PROFILE

CIRCULAR

ELLIPTICAL

CONCRETE PIPE

See Sheet 2 of 2 for Pipe Tables and NOTES.

INLET CHANNEL PROTECTION DETAIL

OUTLET CHANNEL PROTECTION DETAIL

The depth of the riprap cutoff wall (2'-6" [750] min.) shall match the thickness of the rock channel proctection shown on the plan plus 6" [150].

OHIO DEPARTMENT OF TRANSPORTATION

STATE HYDRAULIC ENGINEER

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7-19-02
7-15-05

HYDRAULIC ENGINEER
M. Wawszkiewicz

All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC-CONSTRUCTION DRAWING

HALF-HEIGHT HEADWALLS FOR CONCRETE PIPE

NUMBER
HW-2.2

Width of riprap and rock channel protection shall be equal to the width of headwall unless otherwise shown on the plans. (Minimum width 4'-0" [1.2 m].)

NOTES

GENERAL: If the pipe is depressed, a riprap reinforced concrete slab shall slope up to the channel bottom at a slope of 6 to 1 and terminate with a cutoff wall that has a depth of 6" [150] below the depression depth. Payment for the slab shall be made per square yard of **Item 601 Riprap using 6" Reinforced Concrete Slab** and shall include the cost of the cutoff wall. Reinforcing for the 6" reinforced concrete slab and cutoff wall shall be as shown on Standard Hydraulic Construction Drawing CB-3.1.

This drawing is for cast in place half-height concrete headwalls. When furnishing precast half-height headwalls, conform to pre-approved designs on file with the Office of Materials Management. Precast half-height headwalls are only approved for round conduits with a maximum conduit diameter of 78" [1950].

CONCRETE: Concrete for headwalls shall be Class C.

Concrete quantities are based on headwalls without the 6" [150] extension under the channel protection.

C.I.P. HEADWALL FOR CONCRETE PIPE (English)

CIRCULAR					ELLIPTICAL					
D	W	H	T	Conc. cu. yds.	Span	Rise	W	H	T	Conc. cu. yds.
12"	2'-0"	3'-0"	12"	0.20	23"	14"	3'-0"	3'-2"	12"	0.29
15"	2'-6"	3'-2"	12"	0.25	30"	19"	3'-7"	3'-4"	12"	0.35
18"	3'-0"	3'-3"	12"	0.31	34"	22"	3'-11"	3'-5"	12"	0.38
21"	3'-6"	3'-4"	12"	0.37	38"	24"	4'-6"	3'-6"	12"	0.44
24"	4'-0"	3'-6"	12"	0.43	42"	27"	4'-8"	3'-7"	12"	0.45
27"	4'-6"	3'-8"	12"	0.49	45"	29"	5'-2"	3'-8"	12"	0.49
30"	5'-0"	3'-9"	12"	0.56	49"	32"	5'-5"	3'-10"	12"	0.52
33"	5'-6"	3'-10"	12"	0.62	53"	34"	5'-11"	4'-0"	14"	0.66
36"	6'-0"	4'-0"	12"	0.69	60"	38"	6'-10"	4'-2"	14"	0.82
39"	6'-6"	4'-2"	12"	0.77	68"	43"	8'-0"	4'-4"	16"	1.01
42"	7'-0"	4'-3"	12"	0.84	76"	48"	9'-2"	5'-0"	16"	1.34
48"	8'-0"	4'-6"	14"	1.09	83"	53"	10'-4"	5'-2"	18"	1.65
54"	9'-3"	4'-9"	14"	1.32	91"	58"	11'-6"	5'-5"	18"	1.97
60"	10'-6"	5'-6"	16"	1.93	98"	63"	12'-7"	5'-7"	20"	2.38
66"	11'-9"	5'-9"	18"	2.42	106"	68"	13'-9"	5'-10"	20"	2.69
72"	13'-0"	6'-0"	18"	2.77	113"	72"	14'-9"	6'-0"	22"	3.14
78"	14'-3"	6'-3"	20"	3.37	121"	77"	15'-11"	6'-3"	22"	3.49
84"	15'-6"	6'-6"	22"	4.05	128"	82"	17'-0"	6'-5"	24"	4.04
90"	16'-9"	6'-9"	22"	4.51	136"	87"	18'-2"	6'-8"	24"	4.84
96"	18'-0"	7'-0"	24"	5.31	143"	92"	19'-4"	6'-10"	26"	5.12
102"	19'-3"	7'-3"	26"	6.20	151"	97"	20'-6"	7'-1"	26"	5.42
108"	20'-6"	7'-6"	26"	6.78	166"	106"	22'-7"	7'-5"	28"	6.60
114"	21'-9"	7'-9"	28"	7.81	180"	116"	24'-10"	7'-10"	30"	7.99
120"	23'-0"	8'-0"	30"	8.93	--	--	--	--	--	--
126"	24'-3"	8'-3"	30"	9.57	--	--	--	--	--	--
132"	25'-6"	8'-6"	32"	10.84	--	--	--	--	--	--
144"	28'-8"	9'-0"	34"	13.00	--	--	--	--	--	--

C.I.P. HEADWALL FOR CONCRETE PIPE (Metric)

CIRCULAR					ELLIPTICAL					
D (mm)	W (mm)	H (mm)	T (mm)	Conc. (m^3)	Span (mm)	Rise (mm)	W (mm)	H (mm)	T (mm)	Conc. (m^3)
300	600	925	300	0.15	575	365	925	975	300	0.22
375	750	975	300	0.19	770	490	1100	1025	300	0.27
450	900	1000	300	0.24	865	550	1200	1050	300	0.29
525	1050	1025	300	0.28	960	610	1375	1075	300	0.34
600	1200	1075	300	0.33	1055	670	1425	1100	300	0.34
675	1350	1125	300	0.37	1150	730	1575	1125	300	0.37
750	1500	1150	300	0.43	1250	795	1650	1175	300	0.40
825	1650	1175	300	0.47	1345	855	1800	1225	375	0.50
900	1800	1225	300	0.53	1535	975	2075	1275	375	0.63
975	1950	1275	300	0.59	1730	1095	2450	1325	400	0.77
1050	2100	1300	300	0.64	1920	1220	2800	1525	400	1.02
1200	2400	1375	350	0.83	2110	1340	3150	1575	450	1.26
1350	2775	1450	350	1.01	2305	1465	3500	1650	450	1.51
1500	3150	1675	400	1.48	2495	1585	3825	1700	500	1.82
1650	3525	1750	450	1.85	2690	1705	4200	1775	500	2.06
1800	3900	1825	450	2.12	2880	1830	4500	1825	550	2.40
1950	4275	1900	500	2.58	3070	1950	4850	1900	550	2.67
2100	4650	1975	550	3.10	3265	2075	5175	1950	600	3.09
2250	5025	2050	550	3.45	3455	2195	5525	2025	600	3.70
2400	5400	2125	600	4.06	3648	2315	5900	2075	650	3.91
2550	5775	2200	650	4.74	3840	2440	6250	2150	650	4.14
2700	6150	2275	650	5.18	4225	2680	6875	2250	700	5.05
2850	6525	2350	700	5.97	4610	2925	7575	2400	750	6.11
3000	6900	2450	750	6.83	--	--	--	--	--	--
3150	7275	2525	750	7.32	--	--	--	--	--	--
3300	7650	2600	825	8.29	--	--	--	--	--	--
3600	8400	2750	875	9.94	--	--	--	--	--	--

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