

APPENDIX D. SANITARY SEWER AND STORMWATER DESIGN AND CONSTRUCTION

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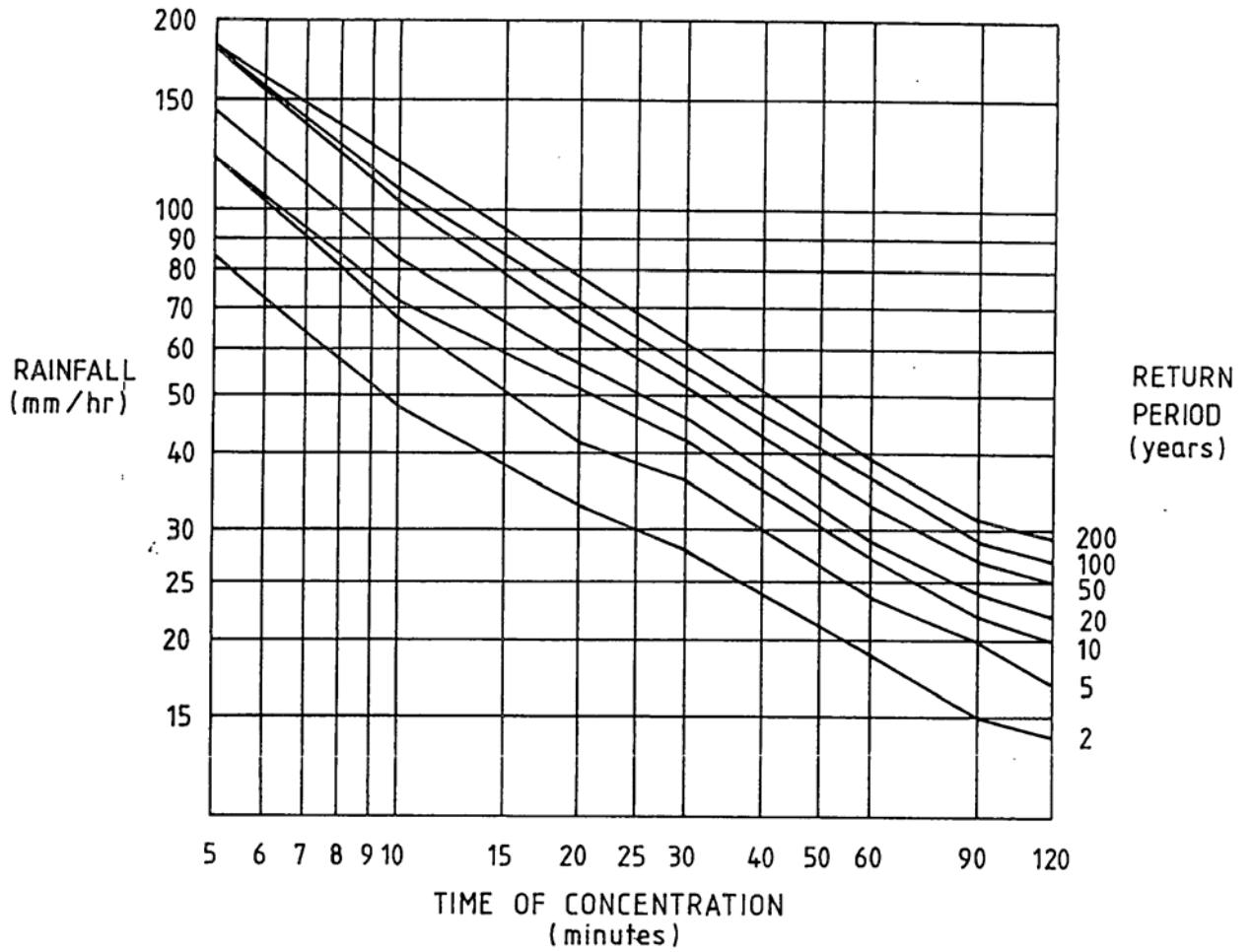
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Appendix 1. Peak Factors For Sewage Wastewater Flow

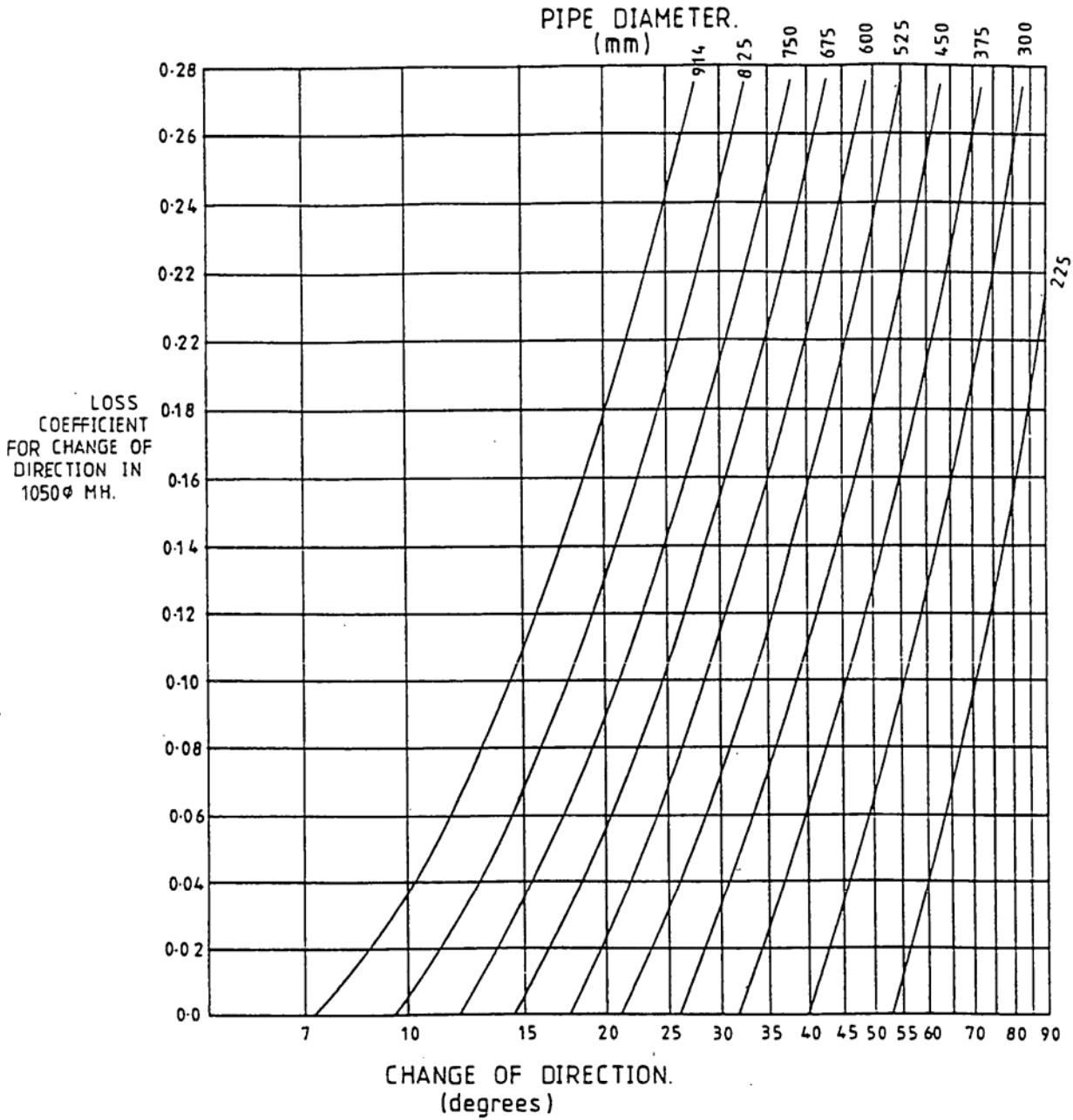
AREA (ha)	POPULATION														AREA (ha)
	20	50	100	200	500	1,000	2,000	5,000	10,000	20,000	50,000	100,000	200,000		
1	13.6	9.8	8.3	7.3	6.6	6.3	.	.	.	.	.	.	.	1
2	12.3	8.8	7.4	6.6	6.0	5.7	5.4	.	.	.	.	.	.	2
3	.	8.3	7.0	6.2	5.6	5.3	5.1	.	.	.	.	.	.	3
4	.	7.9	6.7	6.0	5.4	5.1	4.9	4.7	.	.	.	.	.	4
5	.	7.7	6.5	5.8	5.2	4.9	4.7	4.6	.	.	.	.	.	5
6	.	.	6.3	5.6	5.1	4.8	4.6	4.5	.	.	.	.	.	6
7	.	.	6.2	5.5	4.9	4.7	4.5	4.4	4.3	.	.	.	.	7
8	.	.	6.0	5.4	4.8	4.6	4.4	4.3	4.2	.	.	.	.	8
9	.	.	5.9	5.3	4.8	4.5	4.3	4.2	4.1	.	.	.	.	9
10	.	.	5.8	5.2	4.7	4.4	4.3	4.1	4.1	.	.	.	.	10
20	.	.	.	4.7	4.2	4.0	3.9	3.7	3.7	3.6	.	.	.	20	
30	4.0	3.8	3.6	3.5	3.5	3.4	.	.	.	30	
40	3.8	3.6	3.5	3.4	3.3	3.3	3.2	.	.	40	
50	3.7	3.5	3.4	3.2	3.2	3.2	3.1	.	.	50	
60	3.4	3.3	3.2	3.1	3.1	3.0	.	.	60	
70	3.3	3.2	3.1	3.0	3.0	3.0	3.0	.	70	
80	3.2	3.1	3.0	3.0	2.9	2.9	2.9	.	80	
90	3.2	3.1	3.0	2.9	2.9	2.9	2.9	2.8	90	
100	3.1	3.0	2.9	2.9	2.8	2.8	2.8	2.8	100	
200	2.7	2.6	2.6	2.6	2.5	2.5	2.5	200	
300	2.5	2.4	2.4	2.4	2.4	2.4	300	
400	2.4	2.3	2.3	2.3	2.3	2.3	400	
500	2.3	2.3	2.2	2.2	2.2	2.2	500	
600	2.2	2.2	2.2	2.2	2.1	600	
700	2.2	2.1	2.1	2.1	2.1	700	
800	2.1	2.1	2.1	2.1	2.0	800	
900	2.1	2.0	2.0	2.0	2.0	900	
1,000	2.0	2.0	2.0	2.0	2.0	1,000	
2,000	1.8	1.8	1.8	1.8	2,000	
3,000	1.7	1.7	1.7	3,000	
4,000	1.6	1.6	1.6	4,000	
5,000	1.6	1.6	1.6	5,000	
6,000	1.5	1.5	6,000	
7,000	1.5	1.5	7,000	
8,000	1.5	1.4	8,000	
9,000	1.4	1.4	9,000	
10,000	1.4	1.4	10,000	

PEAK FACTORS

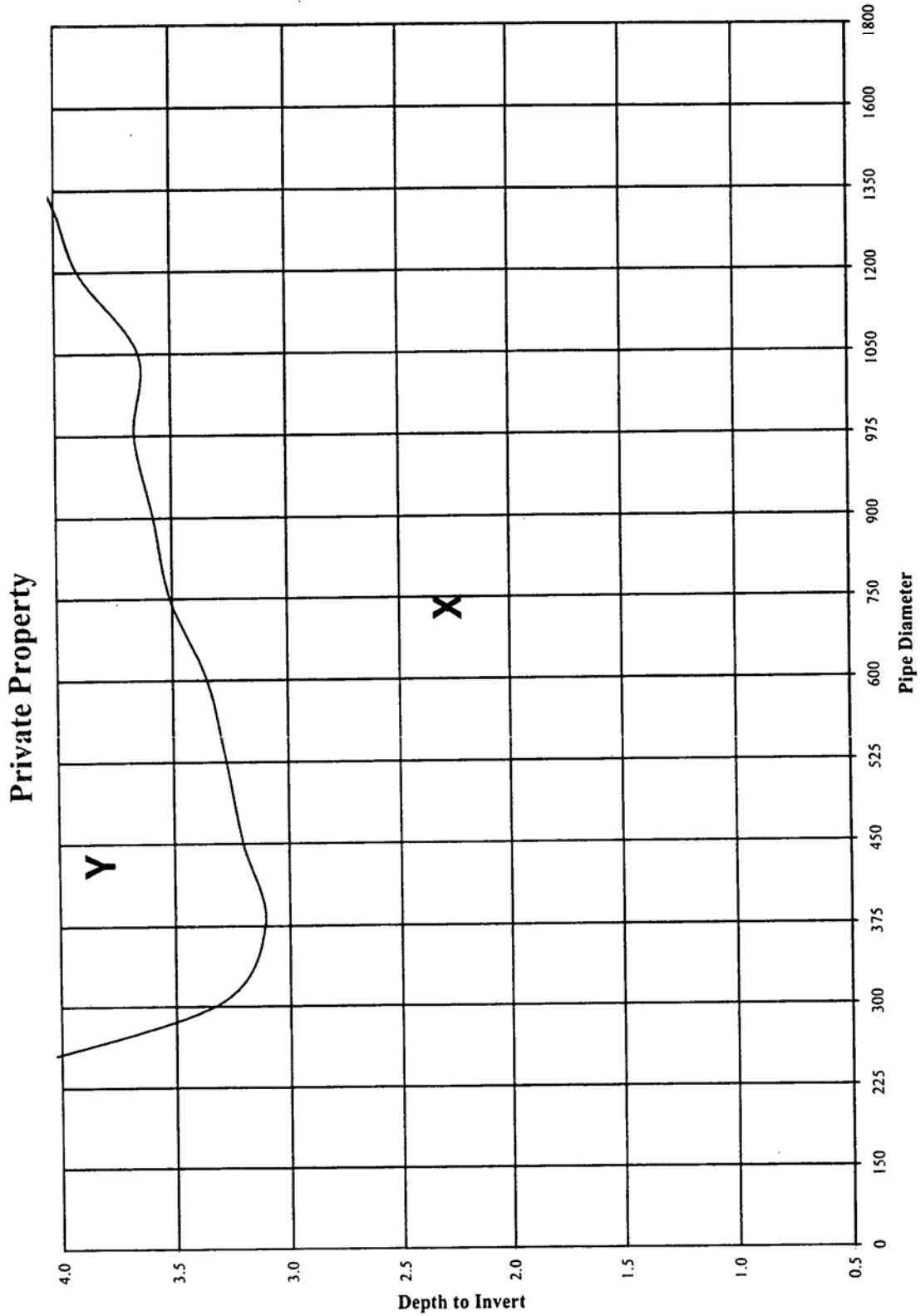
Appendix 2. Rainfall Intensity.



Appendix 3. Head-Loss Through A 1050 Manhole.



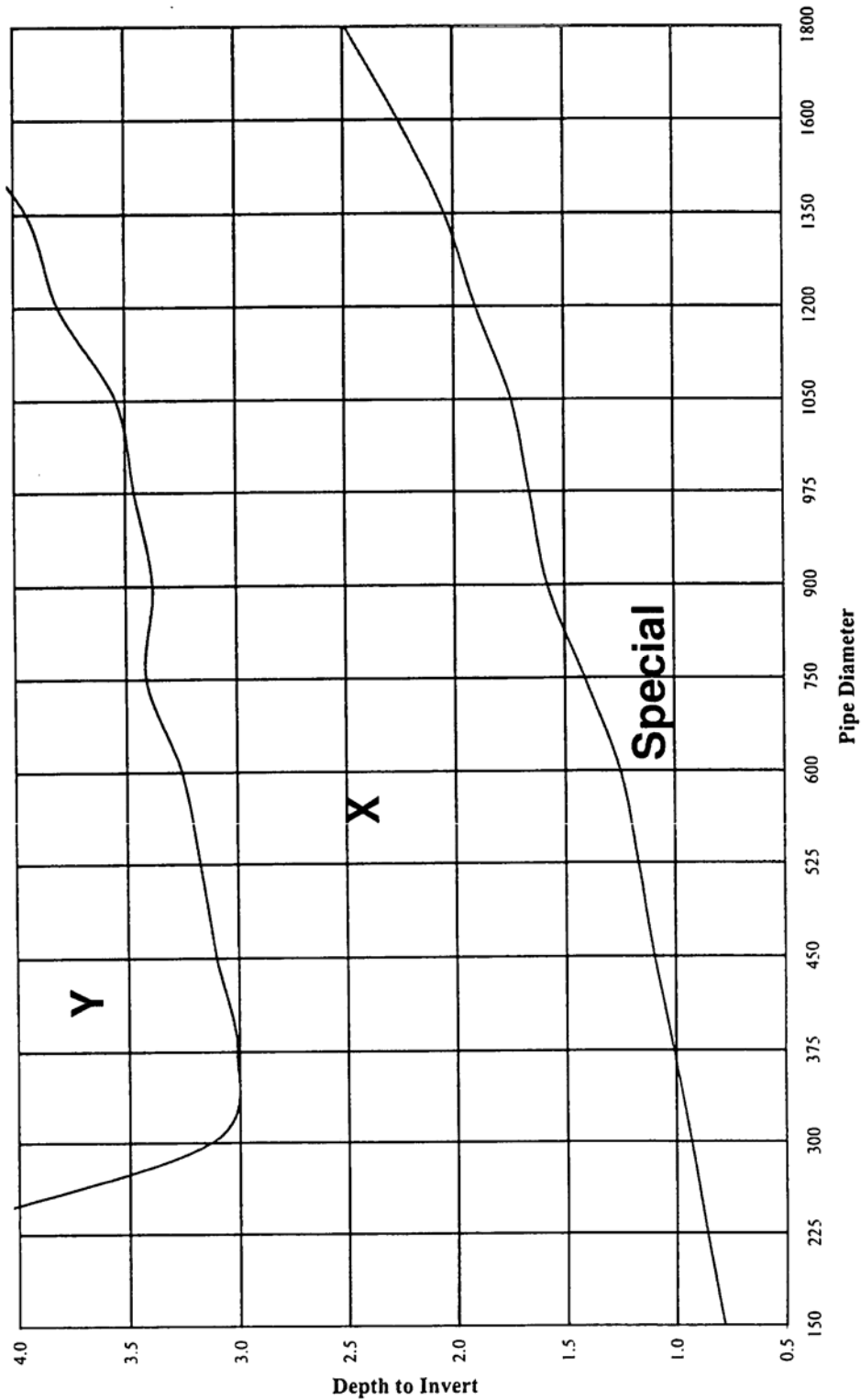
Appendix 4. Pipe Class For Earthenware And Concrete Pipes, Private Property, No Traffic Load.



Drainage Bedding pipe surround for 150/225mm (HS2 bedding). D/4 bedding and selected material for side support for pipes >225mm diameter (H2 bedding).

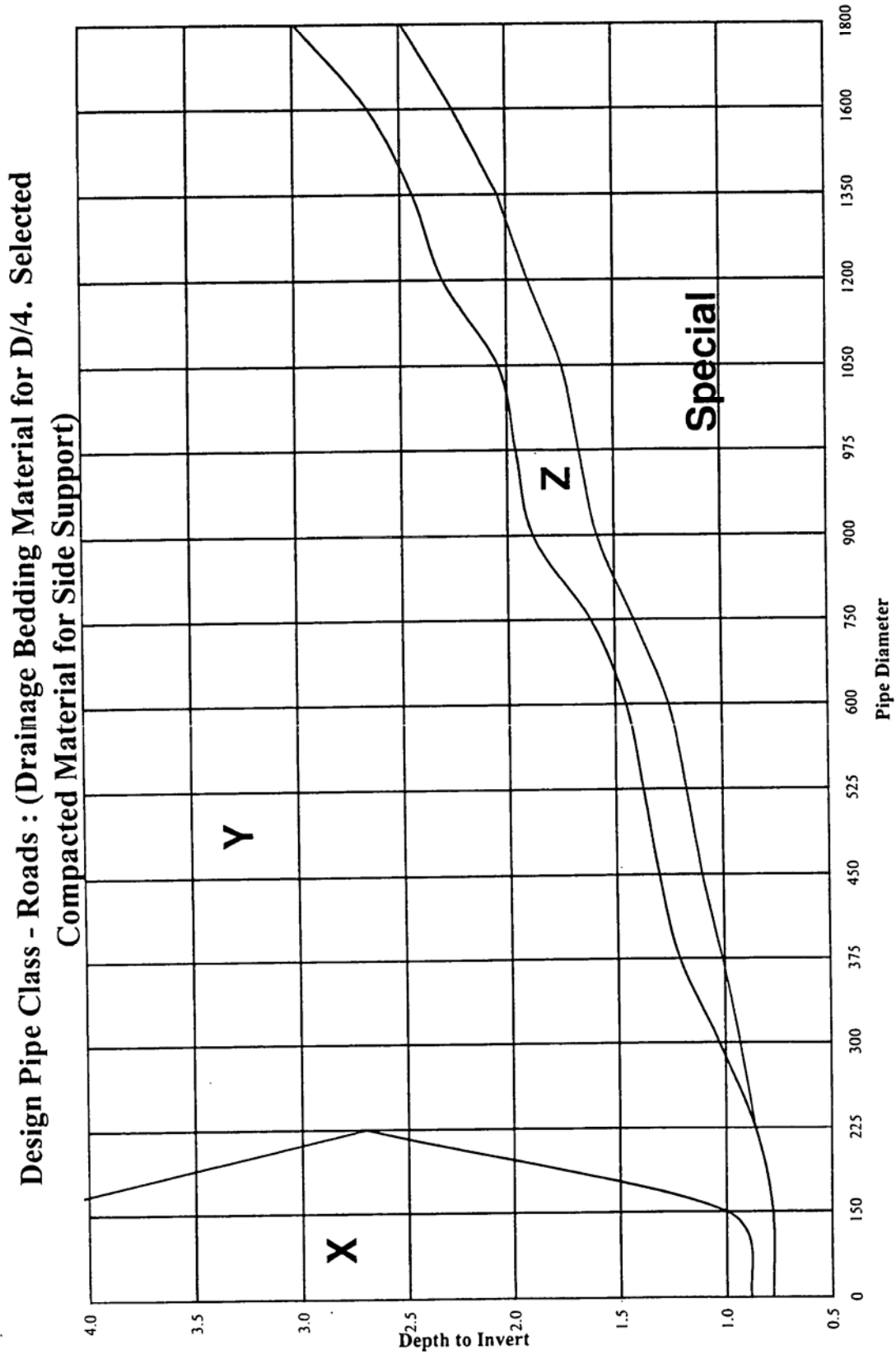
**Appendix 5. Pipe Class For Earthenware And Concrete Pipes,
Private Property And Traffic Load**

Private Property Subject to Traffic Loads



Drainage Bedding Material for Full Pipe Surround (150, 225mm Pipes). DBM for Pipe Bedding Only (to D/4) for Other Pipes and uncontrolled fill for rest.

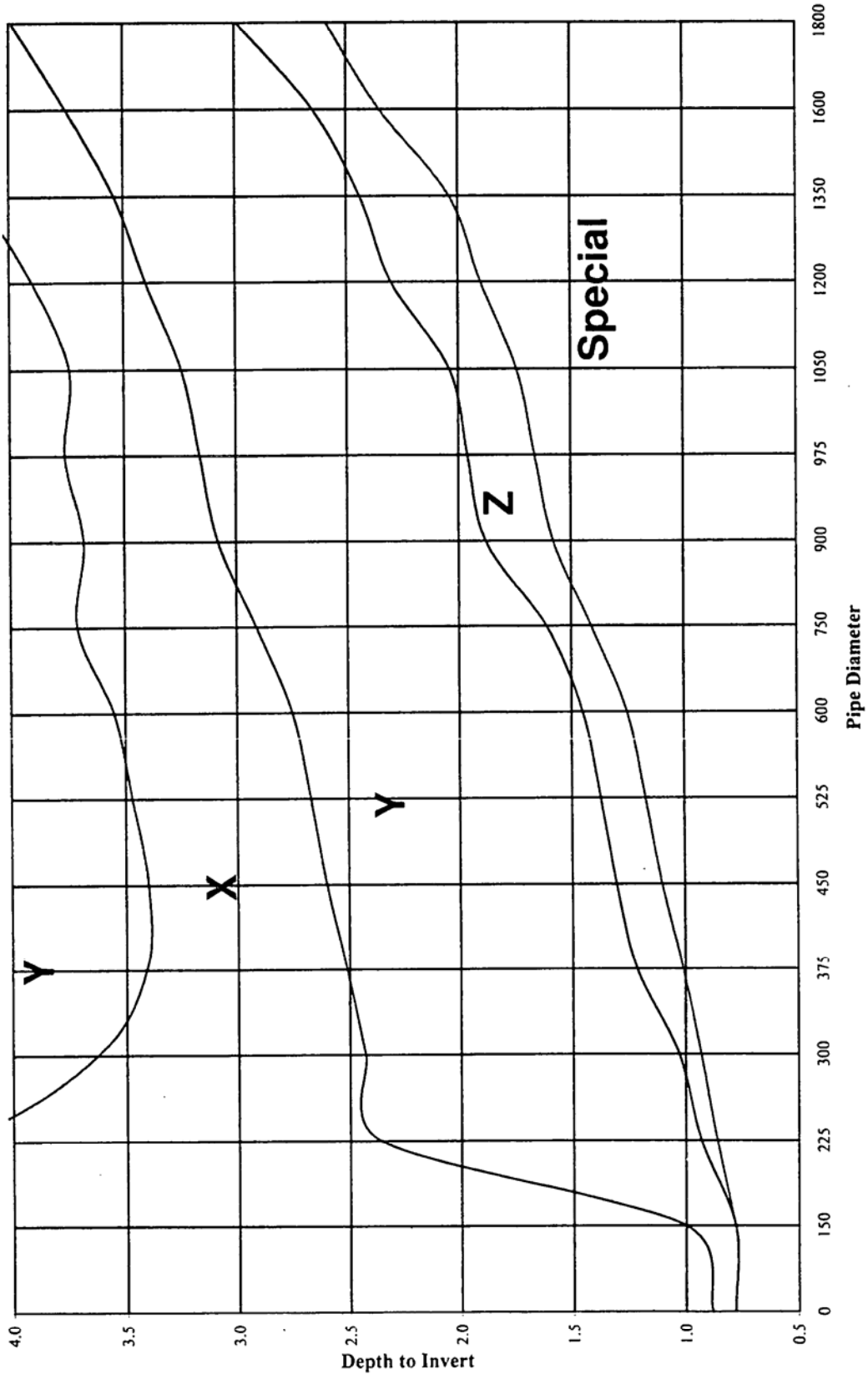
Appendix 6. Pipe Class For Earthenware And Concrete Pipes In Road. H2 Bedding.



Drainage Bedding for Pipe Bedding Only. Compacted Fill For Pipe Side Support (H2 Bedding)

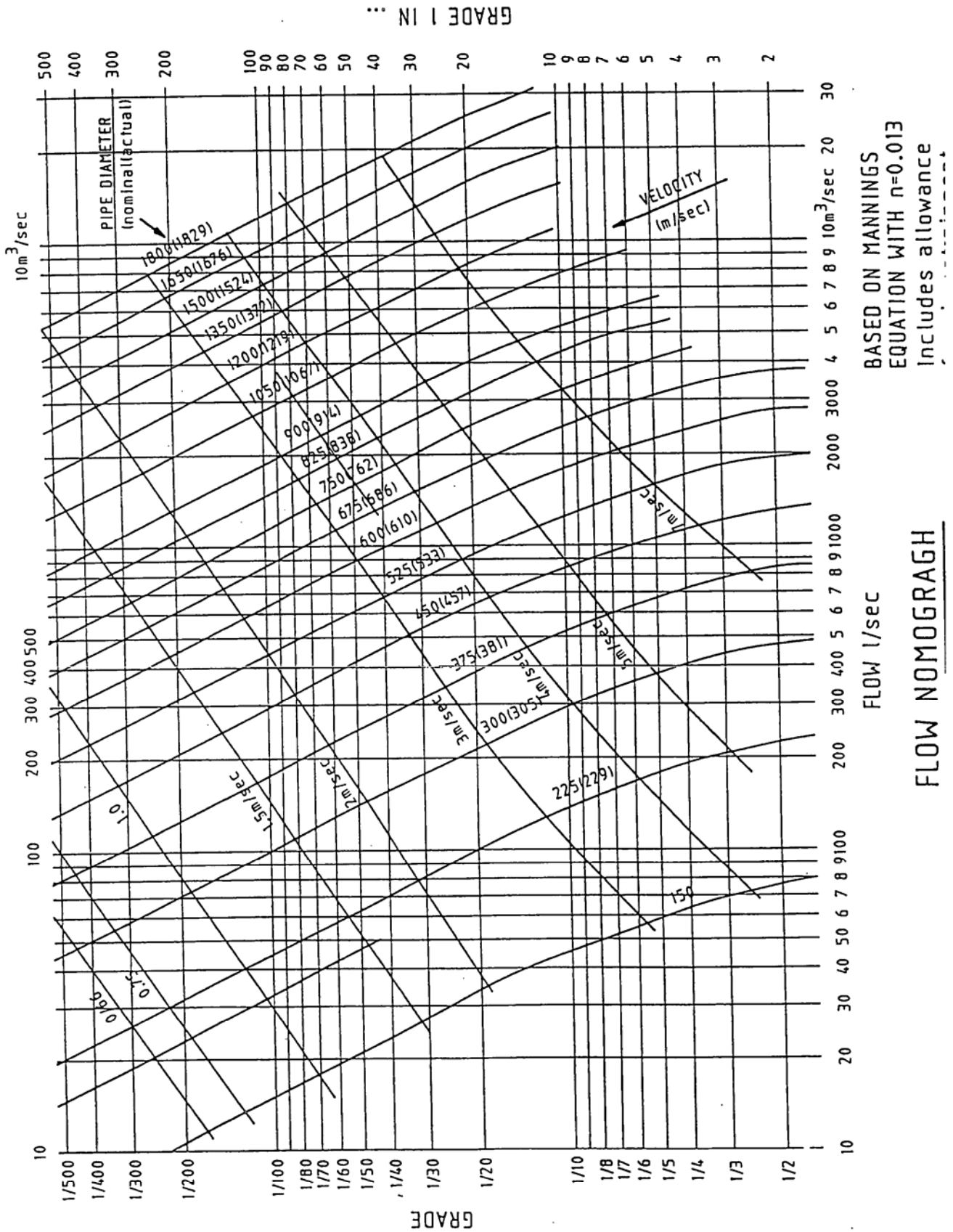
Appendix 7. Pipe Class For Earthenware And Concrete Pipes In Road. HS2 Bedding

Design Pipe Class - Roads : (Pipe Surrounded by Drainage Bedding Material)



Drainage Bedding for Full Pipe Surround. (HS2 Bedding)

Appendix 8. Flow Nomograph.



BASED ON MANNINGS
EQUATION WITH n=0.013
Includes allowance

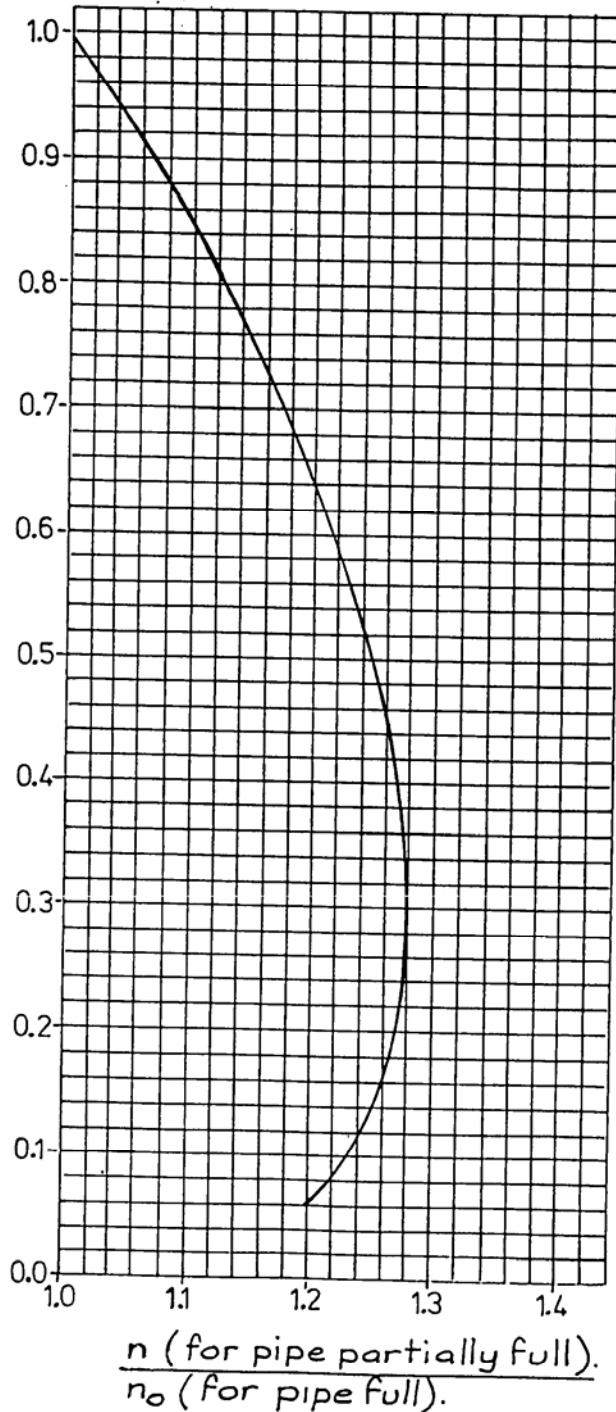
FLOW NOMOGRAPH

Appendix 9. Variation of Manning's "n" With Depth.

W.P.C.F. JOURNAL
 VOL. 48. N° 8.
 1976. PAGE 2059.
 W.P.C.F. MANUAL
 N° 9 PAGE 87.
 REF: MELBOURNE
 AND METROPOLITAN
 BOARD OF WORKS.

$\frac{\text{DEPTH OF FLOW } d}{\text{DIAMETER OF PIPE } D_0}$

$\frac{n}{n_0} = 0.5(x-x^7)+1$
 where $x = 1 - \frac{d}{D_0}$



**VARIATION OF
 MANNING'S 'n'
 WITH DEPTH FOR
 CIRCULAR PIPES.**

DRAINAGE BRANCH
 DRAWN: V.J.G. 21-7-198
 APPROVED *[Signature]*
A 330/509

