PLAINTIFF'S EXHIBIT

CT-1624

TECHNICAL SPECIFICATIONS

CertainTeed

CertainTeed Corporation
Pipe and Plastics Group

SPECIFICATIONS CLASSIFICATION: A/C Standard Product Specification		
T.C.O. REF. NO. 17	SPECIFICATION NO: 4A	PAGE NO.: I
SUPERSEDES: May 31, 1977	DATE OF ISSUE: MAY 17 1979	

DESCRIPTION:

AGRI-PERM Pipe for Agricultural Irrigation Systems

- INDEX -

Item	Page
General	1
General Product Description	1
Conformance	1
Physical Requirements	
Hydrostatic Strength	2
Flexural Strength	2
Crushing Strength	2 & 3
Standard Coupling	3
Rubber Rings	3
Lubricant	4
Packaging	4
Marking	4 & 5
Standard Pipe	6
Standard Coupling	6
Fully Machined	7
Direct Tap Couplings 3" & 4"	8
Threaded Brass Insert Couplings	9 & 10
End Cap	11
Tapped Couplings 2½" x 2" NPT Hexagonal Bushing	12
Coupling Adaptor A/C to Steel or Plastic	13
Coupling Reducer CG to CG	14
Elbows	15
Tee Fittings	16 & 17
Alfalfa Tee Fittings	18

CTD015361

PREPARED BY:	APPROVED BY:	R & D	MFG.	SALES	I.E.	OTHERS

TECHNICAL SPECIFICATIONS

CertainTeed

CertainTeed Corporation
Pipe and Plastics Group

SPECIFICATIONS CLASSIFICATION: A/C Standard Product Specification		
T.C.O. REF. NO. 17	SPECIFICATION NO: 4 A	PAGE NO.: 1
SUPERSEDES: November 14, 1978		DATE OF ISSUE: MAY 17 1979

DESCRIPTION:

AGRI-PERM Pipe for Agricultural Irrigation Systems

1.0 GENERAL

The asbestos cement pipe described herein is designed for use in irrigation supply lines and distribution systems. Agri-Perm irrigation pipe is available in Type 25 in the following pipe sizes 6", 8", 10", 12", 14", 15", 16", 18", 20", 21" and 24".

The official line is 6" thru 16" Type 25. The rest of the sizes are being included for dimensional information and testing requirements. These additional sizes are non-inventoried items.

2.0 GENERAL PRODUCT DESCRIPTION

Unless otherwise listed herein, refer to "General Product Specification Data", Section D of the General Standards Manual, for information concerning the following:

1. Composition
2. Trademarks
3. Test Methods
4. General Requirements
   a. Pipe length
   b. Lubricant
   c. Marking
   d. Installation Instructions
   e. Finish
   f. Straightness
   g. Leakage Allowance

All A/C Irrigation Sewer pipe and couplings shall be completely free of loose or hanging A/C chips in the interior. Machined outer surfaces of all pipe (regardless of length), fittings, and adaptors shall be free of hanging machined trim (lace curtains).

The interior corner of the pipe nose shall be free of all loose or hanging chips. The approved method for cleaning the pipe interior nose is to use the I.D. bevel tool to break this corner.

3.0 CONFORMANCE

The Agri-Perm Irrigation Product line will meet the requirements of latest issue of:

U.S. Department of Agriculture Soil Conservation Service Guide 430-BB.

Note: Individual State soil conservation specifications are based on the National Specification. Agri-Perm pipe will also conform to these specifications. State specifications may specify the type chemical resistance required and modifications to marking.

CTD015362

PREPARED BY:	APPROVED BY:	R & D	MFG.	SALES	I.E.	OTHERS
DBN	mds					

4.0 CHEMICAL REQUIREMENTS

Uncombined Calcium Hydroxide - 1.0 per cent maximum

5.0 PHYSICAL REQUIREMENTS

5.1 Hydrostatic Strength

Each standard random and short length MEO and FM and each coupling, shall be subjected to an internal hydrostatic test as shown in the following Table:

Pipe Designation	Applied Hydrostatic Proof Test, psi
Type 25	75

Tapped Couplings, Coupling Adaptors, Reducers, and End Caps shall also be capable of meeting this test.

5.2 Flexural Strength

Each standard 13 foot length of pipe in sizes 6 and 8 inch shall be tested for flexural strength in accordance with the following table when tested in accordance with ASTM C500.

FLEXURAL PROOF LOADS
Total Applied Load, Lbs. 12 ft. Span

Nominal Pipe Size Inches	Type 25
6	975
8	1875

5.3 Crush Requirements

A one foot unmachined sample shall be taken from a pipe in each size and class for each 300 lengths or portion thereof per shift of manufacturing for this test. The test shall be performed in accordance with ASTM C500.

Each coupling and fitting stock shall meet the same requirements as the pipe.

Fully Machined Pipe and Threaded Couplings shall withstand 75 percent of the minimum crushing strength specified for the corresponding size of pipe.

TECHNICAL SPECIFICATIONS

CertainTeed

CertainTeed Corporation
Pipe and Plastics Group

SPECIFICATIONS CLASSIFICATION: A/C Standard Product Specification		
T.C.O. REF. NO. 17	SPECIFICATION NO: 4A	PAGE NO.: 3
SUPERSEDES: January 16, 1978	DATE OF ISSUE: MAY 17 1979	

DESCRIPTION:

AGRI-PERM Pipe for Agricultural Irrigation Systems

MINIMUM CRUSHING STRENGTH LBS./FT.

Nominal Pipe Size Inches	Type 25
6	1000
8	1300
10	1500
12	1500
14	1500
15	1500
16	1500
18	1800
20	2000
21	2400
24	2400

6.0 STANDARD COUPLING

One coupling suitable for the particular size and class of pipe with which it is to be used shall be attached to each standard and random length and shipped as a prebelled unit. Other couplings for use with includes shall be shipped loose.

7.0 B.O.D. CONTROL

All B.O.D.'s in this specification are called out as minimums. Costs are based on a B.O.D. + .04" over the minimum and it is intended that the costs will prevent excessive B.O.D.'s.

8.0 RUBBER RINGS

Two CG rubber rings shall be furnished with each coupling. The rubber rings shall meet the requirements of the latest issue of ASTM D1869 and P&PG Purchasing Specification No. 507. Rubber rings shall be composed of natural rubber, synthetic elastomer, or when specifically requested, an oil resistant compound. Rubber rings are to be shipped in cartons and properly identified.

CTD015364

PREPARED BY:	APPROVED BY:	R & D	MFG.	SALES	I.E.	OTHERS

9.0 LUBRICANT

Field lubricant shall be furnished in 1¼ quart cans in accordance with the following table. Five (5) gallon pails may be substituted on special customer order.

Pipe Size Inches	Joints Per 1¼ qt. Container All Classes	Joints per 5 Gal. Pails All Classes
6	70	955
8	50	725
10	40	545
12	25	415
14	20	280
15	20	270
16	19	260
18	12	170
20	11	155
21	11	145
24	10	135

10.0 PACKAGING

Packaging shall be in accordance with Standard Packaging Specification No. 4A.

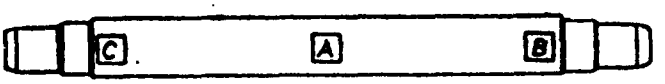
11.0 MARKING

Marking ink shall conform to P&PG Standard Purchasing Specification No. 502.

Color Code:

Use Standard Black ink for Areas (A, B, & C)

Standard Pipe



AREA A At the exact center of the pipe, the following shall be stamped.

CERTAINTEED
(Size) TYPE 25 IRR. TYPE II
AGRI - PERM

CTD015365

TECHNICAL SPECIFICATIONS

CertainTeed

CertainTeed Corporation
Pipe and Plastics Group

SPECIFICATIONS CLASSIFICATION: A/C Standard Product Specification		
T.C.O. REF. NO. 17	SPECIFICATION NO: 4A	PAGE NO.: 5
SUPERSEDES: January 16, 1978	DATE OF ISSUE: MAY 17 1979	

DESCRIPTION:

AGRI-PERM Pipe for Agricultural Irrigation Systems

AREA B

Identification Markings: First line - Month, Day, Year, Plant, Shift Example 03087758C
Second line - Pipe No. 259

AREA C

TYPE 25 Mark Maximum Working Pressure 25 PSI T

Coupling At the approximate center around the coupling.

CERTAINTEED
(Size) TYPE 25 T
AGRI-PERM

T - indicates Coupling has been hydrostatically tested.

Example:

CERTAINTEED
6" TYPE 25 T
AGRI-PERM

Pre-Belled The plant number shall be stamped in black ink on the Coupling B.O.D. and stamped on the pipe O.D. shoulder near to where the coupling is stamped. Stamp to be 1 inch minimum.

Fully Machined (FM) At the approximate center of the pipe, the following shall appear:

CERTAINTEED
(Size) TYPE 25 TYPE II
AGRI-PERM

Example:

CERTAINTEED
6" TYPE 25 TYPE II
AGRI-PERM

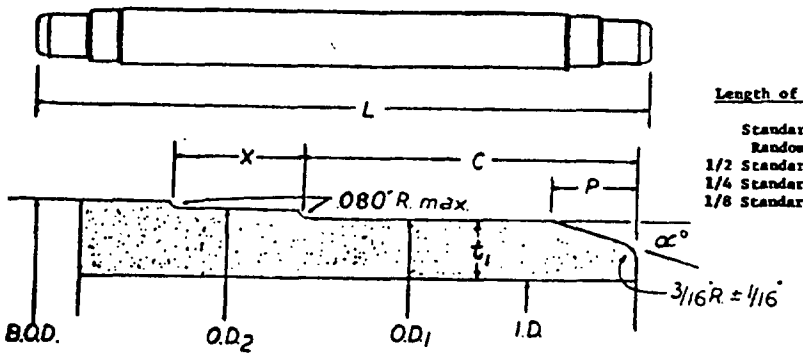
In addition, the following shall appear:

1st line: FM tested at _____psi.
2nd line: Company Code.
Example: FM Tested at 300 psi.
03087758C

CTD015366

PREPARED BY:	APPROVED BY:	R & D	MFG.	SALES	I.E.	OTHERS
LBN	MPR					

STANDARD PIPE



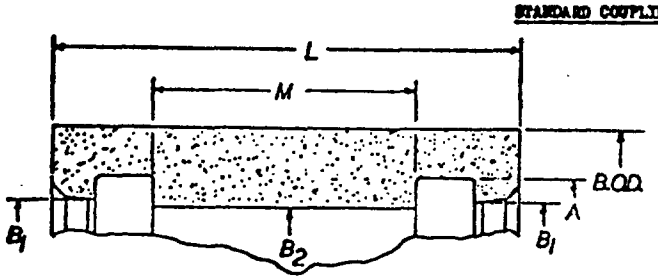
Length of Pipe	L'	Length Tol."
Standard	13'	+0" -1"
Random	7'0" to 12'6" (6" increments)	+0" -1"
1/2 Standard (MEO)	6'6"	+0" -1"
1/4 Standard (MEO)	3'3"	+0" -1"
1/8 Standard (MEO)	19.5" (Sizes 6" thru 12" only)	±0.5"

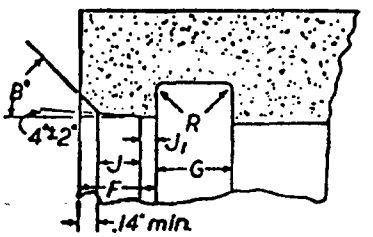
Dimensions

Pipe Size, Inches	I.D." Nom.	OD_1" *	OD_2" *	C" +0.06"	P" +0.06"	αC° ± 2°	X" +0.06"	B.O.D." Min.	t_1" Min.
Type 25									
6	6.00	6.69	6.85	2.40	.750	16	1.50	6.94	.345
8	8.00	8.80	8.96	2.40	.750	16	1.50	9.05	.270
10	10.00	10.89	11.05	2.40	.750	16	1.50	11.14	.300
12	12.00	12.99	13.15	2.90	1.000	16	1.50	13.24	.330
14	14.00	15.07	15.23	3.25	1.000	18	1.50	15.35	.360
15	15.00	16.11	16.27	3.25	1.000	18	1.50	16.39	.390
16	16.00	17.15	17.31	3.25	1.000	18	1.50	17.43	.410
18	18.00	19.23	19.39	3.75	1.000	20	1.50	19.54	.440
20	20.00	21.29	21.45	3.75	1.000	20	1.50	21.60	.480
21	21.00	22.37	22.53	3.75	1.000	20	1.50	22.68	.520
24	24.00	25.51	25.67	3.75	1.000	20	1.50	25.82	.560

* Tolerance $O.D._1$ and $O.D._2$ 6" through 16" ±.02".
18" through 24" ±.03".

STANDARD COUPLING





Coupling Size, Inches	A" *	B_1" *	B_2" *	C" +0.03" -0.01"	J" +0.00" -0.04"	J_1" +0.02" -0.00	F" Min.	R" +0.032" -0.000"	M" +0.00" -0.06"	L" +0.063"	B.O.D." Min.
Type 25											
6	7.43	6.98	6.81	1.00	.42	.18	.76	.093	3.40	7.00	7.95
8	9.54	9.09	8.92	.92	.42	.18	.76	.093	3.50	7.00	10.40
10	11.63	11.18	11.01	.92	.42	.18	.76	.093	3.50	7.00	12.50
12	13.73	13.28	13.11	.92	.42	.18	.76	.093	4.50	8.00	14.70
14	15.95	15.39	15.20	1.00	.42	.25	.83	.093	5.20	9.00	16.90
15	16.99	16.43	16.24	1.00	.42	.25	.83	.093	5.20	9.00	18.40
16	18.03	17.47	17.28	1.00	.42	.25	.83	.093	5.20	9.00	19.31
18	20.11	19.54	19.36	1.00	.42	.25	.83	.093	6.20	10.00	21.45
20	22.17	21.61	21.42	1.00	.42	.25	.83	.093	6.20	10.00	23.62
21	23.25	22.69	22.50	1.00	.42	.25	.83	.093	6.20	10.00	24.85
24	26.39	25.83	25.64	1.00	.42	.25	.83	.093	6.20	10.00	28.09

* Tolerance A, B_1 and B_2 6" through 16" ±.025".
18" through 24" ±.040".

CTD015367

TECHNICAL SPECIFICATIONS

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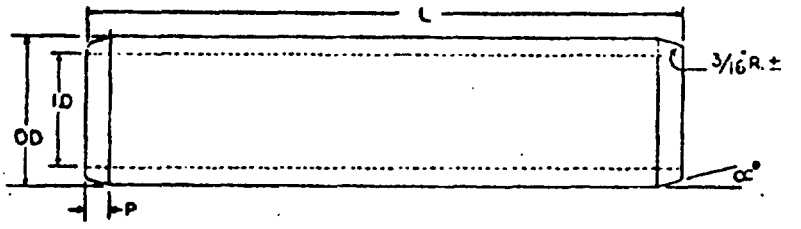
CertainTeed Corporation
Pipe and Plastics Group

SPECIFICATIONS CLASSIFICATION: A/C Standard Product Specification		
T.C.O. REF. NO. 17	SPECIFICATION NO: 4A	PAGE NO.: 7
SUPERSEDES: January 16, 1978	DATE OF ISSUE: MAY 17 1979	

DESCRIPTION:

AGRI-PERM Pipe for Agricultural Irrigation Systems

FULLY MACHINED PIPE (FM)



Pipe Size	P" ±0.06"	oc° ± 2°
6" through 12"	1.00	16
14" through 16"	1.00	18
18" through 24"	1.00	22

Pipe Size	L Std. Half +0" -1"	Std. Quarter +0" -1"	Std. Eighth ± 0.5"
6" thru 12"	6' 6"	3' 3"	19.5"
14" thru 16"	6' 6"	3' 3"	---
18" thru 24"	6' 6"	3' 3"	---

Pipe Size, Inches	I.D." Nom.	OD " *
Type 25		
6	6.00	6.69
8	8.00	8.80
10	10.00	10.89
12	12.00	12.99
14	14.00	15.07
15	15.00	16.11
16	16.00	17.15
18	18.00	19.23
20	20.00	21.29
21	21.00	22.37
24	24.00	25.51

CTD015368

* Tolerance
Center O.D. 6" through 16" ±0.025"
18" through 24" ±0.035"
End O.D. 6" through 16" ±0.020"
18" through 24" ±0.030"
Measured 6" in on both ends.

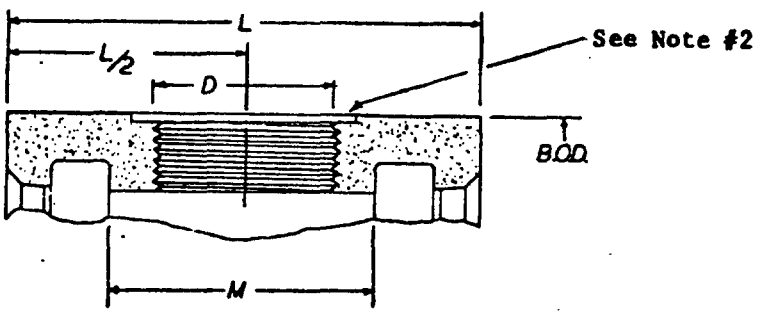
At Plant 57 the following tolerance is effective to allow for gang tooling.

00125" Tolerance - 6" through 16" Center O.D. ±0.025"
End O.D. ±0.020"
18" through 24" Center O.D. ±0.035"
End O.D. ±0.030"

In addition, there cannot be a step greater than 0.025" (0.0125" on a side).

PREPARED BY:	APPROVED BY:	R & D	MFG.	SALES	I.E.	OTHERS

Type 25, 3" and 4" Direct Tap Couplings



Drill Size for 3" Direct Tap Coupling = 3.25"
Drill Size for 4" Direct Tap Coupling = 4.25"

Marking Example:

CERTAINTEED
(3" or 4") DIRECT TAP CPLG
(Size) TYPE 25
AGRI-PERM

B.O.D." Min.

Size" Class	6	8	10	12	14	15	16	18	20	21	24
25	9.40	11.27	13.83	16.19	18.63	19.83	20.95	23.13	25.46	26.72	30.15

L" ± 0.06"

Size" Class	6	8	10	12	14	15	16	18	20	21	24
25	11.50	11.50	11.50	12.50	13.50	13.50	13.50	14.50	14.50	14.50	14.50

M" +0.00" -0.06"

Size" Class	6	8	10	12	14	15	16	18	20	21	24
25	8.00	8.00	8.00	9.00	9.70	9.70	9.70	10.70	10.70	10.70	10.70

Notes:
1. For dimensions not shown, refer to Standard Coupling dimensions
2. Counter bore each tap to a depth that allows the first full thread engagement. Use a 3.5" counter bore for a 3" tap, and a 4.5" counter bore for a 4" tap.
3. Use NPT (IPT) threads.

CTD015369

TECHNICAL SPECIFICATIONS

CertainTeed

CertainTeed Corporation
Pipe and Plastics Group

SPECIFICATIONS CLASSIFICATION: A/C Standard Product Specification		
T.C.O. REF. NO. 17	SPECIFICATION NO: 4A	PAGE NO.: 9
SUPERSEDES: May 31, 1977	DATE OF ISSUE: MAY 17 1979	

DESCRIPTION:

AGRI-PERM Pipe for Agricultural Irrigation Systems

THREADED BRASS INSERT COUPLINGS (TBIC)

USE

To provide a means for making service connections in asbestos cement pressure pipe systems where either NPT or AWWA threads are employed.

PHYSICAL REQUIREMENTS:

All inserts shall be cemented in place with an epoxy adhesive. The workmanship shall be such that there is no evidence of voids or holes, and there shall be no sharp protrusions of the cement on any of its surfaces. The rubber O-ring shall not be placed on the insert until the insert is ready to be cemented in place.

Coupling shall be hydrostatically tested prior to drilling and cementing the insert into position and shall meet the requirements of the standard coupling. It is also intended that couplings shall be able to withstand the specific hydrostatic pressure after the inserts have been secured.

RUBBER RINGS:

Each coupling shall be supplied with two (2) CG Rubber Rings of the appropriate size and class. Oil resistant rings will be supplied when specified by the purchaser.

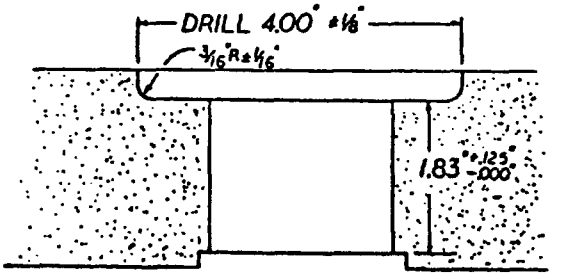
PLASTIC CLOSURES:

Prior to insertion, storage and/or shipment, each insert shall be covered with a plastic closure to prevent damage to the brass threads. Plastic closures are defined in Standard Purchasing Specification No. 525.

BRASS INSERTS:

Threaded Brass Inserts and Bushings shall meet the requirements of Purchasing Specifications 523A and 562. Threaded Brass Inserts are available in 3/4" and 1" AWWA "A" and "B" lengths, 3/4" NPT, 1" NPT in "A" and "B" lengths, 1½" NPT in "A", "B" and "C" lengths. In the cases marked ①, a 1½" NPT insert shall be used and bushed down, if necessary, to the proper size.

In the cases marked ②, the coupling shall be counterbored, as shown below, to allow for proper joining of the Corporation Stop. A "C" length 1½" NPT insert shall be used and bushed down, if necessary.



CTD015370

PREPARED BY:	APPROVED BY:	R & D	MFG.	SALES	I.E.	OTHERS
DAH	MLS					

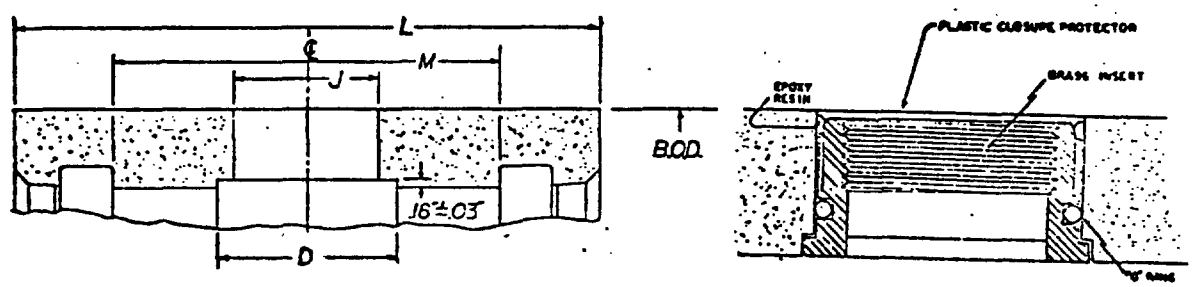
MARKING

Insert size is to be stenciled near the insert. Example: 1½" NPT. Other marking as shown.

Notes:
1. For machining dimensions not shown refer to standard CG Pipe and Coupling in the specification.
2. TBIC's are available in any combination of listed inserts and coupling sizes.
3. TBIPA's are available in any combination of listed inserts and pipe sizes.
4. Double outlet - Inserts are to be located 180° apart.
5. Protrusions shall be filleted with epoxy.
6. "J" diameter to be centered on "D".
7. Rubber "O" rings per Standard Purchasing Specification No. 524.

PROCEDURE FOR USE OF BUSHINGS

Use normal cleaning procedure for inserts and bushings (degreasing). After shaking the bottle as directed on the label, apply Loc-tite #262 to the second full thread of the bushing, filling the thread nearly full all the way around. Screw the bushing into the insert and tighten immediately to about 60-80 foot pounds. If Loc-tite oozes outside the fitting in any noticeable amount, use less. Allow 24 hours to cure.



Note: For dimensions not shown, refer to Standard Coupling Dimensions.

Class Size	M" +.00" -.06"	L" ± 0.06"	B.O.D." Min.	Insert Length
6	5.00	8.50	8.20	A
8	5.00	8.50	10.75	A
10	5.00	8.50	13.05	A
12	6.00	9.50	15.38	A

Insert Size	J" ± .01"	D" ± .03"
3/4" NPT	1.335	2.56
1" NPT	1.635	2.56
1¼" NPT *		
1½" NPT	2.240	2.56
3/4" AWWA	1.635	2.56
1" AWWA	1.885	2.56

Marking:

CERTAINTEED
TBIC
(Size) TYPE 25
AGRI-PERM

* 1¼" NPT - Use 1½" NPT and bush down to 1¼" NPT. Bushings per Spec 562.

TECHNICAL SPECIFICATIONS

CertainTeed

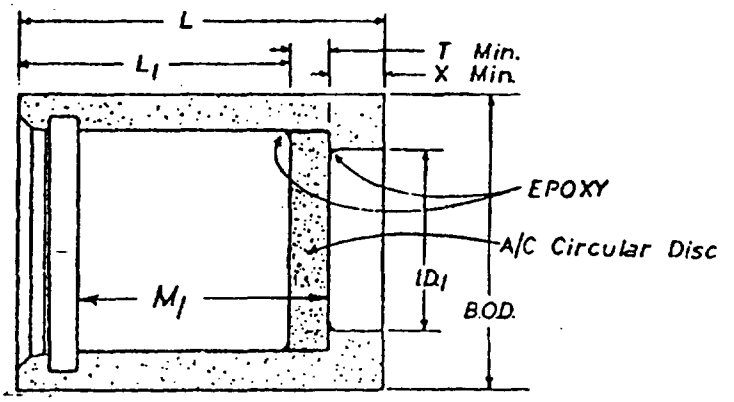
CertainTeed Corporation
Pipe and Plastics Group

SPECIFICATIONS CLASSIFICATION: A/C Standard Product Specification		
T.C.O. REF. NO.: 17	SPECIFICATION NO: 4A	PAGE NO.: 11
SUPERSEDES: June 19, 1978	DATE OF ISSUE: MAY 17 1979	

DESCRIPTION:

AGRI-PERM Pipe for Agricultural Irrigation Systems

End CAP



Refer to standard coupling this specification for machining dimensions not shown.

Dimensions

Pipe Size, Inches	Type	Nom. I.D.,"	B.O.D." Min.	L_1" ±.063"	L" ±.063"	X" Min.	M_1" +.00" -.06"	A/C Circular Disc T" Min.	A/C Circular Disc Dia.
6	25	6.00	7.95	3.50	4.50	.50	2.20	.50	6.65
8	25	8.00	10.40	3.50	4.50	.50	2.25	.50	8.79
10	25	10.00	12.50	3.50	4.50	.50	2.25	.50	10.90
12	25	12.00	14.70	4.00	5.25	.625	2.88	.625	13.00

Marking:

CERTAINTEED
END CAP
(Size) Type 25
AGRI-PERM

CTD015372

PREPARED BY:	APPROVED BY:	R & D	MFG.	SALES	I.E.	OTHERS

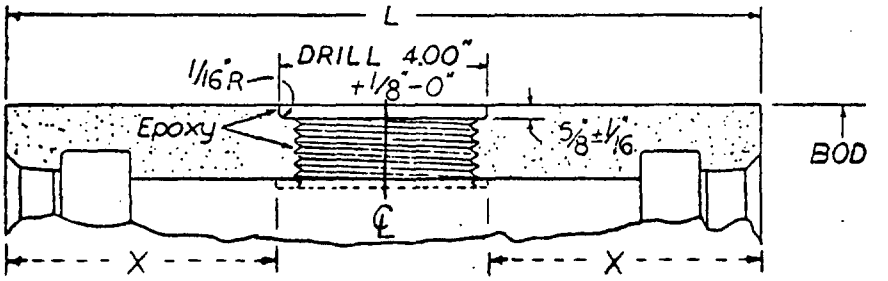
TAPPED COUPLING WITH 2½" x 2" HEXAGONAL BUSHING

Physical Requirements

Coupling shall be hydrostatically tested prior to drilling and tapping and shall meet the requirements of the standard coupling. It is also intended that couplings shall be able to withstand the specified hydrostatic pressure after the bushing has been secured.

Rubber Rings

Each coupling shall be supplied with two (2) rubber rings of the appropriate size and class. Oil resistant rings will be supplied when specified by the purchaser.



Marking:

CERTAINTEED
(Size) TYPE 25
2" NPT TAPPED CPLG
AGRI-PERM

Note: It is not essential that the coupling be machined on the entire I.D. The dotted line above shows an acceptable machining alternative. X" ± .125" for all classes 6" - 10" = 3.50", 12" = 4.00", 14" - 16" = 4.50", 18" - 24" = 5.00".

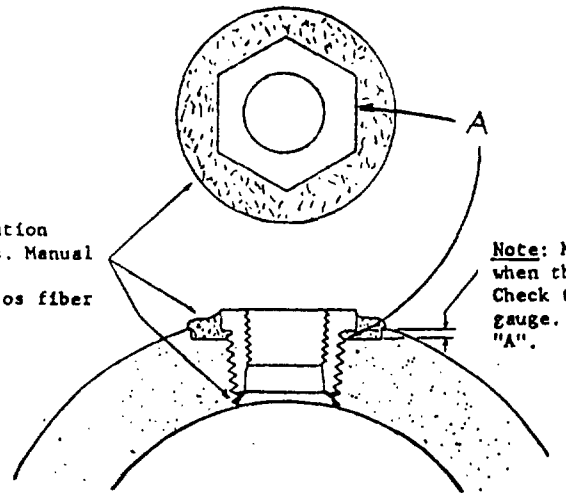
L" = 15.00" + .25" - .00" for all sizes

For dimensions not shown refer to standard coupling pages.

Class Size	B.O.D" Min.
6	9.25
8	11.50
10	13.90
12	16.25
14	18.60
15	19.80
16	20.20
18	23.00
20	25.40
21	26.70
24	30.10

2½" x 2" Hexagonal Bushing may be manufactured in:

a. Galvanized Iron
b. Brass
c. Malleable Iron
d. Stainless Steel



Epoxy Formulation Per Gen. Stds. Manual Section "0". Use no asbestos fiber filler.

Note: Must have clearance when thread is tight. Check threads with go/no-go gauge. Check visually at "A".

CTD015373

TECHNICAL SPECIFICATIONS

CertainTeed

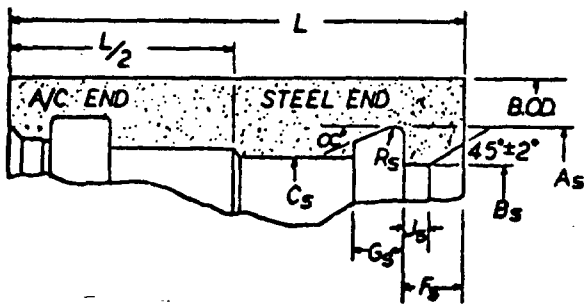
CertainTeed Corporation
Pipe and Plastics Group

SPECIFICATIONS CLASSIFICATION: A/C Standard Product Specification		
T.C.O. REF. NO.: 17	SPECIFICATION NO.: 4A	PAGE NO.: 13
SUPERSEDES: January 17, 1978	DATE OF ISSUE: MAY 17 1979	

DESCRIPTION:

AGRI-PERM Pipe for Agricultural Irrigation Systems

Type 25 Coupling Adaptor - Agri-Perm to Steel or Plastic



Marking:

CERTAINTEED
(Size) TYPE 25
CPLG ADPT A/C TO STEEL
AGRI-PERM

STEEL PIPE END or PLASTIC PIPE END — Located at the adaptor end where the steel or plastic pipe is to be inserted.

Dimensions

Adaptor Size, In.	Type and Class	Steel or Plastic Size In.	Steel or Plastic O.D.	OC° ±2°	C_s" +.01" -.01"	F_s" Min.	J_s" +.03" -.00"	R_s" ±.010"	A_s" ±.025"	B_s" ±.025"	C_s" ±.025"	L" ±.06"	B.O.D." Min.
6	All	4	4.500	13	.70	.812	.25	.125	5.52	4.56	4.63	7.00	8.18
6	All	6	6.625	13	.63	.50	.35	.200	7.31	6.69	6.77	7.00	8.18
8	All	6	6.625	13	.63	.50	.35	.200	7.31	6.69	6.77	7.00	10.50
8	All	8	8.625	16	.63	.62	.50	.200	9.40	8.69	8.78	7.00	10.50
10	All	10	10.750	16	.63	.62	.50	.200	11.55	10.81	10.91	7.00	12.50
12	All	12	12.750	16	.63	.62	.50	.200	13.55	12.81	12.92	8.00	14.70

Rubber Rings

Each coupling adaptor shall be supplied with two (2) rubber rings. The ring for the A/C end shall be of CO design of the proper size and class. The ring for the steel end shall be as shown below:

Coupling Size In.	Steel End Ring to be supplied.
6 x 4	4" Class 100 FLUID-TITE - Std. Purchasing Spec.No.503-B
6 x 6	6" CAS ring per Std. Purchasing Spec. No.531
8 x 6	6" CAS ring per Std. Purchasing Spec. No. 531
8 x 8	8" Sewer ring per Std. Purchasing Spec. No. 531
10 x 10	10" Sewer ring per Std. Purchasing Spec. No. 531
12 x 12	12" Sewer ring per Std. Purchasing Spec. No. 531

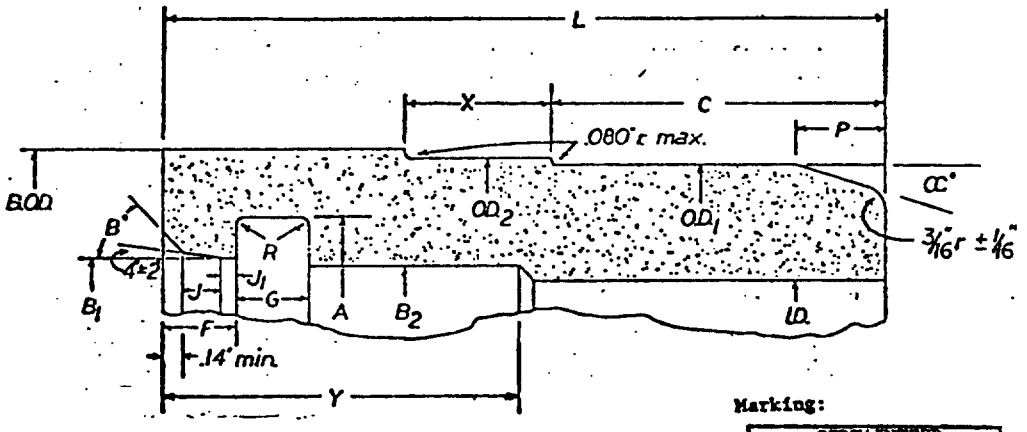
* Oil resistant rings will be supplied when specified by the customer.

Note: 1. For dimensions not shown, refer to standard coupling dimensions, this specification.
2. For excessively oval steel pipe, field re-working of the B_s to the C_s dimension is permitted.

CTD015374

PREPARED BY:	APPROVED BY:	R & D	MFG.	SALES	I.E.	OTHERS
JBY	MRS					

Type 25 Coupling Reducer



Marking:

CERTAINTEED
CRD CLASS
(Size) TYPE 25
AGRI-PERM

Reducer Size, In. Type 25	Nominal I.D."	Y" ± .13"	L" ± .063"	B.O.D." Min.
8 to 6	6.60	3.50	6.50	9.26
10 to 8	8.70	3.50	6.50	11.18
12 to 10	10.60	3.50	7.00	13.27
14 to 12	12.70	4.00	7.75	15.44
15 to 14	14.90	4.50	8.00	17.60
16 to 14	14.90	4.50	8.00	17.94
16 to 15	15.90	4.50	8.00	18.40
18 to 16	16.80	4.50	9.00	19.80
20 to 18	19.00	5.00	10.00	21.77
21 to 20	21.00	5.00	10.00	24.01
24 to 21	21.80	5.00	10.00	26.08

Note: A) For machining dimensions not shown refer to standard pipe and coupling this specification.
B) I.D. subject to manufacturing tolerances, machining of I.D. not required on pipe side.
C) Physical Requirements - Coupling Reducer shall be designed to meet the hydrostatic test requirements of Type 25.
D) Rubber Ring - Each Coupling Reducer shall be supplied with one (1) FLUID-TITE CG rubber ring of the appropriate size.

Oil resistant rings will be supplied when specified by the customer.

TECHNICAL SPECIFICATIONS

CertainTeed

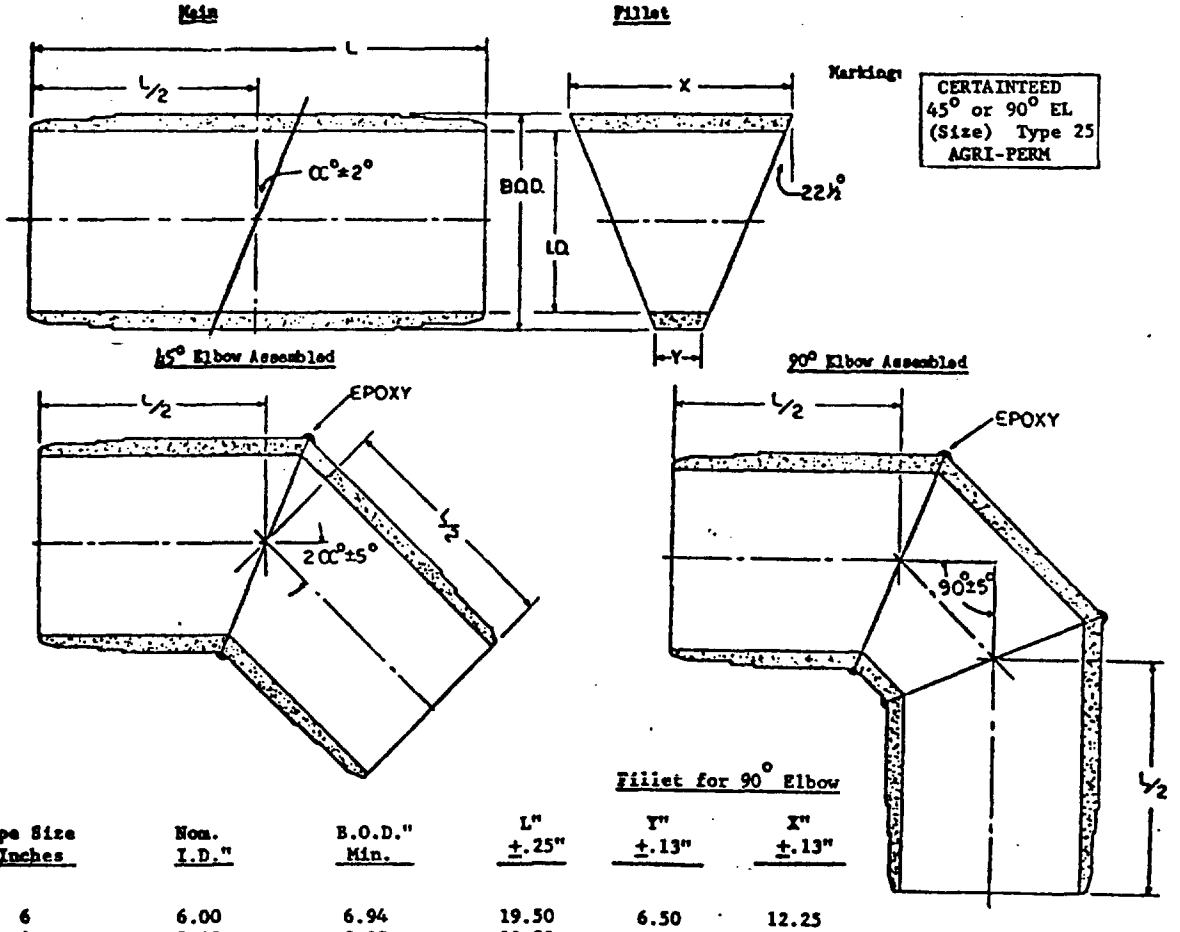
CertainTeed Corporation
Pipe and Plastics Group

SPECIFICATIONS CLASSIFICATION: A/C Standard Product Specification		
T.C.O. REF. NO.: 17	SPECIFICATION NO.: 4A	PAGE NO.: 15
SUPERSEDES: May 31, 1977	DATE OF ISSUE: MAY 17 1979	

DESCRIPTION:

AGRI-PERM Pipe for Agricultural Irrigation Systems

45° and 90° Elbows



Pipe Size Inches	Nom. I.D."	B.O.D." Min.	L" ±.25"	Y" ±.13"	X" ±.13"
6	6.00	6.94	19.50	6.50	12.25
8	8.00	9.05	19.50	5.75	13.25
10	10.00	11.14	19.50	4.75	14.00
12	12.00	13.24	19.50	4.00	15.00
14	14.00	15.35	19.50	3.25	16.00
15	15.00	16.39	19.50	2.50	16.25
16	16.00	17.43	19.50	2.00	16.50
18	18.00	19.54	39.00	10.50	26.75
20	20.00	21.60	39.00	9.25	27.25
21	21.00	22.68	39.00	8.75	27.75
24	24.00	25.82	39.00	7.25	28.70

All Pipe Sizes Types 25	α°	2α°
45° Elbow	22½	45
90° Elbow	22½	45

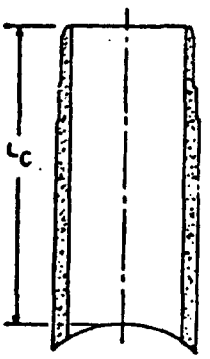
Note: 1. Refer to Standard Pipe for machining dimensions not shown, this specification.
2. Epoxy all adjoining surfaces. Remove excess on inside for smooth surfaces.
3. For fabrication of 90° elbows, add fillet to center of 45° elbow.
4. Epoxy fillet on all outside adjoining surfaces.

CTD015376

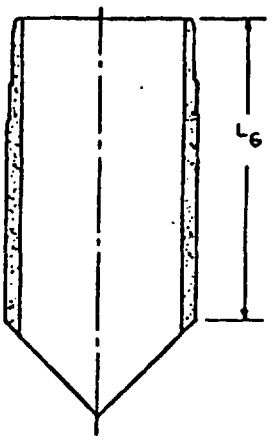
PREPARED BY:	APPROVED BY:	R & D	MFG.	SALES	I.E.	OTHERS

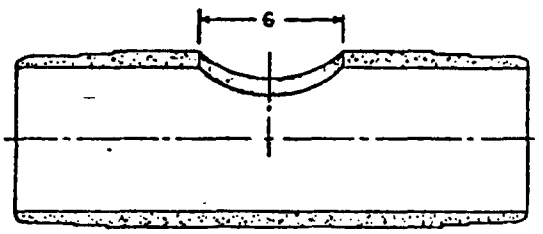
Type 25
Tee Fittings

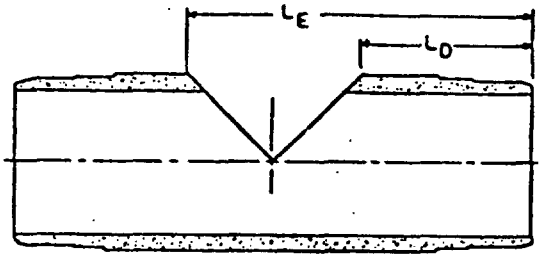
Reducing

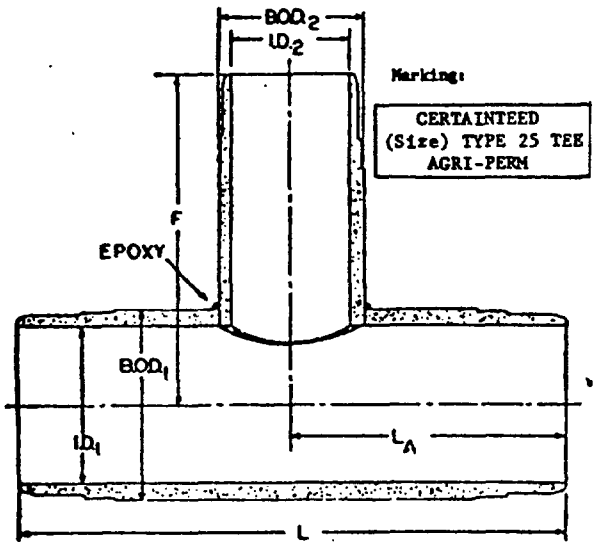


Non-Reducing









Marking:

CERTAINTEED
(Size) TYPE 25 TEE
AGRI-PERM

Main Pipe Size, In. Type 25	Nom. I.D."	B.O.D." Min.
6 x 6	6.00	6.94
8 x 8	8.00	9.05
10 x 10	10.00	11.14
12 x 12	12.00	13.24
14 x 14	14.00	15.35
15 x 15	15.00	16.39
16 x 16	16.00	17.43
18 x 18	18.00	19.54
20 x 20	20.00	21.60
21 x 21	21.00	22.68
24 x 24	24.00	25.82

Branch Pipe Size, In. Type 25	Nom. I.D."	B.O.D." Min.
6	6.00	6.94
8	8.00	9.05
10	10.00	11.14
12	12.00	13.24
14	14.00	15.35
15	15.00	16.39
16	16.00	17.43
18	18.00	19.54
20	20.00	21.60
21	21.00	22.68
24	24.00	25.82

For 6" through 16" pipe machining dimensions refer to standard Pipe, Type 25.

Non-Reducing

Tee Size In.	L_A"	I_D"$^{+.00"}_{-.06"}$	L_E"$^{+.06"}_{-.00"}$	L_G"$\pm$.06"	F"
6x 6x 6	10.75	7.23	14.27	7.23	10.75
8x 8x 8	12.00	7.44	16.56	7.44	12.00
10x10x10	13.00	7.46	18.54	7.46	13.00
12x12x12	14.50	7.91	21.09	7.91	14.50
14x14x14	16.75	8.56	23.94	8.31	16.00
15x15x15	17.00	8.61	25.39	8.61	17.00
16x16x16	17.25	8.49	26.01	8.49	17.25
18x18x18	19.25	9.43	29.09	9.57	19.50
20x20x20	20.50	9.60	31.40	9.61	20.50
21x21x21	21.75	9.85	32.95	9.72	21.75
24x24x24	22.75	9.71	35.79	9.70	22.75

G" Refer to Central Engineering Dwg. 9641

CTD015377

TECHNICAL SPECIFICATIONS

CertainTeed

CertainTeed Corporation
Pipe and Plastics Group

SPECIFICATIONS CLASSIFICATION: A/C Standard Product Specification

T.C.O. REF. NO.	SPECIFICATION NO:	PAGE NO.:
17	4A	17

SUPERSEDES: May 31, 1977

DATE OF ISSUE: MAY 17 1979

DESCRIPTION:

AGRI-PERM Pipe for Agricultural Irrigation Systems

L = Length + 0" - 3"

Main Pipe Size, Inches	Branch Size, Inches										
	6	8	10	12	14	15	16	18	20	21	24
6x6	39										
8x8	39	39									
10x10	39	39	39								
12x12	39	39	39	39							
14x14	39	39	39	39	39						
15x15	39	39	39	39	39	39					
16x16	39	39	39	39	39	39	39				
18x18	39	39	39	39	52	52	52	52			
20x20	39	39	39	39	52	52	52	52	52		
21x21	39	39	39	39	52	52	52	52	52	52	
24x24	39	39	39	39	52	52	52	52	52	52	78

Reducing

L_A" ± .25"

Main Pipe Size, Inches	Branch Pipe Size, Inches										
	6"	8"	10"	12"	14"	15"	16"	18"	20"	21"	24"
6 x 6											
8 x 8	10.75										
10 x 10	10.75	12.00									
12 x 12	11.75	12.50	14.50								
14 x 14	11.75	13.00	14.00	15.00							
15 x 15	11.75	13.00	14.00	15.00	16.25						
16 x 16	11.75	13.00	14.00	15.00	16.25	17.00					
18 x 18	12.50	13.75	15.00	16.00	17.00	17.75	18.25				
20 x 20	12.50	13.75	15.00	16.00	17.00	17.75	18.25				
21 x 21	12.50	13.75	15.00	16.00	17.00	17.75	18.25				
24 x 24	12.50	13.75	15.00	16.00	17.00	17.75	18.25				

F"

Main Pipe Size, Inches	Branch Pipe Size, Inches										
	6"	8"	10"	12"	14"	15"	16"	18"	20"	21"	24"
6 x 6											
8 x 8	12.00										
10 x 10	13.00	13.00									
12 x 12	14.00	14.00	14.00								
14 x 14	15.25	15.25	15.25	15.75							
15 x 15	16.25	16.25	16.25	16.50	17.00						
16 x 16	16.50	16.50	16.50	17.00	17.75	17.25					
18 x 18	17.75	17.75	17.75	18.00	18.50	18.50	18.50				
20 x 20	18.75	18.75	18.75	19.00	19.50	19.50	19.50	20.50			
21 x 21	19.25	19.25	19.25	19.50	20.00	20.00	20.00	21.00	21.00		
24 x 24	20.75	20.75	20.75	21.00	21.50	21.50	21.50	22.50	22.50	23.50	

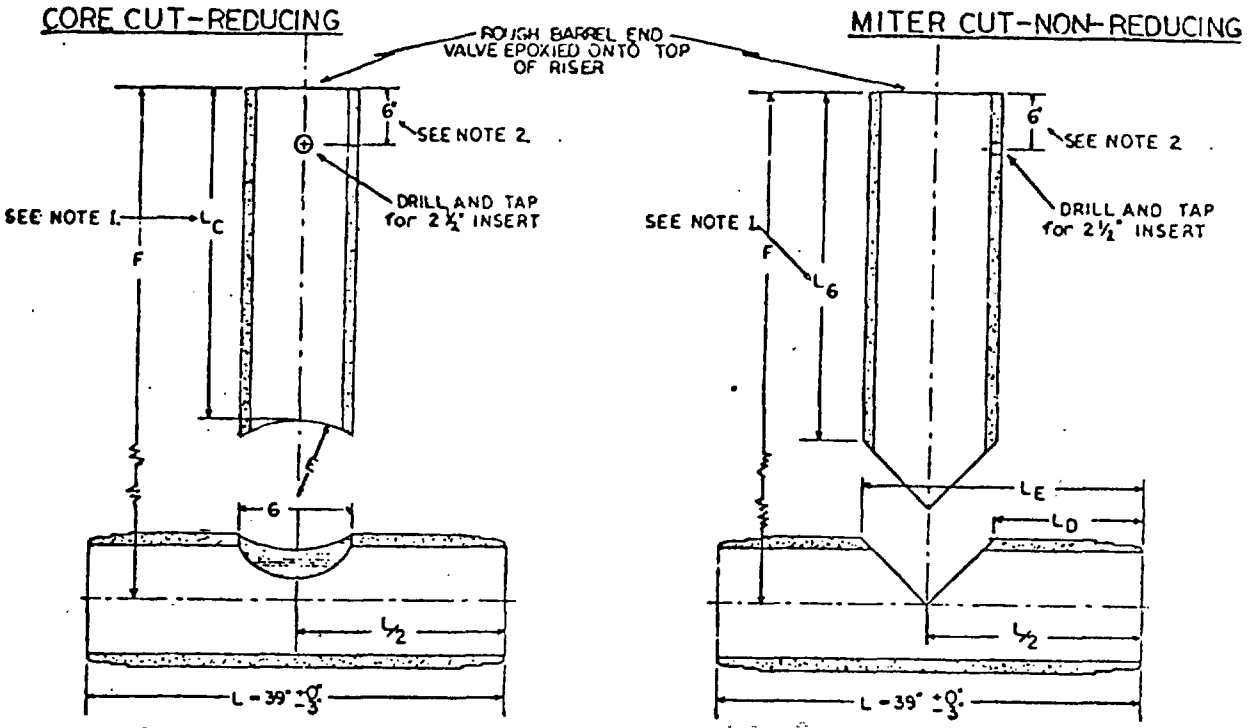
L_C" ± .25"

Main Pipe Size, Inches	6"	8"	10"	12"	14"	15"	16"	18"	20"	21"	24"
6 x 6											
8 x 8	8.00										
10 x 10	8.00	8.00									
12 x 12	8.00	8.00	8.00								
14 x 14	8.25	8.25	8.25	8.75							
15 x 15	8.75	8.75	8.75	9.00	9.50						
16 x 16	8.75	8.75	8.75	9.00	9.50	9.50					
18 x 18	8.75	8.75	8.75	9.00	9.50	9.50	9.50				
20 x 20	8.75	8.75	8.75	9.00	9.50	9.50	9.50	10.50			
21 x 21	8.75	8.75	8.75	9.00	9.50	9.50	9.50	10.50	10.50		
24 x 24	8.75	8.75	8.75	9.00	9.50	9.50	9.50	10.50	10.50	11.50	

CTD015378

PREPARED BY:	APPROVED BY:	R & D	MFG.	SALES	I.E.	OTHERS

TYPE 25 ALFALFA TEE



Material

1. Main and Riser - Standard Class 150 pipe. Machine ends for Type 25 machining dimensions, this specification.
2. Valve - Refer to Standard Purchasing Specification No. 553.
3. Reregoral Bushing - Refer to Standard Purchasing Specification No. 551.
4. All joints to be joined and made smooth with epoxy cement.

Reducing Tee's

Alfalfa Tee Size, Inches ø	L_C" +0" -1"	F" +0" -1"
10 x 10 x 8	48.93	54.00
12 x 12 x 8	49.06	55.00
12 x 12 x 10	49.06	55.00
14 x 14 x 8	49.22	56.25
14 x 14 x 10	49.22	56.25
14 x 14 x 12	49.22	56.25
16 x 16 x 8	49.33	57.50
16 x 16 x 10	49.33	57.50
16 x 16 x 12	49.33	57.50
16 x 16 x 14	49.33	57.50

Pipe main and riser I.D. to be nominal size.

Core drill for hole (G dimension) and contour cutting (E dimension), refer to Engineering Tooling Drawing 9641.

Non-Reducing Tee's

Alfalfa Tee Size, Inches ø	L_D" +.00" -.06"	L_E" +.06" -.00"	L_6" ±.06"	F" Nom.
8 x 8 x 8	14.78	24.22	48.00	52.00
10 x 10 x 10	13.57	25.43	48.00	53.00
12 x 12 x 12	12.44	26.56	48.00	54.00
14 x 14 x 14	11.29	27.71	48.00	55.00
16 x 16 x 16	10.17	28.83	48.00	56.00

Marking:

CERTAINTEED
(Size) ALFALFA TEE
AGRI-PERM

Note: 1. Except as otherwise ordered, the riser length is to be 48" ± 2" as measured from the top of the main to the bottom of the valve (I/C top).
2. An air relief valve connection, galvanized iron bushing, will be installed in riser only when ordered. Size and location must be specified or insert will be located as shown in riser above (outlet parallel to main flow).

#4A CG Irrigation