

ALLOWABLE HEIGHT OF FILL ABOVE TOP OF CIRCULAR CONCRETE PIPE (METERS)

INDUCED TRENCH METHOD

D (in.)	CLASS OF PIPE								
	CLASS III			CLASS IV			CLASS V		
	CLASS OF BEDDING			CLASS OF BEDDING			CLASS OF BEDDING		
	A	B	C	A	B	C	A	B	C
18	18.0	10.8	9.0	27.0	16.3	13.3	41.0	24.9	20.6
24	18.0	10.6	9.0	27.0	16.3	13.3	41.0	24.9	20.6
30	18.0	10.6	9.0	27.0	16.3	13.3	41.0	24.9	20.6
36	18.0	10.6	8.6	27.0	16.3	13.3	41.0	24.9	20.5
42	18.0	10.3	8.6	27.0	16.3	13.3	41.0	24.9	20.6
48	18.0	10.3	8.8	27.0	16.3	13.3	41.0	24.9	20.6
54	18.0	10.3	8.3	27.0	16.0	13.3	41.0	24.9	20.6
60	17.6	10.0	8.0	27.0	15.6	12.9	41.0	24.6	20.3
66	17.6	10.0	8.0	27.0	15.6	12.9	41.0	24.6	20.3
72	17.6	10.0	8.0	27.0	15.6	12.9	41.0	24.6	20.3
78	17.6	9.8	7.8	27.0	15.6	12.6	41.0	24.6	20.3
84	17.3	9.6	7.6	27.0	15.6	12.8	41.0	24.6	20.0
90	17.3	9.3	7.3	26.7	15.3	12.3	41.0	24.3	20.0
96	17.0	9.0	7.0	26.7	15.0	12.3	41.0	24.3	20.0

DESIGN PARAMETERS	
BEDDING CLASS	BEDDING FACTOR
A	3.43
B	2.10
C	1.76

p' = projection ratio = 1
 r = settlement ratio = -0.7

POSITIVE OR NEGATIVE PROJECTION METHOD

D (in.)	CLASS OF PIPE								
	CLASS III			CLASS IV			CLASS V		
	CLASS OF BEDDING			CLASS OF BEDDING			CLASS OF BEDDING		
	A	B	C	A	B	C	A	B	C
18	5.8	3.8	3.2	8.5	5.5	4.7	13.1	8.5	7.0
24	6.1	4.0	3.4	9.1	6.1	4.9	14.0	9.1	7.6
30	6.4	4.0	3.4	9.5	6.1	4.9	14.0	9.1	7.6
36	6.4	4.0	3.4	9.5	6.1	5.0	14.3	9.1	7.9
42	6.4	4.0	3.5	9.8	6.4	5.0	14.6	9.4	7.9
48	6.4	4.1	3.5	9.8	6.4	5.2	14.6	9.4	7.9
54	6.4	4.3	3.5	9.8	6.4	5.2	14.6	9.4	7.9
60	6.4	4.3	3.6	9.8	6.4	5.2	14.6	9.4	7.9
66	6.4	4.3	3.7	9.8	6.4	5.2	14.6	9.4	7.9
72	6.4	4.3	3.7	10.1	6.4	5.2	14.8	9.4	7.9
78	6.4	4.3	3.7	10.1	6.4	5.2	14.8	9.4	7.9
84	6.4	4.3	3.7	10.1	6.4	5.2	14.8	9.4	7.9
90	6.4	4.3	3.7	10.1	6.4	5.2	14.6	9.4	7.9
96	6.4	4.3	3.7	10.1	6.4	5.2	14.6	9.4	7.9

DESIGN PARAMETERS	
BEDDING CLASS	BEDDING FACTOR
A	2.80
B	1.90
C	1.50

p = projection ratio = 0.25
 r = settlement ratio = +0.7

NOTES:

- 1 - PROCEDURES ACCORDING TO THE "CONCRETE PIPE DESIGN MANUAL, 1987".
- 2 - UNIT WEIGHT OF SOIL: 120 lb/ft³
- 3 - SAFETY FACTOR ACCORDING TO ASTM. FOR CLASSES III AND IV = 1.5; FOR CLASS V = 1.25

EFFECTIVE DATE : AUGUST 1999

COMMONWEALTH OF PUERTO RICO DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS HIGHWAY AND TRANSPORTATION AUTHORITY		
REINFORCED CONCRETE PIPE INSTALLATION METHODS ALLOWABLE HEIGHT OF FILL ABOVE TOP OF CIRCULAR CONCRETE PIPE		RECOMMENDED BY: <i>[Signature]</i> DESIGN AREA DIRECTOR DATE: Feb-27-99 APPROVED BY: EXECUTIVE DIRECTOR DATE: 5-14-99 APPROVED BY: <i>[Signature]</i> DIV. ADM. FHWA-PR DIVISION DATE: 8-4-99
DATE	REVISION	BY
07-1999	GENERAL REVISION	LV.
STD. DWG.	RCP 4 OF 4	