

S U M M A R Y

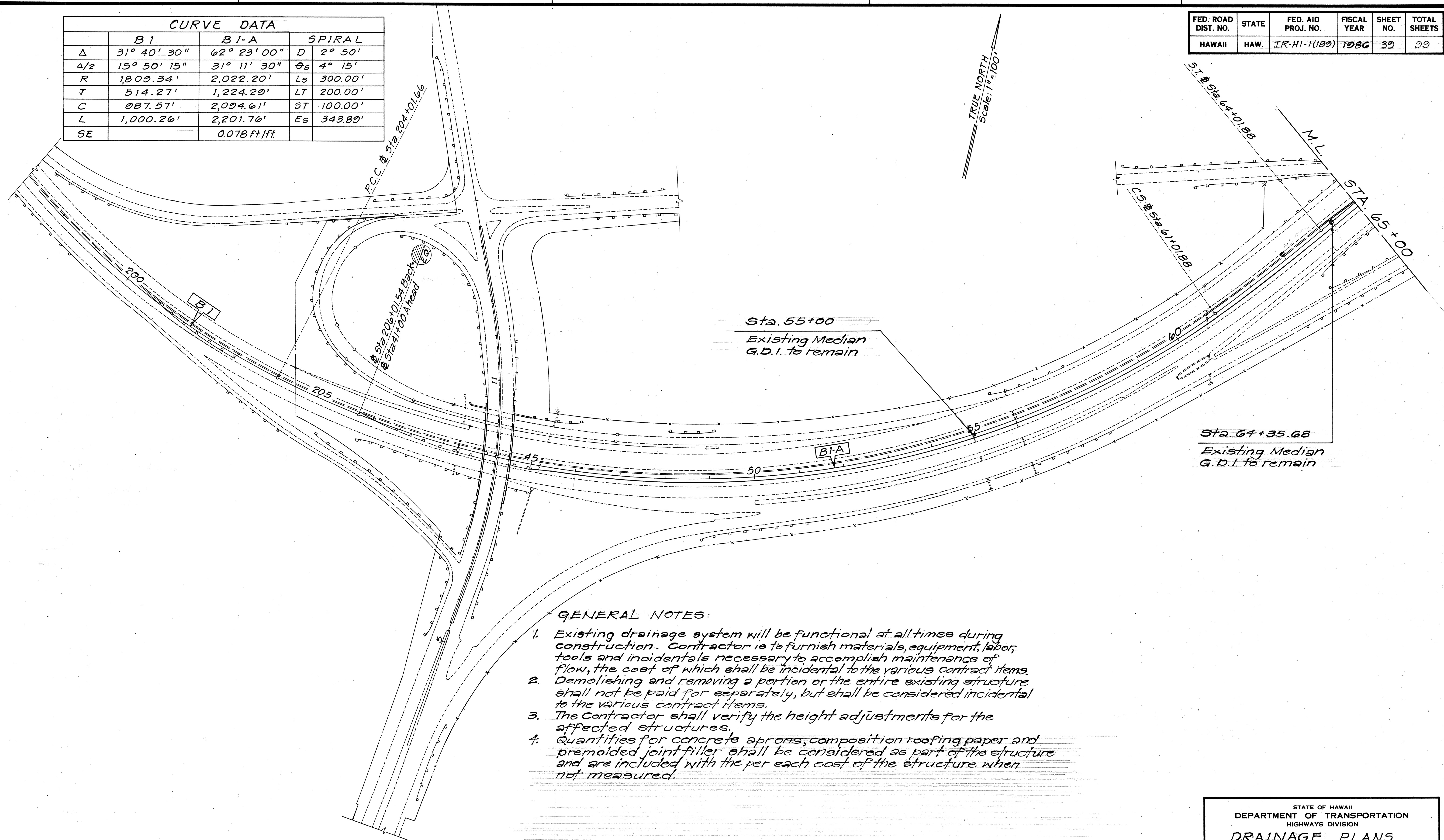
PROJECT: INTERSTATE H-1, PALAILAI INTERCHANGE TO KUNIA INTERCHANGE
CONSTRUCTION OF ADDITIONAL LANES
PROJECT NO.: IR-H1-1(189)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	IR-HI-1(189)	1996	38	99

[illegible]

CURVE DATA				
	B1	B1-A	SPIRAL	
Δ	31° 40' 30"	62° 23' 00"	D	2° 50'
$\Delta/2$	15° 50' 15"	31° 11' 30"	θ_s	4° 15'
R	1,809.34'	2,022.20'	Ls	300.00'
T	514.27'	1,224.29'	LT	200.00'
C	987.57'	2,094.61'	ST	100.00'
L	1,000.26'	2,201.76'	Es	343.89'
SE		0.078 ft./ft.		

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(182)	1986	39	99



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.
- The Contractor shall verify the height adjustments for the affected structures.
- Quantities for concrete aprons, composition roofing paper and preformed joint filler shall be considered as part of the structure and are included with the per each cost of the structure when not measured.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

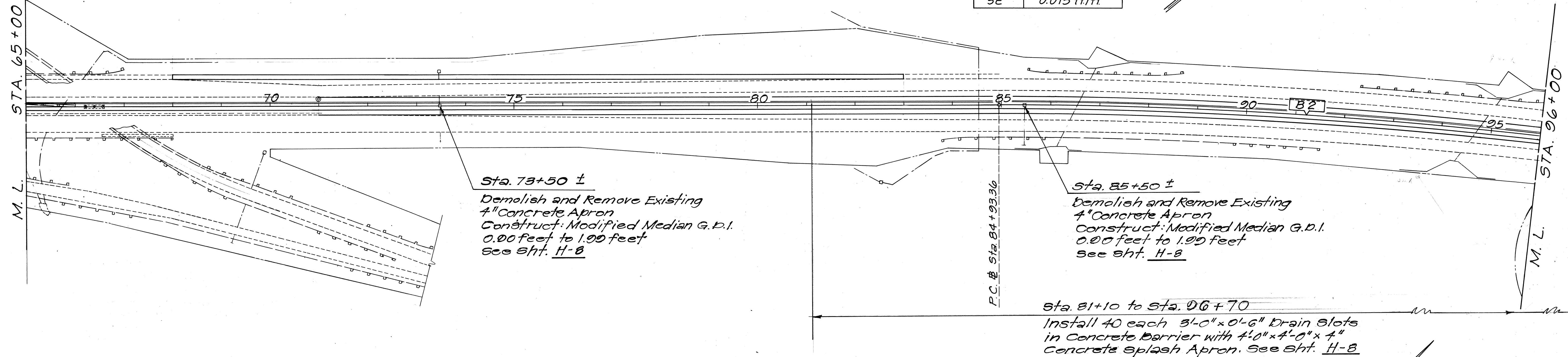
DRAINAGE PLANS

INTERSTATE ROUTE H-1
Palailai Interchange to Kunia Interchange
Construction of Additional Lanes
F.A.I. PROJ. No. IR-HI-1(182)
Scale: 1"=100' Date: July, 1985
SHEET No. H-2 OF 14 SHEETS

CURVE DATA B2	
Δ	6° 50' 00"
$\Delta/2$	3° 25' 00"
R	10,000.00'
T	597.03'
L	1,192.64'
C	1,191.93'
SE	0.015 ft/ft

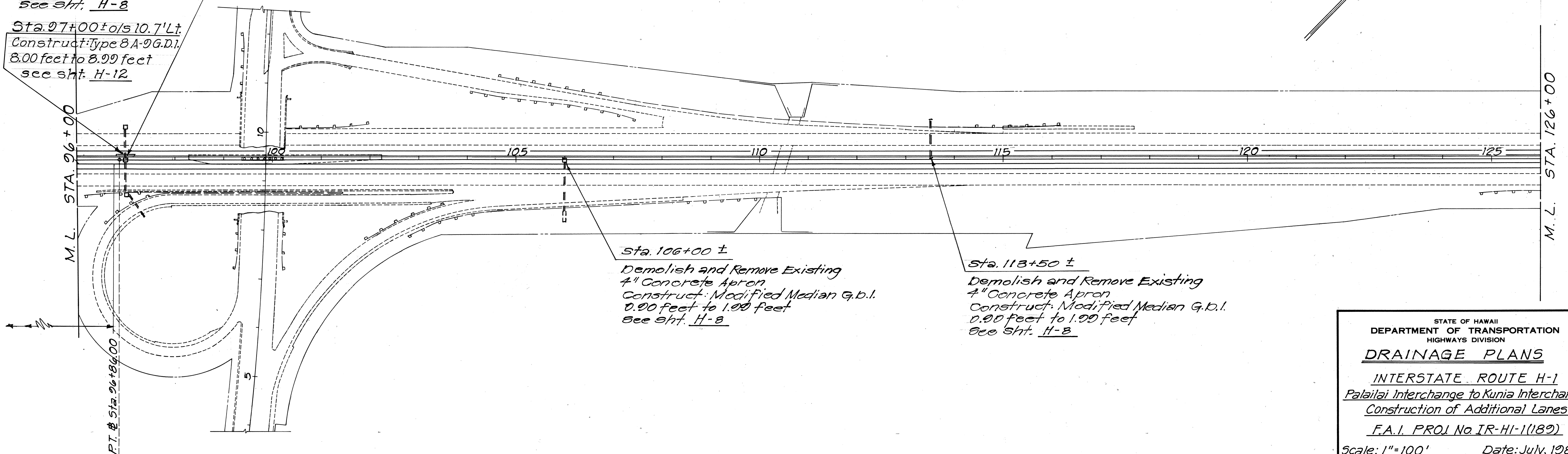
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(182)	1986	40	99

TRUE NORTH
Scale: 1"=100'



Sta. 97+00 ±
Demolish and Remove Existing
4" Concrete Apron
Construct: Modified Median G.D.I.
0.00 feet to 1.00 feet
See Sht. H-8

Sta. 97+00 ± or 10.7' Lt.
Construct: Type 8A-9 G.D.I.
8.00 feet to 8.99 feet
See Sht. H-12



TRUE NORTH
Scale: 1"=100'

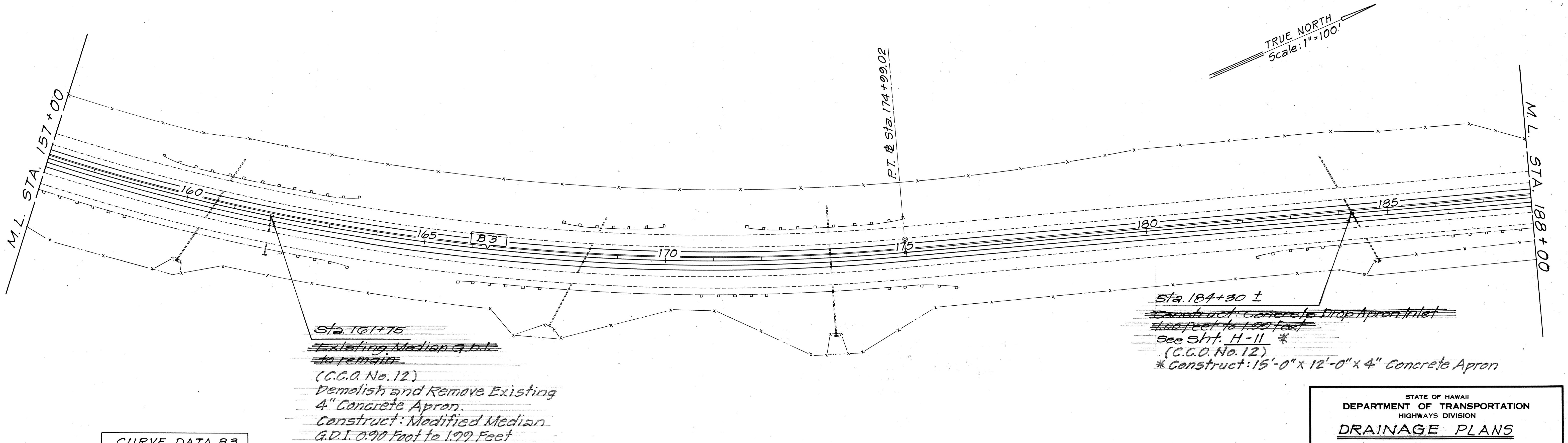
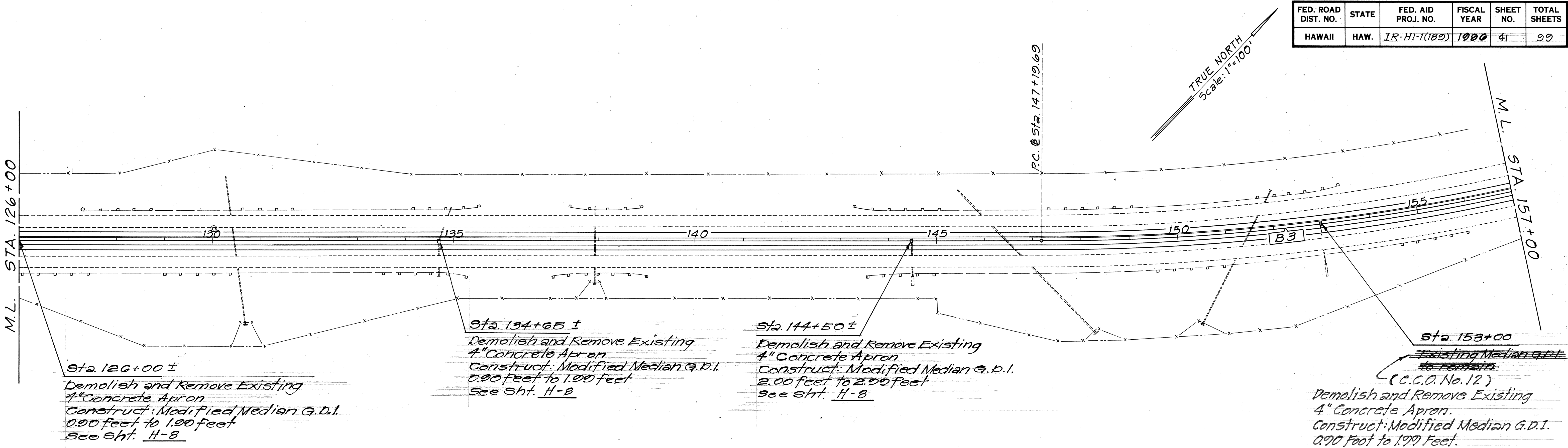
SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
CHECKED BY	
NOTE BOOK	
NO.	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLANS

INTERSTATE ROUTE H-1
Palailai Interchange to Kunia Interchange
Construction of Additional Lanes
F.A.I. PROJ. No. IR-HI-1(182)
Scale: 1"=100' Date: July, 1985
SHEET No. H-3 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(182)	1980	41	99



CURVE DATA B3	
Δ	34° 44' 30"
Δ/2	17° 22' 15"
R	4,583.66'
T	1,433.87'
L	2,770.33'
C	2,736.95'
SE	0.035 ft./ft.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLANS

INTERSTATE ROUTE H-1
Palailai Interchange to Kunia Interchange
Construction of Additional Lanes
F.A.I. PROJ. No. IR-HI-1(182)
Scale: 1"=100' Date: July, 1985
SHEET No. H-4 OF 14 SHEETS

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
NO.	

CURVE DATA B4			
CIRCULAR		SPIRAL	
Δ	28° 04' 30"	Δ	35° 34' 30"
$\Delta/2$	14° 02' 15"	D_c	2° 30' 00"
R	2,291.83'	θ_s	3° 45' 00"
T	573.01'	L_s	300.00'
L	1,123.00'	T_s	885.78'
C	1,111.80'	E_s	116.77'

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(189)	1986	42	99

Sta. 192+00 $\frac{1}{2}$ 10.7' Lt.

Construct: Type GA-9G.D.I.
Install: 24" CSF, 0.070"
See Sht. H-9

Sta. 192+00 $\pm$

Demolish and Remove Existing
Median G.D.I.
Construct: Modified Median G.D.I.
4.00 feet to 4.20 feet
See Sht. H-9

Sta. 214+00 $\pm$

Demolish and Remove Existing
4" Concrete Apron
Construct: Modified Median G.D.I.
0.00 feet to 1.00 feet
See Sht. H-8

Sta. 222+70

Existing Median G.D.I.
to remain
(C.C.O. No. 12)
Construct: 15'-0" x 12'-0" x 4"
Concrete Apron Around
existing Median G.D.I.

Sta. 230+00 $\pm$

Demolish and Remove Existing
4" Concrete Apron
Construct: Modified Median G.D.I.
0.00 feet to 1.00 feet
See Sht. H-8

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLANS

INTERSTATE ROUTE H-1
Palailai Interchange to Kunia Interchange
Construction of Additional Lanes

F.A.I. PROJ. No. IR-HI-1(189)

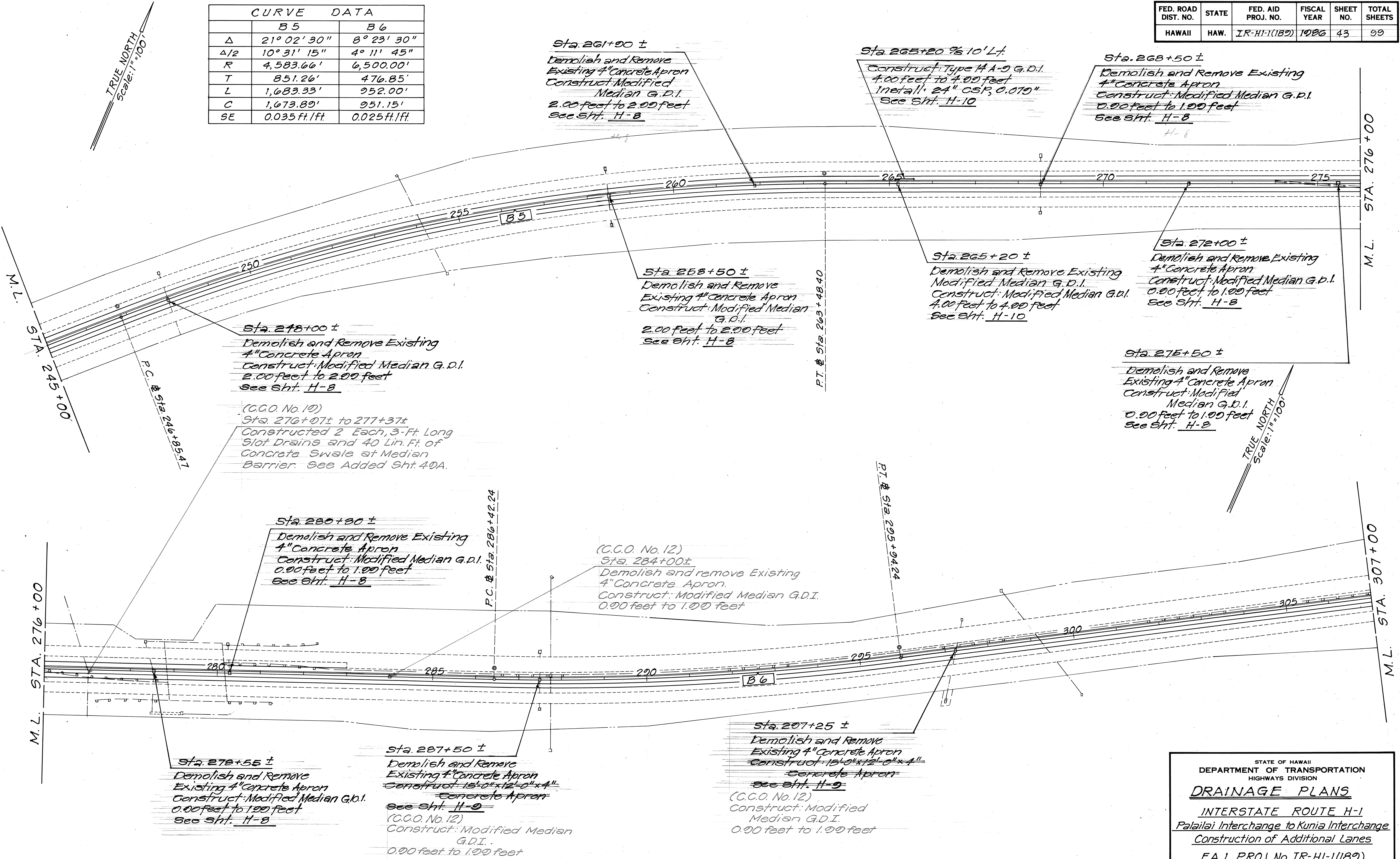
Scale: 1"=100' Date: July, 1985

SHEET No. H-5 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(182)	1986	43	99

CURVE DATA		
	B5	B6
Δ	21° 02' 30"	8° 23' 30"
Δ/2	10° 31' 15"	4° 11' 45"
R	4,583.66'	6,500.00'
T	851.26'	476.85'
L	1,683.33'	952.00'
C	1,673.89'	951.15'
SE	0.035 ft./ft.	0.025 ft./ft.

TRUE NORTH
Scale: 1"=100'



SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
NOTED BY	
CHECKED BY	
NO.	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLANS

INTERSTATE ROUTE H-1
Palailai Interchange to Kunia Interchange
Construction of Additional Lanes

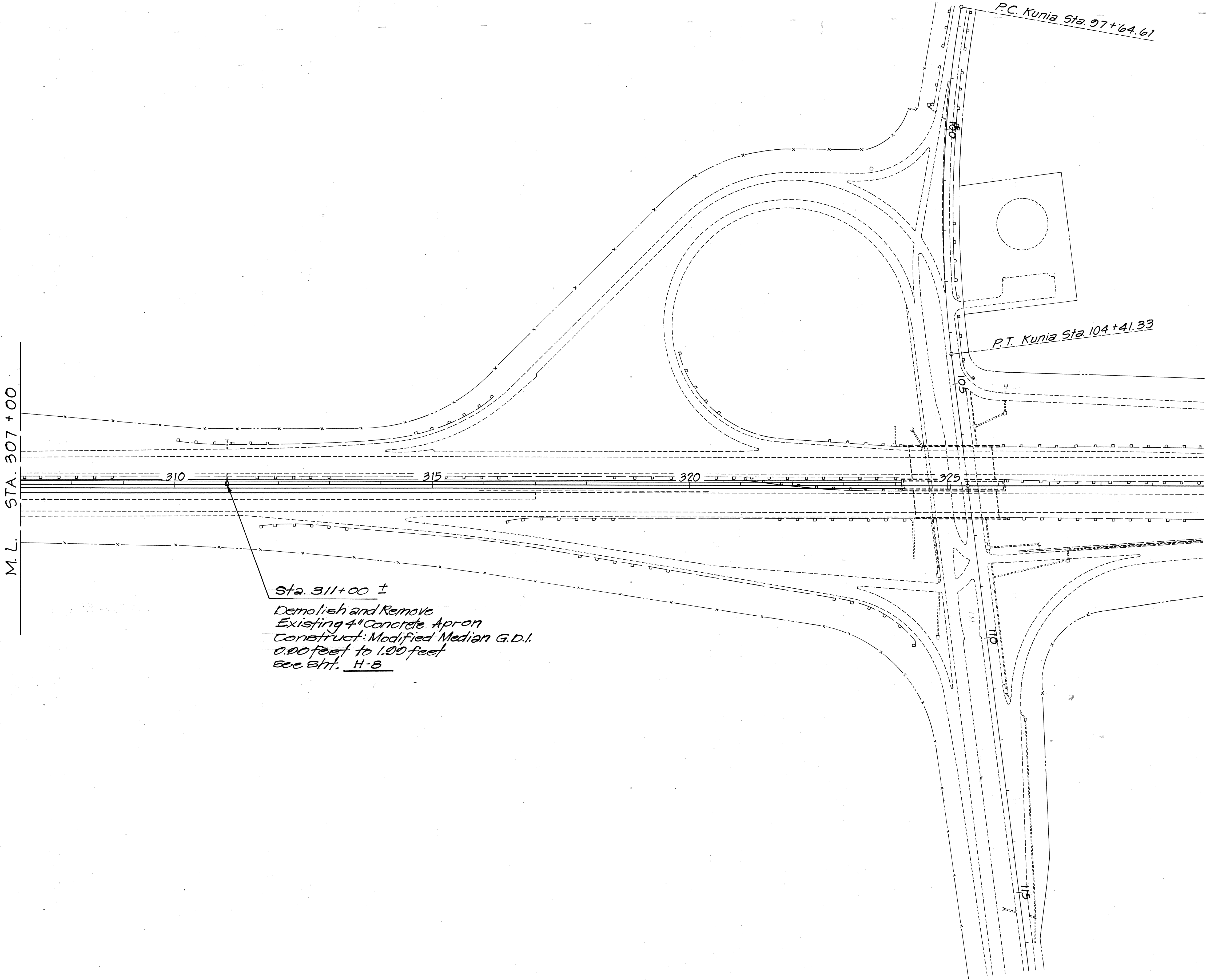
F.A.I. PROJ. No. IR-HI-1(182)

Scale: 1"=100' Date: July, 1985

SHEET No. H-6 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(189)	1986	44	99

TRUE NORTH
Scale: 1"=100'



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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLANS

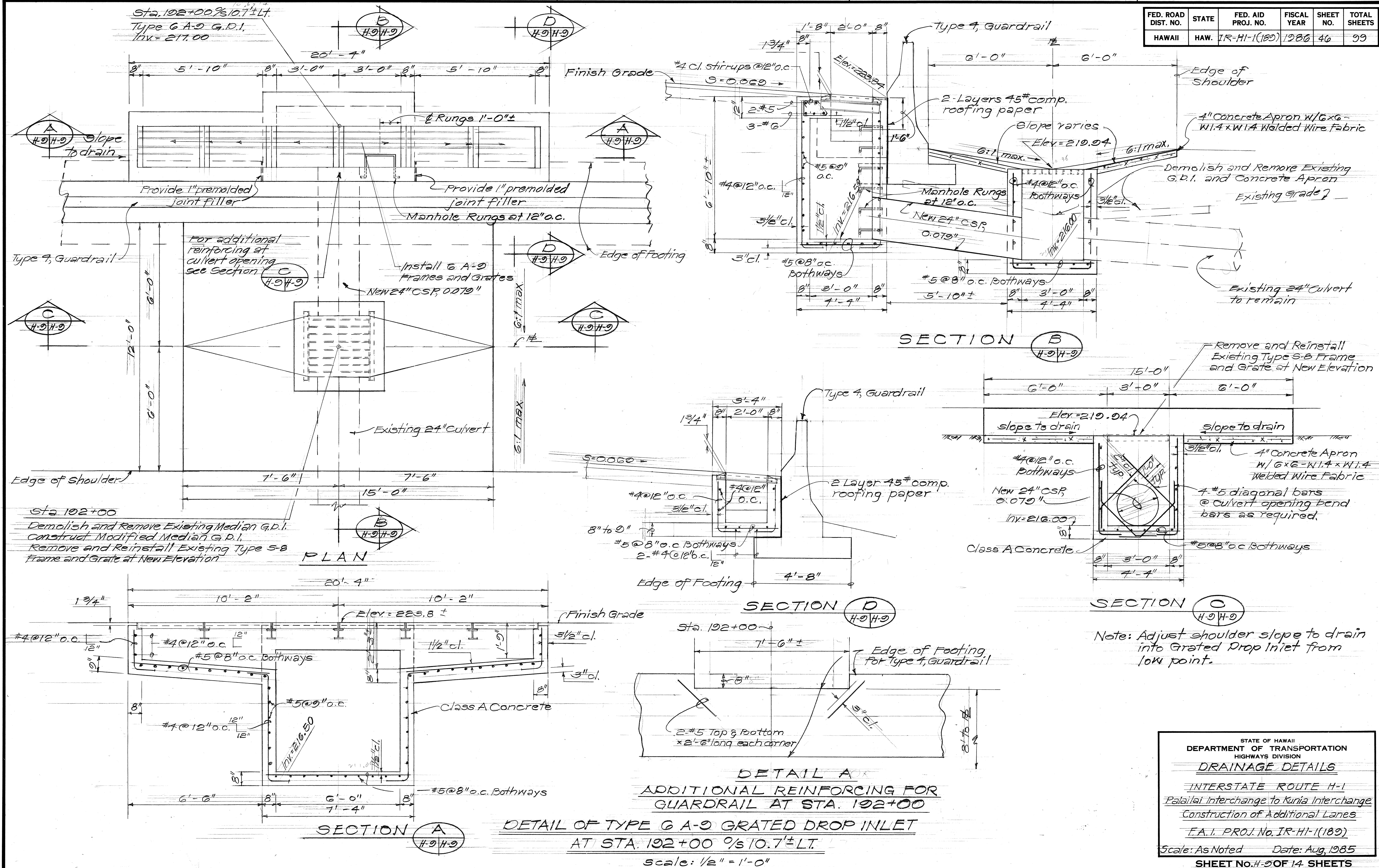
INTERSTATE ROUTE H-1
Palailai Interchange to Kunia Interchange
Construction of Additional Lanes

F.A.I. PROJ. No. IR-HI-1(189)

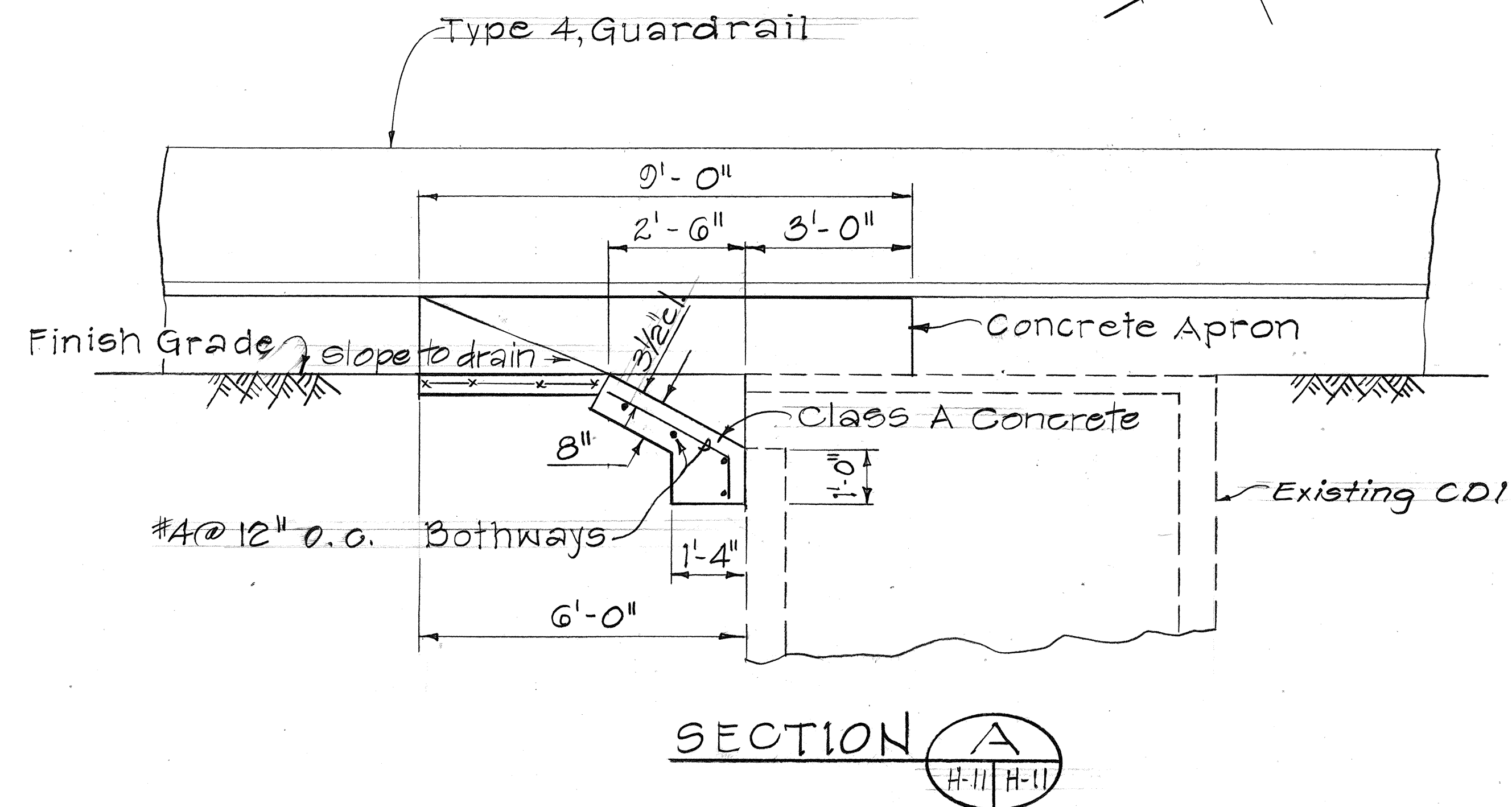
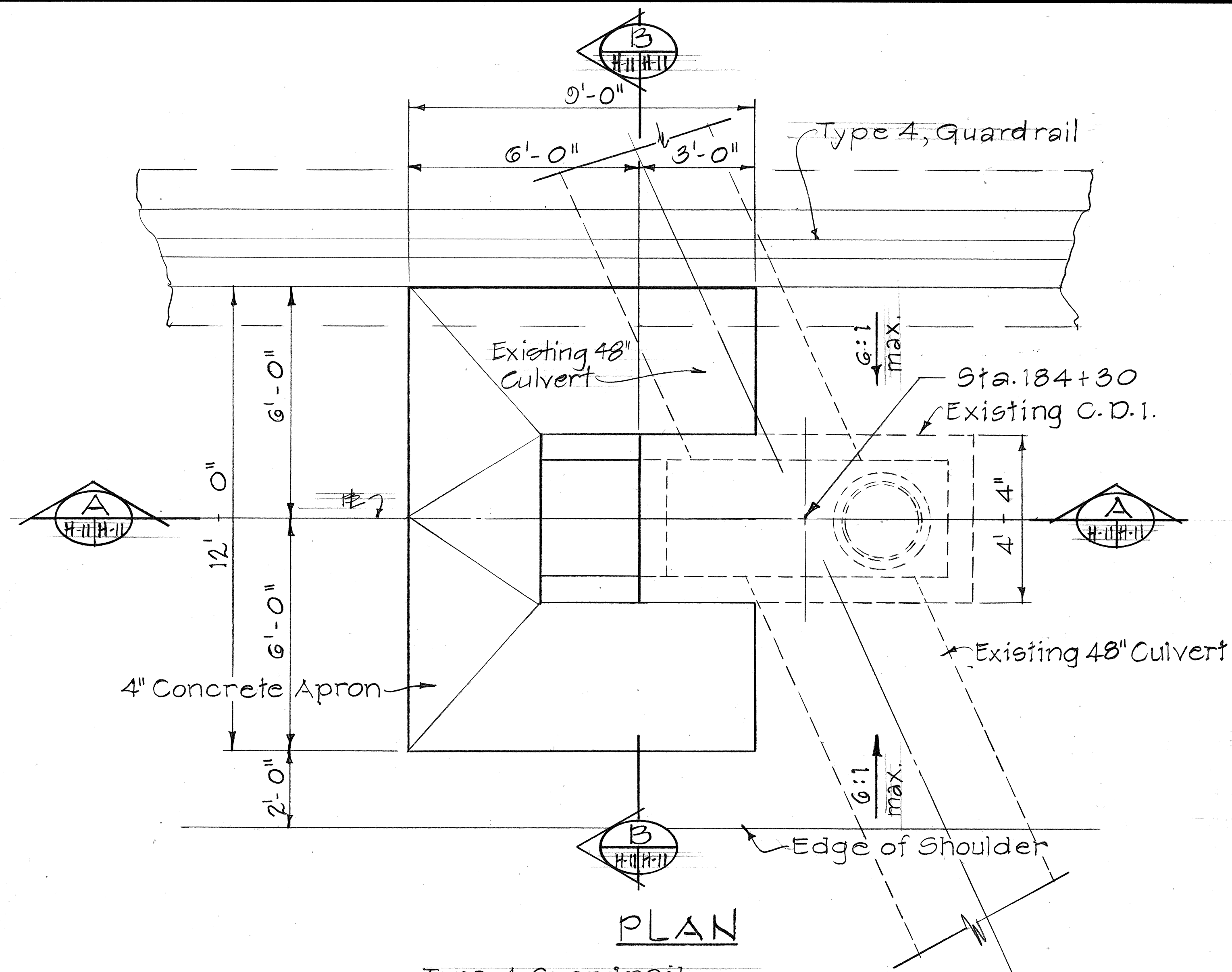
Scale: 1"=100' Date: July, 1985

SHEET No. H-7 OF 14 SHEETS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
INTERSTATE ROUTE H-1
Palala Interchange to Kunia Interchange
Construction of Additional Lanes
E.A.1. PROJ. No. IR-HI-1(189)
Scale: As Noted Date: Aug, 1985
SHEET No. 4 OF 14 SHEETS

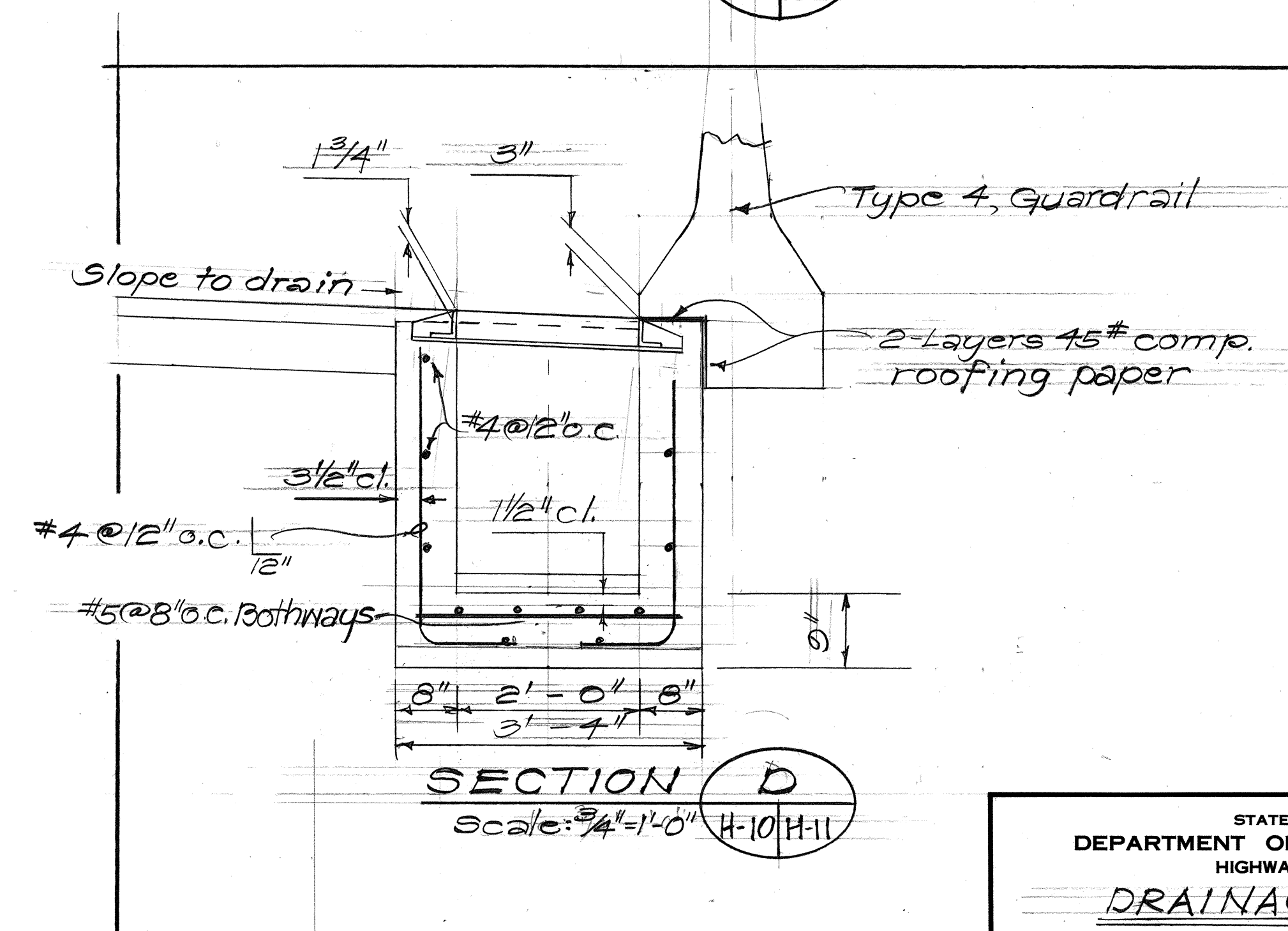
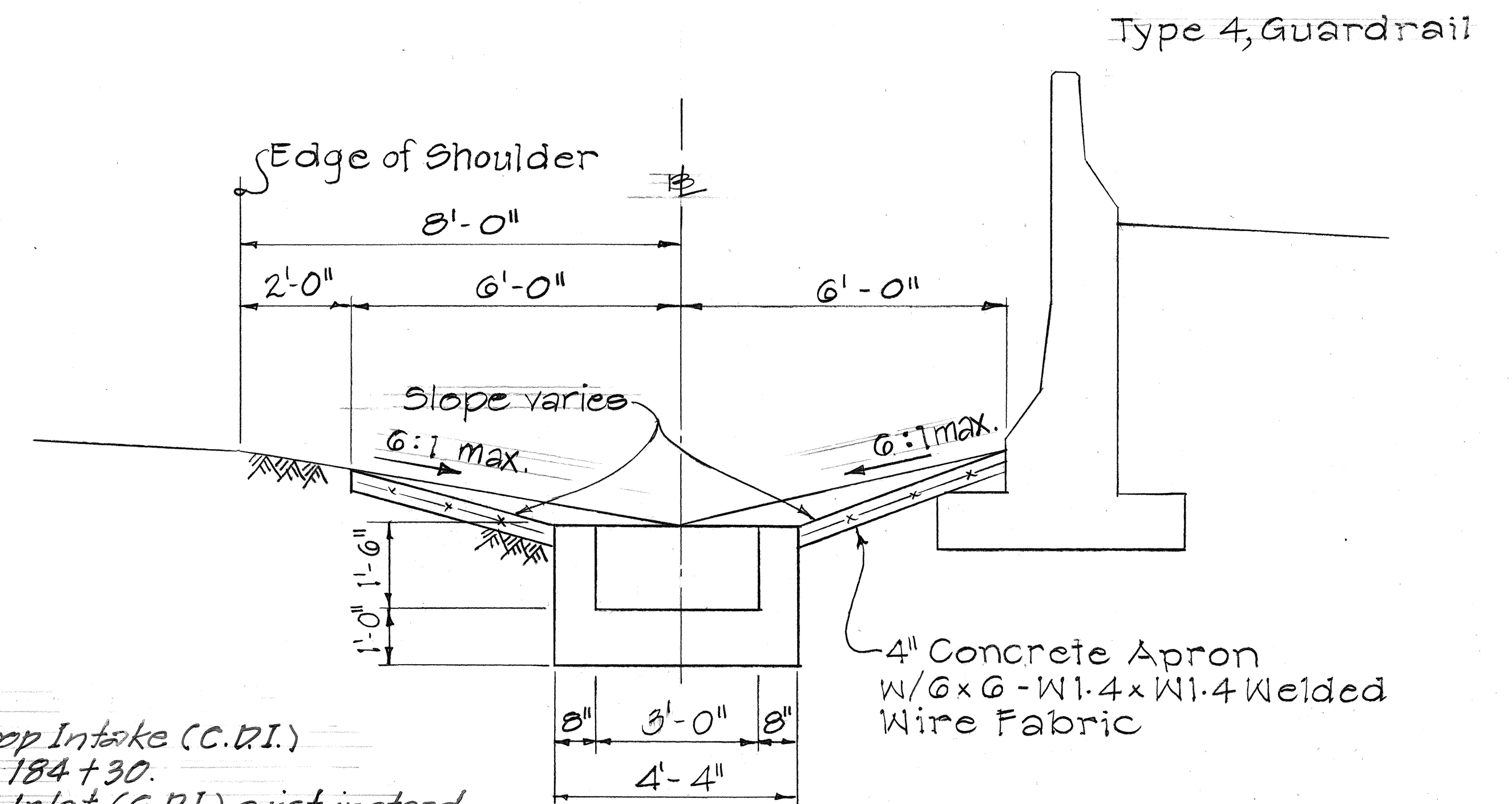


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(189)	1986	48	99



DETAIL OF CONCRETE DROP APRON INLET AT STA. 184+30 ±

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



STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
DRAINAGE DETAILS
INTERSTATE ROUTE H-1 Palailai Interchange to Kunia Interchange Construction of Additional Lanes
F.A.I. PROJ. No. IR-HI-1(189)
Scale: As Noted Date: Aug, 1985
SHEET No. H-11 OF 14 SHEETS

Existing 24" Culvert

26'-10"

8" 9'-1" 8" 3'-0" 3'-0" 8" 9'-1" 8"

Sta. 97+00 $\pm$ 10.7' L.t.
Type 8 A-9 G.D.I.
Inv. = 132.56 $\pm$
Rungs 1'-0" $\pm$

Provide 1" premolded joint filler

Manhole Rungs at 12" o.c.

Install 8 A-9 Frames and Grates

Edge of Footing

Existing 24" Culvert

12'-0"

6'-0"

6'-0"

Existing 24" Culvert

7'-6"

7'-6"

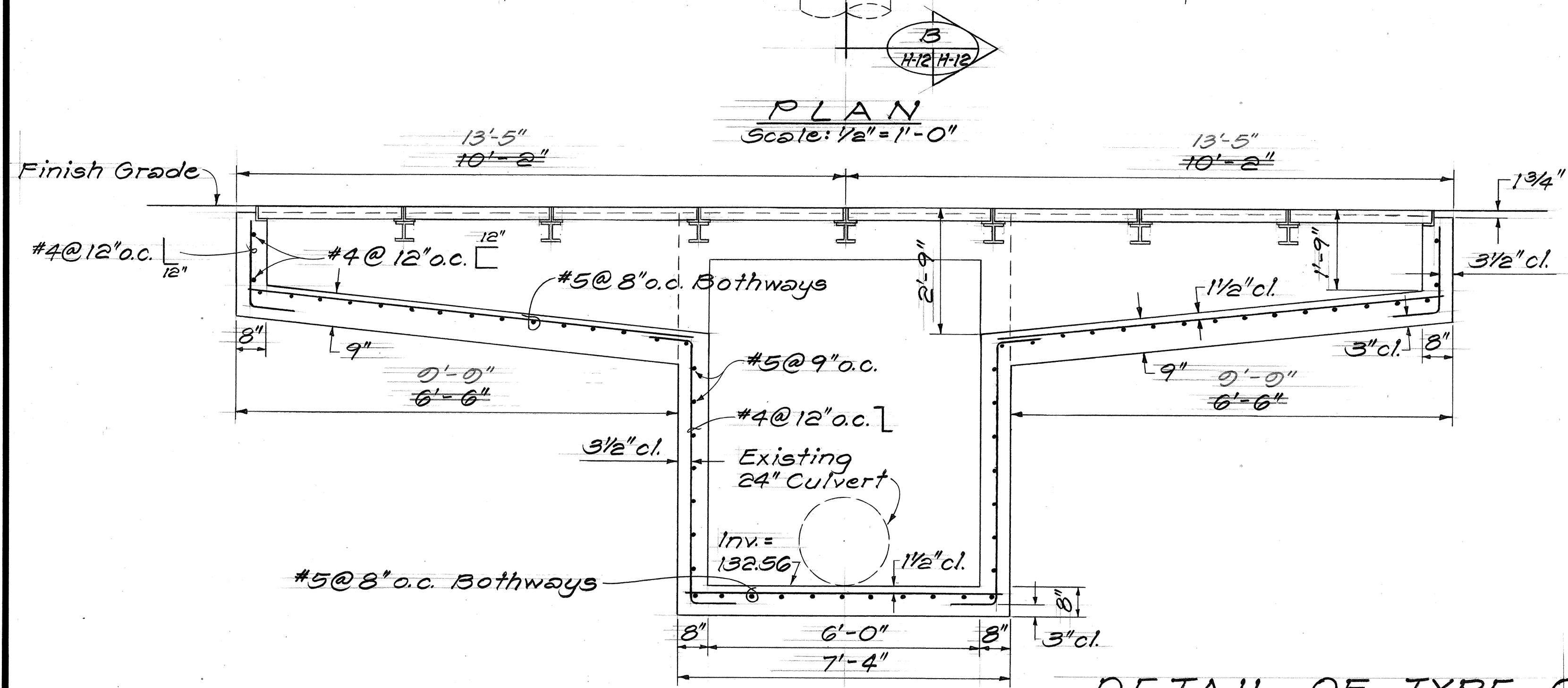
15'-0"

Edge of Shoulder

Sta. 97+00
Modified Median G.D.I.
See Sht. H8 Details

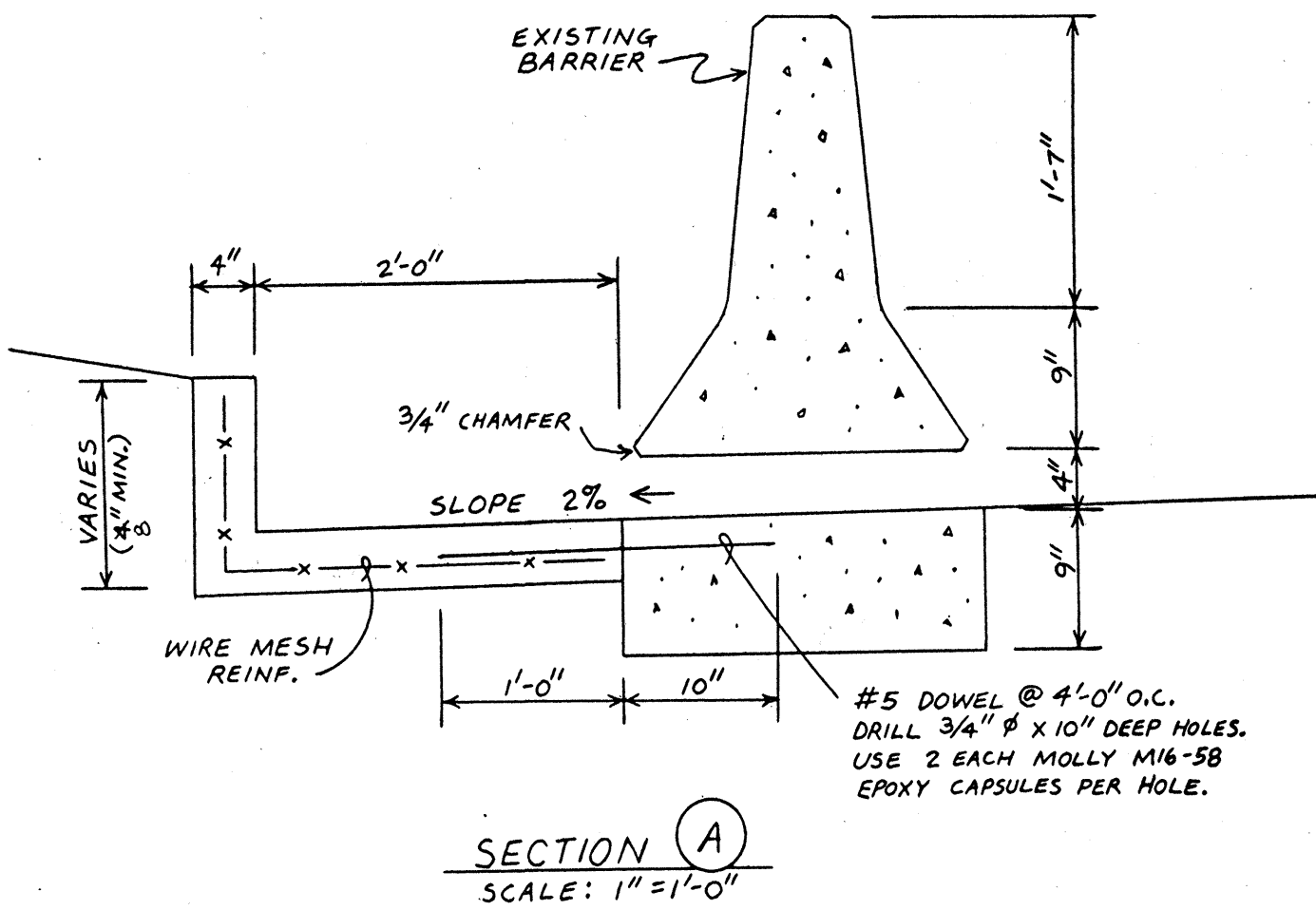
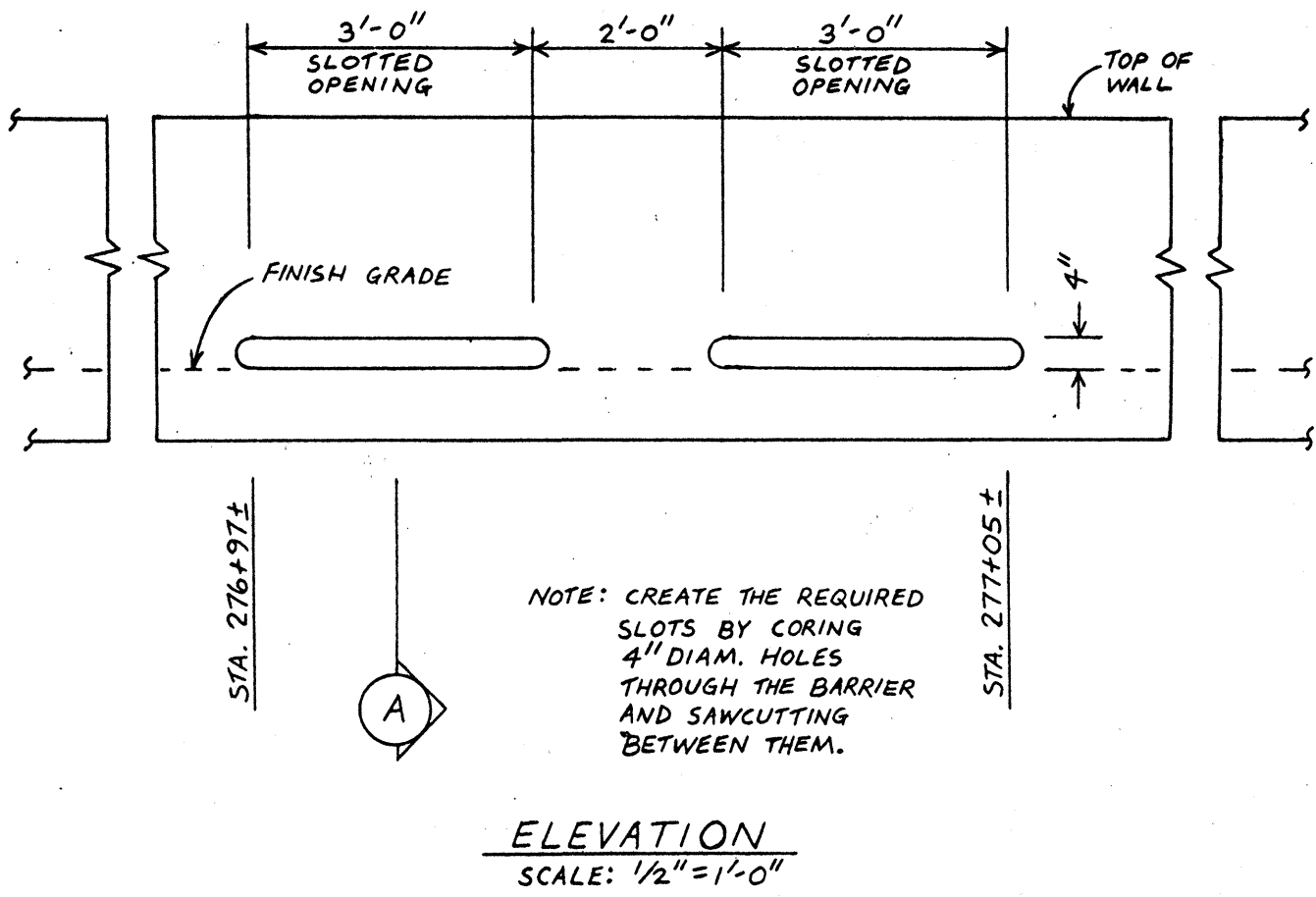
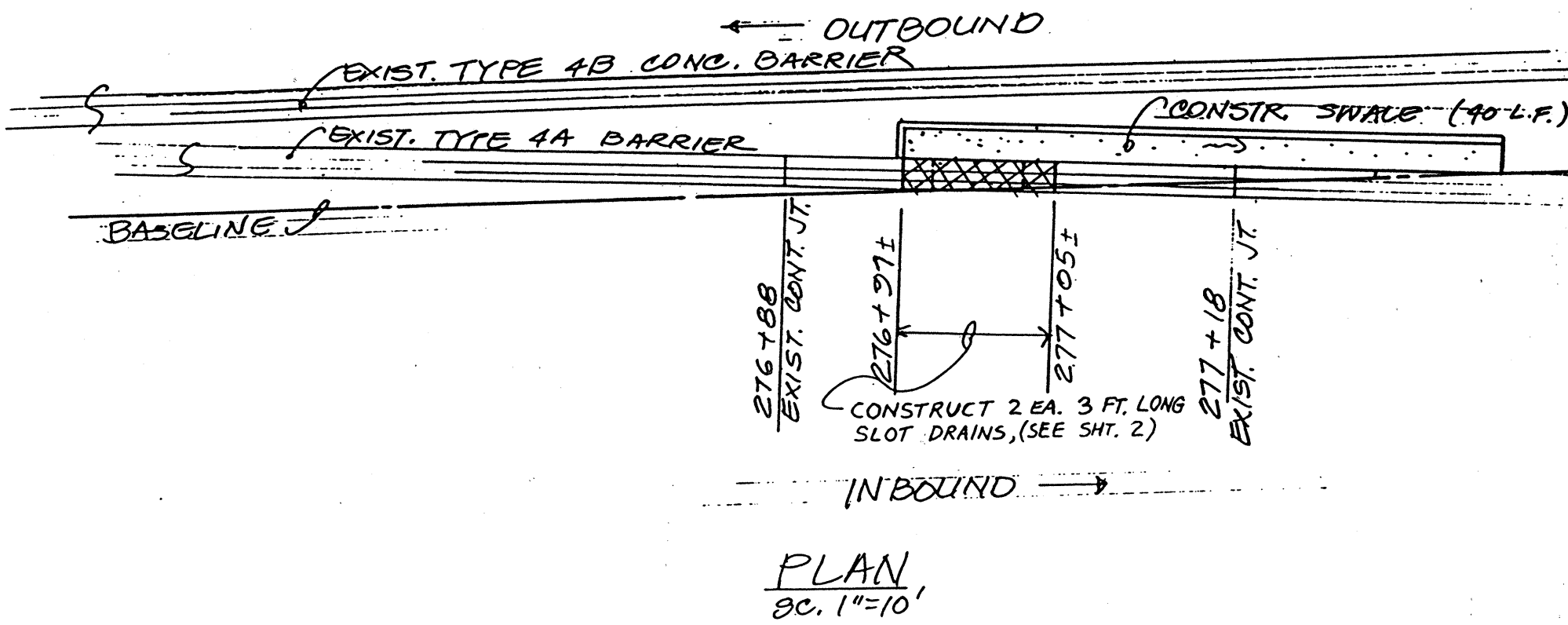
6:1 max.

6:1 max.



49

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(180)	1975	49A	90



Note: This tracing prepared during "As-Built" posting.

Contract Change Order No. 10

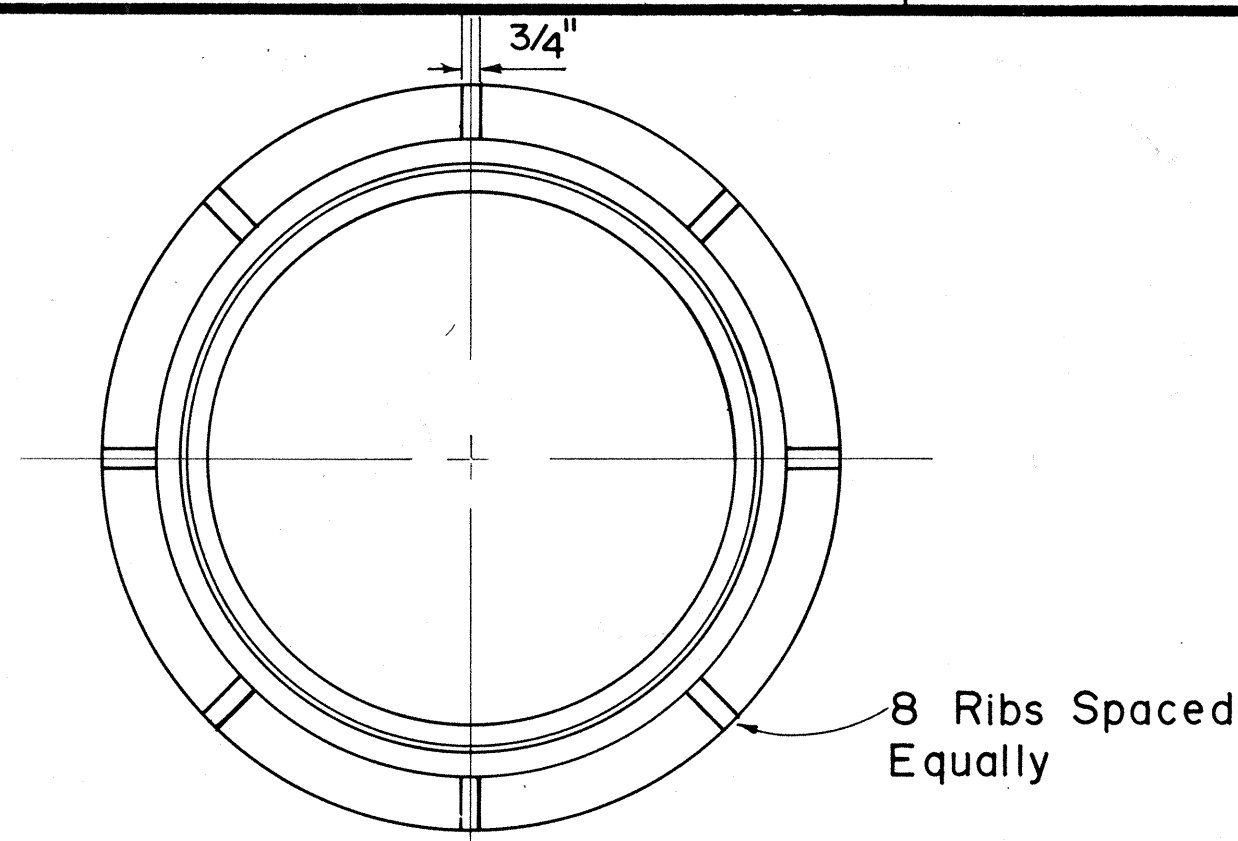
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
INTERSTATE ROUTE H-1
Palailai Interchange to Kunia Interchange
Construction of Additional Lanes
F.A.I. PROJ. No. IR-HI-1(180)

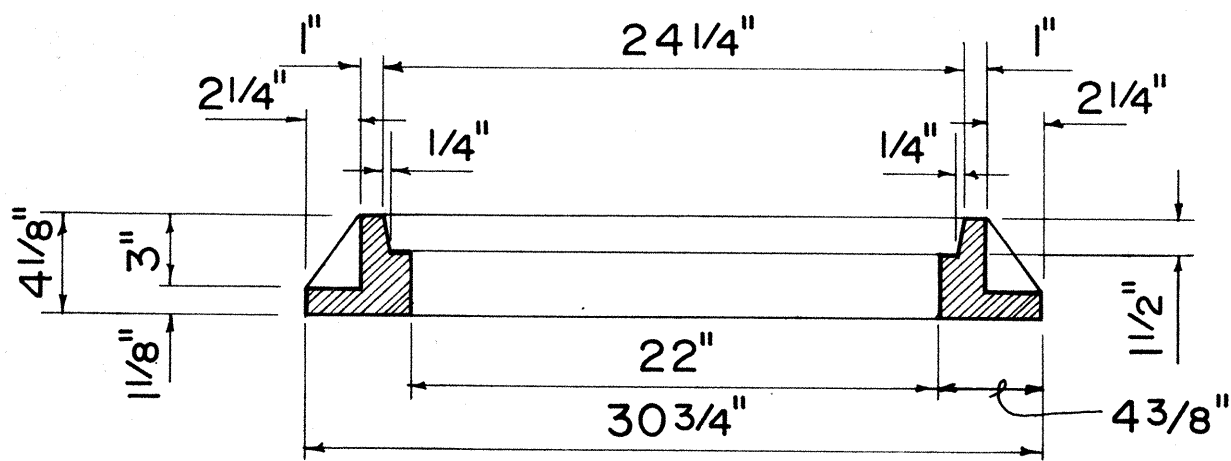
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SHEET No. 1 OF 1 SHEETS

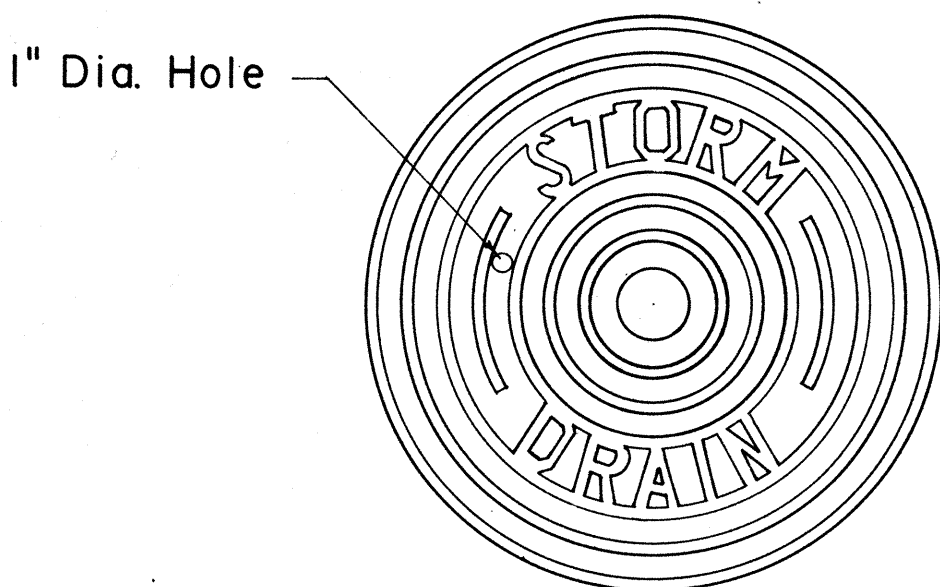
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI(198)	1986	50	99



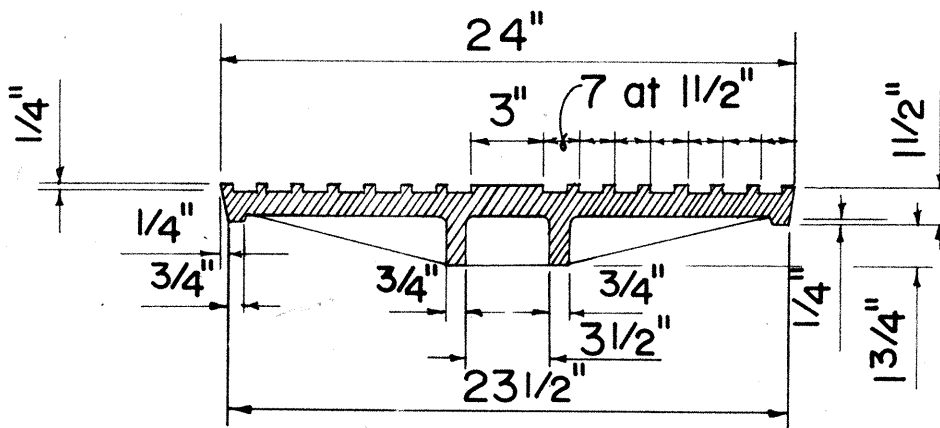
PLAN OF FRAME



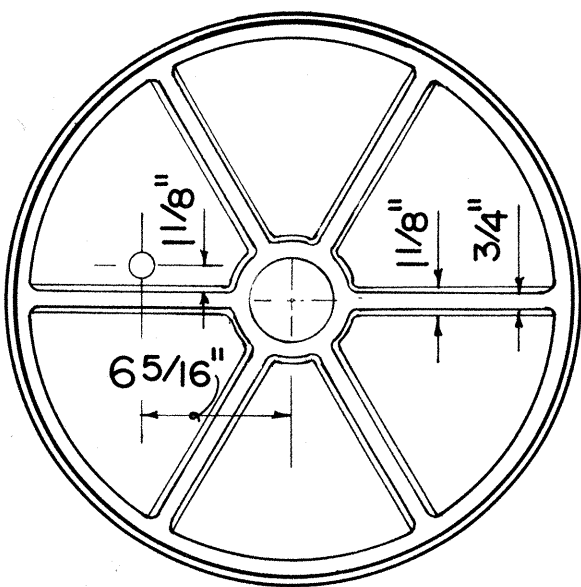
SECTION OF FRAME



TOP VIEW OF COVER

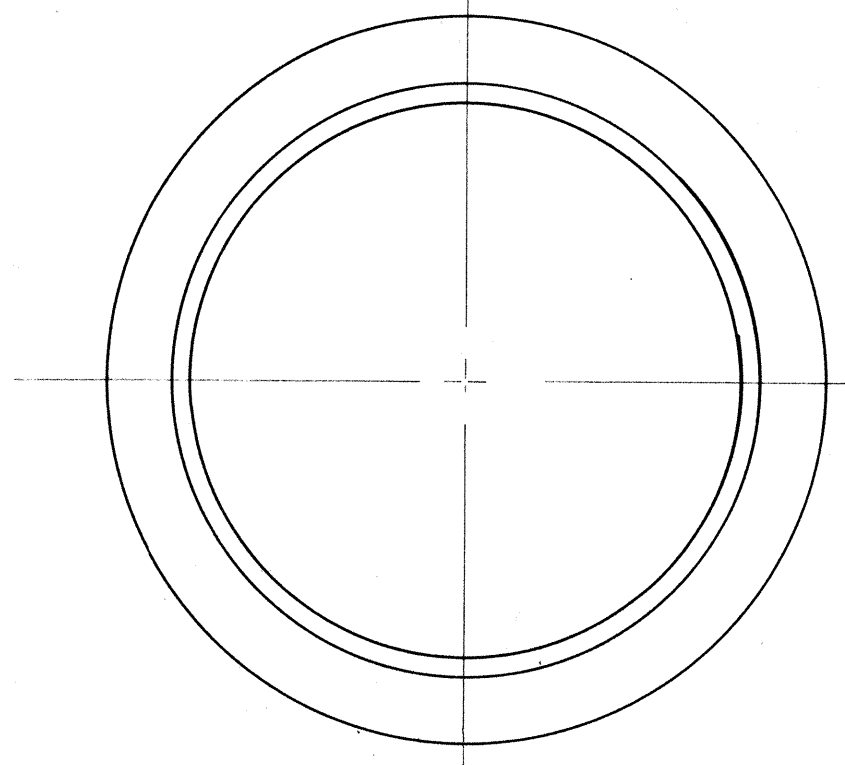


SECTION

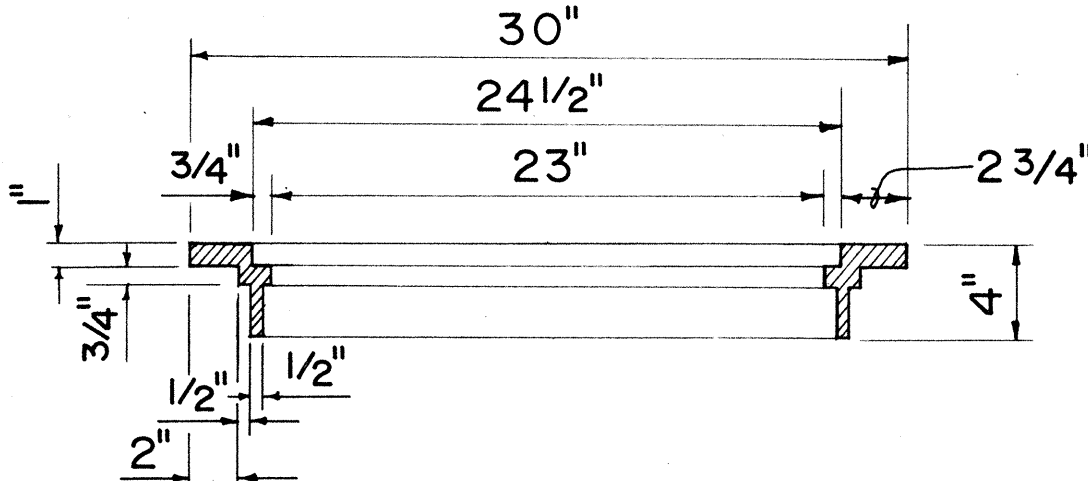


BOTTOM VIEW OF COVER

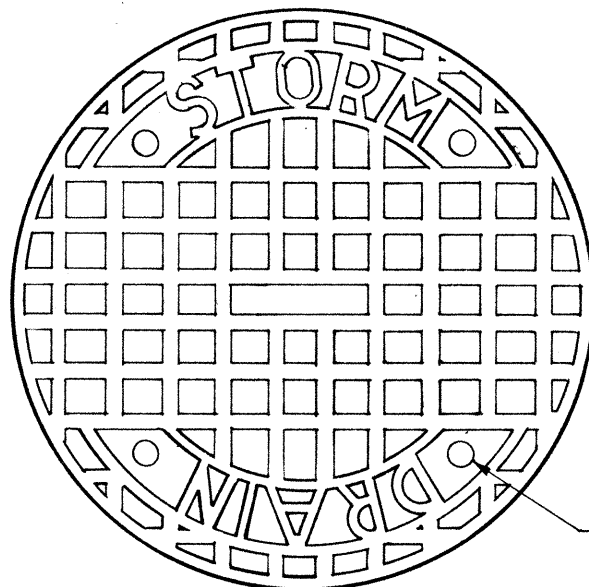
TYPE "P" CAST IRON
FRAME AND COVER



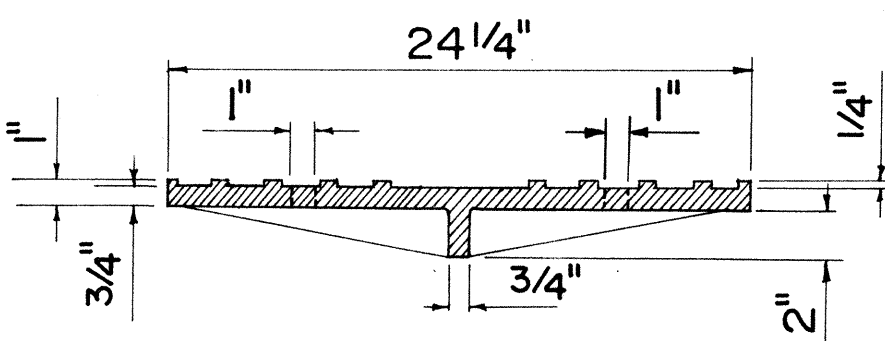
PLAN OF FRAME



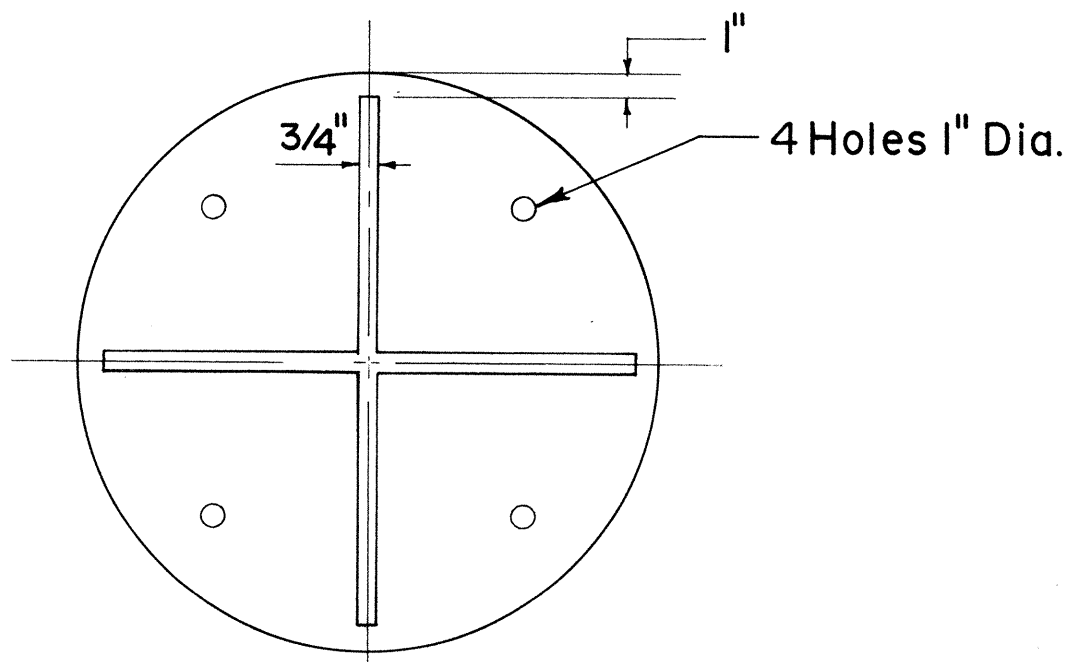
SECTION OF FRAME



TOP VIEW OF COVER

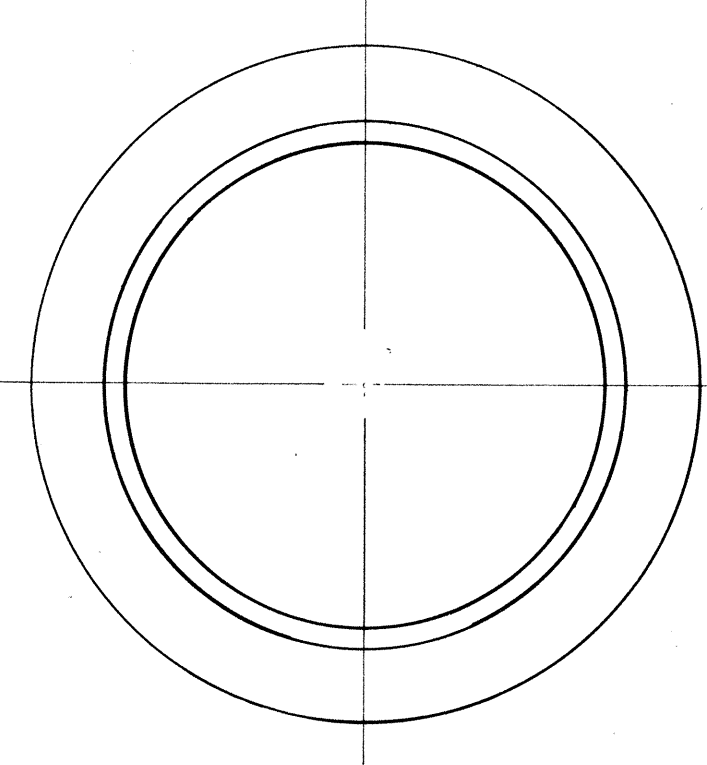


SECTION

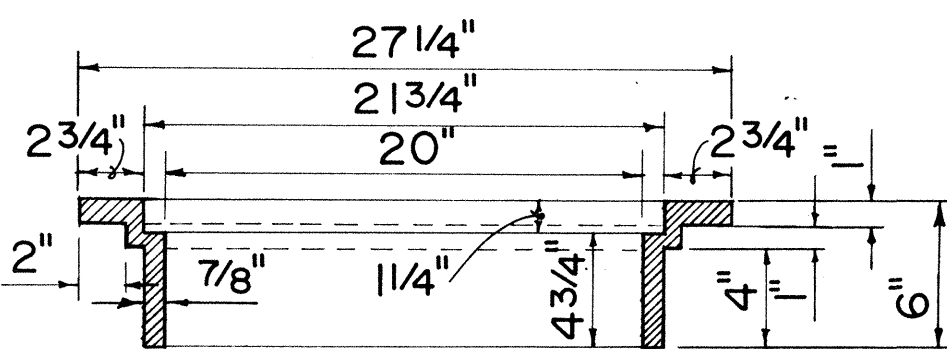


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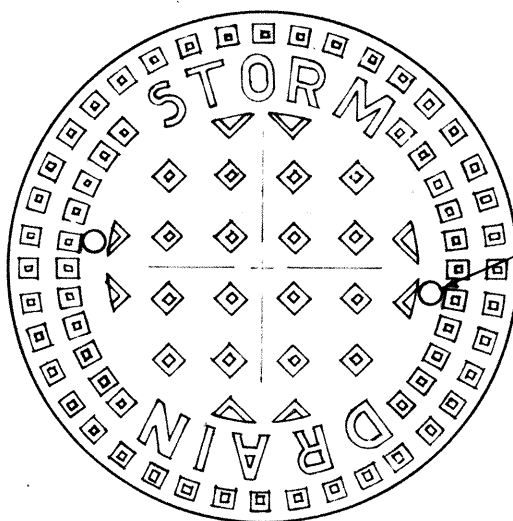
TYPE "B" CAST IRON
FRAME AND COVER



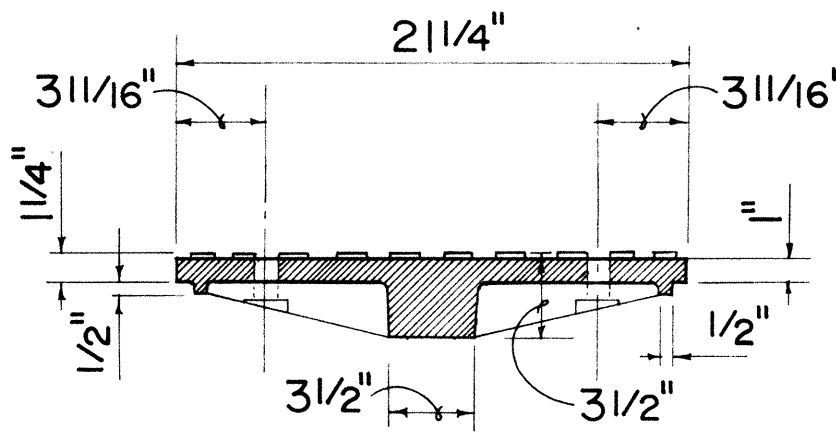
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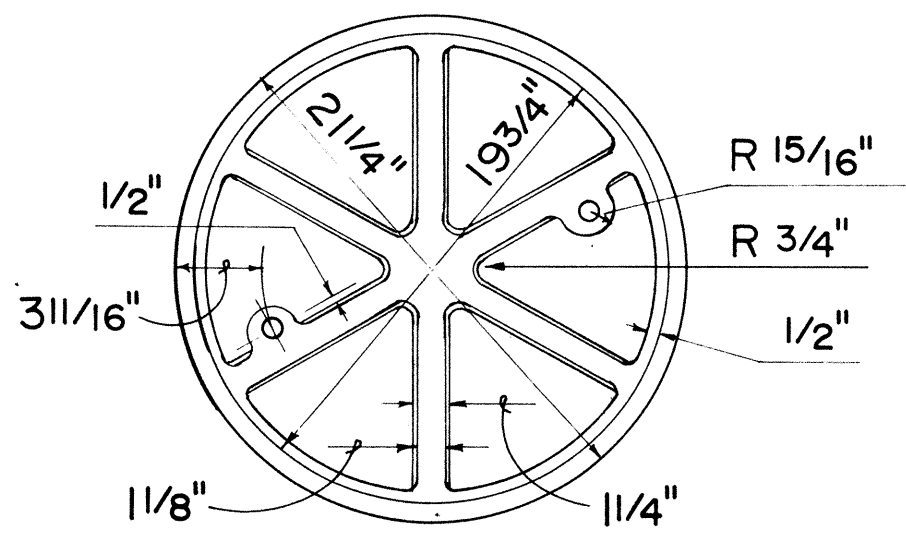
SECTION OF FRAME



TOP VIEW OF COVER

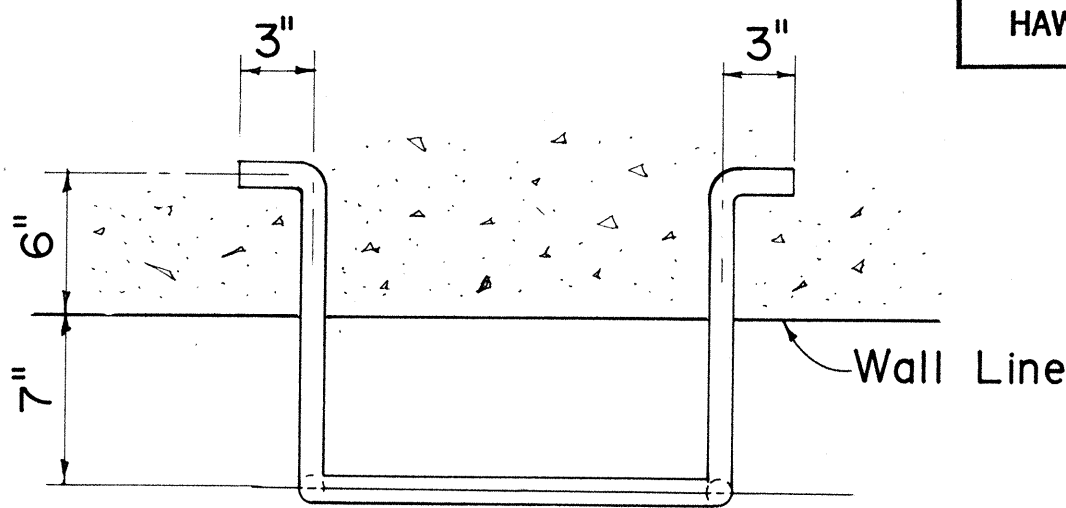


SECTION

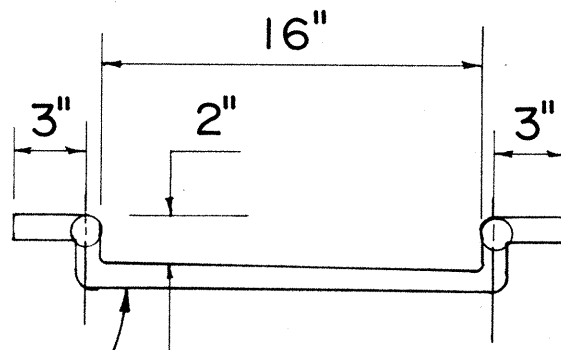


BOTTOM VIEW OF COVER

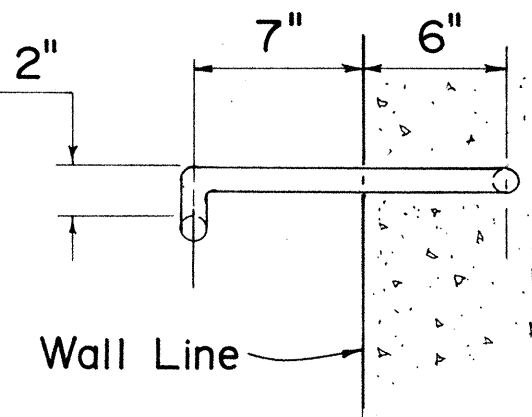
TYPE "A" CAST IRON
FRAME AND COVER



PLAN



FRONT VIEW



SIDE VIEW

MANHOLE RUNG

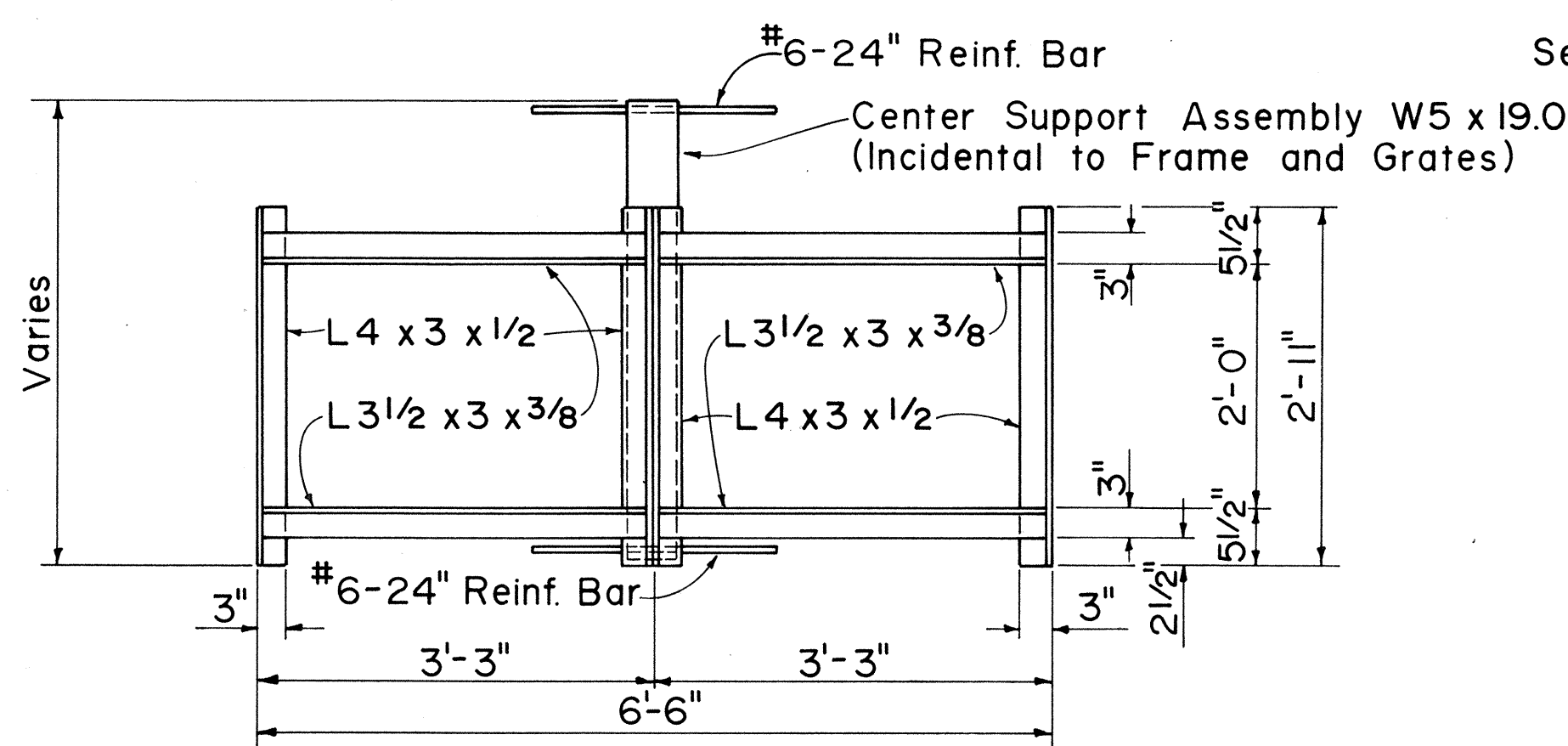
APPROVAL RECOMMENDED:
J. Takano 6-19-79
HYDRAULIC DESIGN ENGINEER DATE
APPROVED:
Herbert Zaleishi 6-22-79
ASSISTANT CHIEF, ENGINEERING DATE

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

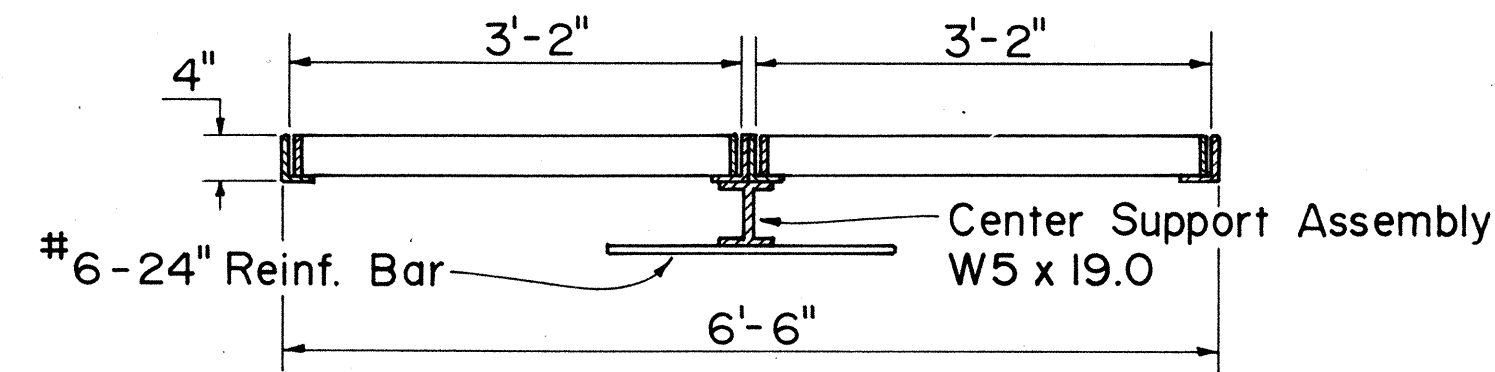
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
STANDARD DETAILS CATCH BASIN AND MANHOLE CASTINGS
Not To Scale Date: Dec. 1977

SHEET NO. 4-13 OF 14 SHEETS DH 6

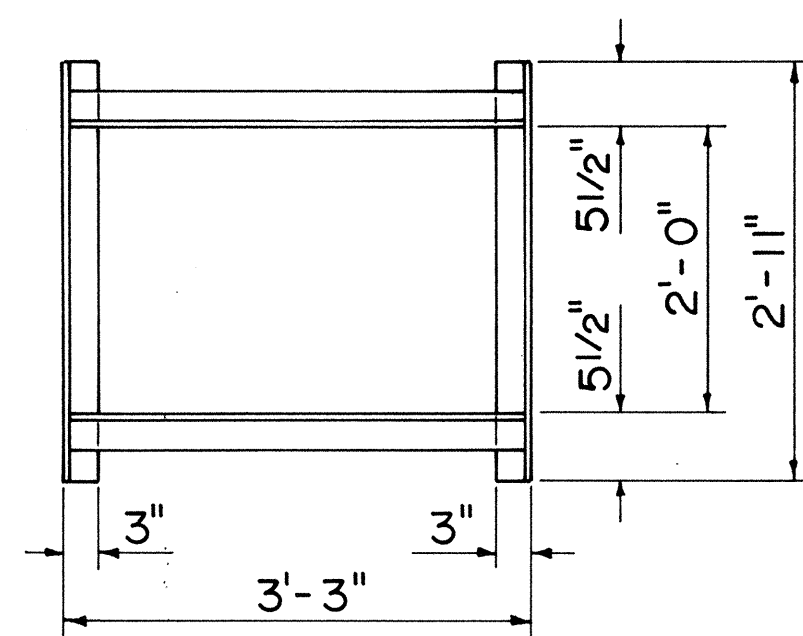
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-H-1(198)	1986	51	99



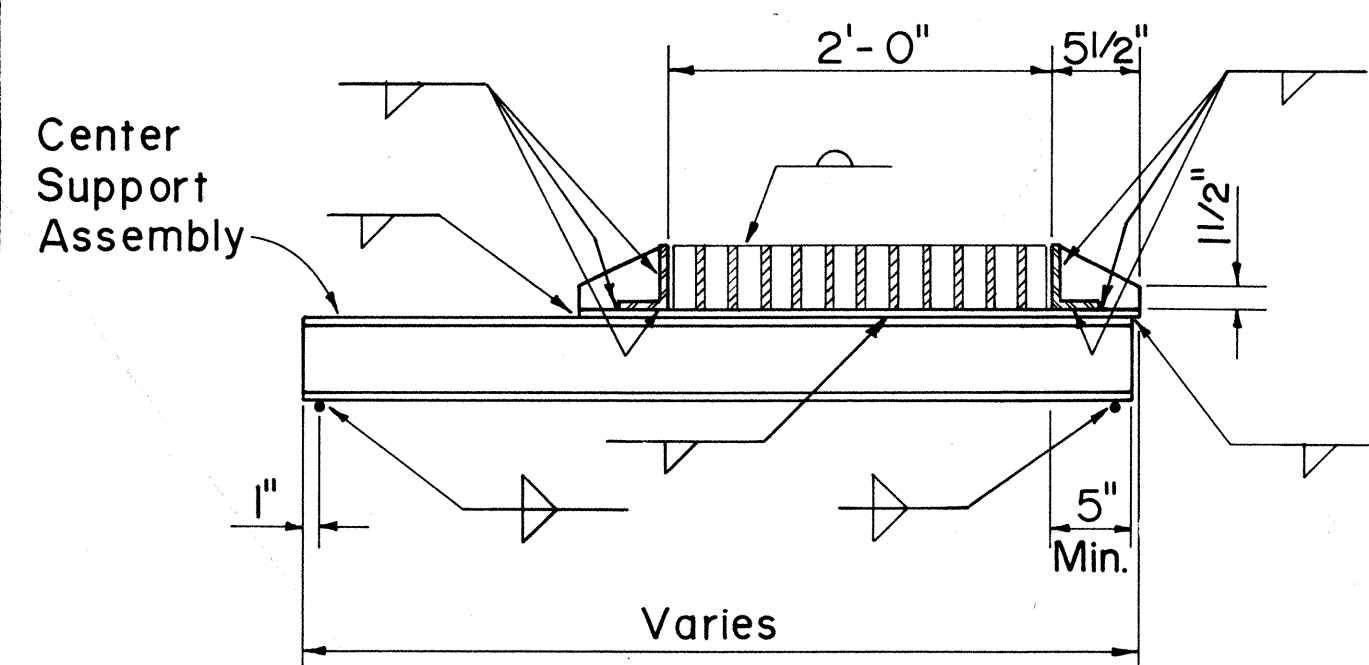
PLAN
(Two or More Grates)



LONGITUDINAL SECTION
(Thru Frame & Grate)

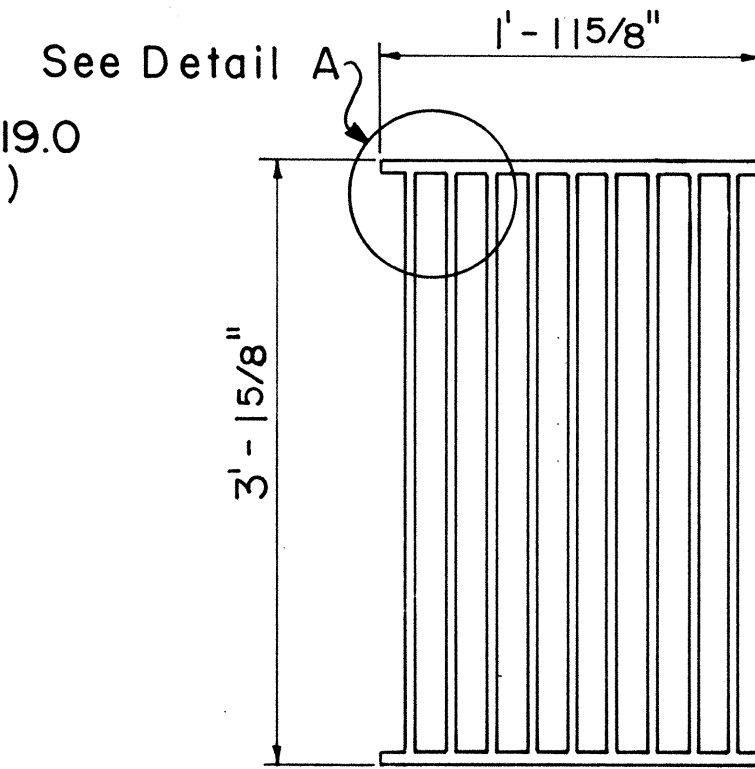


PLAN
(Single Grate)

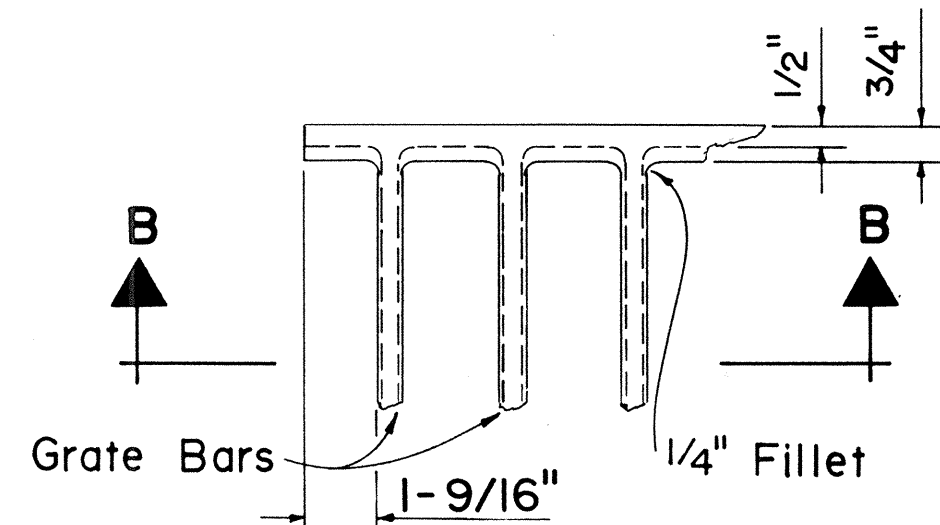


CROSS SECTION
(Thru Frame & Grate)

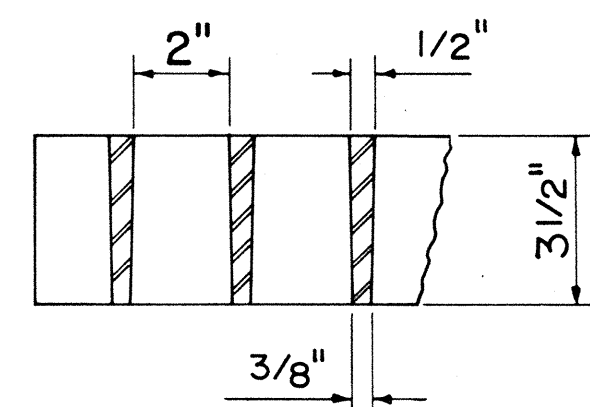
FRAME DETAILS



PLAN

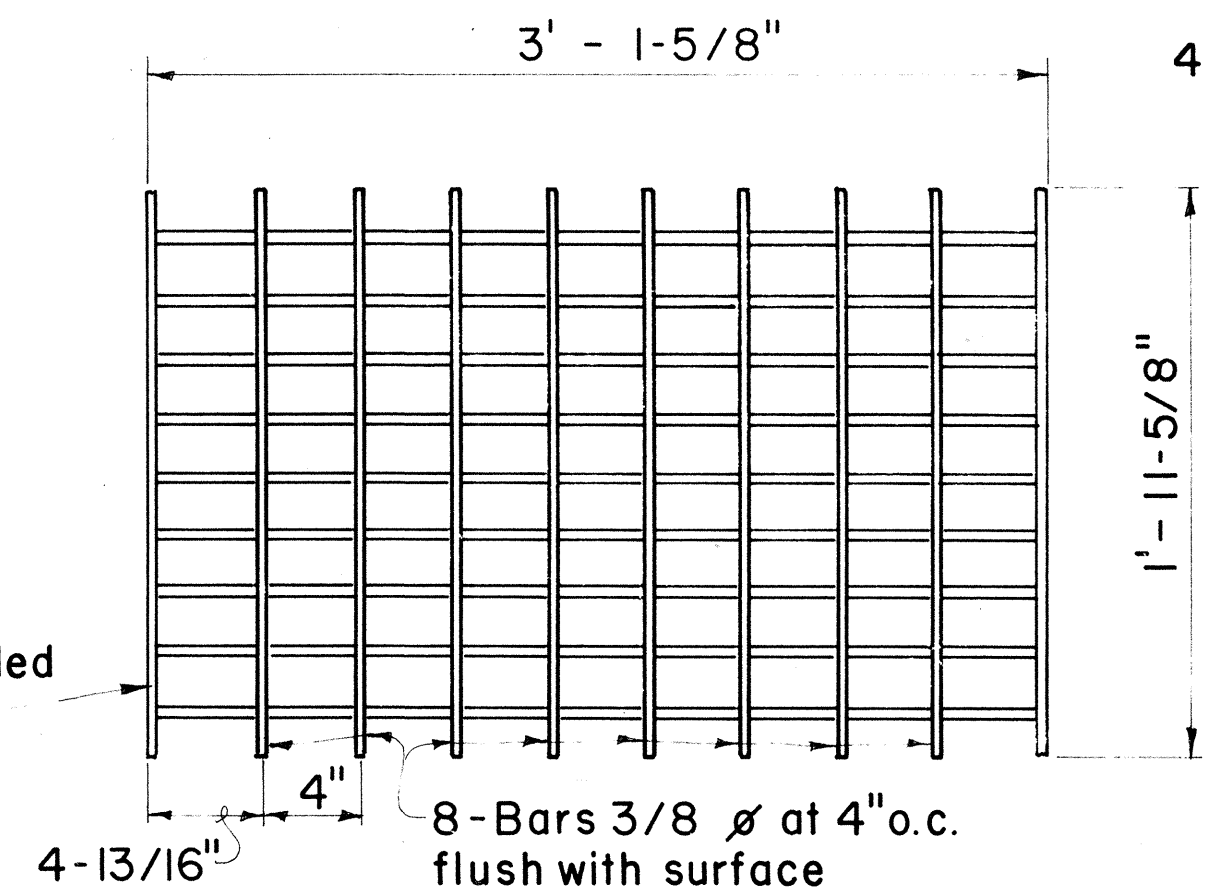


DETAIL A



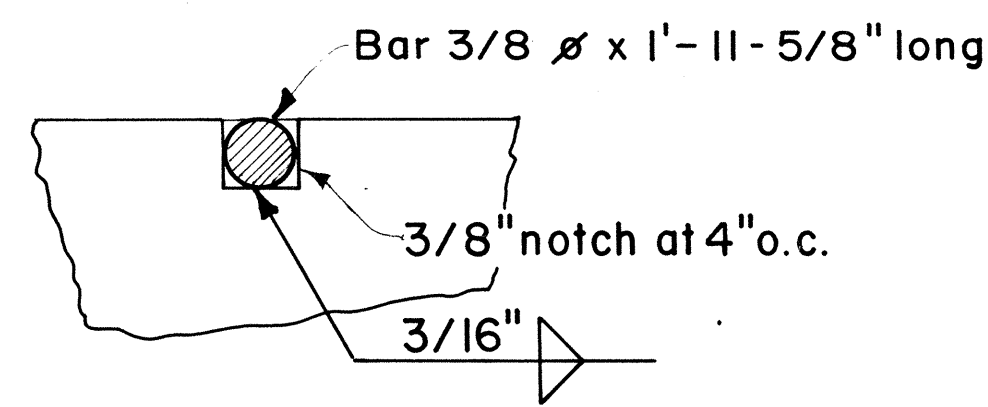
SECTION B-B

ALTERNATIVE CAST MALLEABLE IRON
OR CAST STEEL GRATE

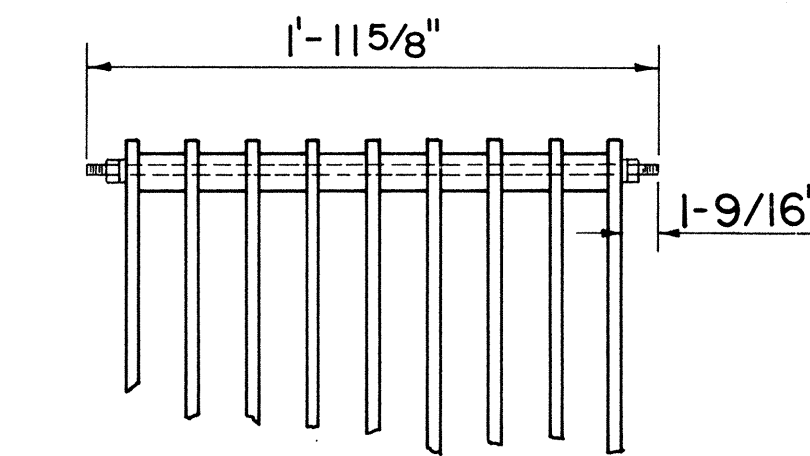


PLAN

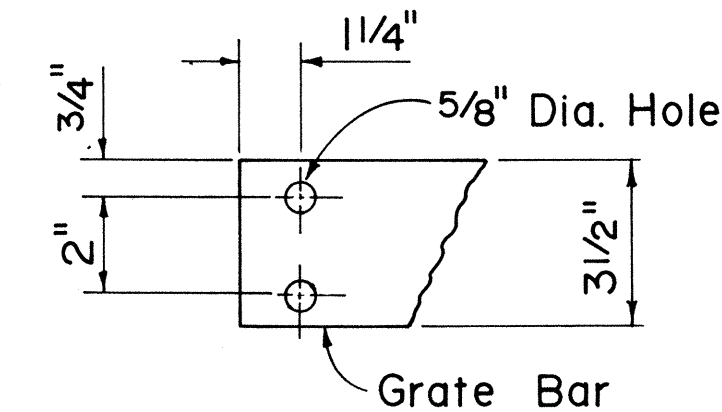
TYPE A-9P STEEL GRATE



NOTCH DETAIL

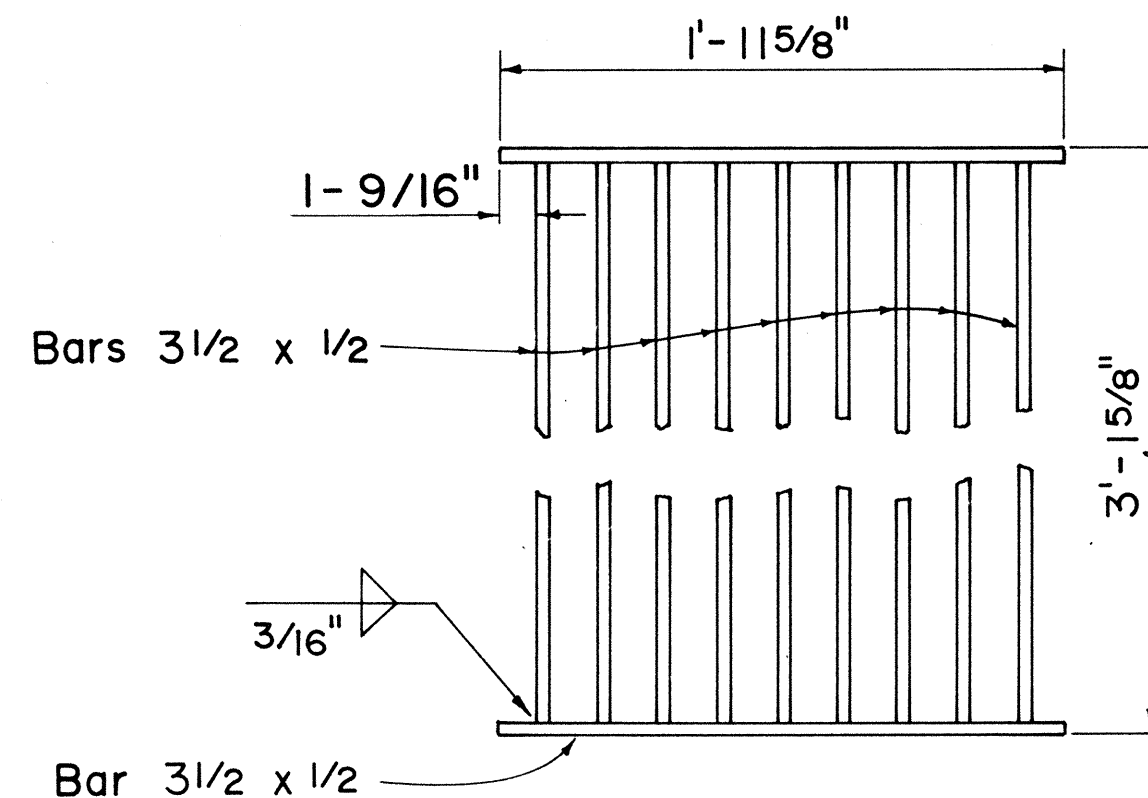


BOLTED END BLOCK



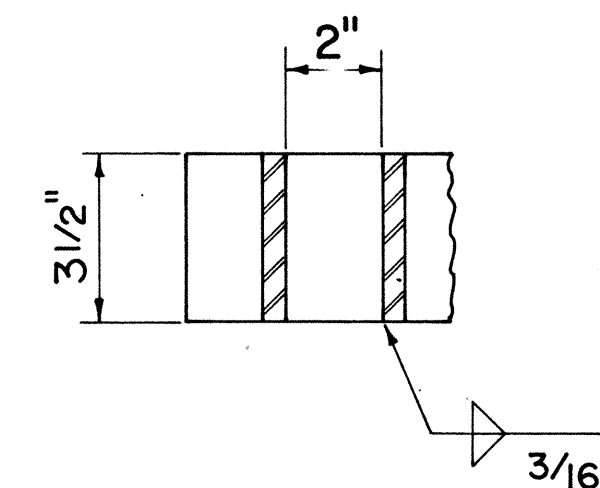
END OF BAR

ALTERNATIVE BOLTED GRATE

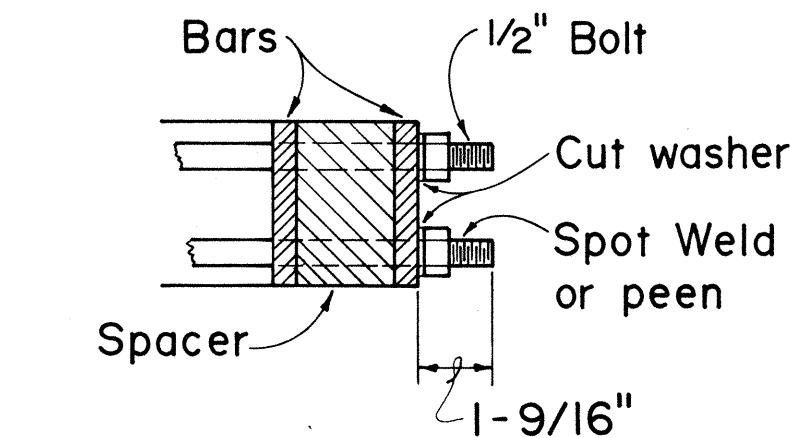


PLAN

ALTERNATIVE WELDED GRATE



SECTION



BOLTING DETAIL

GENERAL NOTES

- Contractor has the option of using cast malleable iron, cast steel, welded, or bolted grate.
- All welds 3/8" unless otherwise noted.
- Type A-9 - Use in location not accessible to bicycle traffic.
- Grate shall be parallel to the direction of flow.

APPROVAL RECOMMENDED:
HYDRAULIC DESIGN ENGINEER
DATE 6-19-79

APPROVED:
ASSISTANT CHIEF, ENGINEERING
DATE 6-22-79

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.	fio	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. H-14 OF 14 SHEETS DH 7