

Site1 at Gorton Lane, Manchester

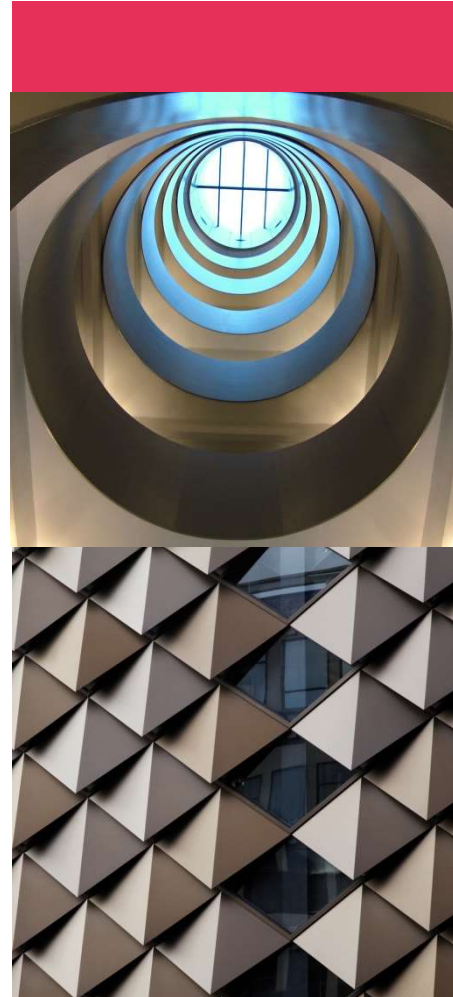
Drainage maintenance report

Curtins Ref: 8790-CUR-00-XX-RE-C-002

Revision: V01

Issue Date: 05 June 2023

Site Address: Gorton Lane, Manchester, M12 5WF



Curtins
Merchant Exchange
17-19 Whitworth Street West
Manchester, M1 5WG
Tel: 0161 236 2394
www.curtins.com

STRUCTURES • TRANSPORT PLANNING • ENVIRONMENTAL • CIVILS & INFRASTRUCTURE • EXPERT ADVICE • SUSTAINABILITY • STAKEHOLDER ENGAGEMENT
Birmingham • Bristol • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kendal • Leeds • Liverpool • London • Manchester • Nottingham

Control Sheet

Rev	Description	Issued by	Checked	Date
P01	Issued for information	MW	MW	05/06/2023

This report has been prepared for the sole benefit, use, and information for the client. The liability of Curtins with respect to the information contained in the report will not extend to any third party.

Author	Signature	Date
Marta Wolska MEng (Hons) Principal Civil Engineer		05 June 2023

Reviewed	Signature	Date
Marta Wolska MEng (Hons) Principal Civil Engineer		05 June 2023



Table of contents

1.0 Maintenance 3

1.2 Components 3

1.3 Inspection, Manhole and Catchpit Chambers 4

1.4 Pipes 4

1.5 Drainage Channels and Gullies 5

1.6 Attenuation Tanks 7

1.7 Flow Control Units 8

1.8 Permeable pavements 9

Appendices

Appendix A

Drainage layout and details

1.0 Maintenance

- 1.1.1 This section is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.
- 1.1.2 The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

1.2 Components

- 1.2.1 The following components have been included within the private drainage design for the proposed development:
- Inspection, Manhole and Catchpit Chambers
 - Pipes
 - Gullies/channels
 - Attenuation Tank
 - Flow Control Unit
 - Permeable pavement
- 1.2.2 The maintenance strategy should be implemented to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.
- 1.2.3 The maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.
- 1.2.4 Maintenance of the drainage network will be the responsibility of an on-site facilities management team.
- 1.2.5 It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event.
- 1.2.6 Significant sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects.
- 1.2.7 Long-term management practices include monthly sweeping of external paved areas. The sweeping program will remove sand and contaminants directly from paved surfaces before they become mobilised during storm events and transported to the drainage system.
- 1.2.8 During the winter months, drainage features such as gullies and channels should be cleared of ice, snow, debris or litter

- 1.2.9 Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the filter drains and the upstream/downstream chambers.
- 1.2.10 The as built CCTV should be provided to Curtins Engineer review when the below ground drainage completed.
- 1.2.11 The existing public sewer located within site will be maintained by United Utilities.

1.3 Inspection, Manhole and Catchpit Chambers

- 1.3.1 Access points have been located at the head of each run, at a change in direction and at a change of pipe size in accordance with Building Regulations Part H.
- 1.3.2 The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access.

1.4 Pipes

- 1.4.1 Pipes are proprietary products and the materials can vary across the site and as such where used the manufacture's recommendations should be followed. Regardless of the product used the pipes will be fully compliant with the Curtins drainage specification.
- 1.4.2 Pipes are intended to be the main conveyance across the development and where oversized they form the attenuation volume required by the limitation of the discharge rate. They are intended to be dry except for during rainfall events. These have been designed to be self-cleaning where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.
- 1.4.3 Access for maintenance is provided through access chambers and manholes.

- 1.4.4 Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be drainage correctly thus exposing the development to a greater level of flood risk.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection should be provided as post construction CCTV survey.	N/A
Regular maintenance\ inspection	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
	Check and remove large vegetation growth near pipe runs.	Monthly or as required
Remedial Action	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

1.5 Drainage Channels and Gullies

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

- 1.5.2 Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating.
- 1.5.3 Sediment\material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the car park channels.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection.	Half yearly and after large storms.
Regular maintenance\ inspection	Litter and debris removal	Monthly or as required.
	Check and remove large vegetation growth near gully gratings.	Monthly or as required
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	3-monthly, 48 hours after large storms.
Remedial Action	Inspect sumps and outlet pipes and rod through poorly performing channels and outlets as initial remediation.	As required.

1.6 Attenuation Tanks

- 1.6.1 The attenuation tanks are currently specified as geocellular units, which are wrapped in a geotextile blanket and are intended for storage of surface water run-off from the site up to and including the 1 in 100 year plus 40% climate change event to reduce the rate of run-off into the downstream network and to minimise flood risk.
- 1.6.2 The geocellular units and geotextile are proprietary products and therefore manufacturer's recommendations should also be taken into consideration.
- 1.6.3 Access for maintenance should be provided by an access shaft located on the tank and from the manhole chambers downstream of the tank.
- 1.6.4 Regular inspection and maintenance is important for the effective operation of attenuation tanks as designed. As the feature is buried, a regular inspection regime is very important to ensure the correction functionality of the surface water drainage network.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets, outlets and overflows for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures.	Annually (or as required after heavy rainfall events)

Remedial Actions	Repair/rehabilitation of inlets, outlets and overflows.	As required.
------------------	---	--------------

1.7 Flow Control Units

1.7.1 The flow control units are intended for flood control and flow restriction.

1.7.2 The flow control is specified as Hydro-brake and is a proprietary product; therefore, manufacturer's recommendations should also be taken into consideration.

1.7.3 Access for maintenance has been provided by locating within manhole chambers.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures and flow control chambers.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets.	As required.

1.8 Permeable pavements

- 1.8.1 The pavement should be inspected regularly for clogging, litter, weeds and water ponding, preferably during and after heavy rainfall to check effective operation. Permeable pavements need to be regularly cleaned of silt and other sediments to preserve their infiltration capacity. The SuDS Manual indicates that sweeping once per year is sufficient for most sites, however the sweeping frequency should be adjusted to suit site specific conditions and should also be informed by annual inspection reports.
- 1.8.2 The below table outlines the proposed operation and maintenance regime for permeable pavements. This is adapted from The SuDS Manual (C753).

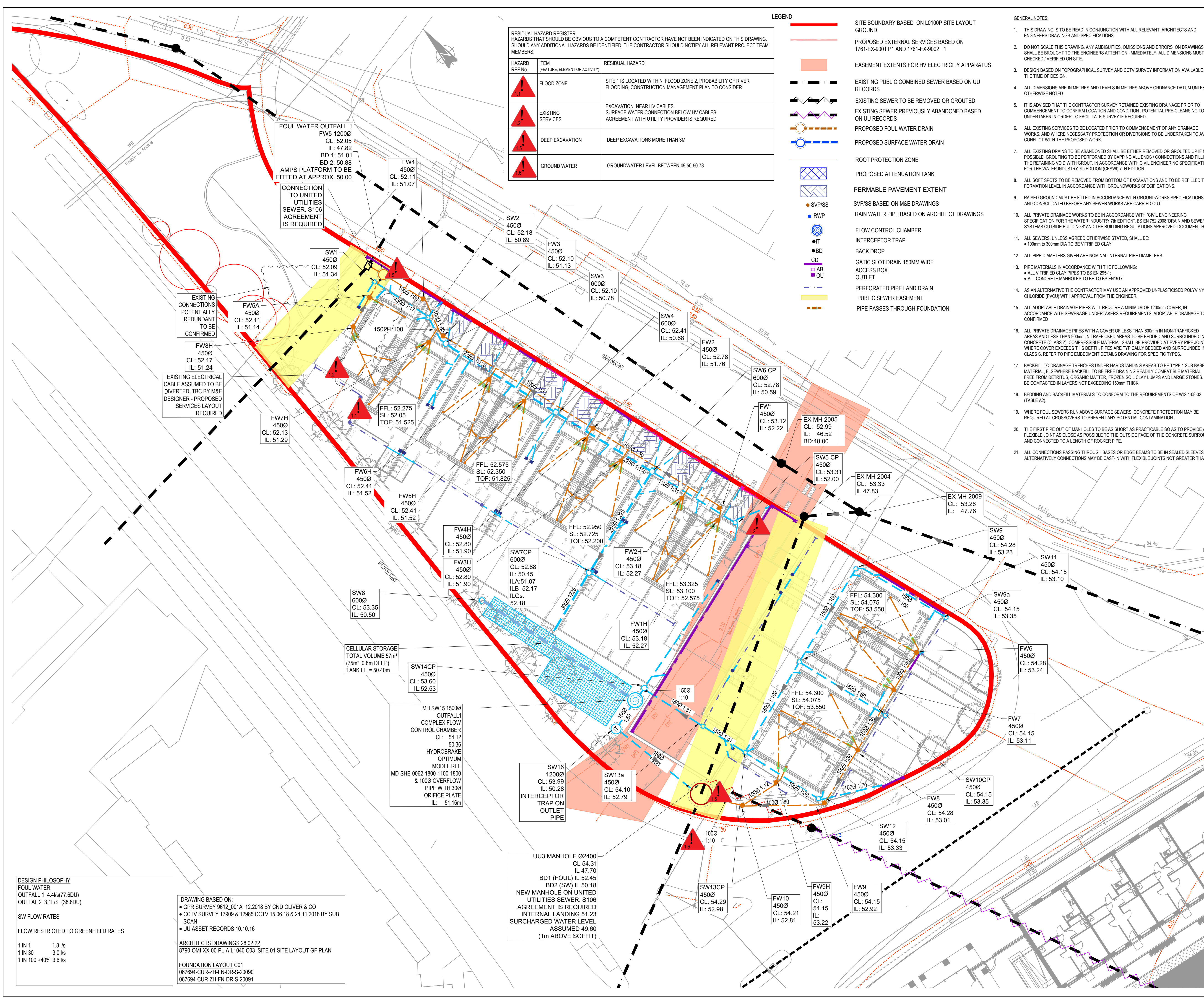
Maintenance Schedule	Required Action	Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall or reduced frequency as required, based on site- specific observations of clogging - pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediments
Occasional maintenance	Stabilise and mow contributing and advancement areas	As required
	Removal of weeds or management using glyphosphate applied directly into the weeds by an applicator rather than spraying	As required –once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required



	Remedial work to any depressions rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
--	---	-------------

Appendix A

Drainage layout and details



RESIDUAL HAZARD REGISTER		
HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR HAVE NOT BEEN INDICATED ON THIS DRAWING. SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED, THE CONTRACTOR SHOULD NOTIFY ALL RELEVANT PROJECT TEAM MEMBERS.		
HAZARD REF No.	ITEM (FEATURE, ELEMENT OR ACTIVITY)	RESIDUAL HAZARD
1.1	FLOOD ZONE	SITE 1 IS LOCATED WITHIN FLOOD ZONE 2, PROBABILITY OF RIVER FLOODING, CONSTRUCTION MANAGEMENT PLAN TO CONSIDER
1.2	EXISTING SERVICES	EXCAVATION NEAR HV CABLES SURFACE WATER CONNECTION BELOW HV CABLES AGREEMENT WITH UTILITY PROVIDER IS REQUIRED
1.3	DEEP EXCAVATION	DEEP EXCAVATIONS MORE THAN 3M
1.4	GROUND WATER	GROUNDWATER LEVEL BETWEEN 49.50-50.78

LEGEND

- SITE BOUNDARY BASED ON L0100P SITE LAYOUT GROUND
- PROPOSED EXTERNAL SERVICES BASED ON 1761-EX-9001 P1 AND 1761-EX-9002 T1
- EASEMENT EXTENTS FOR HV ELECTRICITY APPARATUS
- EXISTING PUBLIC COMBINED SEWER BASED ON UU RECORDS
- EXISTING SEWER TO BE REMOVED OR GROUTED
- EXISTING SEWER PREVIOUSLY ABANDONED BASED ON UU RECORDS
- PROPOSED FOUL WATER DRAIN
- PROPOSED SURFACE WATER DRAIN
- ROOT PROTECTION ZONE
- PROPOSED ATTENUATION TANK
- PERMABLE PAVEMENT EXTENT
- SVP/ISS BASED ON M&E DRAWINGS
- RAIN WATER PIPE BASED ON ARCHITECT DRAWINGS
- FLOW CONTROL CHAMBER
- INTERCEPTOR TRAP
- BACK DROP
- GATIC SLOT DRAIN 150MM WIDE ACCESS BOX OUTLET
- PERFORATED PIPE LAND DRAIN
- PUBLIC SEWER EASEMENT
- PIPE PASSES THROUGH FOUNDATION

GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF DESIGN.
- ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
- IT IS ADVISED THAT THE CONTRACTOR SURVEY RETAINED EXISTING DRAINAGE PRIOR TO COMMENCEMENT TO CONFIRM LOCATION AND CONDITION. POTENTIAL PRE-CLEANING TO BE UNDERTAKEN IN ORDER TO FACILITATE SURVEY IF REQUIRED.
- ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
- ALL EXISTING DRAINS TO BE ABANDONED SHALL BE EITHER REMOVED OR GROUTED UP IF NOT POSSIBLE. GROUTING TO BE PERFORMED BY CAPPING ALL ENDS / CONNECTIONS AND FILLING THE RETAINING VOID WITH GROUT, IN ACCORDANCE WITH CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION (CESW) 7TH EDITION.
- ALL SOFT SPOTS TO BE REMOVED FROM BOTTOM OF EXCAVATIONS AND TO BE REFILLED TO FORMATION LEVEL IN ACCORDANCE WITH GROUNDWORKS SPECIFICATIONS.
- RAISED GROUND MUST BE FILLED IN ACCORDANCE WITH GROUNDWORKS SPECIFICATIONS AND CONSOLIDATED BEFORE ANY SEWER WORKS ARE CARRIED OUT.
- ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2008 DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS AND THE BUILDING REGULATIONS APPROVED DOCUMENT H.
- ALL SEWERS, UNLESS AGREED OTHERWISE STATED, SHALL BE:
 - 100mm to 300mm DIA TO BE VITRIFIED CLAY.
- ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS.
- PIPE MATERIALS IN ACCORDANCE WITH THE FOLLOWING:
 - ALL VITRIFIED CLAY PIPES TO BS EN 295-1.
 - ALL CONCRETE MANHOLES TO BE TO BS EN1917.
- AS AN ALTERNATIVE THE CONTRACTOR MAY USE AN APPROVED UNPLASTICISED POLYVINYL CHLORIDE (PVCU) WITH APPROVAL FROM THE ENGINEER.
- ALL ADAPTABLE DRAINAGE PIPES WILL REQUIRE A MINIMUM OF 1200mm COVER, IN ACCORDANCE WITH SEWERAGE UNDERTAKERS REQUIREMENTS. ADAPTABLE DRAINAGE TO BE CONFIRMED
- ALL PRIVATE DRAINAGE PIPES WITH A COVER OF LESS THAN 600mm IN NON-TRAFFICKED AREAS AND LESS THAN 900mm IN TRAFFICKED AREAS TO BE BEDDED AND SURROUNDED IN CONCRETE (CLASS Z), COMPRESSIBLE MATERIAL SHALL BE PROVIDED AT EVERY PIPE JOINT. WHERE COVER EXCEEDS THIS DEPTH, PIPES ARE TYPICALLY BEDDED AND SURROUNDED IN CLASS S. REFER TO PIPE EMBEDMENT DETAILS DRAWING FOR SPECIFIC TYPES.
- BACKFILL TO DRAINAGE TRENCHES UNDER HARSTANDING AREAS TO BE TYPE 1 SUB BASE MATERIAL, ELSEWHERE BACKFILL TO BE FREE DRAINING READILY COMPATIBLE MATERIAL. FREE FROM DETRITUS, ORGANIC MATTER, FROZEN SOIL, CLAY LUMPS AND LARGE STONES, TO BE COMPACTED IN LAYERS NOT EXCEEDING 150mm THICK.
- BEDDING AND BACKFILL MATERIALS TO CONFORM TO THE REQUIREMENTS OF WIS 4-082 (TABLE A2).
- WHERE FOUL SEWERS RUN ABOVE SURFACE SEWERS, CONCRETE PROTECTION MAY BE REQUIRED AT CROSSOVERS TO PREVENT ANY POTENTIAL CONTAMINATION.
- THE FIRST PIPE OUT OF MANHOLES TO BE AS SHORT AS PRACTICABLE SO AS TO PROVIDE A FLEXIBLE JOINT AS CLOSE AS POSSIBLE TO THE OUTSIDE FACE OF THE CONCRETE SURROUND AND CONNECTED TO A LENGTH OF ROCKER PIPE.
- ALL CONNECTIONS PASSING THROUGH BASES OR EDGE BEAMS TO BE IN SEALED SLEEVES. ALTERNATIVELY CONNECTIONS MAY BE CAST-IN WITH FLEXIBLE JOINTS NOT GREATER THAN

- 150MM FROM FACE OF CONCRETE.
- WHERE DRAINAGE PIPES ARE LESS THAN 300mm BELOW THE UNDERSIDE OF THE GROUND FLOOR SLAB, CONCRETE ENCASEMENT IS REQUIRED (CLASS Z), COMPRESSIBLE JOINTS ARE TO BE PROVIDED AT EVERY PIPE JOINT WITHIN THE CONCRETE.
- WHERE PIPES ARE MORE THAN 300mm BELOW THE UNDERSIDE OF THE SLAB, CLASS S BEDDING IS ACCEPTABLE.
- SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.
- PLASTIC CHANNEL SECTIONS WILL NOT BE PERMITTED WITHIN MANHOLE CHAMBERS. CLAYWARE CHANNELS SHALL BE USED WITHIN MANHOLES FOR PIPE SIZES UP TO AND INCLUDING 300mm DIAMETER.
- ALL NEW CONNECTIONS INTO EXISTING MANHOLES (OR INTO EXISTING SEWERS) TO BE 'SOFFITS LEVEL' UNLESS OTHERWISE NOTED.
- SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED TO PROVE THAT SUCH PRECAUTIONS ARE NOT REQUIRED.
- SEWERS MUST HAVE 5m CLEARANCE FROM TREES AND HEDGES OR TO HAVE SUITABLE ROOT PROTECTION IN ACCORDANCE WITH SFA REQUIREMENTS.
- THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION IN THEM MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.
- ALL INTERNAL DRAINAGE CONNECTIONS ARE PROVIDED TO THE PENETRATION POSITIONS SHOWN ON ARCHITECT AND M&E DRAWINGS. REFER TO DIMENSIONED LOCATIONS ON ARCHITECT'S GROUND FLOOR SETTING-OUT PLANS.
- RAINWATER AND FOUL WATER POP UP LOCATIONS AND SIZES TO BE CONFIRMED BY ARCHITECT AND M&E ENGINEER.
- ALL UNDERGROUND FOUL DRAINAGE SHOULD BE SUITABLY VENTED AT OR NEAR TO THE HEAD OF RUNS.
- ALL ACCESS FITTINGS, STACKS, RWPS AND GULLIES TO BE RODDABLE. ALL TO HAVE LOW LEVEL RODDING ACCESS PLATES UNLESS AN ALTERNATIVE MEANS OF ACCESS IS AGREED. ACCESS POINT TO BE ABOVE ANY GROUND FLOOR CONNECTED APPLIANCE SPILL LEVEL.
- LARGE ACCESS FITTING REQUIRED ABOVE GROUND WHERE GREATER THAN 12M UP TO 22M TO A JUNCTION. SMALL ACCESS FITTING REQUIRED UP TO 12M TO A JUNCTION.
- ALL GULLY AND CHANNEL DRAIN OUTLETS AND TERMINATION POINTS TO BE TRAPPED AND RODDABLE. INTERNAL GULLIES AND CHANNEL DRAINS TO BE SPECIFIED BY OTHERS.
- ALL BRANCH CONNECTIONS TO BE MADE WITH SWEPT BENDS IN THE DIRECTION OF FLOW IN THE MAIN SEWER.
- ALL FOUL CONNECTIONS TO BE 1000 UNLESS NOTED OTHERWISE. WHERE NO WCS ARE CONNECTED UPSTREAM, UNDERSLAB FW DRAINAGE TO BE LAID AT 1:40 MIN. AFTER THE CONNECTION OF AT LEAST 1 No. WC, A MIN. FALL OF 1:80 APPLIES.
- ALL INTERNAL COVERS TO HAVE MECHANICALLY JOINTED CORNERS AND DOUBLE SEALED WITH RECESSED TRAY TO ALLOW FOR FINISHES.
- ALL MANHOLE COVERS IN BLOCKS/SLAB AND EXTERNAL PAVING AREAS TO HAVE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT ARCHITECT'S PAVING PROPOSAL.
- UNLESS NOTED OTHERWISE IN THE MANHOLE SCHEDULE, ALL MANHOLE, GULLY AND CHANNEL COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
 - B125 LOAD CLASS IN PEDESTRIAN AREAS
 - D400 LOAD CLASS IN VEHICULAR AREAS
- COVER LEVELS, GULLY POSITIONS, AND BUILDING LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/LANDSCAPE ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.
- SLOPES SHOWN INDICATIVELY. CONTRACTOR SHOULD BUILD INVERT LEVELS SHOWN ON DRAWING
- OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.
- THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING:
 - (I) ALL OPERATIONS SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE GENERAL HEALTH AND SAFETY POLICY OF THE DEVELOPER AS REQUIRED BY SECTIONS 2 OF THE HEALTH AND SAFETY AT WORK ACT 1974 AND IN PARTICULAR THE CONSTRUCTION (GENERAL PROVISIONS) REGULATIONS.
 - (II) THE LOCAL AUTHORITY AND UTILITIES COMPANIES ARE TO BE NOTIFIED PRIOR TO COMMENCEMENT OF WORK ON SITE.
 - (III) PRIOR TO CONSTRUCTION THE ACTUAL POSITIONS AND DEPTHS OF SERVICES LIKELY TO BE AFFECTED BY THE WORKS SHOULD BE ESTABLISHED BY MEANS OF HAND DIG IN CLOSE LIAISON WITH THE UTILITY COMPANIES. THE CONTRACTOR SHALL IMMEDIATELY ADVISE THE ENGINEER OF ANY SERVICES EXPOSED WHICH MAY AFFECT THE DESIGN.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT PIPES ARE ADEQUATELY PROTECTED FROM CONCENTRATED LOADING BY CONSTRUCTION TRAFFIC DURING THE CONSTRUCTION PERIOD.
- THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT, AND TEMPORARY AND PERMANENT DIVERSION WORKS, AS NECESSARY TO ALL EXISTING SERVICES.
- THE CONTRACTOR SHALL ALLOW FOR KEEPING TRENCHES AND EXCAVATIONS AS DRY AS PRACTICABLE BY PUMPING FROM TEMPORARY SUMPS AND DE-WATERING AS APPROPRIATE. THE POINT AND METHOD OF DISCHARGE TO BE AGREED WITH THE DRAINAGE AUTHORITY & LFA AND ENVIRONMENT AGENCY.
- IT IS ADVISED THAT DRAINAGE WORKS ARE TO BE CONSTRUCTED FROM THE OUTFALL TOWARDS THE HEAD OF RUN TO ENSURE THE OUTFALL CAN BE ACHIEVED.
- ALL DRAINS TO BE CCTV SURVEYED ON COMPLETION OF THE WORKS.

INFORMATION REQUIRED:

- DIVERSION OF EXTERNAL SERVICES IN DWG
- PROPOSED SERVICES IN DWG

C03	TANK SHAPE AMENDED	18.03.22	MW	MW
C02	MANHOLE LANDING AMENDED	07.03.22	MW	MW
C01	ISSUED FOR CONSTRUCTION	01.03.22	TH	MW
P02	ISSUED FOR PLANNING CONDITION DISCHARGE	05.11.21	ATL	CG
Rev:	Description:	Date:	By:	Chkd:



Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG
0161 235 2384
manchester@curtins.com
www.curtins.com

Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer
Birmingham • Bristol • Cambridge • Cardiff • Douglas • Edinburgh • Glasgow • Kentish • Leeds • Liverpool • London • Manchester • Nottingham

Status: CONSTRUCTION

Project: GORTON LANE, MANCHESTER

Orig Title: PROPOSED DRAINAGE STRATEGY

PROPOSED DRAINAGE STRATEGY

8790 - CUR - 01 - XX - DR - D - 92500 -C03

DESIGN PHILOSOPHY

FOUL WATER

OUTFALL 1 4.41s(77.6DU)

OUTFALL 2 3.11s (38.8DU)

SW FLOW RATES

FLOW RESTRICTED TO GREENFIELD RATES

1 IN 1 1.81s

1 IN 30 3.01s

1 IN 100 +0.4% 3.61s

DRAWING BASED ON:

- GPR SURVEY 9612_001A 12.2018 BY CND OLIVER & CO
- CCTV SURVEY 17909 & 12985 CCTV 15.06.18 & 24.11.2018 BY SUB SCAN
- UU ASSET RECORDS 10.10.16

ARCHITECTS DRAWINGS 28.02.22

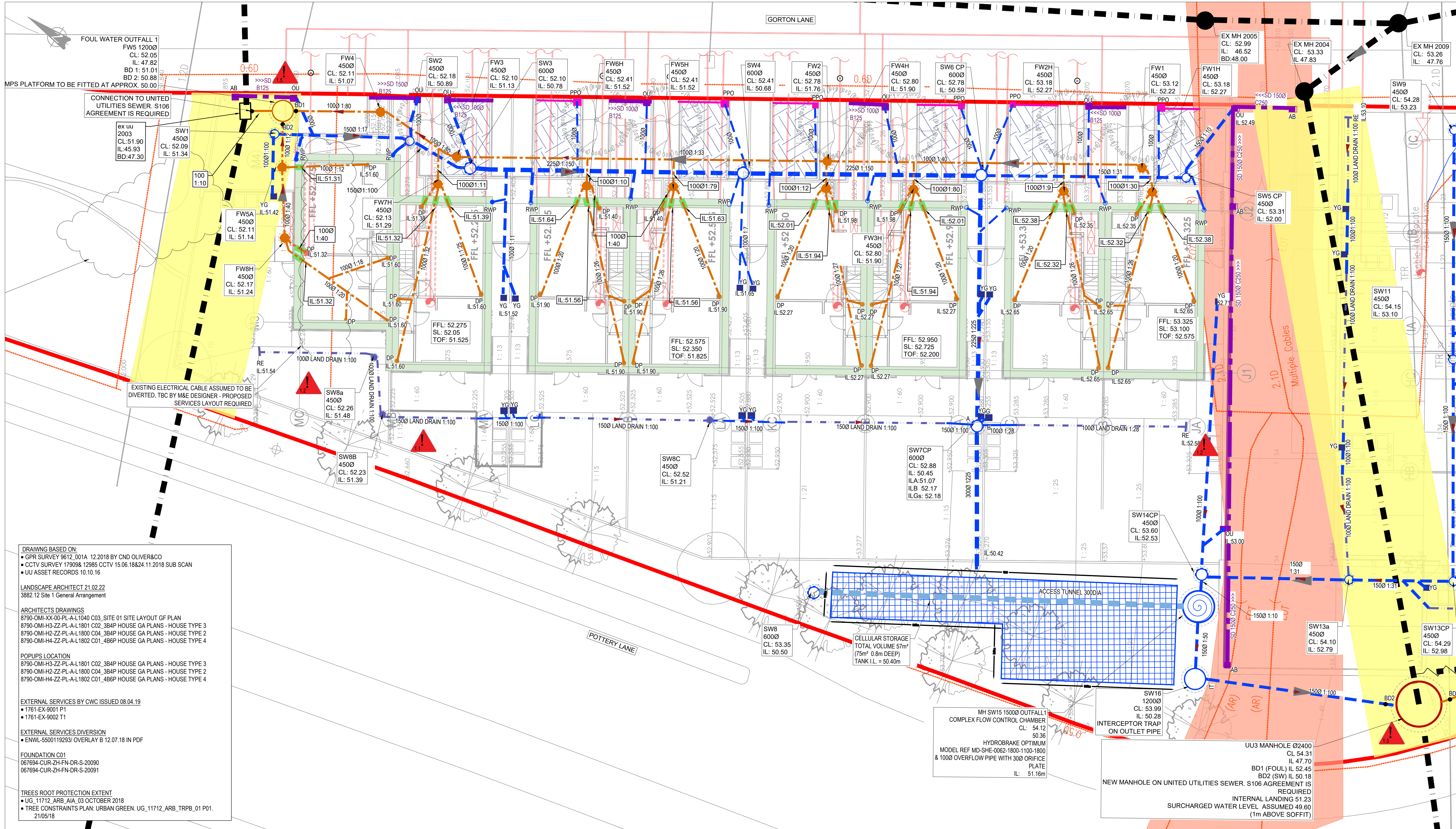
8790-OMI-XX-00-PL-A-L1040 C03_SITE 01 SITE LAYOUT GF PLAN

FOUNDATION LAYOUT C01

067694-CUR-ZH-FN-DR-S-20090

067694-CUR-ZH-FN-DR-S-20091

U:\m\p\Projects\87901 - 06800007694 - Gorton Lane\QMS 4 Production\B Models & Drawings\Cur-C04\Site 1.



DRAWING BASED ON:
• GPR SURVEY 9612_001A 12.2018 BY CND OLIVER&CO
• CCTV SURVEY 179038 12985 CCTV 15.06.18&24.11.2018 SUB SCAN
• UU ASSET RECORDS 10.10.16

LANDSCAPE ARCHITECT 21.02.22
3882.12 Site 1 General Arrangement

ARCHITECTS DRAWINGS
8790-OMI-XX-00-PL-A-L1040 C03_SITE 01 SITE LAYOUT GF PLAN
8790-OMI-H3-ZZ-PL-A-L1801 C02_384P HOUSE GA PLANS - HOUSE TYPE 3
8790-OMI-H2-ZZ-PL-A-L1800 C04_384P HOUSE GA PLANS - HOUSE TYPE 2
8790-OMI-H4-ZZ-PL-A-L1802 C01_486P HOUSE GA PLANS - HOUSE TYPE 4

POPPUS LOCATION
8790-OMI-H3-ZZ-PL-A-L1801 C02_384P HOUSE GA PLANS - HOUSE TYPE 3
8790-OMI-H2-ZZ-PL-A-L1800 C04_384P HOUSE GA PLANS - HOUSE TYPE 2
8790-OMI-H4-ZZ-PL-A-L1802 C01_486P HOUSE GA PLANS - HOUSE TYPE 4

EXTERNAL SERVICES BY CWC ISSUED 08.04.19
• 1761-EX-9001 P1
• 1761-EX-9002 T1

EXTERNAL SERVICES DIVERSION
• ENWL-5500119293/ OVERLAY B 12.07.18 IN PDF

FOUNDATION C01
067694-CUR-ZH-FN-DR-S-20090
067694-CUR-ZH-FN-DR-S-20091

TREES ROOT PROTECTION EXTENT
• UG_11712_ARB_AIA_03 OCTOBER 2018
• TREE CONSTRAINTS PLAN: URBAN GREEN_UG_11712_ARB_TRPB_01 P01.
21/05/18

LEGEND

- SITE BOUNDARY BASED ON L0100P SITE LAYOUT REV P 19.03.19
- PROPOSED EXTERNAL SERVICES BASED ON 1761-EX-9001 P1 AND 1761-EX-9002 T1
- EXISTING PUBLIC COMBINED SEWER BASED ON UU RECORDS
- EXISTING SEWER TO BE ABANDONED
- EXISTING SEWER PREVIOUSLY ABANDONED BASED ON UU RECORDS
- PROPOSED FOUL WATER DRAIN
- PROPOSED SURFACE WATER DRAIN
- PIPE THROUGH FOUNDATION ROOT PROTECTION ZONE
- PERFORATED PIPE LAND DRAIN
- PROPOSED ATTENUATION TANK
- PUBLIC SEWER EASEMENT
- PERMABLE PAVEMENT EXTENT
- FOUNDATION BASED ON STRUCTURES DRAWING
- SVP/SS BASED ON M&E DRAWINGS
- RAIN WATER PIPE BASED ON ARCHITECT DRAWINGS
- YARD GULLY SHOWN
- FLOW CONTROL CHAMBER
- INTERCEPTOR TRAP
- CATCHPIT
- PERMEABLE PAVEMENT OUTLET WITH PERFORATED PIPE BACK DROP
- GATIC SLOT DRAIN 150MM WIDE
- ACCESS BOX
- OUTLET
- SVP/SS
RWP
YG
IT
CP
PPO
BD
CD
AB
OU

RESIDUAL HAZARD REGISTER		
HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR HAVE NOT BEEN INDICATED ON THIS DRAWING. SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED, THE CONTRACTOR SHOULD NOTIFY ALL RELEVANT PROJECT TEAM MEMBERS.		
HAZARD REF No.	ITEM (FEATURE, ELEMENT OR ACTIVITY)	RESIDUAL HAZARD
1.1	FLOOD ZONE	SITE 1 IS LOCATED WITHIN FLOOD ZONE 2. PROBABILITY OF RIVER FLOODING. CONSTRUCTION MANAGEMENT PLAN TO CONSIDER
1.2	EXISTING SERVICES	EXCAVATION NEAR HV CABLES SURFACE WATER CONNECTION BELOW HV CABLES AGREEMENT WITH UTILITY PROVIDER IS REQUIRED
1.3	DEEP EXCAVATION	DEEP EXCAVATIONS MORE THAN 3M
1.4	GROUND WATER	GROUND WATER 49.50-50.78

FOR SW AND FW FLOW RATES PLEASE REFER TO MAIN DRAINAGE STRATEGY DWG: 67694-CUR-00-XX-DR-92500

INFORMATION REQUIRED:
• DIVERSION OF EXTERNAL SERVICES IN DWG
• PROPOSED SERVICES IN DWG

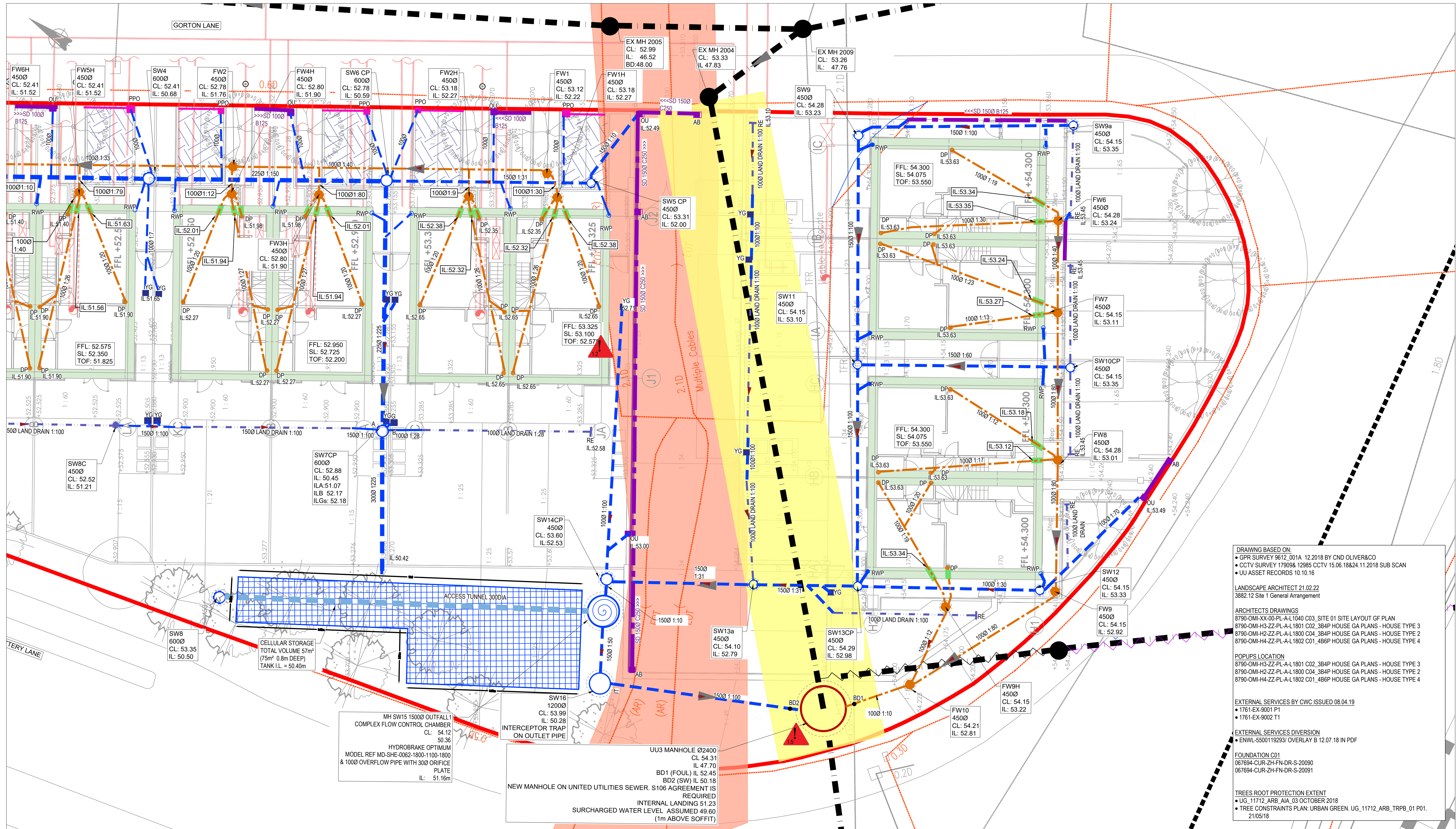
Rev	Description	Date	By	Chkd
C03	TANK SHAPE UPDATED	18.03.22	MW	MW
C02	LANDING LEVEL UPDATED	07.03.22	MW	MW
C01	ISSUED FOR CONSTRUCTION	04.03.22	TH	MW

curtins

Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG
0161 236 2394
manchester@curtins.com
www.curtins.com

Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer
Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kenton • Leeds • Liverpool • London • Manchester • Nottingham

CONSTRUCTION				
GORTON LANE				
PLOT DRAINAGE SITE 1 SHEET 10F 2				
Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	04.03.22	MW	MW	MW
Scale: 1:100				
Project No:	Originator:	Zone:	Level:	Type: Discipline: Category / Number: Rev:
067694 - CUR - XX - 00 - DR - C -	92561	-C03		



DRAWING BASED ON:
• GPR SURVEY 9612_001A 12.2018 BY CND OLIVER&CO
• CCTV SURVEY 179098 12985 CCTV 15.06.18&24.11.2018 SUB SCAN
• UU ASSET RECORDS 10.10.16

LANDSCAPE ARCHITECT 21.02.22
3882.12 Site 1 General Arrangement

ARCHITECTS DRAWINGS
8790-OMI-XX-00-PL-A-L1040 C03 SITE 01 SITE LAYOUT GF PLAN
8790-OMI-H3-ZZ-PL-A-L1801 C02 3B4P HOUSE GA PLANS - HOUSE TYPE 3
8790-OMI-H2-ZZ-PL-A-L1800 C04 3B4P HOUSE GA PLANS - HOUSE TYPE 2
8790-OMI-H4-ZZ-PL-A-L1802 C01 4B6P HOUSE GA PLANS - HOUSE TYPE 4

POPPUS LOCATION
8790-OMI-H3-ZZ-PL-A-L1801 C02 3B4P HOUSE GA PLANS - HOUSE TYPE 3
8790-OMI-H2-ZZ-PL-A-L1800 C04 3B4P HOUSE GA PLANS - HOUSE TYPE 2
8790-OMI-H4-ZZ-PL-A-L1802 C01 4B6P HOUSE GA PLANS - HOUSE TYPE 4

EXTERNAL SERVICES BY CWC ISSUED 08.04.19
• 1761-EX-9001 P1
• 1761-EX-9002 T1

EXTERNAL SERVICES DIVERSION
• ENWL-5500119293/ OVERLAY B 12.07.18 IN PDF

FOUNDATION C01
067694-CUR-ZH-FN-DR-S-20090
067694-CUR-ZH-FN-DR-S-20091

TREES ROOT PROTECTION EXTENT
• UG 11712_ARB_AIA 03 OCTOBER 2018
• TREE CONSTRAINTS PLAN: URBAN GREEN. UG 11712_ARB_TRPB_01 P01.
21/05/18

LEGEND

- SITE BOUNDARY BASED ON L0100P SITE LAYOUT REV P 19.03.19
- PROPOSED EXTERNAL SERVICES BASED ON 1761-EX-9001 P1 AND 1761-EX-9002 T1
- EXISTING PUBLIC COMBINED SEWER BASED ON UU RECORDS
- EXISTING SEWER TO BE ABANDONED
- EXISTING SEWER PREVIOUSLY ABANDONED BASED ON UU RECORDS
- PROPOSED FLOW DRAIN
- PROPOSED SURFACE WATER DRAIN
- PIPE THROUGH FOUNDATION ROOT PROTECTION ZONE
- PERFORATED PIPE LAND DRAIN
- PROPOSED ATTENUATION TANK
- PUBLIC SEWER EASEMENT

- PERMEABLE PAVEMENT EXTENT
- FOUNDATION BASED ON STRUCTURES DRAWING
- SVP/SS BASED ON M&E DRAWINGS
- RAIN WATER PIPE BASED ON ARCHITECT DRAWINGS
- YARD GULLY SHOWN INDICATIVELY
- FLOW CONTROL CHAMBER
- INTERCEPTOR TRAP
- CATCHPIT
- PERMEABLE PAVEMENT OUTLET WITH PERFORATED PIPE BACK DROP
- GATIC SLOT DRAIN 150MM WIDE ACCESS BOX
- OUTLET

RESIDUAL HAZARD REGISTER		
HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR HAVE NOT BEEN INDICATED ON THIS DRAWING. SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED, THE CONTRACTOR SHOULD NOTIFY ALL RELEVANT PROJECT TEAM MEMBERS.		
HAZARD REF No.	ITEM (FEATURE, ELEMENT OR ACTIVITY)	RESIDUAL HAZARD
1.1	FLOOD ZONE	SITE 1 IS LOCATED WITHIN FLOOD ZONE 2. PROBABILITY OF RIVER FLOODING. CONSTRUCTION MANAGEMENT PLAN TO CONSIDER
1.2	EXISTING SERVICES	EXCAVATION NEAR HV CABLES SURFACE WATER CONNECTION BELOW HV CABLES AGREEMENT WITH UTILITY PROVIDER IS REQUIRED
1.3	DEEP EXCAVATION	DEEP EXCAVATIONS MORE THAN 3M
1.4	GROUND WATER	GROUNDWATER 49.50-50.78

FOR SW AND FW FLOW RATES PLEASE REFER TO MAIN DRAINAGE STRATEGY DWG: 67694-CUR-00-XX-DR-92500

INFORMATION REQUIRED:
• DIVERSION OF EXTERNAL SERVICES IN DWG
• PROPOSED SERVICES IN DWG

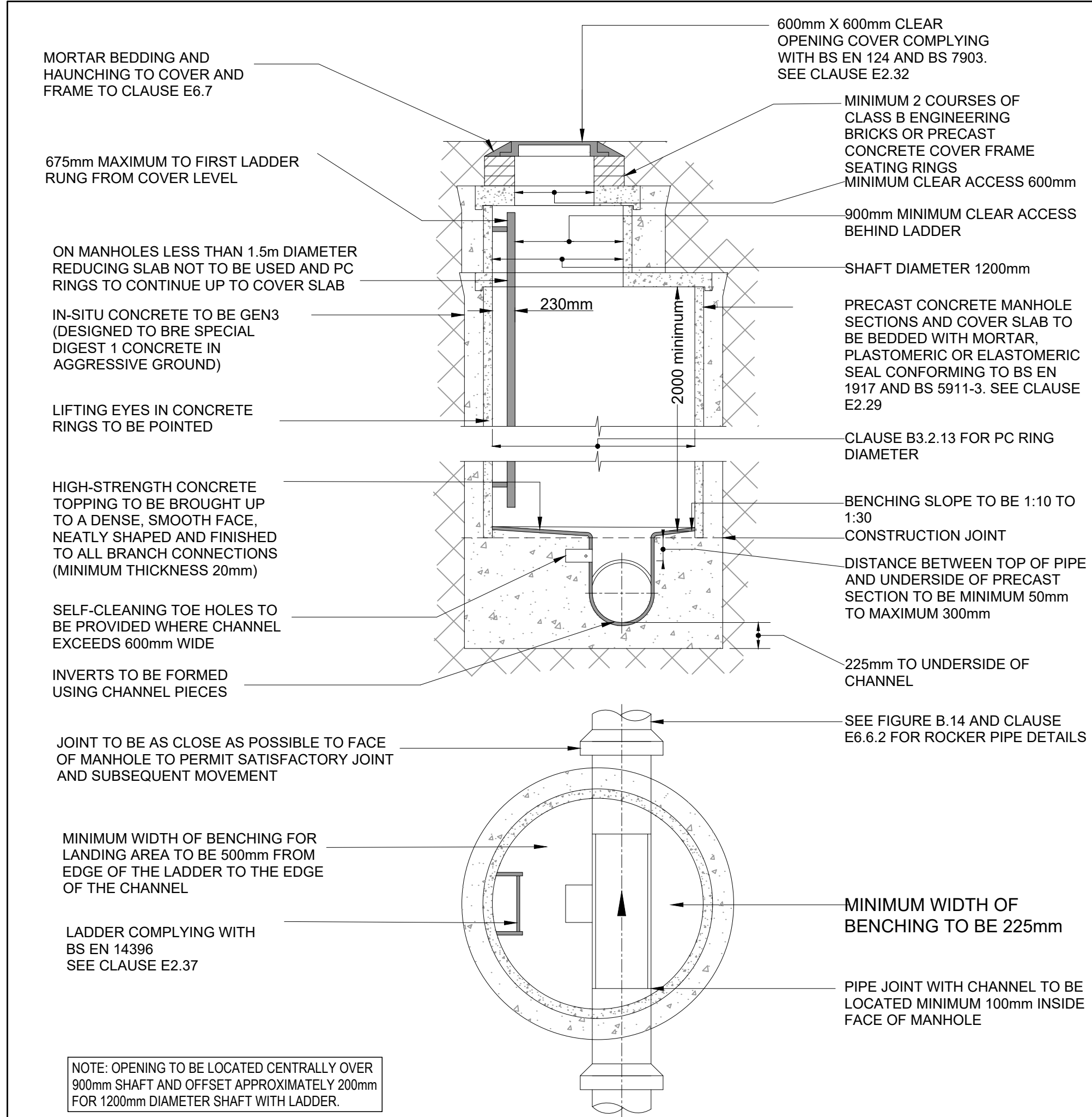
Rev	Description	Date	By	Chkd
C03	TANK SHAPE CHANGED	18.03.22	MW	MW
C02	LANDING LEVEL WITHIN MANHOLES AMENDED	07.03.22	MW	MW
C01	ISSUED FOR CONSTRUCTION	04.03.22	TH	MW

curtins

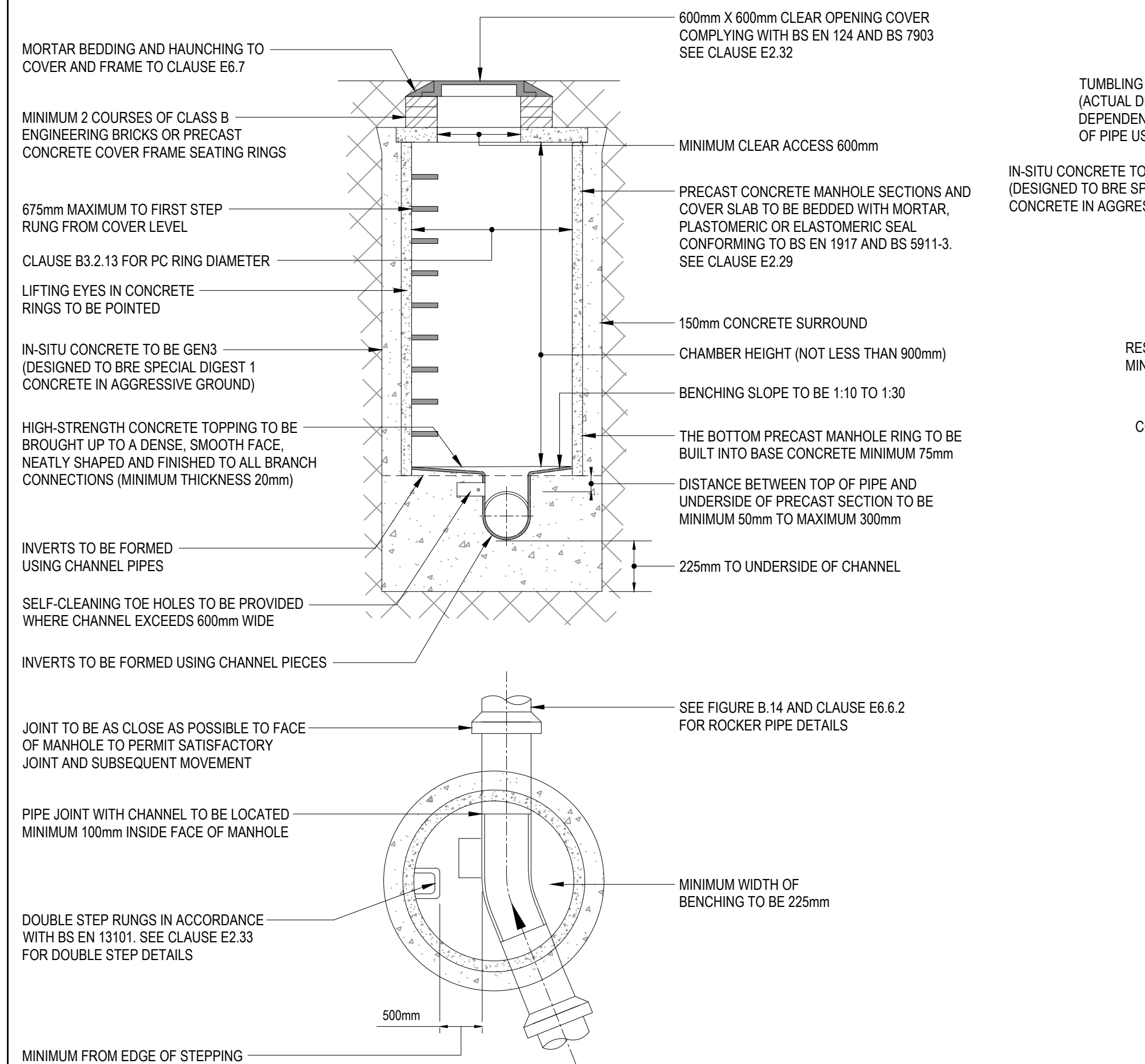
Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG
0161 236 2394
manchester@curtins.com
www.curtins.com

City & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer
Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kenton • Leeds • Liverpool • London • Manchester • Nottingham

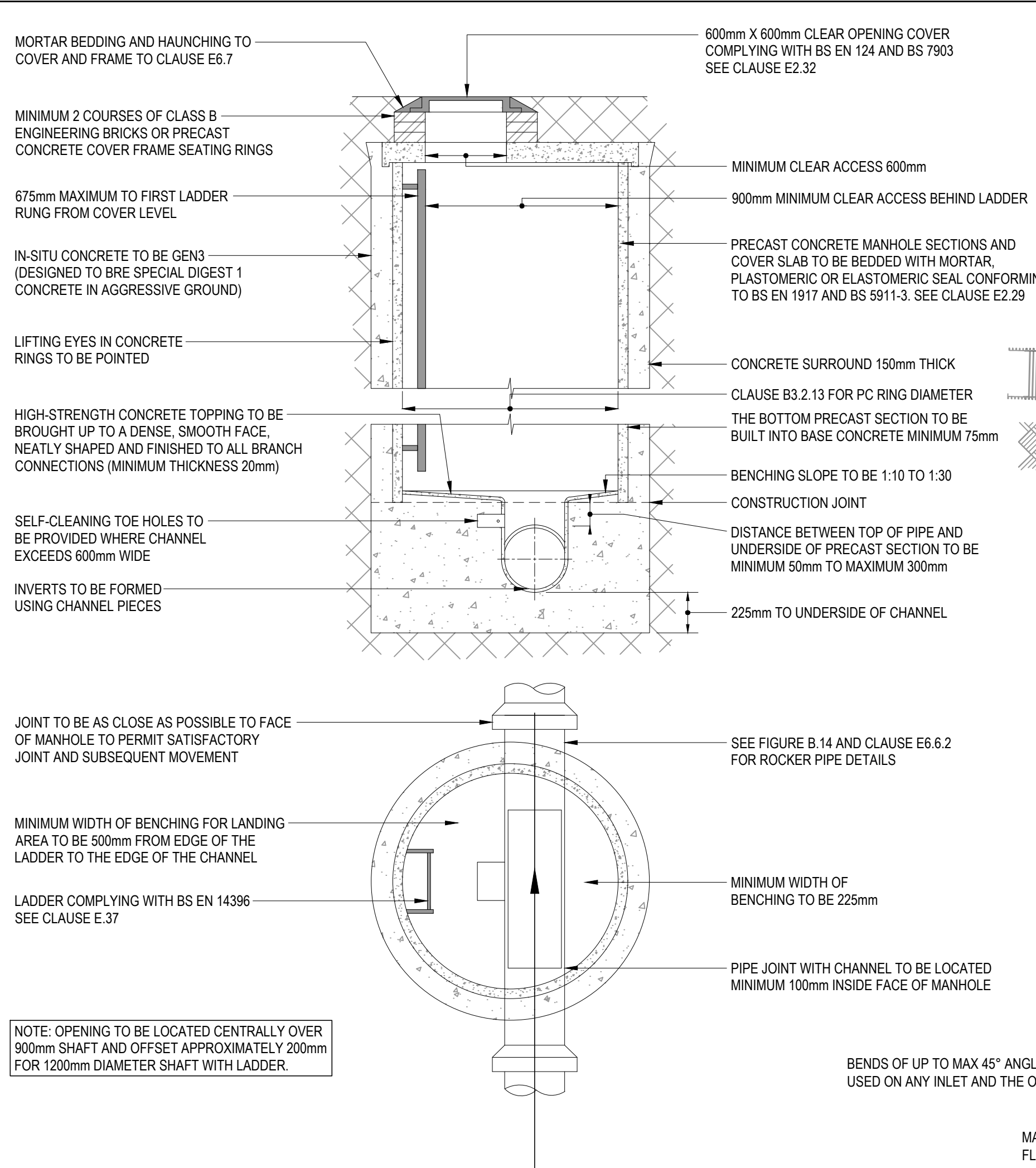
Status:		CONSTRUCTION	
Project:		GORTON LANE	
Dig Title:		PLOT DRAINAGE SITE 1 SHEET 2 OF 2	
Size:	Date:	Drawn By:	Designed By:
A1	04/03/22	MW	MW
Scale:	1:100		
Project No:	Originator:	Zone:	Level:
067694 - CUR - XX - 00 - DR - C - 92562	-C03		



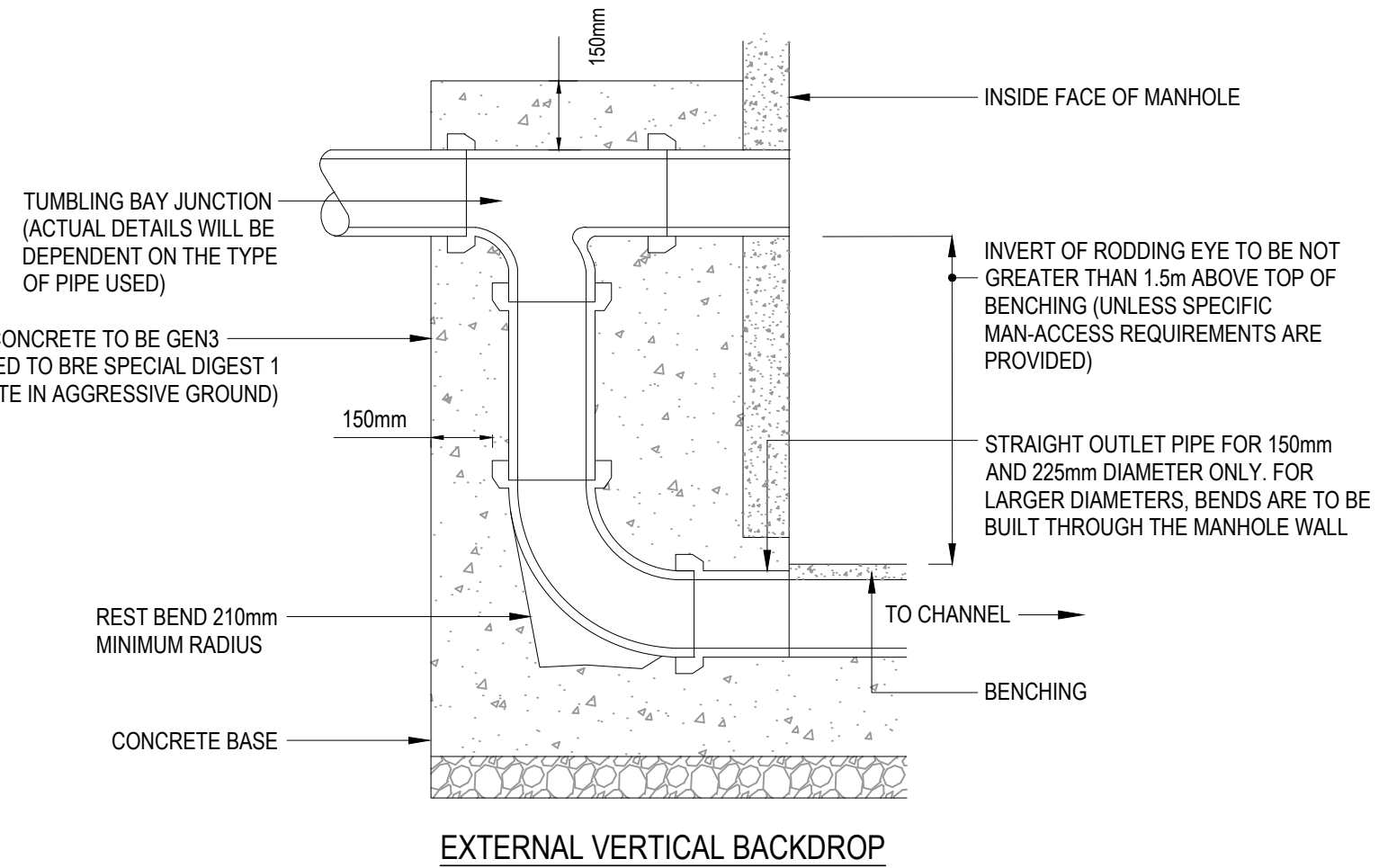
TYPICAL MANHOLE DETAIL - TYPE 1A
(DEPTH FROM COVER TO SOFFIT OF PIPE 3m TO 6m)



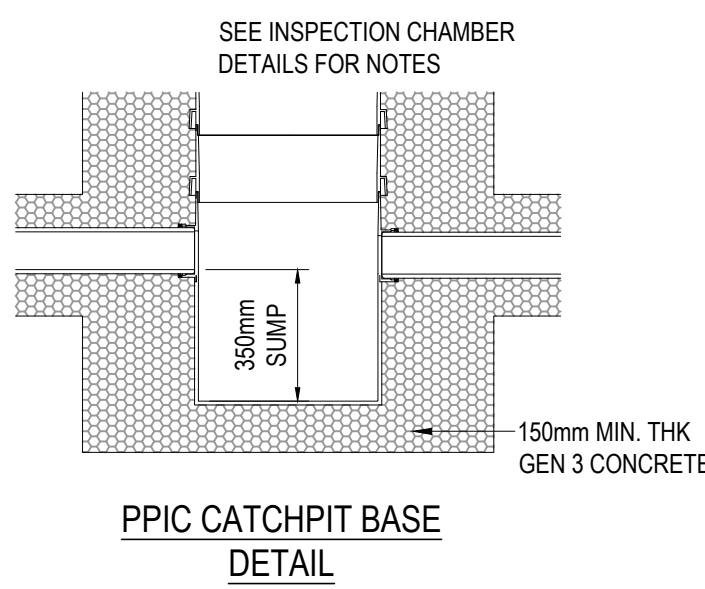
TYPICAL MANHOLE DETAIL - TYPE 2
(MAXIMUM DEPTH FROM COVER TO SOFFIT OF PIPE 3.0 m)



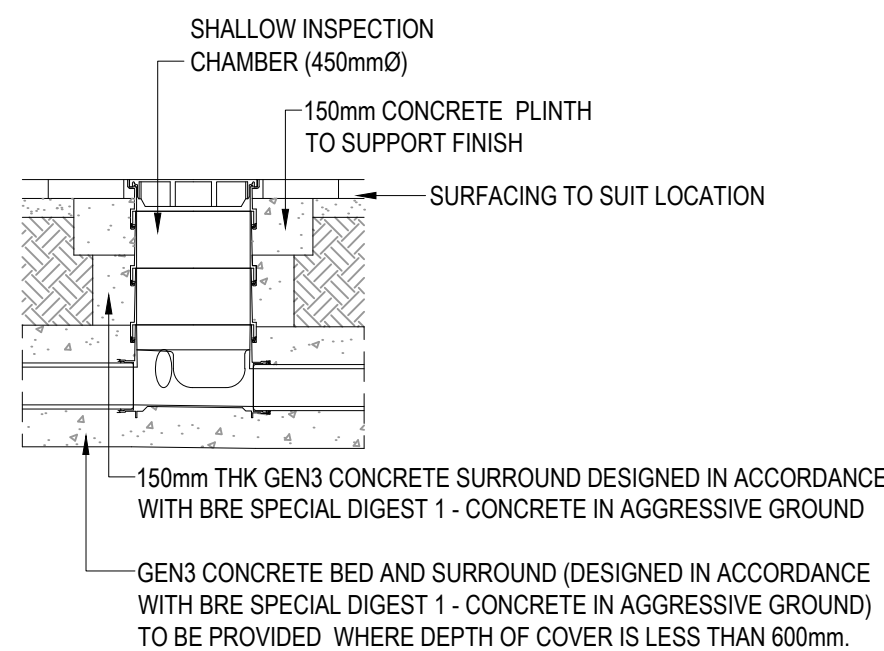
TYPICAL MANHOLE DETAIL - TYPE 1B
(DEPTH FROM COVER TO SOFFIT OF PIPE 3m TO 6m)



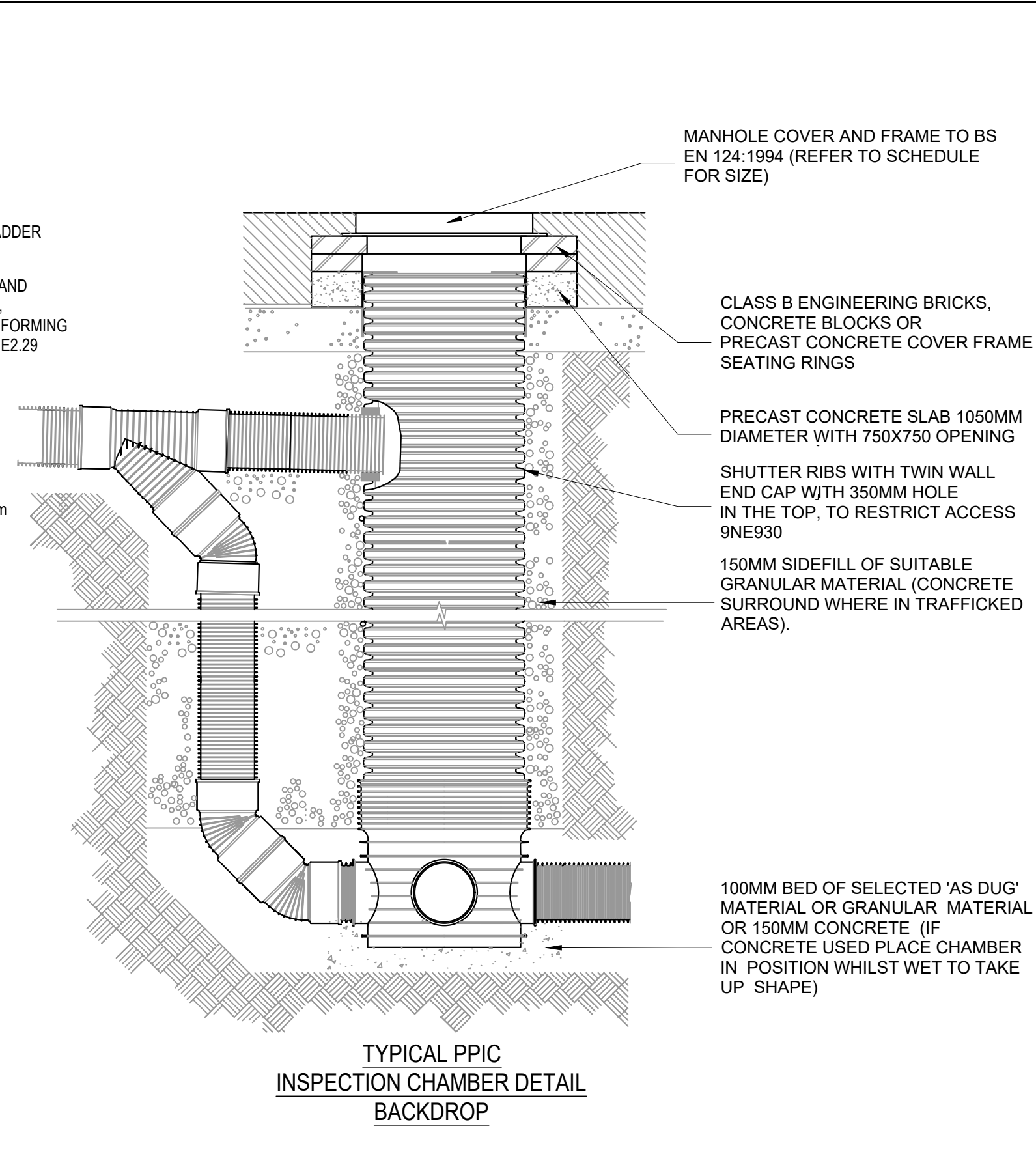
EXTERNAL VERTICAL BACKDROP



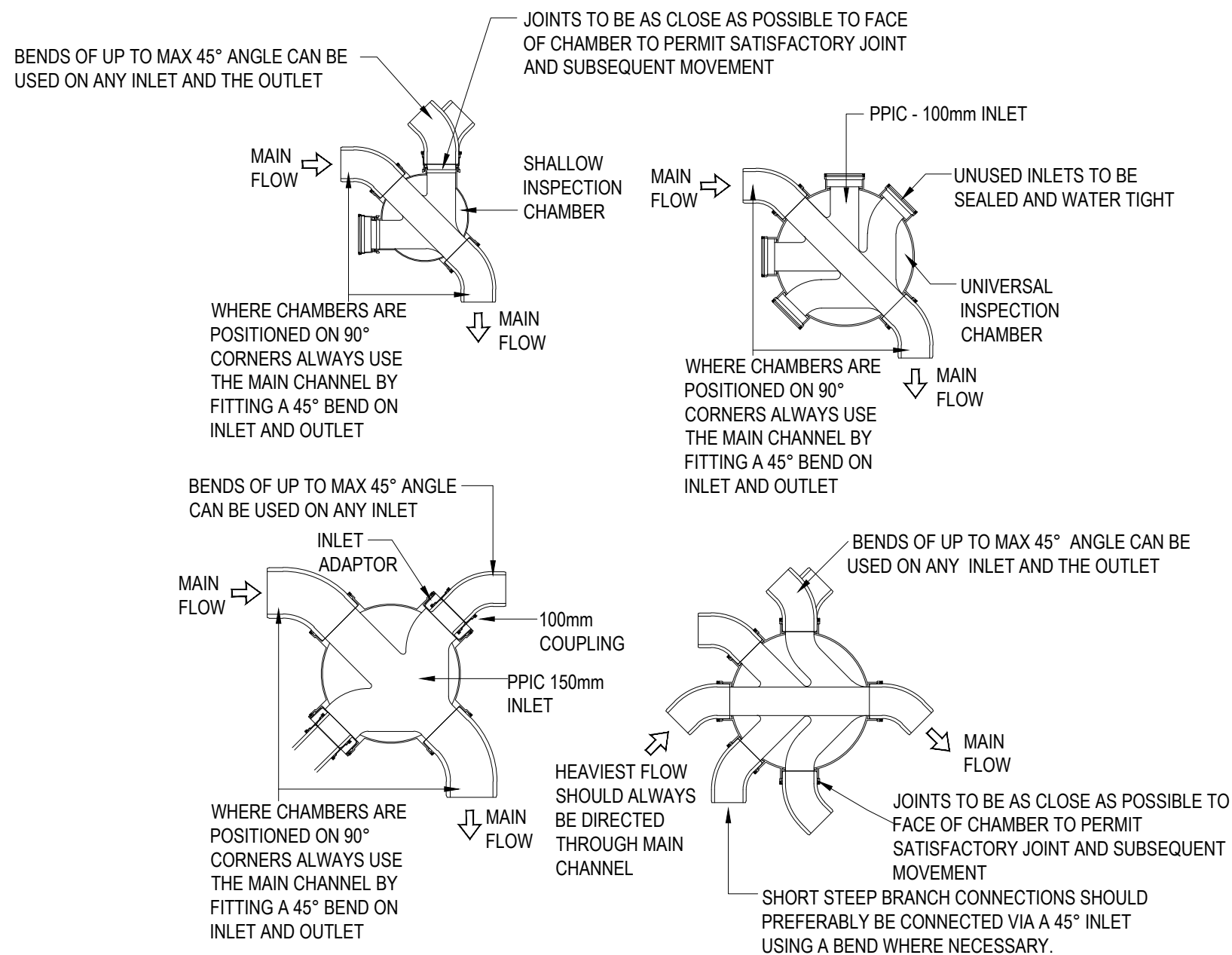
PPIC CATCHPIT BASE
DETAIL



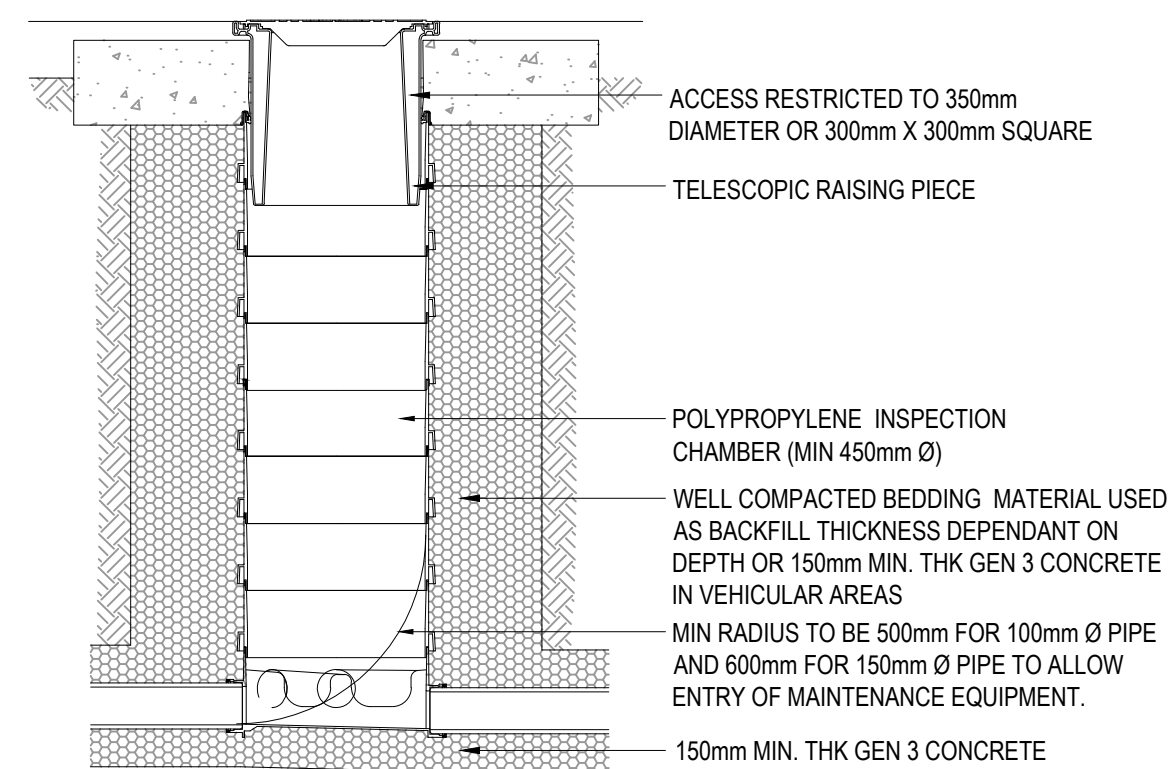
SHALLOW INSPECTION CHAMBER
MAX DEPTH 0.6m



TYPICAL PPIC
INSPECTION CHAMBER DETAIL
BACKDROP



INSPECTION CHAMBER BASE DETAILS



DEEP INSPECTION CHAMBER
DEPTHS BETWEEN 1.2m AND 3.0m
TYPICAL INSPECTION CHAMBER DETAILS - PPIC

GENERAL NOTES:

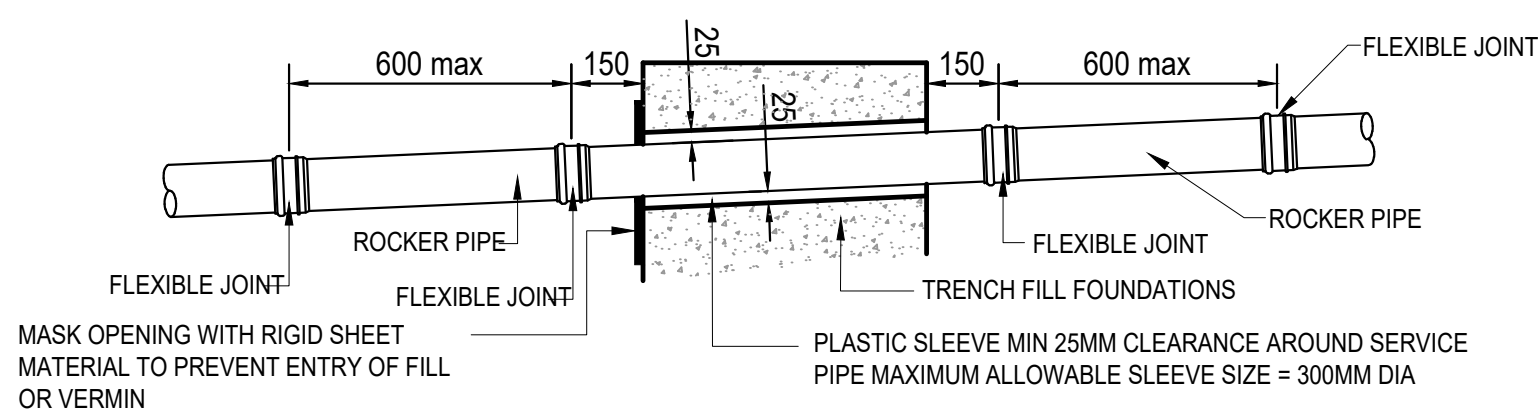
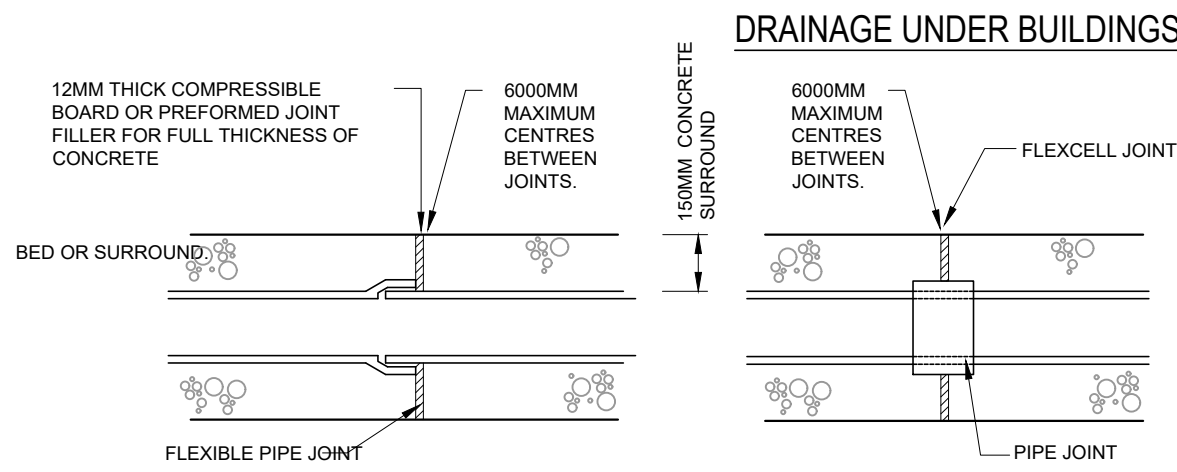
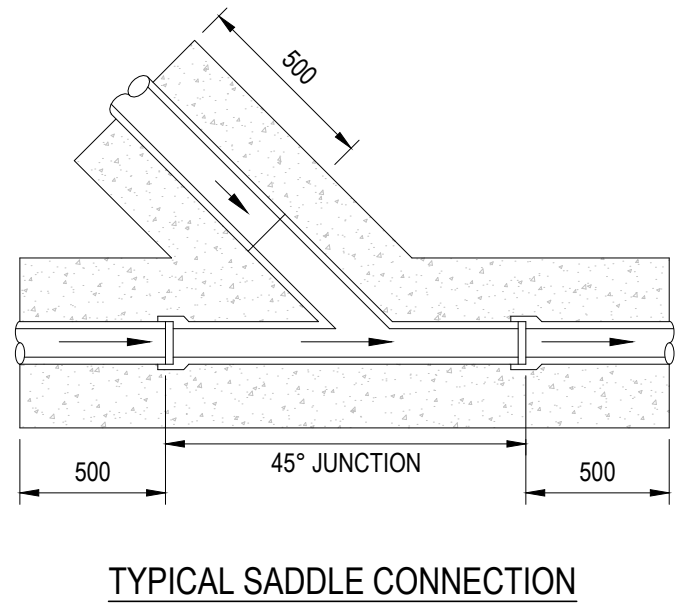
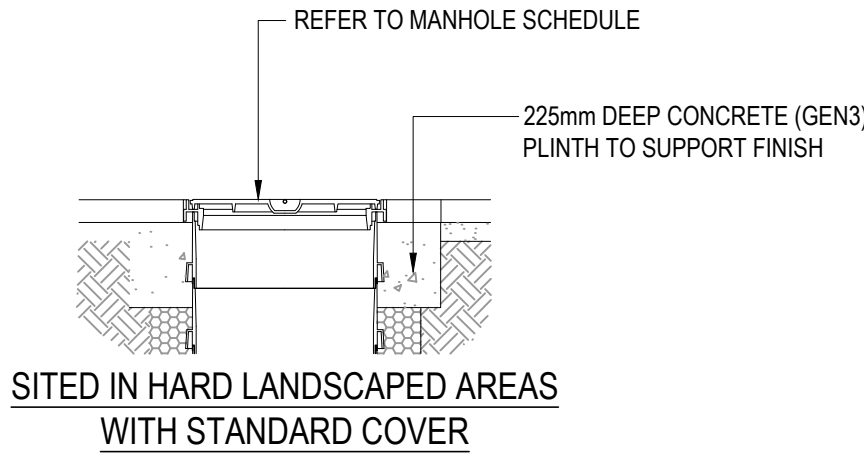
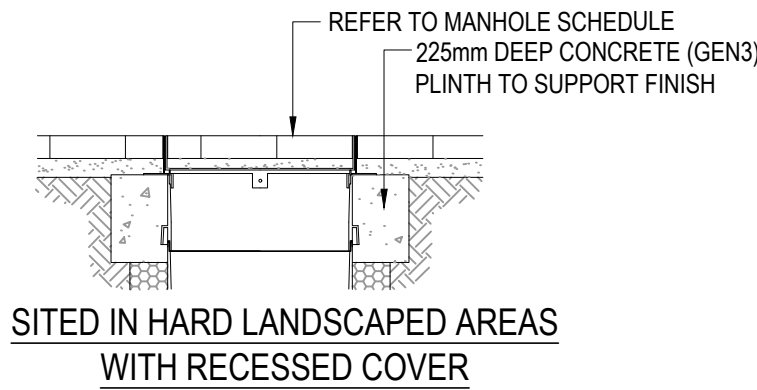
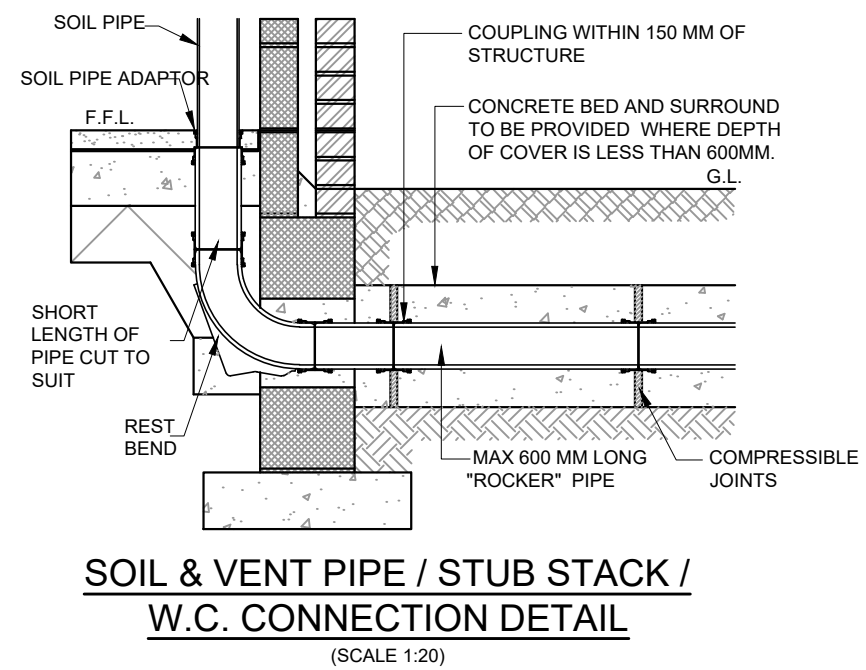
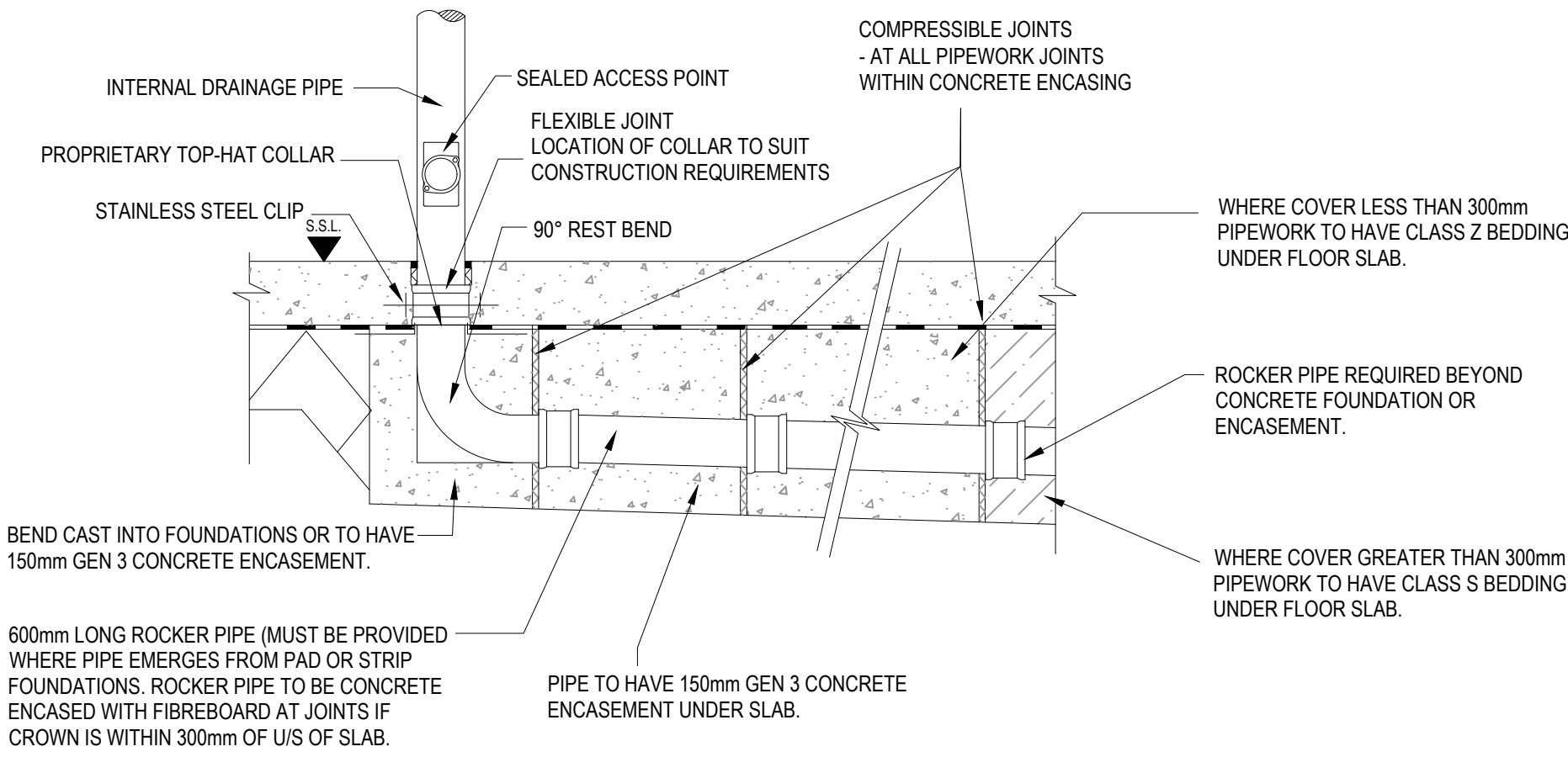
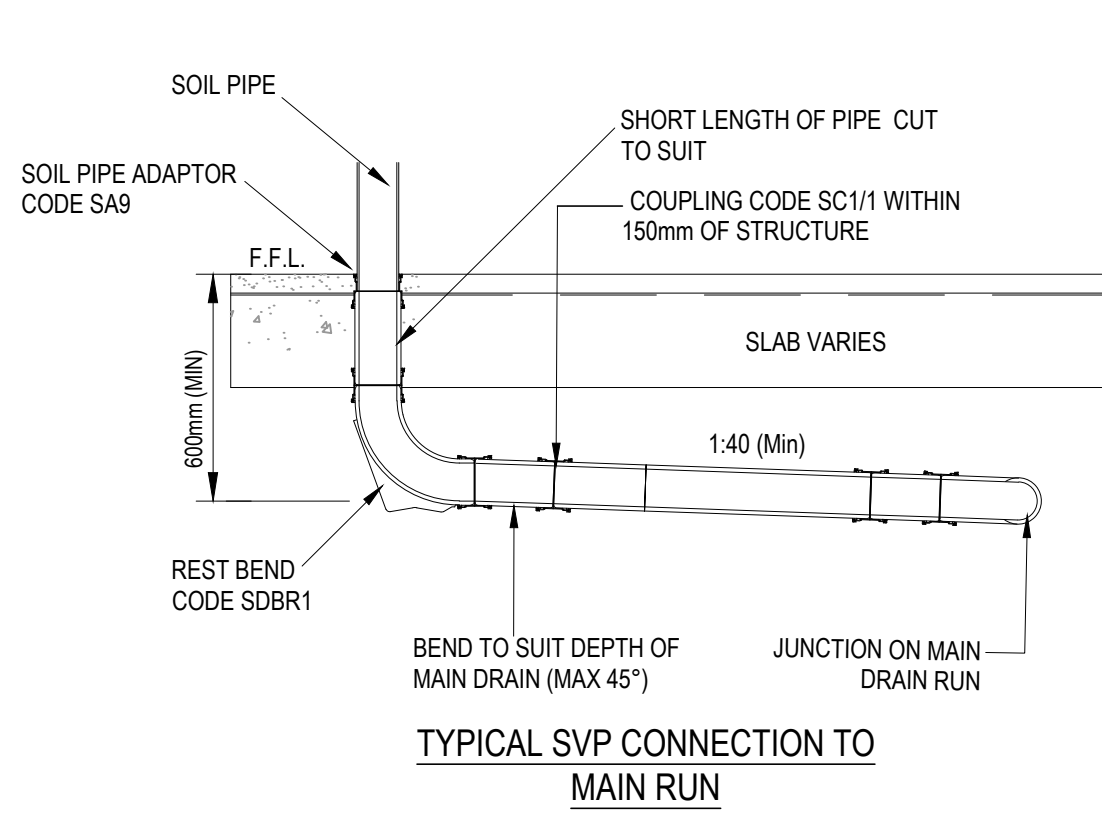
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. SULPHATE RESISTANT CONCRETE DC2 SHOULD BE USED WHERE SULPHATES PRESENT, REFER TO SI

C01	ISSUED FOR CONSTRUCTION	04/03/22	TH	MW
P01	ISSUED FOR PLANNING CONDITION DISCHARGE	05/11/21	ATL	CG
Rev:	Description:	Date:	By:	Chkd:
 Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG 0161 235 2394 manchester@curtins.com www.curtins.com Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kentish • Leeds • Liverpool • London • Manchester • Nottingham				

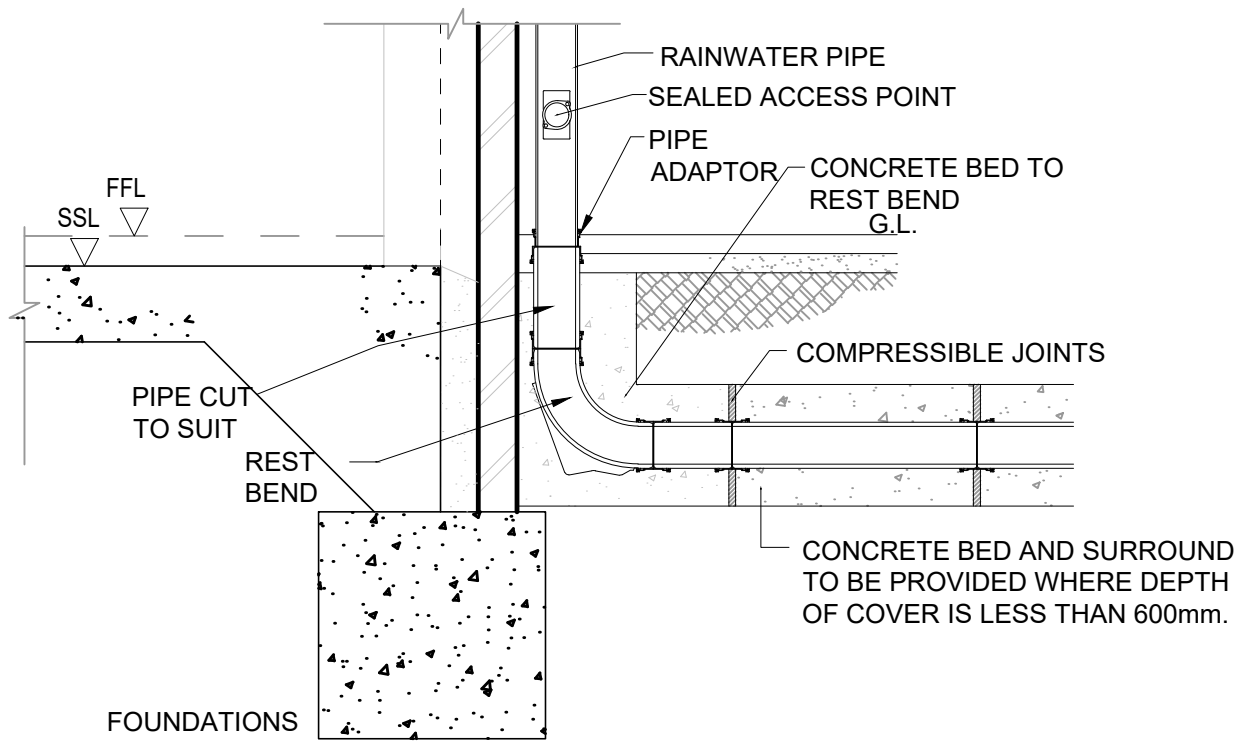
Status:	CONSTRUCTION			
Project:	GORTON LANE			
Orig Title:	SITE 1 DRAINAGE DETAILS SHEET 1 OF 5			
Size:	A1	Date:	05.11.21	Drawn By:
Scale:	NOT TO SCALE	ATL	ATL	ATL
Project No:	Originator:	Zone:	Level:	Type: Discipline: Category / Number: Rev:
8790	CUR	ZZ	XX	DR - C - 92530 - C01

GENERAL NOTES:

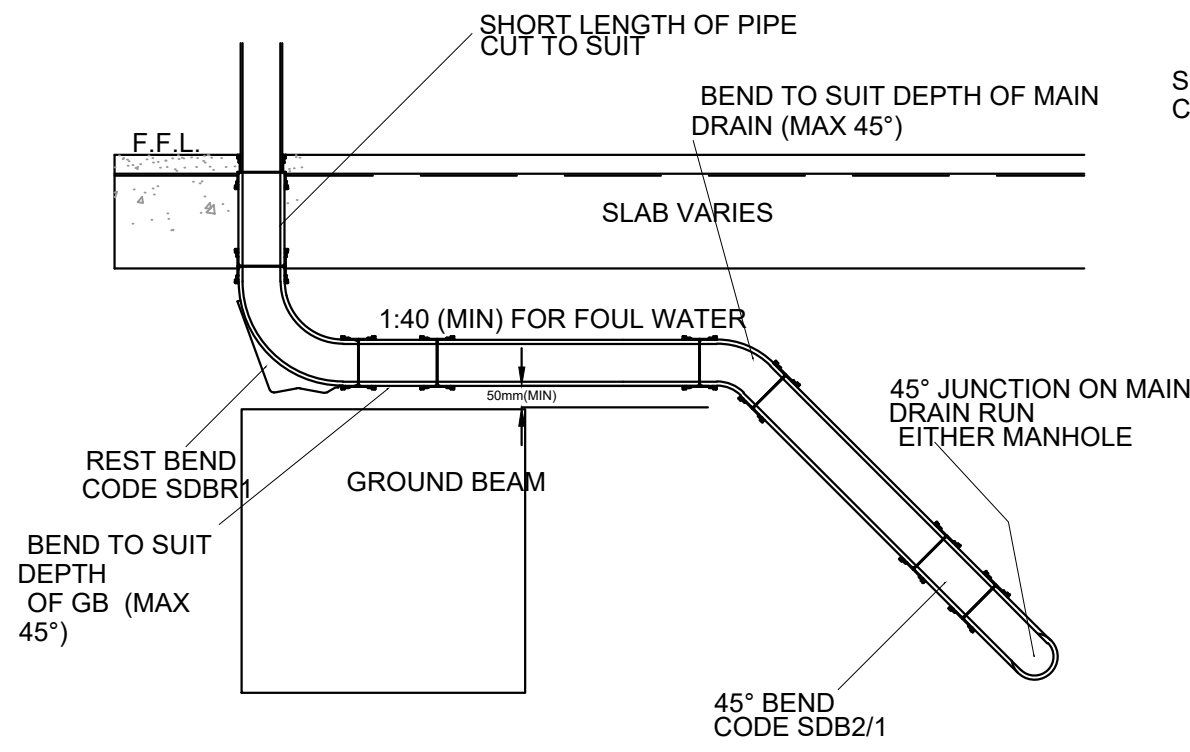
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. SULPHATE RESISTANT CONCRETE DC2 SHOULD BE USED WHERE SULPHATES PRESENT, REFER TO SI



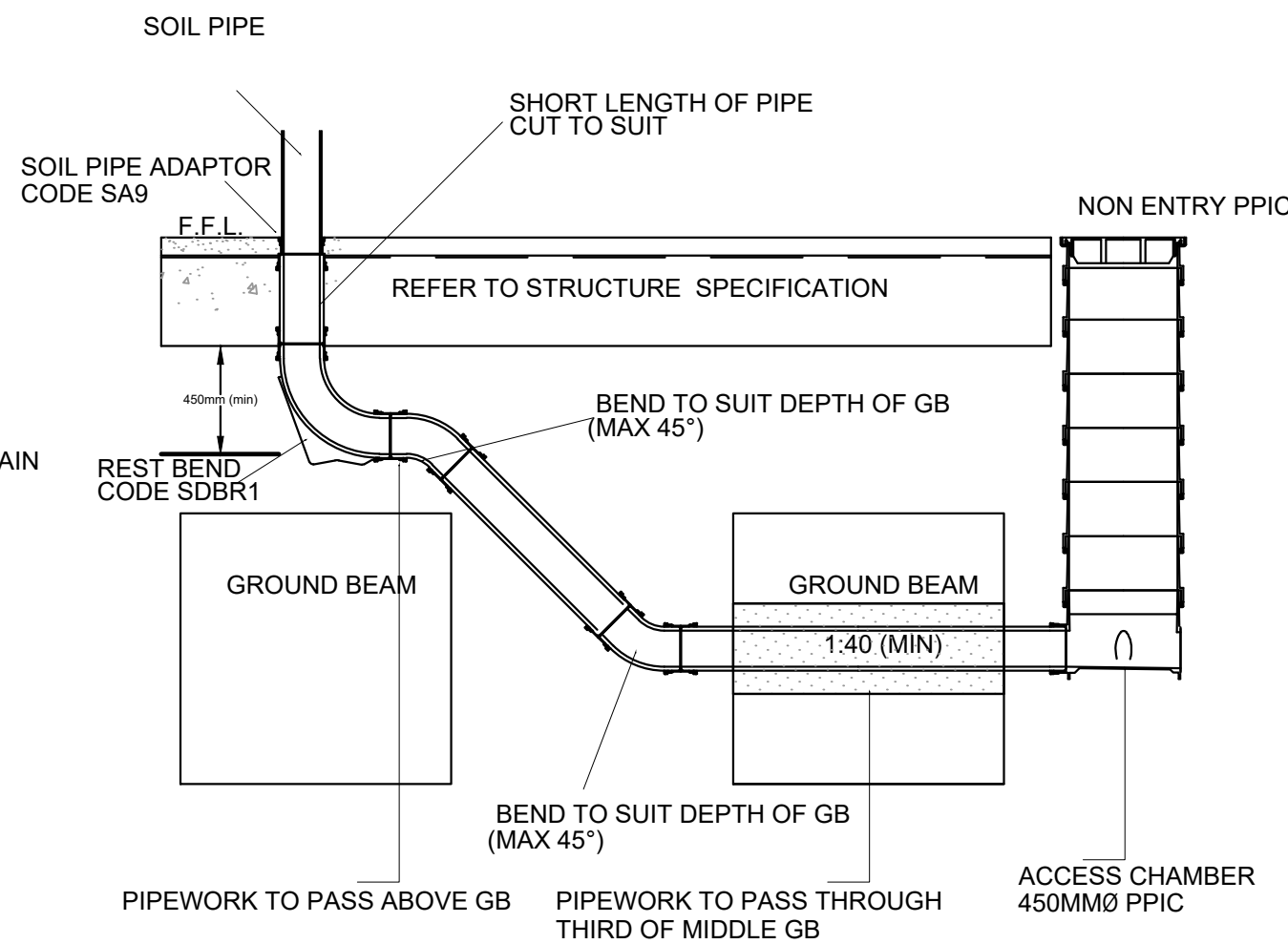
PIPES PASSING THROUGH GROUND BEAM SCALE 1:20



RWP CONNECTION DETAIL



PIPE PASSING OVER GROUND BEAM- DETAIL A



DETAIL FOR HOUSES-N DETAIL B

NOTE
IF IT IS NOT POSSIBLE TO PROVIDE A CONNECTION OF A CONSTANT SLOPE THEN SECTIONS SHOWN IN DETAILS 'A' TO 'B' SHOULD BE USED.

C01	ISSUED FOR CONSTRUCTION	04/03/22	TH	MW
P01	ISSUED FOR PLANNING CONDITION DISCHARGE	05/11/21	ATL	CG
Rev:	Description:	Date:	By:	Chkd:

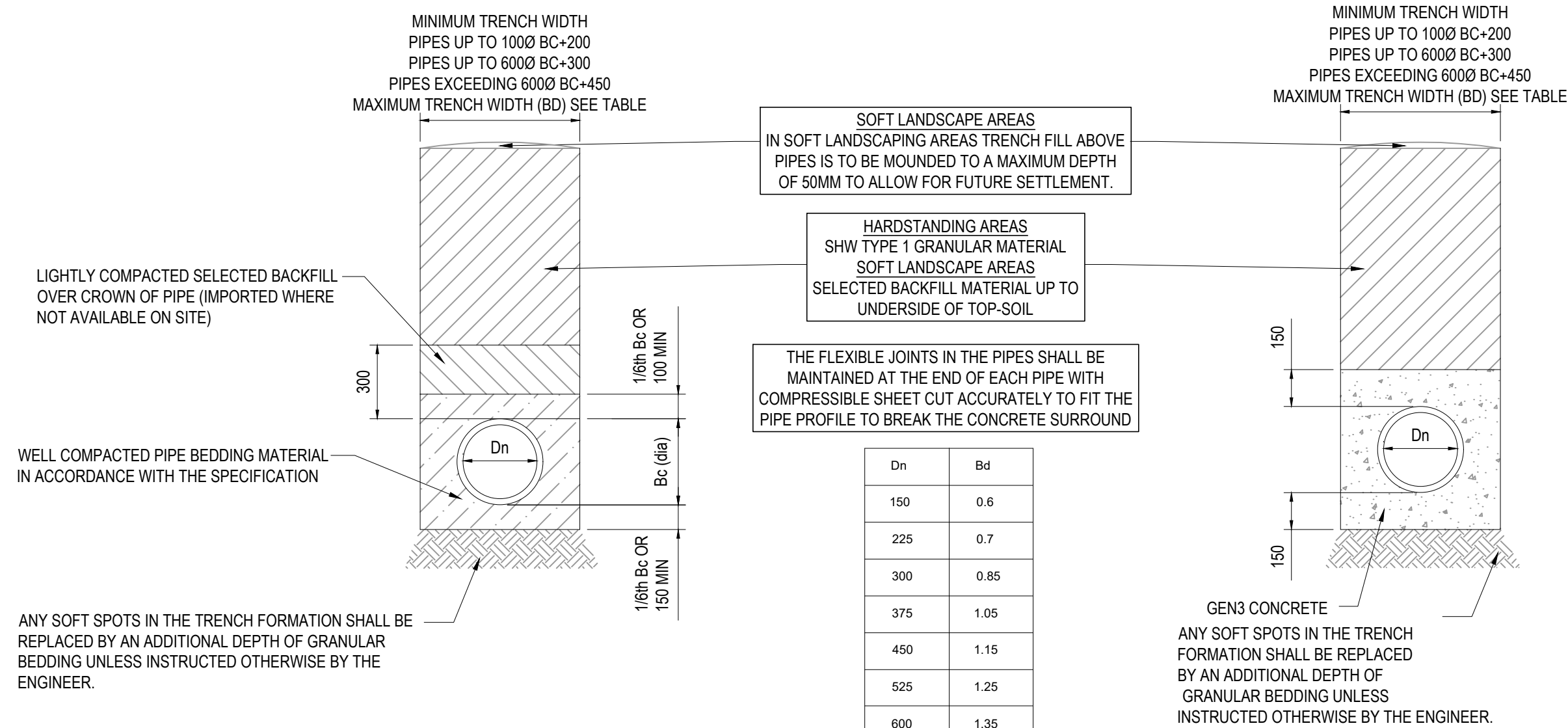
Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG
0161 235 2394
manchester@curtins.com
www.curtins.com

Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer
Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kentish • Leeds • Liverpool • London • Manchester • Nottingham

Status:	CONSTRUCTION			
Project:	GORTON LANE			
Orig Title:	SITE 1 DRAINAGE DETAILS SHEET 2 OF 5			
Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	05.11.21	ATL	ATL	ATL
Scale:	NOT TO SCALE			
Project No:	Originator:	Zone:	Level:	Type: Discipline: Category / Number: Rev:
8790	- CUR	- ZZ	- XX	- DR - C - 92531 - C01

GENERAL NOTES:

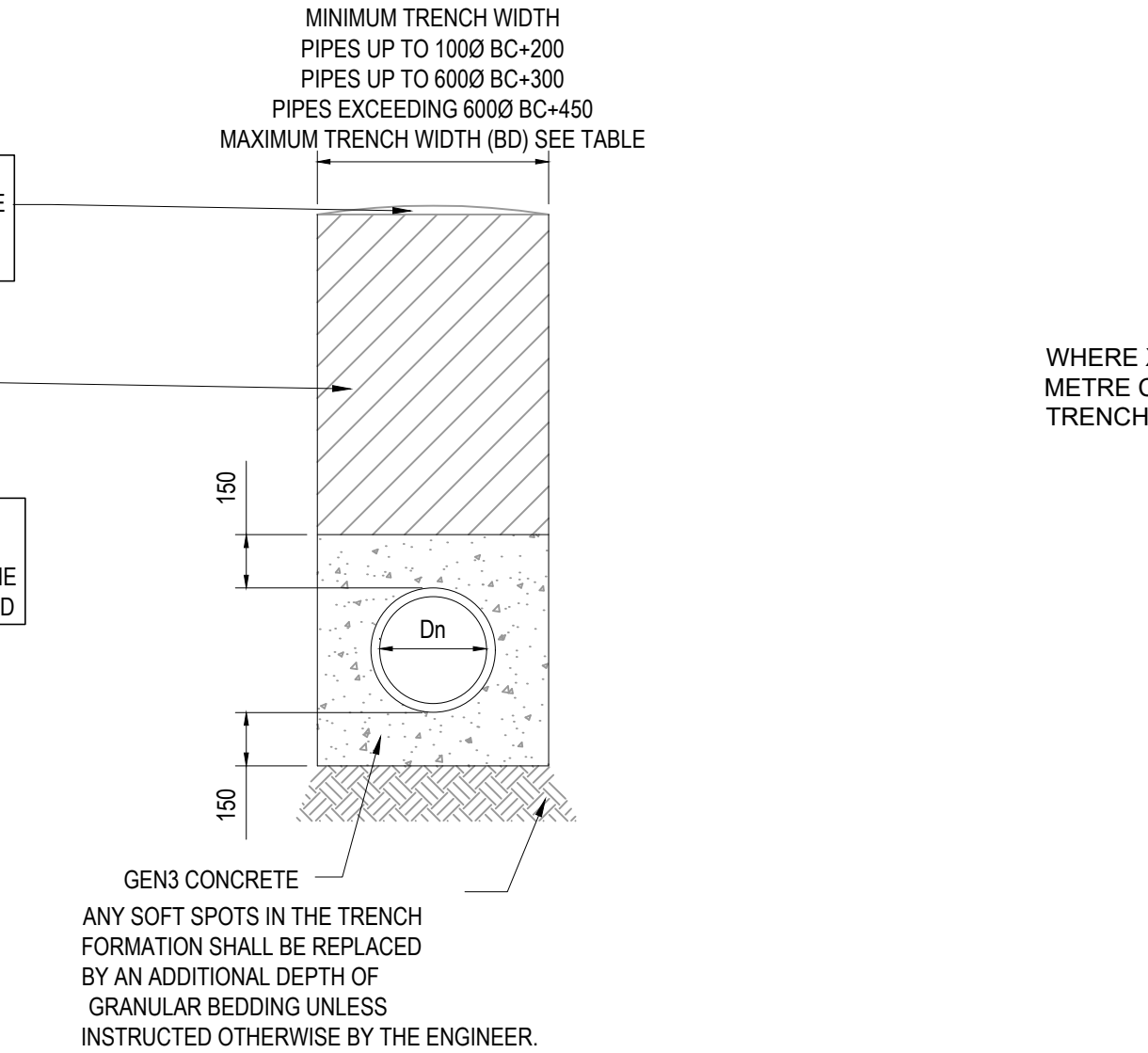
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.



CLASS S - 360° GRANULAR SURROUND PIPE BEDDING DETAIL

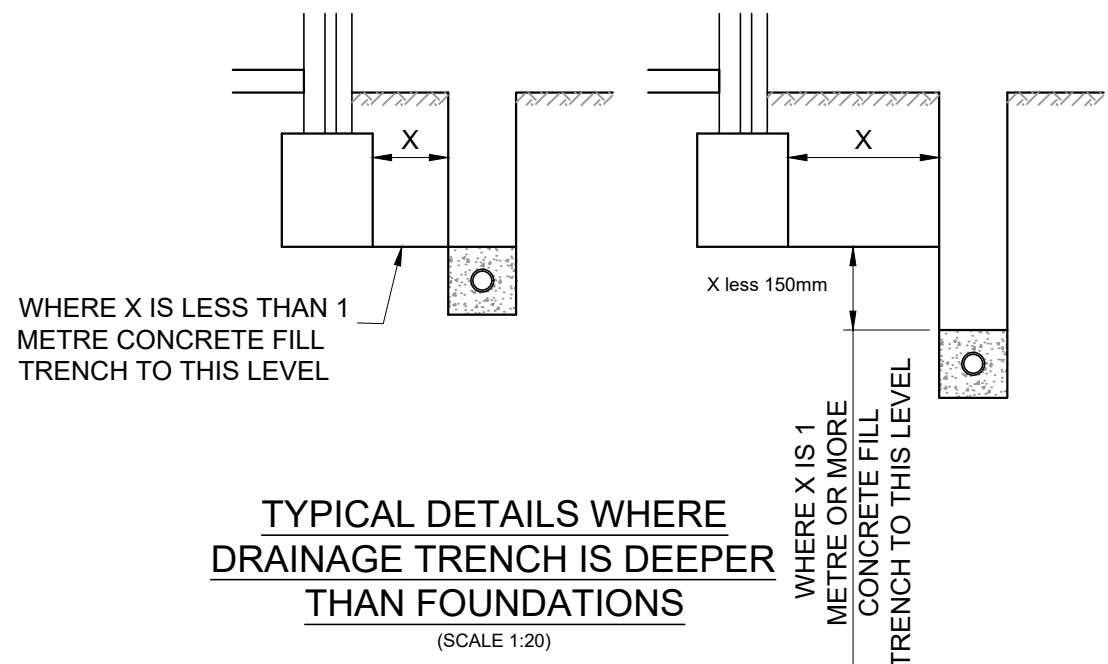
Dn	Bd
150	0.6
225	0.7
300	0.85
375	1.05
450	1.15
525	1.25
600	1.35
675	1.45
750	1.50

MAXIMUM TRENCH WIDTH

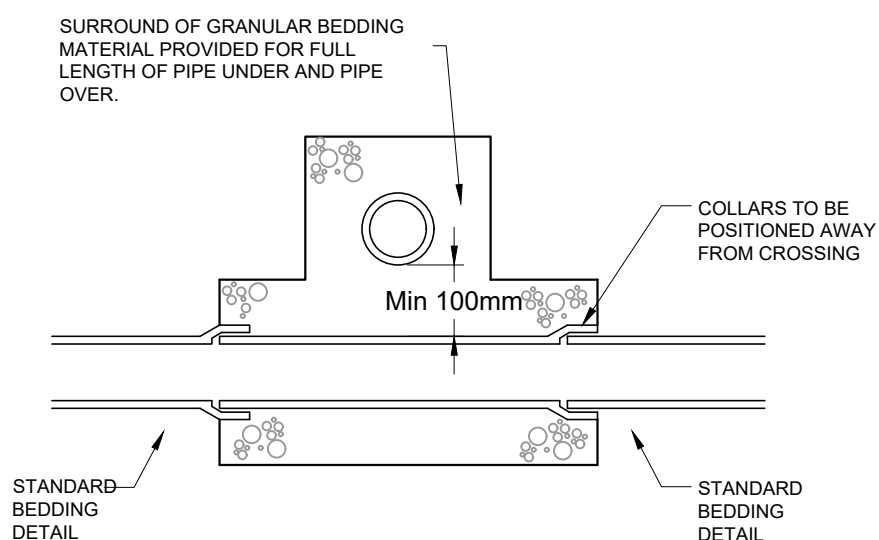


CLASS Z - CONCRETE BED AND SURROUND PIPE BEDDING DETAIL

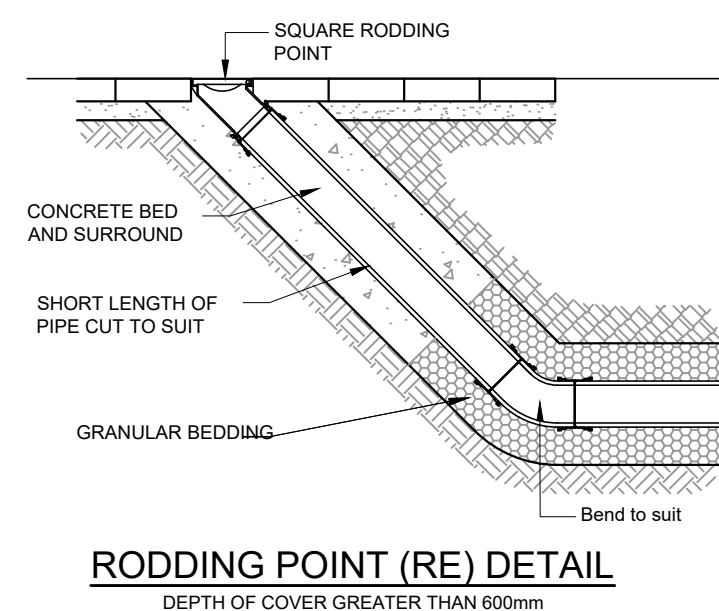
(COVER < 900mm IN VEHICULAR LOADING AND OPEN FIELD.)
(COVER < 600mm ELSEWHERE EXCEPT UNDER BUILDINGS.)



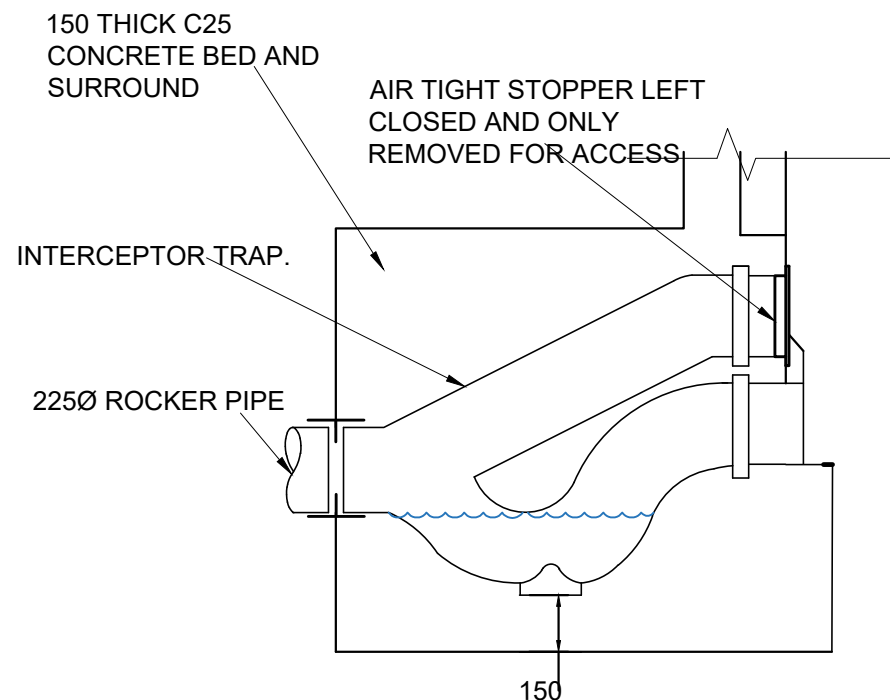
TYPICAL DETAILS WHERE
DRAINAGE TRENCH IS DEEPER
THAN FOUNDATIONS
(SCALE 1:20)



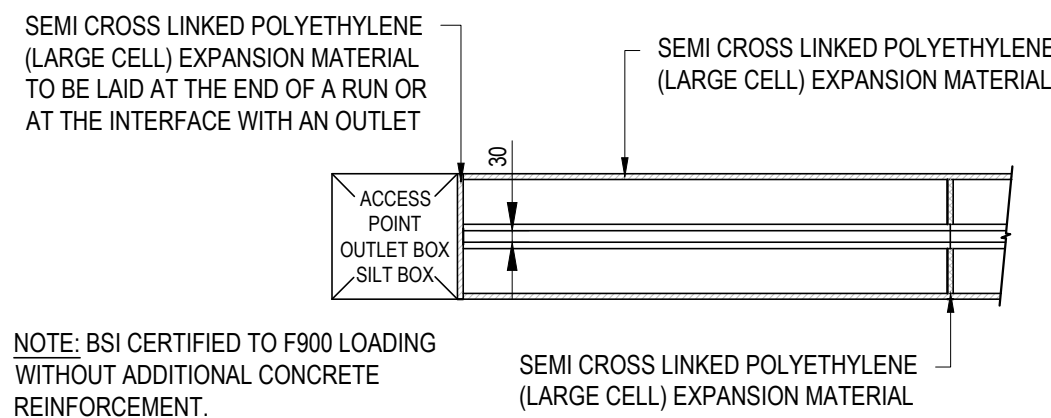
PIPE CROSSINGS DETAIL



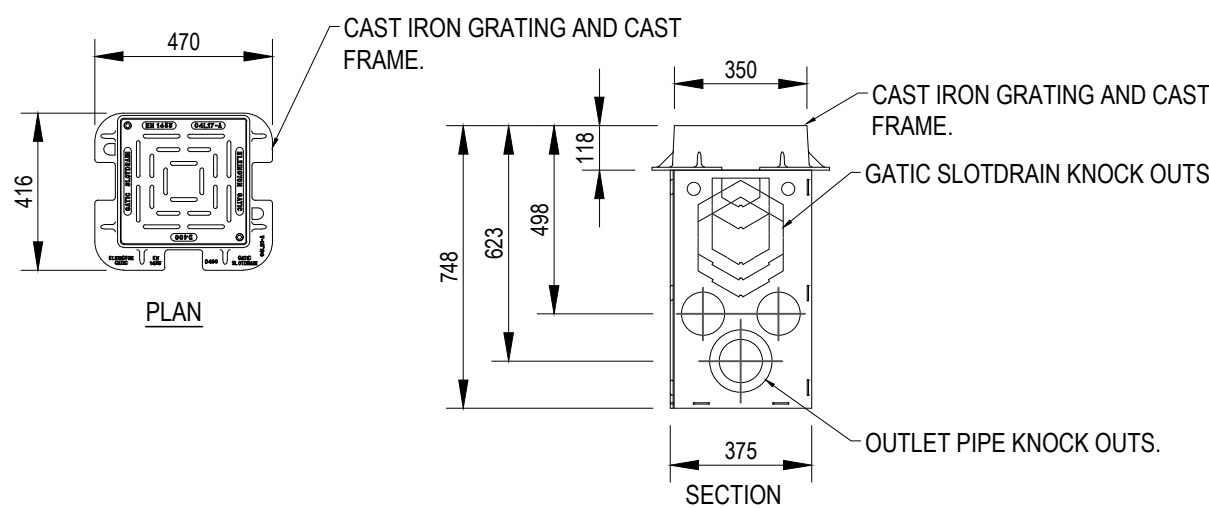
RODDING POINT (RE) DETAIL



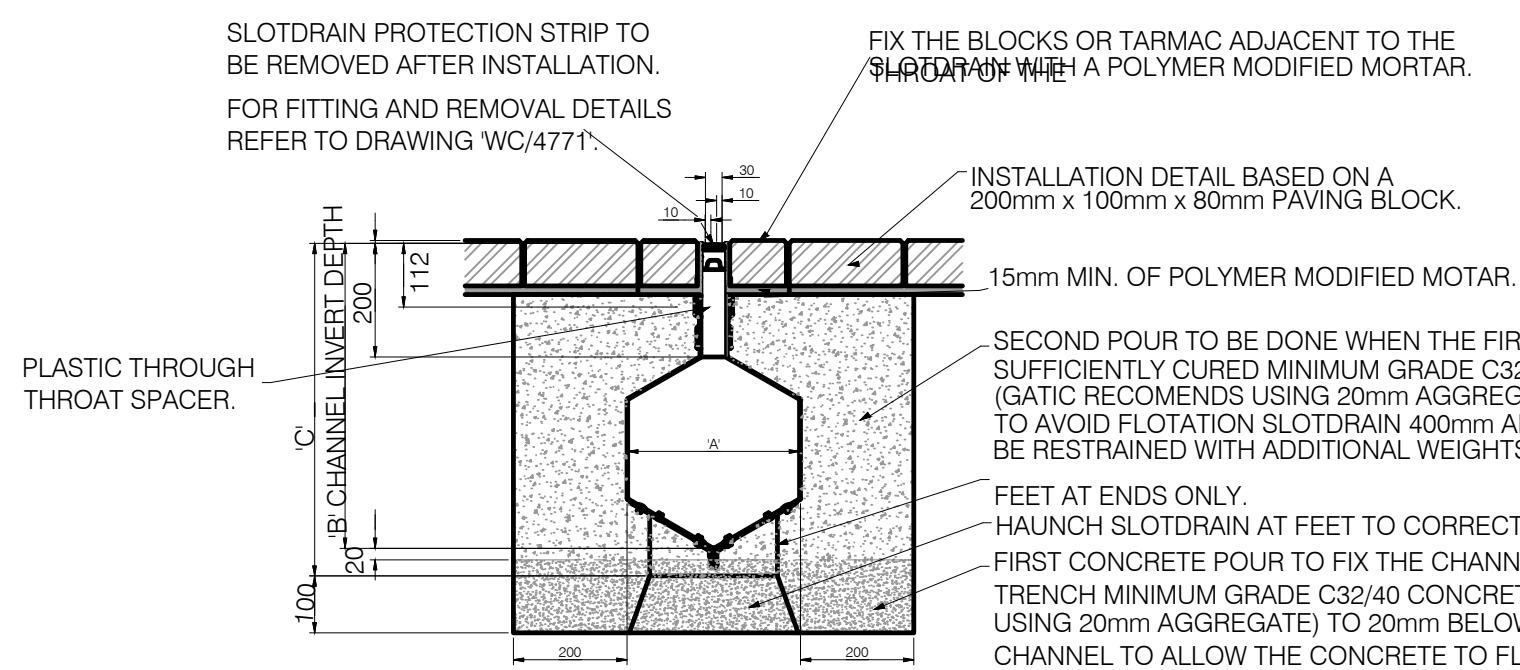
INTERCEPTOR TRAP



GATIC PLAN DETAIL

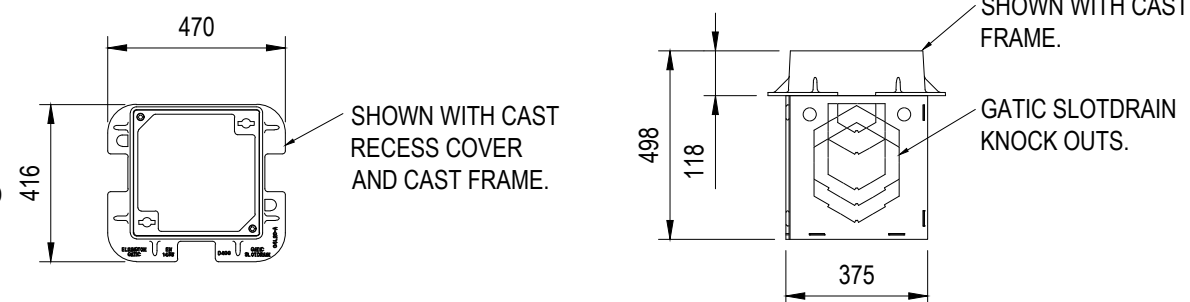


GATIC SLOTDRAIN 350mm OUTLET UNIT
SECTION AND PLAN DETAILS
NTS

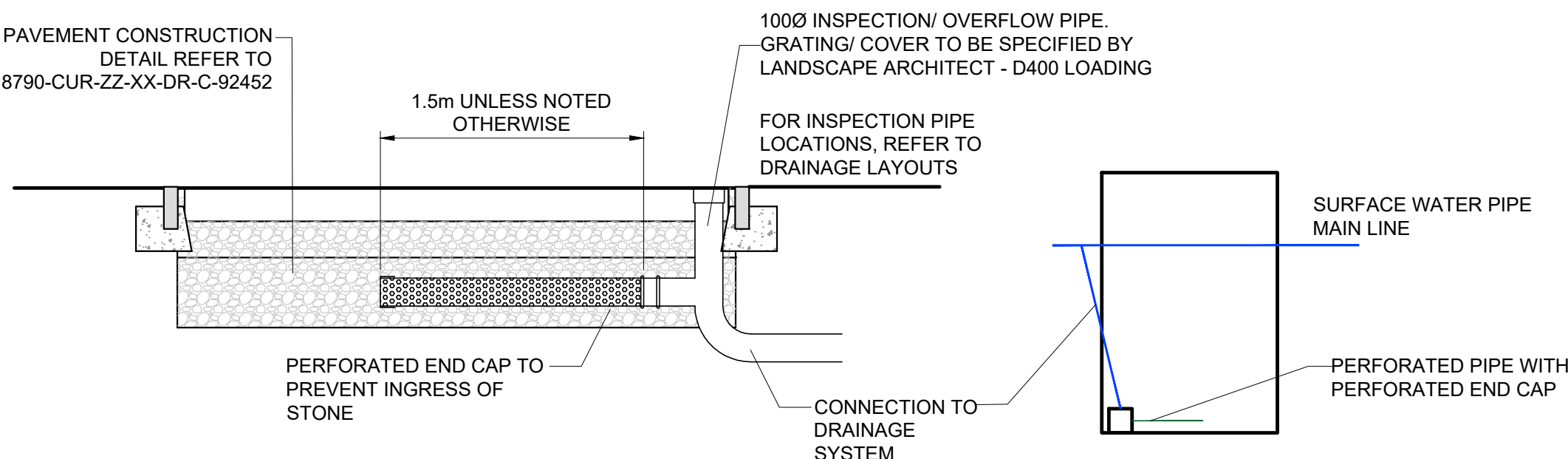


GATIC SLOTDRAIN CASTSLOT TREADSAFE

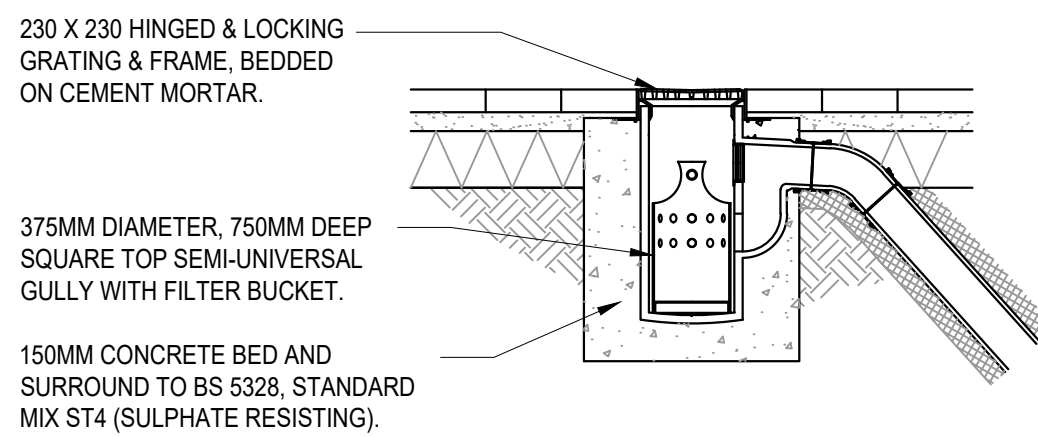
WIDTH 'A'	INVERT 'B'	DEPTH 'C'
150	366	415



350 ACCESS BOX
SECTION AND PLAN DETAILS
NTS



TYPICAL OUTLET FROM PERMEABLE PAVING (PPO)



TYPICAL TRAPPED AND RODDABLE YARD GULLY DETAIL

NOTE:
THE DEPTH OF THE GULLY CAN BE INCREASED BY UP TO 300MM BY FITTING A 225MM COUPLING AND A 300 MM HIGH RAISING PIECE BETWEEN THE FRAME AND THE GULLY BODY.

C01	ISSUED FOR CONSTRUCTION	04/03/22	TH	MW
P01	ISSUED FOR PLANNING CONDITION DISCHARGE	05/11/21	ATL	CG
Rev:	Description:	Date:	By:	Chkd:



Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG
 0161 236 2394
manchester@curtins.com
www.curtins.com

Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer
 Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kendal • Leeds • Liverpool • London • Manchester • Nottingham

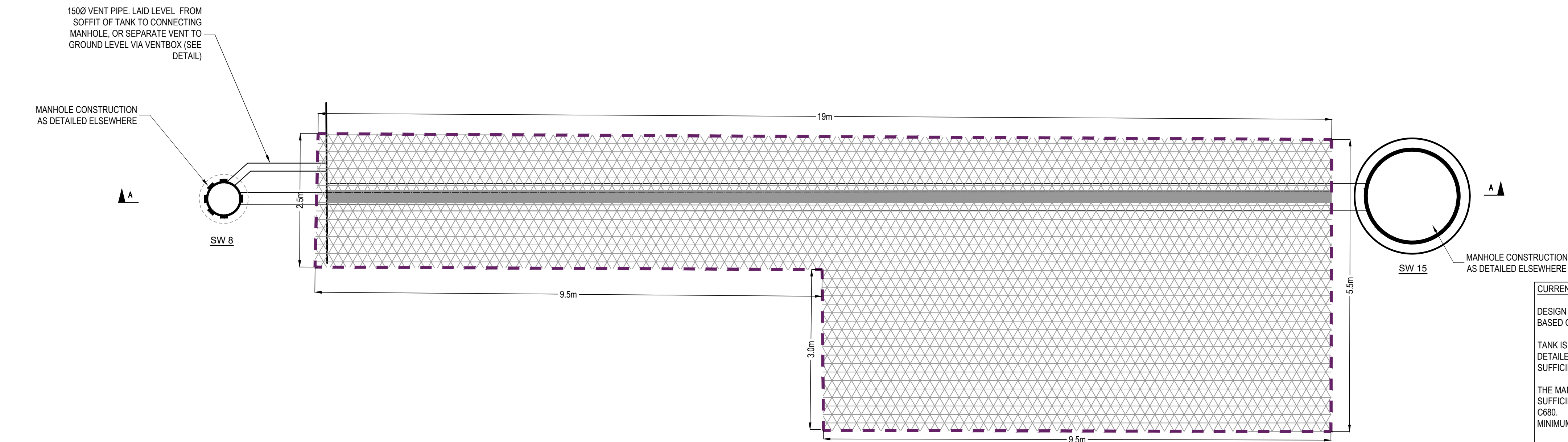
Status: CONSTRUCTION

Project: **GORTON LANE**

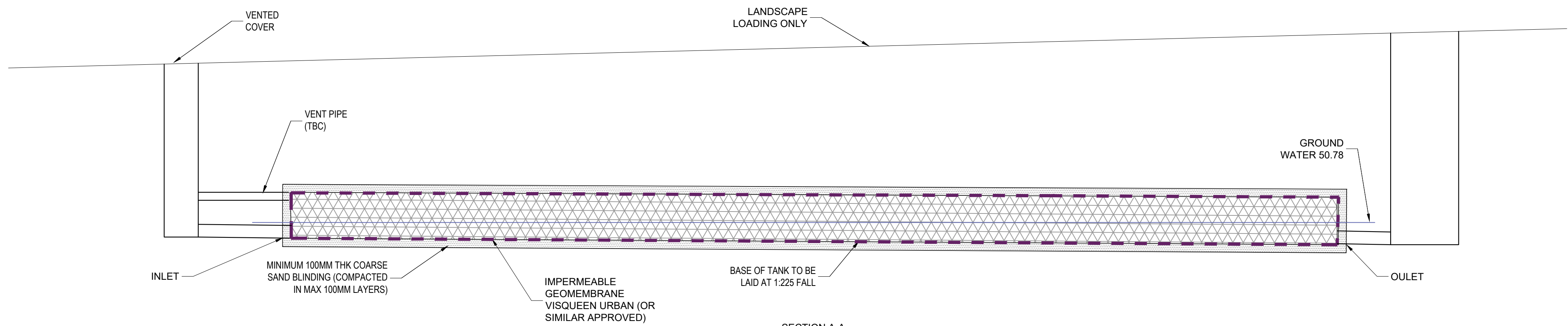
Dwg Title:

SITE 1 DRAINAGE DETAILS
SHEET 3 OF 5

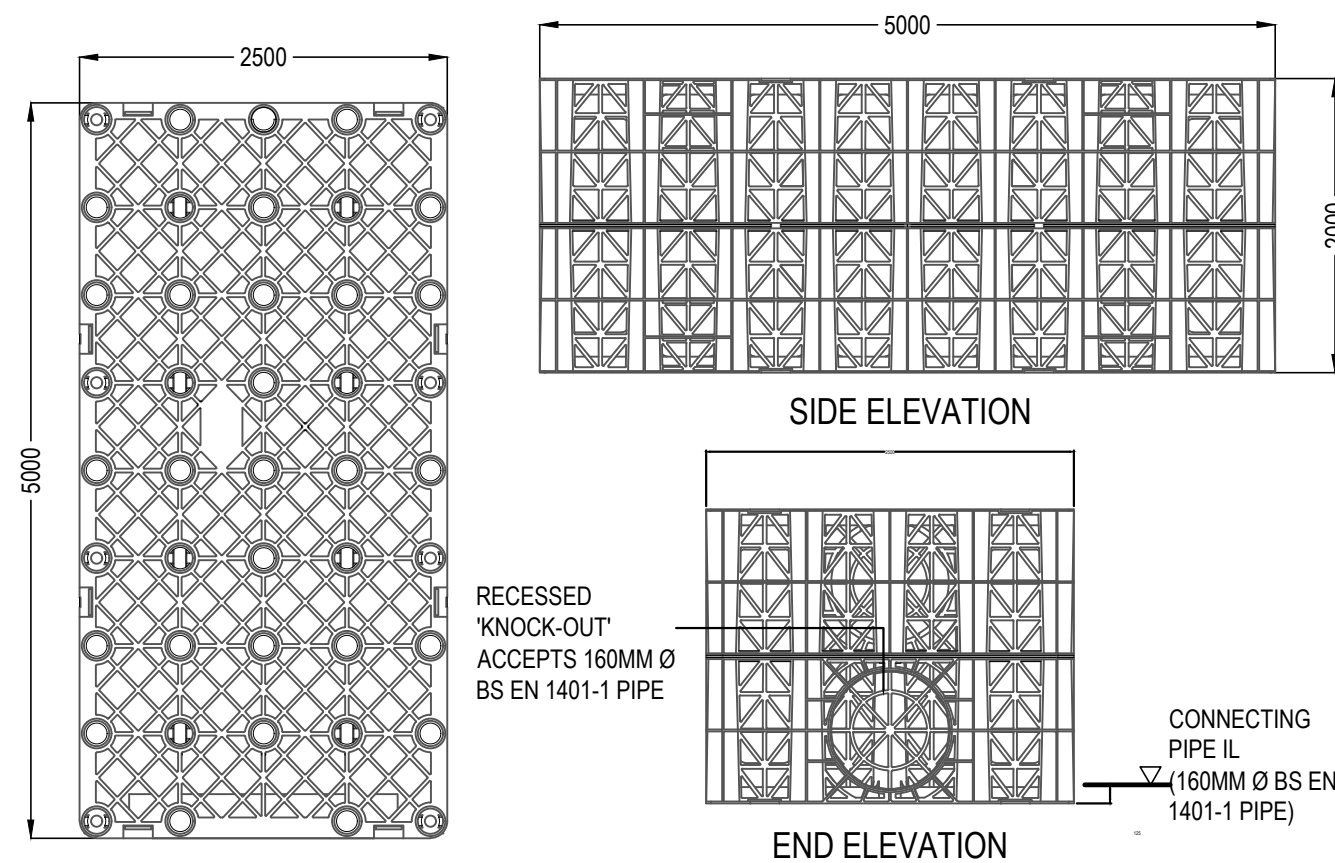
Size:	Date:	Drawn By:	Designed By:	Checked By:			
A1	05.11.21	ATL	ATL	ATL			
Scale: NOT TO SCALE							
Project No:	Originator:	Zone:	Level:	Type:	Discipline:	Category / Number:	Rev:
8790 - CUR - ZZ - XX - DR - C - 92532 - C01							



TYPICAL ATTENUATION
TANK PLAN



SECTION A-A



CURRENT DESIGN ASSUMPTIONS

DESIGN BASED POLYSTORM DEEP (PSM1A) 0.50m (W) 0.40m (H), 1m (L) BASED ON APPROXIMATE MINIMUM BURIAL DEPTH OF 2.95m

TANK IS LOCATED IN AN AREA SUBJECT TO PEDESTRIAN LOADING. DETAILED STRUCTURAL CALCULATIONS REQUIRED TO PROVE TANK HAS SUFFICIENT STRENGTH.

THE MANUFACTURER WILL NEED TO CONFIRM THAT THE TANK HAS SUFFICIENT STRENGTH FOR THIS LOCATION IN ACCORDANCE WITH CIRIA C680.

MINIMUM GROUND LEVEL IS APPROX. 53.35, DEPTH TO SOFFIT 2.15m

TOP OF TANK 51.20
INVERT LEVEL OF INLET PIPE 50.50
INVERT LEVEL OF OUTLET PIPE 50.40
BASE OF TANK TO BE LAID AT 1:225 FALL.

DIMENSIONS OF TOTAL UNIT ARE AS SHOWN.
PLAN AREA OF TANK IS 75m²
TOTAL DEPTH OF TANK IS 0.8m.
ATTENUATION VOLUME, BASED ON 95% VOID RATIO IS 57m³

IMPERMEABLE MEMBRANE, BED AND SURROUND TO BE CONFIRMED WITH THE MANUFACTURER.

GROUND WATER LEVEL 50.78AOD TANK IS NOT AT RISK OF FLOATATION.

REFER TO DRAINAGE LAYOUT FOR TANK & INLET/OUTLET LOCATIONS.

GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- REFER TO THE DRAINAGE LAYOUT FOR THE LOCATION OF THE FLOW CONTROL.
- FLOW CONTROL TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
- WHERE ALTERNATIVE FLOW CONTROL DEVICE IS PREFERRED, IT WILL BE SUBJECT TO REDESIGN TO CONFIRM WHETHER THE SYSTEM HAS CAPACITY.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- THE DESIGN OF THE TANK SHOULD BE PROVIDED BY THE MANUFACTURER OR SUPPLIER TO ENSURE THE TANK IS SUFFICIENT FOR THE SITE SPECIFIC CRITERIA.
- THE TANK DESIGN SHOULD INCORPORATE:
 - CRATES SUBJECT TO PEDESTRIAN LOADING,
 - SUITABLE MAINTENANCE ACCESS; AND
 - VENTING TO PREVENT TRAPPED AIR POCKETS.
- THE STRENGTH OF THE TANK SHOULD COMPLY WITH CIRIA C680 STRUCTURAL DESIGN OF MODULAR GEOCELLULAR DRAINAGE TANKS.
- ACCESS FOR MAINTENANCE SHOULD BE IN ACCORDANCE WITH CIRIA GUIDANCE.
- VENTING TO THE TANK SHOULD BE CONFIRMED BY THE TANK MANUFACTURER. VENTING SHOULD BE LOCATED WITHIN LANDSCAPED AREAS, OR ROUTED BACK TO THE NEAREST MANHOLE ABOVE THE DESIGN WATER LEVEL.
- CONSTRUCTION AND INSTALLATION OF THE TANK SHOULD BE STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION REQUIREMENTS.
- THE CURRENT DESIGN OF THE TANK IS BASED ON USE OF POLYPIPE POLYSTORM PSM1A UNITS, TO ALLOW AN ASSUMPTION OF UNIT SIZES WITHIN THE OVERALL DESIGN. HOWEVER, WHERE AN ALTERNATIVE SYSTEM IS PROPOSED, THE DIMENSIONS OF THE UNITS WILL NEED TO BE CHECKED WITHIN THE DESIGN AND MAY RESULT IN A REDESIGN.
- THE CONTRACTOR SHALL PROHIBIT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION. TEMPORARY FENCING CAN BE USED TO PROHIBIT TRADE STOCKS, PILLING MATERIALS, HEAVY PLANTS ETC.

C03	TANK SHAPE AMENDED	18/03/22	MW	MW
C02	GROUNDWATER LEVEL AMENDED	07/04/22	MW	MW
C01	ISSUED FOR CONSTRUCTION	04/03/22	TH	MW
P01	ISSUED FOR PLANNING CONDITION DISCHARGE	05/11/21	ATL	CG

Rev:	Description:	Date:	By:	Chkd:
------	--------------	-------	-----	-------

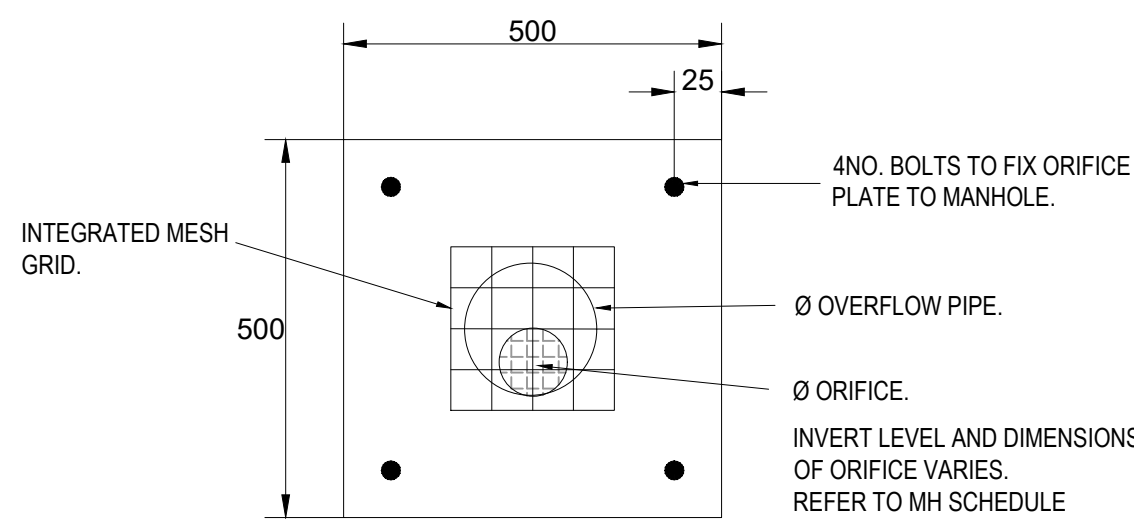
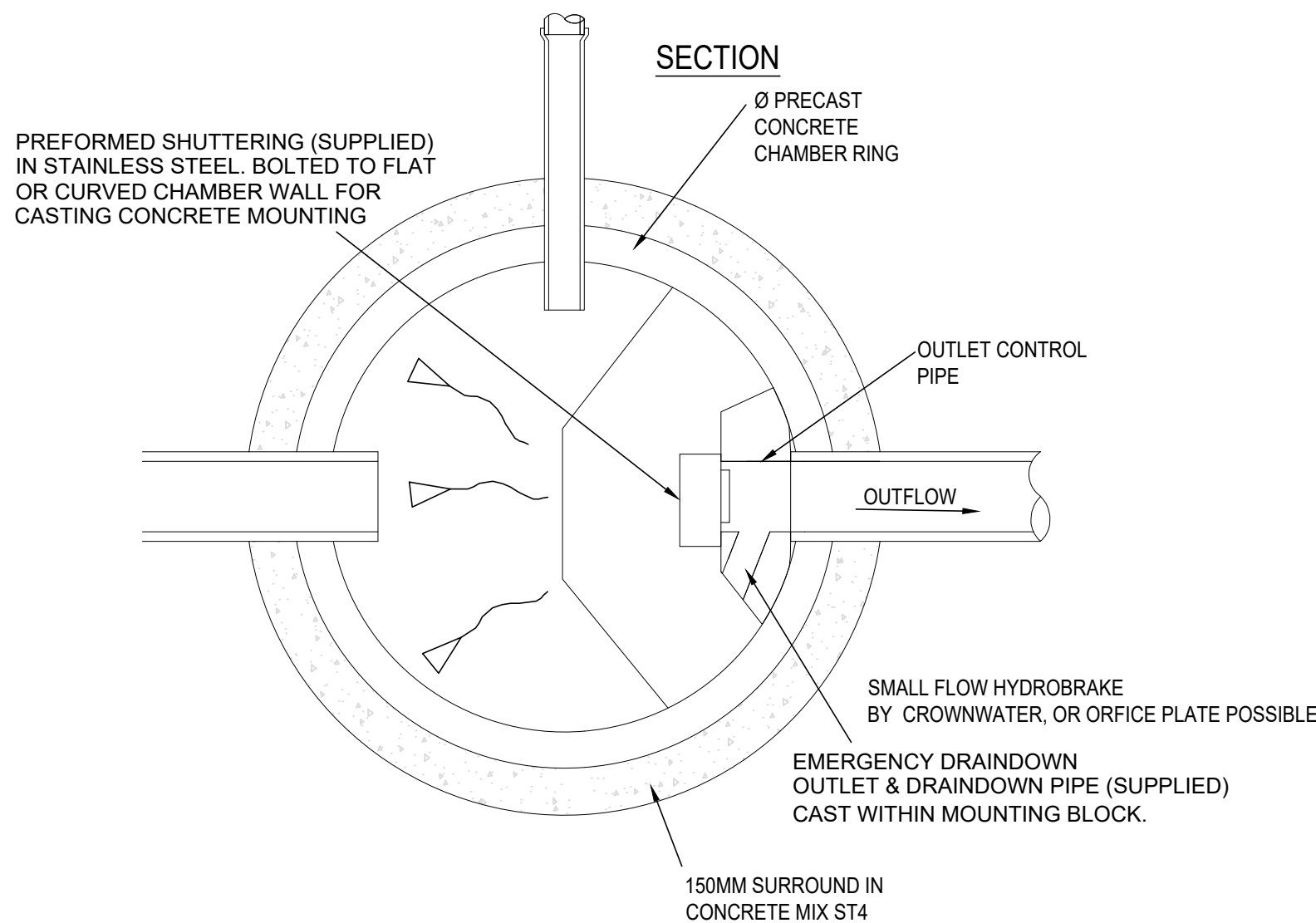
Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG
0161 235 2384
manchester@curtins.com
www.curtins.com

Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer
Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kentish • Leeds • Liverpool • London • Manchester • Nottingham

Status:	CONSTRUCTION			
Project:	GORTON LANE			
Orig Title:	SITE 1 DRAINAGE DETAILS SHEET 4 OF 5			
Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	05.11.21	ATL	ATL	ATL
Scale:	NOT TO SCALE			
Project No:	Originator:	Zone:	Level:	Type: Discipline: Category / Number: Rev:
8790	- CUR	- ZZ	- XX	- DR - C - 92533 - C03

GENERAL NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
4. FLOW CONTROL TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.
5. WHERE ALTERNATIVE FLOW CONTROL DEVICE IS PREFERRED, IT WILL BE SUBJECT TO REDESIGN TO CONFIRM WHETHER THE SYSTEM HAS CAPACITY.
6. SURFACE WATER DRAINAGE CONNECTION SUBJECT TO S106 AGREEMENT WITH SEVERN TRENT WATER
7. SULPHATE RESISTANT CONCRETE DC2 SHOULD BE USED WHERE SULPHATES PRESENT. REFER TO SI.



TYPICAL ORIFICE PLATE DETAIL

FLOW CONTROL DETAILS				
MANHOLE REF	HYDROBRAKE IL (a)	OVERFLOW IL (b)	OVERFLOW PIPE Ø	ORIFICE Ø
SW 15	50.36	51.16	100	30

PRIVATE HYDROBRAKE CONTROL CHAMBER

Technical Specification

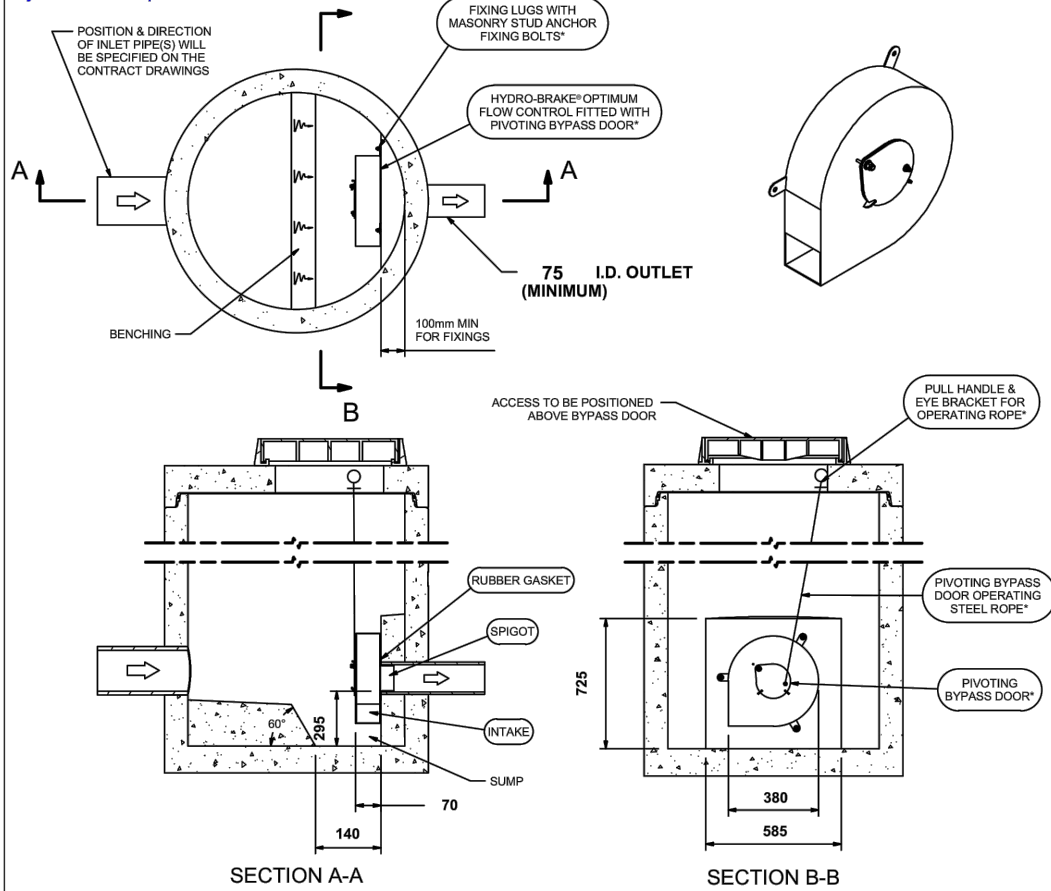
Control Point	Head (m)	Flow (l/s)
Primary Design	1.100	1.800
Flush-Flo™	0.272	1.624
Kick-Flo®	0.554	1.321
Mean Flow		1.487

Hydro-Brake® Optimum Flow Control including:

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



hydro-int.com/patents



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

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES

**DESIGN
ADVICE**

The head/flow characteristics of this SHE-0062-1800-1100-1800 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modeling evaluates the full head/flow characteristic curve.

The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.



Hydro
International

SHE-0062-1800-1100-1800
Hydro-Brake® Optimum

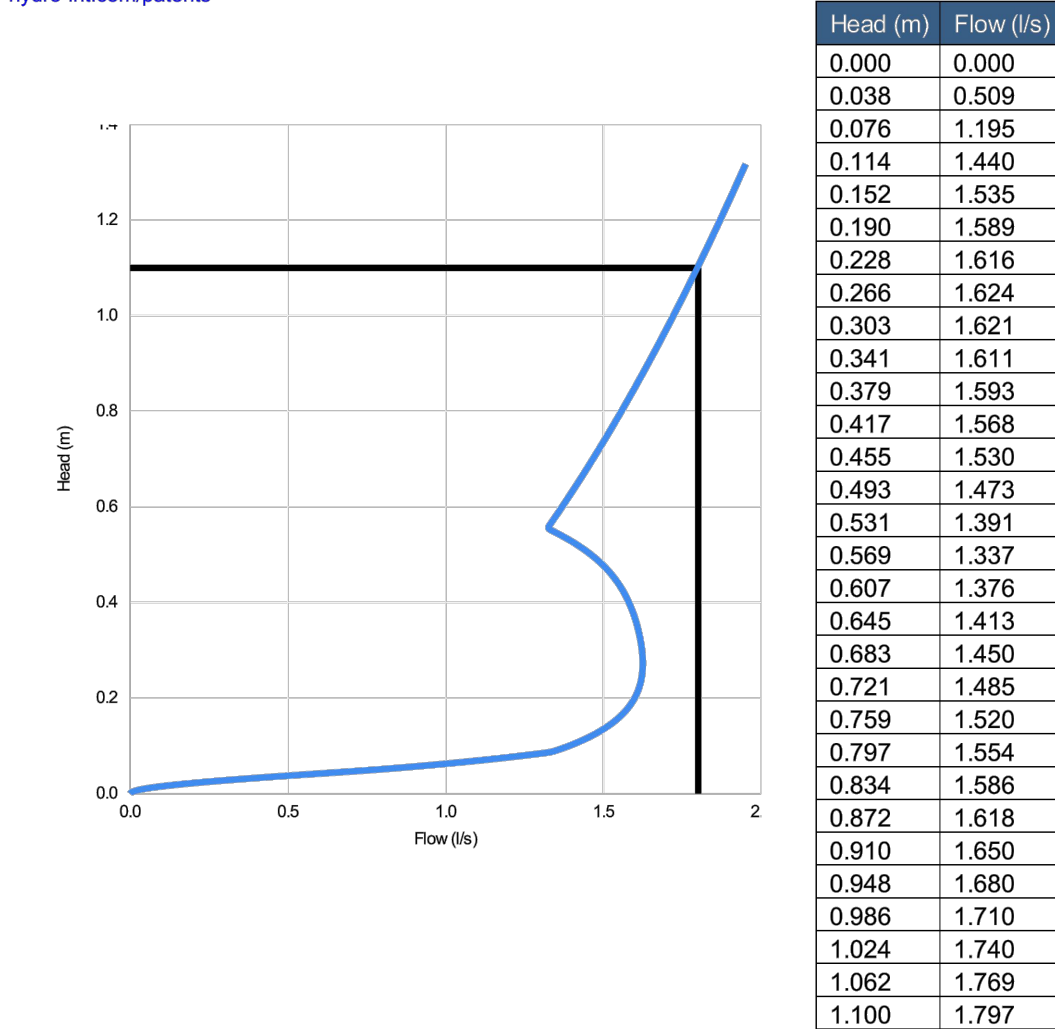
© 2021 Hydro International Ltd, Shearwater House, Clevedon Hall Estate, Victoria Road, Clevedon, B521 7RD. Tel: 01275 878371 Fax: 01275 874679 Web: www.hydro-int.com Email: enquiries@hydro-int.com
andy.losly@curtins.com

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.100	1.800
Flush-Flo	0.272	1.624
Kick-Flo®	0.554	1.321
Mean Flow		1.487



hydro-int.com/patents



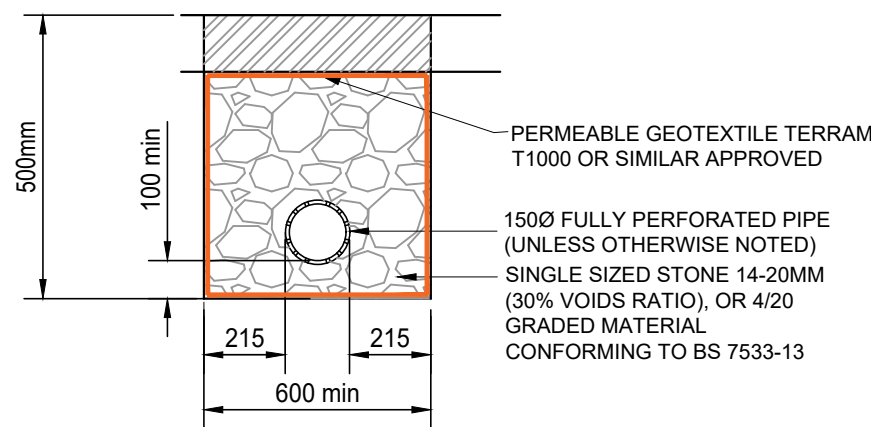
DESIGN ADVICE The head/flow characteristics of this SHE-0062-1800-1100-1800 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

DATE	05/11/2021 11:44
Site	Gorton Site 1
DESIGNER	Andrew Losty
Ref	8790



SHE-0062-1800-1100-1800
Hydro-Brake Optimum



LAND DRAIN

C01	ISSUED FOR CONSTRUCTION	04/03/22	TH	MW
P01	ISSUED FOR PLANNING CONDITION DISCHARGE	05/11/21	ATL	CG
Rev:	Description:	Date:	By:	Chkd:



Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG
0161 236 2394
manchester@curtains.com
www.curtains.com

Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer
Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kendal • Leeds • Liverpool • London • Manchester • Nottingham

Status: CONSTRUCTION

Project: GORTON LANE

Drp Title:

SITE 1 DRAINAGE DETAILS
SHEET 5 OF 5

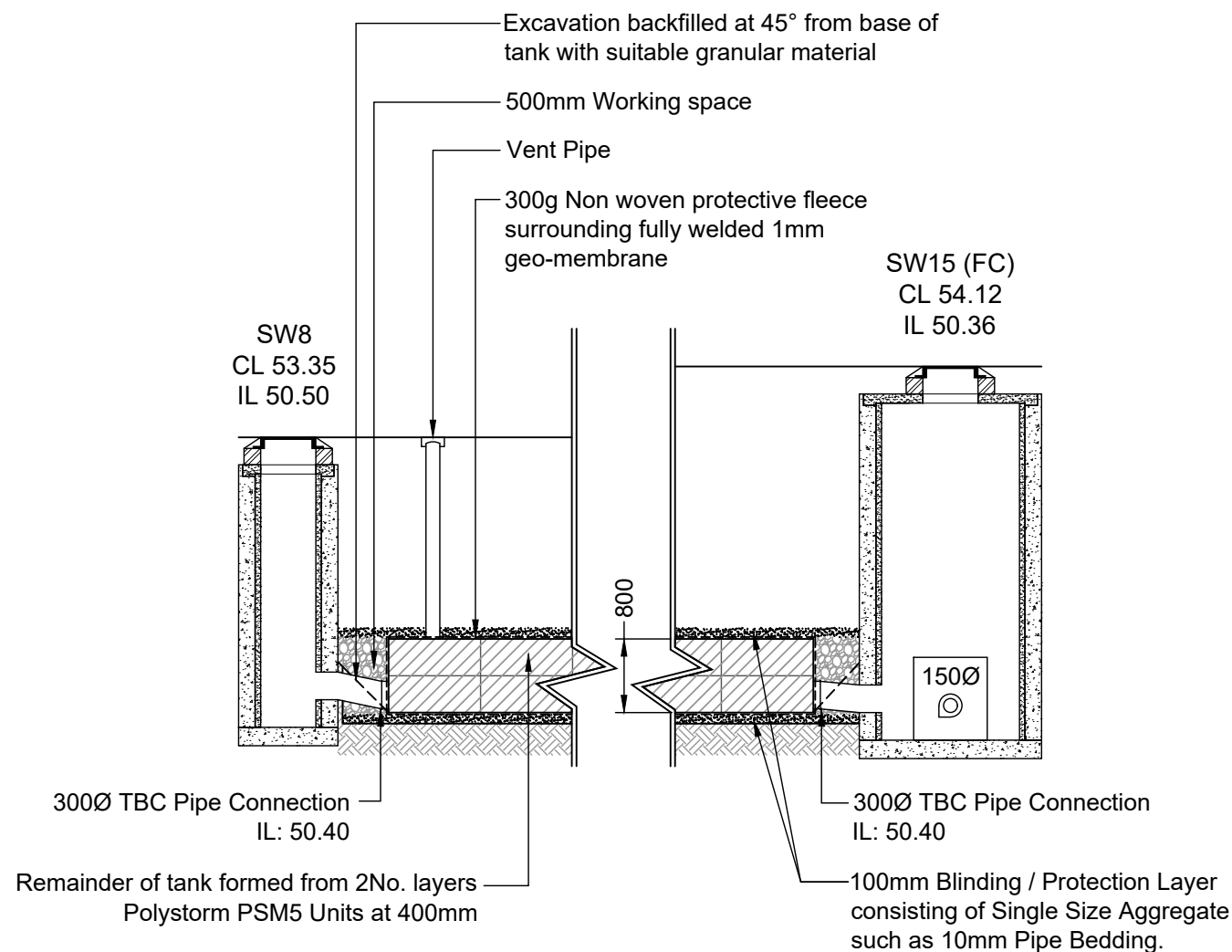
Size:	Date:	Drawn By:	Designed By:	Checked By:			
A1	05.11.21	ATL	ATL	ATL			
Scale: NOT TO SCALE							
Project No:	Originator:	Zone:	Level:	Type:	Discipline:	Category / Number:	Rev:
8790 - CUR - ZZ - XX - DR - C - 92534 - C01							

NOTES

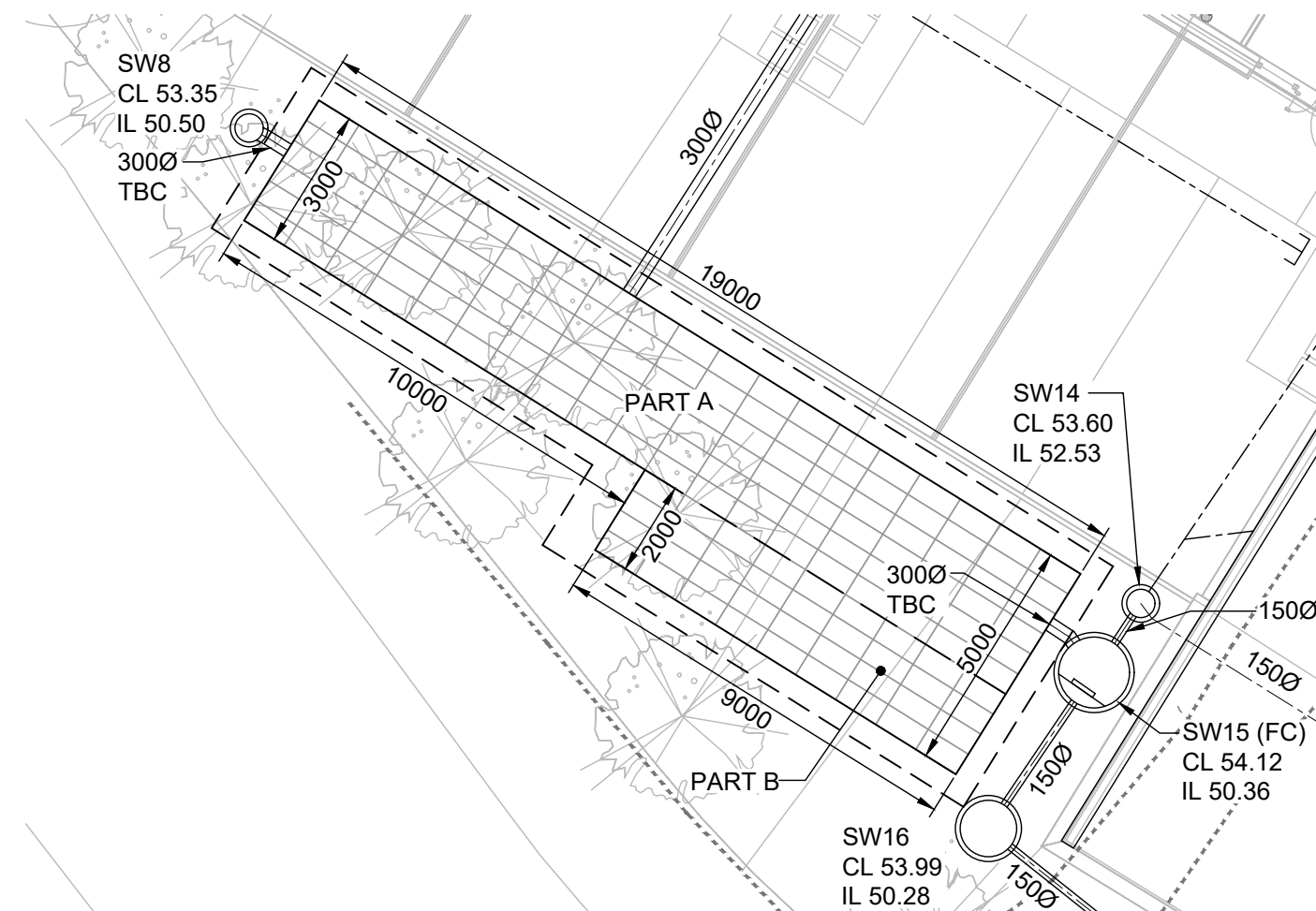
PART A
19.0 x 3.0 x 0.8m deep
PART B
9.0 x 2.0 x 0.8m deep
Total Vol = 60.00m³
Net Vol ≈ 57.00m³
At 95% min Void Ratio
300 PSM5 units

Extents of excavation to be an additional 500mm around the perimeter of the tank

1. Proposed Hydro WMS layout.
2. All dimensions are in millimetres, all elevations in metres unless otherwise stated.
3. All temporary and enabling works by others.
4. All dimensions of fabricated items are nominal and may vary within manufacturing tolerances.



Proposed Section
(Scale 1:75)

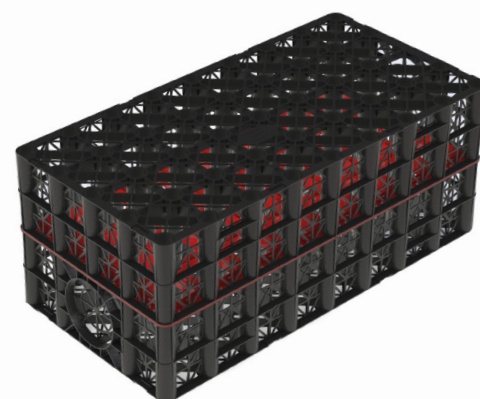


Proposed Plan
(Scale 1:150)

B	UPDATE TANK TYPE & SECTION NOTES	21/03/2022
A	UPDATE TANK LOCATION & SETUP	16/03/2022
REV	AMENDMENT	DATE

Product code: PSM5

Polystorm Deep has been designed for use in trafficked applications such as lorry parks and industrial access roads. It has a vertical compressive strength of 61 tonnes/m² and a lateral compressive strength of 14.6 tonnes/m². This allows for deeper burial, and consequently higher volumes of water capture and storage. It can be buried deeper than any other Polystorm cell and can be value engineered as part of a hybrid system.



Applications

The Polystorm Deep modular cells are combined to form a structure that receives rainwater collected from roofs or surface drains. The rainwater is then either attenuated by the structure, when wrapped in an impermeable membrane, or infiltrated by the structure, when wrapped in a permeable geotextile.

Key Benefits

- Vertical compressive strength of 61 tonnes/m² and highest lateral compressive strength of any Polystorm unit
- Ideal for retention, attenuation and infiltration applications with a suitable geomembrane or geotextile
- Designed for trafficked conditions which require deep burial depths
- Allows flexibility of shape – ideal for narrow strips or use in restricted areas
- Can be used as part of a value engineered hybrid system in trafficked applications with Polystorm-R and Polystorm Xtra
- Can be used as part of a value engineered hybrid system for non-trafficked applications with Polystorm Lite and Polystorm-R
- Undergone testing in accordance to BBA certification
- Integrated inlet and outlet
- 3D flow throughout the structure
- 95% void ratio
- Light in weight yet robust – excellent Health & Safety and installation benefits
- 100% recyclable
- 50 years creep limited life expectancy
- Manufactured from over 82% recycled material

Technical Support

Detailed guidance and assistance is available.

For further information, please contact our Technical Team on +44 (0) 1509 615100 or email civils@polypipe.com or visit www.polypipe.com/civils-technical-hub

ELEMENT	VALUE
PHYSICAL PROPERTIES	
Length	1m
Width	0.5m
Depth	0.4m
Total volume	0.2m ³
Unit weight	11kg
Unit storage volume	0.19m ³ (190 litres)
Void ratio	95%
SHORT TERM COMPRESSIVE STRENGTH	
Vertical	Maximum 610kN/m ² *
Lateral	Maximum 146kN/m ² *
SHORT TERM DEFLECTION	
Vertical	60kN/m ² per mm
Lateral	10.1kN/m ² per mm
OTHER PROPERTIES	
Maximum burial depths:	
Heavy trafficked	7.9m**
Light trafficked	8.2m**
Non-trafficked	8.4m**

Each unit includes 4 Clips and 2 Shear Connectors.

* Compressive strength at yield, maximum recommended value for design purposes.

** Based on ground conditions being dense sand and gravel with no groundwater present using the calculation methodology detailed within CIRIA C680 (2008). Where ground conditions differ please consult our water management solutions technical department on +44 (0) 1509 615100.

Polystorm Deep Modular Cell can be utilised in these SuDS techniques

TECHNIQUES													
Blue-Green Roofs	Podium Decks	Trees	Sports Pitches	Cycle Paths	Permeable Paving (sub base & podium)	Bioretention & Rain Gardens	Attenuation Storage Tanks	Infiltration	Swales	Filter Drains	Detention Basins	Ponds & Wetlands	Filter Strips
			✓			✓	✓	✓	✓	✓	✓	✓	

Visit www.polypipe.com/greeninfrastructure

All descriptions and illustrations in this publication are intended for guidance only and shall not constitute a 'sale by description'. All dimensions and weights given are nominal and Polypipe may modify and change the information, products and specifications from time to time for a variety of reasons, without prior notice. The information in this publication is provided 'as is' on January 2019. Updates will not be issued automatically. This information is not intended to have any legal effect, whether by way of advice, representation or warranty (express or implied). We accept no liability whatsoever (to the extent permitted by law) if you place any reliance on this publication you must do so at your own risk. All rights reserved. Copyright in this publication belongs to Polypipe and all such copyright may not be used, sold, copied or reproduced in whole or part in any manner in any media to any person without prior consent. Polypipe is a registered trademark of Polypipe. All Polypipe products are protected by Design Right under CDPA 1988. Copyright © 2019 Polypipe. All rights reserved.

Our Locations

Birmingham

2 The Wharf
Bridge Street
Birmingham
B1 2JS
T. 0121 643 4694
birmingham@curtins.com

Bristol

Quayside
40-58 Hotwell Road
Bristol
BS8 4UQ
T. 0117 302 7560
bristol@curtins.com

Cardiff

3 Cwrt-y-Parc
Earlswood Road
Cardiff
CF14 5GH
T. 029 2068 0900
cardiff@curtins.com

Douglas

Varley House
29-31 Duke Street
Douglas
Isle of Man
IM1 2AZ
T. 01624 624 585
douglas@curtins.com

Dublin

39 Fitzwilliam Square
Dublin 2
Ireland
T. 00353 1 507 9447
dublin@curtins.com

Edinburgh

1a Belford Road
Edinburgh
EH4 3BL
T. 0131 225 2175
edinburgh@curtins.com

Glasgow

Queens House
29 St Vincent Place
Glasgow
G1 2DT
T. 0141 319 8777
glasgow@curtins.com

Kendal

28 Lowther Street
Kendal
Cumbria
LA9 4DH
T. 01539 724 823
kendal@curtins.com

Leeds

Rose Wharf
Ground Floor
Leeds
L29 8EE
T. 0113 274 8509
leeds@curtins.com

Liverpool

Curtin House
Columbus Quay
Riverside Drive
Liverpool
L3 4DB
T. 0151 726 2000
liverpool@curtins.com

London

40 Compton Street
London
EC1V 0BD
T. 020 7324 2240
london@curtins.com

Manchester

Merchant Exchange
17-19 Whitworth Street West
Manchester
M1 5WG
T. 0161 236 2394
manchester@curtins.com

Nottingham

56 The Ropewalk
Nottingham
NG1 5DW
T. 0115 941 5551
nottingham@curtins.com