

Y = $\frac{Bd}{10}$ (150 Min) for pipes up to 6000
 Y = $\frac{Bd}{10}$ (100 min) for pipes 6750 and above

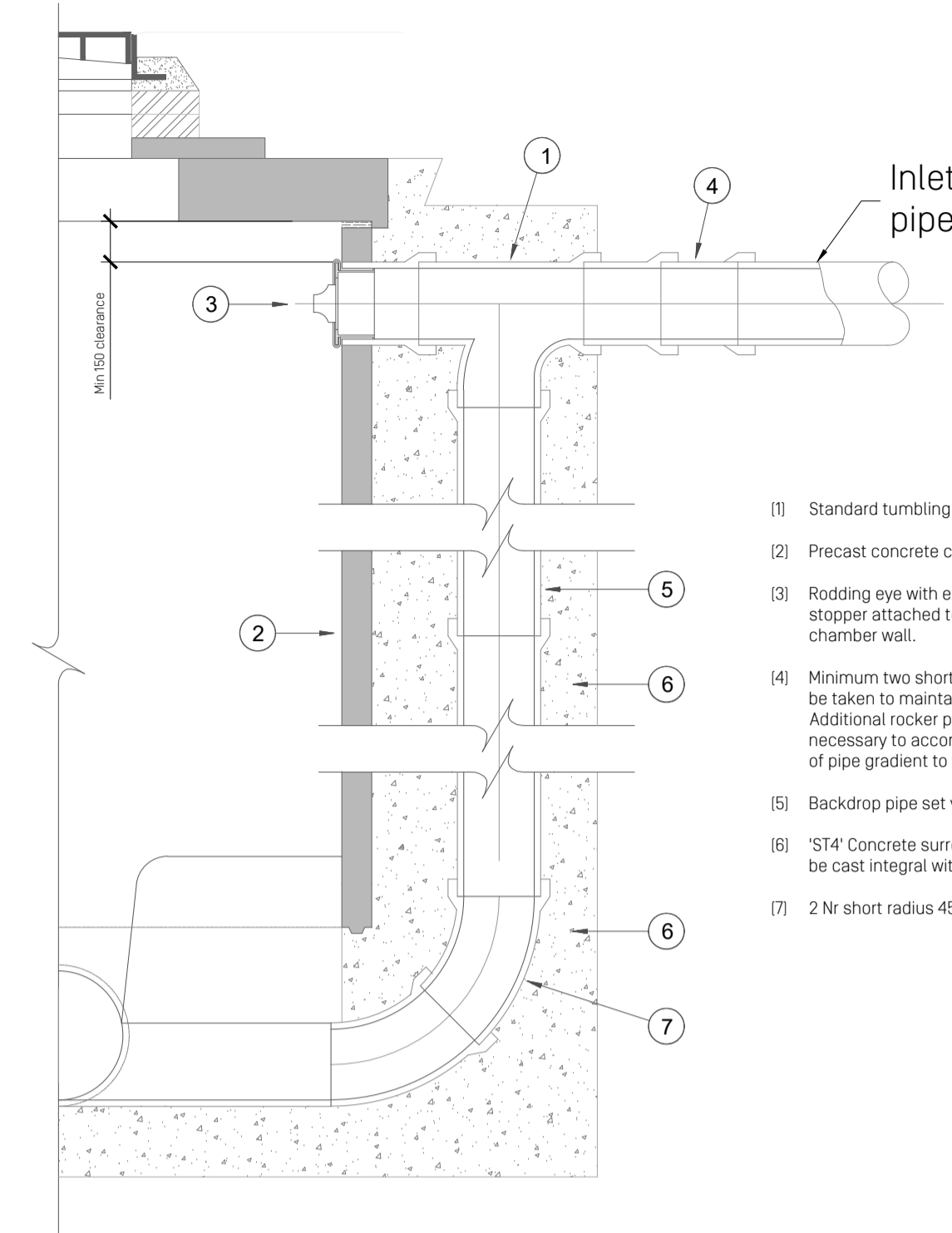
**TYPE S
BEDDING FACTOR 2.2**

PIPE FULLY SURROUNDED WITH GRANULAR MATERIAL HAVING A COMPACTION FRACTION NOT GREATER THAN 0.2

Suitable fill - the suitable fill shall be suitable for the location and shall be carefully compacted to provide a stable fill without damaging the pipe. Fill under car parking areas, shared drives and private roads shall be well compacted graded granular material. Fill under adoptable roads may need to be type 1 granular sub-base material - check with highway authority if appropriate.

Granular material - for rigid pipes the granular material should conform to BS EN: 1610 Annex B Table B.15 and should be single size material or graded material from 5mm up to a maximum size of 10mm for 100mm diameter pipes, 14mm for 150mm diameter pipes, 20mm for pipes from 150mm to 600mm diameter and 40mm for pipes more than 600mm diameter.

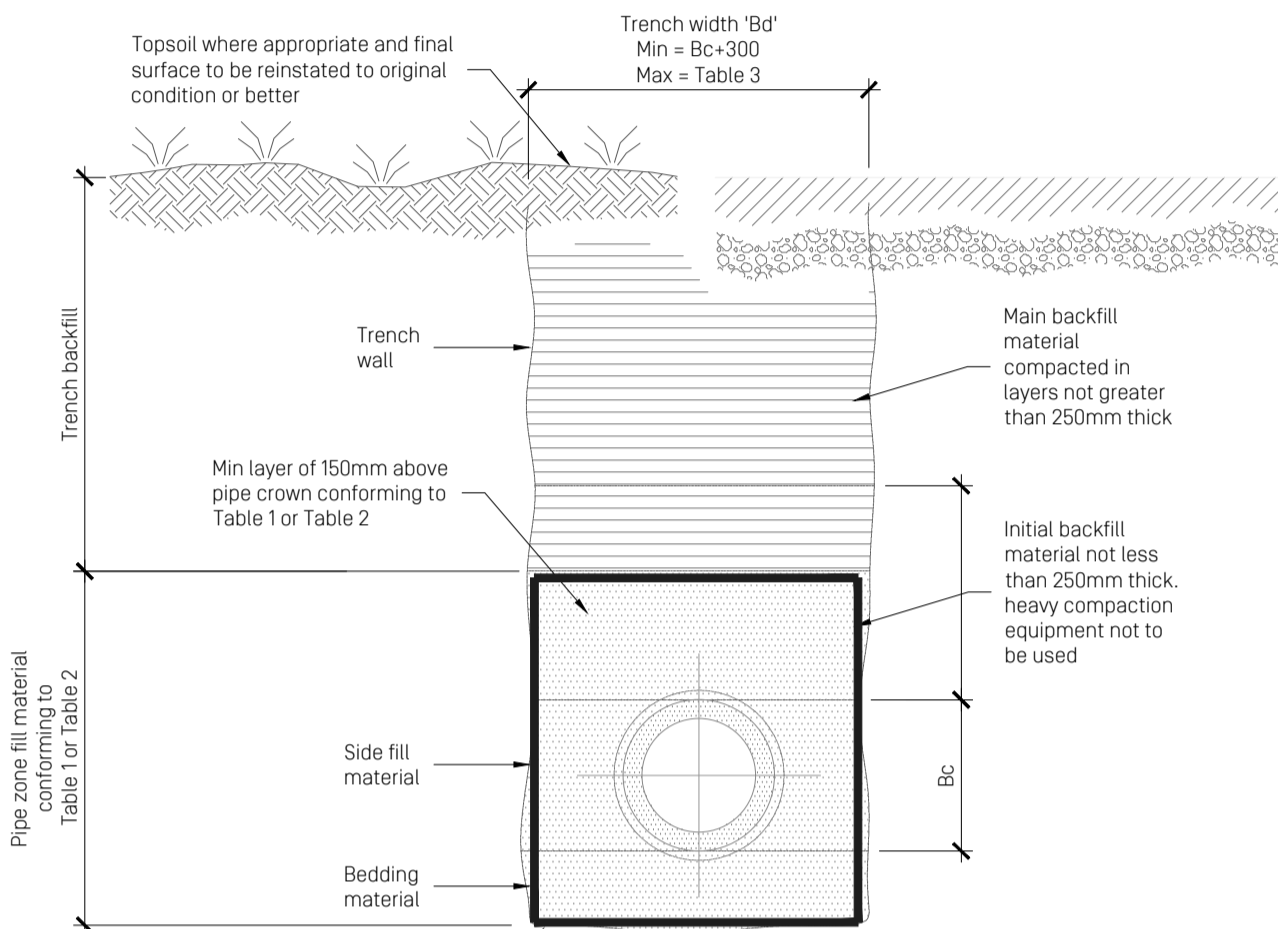
NOMINAL SIZE	LAID IN FIELDS	LAID IN LIGHT ROADS	LAID IN MAIN ROADS
CLASS 120 CLAYWARE PIPES (CLASS S BEDDING)			
100mm	0.6m - 8.0+ m	1.2m - 8.0+ m	1.2m - 8.0m
225mm	0.6m - 5.0m	1.2m - 5.0m	1.2m - 4.5m
400mm	0.6m - 4.5m	1.2m - 4.5m	1.2m - 4.0m
600mm	0.6m - 4.5m	1.2m - 4.5m	1.2m - 4.0m
CLASS M CONCRETE PIPES (CLASS S BEDDING)			
300mm	0.6m - 3.0m	1.2m - 3.0m	1.2m - 2.5m
450mm	0.6m - 3.5m	1.2m - 3.5m	1.2m - 2.5m
600mm	0.6m - 3.5m	1.2m - 3.5m	1.2m - 3.0m
THERMOPLASTIC PIPES (CLASS S BEDDING)			
100 - 300mm	0.6m - 7.0m	0.9 - 7.0m	0.9m - 7.0m



- (1) Standard tumbling bay junction.
- (2) Precast concrete chamber.
- (3) Rodding eye with expanding pipe stopper attached to chain bolted to chamber wall.
- (4) Minimum two short rocker pipes. Care to be taken to maintain flexibility of joints. Additional rocker pipes to be used if necessary to accommodate transition of pipe gradient to vertical downpipe.
- (5) Backdrop pipe set vertical.
- (6) 'S14' Concrete surround to backdrop to be cast integral with manhole surround.
- (7) 2 Nr short radius 45° bends.

DROP PIPE DIA	
Diameter of high level pipe (mm)	Diameter of drop pipe (mm)
150	150
225	225
300	300
375	300
450	300
525	375
600	450

TYPICAL DETAIL OF A BACKDROP ENTRY INTO A BENCHED MANHOLE (not to scale)



TYPICAL TRENCH CONFIGURATION
(not to scale)

PIPE BEDDING AND BACKFILL
(not to scale)

Root Barrier
 'Terram root guard' (or similar approved bonded polypropylene or bonded polyethylene) to provide root barrier protection to drainage trench in location if required, to be laid and jointed in accordance with manufacturer's recommendations. Root barrier to fully encapsulate pipe zone fill material.

PERMITTED PIPE MATERIALS

Vitrified Clay (100mm - 300mmØ)

- 1. Pipes for foul sewers and surface water sewers shall comply with the relevant requirements of BS EN 295 and BS 85 (surface water pipes only). Vitrified clay pipes and fittings for sewers shall have flexible mechanical joints.

Solid Wall Plastic Pipes

- 2. Pipes to conform to BS 4660 and BS EN 1401-1

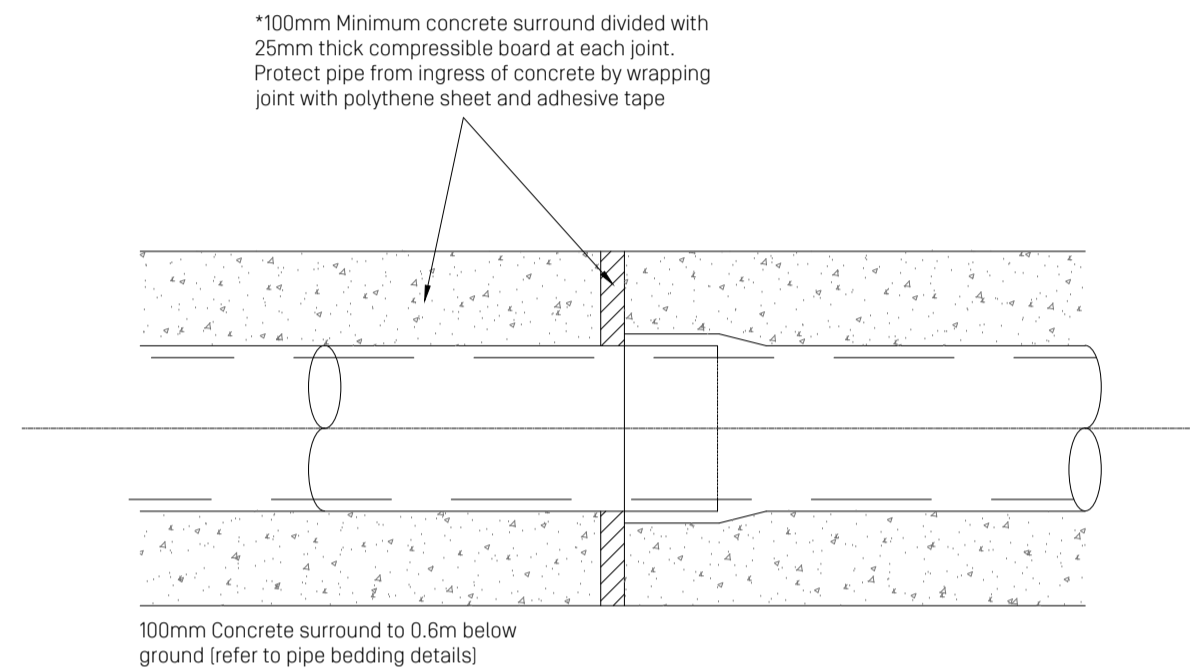
Structured Wall Plastic Pipes

- 3. Pipes to conform with Clause 6.15 of WIS 4-35-01 (stiffness class B), and BS EN 13476 Pt 2:2007 or Pt 3:2007

4. Approved systems

- Polysewer - 100mm, 150mm, 225mm, 300mm
- Quantum (Marley) - 100mm, 150mm, 225mm, 300mm
- Ultrarib (Uponor and Wavin) - 100mm, 150mm, 225mm, 300mm
- Funke - 100mm, 150mm, 225mm, 300mm

LEGEND	
	Main backfill material
	Selected fill
	Granular material as defined in Tables 1 and 2, as appropriate
	Grade C20 concrete (unless shown otherwise)

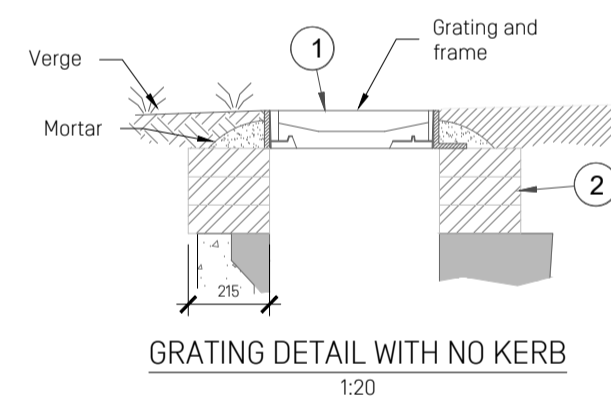


SIDE ELEVATION

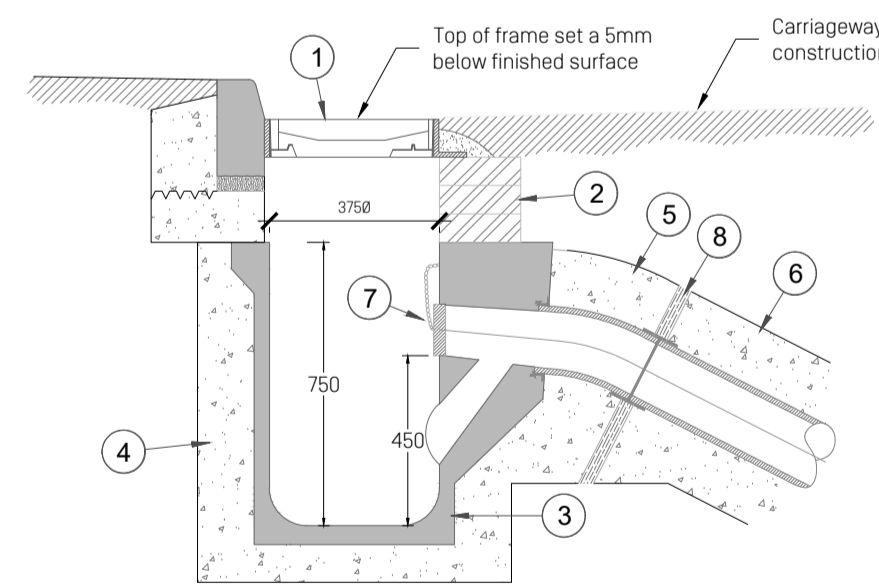
CROSS SECTION

TYPE Z BEDDING (CONCRETE ENCASED PIPES) PROTECTION FOR PIPES LAID AT SHALLOW

DEPTHS
NOT TO SCALE



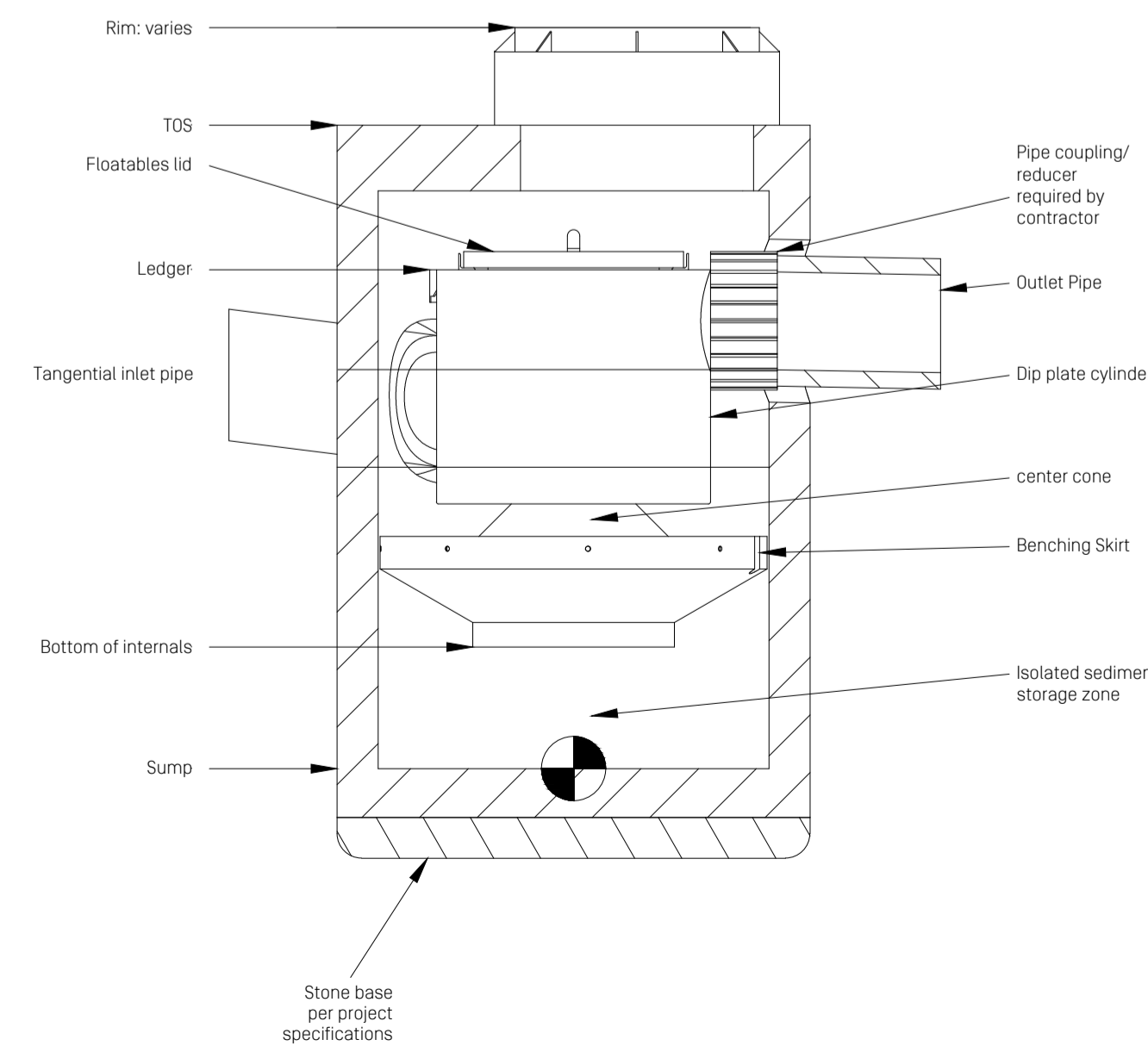
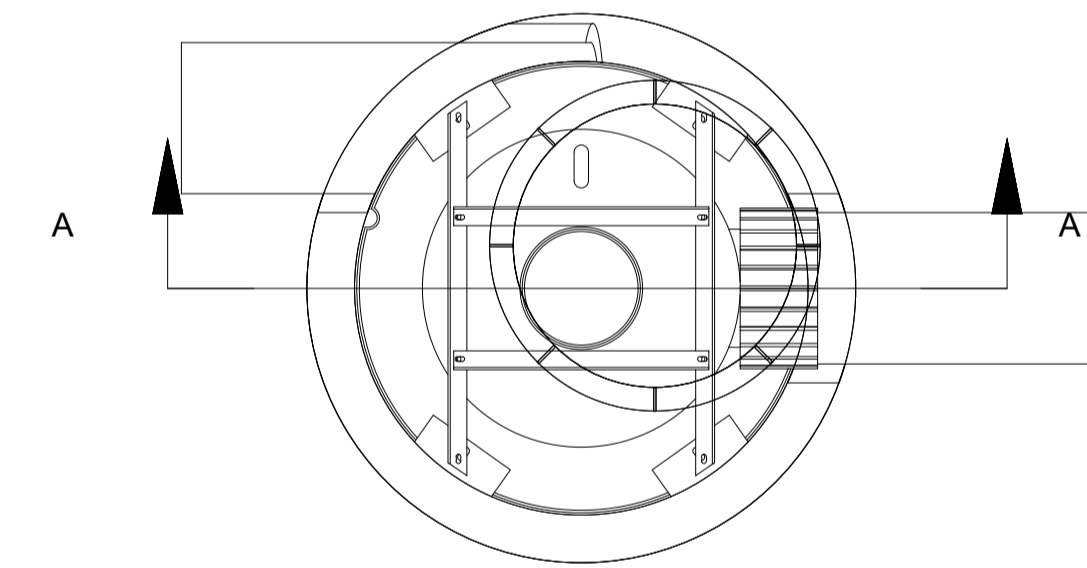
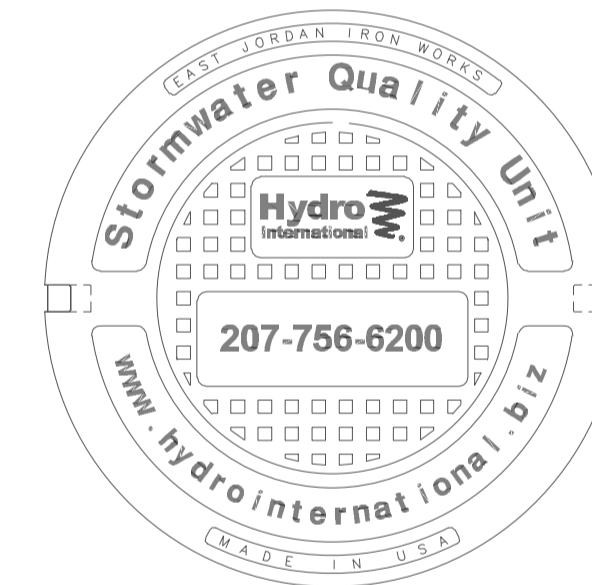
GRATING DETAIL WITH NO KERB
1:20



All gullies to Suffolk County Council specification S7.13

TYPICAL ROAD GULLY DETAIL
1:20

- (1) All gully gratings shall have a minimum frame depth of 100mm and be silent in use. Gratings shall be clearly marked on the upper surface with the makers name/logo, the loading class and mark of the certifying body. The clear opening shall be approx 370mm (along the kerbline) by 430mm, to give a waterway area of approx 1000mm². Gratings shall incorporate a captive hinge arrangement to prevent removal and theft. Double triangular gratings are not permitted. The grating and frame shall be set on a 10-20mm thick resin mortar as set out in the highway agency guidance note h104/2, with top surface finished 5mm below the adjoining carriageway surface and butting against face of kerb. Any gap with the kerb face shall be filled with Class 1 mortar.
- HOUSING ESTATE ROADS AND CYCLEPATHS/FOOTWAYS**
The grating shall be to BS EN 124 loading Class C250. In cyclepaths and footways the grating shall be a 'pedestrian friendly' mesh grate design.
- LOCAL DISTRIBUTOR AND HIGHER CLASSIFICATION ROADS**
The grating shall be to BS EN 124 loading Class D400.
- (2) At least one and normally not more than three courses of Class B Engineering 225mm brickwork to BS EN 771 5:772 laid square. Where the total road construction depth exceeds 450mm and the gully connection pipe passes under the carriageway more than three courses of brickwork will be permitted, to a maximum of five courses. Change in profile from square to circular to be shaped in Class 1 mortar.
- (3) Gully pot to be precast concrete trapped to BS 5911-6(2004) having internal dimensions 375mmØ and 750mm depth.
- (4) 150mm Thick concrete surround (Mix 'ST1' to BS 8500).
- (5) Where the gully connection pipe passes under the carriageway the invert of the pipe at the outlet shall be set at least 175mm below formation level. The invert shall be at least 315mm below the top of the sub-base.
- (6) A min 150mm thick concrete surround (Mix 'ST1') shall be continued to the connection pipe until a depth of cover of 900mm to the crown of the pipe has been achieved.
- (7) Plastic stopper and chain.
- (8) Joint filler board to maintain flexible joints through concrete surround.



SECTION A-A

TYPICAL DOWNSTREAM STREAM DEFENDER
 PRELIMINARY DRAWING
 This drawing is for advisory purposes only and must not be read as a construction issue. The design is not fixed and design changes are likely.

PI	28/07/23	Preliminary Issue	RB	JRS
Rev	Date	Description	By	Check

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Client	Cocksedge Building Constructors
Project	Barrett's Lane, Needham Market Suffolk IP6 8DL
Title	Private Construction Details Sheet 4
Scale @ A1	AS SHOWN
Status	Preliminary



Date	Job Number	By	Checked By
July 2023	0304	RB	JRS
Drawing No.	C433	Revision	P1

TABLE 2 GRANULAR BEDDING AND SIDE FILL MATERIALS FOR FLEXIBLE PIPES			
Pipe nominal Dia (mm)	Maximum particle size (mm)	Suitable materials	
		Imported granular materials (Note a)	Maximum cf value for 'as dug' granular material S (Note b)
1000	10	10mm Nominal single sized	0.15
Over 1000 to 1500	15	10 OR 14 Nominal single sized, or 14 TO 5mm Graded	0.15
Over 1500 to 3000	20	10, 14 OR 20 Nominal single sized, or 14 TO 5mm Graded, or 20 TO 5mm Graded	0.15
Over 3000 to 6000	20	10, 14, 20 OR 40mm Nominal single sized crushed rock, or 14 TO 5mm Graded, or 20 TO 5mm Graded	0.15
Over 6000	40	10, 14, 20 OR 40mm Nominal single sized crushed rock, or 14 TO 5mm Graded, or 20 TO 5mm Graded, or 40 TO 5mm Graded	0.15

TABLE 3 MAX TRENCH WIDTHS	
Pipe Dia (mm)	Max trench width measured 300mm above pipe soffit
100	550
150	800
225	700
300	750
375	1050
450	1150
525	1200
600	1350
675	1450
750	1500
825	1600
900	1900
1000	2000

- NOTES**
- a) Imported granular material to include natural aggregates, air-cooled blast furnace slag and sintered pulverised-fuel ash to BS EN 12620 & PD 6682-1.
 - b) Compaction fraction value (see Appendix A of WIS 4-08-01).
 - c) Material excavated from trenches dug through land contaminated with domestic, building or industrial waste shall not be used as bedding or side fill material.