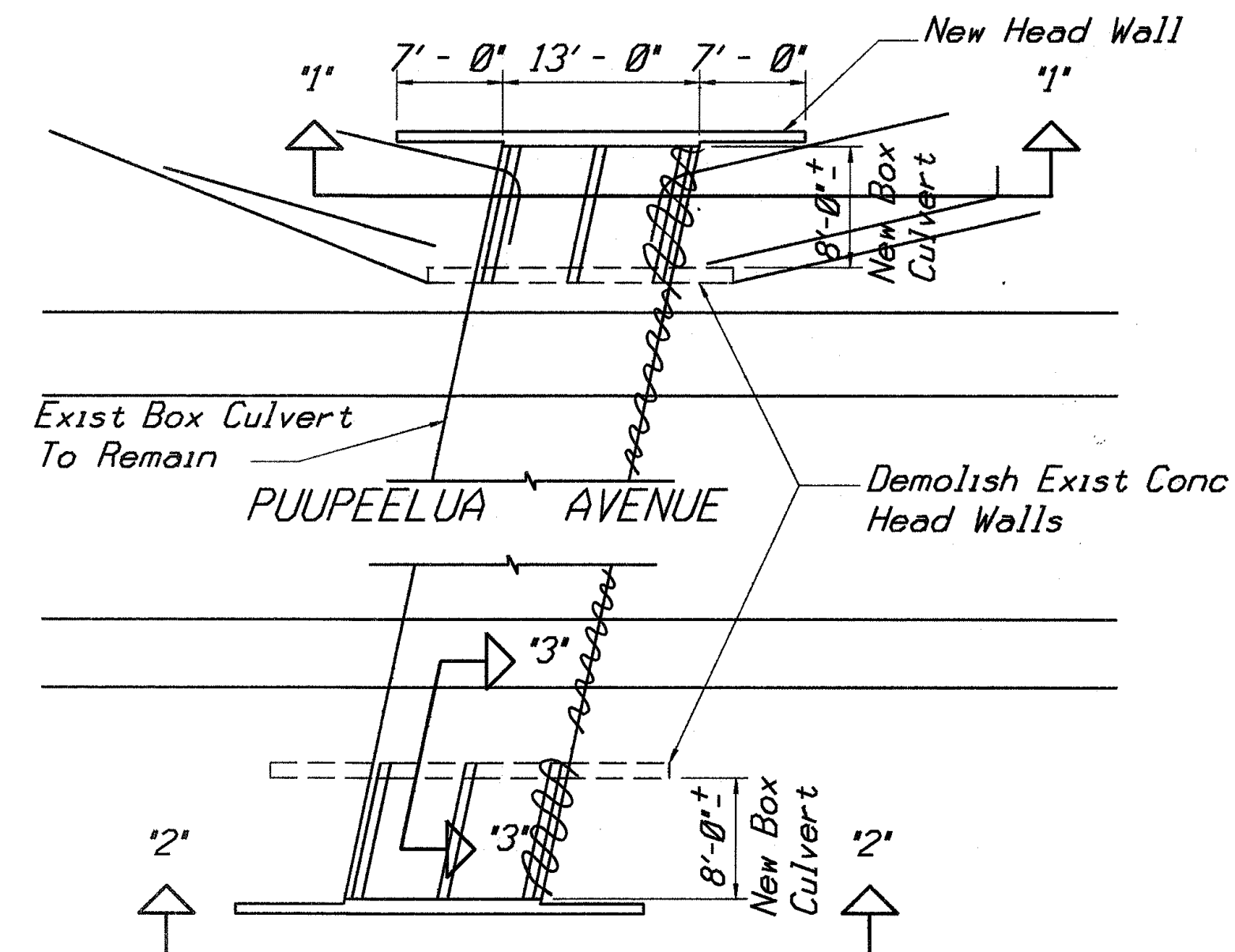
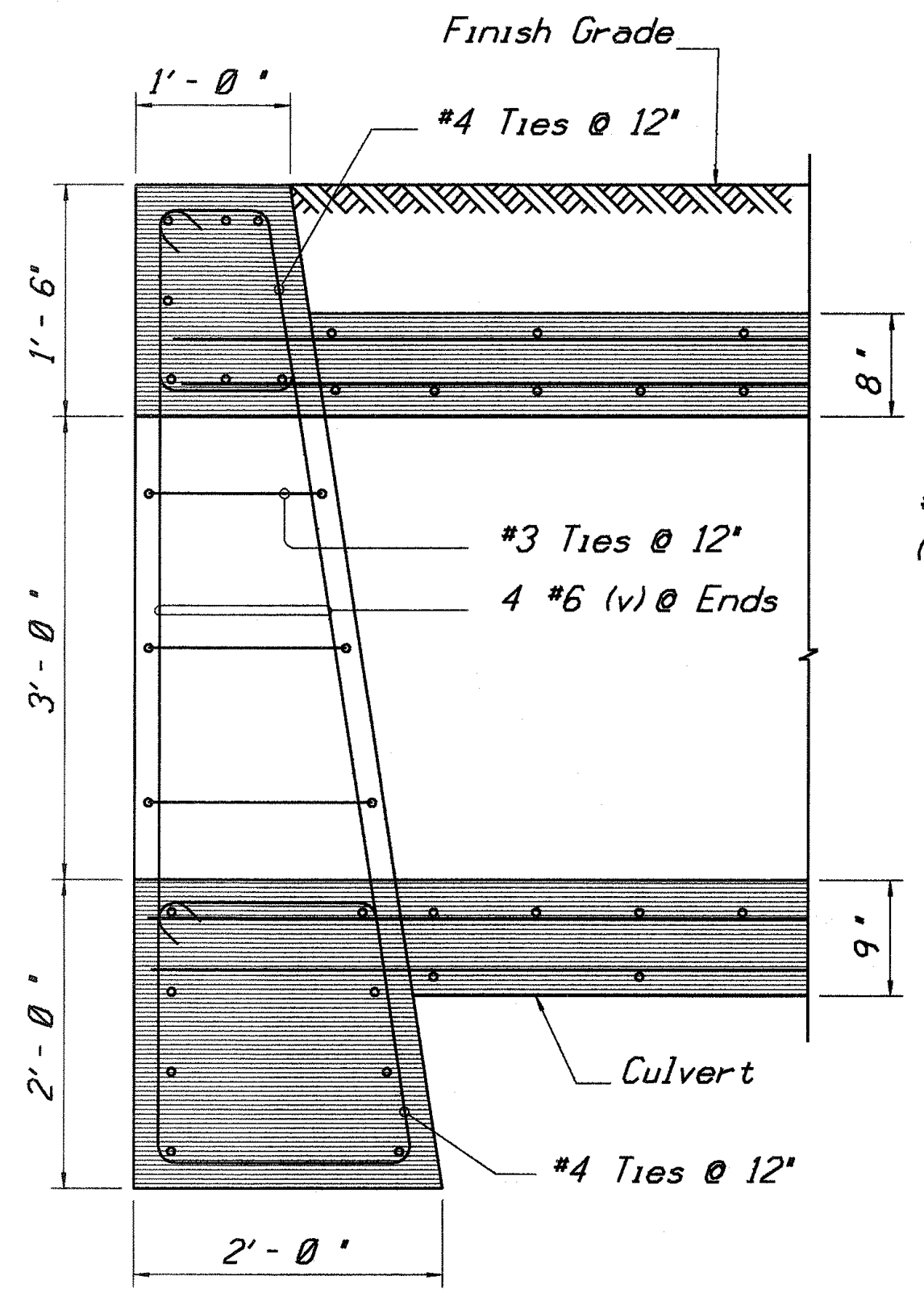


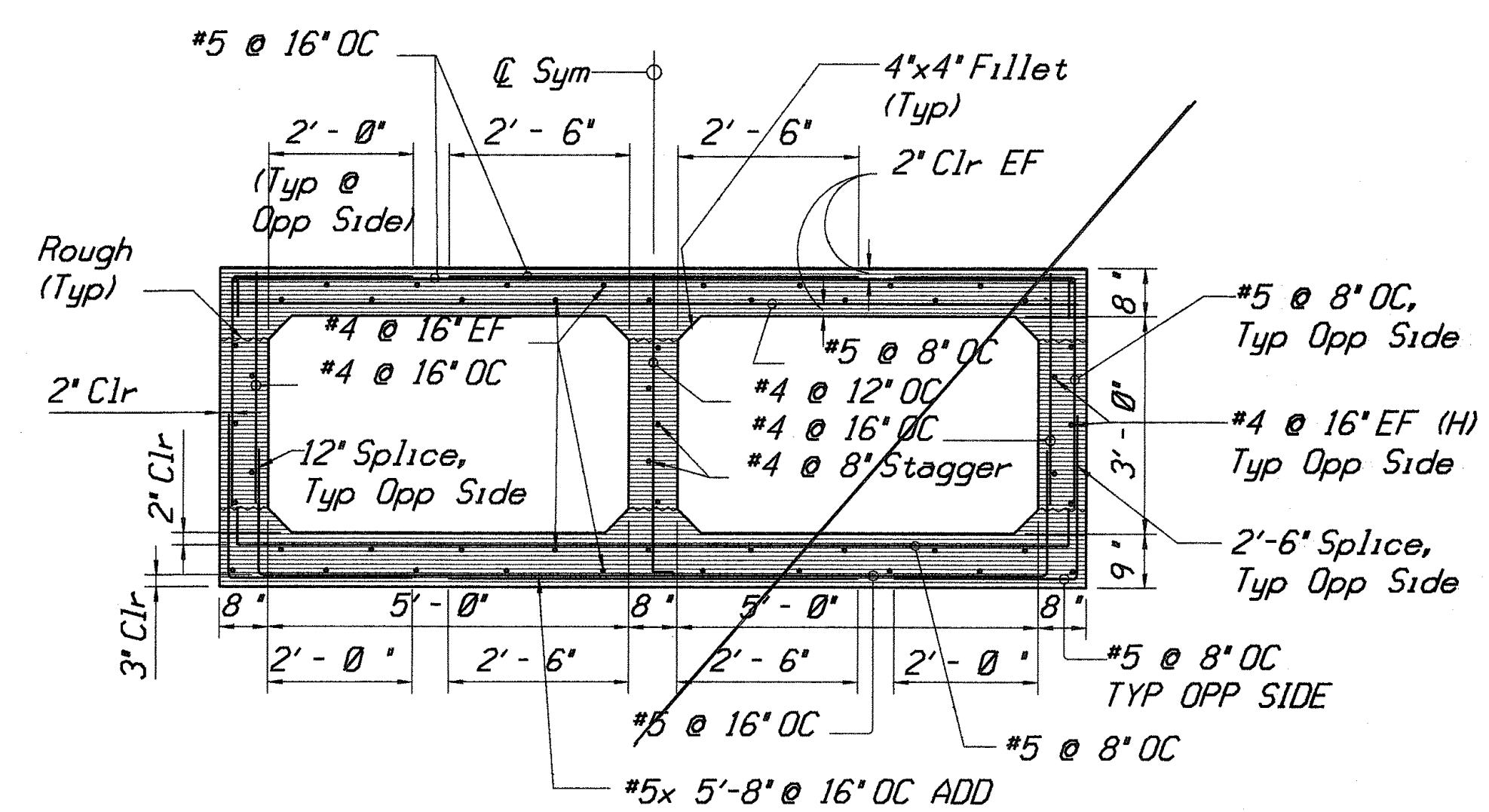
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP - 0480(2)	1998	23	43



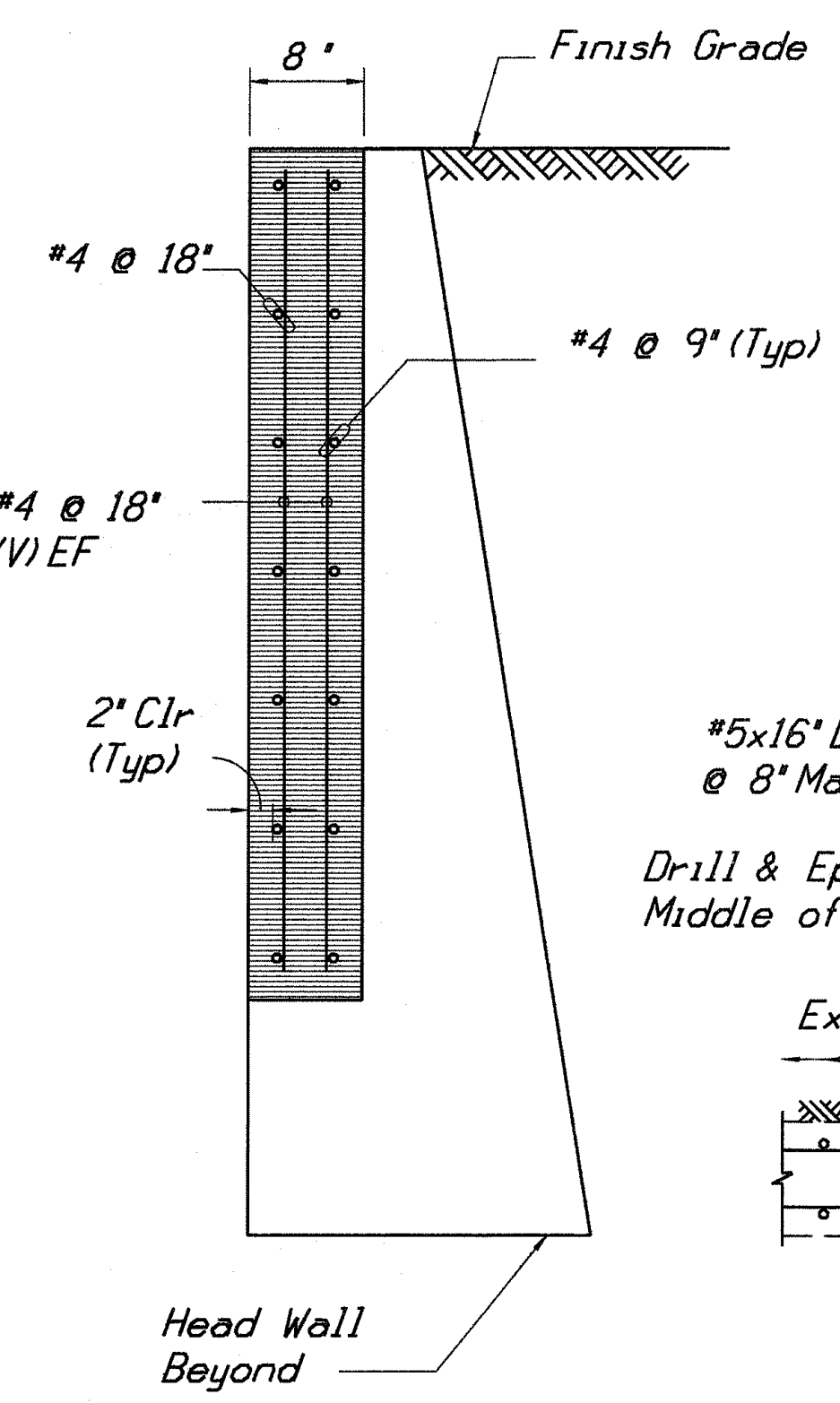
PLAN - EXTENSION OF
DUAL 5'x3' BOX CULVERT
1:10 = 1'-0"
SINGLE



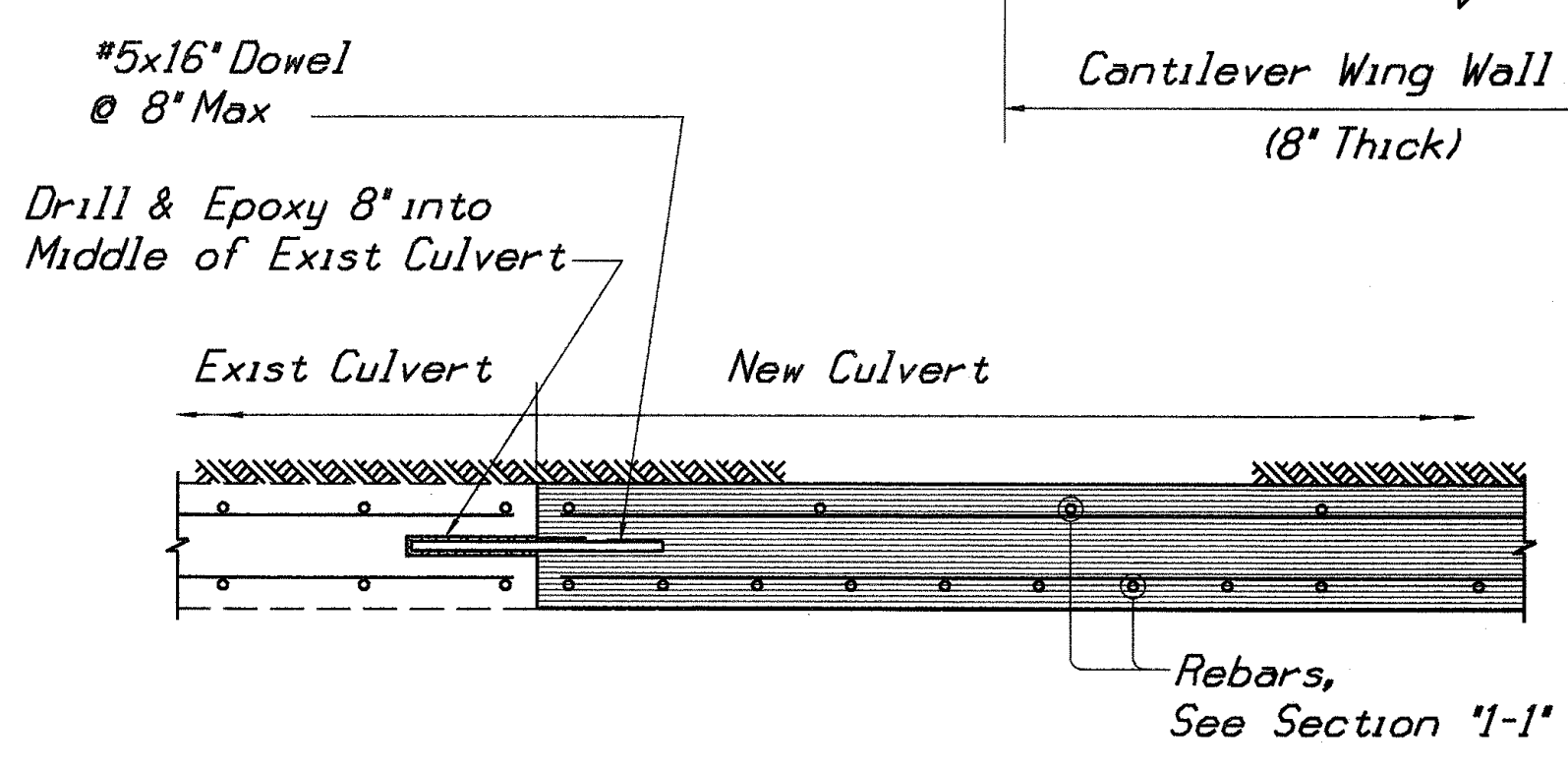
SECTION "4-4"
HEAD WALL
1' = 1'-0"



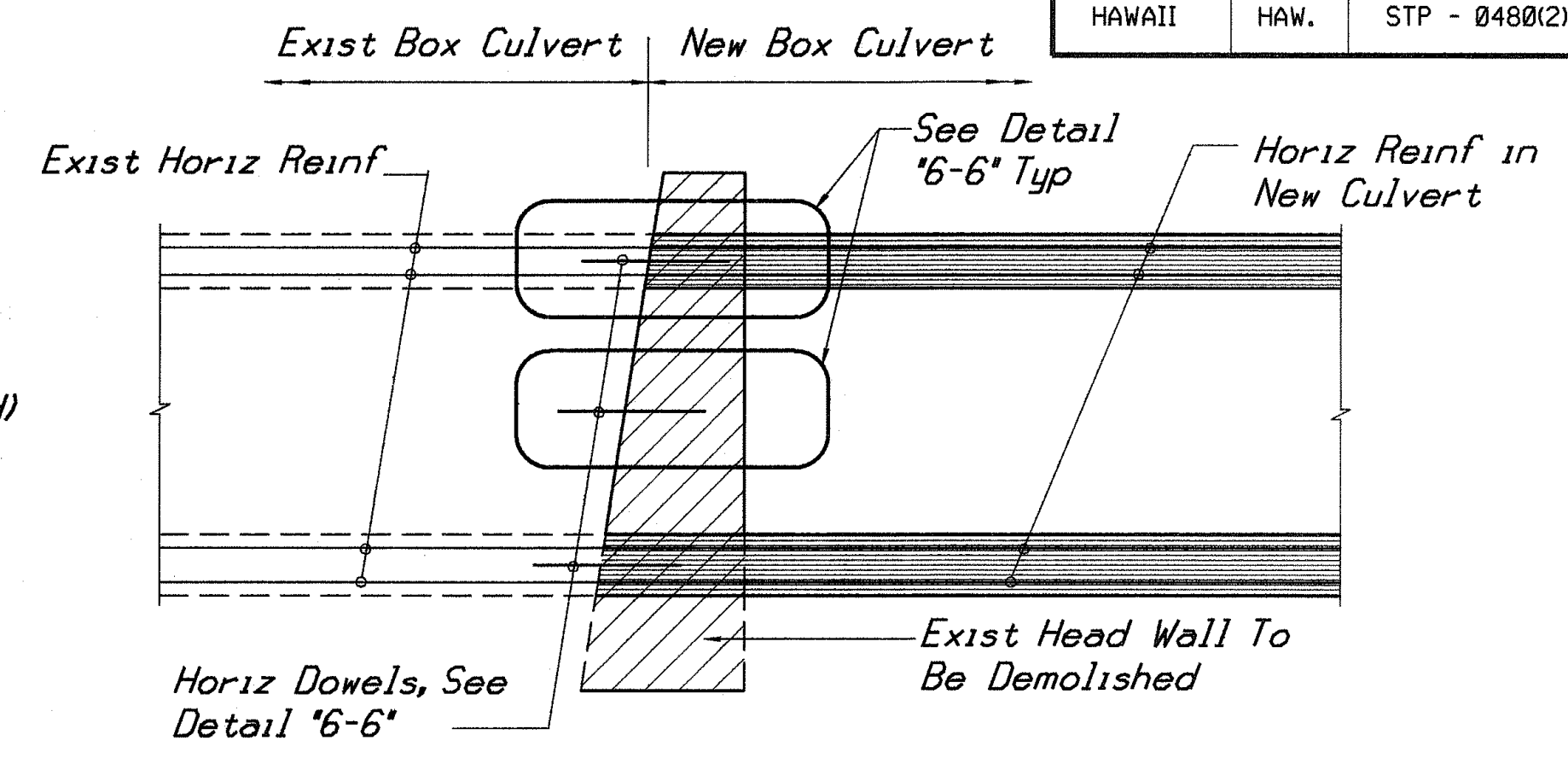
SECTION "1-1" SINGLE
3'x5' DUAL CONCRETE BOX CULVERT
1/2" = 1'-0"



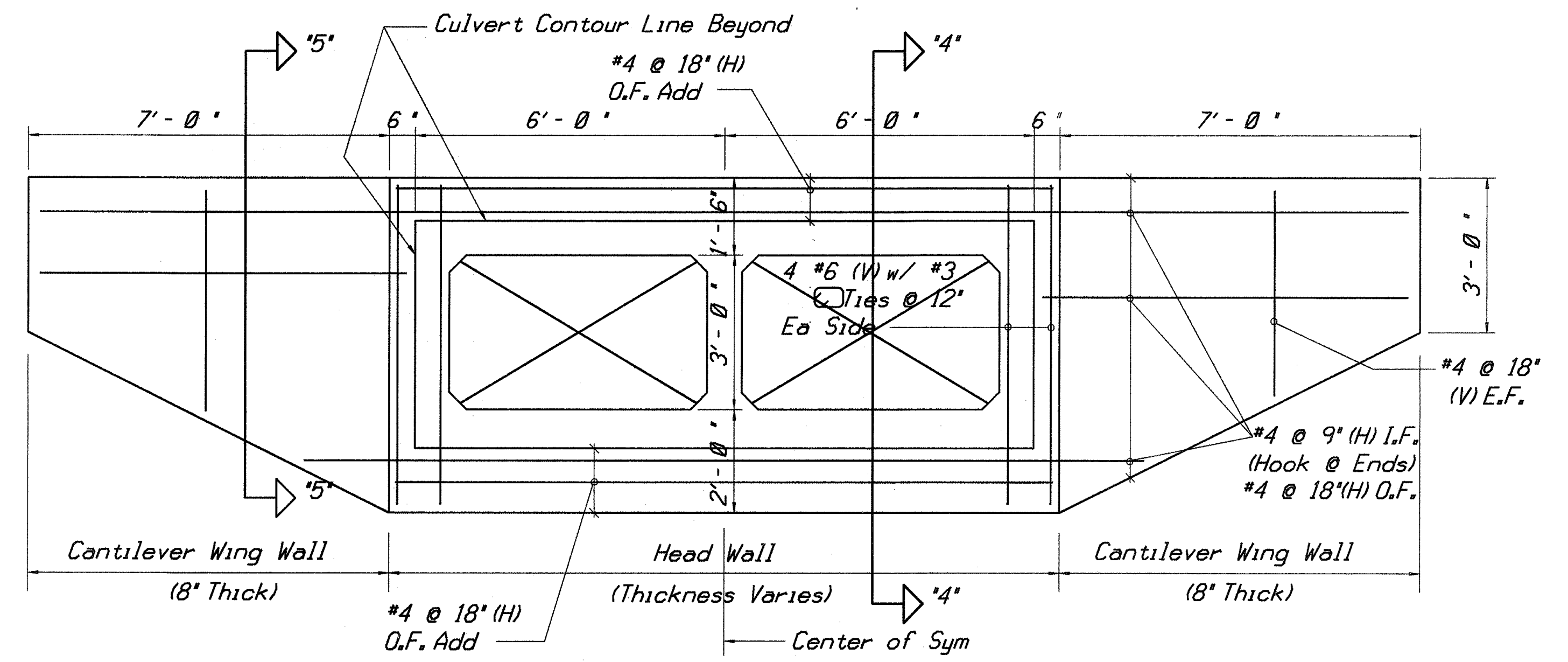
SECTION "5-5"
WING WALL
1' = 1'-0"



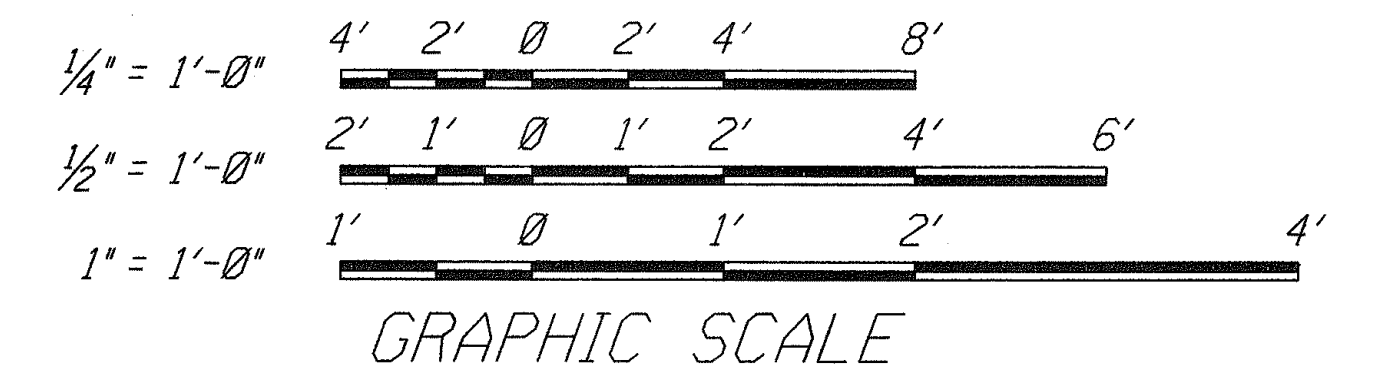
DETAIL "6-6"
EXIST/NEW BOX CULVERT CONNECTION
1' = 1'-0"



SECTION "3-3"
EXISTING/NEW DRAIN LINES CONNECTION
1/2" = 1'-0"



ELEVATION HEAD WALL "2-2"
1/2" = 1'-0"



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

BOX CULVERT EXTENSION AND HEADWALL DETAILS FOR DUAL 5'x3' BOX CULVERT

DAVID M. YAMAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 1399-S
HAWAII, U.S.A.

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SATO & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

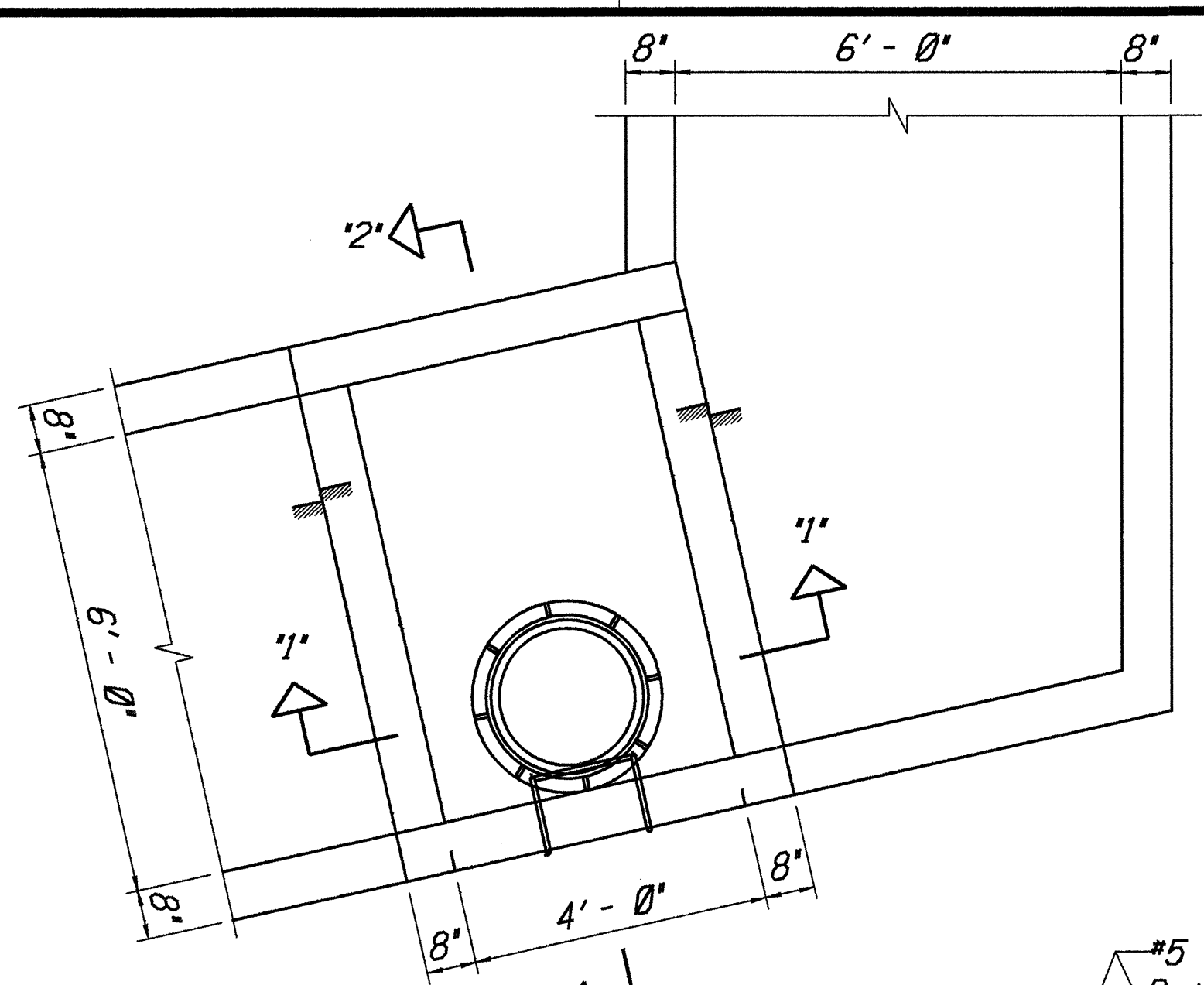
DRAINAGE DETAILS

Puupeeelua Avenue Resurfacing
Maunaloa Highway to Farrington Avenue
And
FARRINGTON AVENUE RESURFACING
Puupeeelua Avenue to Kalae Highway
Federal - Aid Project No. STP - 0480(2)

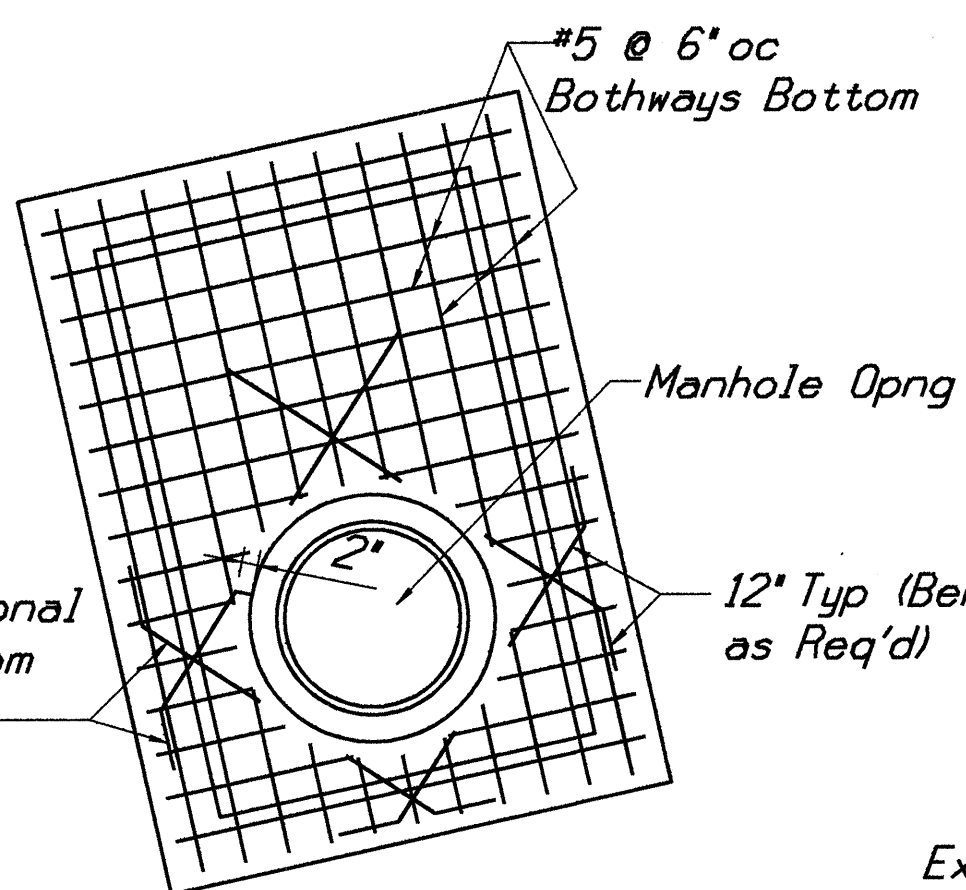
SCALE: AS NOTED DATE: MARCH 1998

SHEET No. 1 OF 4 SHEETS

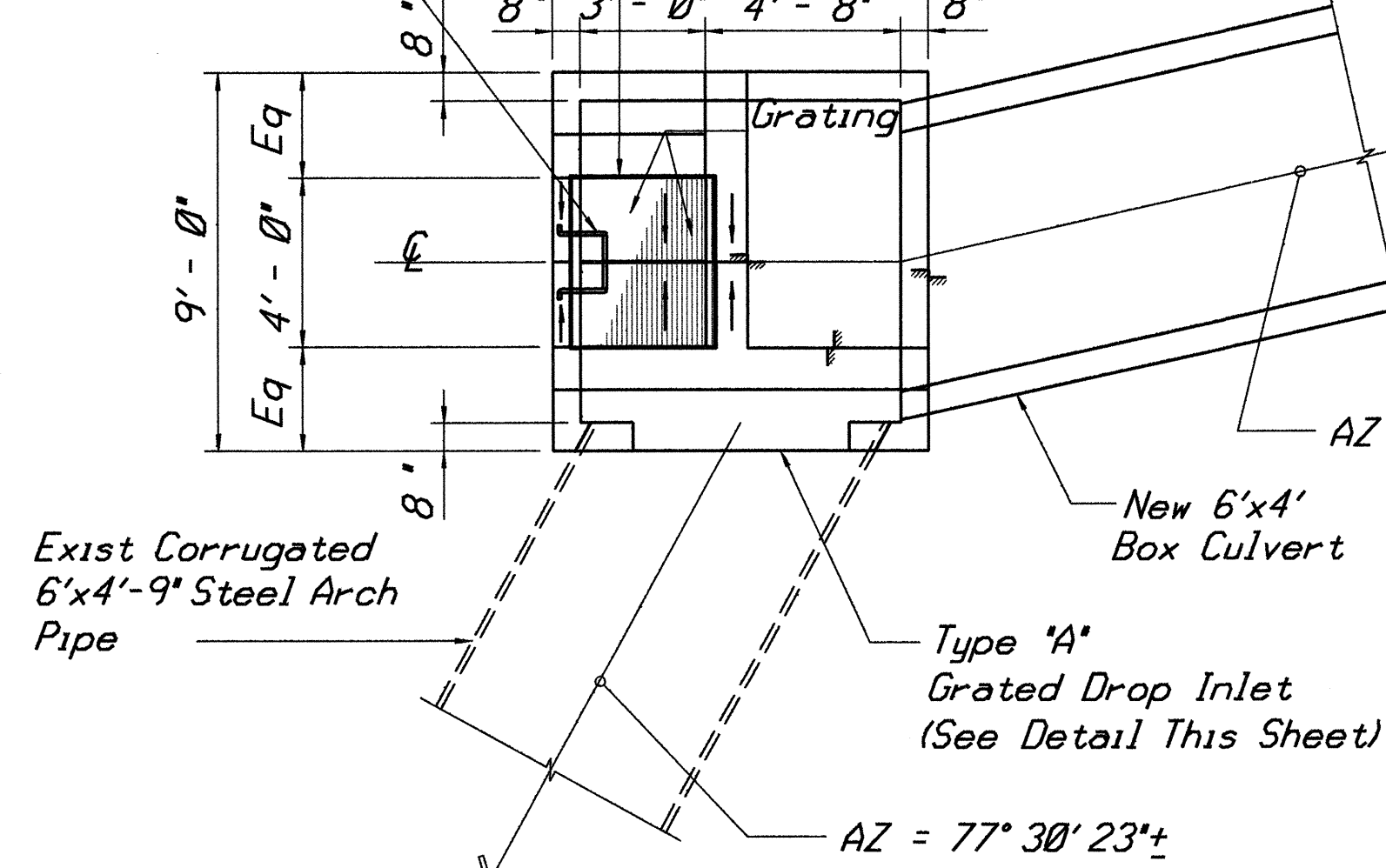
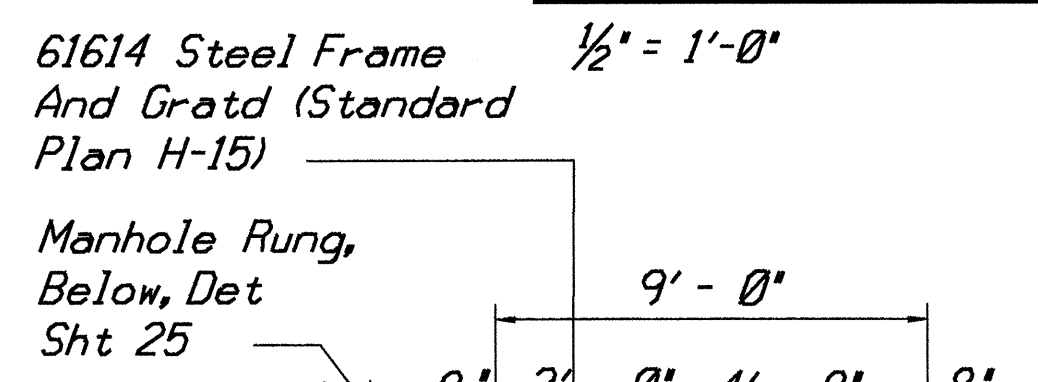
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP - 0480(2)	1998	24	43



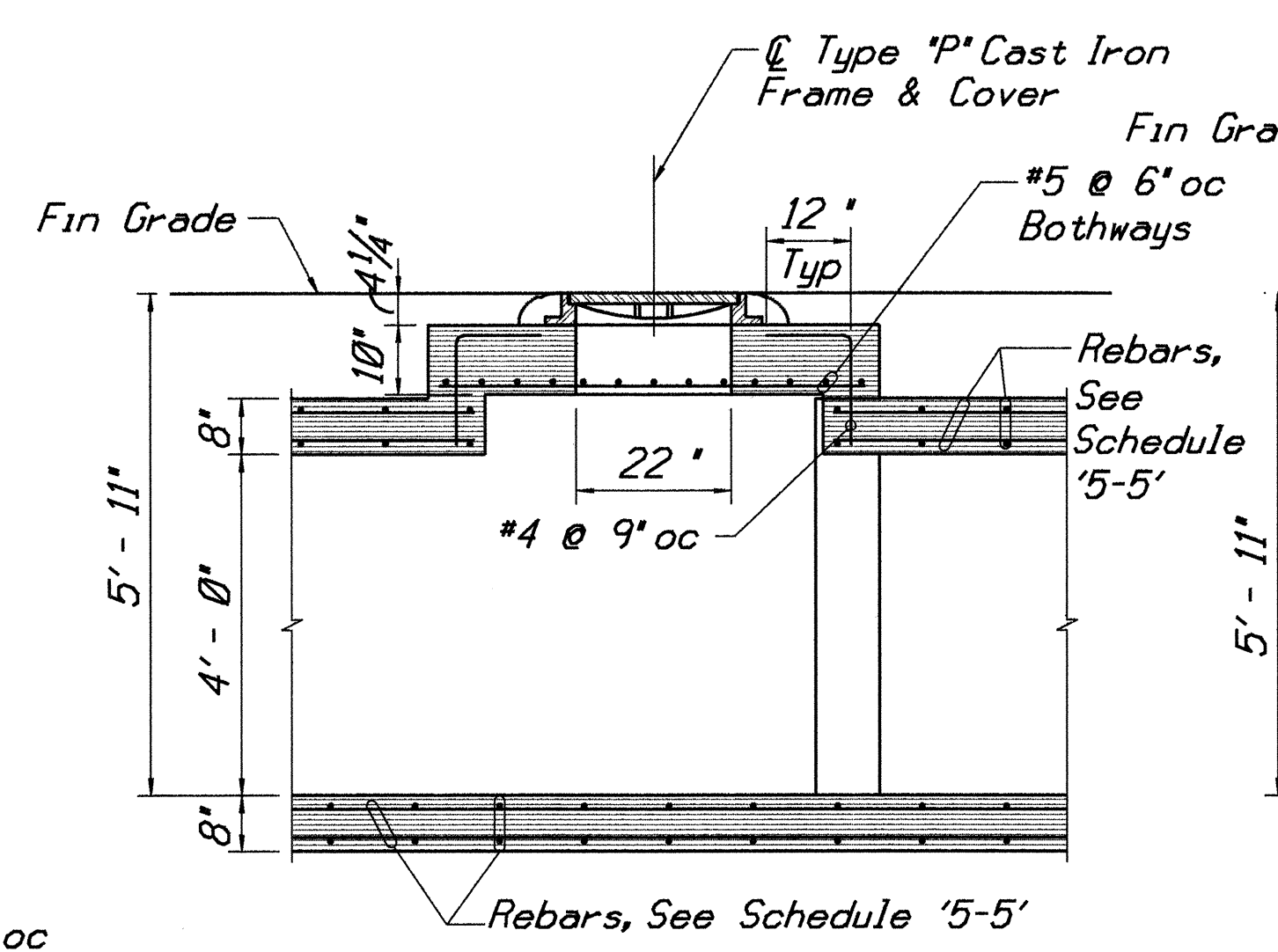
PLAN VIEW
TYPE "1" SDMH
1/2" = 1'-0"



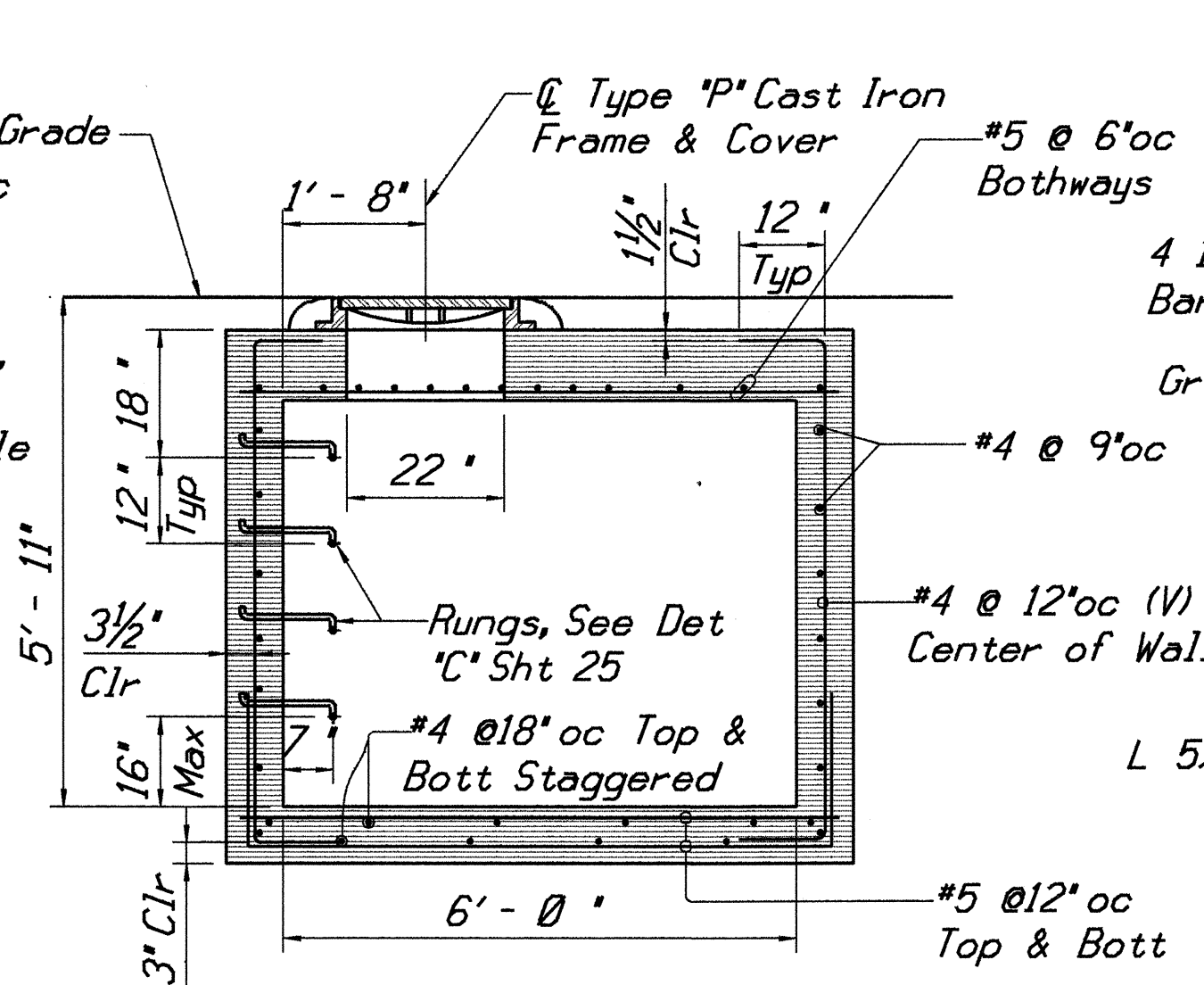
PLAN, TOP SLAB REINFORCING
TYPE "1" SDMH
1/2" = 1'-0"



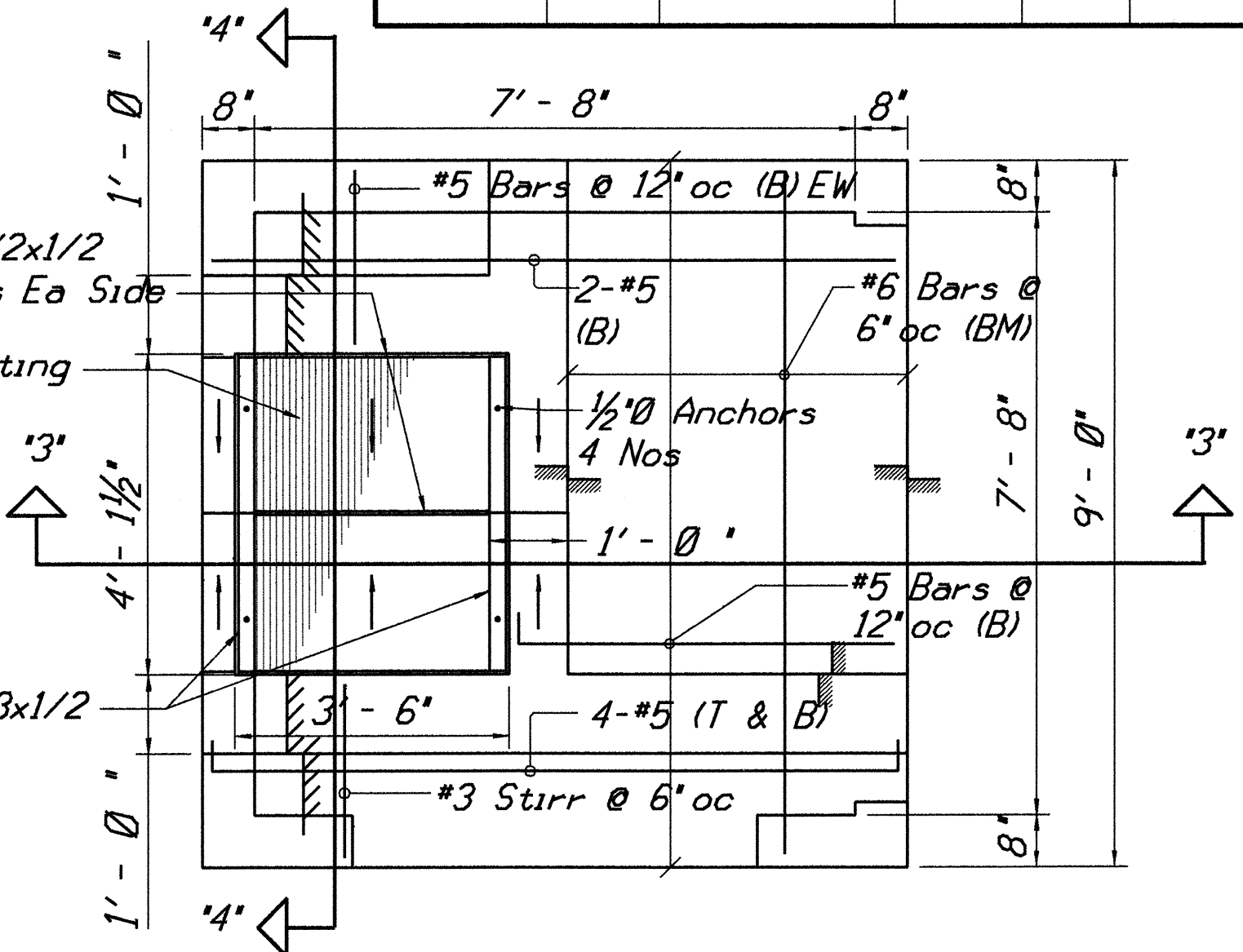
OVERALL PLAN DRAINLINE "B"
1/4" = 1'-0"



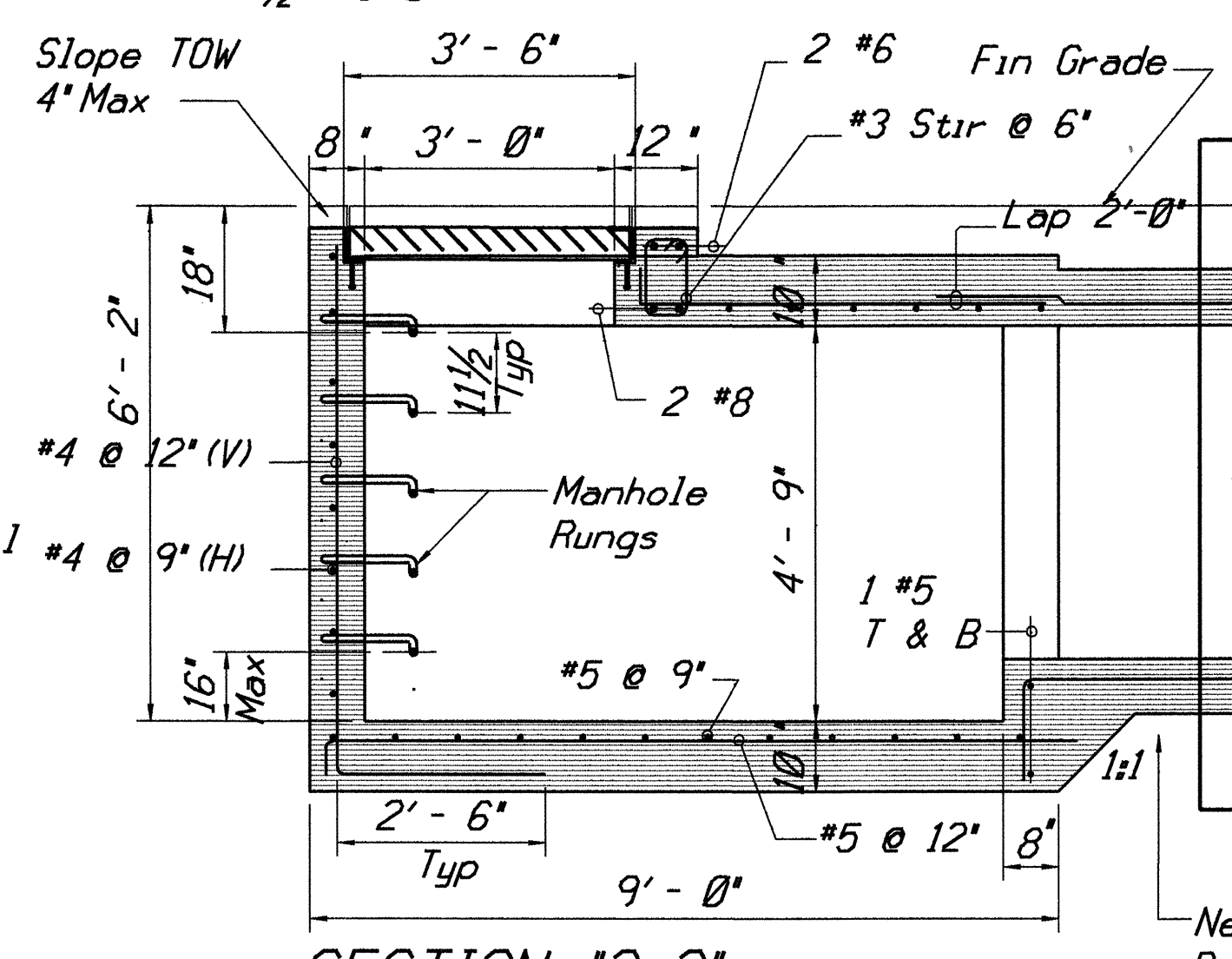
SECTION "1-1"
TYPE "1" SDMH
1/2" = 1'-0"



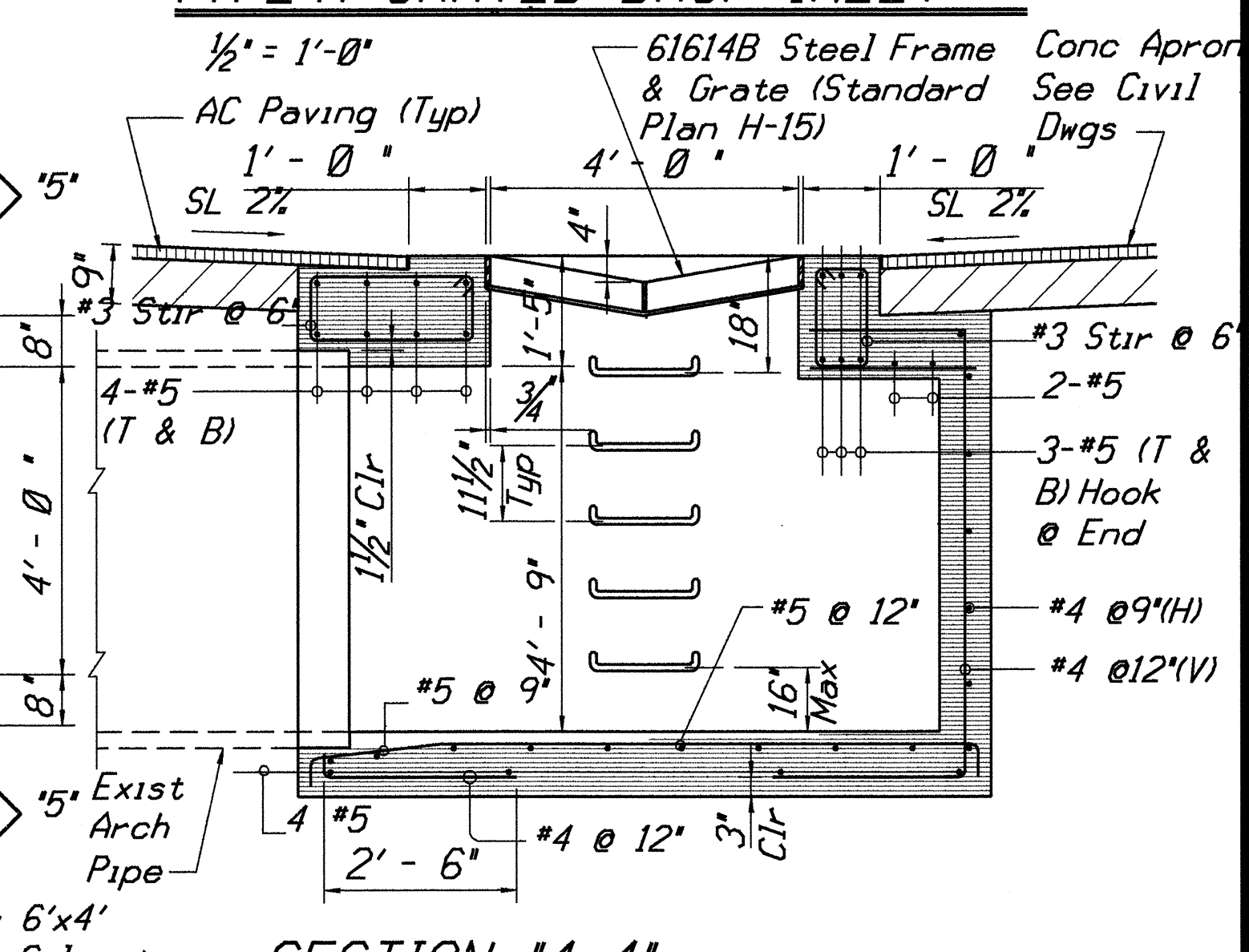
SECTION "2-2"
TYPE "1" SDMH
1/2" = 1'-0"



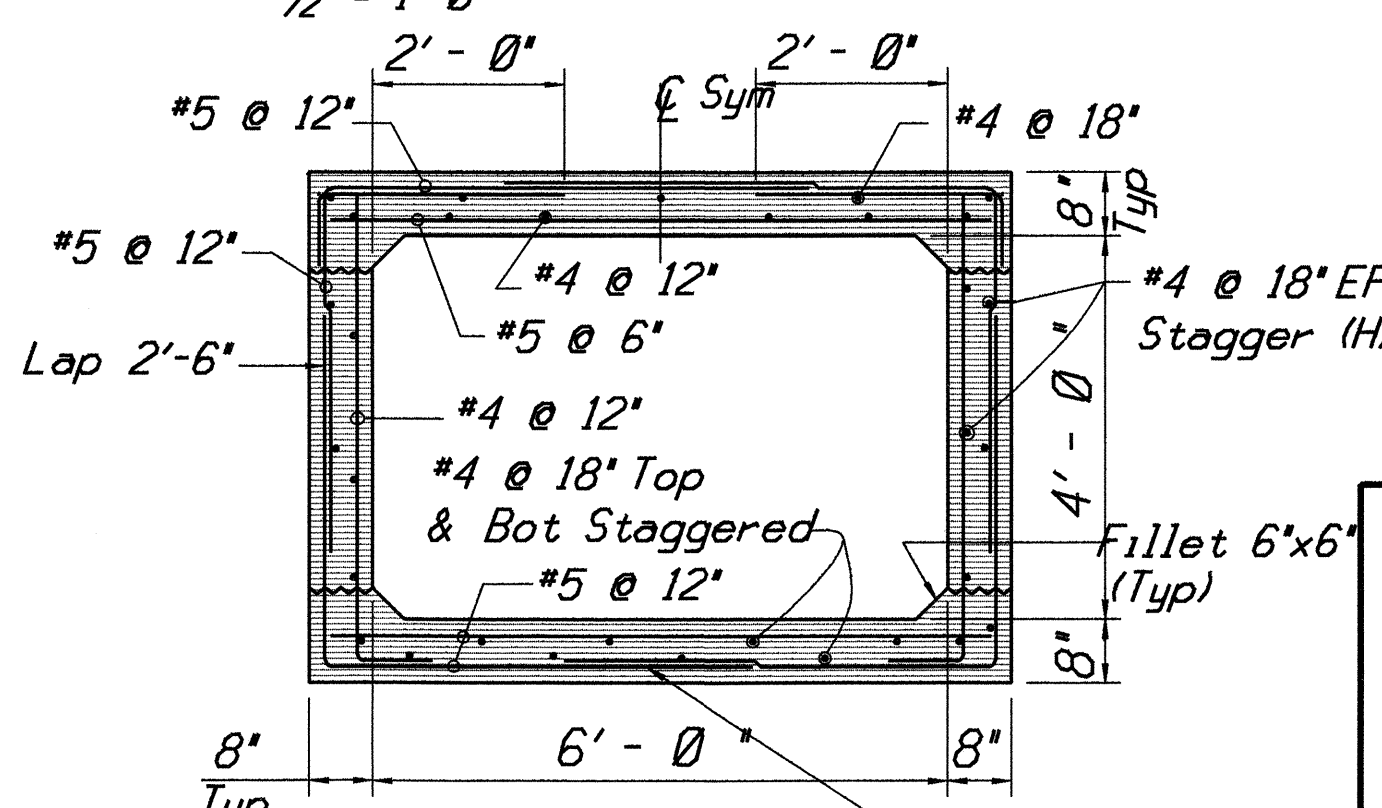
TOP SLAB REINFORCING
TYPE "A" GRATED DROP INLET
1/2" = 1'-0"



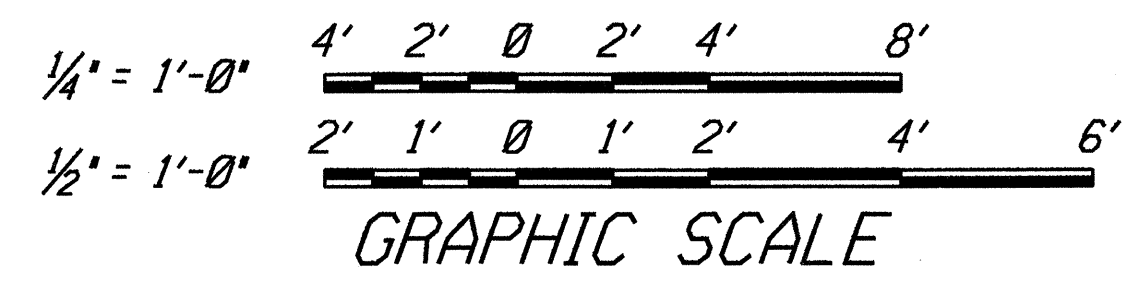
SECTION "3-3"
TYPE "A" GRATED DROP INLET
1/2" = 1'-0"



SECTION "4-4"
TYPE "A" GRATED DROP INLET
1/2" = 1'-0"



SECTION "5-5"
SINGLE CELL BOX CULVERT
1/2" = 1'-0"



DAVID M. YAMAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 1399-S
HAWAII, U.S.A.

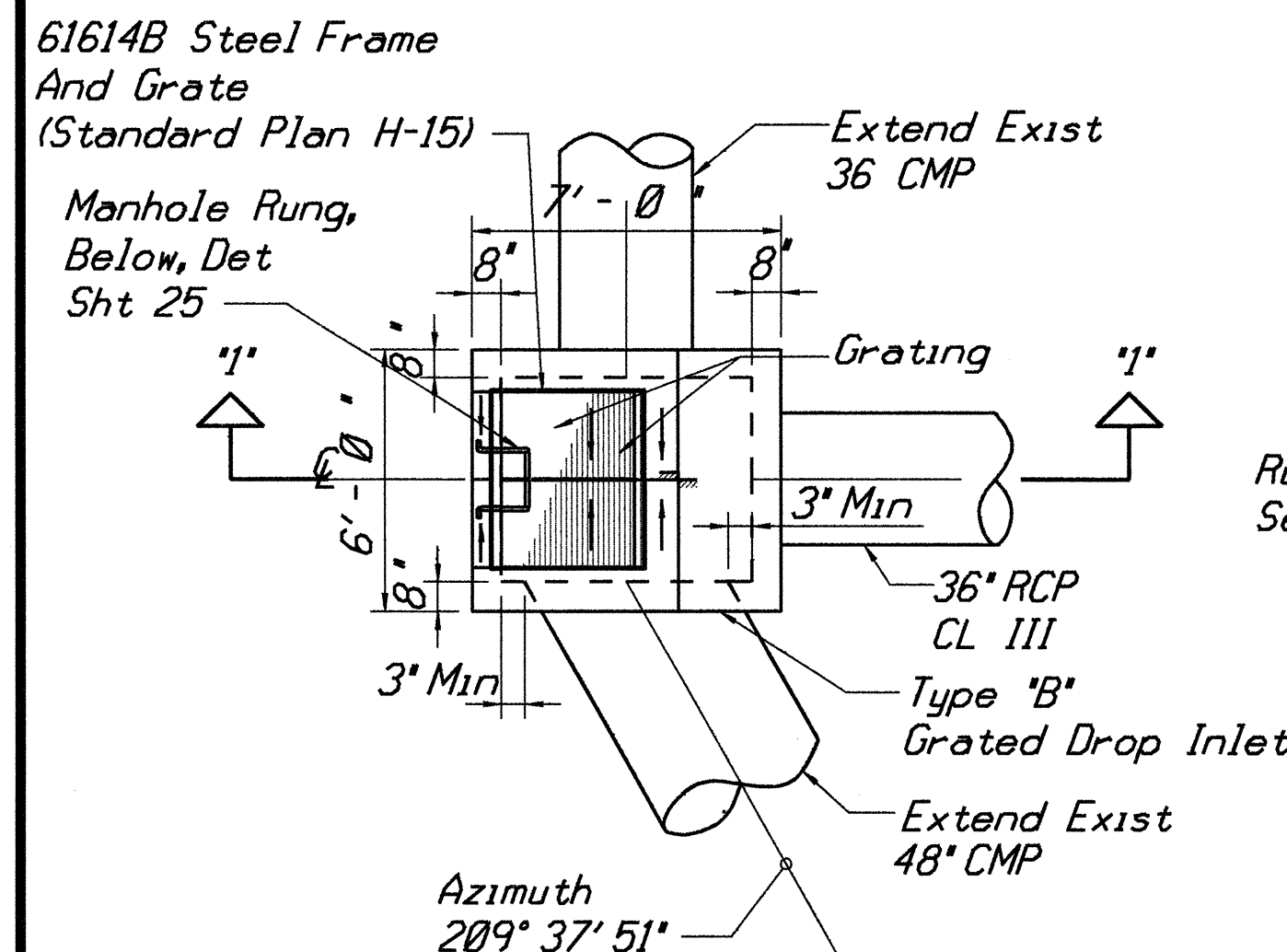
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SATO & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
PULPEELUA AVENUE RESURFACING
Maunaloa Highway to Farrington Avenue
And
FARRINGTON AVENUE RESURFACING
Puuepelua Avenue to Kalae Highway
Federal - Aid Project No. STP - 0480(2)

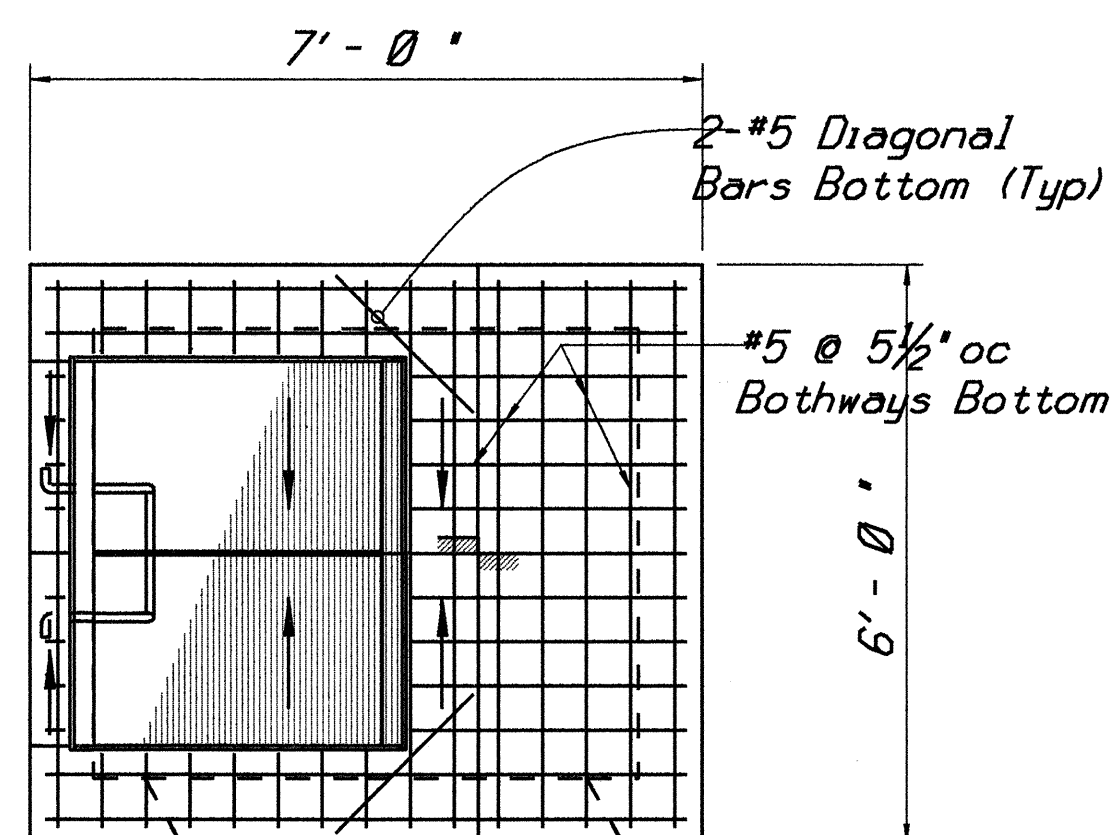
SCALE: AS NOTED
DATE: MARCH 1998
SHEET No. 2 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP - 0480(2)	1998	25	43



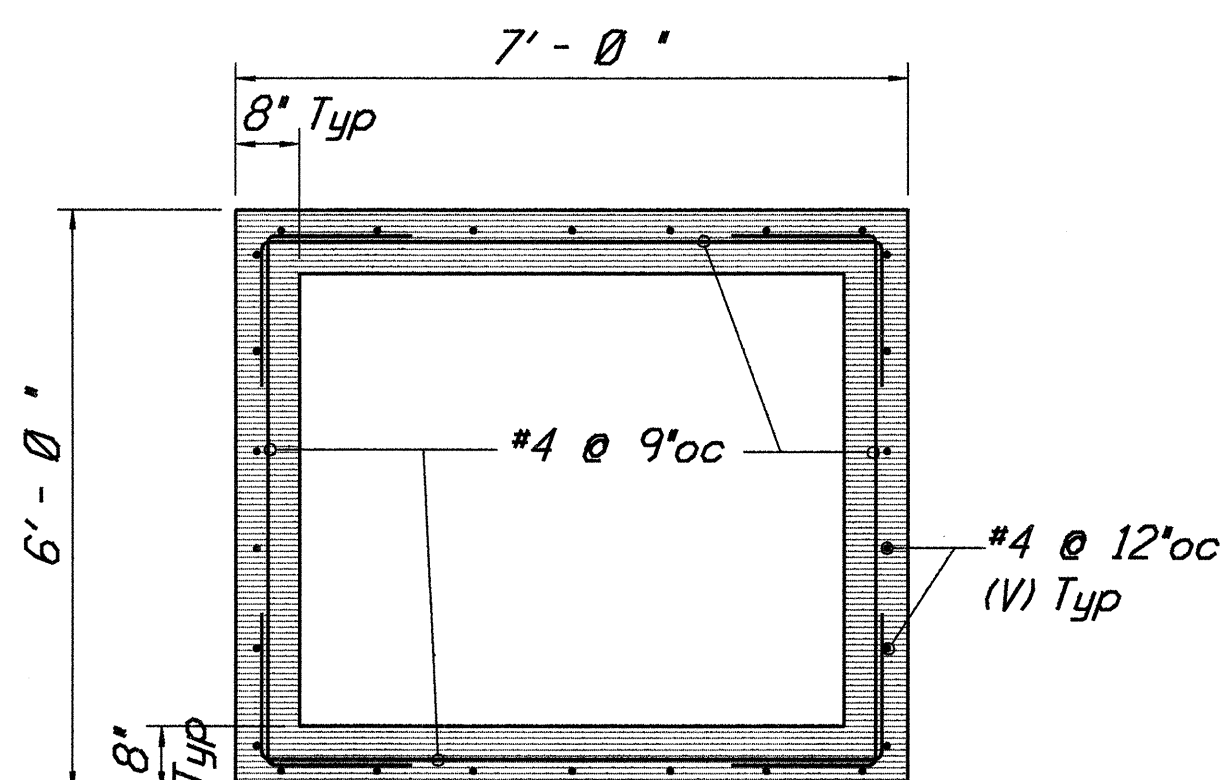
PLAN VIEW
TYPE "B" GRATED DROP INLET DETAILS

1/4" = 1'-0"



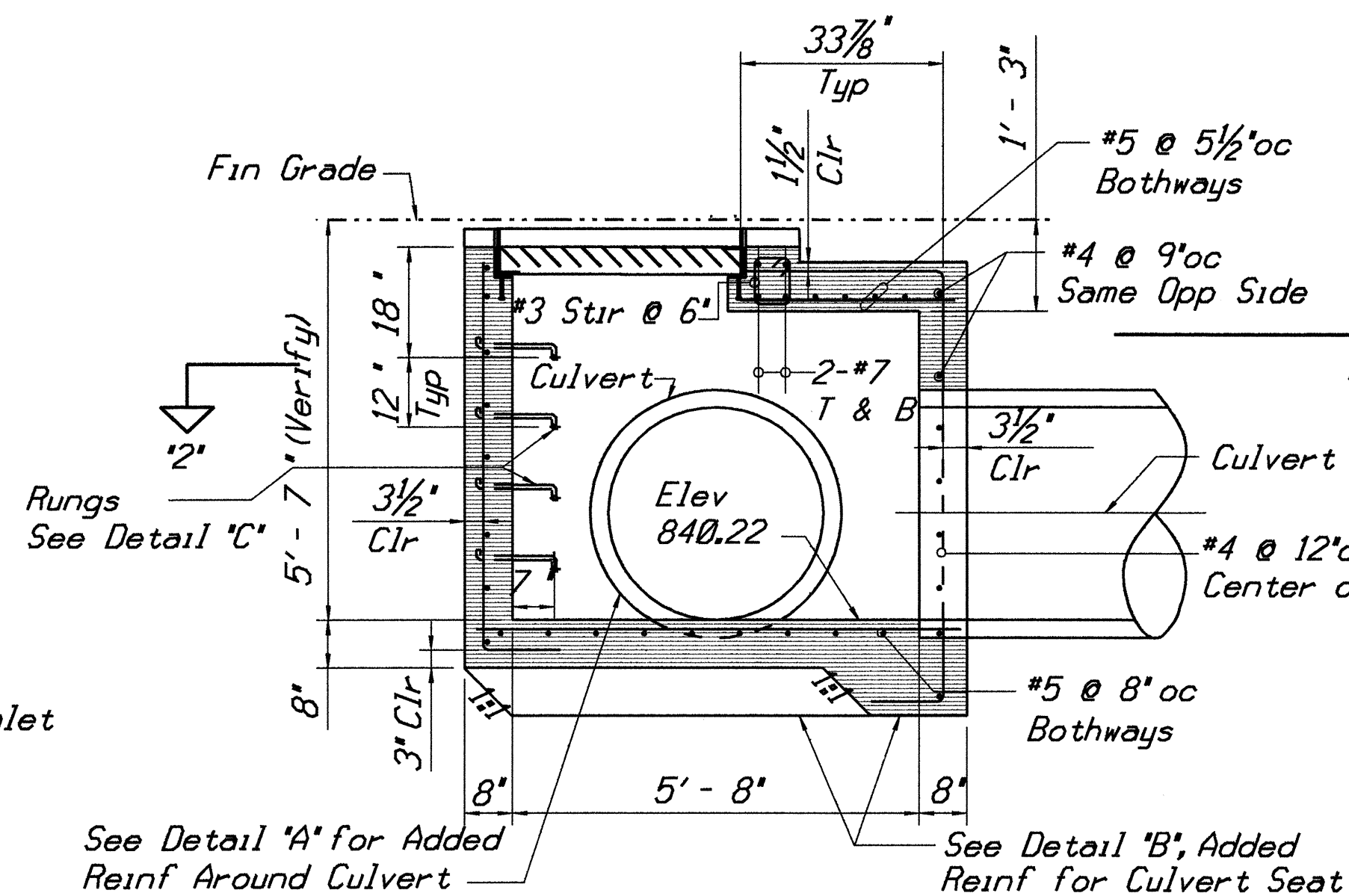
PLAN, TOP SLAB REINFORCING STORM
TYPE "B" GRATED DROP INLET DETAILS

1/2" = 1'-0"



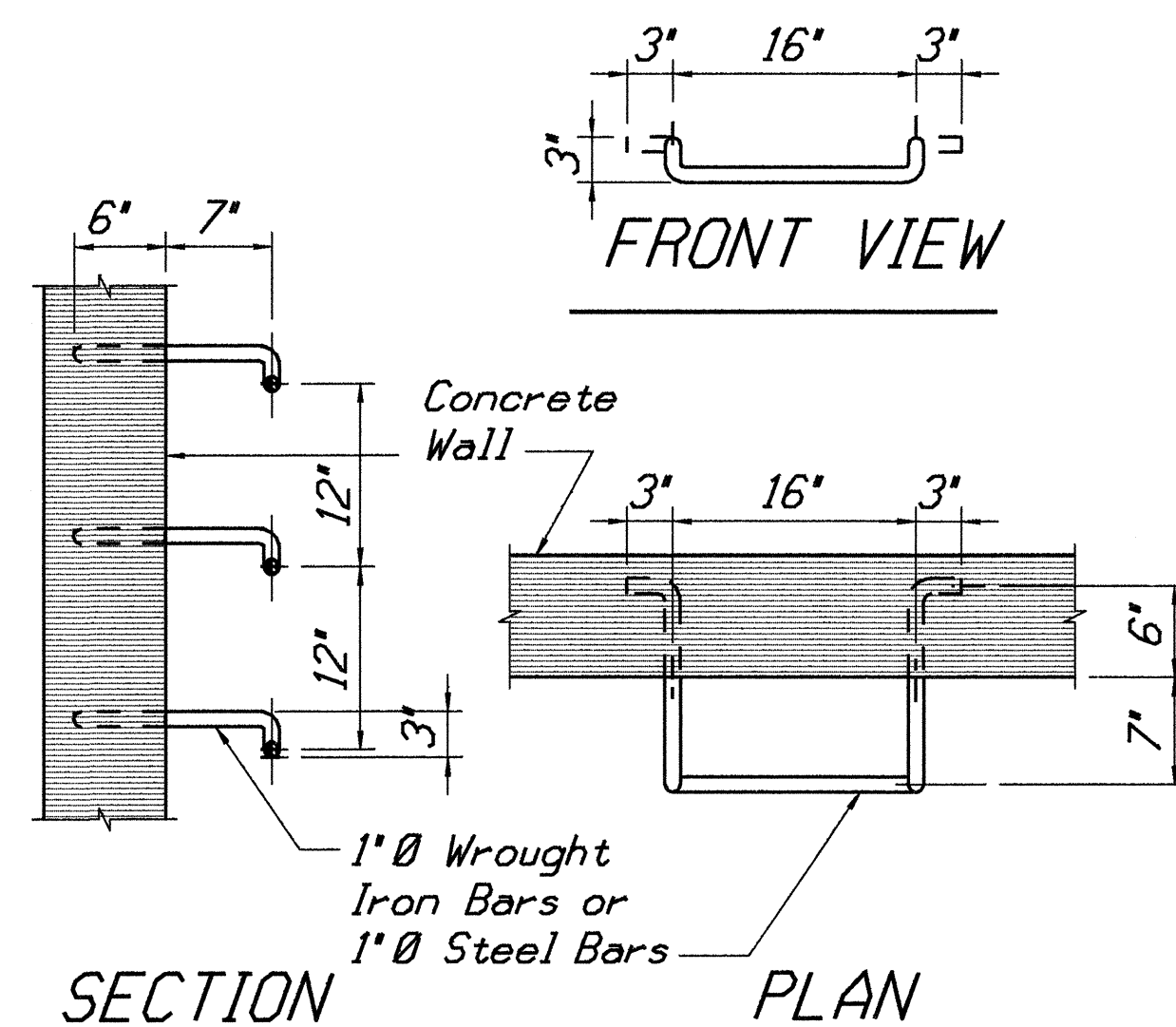
SECTION "2-2" THROUGH WALLS
TYPE "B" GRATED DROP INLET DETAILS

1/2" = 1'-0"



SECTION "1-1" TYPE "B"
GRATED DROP INLET DETAILS

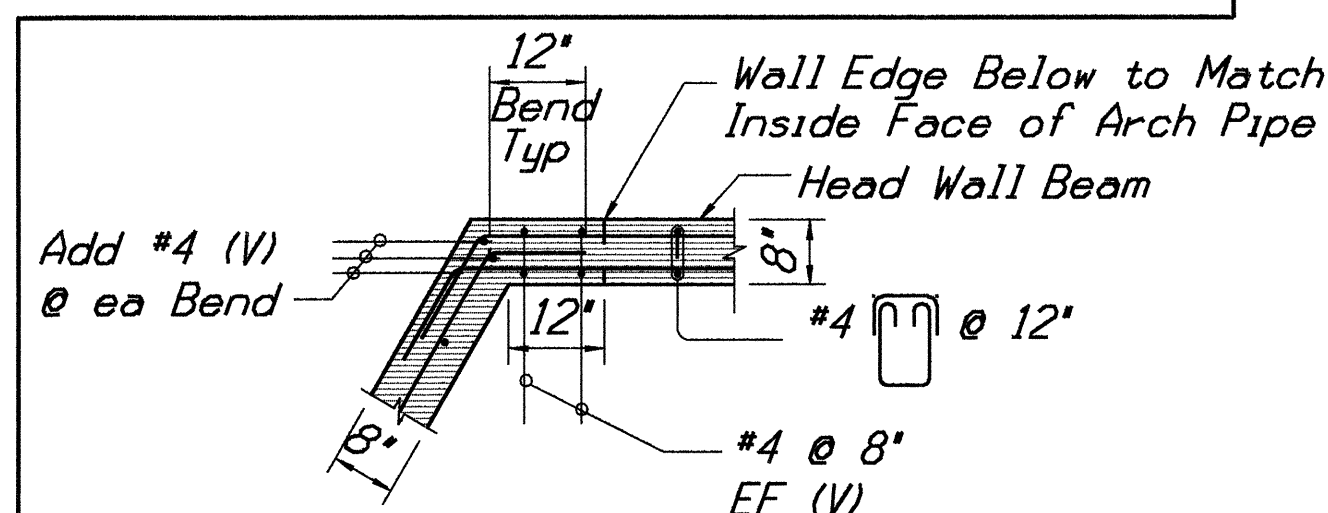
1/2" = 1'-0"



SECTION

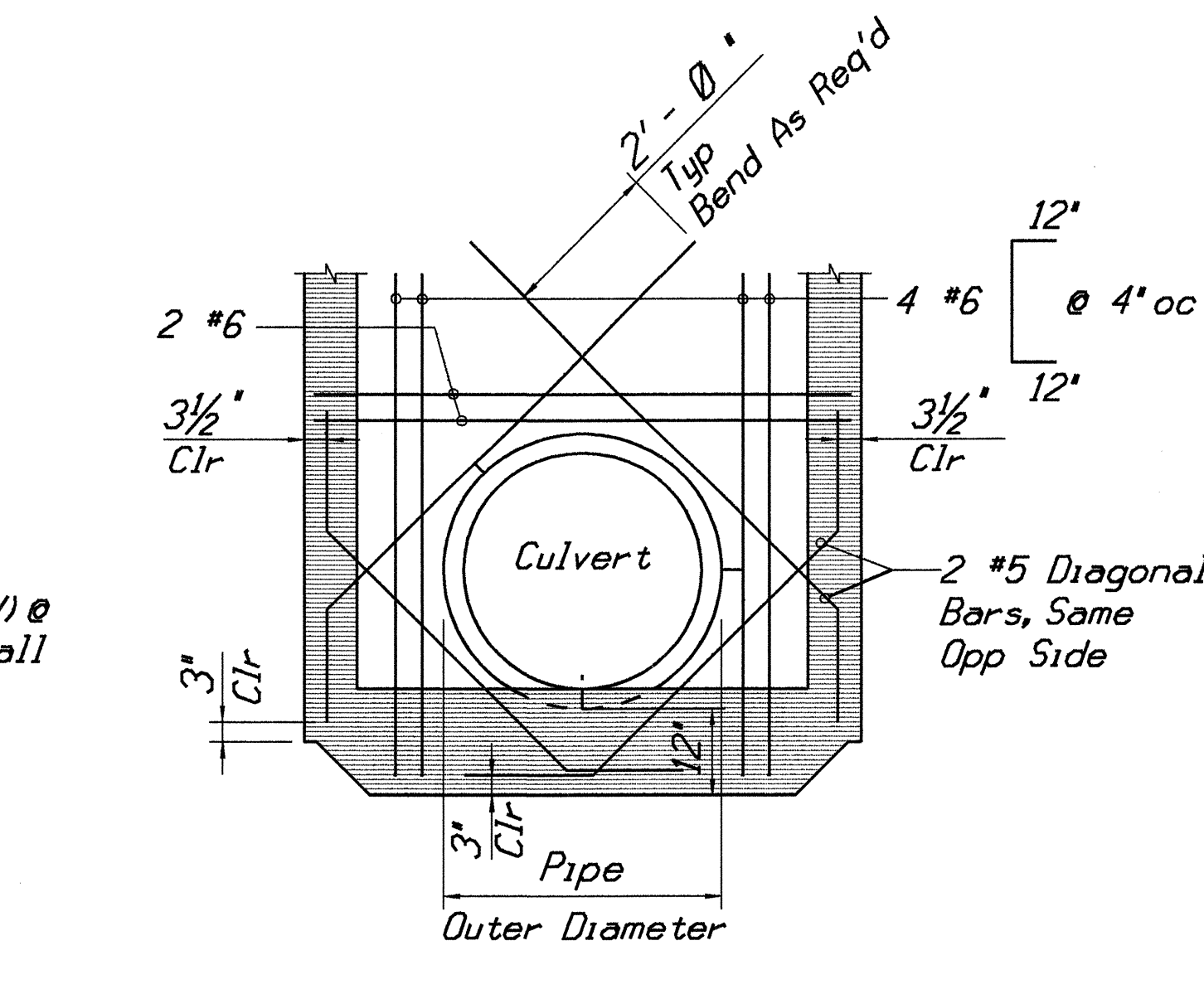
DETAIL "C"
MANHOLE RUNGS

1" = 1'-0"



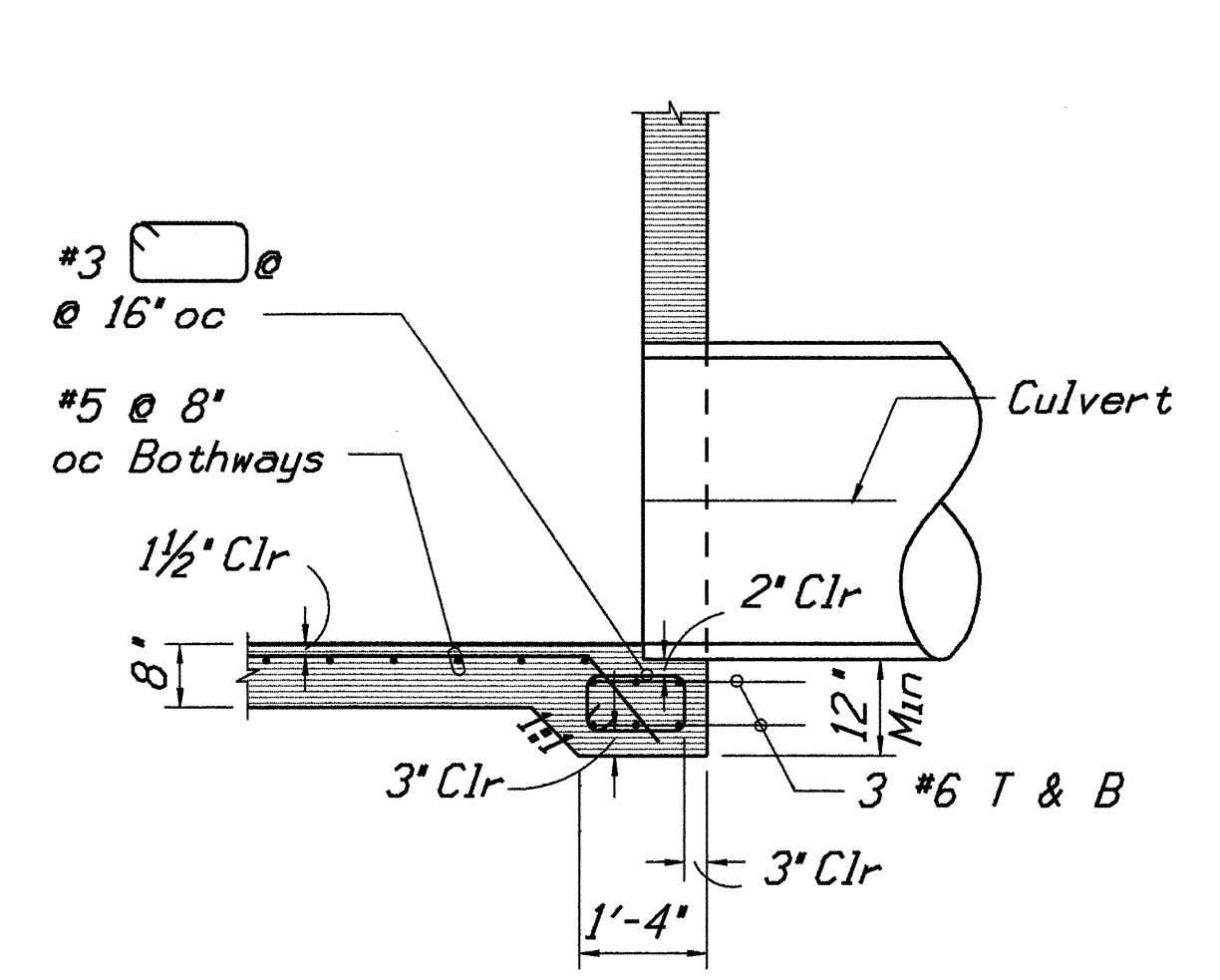
DETAIL "D"
HEAD WALL CORNER

1/2" = 1'-0"



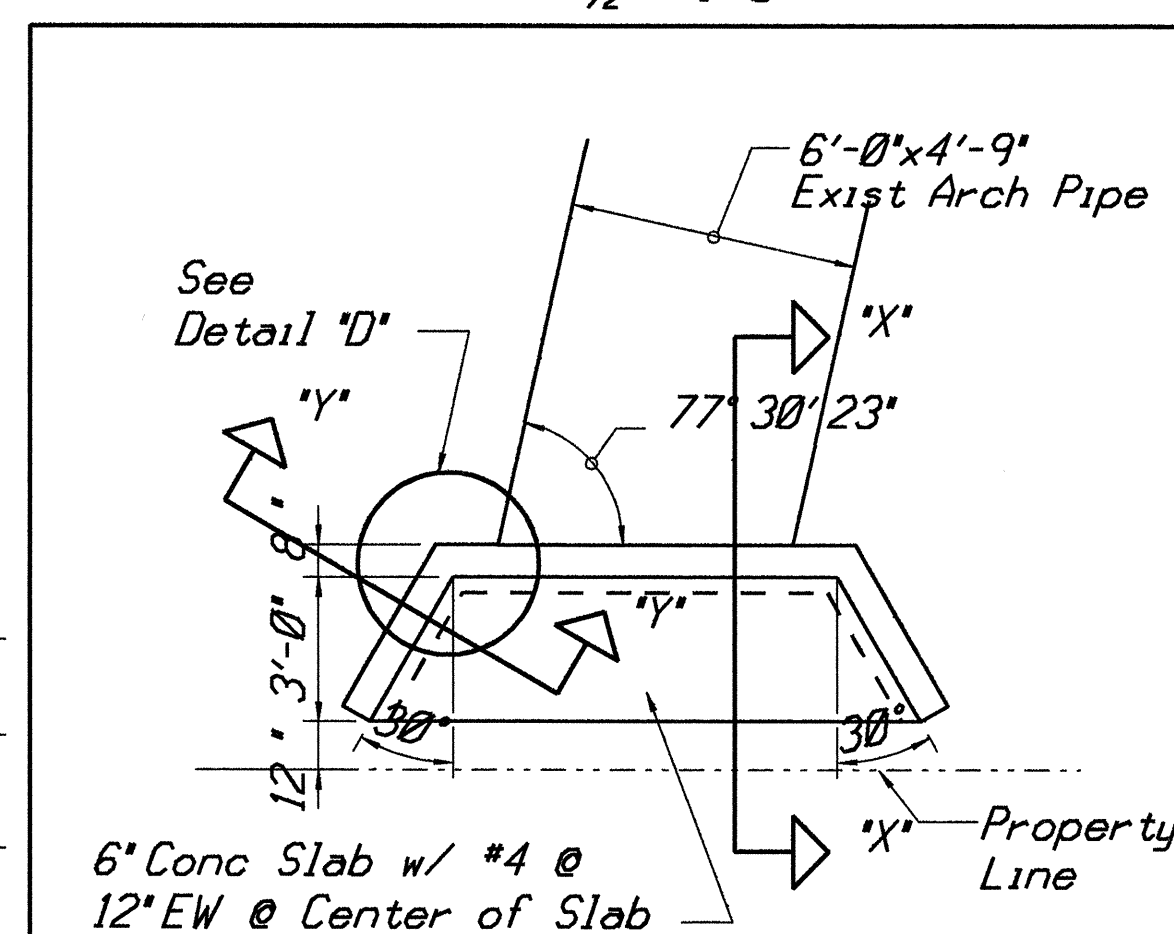
DETAIL "A"
ADDED REINFORCING AROUND CULVERT

1/2" = 1'-0"



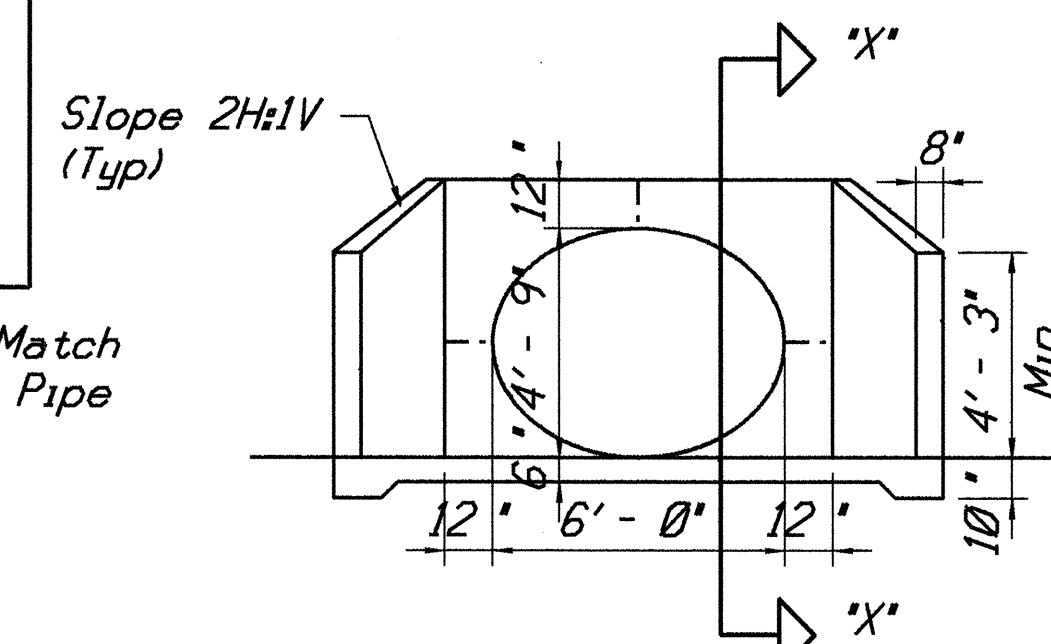
DETAIL "B"
CULVERT SEAT DETAIL

1/2" = 1'-0"



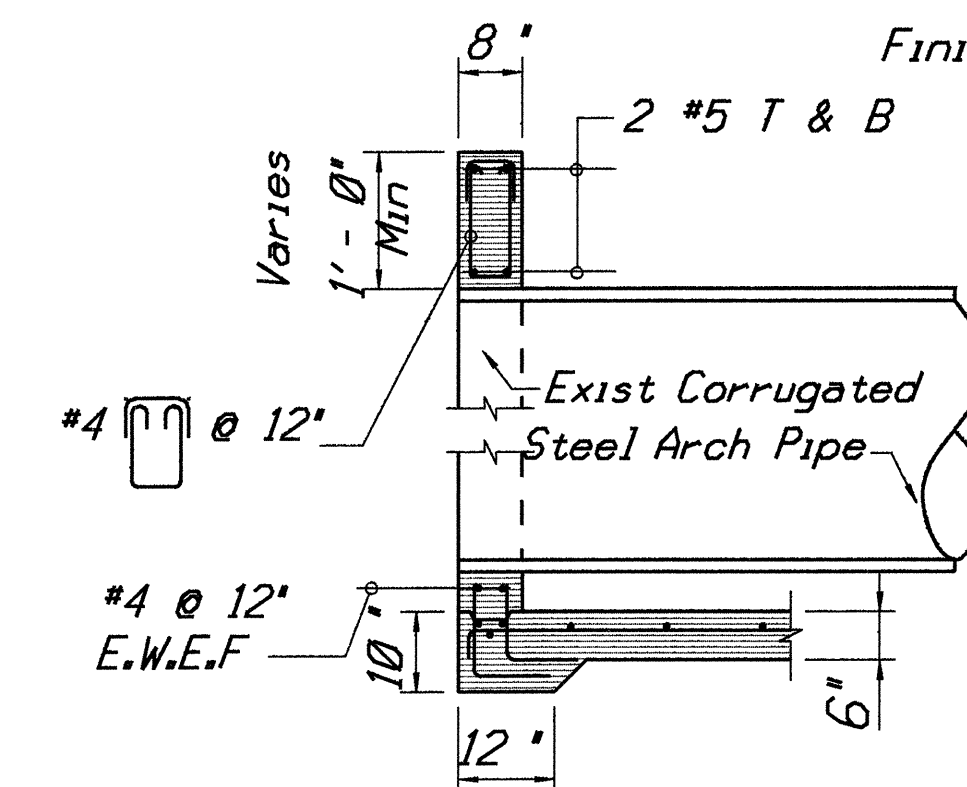
PLAN

1/4" = 1'-0"



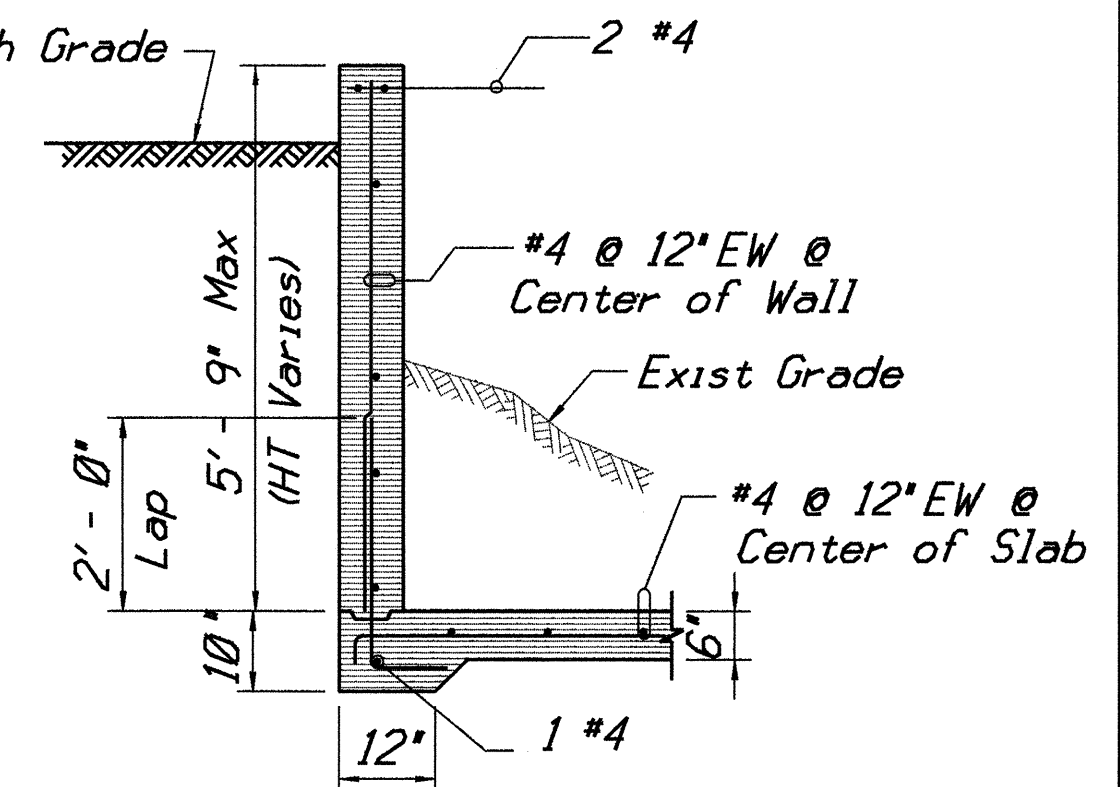
ELEVATION

1/4" = 1'-0"



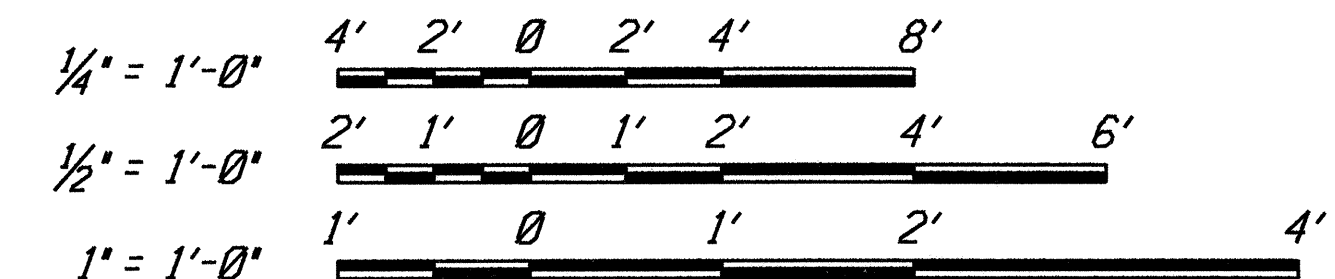
SECTION "X-X"
THROUGH HEAD WALL

1/2" = 1'-0"



SECTION "Y-Y"
THROUGH WING WALL

1/2" = 1'-0"



GRAPHIC SCALE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

DATE: MARCH 1998

SHEET No. 3 OF 4 SHEETS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

PULPELUA AVENUE RESURFACING

Maunaloa Highway to Farrington Avenue

And

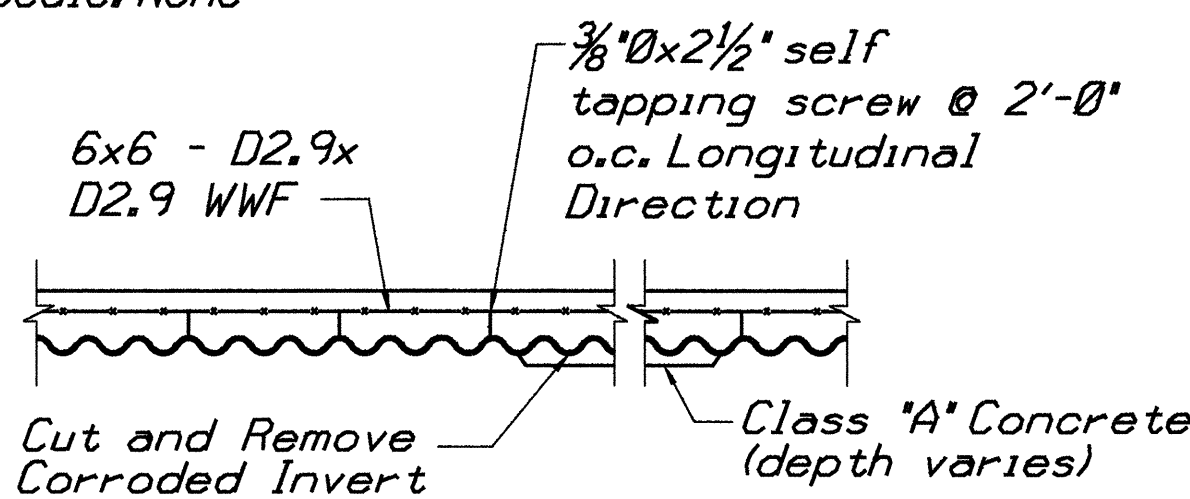
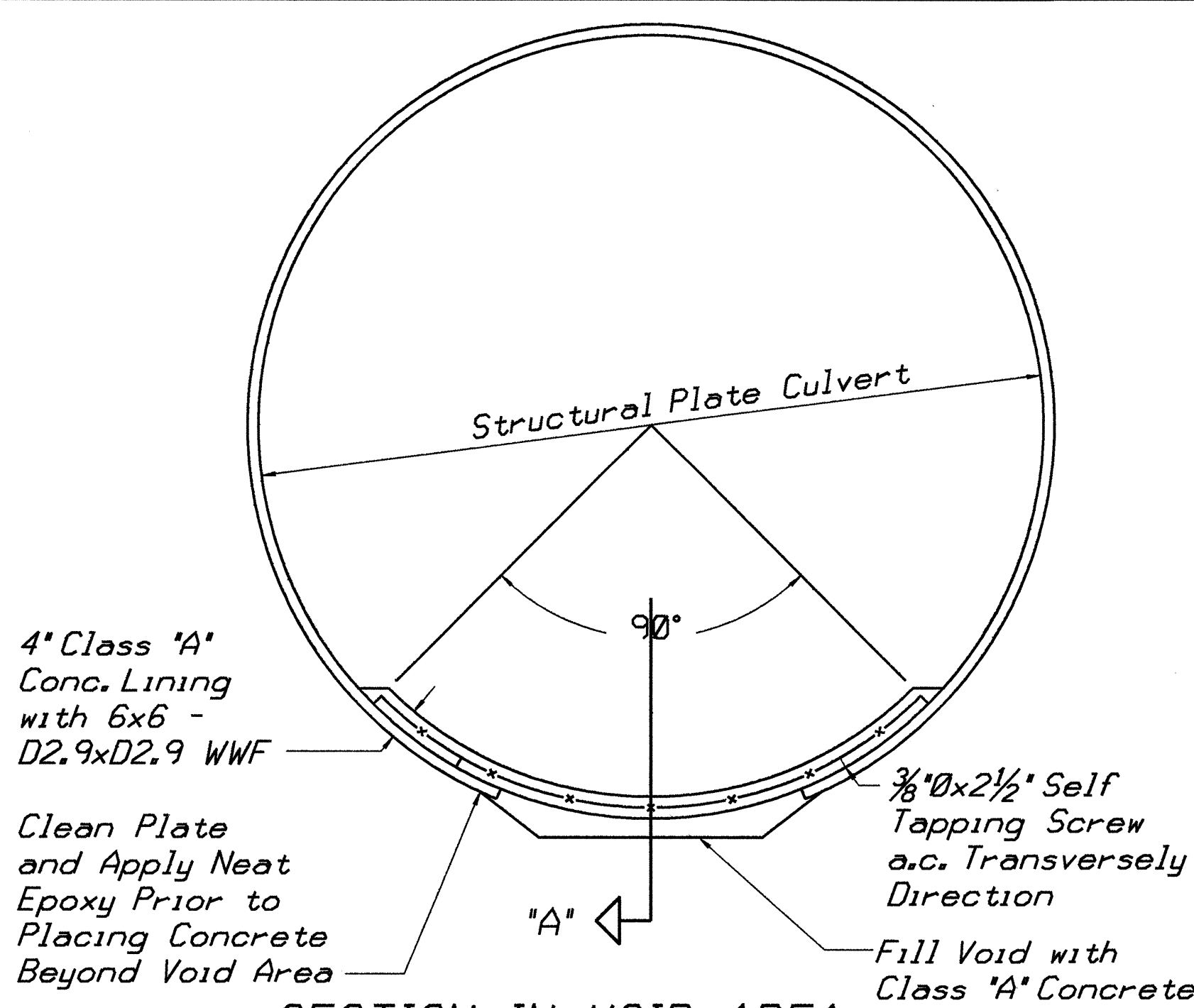
FARRINGTON AVENUE RESURFACING

Puupelua Avenue to Kalae Highway

Federal - Aid Project No. STP - 0480(2)

SCALE: AS NOTED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP - 0480(2)	1998	26	43

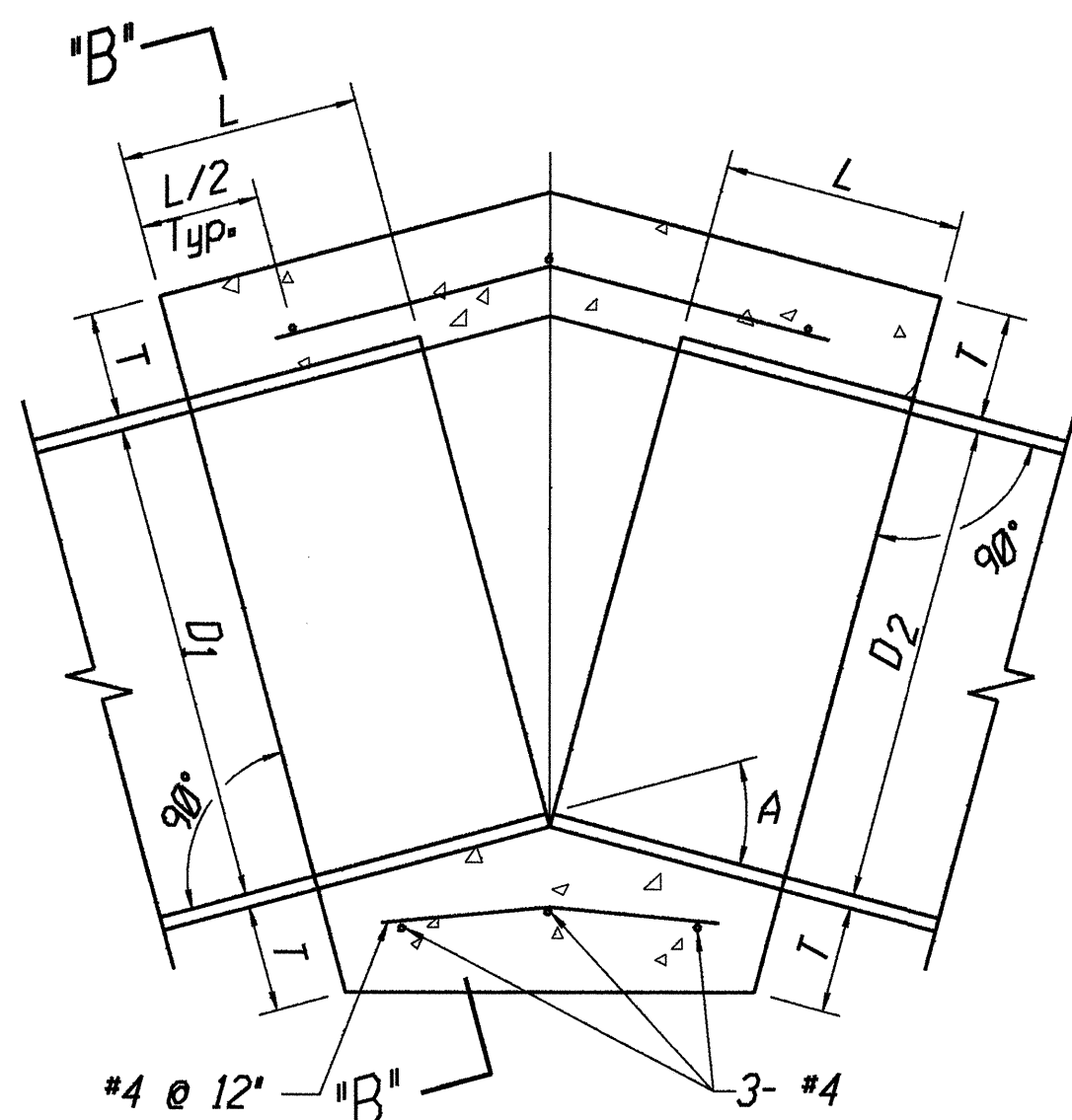
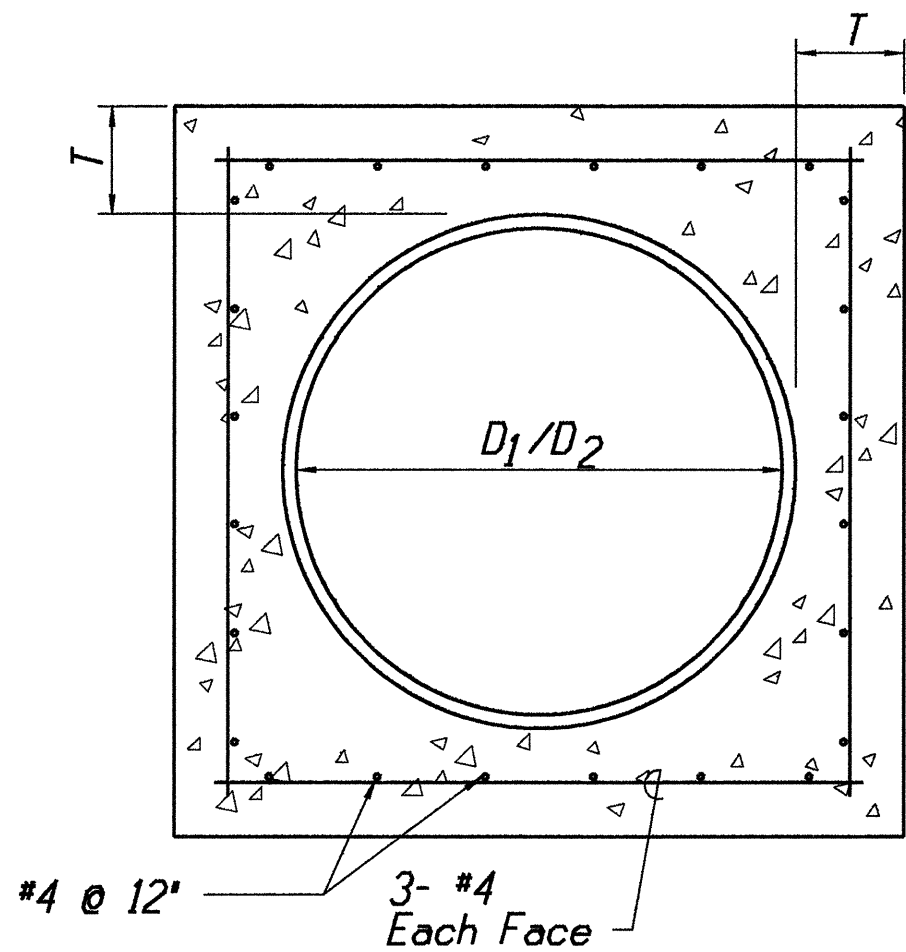


NOTES:

- The concrete placed in the culvert shall be allowed to cure for a minimum of 48 hours before water is allowed to flow on the invert.
- The culvert surface to be in contact with the concrete shall be clean and dry to the satisfaction of the engineer. Badly corroded sections shall be cut and removed, provided the structural integrity of the culvert is not compromised. Epoxy shall be neatly applied to the clean metal surface prior to placing concrete.
- The welded wire fabric steel reinforcement shall be placed two inches above the crest of corrugations by welding to self tapping screws. The screws shall be drilled and tapped to the sectional plate culvert at two feet on centers longitudinally and 1'-0" transversely. If lapping of the welded wire fabric is necessary, it shall be lapped a minimum of six inches.
- The welded wire fabric, screws and epoxy shall not be paid for separately but shall be considered incidental to concrete.
- The concrete culvert lining shall be scored 3/4-inch deep laterally along the crest of corrugations, 20 feet on-center.
- Concrete: $F_c' = 3,000$ psi
Rebars: ASTM A615 Grade 60

DETAILS OF CONCRETE CULVERT LINING

Scale: None

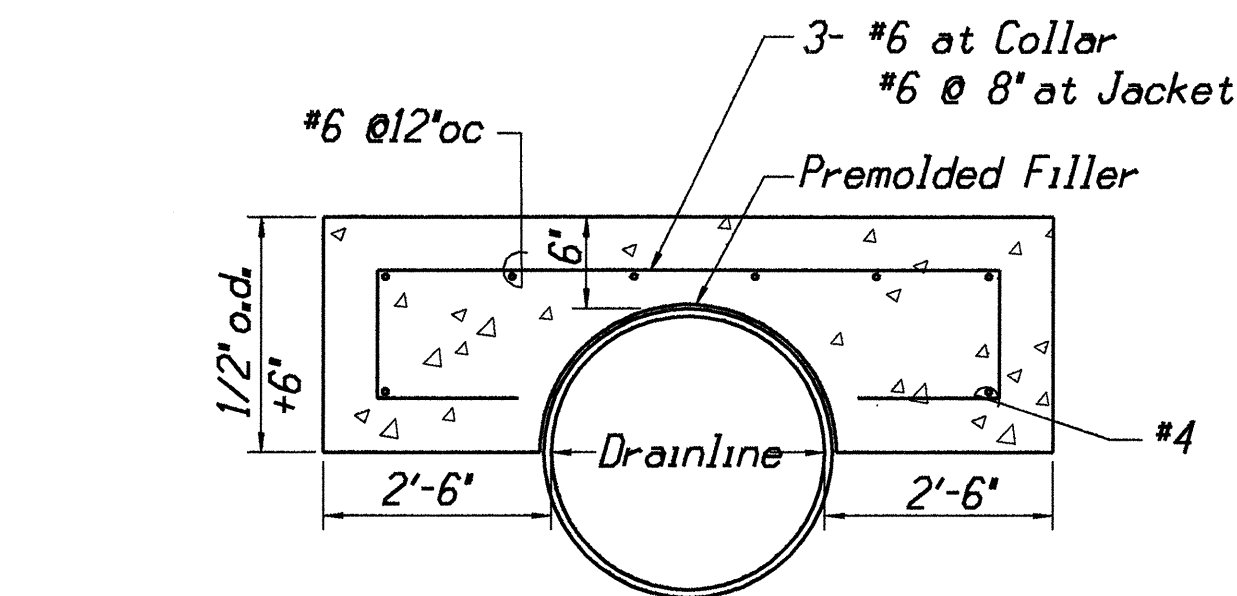
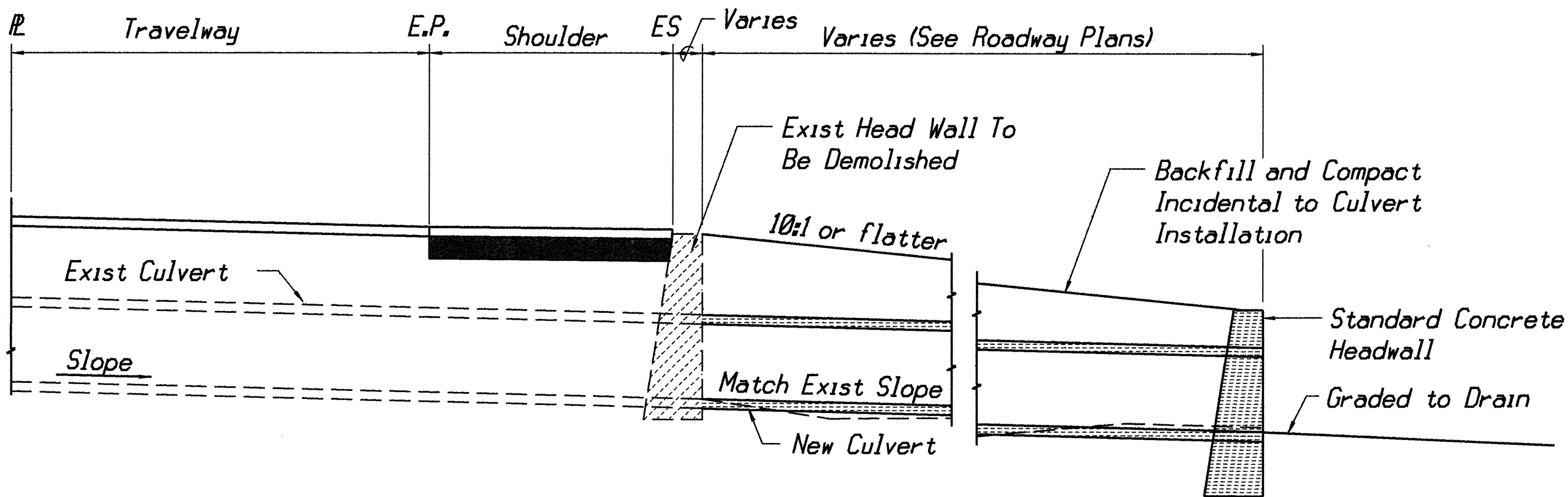


NOTES:

- Where pipes of different diameters are joined with a concrete collar, L and T shall be those of the larger pipe $D=D$ or D whichever is greater.
- For pipe sizes not listed use next larger size.
- Omit reinforcing on pipes 24" and less in diameter and on all pipes where angle A is less than 10°.
- Join pipes at inverts.
- Reinforcement shall be placed 1 1/2' clear from outside diameter of pipe.

D	L	T
12"	1.0'	4"
18"	1.0'	5"
24"	1.0'	6"
36"	1.5'	8"
48"	1.5'	10"
54"	1.5'	10"
60"	1.75'	11"
66"	1.75'	11"
72"	2.0'	12"

CONCRETE COLLAR DETAILS



SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

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David M. Yamamoto

DAVID M. YAMAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 1399-S
HAWAII, U.S.A.

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DRAINAGE DETAILS

PULPEELUA AVENUE RESURFACING
Maunaloa Highway to Farrington Avenue
And
FARRINGTON AVENUE RESURFACING
Puupaelua Avenue to Kalae Highway
Federal - Aid Project No. STP - 0480(2)

SCALE: AS NOTED DATE: MARCH 1998

SHEET No. 4 OF 4 SHEETS