

AWWA C100-08
(Formerly 7C.1-1908)

AMERICAN WATER WORKS ASSOCIATION

STANDARD SPECIFICATIONS

for

**Cast Iron Water Pipe and
Special Castings**

Adopted May 12, 1908

With the Compliments of

**UNITED STATES PIPE AND FOUNDRY COMPANY
Burlington, N. J.**

**UNITED STATES PIPE and FOUNDRY CO.
1204-6 Praetorian Building
DALLAS 1, TEXAS**

AMERICAN WATER WORKS ASSOCIATION

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STANDARD SPECIFICATIONS

FOR CAST IRON WATER PIPES AND
SPECIAL CASTINGS

WITH TABLES OF DIMENSIONS
THICKNESS AND
WEIGHTS

A.W.W.A. Specifications for Cast Iron Pipe (1908) contained herein have been superseded by Specification for Cast Iron Pipe (ASA—A21.2.1939). Most manufacturers of Cast Iron Pipe are prepared to furnish pipe in accordance with either Specification. The Specifications for Special Castings herein contained are still Standard.

*American Water Works Association
April 1, 1944*

ADOPTED MAY 12, 1908

April 1952

AMERICAN WATER WORKS ASSOCIATION
Incorporated

521 Fifth Avenue, New York 17, N. Y.

Standard Specifications

for

Cast Iron Pipe and Special Castings

Description of Pipes

SECTION 1. The pipes shall be made with hub and spigot joints and shall accurately conform to the dimensions given in Tables Nos. 1 and 2. They shall be straight and shall be true circles in section, with their inner and outer surfaces concentric, and shall be of the specified dimensions in outside diameter. They shall be at least 12 feet in length, exclusive of socket.

Pipes with thickness and weight intermediate between the classes in Table No. 2 shall be made of the same outside diameter as the next heavier class. Pipes with thickness and weight less than shown by Table No. 2 shall be made of the same outside diameter as the Class A pipe; and pipes with thickness and weight more than shown by Table No. 2 shall be made of the same outside diameter as the Class D pipe.

All pipes having the same outside diameter shall have the same inside diameter at both ends. The inside diameter of the lighter pipes of each standard outside diameter shall be gradually increased for a distance of about 6 inches from each end of the pipe so as to obtain the required standard thickness and weight for each size and class of pipe.

For pipes of each size from 4-inch to 24-inch inclusive, there shall be two standards of outside diameter, and for pipes from 30-inch to 60-inch inclusive, there shall be four standards of outside diameter, as shown by Table No. 1.

For pipes 4-inch to 12-inch inclusive, one class of special castings shall be furnished, made from Class D pattern. Those having spigot ends shall have outside diameters of spigot ends midway between the two standards of outside diameter as shown by Table No. 1, and shall be tapered back for a distance of 6 inches.

For pipes from 14-inch to 24-inch inclusive, two classes of special castings shall be furnished; Class B special castings with Classes A

and B pipes, and Class D special castings with Classes C and D pipes; the former shall have cast on them the letters "AB" and the latter "CD." For pipes 30-inch to 60-inch inclusive, four classes of special castings shall be furnished, one for each class of pipe, and shall have cast on them the letter of the class to which they belong.

Allowable Variation in Diameter of Pipes and Sockets

SECTION 2. Especial care shall be taken to have the sockets of the required size. The sockets and spigots will be tested by circular gauges, and no pipe will be received which is defective in joint-room from any cause. The diameters of the sockets and the outside diameters of the spigot ends of the pipes shall not vary from the standard dimensions by more than .06 of an inch for pipes 16 inches or less in diameter; .08 of an inch for 18-inch, 20-inch and 24-inch pipes; .10 of an inch for 30-inch, 36-inch and 42-inch pipes; .12 of an inch for 48-inch, and .15 of an inch for 54-inch and 60-inch pipes.

Allowable Variation in Thickness

SECTION 3. For pipes whose standard thickness is less than 1 inch, the thickness of metal in the body of the pipe shall not be more than .08 of an inch less than the standard thickness, and for pipes whose standard thickness is 1 inch or more, the variation shall not exceed .10 of an inch, except that for spaces not exceeding 8 inches in length in any direction, variations from the standard thickness of .02 of an inch in excess of the allowance above given shall be permitted. For special castings of standard patterns a variation of 50 per cent greater than allowed for straight pipes shall be permitted.

Defective Spigots May be Cut

SECTION 4. Defective spigot ends on pipes 12 inches or more in diameter may be cut off in a lathe and a half round wrought-iron band shrunk into a groove cut in the end of the pipe. Not more than 12 per cent of the total number of accepted pipes of each size shall be cut and banded, and no pipe shall be banded which is less than 11 feet in length, exclusive of the socket.

In case the length of a pipe differs from 12 feet, the standard weight of the pipe given in Table No. 2 shall be modified in accordance therewith.

Special Castings

SECTION 5. All special castings shall be made in accordance with the cuts and the dimensions given in the tables forming a part of these specifications.

The diameters of the sockets and the external diameters of the spigot ends of the special castings shall not vary from the standard dimensions by more than .12 of an inch for castings 16 inches or less in diameter; .15 of an inch for 18-inch, 20-inch and 24-inch; .20 of an inch for 30-inch, 36-inch and 42-inch and .24 of an inch for 48-inch, 54-inch and 60-inch. These variations apply only to special castings made from standard patterns.

The flanges on all manhole castings and manhole covers shall be faced true and smooth, and drilled to receive bolts of the sizes given in the tables. The manufacturer shall furnish and deliver all bolts for bolting on the manhole covers, the bolts to be of the sizes shown on plans and made of the best quality of mild steel, with hexagonal heads and nuts and sound, well-fitting threads.

Marking

SECTION 6. Every pipe and special casting shall have distinctly cast upon it the initials of the maker's name. When cast especially to order, each pipe larger than 4-inch may also have cast upon it figures showing the year in which it was cast and a number signifying the order in point of time in which it was cast, the figures denoting the year being above and the number below, thus:

1908	1908	1908
1	2	3

etc., also any initials, not exceeding four, which may be required by the purchaser. The letters and figures shall be cast on the outside and shall not be less than 2 inches in length and $\frac{1}{4}$ of an inch in relief for pipes 8 inches in diameter and larger. For smaller sizes of pipes the letters may be 1 inch in length. The weight and the class letter shall be conspicuously painted in white in the inside of each pipe and special casting after the coating has become hard.

Allowable Percentage of Variation in Weight

SECTION 7. No pipe shall be accepted the weight of which shall be less than the standard weight by more than 5 per cent for pipes,

16 inches or less in diameter, and 4 per cent for pipes more than 16 inches in diameter, and no excess above the standard weight of more than the given percentage for the several sizes shall be paid for. The total weight to be paid for shall not exceed for each size and class of pipe received the sum of the standard weights of the same number of pieces of the given size and class by more than 2 per cent.

No special casting shall be accepted the weight of which shall be less than the standard weight by more than 10 per cent for pipes 12 inches or less in diameter, and 8 per cent for larger sizes, except that curves, Y-pieces and breeches pipe may be 12 per cent below the standard weight, and no excess above the standard weight of more than the above percentages for the several sizes will be paid for. These variations apply only to castings made from the standard patterns.

Quality of Iron

SECTION 8. All pipes and special castings shall be made of cast iron of good quality, and of such character as shall make the metal of the castings strong, tough and of even grain, and soft enough to satisfactorily admit of drilling and cutting. The metal shall be made without any admixture of cinder iron or other inferior metal, and shall be remelted in a cupola or air furnace.

The contractor shall have the right to make and break three bars from each heat or run of metal, and the test shall be based upon the average results of the three bars. Should the dimensions of the three bars differ from those given below, a proper allowance therefor shall be made in the results of the tests.

Tests of Material

SECTION 9. Specimen bars of the metal used, each being twenty-six inches long by two inches wide and one inch thick, shall be made without charge as often as the engineer may direct, and in default of definite instructions, the contractor shall make and test at least one bar from each heat or run of metal. The bars when placed flatwise upon supports twenty-four inches apart, and loaded in the center, shall support a load of 2,000 pounds, and show a deflection of not less than .30 of an inch before breaking; or if preferred, tensile bars shall be made which will show a breaking point of not less than 20,000 pounds per square inch.

Casting of Pipe

SECTION 10. The straight pipes shall be cast in dry sand molds in a vertical position. Pipes 16 inches or less in diameter shall be cast with the hub end up or down, as specified in the proposals. Pipes 18 inches or more in diameter shall be cast with the hub end down.

The pipes shall not be stripped or taken from the pit while showing color of heat, but shall be left in the flasks for a sufficient length of time to prevent unequal contraction by subsequent exposure.

Quality of Castings

SECTION 11. The pipes and special castings shall be smooth, free from scales, lumps, blisters, sand holes and defects of every nature which unfit them for the use for which they are intended. No plugging or filling will be allowed.

Cleaning and Inspection

SECTION 12. All pipes and special castings shall be thoroughly cleaned and subjected to a careful hammer inspection. No casting shall be coated unless entirely clean and free from rust, and approved in these respects by the engineer immediately before being dipped.

Coating

SECTION 13. Every pipe and special casting shall be coated inside and out with coal-tar pitch varnish. The varnish shall be made from coal tar. To this material sufficient oil shall be added to make a smooth coating, tough and tenacious when cold, and not brittle nor with any tendency to scale off.

Each casting shall be heated to a temperature of 300 degrees Fahrenheit immediately before it is dipped, and shall possess not less than this temperature at the time it is put in the vat. The ovens in which the pipes are heated shall be so arranged that all portions of the pipe shall be heated to an even temperature. Each casting shall remain in the bath at least five minutes.

The varnish shall be heated to a temperature of 300 degrees Fahrenheit (or less if the engineer shall so order), and shall be maintained at this temperature during the time the casting is immersed.

Fresh pitch and oil shall be added when necessary to keep the mixture at the proper consistency, and the vat shall be emptied of its contents and refilled with fresh pitch when deemed necessary by the engineer. After being coated the pipe shall be carefully drained of the surplus varnish. Any pipe or special casting that is to be recoated shall first be thoroughly scraped and cleaned.

Hydrostatic Test

SECTION 14. When the coating has become hard, the straight pipes shall be subjected to a proof by hydrostatic pressure, and, if required by the engineer, they shall also be subjected to a hammer test under this pressure.

The pressure to which the different sizes and classes of pipes shall be subjected are as follows:

	20-Inch Diameter and Larger Pounds Per Square Inch	Less than 20-Inch Diameter Pounds Per Square Inch
Class A Pipe	150	300
Class B Pipe	200	300
Class C Pipe	250	300
Class D Pipe	300	300

Weighing

SECTION 15. The pipes and special castings shall be weighed for payment under the supervision of the engineer after the application of the coal-tar pitch varnish. If desired by the engineer, the pipes and special castings shall be weighed after their delivery, and the weights so ascertained shall be used in the final settlement, provided such weighing is done by a legalized weighmaster. Bids shall be submitted and a final settlement made upon the basis of a ton of 2,000 pounds.

Contractor to Furnish Men and Material

SECTION 16. The contractor shall provide all tools, testing machines, materials and men necessary for the required testing, inspection and weighing at the foundry of the pipe and special castings; and should the purchaser have no inspector at the works, the

contractor shall, if required by the engineer, furnish a sworn statement that all of the tests have been made as specified, this statement to contain the results of the tests upon the test bars.

Power of Engineer to Inspect

SECTION 17. The engineer shall be at liberty at all times to inspect the material at the foundry, and the moldings, castings and coating of the pipes and special castings. The forms, sizes, uniformity and conditions of all pipes and other castings herein referred to shall be subject to his inspection and approval, and he may reject, without proving, any pipe or other casting which is not in conformity with the specifications or drawings.

Inspector to Report

SECTION 18. The inspector at the foundry shall report daily to the foundry office all pipes and special castings rejected, with the causes for rejection.

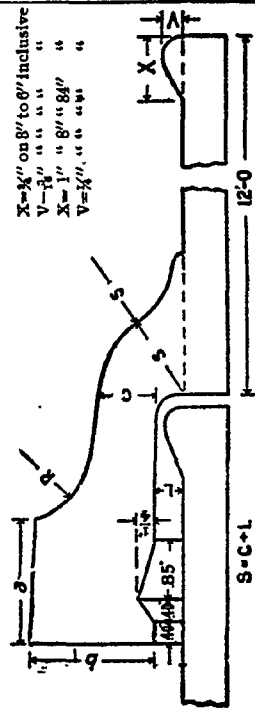
Castings to be Delivered Sound and Perfect

SECTION 19. All the pipes and other castings must be delivered in all respects sound and conformable to these specifications. The inspection shall not relieve the contractor of any of his obligations in this respect, and any defective pipes or other castings which may have passed the engineer at the works or elsewhere shall be at all times liable to rejection when discovered, until the final completion and adjustment of the contract; provided, however, that the contractor shall not be held liable for pipes or special castings found to be cracked after they have been accepted at the agreed point of delivery. Care shall be taken in handling the pipes not to injure the coating, and no pipes or other material of any kind shall be placed in the pipes during transportation at or any time after they have received the coating.

Definition of the Word "Engineer"

SECTION 20. Wherever the word "engineer" is used herein it shall be understood to refer to the engineer or inspector acting for the purchaser and to his properly authorized agents, limited by the particular duties intrusted to them.

STANDARD DIMENSIONS OF PIPE

Table No. 1
Classes A, B, C, D

Nominal Diam. Inches	Classes	Actual Outside Diameter, Inches	Diam. of Sockets		Depth of Sockets		A	B	C
			Pipe Inches	Special Castings Inches	Pipe Inches	Special Castings Inches			
4	A, B, C, D	4.80	5.60	5.70	3.50	4.00	1.5	1.50	.85
6	A, B, C, D	7.10	7.90	8.00	4.00	4.50	1.5	1.40	.70
8	A, B, C, D	9.00	9.80	10.00	4.00	4.50	1.5	1.40	.70
10	A, B, C, D	11.00	11.80	12.00	4.00	4.50	1.5	1.40	.70
12	A, B, C, D	13.00	13.80	14.00	4.00	4.50	1.5	1.40	.70
14	A, B, C, D	15.00	15.80	16.00	4.00	4.50	1.5	1.40	.70
16	A, B, C, D	17.00	17.80	18.00	4.00	4.50	1.5	1.40	.70
18	A, B, C, D	19.00	19.80	20.00	4.00	4.50	1.5	1.40	.70
20	A, B, C, D	21.00	21.80	22.00	4.00	4.50	1.5	1.40	.70
22	A, B, C, D	23.00	23.80	24.00	4.00	4.50	1.5	1.40	.70
24	A, B, C, D	25.00	25.80	26.00	4.00	4.50	1.5	1.40	.70
26	A, B, C, D	27.00	27.80	28.00	4.00	4.50	1.5	1.40	.70
28	A, B, C, D	29.00	29.80	30.00	4.00	4.50	1.5	1.40	.70
30	A, B, C, D	31.00	31.80	32.00	4.00	4.50	1.5	1.40	.70
32	A, B, C, D	33.00	33.80	34.00	4.00	4.50	1.5	1.40	.70
34	A, B, C, D	35.00	35.80	36.00	4.00	4.50	1.5	1.40	.70
36	A, B, C, D	37.00	37.80	38.00	4.00	4.50	1.5	1.40	.70
38	A, B, C, D	39.00	39.80	40.00	4.00	4.50	1.5	1.40	.70
40	A, B, C, D	41.00	41.80	42.00	4.00	4.50	1.5	1.40	.70
42	A, B, C, D	43.00	43.80	44.00	4.00	4.50	1.5	1.40	.70
44	A, B, C, D	45.00	45.80	46.00	4.00	4.50	1.5	1.40	.70
46	A, B, C, D	47.00	47.80	48.00	4.00	4.50	1.5	1.40	.70
48	A, B, C, D	49.00	49.80	50.00	4.00	4.50	1.5	1.40	.70
50	A, B, C, D	51.00	51.80	52.00	4.00	4.50	1.5	1.40	.70
52	A, B, C, D	53.00	53.80	54.00	4.00	4.50	1.5	1.40	.70
54	A, B, C, D	55.00	55.80	56.00	4.00	4.50	1.5	1.40	.70
56	A, B, C, D	57.00	57.80	58.00	4.00	4.50	1.5	1.40	.70
58	A, B, C, D	59.00	59.80	60.00	4.00	4.50	1.5	1.40	.70
60	A, B, C, D	61.00	61.80	62.00	4.00	4.50	1.5	1.40	.70
62	A, B, C, D	63.00	63.80	64.00	4.00	4.50	1.5	1.40	.70
64	A, B, C, D	65.00	65.80	66.00	4.00	4.50	1.5	1.40	.70
66	A, B, C, D	67.00	67.80	68.00	4.00	4.50	1.5	1.40	.70
68	A, B, C, D	69.00	69.80	70.00	4.00	4.50	1.5	1.40	.70
70	A, B, C, D	71.00	71.80	72.00	4.00	4.50	1.5	1.40	.70
72	A, B, C, D	73.00	73.80	74.00	4.00	4.50	1.5	1.40	.70
74	A, B, C, D	75.00	75.80	76.00	4.00	4.50	1.5	1.40	.70
76	A, B, C, D	77.00	77.80	78.00	4.00	4.50	1.5	1.40	.70
78	A, B, C, D	79.00	79.80	80.00	4.00	4.50	1.5	1.40	.70
80	A, B, C, D	81.00	81.80	82.00	4.00	4.50	1.5	1.40	.70

STANDARD THICKNESS AND WEIGHTS OF CAST IRON PIPE
Table No. 2
Classes A, B, C, D

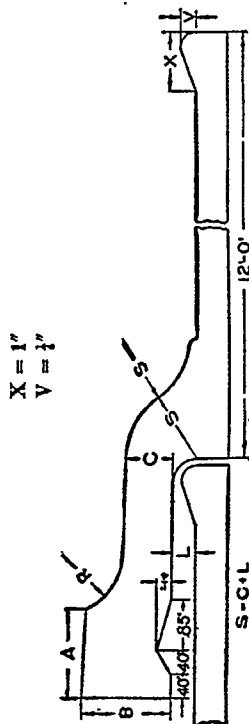
Nominal Diameter Inside	Thick-ness	CLASS A 100-Pound Head 45 Pounds Pressure		CLASS B 200-Pound Head 90 Pounds Pressure		CLASS C 240-Pound Head 110 Pounds Pressure		CLASS D 400-Pound Head 175 Pounds Pressure	
		Weight per Foot	Length	Weight per Foot	Length	Weight per Foot	Length	Weight per Foot	Length
4	.45	30.0	24.0	45.0	21.7	55.0	22.3	85.0	30.0
6	.50	45.0	37.0	67.0	33.3	85.0	35.8	120.0	45.0
8	.54	67.0	55.0	100.0	47.5	120.0	52.1	160.0	67.0
10	.58	89.0	73.0	133.0	63.1	160.0	70.8	210.0	89.0
12	.62	111.0	91.0	166.0	81.7	200.0	91.7	270.0	111.0
14	.66	133.0	109.0	199.0	102.5	240.0	116.7	330.0	133.0
16	.70	155.0	127.0	232.0	123.0	280.0	140.0	390.0	155.0
18	.74	177.0	145.0	265.0	143.6	320.0	163.0	450.0	177.0
20	.78	199.0	163.0	298.0	163.0	360.0	186.0	510.0	199.0
22	.82	221.0	181.0	331.0	182.5	400.0	209.0	570.0	221.0
24	.86	243.0	199.0	364.0	202.0	440.0	232.0	630.0	243.0
26	.90	265.0	217.0	397.0	221.7	480.0	255.0	690.0	265.0
28	.94	287.0	235.0	430.0	241.3	520.0	278.0	750.0	287.0
30	.98	309.0	253.0	463.0	261.0	560.0	301.0	810.0	309.0
32	1.02	331.0	271.0	496.0	280.7	600.0	324.0	870.0	331.0
34	1.06	353.0	289.0	529.0	299.7	640.0	347.0	930.0	353.0
36	1.10	375.0	307.0	562.0	319.3	680.0	370.0	990.0	375.0
38	1.14	397.0	325.0	595.0	338.8	720.0	393.0	1050.0	397.0
40	1.18	419.0	343.0	628.0	358.3	760.0	416.0	1110.0	419.0
42	1.22	441.0	361.0	661.0	377.8	800.0	439.0	1170.0	441.0
44	1.26	463.0	379.0	694.0	397.3	840.0	462.0	1230.0	463.0
46	1.30	485.0	397.0	727.0	416.8	880.0	485.0	1290.0	485.0
48	1.34	507.0	415.0	760.0	436.3	920.0	508.0	1350.0	507.0
50	1.38	529.0	433.0	793.0	455.8	960.0	531.0	1410.0	529.0
52	1.42	551.0	451.0	826.0	475.3	1000.0	554.0	1470.0	551.0
54	1.46	573.0	469.0	859.0	494.8	1040.0	577.0	1530.0	573.0
56	1.50	595.0	487.0	892.0	514.3	1080.0	600.0	1590.0	595.0
58	1.54	617.0	505.0	925.0	533.8	1120.0	623.0	1650.0	617.0
60	1.58	639.0	523.0	958.0	553.3	1160.0	646.0	1710.0	639.0
62	1.62	661.0	541.0	991.0	572.8	1200.0	669.0	1770.0	661.0
64	1.66	683.0	559.0	1024.0	592.3	1240.0	692.0	1830.0	683.0
66	1.70	705.0	577.0	1057.0	611.8	1280.0	715.0	1890.0	705.0
68	1.74	727.0	595.0	1090.0	631.3	1320.0	738.0	1950.0	727.0
70	1.78	749.0	613.0	1123.0	650.8	1360.0	761.0	2010.0	749.0
72	1.82	771.0	631.0	1156.0	670.3	1400.0	784.0	2070.0	771.0
74	1.86	793.0	649.0	1189.0	689.8	1440.0	807.0	2130.0	793.0
76	1.90	815.0	667.0	1222.0	709.3	1480.0	830.0	2190.0	815.0
78	1.94	837.0	685.0	1255.0	728.8	1520.0	853.0	2250.0	837.0
80	1.98	859.0	703.0	1288.0	748.3	1560.0	876.0	2310.0	859.0
82	2.02	881.0	721.0	1321.0	767.8	1600.0	899.0	2370.0	881.0
84	2.06	903.0	739.0	1354.0	787.3	1640.0	922.0	2430.0	903.0
86	2.10	925.0	757.0	1387.0	806.8	1680.0	945.0	2490.0	925.0
88	2.14	947.0	775.0	1420.0	826.3	1720.0	968.0	2550.0	947.0
90	2.18	969.0	793.0	1453.0	845.8	1760.0	991.0	2610.0	969.0
92	2.22	991.0	811.0	1486.0	865.3	1800.0	1014.0	2670.0	991.0
94	2.26	1013.0	829.0	1519.0	884.8	1840.0	1037.0	2730.0	1013.0
96	2.30	1035.0	847.0	1552.0	904.3	1880.0	1060.0	2790.0	1035.0
98	2.34	1057.0	865.0	1585.0	923.8	1920.0	1083.0	2850.0	1057.0
100	2.38	1079.0	883.0	1618.0	943.3	1960.0	1106.0	2910.0	1079.0

The above weights are per length to lay 12 feet, including standard sockets; proportionate allowance to be made for any variation.

STANDARD DIMENSIONS OF PIPE

High Pressure Service
Classes E, F, G, H

Table No. 3



Nominal Diam. Inches	Classes	Actual Outside Diam. Inches	Diam. of Sockets		Depth of Sockets	A	B	C	R	Nominal Diam. Inches
			Pipe and Specials	Pipe						
6	E-F	7.22	8.02	4.00	1.50	1.75	.75	1.10	1.10	6
6	G-H	7.38	8.18	4.00	1.50	1.85	.85	1.10	1.10	6
8	E-F	9.42	10.22	4.00	1.50	1.85	.85	1.10	1.10	8
8	G-H	9.60	10.40	4.00	1.50	1.95	.95	1.10	1.10	8
10	E-F	11.60	12.40	4.50	1.75	1.95	.95	1.10	1.10	10
10	G-H	11.84	12.64	4.50	1.75	2.05	1.05	1.10	1.10	10
12	E-F	13.78	14.58	4.50	1.75	2.05	1.05	1.10	1.10	12
12	G-H	14.08	14.88	4.50	1.75	2.20	1.20	1.10	1.10	12
14	E-F	15.98	16.78	4.50	2.00	2.15	1.15	1.10	1.10	14
14	G-H	16.32	17.12	4.50	2.00	2.35	1.35	1.10	1.10	14
16	E-F	18.16	18.96	4.50	2.00	2.30	1.25	1.15	1.15	16
16	G-H	18.54	19.34	4.50	2.00	2.55	1.45	1.15	1.15	16
18	E-F	20.34	21.14	4.50	2.25	2.45	1.40	1.15	1.15	18
18	G-H	20.78	21.58	4.50	2.25	2.75	1.65	1.15	1.15	18
20	E-F	22.54	23.34	4.50	2.25	2.55	1.50	1.15	1.15	20
20	G-H	23.02	23.82	4.50	2.25	2.85	1.75	1.20	1.20	20
24	E-F	26.90	27.90	5.00	2.25	2.85	1.70	1.20	1.20	24
30	E	33.10	34.10	5.00	2.25	3.25	1.80	1.50	1.50	30
30	F	33.46	34.46	5.00	2.25	3.50	2.00	1.55	1.55	30
36	E	39.60	40.60	5.00	2.25	3.70	2.05	1.70	1.70	36
36	F	40.04	41.04	5.00	2.25	4.00	2.30	1.80	1.80	36

STANDARD THICKNESS AND WEIGHTS OF CAST IRON PIPE

For Fire Lines and Other High Pressure Service

Table No. 4

Classes E, F, G, H

Nominal Diameter Inches	Thick-ness Inches	217 Pounds Pressure		Nominal Diameter Inches	Thick-ness Inches	260 Pounds Pressure		Nominal Diameter Inches	Thick-ness Inches	304 Pounds Pressure		Nominal Diameter Inches	Thick-ness Inches	347 Pounds Pressure		Nominal Diameter Inches
		Weight per Foot	Length			Weight per Foot	Length			Weight per Foot	Length			Weight per Foot	Length	
6	.58	41.7	500	6	.65	520	6	.72	560	6	.79	600	6	.86	640	6
8	.66	49.6	595	8	.73	620	8	.80	660	8	.87	700	8	.94	740	8
10	.74	58.3	740	10	.81	700	10	.88	740	10	.95	780	10	1.02	820	10
12	.82	67.0	835	12	.89	780	12	.96	820	12	1.03	860	12	1.10	900	12
14	.90	75.7	930	14	.97	840	14	1.04	880	14	1.11	920	14	1.18	960	14
16	.98	84.4	1035	16	1.05	900	16	1.12	940	16	1.19	980	16	1.26	1020	16
18	1.07	93.1	1140	18	1.14	960	18	1.21	1000	18	1.28	1040	18	1.35	1080	18
20	1.15	101.8	1245	20	1.22	1020	20	1.29	1060	20	1.36	1100	20	1.43	1140	20
24	1.31	118.8	1500	24	1.38	1140	24	1.45	1180	24	1.52	1220	24	1.59	1260	24
30	1.55	145.0	1875	30	1.62	1360	30	1.69	1400	30	1.76	1440	30	1.83	1480	30
36	1.80	171.2	2250	36	1.87	1620	36	1.94	1660	36	2.01	1700	36	2.08	1740	36

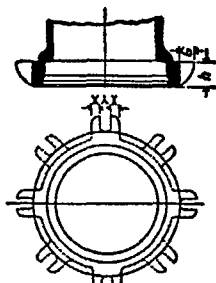
The above weights are per length to lay 12 feet, including standard sockets; proportionate allowance to be made for any variation.

For HIGH PRESSURE PIPE from 6 inches to 24 inches inclusive, one class of special castings shall be furnished for Classes E and F pipe, and one class of special castings for Classes G and H pipe. For 30-inch and 36-inch pipe, one class of special castings shall be furnished for each class of pipe.

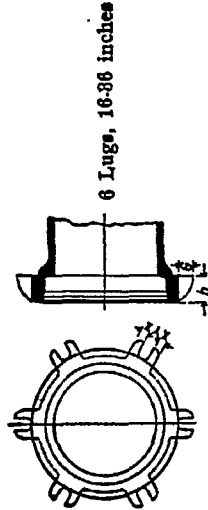
STANDARD LUGS

Number and Weights of Lugs on Outlets of Different Sizes

Table No. 5



4 Lugs, 12-14 inches
8 Lugs, 42-60 inches



6 Lugs, 16-36 inches

Nominal Diameter of Outlet, inches	Number of Pairs of Lugs	Approximate Weight on One Bell, Pounds	Nominal Diameter of Outlet, inches	Number of Pairs of Lugs	Approximate Weight on One Bell, Pounds
12	4	82	30	6	80
14	4	82	36	6	80
16	6	86	42	8	111
18	6	86	48	8	114
20	6	86	54	8	184
24	6	86	60	8	187

Two pairs of lugs are placed on the vertical axis of each bell, the others at equal distances around circumference. H is equal depth of bell on all sizes.
G equals 2.60 inches, X equals 1.35 inches, Y equals 1.63 inches for 12 to 24 inches inclusive.
G equals 3.00 inches, X equals 1.50 inches, Y equals 2.00 inches for 30 to 60 inches inclusive.

STANDARD SPECIAL CASTINGS FOR WATER

Standard Curves, Bell and Spigot, 1/4, 1/8, 1/16

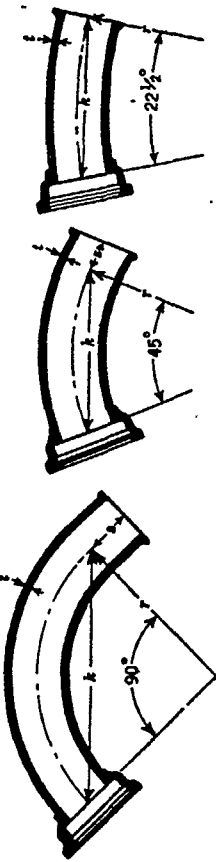


TABLE NO. 6

¼ Curves					½ Curves					¾ Curves					H Curves									
Nominal, In.	Class	Dimensions, Inches			Approx. Weight, Pounds	Nominal, In.	Class	t	r	k	Approx. Weight, Pounds	Nominal, In.	Class	t	r	k	Approx. Weight, Pounds	Nominal, In.	Class	t	r	k	Approx. Weight, Pounds	
		t	r	k																				
4	D	.52	16	22.60	82	4	D	.52	24	18.40	66	48	D	.52	24	18.40	66	48	D	.52	24	18.40	66	48
6	D	.55	16	22.60	130	6	D	.55	24	18.40	105	48	D	.55	24	18.40	105	48	D	.55	24	18.40	105	48
8	D	.60	16	22.60	200	8	D	.60	24	18.40	150	48	D	.60	24	18.40	150	48	D	.60	24	18.40	150	48
10	D	.68	16	22.60	278	10	D	.68	24	18.40	202	48	D	.68	24	18.40	202	48	D	.68	24	18.40	202	48
12	D	.75	16	22.60	366	12	D	.75	24	18.40	265	48	D	.75	24	18.40	265	48	D	.75	24	18.40	265	48
14	D	.82	16	22.60	406	14	D	.82	24	18.40	359	48	D	.82	24	18.40	359	48	D	.82	24	18.40	359	48
16	D	.89	16	22.60	504	16	D	.89	24	18.40	445	48	D	.89	24	18.40	445	48	D	.89	24	18.40	445	48
18	D	.96	16	22.60	594	18	D	.96	24	18.40	533	48	D	.96	24	18.40	533	48	D	.96	24	18.40	533	48
20	D	1.03	16	22.60	676	20	D	1.03	24	18.40	621	48	D	1.03	24	18.40	621	48	D	1.03	24	18.40	621	48
24	D	1.16	30	42.40	1056	24	D	1.16	30	42.40	864	48	D	1.16	30	42.40	864	48	D	1.16	30	42.40	864	48
30	A	.88	36	50.90	1814	30	A	.88	36	50.90	1458	48	D	1.26	30	42.40	1056	48	D	1.26	30	42.40	1056	48
36	A	.99	48	67.90	2964	36	A	.99	48	67.90	2472	48	D	1.42	30	42.40	1290	48	D	1.42	30	42.40	1290	48
42	B	1.03	36	50.90	2082	42	B	1.03	36	50.90	1684	48	D	1.54	30	42.40	1514	48	D	1.54	30	42.40	1514	48
48	B	1.20	36	50.90	2454	48	B	1.20	36	50.90	1916	48	D	1.58	30	42.40	1738	48	D	1.58	30	42.40	1738	48
30	D	1.37	36	50.90	2836	30	D	1.37	36	50.90	2291	48	D	1.78	30	42.40	2082	48	D	1.78	30	42.40	2082	48
36	A	.99	48	67.90	2964	36	A	.99	48	67.90	2472	48	D	1.80	30	42.40	2186	48	D	1.80	30	42.40	2186	48
36	B	1.15	48	67.90	3500	36	B	1.15	48	67.90	2916	48	D	1.80	30	42.40	2306	48	D	1.80	30	42.40	2306	48
36	C	1.36	48	67.90	4120	36	C	1.36	48	67.90	3430	48	D	1.80	30	42.40	2410	48	D	1.80	30	42.40	2410	48
36	D	1.58	48	67.90	4820	36	D	1.58	48	67.90	4012	48	D	1.80	30	42.40	2530	48	D	1.80	30	42.40	2530	48
42	B	1.26	30	42.40	2082	42	B	1.26	30	42.40	1684	48	D	1.80	30	42.40	2650	48	D	1.80	30	42.40	2650	48
48	B	1.42	30	42.40	2454	48	B	1.42	30	42.40	1916	48	D	1.80	30	42.40	2770	48	D	1.80	30	42.40	2770	48
30	D	1.54	30	42.40	2836	30	D	1.54	30	42.40	2291	48	D	1.80	30	42.40	2890	48	D	1.80	30	42.40	2890	48
36	A	.99	48	67.90	2964	36	A	.99	48	67.90	2472	48	D	1.80	30	42.40	3010	48	D	1.80	30	42.40	3010	48
36	B	1.15	48	67.90	3500	36	B	1.15	48	67.90	2916	48	D	1.80	30	42.40	3130	48	D	1.80	30	42.40	3130	48
36	C	1.36	48	67.90	4120	36	C	1.36	48	67.90	3430	48	D	1.80	30	42.40	3250	48	D	1.80	30	42.40	3250	48
36	D	1.58	48	67.90	4820	36	D	1.58	48	67.90	4012	48	D	1.80	30	42.40	3370	48	D	1.80	30	42.40	3370	48

STANDARD SPECIAL CASTINGS FOR WATER

Standard Curves, Bell and Spigot—Standard Offsets

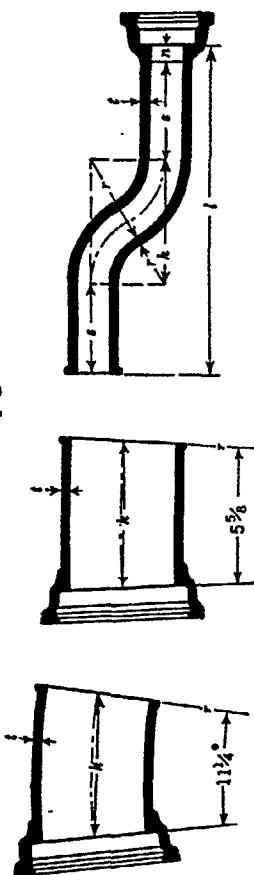


TABLE No. 8

Curves				Curves				Curves			
Nominal Diam., In.	Class	t	r	k	Approx. Weight, Pounds	Nominal Diam., In.	Class	t	r	k	Approx. Weight, Pounds
4	D	.52	120	23	52	4	D	8	35.85	91	
6	D	.55	120	23	52	6	D	14	46.25	183	
8	D	.60	120	23	52	8	D	15	48.00	280	
10	D	.68	120	23	52	10	D	16	49.70	390	
12	D	.75	120	23	52	12	D	17	51.45	530	
14	B	.60	180	35	28	14	B	18	53.70	555	
16	B	.82	180	35	28	16	B	19	55.40	708	
18	B	.70	180	35	28	18	B	20	57.00	900	
20	B	.89	180	35	28	20	B	21	58.70	1100	
22	B	.75	180	35	28	22	B	22	60.40	1300	
24	B	.96	180	35	28	24	B	23	62.10	1500	
26	B	.80	240	47	05	26	B	24	63.80	1700	
28	B	1.03	240	47	05	28	B	25	65.50	1900	
30	B	.88	240	47	05	30	B	26	67.20	2100	
32	B	1.16	240	47	05	32	B	27	68.90	2300	
34	B	.88	240	47	05	34	B	28	70.60	2500	
36	B	1.03	240	47	05	36	B	29	72.30	2700	
38	B	1.20	240	47	05	38	B	30	74.00	2900	
40	B	1.37	240	47	05	40	B	31	75.70	3100	
42	B	.99	240	47	05	42	B	32	77.40	3300	
44	B	1.15	240	47	05	44	B	33	79.10	3500	
46	B	1.36	240	47	05	46	B	34	80.80	3700	
48	B	1.52	240	47	05	48	B	35	82.50	3900	
50	B	1.68	240	47	05	50	B	36	84.20	4100	
52	B	1.28	240	47	05	52	B	37	85.90	4300	
54	B	1.54	240	47	05	54	B	38	87.60	4500	
56	B	1.71	240	47	05	56	B	39	89.30	4700	
58	B	1.26	240	47	05	58	B	40	91.00	4900	
60	B	1.42	240	47	05	60	B	41	92.70	5100	
62	B	1.66	240	47	05	62	B	42	94.40	5300	
64	B	1.83	240	47	05	64	B	43	96.10	5500	
66	B	1.35	240	47	05	66	B	44	97.80	5700	
68	B	1.55	240	47	05	68	B	45	99.50	5900	
70	B	1.70	240	47	05	70	B	46	101.20	6100	
72	B	1.30	240	47	05	72	B	47	102.90	6300	
74	B	1.53	240	47	05	74	B	48	104.60	6500	
76	B	1.67	240	47	05	76	B	49	106.30	6700	
78	B	1.39	240	47	05	78	B	50	108.00	6900	
80	B	1.62	240	47	05	80	B	51	109.70	7100	
82	B	1.78	240	47	05	82	B	52	111.40	7300	
84	B	1.41	240	47	05	84	B	53	113.10	7500	
86	B	1.64	240	47	05	86	B	54	114.80	7700	
88	B	1.80	240	47	05	88	B	55	116.50	7900	
90	B	1.43	240	47	05	90	B	56	118.20	8100	

STANDARD SPECIAL CASTINGS FOR WATER

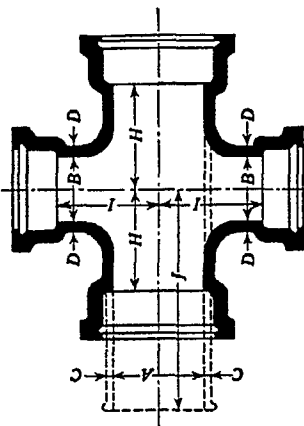


Table No. 10 Standard Branches

Nominal Diam., Inches		Class	Dimensions, Inches			Approximate Weights, Pounds			
A	B		H	J	I	2 Bells	3 Bells	4 Bells	4 Bells
4	3	D	11	23	11	121	120	153	153
4	4	D	11	23	11	125	128	164	166
6	3	D	12	24	12	173	170	207	204
6	4	D	12	24	12	185	183	223	221
6	6	D	12	24	12	203	200	259	257
8	4	D	13	25	13	262	255	301	294
8	6	D	13	25	13	278	270	333	325
8	8	D	13	25	13	301	294	378	372
10	4	D	14	26	14	356	338	395	377
10	6	D	14	26	14	371	352	424	406
10	8	D	14	26	14	389	371	461	443
10	10	D	14	26	14	414	395	511	488
12	4	D	15	27	15	473	445	514	486
12	6	D	15	27	15	486	458	540	512
12	8	D	15	27	15	502	474	573	545
12	10	D	15	27	15	519	491	605	577
12	12	D	15	27	15	540	512	651	623
14	4	B	16	28	16	485	450	535	530
14	6	B	16	28	16	614	588	661	641
14	8	B	16	28	16	634	608	680	655
14	10	B	16	28	16	679	653	730	706
14	12	B	16	28	16	700	674	730	706
14	14	B	16	28	16	750	724	787	761
14	16	B	16	28	16	822	796	855	825
14	18	B	16	28	16	860	834	890	860
14	20	B	16	28	16	900	874	938	908
14	22	B	16	28	16	950	924	998	968
14	24	B	16	28	16	1000	974	1048	1018
16	4	B	17	29	17	615	610	675	670

STANDARD SPECIAL CASTINGS FOR WATER

Table No. 10—Continued. Standard Branches.

Nominal Diam. Inches		Class	Dimensions, Inches			Approximate Weights, Pounds			
						2-Way Branches	3-Way Branches	4-Way Branches	
A	B		H	J	I	2 Balls	3 Balls	4 Balls	
16	4	D	17	29	17	768	760	864	841
16	6	B	17	29	17	690	685	695	690
16	6	D	17	29	17	802	779	902	879
16	8	B	17	29	17	645	640	780	735
16	8	D	17	29	17	881	808	961	938
16	10	B	17	29	17	660	655	760	755
16	10	D	17	29	17	872	849	1042	1019
16	12	B	17	29	17	685	680	805	800
16	12	D	17	29	17	884	861	1066	1048
16	14	B	17	29	17	695	690	835	820
16	14	D	17	29	17	908	880	1104	1082
16	16	B	17	29	17	729	727	904	901
16	16	D	17	29	17	991	969	1262	1269
18	4	B	18	30	18	755	750	820	815
18	4	D	18	30	18	953	927	1046	1020
18	6	B	18	30	18	765	760	840	835
18	6	D	18	30	18	968	942	1075	1049
18	8	B	18	30	18	780	775	870	865
18	8	D	18	30	18	1000	974	1140	1114
18	10	B	18	30	18	795	790	900	895
18	10	D	18	30	18	1088	1012	1216	1190
18	12	B	18	30	18	815	810	940	935
18	12	D	18	30	18	1075	1049	1260	1264
18	14	B	18	30	18	825	820	955	950
18	14	D	18	30	18	1088	1057	1268	1280
18	16	B	18	30	18	855	850	1020	1015
18	16	D	18	30	18	1108	1082	1266	1280
18	18	B	18	30	18	895	869	1101	1096
18	18	D	18	30	18	1170	1144	1480	1454
20	4	B	19	31	19	928	916	1006	999
20	4	D	19	31	19	1172	1145	1278	1248
20	6	B	19	31	19	980	920	1010	1000
20	6	D	19	31	19	1188	1164	1304	1280
20	8	B	19	31	19	945	935	1035	1025
20	8	D	19	31	19	1212	1188	1352	1328
20	10	B	19	31	19	955	945	1060	1050
20	10	D	19	31	19	1253	1227	1431	1407
20	12	B	19	31	19	975	965	1100	1090
20	12	D	19	31	19	1268	1268	1479	1479
20	14	B	19	31	19	980	970	1110	1100
20	14	D	19	31	19	1342	1318	1618	1588
20	16	B	19	31	19	1010	1000	1170	1160
20	16	D	19	31	19	1347	1338	1622	1597
20	18	B	19	31	19	1085	1025	1215	1215
20	18	D	19	31	19	1365	1341	1658	1634
20	20	B	19	31	19	1077	1070	1314	1307

STANDARD SPECIAL CASTINGS FOR WATER

Table No. 10—Continued. Standard Branches

Nominal Diam. Inches		Class	Dimensions, Inches			Approximate Weights, Pounds			
						2-Way Branches	3-Way Branches	4-Way Branches	
A	B		H	J	I	2 Balls	3 Balls	4 Balls	
20	20	D	19	31	19	1462	1488	1852	1828
24	6	B	21	33	21	1809	1289	1425	1405
24	6	D	21	33	21	1670	1057	1809	1775
24	8	B	21	33	21	1823	1308	1453	1438
24	8	D	21	33	21	1097	1064	1863	1860
24	10	B	21	33	21	1841	1821	1489	1469
24	10	D	21	33	21	1732	1699	1938	1900
24	12	B	21	33	21	1802	1842	1582	1511
24	12	D	21	33	21	1768	1785	2005	1973
24	14	B	21	33	21	1402	1881	1609	1689
24	14	D	21	33	21	1810	1777	2088	2055
24	16	B	21	33	21	1448	1428	1684	1678
24	16	D	21	33	21	1858	1825	2185	2151
24	18	B	21	33	21	1440	1440	1727	1706
24	18	D	21	33	21	1885	1852	2238	2205
24	20	B	21	33	21	1474	1454	1756	1736
24	20	D	21	33	21	1891	1891	2518	2484
24	24	B	21	33	21	1523	1503	1854	1834
24	24	D	21	33	21	2146	2118	2727	2694
24	24	A	21	33	21	1272	1300	1407	1484
24	24	B	21	33	21	1483	1417	1850	1833
24	24	C	21	33	21	1693	1678	1870	1850
24	24	D	21	33	21	1920	1920	2118	2089
24	24	A	21	33	21	1818	1846	1458	1481
24	24	B	21	33	21	1482	1468	1624	1609
24	24	C	21	33	21	1765	1745	1953	1934
24	24	D	21	33	21	2004	1990	2183	2168
24	24	A	21	33	21	1860	1898	1512	1540
24	24	B	21	33	21	1588	1821	1688	1668
24	24	C	21	33	21	1857	1887	2076	2056
24	24	D	21	33	21	2108	2094	2819	2808
24	24	A	21	33	21	1895	1420	1555	1580
24	24	B	21	33	21	1555	1540	1715	1700
24	24	C	21	33	21	1911	1891	2184	2164
24	24	D	21	33	21	2154	2140	2411	2398
24	24	A	21	33	21	1547	1575	1787	1764
24	24	B	21	33	21	1805	1789	2085	2069
24	24	C	21	33	21	2159	2140	2487	2477
24	24	D	21	33	21	2567	2553	3026	3018
24	24	A	21	33	21	1648	1675	1805	1832
24	24	B	21	33	21	1899	1888	2200	2184
24	24	C	21	33	21	2272	2258	2682	2643
24	24	D	21	33	21	2692	2678	3206	3192
24	24	A	21	33	21	1757	1741	2024	2007
24	24	B	21	33	21	2044	2044	2387	2318

STANDARD SPECIAL CASTINGS FOR WATER

Table No. 10—Continued. Standard Branches

Nominal Diam. Inches		Class	Dimensions, Inches				Approximate Weights, Pounds			
			H	J	I		2 Bells	3 Bells	4 Bells	
80	18	C	20	84	28		2484	2353	2802	2781
80	18	D	20	84	28		2805	2791	3361	3348
80	20	A	21	86	28		1857	1818	2117	2118
80	20	B	21	86	28		2088	2088	2564	2490
80	20	C	21	86	28		2087	2555	3237	3128
80	20	D	21	86	28		3041	2931	3657	3588
80	24	A	28	88	26		1979	1940	2312	2274
80	24	B	28	88	26		2818	2210	2712	2648
80	24	C	28	88	26		2847	2730	3474	3362
80	24	D	28	88	26		3290	3170	4014	3895
80	30	A	26	48	26		2212	2120	2602	2520
80	30	B	26	48	26		2593	2158	3106	2960
80	30	C	26	48	26		3810	3137	4110	3937
80	30	D	26	48	26		3850	3660	4700	4609
86	8	A	14	26	27		1751	1777	1988	1963
86	8	B	14	26	27		2078	2078	2208	2208
86	8	C	14	26	27		2421	2438	2670	2691
86	8	D	14	26	27		2780	2780	3038	3089
86	10	A	15	27	27		1810	1835	1906	2021
86	10	B	15	27	27		2128	2147	2345	2384
86	10	C	15	27	27		2534	2546	2822	2884
86	10	D	15	27	27		2803	2802	3186	3188
86	12	A	16	28	27		1884	1900	2034	2109
86	12	B	16	28	27		2219	2288	2458	2477
86	12	C	16	28	27		2844	2650	2862	2978
86	12	D	16	28	27		3082	3033	3349	3350
86	14	A	18	30	29		2089	2045	2279	2304
86	14	B	18	30	29		2415	2438	2709	2728
86	14	C	18	30	29		2872	2868	3251	3268
86	14	D	18	30	29		3470	3470	4088	4088
86	16	A	19	31	29		2135	2160	2410	2486
86	16	B	19	31	29		2531	2540	2858	2872
86	16	C	19	31	29		3003	3014	3481	3443
86	16	D	19	31	29		3618	3617	4281	4280
86	18	A	20	34	29		2279	2346	2581	2548
86	18	B	20	34	29		2701	2650	3073	3022
86	18	C	20	34	29		3206	3186	3673	3604
86	18	D	20	34	29		3852	3755	4506	4409
86	20	A	21	36	29		2409	2346	2752	2689
86	20	B	21	36	29		2885	2800	3336	3251
86	20	C	21	36	29		3597	3426	4212	4101
86	20	D	21	36	29		4050	3905	4757	4612
86	24	A	23	38	29		2451	2518	2844	2807
86	24	B	23	38	29		3089	3014	3624	3589
86	24	C	23	38	29		3806	3695	4585	4474

STANDARD SPECIAL CASTINGS FOR WATER

Table No. 10—Continued. Standard Branches

Nominal Diam. Inches		Class	Dimensions, Inches				Approximate Weights, Pounds			
			H	J	I		2 Bells	3 Bells	4 Bells	
86	24	D	28	38	29		4511	4808	5307	5161
86	30	A	26	43	29		2880	2708	3342	3120
86	30	B	26	43	29		3594	3438	4385	4179
86	30	C	26	43	29		4248	4055	5140	4947
86	30	D	26	43	29		5160	4918	6050	5850
86	36	A	29	46	29		3067	2946	3589	3418
86	36	B	29	46	29		4046	3891	4956	4800
86	36	C	29	46	29		4788	4595	5867	5678
86	36	D	29	46	29		5310	5087	7009	6857
86	42	A	16	28	30		2507	2577	3407	3277
86	42	B	16	28	30		2870	2889	3181	3170
86	42	C	16	28	30		3478	3507	3880	3860
86	42	D	16	28	30		3971	3989	4307	4285
86	42	A	18	30	32		2871	2789	2943	3010
86	42	B	18	30	32		3075	3114	3400	3440
86	42	C	18	30	32		3747	3776	4147	4177
86	42	D	18	30	32		4580	4609	5368	5306
86	42	A	19	31	32		2778	2846	3080	3148
86	42	B	19	31	32		3196	3235	3553	3592
86	42	C	19	31	32		3891	3920	4325	4354
86	42	D	19	31	32		4754	4772	5367	5306
86	42	A	20	34	32		3950	3984	4441	4398
86	42	B	20	34	32		4407	4437	4904	4844
86	42	C	20	34	32		4983	4912	5108	5028
86	42	D	20	34	32		5049	4989	5510	5409
86	42	A	21	36	32		3104	3056	3450	3411
86	42	B	21	36	32		3582	3486	4000	3913
86	42	C	21	36	32		4015	4479	5251	5251
86	42	D	21	36	32		5297	5123	6122	5943
86	42	A	23	38	32		3314	3266	3724	3676
86	42	B	23	38	32		3852	3756	4370	4274
86	42	C	23	38	32		4905	4829	5366	5280
86	42	D	23	38	32		5709	5585	6370	6205
86	42	A	26	43	32		3679	3583	4144	4018
86	42	B	26	43	32		4554	4370	5416	5230
86	42	C	26	43	32		5049	5402	6075	6428
86	42	D	26	43	32		6561	6358	7729	7126
86	42	A	29	46	32		4070	3950	4705	4570
86	42	B	29	46	32		4908	4718	5345	5159
86	42	C	29	46	32		6150	5904	7281	7015
86	42	D	29	46	32		7187	6884	8512	8209
86	42	A	32	49	32		4398	4287	5100	4988
86	42	B	32	49	32		5538	5348	6451	6248
86	42	C	32	49	32		7001	6755	8392	8146
86	42	D	32	49	32		8158	7855	9803	9500

STANDARD SPECIAL CASTINGS FOR WATER

Table No. 10—Continued. Standard Branches

Nominal Diam. Inches	Class	Dimensions, Inches				Approximate Weights, Pounds			
		H	J	I		3 Way Branches	4 Way Branches		
						2 Bells	3 Bells	4 Bells	
48	A	17	29	38		3286	3810	8658	8707
48	B	17	29	38		3753	3804	4107	4160
48	C	17	29	38		4510	4576	4940	5007
48	D	17	29	38		5564	5624	6370	6486
48	A	18	30	35		3423	3470	3762	3815
48	B	18	30	35		4178	4226	4836	4899
48	C	18	30	35		4905	5030	5712	5778
48	D	18	30	35		5754	5815	6560	6666
48	A	19	31	35		3565	3619	3947	4001
48	B	19	31	35		4046	4098	4400	4519
48	C	19	31	35		5055	5121	5755	5821
48	D	19	31	35		5907	6029	6860	6921
48	A	20	34	35		3775	3720	4100	4120
48	B	20	34	35		4287	4225	4718	4655
48	C	20	34	35		5470	5407	6028	6256
48	D	20	34	35		6338	6227	7259	7158
48	A	21	36	35		3856	3860	4378	4282
48	B	21	36	35		4500	4380	4978	4853
48	C	21	36	35		5745	5604	6352	6511
48	D	21	36	35		6607	6425	7574	7892
48	A	22	38	35		4231	4125	4706	4609
48	B	22	38	35		5028	4908	5708	5678
48	C	22	38	35		6193	6052	7273	7181
48	D	22	38	35		7064	6882	7894	7812
48	A	26	48	35		4748	4558	5361	5168
48	B	26	48	35		5685	5451	6358	6413
48	C	26	48	35		7043	6763	7885	7985
48	D	26	48	35		8051	7708	8903	8980
48	A	29	46	35		5150	4958	5859	5863
48	B	29	46	35		6323	6089	7352	7143
48	C	29	46	35		7603	7328	8915	8635
48	D	29	46	35		8680	8487	10366	9928
48	A	32	49	35		5503	5367	6266	6069
48	B	32	49	35		6831	6587	7978	7789
48	C	32	49	35		8278	7999	9760	9470
48	D	32	49	35		9644	9301	11367	11024
48	A	35	52	35		6043	5846	7048	6846
48	B	35	52	35		7359	7424	8976	8841
48	C	35	52	35		9229	8950	11006	10726
48	D	35	52	35					

STANDARD SPECIAL CASTINGS FOR WATER

Standard Y Branches, Type 1

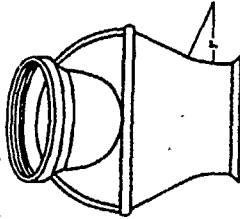
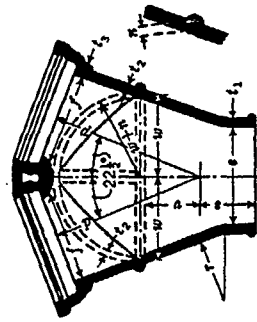
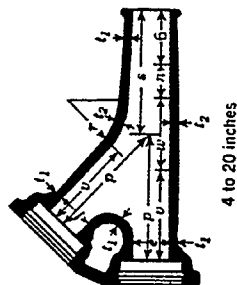


Table No. 11

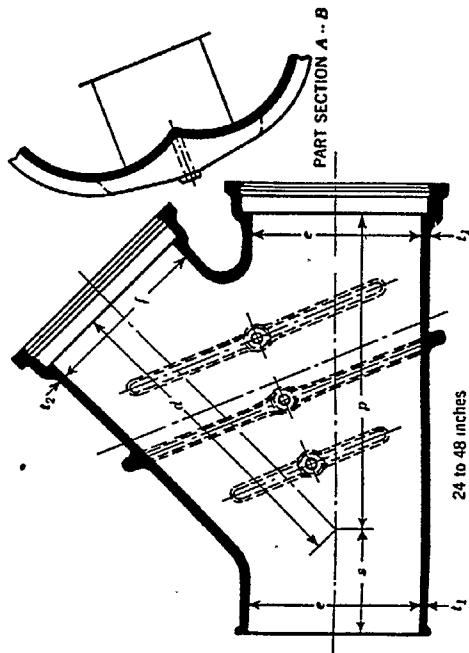
Nominal Diam., Inches	Class	Dimensions, Inches				P	Y	V	B	F	Thickness, Inches			Approx. Weight, Pounds
		t ₁	t ₂	t ₃	t ₄						t ₁	t ₂	t ₃	
12	D	160	2160	500	9.79	1.17	30	1.03	1.40	1.03	.75	1.08	.75	687
14	D	180	2400	500	11.30	1.22	30	1.03	1.40	1.03	.75	1.08	.75	733
16	D	180	2700	500	13.00	1.22	30	1.03	1.40	1.03	.75	1.08	.75	783
18	D	180	3000	500	14.70	1.22	30	1.03	1.40	1.03	.75	1.08	.75	833
20	D	180	3300	500	16.40	1.22	30	1.03	1.40	1.03	.75	1.08	.75	883
22	D	180	3600	500	18.10	1.22	30	1.03	1.40	1.03	.75	1.08	.75	933
24	D	180	3900	500	19.80	1.22	30	1.03	1.40	1.03	.75	1.08	.75	983
26	D	180	4200	500	21.50	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1033
28	D	180	4500	500	23.20	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1083
30	D	180	4800	500	24.90	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1133
32	D	180	5100	500	26.60	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1183
34	D	180	5400	500	28.30	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1233
36	D	180	5700	500	30.00	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1283
38	D	180	6000	500	31.70	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1333
40	D	180	6300	500	33.40	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1383
42	D	180	6600	500	35.10	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1433
44	D	180	6900	500	36.80	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1483
46	D	180	7200	500	38.50	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1533
48	D	180	7500	500	40.20	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1583
50	D	180	7800	500	41.90	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1633
52	D	180	8100	500	43.60	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1683
54	D	180	8400	500	45.30	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1733
56	D	180	8700	500	47.00	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1783
58	D	180	9000	500	48.70	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1833
60	D	180	9300	500	50.40	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1883
62	D	180	9600	500	52.10	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1933
64	D	180	9900	500	53.80	1.22	30	1.03	1.40	1.03	.75	1.08	.75	1983
66	D	180	10200	500	55.50	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2033
68	D	180	10500	500	57.20	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2083
70	D	180	10800	500	58.90	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2133
72	D	180	11100	500	60.60	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2183
74	D	180	11400	500	62.30	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2233
76	D	180	11700	500	64.00	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2283
78	D	180	12000	500	65.70	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2333
80	D	180	12300	500	67.40	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2383
82	D	180	12600	500	69.10	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2433
84	D	180	12900	500	70.80	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2483
86	D	180	13200	500	72.50	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2533
88	D	180	13500	500	74.20	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2583
90	D	180	13800	500	75.90	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2633
92	D	180	14100	500	77.60	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2683
94	D	180	14400	500	79.30	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2733
96	D	180	14700	500	81.00	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2783
98	D	180	15000	500	82.70	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2833
100	D	180	15300	500	84.40	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2883
102	D	180	15600	500	86.10	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2933
104	D	180	15900	500	87.80	1.22	30	1.03	1.40	1.03	.75	1.08	.75	2983
106	D	180	16200	500	89.50	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3033
108	D	180	16500	500	91.20	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3083
110	D	180	16800	500	92.90	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3133
112	D	180	17100	500	94.60	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3183
114	D	180	17400	500	96.30	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3233
116	D	180	17700	500	98.00	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3283
118	D	180	18000	500	99.70	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3333
120	D	180	18300	500	101.40	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3383
122	D	180	18600	500	103.10	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3433
124	D	180	18900	500	104.80	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3483
126	D	180	19200	500	106.50	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3533
128	D	180	19500	500	108.20	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3583
130	D	180	19800	500	109.90	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3633
132	D	180	20100	500	111.60	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3683
134	D	180	20400	500	113.30	1.22	30	1.03	1.40	1.03	.75	1.08	.75	3733
136	D	180	20700	500	115.00	1.22	30	1.03	1.40	1.03	.75	1.08	.75	37

STANDARD SPECIAL CASTINGS FOR WATER

Y Branches, Type 2



4 to 20 inches



24 to 48 inches

Table No. 12

Nominal Diam., Inch.	Class	s	p	v	w	n	r	Thickness Inches		Approx. Weight Pounds
								t ₁	t ₂	
4	D	11.50	10.00	7.18	6.64	2.18	0	.52	.64	103
6	D	13.00	13.00	9.27	7.46	3.27	0	.55	.67	181
8	D	14.00	16.00	11.85	8.39	3.85	0	.60	.72	291
10	D	15.50	18.50	13.94	9.12	4.94	0	.68	.83	434
12	D	17.00	21.50	16.54	10.54	5.92	0	.75	.93	633
14	B	18.00	24.00	18.62	12.75	6.82	0	.80	.84	690
16	B	19.00	26.00	20.62	14.75	7.72	0	.85	.92	985
18	B	20.00	28.00	22.62	16.75	8.60	0	.90	1.00	1275
20	B	21.00	30.00	24.62	18.75	9.48	0	.95	1.03	1569
22	B	22.00	32.00	26.62	20.75	10.36	0	1.00	1.12	1863
24	B	23.00	34.00	28.62	22.75	11.24	0	1.05	1.16	2157
26	B	24.00	36.00	30.62	24.75	12.12	0	1.10	1.20	2451
28	B	25.00	38.00	32.62	26.75	13.00	0	1.15	1.26	2745
30	B	26.00	40.00	34.62	28.75	13.88	0	1.20	1.30	3039
32	B	27.00	42.00	36.62	30.75	14.76	0	1.25	1.38	3333
34	B	28.00	44.00	38.62	32.75	15.64	0	1.30	1.46	3627
36	B	29.00	46.00	40.62	34.75	16.52	0	1.35	1.54	3921
38	B	30.00	48.00	42.62	36.75	17.40	0	1.40	1.62	4215
40	B	31.00	50.00	44.62	38.75	18.28	0	1.45	1.70	4509
42	B	32.00	52.00	46.62	40.75	19.16	0	1.50	1.78	4803
44	B	33.00	54.00	48.62	42.75	20.04	0	1.55	1.86	5097
46	B	34.00	56.00	50.62	44.75	20.92	0	1.60	1.94	5391
48	B	35.00	58.00	52.62	46.75	21.80	0	1.65	2.02	5685
50	B	36.00	60.00	54.62	48.75	22.68	0	1.70	2.10	5979
52	B	37.00	62.00	56.62	50.75	23.56	0	1.75	2.18	6273
54	B	38.00	64.00	58.62	52.75	24.44	0	1.80	2.26	6567
56	B	39.00	66.00	60.62	54.75	25.32	0	1.85	2.34	6861
58	B	40.00	68.00	62.62	56.75	26.20	0	1.90	2.42	7155
60	B	41.00	70.00	64.62	58.75	27.08	0	1.95	2.50	7449
62	B	42.00	72.00	66.62	60.75	27.96	0	2.00	2.58	7743
64	B	43.00	74.00	68.62	62.75	28.84	0	2.05	2.66	8037
66	B	44.00	76.00	70.62	64.75	29.72	0	2.10	2.74	8331
68	B	45.00	78.00	72.62	66.75	30.60	0	2.15	2.82	8625
70	B	46.00	80.00	74.62	68.75	31.48	0	2.20	2.90	8919
72	B	47.00	82.00	76.62	70.75	32.36	0	2.25	2.98	9213
74	B	48.00	84.00	78.62	72.75	33.24	0	2.30	3.06	9507
76	B	49.00	86.00	80.62	74.75	34.12	0	2.35	3.14	9801
78	B	50.00	88.00	82.62	76.75	35.00	0	2.40	3.22	10095
80	B	51.00	90.00	84.62	78.75	35.88	0	2.45	3.30	10389
82	B	52.00	92.00	86.62	80.75	36.76	0	2.50	3.38	10683
84	B	53.00	94.00	88.62	82.75	37.64	0	2.55	3.46	10977
86	B	54.00	96.00	90.62	84.75	38.52	0	2.60	3.54	11271
88	B	55.00	98.00	92.62	86.75	39.40	0	2.65	3.62	11565
90	B	56.00	100.00	94.62	88.75	40.28	0	2.70	3.70	11859
92	B	57.00	102.00	96.62	90.75	41.16	0	2.75	3.78	12153
94	B	58.00	104.00	98.62	92.75	42.04	0	2.80	3.86	12447
96	B	59.00	106.00	100.62	94.75	42.92	0	2.85	3.94	12741
98	B	60.00	108.00	102.62	96.75	43.80	0	2.90	4.02	13035
100	B	61.00	110.00	104.62	98.75	44.68	0	2.95	4.10	13329

STANDARD SPECIAL CASTINGS FOR WATER

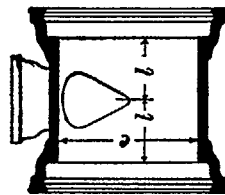
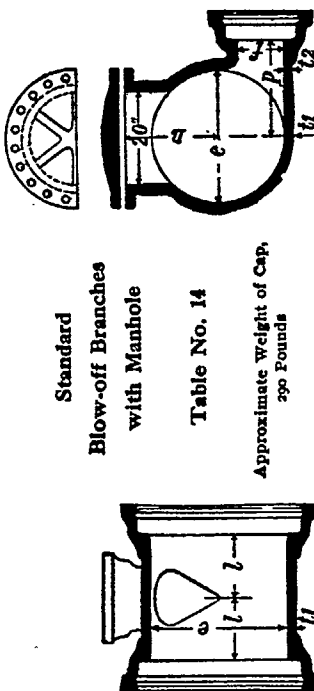
Standard
Blow-off Branches

Table No. 13

Nominal Diameter Inches	Class	l	p	Thickness Inches		Approx. Weight Pounds	Nominal Diameter Inches	Class	l	p	Thickness Inches		Approx. Weight Pounds	
				t ₁	t ₂						t ₁	t ₂		
8	D	12	7	.60	.52	227	30	12	A	13	23	.90	.75	1702
10	D	12	8	.68	.52	286	36	12	B	13	23	1.15	.75	1972
12	D	12	8	.68	.55	300	36	12	C	13	23	1.36	.75	2285
14	D	12	10	.75	.52	365	36	12	D	13	23	1.58	.75	2627
16	D	12	6	.75	.55	379	42	12	A	15	26	1.10	.75	2483
18	D	12	11	.68	.55	400	42	12	B	15	26	1.28	.75	2728
20	D	12	11	.82	.52	471	42	12	C	15	26	1.54	.75	3271
22	D	12	11	.68	.55	415	42	12	D	15	26	1.78	.75	3768
24	D	12	11	.82	.55	486	42	16	A	15	26	1.10	.70	2489
26	D	12	12	.70	.52	497	42	16	B	15	26	1.28	.70	2786
28	D	12	12	.89	.52	597	42	16	C	15	26	1.54	.89	3365
30	D	12	12	.70	.55	513	42	16	D	15	26	1.78	.89	3862
32	D	12	12	.89	.55	613	48	12	A	17	30	1.26	.75	3274
34	D	12	13	.75	.52	586	48	12	B	17	30	1.42	.75	3699
36	D	12	13	.96	.52	704	48	12	C	17	30	1.71	.75	4417
38	D	12	13	.75	.55	608	48	12	D	17	30	1.96	.75	5107
40	D	12	13	.96	.55	720	48	16	A	17	30	1.26	.70	3337
42	D	12	14	.80	.52	687	48	16	B	17	30	1.42	.70	3703
44	D	12	14	1.03	.52	850	48	16	C	17	30	1.71	.89	4523
46	D	12	14	.80	.55	705	48	16	D	17	30	1.96	.89	5214
48	D	12	14	1.03	.55	867	54	12	A	19	38	1.35	.75	4287
50	D	12	16	.89	.55	916	54	12	B	19	38	1.55	.75	4945
52	D	12	16	1.16	.55	1149	54	12	C	19	38	1.90	.75	5981
54	D	12	16	.89	.60	935	54	12	D	19	38	2.23	.75	7002
56	D	12	16	1.16	.60	1170	54	16	A	19	38	1.35	.70	4355
58	D	12	16	.88	.60	1269	54	16	B	19	38	1.55	.70	5018
60	D	12	16	1.03	.60	1392	54	16	C	19	38	1.90	.89	6096
62	D	12	16	1.20	.60	1616	54	16	D	19	38	2.28	.89	7126
64	D	12	16	1.37	.60	1807	60	12	A	21	36	1.39	.75	5263
66	D	12	16	.88	.75	1815	60	12	B	21	36	1.67	.75	6159
68	D	12	16	1.03	.75	1426	60	12	C	21	36	2.00	.75	7418
70	D	12	16	1.20	.75	1658	60	12	D	21	36	2.38	.75	8798
72	D	12	16	1.37	.75	1913	60	16	A	21	36	1.39	.70	5886
74	D	12	16	.99	.60	1658	60	16	B	21	36	1.67	.70	6283
76	D	12	16	1.15	.60	1922	60	16	C	21	36	2.00	.89	7542
78	D	12	16	1.36	.60	2294	60	16	D	21	36	2.38	.89	8927
80	D	12	16	1.58	.60	2576	60	16						

STANDARD SPECIAL CASTINGS FOR WATER



Standard
Blow-off Branches
with Manhole

Table No. 14

Approximate Weight of Cap,
300 Pounds

Nom'l Diam. Inches	Class	l	p	a	Thickness Inches	Approximate Weight, Lbs.	Nom'l Diam. Inches	Class	l	p	a	Thickness Inches	Approximate Weight, Lbs.
8	A	17	20	21	1.03	1628	48	A	17	20	21	1.03	1628
8	B	17	20	21	1.20	2015	48	B	17	20	21	1.20	2015
8	C	17	20	21	1.37	2402	48	C	17	20	21	1.37	2402
8	D	17	20	21	1.54	2789	48	D	17	20	21	1.54	2789
10	A	17	20	21	1.03	1803	48	A	17	20	21	1.03	1803
10	B	17	20	21	1.20	2190	48	B	17	20	21	1.20	2190
10	C	17	20	21	1.37	2577	48	C	17	20	21	1.37	2577
10	D	17	20	21	1.54	2964	48	D	17	20	21	1.54	2964
12	A	17	20	21	1.03	2180	48	A	17	20	21	1.03	2180
12	B	17	20	21	1.20	2567	48	B	17	20	21	1.20	2567
12	C	17	20	21	1.37	2954	48	C	17	20	21	1.37	2954
12	D	17	20	21	1.54	3341	48	D	17	20	21	1.54	3341
14	A	17	20	21	1.03	2567	48	A	17	20	21	1.03	2567
14	B	17	20	21	1.20	2954	48	B	17	20	21	1.20	2954
14	C	17	20	21	1.37	3341	48	C	17	20	21	1.37	3341
14	D	17	20	21	1.54	3728	48	D	17	20	21	1.54	3728
16	A	17	20	21	1.03	2954	48	A	17	20	21	1.03	2954
16	B	17	20	21	1.20	3341	48	B	17	20	21	1.20	3341
16	C	17	20	21	1.37	3728	48	C	17	20	21	1.37	3728
16	D	17	20	21	1.54	4115	48	D	17	20	21	1.54	4115
18	A	17	20	21	1.03	3341	48	A	17	20	21	1.03	3341
18	B	17	20	21	1.20	3728	48	B	17	20	21	1.20	3728
18	C	17	20	21	1.37	4115	48	C	17	20	21	1.37	4115
18	D	17	20	21	1.54	4502	48	D	17	20	21	1.54	4502

AMERICAN STANDARD MANHOLE PIPE

Table No. 15

Nom'l Diam. Inches	Class	l	p	a	Thickness Inches	Approximate Weight, Lbs.	Nom'l Diam. Inches	Class	l	p	a	Thickness Inches	Approximate Weight, Lbs.
8	A	17	20	21	1.03	1628	48	A	17	20	21	1.03	1628
8	B	17	20	21	1.20	2015	48	B	17	20	21	1.20	2015
8	C	17	20	21	1.37	2402	48	C	17	20	21	1.37	2402
8	D	17	20	21	1.54	2789	48	D	17	20	21	1.54	2789
10	A	17	20	21	1.03	1803	48	A	17	20	21	1.03	1803
10	B	17	20	21	1.20	2190	48	B	17	20	21	1.20	2190
10	C	17	20	21	1.37	2577	48	C	17	20	21	1.37	2577
10	D	17	20	21	1.54	2964	48	D	17	20	21	1.54	2964
12	A	17	20	21	1.03	2180	48	A	17	20	21	1.03	2180
12	B	17	20	21	1.20	2567	48	B	17	20	21	1.20	2567
12	C	17	20	21	1.37	2954	48	C	17	20	21	1.37	2954
12	D	17	20	21	1.54	3341	48	D	17	20	21	1.54	3341
14	A	17	20	21	1.03	2567	48	A	17	20	21	1.03	2567
14	B	17	20	21	1.20	2954	48	B	17	20	21	1.20	2954
14	C	17	20	21	1.37	3341	48	C	17	20	21	1.37	3341
14	D	17	20	21	1.54	3728	48	D	17	20	21	1.54	3728
16	A	17	20	21	1.03	3341	48	A	17	20	21	1.03	3341
16	B	17	20	21	1.20	3728	48	B	17	20	21	1.20	3728
16	C	17	20	21	1.37	4115	48	C	17	20	21	1.37	4115
16	D	17	20	21	1.54	4502	48	D	17	20	21	1.54	4502
18	A	17	20	21	1.03	4115	48	A	17	20	21	1.03	4115
18	B	17	20	21	1.20	4502	48	B	17	20	21	1.20	4502
18	C	17	20	21	1.37	4889	48	C	17	20	21	1.37	4889
18	D	17	20	21	1.54	5276	48	D	17	20	21	1.54	5276

Standard Manhole Pipe
Approximate Weight of Cap, 300 Pounds

1-17 inches on 30 inches to 48 inches; 19 inches on 54 inches; 21 inches on 60 inches diameter.

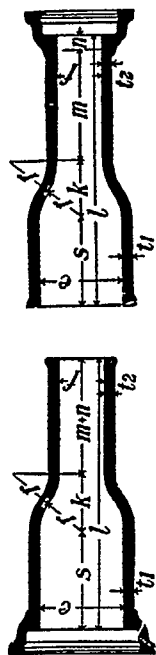
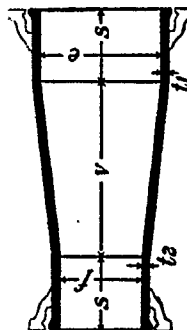
STANDARD SPECIAL CASTINGS FOR WATER
Standard Reducers and Increasers, Type No. 1

Table No. 16

Diam. Inches	Thickness, Inches		r	m	k	Thickness, Inches		Weights, Pounds	
	t1	t2				t1	t2	Large End Bell	Small End Bell
6	4	4	8	14.70	3.30	.55	.52	99	88
8	4	4	4	12.70	5.80	.60	.52	131	108
8	6	6	4	14.10	8.90	.60	.55	149	188
10	4	4	5	10.90	7.10	.68	.52	161	183
10	6	6	5	12.00	6.00	.68	.55	181	160
10	8	8	5	18.60	4.40	.68	.60	205	195
12	6	6	6	10.10	7.80	.75	.55	225	191
12	8	8	6	11.40	6.60	.75	.60	246	234
12	10	10	6	13.20	4.80	.75	.68	271	260

Class D. 6x4 inches to 12x30 inches. On all sizes n = 10 inches.
On all sizes l = 30 inches and s = 10 inches.

AMERICAN STANDARD REDUCERS AND INCREASERS



Type No. 2

6x4 inches to
60x54 inches

Table No. 17

Nominal Diam. Inches	Thickness, Inches		Class	Spigot Ends	Weights, Pounds	
	t1	t2			Large End Bell	Small End Bell
6	4	4	D	82	104	97
8	4	4	D	104	132	119
8	6	6	D	121	150	148
10	4	4	D	131	163	146
10	6	6	D	150	180	169
10	8	8	D	170	201	188
12	4	4	D	163	201	179
12	6	6	D	181	218	203
12	8	8	D	202	240	231
13	10	10	D	239	287	261
14	6	6	B	194	249	216
14	8	8	B	234	288	258
14	10	10	B	230	275	248
14	8	8	D	230	314	288

On all sizes s = 8 inches.

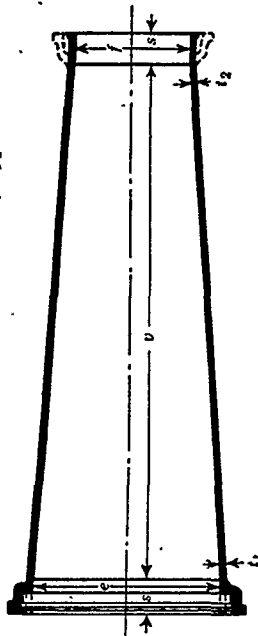
STANDARD SPECIAL CASTINGS FOR WATER

Standard Reducers and Increasers, Type No. 2

Table No. 17—Continued

Nominal Diam., Inches		y	Thickness, Inches		Class	Weights, Pounds		
e	f		t ₁	t ₂		Spigot Ends	Large End Bell	Small End Bell
14	10	20	.06	.68	B	250	805	279
14	10	20	.82	.68	D	290	844	320
14	13	20	.66	.75	B	284	839	321
14	13	20	.82	.75	D	324	878	360
16	6	20	.70	.55	B	226	300	248
16	6	20	.80	.55	D	278	355	300
16	8	20	.70	.60	B	252	326	280
16	8	20	.80	.60	D	304	381	332
16	10	20	.70	.68	B	282	856	312
16	10	20	.80	.68	D	334	410	364
16	12	20	.70	.75	B	317	891	353
16	12	20	.80	.75	D	368	445	405
16	14	20	.70	.66	B	315	889	370
16	14	20	.80	.66	D	407	484	461
18	8	20	.75	.82	B	287	374	315
18	8	20	.80	.82	D	345	468	378
18	10	20	.75	.68	B	317	404	347
18	10	20	.80	.68	D	375	463	405
18	12	20	.75	.75	B	352	488	388
18	12	20	.80	.75	D	410	502	440
18	14	20	.75	.66	B	350	487	405
18	14	20	.80	.66	D	443	541	502
18	16	20	.75	.82	B	383	469	457
18	16	20	.80	.82	D	462	565	509
20	10	26	.80	.68	B	414	516	445
20	10	26	1.08	.68	D	499	615	520
20	12	26	.80	.75	B	455	566	491
20	12	26	1.08	.75	D	539	656	576
20	14	26	.80	.66	B	453	554	508
20	14	26	1.08	.66	D	538	700	638
20	16	26	.80	.82	B	490	592	564
20	16	26	1.08	.82	D	635	751	711
20	18	26	.80	.75	B	581	683	617
20	18	26	1.08	.75	D	688	800	776
24	14	26	.80	.66	B	552	680	607
24	14	26	1.16	.66	D	710	806	764
24	16	26	.80	.70	B	589	717	668
24	16	26	1.16	.70	D	762	917	888
24	18	26	.80	.75	B	680	758	717
24	18	26	1.16	.75	D	810	965	901
24	20	26	.80	.80	B	675	803	776
24	20	26	1.16	.80	D	871	1037	987
30	18	26	.80	.75	B	710	903	796
30	18	26	1.08	.75	D	791	969	878
30	18	26	1.20	.75	C	956	1166	1048
30	18	26	1.37	.86	D	1054	1305	1146
30	20	26	.88	.80	A	764	947	856

On all sizes a = 8 inches.

STANDARD SPECIAL CASTINGS FOR WATER
Standard Reducers and Increasers, Type No. 2

Long Increaser. 48 to 30 inches x 132 inches y

Table No. 17—Continued

Nominal Diam., Inches		y	Thickness, Inches		Class	Weights, Pounds		
e	f		t ₁	t ₂		Spigot Ends	Large End Bell	Small End Bell
30	20	26	1.03	.80	B	836	1014	937
30	20	26	1.20	1.03	C	1018	1227	1134
30	20	26	1.37	1.03	D	1115	1366	1232
30	20	26	.88	.80	A	1468	1661	1569
30	20	26	1.03	.80	B	1626	1804	1728
30	20	26	1.20	1.03	C	1981	2190	2008
30	20	26	1.37	1.03	D	2172	2423	2289
30	24	26	.88	.89	A	854	1047	981
30	24	26	1.03	.89	B	935	1113	1063
30	24	26	1.20	1.16	C	1144	1354	1300
30	24	26	1.37	1.16	D	1242	1492	1398
30	24	26	.88	.89	A	1661	1921	1809
30	24	26	1.03	.89	B	1820	1998	1946
30	24	26	1.20	1.16	C	2228	2438	2384
30	24	26	1.37	1.16	D	2419	2670	2575
36	20	32	.99	.80	A	1039	1286	1141
36	20	32	1.15	.80	B	1170	1450	1272
36	20	32	1.36	1.03	C	1417	1739	1534
36	20	32	1.58	1.03	D	1589	1951	1705
36	20	32	.99	.89	A	1771	2018	1872
36	20	32	1.15	.89	B	1994	2274	2095
36	20	32	1.36	1.03	C	2416	2738	2533
36	20	32	1.58	1.03	D	2710	3072	2827
36	24	32	.99	.89	A	1153	1339	1280
36	24	32	1.15	.89	B	1283	1584	1411
36	24	32	1.36	1.16	C	1562	1884	1718
36	24	32	1.58	1.16	D	1734	2086	1890
36	24	32	.99	.89	A	1964	2211	2091
36	24	32	1.15	.89	B	2188	2468	2314
36	24	32	1.36	1.16	C	2664	2985	2820
36	24	32	1.58	1.16	D	2957	3319	3113
36	30	32	.99	.88	A	1243	1490	1438
36	30	32	1.15	1.03	B	1467	1747	1645
36	30	32	1.36	1.20	C	1730	2051	1939
36	30	32	1.58	1.37	D	2013	2375	2264

On all sizes a = 8 inches.

STANDARD SPECIAL CASTINGS FOR WATER

Standard Reducers and Increasers, Type No. 2

Table No. 17—Continued

Nominal Diam. Inches		v	Thickness, Inches		Class	Weights, Pounds		
			t ₁	t ₂		Spigot End	Large End Ball	Small End Ball
36	30	66	.99	.89	A	2119	2806	2812
36	30	66	1.15	1.08	B	2502	2788	2680
36	30	66	1.36	1.20	C	2950	3271	3159
36	30	66	1.58	1.37	D	3434	3796	3684
42	30	32	1.10	.80	A	1203	1602	1364
42	20	32	1.28	.80	B	1418	1768	1515
42	20	32	1.54	1.03	C	1768	2108	1868
42	20	32	1.78	1.03	D	1975	2445	2092
42	20	66	1.10	.80	A	2152	2491	2254
42	20	66	1.28	.80	B	2410	2764	2511
42	20	66	1.54	1.03	C	2899	3405	3106
42	20	66	1.78	1.03	D	3389	3989	3636
42	24	32	1.10	.89	A	1876	1715	1504
42	24	32	1.28	.89	B	1527	1681	1454
42	24	32	1.54	1.16	C	1898	2318	2058
42	24	32	1.78	1.16	D	2120	2580	2276
42	24	66	1.10	.89	A	2846	2685	2472
42	24	66	1.28	.89	B	3208	2988	2780
42	24	66	1.54	1.16	C	3827	3652	3392
42	24	66	1.78	1.16	D	4466	4066	3772
42	30	32	1.10	.88	A	1467	1606	1380
42	30	32	1.28	.88	B	1711	2065	1869
42	30	32	1.54	1.20	C	2005	2480	2275
42	30	32	1.78	1.20	D	2309	2869	2650
42	30	66	1.10	.88	A	2500	2389	2188
42	30	66	1.28	.88	B	2917	2871	2685
42	30	66	1.54	1.20	C	3523	3998	3782
42	30	66	1.78	1.20	D	4098	4503	4244
42	36	32	1.10	.99	A	1645	1984	1891
42	36	32	1.28	.99	B	1926	2281	2107
42	36	32	1.54	1.36	C	2320	2785	2543
42	36	32	1.78	1.36	D	2714	3184	3070
42	36	66	1.10	.99	A	2803	3143	3050
42	36	66	1.28	.99	B	3285	3639	3465
42	36	66	1.54	1.36	C	3958	4378	4279
42	36	66	1.78	1.36	D	4631	5101	4938
48	30	66	1.28	.88	A	2975	3381	3168
48	30	66	1.42	.88	B	3426	3868	3606
48	30	66	1.71	1.20	C	4092	4641	4301
48	30	66	1.96	1.37	D	4762	5388	5018
48	30	132	1.28	.88	A	5363	5769	5556
48	30	132	1.42	.88	B	6180	6685	6369
48	30	132	1.71	1.20	C	7379	7928	7588
48	30	132	1.96	1.37	D	8588	9214	8839
48	36	66	1.28	.99	A	3278	3684	3525
48	36	66	1.42	.99	B	3796	4252	4077
48	36	66	1.71	1.36	C	4527	5076	4849

On all sizes 1/8 inch.

STANDARD SPECIAL CASTINGS FOR WATER

Standard Reducers and Increasers, Type No. 2

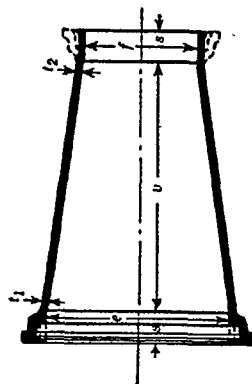
Table No. 17—Continued

Nominal Diam. Inches		v	Thickness, Inches		Class	Weights, Pounds		
			t ₁	t ₂		Spigot End	Large End Ball	Small End Ball
54	48	66	1.36	1.58	D	5800	5025	5062
54	48	132	1.26	.99	A	5909	6816	6156
54	48	132	1.42	1.15	B	6844	7299	7125
54	48	132	1.71	1.36	C	8104	8713	8485
54	48	132	1.96	1.58	D	9558	10184	9921
54	48	66	1.26	1.10	A	8639	4006	3908
54	48	66	1.42	1.28	B	4212	4067	4564
54	48	66	1.71	1.54	C	5100	5649	5516
54	48	66	1.96	1.78	D	5959	6585	6429
54	48	132	1.26	1.10	A	6997	7003	6990
54	48	132	1.42	1.28	B	7594	8049	7948
54	48	132	1.71	1.54	C	9197	9746	9612
54	48	132	1.96	1.78	D	10747	11378	11217
54	48	66	1.35	.99	A	3722	4228	3669
54	48	66	1.55	1.15	B	4890	4925	4610
54	48	66	1.90	1.36	C	5259	5953	5580
54	48	66	2.23	1.58	D	6181	6995	6548
54	48	132	1.35	.99	A	6710	7216	6857
54	48	132	1.55	1.15	B	7806	8401	8087
54	48	132	1.90	1.36	C	9484	10178	9805
54	48	132	2.23	1.58	D	11148	11962	11510
54	48	66	1.35	1.10	A	4103	4009	4442
54	48	66	1.55	1.28	B	4745	5340	5100
54	48	66	1.90	1.54	C	5832	6826	6247
54	48	66	2.23	1.78	D	6841	7655	7810
54	48	132	1.35	1.10	A	7398	7993	7787
54	48	132	1.55	1.28	B	8556	9151	8910
54	48	132	1.90	1.54	C	10517	11211	10932
54	48	132	2.23	1.78	D	12388	13152	12807
54	48	66	1.35	1.20	A	4578	5083	4984
54	48	66	1.55	1.42	B	5356	5851	5711
54	48	66	1.90	1.71	C	6401	7095	6950
54	48	66	2.23	1.96	D	7512	8326	8187
54	48	132	1.35	1.26	A	8253	8759	8600
54	48	132	1.55	1.42	B	9478	10073	9933
54	48	132	1.90	1.71	C	11544	12390	12093
54	48	132	2.23	1.96	D	13550	14304	14175
60	48	66	1.39	.99	A	4916	4711	4942
60	48	66	1.67	1.15	B	4906	5676	5186
60	48	66	2.00	1.36	C	5807	6992	6189
60	48	66	2.38	1.58	D	6900	7984	7322
60	48	132	1.39	.99	A	7384	7999	7681
60	48	132	1.67	1.15	B	8546	9516	9126
60	48	132	2.00	1.36	C	10381	11405	10992
60	48	132	2.38	1.58	D	12554	13527	13216
60	48	66	1.39	1.10	A	4477	5092	4916
60	48	66	1.67	1.28	B	5321	6001	5676

On all sizes 1/8 inch.

STANDARD SPECIAL CASTINGS FOR WATER

Standard Reducers and Increaseers, Type No. 2

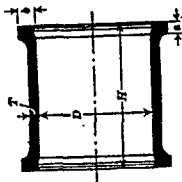


Short Increaseer, 48 to 30 x 66 inches v

Table No. 17—Continued

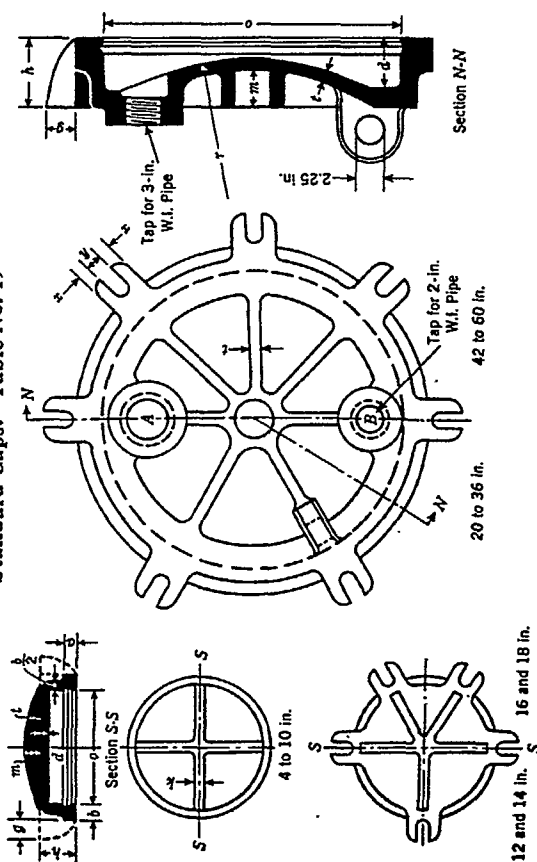
Nominal Diam., Inches		v	Thickness, Inches		Class	Weights, Pounds		
e	f		t ₁	t ₂		Spigot Ends	Large End Bell	Small End Bell
60	42	66	2.00	1.54	C	6440	7264	6855
60	42	66	2.38	1.78	D	7619	8593	8089
60	42	132	1.39	1.10	A	8072	8687	8411
60	42	132	1.67	1.28	B	9395	10265	9950
60	42	132	2.00	1.54	C	11614	12439	12030
60	42	132	2.38	1.78	D	13743	14716	14213
60	48	66	1.39	1.26	A	4957	5572	5363
60	48	66	1.67	1.42	B	5832	6502	6287
60	48	66	2.00	1.71	C	7006	7830	7555
60	48	66	2.38	1.96	D	8285	9259	8910
60	48	132	1.39	1.26	A	8938	9552	9344
60	48	132	1.67	1.42	B	10517	11187	10972
60	48	132	2.00	1.71	C	12534	13458	13183
60	48	132	2.38	1.96	D	14943	15917	15598
60	54	66	1.39	1.35	A	5404	6019	5910
60	54	66	1.67	1.55	B	6348	7018	6901
60	54	66	2.00	1.90	C	7750	8574	8444
60	54	66	2.38	2.23	D	9178	10152	9992
60	54	132	1.39	1.35	A	9745	10360	10251
60	54	132	1.67	1.55	B	11462	12132	12075
60	54	132	2.00	1.90	C	13979	14803	14673
60	54	132	2.38	2.23	D	16557	17530	17371

On all sizes a = 8 inches.

STANDARD SPECIAL CASTINGS FOR WATER
Standard SleevesFor dimensions a and b see Table No. 1
Table No. 18

Nom'l Diam., Inches	Class	D	H	T	Approx. Weight, Pounds	Nom'l Diam., Inches	Class	D	H	T	Approx. Weight, Pounds
4	D	5.80	10	.65	47	36	B	39.40	15	1.40	943
4	D	5.80	15	.65	61	36	C	39.80	15	1.60	1077
6	D	7.90	10	.70	68	36	A	40.20	15	1.80	1217
6	D	7.90	15	.70	87	36	B	39.00	24	1.25	1202
8	D	10.10	12	.75	104	36	C	39.40	24	1.40	1362
8	D	10.10	15	.75	119	36	A	39.80	24	1.60	1563
10	D	12.20	12	.80	123	36	C	40.20	24	1.80	1772
10	D	12.20	15	.80	176	42	A	45.30	15	1.40	1097
12	D	14.30	14	.85	174	42	B	45.60	15	1.50	1184
12	D	14.30	18	.85	223	42	C	46.20	15	1.75	1381
14	B	16.20	15	.85	220	42	D	46.70	15	1.95	1561
14	D	16.20	18	.85	249	42	A	45.30	24	1.40	1577
14	D	16.50	15	.90	240	42	B	45.60	24	1.50	1702
14	D	16.50	18	.90	280	42	C	46.20	24	1.75	1997
16	B	18.50	15	.90	274	42	D	46.70	24	1.95	2262
16	D	18.50	24	.90	391	48	A	51.60	15	1.50	1337
16	D	18.90	15	1.00	305	48	B	51.90	15	1.65	1481
16	D	18.90	24	1.00	443	48	C	52.50	15	1.95	1752
18	B	20.60	15	.95	321	48	D	53.10	15	2.20	1986
18	B	20.60	24	.95	462	48	A	51.60	24	1.50	1922
18	D	21.00	15	1.05	369	48	B	51.90	24	1.65	2129
18	D	21.00	24	1.05	518	48	C	52.50	24	1.95	2532
20	B	22.70	15	1.00	374	48	D	53.10	24	2.20	2879
20	D	22.70	24	1.00	532	54	A	57.70	15	1.60	1912
20	D	23.10	15	1.15	440	54	B	58.20	15	1.80	1835
20	D	23.10	24	1.15	625	54	C	58.90	15	2.15	2158
24	B	26.90	15	1.05	477	54	D	59.50	16	2.45	2450
24	D	26.90	24	1.05	680	54	A	57.70	24	1.60	2316
24	D	27.40	15	1.25	583	54	B	58.20	24	1.80	2634
24	D	27.40	24	1.25	821	54	C	58.90	24	2.15	3126
30	A	32.80	15	1.15	648	54	D	59.50	24	2.45	3571
30	B	33.10	15	1.15	652	60	A	63.90	15	1.70	1906
30	C	33.50	15	1.32	780	60	B	64.50	15	1.90	2127
30	D	33.80	15	1.50	876	60	C	65.30	15	2.25	2491
30	A	33.80	24	1.15	943	60	D	65.90	15	2.60	2895
30	B	33.10	24	1.15	949	60	A	63.90	24	1.70	2731
30	C	33.50	24	1.32	1088	60	B	64.50	24	1.90	3068
30	D	33.80	24	1.50	1262	60	C	65.30	24	2.25	3601
36	A	39.00	15	1.25	833	60	D	65.90	24	2.60	4231

STANDARD SPECIAL CASTINGS FOR WATER
Standard Caps. Table No. 19



Bosses A and B cast on only when so ordered

Nominal Diam. Inches	Class	d	o	I	t	m	k	r	Approx. Weight Pounds
4	D	4.00	5.70	.....	.60	.....	.....	.....	26
6	D	4.00	7.80	.....	.65	.....	.....	.....	40
8	D	4.00	10.00	.....	.75	.....	.....	.....	59
10	D	4.00	12.10	.....	.75	1.50	.75	16.30	81
12	D	4.00	14.20	.....	.75	1.75	.75	18.70	104
14	B	4.00	16.10	.....	.90	1.90	.75	22.40	140
16	B	4.00	18.45	.....	1.00	1.90	.75	22.40	149
18	B	4.00	18.40	.....	1.00	2.00	.75	27.00	183
18	B	4.00	18.80	.....	1.00	2.00	.75	27.00	198
20	B	4.00	20.82	.....	1.00	2.00	1.00	32.00	226
20	B	4.00	21.00	.....	1.00	2.00	1.00	32.90	242
22	B	4.00	22.06	.....	1.00	3.00	1.00	18.20	308
22	B	4.00	23.96	.....	1.05	3.50	1.00	23.50	392
24	B	4.00	27.32	2.50	1.05	3.50	1.15	34.50	442
26	B	4.60	32.74	2.62	1.15	3.50	1.15	34.50	589
30	B	4.60	33.40	2.62	1.15	3.50	1.15	34.50	647
30	B	4.60	33.95	2.62	1.15	3.50	1.15	34.50	647
30	C	4.60	38.94	2.02	1.25	3.60	1.15	34.50	704
36	C	4.60	38.95	2.12	1.25	4.00	1.25	44.00	849
36	C	4.60	39.70	2.12	1.30	3.95	1.25	44.00	918
36	C	4.60	39.70	2.12	1.35	3.85	1.25	44.00	968
36	C	4.60	40.16	3.37	1.40	4.00	1.40	63.50	1084
42	C	5.00	45.20	3.37	1.60	3.90	1.40	63.50	1300
42	C	5.00	46.10	3.37	1.60	3.90	1.40	63.50	1388
42	C	5.00	46.10	3.37	1.70	3.70	1.40	63.50	1530
48	C	5.00	51.80	3.62	1.70	4.00	1.60	76.60	1679
48	C	5.00	51.80	3.62	2.00	3.70	1.60	76.60	1772
48	C	5.00	52.40	3.62	2.10	3.60	1.60	76.60	1944
48	C	5.00	52.98	3.62	2.10	3.60	1.60	76.60	2143
54	C	5.50	57.65	3.87	2.00	4.50	1.60	89.00	2341
54	C	5.50	58.10	3.87	2.00	4.40	1.60	89.00	2529
54	C	5.50	59.40	3.87	2.10	4.30	1.60	89.00	2710
54	C	5.50	59.40	3.87	2.20	4.20	1.60	89.00	3003
60	C	5.60	63.40	4.12	2.00	4.60	1.60	99.00	2868
60	C	5.60	64.90	4.12	2.10	4.40	1.60	99.00	3082
60	C	5.60	65.20	4.12	2.20	4.30	1.60	99.00	3388
60	C	5.60	65.20	4.12	2.30	4.20	1.60	99.00	3687

[illegible]