

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing. Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

GENERAL NOTES

- All dimensions in millimetres.
- The pipe embedments indicate the minimum trench dimensions which should be assumed for initial design purposes; the minimum trench widths shown will usually be sufficient to allow adequate compaction of the embedment material. All pipework should be designed in accordance with BS EN 1295-1.

For narrow trenching techniques the minimum trench width may be reduced, providing that the design indicates that the reduced embedment width is sufficient to support the pipework.

- Where selected excavated material may migrate into the native soil or vice versa, geotextile membrane shall be provided around the embedment materials.

Where selected excavated material is used as embedment material, the ground should be checked for aggressiveness and the pipework protected if necessary.

CLASSIFICATION OF PIPES

- Pipework is normally classified as follows:-

Rigid: Clay, Concrete and Reinforced Concrete.

Semi Rigid: Ductile Iron.

Flexible: Steel, PVC-u, mPVC(PVC-A), KKPVC, Polyethylene, GRP.

FLEXIBLE PIPE EMBEDMENTS

- Flexible pipe embedments shall normally be Class S1 or S2; Class S3 may be used where the selected excavated material is reasonably uniform and the backfilling can be closely controlled.

SEMI RIGID PIPE EMBEDMENTS

- Semi rigid pipe embedments shall normally be Class S1, S2, S3, S4, S5 or Class B1 and B2.

Class D embedments should only be used where the selected excavated material is reasonably uniform and the backfilling can be closely controlled.

RIGID PIPE EMBEDMENTS

- Rigid pipe embedments shall be class D, F, B, S or A.

Bedding factors are derived from "A guide to design loadings for buried rigid pipes" and BS 4-11-02 "Revised bedding factor for Verified Clay drains and sewers".

- Embedment dimensions shall be in accordance with Table 2.

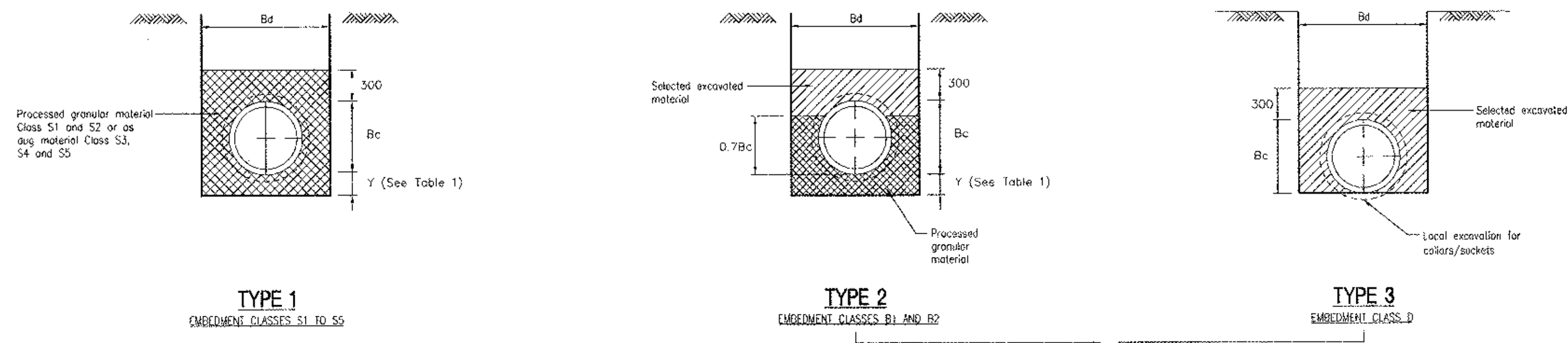
PROCESSED GRANULAR MATERIAL

- Processed granular material shall comply with BS 4-08-02. The grading of processed granular material shall be as specified.

Limestone material shall not be used where the native ground or ground water has a pH of 6 or less.

CONCRETE EMBEDMENTS

- Class 3 concrete embedments shall be used in non aggressive ground. Elsewhere the cement type and mix design should be selected to suit the sulphate content and pH of the ground and groundwater.



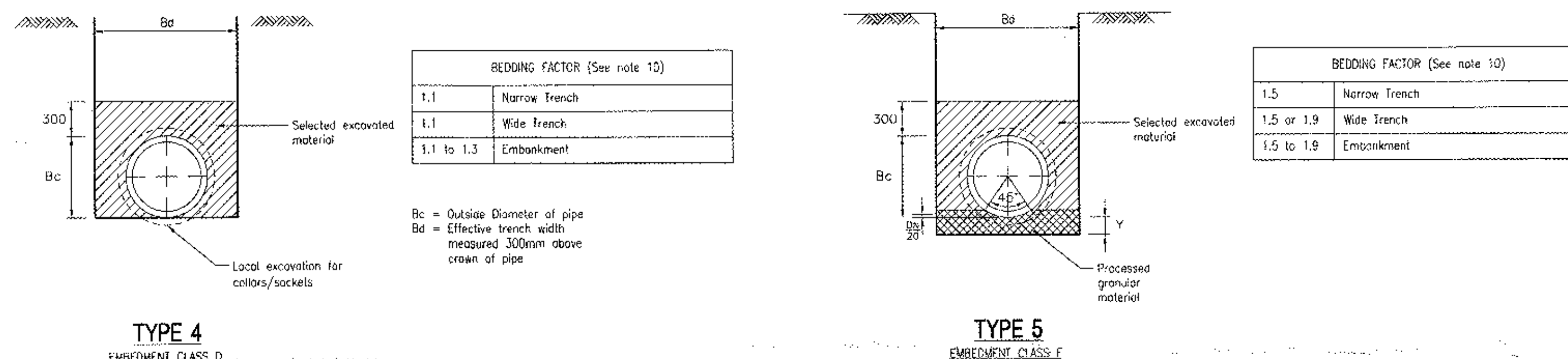
Nominal Int. Pipe Dia	Dimension Y1 (Even trench bottom)	Dimension Y2 (Rock or uneven trench bottom*)	Minimum Effective Trench Width Bd (see note 2)
<400	100	200	Bc+300
400-700	150	250	Bc+450
725-900	200	300	Bc+600
925-1200	250	350	Bc+800

*Note:
The minimum depth of processed granular material under pipe sockets shall be 50mm for even trench bottom and 150mm for uneven trench bottom.

Bc = Outside Diameter of pipe
Bd = Effective trench width measured 300mm above crown of pipe

FLEXIBLE AND SEMI RIGID PIPE EMBEDMENTS

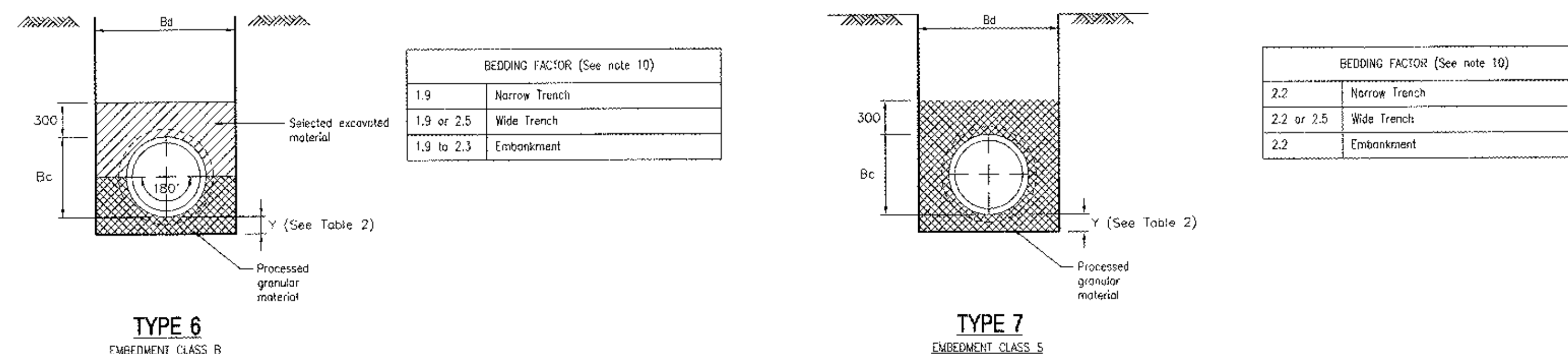
SEMI RIGID PIPE EMBEDMENTS



1.1	Narrow Trench
1.1	Wide Trench
1.1 to 1.3	Embankment

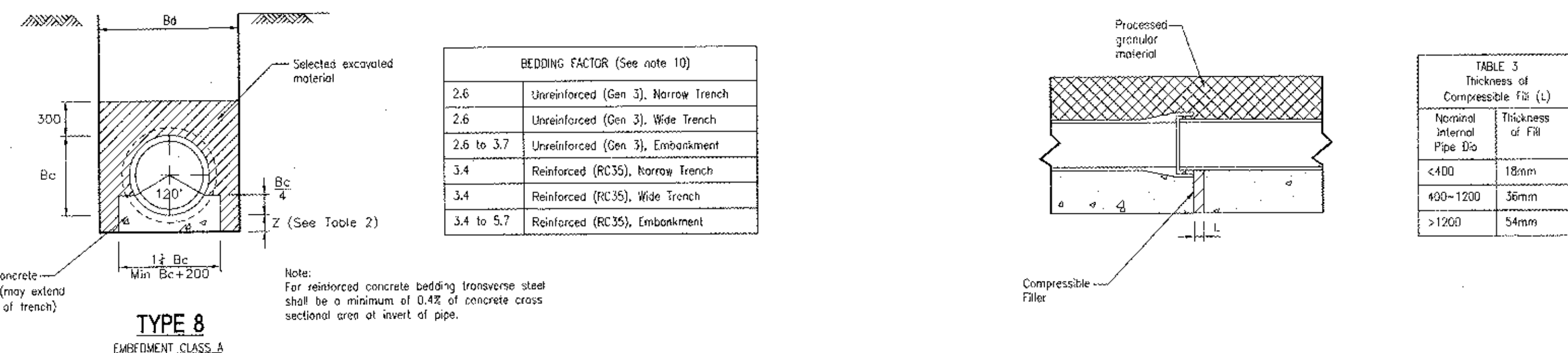
Bc = Outside Diameter of pipe
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1.5	Narrow Trench
1.5 or 1.9	Wide Trench
1.5 to 1.9	Embankment



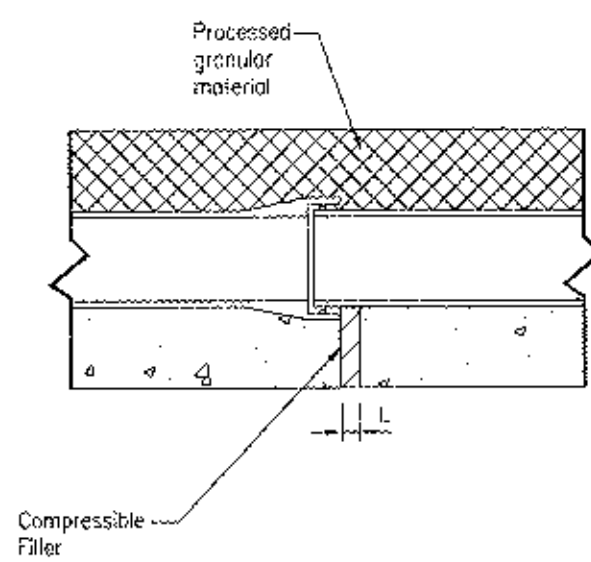
1.9	Narrow Trench
1.9 or 2.5	Wide Trench
1.9 to 2.3	Embankment

2.2	Narrow Trench
2.2 or 2.5	Wide Trench
2.2	Embankment



2.6	Unreinforced (Gen 3), Narrow Trench
2.6	Unreinforced (Gen 3), Wide Trench
2.6 to 3.7	Unreinforced (Gen 3), Embankment
3.4	Reinforced (RC35), Narrow Trench
3.4	Reinforced (RC35), Wide Trench
3.4 to 5.7	Reinforced (RC35), Embankment

Nominal Internal Pipe Dia	Thickness of Fill
<400	18mm
400-1200	36mm
>1200	54mm



FLEXIBLE JOINT DETAIL
CONCRETE BED
SPIGOT AND SOCKET PIPES

NOMINAL INT. PIPE DIA	DIMENSION Y1 (EVEN TRENCH BOTTOM (MIN))	DIMENSION Y2 (ROCK OR UNEVEN TRENCH BOTTOM (MIN))	PROCESSED GRANULAR MATERIAL	DIMENSION Z (MIN)	MAX PERMITTED TRENCH WIDTH
150	100	200	10mm single sized or 14mm to 5mm graded	100	750
225	100	200	10mm single sized or 14mm to 5mm graded	100	825
300	100	200	10mm single sized or 14mm to 5mm graded	100	925
375	100	200	10mm single sized or 14mm to 5mm graded	100	1050
450	150	200	10mm single sized or 14mm to 5mm graded	150	1150
525	150	250	10mm single sized or 14mm to 5mm graded	150	1200
600	150	250	10mm single sized or 14mm to 5mm graded	150	1350
675	150	250	10mm single sized or 14mm to 5mm graded	225	1450
750	225	300	10mm single sized or 14mm to 5mm graded	225	1500
825	225	300	10mm single sized or 14mm to 5mm graded	225	1600
900	225	300	10mm single sized or 14mm to 5mm graded	225	1600
975	225	300	10mm single sized or 14mm to 5mm graded	300	2000
1050	225	300	10mm single sized or 14mm to 5mm graded	300	2100
1125	225	300	10mm single sized or 14mm to 5mm graded	300	2200
1200	250	350	10mm single sized or 14mm to 5mm graded	300	2300
1350	375	450	10mm single sized or 14mm to 5mm graded	375	2500
1500	375	450	10mm single sized or 14mm to 5mm graded	375	2700
1650	375	450	10mm single sized or 14mm to 5mm graded	450	2800
1800	375	450	10mm single sized or 14mm to 5mm graded	450	3100
1950	400	500	10mm single sized or 14mm to 5mm graded	525	3200
2100	425	550	10mm single sized or 14mm to 5mm graded	525	3400
2400	450	675	10mm single sized or 14mm to 5mm graded	600	3700

*Note:
Bc = Outside Diameter of pipe
Bd = Effective trench width measured 300mm above crown of pipe

DETAIL TYPES 4 TO 8 RELATE TO RIGID PIPE EMBEDMENTS

P1	25.03.12	Issued for approval	CB	PW	IC
Rev.	Date	Amendment	Drawn	Chkd.	Appd.

RSK

LAND & DEVELOPMENT ENGINEERING LTD

Spring Lodge
172 Chester Road
Helsby
Cheshire, WA5 6AR
United Kingdom

Tel: +44 (0) 1628 728006
Fax: +44 (0) 1628 725633
Email: rsk@rsk.co.uk
Web: www.rsk.co.uk

Client

Taylor Wimpey (Manchester) Ltd

Project Title

Calderstones Phase 3

Drawing Title

Drainage Construction
Details. Sheet 3 of 4
Pipe Surround & Embedments

Drawn	Date	Checked	Date	Approved	Date
CB	March 12	PW	March 12	ISC	March 12
Scale	NTS	Orig Size		Dimensions	

Project No.	Drawing File
880209	

Drawing No.	Rev.
11-03	P1