

DRAINAGE SUMMARY

SAFETY IMPROVEMENTS,
PROJ.: KALIHI STREET TO PALI HIGHWAY PROJ. NO.: I-HI-I(112)-19

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-I(112)-19	1973	51	176

STRUCTURES				ESTIMATED QUANTITIES														REMARKS																
NUMBER	TYPE	STATION	ITEM NO.	206.01	206.80	503.001	602.101	603.1902	603.2066	604.201	604.236	604.237	604.238	604.305	605.006	605.012	605.300																	
			DETAIL SHEET	Structure Excavation other than at Bridges	Filter Material	Concrete other than in Bridges	Reinforcing Steel other than in Bridges	Remove, Clean and Relay Existing 24" Pipe	24-Inch Corrugated Metal Pipe, Sheet Thickness, 0.079 inch	Type "A" Cast Iron Frame and Cover	Type "S" Steel Frame and Grate	Type 6.11-20-1-4 Steel Frame and Grate	Modified Type "S" Steel Frame and Grates	Removing, Cleaning and Returning type B Cast Iron Frame and Cover	6-Inch Perforated Underdrain Pipe	12-Inch Perforated Underdrain Pipe	Adjusting Underdrain Cleanout																	
			UNIT USED	C.Y.	C.Y.	C.Y.	Lb.	L.F.	L.F.	Ea.	Ea.	Ea.	Ea.	Ea.	L.F.	L.F.	Ea.																	
1	C.B. #63 Type D	Sta. 50 + 50 W.B.	GH	1.0		1.6	330				2			1				Install 2 Grates																
2	C.B. #68 Type C	Sta. 52 + 75 E.B.	4H, 5H	5.7		2.8	400				3							" 3 "																
3	C.B. #70 Type D	Sta. 54 + 75 E.B.	4H, 5H	5.7		2.8	400				3							" 3 "																
4	C.B. #72 Type C	Ramp "K-G" Sta. 9 + 50	GH			1.0	177				2			1				" 2 "																
5	C.B. Type D	Sta. 56 + 04 W.B.	7H			1.0	158			1				1				Adjust Catch Basin																
6	C.B. #74 Type C	Ramp "K-E" Sta. 15 + 55	8H	6.9		3.8	122		4			2		1				Construct new Drop Intake w/2 Grates - Demolish Catch Basin																
7	C.B. #2-F Type C	Ramp "K-E" Sta. 18 + 16	9H	8.4		4.3	122		4			2		1				Construct new D.I. w/2 Grates - Demolish C.B. - Existing sprinkler line																
8	C.B. #4-F Type C	Sta. 62 + 00 E.B.	10H	2.6		2.2	444					2		1				Install 2 Grates - Existing sprinkler line																
9	C.B. #6-F Type C	Sta. 63 + 75 E.B.	10H	1.1		1.7	396					2		1				" " " " " "																
10	C.B. #11-F Type C	Sta. 67 + 25 E.B.	9H	10.4		4.5	131		4			2		1				Construct new D.I. w/2 Grates - Demolish C.B. - Existing sprinkler line																
11	C.B. #15-F Type C	Sta. 70 + 75 E.B.	8H	8.8		3.7	122		4			2		1				" " " " " "																
12	C.B. #14-F Type B	Sta. 70 + 75 W.B.	11H	4.0		3.7	122					2		1				" " " " " "																
13	C.B. #17-F Type C	Sta. 73 + 25 E.B.	11H	9.4		3.8	122					2		1				" " " " " "																
14	C.B. #18-F Type B	Ramp "I" Sta. 2 + 10	12H	3.9		4.0	194					2		1				" " " " " "																
15	C.B. #20-F Type D	Ramp "I" Sta. 0 + 45	13H	4.9		4.2	439				2			1				Install 2 Grates - Existing sprinkler line																
16	C.B. #21-F Type D	Sta. 75 + 36 E.B.												1				Demolish C.B. and plug existing culvert - Existing sprinkler line																
17	C.B. #24-F Type D	Sta. 77 + 00 W.B.	13H	4.9		4.2	439				2			1				Install 2 Grates - Existing sprinkler line																
18	C.B. #28-F Type D	Sta. 78 + 80 W.B.	13H	4.9		4.2	439				2			1				" " " " " "																
19	C.B. #32-F Type A	Sta. 81 + 75 W.B.	14H	8.4		4.4	127		6		2	2		1				Construct new D.I. w/4 Grates - Demolish C.B. - Existing sprinkler line																
20	C.B. #30-F Type D	Ramp "A" Sta. 1 + 50	15H	1.8		1.8	366				2			1				Install 2 Grates - Existing sprinkler line																
21	C.B. #37-F Type C	Sta. 85 + 00 W.B.	16H	4.5		2.2	245				2							" " " " " " - Reconstruct Conc. Curb & Gutter																
22	New SDMH Type A-1	Sta. 85 + 90.20 W.B.	17H, 40H	7.7		2.7	112			1								Construct new SDMH																
23	New Drop Intake	Sta. 86 + 15 W.B.	17H, 39H	12.0		4.0	122					2						New Drop Intake w/2 Grates																
24	C.B. #42-F Type C	Sta. 89 + 00 W.B.	12H	3.0		3.5	122		2			2		1				Construct new D.I. w/2 Grates - Demolish C.B. - Existing sprinkler line																
25	C.B. #50-F Type C	Sta. 101 + 00 E.B.	18H	8.2		3.7	122		6			2		1				" " " " " "																
26	C.B. #52-F Type C	Sta. 106 + 00 E.B.	19H	1.0		2.0	344				2			1				Install 2 Grates - Existing sprinkler line																
27	C.B. #55-F Type C	Sta. 108 + 25 E.B.	18H	2.6		1.5	296				2			1				" " " " " "																
Sub-Total - This Sheet				131.8		79.3	6413		30	2	26	26		22																				
SHEET 11 OF 41 H SHEETS																																		

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

DRAINAGE SUMMARY

SAFETY IMPROVEMENTS,
 PROJ.: KALIHI STREET TO PALI HIGHWAY PROJ. NO.: I-HI-1(112):19

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):19	1973	52	176

STRUCTURES			ESTIMATED QUANTITIES														REMARKS													
NUMBER	TYPE	STATION	ITEM NO.	206.	206.	503.	602.	603.	603.	604.	604.	604.	604.	605.	605.	605.														
				01	80	001	101	1902	2066	201	236	237	238	305	006	012	300													
			DETAIL SHEET	Structure Excavation other than at Bridges	Filter Material	Concrete other than in Bridges	Reinforcing Steel other than in Bridges	Remove Clean and Relay Existing 24" Pipe	24-Inch Corrugated Metal Pipe, Sheet Thickness, 0.079 inch	Type "A" Cast Iron Frame and Cover	Type "S" Steel Frame and Grofe	Type 6:1 20-1/4 Steel Frame and Grate	Modified Type "S" Steel Frame and Grates	Removing, Cleaning and Replacing Type "S" Cast Iron Frame and Cover	6-Inch Perforated Underdrain Pipe	12-Inch Perforated Underdrain Pipe	Adjusting Underdrain Cleanout													
			UNIT USED	C.Y.	C.Y.	C.Y.	Lb.	L.F.	L.F.	Ea.	Ea.	Ea.	Ea.	L.F.	L.F.	Ea.														
28	C.B.#56-F Type B	Sta. 110+00 W.B.	20H, 30H	3.2		3.3	35		4		2			1				Construct new D.I. w/2 Grates - Demolish C.B. - Existing sprinkler line												
29	C.B.#57-F Type D	Sta. 110+05 E.B.	21H			1.6	440				2			1				Install 2 Grates - Existing sprinkler line												
30	C.B.#61-F Type A	Sta. 111+70 E.B.	24H	1.0		2.0	497				2			1				" " " w/throat opening - Existing sprinkler line												
31	C.B.#60-F Type A	Sta. 111+70 W.B.	25H	4.7		2.5	279	6			2			1				" " " " " " " " " " " "												
32	C.B.#63-F Type B	Sta. 114+50 E.B.	26H	1.0		1.5	259				2			1				" " " - Existing sprinkler line												
33	C.B.#62-F Type C	Ramp "7" Sta. 9+20	27H			1.0	207				2			1				" " " " " " " " " " " "												
34	C.B.#64-F Type C	Ramp "7" Sta. 7+50	27H			1.0	216				2			1				" " " " " " " " " " " "												
35	C.B.#66-F Type C	Ramp "6" Sta. 5+00	4H, 5H	5.7		2.8	400				3							" 3 " " " " " " " " " " " "												
36	C.B.#67-F Type A	Ramp "6" Sta. 7+25	4H, 5H	7.3		3.4	500				4							" 4 " " " " " " " " " " " "												
37	C.B.#69-F Type B	Sta. 121+00 W.B.	19H			2.0	251				2			1				" 2 " " " " " " " " " " " "												
38	C.B.#70-F Type C	Ramp "6" Sta. 9+25	28H			1.6	408				2			1				" " " " " " " " " " " "												
39	C.B.#72-F Type C	Ramp "6" Sta. 11+50	22H			1.6	473				2			1				" " " " " " " " " " " "												
40	C.B.#71-F Type B	Sta. 123+75 W.B.	20H	1.0		1.1	256				2			1				" " " " " " " " " " " "												
41	C.B.#75-F Type C	Ramp "6" Sta. 13+50	23H			1.6	453				2			1				" " " " " " " " " " " "												
42	C.B.#74-F Type B	Sta. 125+75 W.B.	29H	1.0		1.9	354				2			1				" " " " w/throat opening - Existing sprinkler line												
43	C.B.#1-F(T) Type B	Sta. 128+25 W.B.	30H	0.5		2.0	297				2			1				" " " - Existing sprinkler line												
44	C.B.#2-F(T) Type D	Sta. 128+25 E.B.	31H	2.6		2.2	45	10			2			1				Construct new D.I. w/grates & throat opening - Demolish C.B. - Existing sprinkler line												
45	C.B.#4-F(T) Type D	Sta. 129+75 W.B.	32H	1.0		2.0	320				2			1				Install 2 Grates - Existing sprinkler line												
46	C.B.#5-F(T) Type D	Sta. 130+25 E.B.	31H	6.0		2.5	49	16			2			1				Construct new D.I. w/grates & throat opening - Demolish C.B. - Existing sprinkler line												
47	C.B.#6-F(T) Type A	Sta. 132+75 W.B.	33H	0.5		2.3	122				4			1				Install 4 Grates - Existing sprinkler line												
48	C.B.#7-F(T) Type A	Sta. 132+75 E.B.	31H	6.0		2.5	49	16			2			1				Construct new D.I. w/grates & throat opening - Demolish C.B. - Existing sprinkler line												
49	C.B.#9-F(T) Type D	Sta. 134+40 E.B.	31H	4.9		2.3	48	16			2			1				" " " " " " " " " " " "												
50	C.B.#2-L(T) Type A	Sta. 136+73 W.B.	34H	7.8		4.7	503				3			1				Install 2 Grates - Existing sprinkler line												
51	C.B.#4-L(T) Type D	Sta. 137+42 E.B.	35H	4.9		4.8	197							3	1			Construct new D.I. w/3 Grates												
52	C.B.#9-L(T) Type C	Sta. 140+28 W.B.	36H	8.1		3.5	429				2			1				Install 2 Grates - Existing sprinkler line												
53	C.B.#6-L(T) Type D	Sta. 140+50 E.B.	37H	2.0		2.6	295				2			1				" " " " " " " " " " " "												
54	C.B.#10-L(T) Type C	Sta. 141+96 W.B.	36H	7.6		5.5	463				2			1				" " " " " " " " " " " "												
Sub - Total - This Sheet				76.8		65.8	7845	6	62		56	2	3	25				SHEET 24 OF 41H SHEETS												

DATE	.....
DESIGNED BY	.....
CHECKED BY	.....
NOTED BY	.....
NO.	.....

DRAINAGE SUMMARY

SAFETY IMPROVEMENTS,
PROJ.: KALIHI STREET TO PALI HIGHWAY PROJ. NO.: I-HI-I(112):19

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IHI(112):19	1973	53	176

STRUCTURES				ESTIMATED QUANTITIES																REMARKS															
NUMBER	TYPE	STATION	ITEM NO.	206.	206.	503.	602.	603.	603.	604.	604.	604.	604.	605.	605.	605.																			
				01	80	001	101	1902	2066	201	236	237	238	305	006	012	300																		
			DETAIL SHEET	Structure Excavation other than at Bridges	Filter Material	Concrete other than in Bridges	Reinforcing Steel other than in Bridges	Remove Clean and Relay Existing 24" Pipe	24-Inch Corrugated Metal Pipe, Sheet Thickness, 0.079 inch	Type "A" Cast Iron Frame and Cover	Type "S" Steel Frame and Grate	Type 6x11-20-1-4 Steel Frame and Grate	Modified Type "S" Steel Frame and Grates	Removing, Cleaning and Reinstalling Type B Cast Iron Frame and Cover	6-Inch Perforated Underdrain Pipe	12-Inch Perforated Underdrain Pipe	Adjusting Underdrain Cleanout																		
			UNIT USED	C.Y.	C.Y.	C.Y.	Lb.	L.F.	L.F.	Ea.	Ea.	Ea.	Ea.	L.F.	L.F.	Ea.																			
55	C.B.#11-L(7) Type D	Ramp "D" Sta. 3+51	37H	6.2		4.5	202				2			1																Construct new D.I. w/2 Grates ~ Demolish C.I.D. ~ Existing sprinkler line					
56	C.B.#13-L(7) Type D	@ Sta. 145 + 78 W.B.	26H			1.6	320				2			1																Install 2 Grates ~ Existing sprinkler line					
57	C.B.#16-L(7) Type D	@ Sta. 148 + 00 W.B.	4H, 5H	4.2		2.2	300				2																			Install 2 Grates ~ Reconstruct existing conc. curb and gutter					
	24" Culvert	@ Sta. 85 + 03 W.B. to @ Sta. 85 + 86.37 W.B.	17H	42.0							86																								
	24" Culvert	@ Sta. 85 + 02.03 W.B. to @ Sta. 86 + 12 W.B.	17H	11.0							22																								
	6" Underdrain	@ Sta. 134 + 40 ± to @ Sta. 134 + 59 ±	30H	2.1	2.0									22																					
	Existing Cleanout	@ Sta. 106 + 00 ± to @ Sta. 114 + 37 ±	20H													8																			

ORIGINAL
PLAN
NOTE BOOK
No.

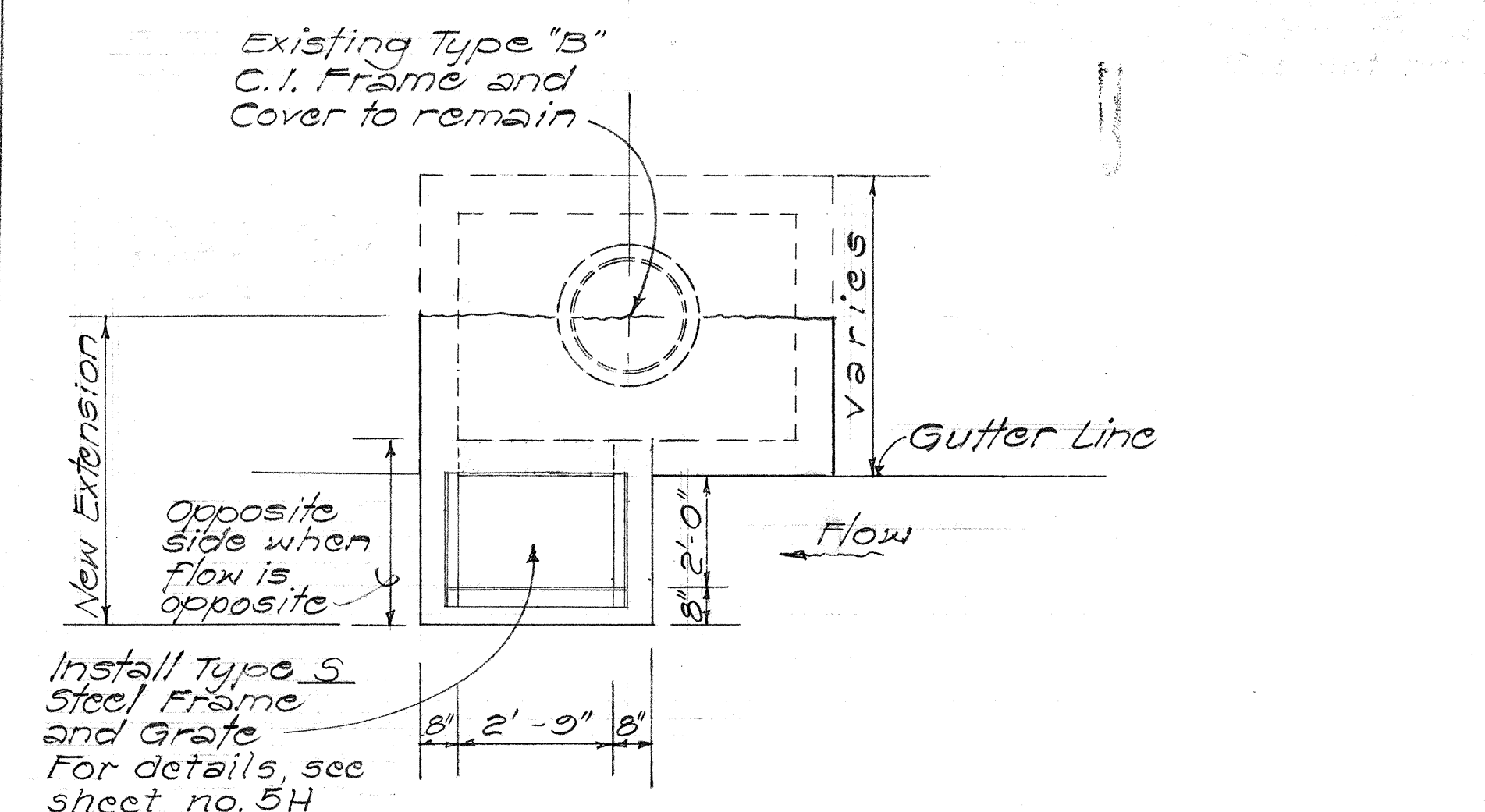
SURVEY LOCATED BY
DATE

DRAWN BY
DESIGNED BY
CHECKED BY

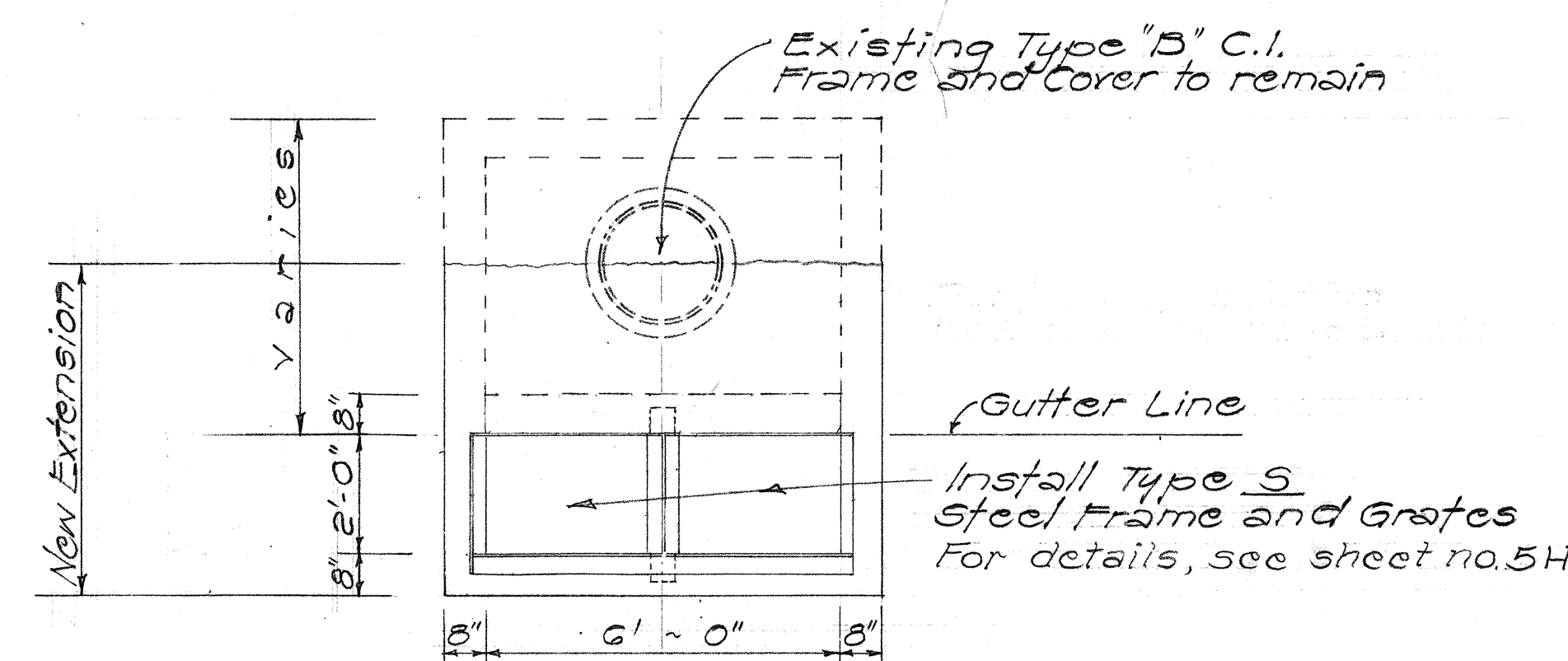
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-11-112-10	1973	54	176

GENERAL NOTES

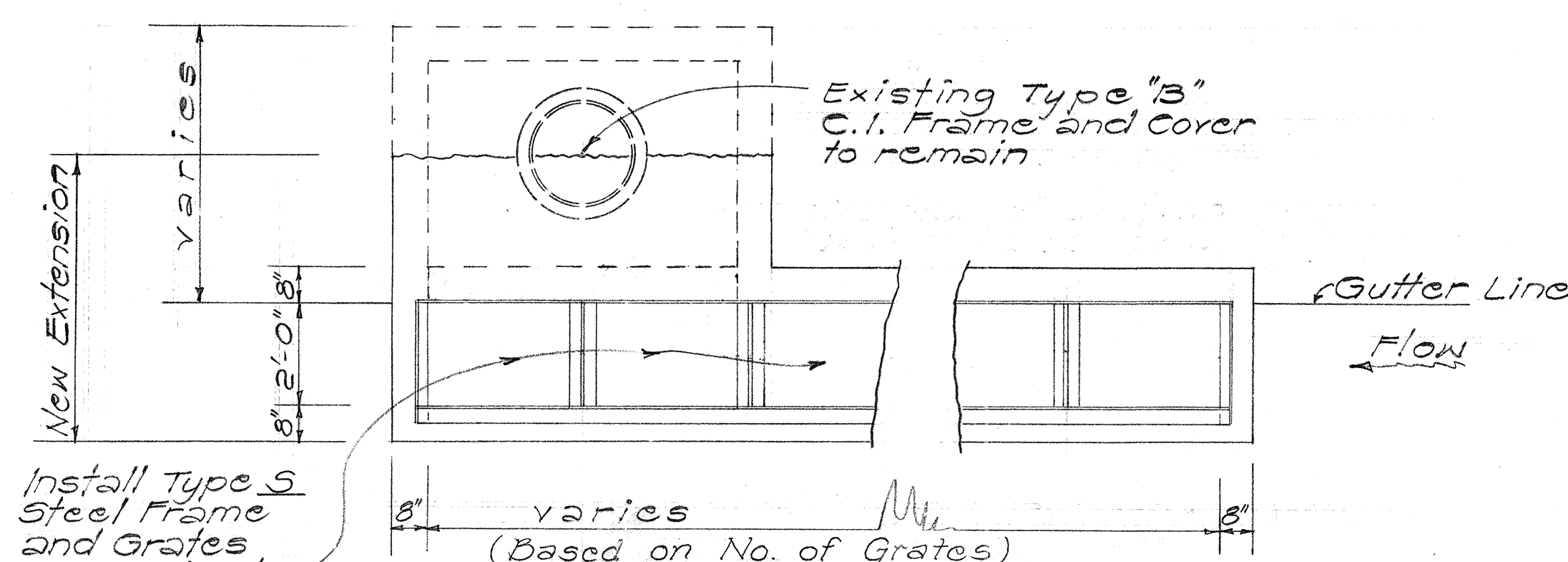
1. Demolishing and removing a portion or the entire existing structure shall not be paid for separately, but shall be considered incidental to structural concrete.
2. Unnecessary culvert lengths within the catch basins or storm drain manholes shall be neatly cut flush with the face of the wall.
3. Contractor shall reuse salvaged manhole rungs and also provide new manhole rungs whenever necessary.
Manhole Rungs (16" o.c) are required when "H" is greater than 4 feet 6 inches. Only one rung (12 inches from the bottom) is required if "H" is 4 feet 6 inches or less. Manhole Rungs may be placed at any location as ordered by the Engineer. (For detail of Manhole Rung see sheet no. 41H) Manhole Rungs shall be considered incidental to structural concrete.
4. Salvaged C.I. Frame and Covers shall be cleaned and returned to 727 Kakoi Street, Honolulu, Hawaii 96819.
5. Exposed portion of C.I. frame shall be cleaned before pouring concrete for top slab.
6. Contractor shall verify the locations of all culverts and sprinkler lines in the field. Any culvert or sprinkler line damaged during construction shall be repaired or replaced by the Contractor at his expense. (See Sprinkler Plans for approximate location of existing sprinkler lines at Catch Basins.
7. Reconstruction of existing Concrete Curb and Gutter shall be considered incidental to Structural Concrete.
8. If necessary all adjustments to the existing subdrain pipes and cleanouts shall be made by the Contractor, and the work mentioned shall not be paid for separately but shall be considered incidental to the various contract items. The work mentioned above does not apply to subdrain work as indicated in these plans.
9. Location of C.I. Frame & Cover for S.D.M.H. or Catch Basin shall be determined by the Engineer in the field.
10. For typical pavement structure, see typical roadway section.
11. Only non-pneumatic type of drill as approved by the Engineer will be permitted for drilling holes in concrete.
12. For location of swale see roadway plans.
13. Contractor shall use Structural Concrete for all modified or new Drop Intakes.



PLAN
MODIFICATION FOR 1 GRATE



PLAN
MODIFICATION FOR 2 GRATES



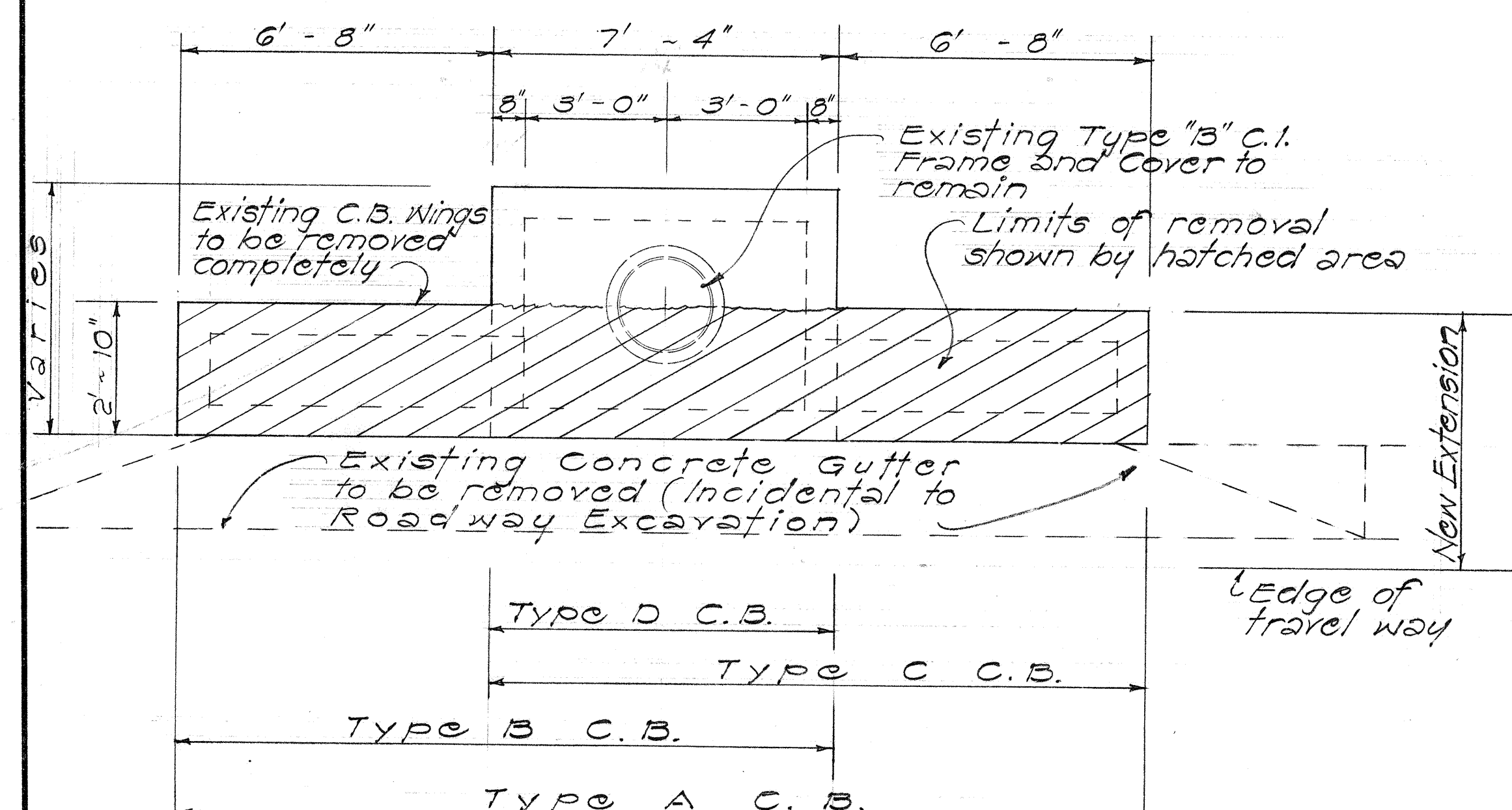
Install Type S Steel Frame and Grates as required. For details see sheet no. 5H

8" varies 8" (Based on No. of Grates)

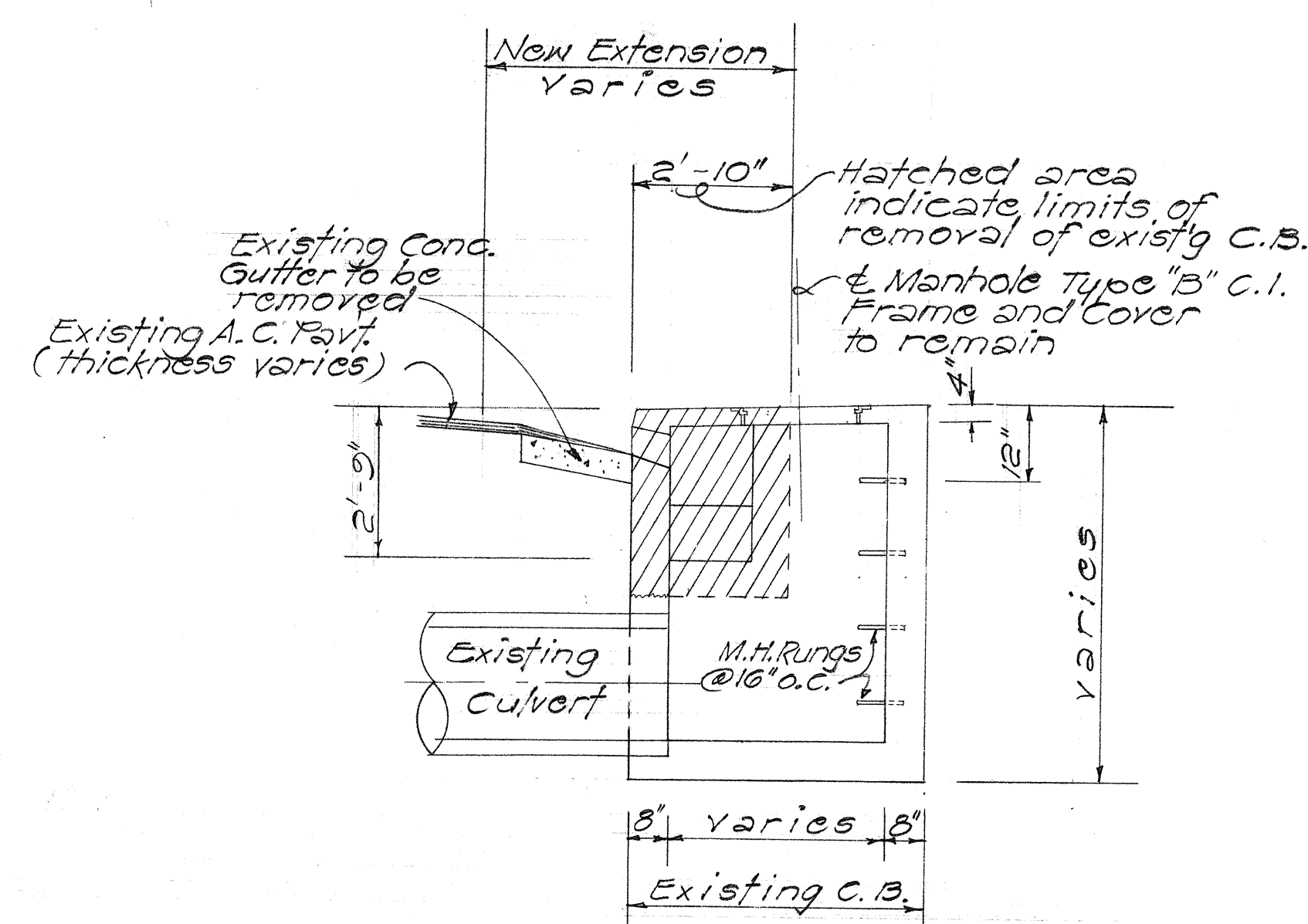
P L A N

MODIFICATION FOR 3 OR MORE GRATES

PLAN VIEW OF MODIFICATIONS TO
CONVERT EXISTING CATCH BASINS
TO USE ONE OR MULTIPLE GRATES



P L A N



SECTION

DETAILS - REMOVAL OF EXISTING CATCH BASINS

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

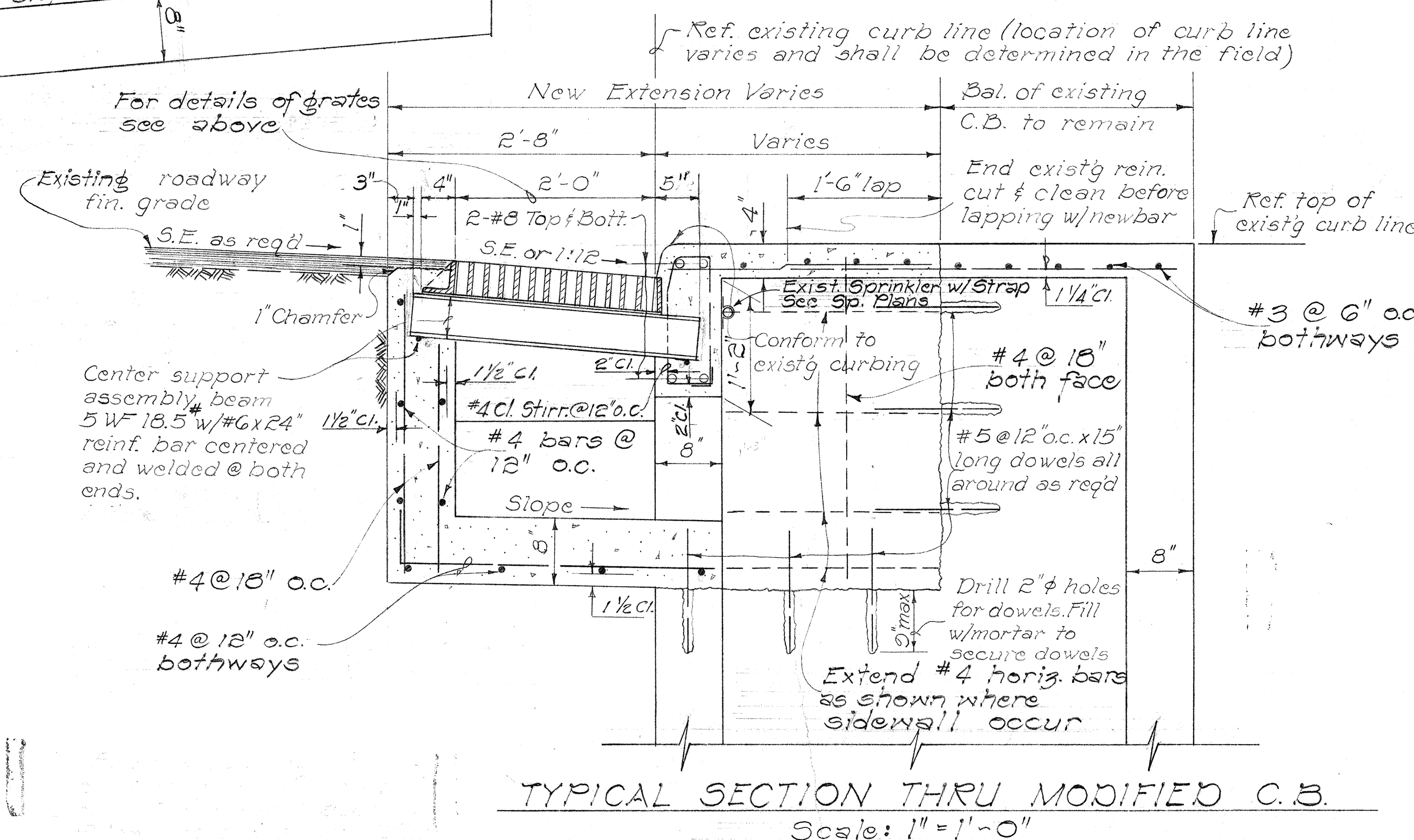
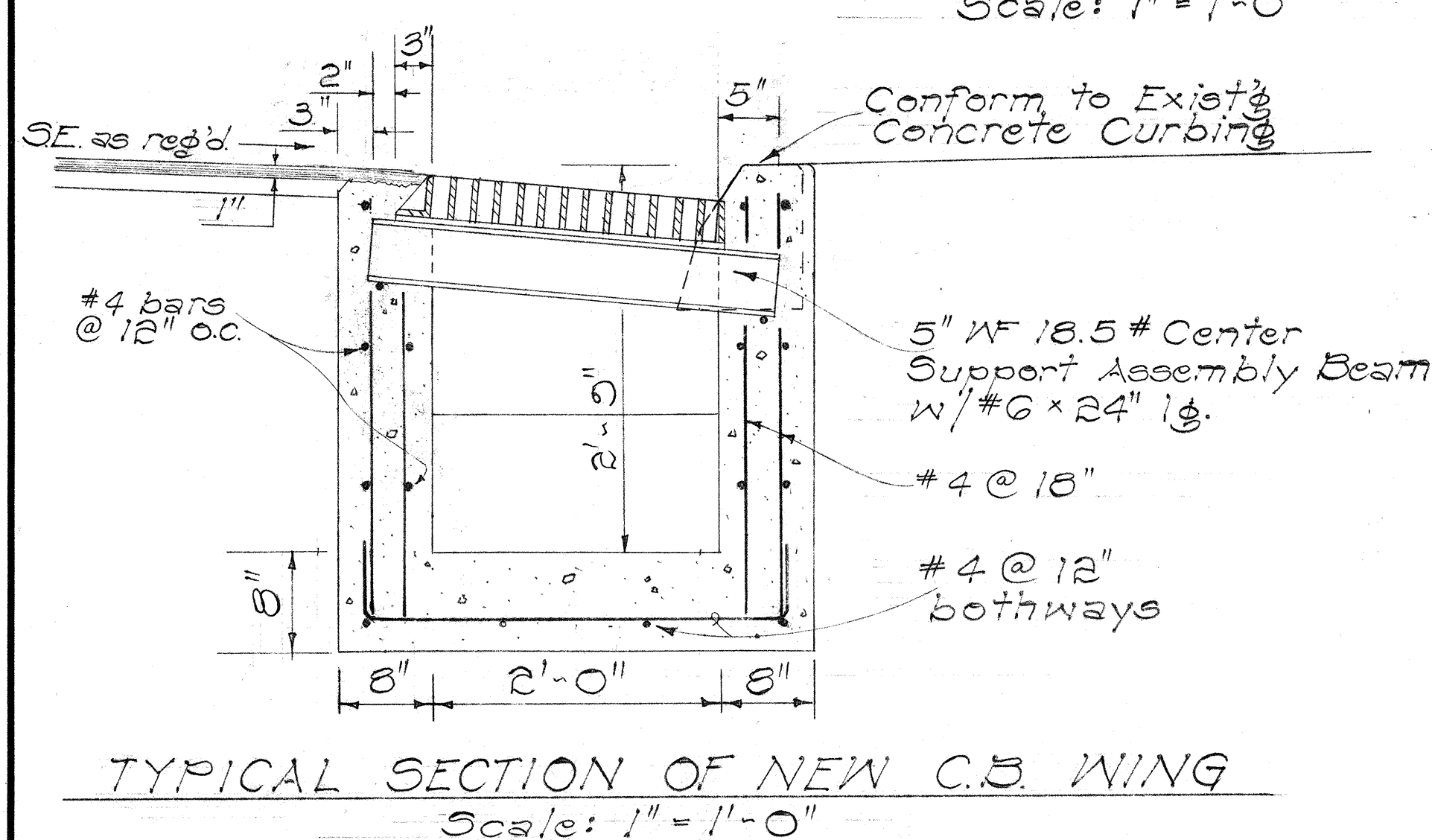
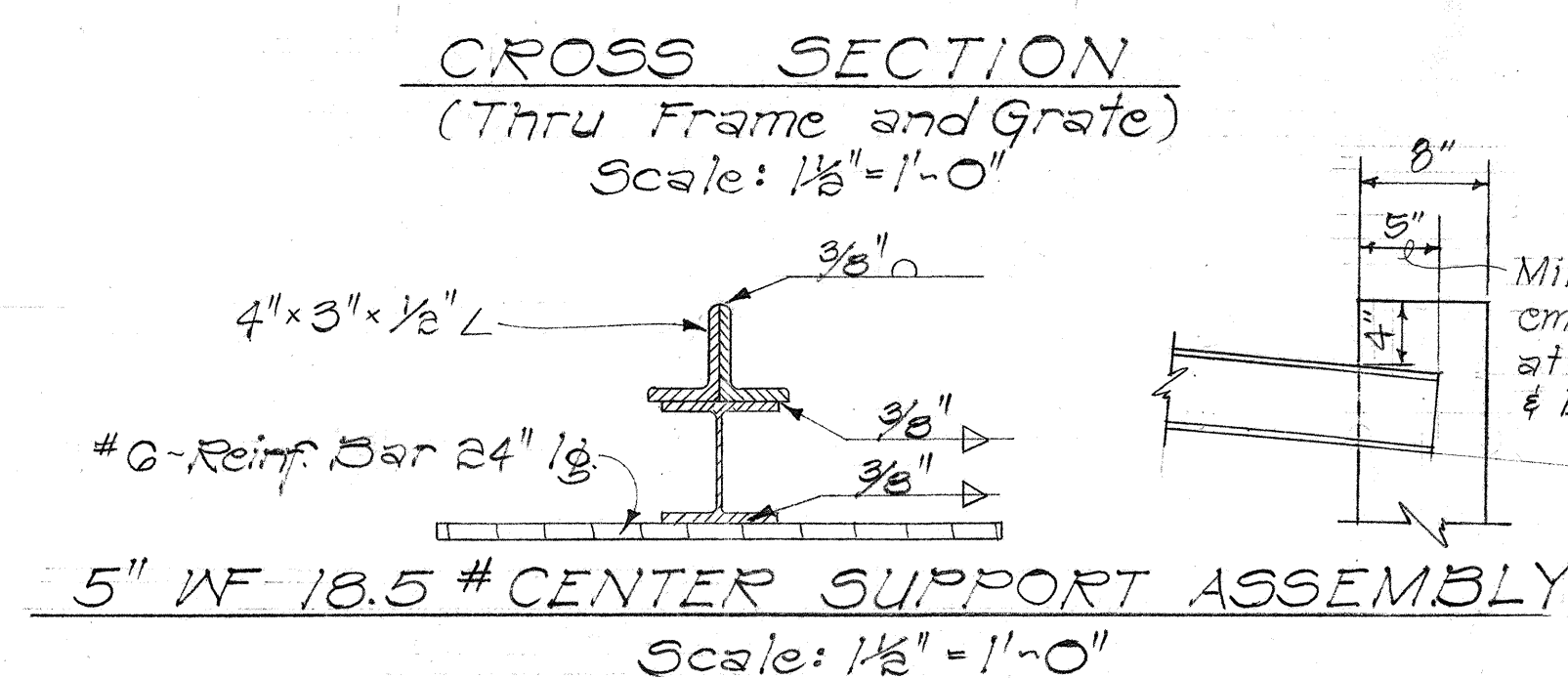
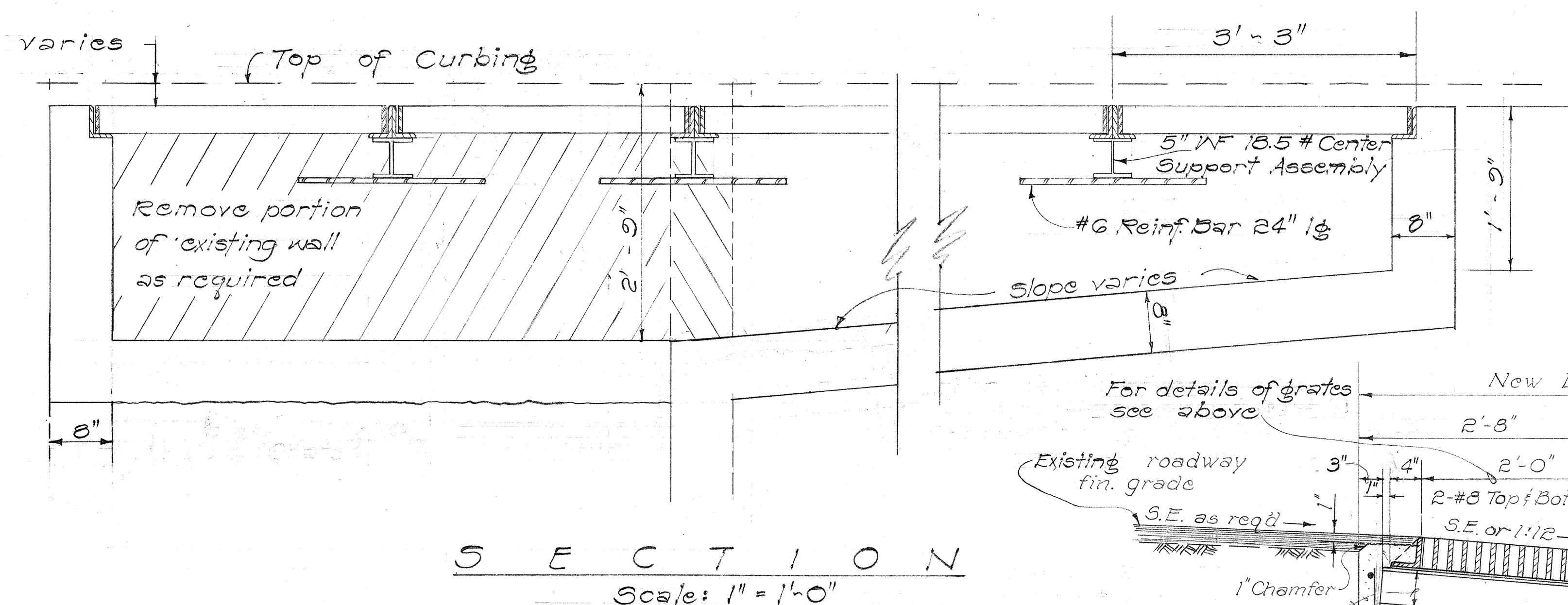
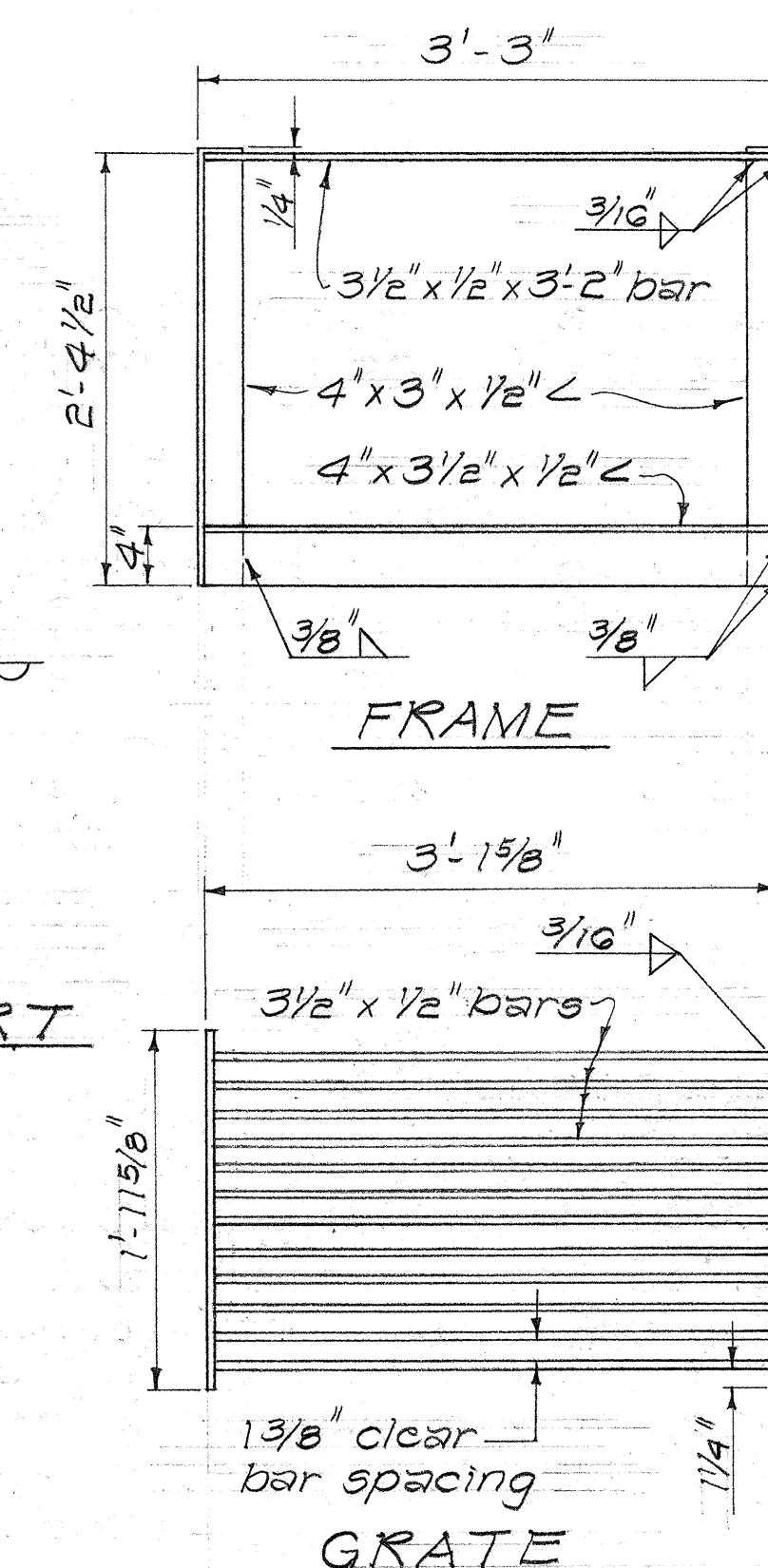
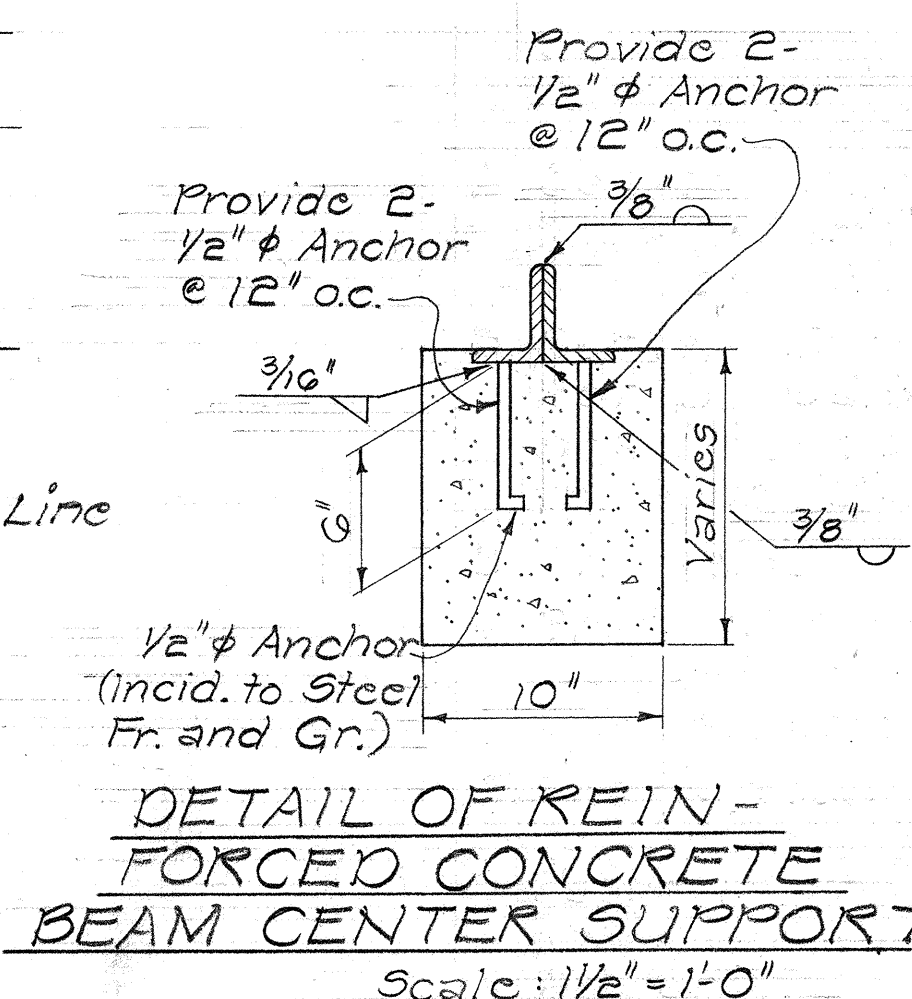
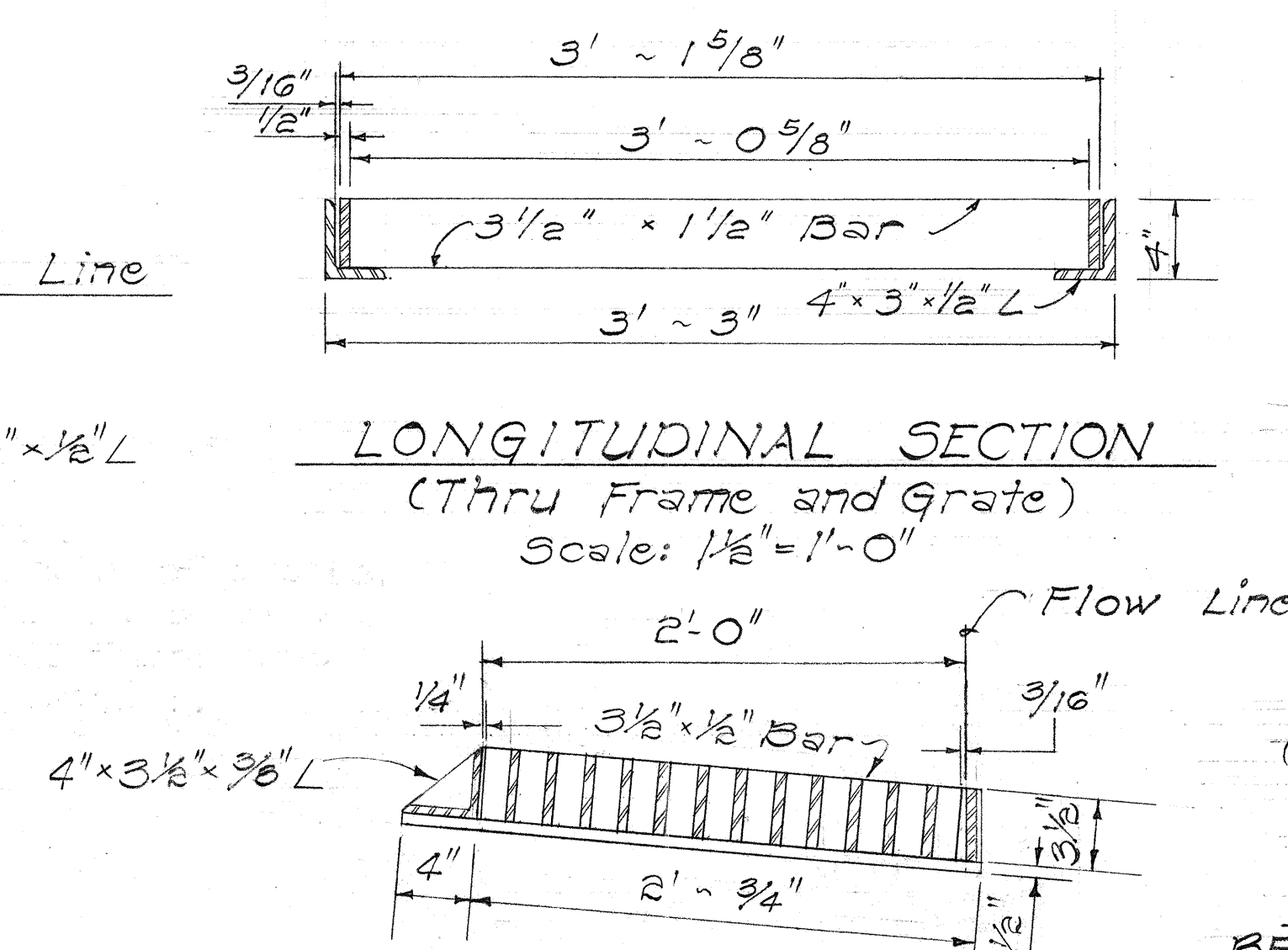
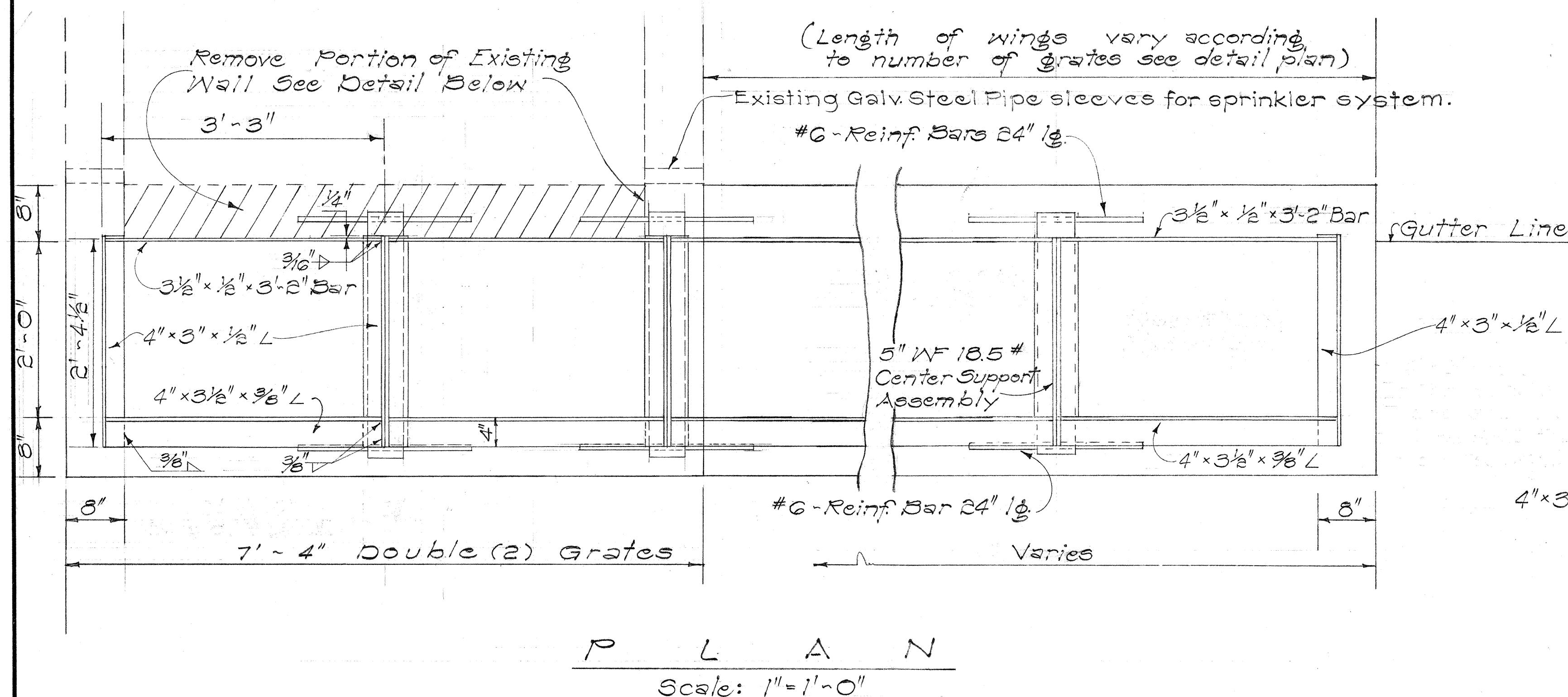
Modification of Catch
Basins with Grated Inlet
within an Existing Gutter

Safety Improvements from
Kalihi Street to Pali Highway
Fed. Aid Interstate Proj. No. I-HI-1(112):1

Scale: 3/8"=1'-0" Date: April, 1973

SHEET NO. 44 OF 414 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-47-(112):19	1973	55	176



- NOTES:

1. Center Support Assembly shall be used when two or more Gratings are specified.
 2. Center Support Assembly shall not be paid for separately but shall be considered as incidental to Type "S" Steel Frame and Grate.
 3. All welds $\frac{3}{8}$ " unless noted otherwise.
 4. Grate and Frame shall be hot dip galvanized after fabrication, see specifications.
 5. The various materials shall conform to the specifications of ASTM as listed in the following tabulation and the Std. Specifications.
- | Material | ASTM Designation |
|------------------------|---------------------|
| Structural Steel | A23, Grade D |
| Cast Steel | A27, Grade G5-35 |
| Malleable Iron Casting | A47, Grade No.35018 |
6. Contractor has the option of using cast malleable iron, cast steel, welded, bolted, cast malleable iron and block or cast steel and block grate.
 7. Frames & Grates shall have edges ground smooth.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

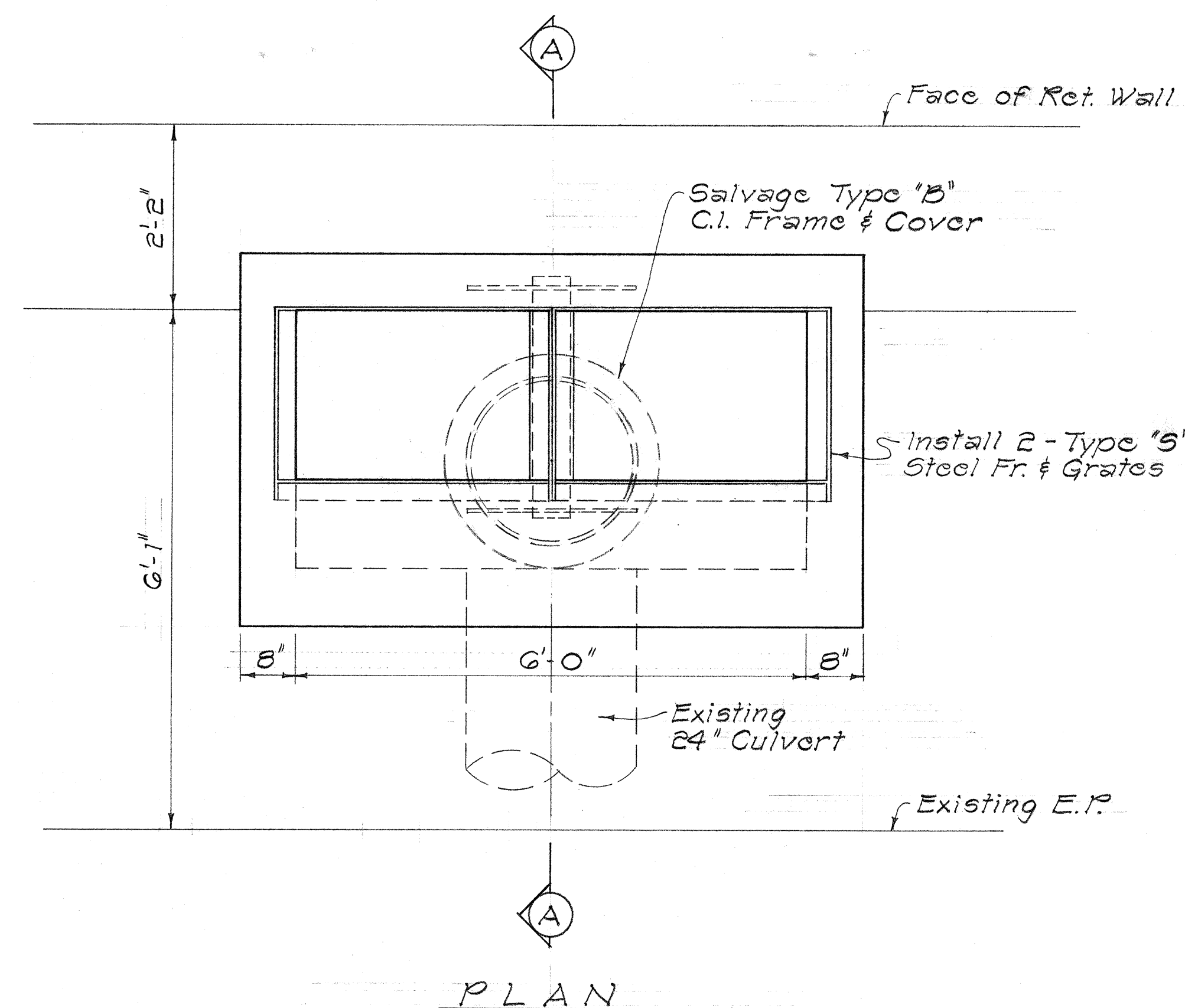
MODIFICATIONS OF C.B. WITH GRA-
TED INLET WITHIN EXISTING GUTTER
AND DETAILS OF TYPE "S" STEEL
FRAME AND GRATES

Safety Improvement
Middle St. to Pali Hwy.
F.A.I. Proj. No. I-H-1(112):10

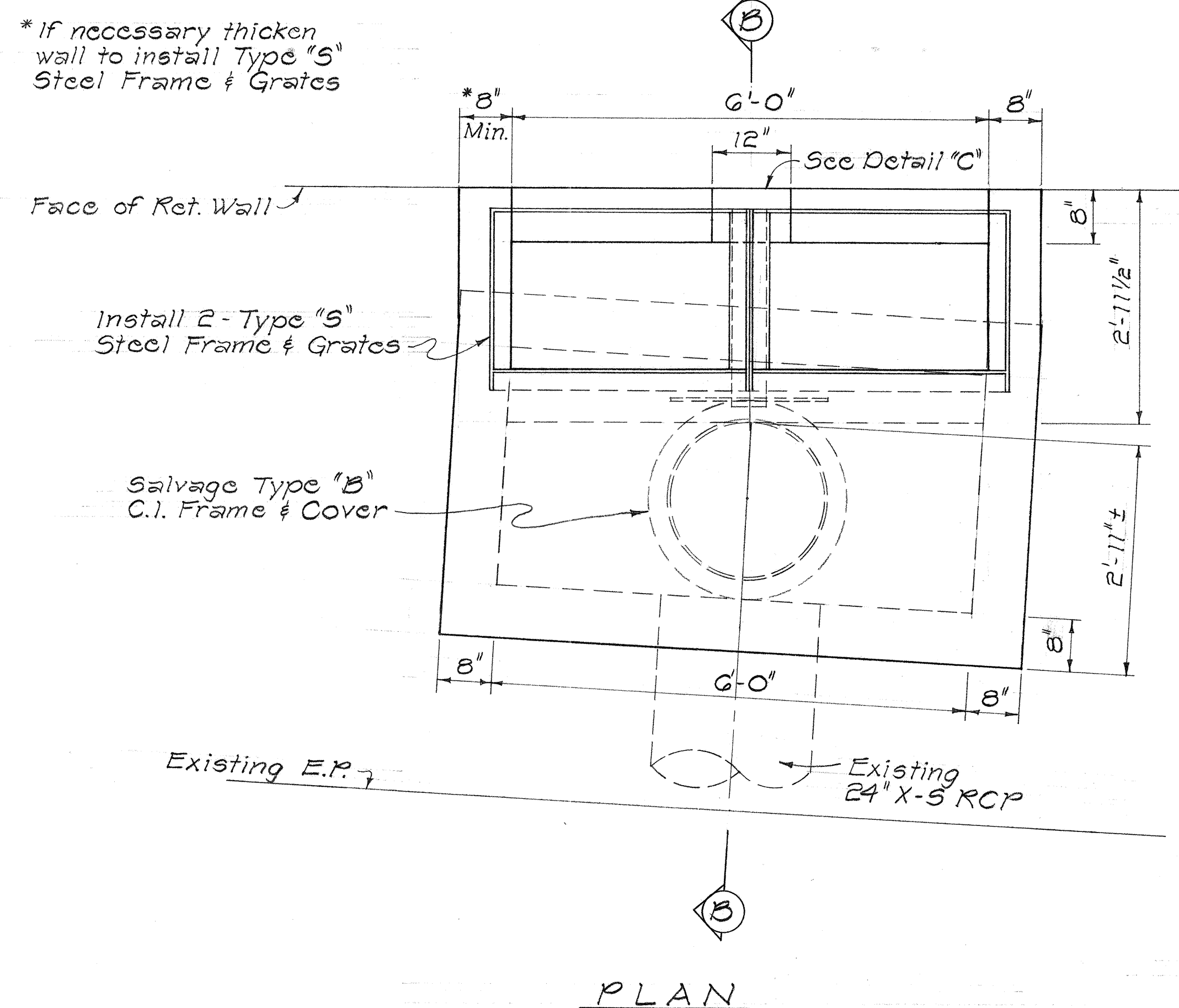
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SHEET NO. 54 OF 41 SHEETS

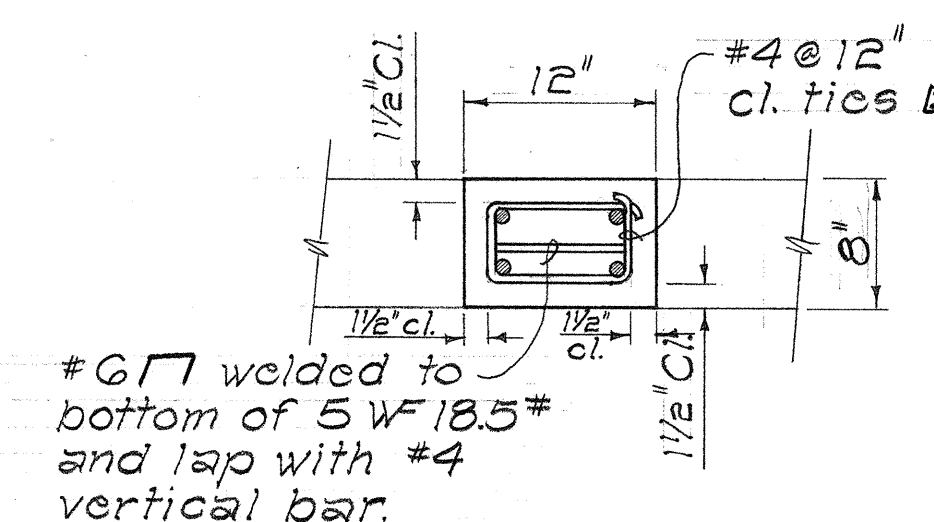
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):12	1973	56	176



PLAN

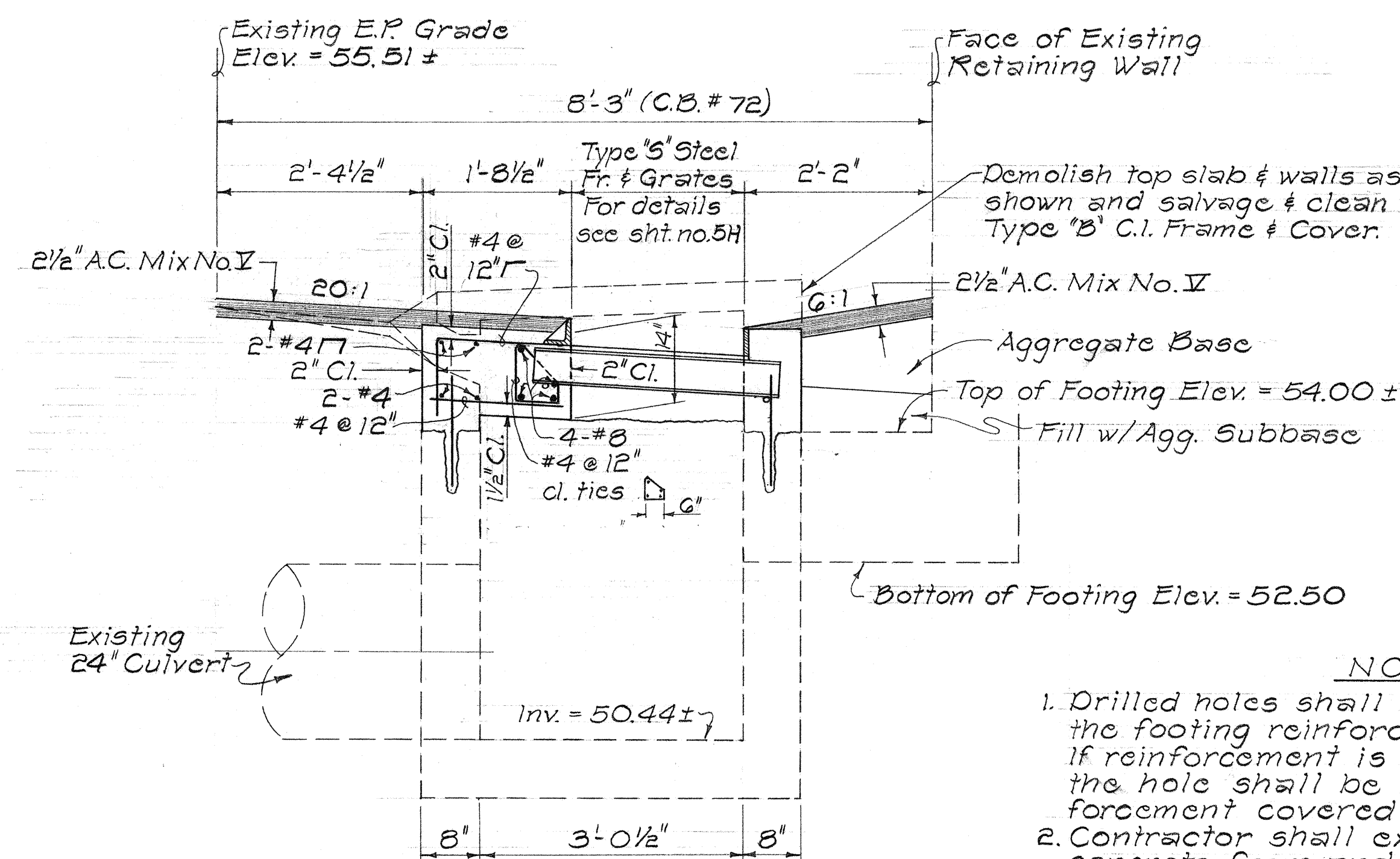


PLAN

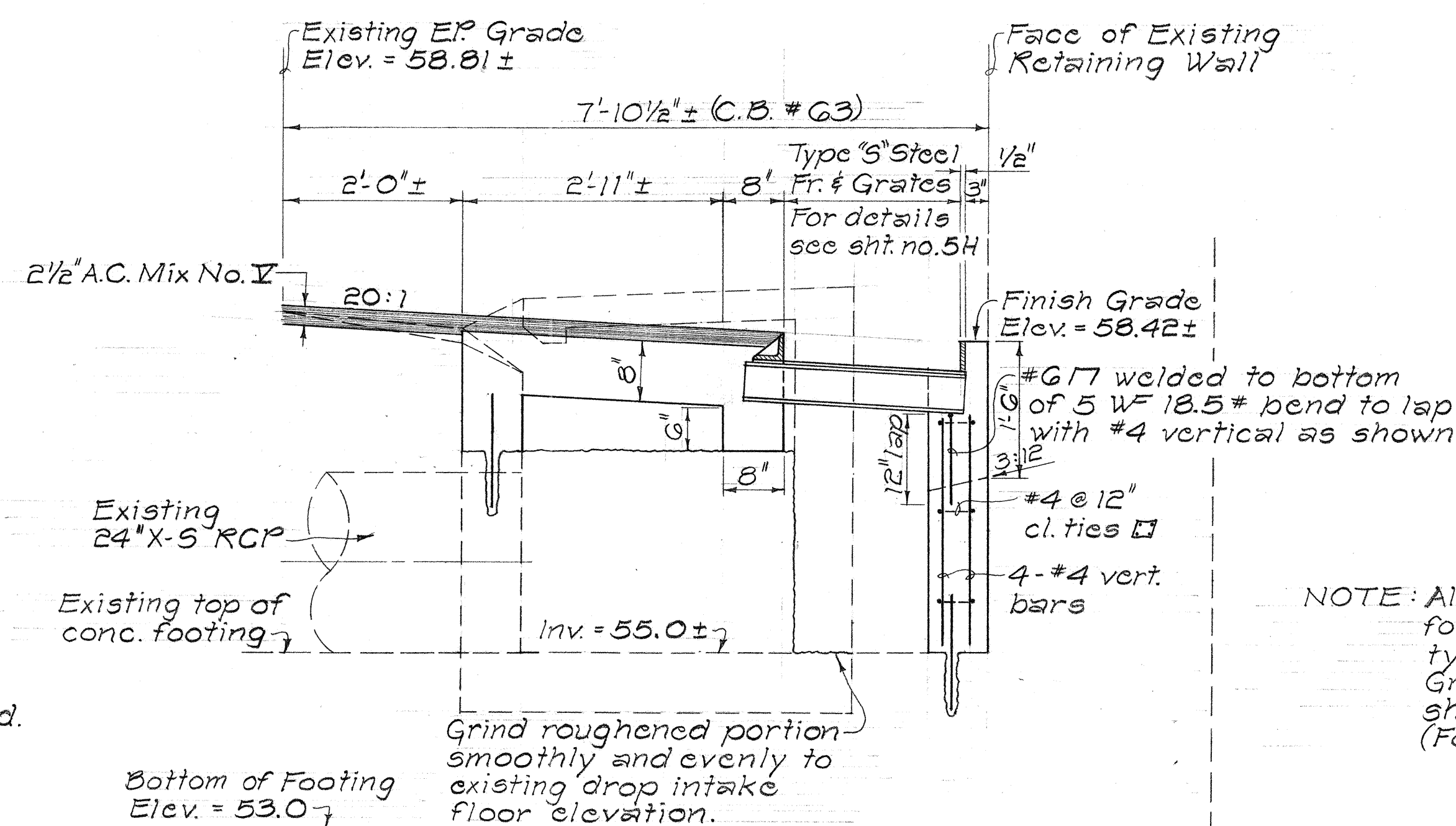


#6 welded to bottom of 5 W 18.5* and lap with #4 vertical bar.

DETAIL "C"
Scale: 1" = 1'-0"



SECTION "A-A"



SECTION "B-B"

NOTES

1. Drilled holes shall be located such that the footing reinforcement will not be exposed. If reinforcement is encountered in drilling, the hole shall be relocated and the reinforcement covered with epoxy mortar.
2. Contractor shall exercise care in removing concrete from and in the proximity of existing structures. Any damage to existing structures shall be repaired as directed by the Engineer and at the Contractor's expenses.
3. Epoxy mortar shall be approved by the Engineer.

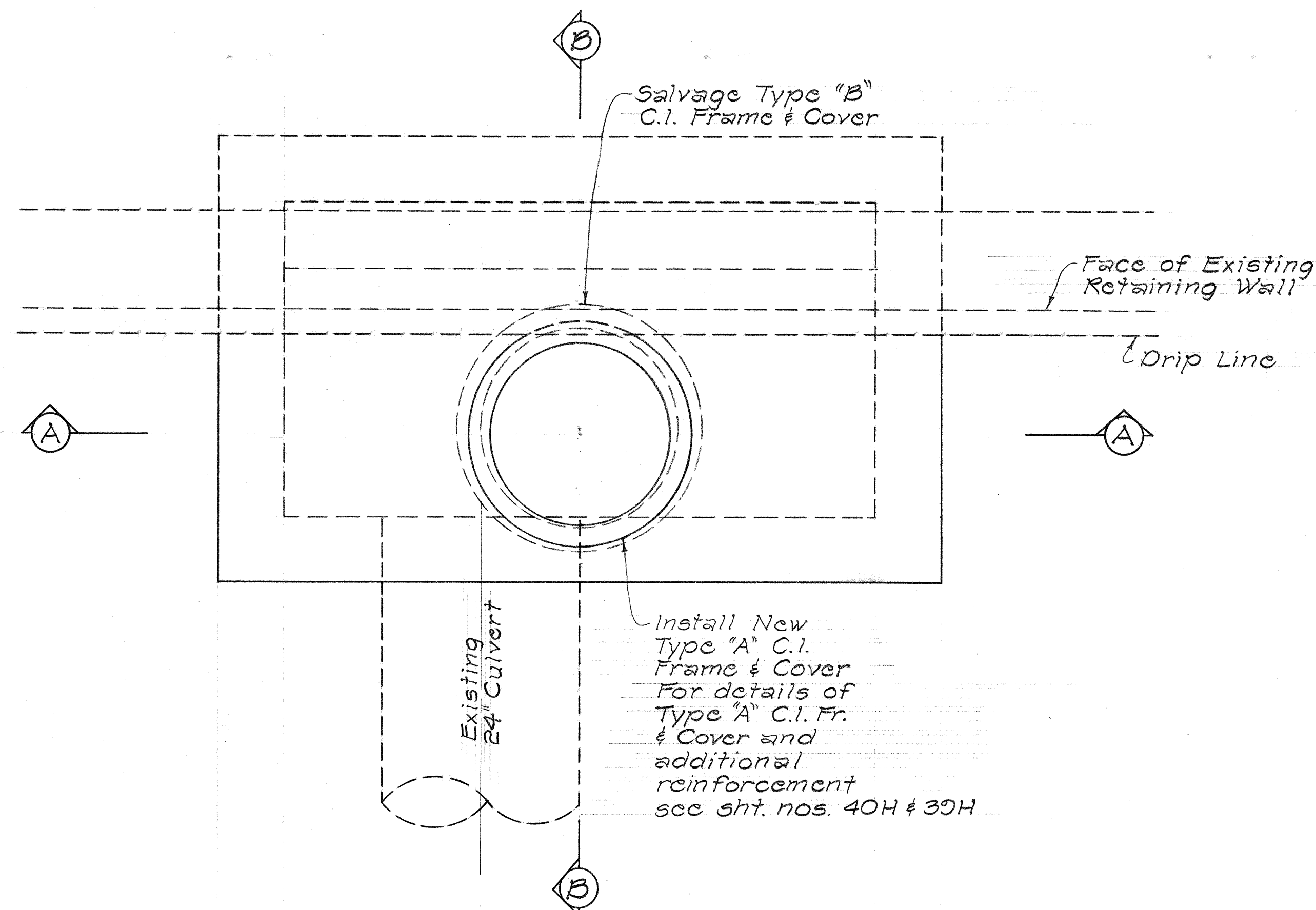
DETAILS OF CATCH BASINS @ RAMP "K-6" STA. 9+50 (C.B. #72) @ STA. 50+90 ± W.B. (C.B. #63)

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

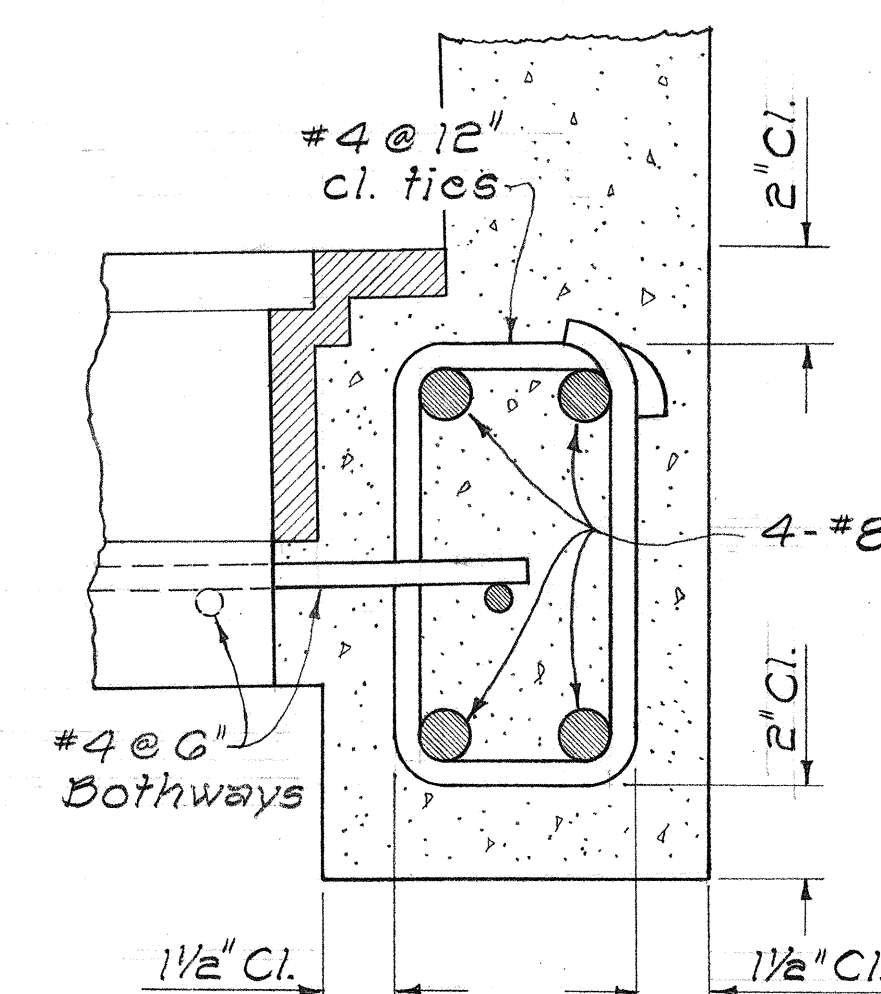
NOTE: All notes, dimensions and reinforcing layouts are similar to typical section for Type "S" Grated Drop Intake except as shown or noted on this sheet. (For details, see sht. no. 39H)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF CATCH BASIN
WITH TYPE "S" GRATED INLET
Safety Improvements
Kalani Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):19
Scale As Noted Date: Apr. 1973
SHEET No. 64 OF 41 SHEETS

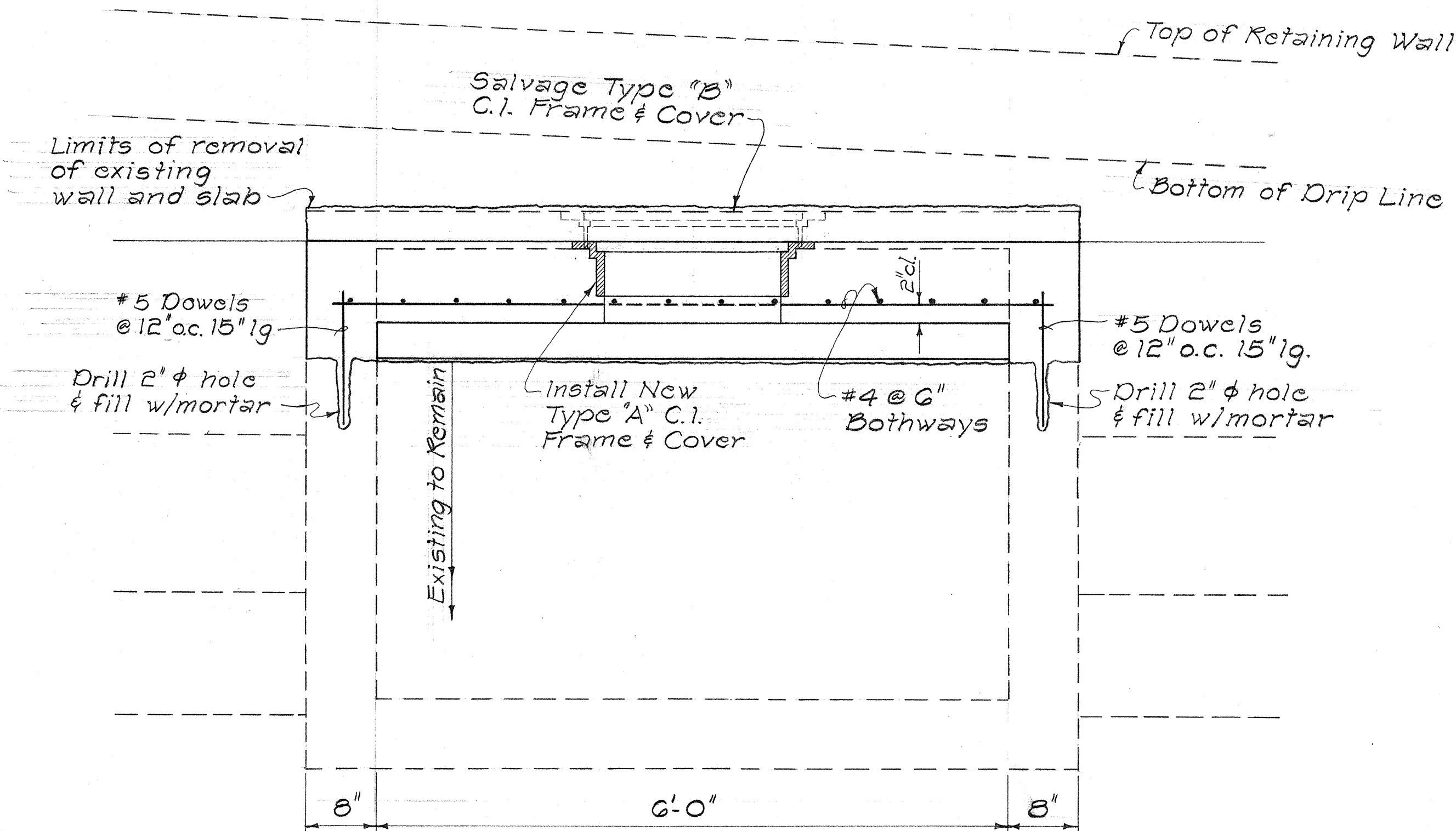
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112)13	1973	57	176



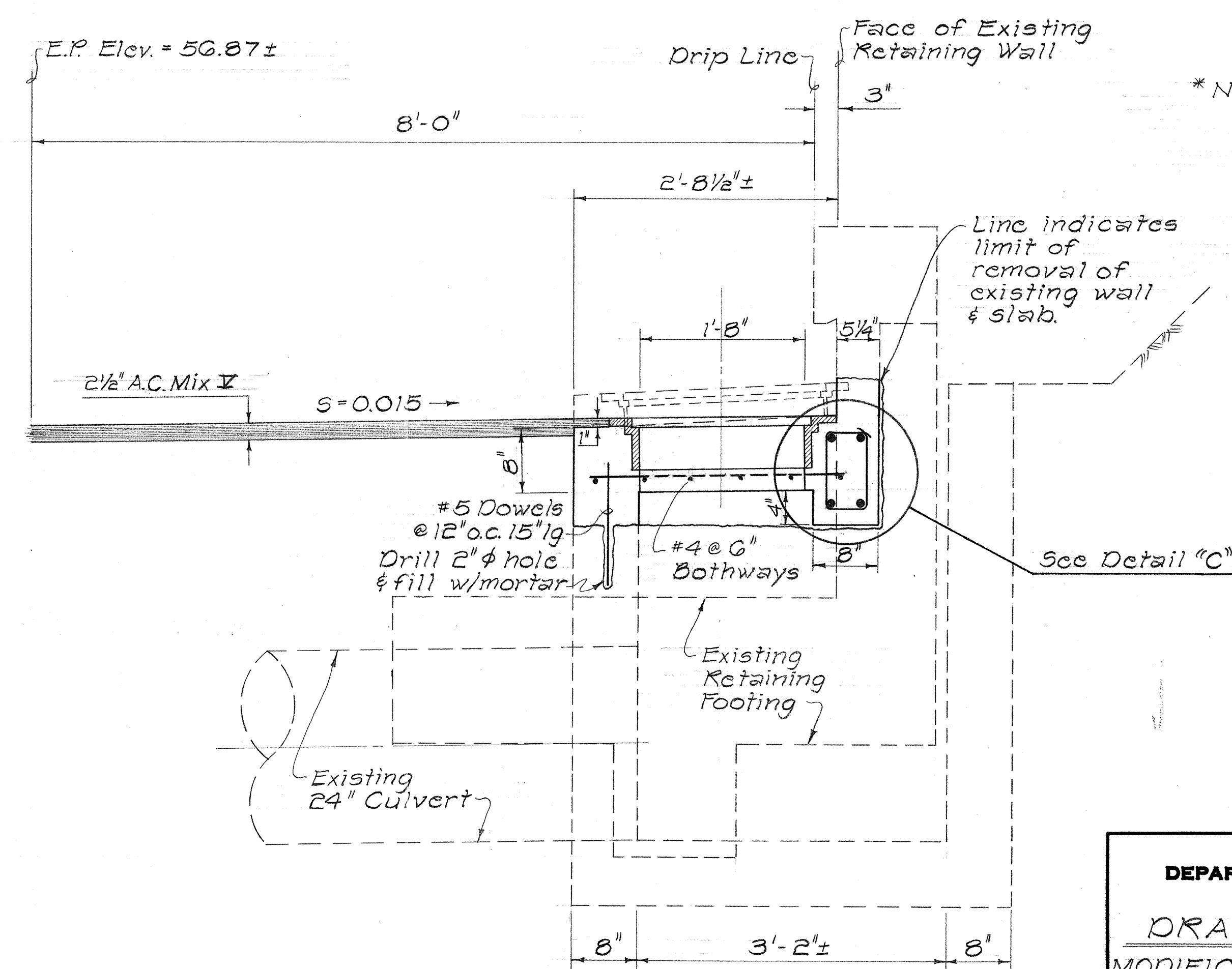
PLAN
Scale: 1"=1'-0"



DETAIL "C"
Scale: 3"=1'-0"



SECTION "A-A"
Scale: 1"=1'-0"



SECTION "B-B"
Scale: 1"=1'-0"

DETAILS OF C.B. @ STA. 56 + 04 W.B.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

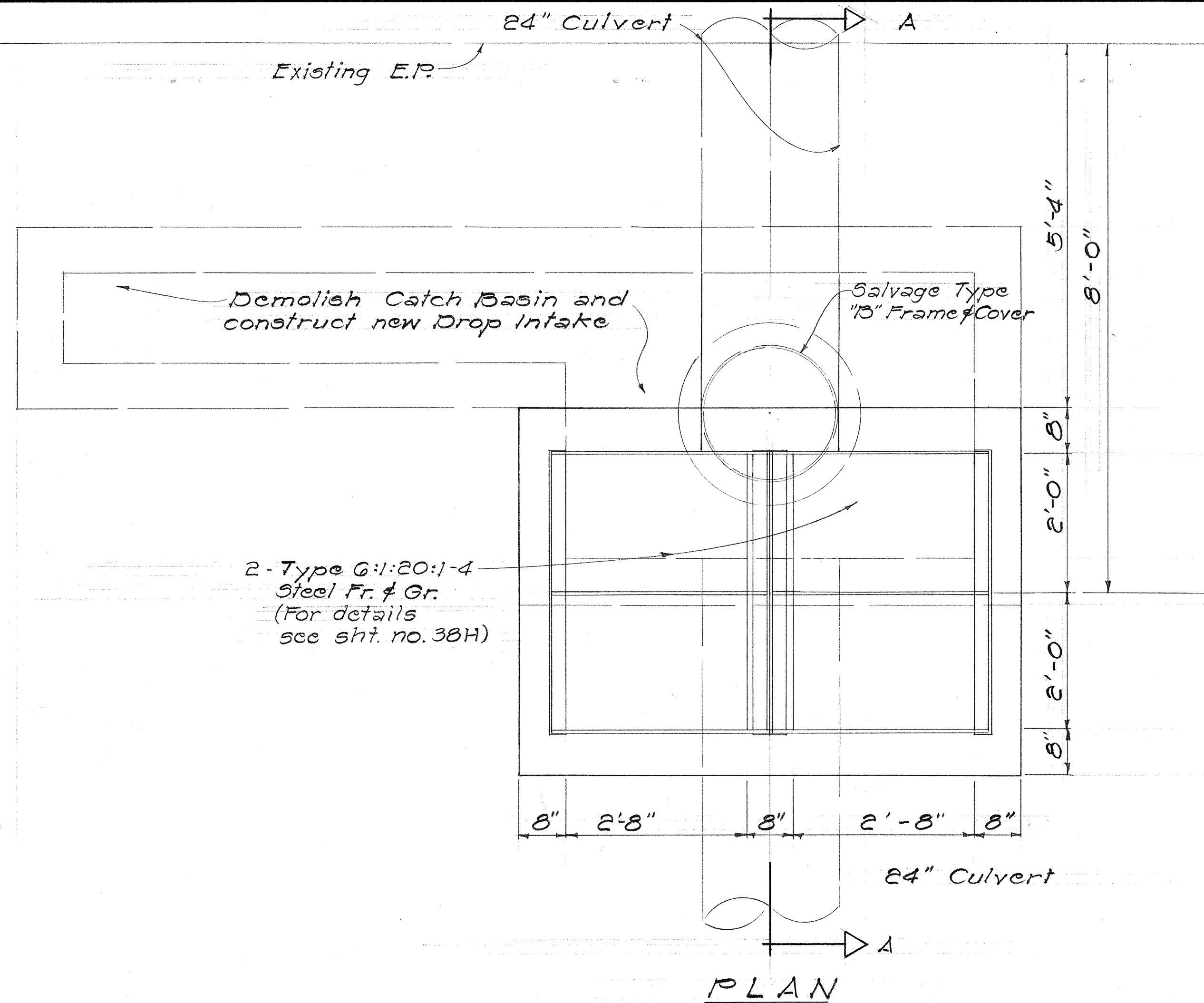
DRAINAGE DETAILS
MODIFICATION OF CATCH BASIN
@ STA. 56 + 04 W.B.

Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):19
Scale As Noted Date: April, 1973

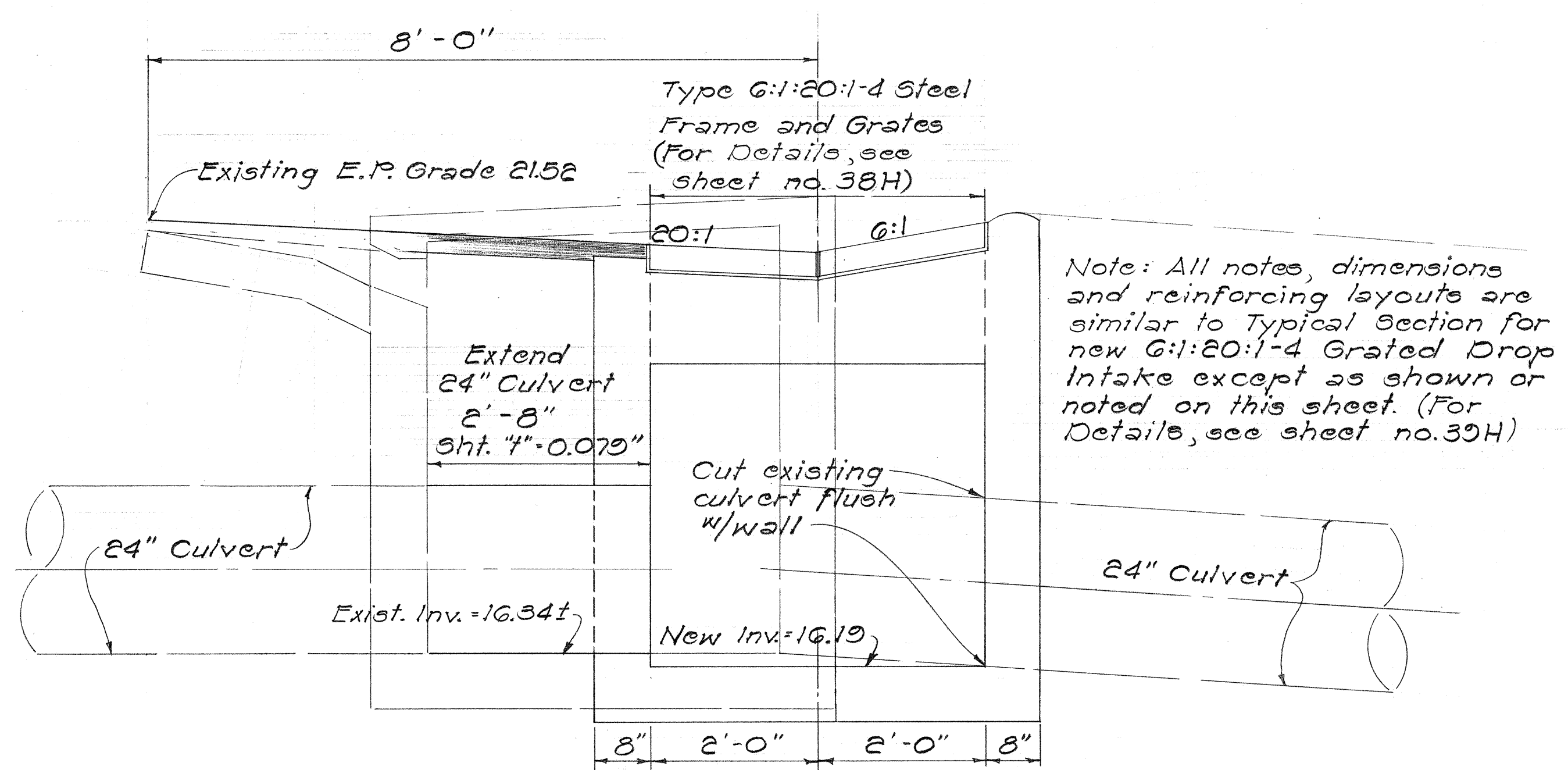
SHEET No. 7H OF 41 HSHEETS

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
ORIGINAL	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):10	1973	50	176

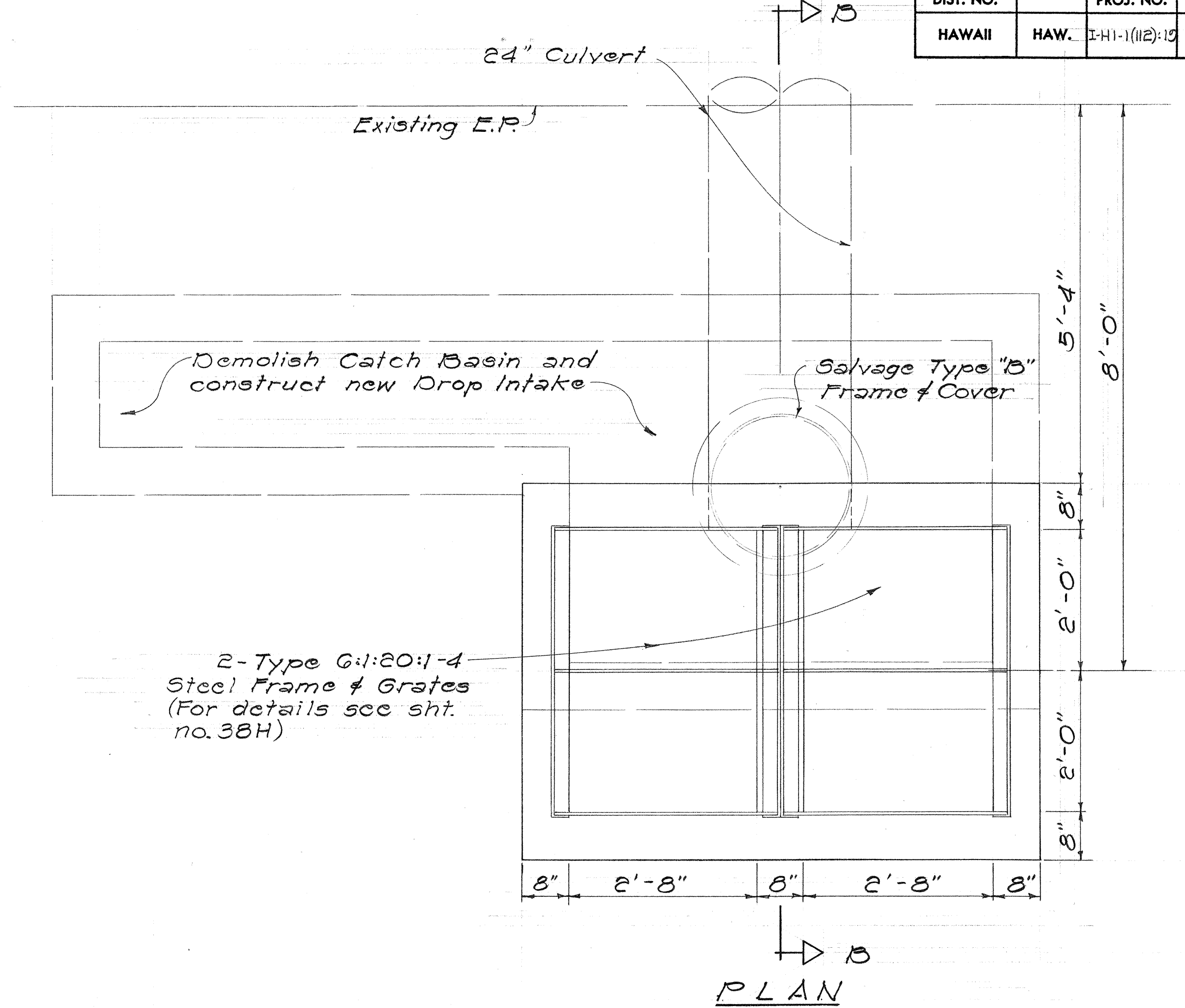


PLAN

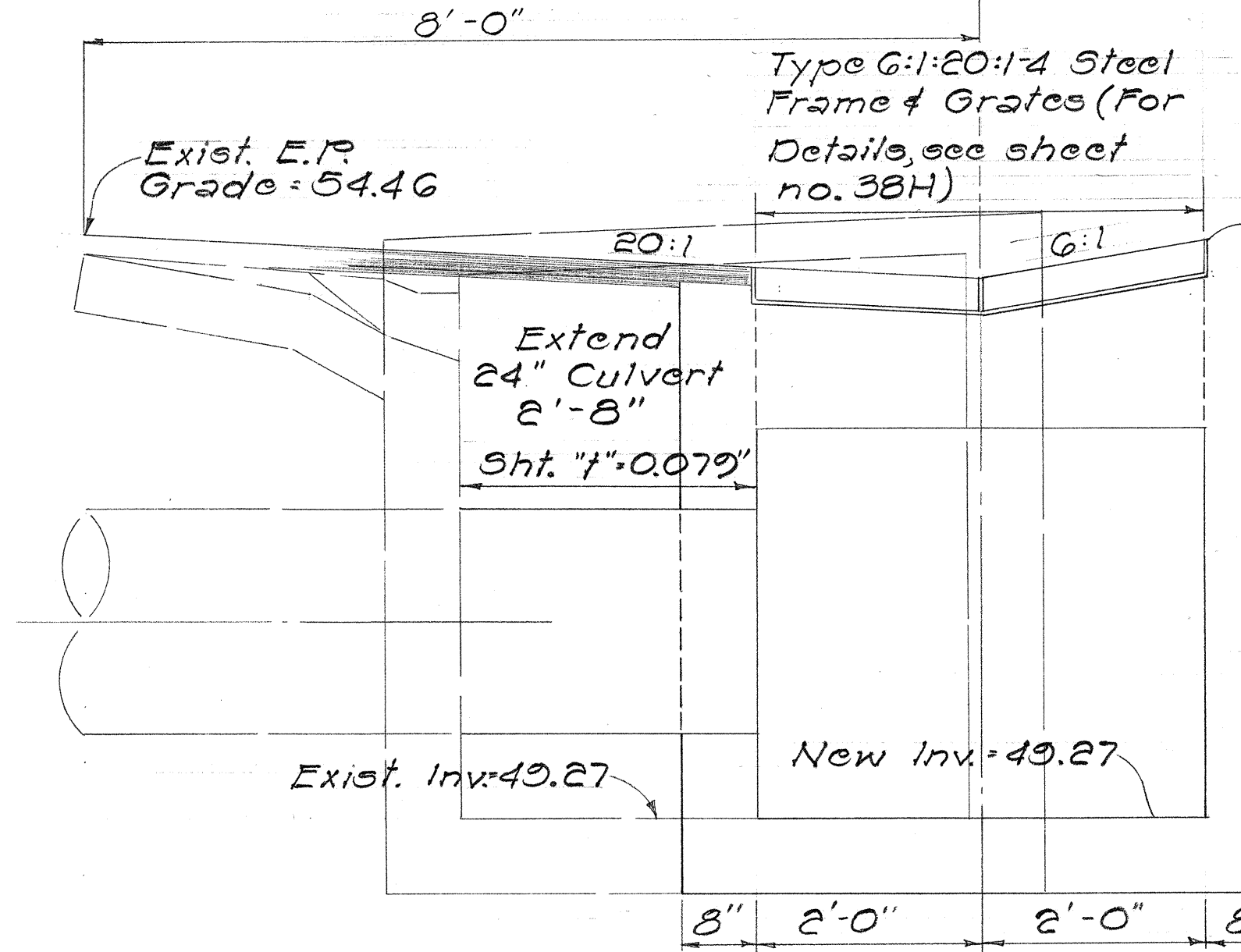


SECTION "A-A"

NEW G:1:20:1-4 GRATED DROP INTAKE
AT STA. 70 + 75 E.B.



PLAN



SECTION "B-B"

NEW G:1:20:1-4 GRATED DROP INTAKE
@ RAMP "K-2" STA. 15 + 95

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

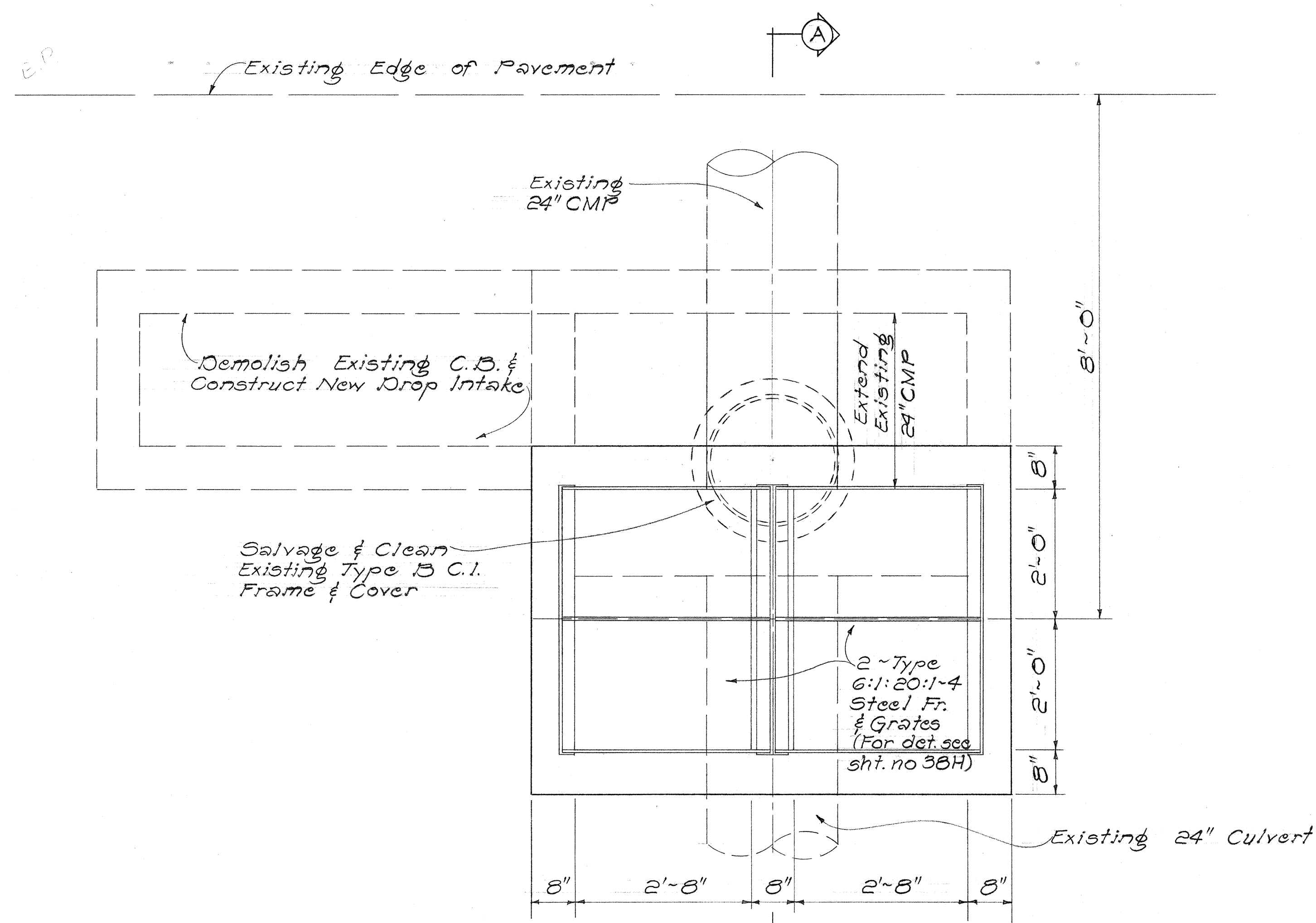
NEW G:1:20:1-4
GRATED DROP INTAKE

Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):10
Scale: 3/4"=1'-0" Date: Apr, 1973

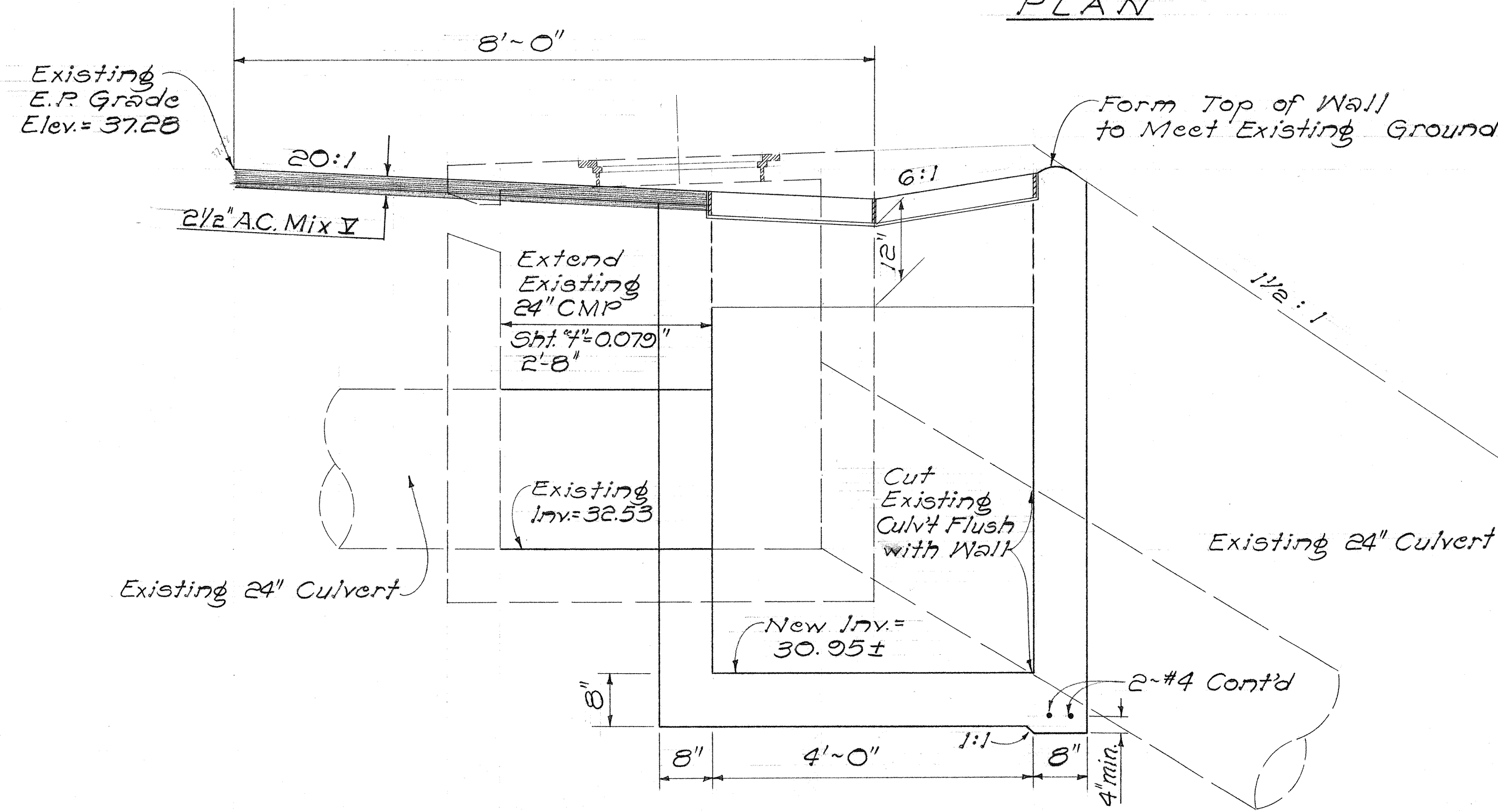
SHEET No. 50 OF 41 HSHEETS

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):10	1973	59	176

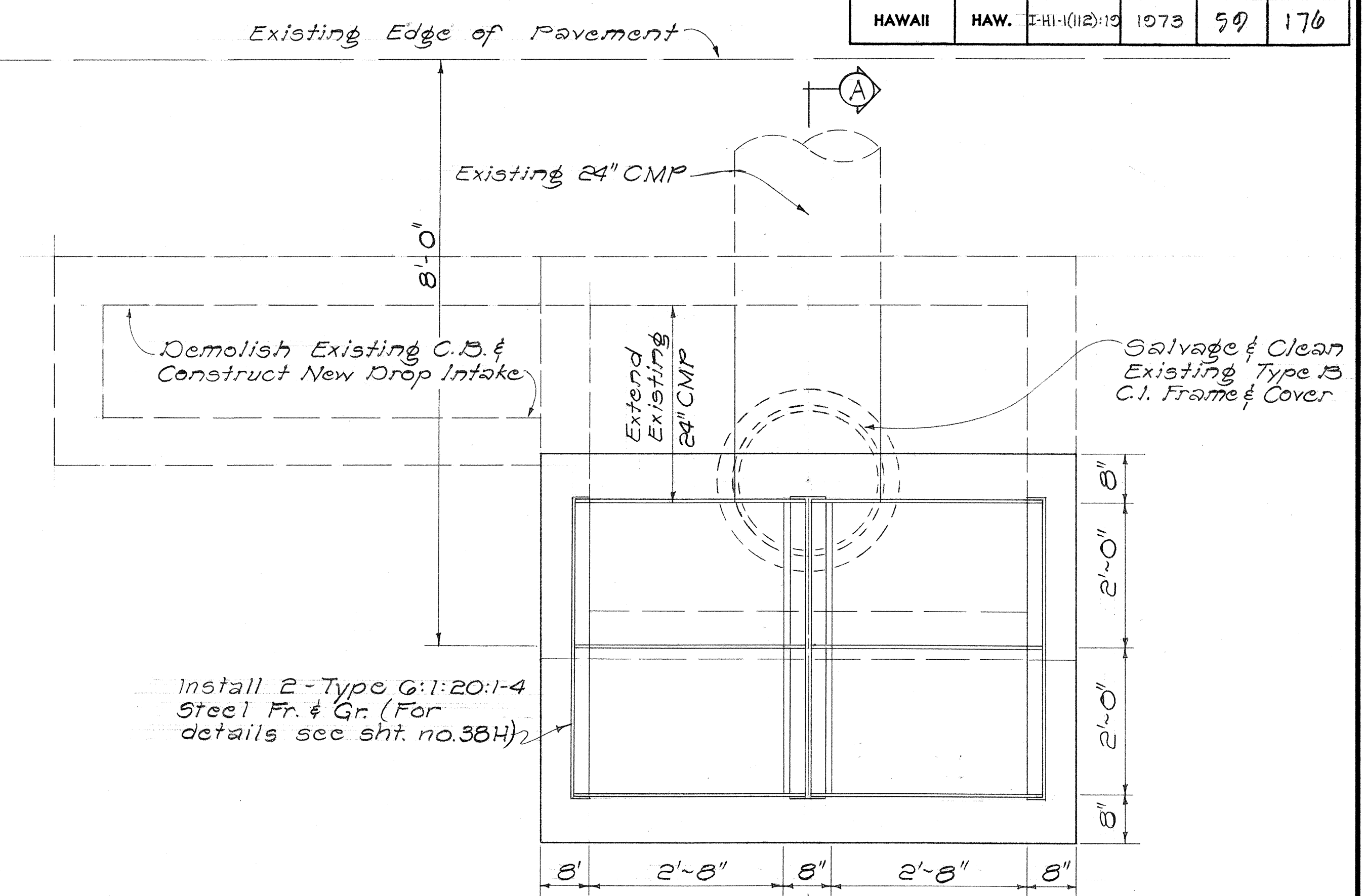


PLAN

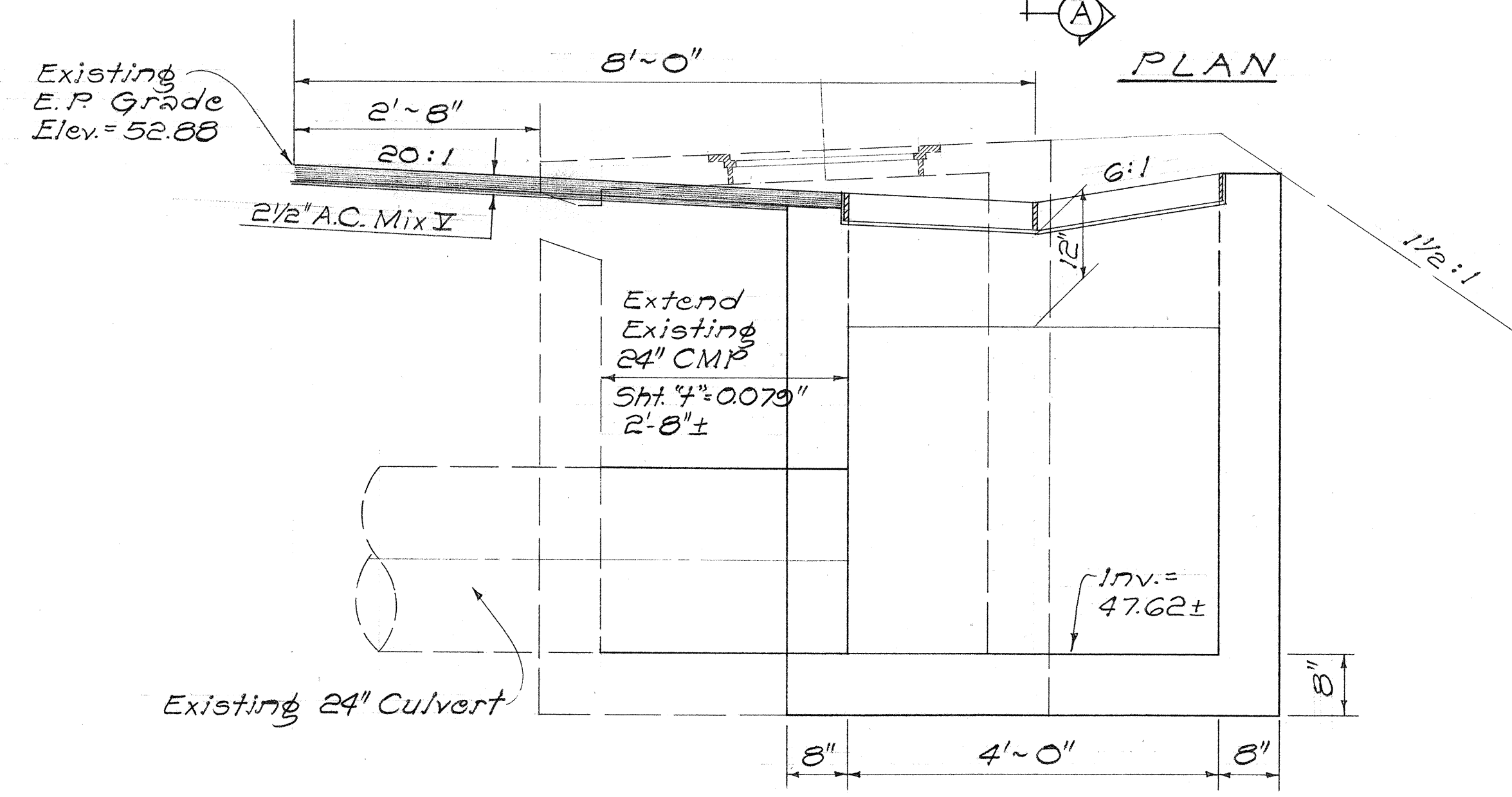


SECTION "A-A"

C.B. #11-F Sta. 67+25 E.B.



PLAN



SECTION "A-A"

C.B. #2-F Ramp K-2 Sta. 18+16±

NOTE:
Except as noted on this sheet, see typical section for notes, dimensions and reinforcing steel details for Type G:1:20:1-4 Grated Drop Intake on sht. no. 39H

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

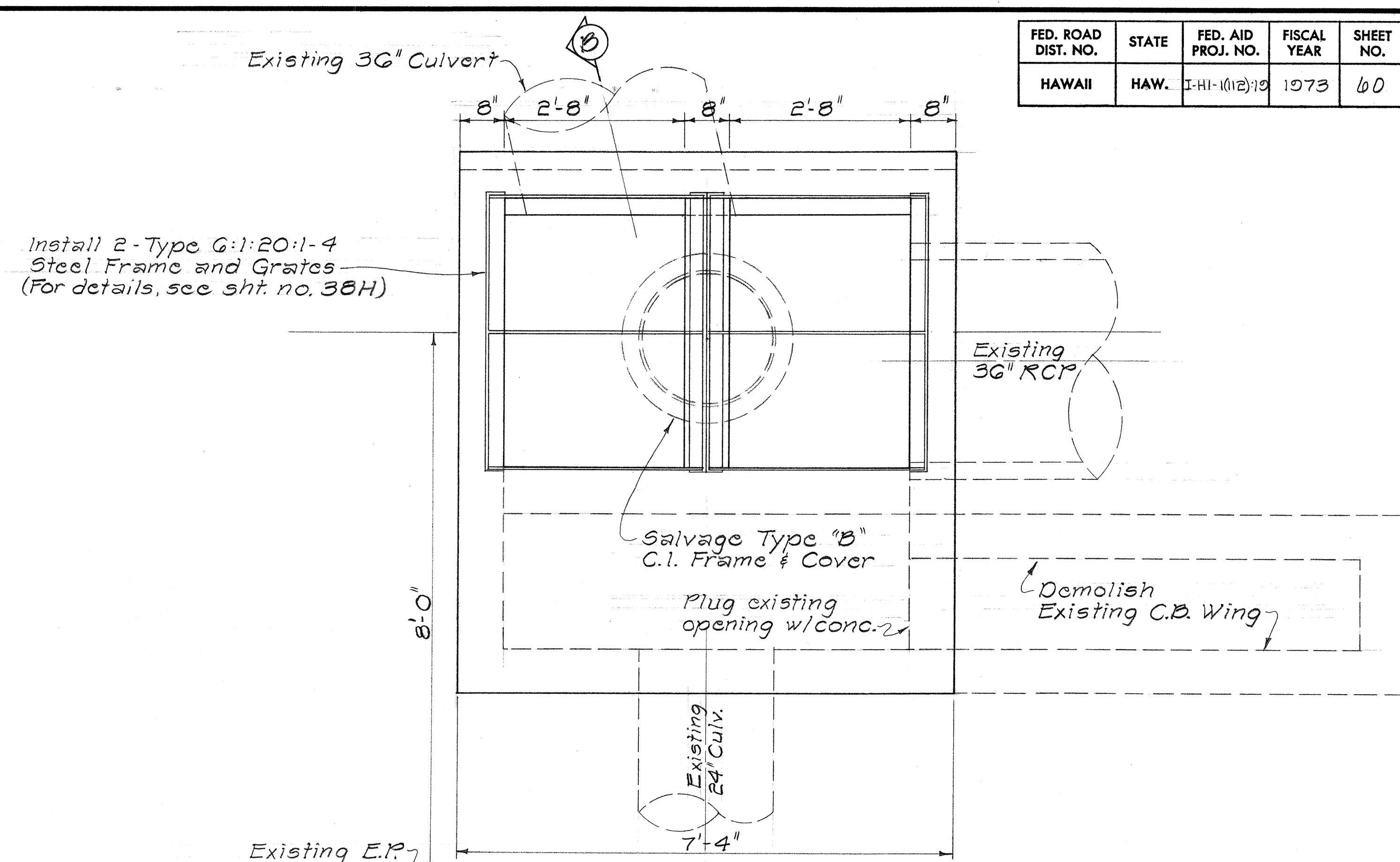
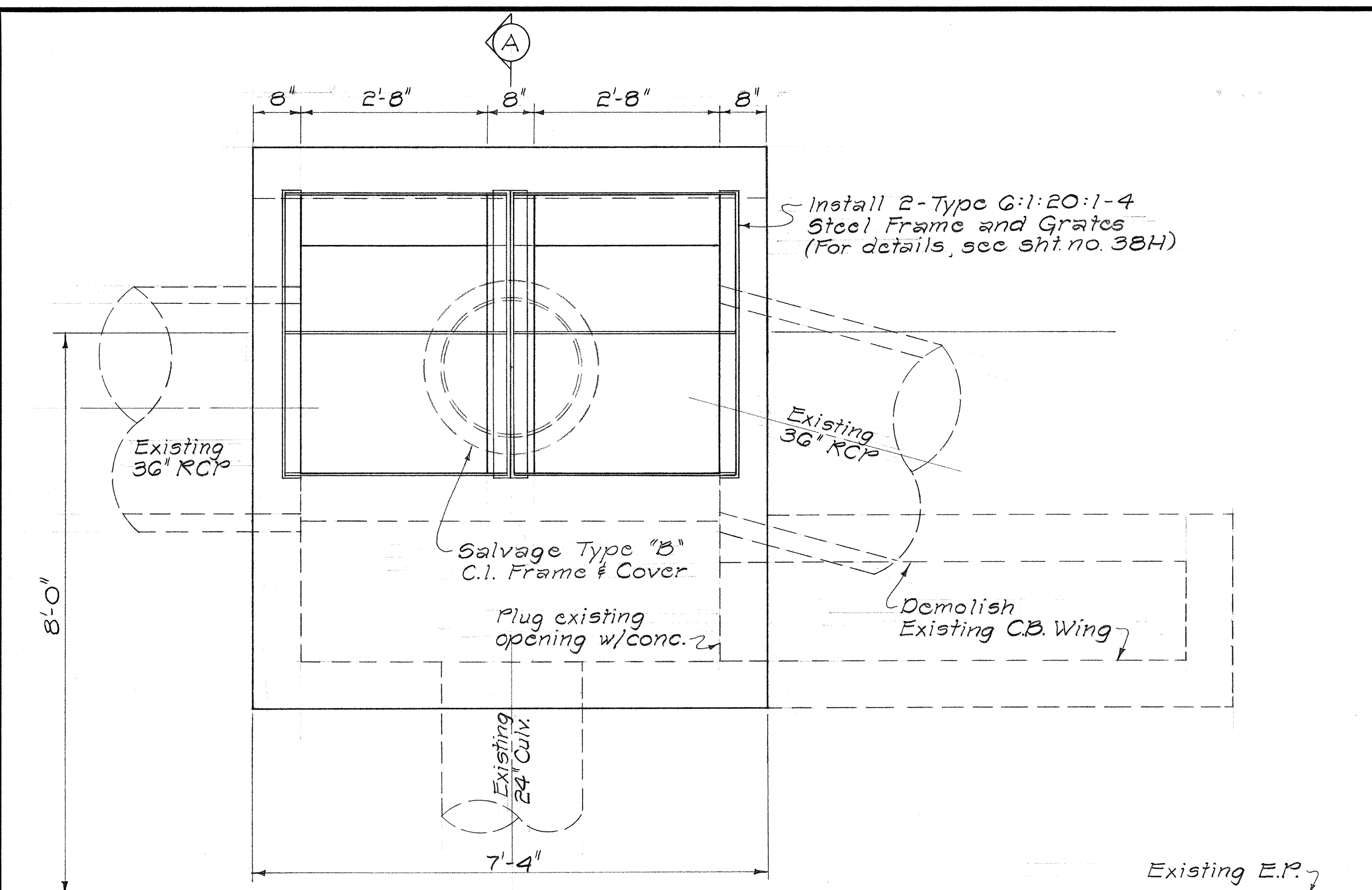
NEW TYPE G:1:20:1-4 GRATED INLETS

Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):10
Scale: 3/4"=1'-0" Date: Apr., 1973

SHEET No. 59 OF 41 H SHEETS

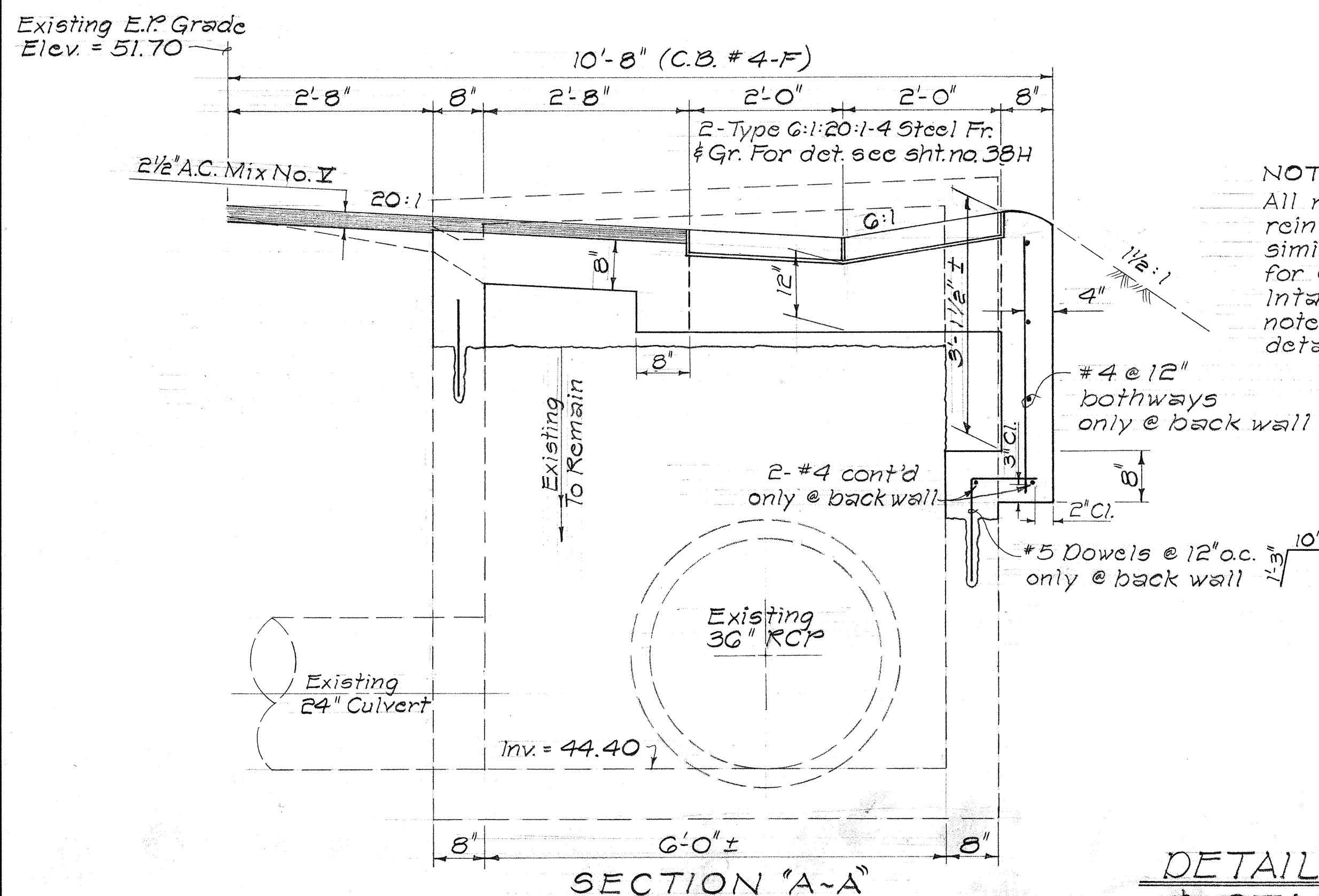
DATE	DESIGNED BY	CHECKED BY
PLAN	NOTED BY	QUANTITIES BY
ORIGINAL	NOTE BOOK	NO.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(112)15	1973	60	176



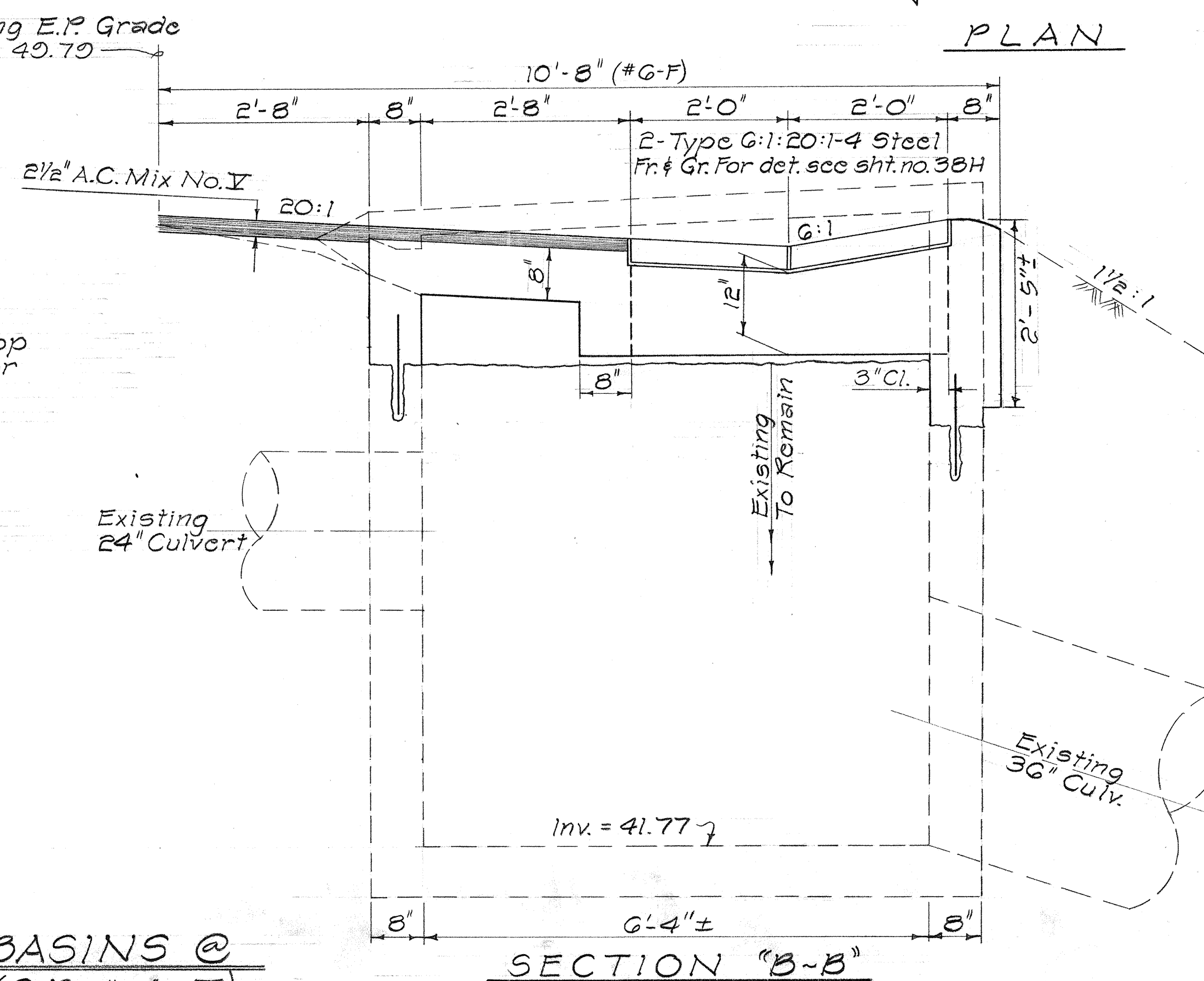
PLAN

PLAN



NOTE:
All notes, dimensions and reinforcing layouts are similar to typical section for G:1:20:1-4 Grated Drop Intake except as shown or noted on this sheet (For details, see sht. no. 38H)

SECTION "A-A"



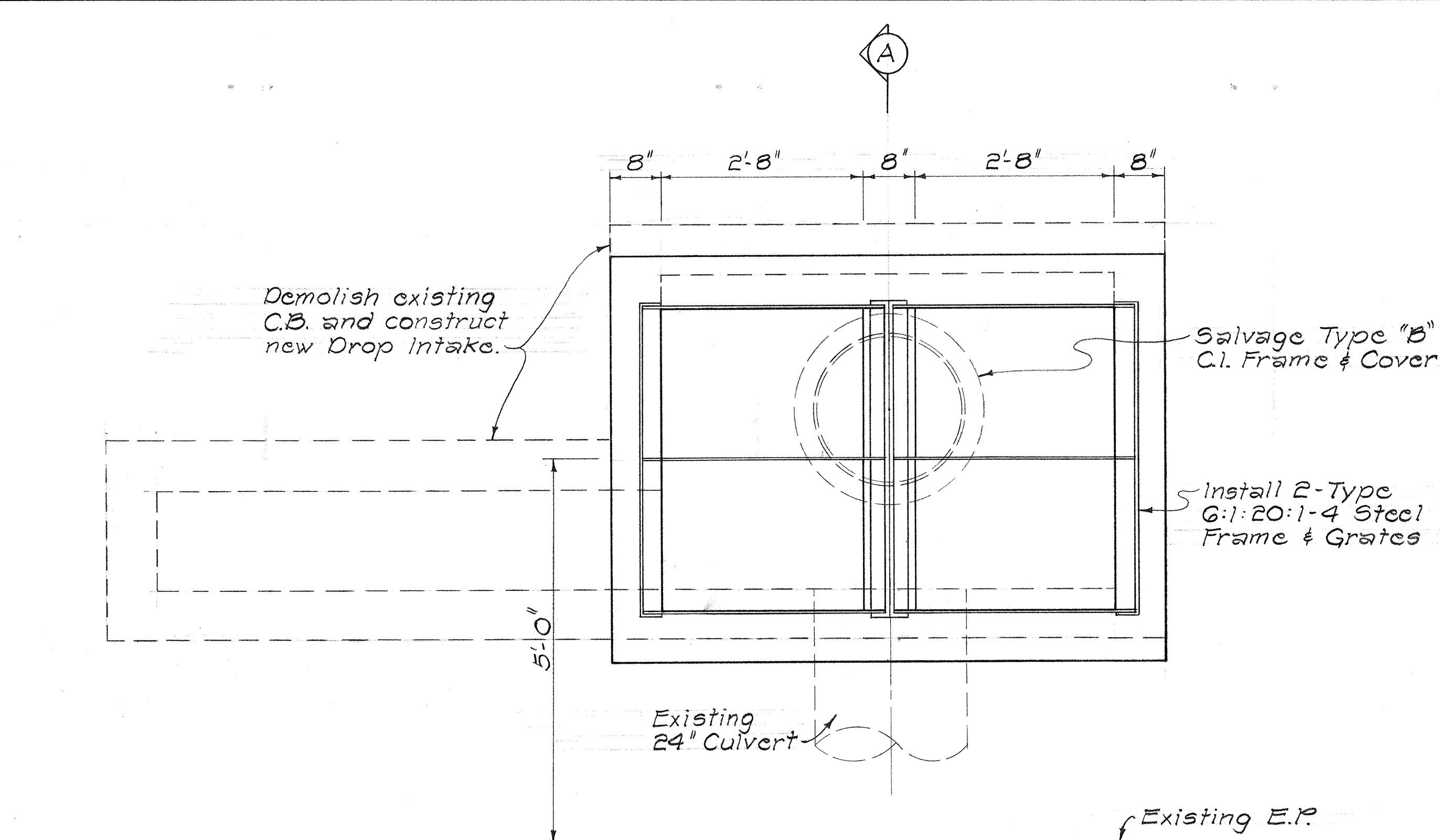
SECTION "B-B"

DETAILS OF CATCH BASINS @
 @ STA. 62+00 E.B. (C.B. #4-F)
 @ STA. 63+75 E.B. (C.B. #6-F)
 Scale: 3/4" = 1'-0"

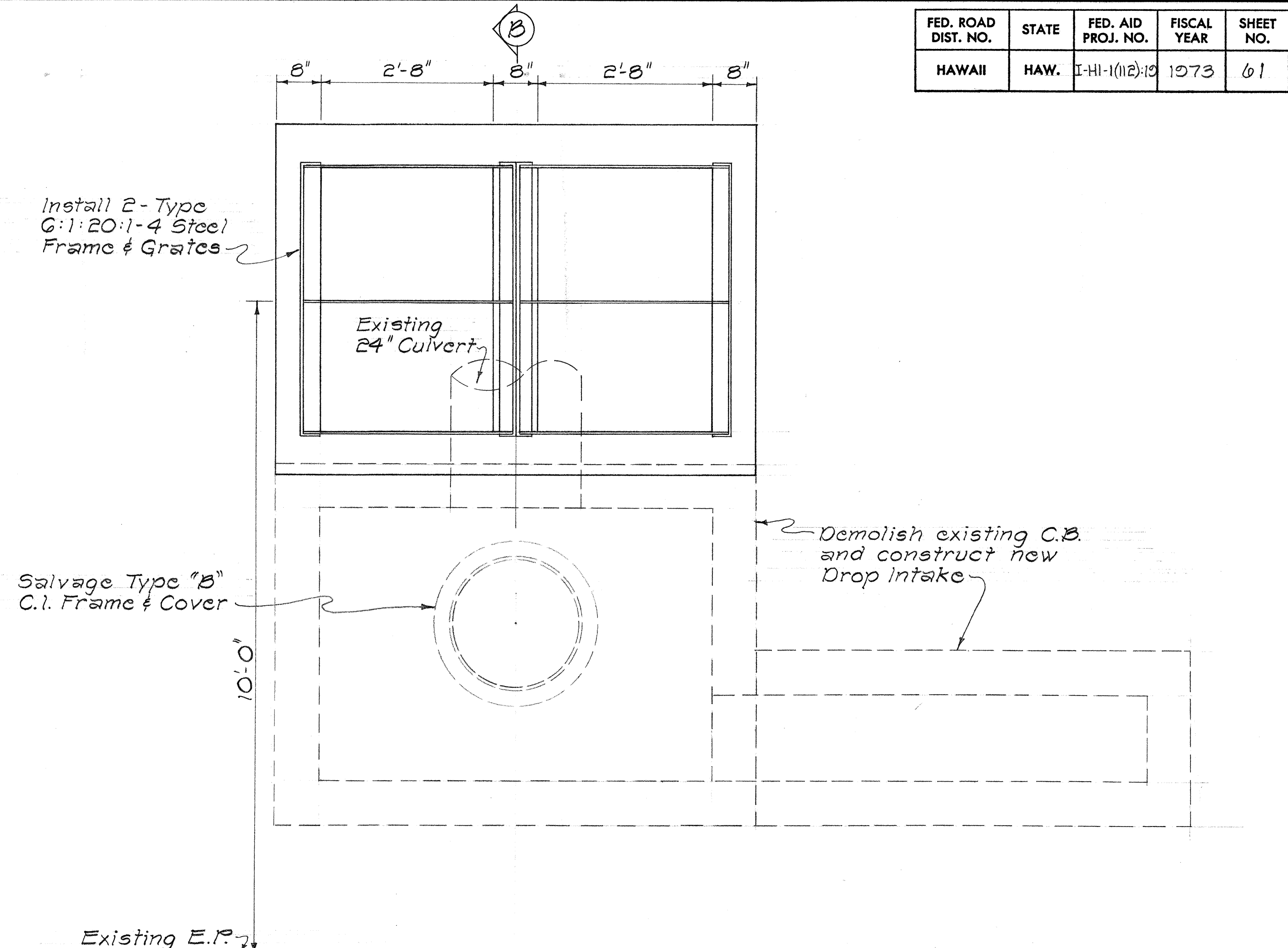
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
DRAINAGE DETAILS
 MODIFICATION OF CATCH BASINS
 WITH TYPE G:1:20:1-4
 GRATED INLET
 Safety Improvements
 Kalihi Street to Pali Highway
 F.A.I. Proj. No. I-H-1(112)15
 Scale: 3/4"=1'-0" Date: Apr., 1973
SHEET No. 10H OF 41H SHEETS

DESIGNED BY	DATE
CHECKED BY	
NOTED BY	
ORIGINAL PLAN	

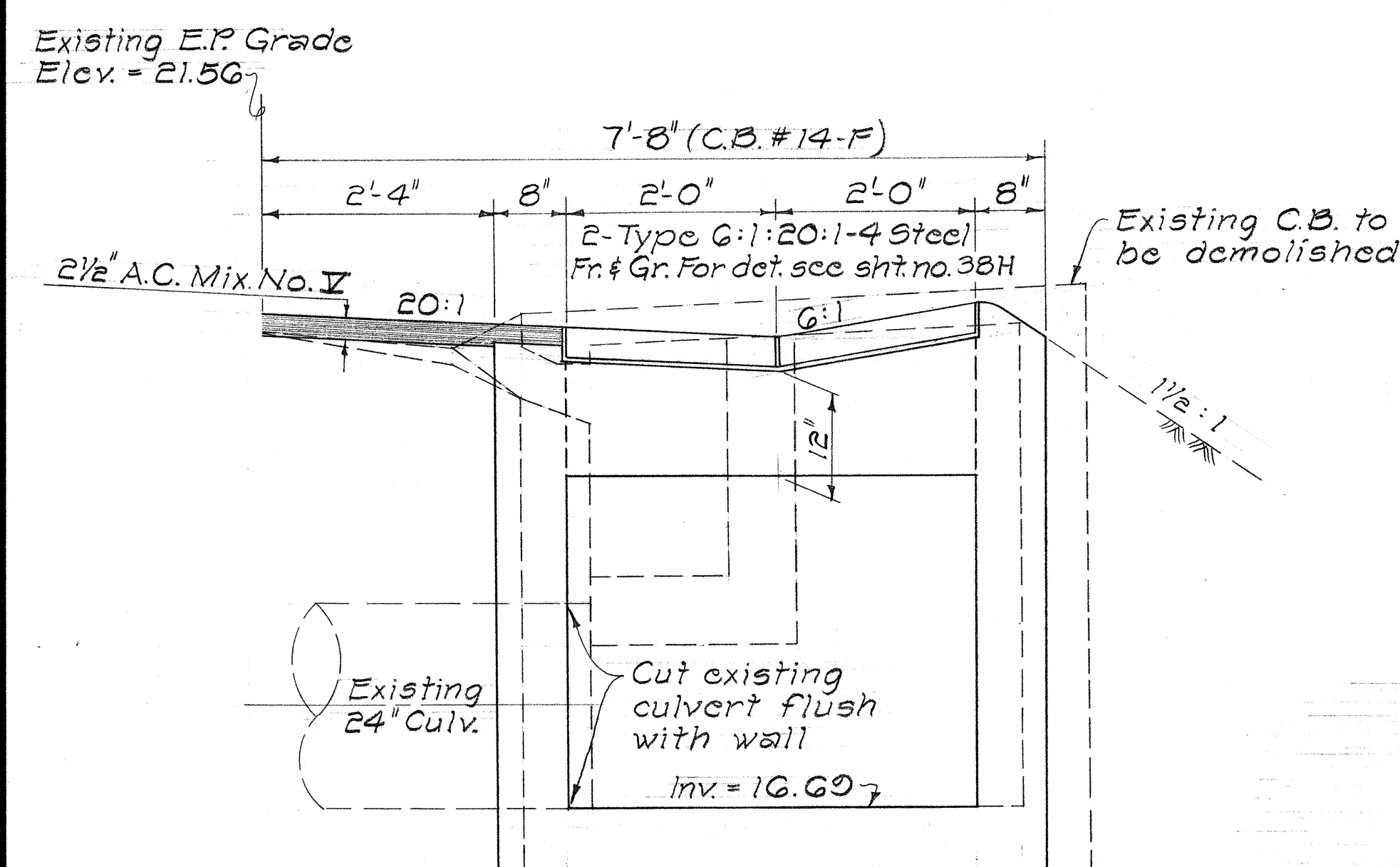
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112)-12	1973	61	176



PLAN

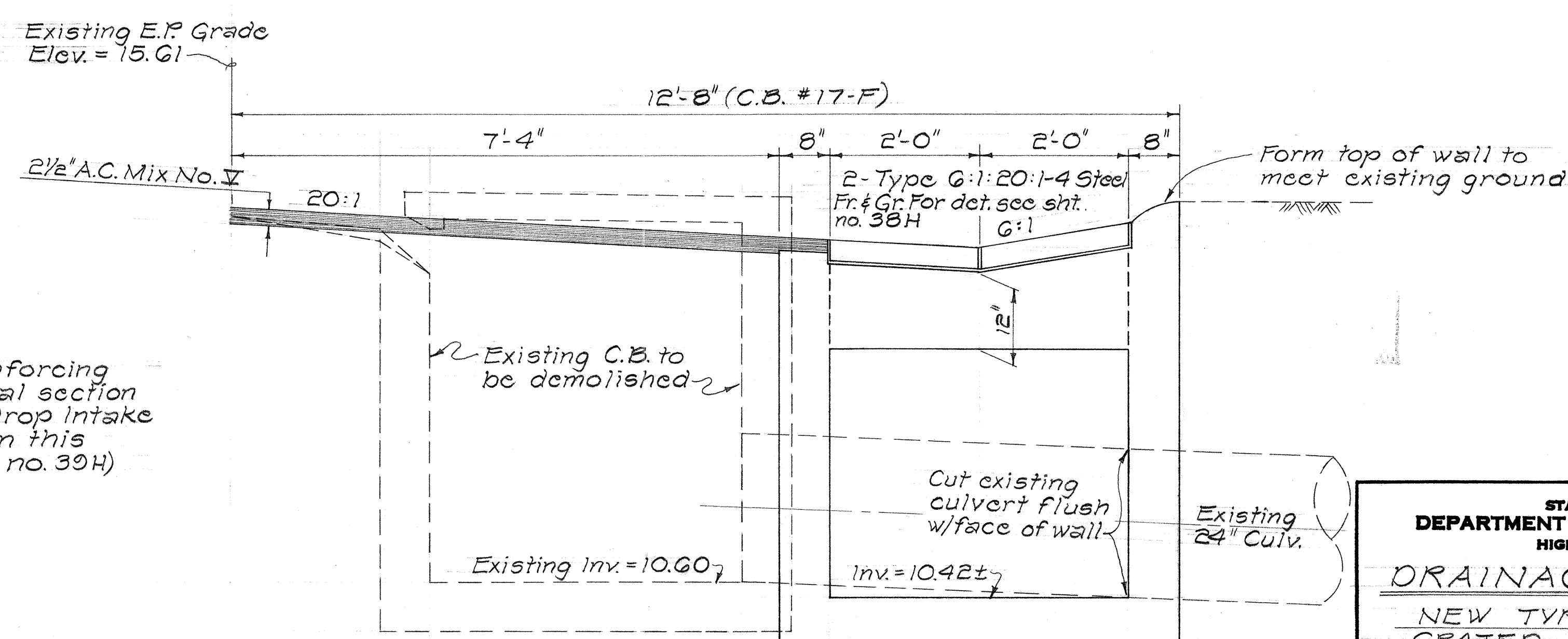


PLAN



SECTION "A-A"

NOTE:
All notes, dimensions and reinforcing layouts are similar to typical section for new G:1:20:1-4 Grated Drop Intake except as shown or noted on this sheet. (For details, see sht. no. 39H)



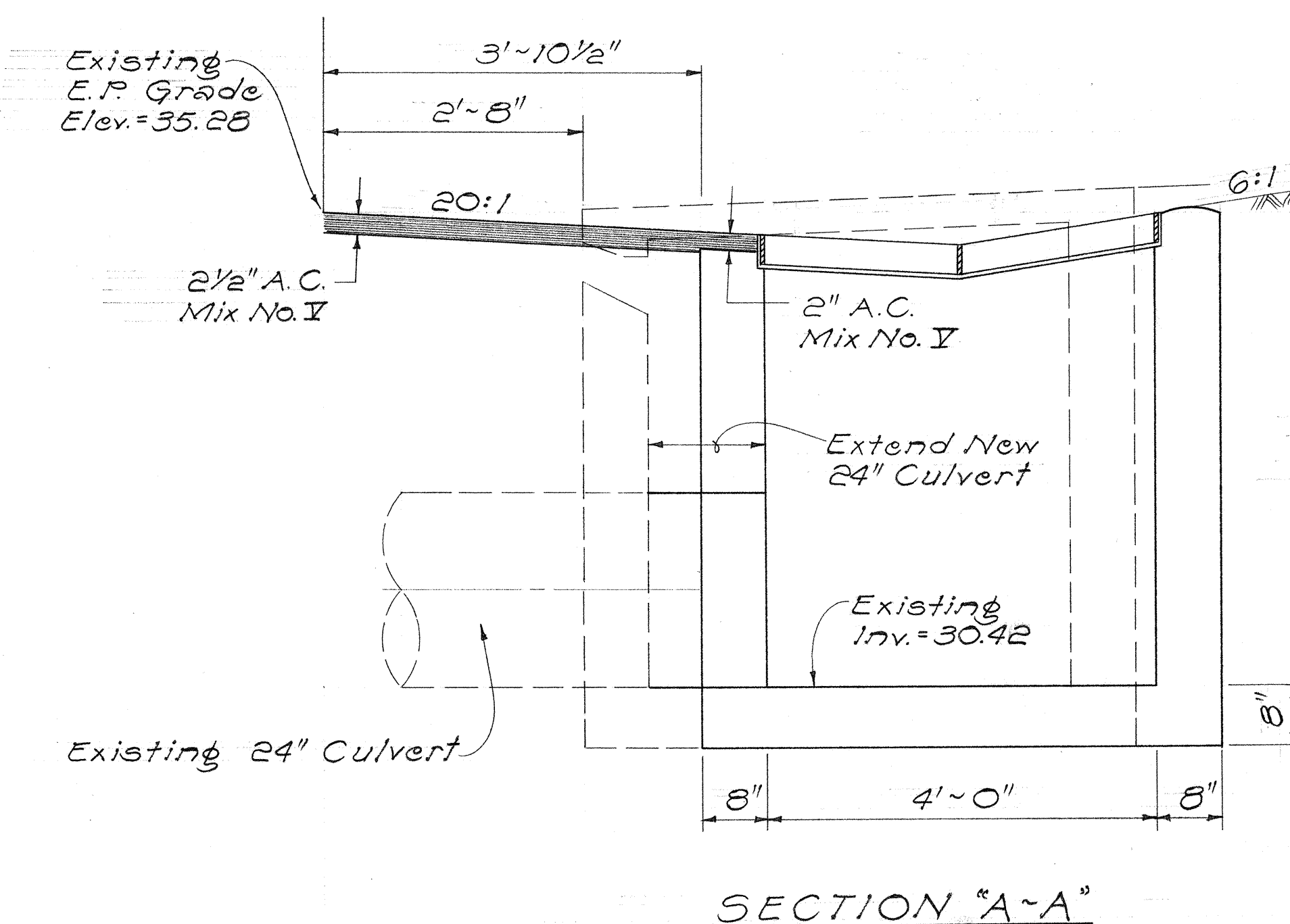
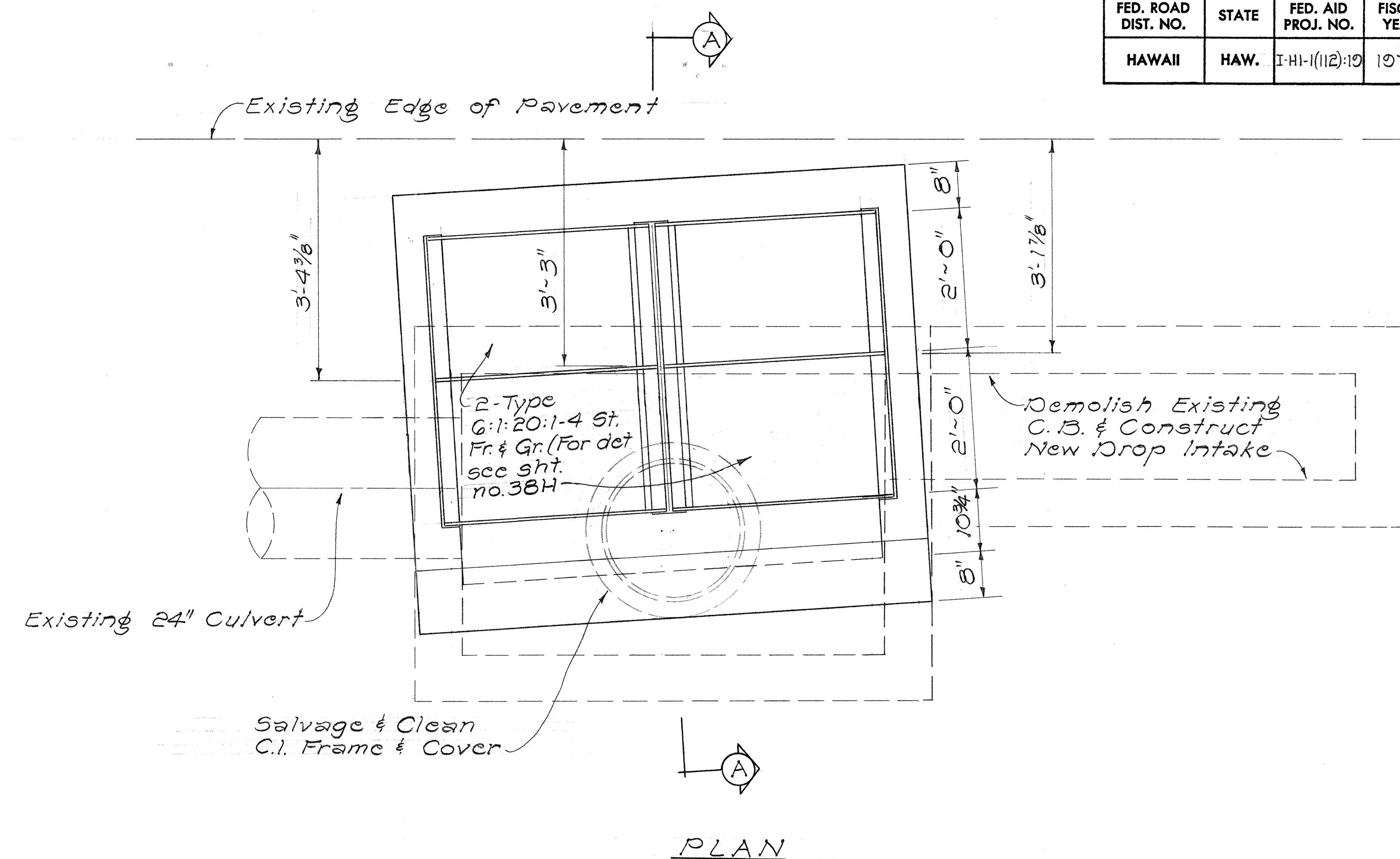
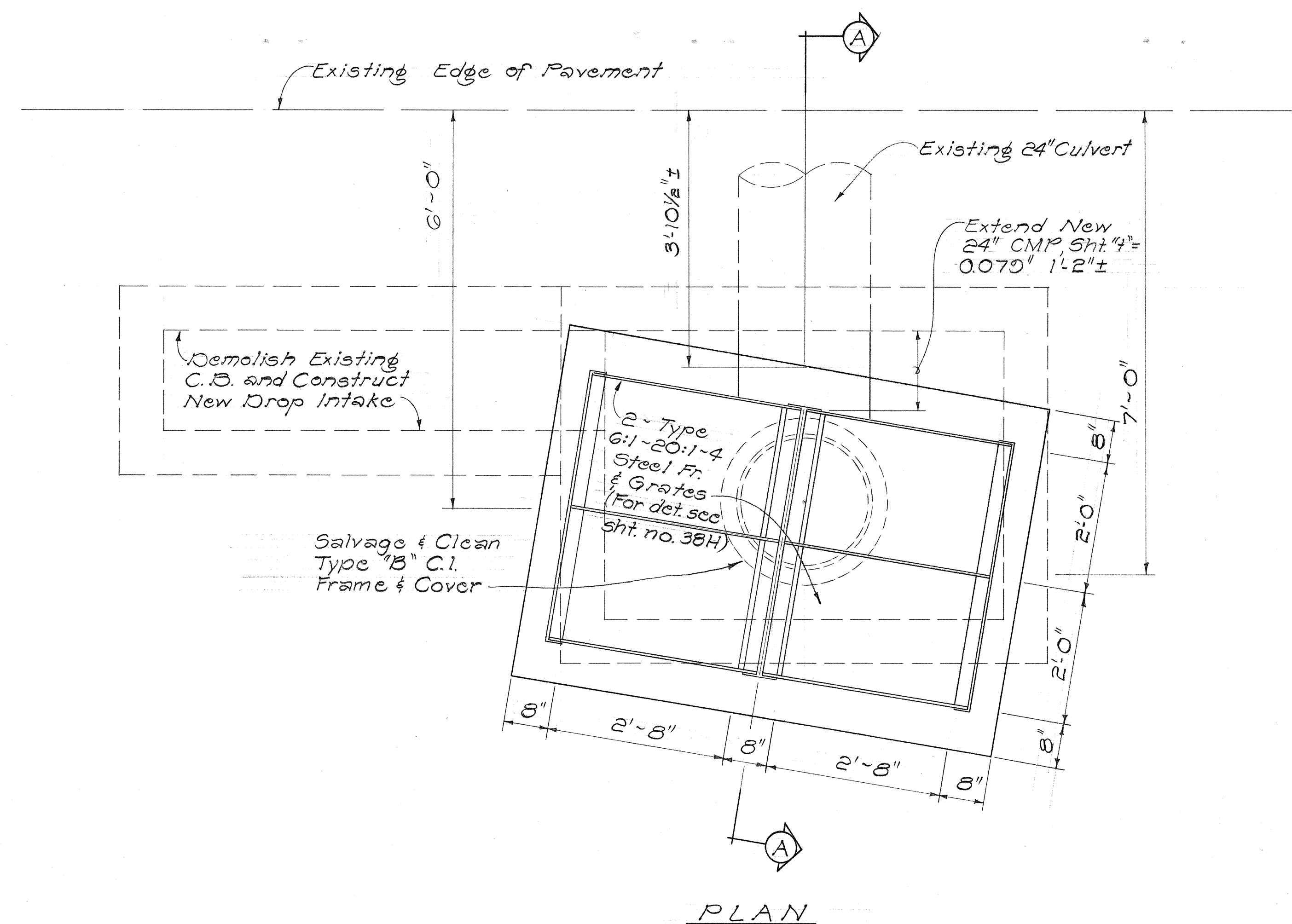
SECTION "B-B"

NEW G:1:20:1-4 GRATED DROP INTAKE
 @ STA. 70 + 75 W.B. (C.B. #14-F)
 @ STA. 73 + 25 E.B. (C.B. #17-F)
 Scale: 3/4" = 1'-0"

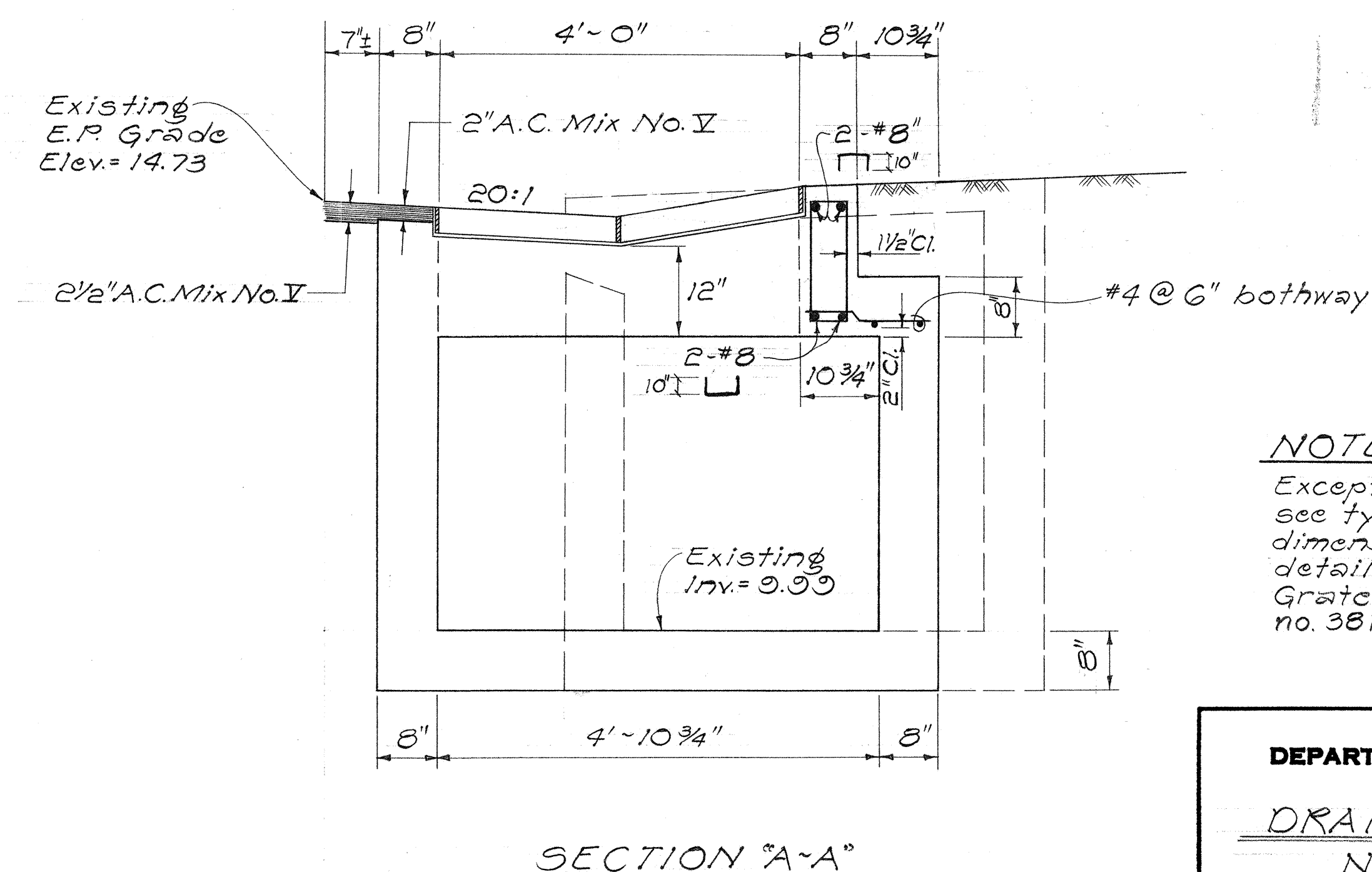
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
DRAINAGE DETAILS
 NEW TYPE G:1:20:1-4
 GRATED DROP INTAKE
 Safety Improvements
 Kalihi Street to Pali Highway
 F.A.I. Proj. No. I-HI-1(112)-10
 Scale: 3/4" = 1'-0" Date: Apr, 1973
SHEET No. 114 OF 41 SHEETS

DATE	.....
SURVEY MONITOR 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.	I-HI-1(112):19	1973	62	176



NOTE:
Except as noted on this sheet see typical section for notes, dimensions and reinforcing steel details for Type G:1-20:1-4 Grated Drop Intake on sht. no. 39H



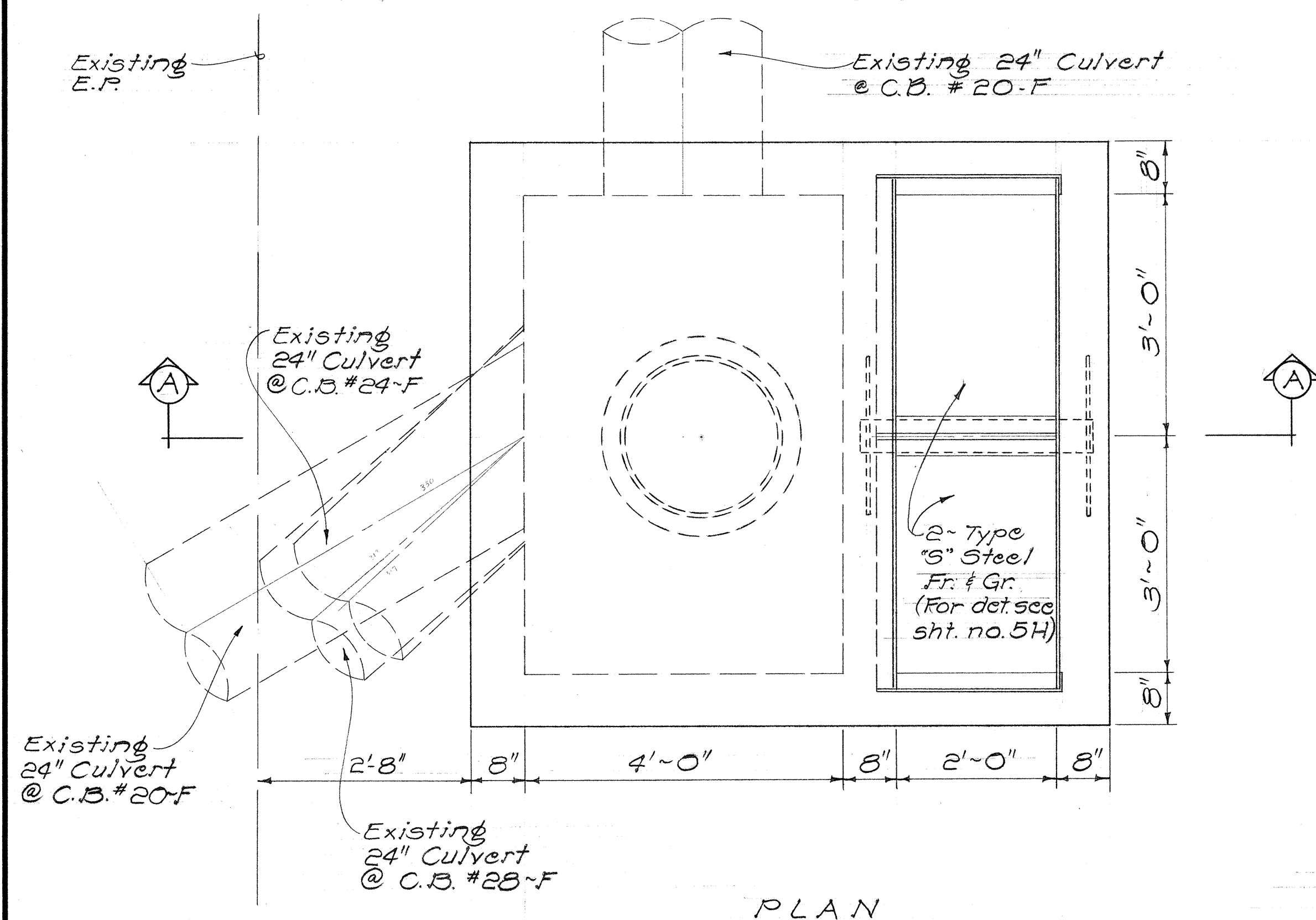
NOTE:
Except as noted on this sheet see typical section for notes, dimension and reinforcing steel details for Type G:1-20:1-4 Grated Drop Intake on sht. no. 38H.

C.B. #18-F 'R-1' STA. 2+10

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
NEW G:1-20:1-4
GRADED DROP INTAKE
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):19
Scale: 3/4" = 1'-0" Date: April, 1973
SHEET No. 124 OF 41 SHEETS

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

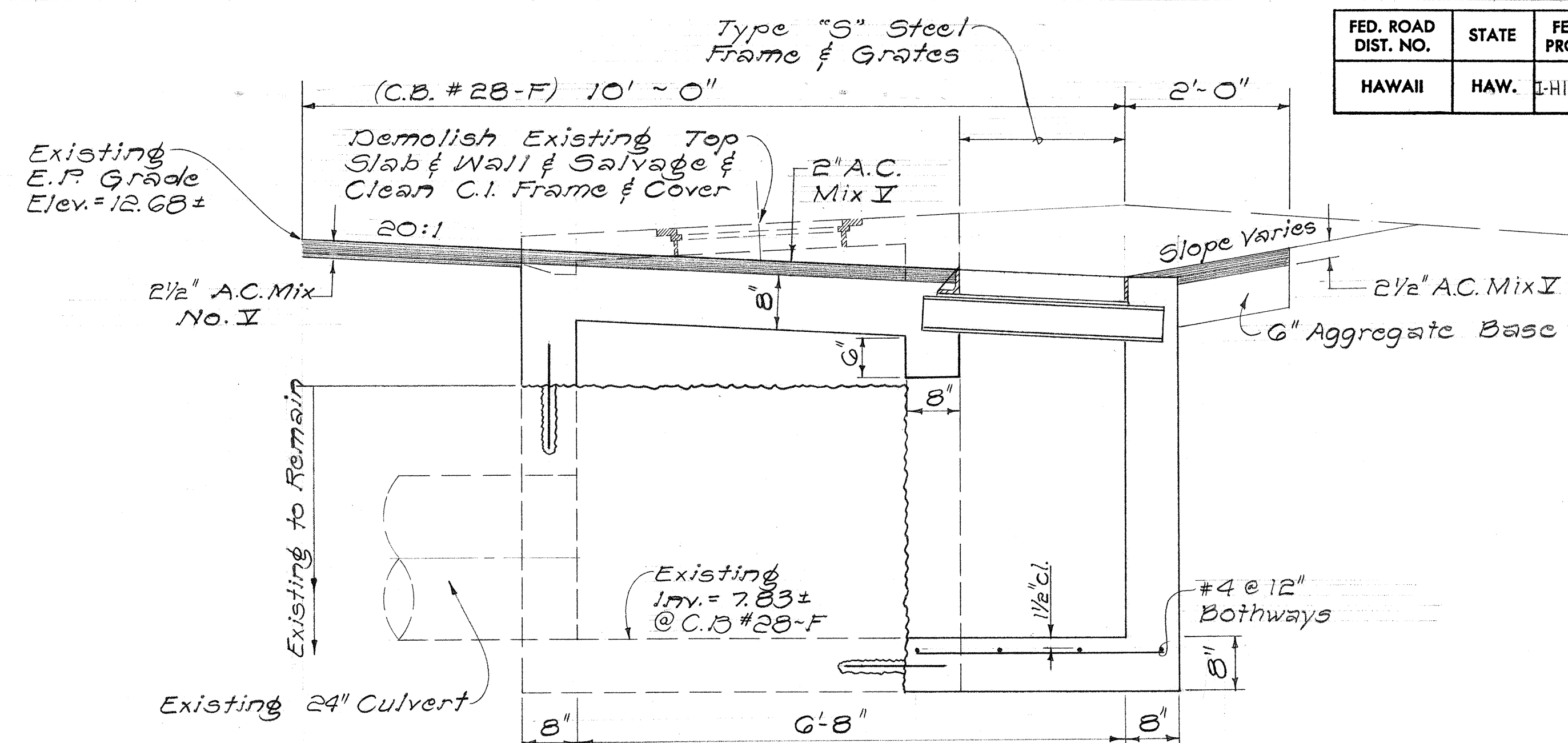
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):10	1973	63	176



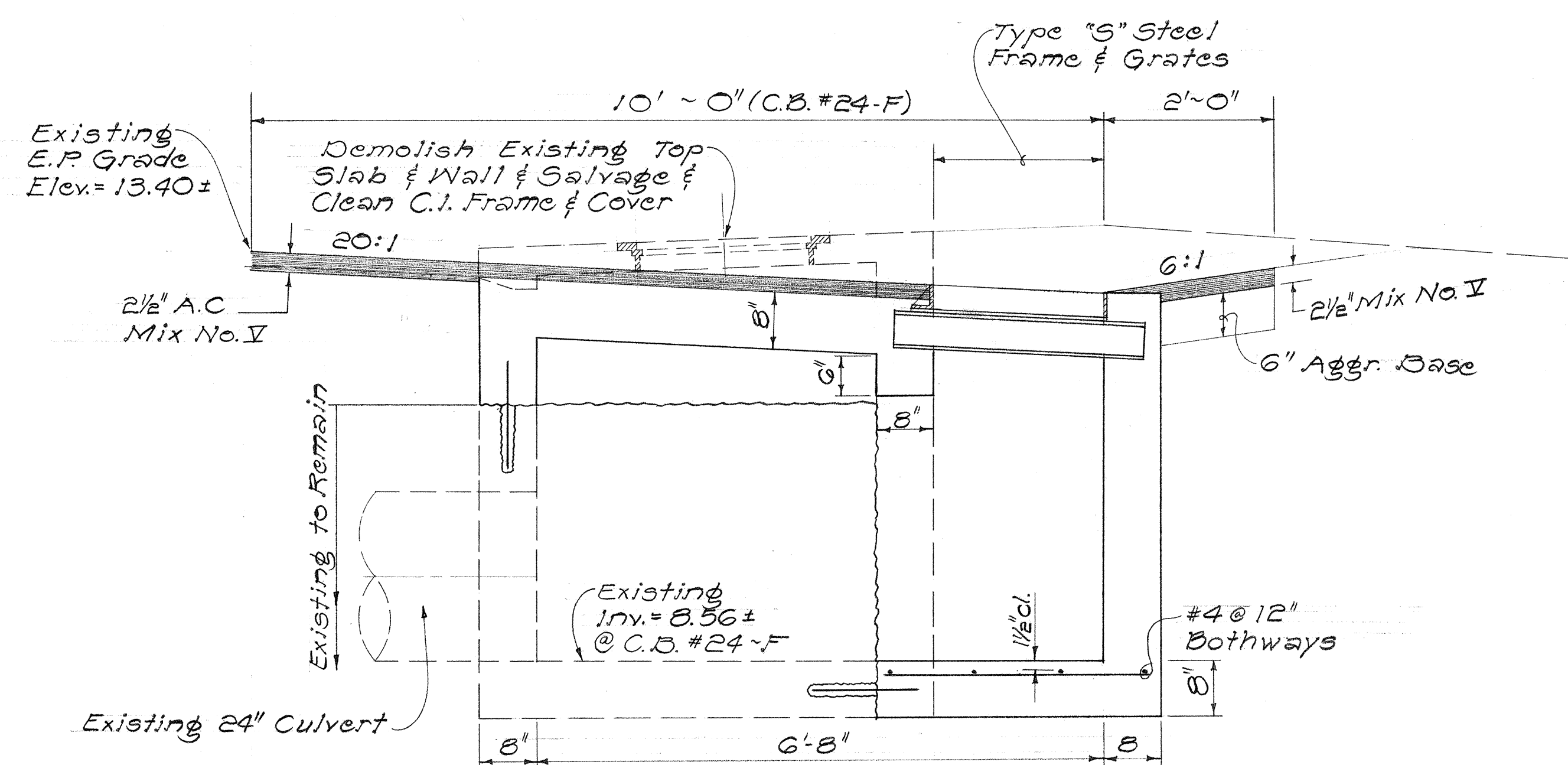
PLAN

NOTE:

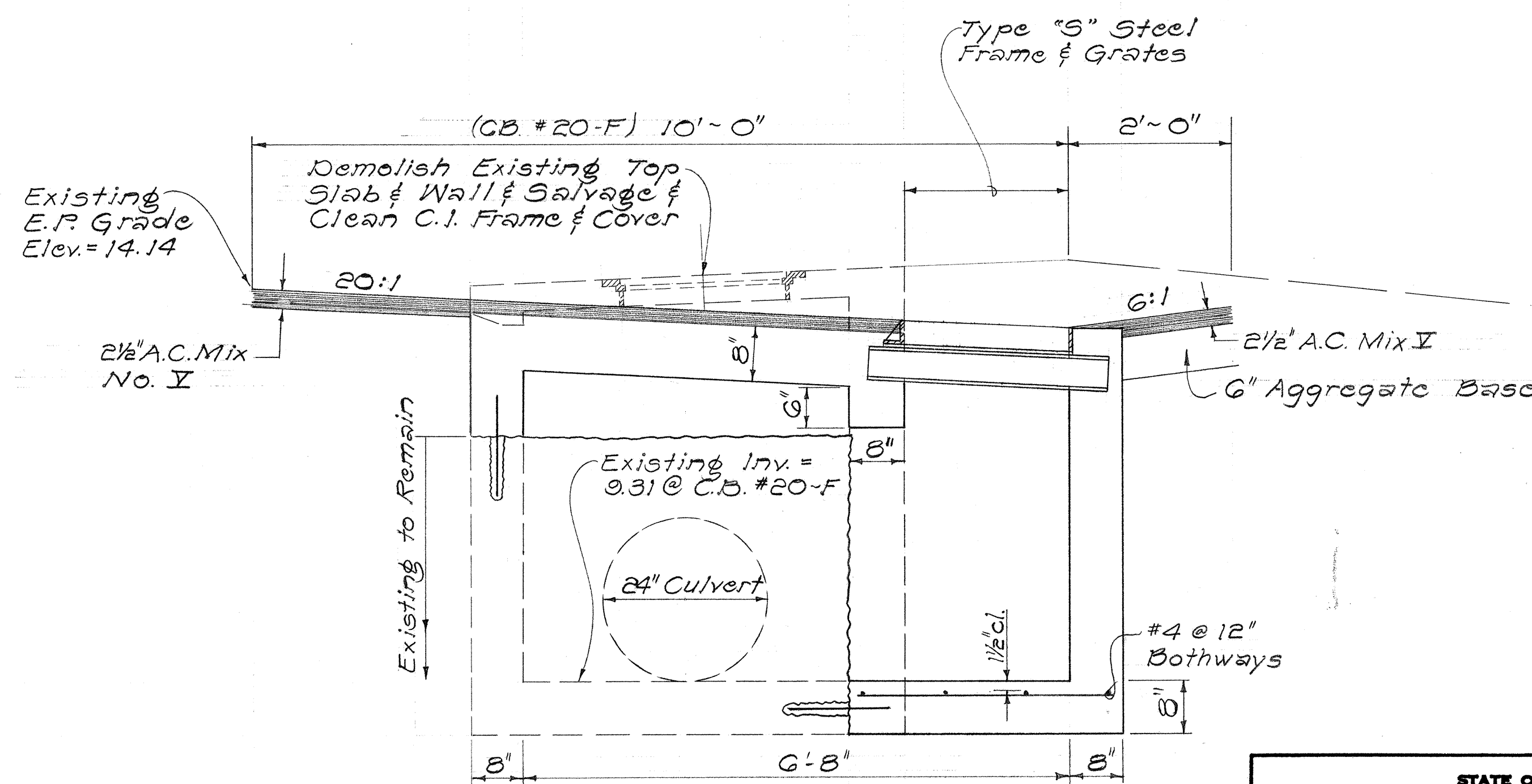
All notes, dimensions and reinforcing layouts are similar to typical section for Type "S" Grated Drop Intake except as shown or noted on this sheet (For details, see sht. no. 39H)



SECTION "A-A"



SECTION "A-A"



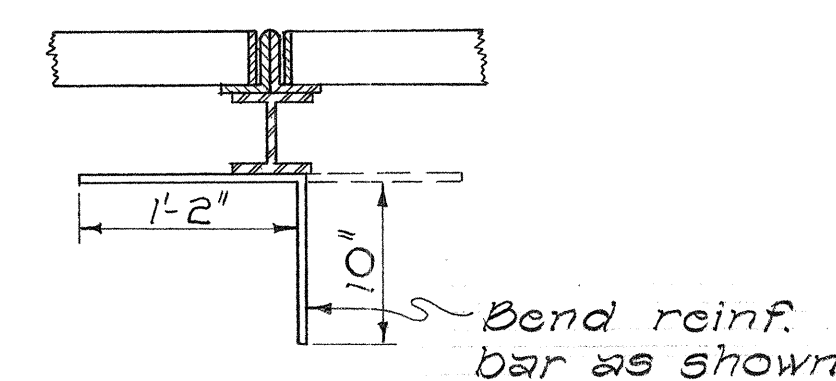
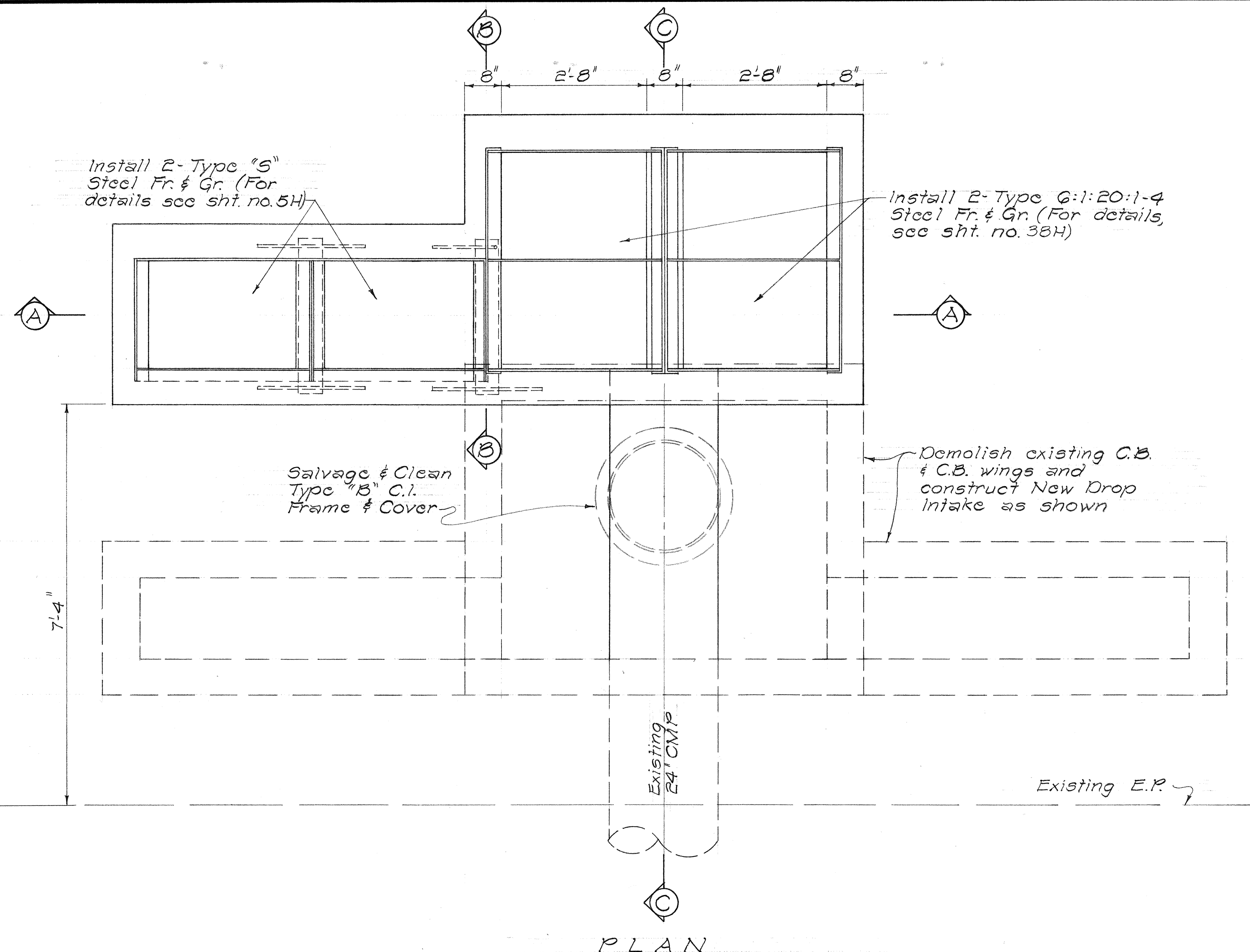
SECTION "A-A"

DETAILS OF CATCH BASINS AT
 STA. 77+00 W.B. (C.B. #24-F)
 STA. 78+80 (C.B. #28-F)
 STA. 0+45 R-1 (C.B. #20-F)

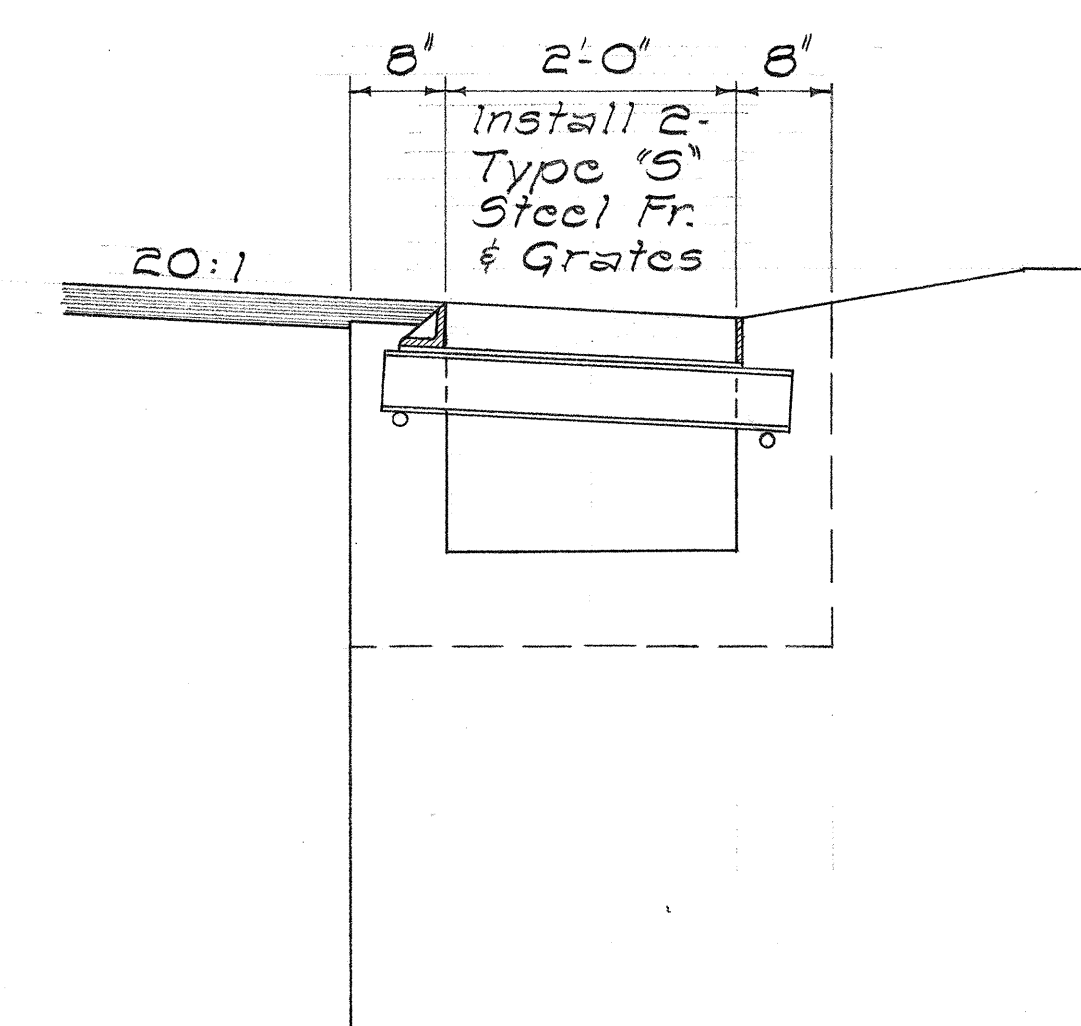
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 DRAINAGE DETAILS
 MODIFICATIONS OF CATCH BASINS
 WITH TYPE "S" GRATED INLET
 Safety Improvements
 Kalihi Street to Pali Highway
 F.A.I. Proj. No. I-HI-1(112):10
 Scale: 3/4"=1'-0" Date: Apr. 1973
 SHEET No. 13H OF 41 H SHEETS

DESIGNED BY	DATE
CHECKED BY	
NOTED BY	
ORIGINAL PLAN	
NO.	

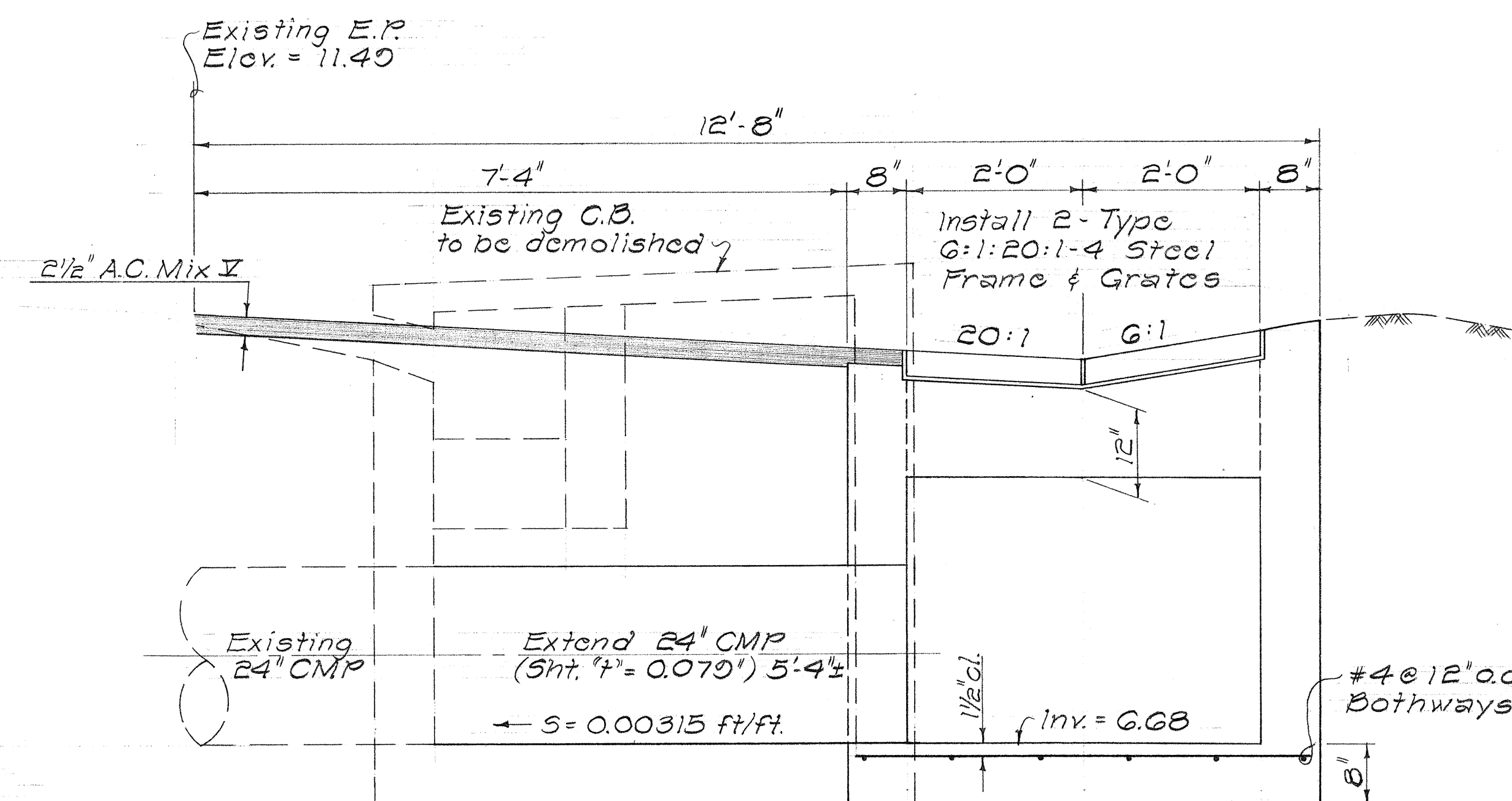
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(112):12	1973	64	176



DETAIL "D"
Scale: 1" = 1'-0"



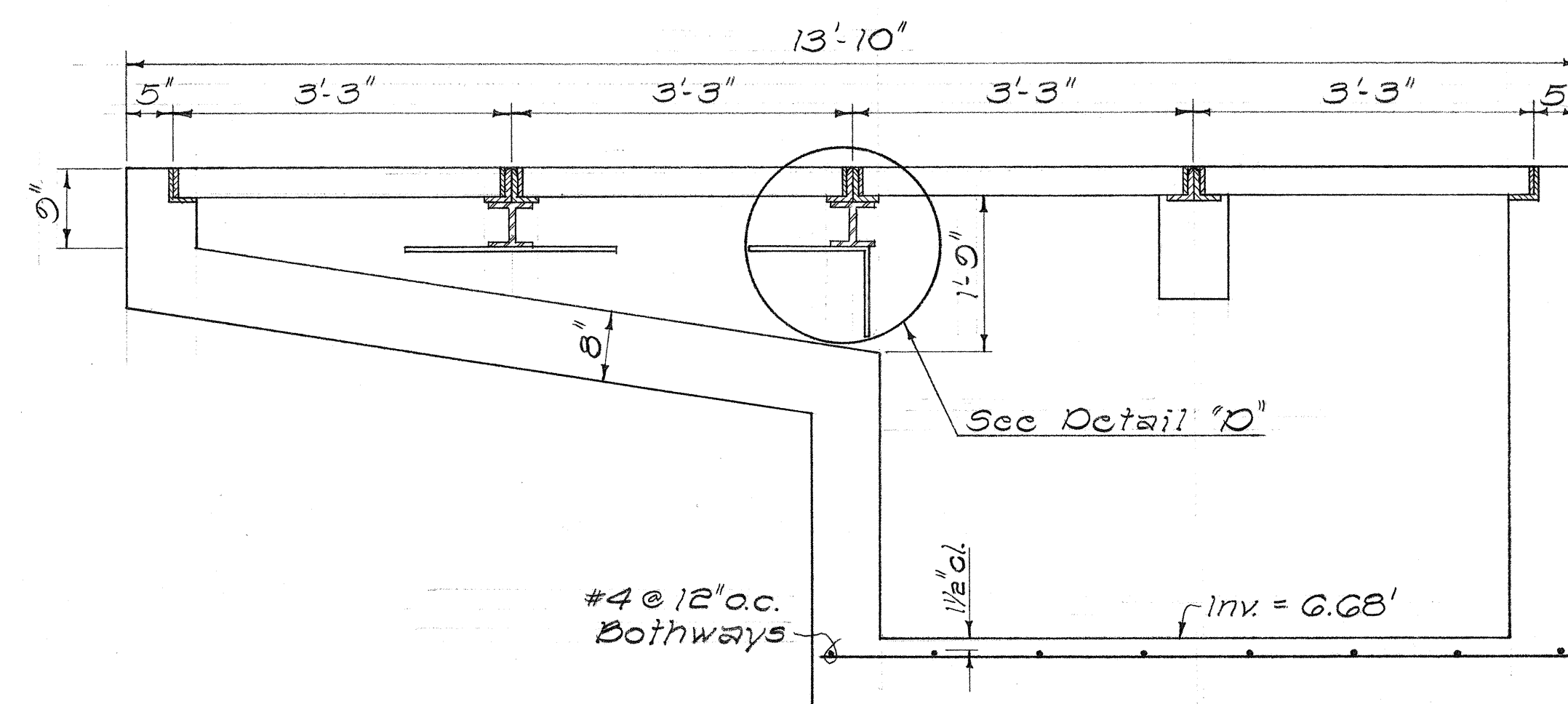
SECTION "B-B"



SECTION "C-C"

NOTE:

All notes, dimensions and reinforcing layouts are similar to typical section for Type G:1:20:1-4 Grated Drop Intake except as shown or noted on this sheet. (For details, see sht. no. 38H)



SECTION "A-A"

NEW G:1:20:1-4 GRATED DROP INTAKE

@ STA. 81 + 75 W.B. (C.B. #32-F)

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

NEW TYPE G:1:20:1-4
GRATED DROP INTAKE

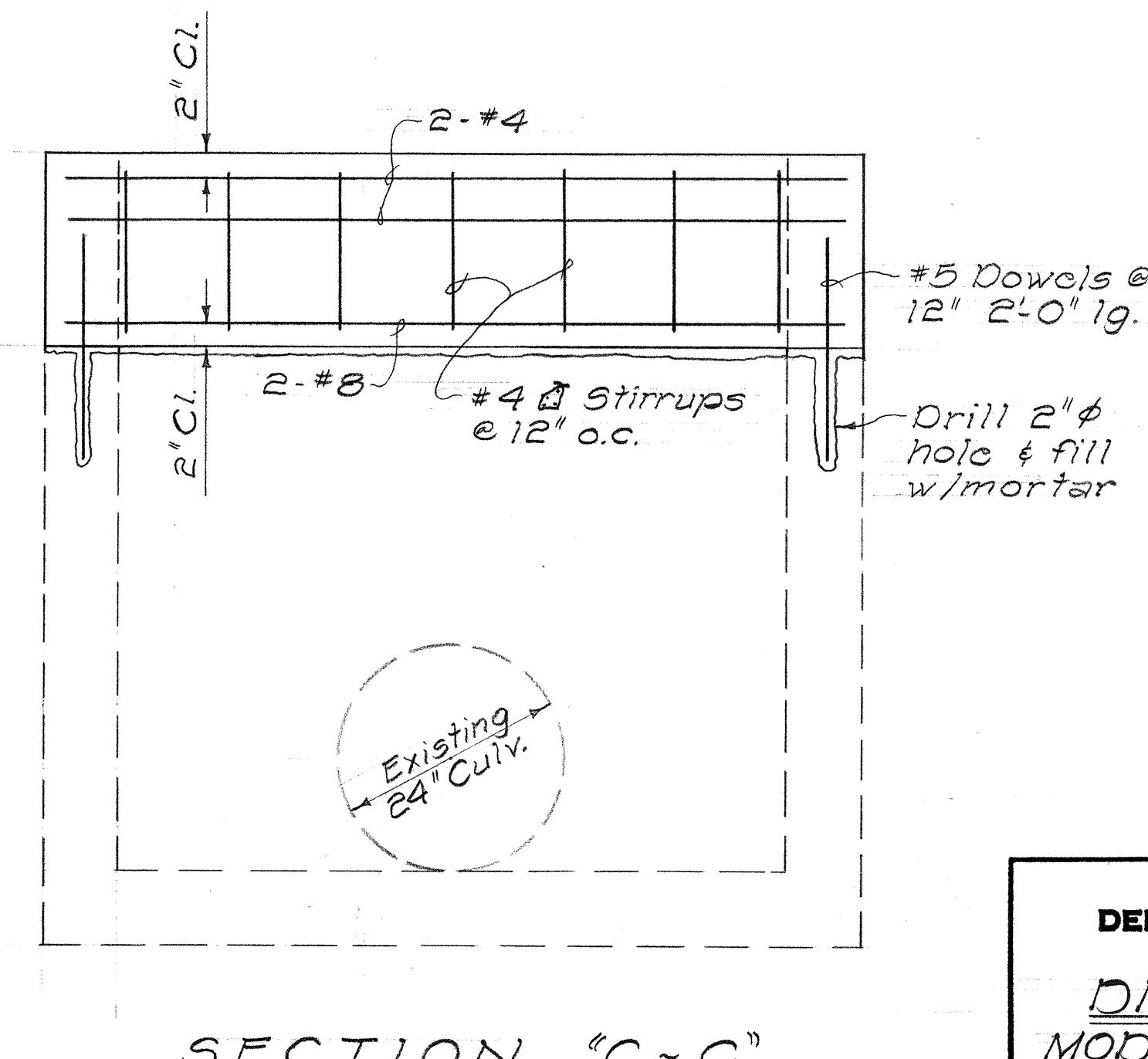
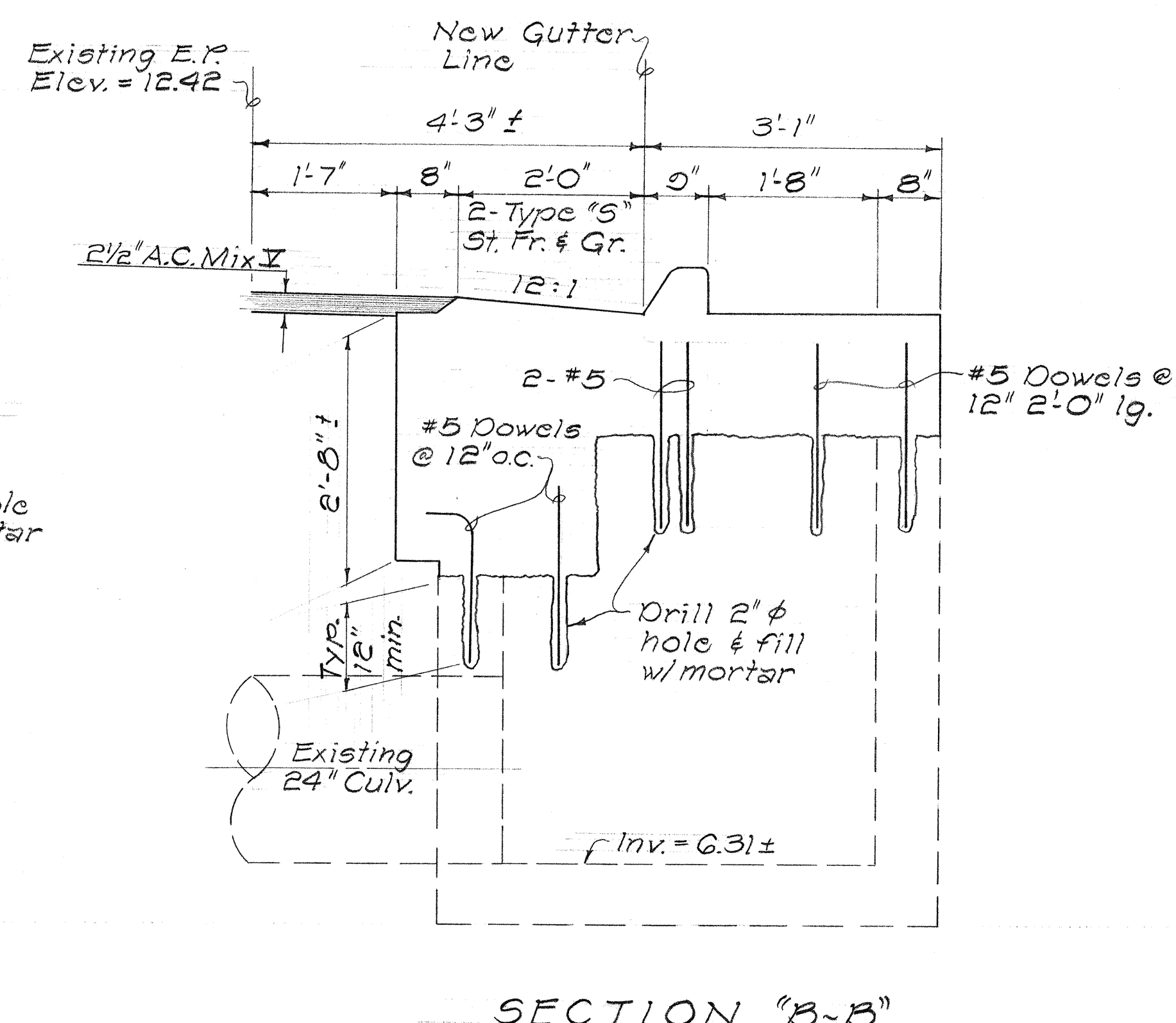
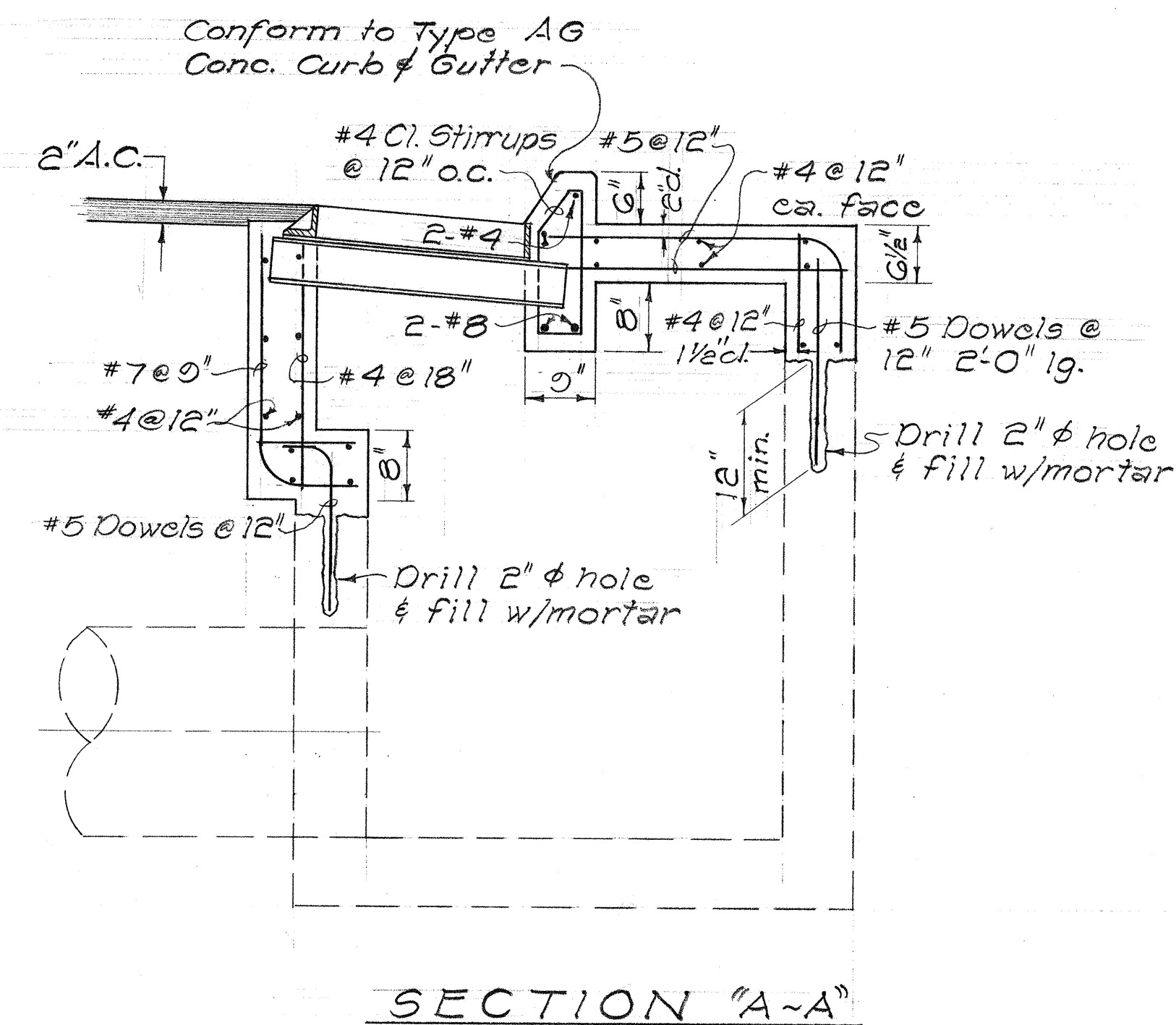
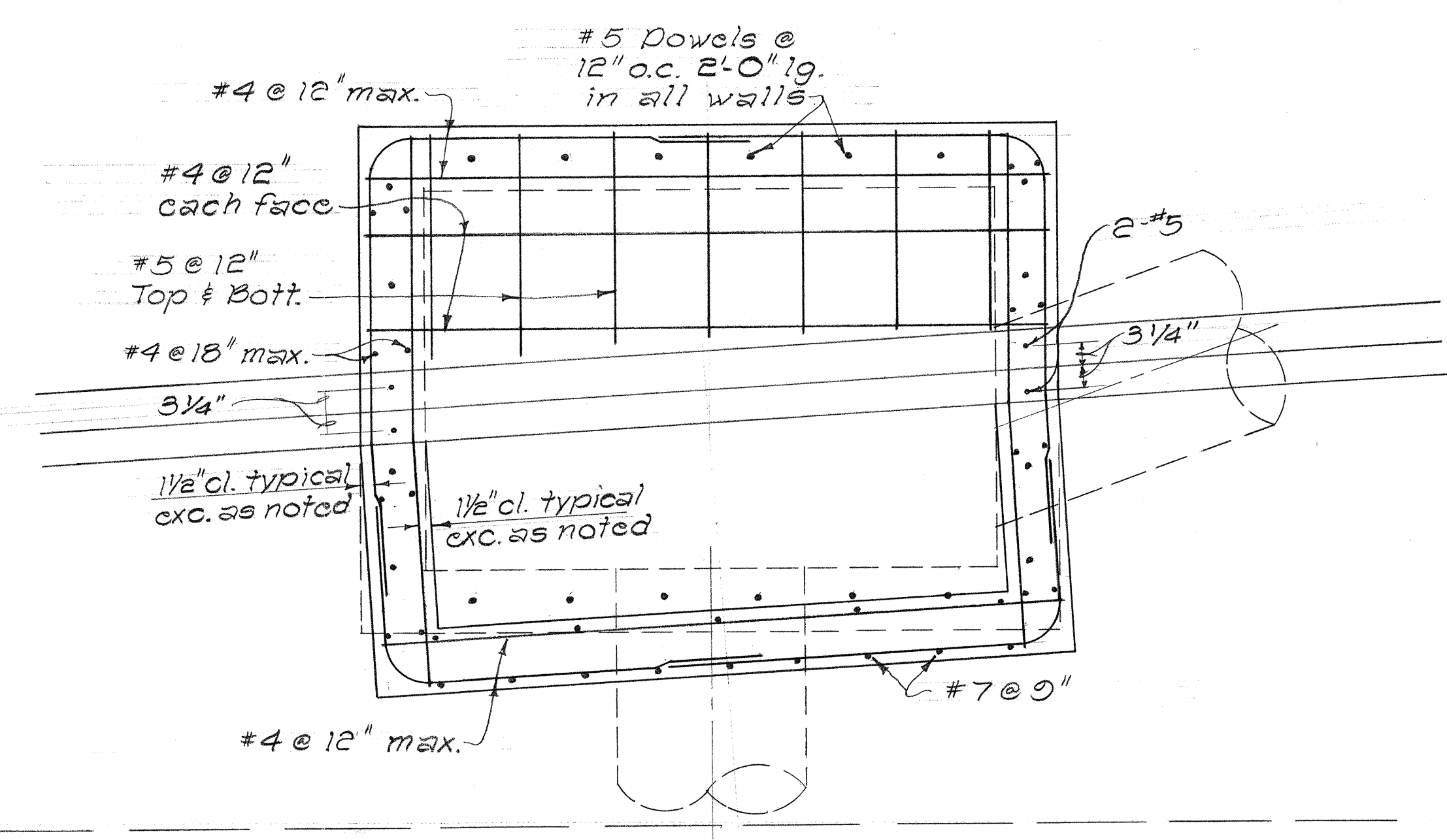
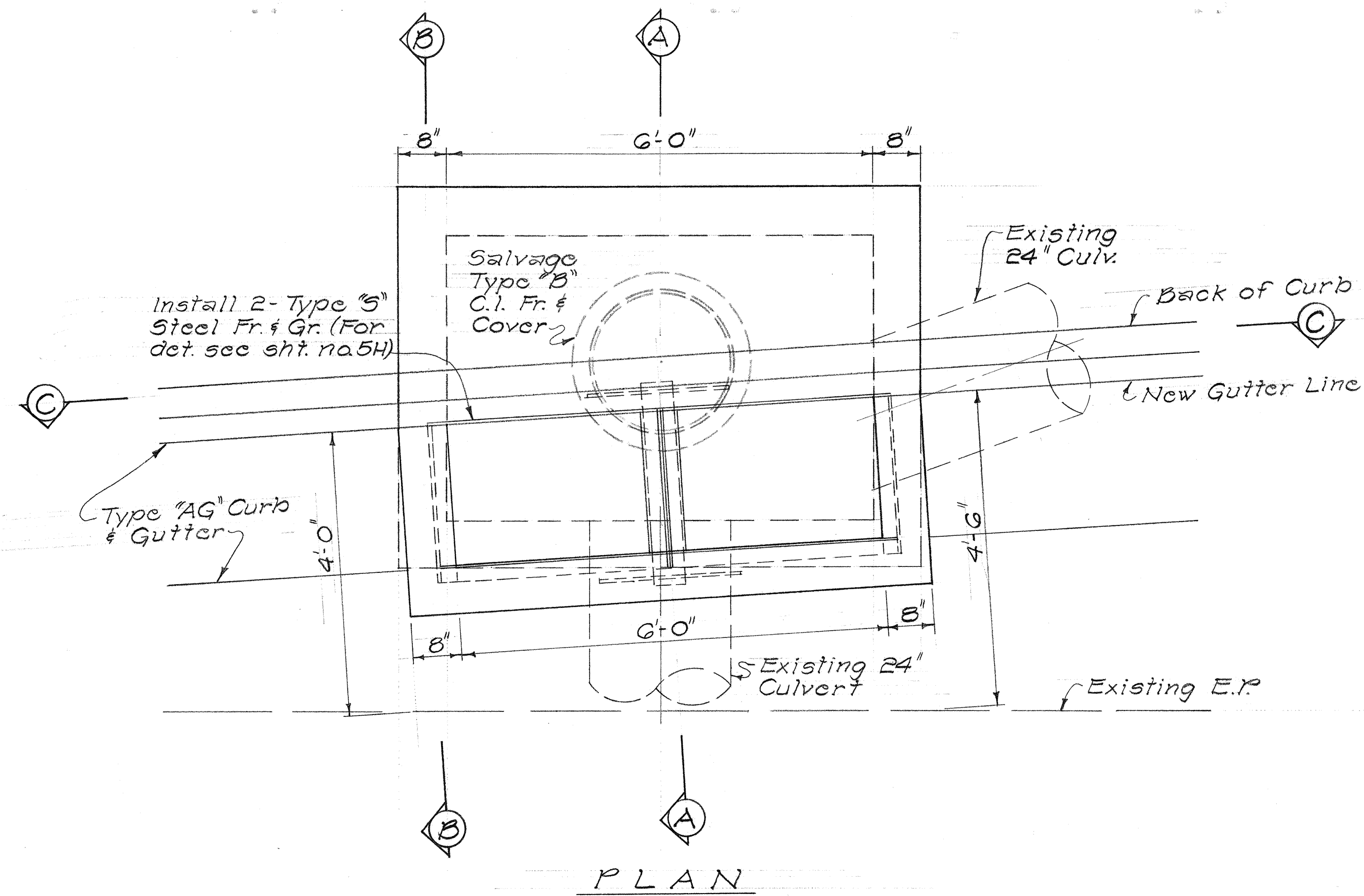
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-H-1(112):12

Scale As Shown Date: Apr., 1973

SHEET No. 14H OF 41H SHEETS

ORIGINAL PLAN	DATE
DESIGNED BY	
CHECKED BY	
NOTED BY	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):19	1973	65	176

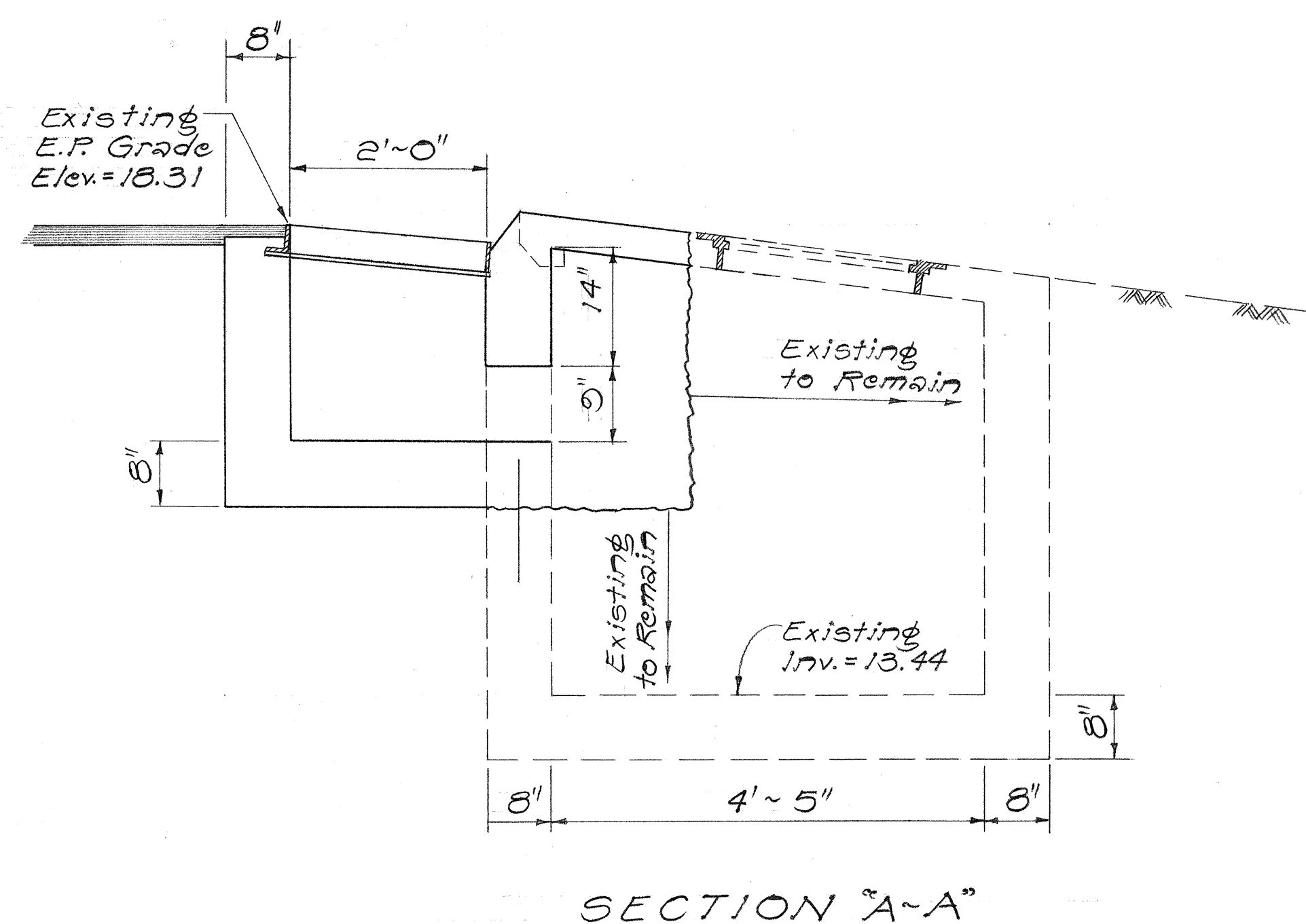
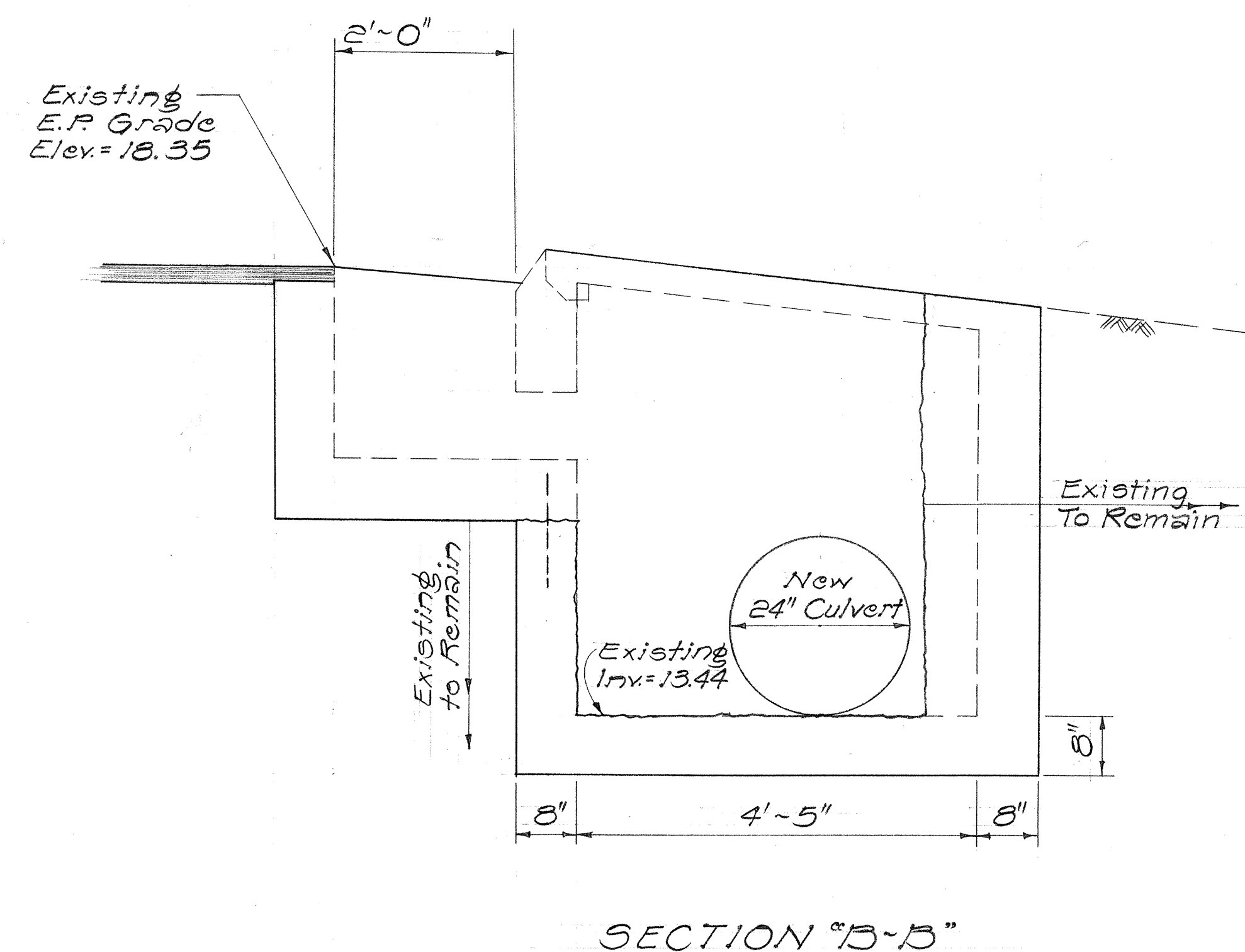
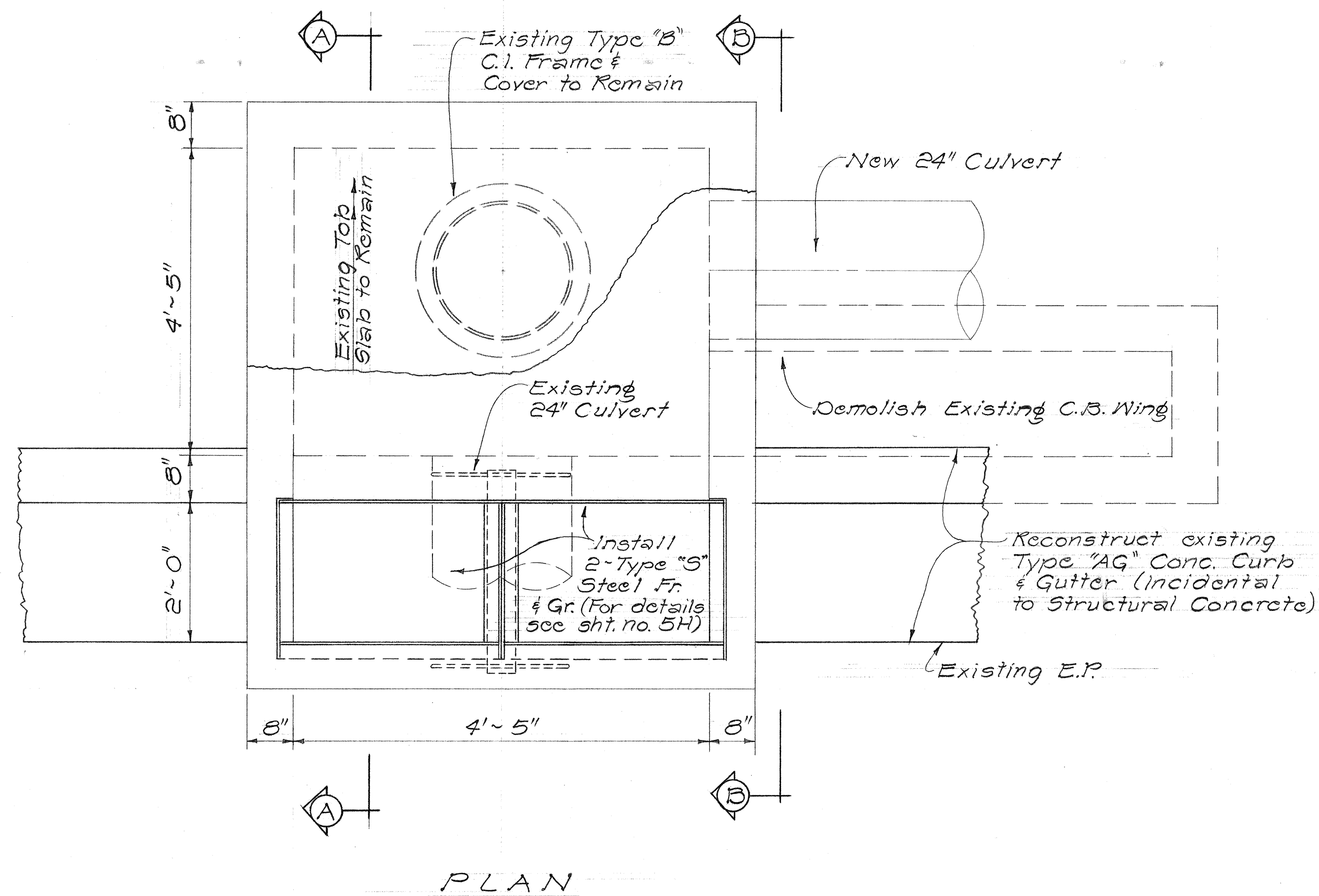


DETAIL OF CATCH BASIN @
RAMP "4" STA. 1 + 50 (CB # 30-F)
Scale: 3/4" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF CATCH BASIN
WITH TYPE "S" GRATED INTAKE
SAFETY IMPROVEMENTS
KALIHI STREET TO PALI HIGHWAY
F.A.I. PROJ. No. I-HI-1(112):19
Scale: As Noted Date: April, 1973
SHEET No. 15H OF 4TH SHEETS

SURVEY PLOTTED BY	DATE
DRAWN BY	
CHECKED BY	
REVIEWED BY	
APPROVED BY	
NOTE BOOK	
No.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):10	1973	66	176



NOTE:
Except as noted on this sheet see typical section for notes, dimension and reinforcing steel details for Type "S" Grated Drop Intake on sht. no. 4H & 5H

DETAILS OF C.B. #37-F @ STA. 85+00 W.B.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF CATCH BASIN
WITH TYPE "S" GRATED INLET
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):10
Scale: 3/4" = 1'-0" Date: April, 1973
SHEET No. 66 OF 41 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(112):10	1973	67	176

Sta. 85+00

Modified Catch Basin
For Details, See
Sheet No. 16H

Sta. 85+15

New 24" CMP

A

Sta. 85+42.50
Existing
Designation
Sign

Sta. 85+90.20

Type A-1 S.D.M.H.
For Details, See
Sheet No. 40H

P.T. Sta.
85+98.04

Sta. 86+15±

Type 6:1:20:1-4
Drop Intake
For Details, See
Sheet No. 30H

New 24" CMP

Edge of Swale

Swale

Edge of Pavement

324° 52' 00"

For details of Type "A"
C.I. Frame & Cover
see sht. no. 41H

5'-0" to center
of S.D.M.H.

P L A N
Scale: 1"=5'

Existing Ground

18.41

Sta. 0+15

S = 0.1042'/1' Inv. = 15.75

S = 0.0120'/1'

24" C.M.P. Sht. "t" = 0.079

21.61

Inv. = 16.65

S = 0.0296'/1'

22.39

Inv. = 17.26

Sta. 0+00

Inv. of Culvert = 14.5±

P R O F I L E
Scale: 1"=5'

NEW DRAINAGE LINE FROM
Sta. 85+00± W.B. TO Sta. 86+15± W.B.

E.P.

10'-0"

20.73

20.27

1/2:12

1:12

2'-0"

6" Min.

6" Max.

24" C.M.P.

16.48±

14.48

3'-6"

3'-6"

SECTION "A-A"

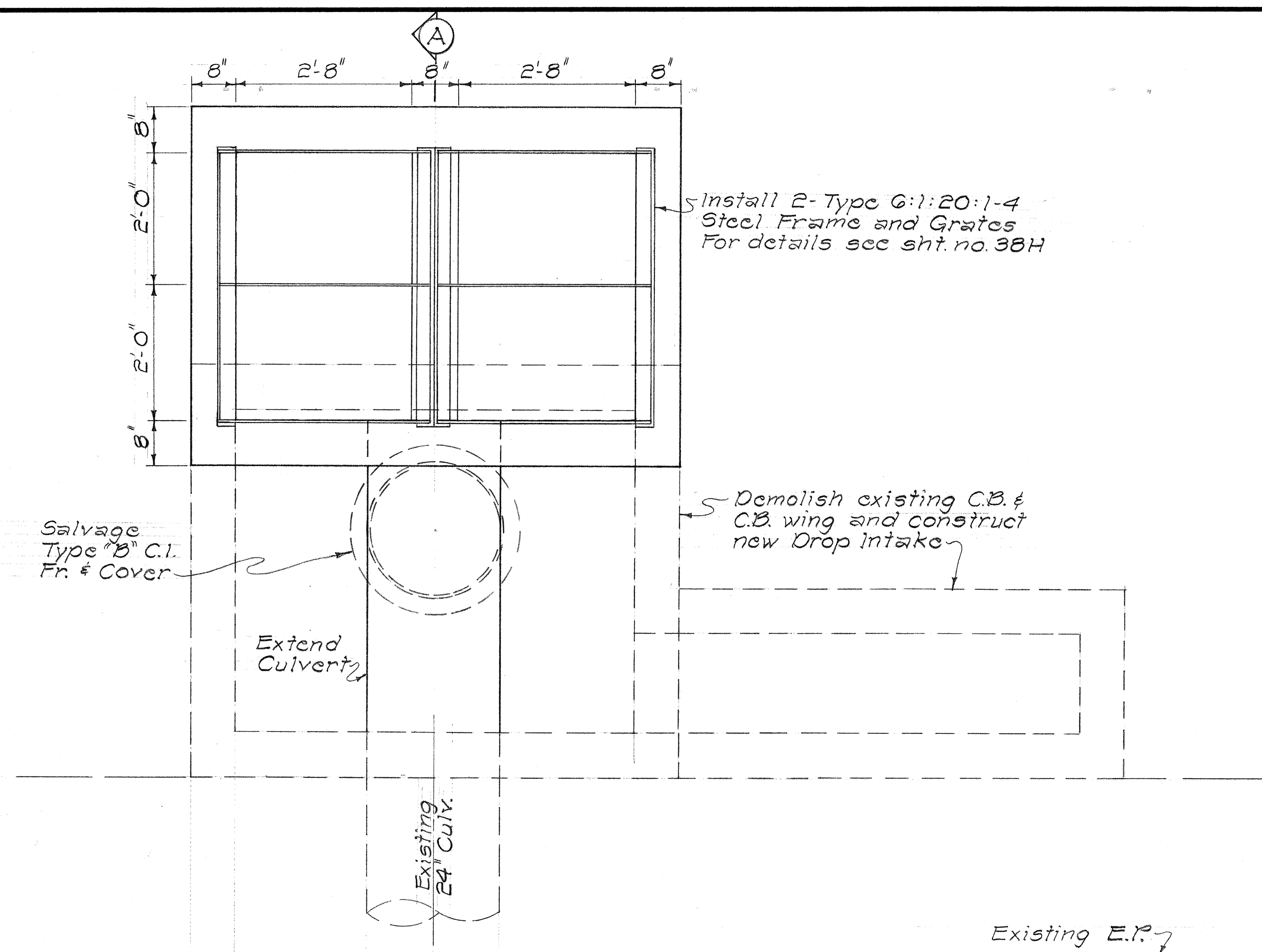
Scale: 3/4"=1'-0"

EXISTING DESIGNATION
SIGN FOOTING

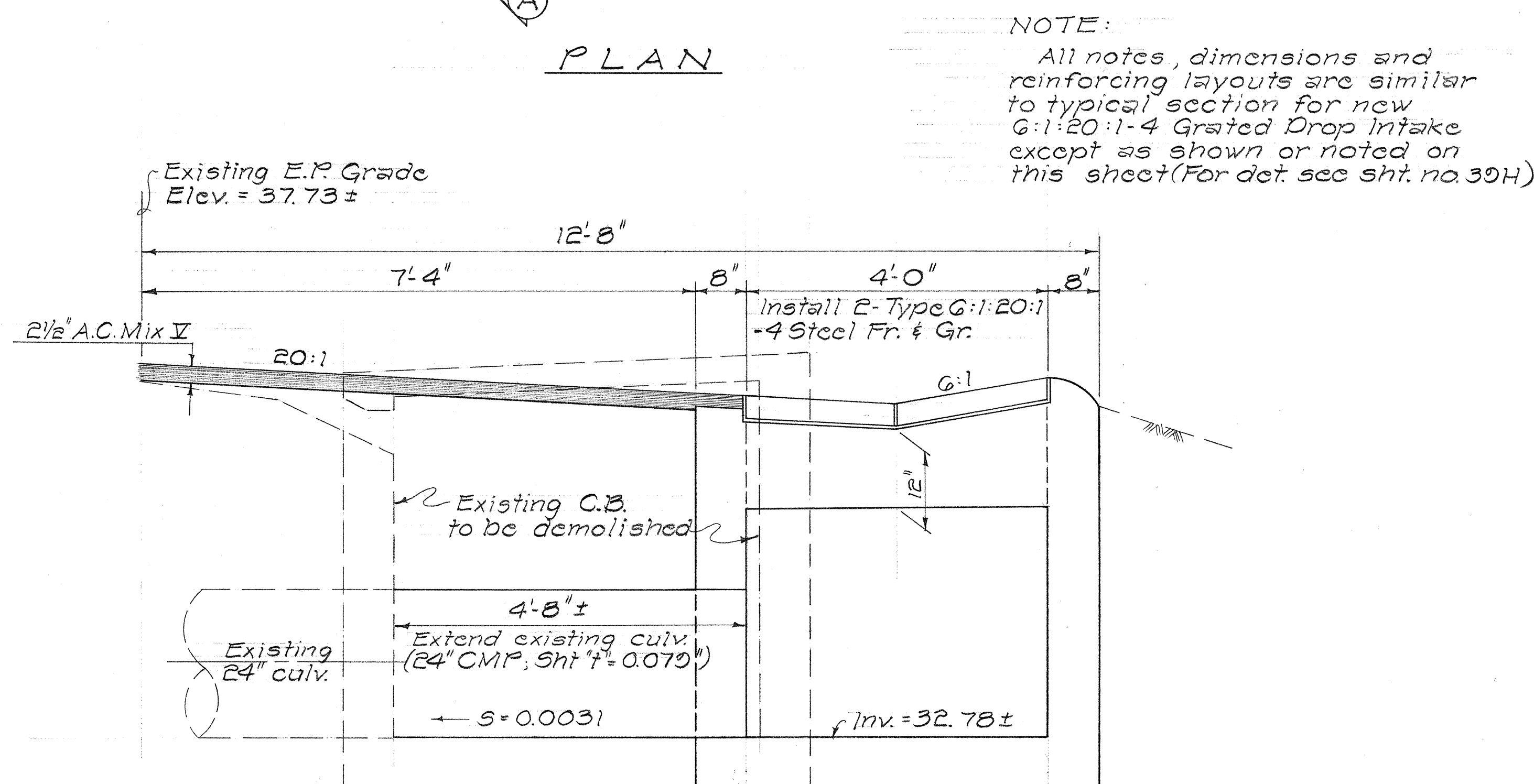
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
PLAN & PROFILE FOR NEW
DRAINAGE LINE FROM Sta.
85+00± W.B. TO Sta. 86+15± W.B.
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-H-1(112):10
Scale As Noted Date: April, 1973
SHEET No. 17H OF 41 HSHEETS

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(112):10	1973	68	176



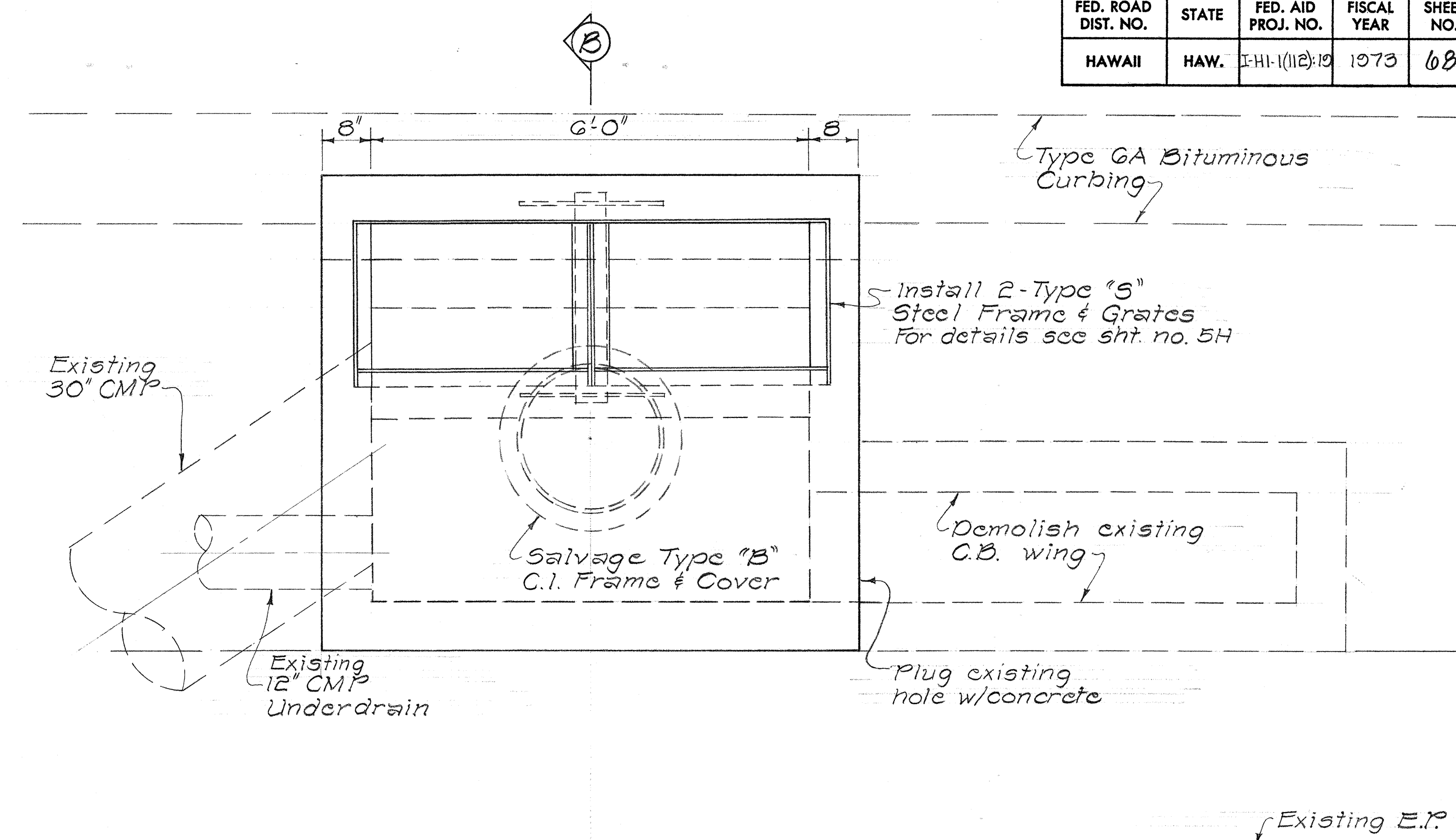
PLAN



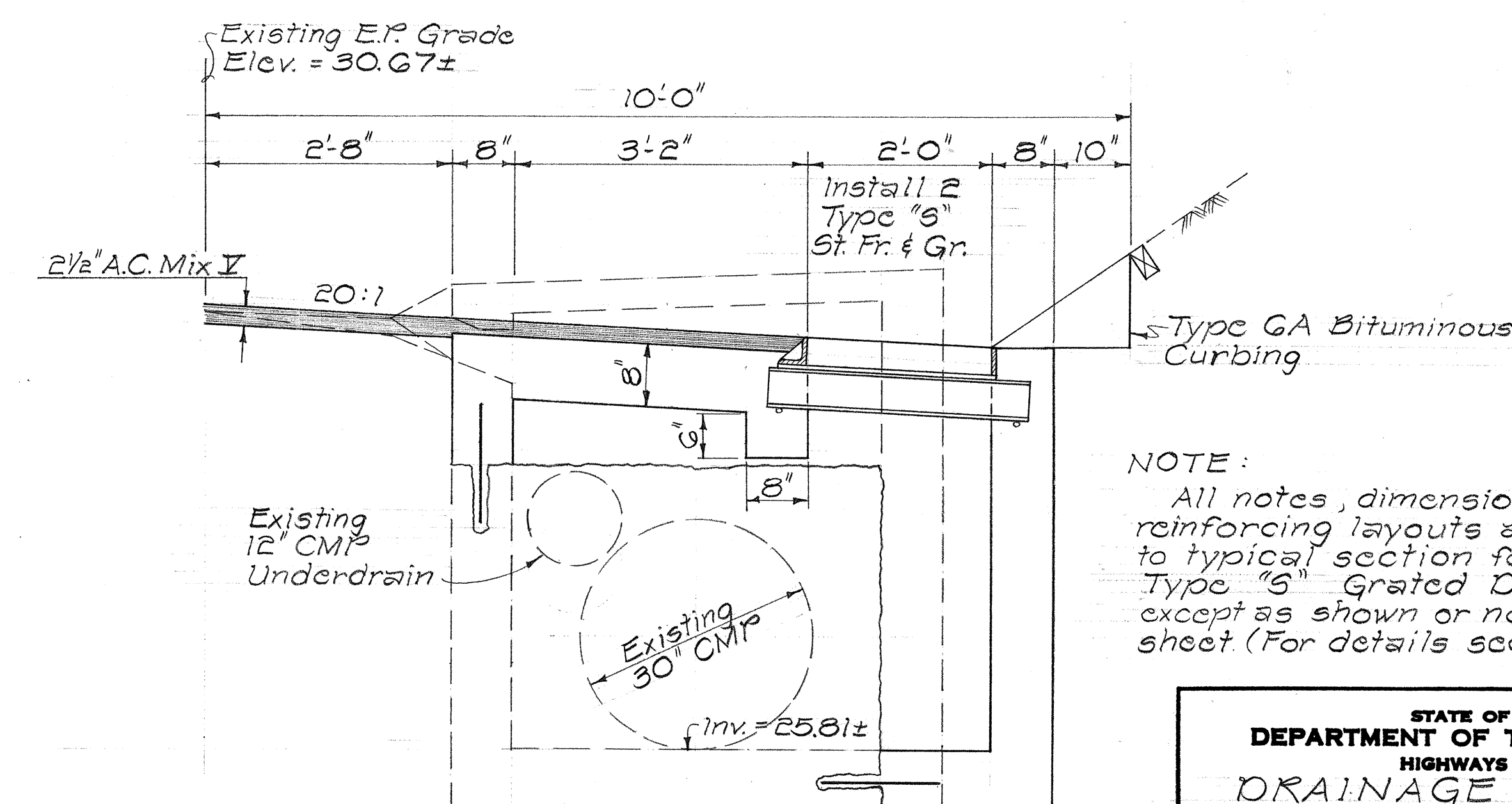
SECTION "A-A"

NEW G:1:20:1-4 GRATED DROP INTAKE @
STA. 101 + 00 E.B. (C.B. # 50-F)

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



PLAN



SECTION "B-B"

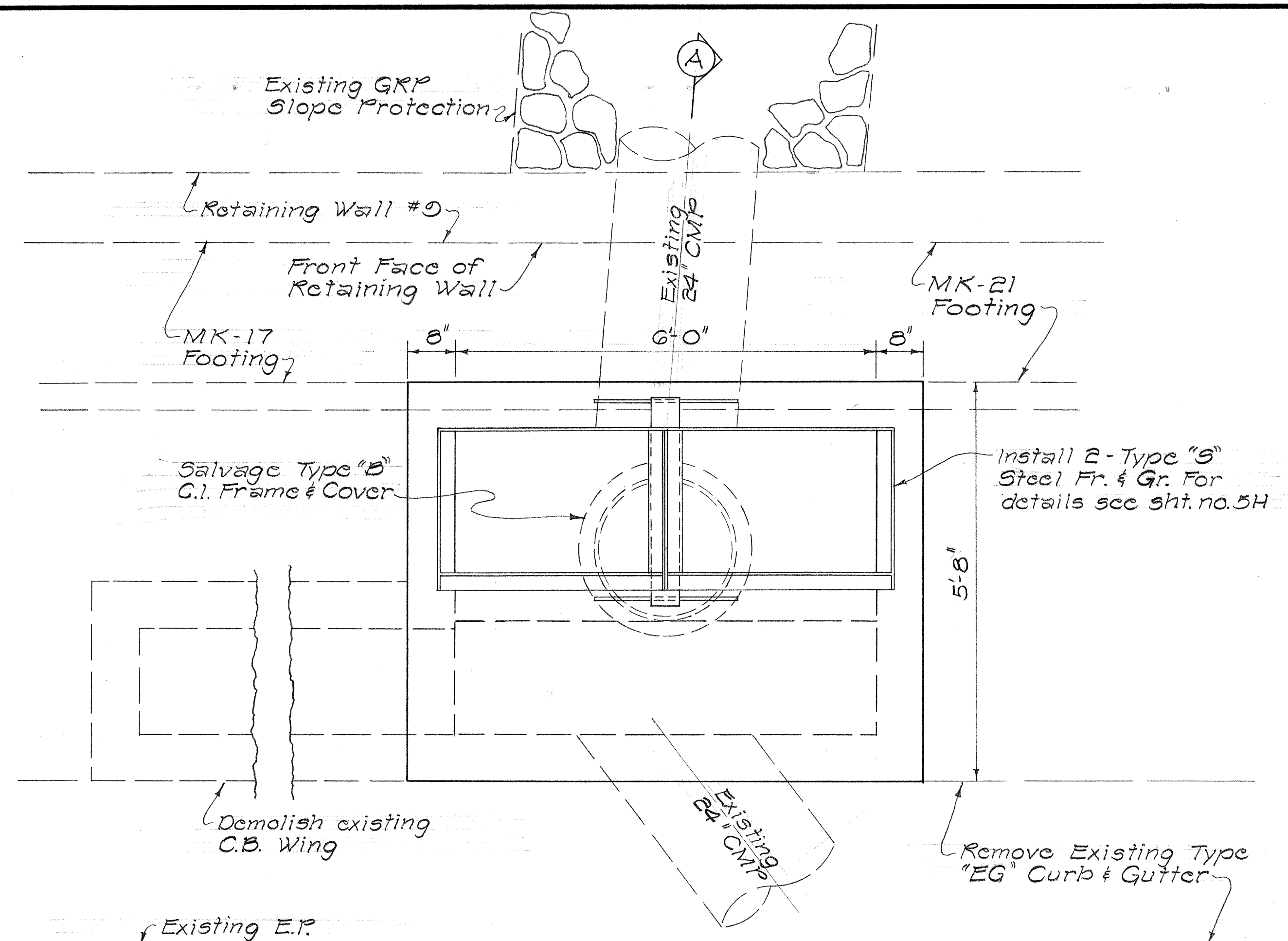
DETAILS OF CATCH BASIN @
STA. 108 + 25 E.B. (C.B. # 55-F)

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

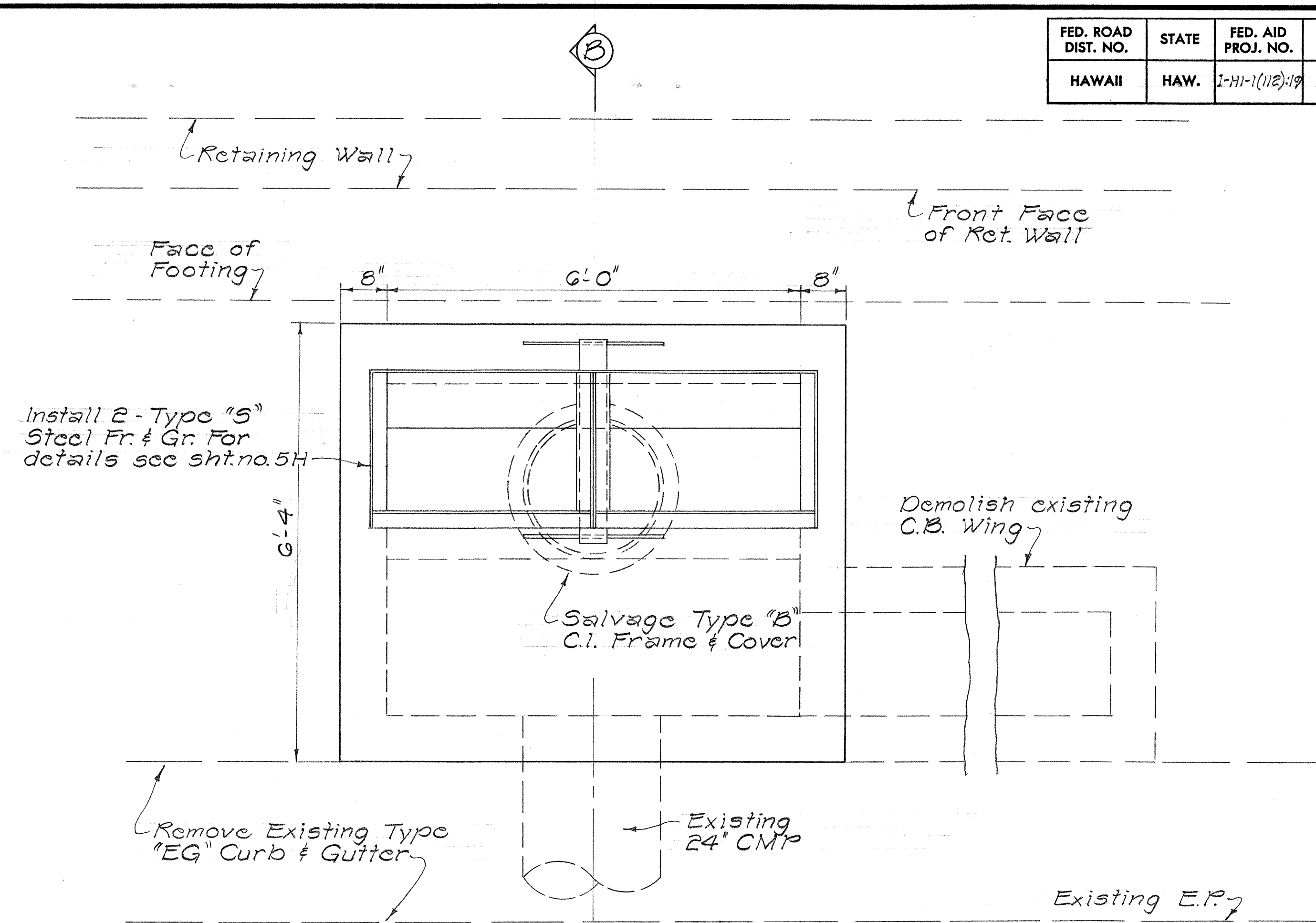
NOTE:
All notes, dimensions and reinforcing layouts are similar to typical section for Type "S" Grated Drop Intake except as shown or noted on this sheet. (For details see sht. no. 39H)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF CATCH BASINS
WITH TYPE "S" GRATED INLET
AND NEW TYPE G:1:20:1-4
GRATED DROP INTAKE
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-H-1(112):10
Scale: 3/4" = 1'-0" Date: April, 1973
SHEET No. 16H OF 41H SHEETS

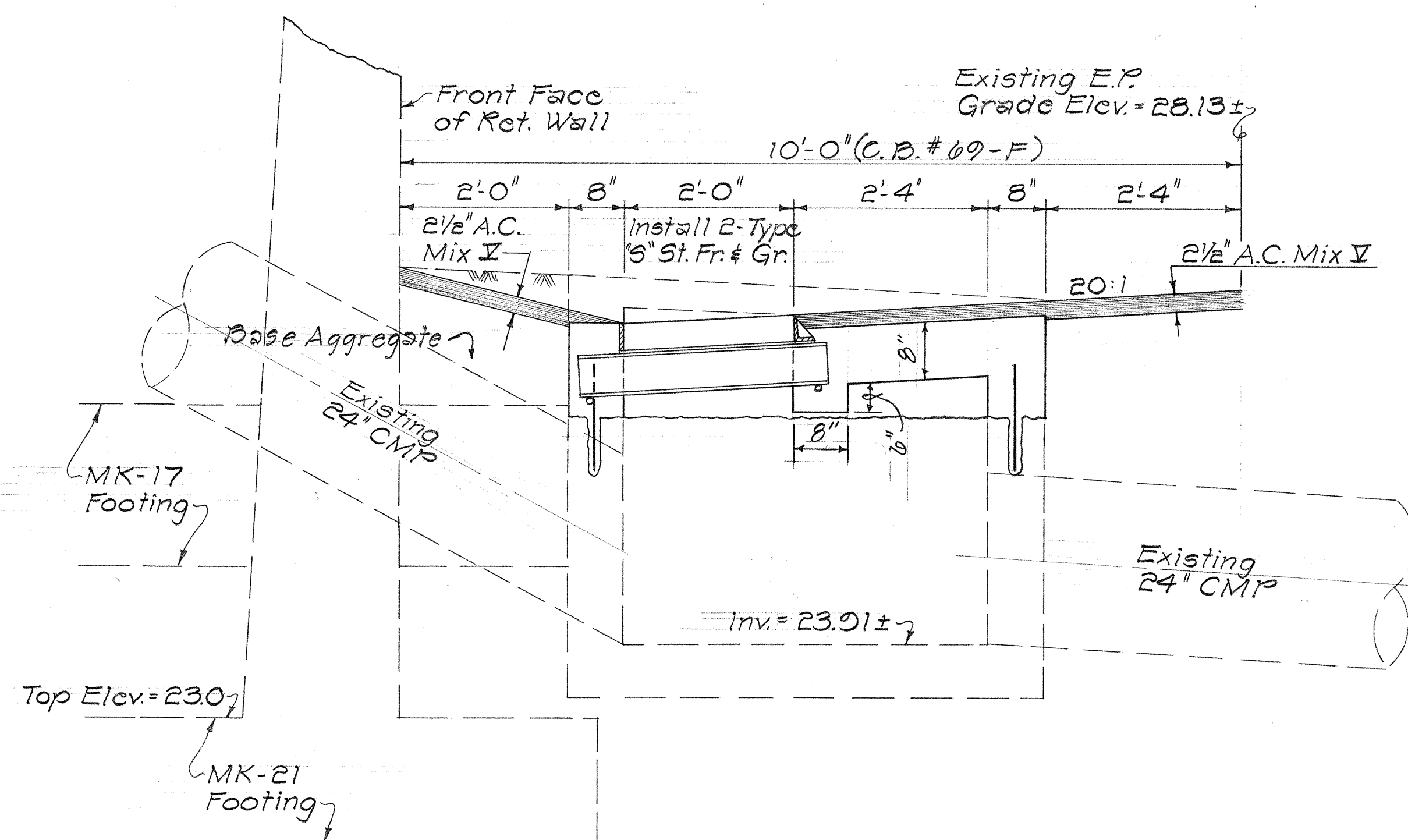
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):19	1973	69	176



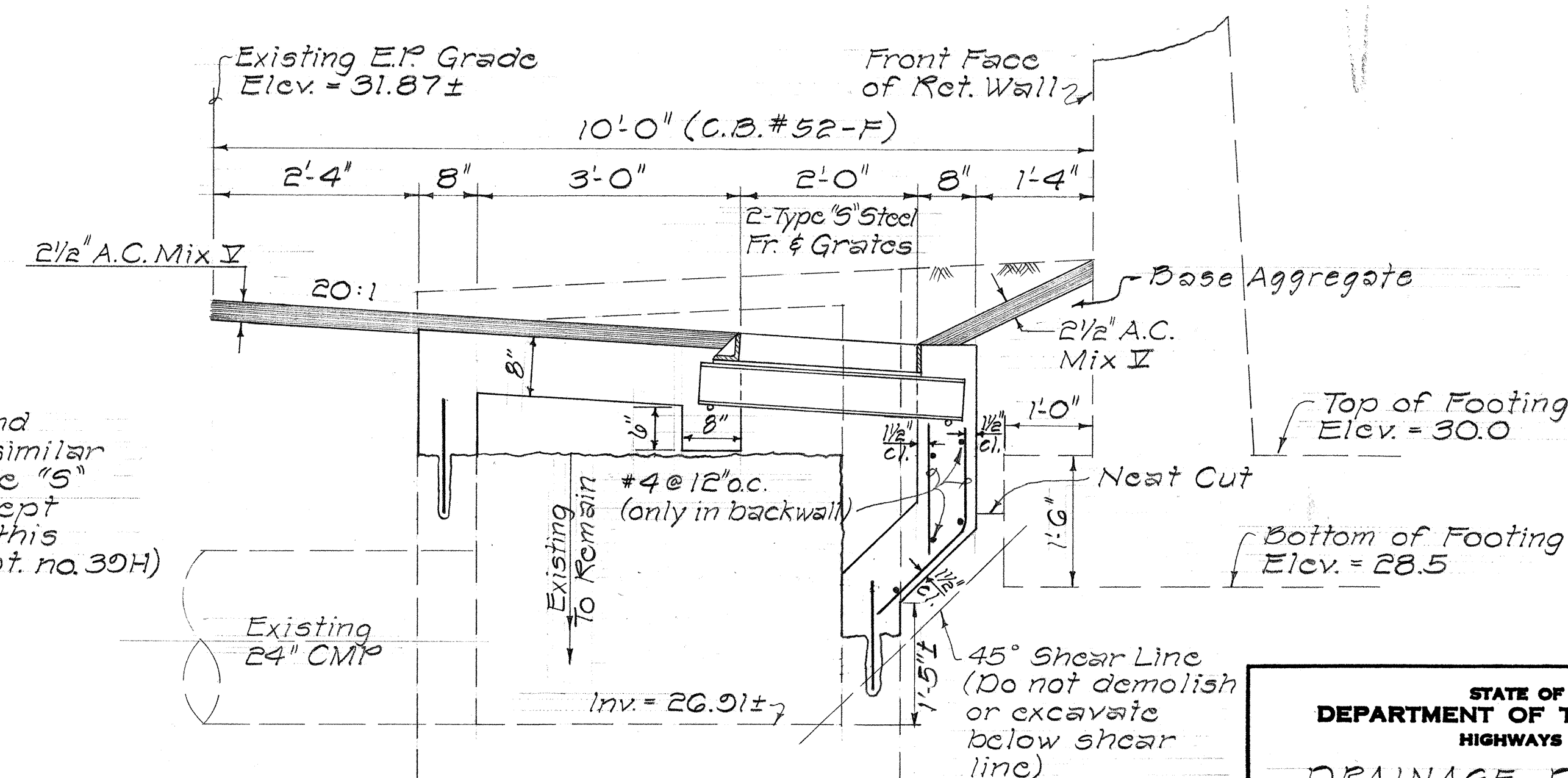
PLAN



PLAN



SECTION "A-A"



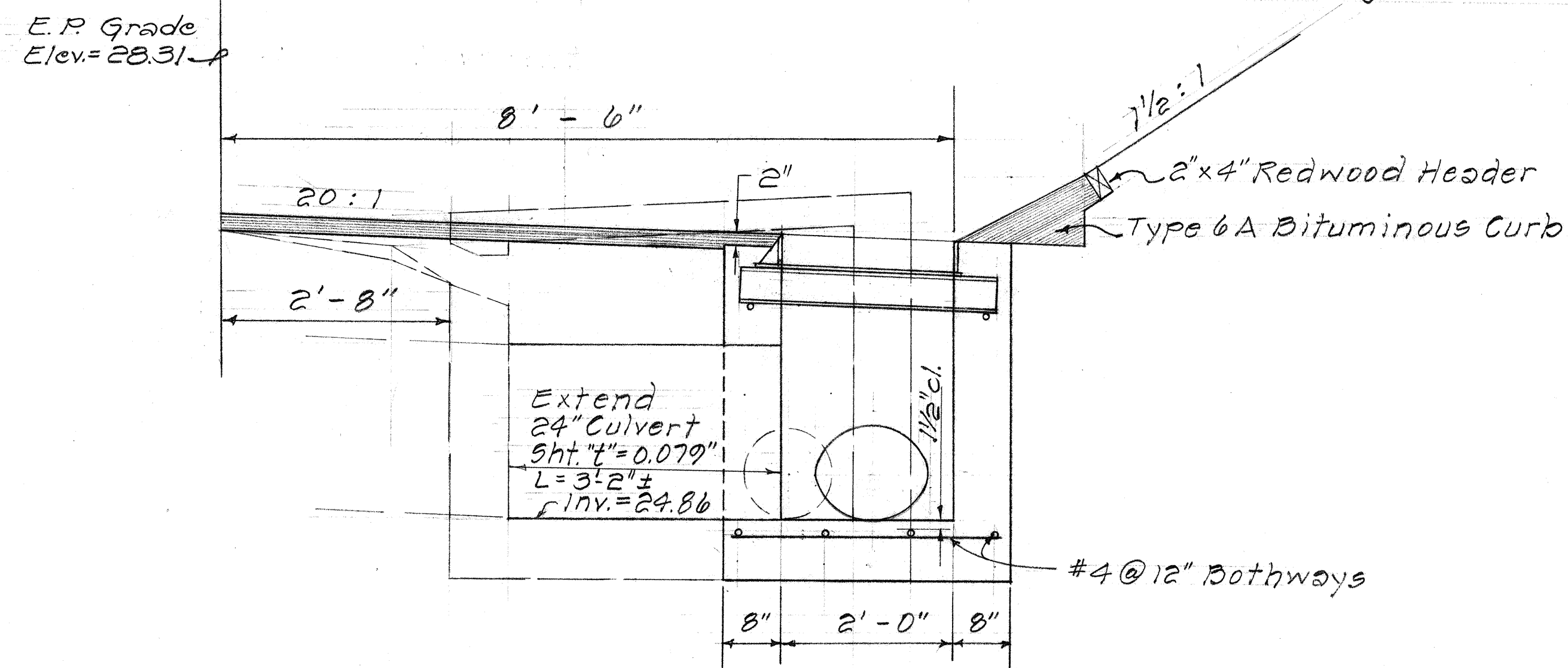
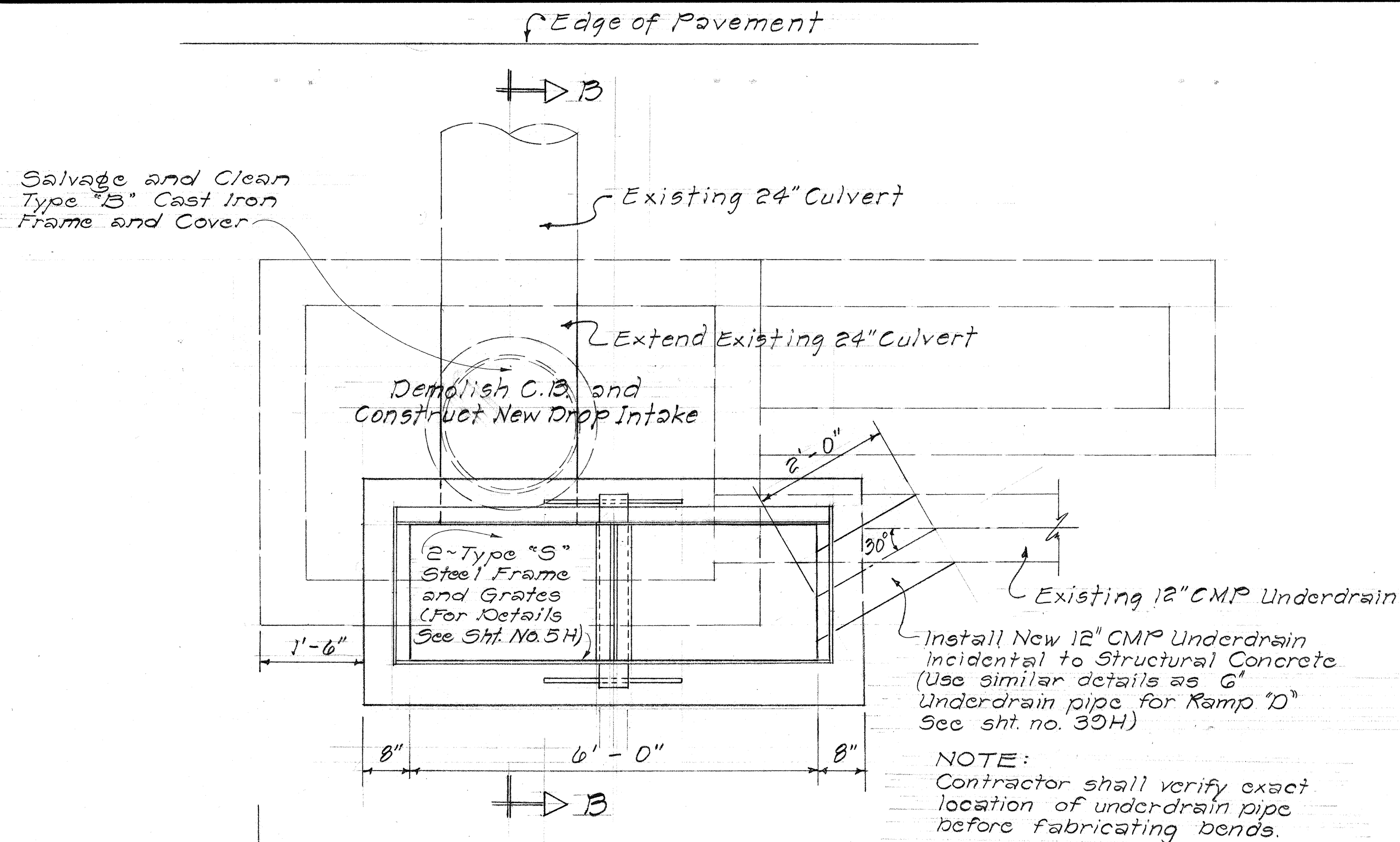
SECTION "B-B"

NOTES:
All notes, dimensions and reinforcing layouts are similar to typical section for Type "5" Grated Drop Intake except as shown or noted on this sheet. (For details, see sht. no. 39H)

DETAILS OF CATCH BASINS @
STA. 106 + 00 E.B. (C.B. #52-F)
STA. 121 + 00 W.B. (C.B. #69-F)
Scale: 3/4" = 1'-0"

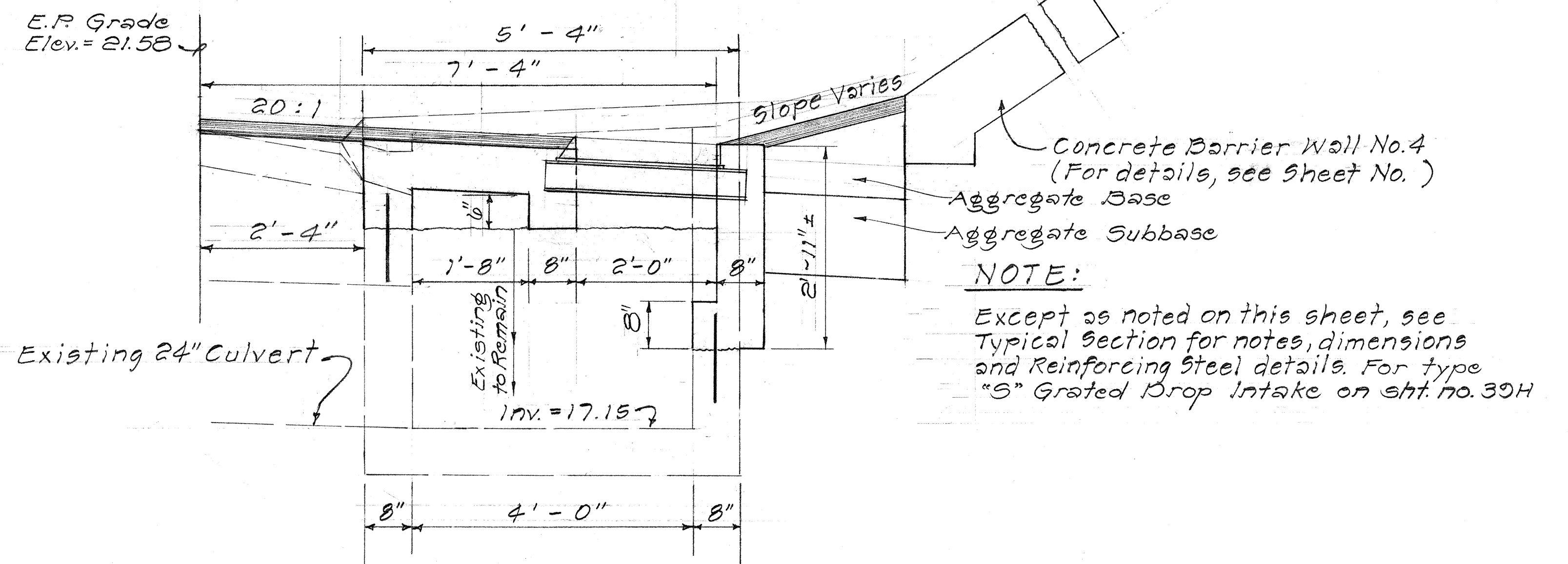
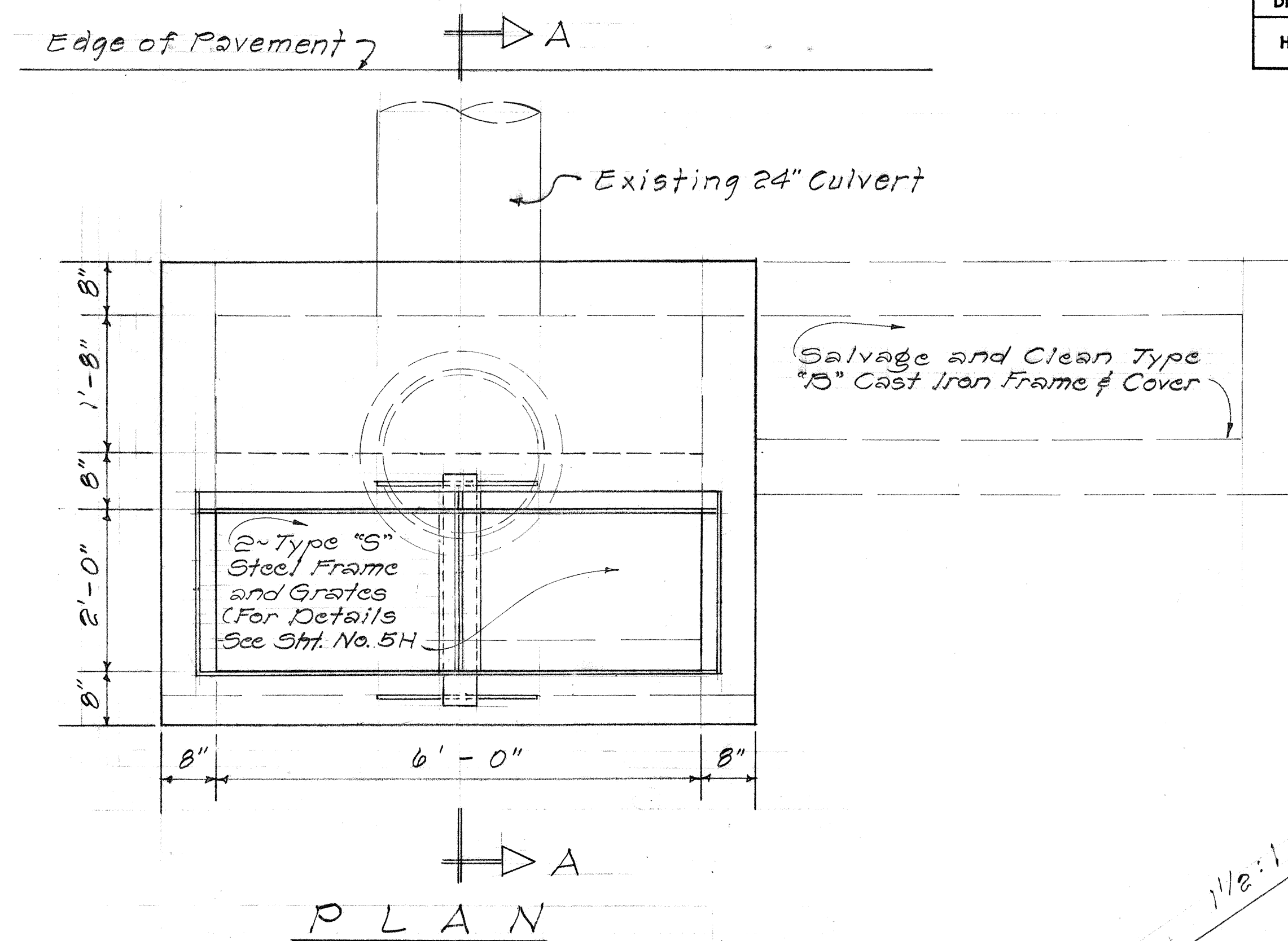
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF CATCH BASINS
WITH TYPE "5" GRATED INLET
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):19
Scale: 3/4" = 1'-0" Date: April, 1973
SHEET No. 69 OF 41 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(112)19	1973	70	176



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

NEW TYPE "S" DROP INTAKE AT
STA. 110+00 W.B.



SECTION "A-A"

DETAILS OF C.B. # 71-F
AT STA. 123+75 W.B.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

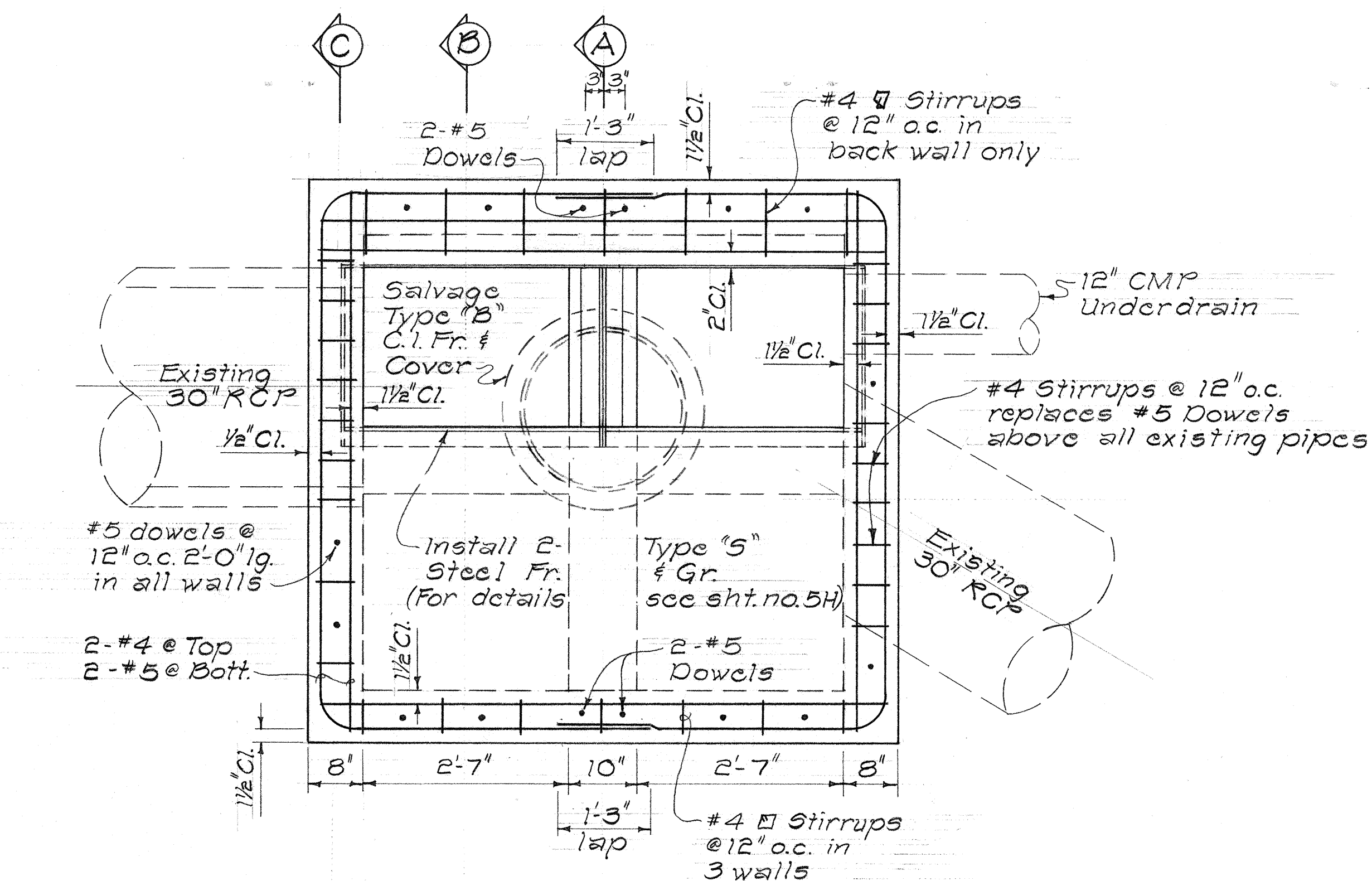
DRAINAGE DETAILS
MODIFICATIONS OF CATCH BASINS
WITH TYPE "S" GRATED INLETS

Safety Improvements
Kalihi St. to Pali Hwy.
F.A.I. Proj. No. I-H-1(112):19
Scale: 3/4" = 1'-0" Date: April, 1973

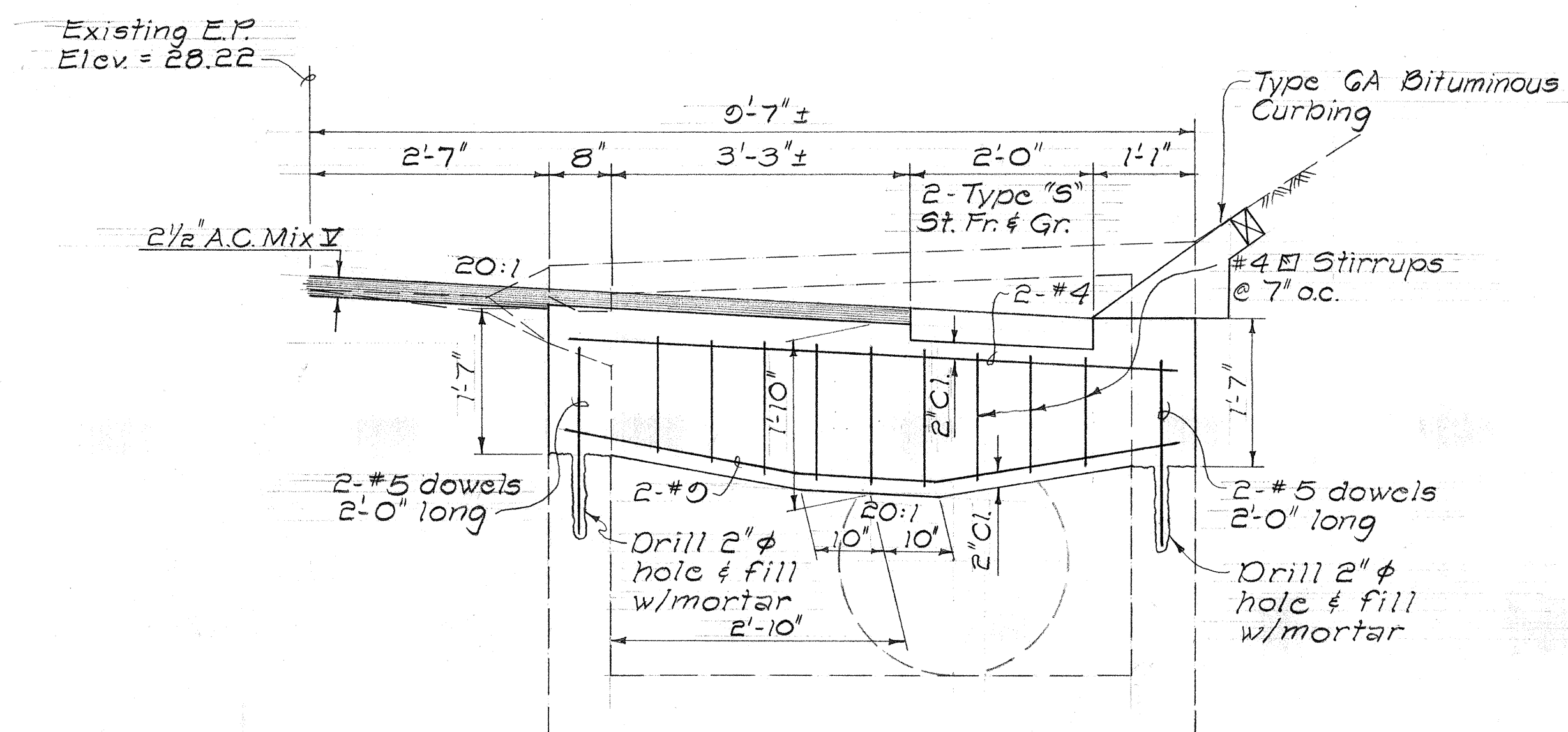
SHEET No. 20H OF 41 H SHEETS

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

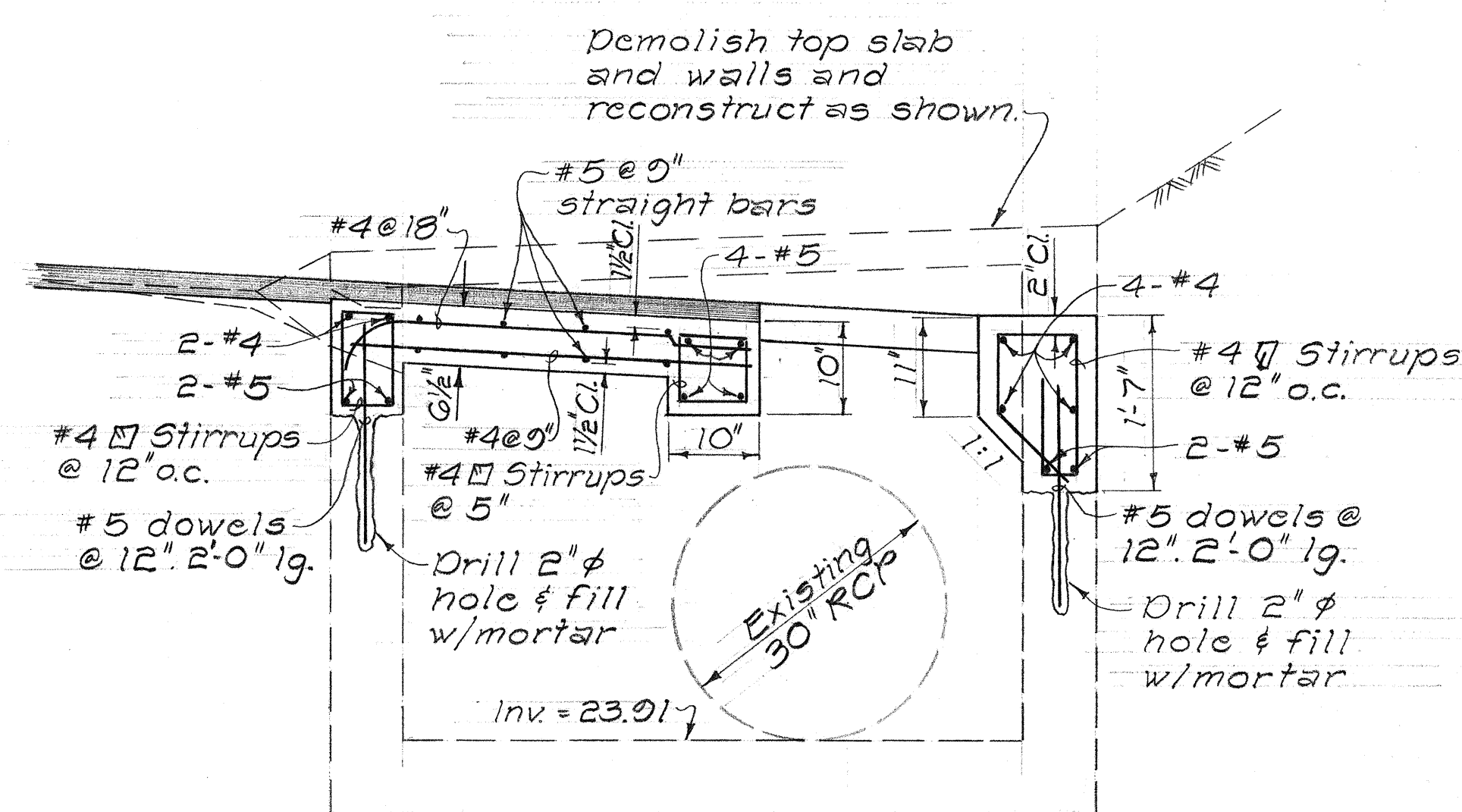
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(112):19	1973	71	176



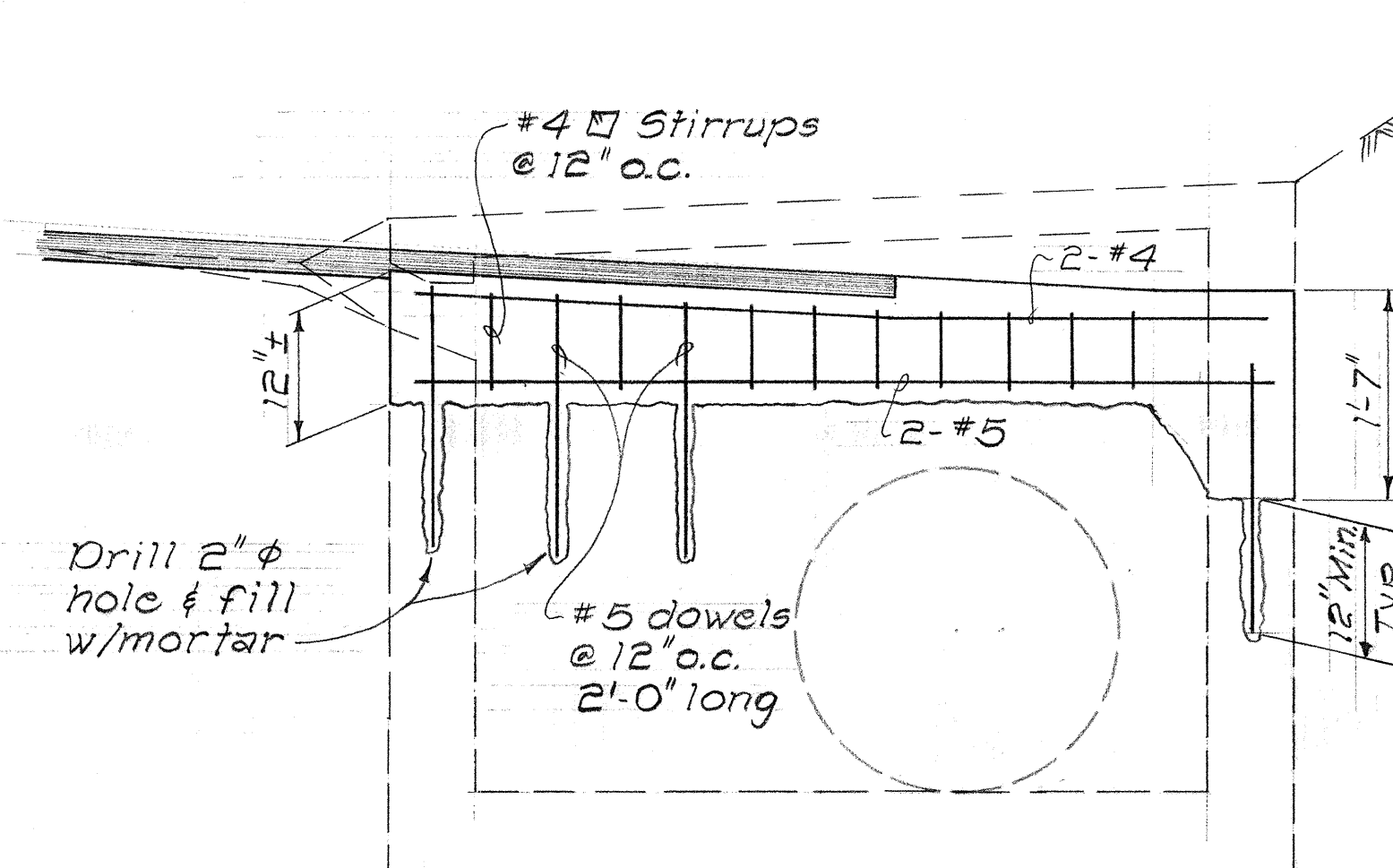
PLAN



SECTION "A-A"
(DETAILS OF TRANSVERSE BEAM)



SECTION "B-B"
(DETAILS OF LONGITUDINAL BEAM & SLAB)



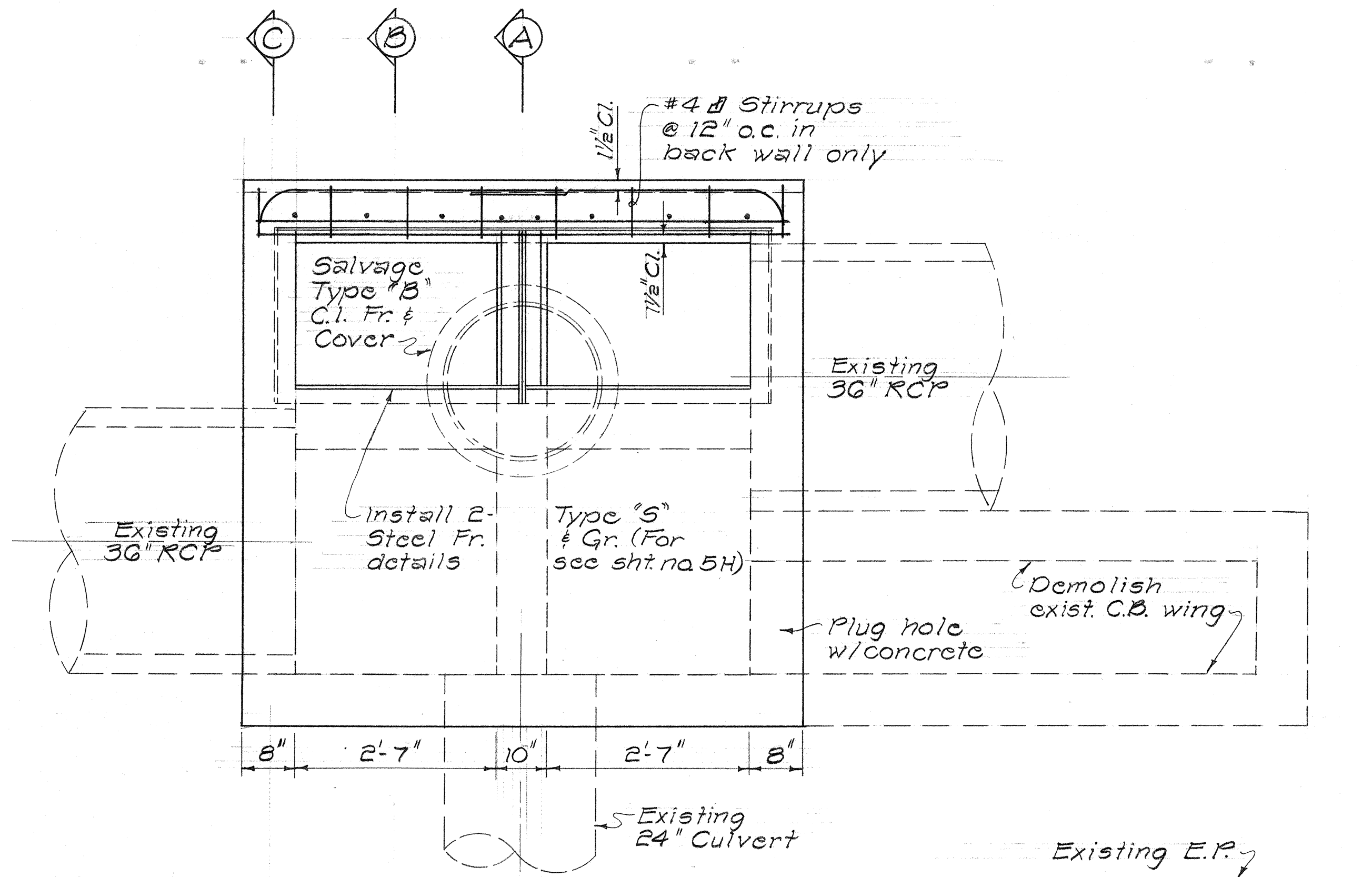
SECTION "C-C"
(DETAILS OF SIDE WALL)

DETAILS OF CATCH BASIN @
STA. 110 + 05 ± E.B. (C.B. #57-F)
Scale: 3/4" = 1'-0"

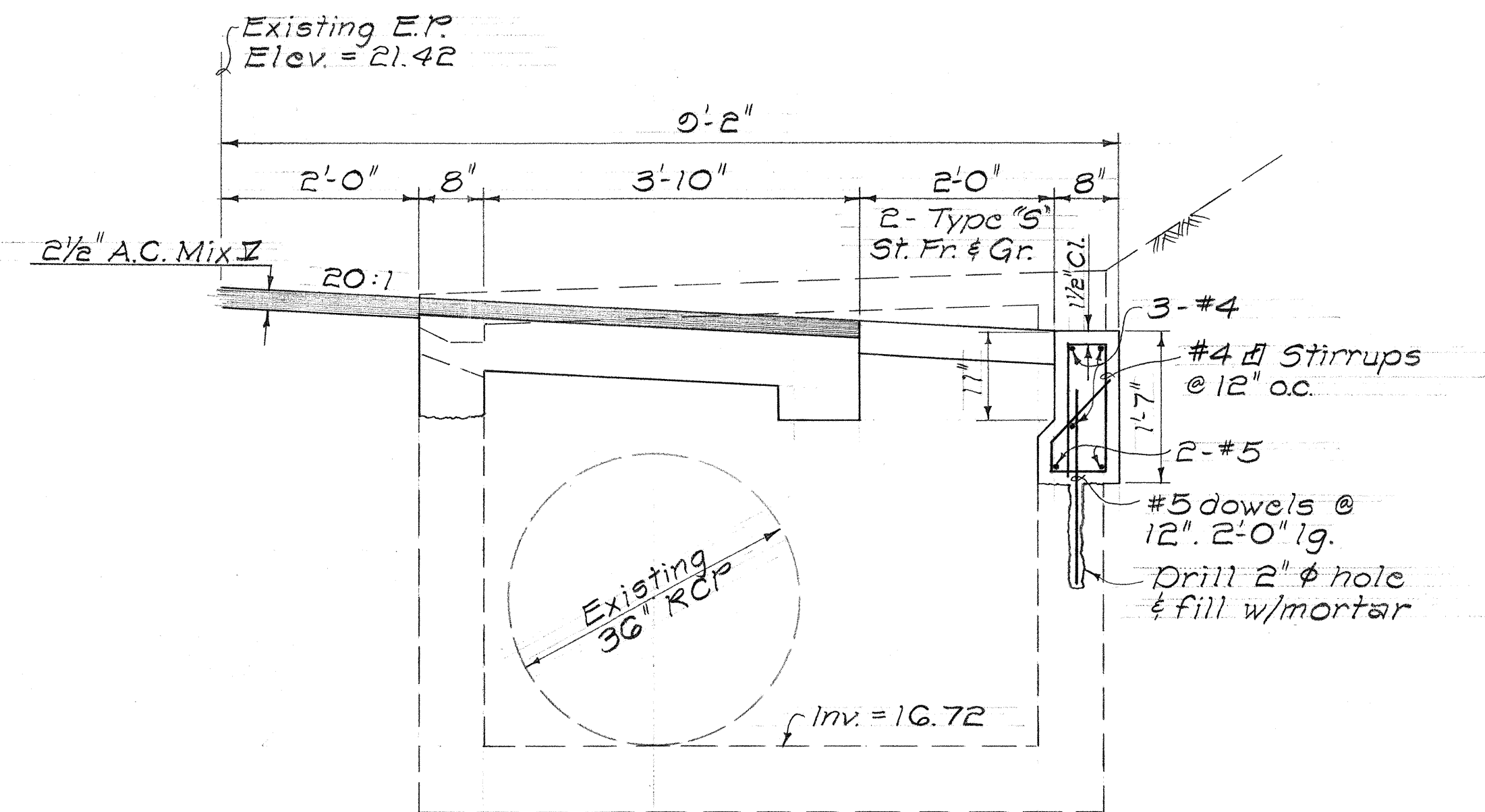
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF CATCH BASINS
WITH TYPE "S" GRATED INLET
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-H-1(112):19
Scale: 3/4" = 1'-0" Date: Apr, 1973
SHEET No. 21H OF 41H SHEETS

DATE	_____
DESIGNED BY	_____
CHECKED BY	_____
NOTED BY	_____
ORIGINAL PLAN	_____

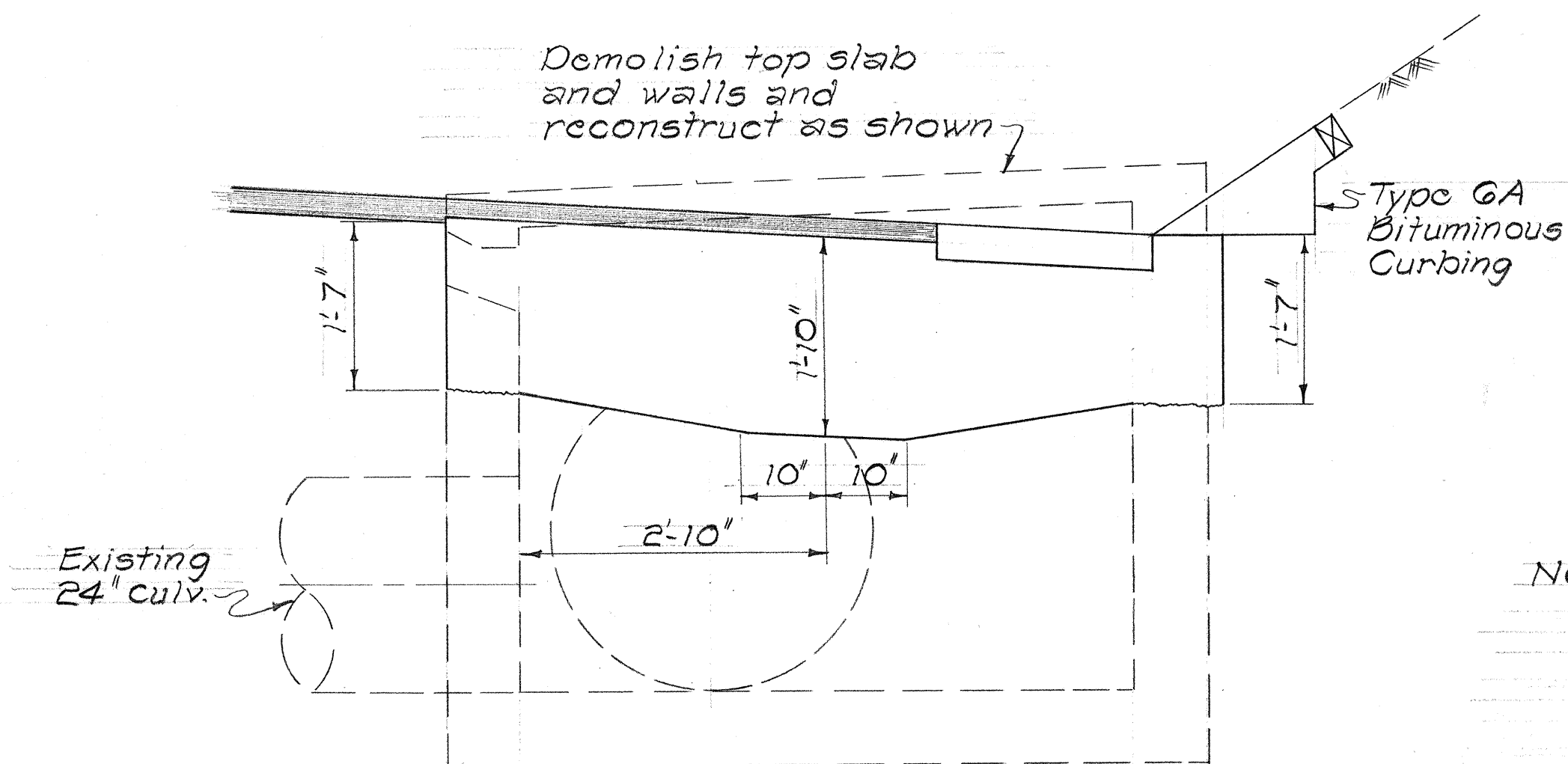
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112)-10	1973	72	176



PLAN



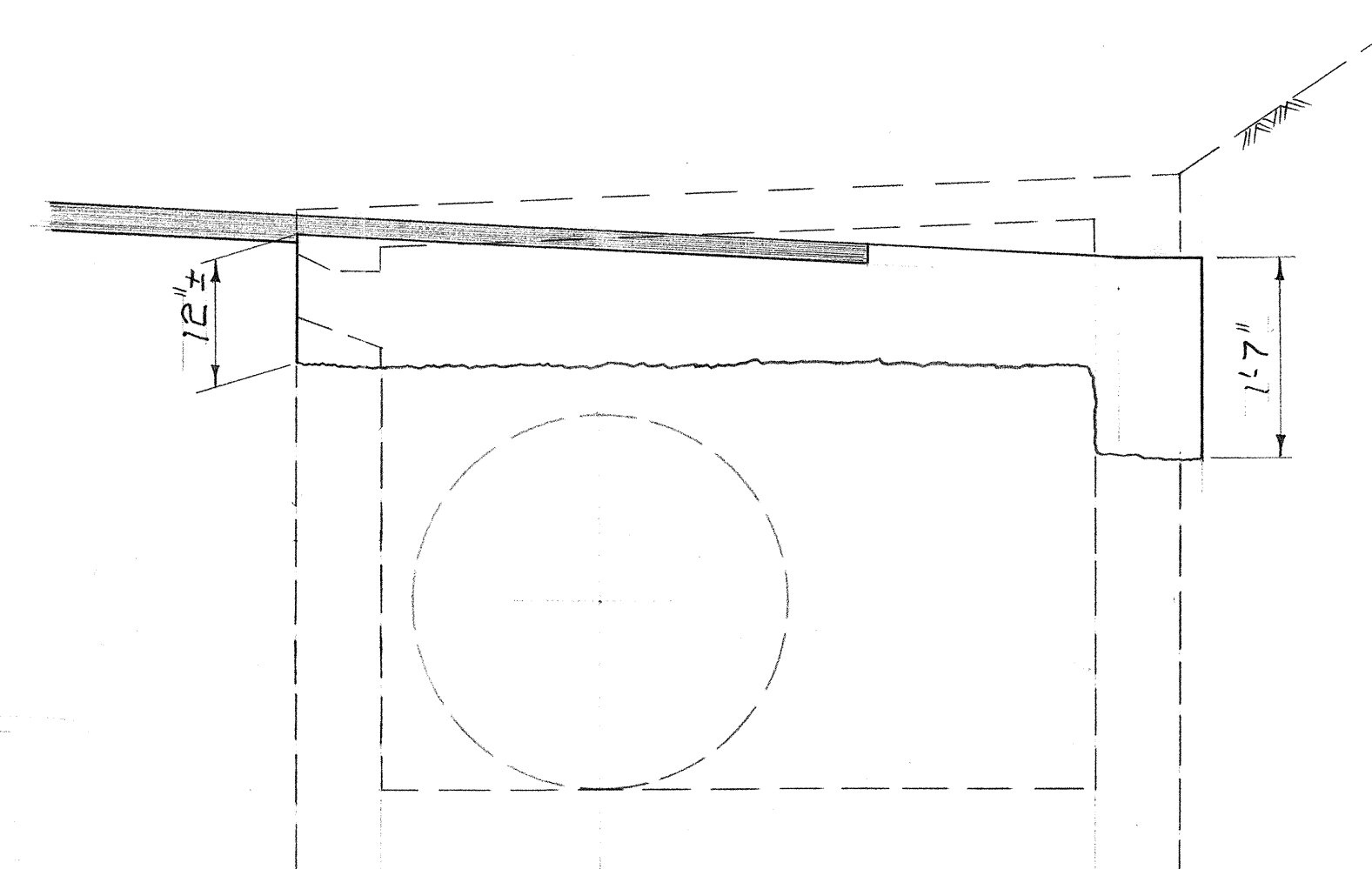
SECTION "B-B"
(DETAILS OF LONGITUDINAL BEAM & SLAB)



SECTION "A-A"
(DETAILS OF TRANSVERSE BEAM)

NOTE:

All notes, dimensions and reinforcing layouts are similar to C.B. #57-F except as shown or noted on this sheet (For details, see sht. no. 21H)



SECTION "C-C"
(DETAILS OF SIDE WALL)

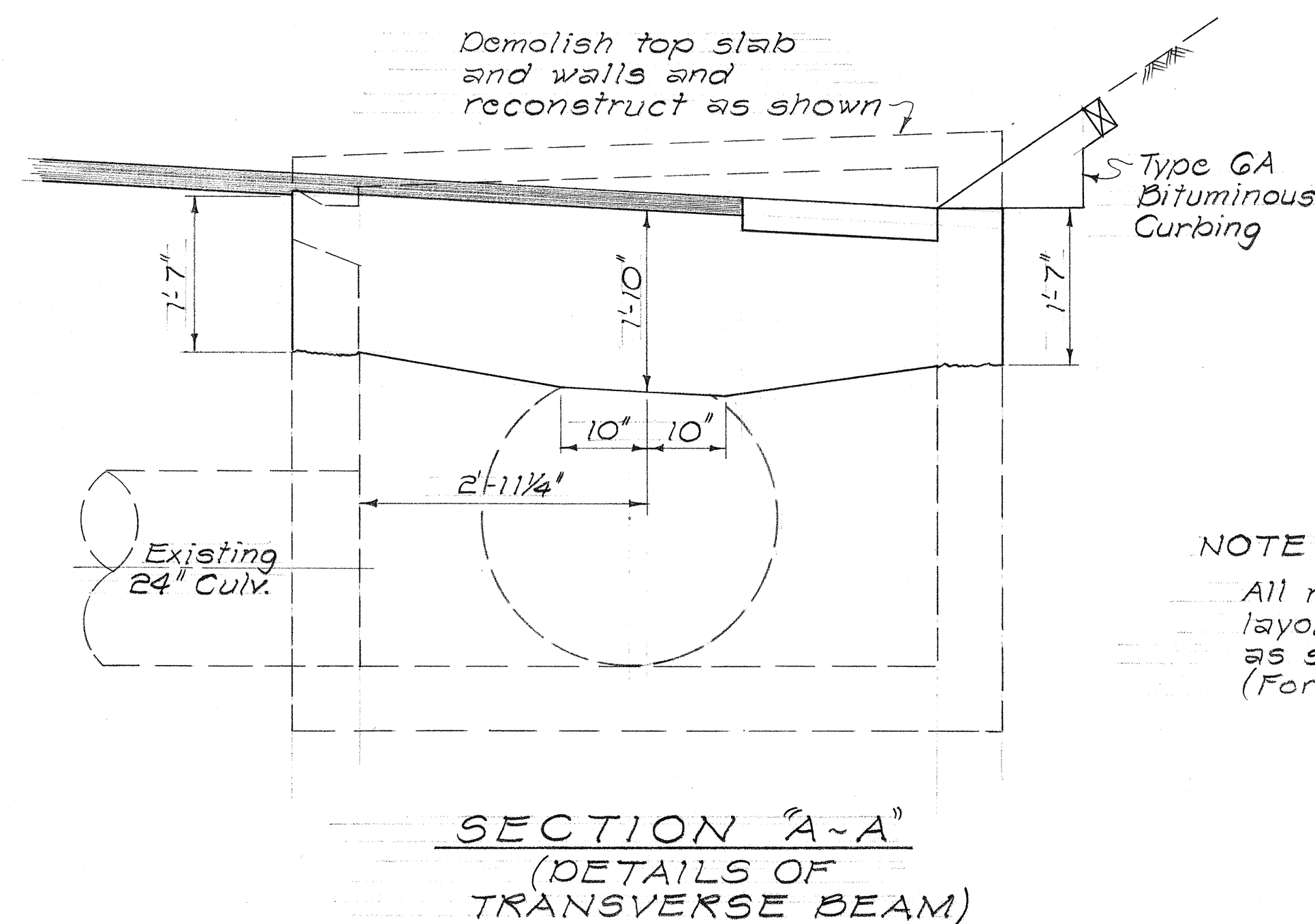
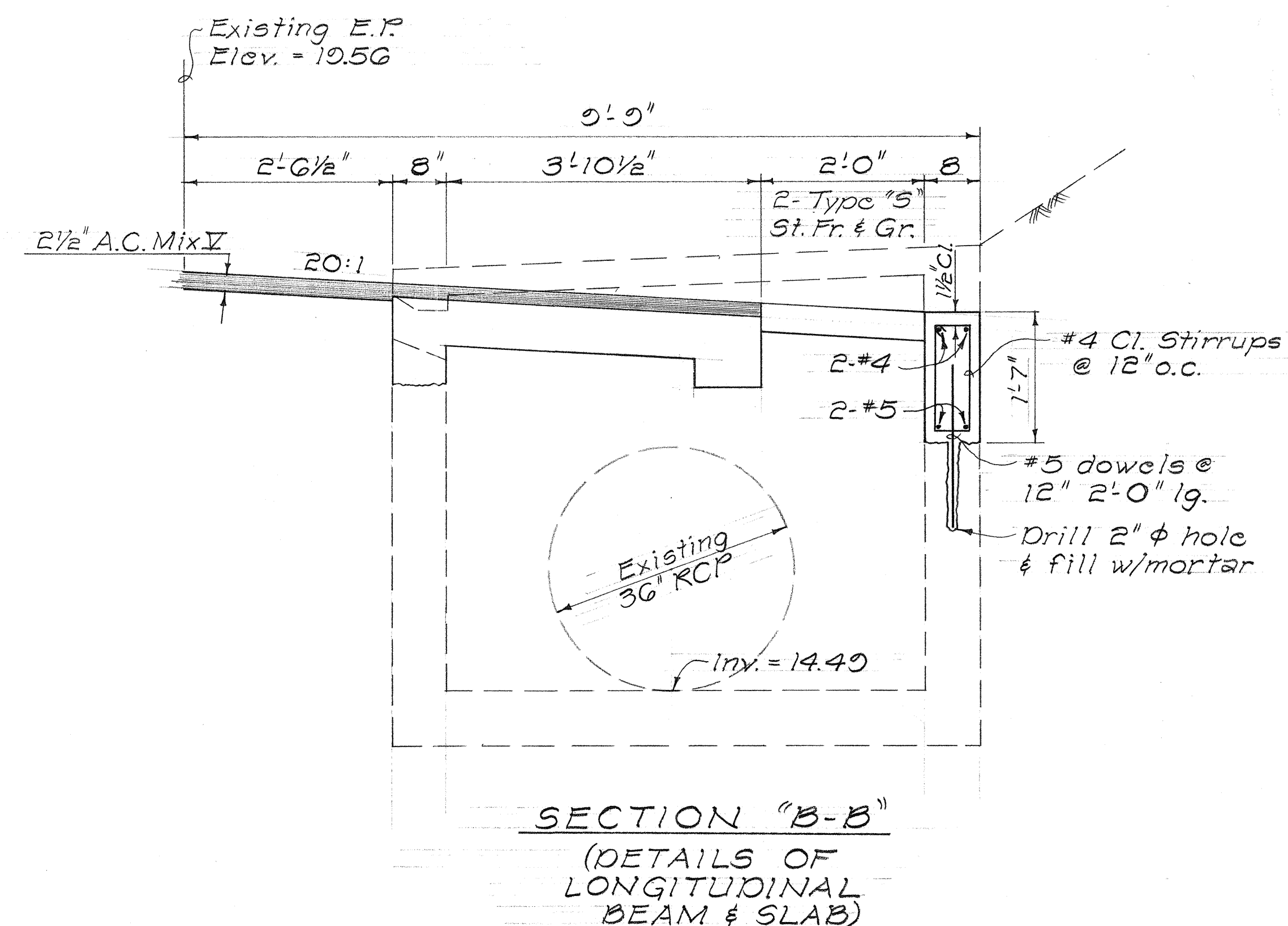
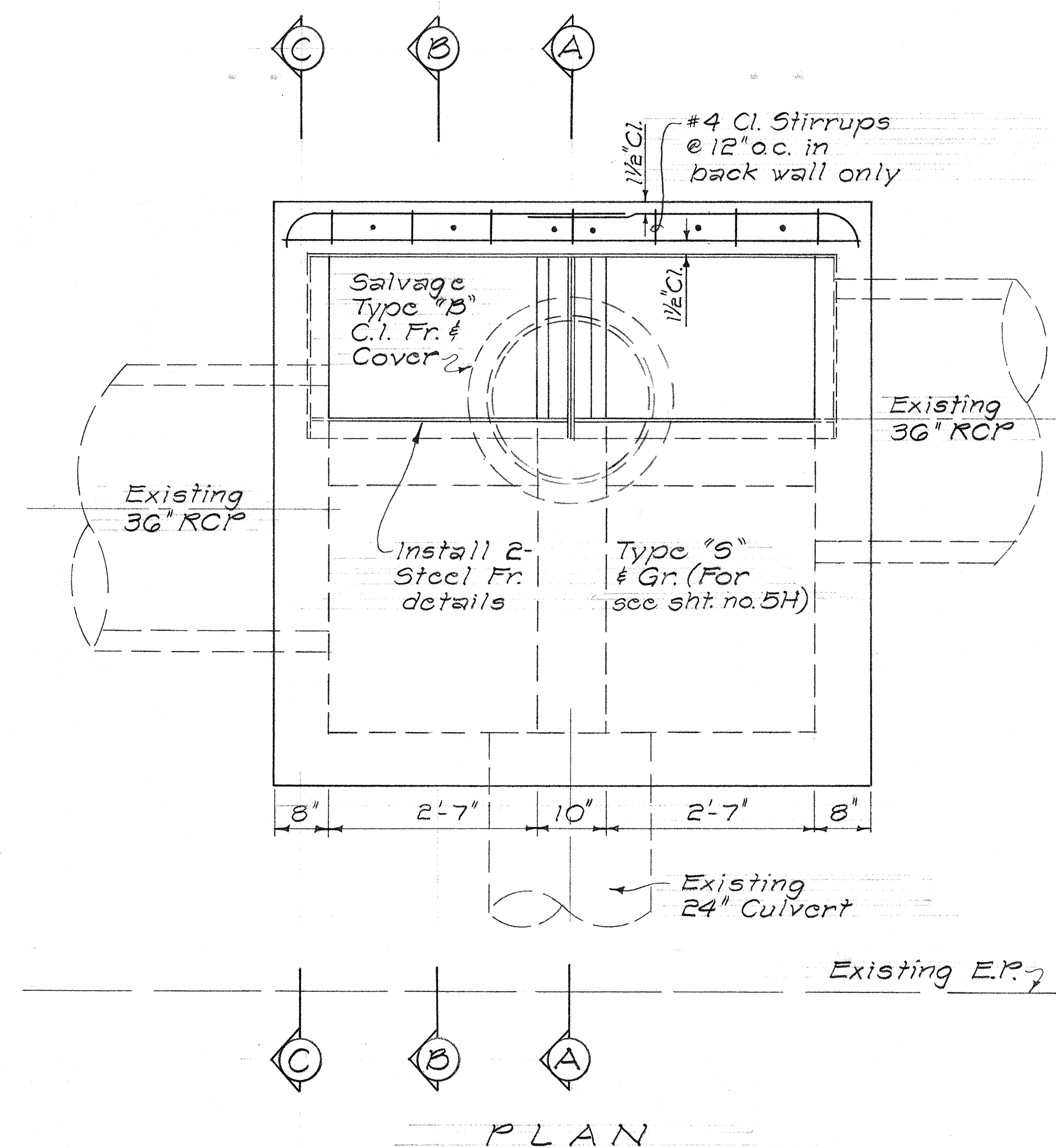
DETAILS OF CATCH BASIN @
RAMP "G" STA. 11 + 50 (C.B. #72-F)

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

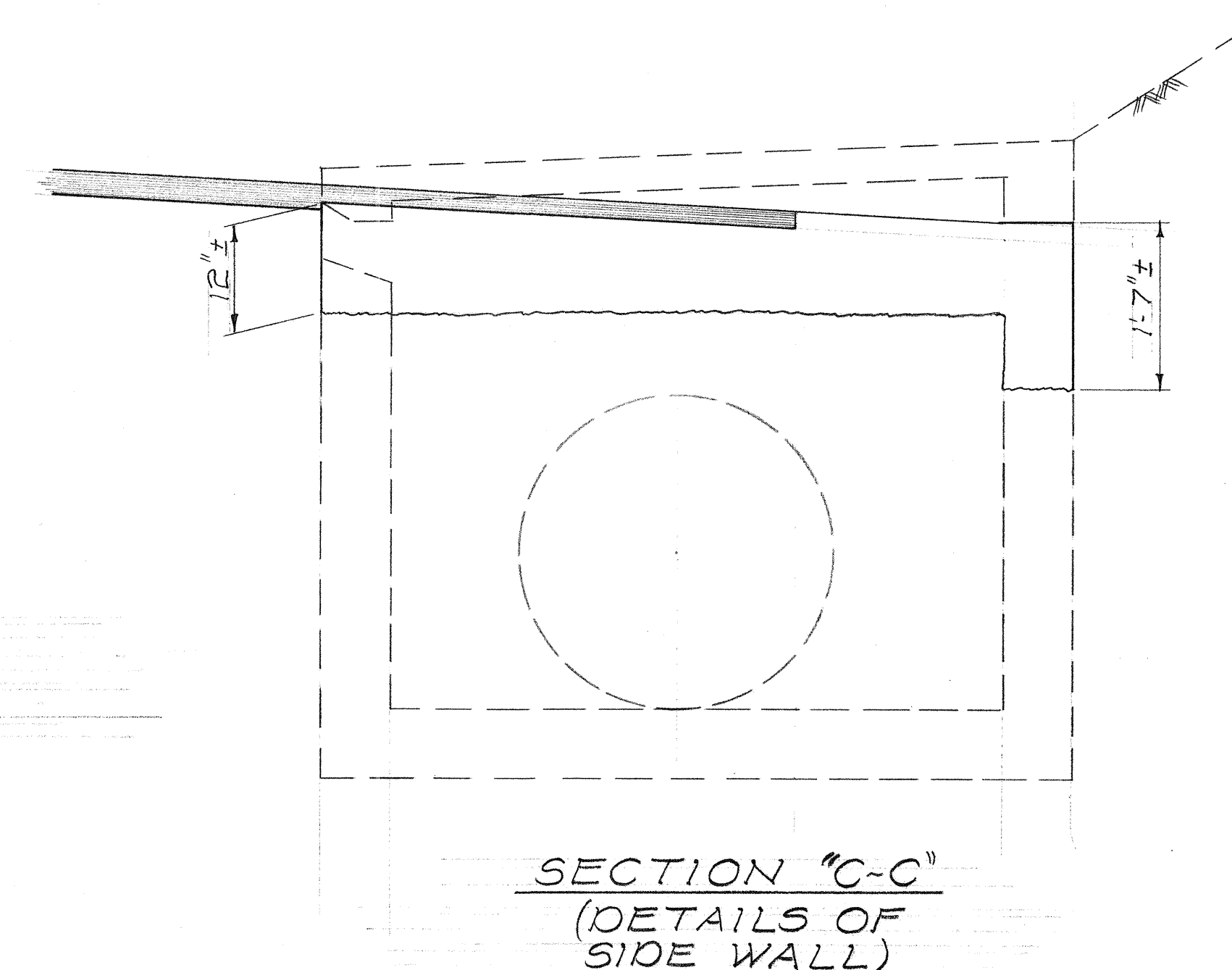
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF CATCH BASIN
WITH TYPE "S" GRATED INLET
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112)-10
Scale: 3/4" = 1'-0" Date: Apr, 1973
SHEET No. 22H OF 41H SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1-1(12):15	1973	73	176



NOTE:
All notes, dimensions and reinforcing layouts are similar to C.B. #57-F except as shown or noted on this sheet.
(For details, see sht. no. 21H)



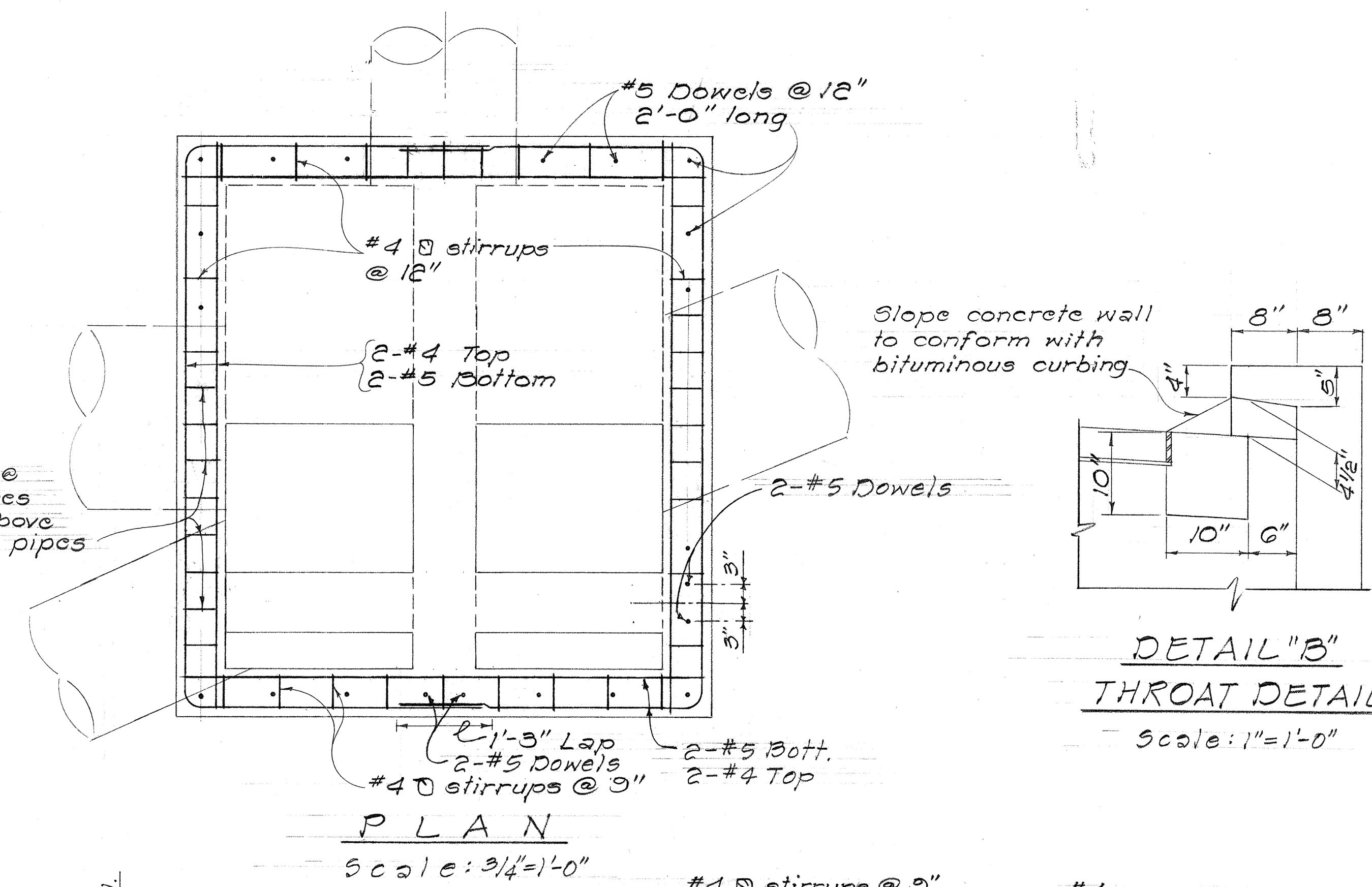
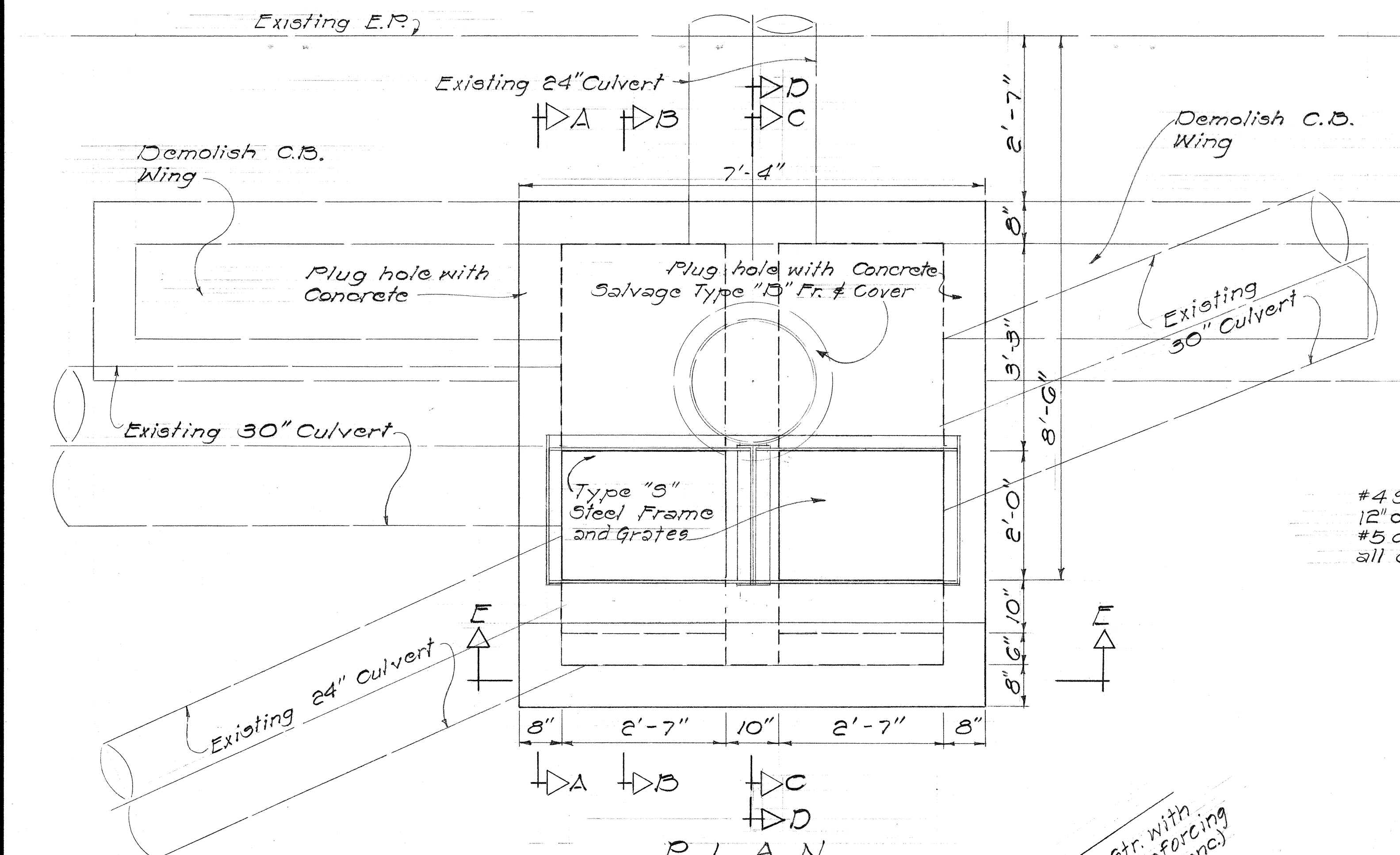
DETAILS OF CATCH BASIN @
RAMP "G" STA. 13 + 50 (C.B. #75-F)

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

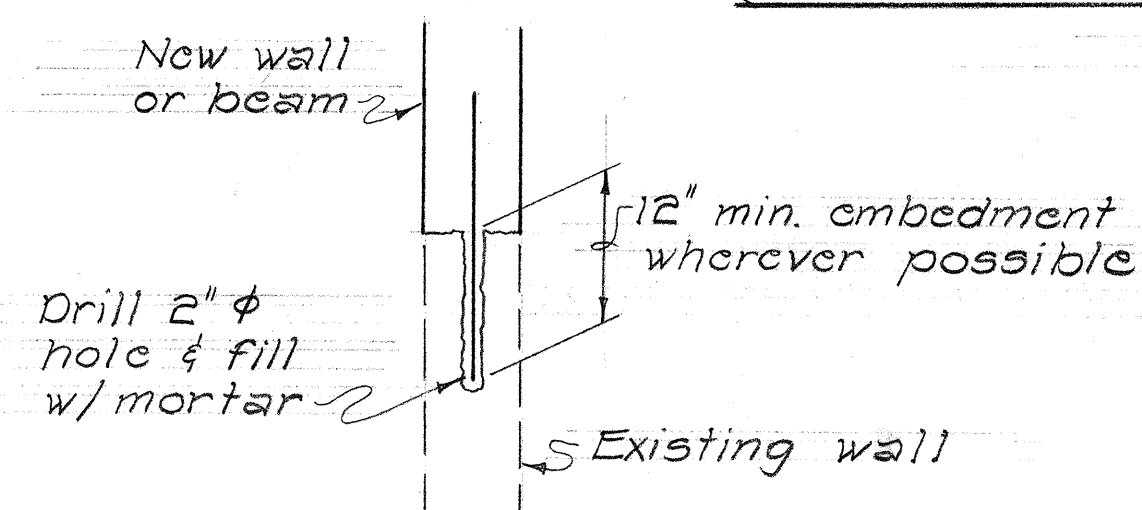
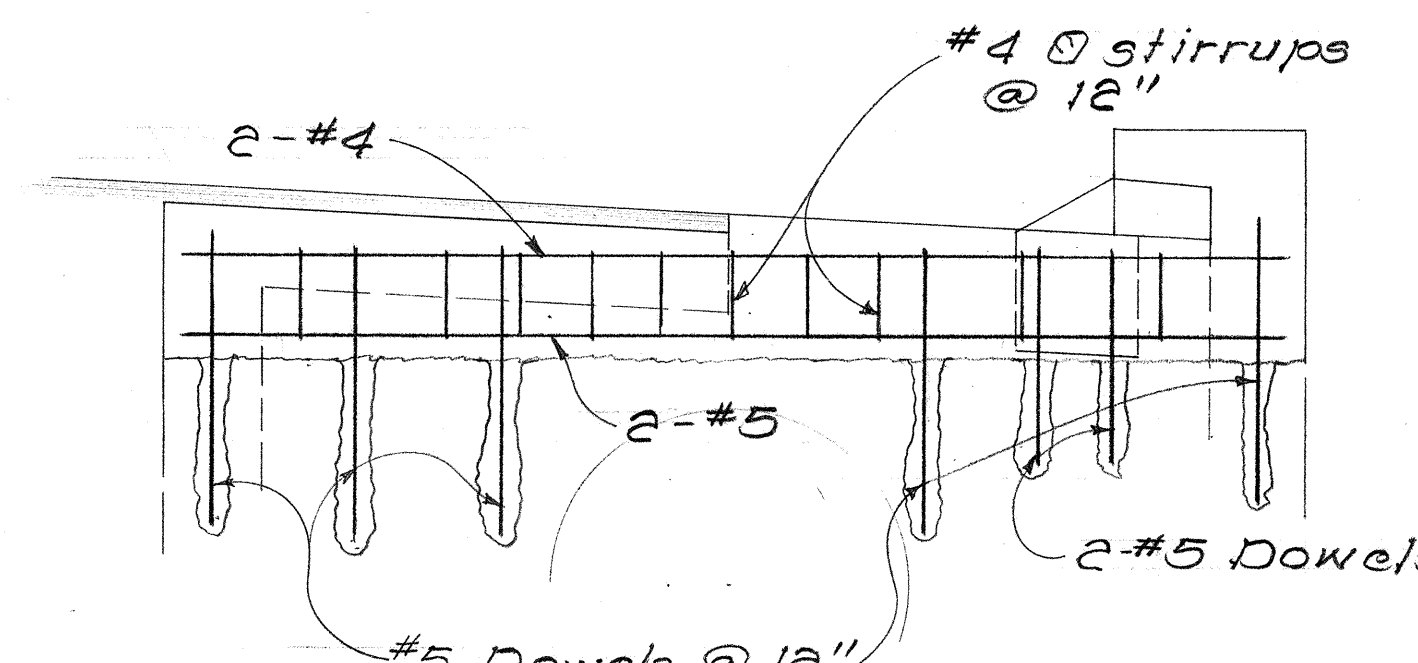
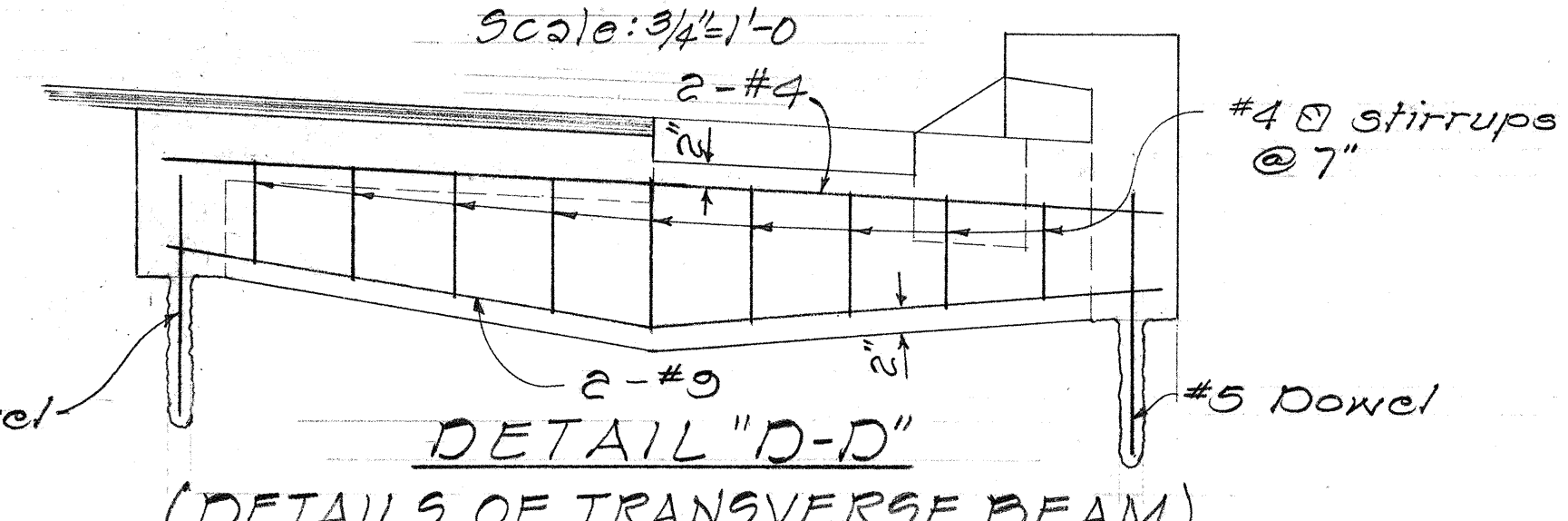
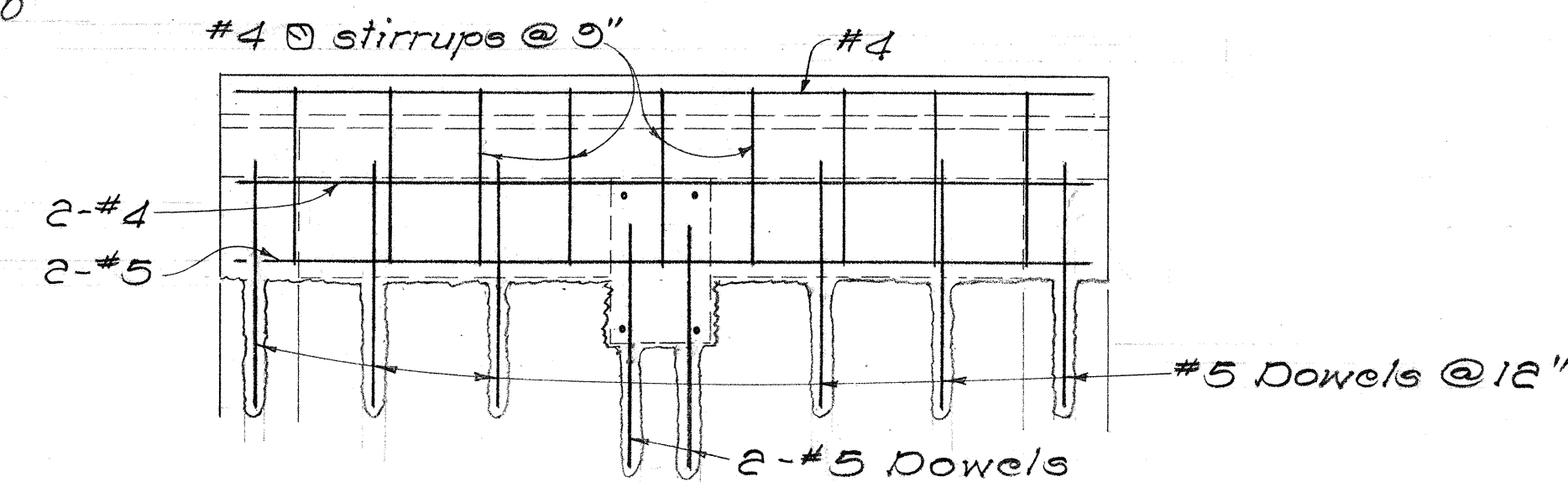
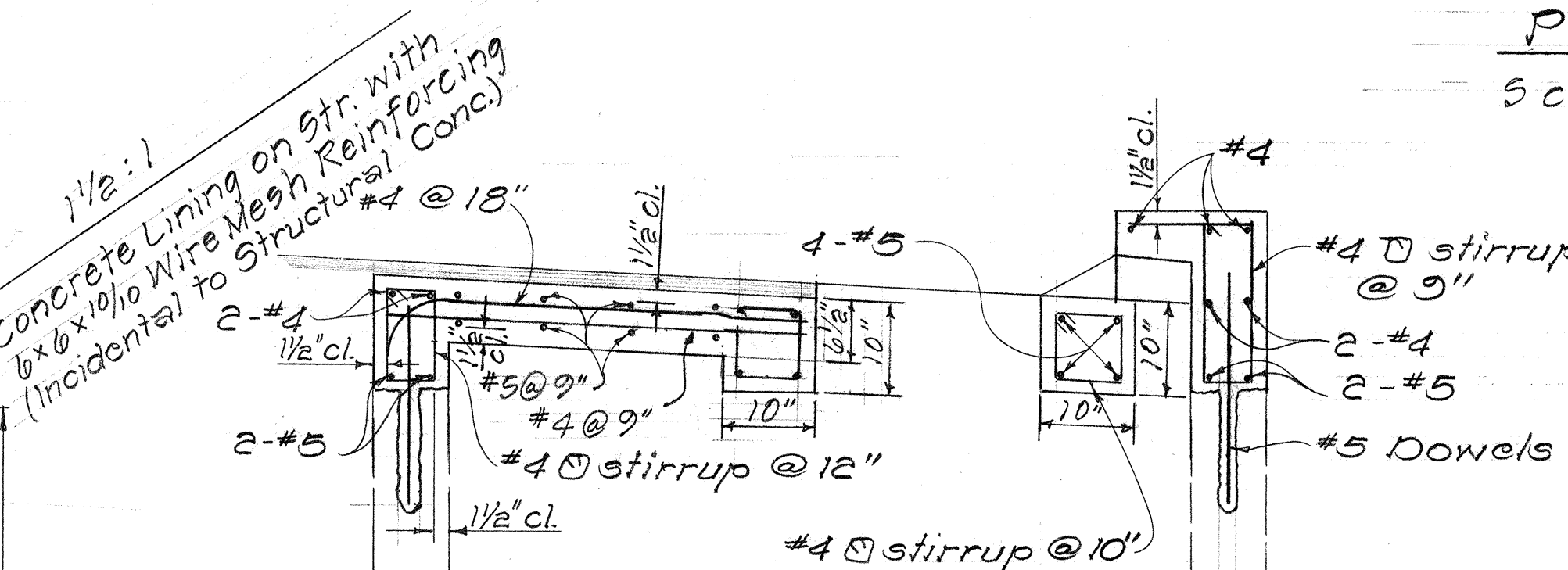
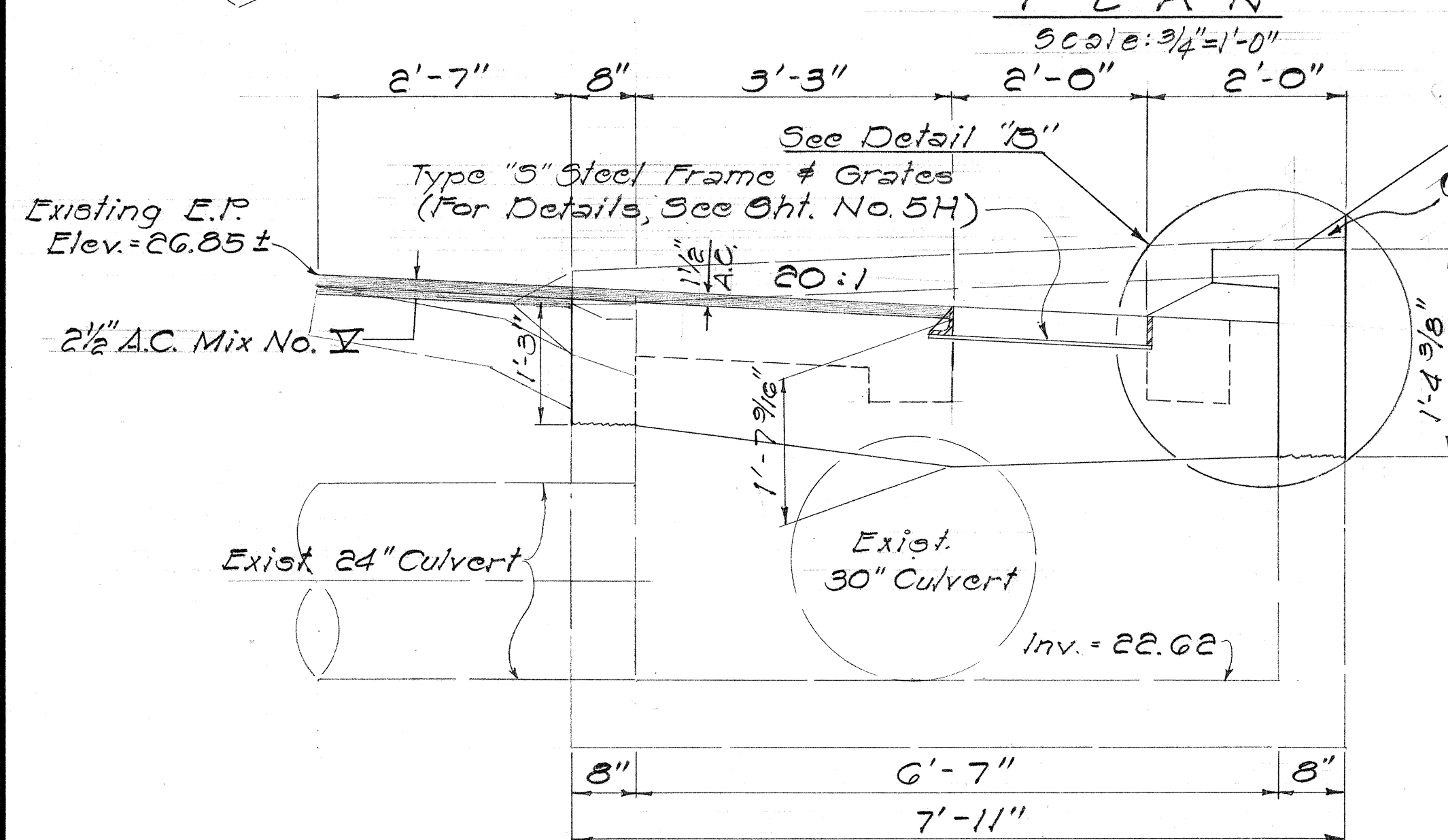
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF CATCH BASIN
WITH TYPE "5" GRATED INLET
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-H-1-1(12):15
Scale: 3/4" = 1'-0" Date: Apr, 1973
SHEET No. 23H OF 41 H SHEETS

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
APPROVED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):19	1973	74	176



DETAIL "B"
THROAT DETAIL
Scale: 1"=1'-0"

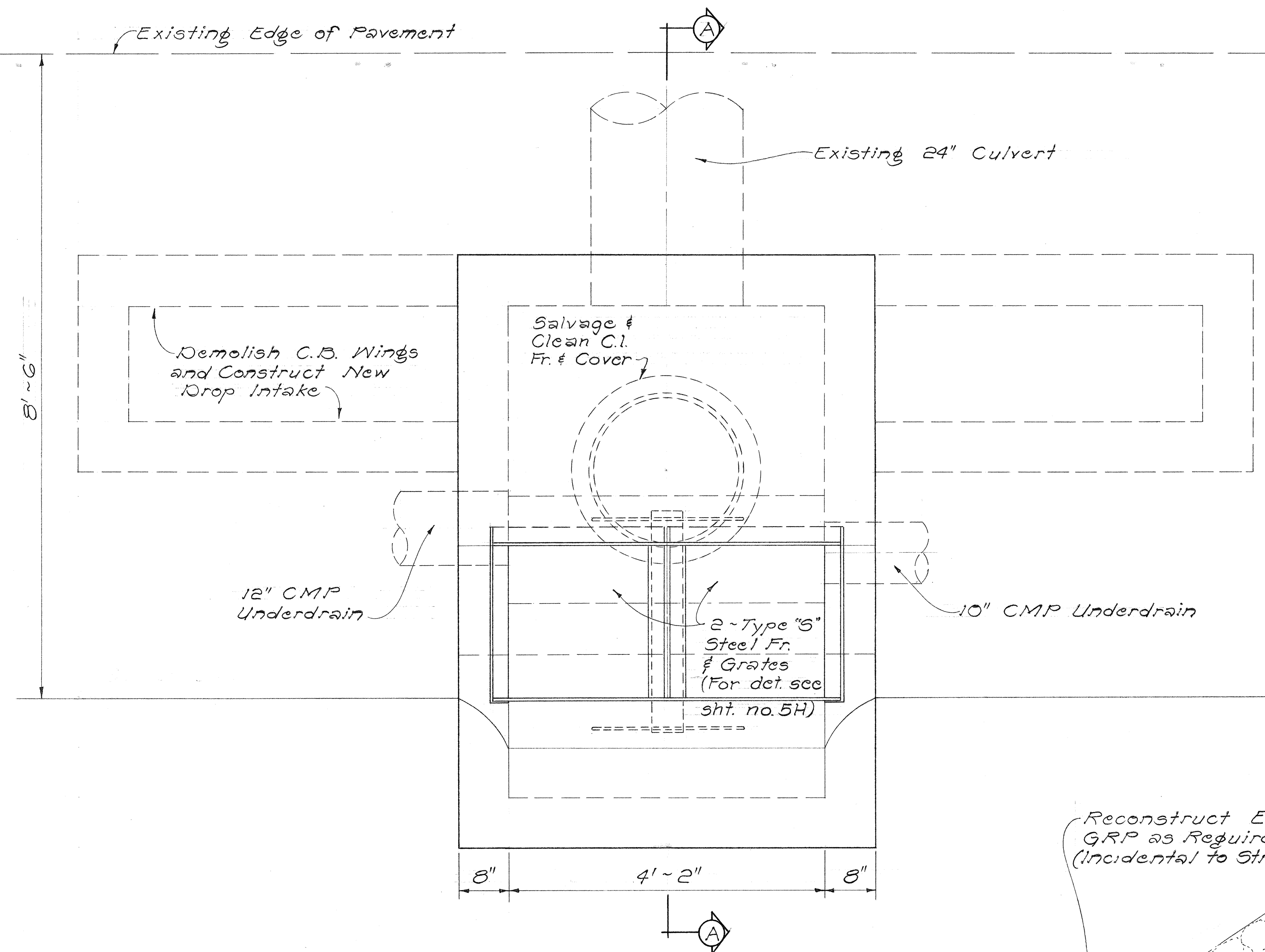


C.B. # 61-F
STA. 111+70 E.B.

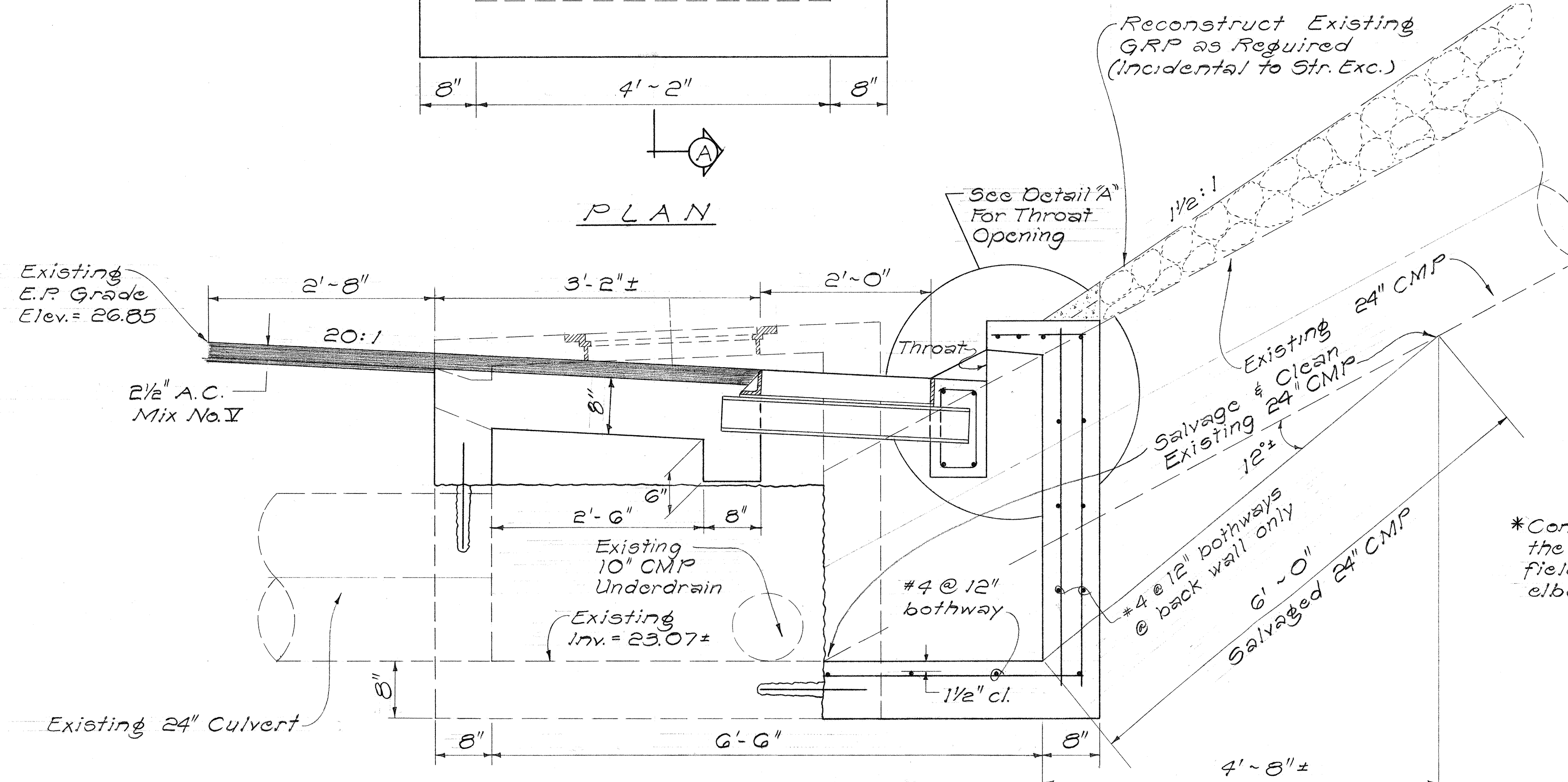
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF CATCH BASIN WITH TYPE "B" GRATED INLET & THROAT OPENING
Safety Improvement
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):19
Scale: As Noted Date: Apr, 1973
SHEET No. 24H OF 41H SHEETS

DATE	.....
DESIGNED BY	.....
CHECKED BY	.....
NO.	.....

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-H1-1(112):10	1973	75	176



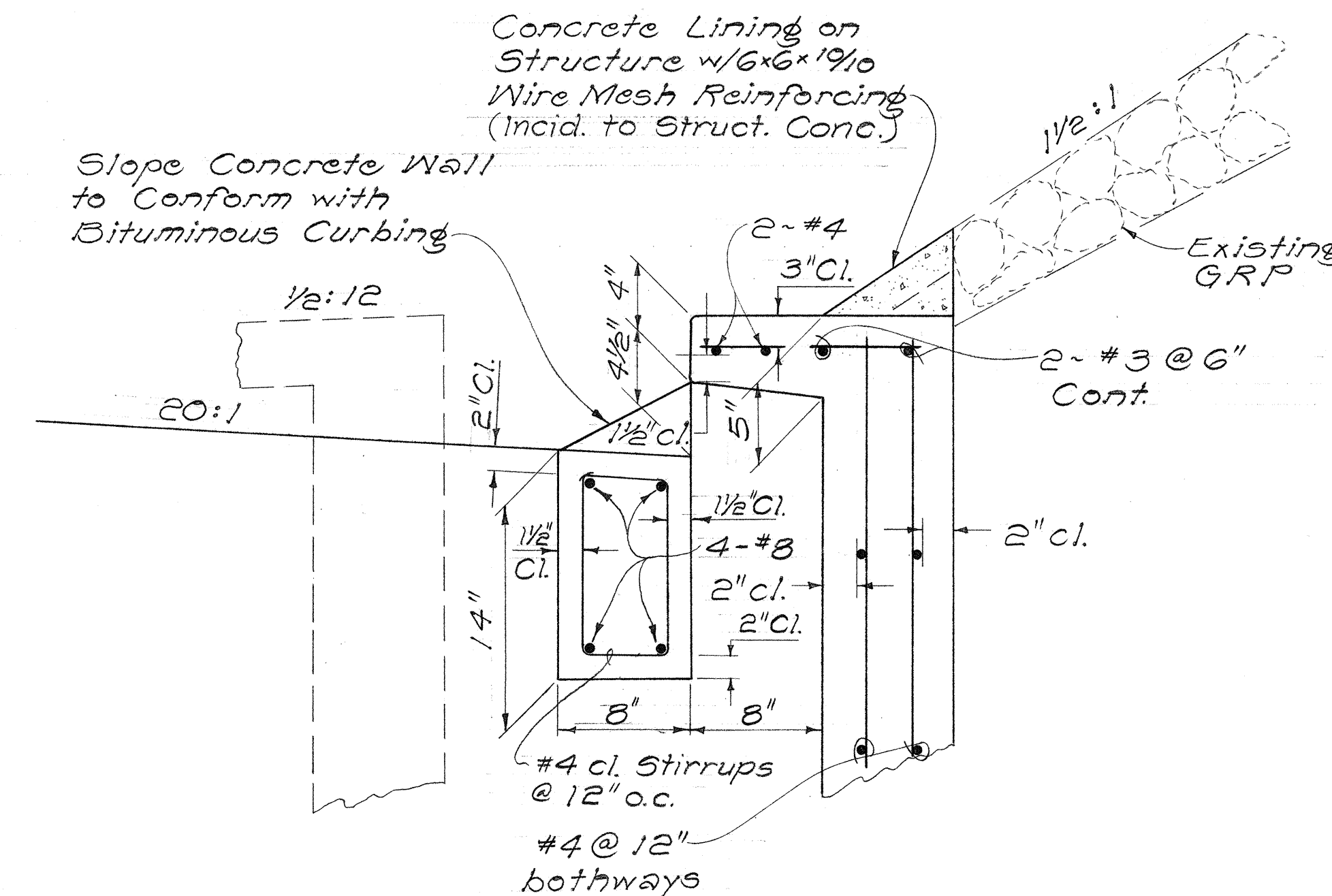
PLAN



SECTION "A-A"

C.B. #60-F STA. 111+70 W.B.

Scale: 1"=1'-0"



DETAIL "A"

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

NOTE:

Except as noted on this sheet, see typical section for notes, dimension, and reinforcing steel details for Type "S" Grated Drop Intake on sht. no. 39H

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

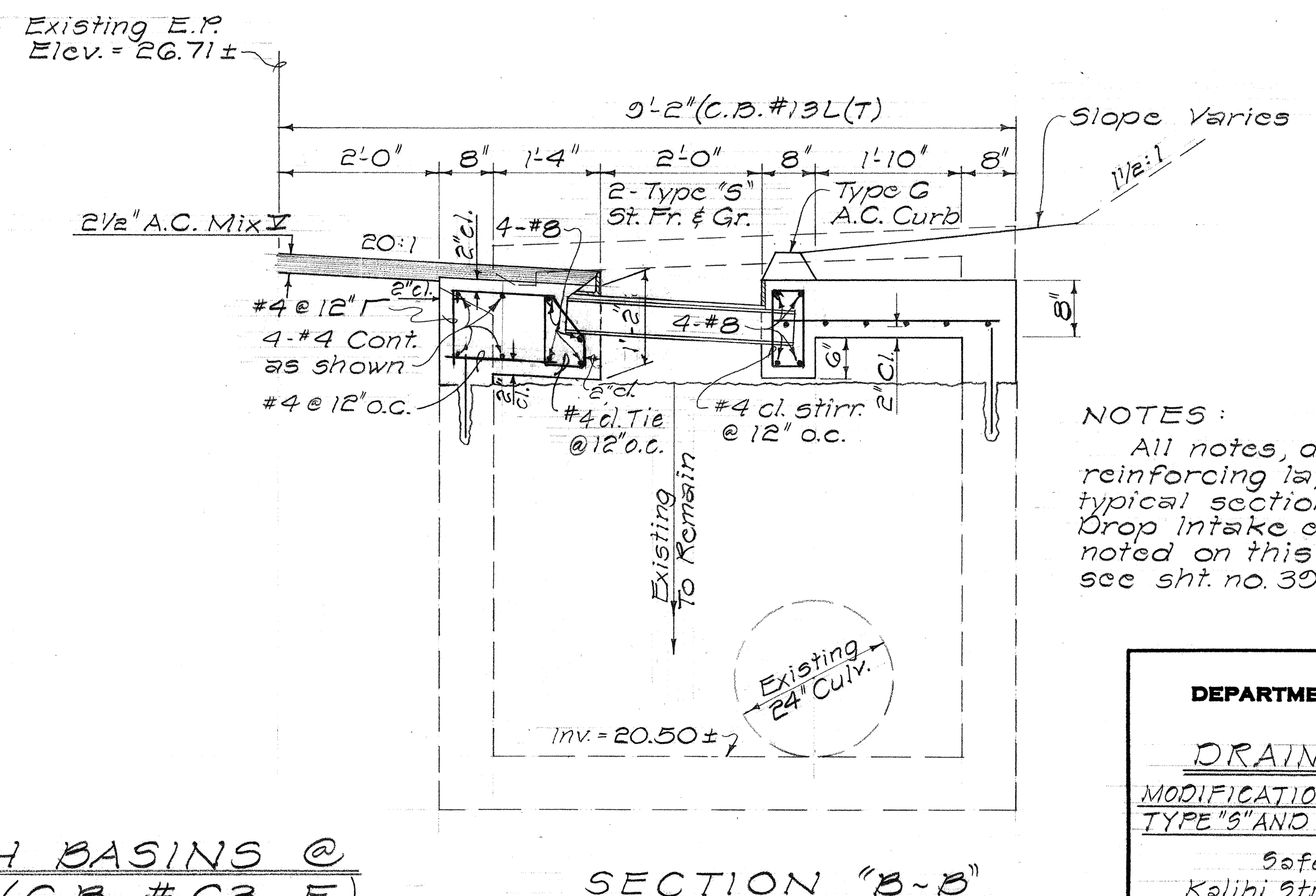
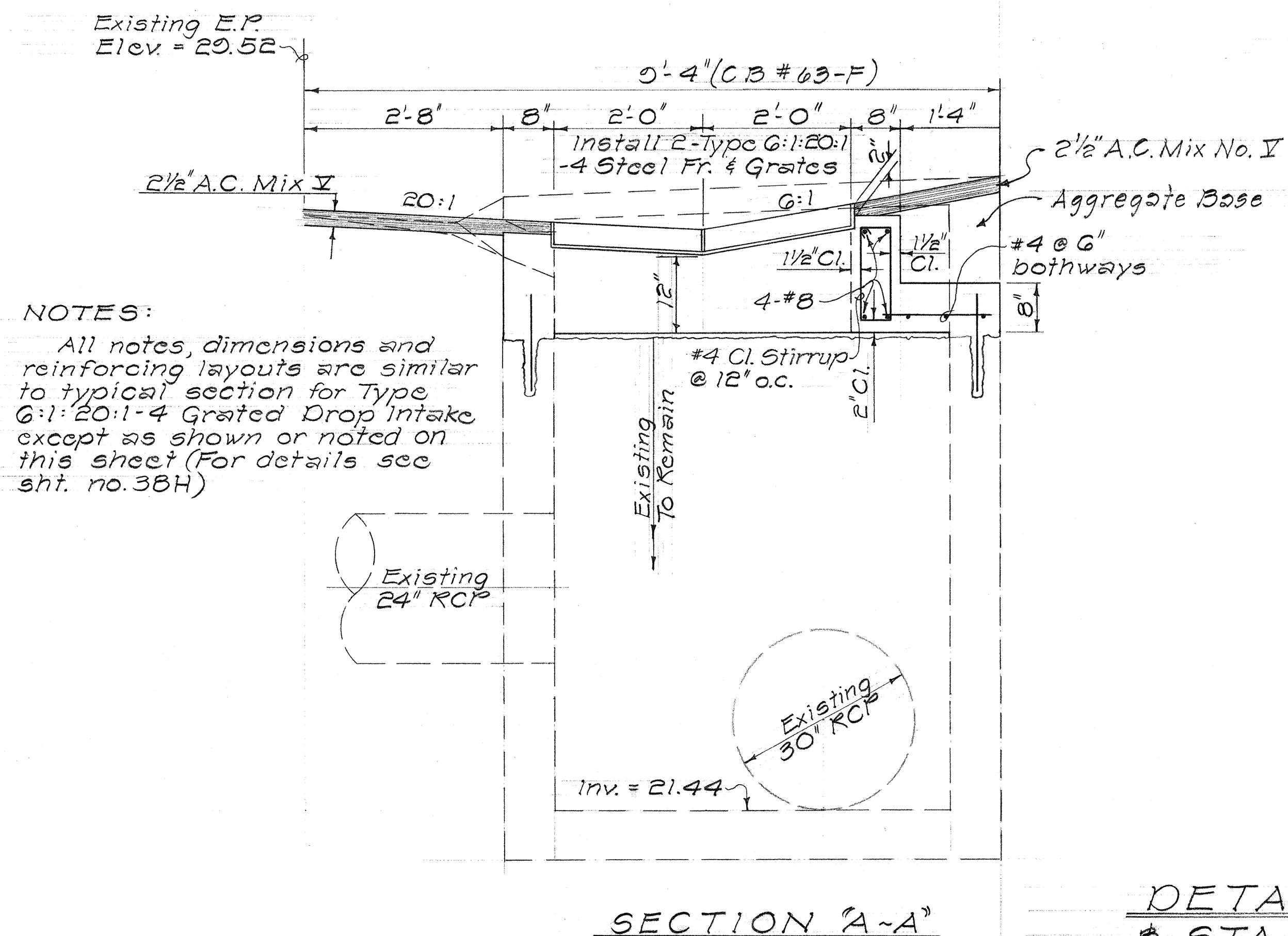
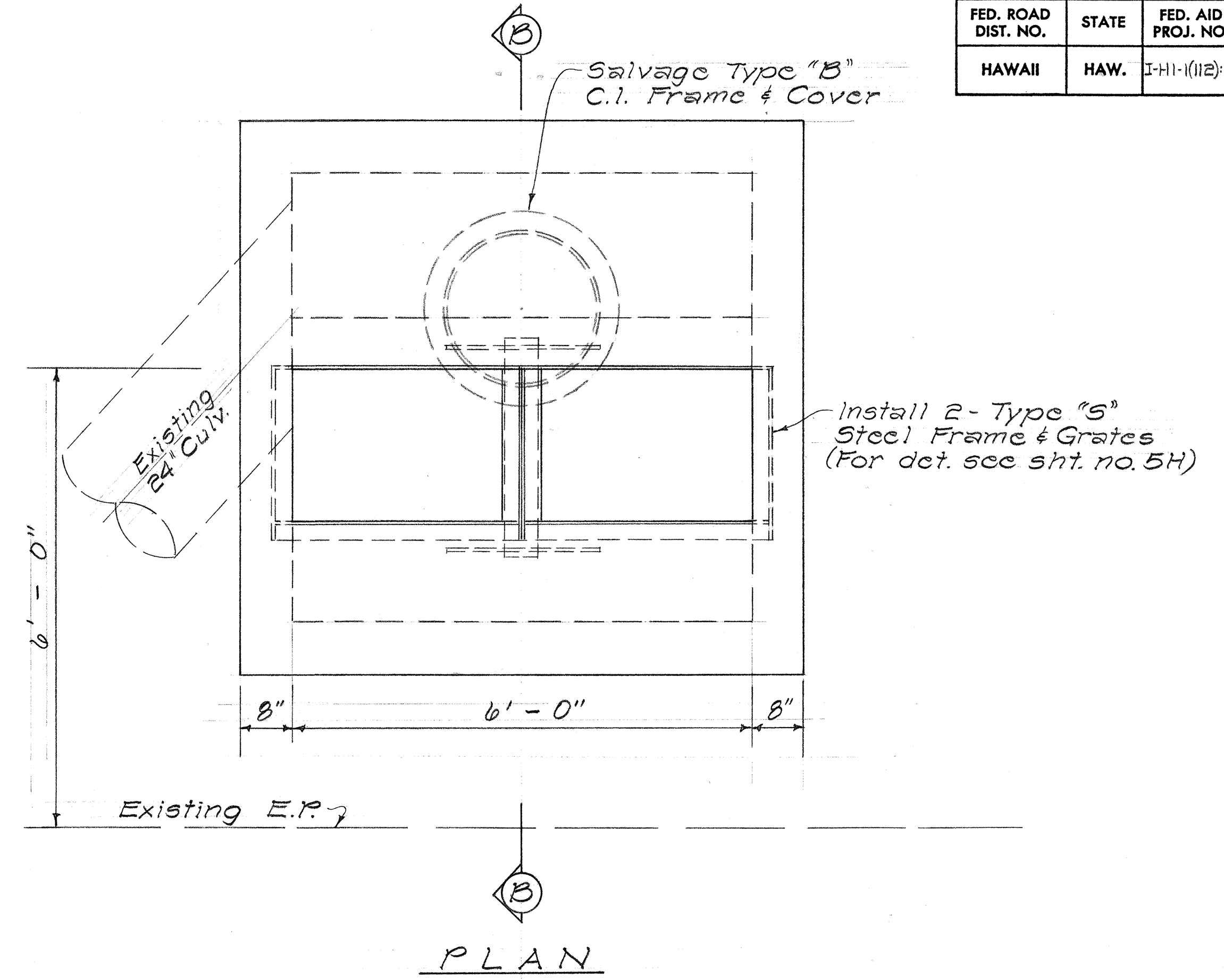
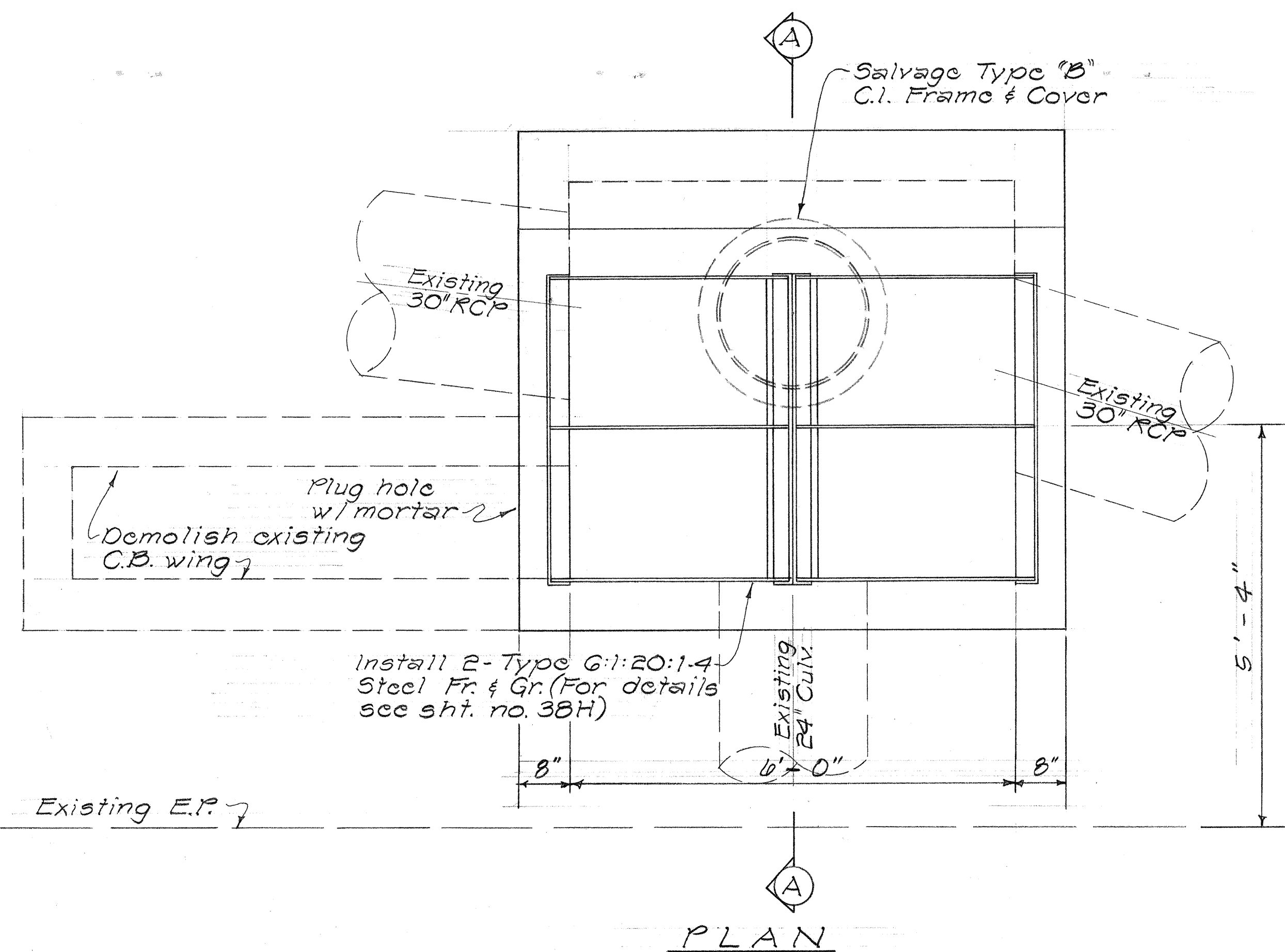
DRAINAGE DETAILS
MODIFICATION OF CATCH BASIN
WITH TYPE "S" GRATED
AND THROAT INLET

Safety Improvements
Kalihi Street To Pali Highway
F.A.I. Proj. No. I-H1-1(112):10
Scale As Noted Date: Apr. 1973

SHEET No. 25H OF 41H SHEETS

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
ORIGINAL PLAN	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):19	1973	76	176



NOTES:
All notes, dimensions and reinforcing layouts are similar to typical section for Type G:1:20:1-4 Grated Drop Intake except as shown or noted on this sheet (For details see sht. no. 38H)

NOTES:
All notes, dimensions and reinforcing layouts are similar to typical section for Type S Grated Drop Intake except as shown or noted on this sheet. (For details see sht. no. 39H)

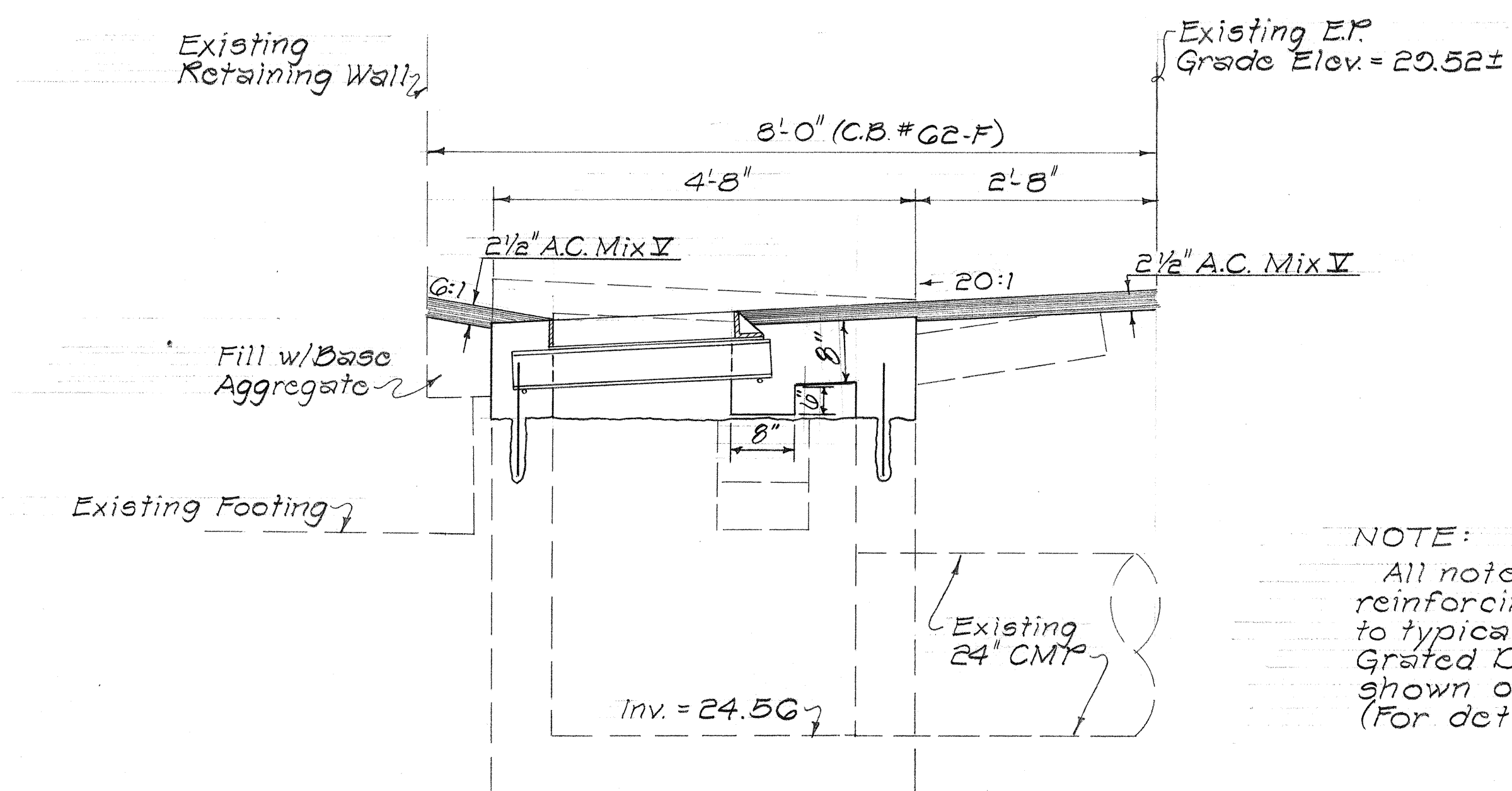
DETAILS OF CATCH BASINS @
STA. 114 + 50 E.B. (C.B. #63-F)
STA. 145 + 78 W.B. (C.B. #13-L(T))

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

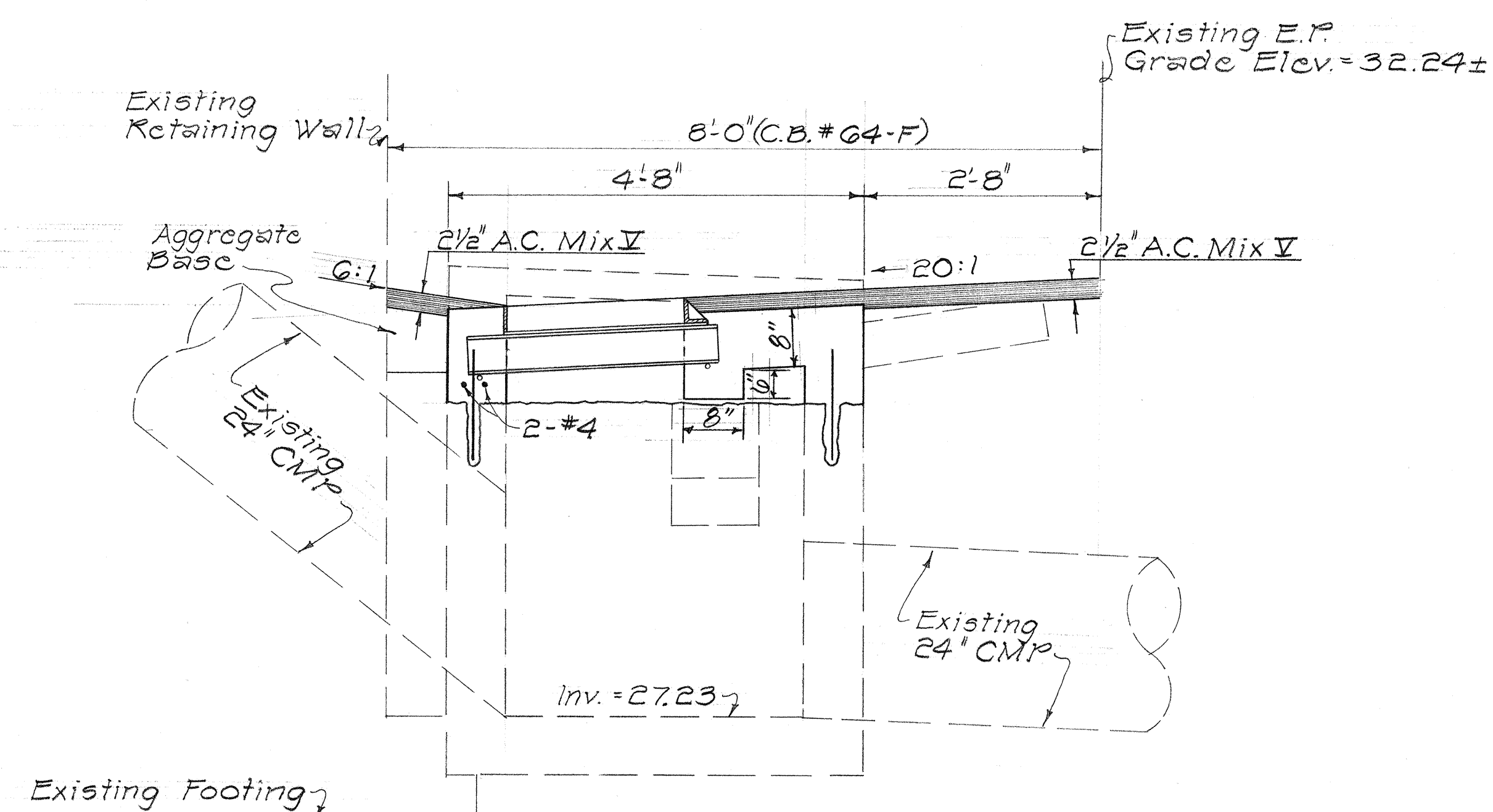
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF CATCH BASIN WITH
TYPE "S" AND G:1:20:1-4 GRATED INLETS
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):19
Scale: 3/4" = 1'-0" Date: April, 1973
SHEET No. 26H OF 41 HSHEETS

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
APPROVED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):10	1973	77	176



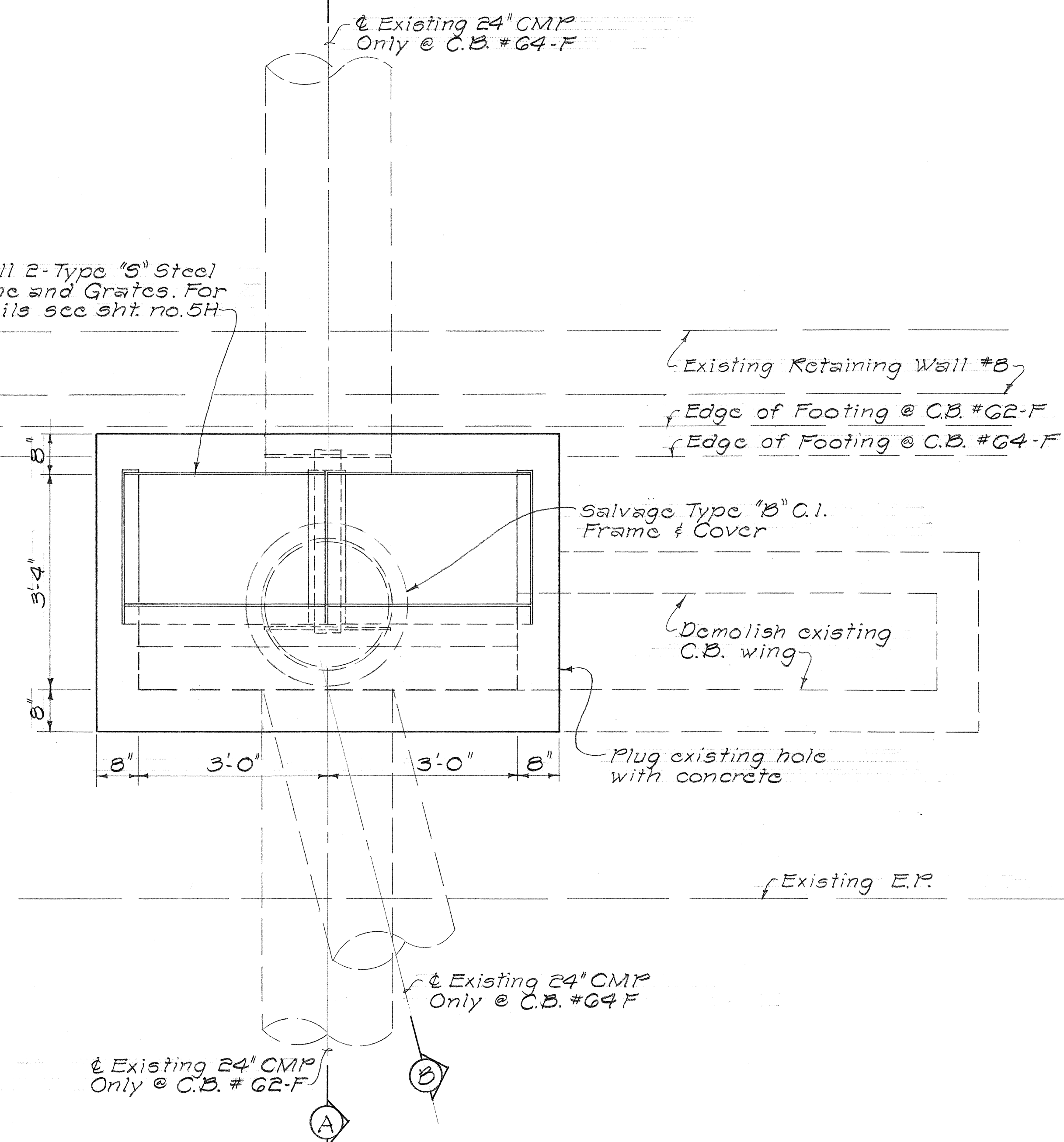
SECTION "A-A"



SECTION "B-B"

NOTE:
All notes, dimensions and reinforcing layouts are similar to typical section for Type "S" Grated Drop Intake except as shown or noted on this sheet. (For details see sht. no. 39H)

Install E-Type "S" Steel Frame and Grates. For details see sht. no. 5H



PLAN

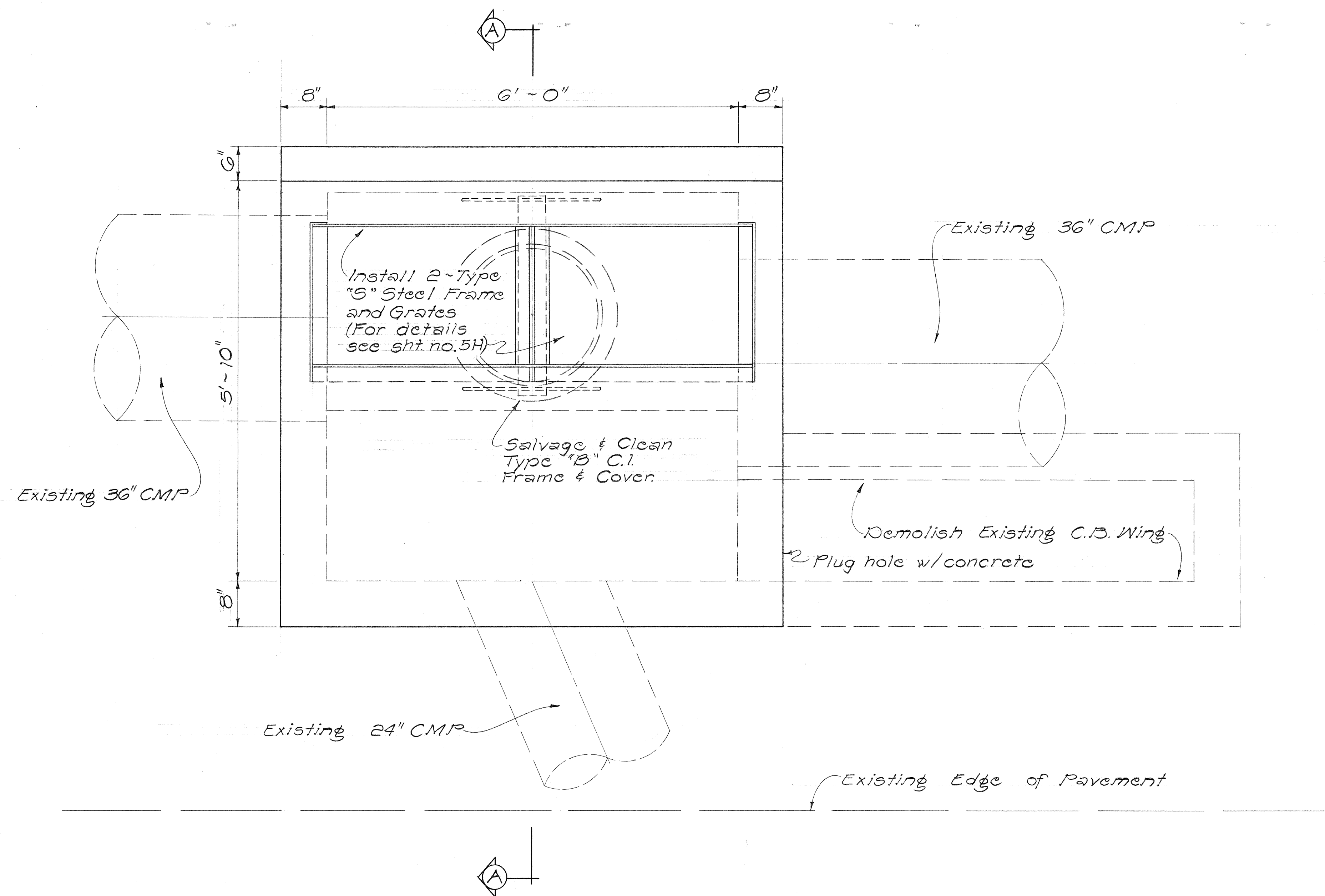
DETAILS OF CATCH BASINS @
RAMP "7" STA. 7+50 (C.B. #64-F)
RAMP "7" STA. 9+90 (C.B. #62-F)

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF CATCH BASINS
W/TYPE "S" GRATED INLET
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):10
Scale: 3/4" = 1'-0" Date: Apr, 1973
SHEET No. 27H OF 41 HSHEETS

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112)-10	1973	78	176

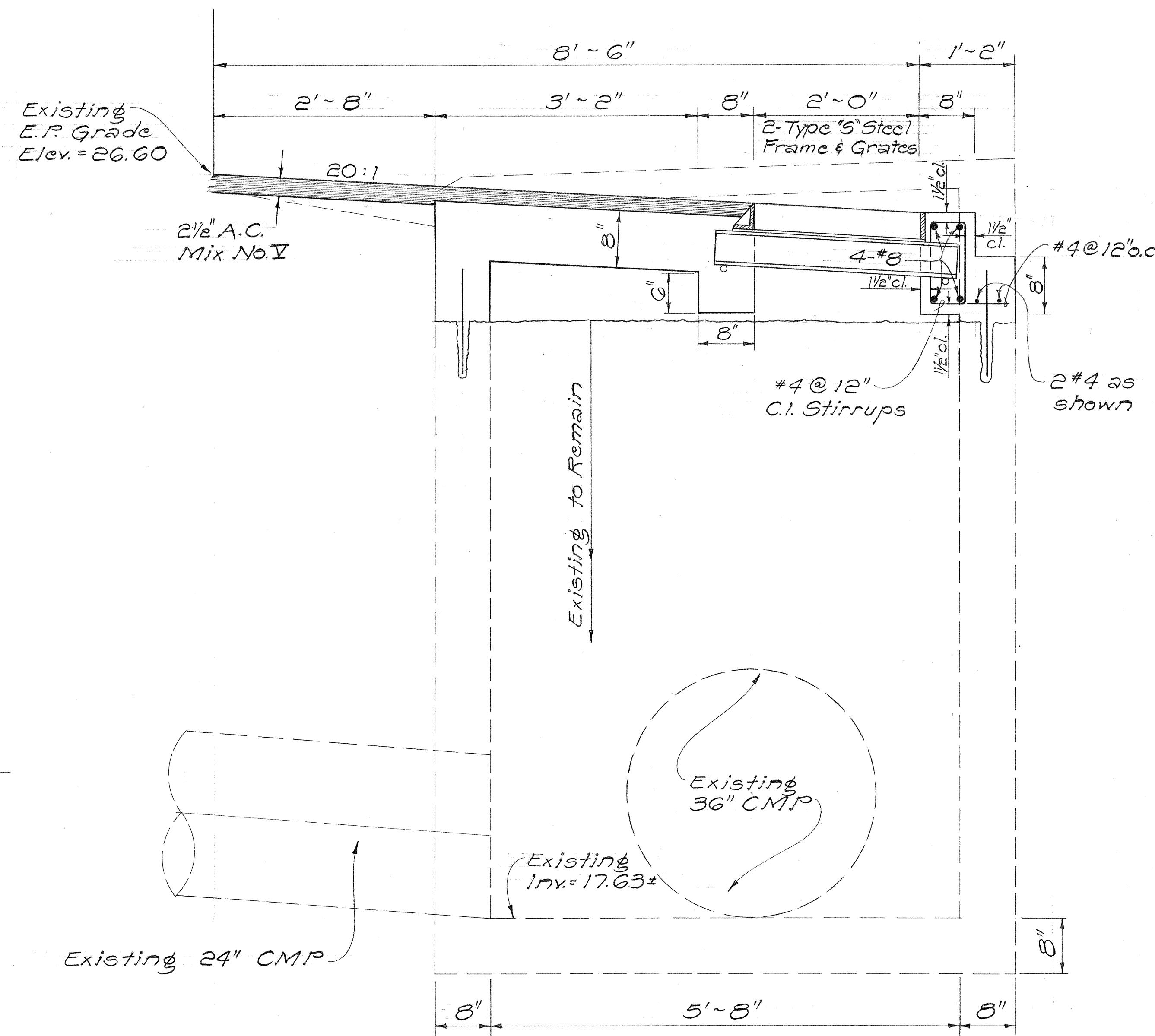


PLAN

NOTE:

Except as noted on this sheet see typical section for notes dimension and reinforcing steel details for Type "S" Grated Drop Intake on sh. no. 39H

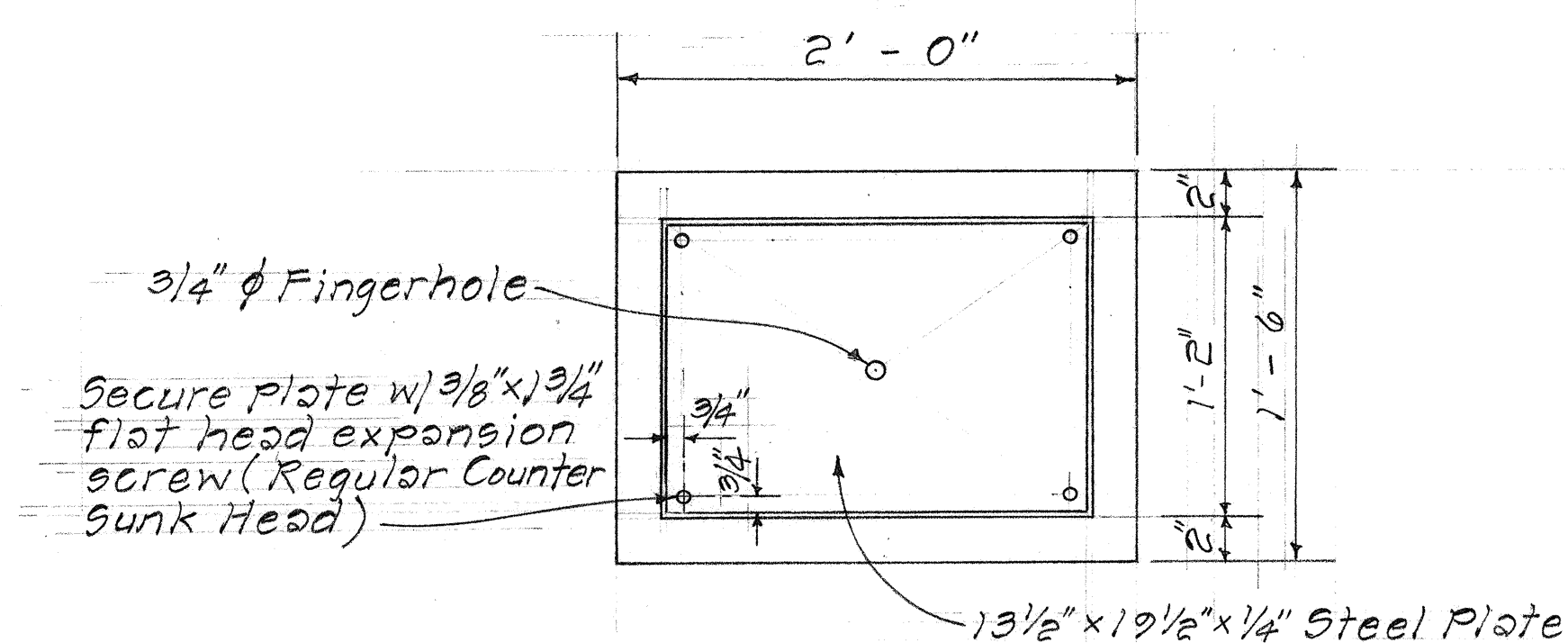
DETAIL OF C.B. #70-F @ RAMP 6 STA. 9+25



SECTION "A-A"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATIONS OF CATCH BASIN
WITH TYPE "S" GRATED INLET
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112)-10
Scale: 1"=1'-0" Date: Apr, 1973
SHEET No. 28H OF 41H SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(112)-10	1973	79	176

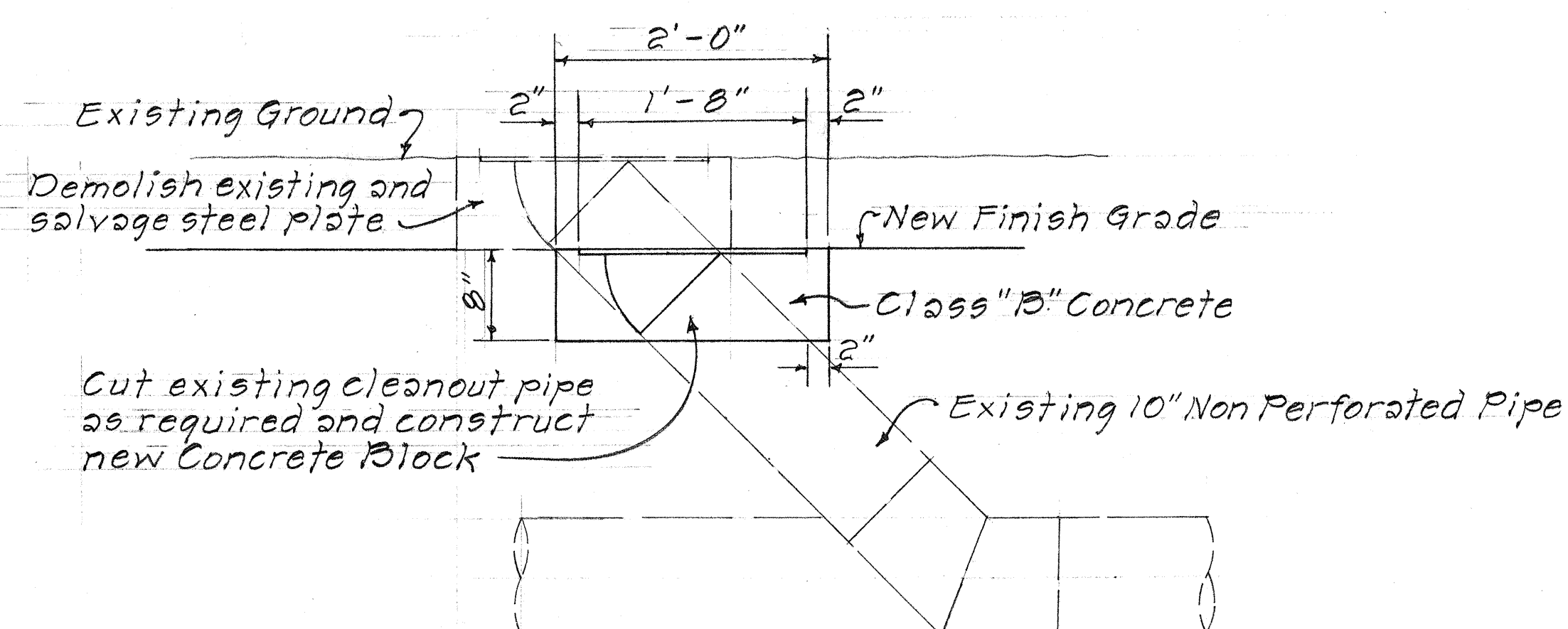


PLAN

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

NOTE:

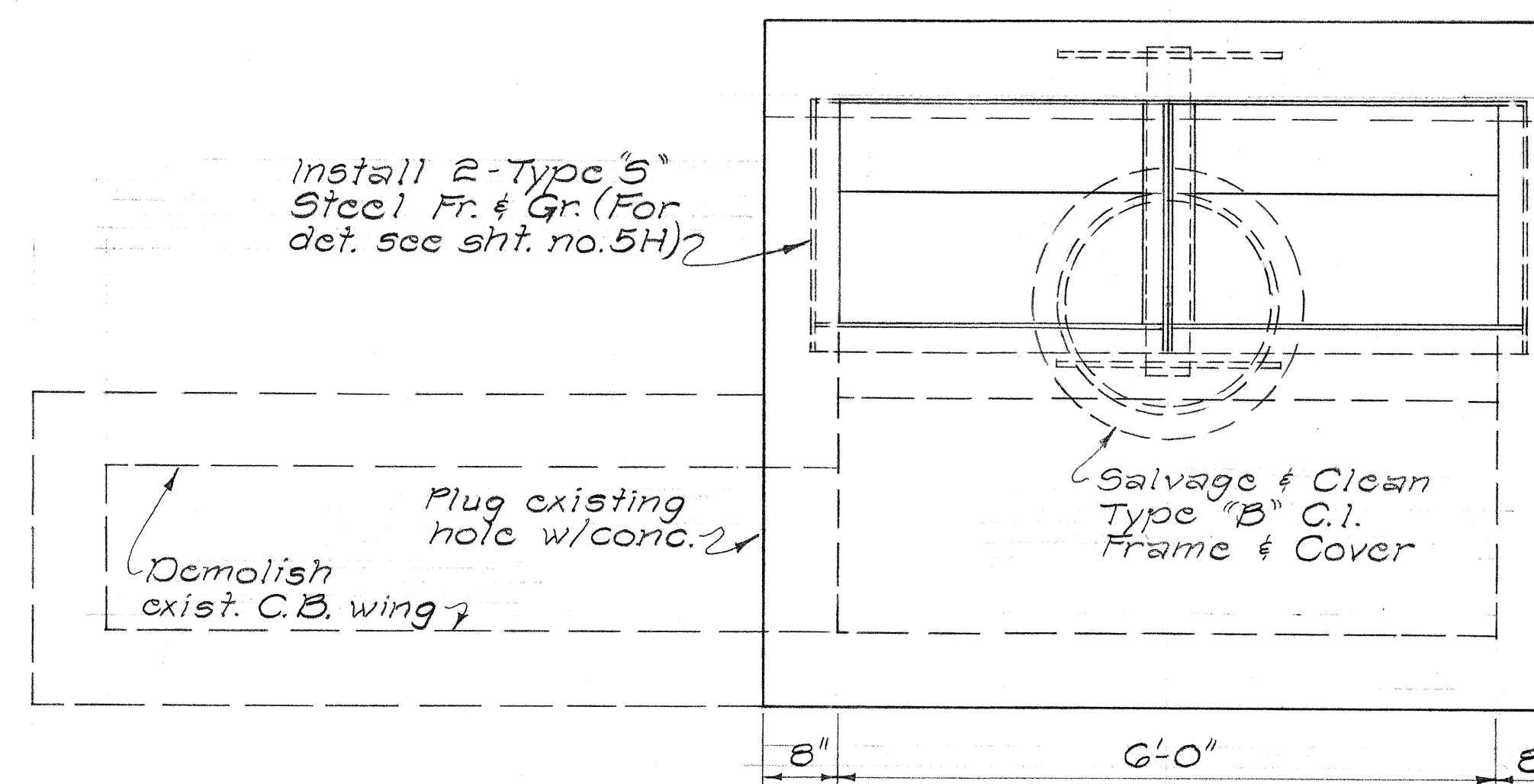
Demolishing existing concrete block, salvaging steel plate and cutting existing non-perforated pipe shall be considered incidental to Pay Item "Adjusting Underdrain Cleanouts"



DETAILS FOR ADJUSTMENTS TO THE EXISTING UNDERDRAIN CLEANOUTS

Scale: 1" = 1'-0"

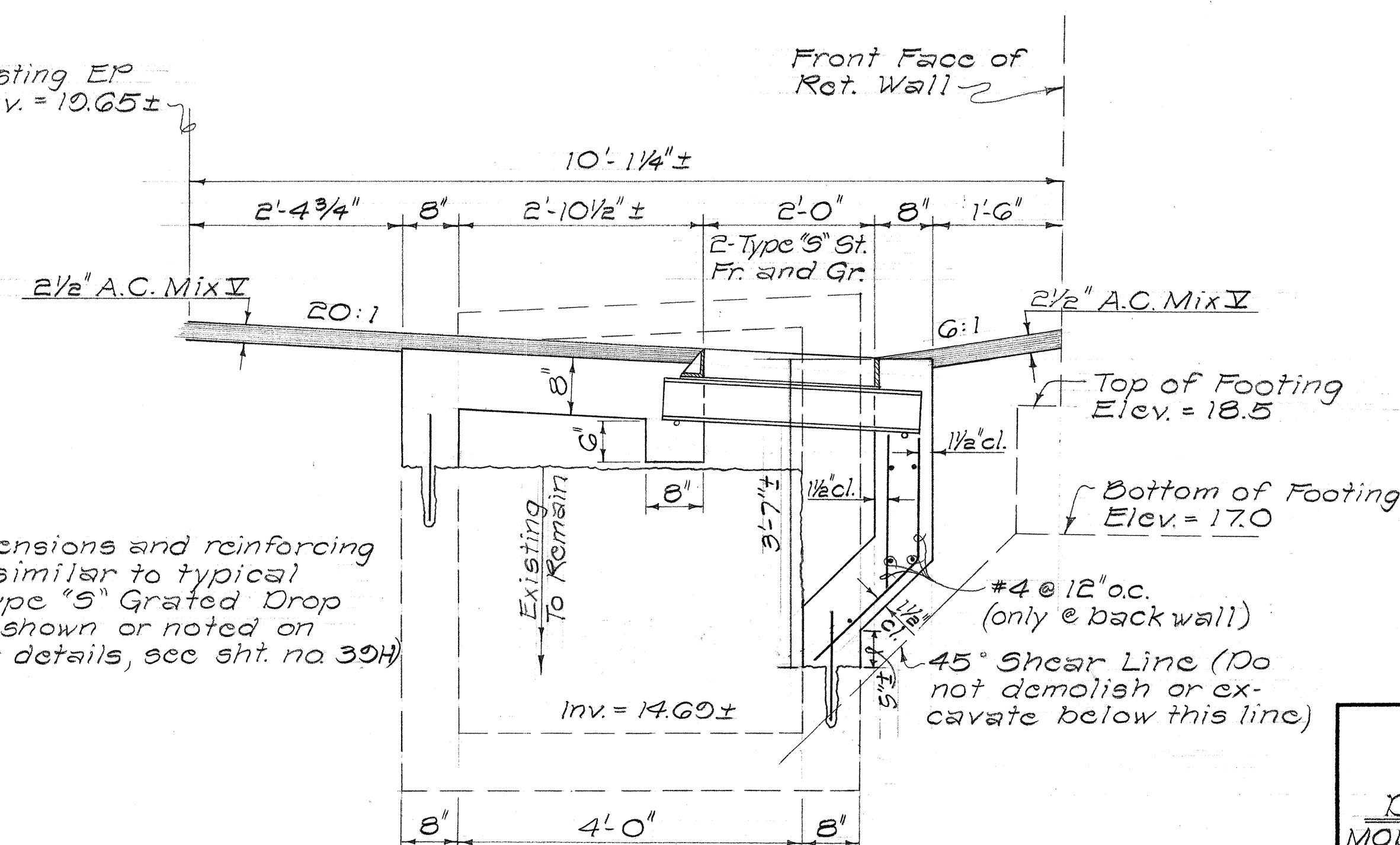
Face of Ret. Wall
Face of Footing



PLAN

Existing E.P. 7

Existing EP
Elev. = 10.65±



SECTION "A-A"

NOTE:

All notes, dimensions and reinforcing layouts are similar to typical section for Type "S" Grated Drop Intake unless shown or noted on this sheet. (For details, see sht. no. 30H)

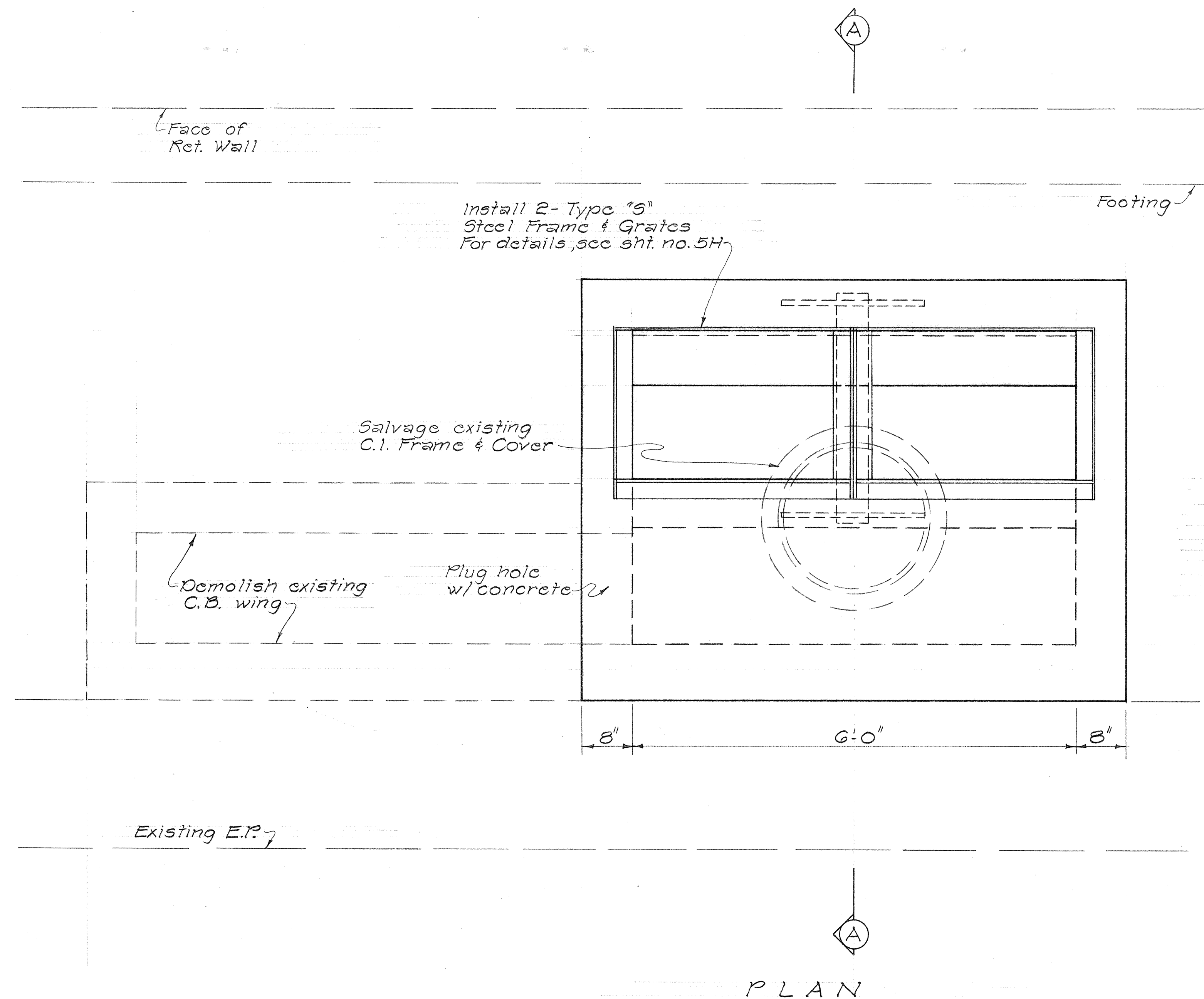
DETAILS OF CATCH BASIN @ STA. 125 + 75 W.B. (C.B. #74-F)

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATIONS TO CATCH BASIN
FOR TYPE "S" GRATED INLET &
DETAILS FOR ADJUSTMENTS TO
THE UNDERDRAIN CLEANOUTS
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-H-1(112)-10
Scale As Noted Date: Apr. 1973
SHEET No. 20H OF 41H SHEETS

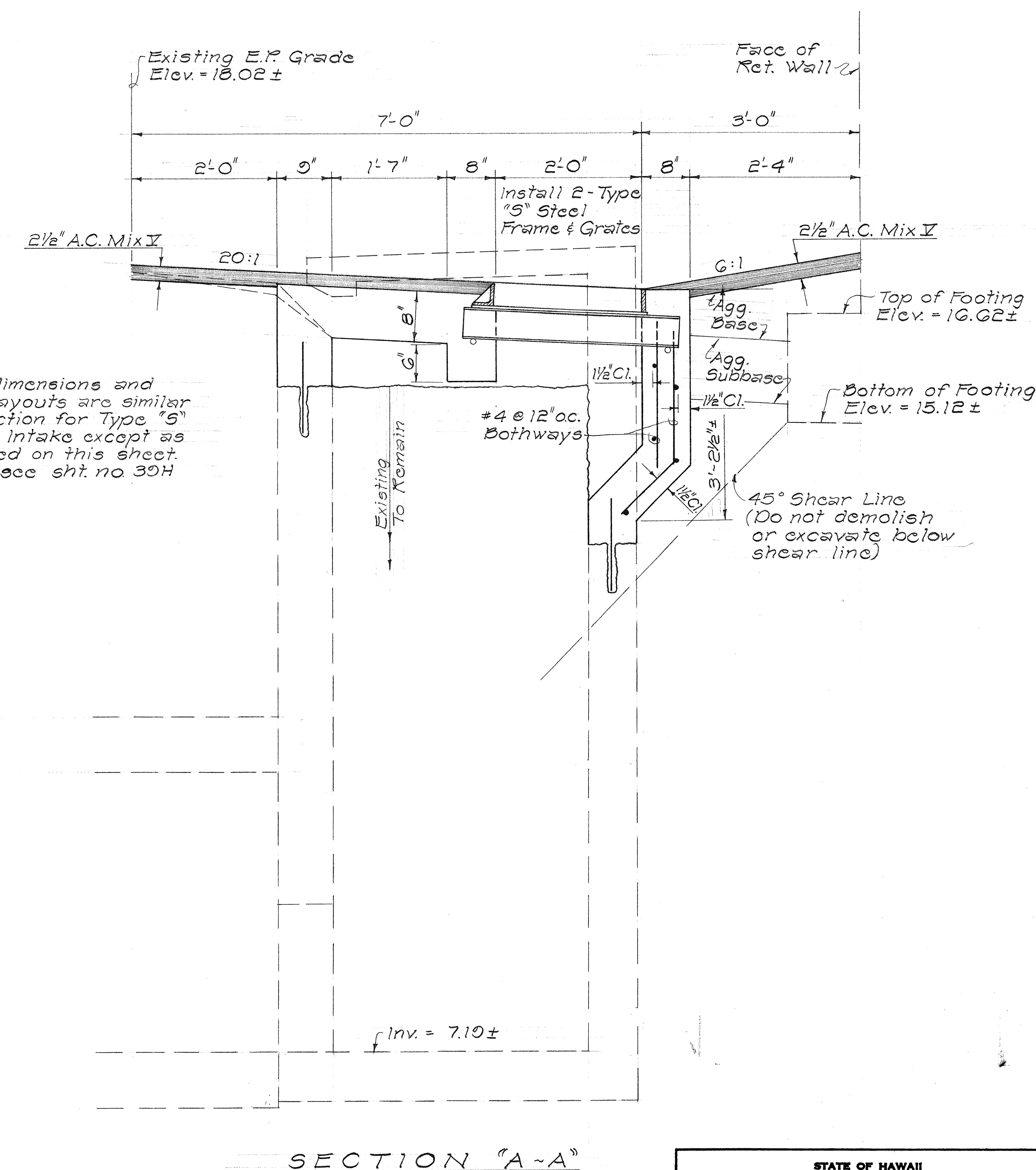
DATE	.....
DESIGNED BY	.....
CHECKED BY	.....
NO.	.....

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):10	1973	80	176



NOTES:

All notes, dimensions and reinforcing layouts are similar to typical section for Type "5" Grated Drop Intake except as shown or noted on this sheet. (For details see sht. no. 30H)

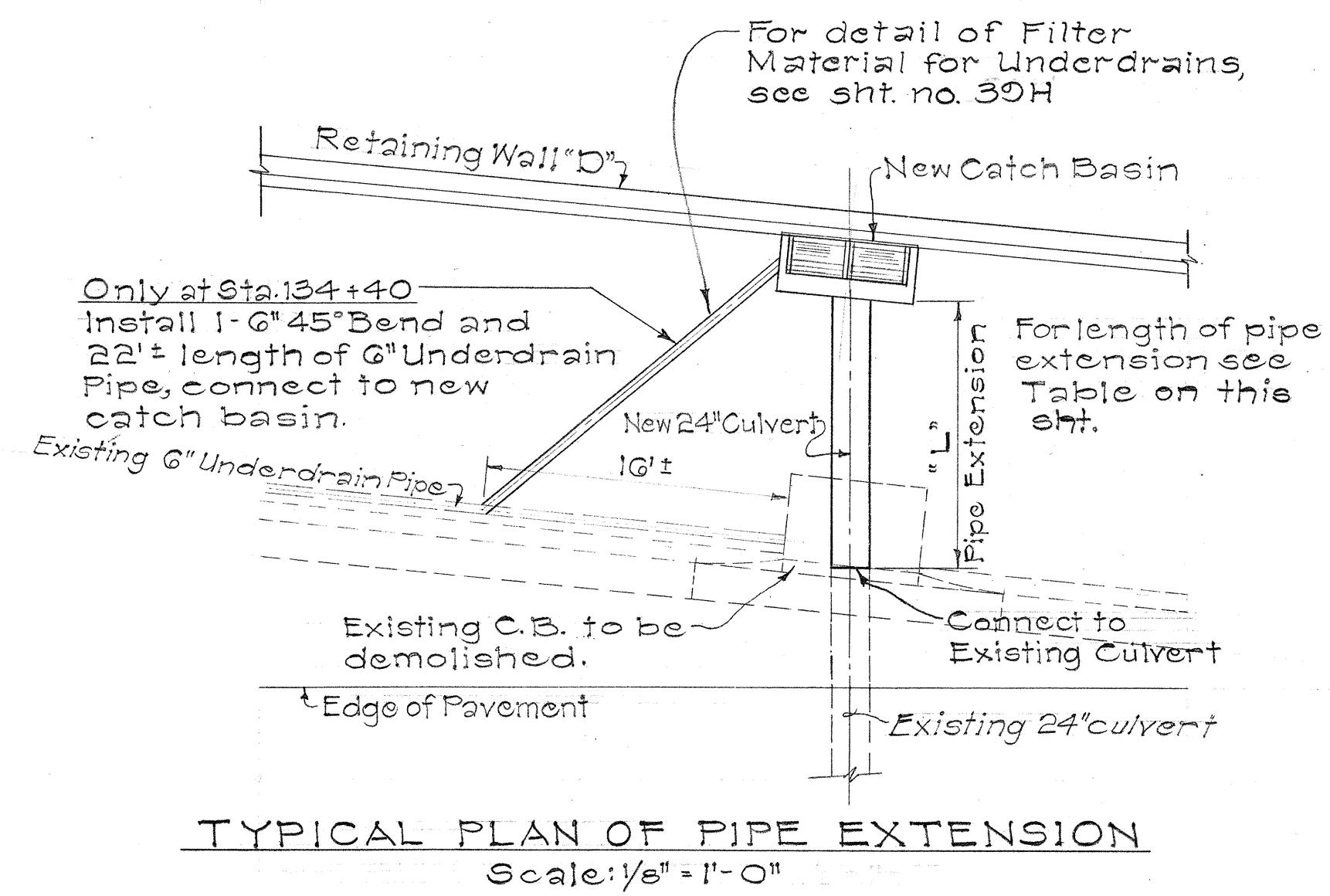
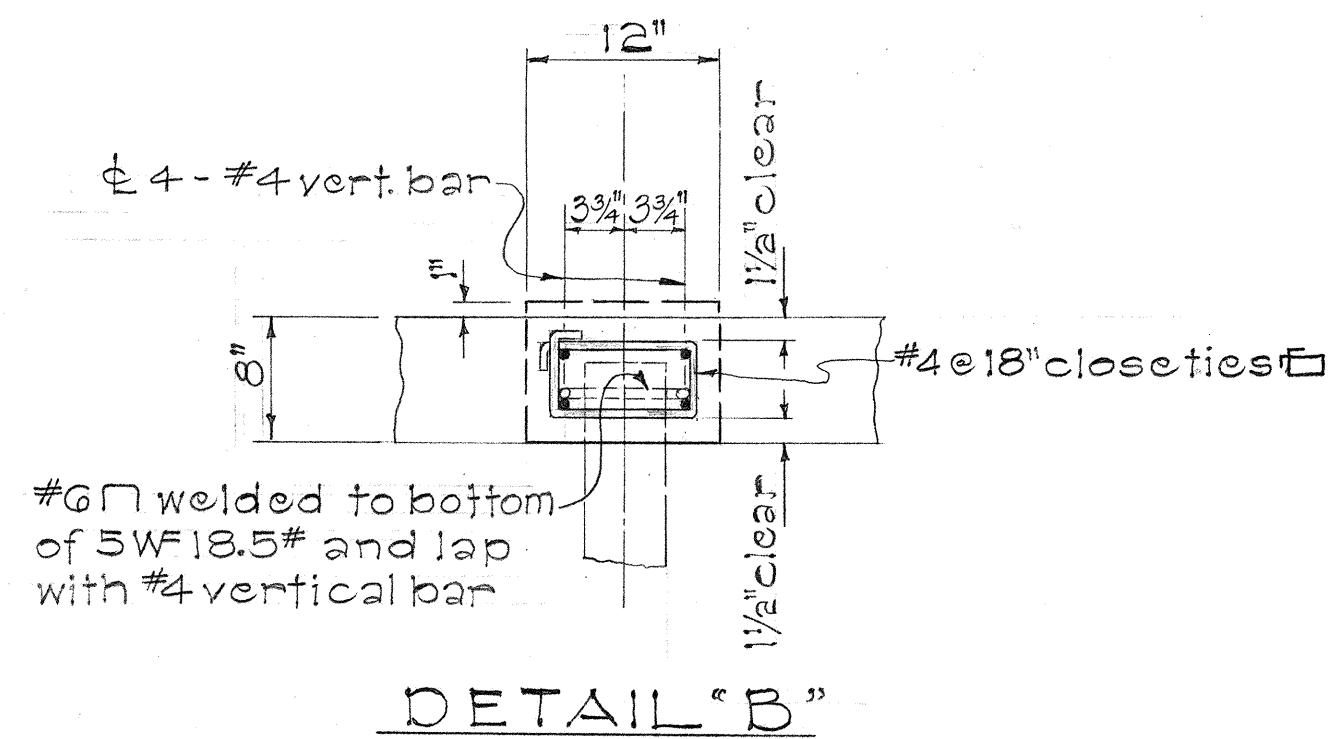
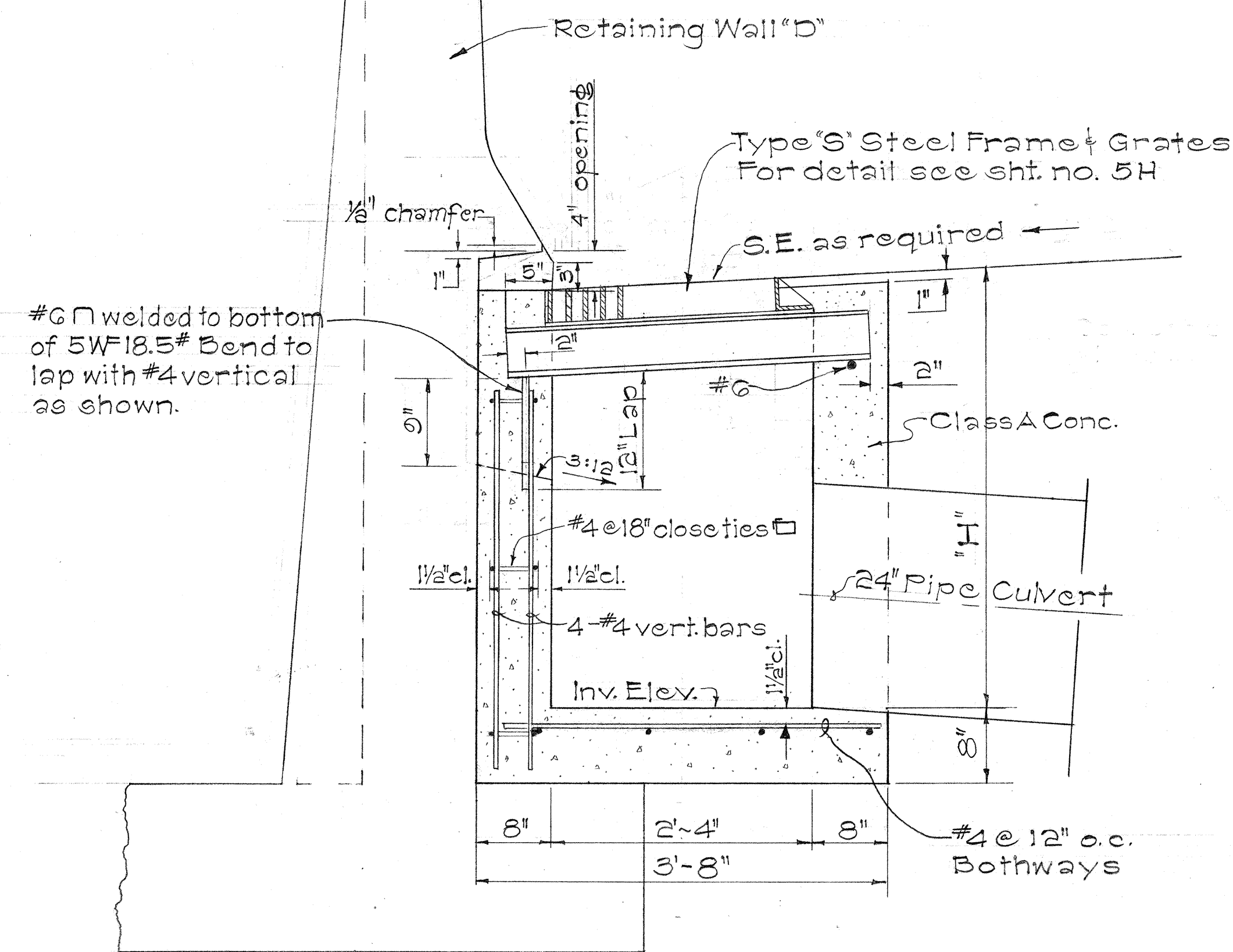
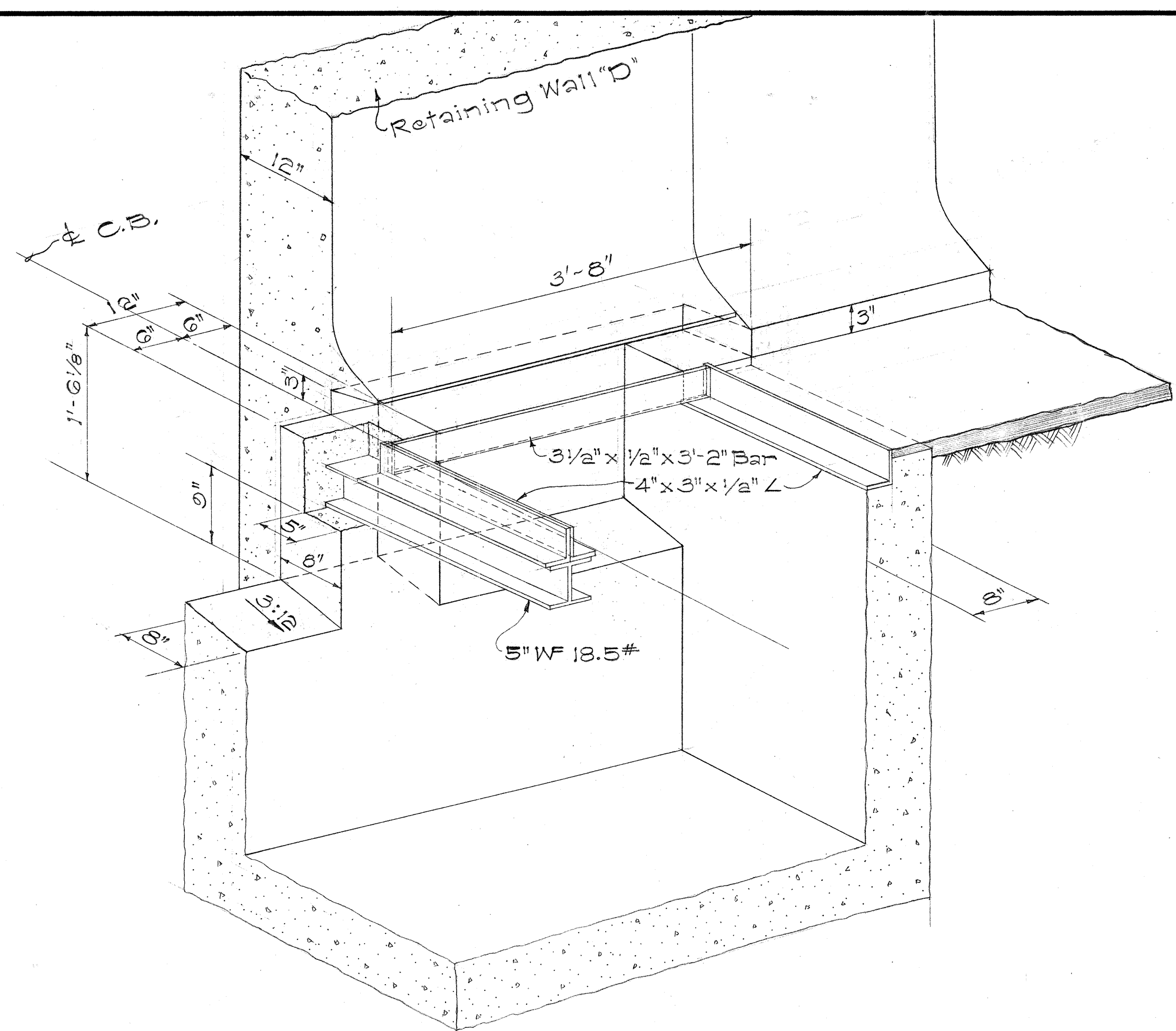
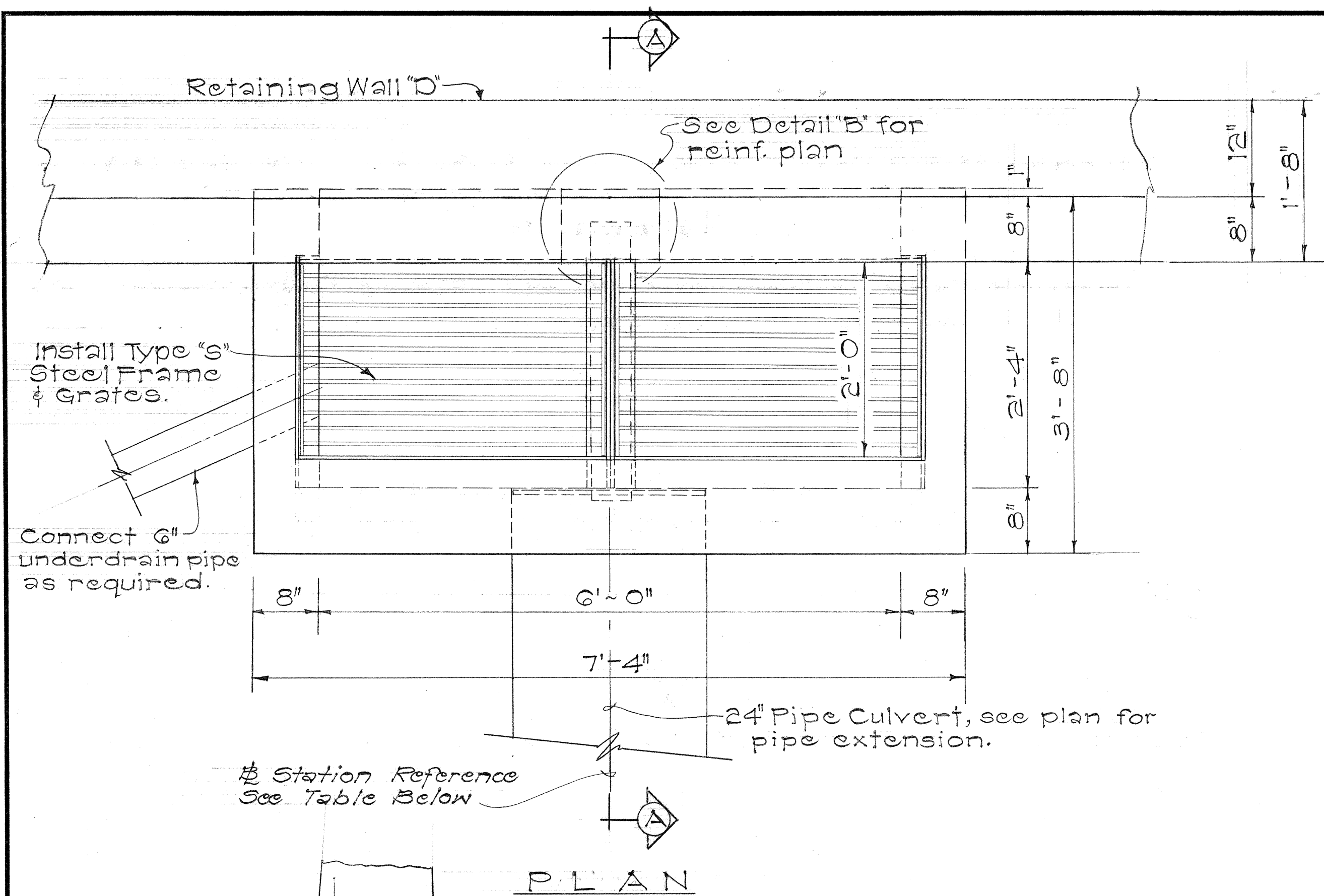


DETAILS OF CATCH BASIN @
STA. 128 + 25 W.B. (C.B. #1-F(T))
Scale: 1" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF CATCH BASIN
WITH TYPE "5" GRATED INLET
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):10
Scale: 1" = 1'-0" Date: Apr. 1973
SHEET No. 30H OF 41 H SHEETS

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
ORIGINAL	
PLAN	
NOTE BOOK	
No.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H1-1(112)-10	1973	81	176



CATCH BASIN LOCATION			
STATION	INV. ELEV.	"H"	"L"
134 + 40 E.B.	11.63	4.12	14.26
132 + 75 E.B.	10.84	4.32	15.22
130 + 25 E.B.	12.68	3.76	15.0
128 + 25 E.B.	13.94	3.79	8.66

DETAILS FOR NEW CATCH BASINS FROM
 STATION 128 + 25 E.B. TO 134 + 40 E.B.
 Scale: 1" = 1'-0"

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

DRAINAGE DETAILS

New Catch Basins with Grated Inlet along Retaining Wall "D"

Safety Improvements from Kalihī St. to Pali Highway

Fed. Aid Inter. Proj. No. I-H1-1(112)-10

Scale As Shown Date: April, 1973

SHEET No. 81 H. OF 41 H. SHEETS

DESIGNED BY	DATE
TRACED BY	
NOTED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
NO.	

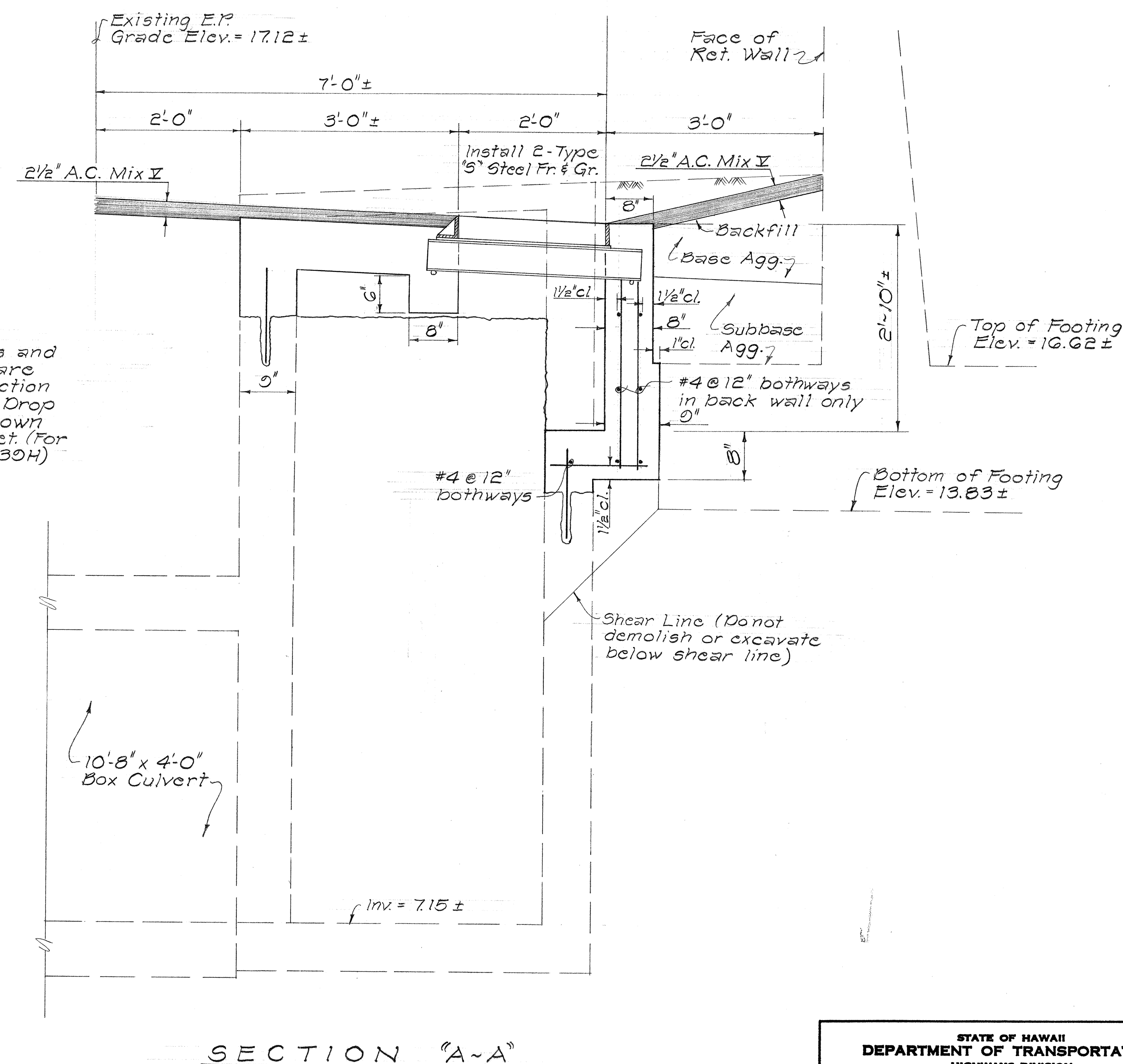
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

MODIFICATION OF CATCH BASIN
WITH TYPE "S" GRATED INLET

Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112) : 10
Scale: 1"=1'-0" Date: Apr., 1973

SHEET NO. 32 OF 41 H SHEETS



NOTE :
All notes , dimensions and reinforcing layouts are similar to typical section for Type "S" Grated Drop Intake except as shown or noted on this sheet. (For details, see sht. no. 394)

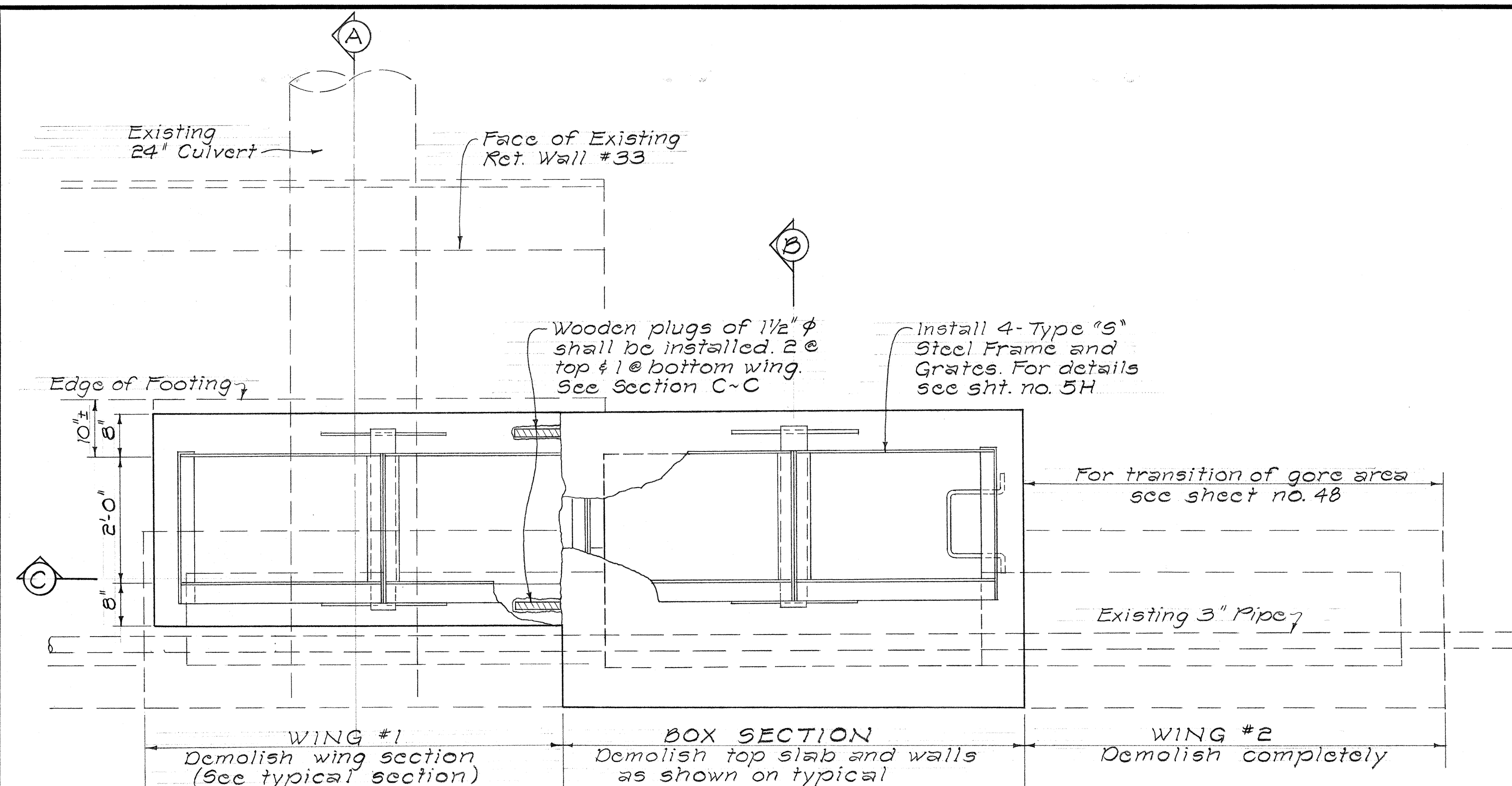
DETAILS OF CATCH BASIN @
Sta. 129 + 75 W.B. (C.B. #4-F(T))

Scale: $1'' = 1'-0''$

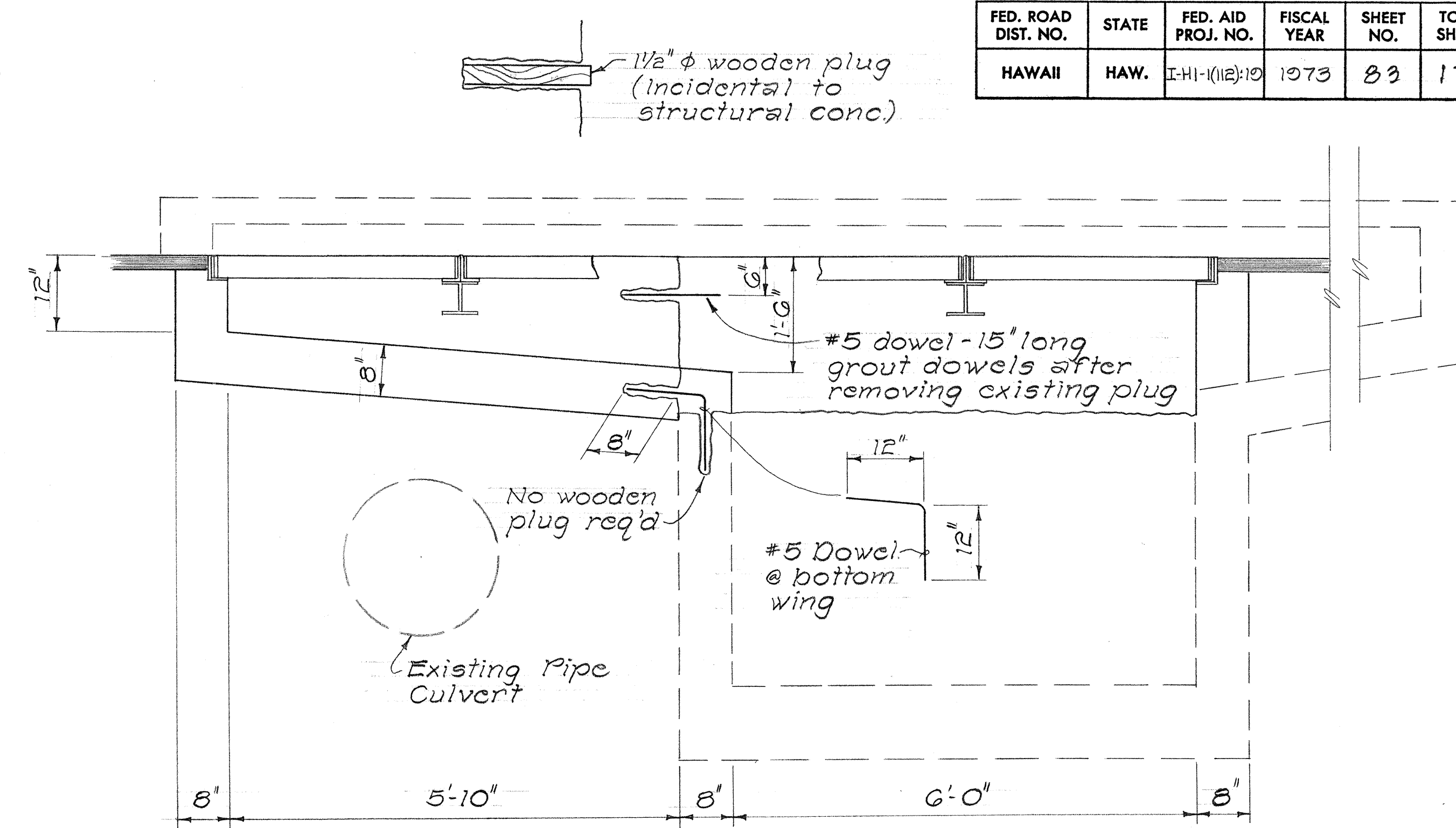
ORIGINAL PLAN	SURVEY PLOTTED BY _____ DATE _____
NOTE BOOK	DRAWN BY _____
	TRACED BY _____
	DESIGNED BY _____
	QUANTITIES BY _____
	CHECKED BY _____
No. _____	

K&F CRYSTALINE®
GRAVIMETRIC ANALYSIS

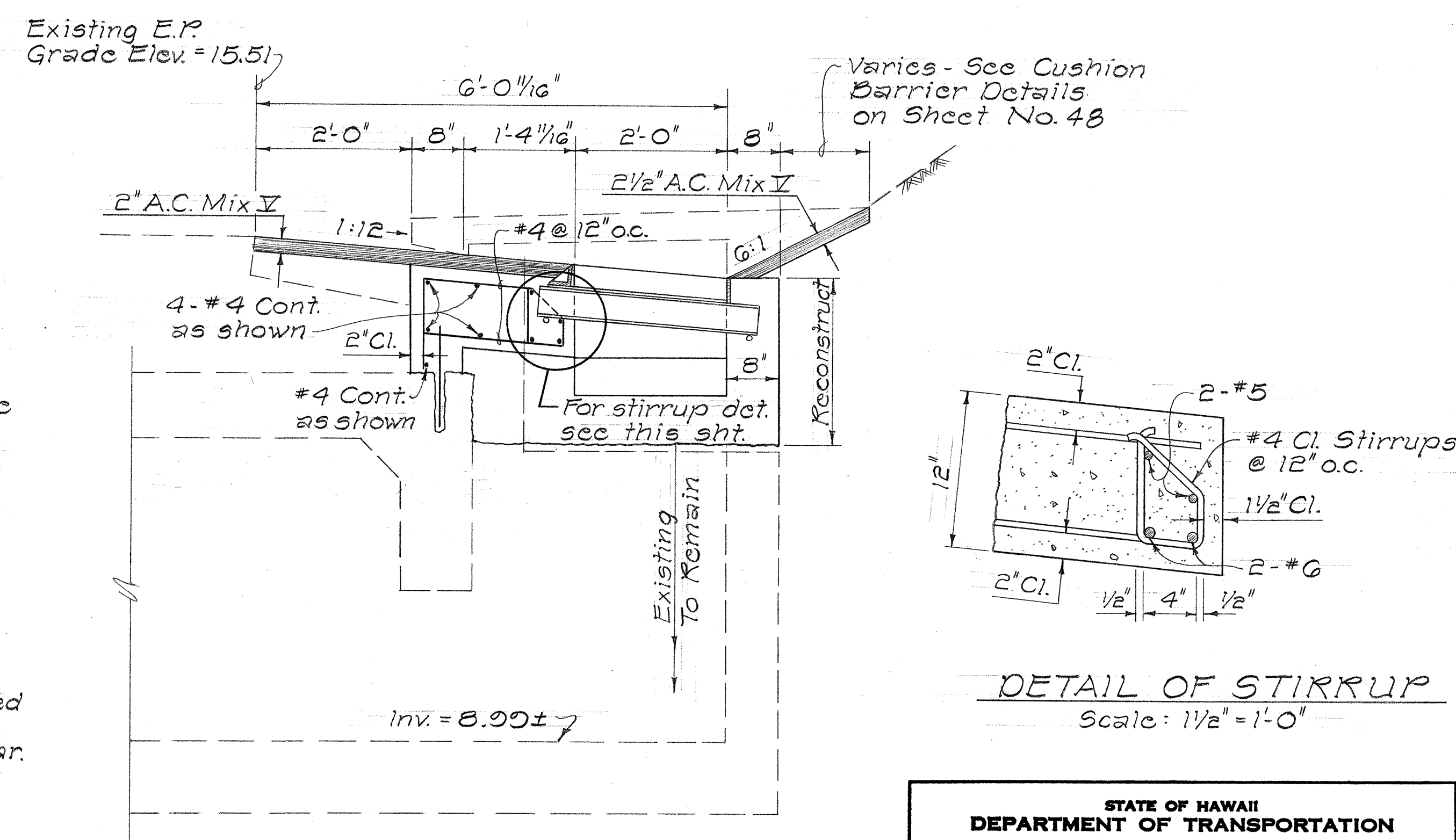
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):10	1973	83	176



PLAN



SECTION "C-C"



SECTION "B-B"

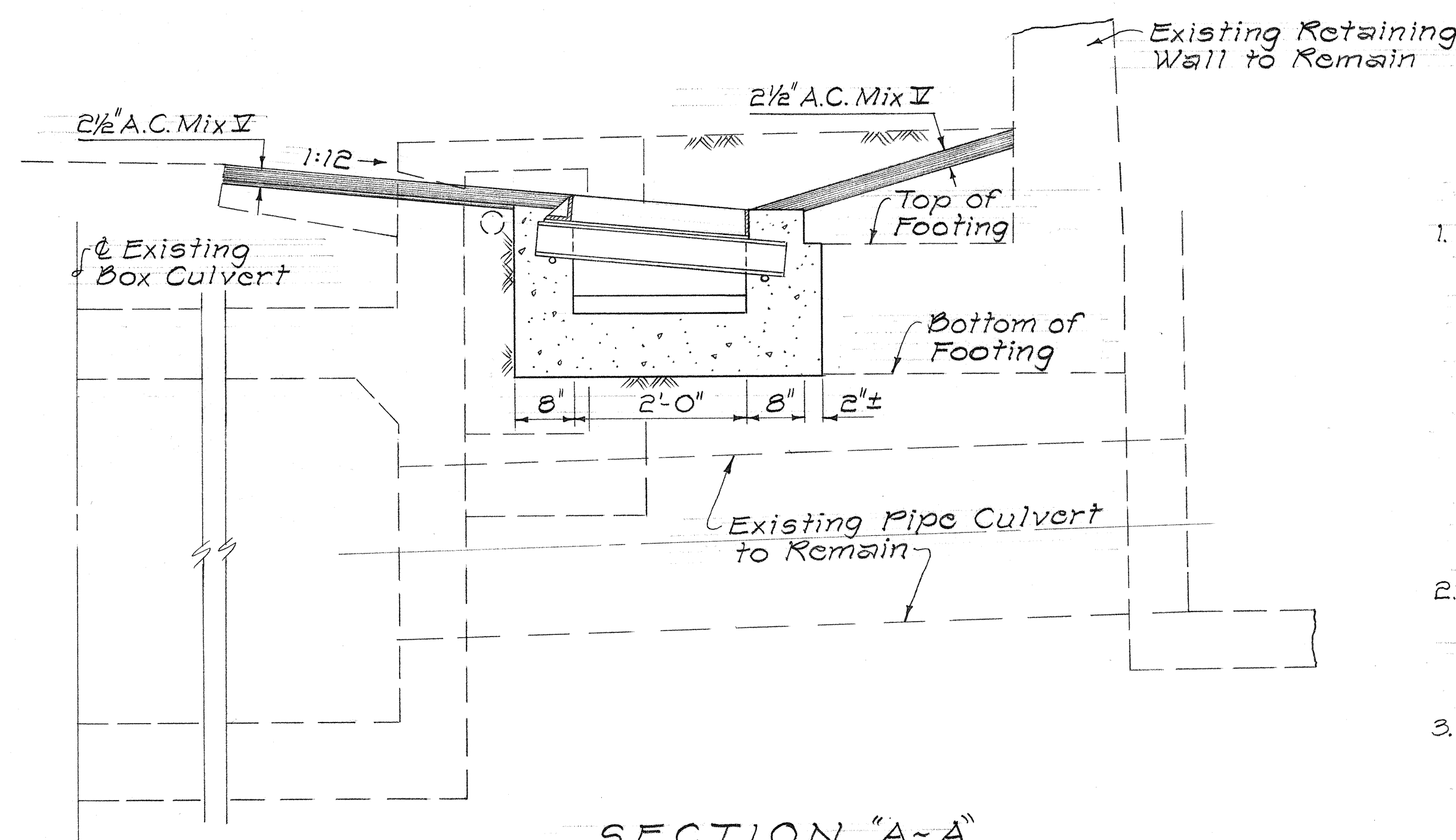
DETAIL OF STIRRUP
Scale: 1/2" = 1'-0"

NOTES:

- Contractor shall work in increments in modifying C.B. Contractor shall demolish wing section #1 first and shall form and pour concrete as shown in typical before commencing work for box and wing section #2. At connection of wing #1 and box, wooden plugs of 1 1/2" diameter shall be installed at all locations for #5 reinforcing bar dowels and #6 reinforcing bar for W^F Anchor. For details of dowels see this sheet. For detail of #6 reinforcing bar for W^F Anchor see sht. no. 5H
- Drilled holes shall be located such that the Reinforced Concrete Box reinforcement will not be exposed. If reinforcement is encountered in drilling, the hole shall be relocated and the reinforcement covered with epoxy mortar.
- Contractor shall exercise care in removing concrete from and in the proximity of existing structures. Any damage to existing structures shall be repaired as directed by the Engineer and at the expenses of the Contractor.
- Epoxy mortar shall be approved by the Engineer.

DETAILS OF CATCH BASIN @ STA. 132 + 75 W.B. (C.B. #G-F(T))

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

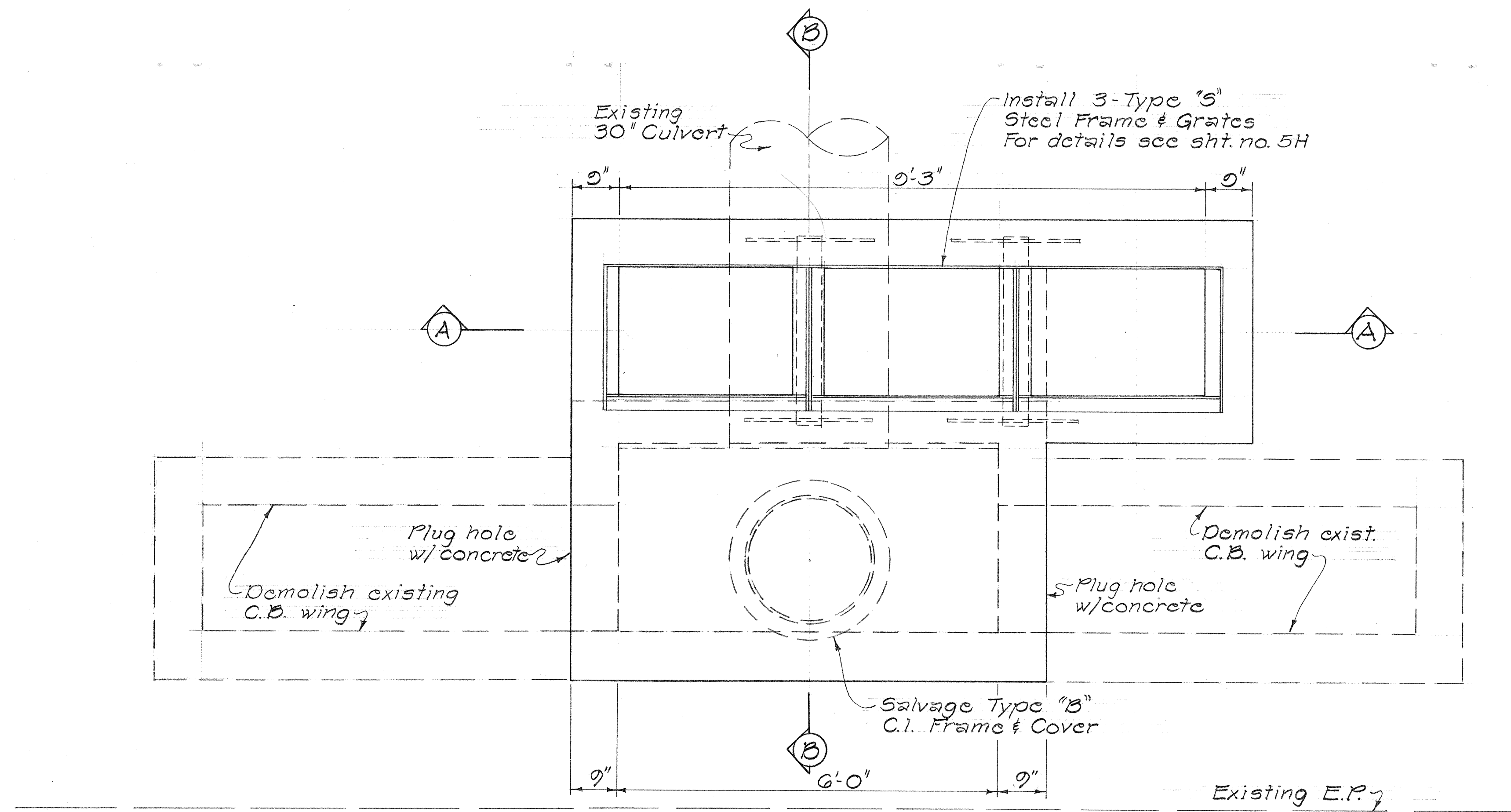


SECTION "A-A"

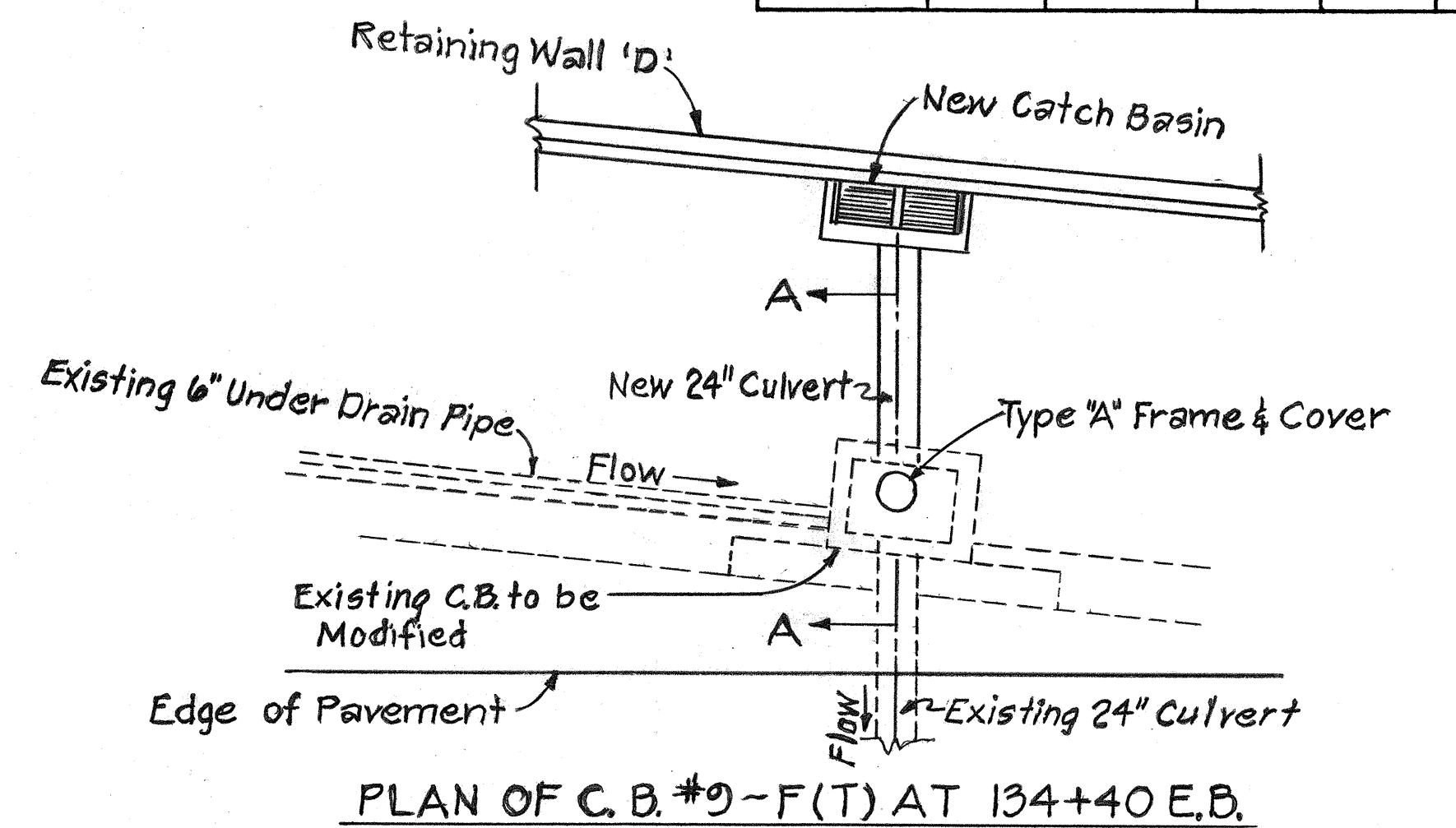
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF CATCH BASIN
WITH TYPE "S" GRATED INLET
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):10
Scale As Noted Date: Apr., 1973
SHEET No. 83 OF 41 SHEETS

DESIGNED BY	DATE
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

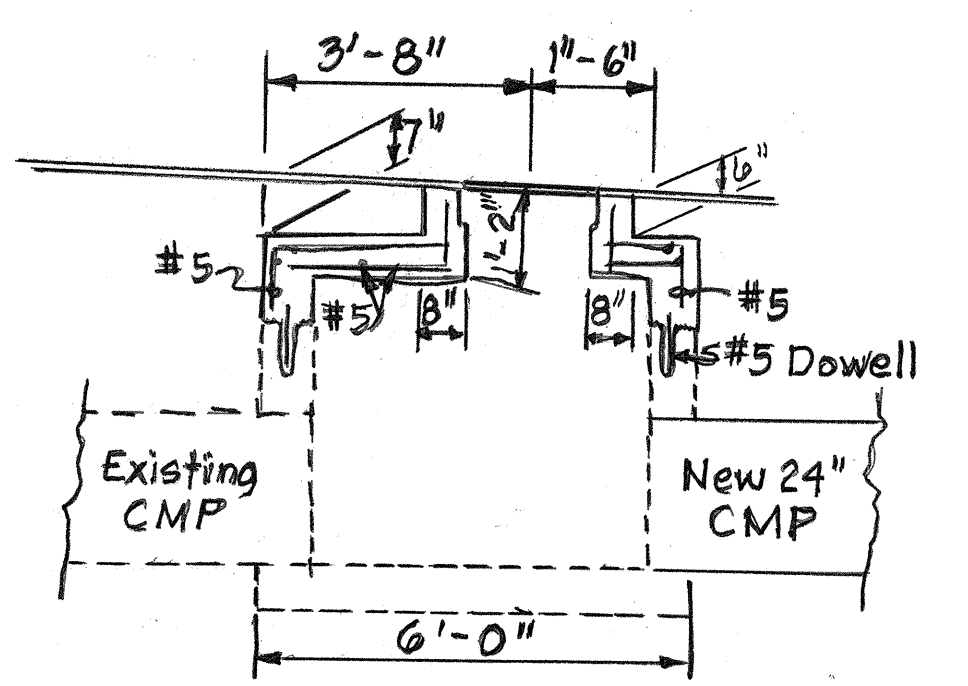
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):19	1973	84	176



PLAN

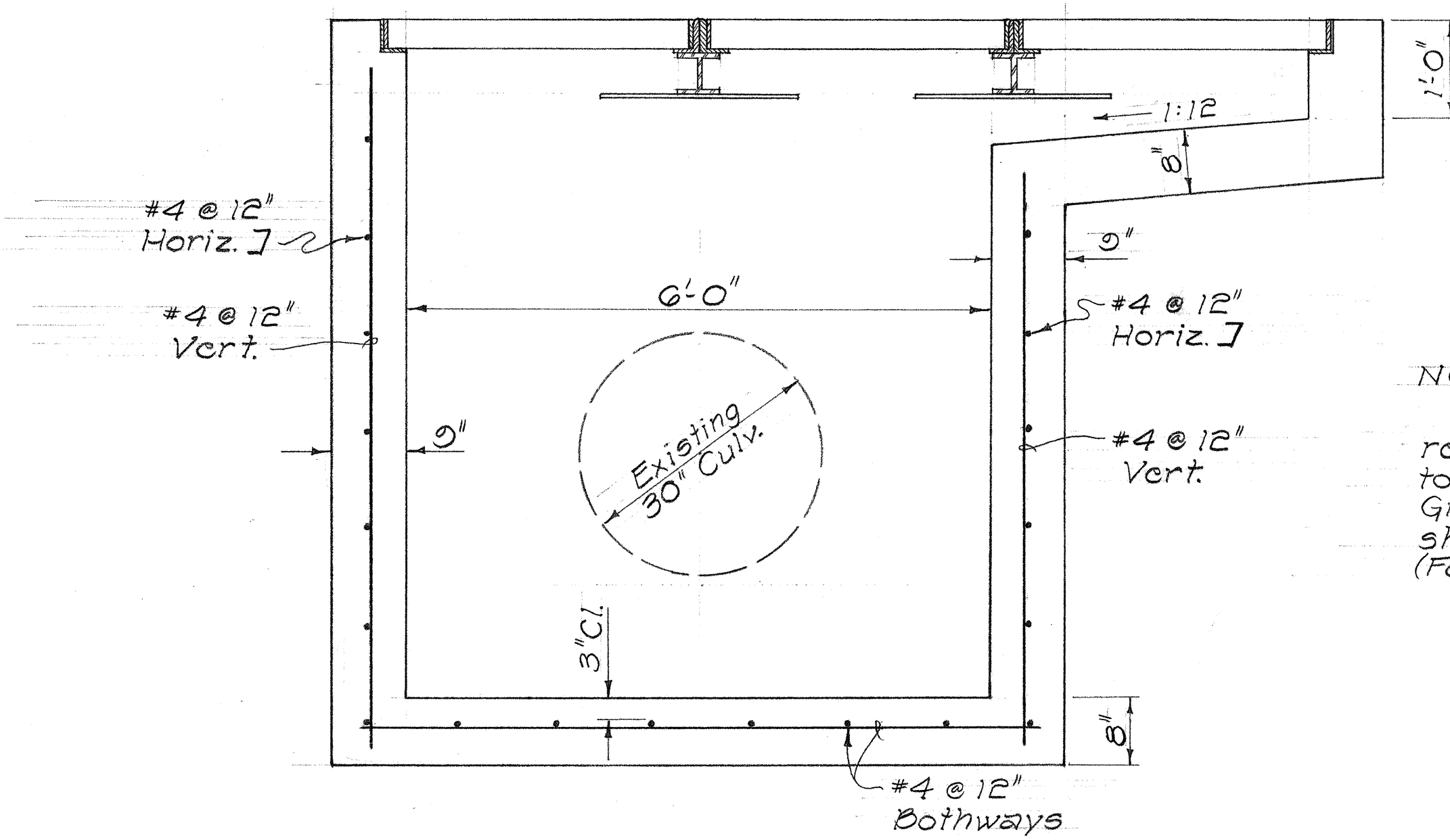


PLAN OF C.B. #9-F(T) AT 134+40 E.B.



SECTION "A-A"

C.C.O. #5

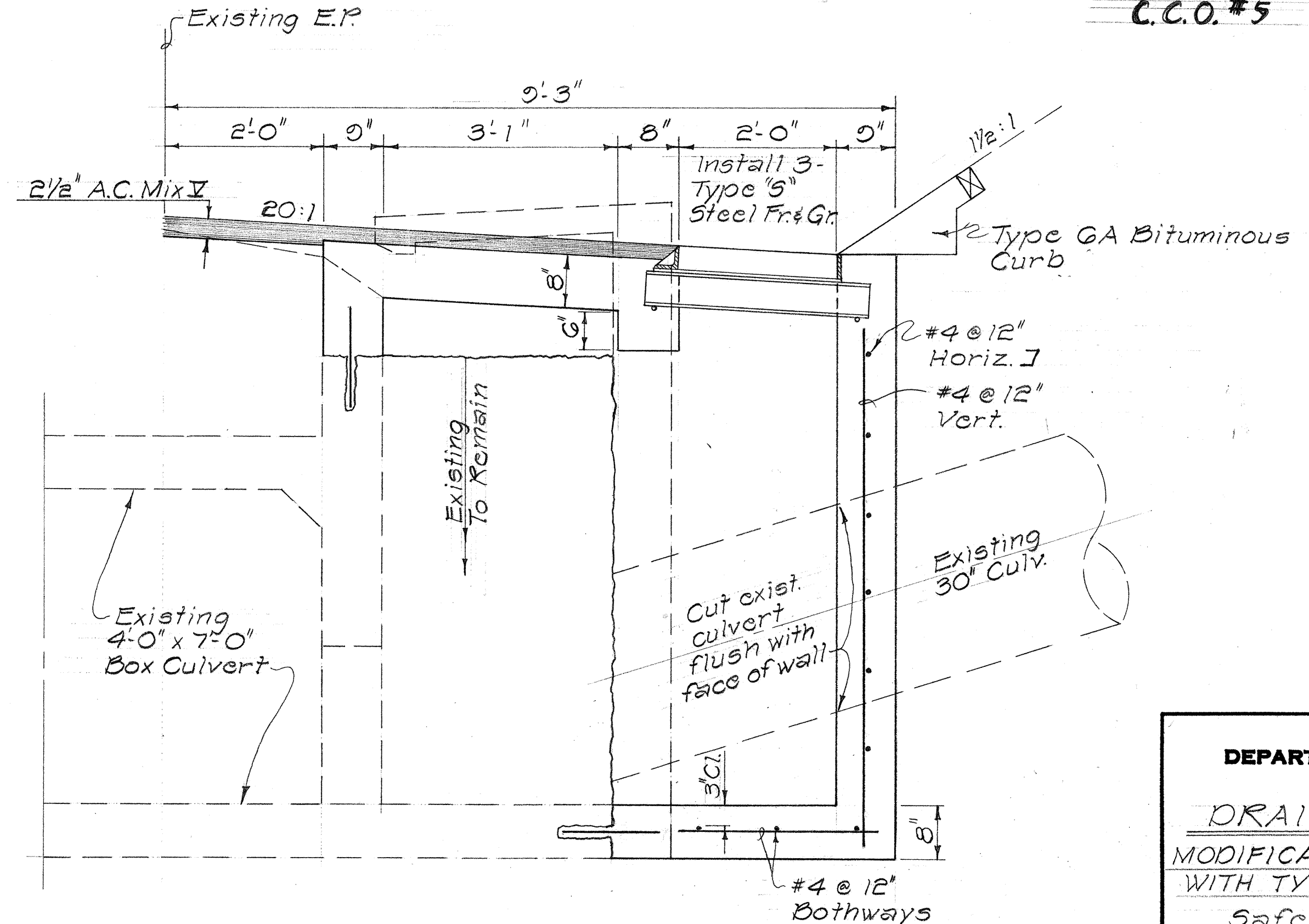


SECTION "A-A"

NOTE:
All notes, dimensions and reinforcing layouts are similar to typical section for Type 'S' Grated Drop Intake except as shown or noted on this sheet. (For details, see sht. no. 30H)

DETAILS OF CATCH BASIN @
STA. 136 + 73 W.B. (C.B. #2L(T))

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



SECTION "B-B"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
MODIFICATION OF CATCH BASINS
WITH TYPE 'S' GRATED INLET

Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):19

Scale: 3/4" = 1'-0" Date: Apr, 1973

SHEET No. 34H OF 41H SHEETS

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NO.	

[illegible]

3'-3"

3'-3"

#6 Reinf. Bar 24" long

4" x 3/2" x 3/8" L

5" WF 18.5 #
Center Support
Assembly
(For details
see sht. no. 5H)

1/2" φ Anchor

3/2" x 1/2" bar

#6 Reinf. Bar 24" long
bend @ 1'-2"

4" x 3" x 1/2" L

1/2" φ Anchor

3/2" x 1/2" bar

2'-0"

2'-0"

PLAN

3'-3"

3'-3"

4"

2'-0"

2'-0"

1/2"

20:1

20:1

1'-6"

5/8" φ Anchor

Bend reinf. bar
as shown in
back wall only

1'-2"

10"

3/2" x 1/2" bar

4" x 3" x 1/2" bar

CROSS SECTION

Technical drawing of a beam-to-column connection. The main drawing shows a beam with a 20:1 slope, a 5 1/2 inch diameter anchor, and dimensions: 4 inch top flange, 2'-0 inch span, 1/2 inch gap, 2'-0 inch span, 1'-6 inch bottom flange, and 3/16 inch gap. A circular callout shows a detail of the 3/16 inch x 1/2 inch bar and the 4 inch x 3/16 inch x 1/2 inch bar.

MODIFIED TYPE "S" STEEL FRAME AND GRATES
Scale: 1" = 1' ~ 8"

Scale: $1'' = 1' \sim 0'$

[illegible]

1. Except as shown on this sheet all details for Modified Type "S" Steel Frame and Grates are similar to Type "S" Steel Frame & Grates (For details see Sht. no. 5H)
2. All notes as shown for Type "S" Steel Frame and Grates on Sht. no. 5H are applicable to Modified Type "S" Steel Frame and Grates.
3. Cut existing culverts flush with the inner face of wall.

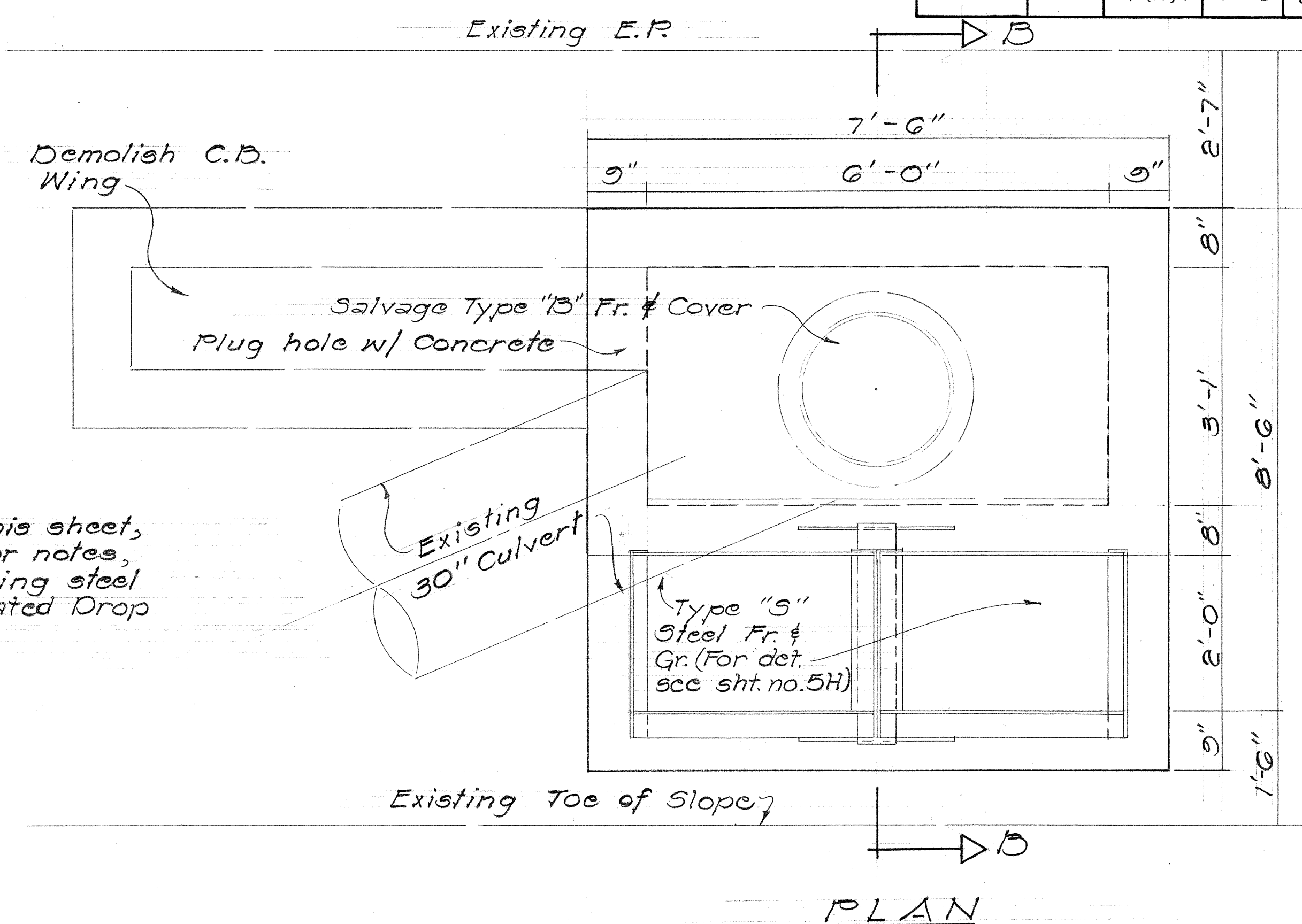
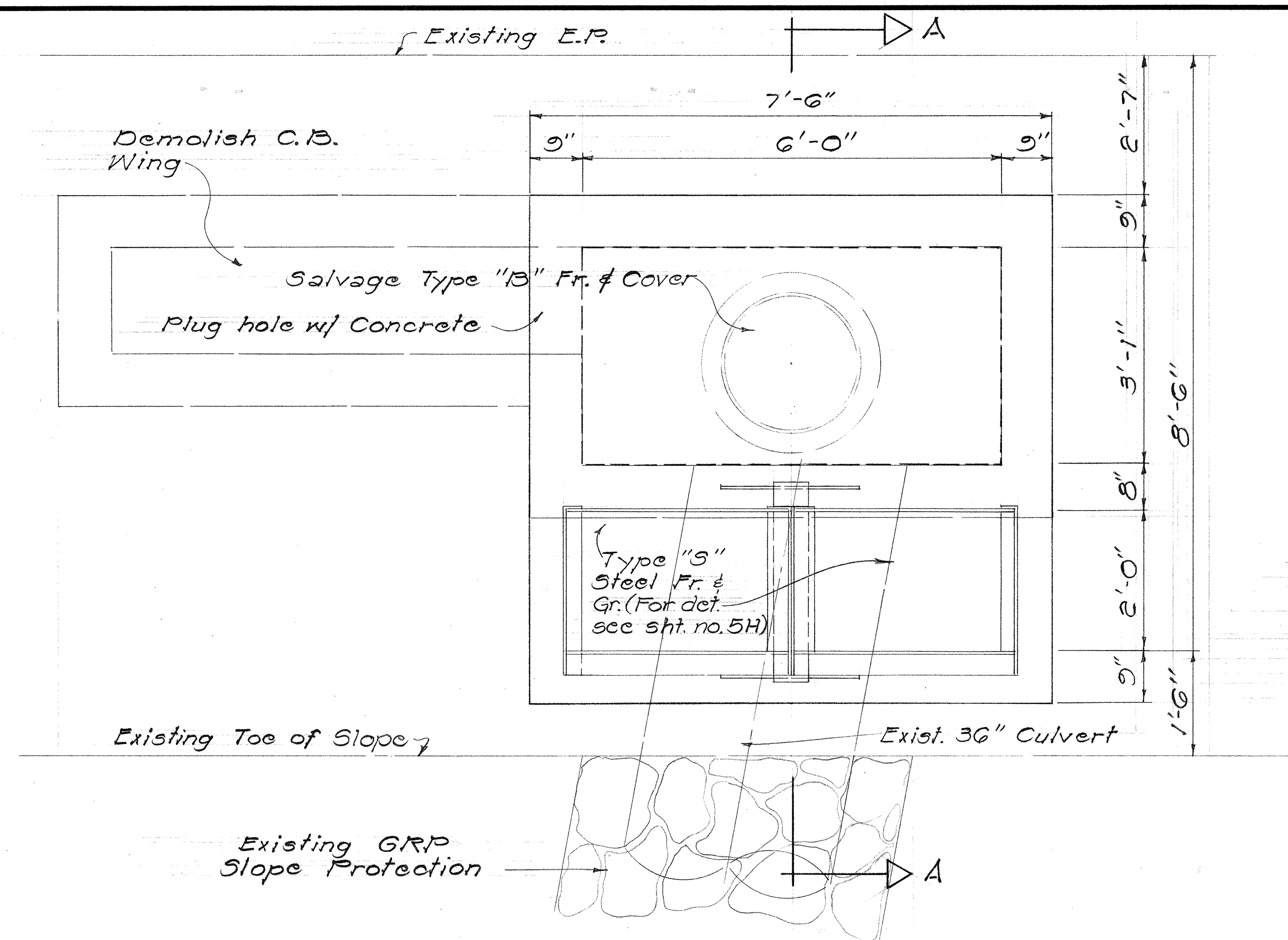
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
NEW MODIFIED TYPE "S"
GRADED DROP INTAKE AND
DETAILS OF MODIFIED TYPE "S"
STEEL FRAME AND GRATES

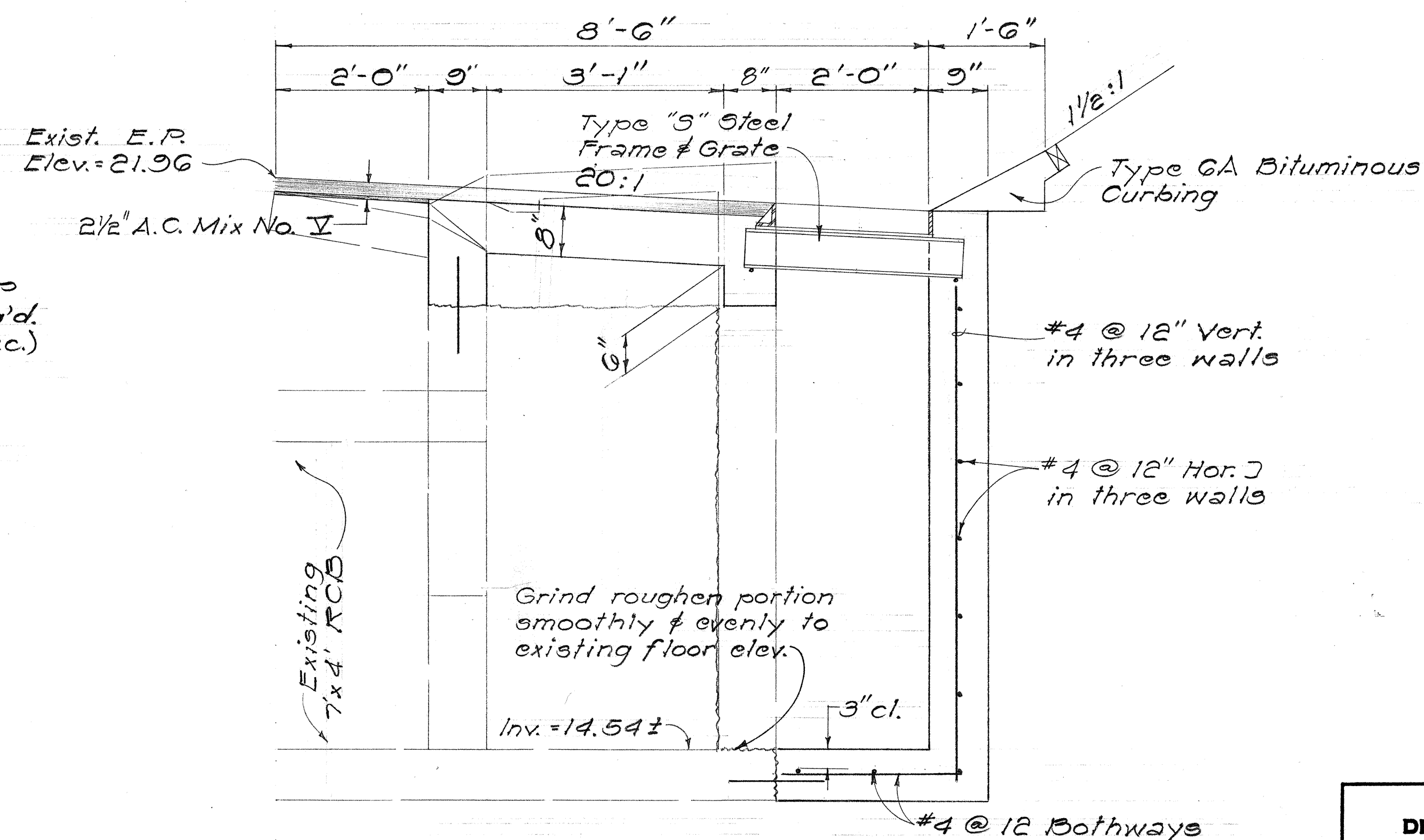
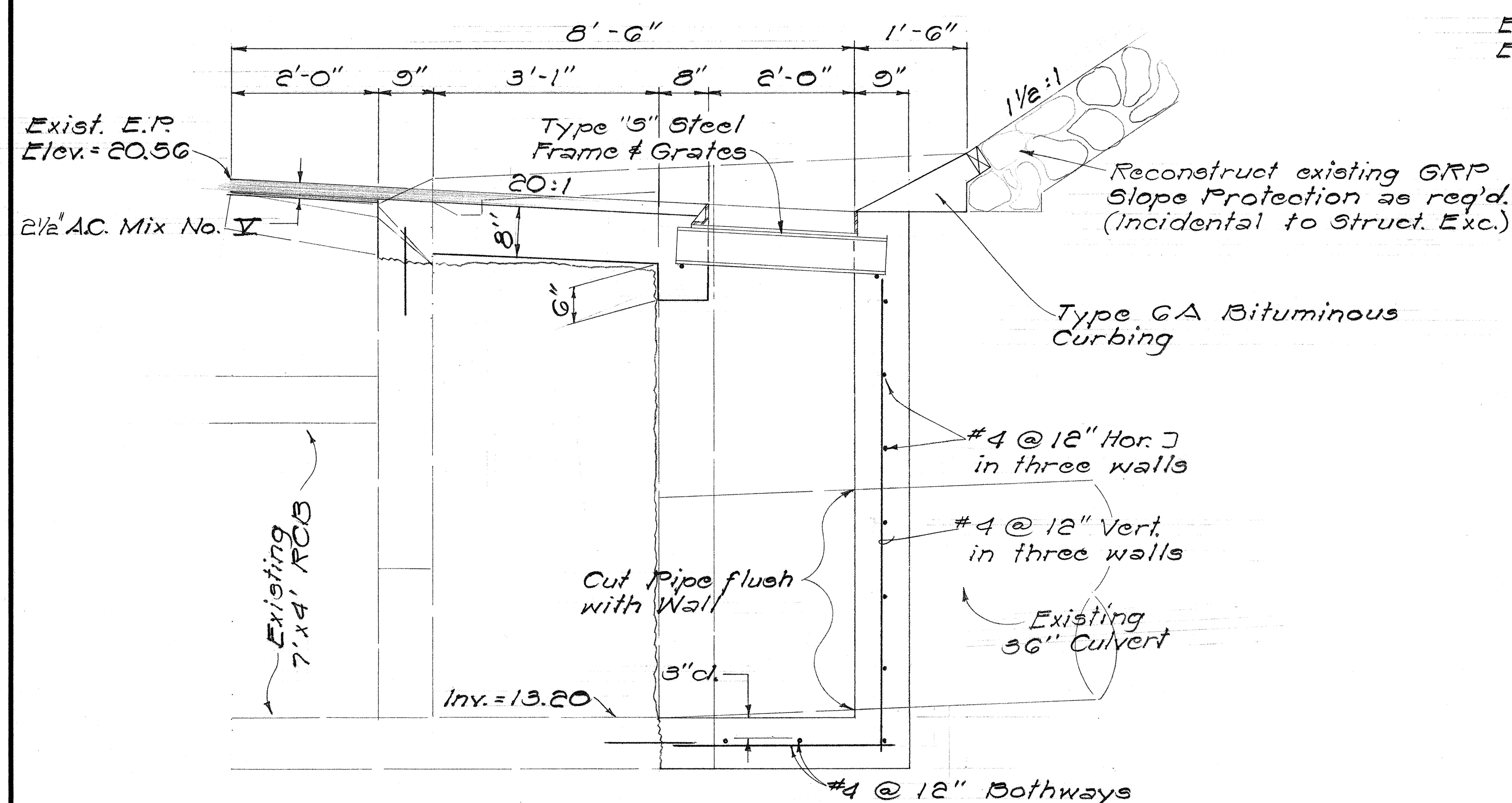
Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):10
Scale As Noted Date: April, 1973

SHEET NO. 35 HOF 414 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HA-1(112):10	1973	86	176



NOTE:
Except as noted on this sheet,
see Typical Section for notes,
dimensions and reinforcing steel
details for Type "S" Grated Drop
Intake on sht. no. 304



SECTION A-A
DETAILS FOR C.B. #9L(T)
AT & STA. 140+28 W.B.

DETAILS FOR C.B. #10L(T)
AT STA. 141+96 W.B.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

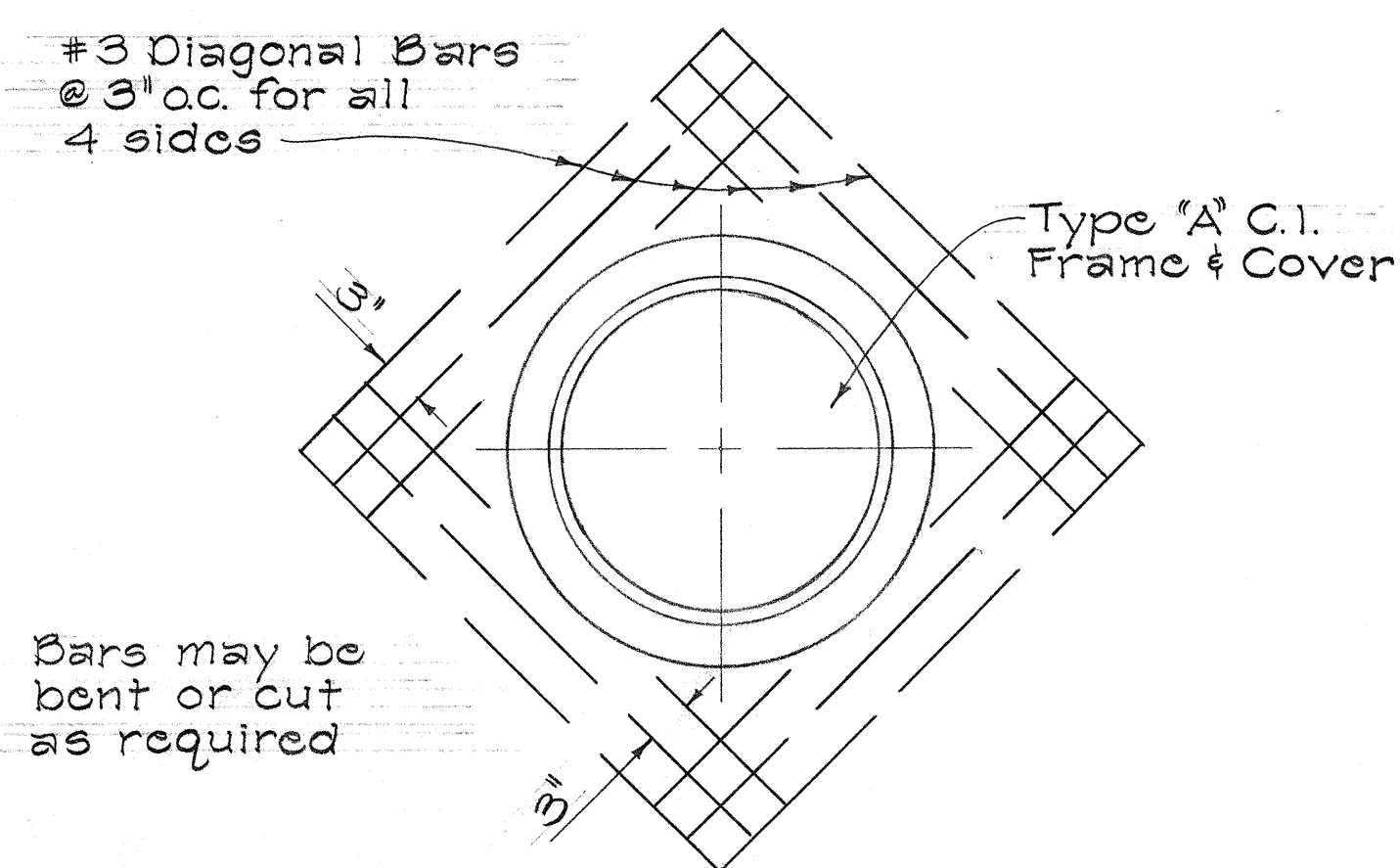
MODIFICATIONS OF CATCH BASINS
WITH TYPE "G" GRATED INLET

Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):10
Scale: 3/4"=1'-0" Date: April, 1973

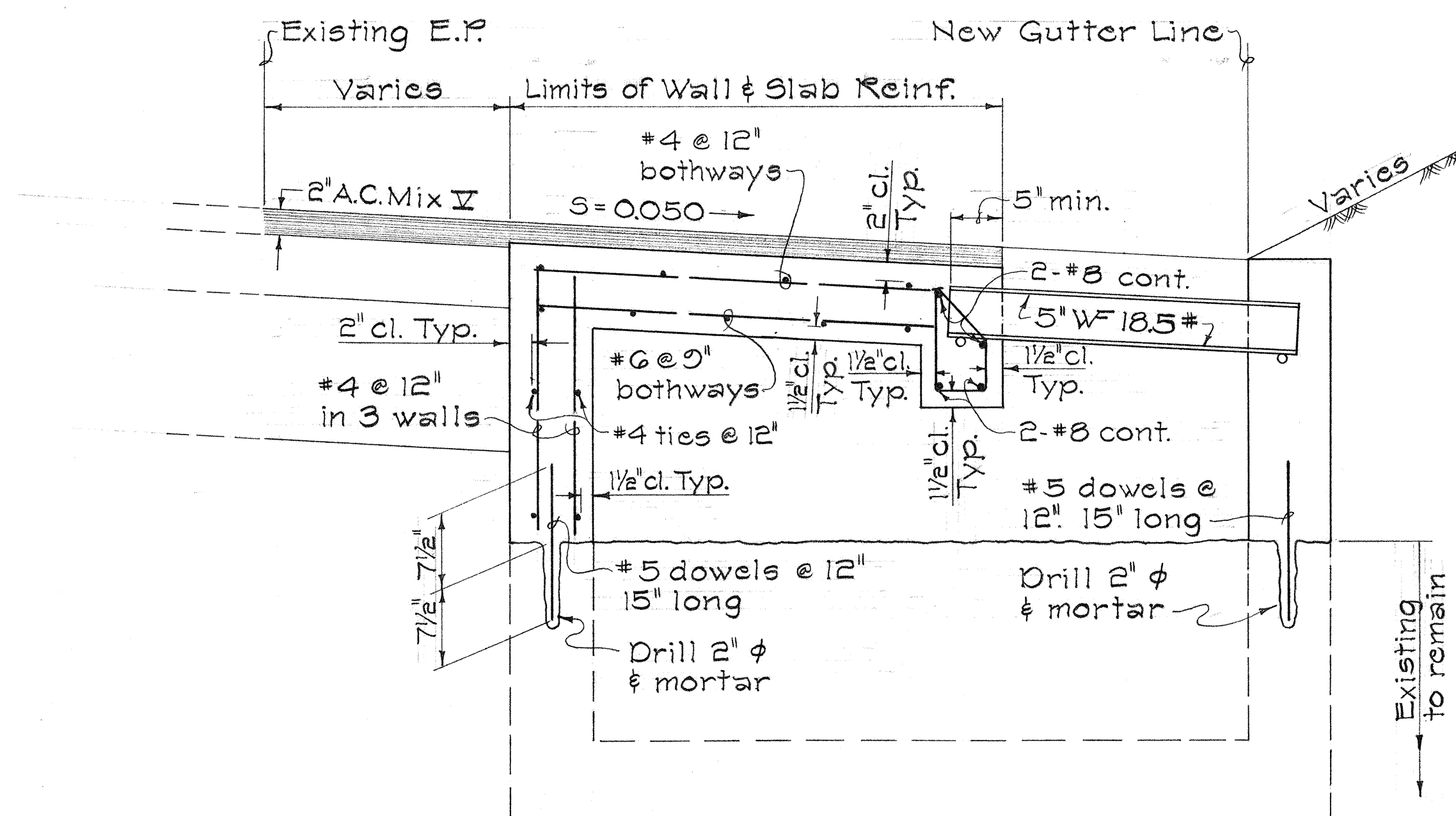
SHEET No. 36HOF41 H SHEETS

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

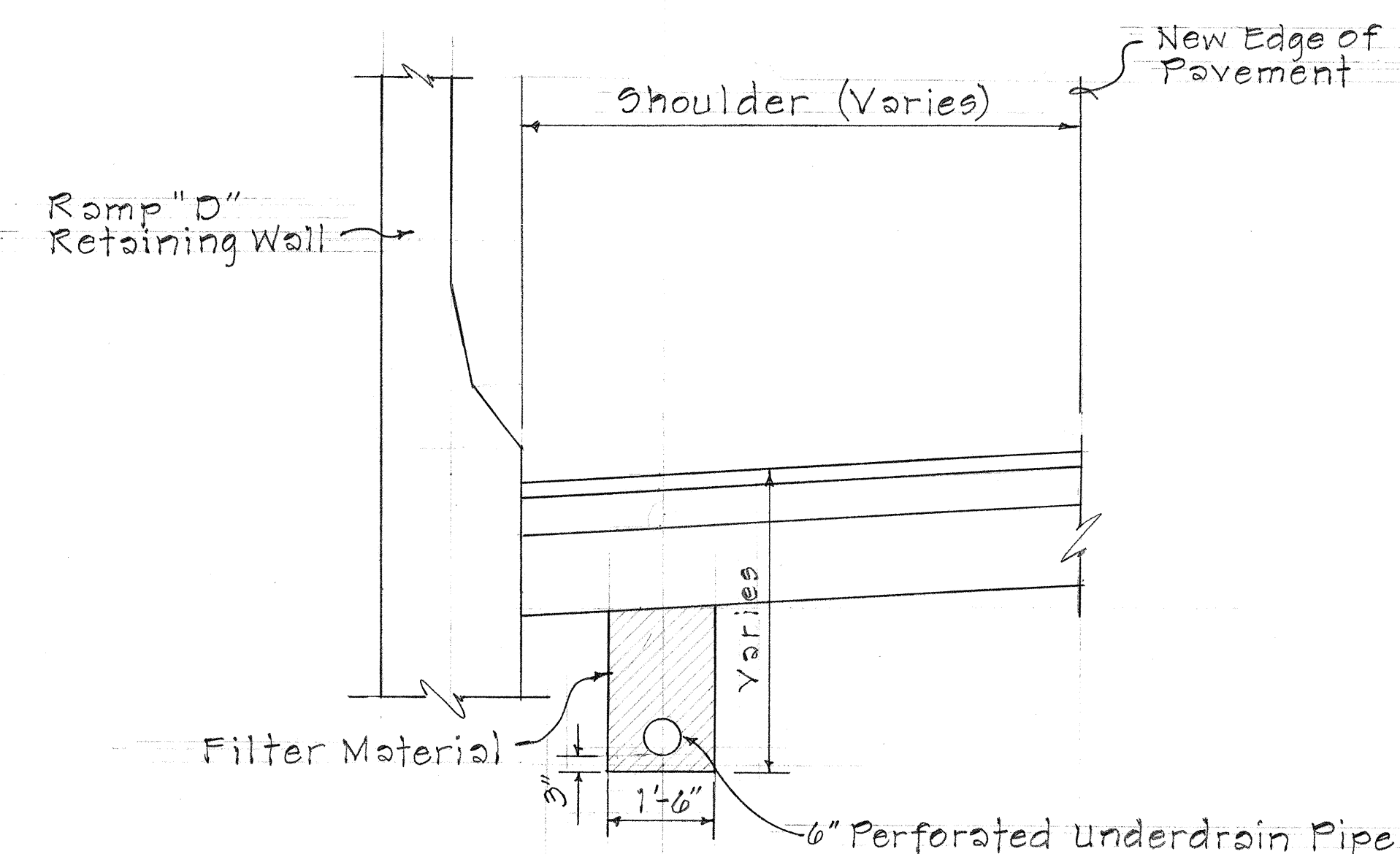
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):10	1973	89	176



TYPICAL REINFORCEMENT FOR TYPE "A" C.I. FRAME & COVER
Scale: 1"=1'-0"

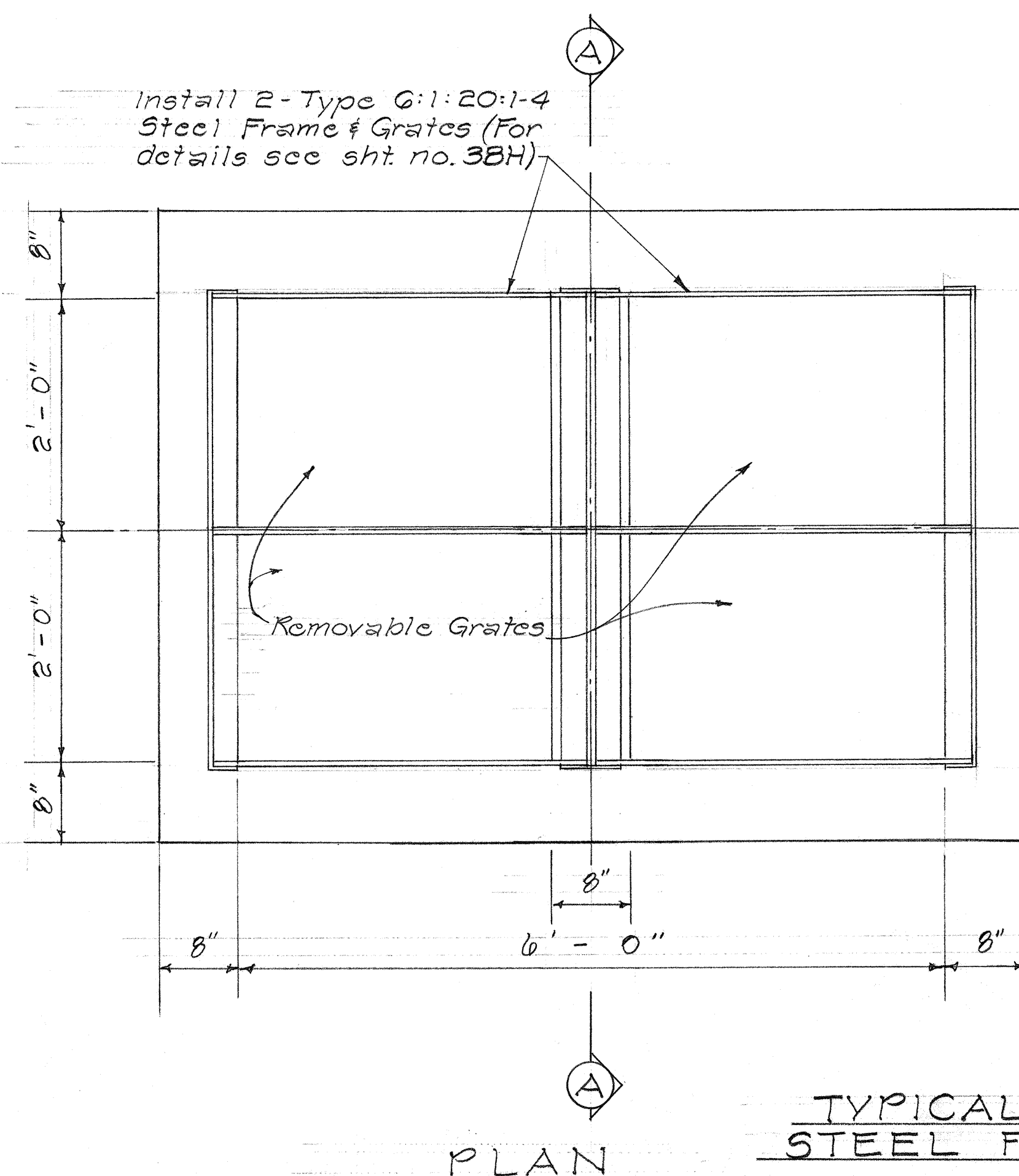


NOTE:
Use Typical as shown above except when specified in other parts of the plan.

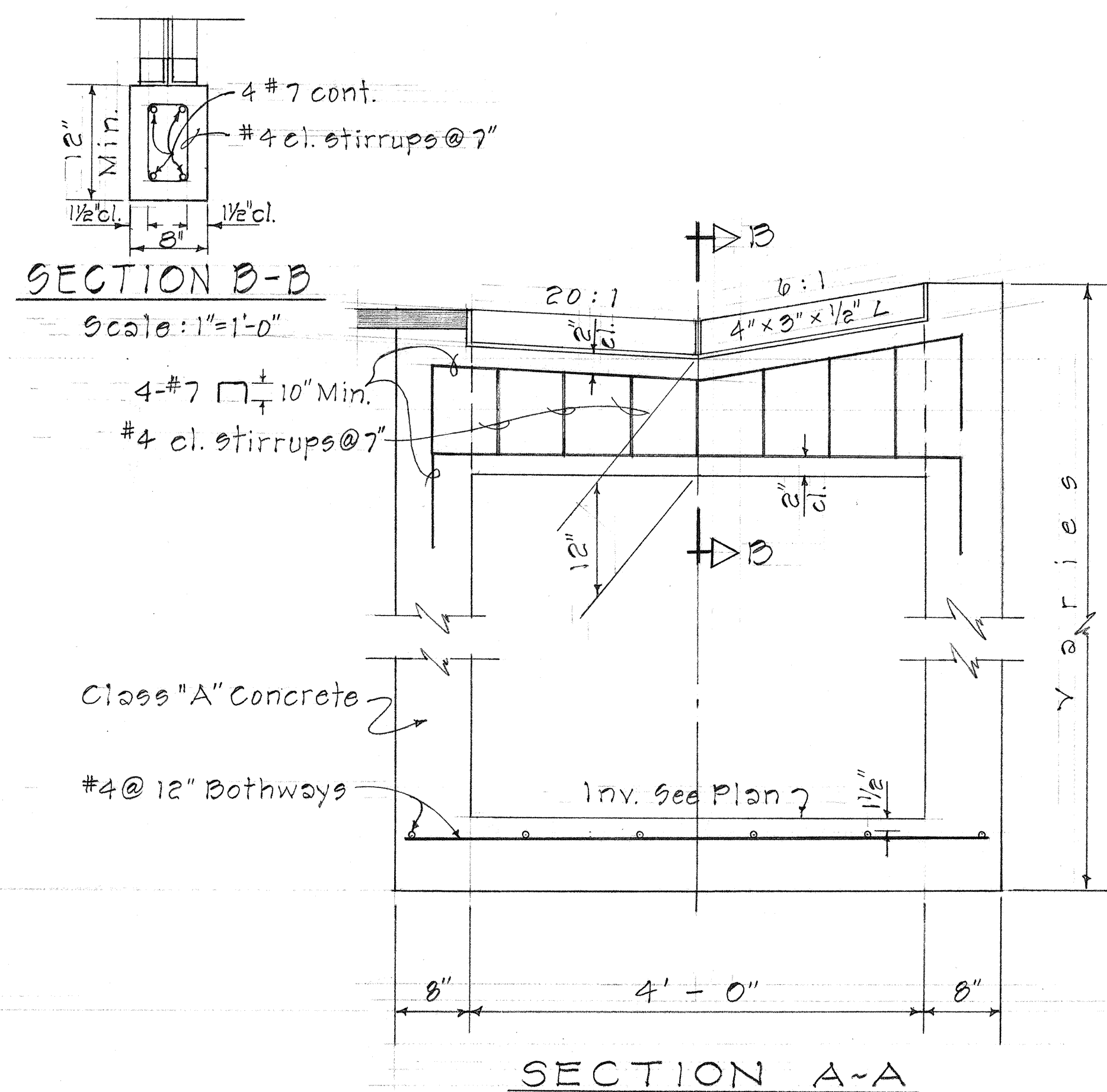


TYPICAL SECTION AT RAMP "D"
Scale: 1/2"=1'-0"

TYPICAL DETAILS - MODIFIED TYPE "S" STEEL FRAME & GRATES DROP INTAKE
Scale: 1"=1'-0"



PLAN



SECTION A-A

TYPICAL DETAILS - NEW TYPE G:1:20:1-4 STEEL FRAME & GRATES DROP INTAKE
Scale: 1"=1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

TYPICAL DETAILS

Safety Improvements
Kalihi Street to Pali Highway
F.A.I. Proj. No. I-HI-1(112):10
Scale As Noted Date: Apr, 1973
SHEET No. 39 OF 41 SHEETS

