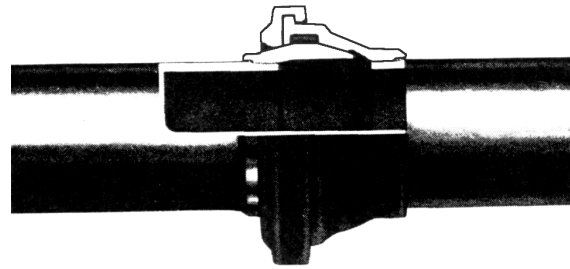


CLOW DUCTILE IRON BALL AND SOCKET PIPE

Clow Ball and Socket Pipe is a ball and socket type joint to meet the severe requirements for crossing rivers, streams and lakes, and for other uses where free turning deflection and a restrained joint are needed. The joint is boltless. Restraint is provided by a bayonet-type locking of the retainer over the bell. Joint design assures uniform load distribution between the restraining components, even when the joint is fully deflected.

Each pipe consists of a bell, ball, and retainer assembled on a centrifugally cast barrel. All pipe components are rugged, high-strength ductile iron. The barrel is cast of 60-42-10 ductile iron in accordance with American National Standard A21.51. The bell, ball, and retainer are cast of 70-50-05 ductile iron in accordance with the applicable requirements of American National Standard A21.10.

Pipe components are machined to precise tolerances to assure premium performance and ease of assembly. Each pipe is hydrostatically tested at the factory.

The gasket is made of high quality rubber and is symmetrical in shape so that it cannot be installed backwards.

Clow Ball and Socket Pipe is manufactured in 6" through 36" sizes to the dimensions and weights shown on page 18. The connecting pieces shown on page 19 can be furnished to meet the most demanding job requirements and exacting specifications. Two thickness classes are offered in the 18" through 36" sizes, one of which is buoyant and will float when filled with air.

A RUGGED EASY-TO-ASSEMBLE JOINT

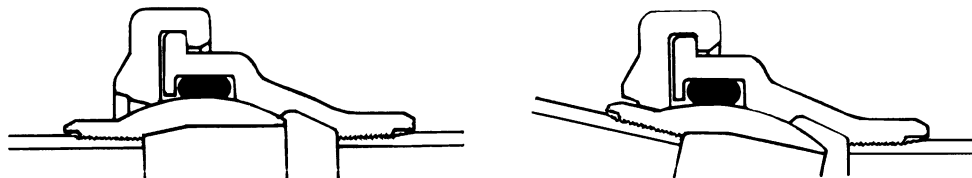
The Clow Ball and Socket Joint is a boltless, push-on type joint designed to simplify assembly and speed up installation. The gasket is inserted in the bell and compressed by the entering ball as the joint is made up.

The joint is restrained by locking the bayonet-type retainer over the lugs on the bell. To prevent rotation of the retainer after assembly, a ductile iron retainer lock is inserted between the lugs and held in place by a corrosion-resistant roll pin. The roll pin and retainer lock can easily be removed to permit disassembly of the joint.

The absence of any bolts or split parts saves confusion and nuisance during assembly. Joint construction and the symmetrical shape of the gasket assures that the joint can be assembled properly under adverse conditions, even by a diver under water.

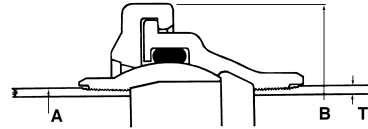
Full 18' 0" laying lengths mean fewer joints, and the speed of assembly saves time as well as dredging, diving, or other installation costs sometimes encountered in laying pipe in river bottom trenches.

Laid lengths on any given order need not all be 18' 0", but may vary to suit different conditions. In many cases, where a great amount of curvature is required in a line, it may be advisable to use 9-foot lengths to obtain the proper number of joints to provide the required curvature.

FULL 15° FREE TURNING DEFLECTION WITH NO REDUCTION IN THE WATERWAY

No restriction of the pipe waterway takes place in this joint when set to its maximum 15° deflection. It is recommended, however because of possible field conditions which may be encountered, that in laying out ball joint pipelines, the "design" deflection be limited to 12° per joint.

CLOW BALL AND SOCKET PIPE



**Ball and Socket
DIMENSIONS AND WEIGHT**

Nominal Pipe Size Inches	A21.51 Thickness Class Number	Pressure Rating psi	Dimensions in Inches			Pipe Barrel lbs./foot	Weight of Full Length Pipe* as Shipped in Pounds
			T Thickness	A Pipe O.D.	B Retainer O.D.		
6	55	350	.40	6.90	13.88	25.0	545
8	55	350	.42	9.05	16.63	34.8	770
10	55	350	.44	11.10	19.13	45.1	1005
12	55	350	.46	13.20	22.00	56.3	1270
14	56	350	.51	15.30	24.50	72.5	1655
16	56	350	.52	17.40	27.00	84.4	1990
18	56	350	.53	19.50	30.00	96.7	2375
18	58†	350	.59	19.50	30.00	107.3	2560
20	56	350	.54	21.60	32.75	109.3	2810
20	59†	350	.63	21.60	32.75	127.0	3110
24	56	350	.56	25.80	38.25	135.9	3700
24	62†	350	.74	25.80	38.25	178.3	4415
30	58†	250	.71	32.00	46.25	213.6	5855
30	61†	250	.83	32.00	46.25	248.7	6435
36	57†	250	.78	38.30	54.25	281.3	8145
36	59†	250	.88	38.30	54.25	316.6	8725

*Weight is based on 18'0" nominal laying length. Minimum laying length is 7' 0"

TABLE OF BUOYANCY FOR RIVER CROSSING PIPE

Nominal Pipe Size Inches	A21.51 Thickness Class Number	Wall Thickness in Inches	Weight of Pipe as Shipped	Weight of Full Length Pipe Under Water		Maximum Safe Tension in Pounds††
				Full of Air	Full of Water	
6	55	.40	545	240	465	50,000
8	55	.42	770	240	655	70,000
10	55	.44	1005	220	860	95,000
12	55	.46	1270	155	1080	120,000
14	56	.51	1655	160	1410	145,000
16	56	.52	1990	45	1685	165,000
18	56	.53	2375	-70	2015	195,000
18	58	.59	2560	110	2170	195,000
20	56	.54	2810	-200	2375	210,000
20	59†	.63	3110	100	2635	210,000
24	56	.56	3700	-620	3110	260,000
24	62†	.74	4415	95	3715	260,000
30	58	.71	5855	-900	4920	400,000
30	61	.83	6435	-180	5360	400,000
36	57	.78	8145	-1300	6880	400,000
36	59	.88	8725	-725	7330	400,000

† Thickness required to overcome buoyancy. †† Maximum tension that can safely be applied to a single joint when pulling pipe into position or laying it from a barge.

Weights above do not include cement lining.

STANDARD PRACTICE

While Clow Ball and Socket Pipe is regularly furnished in 18' 0" nominal laying lengths, we reserve the right to furnish a limited percentage of shorter lengths. We will always ship a footage of pipe not less than the total ordered. We also reserve the right to furnish a total footage greater than the footage ordered to allow the use of full length pipe without cutting. Any exceptions to this standard practice must be clearly specified at the time of order.

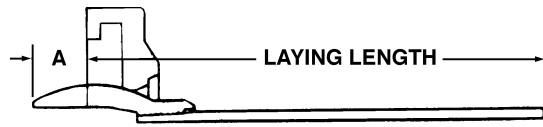
Exact Laying Lengths: If any piece of pipe or length of piping must be furnished with an exact laying length, this must be

specified. Random lengths will be used in making up exact laying lengths greater than 18 feet.

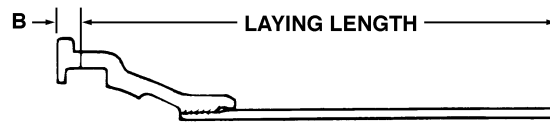
End Connections: Clow Ball and Socket Pipe can be furnished with the end connections listed on page 19. The type of end connection and length of connecting piece must be specified.

Accessories: Clow Ball and Socket Pipe is shipped with the retainer assembled on the pipe and secured to the ball end by hook bolts. Gaskets, lubricant, retainer locks and retainer lock pins are shipped in a separate container.

CLOW BALL AND SOCKET PIPE CONNECTING PIECES



Ball and Plain End



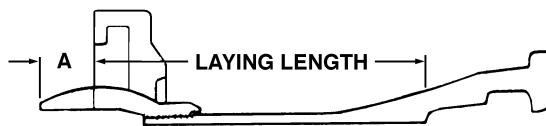
Bell and Plain End



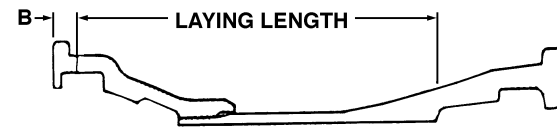
Ball and Super-Lock Plain End



Bell and Super-Lock Plain End



Ball and Super-Lock Bell



Bell and Super-Lock Bell

DIMENSIONS AND WEIGHTS

Nominal Pipe Size	Dimensions in Inches					Approximate Weight Pounds*					
	Thickness		Plain End O.D.	A	B	Ball and Plain End	Bell and Plain End	Ball and Super-Lock Plain End	Bell and Super-Lock Plain End	Ball and Super-Lock Bell	Bell and Super-Lock Bell
	A21.51 Class	Wall T									
6	55	.40	6.90	2.25	1.00	510	480	530	500	535	505
8	55	.42	9.05	2.63	1.13	720	675	755	710	760	715
10	55	.44	11.10	2.88	1.13	940	880	985	925	990	930
12	55	.46	13.20	3.25	1.13	1185	1100	1245	1160	1250	1165
14	56	.51	15.30	3.50	1.25	1545	1420	1630	1505	1620	1495
16	56	.52	17.40	3.75	1.25	1835	1680	1935	1780	1930	1770
18	56	.53	19.50	4.25	1.25	2185	1930	2330	2075	2300	2045
18	58	.59	19.50	4.25	1.25	2375	2115	2520	2260	2485	2225
20	56	.54	21.60	4.50	1.25	2585	2190	2755	2360	2715	2320
20	59	.63	21.60	4.50	1.25	2900	2495	3070	2665	3030	2625
24	56	.56	25.80	5.25	1.25	3365	2780	3655	3070	3510	2955
24	62	.74	25.80	5.25	1.25	4115	3510	4405	3800	4290	3690
30	58	.71	32.00	6.25	1.25	5350	4635	5810	4825	5520	4635
30	61	.83	32.00	6.25	1.25	5965	4965	6425	5425	6135	5135
36	57	.78	38.30	7.25	1.25	7450	5815	7635	6000	7805	6170
36	59	.88	38.30	7.25	1.25	8065	6415	8250	6600	8420	6770

* Weights shown are for 18 ft. laying lengths. Weights of shorter pieces can be determined by subtracting the appropriate barrel weight. (See page 8, 9)

Maximum laying length is 18 ft. Minimum laying length is 2' 0" for the 6 thru 12 in. sizes, 3' 0" for the 14 thru 20 in. sizes and 4' 0" for the 24 in. thru 36 in. size. (7'-0" for Ball and Super-Lock Bell.)

Pipe can be furnished Ball and MJ Bell, Bell and MJ Bell, Ball and Tyton Bell, Bell and Tyton Bell, Ball and Locked MJ Plain End, Bell and Locked MJ Plain End, Ball and Flange or Bell and Flange.

Order must specify laying length of connecting pieces.