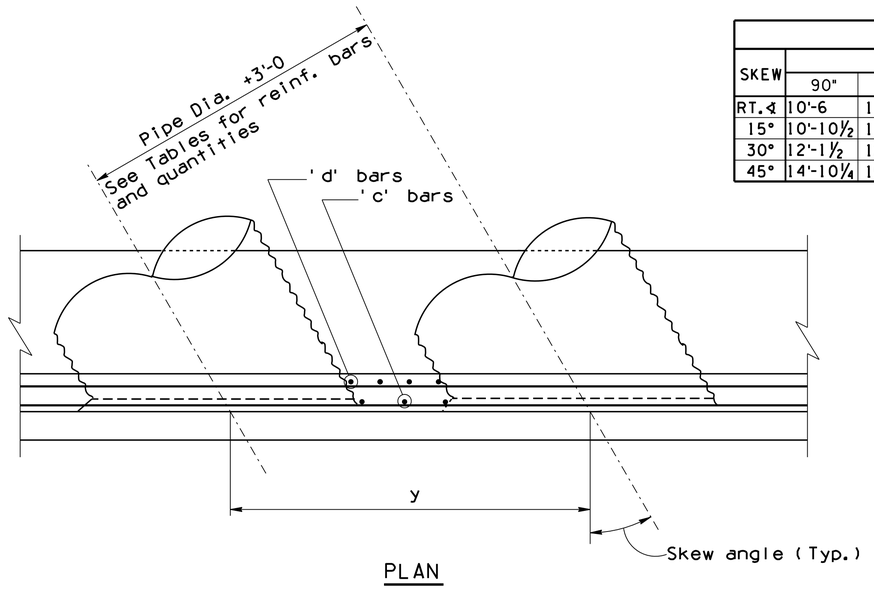
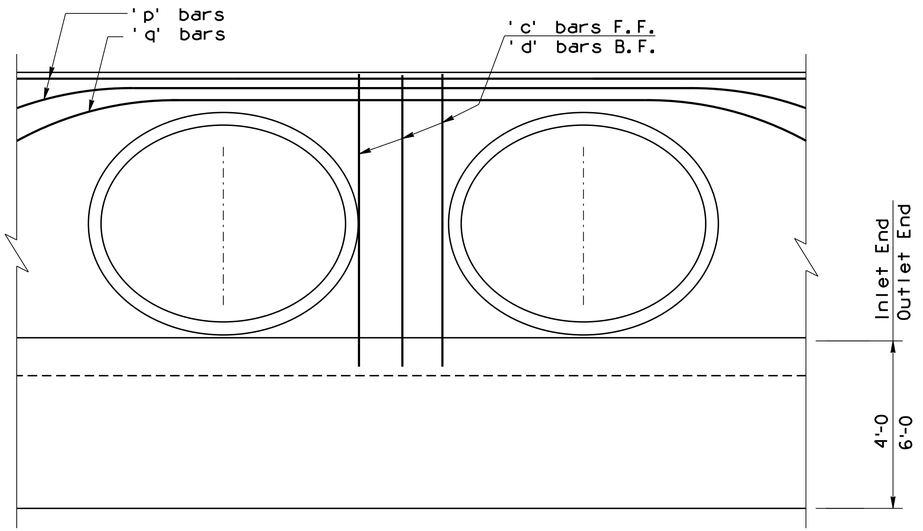


PLAN



ELEVATION

DIMENSION Y (FT.)										
SKEW	PIPE Dia. (Inches)									
	90"	96"	102"	108"	114"	120"	126"	132"	138"	144"
RT.∢	10'-6	11'-0	11'-6	12'-0	12'-6	13'-0	13'-6	14'-0	14'-6	15'-0
15°	10'-10½	11'-4⅝	11'-10⅞	12'-5⅛	12'-11¼	13'-5½	13'-11¾	14'-5⅞	15'-0⅛	15'-6⅜
30°	12'-1½	12'-8⅜	13'-3⅜	13'-10¼	14'-5¼	15'-0⅛	15'-7	16'-2	16'-8⅞	17'-3⅞
45°	14'-10¼	15'-6⅝	16'-3⅛	16'-11⅝	17'-8⅛	18'-4⅝	19'-1⅛	19'-9⅝	20'-6⅛	21'-2½

No. OF ADDITIONAL BARS REQUIRED FOR ADDITIONAL PIPE											
SKEW	MARK	PIPE Dia. (Inches)									
		90	96	102	108	114	120	126	132	138	144
RT.∢	c	3	3	3	3	3	3	3	3	3	3
	d	4	4	4	4	4	4	4	4	4	4
	e8	10	10	11	11	12	12	13	13	14	14
	u *	6	7	7	7	8	8	8	9	9	9
15°	c	3	3	3	3	3	3	3	3	3	3
	d	4	4	4	4	4	4	4	4	4	4
	e8	10	11	11	12	12	13	13	14	14	15
	u *	7	7	7	8	8	8	9	9	10	10
30°	c	3	3	3	3	3	3	3	3	3	3
	d	4	4	4	4	4	4	4	4	4	4
	e9	11	12	13	13	14	14	15	15	16	17
	u *	8	8	8	9	9	10	10	10	11	11
45°	c	4	4	4	4	4	4	4	4	4	4
	d	5	5	5	5	5	5	5	5	5	5
	e9	14	15	16	16	17	18	18	19	20	20
	u *	10	10	10	11	11	12	12	13	13	13

* For Outlet End double No. of 'u' bars

CONCRETE QUANTITIES PER ADDITIONAL PIPE (C.Y.)									
	PIPE Dia.	INLET END				OUTLET END			
		RT.∢	15°	30°	45°	RT.∢	15°	30°	45°
2:1 Slope	90"	7.2	7.5	8.0	10.2	7.8	8.3	9.2	11.6
	96"	7.8	8.1	8.7	11.1	8.5	8.9	9.9	12.6
	102"	8.5	8.8	9.4	12.0	9.2	9.6	10.7	13.6
	108"	9.1	9.4	10.1	12.9	9.8	10.3	11.4	14.6
	114"	9.8	10.2	10.9	13.8	10.6	11.1	12.3	15.6
	120"	10.5	10.9	11.7	14.9	11.3	11.8	13.2	16.7
	126"	11.2	11.6	12.5	15.9	12.0	12.6	14.0	17.8
	132"	12.0	12.4	13.4	17.0	12.8	13.4	15.0	18.9
	138"	12.8	13.2	14.3	18.0	13.7	14.2	15.9	20.0
	144"	13.6	14.0	15.2	19.2	14.5	15.1	16.9	21.3
4:1 Slope	90"	6.8	7.1	7.8	9.7	7.7	8.2	9.0	11.1
	96"	7.4	7.7	8.4	10.5	8.4	8.8	9.6	12.0
	102"	8.0	8.3	9.2	11.4	9.0	9.5	10.5	13.0
	108"	8.7	9.0	9.8	12.3	9.6	10.2	11.1	14.0
	114"	9.3	9.7	10.6	13.2	10.3	11.0	12.0	14.9
	120"	10.0	10.4	11.3	14.2	11.0	11.7	12.7	16.0
	126"	10.7	11.1	12.1	15.2	11.8	12.5	13.6	17.1
	132"	11.5	11.9	12.9	16.2	12.5	13.3	14.5	18.1
	138"	12.2	12.7	13.7	17.3	13.2	14.2	15.3	19.3
	144"	13.0	13.5	14.3	18.4	14.0	15.0	16.0	20.5
6:1 Slope	90"	6.4	6.7	7.7	9.1	7.6	7.8	8.9	10.5
	96"	7.0	7.3	8.3	9.9	8.2	8.4	9.5	11.4
	102"	7.6	7.9	8.9	10.8	8.8	9.1	10.2	12.4
	108"	8.2	8.5	9.6	11.6	9.3	9.7	10.9	13.3
	114"	8.9	9.2	10.3	12.5	10.1	10.5	11.7	14.2
	120"	9.5	9.9	11.0	13.5	10.7	11.2	12.5	15.3
	126"	10.2	10.6	11.7	14.5	11.4	12.0	13.2	16.4
	132"	11.0	11.3	12.4	15.5	12.2	12.7	14.0	17.4
	138"	11.7	12.1	13.2	16.5	12.8	13.6	14.8	18.5
	144"	12.5	12.9	14.0	17.6	13.6	14.4	15.7	19.7

REINF. BAR QUANTITIES PER ADDITIONAL PIPE (Lbs.)																							
PIPE Dia.	INLET END												OUTLET END										
	RT.∢			15°			30°			45°			RT.∢			15°			30°			45°	
	2:1	4:1	6:1	2:1	4:1	6:1	2:1	4:1	6:1	2:1	4:1	6:1	2:1	4:1	6:1	2:1	4:1	6:1	2:1	4:1	6:1	2:1	4:1	6:1
90"	280	270	245	320	285	280	340	300	300	460	385	385	345	340	315	400	360	355	425	390	385	570	495	490
96"	320	320	280	350	335	300	365	355	320	560	460	440	395	395	355	425	415	375	450	445	405	670	565	550
102"	385	375	355	475	380	375	470	380	375	605	485	470	460	455	435	550	460	450	560	470	465	715	600	580
108"	475	465	380	505	420	410	500	410	400	680	640	540	550	545	460	590	505	495	595	510	495	800	760	660
114"	510	510	485	525	505	490	535	515	490	825	695	665	600	600	570	610	590	580	635	610	590	950	815	790
120"	530	530	505	630	545	525	640	530	520	875	735	705	615	615	595	720	635	615	745	640	620	1005	860	835
126"	565	565	540	670	565	545	695	565	550	915	760	740	650	650	630	770	660	640	800	675	660	1050	890	870
132"	715	710	610	725	640	595	725	590	570	1210	985	845	815	805	710	825	740	695	840	800	680	1350	1125	985
138"	770	770	735	790	770	765	785	730	605	1275	1055	1015	870	825	835	895	880	870	905	850	725	1420	1195	1155
144"	800	800	770	965	820	780	835	775	745	1330	1085	1045	905	905	875	1075	930	890	955	900	865	1475	1225	1190

BAR LENGTH ADJUSTMENT PER ADDITIONAL PIPE (FT.)												
SKEW	MARK *	PIPE Dia. (Inches)										
		90"	96"	102"	108"	114"	120"	126"	132"	138"	144"	
RT.∢	j, n1, n2, p, q	10'-6	11'-0	11'-6	12'-0	12'-6	13'-0	13'-6	14'-0	14'-6	15'-0	
15°	g, n1, n2, p, q	10'-9	11'-3	12'-0	12'-6	13'-0	13'-6	14'-0	14'-6	15'-0	15'-6	
30°	g, n1, n2, p, q	12'-0	12'-9	13'-3	13'-9	14'-6	15'-0	15'-6	16'-3	16'-9	17'-3	
45°	g, n1, n2, p, q	14'-9	15'-6	16'-3	17'-0	17'-9	18'-3	19'-0	19'-9	20'-6	21'-3	

* Increase bar lengths for single pipes by dimensions in table for each additional pipe.

NOTES:

Multipipe culvert headwall quantities are obtained by multiplying quantity shown in tables by the number of additional pipes and adding to single pipe headwall quantity. Number of bars and quantities shown in tables are for one headwall.

NOTE:

For General Notes and additional Details, see SD 6.30 (1 of 5).

Note to Designer:
The information presented in this Standard Detail has been prepared in accordance with recognized engineering principles and is for general use. It should not be used for specific application without competent verification of its suitability and applicability by a licensed professional engineer. Contents within the inner border line shall not be altered.

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	Original Issue	S.M.M.	7-12
2			
3			
4			

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APPROVED FOR DISTRIBUTION: Jean A. Nehme

ARIZONA DEPARTMENT OF TRANSPORTATION
INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION
BRIDGE GROUP STRUCTURE DETAIL

PIPE CULVERT HEADWALLS
MULTI-PIPE WITHOUT APRON

ROUTE	PROJECT NO.	F.A. NO.	DRAWING NO.
			SD 6.35 (1 of 2)
LOCATION			SHEET NO. OF

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