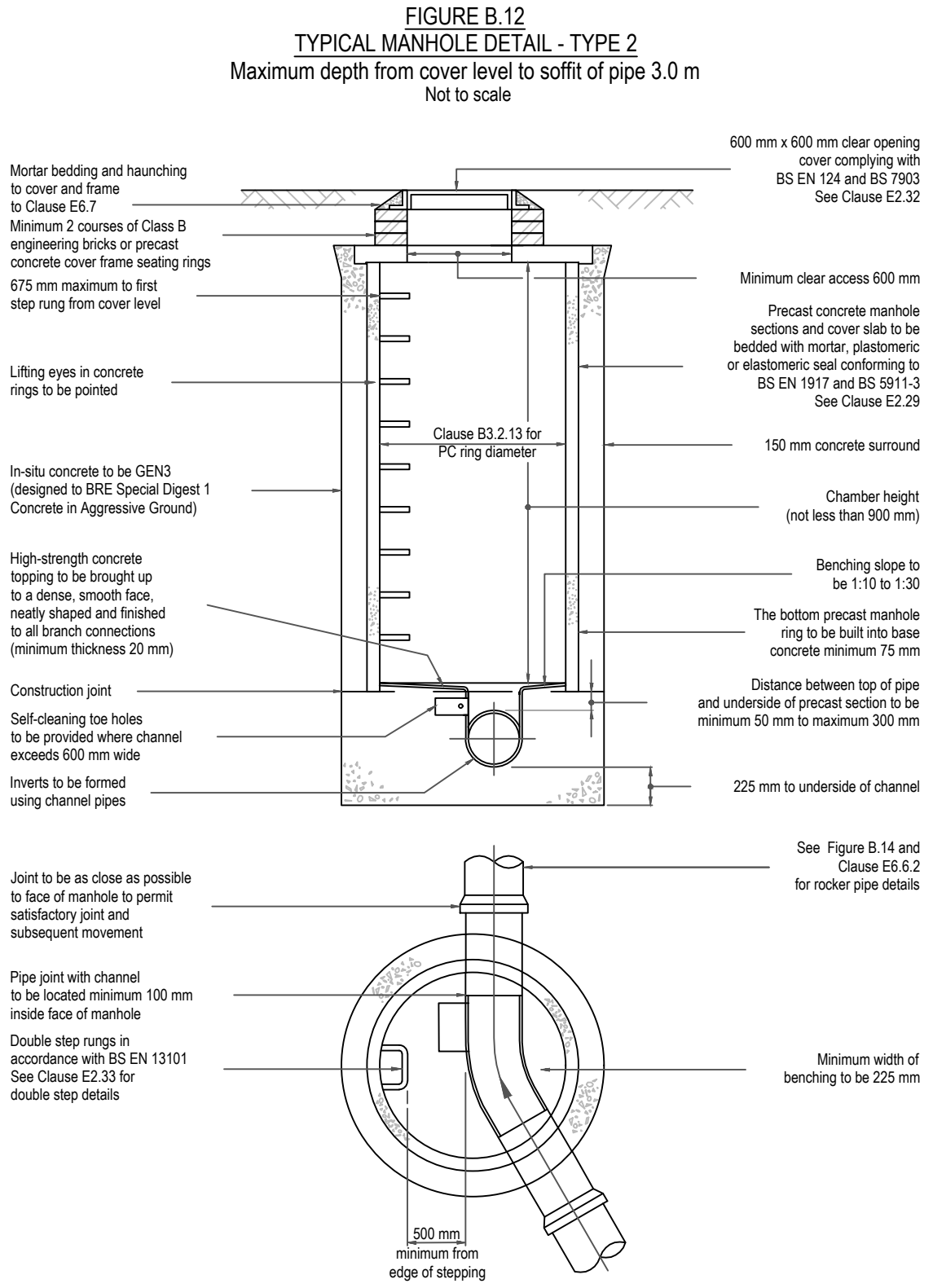
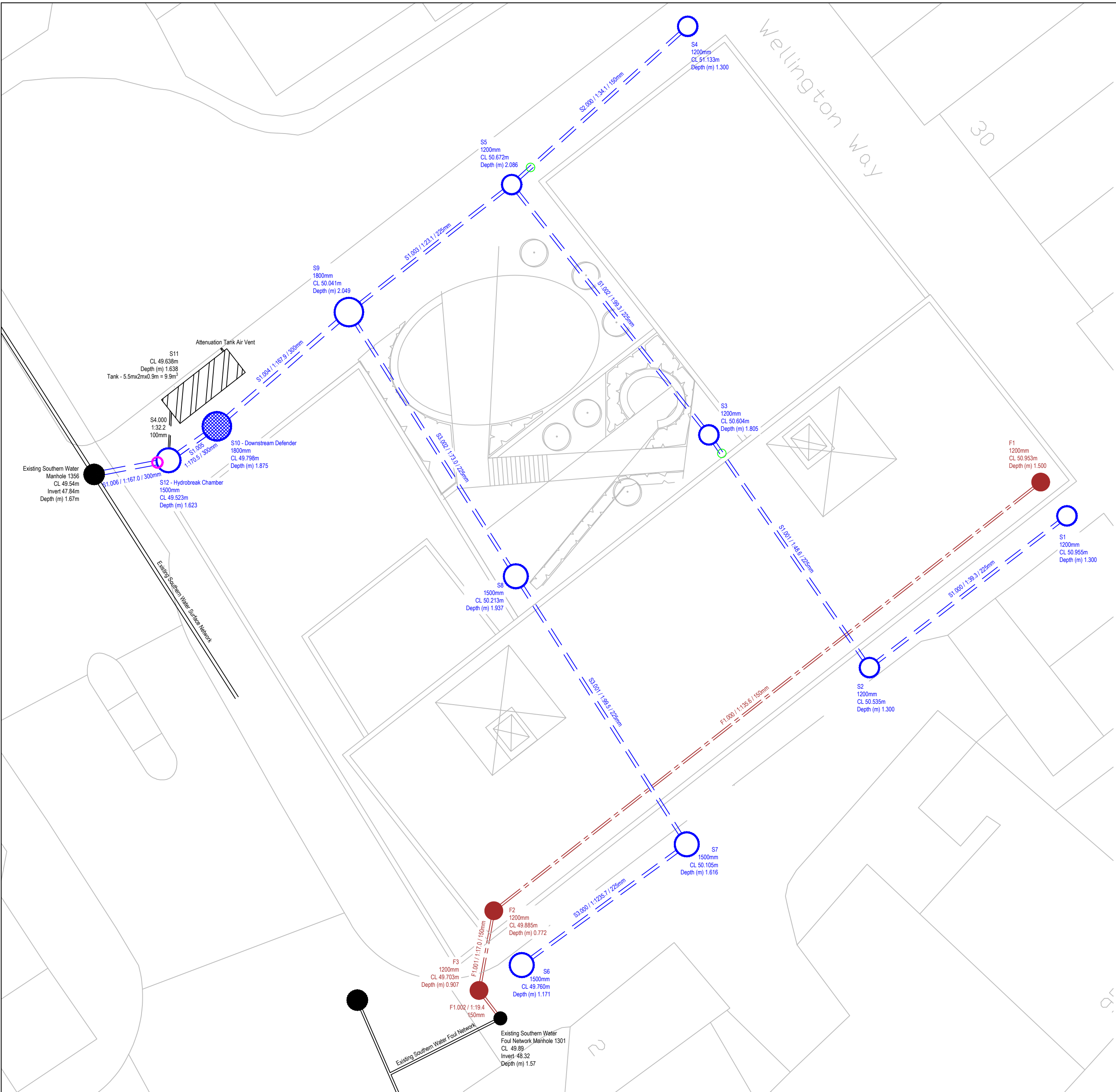
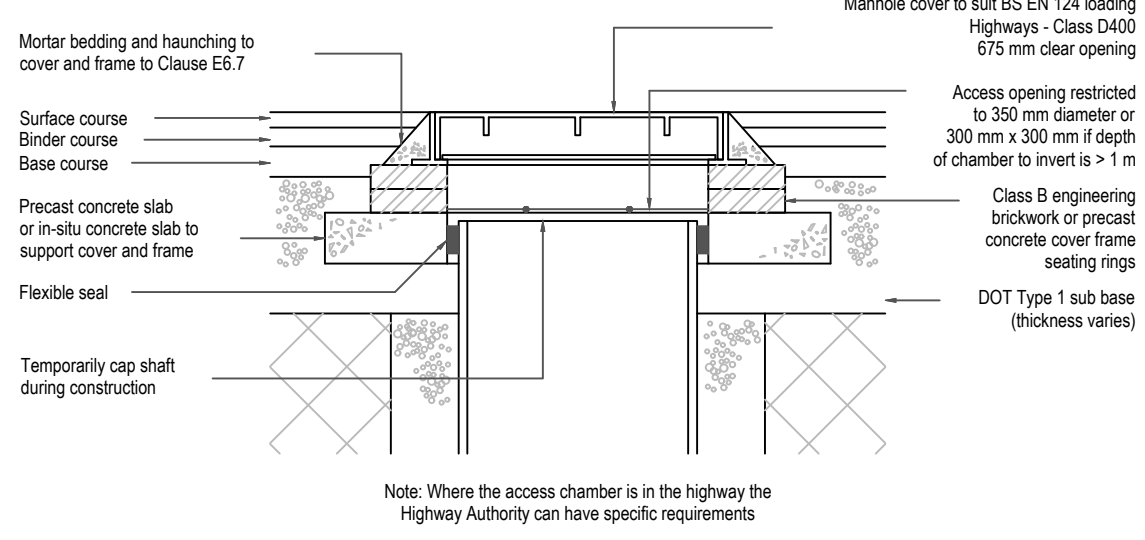




TYPICAL CLASS D 400 COVER DETAIL
Not to scale

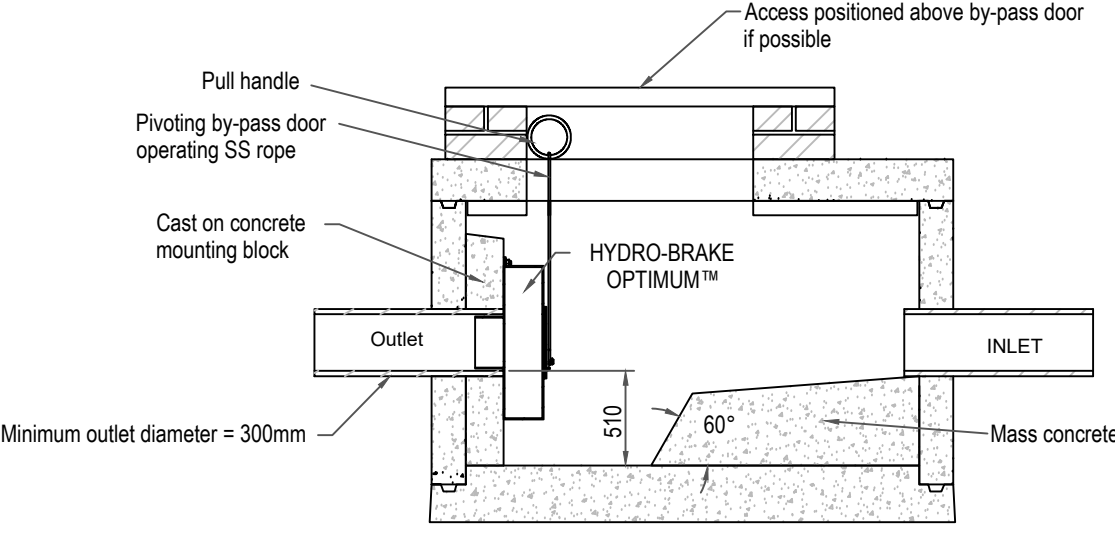


Hydro-Brake Detail
Not To Scale

Technical Specification Criteria		
Control Point	Head (m)	Flow (L/s)
Primary Design	1.323	47.400
Flush Flow	0.471	47.352
Kick Flow	0.963	40.669
Mean Flow		39.586

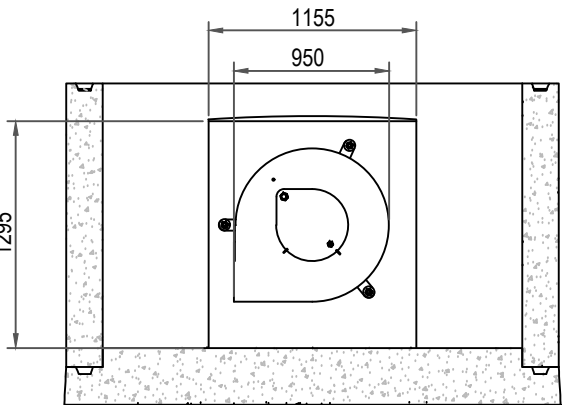
Foul Network Manhole Schedule												
Manhole Name	Cover Level (m)	MH Depth (m)	Manhole Connection	Manhole Diameter (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Manhole Type	Cover Type
F1	50.953	1.500	Open Manhole	1200	F1.000	49.453	150				Type 2	Type D400
F2	49.885	0.772	Open Manhole	1200	F1.001	49.113	150	F1.000	49.113	150	Type 2	Type D400
F3	49.703	0.907	Open Manhole	1200	F1.002	48.796	150	F1.001	48.796	150	Type 2	Type D400
F	49.750	1.074	Open Manhole	450		OUTFALL		F1.002	48.676	150		

Surface Network Manhole Schedule													
Manhole Name	Cover Level (m)	MH Depth (m)	Manhole Connection	Manhole Diam.,L'W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Pipes In Backdrop (mm)	Manhole Type	Cover Type
S1	50.955	1.300	Open Manhole	1200	S1.000	49.655	225					Type 2	Type D400
S2	50.535	1.300	Open Manhole	1200	S1.001	49.235	225	S1.000	49.235	225		Type 2	Type D400
S3	50.604	1.805	Open Manhole	1200	S1.002	48.799	225	S1.001	48.849	225	50	Type 2	Type D400
S4	51.133	1.300	Open Manhole	1200	S2.000	49.833	150					Type 2	Type D400
S5	50.672	2.086	Open Manhole	1200	S1.003	48.587	225	S1.002	48.586	225		Type 2	Type D400
								S2.000	49.372	150	710		
S6	49.760	1.171	Open Manhole	1500	S3.000	48.589	225					Type 2	Type D400
S7	50.105	1.616	Open Manhole	1500	S3.001	48.489	225	S3.000	48.489	225		Type 2	Type D400
S8	50.213	1.937	Open Manhole	1500	S3.002	48.276	225	S3.001	48.277	225		Type 2	Type D400
S9	50.041	2.049	Open Manhole	1800	S1.004	47.992	300	S1.003	47.992	225		Type 2	Type D400
								S3.002	47.992	225			
S10	49.798	1.875	Open Manhole	1800	S1.005	47.923	300	S1.004	47.923	300		Type 2	Type D400
S11	49.638	1.638	Open Manhole	1200	S4.000	48.000	100					Type 2	Type D400
S12	49.523	1.623	Open Manhole	1500	S1.006	47.900	300	S1.005	47.900	300		Type 2	Type D400
								S4.000	47.900	100			
S	49.540	1.670	Open Manhole	0		OUTFALL		S1.006	47.870	300			

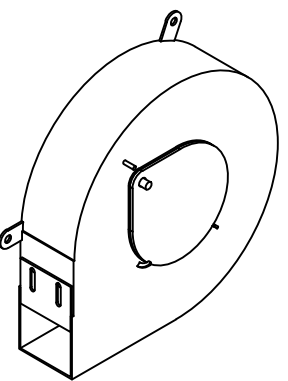
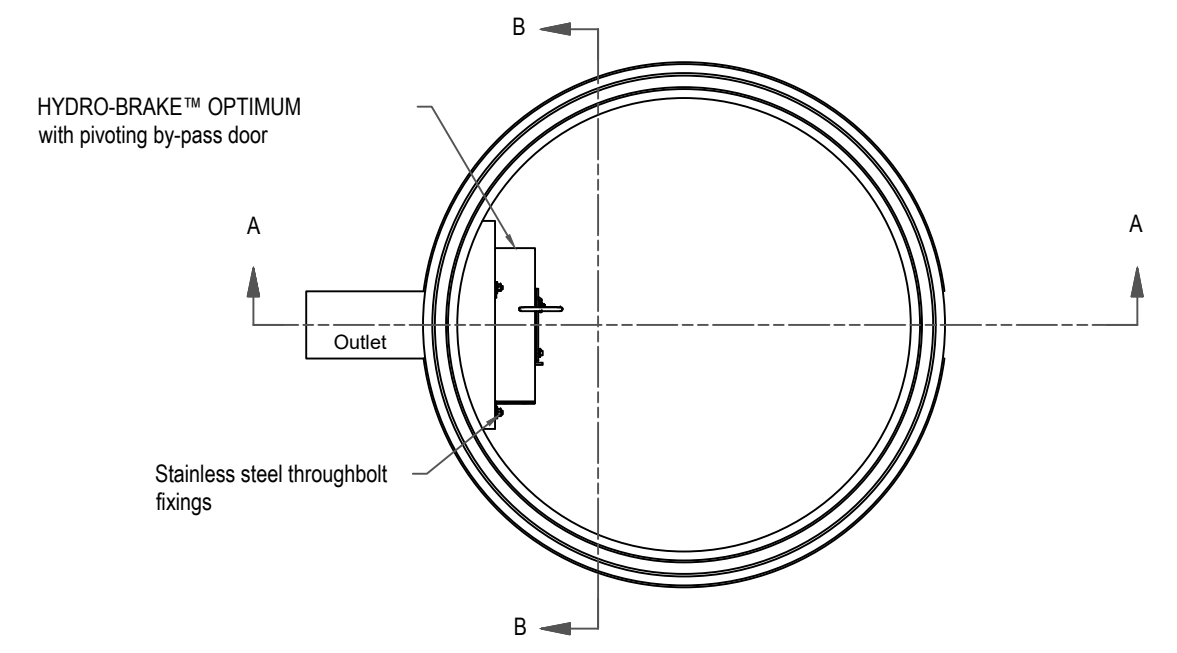


Section A - A

BBA Approved
MD-SHE-0284-4740-1323-4740
HYDRO-BRAKE OPTIMUM™



Section B - B
(view on mounting block)



- This drawing shall be read in conjunction with all relevant general arrangement (GA) & detailed drawings.
- All components shall be manufactured in accordance with the production specification HRD-FM09/15.
- HYDRO-BRAKE OPTIMUM™ is also available with alternative fixing mounts (e.g. curved back plate, push fit).
- For pipe and manhole size detail please refer to network and manhole details.

- Notes:**
- All levels relate to Ordnance Datum from site survey information provided by Client (Thornton Reynolds Ltd).
 - The developer must self-verify and certify that the design criteria, material standards and workmanship specifications for the proposed adoptable sewers are in accordance with those set out in 'Sewers for Adoption' 7th Edition, The Ministers Standards and the requirements of the Statutory Sewerage Undertaker.
 - E232 Manhole Cover and Frames
 - Manhole covers and frames shall comply with the relevant provisions of BS EN 124, BS 7903 and Highways Agency Guidance Document HA 104/09. They shall be of a non-rocking design which does not rely on the use of cushion inserts.
 - As a minimum, Class D400 covers shall be used in carriageways of roads (including pedestrian streets), hard shoulders and parking areas used by all types of road vehicles. Class D 400 should also be used for Manholes located on agricultural land due to heavy vehicular use.
 - Class B125 covers shall be used in footways, pedestrian areas and comparable locations.
 - All manhole covers shall be the non-ventilating type and shall have closed keyways.
 - All Pipes designed to be PVC-U in accordance with Sewers for Adoption 7th Edition. Approval from (Southern Water) prior to construction.
 - E2.22 Thermoplastics Structures Wall Pipe.
 - Thermoplastics structures wall sewer pipe shall comply with the relevant provisions of BS EN 13476-1 and WIS 4-35-01 and BS EN 13476-2 or BS EN 13476-3. Pipes shall be BSI kitemarked or have equivalent Third Party Certification.
 - Pipes less than or equal to 500mm in diameter shall have nominal short-term ring stiffness not less than 8kN per m2 (SN8) or be subject to a quality system for storage and embedment.
 - Nominal short term ring stiffness of 2kN per m2 (SN2) is acceptable for pipes greater than 500mm in diameter, subject to structural design load calculations which shall be provided to support this.
 - Transportation, handling, storage and laying shall be in accordance with the manufacturer's recommendations.
 - Where a fitting is installed on a sewer length, it shall have the same internal bore as the sewer. Maximum length of pipe for laying is 3m or 10 x DN, whichever is the greater, unless welded joints are used.
 - The contractor SHALL verify invert level of the proposed outfall PRIOR to commencement of drainage works and report levels to the Engineer for approval.
 - All manholes to be constructed to Southern Water standard adoptable details available online from <http://www.southernwater.co.uk>.
 - All pipes to have 150mm granular bed and surround 20mm clean stone or approved alternative.
 - Pipes with cover lower than 500mm will require reinforced concrete slab protection as per Figure B.25 SFA 7th Edition. Slab to have minimum 300mm bearing each side of pipe and shall consist of 150mm depth of GEN3 Sulphate Resisting concrete complying to EN 1 of SFA7 specification. Reinforcement to be two layers of A363 reinforcement laid with 40mm cover to the underside of the slab.
 - Where surface network crosses foul network use well compacted fill in between pipe crossings.
 - Design based on provided utility information. There may be other services onsite which are unknown that could affect the location apparatus.
 - Gully positions to be determined once final site design and ground profile is completed. Surface Water Network has included all access roads areas for total impermeable area.
 - Hydrobrake (Vortex Control Unit) Model Number - MD-SHE-0284-474-1323-4740. Product Details taken from Design Tool at <http://www.hydro-int.com/uk/hydro-brake-optimum-design-tool>
 - See Network Details for Attenuation Tank detail.
 - Current design based on 50% betterment in brown field run-off rate as required in FRA. Existing run-off rate on site 94.71l/s, therefore discharge from site limited to 47.41l/s.
 - Surface water connection to existing Southern Water sewer may require capacity test on existing sewer to confirm Southern Waters maximum discharge rate from site. This may require a redesign of on site drainage network if Southern Water request a lower discharge rate than 47.4l/s.
 - Rainwater down pipes location not provided at time of design.
 - Internal Foul branch lines not provided at time of design. Architect to show internal connections to foul network upon finalising internal foul layout. Foul Network designed for number of units onsite December 2017. If internal layout is to change after drainage design issued, Foul Network may require redesign.
- *NOT FOR CONSTRUCTION UNTIL S104 AGREED WITH UTILITY PROVIDER**

- KEY:**
- Adoptable Surface Network
 - Non Adoptable Surface Network
 - Hydro Brake
 - Downstream Defender
 - Backdrops
 - Adoptable Foul Network

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SCHEME:

CES482 Wellington Way, Waterlooille Drainage Design

DRAWING TITLE:

CES482 General Arrangement and Standard Details

DRAWN BY:	Henri Roberts	DATE DRAWN:	21/12/2017
CHECKED BY:	Mark Roberts	DATE CHECKED:	21/12/2017
SHEET:	1 of 1	SCALES:	1:200

Drawing No. CES482/01

REV A