DRAINAGE NOTES:

1. This drawing is to be read in conjunction with all other relevant architectural and engineering drawings, any discrepancies, errors or omissions to be brought to the attention of the designer.
2. All dimensions to be checked by the contractor on site prior to commencement of works.
3. Engineer to be informed by the contractor of any discrepancies prior to the commencement of works on site.
4. Dimensions of all boundaries and adjoining roads to be checked on site prior to commencement of works.
5. Do not scale, all measurements and coordinates to be checked on site.
6. Before starting work, check invert levels and positions of existing drains, sewers, inspection chambers and manholes against information shown on drawings and report any discrepancies to the Engineer. Adequately protect existing drains and maintain normal operation during construction.
7. All pipes and junctions, U-PVC to IS 424 or BS 4660/5481, concrete to IS 6 or BS 5911 CE certified, as indicated on details.
8. All covers, gratings and frames to be grey iron or ductile iron, Class D400 to EN 124, CE certified, UNO.
9. Bedding class B UNO, assuming sound clay subsoil. Notify Engineer where subsoil varies from that assumed and obtain further instructions.
10. Excavate to formation immediately before laying bedding or pipework. Remove hard and soft spots. Notify and allow the Engineer to make inspections of each section of work.
11. Type Y concrete surround for shallow pipes below buildings. Where crown of pipe is less than 300 mm below underside of slab, encase pipe in concrete of same mix as slab and cast integrally with the slab. Extend length of concrete surround to within 150 mm of next nearest flexible joint. Excavate trench after hardcore has been laid and compacted. Lay concrete blinding, 25 mm thick over full width of trench and allow to set. Lay pipes on blinding on folded wedges of compressible board not less than 100 mm above blinding.
12. Class Z concrete surround: **To be used where minimum cover of 1.2m in roads and driveways, 0.9m in open spaces and footpaths not adjacent to roadways and 0.6m in gardens cannot be achieved.** Concrete mix GEN 3. Lay concrete blinding, 25 mm thick over full width of trench and allow to set. Lay pipes on blinding on folded wedges of compressible board not less than 100 mm above blinding.
13. Form vertical construction joints in surround at face of flexible pipe joints using 18 mm thick compressible board pre-cut to profile of pipe. Fill any gap between spigot and socket with resilient material to prevent entry of concrete.
14. After initial testing, place and compact more concrete for full width of trench to encase pipe to 150 mm above crown or to other height as specified or shown on drawings.
15. Provide rocker pipes where pipelines pass through or into structures.
16. Flush out system prior to inspection, testing and handover.
17. Provide advance notice to Engineer to enable him to attend tests. Air test sections of pipework as work progresses.
18. For final approval, water test to BS 8301.
19. Carry out and record CCTV survey of pipe network and a condition report.
20. Provide three copies to the Engineer. Remedy all defects as instructed.
21. All works to be carried out in accordance with the "Recommendations for Site Development Works for Housing Areas" 1998 and Irish Waters Code of Practice for Wastewater Infrastructure (*Document IW-CDS-5030-03*) and Wastewater Infrastructure Standard Details (*Document IW-CDS-5030-01*).
22. AJs less than 600mm deep to be Wavin 315 AJs with D4492 covers and frames OEA.
23. Inspection chambers and AJs over 600mm deep to be Wavin Tegra 600 IC with Group 2 (B125) covers outside road and parking areas and Group 4 (D400) covers within road and parking areas.
24. All manhole, inspection chambers and AJ shafts to be sealed.
25. All surface water pipelines greater than 225mm Ø to be spigot and socket concrete pipes, in accordance with the requirements of IS 6.
26. 100-225mm surface water pipelines to be uPVC, in accordance with the requirements of IS EN 1401 2009/2012.
27. 100-225mm foul sewer pipelines to be uPVC, in accordance with the requirements of IS EN 1401 2009/2012 and Section 3.13 of Irish Waters Code of Practice for Wastewater Infrastructure (*Document IW-CDS-5030-03*).
28. Where located within grassed/landscaped areas, manhole covers shall be be surrounded by a concrete plinth, 200mm all round and 100mm deep formed with C20/25 concrete, 20mm aggregate size, bedded in Clause 804 material. The plinth shall incorporate mild steel reinforcement links and shall have a bull-nose finish around its external perimeter.

MANHOLE CONSTRUCTION

1. Concrete manholes shall be constructed of precast units complying with I.S.420 .
2. The base, and benching shall be formed insitu of Grade 20 concrete.
3. The base shall be 225mm thick and the channel be purpose made half round channels.
4. The precast rings shall be surrounded in 150mm thick Grade 20 concrete.
5. A flexible joint shall be provided to each pipe within 500mm of the inner face of the manhole wall.
6. Projecting pipes shall be surrounded with grade 20 concrete with the base been cast monolithically with the manhole base. a further "rocker" pipe shall be provided for pipes up to 450mm dia. of 500mm to 750mm length, and pipes greater than 450mm dia. 750mm to 1000mm length.

LADDER RUNGS

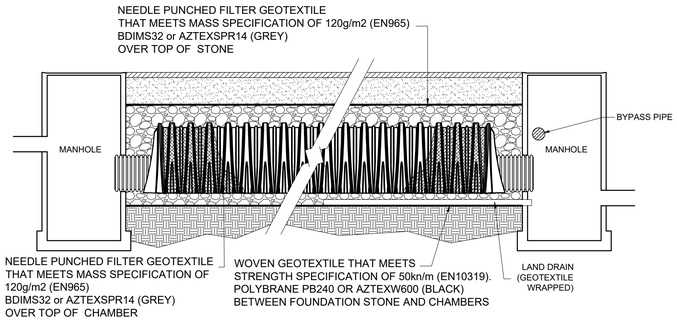
Ladder rungs shall be 20mm diameter mild steel heavily galvanised after manufacture as shown on the drawing and fitted at 300mm centres. length embedded in wall 125mm.

ACCESS LADDERS

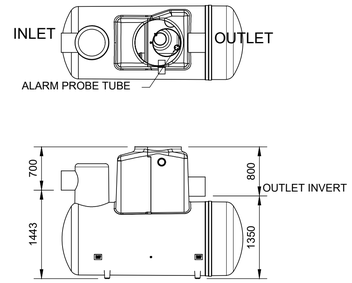
Access ladders to be manufactured from mild steel with 65mm x 12mm stringers 300mm apart with 20mm diameter rungs at 300mm c/c. Mild steel stays 65mm x 12mm to be provided at intervals not exceeding 2.4m. Ladder and stays to be heavily galvanised to BS 729 after manufacture. The ladder is to be fixed with 18mm Ø stainless steel bolts.

BENCHING

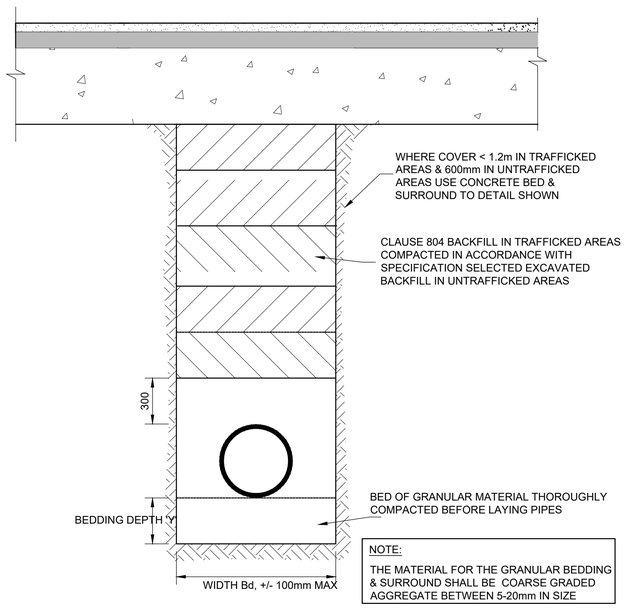
Benching is to be formed in Grade 30 concrete and should rise vertically from the top edge of the channel to a height not less than that of the soffit of the outlet and slope upwards to meet the wall of the manhole at at gradient of 1:6 (min. rise 25mm). It should be floated with a steel float to a smooth hard surface with a 25mm thick coat of 1:1 cement mortar laid while the benching concrete is still green.



TYPICAL SECTION THROUGH ONLINE STORMTECH MC3500 CHAMBER
SCALE 1:50



TYPICAL BYPASS SEPARATOR DETAILS
SCALE 1:50



NOTE:
THE MATERIAL FOR THE GRANULAR BEDDING & SURROUND SHALL BE COARSE GRADED AGGREGATE BETWEEN 5-20mm IN SIZE

TYPICAL BEDDING DETAILS

MANHOLE CONSTRUCTION
CONCRETE MANHOLES SHALL BE CONSTRUCTED OF PRECAST UNITS COMPLYING WITH I.S.420 AND SHALL BE OF THE DIMENSIONS AS SHOWN ON THE DRAWING. THE BASE, AND BENCHING SHALL BE FORMED INSITU OF GRADE 20 CONCRETE. THE BASE SHALL BE 225mm THICK AND THE CHANNEL BE PURPOSE MADE HALF ROUND CHANNELS. THE PRECAST RINGS SHALL BE SURROUNDED IN 150mm THICK GRADE 20 CONCRETE.
A FLEXIBLE JOINT SHALL BE PROVIDED TO EACH PIPE WITHIN 500mm OF THE INNER FACE OF THE MANHOLE WALL. PROJECTING PIPES SHALL BE SURROUNDED WITH GRADE 20 CONCRETE WITH THE BASE BEEN CAST MONOLITHICALLY WITH THE MANHOLE BASE. A FURTHER "ROCKER" PIPE SHALL BE PROVIDED FOR PIPES UP TO 450mm DIA. OF 500mm TO 750mm LENGTH, AND PIPES GREATER THAN 450mm DIA. 750mm TO 1000mm LENGTH.

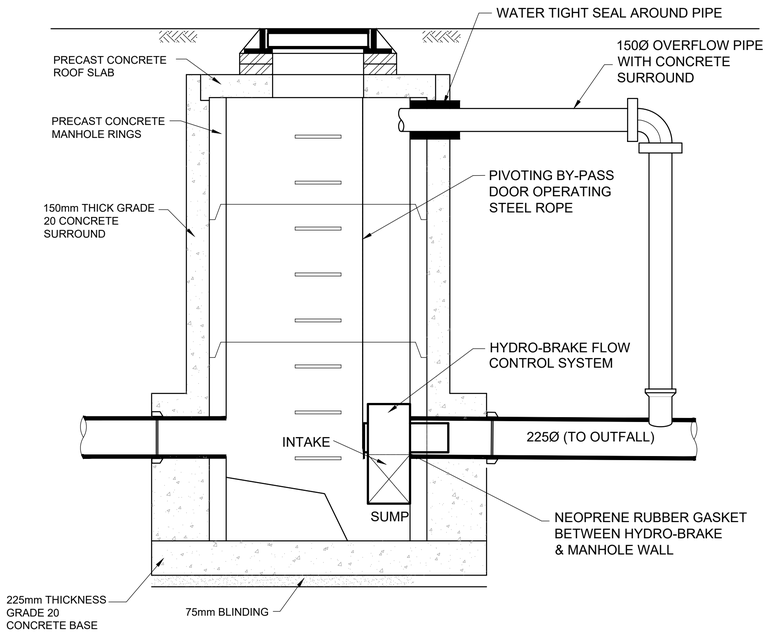
COVERS
COVERS AND FRAMES TO COMPLY WITH THE REQUIREMENTS OF IS/EN 124:1994. ALL MANHOLE COVERS TO BE AN APPROVED MINIMUM CLASS D400 WITH 600x600mm CLEAR OPENING FOR NON-RECESSED COVERS AND 610x610mm CLEAR OPENING FOR RECESSED COVERS.

LADDER RUNGS
LADDER RUNGS SHALL BE 20mm DIAMETER MILD STEEL HEAVILY GALVANISED AFTER MANUFACTURE AS SHOWN ON THE DRAWING AND FITTED AT 300mm CENTRES. LENGTH EMBEDDED IN WALL 125mm.

ACCESS LADDERS
ACCESS LADDERS TO BE MANUFACTURED FROM MILD STEEL WITH 65mm X 12mm STRINGERS 300mm APART WITH 20mm DIAMETER RUNGS AT 300mm c/c. MILD STEEL STAYS 65mm X 12mm TO BE PROVIDED AT INTERVALS NOT EXCEEDING 2.4m. LADDER AND STAYS TO BE HEAVILY GALVANISED TO BS 729 AFTER MANUFACTURE. THE LADDER IS TO BE FIXED WITH 18mm Ø STAINLESS STEEL BOLTS.

BENCHING
BENCHING IS TO BE FORMED IN GRADE 30 CONCRETE AND SHOULD RISE VERTICALLY FROM THE TOP EDGE OF THE CHANNEL TO A HEIGHT NOT LESS THAN THAT OF THE SOFFIT OF THE OUTLET ANDSLOPE UPWARDS TO MEET THE WALL OF THE MANHOLE AT AT GRADIENT OF 1:6 (MIN. RISE 25mm). IT SHOULD BE FLOATED WITH A STEEL FLOAT TO A SMOOTH HARD SURFACE WITH A 25mm THICK COAT OF 1:1 CEMENT MORTAR LAID WHILE THE BENCHING CONCRETE IS STILL GREEN.

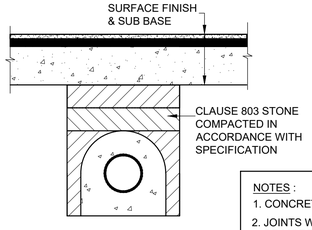
NOTE: HYDRO-BRAKE DEVICE TO BE FITTED STRICTLY IN ACCORDANCE WITH MANUFACTURERS INSTRUCTION GUIDELINES, SPECIFICATIONS & STANDARDS / DETAILS



SECTION THROUGH HYDROBRAKE MANHOLE S8
SCALE 1:20

PIPE DIA.	WIDTH Bd	'Y' UNIFORM SOIL	'Y' ROCK, etc.
100	550	100	200
150	600	100	200
225	700	150	200
300	750	150	200
375	1050	150	200
450	1150	150	200
525	1200	150	200
600	1350	150	200
675	1450	150	200
750	1500	150	200
825	1600	150	225
900	1900	150	225
975	2000	175	250
1050	2300	175	275
1200	2300	200	300
OVER 1200	DIA.+1000	DIA./6	DIA./4

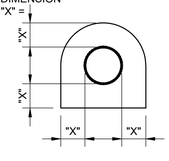
DETAIL OF GRANULAR BED & SURROUND TO SURFACE WATER & FOUL DRAINAGE



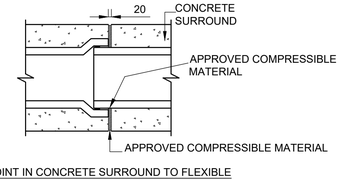
CONCRETE BED & SURROUND

NOTES :
1. CONCRETE TO BE GRADE 20.
2. JOINTS WITH APPROVED COMPRESSIBLE MATERIAL SHALL NOT BE MORE THAN 5m APART.

200mm FOR PIPES > 600Ø
150mm FOR PIPES < 600Ø
DIMENSION "X" =



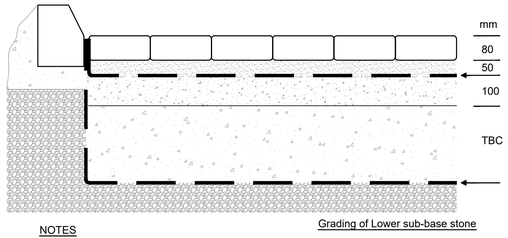
CONCRETE BED & SURROUND



JOINT IN CONCRETE SURROUND TO FLEXIBLE JOINTED SPIGOT & SOCKET CONCRETE PIPES

CONSTRUCTION DETAILS FOR CONCRETE BED & SURROUND TO SURFACE WATER & FOUL DRAINAGE

Typical Infiltration System with a CBR greater than 5%
Parking Areas subject to trafficking by Cars and Vans only



NOTES
* Specification for sub-base and laying course:- the crushed stone must possess well defined edges and have a minimum 10% fines value of 150kN when tested in accordance with BS812 Part iii.

Grading of Lower sub-base stone

SIEVE SIZE	% PASSING
100mm	100
63mm	90-100
37.5mm	60-80
20mm	15-30
10mm	0-5

TYPICAL SECTION THROUGH PERMEABLE PAVING
SCALE 1:10

REV.	AMENDMENT	DATE	BY
B	Issued for SHD	04 03 19	c.macg
A	For Pre-planning discussion	17 09 18	c.macg

Project: **Strategic Housing Development at Finnabair South, Inner Relief Road/R215, Dundalk, Co. Louth**

Title: **Typical Surface Water Drainage Details**

Client/Architect: **JC Van Dijk/Van Dijk Architects**

Drawn: c.macg

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Dwg. No.: 18027/C06B