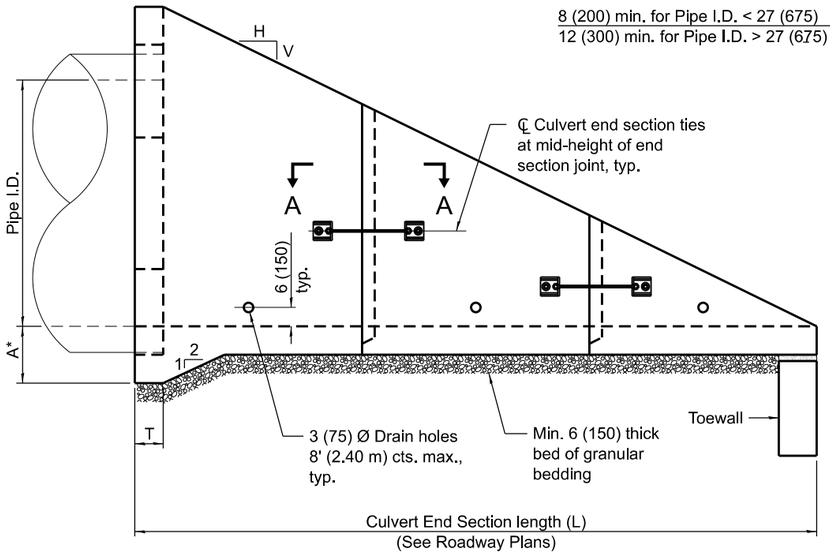
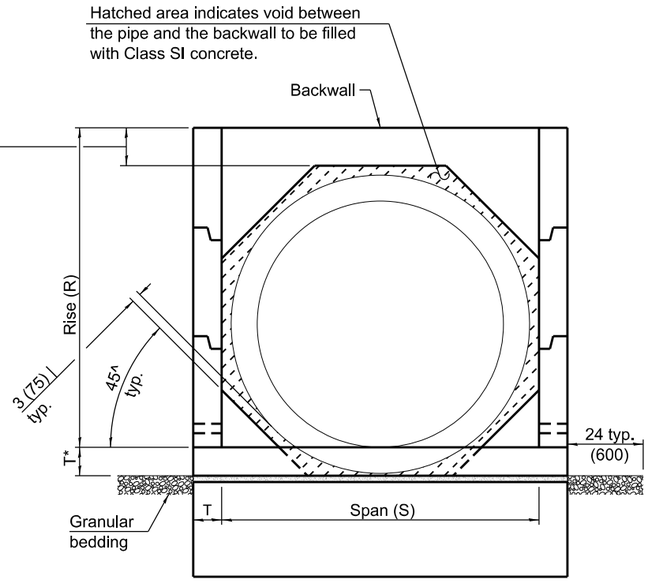
PIPE CULVERT END SECTION DIMENSIONS

Pipe I.D.	A	R	S	T	L Slope of End Section 1:2	1:3	1:4	1:6
15 (375)	14 (350)	29 (737)	28 (711)	8 (200)	5'-6" (1.68 m)	7'-11" (2.42 m)	10'-4" (3.16 m)	15'-2" (4.63 m)
18 (450)	15 (375)	33 (838)	32 (813)	8 (200)	6'-2" (1.88 m)	8'-11" (2.72 m)	11'-8" (3.56 m)	17'-2" (5.24 m)
21 (525)	15 (375)	36 (914)	34 (864)	8 (200)	6'-8" (2.03 m)	9'-8" (2.95 m)	12'-8" (3.86 m)	18'-8" (5.69 m)
24 (600)	15 (375)	39 (990)	38 (970)	8 (200)	7'-2" (2.19 m)	10'-5" (3.18 m)	13'-8" (4.17 m)	20'-2" (6.15 m)
27 (675)	15 (375)	3'-10" (1.17 m)	3'-6" (1.07 m)	8 (200)	8'-4" (2.54 m)	12'-2" (3.71 m)	16'-0" (4.88 m)	23'-8" (7.21 m)
30 (750)	16 (400)	4'-2" (1.27 m)	3'-10" 1.17 m)	8 (200)	9'-0" (2.75 m)	13'-2" (4.02 m)	17'-4" (5.29 m)	25'-8" (7.83 m)
33 (825)	16 (400)	4'-5" (1.35 m)	4'-0" (1.22 m)	8 (200)	9'-6" (2.90 m)	13'-11" (4.25 m)	18'-4" (5.60 m)	27'-2" (8.29 m)
36 (900)	16 (400)	4'-8" (1.42 m)	4'-4" (1.32 m)	8 (200)	10'-0" (3.05 m)	14'-8" (4.47 m)	19'-4" (5.90 m)	28'-8" (8.74 m)
42 (1050)	17 (425)	5'-3" (1.60 m)	5'-0" (1.52 m)	8 (200)	11'-2" (3.41 m)	16'-5" (5.01 m)	21'-8" (6.61 m)	32'-2" (9.81 m)
48 (1200)	17 (425)	5'-9" (1.75 m)	5'-6" (1.68 m)	8 (200)	12'-2" (3.71 m)	17'-11" (5.46 m)	23'-8" (7.22 m)	35'-2" (10.73 m)
54 (1350)	18 (450)	6'-4" (1.93 m)	6'-2" (1.88 m)	8 (200)	13'-4" (4.07 m)	19'-8" (6.00 m)	26'-0" (7.93 m)	38'-8" (11.79 m)
60 (1500)	18 (450)	6'-10" (2.08 m)	6'-8" (2.03 m)	8 (200)	14'-4" (4.37 m)	21'-2" (6.46 m)	28'-0" (8.54 m)	41'-8" (12.71 m)
66 (1650)	19 (475)	7'-5" (2.26 m)	7'-4" (2.24 m)	8 (200)	15'-6" (4.73 m)	22'-11" (6.99 m)	30'-4" (9.26 m)	45'-2" (13.78 m)
72 (1800)	19 (475)	7'-11" (2.41 m)	7'-10" (2.39 m)	8 (200)	16'-6" (5.03 m)	24'-5" (7.45 m)	32'-4" (9.87 m)	48'-2" (14.70 m)
78 (1950)	21 (525)	8'-6" (2.59 m)	8'-6" (2.59 m)	9 (230)	17'-9" (5.41 m)	26'-3" (8.01 m)	34'-9" (10.60 m)	51'-9" (15.78 m)
84 (2100)	21 (525)	9'-0" (2.74 m)	9'-0" (2.74 m)	9 (230)	18'-9" (5.72 m)	27'-9" (8.46 m)	36'-9" (11.21 m)	54'-9" (16.70 m)

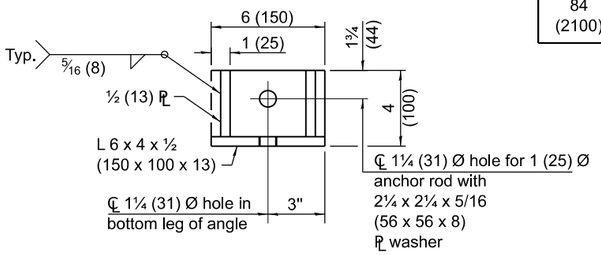


ELEVATION

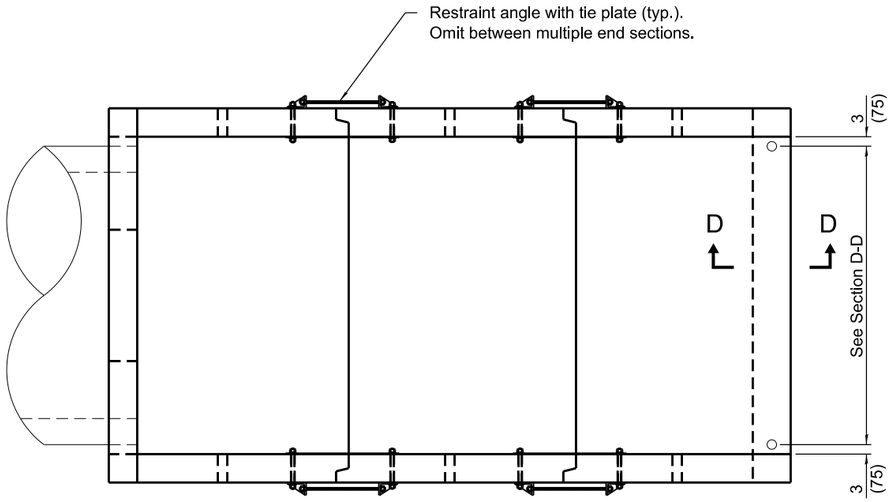


END VIEW

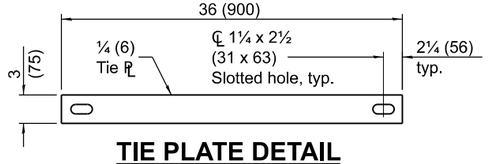
- This dimension shall be increased by 1½ (38) for CIP field construction. See General Notes.



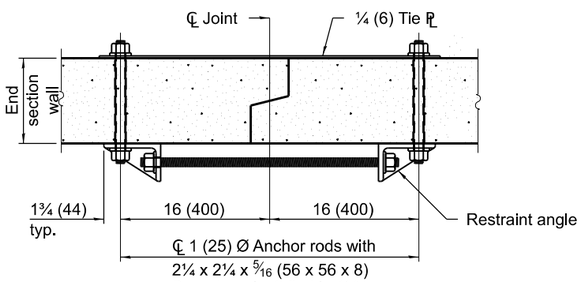
RESTRAINT ANGLE DETAIL



PLAN



TIE PLATE DETAIL



SECTION A-A

(Showing end section tie details)

See Sheet 2 for GENERAL NOTES

Illinois Department of Transportation

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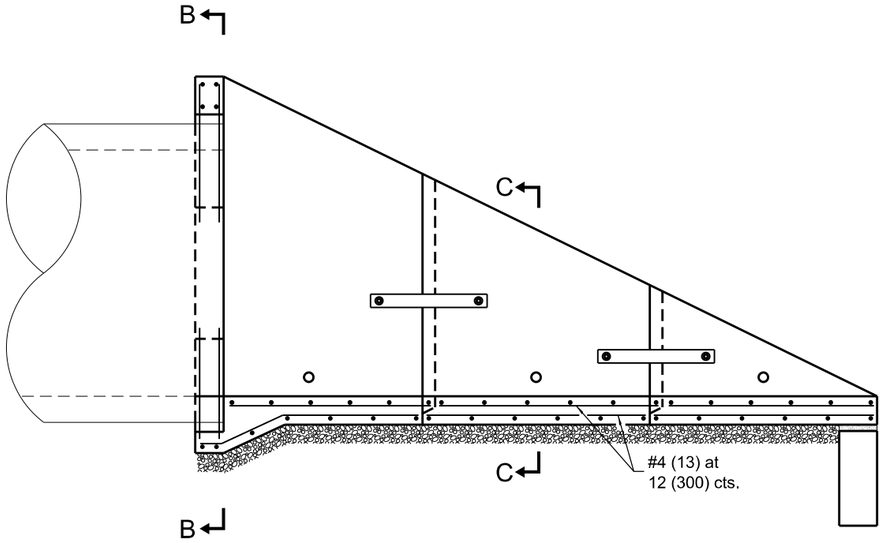
ISSUED 1-1-97

DATE	REVISIONS
4-15-16	Added general note for
	multiple end sections.
4-1-16	Added note to omit restraint angle
	and tie plate for mult. end sections.

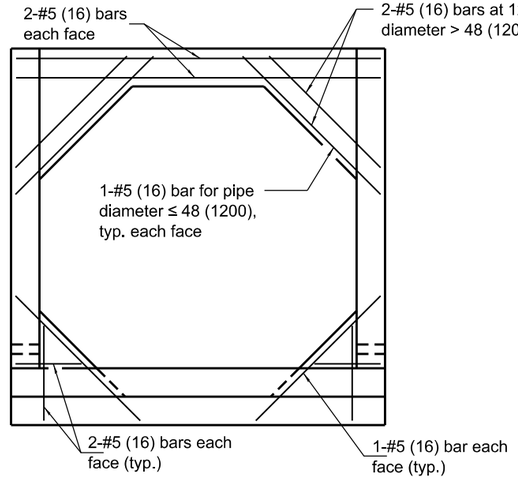
CONCRETE END SECTIONS FOR PIPE CULVERTS 15" (375 mm) THRU 84" (2100 mm) DIA.

STANDARD 542001-06



LONGITUDINAL SECTION

(Showing bottom slab and backwall reinforcement.)



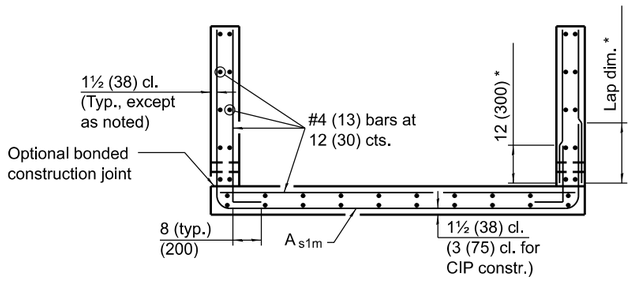
SECTION B-B

(Showing backwall reinforcement only.)
(Pipe omitted for clarity.)

LAP DIMENSION

#4 (13) bar = 17 (425)
#5 (16) bar = 21 (525)
#6 (19) bar = 25 (625)

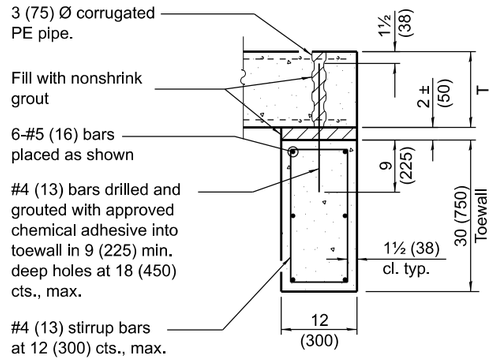
* The Contractor may use lap splices for the sidewall reinforcement at the locations shown.



SECTION C-C

REINFORCEMENT SCHEDULE

Pipe I.D.	As1m	
	Bar Size	Bar Spacing
15 (375)	4 (13)	12 (300)
18 (450)	4 (13)	12 (300)
21 (525)	4 (13)	12 (300)
24 (600)	4 (13)	12 (300)
27 (675)	4 (13)	12 (300)
30 (750)	4 (13)	12 (300)
33 (825)	4 (13)	12 (300)
36 (900)	4 (13)	12 (300)
42 (1050)	4 (13)	8 (200)
48 (1200)	4 (13)	8 (200)
54 (1350)	5 (16)	8 (200)
60 (1500)	5 (16)	8 (200)
66 (1650)	5 (16)	8 (200)
72 (1800)	6 (19)	8 (200)
78 (1950)	6 (19)	8 (200)
84 (2100)	6 (19)	8 (200)



SECTION D-D

GENERAL NOTES

This Standard is for use with single pipe culverts and multi-pipe culvert installations. For multi-pipe culvert installations, place the end sections side-by-side leaving a 3 (75) space between adjacent end section walls and fill the space(s) with Class SI concrete.

The number of segments shown in elevation is for example only. The length and number of precast sections required to construct the end section shall be determined by the Contractor.

See roadway plans for slope (V:H) and pipe inside diameter.

End section may be installed up to | 15 degrees skewed with roadway.

2¼ x 2¼ x 5/16 (56 x 56 x 8) plate washers shall be provided under each nut required for the anchor rods. Holes in the walls for the culvert tie assembly may be drilled using core bits in lieu of formed holes.

See Standard 542311 for end sections having traversable pipe grate.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

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CONCRETE END SECTIONS FOR PIPE CULVERTS 15" (375 mm) THRU 84" (2100 mm) DIA.

(Sheet 2 of 3)

STANDARD 542001-06

QUANTITIES

Pipe I.D.	Concrete yd³(m³) ① Slope of End Section 1:2	1:3	1:4	1:6	Reinforcement Without Lap lbs. (kg) Slope of End Section 1:2	1:3	1:4	1:6	Reinforcement With Lap lbs. (kg) Slope of End Section 1:2	1:3	1:4	1:6
15 (375)	1.3 (1.0)	1.7 (1.3)	2.1 (1.6)	2.8 (2.1)	190 (85.2)	230 (104.1)	280 (123.3)	360 (159.2)	210 (94.9)	260 (117.6)	310 (140.3)	410 (182.9)
18 (450)	1.6 (1.2)	2.1 (1.6)	2.6 (2.0)	3.5 (2.7)	230 (104.3)	290 (131.1)	350 (158.0)	460 (207.3)	260 (114.8)	330 (146.0)	400 (177.3)	520 (234.0)
21 (525)	1.8 (1.4)	2.3 (1.8)	2.9 (2.2)	3.9 (3.0)	260 (114.5)	320 (143.3)	380 (172.2)	510 (229.9)	280 (126.5)	360 (159.7)	430 (193.0)	580 (259.5)
24 (600)	2.1 (1.6)	2.7 (2.1)	3.3 (2.5)	4.5 (3.4)	270 (121.9)	350 (155.8)	420 (189.3)	560 (251.5)	300 (133.9)	390 (172.8)	470 (211.6)	630 (282.6)
27 (675)	2.6 (2.0)	3.4 (2.6)	4.2 (3.2)	5.8 (4.4)	350 (155.5)	440 (198.5)	540 (244.4)	740 (336.3)	380 (169.6)	480 (217.8)	600 (269.6)	830 (373.2)
30 (750)	2.9 (2.2)	3.9 (3.0)	4.9 (3.7)	6.8 (5.2)	380 (169.6)	490 (219.2)	600 (271.9)	830 (374.0)	410 (184.5)	530 (240.0)	660 (299.2)	920 (413.9)
33 (825)	3.2 (2.4)	4.3 (3.3)	5.3 (4.1)	7.4 (5.7)	400 (179.7)	520 (234.9)	640 (290.3)	880 (397.6)	430 (195.2)	570 (257.2)	710 (319.0)	970 (438.9)
36 (900)	3.5 (2.7)	4.7 (3.6)	5.9 (4.5)	8.3 (6.3)	440 (197.8)	580 (262.4)	720 (323.8)	990 (449.4)	480 (214.2)	630 (286.1)	780 (354.0)	1090 (493.7)
42 (1050)	4.3 (3.3)	5.8 (4.4)	7.3 (5.6)	10.3 (7.9)	570 (256.4)	770 (346.4)	950 (429.0)	1330 (601.3)	620 (279.4)	840 (380.0)	1040 (471.6)	1470 (663.7)
48 (1200)	5.0 (3.8)	6.8 (5.2)	8.6 (6.6)	12.2 (9.3)	670 (301.1)	910 (409.9)	1140 (514.8)	1610 (728.2)	720 (325.6)	990 (445.8)	1240 (561.2)	1760 (796.8)
54 (1350)	6.0 (4.6)	8.2 (6.3)	10.3 (7.9)	14.7 (11.2)	890 (403.6)	1200 (544.5)	1530 (692.0)	2170 (985.0)	990 (448.6)	1340 (608.1)	1710 (775.8)	2440 (1108.2)
60 (1500)	6.8 (5.2)	9.3 (7.1)	11.8 (9.0)	16.8 (12.8)	1020 (461.5)	1400 (635.3)	1780 (806.8)	2530 (1149.8)	1120 (508.8)	1550 (704.5)	1980 (896.8)	2820 (1281.5)
66 (1650)	7.9 (6.0)	10.9 (8.3)	13.8 (10.6)	19.7 (15.1)	1150 (519.0)	1570 (712.4)	2010 (911.1)	2880 (1305.8)	1260 (570.2)	1730 (786.1)	2220 (1007.9)	3190 (1449.3)
72 (1800)	8.8 (6.7)	12.2 (9.3)	15.5 (11.9)	22.2 (17.0)	1520 (689.9)	2120 (962.1)	2690 (1222.5)	3880 (1761.3)	1710 (777.0)	2400 (1088.2)	3050 (1384.8)	4410 (2001.0)
78 (1950)	11.4 (8.7)	15.8 (12.1)	20.1 (15.4)	28.9 (22.1)	1750 (791.1)	2400 (1090.7)	3100 (1409.0)	4490 (2039.7)	1950 (885.5)	2700 (1223.1)	3490 (1583.9)	5060 (2298.9)
84 (2100)	12.6 (9.6)	17.4 (13.3)	22.3 (17.0)	32.1 (24.5)	1900 (862.7)	2680 (1217.4)	3430 (1558.6)	4960 (2254.4)	2120 (959.6)	3000 (1359.6)	3840 (1743.2)	5560 (2526.8)

① For cast-in-place construction, increase concrete volumes by approximately 12%.

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