INLET WINGS

Span	Height	0° Skew				5° Skew				10° Skew				15° Skew				20° Skew			
		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.	
		1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs
6'	3'	5.41	0.86	394	80	5.47	0.87	405	80	5.53	0.88	409	81	5.80	0.89	436	83	6.14	0.92	462	85
	4'	7.11	0.86	516	80	7.46	0.87	540	80	7.57	0.88	544	81	7.97	0.89	583	83	8.38	0.92	602	85
	5'	9.32	0.86	666	80	9.56	0.87	688	80	9.83	0.88	698	81	10.44	0.89	752	83	11.03	0.92	796	85
	6'	11.95	0.86	846	80	12.18	0.87	861	80	12.60	0.88	883	81	13.07	0.89	910	83	14.06	0.92	978	85
	7'	14.99	0.86	1144	80	15.23	0.87	1169	80	15.67	0.88	1191	81	16.32	0.89	1169	83	17.26	0.92	1238	85
8'	3'	5.70	1.13	440	105	5.77	1.14	453	106	5.83	1.15	457	107	6.11	1.17	493	109	6.46	1.21	522	112
	4'	7.41	1.13	541	105	7.76	1.14	565	106	7.88	1.15	570	107	8.28	1.17	613	109	8.71	1.21	635	112
	5'	9.62	1.13	691	105	9.86	1.14	713	106	10.14	1.15	724	107	10.76	1.17	782	109	11.35	1.21	829	112
	6'	12.25	1.13	908	105	12.48	1.14	922	106	12.91	1.15	949	107	13.39	1.17	985	109	14.39	1.21	1058	112
	7'	15.29	1.13	1169	105	15.54	1.14	1194	106	15.99	1.15	1217	107	16.64	1.17	1202	109	17.59	1.21	1272	112
	8'	22.19	1.13	1272	105	22.92	1.14	1341	106	23.44	1.15	1373	107	24.54	1.17	1454	109	26.21	1.21	1536	112
10'	3'	6.01	1.40	484	130	6.08	1.41	497	131	6.15	1.43	502	132	6.43	1.45	532	135	6.79	1.49	563	139
	4'	7.72	1.40	587	130	8.07	1.41	612	131	8.20	1.43	617	132	8.60	1.45	656	135	9.04	1.49	679	139
	5'	9.93	1.40	740	130	10.18	1.41	763	131	10.46	1.43	774	132	11.09	1.45	827	135	11.69	1.49	876	139
	6'	12.56	1.40	960	130	12.80	1.41	974	131	13.23	1.43	1003	132	13.73	1.45	1033	135	14.74	1.49	1109	139
	7'	15.61	1.40	1224	130	15.86	1.41	1250	131	16.32	1.43	1274	132	16.98	1.45	1248	135	17.94	1.49	1326	139
	8'	22.53	1.40	1329	130	23.26	1.41	1400	131	23.79	1.43	1433	132	24.90	1.45	1509	135	26.59	1.49	1594	139
	9'	27.10	1.40	1696	130	27.89	1.41	1777	131	28.51	1.43	1813	132	29.59	1.45	1889	135	31.58	1.49	1994	139
	10'	32.19	1.40	1986	130	32.69	1.41	2024	131	33.64	1.43	2086	132	35.14	1.45	2186	135	37.00	1.49	2309	139
12'	8'	22.90	1.69	1358	156	23.64	1.69	1431	157	24.18	1.71	1464	159	25.30	1.74	1535	162	27.01	1.79	1634	196
	9'	27.51	1.69	1727	156	28.27	1.69	1809	157	28.90	1.71	1836	159	29.99	1.74	1923	162	32.01	1.79	2034	196
	10'	32.56	1.69	2017	156	33.07	1.69	2055	157	34.04	1.71	2118	159	35.55	1.74	2211	162	37.44	1.79	2350	196
	11'	38.57	1.69	2712	156	39.08	1.69	2769	157	40.14	1.71	2826	159	41.99	1.74	2936	162	44.34	1.79	3066	196
	12'	45.28	1.69	3461	156	45.88	1.69	3529	157	47.13	1.71	3648	159	48.97	1.74	3754	162	52.07	1.79	3964	196

Span	Height	25° Skew				30° Skew				35° Skew				40° Skew				45° Skew			
		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.	
		1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs
6'	3'	6.53	0.95	487	88	6.62	1.00	503	93	6.60	1.05	496	98	6.87	1.13	507	105	7.28	1.22	542	113
	4'	8.81	0.95	640	88	9.05	1.00	671	93	9.03	1.05	660	98	9.33	1.13	676	105	9.80	1.22	719	113
	5'	11.65	0.95	840	88	11.77	1.00	852	93	11.92	1.05	862	98	12.11	1.13	879	105	12.66	1.22	907	113
	6'	14.73	0.95	1025	88	14.89	1.00	1041	93	15.07	1.05	1059	98	15.45	1.13	1076	105	16.22	1.22	1129	113
	7'	18.19	0.95	1306	88	18.38	1.00	1338	93	18.41	1.05	1340	98	19.11	1.13	1383	105	20.11	1.22	1447	113
8'	3'	6.86	1.25	549	116	6.97	1.31	559	121	6.96	1.38	560	128	7.26	1.48	573	137	7.71	1.60	611	149
	4'	9.15	1.25	670	116	9.40	1.31	697	121	9.40	1.38	696	128	9.72	1.48	713	137	10.23	1.60	758	149
	5'	11.99	1.25	874	116	12.13	1.31	880	121	12.30	1.38	898	128	12.51	1.48	910	137	13.09	1.60	946	149
	6'	15.07	1.25	1108	116	15.24	1.31	1118	121	15.45	1.38	1144	128	15.86	1.48	1163	137	16.65	1.60	1219	149
	7'	18.54	1.25	1331	116	18.75	1.31	1361	121	18.79	1.38	1376	128	19.52	1.48	1421	137	20.55	1.60	1487	149
	8'	27.46	1.25	1637	116	27.73	1.31	1678	121	28.23	1.38	1690	128	28.87	1.48	1759	137	30.33	1.60	1844	149
10'	3'	7.21	1.55	594	144	7.33	1.62	610	150	7.34	1.71	634	188	7.66	1.83	658	201	8.14	1.99	697	217
	4'	9.50	1.55	718	144	9.77	1.62	747	150	9.79	1.71	774	188	10.13	1.83	802	201	10.67	1.99	849	217
	5'	12.35	1.55	926	144	12.50	1.62	938	150	12.69	1.71	980	188	12.92	1.83	1003	201	13.54	1.99	1038	217
	6'	15.44	1.55	1164	144	15.62	1.62	1179	150	15.84	1.71	1230	188	16.27	1.83	1260	201	17.10	1.99	1317	217
	7'	18.90	1.55	1390	144	19.13	1.62	1426	150	19.19	1.71	1466	188	19.94	1.83	1521	201	21.00	1.99	1588	217
	8'	27.85	1.55	1700	144	28.14	1.62	1746	150	28.65	1.71	1783	188	29.32	1.83	1858	201	30.81	1.99	1949	217
	9'	33.16	1.55	2059	144	33.52	1.62	2119	150	34.13	1.71	2161	188	34.99	1.83	2229	201	37.02	1.99	2373	217
	10'	39.02	1.55	2460	144	39.57	1.62	2534	150	40.08	1.71	2610	188	41.61	1.83	2724	201	43.56	1.99	2845	217
12'	8'	28.30	1.86	1738	204	28.60	1.95	1784	213	29.13	2.06	1795	265	29.82	2.20	1853	334	31.36	2.38	1961	361
	9'	33.61	1.86	2098	204	33.99	1.95	2157	213	34.62	2.06	2173	265	35.50	2.20	2237	334	37.57	2.38	2371	361
	10'	39.48	1.86	2499	204	40.05	1.95	2557	213	40.58	2.06	2624	265	42.13	2.20	2733	334	44.12	2.38	2857	361
	11'	46.53	1.86	3210	204	46.83	1.95	3279	213	47.71	2.06	3377	265	49.46	2.20	3521	334	51.86	2.38	3732	361
	12'	54.07	1.86	4114	204	54.80	1.95	4184	213	55.90	2.06	4269	265	57.84	2.20	4381	334	61.21	2.38	4679	361

OUTLET WINGS

Span	Height	0° Skew				5° Skew				10° Skew				15° Skew				20° Skew			
		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.	
		1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs
6'	3'	8.58	1.55	639	135	8.74	1.56	657	135	8.75	1.58	658	137	8.96	1.61	667	140	9.17	1.65	685	143
	4'	11.40	1.55	837	135	11.58	1.56	843	135	11.60	1.58	845	137	11.65	1.61	853	140	11.97	1.65	867	143
	5'	14.49	1.55	1043	135	14.71	1.56	1062	135	14.74	1.58	1060	137	14.78	1.61	1062	140	15.34	1.65	1098	143
	6'	17.97	1.55	1241	135	17.99	1.56	1235	135	18.26	1.58	1278	137	18.51	1.61	1281	140	18.92	1.65	1314	143
	7'	21.70	1.55	1493	135	21.82	1.56	1512	135	22.09	1.58	1584	137	22.38	1.61	1611	140	23.06	1.65	1656	143
8'	3'	9.12	2.02	706	177	9.29	2.03	723	178	9.31	2.05	726	180	9.53	2.09	751	184	9.76	2.15	770	189
	4'	11.96	2.02	877	177	12.14	2.03	883	178	12.17	2.05	885	180	12.23	2.09	908	184	12.56	2.15	919	189
	5'	15.06	2.02	1083	177	15.28	2.03	1102	178	15.31	2.05	1100	180	15.36	2.09	1117	184	15.94	2.15	1154	189
	6'	18.55	2.02	1316	177	18.57	2.03	1310	178	18.84	2.05	1360	180	19.11	2.09	1385	184	19.53	2.15	1419	189
	7'	22.28	2.02	1534	177	22.41	2.03	1553	178	22.68	2.05	1625	180	22.99	2.09	1670	184	23.68	2.15	1712	189
	8'	30.92	2.02	1924	177	31.11	2.03	1901	178	31.48	2.05	1930	180	31.62	2.09	1958	184	32.45	2.15	1996	189
10'	3'	9.69	2.51	775	220	9.86	2.52	794	221	9.89	2.55	794	223	10.12	2.59	805	228	10.37	2.67	825	235
	4'	12.54	2.51	949	220	12.72	2.52	956	221	12.76	2.55	958	223	12.83	2.59	967	228	13.73	2.67	980	235
	5'	15.65	2.51	1160	220	15.87	2.52	1179	221	15.91	2.55	1177	223	15.97	2.59	1181	228	16.57	2.67	1218	235
	6'	19.14	2.51	1396	220	19.17	2.52	1389	221	19.44	2.55	1434	223	19.72	2.59	1452	228	20.16	2.67	1488	235
	7'	22.88	2.51	1617	220	23.01	2.52	1636	221	23.29	2.55	1710	223	23.61	2.59	1738	228	24.32	2.67	1784	235
	8'	31.56	2.51	2011	220	31.75	2.52	1988	221	32.13	2.55	2018	223	32.27	2.59	2032	228	33.13	2.67	2072	235
	9'	37.18	2.51	2325	220	37.38	2.52	2357	221	37.48	2.55	2342	223	38.21	2.59	2395	228	39.20	2.67	2454	235
	10'	43.26	2.51	2781	220	43.54	2.52	2767	221	43.61	2.55	2801	223	44.42	2.59	2844	228	45.49	2.67	2910	235
12'	8'	32.22	2.98	2038	264	32.41	2.99	2025	265	32.79	3.02	2056	268	32.95	3.08	2073	274	33.82	3.17	2126	311
	9'	37.85	2.98	2373	264	38.05	2.99	2405	265	38.15	3.02	2390	268	38.90	3.08	2446	274	39.90	3.17	2505	311
	10'	43.94	2.98	2829	264	44.21	2.99	2815	265	44.29	3.02	2850	268	45.12	3.08	2896	274	46.20	3.17	2975	311
	11'	50.88	2.98	3330	264	51.13	2.99	3362	265	51.25	3.02	3360	268	52.34	3.08	3422	274	53.70	3.17	3536	311
	12'	58.80	2.98	4507	264	58.86	2.99	4482	265	59.56	3.02	4558	268	60.40	3.08	4593	274	61.49	3.17	4699	311

Span	Height	25° Skew				30° Skew				35° Skew				40° Skew				45° Skew			
		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.		Conc. C.Y.		Steel lbs.	
		1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs	1 Bbl.	Δc	1 Bbl.	Δs
6'	3'	9.16	1.71	679	149	9.29	1.79	703	156	9.25	1.90	695	165	9.62	2.03	711	177	10.19	2.20	763	191
	4'	11.89	1.71	862	149	12.21	1.79	905	156	12.19	1.90	892	165	12.58	2.03	714	177	13.21	2.20	874	191
	5'	15.28	1.71	1099	149	15.43	1.79	1120	156	15.62	1.90	1131	165	15.86	2.03	1150	177	16.57	2.20	1195	191
	6'	18.85	1.71	1317	149	19.04	1.79	1342	156	19.26	1.90	1362	165	19.75	2.03	1584	177	20.67	2.20	1453	191
	7'	22.81	1.71	1631	149	23.03	1.79	1672	156	23.05	1.90	1673	165	23.90	2.03	1725	177	25.06	2.20	1805	191
8'	3'	9.76	2.23	764	196	9.91	2.34	776	204	9.91	2.47	783	216	10.32	2.64	801	231	10.95	2.86	857	251
	4'	12.50	2.23	915	196	12.85	2.34	947	204	12.85	2.47	952	216	13.29	2.64	975	231	13.98	2.86	1038	251
	5'	15.90	2.23	1155	196	16.08	2.34	1164	204	16.30	2.47	1190	216	16.58	2.64	1205	231	17.34	2.86	1259	251
	6'	19.48	2.23	1423	196	19.69	2.34	1435	204	19.94	2.47	1470	216	20.48	2.64	1496	231	21.45	2.86	1569	251
	7'	23.44	2.23	1679	196	23.69	2.34	1711	204	23.74	2.47	1733	216	24.64	2.64	1787	231	25.85	2.86	1870	251
	8'	32.50	2.23	2019	196	32.81	2.34	2062	204	33.35	2.47	2084	216	34.09	2.64	2158	231	35.76	2.86	2264	251
10'	3'	10.40	2.77	824	243	10.57	2.89	849	254	10.60	3.06	874	298	11.05	3.27	911	318	11.74	3.54	961	344
	4'	13.14	2.77	978	243	13.51	2.89	1021	254	13.55	3.06	1047	298	14.03	3.27	1089	318	14.77	3.54	1147	344
	5'	16.54	2.77	1223	243	16.79	2.89	1244	254	17.00	3.06	1289	289	17.32	3.27	1323	318	18.15	3.54	1384	344
	6'	20.13	2.77	1495	243	20.36	2.89	1520	254	20.65	3.06	1573	298	21.23	3.27	1617	318	22.27	3.54	1684	344
	7'	24.10	2.77	1754	243	24.38	2.89	1799	254	24.46	3.06	1839	298	25.40	3.27	1912	318	26.67	3.54	1989	344
	8'	33.19	2.77	2097	243	33.53	2.89	2154	254	34.10	3.06	2193	298	34.89	3.27	2281	318	36.62	3.54	2387	344
	9'	38.96	2.77	2490	243	39.37	2.89	2559	254	40.04	3.06	2604	298	41.01	3.27	2687	318	43.32	3.54	2848	344
	10'	45.27	2.77	2924	243	45.87	2.89	3008	254	46.44	3.06	3087	298	48.13	3.27	3218	318	50.32	3.54	3354	344
12'	8'	33.90	3.29	2159	323	34.26	3.44	2207	337	34.87	3.64	2230	397	35.70	3.89	2294	475	37.49	4.21	2424	513
	9'	39.68	3.29	2552	323	40.11	3.44	2614	337	40.81	3.64	2641	397	41.83	3.89	2712	475	44.21	4.21	2871	513
	10'	46.00	3.29	2987	323	46.62	3.44	3048	337	47.22	3.64	3125	397	48.96	3.89	3245	475	51.21	4.21	3392	513
	11'	53.70	3.29	3747	323	53.85	3.44	3803	337	54.81	3.64	3911	397	56.73	3.89	4067	475	59.38	4.21	4300	513
	12'	61.50	3.29	4669	323	62.28	3.44	4742	337	63.44	3.64	4837	397	65.55	3.89	4960	475	69.28	4.21	5287	513

Δc = inlet or outlet concrete quantity per additional barrel.

Δs = inlet or outlet steel quantity per additional barrel.

NOTE:

For General Notes, Dimensions, and additional Details, see SD 6.01 (1 & 2 of 5). For Headwall Details see SD 6.08 (1 to 8).

NOTES:

All quantities are for headwalls of barrels shown in Table No. 1 (0-10' Fill).
Quantities are shown for single barrel culvert only.
Multi-barrel culvert headwall quantities are obtained by adding, for each additional barrel, Δs and Δc to the inlet and outlet quantities.

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 professional examination and 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.U.H.	2-12
2	Added 3',4',5' height for existing box extensions only	D.B.B.	5-15
3			
4			

DESIGN APPROVED

APPROVED FOR DISTRIBUTION

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

REINFORCED CONCRETE BOX CULVERTS
HEADWALL QUANTITIES
4 : 1 SLOPE

ROUTE | PROJECT NO. | FA NO. | DRAWING NO. SD 6.09 (2 of 3)

LOCATION | SHEET NO. OF

22-JAN-2016 10:36 G:\Bridge\CADD\Standards\SD_Sheets\SD 6 Drainage Stuctures\SD 6.01-6.11 Series\SD609-1 to 3\sd609-2_0116.dgn