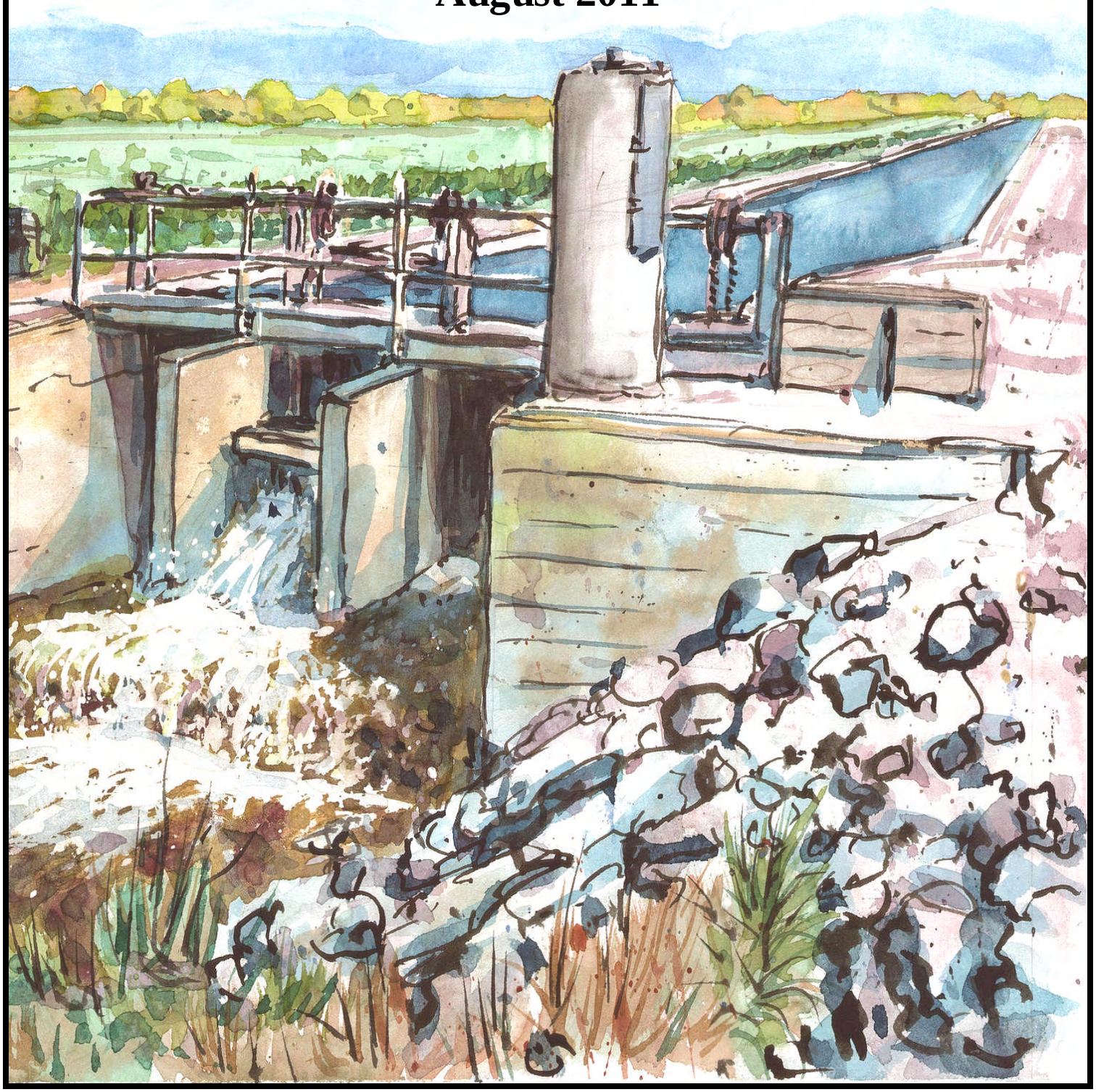
WATER & POWER

Serving Central California since 1887

# IRRIGATION CONSTRUCTION & ENGINEERING DESIGN STANDARDS

## August 2011



# CONSTRUCTION & ENGINEERING STANDARDS

## REVISION CHECK SHEET

| REVISION | DATE | REVISION | DATE |
|---|---|---|---|
| 1 | 09/24/96 | 16 | 08/22/11 |
| 2 | 08/20/97 | 17 | |
| 3 | 01/02/98 | 18 | |
| 4 | 07/08/98 | 19 | |
| 5 | 10/14/98 | 20 | |
| 6 | 01/07/99 | 21 | |
| 7 | 06/10/99 | 22 | |
| 8 | 01/27/00 | 23 | |
| 9 | 04/10/00 | 24 | |
| 10 | 07/13/00 | 25 | |
| 11 | 07/19/02 | 26 | |
| 12 | 03/12/03 | 27 | |
| 13 | 06/23/03 | 28 | |
| 14 | 03/01/04 | 29 | |
| 15 | 08/06/04 | 30 | |

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| ES 102 | 1 | PERFORATED UNDERGROUND DRAINAGE LINES | 10/21/00 | C |
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ENGINEERING STANDARDS

WATER & POWER
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IRRIGATION
ENGINEERING
STANDARDS

| SHEET | | |
|---|---|---|
| 1 OF 1 | DWG NO. ES 1 G | REVISED 09/20/2011 |

# CANAL AND DITCH DESIGN SPECIFICATIONS

VERTICAL TRANSITIONS IN GRADE Horizontal (H) : Vertical (V)

Main Canals and Laterals:
4:1 OR 15° MAXIMUM

Improvement District and Private Ditches:
2:1 OR 26° MAXIMUM

HORIZONTAL TRANSITION IN ALIGNMENT FROM CANAL LINING TO A STRUCTURE:

1 TRANSVERSE : 2 LONGITUDINAL (Minimum)

STANDARD DESIGN FREEBOARD

| | Inches | Feet |
|---|---|---|
| Upper Main Canals | 18" | 1.5' |
| Main Canals (800 - 2050 cfs) | 12" | 1.0' |
| Laterals (15 - 250 cfs) | 6" | 0.5' |
| Ditches (5-30 cfs) | 4" | 0.2' |

MANNING'S "N" FOR CONCRETE LINED CANALS:

0.015

MAXIMUM DESIGN HEADLOSS TOTAL FOR CANAL SIPHONS:
Up to 100 feet in length including transitions: 0.2 FT.
Over 100: A site specific engineering design is required.

FOR DESIGN OF CANAL SIPHONS FOR ROAD CROSSINGS:
(To include transition structures)
Refer to the Current Cal-Trans Siphon Standards.

BANKS OF DITCHES:
Refer To CS 143

BANKS OF CANALS:
Refer to CS 127

TURLOCK IRRIGATION DISTRICT

*IRRIGATION SYSTEM ADMINISTRATION*
ENGINEERING STANDARDS

CANAL AND DITCH DESIGN SPECIFICATIONS

| REV | DESCRIPTION | INIT | CHK | RV'D | RV'D | APP | DATE |
|---|---|---|---|---|---|---|---|
| 1 | Revised Wording for Clarification | HBB | | | | BDH | 1-27-92 |
| | Initial Issue | JAS | RRV | | | BDH | 9-12-86 |

SHEET 1 OF 1

DWG NO. ES 101

# PERFORATED UNDERGROUND DRAINAGE LINES

AVERAGE DESIGN FLOW: 0.03 gpm/lf of line

LATERAL SPACING: Shall not exceed 500 ft.

MATERIAL: PERFORATED POLYETHYLENE (ASTM F 405, F 667).
All slots and holes shall be free of tag ends and other material.

GRAVEL ENVELOPE:

The envelope material shall be washed gravel, free of organic matter, clays, and other deleterious substances that could, in time, change the hydraulic conductivity of the envelope. Envelope material is to be well graded gravel with 100% passing .75" clear square screen openings, no more than 30% passing a #60, and no more than 5% passing a #200 US standard series sieve. The envelope shall be placed completely around the pipe with a minimum thickness of 3 inches.

MINIMUM DEPTH FOR DRAIN LINES: 5.5'

## LINE CAPACITY CHART

SLOPE: 1.0'/1000' (0.001) MANNINGS "n"=0.015

| SIZE | FLOW (cfs) | FLOW (gpm) |
|---|---|---|
| 6" | 0.15 | 67 |
| 8" | 0.33 | 148 |
| 10" | 0.61 | 274 |
| 12" | 0.96 | 431 |
| 15" | 1.70 | 763 |

TRENCH GRADE:

The minimum grade except where otherwise specified by the engineer is 1 foot in 1000 feet. The maximum allowable gradual departure from grade is 0.1 feet. No uphill grades are allowed.

LAYING THE DRAIN TUBING:

The plastic tubing shall be well-bedded with the envelope material completely surrounding the tubing. The maximum allowable stretch of the tubing is 5%. Care shall be taken to prevent damage to the tubing from rock and clods during the back-filling operation.

END RETURN/VENT:

A capped end return to one foot above natural ground shall be provided at the start of each drain line to act as an air vent.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| C | STDS. COM. APPROVAL | | | | | | |
| C | Revised Mannings "n" | | | | | | 10-21-00 |
| B | Revised standards – include const. spec. | BDH | | | BDH | BLL | 9-3-96 |
| A | Revised wording for clarification | HBB | | | | BDH | 1-27-96 |
| | | | | | | | |
| -- | INITIAL ISSUE | JAS | RRV | | | BDH | 9-12-86 |

PERFORATED UNDERGROUND DRAINAGE LINES

SHEET 1 OF 1

ES 102C

1 PAGE

# DESIGN STANDARD FOR SURFACE DRAINS

A STANDARD OF 5 CFS PER 1000 ACRES SHALL BE USED AS THE DESIGN FLOW FOR THE PIPING OF OPEN SURFACE DRAINS

## MAXIMUM SIZE OF SURFACE INLETS

| ACRES DRAINED | PIPE SIZE |
|---|---|
| 10 | 4" |
| 20 | 4" |
| 40 | 6" |
| 80 | 8" |
| 120 | 10" |
| 160 | 12" |

TURLOCK IRRIGATION DISTRICT

IRRIGATION SYSTEM ADMINISTRATION
ENGINEERING STANDARDS

DESIGN STANDARD FOR SURFACE DRAINS

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| B | STDS. COM. APPROVAL | GKT | | JB | CDB | L.R. | |
| | | | | | | | |
| | | | | | | | |
| B | CONVERSION TO CAD | | | CEC | JB | BDH | 4/00 |
| A | ADD WORDING – CLARIFICATION | HBB | | | JB | BDH | 01/27/92 |
| -- | INITIAL ISSUE | JAS | RRV | | | BDH | 09/12/86 |

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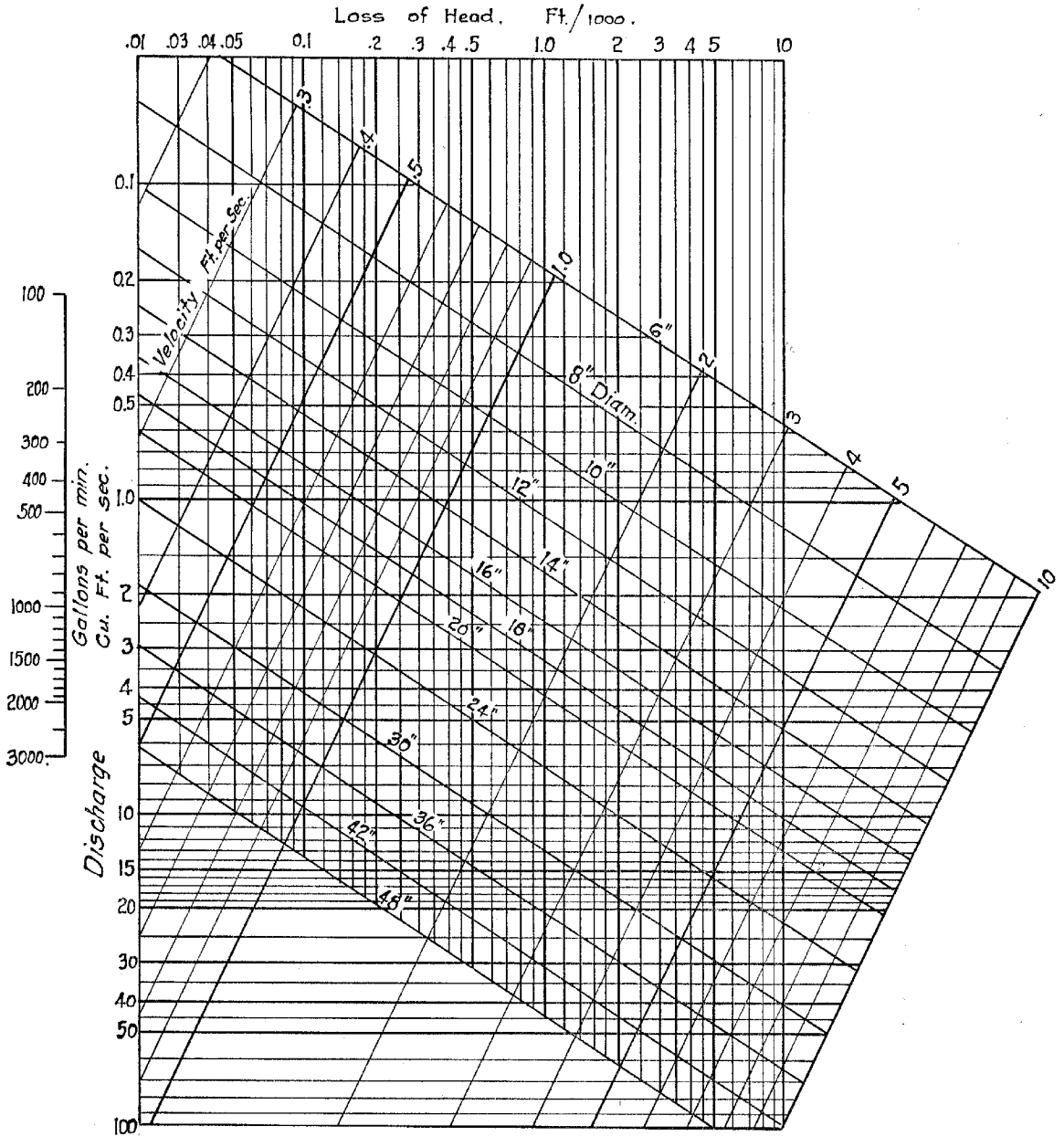
# FLOW OF WATER IN CONCRETE PIPE




From Scobey's Formula $Q = 0.00546\ C_s\ d^{2.625}\ H^{0.5}$

for this chart $C_s = 0.310$ for monolithic concrete pipe.

For other values of $C_s$ see "Hydraulic & Excavation Tables" U.S. Dept. of Interior, page 105.

1 C.F.S. = 448.8 G.P.M.

# TURLOCK IRRIGATION DISTRICT

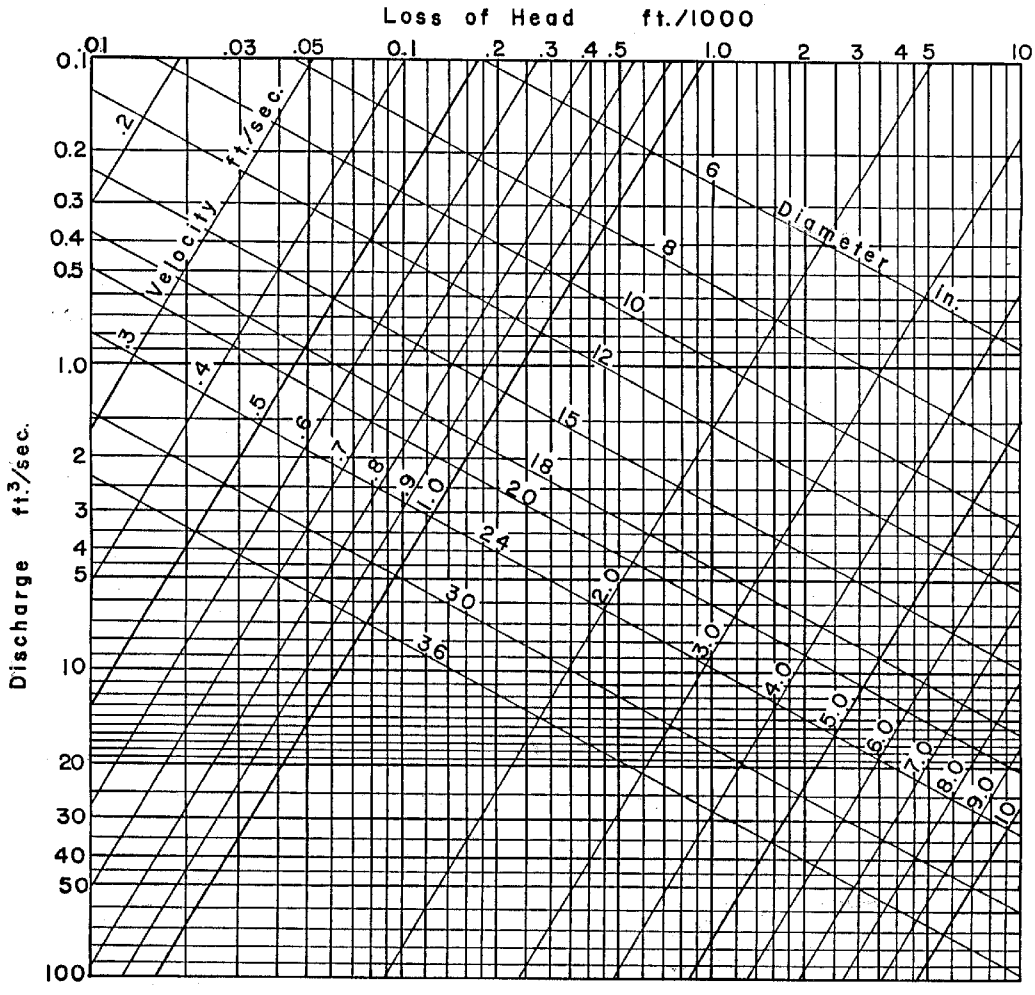
| REV. | DATE: | DESCRIPTION | CKD. | RV'D | RV'D | APP. |
|---|---|---|---|---|---|---|
| | | | | | | |

ENGINEERING STANDARD

FLOW OF WATER IN CONCRETE PIPE

| | |
|---|---|
| DATE: 9-12-86 | SCALE: NONE |
| DRAWN: JAS | REVIEWED: |
| DESIGNED: | REVIEWED: |
| CHECKED: RRV | APPROVED: BDH |
| SHEET OF | STD. NO. ES 104 |

# FLOW OF WATER IN PLASTIC PIPE




From Hazen-Williams Formula $Q = 0.432\, C_H D^{2.63} S^{0.54}$

Q in ft.³/sec. (cfs) discharge

$C_H$ = 150 for plastic pipe (n = 0.009)

D = diameter in feet

S = slope of energy line in ft/ft.

1 cfs = 448.8 gpm

# TURLOCK IRRIGATION DISTRICT

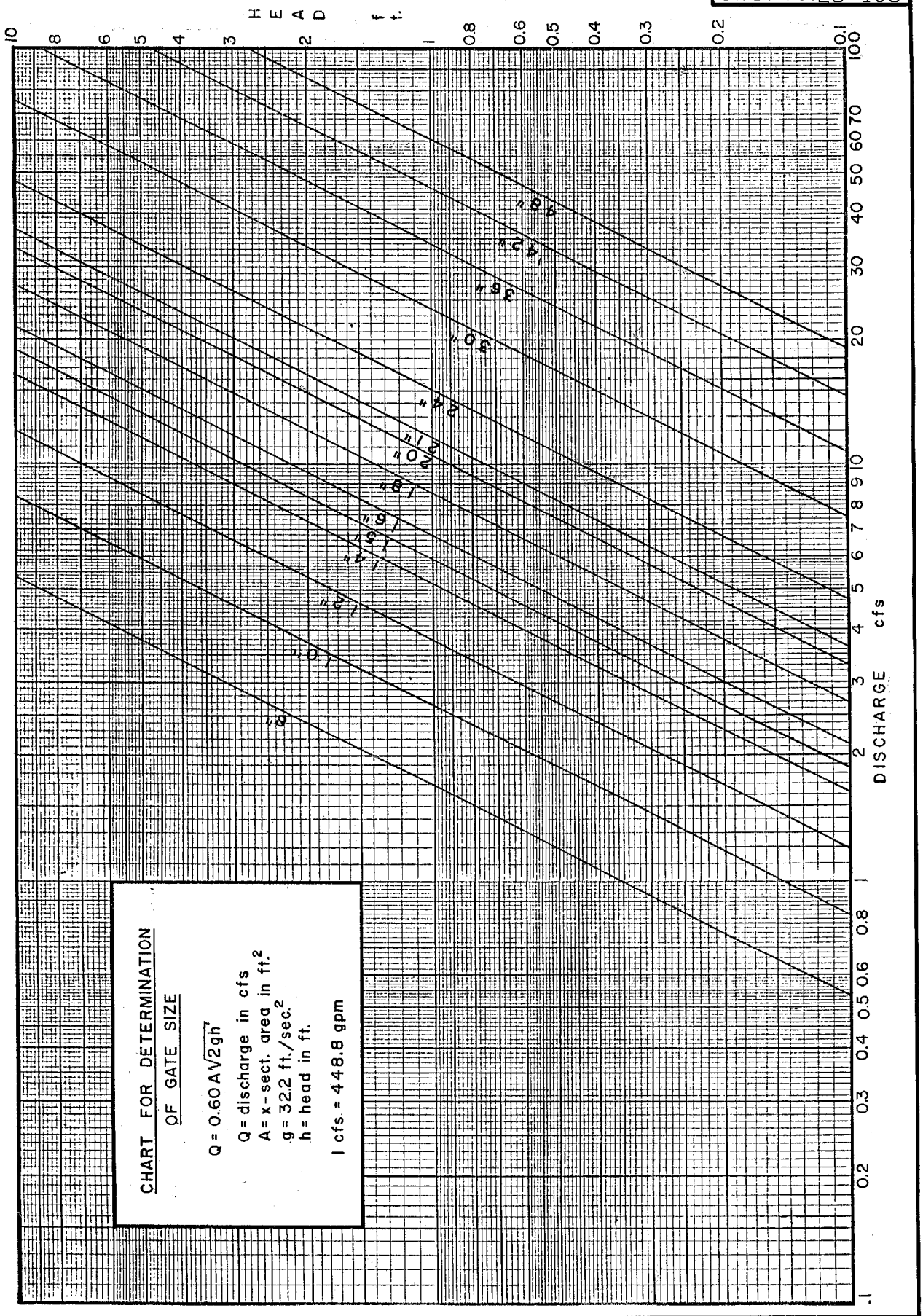
| REV. | DATE: | DESCRIPTION | CKD. | AV'D | AV'D | APP. |
|---|---|---|---|---|---|---|
| | | | | | | |

ENGINEERING STANDARD

FLOW OF WATER IN PLASTIC PIPE

| | |
|---|---|
| DATE: 9-12-86 | SCALE: NONE |
| DRAWN: JAS | REVIEWED: |
| DESIGNED: RRV | REVIEWED: |
| CHECKED: RRV | APPROVED: BDH |
| SHEET OF | STD. NO. ES 105 |

STND. NO. ES 106




# TURLOCK IRRIGATION DISTRICT

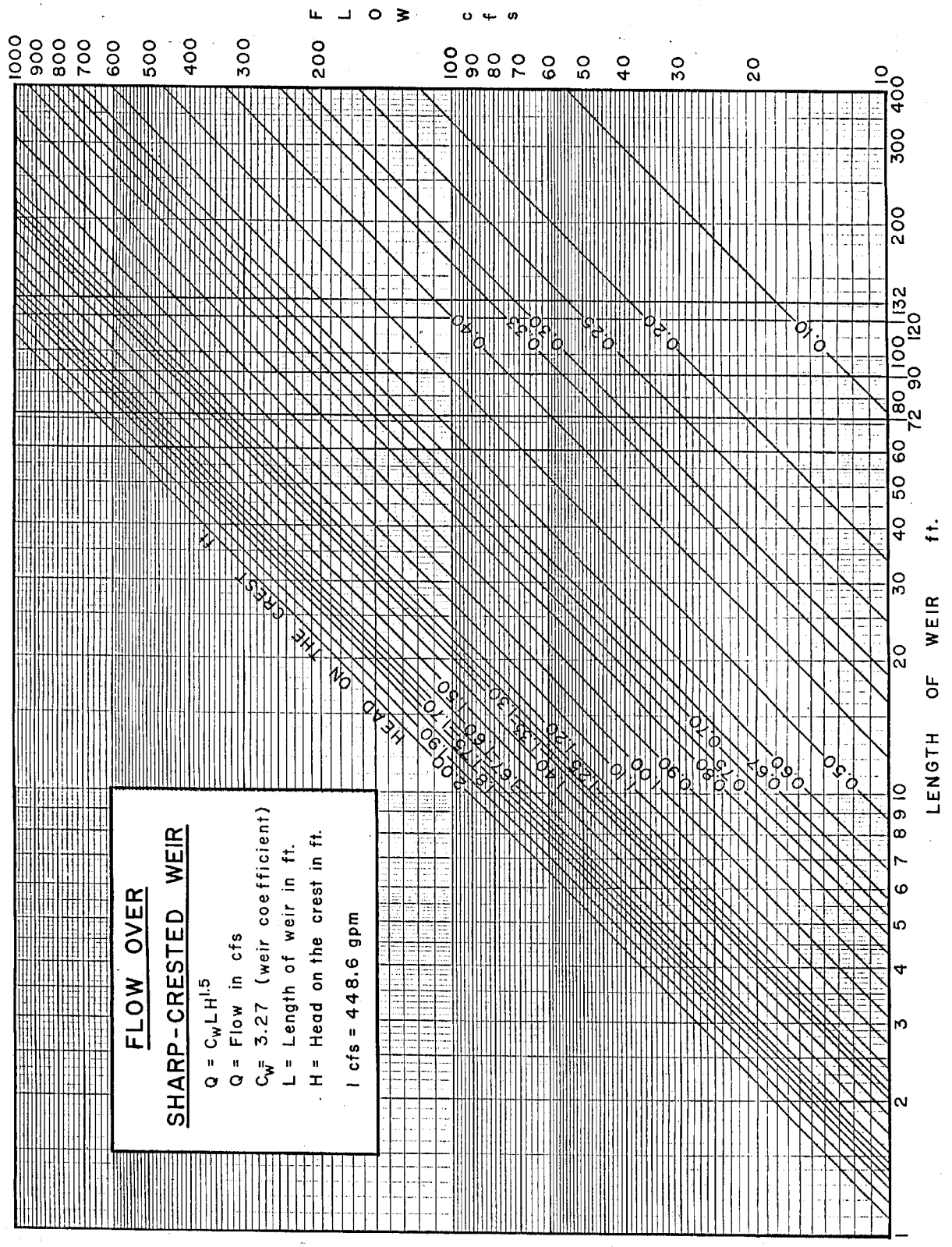
| REV. | DATE: | DESCRIPTION | CKD. | RV'D | RV'D | APP. |
|---|---|---|---|---|---|---|
| | | | | | | |

ENGINEERING STANDARD

## FLOW THROUGH GATES FREE & SUBMERGED DISCHARGE

| | |
|---|---|
| DATE: 9-12-86 | SCALE: NONE |
| DRAWN: JAS | REVIEWED: |
| DESIGNED: RRV | REVIEWED: |
| CHECKED: RRV | APPROVED: BDH |
| SHEET OF | STD. NO. ES 106 |

STND. NO. ES 107



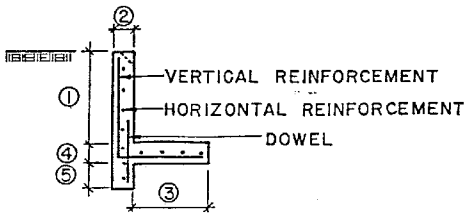

# TURLOCK IRRIGATION DISTRICT

| REV. | DATE: | DESCRIPTION | CKD. | RV'D | RV'D | APP. |
|---|---|---|---|---|---|---|
| | | | | | | |

ENGINEERING STANDARD

## FLOW OVER SHARP CRESTED WEIR

| | |
|---|---|
| DATE: 9-12-86 | SCALE: NONE |
| DRAWN: JAS | REVIEWED: |
| DESIGNED: RRV | REVIEWED: |
| CHECKED: RRV | APPROVED: BDH |
| SHEET OF | STD. NO. ES 107 |




# TURLOCK IRRIGATION DISTRICT

## ENGINEERING DESIGN STANDARD

## RETAINING WALLS & WEIR OVERPOURS

DESIGN ASSUMPTIONS:

- $f'_c = 3000$ psi , $\gamma_{conc.} = 150$ pcf
- $f_y = 40000$ psi
- $\gamma_{soil} = 120$ pcf, $\phi = 30°$, $C_a = 1/3$
- #4@12" E.W. reinforcement in 8" slab carried through footing.

| ① HEIGHT ABOVE FLOOR | ② WALL THICK-NESS | ③ FOOTING WIDTH | ④ FOOTING THICK-NESS | ⑤ STEM DEPTH | VERTICAL REINFORCEMENT | | HORIZONTAL REINFORCEMENT | DOWEL |
|---|---|---|---|---|---|---|---|---|
| | | | | | RETAINING WALL | WEIR OVERPOUR | | |
| 1' | 6" | 1.0' | 8" | 6" | #4 @ 10" | #4 @ 10" | #4 @ 18" | 2'-#4@18" |
| 2' | 6" | 1.0' | 8" | 6" | #4 @ 10" | #4 @ 10" | #4@18" | 2.5'-#4@18" |
| 3' | 6" | 1.5' | 8" | 6" | #4 @ 10" | #4 @ 10" | #4@18" | 2.5'-#4@18" |
| 4' | 6" | 2.0' | 8" | 12" | #4 @ 10" | #4 @ 10" | #4@18" | 3'-#4@18" |
| 5' | 6" | 2.5' | 8" | 12" | #4 @ 10" | #4 @ 9" | #4@18" | 3'-#4@18" |
| 6' | 8" | 3.0' | 12" | 12" | #4 @ 6" | #4 @ 6" | #4@12" | 3'-#4@12" |
| 7' | 8" | 3.5' | 12" | 12" | #4 @ 6" | #4 @ 6" | #4@12" | 3'-#4@12" |
| 8' | 8" | 4.0' | 12" | 12" | #4 @ 6" | #5@6" - cut off alternate bars @ 4'-0" | #4@12" | 3'-#4@12" |
| 9' | 10" | 4.5' | 12" | 18" | #5 @ 7" | #5 @ 6" | #4@10" | 4'-#4@10" |
| 10' | 10" | 5.0' | 12" | 18" | #5 @ 6" | #5@4" - cut off alternate bars @ 4'-0" | #4@10" | 4'-#4@10" |
| 11' | 10" | 6.0' | 16" | 24" | #5@4" - cut off alternate bars @ 4'-0" | #5@4" - cut off alternate bars @ 4'-0" | #4@10" | 5'-#4@10" |
| 12' | 12" | 6.5' | 16" | 24" | #5@4" - cut off every 3rd bar @ 4'-0" | #7@6" - cut off alternate bars @ 4'-0" | #4@9" | 5'-#4@9" |
| 13' | 12" | 7.5' | 16" | 24" | #7@6" - cut off alternate bars @ 4'-0" | #7@6" - cut off alternate bars @ 5'-0" | #4@9" | 5'-#4@9" |
| 14' | 12" | 8.5' | 16" | 24" | #7@6" - cut off alternate bars @ 5'-0" | #7@4" - cut off 2 out of 3 bars @ 6'-0" | #4@9" | 5'-#4@9" |

TURLOCK IRRIGATION DISTRICT

DESIGN STANDARD FOR RETAINING WALLS & WEIR OVERPOURS

ENGINEERING STANDARD

DATE: 9-12-86

SCALE: NONE

DRAWN: JAS

DESIGNED: RRV

CHECKED: RRV

REVIEWED:

REVIEWED:

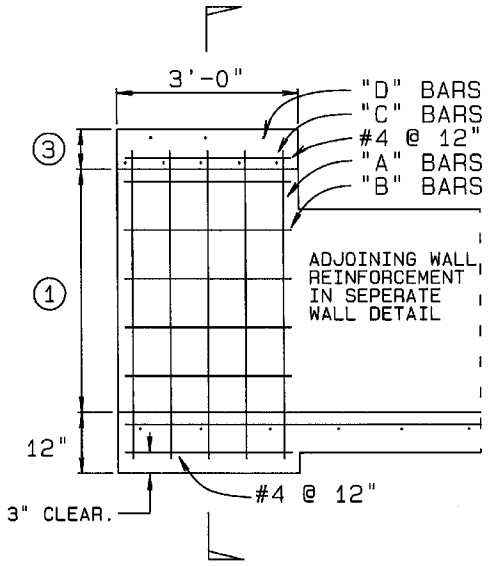
APPROVED: [signature]

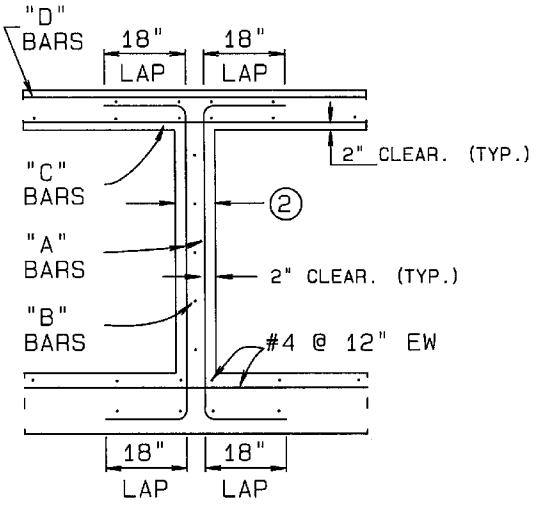
SHEET OF

STD. NO. ES 108

REV. | DATE: | DESCRIPTION | CK'D. | RV'D | RV'D | APP.

STND. NO. ES 108




| ① HEIGHT ABOVE FLOOR | ② WALL THICK-NESS | "A" BARS | "B" BARS |
|---|---|---|---|
| 4' | 6" | #4 @ 10" | #4 @ 18" |
| 5' | 6" | #4 @ 9" | #4 @ 18" |
| 6' | 8" | #4 @ 6" | #4 @ 12" |
| 7' | 8" | #4 @ 6" | #4 @ 12" |
| 8' | 8" | #5 @ 6" | #4 @ 12" |
| 9' | 10" | #5 @ 6" | #4 @ 10" |
| 10' | 10" | #6 @ 10" | #4 @ 10" |
| 11' | 10" | #6 @ 10" | #4 @ 10" |
| 12' | 12" | #6 @ 6" | #4 @ 9" |
| 13' | 12" | #6 @ 6" | #4 @ 9" |
| 14' | 12" | #6 @ 6" | #4 @ 9" |

| WALK-WAY SPAN LENGTH | ③ WALK-WAY THICK. | "C" BARS | "D" BARS |
|---|---|---|---|
| 4' | 8" | 3 - #4 | 3 - #4 |
| 5' | 8" | 3 - #4 | 3 - #4 |
| 6' | 8" | 4 - #4 | 3 - #4 |
| 7' | 8" | 5 - #4 | 3 - #4 |
| 8' | 8" | 6 - #4 | 3 - #4 |
| 9' | 8" | 5 - #5 | 3 - #4 |
| 10' | 8" | 6 - #5 | 3 - #4 |
| 11' | 8" | 5 - #6 | 3 - #4 |
| 12' | 8" | 6 - #6 | 3 - #4 |
| 13' | 10" | 6 - #6 | 3 - #5 |
| 14' | 10" | 5 - #7 | 3 - #5 |
| 15' | 10" | 6 - #7 | 3 - #5 |
| 16' | 10" | 5 - #8 | 3 - #5 |
| 17' | 10" | 6 - #8 | 4 - #5 |
| 18' | 10" | 7 - #8 | 4 - #5 |
| 19' | 10" | 7 - #8 | 4 - #5 |
| 20' | 10" | 8 - #8 | 5 - #5 |

## DESIGN ASSUMPTIONS

$F'_C$ = 3000 PSI, $\gamma_{CONC.}$ = 150 PCF

$F_Y$ = 40000 PSI

#4 @ 12" E.W. REINFORCEMENT IN 8" SLAB CARRIED THROUGH FOOTING.

DESIGN LIVE LOAD = 600 LBS
( 3 PEOPLE @ 200 LBS EACH )

SPAN LENGTH: ℄ TO ℄ OF SUPPORTS

# TURLOCK IRRIGATION DISTRICT

| REV. | DATE: | DESCRIPTION | CKD. | RV'D | RV'D | APP. |
|---|---|---|---|---|---|---|
| | | | | | | |

ENGINEERING STANDARD

## DESIGN STANDARD FOR CANAL WALKWAY

| | |
|---|---|
| DATE: 9-12-86 | SCALE: NONE |
| DRAWN: JHS | REVIEWED: |
| DESIGNED: RRV | REVIEWED: |
| CHECKED: RRV | APPROVED: BDH |
| SHEET OF | STD. NO. ES 109 |

# UNDERGROUND FACILITIES CROSSING DISTRICT IRRIGATION FACILITIES

**Revocable License Agreement**
Facility owners wishing to cross District facilities shall request and obtain a revocable license agreement from the District prior to constructing improvements within the District's right-of-way.

**Minimum Clearance and Posting**
All facilities crossing District irrigation facilities shall provide 24" minimum clearance below District facilities. All facilities crossing District irrigation facilities shall have a sign (supplied and installed by the District) posted on the canal bank. (See page two for details)

**Timing of Construction**
Any construction within the Turlock Irrigation District right-of-way that may affect the flow of water in the District's canals and/or pipelines can not be undertaken during the irrigation season which is generally from March 1 to November 1 unless approved by the Turlock Irrigation District.

**Required Inspections**
The District must be notified a minimum of 2 working days in advance of any construction affecting District facilities in order to schedule the required inspections.

**Lined Canals**
Crossings under lined canals shall be drilled or bored and jacked in-place.

**Unlined Canals or Drains**
Unlined canals or drains may be open-cut during the off-season. A six inch minimum thickness unreinforced concrete protection slab shall be placed a minimum of 24 inches below the invert of the canal. The width of the concrete slab shall be the outside dimension of the utility cable or pipeline plus 36 inches and extend the bottom width of the canal. The backfill shall be compacted to 95% maximum density. Compaction tests in accordance with ASTM D-1557 shall be performed and the results provided to the District. The operating roadway and banks shall be replaced to the original condition.

**Crossings Utilizing a Casing**
When a casing is used, it must extend from outside of embankment to outside of embankment. The casing shall have a wall thickness of 1/4" for galvanized or 3/8" non-galvanized steel pipe. The casing pipe minimum diameter shall be the utility cable or pipe outside dimension at the bell plus six (6) inches. The utility cable or pipe shall be firmly attached to redwood skids with steel straps for installation. After all casing pipe and utility cable or pipe is installed, ends of casing shall be closed with redwood bulkheads closely fitted around the utility cable or pipe.

**Direct Installation of Crossing Facility**
Plastic pipe with a standard dimensional ratio (SDR) of 41 or less, or Plastic Irrigation Pipe (PIP) of 100 psi or higher rating may be installed from outside bank to outside bank without casings. The pipe sections shall be joined with elastomeric ring slip couplings. Other materials may be used with the approval of the District.

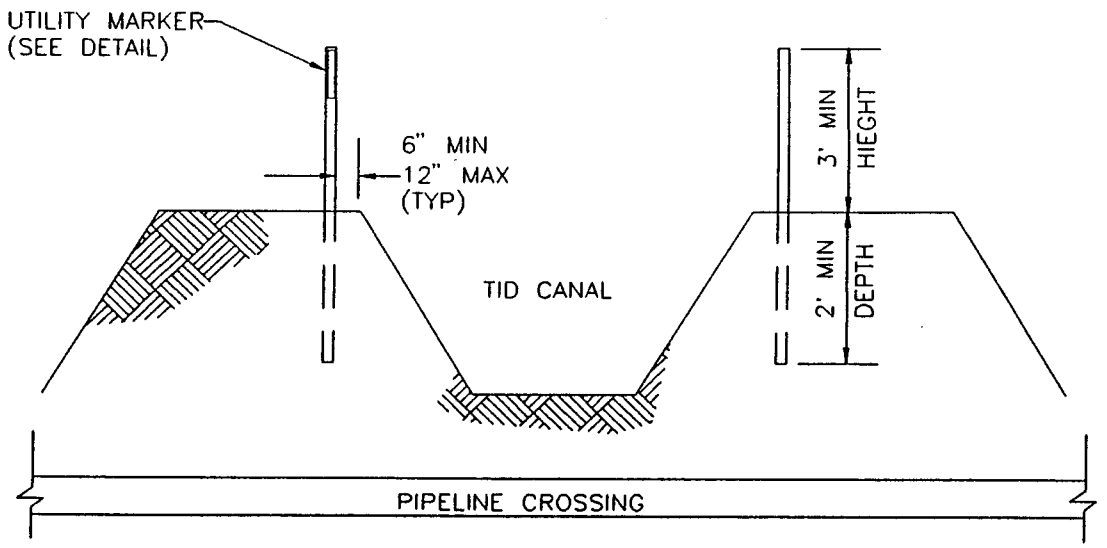
TURLOCK IRRIGATION DISTRICT

**IRRIGATION ENGINEERING STANDARDS**

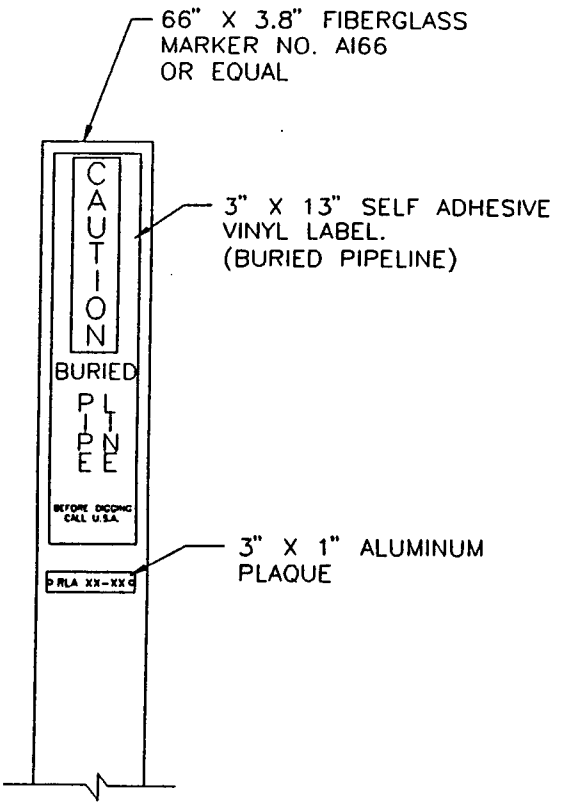
UNDERGROUND FACILITIES CROSSING DISTRICT IRRIGATION FACILITIES

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| B | STANDARDS COMMITTEE APPROVAL | BB | SB | Kab | JAR, | | 1-8-97 |
| | | | | | | | |
| B | Revised wording to include const. specs | BB | | | BDH | BDH | 1-9-97 |
| A | Revised wording for clarification | HBB | | | | BDH | 2-21-92 |
| | Initial Issue | JAS | RRV | | | BDH | 9-12-86 |

SHEET 1 OF 2 | DWG NO. ES 110 B | PAGE




UNDERGROUND FACILITIES CROSSING MARKER LOCATION




## CONSTRUCTION NOTES

1. PIPELINE CROSSING MARKER SHALL BE PLACED NO MORE THAN 12 INCHES FROM THE EDGE OF LINING OR CANAL.
2. THE MARKER POST SHALL BE FIBERGLASS MARKER NO. AI66 FROM SAFETY LITE OR EQUAL.
3. THE MARKER POST VINYL LABEL SHALL BE "BURIED PIPELINE" TYPE FROM SAFETY LITE OR EQUAL.
4. PIPELINE CROSSING MARKER SHALL HAVE A 3" X 1" PLAQUE CONTAINING THE REVOCABLE LICENCE NUMBER FOR FUTURE REFERENCE.

# UNDERGROUND FACILITIES CROSSING DISTRICT IRRIGATION FACILITIES

IRRIGATION ENGINEERING STANDARDS

| SHEET | DWG. NO. | PAGE |
|---|---|---|
| 2 OF 2 | ES 110 B | |

# REQUIRED EASEMENTS AND RIGHTS-OF-WAY

1. 25 foot wide easement for irrigation pipelines, pumplines, spill lines, drain lines and subsurface drainage lines, centered on the pipeline.

2. 40 foot wide easement for irrigation and drainage ditches, lined or dirt bank, centered on the ditch.

3. 15 foot wide easement from road and canal rights-of-way for irrigation or drainage pipelines whose center line is less than 12 ½ feet from the right-of-way.

4. 10 foot wide easement from rights-of-way for pipelines within developments that are parallel to and adjoining the street right-of-way line behind the sidewalk. If the same area is to be occupied with other utilities (joint utility trench) 15 feet is required.

5. 50 foot square easement for drainage and irrigation pumps, centered on the pump. A 20 foot access easement from a public road to the pump is required.

6. 12 foot wide access easement to control structures and access manholes. Access easements to control structures shall be free of encroaching structures and consist of an all-weather surface.

7. Easement for canals are determined by the width needed to accommodate the standard roadway and embankment width (CS 127) on both sides of canal, plus the canal width necessary to convey the designed flow rate.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

| REV | DESCRIPTION | INITI | CHK | RVD | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| B | STANDARDS COMMITTEE APPROVAL | BB | L.R. | JB | CDB | | 5-11-99 |
| | | | | | | | |
| B | Revised Wording | | | | JB | B22 | 5/11/99 |
| A | Wording Changes | HBB | | | | BDH | 3/23/92 |
| -- | Initial Issue | JAS | RRV | | | BDH | 9/12/86 |

REQUIRED EASEMENTS AND RIGHTS-OF-WAY

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PAGE

STND. NO. ES 112

# IRRIGATION PUMP AND WELL STANDARDS

THIS STANDARD CONSISTS OF THE FOLLOWING PAGES:

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|---|---|
| COVER | 1 PAGE |
| TEXT | 10 PAGES |
| CS 122 | 1 PAGE |
| CS 141 | 2 PAGES |

TURLOCK IRRIGATION DISTRICT

| REV. | DATE: | DESCRIPTION | CKD. | RV'D | RV'D | APP. |
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ENGINEERING STANDARD

IRRIGATION PUMP AND WELL STANDARDS

| | |
|---|---|
| DATE: 3-21-89 | SCALE: |
| DRAWN: AWV | REVIEWED: |
| DESIGNED: WBF | REVIEWED: |
| CHECKED: | APPROVED: W Styer |
| SHEET 1 OF 14 | STD. NO. ES 112 |

Date: March 30, 1989

**TURLOCK IRRIGATION DISTRICT**
**IRRIGATION PUMP AND WELL STANDARDS**

Preamble

The intent of these standards is to insure that wells used to provide the Turlock Irrigation District (hereinafter District) with water or to control groundwater levels are constructed using high quality methods and materials that will assure a sound well with high quality water that will protect groundwater resources, and will serve the long term best interests of the District, and meet county and state standards.

I. Well Driller

A. The well driller shall have a valid California State Contractors License A or C-57 issued in accordance with the provisions of the Contractors License Law of the State of California (Chapter 9, Division 3, business and professions code).

B. Minimum of three years experience is recommended.

C. Minimum of three references.

D. Well driller should be familiar with local soil conditions.

E. Well driller must obtain a drilling permit from County Health Department and comply with all applicable county and state standards.

II. Location

A. The proposed irrigation well shall not be closer than 3 mile from any other irrigation deep well, District drainage well, or municipal supply well.

B. Shall meet County set back requirements.

C. Should be adjacent to District canal bank such that water may be delivered to either the canal or the head of a pipeline and meet space requirements in Section V J. An alternative location may be considered by District.

III. Analysis of Existing Conditions

Recent groundwater studies by the District give a generalized level of information regarding anticipated

salinity levels for proposed wells. Analysis of existing wells within a mile of the proposed well will only give an indication of anticipated groundwater salinity problems. Use of this information in constructing a new well will not assure that saline groundwater problems, Ecw greater than 1.5, will not develop and that remedial work to correct salinity problems will not have to be performed. The final well must have a salinity level less than Ecw of 1.5.

IV. Test Hole Requirements

Aquifers with bad water quality can be located by a test hole and provisions can then be planned to seal those aquifers during full scale construction of the well. The purpose of a "test hole" is to provide design and construction information necessary to reasonably assure that the water quality in the completed well will have a salinity level Ecw less than 1.5.

A. A test hole is required prior to drilling and constructing a new well. Pumping strata with water having an Ecw greater than 1.5 shall be identified.

B. Driller shall provide the District with the test hole drilling log and Ec log. A sieve analysis should be made from the aquifers to be used to supply the water.

C. Prior to constructing the main well, the well driller will submit to the District for review and comment his proposal on well drilling, casing installation, sealing of strata with water quality exceeding an Ecw of 1.5, and gravel pack grading where a rotary dug well is to be installed.

V. Standards for well construction

The well to be constructed may be either a closed bottom gravel packed rotary dug well or an open bottom cable tool dug well. The well driller shall conform to the below District standard applicable to the drilling method used.

A. Well Type: Gravel Packed Rotary

1. The well is to be straight such that the pump can be installed with adequate clearance and true such that the pump shaft will align with a level motor base.

2. The well shall be gravel packed with a closed bottom and the preferred drilling method shall be reverse rotary. Alternative drilling methods require prior approval by T.I.D.

3. Well casing shall be standard or line grade S" thick meeting ASTM A139 or A135. To minimize corrosion, the

steel should have .2% copper.

4. A 16 to 18 inch diameter casing recommended.

5. Well must be solid cased to first water bearing strata below 50' with a neat cement-sand grout seal placed from the bottom up with a tremie pipe for the first 50 feet. Drilling mud or Bentonite may not be used to seal the conductor casing.

6. Well shall be landed on clay with a minimum of 10 feet of blank casing capped on the bottom.

7. A minimum of 18" of casing to remain above natural ground prior to constructing the pad foundation when pad construction to be by T.I.D. Weld a temporary protective cap cover over the open casing until the pump is installed.

8. Perforations should be no larger than 3/16", machine made louver form, facing down, perpendicular to the well axis, and made of the same material as the casing. Alternative types of screens or perforations require prior approval by the District.

9. The gravel pack shall be washed, natural, well rounded pea gravel containing no silt or clay, no larger than 5/16", and graded such that 70% retained of the gravel pack is between 4 and 9 times the 70% retained size of the finest portion of the aquifer. The coefficient of uniformity for the gravel pack should be equal to or less than 2.50. Crushed rock may not be used for the gravel pack.

10. Overbore should be minimum of 8" larger than well casing to minimize problems in placement of gravel pack. The gravel shall be placed in a slow steady manner using equipment and methods to eliminate voids and bridging within the gravel pack.

11. Conductor casing should be aluminum or galvanized corrugated metal.

12. Conductor casing shall be a minimum of 50' deep and landed on clay if possible.

13. Conductor casing should be a minimum of 12" larger than casing and should provide a minimum of 6" between the

casing and conductor casing to minimize bridging in the gravel pack.

14. A minimum of 12" of conductor casing should remain above natural ground and the grout seal shall be visible prior to placing foundation slab.

15. A 2" galvanized sounding tube, welded at a 45" angle to the casing with no burs, and a 10" gravel fill pipe, attached at a 45" angle to the conductor casing shall be provided. The exposed ends are to have a removable cap.

16. The space between the casing and pump head shall be sealed with a compressible gasket or non-shrink grout seal.

17. Well driller to notify the District a minimum of 48 hours before starting to drill well.

B. Well Type: Cable Tool

1. The well is to be straight such that the pump can be installed with adequate clearance and true such that the pump shaft will align with a level motor base.

2. The well shall be blank cased with an open bottom and the drilling method shall be by cable tool.

3. Well casing shall be standard or line grade ¼" thick meeting ASTM A139 or A135. To minimize corrosion, the steel should have .2% copper.

4. A 16 to 18 inch diameter casing recommended.

5. Well must be solid cased to first water bearing strata below 50' with a neat cement-sand grout seal, placed from the bottom up with a tremie pipe, for the first 50 feet. Drilling mud or Bentonite may not be used to seal the casing.

6. Well casing should be landed in clay a minimum of 10 feet.

7. A minimum of 18" of casing to remain above natural ground prior to constructing the pad foundation when pad construction to be by T.I.D. Weld a temporary protective cap cover over the open casing until the

pump is installed.

8. Overbore should be a minimum of 6" larger than well casing to minimize problems in placement of the grout seal.

9. Temporary conductor casing shall be a minimum of 50' deep and landed on clay if possible to insure the grout seal reaches the 50 foot depth. The conductor casing shall be withdrawn as the grout seal is placed from the bottom up.

10. Temporary conductor casing should be a minimum of 6" larger than well casing and should provide a minimum of 3" between the well casing and conductor casing to minimize bridging when the grout seal is placed.

11. The grout seal shall be visible prior to placing foundation slab.

12. A 2" galvanized sounding tube, welded at a 45" angle to the casing with no burs, shall be provided. The exposed end is to have a removable cap.

13. The space between the casing and pump head shall be sealed with a compressible gasket or non-shrink grout seal.

14. Well driller to notify the District a minimum of 48 hours before starting to drill well.

C. In addition to the above well construction standards, those applicable portions of the current California Department of Water Resources Water Well Standards", Bulletin 74, shall be adhered to. More restrictive county standards and regulations regarding well construction shall be adhered to.

D. Well Development

1. The well shall be developed by the drilling company after completion of drilling using equipment with a capacity of 1.5 times the planned well output. After development is complete, a sand test shall be made. The test shall consist of pumping the well for 30 minutes at 1.5 times the planned design capacity. Sand production greater than 10 ppm may require additional development or modifications to pump equipment to reduce wear from sand.

2. To assess the capacity of the well, a four point drawdown test should be made with pumping points evenly spread between 0 and 1.5 times the well design capacity. Pumping should continue at each rate for a sufficient length of time to bring about a relatively steady water level in the well. The well driller should determine the length of time for well recovery after final drawdown.

3. The District Hydrographer will verify the output of the developed well and the output curve supplied by the drilling company. The hydrographers shall be notified 24 hours prior to the start of well development.

4. A water quality test (irrigation panel) will be taken by the District staff at the completion of development.

E. Pump

1. The District shall review the pump purchase specifications and make recommendations to the pump installer.

2. The installation of the pump shall be such that the shaft is straight and that the column is assembled correctly.

3. The pumping plant must meet a minimum of 50% overall efficiency, with a motor overload not exceeding manufactures recommendations.

F. Electrical Panel

1. District to stake location for service pole.

2. Panel to be located on service pole a minimum of 6' from well.

3. Bottom of panel to be a minimum of 18" above natural ground.

4. Wiring from panel to pump to meet county standards.

5. A part wind panel is required for motors 40 H.P. and up.

6. Panel must have 3 leg protection.

7. Locking devices must be on panel and main switch. 8.

All county codes to be met.

8. All county codes to be met.

G. Foundation

A slab type foundation shall be used and constructed to District construction standards, drawing No. CS141A or CS141B.

1. The pump foundation slab shall be a minimum of 10 foot square with the top 4" above finished grade.

2. The finish grade of the pump head shall be a minimum of 1 inch above the top of the slab.

3. The joint between the casing grout seal and the foundation slab shall be clean and free of grease or loose material prior to pouring the foundation slab to pouring the foundation slab to insure a good seal.

H. Discharge pipe

1. Discharge shall have a minimum of 10 gage thickness.

2. Discharge pipe from pump into canal shall be constructed to the District standard CS 122.

3. Spillover discharges into canal should be constructed at the time of pump installation and built to District standard CS 122.

4. Pumps discharging into Improvement District pipelines may require raising improvement district structures at the time of pump installation.

5. The discharge line shall have a minimum of 10 diameters of straight, level pipe between the pump head and the control valve. A 3/4" brass testing plug shall be installed in a 304 stainless steel female pipe bung in the 2 o'clock position, a distance of 8 pipe diameters downstream of the pump head.

6. Discharge control should be gate valves or geared butterfly valves, using mechanical connectors, one of

which shall be a flanged couple adapter. The valve should be supported.

7. The pump discharge should discharge into District canal.

I. Safety

Construction will be done in compliance with county and state safety codes.

J. Easement

1. A 20' access easement is required for access to well site.

2. A 50' X 50' Grant of Easement to the District is required for the well site.

3. A chain link fence enclosure may be placed around the pump and drop pole and built to District Standards.

4. The well shall be located off the bank of the District canal.

5. An easement appropriate for appurtenant pump and well facilities shall be provided.

K. Building. Any pump house building should be built to the District construction standards.

VI. Abandonment of Wells

During the life of a well, its condition may deteriorate beyond what is economical or feasible to rehabilitate, its use may no longer be needed, or groundwater conditions change rendering the well unusable and the District makes the determination that the well is to be abandoned.

All "abandoned" wells and exploration or test holes shall be destroyed. The objective of destruction is to restore as nearly as possible those surface conditions that existed before the well was constructed and taking into account changes that have occurred since the well was constructed.

A. Preliminary Work

Prior to destroying the well, it will be investigated to determine its condition, the location of any obstructions that may interfere with filling or sealing, and any special circumstances that may be required for the well's destruction.

1. Obstructions will be removed if possible.

2. A down hole television is recommended to determine the well condition.

B. Filling and Sealing Conditions

Following are sealing and filling requirements to be practiced when the conditions below are encountered:

1. For a well wholly situated in unconsolidated material in an unconfined groundwater zone, the upper 20 feet shall be sealed with impervious material and the remainder of the well shall be filled with clay, sand, or other suitable inorganic material.

2. For a well penetrating several aquifers or formations, the upper 20 feet of the well shall be sealed with impervious material.

   In areas where the interchange of water between aquifers will result in a significant deterioration of the quality of water in one or more aquifers, or will result in a loss of artesian pressure, the well shall be filled and sealed so as to prevent such interchange. To prevent the vertical movement of water from the producing formation, impervious material must be placed opposite confining formations above and below the producing formations for a distance of 10 feet or more. The formation producing the deleterious water shall be sealed by placing impervious material opposite the formation, and opposite the confining formations for a sufficient vertical distance, but no less than 10 feet in both directions, or in the case of "bottom" waters, in the upward direction.

   In locations where interchange is in no way detrimental, suitable inorganic material may be placed

opposite the formations penetrated. When the boundaries of the various formations are unknown, the well casing shall be filled entirely with sealing material.

C. Placement of Material

The following requirements shall be observed in placing fill or sealing material in wells to be destroyed:

1. The well shall be filled with the appropriate material (as described in item D of this section) from the bottom of the well up.

2. Where neat cement grout, sand-cement grout, or concrete is used, it shall be poured in one continuous operation.

3. Sealing material shall be placed in the interval or intervals to be sealed by methods that prevent free fall, dilution, and/or separation of aggregates from cementing materials.

4. Where the head (pressure) producing flow is great, special care and methods must be used to restrict the flow while placing the sealing material. In such cases, the casing must be perforated opposite the area to be sealed and the sealing material forced out under pressure into the surrounding formation.

5. In destroying gravel-packed wells, the casing shall be perforated or otherwise punctured opposite the area to be sealed. The sealing material shall then be placed within the casing, completely filling the portion adjacent to the area to be sealed and then forced out under pressure into the gravel envelope.

6. When pressure is applied to force sealing material into the annular space, the pressure shall be maintained for a length of time sufficient for the cementing mixture to set.

7. To assure that the well is filled and there has been no jamming or "bridging" of the material, verification shall be made that the volume of material placed in the well installation at least equals the volume of the empty hole.

D. Materials

Requirements for sealing and fill materials are as follows:

1. Impervious Sealing Materials. No material is completely impervious. However, sealing materials shall have such a low permeability that the volume of water passing through them is of small consequence.

   Preferred impervious materials include neat cement, sand-cement grout, concrete. Native material or sand silt clay mixtures with a coefficient of permeability less than 10 feet per year may be used. Drilling muds shall NOT be used.

2. Filler Material. Many materials are suitable for use as a filler in destroying wells. These include clay, silt, sand, gravel, crushed stone, native soils, and mixtures of the aforementioned types. Material containing organic matter shall not be used.

E. Sealing Wells in Urban Areas

In incorporated areas or unincorporated areas developed for multiple habitation, to make further use of the well site, the following additional requirements must be met:

1. A hole shall be excavated around the well casing to a depth of 5 feet below the ground surface and the well casing removed to the bottom of the excavation.

2. The sealing material used for the upper portion of the well shall be allowed to spill over into the excavation to form a cap.

3. After the well has been properly filled, including sufficient time for sealing material in the excavation to set, the excavation shall be filled with native soil.

F. Temporary Cover

During periods when no work is being done on the well, such as overnight or while waiting for sealing material to set, the well and surrounding excavation, if any, shall be covered. The cover shall be sufficiently strong and well enough anchored to prevent anchored to prevent the introduction of foreign material into the well and to

protect the public from a potentially hazardous situation.

G. In addition to the above well abandonment standards, those applicable portions of the current California Department of Water Resources "Water Well Standards", Bulletin 74, shall be adhered to. More restrictive county standards and regulations regarding well abandonment shall be adhered to.

# CONDITIONS FOR DOWNSIZING IRRIGATION FACILITIES

Irrigation facilities may be designed and installed for a rate of flow of less than the standard irrigation flow of 15 CFS if the following conditions exist:

1. The irrigated parcels historically use less than the standard flow or changes in land use, cropping or other factors make the use of a smaller flow reasonable and practical for the remaining lands being irrigated.

2. The reduced flow will not unreasonably affect the:

   a. Operation of the District's Irrigation System.

   b. Operation of the affected Water Distribution Service Area.

   c. Operation of the affected Improvement District or private facilities.

   d. The customer's irrigation practices.

The standard flow rate for downsized facilities is 5 CFS or historical usage of the affected parcels.

TURLOCK IRRIGATION DISTRICT

*IRRIGATION SYSTEM ADMINISTRATION*

ENGINEERING STANDARDS

CONDITIONS FOR DOWNSIZING IRRIGATION FACILITIES

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| 1 | WORDING CHANGES | HBB | | | | BDH | 3-23-92 |
| | ORIGINAL ISSUE | AWV | WBF | | | WBF | 9-18-90 |

SHEET OF

DWG NO. ES 113

# WATER QUALITY STANDARD
# FOR DISCHARGE TO CANAL SYSTEM

| Constituent | Unit | Maximum Concentration |
|---|---|---|
| Sodium (Na) | meq/l | 3 |
| Chloride (Cl) | meq/l | 4 |
| Conductivity (EC) | µmhos | 1400 |
| Nitrates ($NO_3$) | ppm | 200 |
| Boron (B) | ppm | 0.7 |
| Adj. SAR | | <3.0 @ EC=1000<br><6.5 @ EC=1400 |
| Sand Production (sediment)** | ppm | 10 |
| pH | | 6.5 – 8.4 |

**NOTE:**
Municipal and Industrial discharges may have other constituents that could impact the District's ability to allow such discharges into the facility.

Reference Std. ES 112**

TURLOCK IRRIGATION DISTRICT

ENGINEERING STANDARDS

IRRIGATION SYSTEM WATER QUALITY

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| A | STDS. COM. APPROVAL | | | JAC | CPB | | |
| A | MOD. SEVERAL CONSTITUENTS | | | | BJZ | | 11/99 |
| -- | INITIAL ISSUE | BDH | | WF | BDH | BLL | 09/03/96 |

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| CS 100 | 1 | CONCRETE PIPE DETAIL | 05/11/99 | C |
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IRRIGATION CONSTRUCTION STANDARDS

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WATER & POWER
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IRRIGATION CONSTRUCTION STANDARDS

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1. At least 30 calendar days prior to the commencement of any work to remove existing irrigation facilities or to construct new irrigation facilities, the developer shall sign the irrigation improvements agreement with Turlock Irrigation District (TID) and provide the two required improvement securities and the required public liability and property damage insurance coverage.

2. Developments adjoining TID canals shall construct a solid masonry or concrete wall, a minimum of six feet in height, next to the TID right-of-way as per TID Construction Standard CS 166.

3. Lots adjoining irrigated ground must be graded so that the backs of lot and house pad elevations are at least 6 inches higher than the adjoining irrigated ground.

4. Contractor shall verify pipe sizes and inverts prior to construction of irrigation facilities.

5. Contractor must furnish a detailed construction and inspection schedule for TID written approval prior to excavation or construction within district rights-of-way or easements. Irrigation service must be maintained during the irrigation season, which is generally between March 1 through October 31, but can vary.

6. TID reserves the right to construct all structures within developments. If TID constructs the structures, the developer shall provide a deposit to the TID for the estimated construction costs. The pipeline contractor shall leave an open space of 6 feet minimum and 8 feet maximum at each structure location. The opening shall be formed and finished or sawn; construction of the opening by impact methods is not allowed.

7. All construction of TID irrigation facilities shall be done in accordance with the California Building Code, other recognized national standards, and TID standards and specifications. TID standards and specifications shall govern in the event of a discrepancy.

8. All irrigation structure boxes shall be formed inside and out and concrete vibrated sufficiently to provide for smooth surface walls without voids and honeycombs. Waterstop (Waterstop RX or approved equal) shall be used at all cold joints and shall be installed in accordance with the instructions recommended by the manufacturer.

9. Concrete shall be 3,000 psi or stronger at 28 days. Upon request by TID, concrete compressive tests on irrigation facility construction will be done by contractor at contractor's expense. It is the contractor's responsibility to deliver concrete samples to the concrete lab and send the results to TID.

10. All earthwork for irrigation facilities shall achieve a minimum relative compaction of 90% in rural areas and 95% in developed areas, according to ASTM D-1557. City, County and State compaction standards may, in some cases, supercede the above standards. Upon request by TID, test results verifying this shall be furnished to the TID by any contractor engaged in this work for the TID.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

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| | | | | | | | |
| | | | | | | | |
| C | REV NOTE 2, 8, 7, 11, & 15, ADD 18 | | | AWV | | | 7/10 |
| B | COMBINED CS 050A & CS 075 | | | MLC | | | 4/87 |
| A | ELIMINATE ALTERNATE DETAIL | RV | | | | BDH | |

CONSTRUCTION AND DEVELOPMENT STANDARD SPECIFICATIONS

SHEET 1 OF 2

CS 050C

PAGE

11. Prior to working on TID facilities, contractors are responsible for contacting Underground Service Alert for utility locations at 800-227-2600.

12. Inspections must be requested two working days in advance. The TID's inspector shall inspect all work phases on irrigation facilities for conformance to approved engineering plans and TID specifications. Reinforcing shall not be encased in concrete without prior TID inspection and approval. Likewise, concrete structures and pipelines shall not be covered with earth prior to TID inspection and approval.

13. Control structures and access manholes shall be constructed adjacent to public rights-of-way. If no public access is available, an access easement from a public right-of-way, a minimum of 12 feet in width, shall be provided to all control structures and access manholes. Access easements to control structures shall be free of encroachments, accommodate vehicle access, and must have an all weather surface.

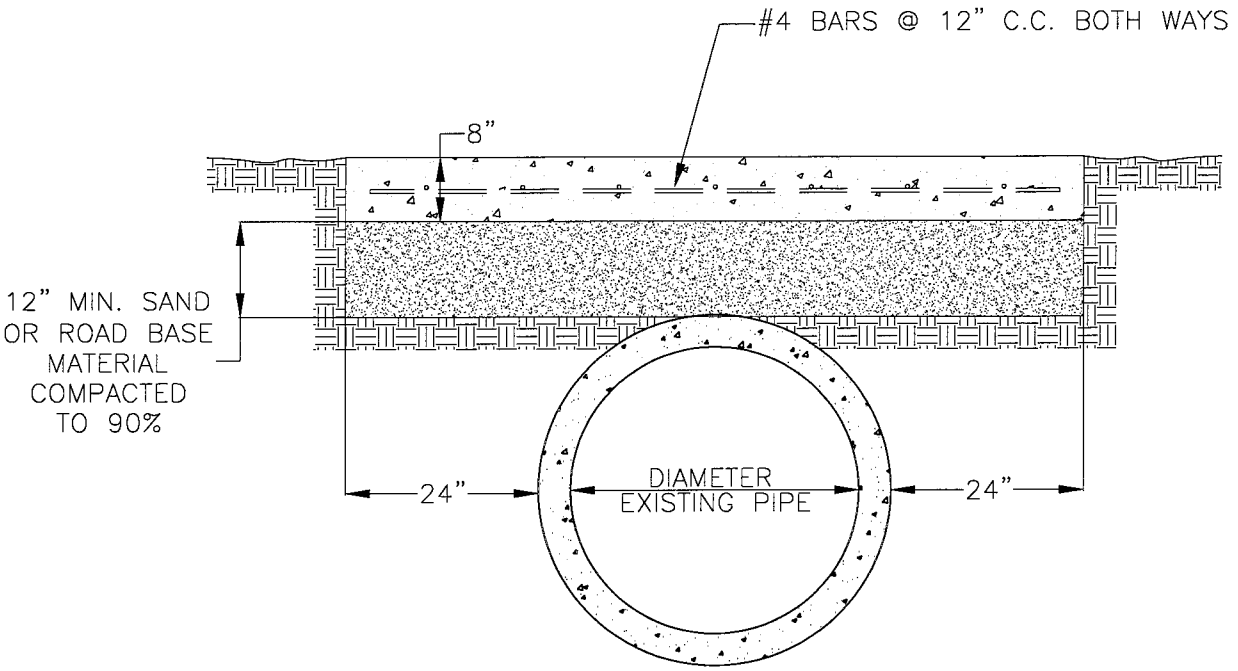
14. Fences within irrigation easements must be constructed to allow access to irrigation facilities, as directed by TID.

15. All irrigation facilities shall pass the pressure test described in Caltrans Standard Specification 65-1.08. Upon request by the TID, the test will be performed by contractor at contractor's expense. The tested head shall be the maximum operational pressure of the line which will be supplied by the TID. The testing shall be observed and certified by a licensed Civil Engineer.

16. Irrigation facilities which are determined, by TID, as no longer needed shall be removed prior to development.

17. All pipeline installations shall include a #12 THHN coated solid tracer wire (TID Stock No. E-5625-0) on pipe. Tracer wire to be placed on top side of pipe and attached using 2" 10 mil poly tape or acceptable alternative.

18. Used materials, rejects, misfits or seconds are not acceptable for use on irrigation facilities.

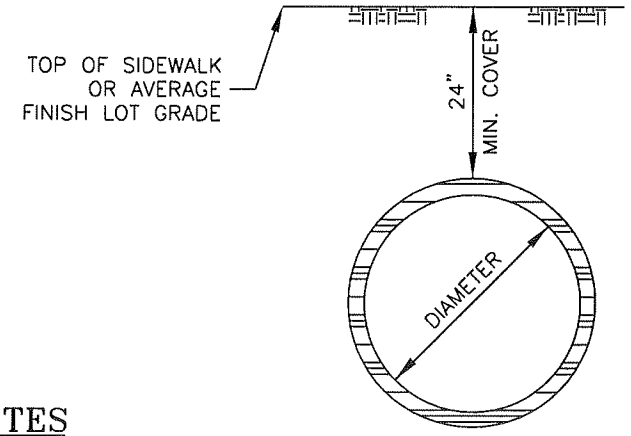



NOTE: USE OF THIS STANDARD REQUIRES T.I.D. APPROVAL OF A VARIANCE. APPLICANT MUST ADEQUATELY DEMONSTRATE NECESSITY FOR USE OF THIS STANDARD.

| TURLOCK IRRIGATION DISTRICT | | | | | | | | IRRIGATION CONSTRUCTION STANDARDS |
|---|---|---|---|---|---|---|---|---|
| B | STDS. COM. APPROVAL | CDB | | | | | | |
| | | | | | | | | DRIVEWAY PROTECTION FOR EXISTING CONCRETE PIPE |
| B | UPDATE DETAILS, RENUMBERED | | | | | BDH | 10/99 | |
| | WAS SS 104 | | | | | | | |
| A | ELIMINATE ALTERNATE DETAIL | RV | | | | BDH | 4/87 | |
| -- | INITIAL ISSUE | | | | | | | SHEET 1 OF 1 |
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE | CS 060B PAGE |

# FOR DEVELOPMENT APPLICATIONS

PIPE DIAMETER <14" – AWWA C900 PVC, DR 25 (GASKETED)
PIPE DIAMETER =>14" – AWWA C905 PVC, DR 25 (GASKETED)

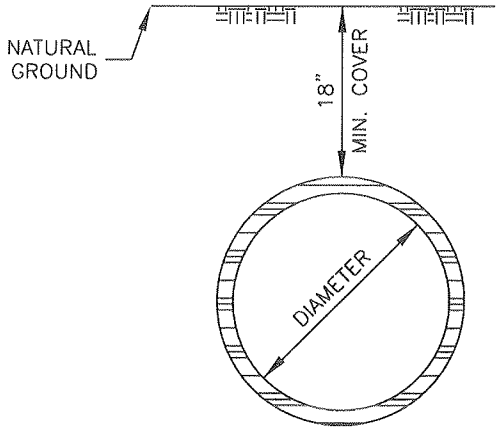



## NOTES

- SUBDIVISION INSTALLATIONS TO INCLUDE A #12 THHN COATED SOLID TRACER WIRE ON PIPE. TRACER WIRE TO BE PLACED ON TOP SIDE OF PIPE AND ATTACHED USING 2" WIDE 10-MIL POLY TAPE.

# FOR RURAL APPLICATIONS

PLASTIC IRRIGATION PIPE (PIP) – GASKETED P.R. 100, SDR 41 PVC




TURLOCK IRRIGATION DISTRICT

IRRIGATION
CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| -- | INITIAL ISSUE | AWV | | | | | 7/10 |

PLASTIC PIPE
DETAIL

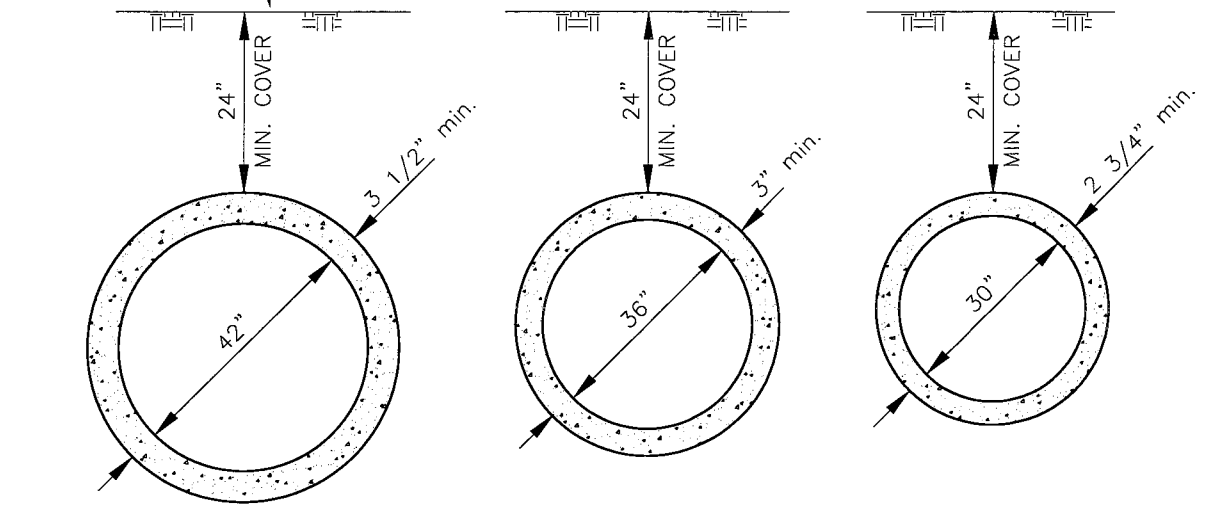
SHEET 1 OF 1

CS 099

PAGE

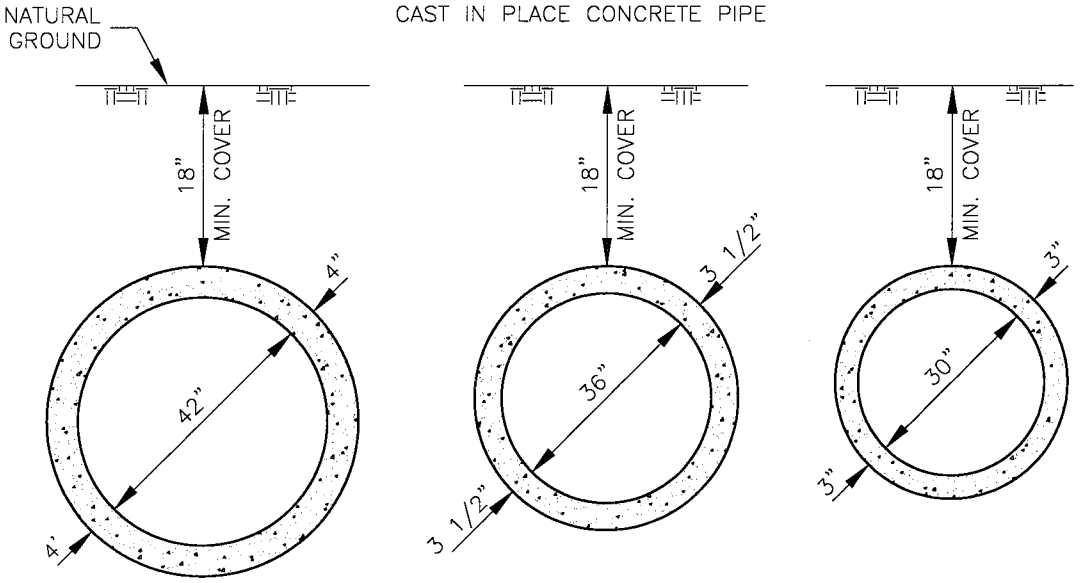
# FOR DEVELOPMENT APPLICATIONS

C-76, CLASS III, REINFORCED CONCRETE PIPE
WITH RUBBER GASKET JOINTS




# FOR RURAL APPLICATIONS

CAST IN PLACE CONCRETE PIPE




## NOTES

- SUBDIVISION INSTALLATIONS TO INCLUDE A #12 THHN COATED SOLID TRACER WIRE ON PIPE (T.I.D. STOCK NO. E-5625-0). TRACER WIRE TO BE PLACED ON TOP SIDE OF PIPE AND ATTACHED USING 2" 10 MIL POLY TAPE.

TURLOCK IRRIGATION DISTRICT

IRRIGATION
CONSTRUCTION STANDARDS

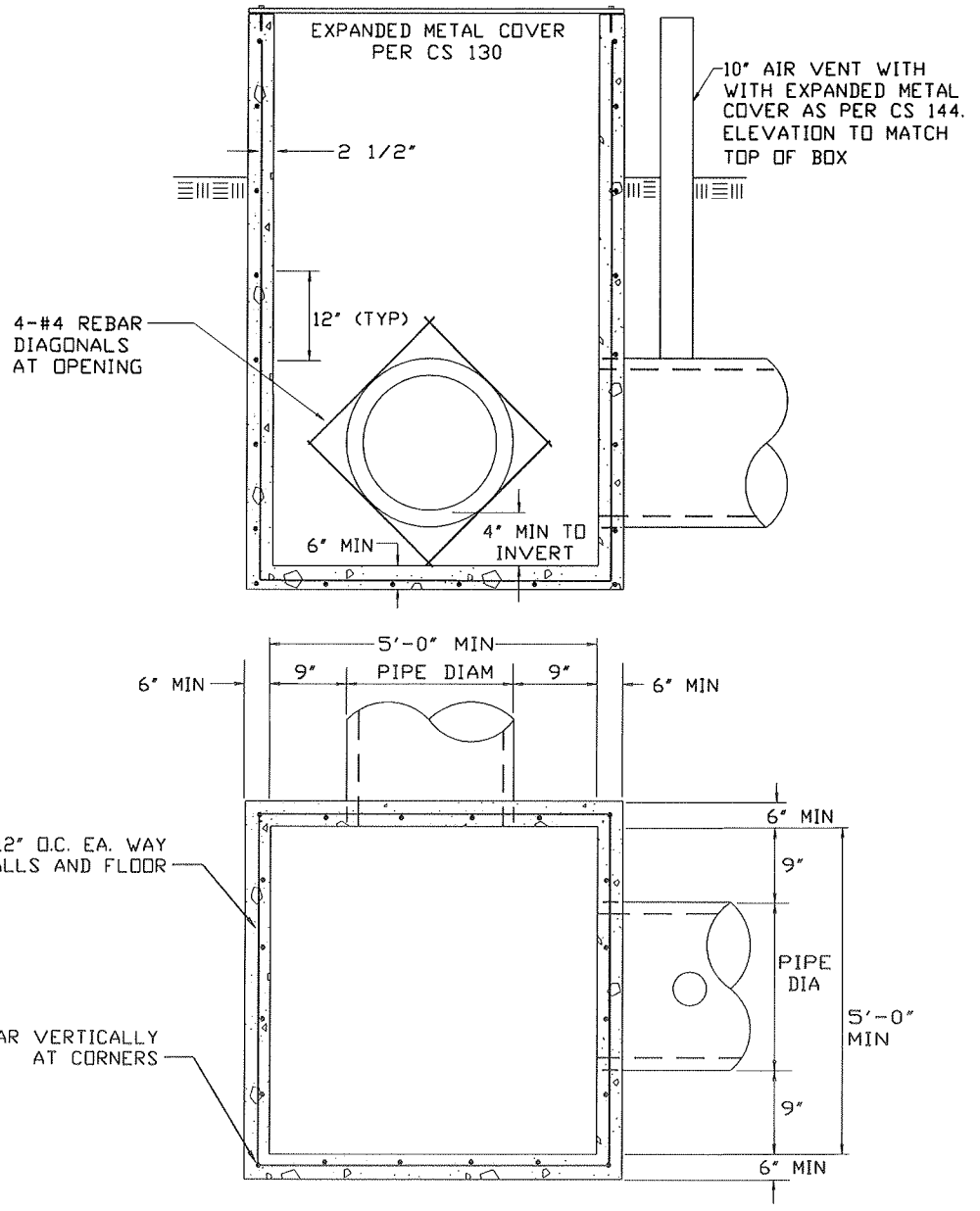
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| C | STDS. COM. APPROVAL | BB | R.R. | | CDB | | 5-11-99 |
| C | CHNGED STK. # OF TRACER WIRE | | | | BLL | | 5-11-99 |
| B | COMBINED DEVELOP. & TID STD. | | | | JB | BLL | 1/99 |
| A | COMBINED RURAL AND SUBDIVISION APPLICATIONS | BB | | | JB | BLL | 8/97 |
| -- | INNITIAL ISSUE | JAS | BDH | | | BDH | 07/24/85 |

CONCRETE PIPE DETAIL

SHEET 1 OF 1

CS 100C

PAGE




NOTES

1. CENTER BOX ON PIPELINES.
2. TOP OF BOX ELEVATION SHALL BE 2 FEET ABOVE HYDRAULIC GRADE LINE AS DETERMINED BY TID ENGINEERING.
3. WALLS MUST BE FORMED INSIDE AND OUT.
4. "WATERSTOP RX" OR APPROVED EQUAL SHALL BE USED AT ALL COLD JOINTS.
5. ALL GATES TO BE "WATERMAN C-10" OF NEW MANUFACTURE AND INSTALLED AS PER MANUFACTURER'S SPECIFICATIONS. SEE PLANS FOR LOCATION AND SIZE.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargile

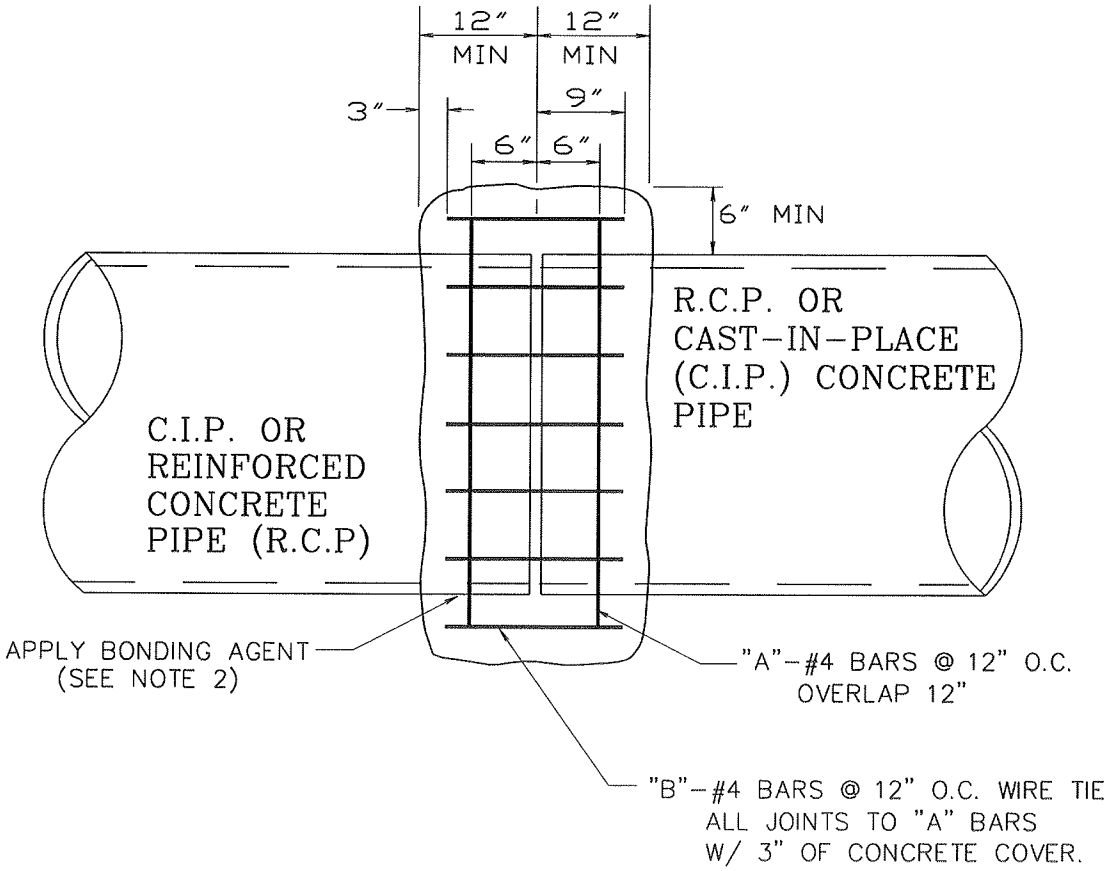
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| D | REV NOTE 2, 4, & 5, 6" WALLS | | | AWV | | | 7/10 |
| C | COMBINE CS101 & SS107 | | | | | | 6/01 |
| B | EXP. METAL COVER | | RV | | BDH | | 12/87 |
| A | MIN. BOX DIMENSION | | RV | | BDH | | 4/87 |
| -- | INITIAL ISSUE | SEB | | | | | 12/86 |

# TYPICAL CONTROL BOX

SHEET 1 OF 1

CS 101D

PAGE




NOTES:

1. IF PIPE JOINT INVOLVES A BEND OR TURN USE A COLLAR WIDTH OF 36" AND A MIN. OF 3 "A" BARS.
2. CLEAN THE PIPE SURFACE THOROUGHLY AND APPLY AN APPROVED BONDING AGENT TO THE PIPES PRIOR TO POURING THE COLLAR.
3. DRYPACK AND BAND INTERIOR PIPE JOINT.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| B | WO and C&M AGM | Keith Cargill | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| B | GENERAL REVISION | | | AWV | | | 7/10 |
| A | WIRE TIE JOINTS | ABO | | | | | |

CONCRETE COLLAR FOR IRRIGATION PIPELINES

SHEET 1 OF 1

CS 102B

PAGE

TURLOCK IRRIGATION DISTRICT

IRRIGATION
CONSTRUCTION STANDARDS

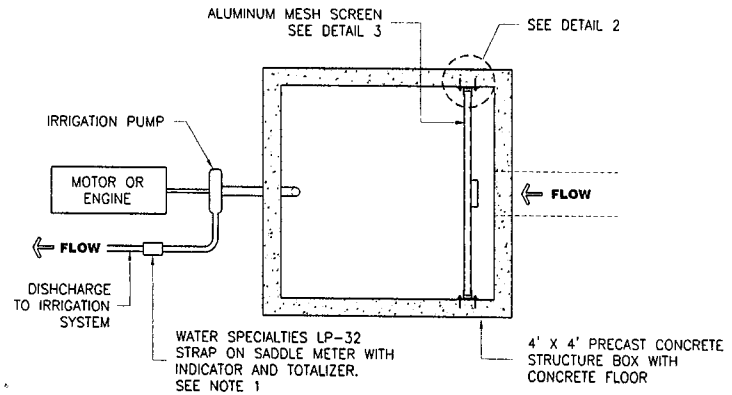
SPRINKLER IRRIGATION
CONNECTION TO LATERAL

| REV | DESCRIPTION | INIT | CHK | RVO | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| B | STDS. COM. APPROVAL | | | | | | |
| --- | INITIAL ISSUE | JAS | BDH | | JTB | BLL | 12/97 |
| A | CAD CONVERSION | | | | | REW | 11/12/81 |
| B | ADD FLOWMETER, SHEET 2 & 3 | | | | | | |

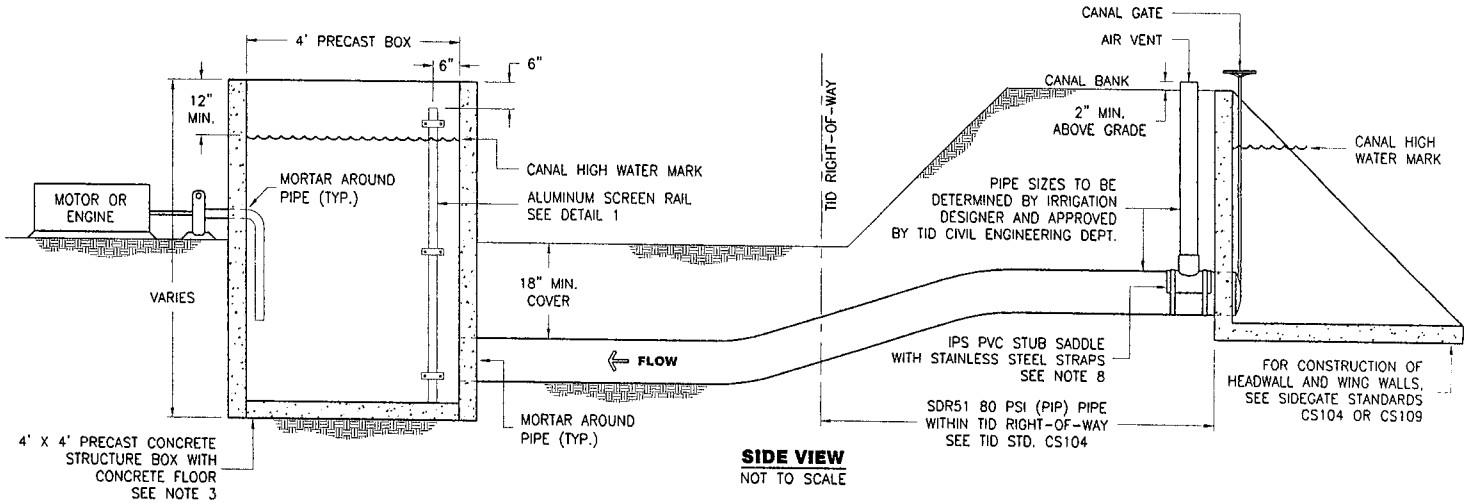
SHEET 1 OF 3

CS 103B

PAGE




**STRUCTURE BOX PLAN VIEW**
NOT TO SCALE




**SIDE VIEW**
NOT TO SCALE

## NOTES:

1) OWNER RESPONSIBLE TO MAINTAIN ALL EQUIPMENT OUTSIDE TID RIGHT-OF-WAY.

2) PIPELINE TO BE SDR51 80 PSI PLASTIC IRRIGATION PIPE (PIP) WITHIN TID RIGHT-OF-WAY. SIZE TO BE DETERMINED BY AN IRRIGATION DESIGNER AND APPROVED BY TID.

3) STRUCTURE BOX TO BE A STACKABLE 4' X 4' PRECAST CONCRETE STRUCTURE BOX. OWNER MAY CHOOSE TO POUR A CONCRETE FLOOR OR ORDER PRECAST STRUCTURE BOX WITH AN EXISTING CONCRETE FLOOR.

4) TOP OF STRUCTURE BOX TO BE A MINIMUM OF 12" ABOVE CANAL HIGH WATER MARK. ELEVATION TO BE VERIFIED BY TID CIVIL ENGINEERING DEPARTMENT PRIOR TO CONSTRUCTION.

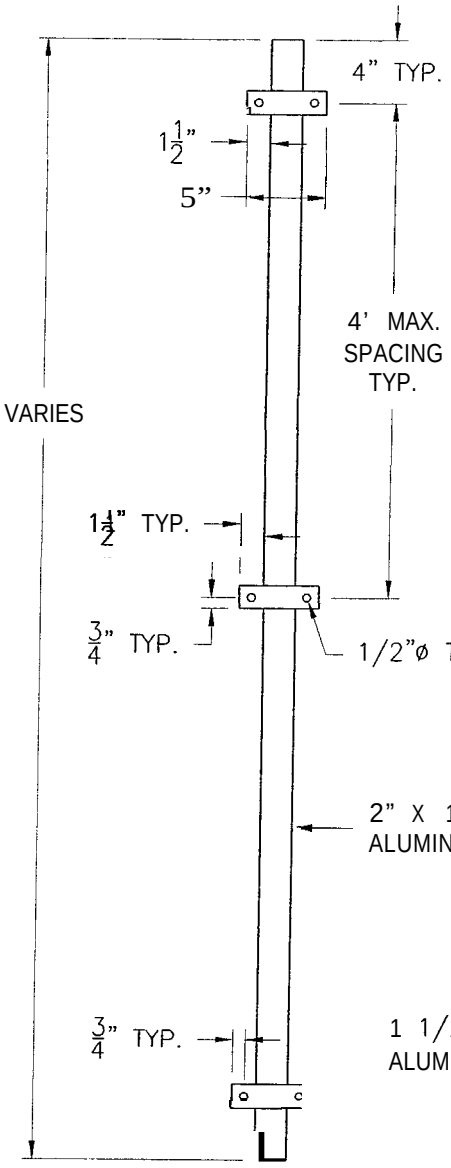
5) THE METER MUST HAVE A FULL FLOW OF WATER FOR PROPER ACCURACY. FULLY OPENED GATE VALVES, FITTINGS OR OTHER OBSTRUCTIONS THAT INDUCE FLOW DISTURBANCES ARE TO BE A MINIMUM OF 10 PIPE DIAMETERS UPSTREAM AND 2 PIPE DIAMETERS DOWNSTREAM FROM THE FLOW METER. INSTALLATIONS WITH LESS THAN 10 PIPE DIAMETERS OF STRAIGHT PIPE REQUIRE STRAIGHTENING VANES. METERS WITH STRAIGHTENING VANES REQUIRE A MINIMUM OF 5 PIPE DIAMETERS UPSTREAM AND 1 PIPE DIAMETER DOWNSTREAM.

6) FLOW METER TO BE ACCESSIBLE BY TID.

7) ALL CONDUITS INTRODUCED THROUGH WALL OF STRUCTURE BOX ARE TO BE MORTARED.

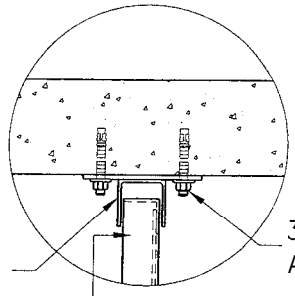
8) IPS PVC STUB SADDLE TO BE USED TO INSTALL VENT PIPE. SADDLE IS TO BE GLUED AND STRAPPED TO THE PIPELINE WITH STAINLESS STEEL STRAPS. A PVC TEE MAY BE SUBSTITUED FOR STUB SADDLE.

9) EXPOSED PORTION OF VENT PIPE TO BE PAINTED WITH AN ULTRAVIOLET (UV) PROTECTIVE PAINT.




**DETAIL 1**

ALUM. SCREEN RAIL
QTY. OF 2 REQD



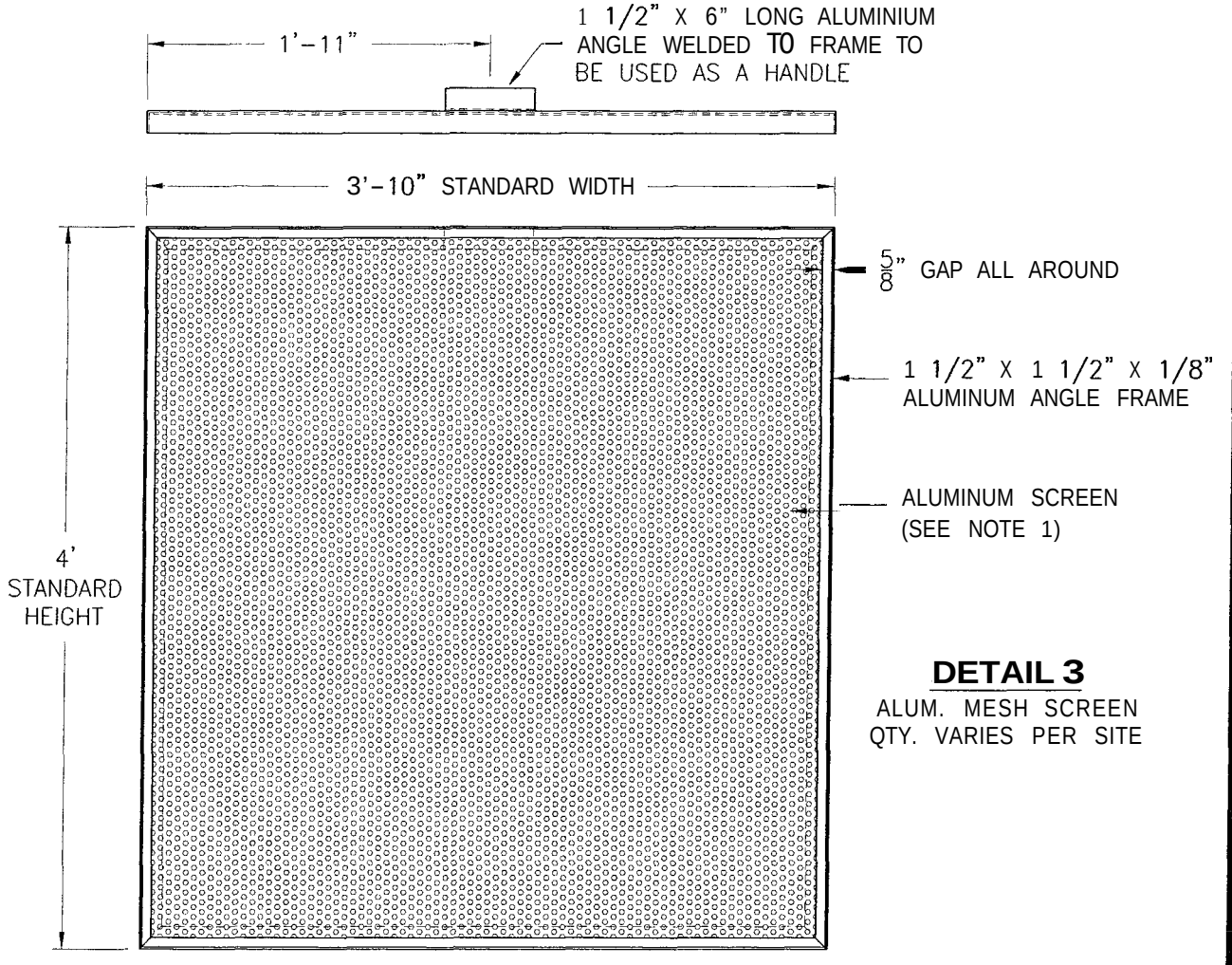

**DETAIL 2**

SCREEN RAIL CONNECTION

| | TURLOCK IRRIGATION DISTRICT | | | | | | | IRRIGATION CONSTRUCTION STANDARDS |
|---|---|---|---|---|---|---|---|---|
| B | STDS. COM. APPROVAL | | | K.C | | | | |
| | | | | | | | | SPRINKLER IRRIGATION CONNECTION TO LATERAL |
| | | | | | | | | |
| B | ADD FLOWMETER, SHEET 2 & 3 | | | | | | | |
| A | CAD CONVERSION | | | | JTB | BLL | 12/97 | |
| -- | INITIAL ISSUE | JAS | BDH | | | REW | 11/12/81 | SHEET 2 OF 3 |
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE | CS 103B PAGE |

## NOTES

1) SCREEN AND SCREEN FRAME TO BE MADE OF 6061-T6 ALUMINUM
2) SCREEN MESH SIZE TO BE DETERMINED BY OWNER/ IRRIGATION DESIGNER.
3) STANDARD HEIGHT AND WIDTH FOR SCREENS IS SHOWN. AVERAGE WEIGHT FOR THIS SIZE SCREEN IS 35 LBS PER SCREEN.
4) A 6" LENGTH OF ANGLE IS TO BE WELDED TO THE SCREEN FRAME TO BE USED AS A HANDLE SO THAT OWNER CAN REMOVE SCREEN FOR CLEANING.
5) SCREEN DIMENSIONS WILL VARY FROM SITE TO SITE.




**DETAIL 3**
ALUM. MESH SCREEN
QTY. VARIES PER SITE

| TURLOCK IRRIGATION DISTRICT | | | | | | | |
|---|---|---|---|---|---|---|---|
| B | STDS. COM. APPROVAL | | | 9.12. | | | |
| | | | | | | | |
| | | | | | | | |
| B | ADD FLOWMETER, SHEET 2 & 3 | | | | | | |
| A | CAD CONVERSION | | | | JTB | BLL | 12/97 |
| -- | INITIAL ISSUE | JAS | BDH | | | REW | 11/12/81 |
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |

IRRIGATION CONSTRUCTION STANDARDS

SPRINKLER IRRIGATION CONNECTION TO LATERAL

SHEET 3 OF 3

CS 103B

PAGE

TURLOCK IRRIGATION DISTRICT

IRRIGATION
CONSTRUCTION STANDARDS

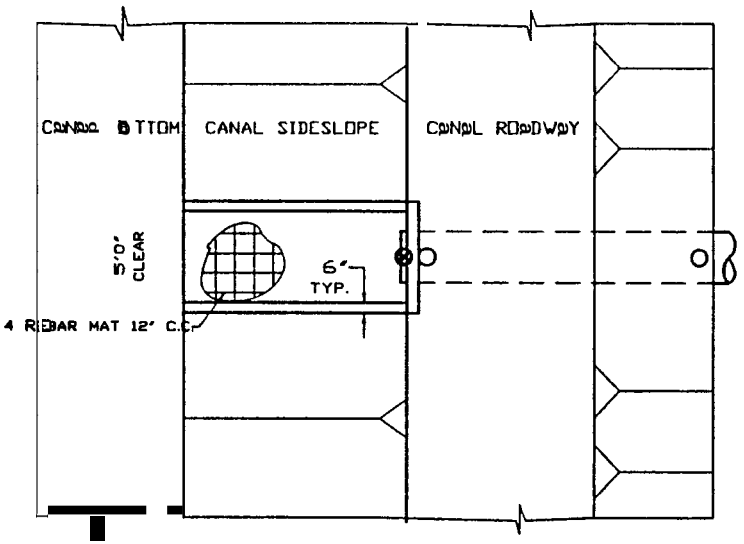
# CANAL SIDEGATE FOR IRRIGATION PIPELINE

| REV | DESCRIPTION | INIT | CHK | RVD | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| C | STDS. COM. APPROVAL | | | | | | 5-'96 |
| | | | | | | | |
| C | ADD SHEET 2 | | | | | BLL | 6-98 |
| B | CAD. PLAN VIEW | ABO | DCL | | BDH | BLL | 4/18/96 |
| A | NOTES | JAS | | | | BDH | 05/01/87 |

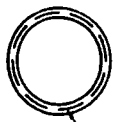
SHEET 1 OF 2

CS 104C

PAGE

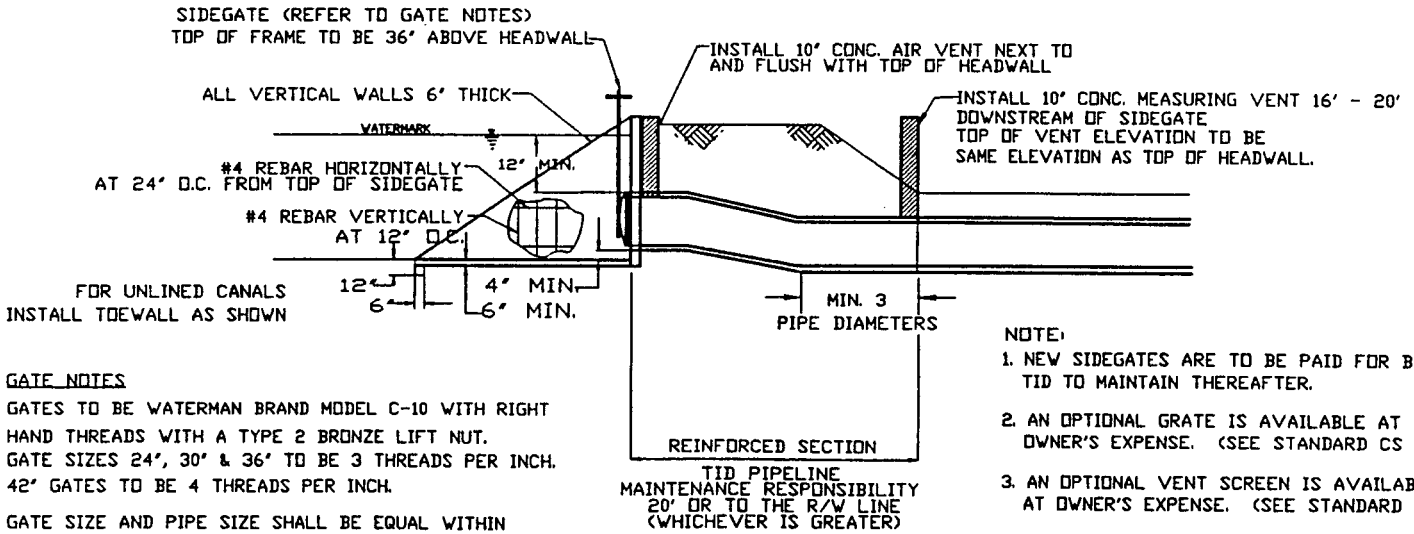



TYPICAL SECTION
C-76 OR C.I.P.



| INSIDE PIPE DIAMETER | WALL THICKNESS |
|---|---|
| 30" | 4" |
| 36" | 4" |
| 42" | 5" |

REINFORCE PIPE WITH 6"x6" 10/10 W.W.F.



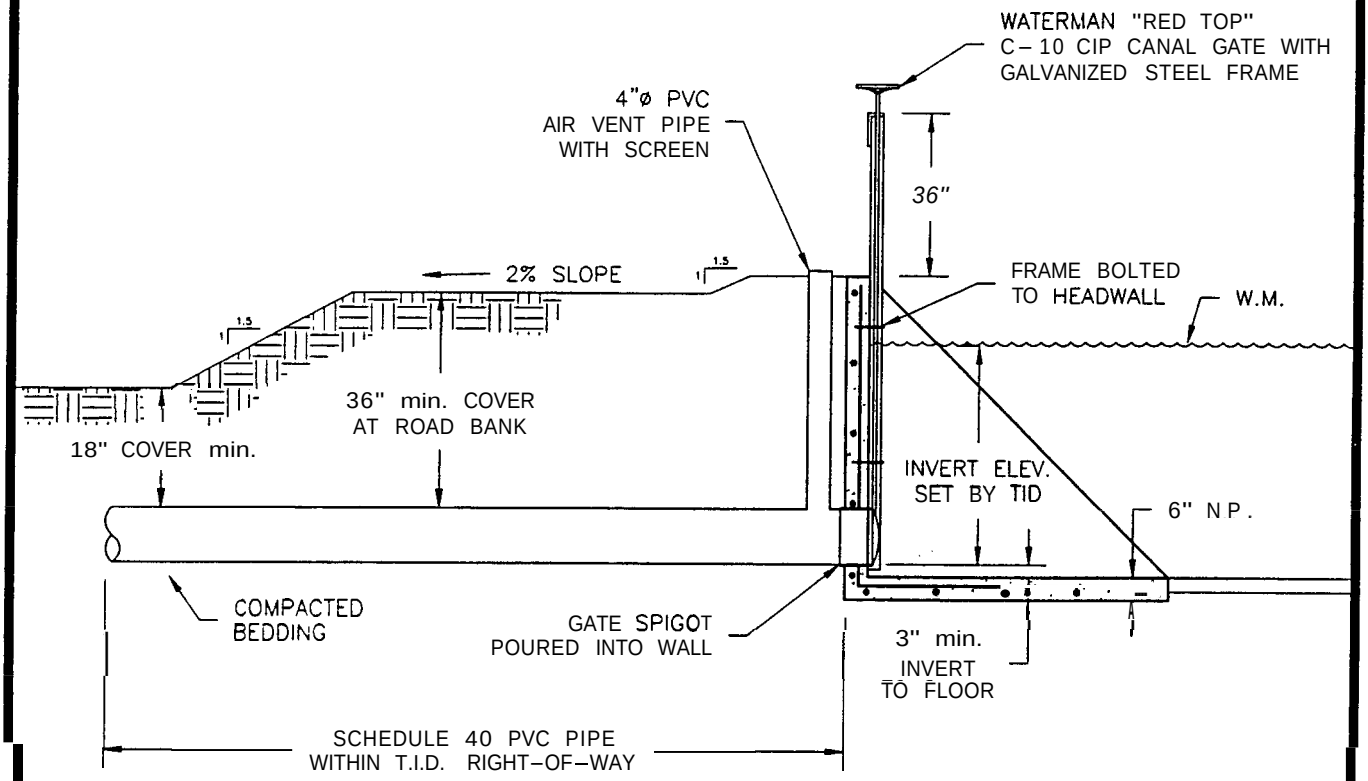

GATE NOTES

GATES TO BE WATERMAN BRAND MODEL C-10 WITH RIGHT HAND THREADS WITH A TYPE 2 BRONZE LIFT NUT.
GATE SIZES 24", 30" & 36" TO BE 3 THREADS PER INCH.
42" GATES TO BE 4 THREADS PER INCH.

GATE SIZE AND PIPE SIZE SHALL BE EQUAL WITHIN THE TID MAINTAINED SECTION.

NOTE:

1. NEW SIDEGATES ARE TO BE PAID FOR BY OWNER. TID TO MAINTAIN THEREAFTER.
2. AN OPTIONAL GRATE IS AVAILABLE AT OWNER'S EXPENSE. (SEE STANDARD CS 115)
3. AN OPTIONAL VENT SCREEN IS AVAILABLE AT OWNER'S EXPENSE. (SEE STANDARD CS 124)




**PIPE INSTALLATION** AND **TURNOUT WITH GATE (section)** NOT TO SCALE

NOTES:

A. PIPE WITHIN THE T.I.D. RIGHT–OF–WAY TO BE SCHEDULE 40 PVC. ANY EXPOSED PVC (VENT) TO BE PAINTED (FOR U.V. PROTECTION).

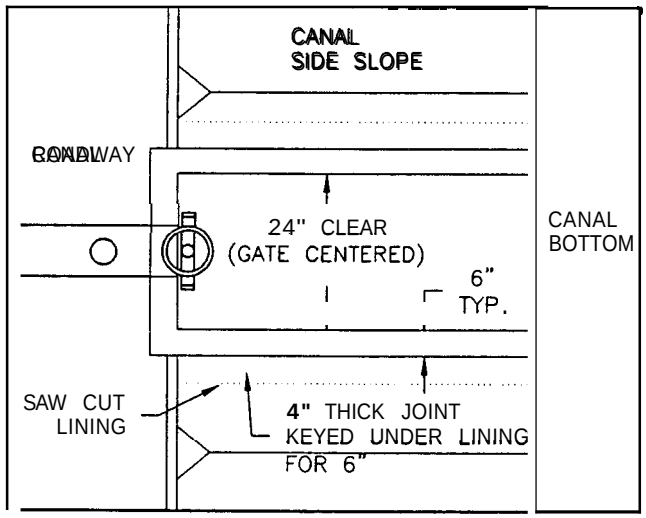
B. CANAL GATE TO BE GALVANIZED STEEL WATERMAN "RED TOP" C – 10 CIP (AVAILABLE IN 6, 8, 10, & 12 INCH DIAMETERS)

C. PIPE WITHIN TID RIGHT–OF–WAY TO BE SUPPORTED ON COMPACTED BEDDING (min. 90%) AND HAVE COMPACTED BACKFILL (90%).

D. EDGE OF TID RIGHT–CF–WAY AND ELEVATION OF PIPE INVERT TO BE LOCATE; BY TID.

E. TURNOUT AT CANAL TO BE 6" THICK CONCRETE (3000psi) WITH #4 BARS AT 12" EACH WAY.

F. CANAL BANK IS TO EE RESTORED TO ITS ORIGINAL CONDITION.



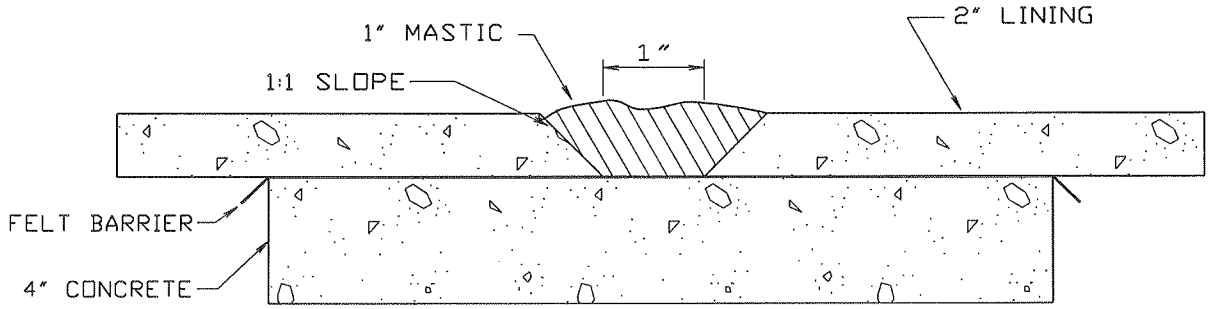

**TURNOUT (plan view)** NOT TO SCALE

TURLOCK IRRIGATION DISTRICT

IRRIGATION
CONSTRUCTION STANDARDS

CANAL SIDEGATE FOR IRRIGATION PIPELINE

| SHEET | | |
|---|---|---|
| 2 of 2 | CS104C | |




NOTE:

1. EXPANSION JOINTS SHALL BE PLACED IN CANAL LINING AT 200 FT. INTERVALS.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

# EXPANSION JOINT DETAIL

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 1 | FELT BARRIER/NOTE 1 | | RRV | | | BDH | 2/88 |
| --- | INITIAL ISSUE | SEB | BDH | | | REW | 2/88 |

SHEET 1 OF 1

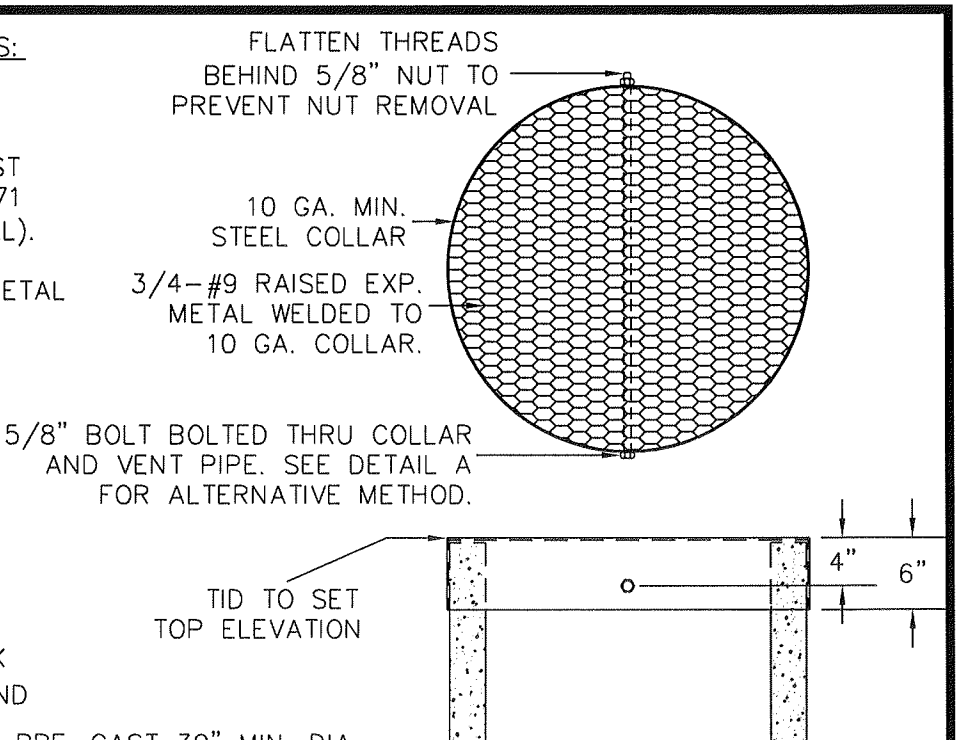
CS 106

PAGE

CONSTRUCTION NOTES:

1) METAL COVER TO BE PAINTED SHERWIN WILLIAMS RAIN FOREST GREEN, PART #SW4071 (OR APPROVED EQUAL).

2) RECESS EXPANDED METAL COVER INSIDE 10 GA. STEEL COLLAR.




**DETAIL A**

TO BE USED FOR MEASURING VENTS N.T.S.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| C | REV NOTE 1, SPECIFY VENT DIA | | | AWV | | | 7/10 |
| B | COMBINE CS 107 W/CS 124 | | | | | | |
| A | RE-DRAWN IN CAD | | | | JTB | BLL | 8/6/97 |
| -- | INITIAL ISSUE | JAS | BDH | | | REW | 11/81 |

# ACCESS AND AIR VENT

SHEET 1 OF 1

CS 107C

PAGE

NOTES:

1) T.I.D. ENGINEER TO APPROVE SPECIFICATIONS OF STEEL PIPE BASED UPON LENGTH AND PIPE DIAMETER .

2) T.I.D REFLECTIVE TAPE STOCK NUMBER IS 0-7762-2.




| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| B | STDS. COM. APPROVAL | CDB | | | | BB | |
| | | | | | | | |
| | | | | | | | |
| B | ADD REFLECTIVE TAPE SPEC. | | | | | BJ2 | 10/99 |
| A | ADD DAYTON COUPLER | RV | | | | BDH | 4/87 |
| -- | INITIAL ISSUE | | | | | | |

TURLOCK IRRIGATION DISTRICT

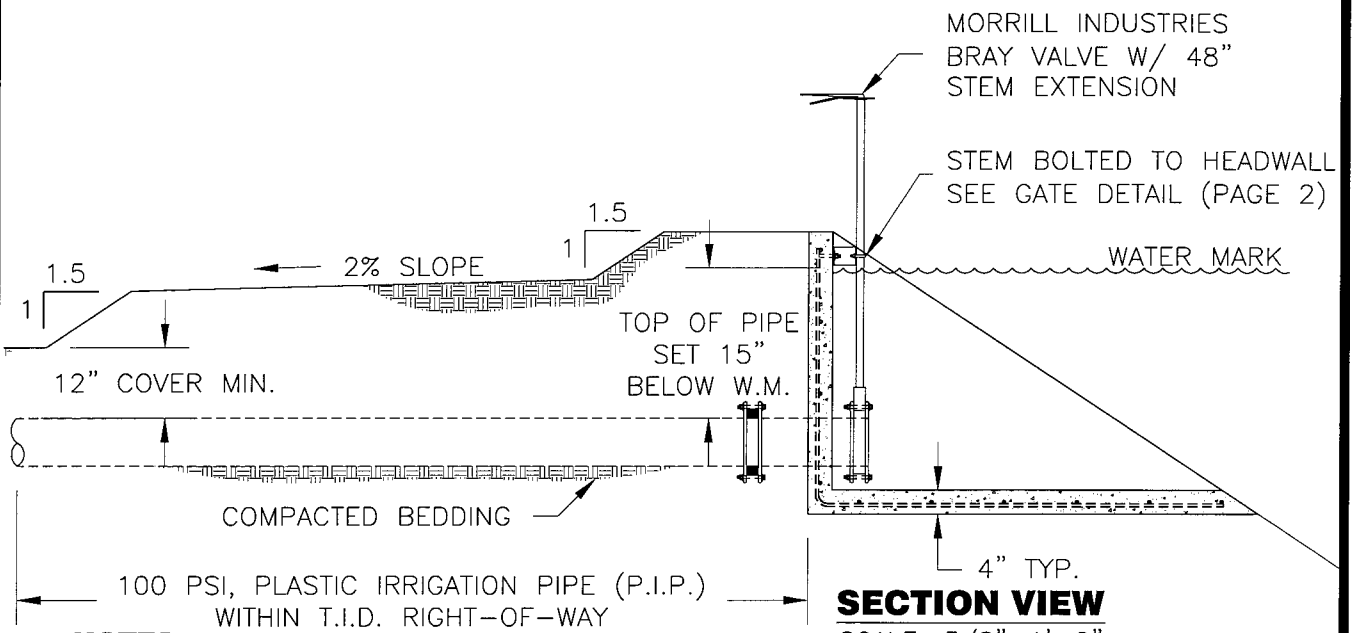
IRRIGATION CONSTRUCTION STANDARDS

# PUMP LINE CROSSING OVER CANAL

SHEET 1 OF 1

CS 108B

PAGE




**SECTION VIEW**
SCALE: 3/8"=1'-0"

**NOTES:**

1) PIPE WITHIN THE T.I.D. RIGHT-OF-WAY TO BE 100 PSI, PLASTIC IRRIGATION PIPE (P.I.P.)

2) CANAL GATE TO BE MORRILL INDUSTRIES LEVER OPERATED BRAY VALVE WITH 48" EXTENSION AVAILABLE IN:
   6" DIA. (PART # BLO-6W48)
   8" DIA. (PART # BLO-8W48).

3) FLANGE BOLTS ARE TO BE STAINLESS STEEL:
   6" VALVE - 5/8" X 3 1/2" BOLT (QTY OF 8)
   8" VALVE - 3/4" X 4" BOLT (QTY OF 8)

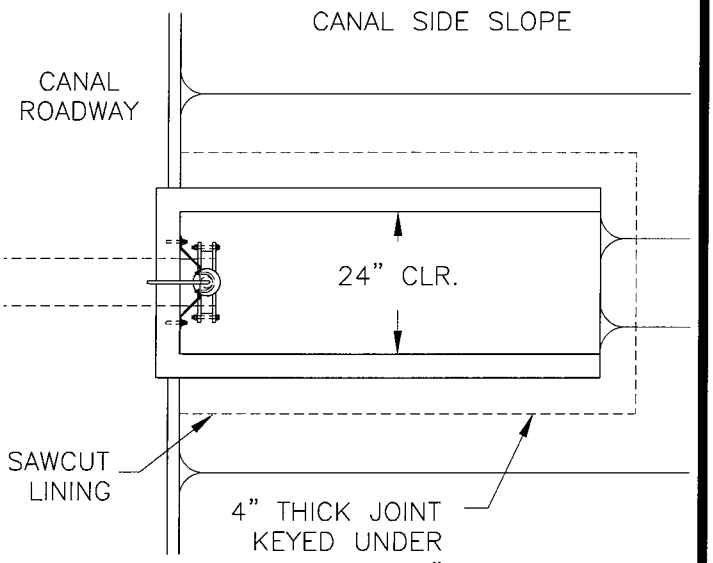
4) PIPE WITHIN T.I.D. RIGHT-OF-WAY TO BE SUPPORTED ON COMPACTED BEDDING (MIN. 90%) AND HAVE COMPACTED BACKFILL (MIN. 90%)

5) EDGE OF RIGHT-OF-WAY AND ELEVATION OF PIPE INVERT TO BE LOCATED BY T.I.D.

6) TURNOUT AT CANAL TO BE 4" THICK CONCRETE (3000 PSI) WITH #4 BARS AT 12" ON CENTER EACH WAY

7) CANAL BANK TO BE RESTORED TO ITS ORIGINAL CONDITION

8) APPROXIMATE FLOW RATES:
   6" VALVE: 600 GPM
   8" VALVE: 1100 GPM




**PLAN VIEW**
SCALE: 3/8"=1'-0"

TURLOCK IRRIGATION DISTRICT

IRRIGATION
CONSTRUCTION STANDARDS

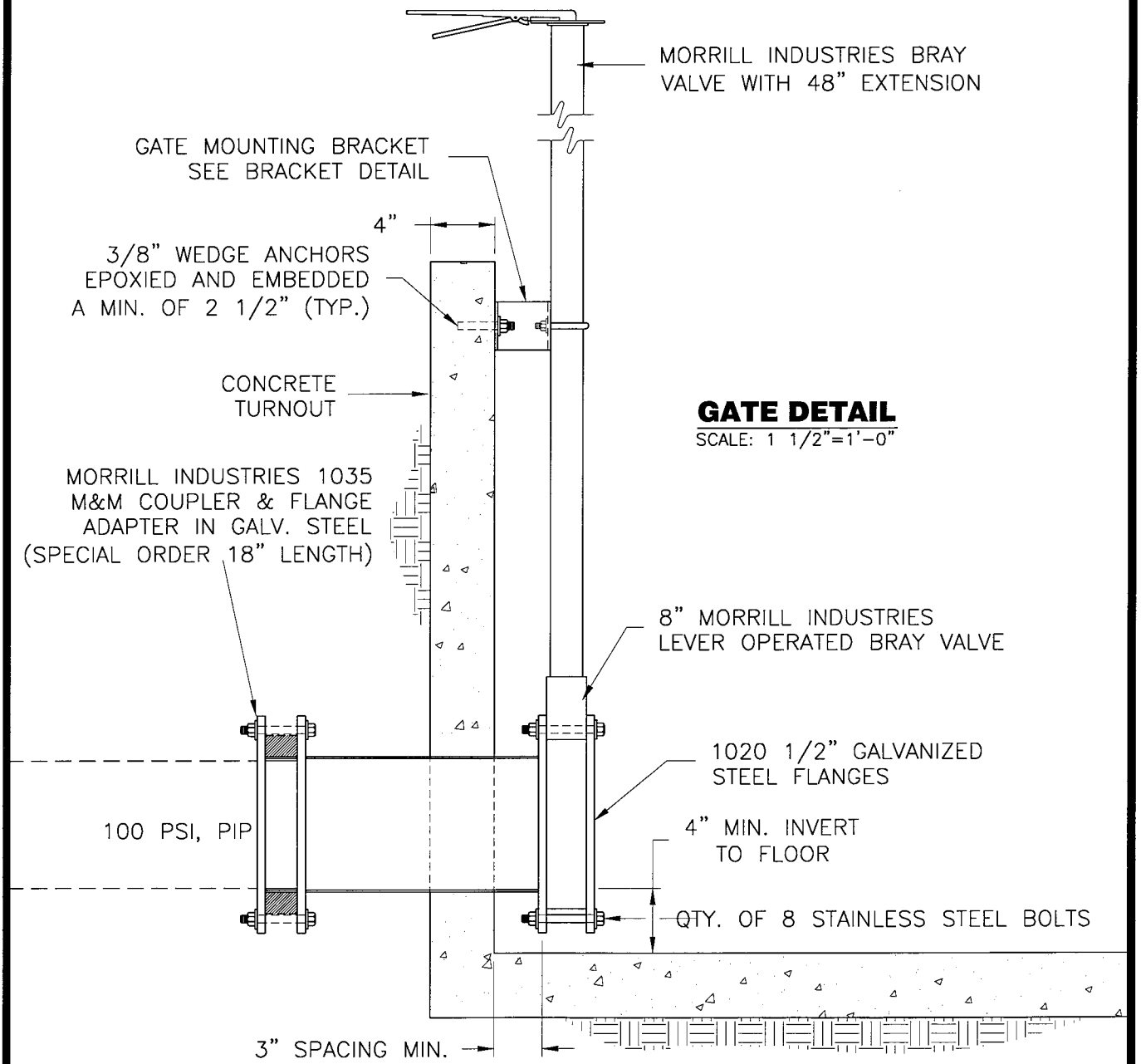
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| A | STDS. COM. APPROVAL | LAR | JLE | | | | |
| -- | INITIAL ISSUE | FJL | | | | JTB | 01/06/03 |

# SMALL CANAL SIDEGATE FOR IRRIGATION PIPELINE

SHEET 1 OF 3

CS 109A

PAGE



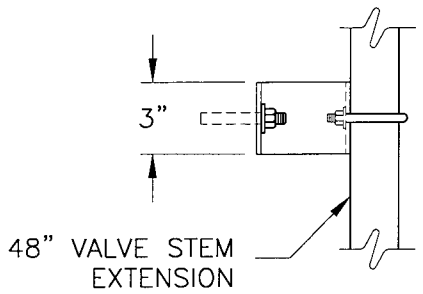

**GATE DETAIL**
SCALE: 1 1/2"=1'-0"

TURLOCK IRRIGATION DISTRICT

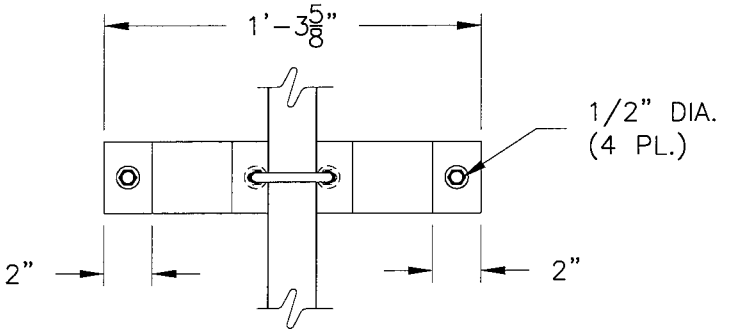
IRRIGATION
CONSTRUCTION STANDARDS

SMALL CANAL SIDEGATE
FOR IRRIGATION
PIPELINE

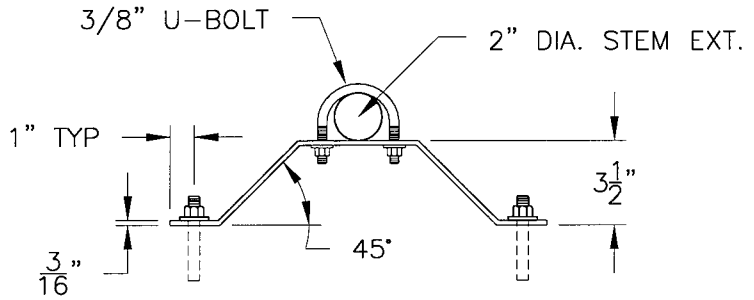
| SHEET | PAGE |
|---|---|
| 2 of 3 | CS109A |




**BRACKET END VIEW**



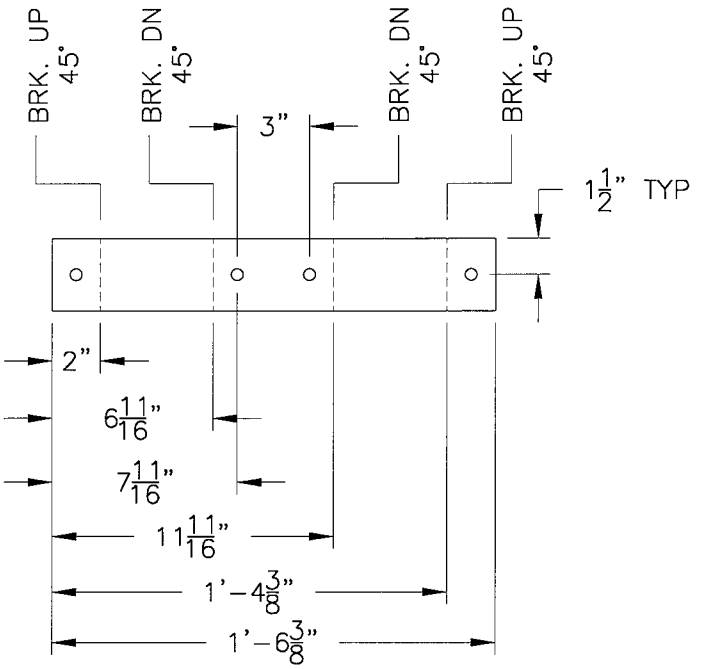

**BRACKET PLAN VIEW**




**BRACKET TOP VIEW**

**SHEET METAL LAYOUT**

3/16" STAINLESS STEEL
SCALE: 1 1/2"=1'-0"




TURLOCK IRRIGATION DISTRICT

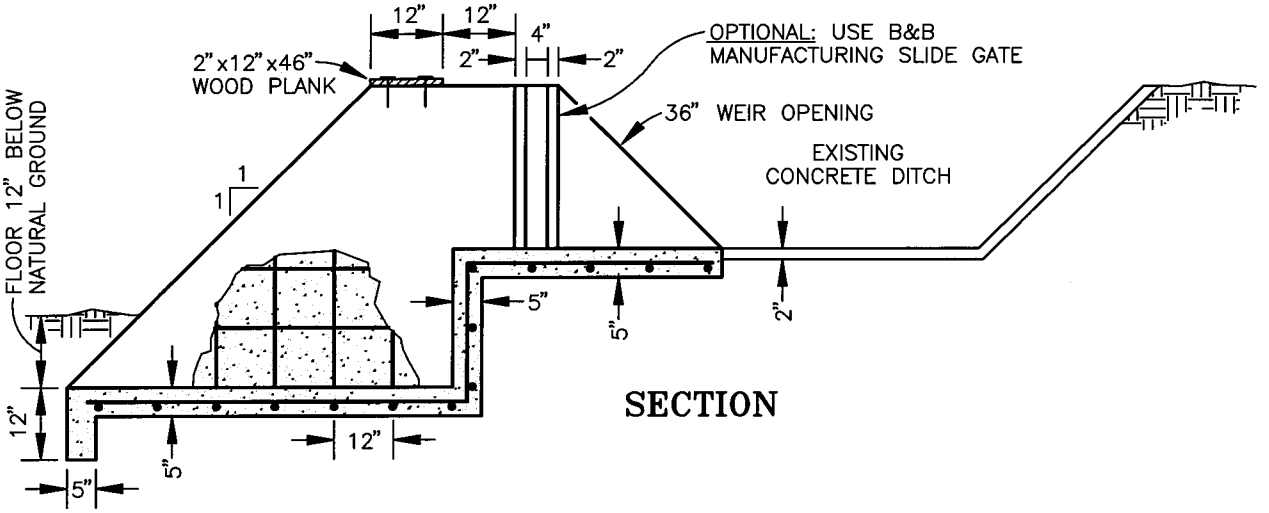
IRRIGATION
CONSTRUCTION STANDARDS

SMALL CANAL SIDEGATE
FOR IRRIGATION
PIPELINE

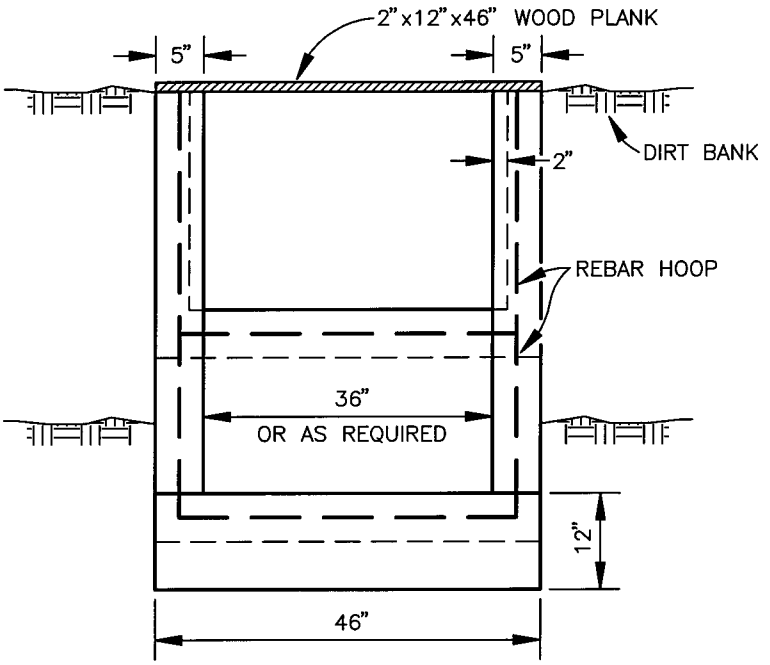
SHEET 3 of 3

CS109A

PAGE

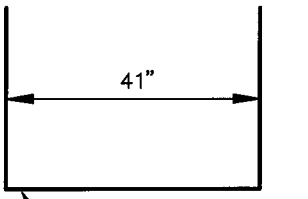



## SECTION




## PROFILE

## DIAGRAM A




## NOTE

- WALLS CONSIST OF #4 REBAR AT 12" C.C WITH #4 REBAR U-SHAPED HOOPS AT 12" C.C. SEE DIAGRAM A

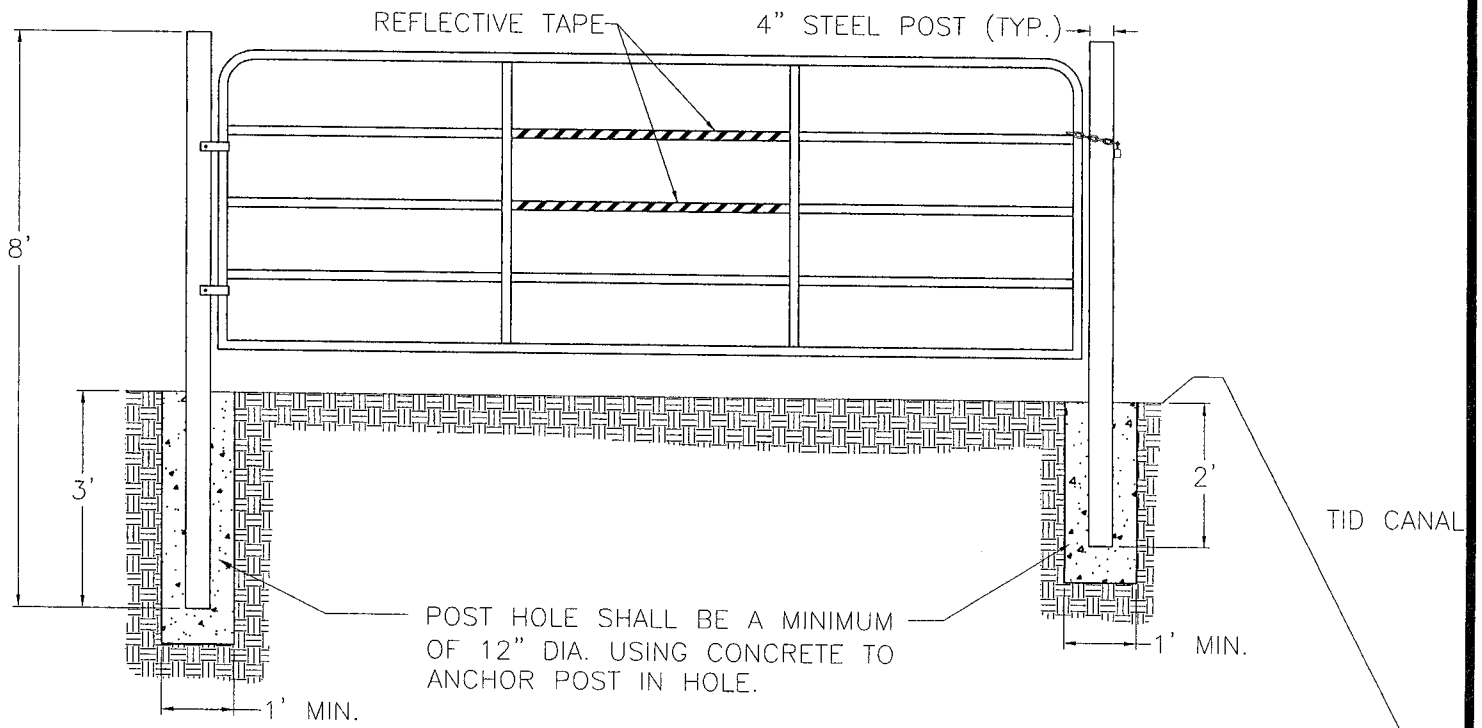
| TURLOCK IRRIGATION DISTRICT | | | | | | | | IRRIGATION CONSTRUCTION STANDARDS |
|---|---|---|---|---|---|---|---|---|
| A | STDS. COM. APPROVAL | BB | | BB | | R.C. | 11-97 | WEIR-BOARD SLIDE GATE |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| A | CAD CONVERSION | | | | | BB | 12/97 | |
| -- | INNITIAL ISSUE | JAS | BDH | | | REW | 12/17/81 | SHEET 1 OF 1 |
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE | CS 110A PAGE |

GATE SPECIFICATIONS:

1) "FARM MASTER GALVANIZED TUBE GATE" OR APPROVED EQUAL.
2) GATE HEIGHT 50" (MIN.).
3) LENGTH 12' (MIN.).
4) GATE SHALL BE MADE FROM 1-5/8" O.D. OR LARGER STEEL TUBING.
5) GATE SHALL HAVE 5 HORIZONTAL TUBES (MIN.) EVENLY SPACED.
6) GATE SHALL HAVE 4 VERTICAL SUPPORTS EVENLY SPACED.
7) GATE SHALL HAVE 2 METAL HINGES.
8) GATE SHALL BE SECURED BY A CHAIN AND A T.I.D. PADLOCK. IF DOUBLE GATE INSTALLATION IS NECESSARY, GATES ARE TO BE SECURED TOGETHER BY A CHAIN AND A T.I.D. PADLOCK WITH A MAXIMUM GAP BETWEEN GATES OF 6".
9) GATE(S) AND POSTS MAY BE PAINTED SHERWIN WILLIAMS RAIN FOREST GREEN (PART #SW4071) OR GALVANIZED.
10) GATE SHALL BE LOCATED A MINIMUM OF 90-FEET FROM THE EDGE OF PAVEMENT, UNLESS OTHERWISE APPROVED.

NOTE:

1) OWNER MUST OBTAIN A REVOCABLE LICENSE FROM T.I.D. PRIOR TO CONSTRUCTION.
2) T.I.D. TO INSTALL REFLECTIVE TAPE AS PART OF FINAL INSPECTION.
3) HINDGED GATE POST SHALL BE LOCATED ON THE SIDE OPPOSITE THE CANAL.




TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

# METAL GATE FOR CANAL ROADS

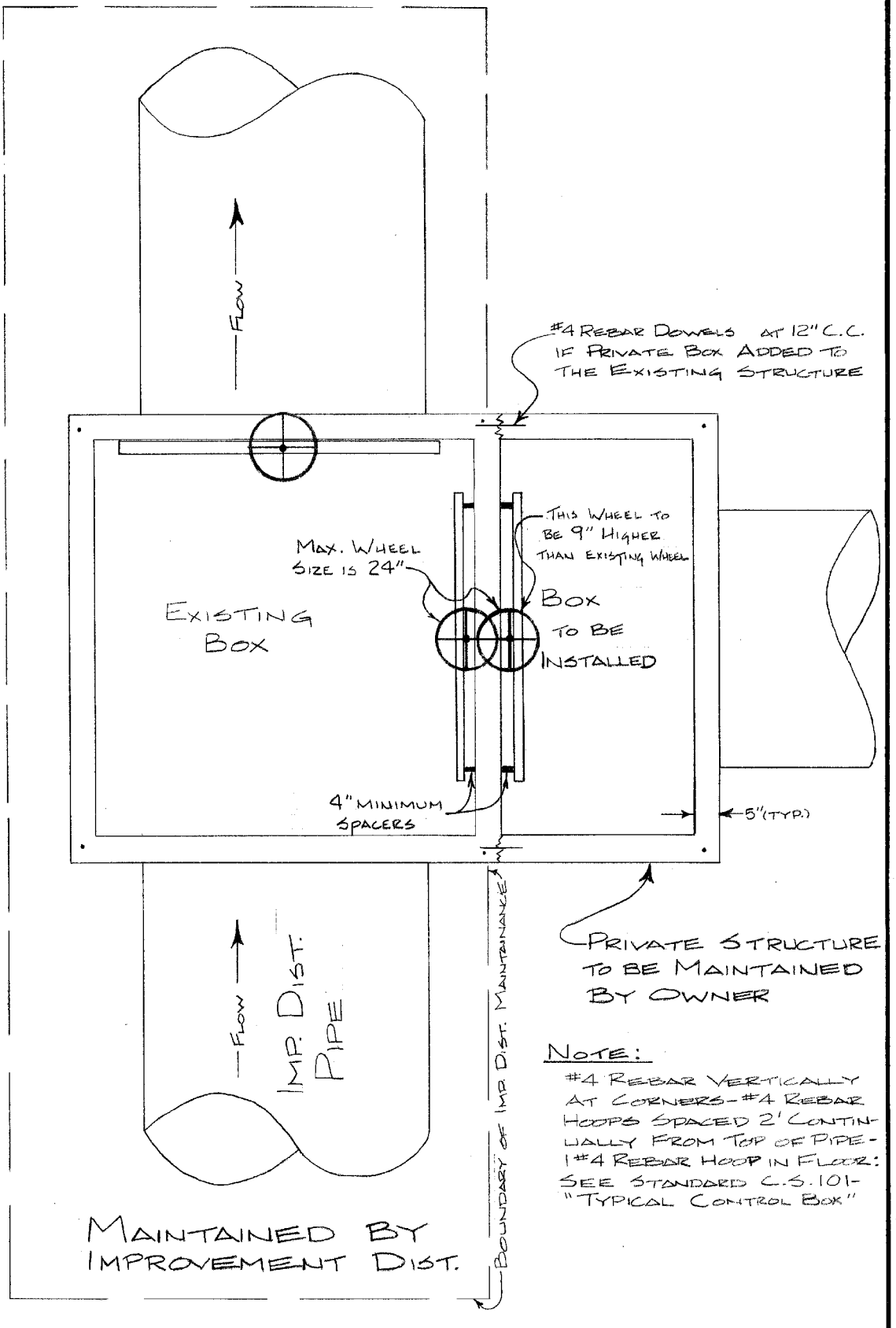
CS 113D

SHEET 1 OF 1

PAGE

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| D | STDS. COM. APPROVAL | | | | | | |
| D | ADDED NOTE 3/ADDED SPEC. 10 | | | | | | |
| C | ADDED NOTE 2/ADDED SPEC. 1 | | | JB | LR | CDB | 10/01/02 |
| | CHANGED SPEC. 4, 5, & 9 | | | JB | LR | CDB | 07/01/02 |
| B | ADDED NOTE/CHANGED COLOR | | | | JB | BLL | 5/11/99 |
| A | ADDED SPECIFICATION 7 & 8 | SEB | | | | | 4/22/87 |

DWG. NO. C.S.114




NOTE:

#4 REBAR VERTICALLY AT CORNERS - #4 REBAR HOOPS SPACED 2' CONTINUALLY FROM TOP OF PIPE - 1 #4 REBAR HOOP IN FLOOR: SEE STANDARD C.S.101 - "TYPICAL CONTROL BOX"

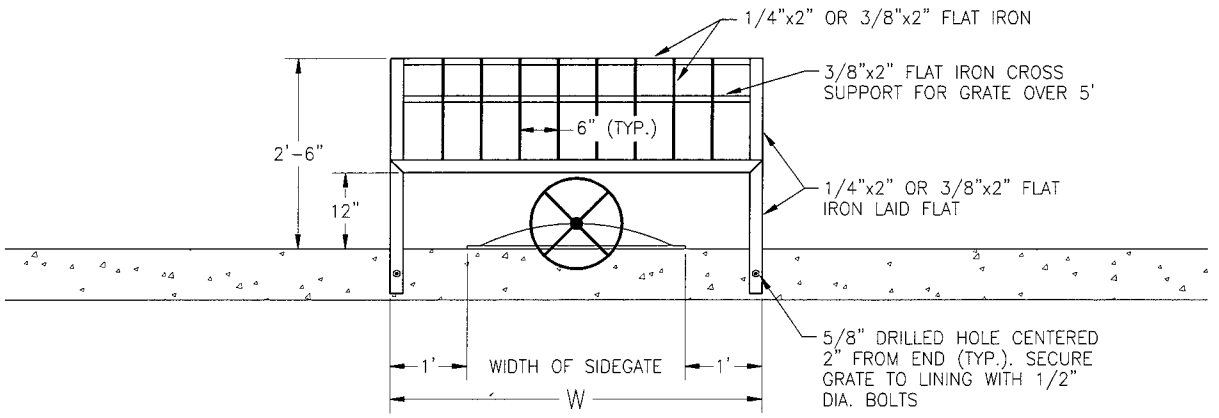
# TURLOCK IRRIGATION DISTRICT

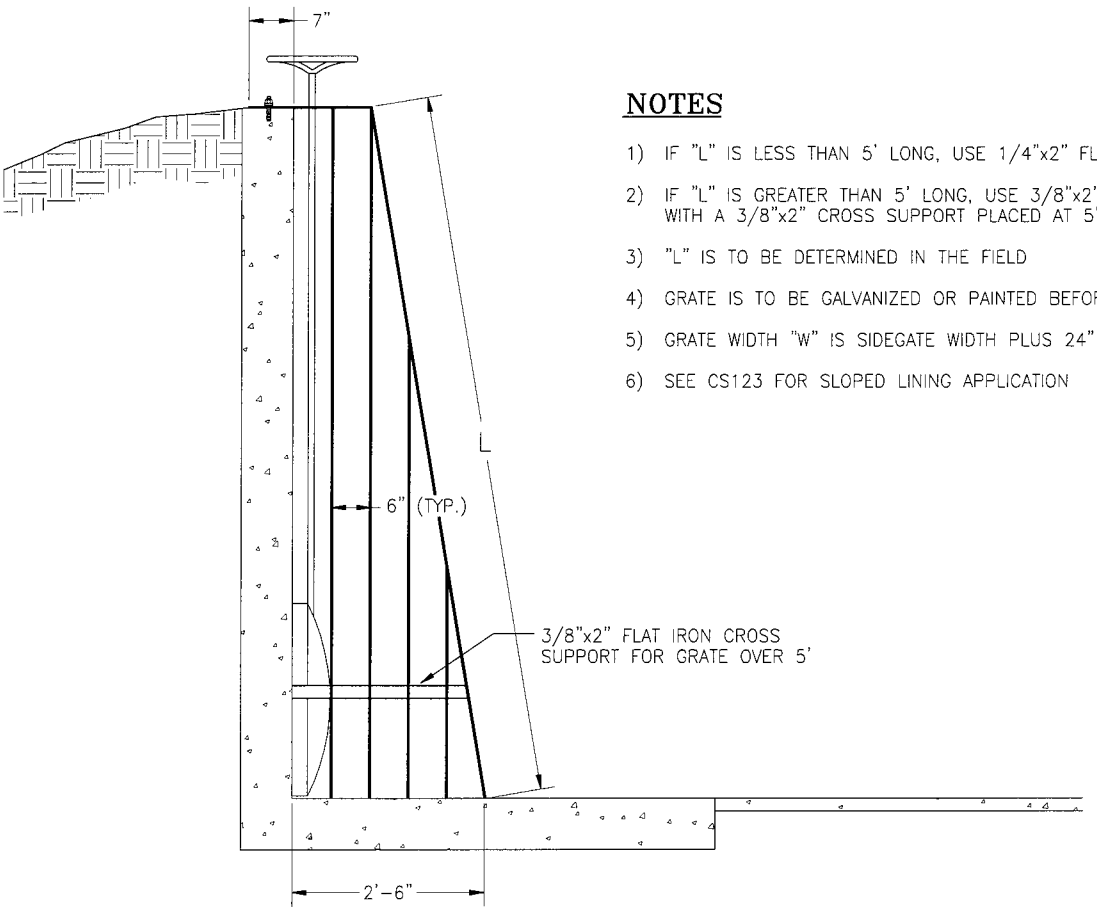
| REV. | DATE | DESCRIPTION | APP. |
|---|---|---|---|
| 1 | 5-1-87 | NOTES | BDH |

**CONSTRUCTION STANDARDS**

DOUBLE BOX STRUCTURE

| | | | |
|---|---|---|---|
| DWG. NO: C.S.114 | | SCALE: NONE | |
| DATE: 3-1-83 | | SHEET OF | |
| DR. BY: JAS | | APP. BY: | |
| CK. BY: BDH | | APP. BY: | |
| APP. BY: | | APP. BY: | |




## NOTES

1) IF "L" IS LESS THAN 5' LONG, USE 1/4"x2" FLAT IRON
2) IF "L" IS GREATER THAN 5' LONG, USE 3/8"x2" FLAT IRON WITH A 3/8"x2" CROSS SUPPORT PLACED AT 5' FROM TOP
3) "L" IS TO BE DETERMINED IN THE FIELD
4) GRATE IS TO BE GALVANIZED OR PAINTED BEFORE INSTALLATION
5) GRATE WIDTH "W" IS SIDEGATE WIDTH PLUS 24"
6) SEE CS123 FOR SLOPED LINING APPLICATION

# TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

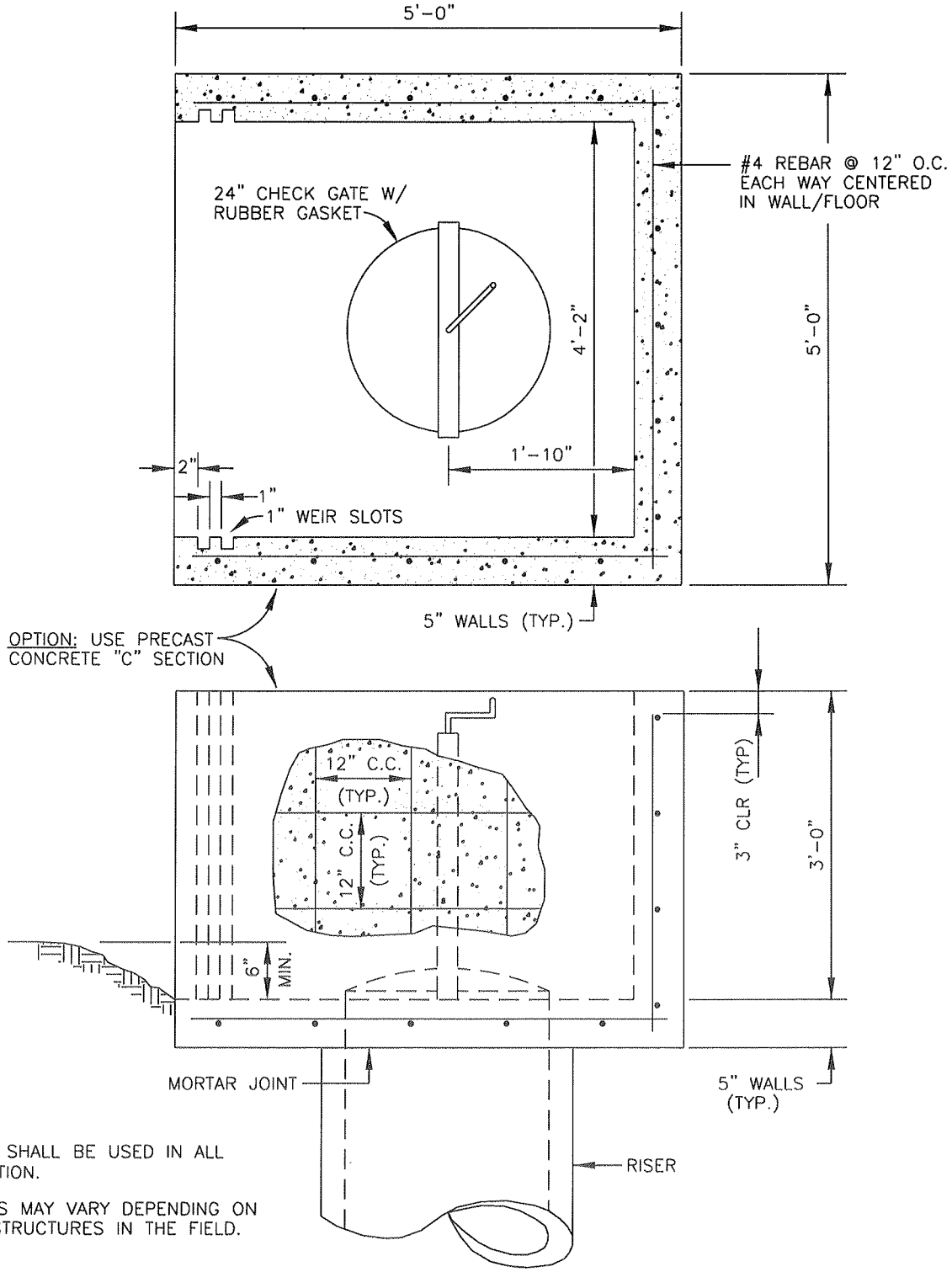
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| A | STDS. COM. APPROVAL | LR | SB | [illegible] | BB | | 10-9E |
| A | CONVERTED TO CAD (Added Note 6) | | | | [illegible] | B22 | 10-98 |
| -- | INITIAL ISSUE | JAS | | | BDH | | 3/29/85 |

GRATE FOR CANAL SIDEGATE WITH VERTICAL WALLS

SHEET 1 OF 1

CS 115A

PAGE




## NOTES

- #4 REBAR SHALL BE USED IN ALL CONSTRUCTION.
- DIMENSIONS MAY VARY DEPENDING ON EXISTING STRUCTURES IN THE FIELD.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

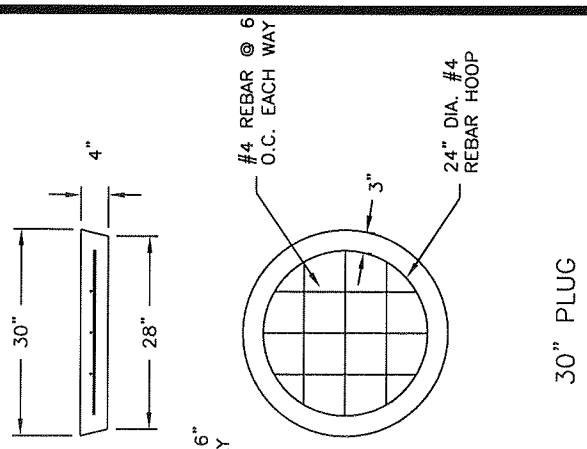
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| B | SHOW RISER | | | AWV | | | 7/10 |
| A | ADD OPTION PRECAST "C" BOX | | | | | | |
| -- | INITIAL ISSUE | JAS | BDH | | | REW | 05/13/83 |

# 24" CHECK GATE & U-BOX STRUCTURE

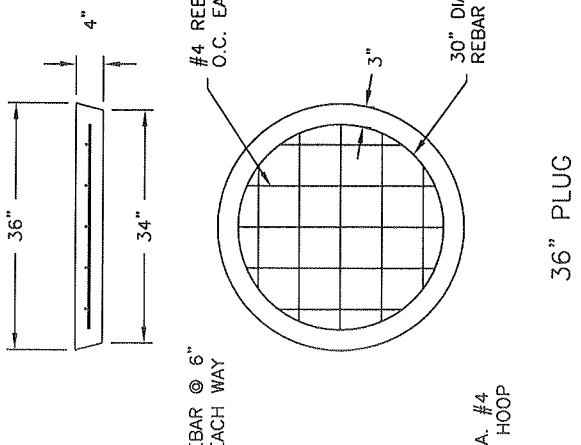
SHEET 1 OF 1

CS 116B

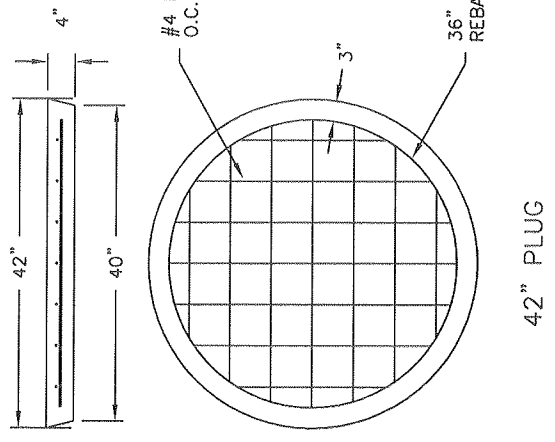
PAGE



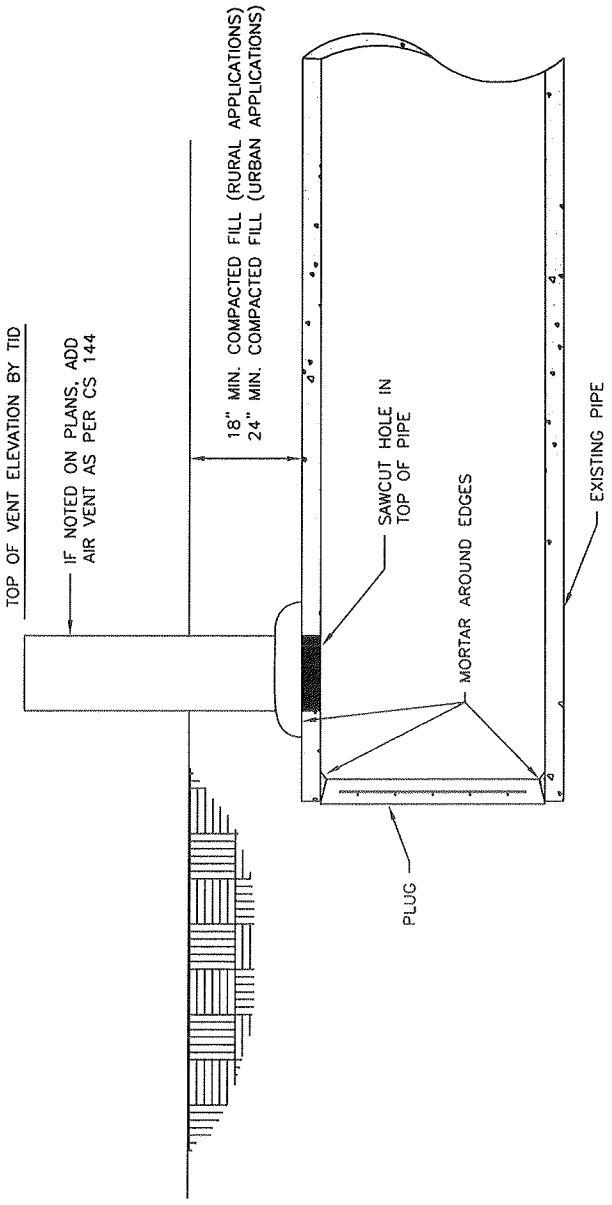

30" PLUG




36" PLUG




42" PLUG



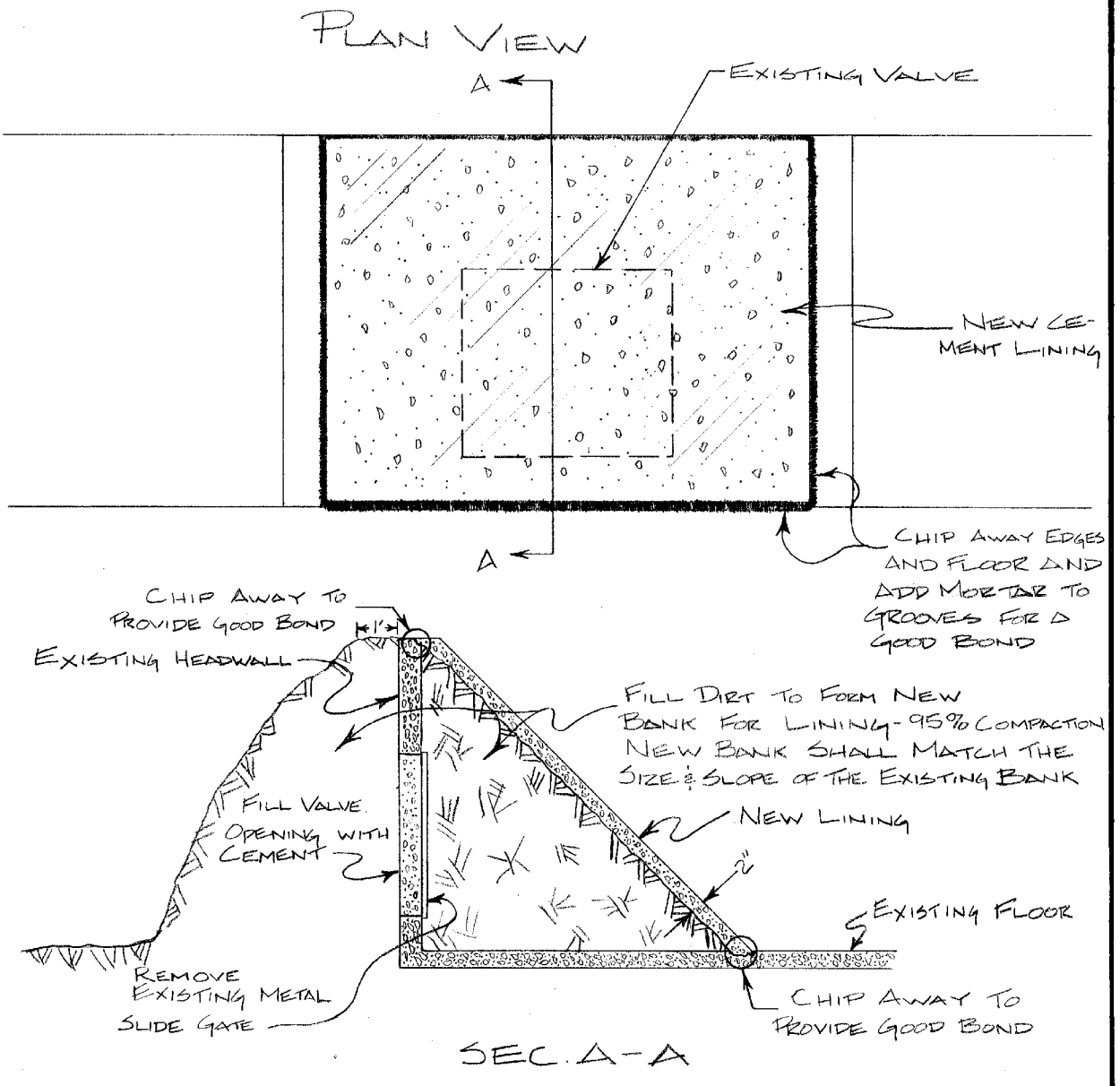

| TURLOCK IRRIGATION DISTRICT | | | | | | | IRRIGATION CONSTRUCTION STANDARDS |
|---|---|---|---|---|---|---|---|
| WO and C&M AGM | Keith Cargill | | | | | | |
| | | | | | | | REINFORCED CONCRETE PIPE PLUG |
| | | | | | | | |
| B | ADD VENT | | | AWV | | | 7/10 |
| A | RE-DRAWN INTO CAD | | | | | | |
| -- | INITIAL ISSUE | JAS | BDH | | | REW | 5/16/83 |
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |

SHEET 1 OF 1

CS 117B

PAGE

DWG. NO. C-S118



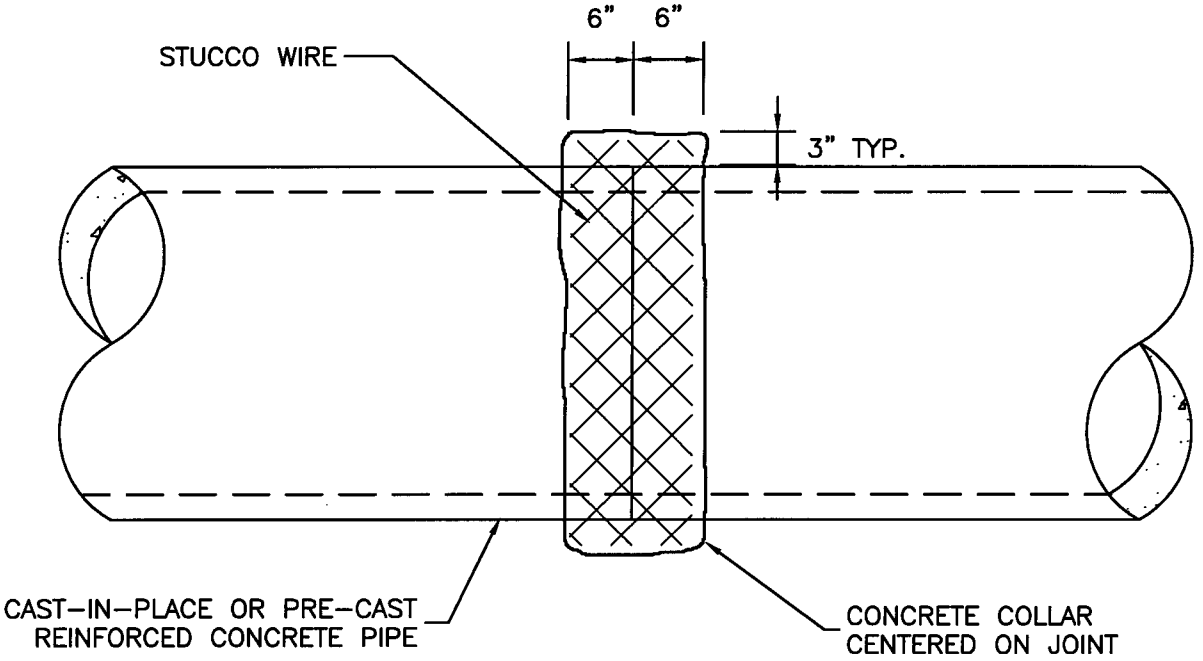

# TURLOCK IRRIGATION DISTRICT

| REV. | DATE | DESCRIPTION | APP. |
|---|---|---|---|
| 1 | 5-1-87 | NOTES | BDH |

**CONSTRUCTION STANDARDS**

SEALING CHECK GATE IN DITCH

| | | | |
|---|---|---|---|
| DWG. NO: C-S118 | | SCALE: NONE | |
| DATE: 5-23-83 | | SHEET OF | |
| DR. BY: JAS | | APP. BY: | |
| CK. BY: BDH | | APP. BY: | |
| APP. BY: RSW | | APP. BY: | |




NOTES:

1. THIS TYPE OF CONCRETE COLLAR IS TO BE USED ONLY WITH PIPE OF 24" DIA. OR LESS.
2. SAND/CEMENT WITH NO AGGREGATE (MORTAR) IS RECOMMENDED FOR CONSTRUCTION OF COLLAR.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| A | STDS. COM. APPROVAL | BB | | | SB | LR | 11-97 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| A | RE-DRAWN INTO CAD | | | | | BJR | 12/8/97 |
| -- | INITIAL ISSUE | JAS | BDH | | | REW | 6/6/83 |

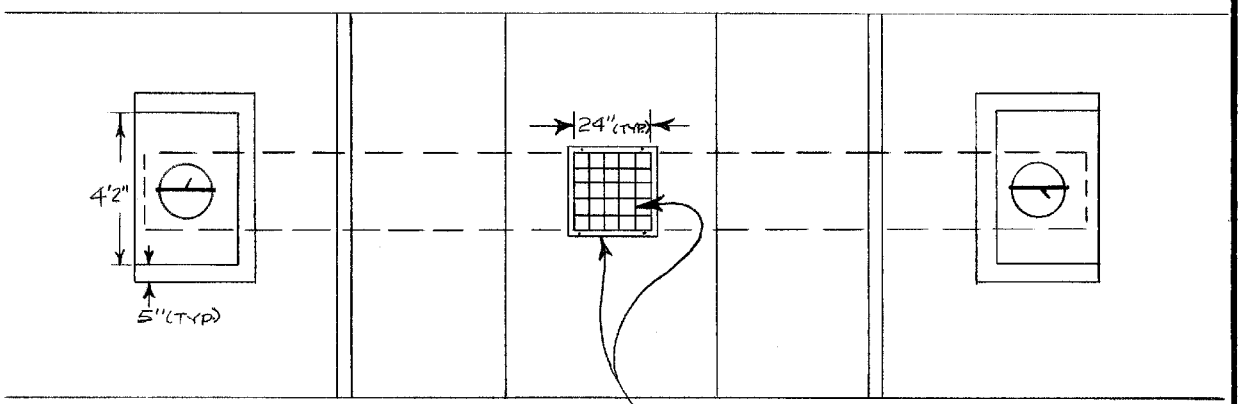
CONCRETE COLLAR FOR SMALL DIAMETER PIPE

SHEET 1 OF 1

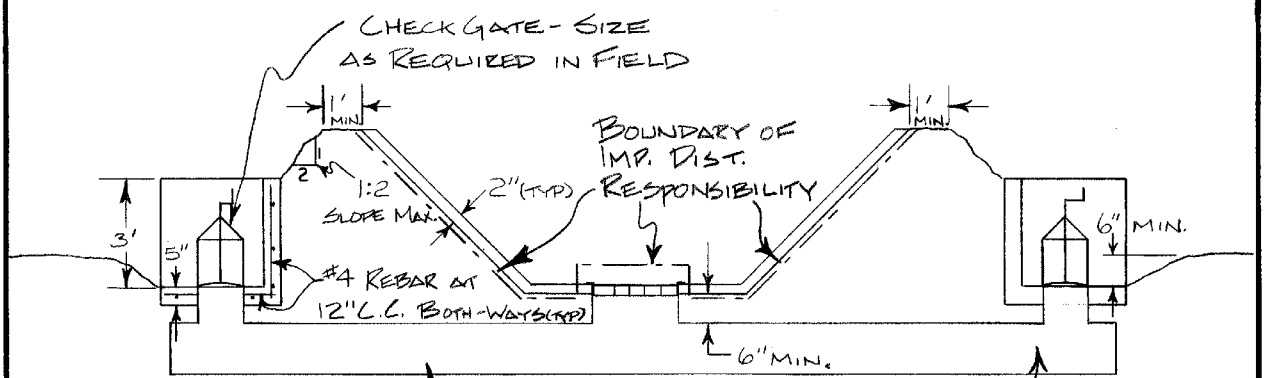
CS 119A

PAGE

DWG. NO. CS 120




NOTE:
GRILL IS TO BE MADE OF 2"x¼" GALVANIZED FLAT IRON ON EDGE AT 6" C.C. BOTH WAYS, AND BORDERED WITH 2"x¼" GALVANIZED ANGLE IRON SECURED WITH 4 ½" BOLTS IN CONCRETE ANCHOR



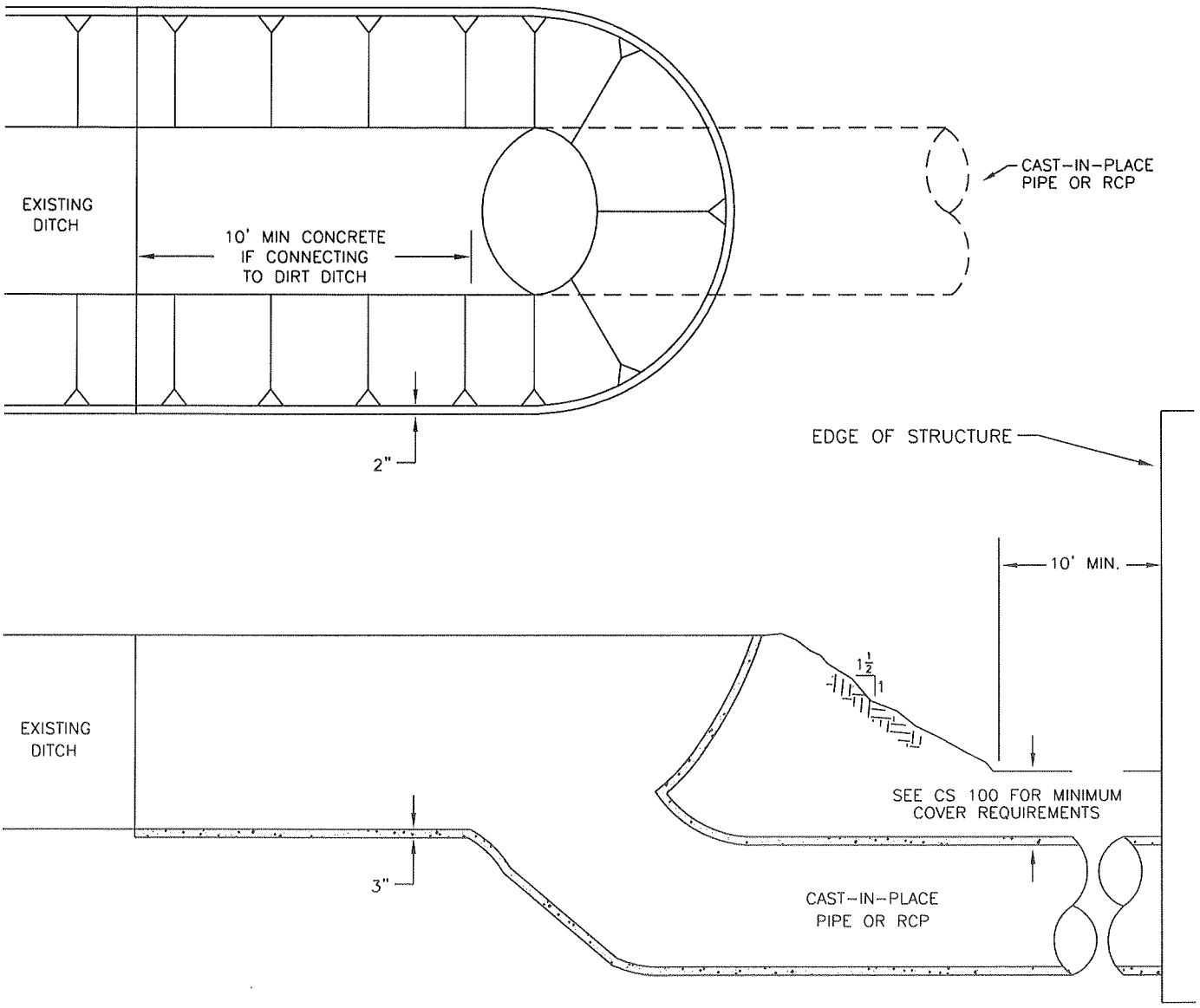

## TURLOCK IRRIGATION DISTRICT

| REV. | DATE | DESCRIPTION | APP. |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

**CONSTRUCTION STANDARDS**

PIPELINE DISCHARGE FROM LINED DITCHES

| | |
|---|---|
| DWG. NO: CS 120 | SCALE: NONE |
| DATE: 10-13-83 | SHEET OF |
| DR. BY: JAS | APP. BY: |
| CK. BY: BDH | APP. BY: |
| APP. BY: RCW | APP. BY: |




NOTES:

1) IF DIRECTION OF WATER FLOW IS INTO PIPE, PROVIDE GRATE TO COVER OPENING. GRATE IS TO BE CONSTRUCTED OF GALVANIZED 3/8" X 2" FLAT IRON.

2) FOR CAST-IN-PLACE APPLICATION USE RADIUS CURVE AT TRANSITION.

3) FOR REINFORCED CONCRETE PIPE APPLICATION USE PREFABRICATED MITERED JOINT AT TRANSITION.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Coigill

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| B | ADD RCP NOTE | | | AWV | | | 7/10 |
| A | REV. NOTES, CONVERT TO CAD | | | CEC | JTB | | 02/00 |
| 2 | NOTES & DISTANCES | | | SEB | BDH | | 11/87 |
| 1 | REVISED DITCH END | | | | BDH | | 04/30/87 |
| -- | INITIAL ISSUE | | | | | | |

# CONNECTION BETWEEN PIPE AND CONC. LINED DITCH

SHEET 1 OF 1

CS 121B

PAGE

NOTES:

1) ALL DISCHARGES INTO T.I.D. CANAL REQUIRE A REVOCABLE LICENSE AGREEMENT.

2) ALL DISCHARGES INTO T.I.D. CANAL REQUIRE A FLOWMETER CAPABLE OF INSTANTANEOUS FLOW (CFS) AND TOTALIZING FLOW (ACRE-FT.).

3) IF 4 PIPE DIAMETERS CAN NOT BE OBTAINED FOR THE INSTALLATION OF A FLOW METER, THEN FLOW STRAIGHTENING VANES SHALL BE INSTALLED UPSTREAM OF THE METER.




DISCHARGE DETAIL

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

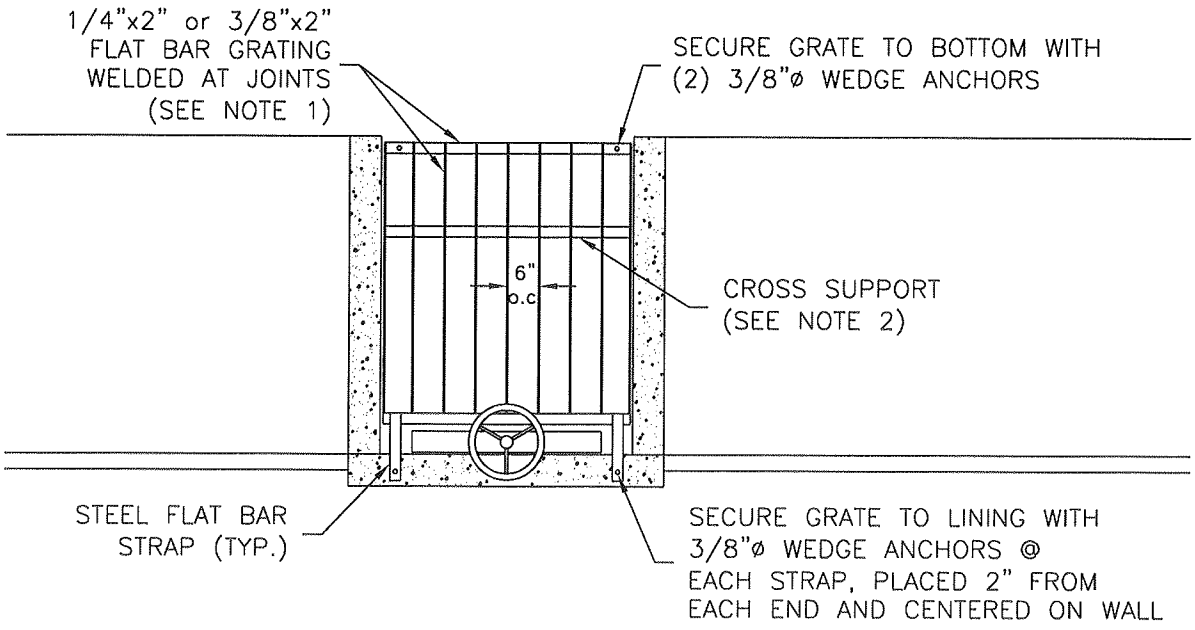
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| C | STDS. COM. APPROVAL | BB | LR | | | CDB | 5-11-99 |
| | | | | | | | |
| C | ADD NOTES 2,3 | | | | | B22 | 5/99 |
| B | DISCHARGE – PUMP TO CANAL | RV | | | | RV | 3/89 |
| A | MODIFY DISCHARGE | RV | | | | BDH | 4/87 |
| -- | INITIAL ISSUE | | | | | | |

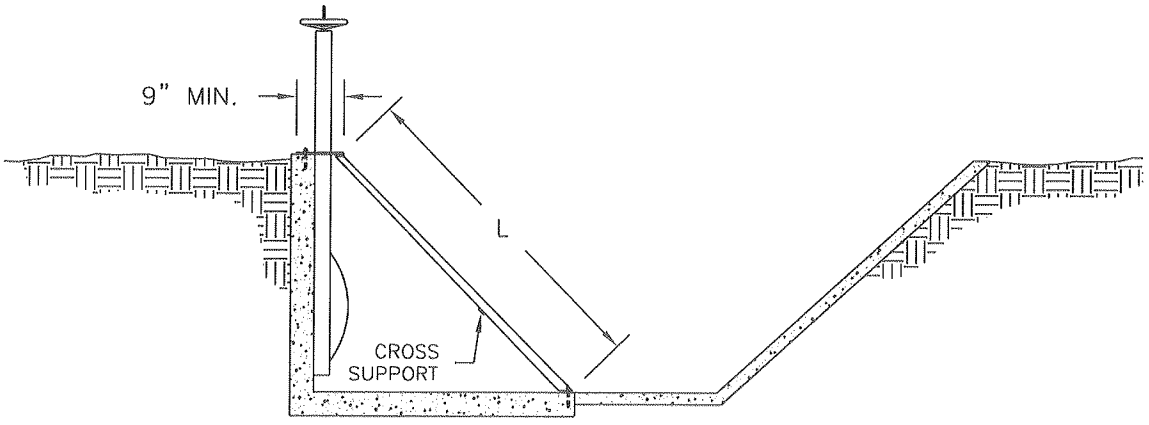
# PUMP DISCHARGES INTO CANAL

SHEET 1 OF 1

CS 122C

PAGE




## NOTES:

1. IF L IS LESS THAN 5' LONG: USE 1/4"x2" FLAT BAR
2. IF L IS GREATER THAN 5' LONG: USE 3/8"x2" FLAT BAR WITH A 3/8"x2" CROSS SUPPORT PLACED AT 5'
3. GRATE TO BE GALVANIZED OR PAINTED BEFORE INSTALLATION
4. SEE CS115 FOR VERTICAL WALL APPLICATION

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

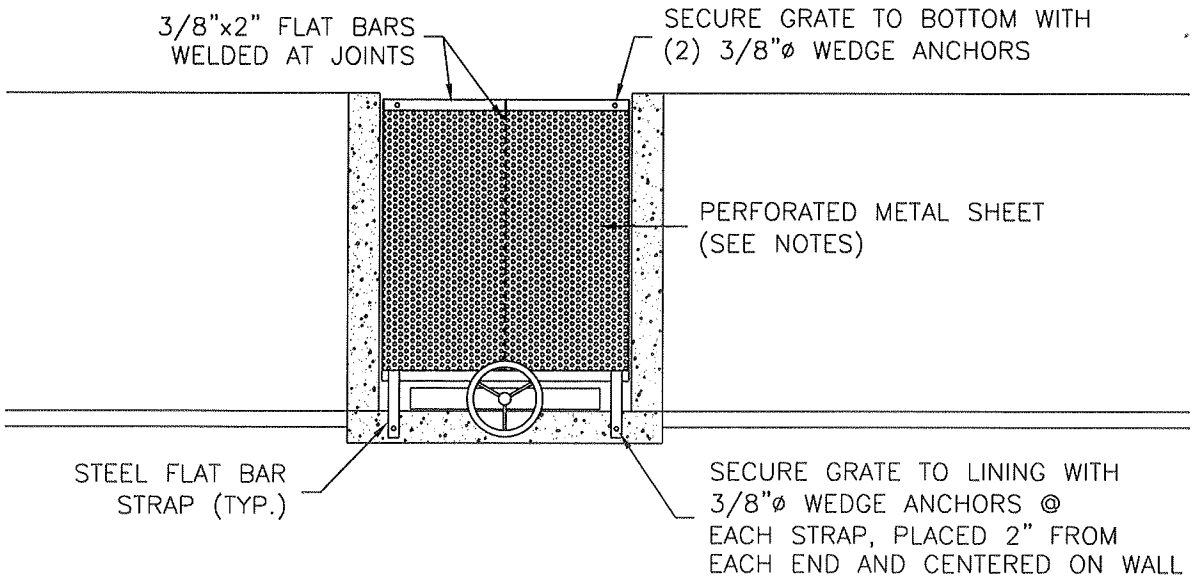
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| C | ADDED PERFORATED METAL SHEET | TBH | | | | JTD | 12/03 |
| B | CONVERTED TO CAD (Added Note 4) | | | | | | |
| A | TITLE CHANGE | | | | | BDH | 1/11/84 |
| -- | INITIAL ISSUE | | | | | BDH | 9/15/83 |

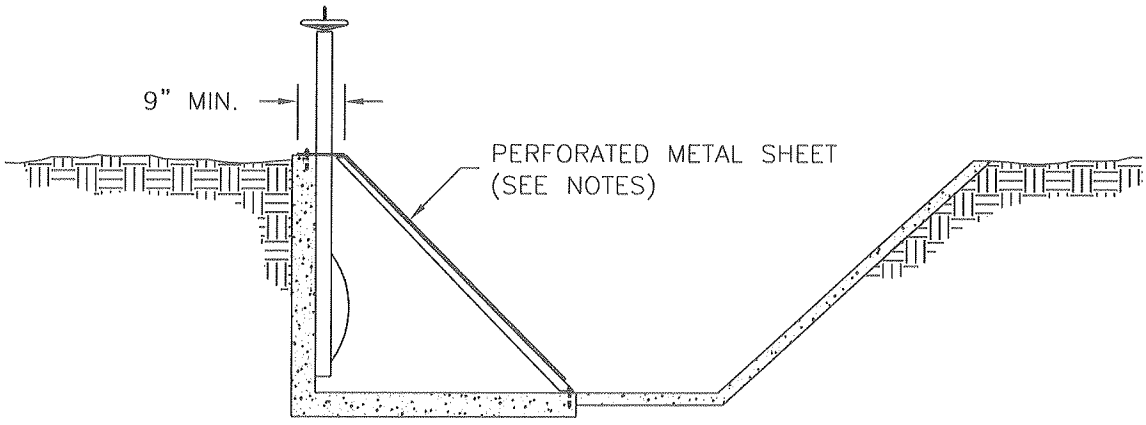
# GRATE FOR CANAL SIDE GATE WITH SLOPED LINING

SHEET 1 OF 2

CS 123C

PAGE



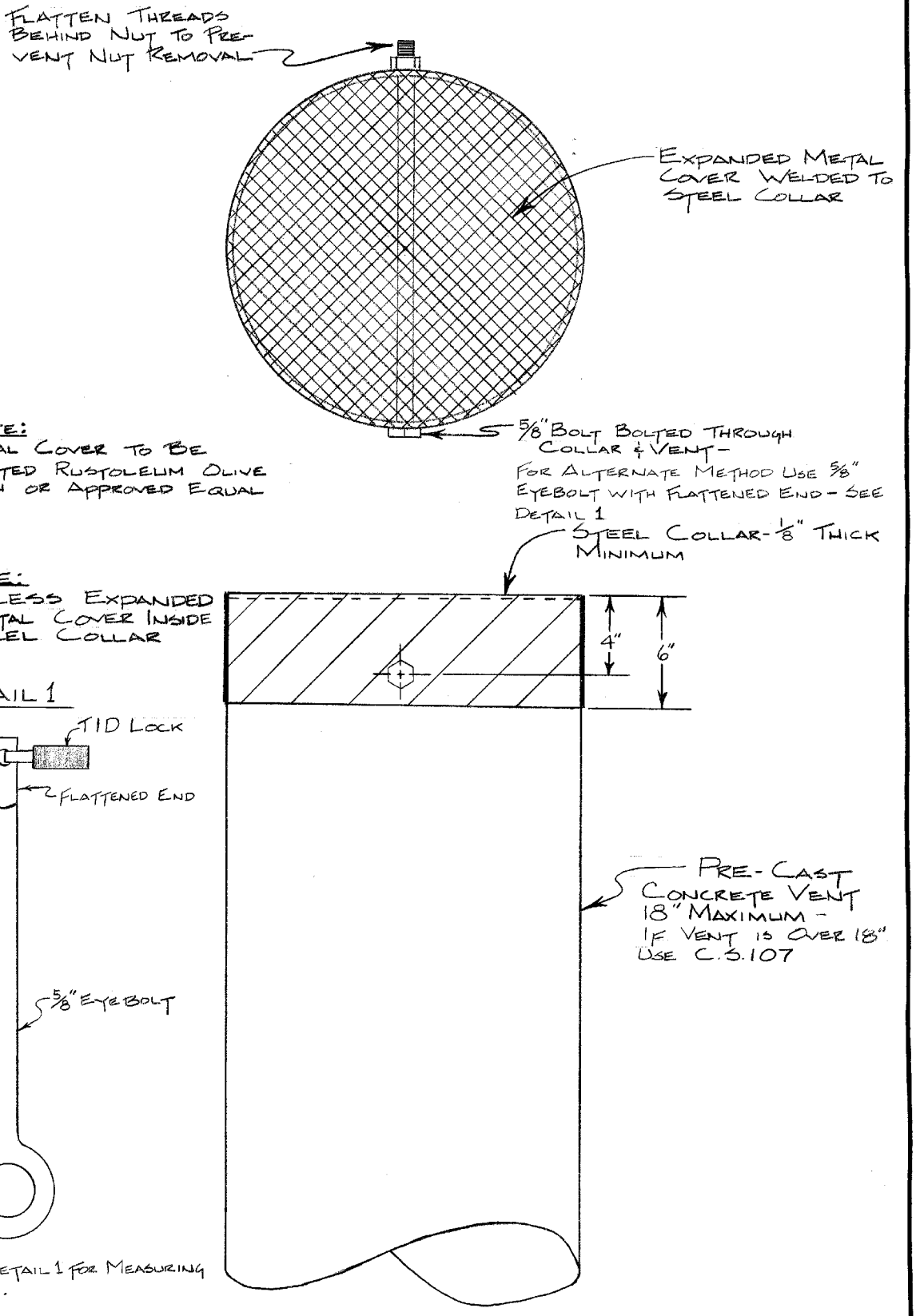




**NOTES:**

1. PERFORATED METAL SHEET TO BE WELDED TO FLAT BARS
2. FLAT BARS & PERFORATED METAL SHEET TO BE GALVANIZED OR PAINTED BEFORE INSTALLATION
3. PERFORATION SIZE AND SPACING TO BE DETERMINED BY OWNER/IRRIGATION DESIGNER

| TURLOCK IRRIGATION DISTRICT | GRATE FOR CANAL SIDE GATE WITH SLOPED LINING | | |
|---|---|---|---|
| IRRIGATION CONSTRUCTION STANDARDS | SHEET 2 OF 2 | CS 123C | PAGE |

DWG. NO. C-S 124




NOTE:
METAL COVER TO BE PAINTED RUSTOLEUM OLIVE GREEN OR APPROVED EQUAL

NOTE:
RECESS EXPANDED METAL COVER INSIDE STEEL COLLAR

DETAIL 1

USE DETAIL 1 FOR MEASURING VENTS.

TURLOCK IRRIGATION DISTRICT

| REV. | DATE | DESCRIPTION | CKD. | RV'D. | RV'D | APP. |
|---|---|---|---|---|---|---|
| 1 | 10-10 | DETAIL 1 | BDH 4/6/84 | | | |

CONSTRUCTION STANDARDS

COVER FOR SMALL DIAMETER CONCRETE VENTS

| | |
|---|---|
| DATE: 4-12-84 | SCALE: NONE |
| DRAWN: JAS | REVIEWED: |
| DESIGNED | REVIEWED: |
| CHECKED BDH | APPROVED: |
| SHEET OF | DWG. NO. C-S 124 |

## CROSS SECTION

## NOTES:

1) NOTIFY TID 24 HOURS BEFORE STARTING WORK. THE INSTALLATION MUST BE INSPECTED BEFORE IT IS BACKFILLED.
2) DRAINS MUST BE AT LEAST 200 FEET FROM CATTLE PENS. NO MANURE MAY BE DISCHARGED INTO THE DRAIN AT ANY TIME.
3) DRAIN PIPE SHALL BE SIZED ACCORDING TO TID STANDARD ES 103.
4) PIPE MUST BE MIN. 16 GAUGE GALVANIZED STEEL CORRUGATED PIPE. NO PLASTIC OR CEMENT PIPE ALLOWED.
5) END OF PIPE MUST EXTEND PAST THE EDGE OF THE MINIMUM POOL.
6) WATERMAN RED TOP FLAP GATE F-10SB OR APPROVED EQUAL MUST BE USED IF PIPE IS BELOW THE HIGH WATER LINE.
7) IF PIPE EXTENDS MORE THAN 1/3 OF ITS LENGTH INTO DRAIN, SUPPORT END WITH PRESSURE TREATED OR REDWOOD SUPPORT.
8) CONCRETE 3-WALL STRUCTURE SHALL CONSIST OF 5" WALLS WITH #4 REBAR AT 12" C.C. BOTH WAYS.
9) STRUCTURE BOX SHALL BE A MINIMUM OF 18" OR 2 TIMES THE PIPE DIAMETER.
10) BOTTOM OF PIPE MUST BE INSTALLED A MIN. OF 3" ABOVE THE INSIDE FLOOR OF STRUCTURE.
11) TOP OF PIPE AND FIELD LEVEL SHOULD BE THE SAME.
12) CANAL BANK IS TO BE RESTORED TO ITS ORIGINAL CONDITION. MAINTAIN EMBANKMENT HEIGHT.
13) DRAINS CROSSING PUBLIC ROADS MUST MEET ALL CITY/COUNTY REQUIREMENTS AND SPECIFICATIONS.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

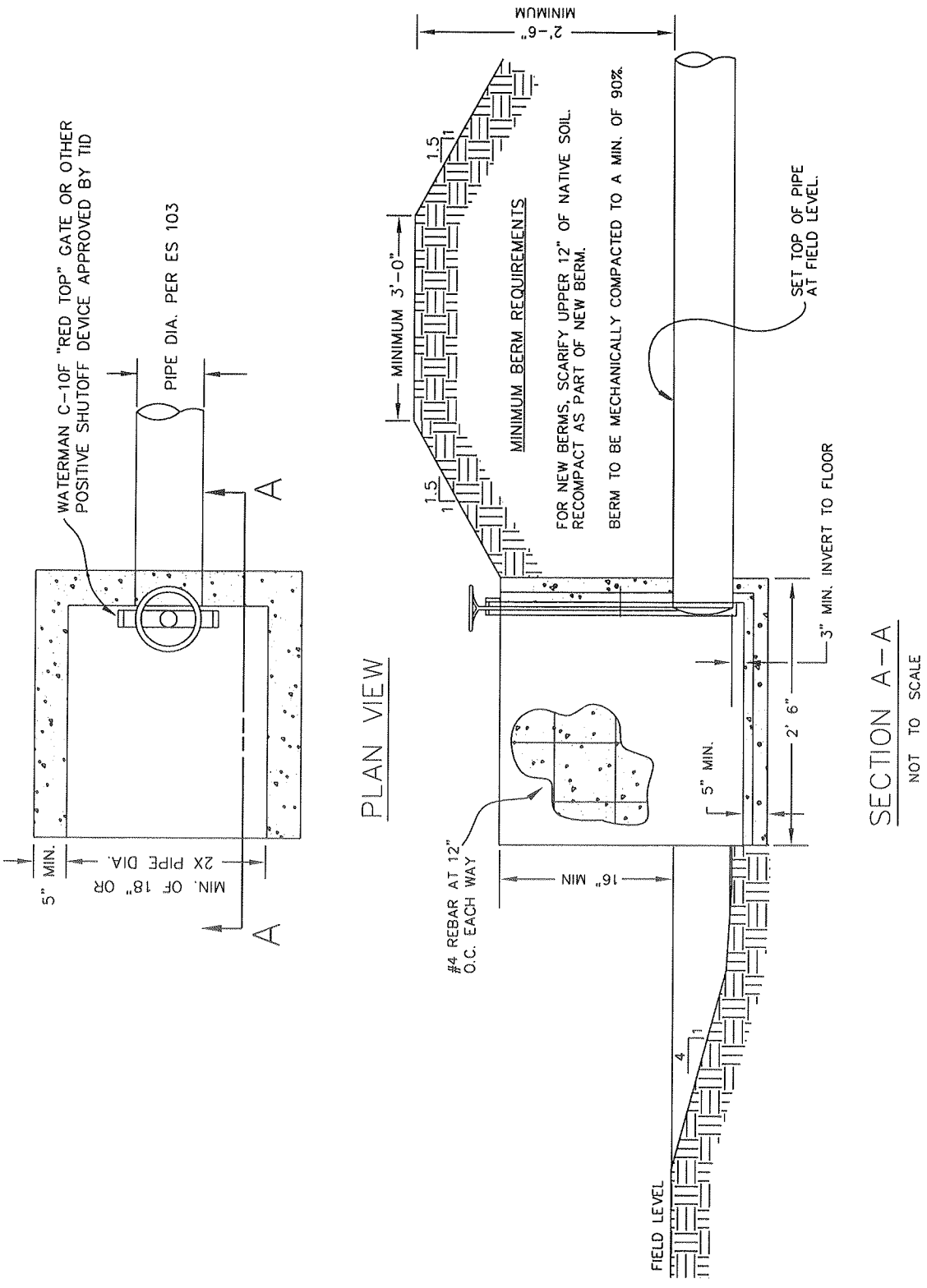
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| B | REVISE NOTES | | | AWV | | | 7/10 |
| A | ADD GATE & MIN. BERM REQ. | | | CEC | JTB | BLL | 4/00 |
| -- | INITIAL ISSUE | JAS | | | | BDH | 3/85 |

# GATED DRAIN LINE INTO TID DRAIN DITCH

SHEET 1 OF 2

CS 125A

PAGE




TURLOCK IRRIGATION DISTRICT

IRRIGATION
CONSTRUCTION STANDARDS

# GATED DRAIN LINE INTO TID DRAIN DITCH

SHEET 2 OF 2

CS 125A

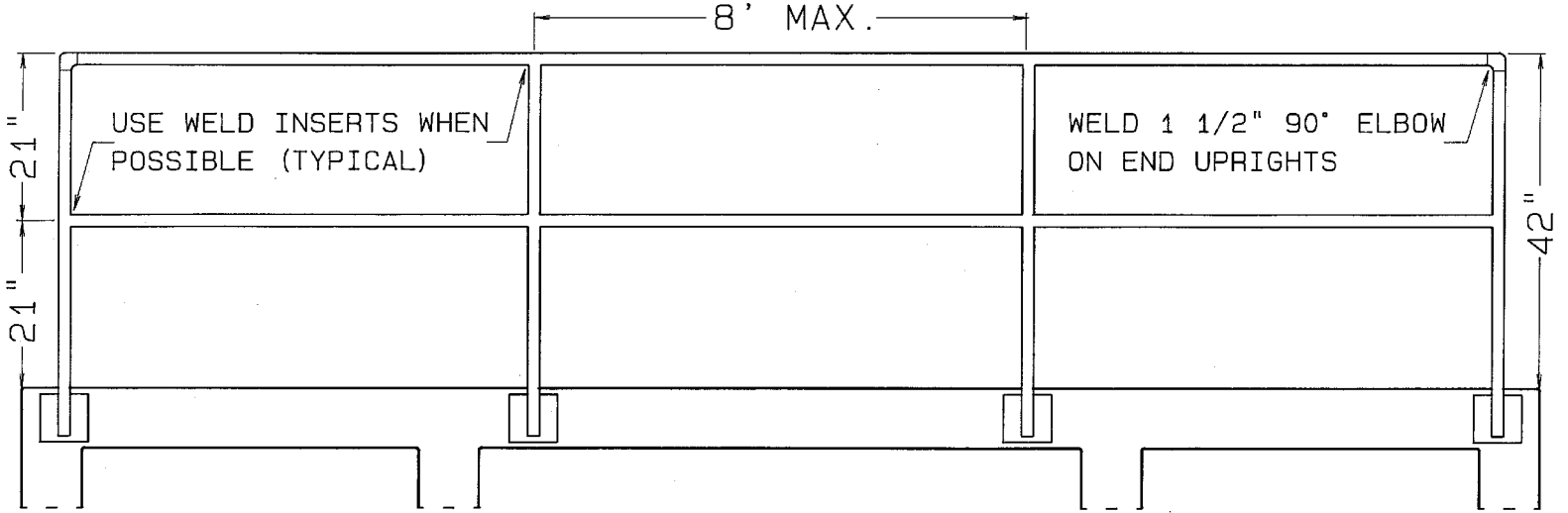
PAGE

# TURLOCK IRRIGATION DISTRICT

CONSTRUCTION/SUBDIVISION STANDARD

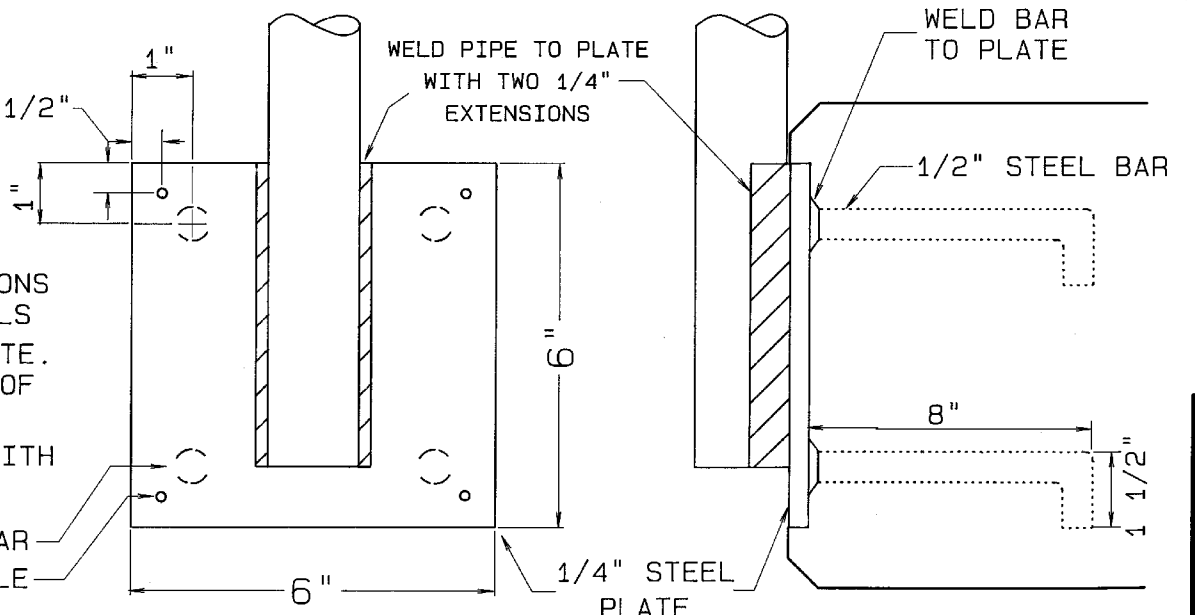
## CANAL STRUCTURE GUARDRAIL

| REV. | DATE: | DESCRIPTION | CKD. | RV'D | RV'D | APP. |
|---|---|---|---|---|---|---|
| 2 | 4/87 | ADD NOTE 4 | RV | | | RV |
| 1 | 12/86 | MODIFY ANCHORAGE | RV | | | RV |




## NOTES

1. STEEL TUBING - 1 1/2" O.D. SCH. 40 OR EQUIVALENT
2. DESIGNED PER OSHA REQUIREMENTS GENERAL INDUSTRY SAFETY ORDERS ARTICLE 2 STANDARD SPECIFICATIONS SECTION 3209 STANDARD GUARDRAILS
3. CAST PLATE W/STUDS INTO CONCRETE. ATTACH EXTENSIONS AT THE TIME OF GUARDRAIL INSTALLATION
4. GUARDRAILS ARE TO BE PAINTED WITH RUST PREVENTATIVE PAINT




DATE: 3/22/85 | SCALE: NONE

DRAWN: JSH | REVIEWED:

DESIGNED: RRV | REVIEWED:

CHECKED: BDH | APPROVED:

SHEET 1 OF 1 | DWG. NO. CS126

DWG. NO. CS 126

CONCRETE LINING THICKNESS CHART

| FLOW (Q) | A | B |
|---|---|---|
| 0-250 C.F.S. | 2" | 3" |
| 250-500 C.F.S. | 2 1/2" | 3 1/2" |
| 500-1500 C.F.S. | 3" | 4" |
| 1500-3500 C.F.S. | 3 1/2" | 4 1/2" |

NOTE: THIS CHART REPRESENTS MIN. REQUIREMENTS. THE ENGINEER WILL DETERMINE REQUIREMENTS IF SPECIAL CONDITIONS ARISE.

NOTES:

1. ALL MEASUREMENTS TYPICAL TO EACH SIDE OF CANAL.
2. CANAL HEIGHT AND WIDTH TO BE ESTABLISHED BY ENGINEER.
3. ROADWAY WIDTH IS A MINIMUM. ACTUAL WIDTH TO BE DETERMINED BY ENGINEER AND WILL BE BASED ON THE FOLLOWING:
   1. SIZE OF CANAL
   2. FILL HEIGHT
   3. LINING
   4. SOIL TYPE
4. THE 2% ROADWAY SLOPE IS TYPICAL FOR MOST CANALS. THE ENGINEER MAY DETERMINE AN ALTERNATIVE ROADWAY CONSTRUCTION IF NEEDED.

# TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

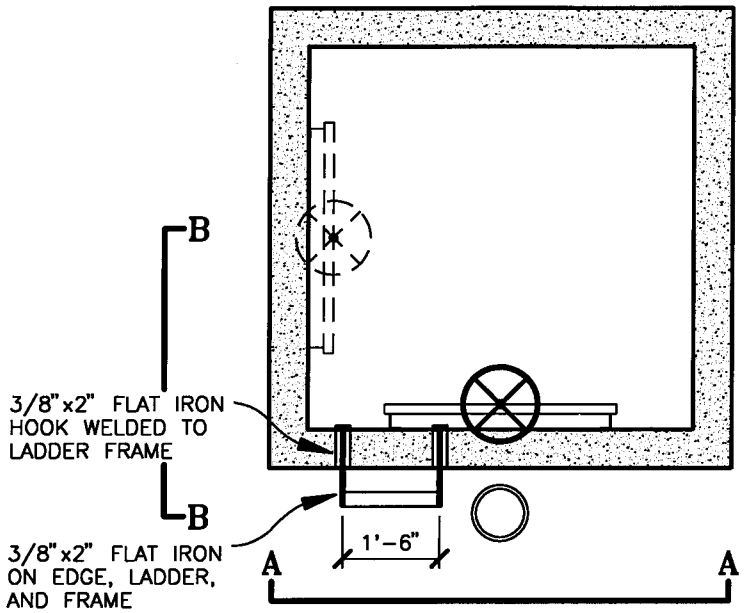
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| B | ADDED 22' MIN TO ROW LINE | | | AWV | | | 7/10 |
| A | ADDED CROSS SLOPE & MATRIX | | | | | | |
| -- | INITIAL ISSUE | JAS | BDH | | | BDH | 07/24/85 |

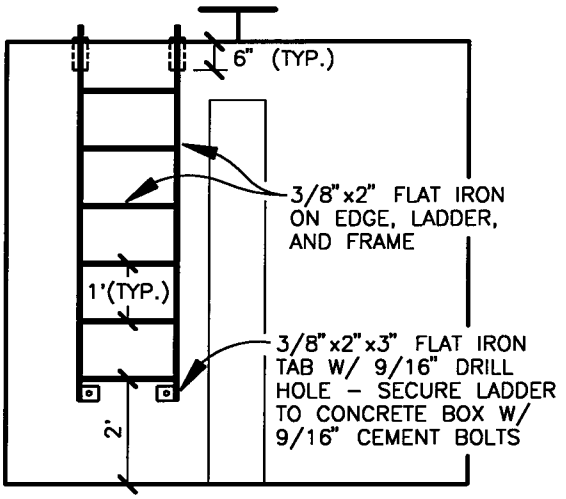
## LATERAL AND ROADWAY CONSTRUCTION

SHEET 1 OF 1

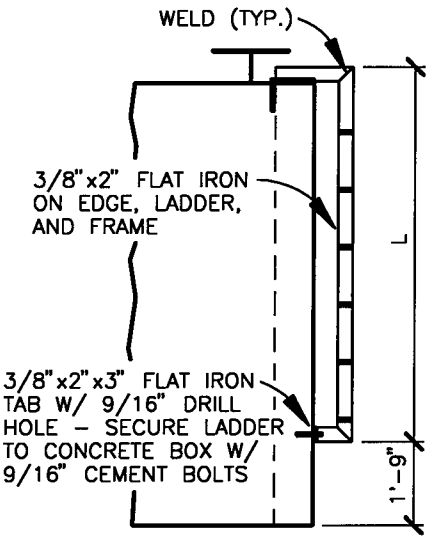
CS 127B

PAGE




**SECTION A-A**




**SECTION B-B**

## NOTES

- "L" TO BE DETERMINED BY HEIGHT OF CONCRETE STRUCTURE
- LADDER IS TO BE GALVANIZED BEFORE INSTALLATION
- LADDER IS TO BE MOUNTED ON SAME WALL AS THE STOP GATE AND NEXT TO WALL WITH SIDE GATE

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

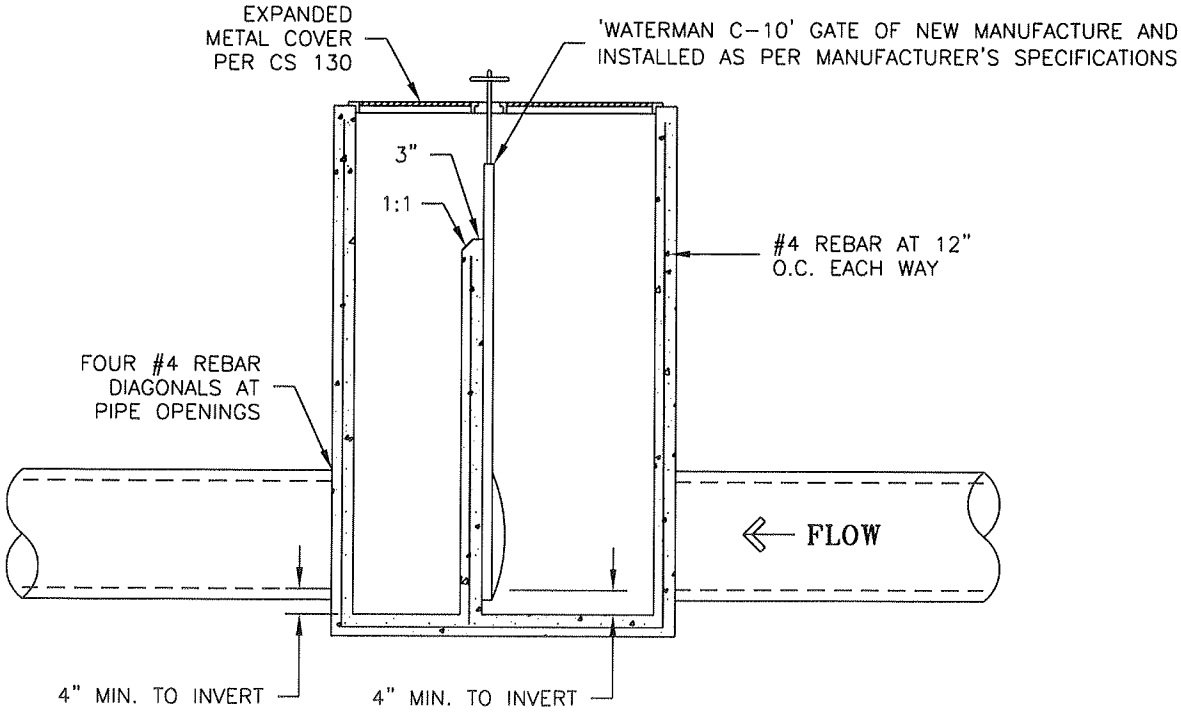
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| A | STDS. COM. APPROVAL | JAS | BB | | JAS | BTB | 8-19-97 |
| A | DRAWN ON CAD | BB | | | JAS | BTB | 8/97 |
| -- | INNITIAL ISSUE | JAS | BDH | | JAS | BDH | 07/25/85 |

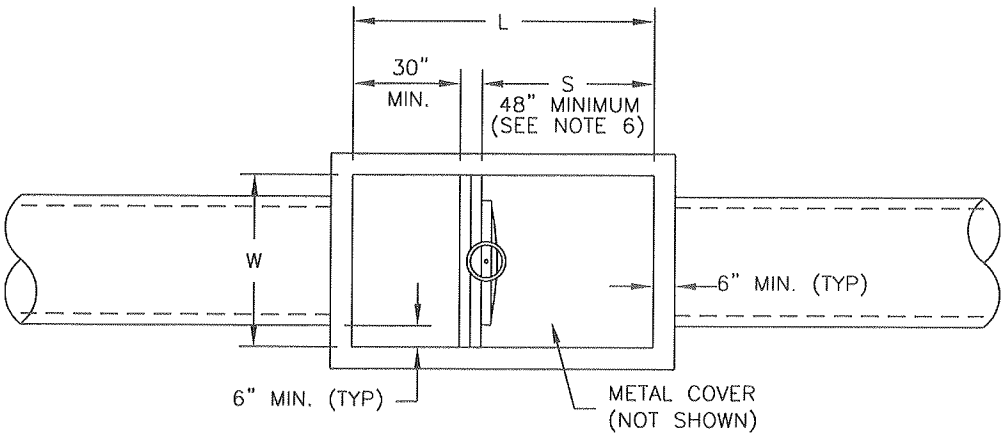
GALVANIZED LADDER FOR CONTROL STRUCTURE

SHEET 1 OF 1

CS 128A

PAGE




## NOTES:

1. ELEVATIONS TO BE SET BY TID.
2. WALLS, FLOOR, AND WEIR TO BE 6" MINIMUM THICKNESS AND FORMED INSIDE AND OUT.
3. STRUCTURE REINFORCEMENT: #4 REBARS AT 12" O.C. EACH WAY AT CENTER (TYPICAL WALLS, FLOOR AND WEIR). BEND BARS FROM WALLS AND FLOORS 18" TO TIE WITH BARS IN WEIR.
4. L = MINIMUM 7'-0"
5. W = WIDTH OF SIDEGATE + 12"
6. S = GREATER OF: 48" OR WIDTH OF SIDEGATE + 12"
7. CENTER BOX AND GATE ON PIPELINE.
8. INSTALL METAL COVER PER STANDARD CS130.
9. "WATERSTOP RX" OR APPROVED EQUAL SHALL BE USED AT ALL COLD JOINTS.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

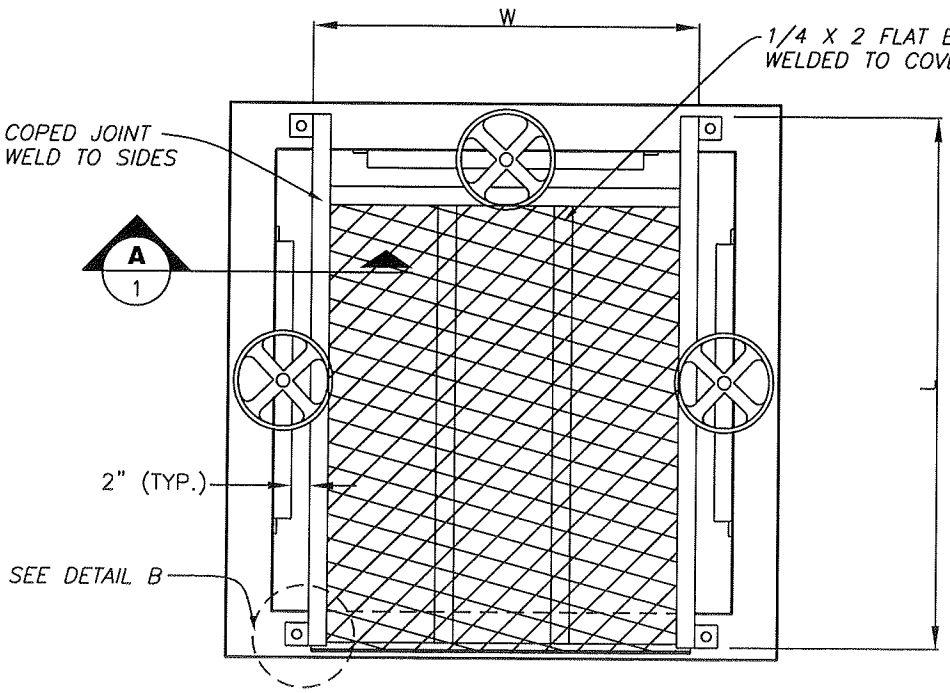
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| B | GENERAL UPDATE | | | AWV | | | 7/10 |
| A | RE-DRAWN INTO CAD, COMBINED WITH DEVELOP. STD. | | | | | | |
| -- | INITIAL ISSUE | JAS | RRV | | | BDH | 4/23/87 |

# CONTROL STRUCTURE WITH WEIR OVERPOUR

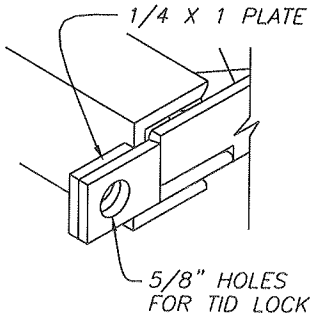
SHEET 1 OF 1

CS 129B

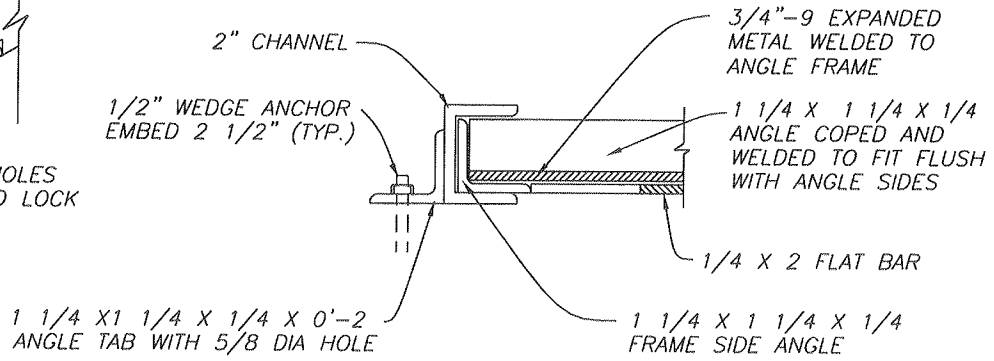
PAGE




PLAN




**DETAIL B**

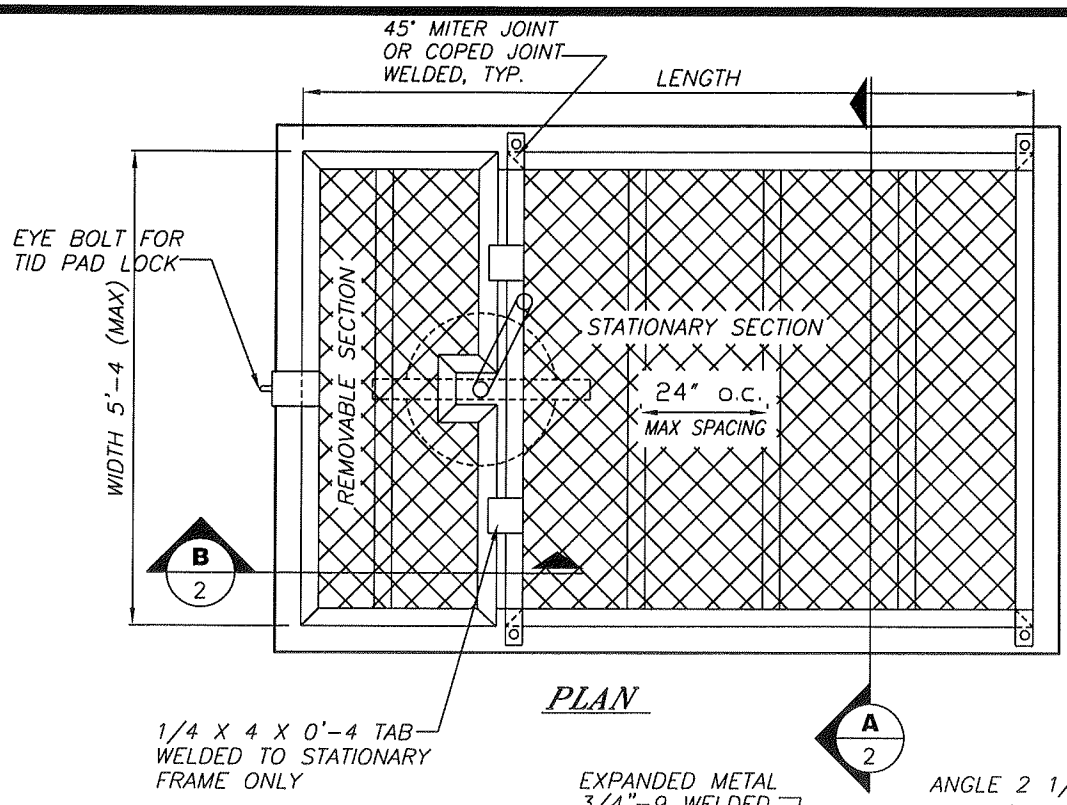


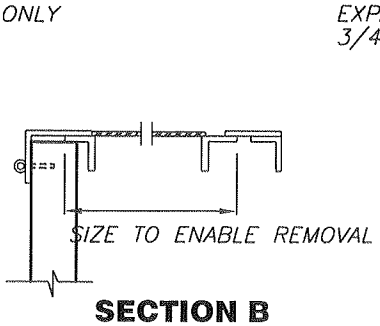

**SECTION A**

NOTES:

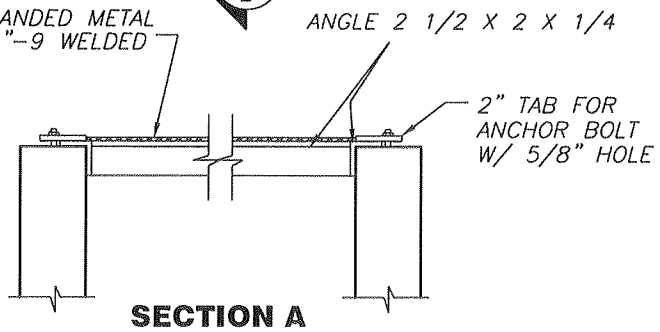
1. DIMENSIONS L & W TO COVER OPENING WILL BE DETERMINED BY SIZE OF BOX AND NUMBER OF GATES.
2. WELD ANGLE TO ALL SIDES OF EXPANDED METAL.
3. WELD 1 1/4 X 1 1/4 X 1/4 X 0'-2 ANGLE TO ENDS OF CHANNEL TO SECURE GUIDES TO CONTROL BOX.
4. ALL HARDWARE TO BE PAINTED W/RED OXIDE PRIMER.

| TURLOCK IRRIGATION DISTRICT | | | | | | | IRRIGATION CONSTRUCTION STANDARDS | |
|---|---|---|---|---|---|---|---|---|
| WO and C&M AGM | Keith Cargel | | | | | | EXPANDED METAL COVER FOR CONTROL BOX | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| -- | RE-ISSUE | AWV | | | | 7/10 | SHEET 1 OF 2 | CS 130C |
| REV | DESCRIPTION | INIT | CHK | RV'D | RV'D | APP DATE | | PAGE |




**SECTION B**




**SECTION A**

NOTES:

1. WELD ANGLE IRON TO ALL SIDES OF EXPANDED METAL.
2. ALL HARDWARE TO BE PAINTED TID RED OXIDE PRIMER.
3. IF LADDER IS REQUIRED IT WILL BE INSTALLED BEFORE EXPANDED METAL COVER.
4. CONSTRUCT A SQUARE OPENING 3" X 3" CENTERED OVER VALVE CRANK.
5. FOR A CONTROL BOX WITH STOP GATES, DETERMINE LENGTH AND WIDTH IN THE FIELD THEN BUILD THE FRAME WITH A 2" CLEARANCE BETWEEN VALVE FRAME AND THE EDGE OF THE STRUCTURE COVER.
6. ANCHOR BOLTS TO BE 1/2" DIAMETER, POURED IN PLACE & EMBEDDED MINIMUM 5". (ALTERNATE: WEDGE ANCHOR EMBEDDED 2 1/2")

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

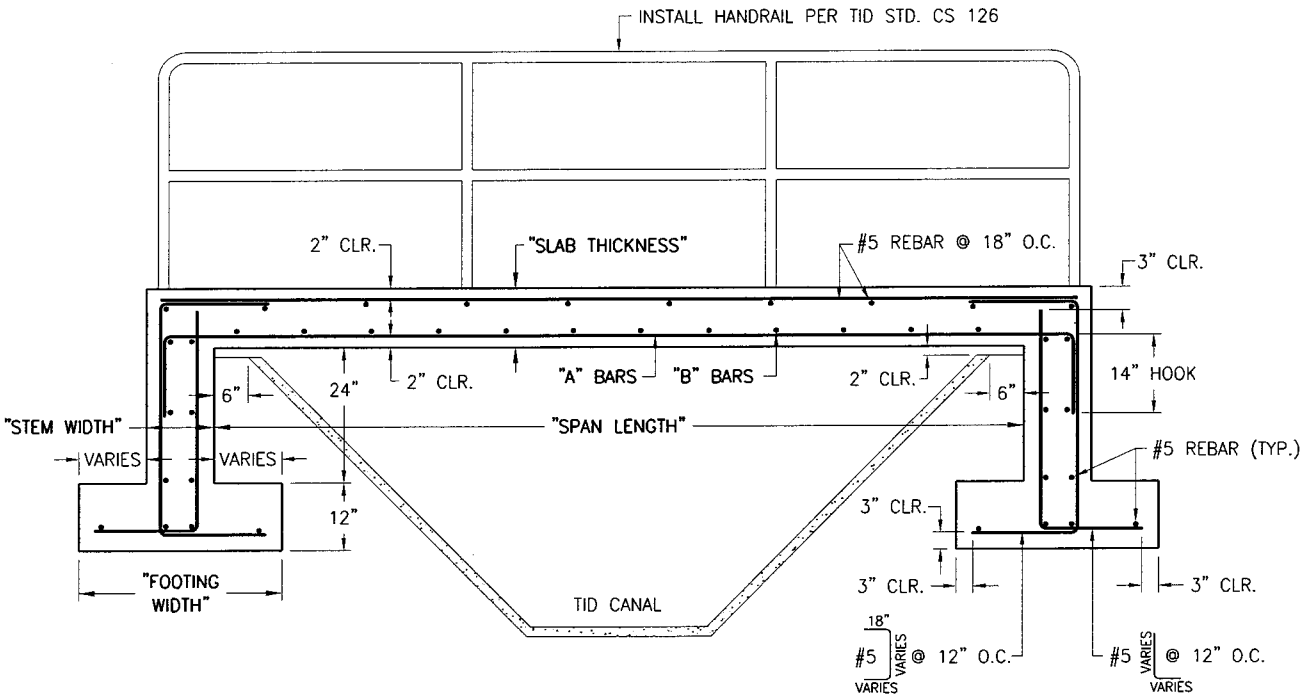
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| B | MADE AS OPTION | | | AWV | | | 7/10 |
| A | MODIFIED CONSTRUCTION | | | | | | |
| -- | INITIAL ISSUE | JAS | RRV | | | BDH | 2-25-86 |

# EXPANDED METAL COVER FOR WEIR OVERPOUR

SHEET 2 OF 2

CS 130C

PAGE




| SPAN LENGTH | SLAB THICKNESS | STEM WIDTH | FOOTING WIDTH | "A" BARS | "B" BARS |
|---|---|---|---|---|---|
| 12' | 10.5" | 12" | 30" | #7 @ 6" | #5 @ 12" |
| 14' | 11.5" | 12" | 30" | #7 @ 6" | #5 @ 12" |
| 16' | 12.5" | 14" | 36" | #7 @ 6" | #5 @ 12" |
| 18' | 13.5" | 14" | 36" | #8 @ 6" | #5 @ 12" |
| 20' | 14.5" | 14" | 36" | #8 @ 6" | #5 @ 12" |
| 22' | 15.5" | 16" | 42" | #8 @ 6" | #5 @ 12" |
| 24' | 16.5" | 16" | 42" | #8 @ 6" | #5 @ 12" |

LOAD FACTOR DESIGN (HS20-44 & ALTERNATE & PERMIT DESIGN LOAD)
CONCRETE COMPRESSIVE STRENGTH (F'c = 3,000 PSI MIN.)
STEEL YIELD STRENGTH (Fy = 60,000 PSI)
STANDARD WIDTH OF BRIDGE (20 FEET WIDE)
NO SPLICES ALLOWED

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

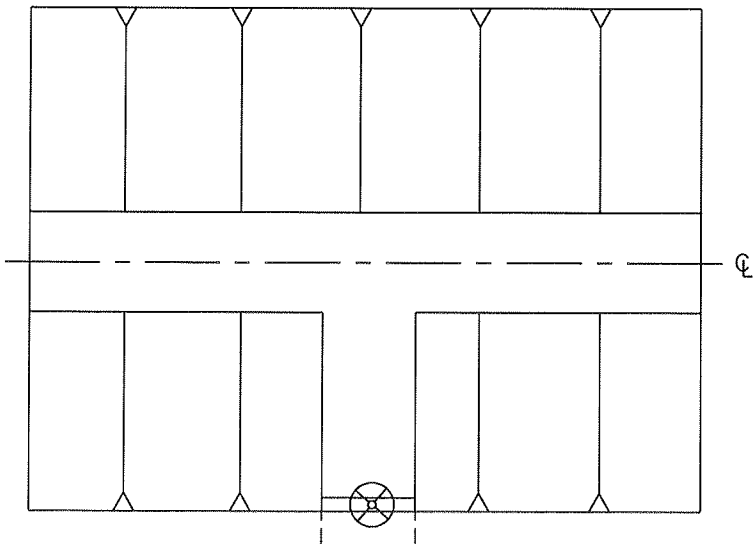
# CONCRETE BRIDGE

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| A | STDS. COM. APPROVAL | | | | | | |
| A | REDESIGN BRIDGE | TBH | | | | | 12/03 |
| -- | INITIAL ISSUE | JAS | RRV | | | BDH | 09/86 |

SHEET 1 OF 1

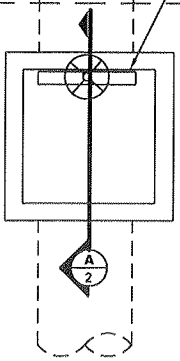
CS 133A

PAGE




EASEMENT OR R/W

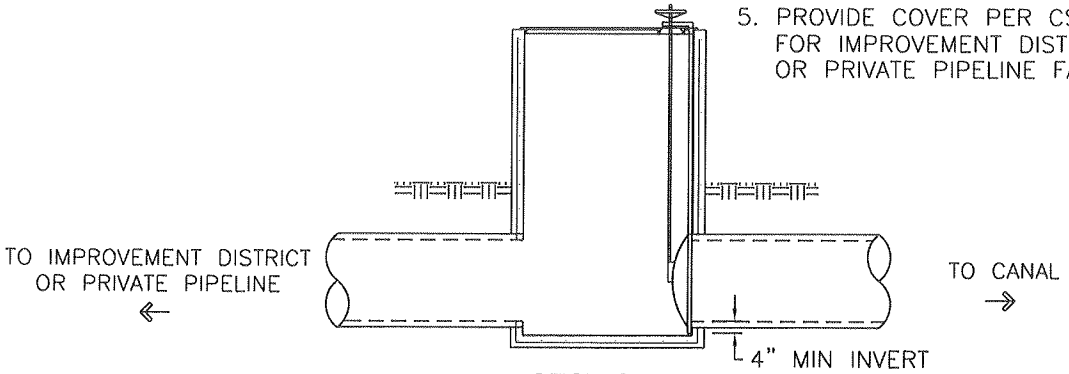
SIDEGATE TO BE INSTALLED




**PLAN**

NOTES:

1. SIDEGATE IN BOX MUST BE HUNG IN REVERSE
2. DISTANCE FROM CANAL TO REVERSE SIDEGATE TO BE DETERMINED BY TID
3. SEE CS101 FOR BOX DETAIL IF NEW BOX IS TO BE INSTALLED
4. INSTALLATION TO BE INSPECTED BY TID
5. PROVIDE COVER PER CS130 FOR IMPROVEMENT DISTRICT OR PRIVATE PIPELINE FACILITIES




**SECTION A**

| TURLOCK IRRIGATION DISTRICT | | | | | | | IRRIGATION CONSTRUCTION STANDARDS |
|---|---|---|---|---|---|---|---|
| WO and C&M AGM | Keith Cargill | | | | | | |
| | | | | | | | REVERSE SIDEGATE |
| C | REVISE NOTE 5 | | | AWV | | | 7/10 |
| B | DRAWN IN CAD, MOD. NOTE 5 | | | CEC | | | 12/05/00 |
| A | ADD NOTE 5 | | | RV | | BDH | 4/87 |
| -- | INITIAL ISSUE | SEB | NM | | | BDH | 11/05/85 |
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |

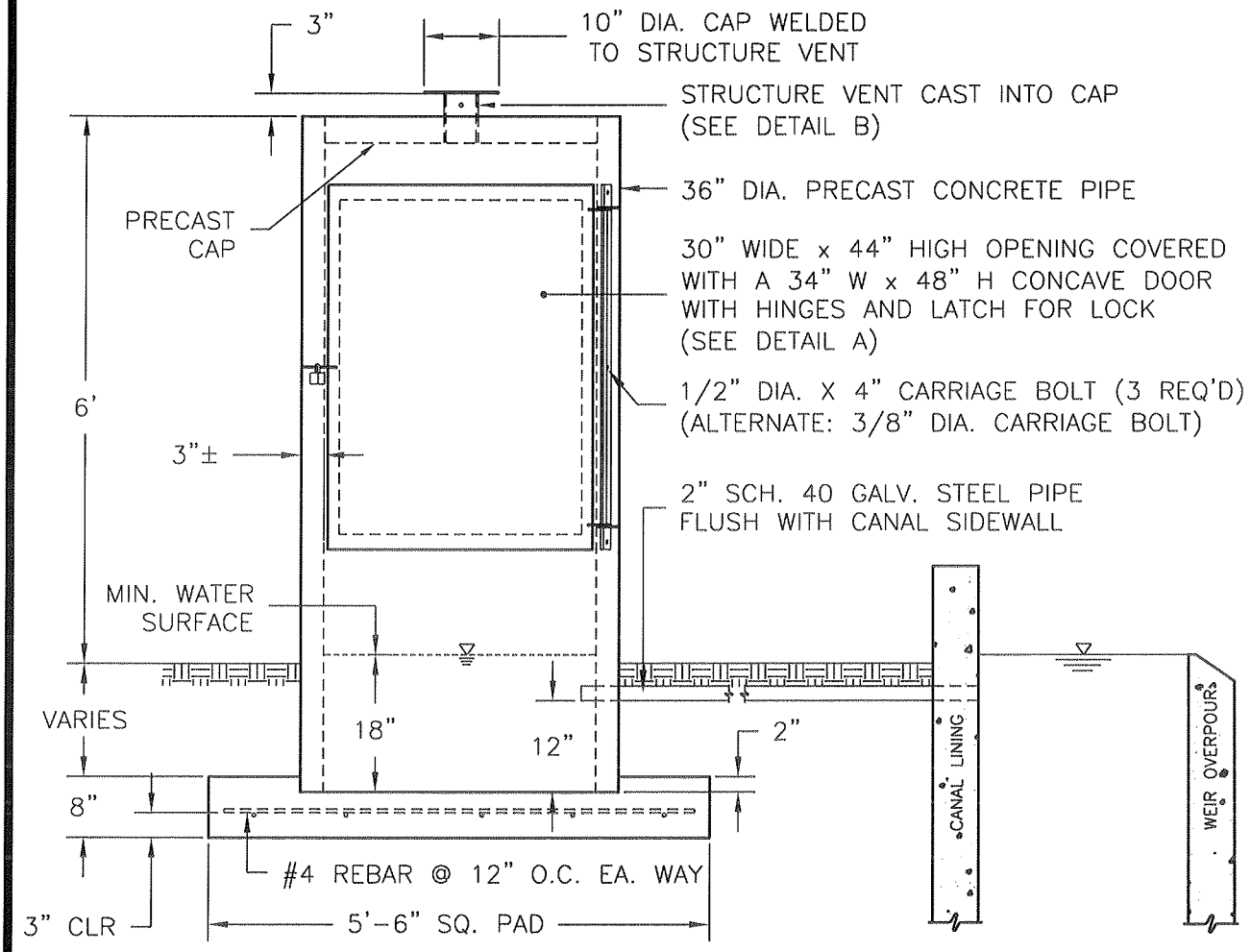
SHEET 1 OF 1

CS 134C

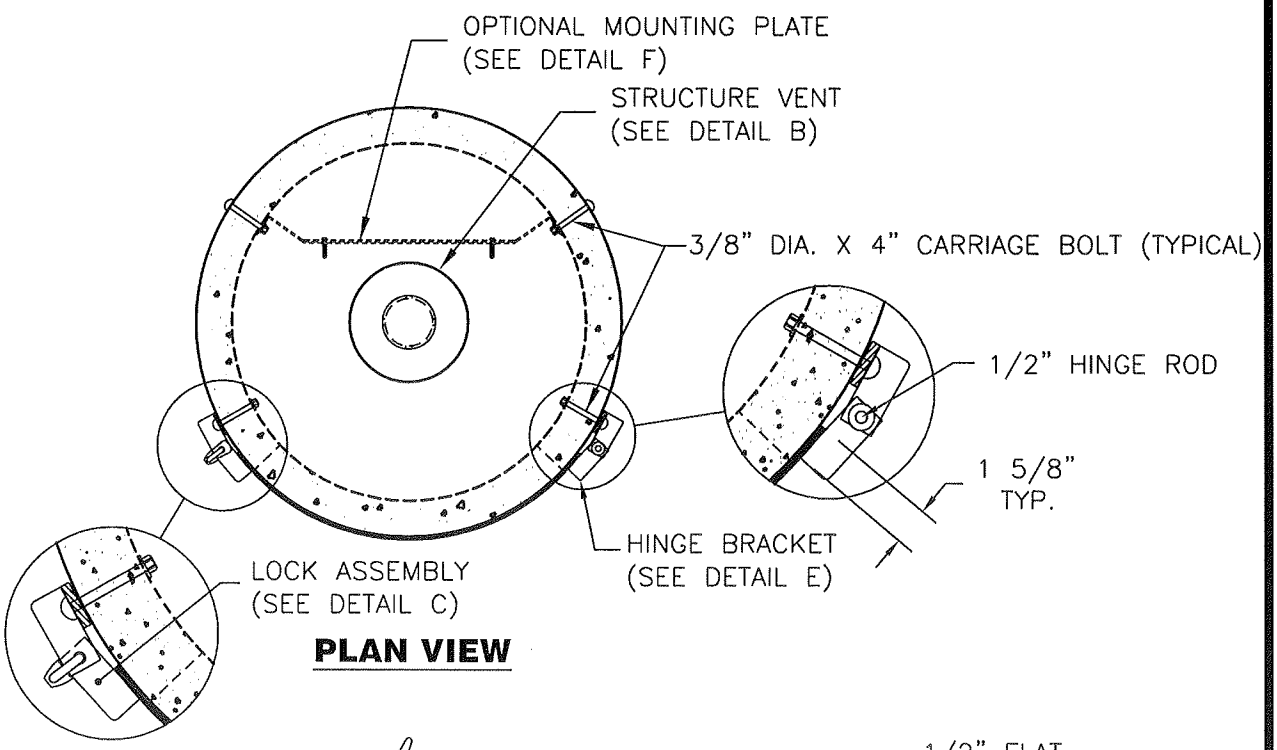
PAGE

## RECORDER STATION CONSTRUCTION NOTES

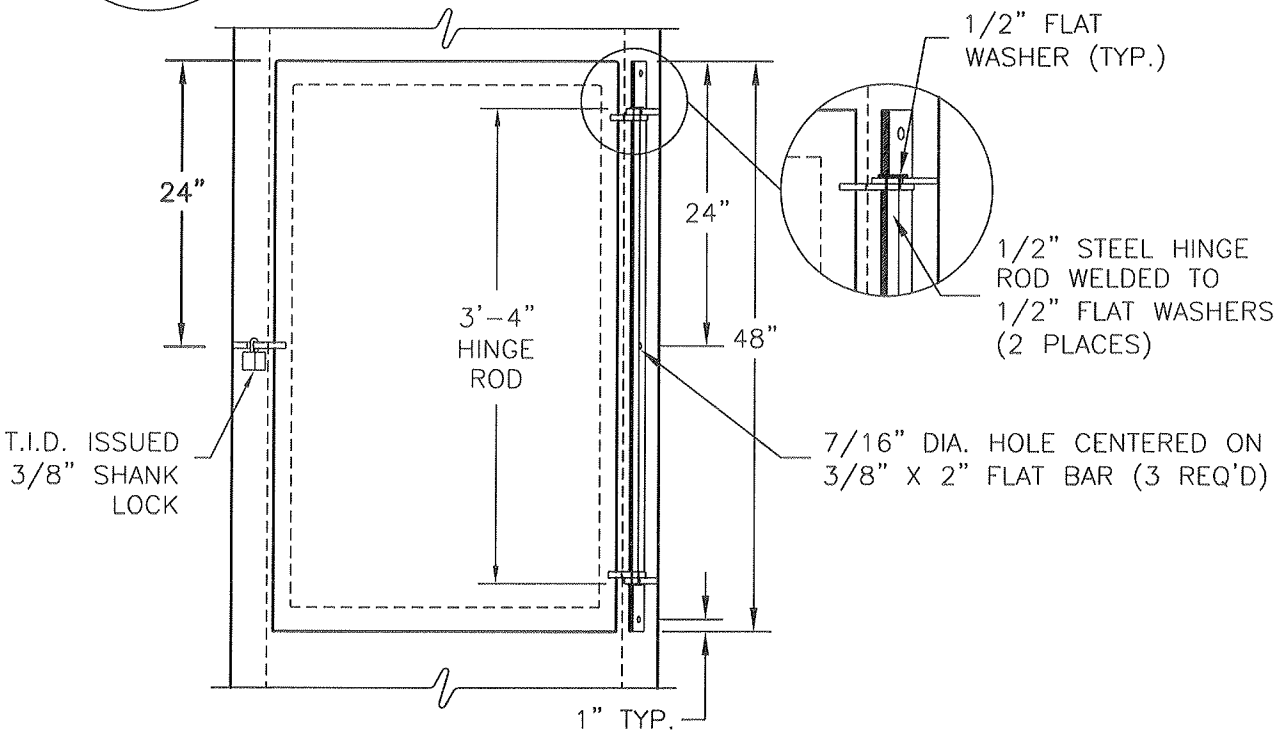
1) EXACT ORIENTATION OF INLET CONDUIT AND DEPTH OF STILLING WELL TO BE DETERMINED BY ENGINEER.
2) INLET CONDUIT TO BE 2" SCH. 40 PIPE.
3) ALL HARDWARE TO BE GALVANIZED.
4) METAL DOOR TO BE CONSTRUCTED OUT OF 1/4" STEEL.
5) THE CONDUIT TO BE CUT FLUSH WITH THE CANAL SIDEWALL.
6) REMOVE ALL SHARP EDGES.




| TURLOCK IRRIGATION DISTRICT | | | | | | | | CONSTRUCTION STANDARDS |
|---|---|---|---|---|---|---|---|---|
| WO and C&M AGM | | Keith Cargill | | | | | | RECORDER STATION STRUCTURE |
| D | GENERAL REVISION | AWV | | | | | 7/10 | |
| C | REMOVED 45° TO CONDUIT | FJL | | | JTB | | 4/02 | |
| B | ADDED 45° TO CONDUIT | FJL | | | JTB | | 1/01 | |
| A | CONVERSION TO CAD | | | | JTB | BLL | 5/99 | |
| -- | INITIAL ISSUE | RRV | RRV | | | BDH | 12/86 | SHEET 1 OF 5 |
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE | CS135D PAGE |




**PLAN VIEW**




**DETAIL A**

SCALE: N.T.S.

TURLOCK IRRIGATION DISTRICT

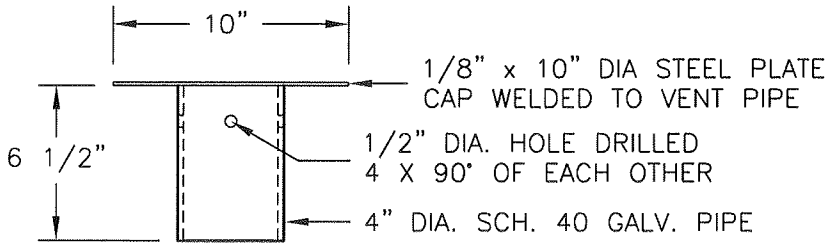
IRRIGATION
CONSTRUCTION STANDARDS

RECORDER
STATION
STRUCTURE

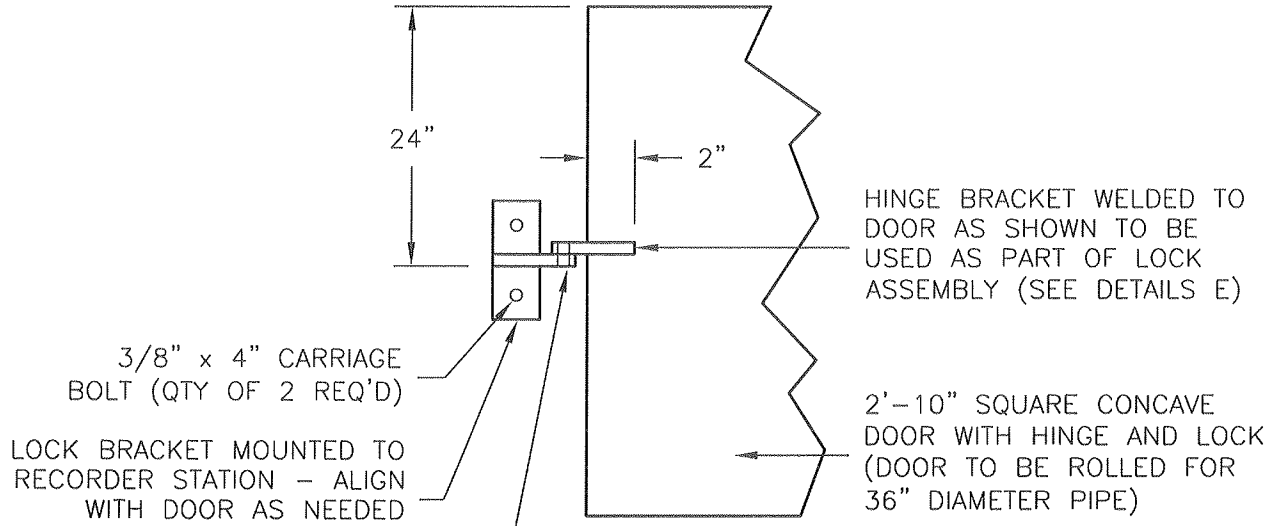
SHEET 2 OF 5

CS135D

PAGE

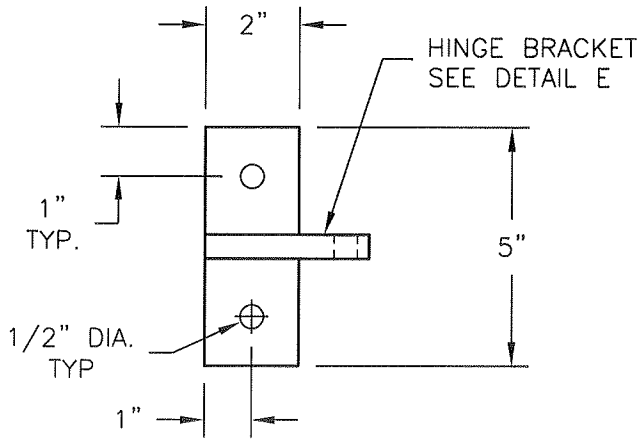



**DETAIL B**
STRUCTURE VENT
(QTY. OF 1 REQ'D)
N.T.S.



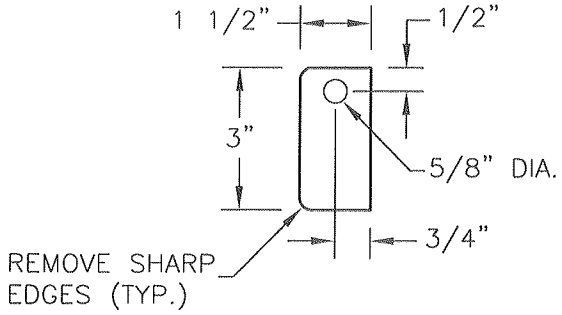

**DETAIL C**
LOCK ASSEMBLY
FRONT VIEW
N.T.S.

| TURLOCK IRRIGATION DISTRICT | RECORDER STATION STRUCTURE | |
|---|---|---|
| IRRIGATION CONSTRUCTION STANDARDS | SHEET 3 OF 5 | CS135D PAGE |




**DETAIL D**

LOCK BRACKET
3/8" X 2" FLAT BAR
(QTY OF 1 REQ'D)
SCALE: N.T.S.




**DETAIL E**

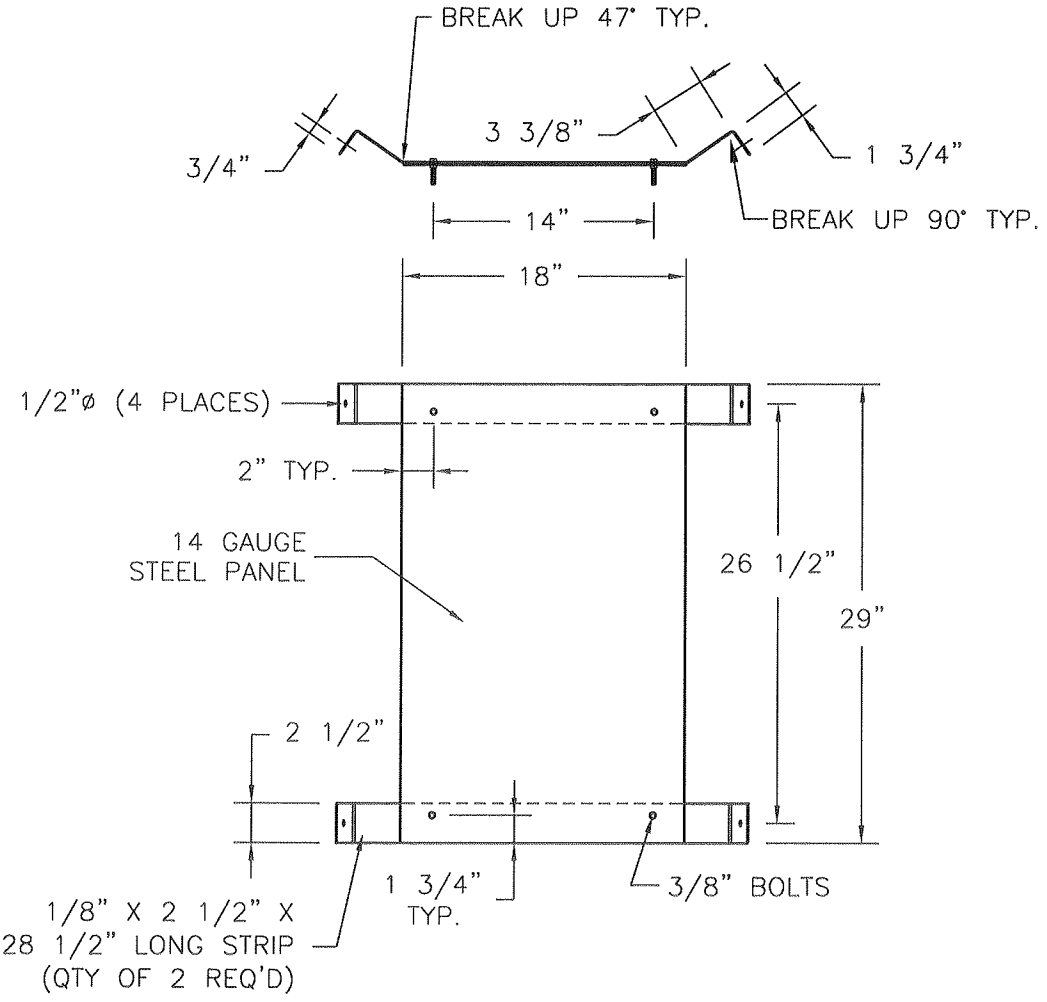
HINGE BRACKET
1/2" X 1 1/2" FLAT BAR
(QTY OF 4 REQ'D)
SCALE: N.T.S.

| | | |
|---|---|---|
| TURLOCK IRRIGATION DISTRICT | | RECORDER STATION STRUCTURE |
| IRRIGATION CONSTRUCTION STANDARDS | SHEET 4 OF 5 | CS135D PAGE |

# RECORDER STATION MOUNTING PLATE

CONSTRUCTION NOTES:

1) PANEL TO BE USED WITH SIERRA CONTROLS 24" X 20" NEMA ENCLOSURE.
2) 1/8" STRIPS TO BE STITCH WELDED TO PLATE 1/2" ON 6" PATTERN.
   (4)3/8" BOLTS TO BE INSTALLED WITH NUTS.
   NUTS TO BE TACK WELDED IN PLACE TO BACK PLATE.
3) COMPLETE ASSEMBLY TO BE PAINTED OR GALVANIZED AS DETERMINED BY THE TURLOCK IRRIGATION DISTRICT.

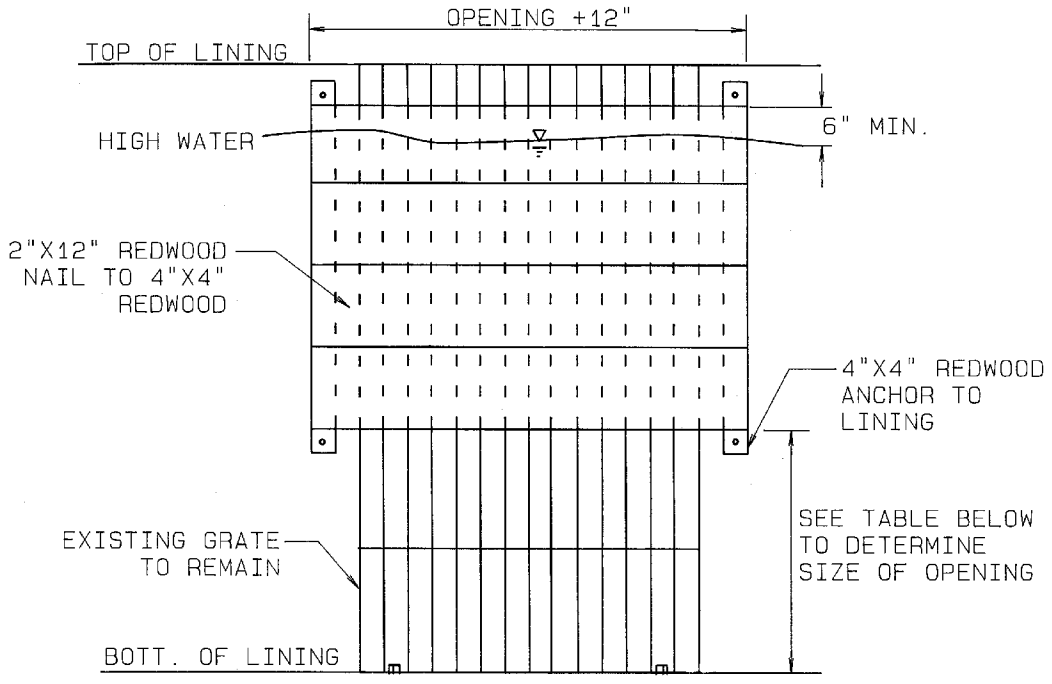


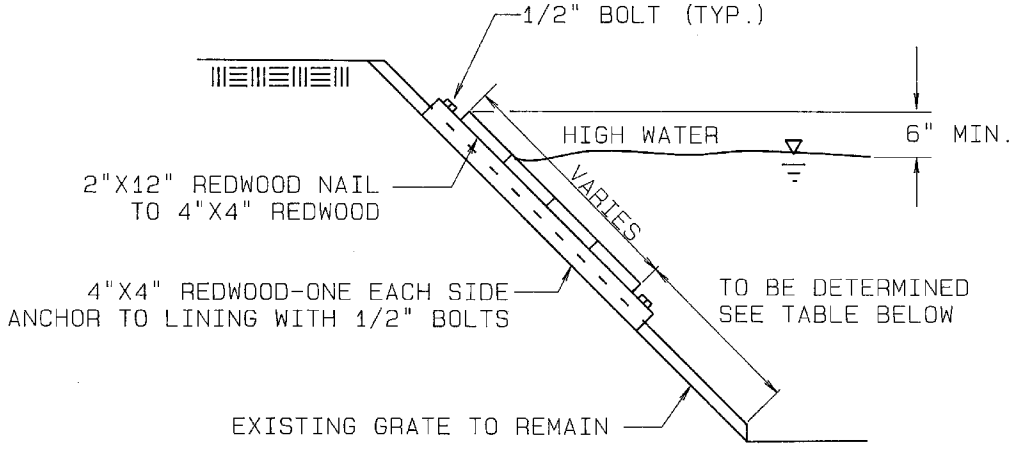

**DETAIL F**

SCALE: N.T.S.

| | | |
|---|---|---|
| TURLOCK IRRIGATION DISTRICT | | RECORDER STATION STRUCTURE |
| IRRIGATION CONSTRUCTION STANDARDS | SHEET 5 OF 5 | CS135D PAGE |

DWG. NO. CS 136




## REQUIRED OPENING BELOW BOARDS

| GATE SIZE | 16" | 18" | 20" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|---|---|
| OPENING ($ft^2$) | 3.0 | 3.75 | 4.5 | 6.5 | 10.25 | 14.5 | 20.0 | 26.0 |

OPENING SIZE BASED ON PROVIDING TWICE THE FULL GATE OPENING

# TURLOCK IRRIGATION DISTRICT

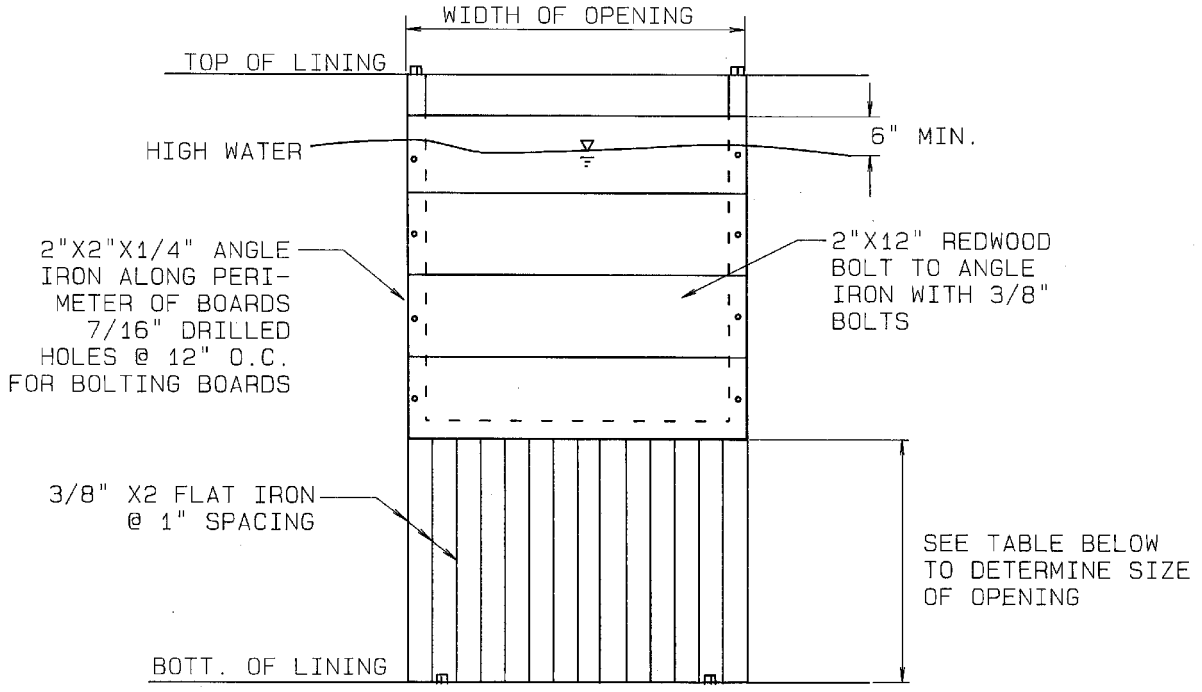
| REV. | DATE: | DESCRIPTION | CKD. | AV'D | AV'D | APP. |
|---|---|---|---|---|---|---|
| | | | | | | |

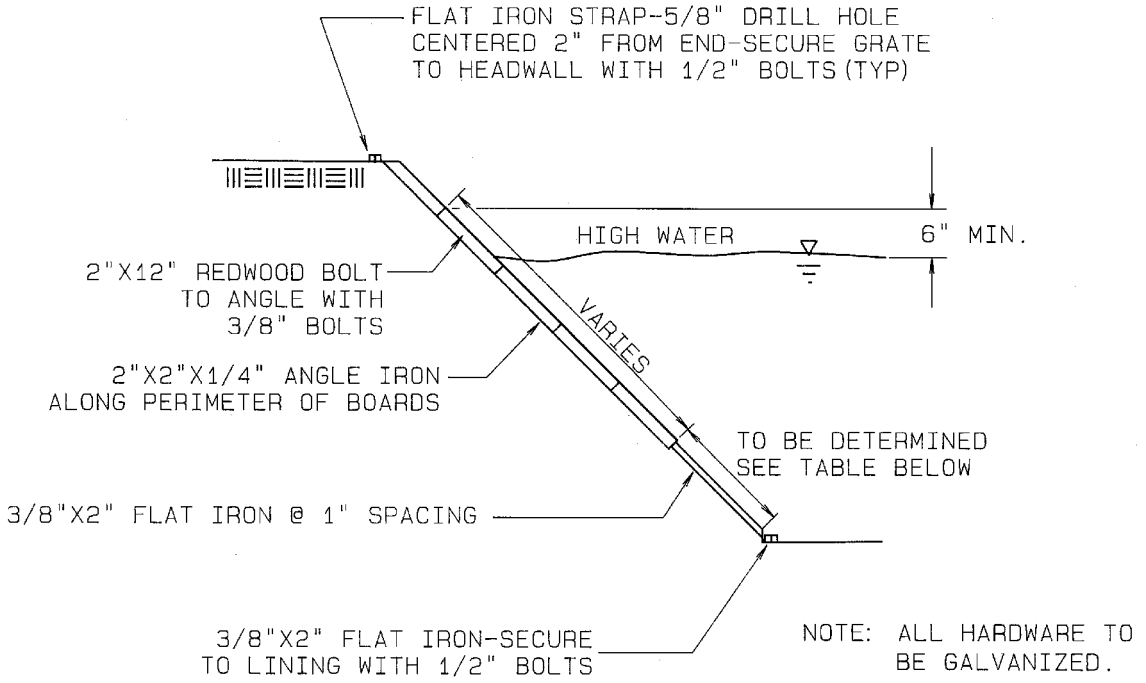
CONSTRUCTION/SUBDIVISION STANDARD

## GRATE MODIFICATION FOR BOOSTER PUMP INTAKE

| | |
|---|---|
| DATE: 1/13/86 | SCALE: NONE |
| DRAWN: SEB | REVIEWED: |
| DESIGNED: RAV | REVIEWED: |
| CHECKED: RRV | APPROVED: BDH |
| SHEET OF | DWG. NO. CS 136 |

DWG. NO. CS 137




## REQUIRED OPENING BELOW BOARDS

| GATE SIZE | 16" | 18" | 20" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|---|---|
| OPENING ($ft^2$) | 3.0 | 3.75 | 4.5 | 6.5 | 10.25 | 14.5 | 20.0 | 26.0 |

OPENING SIZE BASED ON PROVIDING TWICE THE FULL GATE OPENING

# TURLOCK IRRIGATION DISTRICT

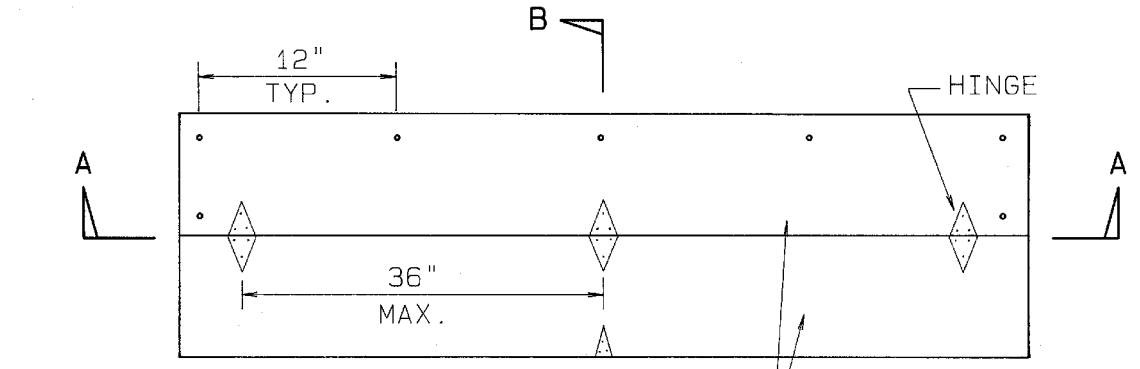
| REV. | DATE: | DESCRIPTION | CKD. | AV'D | AV'D | APP. |
|---|---|---|---|---|---|---|
| | | | | | | |

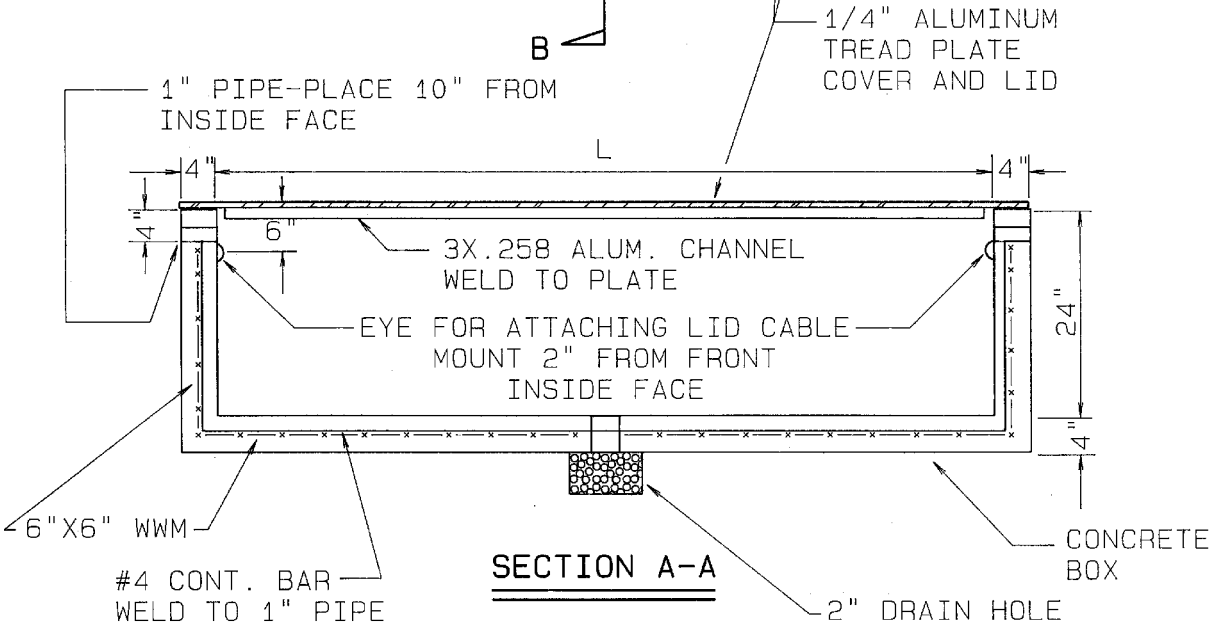
CONSTRUCTION/SUBDIVISION STANDARD

## DEBRIS GRATE FOR BOOSTER PUMP INTAKE

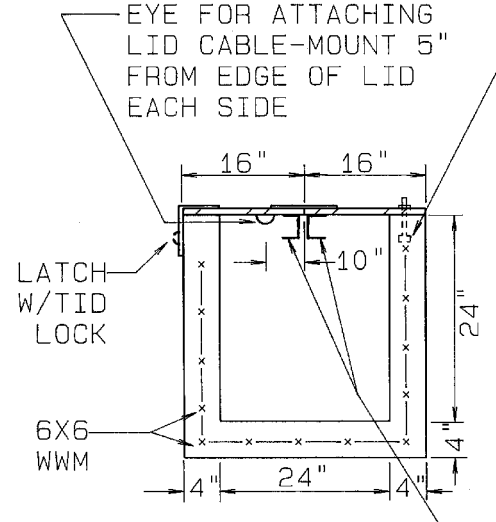
| | |
|---|---|
| DATE: 1/12/86 | SCALE: NONE |
| DRAWN: SEB | REVIEWED: |
| DESIGNED: ARV | REVIEWED: |
| CHECKED: RRV | APPROVED: BDH |
| SHEET OF | DWG. NO. CS 137 |

DWG. NO. CS138




SECTION A-A




SECTION B-B

NOTES:

1. L=LENGTH OF BOARDS +12"
2. IF L>7', USE 2 LIDS OF EQUAL LENGTH.
3. PROVIDE 20" OF 1/4" CABLE FOR STAY FOR EACH SIDE OF LID.
4. BOX MAY BE INSTALLED ON TOP OF GROUND OR EMBEDDED 12" INTO THE GROUND
5. ALL HARDWARE TO BE GALVANIZED OR EQUAL CORROSION RESISTANT TREATMENT.

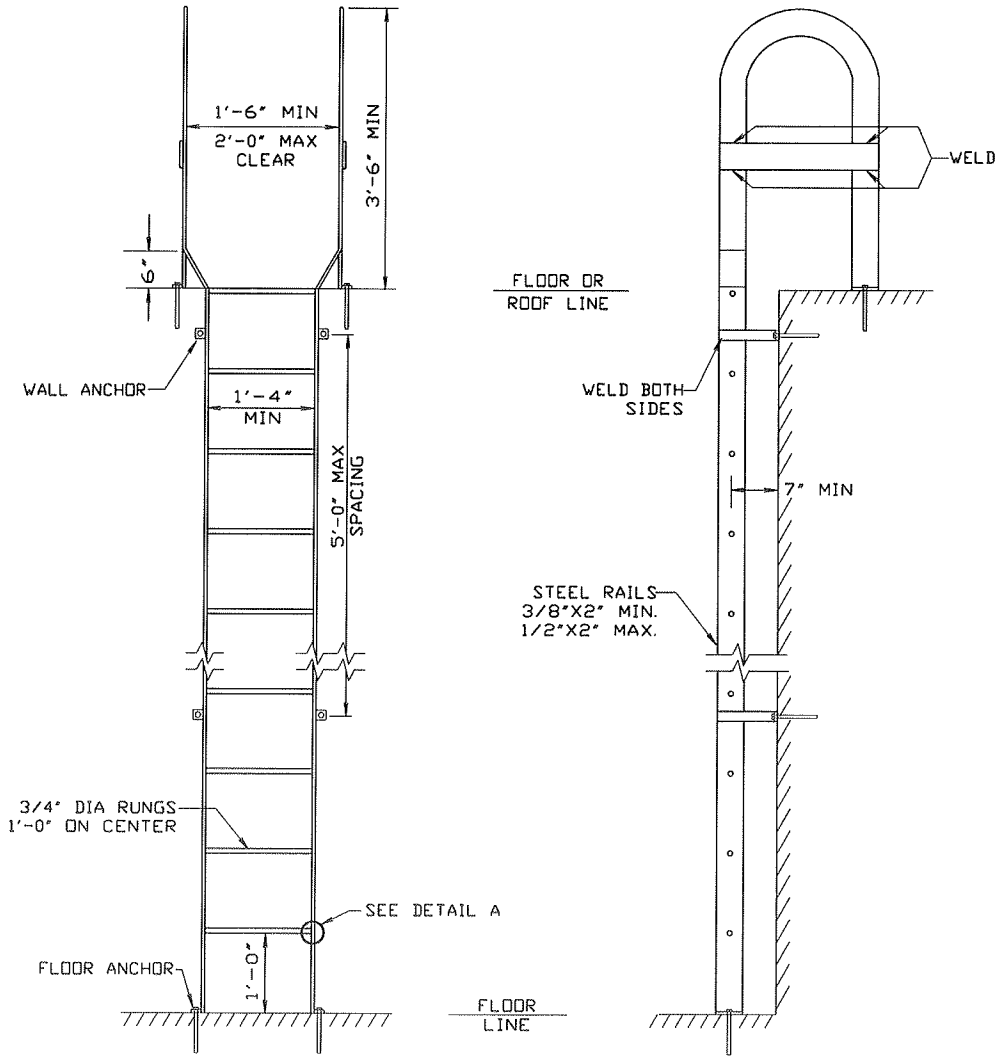
# TURLOCK IRRIGATION DISTRICT

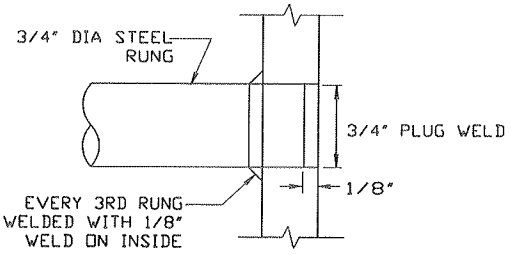
| REV. | DATE: | DESCRIPTION | CKD. | RV'D | RV'D | APP. |
|---|---|---|---|---|---|---|
| | | | | | | |

CONSTRUCTION/SUBDIVISION STANDARD

## CONCRETE WEIR BOARD BOX

| | |
|---|---|
| DATE: 2/5/87 | SCALE: NONE |
| DRAWN: SEB | REVIEWED: |
| DESIGNED: RRV | REVIEWED: |
| CHECKED: RRV | APPROVED: BDH |
| SHEET OF | DWG. NO. CS 138 |




DETAIL A

NOTES:

1. ALL LADDER PARTS AND APPURTENANCES SHALL BE PAINTED OR OTHERWISE TREATED TO RESIST CORROSION.
2. CAGES OR APPROVED SAFETY DEVICES ARE REQUIRED ON LADDERS OF LENGTH OF MORE THAN 20 FT. TO A MAXIMUM UNBROKEN LENGTH OF 30 FT.
3. ALL ANCHORS SHALL BE A MINIMUM OF 1/2" DIA. AND 6" IN LENGTH.
4. ALL CLEARANCES, SPECIAL APPLICATIONS, AND INSTALLATIONS SHALL CONFORM TO THE PROVISIONS OF SEC. 3277 OF TITLE 8 OF OSHA GENERAL INDUSTRY SAFETY ORDERS.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| -- | INITIAL ISSUE | SEB | RRV | | | BDH | 9/87 |

# FIXED METAL LADDER FOR ROOF ACCESS

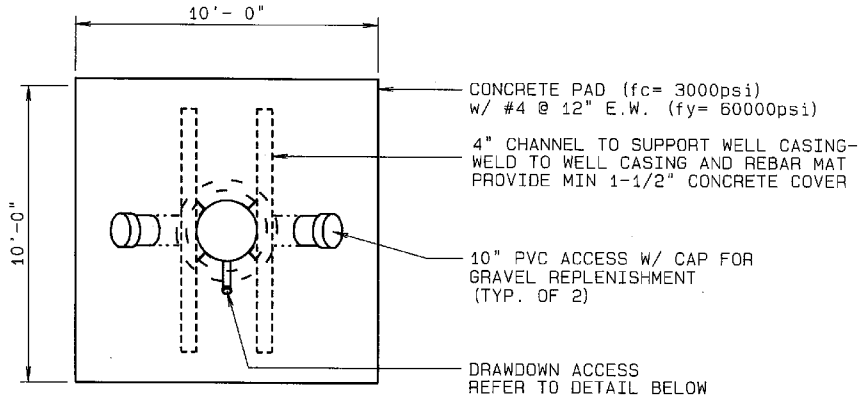
SHEET 1 OF 1

CS 139

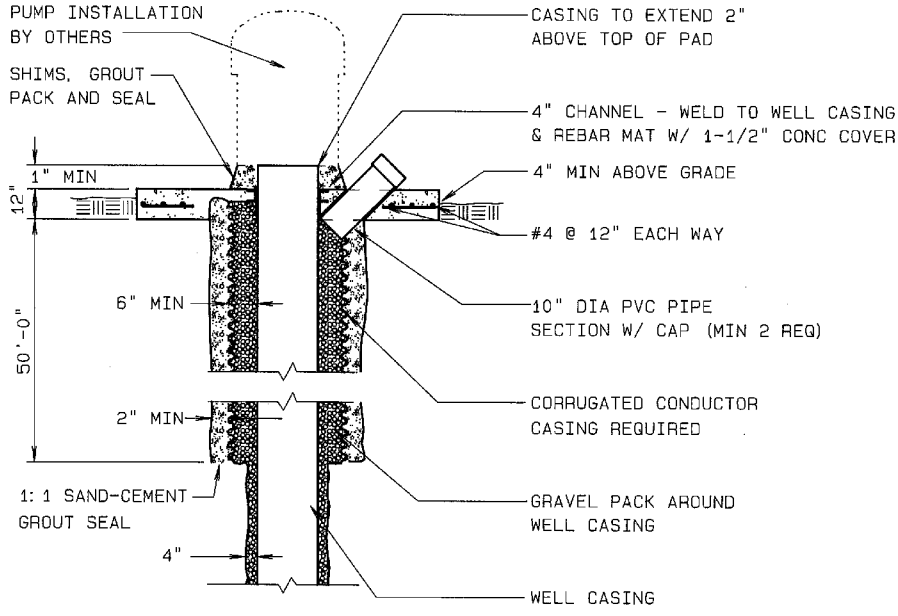
PAGE

DWG. NO. CS 141

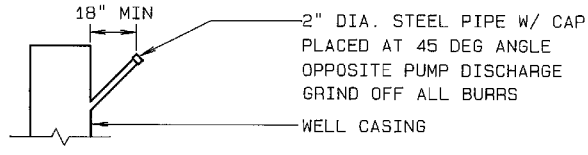
NOTE: THIS STANDARD IS APPLICABLE ONLY TO NEW INSTALLATIONS WHERE THE WELL CASING IS SEALED.




## PLAN VIEW




## SECTION




## DRAWDOWN ACCESS DETAIL

# TURLOCK IRRIGATION DISTRICT

| REV. | DATE: | DESCRIPTION | CKD. | RV'D | RV'D | APP. |
|---|---|---|---|---|---|---|
| | | | | | | |

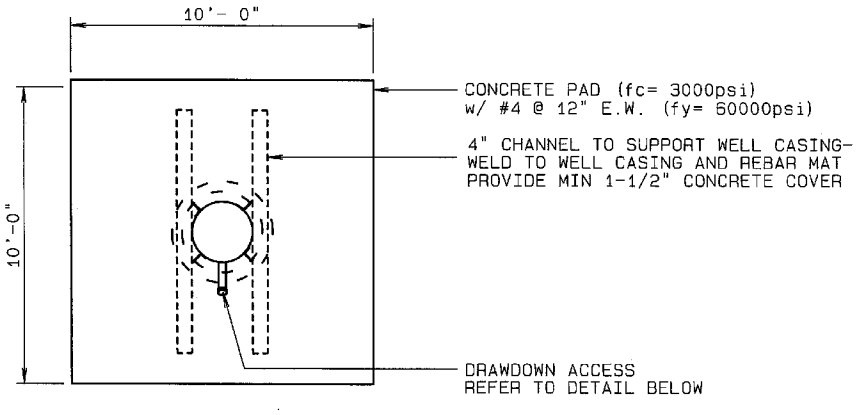
CONSTRUCTION/SUBDIVISION STANDARD

**PAD FOUNDATION FOR GRAVEL-PACKED WELL**

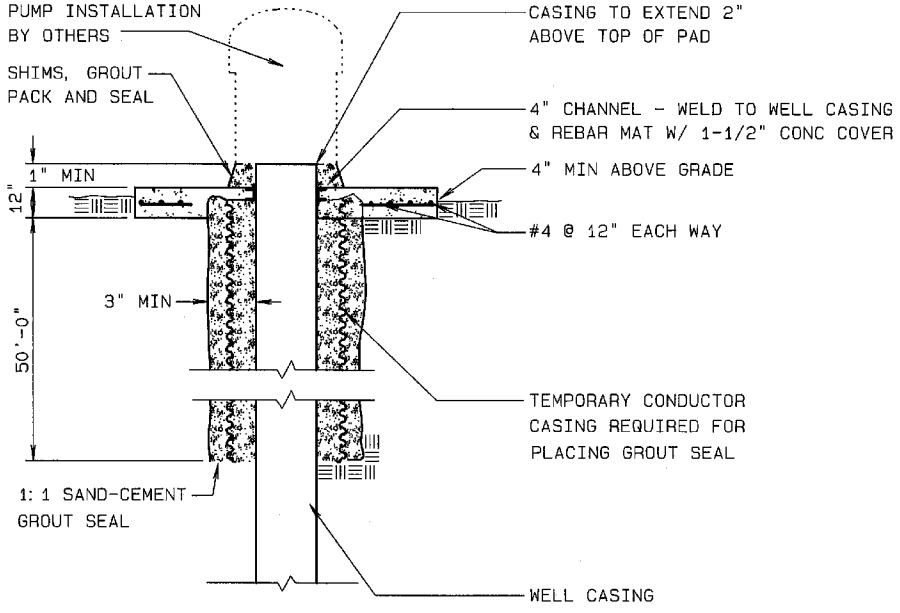
| | |
|---|---|
| DATE: 2/2/89 | SCALE: NONE |
| DRAWN: RAE | REVIEWED: |
| DESIGNED: RRV | REVIEWED: |
| CHECKED: | APPROVED: RRV |
| SHEET 1 OF 1 | DWG. NO. CS 141 |

DWG. NO. CS 141B

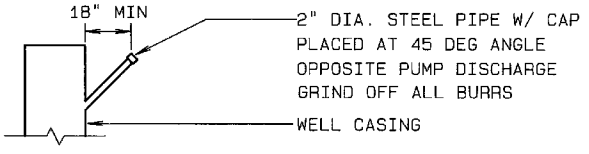
NOTE: THIS STANDARD IS APPLICABLE ONLY TO NEW INSTALLATIONS WHERE THE WELL CASING IS SEALED.




## PLAN VIEW




## SECTION




## DRAWDOWN ACCESS DETAIL

# TURLOCK IRRIGATION DISTRICT

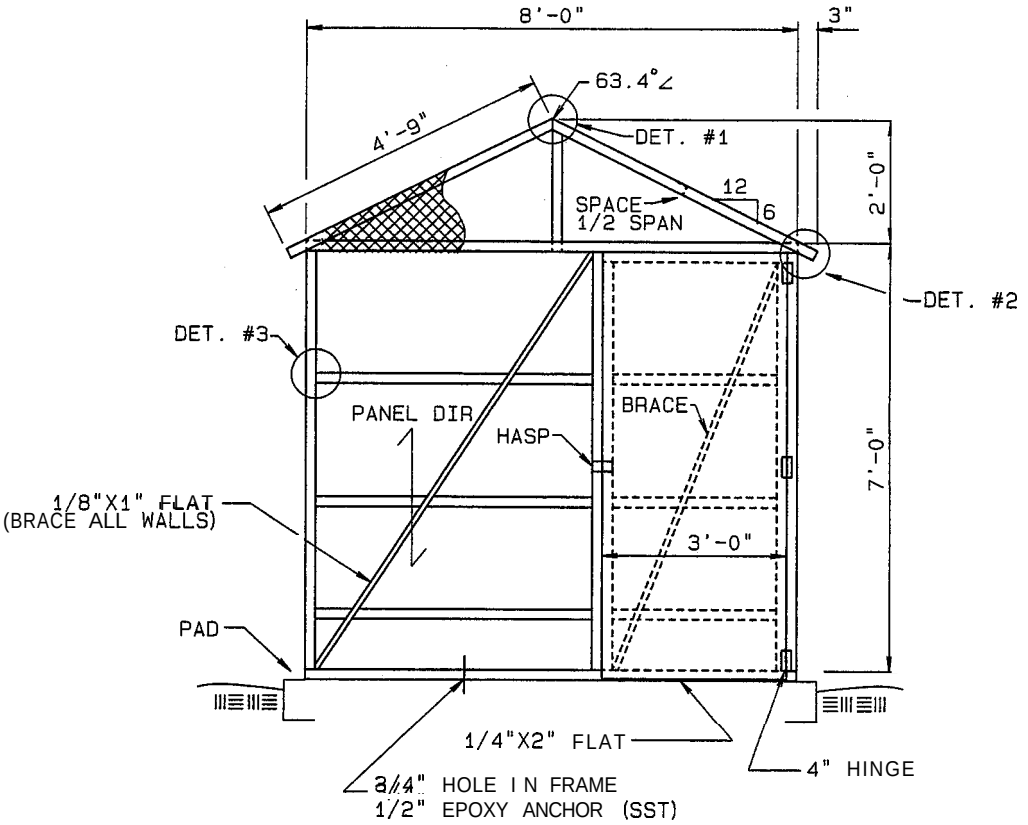
| REV. | DATE: | DESCRIPTION | CKD. | RV'D | RV'D | APP. |
|---|---|---|---|---|---|---|
| | | | | | | |

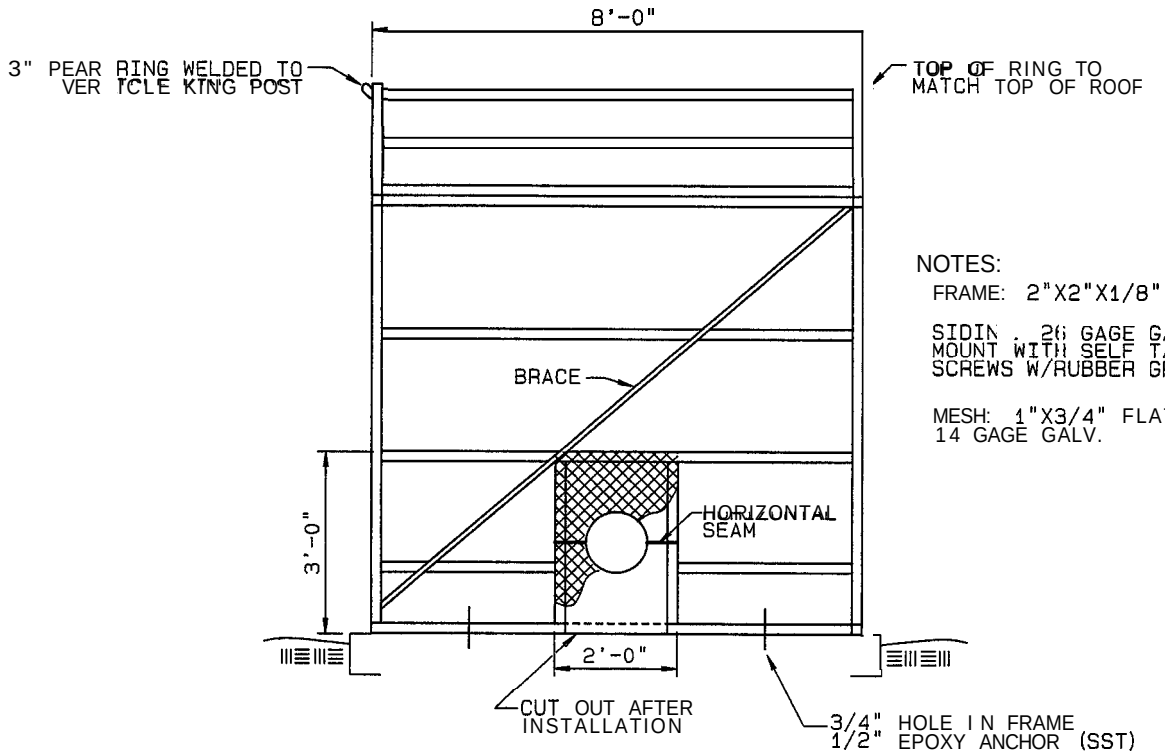
CONSTRUCTION/SUBDIVISION STANDARD

**PAD FOUNDATION FOR CABLE TOOL WELL**

| | | | |
|---|---|---|---|
| DATE: | 2/2/89 | SCALE: | NONE |
| DRAWN: | RAE | REVIEWED: | |
| DESIGNED: | RRV | REVIEWED: | |
| CHECKED: | | APPROVED: | RRV |
| SHEET | 1 OF 1 | DWG. NO. | CS 141B |

DWG. NO.CS 142




NOTES:

FRAME: 2"X2"X1/8" ANGLE

SIDING: 26 GAGE GALV.
MOUNT WITH SELF TAPPING
SCREWS W/RUBBER GROMMET

MESH: 1"X3/4" FLAT
14 GAGE GALV.

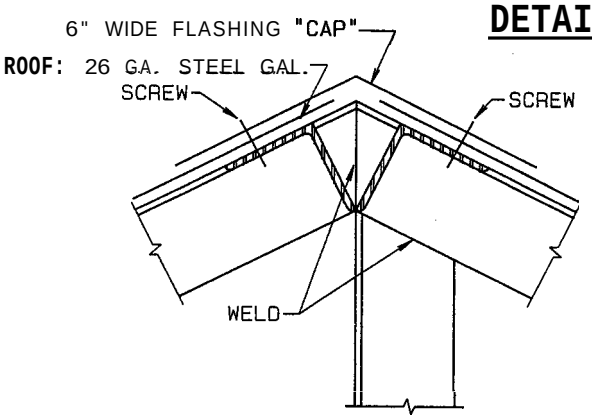
# TURLOCK IRRIGATION DISTRICT

CONSTRUCTION/SUBDIVISION STANOARD

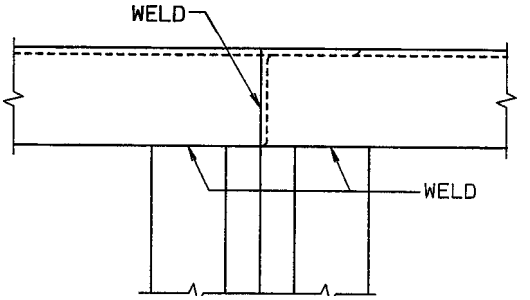
## PUMP HOUSE FRAME

| | |
|---|---|
| DATE: 5/30/89 | SCALE: NONE |
| DRAWN: SEB | REVIEWED |
| DESIGNED: WF | REVIEWED |
| CHECKED: | APPROVED CWBC |

## DETAIL 1

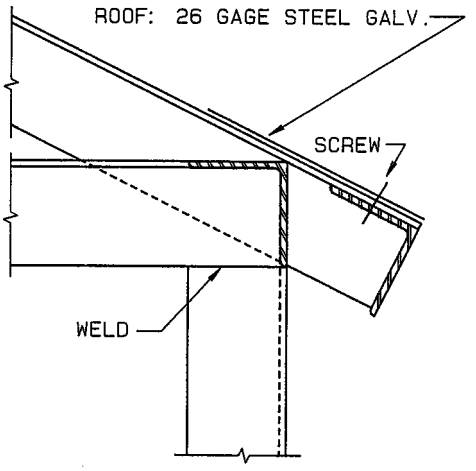



SIDE VIEW

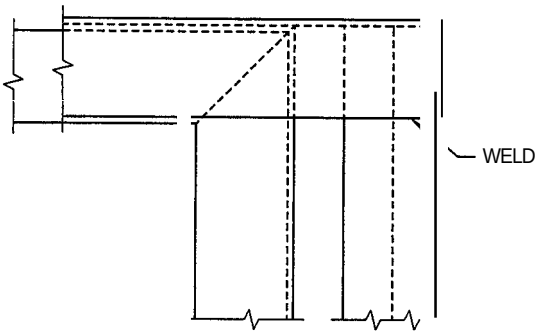



PLAN VIEW

## DETAIL 2

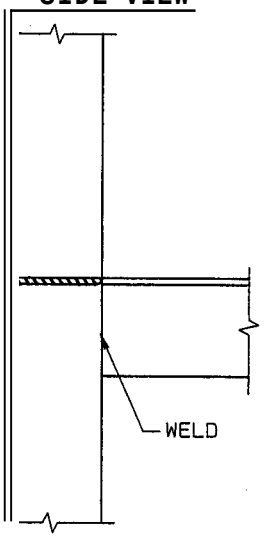



SIDE VIEW

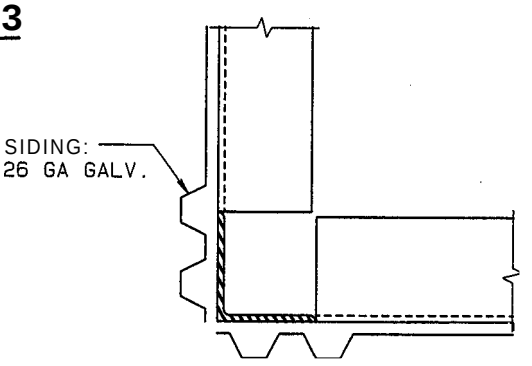



PLAN VIEW

## DETAIL 3



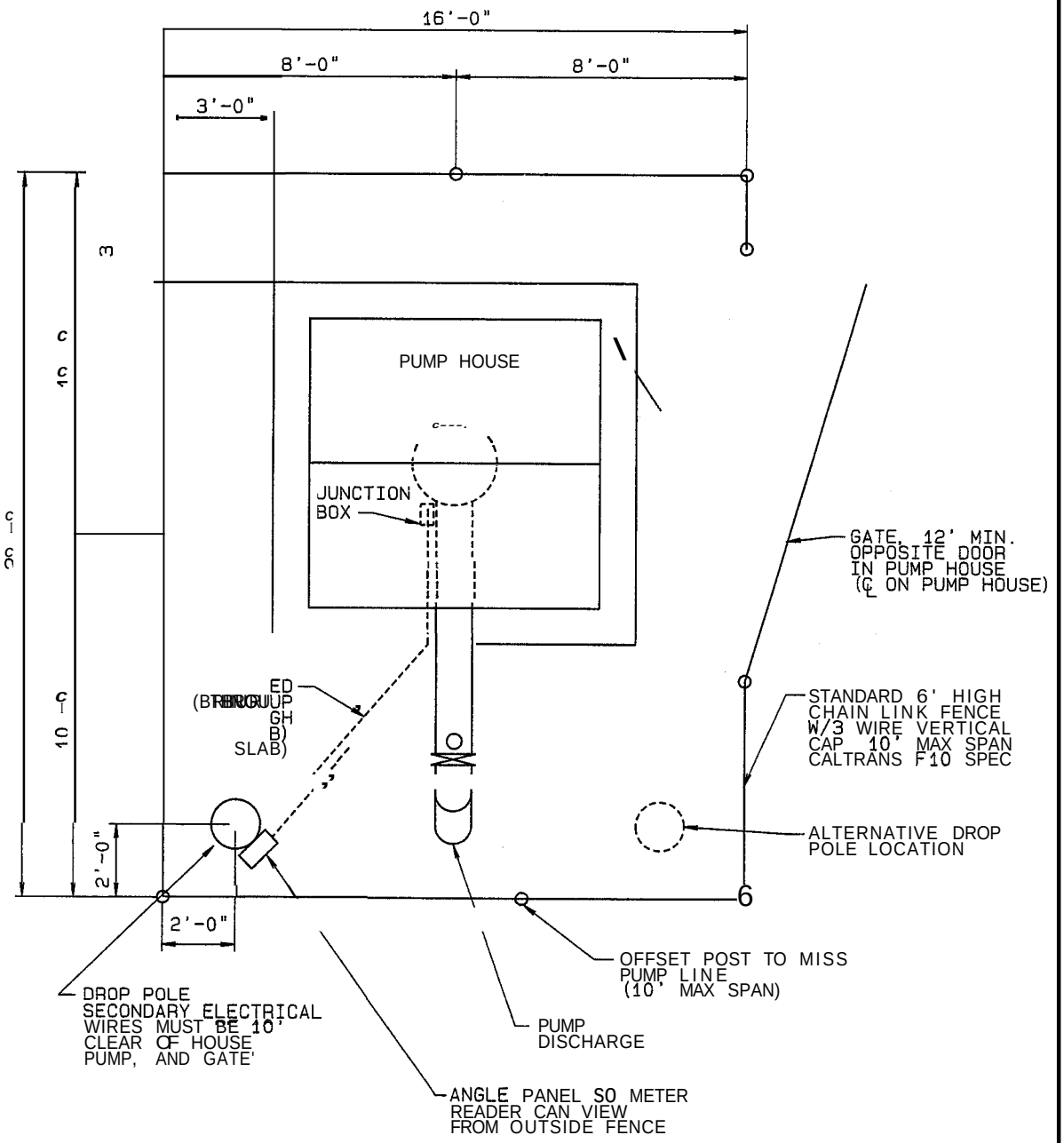

SIDE VIEW




PLAN VIEW

I/CS142/2

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | CONSTRUCTION/SUBDIVISION STANDARD | DATE: 5/30/89 | SCALE: NONE |
| | | | | | | | PUMP HOUSE | DRAWN SEB | REVIEWED: |
| | | | | | | | | DESIGNED: WF | REVIEWED: |
| | | | | | | | | CHECKED: | APPROVED: WBC |
| 1. | DATE: | DESCRIPTION | CKD. | RV'D | RV'D | APP. | FRAME DETAILS | SHEET 2 OF 3 | DWG. NO. CS 142 |




I/CS142/3

# TURLOCK IRRIGATION DISTRICT

| EV. | DATE: | DESCRIPTION | CKD. | RV'D | RV'D | APP. |
|---|---|---|---|---|---|---|

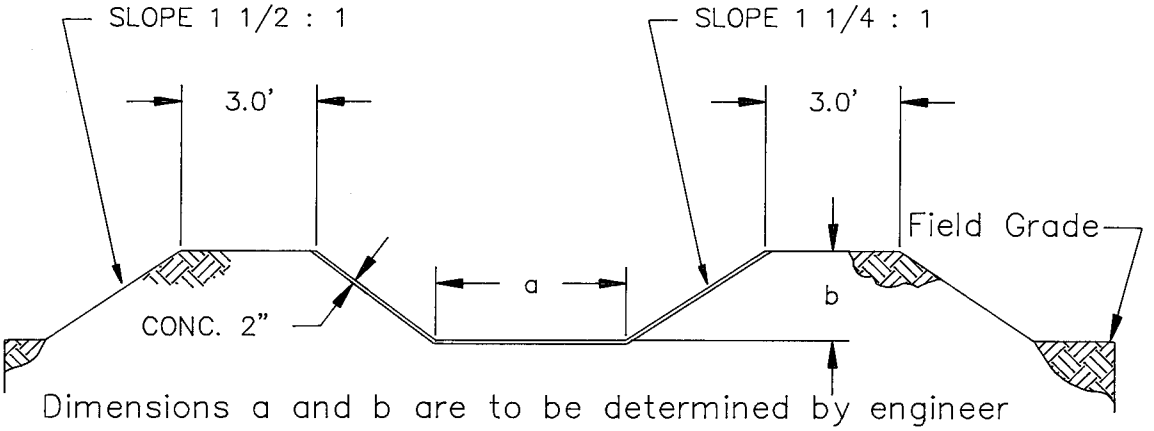
CONSTRUCTION/SUBDIVISION STANDARD

## PUMPING PLANT SITE PLAN

| | |
|---|---|
| DATE: 6/2/89 | SCALE NONE |
| DRAWN: SEB | REVIEWED: |
| DESIGNED: WF | REVIEWED: |
| CHECKED: | APPROVED: WBC |
| SHEET 3 OF 3 | DWG. NO. CS 142 |

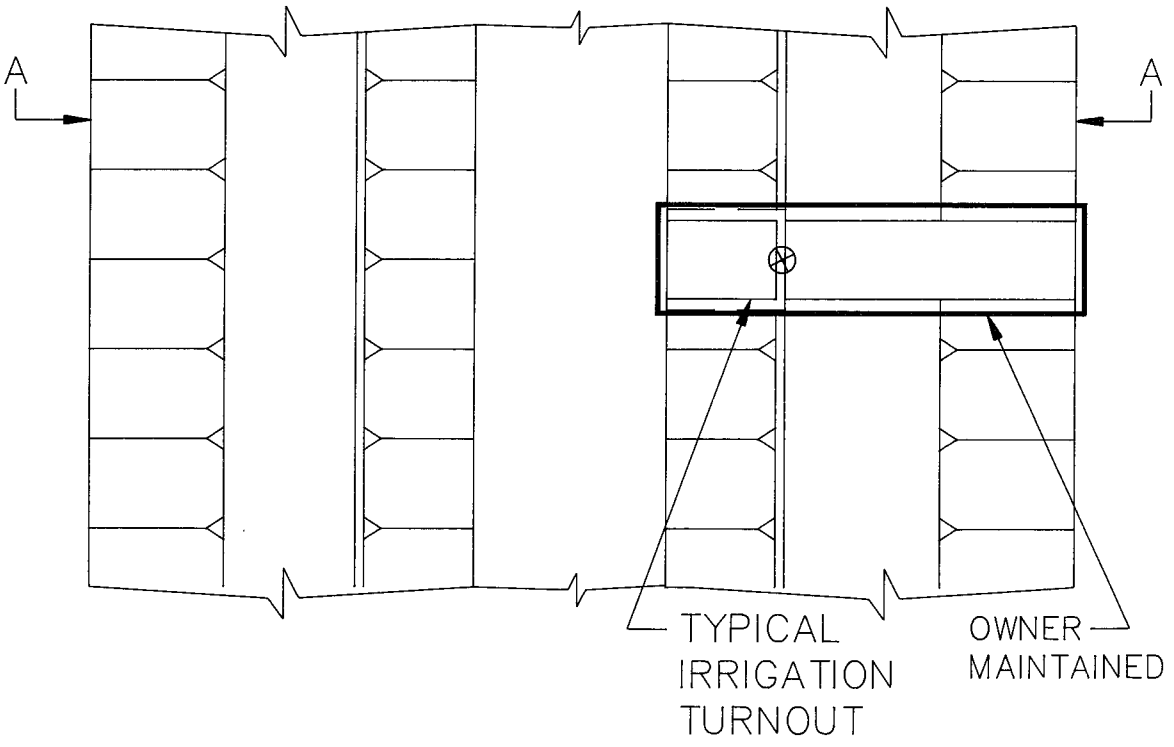
# IMPROVEMENT DISTRICT DITCH CONSTRUCTION

## DITCH CROSS SECTION A–A




Dimensions a and b are to be determined by engineer
Match existing cross section during repair
Note: Refer to drawing A–511 for cross section design

## FACILITY MAINTENANCE RESPONSIBILITY




TURLOCK IRRIGATION DISTRICT

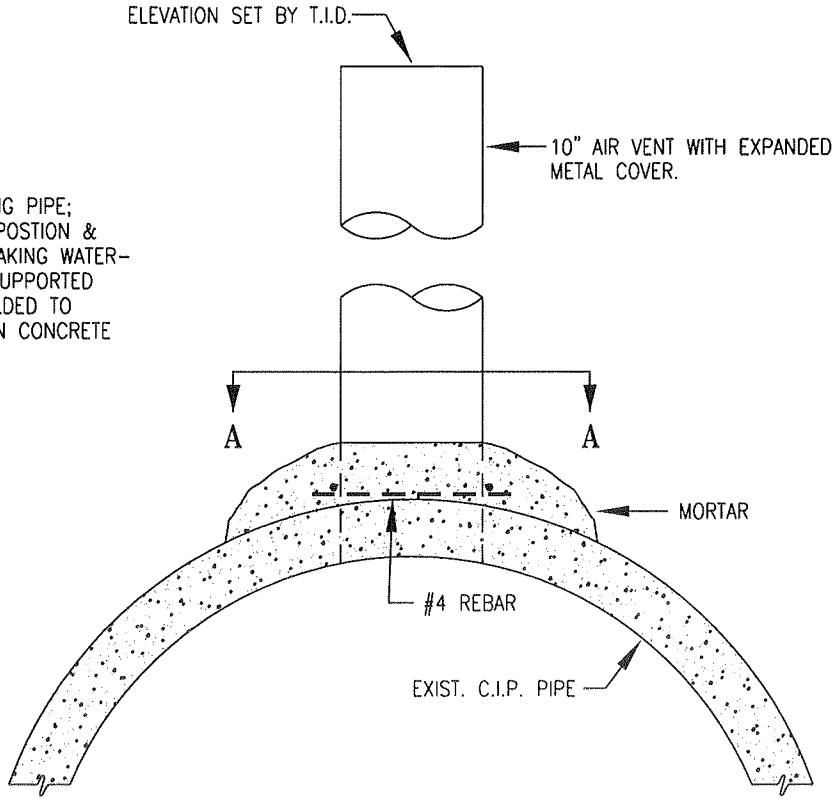
*IRRIGATION SYSTEM ADMINISTRATION*
CONSTRUCTION STANDARDS

IMPROVEMENT DISTRICT DITCH DESIGN

| REV | DESCRIPTION | INIT | CHK | RV'D | RV'D | APP | DATE |
|---|---|---|---|---|---|---|---|
| | INITITAL ISSUE | HBB | | | | BDH | 2/21/92 |

SHEET 1 OF 1

DWG NO. CS 143



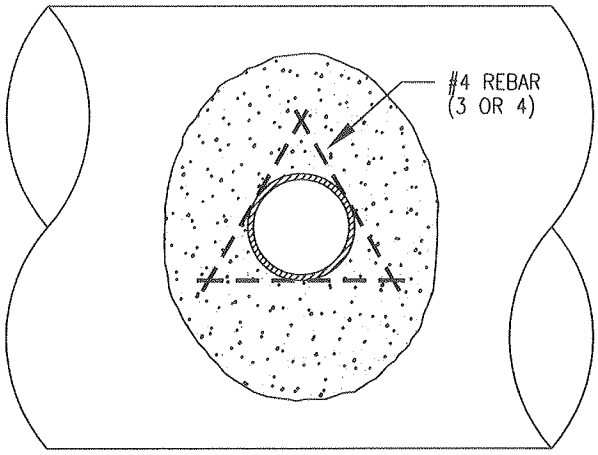

## NOTE

CUT HOLE IN EXISTING PIPE; PLACE AIR VENT IN POSTION & MORTAR IN PLACE MAKING WATER-TIGHT CONNECTION SUPPORTED BY CROSS BARS WELDED TO PIPE & EMBEDDED IN CONCRETE (SEE SECTION A-A)

## APPLICATIONS

RURAL: USE PRECAST CONCRETE AIR VENT.

SUBDIVISION: USE 10 GAUGE STEEL AIR VENT. ALL PAINTED SHERWIN-WILLIAMS RAIN FOREST GREEN, PART NO. SW4071 (OR APPROVED EQUAL)




SECTION A-A

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

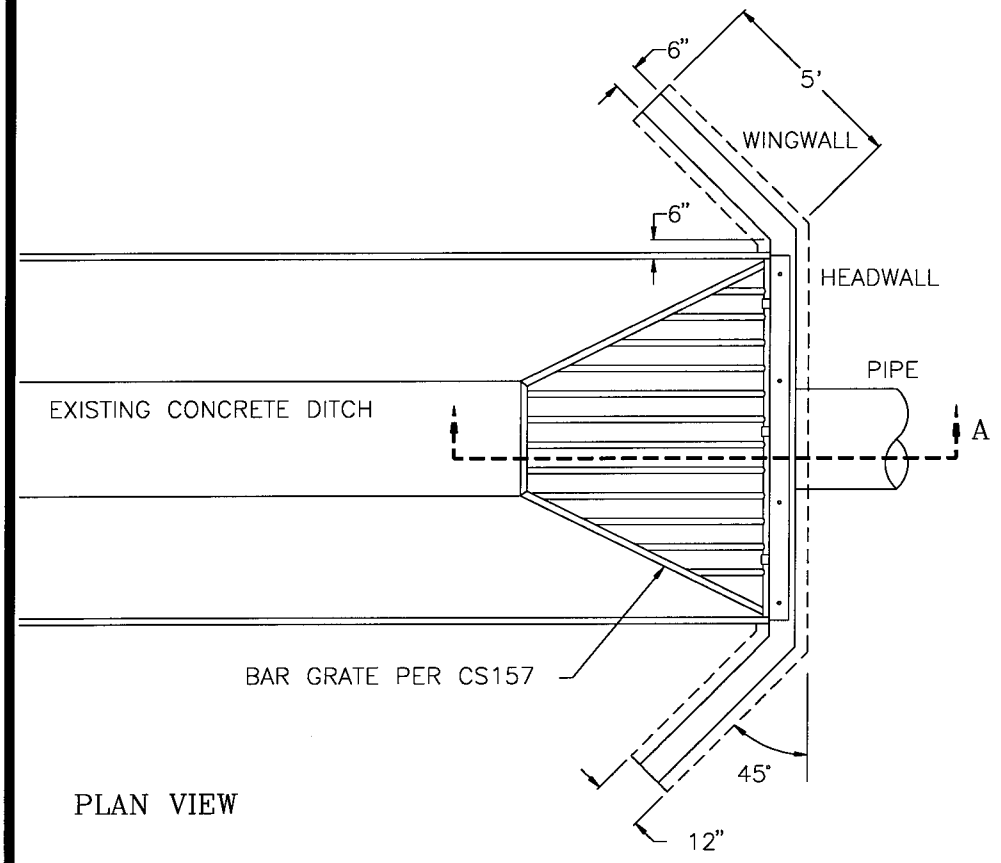
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| B | CHANGE PAINT SPEC | | | AWV | | | 7/10 |
| A | RENUMBER-WAS SS102, ADD APPLICATION NOTE | | | | | | |
| -- | INITIAL ISSUE | JAS | BDH | | REW | BDH | 07/24/85 |

# AIR VENT INSTALLATION

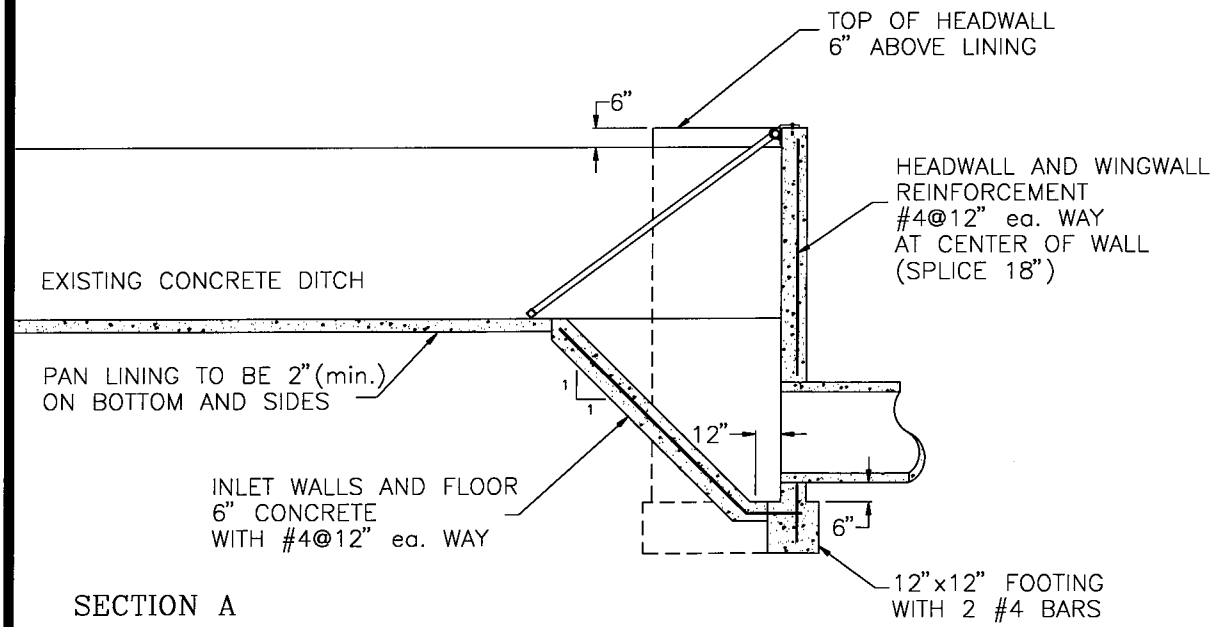
SHEET 1 OF 1

CS 144B

PAGE




PLAN VIEW




SECTION A

# TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

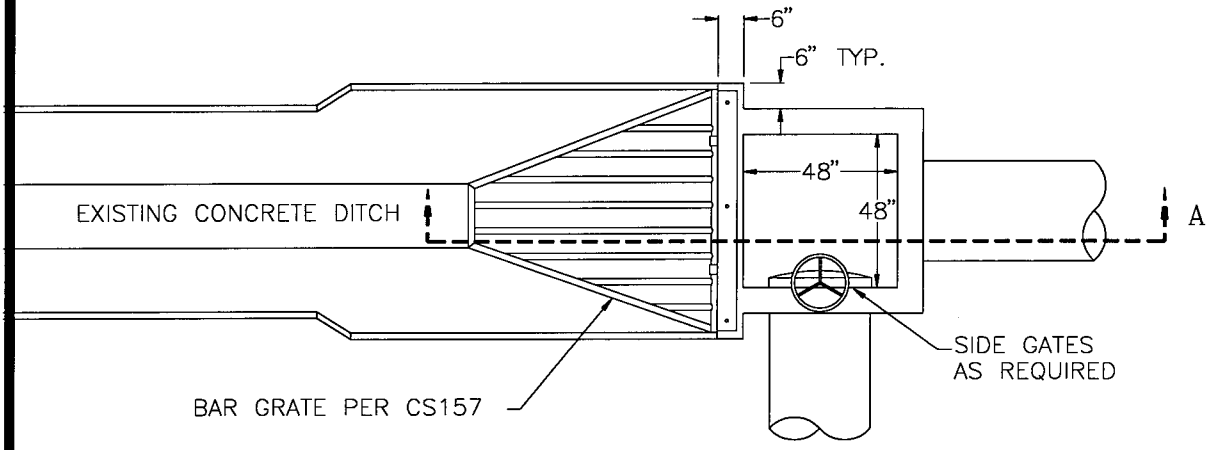
## DROP INLET

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| A | STDS. COM. APPROVAL | JAS | BB | | | EB | 8.19.97 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| A | REVISED BAR GRATE RENUMBERED FROM SS108 | BB | | | | BDH | 8-19-97 |
| -- | INITIAL ISSUE | JAS | BDH | | | BDH | 4/22/87 |

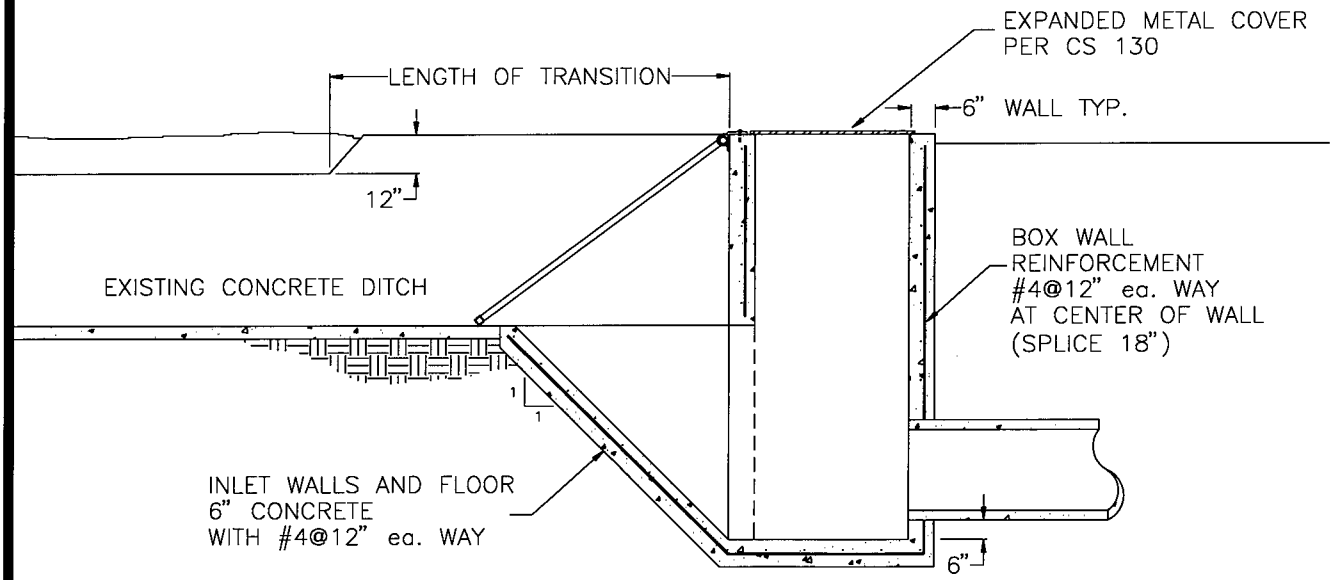
SHEET 1 OF 1

CS 145 A

PAGE

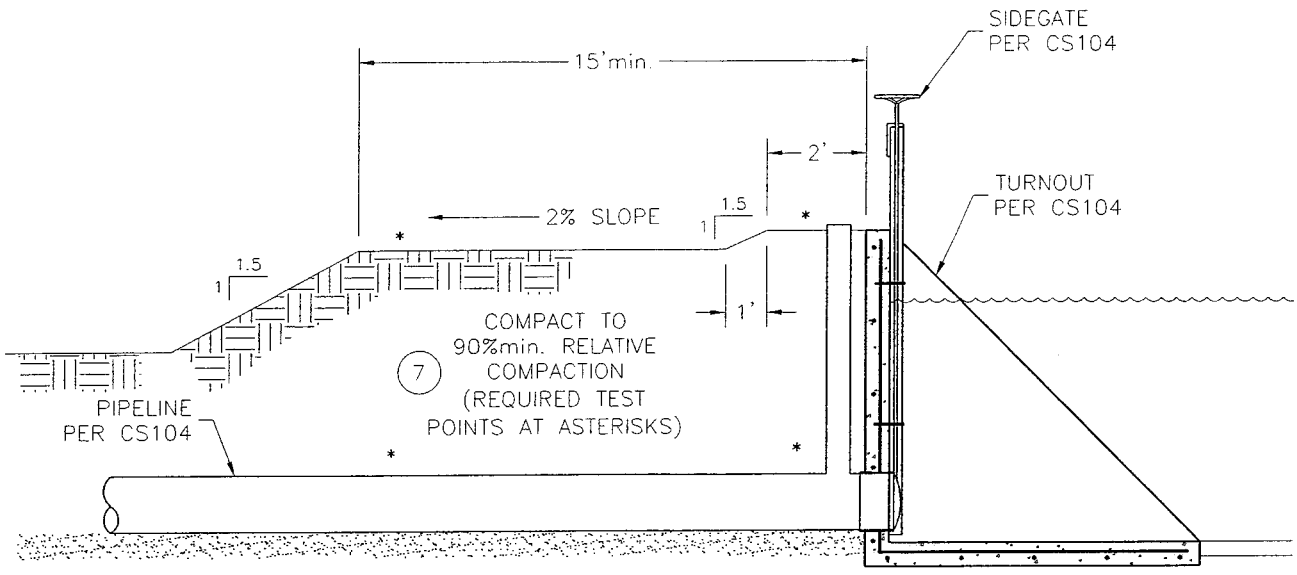



PLAN VIEW

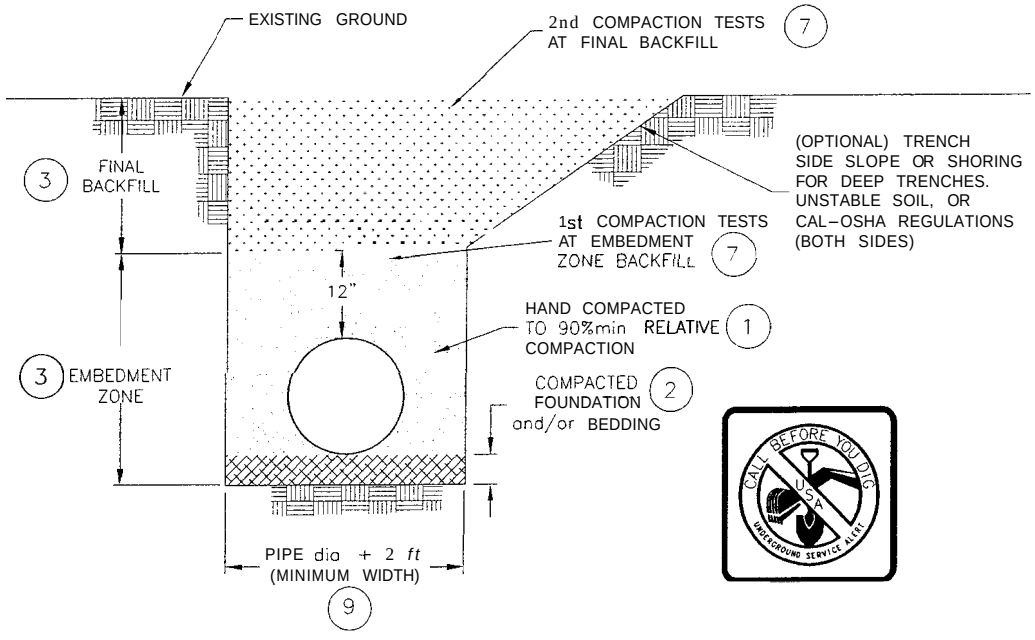



SECTION A

| TURLOCK IRRIGATION DISTRICT | | | | | | | | IRRIGATION CONSTRUCTION STANDARDS |
|---|---|---|---|---|---|---|---|---|
| A | STDS. COM. APPROVAL | JAQ | BB | | SB | 8-17-97 | | DROP INLET INTO BOX |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| A | REVISED BAR GRATE RENUMBERED FROM SS106 | BB | | | BJZ | 8/97 | | |
| -- | INITIAL ISSUE | JAS | BDH | | BDH | 4/22/87 | SHEET 1 OF 1 | CS 146 A |
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE | PAGE |




**CANAL ROADWAY STANDARD**




**PIPELINE TRENCH CONSTRUCTION**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| TURLOCK IRRIGATION DISTRICT | | | | | | | | IRRIGATION CONSTRUCTION STANDARDS |
| | STDS. COM. APPROVAL | | | | | | | |
| | | | | | | | | **CUSTOMER** INSTALLED CANAL SIDE GATE **FOR** IRRIGATION PIPELINE |
| | | | | | | | | |
| | | | | | | | | |
| A | REMOVED GUARANTEE REQ. | | | | | | 12/03 | |
| -- | INITIAL ISSUE | | | | | | | SHEET 1 OF 3 |
| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE | CS147A PAGE |

CONSTRUCTION NOTES:

1. COMPACTED EARTHFILL IN THE EMBEDMENT ZONE SHALL MEET 90% MINIMUM DENSITY (ASTM D-1557) AND RE ACCOMPLISHED BY MANUALLY DIRECTED COMPACTORS TO A MINIMUM DEPTH OF 12 INCHES OVER TOP OF PIPE THE MAXIMUM LAYER THICKNESS FOR EACH LIFT SHALL BE 8 INCHES BEFORE COMPACTION. ALL FINAL BACKFILL TO ALSO MEET 90% MINIMUM DENSITY. HEAVY COMPACTION EQUIPMENT SHALL NOT BE OPERATED WITHIN 2 FEET OF ANY STRUCTURE

2. ALL STRUCTURE SUBGRADES ARE TO BE INSPECTED BY THE TID ENGINEERING DEPARTMENT REPRESENTATIVE PRIOR TO CONCRETE POUR OR BACKFILL

3. EARTHFILL SHALL BE SELECT NATIVE MATERIAL, CONTAINING NO MATERIALS OVER 3 INCHES IN DIAMETER OR LENGTHS, AND BE COMPACTED AGAINST UNDISTURBED EARTH FILL MATERIALS SHALL CONTAIN NO SOD, BRUSH, ROOTS, OR OTHER ORGANIC OR UNSUITABLE MATERIAL AS DETERMINED BY THE TID ENGINEERING DEPARTMENT REPRESENTATIVE

4 PIPELINE SHALL BE INSTALLED ACCORDING TO MANUFACTURERS INSTRUCTIONS AND SPECIFICATIONS MINIMUM DEPTH OF COVER WITHIN THE TID RIGHT-OF-WAY SHALL BE 36 INCHES UNDER CANAL ROAD BANKS AND 18 INCHES ELSEWHERE

5 PIPE MATERIAL WITHIN THE TID RIGHT-OF-WAY SHALL BE ACCORDING TO THE CURRENT EDITION OF TID CONSTRUCTION STANDARD CS104

6 THE EDGE OF THE TID RIGHT-OF-WAY AND THE ELEVATION OF THE PIPE INVERT SHALL BE SET BY THE TID SURVEY DEPARTMENT PRIOR TO THE START OF CONSTRUCTION

7. A SOIL CURVE AND FOUR COMPACTION TESTS ARE REQUIRED AND SHALL BE AT APPLICANT'S EXPENSE A SOIL CURVE MUST BE OBTAINED PRIOR TO CONSTRUCTION AND TWO COMPACTION TESTS SHALL BE DONE AT EACH STAGE OF BACKFILLING--STAGE 1 EMBEDMENT ZONE, STAGE 2 FINAL BACKFILLING (SEE SHEET 1)

8. DEWATERING DUE TO HIGH GROUNDWATER MAY BE REQUIRED. SHOULD GROUNDWATER BE ENCOUNTERED, THE APPLICANT SHALL CONTACT THE TID ENGINEERING DEPARTMENT REPRESENTATIVE FOR APPROVAL OF DEWATERING METHODS AND BEFORE COMMENCING BACKFILL OPERATIONS.

9. TRENCH WIDTH SHALL BE 2 FEET WIDER THAN THE PIPELINE DIAMETER

10 LINING AT THE TURNOUT LOCATION IS TO BE SAWCUT AND REMOVED. THE REMAINING JOINT BETWEEN THE LINING AND TURNOUT IS TO BE BONDED WITH 4 INCH THICK CONCRETE KEYED UNDER THE EXISTING LINING FOR 6". AN EPOXY BONDING AGENT ("CCI CONSTRUCTION CHEMICALS LPL EPOXY BONDER" OR EQUIVALENT) IS TO BE USED AT THE JOINTS.

11 TURNOUT SHALL BE 6 INCH THICK POURED IN PLACE REINFORCED* CONCRETE WITH TYPE II PORTLAND CEMENT, A MAXIMUM AGGREGATE SIZE OF 3/4 INCH, AND MAXIMUM SLUMP OF 4 INCHES. CONCRETE 28 DAY COMPRESSIVE STRENGTH TO BE A MINIMUM OF 3000psi. READY MIX CONCRETE TO COMPLY WITH ASTM C-94. CONCRETE SHALL BE PREVENTED FROM DRYING FOR A CURING PERIOD OF AT LEAST 7 DAYS AFTER IT IS PLACED. EXPOSED SURFACES SHALL BE KEPT CONTINUOUSLY MOIST FOR THE ENTIRE PERIOD OR A CURING COMPOUND ("MEADOWS 1100 CURING COMPOUND" OR EQUIVALENT) MAY BE APPLIED. *TURNOUT REINFORCEMENT SHALL BE #4 BARS AT 12 INCHES EACH WAY. SEE CONSTRUCTION STANDARD CS104 FOR FURTHER DETAILS.

12 A CURRENT EDITION OF CONSTRUCTION STANDARD CS104 SHOULD ACCOMPANY THIS STANDARD.

TURLOCK IRRIGATION DISTRICT NOTES:

1. THESE DRAWINGS CONSTITUTE TID's APPROVAL AS TO THE ENGINEERING ASPECTS ONLY AND DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY ASPECT HEREOF OR THE INTERFERENCE WITH ANY PROPERTY, EQUIPMENT, OR INTEREST OF THE TID. NO CONSTRUCTION ON, OR INTERFERENCE WITH, TID PROPERTY SHALL OCCUR UNTIL THE TID HAS APPROVED AN "APPLICATION FOR SIDEGATE".

2. ALL CONSTRUCTION WORKS COMPLETED BY CUSTOMERS SHALL BE PERFORMED BY A LICENSED CONTRACTOR (STATE OF CALIFORNIA) APPROVED BY THE TID ENGINEERING DEPARTMENT REPRESENTATIVE PRIOR TO COMMENCING WORK.

3. ALL SIDEGATES INSTALLED BY CUSTOMERS WILL REQUIRE A $4,000 PERFORMANCE BOND OR EQUIVALENT CASH DEPOSIT PRIOR TO COMMENCING WORK.

4. ALL CONSTRUCTION WITHIN THE TID RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH THE ATTACHED DRAWINGS AND THE CURRENT EDITION OF TID CONSTRUCTION STANDARD(s) CS104.

5. CONSTRUCTION WITHIN THE TID RIGHT-OF-WAY WILL NOT BE ALLOWED DURING THE IRRIGATION SEASON (GENERALLY MARCH 1 TO NOVEMBER 1).

6. WHERE THE PLANS OR SPECIFICATIONS DESCRIBE PORTIONS OF THE WORK IN GENERAL TERMS, BUT NOT IN COMPLETE DETAIL, IT IS UNDERSTOOD THAT ONLY THE BEST GENERAL PRACTICE IS TO PREVAIL AND THAT ONLY MATERIALS AND WORKMANSHIP OF THE FIRST QUALITY ARE TO BE USED.

7. APPLICANT AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

8. CAL-OSHA SAFETY REQUIREMENTS SHALL BE IN EFFECT DURING ALL CONSTRUCTION. SPECIAL SAFETY PRECAUTIONS SHALL BE TAKEN WHEN WORKING IN THE VICINITY OF GAS, OIL, OR ELECTRICAL LINES.

9. APPLICANT SHALL OBTAIN A DIG ALERT IDENTIFICATION NUMBER AT LEAST TWO WORKING DAYS BEFORE DIGGING UNDERGROUND.

10. THE TID WILL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES TO, OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE OBTAINED IN WRITING FROM THE TID ENGINEERING DEPARTMENT REPRESENTATIVE.

11. ALL IMPROVEMENTS SHALL BE PAID FOR BY THE APPLICANT THE TID WILL BE THE OWNER OF AND WILL MAINTAIN ALL IMPROVEMENTS WITHIN THE TID RIGHT-OF-WAY

12. ANY DAMAGES TO TID FACILITIES DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED PER THE TID CONSTRUCTION STANDARDS AT THE SOLE COST OF THE APPLICANT.

13. SCHEDULE FOR SIDEGATE INSTALLATION SHALL BE APPROVED BY THE TID WATER DISTRIBUTION DEPARTMENT MANAGER PRIOR TO COMMENCING WORK.

14. INSPECTIONS CONCERNING VARIOUS STAGES OF WORK WILL BE REQUIRED, AS STATED IN THE ATTACHED SPECIFICATIONS, AT THE APPLICANT'S EXPENSE. THEY INCLUDE:
    A. SOIL COMPACTION TESTING
    B. INSPECTION OF FOUNDATIONS, FORMS, AND REINFORCING STEEL PRIOR TO PLACING CONCRETE
    C. POST CONSTRUCTION ACCEPTANCE.

15. CONTACT THE TURLOCK IRRIGATION DISTRICT ENGINEERING DEPARTMENT AT LEAST FIVE (5) WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION, AT LEAST ONE (1) WORKING DAY PRIOR TO POURING CONCRETE, AND WITHIN FIVE (5) WORKING DAYS AFTER SUCH WORK IS COMPLETED. WORK WITHIN THE TID RIGHT-OF-WAY SHALL PROCEED IN A CONTINUOUS MANNER ONCE STARTED. THE TID ENGINEERING DEPARTMENT SHALL BE NOTIFIED OF ANY WORK STOPPAGES. WHENEVER WORK IS TO RESTART, THE TID ENGINEERING DEPARTMENT SHALL REQUIRE AN ADDITIONAL TWO (2) WORKING DAY NOTICE. THE TID ENGINEERING DEPARTMENT SHALL ALSO BE CONTACTED A MINIMUM OF TWO (2) WORKING DAYS PRIOR TO ALL CONSTRUCTION SCHEDULED ON A HOLIDAY OR WEEKEND.

16. APPLICANT MUST NOTIFY TID UPON COMPLETION OF CONSTRUCTION IN ORDER FOR THE TID ENGINEER TO MAKE A FINAL INSPECTION FOR ACCEPTANCE OF THE IMPROVEMENTS.

APPROVED BY TURLOCK IRRIGATION DISTRICT FOR IRRIGATION FACILITIES ONLY.

TURLOCK IRRIGATION DISTRICT

IRRIGATION
CONSTRUCTION STANDARDS

CUSTOMER INSTALLED
CANAL SIDE GATE FOR
IRRIGATION PIPELINE

SHEET 3 OF 3

CS147A

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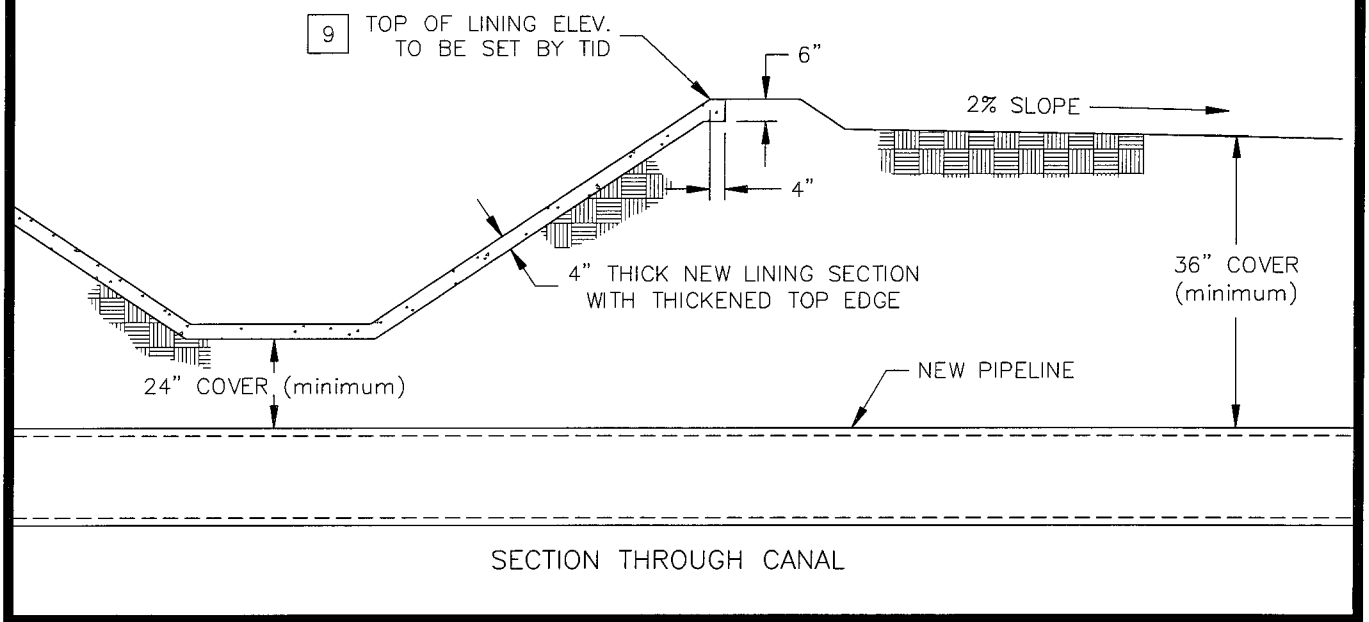
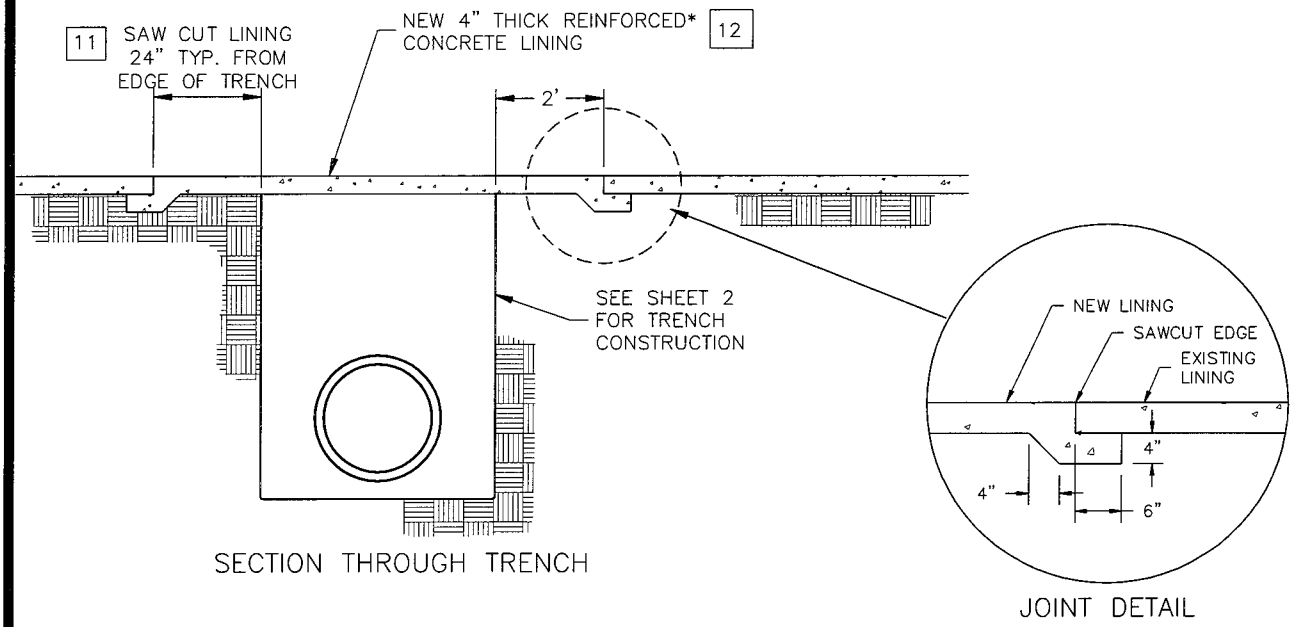



SECTION THROUGH CANAL




SECTION THROUGH TRENCH

JOINT DETAIL

NOTES:

A. *CONCRETE REINFORCEMENT IS TO BE FIBERMESH "MD" AT 1.25 POUNDS PER CUBIC YARD
B. CANAL BANK IS TO BE RESTORED TO ITS ORIGINAL CONDITION (SEE ALSO CS127)
C. PIPELINE UNDER CANAL SHALL BE CONTINUOUS 40' LENGTH (100psi PVC) WITH MIDPOINT CENTERED ON CANAL CENTERLINE
D. SEE SHEETS 2,3,&4 FOR ADDITIONAL CONSTRUCTION NOTES

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| — | STDS. COM. APPROVAL | JB | BB | | BB | JR. | 5-1-98 |
| — | INITIAL ISSUE | | | | JB | BB | 6-98 |

# SAW-CUT LINING CONSTRUCTION

SHEET 1 OF 4

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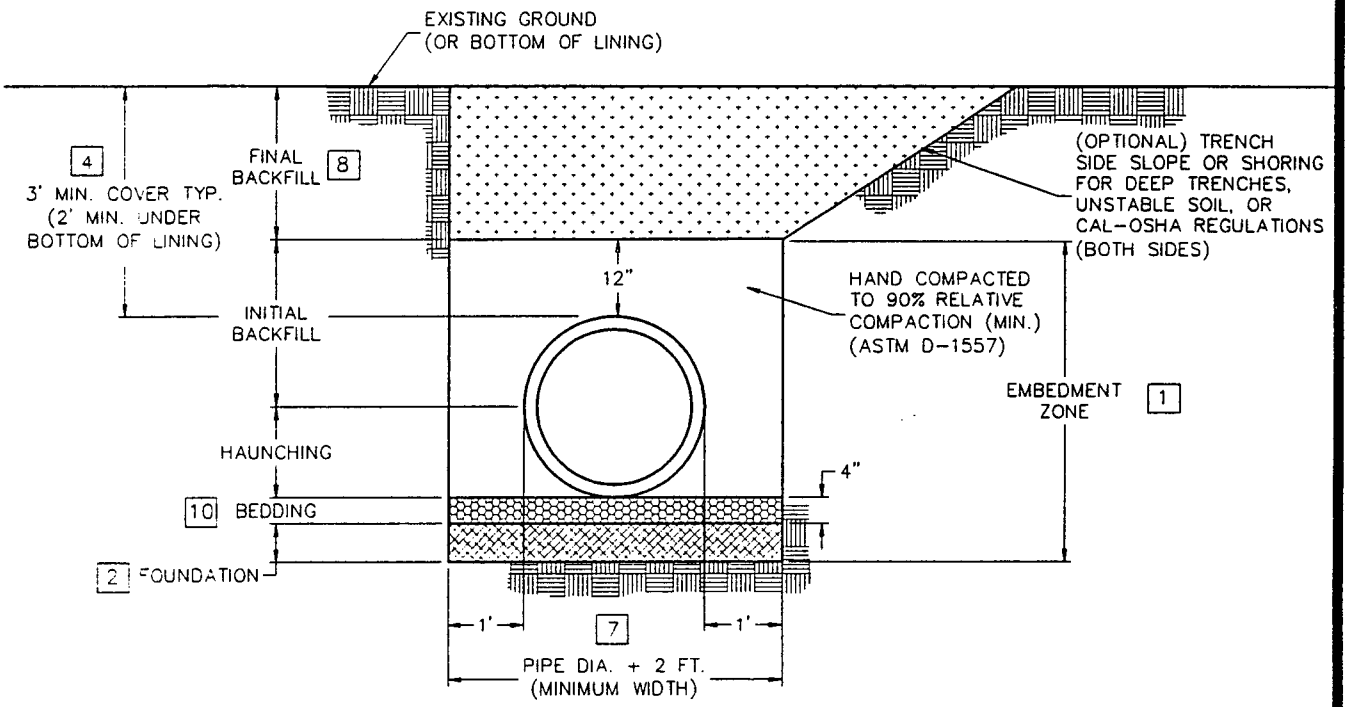



SECTION THROUGH TRENCH

NOTES:

A. ALL COMPACTION TO BE DONE WITH 8" LAYERS (MAXIMUM) TO 90% RELATIVE COMPACTION (MINIMUM) (ASTM D-1557)
B. FINAL BACKFILL TO BE SUITABLE NATIVE MATERIAL
C. SEE SHEETS 3&4 FOR ADDITIONAL CONSTRUCTION NOTES

TURLOCK IRRIGATION DISTRICT

IRRIGATION
CONSTRUCTION STANDARDS

SAW-CUT LINING
CONSTRUCTION

SHEET 2 OF 4

CS 148

PAGE

CONSTRUCTION NOTES:

1. COMPACTED EARTHFILL IN THE EMBEDMENT ZONE SHALL MEET 90% MINIMUM DENSITY (ASTM D-1557) AND BE ACCOMPLISHED BY MANUALLY DIRECTED COMPACTORS TO A MINIMUM DEPTH OF 12 INCHES OVER TOP OF PIPE. THE MAXIMUM LAYER THICKNESS SHALL BE 8 INCHES BEFORE COMPACTION. (SEE SHEET 2) HEAVY COMPACTION EQUIPMENT SHALL NOT BE OPERATED WITHIN 2 FEET OF ANY STRUCTURE.

2. ALL STRUCTURE SUBGRADES ARE TO BE INSPECTED BY THE TID ENGINEERING DEPARTMENT REPRESENTATIVE PRIOR TO CONCRETE POUR OR BACKFILL AND SHALL MEET 90% MINIMUM DENSITY.

3. EARTHFILL SHALL BE SELECT NATIVE MATERIAL CONTAINING NO MATERIALS OVER 3 INCHES IN DIAMETER OR LENGTH, AND BE COMPACTED AGAINST UNDISTURBED EARTH. FILL MATERIALS SHALL CONTAIN NO SOD, BRUSH, ROOTS, OR OTHER ORGANIC OR UNSUITABLE MATERIAL AS DETERMINED BY THE TID ENGINEERING DEPARTMENT REPRESENTATIVE.

4. THE PIPELINE SHALL BE INSTALLED ACCORDING TO MANUFACTURERS INSTRUCTIONS AND SPECIFICATIONS. MINIMUM DEPTH OF COVER SHALL BE 36 INCHES WITHIN TID CANAL BANKS AND RIGHT-OF-WAYS EXCEPT UNDER CHANNEL BOTTOMS WHERE THE MINIMUM COVER SHALL BE 24 INCHES. PIPELINE CASING, IF USED, SHALL CONFORM TO TID STANDARD ES110.

5. TID REQUIRED INSPECTIONS AND COMPACTION TESTS SHALL BE AT APPLICANT'S SOLE EXPENSE. ANY RETEST SHALL BE PAID BY THE APPLICANT.

6. DEWATERING DUE TO HIGH GROUNDWATER MAY BE REQUIRED. SHOULD GROUNDWATER BE ENCOUNTERED, THE APPLICANT SHALL CONTACT THE TID ENGINEERING DEPARTMENT REPRESENTATIVE FOR APPROVAL OF DEWATERING METHODS AND BEFORE COMMENCING BACKFILL OPERATIONS.

7. TRENCH WIDTHS SHALL BE AS SHOWN UNLESS THE PIPELINE SIZE IS 4 INCHES OR SMALLER-WHERE THE TRENCH WIDTH SHALL HAVE A MINIMUM WIDTH OF 12 INCHES.

8. ALL FINAL BACKFILLING SHALL HAVE MINIMUM 90% RELATIVE COMPACTION UNLESS OTHER LOCAL AGENCY STANDARDS DICTATE OTHERWISE.

9. THE ELEVATION OF THE TOP OF LINING IS TO BE SET BY THE TID SURVEY DEPARTMENT PRIOR TO THE START OF CONSTRUCTION.

10. BEDDING SHALL BE REQUIRED FOR REINFORCED CONCRETE PIPE INSTALLATIONS. BEDDING SHALL BE MINIMUM 4 INCHES DEEP OR AS SPECIFIED BY THE TID ENGINEERING DEPARTMENT REPRESENTATIVE. WHEN BEDDING IS REQUIRED A CLAY PLUG SHALL BE CONSTRUCTED UPSTREAM OF EACH MANHOLE OR AT 400 FOOT INTERVALS. THE CLAY PLUG SHALL HAVE A MINIMUM 12 INCH WIDTH AND EXTEND A MINIMUM OF 12 INCHES INTO UNDISTURBED TRENCH WALLS, TRENCH BOTTOM, AND ABOVE TOP OF PIPE. BEDDING SHALL MEET 90% MINIMUM DENSITY AND CONFORM TO THE SPECIFICATIONS BELOW. SOIL TYPES SHALL BE AS DETERMINED BY THE TID ENGINEERING DEPARTMENT REPRESENTATIVE. OTHER BEDDING MATERIALS MAY BE USED WITH PRIOR APPROVAL BY THE TID ENGINEERING DEPARTMENT REPRESENTATIVE.
   A. ON SANDY SOIL
      BEDDING:
      1 1/2 INCH MAX. AGGREGATE-CLASS 2
   B. ON CLAY SOIL
      BEDDING:
      1 1/2 INCH MAX. AGGREGATE-CLASS 2
      HAUNCHING:
      SAND SHALL BE PLACED IN MAX. 8 INCH LIFTS IN HAUNCHING ZONE

11. APPLICANT SHALL INSTALL NEW CONCRETE LINING AS PER TID STANDARDS AND ATTACHED DETAILS. A MINIMUM OF 24 INCHES ON EACH SIDE OF THE TRENCH AREA (OR AS DIRECTED BY THE TID ENGINEERING DEPARTMENT REPRESENTATIVE) SHALL BE SAWCUT AND REMOVED. SOIL IN THE TRENCH AREA SHALL BE COMPACTED TO 90% AND MOISTENED PRIOR TO PLACEMENT OF NEW CONCRETE.

12. CONCRETE LINING SHALL BE POURED IN PLACE REINFORCED* CONCRETE WITH TYPE II PORTLAND CEMENT, A MAXIMUM AGGREGATE SIZE OF 1/2 INCH, AND MAXIMUM SLUMP OF 4 INCHES. CONCRETE 28 DAY COMPRESSIVE STRENGTH TO BE A MINIMUM OF 3000psi. CONCRETE SHALL BE PREVENTED FROM DRYING FOR A CURING PERIOD OF AT LEAST 7 DAYS AFTER IT IS PLACED. EXPOSED SURFACES SHALL BE KEPT CONTINUOUSLY MOIST FOR THE ENTIRE PERIOD OR A CURING COMPOUND ("MEADOWS 1100 CURING COMPOUND" OR EQUIVALENT) MAY BE APPLIED. *REINFORCEMENT SHALL BE "FIBERMESH MD" AT 1.25 POUNDS PER CUBIC YARD OF CONCRETE (OR PRE-APPROVED EQUIVALENT).

13. UTILITY MARKERS AND POSTS SHALL BE INSTALLED ACCORDING TO TID STANDARD ES110

TURLOCK IRRIGATION DISTRICT (TID) NOTES:

1. THESE DRAWINGS CONSTITUTE TID's APPROVAL AS TO THE ENGINEERING ASPECTS ONLY AND DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY ASPECT HEREOF OR THE INTERFERENCE WITH ANY PROPERTY, EQUIPMENT, OR INTEREST OF THE TID. NO CONSTRUCTION ON, OR INTERFERENCE WITH, TID PROPERTY SHALL OCCUR UNTIL THE TID HAS APPROVED AN "APPLICATION FOR PIPELINE INSTALLATION".

2. ALL CONSTRUCTION WORKS COMPLETED BY APPLICANT SHALL BE PERFORMED BY A LICENSED CONTRACTOR (STATE OF CALIFORNIA) TO BE APPROVED BY THE TID ENGINEERING DEPARTMENT REPRESENTATIVE PRIOR TO COMMENCING WORK. THE APPLICANT'S CONTRACTOR SHALL BE REQUIRED TO POST A PERFORMANCE BOND.

3. ALL CONSTRUCTION WITHIN THE TID RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH THE ATTACHED DRAWINGS AND THE CURRENT EDITION OF TID CONSTRUCTION STANDARDS.

4. CONSTRUCTION WITHIN THE TID RIGHT-OF-WAY WILL NOT BE ALLOWED DURING THE IRRIGATION SEASON (GENERALLY MARCH 1 TO NOVEMBER 1).

5. A PROJECT SCHEDULE SHALL BE APPROVED BY THE TID WATER DISTRIBUTION DEPARTMENT MANAGER PRIOR TO COMMENCING WORK.

6. WHERE THE PLANS OR SPECIFICATIONS DESCRIBE PORTIONS OF THE WORK IN GENERAL TERMS, BUT NOT IN COMPLETE DETAIL, IT IS UNDERSTOOD THAT ONLY THE BEST GENERAL PRACTICE IS TO PREVAIL AND THAT ONLY MATERIALS AND WORKMANSHIP OF THE FIRST QUALITY ARE TO BE USED.

7. APPLICANT AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

8. CAL-OSHA SAFETY REQUIREMENTS SHALL BE IN EFFECT DURING ALL CONSTRUCTION. SPECIAL SAFETY PRECAUTIONS SHALL BE TAKEN WHEN WORKING IN THE VICINITY OF GAS, OIL, OR ELECTRICAL LINES.

9. APPLICANT SHALL OBTAIN A DIG ALERT IDENTIFICATION NUMBER AT LEAST TWO WORKING DAYS BEFORE DIGGING UNDERGROUND.

10. ANY DAMAGES TO TID FACILITIES DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED PER THE TID CONSTRUCTION STANDARDS AT THE SOLE COST OF THE APPLICANT.

11. THE APPLICANT GUARANTEES ALL CONSTRUCTED IRRIGATION WORKS AND IMPROVEMENTS WITHIN THE TID RIGHT-OF-WAY FOR A PERIOD OF ONE YEAR FOLLOWING COMPLETION OF CONSTRUCTION AND ACCEPTANCE BY TID. THE GUARANTEE INCLUDES REPAIR BY THE APPLICANT OR PAYMENT BY THE APPLICANT FOR REPAIRS DONE BY TID. SEE THE ATTACHED "ONE YEAR GUARANTEE" FORM FOR FURTHER DETAILS.

12. THE TID WILL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES TO, OR USES OF, THESE PLANS. ALL CHANGES TO THE PLANS MUST BE OBTAINED IN WRITING FROM THE TID ENGINEERING DEPARTMENT REPRESENTATIVE.

13. THE APPLICANT SHALL BE REQUIRED TO HAVE A PRE-CONSTRUCTION CONFERENCE WITH THE TID ENGINEERING DEPARTMENT REPRESENTATIVE PRIOR TO STARTING ANY WORK WITHIN THE TID RIGHT-OF-WAY.

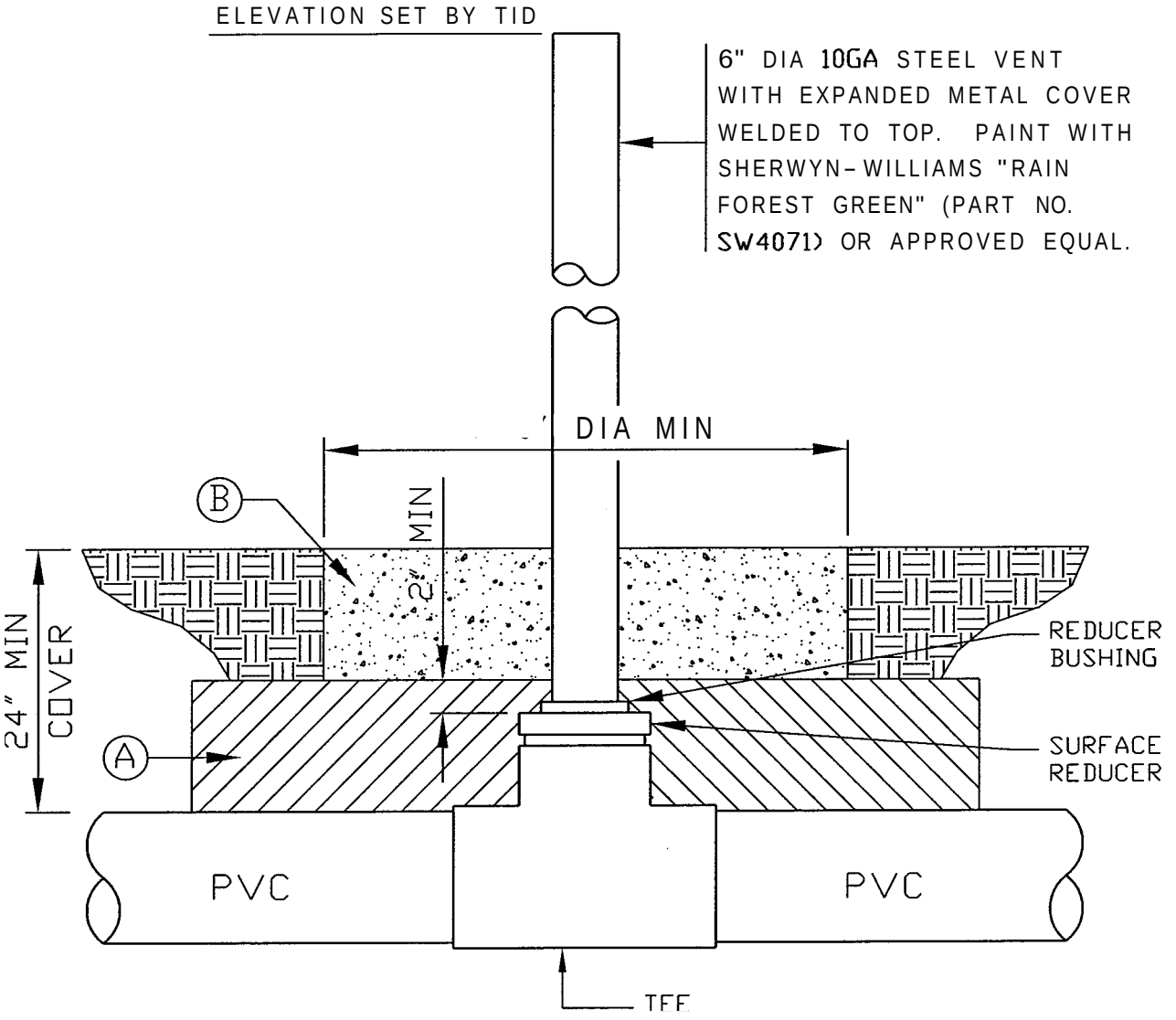
14. INSPECTIONS CONCERNING VARIOUS STAGES OF WORK WILL BE REQUIRED, AS STATED IN THE ATTACHED SPECIFICATIONS, AT THE APPLICANT'S EXPENSE. THEY INCLUDE:
    A. SOIL COMPACTION TESTING
    B. INSPECTION OF FOUNDATIONS, FORMS, AND REINFORCING STEEL PRIOR TO PLACING CONCRETE
    C. POST CONSTRUCTION ACCEPTANCE.

15. CONTACT THE TURLOCK IRRIGATION DISTRICT ENGINEERING DEPARTMENT AT LEAST FIVE (5) WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION, AT LEAST ONE (1) WORKING DAY PRIOR TO POURING CONCRETE, AND WITHIN FIVE (5) WORKING DAYS AFTER SUCH WORK IS COMPLETED. WORK WITHIN THE TID RIGHT-OF-WAY SHALL PROCEED IN A CONTINUOUS MANNER ONCE STARTED. THE TID ENGINEERING DEPARTMENT SHALL BE NOTIFIED OF ANY WORK STOPPAGES. WHENEVER WORK IS TO RESTART, THE TID ENGINEERING DEPARTMENT SHALL REQUIRE AN ADDITIONAL TWO (2) WORKING DAY NOTICE. THE TID ENGINEERING DEPARTMENT SHALL ALSO BE CONTACTED A MINIMUM OF TWO (2) WORKING DAYS PRIOR TO ALL CONSTRUCTION SCHEDULED ON A HOLIDAY OR WEEKEND.

16. APPLICANT MUST NOTIFY TID UPON COMPLETION OF CONSTRUCTION IN ORDER FOR THE TID ENGINEERING REPRESENTATIVE TO MAKE A FINAL INSPECTION FOR ACCEPTANCE OF THE IMPROVEMENTS. ANY WORK WITHIN THE TID RIGHT-OF-WAY SHALL NOT BE DEEMED COMPLETE UNTIL THE TID ENGINEERING DEPARTMENT HAS BEEN PROVIDED WITH A SET OF AS-BUILT PLANS.

APPROVED BY TURLOCK IRRIGATION DISTRICT FOR IRRIGATION FACILITIES ONLY.

| | |
|---|---|
| TURLOCK IRRIGATION DISTRICT | SAW-CUT LINING CONSTRUCTION |
| IRRIGATION CONSTRUCTION STANDARDS | SHEET 4 OF 4 — CS 148 — PAGE |




(A) MINIMUM 6'-0 DIAMETER COMPACTED EARTH FILL (MIN. 95% RELATIVE COMPACTION).

(B) POUR MINIMUM OF 1-CUBIC YARD CONCRETE AGAINST NATIVE MATERIAL.

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

| EV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| -- | STDS. COM. APPROVAL | | | | | | |
| -- | INNITIAL ISSUE | AWV | | | | | 12/03 |

# AIR VENT FOR PVC PIPE

SHEET 1 OF 1

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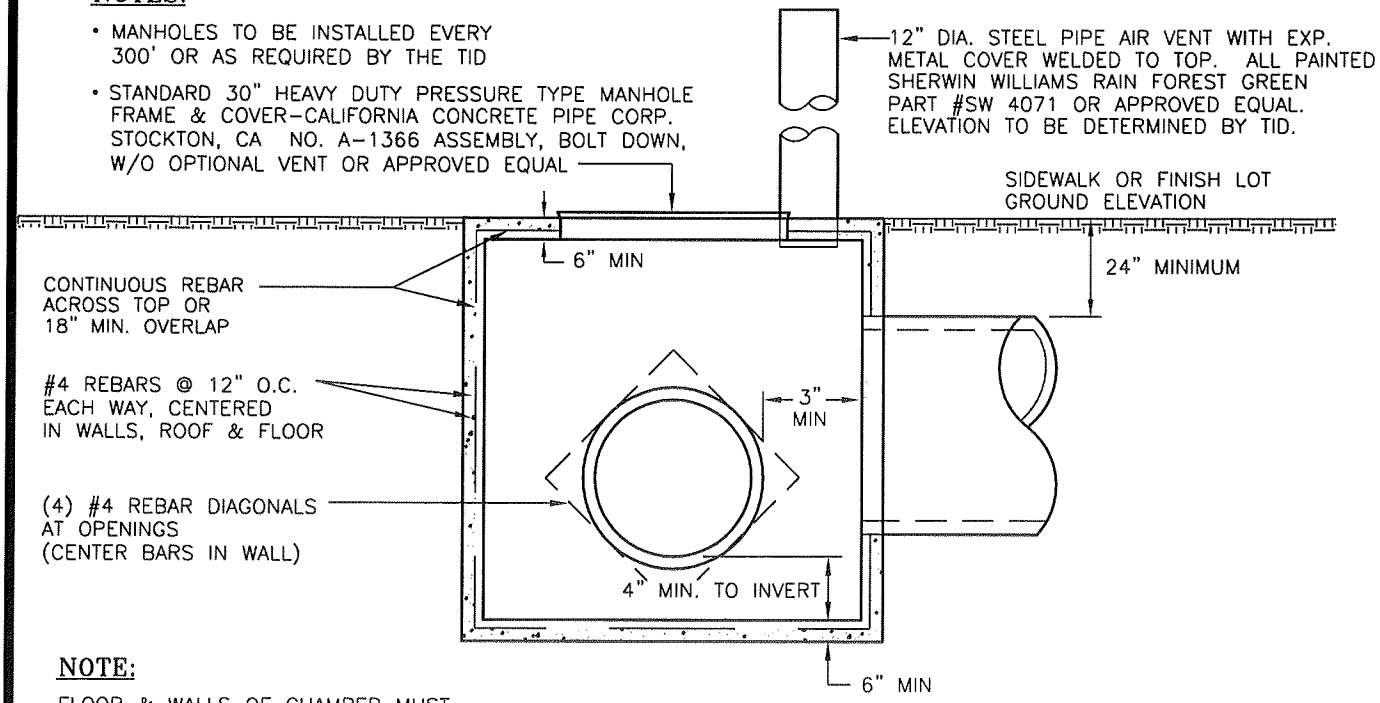
PAGE

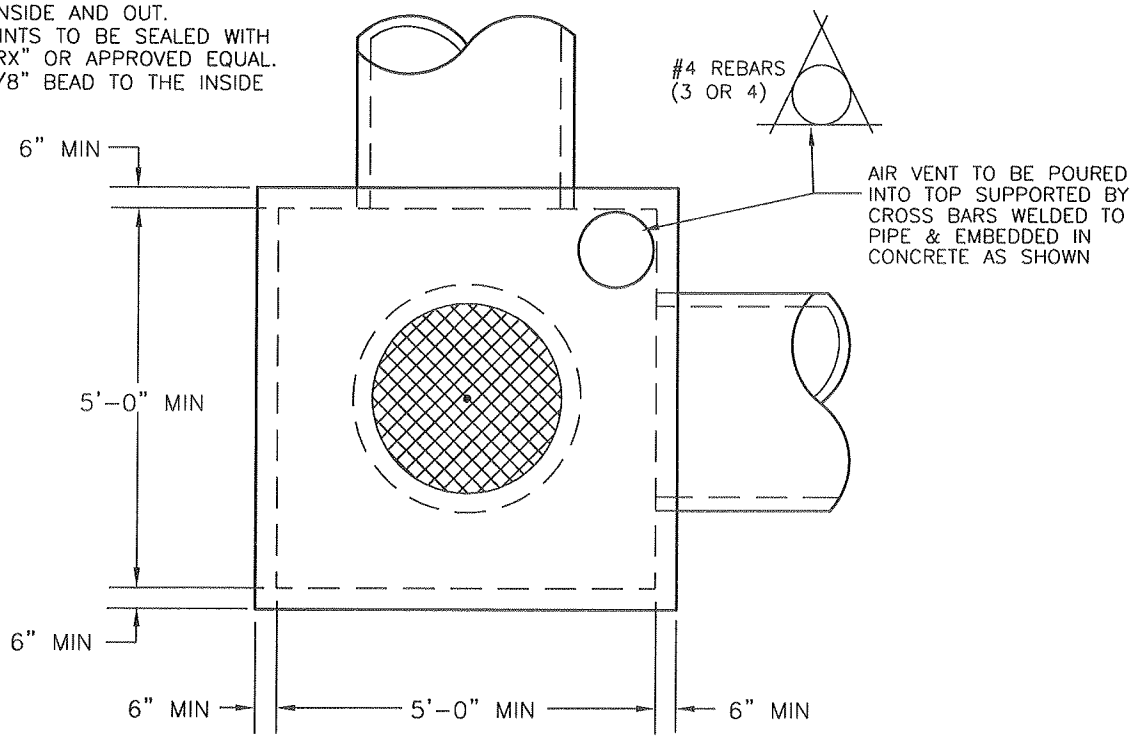
## NOTES:

- MANHOLES TO BE INSTALLED EVERY 300' OR AS REQUIRED BY THE TID
- STANDARD 30" HEAVY DUTY PRESSURE TYPE MANHOLE FRAME & COVER–CALIFORNIA CONCRETE PIPE CORP. STOCKTON, CA NO. A–1366 ASSEMBLY, BOLT DOWN, W/O OPTIONAL VENT OR APPROVED EQUAL




## NOTE:

FLOOR & WALLS OF CHAMBER MUST BE FORMED INSIDE AND OUT. ANY COLD JOINTS TO BE SEALED WITH "WATERSTOP RX" OR APPROVED EQUAL. PROVIDE A 3/8" BEAD TO THE INSIDE OF REBAR.




TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

| REV | DESCRIPTION | INIT | CHK | RV'D | APP | APP | DATE |
|---|---|---|---|---|---|---|---|
| D | CHANGE MANHOLE SIZE TO 30" | | | AWV | | | 7/10 |
| C | NEW MANHOLE SPECS. | | | | | | 01/25/00 |
| B | 4" MINIMUM INV. DIMENSION | | | | BDH | | |
| A | CHANGE AIRWAY SIZE | | | | BDH | | |
| -- | INITIAL ISSUE | JAS | BDH | | | REW | 11/12/81 |

# PRESSURE BOX AND MANHOLE ACCESS

SHEET 1 OF 1

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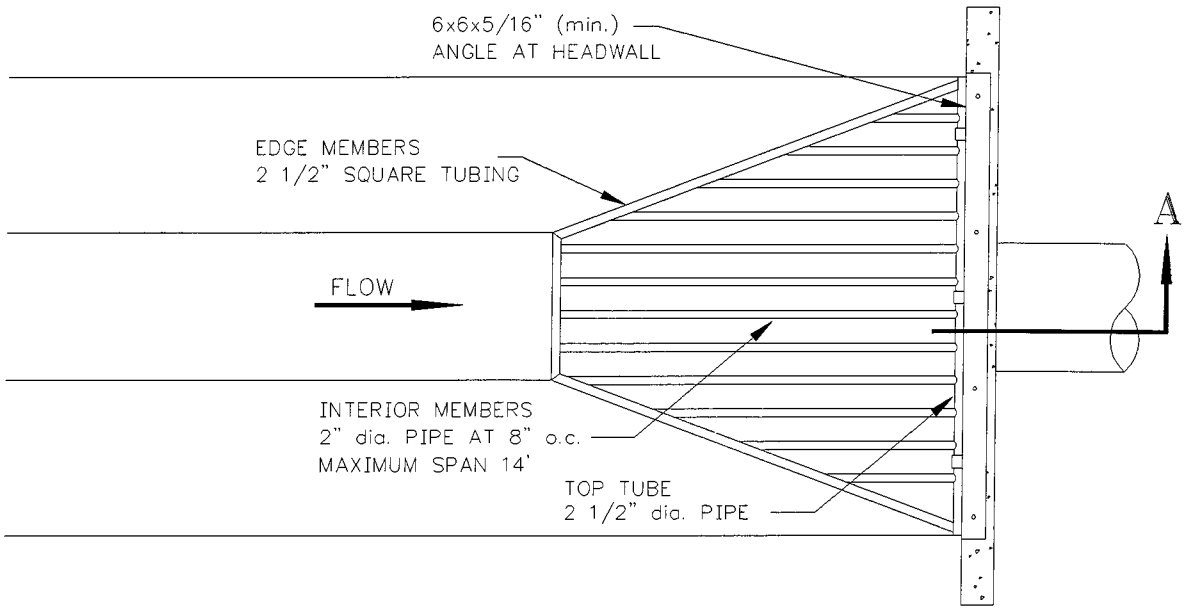
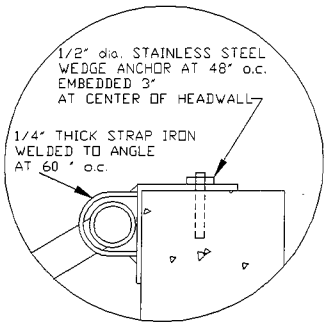
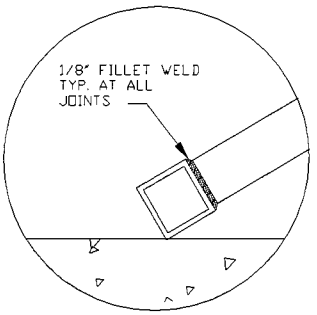


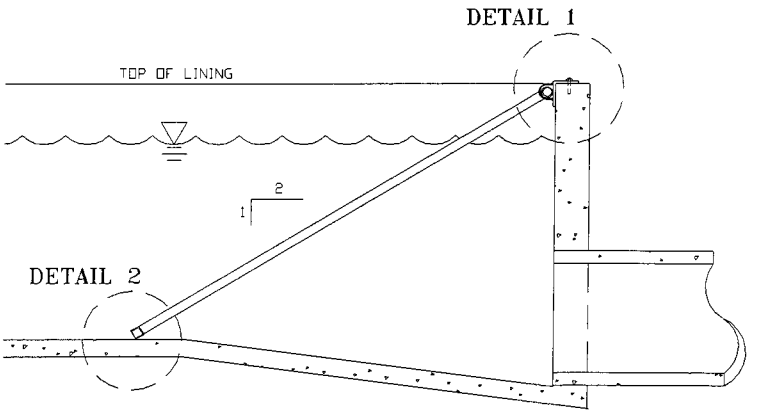

PLAN VIEW




DETAIL 1




DETAIL 2




SECTION A

NOTES:
1. GRATE TO BE MADE OF UNTREATED STEEL
2. STEEL PIPE TO BE ASTM A500 GRADE B
3. SAFETY GRATE SHALL BE INSTALLED IN NON-RURAL AREAS

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

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# SAFETY GRATE FOR SIPHON

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## PLASTIC PIPELINES

1) PLASTIC PIPELINES MAY BE INSTALLED IN AGRICULTURAL AREAS. THE PIPELINES SHALL BE 100 PSI PIP (PLASTIC IRRIGATION PIPE) WITH ELASTOMERIC RING SLIP COUPLINGS.

2) THE PIPE MATERIAL SHALL CONFORM TO ASTM D1784.

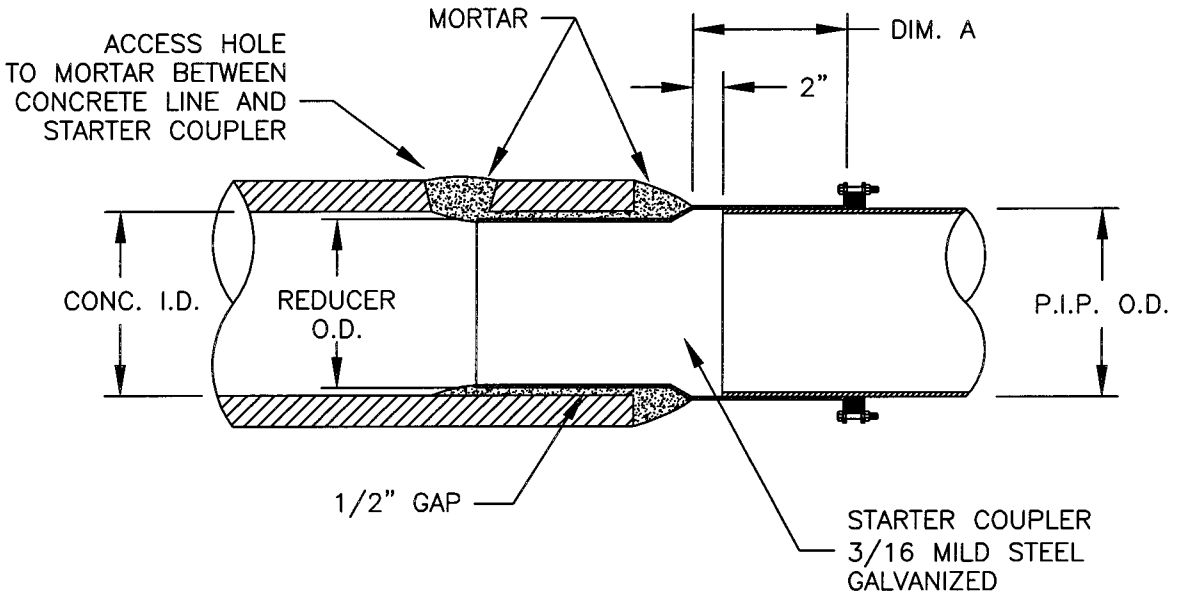
3) THE PIPELINE DESIGN SHALL CONFORM TO NRCS STANDARD 430DD AND ASAE STANDARD S376.2.

4) MINIMUM DEPTH OF COVER SHALL BE 30 INCHES.

5) REFER TO CONSTRUCTION STANDARD CS 104C, PAGE 2 WHEN CONNECTING PLASTIC PIPELINES TO CANAL SIDEGATES.

6) ALL PLASTIC CONNECTIONS TO CONCRETE PIPES SHALL BE COMPLETED USING THE FOLLOWING DETAIL IF THE LENGTH OF PIPE BEING REPLACED EXCEEDS 25 FEET. REPLACE CONCRETE PIPE WITH SAME SIZE P.I.P. PIPE. STARTER COUPLER MUST BE CUSTOM ORDERED TO FIT EACH SPECIFIC APPLICATION.

7) IF THE LENGTH OF CONCRETE PIPE BEING REPLACED IS LESS THAN 25 FEET, USE STARTER COUPLER NO. 2006, M & M STARTER COUPLERS (GALVANIZED) FOR TRANSITION.

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|---|---|---|---|---|---|---|---|
| -- | STDS. COM. APPROVAL | CDB | | | EB | 8/99 | SMALL DIAMETER PRESSURE PIPE |
| -- | INITIAL ISSUE | | | | BJ2 | 8/99 | SHEET 1 OF 1 — CS 158 — PAGE |
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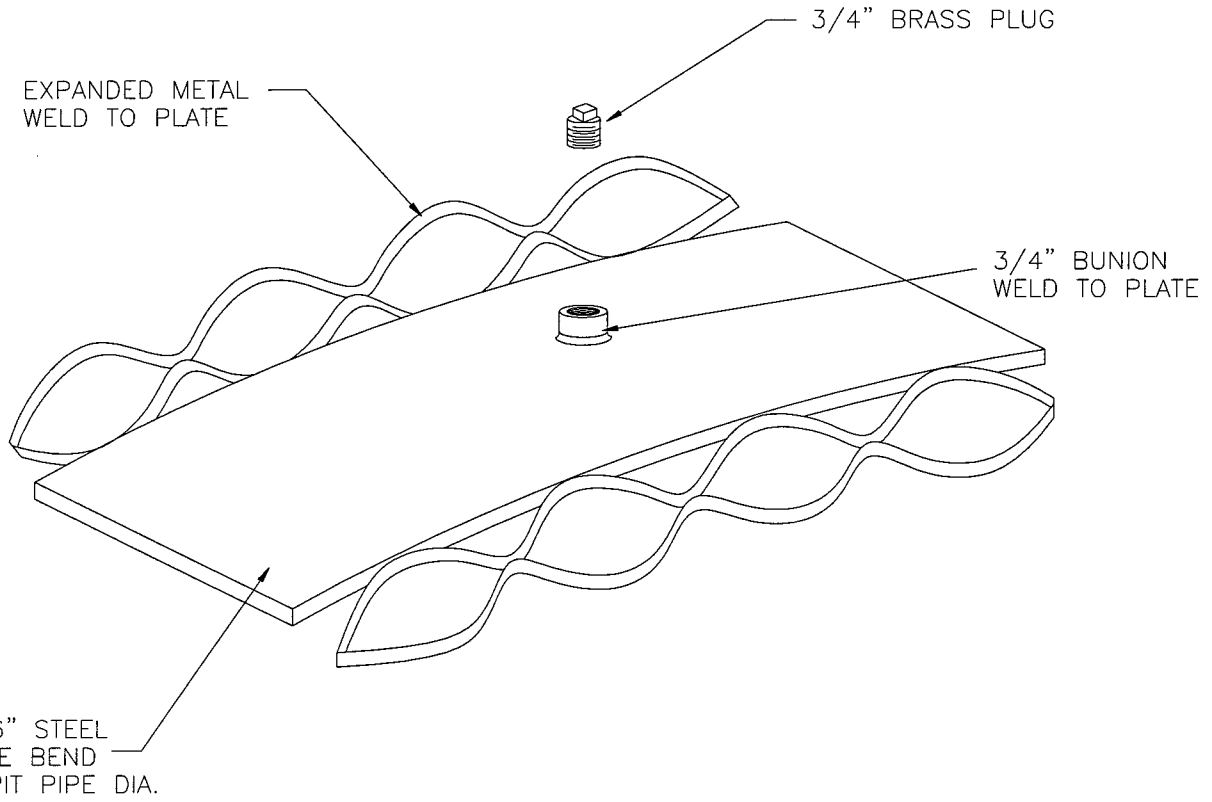


# TURLOCK IRRIGATION DISTRICT

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## FLOW METER TAP FOR CONCRETE PIPE

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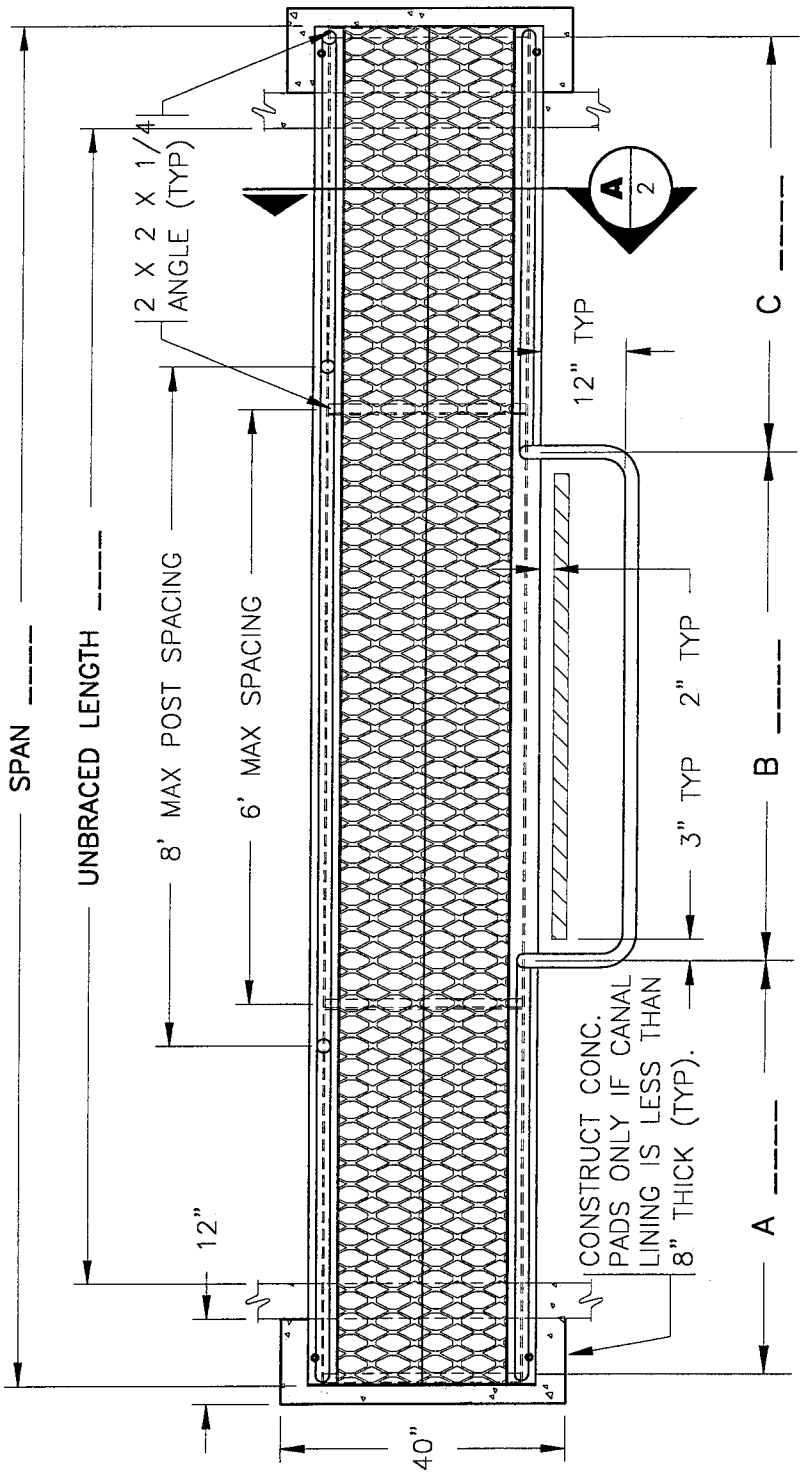


**SINGLE BOARDBAY WALKWAY**

N.T.S.

QTY REQD: _____

LOCATION: _____

| TURLOCK IRRIGATION DISTRICT | | | | | | | IRRIGATION CONSTRUCTION STANDARDS | |
|---|---|---|---|---|---|---|---|---|
| | STDS. COM. APPROVAL | GKT | | | LR. | CPB | CANAL WALKWAY AND HANDRAIL | |
| -- | INITIAL ISSUE | | | | | 9/1/06 | SHEET 1 OF 4 | CS 162 |
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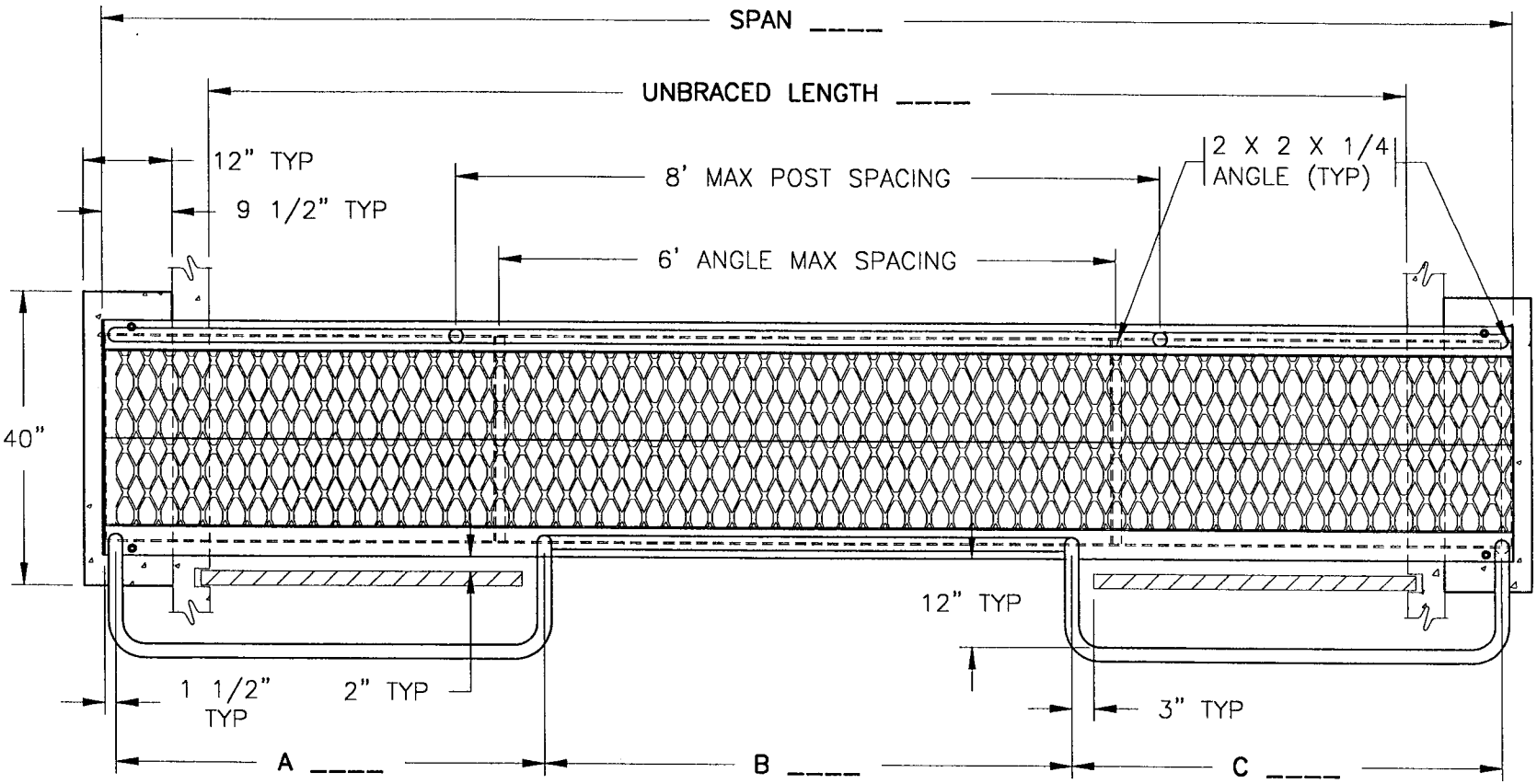
CANAL WALKWAY
AND HANDRAIL




**DUAL BOARDBAY WALKWAY**

N.T.S.

QTY REQD:

IRRIGATION
CONSTRUCTION STANDARDS

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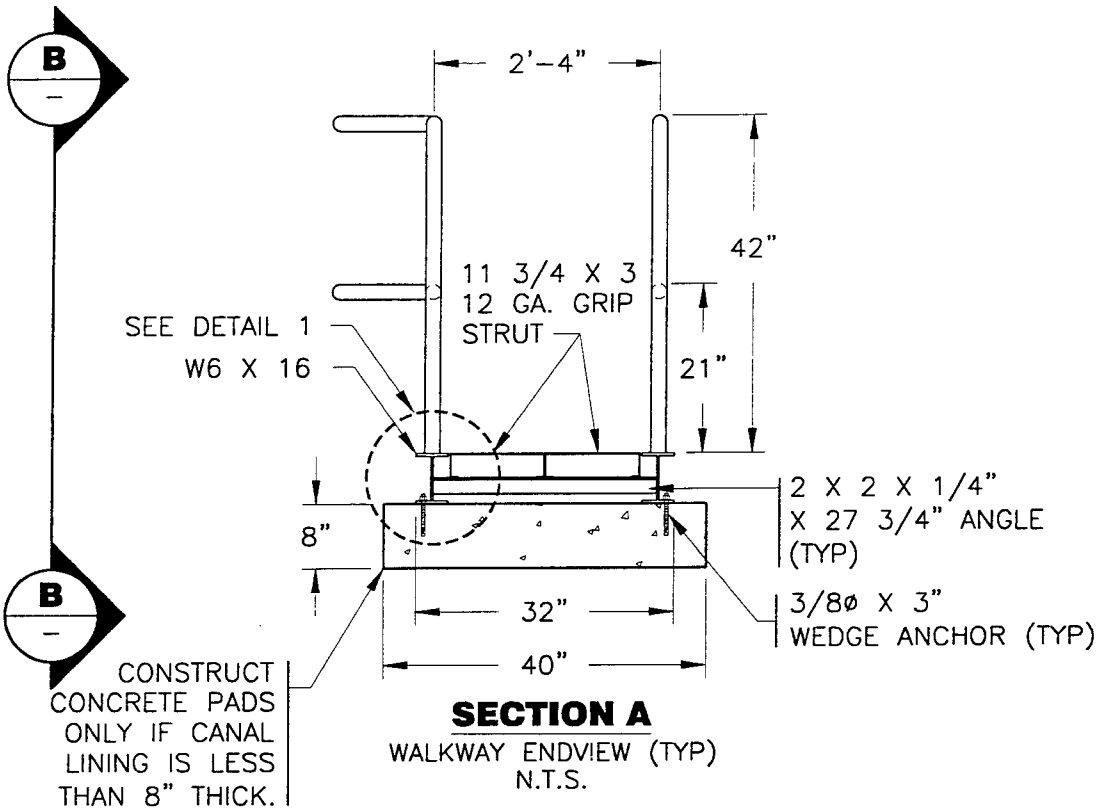
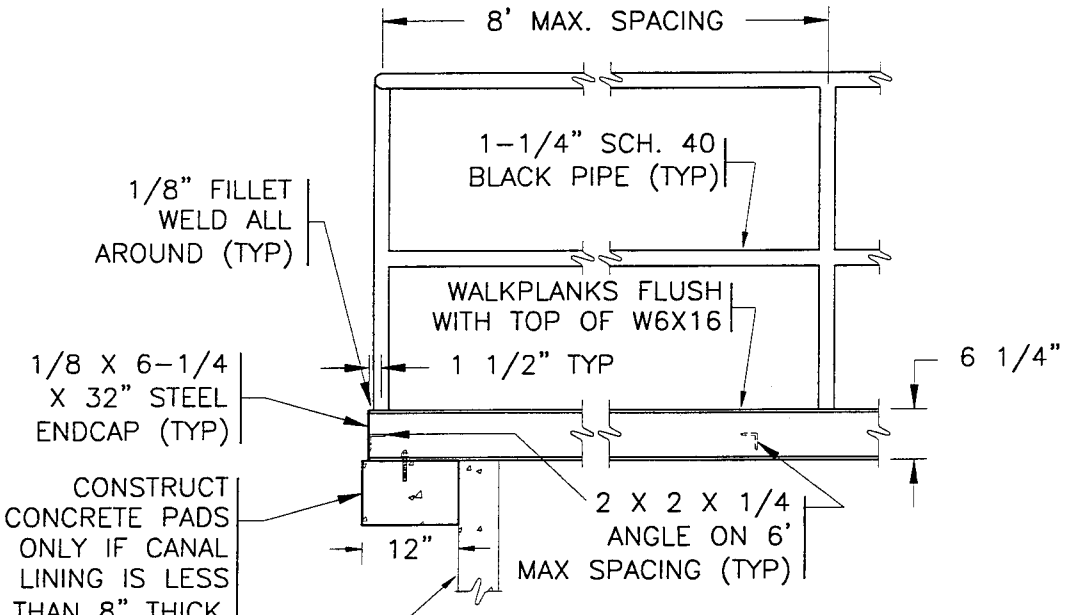



**SECTION A**

WALKWAY ENDVIEW (TYP)
N.T.S.




**SECTION B-B**

WALKWAY ELEVATION VIEW (TYP)
N.T.S.

CANAL WALKWAY
AND HANDRAIL

IRRIGATION
CONSTRUCTION STANDARDS

SHEET
3 OF 4

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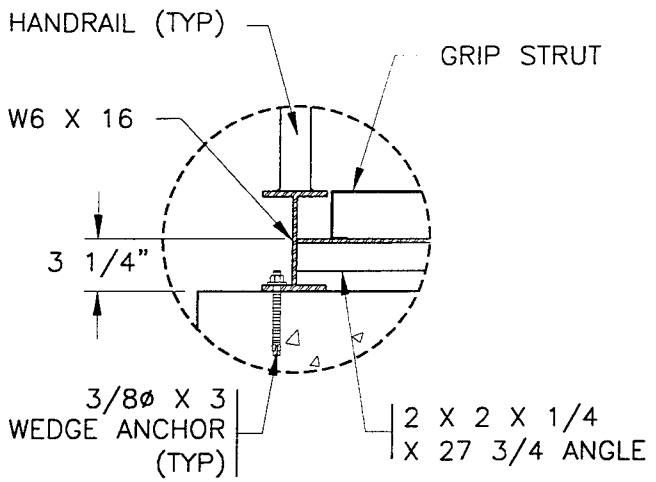



**DETAIL 1**
N.T.S.

| CONCRETE PADS REQUIRED |
|---|
| ☐ YES |
| ☐ NO |

CONCRETE PADS REQUIRED IF CANAL LINING IS LESS THAN 8" INCHES THICK.

## CONSTRUCTION NOTES

1) MAXIMUM SPACING OF HANDRAIL VERTICLE POSTS IS 8' MAXIMUM.

2) MAXIMUM SPACING OF 2 X 2 X 1/4 SUPPORT ANGLE IS 6' MAXIMUM.

3) IF CANAL LINING IS LESS THAN 8" THICK, CONCRETE PADS ARE TO BE CONSTRUCTED. SEE PAGE 1 FOR DETAILS. IF CANAL LINING IS MORE THAN 8" THICK, WALKWAY TO SPAN THE WIDTH OF CANAL.

4) REMOVE EXISTING WOODEN WALKPLANKS.

5) INSTALL HANDRAILS AND WALKWAY AS SHOWN.

6) HANDRAIL TUBING TO BE 1 1/4" SCH. 40 BLACK PIPE.

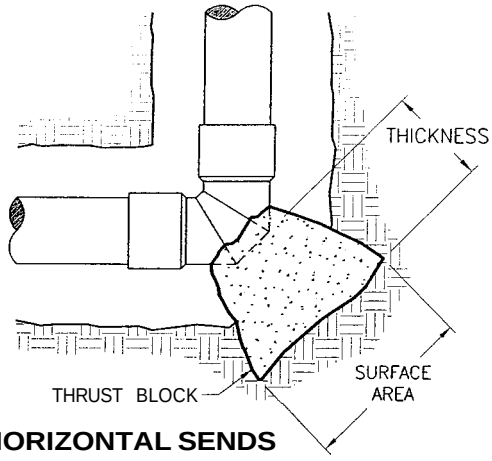
7) GRIP STRUT WALKWAYS ARE "McNICHOLS CO." 12 GA. X 11 3/4 X 3" (5 DIAMOND) GRIP STRUT PANELS. CATALOG #53012.

8) WEDGE ANCHORS ARE TO BE 3/8 DIA. EMBEDDED A MIN. OF 2 1/2" INTO CONCRETE.

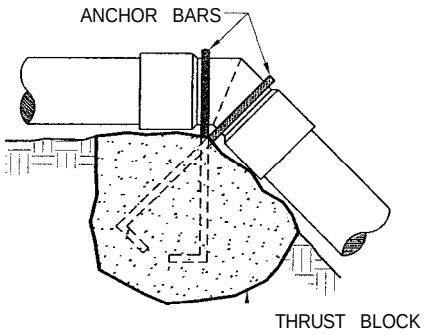
9) HANDRAILS AND WALKWAYS TO BE GALVANIZED.

10) HANDRAILS AND WALKWAYS TO BE FREE OF ANY SHARP EDGES.

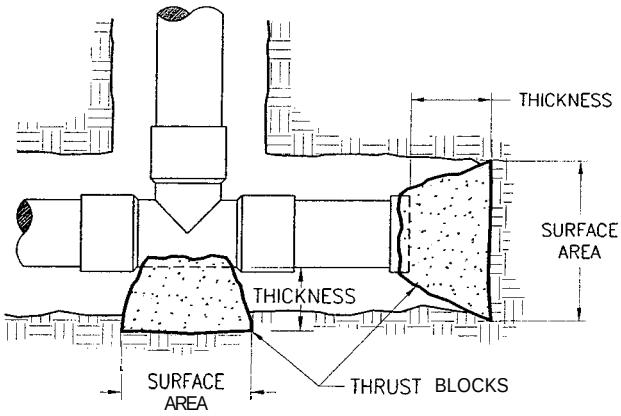
11) MAXIMUM UNBRACED LENGTH FOR WALKWAY IS 22 FEET. IF A LONGER WALKWAY IS REQUIRED, CONTACT CIVIL ENGINEERING.




**HORIZONTAL SENDS**




**VERTICAL SENDS**




**TEES & DEAD ENDS**

| DIAMETER OF PIPE (INCHES) | HORIZONTAL BENDS | | VERTICAL BENDS |
|---|---|---|---|
| | SURFACE AREA (SQ. FT.) | THICKNESS (INCHES) | WEIGHT (LBS) |
| 22.5° BENDS | | | |
| 8 | 1 | 6 | 1000 |
| 10 | 1 | 6 | 1600 |
| 12 | 1.5 | 8 | 2200 |
| 14 | 1.5 | 8 | 3000 |
| 16 | 2 | 12 | 4000 |
| 18 | 2.5 | 12 | 5000 |
| 20 | 3 | 16 | 6200 |
| 45° BENDS | | | |
| 8 | 1 | 8 | 2000 |
| 10 | 1.5 | 12 | 3000 |
| 12 | 2.5 | 14 | 4400 |
| 14 | 3 | 14 | 5900 |
| 16 | 4 | 18 | 7700 |
| 18 | 5 | 18 | 9800 |
| 20 | 6 | 20 | 12000 |
| 90° BENDS | | | |
| 8 | 2 | 12 | 3600 |
| 10 | 3 | 14 | 5600 |
| 12 | 4 | 14 | 8000 |
| 14 | 5.5 | 18 | 10900 |
| 16 | 7 | 18 | 14200 |
| 18 | 9 | 24 | 18000 |
| 20 | 11 | 24 | 22200 |
| TEES & DEAD ENDS | | | |
| 8 | 1.5 | 12 | – |
| 10 | 2 | 14 | – |
| 12 | 3 | 14 | – |
| 14 | 4 | 18 | – |
| 16 | 5 | 18 | – |
| 18 | 6.5 | 24 | – |
| 20 | 8 | 24 | – |

**NOTES:**

THRUST BLOCKS SHALL BE REQUIRED FOR ALL PUMPLINES

ALL VALUES SHOWN ARE FOR A HYDROSTATIC PRESSURE OF 50 PSI AND A SOIL RESISTANCE OF 2000 PSF. TID WILL CONSIDER REDUCTION OF THRUST BLOCK SURFACE AREA UPON SUBMITTAL OF APPROVED SOIL RESISTANT TEST RESULTS GREATER THAN 2000 PSF

ALL THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED SOIL

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

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# THRUST BLOCKS

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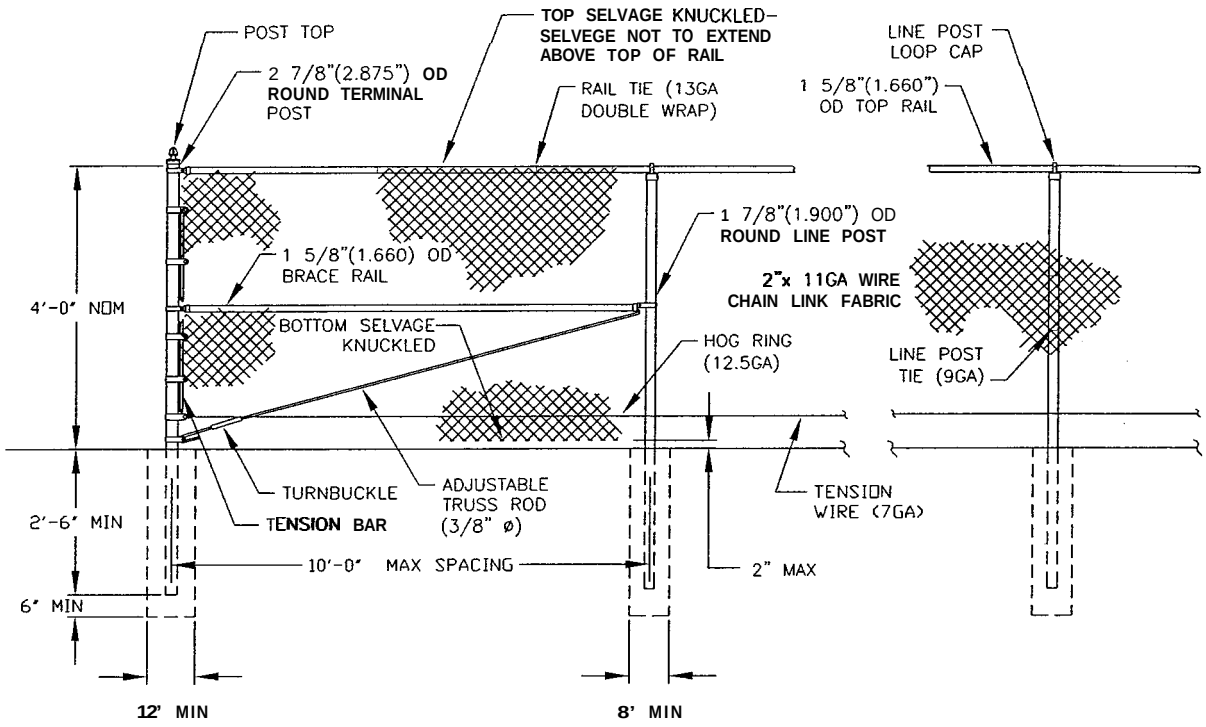
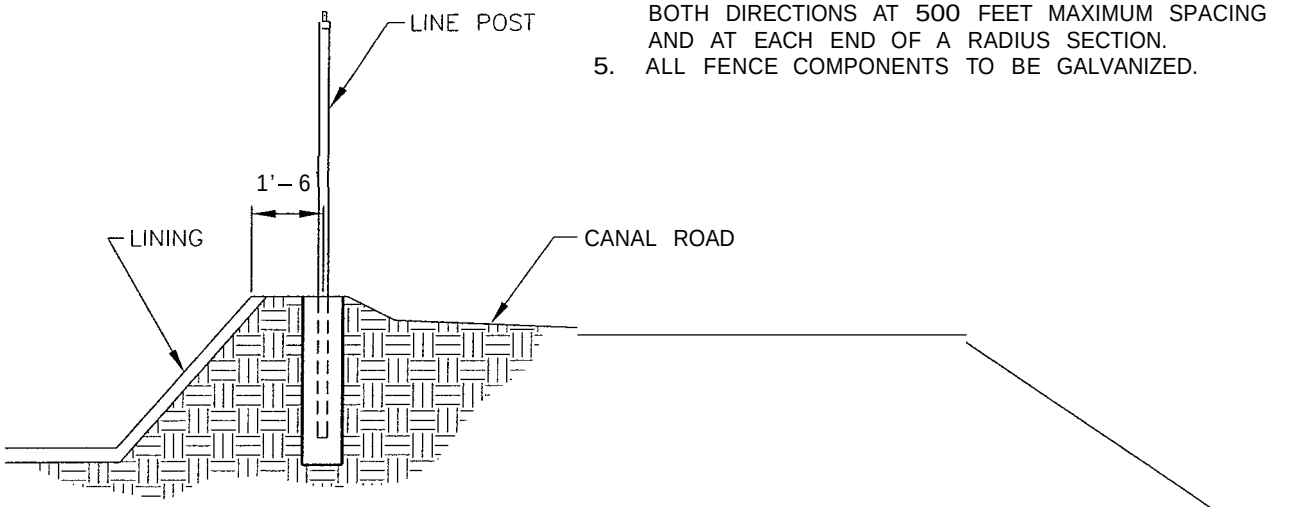



**NOTES:**

1. TERMINAL POST TO BE 2 7/8" X 5.79 LB/FT.
2. LINE POST TO BE I 7/8" X 2.72 LB/FT.
3. RAIL & BRACE TO BE I 5/8" X 2.27 LB/FT.
4. LINE POSTS TO BE BRACED AND TRUSSED IN BOTH DIRECTIONS AT 500 FEET MAXIMUM SPACING AND AT EACH END OF A RADIUS SECTION.
5. ALL FENCE COMPONENTS TO BE GALVANIZED.




CROSS SECTION AT CANAL BANK ROAD

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

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| -- | INITIAL ISSUE | AWV | | | | TBH | 07/04 |

# CANAL FENCE & GATES

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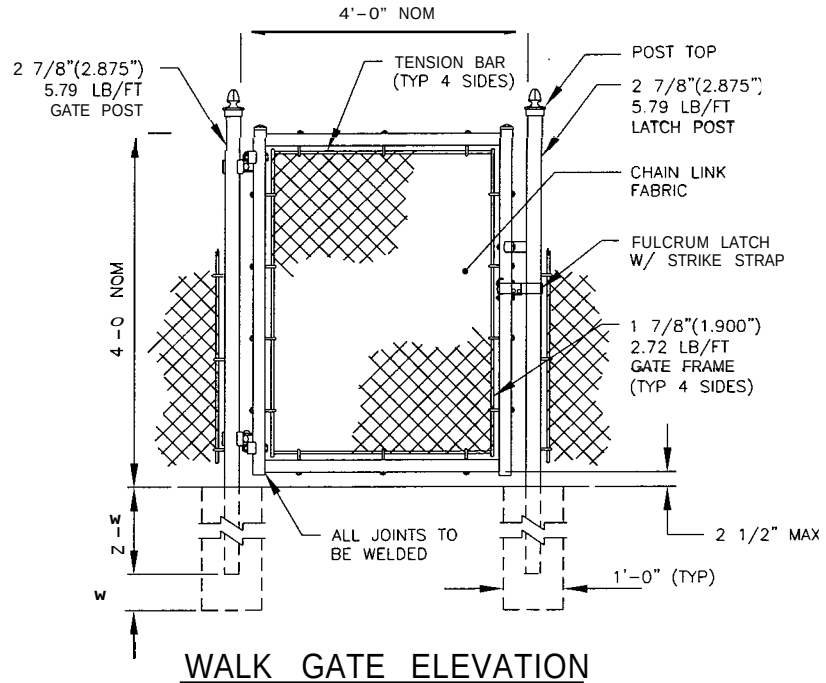
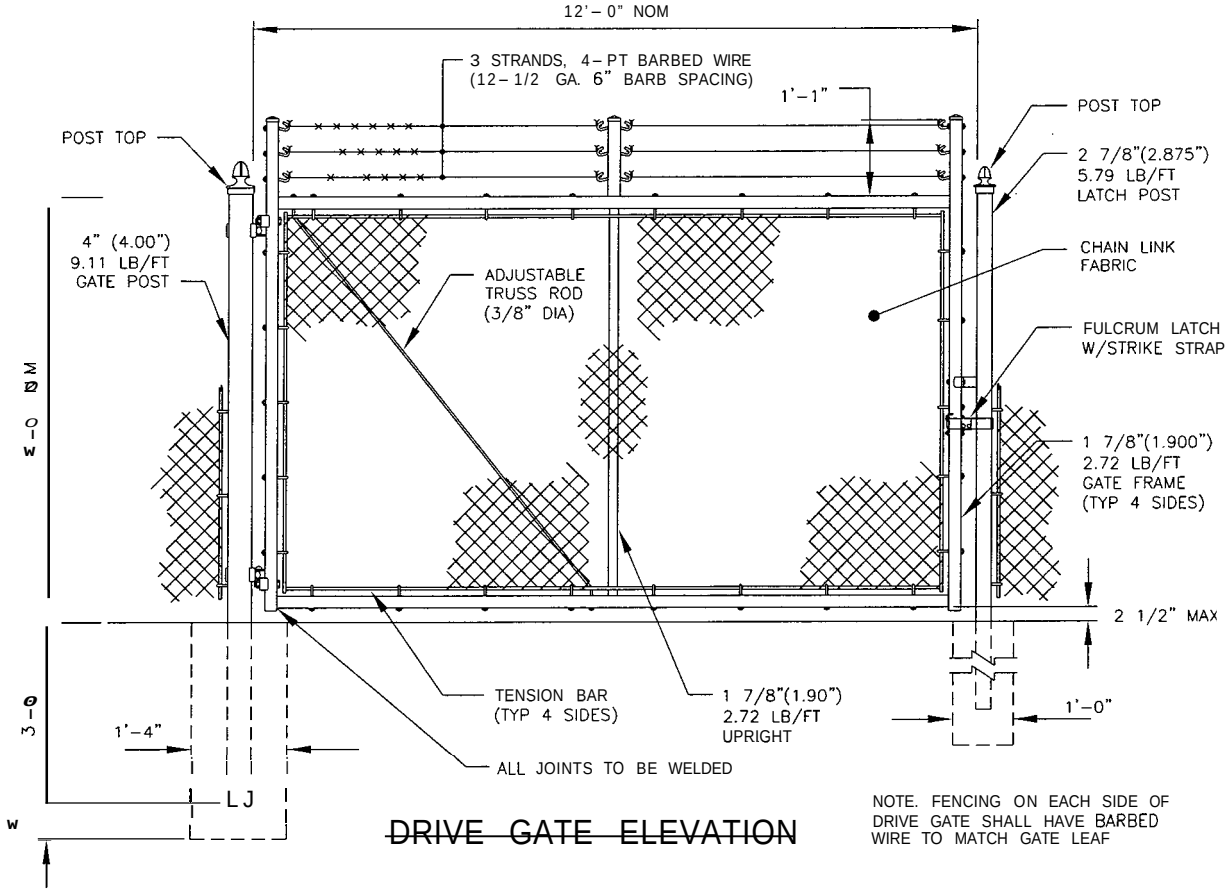



WALK GATE ELEVATION




~~DRIVE GATE ELEVATION~~

NOTE. FENCING ON EACH SIDE OF DRIVE GATE SHALL HAVE BARBED WIRE TO MATCH GATE LEAF

TURLOCK IRRIGATION DISTRICT

IRRIGATION
CONSTRUCTION STANDARDS

# CANAL FENCE & GATES

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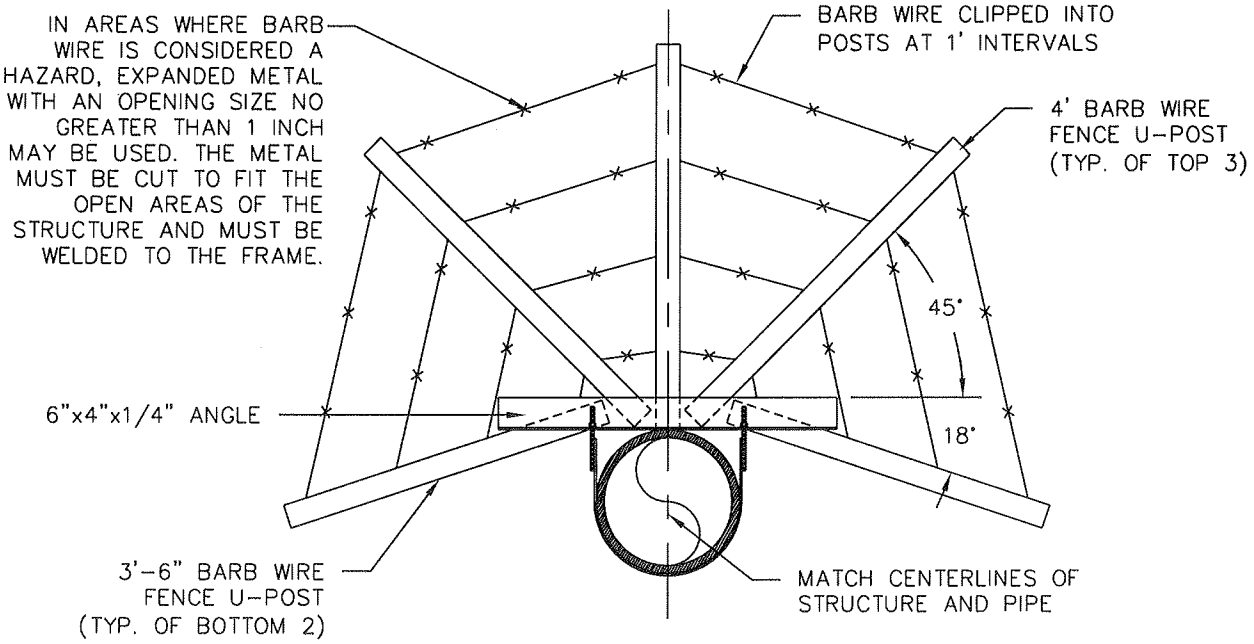
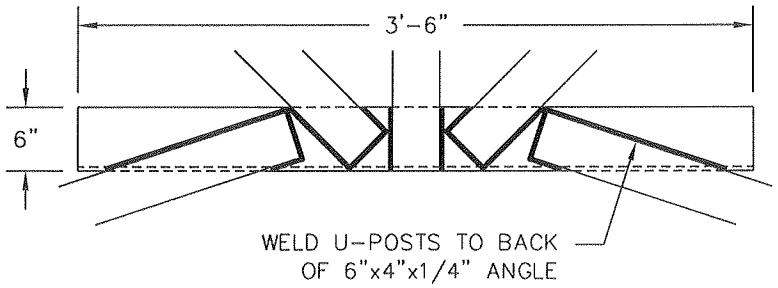
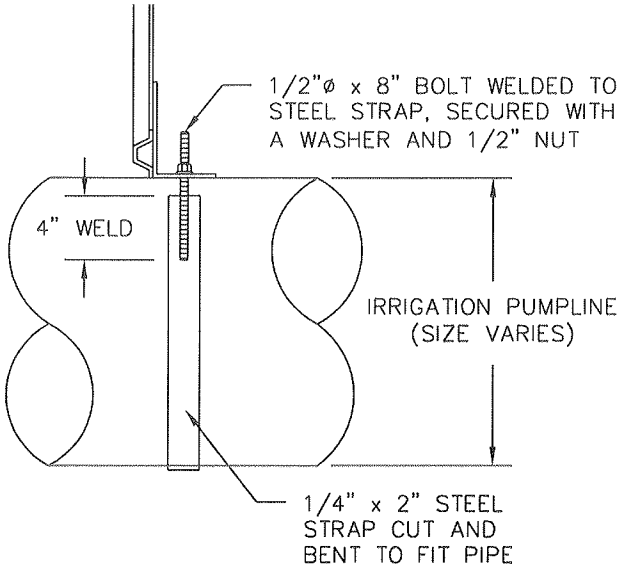
2 ~~PAGE~~ PAG




**NOTES:**

1. ALL COMPONENTS OF STRUCTURE SHALL BE STEEL AND GALVANIZED OR PAINTED
2. APPLY A CONSTRUCTION ADHESIVE BETWEEN PIPE AND STRAP
3. TIE OFF LOOSE ENDS OF BARB WIRES TO PREVENT LOOSENING
4. THE STRUCTURE MUST BE PLACED A MINIMUM OF 3 FEET FROM THE EDGE OF THE CANAL BANK

TURLOCK IRRIGATION DISTRICT

IRRIGATION CONSTRUCTION STANDARDS

WO and C&M AGM — Keith Cargill

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# PIPE CROSSING BARB WIRE FENCE

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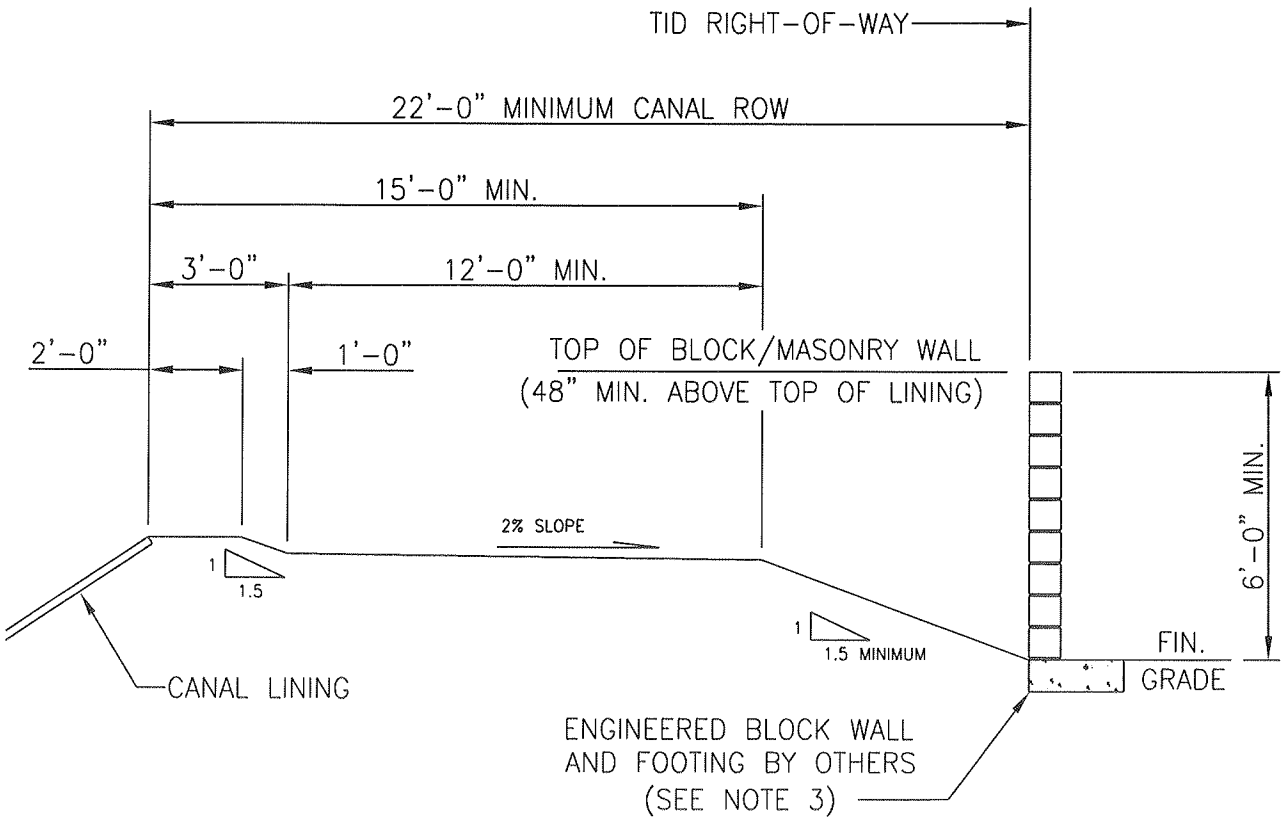


NOTES:

1. ALL MEASUREMENTS TYPICAL TO EACH SIDE OF CANAL.
2. CANAL RIGHT-OF-WAY WIDTH IS MINIMUM REQUIRED FOR EQUIPMENT CLEARANCES.
3. ALTERNATE BLOCK WALL CONFIGURATIONS WILL BE ALLOWED UPON PRIOR APPROVAL OF A PROPOSED DESIGN. CONTACT THE TID CIVIL ENGINEERING DEPARTMENT FOR REQUIREMENTS.

| TURLOCK IRRIGATION DISTRICT | | | | | | | IRRIGATION CONSTRUCTION STANDARDS |
|---|---|---|---|---|---|---|---|
| WO and C&M AGM | Keith Cargill | | | | | | CANAL ROADWAY for DEVELOPMENT APPLICATIONS |
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |
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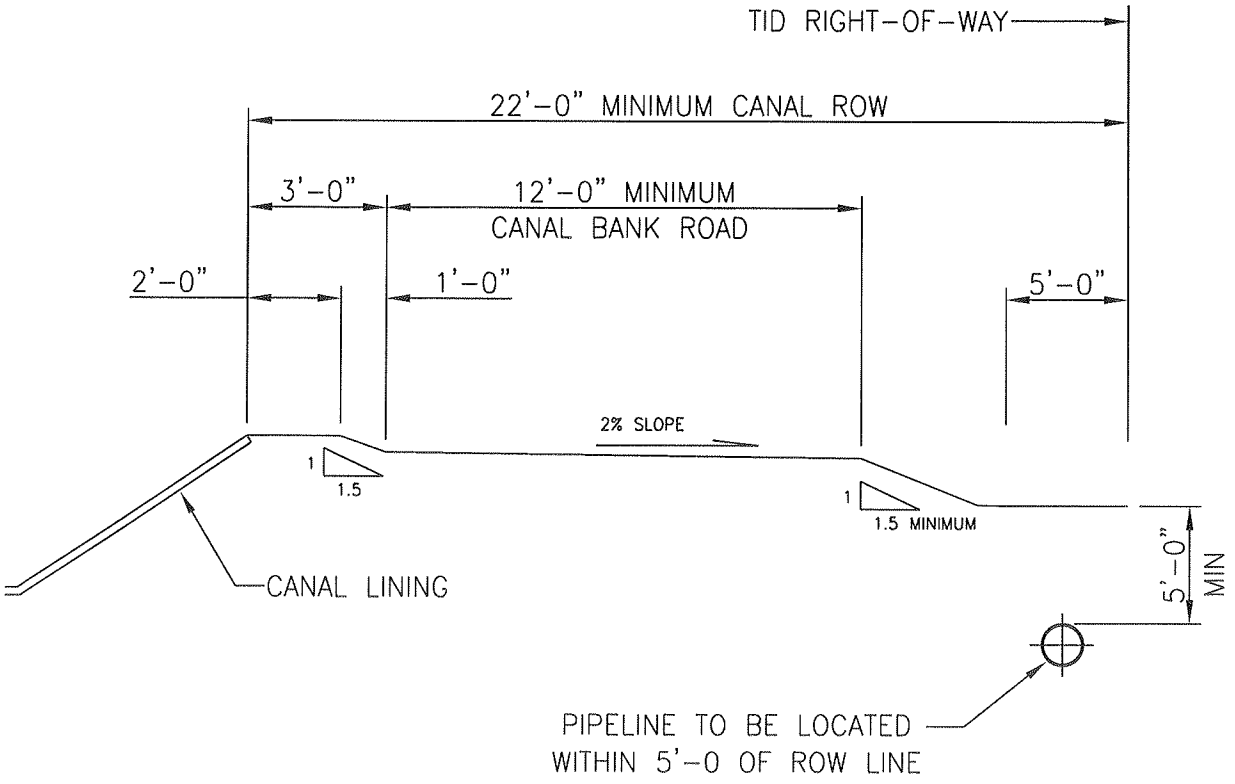


NOTES:

1. ALL MEASUREMENTS TYPICAL TO EACH SIDE OF CANAL.
2. CANAL RIGHT-OF-WAY WIDTH IS MINIMUM REQUIRED FOR EQUIPMENT CLEARANCES.
3. PRESSURIZED PIPE TO BE PVC MINIMUM 125 PSI, SDR 32.5, PLASTIC IRRIGATION PIPE (PIP).
4. INSTALLATION SHALL INCLUDE A COATED #12 THHN SOLID TRACER WIRE ON PIPE. TRACER WIRE TO BE PLACED ON TOP SIDE OF PIPE AND ATTACHED USING 2" 10-MIL POLY TAPE OR ACCEPTABLE EQUAL.
5. THE TOP ELEVATION OF ANY ABOVE GROUND PIPELINE APPURTENANCES SUCH AS AIR VENTS, VALVES, ETC., MUST NOT PROJECT HIGHER THAN THE FINISHED GRADE OF THE CANAL BANK ROAD SURFACE.

| TURLOCK IRRIGATION DISTRICT | | | | | | | IRRIGATION CONSTRUCTION STANDARDS |
|---|---|---|---|---|---|---|---|
| WO and C&M AGM | Keith Cargile | | | | | | PARALLEL PIPELINE IN CANAL ROW APPLICATIONS |
| | | | | | | | |
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