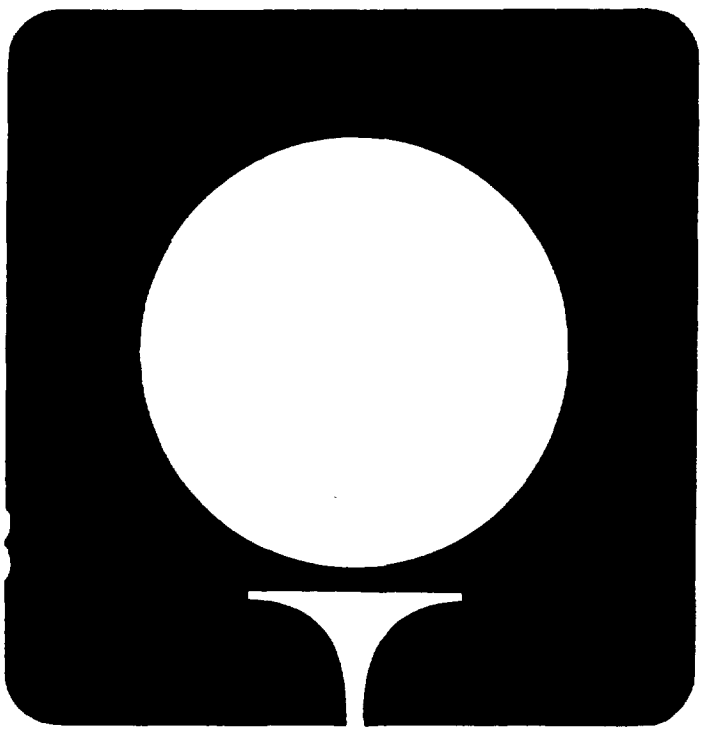
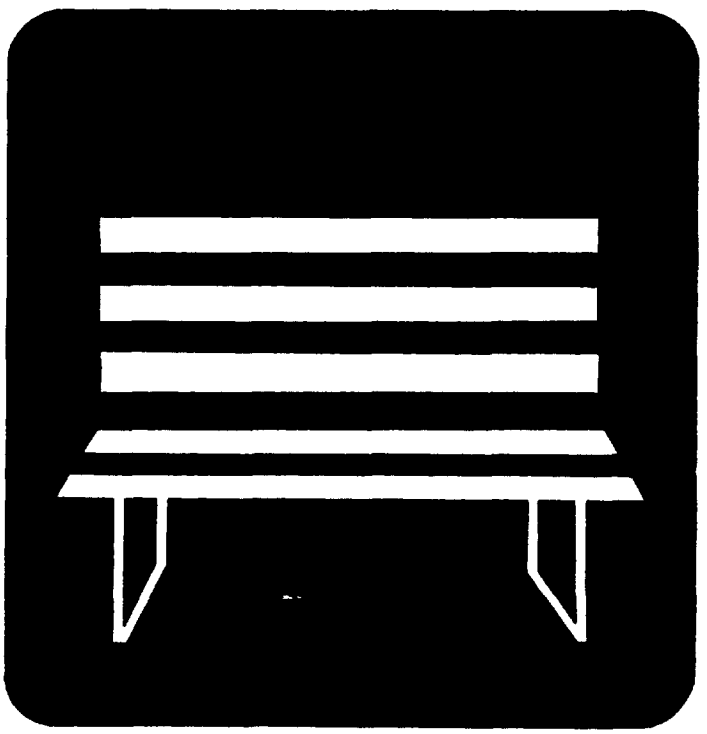
PLAINTIFF'S
EXHIBIT
CT-93

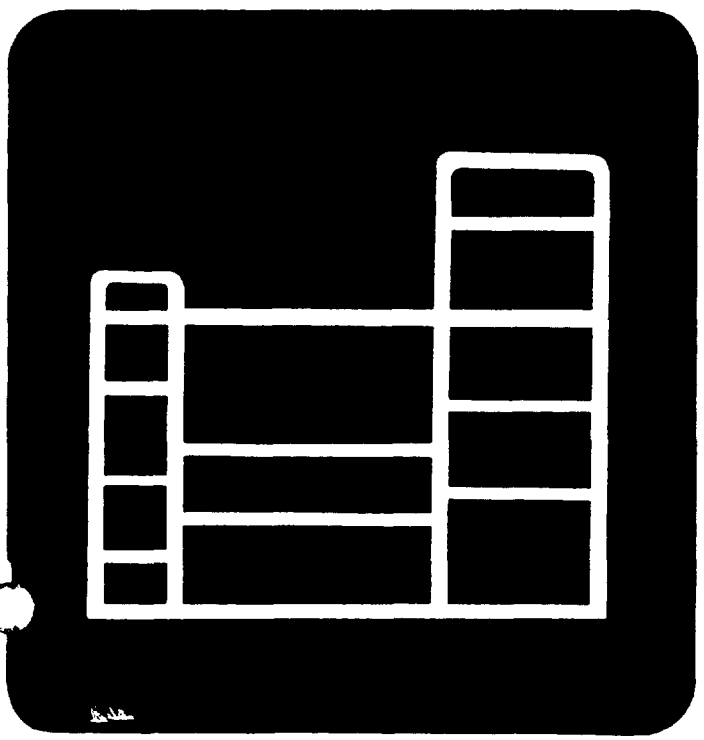
Certain-teed

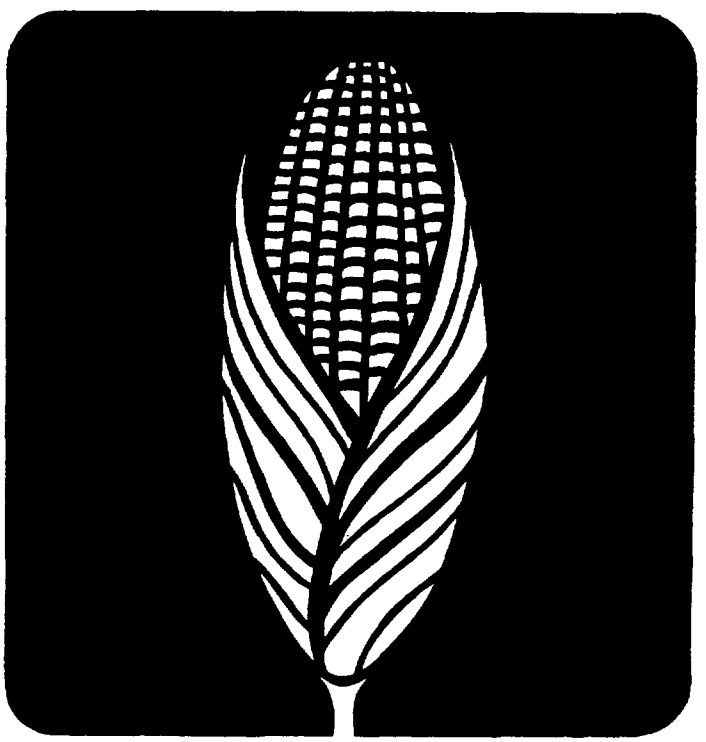
asbestos-cement irrigation pipe

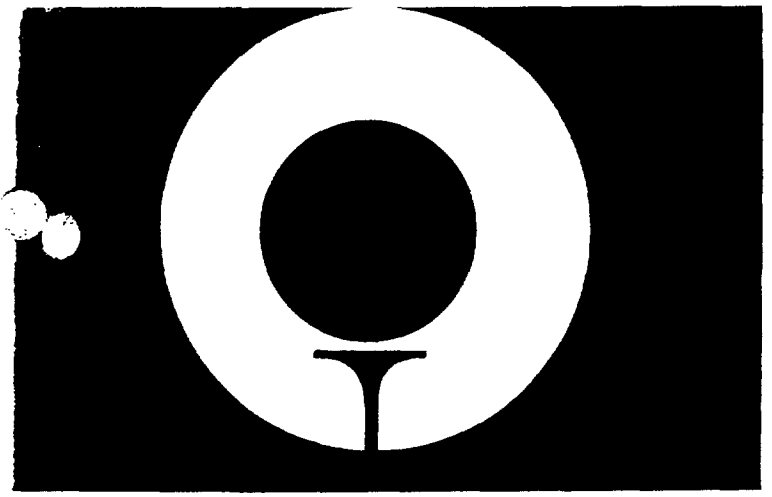
CERTAIN



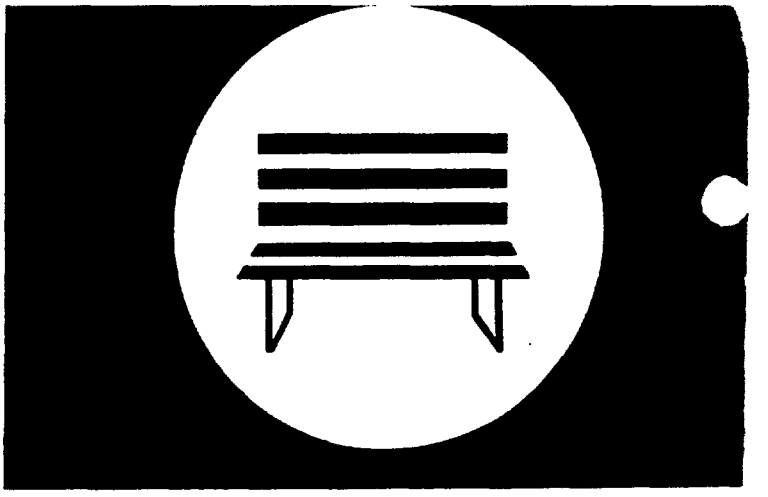








GOLF COURSES



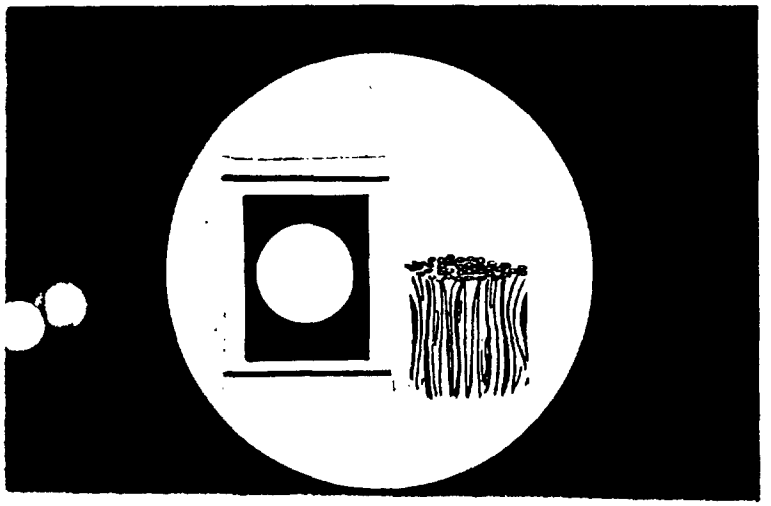
PARKS

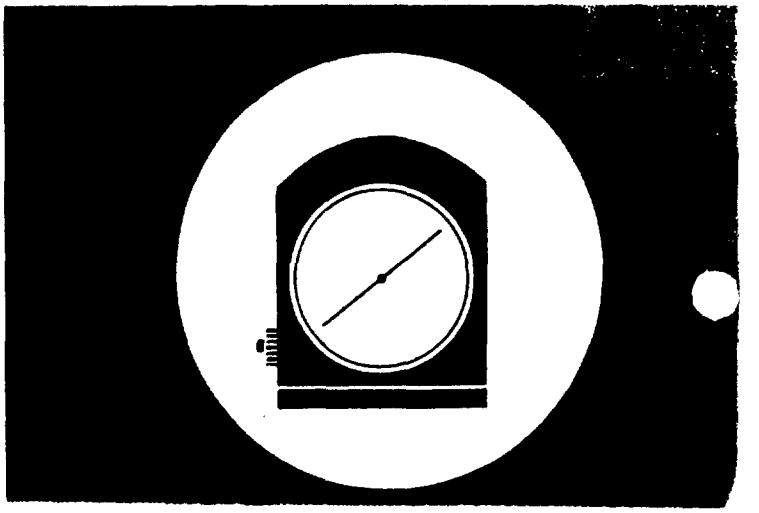
THE GRASS IS

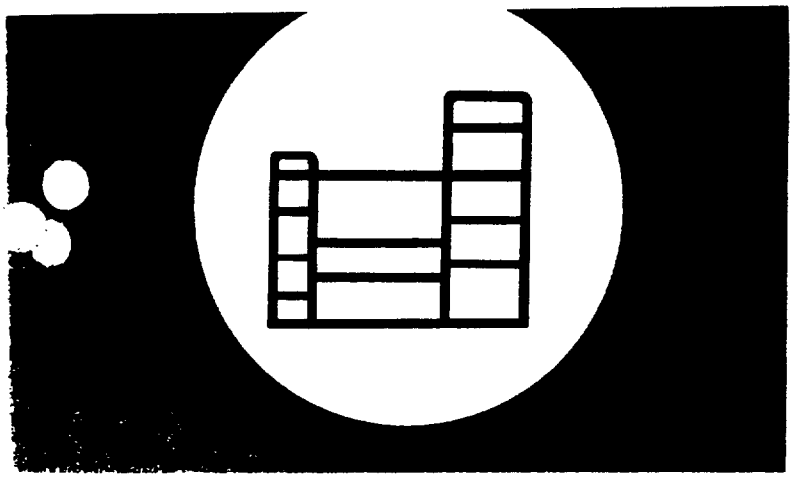
Rain makes the grass grow. And irrigation systems using Certain-teed Irrigation Pipe "make rain", wherever and whenever moisture is needed. Dependable, trouble-free Certain-teed asbestos-cement pipe delivers water to golf greens and fairways, to park, playground and cemetery lawns, to farm and

BUILT TO LAST—Certain-teed Asbestos-Cement Pipe is a blend of finest grade portland cement, silica, and tough asbestos fibers. Result: long life.

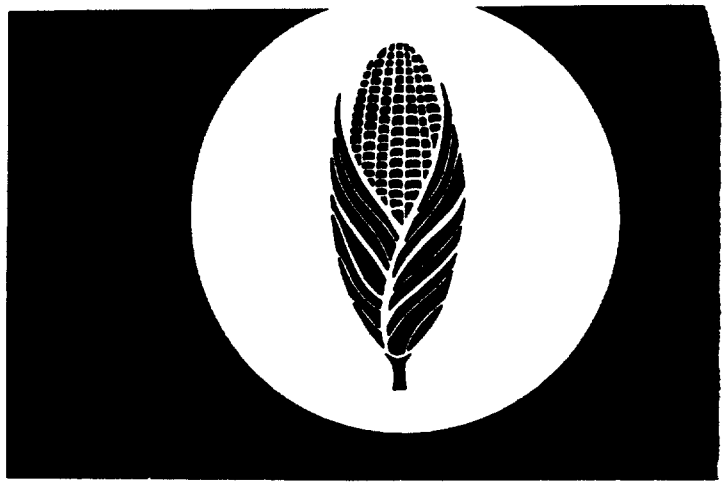
HIGHEST QUALITY—Exacting standards are maintained throughout manufacture. Each length, each coupling is inspected and tested.







PLAYGROUNDS



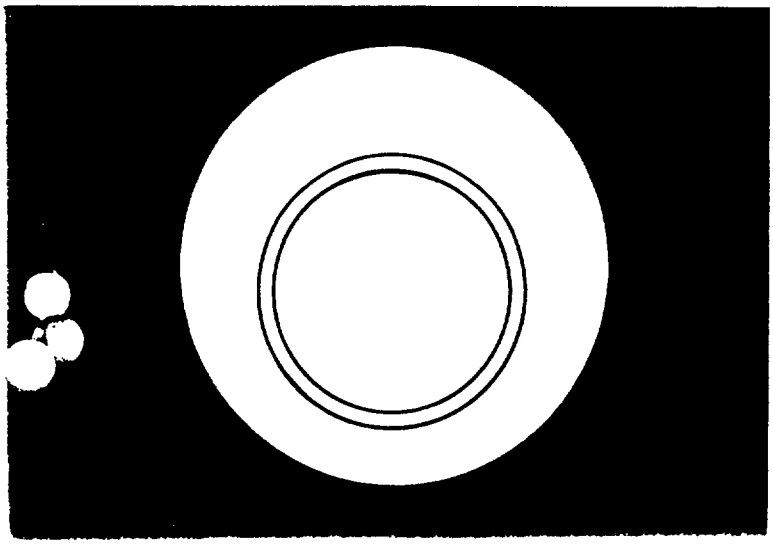
FARMS AND ORCHARDS

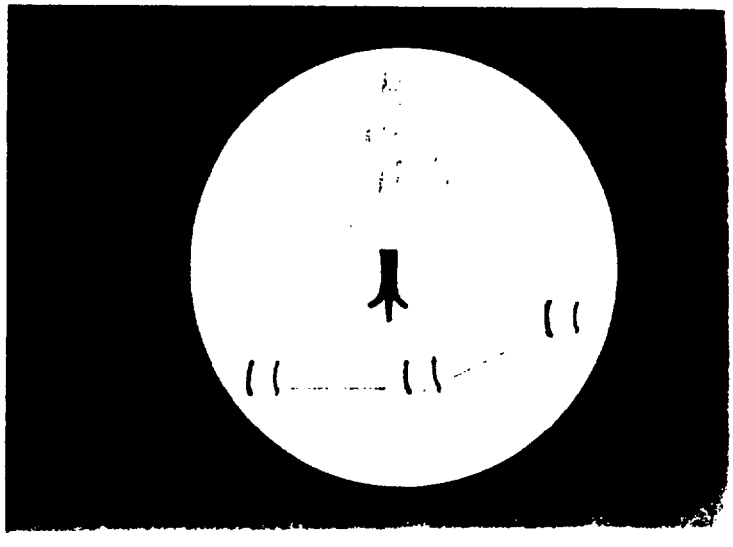
ALWAYS GREENER

orchard crops. Certain-teed systems "pay for themselves". Actually, economies begin the very first day of delivery, because of the many money-saving features of this modern, lightweight, durable pipe. Let Certain-teed show you how much you can benefit from an efficient, economical system of "rain-making".

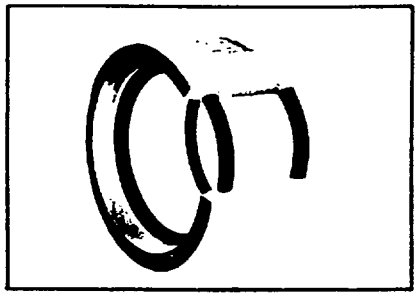
SMOOTH BORE—This modern pipe is highly corrosion-resistant, cannot rust or tuberculate. Stays trouble-free, delivers full flow. Nozzle clogging is eliminated.

ADAPTABLE — Easily installed with a minimum of time and labor. Lines can be laid to avoid obstacles and follow ground contours, because deflection is possible at each joint: 5° on 3" through 12" sizes, 3° on 14" through 24" sizes.





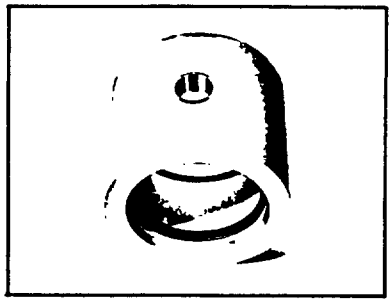
CERTAIN-TEED FLUID-TITE® COUPLING



This exclusive, patented coupling is one of the finest pipe connections ever devised. Initial compression of the gaskets seals the joints tightly and permanently. With this modern coupling, more pipe is laid per hour with fewer men.

• Quick Installation • Permanent, Tight Seal • No Heavy Machinery • Deflection Allowed at Each Joint • Just Lubricate—Slide Pipe In • Absorbs Vibration.

THREADED BRASS INSERT COUPLING AND PIPE SECTIONS



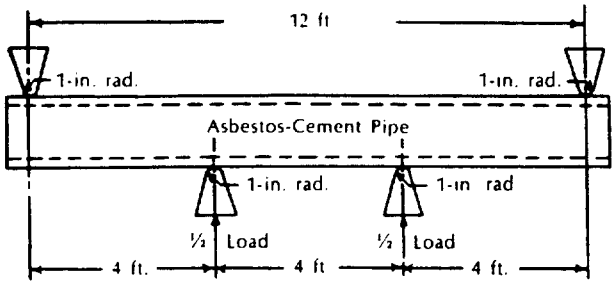
No time-consuming tapping necessary. Heavy-duty Certain-teed Threaded Brass Inserts assure fast, water-tight connections to sprinklers.

COMPLETE RANGE OF FITTINGS

To serve the varied needs of today's complete irrigation systems, Certain-teed manufactures a full line of adapter and reducer fittings. Connections can easily be made with lengths and fittings of different sizes and different materials

FLEXURAL TEST LOADS

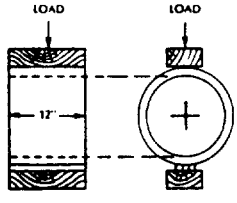
Nominal Diameter Inches	Class 100 Irrigation	Class 150 Irrigation	Class 200 Irrigation
	Total Applied Load—Lbs.		
3	565	625	685
4	900	1,100	1,400
6	2,100	2,800	3,700
8	4,000	5,700	7,600



Assembly for Flexure Strength Test.

MINIMUM CRUSHING STRENGTH

Nominal Diameter Inches	Class 100 Irrigation	Class 150 Irrigation	Class 200 Irrigation
	Total Applied Load—Lbs.		
3	4,600	6,700	8,800
4	4,100	5,400	8,700
6	4,000	5,400	9,000
8	4,000	5,500	9,300
10	4,400	7,000	11,000
12	5,200	7,600	11,800
14	5,200	8,600	13,500
15	5,600	9,000	14,500
16	5,800	9,200	15,400
18	6,500	10,100	
20	7,100	10,900	
21	7,600	11,300	
24	8,100	12,700	



Assembly for Crushing Strength Test

THRUST BLOCKING

Thrust blocks are required at points where the pipe changes direction, such as:

All points where bend is greater than 10°.

At all tees, wyes, caps, valves, hydrants, reducers, etc.

Step 1. Add 50 lbs. for pressure testing to the maximum rating of the pipe. Multiply this figure by the appropriate value shown in the following table:

THRUST PER POUND OF WATER PRESSURE AT VARIOUS FITTINGS (LBS.)

Pipe Size	Dead End or Tee	90° Elbow	45° Elbow	22½° Elbow
4	19	27	15	7
6	39	55	30	15
8	67	94	51	26
10	109	154	84	43
12	155	218	119	61
14	210	296	161	82
15	238	335	183	93
16	272	383	209	106
18	351	494	269	137
20	434	611	333	169
21	474	668	364	185
24	623	878	478	244

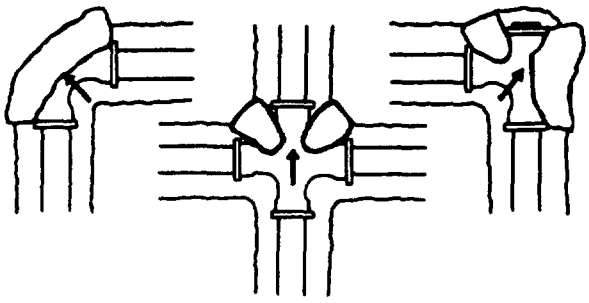
Step 2. Determine the bearing strength of the soil from the table below.

BEARING STRENGTH OF SOILS

Soils and Safe Bearing Loads	Lbs. Sq. Ft.
Sound Shale	10,000
Cemented Gravel and Sand difficult to pick	4,000
Coarse and fine compact Sand	3,000
Medium Clay — Can be spaded	2,000
Soft Clay	1,000
Muck	0

Step 3. Divide the total thrust obtained in Step 1 by the bearing strength of the soil, to determine the square feet of area required for the thrust block.

EXAMPLES OF THRUST BLOCKING



CERTAIN-TEED INSPECTION TESTS

HYDROSTATIC TEST

Each standard, random or short length of pipe, and each coupling sleeve is tested under an internal hydrostatic pressure as follows: Class 100 Irrigation, 350 psi; Class 150 Irrigation, 525 psi; Class 200 Irrigation, 700 psi. The specified test pressure is maintained for at least 5 sec. From each 300 standard lengths of pipe, of each size and class, one length is hydrostatically tested to a pressure of 400 psi for Class 100 Irrigation, 600 psi for Class 150 Irrigation, and 800 psi for Class 200 Irrigation.

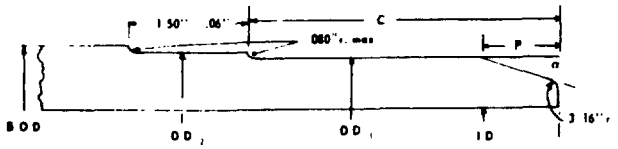
FLEXURAL TEST

Each standard length of pipe having a nominal diameter of 3, 4, 6, or 8 in. is tested in flexure for at least 5 sec. The supports are 12 ft. apart. The total load is divided equally and applied at the third points of the clear span.

CRUSHING TEST

From each 300 lengths of pipe, or fraction thereof, of each size and class when specifically requested, one length is selected by the inspector for a three-edge bearing test before shipment. From each selected length, one unmachined section of pipe one foot long is cut. This section is tested by the ASTM three-edge bearing method and must not fail until the total applied load exceeds the applicable value specified. The rate of loading is 2,000 pounds per minute per lineal foot, with a tolerance of plus or minus 500 pounds per minute per lineal foot.

FLUID-TITE® CG Pipe

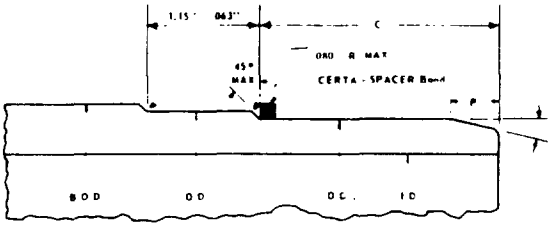


FLUID-TITE® CG Coupling

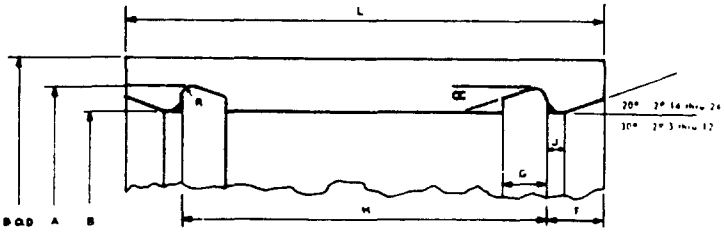


Nom. I.D."	B.O.D."*	O.D.$_1$ ±.02"	O.D.$_2$ ±.02"	C ±.06"	Nom. Size and Class	A ±.025"	B_1 ±.025"	B.O.D."*	L +.25" −.00"
6.00	7.16	6.91	7.07	2.40	6"-100	7.65	7.20	8.40	7.00
8.00	9.32	9.11	9.27	2.40	8"-100	9.85	9.40	10.80	7.00
10.00	11.46	11.24	11.40	2.40	10"-100	11.98	11.53	13.30	7.00
12.00	13.70	13.44	13.60	2.90	12"-100	14.18	13.73	15.55	8.00
13.60	15.36	15.07	15.23	3.25	14"-100	15.95	15.39	17.60	9.00
15.50	17.50	17.15	17.31	3.25	16"-100	18.03	17.47	19.80	9.00
5.80	7.12	6.91	7.07	2.40	6"-150	7.65	7.20	8.76	7.00
7.80	9.44	9.11	9.27	2.40	8"-150	9.85	9.40	11.32	7.00
10.00	11.85	11.66	11.82	2.40	10"-150	12.40	11.95	14.36	7.00
12.00	14.11	13.92	14.08	2.90	12"-150	14.66	14.21	17.00	8.00
14.00	16.41	16.22	16.38	3.25	14"-150	17.10	16.54	19.80	9.00
16.00	18.65	18.46	18.62	3.25	16"-150	19.34	18.78	22.28	9.00
5.70	7.36	6.91	7.07	2.40	6"-200	7.65	7.20	9.35	7.00
7.60	9.68	9.11	9.27	2.40	8"-200	9.85	9.40	12.00	7.00
9.60	11.88	11.66	11.82	2.40	10"-200	12.40	11.95	15.15	7.00
11.44	14.11	13.92	14.08	2.90	12"-200	14.66	14.21	17.90	8.00
13.60	16.44	16.22	16.38	3.25	14"-200	17.10	16.54	20.50	9.00
15.50	18.74	18.46	18.62	3.25	16"-200	19.34	18.78	23.20	9.00

FLUID-TITE® Pipe with CERTA-SPACER® Band



FLUID-TITE® Coupling



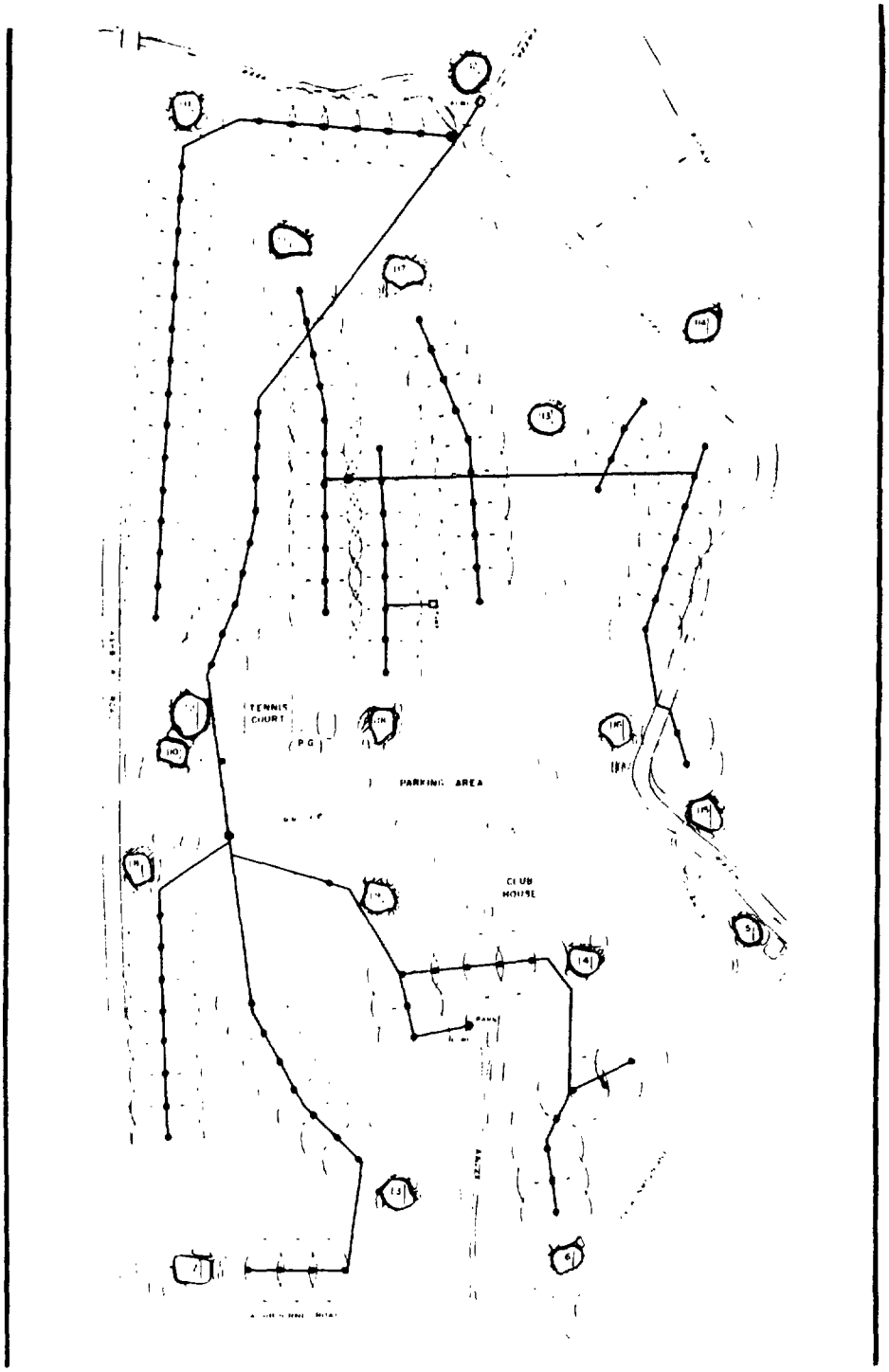
Nom. I.D."	O.D.$_1$ ± 02"	O.D.$_2$ ± 02"	C ±.06"	B.O.D."*	Nom. Size and Class	A** ±.025"	B** ±.025"	B.O.D."*	L +.25" −.00"
3.00	3.74	3.90	2.60	3.93	3"-100	4.57	3.850	5.35	6.25
4.00	4.64	4.80	2.90	5.02	4"-100	5.57	4.755	6.47	6.50
18.00	19.90 *	20.06 *	4.88	20.44	18"-100	21.20	20.080	23.40	11.10
20.00	22.12 *	22.28 *	4.88	22.50	20"-100	23.42	22.300	25.82	11.10
24.00	26.48 *	26.64 *	4.88	27.17	24"-100	27.78	26.660	30.60	11.10
3.00	3.84	4.00	2.60	4.03	3"-150	4.69	3.950	5.55	6.25
4.00	4.81	4.97	2.90	5.14	4"-150	5.74	4.925	6.66	6.50
18.00	20.94 *	21.10 *	4.88	21.20	18"-150	22.24	21.120	25.33	11.10
20.00	23.28 *	23.44 *	4.88	23.54	20"-150	24.58	23.460	27.97	11.10
24.00	27.96 *	28.12 *	4.88	28.22	24"-150	29.26	28.140	33.44	11.10
3.00	3.84	4.00	2.60	4.18	3"-200	4.69	3.950	5.75	6.25
3.93	4.81	4.97	2.90	5.32	4"-200	5.74	4.925	6.94	6.50

*Subject to Manufacturing Tolerances. ** A and B Tolerances for 18", 20" and 24": ±.040".

To better service your requirements, please contact your local Certain-teed Sales Agent or Certain-teed Sales Representative for availability.

HEAT CONTROL & FROST CONTROL

Today, new installations of Certain-teed Asbestos-Cement Pipe are providing priceless protection against heat and frost damage to crops. It has been scientifically proved that moisture, sprayed into the air through these systems, protects against frost damage on cold days and cools and shields crops against heat on hot days. Added to this scientific proof are many "success stories" reported to Certain-teed by owners of orchards (grapes, oranges, apples) and farms (beans, tomatoes, cotton, sorghum, wheat).



EXPERT ASSISTANCE ON INSTALLATION TECHNIQUES

CERTAIN

Pipe and Plastics Group

CERTAIN-TEED PRODUCTS CORPORATION, Valley Forge, PA 19481

AP-60-HH 6-71 Rev.