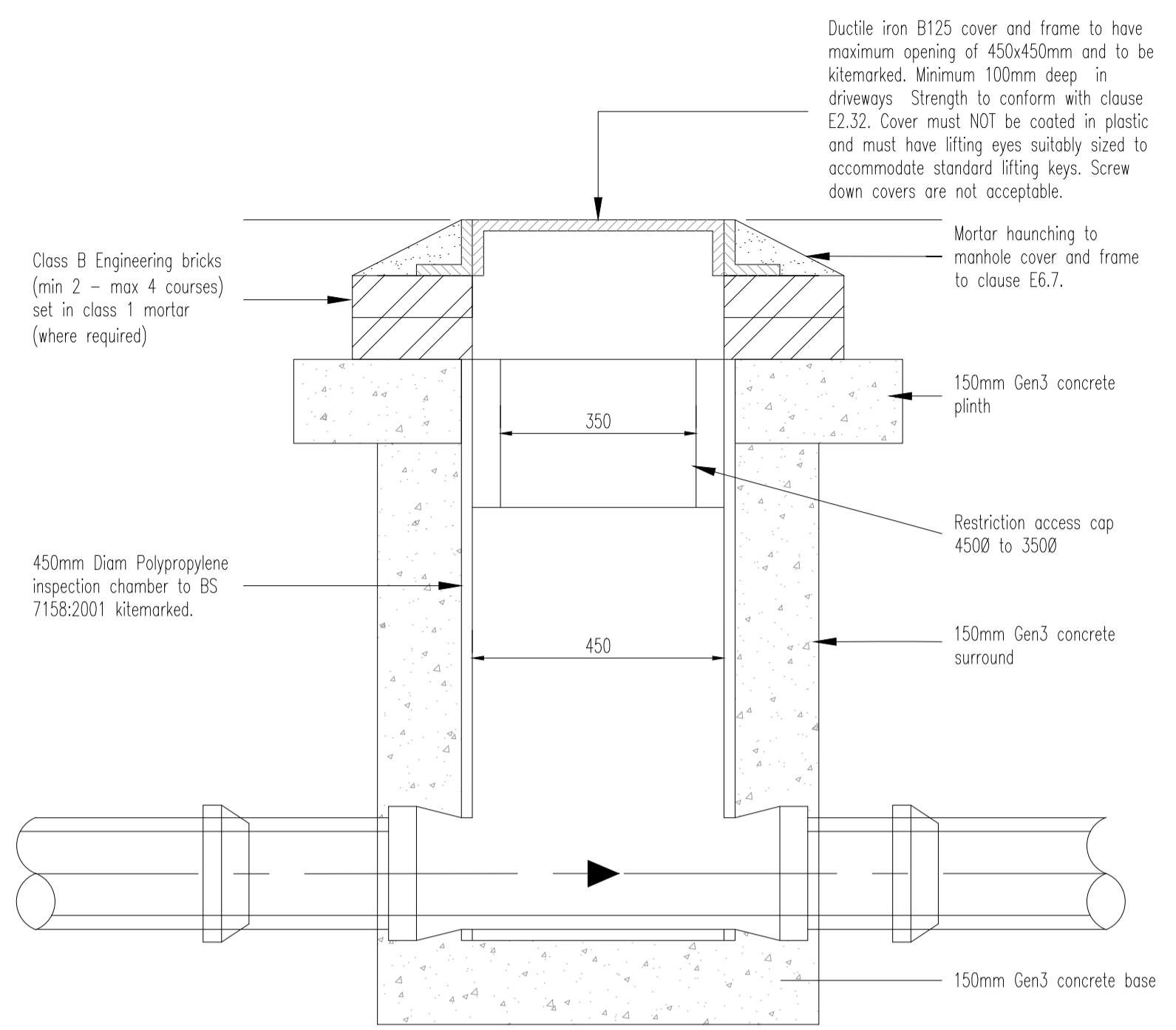


- Yorkshire Water Notes**
- All adaptable sewer works and material to be in accordance with "Code for Adoption", The Relevant British/European and Yorkshire Water's Standards/Requirements/Addendum to the Mechanical and Electrical Specification and Kitemarked.
  - Manhole covers shall/must have a clear opening of 600mm and shall be Class D400 to BS EN 124 with 150mm deep frames in highways.
  - Filled ground must be filled and consolidated under the supervision and to the satisfaction of Yorkshire Water before any sewer works are carried out.
  - Yorkshire Water is not obliged to accept filter drain/land drainage run-off into the public sewer network or adaptable drainage system (directly or in-directly). An alternative method of disposal of the land drainage run-off will therefore be required and you will have to liaise with the Local Authority, Land Drainage Section regarding the disposal of the filter drain/land drainage run-off.
  - The adaptable sewers should be a minimum of 1m and manholes 0.5m from kerb faces and service margins.
  - Sewers must have 5 metres clearance from trees and hedges or the width of the canopy at mature height.
  - Sewers to be laid in Class "S" Bedding (150mm granular bed and surround). Where depth of cover to top of the sewer is less than 1.2m in highways and verges (or less than 900mm in nonvehicular access areas) then a concrete slab should be provided above granular bed and surround.
  - Bedding and backfill material to conform to the requirement of Water Industry Specification 4-08-02 (Table A2).
  - Yorkshire Water policy is that Type "C" brick manholes and 1050mm diameter manhole rings are not preferred. Instead, it is preferred that you use a type "B" manhole with 1200mm diameter or 1500mm diameter rings, with the opening sited over the channel where depth of cover to pipe soffit is 1 - 1.5m.
  - Adaptable plastic sewer pipes to be BS1 Kitemarked (certified to WIS 4-35-01 and BS/EN13476). Adaptable plastic sewer pipes to be laid in maximum 3 metre lengths unless there is a specific operational need to lay longer lengths. Plastic channel sections in manholes are not acceptable and Yorkshire Water would require clay ware channel in manholes.
  - The minimum crushing strength for clay pipes should be as follows: 100mm dia. 40KN/m, 150mm dia. 40KN/m, 225mm dia. 45KN/m and 300mm dia. 72KN/m. The minimum crushing strength for concrete pipes should be - (Class 120 to EN 1916/BS5911-1 2002). Plastic pipes should conform to WIS 4-35-01 and BS EN13476.
  - Where a B125 cover and frame has been approved, this must not be coated in plastic and must have lifting eyes suitably sized to accommodate standard lifting keys. Screw down covers are not acceptable.
  - There must be enough clearance of crossovers to accommodate bedding to both pipes, approx. 300mm - if crossover is near the rocker then the clearance needed may need to be increased.
- General Notes**
- Precast concrete manhole units shall comply with the relevant provisions of BS EN 1917 and BS 5911-3 and shall be manufactured from concrete with a Design Chemical Class DC-4 unless the sewerage company can be satisfied that a lower class will resist attack from soils and groundwater. Units which bed into bases shall be manufactured so that imposed vertical loads are transmitted directly via the full wall thickness of the unit. The profiles of joints between units and the underside of slabs shall be capable of withstanding applied loadings from such slabs and spigot-ended sections shall only be used where the soffit of the slab is recessed to receive them.
  - All levels of existing drainage to be confirmed prior to work commencing on site.
  - The contractor must allow for any fees required for road and sewer opening permits, sewer connections and make the appropriate applications.

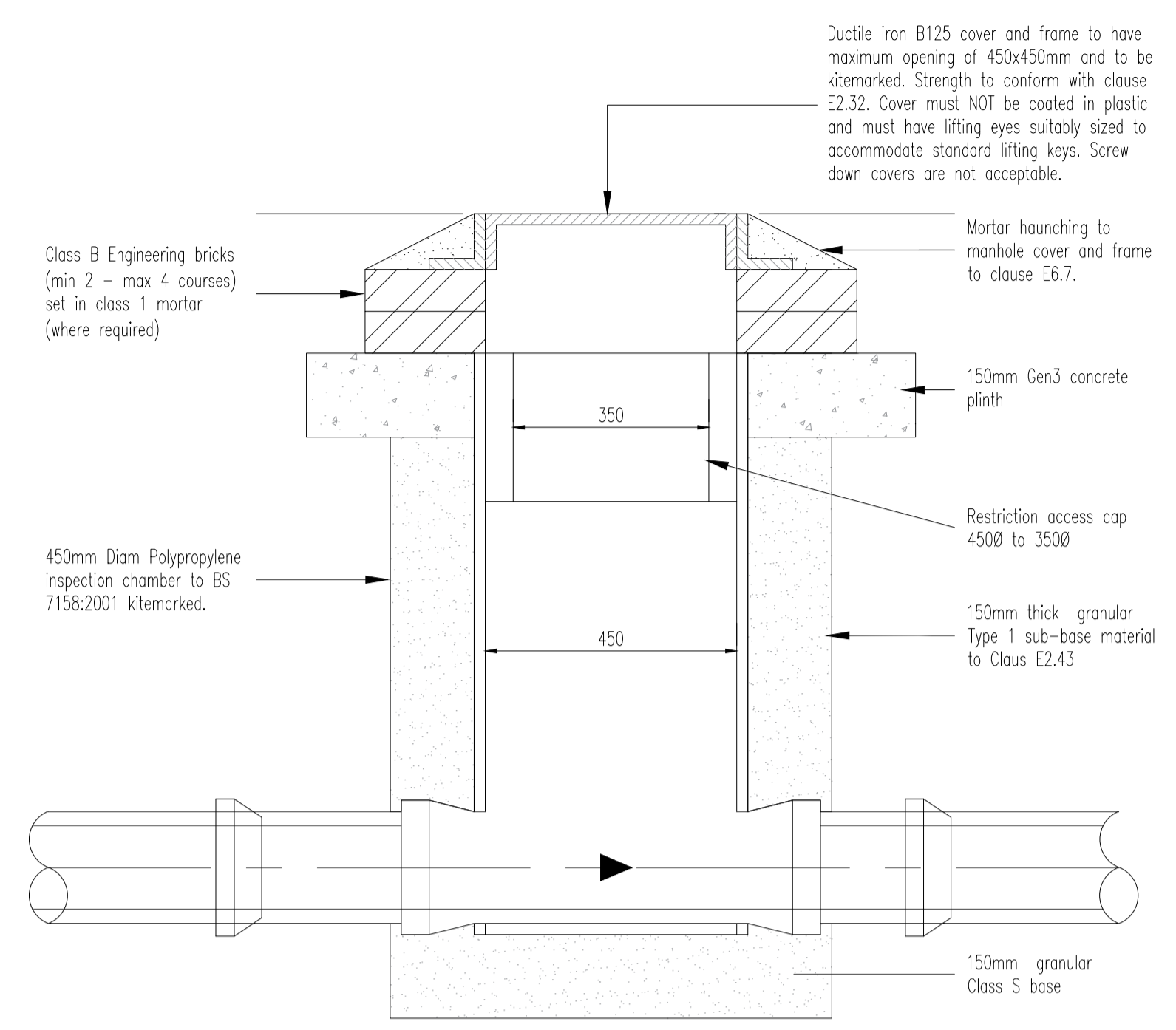


DEMARICATION CHAMBER LOCATED IN DRIVEWAY (1:10)

For depth of chamber greater than 1200mm maximum depth 3000mm

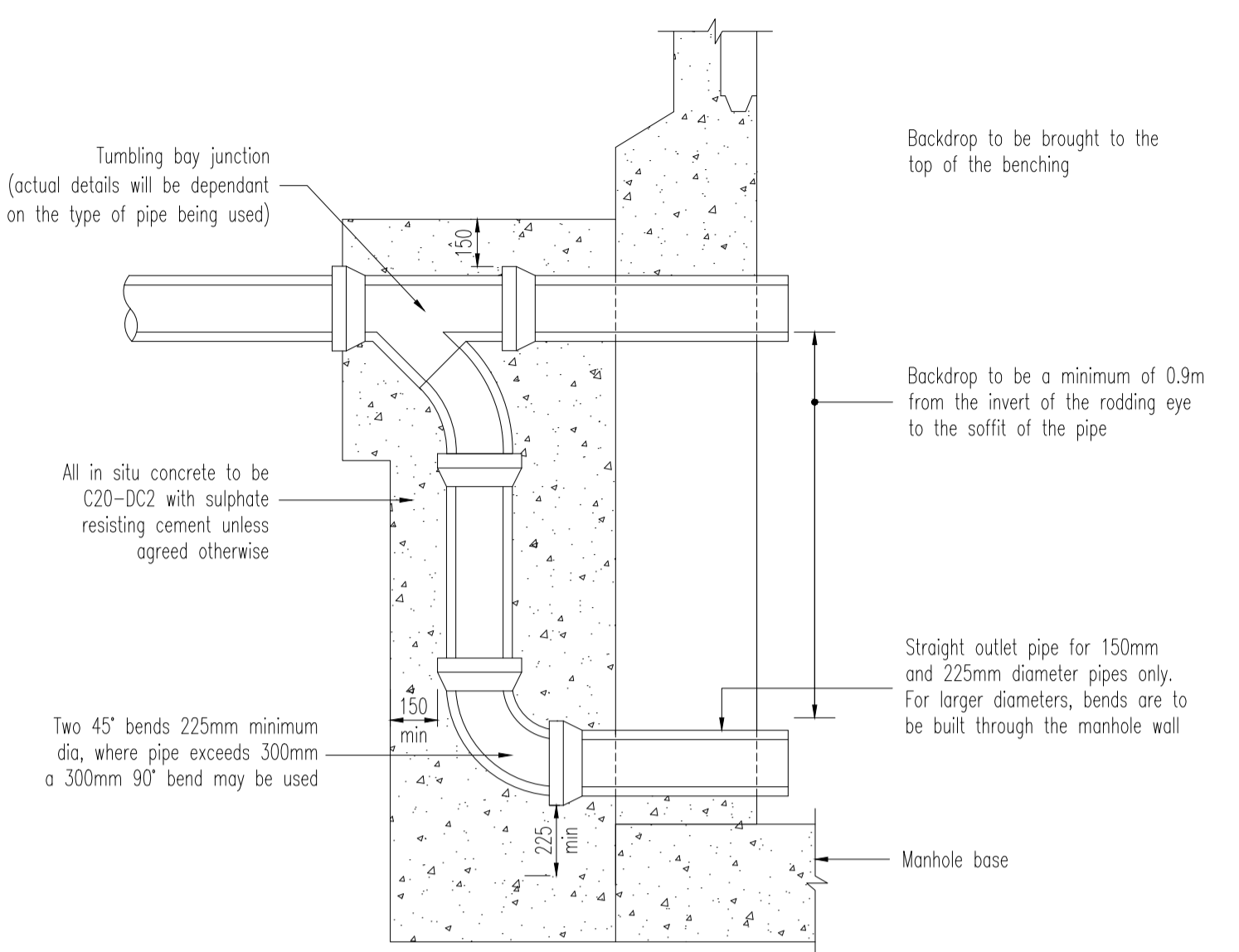
Note:  
Where depth to soffit exceeds 2.0m on the lateral connections a type B manhole is to be installed

**NOTE**  
Lateral sewers to be Plastidrain (110 & 160 O.D.) in UPVC manufactured by Hepworth and approved by Yorkshire Water. Demarcation chamber to be polypropylene Non-Entry Inspection Chamber up to 2.0m depth manufactured by Wavin and approved by Yorkshire Water to BS EN 13598-1:2003.



DEMARICATION CHAMBER LOCATED IN GARDENS (1:10)

For depth of chamber greater than 1200mm maximum depth 3000mm



TYPICAL BACKDROP DETAIL (1:20)

Extract from Table A2 WIS 4-08-02

Processed granular bedding and sidefill materials for flexible pipes.

Pipe nominal bore (mm) see note (d)	Nominal maximum particle size (mm)	Materials specified in British Standards see note (a)
100	10	10mm nominal single size
Over 100 to 150	15	10-14mm nominal single size or 14mm to 5mm graded
Over 150 to 300	20	10-14mm or 20mm nominal single size or 14mm to 5mm graded or 20mm to 5mm graded
Over 300 to 500	20	14 or 20mm nominal single size or 14mm to 5mm graded or 20mm to 5mm graded
Over 550	40	14 - 20mm or 40mm nominal single size or 14mm to 5mm graded or 20mm to 5mm graded or 40mm to 5mm graded

- Notes:
- Processed granular materials to include aggregates to BS 882, air-cooled blast furnace slag to BS1047 and lightweight aggregates to BS 3797
  - For the purpose of this table, PE pipe of 630mm O.D. can be regarded as having nominal bores of over 550mm, irrespective of wall thickness.
  - Nominal bore is used in preference to DN because of the different nominal size classifications for flexible pipes

Minimum recommended trench widths for structured wall pipes in poor ground conditions

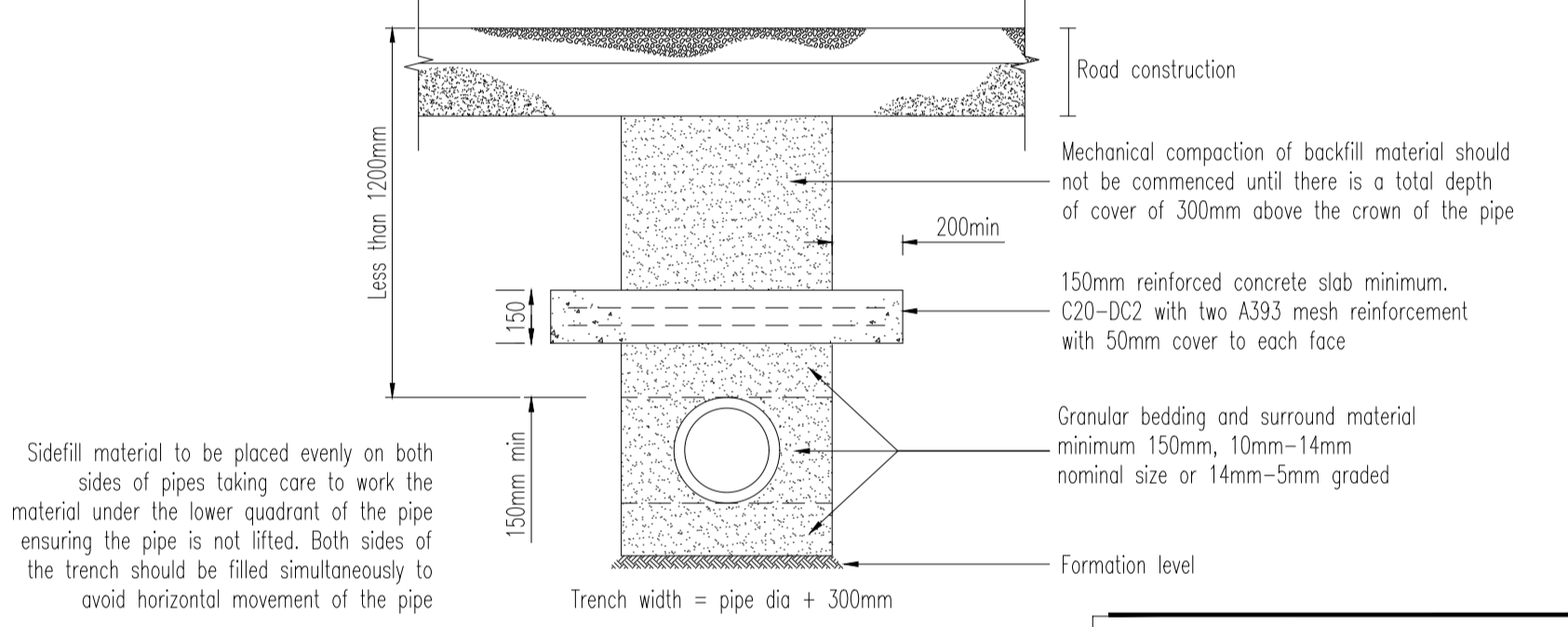
Native Soil Modulus between 3 and 4 Mpa  
Typical Soil Classifications : Very loose gravel, loose sand, medium dense clayey silty sand, firm clay

Nominal Pipe Diameter (mm)	150	225	300	375	450	525	600	750	900
Minimum Trench Width (mm)*	450	525	600	750	900	1050	1200	1500	1800

\* A vertical trench face has been assumed to allow a modulus of 7 Mpa to be achieved for the pipe bedding and sidefill material.

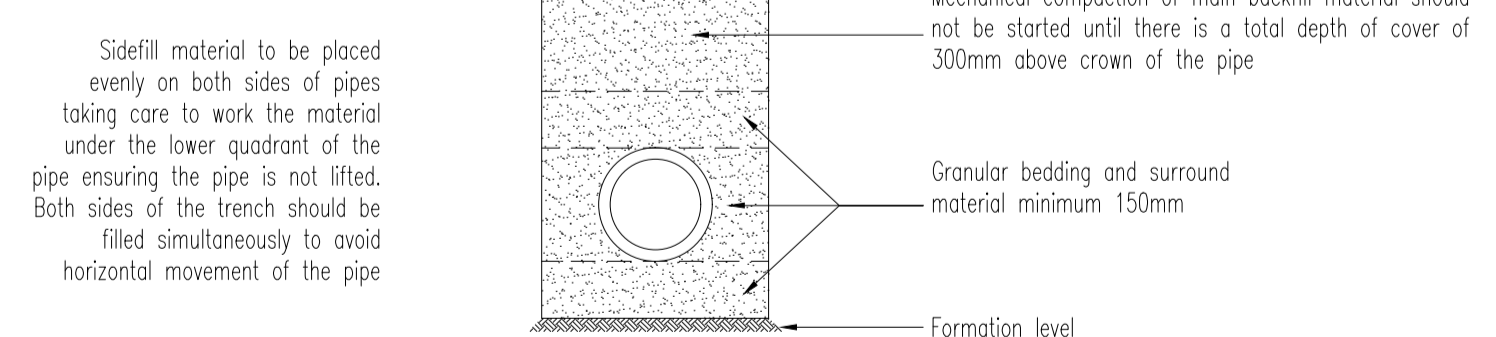
Other assumed values:	Depth of cover	Traffic Loading	Pipe stiffness
	= 6.0 metres (max)	= Main Road	= SNB

Note. Where the native soil modulus is below 3Mpa or the depth of cover exceeds 6 metres guidance should be sought from the pipe manufacturer regarding structural design and installation details.

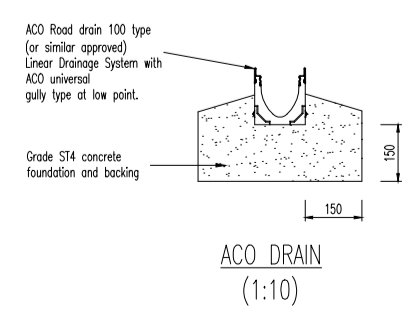


CONCRETE PROTECTION FOR PIPES AT DEPTHS OF COVER LESS THAN 1.2m (1:20)

Any trench box/sheeting to terminate 150mm above crown of pipe to prevent displacement of granular material. Boxing/sheeting to be removed progressively during placement of main backfill



TYPICAL DETAIL THROUGH CLASS S BEDDING (1:20)



ACO DRAIN (1:10)

SUBJECT TO THE APPROVAL OF ALL RELEVANT AUTHORITIES

Manufacturer List

PIPES				
Product Name	Diameter (mm)	Manufacturer	Material	
Superleve	100 & 150 (I.D.)	Hepworth	Vitrified Clay	
Superseal	150 & 225 (I.D.)	Hepworth	Vitrified Clay	
Denseleve	100,150 & 225 (I.D.)	Naylor	Vitrified Clay	
Denseal	100,150 & 225 (I.D.)	Naylor	Vitrified Clay	
Ultra-Drain	110 & 160 (O.D.)	Uponor	uPVC	
Plastidrain	110 & 160 (O.D.)	Hepworth	uPVC	
OsmaDrain	110 & 160 (O.D.)	Wavin	uPVC	
Osma UltraRib	150 & 225 (I.D.)	Wavin	uPVC	
Solid Wall	110 & 160 (O.D.)	Marley	uPVC	
Quantum	150 & 225 (I.D.)	Marley	uPVC	
Underground Drain	110 & 160 (O.D.)	Polypipe	uPVC	
Ridgisewer	150 & 225 (I.D.)	Polypipe	uPVC	

Demarcation Chamber				
Manufacturer	Product Name	Material	Max depth	Cover Type
Naylor	Plastic Inspection Chamber	Polypropylene	Up to 1200mm	Class B125
Hepworth	PPIC	Polypropylene	Up to 1200mm	Class B125
Uponor	Inspection Chamber (450mm Ø)	Polypropylene	Up to 1200mm	Class B125
Marshalls	Inspection Chamber To BS 5911 pt 2	Precast concrete	Up to 1000mm	Class B125
Wavin	Osma UltraRib Inspection Chamber	Polypropylene	Up to 1200mm	Class B125
Wavin	OsmaDrain Universal Inspection Chamber	Polypropylene	Up to 1200mm	Class B125
Wavin	Non Entry Inspection Chamber	Polypropylene	Up to 2000mm	Class B125
Marley	Inspection Chamber (450mm Ø)	Polypropylene	Up to 1200mm	Class B125
Polypipe	110 Inspection Chamber (460mm Ø)	Polypropylene	Up to 1200mm	Class B125
Polypipe	Non man Entry Deep Inspection Chamber System	Polypropylene	Up to 2000mm	Class B125

Note:  
Where a B125 cover and frame has been approved, this must not be coated in plastic and must have lifting eyes suitably sized to accommodate standard lifting keys. Screw down covers are not acceptable.

Rev	IC	MI	MI
/	14.11.25	Preliminary issue	
By	Date	Revision	Chk

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ARP Associates is a trading division of ARP Geotechnical Ltd, a company registered in England and Wales with company number 371333, whose registered office is at 5/6 Northwest Business Park, Servia Hill, Leeds LS6 2QH

TITLE  
TYPICAL DRAINAGE DETAILS SHEET 2 OF 2

PROJECT  
COCKLEY HILL, KIRKHEATON

CLIENT  
GLEESON HOMES

DRAWING STATUS  
APPROVAL

Scale AS SHOWN @ A1 Date NOV 25 Drawn IC Chk. MI

Dwg. No. 2298/03/07.02 Rev /