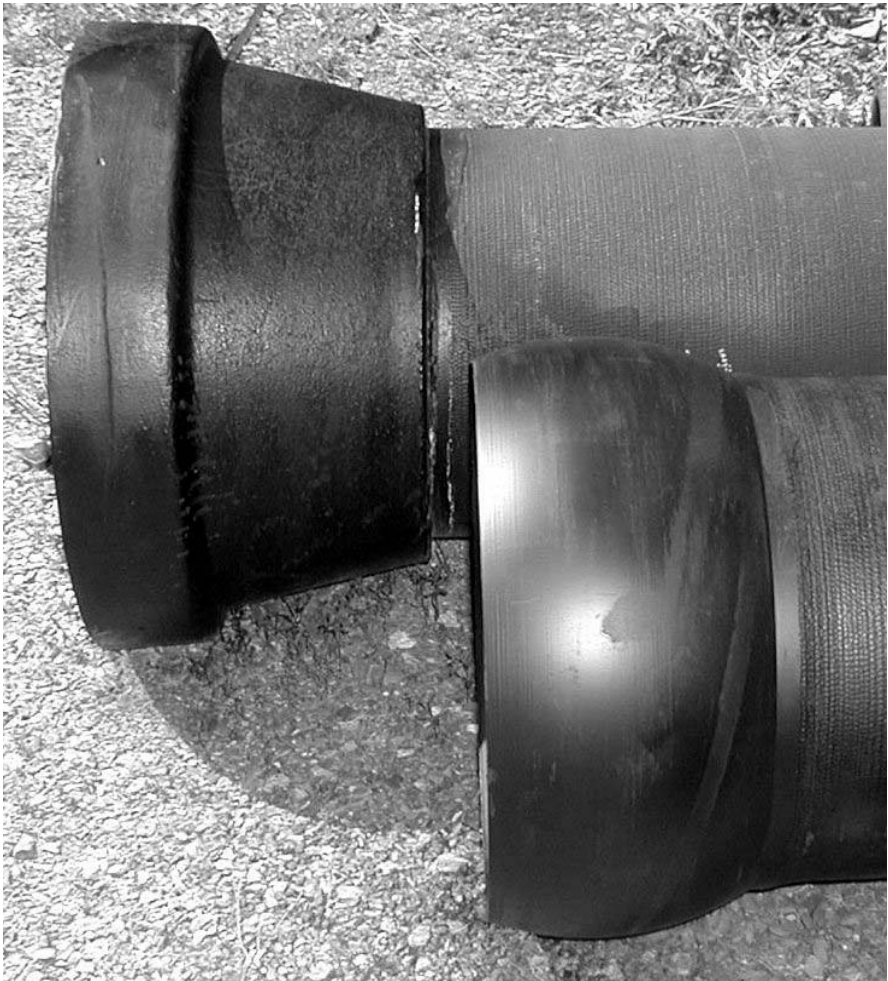




River Crossing Ductile Iron Pipe

6" through 36" Diameters

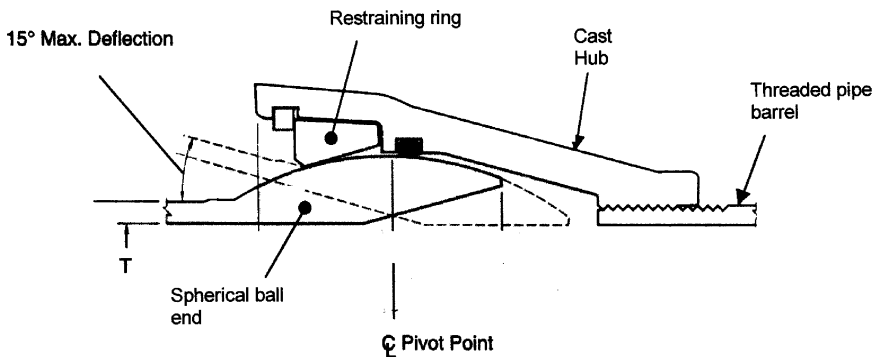
River
Crossing
Pipe





River Crossing Ductile Iron Pipe

River Crossing pipe is engineered for submerged pipeline projects and other severe service applications where deflection up to 15° are required. All major components of the river crossing joint are ductile iron. The joint is a boltless system consisting of a ball-and-socket design with joint restraint provided by a ductile iron restraining ring. The river crossing assembly is rated at 350 psi for 6"-24" and 250 psi for 30" and 36". Disassembly, if required, can be easily accomplished. (The river crossing joint shown below is representative only. Please call for actual joint configuration.)



Installation of River Crossing Pipe

The most common methods used for crossing streams, rivers, lakes, and other areas where additional deflection is needed include the following:

- pulling the pipe into position after assembly on the bank
- lowering the pipe from a barge to divers or using a chute to slide pipe into place
- diversion of water using a cofferdam (smaller bodies of water) for dry installation

When using the pulling method, proper planning is required at the jobsite. Access to the banks on either side must be available along with adequate room for assembly and equipment. Bank grade and stability must be adequate. The length of the crossing must also be considered since the pulling force for long pipelines may be excessive. Strong currents can also interfere with proper placement.

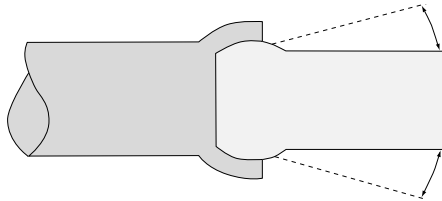
Depending on project conditions, it is generally advisable to prepare a trench for the pipe to be installed. This prevents movement of the pipeline due to currents and erosion. It also provides protection of the pipeline and allows normal river flow. Particular care should be taken to assure that no joint is deflected beyond its maximum limit especially at the bank approach locations.

Additional information regarding subaqueous pipe installation can be found in ANSI/AWWA C600 "Installation of Ductile-Iron Water Mains and Their Appurtenances".



Pipe Buoyancy

River crossing pipe in 6” through 16” sizes are heavier than the water displaced and will not float even when empty. Supplemental buoyancy can be added by attaching steel drums or other flotation devices to the pipe as it is assembled. The 18” and larger sizes are normally lighter than the displaced water and will float when empty. Heavier thickness classes may be required or weights attached if flotation is not desired.



Provides restrained boltless joints with 15° deflection in any direction from centerline.

Nominal Pipe Size	ANSI Class	Pressure Rating	Dimensions in Inches			Weight of Full Length Pipe	Weight of Full length pipe under water		Safe end pull in Tons
			Thickness	Pipe O.D.	Joint O.D.		Full of Water	Full of Air	
8	55	350	.42	9.05	16.63	770	655	240	70,000
10	55	350	.44	11.10	19.13	1005	860	220	95,000
12	55	350	.46	13.20	22.00	1270	1080	115	120,000
14	56	350	.51	15.30	24.50	1655	1410	160	145,000
16	56	350	.52	17.40	27.00	1990	1685	45	165,000
18	56	350	.53	18.50	30.00	2375	2015	-70	195,000
18	58	350	.59	19.50	30.00	2560	2170	110	195,000
20	56	350	.54	21.60	32.75	2810	2375	-200	210,000
20	59	350	.63	21.60	32.75	3110	2635	100	210,000
24	56	350	.56	25.80	38.25	3700	3110	-620	260,000
24	62	350	.74	25.80	38.25	4415	3715	95	260,000
30	58	250	.71	32.00	46.25	5855	4920	-900	400,000
30	61	250	.83	32.00	46.25	6435	5360	-180	400,000
36	57	250	.78	38.30	54.25	8145	6880	-1300	400,000
36	59	250	.88	38.30	54.25	8725	7330	-725	400,000



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Facts to Consider with River Crossing Pipe

The suggested total length of any river crossing pipe order is the requested length of the crossing plus one full length of river crossing pipe. The additional piece is cut in half in the field to accomplish the transition to other piping at the river bank locations. The plain ends on the cut pieces enter the transition fittings, while the river crossing end attaches to the companion bell and spigot.

When a job requires the use of a cofferdam for a dry trench installation and the deflections are not excessive, standard SNAP-LOK restrained joint pipe should be considered instead of the river crossing pipe. The photo below shows a SNAP-LOK pipeline being pulled into place across a shallow river.



Suggested Specifications for River Crossing Pipe

- Pipe shall be ductile iron manufactured in accordance with the requirements of ANSI/AWWA C151/A21.51 “*Ductile-Iron Pipe, Centrifugally Cast, For Water*”.
- Push-on joints for such pipe shall meet the requirements of ANSI/AWWA C111/A21.11 “*Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings*”.
- Pipe shall allow deflection of up to 15 degrees.
- Pipe thickness shall be equal to the manufacturer’s standard.
- Pipe shall have cement mortar lining and seal coating, where applicable, in accordance with ANSI/AWWA C104/A21.4 “*Cement-Mortar Lining for Ductile-Iron Pipe and Fittings For Water*”.



Pipe Bouyancy Chart

Listed values are net weight per foot of pipe. A positive value indicates the pipe will sink
 A negative value indicates the pipe will float and the listed weight per foot is required to sink the pipe

Size	Class	Restrained Joint Pipe			
		UNL	CL	DCL	DCL w/rings
6"	350	1.6	3.1	4.6	5.6
	50	1.6	3.1	4.6	5.6
	51	3.4	4.9	6.4	7.4
	52	5.3	6.8	8.3	9.2
	53	7.1	8.6	10.1	11.0
	54	8.9	10.4	11.9	12.8
	55	10.7	12.2	13.7	14.6
	56	12.4	13.9	15.4	16.3
8"	350	-4.1	-2.1	-0.1	1.4
	50	-2.4	-0.4	1.6	3.1
	51	0	2.0	4.0	5.5
	52	2.4	4.4	6.4	8.0
	53	4.9	6.9	8.9	10.4
	54	7.3	9.3	11.3	12.8
	55	9.7	11.7	13.7	15.2
	56	12.1	14.1	16.1	17.6
10"	350	-11.2	-8.7	-6.3	-4.4
	50	-8.1	-5.6	-3.2	-1.3
	51	-5.1	-2.6	-0.2	1.7
	52	-2.0	0.5	2.9	4.7
	53	1.0	3.5	5.9	7.7
	54	4.0	6.5	8.9	10.8
	55	7.0	9.5	11.9	13.8
	56	10.0	12.5	14.9	16.7



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River Crossing Pipe

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Size	Class	Restrained Joint Pipe			
		UNL	CL	DCL	DCL w/rings
12"	350	-20.0	-17.0	-14.1	-11.5
	50	-16.4	-13.4	-10.5	-7.9
	51	-12.7	-9.7	-6.8	-4.2
	52	-9.0	-6.0	-3.1	-0.6
	53	-5.5	-2.5	0.4	3.0
	54	-1.8	1.2	4.1	6.6
	55	1.7	4.7	7.6	10.2
	56	5.3	8.3	11.2	13.7
14"	350	-29.0	-23.9	-18.7	-15.7
	50	-26.1	-21.0	-15.8	-12.8
	51	-21.9	-16.8	-11.6	-8.5
	52	-17.6	-12.5	-7.3	-4.3
	53	-13.3	-8.2	-3.0	0
	54	-9.1	-4.0	1.2	4.2
	55	-4.9	0.2	5.4	8.4
	56		4.3	9.5	12.5
16"	350	-40.0	-34.1	-28.2	-24.6
	50	-40.0	-34.1	-28.2	-24.6
	51	-35.1	-29.2	-23.3	-19.7
	52	-30.2	-24.3	-18.4	-14.8
	53	-25.4	-19.5	-13.6	-9.9
	54	-20.5	-14.6	-8.7	-5.1
	55	-15.7	-9.8	-3.9	-0.3
	56	-10.9	-5.0	0.9	4.6
	57				

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River Crossing Pipe

Pipe Bouyancy Chart					
Listed values are net weight per foot of pipe. A positive value indicates the pipe will sink A negative value indicates the pipe will float and the listed weight per foot is required to sink the pipe					
Size	Class	Restrained Joint Pipe			
		UNL	CL	DCL	DCL w/rings
18"	300	-58.0	-51.4	-44.8	-40.5
	350	-54.3	-47.7	-41.1	-36.8
	50	-56.1	-49.5	-42.9	-38.6
	51	-50.6	-44.0	-37.4	-33.1
	52	-45.1	-38.5	-31.9	-27.6
	53	-39.7	-33.1	-26.5	-22.2
	54	-34.2	-27.6	-21.0	-16.7
	55	-28.7	-22.1	-15.5	-11.2
	56	-23.3	-16.7	-10.1	-5.9
	58				
20"	300	-75.0	-67.7	-60.3	-55.4
	350	-71.0	-63.7	-56.3	-51.3
	50	-75.0	-67.7	-60.3	-55.4
	51	-68.9	-61.6	-54.2	-49.3
	52	-62.8	-55.5	-48.1	-43.1
	53	-55.8	-48.5	-41.1	-36.1
	54	-50.6	-43.3	-35.9	-30.9
	55	-44.5	-37.2	-29.8	-24.9
	56	-38.4	-31.1	-23.7	-18.8
	59				



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River Crossing Pipe

Pipe Bouyancy Chart					
Listed values are net weight per foot of pipe. A positive value indicates the pipe will sink A negative value indicates the pipe will float and the listed weight per foot is required to sink the pipe					
Size	Class	Restrained Joint Pipe			
		UNL	CL	DCL	DCL w/rings
24"	250	-122.8	-114.0	-105.2	-98.5
	300	-115.4	-106.6	-97.8	-91.2
	350	-108.0	-99.2	-90.4	-83.8
	50	-120.3	-111.5	-102.7	-96.1
	51	-112.9	-104.1	-95.3	-88.7
	52	-105.6	-96.8	-88.0	-81.3
	53	-98.2	-89.4	-80.6	-73.9
	54	-60.8	-52.0	-43.2	-36.6
	55	-83.5	-74.7	-65.9	-59.3
	56	-76.2	-67.4	-58.6	-51.9
30"	150	-222.8	-211.0	-199.2	-194.8
	200	-210.8	-199.0	-187.2	-182.8
	250	-198.8	-187.0	-175.2	-170.8
	300	-189.8	-178.0	-166.2	-161.8
	350	-177.9	-166.1	-154.3	-149.9
	50	-207.8	-196.0	-184.2	-179.8
	51	-195.8	-184.0	-172.2	-167.8
	52	-183.8	-172.0	-160.2	-155.8
	53	-171.9	-160.1	-148.3	-143.9
	54	-160.0	-148.2	-136.4	-132.0
	55	-148.1	-136.3	-124.5	-120.1
	56	-136.3	-124.5	-112.7	-106.3



Pipe Bouyancy Chart

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 A negative value indicates the pipe will float and the listed weight per foot is required to sink the pipe

Size	Class	Restrained Joint Pipe			
		UNL	CL	DCL	DCL w/rings
36"	150	-333.9	-319.6	-305.3	-300.0
	200	-319.5	-305.2	-290.9	-285.6
	250	-301.5	-287.2	-272.9	-267.6
	300	-287.1	-272.8	-258.5	-253.2
	350	-269.2	-254.9	-240.6	-235.2
	50	-315.9	-301.6	-287.3	-282.0
	51	-297.9	-283.6	-269.3	-264.0
	52	-280.0	-265.7	-251.4	-246.1
	53	-262.1	-247.8	-233.5	-228.2
	54	-244.3	-230.0	-215.7	-210.4
	55	-226.5	-212.2	-197.9	-192.6
	56	-208.7	-194.4	-180.1	-174.8
42"	150	-466.9	-450.3	-433.7	-426.5
	200	-441.8	-425.2	-408.6	-401.5
	250	-420.8	-404.2	-387.6	-380.4
	300	-400.0	-383.4	-366.8	-359.6
	350	-375.0	-358.4	-341.8	-334.6
	50	-441.8	-425.2	-408.6	-401.4
	51	-416.7	-400.1	-383.5	-376.3
	52	-391.6	-375.0	-358.4	-351.2
	53	-366.7	-350.1	-333.5	-326.3
	54	-341.8	-325.2	-308.6	-301.4
	55	-317.0	-300.4	-283.8	-276.6
	56	-292.3	-275.7	-259.1	-251.9



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River Crossing Pipe

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Size	Class	Restrained Joint Pipe			
		UNL	CL	DCL	DCL w/rings
48"	150	-616.5	-597.6	-578.7	-570.6
	200	-587.8	-568.9	-550.0	-541.9
	250	-559.1	-540.2	-521.3	-513.2
	300	-530.5	-511.6	-492.7	-484.6
	350	-502.0	-483.1	-464.2	-456.1
	50	-592.5	-573.6	-554.7	-546.6
	51	-559.1	-540.2	-521.3	-513.2
	52	-525.7	-506.8	-487.9	-479.8
	53	-492.5	-473.6	-454.7	-446.6
	54	-459.3	-440.4	-421.5	-413.4
	55	-426.2	-407.3	-388.4	-380.3
	56	-393.2	-374.3	-355.4	-347.3