

Site 2 at Gorton Lane, Manchester

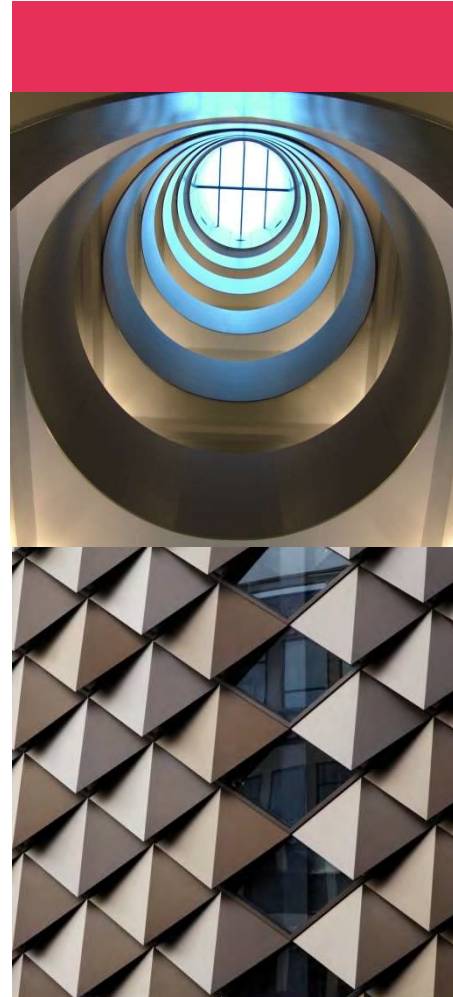
Drainage maintenance report

Curtins Ref: 8790-CUR-00-XX-RE-C-003

Revision: V01

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Site Address: Gorton Lane, Manchester, M12 5WF



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Control Sheet

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

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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



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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.

1.3 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.
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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).

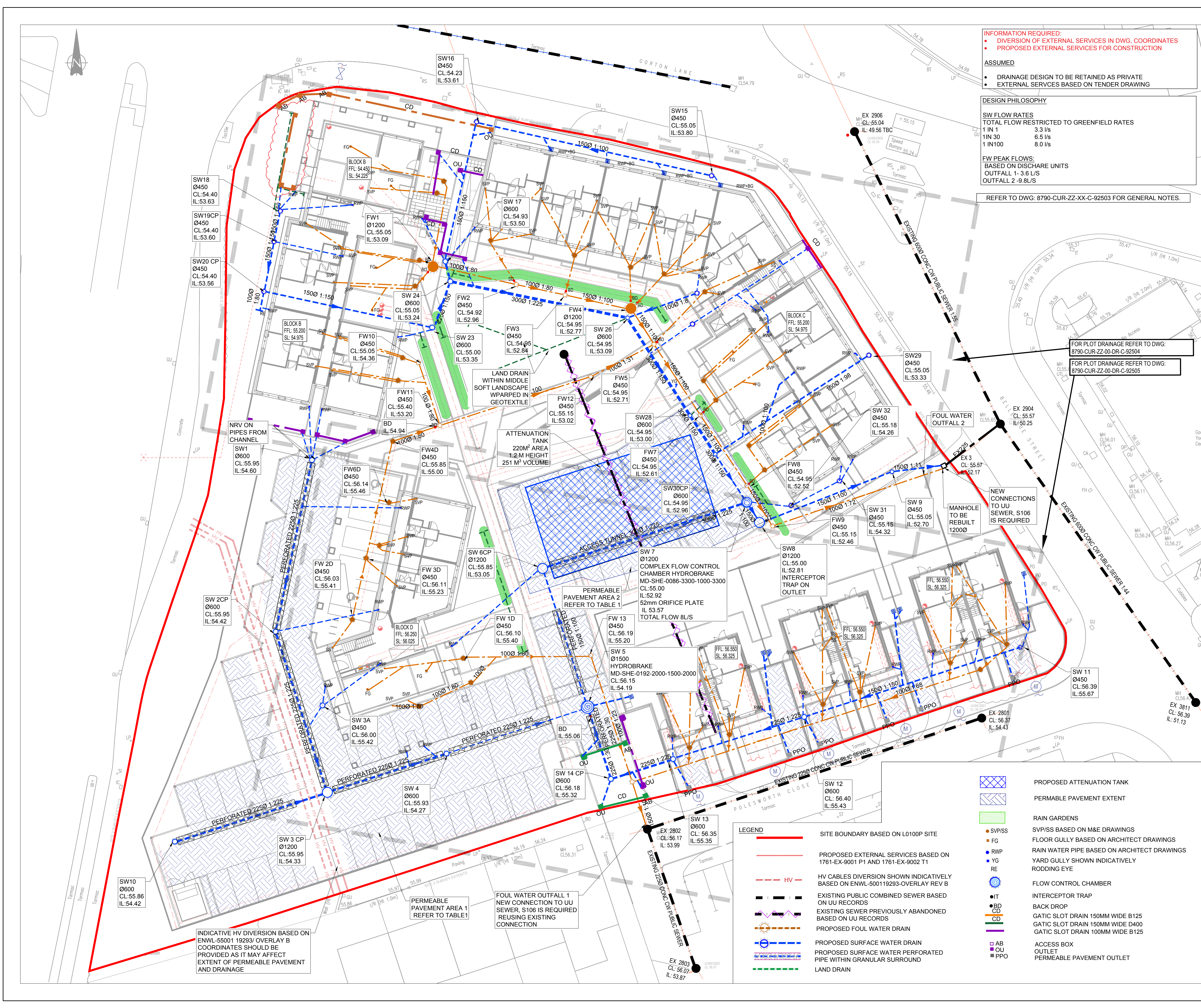
Maintenance Schedule	Required Action	Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall or reduced frequency as required, based on site- specific observations of clogging - pay particular attention to areas where water 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
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Appendix A

Drainage layout and details



INFORMATION REQUIRED:

- DIVERSION OF EXTERNAL SERVICES IN DWG, COORDINATES
- PROPOSED EXTERNAL SERVICES FOR CONSTRUCTION

ASSUMED

- DRAINAGE DESIGN TO BE RETAINED AS PRIVATE
- EXTERNAL SERVICES BASED ON TENDER DRAWING

DESIGN PHILOSOPHY

SW FLOW RATES
TOTAL FLOW RESTRICTED TO GREENFIELD RATES
1 IN 1 3.3 l/s
1 IN 30 6.5 l/s
1 IN 100 8.0 l/s

FW PEAK FLOWS:
BASED ON DISCHARGE UNITS
OUTFALL 1- 3.6 L/S
OUTFALL 2- 9.8 L/S

REFER TO DWG: 8790-CUR-ZZ-XX-C-92503 FOR GENERAL NOTES.

DRAWING BASED ON:

- GPR SURVEY 9612_001A 12.2018 BY CND OLIVER&CO
- CCTV SURVEY 17909712895 CCTV 15.06.18 & 24.11.18 SUBSCAN
- UU ASSET RECORDS 10.10.16

ARCHITECTS DRAWINGS

- 8970-OMI-XX-00-PL-A-L1001 C07_SITE 02 STRUCTURAL GRID
- 1405 DWG:L0130 REV A
- 8790-OMI-XX-00-PL-A-L1030 C04_SITE 02 SITE LAYOUT GF PLAN
- L0145B REFUSE STRATEGY PLAN
- L1752 BLOCK C FIRE STRATEGY PLANS - GROUND FLOOR
- L1750 BLOCK A FIRE STRATEGY PLANS
- L1751 BLOCK B FIRE STRATEGY PLANS
- L1755 BLOCK D LAYOUT FIRE STRATEGY PLANS
- 8790-DEP-XX-GF-DR-L-0005 LANDSCAPE GA

POPUKS LOCATION

- 8790-OMI-BB-00-PL-A-L1100 C04
- 8790-OMI-CC-00-PL-A-L1110- C04
- 8790-OMI-CC-00-PL-A-L1111 -C04
- 8790-OMI-DD-00-PL-A-L1120 C03

DISCHARGE UNITS AND RWP AREA RECIVED FROM CWC 05.01.21

- 1761-FOUL DRAINAGE CALCULATION BLOCK B
- 1761-FOUL DRAINAGE CALCULATION BLOCK C
- 1761-FOUL DRAINAGE CALCULATION BLOCK D
- 1761-RAINWATER LOAD 50YR STORM REV 1
- 1761-ROOF SECTION REFERENCES

EXTERNAL SERVICES BY CWC ISSUED 25.03.20

- 1761-EX-9001-T2
- 1761-EX-9002-T2

EXTERNAL SERVICES DIVERSION

- ENWL-55001 19293/OVERLAY B 12.07.18 IN PDF

FOUNDATION 20.12.20

- 8970-CUR-ZB-00-DR-S-20100
- 8970-CUR-ZC-00-DR-S-20100
- 8970-CUR-ZD-00-DR-S-20100
- 8970-CUR-TH-00-DR-S-20100

TREES ROOT PROTECTION EXTENT

- TREE CONSTRAINTS PLAN: URBAN GREEN. UG_577_ARB_TRPB May 2020

SITE 2		
PERMEABLE PAVEMENT 1	CAR PARK	DRIVEWAY
LOWEST COVER LEVEL	55.95	55.95
INVERT LEVEL OF PAVEMENT	55.355	55.355
TOP OF SUBBASE	55.820	55.695
DEPTH M	0.47	0.34
PERMEABLE PAVEMENT 2	CAR PARK	DRIVEWAY
LOWEST COVER LEVEL	54.955	54.955
TOP OF SUBBASE	54.825	54.700
INVERT LEVEL OF PAVEMENT	54.475	54.475
AVERAGE DEPTH M	0.35	0.225

C03	SLOT AND LAND DRAIN ADDED	14.07.21	MW	MW
C02	ISSUED FOR CONSTRUCTION	22.02.21	MW	MW
C01	ISSUE FOR CONSTRUCTION	22.01.21	MW	MW
Rev:	Description:	Date:	By:	Chkd:



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CONSTRUCTION

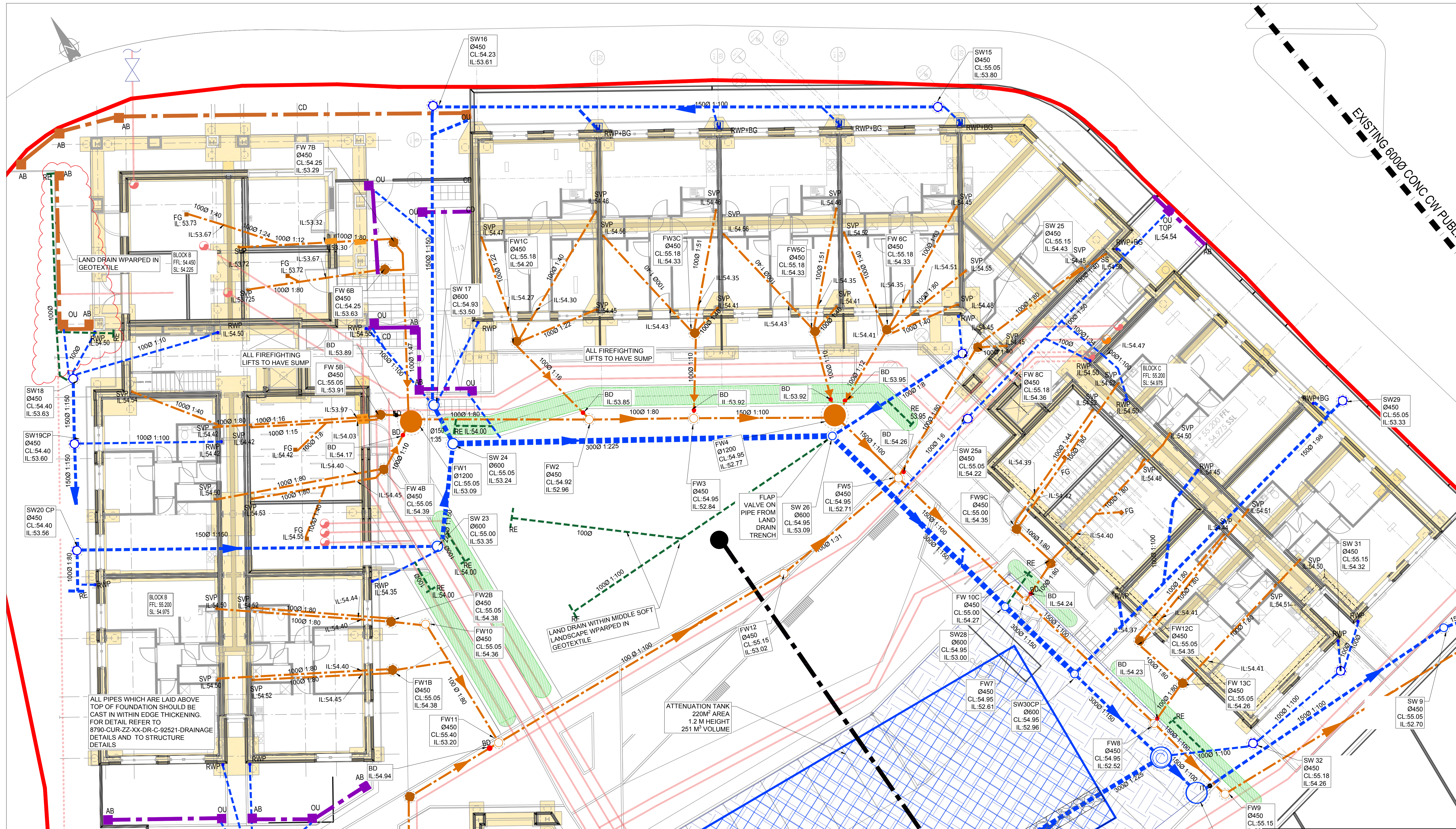
Project: **GORTON LANE, MANCHESTER**

Dwg Title: **SITE 2
PROPOSED DRAINAGE STRATEGY**

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	22.01.21	MW	MW	MW

Scale: 1:200

Project No:	Originator:	Zone:	Level:	Type:	Discipline:	Category/Number:	Rev:
8790	- CUR - ZZ - 00 - DR - C -	92501	-C03				



- LEGEND**
- SITE BOUNDARY BASED ON L0100P SITE
 - PROPOSED EXTERNAL SERVICES BASED ON 1761-EX-9001 P1 AND 1761-EX-9002 T1
 - HV CABLES DIVERSION SHOWN INDICATIVELY BASED ON ENWL-500119293-OVERLAY REV B
 - EXISTING PUBLIC COMBINED SEWER BASED ON UU RECORDS
 - EXISTING SEWER PREVIOUSLY ABANDONED BASED ON UU RECORDS
 - PROPOSED FOUL WATER DRAIN
 - PROPOSED SURFACE WATER DRAIN
 - PROPOSED SURFACE WATER PERFORATED PIPE WITHIN GRANULAR SURROUND
 - PIPE THROUGH FOUNDATION
 - LAND DRAIN
 - PROPOSED ATTENUATION TANK
 - PERMEABLE PAVEMENT EXTENT
 - FOUNDATION BASED ON STRUCTURES DRAWING
 - STEP IN FOUNDATION
 - RAIN GARDENS
 - SVP/SS BASED ON M&E DRAWINGS
 - FLOOR GULLY BASED ON ARCHITECT DRAWINGS
 - RAIN WATER PIPE BASED ON ARCHITECT DRAWINGS
 - YARD GULLY SHOWN INDICATIVELY
 - FLOW CONTROL CHAMBER
 - INTERCEPTOR TRAP

BACK DROP
GATIC SLOT DRAIN 150MM WIDE B125
GATIC SLOT DRAIN 150MM WIDE D400
GATIC SLOT DRAIN 100MM WIDE B125

ACCESS BOX
OUTLET
RODDING EYE
BOTTLE GULLY

INFORMATION REQUIRED:

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- PROPOSED EXTERNAL SERVICES FOR CONSTRUCTION

ASSUMED

- DRAINAGE DESIGN TO BE RETAINED AS PRIVATE
- EXTERNAL SERVICES BASED ON TENDER DRAWING

REFER TO DWG: 8790-CUR-ZZ-XX-C-92503 FOR GENERAL NOTES.

C

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C04	SLOT AND LAND DRAIN ADDED- CLOUDED	14.07.21	MW	MW
C03	NOTES ADDED- CLOUDED	25.05.21	MW	MW
C02	ISSUED FOR CONSTRUCTION	22.02.21	MW	MW
C01	ISSUED FOR CONSTRUCTION	22.01.21	MW	MW

Rev:	Description:	Date:	By:	Chkd:

CONSTRUCTION

GORTON LANE

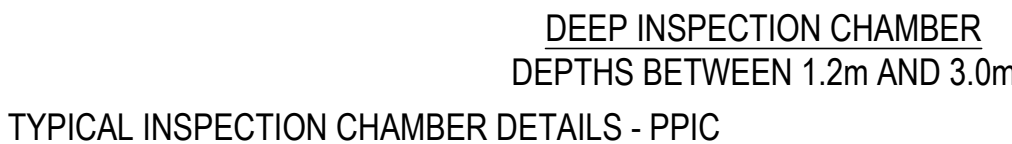
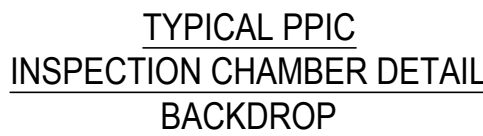
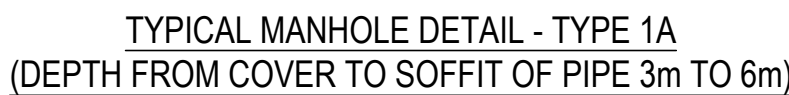
PLOT DRAINAGE LAYOUT
SHEET 1 OF 2

Size:	A1	Date:	22.01.21	Drawn By:	MW	Designed By:	MW	Checked By:	MW
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Project No:	8790 - CUR - ZZ - 00 - DR - C - 92504	Originator:		Zone:		Level:		Type:	
		Discipline:		Category:		Number:		Rev:	

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4. FOR FULL DRAINAGE NOTES REFER TO DWG 8790-CR-ZZ-JX-DR-C-92502 GENERAL NOTES
5. SULPHATE RESISTANT CONCRETE DCC2 SHOULD BE USED WHERE SULPHATES PRESENT. REFER TO SI



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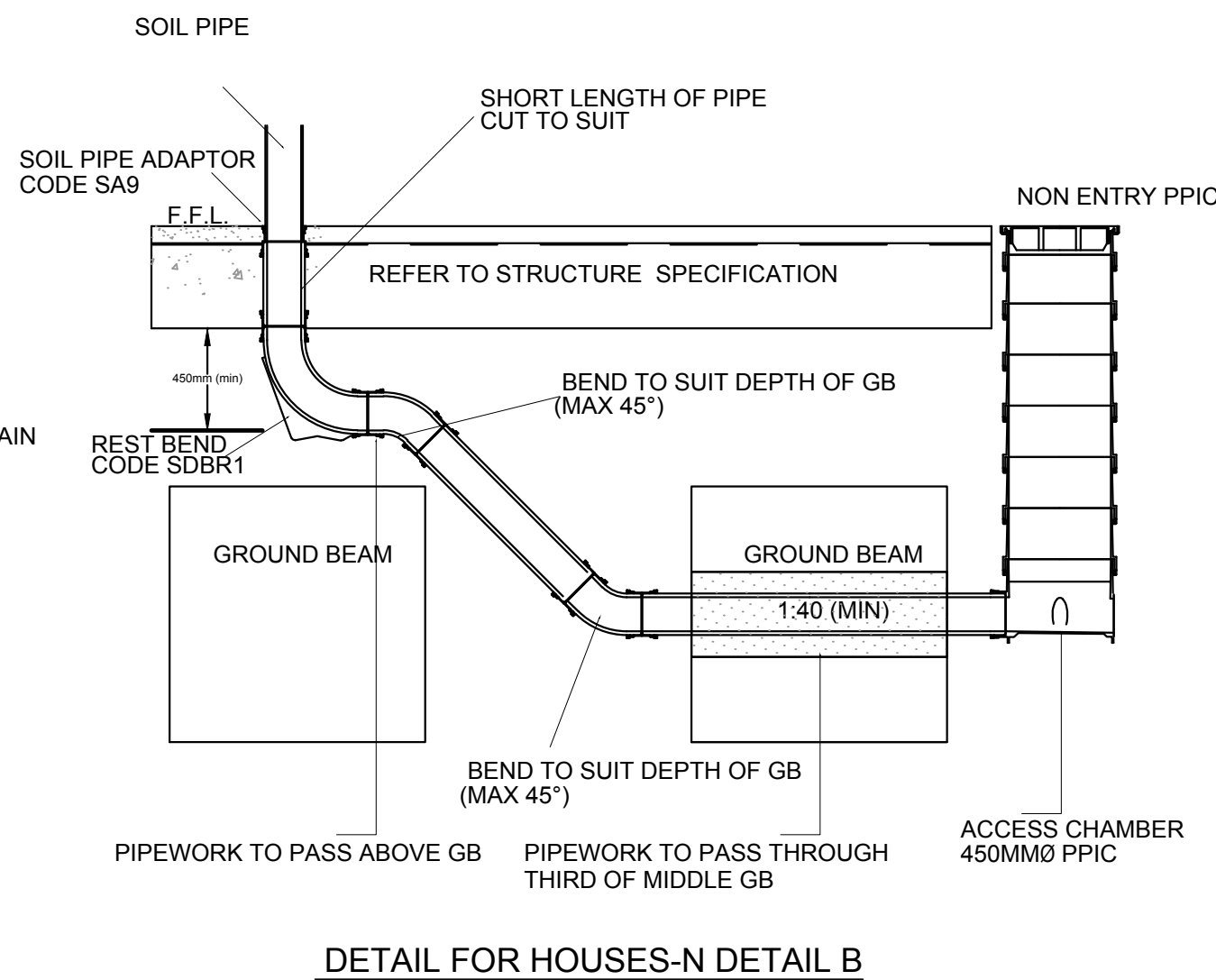
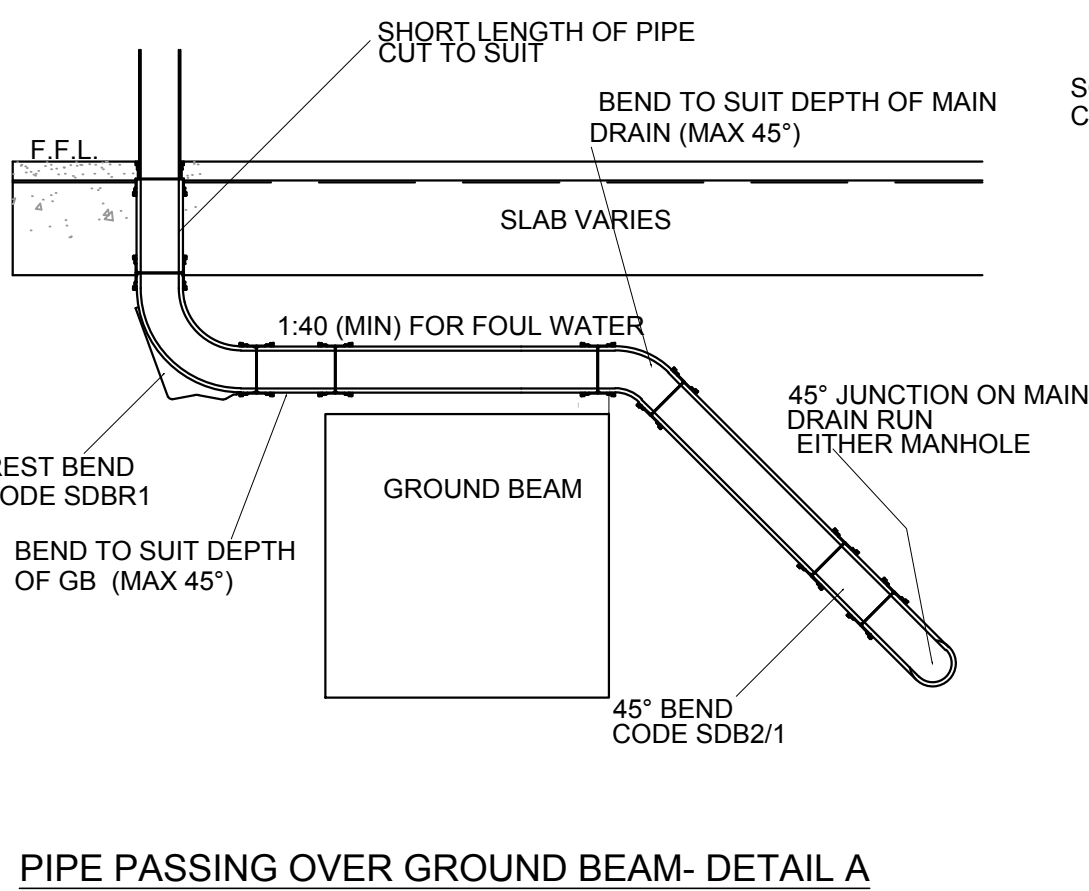
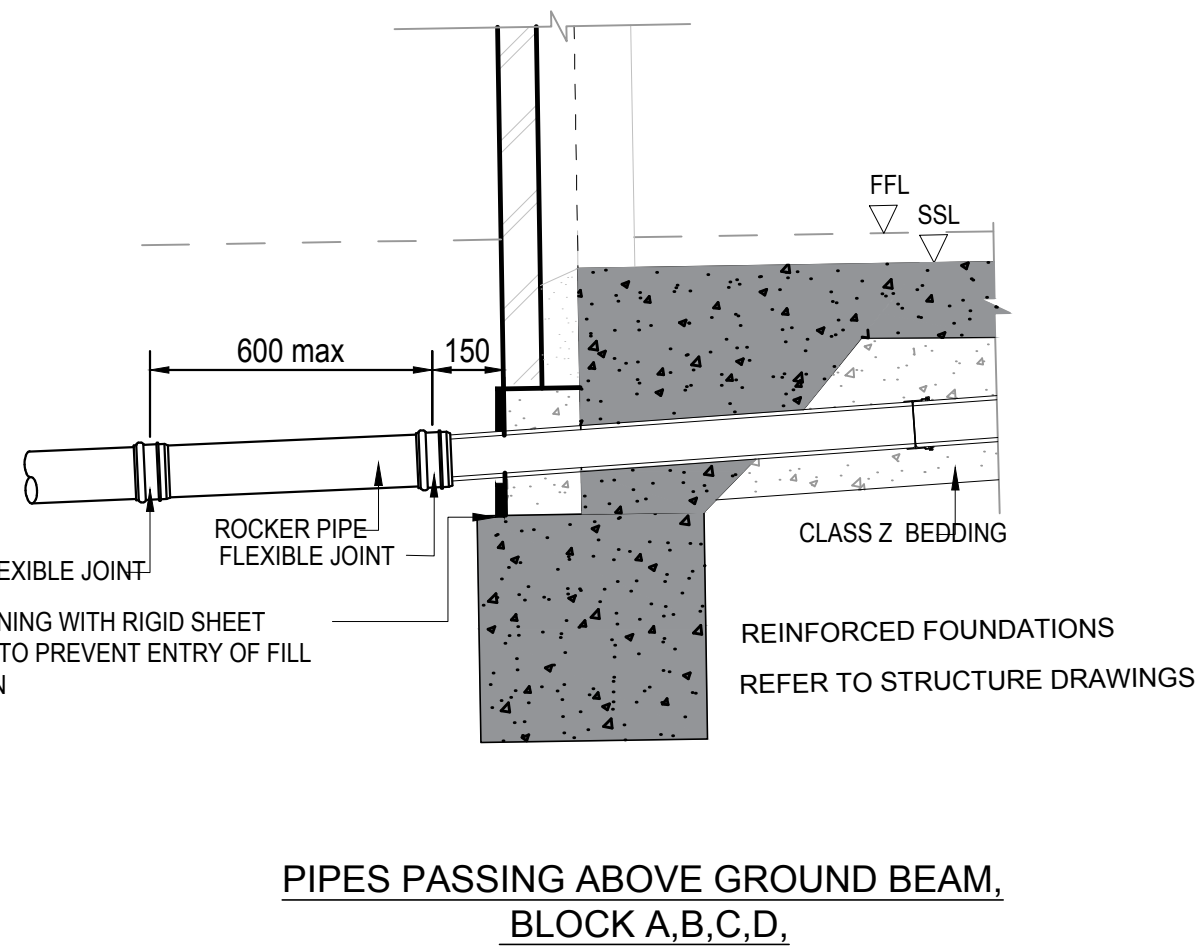
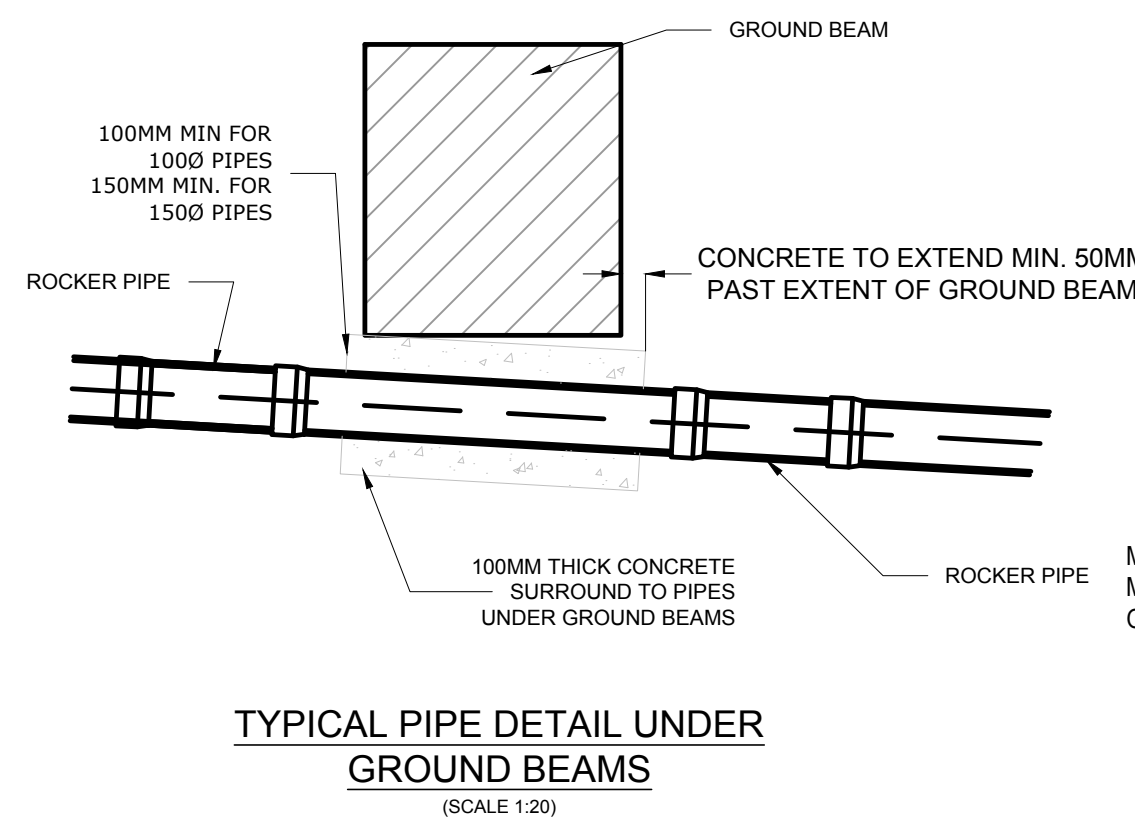
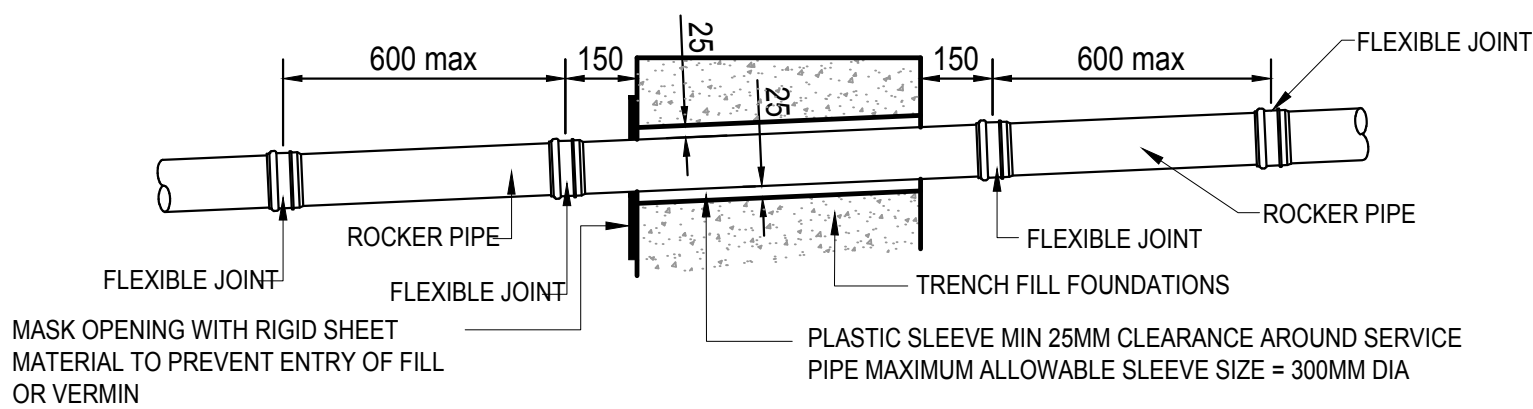
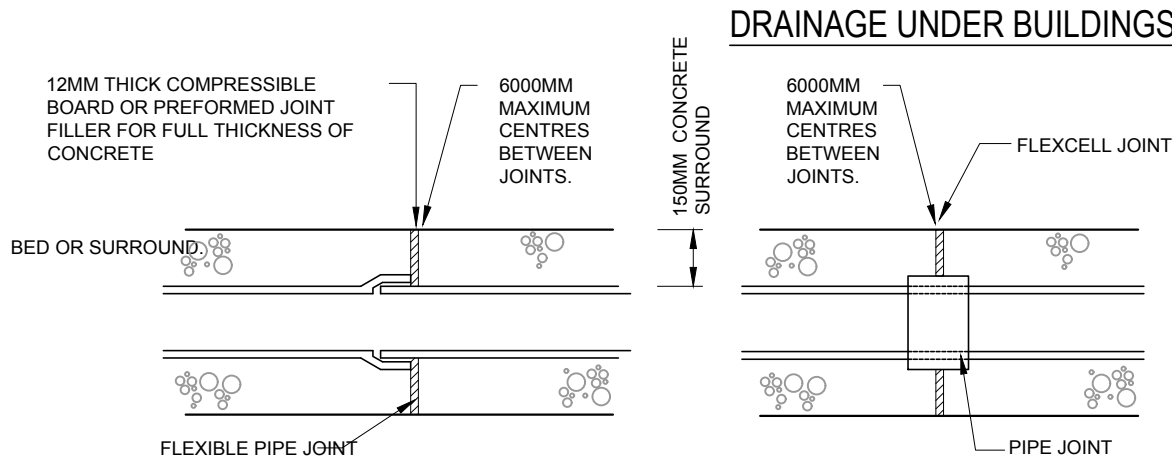
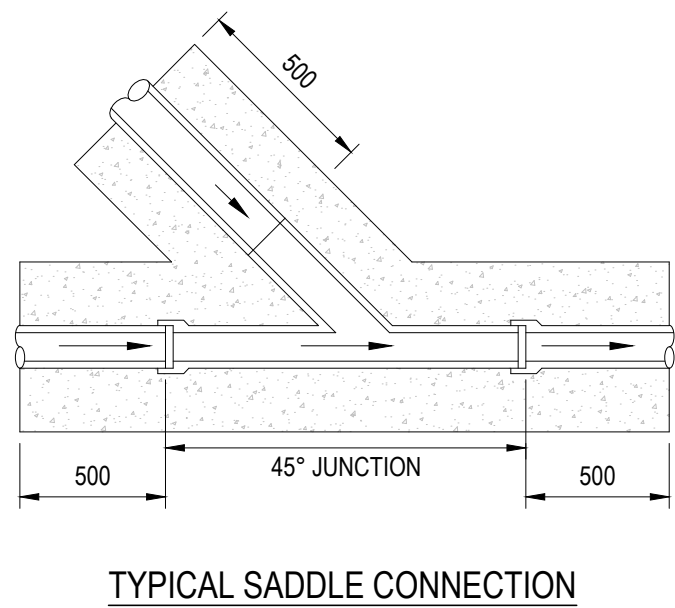
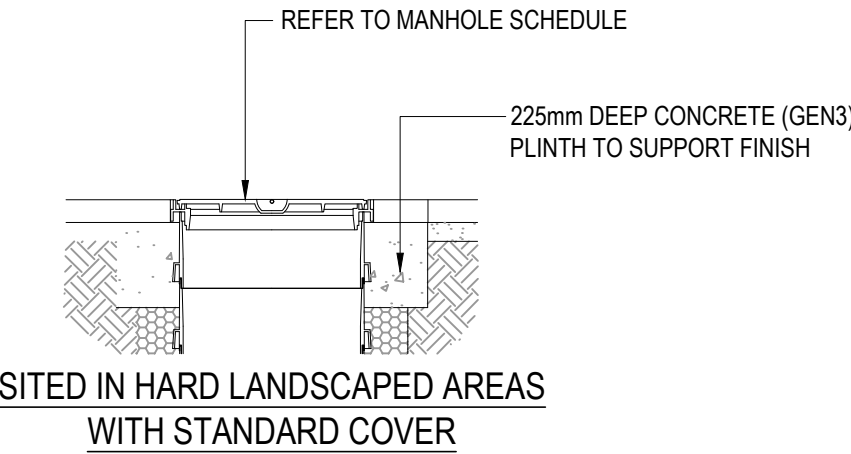
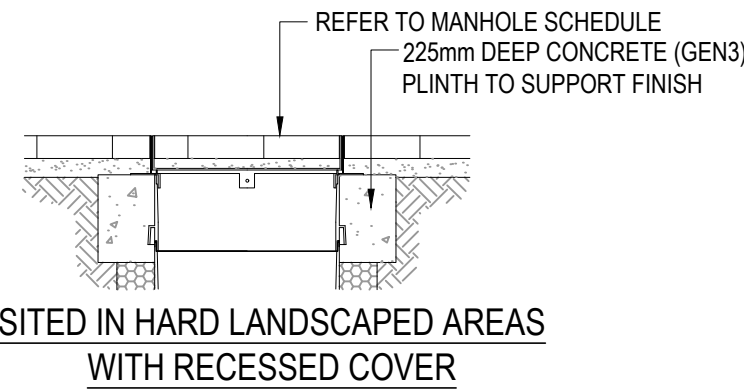
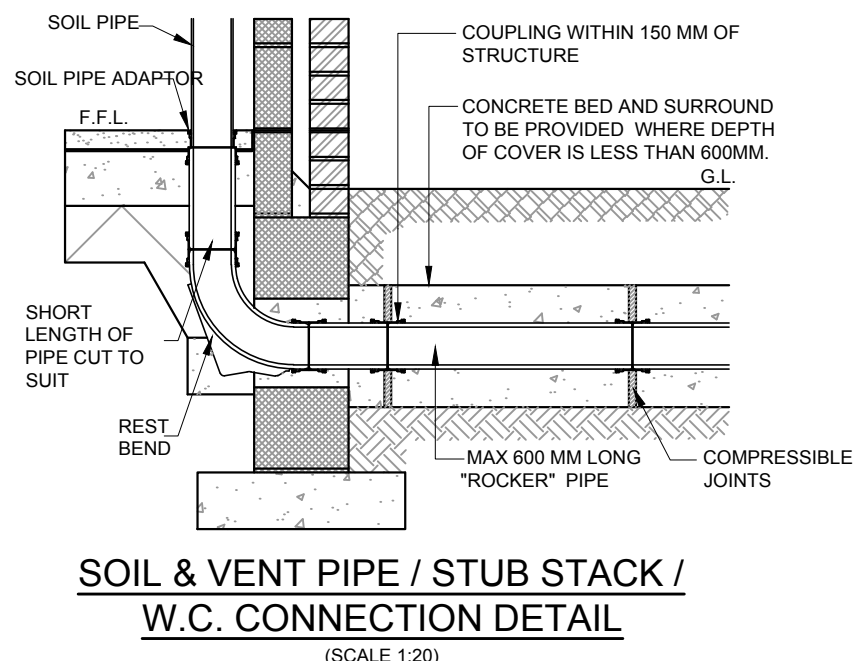
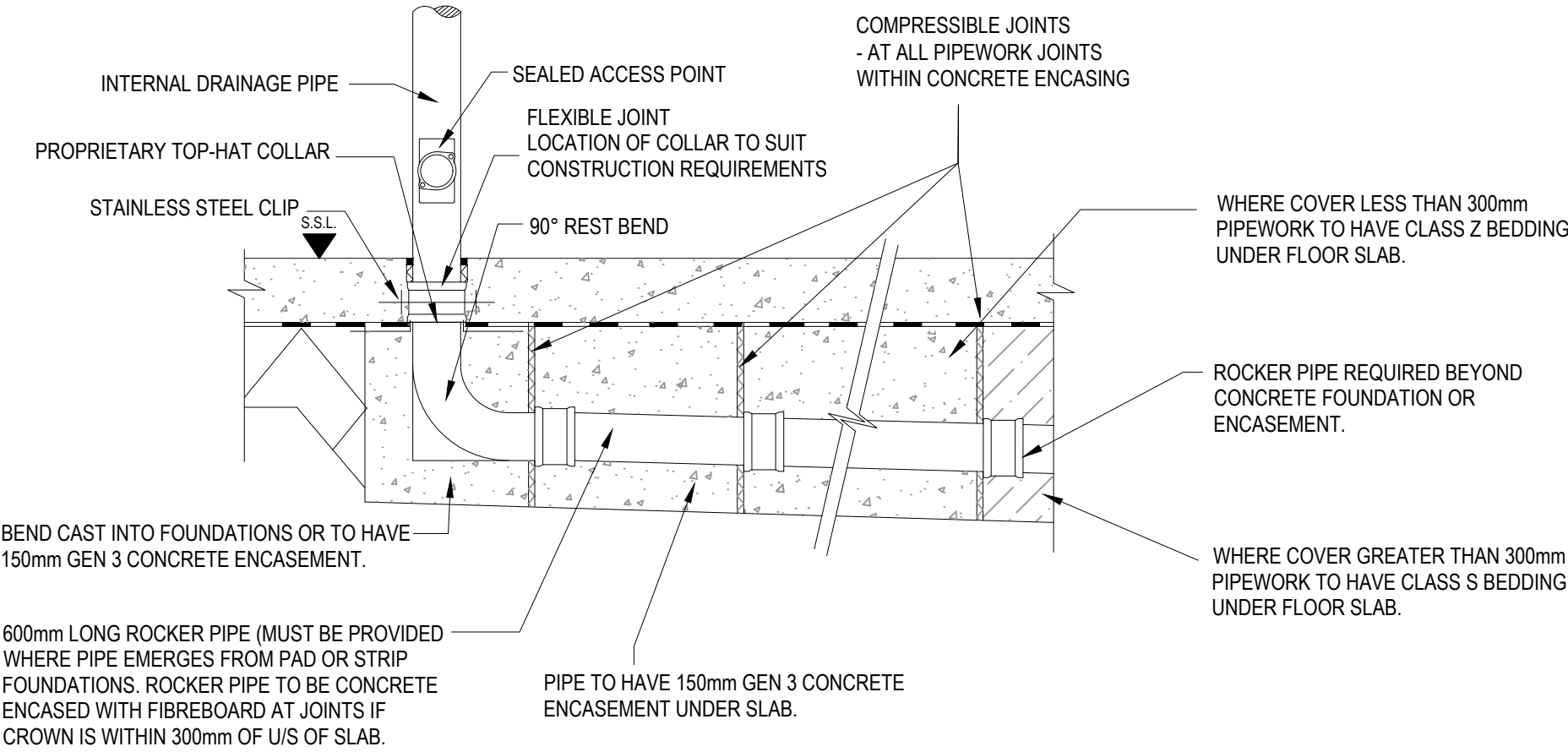
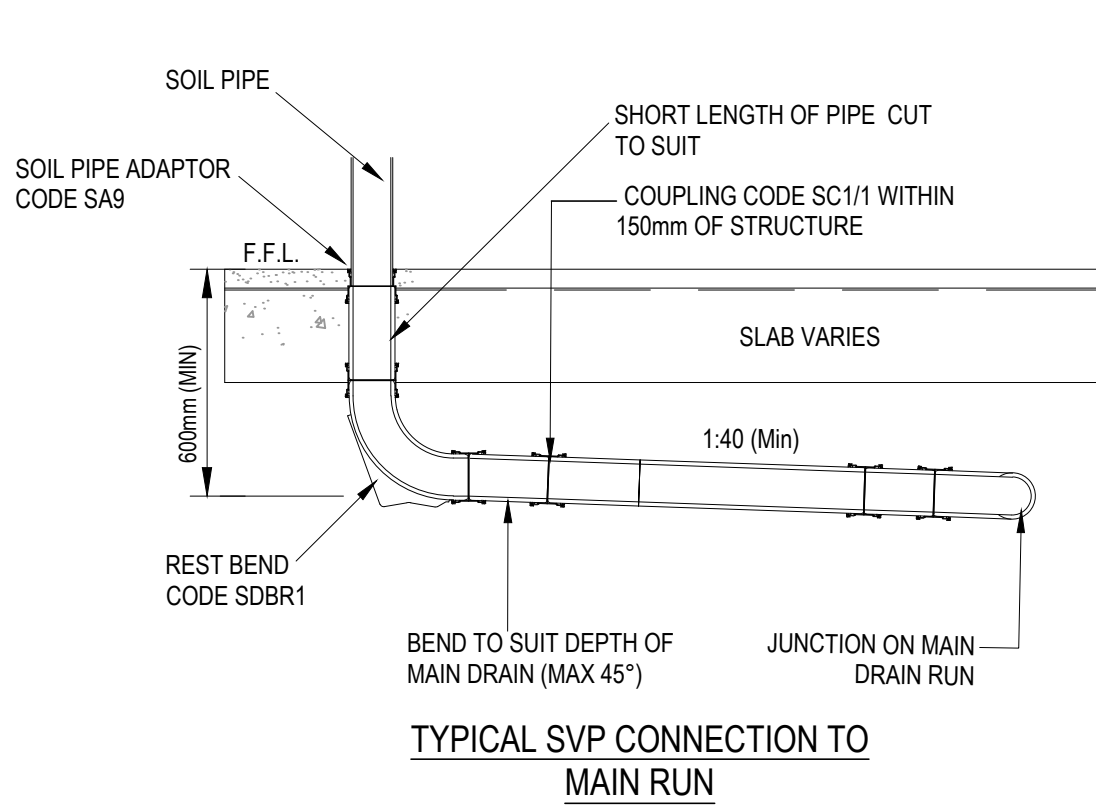
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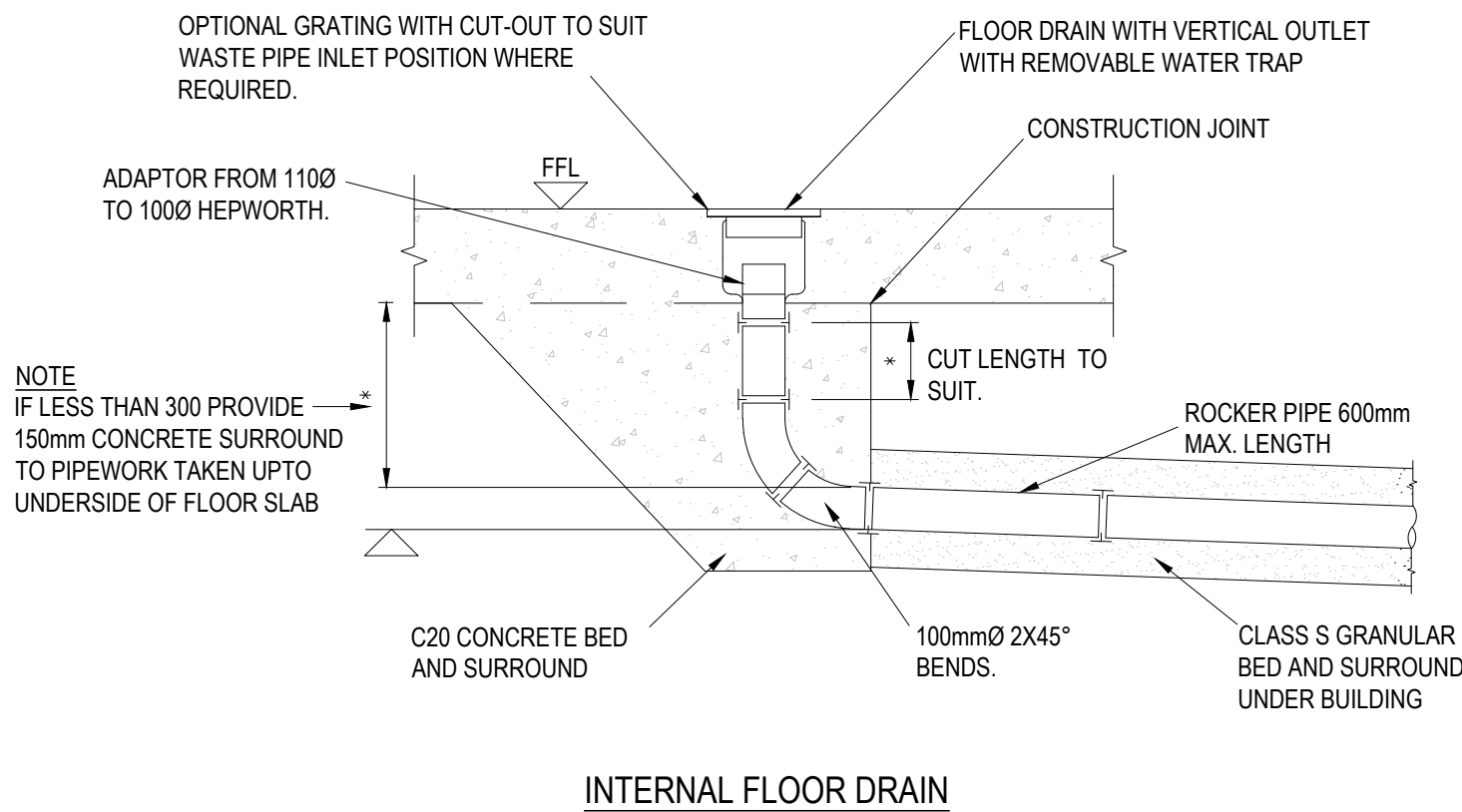
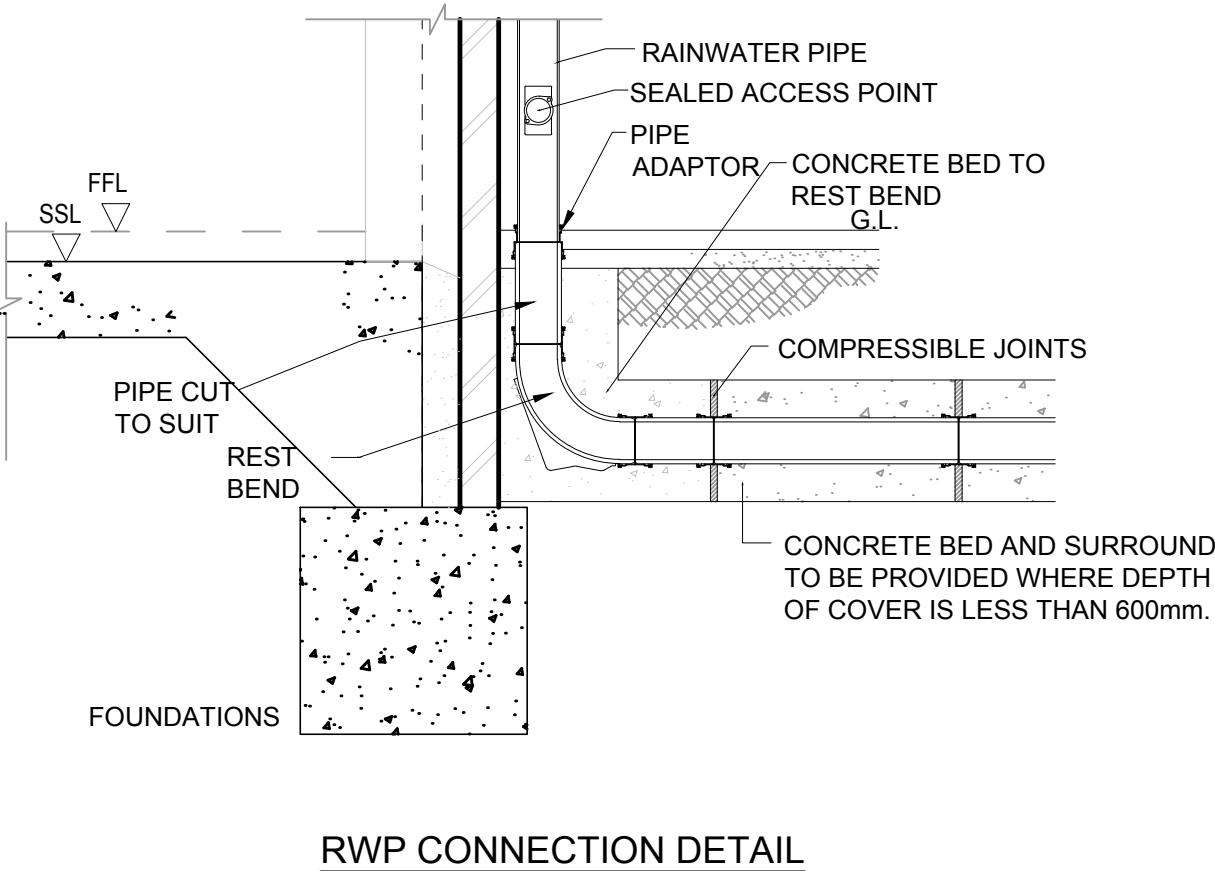
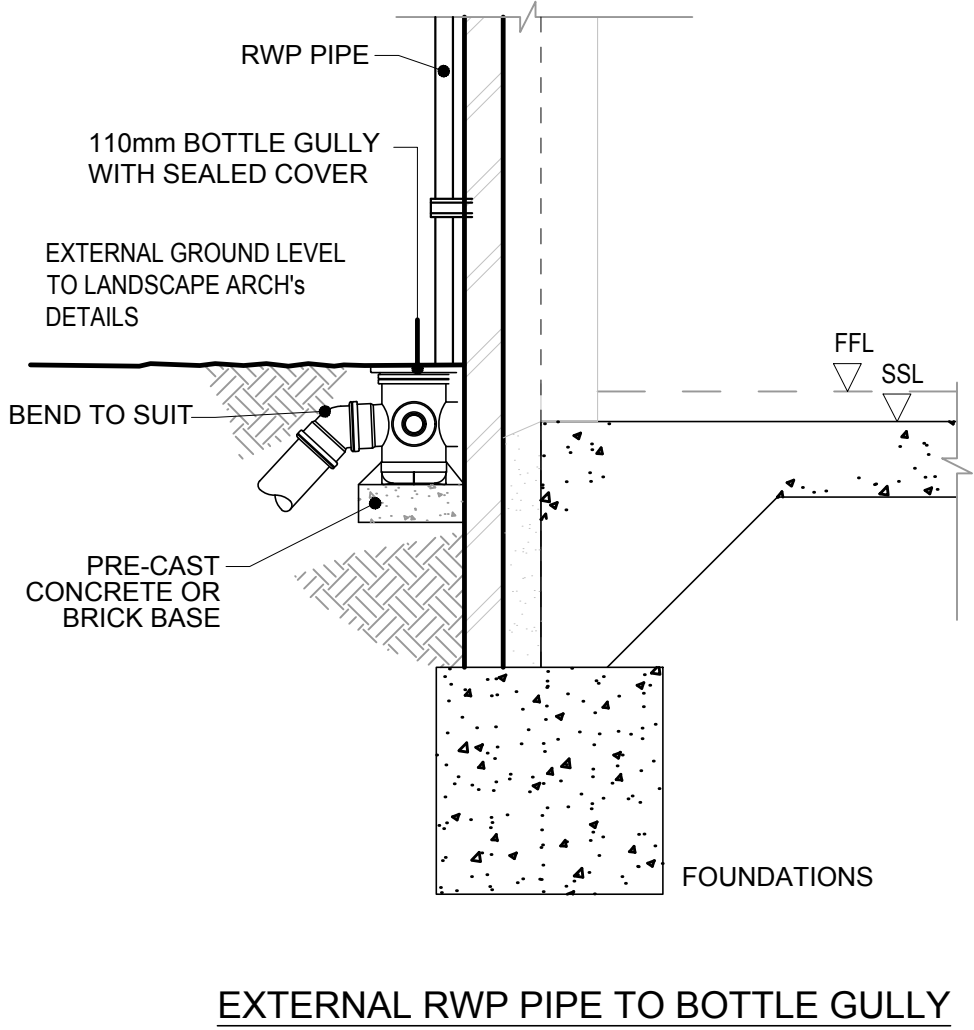
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NOTE
IF IT IS NOT POSSIBLE TO PROVIDE A CONNECTION OF A CONSTANT SLOPE THEN SECTIONS SHOWN IN DETAILS 'A' TO 'B' SHOULD BE USED.



C02	NOTE 10 ADDED	21/02/21	MW	MW
C01	ISSUED FOR CONSTRUCTION	22/01/21	MW	MW
Rev:	Description:	Date:	By:	Chkd:

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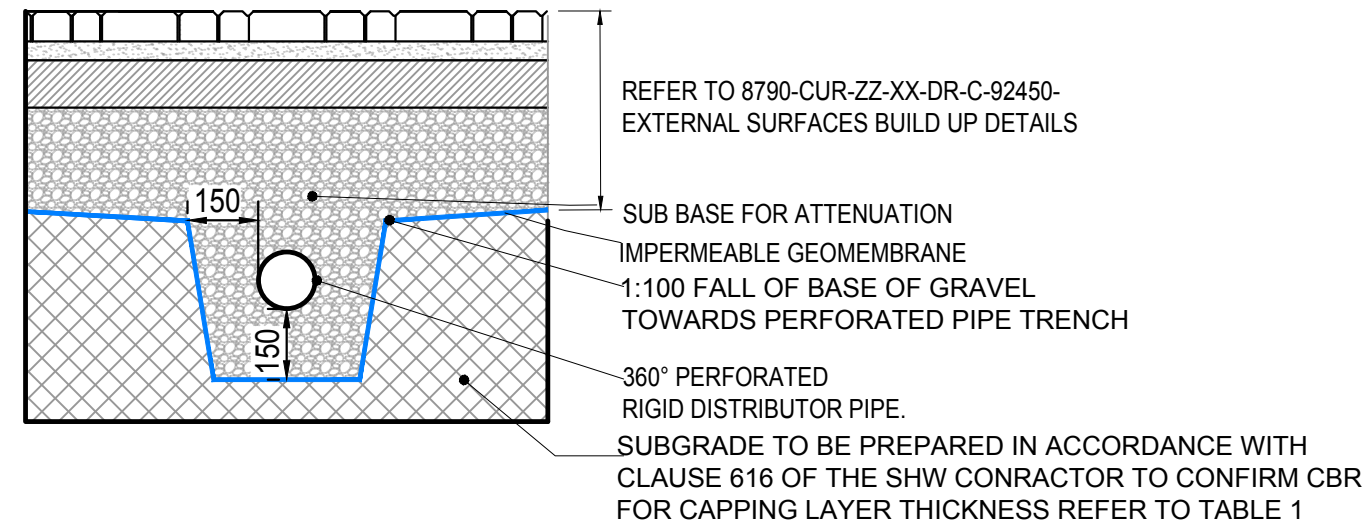
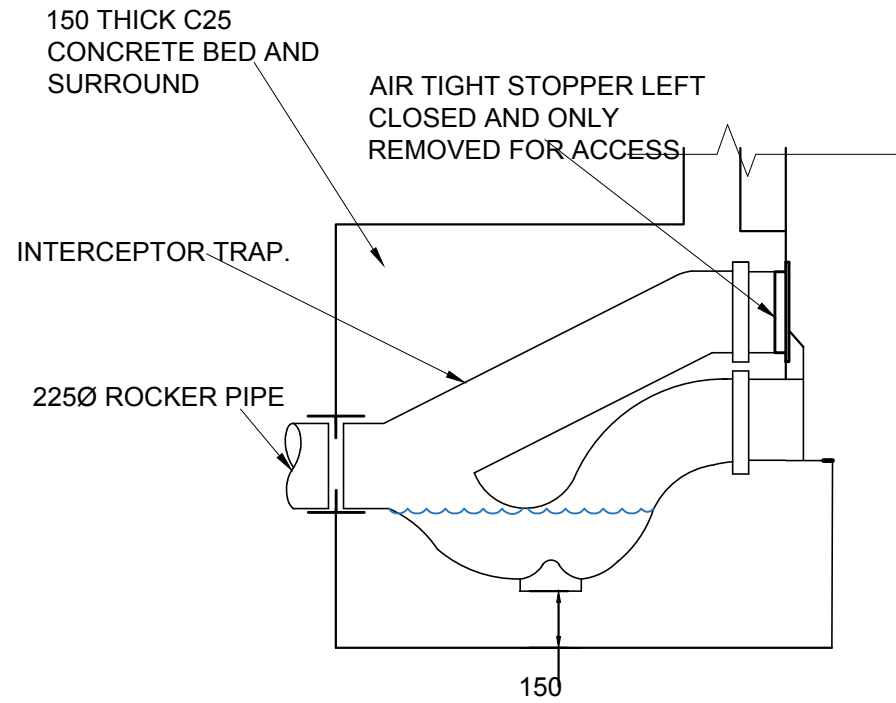
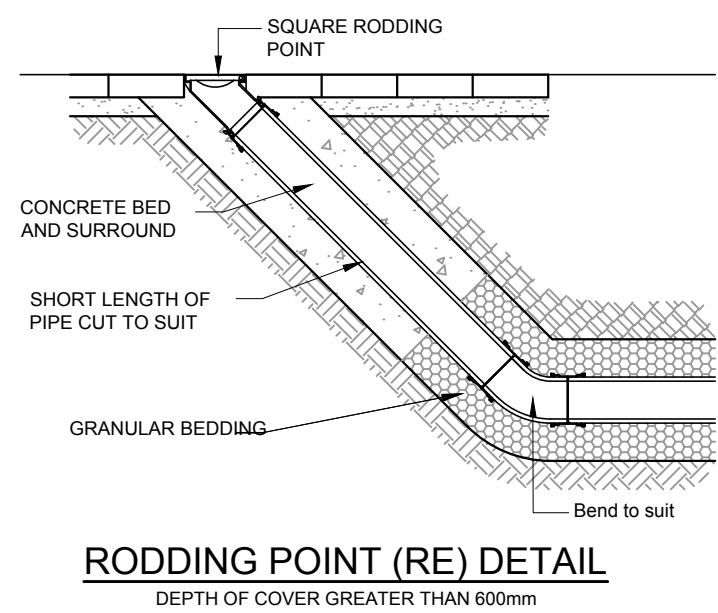
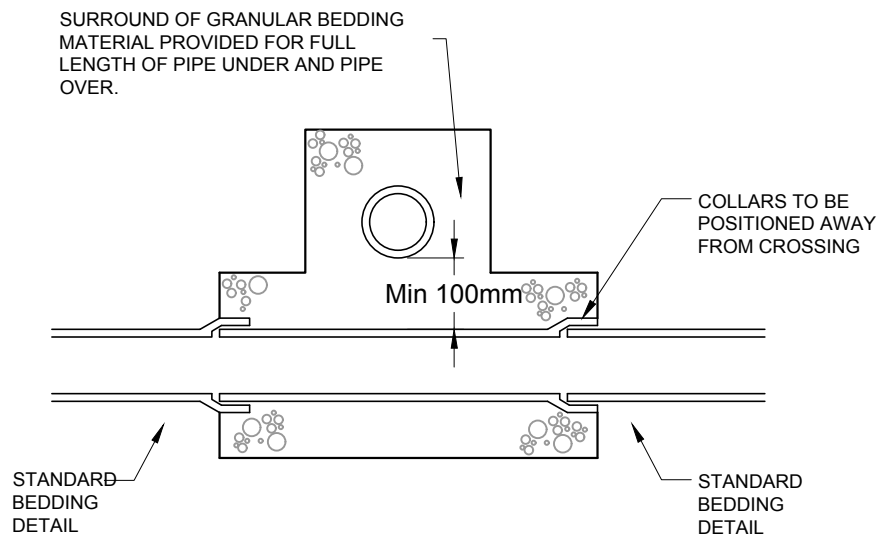
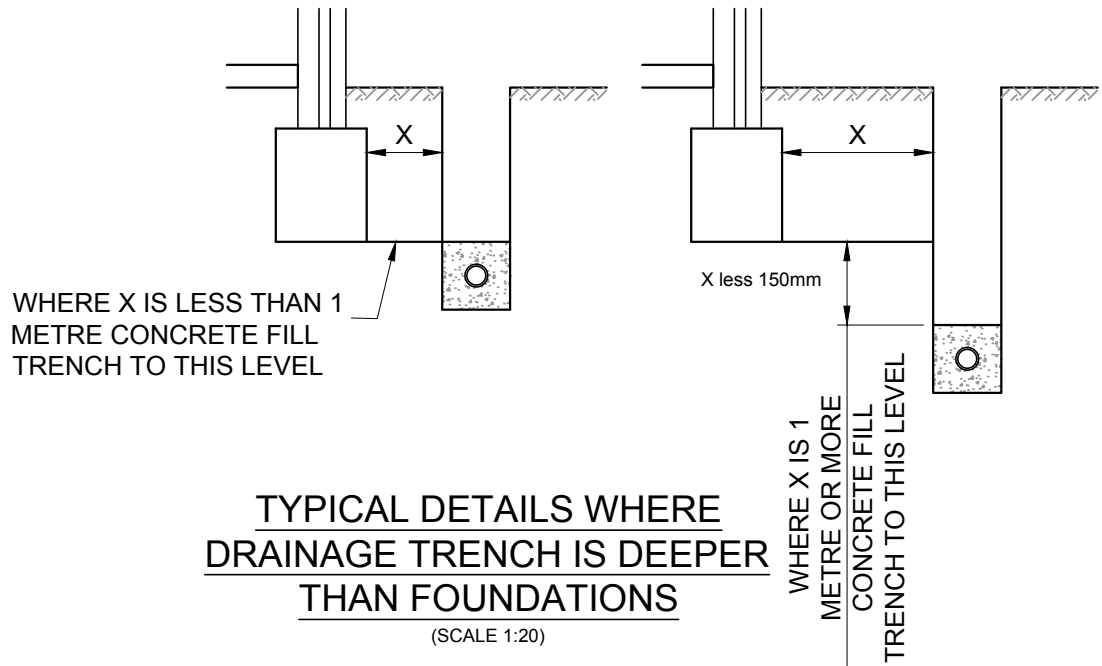
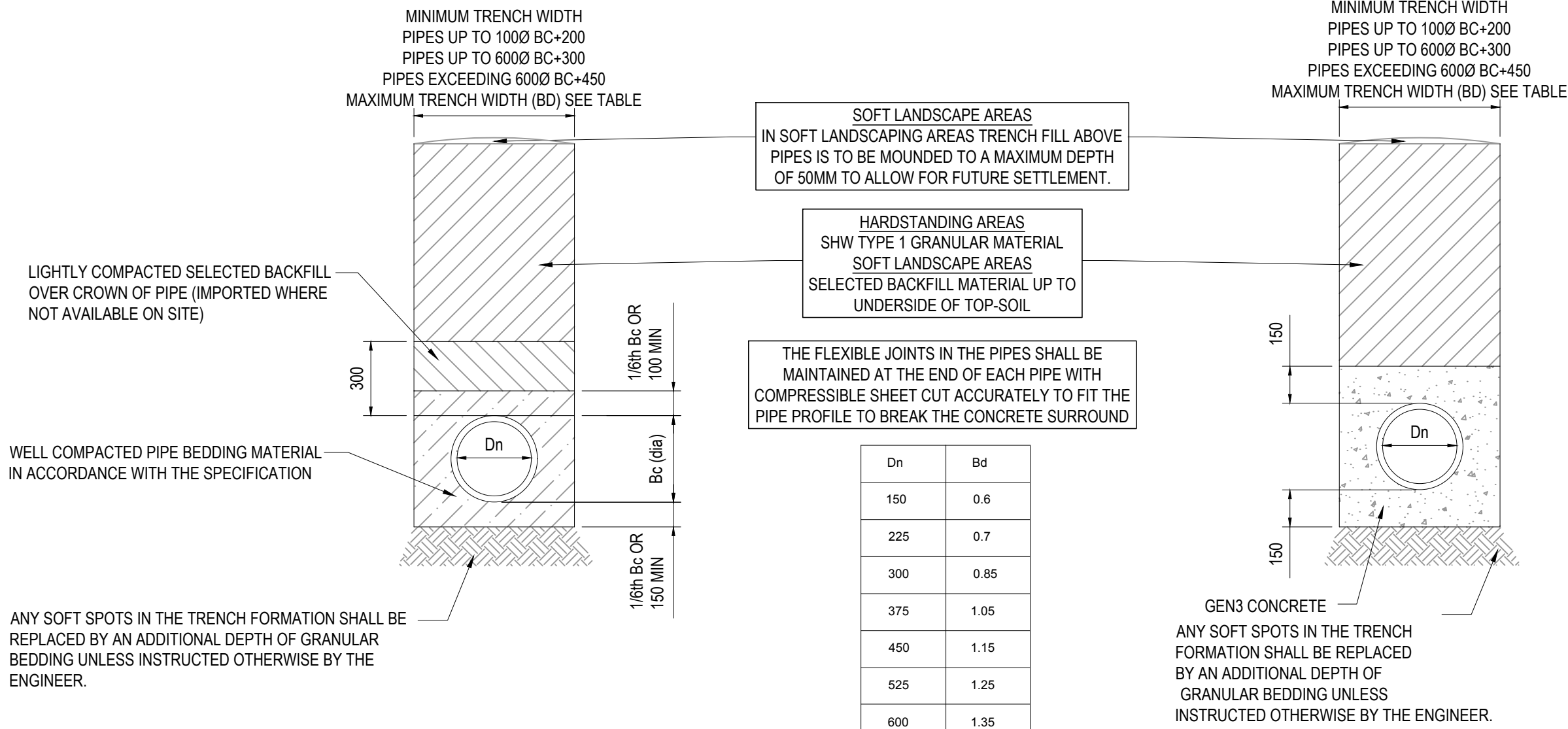
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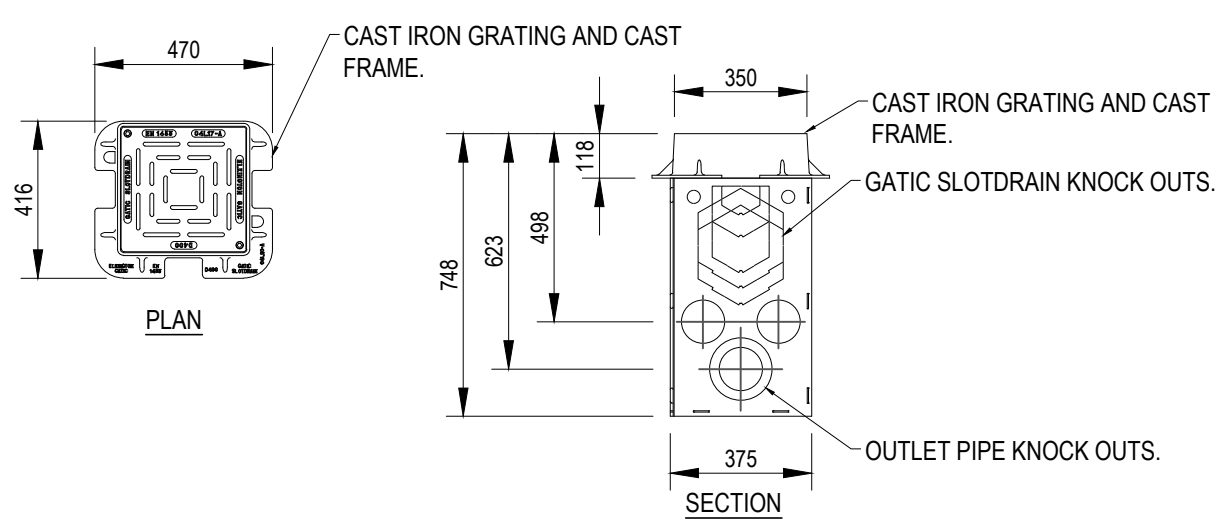
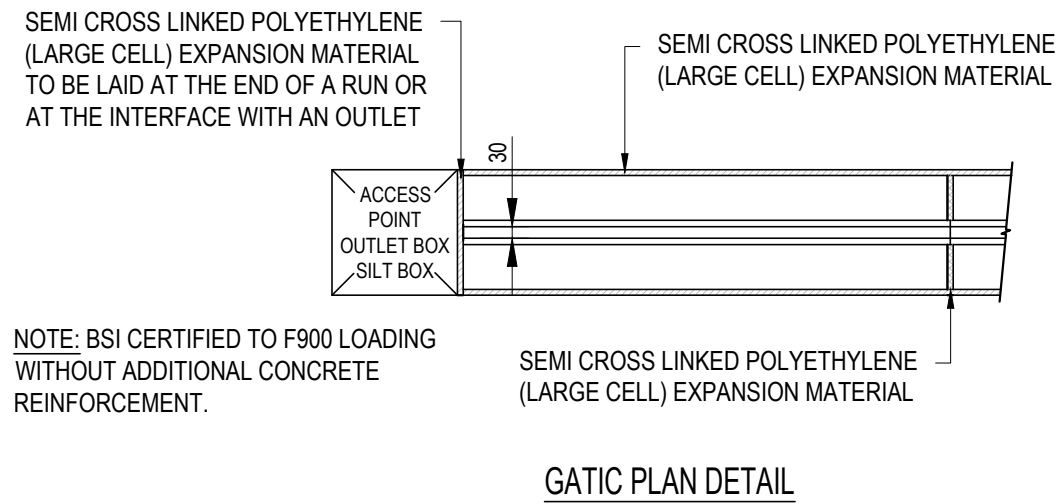
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Project:	GORTON LANE			
Orig Title:	DRAINAGE DETAILS SHEET 2 OF 5			
Size:	A1	Date:	22.01.21	Drawn By:
Scale:	NOT TO SCALE			Designed By:
Project No:	Originator:	Zone:	Level:	Type:
Discipline:	Category / Number:	Rev:		
8790 - CUR - ZZ - XX - DR - C - 92521 - C02				

GENERAL NOTES:

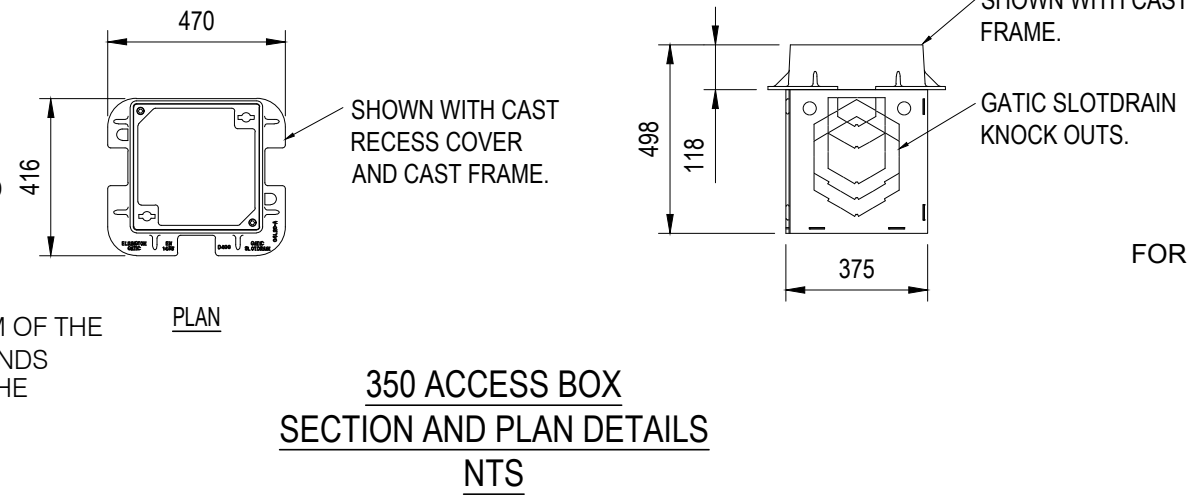
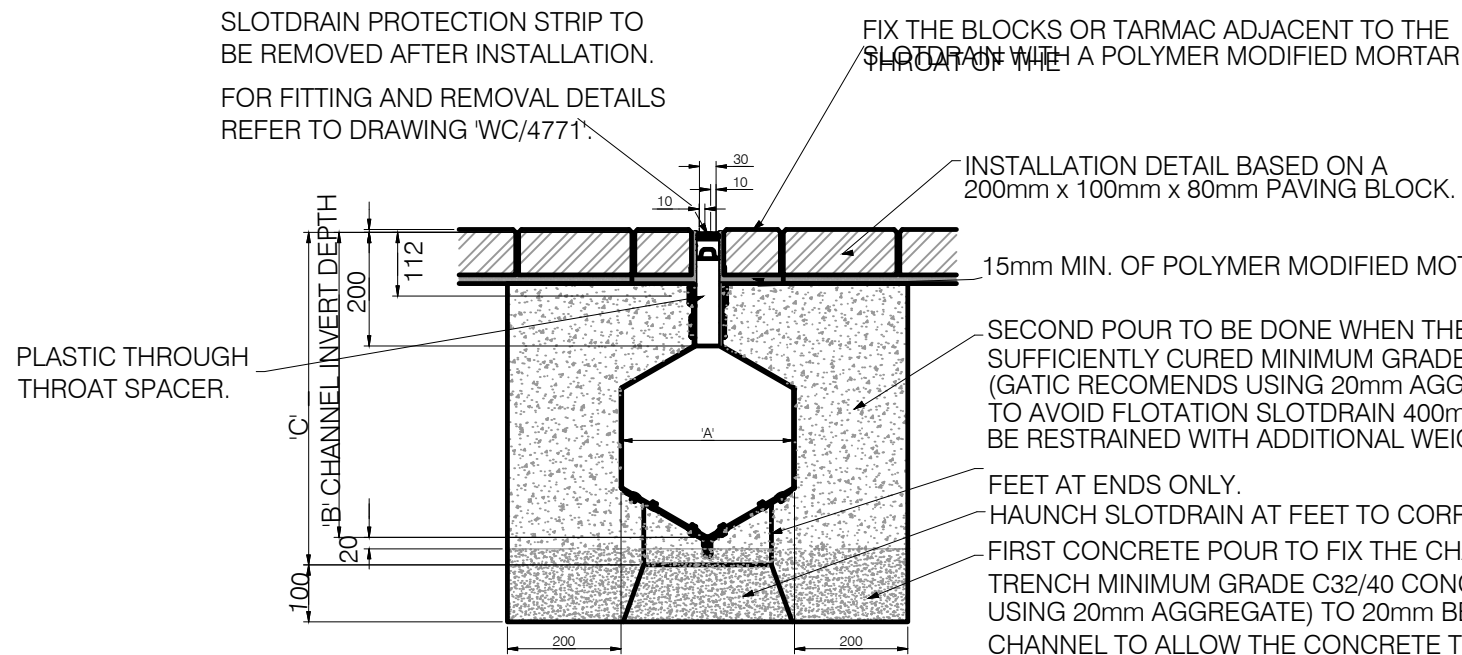
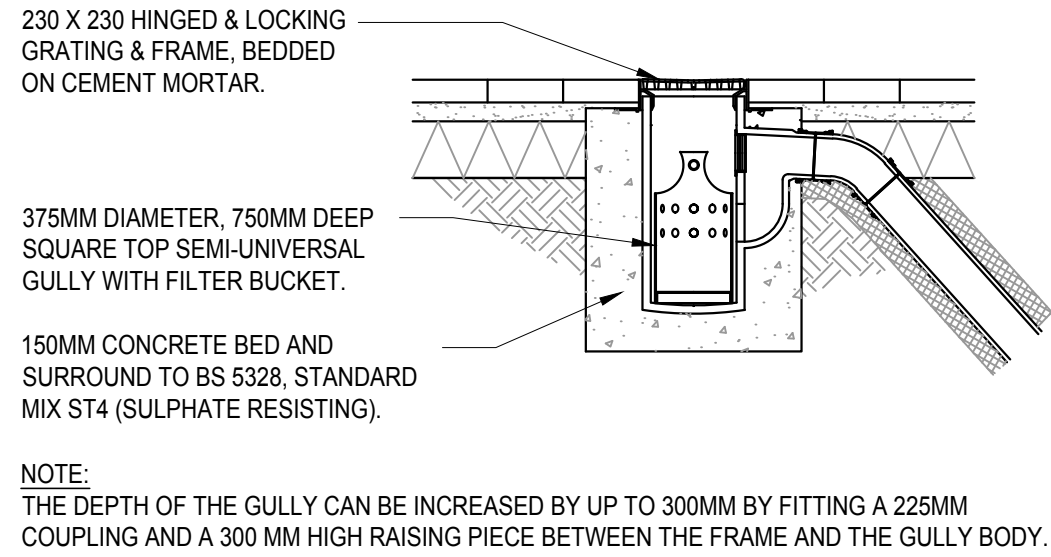
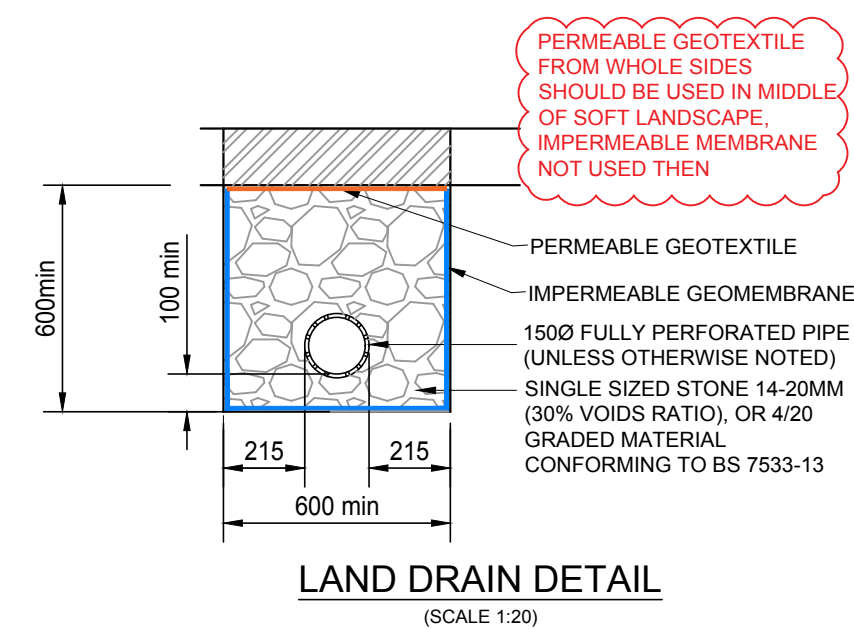
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3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
9. FOR FULL DRAINAGE NOTES REFER TO DWG 8790-CUR-ZZ-XX-DR-C-92502 GENERAL NOTES



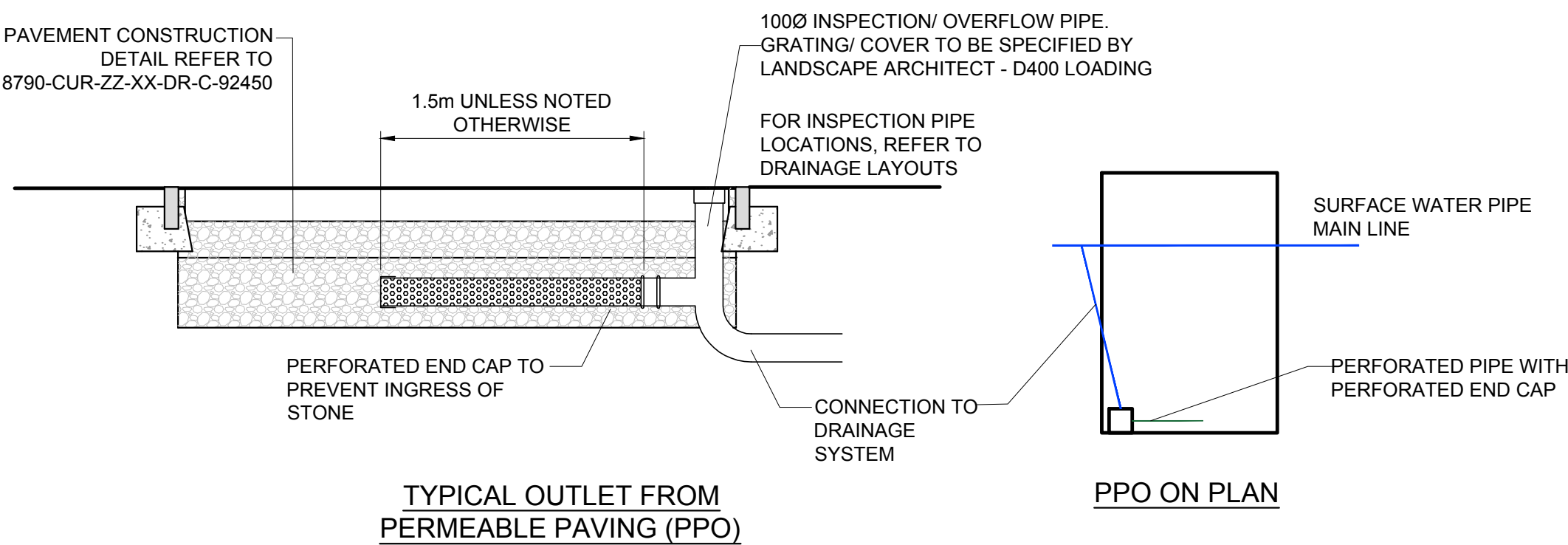
PERFORATED PIPE UNDER PERMEABLE PAVEMENT



GATIC SLOT DRAIN 350mm OUTLET UNIT
SECTION AND PLAN DETAILS
NTS



FOR PAVEMENT CONSTRUCTION
DETAIL REFER TO
8790-CUR-ZZ-XX-DR-C-92450



C03	NOTE ADDED	25/05/21	MW	MW
C02	ISSUED FOR CONSTRUCTION-PPO ADDED	22/02/21	MW	MW
C01	ISSUED FOR CONSTRUCTION	22/01/21	MW	MW
Rev:	Description:	Date:	By:	Chkd:

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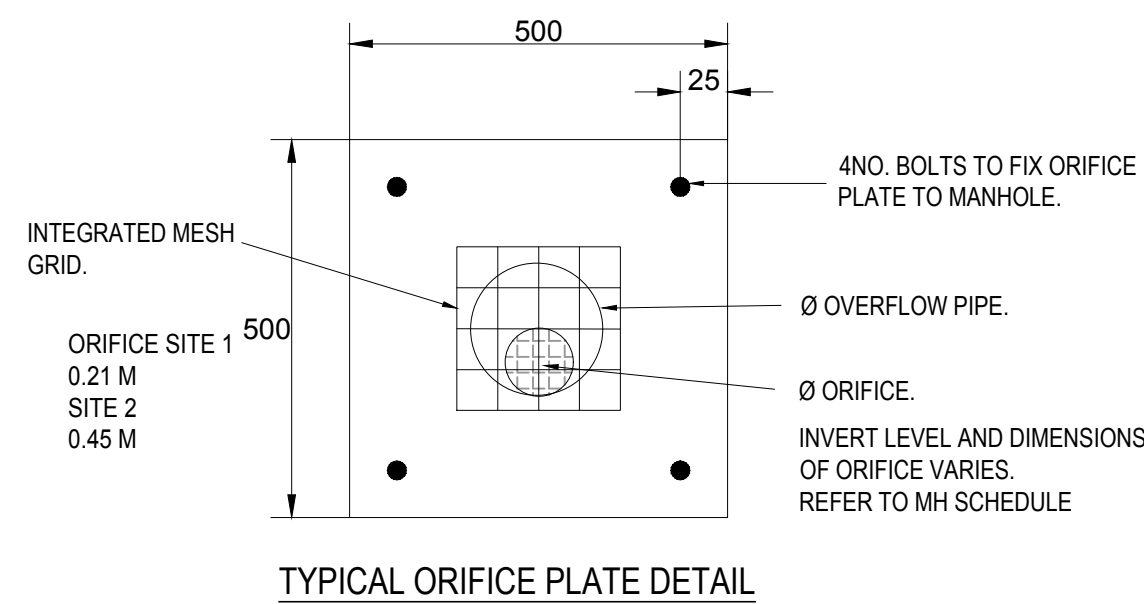
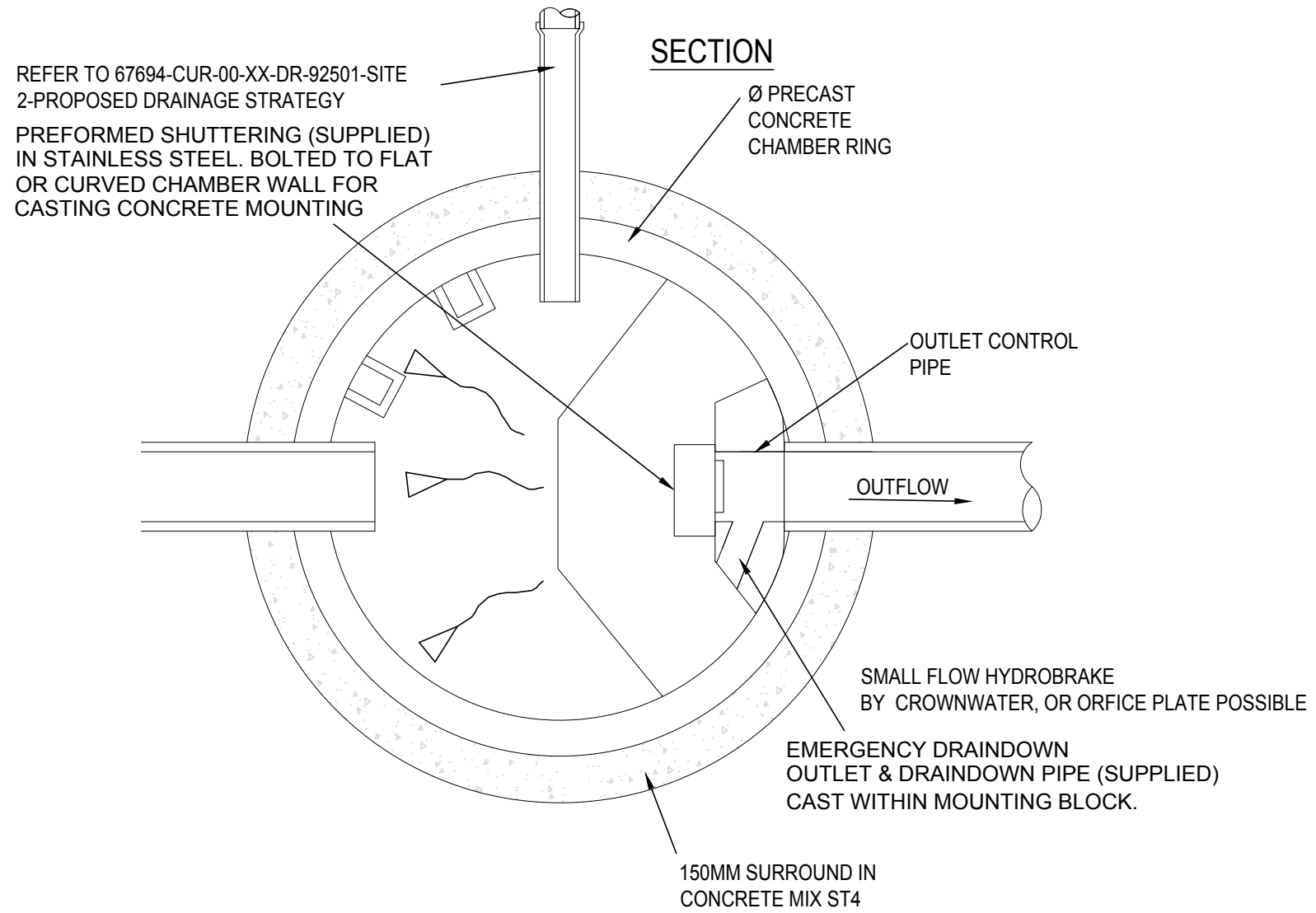
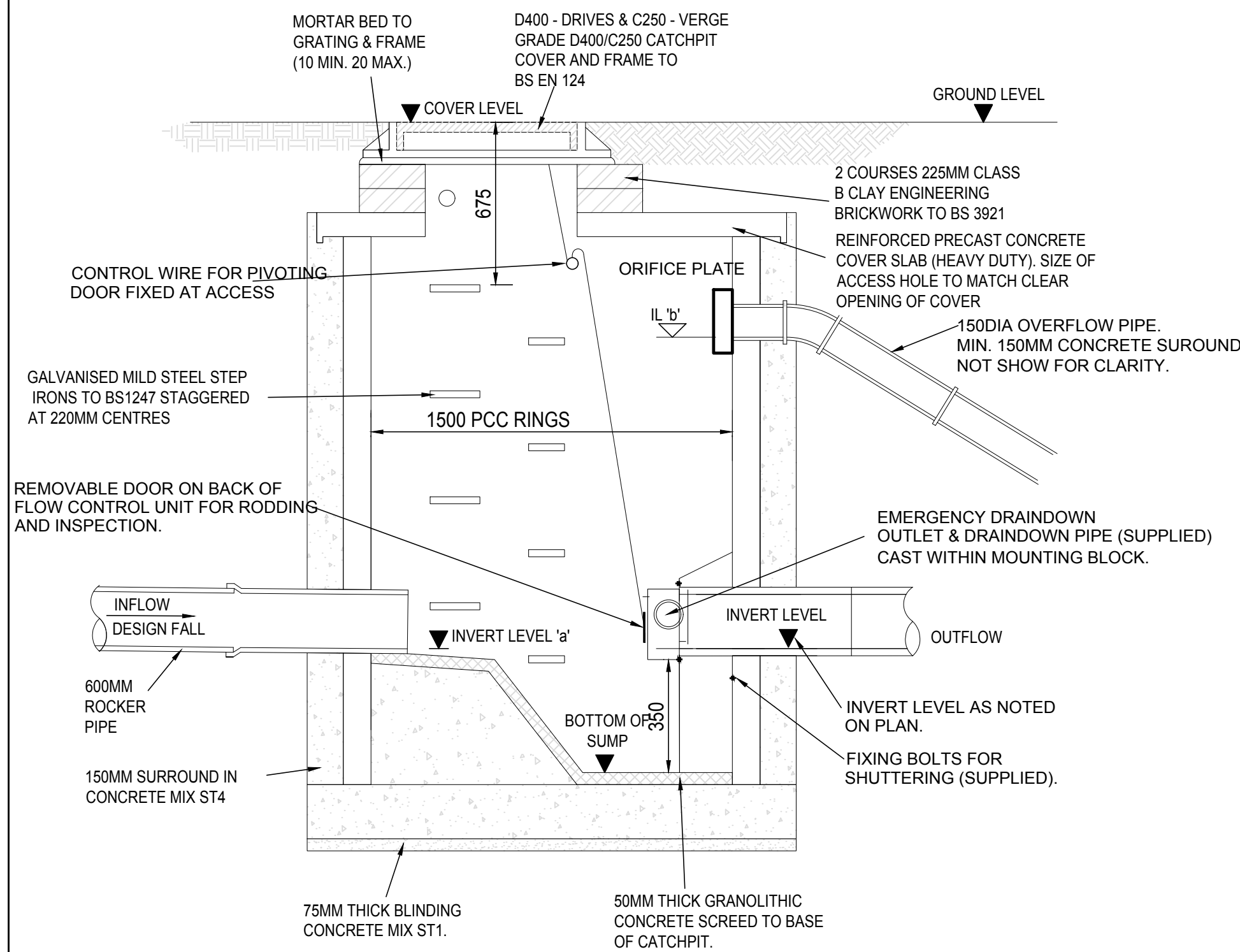
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Status:	CONSTRUCTION			
Project:	GORTON LANE			
Orig Title:	DRAINAGE DETAILS SHEET 3 OF 5			
Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	22.01.21	MJ	MW	CG
Scale: NOT TO SCALE				
Project No:	Originator:	Zone:	Level:	Type: Discipline: Category / Number: Rev:
8790	- CUR - ZZ	- XX - DR - C -	92522	- C03

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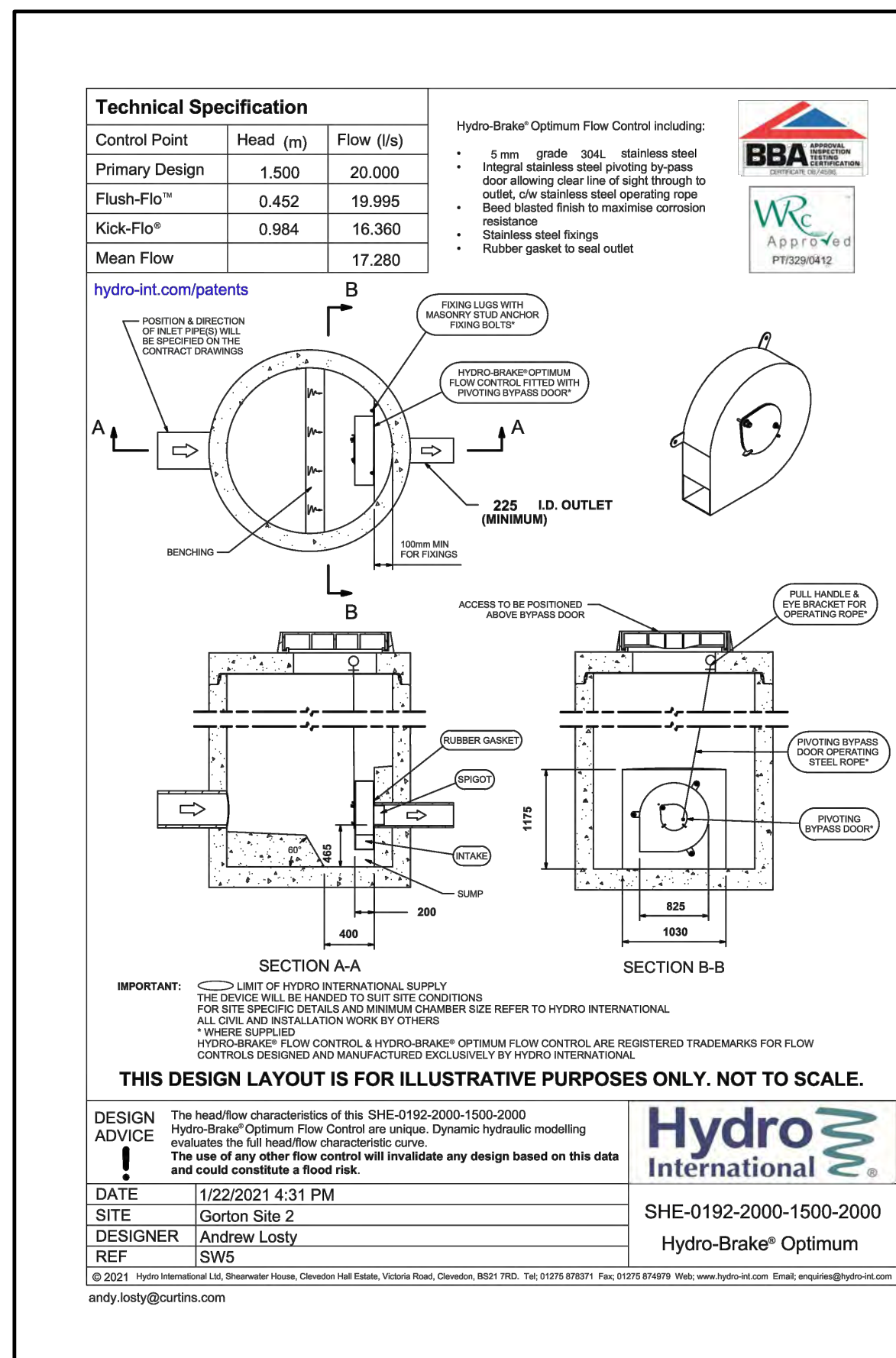
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- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- REFER TO DRAINAGE LAYOUT 8790-CUR-ZZ-00-DR-C-92501 FOR THE LOCATION OF THE ATTENUATION TANK.
- FLOW CONTROL TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.
- WHERE ALTERNATIVE FLOW CONTROL DEVICE IS PREFERRED, IT WILL BE SUBJECT TO REDESIGN TO CONFIRM WHETHER THE SYSTEM HAS CAPACITY.
- SURFACE WATER DRAINAGE CONNECTION SUBJECT TO S106 AGREEMENT WITH SEVERN TRENT WATER
- FOR FULL DRAINAGE NOTES REFER TO DWG 8790-CUR-ZZ-00-DR-C-92520
- SULPHATE RESISTANT CONCRETE DC2 SHOULD BE USED WHERE SULPHATES PRESENT, REFER TO SI

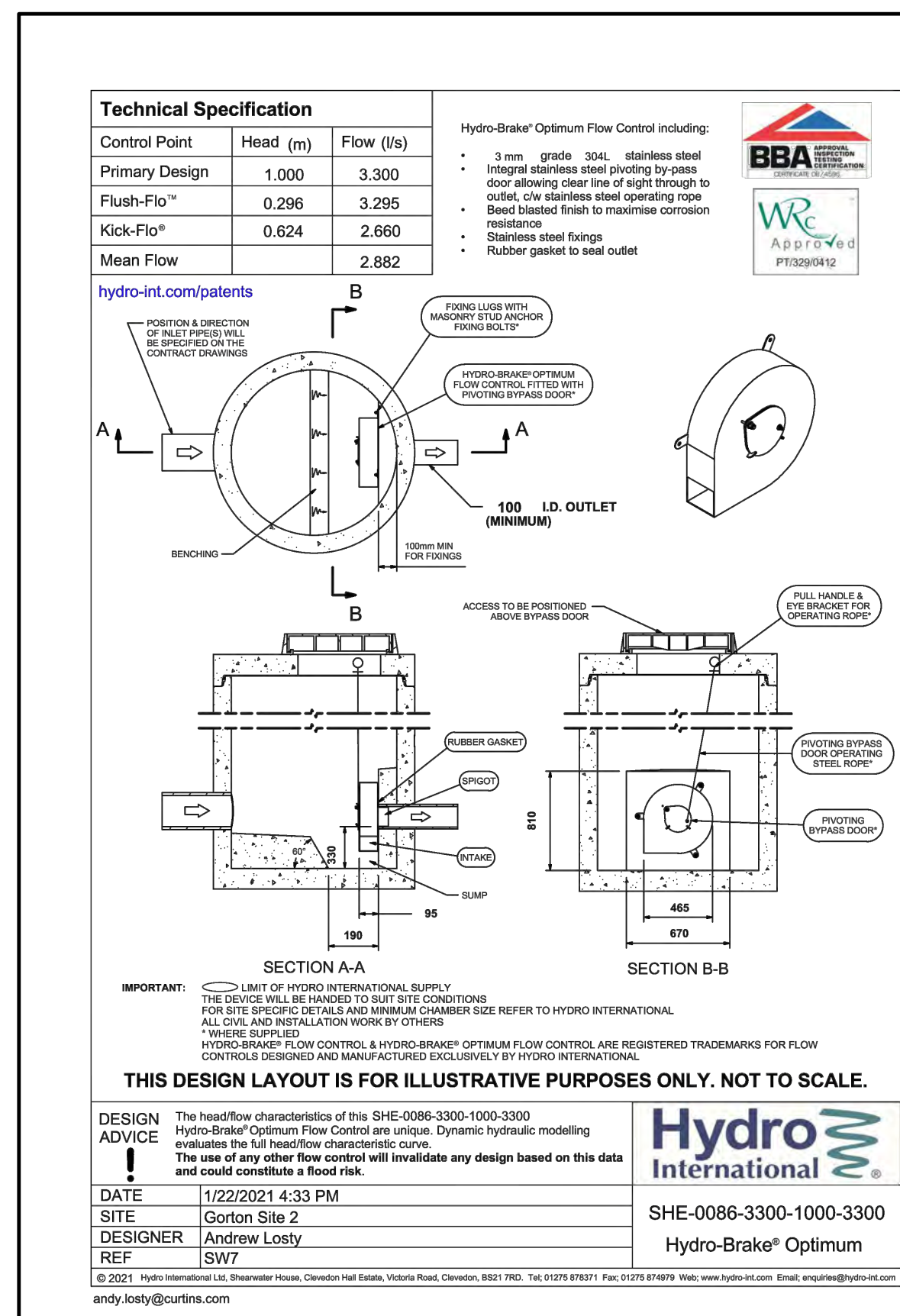
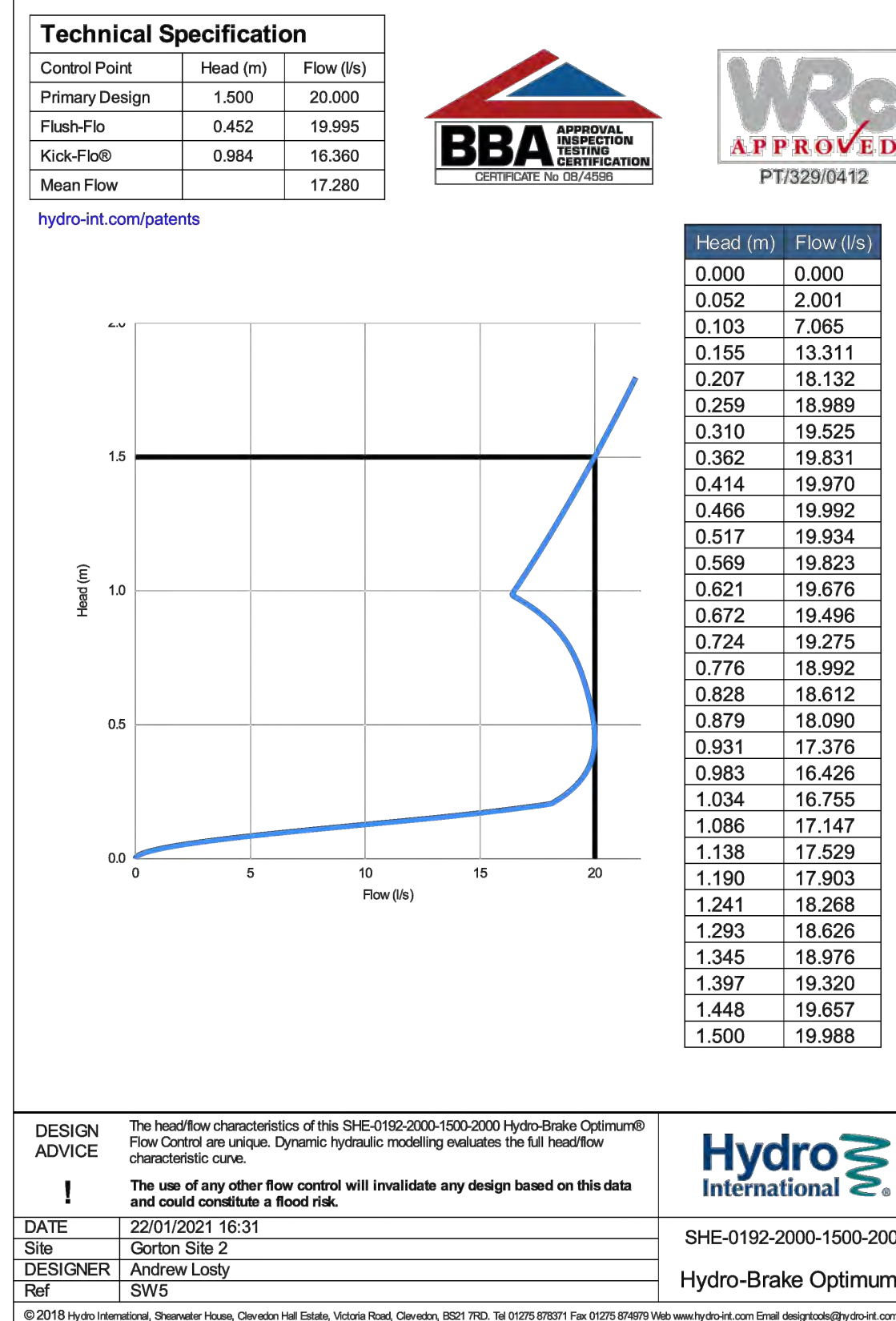


FLOW CONTROL DETAILS				
MANHOLE REF	HYDROBRAKE IL (a)	OVERFLOW IL (b)	OVERFLOW PIPE Ø	ORIFICE Ø
SW 5	54.19	NO OVERFLOW		
SW 7	52.92	53.57	150	52

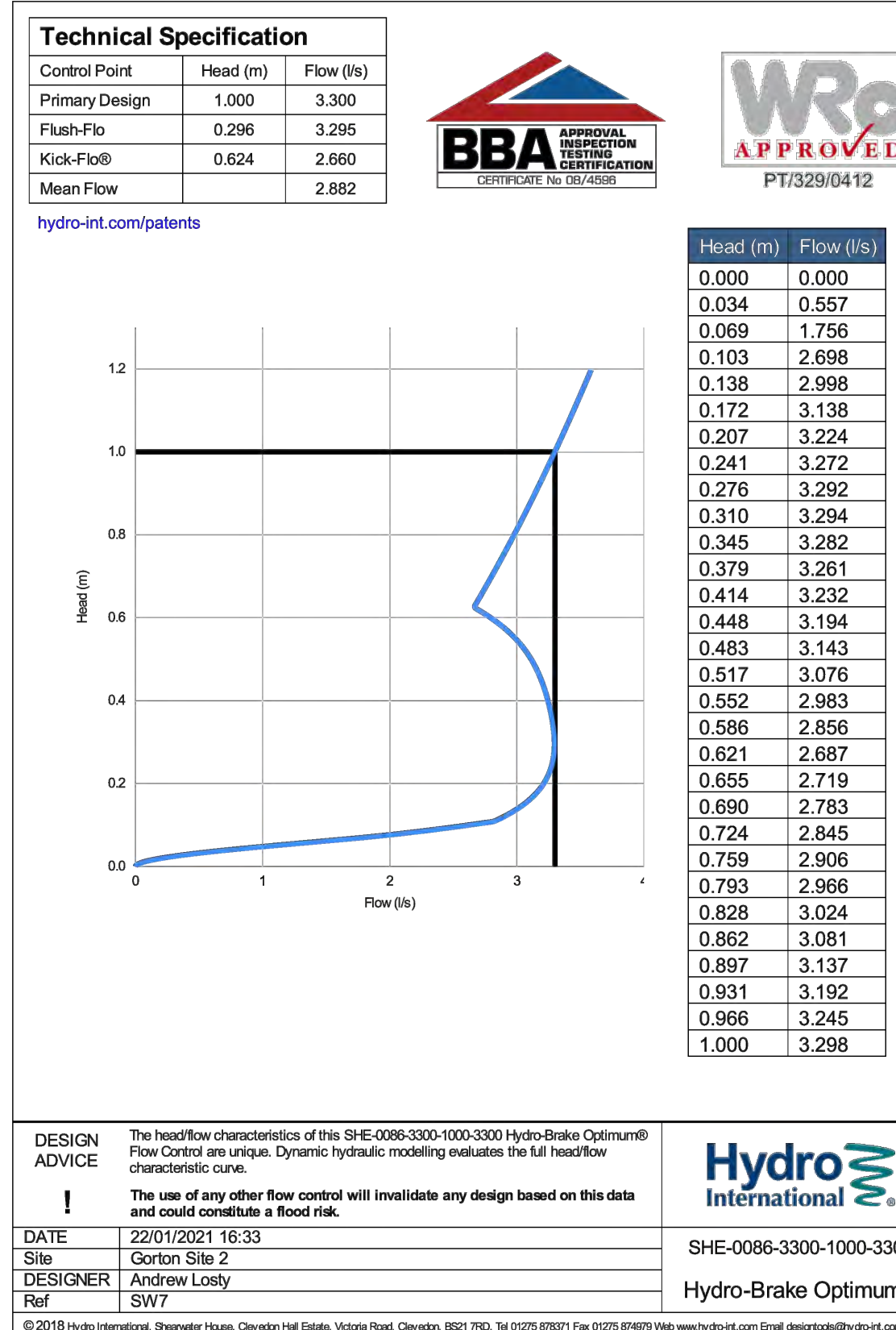
SW5,SW7 PRIVATE HYDROBRAKE CONTROL CHAMBERS



MANHOLE SW 5 HYDROBRAKE DETAILS



MANHOLE SW 7 HYDROBRAKE DETAILS



C02	NOTE 14 ADDED, ORIFICE PLATE CHANGE	21/02/21	MW	MW
C01	ISSUED FOR CONSTRUCTION	22/01/21	MW	MW

Rev: Description: Date: By: Chkd:

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Status:

CONSTRUCTION

Project:

GORTON LANE

Orig Title:

DRAINAGE DETAILS SHEET 5 OF 5

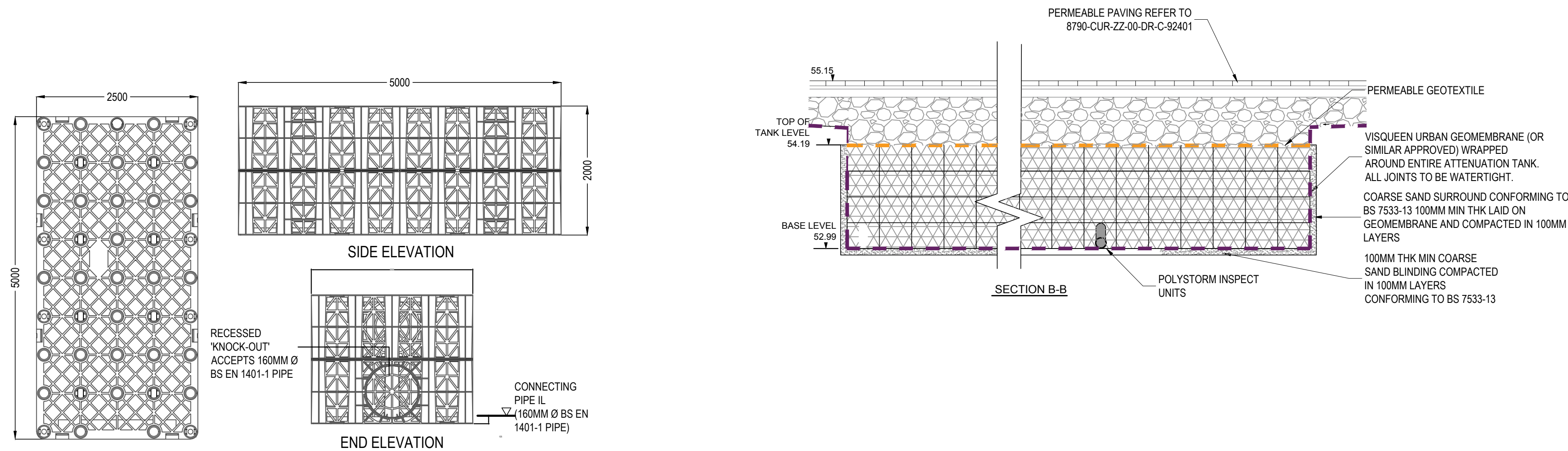
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A1	22.01.21	MJ	MW	CG
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Scale: NOT TO SCALE

Project No: Originator: Zone: Level: Type: Discipline: Category / Number: Rev:

8790 - CUR - ZZ - XX - DR - C - 92524 - C02



- | | | | | |
|------|-------------------------|----------|-----|-------|
| C01 | ISSUED FOR CONSTRUCTION | 22/01/21 | MW | MW |
| Rev: | Description: | Date: | By: | Chkd: |

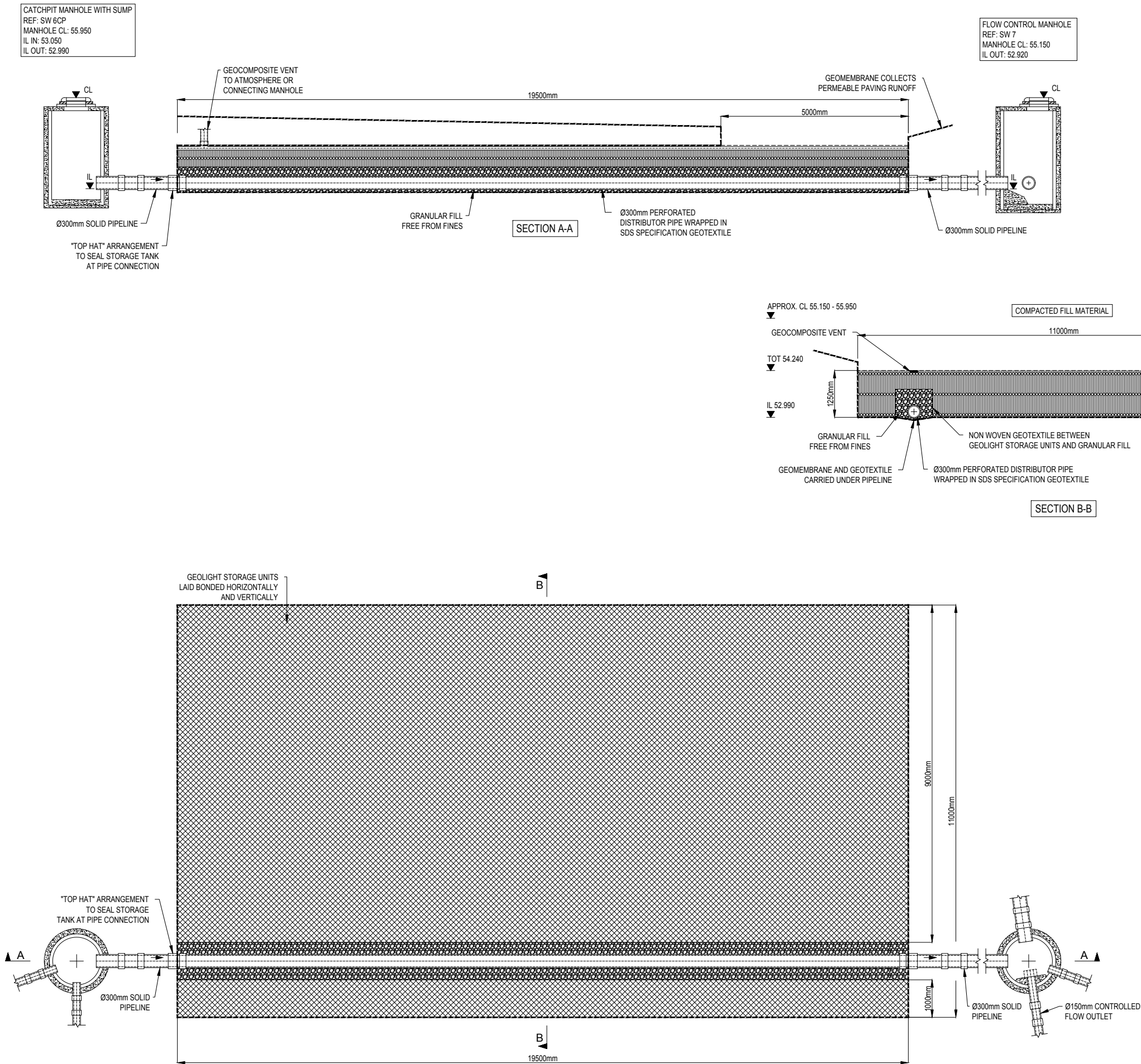
Status:	CONSTRUCTION
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Project: GORTON LANE

Drp Title: DRAINAGE DETAILS SHEET 4 OF 5

Size:	Date:	Drawn By:	Designed By:	Checked By:			
A1	22.01.21	MJ	MW	CG			
Scale: NOT TO SCALE							
Project No:	Originator:	Zone:	Level:	Type:	Discipline:	Category / Number:	Rev:

8790 - CUR - ZZ - XX - DR - C - 92523 - C01



Notes:

This Drawing is to be read in conjunction with all relevant Architects' Engineer's and specialists' drawings and specifications.

Do not scale from this drawing in either paper or digital form. Use written dimensions only.

SDS to leave solid stub only, exiting tank for connection by others.

All external Manholes, Access Points, Junctions & Pipe are shown for guidance only and not part of the SDS program unless otherwise agreed.

A	AMENDED PER NEW REF DRAWINGS	25.02.21
	ISSUED FOR APPROVAL	GM SP
-	ISSUED FOR APPROVAL	08.02.21
		GM SP
Rev	Comments	Date
		DRW CHK



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KELLY CONTRACTING

GORTON LANE, MANCHESTER

ATTENUATION TANK 1 DETAIL

Drawing Number	Revision	Drawing Title	Date
92501	C02	SITE 2 PROPOSED DRAINAGE STRATEGY	22.02.21
92523	C01	DRAINAGE DETAILS SHEET 4 of 5	22.01.21

Scale: NTS Date: 08.02.21
Drawing No: E146319_01_A Rev: A

SDS GEOLight®

Stormwater Management System

Product Profile

SDS GEOLight® is an ultra lightweight honeycombed modular structure made from recycled PVC. The ready to install units are preformed to provide an underground stormwater storage facility, for the application of stormwater attenuation or infiltration.

The high void rate (>95%), high compressive strength (to 1000KN/m²) and low resistance to water flow makes

SDS GEOLight® an ideal material for cost efficient and maintainable underground water storage during storm conditions.

SDS GEOLight® Benefits

- High compressive strength – can be located under all roads, car parks and amenity area surfaces.
- Reduced excavation costs – the very high void rate (95%) minimises the required volume of earthworks.
- Speed of installation – 1000m³ reservoir, completed in one week.
- Light and easy to handle.
- Excellent hydraulic characteristics.
- The honeycomb structure is highly permeable, offering low resistance to water flow.
- SDS GEOLight®'s unique lateral and vertical filling arrangement requires a minimum amount of pipework and stone.
- Depth of tank invert reduced by using patented lateral supply.
- Simplified distribution pipe network, easy maintenance – dispensing with costly and complicated pipework configurations.
- Modular format offers design flexibility to overcome topographical constraints and architectural requirements.
- Greatly reduces the risk of flooding when used as stormwater storage.
- Can also be used for water recycling and combining with irrigation systems.
- Can virtually eliminate pollution when used in combination with specialist separation and filtration technology such as SDS Aqua-Swirl™ and SDS Aqua-Filter™.
- Design service available, including calculations.



APPLICATIONS



RETAIL



INFRASTRUCTURE



INDUSTRIAL



RESIDENTIAL



COMMERCIAL



PUBLIC SECTOR

SDS GEOLight®

Cellular Block structure manufactured from recycled PVC.



APPLICATIONS

- Stormwater Management
- Attenuation/Infiltration
- Bacterial filter-bed for biological treatment
- Hydrocarbon Separation
- Filtration and Separation Units

SPECIFICATIONS

Material	Recycled Rigid PVC
Colour	Dark grey to black
Standard length of a block	2000mm
Standard width of a block	500mm
Standard height of a block	750 mm
Other block sizes available on request	
Void Ratio	> 95%
Specific surface area	160 m ² /m ³ ± 5%
Compressive Strength	400kN/m ²

ADVANTAGES

- Highly cost effective
- Reduced excavation costs
- High void capacity
- Good UV resistance
- Good hydrocarbon resistance

SDS GEOLight®

Cellular Block structure manufactured from recycled PVC.



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GEO DS/0516

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SDS GEOLight®

Stormwater Management System



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SDS GEOLight® is an ultra lightweight honeycombed modular structure, made from recycled PVC, that provides an underground storage facility for the application of stormwater attenuation or infiltration.

Stormwater Management

The Environment Agency is keen to promote the wider use of sustainable drainage systems, which reduce the impact of surface water runoff. There are two main ways of storing surface water for stormwater management:

- Stormwater attenuation tanks
- Soakaway infiltration systems

Stormwater Attenuation Systems

This consists of underground water storage facilities that hold excess water during periods of peak rainfall.

The stored water is gradually released in a controlled manner into the surface water drainage system or directly into watercourses, reducing the risk of upstream and downstream flooding.

Soakaway Infiltration Systems

Soakaways are designed to store surface water runoff until it can be gradually absorbed by the surrounding ground.

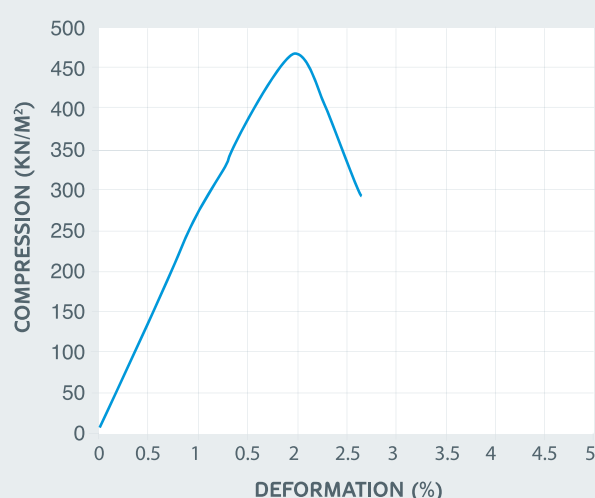
SDS GEOLight® – an efficient and economic solution for stormwater management.

SDS GEOLight® Attenuation

SDS GEOLight® has been specifically designed to form underground water storage reservoirs in stormwater management schemes. Its honeycombed structure gives it certain unique characteristics that make it ideal for this purpose:

- The high void rate (95%) of GEOLight® means that the maximum volume of water is stored in the minimum volume of storage unit.
- High compressive strength. GEOLight® is available in two strengths as standard: 200 and 400kN/m². Note: Higher compressive strengths available from 600 to 1000 kN/m². The graph on the right shows the results of a compression test, where samples of GEOLight® 400 were compressed at the rate of 1mm per minute. The deformation at 400kN/m² is about 1.6%.

RESULTS OF COMPRESSION TEST ON SDS GEOLIGHT® 400



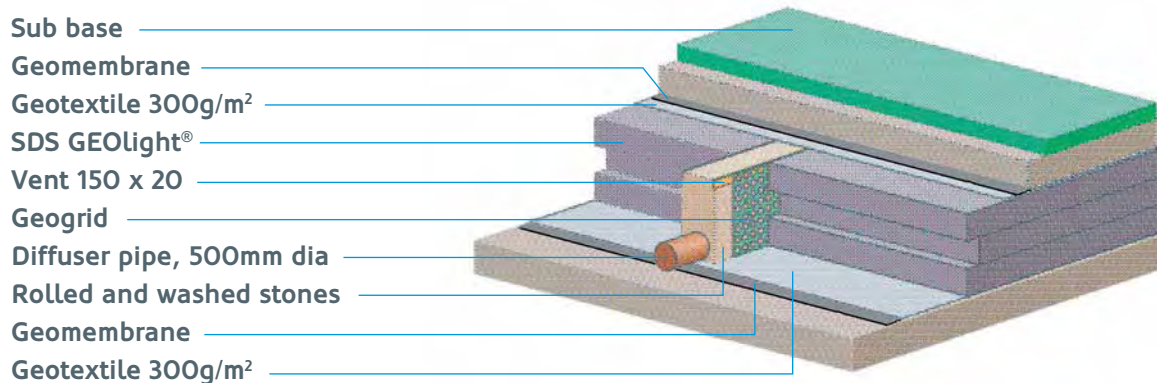
The GEOLight® Stormwater Attenuation System consists of two manholes (inspection chambers) connected by a length of perforated distribution pipe which feeds the stormwater storage reservoirs on either side formed from GEOLight®.

The distribution pipe is normally from 225mm up to 500mm diameter, generally covered in a trench that is filled with draining material such as 15/25 clean graded stone, free from fines.

The reservoirs and distribution pipe are wrapped in a waterproof membrane, such as butyl, to prevent seepage of water into the surrounding ground. The top of each GEOLight® reservoir has a vent which is connected back to the upstream manhole.

A geotextile or 10mm mesh geogrid is laid between the distribution pipe and GEOLight® to prevent the GEOLight® units being clogged by the draining materials.

SDS GEOLight® Attenuation



How does it work?

- 1. In normal conditions, water enters a back drop manhole. This is the upstream manhole and any silt or sediment will collect in the bottom of the chamber. The water then flows along the distribution pipe into the downstream manhole. The upstream pipework is sized to cope with normal flow conditions. The distribution pipe and attenuation tank are sized to cope with storm conditions. The outflow pipe is sized to cope with the permissible discharge.
- 2. In storm conditions the flow restrictor (vortex flow control or orifice plate) in the downstream manhole limits the amount of water flowing out of the manhole. This causes the water level in the distribution pipe to rise and water to spill into the GEOLight® reservoirs on either side. As the water level rises in the reservoirs, air is forced out of the high level vents into the upstream manhole.

- 3. Once the storm has passed, the water level in the GEOLight® reservoirs gradually falls as water passes through the flow restrictor in the downstream manhole. The vents now allow air to return into the GEOLight® reservoirs. Gradually the reservoirs empty. The flow restrictor prevents excess surges of flood water to pass downstream and uses the storage reservoirs to store the water for the period of the storm.

Calculating the storage capacity

The storage capacity of the GEOLight® reservoirs is determined by the maximum outflow permitted, (set by the water company or Environment Agency), the impermeable area of the site and the rainfall return period – normally 1 in 30 years, but again can be dictated by the water company. A full design service, including calculations, can be supplied via a third party consultant.

Please contact SDS for details.

Other uses

The water storage ability of SDS GEOLight® lends itself to a number of other uses:

- Water recycling combines with irrigation systems – this is increasingly popular: GEOLight® is used to retain stormwater which is then pumped as required to a network of standpipes for irrigation.
- Drainage channels – the natural permeability of GEOLight® lends itself for use as an underground drainage channel that collects and drains away groundwater.
- Pollution control – improved water runoff quality. When used in combination with oil / petrol separators, GEOLight® can replenish groundwater without the risk of contamination from oil, chemicals or suspended solids.
- To form lightweight embankments (slope stabilisation) – GEOLight® can be used to quickly form the base of embankments that only weigh a fraction of earth embankments.

Stormwater Attenuation System

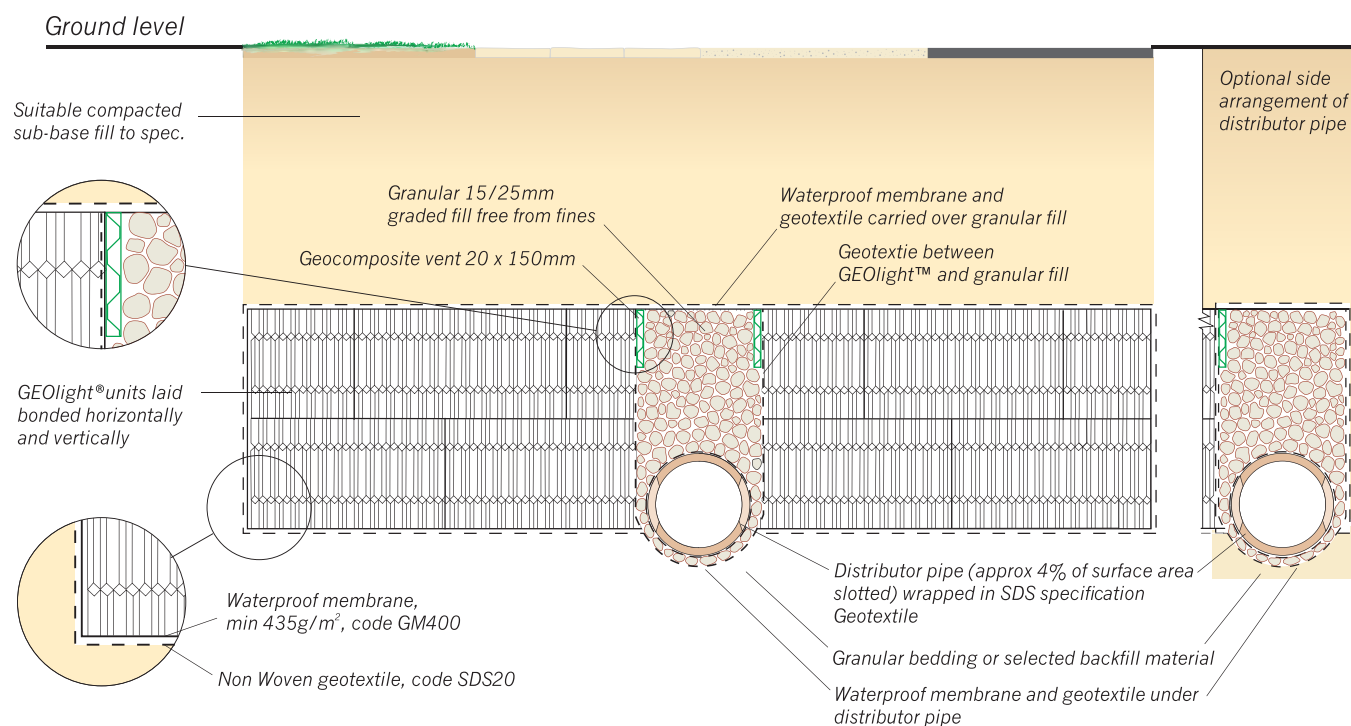
Design Details

The details on these two pages illustrate the construction of a typical SDS GEOLight® Stormwater Attenuation System. The length and height of the GEOLight® reservoirs is determined by the quantity of water to be stored.

The layout of each scheme is specifically designed to suit the characteristics and limitation of the site. Typically the distributor pipe would be arranged in the centre of the reservoir, but can alternatively be placed at the side where topographical constraints dictate.

The high performance waterproof membrane should be sealed continuously to encapsulate the GEOLight® reservoirs, distributor pipe and granular fill. It is protected by a heavyweight needle punched, non woven geotextile. To help with maintenance a high flow geotextile is placed between the granular fill and GEOLight® attenuation units to prevent silt and particles being washed into the reservoir. GEOLight® can be used under a range of surfaces e.g. grass, porous paving, standard paving block, tarmac and concrete.

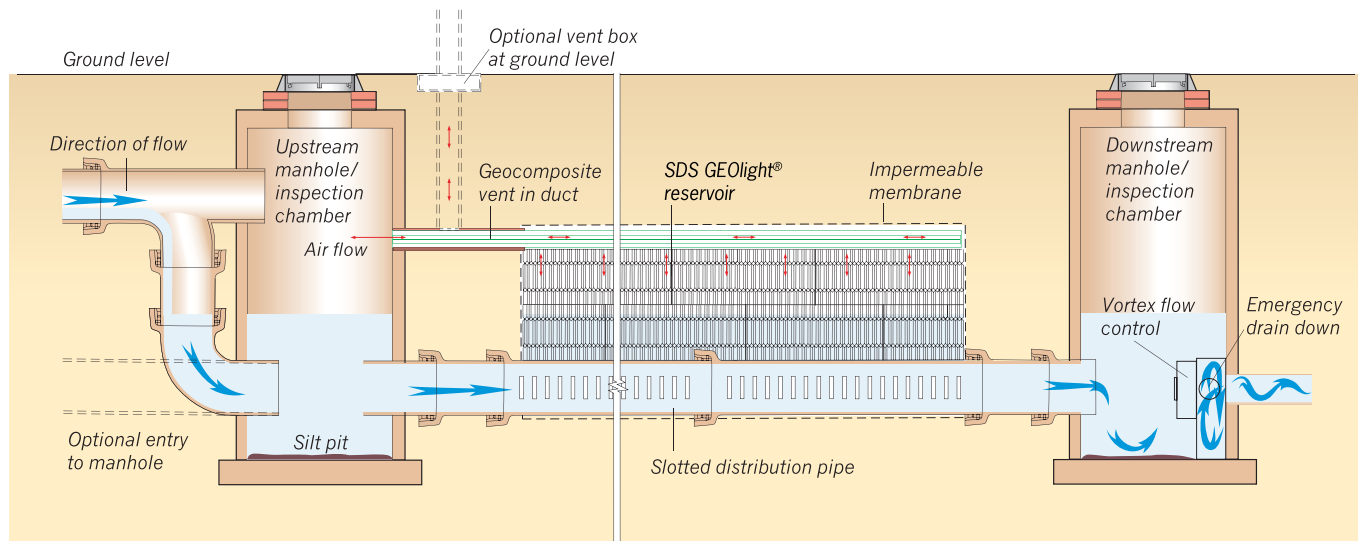
Cross Section



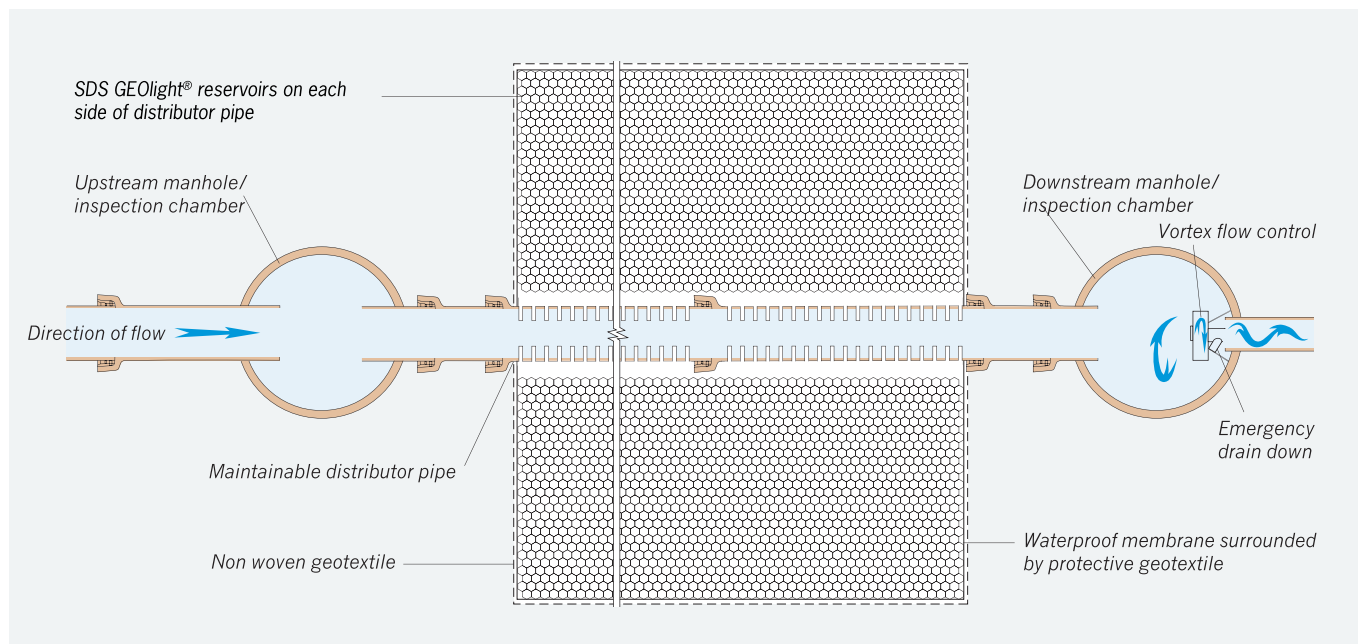
Stormwater Attenuation System

Design Details

Long Section



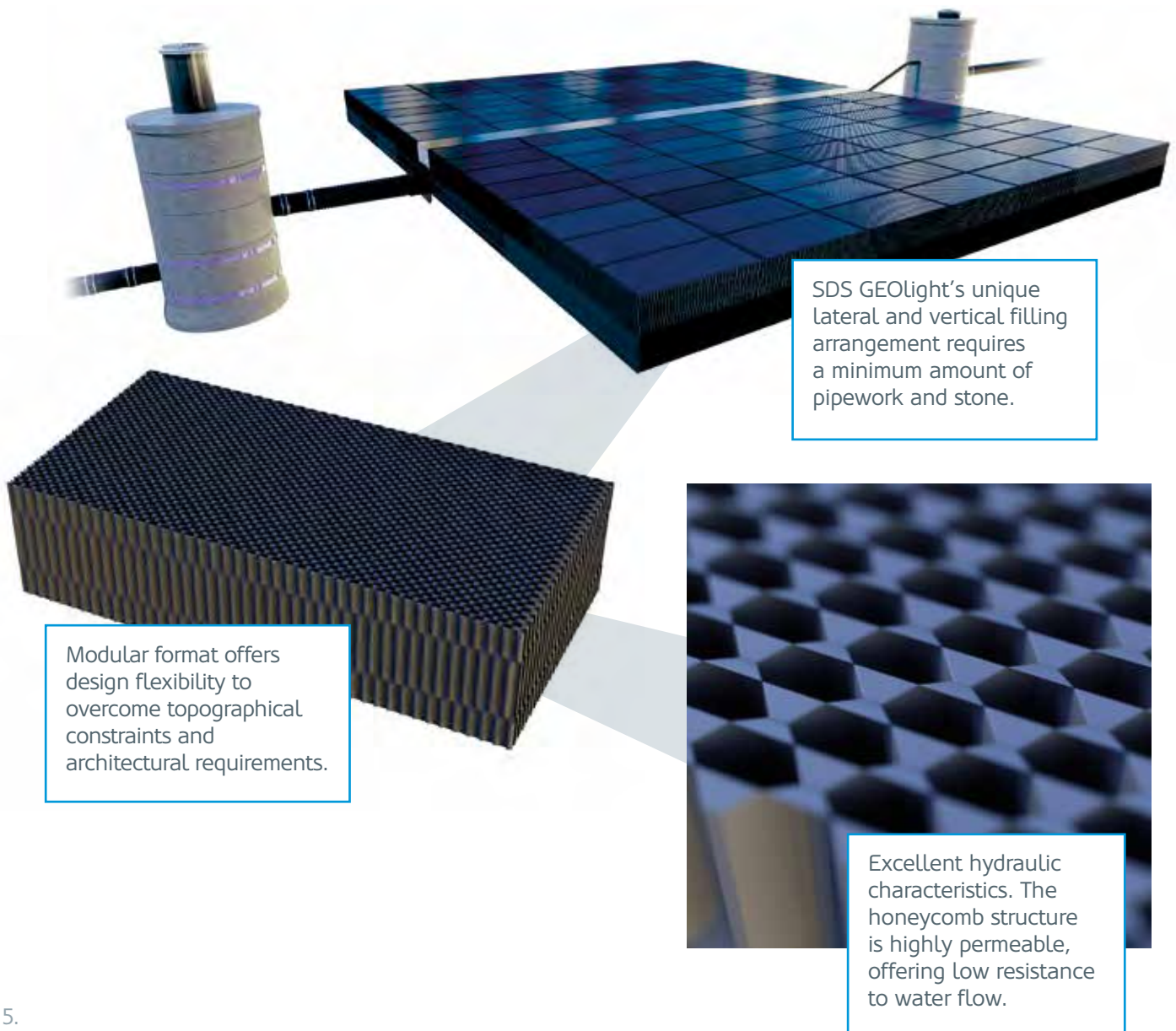
Plan



Benefits

- High compressive strength – can be located under all roads, car parks and amenity area surfaces.
- Reduced excavation costs – the very high void rate (95%) minimises the required volume of earthworks.
- Speed of installation – 1000m³ reservoir, completed in one week.
- Light and easy to handle.
- Depth of tank invert reduced by using patented lateral supply.
- Simplified distribution pipe network, easy maintenance – dispensing with costly and complicated pipework configurations.
- Greatly reduces the risk of flooding when used as stormwater storage.
- Can also be used for water recycling and combining with irrigation systems.
- Can virtually eliminate pollution when used in combination with specialist petrol / oil separators.
- Design service available, including calculations.

GEOLight® block



COSHH and Handling Information

1. COMPOSITION/INFORMATION ON INGREDIENTS:

Hazardous ingredients:

None as finished goods or products.

Types of materials:

Polyvinyl chloride (PVC)
MEK

2. HAZARDS IDENTIFICATION

Nature of hazard:

There are no health risks from the products during normal use. The products may contain various pigment colours and stabilisers that may be toxic. The chemicals are, however, bound within the product material and not easily extracted.

3. FIRST-AID MEASURES

Eye contact:

Plastic materials may cause physical irritation in the eyes. Wash out with large amounts of water. If irritation persists, seek medical advice.

Skin contact:

Not applicable.

Inhalation:

Not applicable.

Ingestion:

Not expected to have any toxic effects.

4. FIRE-FIGHTING MEASURES

Extinguishing media:

On small fires use any hand-held extinguisher type.
On large fires use water.

Fire and explosion hazards:

Melting plastics may flow and spread in a large fire.
Products of fire will be thick black toxic smoke.

Material characteristics:

PVC products will burn in the presence of a flame but are classed as self-extinguishing.

Protective equipment:

Wear self-contained breathing apparatus and protective clothing.

5. HANDLING AND STORAGE

Handling:

There are no hazards associated with the finished products. However, when cutting SDS GEOLight®, we recommend that the correct tools are used e.g. Handsaw or Alligator saw. When cutting, dust may be created; avoid inhaling these dusts. Take care of heat build-up within materials during cutting etc. The pallets of SDS GEOLight® units should be placed on level ground and should not be stacked on site. The maximum weight of the pallet of SDS GEOLight® units as delivered to site is 650kg (700kg on one copy), including packaging. Machines used to lift the pallet should be able to lift this weight safely. Loose individual units should not be stored more than three units high. SDS GEOLight® units are lightweight ranging from 23kg to 55kg and can be easily handled – one or two person lift.

Storage:

SDS GEOLight® units will resist the effects of UV light for up to six months; however, prolonged storage in direct sunlight should be avoided. SDS GEOLight® units should not be stored near to any fuel storage areas or any other solvents. SDS GEOLight® units are very robust and resistant to damage during normal handling; however, they should be secured in areas where impacts from vehicles or construction plant will be avoided.

Material characteristics:

PVC products will burn in the presence of a flame but are classed as self-extinguishing.

Protective equipment:

Wear self-contained breathing apparatus and protective clothing.

6. EXPOSURE CONTROLS / PERSONAL PROTECTION

Respiratory protection:

Not required under normal conditions of use. Where cutting etc. creates dust, wear a disposable half-mask to the standard FFP2S.

Hand protection:

Wear impervious strong gloves to prevent cuts to the hands while handling, cutting etc.

Eye protection:

Wear safety glasses when cutting etc.

Skin protection:

Wear overalls.

7. SITE HAZARDS

Other hazards for consideration:

Working in excavations and trenches – SDS GEOLight® may be designed with a shallow invert for infiltration (soakaway) or attenuation (storage) system. This negates the need for deep excavations or trenches, excavation near services e.g. gas, electricity or contaminated soil areas. N.B. All risk assessments should be undertaken by the main contractor for forklift, access to and working in excavations and trench support.

8. STABILITY AND REACTIVITY

Decomposition products:

Major thermal decomposition products are oxides of carbon. Relevant differences are (in addition): PVC may produce amounts of Hydrogen Chloride.

Stability:

These materials are stable at temperatures up to normal operating limits (moulding parameters).

9. ECOLOGICAL INFORMATION

Biodegradability:

Plastic products are not readily biodegradable but are not detrimental to terrestrial wildlife.

Aquatic toxicity:

Non-toxic to marine life.

10. DISPOSAL CONSIDERATIONS

Method:

The preferred method of disposal is collection and recycling. Plastics can safely be placed with regular industrial or household wastes where recycling is not available.

11. OTHER INFORMATION

As the handling, storage, use and disposal of the product are beyond our control SDS disclaims all liability for loss, damage, injury or expense in any way connected with such activities and further makes no warranties, expressed or implied, as to the suitability of the product for any particular use.

The preferred method of disposal is collection and recycling. Plastics can safely be placed with regular industrial or household wastes where recycling is not available.

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