

FIGURE B.4
TYPICAL MANHOLE DETAIL - TYPE A1
 Depth from cover level to soffit of pipe 3 m to 6 m with ladder and reducing slab
 Rigid material construction without concrete surround

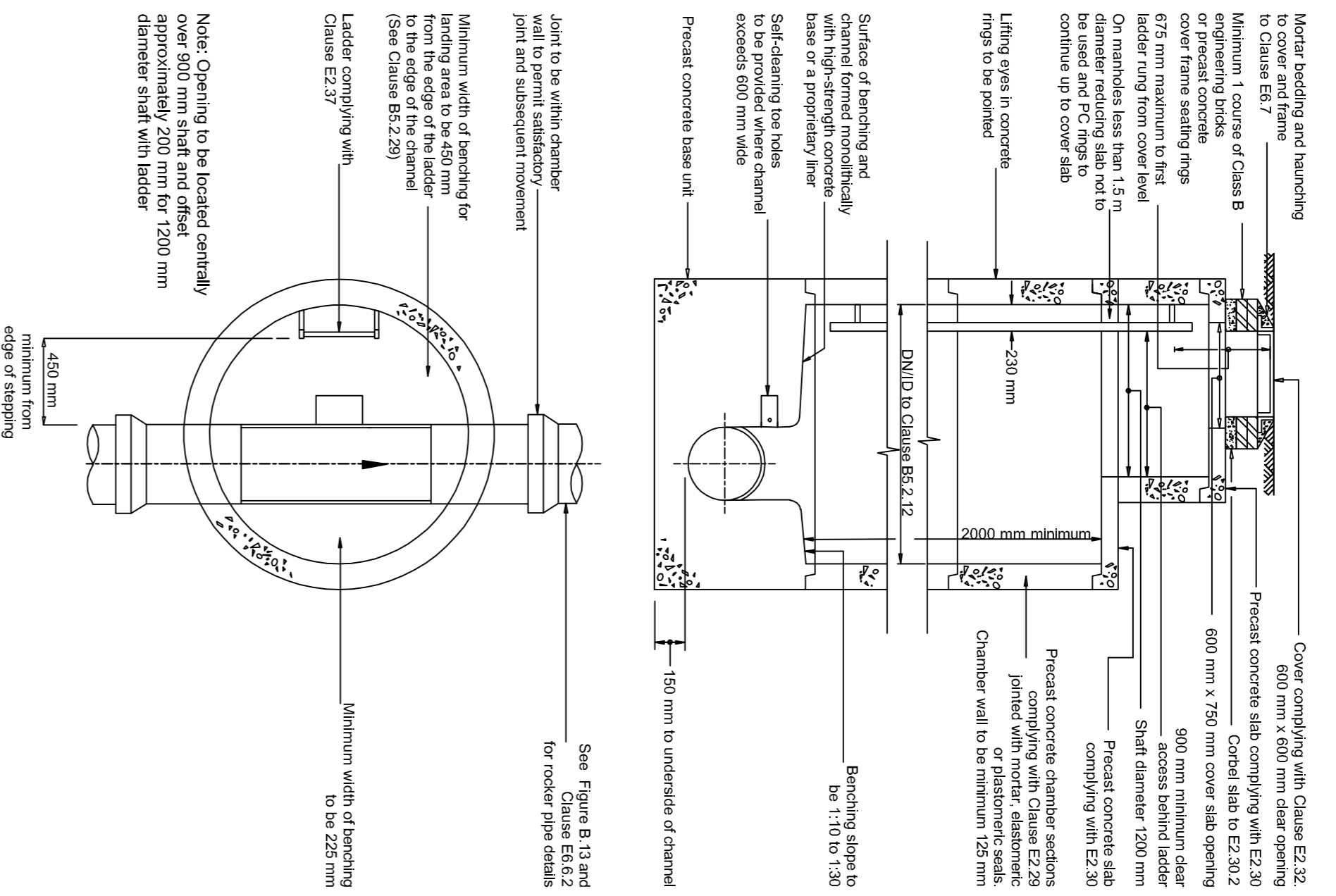


FIGURE B.18
TYPICAL INSPECTION CHAMBER DETAIL - TYPE D
 Depth from cover level to soffit of pipe up to 3 m
 Flexible material construction for use in areas subject to vehicle loading

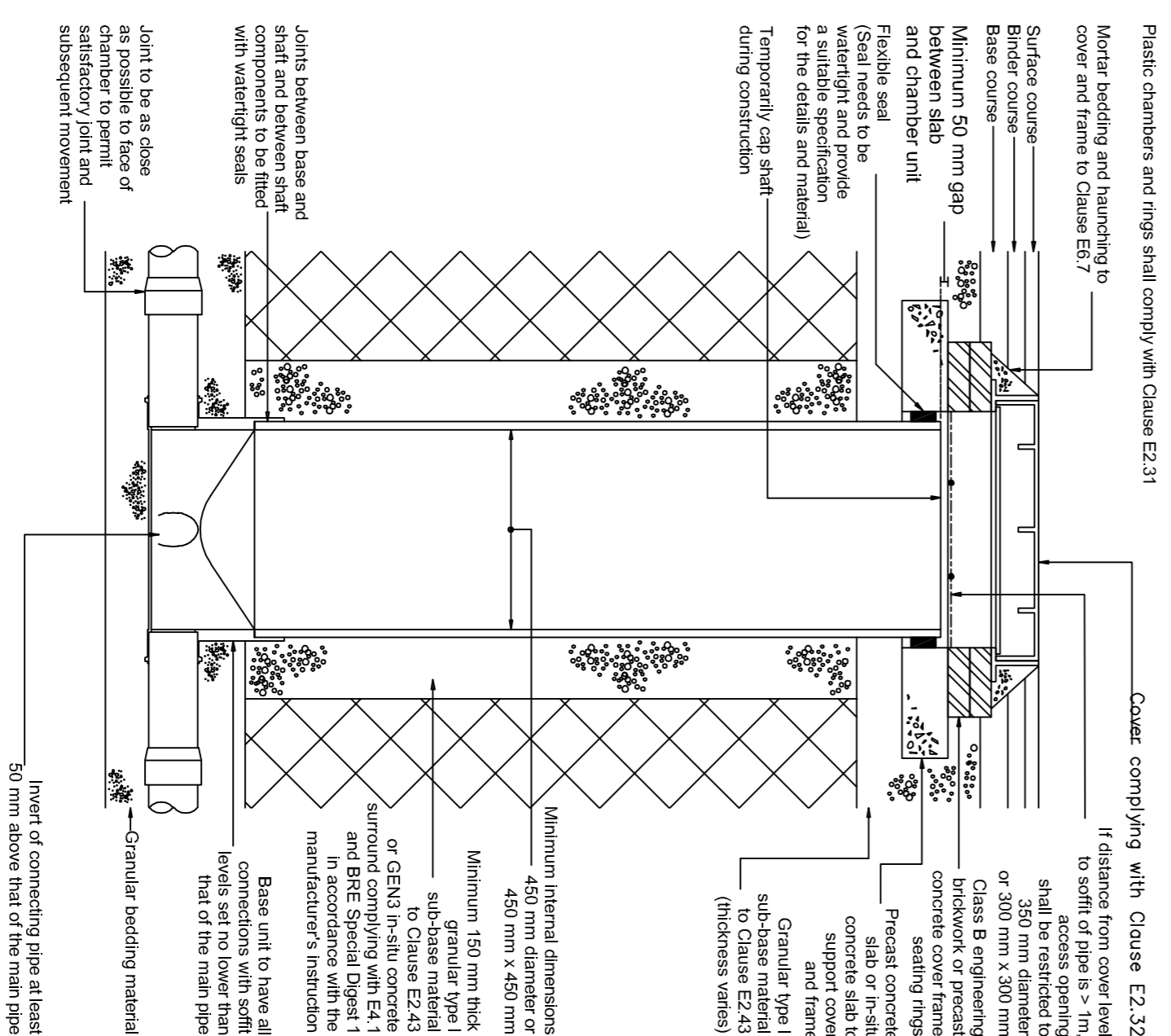


FIGURE B.9
TYPICAL MANHOLE DETAIL - TYPE B
 Depth from cover level to soffit of pipe 1.5 m to 3.0 m
 Rigid material construction without concrete surround

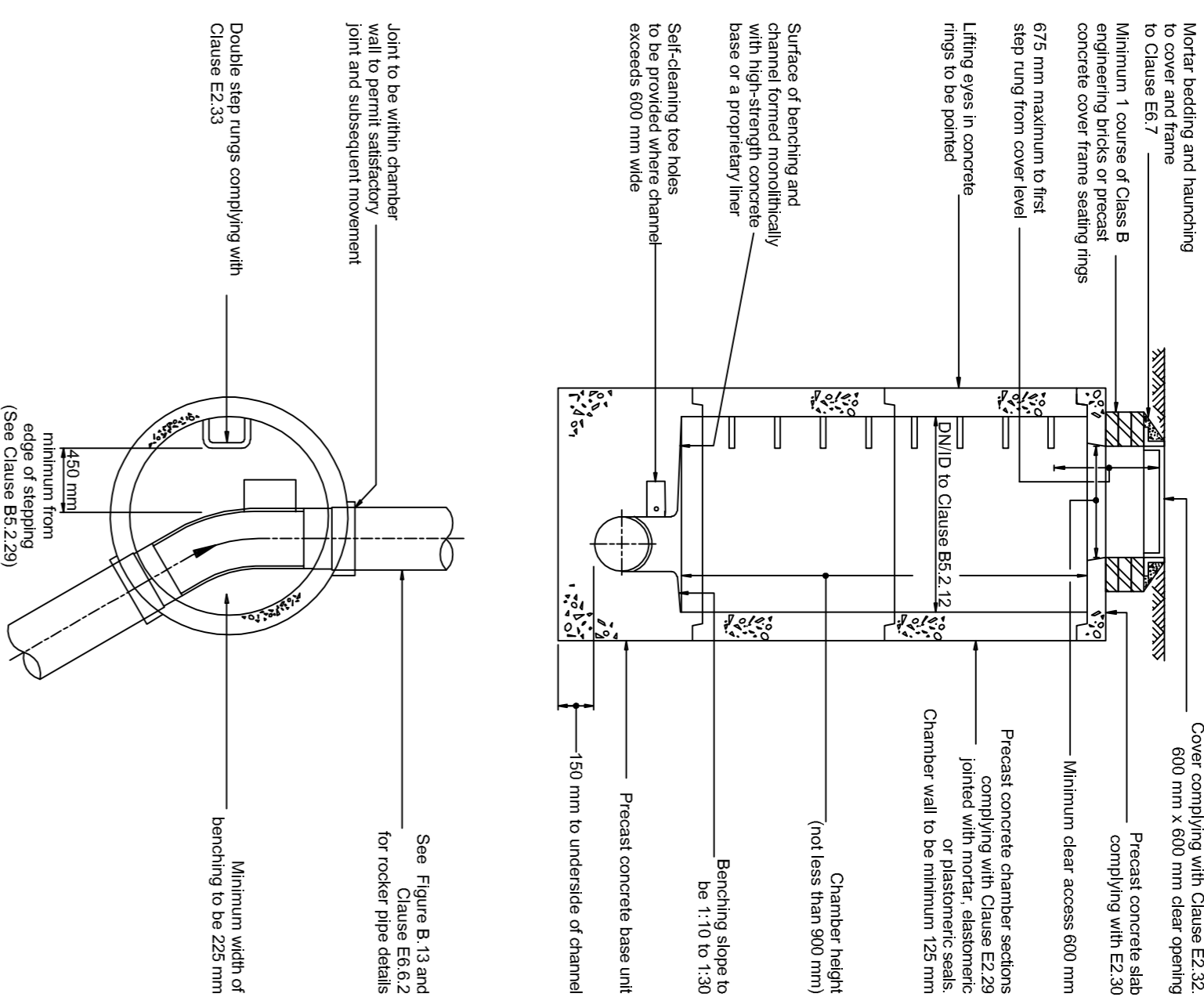


FIGURE B.19
TYPICAL INSPECTION CHAMBER DETAIL - TYPE D
 Flexible material construction alternative top details for use in areas of light vehicle loading
 or landscaped areas

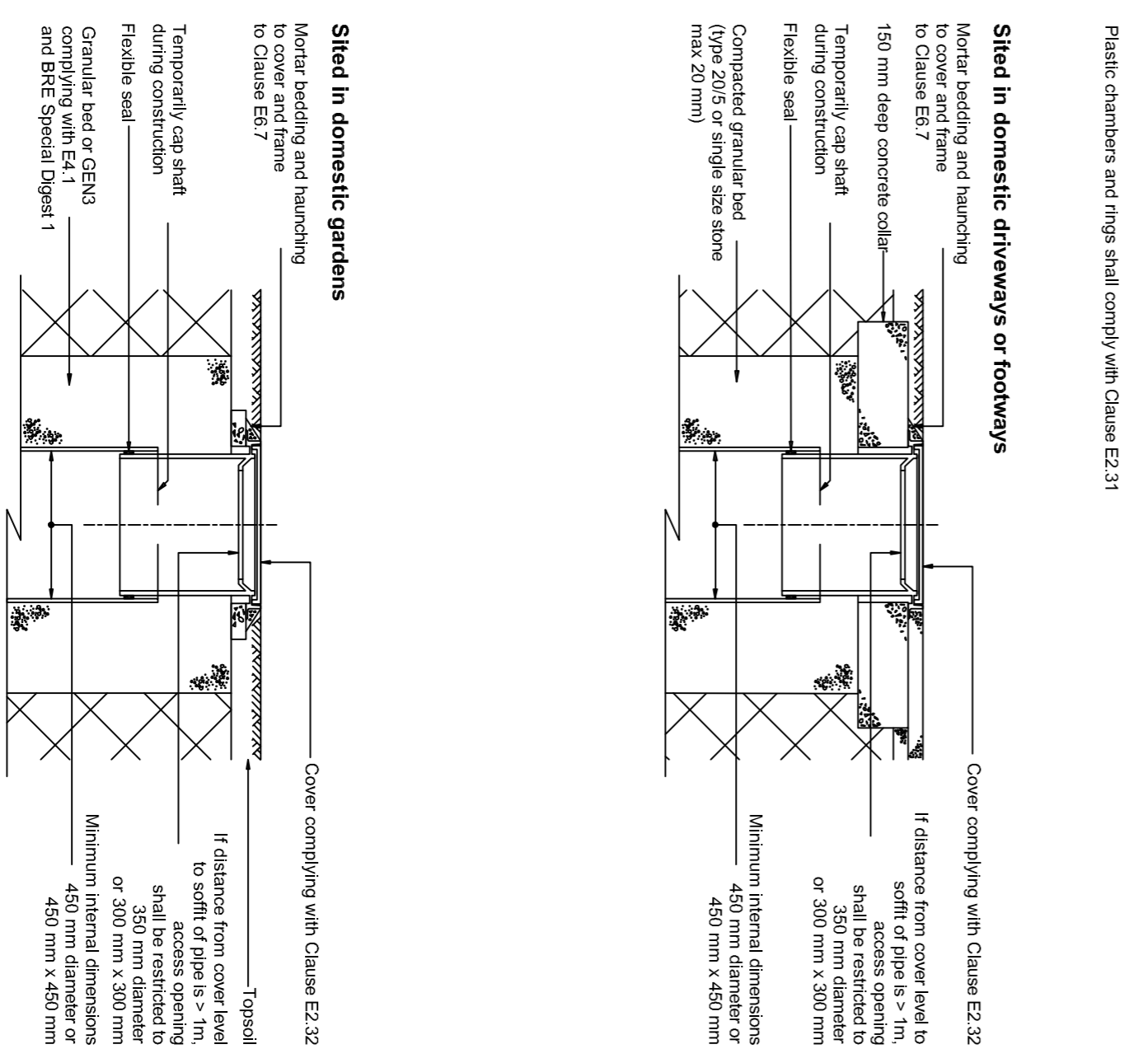


FIGURE B.15
TYPICAL MANHOLE DETAIL - TYPE C
 Depth from cover level to soffit of pipe less than 1.5 m
 Rigid material construction

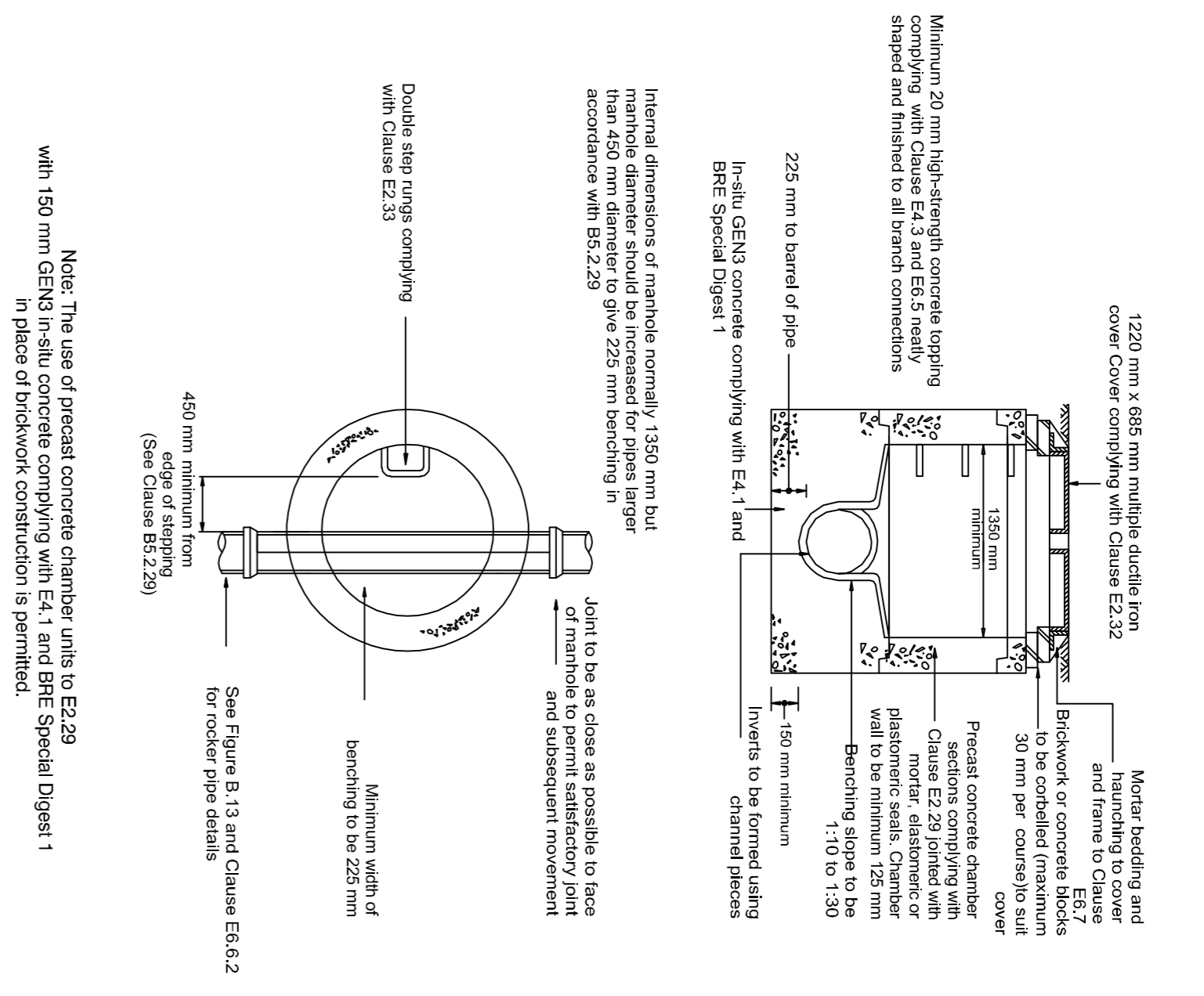


FIGURE B.23
TYPICAL INSPECTION CHAMBER DETAIL - TYPE E
 Depth from cover level to soffit of pipe up to 2 m
 Flexible material construction

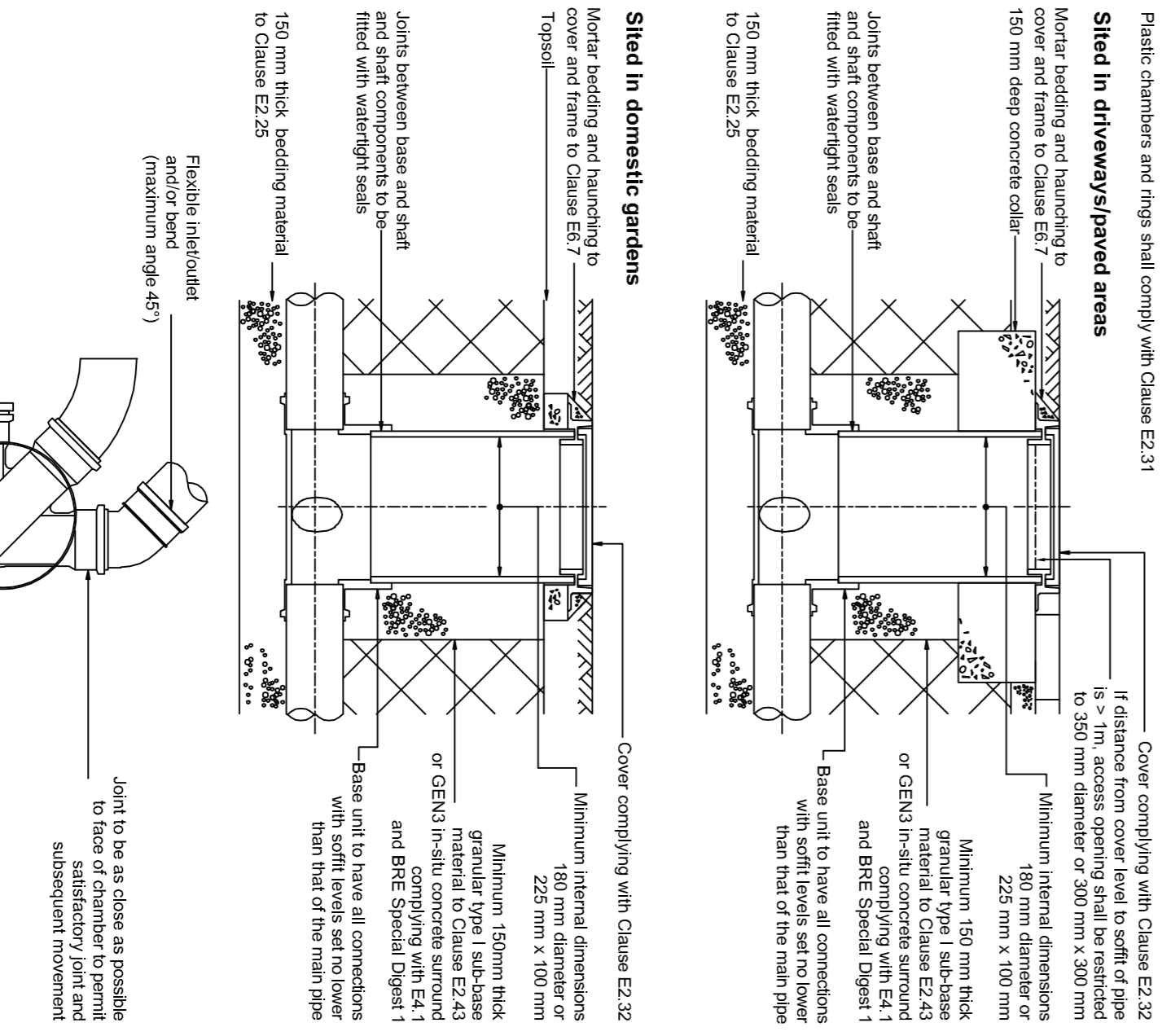


FIGURE B.16
TYPICAL VERTICAL AND RAMPED BACKDROP DETAIL (RIGID MATERIAL)
 For use in manhole types A to D
 Note: Slope gradients are preferred to the use of backdrops.
 Type of backdrop to be used to be agreed with the water company.

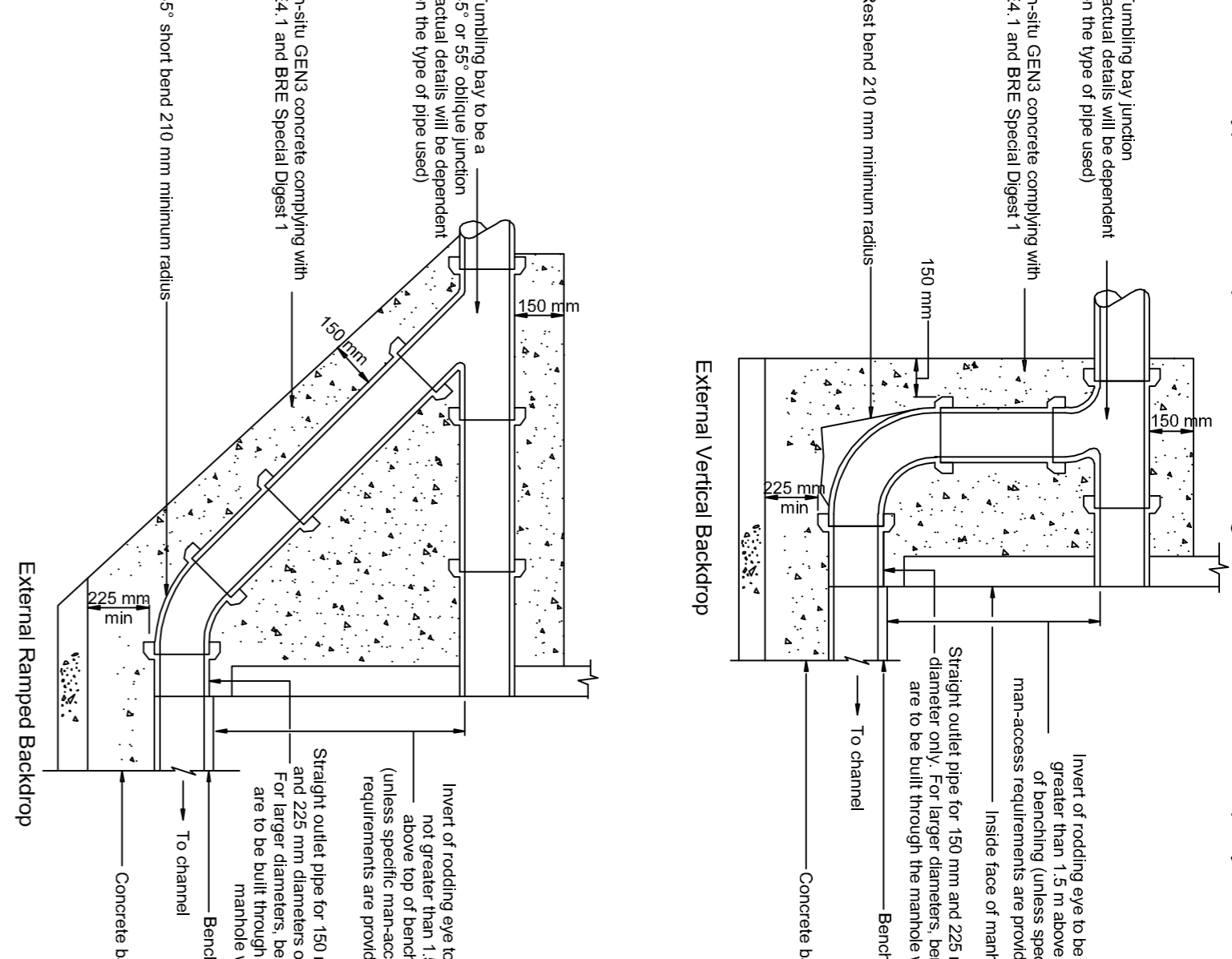
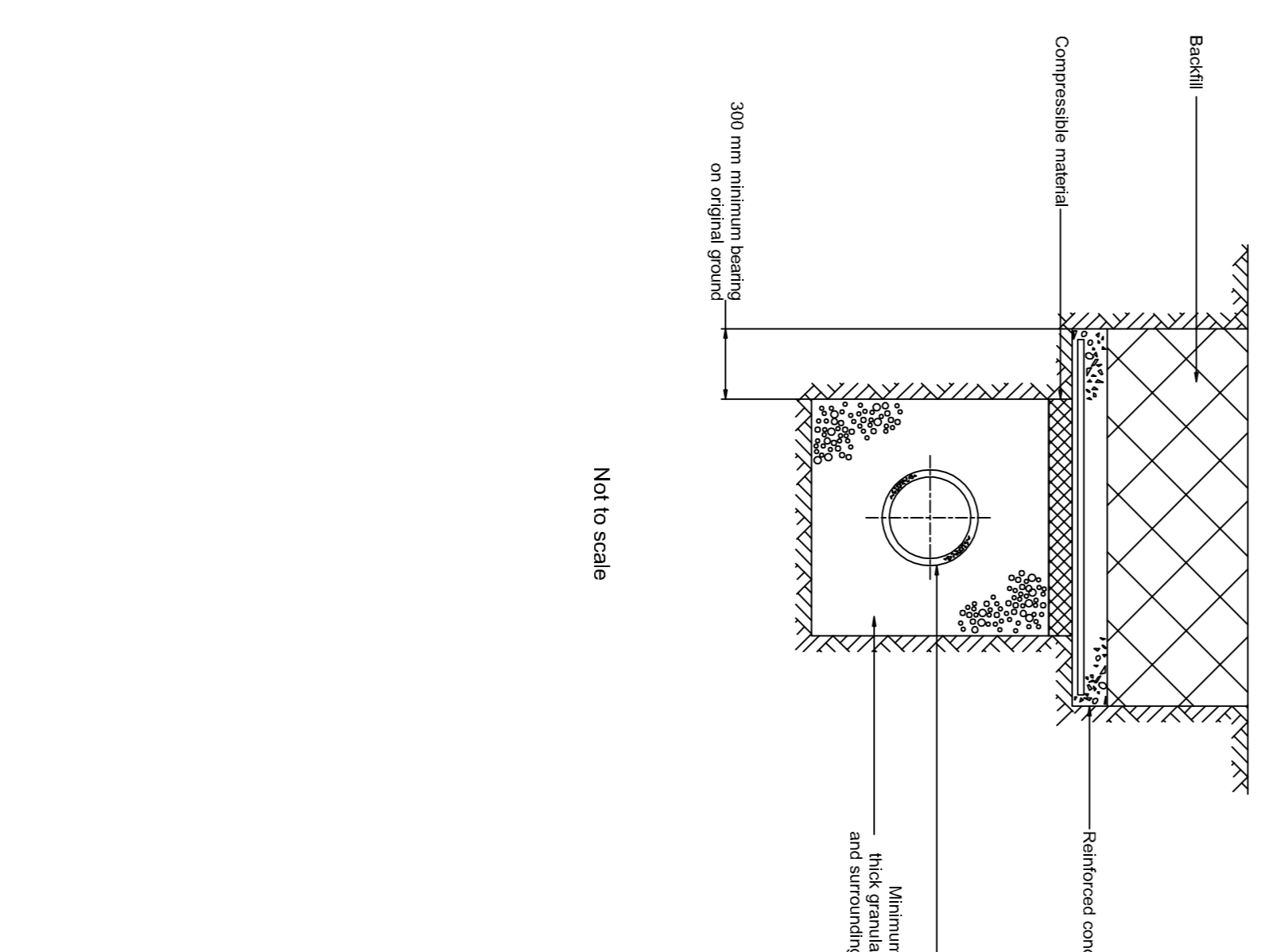


FIGURE B.27
PROTECTION OF PIPES LAID AT SHALLOW DEPTHS



Notes:

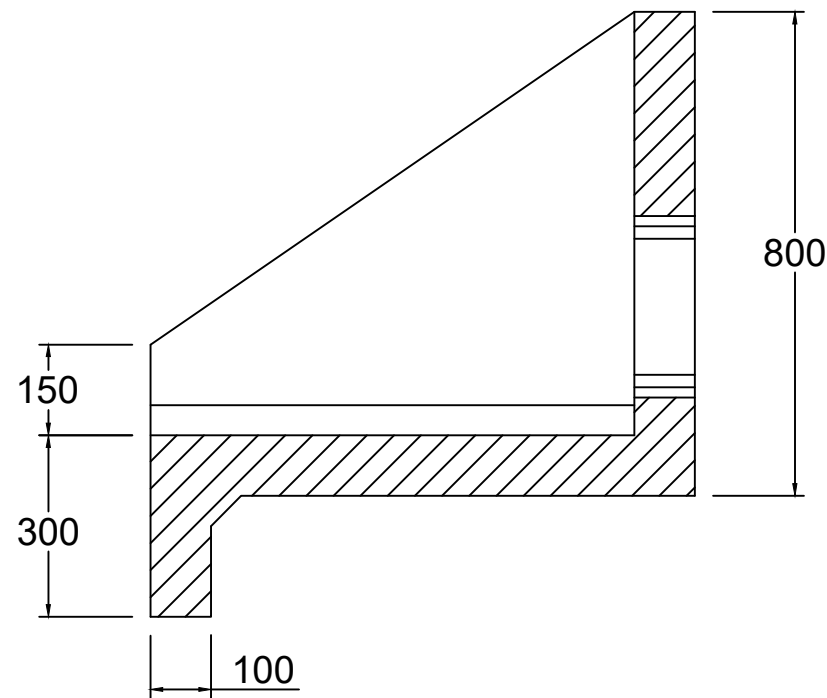
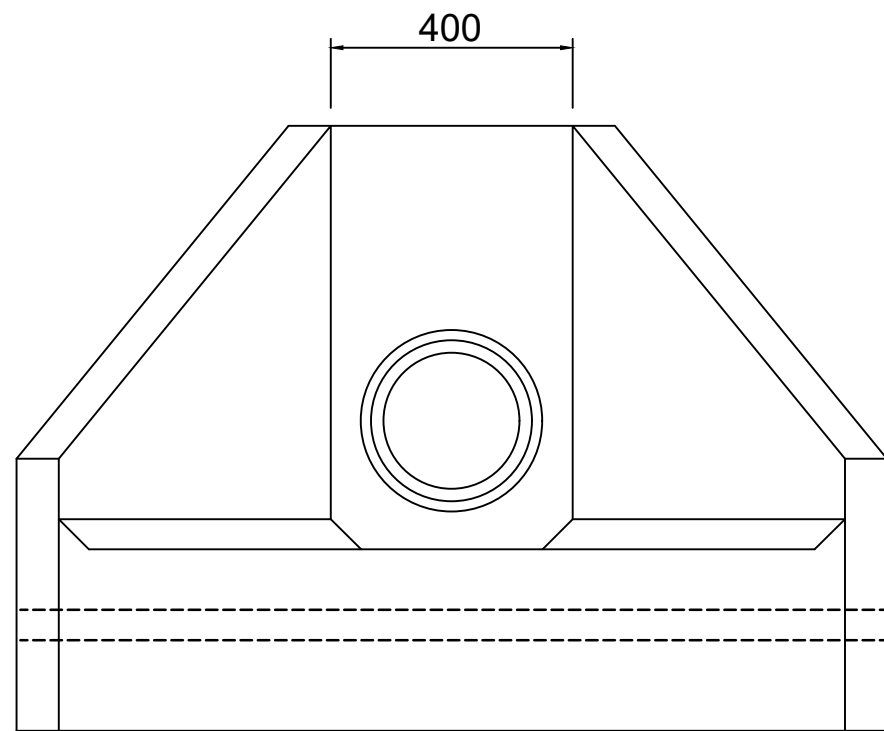
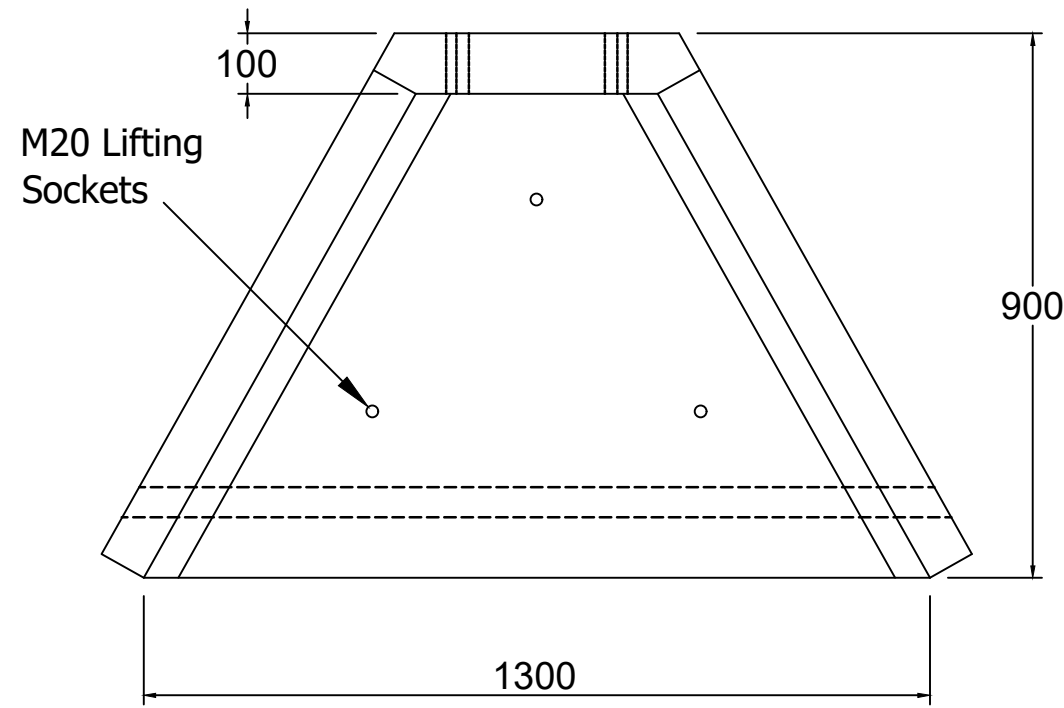
1. Manhole covers and frames shall comply with the relevant provisions of BS EN 124 and they shall be of non-slipping design which does not rely on the use of cushion inlets.
2. D400 covers shall be used in all locations where vehicle loading is expected.
3. All manhole covers shall be non-ventilating type and shall have closed keyways.
4. All details contained within this drawing comply with 'Sewerage Sector Guidance Design and Construction Guidance' and the requirements of Severn Trent Water.
5. UPVC pipework and fittings not to be used on diameter only. For larger diameters bends are to be built through the manhole wall of Severn Trent Water.
6. Compaction and backfill materials to sewer chambers shall generally be in accordance with clause 9.2.2.
7. To ensure that pipes do not float when concrete is poured, fill the pipes with water and if necessary provide side restraints.
8. Backfilling of sewer trenches should refer to Highway Construction Details (HCD) - Drawing F1 and the Specification for Highway Works (SHW) clause 505 which states that trenches should be backfilled with select material as Class B material to SHW clause 503.3(i) or Class 1, 2 or 3 general fill material complying with the 600 series, 49, Class 6F table 60.1. Pipe bedding/surround material shall be provided to the SHW clause 503.3(i) wall tamped under and along the pipe.
9. Type 'S' bedding detail and the concrete bed and surround (Type A) are to be in accordance with the Highway Construction Details (HCD) Appendix B, ref C. The concrete bed and surround should be specified with SHW clause 503.3(i) or Class ST2 concrete with vertical construction joints formed in a surround with face of each and every pipe joint using 18mm thick bitumen impregnated compressible fibroboard to BS 1142 Part 3 pre-cut to finished profile. Any gaps between spigot and socket shall be filled with resilient material to prevent entry of concrete.
10. An absolute minimum cover of 600mm shall apply to new pipes so that any 150mm concrete protection lies beneath the carriageway construction.
11. All non man entry manholes to have covers of a minimum of 450x450mm.
12. Precast concrete manhole ring are not to be cut under any circumstances.
13. All mortar haunching to be epoxy resin.
14. All brickwork and concrete rings not to be greater than 4 courses or sections.

Note: Where the access chamber is in the highway (including any footway), the highway authority can have specific requirements.

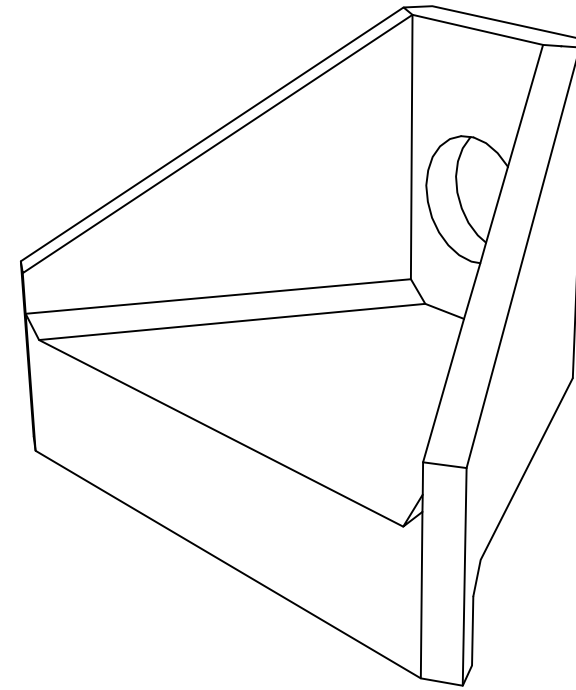
Not to scale

REV	BY	CHK	DESCRIPTION	DATE
			Client Bromford Homes	
PROJECT Proposed Residential Development at Snow Capel Farm, Gloucester				
TITLE Adaptable Drainage Details				
STATUS				
DATE March 2022				
SCALE A1				
DESIGNED BY TM				
DRAWN BY CW				
CHECKED BY EP				
ISSUING OFFICE ALDO A/E				
PROJECT OFFICE BROCKHAM PARK ROTHAMPTON GLOS				
ARCHITECTURE				
ENGINEERING				





Note: Isometric drawing is for reference only, details may not accurately represent actual design - please see detailed views for technical information



- NOTES:**
- All dimensions in mm
 - All measurements ± 1 mm

Specification Information

- Opening in back wall cast to suit outside diameter of the pipework
- Invert level of pipe can be set to your specification

Headwall Installation

Units should be bedded on minimum 150mm of semi-dry concrete.
Sit the headwall level or with a slight fall 1:50 from pipe to spill mouth.

Handling

- Weight of concrete is based on 2.4 tonne/m³+5% is recommended for sizing lifting equipment.
- All lifting points shall be used as specified below - Anchor points & loops - Total Qty: 3
- Unit to be lifted as per lifting diagram

Concrete

- Mix ref: Self-compacting DC4/DS4 Mix
- Lifting strength based on 2 cubes = 20N/mm²
- Characteristic 28 day cube strength = 50N/mm²
- Concrete provides Design Chemical Class 4 (DC4) to special Digest 1, Table F2.

Reinforcement

- Reinforcement to BS EN 13369
- Scheduling, dimensioning, bending & cutting to BS8666
- Cage to be machine tied with steel wire

Manufacture

- Manufacture to BS EN 15258:2008 precast concrete products - Retaining wall elements, Factory Production Control certificate number: 0086-CPR-650448 & BS EN 13369
- Tolerances to BS EN 13369 clause 4.3.1.1
- Finishing:
- Marking: Units shall be indelibly marked to show:
 - Mould reference code
 - De-mould date
 - Job reference number & unique product number
 - Unit weight (kg)

Design

- Concrete design to EC2
- Altho have designed the concrete units only, the site conditions should be assessed for suitability by the scheme designer
- Units are designed to withstand a vertical live load surcharge of 10kN/M²
- Weight of soil = 18kN/M²
- Angle of internal friction = 30 Deg.
- Design Life: >50 years

Fabrication Specification

- Manufacture IAW EN 1090-2 EXC CLASS 1
- Material grade is to be: BS EN 10025 S275
- Welding carried out IAW EN 1090-2 PARA 7.5.4 - 7.5.18
- All fillet and butt welds to have a minimum throat thickness of 6mm & joints to be fully welded where possible.
- Ensure vertical flats are fully welded both sides where possible.
- All sharp edges and burrs are to be removed.
- Remove all weld splatter.
- Holes by punching are permitted with reaming.
- Galvanising is carried out after fabrication to BS EN:ISO 1461

Handrail Specification

- Kee Klamp@Galvanised Size 8 Fittings
- Size 8 48.3mm OD 3.2mm Wall Thickness Galvanised Medium Duty Tube to BS EN 10255
- 360N/m Design Load at stated in BS 8118, BS 6180, BS 6399 & BS 7818, Civil Engineering Specification for the Water Industry (CESWI) 7th Edition Clause 2.60 Handrails & Balusters & The Engineering Equipment and Materials Users' Association (EEMUA) Publication 105 7th Edition Factory Stairways, Ladders and Handrails
- Other design loads available on request
- GRP/FRP Handrails also available

REV	BY	CHK	DESCRIPTION	DATE
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CLIENT **Bromford Homes**

PROJECT
Proposed Residential Development at Snow Capel Farm

STATUS **Planning**

TITLE
Headwall Details

DRG No. 3880-116 Rev:

SCALE: **NTS** DESIGNED BY: **CW**

SIZE: **A3** DRAWN BY: **CW**

DATE: **December 2022** CHECKED BY: **TM**

DEVELOPMENT DESIGN PARTNERSHIP
PLANNING ARCHITECTURE ENGINEERING

ISSUING OFFICE: ALSO AT:
BRIDGEND OFFICE: 8 OLD FIELD ROAD, BOCAM PARK, PENCOED, BRIDGEND, CF35 5LJ
BRISTOL OFFICE: STUDIO 23, KESTREL COURT, HARBOUR ROAD, PORTISHEAD, BS20 7AN

TEL: [REDACTED]
EMAIL: [REDACTED]
WEBSITE: [REDACTED]



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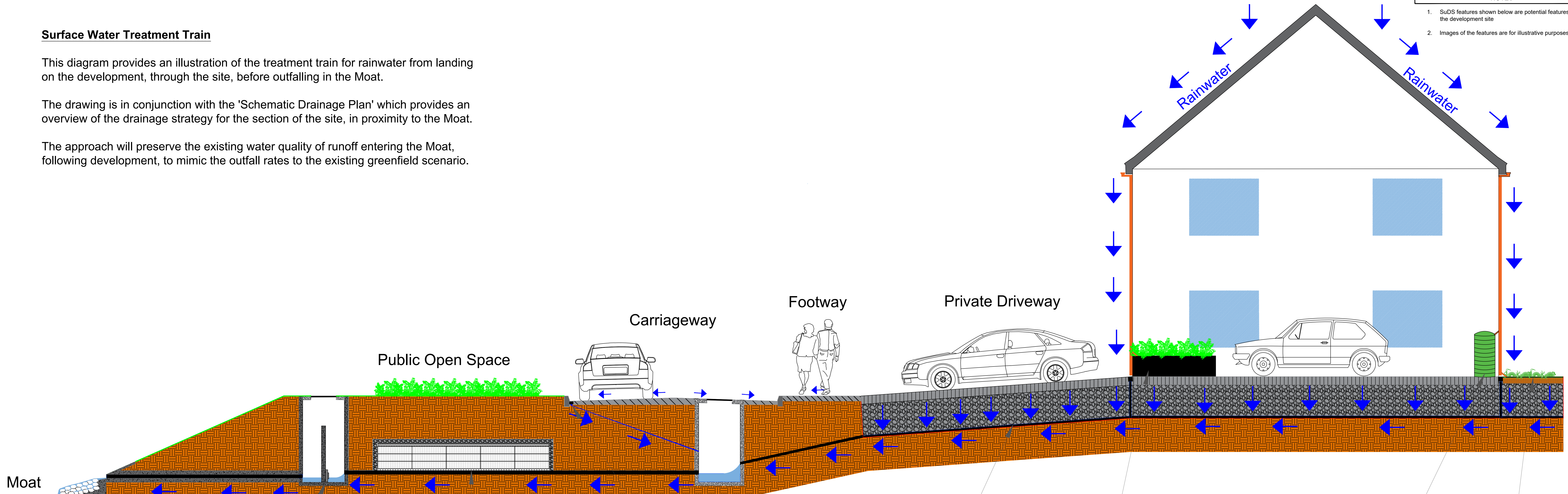
1. SuDS features shown below are potential features for the development site
2. Images of the features are for illustrative purposes only

Surface Water Treatment Train

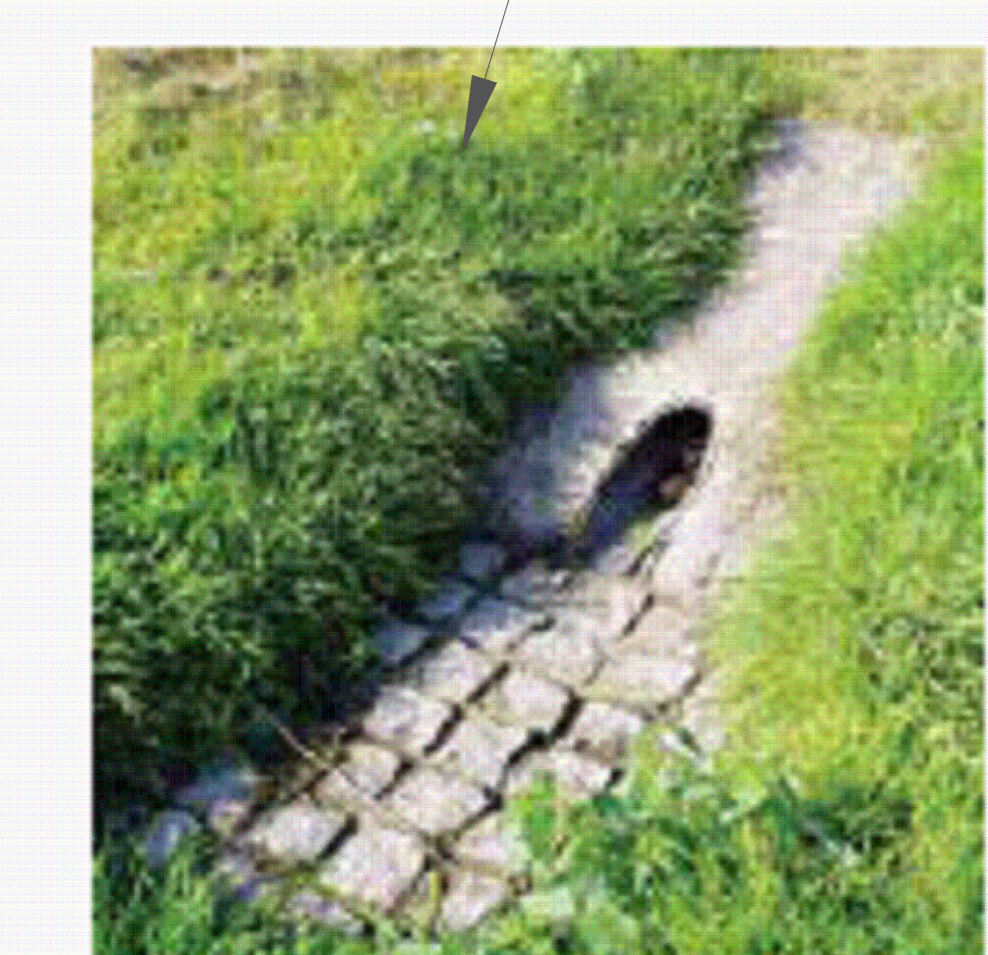
This diagram provides an illustration of the treatment train for rainwater from landing on the development, through the site, before outfalling in the Moat.

The drawing is in conjunction with the 'Schematic Drainage Plan' which provides an overview of the drainage strategy for the section of the site, in proximity to the Moat.

The approach will preserve the existing water quality of runoff entering the Moat, following development, to mimic the outfall rates to the existing greenfield scenario.



Spillway



Spillway
Used as the outfall to the Moat. When the surface water system is outfalling to the Moat the water will be distributed to a wider area via the spillway

Hydrobrake Flow Control on a weir wall



Hydrobrake
A Hydro-Brake flow control chamber is a self-activating vortex flow control with no moving parts and no power requirement.

It is used to control the forward flow of water from the storage to the Moat. This feature will be designed to ensure the litres/second flowing in to the Moat is at the same rate as the pre-development as to maintain the Moat's current water levels.

The weir wall provides an overflow area as an additional safety feature

Cellular Storage



Cellular Storage - Attenuation
An Attenuation Tank/storage is essentially a large container/detention tank acting as a buffer to store excess rainwater and remove the risk of flooding of a residential area in a controlled way.

Excess rainwater detained in a stormwater tank is then released at a controlled rate by the hydrobrake.

Gully with Silt Trap



Gully with Silt Trap
Silt traps are located upstream as part of an attenuation or infiltration drainage system.

The basket contained within the body of the silt trap captures and retains silt as well as any larger particles which may wash in to it and preventing any form of ingress into the SuDS drainage system.

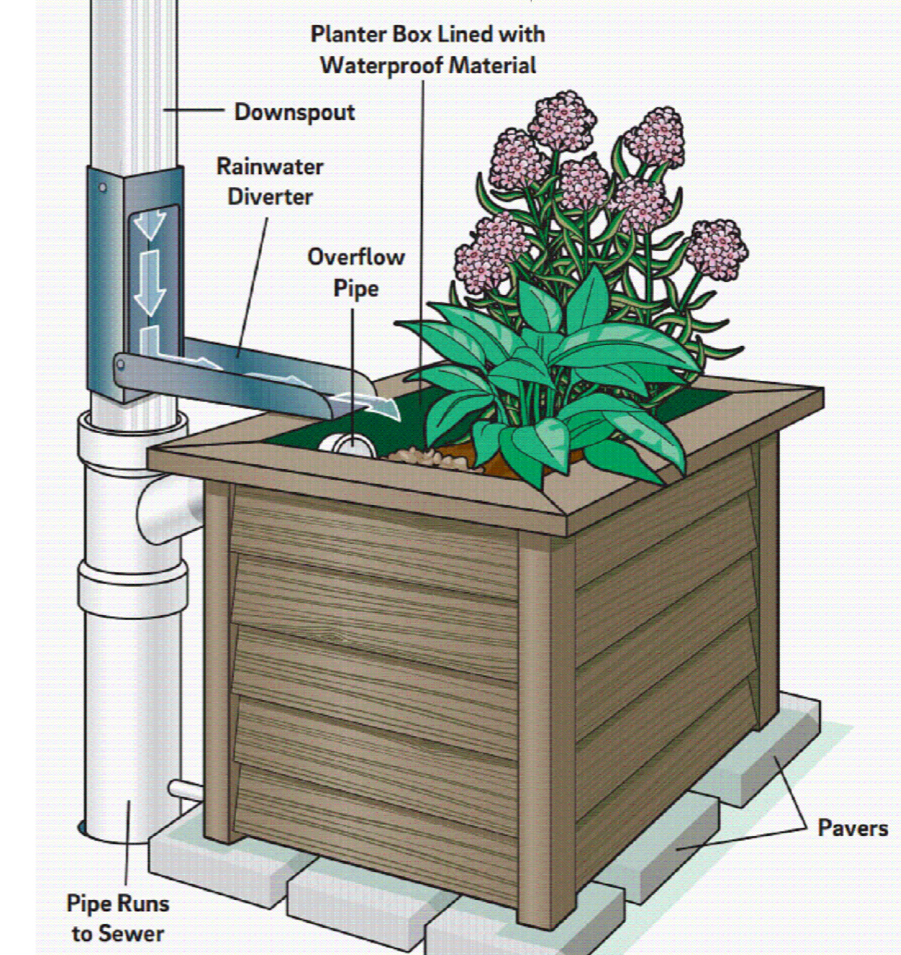
Permeable Paving



Permeable Paving
Permeable pavement is a pavement type with a porous surface that is composed of concrete, open pore pavers or asphalt with an underlying stone storage area. Also considered as green pavement, it allows water to run through it rather than accumulate on it or run off of it.

Permeable surfaces work by allowing water to soak through the surface into the ground below, improving water quality by removing solids as the water travels through the layers.

Suds Planter



SUDS Planter
SuDSPlanter helps tackle pollution by reducing the frequency of CSO discharges during rainfall events.

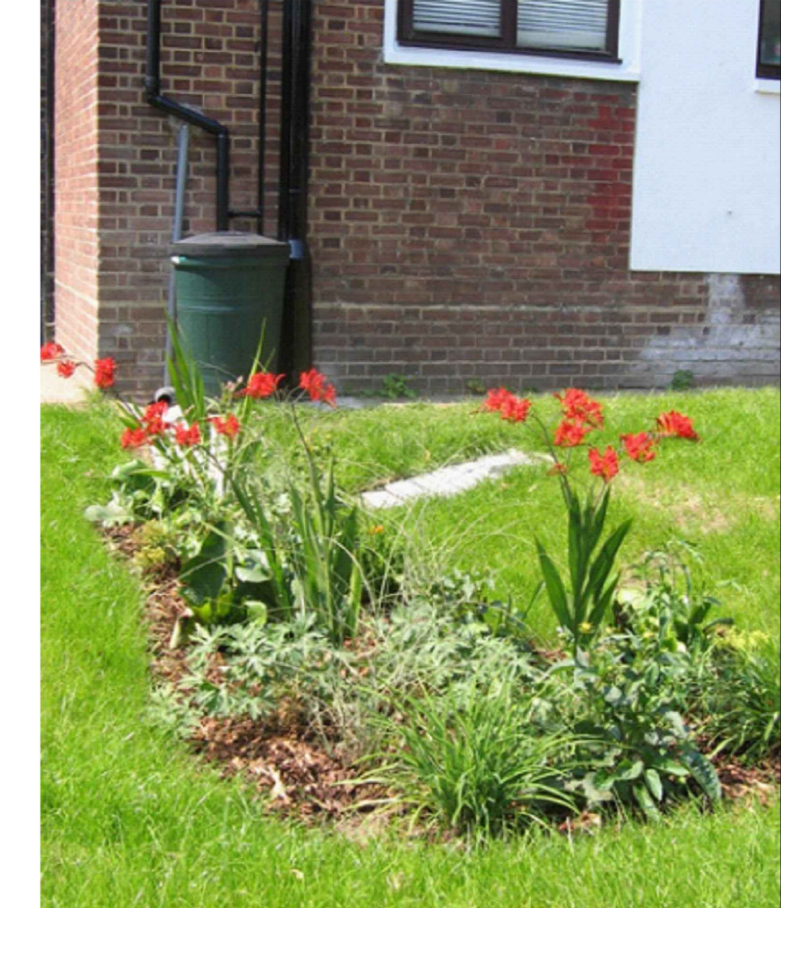
Connected to downpipes, the Planter can remove many of the pollutants often present in the runoff from roofs, such as sediment, bird droppings, metals from some roofing materials and deposits from air pollution.

Water Butt




Waterbutt
A water butt is essentially a big outside storage unit that catches rainwater. It has many benefits because rainwater is great for plants and it's an effective way to save on the water bills and reduce water waste and your carbon footprint

Private Rain Garden



Private Raingarden
A rain garden is a shallow area of ground or dip which receives run-off from roofs and other hard surfaces. It is planted with plants that can stand waterlogging for up to 48 hours at a time. More drought-tolerant plants are used towards the edges. Storm water fills the depression and then drains

REV	BY	CHK	DESCRIPTION	DATE
				
<small>8 Oldfield Road, Bocorn Park, Perceps, G15 5LJ</small>				
STATUS: For Information				
CLIENT: Bromford Homes				
DEVELOPMENT: Proposed Residential Development at Snow Capel Farm, Gloucester				
TITLE: Storm Water Treatment Plan				
SCALE (S): Not To Scale				
DATE: October 2022	DRAWN: TE	CHKD BY: CW	SIZE: A0	
DRAWING NUMBER: 3880-SK001		REVISION: -		