

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

ESTIMATED QUANTITIES

ITEM NO.	206	206	503		602		604		604	604	604	616
	1000	7000	0010		1000		2150		3010	3001	4801	0300
UNIT USED	C.Y.	C.Y.	C.Y.		LBS		EA		EA	EA	EA	EA
TYPE OF STRUCTURE	STATION	Structure Excavation other than at Bridges	Structure Backfill	Class A Concrete other than in Bridges	Reinforcing Steel other than in Bridges		Type A Cast Iron Frame and Cover		Removing, Cleaning, Painting and Reinstalling Type A Cast Iron Frame and Cover for Drainage Manhole	Removing, Cleaning and Reinstalling Type B Steel Frame and Grates	Removing, Cleaning, Painting and Reinstalling Cast Iron Frame and Covers to 727 Kalo Street	Removing, Cleaning and Reinstalling Remote Control Valve to 727 Kalo Street
New C.B.	Sta. 27+00	13		7.8	1360		1				1	
New C.B.	Sta. 29+00	12		7.5	1360		1				1	
New C.B.	Sta. 31+00	12		7.5	1360		1				1	
New C.B.	Sta. 33+25	11		6.0	850		1				1	
New C.B. and New C.B. top	Sta. 34+14.6	11		6.0	670		2				1	
New C.B. top and New C.B.	Sta. 34+20											
New C.B.	Sta. 36+00	11		5.8	750		2				1	
New C.B.	Sta. 36+07.4											
New C.B.	Sta. 43+50	15		7.6	1110		1				1	
New C.B.	Sta. 45+50	12		6.1	980		1				1	
New C.B. top	Sta. 54+95	3		3.7	600					1		
New C.B. top	Sta. 58+92	3		1.5	310					1		
New C.B. top	Sta. 62+40	3		1.5	310					1		
New S.D.M.H. top	Sta. 63+35	3		2.3	100				1			
New C.B. top	Sta. 66+50	2		1.2	300					1		
New S.D.M.H. top	Sta. 81+82.5	2		2.0	300				1			
New S.D.M.H. top	Sta. 85+86	2		2.0	300				1			
New S.D.M.H. top	Sta. 89+75	4		2.2	120				1			
New S.D.M.H. top	Sta. 95+37	2		2.0	300				1			
New S.D.M.H. top	Sta. 99+24	2		2.0	300				1			
Existing RCV	Sta. 61+00 ± Lt											1
Existing RCV	Sta. 67+86 ± Rt											1
Existing RCV	Sta. 74+50 Rt											1
Existing RCV	Sta. 79+20 Rt											1
Existing RCV	Sta. 85+00 ± Lt											1
Existing RCV	Sta. 89+75 ± Lt											1
Existing RCV	Sta. 99+50 ± Rt											1
Existing RCV	Sta. 104+00 ± Lt	123		74.7	11,380							1
TOTAL		140	10.3	77.8	11,980		10		67	4	8	89

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(184)	1984	30	114

GENERAL NOTES

- Demolishing, removing and disposing a portion or the entire existing structure shall not be paid for separately but shall be incidental to the various contract items in the proposal.
- Concrete shall be Type A for catch basin and storm drain manhole modifications.
- 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 of dowels shall be 1 1/2 inches; and voids after installing dowels shall be filled with mortar as directed by the Engineer. The work (Drilling 1 1/2" holes and filling voids with mortar) as mentioned above shall be considered incidental to the various contract items in the proposal.
- All cast iron frames and covers for existing manholes and catch basins which are to be partially or completely demolished shall be stock piled in a neat and orderly manner at the project site as directed by the Engineer and shall remain the property of the State. Payment shall be incidental to the various contract items in the proposal.

DATE

REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE H-1
SAFETY IMPROVEMENTS
KALO LANE TO AINAKOA AVENUE

F.A.I.P. NO. IR-HI-1(184)

No Scale Date: Aug. 1981

SHEET NO. 1 OF 12 SHEETS

C.O. 30R

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1R-HH(184)	1984	31	114

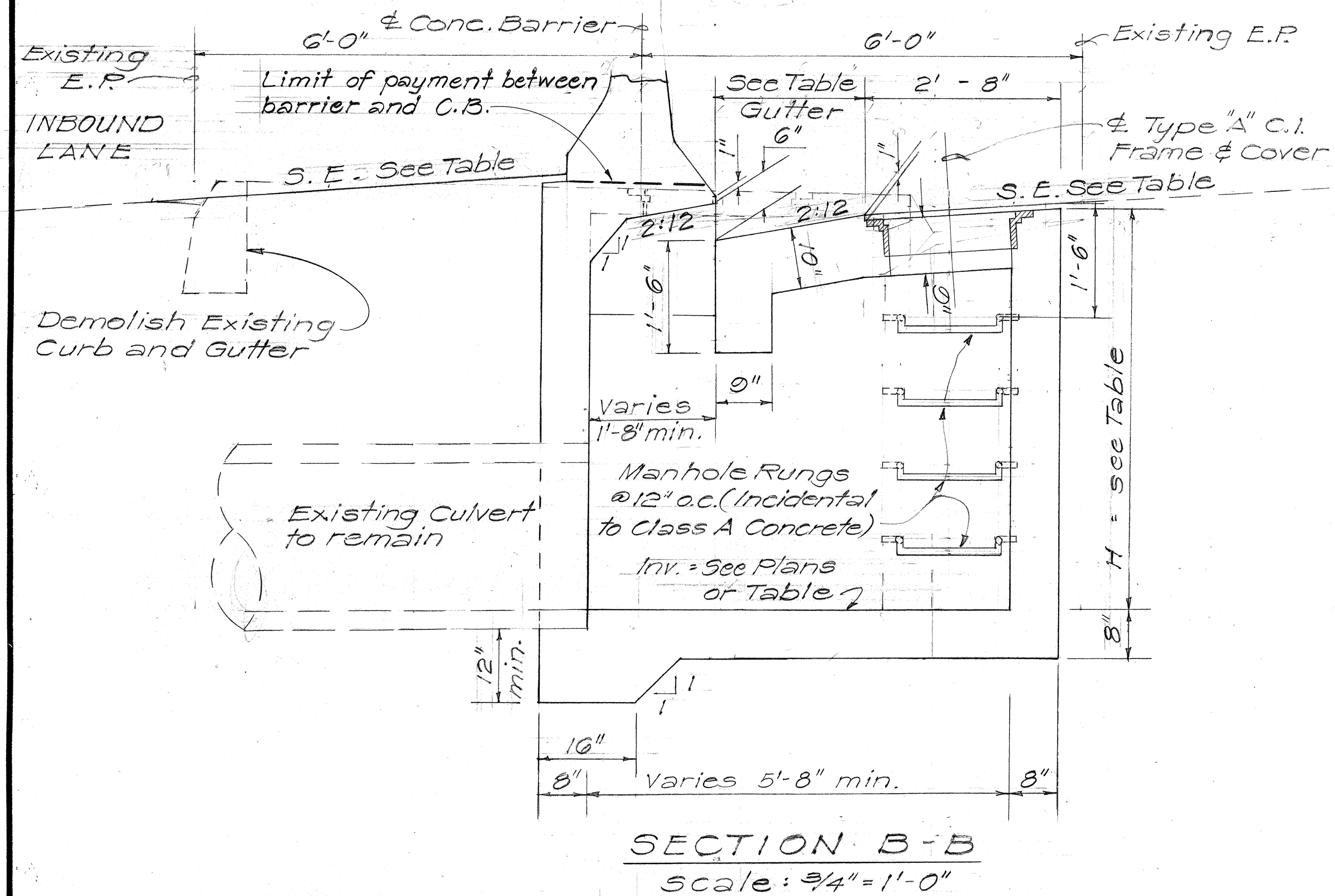
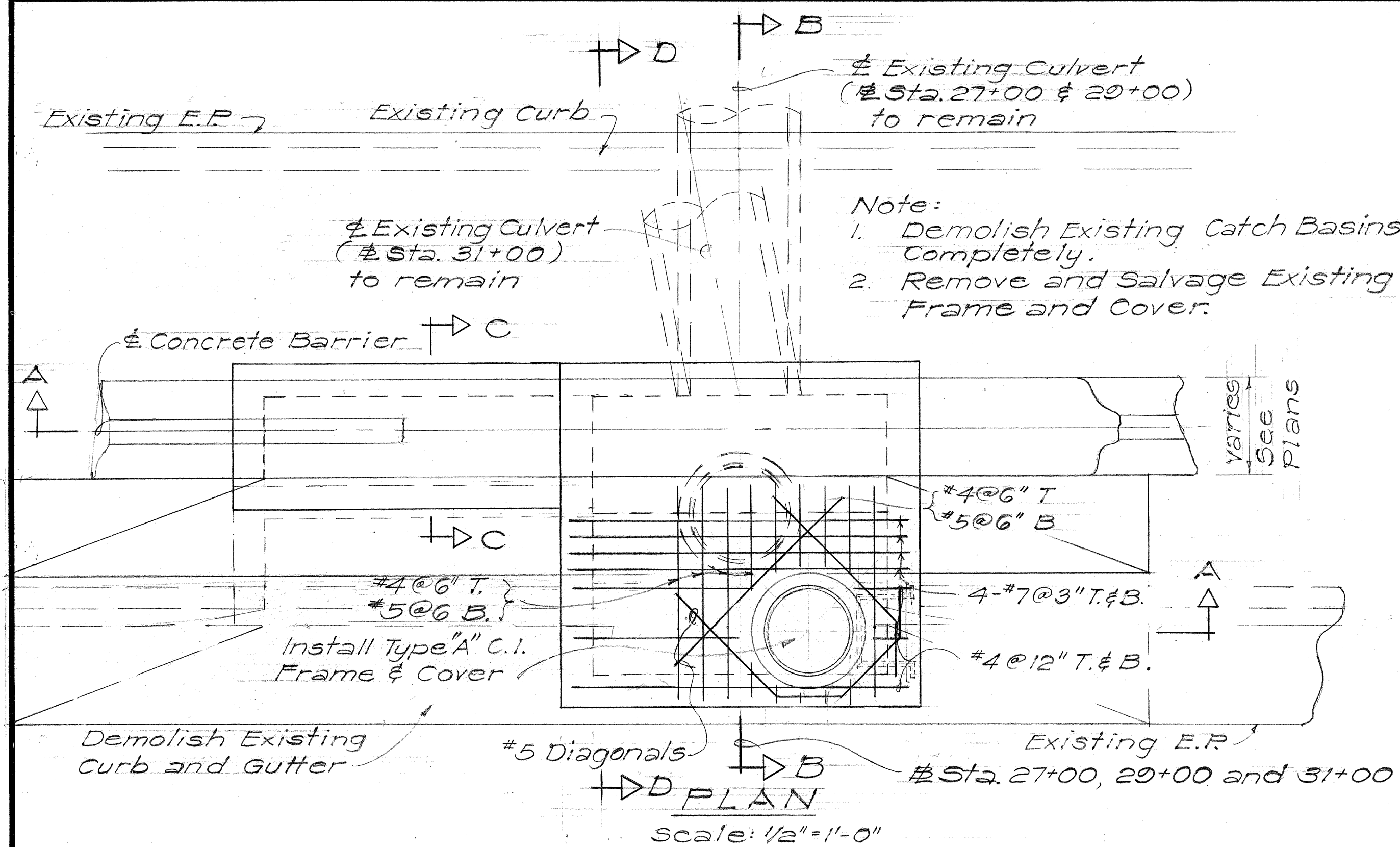
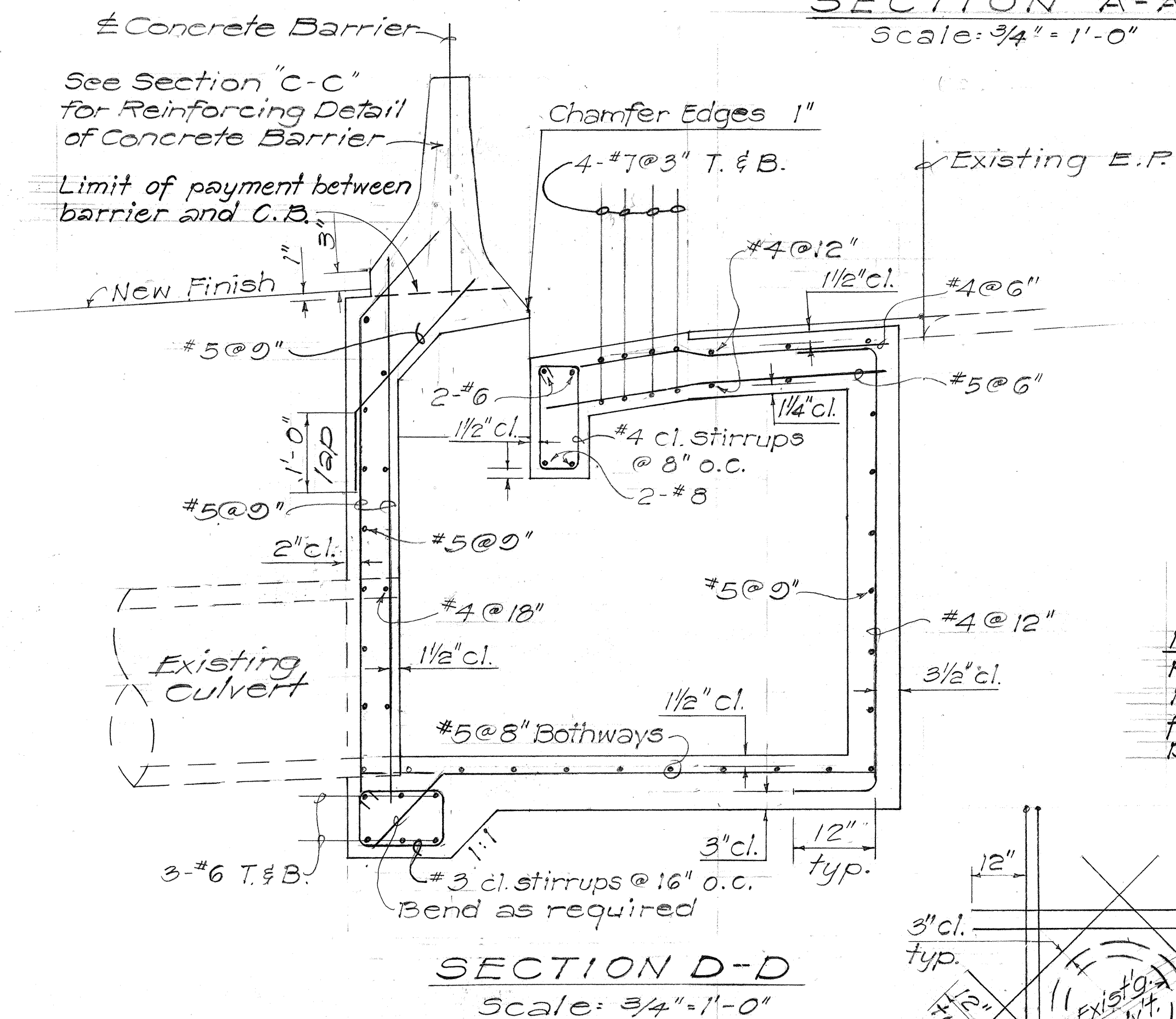
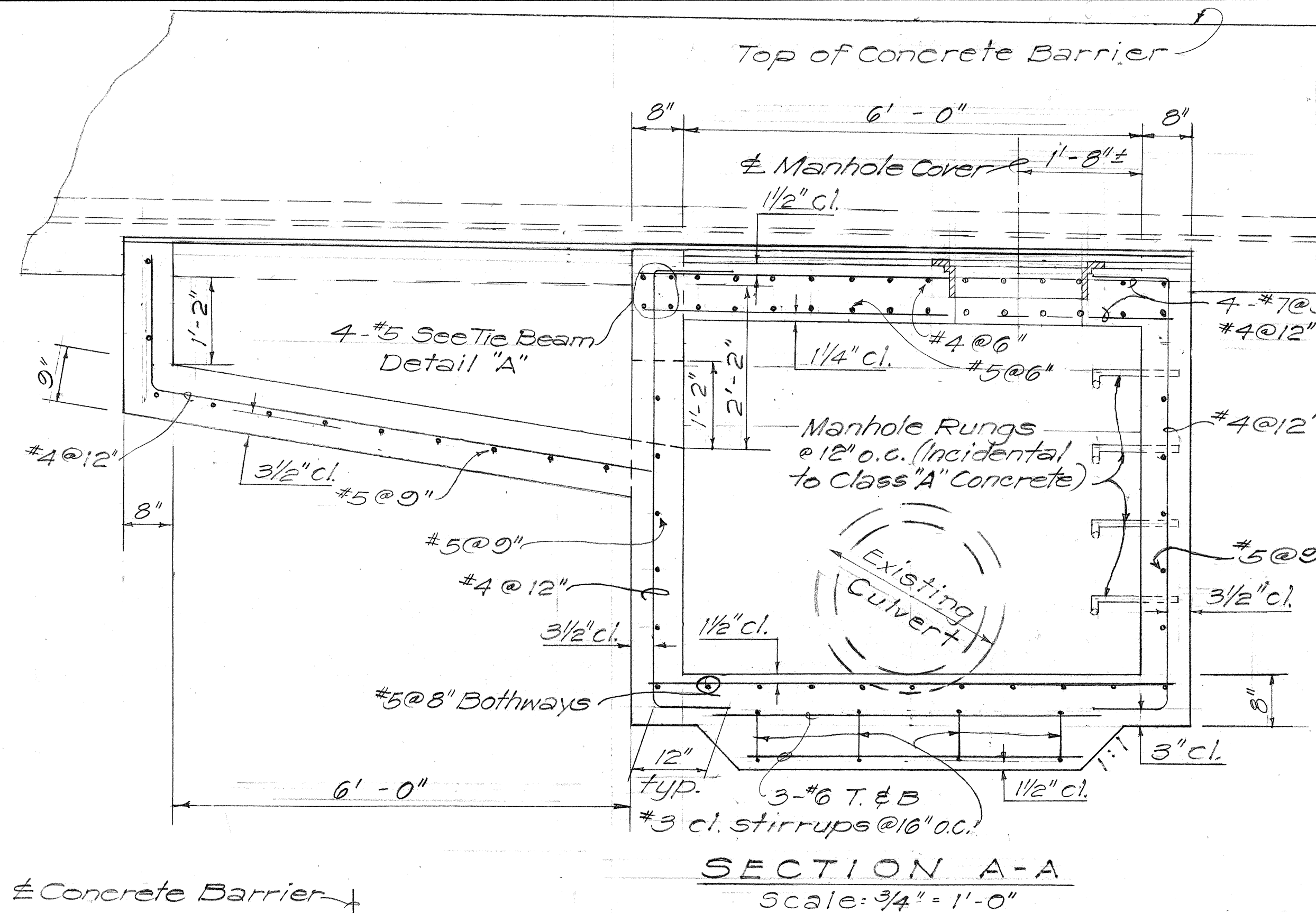


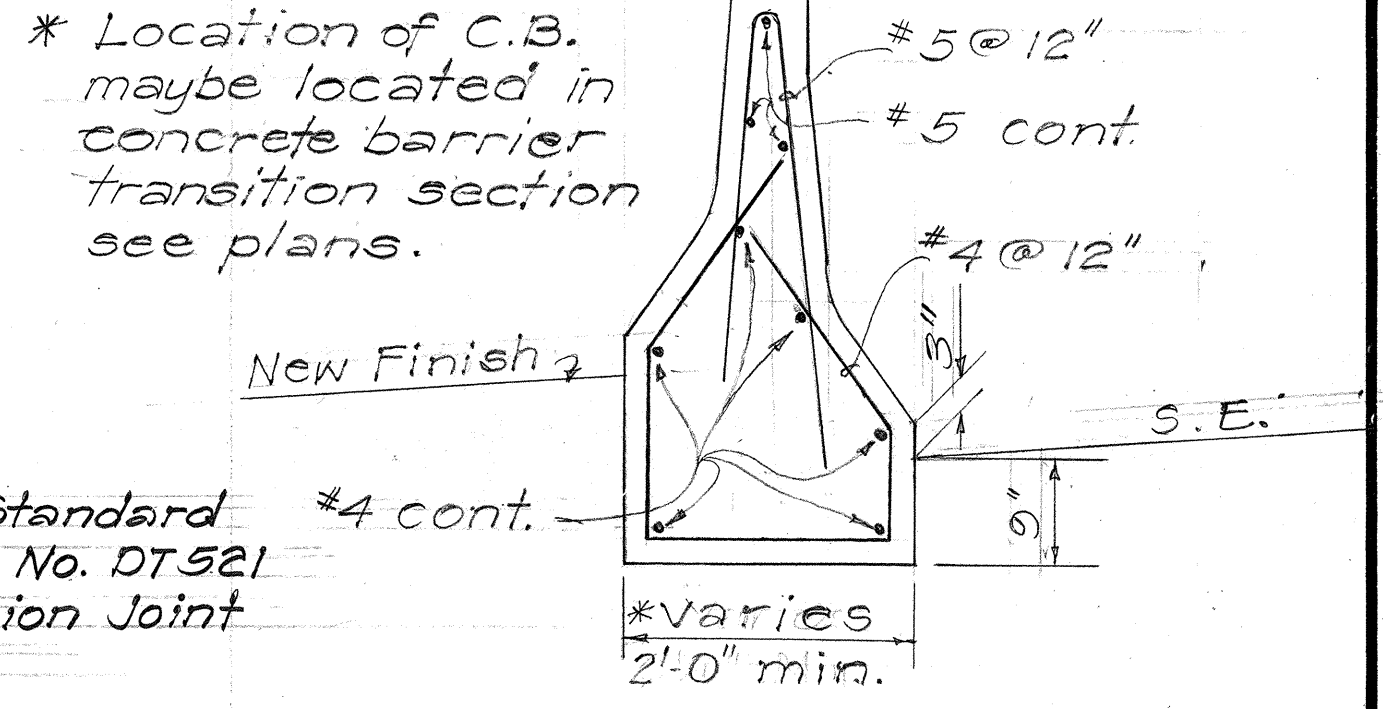
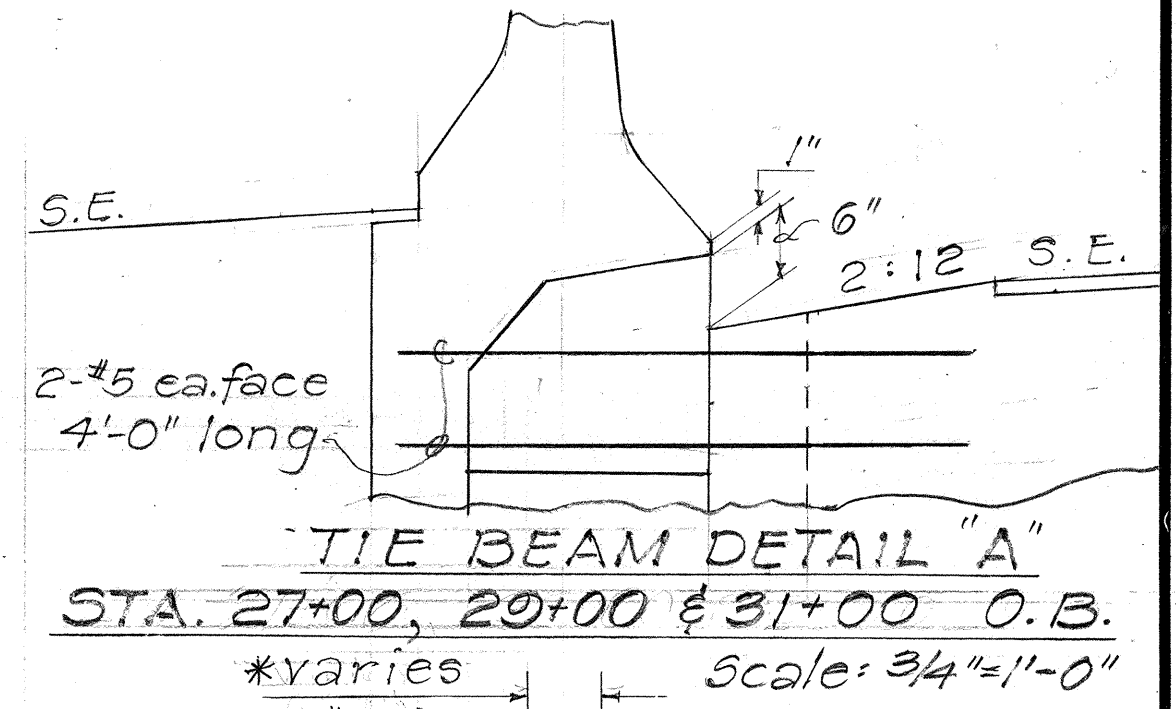
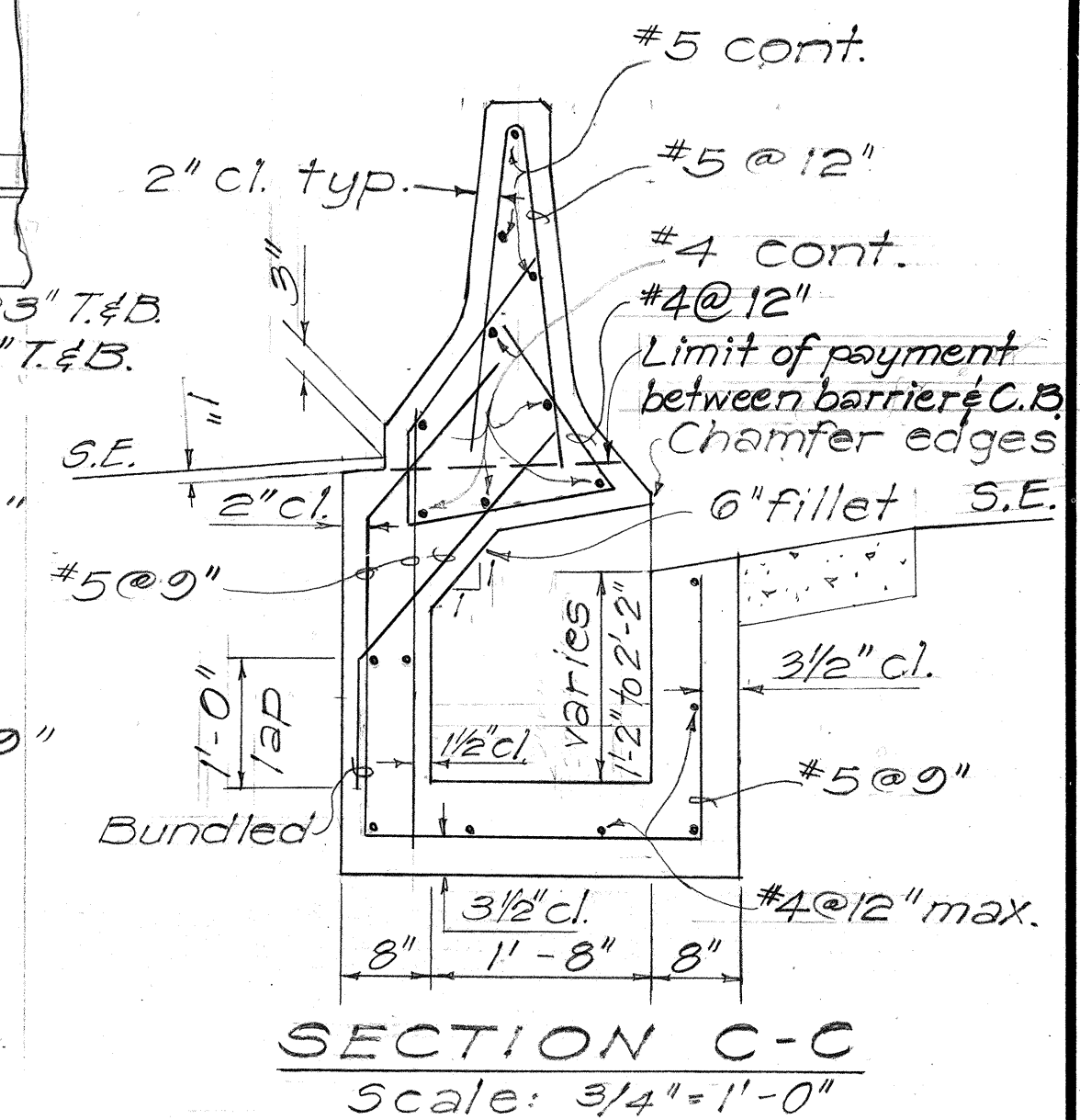
TABLE DATA						
STATION	S.E. INBOUND	S.E. OUTBOUND	INVERT	H	BARRIER WIDTH	GUTTER WIDTH
27+00 O.B.	0.0624 1/2	0.0667 1/2	24.50	5'-9"±	2'-3"±	1' - 11"±
29+00 O.B.	0.0689 1/2	0.0722 1/2	21.00	5'-7"±	2'-0"	2' - 0"
31+00 O.B.	0.0708 1/2	0.0667 1/2	17.50	5'-5"±	2'-0"	2' - 0"

DETAILS OF C.B. AT O.B. # STA. 27+00, 29+00 AND 31+00



Required only when culverts are Reinforced Concrete Pipes.

TYPICAL ADDITIONAL REINF. AT CULVERT OPENINGS - ALL C.B.
Scale: 1/2" = 1'-0"



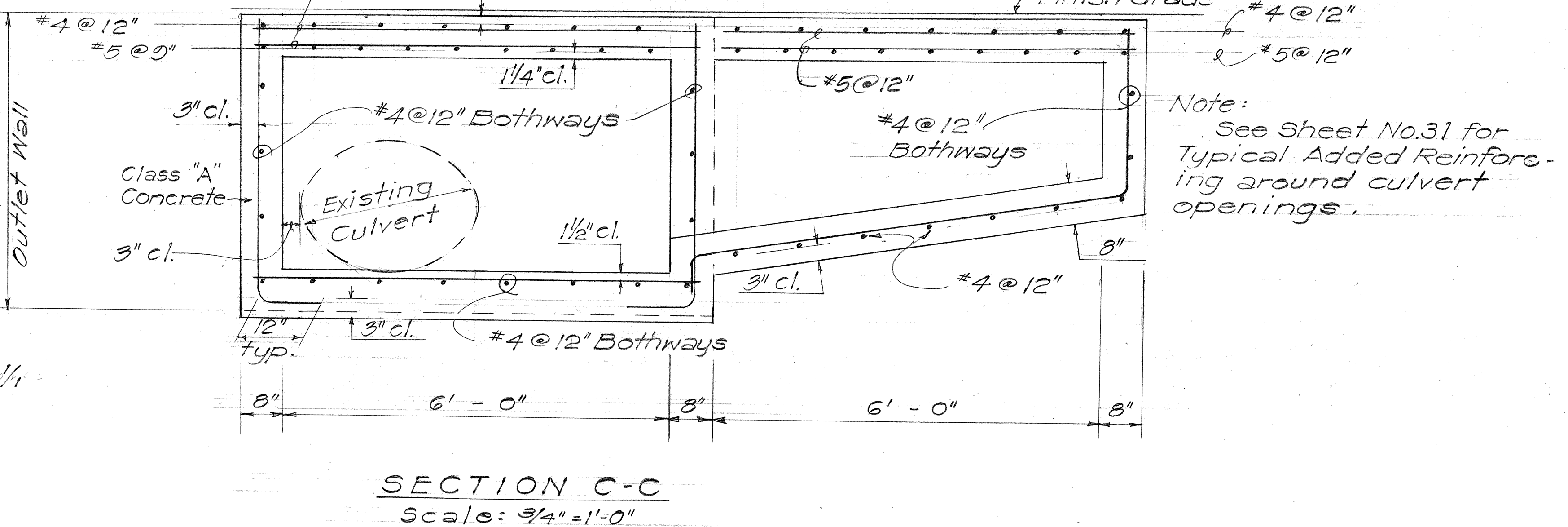
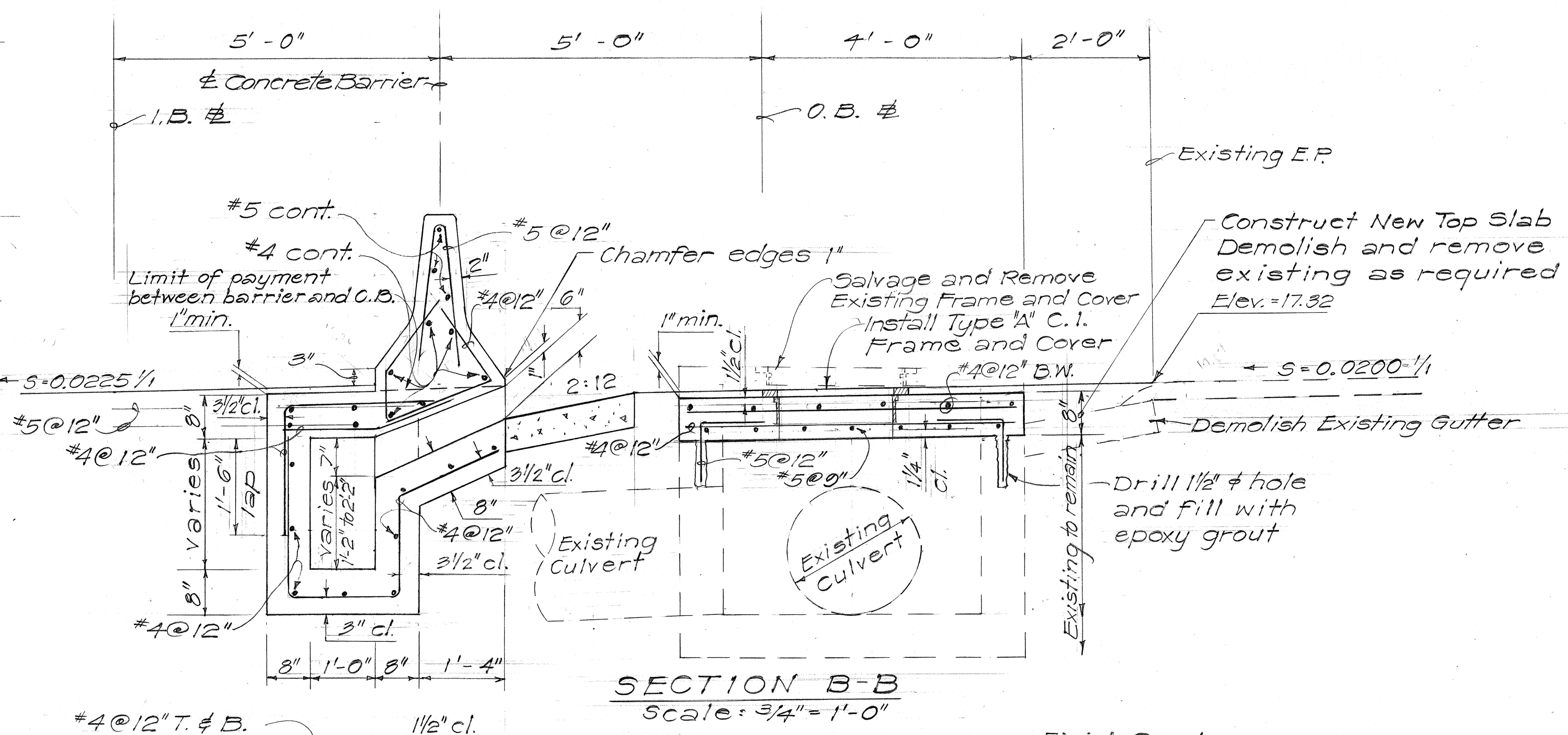
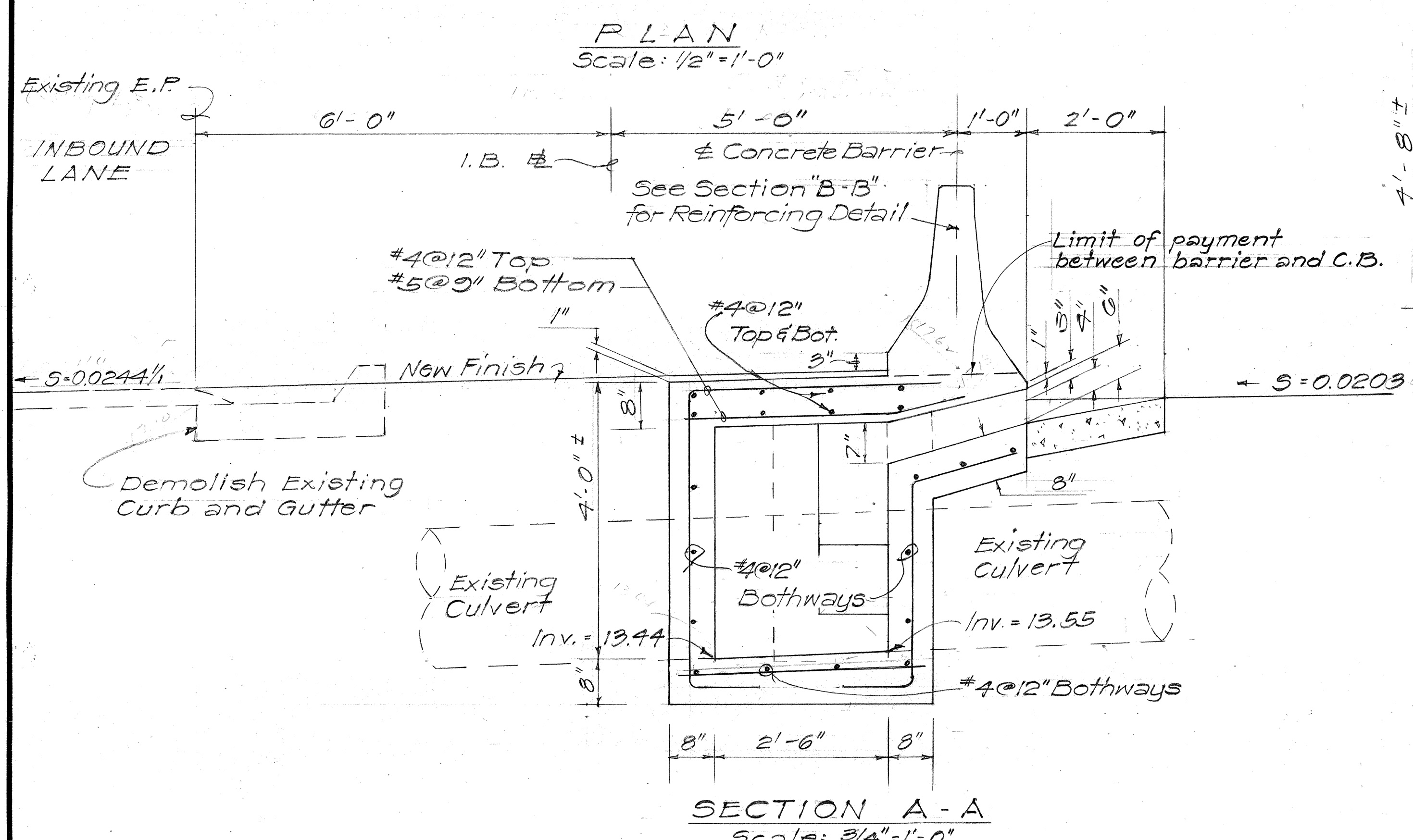
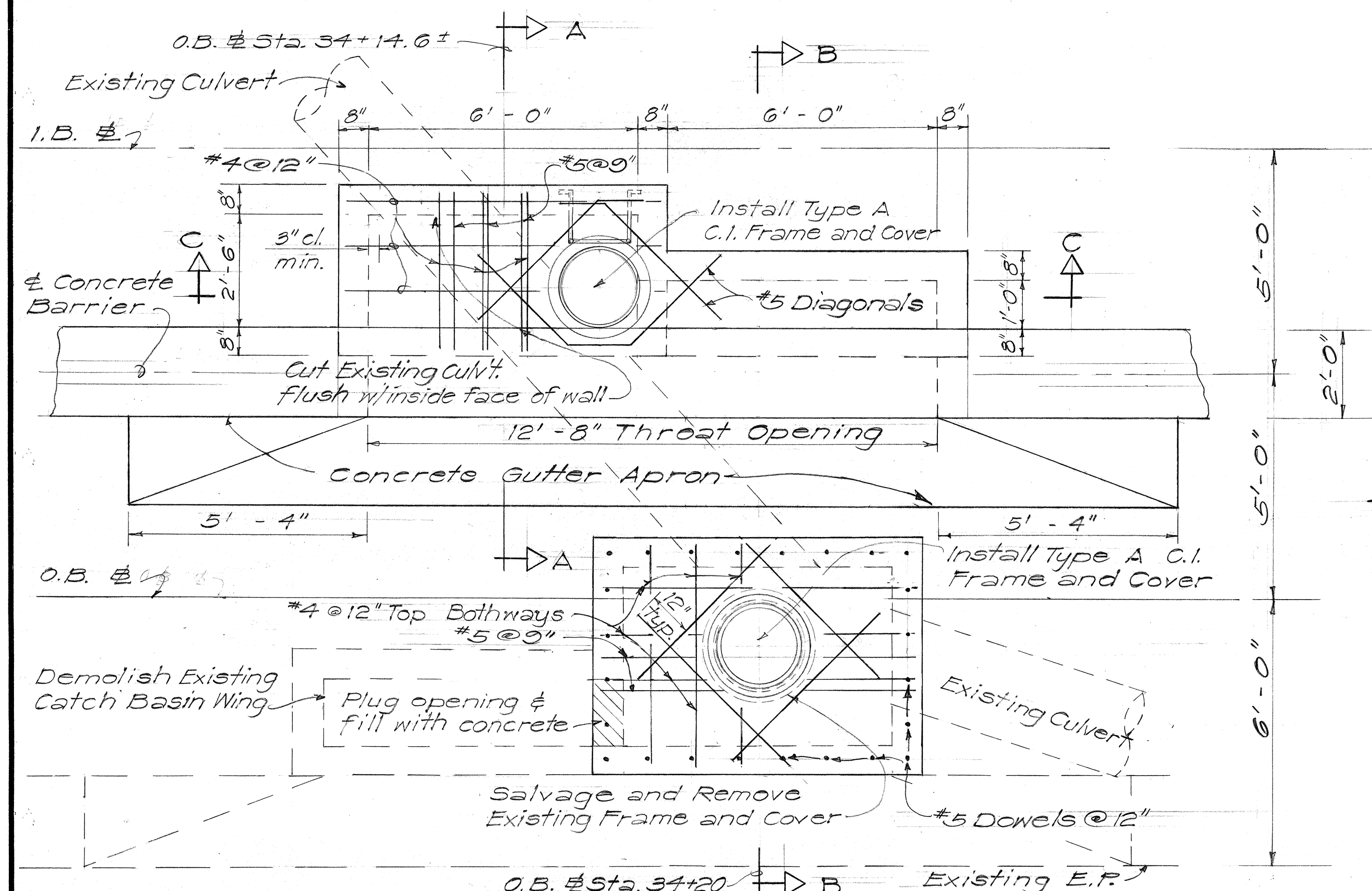
NOTE: Refer to Standard Detail Sht. No. DT521 for Expansion Joint Detail.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE H-1
SAFETY IMPROVEMENTS
KALO LANE TO AINAKOA AVENUE
F.A.I.P. NO. 1R-H1-1(184)
Scale As Noted Date: Aug. 1981
SHEET NO. 2 OF 12 SHEETS

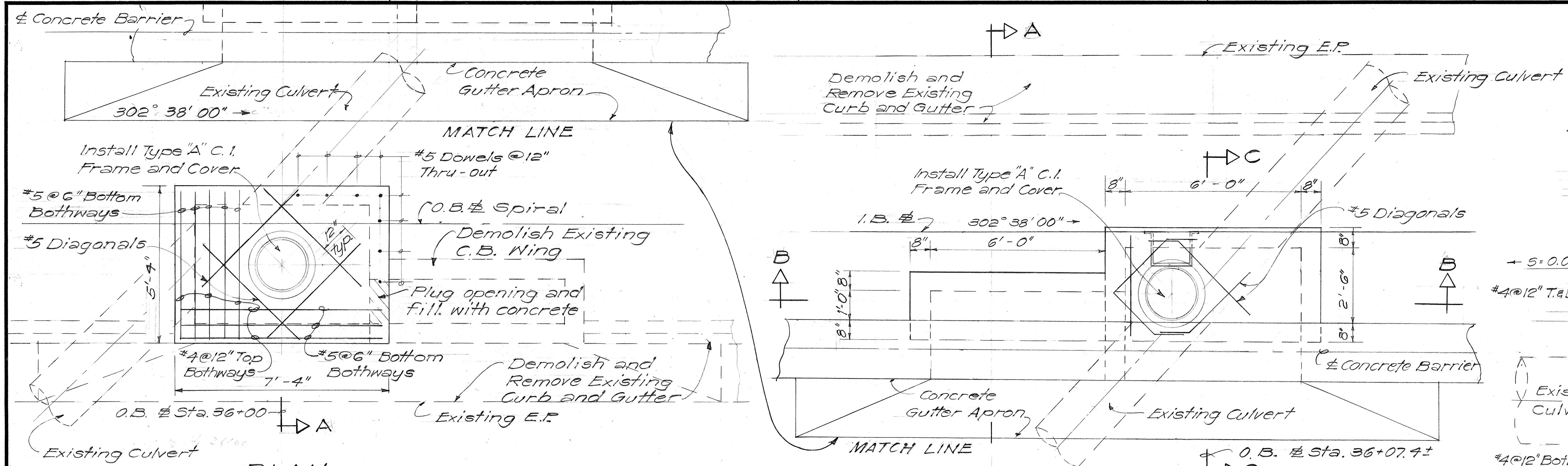
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1R-H1-1084	1984	33	114



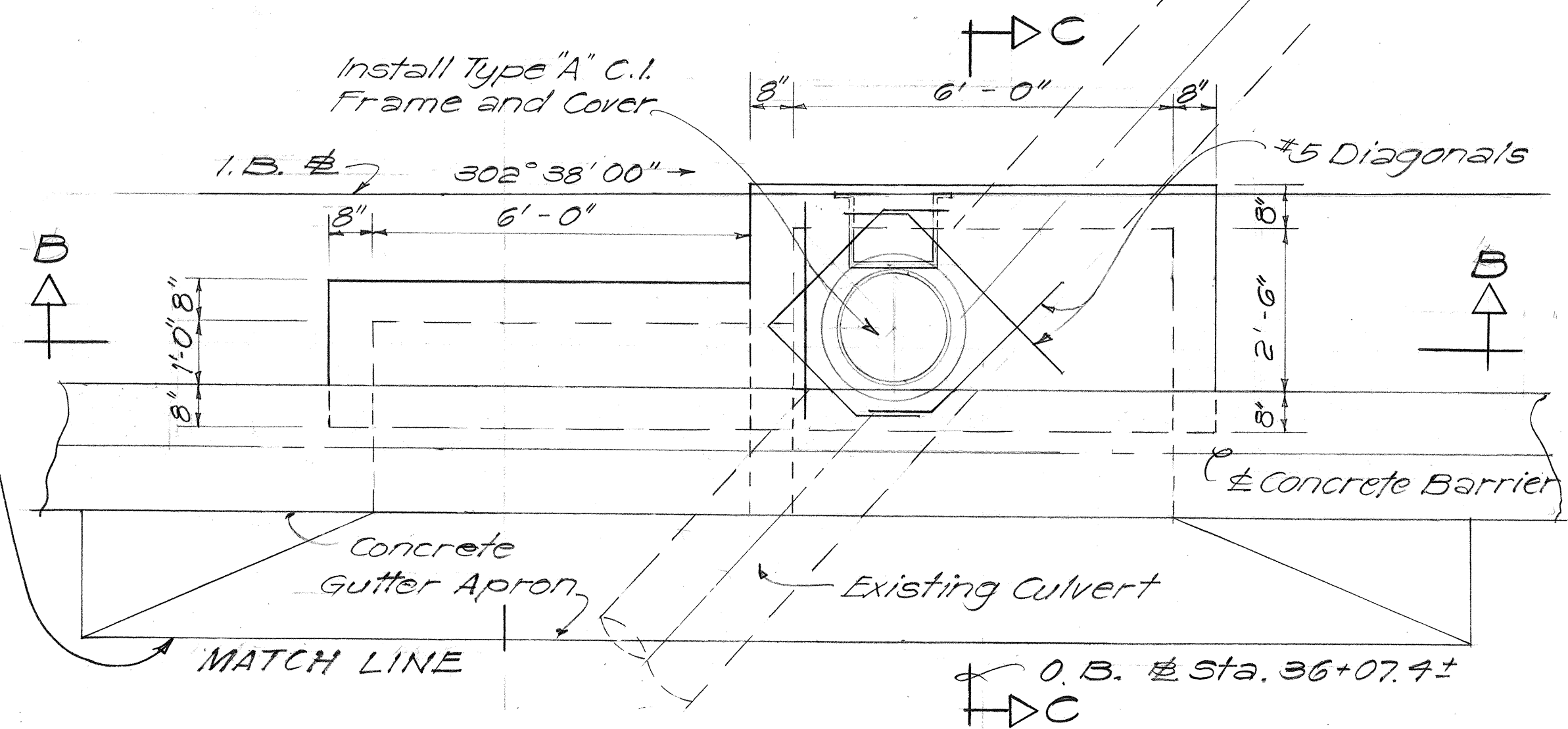
DETAILS OF C.B. AT O.B. Sta. 34+14.6± AND Sta. 34+20

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
INTERSTATE ROUTE H-1
SAFETY IMPROVEMENTS
KALO LANE TO AINAKOA AVENUE
F.A.I.P. NO. 1R-H1-1(184)
Scale As Noted Date: Aug. 1981
SHEET NO. 4 OF 12 SHEETS

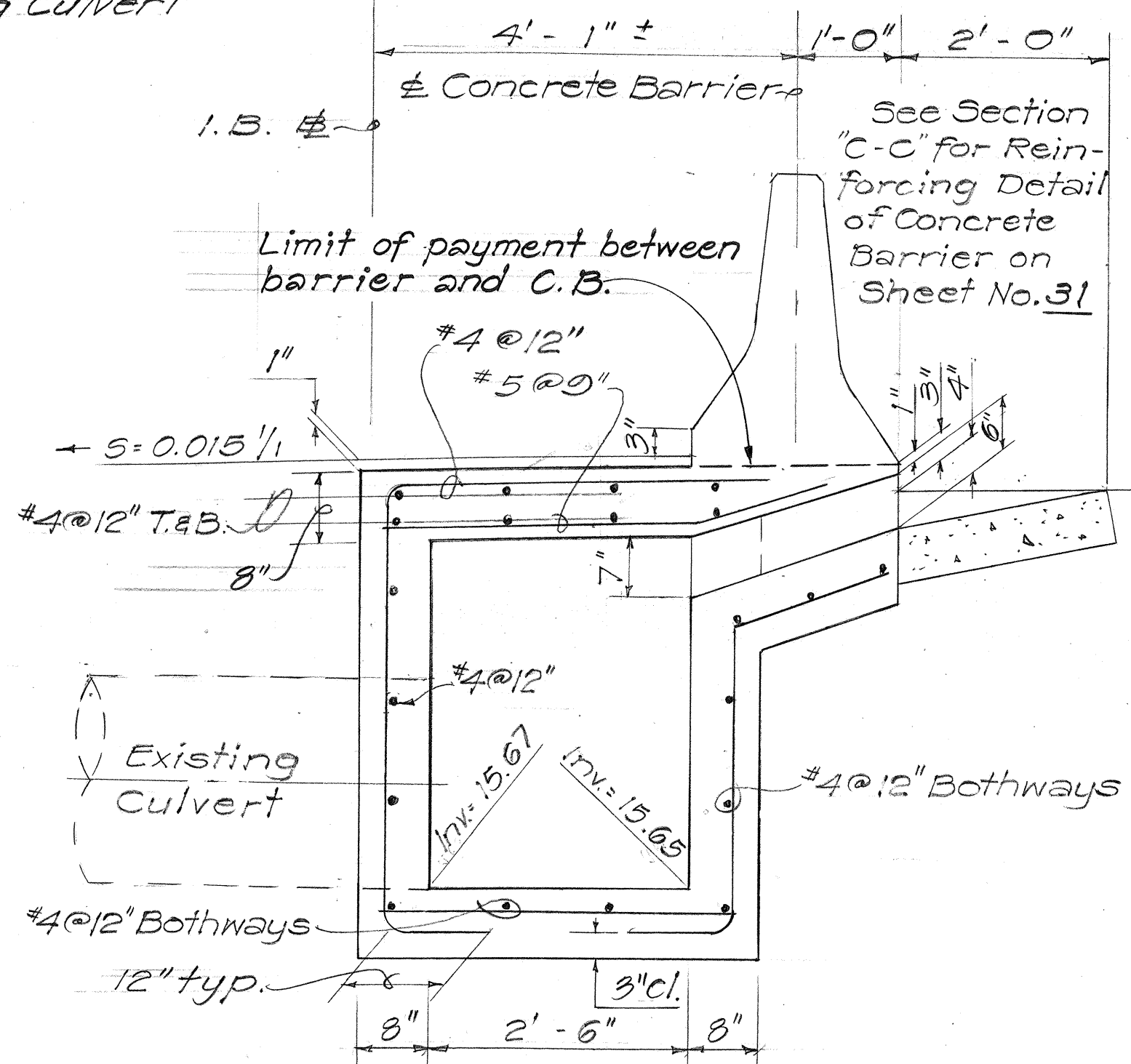
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HAWAII	HAW.	1R-HI-1(184)	1984	34	114



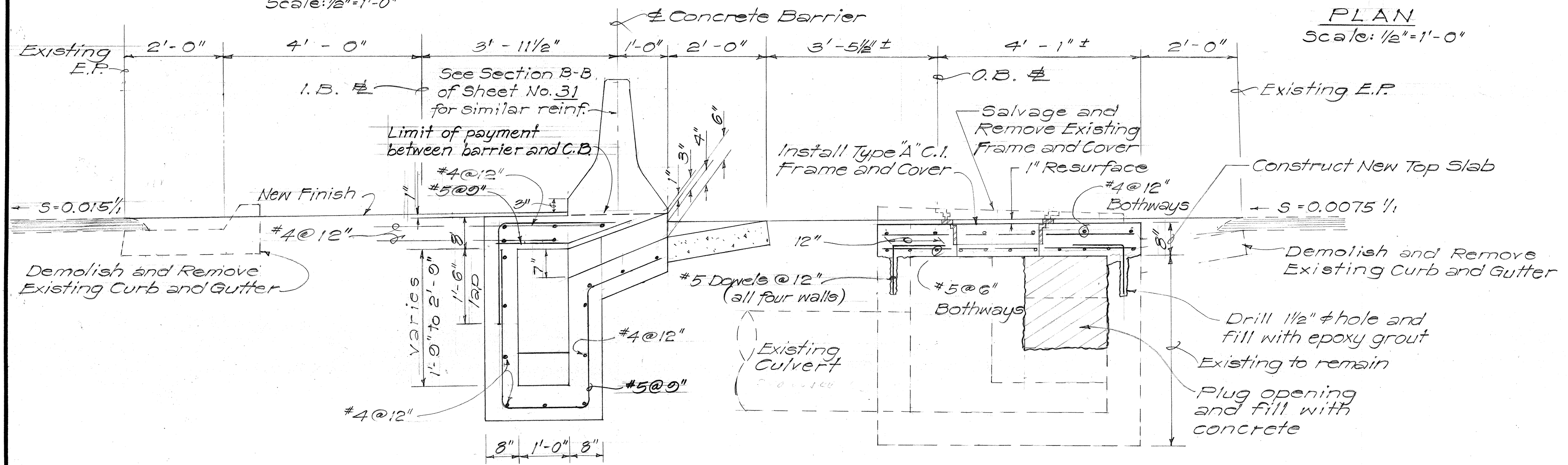
PLAN
Scale: 1/8" = 1'-0"



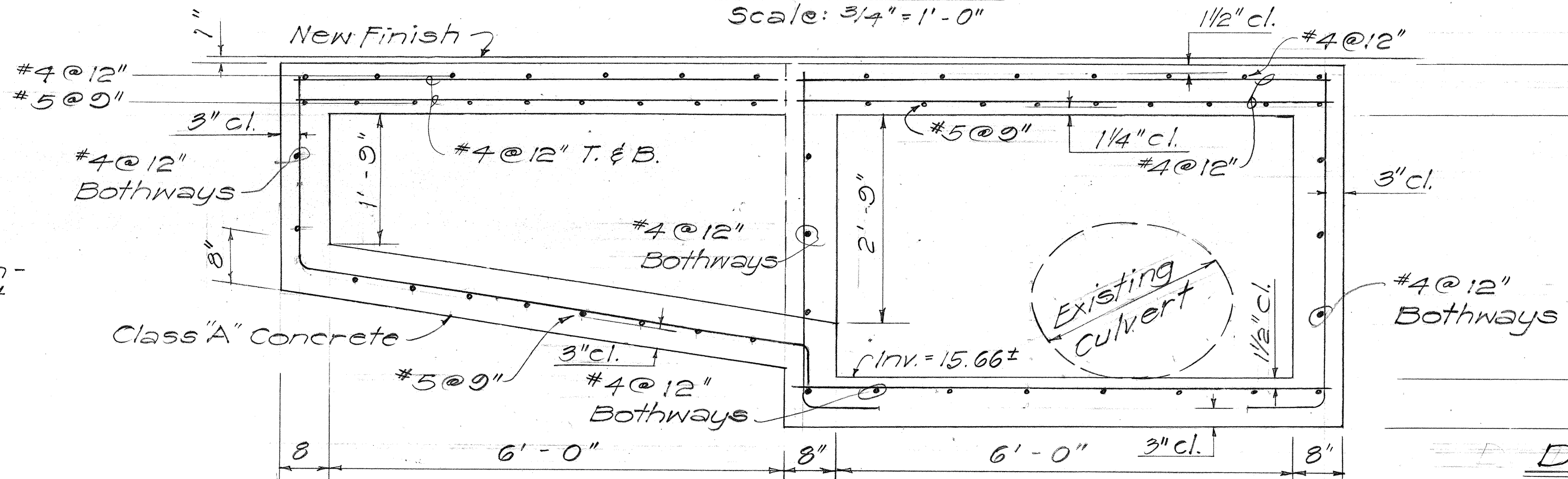
PLAN
Scale: 1/8" = 1'-0"



SECTION C-C
Scale: 3/4" = 1'-0"



SECTION A-A
Scale: 3/4" = 1'-0"



SECTION B-B
Scale: 3/4" = 1'-0"

DETAILS OF C.B. AT
O.B. ± STA. 36+00 AND 36+07.4±

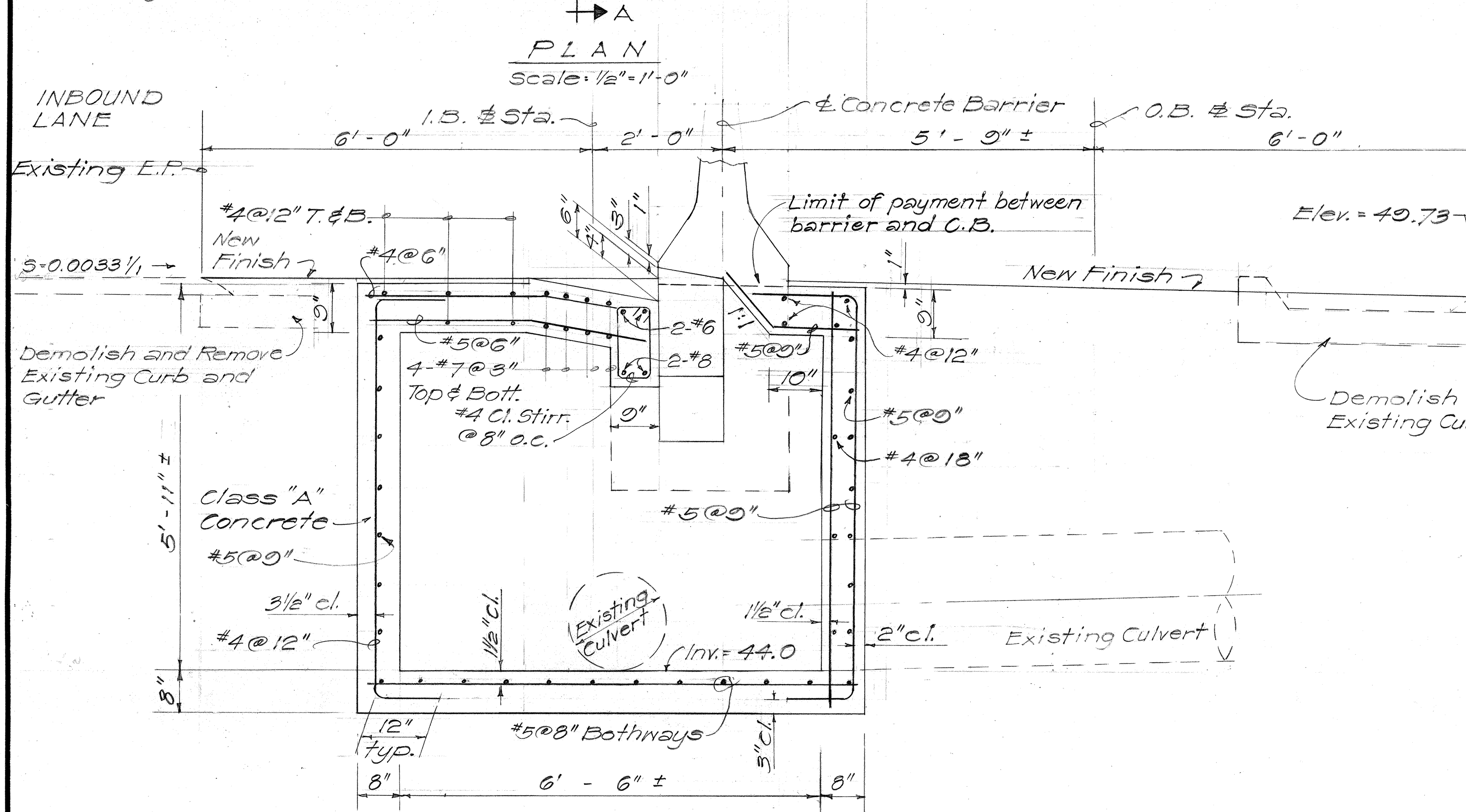
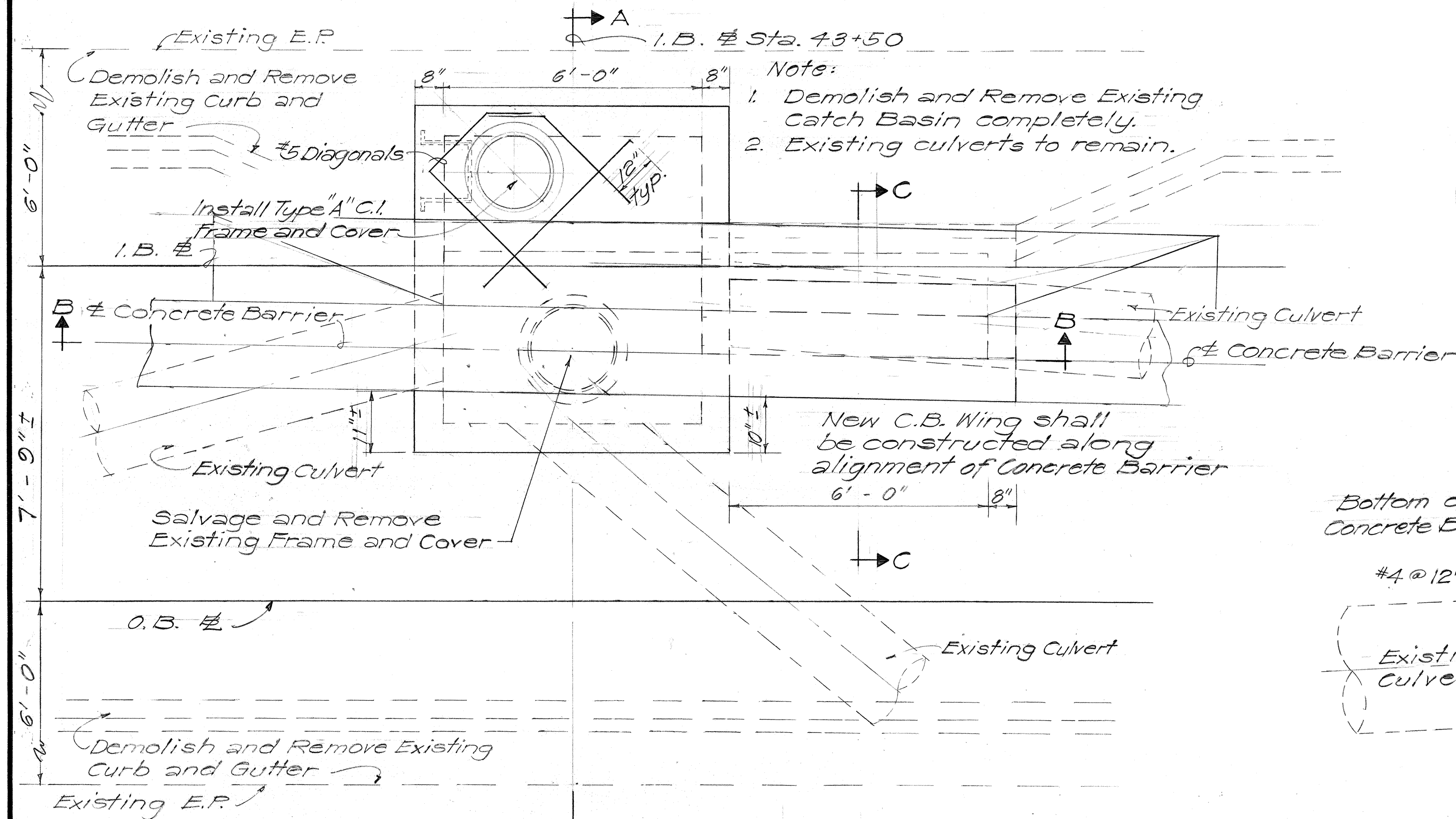
Note:
See Sheet No. 31
for Typical Added Rein-
forcing around culvert
openings.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

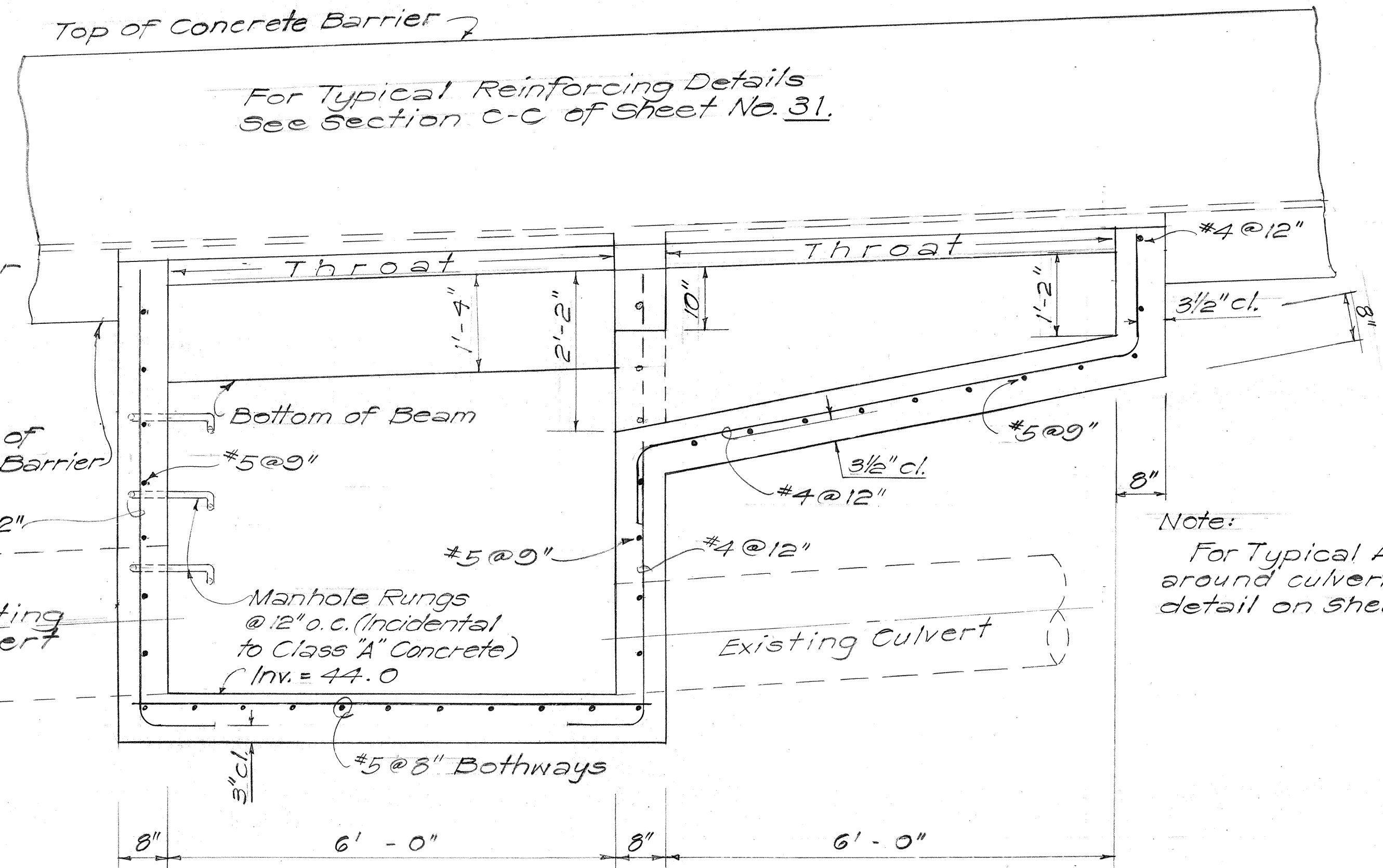
DRAINAGE DETAILS

INTERSTATE ROUTE H-1
SAFETY IMPROVEMENTS
KALO LANE TO AINAKOA AVENUE
F.A.I.P. NO. 1R-HI-1(184)
Scale As Noted Date: Aug. 1981
SHEET NO. 5 OF 12 SHEETS

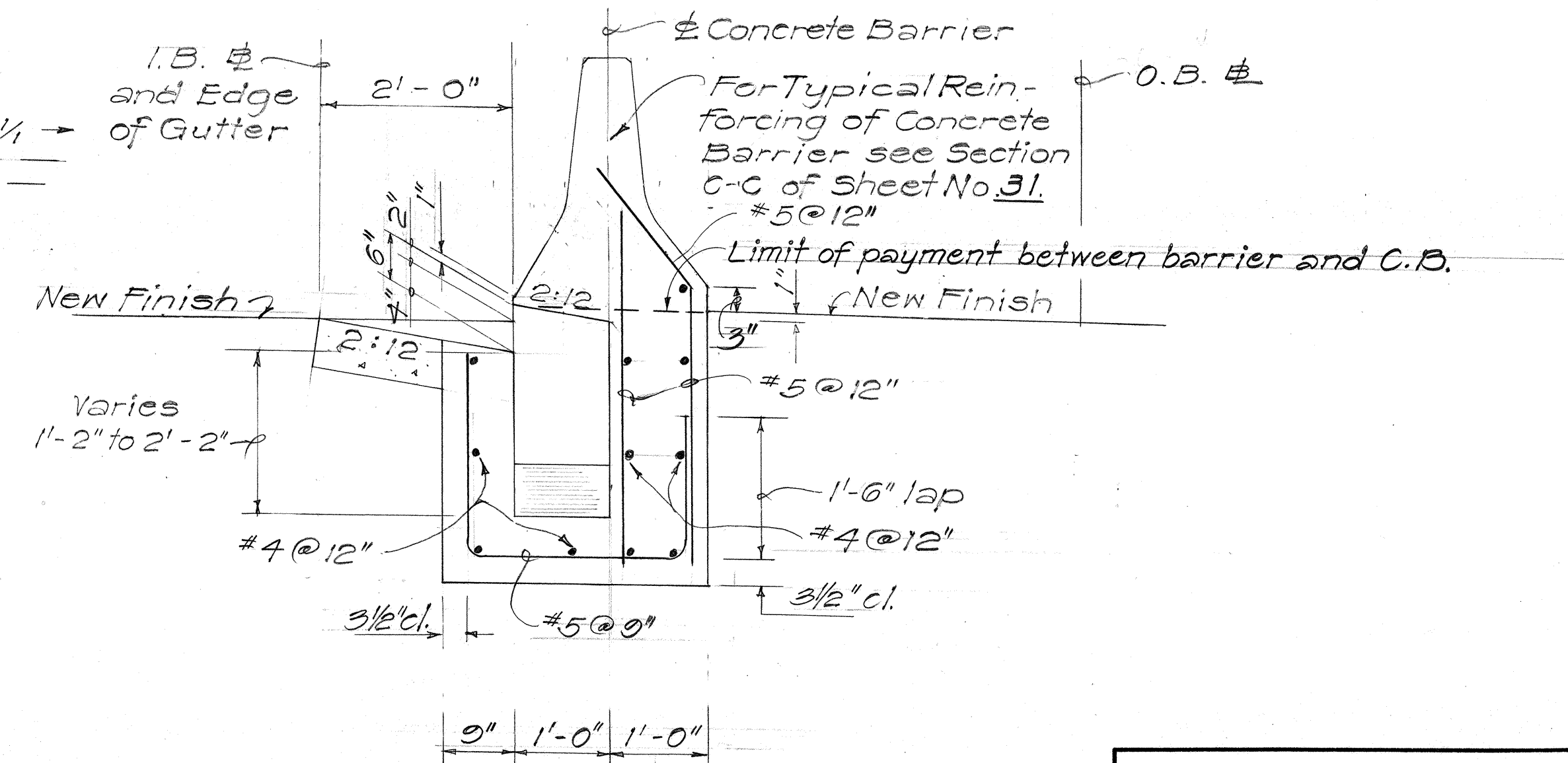
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1R-H1-1(184)	1984	35	114



SECTION A-A
Scale: 3/4" = 1'-0"



SECTION B-B
Scale: 3/4" = 1'-0"



SECTION C-C
Scale: 3/4" = 1'-0"

DETAILS OF C.B. AT I.B. STA. 43+50

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
INTERSTATE ROUTE H-1
SAFETY IMPROVEMENTS
KALO LANE TO AINAKOA AVENUE
F.A.I.R. NO. IR-H1-1(184)
Scale As Noted Date: Aug. 1981
SHEET NO. 6 OF 12 SHEETS

[illegible]

PLAN
Scale: 3/4"=1'-0"

I.B. Station 62+40
O.B. Station 54+25
Existing E.P.

Type 50 or Type 50C
Guard Rail

6'-0"

1'-0"

2'-6"

2'-6"

O.B. Station 62+40
I.B. Station 54+25
Existing E.P.

Relocated Existing Type "B" Frame and Grate. Cut WF Beam as Required

1/2" Chamfer Over Opening

4" Throat Opening Beyond

3"-#5

New Finish

Slope Varies

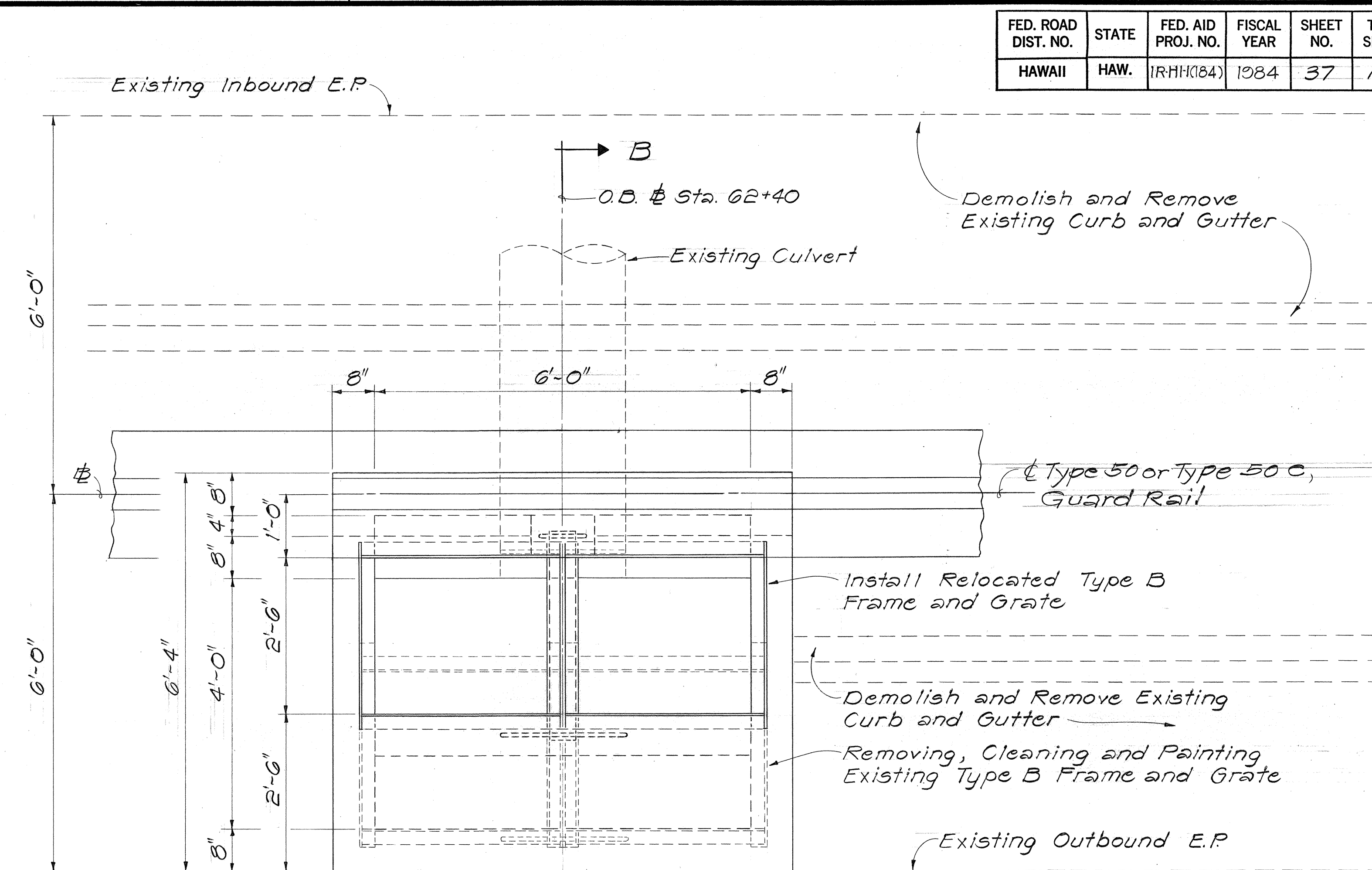
Demolish and Remove Existing Curb and Gutter

Height A
See Table

Limit of payment between barrier and C.B.
Existing Culvert

Existing To Remain

SECTION "A-A" AND "B-B"
(TYPICAL AT 2 C.B.)



The image contains two hand-drawn diagrams illustrating the dimensions and reinforcement of a column.

Left Diagram (Column Dimensions): This diagram shows the vertical and horizontal dimensions of the column. The total height is 6'-4". The vertical dimensions from top to bottom are: 8" (top corner), 5'-0" (main shaft), 4'-0" (lower shaft), 8" (lower corner), 2'-2" (lower section), 8" (lower section), 2'-2" (lower section), and 1'-2" (bottom corner). The total width is 3'-0". The horizontal dimensions from left to right are: 8" (left corner), 3'-0" (main shaft), and 8" (right corner). The diagram is labeled "Symm. about C" (Symmetrical about Centerline).

Right Diagram (Reinforcement Details): This diagram shows the reinforcement details of the column. It includes a cross-section of the column showing the reinforcement bars. The reinforcement consists of 3 #4 bars (labeled "3-#4 2'") and 2 #5 bars (labeled "2-#5"). The reinforcement is arranged in a rectangular pattern with a width of 8" and a height of 1'-0". The reinforcement is labeled "#6 Bar" and "#6 Bar 24" Long". The diagram also shows a "2" cl." (2 inch clearance) and a "1 1/2" cl." (1 1/2 inch clearance) for the reinforcement bars.

DETAILS OF C.B. AT STA. 54+25 AND STA. 62+40
Scale: 3/4" = 1'-0"

7/1/84	Deleted C.B. at Sta. 58+92 Revise Guard Rail height and eliminate 1" A.C. in Section A-A #B-
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE H-1
SAFETY IMPROVEMENTS
KALO LANE TO AINAKOA AVENUE
F.A.I.P. NO. IR-H-1(184)
Scale As Noted Date: Aug. 1981

SHEET No. 8 OF 12 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(184)	1984	C0.975-1	114

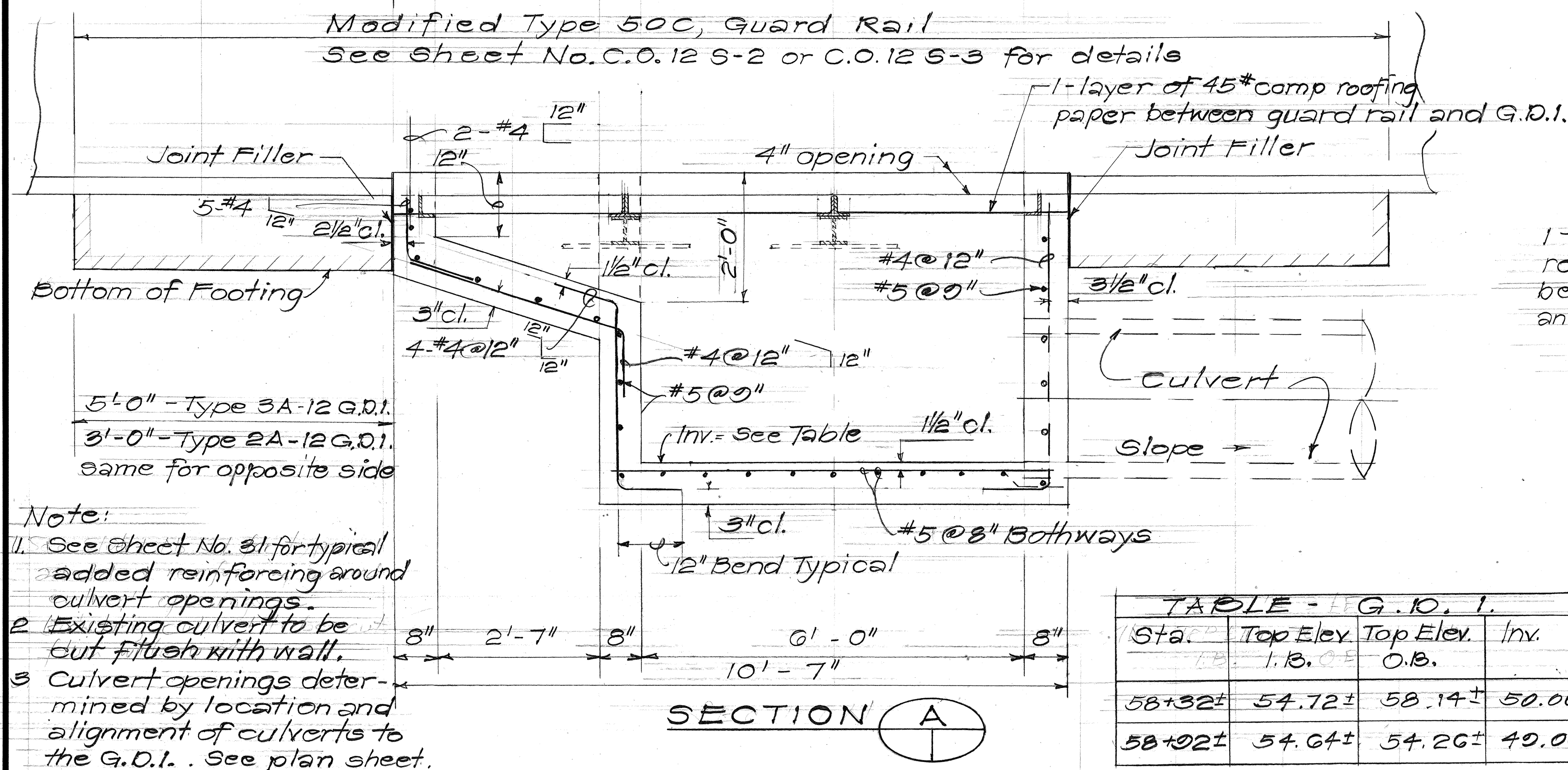
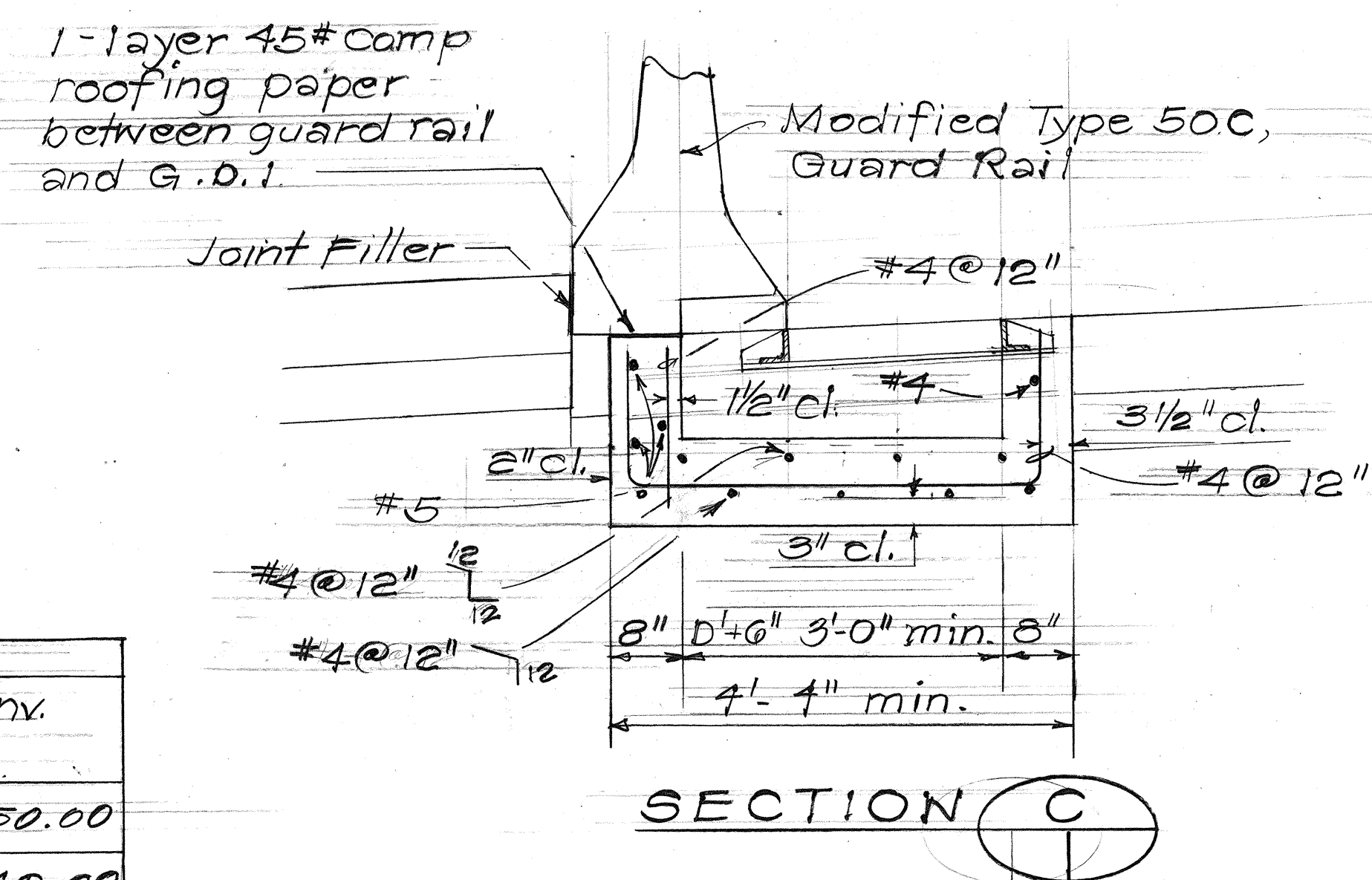
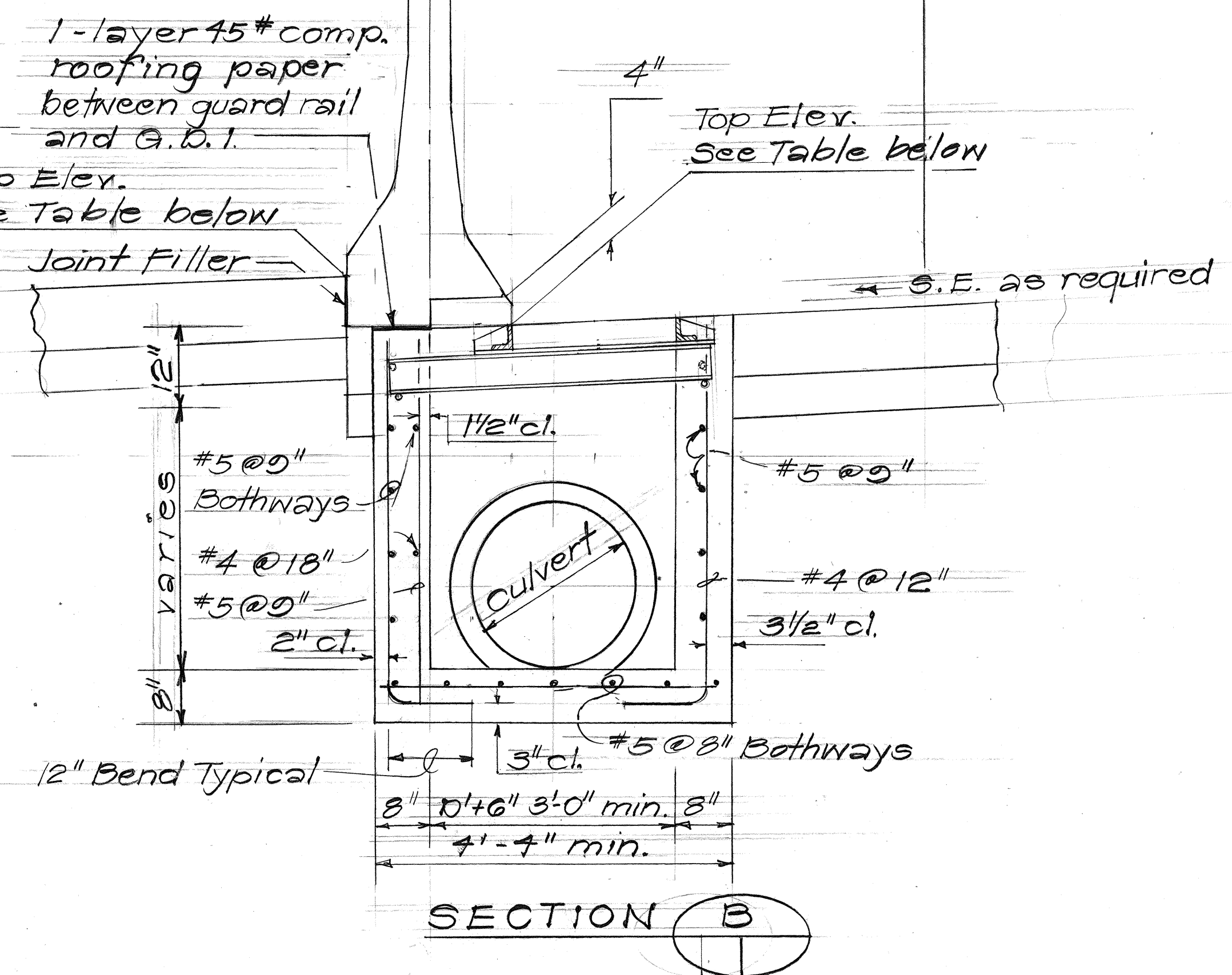
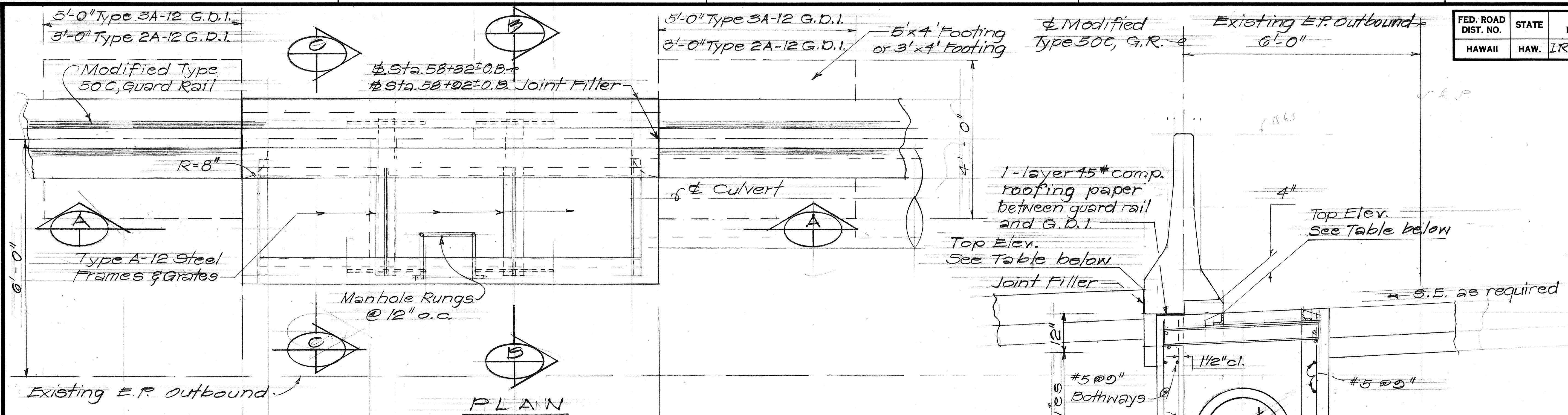


TABLE - G.10.1.			
Sta.	Top Elev.	Top Elev.	Inv.
	I.B.	O.B.	
58+32±	54.72±	58.14±	50.00
58+02±	54.64±	54.26±	49.00

DETAILS OF TYPE 2A-12 AND 3A-12 GRATED DROP INTAKE
AT STA. 58+32 ± 0.5 AND STA. 58+92 ± 0.5
scale: 3/4" = 1'-0"

7/18/84	This sheet added to show revisions and addition of G.D.I's at Sta. 58+32 & Sta. 58+92
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE 4-1
SAFETY IMPROVEMENTS
KALO LANE TO AINAKOA AVENUE

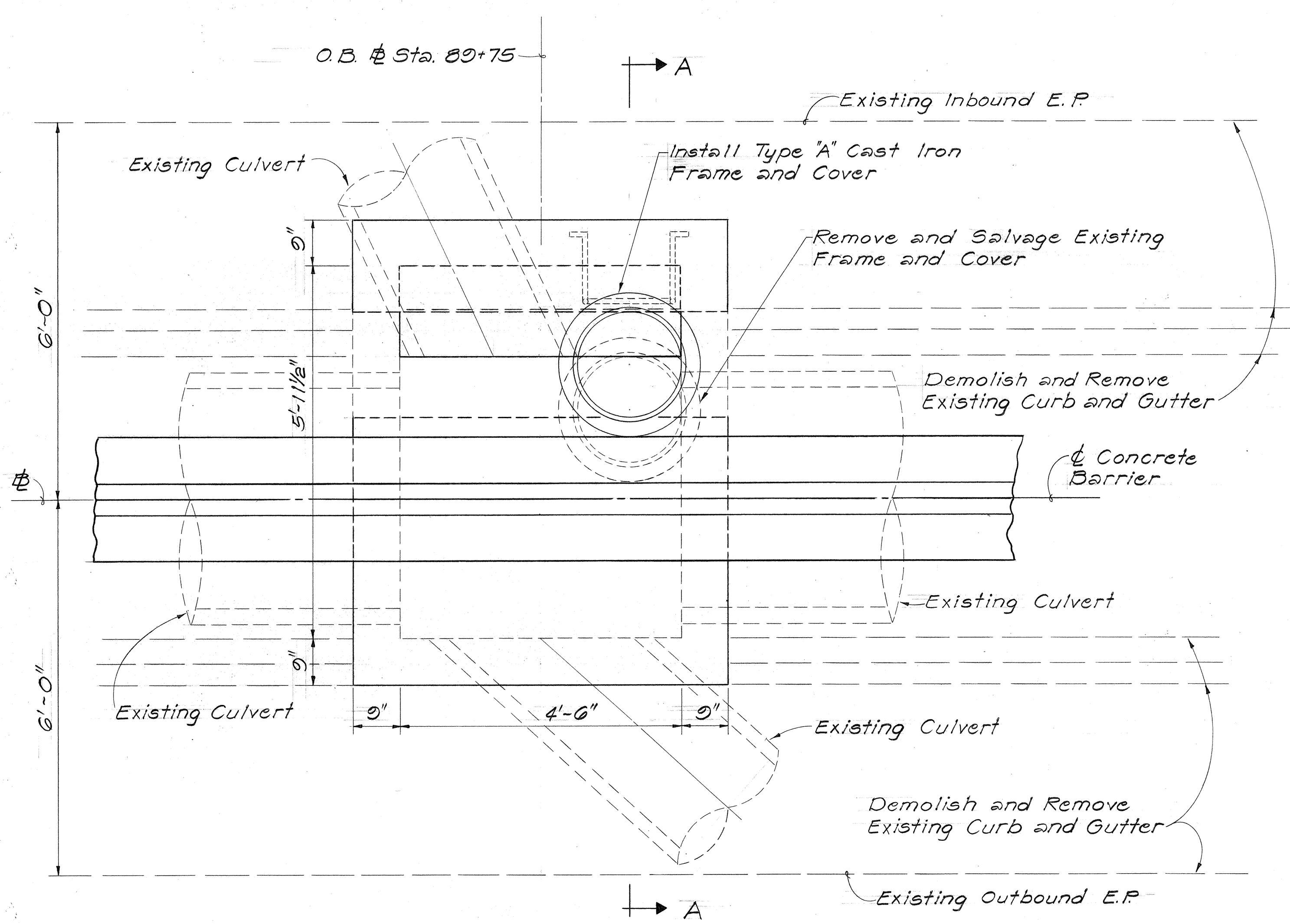
F.A.I.P. No. IR-H-1 (184)

Scale: As Noted Date July, 1984

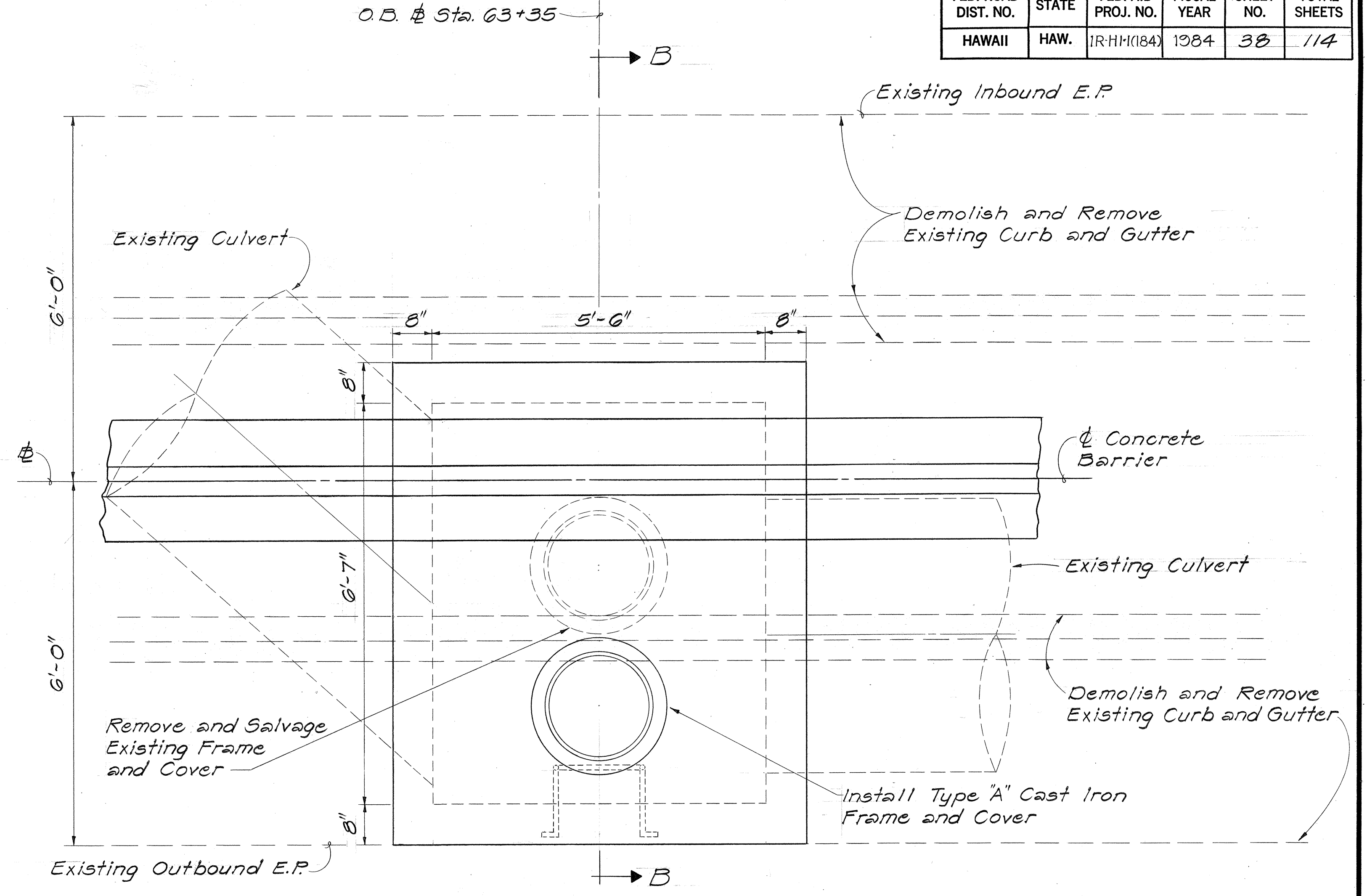
SHEET NO. 8A OF 12 SHEETS

C.O. 37 S-1

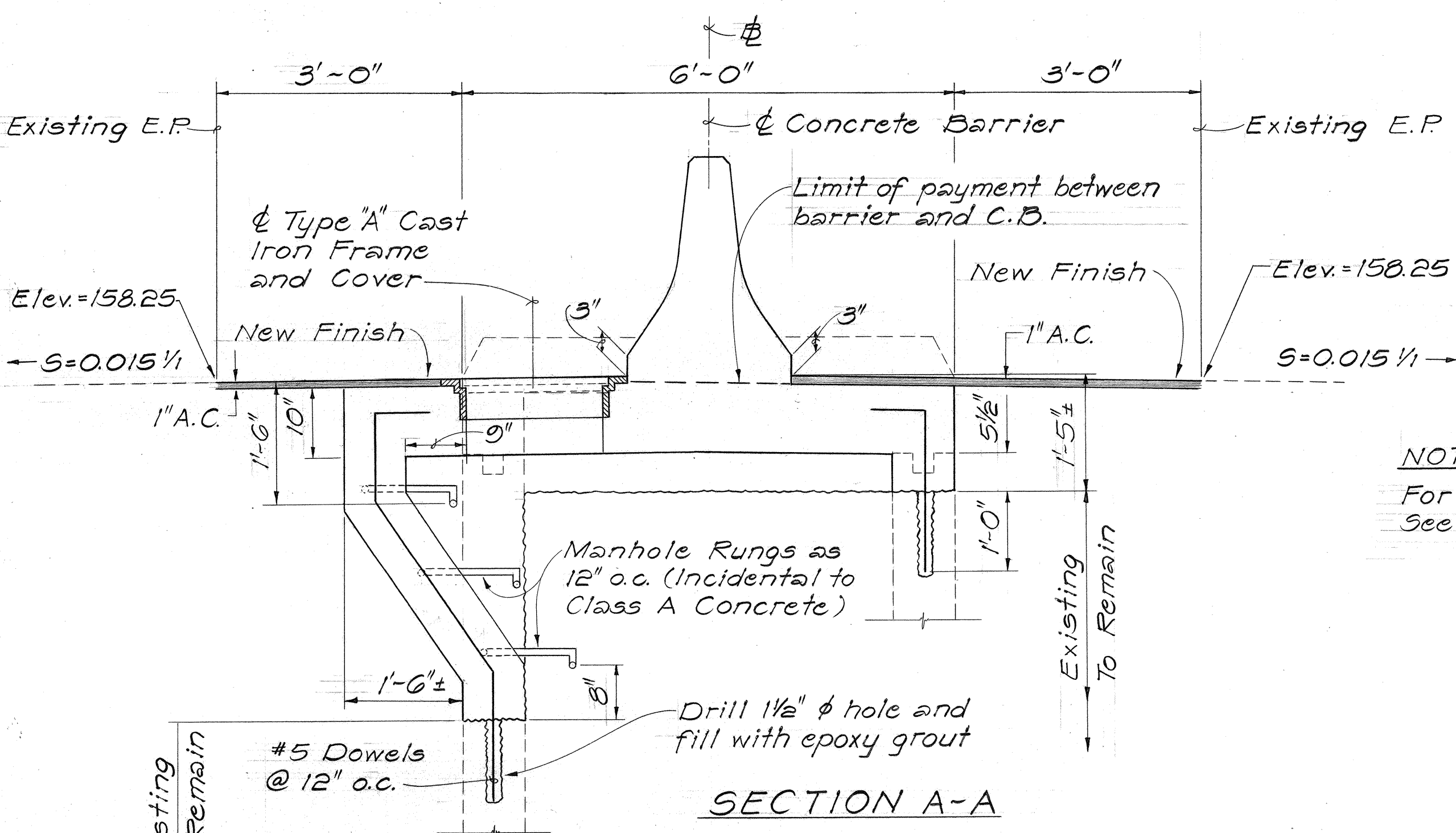
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(184)	1984	38	114



PLAN



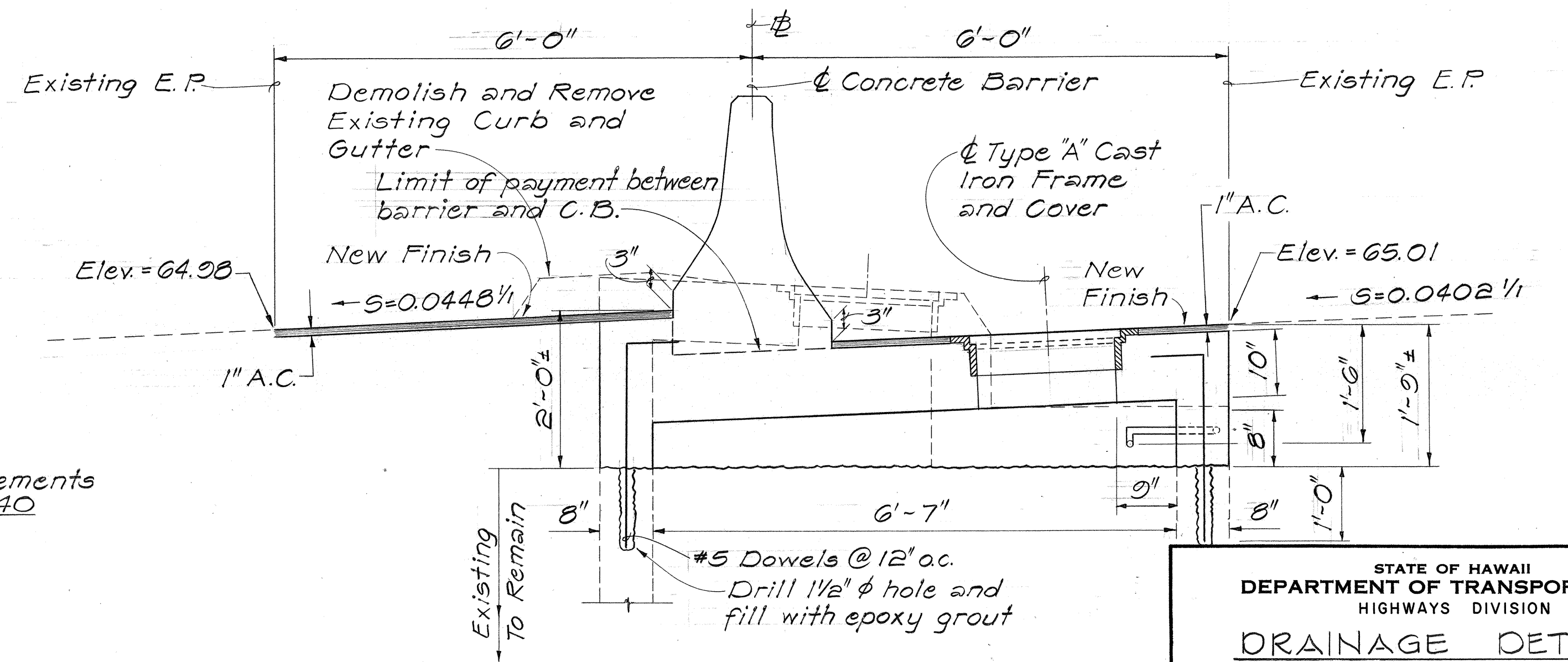
PLAN



SECTION A-A

DETAILS OF SDMH AT STA. 89+75

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



SECTION B-B

DETAILS OF SDMH AT STA. 63+35

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

NOTE:
For Details of Steel Reinforcements
See Section B-B of Sht. No. 40

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

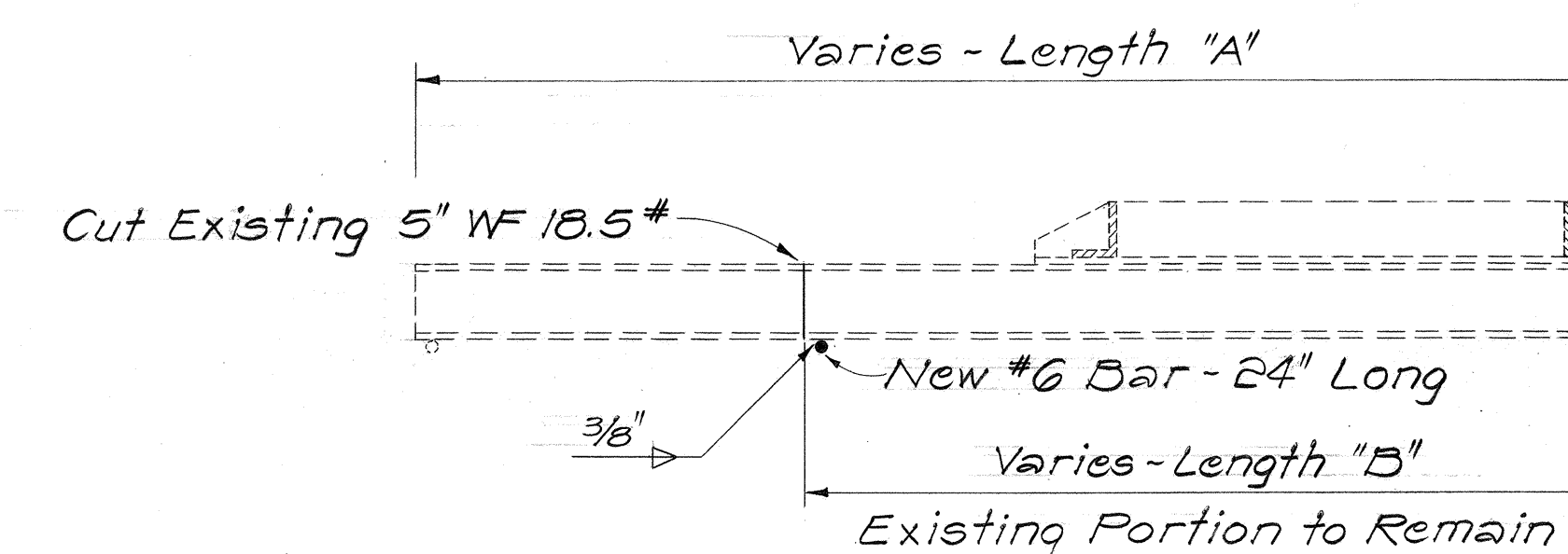
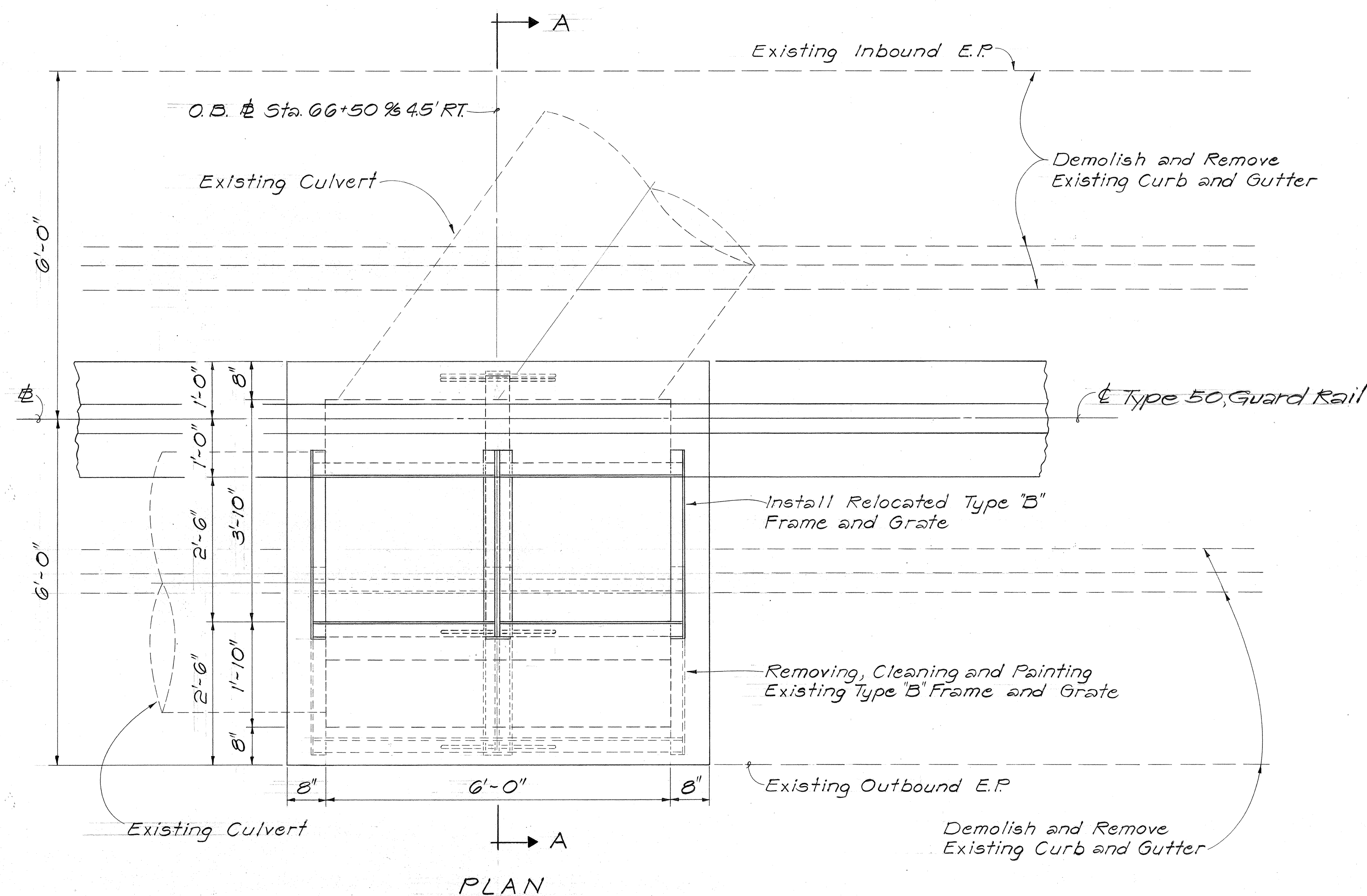
DRAINAGE DETAILS

INTERSTATE ROUTE H-1
SAFETY IMPROVEMENTS
KALO LANE TO AINAKOA AVENUE
F.A.I.P. NO. IR-HI-1(184)
Scale As Noted Date: Aug. 1981

SHEET NO. 9 OF 12 SHEETS

DATE	11/1/81
SURVEY PLOTTED BY	...
DRAWN BY	...
DESIGNED BY	...
CHECKED BY	...
ORIGINAL PLAN	...
NOTE BOOK	...
No.	...

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(184)	1984	39	114

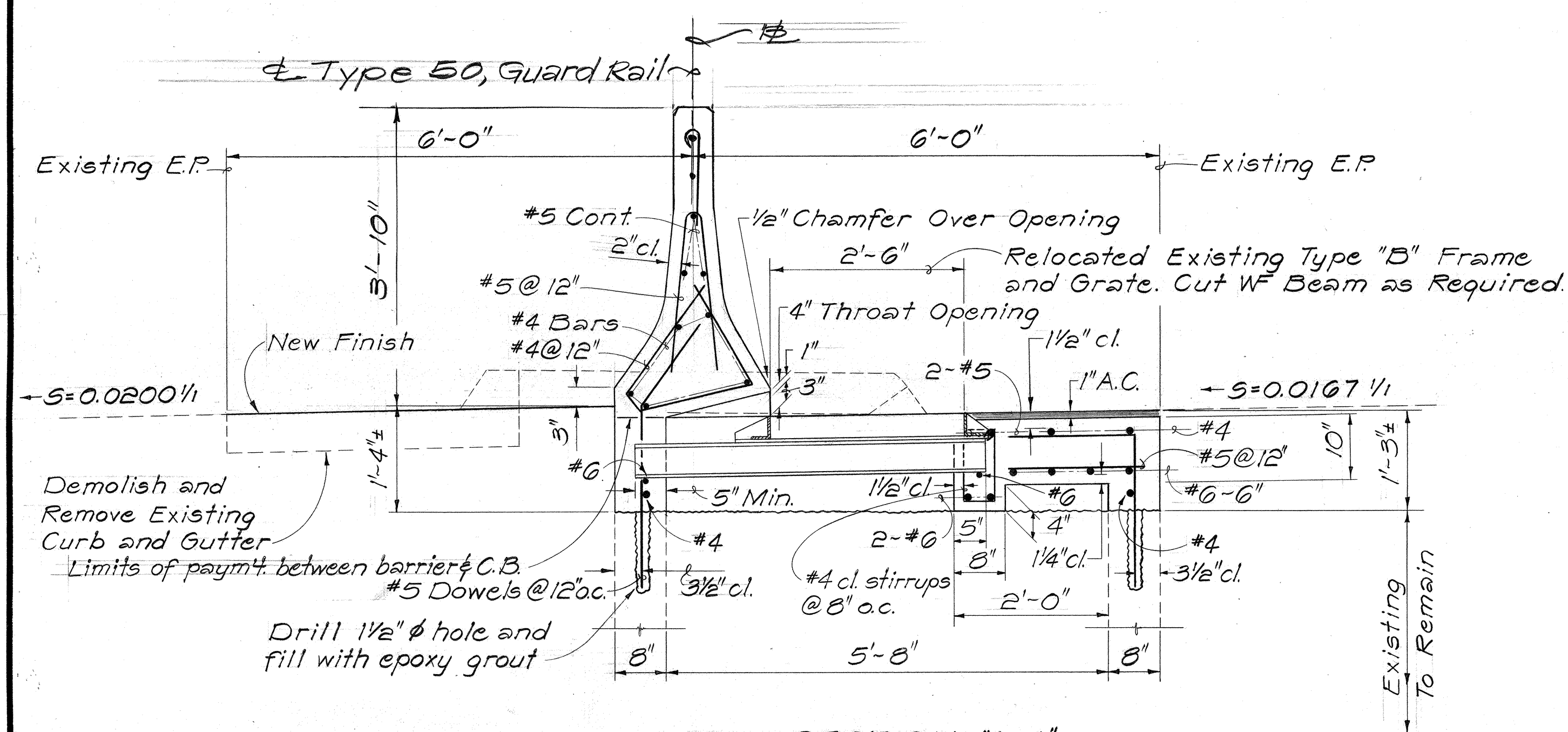


TYPICAL SECTION

STATION	LENGTH "A"	LENGTH "B"
Sta. 66+50	6'-8½"	4'-6½"
Sta. 54+25	5'-0"	3'-2½"
Sta. 62+40	5'-0"	3'-2½"

MODIFIED EXISTING TYPE "B" FRAME

Scale: 1" = 1'-0"



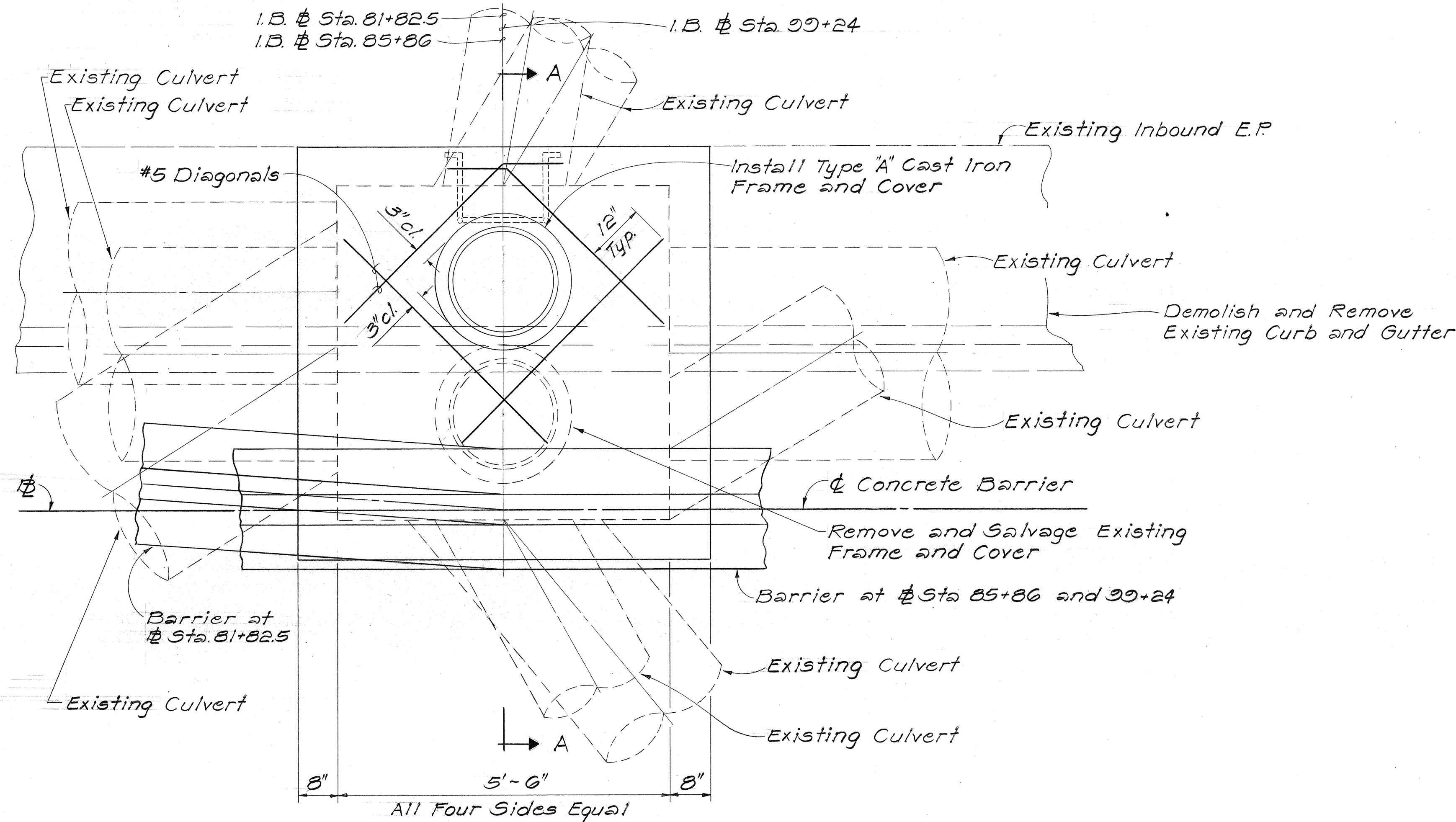
SECTION "A-A"

DETAILS OF C.B. AT ~~ST~~ STA. 66+50 % 45' RT.

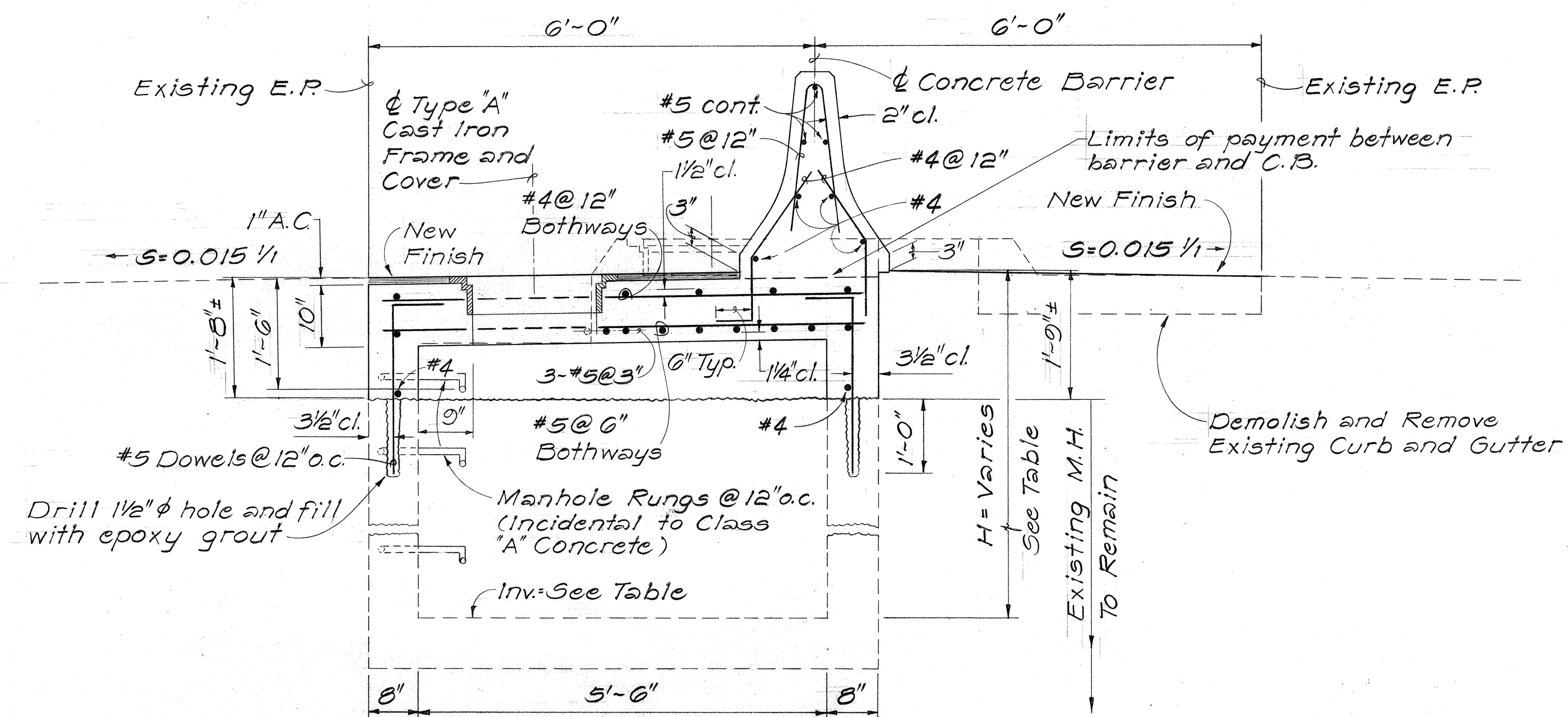
Scale: $3/4" = 1'-0"$

		STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION <u>DRAINAGE DETAILS</u> INTERSTATE ROUTE H-1 SAFETY IMPROVEMENTS KALO LANE TO AINAKOA AVENUE F.A.I.P. NO. 1R-HI-1(184)
7/17/84	Deleted Sta. 58+92 Modified Type B Grate from Table Data.	Scale As Noted Date: Aug. 1981 SHEET NO. 10 OF 12 SHEETS
DATE	REVISION	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1R-H1-1084	1984	40	114

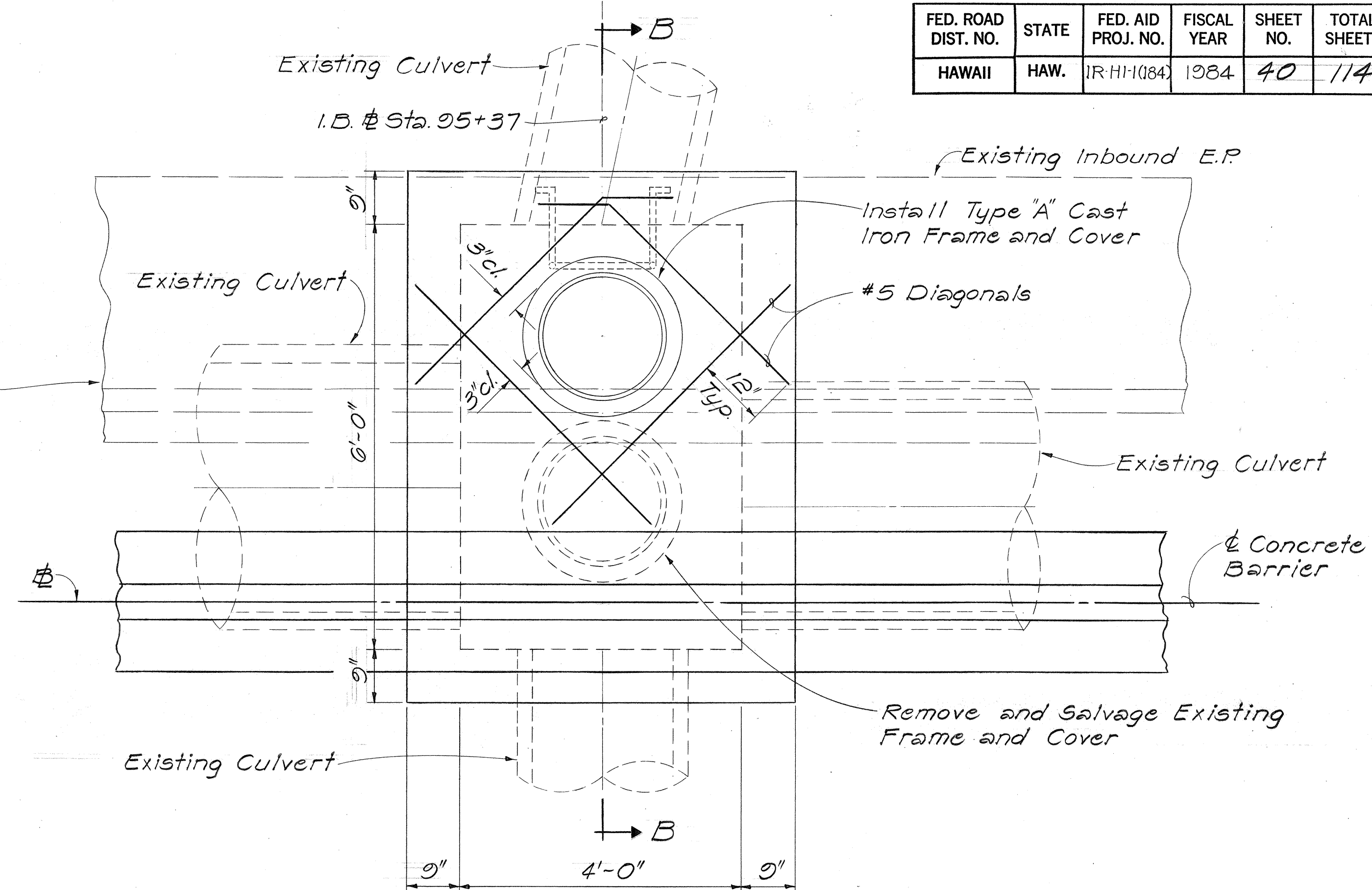


PLAN

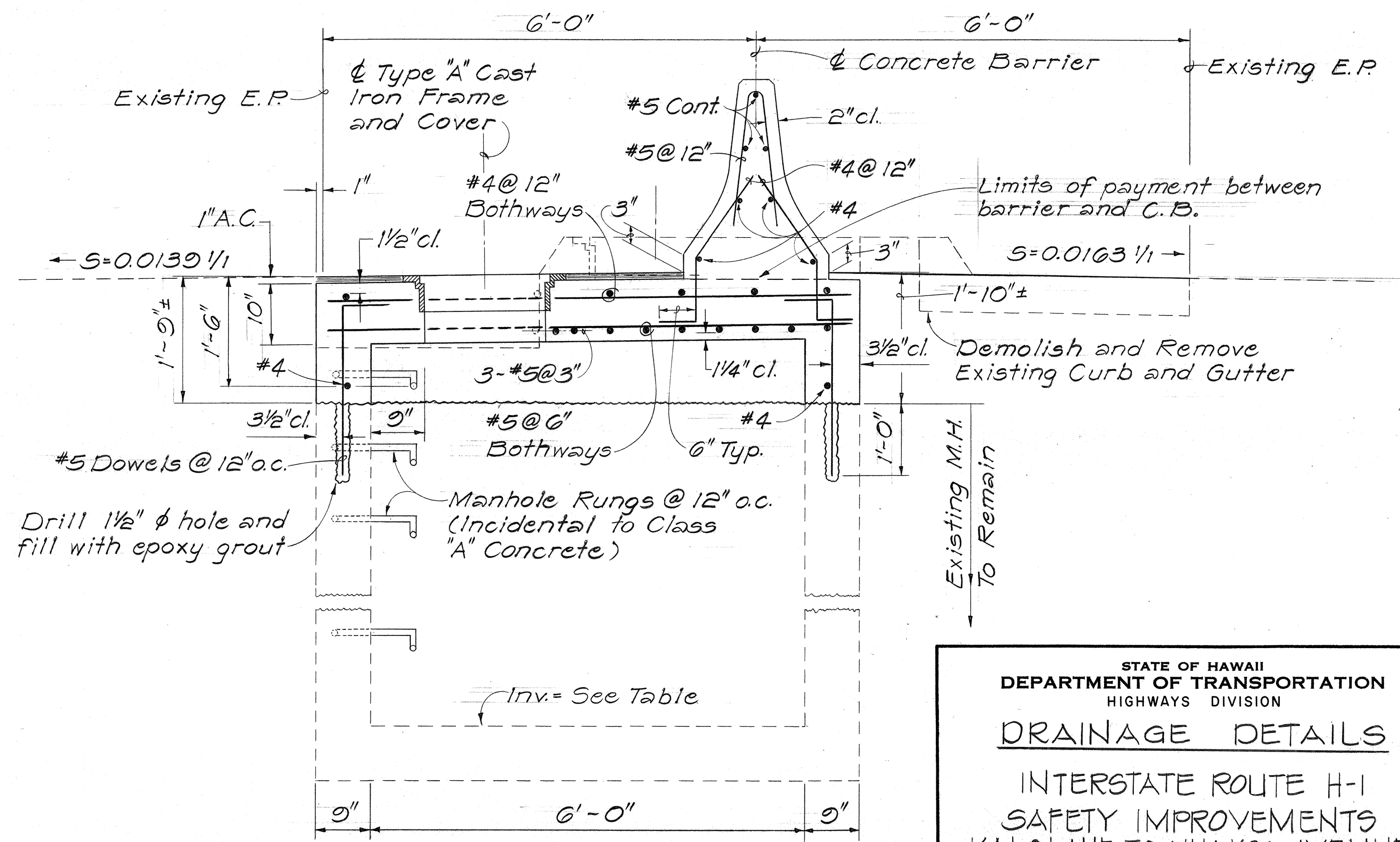


SECTION A-A

DETAILS OF SDMH AT STA. 81+82.5, 85+86 AND 99+24
Scale: 3/4" = 1'-0"



PLAN



SECTION B-B

DETAILS OF SDMH AT STA. 95+37
Scale: 3/4" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

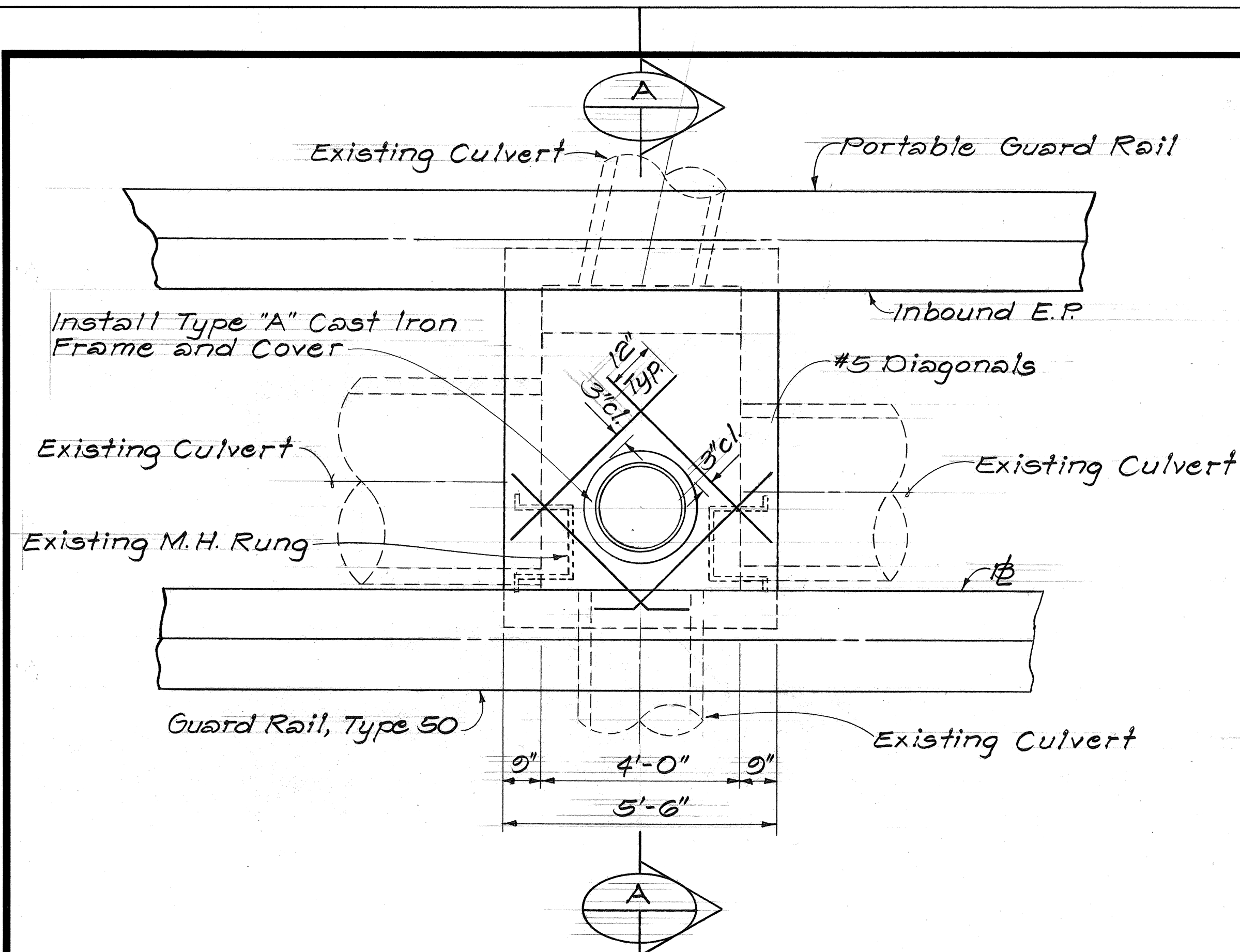
DRAINAGE DETAILS

INTERSTATE ROUTE H-1
SAFETY IMPROVEMENTS
KALOLANE TO AINAKOA AVENUE
F.A.I.P. NO. 1R-H1-1(184)

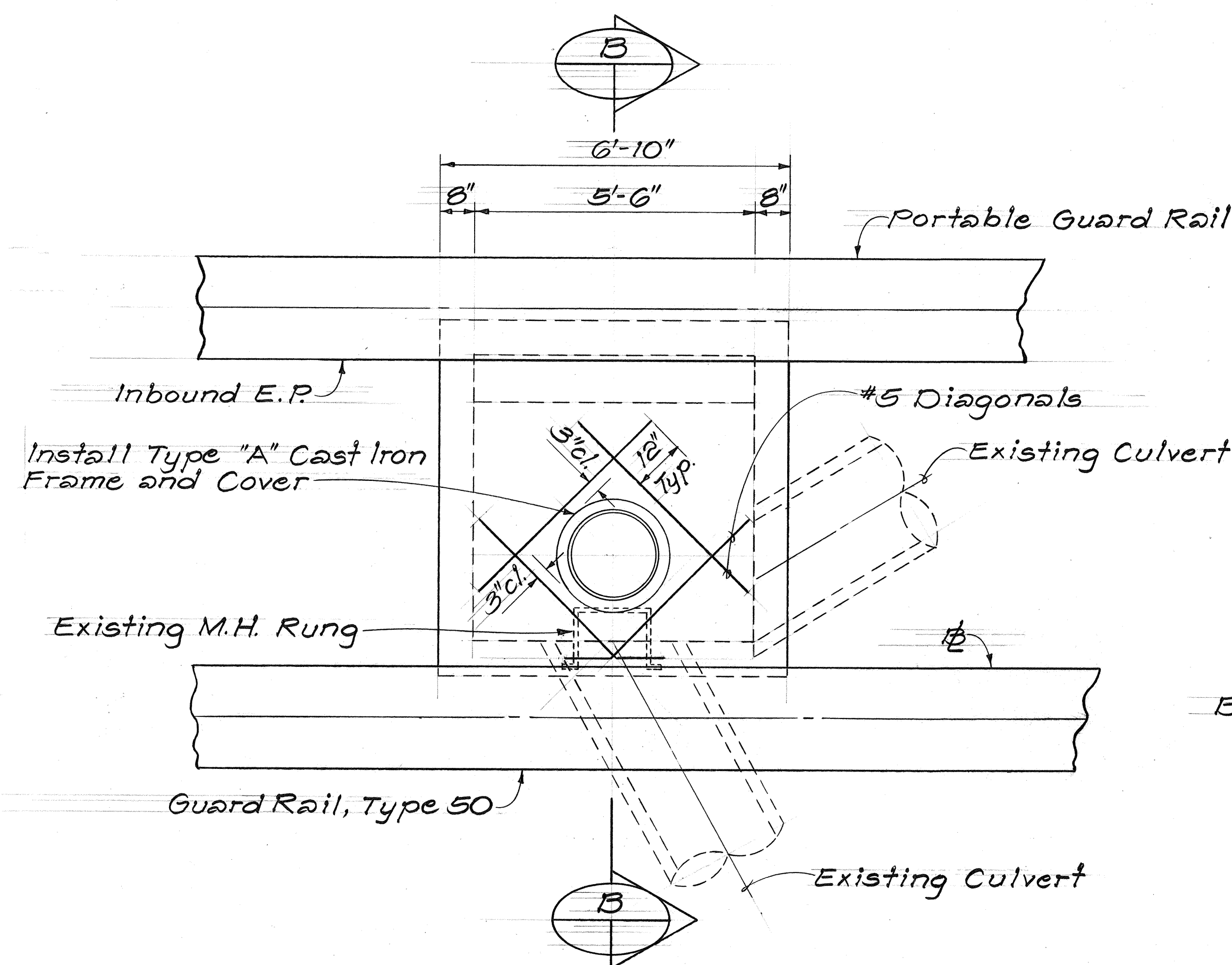
Scale As Noted Date: Aug. 1981

SHEET NO. 11 OF 12 SHEETS

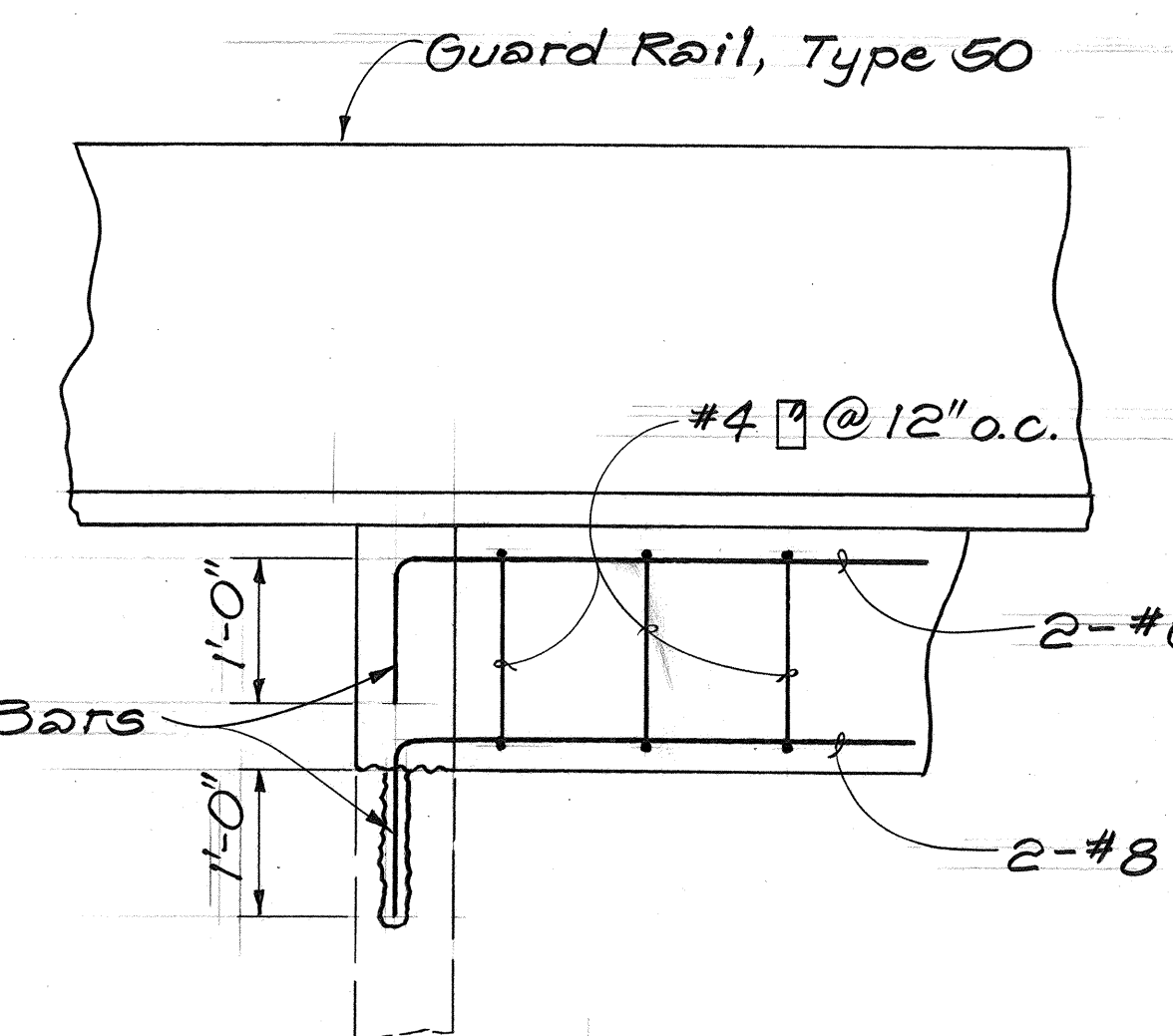
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(184)	1984	C.O.40S-1	114



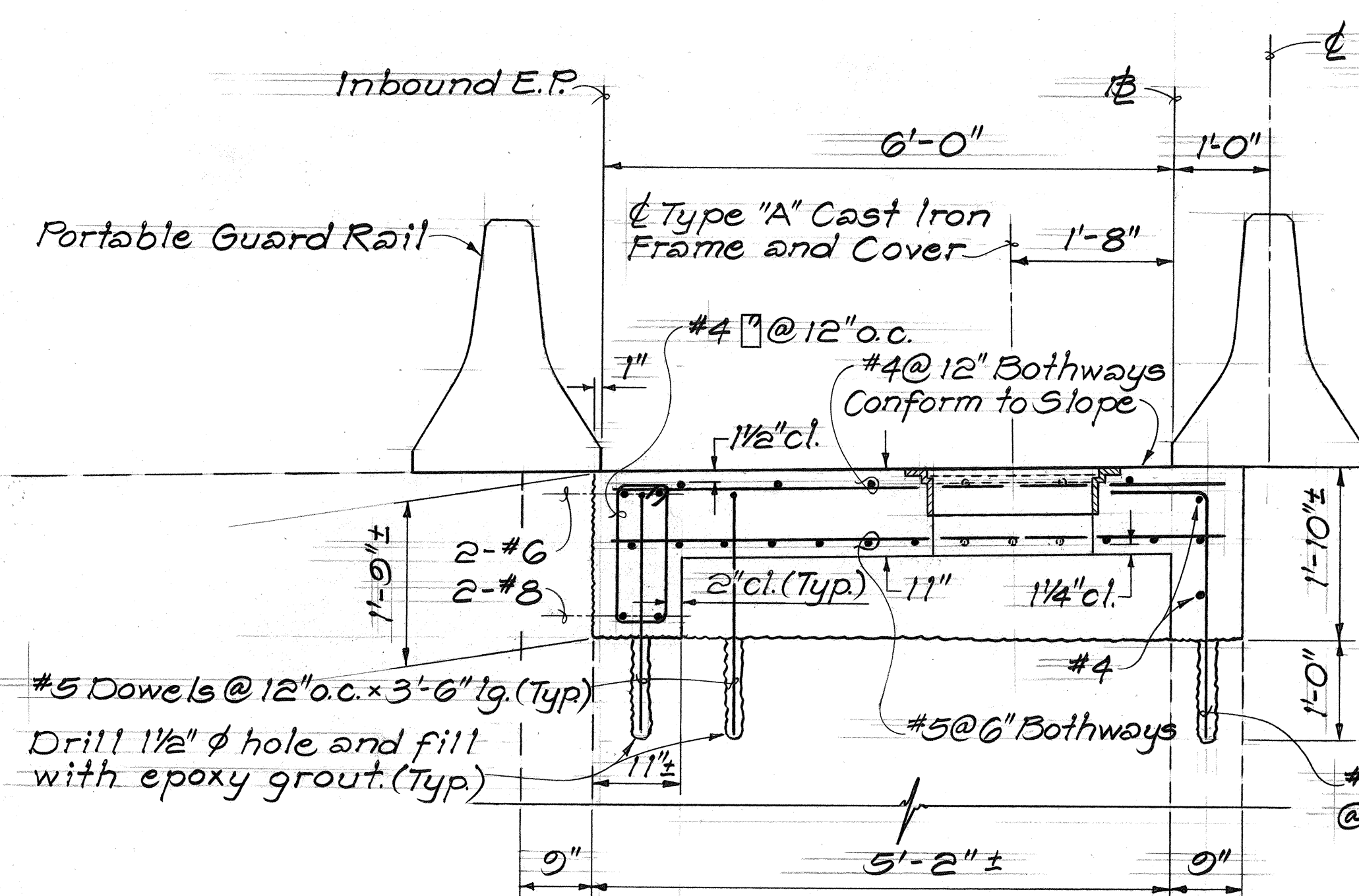
PLAN
Scale: 1/2" = 1'-0"



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

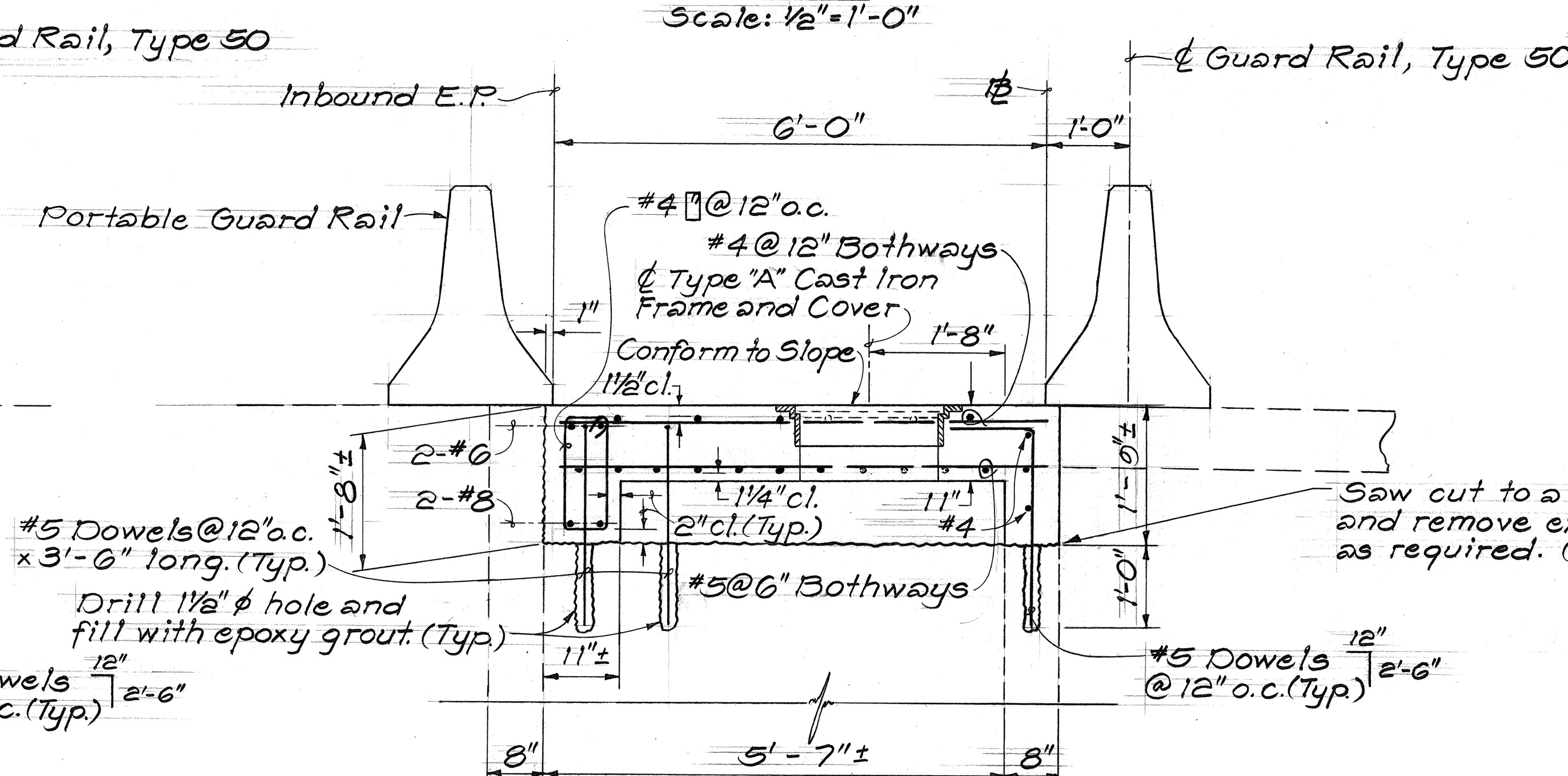


TYPICAL DETAIL OF EDGE BEAM
REINFORCING AT END WALLS OF C.B.
Scale: 3/4" = 1'-0"



SECTION A
Scale: 3/4" = 1'-0"

DETAILS OF S.D.M.H. AT
I.B. # STA. 95+37



SECTION B
Scale: 3/4" = 1'-0"

DETAILS OF S.D.M.H. AT
I.B. # STA. 99+24

6-22-84 Revised Catch Basin at
Sta. 95+37 & Sta. 99+24

DATE REVISION

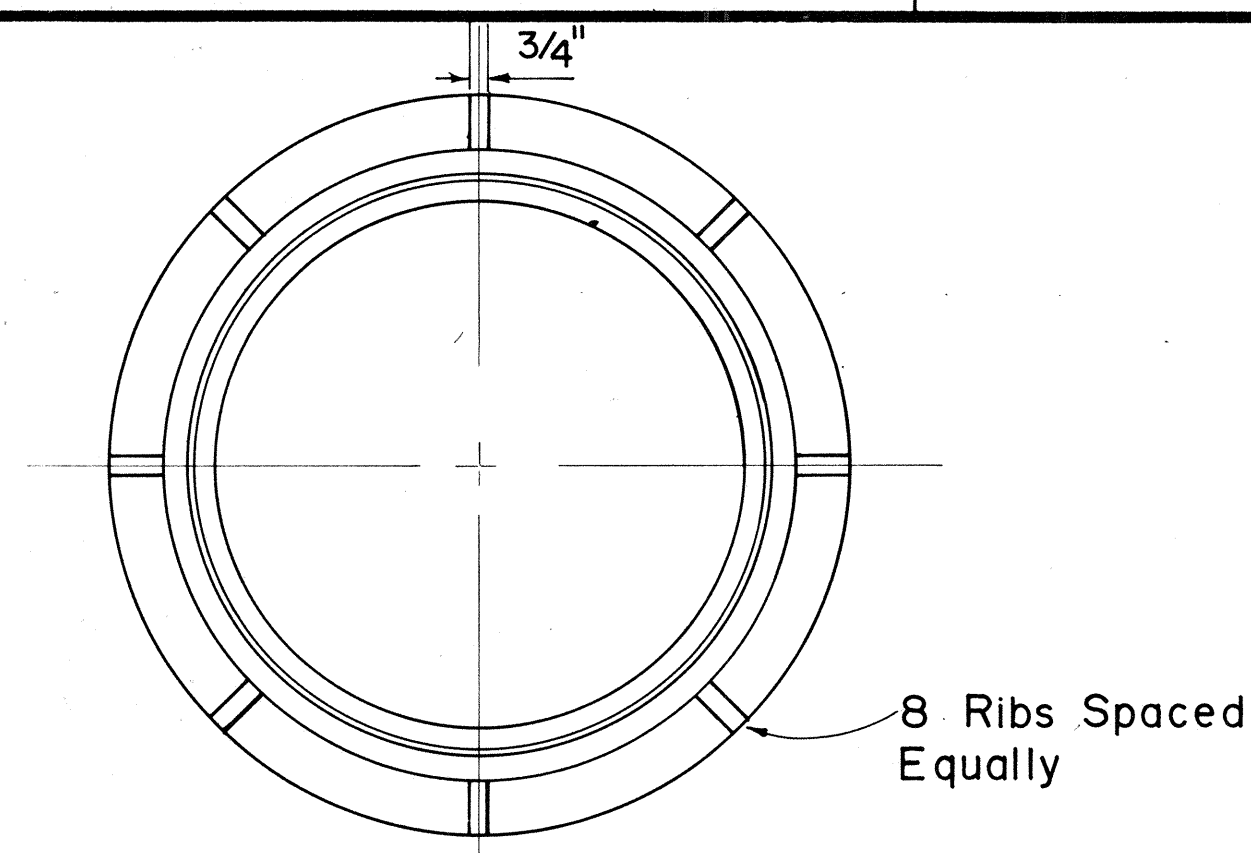
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
INTERSTATE ROUTE H-1
SAFETY IMPROVEMENTS
KALO LANE TO AINAKOA AVENUE
F.A.I.P. NO. IR-HI-1(184)
Scale: As Noted Date: June 1984

SHEET NO. OF SHEETS

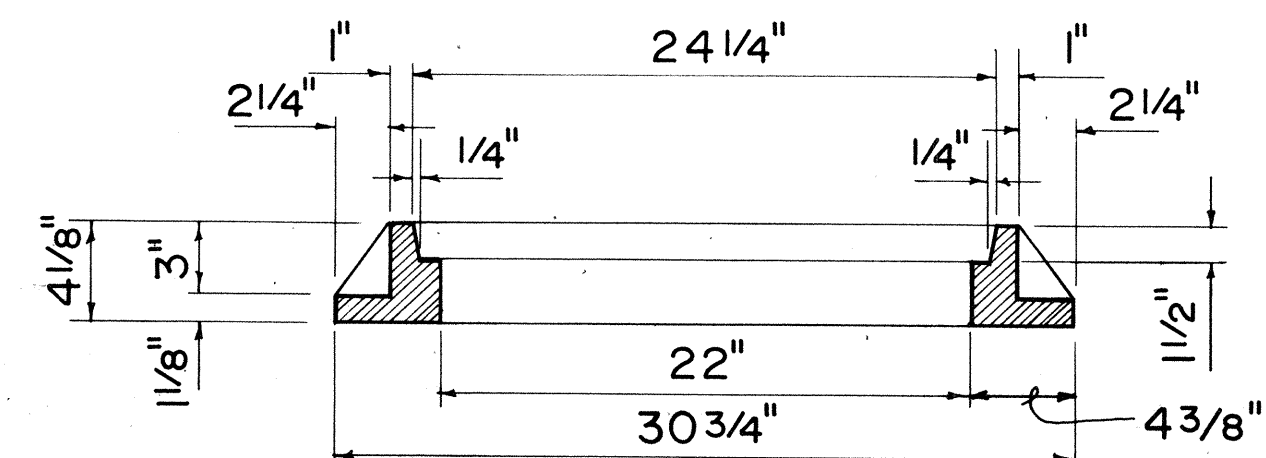
C.O.40S-1

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

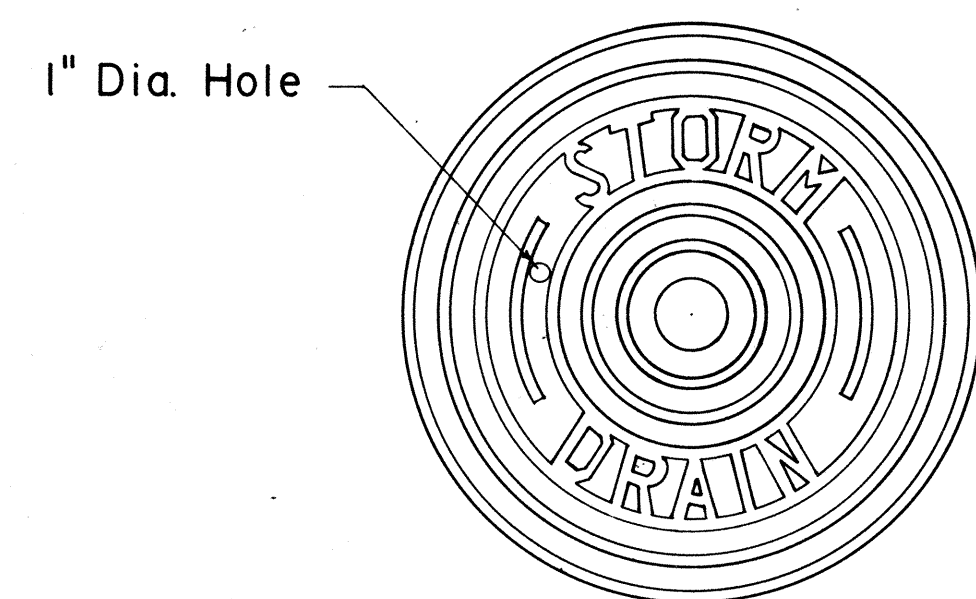
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HH(084)	1984	41	114



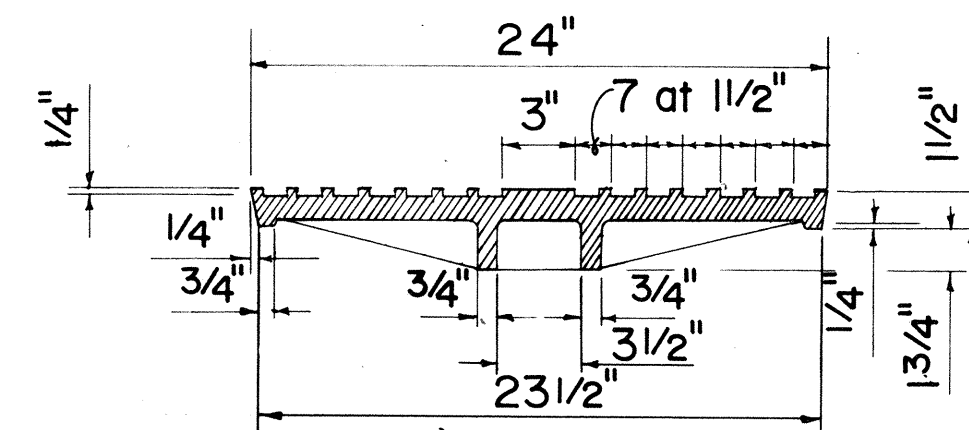
PLAN OF FRAME



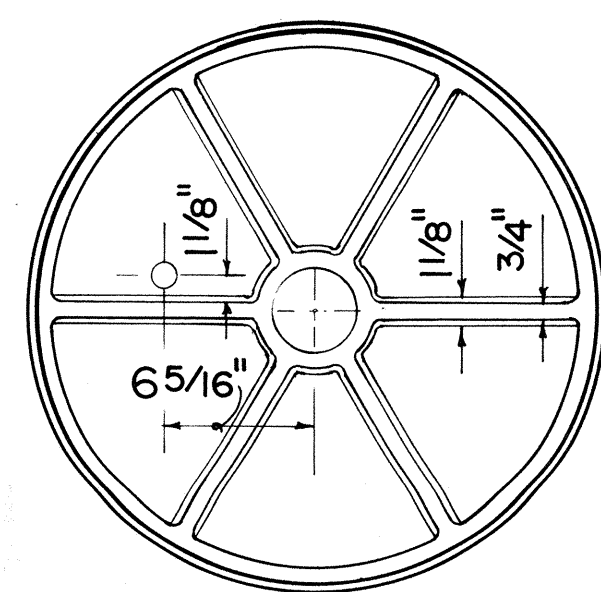
SECTION OF FRAME



TOP VIEW OF COVER

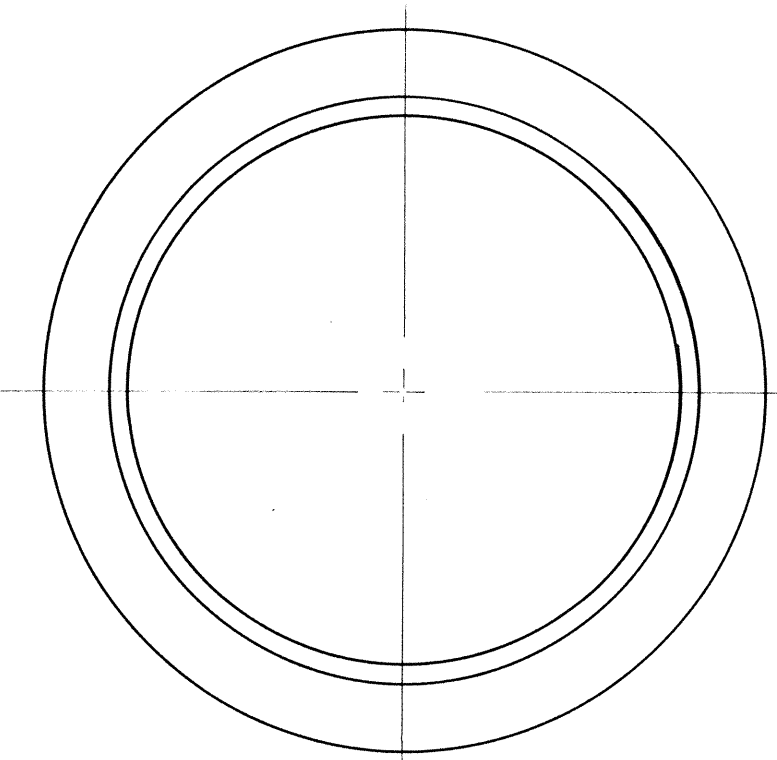


SECTION

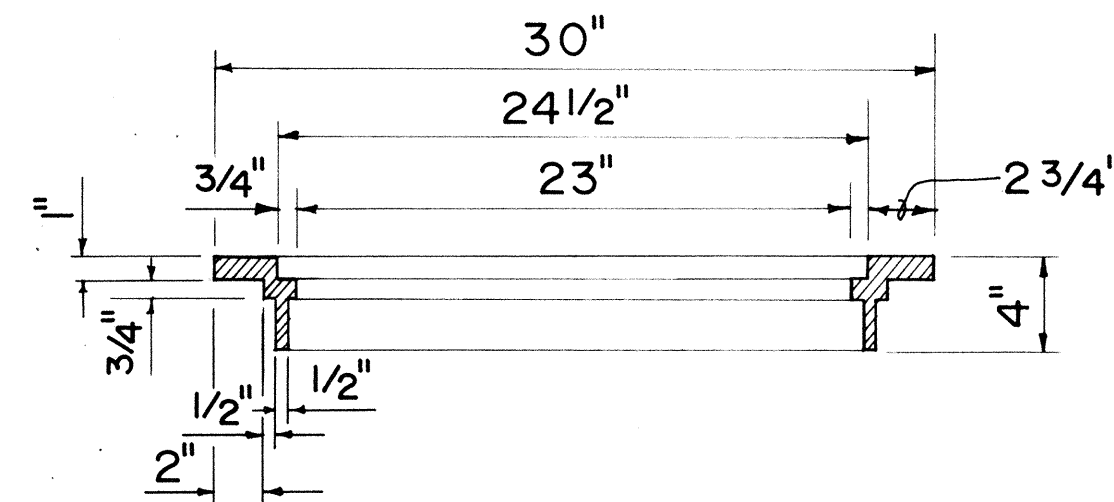


BOTTOM VIEW OF COVER

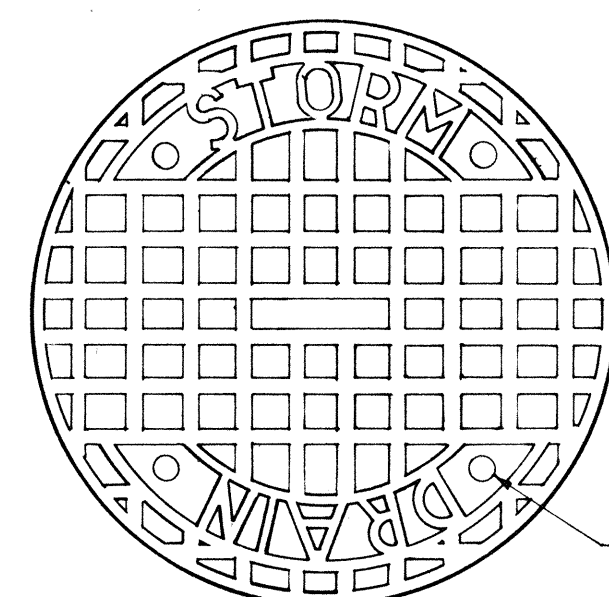
TYPE "P" CAST IRON
FRAME AND COVER



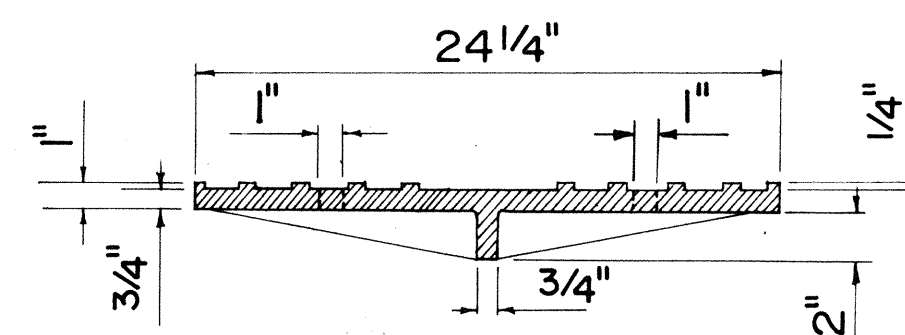
PLAN OF FRAME



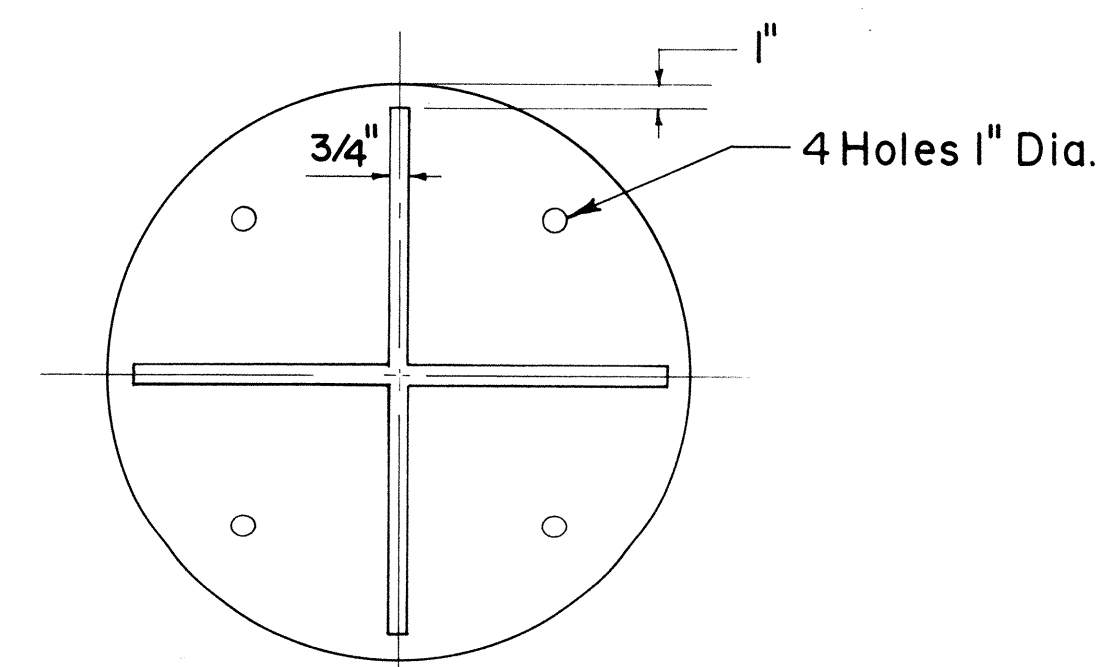
SECTION OF FRAME



TOP VIEW OF COVER

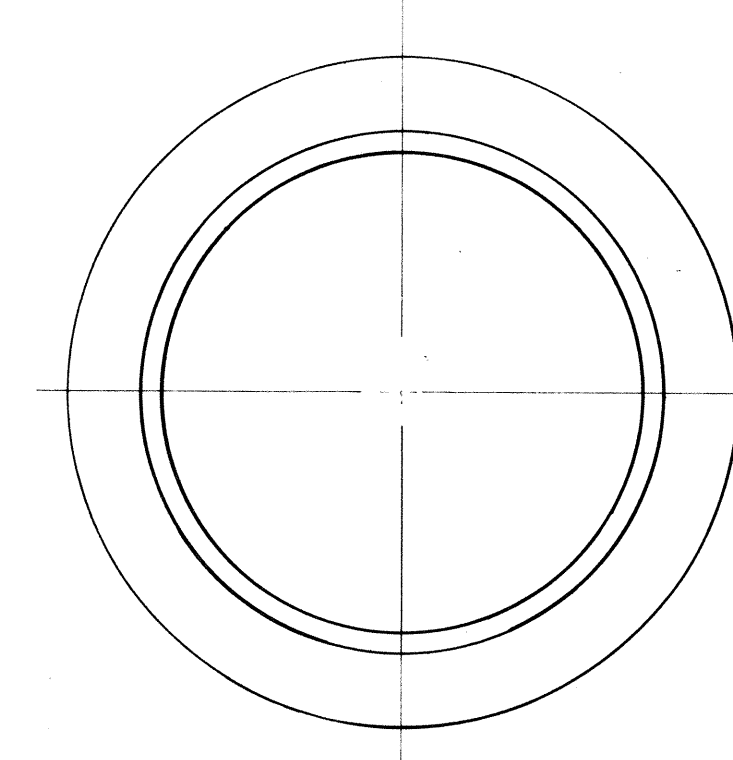


SECTION

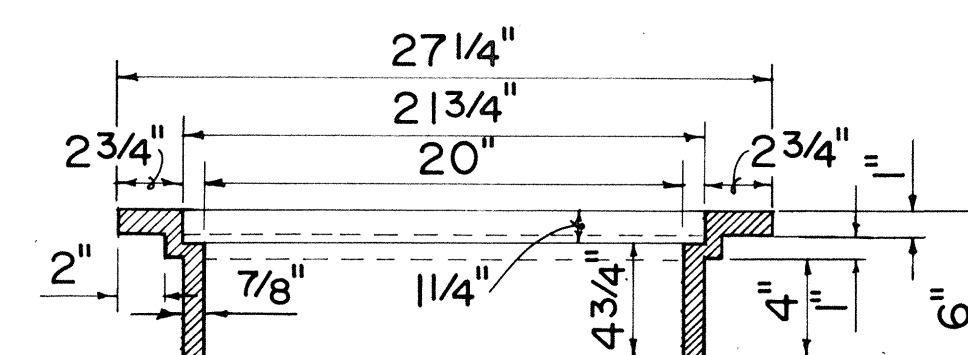


BOTTOM VIEW OF COVER

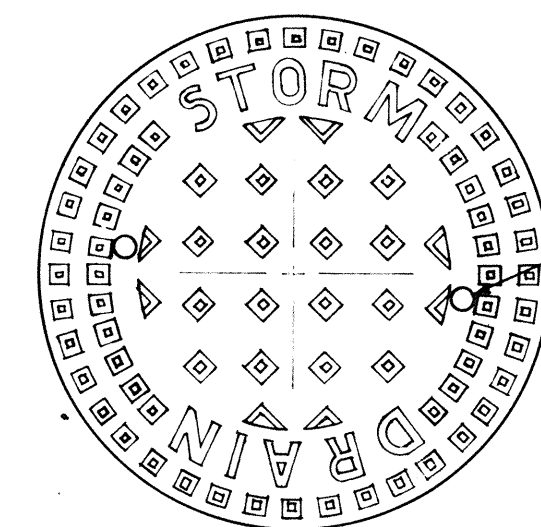
TYPE "B" CAST IRON
FRAME AND COVER



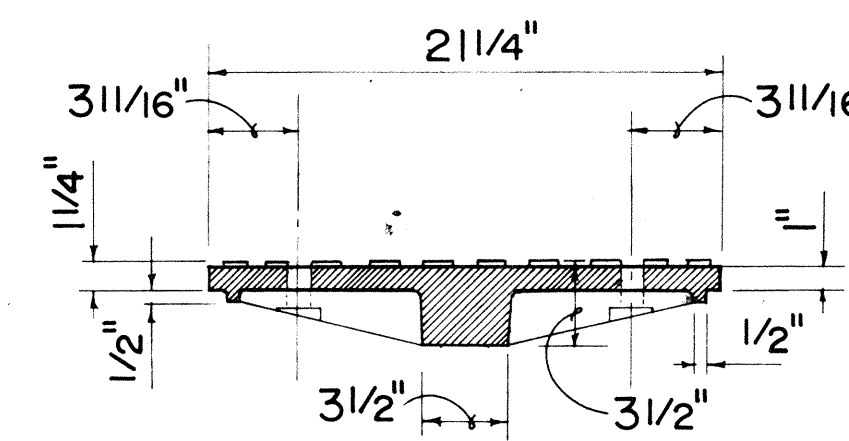
PLAN OF FRAME



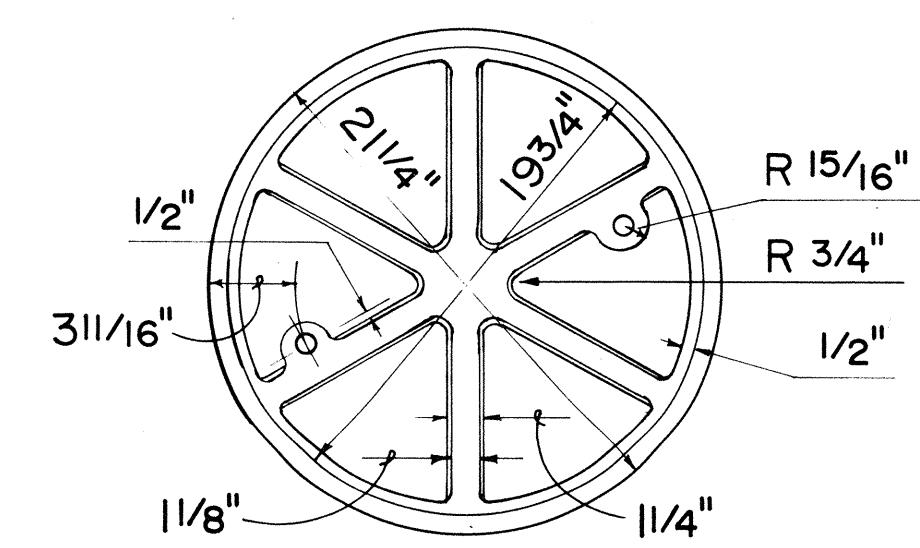
SECTION OF FRAME



TOP VIEW OF COVER

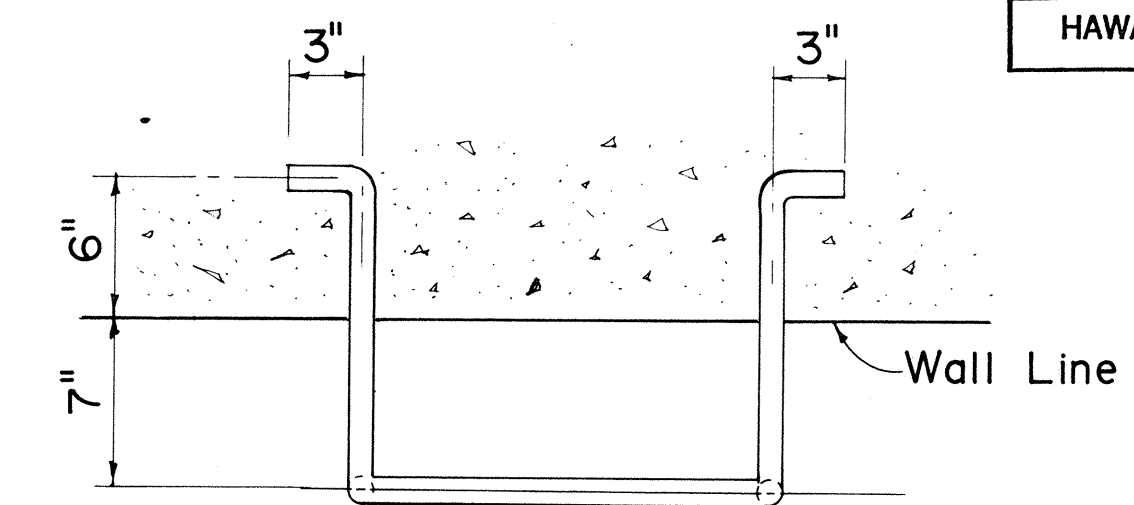


SECTION

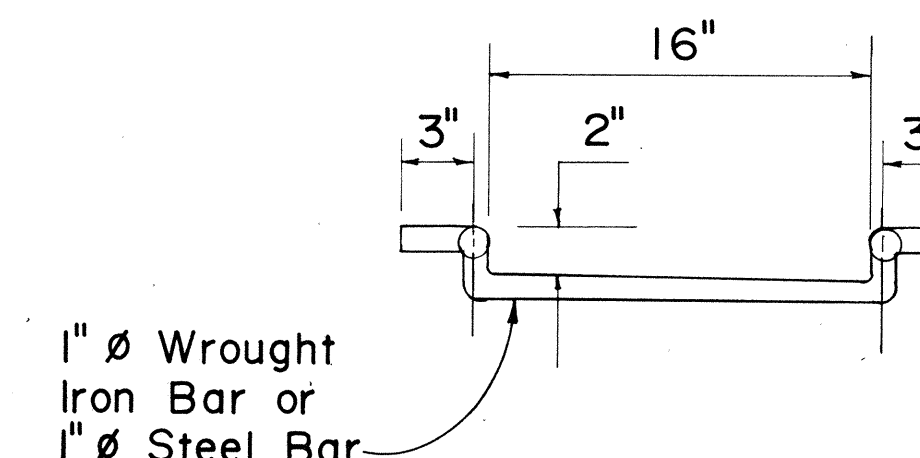


BOTTOM VIEW OF COVER

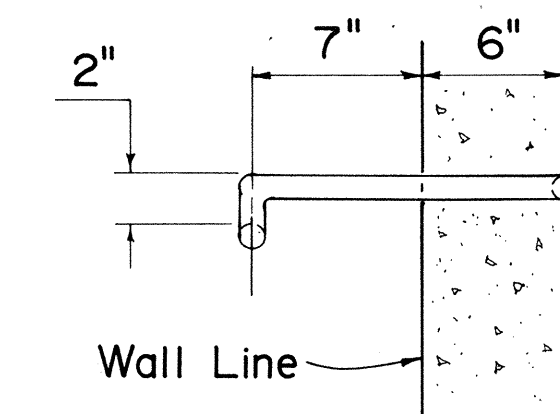
TYPE "A" CAST IRON
FRAME AND COVER



PLAN



FRONT VIEW



SIDE VIEW

MANHOLE RUNG

APPROVAL RECOMMENDED:
P. Takano
 HYDRAULIC DESIGN ENGINEER 6-19-79 DATE
 APPROVED:
Herbert Zakeishi
 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

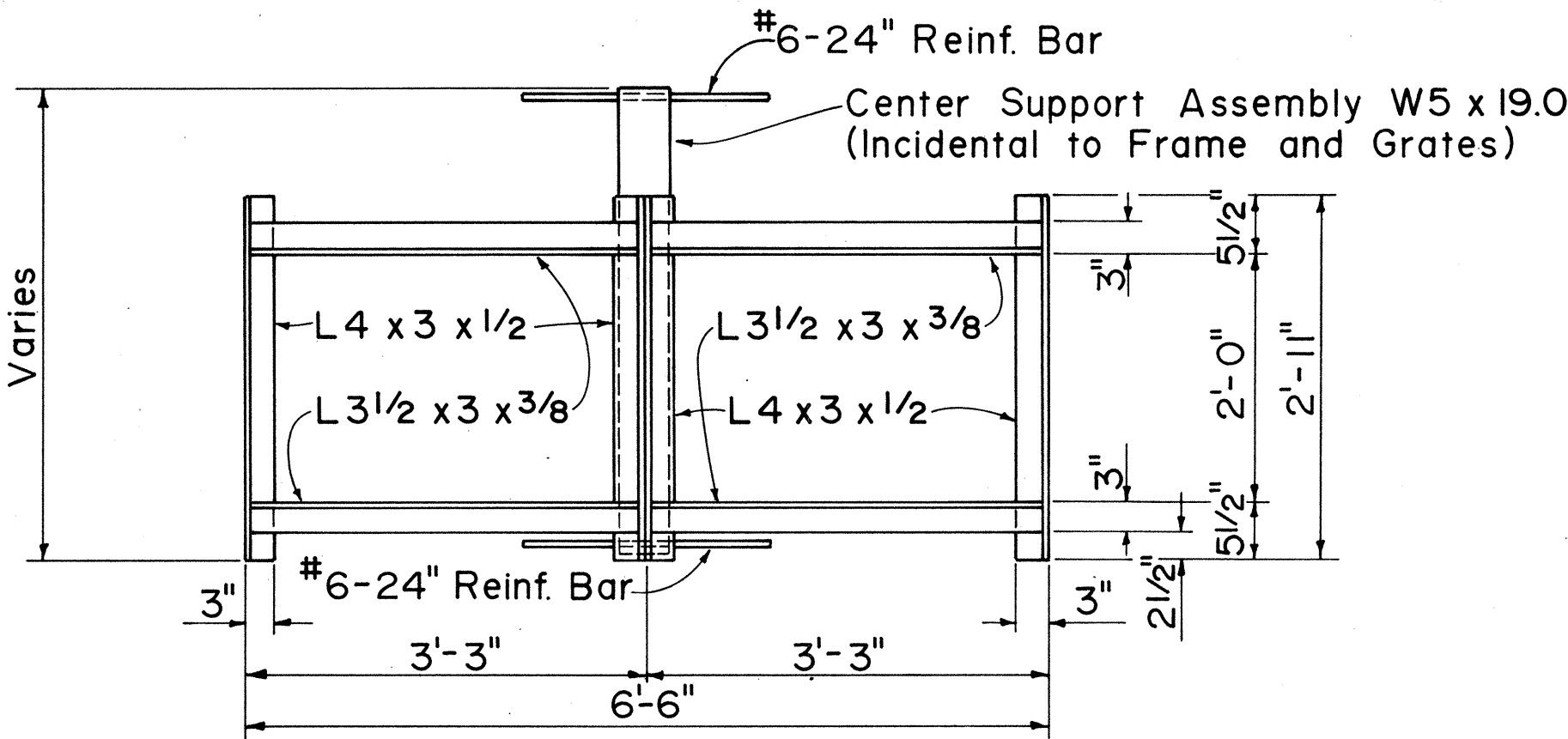
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
STANDARD DETAILS CATCH BASIN AND MANHOLE CASTINGS
Not To Scale Date: Dec. 1977

SHEET NO. 12 OF 12 SHEETS DH 6

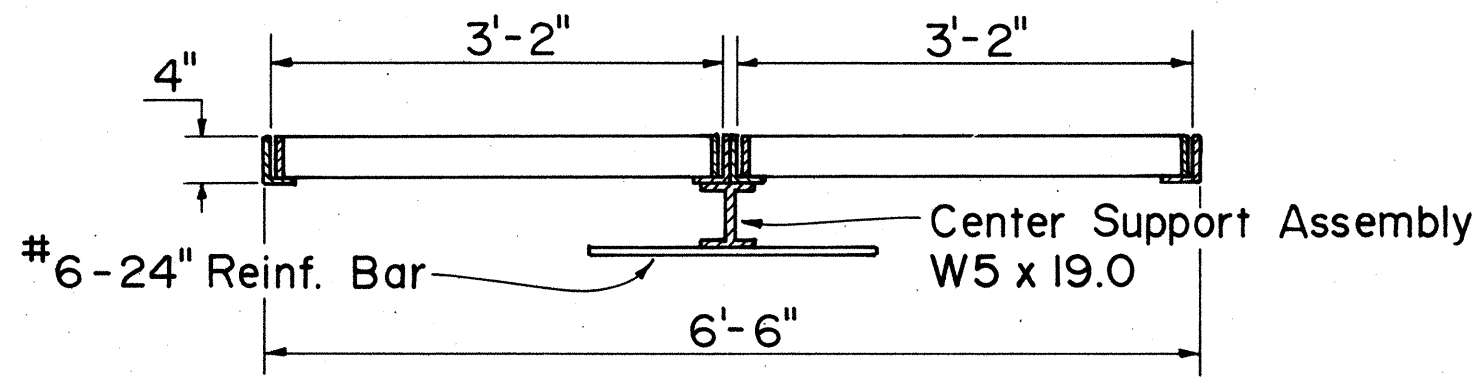
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-H1-1(84)	1984	41	114

GENERAL NOTES

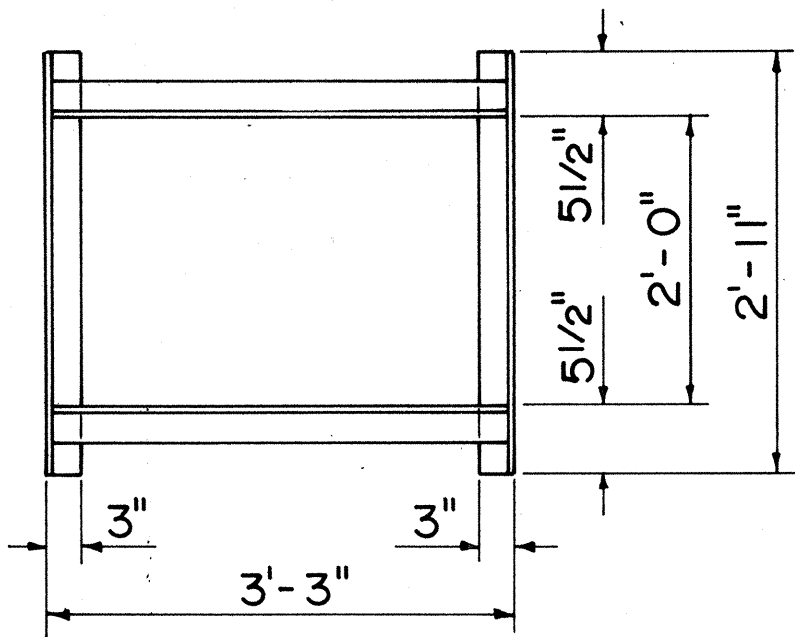
- Contractor has the option of using cast malleable iron, cast steel, welded, or bolted grate.
- All welds 3/8" unless otherwise noted.
- Type A-9 - Use in locations off the roadbed on all types of highways.
- Type A-12 - Use within the roadbed on all types of highways.



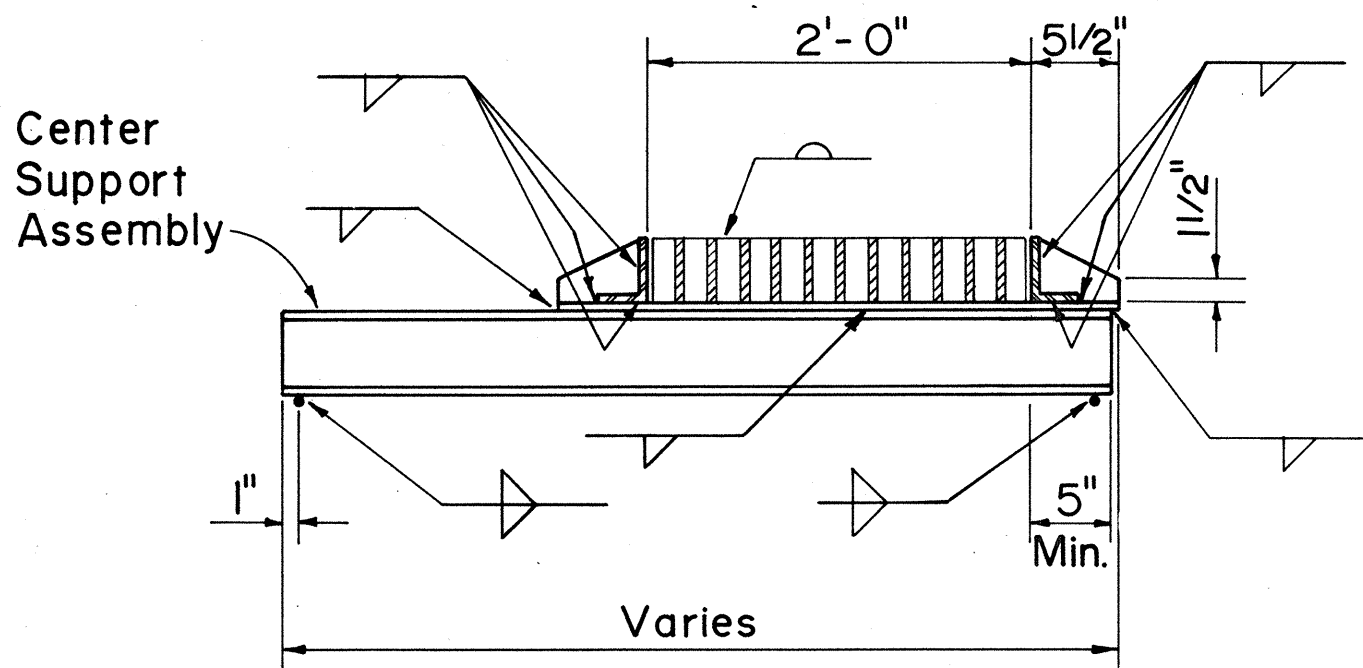
PLAN
(Two or More Grates)



LONGITUDINAL SECTION
(Thru Frame & Grate)

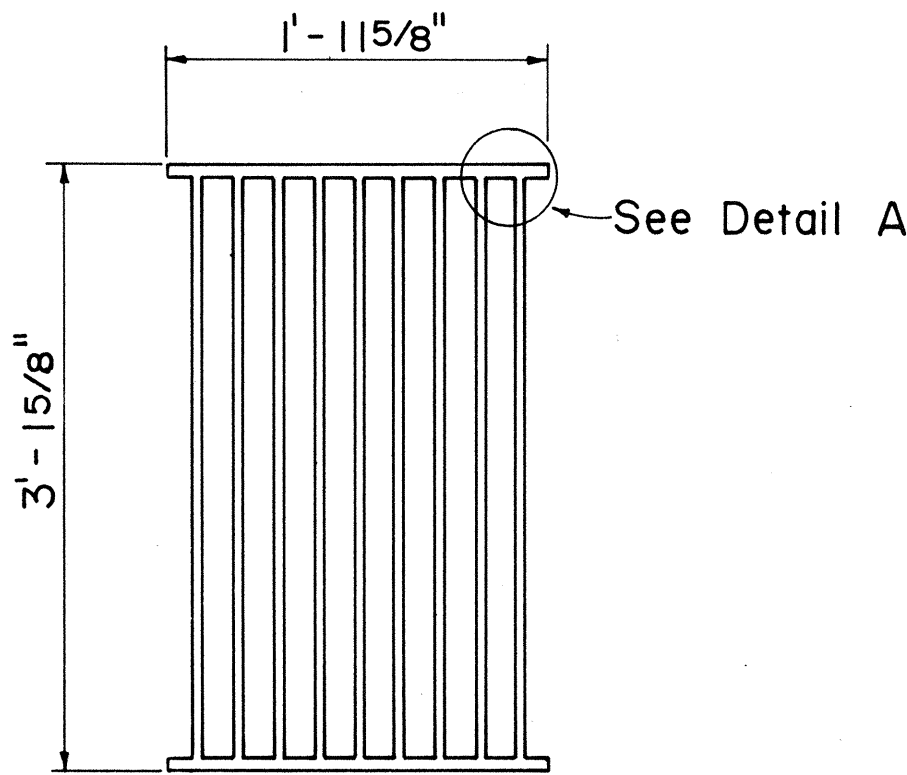


PLAN
(Single Grate)

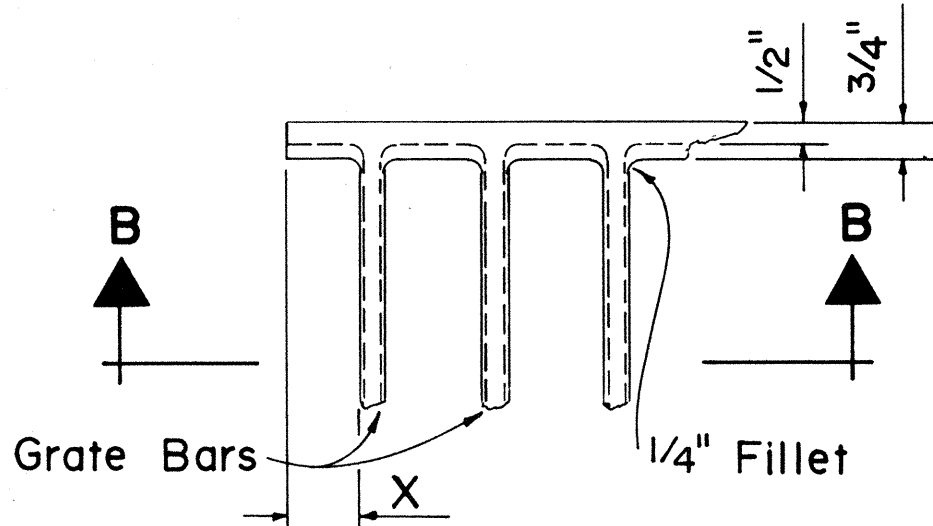


CROSS SECTION
(Thru Frame & Grate)

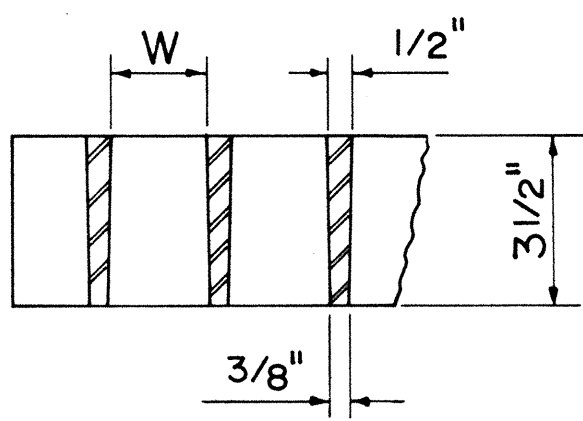
FRAME DETAILS



PLAN

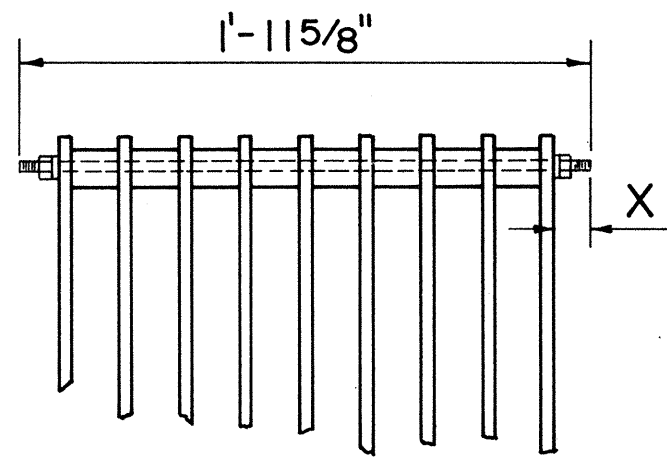


DETAIL A

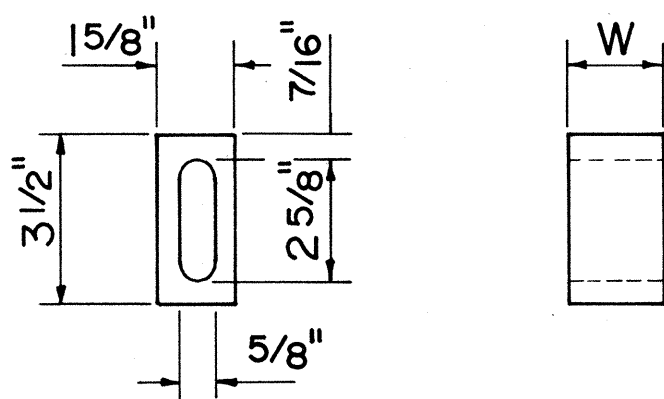


SECTION B-B

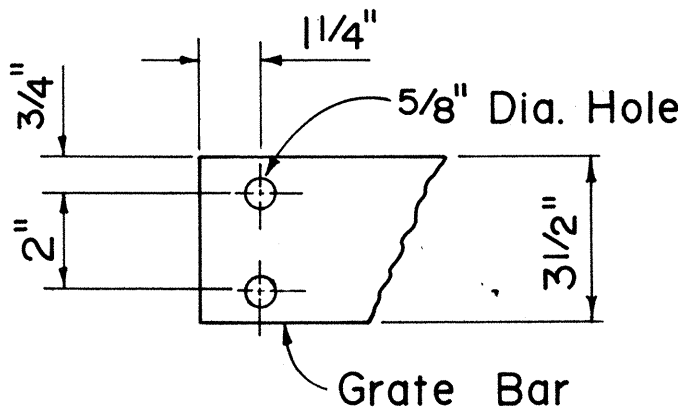
ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL GRATE



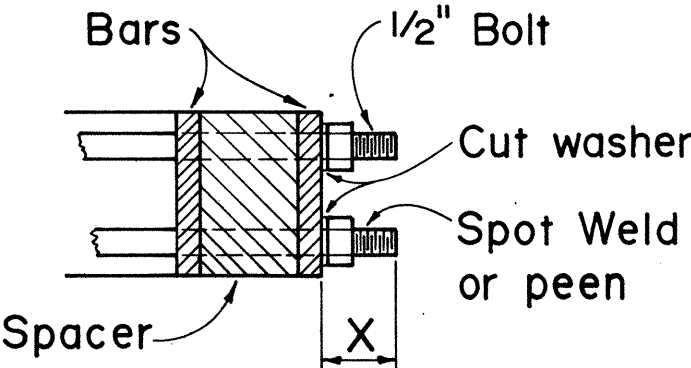
BOLTED END BLOCK



BAR SPACER

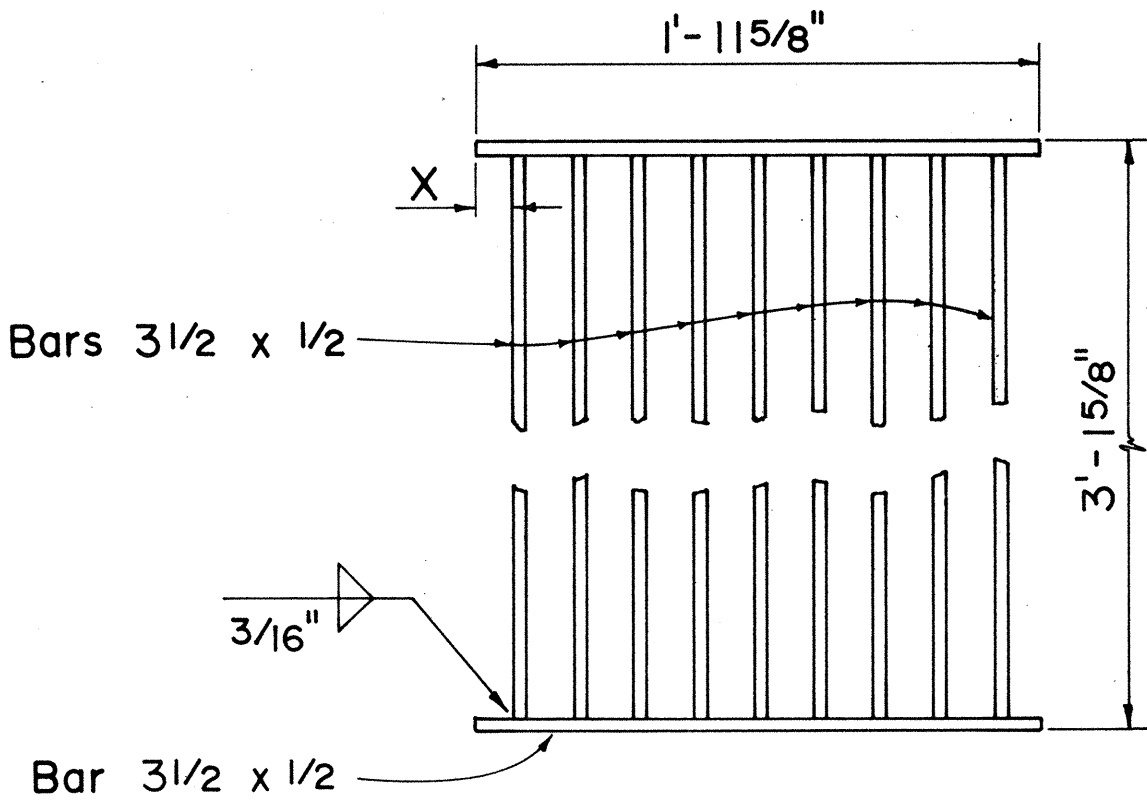


END OF BAR

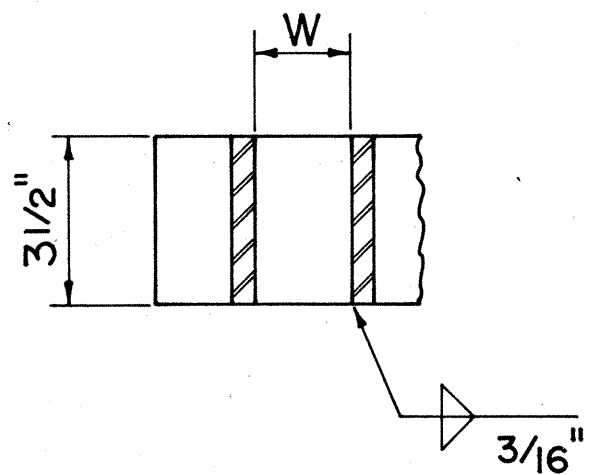


BOLTING DETAIL

ALTERNATIVE BOLTED GRATE



PLAN



SECTION

ALTERNATIVE WELDED GRATE

GRATE BAR SPACING TABLE			
TYPE	NO. BARS	CLEAR BAR SPACING-W	X
A-9	9	2"	1 9/16"
A-12	12	1 3/8"	1 1/4"

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

APPROVAL RECOMMENDED:
P. J. J. J.
 HYDRAULIC DESIGN ENGINEER 6-19-79
 DATE

APPROVED:
Herbert Z. Z. Z.
 ASSISTANT CHIEF, ENGINEERING 6-22-79
 DATE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
STANDARD DETAILS
TYPE A-9 AND A-12 FRAMES AND GRATES
Not To Scale Date: Dec. 1977

SHEET No. 12 A OF 12, SHEETS DH 7

C.O.41S-1