

TABLE 1: PROCESSED AND AS-DUG GRANULAR BEDDING AND SIDEFILL MATERIALS FOR RIGID PIPES

Pipe nominal size (DN)	Nominal maximum particle size (mm) See note (c)	Class of bedding See note (d)	Suitable Materials	
			EITHER: Maximum CF value for acceptability See note	OR: Materials specified in British Standards See note (a)
100	10	S B F	0.15 0.30 0.15	10mm nominal single-size
Over 100 to 150	16	N	0.30	Fine aggregate
		S B F	0.15 0.30 0.15	10mm or 14mm nominal single-size or 14mm to 5mm graded
Over 150 to 300	20	N	0.30	Fine aggregate
		S B F	0.15 0.30 0.15	10, 14 or 20mm nominal single-size or 14mm to 5mm graded or 20 to 5mm graded
Over 300 to 550	20	N	0.30	All-in aggregate or fine aggregate
		S B F	0.15 0.30 0.15	14mm or 20mm nominal single-size or 14mm to 5mm graded or 20 to 5mm graded
Over 550	40	N	0.30	All-in aggregate or fine aggregate
		S B F	0.15 0.30 0.15	14, 20 or 40mm nominal single-size crushed rock or 14mm to 5mm, 20 to 5mm or 40 to 5mm graded
		N	0.30	All-in aggregate or fine aggregate
		S B F	0.15 0.30 0.15	14, 20 or 40mm nominal single-size crushed rock or 14mm to 5mm, 20 to 5mm or 40 to 5mm graded

TABLE 2: PROCESSED GRANULAR BEDDING AND SIDEFILL MATERIALS FOR FLEXIBLE PIPES

Pipe nominal bore (mm) (See note (d))	Nominal maximum particle size (mm)	Suitable Materials		
		EITHER: Maximum CF value for acceptability See note (b)		OR: Materials specified in British Standards See note (a)
		Non-pressure pipe	Pressure pipe	
100	10	0.15	0.30	10mm nominal single-size
Over 100 to 150	16	0.15	0.30	10 or 14mm nominal single-size or 14mm to 5mm graded
Over 150 to 300	20	0.15	0.30	10, 14 or 20mm nominal single-size or 14mm to 5mm graded or 20mm to 5mm graded
Over 300 to 550	20	0.15	0.30	14mm or 20mm nominal single-size or 14mm to 5mm graded or 20 to 5mm graded
Over 550	40	0.15	0.30	14, 20 or 40mm single-size or 14mm to 5mm graded or 20mm to 5mm graded or 40 to 5mm graded.

Notes:

- (a) Processed granular materials to include aggregates to BS EN 13242.
- (b) Compaction Fraction value (CF), see Appendix B of WIs IGN No. 4-08-02.
- (c) For the purpose of this table, PE pipes of 630mm OD can be regarded as having nominal bores of over 550mm, irrespective of wall thickness.
- (d) Nominal bore is used in preference to DN because of the different nominal size classification for flexible pipes.
- (e) For PE80 and PE100 polyethylene pipe complying with current relevant Water Industry Specifications, the maximum sidefill particle size may be increased to 10% of the pipe nominal size.
- (f) For E' values for processed granular materials reference should be made to Table A.3 of WIs IGN No. 4-08-02 where specific site tests have not been performed.
- (g) For ferrous cementitious pipeline materials, the sulphate content of bedding and sidefill materials should not be greater than 0.3% as sulphur trioxide.

Trench Backfill Material

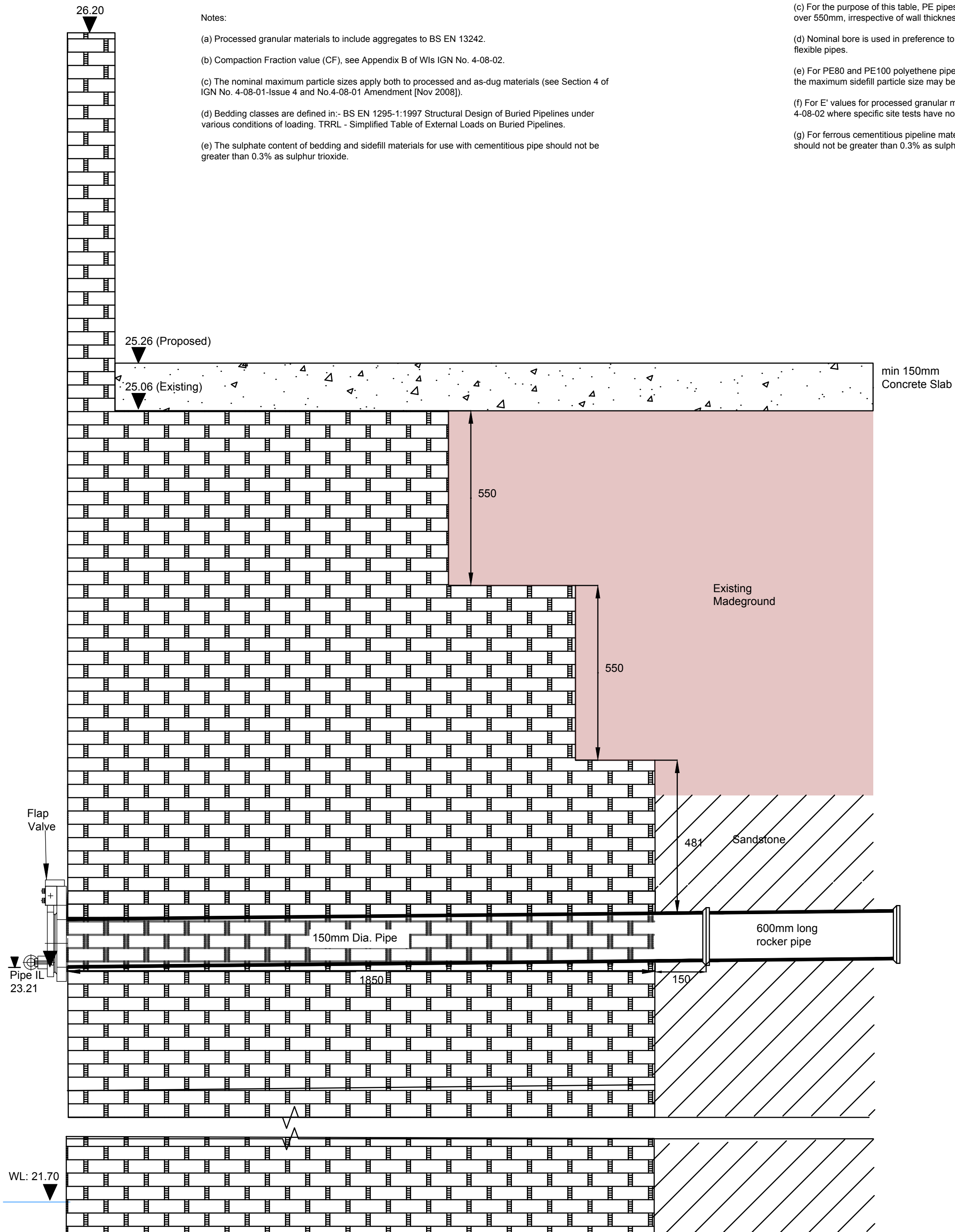
Trench backfill material, whether selected from locally excavated material or imported, shall consist of uniform, readily compactable material, free from vegetable matter, building rubbish and frozen material, or materials susceptible to spontaneous combustion, and excluding clay of liquid limit greater than 80 and/or plastic limit greater than 55 and materials of excessively high moisture content. Clay lumps and stones shall be retained on 75mm and 37.5mm sieves respectively. Where pipe trenches lie beneath road, footway and parking areas trench backfill material shall be type 1 up to formation level.

Bedding and Sidefill Material

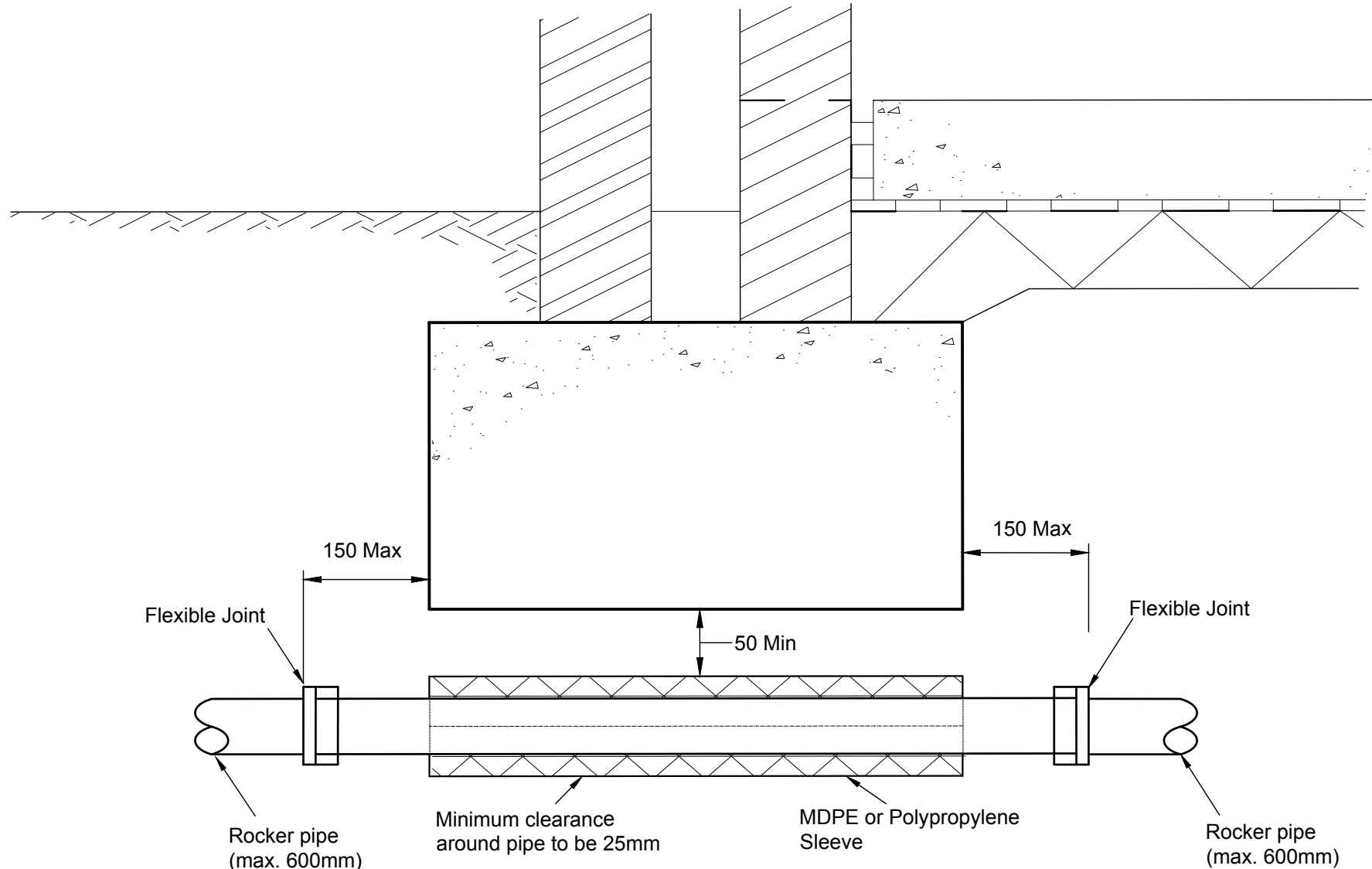
Bedding, sidefill and surround materials shall comply with Water Industry Specification No. 4-08-02. Bedding and sidefill material may be selected as dug granular material or processed granular material complying with Tables 1 and 2 for rigid and flexible pipes respectively. Material excavated from trenches dug through land contaminated with domestic, building or industrial waste should not be used as bedding and sidefill material. Selected excavated material should be readily compactable and be free from organic matter and combustible materials. Frozen soil should not be used. During selection, soil containing clay lumps larger than 75mm and stones larger than those permitted in Tables 1 or 2 as appropriate should be discarded. All selected as-dug granular bedding and sidefill material should be evaluated using the Compaction Fraction Test detailed in Appendix B of the WIs No. 4-08-02. Materials are suitable if the values obtained do not exceed those given in Table 1 and 2 as appropriate.

Notes:

- (a) Processed granular materials to include aggregates to BS EN 13242.
- (b) Compaction Fraction value (CF), see Appendix B of WIs IGN No. 4-08-02.
- (c) The nominal maximum particle sizes apply both to processed and as-dug materials (see Section 4 of IGN No. 4-08-01-Issue 4 and No.4-08-01 Amendment [Nov 2008]).
- (d) Bedding classes are defined in: BS EN 1295-1:1997 Structural Design of Buried Pipelines under various conditions of loading. TRRL - Simplified Table of External Loads on Buried Pipelines.
- (e) The sulphate content of bedding and sidefill materials for use with cementitious pipe should not be greater than 0.3% as sulphur trioxide.

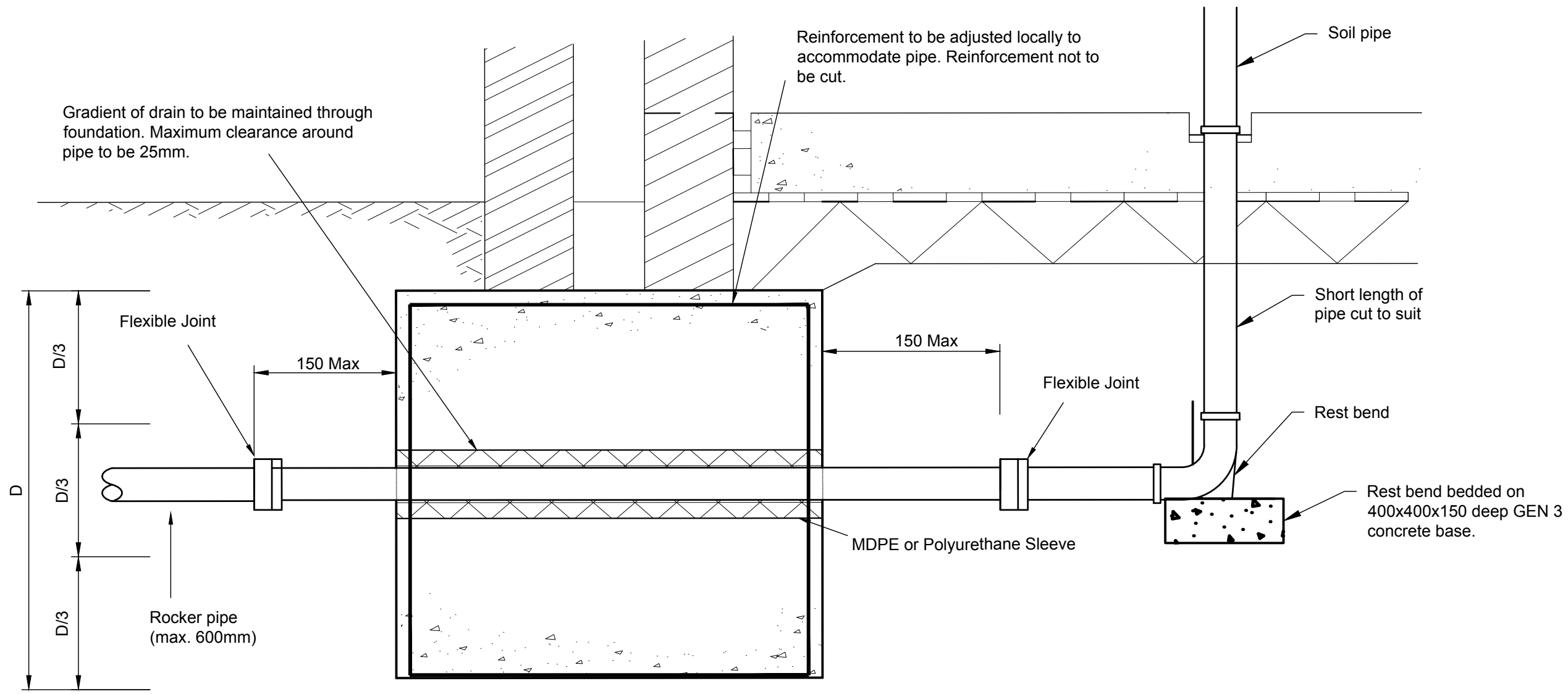


Indicative river wall details taken from intrusive investigation (TP204)



In normal soil conditions the sleeve is to provide a 50mm clearance all round the outside of the drain pipe. This may be achieved by lightly packing the space with compressible drain filler material.

DRAIN BELOW GROUND BEAMS DETAIL



Drain sleeve/duct to be located wholly within the middle third of the foundation depth(d).The engineer is to be advised if this is not possible. In normal soil conditions the sleeve/duct is to give a 50mm clearance all round the outside of the drain pipe (this may be achieved by lightly packing the space with compressible filler material) maximum sleeve O.D to be 250mm without reference to the engineer.

DRAINS THROUGH FOUNDATIONS

NOTES

- ANY drainage works constructed prior to issue of Technical Approval is entirely at the risk of the Contractor/Client.
- The Contractor is to comply fully with the CDM Regulations in the course of constructing the works.
- All adoptable foul sewer drainage works must comply with 'Design and Construction Guidance for foul and surface water sewers, Version 2.1,' and to the satisfaction of United Utilities.
- All levels are in metres above Ordnance Datum.
- All dimensions are in millimeters unless specified otherwise
- All private drainage works must comply with Building Regulations
- Refer to Drawing REN-BGE-C-GEN-005 for General Notes

P01	23.06.2022	UPDATED FOR TOWER CRANES			DF (CE)
P00	04.03.2022	ISSUE FOR STAGE 2 TENDER			DF (CE)
REV	DATE	DESCRIPTION			RVD
REVISIONS					
CLIENT					
PROPERTY ALLIANCE GROUP LTD			 ALLIANCE		
London Office — 163 Tower Bridge Road, London SE1 3LW P /+44 (0) 7999 968 245 E / info@bgeeng.com bgeeng.com —					
PROJECT					
RENAISSANCE					
CIVIL					
GENERAL					
STATUS					
ISSUED FOR INFORMATION					
NOT TO BE ISSUED FOR CONSTRUCTION					
DRAWN	DESIGNED	CHECKED	APPROVED		
CE	JP(CE)	DF (CE)	LJK		
DATUM	GRID	SCALE			
OSGB36	BNG	NTS	A1 SIZE		
TITLE					
PROPOSED DRAINAGE - BASEMENT LEVEL - DRAINAGE DETAILS - SHEET 2					
PROJECT No.		DRAWING No.			REV
L20081		REN-BGE-C-GEN-053			P01