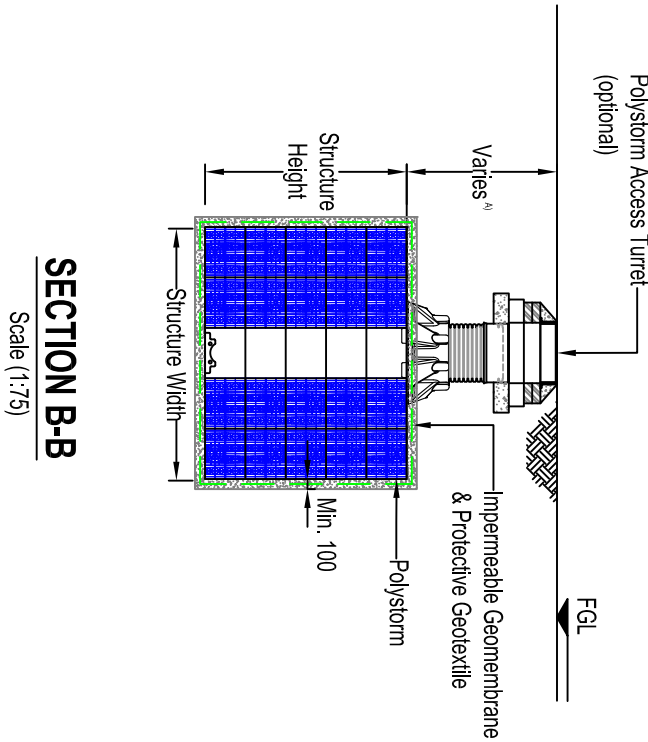
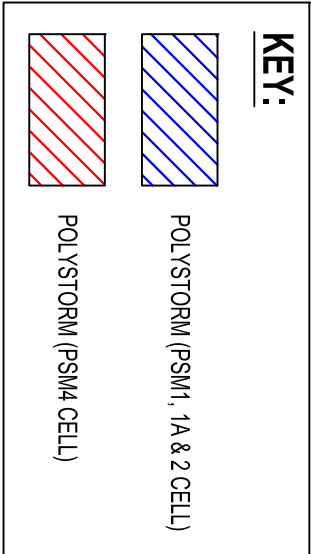
CLIENT
MCLAREN

TITLE
PROPOSED BELOW GROUND DRAINAGE
STANDARD DETAILS
SHEET 2

DISCIPLINE CIVIL			SCALE 1:20
DRAWN JD	DESIGNED JD	CHECKED GB	APPROVED GB
DRAWING No 2998-MHT-Z0-XX-DR-C-00201			ISSUE P03



TYPICAL ATTENUATION TANK PLAN
(Scale 1:75)



POLYSTORM ACCESS NOTES

1. Refer to Polypipe drawing No. PSM_SD_PSM_004 for typical integration into Polystorm structure.

VENTILATION NOTE

For information on Ventilation Options please refer to drawing ref: PSM_SD_PSM_002

MANIFOLD NOTE

Where single pipe hydraulic capacity is exceeded manifold detail may be required. For information on Manifold connections please refer to drawing ref: PSM_SD_008

NOTE A

For information on tank cover depths please refer to drawing ref: PSM_SD_PSM_005 or alternatively contact the Technical Team:- 01509 61500

NOTES

1. All dimensions in millimetres, unless otherwise stated.
2. All dimensions are nominal and may vary within manufacturing or construction tolerances.
3. All site temporary and enabling works by others.
4. Polypipe products to be installed in accordance with Polypipe civils recommendations (refer to Polypipe technical guidance for further information), giving due consideration to the requirements of the organisation who will be taking ultimate owner ship of the installation.
5. This drawing is intended for guidance only. Confirmation of the information contained within this document should be sought from the consulting engineers before final design or construction activities commence.

The information in this document is of an illustrative nature and is supplied by Polypipe Civils without charge. This document does not form the whole or any part of a contract or intended contract with the user. The information within this document should not be solely relied upon to determine the suitability or installation requirements of our products for a proposed application and expected site conditions; expert advice should be sought in this respect. Final determination of the suitability of any information or material for the use contemplated and the manner of use is the sole responsibility of the user and the user must assume all risk and liability in connection therewith. Further information with regard to liabilities may be found at www.polypipe.com/disclaimer.

PROJECT		STATUS	
POLYSTORM STANDARD DETAILS		FOR INFORMATION	
TITLE	DATE		DRAWN BY
	17/03/16		JL
	ORIGINAL SIZE	SCALE	
POLYSTORM ATTENUATION DETAIL	A3	AS SHOWN	
	DRAWING NO.	PSM_SD_PSM_001	REV.

Appendix B – Micro Drainage Calculations

Meinhardt (UK) Ltd		Page 1
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022 File Proposed Surface Water ...	Designed by GB Checked by GB	
Innovyze	Network 2020.1.3	

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	Section Type
S1.000	19.737	0.180	109.6	0.000	5.00	0.600	o	100	Pipe/Conduit
S1.001	12.908	0.142	90.9	0.005	0.00	0.600	o	150	Pipe/Conduit
S1.002	10.193	0.095	107.3	0.000	0.00	0.600	o	150	Pipe/Conduit
S1.003	8.485	0.091	93.2	0.000	0.00	0.600	o	150	Pipe/Conduit
S1.004	8.603	0.056	153.6	0.008	0.00	0.600	o	225	Pipe/Conduit
S1.005	16.729	0.112	149.4	0.000	0.00	0.600	o	225	Pipe/Conduit
S1.006	11.883	0.080	148.5	0.024	0.00	0.600	o	225	Pipe/Conduit
S2.000	12.525	0.138	90.8	0.018	5.00	0.600	o	150	Pipe/Conduit
S2.001	14.794	0.102	145.0	0.000	0.00	0.600	o	225	Pipe/Conduit
S2.002	3.940	0.023	171.3	0.027	0.00	0.600	o	225	Pipe/Conduit
S1.007	34.240	0.205	167.0	0.016	0.00	0.600	o	300	Pipe/Conduit
S3.000	11.409	0.454	25.1	0.021	5.00	0.600	o	225	Pipe/Conduit
S3.001	11.382	0.071	160.3	0.012	0.00	0.600	o	225	Pipe/Conduit
S4.000	19.575	0.073	268.1	0.055	5.00	0.600	o	300	Pipe/Conduit
S3.002	5.231	0.022	237.8	0.022	0.00	0.600	o	300	Pipe/Conduit
S3.003	10.722	0.041	261.5	0.008	0.00	0.600	o	300	Pipe/Conduit

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
S1.000	SWMH11	39.780	38.866	0.814	39.940	38.686	1.154		450
S1.001	SWMH12	39.940	38.600	1.190	39.940	38.458	1.332		450
S1.002	SWMH13	39.940	38.458	1.332	39.940	38.363	1.427		450
S1.003	SWMH14	39.940	38.363	1.427	39.990	38.272	1.568		450
S1.004	SWMH15	39.990	38.298	1.467	40.000	38.242	1.533		600
S1.005	SWMH16	40.000	38.242	1.533	40.150	38.130	1.795		600
S1.006	SWMH17	40.150	38.130	1.795	39.890	38.050	1.615		600
S2.000	SWMH20	39.600	38.223	1.227	39.600	38.085	1.365		600
S2.001	SWMH21	39.600	38.134	1.241	39.900	38.032	1.643		600
S2.002	SWMH22	39.900	38.045	1.630	39.890	38.022	1.643		600
S1.007	SWMH18	39.890	38.022	1.568	39.830	37.817	1.713		600
S3.000	SWMH23	40.100	39.100	0.775	39.400	38.646	0.529		600
S3.001	SWMH24	39.400	37.865	1.310	39.100	37.794	1.081		600
S4.000	Tank 2	40.000	37.975	1.725	39.100	37.902	0.898		150
S3.002	SWMH25	39.100	37.867	0.933	39.600	37.845	1.455		600
S3.003	SWMH26	39.600	37.845	1.455	39.830	37.804	1.726		600

Meinhardt (UK) Ltd										Page 2
10 Aldersgate Street London EC1A 4HJ					ST GABRIELS 2998 PROPOSED DRAINAGE MODEL					
Date 02/09/2022 File Proposed Surface Water ...					Designed by GB Checked by GB					
Innovyze					Network 2020.1.3					
<u>Existing Network Details for Storm</u>										
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	Section Type	
S5.000	23.426	0.160	146.4	0.036	5.00	0.600	o	225	Pipe/Conduit	
S5.001	7.259	0.060	120.0	0.000	0.00	0.600	o	225	Pipe/Conduit	
S5.002	14.933	0.105	142.2	0.018	0.00	0.600	o	300	Pipe/Conduit	
S1.008	5.400	0.021	253.5	0.034	0.00	0.600	o	225	Pipe/Conduit	
S6.000	17.883	0.189	94.6	0.000	5.00	0.600	o	150	Pipe/Conduit	
S6.001	3.823	0.029	131.8	0.031	0.00	0.600	o	225	Pipe/Conduit	
S6.002	10.698	0.076	140.8	0.004	0.00	0.600	o	225	Pipe/Conduit	
S6.003	5.356	0.044	121.7	0.005	0.00	0.600	o	225	Pipe/Conduit	
S6.004	7.850	0.044	178.4	0.028	0.00	0.600	o	225	Pipe/Conduit	
S6.005	4.614	0.010	461.4	0.014	0.00	0.600	o	225	Pipe/Conduit	
S6.006	12.733	0.081	157.2	0.000	0.00	0.600	o	225	Pipe/Conduit	
S6.007	4.520	0.060	75.3	0.000	0.00	0.600	o	225	Pipe/Conduit	
S6.008	17.341	0.119	145.7	0.030	0.00	0.600	o	225	Pipe/Conduit	
S7.000	15.810	0.735	21.5	0.006	5.00	0.600	o	150	Pipe/Conduit	
S6.009	2.073	0.025	82.9	0.000	0.00	0.600	o	225	Pipe/Conduit	
S6.010	2.517	0.013	193.6	0.009	0.00	0.600	o	225	Pipe/Conduit	
PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)	
S5.000	SWMH27	39.013	38.480	0.308	39.190	38.320	0.645		600	
S5.001	SWMH28	39.190	38.290	0.675	39.500	38.230	1.045		600	
S5.002	TANK 3	39.500	37.975	1.225	39.830	37.870	1.660		150	
S1.008	SWMH19	39.830	37.793	1.812	39.910	37.772	1.913	Hydro-Brake®	1200	
S6.000	SWMH01	39.400	38.710	0.540	39.700	38.521	1.029		450	
S6.001	SWMH02	39.700	38.521	0.954	39.700	38.492	0.983		600	
S6.002	SWMH03	39.700	38.496	0.979	39.300	38.420	0.655		600	
S6.003	SWMH04	39.300	38.420	0.655	39.200	38.376	0.599		600	
S6.004	SWMH05	39.200	38.344	0.631	39.150	38.300	0.625		600	
S6.005	TANK 1	39.150	37.765	1.160	39.200	37.755	1.220		150	
S6.006	SWMH06	39.200	37.725	1.250	39.190	37.644	1.321		600	
S6.007	SWMH07	39.190	37.644	1.321	39.240	37.584	1.431		600	
S6.008	SWMH08	39.240	37.584	1.431	39.100	37.465	1.410		600	
S7.000	SWMH10	39.230	38.200	0.880	39.100	37.465	1.485		450	
S6.009	SWMH09	39.100	37.395	1.480	39.020	37.370	1.425		600	
S6.010	EXCWMH01	39.020	37.370	1.425	39.920	37.357	2.338	Hydro-Brake®	1200	
©1982-2020 Innovyze										

Meinhardt (UK) Ltd		Page 3
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backfall (mm)
SSWMH11	39.780	0.914	Open Manhole	450	S1.000	38.866	100				
SSWMH12	39.940	1.340	Open Manhole	450	S1.001	38.600	150	S1.000	38.686	100	
SSWMH13	39.940	1.482	Open Manhole	450	S1.002	38.458	150	S1.001	38.458	150	
SSWMH14	39.940	1.577	Open Manhole	450	S1.003	38.363	150	S1.002	38.363	150	
SSWMH15	39.990	1.718	Open Manhole	600	S1.004	38.298	225	S1.003	38.272	150	
SSWMH16	40.000	1.758	Open Manhole	600	S1.005	38.242	225	S1.004	38.242	225	
SSWMH17	40.150	2.020	Open Manhole	600	S1.006	38.130	225	S1.005	38.130	225	
SSWMH20	39.600	1.377	Open Manhole	600	S2.000	38.223	150				
SSWMH21	39.600	1.515	Open Manhole	600	S2.001	38.134	225	S2.000	38.085	150	
SSWMH22	39.900	1.868	Open Manhole	600	S2.002	38.045	225	S2.001	38.032	225	
SSWMH18	39.890	1.868	Open Manhole	600	S1.007	38.022	300	S1.006	38.050	225	
								S2.002	38.022	225	
SSWMH23	40.100	1.000	Open Manhole	600	S3.000	39.100	225				
SSWMH24	39.400	1.535	Open Manhole	600	S3.001	37.865	225	S3.000	38.646	225	
STank 2	40.000	2.025	Open Manhole	150	S4.000	37.975	300				
SSWMH25	39.100	1.306	Open Manhole	600	S3.002	37.867	300	S3.001	37.794	225	
								S4.000	37.902	300	
SSWMH26	39.600	1.755	Open Manhole	600	S3.003	37.845	300	S3.002	37.845	300	
SSWMH27	39.013	0.533	Open Manhole	600	S5.000	38.480	225				
SSWMH28	39.190	0.900	Open Manhole	600	S5.001	38.290	225	S5.000	38.320	225	
STANK 3	39.500	1.525	Open Manhole	150	S5.002	37.975	300	S5.001	38.230	225	
SSWMH19	39.830	2.037	Open Manhole	1200	S1.008	37.793	225	S1.007	37.817	300	
								S3.003	37.804	300	
								S5.002	37.870	300	
SOUTFALL 2	39.910	2.138	Open Manhole	0		OUTFALL		S1.008	37.772	225	
SSWMH01	39.400	0.690	Open Manhole	450	S6.000	38.710	150				
SSWMH02	39.700	1.179	Open Manhole	600	S6.001	38.521	225	S6.000	38.521	150	
SSWMH03	39.700	1.208	Open Manhole	600	S6.002	38.496	225	S6.001	38.492	225	
SSWMH04	39.300	0.880	Open Manhole	600	S6.003	38.420	225	S6.002	38.420	225	
SSWMH05	39.200	0.856	Open Manhole	600	S6.004	38.344	225	S6.003	38.376	225	
STANK 1	39.150	1.385	Sealed Manhole	150	S6.005	37.765	225	S6.004	38.300	225	
SSWMH06	39.200	1.475	Open Manhole	600	S6.006	37.725	225	S6.005	37.755	225	
SSWMH07	39.190	1.546	Open Manhole	600	S6.007	37.644	225	S6.006	37.644	225	
SSWMH08	39.240	1.656	Open Manhole	600	S6.008	37.584	225	S6.007	37.584	225	
SSWMH10	39.230	1.030	Open Manhole	450	S7.000	38.200	150				
SSWMH09	39.100	1.705	Open Manhole	600	S6.009	37.395	225	S6.008	37.465	225	
								S7.000	37.465	150	
SEXCWMH01	39.020	1.650	Open Manhole	1200	S6.010	37.370	225	S6.009	37.370	225	

Meinhardt (UK) Ltd		Page 4
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
SOUTFALL 1	39.920	2.563	Open Manhole	0		OUTFALL		S6.010	37.357	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SSWMH11	385291.523	395733.844	385291.523	395733.844	Required	
SSWMH12	385286.260	395714.822	385286.260	395714.822	Required	
SSWMH13	385273.845	395718.355	385273.845	395718.355	Required	
SSWMH14	385263.978	395720.911	385263.978	395720.911	Required	
SSWMH15	385257.732	395726.653	385257.732	395726.653	Required	
SSWMH16	385259.628	395735.045	385259.628	395735.045	Required	
SSWMH17	385263.971	395751.201	385263.971	395751.201	Required	
SSWMH20	385296.303	395758.714	385296.303	395758.714	Required	
SSWMH21	385284.187	395761.891	385284.187	395761.891	Required	
SSWMH22	385269.838	395765.489	385269.838	395765.489	Required	
SSWMH18	385267.087	395762.668	385267.087	395762.668	Required	
SSWMH23	385223.973	395732.752	385223.973	395732.752	Required	
SSWMH24	385226.777	395743.811	385226.777	395743.811	Required	

Meinhardt (UK) Ltd		Page 5
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022 File Proposed Surface Water ...	Designed by GB Checked by GB	
Innovyze	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
STank 2	385245.127	395745.640	385245.127	395745.640	Required	
SSWMH25	385228.004	395755.127	385228.004	395755.127	Required	
SSWMH26	385228.379	395760.344	385228.379	395760.344	Required	
SSWMH27	385210.117	395750.851	385210.117	395750.851	Required	
SSWMH28	385211.849	395774.212	385211.849	395774.212	Required	
STANK 3	385218.957	395772.741	385218.957	395772.741	Required	
SSWMH19	385233.581	395769.720	385233.581	395769.720	Required	
SOUTFALL 2	385235.220	395774.865			No Entry	
SSWMH01	385197.360	395742.516	385197.360	395742.516	Required	
SSWMH02	385179.540	395744.019	385179.540	395744.019	Required	
SSWMH03	385179.802	395747.834	385179.802	395747.834	Required	
SSWMH04	385180.551	395758.506	385180.551	395758.506	Required	
SSWMH05	385180.947	395763.848	385180.947	395763.848	Required	
STANK 1	385188.780	395763.335			No Entry	
SSWMH06	385193.390	395763.145	385193.390	395763.145	Required	

Meinhardt (UK) Ltd		Page 6
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022 File Proposed Surface Water ...	Designed by GB Checked by GB	
Innovyze	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SSWMH07	385194.469	395775.832	385194.469	395775.832	Required	
SSWMH08	385194.731	395780.345	385194.731	395780.345	Required	
SSWMH10	385161.684	395782.971	385161.684	395782.971	Required	
SSWMH09	385177.447	395781.753	385177.447	395781.753	Required	
SEXCWMH01	385177.560	395783.823	385177.560	395783.823	Required	
SOUTFALL 1	385177.659	395786.338			No Entry	

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
---------------------	--------------	--------------	--------------	------------------	----------	--------

S1.008	SOUTFALL 2	39.910	37.772	37.770	0	0
--------	------------	--------	--------	--------	---	---

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
---------------------	--------------	--------------	--------------	------------------	----------	--------

S6.010	SOUTFALL 1	39.920	37.357	37.760	0	0
--------	------------	--------	--------	--------	---	---

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs 0 Number of Offline Controls 0			
Number of Online Controls 2 Number of Storage Structures 3			

Meinhardt (UK) Ltd		Page 7
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022 File Proposed Surface Water ...	Designed by GB Checked by GB	
Innovyze	Network 2020.1.3	

Simulation Criteria for Storm

Number of Time/Area Diagrams 4 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 385241 395742 SJ 85241 95742
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Meinhardt (UK) Ltd		Page 8
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: SSWMH19, DS/PN: S1.008, Volume (m³): 6.4

Unit Reference MD-SHE-0131-9000-1500-9000
Design Head (m) 1.500
Design Flow (l/s) 9.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 131
Invert Level (m) 37.793
Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	9.0
Flush-Flo™	0.440	9.0
Kick-Flo®	0.927	7.2
Mean Flow over Head Range	-	7.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.7	1.200	8.1	3.000	12.5	7.000	18.7
0.200	8.1	1.400	8.7	3.500	13.4	7.500	19.3
0.300	8.8	1.600	9.3	4.000	14.3	8.000	19.9
0.400	9.0	1.800	9.8	4.500	15.1	8.500	20.5
0.500	9.0	2.000	10.3	5.000	15.9	9.000	21.1
0.600	8.8	2.200	10.8	5.500	16.7	9.500	21.7
0.800	8.2	2.400	11.2	6.000	17.4		
1.000	7.4	2.600	11.7	6.500	18.0		

Hydro-Brake® Optimum Manhole: SEXCWMH01, DS/PN: S6.010, Volume (m³): 1.9

Unit Reference MD-SHE-0169-1600-1730-1600
Design Head (m) 1.730
Design Flow (l/s) 16.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 169
Invert Level (m) 37.370
Minimum Outlet Pipe Diameter (mm) 225
Suggested Manhole Diameter (mm) 1500

Meinhardt (UK) Ltd		Page 9
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

Hydro-Brake® Optimum Manhole: SEXCWMH01, DS/PN: S6.010, Volume (m³): 1.9

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.730	16.0
Flush-Flo™	0.501	16.0
Kick-Flo®	1.075	12.8
Mean Flow over Head Range	-	13.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.0	1.200	13.4	3.000	20.8	7.000	31.2
0.200	14.0	1.400	14.5	3.500	22.4	7.500	32.3
0.300	15.3	1.600	15.4	4.000	23.9	8.000	33.3
0.400	15.8	1.800	16.3	4.500	25.2	8.500	34.3
0.500	16.0	2.000	17.1	5.000	26.6	9.000	35.2
0.600	15.9	2.200	17.9	5.500	27.8	9.500	36.2
0.800	15.3	2.400	18.7	6.000	29.0		
1.000	13.9	2.600	19.4	6.500	30.1		

Meinhardt (UK) Ltd		Page 10
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

Storage Structures for Storm

Cellular Storage Manhole: STank 2, DS/PN: S4.000

Invert Level (m) 37.975 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	190.0	0.0	0.801	0.0	0.0
0.800	190.0	0.0			

Cellular Storage Manhole: STANK 3, DS/PN: S5.002

Invert Level (m) 37.975 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	95.0	0.0	0.801	0.0	0.0
0.800	95.0	0.0			

Cellular Storage Manhole: STANK 1, DS/PN: S6.005

Invert Level (m) 37.765 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	40.0	0.0	0.801	0.0	0.0
0.800	40.0	0.0			

Time Area Diagram for Green Roof at Pipe Number S1.001 (Storm)

Area (m³) 400 Evaporation (mm/day) 3
Depression Storage (mm) 5 Decay Coefficient 0.050

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:	From:	To:
(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)
0	4 0.007269	32	36 0.001468	64	68 0.000296	96	100 0.000060
4	8 0.005951	36	40 0.001202	68	72 0.000243	100	104 0.000049
8	12 0.004872	40	44 0.000984	72	76 0.000199	104	108 0.000040
12	16 0.003989	44	48 0.000805	76	80 0.000163	108	112 0.000033
16	20 0.003266	48	52 0.000659	80	84 0.000133	112	116 0.000027
20	24 0.002674	52	56 0.000540	84	88 0.000109	116	120 0.000022
24	28 0.002189	56	60 0.000442	88	92 0.000089		
28	32 0.001792	60	64 0.000362	92	96 0.000073		

Meinhardt (UK) Ltd			Page 11																																																																																																																																																				
10 Aldersgate Street		ST GABRIELS																																																																																																																																																					
London		2998																																																																																																																																																					
EC1A 4HJ		PROPOSED DRAINAGE MODEL																																																																																																																																																					
Date 02/09/2022		Designed by GB																																																																																																																																																					
File Proposed Surface Water ...		Checked by GB																																																																																																																																																					
Innovyze		Network 2020.1.3																																																																																																																																																					
<p><u>Time Area Diagram at Pipe Number S1.001 for Storm</u></p> <p>Total Area (ha) 0.006</p> <table><thead><tr><th colspan="2">Time (mins)</th><th>Area</th></tr><tr><th>From:</th><th>To:</th><th>(ha)</th></tr></thead><tbody><tr><td>0</td><td>4</td><td>0.006</td></tr></tbody></table> <p><u>Time Area Diagram at Pipe Number S6.000 for Storm</u></p> <p>Total Area (ha) 0.006</p> <table><thead><tr><th colspan="2">Time (mins)</th><th>Area</th></tr><tr><th>From:</th><th>To:</th><th>(ha)</th></tr></thead><tbody><tr><td>0</td><td>4</td><td>0.006</td></tr></tbody></table> <p><u>Time Area Diagram for Green Roof at Pipe Number S6.001 (Storm)</u></p> <table><tr><td>Area (m³)</td><td>315</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Depression Storage (mm)</td><td>5</td><td>Decay Coefficient</td><td>0.050</td></tr></table> <table><thead><tr><th colspan="2">Time (mins)</th><th>Area</th><th colspan="2">Time (mins)</th><th>Area</th><th colspan="2">Time (mins)</th><th>Area</th><th colspan="2">Time (mins)</th><th>Area</th></tr><tr><th>From:</th><th>To:</th><th>(ha)</th><th>From:</th><th>To:</th><th>(ha)</th><th>From:</th><th>To:</th><th>(ha)</th><th>From:</th><th>To:</th><th>(ha)</th></tr></thead><tbody><tr><td>0</td><td>4</td><td>0.005724</td><td>32</td><td>36</td><td>0.001156</td><td>64</td><td>68</td><td>0.000233</td><td>96</td><td>100</td><td>0.000047</td></tr><tr><td>4</td><td>8</td><td>0.004687</td><td>36</td><td>40</td><td>0.000946</td><td>68</td><td>72</td><td>0.000191</td><td>100</td><td>104</td><td>0.000039</td></tr><tr><td>8</td><td>12</td><td>0.003837</td><td>40</td><td>44</td><td>0.000775</td><td>72</td><td>76</td><td>0.000156</td><td>104</td><td>108</td><td>0.000032</td></tr><tr><td>12</td><td>16</td><td>0.003141</td><td>44</td><td>48</td><td>0.000634</td><td>76</td><td>80</td><td>0.000128</td><td>108</td><td>112</td><td>0.000026</td></tr><tr><td>16</td><td>20</td><td>0.002572</td><td>48</td><td>52</td><td>0.000519</td><td>80</td><td>84</td><td>0.000105</td><td>112</td><td>116</td><td>0.000021</td></tr><tr><td>20</td><td>24</td><td>0.002106</td><td>52</td><td>56</td><td>0.000425</td><td>84</td><td>88</td><td>0.000086</td><td>116</td><td>120</td><td>0.000017</td></tr><tr><td>24</td><td>28</td><td>0.001724</td><td>56</td><td>60</td><td>0.000348</td><td>88</td><td>92</td><td>0.000070</td><td></td><td></td><td></td></tr><tr><td>28</td><td>32</td><td>0.001412</td><td>60</td><td>64</td><td>0.000285</td><td>92</td><td>96</td><td>0.000058</td><td></td><td></td><td></td></tr></tbody></table>						Time (mins)		Area	From:	To:	(ha)	0	4	0.006	Time (mins)		Area	From:	To:	(ha)	0	4	0.006	Area (m³)	315	Evaporation (mm/day)	3	Depression Storage (mm)	5	Decay Coefficient	0.050	Time (mins)		Area	Time (mins)		Area	Time (mins)		Area	Time (mins)		Area	From:	To:	(ha)	From:	To:	(ha)	From:	To:	(ha)	From:	To:	(ha)	0	4	0.005724	32	36	0.001156	64	68	0.000233	96	100	0.000047	4	8	0.004687	36	40	0.000946	68	72	0.000191	100	104	0.000039	8	12	0.003837	40	44	0.000775	72	76	0.000156	104	108	0.000032	12	16	0.003141	44	48	0.000634	76	80	0.000128	108	112	0.000026	16	20	0.002572	48	52	0.000519	80	84	0.000105	112	116	0.000021	20	24	0.002106	52	56	0.000425	84	88	0.000086	116	120	0.000017	24	28	0.001724	56	60	0.000348	88	92	0.000070				28	32	0.001412	60	64	0.000285	92	96	0.000058			
Time (mins)		Area																																																																																																																																																					
From:	To:	(ha)																																																																																																																																																					
0	4	0.006																																																																																																																																																					
Time (mins)		Area																																																																																																																																																					
From:	To:	(ha)																																																																																																																																																					
0	4	0.006																																																																																																																																																					
Area (m³)	315	Evaporation (mm/day)	3																																																																																																																																																				
Depression Storage (mm)	5	Decay Coefficient	0.050																																																																																																																																																				
Time (mins)		Area	Time (mins)		Area	Time (mins)		Area	Time (mins)		Area																																																																																																																																												
From:	To:	(ha)	From:	To:	(ha)	From:	To:	(ha)	From:	To:	(ha)																																																																																																																																												
0	4	0.005724	32	36	0.001156	64	68	0.000233	96	100	0.000047																																																																																																																																												
4	8	0.004687	36	40	0.000946	68	72	0.000191	100	104	0.000039																																																																																																																																												
8	12	0.003837	40	44	0.000775	72	76	0.000156	104	108	0.000032																																																																																																																																												
12	16	0.003141	44	48	0.000634	76	80	0.000128	108	112	0.000026																																																																																																																																												
16	20	0.002572	48	52	0.000519	80	84	0.000105	112	116	0.000021																																																																																																																																												
20	24	0.002106	52	56	0.000425	84	88	0.000086	116	120	0.000017																																																																																																																																												
24	28	0.001724	56	60	0.000348	88	92	0.000070																																																																																																																																															
28	32	0.001412	60	64	0.000285	92	96	0.000058																																																																																																																																															
©1982-2020 Innovyze																																																																																																																																																							

Meinhardt (UK) Ltd		Page 12
10 Aldersgate Street	ST GABRIELS	
London	2998	
EC1A 4HJ	PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	3
Number of Online Controls	2	Number of Time/Area Diagrams	4
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30, 100, 101
Climate Change (%)	0, 0, 0, 45

US/MH				Return	Climate	First (X)	First (Y)	First (Z)	Overflow
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	
S1.000	SSWMH11	15	Summer	2	+0%	101/15	Summer		
S1.001	SSWMH12	120	Summer	2	+0%	101/15	Summer		
S1.002	SSWMH13	60	Winter	2	+0%	100/15	Summer		
S1.003	SSWMH14	120	Summer	2	+0%	30/15	Summer		
S1.004	SSWMH15	120	Summer	2	+0%	100/15	Summer		
S1.005	SSWMH16	120	Summer	2	+0%	30/15	Summer		
S1.006	SSWMH17	30	Summer	2	+0%	30/15	Summer		
S2.000	SSWMH20	15	Summer	2	+0%	30/15	Summer		
S2.001	SSWMH21	30	Summer	2	+0%	30/15	Summer		
S2.002	SSWMH22	30	Summer	2	+0%	30/15	Summer		
S1.007	SSWMH18	30	Summer	2	+0%	30/15	Summer		
S3.000	SSWMH23	15	Summer	2	+0%				
S3.001	SSWMH24	30	Summer	2	+0%	2/15	Summer		
S4.000	STank 2	120	Summer	2	+0%	100/30	Summer		
S3.002	SSWMH25	30	Summer	2	+0%	30/15	Summer		
S3.003	SSWMH26	30	Summer	2	+0%	2/15	Summer		

Meinhardt (UK) Ltd		Page 13
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SSWMH11	38.866	-0.100	0.000	0.00		0.0	OK
S1.001	SSWMH12	38.639	-0.111	0.000	0.14		2.4	OK
S1.002	SSWMH13	38.499	-0.109	0.000	0.15		2.3	OK
S1.003	SSWMH14	38.402	-0.111	0.000	0.15		2.4	OK
S1.004	SSWMH15	38.346	-0.177	0.000	0.09		3.1	OK
S1.005	SSWMH16	38.284	-0.183	0.000	0.08		3.0	OK
S1.006	SSWMH17	38.199	-0.156	0.000	0.16		5.7	OK
S2.000	SSWMH20	38.269	-0.104	0.000	0.20		3.4	OK
S2.001	SSWMH21	38.193	-0.166	0.000	0.08		3.0	OK
S2.002	SSWMH22	38.187	-0.083	0.000	0.34		9.3	OK
S1.007	SSWMH18	38.182	-0.140	0.000	0.20		16.0	OK
S3.000	SSWMH23	39.130	-0.195	0.000	0.04		3.9	OK
S3.001	SSWMH24	38.159	0.069	0.000	0.15		5.1	SURCHARGED
S4.000	STank 2	38.063	-0.212	0.000	0.05	63	2.7	OK
S3.002	SSWMH25	38.152	-0.015	0.000	0.05		2.6	OK
S3.003	SSWMH26	38.161	0.016	0.000	0.05		2.7	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	SSWMH11	
S1.001	SSWMH12	
S1.002	SSWMH13	
S1.003	SSWMH14	
S1.004	SSWMH15	
S1.005	SSWMH16	
S1.006	SSWMH17	
S2.000	SSWMH20	
S2.001	SSWMH21	
S2.002	SSWMH22	
S1.007	SSWMH18	
S3.000	SSWMH23	
S3.001	SSWMH24	
S4.000	STank 2	
S3.002	SSWMH25	
S3.003	SSWMH26	

Meinhardt (UK) Ltd		Page 14
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S5.000	SSWMH27	15 Summer	2	+0%	101/120 Summer			
S5.001	SSWMH28	15 Summer	2	+0%	101/30 Summer			
S5.002	STANK 3	120 Summer	2	+0%	30/30 Summer			
S1.008	SSWMH19	30 Summer	2	+0%	2/15 Summer			
S6.000	SSWMH01	15 Summer	2	+0%				
S6.001	SSWMH02	120 Summer	2	+0%	101/60 Summer			
S6.002	SSWMH03	120 Summer	2	+0%	101/60 Summer			
S6.003	SSWMH04	120 Summer	2	+0%	101/60 Summer			
S6.004	SSWMH05	15 Summer	2	+0%	101/15 Summer			
S6.005	STANK 1	30 Summer	2	+0%	100/15 Summer			
S6.006	SSWMH06	30 Summer	2	+0%	30/30 Summer			
S6.007	SSWMH07	30 Summer	2	+0%	30/15 Summer			
S6.008	SSWMH08	30 Summer	2	+0%	30/15 Summer			
S7.000	SSWMH10	15 Summer	2	+0%	101/15 Summer			
S6.009	SSWMH09	30 Summer	2	+0%	30/15 Summer			
S6.010	SEXCWMMH01	30 Summer	2	+0%	30/15 Summer			

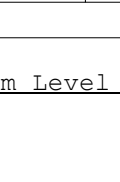
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S5.000	SSWMH27	38.542	-0.163	0.000	0.17		6.6	OK
S5.001	SSWMH28	38.357	-0.158	0.000	0.19		6.6	OK
S5.002	STANK 3	38.089	-0.186	0.000	0.03	61	2.7	OK
S1.008	SSWMH19	38.164	0.146	0.000	0.37		8.9	SURCHARGED
S6.000	SSWMH01	38.737	-0.123	0.000	0.07		1.2	OK
S6.001	SSWMH02	38.559	-0.187	0.000	0.07		2.0	OK
S6.002	SSWMH03	38.533	-0.188	0.000	0.06		2.3	OK
S6.003	SSWMH04	38.466	-0.179	0.000	0.09		2.7	OK
S6.004	SSWMH05	38.418	-0.151	0.000	0.23		6.9	OK
S6.005	STANK 1	37.837	-0.153	0.000	0.23	21	5.5	OK
S6.006	SSWMH06	37.784	-0.166	0.000	0.15		5.5	OK
S6.007	SSWMH07	37.704	-0.165	0.000	0.16		5.5	OK
S6.008	SSWMH08	37.656	-0.153	0.000	0.22		8.3	OK
S7.000	SSWMH10	38.218	-0.132	0.000	0.03		1.2	OK
S6.009	SSWMH09	37.533	-0.087	0.000	0.30		8.9	OK
S6.010	SEXCWMMH01	37.529	-0.066	0.000	0.35		9.8	OK

PN	US/MH Name	Level Exceeded
S5.000	SSWMH27	
S5.001	SSWMH28	
S5.002	STANK 3	
S1.008	SSWMH19	

Meinhardt (UK) Ltd		Page 15
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022 File Proposed Surface Water ...	Designed by GB Checked by GB	
Innovyze	Network 2020.1.3	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Level Exceeded
S6.000	SSWMH01	
S6.001	SSWMH02	
S6.002	SSWMH03	
S6.003	SSWMH04	
S6.004	SSWMH05	
S6.005	STANK 1	
S6.006	SSWMH06	
S6.007	SSWMH07	
S6.008	SSWMH08	
S7.000	SSWMH10	
S6.009	SSWMH09	
S6.010	SEXCWMH01	

Meinhardt (UK) Ltd		Page 16
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022 File Proposed Surface Water ...	Designed by GB Checked by GB	
Innovyze	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	3
Number of Online Controls	2	Number of Time/Area Diagrams	4
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

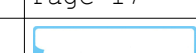
Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 385241 395742 SJ 85241 95742
Data Type	Point
Cv (Summer)	0.950
Cv (Winter)	0.950

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30, 100, 101
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SSWMH11	15 Summer	30	+0%	101/15 Summer			
S1.001	SSWMH12	60 Summer	30	+0%	101/15 Summer			
S1.002	SSWMH13	15 Summer	30	+0%	100/15 Summer			
S1.003	SSWMH14	15 Summer	30	+0%	30/15 Summer			
S1.004	SSWMH15	15 Summer	30	+0%	100/15 Summer			
S1.005	SSWMH16	15 Summer	30	+0%	30/15 Summer			
S1.006	SSWMH17	15 Summer	30	+0%	30/15 Summer			
S2.000	SSWMH20	15 Summer	30	+0%	30/15 Summer			
S2.001	SSWMH21	15 Summer	30	+0%	30/15 Summer			
S2.002	SSWMH22	15 Summer	30	+0%	30/15 Summer			
S1.007	SSWMH18	30 Summer	30	+0%	30/15 Summer			
S3.000	SSWMH23	15 Summer	30	+0%				
S3.001	SSWMH24	15 Summer	30	+0%	2/15 Summer			
S4.000	STank 2	120 Winter	30	+0%	100/30 Summer			
S3.002	SSWMH25	30 Summer	30	+0%	30/15 Summer			
S3.003	SSWMH26	30 Summer	30	+0%	2/15 Summer			

©1982-2020 Innovyze

Meinhardt (UK) Ltd		Page 17
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SSWMH11	38.866	-0.100	0.000	0.00		0.0	OK
S1.001	SSWMH12	38.665	-0.085	0.000	0.37		6.4	OK
S1.002	SSWMH13	38.533	-0.075	0.000	0.30		4.6	OK
S1.003	SSWMH14	38.526	0.013	0.000	0.29		4.7	SURCHARGED
S1.004	SSWMH15	38.506	-0.017	0.000	0.19		6.4	OK
S1.005	SSWMH16	38.497	0.030	0.000	0.20		7.7	SURCHARGED
S1.006	SSWMH17	38.481	0.126	0.000	0.42		15.4	SURCHARGED
S2.000	SSWMH20	38.565	0.192	0.000	0.47		7.9	SURCHARGED
S2.001	SSWMH21	38.512	0.153	0.000	0.21		8.1	SURCHARGED
S2.002	SSWMH22	38.493	0.223	0.000	0.82		22.3	SURCHARGED
S1.007	SSWMH18	38.423	0.101	0.000	0.51		40.5	SURCHARGED
S3.000	SSWMH23	39.147	-0.178	0.000	0.10		8.8	OK
S3.001	SSWMH24	38.319	0.229	0.000	0.41		14.4	SURCHARGED
S4.000	STank 2	38.259	-0.016	0.000	0.06		3.8	OK
S3.002	SSWMH25	38.295	0.128	0.000	0.08		3.8	SURCHARGED
S3.003	SSWMH26	38.305	0.160	0.000	0.07		3.8	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	SSWMH11	
S1.001	SSWMH12	
S1.002	SSWMH13	
S1.003	SSWMH14	
S1.004	SSWMH15	
S1.005	SSWMH16	
S1.006	SSWMH17	
S2.000	SSWMH20	
S2.001	SSWMH21	
S2.002	SSWMH22	
S1.007	SSWMH18	
S3.000	SSWMH23	
S3.001	SSWMH24	
S4.000	STank 2	
S3.002	SSWMH25	
S3.003	SSWMH26	

Meinhardt (UK) Ltd		Page 18
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S5.000	SSWMH27	15 Summer	30	+0%	101/120 Summer			
S5.001	SSWMH28	15 Summer	30	+0%	101/30 Summer			
S5.002	STANK 3	60 Winter	30	+0%	30/30 Summer			
S1.008	SSWMH19	30 Summer	30	+0%	2/15 Summer			
S6.000	SSWMH01	15 Summer	30	+0%				
S6.001	SSWMH02	60 Summer	30	+0%	101/60 Summer			
S6.002	SSWMH03	30 Winter	30	+0%	101/60 Summer			
S6.003	SSWMH04	60 Summer	30	+0%	101/60 Summer			
S6.004	SSWMH05	15 Summer	30	+0%	101/15 Summer			
S6.005	STANK 1	30 Summer	30	+0%	100/15 Summer			
S6.006	SSWMH06	30 Summer	30	+0%	30/30 Summer			
S6.007	SSWMH07	15 Summer	30	+0%	30/15 Summer			
S6.008	SSWMH08	15 Summer	30	+0%	30/15 Summer			
S7.000	SSWMH10	15 Summer	30	+0%	101/15 Summer			
S6.009	SSWMH09	15 Summer	30	+0%	30/15 Summer			
S6.010	SEXCW01	15 Summer	30	+0%	30/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S5.000	SSWMH27	38.577	-0.128	0.000	0.38		14.8	OK
S5.001	SSWMH28	38.394	-0.121	0.000	0.43		15.0	OK
S5.002	STANK 3	38.308	0.033	0.000	0.08	107	6.6	SURCHARGED
S1.008	SSWMH19	38.314	0.296	0.000	0.37		9.0	SURCHARGED
S6.000	SSWMH01	38.751	-0.109	0.000	0.16		2.8	OK
S6.001	SSWMH02	38.585	-0.161	0.000	0.18		5.4	OK
S6.002	SSWMH03	38.560	-0.161	0.000	0.17		6.2	OK
S6.003	SSWMH04	38.500	-0.145	0.000	0.27		8.0	OK
S6.004	SSWMH05	38.480	-0.089	0.000	0.67		20.1	OK
S6.005	STANK 1	37.971	-0.019	0.000	0.63	13	15.3	OK
S6.006	SSWMH06	37.965	0.015	0.000	0.43		15.3	SURCHARGED
S6.007	SSWMH07	37.966	0.097	0.000	0.44		15.3	SURCHARGED
S6.008	SSWMH08	37.972	0.163	0.000	0.42		16.2	SURCHARGED
S7.000	SSWMH10	38.227	-0.123	0.000	0.07		2.7	OK
S6.009	SSWMH09	37.955	0.335	0.000	0.54		16.3	SURCHARGED
S6.010	SEXCW01	37.951	0.356	0.000	0.57		16.0	SURCHARGED

PN	US/MH Name	Level Exceeded
S5.000	SSWMH27	
S5.001	SSWMH28	
S5.002	STANK 3	
S1.008	SSWMH19	

Meinhardt (UK) Ltd		Page 19
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022 File Proposed Surface Water ...	Designed by GB Checked by GB	
Innovyze	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Level Exceeded
S6.000	SSWMH01	
S6.001	SSWMH02	
S6.002	SSWMH03	
S6.003	SSWMH04	
S6.004	SSWMH05	
S6.005	STANK 1	
S6.006	SSWMH06	
S6.007	SSWMH07	
S6.008	SSWMH08	
S7.000	SSWMH10	
S6.009	SSWMH09	
S6.010	SEXCWMH01	

Meinhardt (UK) Ltd		Page 21
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SSWMH11	38.866	-0.100	0.000	0.00		0.0	OK
S1.001	SSWMH12	38.690	-0.060	0.000	0.57		9.7	OK
S1.002	SSWMH13	38.648	0.040	0.000	0.64		9.8	SURCHARGED
S1.003	SSWMH14	38.627	0.114	0.000	0.46		7.4	SURCHARGED
S1.004	SSWMH15	38.623	0.100	0.000	0.28		9.2	SURCHARGED
S1.005	SSWMH16	38.612	0.145	0.000	0.27		10.3	SURCHARGED
S1.006	SSWMH17	38.594	0.239	0.000	0.61		22.2	SURCHARGED
S2.000	SSWMH20	38.674	0.301	0.000	0.63		10.7	SURCHARGED
S2.001	SSWMH21	38.616	0.257	0.000	0.29		10.9	SURCHARGED
S2.002	SSWMH22	38.596	0.326	0.000	1.14		31.1	SURCHARGED
S1.007	SSWMH18	38.503	0.181	0.000	0.62		48.6	SURCHARGED
S3.000	SSWMH23	39.156	-0.169	0.000	0.14		12.3	OK
S3.001	SSWMH24	38.430	0.340	0.000	0.17		6.0	SURCHARGED
S4.000	STank 2	38.428	0.153	0.000	0.08		4.4	SURCHARGED
S3.002	SSWMH25	38.429	0.262	0.000	0.08		4.0	SURCHARGED
S3.003	SSWMH26	38.429	0.284	0.000	0.07		4.0	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	SSWMH11	
S1.001	SSWMH12	
S1.002	SSWMH13	
S1.003	SSWMH14	
S1.004	SSWMH15	
S1.005	SSWMH16	
S1.006	SSWMH17	
S2.000	SSWMH20	
S2.001	SSWMH21	
S2.002	SSWMH22	
S1.007	SSWMH18	
S3.000	SSWMH23	
S3.001	SSWMH24	
S4.000	STank 2	
S3.002	SSWMH25	
S3.003	SSWMH26	

Meinhardt (UK) Ltd		Page 22
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) SurchARGE	First (Y) Flood	First (Z) Overflow	Overflow Act.
S5.000	SSWMH27	15 Summer	100	+0%	101/120 Summer			
S5.001	SSWMH28	120 Winter	100	+0%	101/30 Summer			
S5.002	STANK 3	120 Winter	100	+0%	30/30 Summer			
S1.008	SSWMH19	120 Winter	100	+0%	2/15 Summer			
S6.000	SSWMH01	15 Summer	100	+0%				
S6.001	SSWMH02	30 Summer	100	+0%	101/60 Summer			
S6.002	SSWMH03	30 Summer	100	+0%	101/60 Summer			
S6.003	SSWMH04	30 Summer	100	+0%	101/60 Summer			
S6.004	SSWMH05	15 Summer	100	+0%	101/15 Summer			
S6.005	STANK 1	60 Summer	100	+0%	100/15 Summer			
S6.006	SSWMH06	60 Summer	100	+0%	30/30 Summer			
S6.007	SSWMH07	60 Summer	100	+0%	30/15 Summer			
S6.008	SSWMH08	60 Summer	100	+0%	30/15 Summer			
S7.000	SSWMH10	15 Summer	100	+0%	101/15 Summer			
S6.009	SSWMH09	15 Summer	100	+0%	30/15 Summer			
S6.010	SEXCWMH01	15 Summer	100	+0%	30/15 Summer			

PN	US/MH Name	Water			Surcharged		Flooded		Half Drain Time (mins)	Pipe Flow (l/s)	Status
		Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)					
S5.000	SSWMH27	38.598	-0.107	0.000	0.52					20.6	OK
S5.001	SSWMH28	38.431	-0.084	0.000	0.19					6.4	OK
S5.002	STANK 3	38.430	0.155	0.000	0.03					2.6	SURCHARGED
S1.008	SSWMH19	38.429	0.411	0.000	0.37					9.0	SURCHARGED
S6.000	SSWMH01	38.758	-0.102	0.000	0.23					3.9	OK
S6.001	SSWMH02	38.603	-0.143	0.000	0.28					8.5	OK
S6.002	SSWMH03	38.581	-0.140	0.000	0.29					10.5	OK
S6.003	SSWMH04	38.529	-0.116	0.000	0.44					13.2	OK
S6.004	SSWMH05	38.517	-0.052	0.000	0.93					27.9	OK
S6.005	STANK 1	38.182	0.192	0.000	0.67			23	16.4	16.4	SURCHARGED*
S6.006	SSWMH06	38.176	0.226	0.000	0.46					16.5	SURCHARGED
S6.007	SSWMH07	38.178	0.309	0.000	0.48					16.4	SURCHARGED
S6.008	SSWMH08	38.177	0.368	0.000	0.45					17.1	SURCHARGED
S7.000	SSWMH10	38.232	-0.118	0.000	0.10					3.7	OK
S6.009	SSWMH09	38.164	0.544	0.000	0.58					17.3	SURCHARGED
S6.010	SEXCWMH01	38.161	0.566	0.000	0.57					16.0	SURCHARGED

PN	US/MH Name	Level Exceeded
S5.000	SSWMH27	
S5.001	SSWMH28	
S5.002	STANK 3	
S1.008	SSWMH19	

Meinhardt (UK) Ltd		Page 23
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>		

Meinhardt (UK) Ltd

10 Aldersgate Street
London
EC1A 4HJ

Date 02/09/2022
File Proposed Surface Water ...

Innovyze

ST GABRIELS
2998
PROPOSED DRAINAGE MODEL

Designed by GB
Checked by GB

Network 2020.1.3

Page 24



101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 0.000

Hot Start (mins) 0

MADD Factor * 10m³/ha Storage 2.000

Hot Start Level (mm) 0

Inlet Coeffiecient 0.800

Manhole Headloss Coeff (Global) 0.500

Flow per Person per Day (l/per/day) 0.000

Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0

Number of Storage Structures 3

Number of Online Controls 2

Number of Time/Area Diagrams 4

Number of Offline Controls 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH

FEH Rainfall Version 2013

Site Location GB 385241 395742 SJ 85241 95742

Data Type Point

Cv (Summer) 0.950

Cv (Winter) 0.950

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status OFF

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years) 2, 30, 100, 101

Climate Change (%) 0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SSWMH11	30 Summer	101	+45%	101/15 Summer			
S1.001	SSWMH12	30 Summer	101	+45%	101/15 Summer			
S1.002	SSWMH13	30 Summer	101	+45%	100/15 Summer			
S1.003	SSWMH14	30 Summer	101	+45%	30/15 Summer			
S1.004	SSWMH15	30 Summer	101	+45%	100/15 Summer			
S1.005	SSWMH16	30 Summer	101	+45%	30/15 Summer			
S1.006	SSWMH17	30 Summer	101	+45%	30/15 Summer			
S2.000	SSWMH20	15 Summer	101	+45%	30/15 Summer			
S2.001	SSWMH21	15 Summer	101	+45%	30/15 Summer			
S2.002	SSWMH22	30 Summer	101	+45%	30/15 Summer			
S1.007	SSWMH18	240 Winter	101	+45%	30/15 Summer			
S3.000	SSWMH23	15 Summer	101	+45%				
S3.001	SSWMH24	240 Winter	101	+45%	2/15 Summer			
S4.000	STank 2	240 Winter	101	+45%	100/30 Summer			
S3.002	SSWMH25	240 Winter	101	+45%	30/15 Summer			
S3.003	SSWMH26	240 Winter	101	+45%	2/15 Summer			

©1982-2020 Innovyze

Meinhardt (UK) Ltd		Page 25
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SSWMH11	39.129	0.163	0.000	0.03		0.2	SURCHARGED
S1.001	SSWMH12	39.131	0.381	0.000	0.82		13.9	SURCHARGED
S1.002	SSWMH13	39.048	0.440	0.000	0.92		14.0	SURCHARGED
S1.003	SSWMH14	38.975	0.462	0.000	0.89		14.3	SURCHARGED
S1.004	SSWMH15	38.912	0.389	0.000	0.55		18.4	SURCHARGED
S1.005	SSWMH16	38.871	0.404	0.000	0.49		18.6	SURCHARGED
S1.006	SSWMH17	38.838	0.483	0.000	0.93		33.9	SURCHARGED
S2.000	SSWMH20	38.941	0.568	0.000	0.91		15.4	SURCHARGED
S2.001	SSWMH21	38.845	0.486	0.000	0.41		15.6	SURCHARGED
S2.002	SSWMH22	38.820	0.550	0.000	1.36		36.9	SURCHARGED
S1.007	SSWMH18	38.763	0.441	0.000	0.28		22.0	SURCHARGED
S3.000	SSWMH23	39.168	-0.157	0.000	0.20		17.8	OK
S3.001	SSWMH24	38.757	0.667	0.000	0.15		5.1	SURCHARGED
S4.000	STank 2	38.756	0.481	0.000	0.07		3.9	SURCHARGED
S3.002	SSWMH25	38.756	0.589	0.000	0.08		3.8	SURCHARGED
S3.003	SSWMH26	38.756	0.611	0.000	0.07		3.9	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	SSWMH11	
S1.001	SSWMH12	
S1.002	SSWMH13	
S1.003	SSWMH14	
S1.004	SSWMH15	
S1.005	SSWMH16	
S1.006	SSWMH17	
S2.000	SSWMH20	
S2.001	SSWMH21	
S2.002	SSWMH22	
S1.007	SSWMH18	
S3.000	SSWMH23	
S3.001	SSWMH24	
S4.000	STank 2	
S3.002	SSWMH25	
S3.003	SSWMH26	

Meinhardt (UK) Ltd		Page 26
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022	Designed by GB	
File Proposed Surface Water ...	Checked by GB	
Innovyze	Network 2020.1.3	

101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S5.000	SSWMH27	240 Winter	101	+45%	101/120 Summer			
S5.001	SSWMH28	240 Winter	101	+45%	101/30 Summer			
S5.002	STANK 3	240 Winter	101	+45%	30/30 Summer			
S1.008	SSWMH19	240 Winter	101	+45%	2/15 Summer			
S6.000	SSWMH01	15 Summer	101	+45%				
S6.001	SSWMH02	60 Summer	101	+45%	101/60 Summer			
S6.002	SSWMH03	60 Summer	101	+45%	101/60 Summer			
S6.003	SSWMH04	60 Summer	101	+45%	101/60 Summer			
S6.004	SSWMH05	60 Summer	101	+45%	101/15 Summer			
S6.005	STANK 1	60 Summer	101	+45%	100/15 Summer			
S6.006	SSWMH06	60 Summer	101	+45%	30/30 Summer			
S6.007	SSWMH07	60 Summer	101	+45%	30/15 Summer			
S6.008	SSWMH08	60 Summer	101	+45%	30/15 Summer			
S7.000	SSWMH10	60 Summer	101	+45%	101/15 Summer			
S6.009	SSWMH09	60 Summer	101	+45%	30/15 Summer			
S6.010	SEXCWMMH01	60 Summer	101	+45%	30/15 Summer			

PN	US/MH Name	Water Level		Surcharged Depth		Flooded Volume		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
		(m)	(m)	(m)	(m)	(m ³)	(m ³)					
S5.000	SSWMH27	38.758		0.053		0.000		0.14			5.5	FLOOD RISK
S5.001	SSWMH28	38.757		0.242		0.000		0.16			5.4	SURCHARGED
S5.002	STANK 3	38.756		0.481		0.000		0.03			2.1	SURCHARGED
S1.008	SSWMH19	38.756		0.738		0.000		0.37			9.0	SURCHARGED
S6.000	SSWMH01	38.769		-0.091		0.000		0.33			5.7	OK
S6.001	SSWMH02	38.757		0.011		0.000		0.37			11.1	SURCHARGED
S6.002	SSWMH03	38.753		0.032		0.000		0.36			13.3	SURCHARGED
S6.003	SSWMH04	38.743		0.098		0.000		0.55			16.4	SURCHARGED
S6.004	SSWMH05	38.737		0.168		0.000		1.10			33.0	SURCHARGED
S6.005	STANK 1	38.726		0.736		0.000		0.67		38	16.4	SURCHARGED*
S6.006	SSWMH06	38.718		0.768		0.000		0.46			16.4	SURCHARGED
S6.007	SSWMH07	38.700		0.831		0.000		0.48			16.5	SURCHARGED
S6.008	SSWMH08	38.693		0.884		0.000		0.43			16.3	SURCHARGED
S7.000	SSWMH10	38.670		0.320		0.000		0.10			3.7	SURCHARGED
S6.009	SSWMH09	38.667		1.047		0.000		0.54			16.2	SURCHARGED
S6.010	SEXCWMMH01	38.662		1.067		0.000		0.57			16.0	SURCHARGED

PN	US/MH Name	Level Exceeded
S5.000	SSWMH27	
S5.001	SSWMH28	
S5.002	STANK 3	
S1.008	SSWMH19	

Meinhardt (UK) Ltd		Page 27
10 Aldersgate Street London EC1A 4HJ	ST GABRIELS 2998 PROPOSED DRAINAGE MODEL	
Date 02/09/2022 File Proposed Surface Water ...	Designed by GB Checked by GB	
Innovyze	Network 2020.1.3	

101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

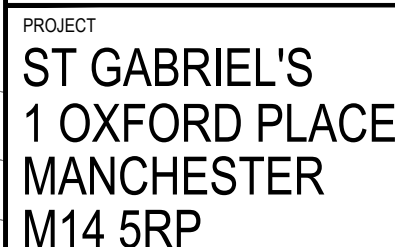
PN	US/MH Name	Level Exceeded
S6.000	SSWMH01	
S6.001	SSWMH02	
S6.002	SSWMH03	
S6.003	SSWMH04	
S6.004	SSWMH05	
S6.005	STANK 1	
S6.006	SSWMH06	
S6.007	SSWMH07	
S6.008	SSWMH08	
S7.000	SSWMH10	
S6.009	SSWMH09	
S6.010	SEXCWMH01	

Appendix C – Overland Flow Routes

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING IS FOR STAGE 3 INFORMATION ONLY.
4. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELAYING ARCHITECTS, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.
5. THIS DRAWING IS BASED ON:
 - SIMPSON HAUGH ARCHITECTURAL DRAWING - 10349-SHP-Z-A-6100-PL-00-001 P08 PROPOSED GROUND FLOOR PLAN - RECEIVED 29.06.23
 - RE-FORM LANDSCAPING PLAN - 0919-RFM-XD-00-00-R-0006-P01-LANDSCAPE WORKING DRAWING RECEIVED 29.06.23
 - LANDSCAPE LEVELS PLAN - 0919-RFM-XD-00-00-M2-0001-P01-LANDSCAPE WORKING DRAWING RECEIVED 23/05/21
 - CHORD ABOVE GROUND DRAINAGE DRAWINGS RECEIVED 29.06.23
 - UNITED UTILITIES SEWER RECORDS DATED SEPTEMBER 2001
 - LASER SURVEYS LTD CCTV SURVEY DRAWING - LAYERSERV0001116 REV A DATED 22.02.22

 SITE BOUNDARY
 OVERLAND FLOW PATH

CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS



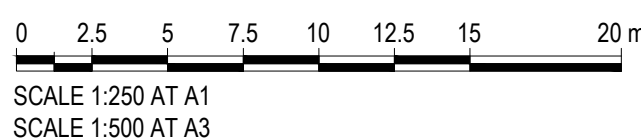
CLIENT
MCLAREN

TITLE	SURFACE WATER OVERLAND FLOW PATHS
-------	-----------------------------------

DISCIPLINE CIVIL			SCALE 1:250
DRAWN	DESIGNED GB	CHECKED GB	APPROVED GB
DRAWING No 2998-MHT-Z0-00-DR-C-00105			ISSUE P01



OXFORD PLACE



Appendix D – United Utilities Approvals

Manchester City Council
By email

Your ref: CDN/23/0625
Our ref: DC/23/3494 v2
Date: 02-NOV-23

Dear Planning Team

Location: St Gabriels Hall 1 Oxford Place Manchester M14 5RP.
Proposal: Discharge of Conditions 13 (Drainage) of 135278/FO/2022.

Further to our review of the submitted documents, United Utilities has no objection to condition 13 being discharged.

The applicant can discuss their drainage proposals with an **Engineer from our Developer Services team by email at SewerAdoptions@uuplc.co.uk**.

Alternative ways to contact the team are detailed in '*Useful information for the applicant*', *Section 3. Contacts*'.

We request that a copy of this letter is made available to the applicant.

Yours faithfully

Planning, Landscape and Ecology Team

Useful information for the applicant:

1. DRAINAGE

We strongly encourage all developments to include sustainable drainage systems to help manage surface water and to offer new opportunities for wildlife to flourish. We request that Local Planning Authorities and applicants do all they can to avoid surface water entering the public sewer. The flows that come from this surface water are very large when compared with the foul water that comes from toilets, showers, baths, washing machines, etc. It is the surface water that uses up a lot of capacity in our sewers and results in the unnecessary pumping and treatment of surface water at our pumping stations and treatment works. If new developments can manage flows through sustainable drainage systems that discharge to an alternative to the public sewer, it will help to minimise the likelihood of sewers spilling into watercourses and the flooding of homes and businesses.

2. UNITED UTILITIES PROPERTY, ASSETS AND INFRASTRUCTURE

Where United Utilities' assets cross the proposed red line boundary, developers must contact our Developer Services team prior to commencing any works on site, including trial holes, groundworks or demolition. Please see 'Contacts' section below.

Water pipelines

United Utilities will not allow building over or in close proximity to a water main.

Wastewater pipelines

United Utilities will not allow a new building to be erected over or in close proximity to a public sewer or any other wastewater pipeline. This will only be reviewed in exceptional circumstances. *Nb. Proposals to extend domestic properties either above, or in close proximity to a public sewer will be reviewed on a case by case basis by either by a building control professional or following a direct application to United Utilities (see our website for further details).*

Important information regarding water and wastewater pipelines and apparatus

It is the applicant's responsibility to investigate and demonstrate the exact relationship between United Utilities' assets and the proposed development.

A number of providers offer a paid for mapping service, including United Utilities (see 'Contacts' section below). The position of the underground apparatus shown on water and wastewater asset maps is approximate only and is given in accordance with the best information currently available. Therefore, we strongly recommend the applicant, or any future developer, does not rely solely on the asset maps to inform decisions relating to the detail of their site and instead investigates the precise location of any underground pipelines and apparatus. Where additional information is requested to enable an assessment of the proximity of proposed development features to United Utilities assets, the proven location of pipelines should be confirmed by site survey; an extract of asset maps will not suffice. The applicant should seek advice from our

Developer Services team on this matter. See '*Contacts*' Section below. United Utilities Water will not accept liability for any loss or damage caused by the actual position of our assets and infrastructure being different from those shown on asset maps.

Developer's should investigate the existence and the precise location of water and wastewater pipelines as soon as possible as this could significantly impact the preferred site layout and/or diversion of the asset(s) may be required. Unless there is specific provision within the title of the property or an associated easement, any necessary disconnection or diversion of assets to accommodate development, will be at the applicant/developer's expense. In some circumstances, usually related to the size and nature of the assets impacted by proposals, developers may discover the cost of diversion is prohibitive in the context of their development scheme.

Any agreement to divert our underground assets will be subject to a diversion application, made directly to United Utilities. This is a separate matter to the determination of a planning application. We will not guarantee, or infer acceptance of, a proposed diversion through the planning process (where diversion is indicated on submitted plans). In the event that an application to divert or abandon underground assets is submitted to United Utilities and subsequently rejected (either before or after the determination of a planning application), applicants should be aware that they may need to amend their proposed layout to accommodate United Utilities' assets.

Where United Utilities' assets exist, the level of cover to United Utilities pipelines and apparatus must not be compromised either during or after construction and there should be no additional load bearing capacity on pipelines without prior agreement from United Utilities. This would include sustainable drainage features, earth movement and the transport and position of construction equipment and vehicles.

Any construction activities in the vicinity of United Utilities' assets, including any assets or infrastructure that may be located outside the applicant's red line boundary, must comply with national building and construction standards and where applicable, our 'Standard Conditions for Works Adjacent to Pipelines', a copy of which is available on our website. The applicant, and/or any subsequent developer should note that our 'Standard Conditions' guidance applies to any design and construction activities in close proximity to water pipelines and apparatus that are no longer in service, as well as pipelines and apparatus that are currently operational.

It is the applicant's responsibility to ensure that United Utilities' required access is provided within any proposed layout and that our infrastructure is appropriately protected. The developer would be liable for the cost of any damage to United Utilities' assets resulting from their activity.

3. WATER AND WASTEWATER SERVICES

If the applicant intends to receive water and/or wastewater services from United Utilities they should visit our website or contact the Developer Services team for advice at the earliest opportunity. This includes seeking confirmation of the required metering arrangements for the proposed development. See '*Contacts*' Section below.

If the proposed development site benefits from existing water and wastewater connections, the applicant should not assume that the connection(s) will be suitable for the new proposal or that any existing metering arrangements will suffice. In addition, if reinforcement of the water network is required to meet potential demand, this could be a significant project and the design and construction period should be accounted for.

In some circumstances we may require a compulsory meter is fitted. For detailed guidance on whether the development will require a compulsory meter please visit <https://www.unitedutilities.com/my-account/your-bill/our-household-charges-20212022/> and go to section 7.7 for compulsory metering.

To promote sustainable development United Utilities offers a reduction in infrastructure charges for applicant's delivering water efficient homes and draining surface water sustainably (criteria applies). For further information, we strongly recommend the applicant visits our website when considering any water or wastewater design <https://www.unitedutilities.com/builders-developers/your-development/planning/building-sustainable-homes/>

Business customers can find additional information on our sustainable drainage incentive scheme at <https://www.unitedutilities.com/Business-services/retailers/incentive-schemes/>

To avoid any unnecessary costs and delays being incurred by the applicant or any subsequent developer, we strongly recommend the applicant seeks advice regarding water and wastewater services, and metering arrangements, at the earliest opportunity. Please see 'Contacts' Section below.

4. CONTACTS

Website

For detailed guidance on water and wastewater services, including application forms and the opportunity to talk to the Developer Services team using the 'Live Chat' function, please visit: <http://www.unitedutilities.com/builders-developers.aspx>

Email

For advice on water and wastewater services or to discuss proposals near to pipelines, email the Developer Services team as follows:

Water mains and water supply, including metering - DeveloperServicesWater@uuplc.co.uk

Public sewers and drainage - SewerAdoptions@uuplc.co.uk

Telephone - 0345 072 6067

Property Searches (for asset maps):

A number of providers offer a paid for mapping service including United Utilities. For more information, or to purchase a sewer and water plan from United Utilities, please visit <https://www.unitedutilities.com/property-searches/>

Water and sewer records can be viewed for free at our Warrington Head Office by calling 0370 751 0101. Appointments must be made in advance. Public sewer records can be viewed at local authority offices. Arrangements should be made directly with the local authority.



Gurdeep Bansal
Meinhardt (UK) Ltd, 10 Aldersgate Street,
London, EC1A 4HJ

**United Utilities Water Ltd
Developer Services & Planning**
2nd Floor Grasmere House
Lingley Mere Business Park
Lingley Green Avenue
Great Sankey
Warrington WA5 3LP

Wastewaterdeveloperservices@uuplc.co.uk

Our Reference	4200047420
Date	13 th November 2023

Dear Sir

Thank you for your build over application of 03/11/2023 regarding the;

1000 mm diameter [combined] public sewer at an unconfirmed depth of 3.6m at 1 Oxford Road M14 SRP

In consideration of the affected public sewer, **United Utilities give consent in principle to the development** and request that all works satisfy the Approved Document's Guidance that supports the Requirement of Part H4 of the Building Regulations.

The following guidance should be passed to the applicant/property owner;

What does this mean?

- You may continue with your development but you must read the following information carefully;
- Your development is subject to the Building Regulations 2010. In 'Part H4' of the guidance that supports these regulations it says that you need our consent to build over public sewers (this can be found in paragraph 1.5 & 1.6 of Part H4). Electronic copies of the building regulations guidance can be found here:

<http://www.planningportal.gov.uk/buildingregulations/approveddocuments/downloads>

What do I need to do next?

- **The most important thing is to establish the exact location of the sewer** to ensure the build is outside the 3m strip (as our records must be viewed as indicative only). If the sewer is found to be closer to the proposed build, United Utilities must be informed.

- We would also recommend that you procure the services of a structural or civil engineer who can make sure that your proposals meet the requirements of the Building Regulations including how to protect the sewer (Part H4) and how to protect your building from the sewer (Part A2 & A3). They will be familiar with these regulations and what needs to be done to satisfy them.

Other useful information.

- United Utilities provides the approximate location of its sewers according to its records. These records are not necessarily accurate or complete nor do they normally show the positions of every sewer, culvert or drain, private connections to the public sewers or the particulars of any private system. No person or company shall be relieved from liability for any damage caused by reason of the actual position and/or depths being different from those indicated.
- The applicant should carry out a site survey to determine the exact position of any underground assets prior to construction. Should the site survey identify any discrepancies the applicant should contact United Utilities Developer Services for further assistance as soon as possible.

Yours faithfully,

Developer Services & Metering



**United Utilities Water Ltd
Developer Services & Planning**
2nd floor Grasmere house
Lingley Mere Business Park
Lingley Green Avenue
Great Sankey
Warrington WA5 3LP

Wastewaterdeveloperservices@uuplc.co.uk

Gurdeep Bansal
Meinhardt (UK) Ltd, 10 Aldersgate Street,
London, EC1A 4HJ

Your Reference	
Our Reference	4200047420
Date	13 th November 2023

Dear Sir

Thank you for your build over consultation of 8th November 2023 regarding the;

**1000 mm diameter [combined] public sewer at an unconfirmed depth of 3.6m at 1 Oxford Road M14
SRP**

In consideration of the affected public sewer, **United Utilities have no objection to the Bin & Bike storage** but would request that all works satisfy the Approved Document's Guidance that supports the requirement of Part H4 of the Building Regulations.

The following guidance should be passed to the applicant/property owner;

What does this mean?

- Permission to build over or near the public sewer is not required from us based on the information you have submitted. However, we would still ask that you take the appropriate steps to protect the public sewer from your development and also protect your development from the public sewer should it ever fail.
- Please note you will be responsible for any damage to the public sewer caused by your development, even were our permission to build is not required.
- These protective measures can be found in the Building Regulations Guidance; electronic copies of the guidance can be found here:

<http://www.planningportal.gov.uk/buildingregulations/approveddocuments/downloads>

- Although your development may be exempt from these regulations, United Utilities would recommend that the guidance is followed as 'good practice' to ensure protection to the sewer and your development.

What do I need to do next?

- The most important thing is to establish the exact location and condition of the sewer as you should not build near to or over a sewer that is in poor condition. Furthermore this will help you be sure that your work will not lead to damage to the public sewer. Defects such as deformation (change in Shape) hair-line cracks, open/displaced joints are unlikely to cause the sewer to fail and will not normally require attention if the sewer remains the same. Once construction starts close to or over the sewer these defects could possibly cause the sewer to collapse. Work to rectify such issues post development can be both intrusive and expensive, the cost of which may be repayable to United Utilities by the applicant.
- You will need to appoint your own contractor, it is usually good practice to contact a number of contractors and get three individual quotes. Currently, United Utilities do not offer this service for customers and are not able to recommend any contractors.
- when carrying out any investigation or CCTV survey work on the public sewer system please fully complete the Request for permission to work on a public sewer (CCTV investigation) form and return to Wastewaterdeveloperservices@uuplc.co.uk and the relevant Network Drainage Engineer for your area will assess the request and issue an approval, if appropriate.

<https://www.unitedutilities.com/builders-developers/your-development/planning/building-over-or-working-near-our-assets/>

- You may need to procure the services of a structural or civil engineer who can make sure that your proposals meet the other requirements of the Building Regulations including how to protect the sewer (Part H4) and how to protect your building from the sewer (Part A2 & A3). They will be familiar with these regulations and what needs to be done to satisfy them.

Other useful information.

- United Utilities provides the approximate location of its sewers according to its records. These records are not necessarily accurate or complete nor do they normally show the positions of every sewer, culvert or drain, private connections to the public sewers or the particulars of any private system. No person or company shall be relieved from liability for any damage caused by reason of the actual position and/or depths being different from those indicated.
- The applicant should carry out a site survey to determine the exact position of any underground assets prior to construction. Should the site survey identify any discrepancies the applicant should contact United Utilities Developer Services for further assistance as soon as possible.

Yours faithfully,

Developer Services & Planning