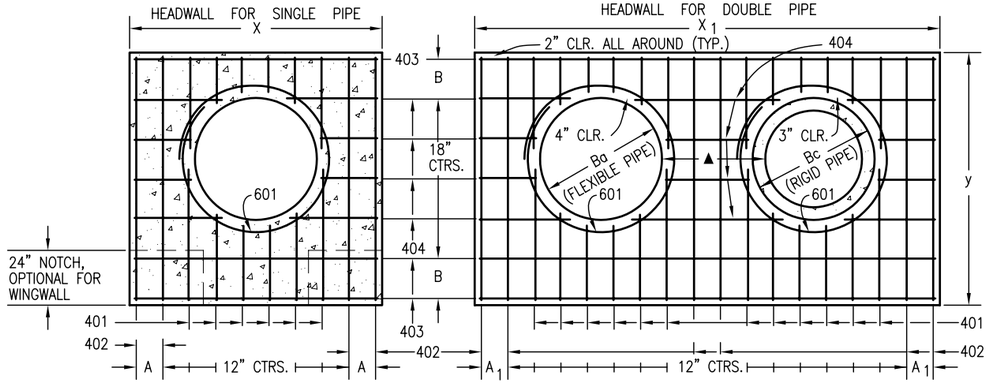
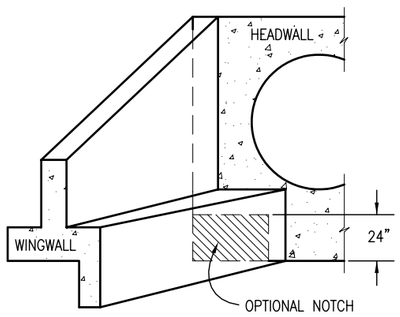
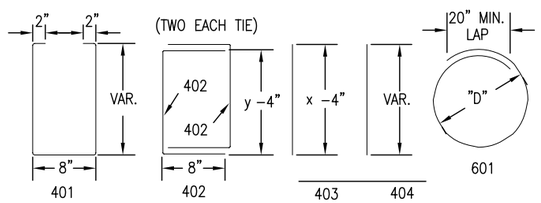


TYPICAL BAR LAYOUT FOR CONCRETE HEADWALLS

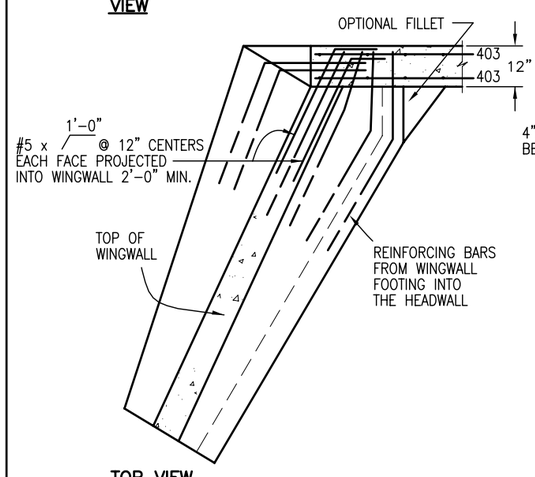


FRONT VIEW



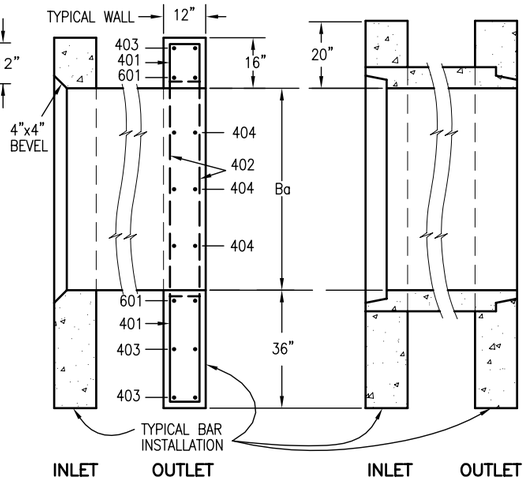
"D" = RIGID PIPE = Bc + 6"
FLEXIBLE PIPE = Ba + 8"
FLEXIBLE ARCH = SPAN + 8"
STRUCTURAL PLATE ARCH = RISE + 8"

BAR BENDING

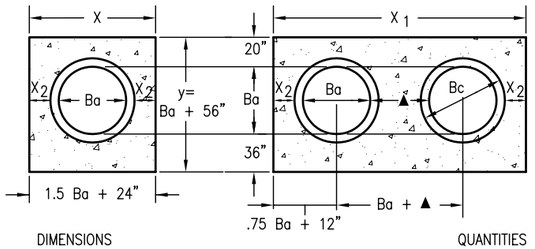


TOP VIEW

WINGWALL CONNECTION

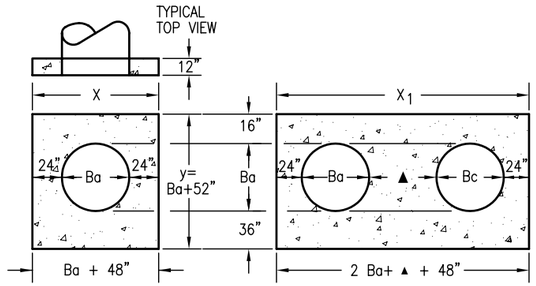


ENDS OF FLEXIBLE PIPE | **ENDS OF RIGID PIPE**



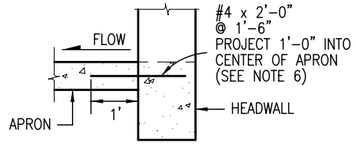
DIMENSIONS									QUANTITIES			
									CONCRETE		STEEL ■	
Ba IN.	Bc IN.	X FT.–IN.	A IN.	X_1 FT.–IN.	A_1 IN.	y FT.–IN.	B IN.	X_2 IN.	SGL CU.YD.	DBL CU.YD.	SGL LBS.	DBL LBS.
54	65	8–9	8 1/2	15–6	7	9–2	17	20	2.12	3.55	209	364
60	72	9–6	7	17–0	10	9–8	11	21	2.35	3.99	236	414
66	79	10–3	11 1/2	18–6	7	10–2	14	22	2.60	4.44	249	453
72	86	11–0	10	20–0	10	10–8	17	23	2.85	4.91	270	476
78	93	11–9	8 1/2	21–3	11	11–2	11	24	3.11	5.29	306	527
84	100	12–6	7	22–6	7	11–8	14	25	3.38	5.68	333	572
90	107	13–3	11 1/2	23–9	8 1/2	12–2	17	26	3.66	6.08	335	593
96	114	14–0	10	25–0	10	12–8	11	27	3.94	6.48	379	649
102	121	14–9	8 1/2	26–3	11 1/2	13–2	14	28	4.24	6.89	400	664
108	128	15–6	7	27–6	7	13–8	17	29	4.54	7.30	424	707

HEADWALL FOR RIGID ROUND PIPE



DIMENSIONS							QUANTITIES			
							CONCRETE		STEEL ■	
Ba IN.	X FT.–IN.	A IN.	X_1 FT.–IN.	A_1 IN.	y FT.–IN.	B IN.	SGL CU. YD.	DBL CU. YD.	SGL LBS.	DBL LBS.
54	8–6	7	15–3	11 1/2	8–10	15	2.19	3.81	211	358
60	9–0	10	16–6	7	9–4	18	2.38	4.25	217	396
66	9–6	7	17–9	8 1/2	9–10	12	2.58	4.70	252	454
72	10–0	10	19–0	10	10–4	15	2.78	5.17	255	472
78	10–6	7	20–0	10	10–10	18	2.98	5.56	276	499
84	11–0	10	21–0	10	11–4	12	3.19	5.95	297	553
90	11–6	7	22–0	10	11–10	15	3.40	6.36	317	517
96	12–0	10	23–0	10	12–4	18	3.62	6.79	321	597
102	12–6	7	24–0	10	12–10	12	3.84	7.21	364	663
108	13–0	10	25–0	10	13–4	15	4.06	7.63	362	678

HEADWALL FOR FLEXIBLE ROUND PIPE



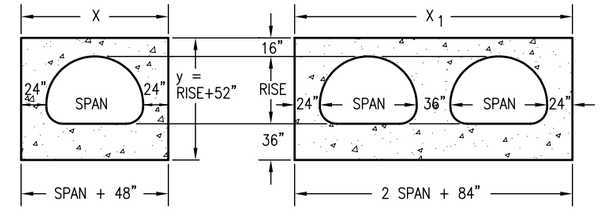
WHEN APRON IS REQUIRED

GENERAL NOTES

1. CONCRETE SHALL BE CLASS B.
2. HEADWALL SHALL BE PERPENDICULAR TO THE PIPE ℄ UNLESS OTHERWISE SHOWN ON THE PLANS. TABULATED DIMENSIONS AND QUANTITIES MUST BE ADJUSTED FOR SKEWED INSTALLATIONS.
3. FOR WINGWALL DETAILS, SEE STANDARD PLAN M–601–20.
4. VOLUME OCCUPIED BY PIPE HAS BEEN DEDUCTED FROM STEEL AND CONCRETE QUANTITIES.
5. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/4 IN.
6. ALL REINFORCING BARS SHALL HAVE A 2 IN. MINIMUM CLEARANCE.

▲ WHEN TWO OR MORE PIPES ARE LAID SIDE BY SIDE, THEY SHALL BE PLACED SO THAT THE ADJACENT PIPES WILL BE 1/2 INSIDE DIAMETER APART, OR 1/2 INSIDE SPAN APART, OR 3 FT. APART (INCLUDING WALL THICKNESS), WHICHEVER IS LESS.

■ ADD 0.89 x (X OR X_1) (LB.) WHEN APRON IS REQUIRED.



DIMENSIONS									QUANTITIES			
									CONCRETE		STEEL ■	
EQUIV. Ba IN.	SPAN IN.	RISE IN.	X FT.–IN.	A IN.	X_1 FT.–IN.	A_1 IN.	y FT.–IN.	B IN.	SGL CU. YD.	DBL CU. YD.	SGL LBS.	DBL LBS.
72	81	59	10–9	8 1/2	20–6	7	9–3	17 1/2	2.72	5.10	250	467
78	87	63	11–3	11 1/2	21–6	7	9–7	10 1/2	2.85	5.34	275	531
84	95	67	11–9	8 1/2	22–10	9	9–11	12 1/2	3.08	5.79	290	547
90	103	71	12–7	7 1/2	24–2	11	10–3	15	3.30	6.21	321	591
96	112	75	13–4	12	25–8	8	10–7	16 1/2	3.52	6.65	314	606
102	117	79	13–9	8 1/2	26–6	7	10–11	9 1/2	3.63	6.86	356	672
108	128	83	14–8	8	28–4	12	11–3	11 1/2	3.96	7.51	376	699

HEADWALL FOR FLEXIBLE PIPE ARCH

DIMENSIONS									QUANTITIES			
									CONCRETE		STEEL ■	
EQUIV. Ba IN.	SPAN FT.–IN.	RISE FT.–IN.	X FT.–IN.	A IN.	X_1 FT.–IN.	A_1 IN.	y FT.–IN.	B IN.	SGL CU. YD.	DBL CU. YD.	SGL LBS.	DBL LBS.
66	6–1	4–7	10–1	10 1/2	19–2	11	8–11	15 1/2	2.52	4.70	232	424
75	7–0	5–1	11–0	10	21–0	10	9–5	9 1/2	2.80	5.25	282	509
84	7–11	5–7	11–11	9 1/2	22–10	9	9–11	12 1/2	3.08	5.79	291	540
93	8–10	6–1	12–10	9	24–8	8	10–5	15 1/2	3.36	6.33	309	622
102	9–9	6–7	13–9	8 1/2	26–6	7	10–11	9 1/2	3.63	6.86	379	673
111	10–11	7–1	14–11	9 1/2	28–10	9	11–5	12 1/2	4.05	7.67	377	711
120	11–10	7–7	15–10	9	30–8	8	11–11	15 1/2	4.36	8.28	395	731
132	12–10	8–4	16–10	9	32–8	8	12–8	11	4.75	9.03	441	839
141	14–1	8–9	18–1	10 1/2	35–2	11	13–1	13 1/2	5.17	9.86	448	931
150	15–4	9–3	19–4	12	37–8	8	13–7	16 1/2	5.69	10.88	490	953
159	15–10	9–10	19–10	9	38–8	8	14–2	11	5.89	11.25	534	1019

HEADWALL FOR STRUCTURAL PLATE ARCH

SKEW ANGLE A°	90	85	80	75	70	65	60	55	50	45	40	35	30
FACTOR (cosecA°)	1.000	1.004	1.015	1.035	1.064	1.103	1.155	1.221	1.305	1.414	1.556	1.743	2.000

SKEW FACTOR TABLE

Computer File Information	
Creation Date: 07/04/06	Initials: SJR
Last Modification Date: 07/04/06	Initials: LTA
Full Path: www.dot.state.co.us/DesignSupport/	
Drawing File Name: 6010100101.dwg	
CAD Ver.: MicroStation V8 Scale: Not to Scale	Units: English

Sheet Revisions	
Date:	Comments

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HEADWALLS FOR PIPES

Issued By: Project Development Branch on July 04, 2006

STANDARD PLAN NO.
M-601-10
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