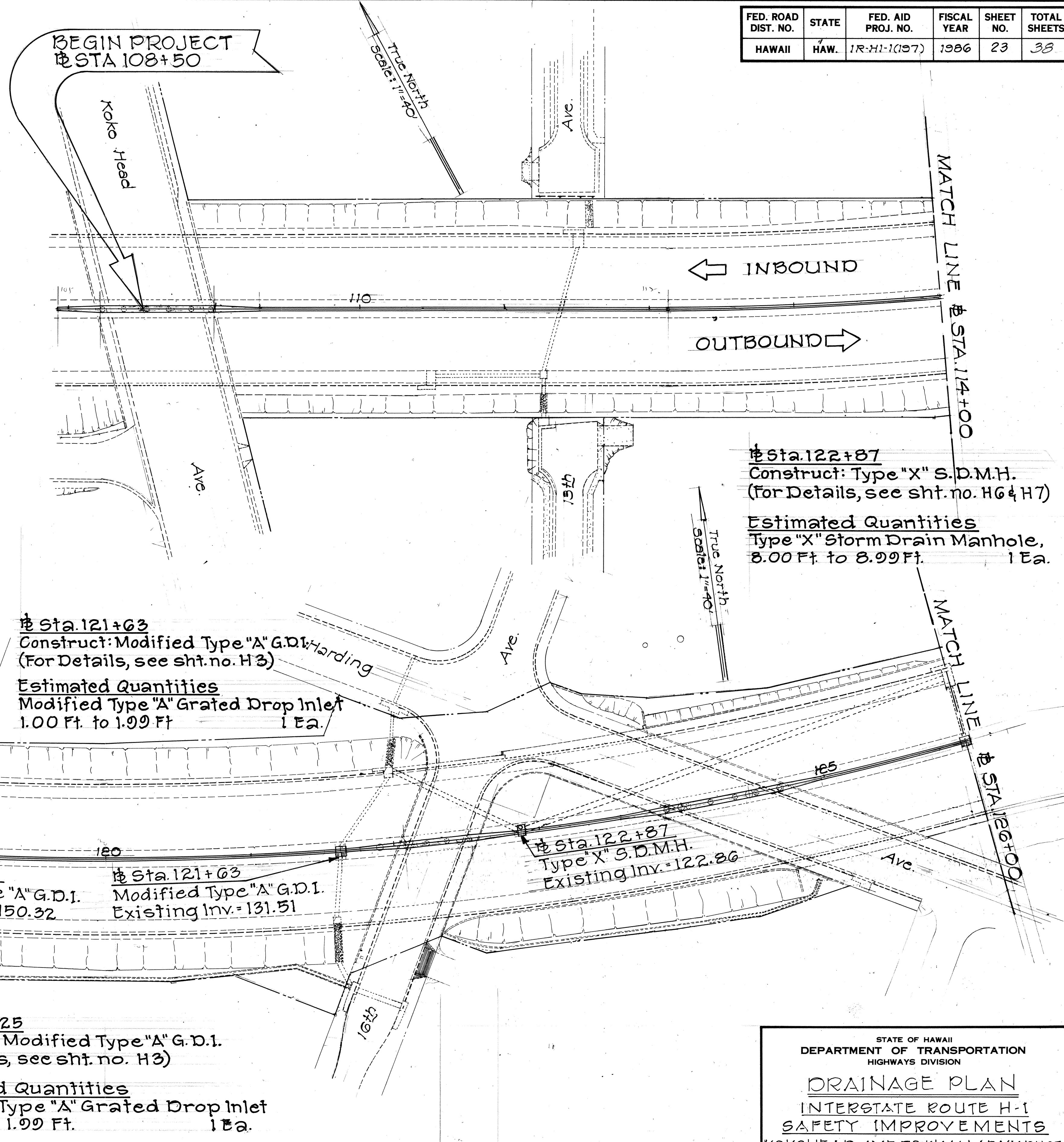


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1R-H1-1(197)	1986	23	38

GENERAL NOTES:

- Existing drainage system will be functional at all times during construction. Contractor is to furnish materials, equipment, labor, tools and incidentals necessary to accomplish maintenance of flow, the cost of which shall be incidental to the various contract items.
- Demolishing and removing a portion or the entire existing structure shall not be paid for separately, but shall be considered incidental to the various contract items.
- Removal of 18" slotted drains shall not be paid for separately but shall be considered incidental to the various contract items.
- Culverts within the grated drop inlet and storm drain manhole shall be cut flush with the inside face of the wall. Above work shall be considered incidental to the various contract items.
- Manhole rungs (12" o.c.) are required when the height of the structure is greater than 4 feet 6 inches. Only one rung (16 inches from the bottom) is required if the height of the structure is 4 feet 6 inches or less. Manhole Rungs may be placed at any location as ordered by the Engineer. Manhole Rungs shall be considered incidental to class A concrete.
- Location of C.I. Frame & Cover for drain manhole shall be determined by the Engineer in the field.
- Contractor shall verify the locations of all culverts in the field. Any culvert damaged during construction shall be repaired or replaced by the Contractor at his expense.
- Only non-pneumatic type of drill as approved by the Engineer will be permitted for drilling holes in concrete. Where indicated on plans, the approximate diameter of drilled holes for installation

GENERAL NOTES continued on sht. no. H2



ORIGINAL PLAN	NO.
SURVEY PLOTTED BY	DAVE
DRAWN BY	
DESIGNED BY	
CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLAN
INTERSTATE ROUTE H-1
SAFETY IMPROVEMENTS
KOKOHEAD AVE TO WAIALAE VIADUCT
F.A.1. PROJ. NO. 1R-H1-1(197)

SCALE: 1"=40' DATE: MAY, 1985
SHEET NO. H1 OF 9 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1R-H1-1(197)	1986	24	38

Sta. 130+50
Construct: Modified Type "A" G.D.I.
(For Details, see sht. no. H3)
Estimated Quantities
Modified Type "A" Grated Drop Inlet
1.00 Ft. to 1.99 Ft. 1 Ea.

Sta. 134+25
Modified Type "B" G.D.I.
Existing Inv. = 87.16
135

Sta. 130+00
Modified Type "A" G.D.I.
Existing Inv. = 102.00

Sta. 126+00
Modified Type "A" G.D.I.
Existing Inv. = 116.50

Sta. 126+00
Construct: Modified Type "A" G.D.I.
(For Details, see sht. no. H3)

Estimated Quantities
Modified Type "A" Grated Drop Inlet
1.00 Ft. to 1.99 Ft. 1 Ea.

Sta. 140+02.37
Construct: Modified Type "C" G.D.I.
(For Details, see sht. no. H5)

Estimated Quantities
Modified Type "C" Grated Drop Inlet
4.00 Ft. to 4.99 Ft. 1 Ea.

Sta. 134+25
Construct: Modified Type "B" G.D.I.
(For Details, see sht. no. H4)

Estimated Quantities
Modified Type "B" Grated Drop Inlet
1.00 Ft. to 1.99 Ft. 1 Ea.

GENERAL NOTES:

- Continued ~ of dowels shall be 1 1/2", after installing dowels, the voids shall be filled with epoxy grout as directed by the Engineer. Above work shall be considered incidental to the various contract items.
- Concrete for grated drop inlets and drain manholes shall be Class "A".
- Existing steel frames and grates shall be cleaned and painted before installation. Above work shall be considered incidental to the various contract items.
- Construction of concrete rigid barrier over the modified drainage structures shall be as detailed in the Roadway Plans.

END OF PROJECT
Sta. 144 + 50

Sta. 138+50
Construct: Modified Type "A" G.D.I.
(For Details, see sht. no. H3)
Estimated Quantities
Modified Type "A" Grated Drop Inlet
1.00 Ft. to 1.99 Ft. 1 Ea.

Sta. 140+02.37
Modified Type "C" G.D.I.
Existing Inv. = 55.80

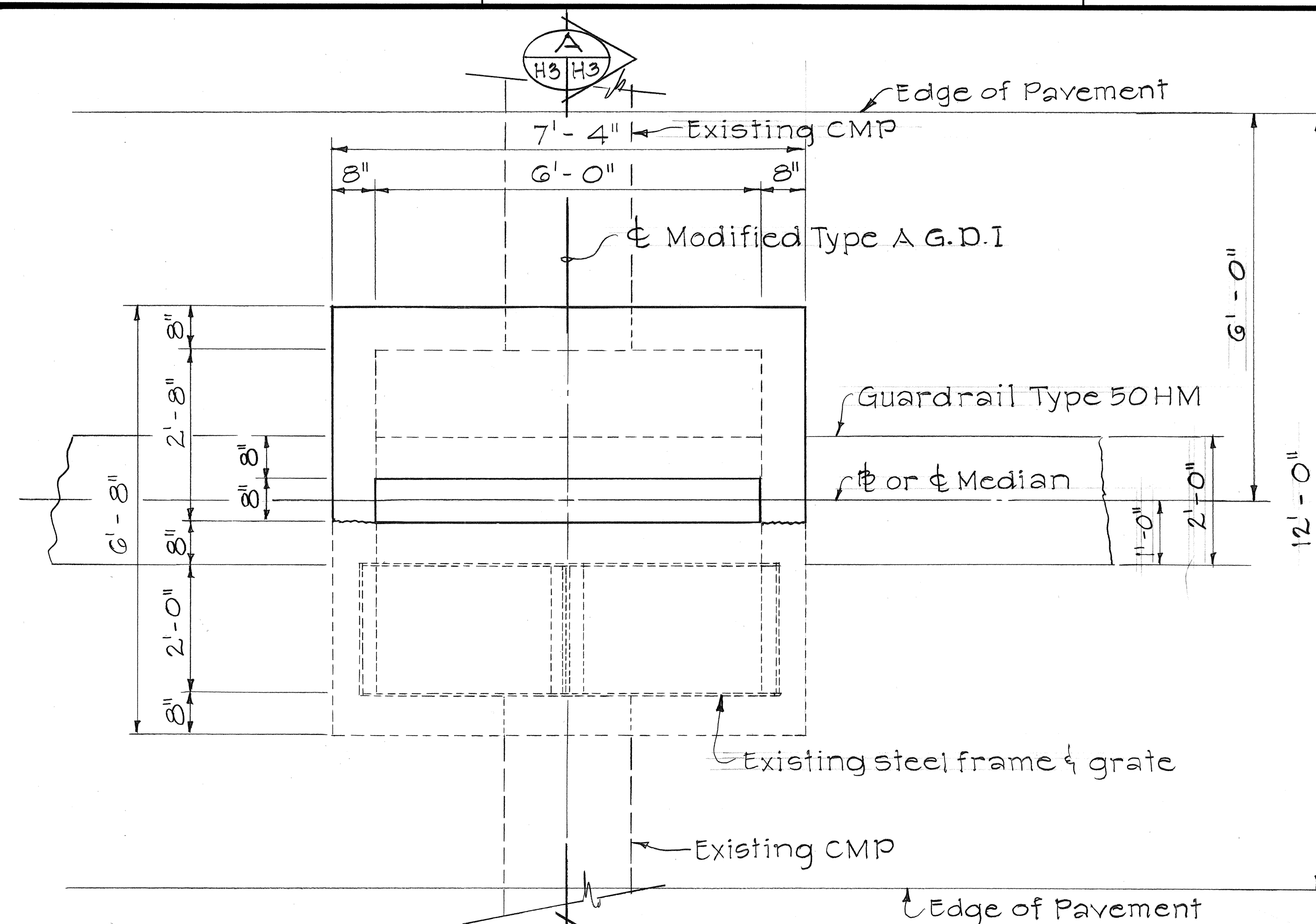
Sta. 138+50
Modified Type "A" G.D.I.
Existing Inv. = 78.28 140

Remove 18" Slotted Drain

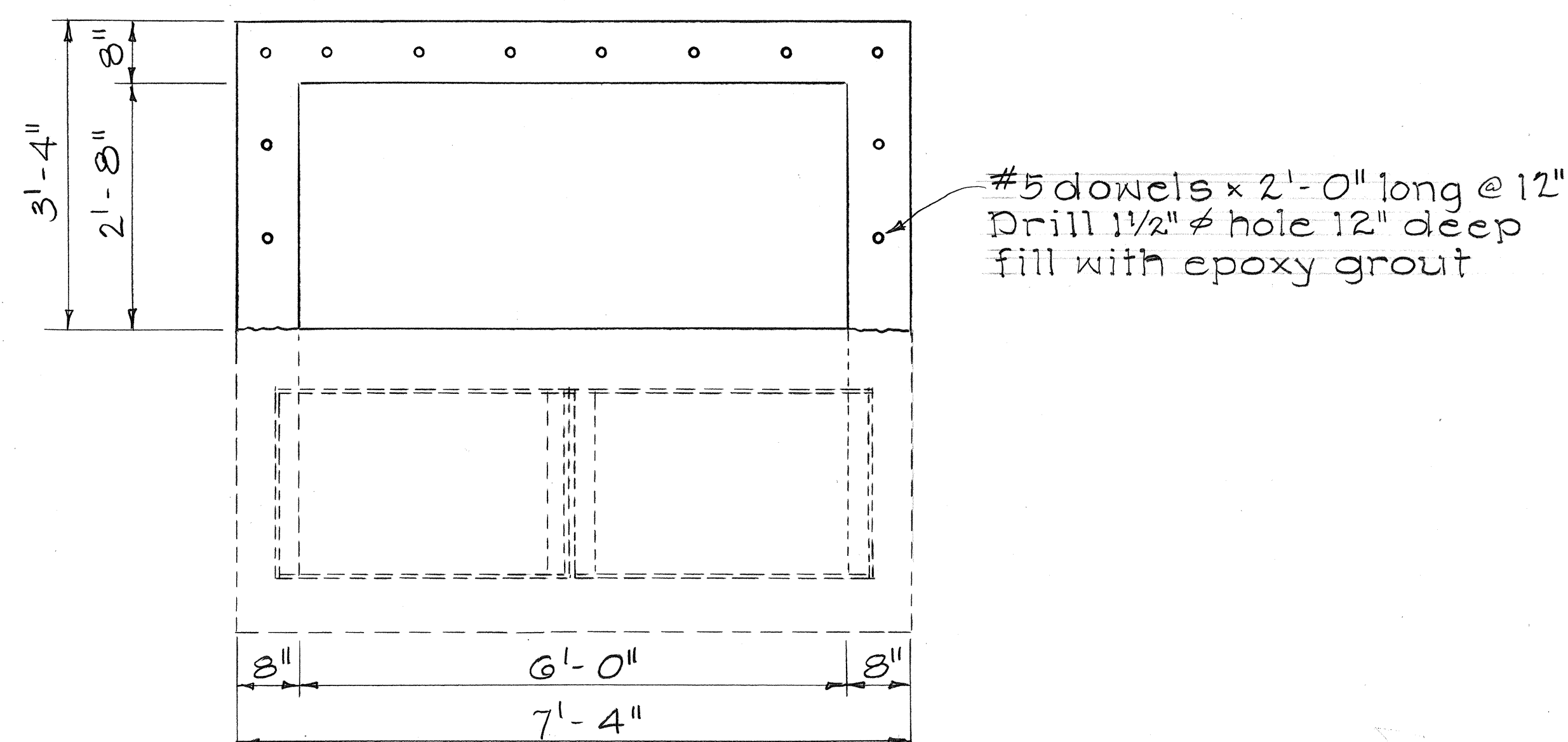
SURVEY PLOTTED BY	DATE
DESIGNED BY	
NOTED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
NO.	

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
DRAINAGE PLAN
INTERSTATE ROUTE H-1 SAFETY IMPROVEMENTS KOKOHEAD AVE TO WAIALAE VIADUCT F.A.1. PROJ. NO. 1R-H1-1(197)
SCALE: 1" = 40' DATE: MAY, 1985
SHEET NO. H2 OF 0 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(107)	1986	25	38

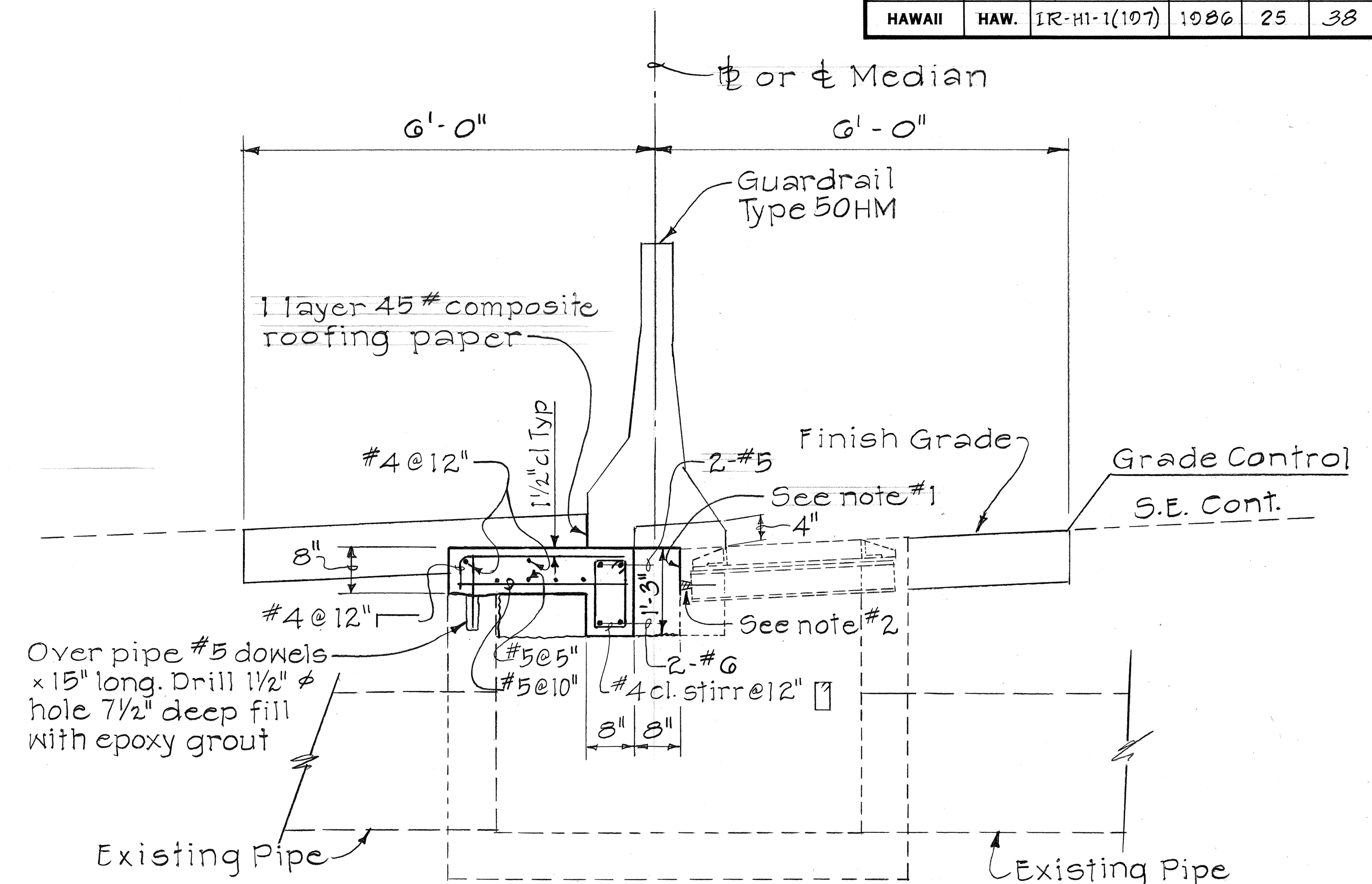


PLAN



PLAN VIEW OF DOWEL LOCATION

DETAILS OF MODIFIED TYPE A GRATED DROP INLET



SECTION A
H3 | H3

NOTES:

1. Remove existing catch basin concrete in such manner as not to damage the existing structure. Exposed surface due to removal, shall be ground smooth to the Engineer's satisfaction.
2. Remove existing reinforcing 1" from exposed surface and fill depression with mortar.

ORIGINAL PLAN	SURVEY PLOTTED BY _____	DATE _____
	DRAWN BY _____	" _____
	TRACED BY _____	" _____
	DESIGNED BY _____	" _____
	QUANTITIES BY _____	" _____
No. _____	CHECKED BY _____	" _____

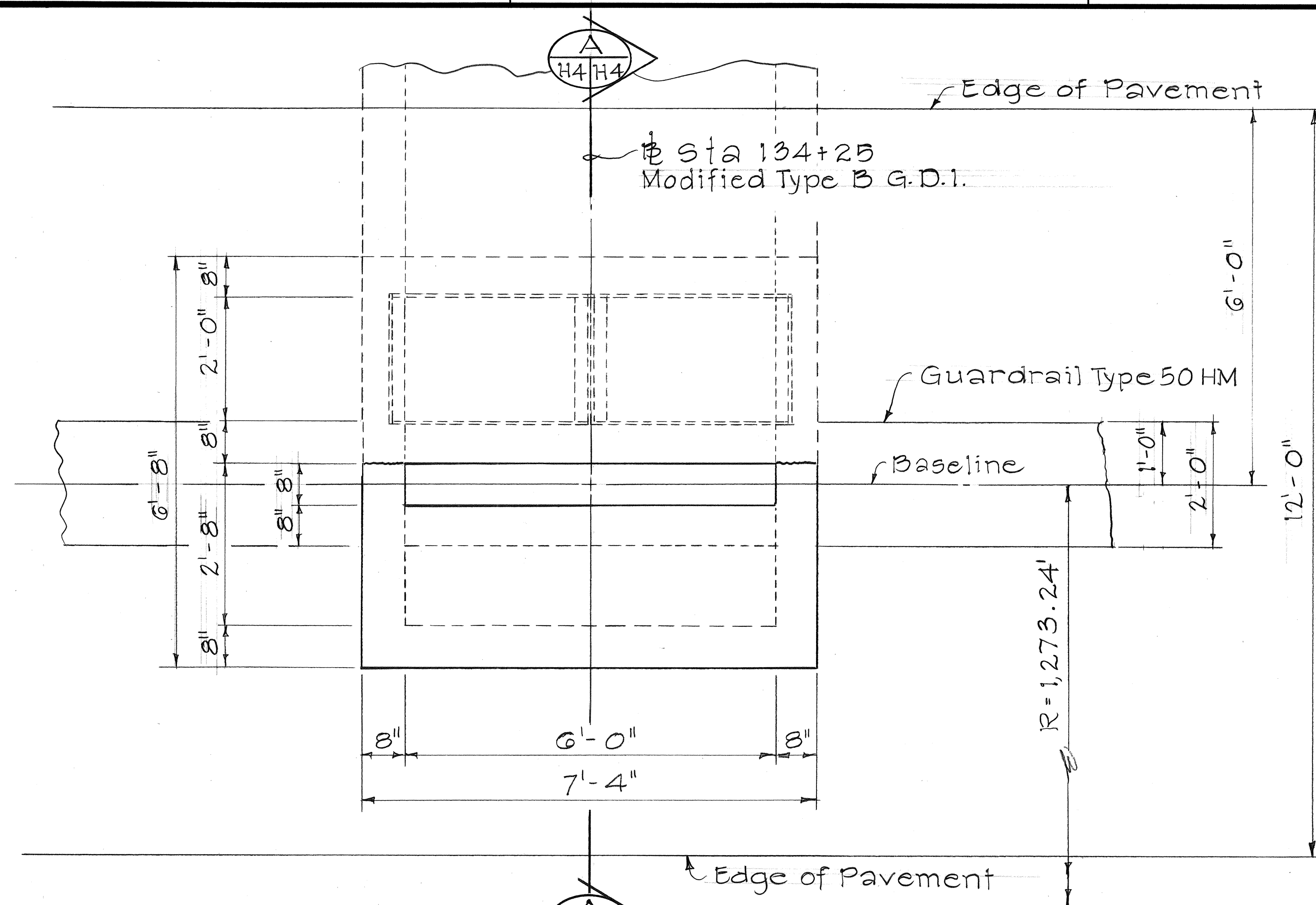
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAIL
INTERSTATE ROUTE H-1
SAFETY IMPROVEMENTS
KOKOHEAD AVE TO WAIALAE VIADUCT
F.A.1. PROJ. NO. 1R-HI-1(197)

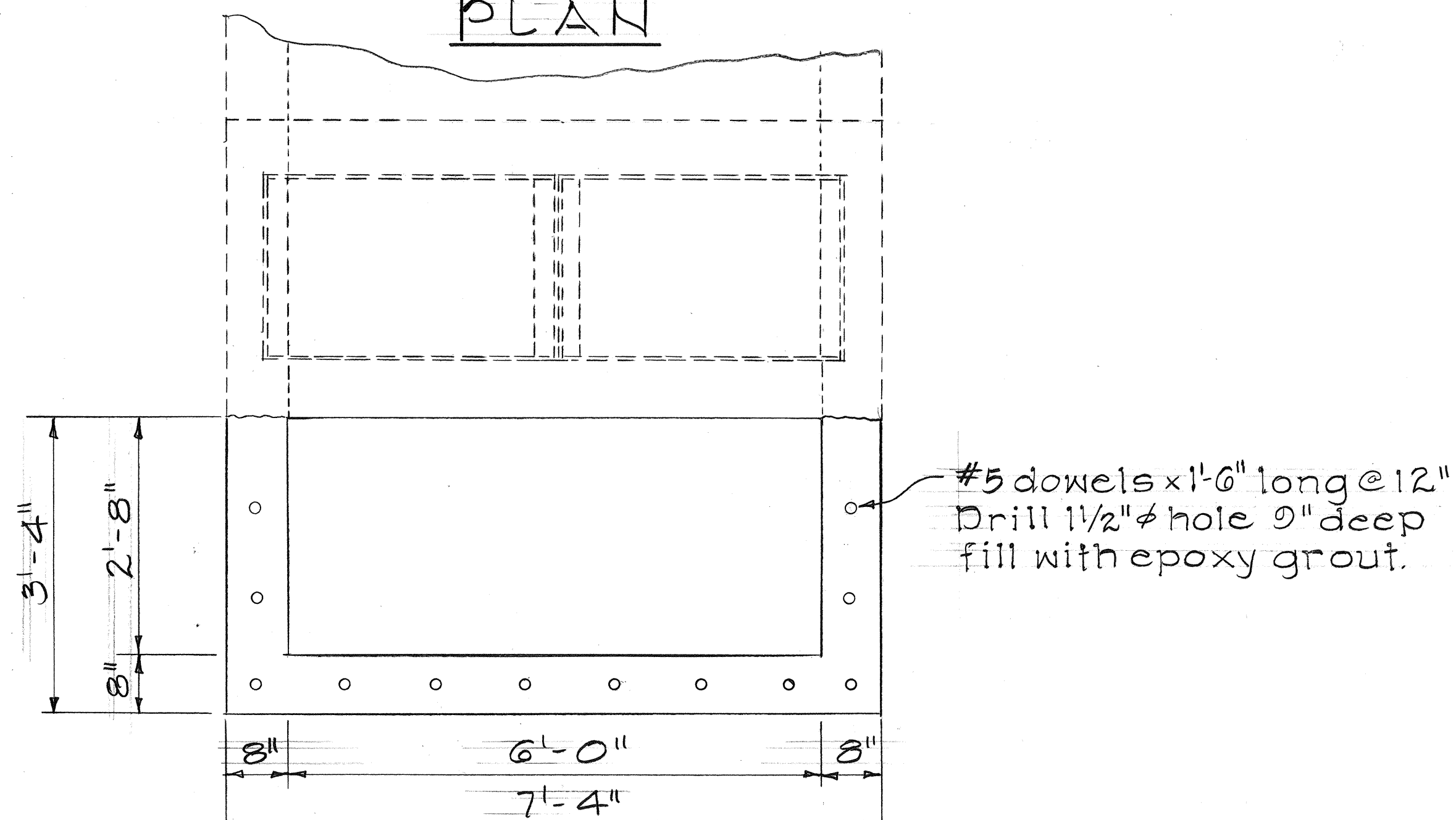
SCALE: 3/4" = 1'-0" DATE: MAY 1985

SHEET NO. 83 OF 9 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(107)	1986	26	38

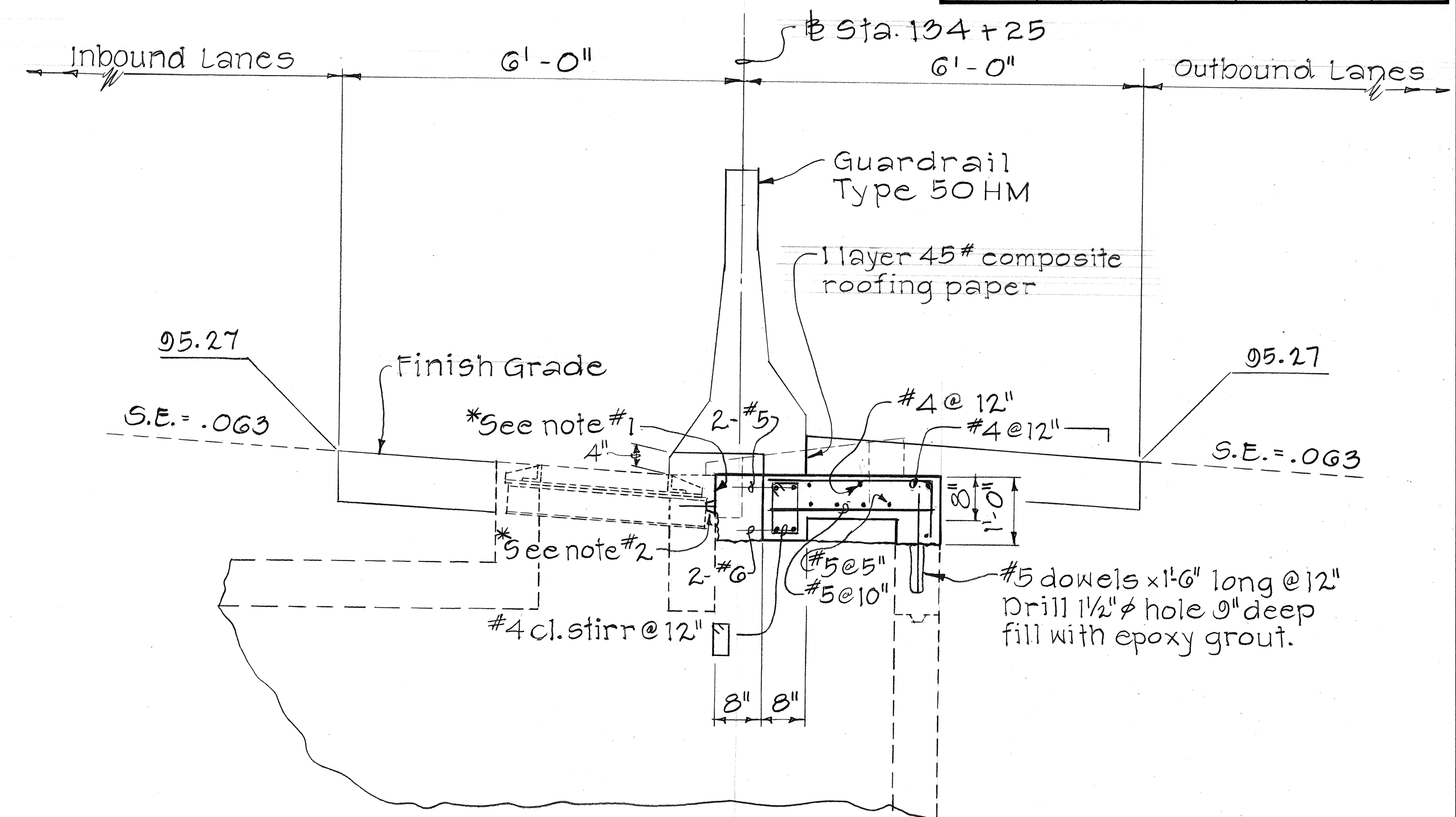


PLAN



PLAN VIEW OF DOWEL LOCATION

DETAILS OF MODIFIED TYPE B GRATED DROP INLET



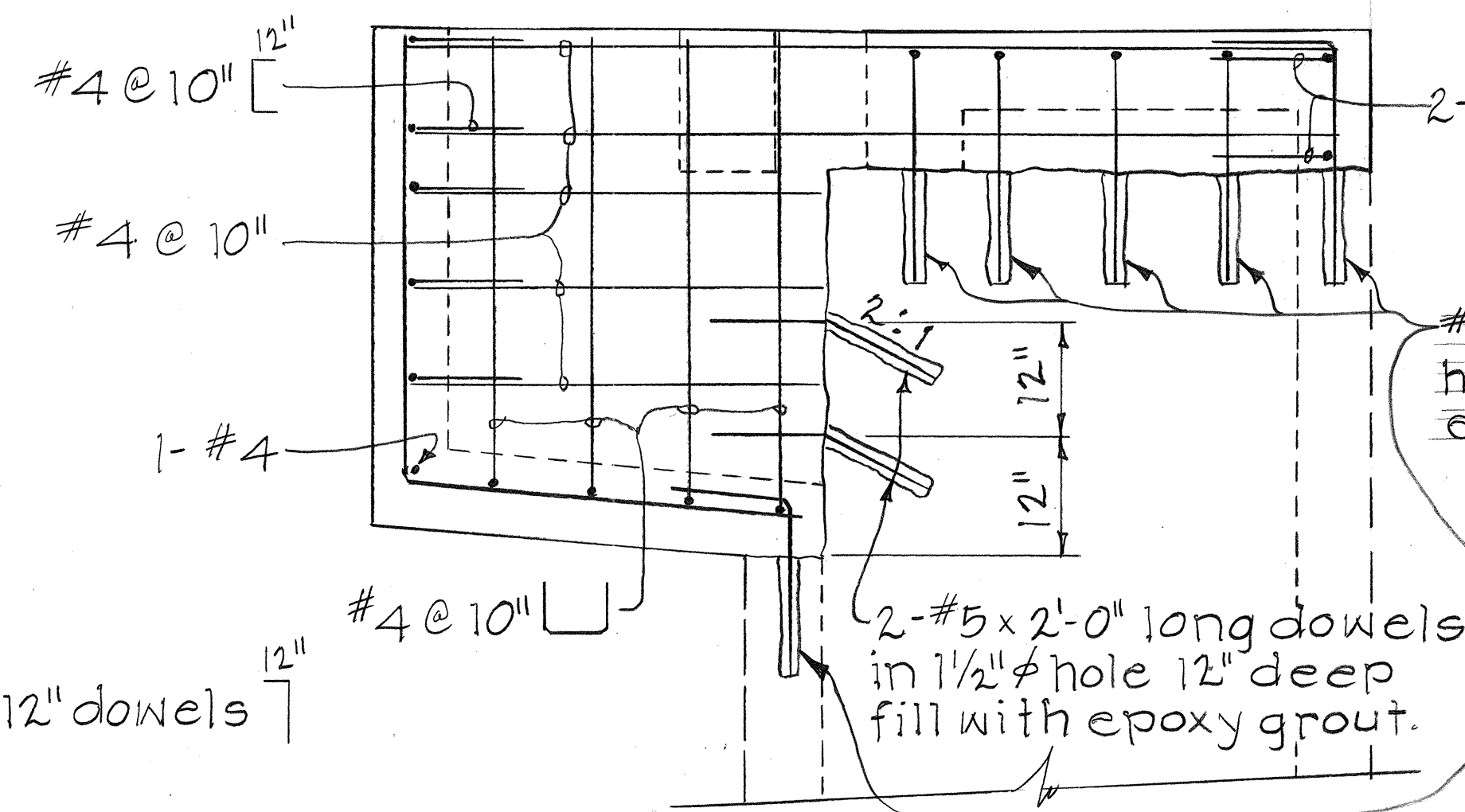
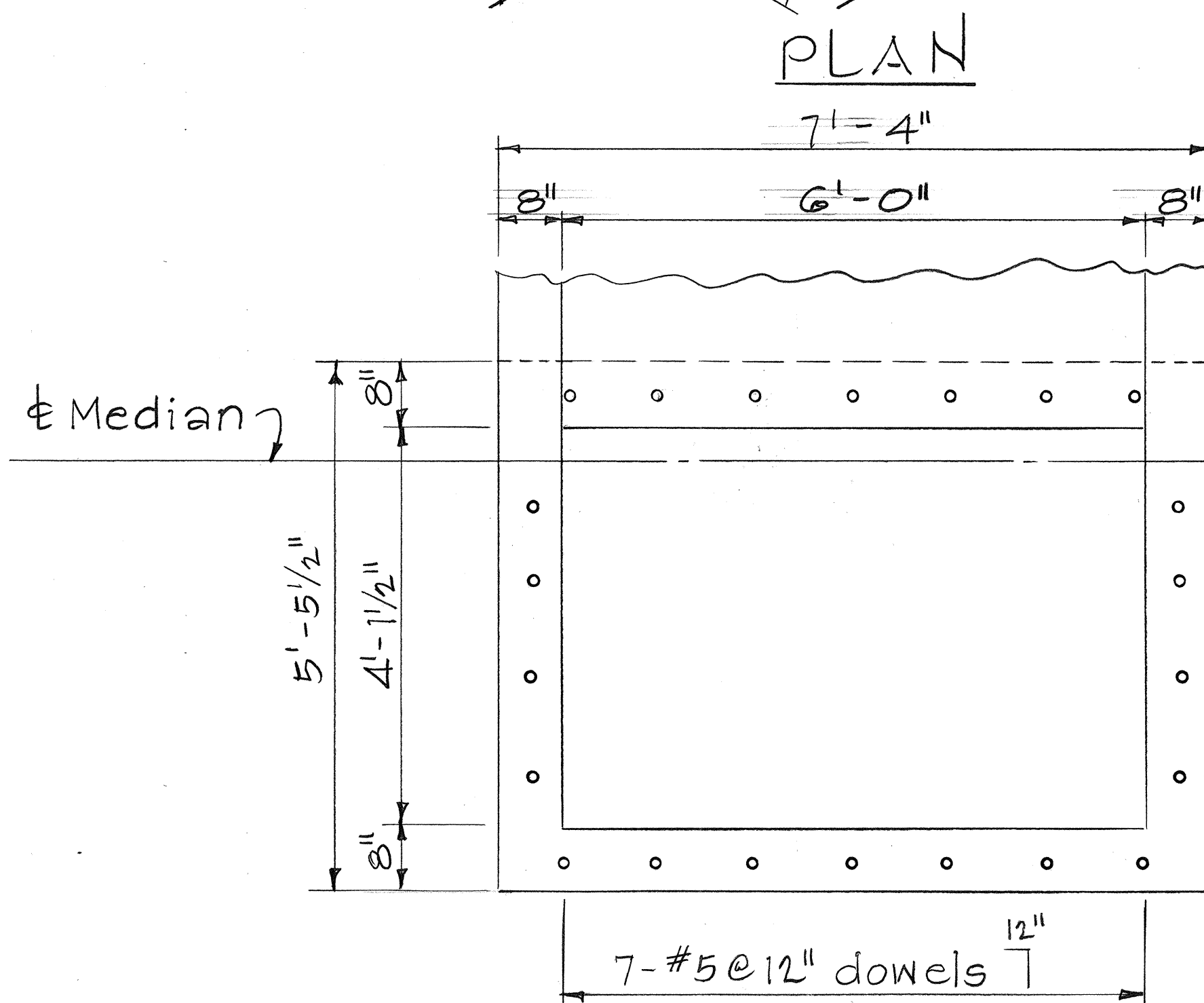
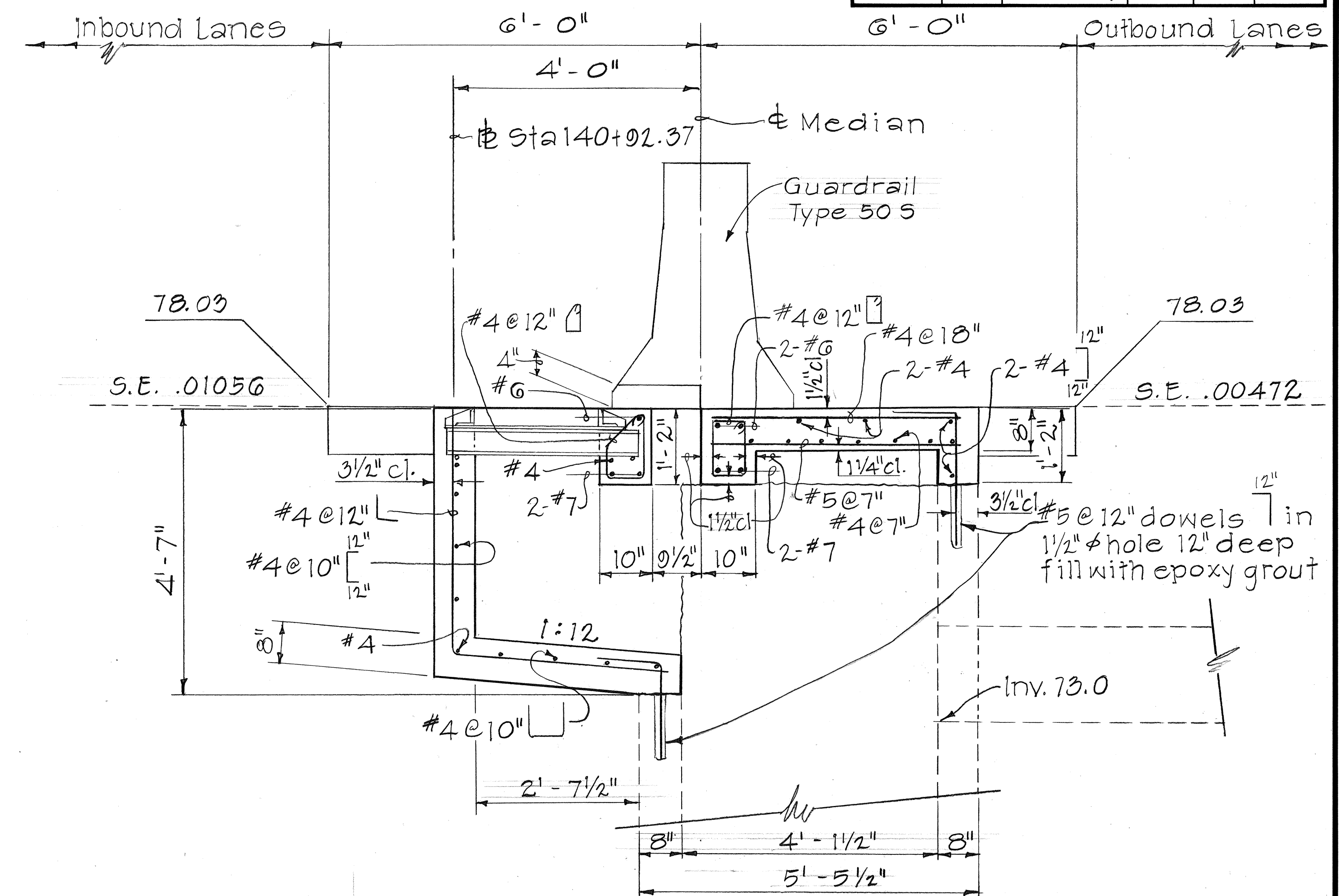
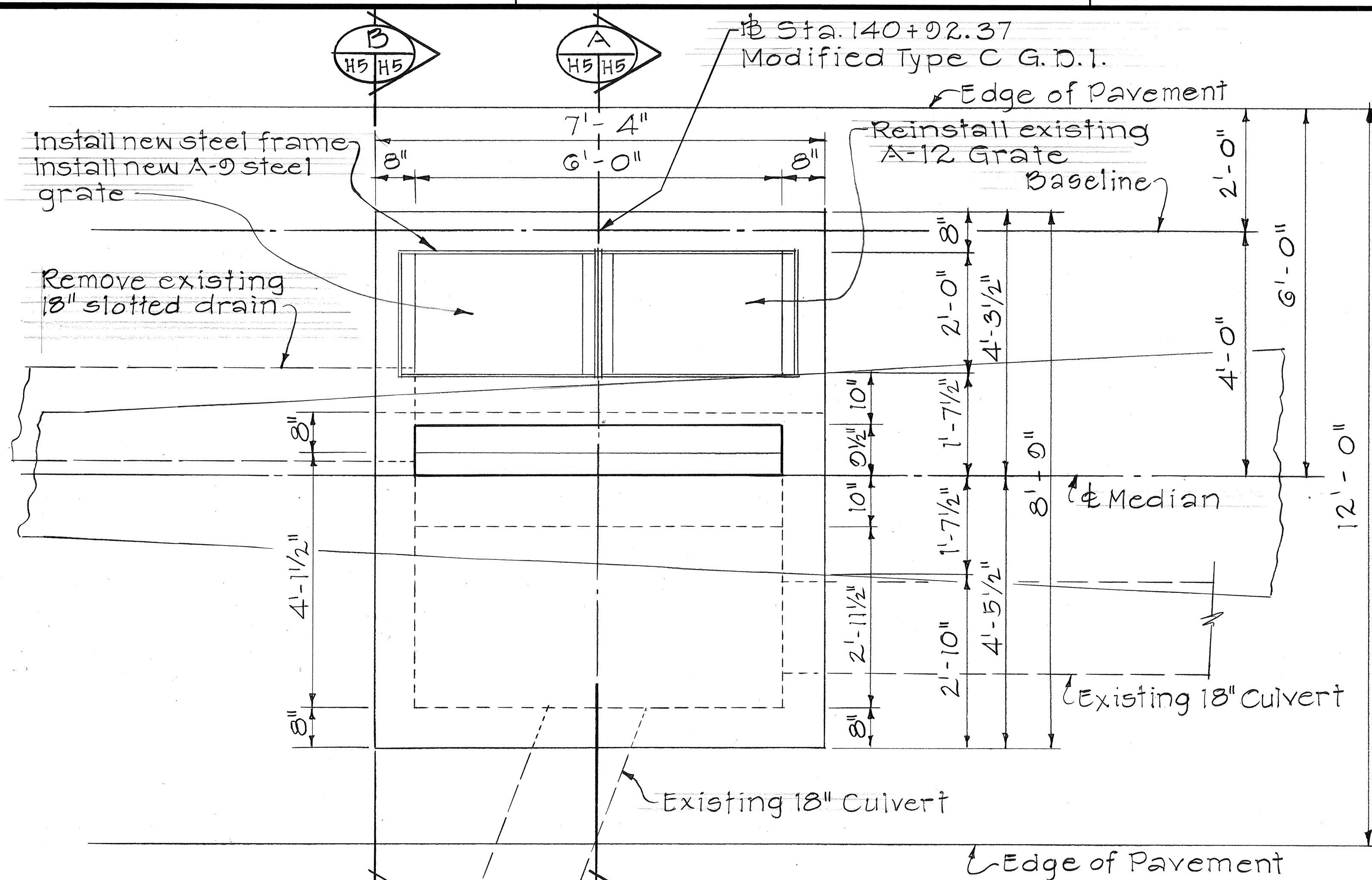
SECTION A

* For note #1 & #2 see sheet no. H3

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTED BOOK	DRAWN BY	
NO.	CHECKED BY	

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
DRAINAGE DETAIL
INTERSTATE ROUTE H-1 SAFETY IMPROVEMENTS KOKOHEAD AVE TO WAIALAE VIADUCT F.A.I. PROJ. NO. IR-HI-1(107)
SCALE: 3/4"=1'-0" DATE: MAY 1985
SHEET NO. H4 OF 9 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(197)	1986	27	38



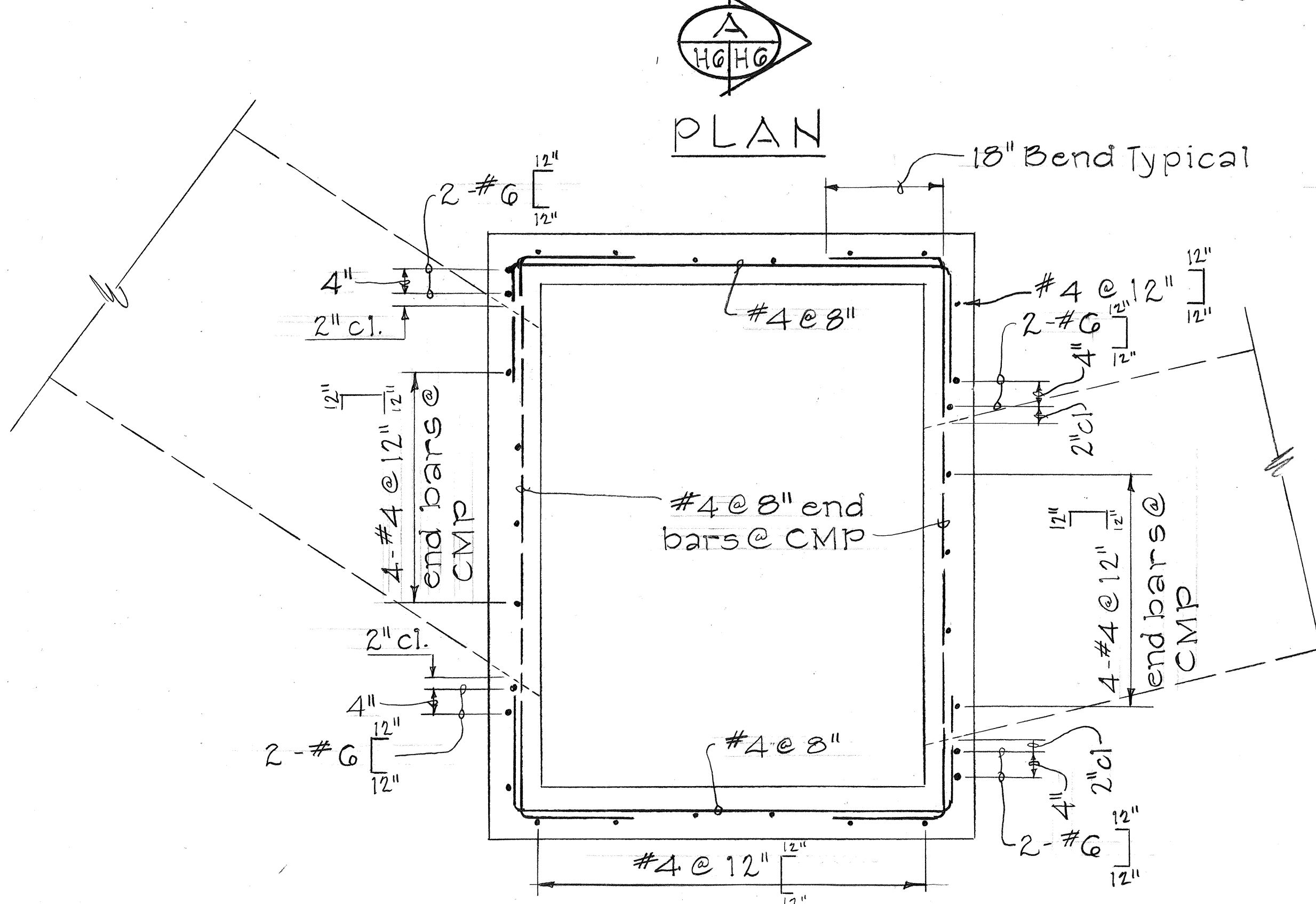
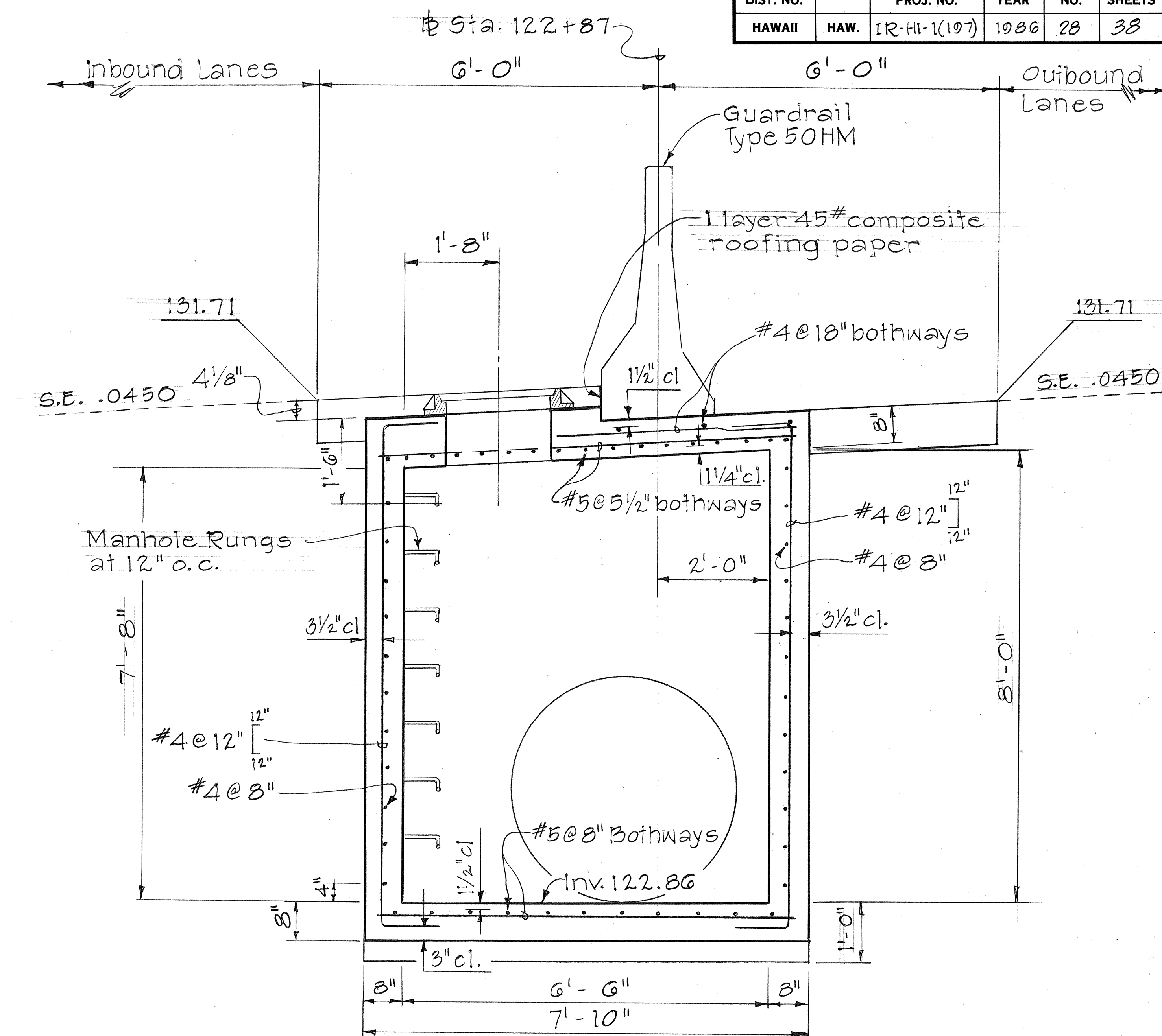
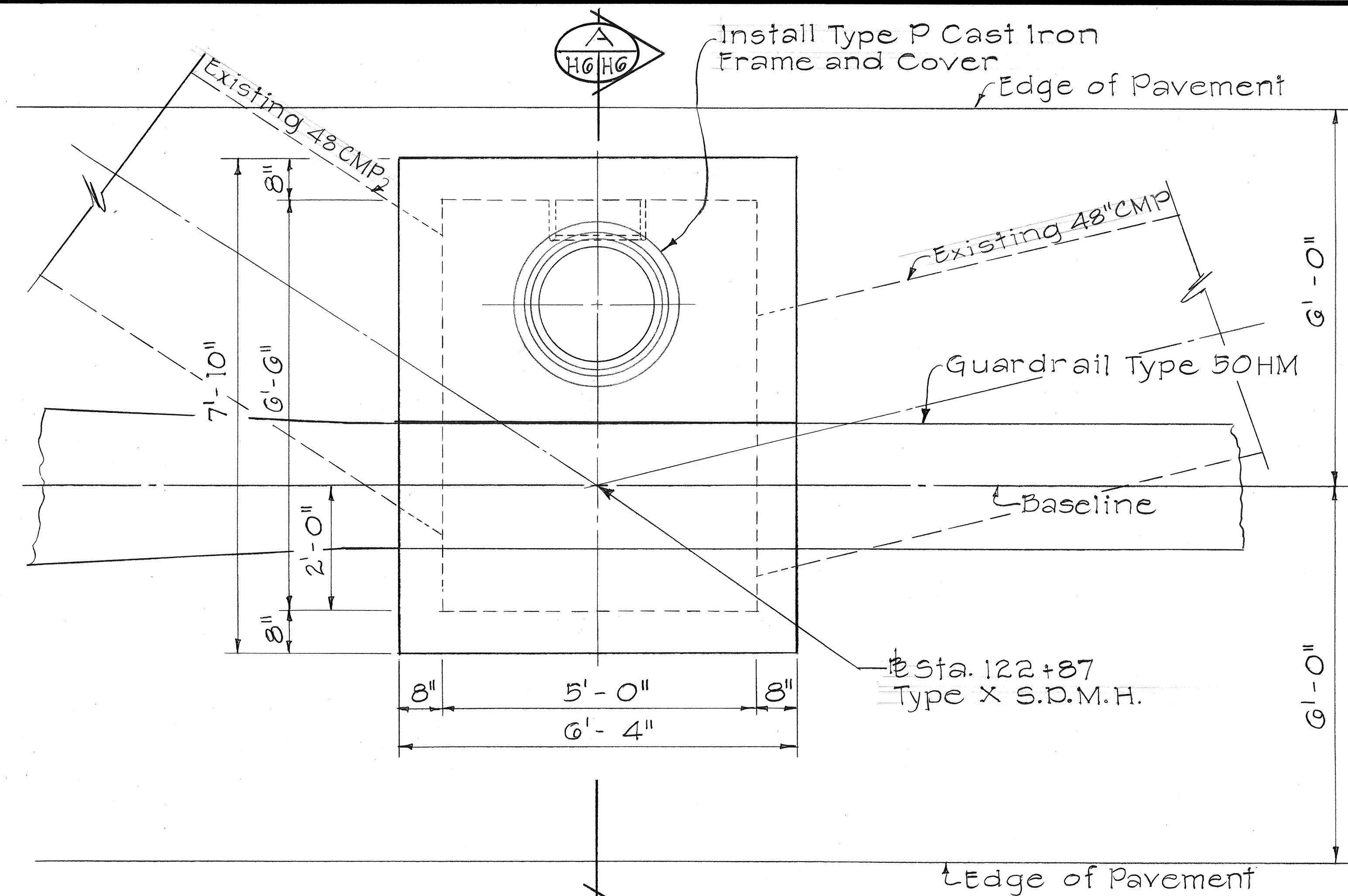
- NOTES:
1. Install new steel frame
 2. Install existing A-12 Steel Grate and new A-9 Steel Grate.

PLAN VIEW OF DOWEL LOCATION

DETAILS OF MODIFIED TYPE C GRATED DROP INLET

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
DRAINAGE DETAIL
INTERSTATE ROUTE H-1 SAFETY IMPROVEMENTS KOKOHEAD AVE TO WAIALAE VIADUCT F.A.I. PROJ. NO. IR-HI-1(197)
SCALE: 3/4"=1'-0" DATE: MAY 1985
SHEET NO. H5 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(107)	1986	28	38

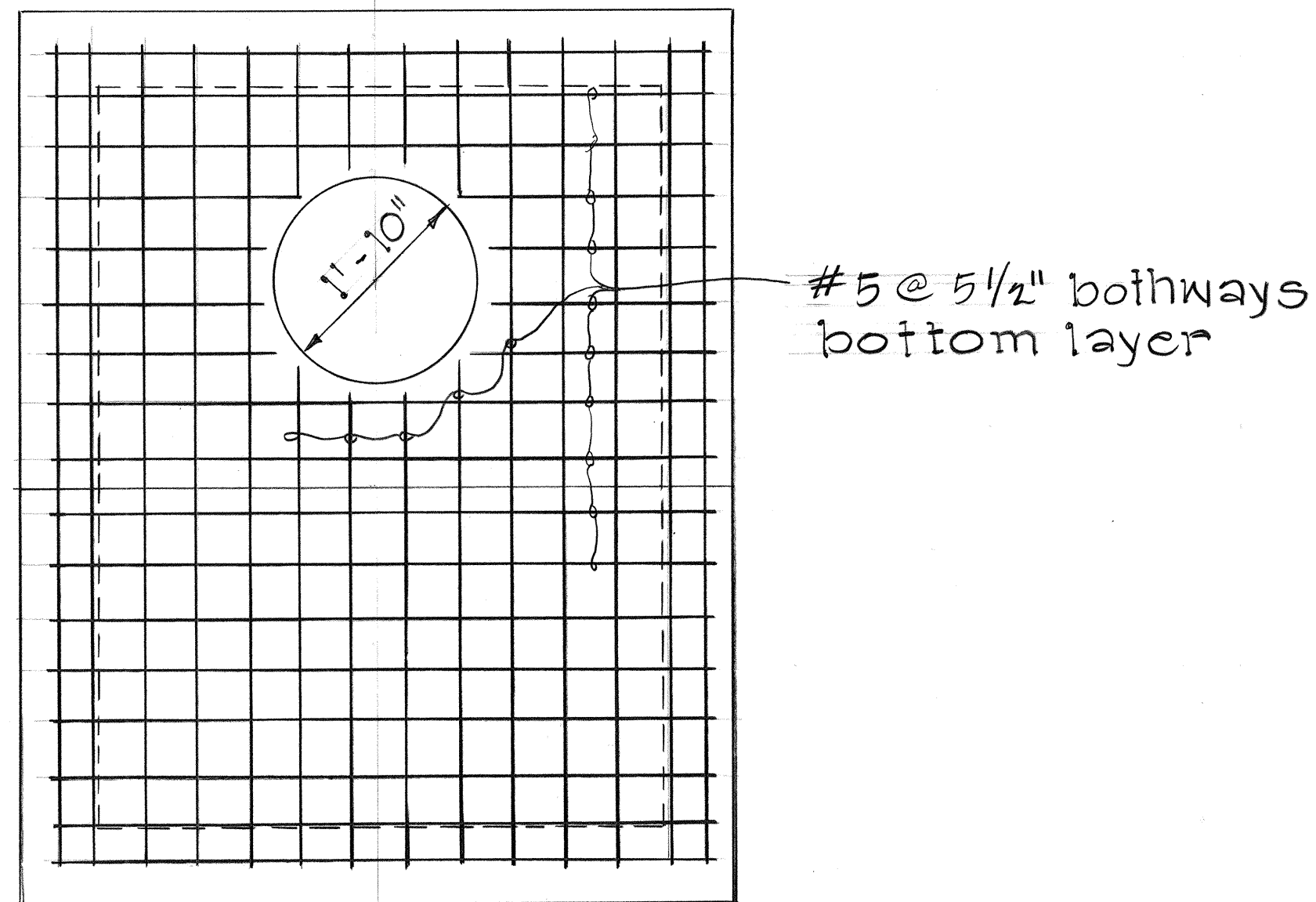


PART PLAN - WALL REINFORCING

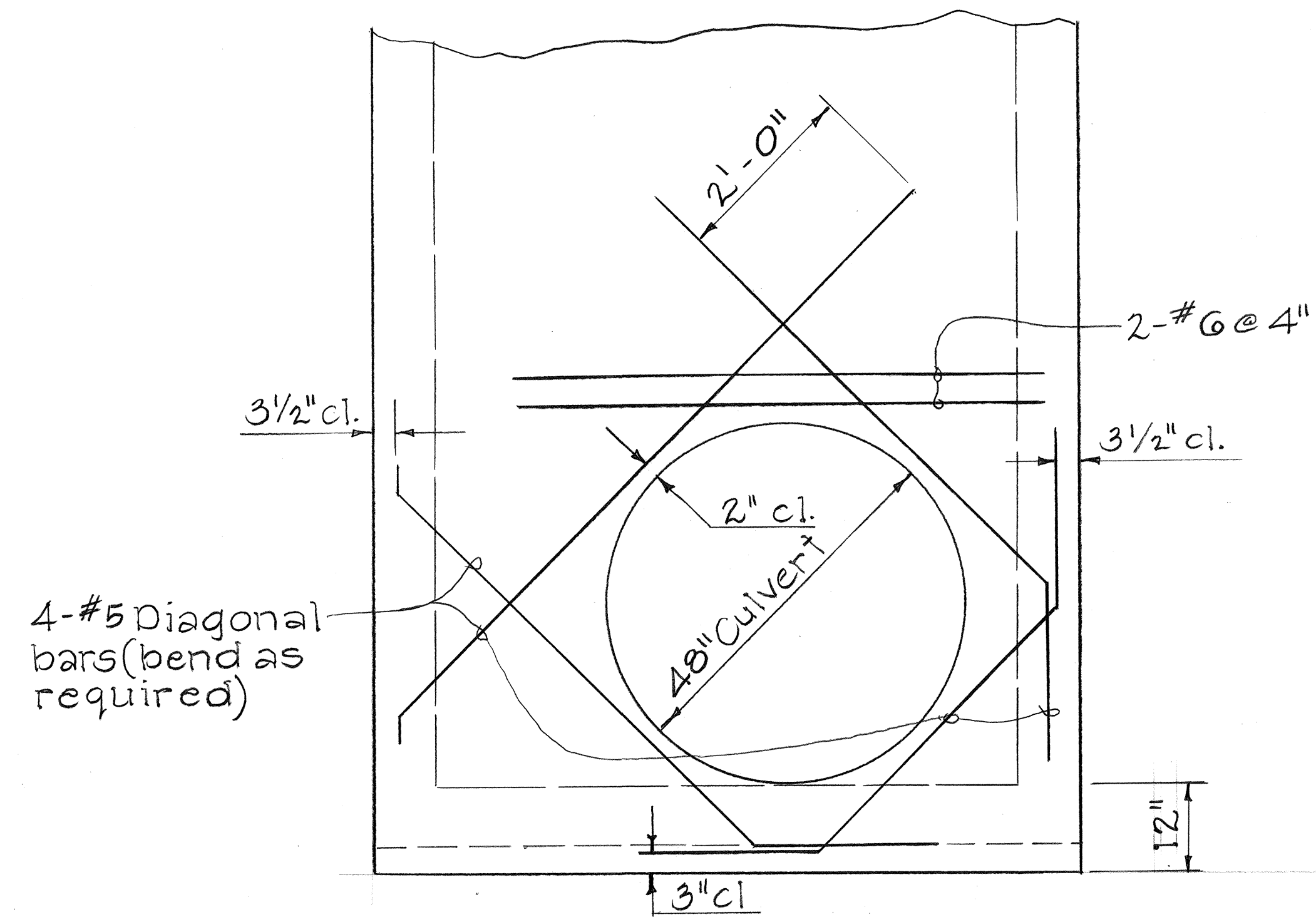
DETAILS OF TYPE X STORM DRAIN MANHOLE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION					
DRAINAGE DETAIL					
INTERSTATE ROUTE H-1					
SAFETY IMPROVEMENTS					
KOKOHEAD AVE TO WAIALAE VIADUCT					
F.A.I. PROJ. NO. IR-HI-1(107)					
SCALE: 3/4" = 1'-0" DATE: MAY 1985					
SHEET NO. H6 OF 9 SHEETS					

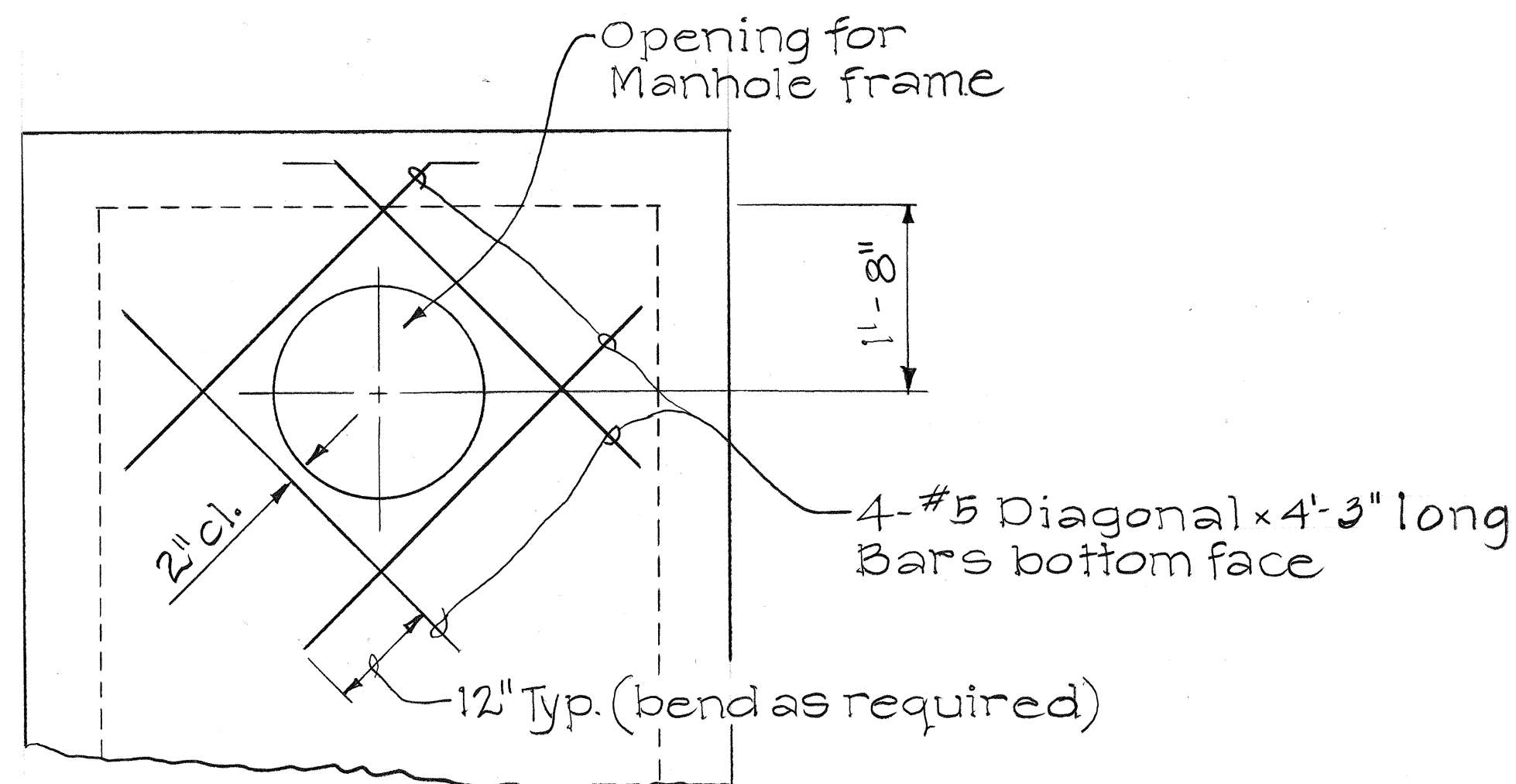
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(197)	1986	29	38



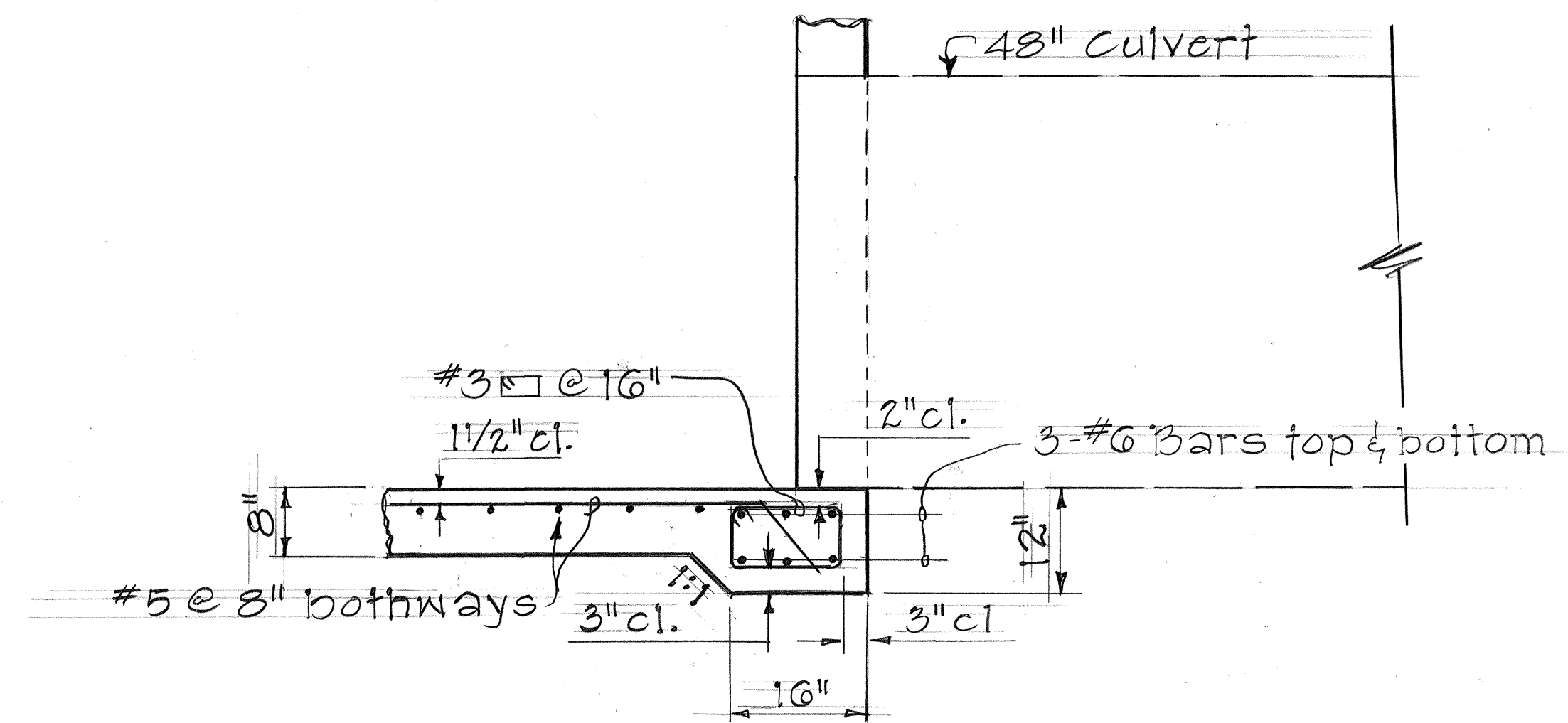
PLAN VIEW TOP SLAB REINFORCING



ADDED REINFORCING FOR CULVERT OPENINGS



ADDED REINFORCING FOR MANHOLE OPENING

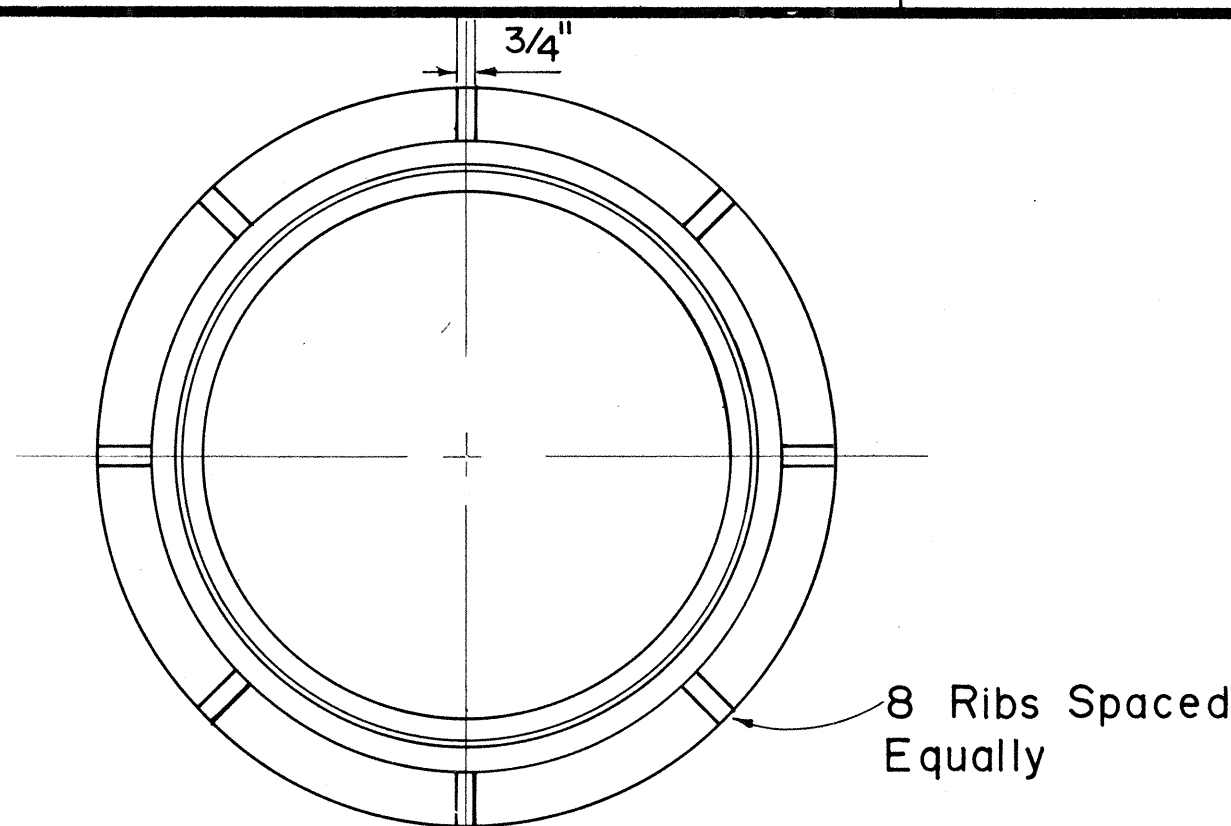


DETAIL OF CULVERT SEAT

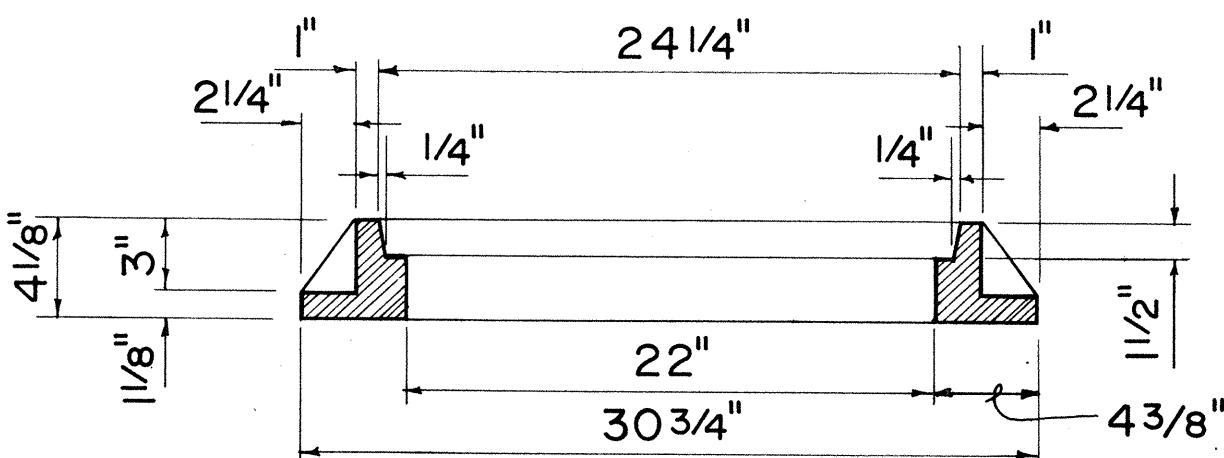
DETAILS OF TYPE X STORM DRAIN MANHOLE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
DRAINAGE DETAIL	
INTERSTATE ROUTE H-1	
SAFETY IMPROVEMENTS	
KOKOHEAD AVE TO WAIKALAE VIADUCT	
F.A. 1. PROJ. NO. IR-HI-1(197)	
SCALE: 3/4" = 1'-0" DATE: MAY 1985	
SHEET No. 17 OF 29 SHEETS	

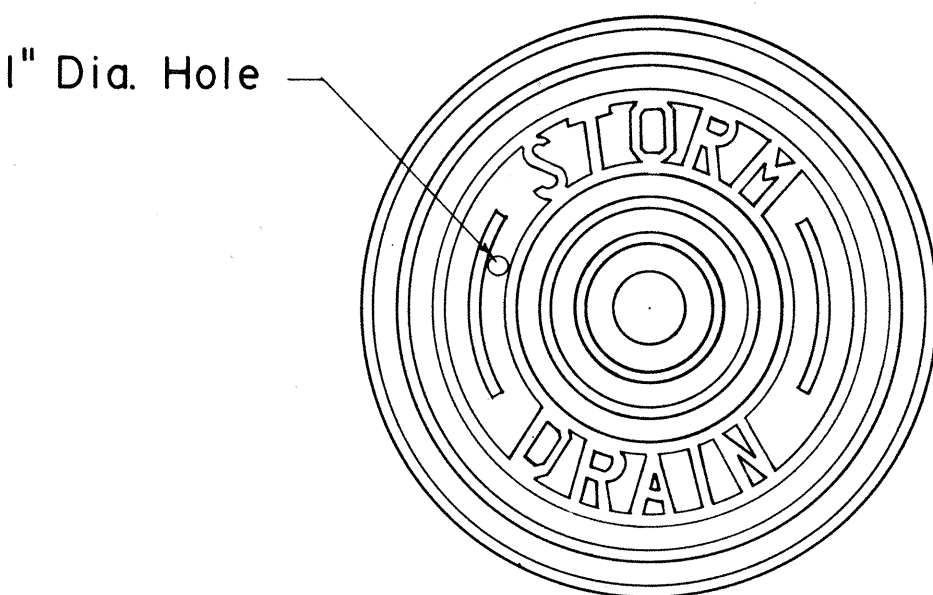
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-111(107)	1986	30	38



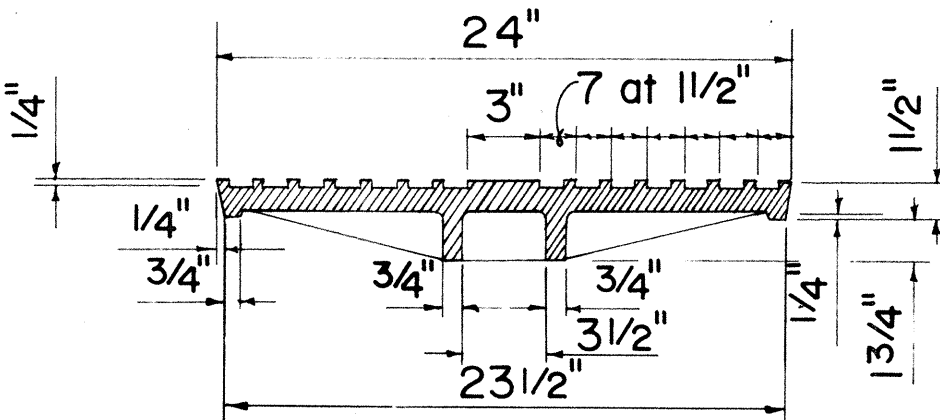
PLAN OF FRAME



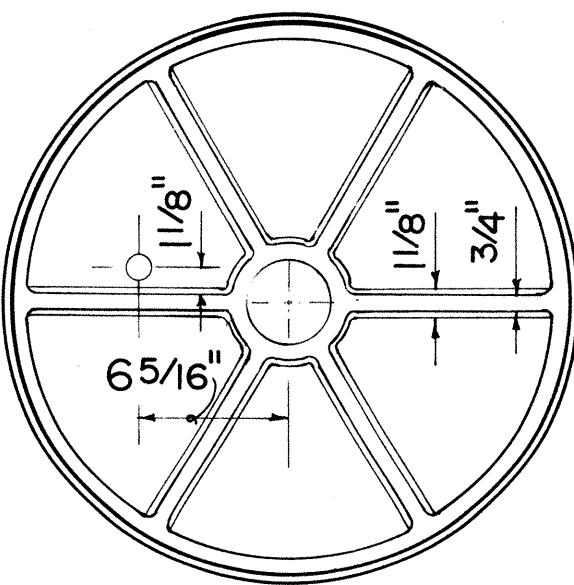
SECTION OF FRAME



TOP VIEW OF COVER

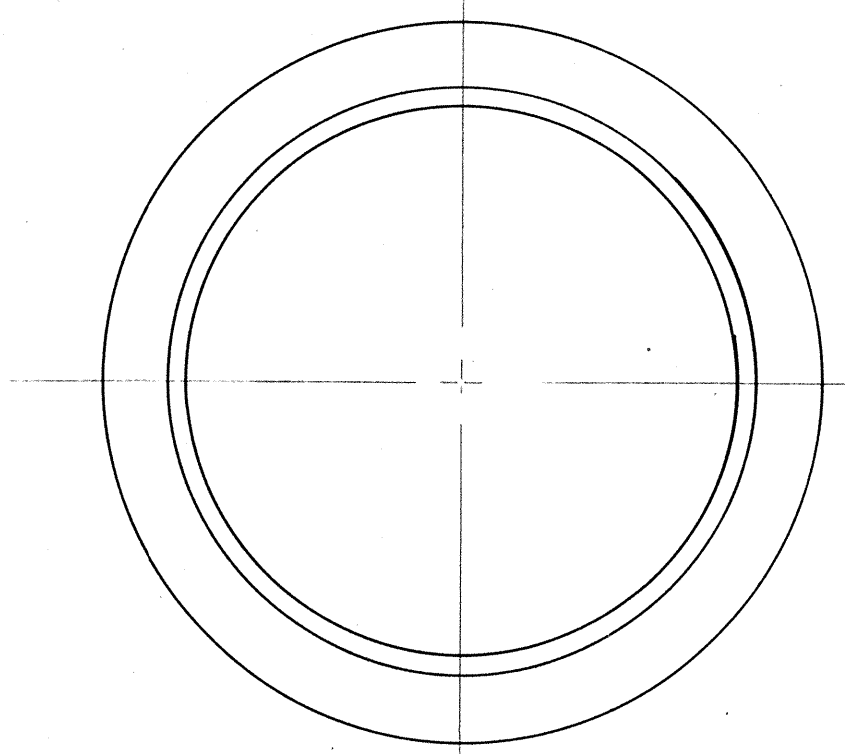


SECTION

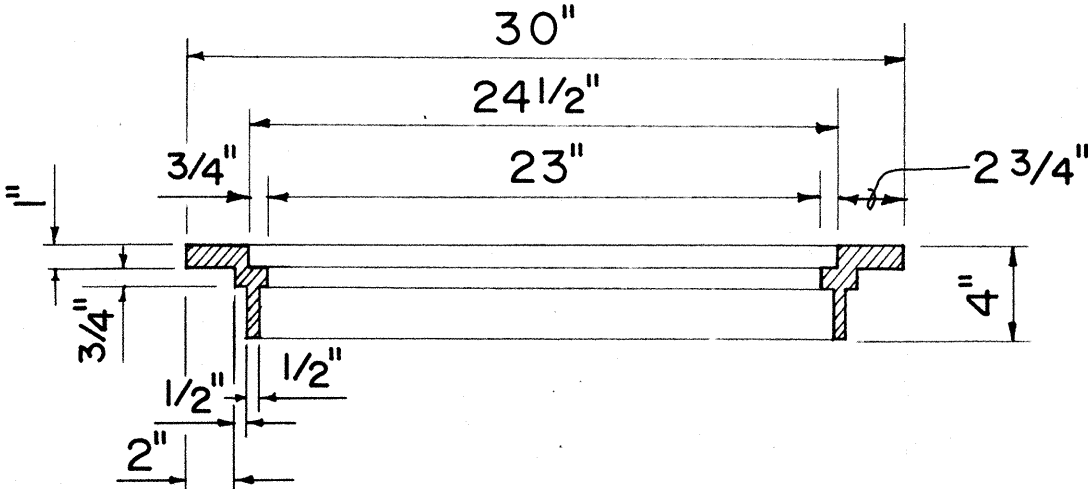


BOTTOM VIEW OF COVER

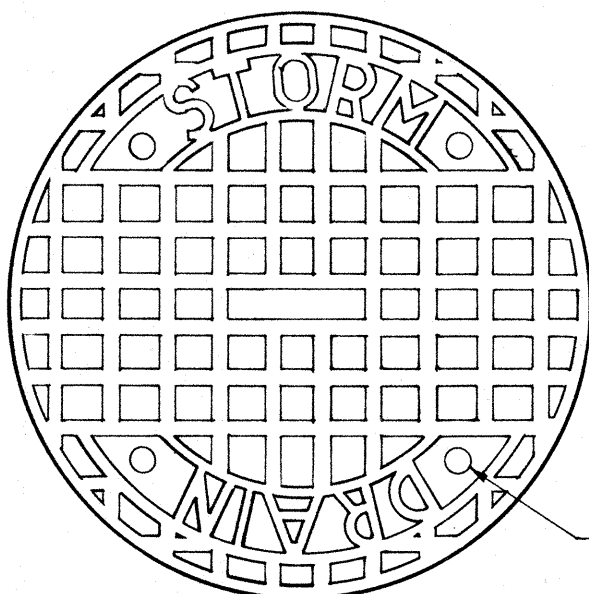
TYPE "P" CAST IRON
FRAME AND COVER



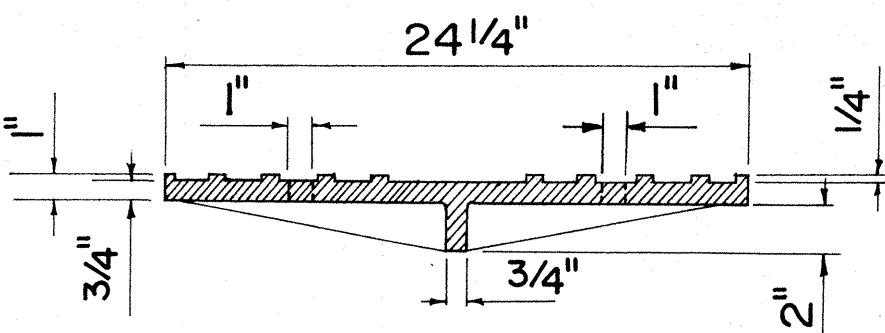
PLAN OF FRAME



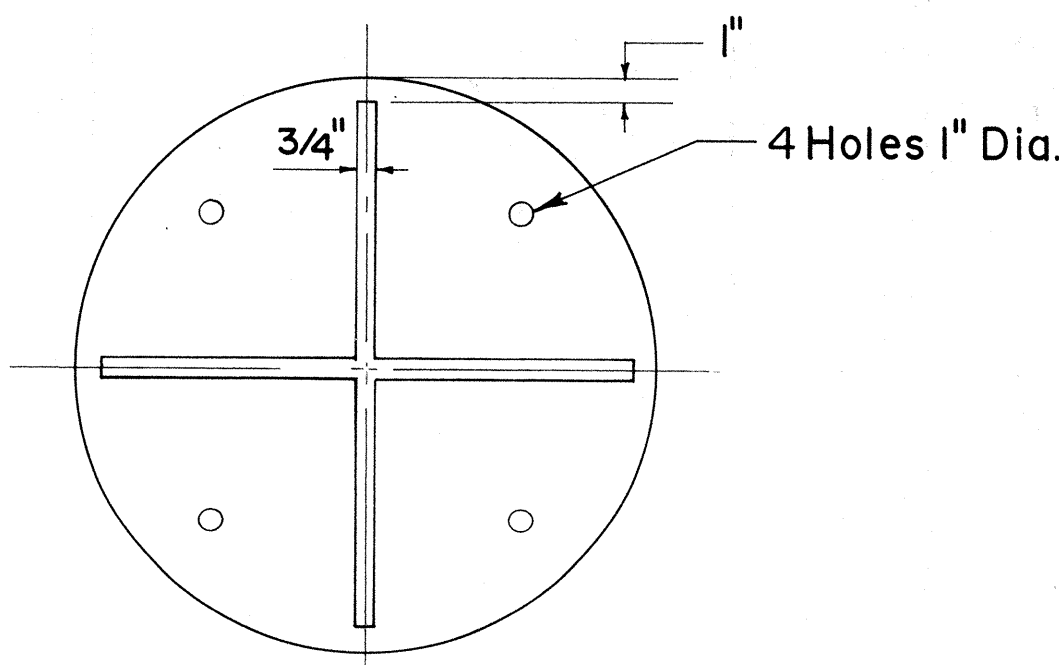
SECTION OF FRAME



TOP VIEW OF COVER

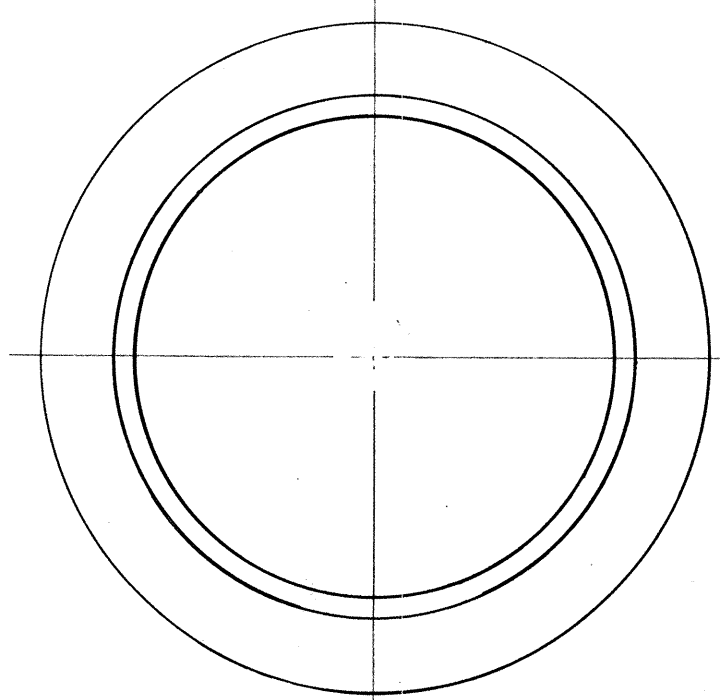


SECTION

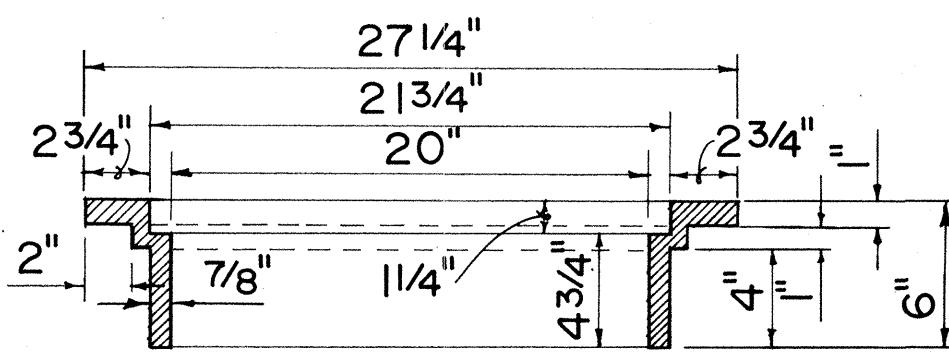


BOTTOM VIEW OF COVER

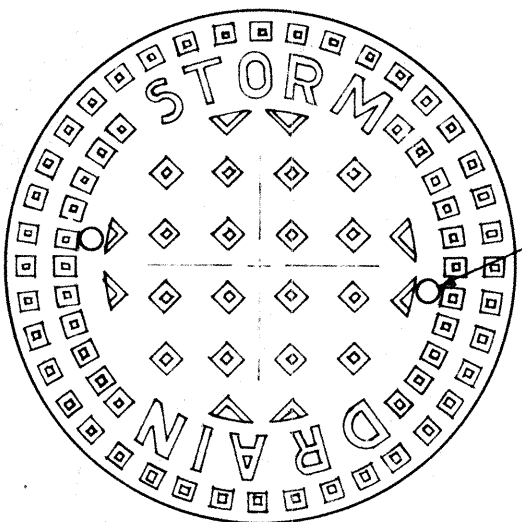
TYPE "B" CAST IRON
FRAME AND COVER



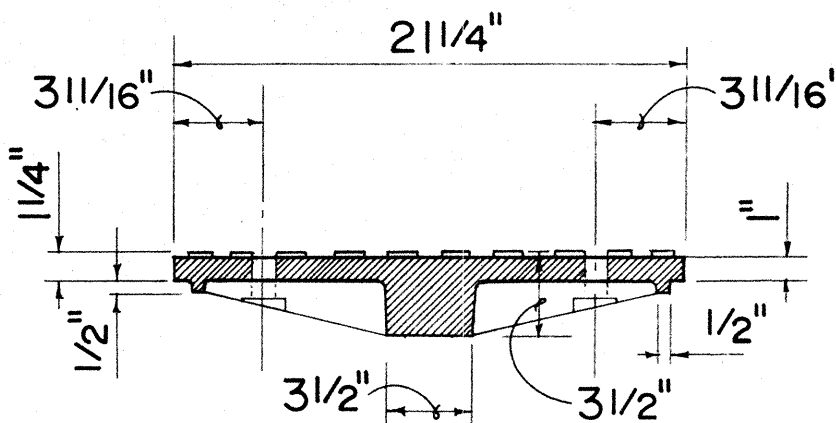
PLAN OF FRAME



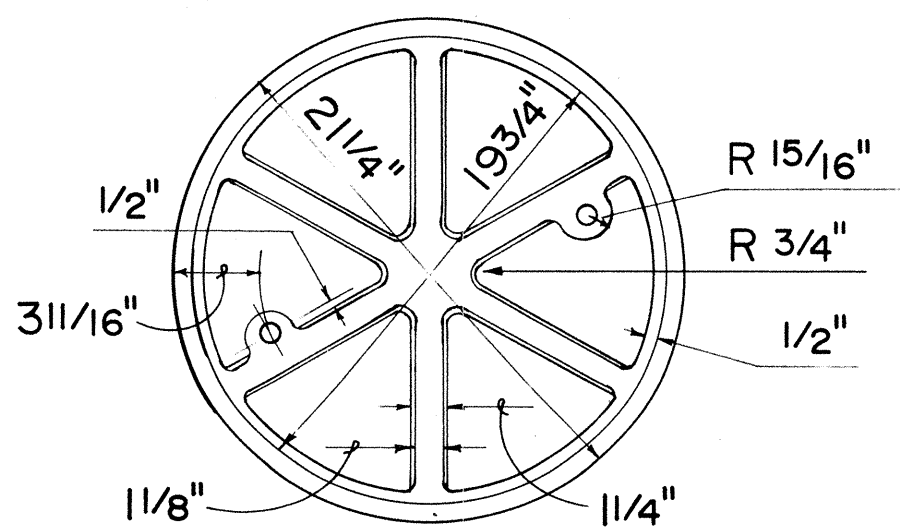
SECTION OF FRAME



TOP VIEW OF COVER

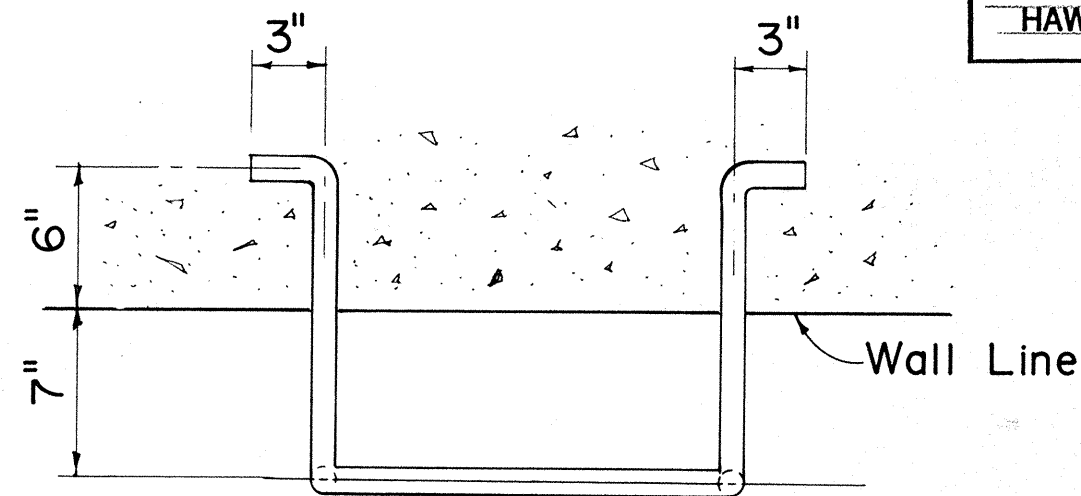


SECTION

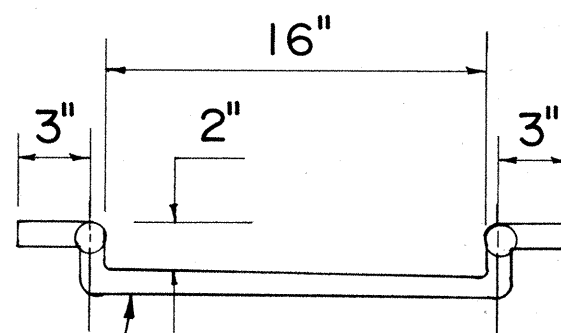


BOTTOM VIEW OF COVER

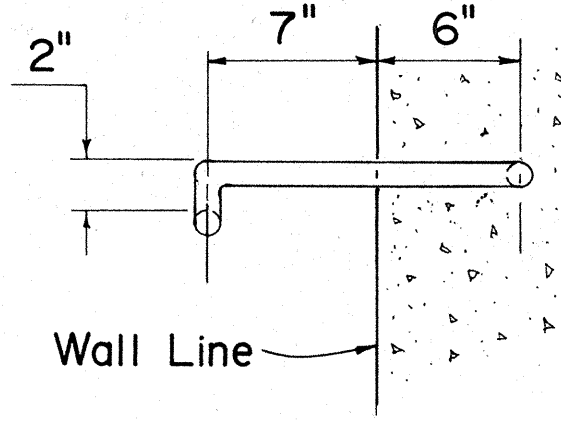
TYPE "A" CAST IRON
FRAME AND COVER



PLAN



FRONT VIEW



SIDE VIEW

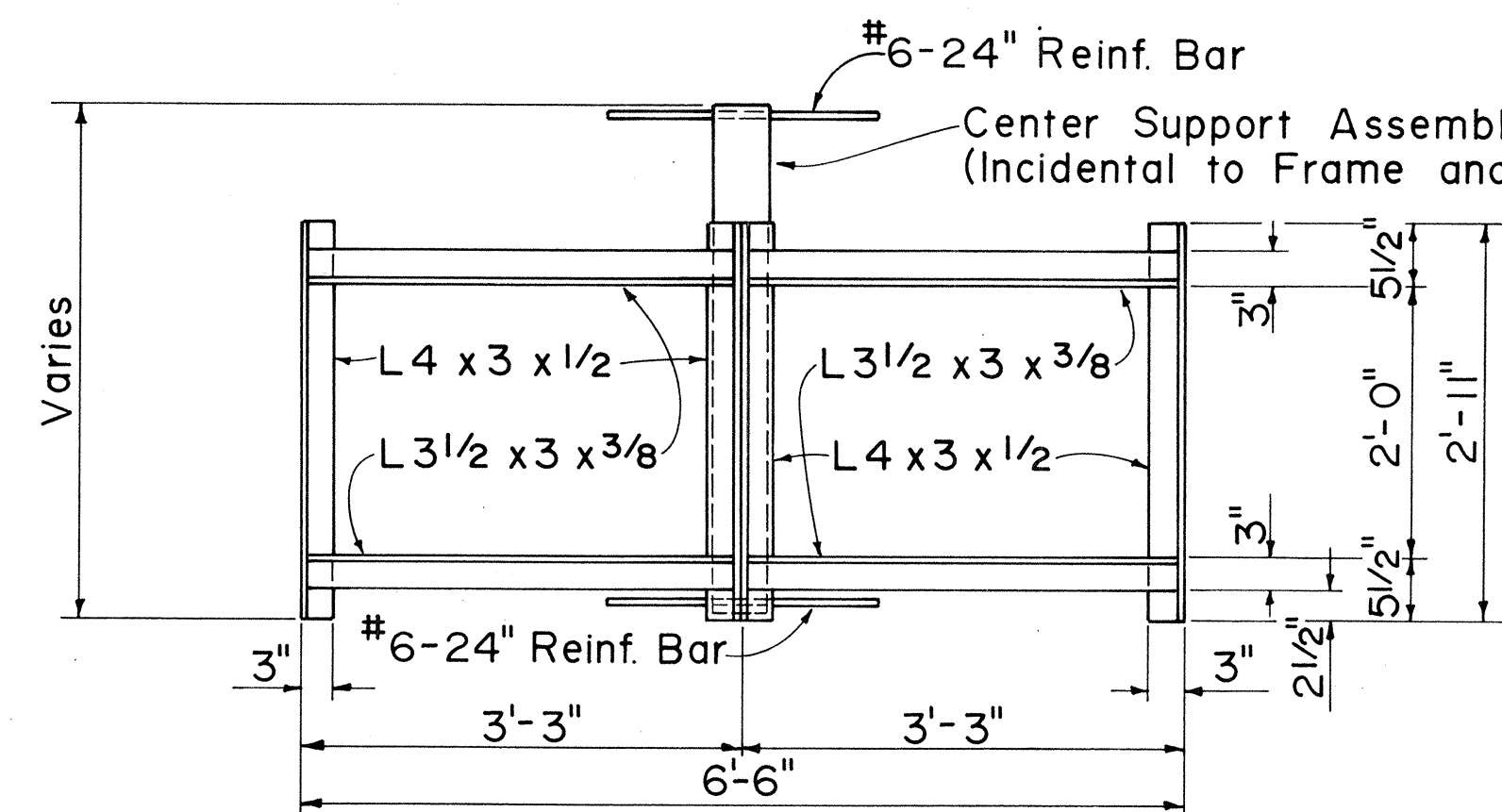
MANHOLE RUNG

APPROVAL RECOMMENDED:
HYDRAULIC DESIGN ENGINEER 6-19-79
DATE
APPROVED:
ASSISTANT CHIEF, ENGINEERING 6-22-79
DATE

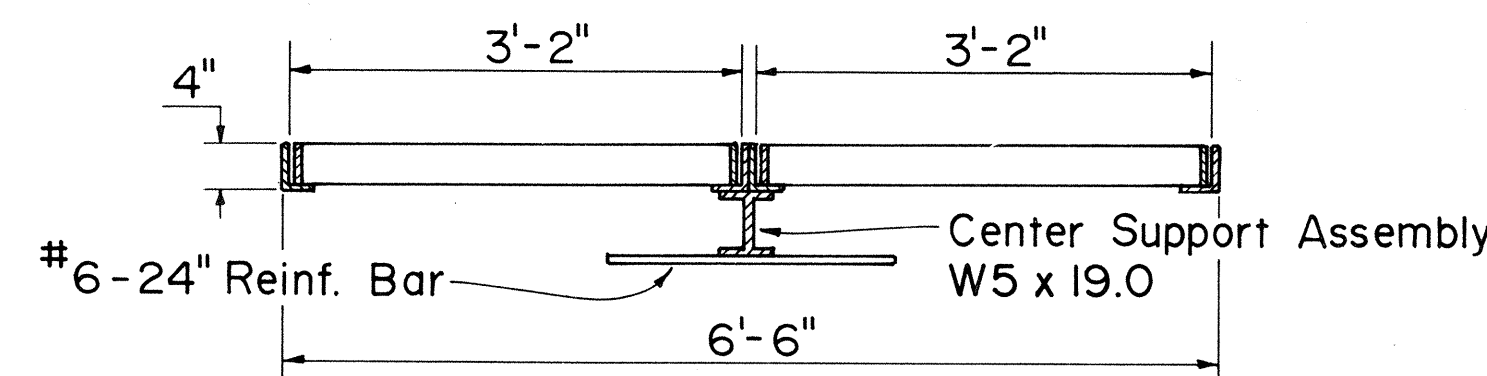
NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 6 approved 12-17-69	H.P.	6/22/79

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CATCH BASIN AND
MANHOLE CASTINGS
Not To Scale Date: Dec. 1977
SHEET NO. 30 OF 38 SHEETS DH 6

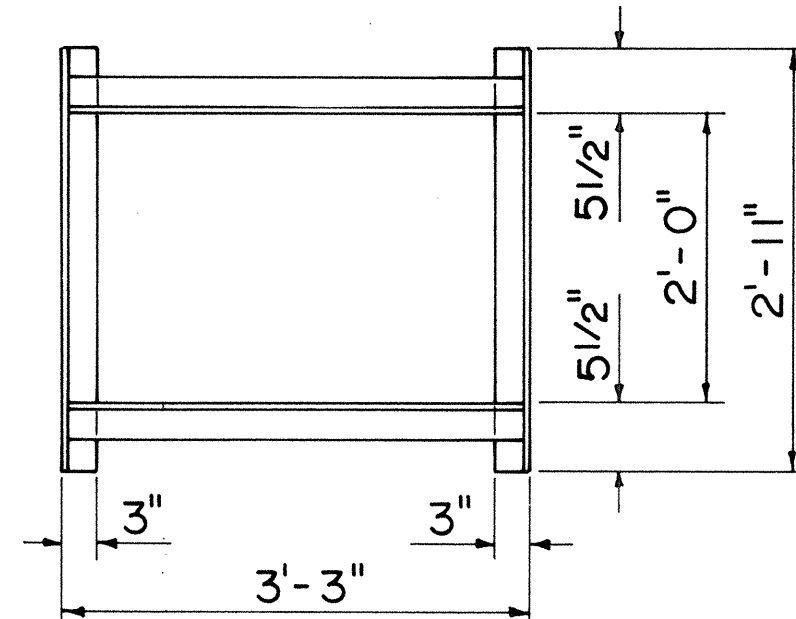
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IRH-1(97)	1986	31	38



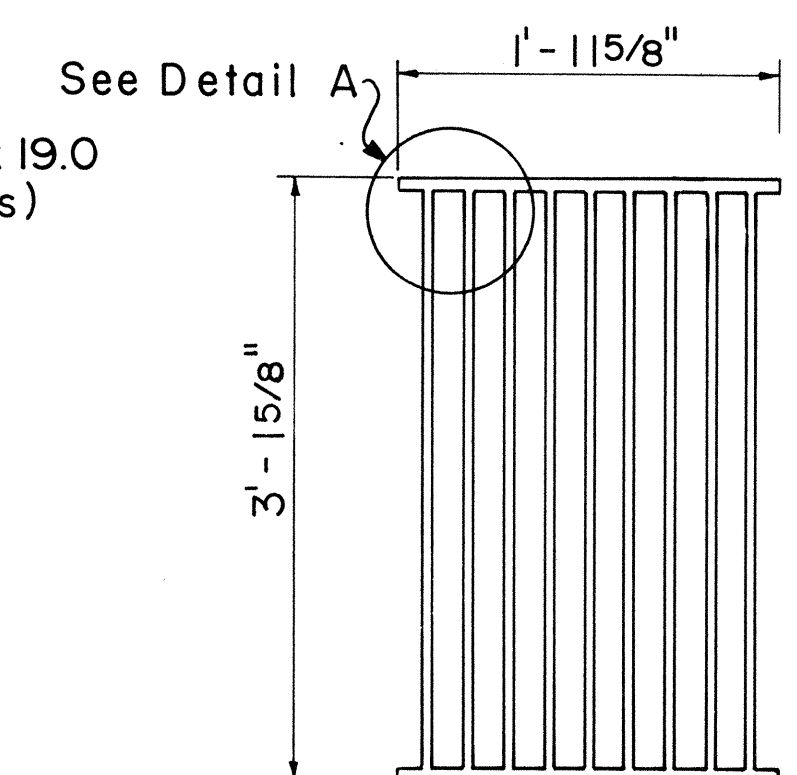
PLAN
(Two or More Grates)



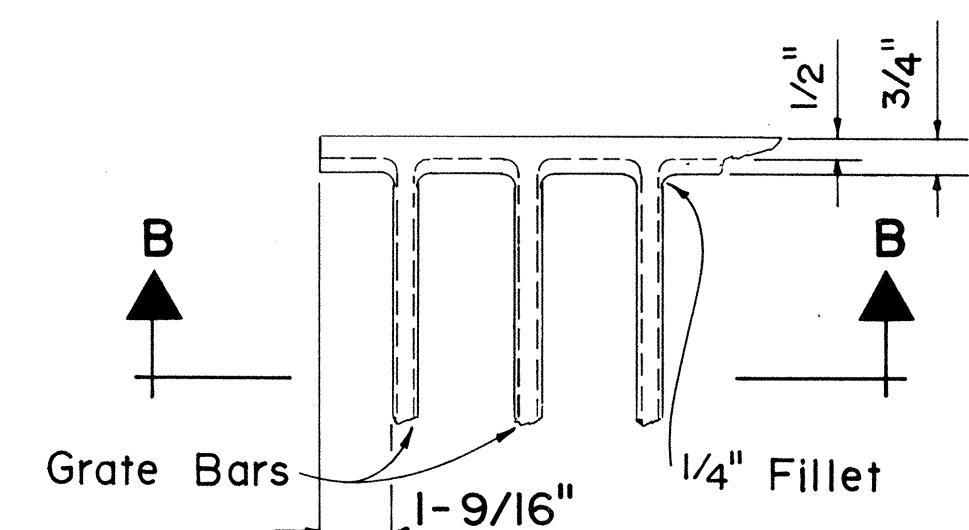
LONGITUDINAL SECTION
(Thru Frame & Gate)



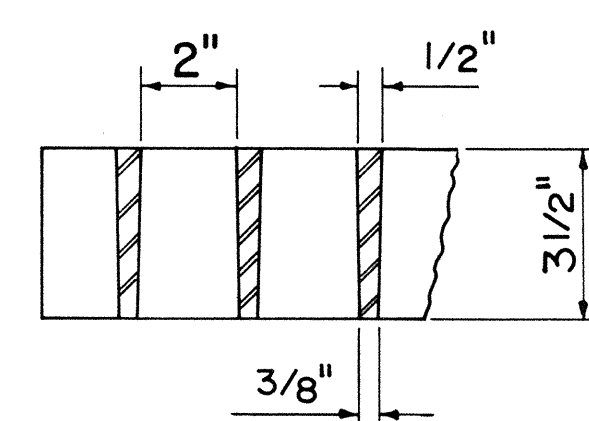
PLAN
(Single Gate)



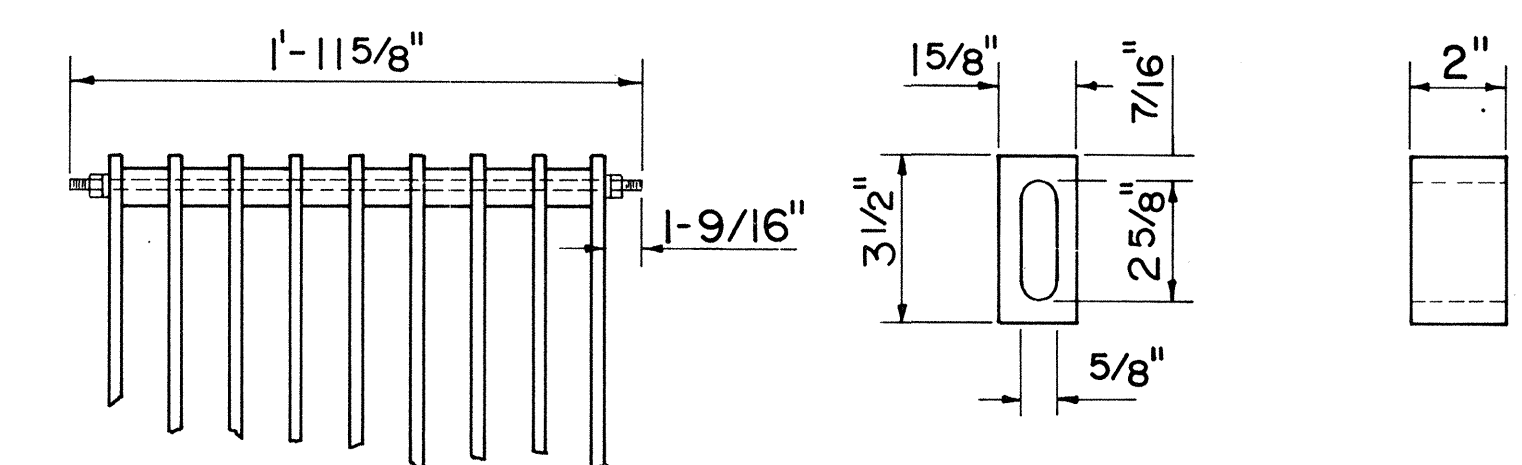
PLAN



DETAIL A

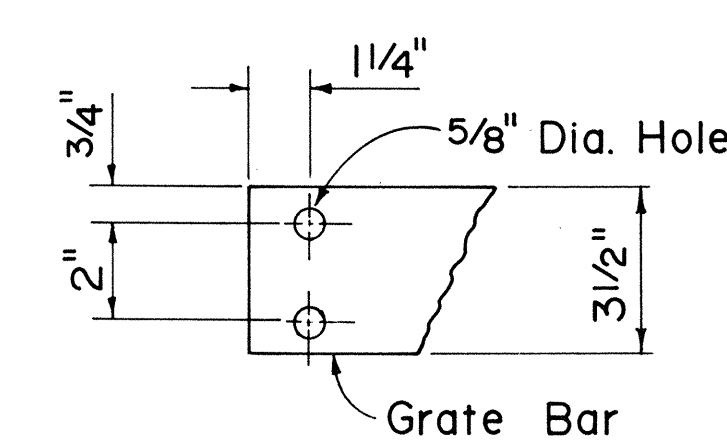


SECTION B-B

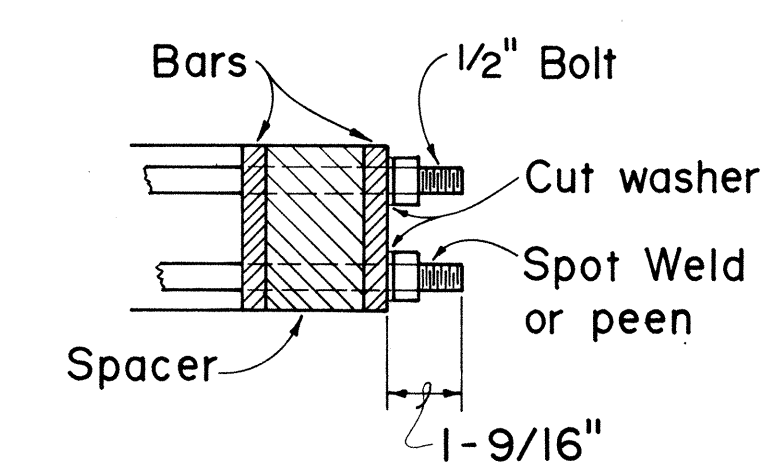


BOLTED END BLOCK

BAR SPACER

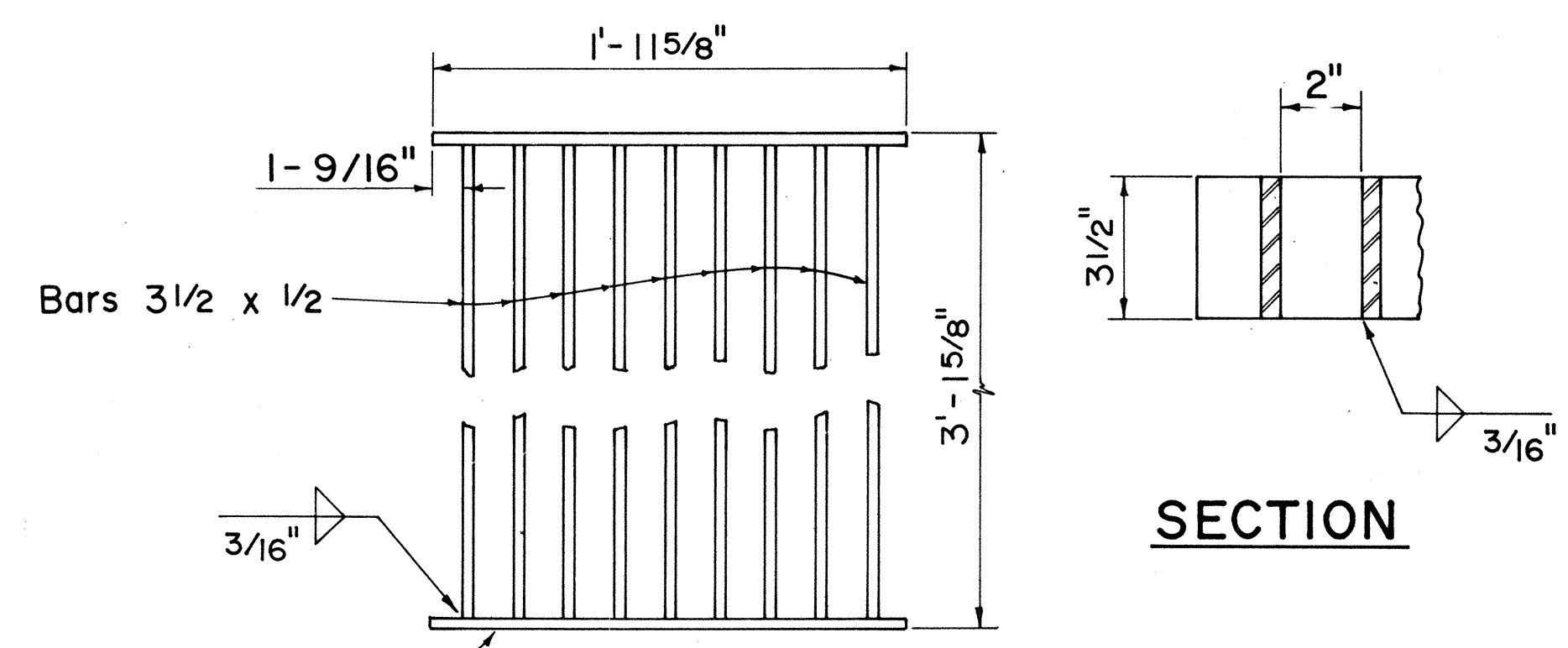


END OF BAR

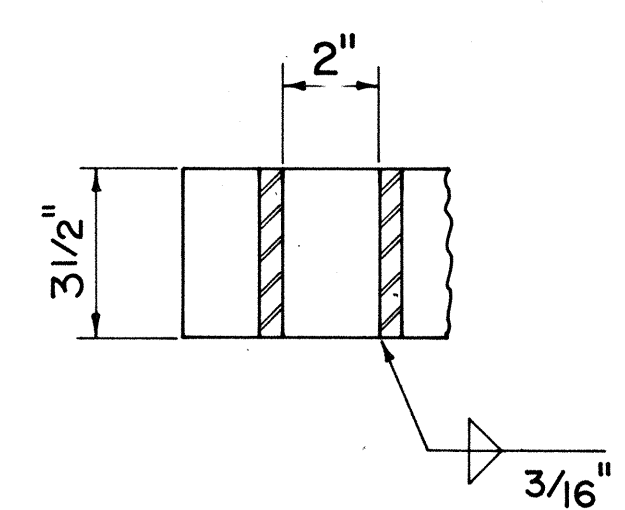


BOLTING DETAIL

ALTERNATIVE BOLTED GRATE



PLAN

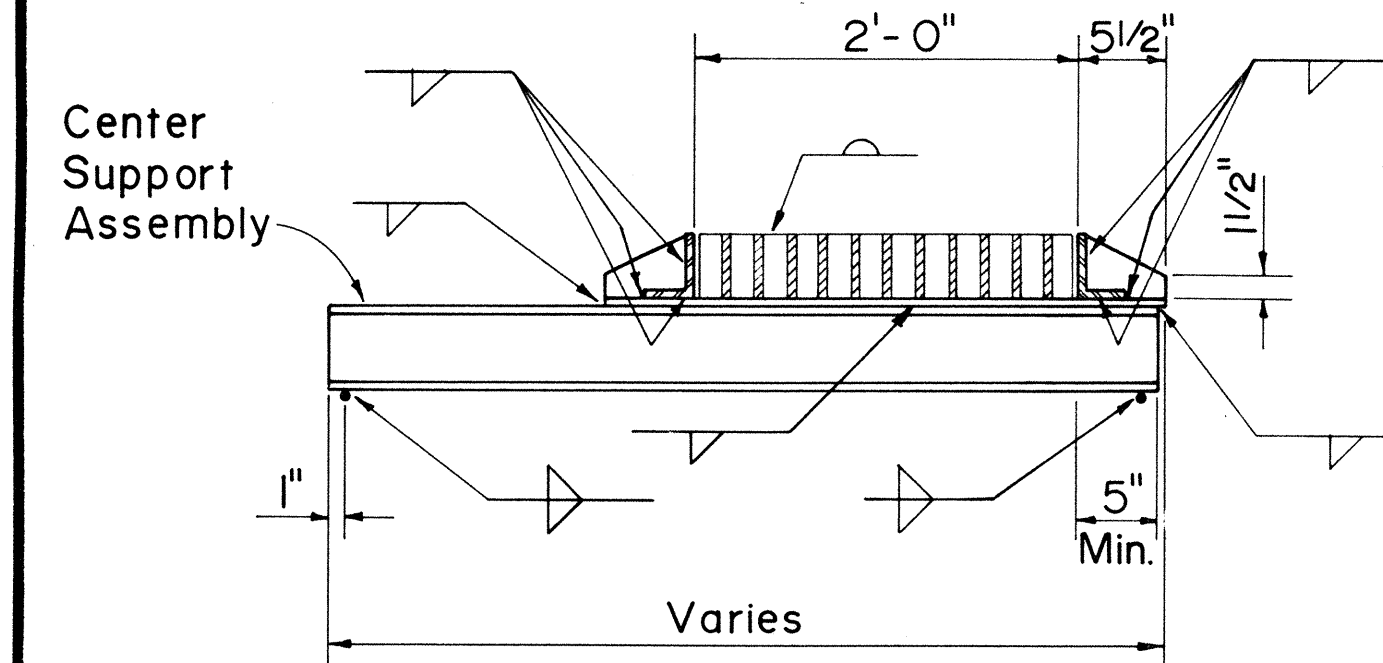


SECTION

TYPE A-9 STEEL GRATE

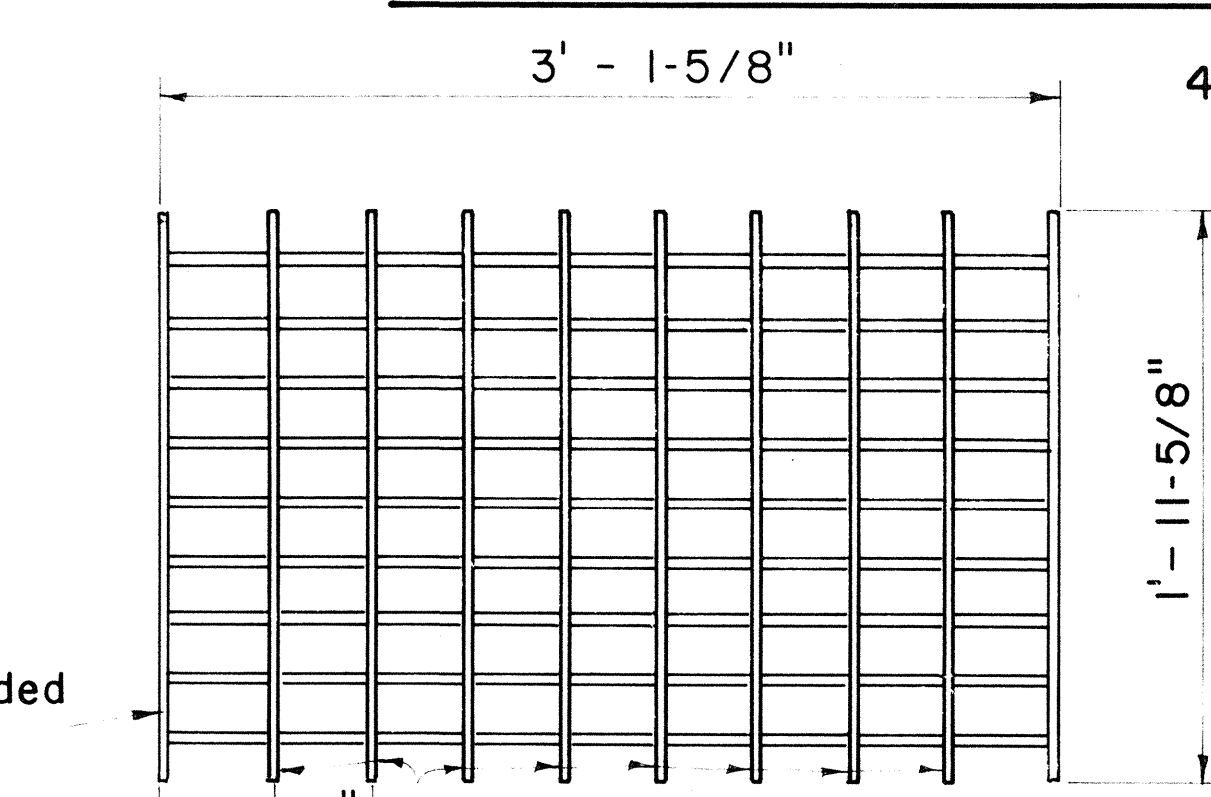
ALTERNATIVE WELDED GRATE

ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL GRATE



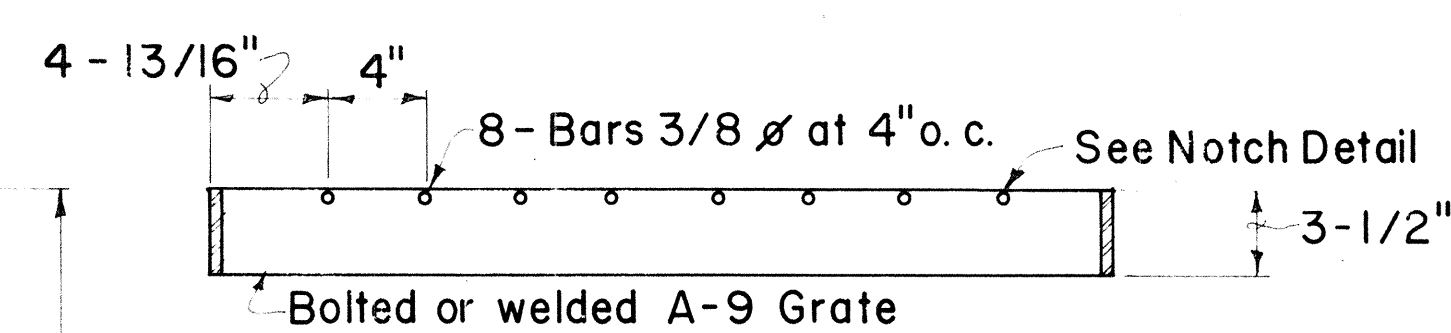
CROSS SECTION
(Thru Frame & Gate)

FRAME DETAILS

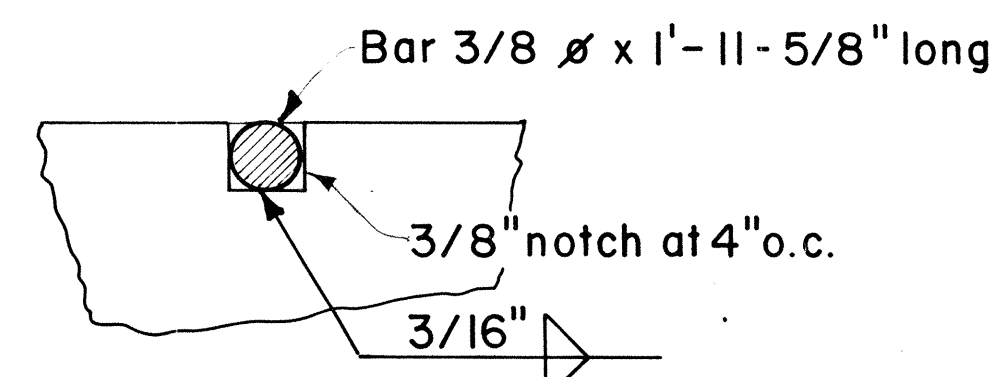


PLAN

TYPE A-9P STEEL GRATE



SECTION



NOTCH DETAIL

APPROVAL RECOMMENDED:
HYDRAULIC DESIGN ENGINEER 6-19-79 DATE
APPROVED:
ASSISTANT CHIEF, ENGINEERING 6-22-79 DATE

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 7 approved 12-17-69	H.T.	6/22/79
2.	Revise standard nomenclature for rolled steel shapes.	H.T.	4/21/82
3.	Revised note no. 3 & no. 4 and eliminated Type A-12 Grate.	H.T.	7-25-84

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
STANDARD DETAILS TYPE A-9 AND A-9P FRAMES AND GRATES
Not To Scale Date: Dec. 1977

SHEET NO. 10 OF 9 SHEETS DH 7