

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A.W.W.A. Specifications for Cast Iron Pipe (1908) contained herein have been superseded by Specification for Cast Iron Pipe (ASA—A21.2.1939).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	1	1908	2	1908	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

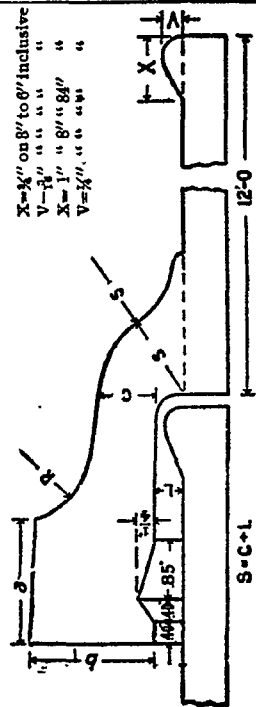
SECTION 19. All the pipes and other castings must be delivered in all respects sound and conformable to these specifications. The inspection shall not relieve the contractor of any of his obligations in this respect, and any defective pipes or other castings which may have passed the engineer at the 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 Diam. 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	6.00	6.90	7.00	4.00	4.50	1.5	1.50	.70
8	A, B, C, D	8.00	9.00	9.10	4.00	4.50	1.5	1.50	.70
10	A, B, C, D	10.00	11.00	11.10	4.00	4.50	1.5	1.50	.70
12	A, B, C, D	12.00	13.00	13.10	4.00	4.50	1.5	1.50	.70
14	A, B, C, D	14.00	15.00	15.10	4.00	4.50	1.5	1.50	.70
16	A, B, C, D	16.00	17.00	17.10	4.00	4.50	1.5	1.50	.70
18	A, B, C, D	18.00	19.00	19.10	4.00	4.50	1.5	1.50	.70
20	A, B, C, D	20.00	21.00	21.10	4.00	4.50	1.5	1.50	.70
24	A, B, C, D	24.00	25.00	25.10	4.00	4.50	1.5	1.50	.70
30	A, B, C, D	30.00	31.00	31.10	4.00	4.50	1.5	1.50	.70
36	A, B, C, D	36.00	37.00	37.10	4.00	4.50	1.5	1.50	.70
42	A, B, C, D	42.00	43.00	43.10	4.00	4.50	1.5	1.50	.70
48	A, B, C, D	48.00	49.00	49.10	4.00	4.50	1.5	1.50	.70
54	A, B, C, D	54.00	55.00	55.10	4.00	4.50	1.5	1.50	.70
60	A, B, C, D	60.00	61.00	61.10	4.00	4.50	1.5	1.50	.70
66	A, B, C, D	66.00	67.00	67.10	4.00	4.50	1.5	1.50	.70
72	A, B, C, D	72.00	73.00	73.10	4.00	4.50	1.5	1.50	.70
78	A, B, C, D	78.00	79.00	79.10	4.00	4.50	1.5	1.50	.70
84	A, B, C, D	84.00	85.00	85.10	4.00	4.50	1.5	1.50	.70

STANDARD THICKNESS AND WEIGHTS OF CAST IRON PIPE
Classes A, B, C, D

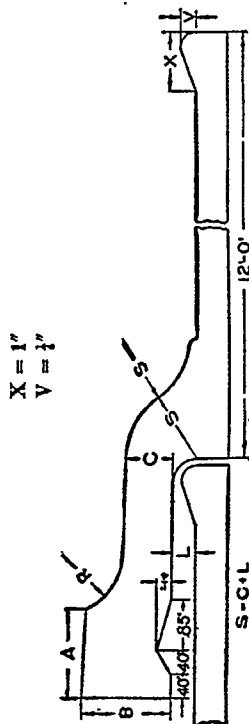
Nominal Diameter Inside	Thick-ness	Weight per Foot	CLASS A 100-Pound Head		CLASS B 50-Pound Head		CLASS C 25-Pound Head		CLASS D 10-Pound Head	
			Thick-ness	Weight per Foot	Thick-ness	Weight per Foot	Thick-ness	Weight per Foot	Thick-ness	Weight per Foot
4	.45	4.5	.45	4.5	.45	4.5	.45	4.5	.45	4.5
6	.50	8.0	.50	8.0	.50	8.0	.50	8.0	.50	8.0
8	.55	12.0	.55	12.0	.55	12.0	.55	12.0	.55	12.0
10	.60	16.0	.60	16.0	.60	16.0	.60	16.0	.60	16.0
12	.65	20.0	.65	20.0	.65	20.0	.65	20.0	.65	20.0
14	.70	24.0	.70	24.0	.70	24.0	.70	24.0	.70	24.0
16	.75	28.0	.75	28.0	.75	28.0	.75	28.0	.75	28.0
18	.80	32.0	.80	32.0	.80	32.0	.80	32.0	.80	32.0
20	.85	36.0	.85	36.0	.85	36.0	.85	36.0	.85	36.0
24	.90	44.0	.90	44.0	.90	44.0	.90	44.0	.90	44.0
30	.95	56.0	.95	56.0	.95	56.0	.95	56.0	.95	56.0
36	1.00	68.0	1.00	68.0	1.00	68.0	1.00	68.0	1.00	68.0
42	1.05	80.0	1.05	80.0	1.05	80.0	1.05	80.0	1.05	80.0
48	1.10	92.0	1.10	92.0	1.10	92.0	1.10	92.0	1.10	92.0
54	1.15	104.0	1.15	104.0	1.15	104.0	1.15	104.0	1.15	104.0
60	1.20	116.0	1.20	116.0	1.20	116.0	1.20	116.0	1.20	116.0
66	1.25	128.0	1.25	128.0	1.25	128.0	1.25	128.0	1.25	128.0
72	1.30	140.0	1.30	140.0	1.30	140.0	1.30	140.0	1.30	140.0
78	1.35	152.0	1.35	152.0	1.35	152.0	1.35	152.0	1.35	152.0
84	1.40	164.0	1.40	164.0	1.40	164.0	1.40	164.0	1.40	164.0

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. Sockets		Depth Sockets	A	B	C	R	Nominal Diam. Inches
			Pipe and Specials	Pipe and Specials						
6	E-F	7.22	8.02	4.00	1.50	1.75	.75	1.10	6	
6	G-H	7.38	8.18	4.00	1.50	1.85	.85	1.10	6	
8	E-F	9.42	10.22	4.00	1.50	1.85	.85	1.10	8	
8	G-H	9.60	10.40	4.00	1.50	1.95	.85	1.10	8	
10	E-F	11.60	12.40	4.50	1.75	1.95	.95	1.10	10	
10	G-H	11.84	12.64	4.50	1.75	2.05	1.05	1.10	10	
12	E-F	13.78	14.58	4.50	1.75	2.05	1.05	1.10	12	
12	G-H	14.08	14.88	4.50	1.75	2.20	1.20	1.10	12	
14	E-F	15.98	16.78	4.50	2.00	2.15	1.15	1.10	14	
14	G-H	16.32	17.12	4.50	2.00	2.35	1.35	1.10	14	
16	E-F	18.16	18.96	4.50	2.00	2.30	1.25	1.15	16	
16	G-H	18.54	19.34	4.50	2.00	2.55	1.45	1.15	16	
18	E-F	20.34	21.14	4.50	2.25	2.45	1.40	1.15	18	
18	G-H	20.78	21.58	4.50	2.25	2.75	1.65	1.15	18	
20	E-F	22.54	23.34	4.50	2.25	2.55	1.50	1.15	20	
20	G-H	23.02	23.82	4.50	2.25	2.85	1.75	1.20	20	
24	E-F	26.90	27.90	5.00	2.25	2.85	1.70	1.20	24	
30	E	33.10	34.10	5.00	2.25	3.25	1.80	1.50	30	
30	F	33.46	34.46	5.00	2.25	3.50	2.00	1.55	30	
36	E	39.60	40.60	5.00	2.25	3.70	2.05	1.70	36	
36	F	40.04	41.04	5.00	2.25	4.00	2.30	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		CLASS E 500-Feet Head 217 Pounds Pressure		CLASS F 600-Feet Head 260 Pounds Pressure		CLASS G 700-Feet Head 304 Pounds Pressure		CLASS H 800-Feet Head 347 Pounds Pressure				
Nominal Diameter Inches	Thick-ness Inches	Weight per Length		Thick-ness Inches	Weight per Length		Thick-ness Inches	Weight per Length		Thick-ness Inches	Weight per Length	
		Foot	Length		Foot	Length		Foot	Length		Foot	Length
6	.58	41.7	500	.61	43.3	.65	47.1	.69	49.6	.....	.....	.....
8	.66	49.8	600	.71	52.1	.75	55.9	.80	60.0	.....	.....	.....
10	.74	58.3	700	.80	62.1	.85	66.1	.90	70.0	.....	.....	.....
12	.82	67.2	800	.89	72.1	.94	76.1	.99	79.0	.....	.....	.....
14	.90	76.7	900	.99	82.1	1.07	86.1	1.16	89.0	.....	.....	.....
16	.98	86.7	1000	1.08	92.1	1.18	96.1	1.27	99.0	.....	.....	.....
18	1.07	97.2	1100	1.17	102.1	1.28	106.1	1.37	109.0	.....	.....	.....
20	1.15	108.2	1200	1.27	112.1	1.39	116.1	1.48	119.0	.....	.....	.....
24	1.31	131.7	1400	1.45	136.1	1.58	140.1	1.72	144.0	.....	.....	.....
30	1.55	161.7	1700	1.73	166.1	1.88	170.1	2.02	174.0	.....	.....	.....
36	1.80	191.7	1800	2.02	196.1	2.19	200.1	2.33	207.0	.....	.....	.....

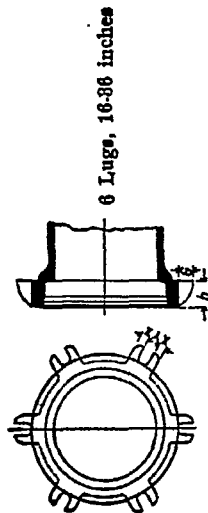
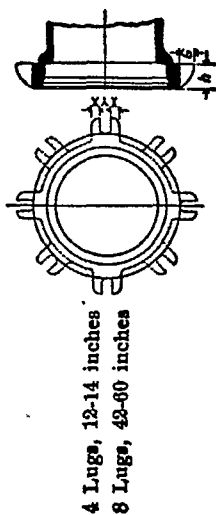
The above weights are per length to lay 12 feet, including standard sockets; proportionate allowance to be made for any variation.

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



Nominal Diameter of Outlet, inches	Number of Pairs of Lugs	Approximate Weight of Lugs on One Bell, Pounds	Nominal Diameter of Outlet, inches	Number of Pairs of Lugs	Approximate Weight of Lugs 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

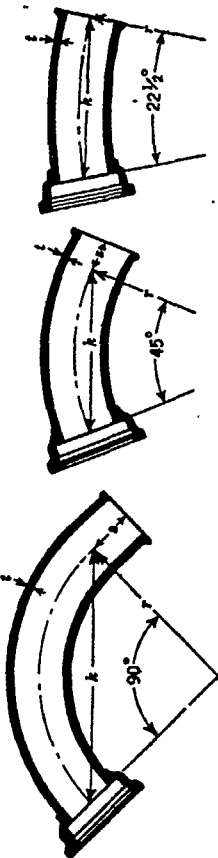


TABLE NO. 6

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	16.22	.60	66	4	D	.52	24.18	.40	66	48.18	70	48.18	70	66	66	66
6	D	.55	16.22	.60	130	6	D	.55	16.22	.60	105	6	D	.55	24.18	.40	105	48.18	70	48.18	70	105	105	105
8	D	.60	16.22	.60	200	8	D	.60	16.22	.60	150	8	D	.60	24.18	.40	150	48.18	70	48.18	70	150	150	150
10	D	.68	16.22	.60	278	10	D	.68	16.22	.60	202	10	D	.68	24.18	.40	202	48.18	70	48.18	70	202	202	202
12	D	.75	16.22	.60	366	12	D	.75	16.22	.60	265	12	D	.75	24.18	.40	265	48.18	70	48.18	70	265	265	265
14	D	.82	16.22	.60	406	14	D	.82	16.22	.60	358	14	D	.82	36.27	.60	358	72.28	10	72.28	10	312	312	312
16	D	.89	16.22	.60	504	16	D	.89	16.22	.60	442	16	D	.89	36.27	.60	442	72.28	10	72.28	10	362	362	362
18	D	.96	18.25	.50	594	18	D	.96	18.25	.50	558	18	D	.96	36.27	.60	558	72.28	10	72.28	10	404	404	404
20	D	.70	24.34	.00	750	20	B	.80	48.36	.70	663	20	B	.96	36.27	.60	663	72.28	10	72.28	10	574	574	574
24	D	.89	24.34	.00	710	24	D	1.03	48.36	.70	964	24	D	1.03	48.36	.70	964	96.37	50	96.37	50	858	858	858
18	D	.75	24.34	.00	888	18	D	.96	36.45	.90	1181	18	D	1.16	60.45	.90	1181	120.46	80	120.46	80	1372	1372	1372
20	D	.80	24.34	.00	840	20	D	.88	60.45	.90	1475	20	D	1.16	60.45	.90	1475	120.46	80	120.46	80	1342	1342	1342
24	D	.96	24.34	.00	1070	24	D	1.03	60.45	.90	1684	24	D	1.20	60.45	.90	1684	120.46	80	120.46	80	1800	1800	1800
20	D	1.03	24.34	.00	1290	20	D	1.37	60.45	.90	2291	20	D	1.37	60.45	.90	2291	120.46	80	120.46	80	2080	2080	2080
24	D	.89	30.42	.40	1290	24	D	.99	90.08	.90	2916	24	D	.99	90.08	.90	2916	180.70	20	180.70	20	2472	2472	2472
24	D	1.16	30.42	.40	1656	24	D	1.15	90.08	.90	3430	24	D	1.35	90.08	.90	3430	180.70	20	180.70	20	3410	3410	3410
30	A	.88	36.50	.90	1814	30	A	1.36	90.08	.90	4012	30	A	1.54	90.08	.90	4012	180.70	20	180.70	20	4300	4300	4300
30	B	1.03	36.50	.90	2082	30	B	1.10	90.08	.90	3286	30	B	1.28	90.08	.90	3286	180.70	20	180.70	20	3778	3778	3778
30	D	1.20	36.50	.90	2454	30	D	1.42	90.08	.90	3778	30	D	1.54	90.08	.90	3778	180.70	20	180.70	20	4000	4000	4000
30	D	1.37	36.50	.90	2836	30	D	1.78	90.08	.90	5360	30	D	1.78	90.08	.90	5360	180.70	20	180.70	20	5300	5300	5300
36	A	.99	48.07	.90	2964	36	A	1.42	90.08	.90	4820	36	A	1.42	90.08	.90	4820	180.70	20	180.70	20	4820	4820	4820
36	B	1.15	48.07	.90	3500	36	B	1.71	90.08	.90	5786	36	B	1.71	90.08	.90	5786	180.70	20	180.70	20	5786	5786	5786
36	D	1.36	48.07	.90	4120	36	D	1.96	90.08	.90	6750	36	D	1.96	90.08	.90	6750	180.70	20	180.70	20	6750	6750	6750
36	D	1.58	48.07	.90	4820	36	D	2.23	90.08	.90	7330	36	D	2.23	90.08	.90	7330	180.70	20	180.70	20	7330	7330	7330
						60	B	1.67	90.08	.90	5990	60	B	1.67	90.08	.90	5990	180.70	20	180.70	20	5990	5990	5990
						60	D	2.38	90.08	.90	7130	60	D	2.38	90.08	.90	7130	180.70	20	180.70	20	7130	7130	7130
						60	D	2.38	90.08	.90	8590	60	D	2.38	90.08	.90	8590	180.70	20	180.70	20	8590	8590	8590
						60	D	2.38	90.08	.90	10240	60	D	2.38	90.08	.90	10240	180.70	20	180.70	20	10240	10240	10240

STANDARD SPECIAL CASTINGS FOR WATER

Standard Curves, Bell and Spigot—Standard Offsets

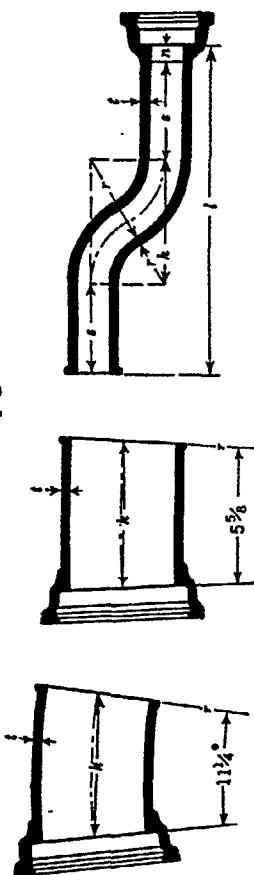


TABLE No. 8

Standard Curves				Bell and Spigot				Standard Offsets			
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	91
6	D	.55	120	23	52	6	D	14	46.25	183	183
8	D	.60	120	23	52	8	D	15	48.00	280	280
10	D	.68	120	23	52	10	D	16	49.70	390	390
12	D	.75	120	23	52	12	D	17	51.45	530	530
14	B	.60	180	35	28	14	B	18	53.70	555	555
16	B	.82	180	35	28	16	B	19	55.40	708	708
18	B	.89	180	35	28	18	B	20	57.10	808	808
20	B	.96	180	35	28	20	B	21	58.80	910	910
22	B	1.03	240	47	05	22	B	22	60.50	1028	1028
24	B	1.16	240	47	05	24	B	23	62.20	1150	1150
26	B	1.28	240	47	05	26	B	24	63.90	1278	1278
28	B	1.35	240	47	05	28	B	25	65.60	1410	1410
30	B	1.42	240	47	05	30	B	26	67.30	1548	1548
32	B	1.49	240	47	05	32	B	27	69.00	1690	1690
34	B	1.56	240	47	05	34	B	28	70.70	1838	1838
36	B	1.63	240	47	05	36	B	29	72.40	1990	1990
38	B	1.70	240	47	05	38	B	30	74.10	2148	2148
40	B	1.77	240	47	05	40	B	31	75.80	2310	2310
42	B	1.84	240	47	05	42	B	32	77.50	2478	2478
44	B	1.91	240	47	05	44	B	33	79.20	2650	2650
46	B	1.98	240	47	05	46	B	34	80.90	2828	2828
48	B	2.05	240	47	05	48	B	35	82.60	3010	3010
50	B	2.12	240	47	05	50	B	36	84.30	3198	3198
52	B	2.19	240	47	05	52	B	37	86.00	3390	3390
54	B	2.26	240	47	05	54	B	38	87.70	3588	3588
56	B	2.33	240	47	05	56	B	39	89.40	3790	3790
58	B	2.40	240	47	05	58	B	40	91.10	3998	3998
60	B	2.47	240	47	05	60	B	41	92.80	4210	4210
62	B	2.54	240	47	05	62	B	42	94.50	4428	4428
64	B	2.61	240	47	05	64	B	43	96.20	4650	4650
66	B	2.68	240	47	05	66	B	44	97.90	4878	4878
68	B	2.75	240	47	05	68	B	45	99.60	5110	5110
70	B	2.82	240	47	05	70	B	46	101.30	5348	5348
72	B	2.89	240	47	05	72	B	47	103.00	5590	5590
74	B	2.96	240	47	05	74	B	48	104.70	5838	5838
76	B	3.03	240	47	05	76	B	49	106.40	6090	6090
78	B	3.10	240	47	05	78	B	50	108.10	6348	6348
80	B	3.17	240	47	05	80	B	51	109.80	6610	6610

STANDARD SPECIAL CASTINGS FOR WATER

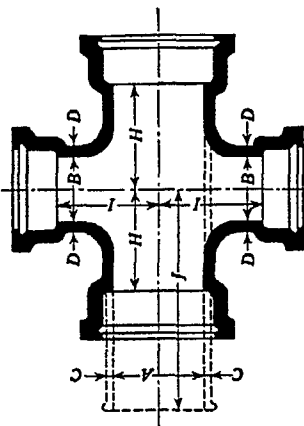


Table No. 10 Standard Branches

Nominal Diam., Inches		Class		Dimensions, Inches				Approximate Weights, Pounds			
A	B			H	J	I		2 Bells	3 Bells	4 Bells	
4	3	D	D	11	23	11		121	120	153	153
6	4	D	D	12	24	12		125	128	166	166
8	4	D	D	12	24	12		173	170	207	204
10	6	D	D	12	24	12		185	183	223	221
12	6	D	D	12	24	12		203	200	259	257
14	6	D	D	12	24	12		262	255	301	294
16	6	D	D	13	25	13		278	270	333	325
18	6	D	D	13	25	13		301	294	378	372
20	8	D	D	14	26	14		356	338	395	377
22	8	D	D	14	26	14		371	352	424	406
24	8	D	D	14	26	14		389	371	401	443
26	8	D	D	14	26	14		414	395	511	483
28	8	D	D	15	27	15		473	445	514	486
30	8	D	D	15	27	15		486	468	540	512
32	8	D	D	15	27	15		502	474	573	545
34	8	D	D	15	27	15		519	491	605	577
36	8	D	D	15	27	15		540	512	651	623
38	8	D	D	16	28	16		485	480	535	530
40	8	D	D	16	28	16		614	588	661	641
42	8	D	D	16	28	16		500	495	580	555
44	8	D	D	16	28	16		634	608	730	700
46	8	D	D	16	28	16		515	510	600	595
48	8	D	D	16	28	16		662	636	787	761
50	8	D	D	16	28	16		535	525	635	625
52	8	D	D	16	28	16		679	663	822	796
54	8	D	D	16	28	16		560	550	680	670
56	8	D	D	16	28	16		698	672	860	834
58	8	D	D	16	28	16		575	569	723	715
60	8	D	D	16	28	16		750	724	963	938
62	8	D	D	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	788	760	864	841
16	6	B	17	29	17	690	685	695	690
16	8	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	705	760	840	885
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	925
18	12	D	18	30	18	1075	1049	1264	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	989
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	1288	1268	1479	1479
20	14	B	19	31	19	980	970	1110	1100
20	14	D	19	31	19	1342	1318	1588	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	1214	1207

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	1482	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	1458	1438
24	8	D	21	33	21	1007	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	1708
24	18	D	21	33	21	1885	1852	2288	2205
24	20	B	21	33	21	1474	1454	1756	1786
24	20	D	21	33	21	2025	1991	2518	2484
24	24	B	21	33	21	1523	1508	1854	1884
24	24	D	21	33	21	2146	2118	2727	2694
30	6	A	18	25	24	1272	1300	1407	1484
30	6	B	18	25	24	1483	1417	1850	1833
30	6	C	18	25	24	1693	1678	1870	1850
30	6	D	18	25	24	1920	1920	2118	2089
30	8	A	14	26	24	1818	1846	1458	1481
30	8	B	14	26	24	1482	1468	1624	1609
30	8	C	14	26	24	1765	1745	1953	1934
30	8	D	14	26	24	2004	1990	2183	2168
30	10	A	15	27	24	1860	1898	1512	1540
30	10	B	15	27	24	1588	1821	1688	1668
30	10	C	15	27	24	1857	1887	2076	2056
30	10	D	15	27	24	2108	2094	2819	2808
30	12	A	15	27	24	1895	1420	1555	1580
30	12	B	15	27	24	1555	1540	1715	1700
30	12	C	15	27	24	1911	1891	2184	2164
30	12	D	15	27	24	2154	2140	2411	2398
30	14	A	18	30	26	1547	1575	1787	1764
30	14	B	18	30	26	1805	1780	2085	2069
30	14	C	18	30	26	2159	2140	2487	2477
30	14	D	18	30	26	2567	2558	3026	3018
30	16	A	19	31	26	1648	1675	1805	1832
30	16	B	19	31	26	1899	1888	2200	2184
30	16	C	19	31	26	2272	2258	2642	2642
30	16	D	19	31	26	2692	2678	3206	3192
30	18	A	20	34	28	1757	1741	2024	2007
30	18	B	20	34	28	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	3-Way Branches		4-Way Branches	
A	B					2 Bells	3 Bells	3 Bells	3 Bells	4 Bells
86	24	D	28	38	29	4511	4866	5807	5161	
86	30	A	26	43	29	2880	2708	3242	3120	
86	30	B	26	48	29	3594	3438	4385	4179	
86	30	C	26	48	29	4248	4055	5140	4947	
86	30	D	26	43	29	5100	4918	6192	5950	
86	36	A	29	46	29	8067	2946	3539	3418	
86	36	B	29	46	29	4046	3891	4966	4800	
86	36	C	29	46	29	4788	4595	5867	5673	
86	36	D	29	46	29	5310	5167	7099	6857	
42	12	A	16	28	30	2507	2577	3407	3387	
42	12	B	16	28	30	2670	2689	3181	3170	
42	12	C	16	28	30	3478	3567	3880	3860	
42	12	D	16	28	30	3971	3989	4807	4825	
42	14	A	18	30	32	2671	2789	2943	3010	
42	14	B	18	30	32	3075	3114	3400	3440	
42	14	C	18	30	32	3747	3776	4147	4177	
42	14	D	18	30	32	4560	4609	5288	5306	
42	16	A	19	31	32	2778	2846	3060	3148	
42	16	B	19	31	32	3196	3235	3552	3592	
42	16	C	19	31	32	3891	3920	4325	4354	
42	16	D	19	31	32	4754	4772	5487	5506	
42	18	A	20	34	32	2950	2941	3208	3258	
42	18	B	20	34	32	3407	3357	3794	3744	
42	18	C	20	34	32	4393	4312	5108	5028	
42	18	D	20	34	32	5049	4939	5810	5709	
42	20	A	21	36	32	3104	3056	3450	3411	
42	20	B	21	36	32	3582	3486	4009	3913	
42	20	C	21	36	32	4615	4479	5347	5251	
42	20	D	21	36	32	5297	5123	6122	5948	
42	24	A	23	38	32	3914	3290	3724	3676	
42	24	B	23	38	32	3852	3755	4570	4274	
42	24	C	23	38	32	4905	4829	5866	5730	
42	24	D	23	38	32	5709	5535	6379	6405	
42	30	A	26	43	32	3679	3553	4140	4018	
42	30	B	26	43	32	4554	4370	5141	5230	
42	30	C	26	43	32	5049	5402	6375	6428	
42	30	D	26	43	32	6561	6258	7729	7426	
42	36	A	29	46	32	4076	3950	4705	4570	
42	36	B	29	46	32	4903	4718	5645	5559	
42	36	C	29	46	32	6150	5904	7261	7015	
42	36	D	29	46	32	7187	6884	8512	8209	
42	42	A	32	49	32	4393	4267	5109	4938	
42	42	B	32	49	32	5533	5348	6641	6456	
42	42	C	32	49	32	7001	6755	8392	8146	
42	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	
A	B						2 Bells	3 Bells	3 Bells	4 Bells
80	18	C	20	84	26	2634	2434	2353	2302	2781
80	18	D	20	84	26	2805	2805	2791	3361	3348
80	20	A	21	86	26	2157	2157	1818	2157	2118
80	20	B	21	86	26	2183	2183	2088	2584	2490
80	20	C	21	86	26	2607	2607	2535	3237	3128
80	20	D	21	86	26	3041	3041	2931	3657	3588
80	24	A	23	88	26	1979	1979	1940	2312	2274
80	24	B	23	88	26	2318	2318	2240	2712	2648
80	24	C	23	88	26	2647	2647	2736	3347	3362
80	24	D	23	88	26	3200	3200	3170	4014	3995
80	30	A	26	43	26	2212	2212	2120	2602	2520
80	30	B	26	43	26	2509	2509	2158	3106	3060
80	30	C	26	43	26	3310	3310	3137	4110	3937
80	30	D	26	43	26	3850	3850	3660	4700	4609
86	8	A	14	26	27	1751	1751	1777	1938	1968
86	8	B	14	26	27	2055	2055	2078	2268	2287
86	8	C	14	26	27	2431	2431	2438	2670	2691
86	8	D	14	26	27	2789	2789	2780	3038	3089
86	10	A	15	27	27	1810	1810	1835	1906	2021
86	10	B	15	27	27	2123	2123	2147	2345	2384
86	10	C	15	27	27	2584	2584	2540	2822	2881
86	10	D	15	27	27	2893	2893	2902	3186	3188
86	12	A	16	28	27	1884	1884	1909	2084	2109
86	12	B	16	28	27	2219	2219	2238	2458	2477
86	12	C	16	28	27	2644	2644	2656	2902	2978
86	12	D	16	28	27	3032	3032	3033	3349	3350
86	14	A	18	30	29	2039	2039	2065	2279	2304
86	14	B	18	30	29	2415	2415	2438	2709	2728
86	14	C	18	30	29	2872	2872	2883	3251	3263
86	14	D	18	30	29	3470	3470	3470	4038	4088
86	16	A	19	31	29	2135	2135	2160	2410	2436
86	16	B	19	31	29	2531	2531	2540	2853	2872
86	16	C	19	31	29	3003	3003	3014	3431	3443
86	16	D	19	31	29	3618	3618	3617	4231	4230
86	18	A	20	34	29	2279	2279	2346	2551	2548
86	18	B	20	34	29	2701	2701	2650	3078	3022
86	18	C	20	34	29	3206	3206	3133	3678	3604
86	18	D	20	34	29	3852	3852	3755	4506	4409
86	20	A	21	36	29	2409	2409	2346	2752	2689
86	20	B	21	36	29	2885	2885	2800	3336	3251
86	20	C	21	36	29	3537	3537	3426	4212	4101
86	20	D	21	36	29	4050	4050	3905	4767	4613
86	24	A	23	38	29	2451	2451	2513	2844	2907
86	24	B	23	38	29	3039	3039	3014	3354	3389
86	24	C	23	38	29	3806	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		3 Way Branches	4 Way Branches		
						2 Bells	3 Bells	4 Bells	
48	A	17	29	88		3286	3810	8658	8707
48	B	17	29	88		3752	3804	4107	4160
48	C	17	29	88		4510	4576	4940	5007
48	D	17	29	88		5564	5624	6486	6486
48	A	18	30	85		3422	3470	3762	3815
48	B	18	30	85		4178	4226	4836	4889
48	C	18	30	85		4905	5030	5712	5778
48	D	18	30	85		5754	5815	6866	6866
48	A	19	31	83		3565	3619	3947	4001
48	B	19	31	83		4046	4098	4400	4519
48	C	19	31	83		5055	5121	5755	5821
48	D	19	31	83		5907	6029	6860	6921
48	A	20	34	85		3775	3720	4100	4120
48	B	20	34	85		4287	4225	4718	4655
48	C	20	34	85		5476	5407	6028	6256
48	D	20	34	85		6328	6227	7158	7158
48	A	21	36	85		3856	3860	4278	4282
48	B	21	36	85		4500	4380	4978	4853
48	C	21	36	85		5745	5604	6352	6511
48	D	21	36	85		6607	6425	7574	7892
48	A	22	38	85		4231	4125	4706	4609
48	B	22	38	85		5028	4908	5708	5678
48	C	22	38	85		6193	6052	7273	7181
48	D	22	38	85		7064	6882	7894	7812
48	A	26	48	85		4748	4558	5361	5168
48	B	26	48	85		5685	5451	6358	6418
48	C	26	48	85		7043	6763	7885	7985
48	D	26	48	85		8051	7708	8903	8980
48	A	29	46	85		5150	4958	5859	5863
48	B	29	46	85		6323	6089	7352	7148
48	C	29	46	85		7603	7328	8915	8685
48	D	29	46	85		8680	8487	10366	9998
48	A	32	49	85		5503	5267	6266	6068
48	B	32	49	85		6831	6587	7978	7789
48	C	32	49	85		8278	7999	9760	9470
48	D	32	49	85		9644	9301	11867	11024
48	A	35	52	85		6048	5846	7048	6846
48	B	35	52	85		7359	7024	8976	8641
48	C	35	52	85		8929	8550	11006	10726
48	D	35	52	85					

STANDARD SPECIAL CASTINGS FOR WATER
Standard Y Branches, Type 1

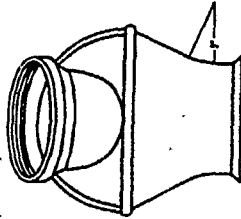
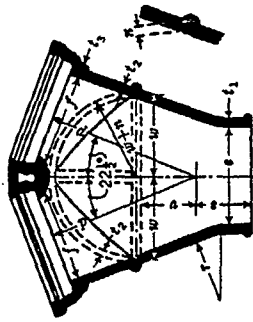


Table No. 11

Nominal Diam. Inches	Class	Dimensions, Inches				Approximate Weights, Pounds			
		H	J	I		3 Way Branches	4 Way Branches		
12	D	12	12	12		160	2160	500	687
14	D	14	14	14		180	2400	500	738
16	D	16	16	16		180	2400	500	738
18	D	18	18	18		180	2400	500	738
20	D	20	20	20		180	2400	500	738
22	D	22	22	22		180	2400	500	738
24	D	24	24	24		180	2400	500	738
26	D	26	26	26		180	2400	500	738
28	D	28	28	28		180	2400	500	738
30	D	30	30	30		180	2400	500	738
32	D	32	32	32		180	2400	500	738
34	D	34	34	34		180	2400	500	738
36	D	36	36	36		180	2400	500	738
38	D	38	38	38		180	2400	500	738
40	D	40	40	40		180	2400	500	738
42	D	42	42	42		180	2400	500	738
44	D	44	44	44		180	2400	500	738
46	D	46	46	46		180	2400	500	738
48	D	48	48	48		180	2400	500	738
50	D	50	50	50		180	2400	500	738
52	D	52	52	52		180	2400	500	738
54	D	54	54	54		180	2400	500	738
56	D	56	56	56		180	2400	500	738
58	D	58	58	58		180	2400	500	738
60	D	60	60	60		180	2400	500	738
62	D	62	62	62		180	2400	500	738
64	D	64	64	64		180	2400	500	738
66	D	66	66	66		180	2400	500	738
68	D	68	68	68		180	2400	500	738
70	D	70	70	70		180	2400	500	738
72	D	72	72	72		180	2400	500	738
74	D	74	74	74		180	2400	500	738
76	D	76	76	76		180	2400	500	738
78	D	78	78	78		180	2400	500	738
80	D	80	80	80		180	2400	500	738
82	D	82	82	82		180	2400	500	738
84	D	84	84	84		180	2400	500	738
86	D	86	86	86		180	2400	500	738
88	D	88	88	88		180	2400	500	738
90	D	90	90	90		180	2400	500	738
92	D	92	92	92		180	2400	500	738
94	D	94	94	94		180	2400	500	738
96	D	96	96	96		180	2400	500	738
98	D	98	98	98		180	2400	500	738
100	D	100	100	100		180	2400	500	738

STANDARD SPECIAL CASTINGS FOR WATER

Y Branches, Type 2

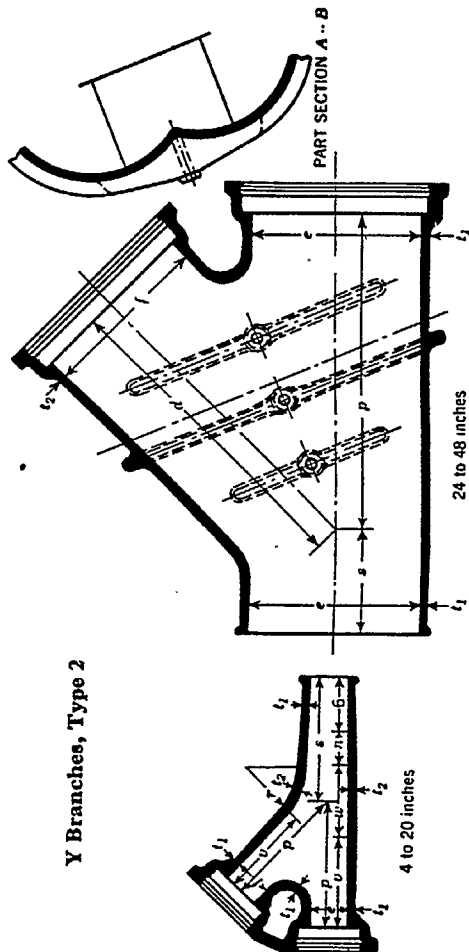


Table No. 12

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	15.54	9.92	4.54	0	.75	.93	633
14	B	18.00	24.00	18.62	10.76	4.82	0	.80	.84	690
16	B	19.00	26.00	18.62	10.76	4.82	0	.82	.84	985
18	B	20.00	28.00	18.62	10.76	4.82	0	.82	.84	985
20	B	21.00	31.00	25.20	11.60	5.70	0	.88	1.03	1413
22	B	22.00	34.00	28.00	12.00	6.00	0	.96	1.12	1398
24	B	23.00	37.00	30.75	12.50	6.50	0	1.03	1.20	1737
26	B	24.00	40.00	33.00	13.00	7.00	0	1.10	1.30	2189
28	B	25.00	43.00	35.00	13.50	7.50	0	1.16	1.33	2600
30	B	26.00	46.00	37.00	14.00	8.00	0	1.22	1.38	3087
32	B	27.00	49.00	39.00	14.50	8.50	0	1.28	1.44	3599
34	B	28.00	52.00	41.00	15.00	9.00	0	1.34	1.50	3874
36	B	29.00	55.00	43.00	15.50	9.50	0	1.40	1.56	4338
38	B	30.00	58.00	45.00	16.00	10.00	0	1.46	1.62	4825
40	B	31.00	61.00	47.00	16.50	10.50	0	1.52	1.68	5319
42	B	32.00	64.00	49.00	17.00	11.00	0	1.58	1.74	5800
44	B	33.00	67.00	51.00	17.50	11.50	0	1.64	1.80	6300
46	B	34.00	70.00	53.00	18.00	12.00	0	1.70	1.86	6800
48	B	35.00	73.00	55.00	18.50	12.50	0	1.76	1.92	7300
50	B	36.00	76.00	57.00	19.00	13.00	0	1.82	1.98	7800
52	B	37.00	79.00	59.00	19.50	13.50	0	1.88	2.04	8300
54	B	38.00	82.00	61.00	20.00	14.00	0	1.94	2.10	8800
56	B	39.00	85.00	63.00	20.50	14.50	0	2.00	2.16	9300
58	B	40.00	88.00	65.00	21.00	15.00	0	2.06	2.22	9800
60	B	41.00	91.00	67.00	21.50	15.50	0	2.12	2.28	10300
62	B	42.00	94.00	69.00	22.00	16.00	0	2.18	2.34	10800
64	B	43.00	97.00	71.00	22.50	16.50	0	2.24	2.40	11300
66	B	44.00	100.00	73.00	23.00	17.00	0	2.30	2.46	11800
68	B	45.00	103.00	75.00	23.50	17.50	0	2.36	2.52	12300
70	B	46.00	106.00	77.00	24.00	18.00	0	2.42	2.58	12800
72	B	47.00	109.00	79.00	24.50	18.50	0	2.48	2.64	13300
74	B	48.00	112.00	81.00	25.00	19.00	0	2.54	2.70	13800
76	B	49.00	115.00	83.00	25.50	19.50	0	2.60	2.76	14300
78	B	50.00	118.00	85.00	26.00	20.00	0	2.66	2.82	14800
80	B	51.00	121.00	87.00	26.50	20.50	0	2.72	2.88	15300
82	B	52.00	124.00	89.00	27.00	21.00	0	2.78	2.94	15800
84	B	53.00	127.00	91.00	27.50	21.50	0	2.84	3.00	16300
86	B	54.00	130.00	93.00	28.00	22.00	0	2.90	3.06	16800
88	B	55.00	133.00	95.00	28.50	22.50	0	2.96	3.12	17300
90	B	56.00	136.00	97.00	29.00	23.00	0	3.02	3.18	17800
92	B	57.00	139.00	99.00	29.50	23.50	0	3.08	3.24	18300
94	B	58.00	142.00	101.00	30.00	24.00	0	3.14	3.30	18800
96	B	59.00	145.00	103.00	30.50	24.50	0	3.20	3.36	19300
98	B	60.00	148.00	105.00	31.00	25.00	0	3.26	3.42	19800
100	B	61.00	151.00	107.00	31.50	25.50	0	3.32	3.48	20300

STANDARD SPECIAL CASTINGS FOR WATER

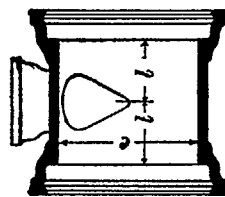
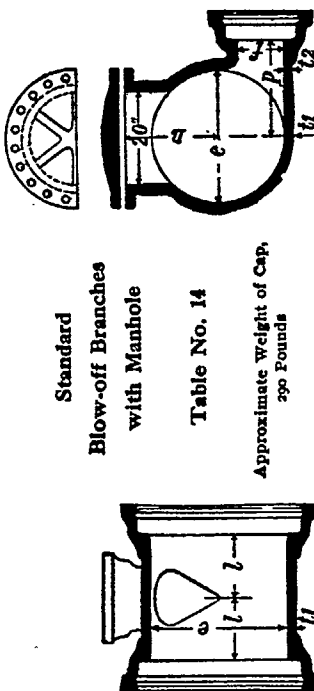
Standard
Blow-off Branches

Table No. 13

Nominal Diameter Inches	Class	l	p	Thickness Inches		Approx. Weight Pounds	Nominal Diameter Inches		l	p	Thickness Inches		Approx. Weight Pounds
				t ₁	t ₂		c	f			t ₁	t ₂	
8	D	12	7	.60	.52	227	30	12	A	13	23	.99	1702
10	D	12	8	.68	.52	286	36	12	B	13	23	1.15	1972
12	D	12	8	.68	.52	300	36	12	C	13	23	1.36	2285
14	D	12	10	.75	.52	365	42	12	D	13	23	1.58	2627
16	D	12	10	.75	.52	365	42	12	A	15	26	1.10	2483
18	D	12	11	.83	.52	400	42	12	B	15	26	1.28	2728
20	D	12	11	.83	.52	471	42	12	C	15	26	1.54	3271
22	D	12	11	.83	.52	415	42	12	D	15	26	1.78	3768
24	D	12	11	.83	.52	486	42	12	A	15	26	1.10	2489
26	D	12	12	.70	.52	497	42	12	B	15	26	1.28	2786
28	D	12	12	.89	.52	597	42	12	C	15	26	1.54	3385
30	D	12	12	.70	.52	513	42	12	D	15	26	1.78	3863
32	D	12	12	.89	.52	613	42	12	A	17	30	1.26	3274
34	D	12	13	.75	.52	586	48	12	B	17	30	1.42	3755
36	D	12	13	.96	.52	704	48	12	C	17	30	1.71	4417
38	D	12	13	.75	.52	608	48	12	D	17	30	1.96	5107
40	D	12	13	.96	.52	720	48	12	A	17	30	1.26	3337
42	D	12	14	.80	.52	687	48	12	B	17	30	1.42	3703
44	D	12	14	1.03	.52	850	48	12	C	17	30	1.71	4523
46	D	12	14	.80	.52	705	48	12	D	17	30	1.96	5214
48	D	12	14	1.03	.52	867	54	12	A	19	38	1.35	4287
50	D	12	14	.89	.52	916	54	12	B	19	38	1.55	4945
52	D	12	16	.89	.52	1149	54	12	C	19	38	1.90	5931
54	D	12	16	.89	.52	935	54	12	D	19	38	2.23	7002
56	D	12	16	1.16	.60	1170	54	12	A	19	38	1.35	4385
58	D	12	16	.88	.60	1269	54	12	B	19	38	1.55	5013
60	D	12	16	1.08	.60	1362	54	12	C	19	38	1.90	6086
62	D	12	16	1.20	.60	1616	54	12	D	19	38	2.28	7128
64	D	12	16	1.37	.60	1807	60	12	A	21	38	1.39	5263
66	D	12	16	.88	.75	1815	60	12	B	21	38	1.57	6159
68	D	12	16	1.08	.75	1426	60	12	C	21	38	2.00	7418
70	D	12	16	1.20	.75	1658	60	12	D	21	38	2.38	8783
72	D	12	16	1.37	.75	1913	60	12	A	21	38	1.39	5386
74	D	12	16	.99	.60	1658	60	12	B	21	38	1.67	6283
76	D	12	16	1.15	.60	1922	60	12	C	21	38	2.00	7542
78	D	12	16	1.36	.60	2234	60	12	D	21	38	2.38	8927
80	D	12	16	1.58	.60	2576	60	12	A	21	38	1.39	5386

STANDARD SPECIAL CASTINGS FOR WATER



Standard
Blow-off Branches
with Manhole

Table No. 14

Approximate Weight of Cap,
390 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	1758	48	B	17	20	21	1.20	1758
8	C	17	20	21	1.37	1888	48	C	17	20	21	1.37	1888
8	D	17	20	21	1.54	2018	48	D	17	20	21	1.54	2018
10	A	17	20	21	1.03	1803	48	A	17	20	21	1.03	1803
10	B	17	20	21	1.20	1933	48	B	17	20	21	1.20	1933
10	C	17	20	21	1.37	2063	48	C	17	20	21	1.37	2063
10	D	17	20	21	1.54	2193	48	D	17	20	21	1.54	2193
12	A	17	20	21	1.03	2208	48	A	17	20	21	1.03	2208
12	B	17	20	21	1.20	2338	48	B	17	20	21	1.20	2338
12	C	17	20	21	1.37	2468	48	C	17	20	21	1.37	2468
12	D	17	20	21	1.54	2598	48	D	17	20	21	1.54	2598
14	A	17	20	21	1.03	2613	48	A	17	20	21	1.03	2613
14	B	17	20	21	1.20	2743	48	B	17	20	21	1.20	2743
14	C	17	20	21	1.37	2873	48	C	17	20	21	1.37	2873
14	D	17	20	21	1.54	3003	48	D	17	20	21	1.54	3003
16	A	17	20	21	1.03	3018	48	A	17	20	21	1.03	3018
16	B	17	20	21	1.20	3148	48	B	17	20	21	1.20	3148
16	C	17	20	21	1.37	3278	48	C	17	20	21	1.37	3278
16	D	17	20	21	1.54	3408	48	D	17	20	21	1.54	3408
18	A	17	20	21	1.03	3423	48	A	17	20	21	1.03	3423
18	B	17	20	21	1.20	3553	48	B	17	20	21	1.20	3553
18	C	17	20	21	1.37	3683	48	C	17	20	21	1.37	3683
18	D	17	20	21	1.54	3813	48	D	17	20	21	1.54	3813

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	1758	48	B	17	20	21	1.20	1758
8	C	17	20	21	1.37	1888	48	C	17	20	21	1.37	1888
8	D	17	20	21	1.54	2018	48	D	17	20	21	1.54	2018
10	A	17	20	21	1.03	1803	48	A	17	20	21	1.03	1803
10	B	17	20	21	1.20	1933	48	B	17	20	21	1.20	1933
10	C	17	20	21	1.37	2063	48	C	17	20	21	1.37	2063
10	D	17	20	21	1.54	2193	48	D	17	20	21	1.54	2193
12	A	17	20	21	1.03	2208	48	A	17	20	21	1.03	2208
12	B	17	20	21	1.20	2338	48	B	17	20	21	1.20	2338
12	C	17	20	21	1.37	2468	48	C	17	20	21	1.37	2468
12	D	17	20	21	1.54	2598	48	D	17	20	21	1.54	2598
14	A	17	20	21	1.03	2613	48	A	17	20	21	1.03	2613
14	B	17	20	21	1.20	2743	48	B	17	20	21	1.20	2743
14	C	17	20	21	1.37	2873	48	C	17	20	21	1.37	2873
14	D	17	20	21	1.54	3003	48	D	17	20	21	1.54	3003
16	A	17	20	21	1.03	3018	48	A	17	20	21	1.03	3018
16	B	17	20	21	1.20	3148	48	B	17	20	21	1.20	3148
16	C	17	20	21	1.37	3278	48	C	17	20	21	1.37	3278
16	D	17	20	21	1.54	3408	48	D	17	20	21	1.54	3408
18	A	17	20	21	1.03	3423	48	A	17	20	21	1.03	3423
18	B	17	20	21	1.20	3553	48	B	17	20	21	1.20	3553
18	C	17	20	21	1.37	3683	48	C	17	20	21	1.37	3683
18	D	17	20	21	1.54	3813	48	D	17	20	21	1.54	3813

Standard Manhole Pipe

Approximate Weight of Cap, 390 Pounds

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

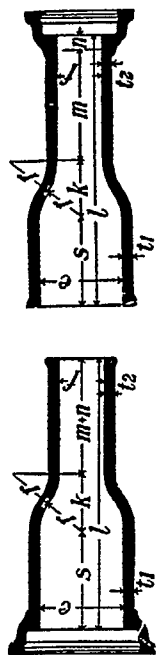
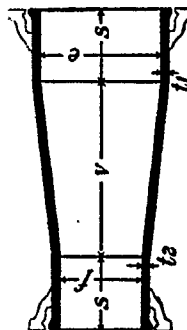
STANDARD SPECIAL CASTINGS FOR WATER
Standard Reducers and Increasers, Type No. 1

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

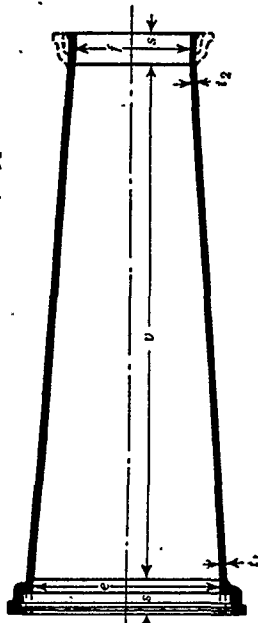
Table No. 17—Continued

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	.08	B	250	805	279
14	10	20	.06	.08	D	290	844	320
14	13	20	.06	.08	B	284	830	321
14	13	20	.06	.08	D	324	878	360
16	6	20	.06	.08	B	220	300	248
16	6	20	.06	.08	D	278	355	300
16	8	20	.06	.08	B	252	326	280
16	8	20	.06	.08	D	304	381	332
16	10	20	.06	.08	B	282	356	312
16	10	20	.06	.08	D	334	410	364
16	12	20	.06	.08	B	317	391	353
16	12	20	.06	.08	D	368	445	405
16	14	20	.06	.08	B	315	389	370
16	14	20	.06	.08	D	407	484	461
18	8	20	.06	.08	B	287	374	315
18	8	20	.06	.08	D	345	438	378
18	10	20	.06	.08	B	317	404	347
18	10	20	.06	.08	D	375	463	405
18	12	20	.06	.08	B	352	438	388
18	12	20	.06	.08	D	410	502	440
18	14	20	.06	.08	B	350	437	400
18	14	20	.06	.08	D	443	541	502
18	16	20	.06	.08	B	383	469	457
18	16	20	.06	.08	D	492	585	569
20	10	26	.08	.08	B	414	516	445
20	10	26	.08	.08	D	499	615	530
20	12	26	.08	.08	B	455	566	491
20	12	26	.08	.08	D	539	655	576
20	14	26	.08	.08	B	453	554	508
20	14	26	.08	.08	D	538	639	564
20	16	26	.08	.08	B	490	592	504
20	16	26	.08	.08	D	635	751	711
20	18	26	.08	.08	B	531	633	617
20	18	26	.08	.08	D	633	751	711
24	14	26	.08	.08	B	552	680	607
24	14	26	.08	.08	D	710	806	764
24	16	26	.08	.08	B	539	677	608
24	16	26	.08	.08	D	762	917	838
24	18	26	.08	.08	B	630	753	717
24	18	26	.08	.08	D	810	965	901
24	20	26	.08	.08	B	675	803	776
24	20	26	.08	.08	D	871	1037	987
30	18	26	.08	.08	B	710	903	796
30	18	26	.08	.08	D	903	1166	1048
30	18	26	.08	.08	C	956	1305	1140
30	18	26	.08	.08	D	1054	1305	1140
30	20	26	.08	.08	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 v

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		Thickness, Inches		Class	Weights, Pounds		
•	f	t ₁	t ₂		Spigot Ends	Large End Bell	Small End Bell
36	30	.99	.89	A	2119	2866	2812
36	30	1.15	1.08	B	2502	2788	2680
36	30	1.36	1.20	C	2950	3271	3159
36	30	1.58	1.37	D	3434	3796	3684
42	30	1.10	.80	A	1203	1602	1364
42	20	1.28	.80	B	1418	1768	1515
42	20	1.54	1.03	C	1768	2108	1868
42	20	1.78	1.03	D	1975	2445	2092
42	20	1.10	.80	A	2152	2491	2254
42	20	1.28	.80	B	2410	2764	2511
42	20	1.54	1.08	C	2889	3405	3106
42	20	1.78	1.08	D	3309	3889	3486
42	24	1.10	.89	A	1876	1715	1504
42	24	1.28	.89	B	1527	1681	1454
42	24	1.54	1.16	C	1898	2318	2058
42	24	1.78	1.16	D	2120	2580	2276
42	24	1.10	.89	A	2846	2685	2472
42	24	1.28	.89	B	2808	2688	2780
42	24	1.54	1.16	C	3287	3652	3392
42	24	1.78	1.16	D	3616	4066	3772
42	30	1.10	.88	A	1467	1806	1680
42	30	1.28	1.03	B	1711	2065	1889
42	30	1.54	1.20	C	2005	2480	2275
42	30	1.78	1.37	D	2309	2869	2650
42	30	1.10	.88	A	2500	2889	2688
42	30	1.28	1.03	B	2917	3271	3085
42	30	1.54	1.20	C	3523	3988	3782
42	30	1.78	1.37	D	4098	4503	4344
42	36	1.10	.99	A	1645	1984	1891
42	36	1.28	1.15	B	1926	2281	2207
42	36	1.54	1.36	C	2320	2785	2643
42	36	1.78	1.58	D	2714	3184	3070
42	36	1.10	.99	A	2803	3143	3050
42	36	1.28	1.15	B	3285	3689	3565
42	36	1.54	1.36	C	3958	4378	4279
42	36	1.78	1.58	D	4681	5101	4938
48	36	1.28	.88	A	2975	3381	3168
48	36	1.42	1.08	B	3426	3868	3606
48	36	1.71	1.20	C	4092	4641	4301
48	36	1.96	1.37	D	4762	5388	5018
48	36	1.28	.88	A	5363	5769	5556
48	36	1.42	1.03	B	6180	6685	6369
48	36	1.71	1.20	C	7379	7928	7588
48	36	1.96	1.37	D	8588	9214	8889
48	36	1.28	.99	A	8278	8984	8525
48	36	1.42	1.15	B	9796	10552	10177
48	36	1.71	1.36	C	11576	12576	12116

On all sizes a=8 inches.

STANDARD SPECIAL CASTINGS FOR WATER

Standard Reducers and Increasers, Type No. 2

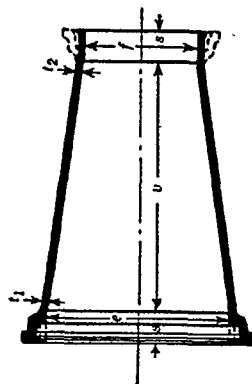
Table No. 17—Continued

Nominal Diam., Inches		Thickness, Inches		Class	Weights, Pounds		
•	f	t ₁	t ₂		Spigot Ends	Large End Bell	Small End Bell
54	36	1.96	1.58	D	5800	5925	5602
54	36	2.23	1.99	A	5909	6016	6156
54	36	2.50	2.23	B	6844	7299	7125
54	36	2.77	2.50	C	8104	8713	8485
54	36	3.04	2.77	D	9558	10184	9921
54	42	1.96	1.58	A	8639	4006	3908
54	42	2.23	1.99	B	4212	4667	4564
54	42	2.50	2.23	C	5100	5649	5516
54	42	2.77	2.50	D	5959	6585	6429
54	42	3.04	2.77	A	6897	7503	7303
54	42	3.31	3.04	B	7594	8049	7948
54	42	3.58	3.31	C	9197	9746	9612
54	42	3.85	3.58	D	10747	11378	11217
54	48	1.96	1.58	A	3722	4228	3869
54	48	2.23	1.99	B	4890	5025	4810
54	48	2.50	2.23	C	5259	5553	5380
54	48	2.77	2.50	D	6181	6605	6548
54	48	3.04	2.77	A	6710	7216	6957
54	48	3.31	3.04	B	7806	8401	8087
54	48	3.58	3.31	C	9484	10178	9805
54	48	3.85	3.58	D	11148	11962	11510
54	48	4.12	3.85	A	1403	4009	4442
54	48	4.39	4.12	B	1745	5340	5100
54	48	4.66	4.39	C	1952	6826	6247
54	48	4.93	4.66	D	2341	7655	7810
54	48	5.20	4.93	A	2398	7903	7787
54	48	5.47	5.20	B	2856	9151	8910
54	48	5.74	5.47	C	3317	11211	10932
54	48	6.01	5.74	D	3838	13152	12807
54	48	6.28	6.01	A	4578	5083	4984
54	48	6.55	6.28	B	5356	5851	5711
54	48	6.82	6.55	C	6401	7095	6950
54	48	7.09	6.82	D	7512	8226	8187
54	48	7.36	7.09	A	8253	8759	8600
54	48	7.63	7.36	B	9478	10073	9933
54	48	7.90	7.63	C	11544	12390	12093
54	48	8.17	7.90	D	13550	14804	14175
54	48	8.44	8.17	A	1609	4711	4942
54	48	8.71	8.44	B	1900	5676	5186
54	48	8.98	8.71	C	2207	6992	6189
54	48	9.25	8.98	D	2680	7884	7322
54	48	9.52	9.25	A	3244	7999	7681
54	48	9.79	9.52	B	3846	9510	9126
54	48	10.06	9.79	C	4581	11405	10902
54	48	10.33	10.06	D	5354	13527	12916
54	48	10.60	10.33	A	6177	16092	15477
54	48	10.87	10.60	B	7051	18261	17646

On all sizes a=8 inches.

STANDARD SPECIAL CASTINGS FOR WATER

Standard Reducers and Increasers, Type No. 2

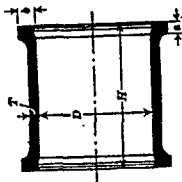


Short Increaser, 48 to 30 x 66 inches v

Table No. 17—Continued

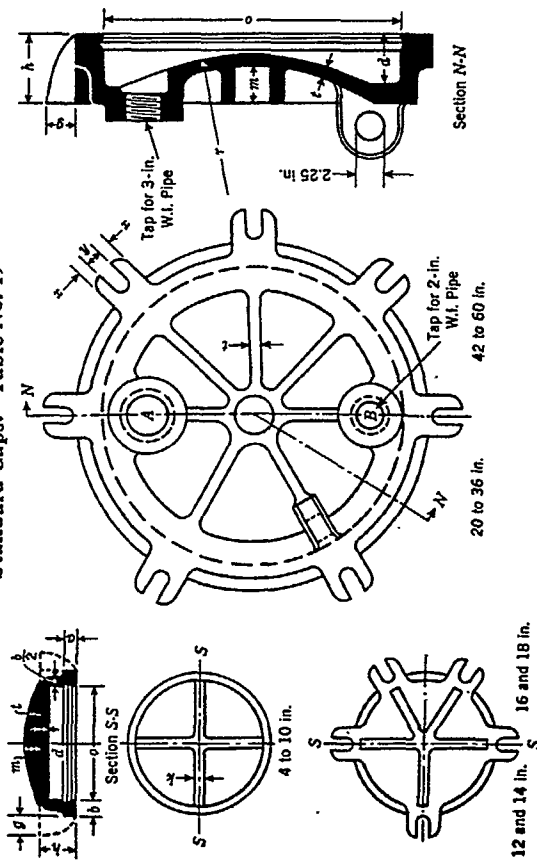
Nominal Diam., Inches		v	Thickness, Inches		Class	Weights, Pounds		
e	f		t ₁	t ₂		Spigot Ends	Large End Bell	Small End Bell
60	42	66	2.00	1.54	C	6440	7264	6855
60	42	66	2.38	1.78	D	7619	8593	8089
60	42	132	1.39	1.10	A	8072	8687	8411
60	42	132	1.67	1.28	B	9395	10265	9950
60	42	132	2.00	1.54	C	11614	12439	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	B	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	B	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	B	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	B	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	l	t	m	k	r	Approx. Weight Pounds
4	D	4.00	5.70	...	.60	...	...	...	26
6	D	4.00	7.60	...	.75	...	...	...	40
8	D	4.00	10.00	...	.90	...	...	...	59
10	D	4.00	12.50	...	1.10	...	...	...	81
12	D	4.00	15.00	...	1.30	...	...	...	104
14	D	4.00	17.50	...	1.50	...	...	...	140
16	D	4.00	20.00	...	1.75	...	...	...	189
18	D	4.00	22.50	...	2.00	...	...	...	258
20	D	4.00	25.00	...	2.25	...	...	...	350
22	D	4.00	27.50	...	2.50	...	...	...	468
24	D	4.00	30.00	...	2.75	...	...	...	615
26	D	4.00	32.50	...	3.00	...	...	...	804
28	D	4.00	35.00	...	3.25	...	...	...	1038
30	D	4.00	37.50	...	3.50	...	...	...	1318
32	D	4.00	40.00	...	3.75	...	...	...	1644
34	D	4.00	42.50	...	4.00	...	...	...	2016
36	D	4.00	45.00	...	4.25	...	...	...	2436
38	D	4.00	47.50	...	4.50	...	...	...	2904
40	D	4.00	50.00	...	4.75	...	...	...	3420
42	D	4.00	52.50	...	5.00	...	...	...	3984
44	D	4.00	55.00	...	5.25	...	...	...	4596
46	D	4.00	57.50	...	5.50	...	...	...	5256
48	D	4.00	60.00	...	5.75	...	...	...	5964
50	D	4.00	62.50	...	6.00	...	...	...	6720
52	D	4.00	65.00	...	6.25	...	...	...	7524
54	D	4.00	67.50	...	6.50	...	...	...	8376
56	D	4.00	70.00	...	6.75	...	...	...	9276
58	D	4.00	72.50	...	7.00	...	...	...	10224
60	D	4.00	75.00	...	7.25	...	...	...	11220
62	D	4.00	77.50	...	7.50	...	...	...	12264
64	D	4.00	80.00	...	7.75	...	...	...	13356
66	D	4.00	82.50	...	8.00	...	...	...	14496
68	D	4.00	85.00	...	8.25	...	...	...	15684
70	D	4.00	87.50	...	8.50	...	...	...	16920
72	D	4.00	90.00	...	8.75	...	...	...	18204
74	D	4.00	92.50	...	9.00	...	...	...	19536
76	D	4.00	95.00	...	9.25	...	...	...	20916
78	D	4.00	97.50	...	9.50	...	...	...	22344
80	D	4.00	100.00	...	9.75	...	...	...	23820
82	D	4.00	102.50	...	10.00	...	...	...	25344
84	D	4.00	105.00	...	10.25	...	...	...	26916
86	D	4.00	107.50	...	10.50	...	...	...	28536
88	D	4.00	110.00	...	10.75	...	...	...	30204
90	D	4.00	112.50	...	11.00	...	...	...	31920
92	D	4.00	115.00	...	11.25	...	...	...	33684
94	D	4.00	117.50	...	11.50	...	...	...	35496
96	D	4.00	120.00	...	11.75	...	...	...	37356
98	D	4.00	122.50	...	12.00	...	...	...	39264
100	D	4.00	125.00	...	12.25	...	...	...	41220

STANDARD SPECIAL CASTINGS FOR WATER
Standard Plugs

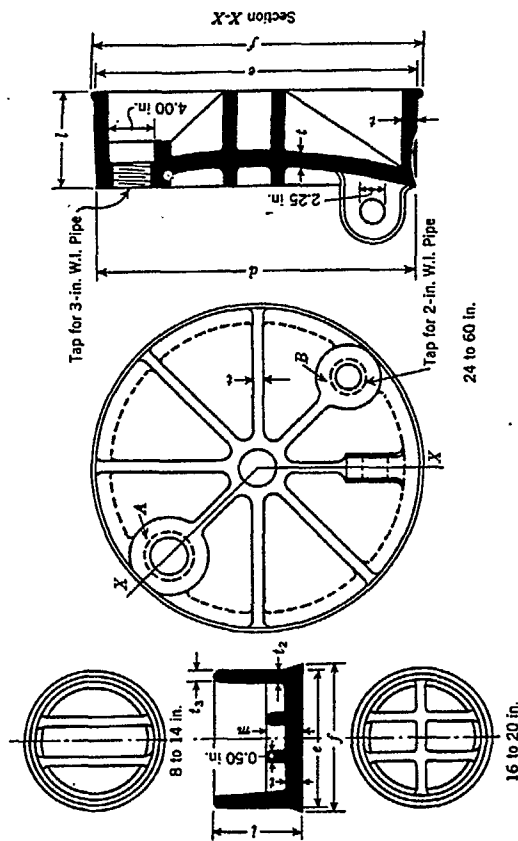


Table No. 20

Nominal Diam. Inches	Class	e	f	d	l	m	t	Thickness, Inches	Number of Ribs	Approx. Weight Pounds
4	D	4.00	5.25	...	...	...	...	...	...	8
6	D	4.00	7.25	...	...	...	...	...	...	14
8	D	4.00	9.25	...	...	...	...	...	...	24
10	D	4.00	11.25	...	...	...	...	...	...	39
12	D	4.00	13.25	...	...	...	...	...	...	59
14	D	4.00	15.25	...	...	...	...	...	...	83
16	D	4.00	17.25	...	...	...	...	...	...	111
18	D	4.00	19.25	...	...	...	...	...	...	143
20	D	4.00	21.25	...	...	...	...	...	...	179
22	D	4.00	23.25	...	...	...	...	...	...	219
24	D	4.00	25.25	...	...	...	...	...	...	263
26	D	4.00	27.25	...	...	...	...	...	...	311
28	D	4.00	29.25	...	...	...	...	...	...	363
30	D	4.00	31.25	...	...	...	...	...	...	419
32	D	4.00	33.25	...	...	...	...	...	...	479
34	D	4.00	35.25	...	...	...	...	...	...	543
36	D	4.00	37.25	...	...	...	...	...	...	611
38	D	4.00	39.25	...	...	...	...	...	...	683
40	D	4.00	41.25	...	...	...	...	...	...	759
42	D	4.00	43.25	...	...	...	...	...	...	839
44	D	4.00	45.25	...	...	...	...	...	...	923
46	D	4.00	47.25	...	...	...	...	...	...	1011
48	D	4.00	49.25	...	...	...	...	...	...	1103
50	D	4.00	51.25	...	...	...	...	...	...	1209
52	D	4.00	53.25	...	...	...	...	...	...	1319
54	D	4.00	55.25	...	...	...	...	...	...	1433
56	D	4.00	57.25	...	...	...	...	...	...	1551
58	D	4.00	59.25	...	...	...	...	...	...	1673
60	D	4.00	61.25	...	...	...	...	...	...	1800
62	D	4.00	63.25	...	...	...	...	...	...	1931
64	D	4.00	65.25	...	...	...	...	...	...	2067
66	D	4.00	67.25	...	...	...	...	...	...	2207
68	D	4.00	69.25	...	...	...	...	...	...	2351
70	D	4.00	71.25	...	...	...	...	...	...	2500
72	D	4.00	73.25	...	...	...	...	...	...	2653
74	D	4.00	75.25	...	...	...	...	...	...	2810
76	D	4.00	77.25	...	...	...	...	...	...	2971
78	D	4.00	79.25	...	...	...	...	...	...	3136
80	D	4.00	81.25	...	...	...	...	...	...	3305
82	D	4.00	83.25	...	...	...	...	...	...	3478
84	D	4.00	85.25	...	...	...	...	...	...	3655
86	D	4.00	87.25	...	...	...	...	...	...	3836
88	D	4.00	89.25	...	...	...	...	...	...	4021
90	D	4.00	91.25	...	...	...	...	...	...	4210
92	D	4.00	93.25	...	...	...	...	...	...	4403
94	D	4.00	95.25	...	...	...	...	...	...	4600
96	D	4.00	97.25	...	...	...	...	...	...	4801
98	D	4.00	99.25	...	...	...	...	...	...	5006
100	D	4.00	101.25	...	...	...	...	...	...	5215

[illegible]