

**Starwood House
Avenue One
Letchworth Garden City**

**Surface Water Drainage
Statement in Support of the
Discharge of Pre-commencement
Conditions 14 & 23**

For

Letchworth Investment LLP

Ref: 40365-BGL-XX-XX-RP-D-00005

Version V2

Date 20.02.2026

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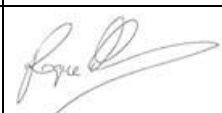
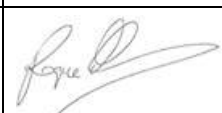
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Issue number	Date	Revision Details
1	13/01/2026	First Issue
2	20/02/2026	Drawings and calculations updated to suit lowered FFLs

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1.0 INTRODUCTION

This report has been prepared by Burrows Graham Ltd. On behalf of Letchworth Investment LLP to support the pre-commencement discharge of Conditions 14 & 23 which are relevant to the drainage strategy included in the Planning Decision Notice (ref. 25/01196/FP).

2.0 DECISION NOTICE

The Decision Notice includes two pre-commencement conditions relevant to the drainage and states the following:-

14. *Development, save for demolition and site clearance to slab level, shall not begin until a scheme for surface water disposal has been submitted to and approved in writing by the Local Planning Authority. No drainage systems for the infiltration of surface water drainage into the ground is permitted other than with the express written consent of the Local Planning Authority, which may be given for those parts of the site where it has been demonstrated that there is no resultant unacceptable risk to controlled waters. The development shall be carried out in accordance with the approved details.*

Reason: To ensure that the development does not contribute to, and is not put at unacceptable risk from or adversely affected by, unacceptable levels of water pollution caused by mobilised contaminants. This is in line with paragraph 187 of the National Planning Policy Framework and relevant position statements within the Environment Agency's Approach to Groundwater Protection.

23. *Prior to the commencement of development, save for demolition and site clearance to slab level, construction drawings of the surface water drainage network, associated sustainable drainage components and flow control mechanisms and a construction method statement shall be submitted and agreed in writing by the local planning authority. The scheme shall then be constructed as per the agreed drawings, method statement, FRA & Drainage Strategy (Ref:40365-BGL-XX-XX-RP-D-0001 Rev: 2, dated 25/04/25) and Technical Note (Ref: 40365-BGL-XX-XX-TN-C-0002 Rev: P02, dated 07/08/25) and remain in perpetuity for the lifetime of the development unless agreed in writing by the Local Planning Authority. No alteration to the agreed drainage scheme shall occur without prior written approval from the Local Authority.*

Reason: To ensure that the development achieves a high standard of sustainability and to comply with NPPF Policies of North Herts Council.

3.0 DRAINAGE STRATEGY

The site is located in flood zone 1 and proposed development classed as less vulnerable, and as such the development can be considered appropriate in accordance with NPPF guidelines.

The Drainage Strategy has been prepared in accordance with the approved Flood Risk Assessment REF: 40365-BGL-XX-XX-RP-D-0001, Version 2 and subsequent Technical Note in response to LLFA Comments 40365-BGL-XX-XX-TN-C-0002 P02. The surface water drainage system will offsite discharge rates to the equivalent greenfield rates and is designed to accommodate the 1 in 100 year plus 40% allowance for climate change storm scenario.

Following submission of the FRA, Technical Note and drainage drawing for planning, there have been minor updates to the drainage layout following further coordination. The main change is the roof drainage layout to units 1 and 2 which has resulted in a manhole being removed. The Building FFLs have also been lowered 220mm with external levels and drainage revised to suit.

The full set of drainage drawings is included in Appendix A showing the Drainage Layout, Manhole Schedule, and Drainage Construction Details.

The drainage has been remodelled in line with the approved strategy and to suit the minor changes with a full set of calculations in Appendix B. They show no negative impact to the proposed drainage strategy and is in line with the drainage strategy in the approved FRA.

There are also details and manufacturer information of proprietary drainage products such as the flow control devices, attenuation tank and petrol interceptors included in Appendix C. If alternative products are used, they will be to the equivalent standards as those included within this document. Any SuDS components will include impermeable membranes to prevent infiltration into the ground

A Construction Method Statement will be provided by the Contractor.

FLOW PATHS

Above ground SuDS have been included where appropriate. The raingardens/ bio-retention areas will have overflows into the drainage system to further reduce risk of flooding. External levels are designed to fall away from buildings to prevent any exceedance flows entering the building. The Exceedance Flows drawing is in Appendix D which has not changed since planning.

3.0 WATER QUALITY

As part of the drainage design, it's required to provide adequate treatment to the surface water in areas at risk of contamination. Calculations using the simple index approach have been carried out to determine whether adequate treatment has been provided. in accordance with The SuDS Manual, CIRIA C753.

To deliver adequate treatment the SuDS components should have a total pollution mitigation index that equals or exceeds the pollution hazard index.

$$\text{Total SuDS mitigation index} \geq \text{Pollution hazard index}$$

The pollution hazard index is taken from table 26.2 of the SuDS Manual.

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways ¹	High	0.8 ²	0.8 ²	0.9 ²

Figure 1 - Pollution hazard indices for different land use classification (Table 26.2 The SuDS Manual CIRIA 753)

Commercial yards and non-residential parking areas are considered as having a medium pollution hazard level. As such, the surface water drainage system must provide sufficient treatment to equal or exceed the corresponding hazard indices.

The indicative mitigation indices for different SuDS components are taken from table 26.3 of The SuDS Manual.

Type of SuDS component	Mitigation indices ¹		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4 ²	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond ⁴	0.7 ³	0.7	0.5
Wetland	0.8 ³	0.8	0.8
Proprietary treatment systems ^{5,6}	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Figure 2 - Indicative SuDS mitigation indices (Table 26.3 The SuDS Manual CIRIA 753)

Where the mitigation index of an individual component is insufficient, two components (or more) in series will be required and calculated as below.

$$\text{Total SuDS mitigation index} = \text{mitigation index}_1 + 0.5(\text{mitigation index}_2) + \dots$$

The surface water drainage system utilises various SuDS components and summarised below.

SuDS Component	Mitigation Indices		
	TSS	Metals	Hydrocarbons
Full Retention Separator	0.8	0.6	0.9
Permeable Paving	0.7	0.6	0.7
Rain Garden	0.8	0.8	0.8

Surface water run-off from the access road will be treated by the bioretention areas, runoff from the yard will pass through full retention separators and car park runoff will be intercepted and treated by lined permeable paving. Based on a medium pollution hazard level of medium, each of the proposed SuDS treatment components in isolation have an equal or higher mitigation index, so therefore provides adequate surface water treatment.

4.0 CONCLUSION

This note has been produced as part of the submission to discharge pre-commencement conditions 14 & 23. Detailed drainage drawings, calculations and manufacturers information have been included within the appendices with changes to the layout remodelled and show no negative effect to the previously approved drawings. This note is expected to provide sufficient detail to demonstrate the design meets the LLFA requirements and is sufficient to discharge the condition.

APPENDIX A – BGL DRAINAGE DRAWINGS



DRAINAGE NOTES:

- Do not scale from this drawing, work to dimensions or co-ordinates provided. All levels are in metres and all dimensions are in millimetres, unless otherwise noted (u.o.n.). If in doubt seek clarification.
- This drawing is to be read in conjunction with all relevant drawings, specifications and documentation.
- The Contractor MUST check the position, size and levels of all existing drains / sewers / pipes / outfalls / manholes that are being retained prior to the commencement of the site works and any discrepancies reported immediately to Burrows Graham Limited. Contractor should allow for cleaning / jetting / surveying retained drainage.
- The Contractor must check for any offsite connections to the existing site drainage and report any findings to Burrows Graham Limited.
- The Contractor is responsible for obtaining all required permits and licenses (S106 agreements).
- All works are assumed to be within public highway or within land owners lands & no works are required on third party land owners property.
- Any gradients of drains indicated are indicative only and the Contractor shall install the drains to the specified levels shown for each chamber (u.o.n.).
- Cover levels of the access points are provisional and subject to adjustment on site to suit the finished ground levels. All external works construction areas to be as located by the architect.
- Positions and sizes of above ground foul and surface water drainage connections ("pop-ups") are indicative only. Setting out and confirmation of the internal requirements is the responsibility of the architect. Contractor to confirm requirement prior to construction.
- Design assumes that no sewerage authority sewers or other drainage systems require modification, diversion or abandoning (u.o.n.).
- Drainage channels are to be ACO Qmax in service yards and ACO Multidrain in car parks, or similar approved. Channels are to be sized by the supplier and approved by the Engineer in writing prior to ordering. Drainage channels to be installed to manufacturers' requirements. Design of channels shall be based on a 1 in 100 year storm return period, 15 minute duration. Outlet units on channel drains to include silt traps.
- All RWP, gully and channel connections shall be 150mm dia Ux/UO. Wastewater stack connections shall be 100mm dia. UNO and shall have internal above ground rodding eyes or large access fittings in accordance with Building Regulations.
- All WPCs, SRWPs and RWP's are shown indicatively. Locations shall be confirmed by others.
- No deep rooting trees/vegetation should be planted within 5.0m of any drainage works.

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SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:

CONSTRUCTION

MAINTENANCE

DEMOLITION

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT

KEY:

- Existing AW Foul Water Sewer
- Existing AW Surface Water Sewer
- Existing Foul Water Drainage
- Existing Surface Water Drainage
- Existing Drainage to be Abandoned
- Surface Water Drainage Pipe
- Surface Water Drainage Manhole
- Surface Water Drainage Channel
- Filter Drainage Pipe
- Officer Kerb Drainage
- Foul Water Drainage Pipe
- Foul Water Drainage Manhole
- Above Ground Syphonic Pipework
- Proposed Permeable Surfacing
- Proposed Green SuDS (Tree Pits/Rain Garden & Green Roofs)
- DU
- Road Gully
- Planning Boundary

C01	19.02.26	GL	Updated to suit lowered site levels and Issued for Construction	RM
T03	13.01.26	GL	SWMH03 removed, Syphonic split between units 1 and 2	RM
T02	07.08.25	GL	Drainage updated to suit QBar discharge	RM
T01	10.07.25	GL	Issued for Tender	RM
P03	24.06.25	FT/PL	Drainage updated following coordination	RM
P02	25.04.25	PG	Unit 1 Car Park Updated	RM
P01	17.04.25	PG	Issued for information	RM
REV	DATE	BY	DESCRIPTION	CHKD

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CLIENT
Wrenbridge

PROJECT
Letchworth, Ave One

DRAWING TITLE
DRAINAGE STRATEGY PLAN

BGL PROJECT NUMBER 40365	DRAWING STATUS CONSTRUCTION	OFFICE SOUTH
SCALE @ A0 1:250	DATE 16.04.2025	DRAWN BY PG
DRAWING No 40365-BGL-XX-XX-DR-C-00210	CHECKED BY RM	REV C01

MANHOLE SCHEDULE - Proposed SW														
Structure Name	Manhole Type	Cover Level	Inlet Pipe Size (mmØ)	Invert Level of Inlet Pipes	Outlet Pipe Size (mmØ)	Invert Level of Outlet	Sump Depth	Approximate Depth to Sump	Internal Size	Class	Cover Type Clear Opening	Easting	Northing	Remarks
SWMH01	PC Ring	80.703	300 450	78.900 78.830	450	78.830	0.600	2.473	1500Ø	D400	600x600	523336.161	232921.532	-
SWMH02	PC Ring	80.800	450	78.680	450	78.680	0.000	2.120	1500Ø	D400	600x600	523314.845	232913.231	-
SWMH04	PC Ring	81.289			450	79.300	0.000	1.989	1500Ø	D400	600x600	523281.298	232886.804	Vented Cover
SWMH05	PC Ring	81.169	450 450	78.640 78.640	600	78.490	0.600	3.279	1800Ø	D400	600x600	523298.309	232906.980	-
SWMH06	PC Ring	81.088	150 300	79.050 79.480	375	78.850	0.600	2.598	1350Ø	D400	600x600	523278.222	232938.127	-
SWMH07	PC Ring	81.088	375	78.700	375	78.700	0.000	2.148	1350Ø	D400	600x600	523271.634	232955.320	-
SWMH08	PC Ring	81.176	600 375	78.360 78.585	600	78.360	0.600	3.416	1500Ø	D400	600x600	523275.381	232967.632	-
SWMH09	PC Ring	81.515			450	79.500	0.600	2.615	1350Ø	D400	600x600	523246.967	232958.353	Vented Cover
SWMH10	PC Ring	81.132	450	78.580	450	78.580	0.600	3.152	1350Ø	D400	600x600	523259.391	232980.873	-
SWMH11	PC Ring	81.208			450	79.260	0.000	1.948	1350Ø	D400	600x600	523275.677	232986.317	Vented Cover
SWMH12	PC Ring	81.140	600 450 450	78.320 78.545 78.630	600	78.320	0.600	3.420	1800Ø	D400	600x600	523269.027	232984.439	-
SWMH13	PC Ring	80.770			450	78.950	0.000	1.820	1350Ø	D400	600x600	523194.779	232980.549	-
SWMH14	PC Ring	81.071	450	78.800	450	78.800	0.000	2.271	1350Ø	D400	600x600	523229.191	232989.455	-
SWMH15	PC Ring	81.044	600 450	78.290 78.440	600	78.290	0.600	3.354	1800Ø	D400	600x600	523263.741	232998.422	-
SWMH15A	PPIC	81.252			150	80.700	0.000	0.552	450Ø	C250	450x450	523282.084	233002.968	Recessed Cover
SWMH16	PPIC	80.670			375	79.600	0.000	1.070	450Ø	D400	300x300	523331.622	233035.494	Recessed Cover
SWMH17	PC Ring	80.706	375 600	78.405 78.180	600	78.180	0.600	3.126	1800Ø	D400	600x600	523336.914	233029.693	-
SWMH18	PC Ring	81.194			450	79.240	0.000	1.954	1350Ø	C250	600x600	523349.640	233010.248	Vented Cover
SWMH19	PC Ring	80.758	600 450	78.160 78.310	375	78.160	0.600	3.198	1800Ø	C250	600x600	523343.931	233028.990	Flow Control

MANHOLE SCHEDULE - PROPOSED FW													
Structure Name	Manhole Type	Cover Level	Inlet Pipe Size (mmØ)	Invert Level of Inlet Pipes	Outlet Pipe Size (mmØ)	Invert Level of Outlet	Approximate Depth to Sump	Internal Size	Class	Cover Type Clear Opening	Easting	Northing	Remarks
FWMH01	PPIC	81.580	100	80.880	100	80.880	0.700	450Ø	C250	450x450	523261.203	232872.702	-
FWMH02	PPIC	81.600	100	80.520	100	80.470	1.130	450Ø	C250	300x300	523274.768	232877.499	Recessed Cover
FWMH03	PC Ring	81.445	100 100 100	80.380 80.380 80.160	100	80.160	1.285	1200Ø	D400	600x600	523273.317	232885.386	-
FWMH04	PC Ring	81.199	100	79.660	100	79.660	1.539	1200Ø	D400	600x600	523300.168	232897.521	-
FWMH05	PC Ring	81.205	100	78.740	100	78.740	2.465	1200Ø	D400	600x600	523280.538	232948.981	-
FWMH06	PPIC	81.566	100	80.800	100	80.800	0.766	450Ø	C250	450x450	523193.492	232962.753	-
FWMH07	PC Ring	81.569	100 100	80.220 79.990	100	79.990	1.579	1200Ø	C250	600x600	523222.750	232974.213	Recessed Cover
FWMH08	PC Ring	81.556	100	79.690	100	80.280	1.866	1200Ø	D400	600x600	523249.164	232949.926	-
FWMH09	PC Ring	81.500	100 100 100 100	79.680 80.355 80.352 80.348	100	79.680	1.820	1200Ø	D400	600x600	523240.530	232972.477	-
FWMH10	PC Ring	81.537	100 100	79.400 79.400	100	79.400	2.137	1200Ø	D400	600x600	523238.024	232979.583	Recessed Cover
FWMH11	PC Ring	81.013	100 100	78.000 78.000	100	78.000	3.013	1200Ø	D400	600x600	523264.698	232990.301	-
FWMH12	PC Ring	81.092	100 100	79.800 79.800	100	79.790	1.302	1200Ø	D400	600x600	523271.333	232990.081	-
FWMH13	PC Ring	81.100	100 100	79.550 77.880	100	77.880	3.220	1200Ø	D400	600x600	523268.007	232998.682	-
FWMH13a	PC Ring	81.102	100 100	77.615 80.008	100	77.615	3.487	1200Ø	D400	600x600	523287.283	233006.580	-
FWMH14	PC Ring	81.213	100	79.880	100	79.880	1.333	1200Ø	D400	600x600	523367.662	232959.464	-
FWMH15	PC Ring	81.051	100 100	78.350 78.690	100	78.350	2.701	1200Ø	C250	600x600	523344.398	233016.831	-
FWMH16	PC Ring	80.831	100 100	76.890 78.050	100	76.890	3.941	1200Ø	D400	600x600	523339.700	233028.057	Recessed Cover

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DRAINAGE NOTES:

1. This drawing is to be read in conjunction with all relevant drawings, specifications and documentation.

2. Refer to drawing 40365-BGL-XX-XX-DR-C-00210 for the Drainage Layout.

C01	19.02.26	GL	Updated to suit lowered site levels and Issued for Construction	RM
T03	13.01.26	GL	SWMH03 removed	RM
T02	07.08.25	GL	Updated to suit revised drainage	RM
T01	10.07.25	GL	Issued for Tender	RM
P01	24.06.25	GL	Preliminary Issue	RM
REV	DATE	BY	DESCRIPTION	CHKD

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CLIENT

WRENBRIDGE

PROJECT

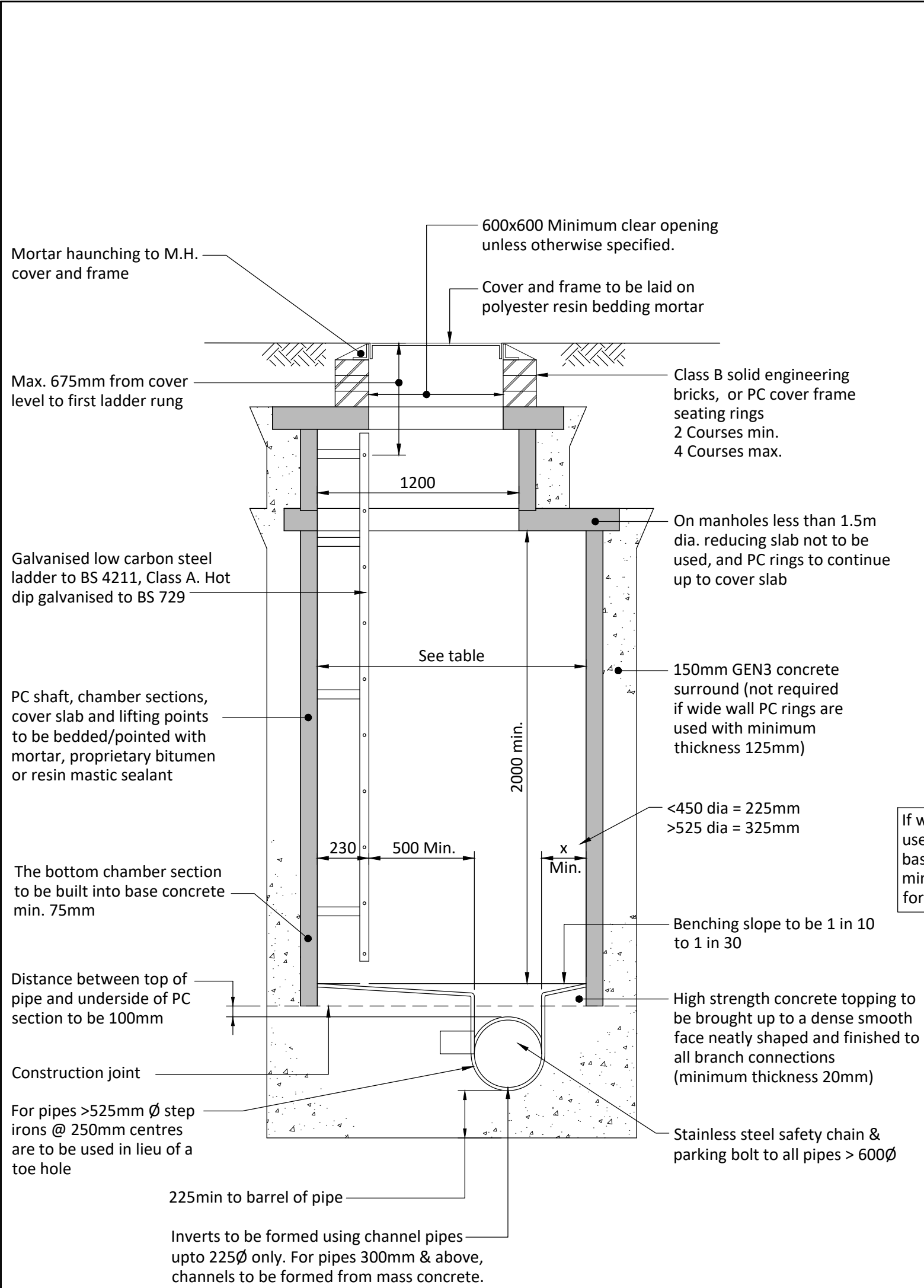
AVENUE ONE
LETCHWORTH

DRAWING TITLE

MANHOLE SCHEDULE

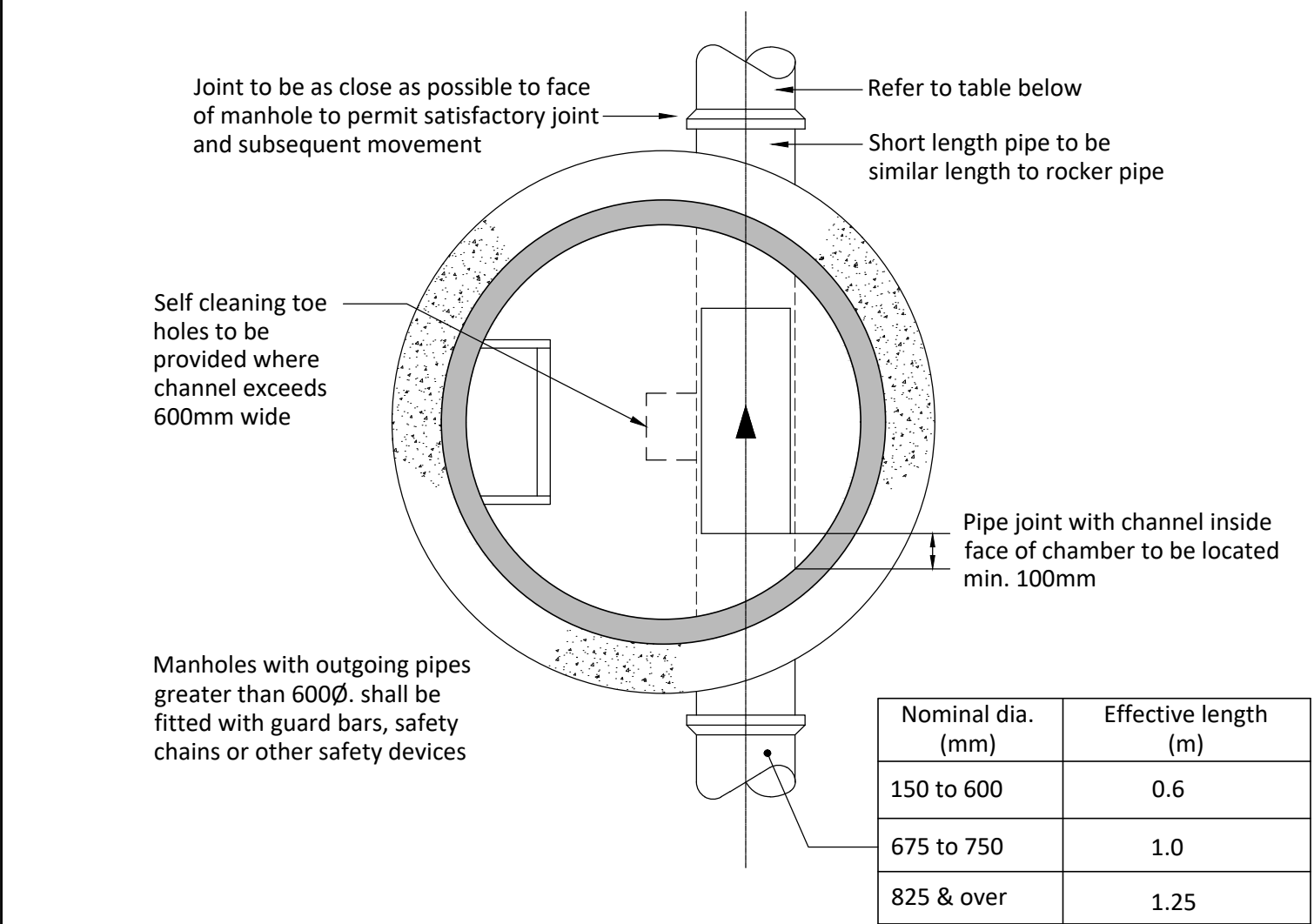
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40365	CONSTRUCTION	SOUTH	
SCALE @ A1	DATE	DRAWN BY	CHECKED BY
NTS	24/06/2025	GL	RM

DRAWING No	REV
40365-BGL-XX-XX-DR-C-00211	C01



DIAMETER OF LARGEST PIPE IN MANHOLE (mm)	MIN. INTERNAL DIAMETER OF MANHOLE (mm)
LESS THAN 375mm	1200
375 - 450	1350
500 - 700	1500
750 - 900	1800
GREATER THAN 900mm	PIPE DIAMETER + 900mm

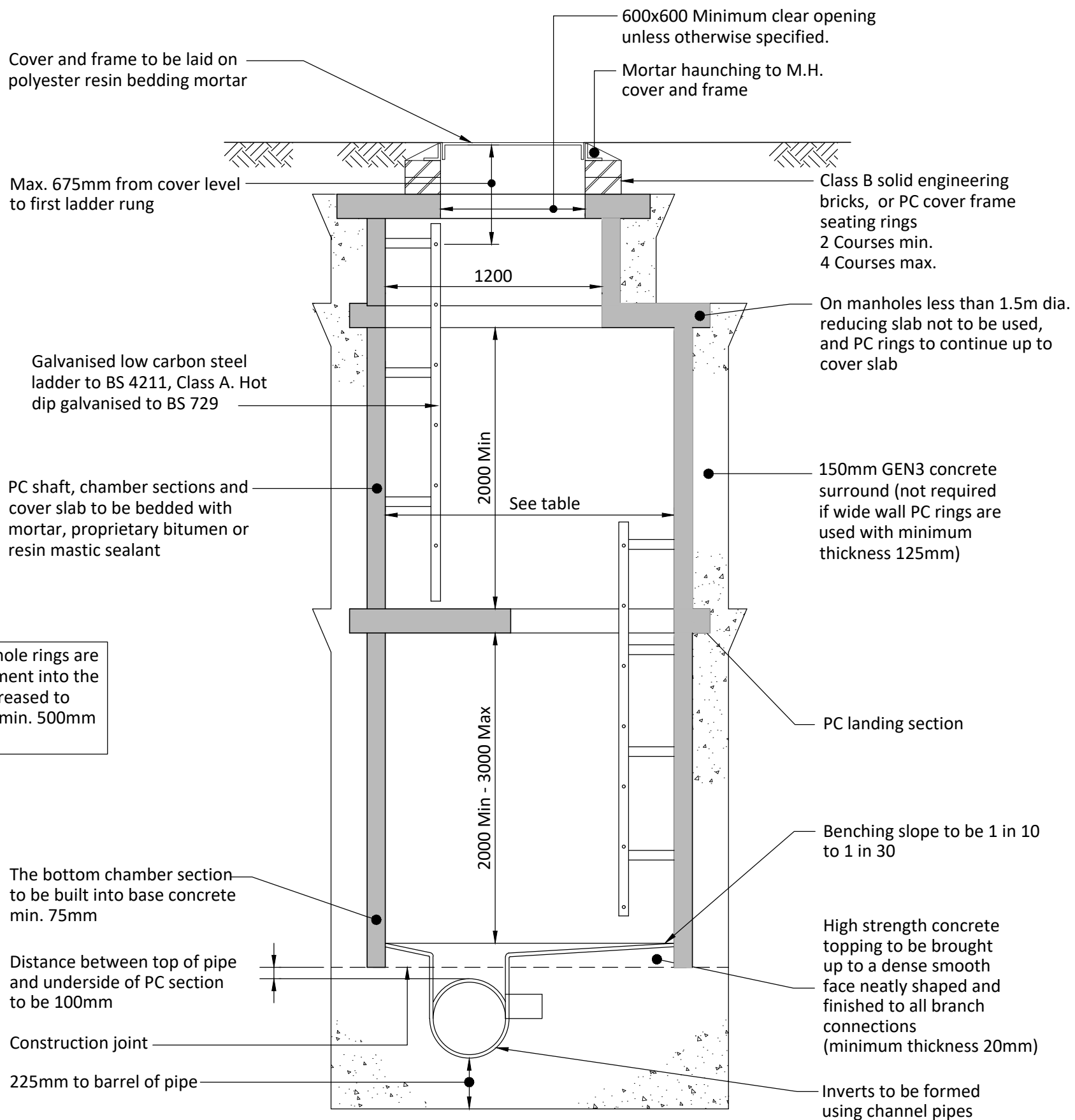
Refer to non-standard detail for manholes with more than 2No. large diameter pipes.



Nominal dia. (mm)	Effective length (m)
150 to 600	0.6
675 to 750	1.0
825 & over	1.25

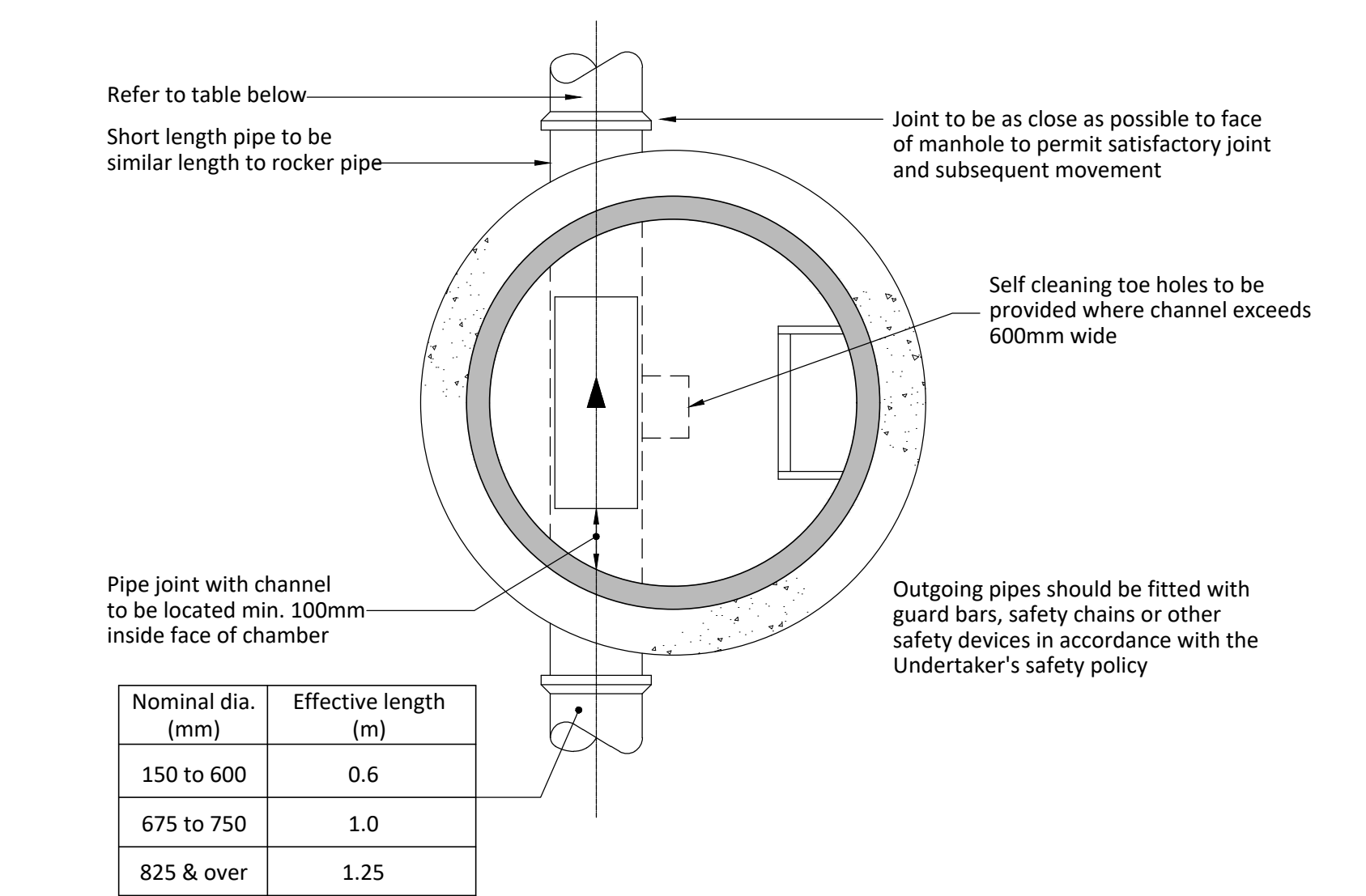
TYPICAL MANHOLE DETAIL TYPE 1A

DEPTH FROM GROUND LEVEL TO SOFFIT OF PIPE 3m TO 6m



DIAMETER OF LARGEST PIPE IN MANHOLE (mm)	INTERNAL DIAMETER OF MANHOLE (mm)
LESS THAN 375mm	1200
375 - 450	1350
500 - 700	1500
750 - 900	1800
GREATER THAN 900mm	PIPE DIAMETER + 900mm

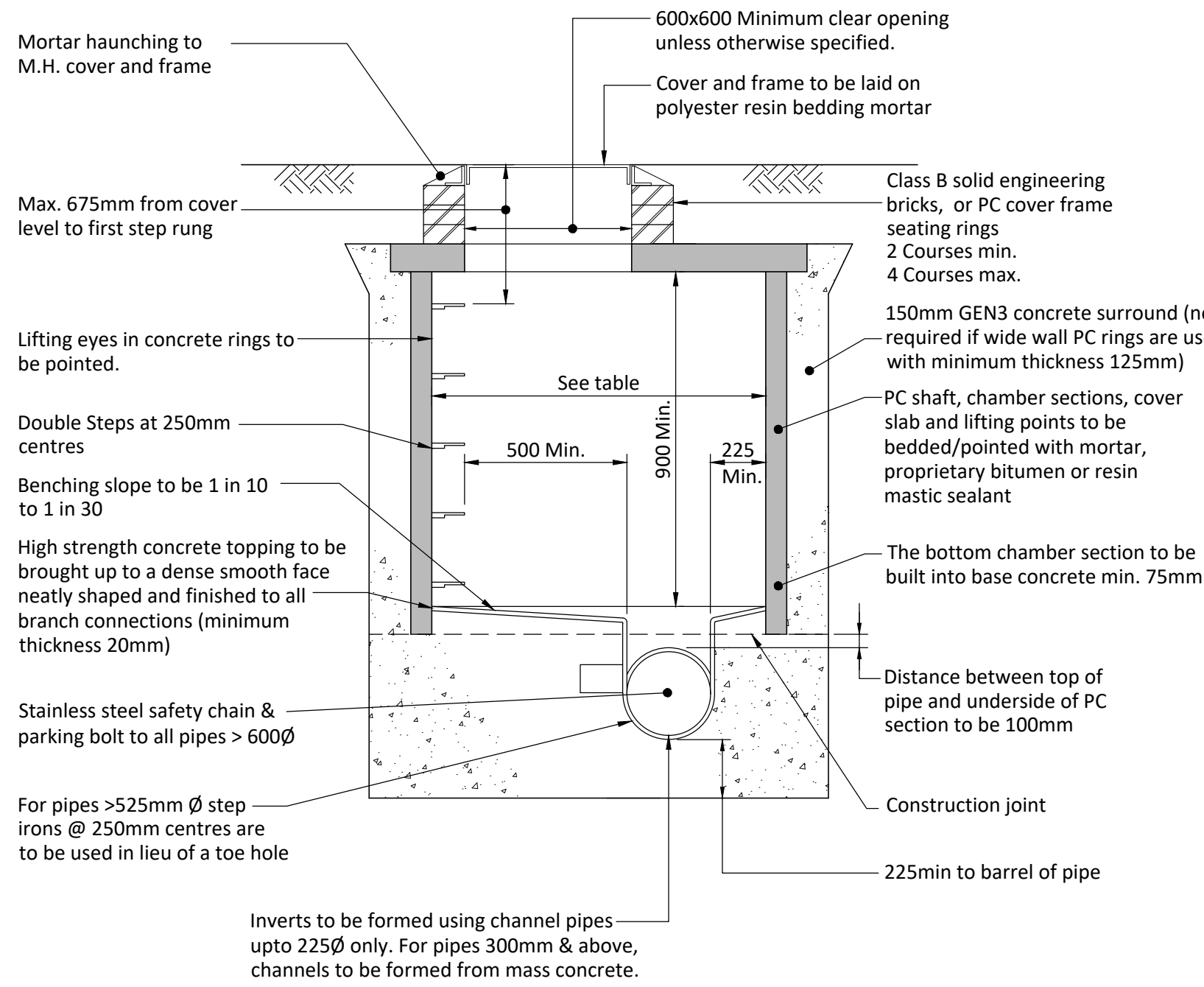
Refer to non-standard detail for manholes with more than 2No. large diameter pipes.



Nominal dia. (mm)	Effective length (m)
150 to 600	0.6
675 to 750	1.0
825 & over	1.25

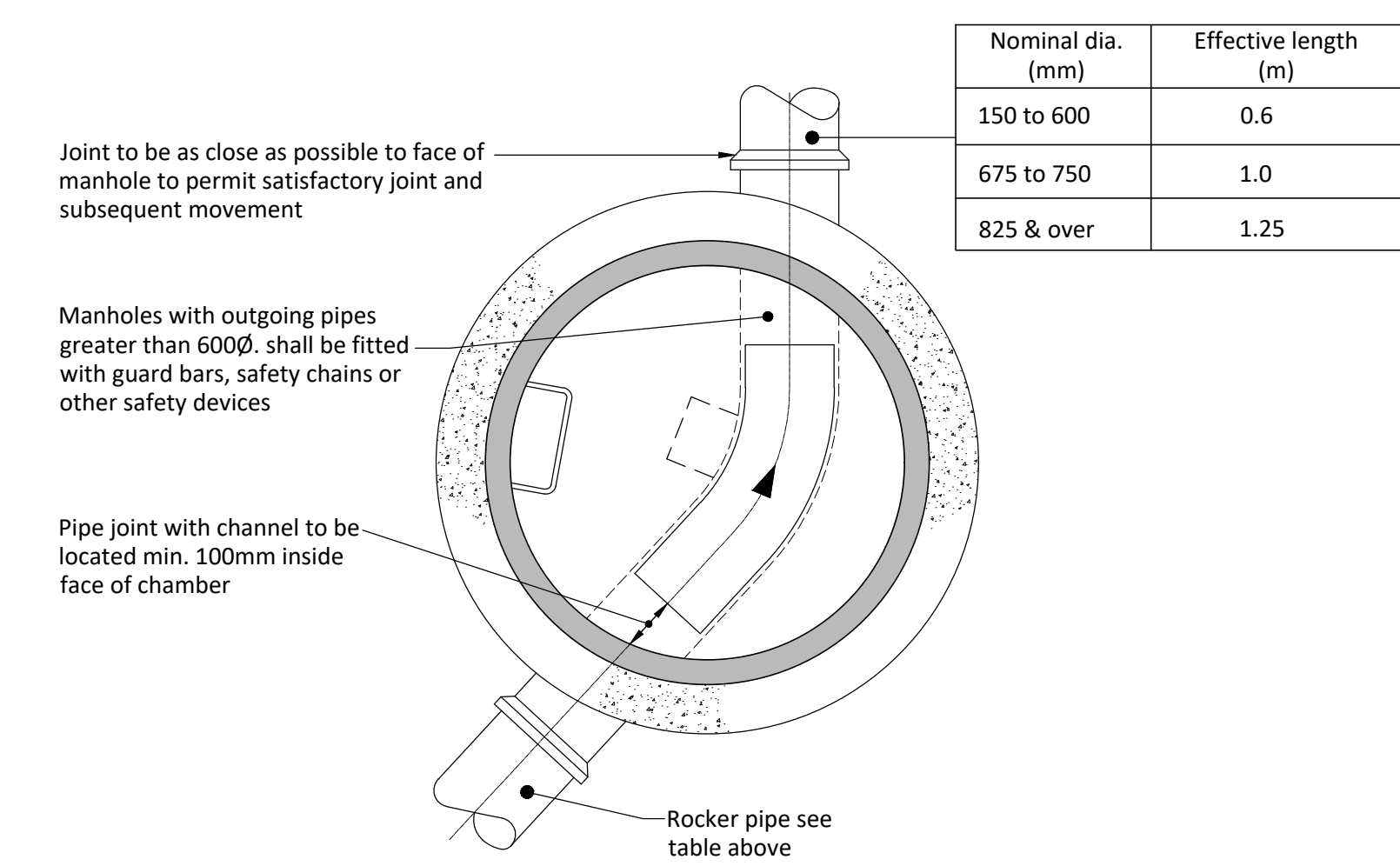
TYPICAL MANHOLE DETAIL TYPE 1B

DEPTH FROM GROUND LEVEL TO SOFFIT OF PIPE 6m MINIMUM



DIAMETER OF LARGEST PIPE IN MANHOLE (mm)	INTERNAL DIAMETER OF MANHOLE (mm)
LESS THAN 375mm	1200
375 - 450	1350
500 - 700	1500
750 - 900	1800
GREATER THAN 900mm	PIPE DIAMETER + 900mm

Refer to non-standard detail for manholes with more than 2No. large diameter pipes.



Nominal dia. (mm)	Effective length (m)
150 to 600	0.6
675 to 750	1.0
825 & over	1.25

TYPICAL MANHOLE DETAIL TYPE 2

DEPTH FROM GROUND LEVEL TO SOFFIT OF PIPE 1.5m* TO 3.0m

NOTE: P.C.C CHAMBER RINGS USED FOR MANHOLES LESS THAN 1500 TO SOFFIT WITHIN HIGHWAYS FOR LOAD CLASS D400 SHALL BE 600X600 CLEAR OPENING. ALL MAINTENANCE SHALL BE CARRIED OUT FROM THE SURFACE. NO STEP RUNGS SHALL BE PROVIDED. THE COVER OPENING SHALL BE LOCATED OVER THE OUTGOING PIPE.

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DEMOLITION

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT

General Notes:

1. This drawing shall be read in conjunction with all the relevant Architects, Engineers' and Service Engineers drawings & specifications.

2. For all buried concrete design sulphate and ASEC classes of DS-1 and AC-1s for Made Ground, Reworked Natural, Holywell Nodular Chalk and New Pit Chalk Formation up to a maximum depth of 18m. Refer to TRC Intrusive Geoenvironmental and Geotechnical Site Assessment dated May 2025.

C01	19.02.26	GL	Issued for Construction	RM
T01	26.06.25	GL	Issued for Tender	RM
REV	DATE	BY	REVISION	CHKD

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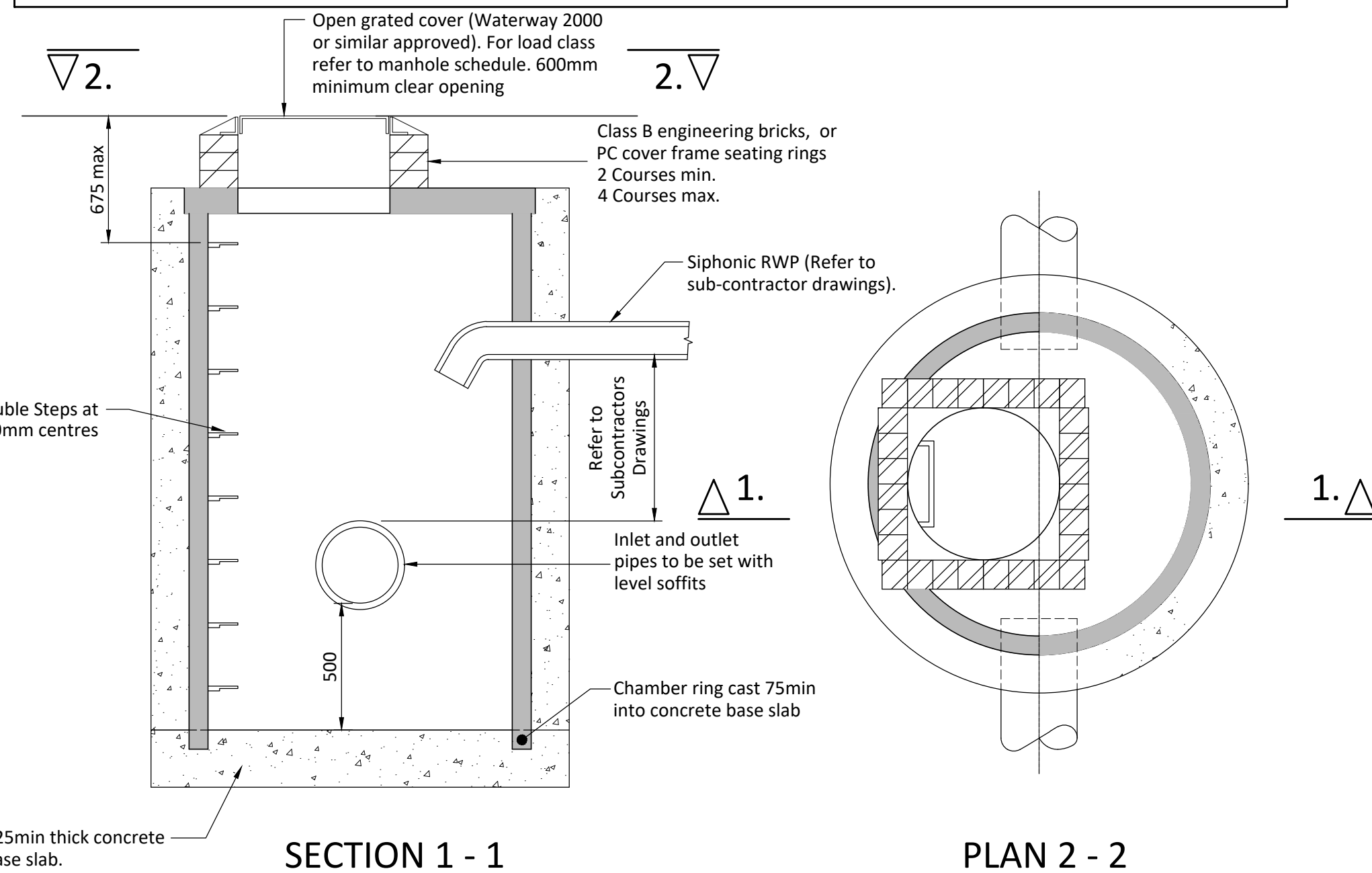
South Office:
Bourne House, Prince Edward Street,
Berkhamsted HP4 3EZ
Tel: +44 (0)161 804 8046

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AVENUE ONE
LETCHWORTH

DRAWING TITLE
DRAINAGE AND EXTERNAL DETAILS
SHEET 1

OUR PROJECT NUMBER 40365	DRAWING STATUS CONSTRUCTION	OFFICE SOUTH
SCALE @ A1 1:100	DATE 26.06.2025	DRAWN BY GL
DRAWING No 40365-BGL-XX-XX-DR-C-00221		CHECKED BY RM
		REV C01



Sited in driveways / hard landscaped areas with recessed cover

Square recessed cover & frame filled with matching finish material

225 mm deep concrete plinth to support finish

Round Ductile Iron cover & frame secured with clips supplied

225 mm deep concrete plinth to support finish

Polypropylene Inspection Chamber

Well compacted bedding material used as backfill

CHAMBER CONSTRUCTION AS FOR PCC MANHOLES

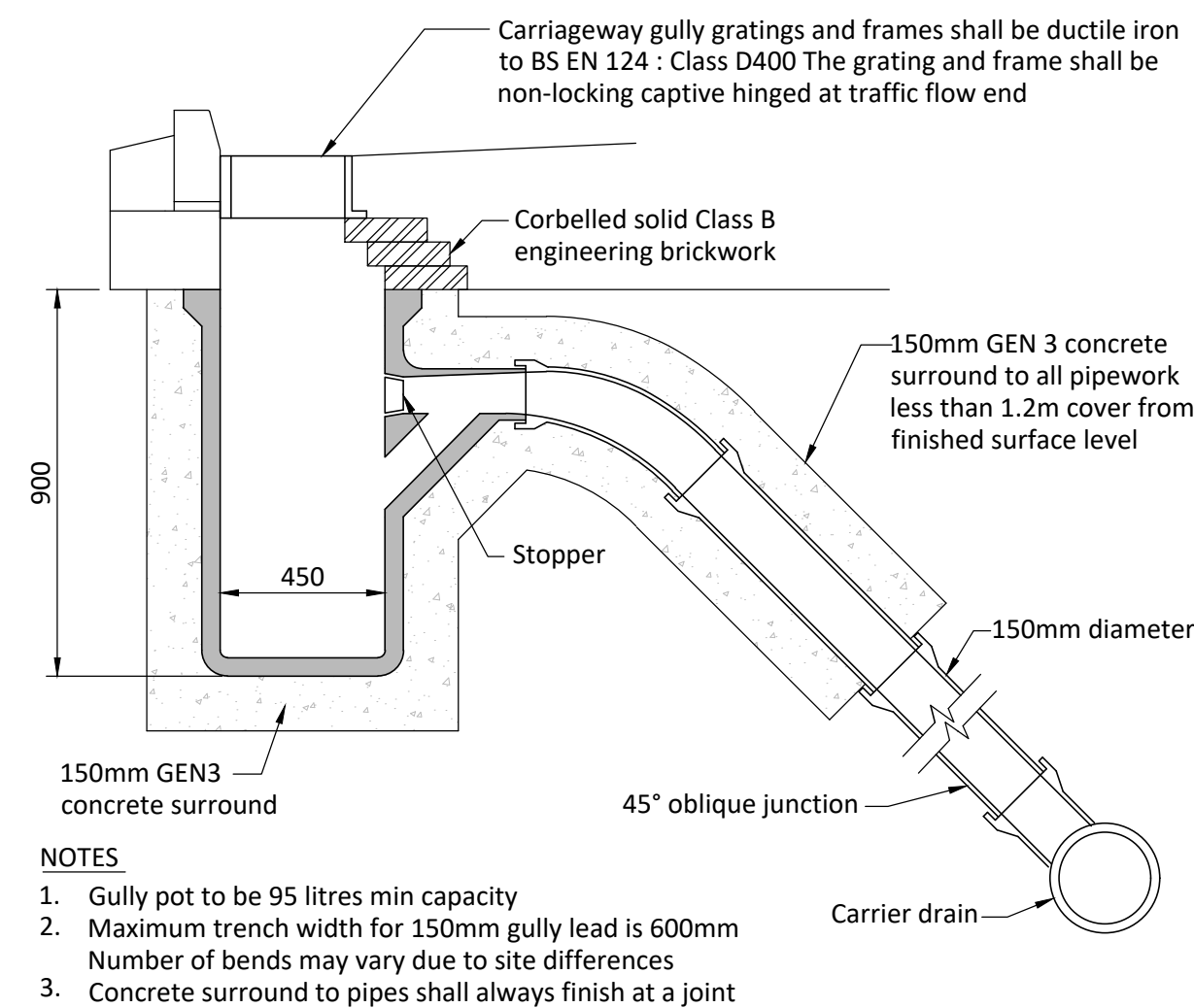
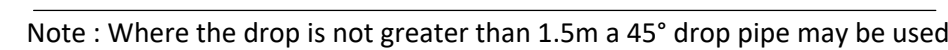
Square airtight cover & frame

Sited in concrete floor slab

Round Ductile Iron cover & frame secured with clips supplied

Topsoil

DEPTH FROM COVER LEVEL TO INVERT LEVEL < 1.2m
NB - Universal Product - Adaptor to pvc-u pipe included



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C01	19.02.2026	GL	Issued for Construction	RM
T01	26.06.2025	GL	Issued for Tender	RM
REV	DATE	BY	REVISION	CHK

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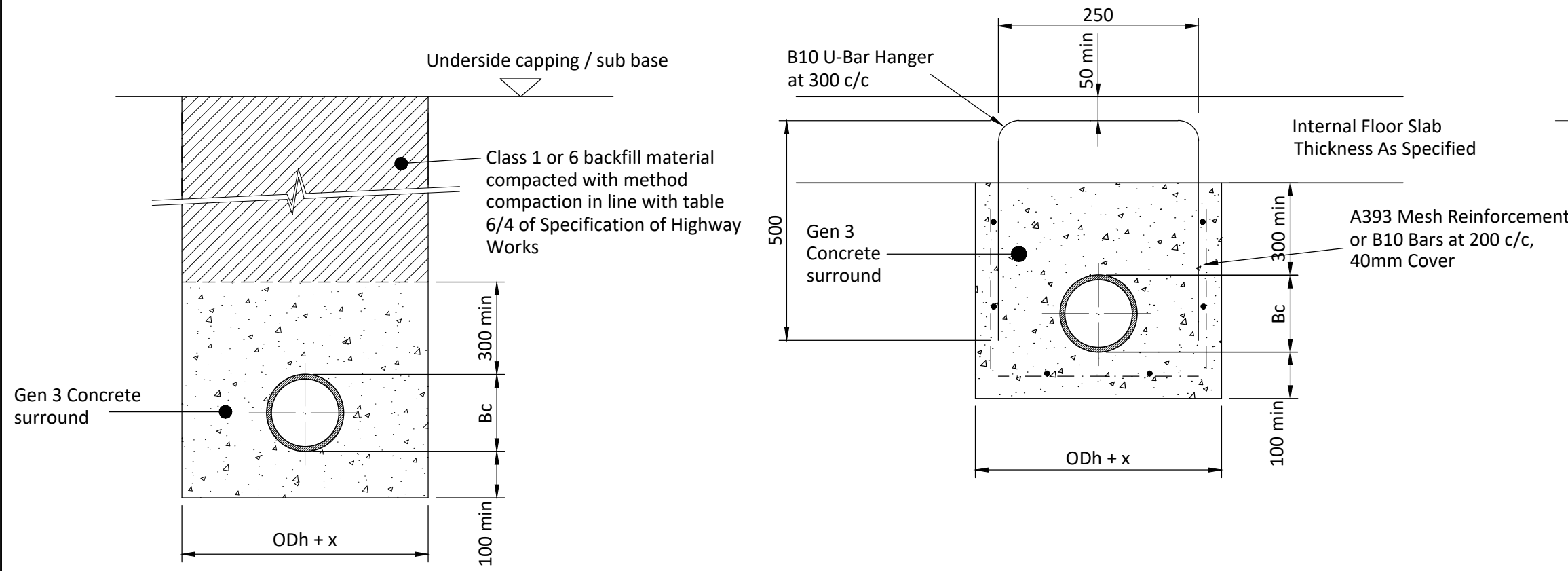
AVENUE ONE
LETCWORTH

DRAWING TITLE

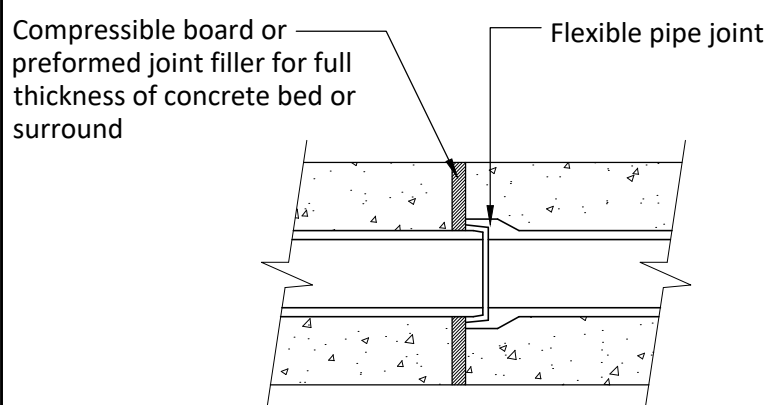
DRAINAGE AND EXTERNAL DETAILS

SHEET 2

OUR PROJECT NUMBER 40365	DRAWING STATUS CONSTRUCTION	OFFICE SOUTH	
SCALE @ A1 1:100	DATE 26.06.2025	DRAWN BY GL	CHECKED BY RM
DRAWING No 40365-BGL-XX-XX-DR-C-00222			REV C01



Class Z Bedding Detail



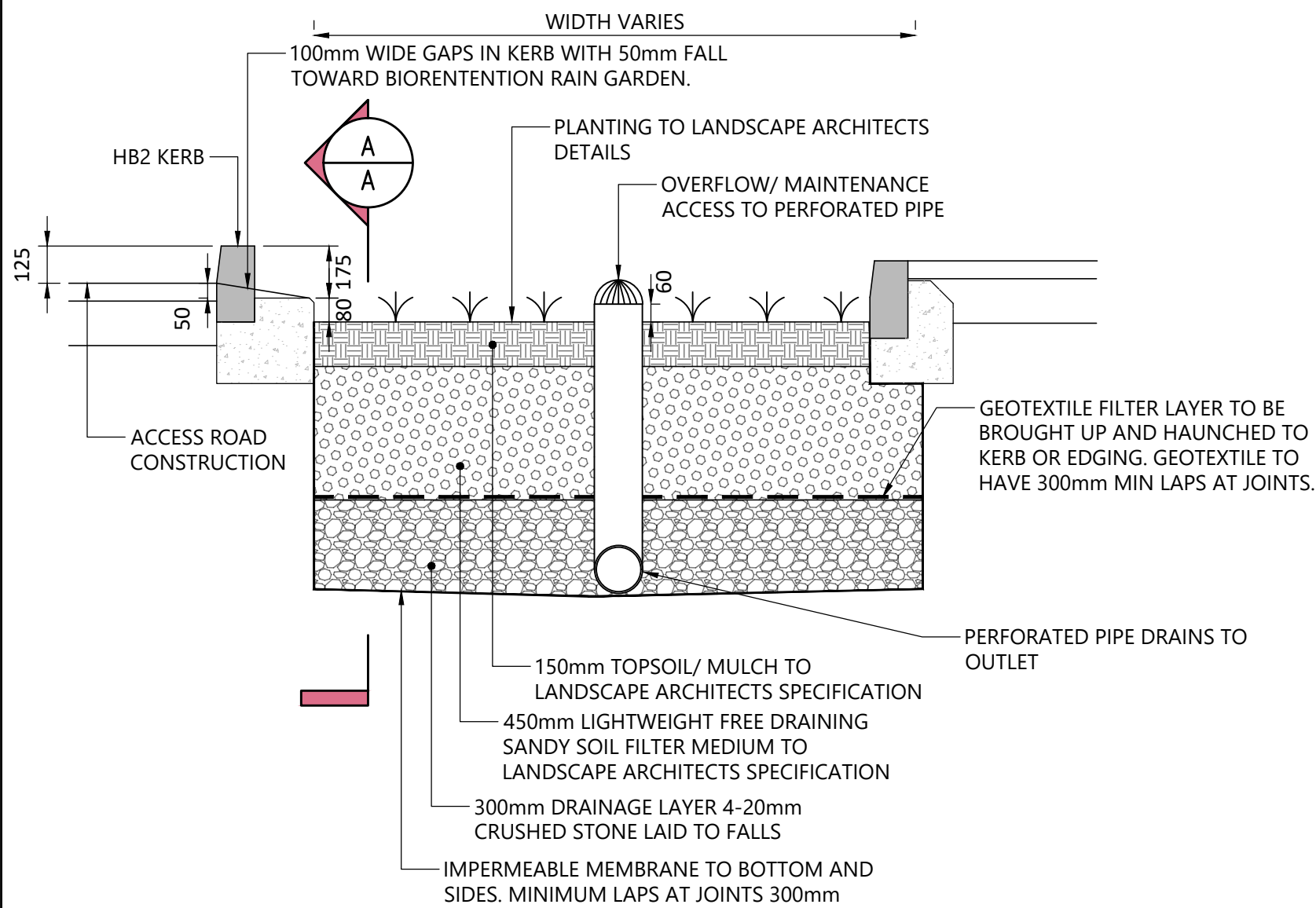
Joints for Concrete Surround to Pipes

(To occur at each pipe joint)

Pipe Ø (mm)	Joint thickness
< 450	18mm
450-1200	36mm
1200 >	54mm

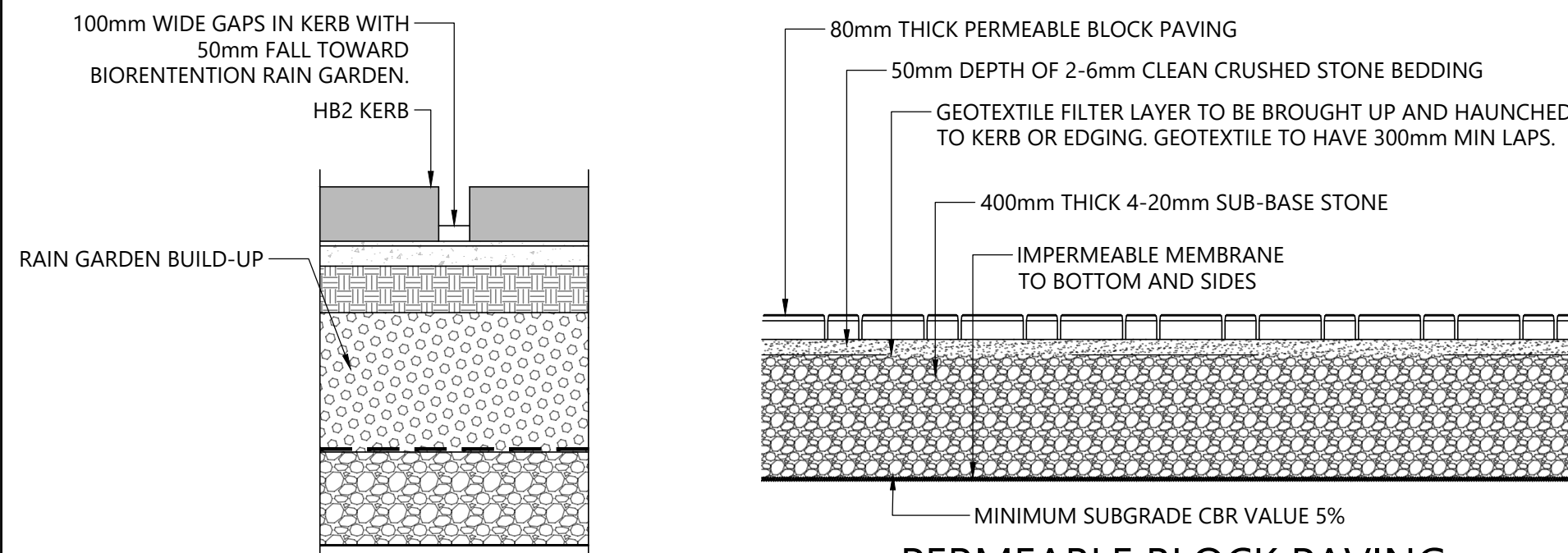
Compressible Filler Table

(Bitumen impregnated insulating board to BS 1142: Part 3)



RAIN GARDEN DETAIL

SCALE 1:20

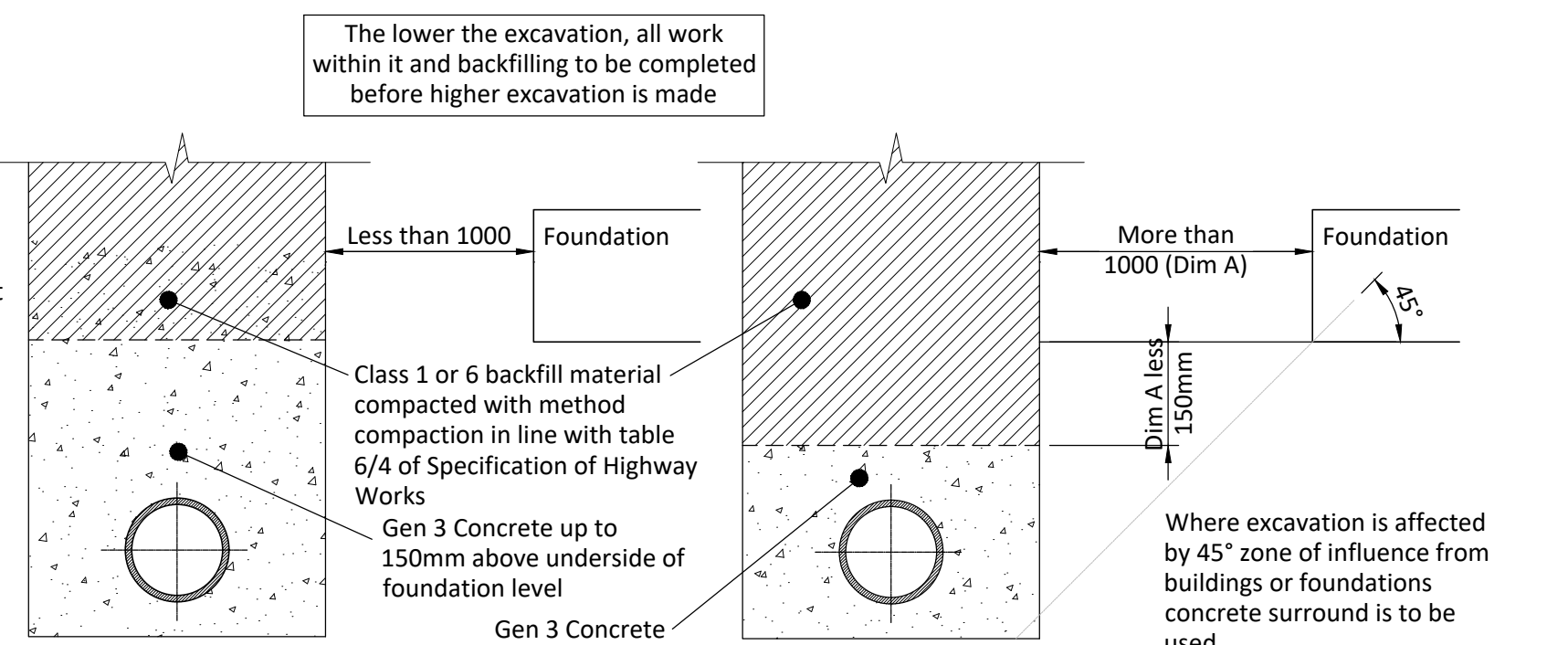


RAIN GARDEN SECTION A-A

SCALE 1:20

PERMEABLE BLOCK PAVING CONSTRUCTION (CAR PARK)

SCALE 1:20

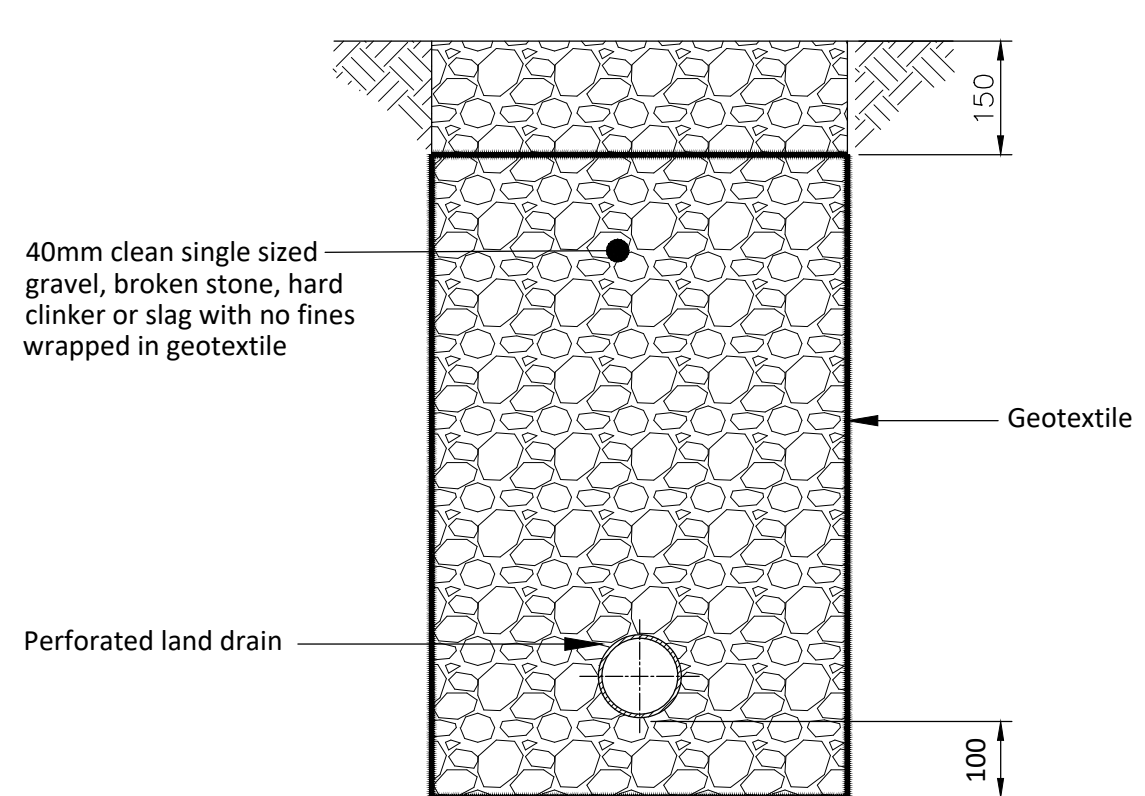


Detail indicating concrete backfilling to trenches in close proximity to building and foundations)

DN (mm)	Supported trench minimum width (OD _h + x) m	Unsupported trench minimum width (OD _h + x) m	
		β > 60°	β ≤ 60°
≤225	OD _h + 0.40	OD _h + 0.40	
>225 to ≤350	OD _h + 0.50	OD _h + 0.50	OD _h + 0.40
>350 to ≤700	OD _h + 0.70	OD _h + 0.70	OD _h + 0.40
>700 to ≤1200	OD _h + 0.85	OD _h + 0.85	OD _h + 0.40
>1200	OD _h + 1.00	OD _h + 1.00	OD _h + 0.40

NOTE:
In the values OD_h + x, x/2 equals the minimum working space between the pipe and the trench wall or the support if present.
Where OD_h is the horizontal outside diameter, in metres
β is the angle of unsupported trench side measured to the horizontal

Table 1 BS EN 1610 : 2015 - Minimum trench width depending on the nominal diameter (DN) of the pipe.



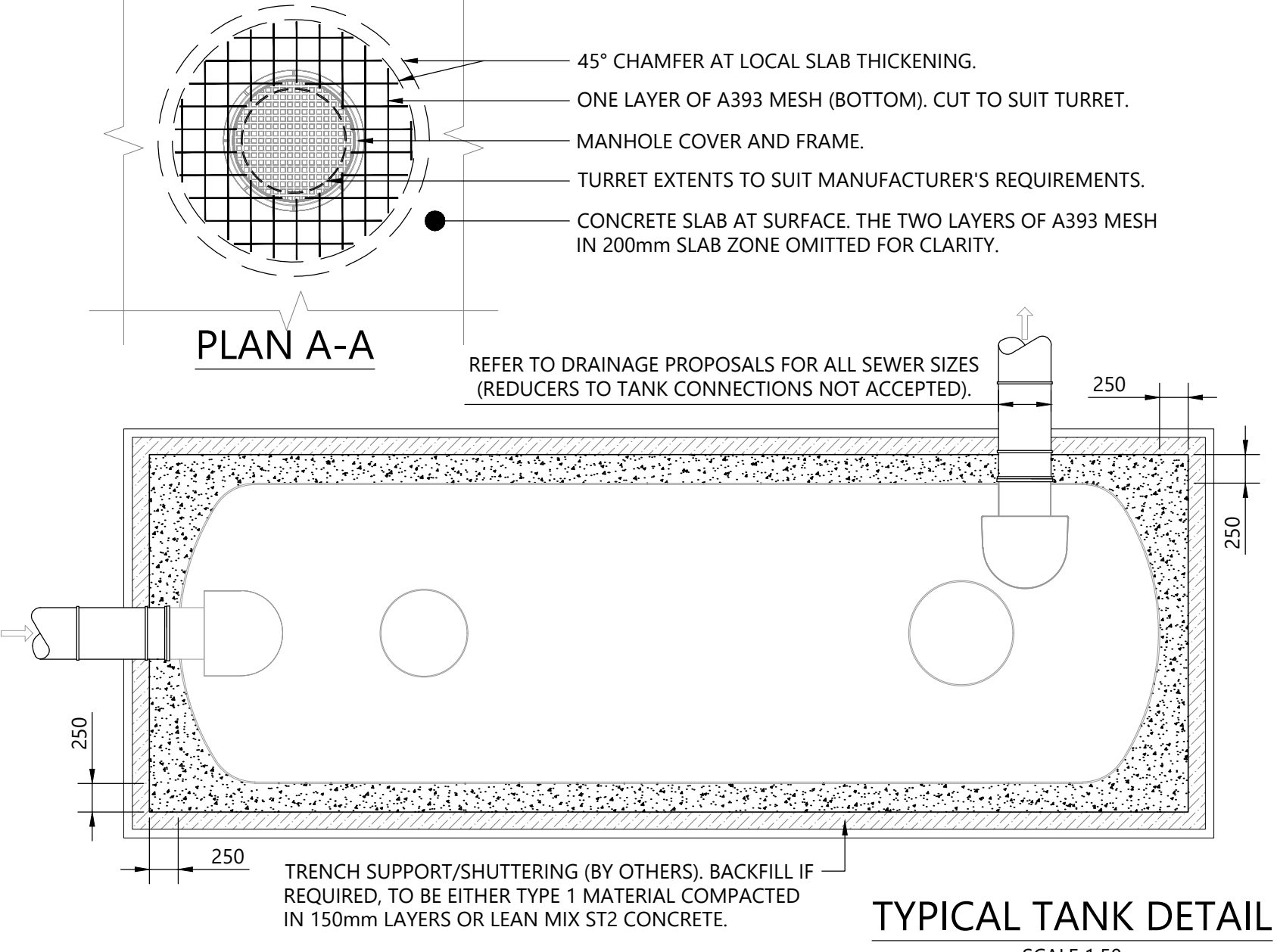
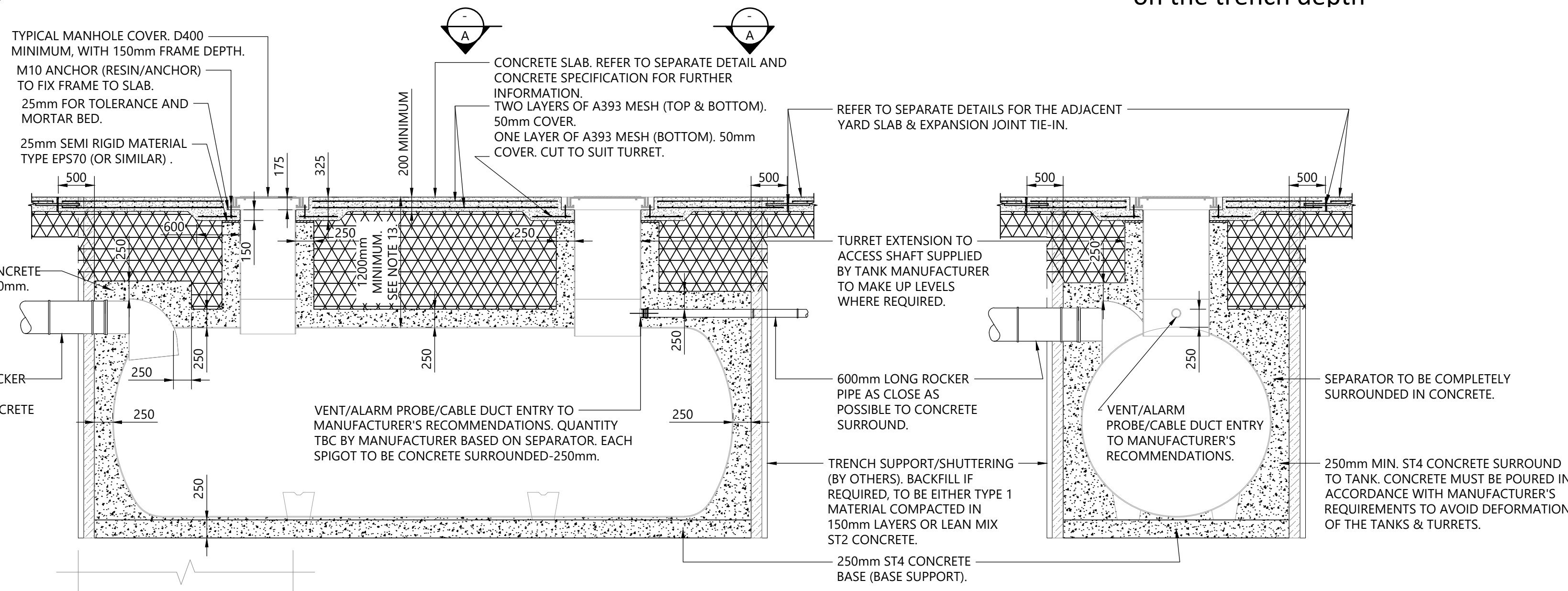
Filter Drain Detail

(Excavation and backfill material to be wrapped with Geotextile)

Trench Depth (m)	Minimum trench Width (m)
<1.00	No minimum width required
≥ 1.00 ≤ 1.75	<1.00
> 1.75 ≤ 4.00	<1.00
> 4.0	<1.00

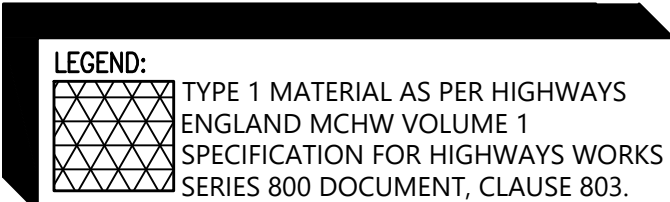
^a maximum depth of unsupported trench

Table 2 BS EN 1610 : 2015 Minimum trench width depending on the trench depth



TYPICAL TANK DETAIL

SCALE 1:50



- NOTES:
- THIS DETAIL IS TYPICAL FOR SEPARATORS (FULL RETENTION, BYPASS, FORECOURT), RAINWATER HARVESTING AND AMMONIA SPILLAGE TANKS.
 - THE PROPOSED TANK IS TO BE INSTALLED TO SUIT THE MANUFACTURER'S RECOMMENDATIONS & REQUIREMENTS.
 - AMMONIA SPILLAGE TANKS MAY REQUIRE A HIGHER GRADE OF SHELL. THE MANUFACTURER TO ADVISE.
 - WHERE TANK DEPTHS ARE LIKELY TO HAVE A COVER OF MORE THAN 2M, THE STRENGTH OF THE TANK IS TO BE TAKEN INTO CONSIDERATION. THE TANK MANUFACTURER IS TO BE CONSULTED FOR ADVICE ON THIS MATTER.
 - AS ITEM 4, THE STRENGTH OF THE TANK IS TO SUIT THE SITE CONDITIONS, INCLUSIVE OF GROUNDWATER TABLE LEVELS, CONTAMINATION AND THE LIKE.
 - THE BASE OF THE TANK IS TO BE SET ON A SUB-GRADE OF MINIMUM 2.5% CBR VALUE. IN THE EVENT THAT SOFT SPOTS ARE FOUND OR GROUND CONDITIONS ARE DEEMED TO BE POOR, ADVISE FROM A GEOTECHNICAL ENGINEER SHOULD BE SOUGHT, WITH BURROWS GRAHAM CONSULTED PRIOR TO UNILATERAL DECISIONS BEING MADE.
 - ORIENTATION OF INLET & OUTLET PIPEWORK IS TO SUIT THE SITE DRAINAGE LAYOUT. IN THE EVENT THAT THE PREFERRED MANUFACTURER DOES NOT OFFER THE REQUIRED CONNECTION ORIENTATION CONNECTION OPTION, ADDITIONAL MANHOLES MAY BE REQUIRED. BURROWS GRAHAM TO BE CONSULTED PRIOR TO UNILATERAL DECISIONS BEING MADE.
 - DESIGN OF THE M&E ASPECTS TO SERVE THE TANK IS BY OTHERS. COMMUNICATION CABLE, ELECTRICAL SUPPLY & KIOSKS ARE NORMAL REQUIREMENTS THAT ARE TO BE CONSIDERED.
 - AUTOMATIC WARNING DEVICES (ALARMS) ARE TO BE PROVIDED TO SEPARATORS TO SUIT BS EN 858 REQUIREMENTS, UNLESS THE LOCAL AUTHORITY CONFIRMS IN WRITING THAT THEY ARE NOT REQUIRED.
 - ITEMS SUCH AS THE AUTOMATIC WARNING DEVICES MAY REQUIRE CONNECTION TO THE SITE BUILDING MANAGEMENT SYSTEM (CLIENT TO ADVISE).
 - ACCESS TO THE TANKS SHOULD BE ALLOWED FOR IN ORDER THAT MAINTENANCE CAN BE UNDERTAKEN IN THE FUTURE.
 - VENTING TO TANKS TO BE PROVIDED TO SUIT THE MANUFACTURER'S REQUIREMENTS.
 - TANK BUOYANCY IS TO BE REVIEWED BY STRUCTURAL ENGINEER.
 - STRAPS TO TIE THE TANK DOWN MAY BE REQUIRED DURING INSTALLATION. THIS TEMPORARY WORKS ISSUE IS TO UNDERTAKEN BY THE CONTRACTOR.

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MAINTENANCE

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C01	19.01.26	GL	Issued for Construction	RM
T02	13.01.26	GL	Permeable Paving and Tank Detail Added	RM
T01	26.06.25	GL	Issued for Tender	RM
REV	DATE	BY	REVISION	CHKD

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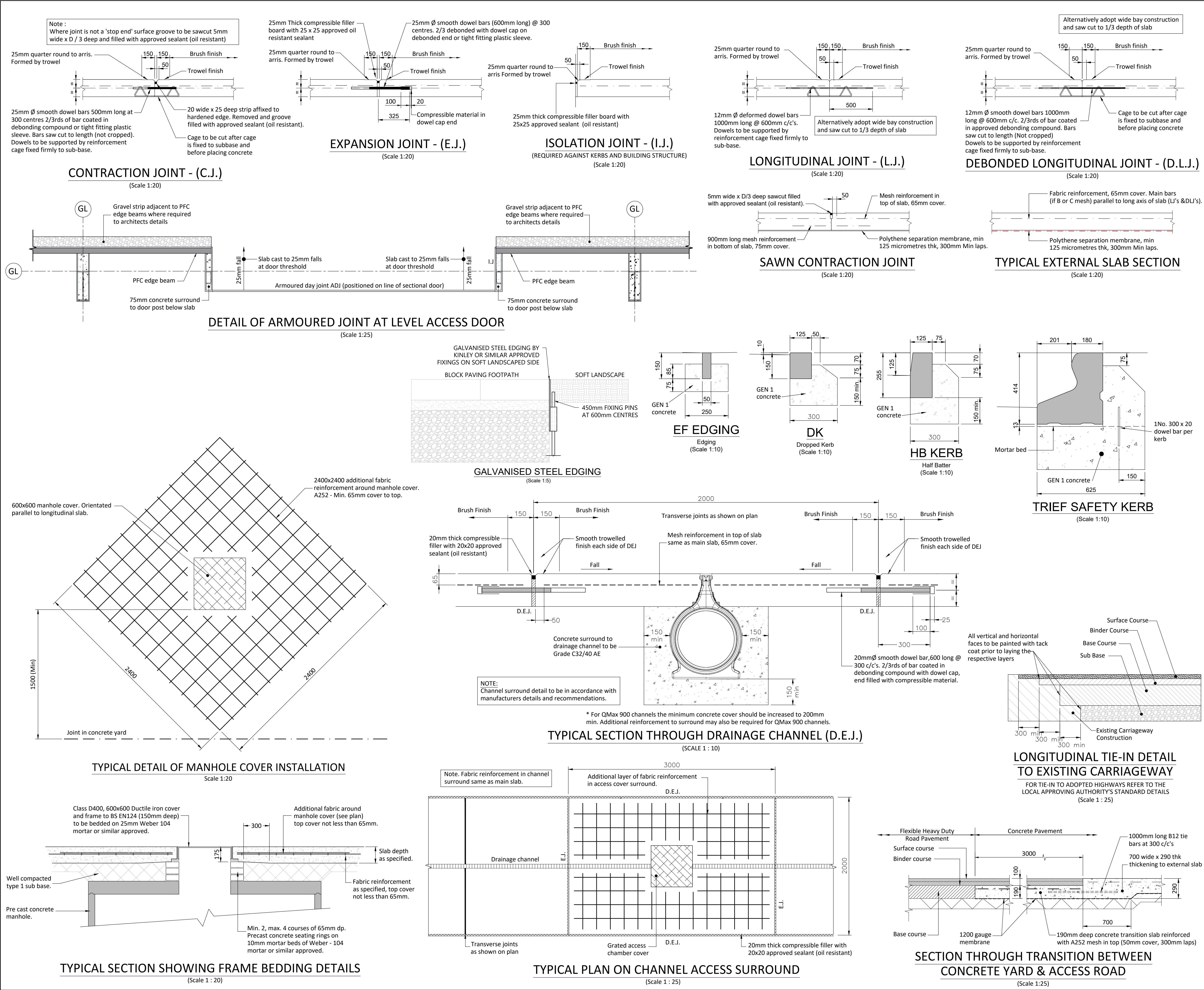
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DRAWING TITLE
DRAINAGE AND EXTERNAL DETAILS SHEET 3

OUR PROJECT NUMBER 40365	DRAWING STATUS CONSTRUCTION	OFFICE SOUTH
SCALE @ A1 1:100	DATE 26.06.2025	DRAWN BY GL CHECKED BY RM
DRAWING No 40365-BGL-XX-XX-DR-C-00223		REV C01



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C01	19.02.26	GL	Issued for Construction	RM
T02	12.08.25	GL	Steel Edging Added	RM
T01	26.06.25	GL	Issued for Tender	RM
REV	DATE	BY	REVISION	CHKD
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CLIENT WRENBRIDGE				
PROJECT AVENUE ONE LETCWORTH				
DRAWING TITLE DRAINAGE AND EXTERNAL DETAILS SHEET 4				
OUR PROJECT NUMBER 40365	DRAWING STATUS CONSTRUCTION	OFFICE SOUTH		
SCALE @ A1 AS NOTED	DATE 26.06.2025	DRAWN BY GL	CHECKED BY RM	
DRAWING No 40365-BGL-XX-XX-DR-C-00224	REV C01			

APPENDIX B – DRAINAGE CALCULATIONS

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	10	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	150.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
DC01	0.036	5.00	80.030	500	523328.204	232941.119	1.000
DC02	0.228	5.00	80.615	500	523336.294	232925.279	1.215
SWMH01			80.703	1500	523336.161	232921.532	1.873
PI01			80.703	1500	523325.505	232917.376	1.998
SWMH02			80.800	1500	523314.845	232913.231	2.120
SWMH04	0.343	5.00	81.289	1500	523274.069	232877.624	1.989
SWMH05			81.169	1800	523298.188	232906.980	2.679
DC03	0.019	5.00	80.380	500	523257.831	232930.338	1.100
DC04	0.202	5.00	80.965	500	523274.604	232934.723	1.005
SWMH06			81.088	1350	523278.222	232938.127	2.238
PI02			81.088	1350	523275.130	232946.514	2.368
SWMH07	0.000		81.088	1350	523271.634	232955.320	2.388
SWMH08			81.176	1500	523275.381	232967.632	2.816
SWMH09	0.296	5.00	81.515	1350	523244.384	232962.863	2.015
TANK01			80.970	1350	523253.782	232977.940	2.380
SWMH10	0.045	5.00	81.137	1350	523259.391	232980.873	2.557
SWMH11	0.487	5.00	81.215	1350	523275.951	232987.072	1.955
SWMH12			81.140	1800	523269.027	232984.439	2.820
Entrance Gulley	0.000	5.00	80.300	600	523172.234	232978.465	0.760
SWMH13	0.050	5.00	80.770	1500	523194.779	232980.549	1.820
SWMH14	0.050	5.00	81.071	1500	523229.191	232989.455	2.271
SWMH15			81.044	1800	523263.741	232998.422	2.754
TANK02			80.680	1500	523326.736	233025.540	2.490
SWMH16	0.100	5.00	80.673	450	523329.108	233033.903	1.073
SWMH17			80.716	1800	523336.914	233029.693	2.536
SWMH18	0.129	5.00	81.194	1500	523349.640	233010.248	1.954
SWMH19			80.785	1800	523343.931	233028.990	2.625
EXMH3052			80.050	1350	523350.768	233047.765	1.950

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	DC01	SWMH01	21.142	0.600	79.030	78.900	0.130	162.6	300	5.29	106.0
2.000	DC02	SWMH01	3.749	0.600	79.400	79.375	0.025	150.0	300	5.05	107.8
1.001	SWMH01	PI01	11.438	0.600	78.830	78.805	0.025	457.5	450	5.49	104.5
1.002	PI01	SWMH02	11.438	0.600	78.705	78.680	0.025	457.5	450	5.69	102.9
1.003	SWMH02	SWMH05	17.791	0.600	78.680	78.640	0.040	444.8	450	6.00	100.6
3.000	SWMH04	SWMH05	37.993	0.600	79.300	78.640	0.660	57.6	450	5.24	106.4
1.004	SWMH05	SWMH08	64.798	0.600	78.490	78.360	0.130	498.4	600	7.00	93.6
4.000	DC03	SWMH06	21.828	0.600	79.280	79.050	0.230	94.9	150	5.35	105.5
5.000	DC04	SWMH06	4.968	0.600	79.960	79.920	0.040	124.2	300	5.06	107.7
4.001	SWMH06	PI02	8.939	0.600	78.850	78.820	0.030	298.0	375	5.50	104.4
4.002	PI02	SWMH07	9.475	0.600	78.720	78.700	0.020	473.7	375	5.69	103.0
4.003	SWMH07	SWMH08	12.870	0.600	78.700	78.585	0.115	111.9	375	5.81	102.0
1.005	SWMH08	SWMH12	17.968	0.600	78.360	78.320	0.040	449.2	600	7.26	92.0
6.000	SWMH09	TANK01	17.766	0.600	79.500	79.400	0.100	177.7	450	5.19	106.7
6.001	TANK01	SWMH10	6.330	0.600	78.590	78.580	0.010	633.0	450	5.33	105.7
6.002	SWMH10	SWMH12	10.275	0.600	78.580	78.545	0.035	293.6	450	5.47	104.6
7.000	SWMH11	SWMH12	7.408	0.600	79.260	79.200	0.060	123.5	450	5.07	107.7
1.006	SWMH12	SWMH15	14.949	0.600	78.320	78.290	0.030	498.3	600	7.49	90.6
8.000	Entrance Gulley	SWMH13	22.641	0.600	79.540	79.250	0.290	78.1	150	5.33	105.7
8.001	SWMH13	SWMH14	35.546	0.600	78.950	78.800	0.150	237.0	450	5.78	102.2
8.002	SWMH14	SWMH15	35.695	0.600	78.800	78.440	0.360	99.2	450	6.07	100.1
1.007	SWMH15	TANK02	68.584	0.600	78.290	78.190	0.100	685.8	600	8.73	83.7
1.008	TANK02	SWMH17	10.993	0.600	78.190	78.180	0.010	1099.3	600	8.98	82.3
9.000	SWMH16	SWMH17	8.869	0.600	79.600	78.405	1.195	7.4	375	5.02	108.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	1.230	86.9	13.8	0.700	1.503	0.036	0.0
2.000	1.281	90.6	88.8	0.915	1.028	0.228	0.0
1.001	0.944	150.1	99.7	1.423	1.448	0.264	0.0
1.002	0.944	150.1	98.2	1.548	1.670	0.264	0.0
1.003	0.957	152.2	95.9	1.670	2.079	0.264	0.0
3.000	2.683	426.8	131.9	1.539	2.079	0.343	0.0
1.004	1.084	306.4	205.4	2.079	2.216	0.607	0.0
4.000	1.032	18.2	7.2	0.950	1.888	0.019	0.0
5.000	1.409	99.6	78.7	0.705	0.868	0.202	0.0
4.001	1.044	115.3	83.4	1.863	1.893	0.221	0.0
4.002	0.826	91.2	82.2	1.993	2.013	0.221	0.0
4.003	1.712	189.1	81.5	2.013	2.216	0.221	0.0
1.005	1.142	322.9	275.4	2.216	2.220	0.828	0.0
6.000	1.522	242.0	114.1	1.565	1.120	0.296	0.0
6.001	0.801	127.3	113.1	1.930	2.107	0.296	0.0
6.002	1.181	187.9	128.9	2.107	2.145	0.341	0.0
7.000	1.828	290.8	189.5	1.505	1.490	0.487	0.0
1.006	1.084	306.4	542.4	2.220	2.154	1.656	0.0
8.000	1.139	20.1	0.0	0.610	1.370	0.000	0.0
8.001	1.316	209.3	18.5	1.370	1.821	0.050	0.0
8.002	2.041	324.7	36.2	1.821	2.154	0.100	0.0
1.007	0.922	260.7	530.9	2.154	1.890	1.756	0.0
1.008	0.726	205.2	522.4	1.890	1.936	1.756	0.0
9.000	6.684	738.3	39.0	0.698	1.936	0.100	0.0

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.009	SWMH17	SWMH19	7.052	0.600	78.180	78.160	0.020	352.6	600	9.07	81.9
10.000	SWMH18	SWMH19	19.592	0.600	79.240	78.430	0.810	24.2	450	5.08	107.6
1.010	SWMH19	EXMH3052	19.981	0.600	78.160	78.100	0.060	333.0	375	9.41	80.3

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.009	1.291	365.0	549.3	1.936	2.025	1.856	0.0
10.000	4.147	659.5	50.2	1.504	1.905	0.129	0.0
1.010	0.987	109.0	576.2	2.250	1.575	1.985	0.0

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	21.142	162.6	300	Circular	80.030	79.030	0.700	80.703	78.900	1.503
2.000	3.749	150.0	300	Circular	80.615	79.400	0.915	80.703	79.375	1.028
1.001	11.438	457.5	450	Circular	80.703	78.830	1.423	80.703	78.805	1.448
1.002	11.438	457.5	450	Circular	80.703	78.705	1.548	80.800	78.680	1.670
1.003	17.791	444.8	450	Circular	80.800	78.680	1.670	81.169	78.640	2.079
3.000	37.993	57.6	450	Circular	81.289	79.300	1.539	81.169	78.640	2.079
1.004	64.798	498.4	600	Circular	81.169	78.490	2.079	81.176	78.360	2.216
4.000	21.828	94.9	150	Circular	80.380	79.280	0.950	81.088	79.050	1.888
5.000	4.968	124.2	300	Circular	80.965	79.960	0.705	81.088	79.920	0.868
4.001	8.939	298.0	375	Circular	81.088	78.850	1.863	81.088	78.820	1.893
4.002	9.475	473.7	375	Circular	81.088	78.720	1.993	81.088	78.700	2.013
4.003	12.870	111.9	375	Circular	81.088	78.700	2.013	81.176	78.585	2.216
1.005	17.968	449.2	600	Circular	81.176	78.360	2.216	81.140	78.320	2.220
6.000	17.766	177.7	450	Circular	81.515	79.500	1.565	80.970	79.400	1.120
6.001	6.330	633.0	450	Circular	80.970	78.590	1.930	81.137	78.580	2.107
6.002	10.275	293.6	450	Circular	81.137	78.580	2.107	81.140	78.545	2.145
7.000	7.408	123.5	450	Circular	81.215	79.260	1.505	81.140	79.200	1.490

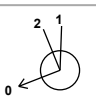
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	DC01	500	Manhole	Adoptable	SWMH01	1500	Manhole	Adoptable
2.000	DC02	500	Manhole	Adoptable	SWMH01	1500	Manhole	Adoptable
1.001	SWMH01	1500	Manhole	Adoptable	PI01	1500	Manhole	Adoptable
1.002	PI01	1500	Manhole	Adoptable	SWMH02	1500	Manhole	Adoptable
1.003	SWMH02	1500	Manhole	Adoptable	SWMH05	1800	Manhole	Adoptable
3.000	SWMH04	1500	Manhole	Adoptable	SWMH05	1800	Manhole	Adoptable
1.004	SWMH05	1800	Manhole	Adoptable	SWMH08	1500	Manhole	Adoptable
4.000	DC03	500	Manhole	Adoptable	SWMH06	1350	Manhole	Adoptable
5.000	DC04	500	Manhole	Adoptable	SWMH06	1350	Manhole	Adoptable
4.001	SWMH06	1350	Manhole	Adoptable	PI02	1350	Manhole	Adoptable
4.002	PI02	1350	Manhole	Adoptable	SWMH07	1350	Manhole	Adoptable
4.003	SWMH07	1350	Manhole	Adoptable	SWMH08	1500	Manhole	Adoptable
1.005	SWMH08	1500	Manhole	Adoptable	SWMH12	1800	Manhole	Adoptable
6.000	SWMH09	1350	Manhole	Adoptable	TANK01	1350	Manhole	Adoptable
6.001	TANK01	1350	Manhole	Adoptable	SWMH10	1350	Manhole	Adoptable
6.002	SWMH10	1350	Manhole	Adoptable	SWMH12	1800	Manhole	Adoptable
7.000	SWMH11	1350	Manhole	Adoptable	SWMH12	1800	Manhole	Adoptable

Pipeline Schedule

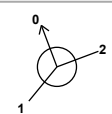
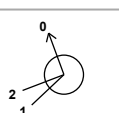
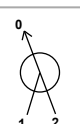
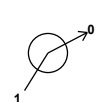
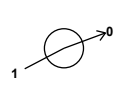
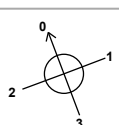
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.006	14.949	498.3	600	Circular	81.140	78.320	2.220	81.044	78.290	2.154
8.000	22.641	78.1	150	Circular	80.300	79.540	0.610	80.770	79.250	1.370
8.001	35.546	237.0	450	Circular	80.770	78.950	1.370	81.071	78.800	1.821
8.002	35.695	99.2	450	Circular	81.071	78.800	1.821	81.044	78.440	2.154
1.007	68.584	685.8	600	Circular	81.044	78.290	2.154	80.680	78.190	1.890
1.008	10.993	1099.3	600	Circular	80.680	78.190	1.890	80.716	78.180	1.936
9.000	8.869	7.4	375	Circular	80.673	79.600	0.698	80.716	78.405	1.936
1.009	7.052	352.6	600	Circular	80.716	78.180	1.936	80.785	78.160	2.025
10.000	19.592	24.2	450	Circular	81.194	79.240	1.504	80.785	78.430	1.905
1.010	19.981	333.0	375	Circular	80.785	78.160	2.250	80.050	78.100	1.575

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.006	SWMH12	1800	Manhole	Adoptable	SWMH15	1800	Manhole	Adoptable
8.000	Entrance Gully	600	Manhole	Adoptable	SWMH13	1500	Manhole	Adoptable
8.001	SWMH13	1500	Manhole	Adoptable	SWMH14	1500	Manhole	Adoptable
8.002	SWMH14	1500	Manhole	Adoptable	SWMH15	1800	Manhole	Adoptable
1.007	SWMH15	1800	Manhole	Adoptable	TANK02	1500	Manhole	Adoptable
1.008	TANK02	1500	Manhole	Adoptable	SWMH17	1800	Manhole	Adoptable
9.000	SWMH16	450	Manhole	Adoptable	SWMH17	1800	Manhole	Adoptable
1.009	SWMH17	1800	Manhole	Adoptable	SWMH19	1800	Manhole	Adoptable
10.000	SWMH18	1500	Manhole	Adoptable	SWMH19	1800	Manhole	Adoptable
1.010	SWMH19	1800	Manhole	Adoptable	EXMH3052	1350	Manhole	Adoptable

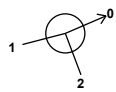
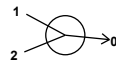
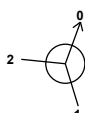
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
DC01	523328.204	232941.119	80.030	1.000	500		0	1.000	79.030 300
DC02	523336.294	232925.279	80.615	1.215	500		0	2.000	79.400 300
SWMH01	523336.161	232921.532	80.703	1.873	1500		1 2	2.000 1.000	79.375 300 78.900 300
PI01	523325.505	232917.376	80.703	1.998	1500		0	1.001	78.830 450
SWMH02	523314.845	232913.231	80.800	2.120	1500		0	1.002	78.705 450
SWMH04	523274.069	232877.624	81.289	1.989	1500		0	3.000	79.300 450

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
SWMH05	523298.188	232906.980	81.169	2.679	1800		1	3.000	78.640	450
						2	1.003	78.640	450	
						0	1.004	78.490	600	
DC03	523257.831	232930.338	80.380	1.100	500		0	4.000	79.280	150
DC04	523274.604	232934.723	80.965	1.005	500		0	5.000	79.960	300
SWMH06	523278.222	232938.127	81.088	2.238	1350		1	5.000	79.920	300
						2	4.000	79.050	150	
						0	4.001	78.850	375	
PI02	523275.130	232946.514	81.088	2.368	1350		1	4.001	78.820	375
						0	4.002	78.720	375	
SWMH07	523271.634	232955.320	81.088	2.388	1350		1	4.002	78.700	375
						0	4.003	78.700	375	
SWMH08	523275.381	232967.632	81.176	2.816	1500		1	4.003	78.585	375
						2	1.004	78.360	600	
						0	1.005	78.360	600	
SWMH09	523244.384	232962.863	81.515	2.015	1350		0	6.000	79.500	450
TANK01	523253.782	232977.940	80.970	2.380	1350		1	6.000	79.400	450
						0	6.001	78.590	450	
SWMH10	523259.391	232980.873	81.137	2.557	1350		1	6.001	78.580	450
						0	6.002	78.580	450	
SWMH11	523275.951	232987.072	81.215	1.955	1350		0	7.000	79.260	450
						1	7.000	79.200	450	
SWMH12	523269.027	232984.439	81.140	2.820	1800		2	6.002	78.545	450
						3	1.005	78.320	600	
						0	1.006	78.320	600	
						0	1.006	78.320	600	
Entrance Gulley	523172.234	232978.465	80.300	0.760	600		0	8.000	79.540	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SWMH13	523194.779	232980.549	80.770	1.820	1500		1 8.000	79.250	150
							0 8.001	78.950	450
SWMH14	523229.191	232989.455	81.071	2.271	1500		1 8.001	78.800	450
							0 8.002	78.800	450
SWMH15	523263.741	232998.422	81.044	2.754	1800		1 8.002 2 1.006	78.440 78.290	450 600
							0 1.007	78.290	600
TANK02	523326.736	233025.540	80.680	2.490	1500		1 1.007	78.190	600
							0 1.008	78.190	600
SWMH16	523329.108	233033.903	80.673	1.073	450		0 9.000	79.600	375
SWMH17	523336.914	233029.693	80.716	2.536	1800		1 9.000 2 1.008	78.405 78.180	375 600
							0 1.009	78.180	600
SWMH18	523349.640	233010.248	81.194	1.954	1500		0 10.000	79.240	450
SWMH19	523343.931	233028.990	80.785	2.625	1800		1 10.000 2 1.009	78.430 78.160	450 600
							0 1.010	78.160	375
EXMH3052	523350.768	233047.765	80.050	1.950	1350		1 1.010	78.100	375

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Starting Level (m)
Rainfall Events	Singular	Skip Steady State	✓	Check Discharge Rate(s) x
Summer CV	1.000	Drain Down Time (mins)	7200	Check Discharge Volume x
Winter CV	1.000	Additional Storage (m³/ha)	0.0	

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
2	0	0	0
30	0	0	0
30	35	0	0
100	40	0	0

Node SWMH19 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	78.160	Product Number	CTL-SHE-0105-6200-1800-6200
Design Depth (m)	1.800	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	6.2	Min Node Diameter (mm)	1200

Node TANK02 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	78.190
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	3045

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	645.0	0.0	1.600	645.0	0.0	1.601	0.0	0.0

Node TANK01 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	78.590
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	2250

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	514.0	0.0	1.200	514.0	0.0	1.201	0.0	0.0

Node SWMH10 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	80.550	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.450
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.33	Length (m)	22.500		

Node SWMH04 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	80.530	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.450
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.33	Length (m)	27.500		

Node SWMH16 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	80.020	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.450
Safety Factor	2.0	Width (m)	74.000	Inf Depth (m)	
Porosity	0.33	Length (m)	5.000		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	DC01	10	79.071	0.041	3.6	0.0081	0.0000	OK
15 minute summer	DC02	10	79.517	0.117	23.1	0.0229	0.0000	OK
15 minute summer	SWMH01	10	78.959	0.129	26.6	0.2282	0.0000	OK
15 minute summer	PI01	11	78.841	0.136	26.1	0.2407	0.0000	OK
15 minute summer	SWMH02	11	78.809	0.129	26.2	0.2277	0.0000	OK
15 minute summer	SWMH04	10	79.388	0.088	34.7	0.1549	0.0000	OK
15 minute summer	SWMH05	12	78.762	0.272	59.9	0.6919	0.0000	OK
15 minute summer	DC03	10	79.313	0.033	1.9	0.0064	0.0000	OK
15 minute summer	DC04	10	80.063	0.103	20.4	0.0202	0.0000	OK
15 minute summer	SWMH06	10	78.968	0.118	22.2	0.1687	0.0000	OK
15 minute summer	PI02	10	78.837	0.117	22.0	0.1672	0.0000	OK
15 minute summer	SWMH07	11	78.792	0.092	21.8	0.1311	0.0000	OK
15 minute summer	SWMH08	12	78.739	0.379	84.4	0.6704	0.0000	OK
15 minute summer	SWMH09	10	79.612	0.112	30.0	0.1598	0.0000	OK
360 minute summer	TANK01	216	78.648	0.058	9.4	28.3556	0.0000	OK
15 minute summer	SWMH10	12	78.720	0.140	14.5	0.2002	0.0000	OK
15 minute summer	SWMH11	10	79.401	0.141	49.3	0.2011	0.0000	OK
15 minute summer	SWMH12	12	78.722	0.402	129.2	1.0231	0.0000	OK
15 minute summer	Entrance Gulley	1	79.540	0.000	0.0	0.0000	0.0000	OK
15 minute summer	SWMH13	10	78.997	0.047	5.1	0.0834	0.0000	OK
15 minute summer	SWMH14	11	78.853	0.053	10.0	0.0937	0.0000	OK
15 minute summer	SWMH15	11	78.715	0.425	141.0	1.0811	0.0000	OK
600 minute summer	TANK02	495	78.577	0.387	31.8	237.9802	0.0000	OK
15 minute summer	SWMH16	10	79.632	0.032	10.1	0.0050	0.0000	OK
600 minute summer	SWMH17	495	78.577	0.397	5.5	1.0110	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	DC01	1.000	SWMH01	3.6	0.525	0.041	0.1649	
15 minute summer	DC02	2.000	SWMH01	23.0	0.991	0.254	0.0871	
15 minute summer	SWMH01	1.001	PI01	26.1	0.781	0.174	0.3850	
15 minute summer	PI01	1.002	SWMH02	26.2	0.680	0.175	0.4452	
15 minute summer	SWMH02	1.003	SWMH05	26.3	0.782	0.173	0.6274	
15 minute summer	SWMH04	3.000	SWMH05	34.1	1.612	0.080	1.0030	
15 minute summer	SWMH05	1.004	SWMH08	69.0	0.552	0.225	10.1035	
15 minute summer	DC03	4.000	SWMH06	1.8	0.661	0.101	0.0611	
15 minute summer	DC04	5.000	SWMH06	20.3	1.030	0.204	0.0981	
15 minute summer	SWMH06	4.001	PI02	22.0	0.799	0.190	0.2458	
15 minute summer	PI02	4.002	SWMH07	21.8	0.890	0.239	0.2370	
15 minute summer	SWMH07	4.003	SWMH08	22.6	1.103	0.119	0.3880	
15 minute summer	SWMH08	1.005	SWMH12	103.1	0.640	0.319	3.4901	
15 minute summer	SWMH09	6.000	TANK01	29.6	1.014	0.122	0.5194	
15 minute summer	TANK01	6.001	SWMH10	-17.4	-0.899	-0.136	0.1417	
15 minute summer	SWMH10	6.002	SWMH12	-10.9	0.437	-0.058	0.5128	
15 minute summer	SWMH11	7.000	SWMH12	49.0	1.269	0.169	0.2862	
15 minute summer	SWMH12	1.006	SWMH15	133.8	0.811	0.436	3.0774	
15 minute summer	Entrance Gulley	8.000	SWMH13	0.0	0.000	0.000	0.0000	
15 minute summer	SWMH13	8.001	SWMH14	4.9	0.523	0.024	0.3411	
15 minute summer	SWMH14	8.002	SWMH15	9.8	0.614	0.030	1.9960	
15 minute summer	SWMH15	1.007	TANK02	170.0	2.075	0.652	7.3646	
15 minute summer	TANK02	1.008	SWMH17	-27.0	-0.926	-0.131	0.5052	
15 minute summer	SWMH16	9.000	SWMH17	10.1	2.338	0.014	0.0382	
15 minute summer	SWMH17	1.009	SWMH19	-11.6	0.184	-0.032	0.6863	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH18	10	79.285	0.045	13.1	0.0786	0.0000	OK
600 minute summer	SWMH19	495	78.577	0.417	5.8	1.0618	0.0000	SURCHARGED
600 minute summer	EXMH3052	495	78.153	0.053	5.7	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH18	10.000	SWMH19	13.0	1.639	0.020	0.1550	
600 minute summer	SWMH19	1.010	EXMH3052	5.7	0.553	0.052	0.2060	401.8

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	DC01	10	79.083	0.053	6.0	0.0103	0.0000	OK
15 minute summer	DC02	10	79.556	0.156	38.3	0.0306	0.0000	OK
15 minute summer	SWMH01	10	78.998	0.168	44.1	0.2976	0.0000	OK
15 minute summer	PI01	12	78.899	0.194	43.5	0.3422	0.0000	OK
15 minute summer	SWMH02	12	78.879	0.199	43.0	0.3522	0.0000	OK
15 minute summer	SWMH04	10	79.411	0.111	57.6	0.1953	0.0000	OK
15 minute summer	SWMH05	11	78.863	0.373	99.5	0.9501	0.0000	OK
15 minute summer	DC03	10	79.323	0.043	3.2	0.0084	0.0000	OK
15 minute summer	DC04	10	80.098	0.138	33.9	0.0270	0.0000	OK
15 minute summer	SWMH06	10	79.006	0.156	36.9	0.2227	0.0000	OK
15 minute summer	PI02	11	78.875	0.155	36.6	0.2215	0.0000	OK
15 minute summer	SWMH07	11	78.827	0.127	36.5	0.1816	0.0000	OK
15 minute summer	SWMH08	11	78.831	0.471	153.8	0.8325	0.0000	OK
15 minute summer	SWMH09	10	79.647	0.147	49.7	0.2097	0.0000	OK
600 minute winter	TANK01	570	78.699	0.109	6.2	53.2536	0.0000	OK
15 minute summer	SWMH10	11	78.798	0.218	39.8	0.3113	0.0000	OK
15 minute summer	SWMH11	10	79.447	0.187	81.7	0.2673	0.0000	OK
15 minute summer	SWMH12	11	78.807	0.487	231.7	1.2399	0.0000	OK
15 minute summer	Entrance Gulley	1	79.540	0.000	0.0	0.0000	0.0000	OK
15 minute summer	SWMH13	10	79.010	0.060	8.4	0.1069	0.0000	OK
15 minute summer	SWMH14	11	78.868	0.068	16.6	0.1197	0.0000	OK
15 minute summer	SWMH15	10	78.782	0.492	225.3	1.2526	0.0000	OK
600 minute winter	TANK02	570	78.699	0.509	29.5	312.5703	0.0000	OK
15 minute summer	SWMH16	11	79.640	0.040	16.8	0.0063	0.0000	OK
600 minute winter	SWMH17	570	78.699	0.519	5.7	1.3199	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	DC01	1.000	SWMH01	6.0	0.525	0.068	0.3002	
15 minute summer	DC02	2.000	SWMH01	38.2	1.131	0.422	0.1265	
15 minute summer	SWMH01	1.001	PI01	43.5	0.897	0.290	0.5561	
15 minute summer	PI01	1.002	SWMH02	43.0	0.772	0.286	0.7603	
15 minute summer	SWMH02	1.003	SWMH05	43.8	0.814	0.288	1.2657	
15 minute summer	SWMH04	3.000	SWMH05	58.1	1.800	0.136	2.0442	
15 minute summer	SWMH05	1.004	SWMH08	119.1	0.632	0.389	13.6616	
15 minute summer	DC03	4.000	SWMH06	3.1	0.764	0.171	0.0890	
15 minute summer	DC04	5.000	SWMH06	33.8	1.174	0.339	0.1430	
15 minute summer	SWMH06	4.001	PI02	36.6	0.917	0.317	0.3565	
15 minute summer	PI02	4.002	SWMH07	36.5	1.021	0.401	0.3586	
15 minute summer	SWMH07	4.003	SWMH08	37.2	1.070	0.197	0.7043	
15 minute summer	SWMH08	1.005	SWMH12	165.8	0.797	0.514	4.3347	
15 minute summer	SWMH09	6.000	TANK01	49.1	1.160	0.203	0.7528	
15 minute summer	TANK01	6.001	SWMH10	-43.7	-1.225	-0.343	0.2568	
15 minute summer	SWMH10	6.002	SWMH12	-32.6	0.558	-0.173	0.8822	
15 minute summer	SWMH11	7.000	SWMH12	81.3	1.446	0.280	0.4171	
15 minute summer	SWMH12	1.006	SWMH15	210.4	0.998	0.687	3.6492	
15 minute summer	Entrance Gulley	8.000	SWMH13	0.0	0.000	0.000	0.0000	
15 minute summer	SWMH13	8.001	SWMH14	8.2	0.604	0.039	0.4864	
15 minute summer	SWMH14	8.002	SWMH15	16.3	0.647	0.050	2.5701	
15 minute summer	SWMH15	1.007	TANK02	251.9	2.309	0.966	8.5617	
15 minute summer	TANK02	1.008	SWMH17	-49.6	-1.162	-0.242	0.7489	
15 minute summer	SWMH16	9.000	SWMH17	16.8	2.672	0.023	0.0694	
15 minute summer	SWMH17	1.009	SWMH19	-21.9	-0.257	-0.060	0.9480	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH18	10	79.297	0.057	21.7	0.1008	0.0000	OK
600 minute winter	SWMH19	570	78.699	0.539	6.0	1.3708	0.0000	SURCHARGED
720 minute summer	EXMH3052	450	78.153	0.053	5.8	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH18	10.000	SWMH19	21.5	1.898	0.033	0.2221	
720 minute summer	SWMH19	1.010	EXMH3052	5.8	0.555	0.053	0.2076	565.3

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	DC01	10	79.514	0.484	16.6	0.0949	0.0000	SURCHARGED
15 minute summer	DC02	10	79.736	0.336	105.2	0.0659	0.0000	SURCHARGED
15 minute summer	SWMH01	10	79.448	0.618	130.8	1.0920	0.0000	SURCHARGED
15 minute summer	PI01	10	79.413	0.708	121.7	1.2513	0.0000	SURCHARGED
15 minute summer	SWMH02	10	79.394	0.714	121.6	1.2622	0.0000	SURCHARGED
15 minute summer	SWMH04	10	79.488	0.188	158.2	0.3330	0.0000	OK
15 minute summer	SWMH05	10	79.371	0.881	274.0	2.2411	0.0000	SURCHARGED
15 minute summer	DC03	11	79.417	0.137	8.8	0.0269	0.0000	OK
15 minute summer	DC04	10	80.239	0.279	93.2	0.0548	0.0000	OK
15 minute summer	SWMH06	10	79.349	0.499	100.2	0.7137	0.0000	SURCHARGED
15 minute summer	PI02	10	79.312	0.592	100.2	0.8478	0.0000	SURCHARGED
15 minute summer	SWMH07	10	79.276	0.576	101.4	0.8249	0.0000	SURCHARGED
15 minute summer	SWMH08	10	79.229	0.869	388.5	1.5361	0.0000	SURCHARGED
15 minute summer	SWMH09	10	79.765	0.265	136.5	0.3785	0.0000	OK
720 minute winter	TANK01	705	79.143	0.553	27.0	270.9651	0.0000	SURCHARGED
720 minute winter	SWMH10	705	79.143	0.563	17.4	0.8061	0.0000	SURCHARGED
15 minute summer	SWMH11	10	79.611	0.351	224.7	0.5027	0.0000	OK
720 minute winter	SWMH12	705	79.143	0.823	40.8	2.0953	0.0000	SURCHARGED
15 minute summer	Entrance Gulley	1	79.540	0.000	0.0	0.0000	0.0000	OK
720 minute winter	SWMH13	705	79.143	0.193	1.7	0.3416	0.0000	OK
720 minute winter	SWMH14	705	79.143	0.343	3.4	0.6066	0.0000	OK
720 minute winter	SWMH15	705	79.143	0.853	42.4	2.1716	0.0000	SURCHARGED
720 minute winter	TANK02	705	79.143	0.953	40.7	585.7975	0.0000	SURCHARGED
15 minute summer	SWMH16	10	79.669	0.069	46.2	0.0109	0.0000	OK
720 minute winter	SWMH17	705	79.143	0.963	5.7	2.4515	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	DC01	1.000	SWMH01	25.7	0.519	0.296	1.4888	
15 minute summer	DC02	2.000	SWMH01	105.1	1.506	1.160	0.2499	
15 minute summer	SWMH01	1.001	PI01	121.7	1.064	0.811	1.8123	
15 minute summer	PI01	1.002	SWMH02	121.6	0.869	0.810	1.8123	
15 minute summer	SWMH02	1.003	SWMH05	122.1	0.845	0.802	2.8189	
15 minute summer	SWMH04	3.000	SWMH05	155.4	1.915	0.364	4.2050	
15 minute summer	SWMH05	1.004	SWMH08	285.7	1.014	0.932	18.2521	
15 minute summer	DC03	4.000	SWMH06	9.7	0.899	0.531	0.3765	
15 minute summer	DC04	5.000	SWMH06	92.8	1.469	0.932	0.3106	
15 minute summer	SWMH06	4.001	PI02	100.2	1.107	0.869	0.9859	
15 minute summer	PI02	4.002	SWMH07	101.4	1.049	1.113	1.0451	
15 minute summer	SWMH07	4.003	SWMH08	102.8	1.134	0.544	1.4195	
15 minute summer	SWMH08	1.005	SWMH12	390.2	1.386	1.208	5.0612	
15 minute summer	SWMH09	6.000	TANK01	135.3	1.497	0.559	1.6058	
15 minute summer	TANK01	6.001	SWMH10	-234.4	-2.270	-1.841	0.6199	
15 minute summer	SWMH10	6.002	SWMH12	-212.4	-1.341	-1.131	1.6280	
15 minute summer	SWMH11	7.000	SWMH12	223.8	1.855	0.770	0.8904	
15 minute summer	SWMH12	1.006	SWMH15	395.0	1.402	1.289	4.2108	
15 minute summer	Entrance Gulley	8.000	SWMH13	0.0	0.000	0.000	0.0000	
15 minute summer	SWMH13	8.001	SWMH14	22.7	0.715	0.109	1.8360	
15 minute summer	SWMH14	8.002	SWMH15	61.9	0.685	0.191	4.2151	
15 minute summer	SWMH15	1.007	TANK02	462.8	2.300	1.775	14.6629	
15 minute summer	TANK02	1.008	SWMH17	-118.1	-1.545	-0.576	2.6715	
15 minute summer	SWMH16	9.000	SWMH17	46.1	3.564	0.062	0.3659	
15 minute summer	SWMH17	1.009	SWMH19	-58.9	-0.463	-0.161	1.7621	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH18	10	79.336	0.096	59.6	0.1691	0.0000	OK
720 minute winter	SWMH19	705	79.143	0.983	6.3	2.5024	0.0000	SURCHARGED
120 minute summer	EXMH3052	66	78.153	0.053	5.8	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH18	10.000	SWMH19	59.2	2.517	0.090	0.8327	
120 minute summer	SWMH19	1.010	EXMH3052	5.8	0.555	0.053	0.2076	780.2

Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	DC01	11	79.912	0.882	22.4	0.1729	0.0000	FLOOD RISK
15 minute summer	DC02	11	80.058	0.658	142.0	0.1290	0.0000	SURCHARGED
15 minute summer	SWMH01	11	79.904	1.074	158.5	1.8980	0.0000	SURCHARGED
15 minute summer	PI01	11	79.850	1.145	159.5	2.0239	0.0000	SURCHARGED
15 minute summer	SWMH02	11	79.795	1.115	160.2	1.9706	0.0000	SURCHARGED
15 minute summer	SWMH04	11	79.916	0.616	213.7	1.0889	0.0000	SURCHARGED
15 minute summer	SWMH05	11	79.722	1.232	367.0	3.1357	0.0000	SURCHARGED
15 minute summer	DC03	11	79.857	0.577	11.8	0.1130	0.0000	SURCHARGED
15 minute summer	DC04	10	80.349	0.389	125.8	0.0762	0.0000	SURCHARGED
15 minute summer	SWMH06	11	79.749	0.899	135.3	1.2860	0.0000	SURCHARGED
15 minute summer	PI02	11	79.672	0.952	132.5	1.3621	0.0000	SURCHARGED
15 minute summer	SWMH07	11	79.591	0.891	133.3	1.2754	0.0000	SURCHARGED
15 minute summer	SWMH08	11	79.494	1.134	502.4	2.0030	0.0000	SURCHARGED
15 minute summer	SWMH09	10	79.825	0.325	184.4	0.4651	0.0000	OK
720 minute winter	TANK01	720	79.476	0.886	33.9	433.8111	0.0000	SURCHARGED
720 minute winter	SWMH10	720	79.476	0.896	21.7	1.2819	0.0000	SURCHARGED
15 minute summer	SWMH11	10	79.768	0.508	303.4	0.7275	0.0000	SURCHARGED
720 minute winter	SWMH12	720	79.476	1.156	54.0	2.9416	0.0000	SURCHARGED
15 minute summer	Entrance Gulley	1	79.540	0.000	0.0	0.0000	0.0000	OK
720 minute winter	SWMH13	720	79.476	0.526	2.2	0.9290	0.0000	SURCHARGED
720 minute winter	SWMH14	720	79.476	0.676	4.4	1.1941	0.0000	SURCHARGED
720 minute winter	SWMH15	720	79.476	1.186	45.6	3.0179	0.0000	SURCHARGED
720 minute winter	TANK02	720	79.476	1.286	43.3	790.1826	0.0000	SURCHARGED
15 minute summer	SWMH16	10	79.681	0.081	62.3	0.0128	0.0000	OK
720 minute winter	SWMH17	720	79.476	1.296	5.7	3.2979	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	DC01	1.000	SWMH01	28.4	0.507	0.327	1.4888	
15 minute summer	DC02	2.000	SWMH01	137.4	1.952	1.518	0.2640	
15 minute summer	SWMH01	1.001	PI01	159.5	1.006	1.062	1.8123	
15 minute summer	PI01	1.002	SWMH02	160.2	1.011	1.067	1.8123	
15 minute summer	SWMH02	1.003	SWMH05	161.8	1.021	1.063	2.8189	
15 minute summer	SWMH04	3.000	SWMH05	214.2	1.857	0.502	6.0197	
15 minute summer	SWMH05	1.004	SWMH08	368.3	1.308	1.202	18.2521	
15 minute summer	DC03	4.000	SWMH06	13.1	0.857	0.720	0.3843	
15 minute summer	DC04	5.000	SWMH06	125.6	1.785	1.261	0.3400	
15 minute summer	SWMH06	4.001	PI02	132.5	1.202	1.149	0.9859	
15 minute summer	PI02	4.002	SWMH07	133.3	1.208	1.461	1.0451	
15 minute summer	SWMH07	4.003	SWMH08	134.1	1.216	0.709	1.4195	
15 minute summer	SWMH08	1.005	SWMH12	503.3	1.787	1.559	5.0612	
15 minute summer	SWMH09	6.000	TANK01	182.7	1.599	0.755	2.0289	
15 minute summer	TANK01	6.001	SWMH10	-348.6	-2.631	-2.738	0.8835	
15 minute summer	SWMH10	6.002	SWMH12	-320.7	-2.024	-1.707	1.6280	
15 minute summer	SWMH11	7.000	SWMH12	302.7	1.923	1.041	1.1192	
15 minute summer	SWMH12	1.006	SWMH15	484.5	1.720	1.581	4.2108	
15 minute summer	Entrance Gulley	8.000	SWMH13	0.0	0.000	0.000	0.0000	
15 minute summer	SWMH13	8.001	SWMH14	36.4	0.681	0.174	4.2686	
15 minute summer	SWMH14	8.002	SWMH15	85.1	0.772	0.262	5.4806	
15 minute summer	SWMH15	1.007	TANK02	548.3	2.539	2.103	18.2341	
15 minute summer	TANK02	1.008	SWMH17	-142.7	-1.719	-0.696	3.0955	
15 minute summer	SWMH16	9.000	SWMH17	62.2	3.847	0.084	0.4891	
15 minute summer	SWMH17	1.009	SWMH19	-75.5	-0.531	-0.207	1.9864	

Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	SWMH18	720	79.476	0.236	5.8	0.4166	0.0000	OK
720 minute winter	SWMH19	720	79.476	1.316	6.3	3.3487	0.0000	SURCHARGED
60 minute summer	EXMH3052	35	78.153	0.053	5.8	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH18	10.000	SWMH19	79.9	2.726	0.121	1.3387	
60 minute summer	SWMH19	1.010	EXMH3052	5.8	0.555	0.053	0.2076	832.1

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	DC01	660	80.030	1.000	12.9	0.1960	37.8094	FLOOD
15 minute summer	DC02	10	80.429	1.029	186.6	0.2017	0.0000	FLOOD RISK
15 minute summer	SWMH01	10	80.145	1.315	184.6	2.3241	0.0000	SURCHARGED
15 minute summer	PI01	10	80.119	1.414	149.4	2.4993	0.0000	SURCHARGED
15 minute summer	SWMH02	10	80.096	1.416	155.6	2.5018	0.0000	SURCHARGED
15 minute summer	SWMH04	10	80.428	1.128	280.7	1.9925	0.0000	SURCHARGED
15 minute summer	SWMH05	10	80.069	1.579	387.0	4.0198	0.0000	SURCHARGED
15 minute summer	DC03	11	80.380	1.100	15.6	0.2156	0.1350	FLOOD
15 minute summer	DC04	10	80.482	0.522	165.3	0.1023	0.0000	SURCHARGED
15 minute summer	SWMH06	11	80.242	1.392	173.4	1.9925	0.0000	SURCHARGED
15 minute summer	PI02	10	80.114	1.394	173.7	1.9943	0.0000	SURCHARGED
720 minute winter	SWMH07	660	80.042	1.342	12.0	1.9209	0.0000	SURCHARGED
720 minute winter	SWMH08	660	80.042	1.682	44.6	2.9718	0.0000	SURCHARGED
600 minute summer	SWMH09	600	80.042	0.542	29.0	0.7759	0.0000	SURCHARGED
600 minute summer	TANK01	600	80.042	1.452	78.9	588.2814	0.0000	SURCHARGED
720 minute winter	SWMH10	660	80.041	1.461	28.5	2.0911	0.0000	SURCHARGED
720 minute winter	SWMH11	660	80.041	0.781	28.0	1.1177	0.0000	SURCHARGED
720 minute winter	SWMH12	660	80.041	1.721	72.4	4.3803	0.0000	SURCHARGED
600 minute winter	Entrance Gully	570	80.049	0.509	0.5	0.1442	0.0000	FLOOD RISK
600 minute winter	SWMH13	570	80.045	1.095	3.3	1.9343	0.0000	SURCHARGED
720 minute winter	SWMH14	660	80.043	1.243	5.6	2.1957	0.0000	SURCHARGED
600 minute winter	SWMH15	570	80.041	1.751	57.6	4.4573	0.0000	SURCHARGED
600 minute winter	TANK02	570	80.045	1.855	66.7	983.9846	0.0000	SURCHARGED
720 minute winter	SWMH16	660	80.044	0.444	5.7	0.7983	0.0000	SURCHARGED
720 minute winter	SWMH17	660	80.045	1.865	7.9	4.7453	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	DC01	1.000	SWMH01	-72.9	-1.035	-0.838	1.4888	
15 minute summer	DC02	2.000	SWMH01	184.6	2.621	2.038	0.2640	
30 minute summer	SWMH01	1.001	PI01	168.6	1.166	1.124	1.8123	
30 minute summer	PI01	1.002	SWMH02	163.5	1.032	1.089	1.8123	
15 minute summer	SWMH02	1.003	SWMH05	170.8	1.078	1.122	2.8189	
15 minute summer	SWMH04	3.000	SWMH05	274.6	1.897	0.643	6.0197	
30 minute summer	SWMH05	1.004	SWMH08	406.2	1.442	1.326	18.2521	
15 minute summer	DC03	4.000	SWMH06	17.2	0.976	0.943	0.3843	
15 minute summer	DC04	5.000	SWMH06	161.6	2.296	1.623	0.3498	
15 minute summer	SWMH06	4.001	PI02	173.7	1.575	1.506	0.9859	
15 minute summer	PI02	4.002	SWMH07	175.4	1.591	1.924	1.0451	
15 minute summer	SWMH07	4.003	SWMH08	177.1	1.606	0.937	1.4195	
15 minute summer	SWMH08	1.005	SWMH12	567.2	2.014	1.756	5.0612	
15 minute summer	SWMH09	6.000	TANK01	240.2	1.672	0.992	2.5266	
15 minute summer	TANK01	6.001	SWMH10	-443.8	-3.315	-3.486	1.0029	
15 minute summer	SWMH10	6.002	SWMH12	-407.6	-2.573	-2.170	1.6280	
15 minute summer	SWMH11	7.000	SWMH12	397.6	2.509	1.367	1.1655	
15 minute summer	SWMH12	1.006	SWMH15	557.9	1.981	1.820	4.2108	
600 minute summer	Entrance Gully	8.000	SWMH13	-0.7	-0.042	-0.037	0.3986	
15 minute summer	SWMH13	8.001	SWMH14	50.3	0.698	0.240	5.6320	
15 minute summer	SWMH14	8.002	SWMH15	90.4	0.690	0.279	5.6556	
15 minute summer	SWMH15	1.007	TANK02	641.2	2.944	2.460	19.3186	
15 minute summer	TANK02	1.008	SWMH17	-180.7	-1.817	-0.880	3.0965	
15 minute summer	SWMH16	9.000	SWMH17	81.8	3.835	0.111	0.5018	
15 minute summer	SWMH17	1.009	SWMH19	-99.3	-0.605	-0.272	1.9864	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
600 minute winter	SWMH18	570	80.043	0.803	8.6	1.4197	0.0000	SURCHARGED
720 minute winter	SWMH19	660	80.044	1.884	7.4	4.7947	0.0000	SURCHARGED
720 minute winter	EXMH3052	660	78.155	0.055	6.2	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	SWMH18	10.000	SWMH19	105.0	2.923	0.159	1.5537	
720 minute winter	SWMH19	1.010	EXMH3052	6.2	0.568	0.057	0.2199	1922.4

APPENDIX C – MANUFACTURER INFORMATION

Technical Specification

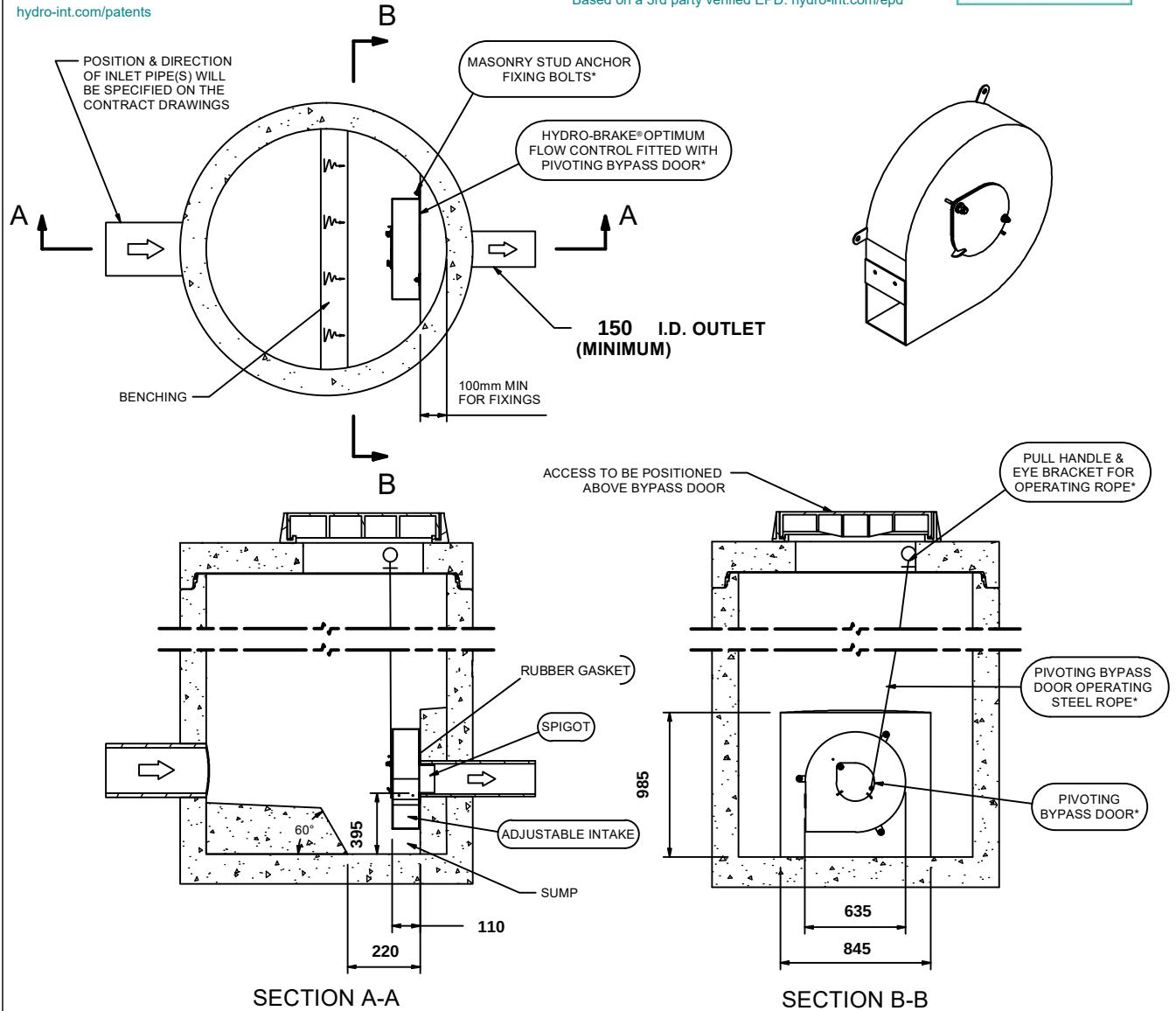
Control Point	Head (m)	Flow (l/s)
Primary Design	1.800	6.200
Flush-Flo™	0.460	5.741
Kick-Flo®	0.939	4.576
Mean Flow		5.183

hydro-int.com/patents

This Hydro-Brake® Optimum includes:

- All in 3 mm Grade 304L stainless steel
- Integral pivoting by-pass door allowing clear line of sight through to outlet, c/w operating rope
- Media blasted for corrosion resistance
- Variable flow rate post installation via adjustable inlet (if necessary)
- Indicative Weight: 25 kg
- Product Carbon Footprint: 93.43 kgCO2e

Based on a 3rd party verified EPD: hydro-int.com/epd



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

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

DESIGN ADVICE



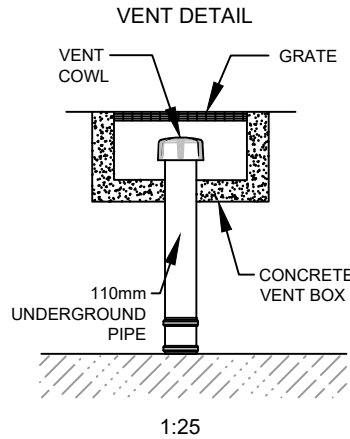
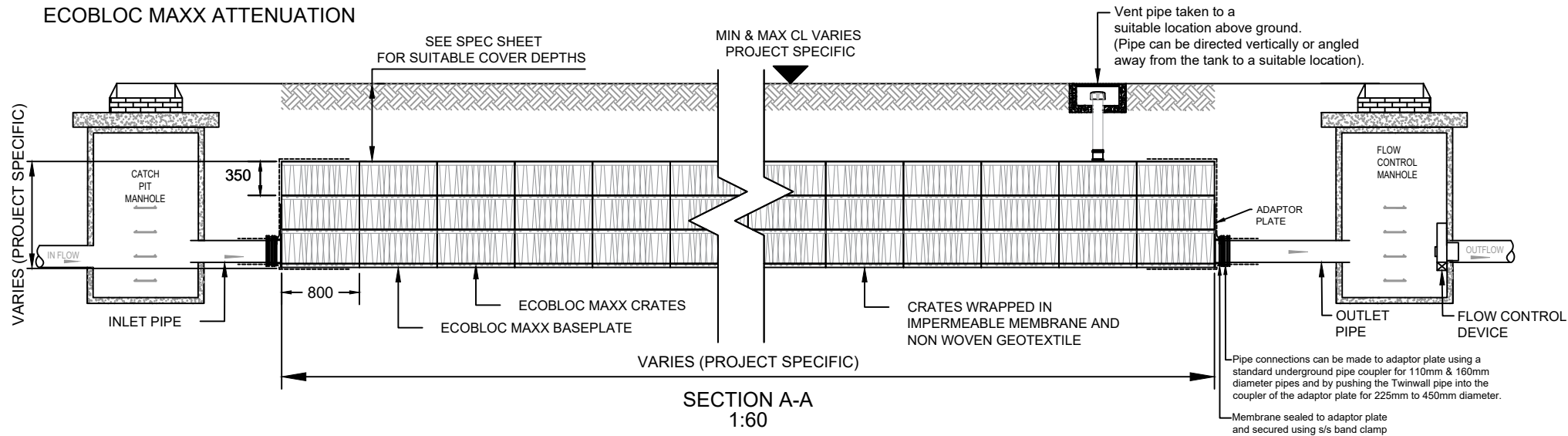
The head/flow characteristics of this SHE-0105-6200-1800-6200 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

**Hydro
International**
 A CRH COMPANY

DATE	19/02/2026 16:28
SITE	Letchworth
DESIGNER	George Leafe
REF	40365

SHE-0105-6200-1800-6200
 Hydro-Brake® Optimum

ECOBLOC MAXX ATTENUATION



NB. The attenuation tank must be vented to a suitable location above ground and it is recommended to have one Ø110mm vent pipe for every 7,500m² of impermeable catchment area.

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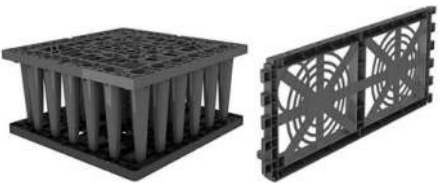
Notice: This drawing is issued only as a guideline and is an estimate of the materials required to construct the drainage system, it should not be used for construction purposes.

Graf UK Ltd makes no warranty or guarantee in relation to the suitability of any of the layout details shown on this drawing in relation to a particular scheme.

NOTES:-

1. All dimensions in mm, unless otherwise stated.
2. All dimensions are nominal and may vary within manufacturing tolerances.
3. All site temporary enabling works by others.
4. Graf products to be installed in strict accordance with Graf recommendations.
5. This drawing is intended for guidance only. Confirmation of the suitability for a particular project should be sought from the consulting engineers prior to final design or commencement of any construction works.

ECOBLOC MAXX



	Crate	Baseplate
Dimensions (mm)	800 x 800 x 350	800 x 800 x 40
Gross Volume (m ³)	0.225m ³	0.025m ³
Net Volume (m ³)	0.217m ³	0.020m ³
Material	Polypropylene	Polypropylene
Weight	9kg	4kg
Void Ratio	>96% depending on number of layers	
Inspectable	Yes, when combined with EcoBloc Flex	
*UCS Vertical	365 kN/m ²	
*UCS Lateral	99.6 kN/m ²	

*Ultimate Compression Strength



P3	REVISED NOTES	AP	21.09.22
P2	LATEST REVISION	AP	15.03.21
REV.	DESCRIPTION	BY	DATE



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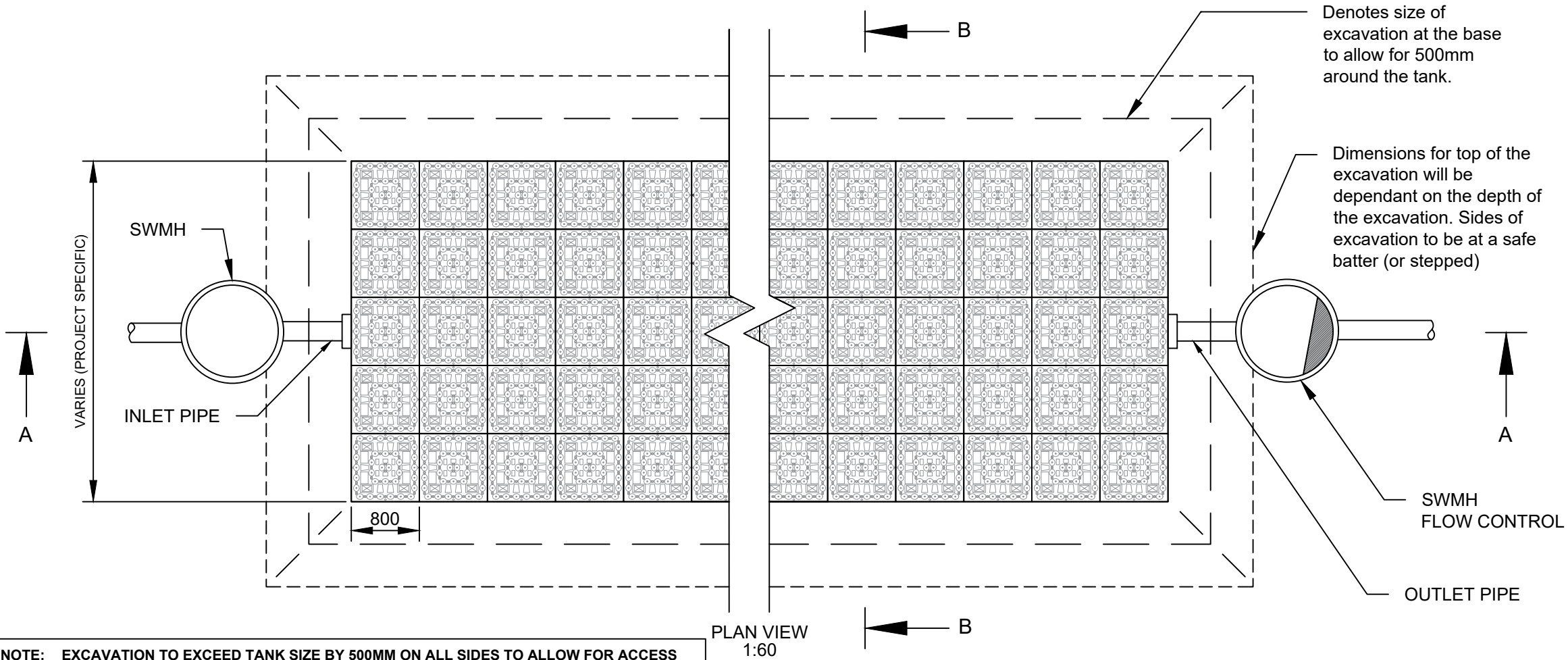
T: 01608 661500 F: 01295 211333
E: info@grafuk.co.uk www.grafuk.co.uk

DRAWN :	DB	DATE :	05.10.2018
CHECKED :	MC	SCALE :	VARIOUS@A3

PROJECT
GRAF STANDARD DETAILS

DESCRIPTION
**ATTENUATION TANK
using GRAF ECOBLOC MAXX**

DRAWING No.	REV.
STANDARD DETAIL.MAXX	P3 (Pg.1)

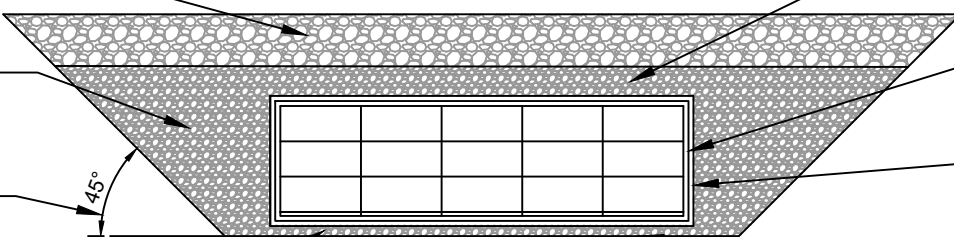


BACKFILL UP TO FINISHED GROUND LEVEL USING SUITABLE MATERIAL AS REQUIRED FOR FINISHED COVER.

8 TO 16mm SINGLE SIZED NON-ANGULAR STONE AROUND SIDES OF TANK TO BE COMPLETED PRIOR TO ANY FILL MATERIAL BEING PLACED ON TOP OF TANK

ANGLE TO SUIT SAFE EXCAVATION OR SURROUNDING GROUND AND DEPTH

BASE LAYER TO BE 8 TO 16mm SINGLE SIZED NON-ANGULAR STONE MIN DEPTH 50mm



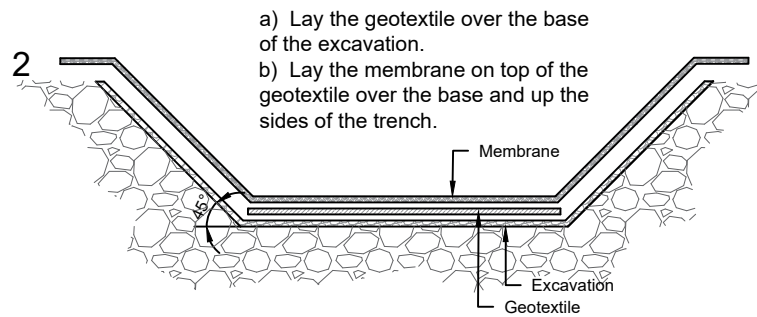
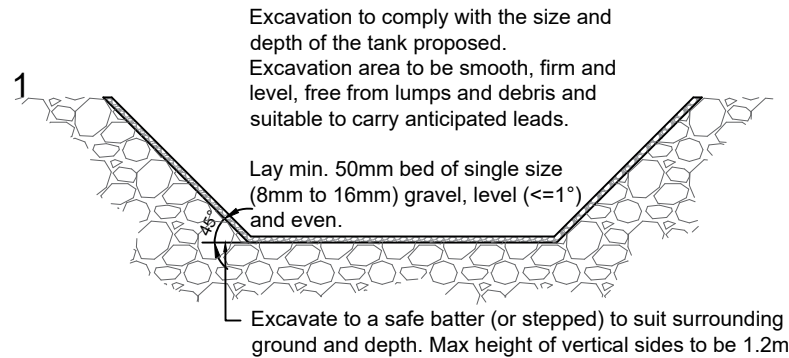
SECTION B-B
1:75

LAYER IMMEDIATELY ABOVE TANK TO BE 8 TO 16mm SINGLE SIZED NON-ANGULAR STONE MIN100mm BEFORE BACKFILLING AS PER FINISHED GROUND COVER

INNER LAYER TO BE 1MM THICK LLDPE IMPERMEABLE MEMBRANE (DENSITY = 0.939 g/cm³). SHEET WIDTHS OF 5.8M AND SUPPLIED IN ROLLS OR LENGTHS TO SUIT INSTALLATION. ALL JOINTS TO BE WEDGE WELDED TO FORM A WATERTIGHT SEAL.

OUTER LAYER TO BE 300g/m² (SNW40) NON-WOVEN GEOTEXTILE. INSTALLED WITH A MIN. OVERLAP OF 300mm

UNDISTURBED EARTH BASE OF EXCAVATION. EXCAVATED AREA TO BE SMOOTH, FIRM AND LEVEL, FREE FROM LUMPS AND DEBRIS AND SUITABLE TO CARRY ANTICIPATED LOADS WITH A MIN CBR VALUE OF 5%. SOFT SPOTS IN EXISTING MATERIAL BELOW BOTTOM OF EXCAVATION ARE TO BE DUG OUT AND THE RESULTANT VOIDS REPLACED WITH TYPE 1.



Geomembrane:
1mm Thick LLDPE Geomembrane
with a density of at least 0.939g/cm³

Geotextile:
300g/m² Non-woven,
needle punched geotextile

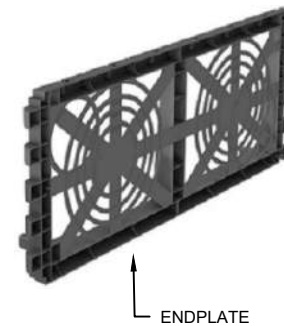
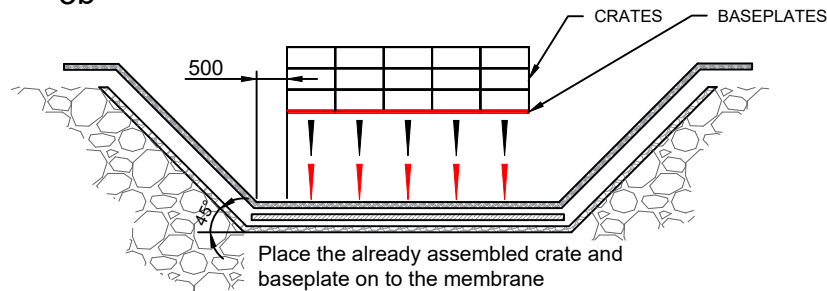
Geomembranes and Geotextiles with characteristics less than those specified are unlikely to be suitable and are therefore not recommended for use with Graf UK systems for this application

3a Assemble Baseplate and Ecobloc Maxx crate as shown below.

ECOBLOC MAXX CRATE

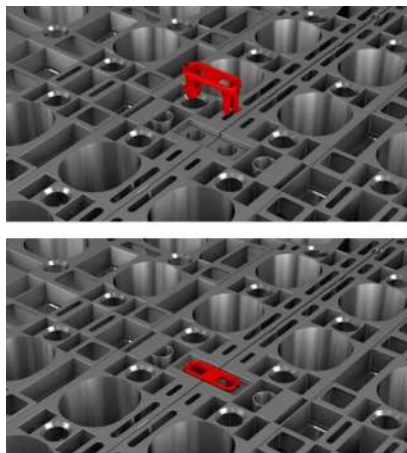


3b

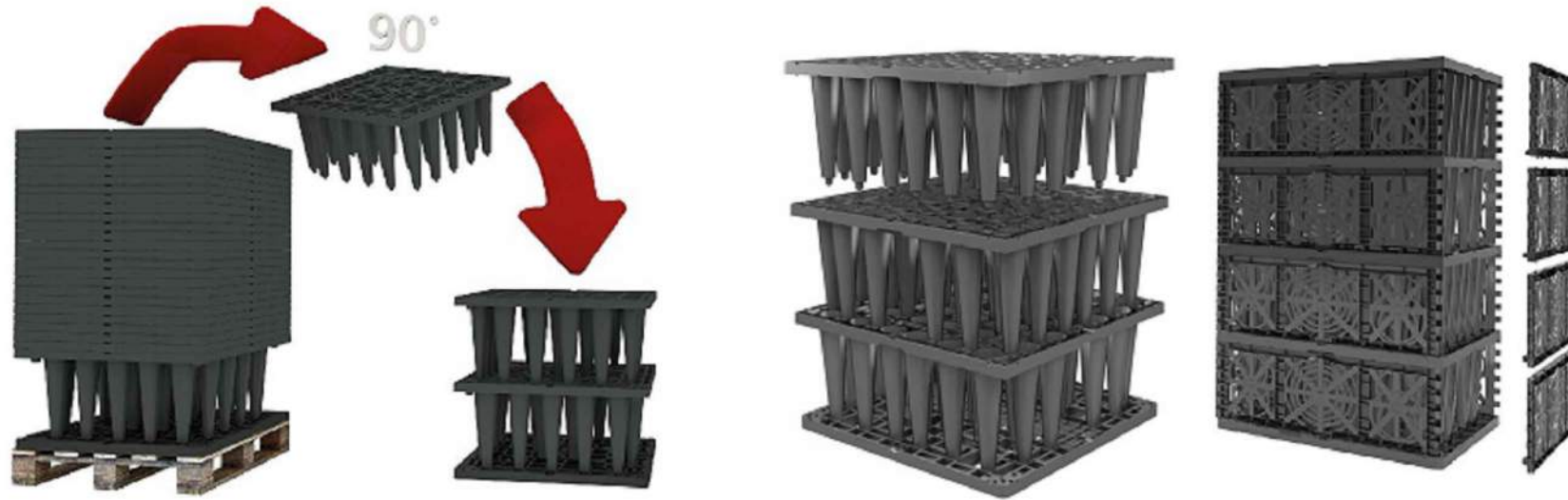


ENDPLATE

Remove a crate from the stack, rotate it 90° and place on top of the previously placed crate ensuring the connector clips are clipped locking the crates together.



Connector clips are Red for illustration purposes only and are Grey in colour



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DO NOT SCALE - IF IN DOUBT ASK

Notice: This drawing is issued only as a guideline and is an estimate of the materials required to construct the drainage system, it should not be used for construction purposes.

Graf UK Ltd makes no warranty or guarantee in relation to the suitability of any of the layout details shown on this drawing in relation to a particular scheme.

INSTALLATION METHOD:-

- a) Excavate the trench with a safe batter (or stepped) ensuring the footprint allows for sufficient space between tank and the sides. (minimum 500mm around all sides of the tank).
b) Mark out the position of the tank including inlets and outlets.
c) Lay min. 50mm of single sized non angular stone (8 to 16mm) as a base for the tank. This can be laid to a maximum fall of 1°.
- a) Lay the Geotextile over the base of the excavation, overlapping any joins by a minimum of 300mm
b) Lay the Membrane on top of the Geotextile over the base and up the sides of the trench.
c) Membrane must be joined by thermal fusion heated wedge welding. It is recommended that the Dual Seam method is used as this generates an unwelded channel which can be pressured with air to check the integrity of the weld.
d) The Membrane and Geotextile used must meet the specification stated on the drawing.
- a) Assemble EcoBloc Maxx Crate and Baseplate, position leg ends into corresponding holes in the Baseplate. The crate will only fit in the correct orientation. Push down firmly to ensure Crate is located correctly.
b) Install already assembled Crates and Baseplates onto the membrane until the first layer is complete. Insert retaining clips into each adjacent Crate.
c) To install the next layer of Crates remove from the stack and turn 90° and position directly above the Crate below. Push down firmly to ensure Crate is located correctly.
d) Continue until all Crates have been installed, ensuring clips are used to secure each Crate.
e) Fit Endplates to the sides of each Crate by positioning the bottom in place then pushing firmly on the top section to locate into place.
- a) Fix adaptor plates to the sides of the crates in the required position for the inlet and outlet pipes.
b) Cut a hole in the Geomembrane and pull up over the adaptor plate sealing the membrane around the spigot of the adaptor plate.
c) Pull Membrane up around the sides and fully wrap the crates, securing the lid in place by heated wedge welding to the side panels.
d) Cover the top and sides with Geotextile to protect the Geomembrane.
e) Install vent pipe connection into the top of the tank at a suitable location.
f) Backfill around the tank and for 100mm above with non-angular stone. Backfill to finished ground level with suitable material in layers.
g) Connect inlet/outlet pipes using appropriate bandseals.
h) In order to prevent silt from entering the tank it is recommended that silt traps or catchpit manholes are installed upstream of any inlet. These should be regularly maintained to avoid the buildup of any silt.

N.B. Installation method may vary depending on depth of the tank and is project specific. For more information or technical questions please contact our Technical Department at Graf UK.

P3	REVISED NOTES	AP	21.09.22
P2	LATEST REVISION	AP	15.03.21
REV.	DESCRIPTION	BY	DATE

GRAF GRAF UK Limited

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E: info@grafuk.co.uk www.grafuk.co.uk

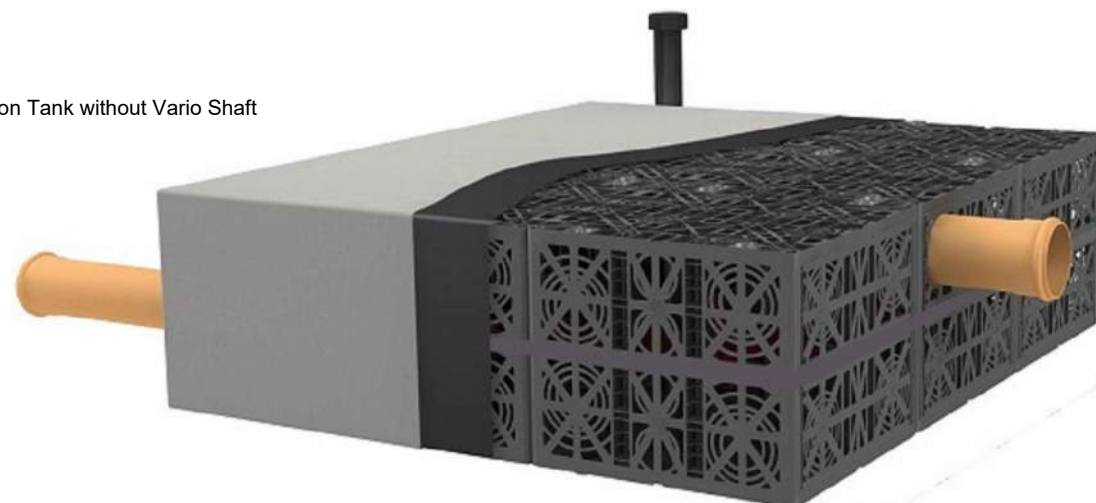
DRAWN :	DB	DATE :	05.10.2018
CHECKED :	MC	SCALE :	VARIOUS@A3

PROJECT
GRAF STANDARD DETAILS

DESCRIPTION
ATTENUATION TANK using GRAF ECOBLOC MAXX

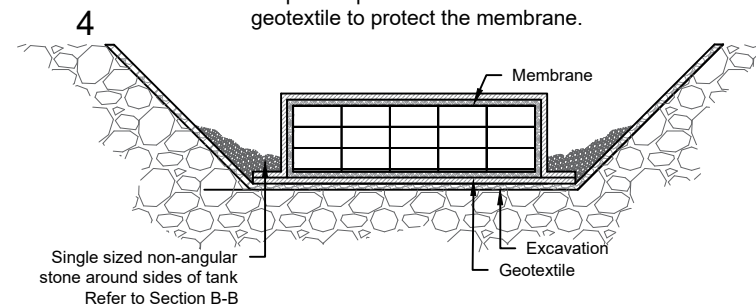
DRAWING No.	REV.
STANDARD DETAIL.MAXX	P3 (Pg.2)

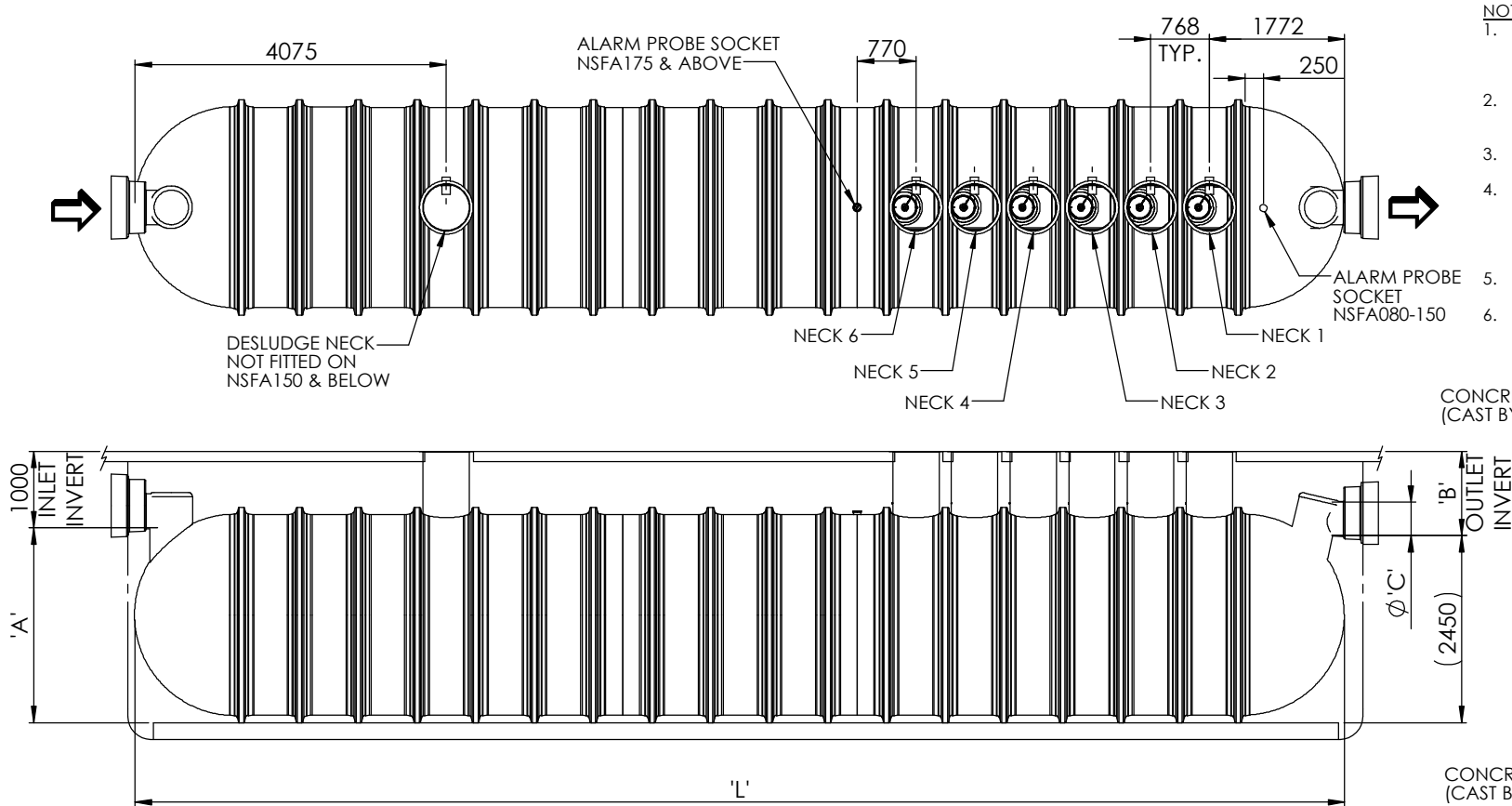
Attenuation Tank without Vario Shaft



Endplates are then clipped to the tank where required.

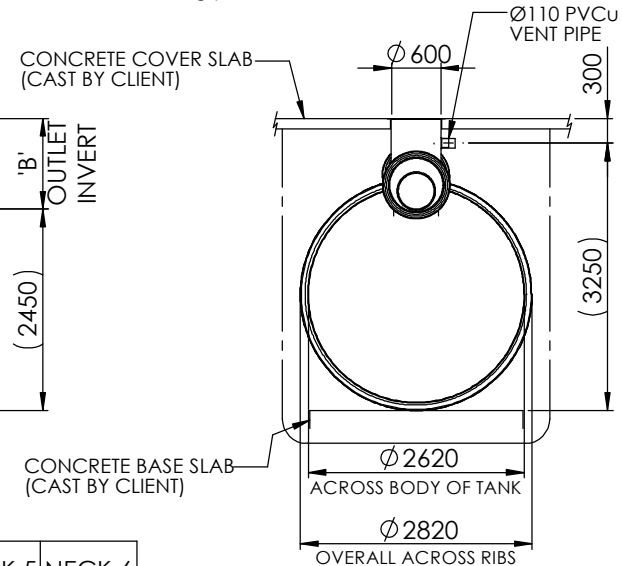
Wrap the crates with the Membrane ensuring it is heat welded/sealed then wrap the top and sides with the geotextile to protect the membrane.





NOTES

1. BS EN 858 STATES MINIMUM CONNECTION SIZES, UNITS ORDERED WITH DIFFERENT SIZE CONNECTIONS ARE NOT FULLY COMPLIANT WITH THE STANDARD. ALTERNATIVE CONNECTORS MAY BE ORDERED.
2. EXTENSION NECKS FOR DEEPER INVERTS CAN BE PROVIDED IN 0.5m INCREMENTS FOR ON SITE ASSEMBLY. MAX 2.0m INVERT RECOMMENDED.
3. ALL UNITS REQUIRE APPROPRIATE COVER & FRAME TO SUIT APPLIED LOADINGS.
4. THIS DRAWING SHOULD BE USED FOR DIMENSIONAL INFORMATION ONLY. IT IS ESSENTIAL THAT THIS DRAWING IS READ IN CONJUNCTION WITH INSTALLATION GUIDELINES SUPPLIED WITH THE UNIT (COPIES ARE AVAILABLE FROM OUR SALES DEPT.).
5. STANDARD PIPE ORIENTATION SHOWN. FOR OTHER AVAILABLE OPTIONS SEE TDS0033.
6. THIS DRAWING IS ALSO AVAILABLE ON OUR WEBSITE www.kingspanenv.com



UNIT REF.	UNIT CLASS	NOMINAL FLOW RATE (L/s)	APPROX. EMPTY WEIGHT (kg)	'L' OVERALL LENGTH	'A' BASE TO INLET INVERT	'B' OUTLET INVERT	'C' STD. PIPE DIA. (GRP)	NECK 1 FITTED	NECK 2 FITTED	NECK 3 FITTED	NECK 4 FITTED	NECK 5 FITTED	NECK 6 FITTED
NSFA080	1	80	1250	5744	2500	1050	300	✓	✓				
NSFA100	1	100	1350	6200	2500	1050	375/400	✓	✓				
NSFA125	1	125	1700	7365	2500	1050	450	✓	✓	✓			
NSFA150	1	150	2000	8675	2550	1100	500/525	✓	✓	✓			
NSFA175	1	175	2400	9975	2550	1100	500/525	✓	✓	✓	✓		
NSFA200	1	200	2700	11280	2550	1100	600	✓	✓	✓	✓		
NSFA210	1	210	2900	11994	2550	1100	600	✓	✓	✓	✓	✓	
NSFA225	1	225	3100	12766	2550	1100	600	✓	✓	✓	✓	✓	
NSFA240	1	240	3300	13582	2550	1100	600	✓	✓	✓	✓	✓	
NSFA255	1	255	3450	14300	2550	1100	600	✓	✓	✓	✓	✓	✓
NSFA270	1	270	3600	15071	2550	1100	600	✓	✓	✓	✓	✓	✓
NSFA285	1	285	3800	15833	2550	1100	600	✓	✓	✓	✓	✓	✓

Please check with Kingspan Environmental For The Latest Issue Of This Drawing			
Issue	Date	Drawn by	Description
04	11.03.19	T.Kelly	CC1444 - Units now built to 1.0m Invert First Fix
03	03.04.18	T.Kelly	CC1425 - Units 210 to 285 Added : Class 2 Reference Deleted

Material : n/a	Tolerance : n/a
Finish : n/a	Thickness : n/a
Weight : n/a	Surface Area : n/a

Drawing : DS0896P

Page 1 of 1

NSFA080 - NSFA285 Full Retention Separators

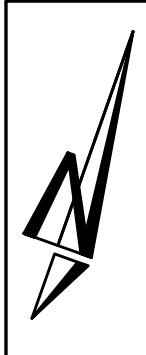
All dimensions in mm

Scale: Not to scale

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APPENDIX D – EXCEEDANCE FLOW PATH



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SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION			
IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:			
CONSTRUCTION			
MAINTENANCE			
DEMOLITION			
IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT			

- GENERAL NOTES:
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL THE RELEVANT ARCHITECTS' ENGINEERS' AND SERVICE ENGINEERS DRAWINGS & SPECIFICATIONS.
 - BASED ON TERRAIN SURVEYS TOPO SURVEY TS25-T3-T1-3D AND CMP ARCHITECTS LAYOUT U560-CMP-SI-ZZ-DR-A-00100 - SITE PLAN.

LEGEND:	SITE BOUNDARY
	EXCEEDANCE FLOW ROUTE

P01	13.01.26	GL	Issued for Information	RM
REV	DATE	BY	DESCRIPTION	CHKD

Burrows Graham

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CLIENT
Wrenbrigde

PROJECT
Letchworth, Ave One

DRAWING TITLE
EXCEEDANCE FLOW PATH

BGL PROJECT NUMBER	DRAWING STATUS	OFFICE
40365	INFORMATION	SOUTH
SCALE @ A0	DATE	DRAWN BY
1:250	13.01.2026	GL
DRAWING No	CHECKED BY	REV
40365-BGL-XX-XX-DR-C-00203	RM	P01

