McWane Ductile

IRON STRONG

McWaneDuctile.com

McWANE DUCTILE IRON PIPE

3"-36"

McWane Ductile is a division of McWane, LLC

For Generations

SURE STOP 350® GASKET FOR TYTON® JOINT

SIZE IN.	RATING PSI	DEFLECTION DEGREES
3	350	5
4	350	5
6	350	5
8	350	5
10	350	5
12	350	5
14	350	4
16	350	4
18	350	4
20	350	2.5
24	350	2.5

Sure Stop 350® Gaskets are available in sizes 3–24 inches, and with a rating of 350-psi, they will meet or exceed the capabilities of Ductile iron pipe, valves and fittings.

Sure Stop 350 Gaskets are NSF 61 approved, UL listed and FM approved.

FM Rating: 3–16 in. = 250-psi | 18–24 in. = 200-psi

APPLICATION NOTES

1. For Ductile iron applications utilizing Tyton pipe, valves and fittings are made to AWWA specifications.
2. In cold weather assembly, maintain the temperature of the gasket above 40° F.
3. The socket of the joint should be clean and free of debris.
4. Gasket should be properly seated in the bell socket. Apply a generous amount of manufacturer approved lubricant* to the gasket's inner surface.
5. Keep the pipe and joint in alignment during assembly. If installed out of alignment, the gasket can be pushed out of position, creating the potential for leaks or failure.
6. After the pipe is homed, take deflection on the pipe if needed while simultaneously pulling back on the pipe to remove slack and engage the gasket teeth.
7. Some extension of the joint will occur when pressurized. To avoid this, the joint should be pulled out after assembly to "set" the stainless steel teeth in the inserted pipe.
8. Once assembled, the joint can be disassembled using steel shims.
9. When cut pipe is used, the following steps are required:
   a. Ensure that the spigot end is properly beveled.
   b. Mark the joint depth on the spigot so it is clear when the joint is fully inserted.
   c. Ensure that the pipe meets the required dimensional tolerances.
10. Do not reuse Sure Stop 350 Gaskets, as they may have been damaged during any previous installation or during removal.
11. Do not use Sure Stop 350 Gaskets to conduct electricity through the pipe joint, as they could be damaged and fail.
12. Do not use Sure Stop 350 Gaskets in aboveground applications.
13. Do not use Sure Stop 350 Gaskets with thick coating on the pipe exterior.
14. If Sure Stop 350 Gaskets are used in straight casings, you must pull the pipe through the casing. Do not push the pipe.

*** Note:** Use only lube as supplied and/or approved by the manufacturer. *Currently approved lubricants provided by McWane Ductile include Phoenix XL-27 and Black Swan.*

FIELD CUT PIPE

When pipe is cut in the field, the cut end may be readily conditioned so that it can be used to make up the next joint. The outside of the cut end should be beveled about 1/4 –inch at an angle of about 30 degrees (Figure 1). This can be quite easily done with a coarse file or a portable grinder. The operation removes any sharp, rough edges which otherwise might damage the gasket.

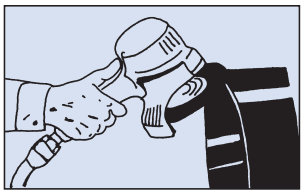
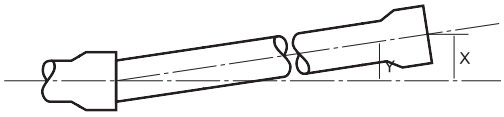


Figure 1

When Ductile iron pipe 14 inches and larger is to be cut in the field, the material should be ordered as "GAUGED FULL LENGTH". Pipe that is "gauged full length" is specially marked to avoid confusion. The ANSI/AWWA standard for Ductile iron pipe requires factory gauging of the spigot end. Accordingly, pipe selected for field cutting should also be field gauged in the location of the cut and found to be within the tolerances shown in Table 1. In the field, a mechanical joint gland can be used as a gauging device.

JOINT DEFLECTION CHART

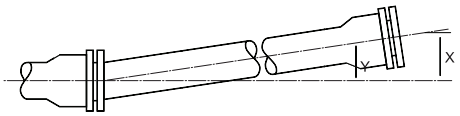


PUSH-ON JOINT PIPE

MAXIMUM ALLOWABLE JOINT DEFLECTION

PIPE SIZE IN.	Y-MAXIMUM JOINT DEFLECTION IN DEGREES	X DEFLECTION IN INCHES 18 FT. LENGTH	APPROXIMATE RADIUS IN FT. OF CURVE PRODUCED BY SUCCESSION OF JOINTS 18 FT. LENGTH
3	5°	19	205
4	5°	19	205
6	5°	19	205
8	5°	19	205
10	5°	19	205
12	5°	19	205
14	5°	19	205
16	5°	19	205
18	5°	19	205
20	5°	19	205
24	5°	19	205
30	5°	19	205
36	5°	15	260

MAXIMUM DEFLECTION FOR FULL LENGTH PIPE



MECHANICAL JOINT PIPE

MAXIMUM ALLOWABLE JOINT DEFLECTION

PIPE SIZE IN.	Y-MAXIMUM JOINT DEFLECTION IN DEGREES	X DEFLECTION IN INCHES 18 FT. LENGTH	APPROXIMATE RADIUS IN FT. OF CURVE PRODUCED BY SUCCESSION OF JOINTS 18 FT. LENGTH
6	7°–7'	27	145
8	5°–21'	20	195
10	5°–21'	20	195
12	5°–21'	20	195
14	3°–35'	13.5	285
16	3°–35'	13.5	285
18	3°–0'	11	340
20	3°–0'	11	340
24	2°–23'	9	450

TABLE 1: SUITABLE PIPE DIAMETERS FOR FIELD CUTS AND RESTRAINED JOINT FIELD

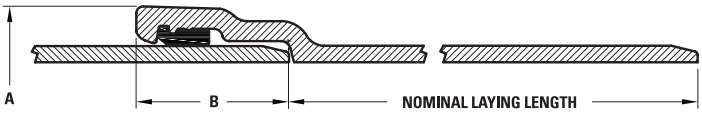
PIPE SIZE IN.	MIN. PIPE DIAMETER IN.	MAX.PIPE DIAMETER IN.	MIN. PIPE CIRCUMFERENCE IN.	MAX. PIPE CIRCUMFERENCE IN.
3	3.9	4.02	12-1/4	12-5/8
4	4.74	4.86	14-29/32	15-9/32
6	6.84	6.96	21-1/2	21-7/8
8	8.99	9.11	28-1/4	28-5/8
10	11.04	11.16	34-11/16	35-1/16
12	13.14	13.26	41-9/32	41-21/32
14	15.22	15.35	47-13/16	48-7/32
16	17.32	17.45	54-13/32	54-13/16
18	19.42	19.55	61	61-13/32
20	21.52	21.65	67-19/32	68
24	25.72	25.85	80-13/16	81-7/32
30	31.94	32.08	100-11/32	100-25/32
36	38.24	38.38	120-1/8	120-9/16

Above Table Based on ANSI/AWWA C151/A21.51 Guidelines for Push-On Joints.

THE BACKHOE METHOD OF ASSEMBLY

A backhoe may be used to assemble pipe of intermediate and larger sizes. The plain end of the pipe should be carefully guided by hand into the bell of the previously assembled pipe. The bucket of the backhoe may then be used to push the pipe until fully seated. A timber header should be used between the pipe and backhoe bucket to avoid damage to the pipe.

TYTON® JOINT PIPE

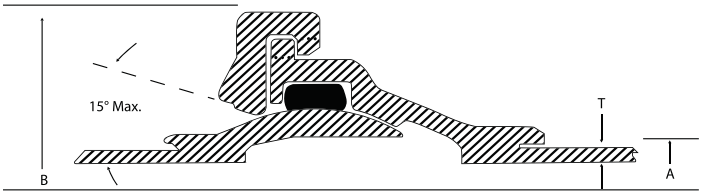


TYTON® PIPE

PIPE SIZE IN.	PIPE THICKNESS IN.		OUTSIDE DIAMETER	*DIMENSIONS IN.	
	FROM	TO	IN.	A	B
3	.25	.40	3.96	5.80	3.00
4	.25	.41	4.80	7.10	3.15
6	.25	.43	6.90	8.63	3.38
8	.25	.45	9.05	10.94	3.69
10	.26	.47	11.10	13.32	3.75
12	.28	.49	13.20	15.06	3.75
14	.28	.51	15.30	17.80	5.00
16	.30	.52	17.40	19.98	5.00
18	.31	.53	19.50	22.00	5.00
20	.33	.54	21.60	24.12	5.25
24	.33	.56	25.80	28.43	5.50
30	.34	.63	32.00	35.40	6.55
36	.38	.73	38.30	41.84	7.00

* Nominal laying length is 18 ft.

BALL AND SOCKET JOINT PIPE



PIPE SIZE IN.	THICKNESS		A PIPE O.D.	B RETAINER O.D.	FULL LENGTH WEIGHT — LB.**			SAFE END PULL LB.
	CLASS (A21.51)	T			AS SHIPPED	UNDER WATER		
						FULL OF AIR	FULL OF WATER	
6	55	.40	6.90	13.88	545	240	465	50,000
8	55	.42	9.05	16.63	770	240	655	70,000
10	55	.44	11.10	19.13	1005	220	860	95,000
12	55	.46	13.20	22.00	1270	155	1080	120,000
14	56	.51	15.30	24.50	1655	160	1410	145,000
16	56	.52	17.40	27.00	1990	45	1685	165,000
18	56	.53	19.50	30.00	2375	-70	2015	195,000
	58*	.59			2560	110	2170	
20	56	.54	21.60	32.75	2810	-200	2375	210,000
	59*	.63			3110	100	2635	
24	56	.56	25.80	38.25	3700	-620	3110	260,000
	62*	.74			4415	95	3715	
30	58	.71	32.00	46.25	5855	-900	4920	335,000
	61*	.83			6435	-180	5360	
36	57	.78	38.30	54.25	8145	-1300	6880	400,000
	59*	.88			8725	725	7330	

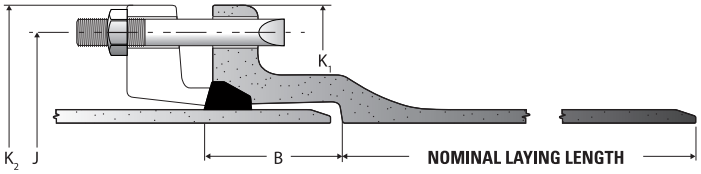
* Thickness required to overcome buoyancy.

** Weights listed are for 18 foot laying lengths. Nominal full lengths vary by size. Pipe, Bell, Ball and Retainer are ductile iron. Dimensions and weights are subject to manufacturing tolerances.

6 in.–24 in. pressure rating: 350-psi;

30 in.–36 in. pressure rating: 250-psi

MECHANICAL JOINT PIPE



PIPE SIZE IN.	PIPE THICKNESS IN.		OD	*DIMENSIONS IN.					T-HEAD BOLTS		BELL WEIGHT LB.	GLAND** BOLTS GASKET WEIGHT LB.
	FROM	TO	IN.	B	J	K_1	K_2	NO.	SIZE IN.	LEN IN.		
3	.25	.40	3.96	2.50	6.19	7.62	7.69	4	5/8	3	11	7
4	.26	.41	4.80	2.50	7.50	9.06	9.12	4	3/4	3-1/2	16	10
6	.25	.43	6.90	2.50	9.50	11.06	11.12	6	3/4	3-1/2	18	16
8	.27	.45	9.05	2.50	11.75	13.31	13.37	6	3/4	4	24	25
10	.29	.47	11.10	2.50	14.00	15.62	15.62	8	3/4	4	31	30
12	.31	.49	13.20	2.50	16.25	17.88	17.88	8	3/4	4	37	40
14	.33	.51	15.30	3.50	18.75	20.25	20.25	10	3/4	4-1/2	61	45
16	.34	.52	17.40	3.50	21.00	22.50	22.50	12	3/4	4-1/2	74	55
18	.35	.53	19.50	3.50	23.25	24.75	24.75	12	3/4	4-1/2	85	65
20	.36	.54	21.60	3.50	25.50	27.00	27.00	14	3/4	4-1/2	98	85
24	.38	.56	25.80	3.50	30.00	31.50	31.50	16	3/4	5	123	105

* Nominal laying length is 18 ft.

** Weight shown for regular grey cast iron follower gland, corten bolts and rubber gasket.

STANDARD DIMENSIONS AND WEIGHTS OF 3" THROUGH 36" PUSH-ON JOINT DUCTILE IRON PIPE

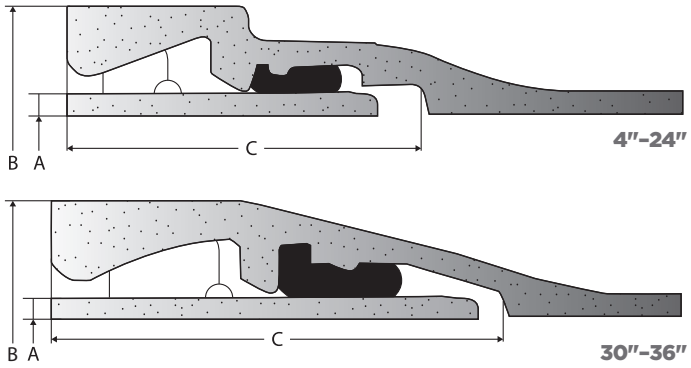
PIPE SIZE IN.	PRESSURE CLASS PSI	NOMINAL THICKNESS IN.	OD* IN.	WT. OF BARREL PER FT. † LB.	TYTON® JOINT		
					WT. OF BELL LB.	WT. PER LGTH.† LB.	AVG. WT. PER FT.‡ LB.
3	350	0.25	3.96	8.90	7.00	185	9.20
4	350	0.25	4.80	10.90	9.00	225	11.30
6	350	0.25	6.90	16.00	11.00	300	16.60
8	350	0.25	9.05	21.10	17.00	395	22.00
10	350	0.26	11.10	27.10	24.00	510	28.40
12	350	0.28	13.20	34.80	29.00	655	36.40
14	250	0.28	15.30	40.40	45.00	770	42.90
	300	0.30	15.30	43.30	45.00	825	45.80
	350	0.31	15.30	44.70	45.00	850	47.20
16	250	0.30	17.40	49.30	54.00	940	52.30
	300	0.32	17.40	52.50	54.00	1000	55.50
	350	0.34	17.40	55.80	54.00	1060	58.80
18	250	0.31	19.50	57.20	59.00	1090	60.50
	300	0.34	19.50	62.60	59.00	1185	65.90
	350	0.36	19.50	66.20	59.00	1250	69.50
20	250	0.33	21.60	67.50	74.00	1290	71.60
	300	0.36	21.60	73.50	74.00	1395	77.60
	350	0.38	21.60	77.50	74.00	1470	81.60
24	200	0.33	25.80	80.80	95.00	1550	86.10
	250	0.37	25.80	90.50	95.00	1725	95.80
	300	0.40	25.80	97.70	95.00	1855	103.00
	350	0.43	25.80	104.90	95.00	1985	110.20
30	150	0.34	32.00	103.50	139.00	2000	111.20
	200	0.38	32.00	115.50	139.00	2220	123.20
	250	0.42	32.00	127.50	139.00	2435	135.20
	300	0.45	32.00	136.50	139.00	2595	144.20
	350	0.49	32.00	148.40	139.00	2810	156.10
36	150	0.38	38.30	138.50	184.00	2675	148.70
	200	0.42	38.30	152.90	184.00	2935	163.10
	250	0.47	38.30	170.90	184.00	3260	181.10
	300	0.51	38.30	185.30	184.00	3520	195.50
	350	0.56	38.30	203.20	184.00	3840	213.40

* Tolerances of OD of spigot end: 3–12 in. = +0.06 in. & -0.06 in. ; 14–24 in. = + 0.05 in. & -0.08 in.; 30–36 in. = +0.08 in. & -0.06 in.

† Including bell; calculated weight of pipe rounded off to the nearest 5 lb.

‡ Including bell; average weight per foot, based on calculated weight of pipe before rounding.

TR-FLEX® RESTRAINED JOINT PIPE



PIPE SIZE IN.	*PRESSURE RATING PSI	A	B	C	# OF D.I. LOCKING SEGMENTS	# OF RUBBER SEGMENTS RETAINERS	MAX DEFLECTION DEGREES	PULLOUT FT.
		INCHES						
4	350	4.80	7.25	4.84	2	1	5	0.03
6	350	6.90	9.52	5.27	2	1	5	0.04
8	350	9.05	11.93	5.82	2	1	5	0.04
10	350	11.10	14.37	6.03	2	1	5	0.05
12	350	13.20	16.68	6.30	4	2	5	0.06
14	350	15.30	19.16	7.75	4	2	3-1/4	0.05
16	350	17.40	21.46	7.95	4	2	3-1/4	0.05
18	350	19.50	23.76	8.19	4	2	3	0.05
20	350	21.60	26.04	8.40	4	2	2-1/2	0.05
24	350	25.80	30.61	8.86	8	4	2-1/4	0.05
30	250	32.00	36.88	10.28	8	4	1-3/4	0.05
36	250	38.30	43.85	10.87	8	4	1-1/2	0.05

*The TR FLEX® Restrained Joint has a working pressure rating equivalent to the working pressure rating of the parent pipe with a maximum working pressure rating of 350-psi for 4 in. through 24 in. and 250-psi for 30 in. through 36 in. NOTE: These deflections are based on joints with nominal dimensions.

NOMINAL THICKNESS FOR STANDARD PRESSURE CLASSES OF DUCTILE IRON PIPE

SIZE IN.	OUTSIDE DIAMETER IN.	PRESSURE CLASS*				
		150	200	250	300	350
		NORMAL THICKNESS — IN.				
3	3.96	—	—	—	—	0.25**
4	4.80	—	—	—	—	0.25**
6	6.90	—	—	—	—	0.25**
8	9.05	—	—	—	—	0.25**
10	11.10	—	—	—	—	0.26
12	13.20	—	—	—	—	0.28
14	15.30	—	—	0.28	0.30	0.31
16	17.40	—	—	0.30	0.32	0.34
18	19.5	—	—	0.31	0.34	0.36
20	21.60	—	—	0.33	0.36	0.38
24	25.80	—	0.33	0.37	0.40	0.43
30	32.00	0.34	0.38	0.42	0.45	0.49
36	38.30	0.38	0.42	0.47	0.51	0.56

* Pressure Classes are defined as the rated water pressure of the pipe in psi. The thicknesses shown are adequate for the rated water working pressure plus a surge allowance of 100-psi. Calculations are based on a minimum yield strength of 42,000 and a 2.0 safety factor times the sum of the working pressure and 100-psi surge allowance.

** Calculated thicknesses for these sizes and pressure ratings are less than those shown above. Presently, these are the lowest nominal thicknesses available in these sizes.

NOTES: Per ANSI/AWWA C150/A21.50 the thicknesses above include the 0.08 in. service allowance and the casting tolerance listed below by size ranges:

SIZE (Inches)	CASTING TOLERANCES (Inches)
3–8	-0.05
10–12	-0.06
14–36	-0.07

RATED WORKING PRESSURE AND MAXIMUM DEPTH OF COVER

PIPE SIZE IN.	PRESSURE CLASS PSI	NOMINAL THICKNESS IN.	LAYING CONDITIONS (TRENCH TYPE)				
			TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5
			MAXIMUM DEPTH OF COVER ‡-FT				
3	350	0.25	78	88	99	100§	100§
4	350	0.25	53	61	69	85	100§
6	350	0.25	26	31	37	47	65
8	350	0.25	16	20	25	34	50
10	350	0.26	11**	15	19	28	45
12	350	0.28	10**	15	19	28	44
14	250	0.28	††	11**	15	23	36
	300	0.30	††	13	17	26	42
	350	0.31	††	14	19	27	44
16	250	0.30	††	11**	15	24	34
	300	0.32	††	13	17	26	39
	350	0.34	††	15	20	28	44
18	250	0.31	††	10**	14	22	31
	300	0.34	††	13	17	26	36
	350	0.36	††	15	19	28	41
20	250	0.33	††	10	14	22	30
	300	0.36	††	13	17	26	35
	350	0.38	††	15	19	28	38
24	200	0.33	††	8**	12	17	25
	250	0.37	††	11	15	20	29
	300	0.40	††	13	17	24	32
	350	0.43	††	15	19	28	37
30	150	0.34	††	--	9	14	22
	200	0.38	††	8**	12	16	24
	250	0.42	††	11	15	19	27
	300	0.45	††	12	16	21	29
	350	0.49	††	15	19	25	33
36	150	0.38	††	--	9	14	21
	200	0.42	††	8**	12	15	23
	250	0.47	††	10	14	18	25
	300	0.51	††	12	16	20	28
	350	0.56	††	15	19	24	32

‡ An allowance for a single H-20 truck with 1.5 impact factor is included for all depths of cover.

§ Calculated maximum depth of cover exceeds 100 ft. (30.5 m).

** Minimum allowable depth of cover is 3 ft. (0.9 m).

†† For pipe 14 in. (350 mm) and larger, consideration should be given to the use of laying conditions other than Type 1.

TYTON® PUSH-ON JOINTS

ASSEMBLY INSTRUCTIONS

Step 1. Thoroughly clean out the bell with special attention to the gasket recess. Remove any foreign material. Clean the spigot or beveled plain end and remove any sharp edges with a standard file.

Step 2. After making sure that the correct gasket is being used, insert it into the recess in the bell with the small end of the gasket facing the bell face.

Step 3. Apply manufacturer-approved lubricant* to the inside surface of the gasket, making sure that the entire surface is coated. Apply a generous coating of lubricant to the beveled portion of the plain end.

Step 4. Guide the plain end into the bell and, while maintaining straight alignment, push the plain end into the bell socket. Once the joint is assembled, necessary deflection can be accomplished. When assembly is complete, the bell face should be aligned between the two white depth rings, for Tyton® Joints.

MECHANICAL JOINT

ASSEMBLY INSTRUCTIONS

Step 1. Clean the bell socket and spigot or plain end. Lubricate both the gasket and plain end by applying manufacturer-approved lubricant*.

Step 2. Place the gland on the plain end with the lip extension toward the plain end. Place the gasket on the plain end with the narrow edge facing the plain end.

Step 3. Insert the plain end into the bell and press the gasket into the bell recess. Push the gland toward the socket and center it around the pipe with the gland lip against the gasket.

Step 4. Insert and tighten the bolts. It is important to maintain the same distance between the gland and the bell face at all times. This is best done by alternating side to side and top to bottom, while tightening the bolts.

Note: Achieving the recommended bolt torque, particularly with large diameter pipe, may require repeating the process up to 5 times or more. See recommended bolt torque ranges in chart below.

PIPE SIZE IN.	BOLT DIAMETER IN.	NUT ACROSS FLATS IN.	WRENCH LENGTH IN.	TORQUE RANGE FOOT LBS.
3	5/8	1-1/16	8	45 to 60
4–24	3/4	1-1/14	10	75 to 90

TR FLEX® RESTRAINED JOINT

ASSEMBLY INSTRUCTIONS

Step 1. **(4"–10")** Lay pipe such that one of the bell slots is accessible.

(12"–20") Lay pipe such that both of the bell slots are accessible, in the horizontal position if possible.

(24"–36") Lay pipe such that all four of the bell slots are accessible, in the diagonal position if possible.

Step 2. Clean the bell socket and insert gasket.

Step 3. Clean the spigot end to the assembly stripes.

Step 4. Lubricate the exposed surface of the gasket and pipe spigot end back to the weld bead.*

Step 5. Make a normal push-on joint assembly, completely homing the pipe until the first assembly stripe is in the bell socket. Keep the joint in straight alignment during the assembly process.

Step 6. **(4"–10")** Insert the right-hand locking segment into a bell slot and slide the segment clockwise around the pipe.

(12"–36") Insert lower locking segment into a bell slot and slide the segment around the pipe.

Step 7. **(4"–10")** Insert left-hand locking segment into the bell slot and slide the segment counter-clockwise around the pipe.

(12"–36") Insert upper locking segment into the same bell slot and rotate around the pipe.

Step 8. **(4"–10")** Hold the segments apart and wedge the rubber retainer into the slot between the two locking segments.

(12"–36") Hold the upper segment in place and wedge the rubber retainer into the slot between the two locking segments.

Step 9. **(4"–10")** None.

(12"–20") Repeat steps 6–8 for other slot. Make sure that all 4 locking segments and 2 rubber retainers are securely in place.

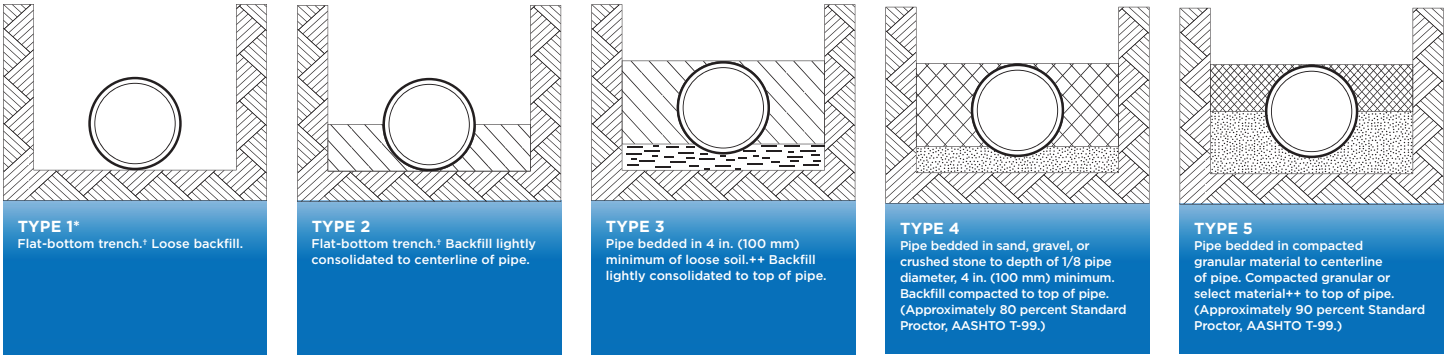
(24"–36") Repeat steps 6–8 for other slot. Make sure that all 8 locking segments and 4 rubber retainers are securely in place.

Step 10. Extend the joint to remove the slack in the locking segment cavity. Joint extension is necessary to attain the marked laying length on the pipe and to minimize growth or extension of the line as it is pressurized.

Step 11. Set the joint deflection as required.

*** Note:** Use only lube as supplied and/or approved by the manufacturer. *Currently approved lubricants provided by McWane Ductile include Phoenix XL-27 and Black Swan.*

LAYING CONDITIONS



TYPE 1*
Flat-bottom trench.† Loose backfill.

TYPE 2
Flat-bottom trench.† Backfill lightly consolidated to centerline of pipe.

TYPE 3
Pipe bedded in 4 in. (100 mm) minimum of loose soil.++ Backfill lightly consolidated to top of pipe.

TYPE 4
Pipe bedded in sand, gravel, or crushed stone to depth of 1/8 pipe diameter, 4 in. (100 mm) minimum. Backfill compacted to top of pipe. (Approximately 80 percent Standard Proctor, AASHTO T-99.)

TYPE 5
Pipe bedded in compacted granular material to centerline of pipe. Compacted granular or select material++ to top of pipe. (Approximately 90 percent Standard Proctor, AASHTO T-99.)

NOTES:

Consideration of the pipe-zone embedment conditions included in this figure may be influenced by factors other than pipe strength. For additional information on pipe bedding and backfill, see ANSI/AWWA C600.

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* For 14 in. (355-mm) and larger pipe, consideration should be given to the use of laying conditions other than Type 1.

† "Flat-bottom" is defined as undisturbed earth.

++ "Loose soil" or "select material" is defined as native soil excavated from the trench, free of rocks, foreign materials, and frozen earth.

DIMENSIONS AND WEIGHTS FOR SPECIAL CLASSES OF PUSH-ON DUCTILE IRON PIPE

PIPE SIZE IN.	THICKNESS CLASS	NOMINAL THICKNESS IN.	OD* IN.	WT. OF BARREL PER FT. † LB.	TYTON® JOINT		
					WT. OF BELL LB.	WT. PER LGTH.† LB.	AVG. WT. PER FT.‡ LB.
3	52	0.28	3.96	9.9	7	185	10.3
3	54	0.34	3.96	11.8	7	220	12.2
3	56	0.40	3.96	13.7	7	255	14.1
4	51	0.26	4.80	11.3	9	210	11.8
4	52	0.29	4.80	12.6	9	235	13.1
4	53	0.32	4.80	13.8	9	255	14.3
4	54	0.35	4.80	15	9	280	15.5
4	55	0.38	4.80	16.1	9	300	16.7
4	56	0.41	4.80	17.3	9	320	17.8
6	50	0.25	6.90	16	11	300	16.6
6	51	0.28	6.90	17.8	11	330	18.4
6	52	0.31	6.90	19.6	11	365	20.2
6	53	0.34	6.90	21.4	11	395	22.0
6	54	0.37	6.90	23.2	11	430	23.8
6	55	0.40	6.90	25	11	460	25.6
6	56	0.43	6.90	26.7	11	490	27.3
8	50	0.27	9.05	22.8	17	425	23.7
8	51	0.30	9.05	25.2	17	470	26.1
8	52	0.33	9.05	27.7	17	515	28.6
8	53	0.36	9.05	30.1	17	560	31.0
8	54	0.39	9.05	32.5	17	600	33.4
8	55	0.42	9.05	34.8	17	645	35.7
8	56	0.45	9.05	37.2	17	685	38.1
10	50	0.29	11.10	30.1	24	565	31.4
10	51	0.32	11.10	33.2	24	620	34.5
10	52	0.35	11.10	36.2	24	675	37.5
10	53	0.38	11.10	39.2	24	730	40.5
10	54	0.41	11.10	42.1	24	780	43.4
10	55	0.44	11.10	45.1	24	835	46.4
10	56	0.47	11.10	48	24	890	49.3
12	50	0.31	13.20	38.4	29	720	40.0
12	51	0.34	13.20	42	29	785	43.6
12	52	0.37	13.20	45.6	29	850	47.2
12	53	0.40	13.20	49.2	29	915	50.8
12	54	0.43	13.20	52.8	29	980	54.4
12	55	0.46	13.20	56.3	29	1040	57.9
12	56	0.49	13.20	59.9	29	1105	61.5
14	50	0.33	15.30	47.5	45	900	50.0
14	51	0.36	15.30	51.7	45	975	54.2
14	52	0.39	15.30	55.9	45	1050	58.4
14	53	0.42	15.30	60.1	45	1125	62.6
14	54	0.45	15.30	64.2	45	1200	66.7
14	55	0.48	15.30	68.4	45	1275	70.9
14	56	0.51	15.30	72.5	45	1350	75.0
16	50	0.34	17.40	55.8	54	1060	58.8
16	51	0.37	17.40	60.6	54	1145	63.6
16	52	0.40	17.40	65.4	54	1230	68.4
16	53	0.43	17.40	70.1	54	1315	73.1
16	54	0.46	17.40	74.9	54	1400	77.9
16	55	0.49	17.40	79.7	54	1490	82.7
16	56	0.52	17.40	84.4	54	1575	87.4
18	50	0.35	19.50	64.4	59	1220	67.7
18	51	0.38	19.50	69.8	59	1315	73.1
18	52	0.41	19.50	75.2	59	1415	78.5
18	53	0.44	19.50	80.6	59	1510	83.9
18	54	0.47	19.50	86	59	1605	89.3
18	55	0.50	19.50	91.3	59	1700	94.6
18	56	0.53	19.50	96.7	59	1800	100.0
20	50	0.36	21.60	73.5	74	1395	77.6
20	51	0.39	21.60	79.5	74	1505	83.6
20	52	0.42	21.60	85.5	74	1615	89.6
20	53	0.45	21.60	91.5	74	1720	95.6
20	54	0.48	21.60	97.5	74	1830	101.6
20	55	0.51	21.60	103.4	74	1935	107.5
20	56	0.54	21.60	109.3	74	2040	113.4
24	50	0.38	25.80	92.9	95	1765	98.2
24	51	0.41	25.80	100.1	95	1895	105.4
24	52	0.44	25.80	107.3	95	2025	112.6
24	53	0.47	25.80	114.4	95	2155	119.7
24	54	0.50	25.80	121.6	95	2385	126.9
24	55	0.53	25.80	128.8	95	2415	134.1
24	56	0.56	25.80	135.9	95	2540	141.2
30	50	0.39	32.00	118.5	139	2270	126.2
30	51	0.43	32.00	130.5	139	2490	138.2
30	52	0.47	32.00	142.5	139	2705	150.2
30	53	0.51	32.00	154.4	139	2920	162.1
30	54	0.55	32.00	166.3	139	3130	174.0
30	55	0.59	32.00	178.2	139	3345	185.9
30	56	0.63	32.00	190.0	139	3560	197.7
36	50	0.43	38.30	156.5	184	3000	166.7
36	51	0.48	38.30	174.5	184	3325	184.7
36	52	0.53	38.30	192.4	184	3645	202.6
36	53	0.58	38.30	210.3	184	3970	220.5
36	54	0.63	38.30	228.1	184	4290	238.3
36	55	0.68	38.30	245.9	184	4610	256.1
36	56	0.73	38.30	263.7	184	4930	273.9

* Tolerances of OD of spigot end: 3–12 in. = +0.06 in. & -0.06 in. ; 14–24 in. = +0.05 in. & -0.08 in. ; 30–36 in. = +0.08 in. & -0.06 in.
† Including bell; calculated weight of pipe rounded off to the nearest 5 lb.
‡ Including bell; average weight per foot, based on calculated weight of pipe before rounding.

STANDARDS APPLICABLE TO DUCTILE IRON PIPE AND FITTINGS

THICKNESS DESIGN OF DUCTILE IRON PIPE	ANSI/AWWA C150/A21.50
DUCTILE IRON PIPE FOR WATER AND OTHER LIQUIDS	ANSI/AWWA C151/A21.51, FEDERAL WWP421D, GRADE C
DUCTILE IRON PIPE FOR GRAVITY FLOW SERVICE	ANSI/ASTM A746
DUCTILE IRON FITTINGS FOR WATER AND OTHER LIQUIDS	ANSI/AWWA C110/A21.10
DUCTILE IRON COMPACT FITTINGS	ANSI/AWWA C153/A21.53
FLANGED FITTINGS	ANSI/AWWA C110/A21.10, ANSI B16.1
DUCTILE IRON PIPE WITH THREADED FLANGES	ANSI/AWWA C115/21.15
COATINGS AND LININGS	
Asphaltic	ANSI/AWWA C151/A21.51, ANSI/AWWA C110/A21.10, ANSI/AWWA C153/A21.53
Cement Lining	ANSI/AWWA C104/A21.4
Various Epoxy Linings and Coatings	MANUFACTURER'S STANDARD
Exterior Polyethylene Encasement	ANSI/AWWA C105/A21.5
JOINTS — PIPE AND FITTINGS	
Push-On and Mechanical Rubber-Gasket Joints	ANSI/AWWA C111/A21.11, FEDERAL WWP421D
Flanged	ANSI/AWWA C115/A21.15, ANSI B16.1
Grooved and Shouldered	ANSI/AWWA C606
PIPE THREADS	ANSI B2.1
INSTALLATION	ANSI/AWWA C600

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