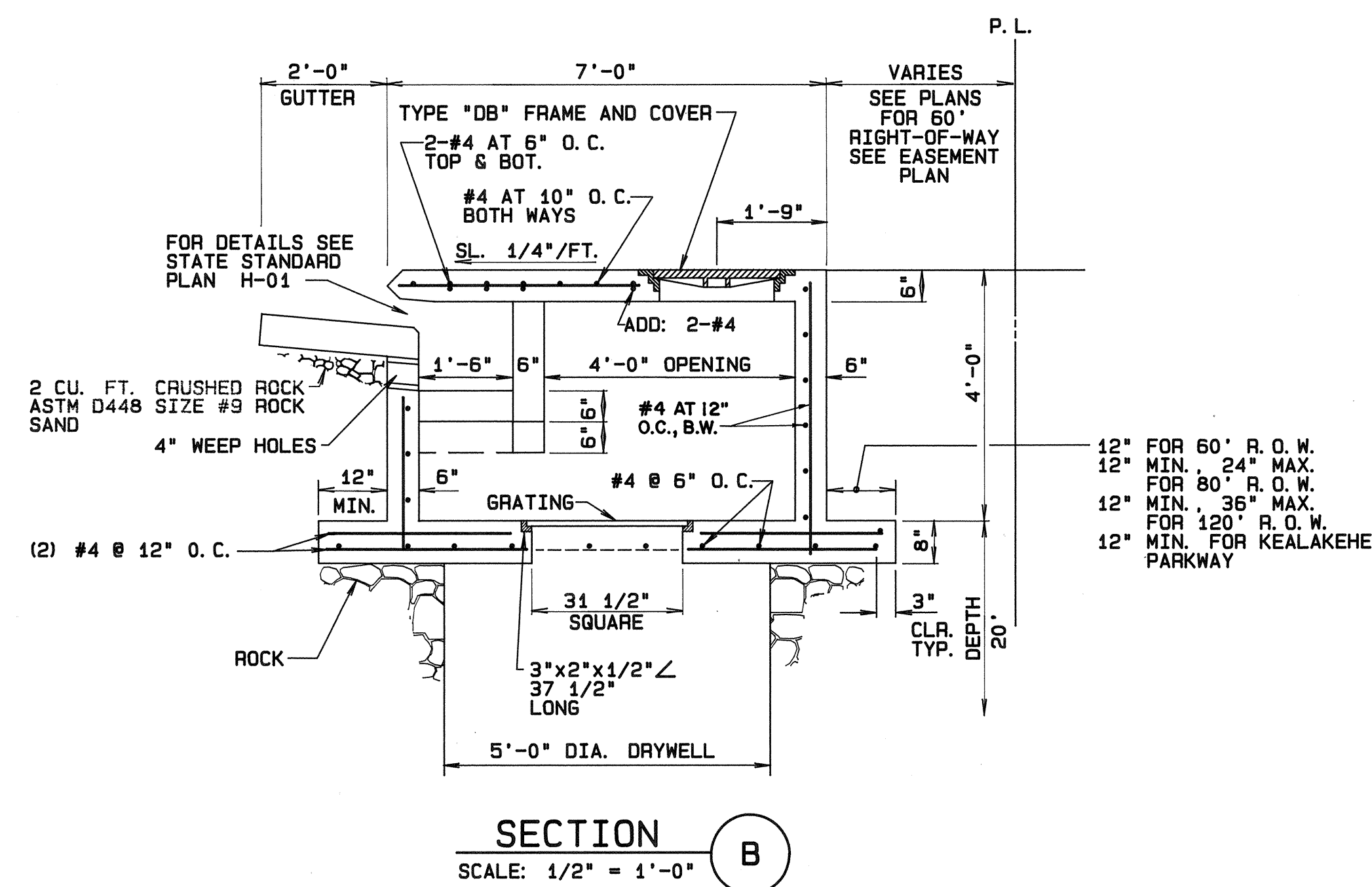
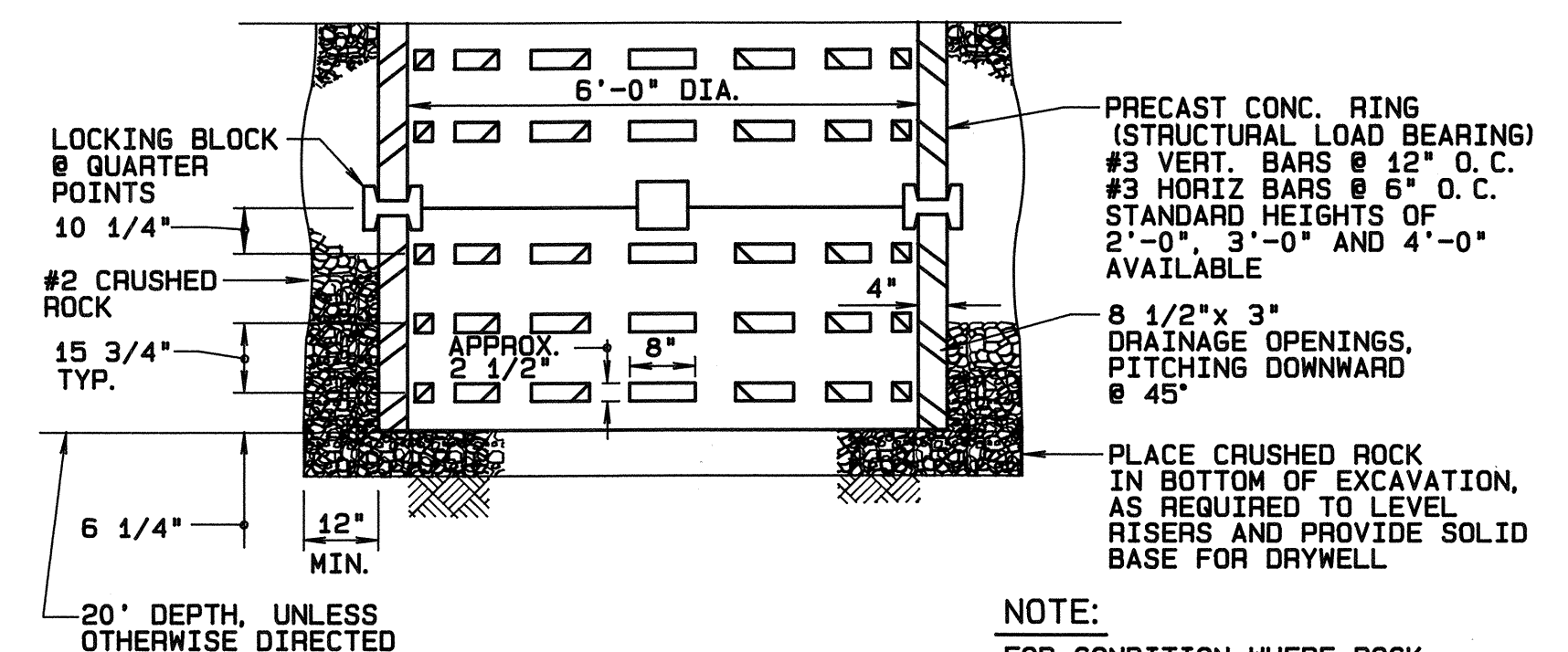
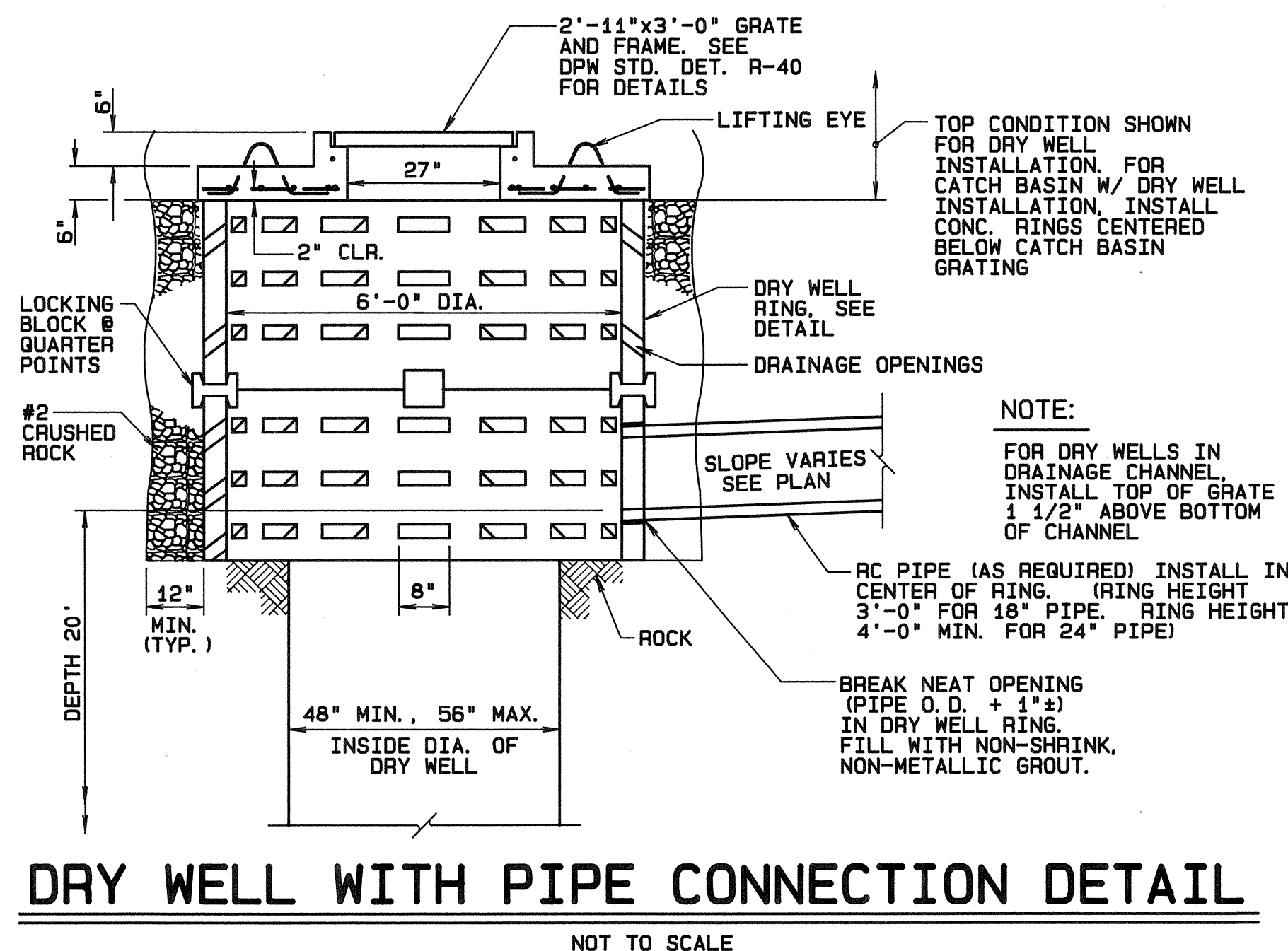
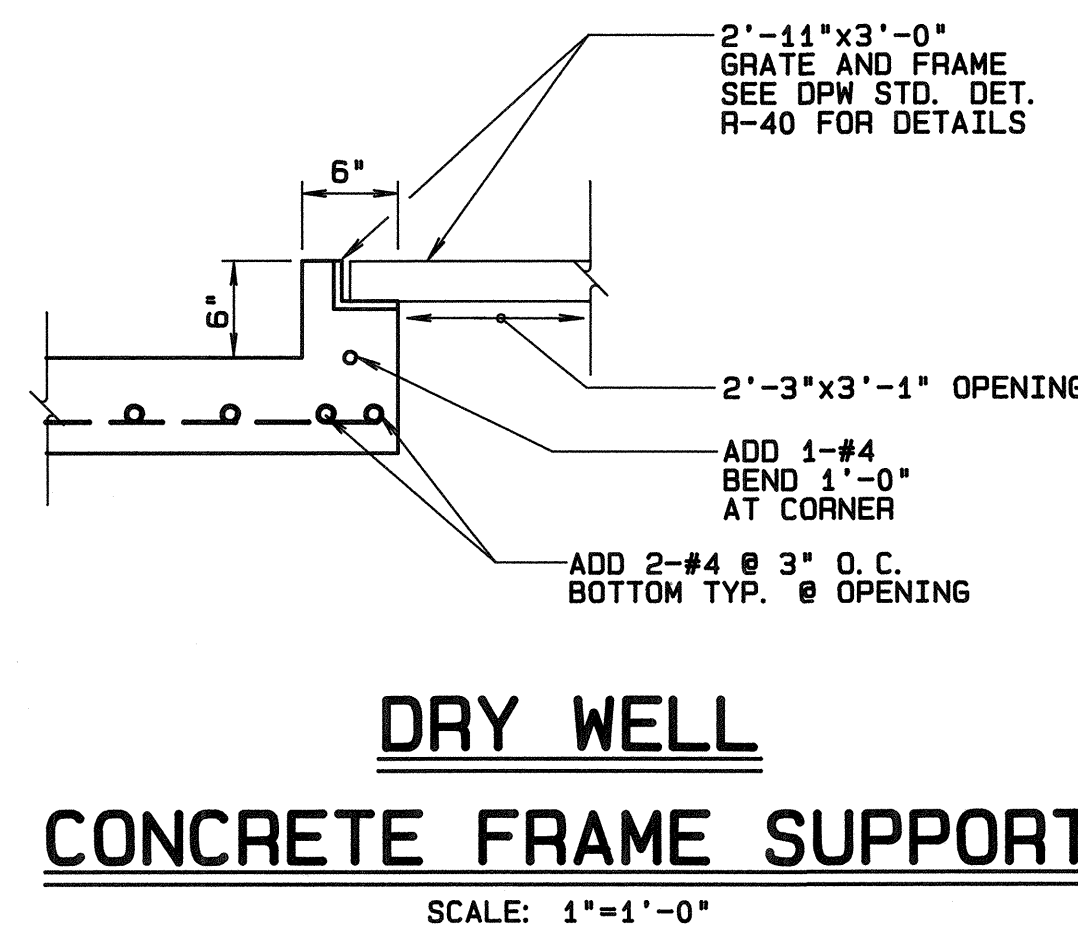
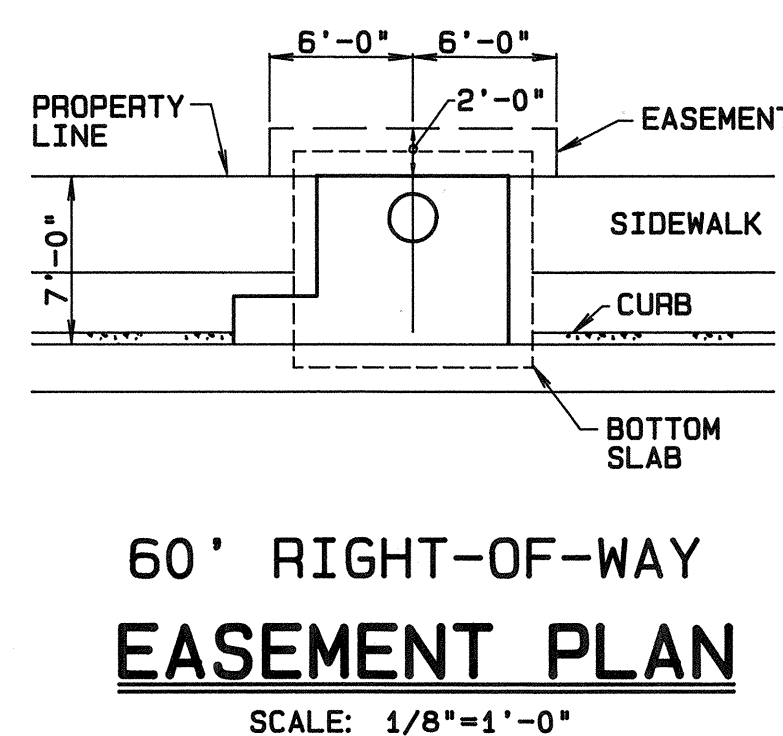


**MODIFIED CATCH BASIN WITH DRY WELL DETAIL**  
SCALE: AS SHOWN



DEPTH OF DRY WELL: 20'  
GRATING FOR DRY WELL:  
1 1/2"x1/4" IRVING TYPE "IHB" BEARING BARS AT 1 3/16" O.C.  
9/32" HEXAGONAL X-BARS AT 4" O.C.  
36"x36" SQ. OR APPR'D. EQUAL

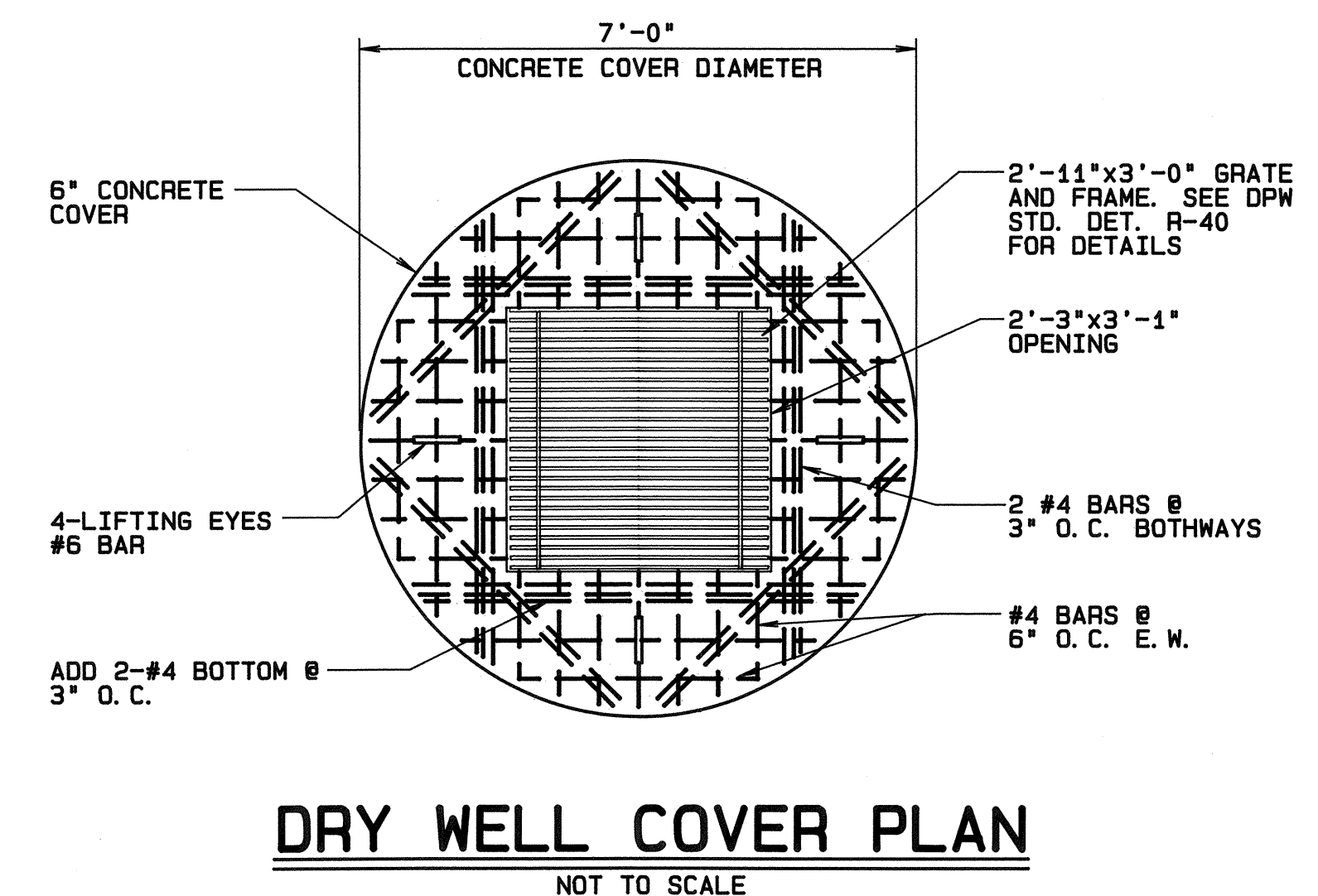
NOTE:  
GRATING, SEATS, CHECKERED PLATE, GUSSET PLATE AND SUPPORT SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION



**DRY WELL RING DETAIL**  
NOT TO SCALE

### DRY WELL NOTES:

- FOR STANDARD DRY WELL INSTALLATION, SEE DPW STD. DET. R-40. MAXIMUM DEPTH OF 7'-0" SQ. I.D. CONC. SECTION TO BE 4'.
- FOR INSTALLATIONS WHERE ROCK IS NON ENCOUNTERED FOR THE FULL 20' DEPTH OF DRY WELL, INSTALL DRY WELL RINGS, SEE DETAIL THIS SHEET, UNLESS OTHERWISE DIRECTED.
- CONCRETE-28 DAYS COMPRESSIVE CONCRETE STRENGTH = 3000 PSI.
- CONTRACTOR SHALL PRESERVE EXISTING GEOLOGICAL FORMATION AT PROPOSED DRY WELL LOCATION TO ENSURE PROPER DRY WELL OPERATION.



**DRY WELL COVER PLAN**  
NOT TO SCALE

PROJECT NO. 190A-02-92

**BELT COLLINS & ASSOCIATES**  
Engineering • Planning • Landscape Architecture  
580 Ala Moana Boulevard Suite 200 Honolulu, Hawaii 96813  
Phone: (808) 521-5351 Telex: BELTH 7430474 Fax: (808) 538-7819

Client:  
**HOUSING FINANCE AND DEVELOPMENT CORPORATION**  
STATE OF HAWAII  
VILLAGES OF LA'I OPUA  
BACKBONE INFRASTRUCTURE PHASE-2A

### MISCELLANEOUS DETAILS-1

Designed by: **AK** Date: **NOV 1993**  
Drawn by: **RS** Proj. no.: **(BCA) 841.0104**  
Approved: \_\_\_\_\_  
Date: \_\_\_\_\_

| Rev | Date | Description | Eng | App |
|-----|------|-------------|-----|-----|
| 1   |      |             |     |     |
| 2   |      |             |     |     |
| 3   |      |             |     |     |

*Alan M. Kato*  
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

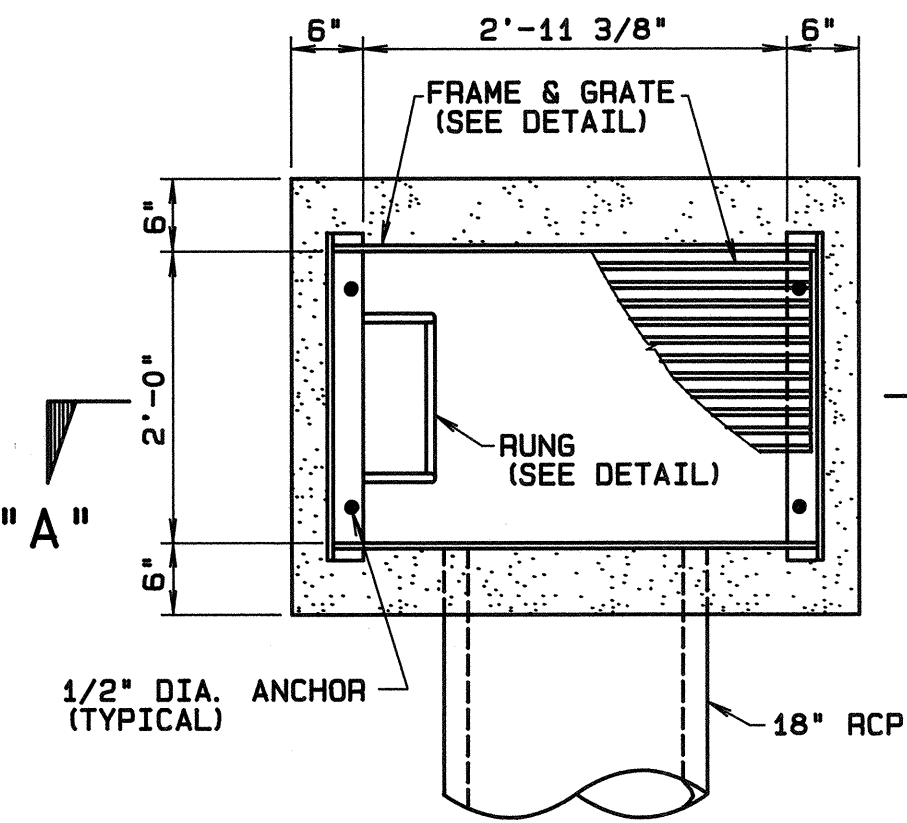
**ALAN M. KATO**  
LICENSED PROFESSIONAL ENGINEER  
No. 7552-C  
HAWAII, U.S.A.

CAD FILE #410104\_2A.DTL-NWS1

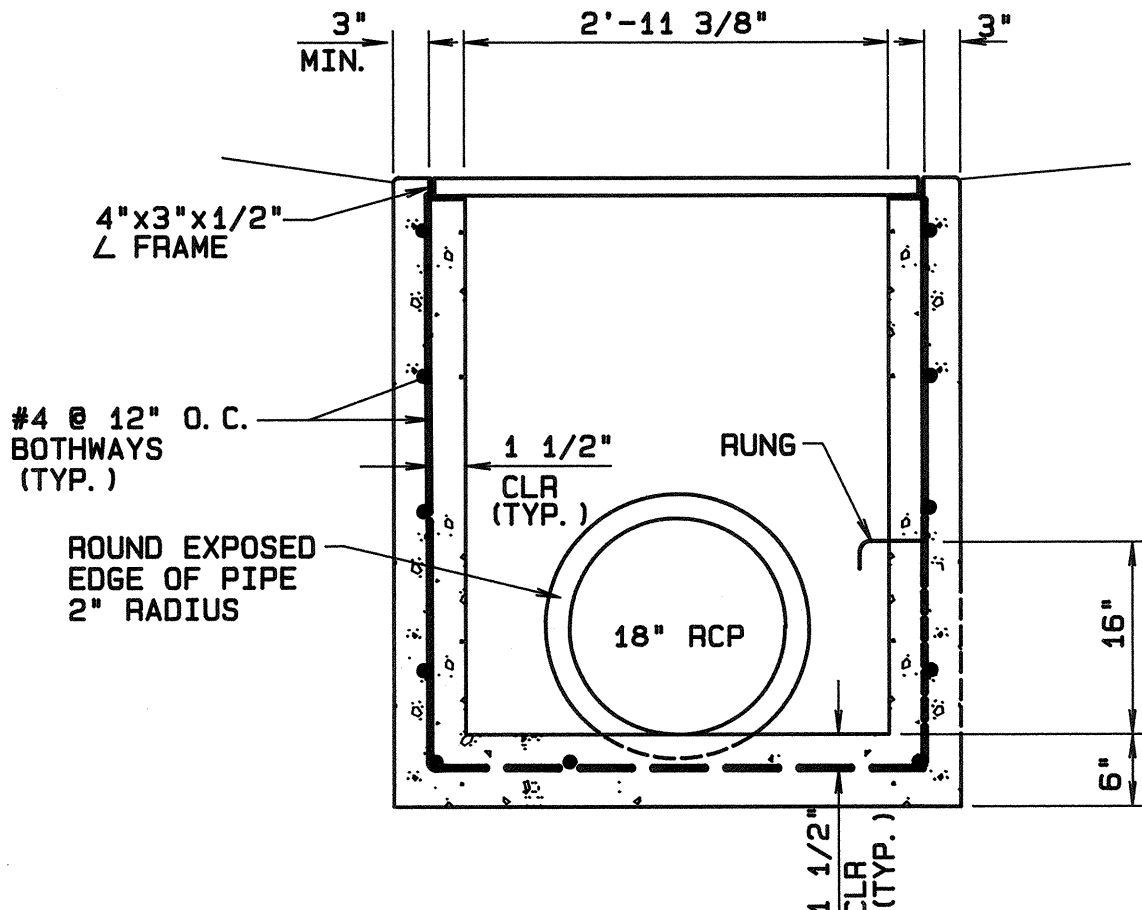


NOTES:

1. BASIN FLOORS SHALL HAVE WOOD TROWEL FINISH AND A MINIMUM SLOPE OF 1/2" 3' FROM ALL DIRECTIONS TOWARD OUTLET PIPE.
2. SET GRATE SO THAT BARS ARE PARALLEL TO DIRECTION OF PRINCIPLE FLOW.



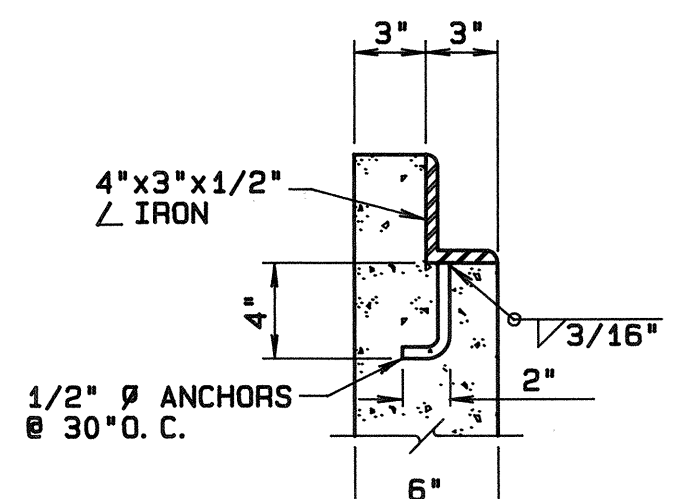
PLAN



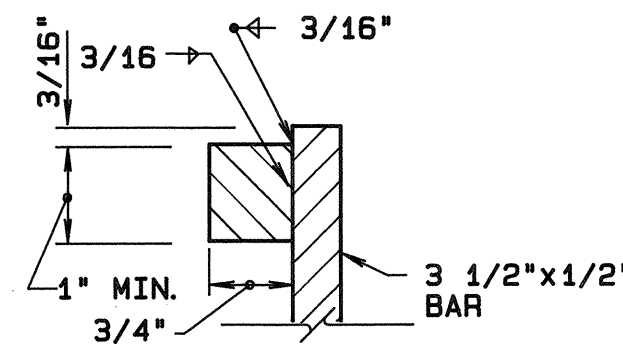
SECTION "A-A"

DRAIN INLET

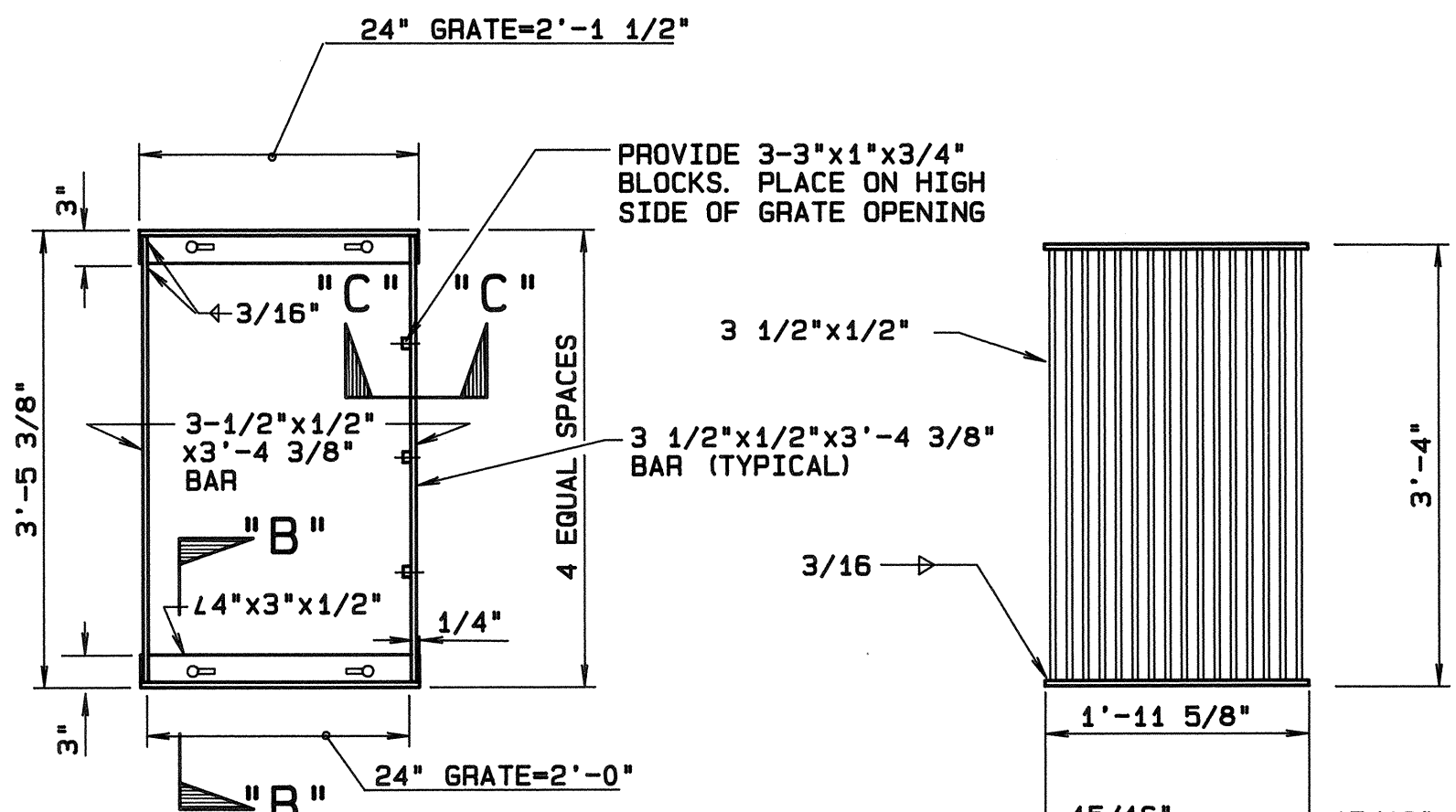
SCALE: 3/4"=1'-0"



SECTION "B-B"



SECTION "C-C"



TYPICAL FRAME

SCALE: 3/4"=1'-0"

WELDED GRATE

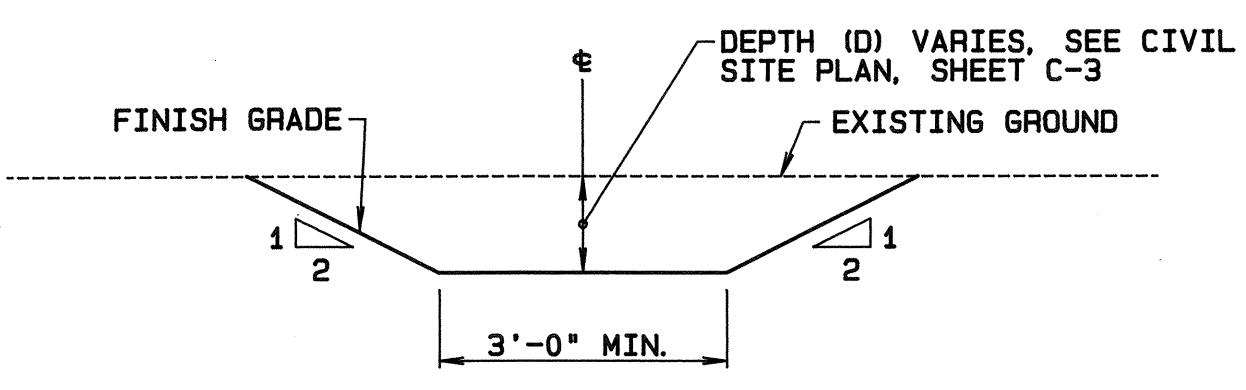
SCALE: 3/4"=1'-0"

NOTES:

1. CONTRACTOR HAS THE OPTION OF USING CAST NODULAR IRON, CAST STEEL, WELDED, BOLTED, OR CAST END BLOCK GRATE.
2. GRATES AND FRAMES SHALL BE GALVANIZED.
3. ROUNDED TOP OF BARS OPTIONAL ON ALL GRATES.
4. PIPE DROP INLETS WITH A GRATE SHALL BE PLACED SO THAT BARS PARALLEL DIRECTION OF PRINCIPLE SURFACE FLOW.

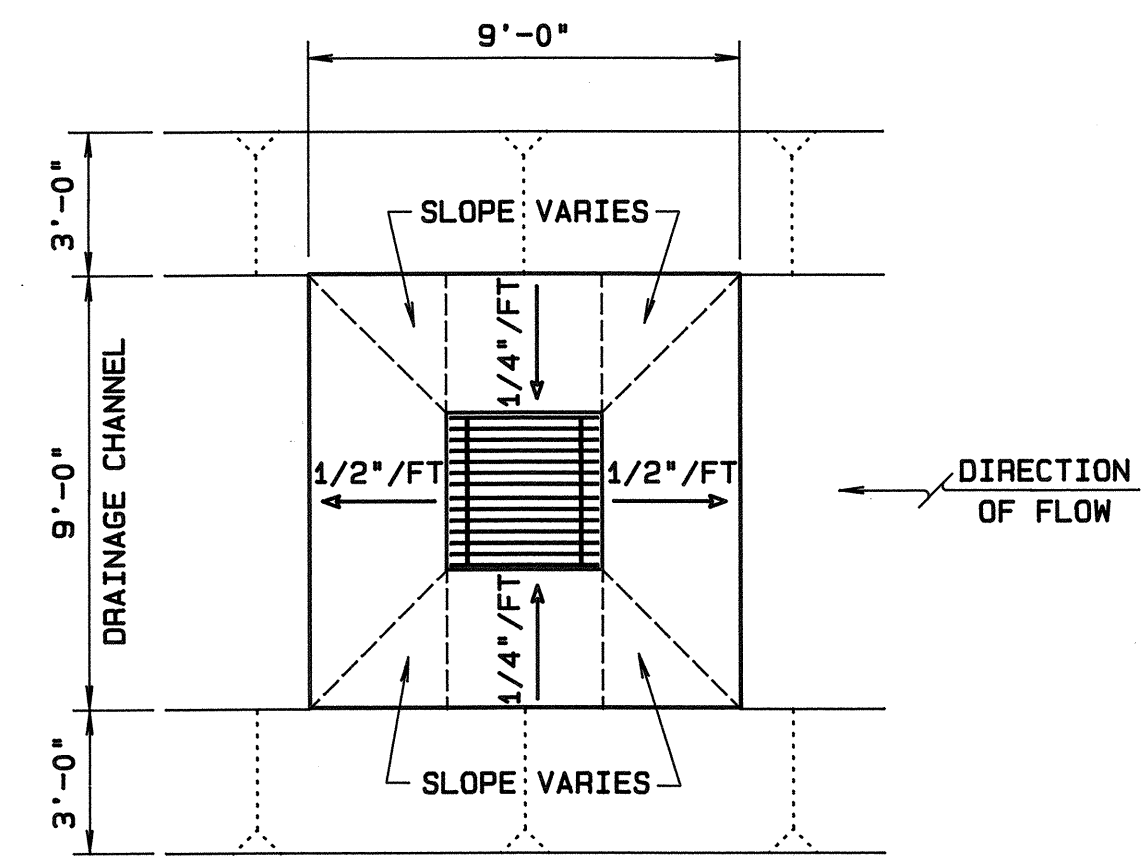
STANDARD FRAME AND GRATE DETAIL

SCALE: AS SHOWN



DRAINAGE CHANNEL DETAIL

NOT TO SCALE

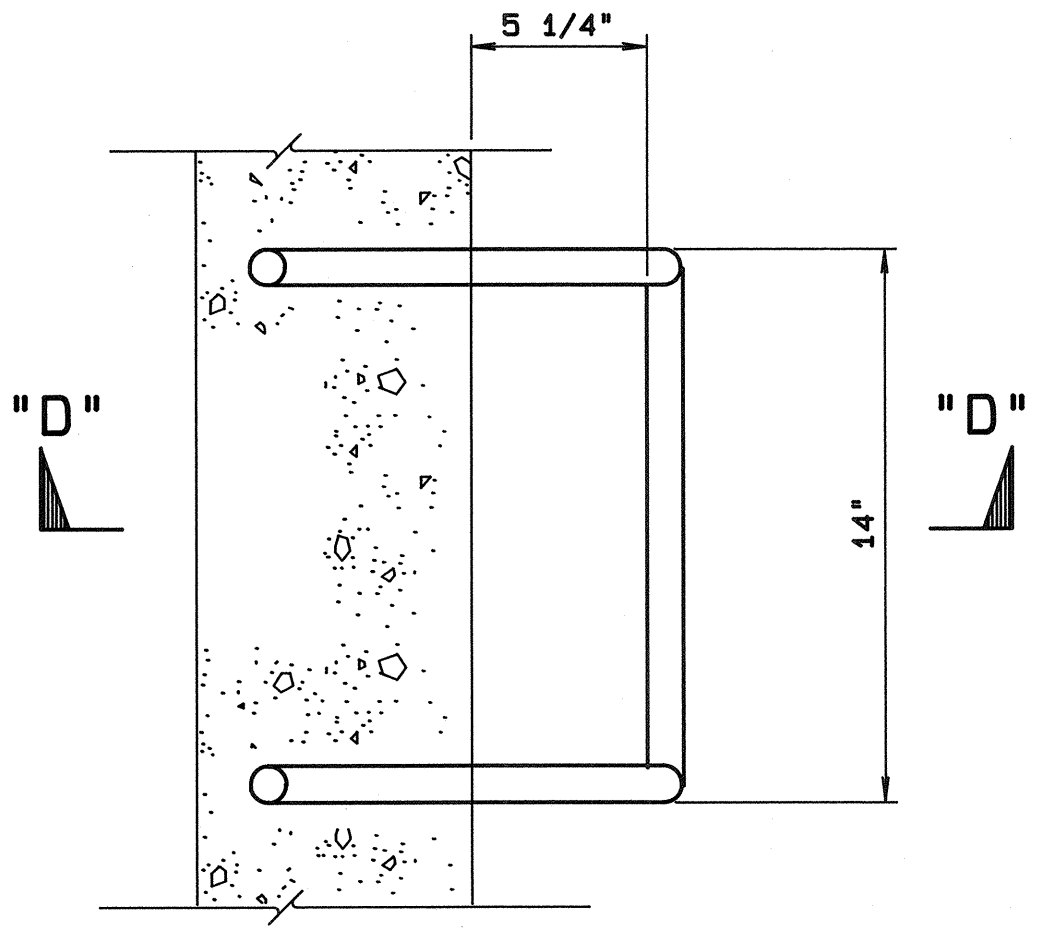


NOTE:

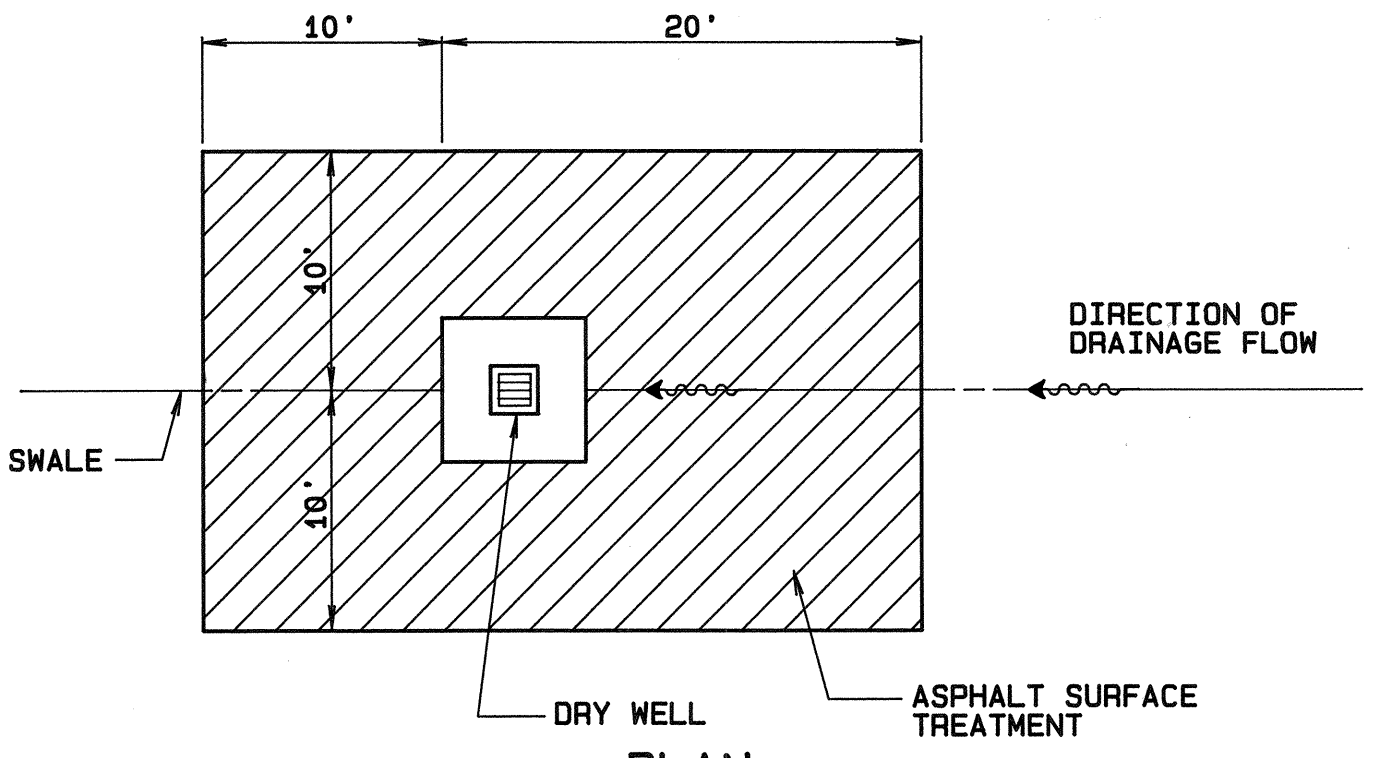
DETAIL IS FOR CONCRETE COVER SLOPES. FOR REINFORCING, FRAME AND GRATING, SEE DPW STANDARD DETAIL R-40.

DRAINAGE CHANNEL DRY WELL COVER PLAN

SCALE: 1/4"=1'-0"



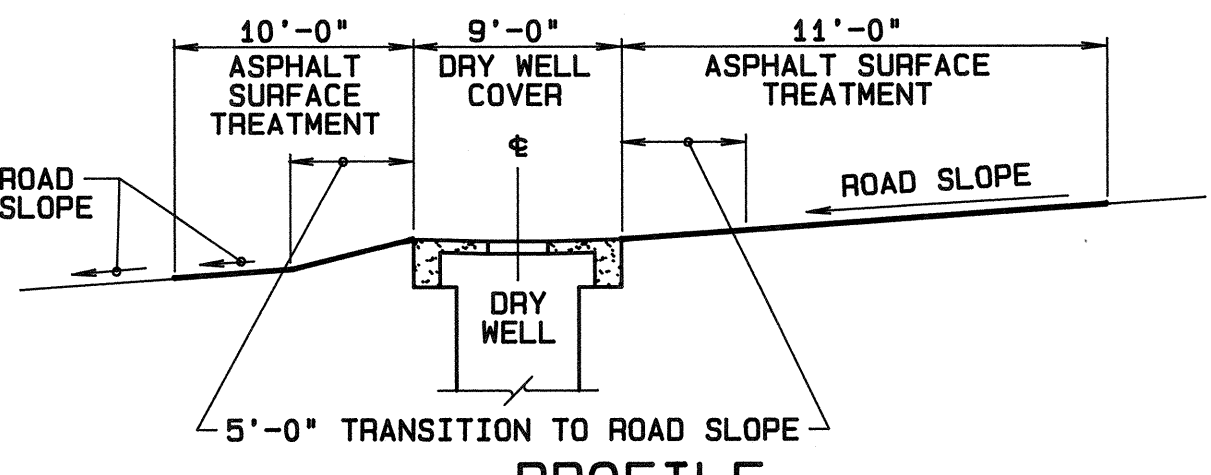
PLAN



PLAN

SCALE: 1/8"=1'-0"

(KEALAKEHE PARKWAY)

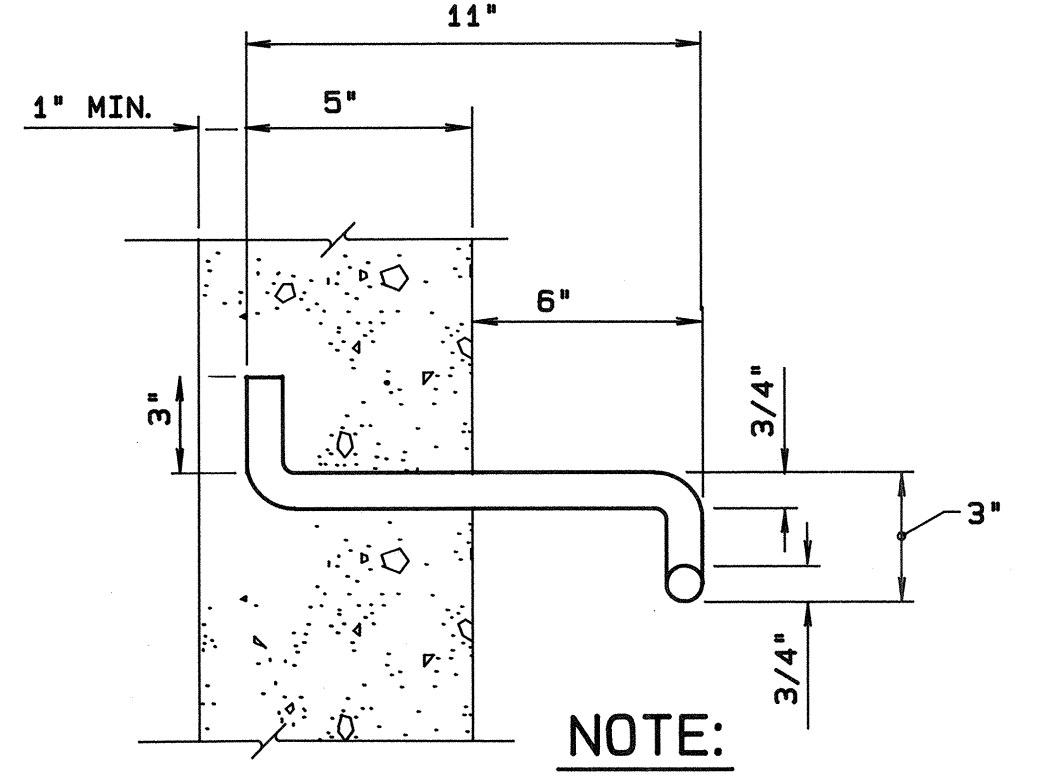


PROFILE

NOT TO SCALE

ASPHALT SURFACE TREATMENT AT DRY WELLS DETAILS

SCALE: AS SHOWN



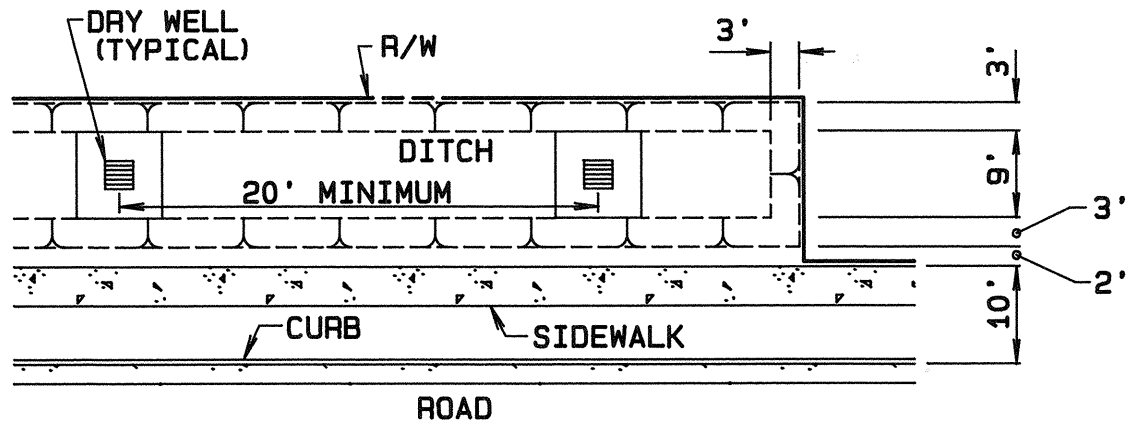
SECTION "D-D"

RUNG DETAIL

NOT TO SCALE

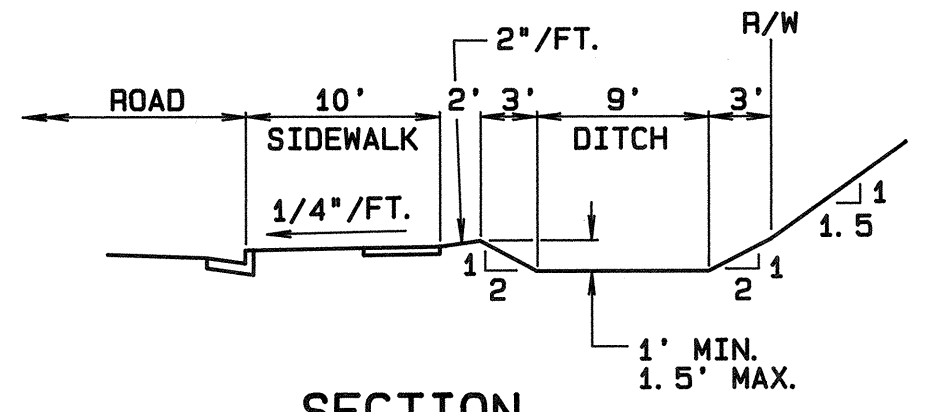
NOTE:

RUNGS SHALL BE 3/4" DIAMETER WROUGHT IRON OR ASTM A36 STEEL RODS AND SHALL BE HOT-DIPPED GALVANIZED OR CADMIUM PLATED AFTER BENDING.



PLAN

SCALE: 1" = 20'



SECTION

SCALE: 1" = 10'

DRAINAGE CHANNEL DETAIL

SCALE AS SHOWN

| Rev | Date | Description | Eng | App |
|-----|------|-------------|-----|-----|
|     |      |             |     |     |
|     |      |             |     |     |
|     |      |             |     |     |

Signature of Alan M. Kato, Licensed Professional Engineer, No. 7552-C, Hawaii, U.S.A.

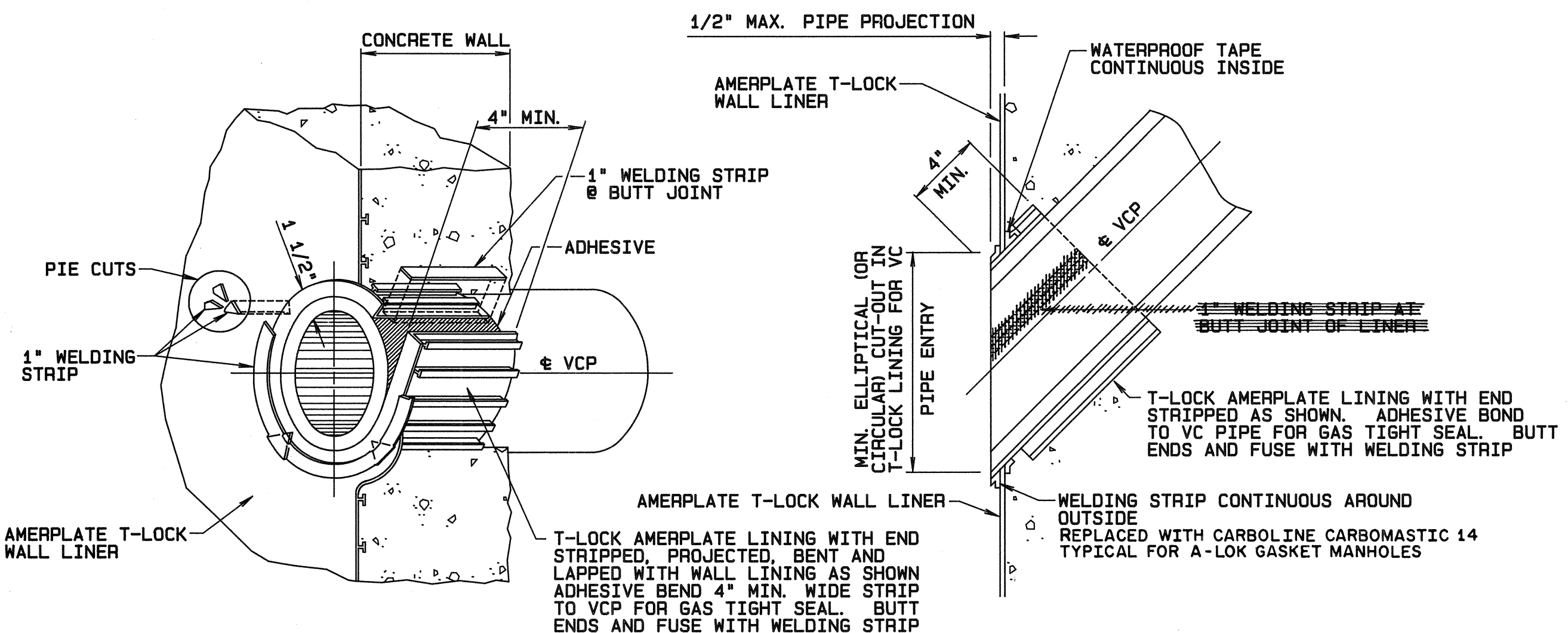
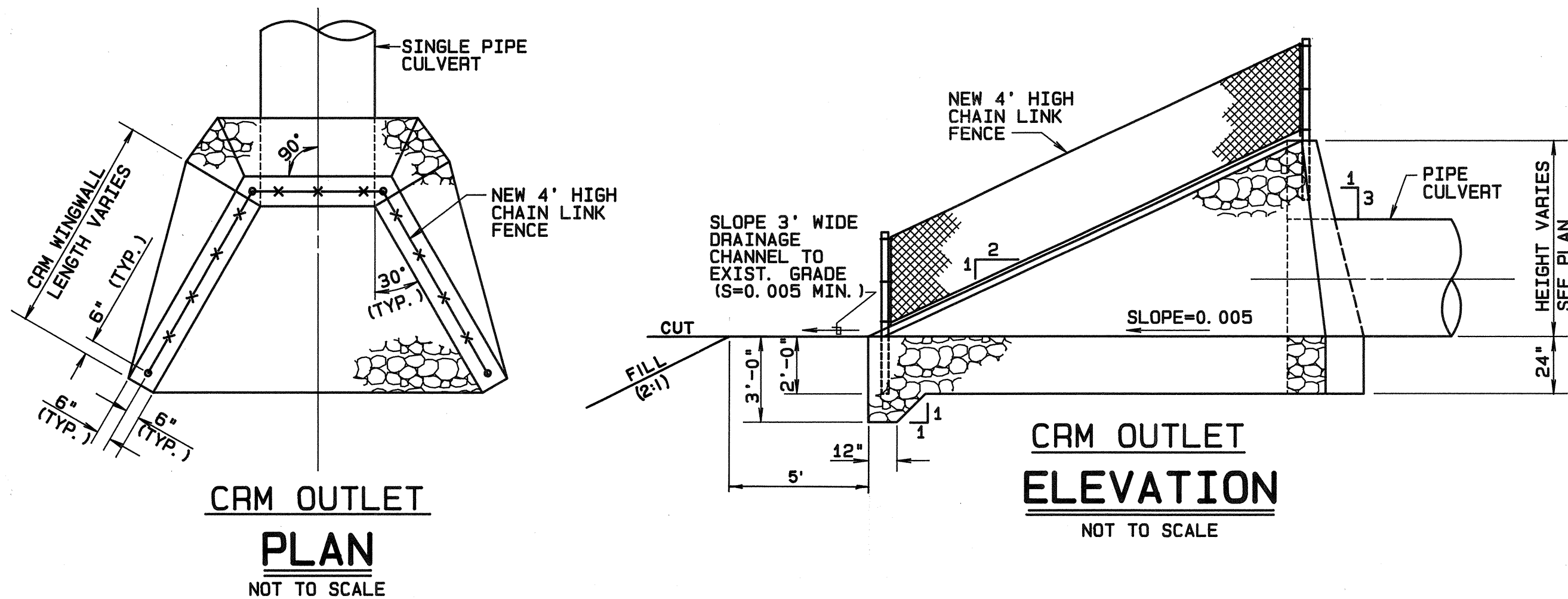
PROJECT NO. 190A-02-92  
BELT COLLINS & ASSOCIATES  
Engineering • Planning • Landscape Architecture  
680 Ala Moana Boulevard Suite 200 Honolulu, Hawaii 96813  
Phone: (808) 521-5361 Telex: BELTH 7430474 Fax: (808) 536-7819

Client: HOUSING FINANCE AND DEVELOPMENT CORPORATION  
STATE OF HAWAII  
VILLAGES OF LA'I OPUA  
BACKBONE INFRASTRUCTURE PHASE-2A

MISCELLANEOUS DETAILS-2  
Designed by: AK Date: NOV 1993  
Drawn by: RS Proj. no.: (BCA) 841. 0104  
Approved: \_\_\_\_\_  
Date: \_\_\_\_\_

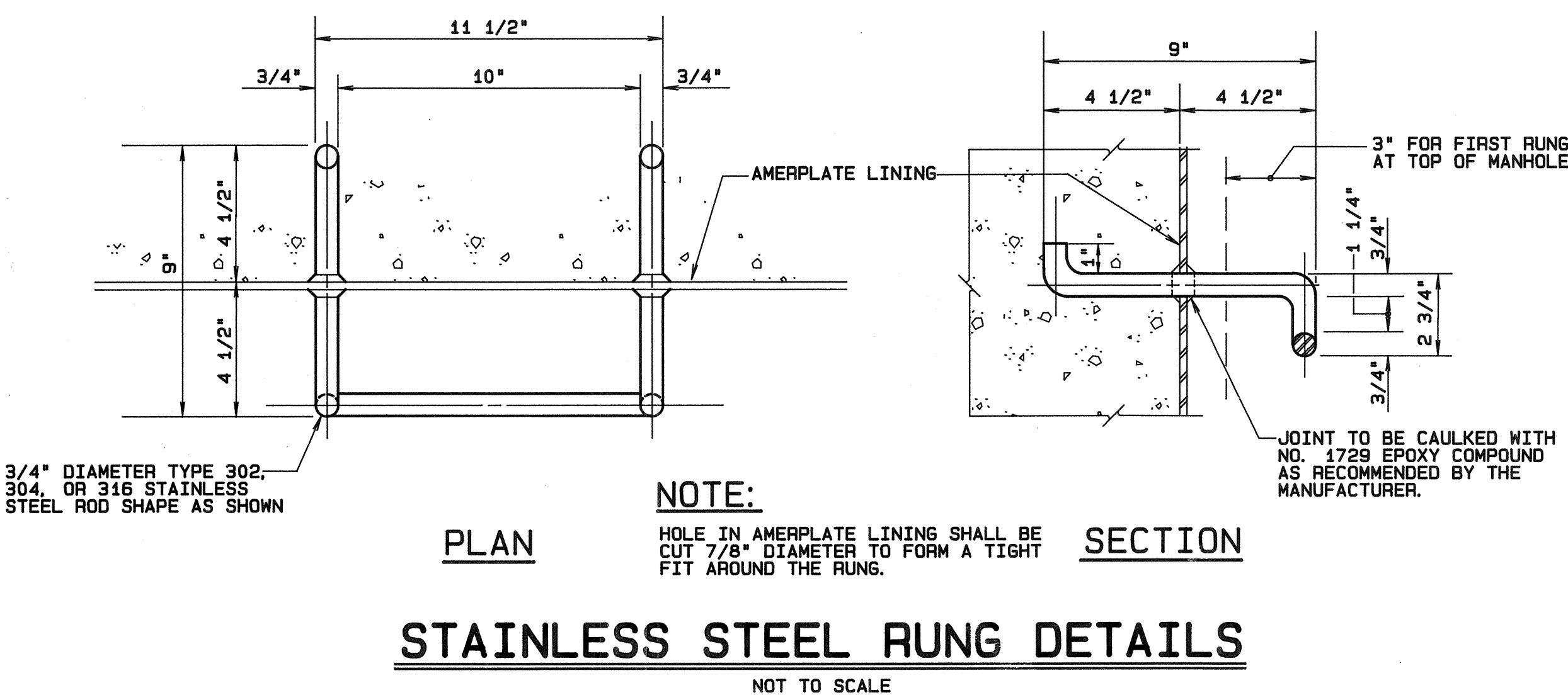
CAD FILE: 8410104\_2A.DTL-S-WIS2





ALTERNATE NO. 1  
PIPE FLUSH W/WALL FACE  
TYPICAL AMERPLATE DETAILS AT VC PIPE ENTRY  
NOT TO SCALE

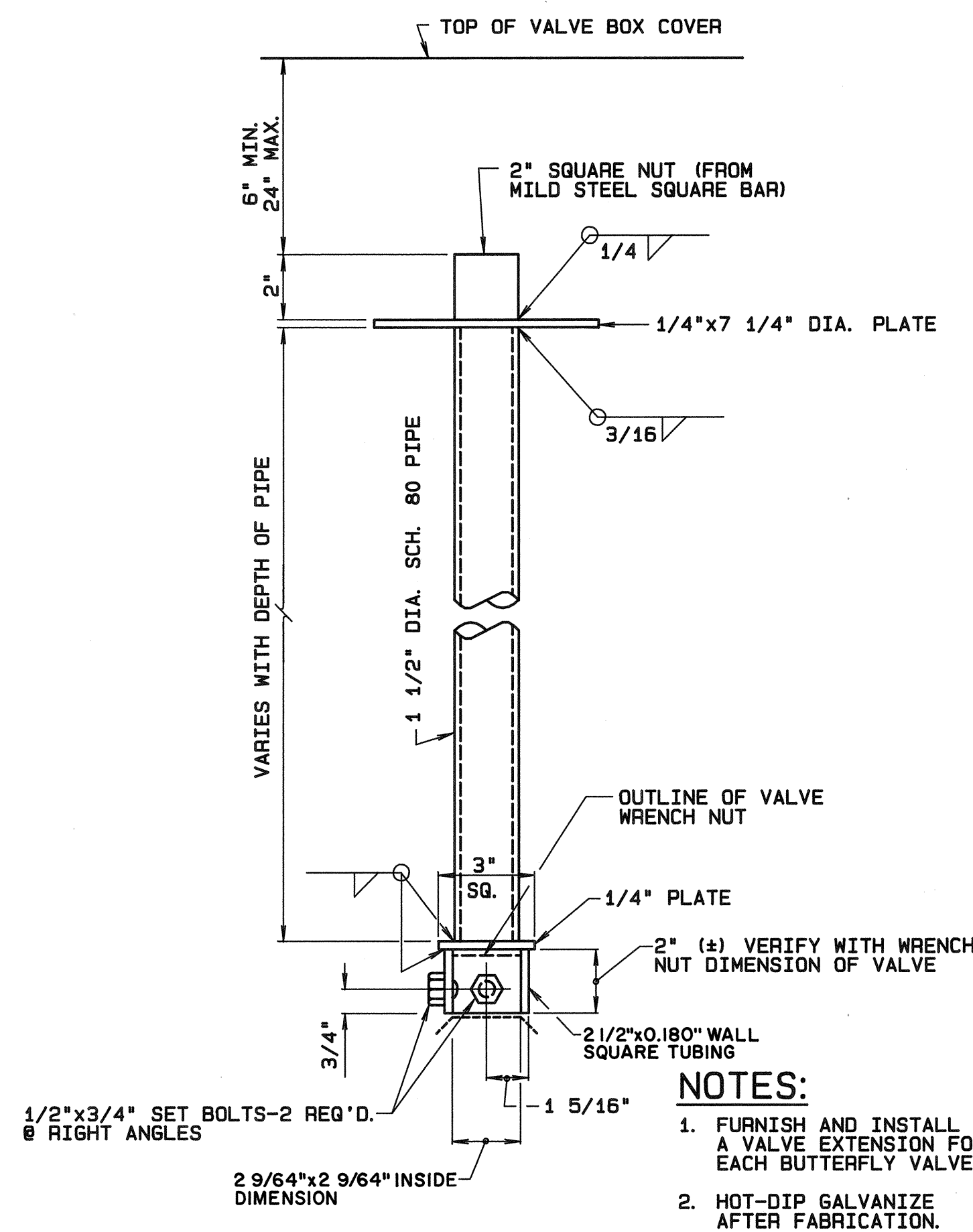
ALTERNATE NO. 2  
PROJECTED THRU WALL FACE  
TYPICAL AMERPLATE DETAILS AT VC PIPE ENTRY  
NOT TO SCALE



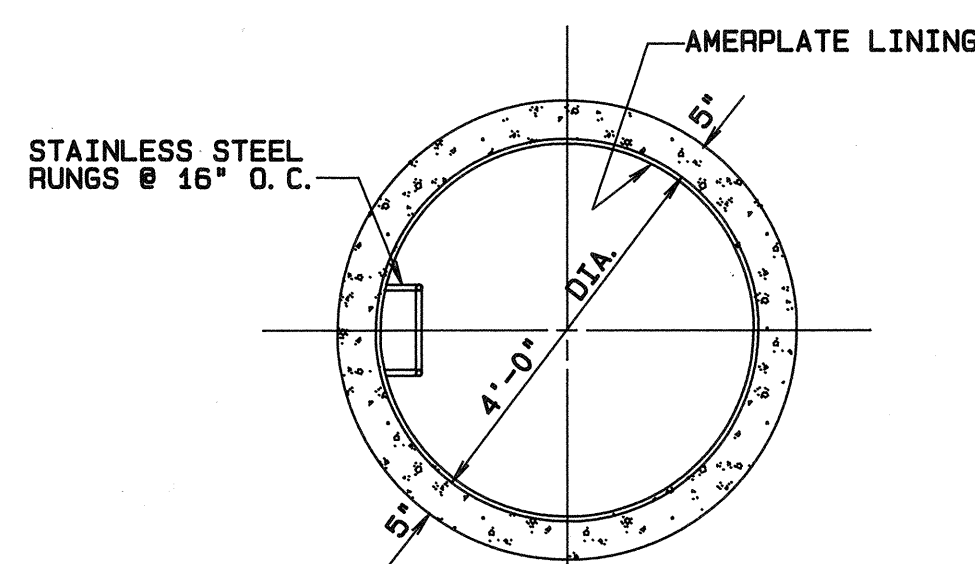
PLAN  
NOT TO SCALE

SECTION  
NOT TO SCALE

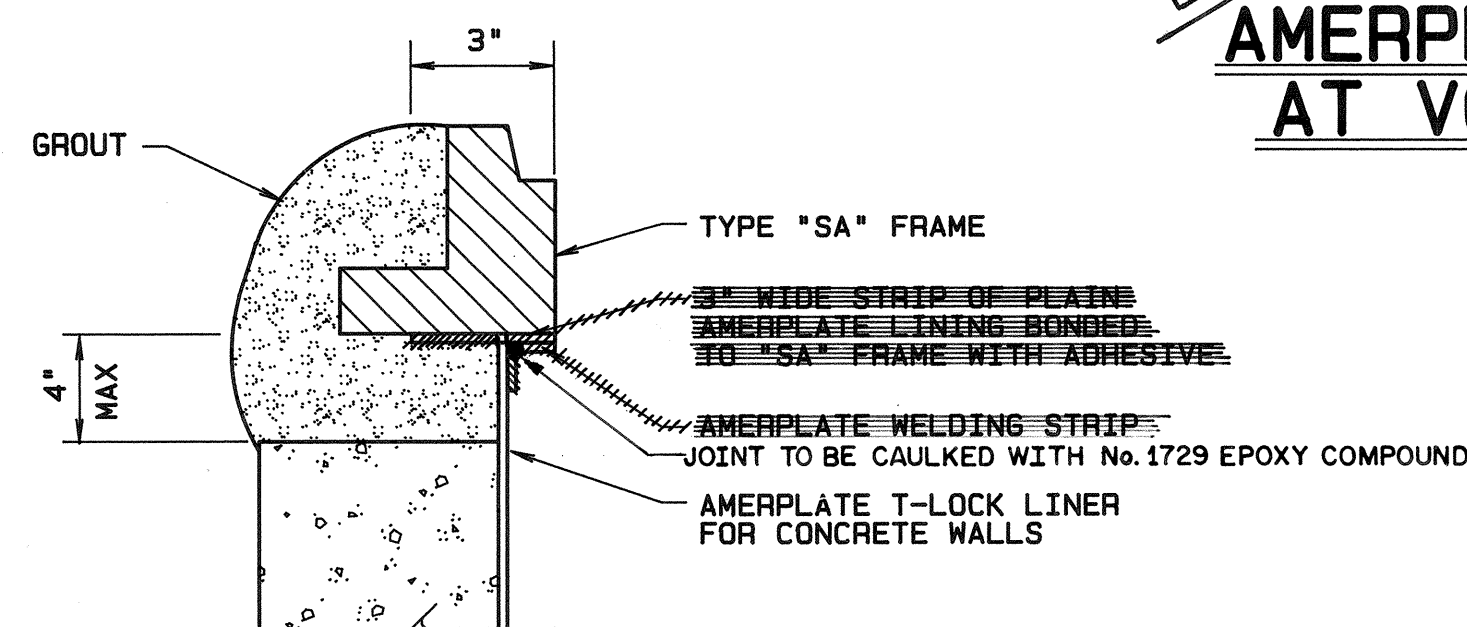
NOTE:  
HOLE IN AMERPLATE LINING SHALL BE CUT 7/8\"/>



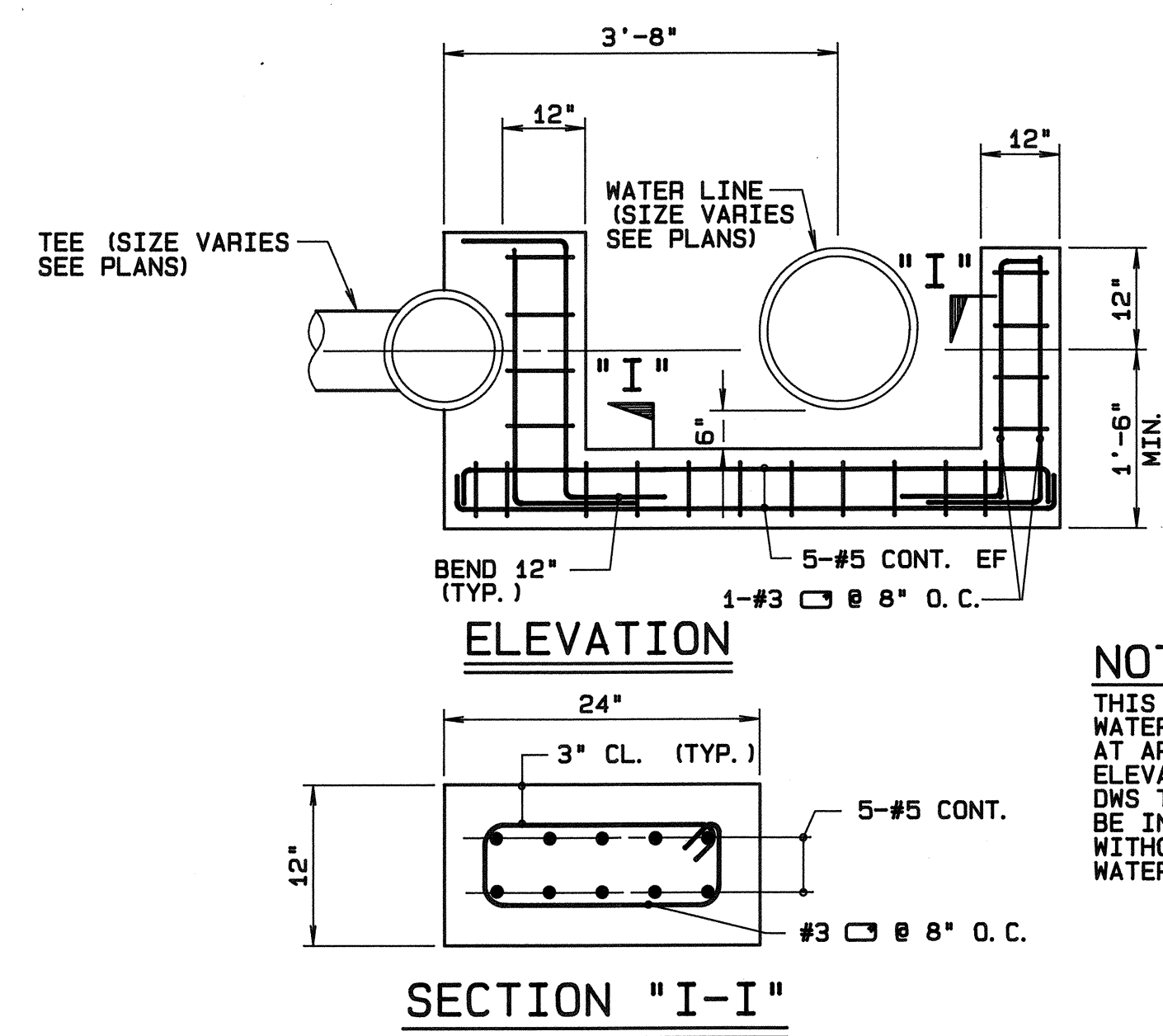
VALVE WRENCH EXTENSION DETAIL  
SCALE: 3\"/>



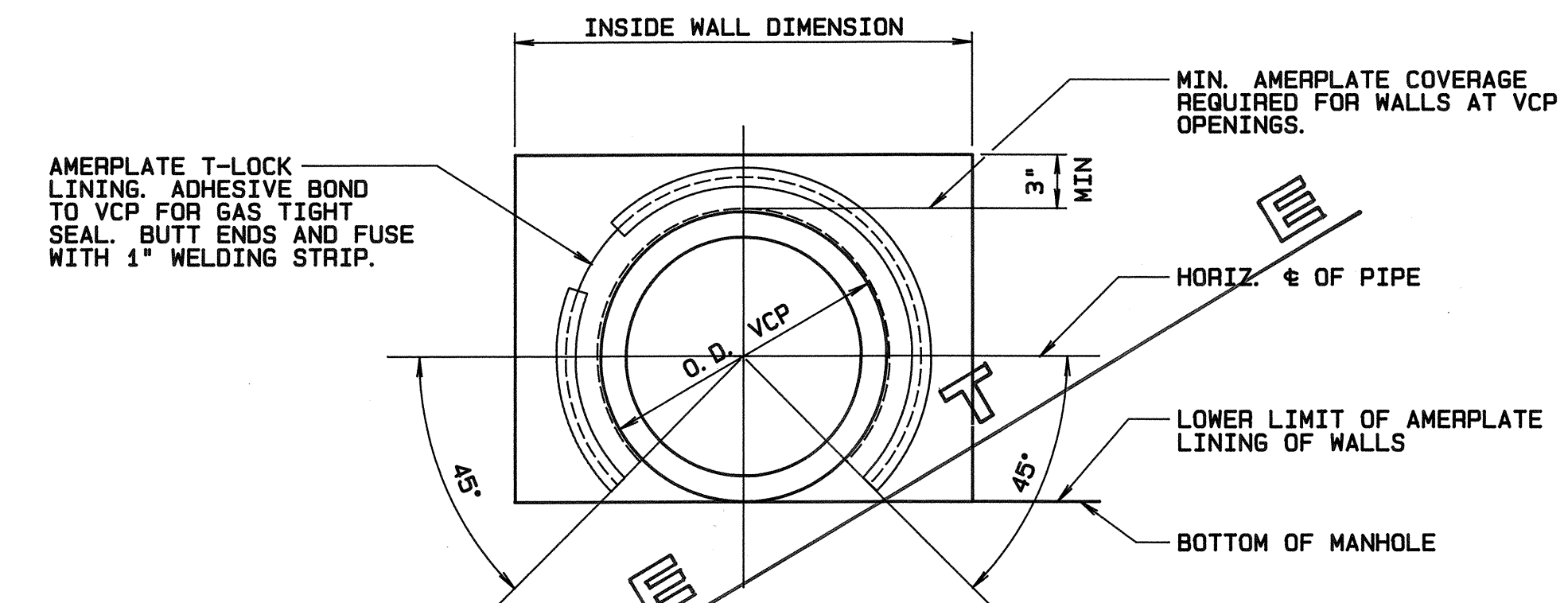
PRE-CAST  
MANHOLE SECTION  
SCALE: 1/2\"/>



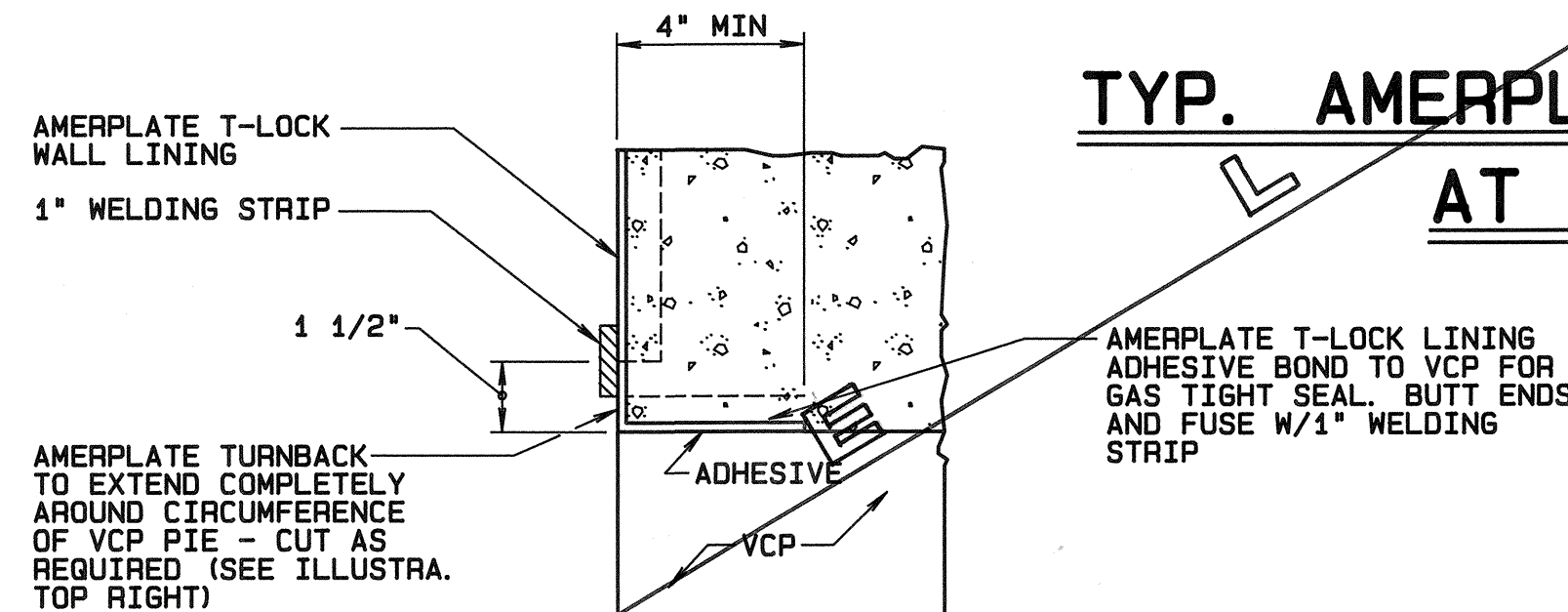
AMERPLATE DETAIL  
AT MANHOLE FRAME  
SCALE: 3\"/>



CONCRETE BLOCK AT TEES  
NOT TO SCALE



TYP. AMERPLATING REQUIREMENTS  
AT VCP OPENING  
NOT TO SCALE



AMERPLATE DETAIL  
AT VCP OPENING  
NOT TO SCALE

| Rev | Date | Description | Eng | App |
|-----|------|-------------|-----|-----|
|     |      |             |     |     |
|     |      |             |     |     |
|     |      |             |     |     |

ALAN M. KATO  
LICENSED PROFESSIONAL ENGINEER  
No. 7552-C  
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

PROJECT NO. 190A-02-92

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Engineering • Planning • Landscape Architecture  
680 Ala Moana Boulevard Suite 200 Honolulu, Hawaii 96813  
Phone: (808) 521-5361 Telex: BELTH 7430474 Fax: (808) 538-7819

Client:  
**HOUSING FINANCE AND DEVELOPMENT CORPORATION**  
STATE OF HAWAII

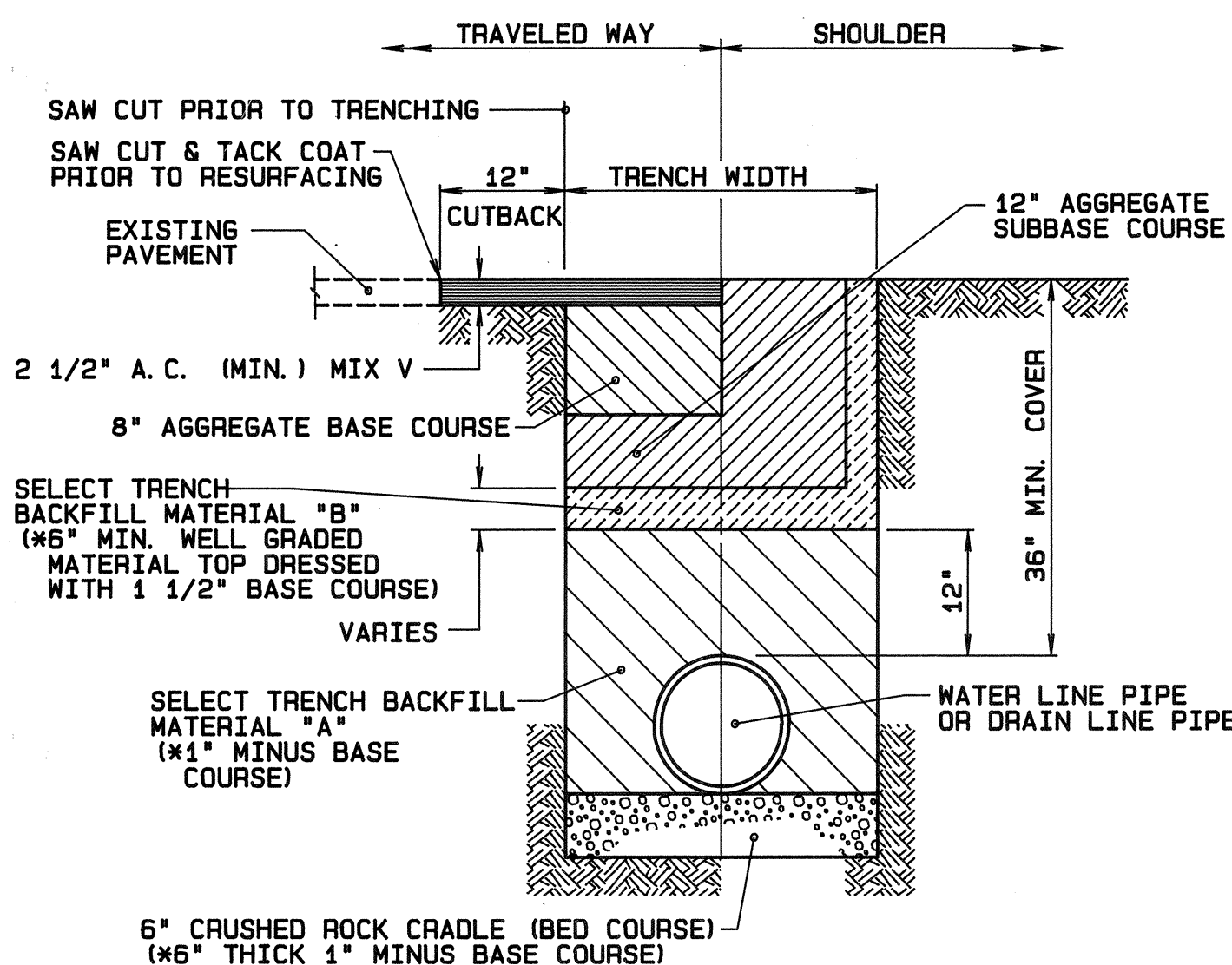
VILLAGES OF LA'I OPUA  
BACKBONE INFRASTRUCTURE PHASE-2A

MISCELLANEOUS DETAILS-3

Designed by: AK Date: NOV 1993  
Drawn by: RS Proj. no.: (BCA) 841.0104  
Approved: \_\_\_\_\_  
Date: \_\_\_\_\_

CAD FILE: 8410104\_2A.DTL-S-M33

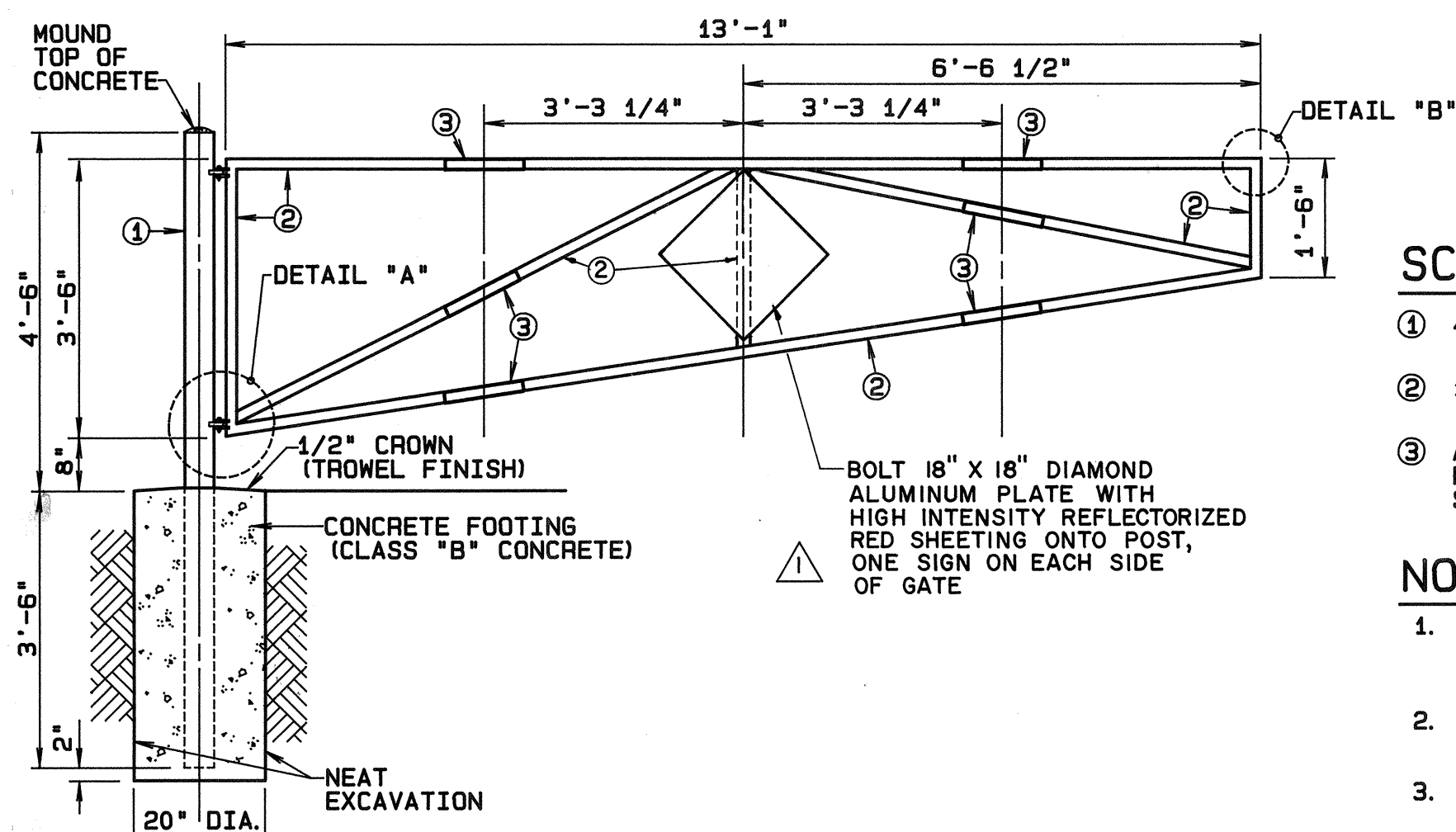




## TYPICAL TRENCH & PAVEMENT REPAIR SECTION

(STATE RIGHT-OF-WAY)

NOT TO SCALE



## ROAD "A" - 20' WIDE ACCESS ROAD HALF VIEW PIPE GATE

SCALE: 1/2"=1'-0"

### NOTES:

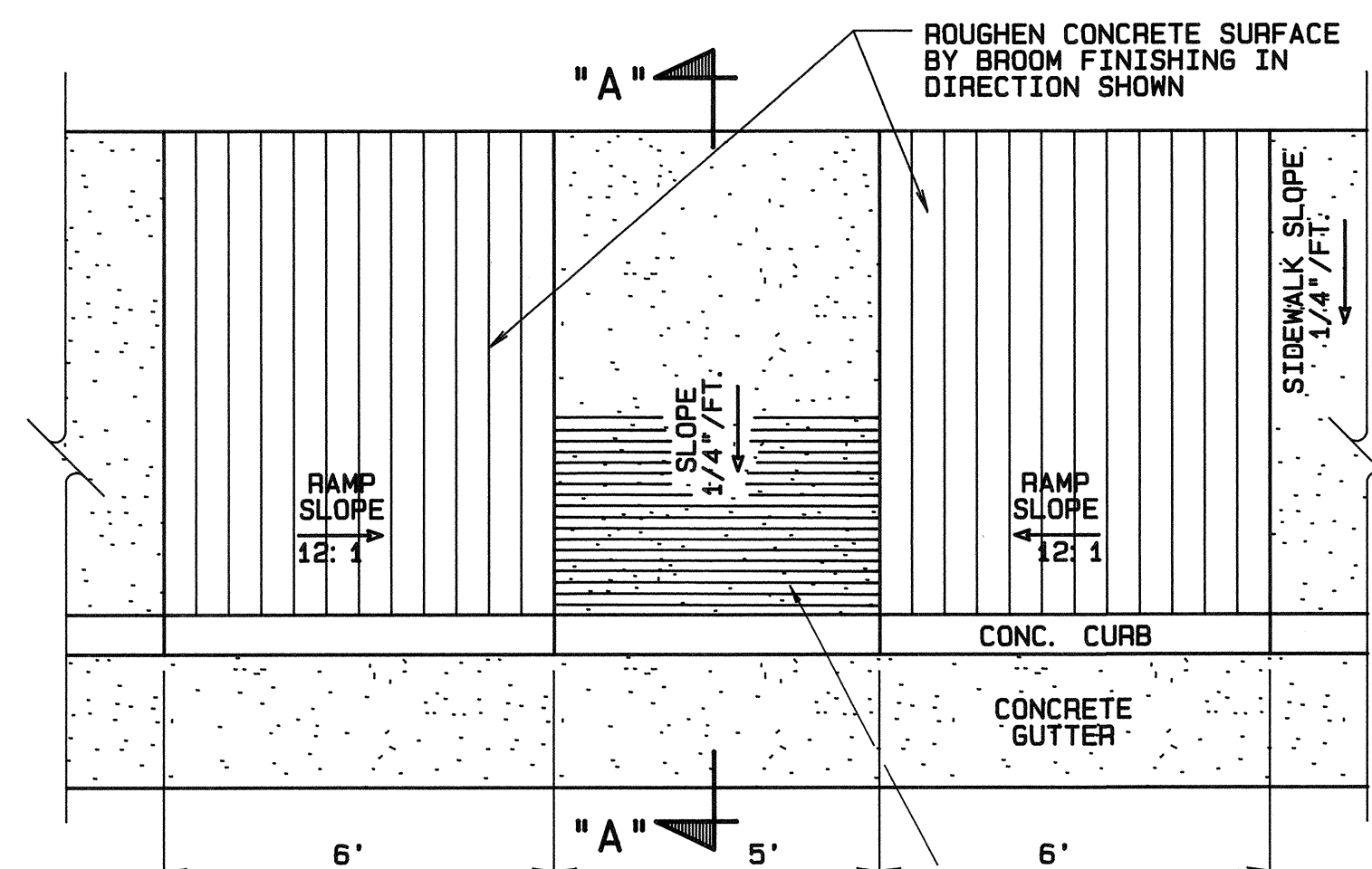
- 6" CRUSHED ROCK CRADLE
  - WHERE UTILITIES WITHIN THE WATER TABLE, USE "3F TO "2
  - IN SOFT AREAS, USE SAND EQUIVALENT (S.E.) > 20
- SELECT TRENCH BACKFILL MATERIAL "A"
  - S.E. ≥ 20
  - 8" MAXIMUM LIFTS
  - 95% COMPACTION
- TRENCH BACKFILL MATERIAL "B"
  - S.E. MUST NOT BE < THE AREA BEING FILLED AND IN NO CASE SHALL THE S.E. BE < 2 REGARDLESS OF WHERE IT IS USED
  - 8" MAXIMUM LIFTS
  - 95% COMPACTION
- SUBBASE COURSE
  - S.E. ≥ 2.5
  - 8" MAXIMUM LIFTS
  - 95% COMPACTION
  - LOCAL MATERIAL MAY BE USED OUTSIDE OF SHOULDER
- DIMENSIONS AND MATERIALS SHOWN AS (\*) APPLY TO WATER LINE PIPE.

### SCHEDULE:

- 4" N.D. PIPE 10.79 LB/FT FILLED WITH CONCRETE.
- 1 1/4" N.D. PIPE 2.27 LBS/FT.
- ATTACH 6"x12" HIGH INTENSITY REFLECTIVE YELLOW PRESSURE-SENSITIVE SHEETING ONTO PIPE GATE, USE SCOTCHLITE 3811 OR EQUAL.

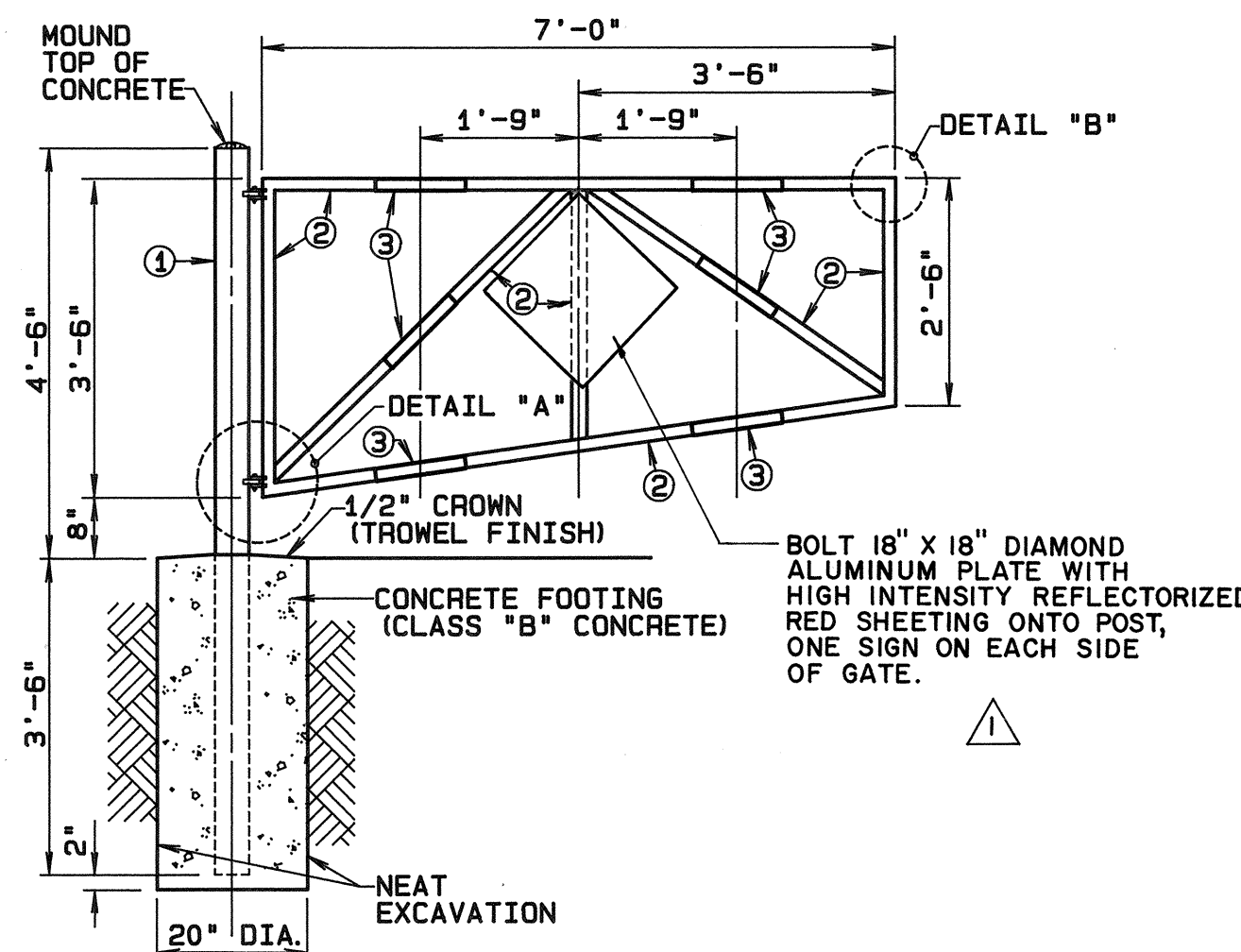
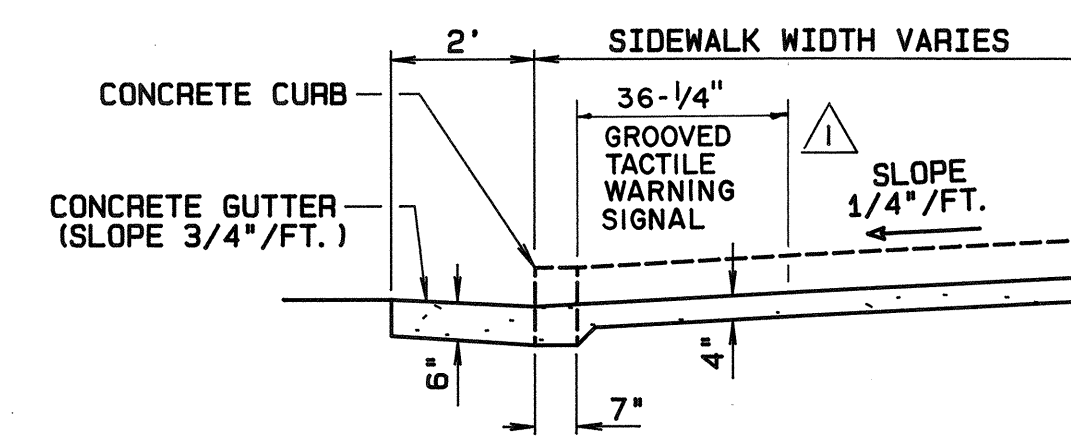
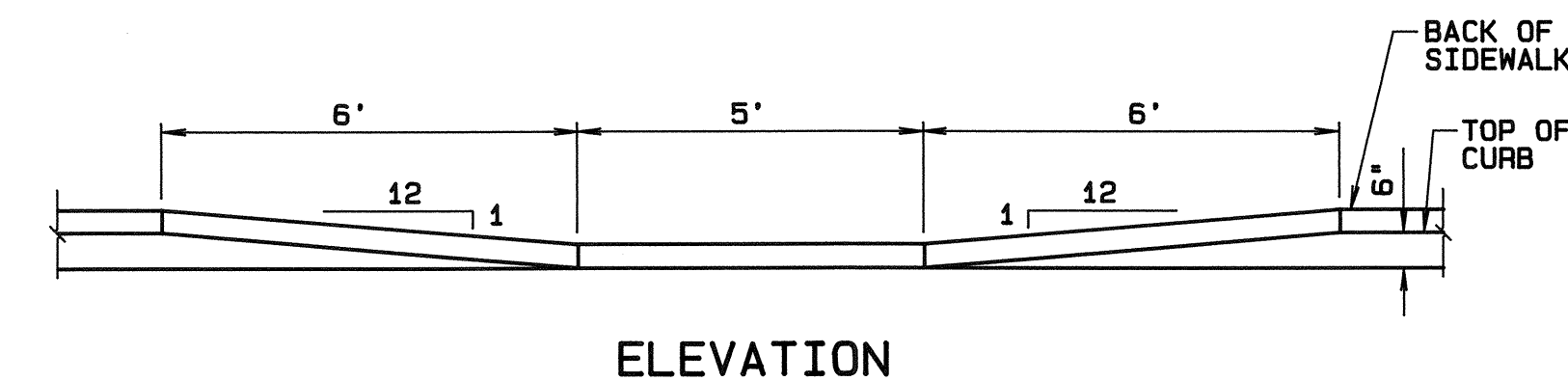
### NOTES:

- GATE HINGE BLADES SHALL BE CHAMFERED 1/32" ALL AROUND AND AS REQUIRED TO PREVENT CONFLICT BETWEEN MOVING PARTS.
- ALL PARTS OF GATES SHALL BE GALVANIZED AFTER FABRICATION.
- ALL HOLES SHALL BE REAMED AS NECESSARY TO ADMIT AS NECESSARY TO ADMIT HINGE BOLTS.



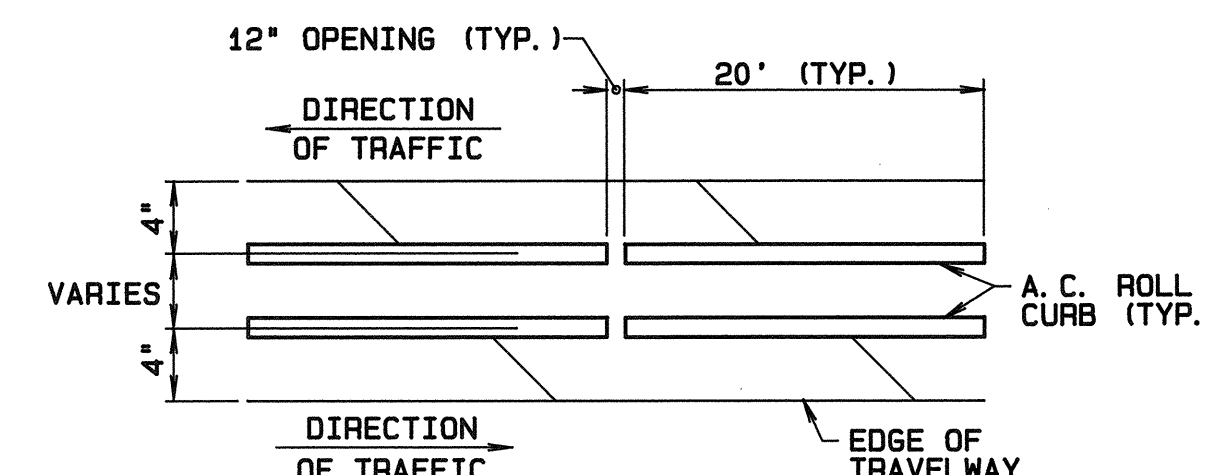
## MODIFIED TYPE "B" RAMP

SCALE: 3/8" = 1'-0"



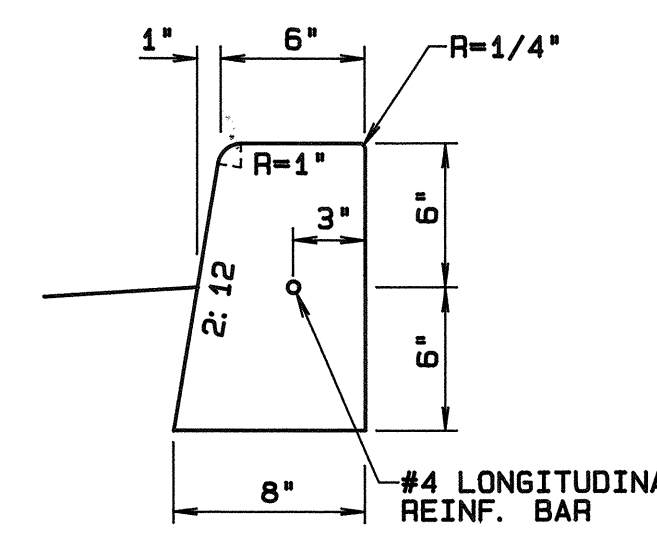
## ACCESS ROAD HALF VIEW 14' PIPE GATE

SCALE: 1/2"=1'-0"



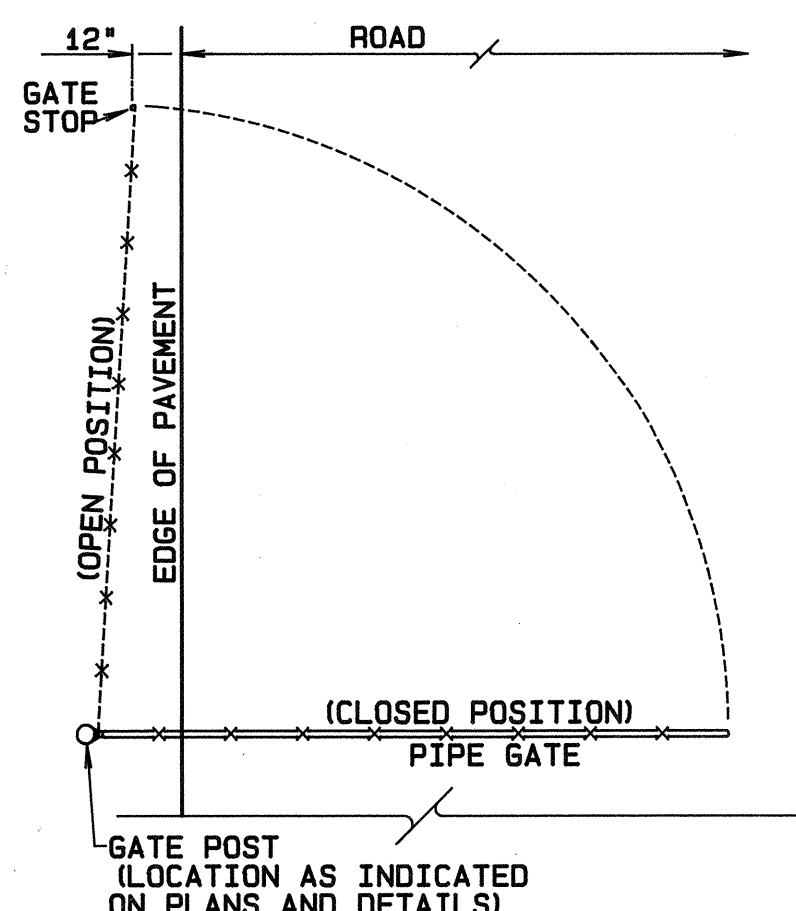
## A.C. ROLL CURB DETAIL

NOT TO SCALE



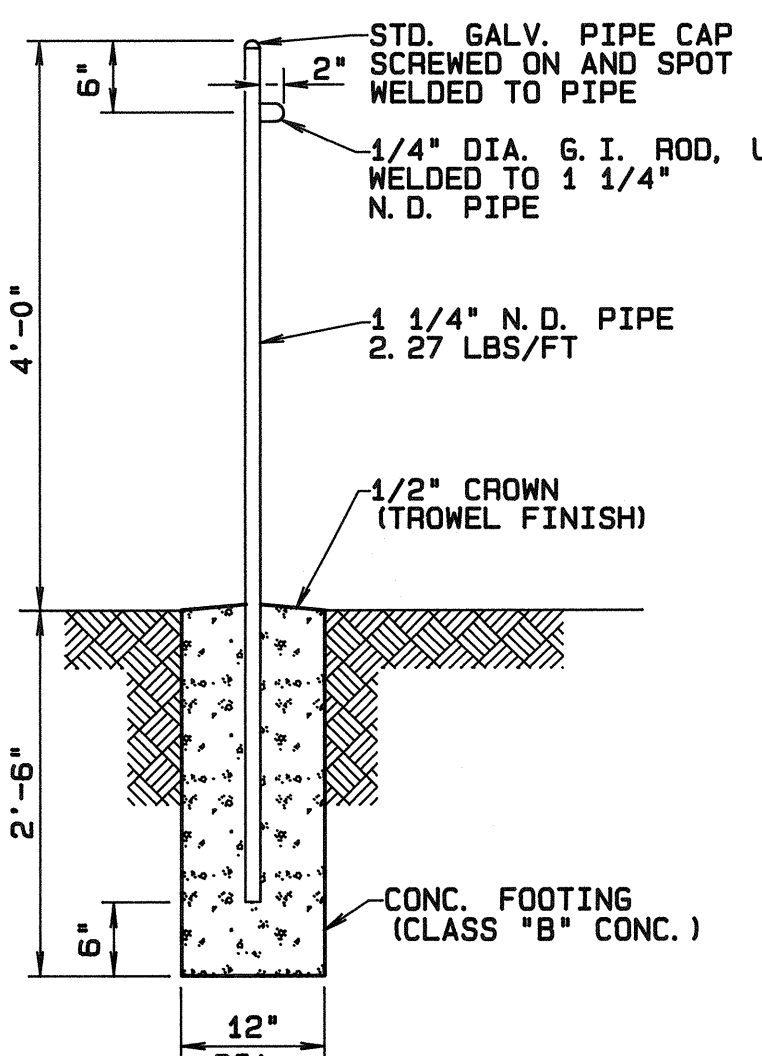
## CAST-IN-PLACE CONCRETE CURB

SCALE: 1 1/2"=1'-0"



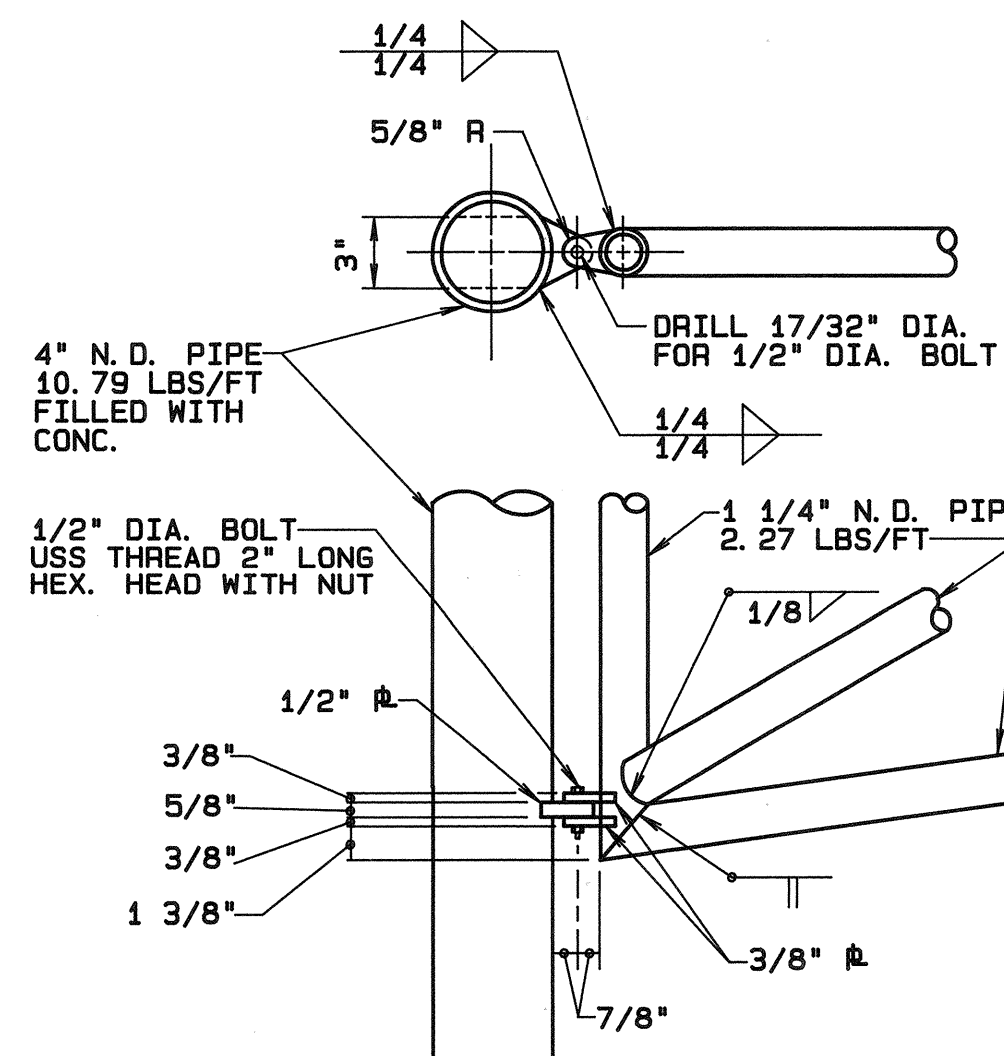
## HALF-VIEW PLAN

NOT TO SCALE



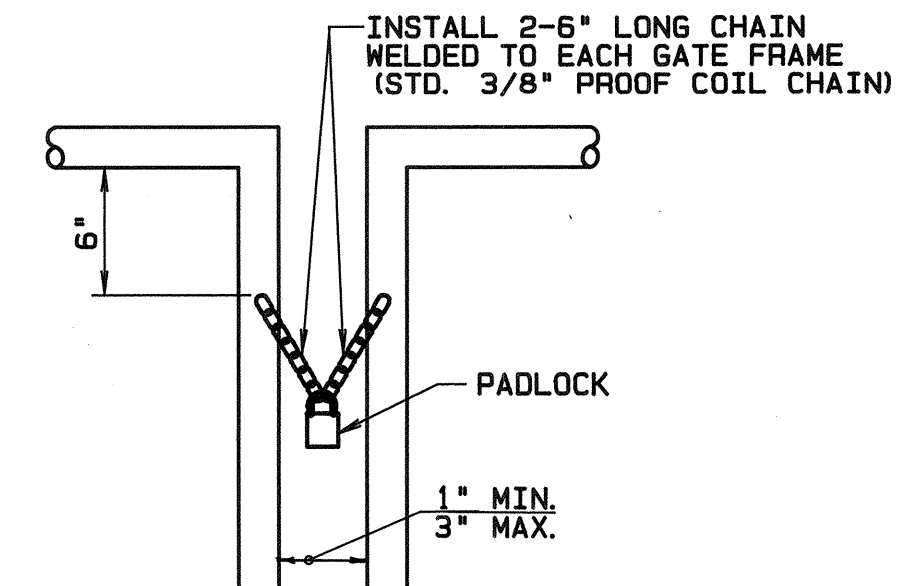
## GATE STOP

NOT TO SCALE



## DETAIL "A"

NOT TO SCALE



## DETAIL "B"

NOT TO SCALE

| Rev     | Date                              | Description | Eng | App |
|---------|-----------------------------------|-------------|-----|-----|
| 2/15/94 | ADDED SIGNS, REVISED RAMP PER DPW |             | AK  |     |

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

ALAN M. KATO  
LICENSED PROFESSIONAL ENGINEER  
No. 7552-C  
HAWAII, U.S.A.

PROJECT NO.190A-02-92

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Client:  
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STATE OF HAWAII  
VILLAGES OF LA'I OPUA  
BACKBONE INFRASTRUCTURE PHASE-2A

**MISCELLANEOUS DETAILS-4**

Designed by: AK Date: NOV 1993  
Drawn by: RS Proj. no.: (BCA) 841.0104  
Approved: \_\_\_\_\_  
Date: \_\_\_\_\_

CAD FILE 8410104\_2A.DTL5-NIS4