

San Antonio Water System Standard Specifications for Construction

ITEM NO. 836
GREY-IRON AND DUCTILE-IRON FITTINGS

836.1 DESCRIPTION: This item shall consist of grey-iron and ductile-iron fittings installation and adjustment installed in accordance with these specifications and as directed by the Engineer.

836.2 836.2 MATERIALS: The materials for grey-iron and ductile-iron fittings installation shall conform to American National Standard for Ductile-Iron (ANSI)/ American Water Works Association (AWWA) C153/A21.53, Compact Fittings 3-inch through 64-inch and ANSI/AWWA C110/A21.10, Full Body Fittings 3-inch through 48-inch for Water Service and the specifications contained within the latest revision of SAWS' Material Specification "Grey-Iron and Ductile-Iron Fittings", Item No. 10-10.

836.3 CONSTRUCTION:

1. Fittings: Shall be either restrained mechanical joint compact or flanged joint unless otherwise specified on the plans or in the contract documents. All mechanical joint compact fittings shall be installed using approved restraining glands in accordance with SAWS Materials specifications # 113-02, no separate payment will be made for these restraining glands. Approved adapters shall be used where necessary to provide a transition between pipes and/or fittings of differing outside diameters. Thrust blocking shall only be utilized, in addition to restraining glands, if specified on the plans, when tying-in to existing non-restrained pipe, or when approved by the SAWS Construction Inspector. Anti-corrosion protection consisting of polyethylene sleeve and asphaltic material for ferrous surfaces shall be applied to exterior surfaces of all fittings installed. Anti-corrosion embedment shall be provided as specified in "Excavation, Trenching and Backfill", Item No. 804.

836.4 MEASUREMENT: Ductile-Iron and Grey-Iron Fittings will be measured by their weight as listed in Table 836-1 of this specification of the various sizes of fittings installed.

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836.5 **PAYMENT:** Payment for Grey-Iron and Ductile-Iron Fittings shall be for Mechanical Joint Compact fittings (AWWA) C153/A21.53 and/or flanged fittings. Payment will be made at the unit price bid for each ton of fittings to the nearest one-hundredth of a ton of fittings installed. Individual fitting weights used for payment calculations will be the weights of fittings listed in Table 836-1 of this specification. Weights of glands, bolts, nuts, gaskets (all types) are considered subsidiary to the fittings and no separate payment will be made for their weight. Payment for fitting weights listed in Table 836-1 shall be full compensation for excavation, installation, anti-corrosion protection, select anti-corrosion embedment material and installation, hauling and disposition of surplus excavated materials, all glands, bolts, nuts, rubbers, and flange gaskets of whatever type required, and concrete thrust/reaction blocking if required. If fittings other than those listed in Table 836-1 are approved and installed, the Contractor shall provide quantities and manufacturers unit weights exclusive of glands, bolts, and rubbers with pay request.

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TABLE 836-1							
WEIGHTS OF GREY-IRON AND DUCTILE-IRON FITTINGS (LBS.)							
BENDS							
Size (Inches)	MJ Compact (C153)	MJ (C110)	FLG SB	Size (Inches)	MJ Compact (C153)	MJ (C110)	FLG SB
1/4 Bend (90 Degrees)				1/8 Bend (45 degrees)			
4	25	55	44	4	21	51	36
6	43	86	67	6	35	75	57
8	61	125	115	8	50	110	105
12	119	258	236	12	96	216	196
16	264	454	478	16	200	345	315
20	447	716	878	20	337	555	485
24	602	1105	1085	24	441	777	730
30	979	1740	1755	30	775	1393	1355
36	1501	2507	2135	36	1140	2163	1755
42	2277	3410	3055	42	1652	2955	2600
48	3016	4595	4095	48	2157	4080	3580
BENDS							
Size (Inches)	MJ Compact (C153)	MJ (C110)	FLG SB	Size (Inches)	MJ Compact (C153)	MJ (C110)	FLG SB
1/16 Bend (22-1/2 Degrees)				1/32 Bend (11-1/4 degrees)			
4	18	50	35	4	17	50	40
6	32	75	64	6	30	73	56
8	46	110	90	8	42	109	90
12	85	220	194	12	74	220	193
16	175	354	315	16	153	354	315
20	314	550	505	20	265	553	505
24	414	809	528	24	339	815	760
30	668	1500	1385	30	603	1410	1395
36	963	2182	1790	36	830	2195	1805
42	1354	3020	2665	42	1210	3035	2680
48	1790	4170	3665	48	1523	4190	3695

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TABLE 836-1 CONTINUATION				
WEIGHTS OF GREY-IRON AND DUCTILE-IRON FITTINGS (LBS.)				
TEES				
Size (Inches)		Weight		
Run	Branch	MJ Compact (C153)	MJ (C110)	FLG Short Body
3	3	26	56	53
4	3	31	76	54
	4	34	80	60
6	4	51	114	90
	6	60	124	98
8	4	67	163	155
	6	78	175	148
	8	90	188	179
12	4	104	316	322
	6	117	325	297
	8	130	339	346
	12	169	407	369
16	6	223	563	573
	8	243	565	555
	12	289	615	590
	16	327	676	635
20	6	343	750	773
	8	378	766	720
	12	412	799	816
	16	513	975	950
	20	574	1068	1005

TABLE 836-1 CONTINUATION				
WEIGHTS OF GREY-IRON AND DUCTILE-IRON FITTINGS (LBS.)				
TEES				
Size (Inches)		Weight		
Run	Branch	MJ Compact (C153)	MJ (C110)	FLG Short Body
24	6	475	1035	1089
	8	482	1047	1060
	12	548	1075	1125
	16	636	1109	1070
	20	751	1504	1510
	24	801	1617	1685
30	8	739	1808	-
	12	785	1842	1801
	16	959	1885	-
	20	1034	1941	-
	24	1270	2496	2475
	30	1386	2531	2615
36	24	1560	2710	2255
	30	1935	3545	3000
	36	2040	3686	3160
42	24	2498	3690	3245
	30	2540	4650	4125
	36	3064	4880	5360
	42	3258	6320	5580
48	24	2955	4995	4385
	30	3179	5140	4455
	36	4095	6280	5555
	42	4298	8130	7195
	48	4541	8420	7385

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TABLE 836-1 CONTINUATION				
WEIGHTS OF GREY-IRON AND DUCTILE-IRON FITTINGS (LBS.)				
CROSSES				
Size (Inches)		Weight		
Run	Branch	MJ Compact (C153)	MJ (C110)	FLG Short Body
3	3	34	70	-
4	3	42	90	-
	4	44	105	-
6	4	63	140	-
	6	74	160	160
8	4	88	185	185
	6	97	205	205
	8	105	239	234
12	4	114	340	-
	6	135	360	360
	8	151	382	385
	12	199	493	495
16	6	250	575	575
	8	270	619	605
	12	332	680	-
	16	409	811	790
20	6	350	760	-
	8	379	822	790
	12	413	883	860
	16	550	1117	1085
	20	598	1274	1230

TABLE 836-1 CONTINUATION				
WEIGHTS OF GREY-IRON AND DUCTILE-IRON FITTINGS (LBS.)				
CROSSES				
Size (Inches)		Weight		
Run	Branch	MJ Compact (C153)	MJ (C110)	FLG Short Body
24	6	566	1025	-
	8	578	1085	1045
	12	610	1153	1110
	16	663	1256	1200
	20	975	1733	1675
	24	924	1835	1835
30	8	650	1795	-
	12	870	2128	1865
	16	900	2373	-
	20	1220	2060	-
	24	1497	2675	2675
	30	1808	3075	3075
36	24	1853	2928	2980
	30	2580	3965	-
	36	2698	4370	4370
42	24	2415	3910	-
	30	2920	5040	-
	36	3788	5425	-
	42	4017	6166	7145
48	24	3435	5210	-
	30	4145	5495	-
	36	4873	6790	-
	42	5465	8815	-
	48	5959	9380	-

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TABLE 836-1 CONTINUATION				
WEIGHTS OF GREY-IRON AND DUCTILE-IRON FITTINGS (LBS.)				
CAPS			PLUGS	
Size (Inches)	MJ Compact (C153)	MJ (C110)	MJ Compact (C153)	MJ (C110)
4	10	17	12	16
6	16	29	19	28
8	24	45	30	46
12	45	82	54	85
16	95	160	97	146
20	141	235	146	218
24	193	346	197	350
30	358	658	381	617
36	627	889	688	861
42	893	1269	1200	1189
48	1076	1684	1550	1544

TABLE 836-1 CONTINUATION				
WEIGHTS OF GREY-IRON AND DUCTILE-IRON FITTINGS (LBS.)				
SOLID SLEEVES				
Size (Inches)	Weight			
	MJ Short Compact (C153)	MJ Long Compact (C153)	MJ Short (C110)	MJ Long (C110)
4	17	21	35	46
6	28	35	45	65
8	38	48	65	86
12	57	77	113	143
16	127	172	190	257
20	201	258	233	359
24	264	337	340	481
30	500	651	690	985
36	725	960	947	1344
42	877	1209	1115	1648
48	1406	1516	1385	2056

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TABLE 836-1 CONTINUATION			
WEIGHTS OF GREY-IRON AND DUCTILE-IRON FITTINGS (LBS.)			
CONCENTRIC REDUCERS			
Size (Inches)		Weight	
Large End	Small End	MJ Compact (C153)	MJ (C110)
6	4	27	59
8	4	38	81
8	6	41	95
12	4	70	136
12	6	69	150
12	8	70	167
16	6	134	234
16	8	136	258
16	12	126	310
20	12	198	427
20	16	219	492
24	12	281	562
24	16	295	633
24	20	316	727
30	16	556	965
30	20	549	1085
30	24	451	1204
36	20	901	1459
36	24	724	1580
36	30	611	1868
42	24	1356	2060
42	30	1087	2370
42	36	1030	2695
48	30	1794	3005
48	36	1534	3370
48	42	1448	3750

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TABLE 836-1 CONTINUATION		
WEIGHTS OF GREY-IRON AND DUCTILE-IRON FITTINGS (LBS.)		
2" Tapped Tees and Crosses		
Size (Inches)	Weight	
	MJ Compact (C153)	MJ (C110)
4	24	47
6	36	71
8	54	97
10	69	130
12	87	169
20	-	259
24	-	320

TABLE 836-1 CONTINUATION		
WEIGHTS OF GREY-IRON AND DUCTILE-IRON FITTINGS (LBS.)		
OFFSETS		
Size (Inches)	Weight	
	MJ Compact (C153)	MJ (C110)
4 x 6	35	75
4 x 12	55	85
6 x 6	35	111
6 x 12	67	139
6 x 24	96	191
8 x 6	82	166
8 x 12	98	210
8 x 24	141	295
12 x 6	121	320
12 x 12	178	420
12 x 24	215	630
20 x 12	-	925
20 x 24	-	1245