

*C.C.O. No. 43:
 Struc. No. 19 - Reoriented
 outfall perpendicular
 to the 48" R.C.P.

ABBREVIATIONS

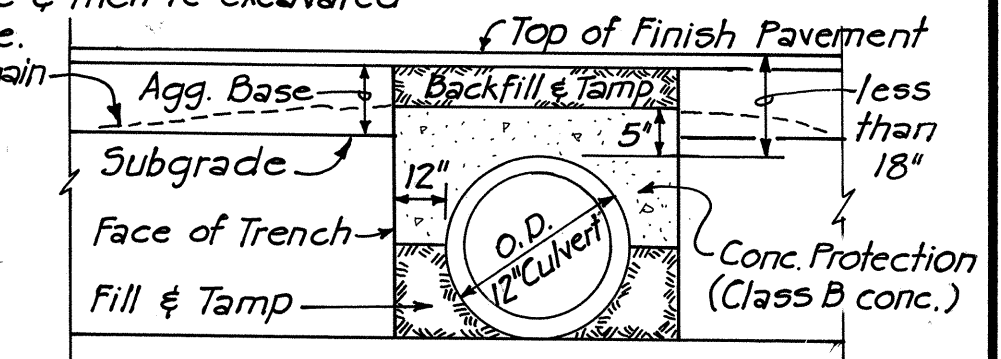
ACP	Asbestos Cement Pipe
RCP	Reinforced Concrete Pipe
Cl.	Class
Inv.	Invert
MH	Manhole

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HH(132)17	1983	11	192

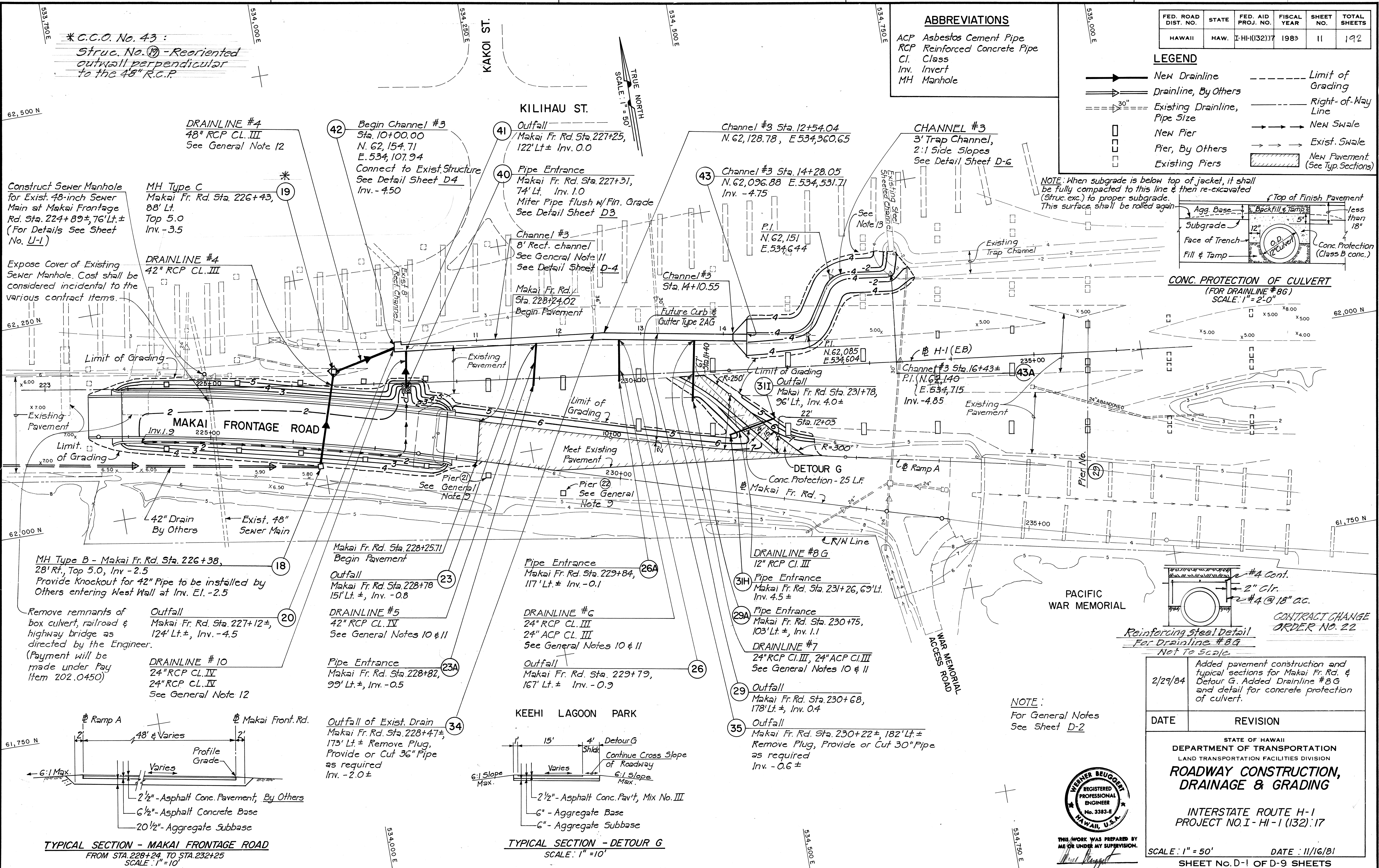
LEGEND

	New Drainline		Limit of Grading
	Drainline, By Others		Right-of-Way Line
	Existing Drainline, Pipe Size		New Swale
	New Pier		Exist. Swale
	Pier, By Others		New Pavement (See Typ. Sections)
	Existing Piers		

NOTE: When subgrade is below top of jacket, it shall be fully compacted to this line & then re-excavated (Struc. exc.) to proper subgrade. This surface shall be rolled again.



CONC. PROTECTION OF CULVERT
 (FOR DRAINLINE #8G)
 SCALE: 1" = 2'-0"



MH Type B - Makai Fr. Rd. Sta. 226+38, 28' Rt., Top 5.0, Inv. -2.5
 Provide knockout for 42" Pipe to be installed by Others entering West Wall at Inv. El. -2.5

Remove remnants of box culvert, railroad & highway bridge as directed by the Engineer.
 (Payment will be made under Pay Item 202.0450)

Outfall
 Makai Fr. Rd. Sta. 227+12±, 124' Lt.±, Inv. -4.5

DRAINLINE #10
 24" RCP CL. IV
 24" RCP CL. IV
 See General Note 12

Makai Fr. Rd. Sta. 228+25.71
 Begin Pavement

Outfall
 Makai Fr. Rd. Sta. 228+78, 151' Lt.±, Inv. -0.8

DRAINLINE #5
 42" RCP CL. IV
 See General Notes 10 & 11

Pipe Entrance
 Makai Fr. Rd. Sta. 228+82, 99' Lt.±, Inv. -0.5

Pipe Entrance
 Makai Fr. Rd. Sta. 229+84, 117' Lt.±, Inv. -0.1

DRAINLINE #6
 24" RCP CL. III
 24" ACP CL. III
 See General Notes 10 & 11

Outfall
 Makai Fr. Rd. Sta. 229+79, 167' Lt.±, Inv. -0.3

DRAINLINE #8G
 12" RCP CL. III

Pipe Entrance
 Makai Fr. Rd. Sta. 231+26, 69' Lt.±, Inv. 4.5±

Pipe Entrance
 Makai Fr. Rd. Sta. 230+75, 103' Lt.±, Inv. 1.1

DRAINLINE #7
 24" RCP CL. III, 24" ACP CL. III
 See General Notes 10 & 11

Outfall
 Makai Fr. Rd. Sta. 230+68, 178' Lt.±, Inv. 0.4

Outfall
 Makai Fr. Rd. Sta. 230+22±, 182' Lt.±, Remove Plug, Provide or Cut 30" Pipe as required, Inv. -0.6±

Outfall of Exist. Drain
 Makai Fr. Rd. Sta. 228+47±, 173' Lt.±, Remove Plug, Provide or Cut 36" Pipe as required, Inv. -2.0±

KEEHI LAGOON PARK

Detour G
 Continue Cross Slope of Roadway
 6:1 Slope Max.

2 1/2" - Asphalt Conc. Pav't, Mix No. III
 6" - Aggregate Base
 6" - Aggregate Subbase

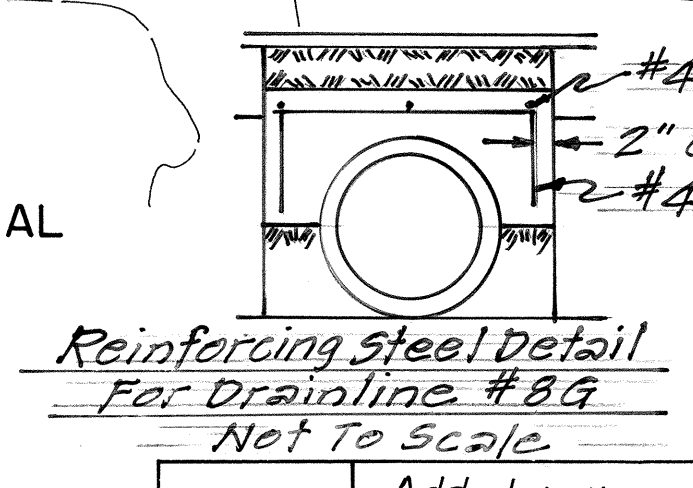
Profile Grade

2 1/2" - Asphalt Conc. Pavement, By Others
 6 1/2" - Asphalt Concrete Base
 20 1/2" - Aggregate Subbase

TYPICAL SECTION - MAKAI FRONTAGE ROAD
 FROM STA. 228+24 TO STA. 232+25
 SCALE: 1" = 10'

TYPICAL SECTION - DETOUR G
 SCALE: 1" = 10'

NOTE:
 For General Notes
 See Sheet D-2



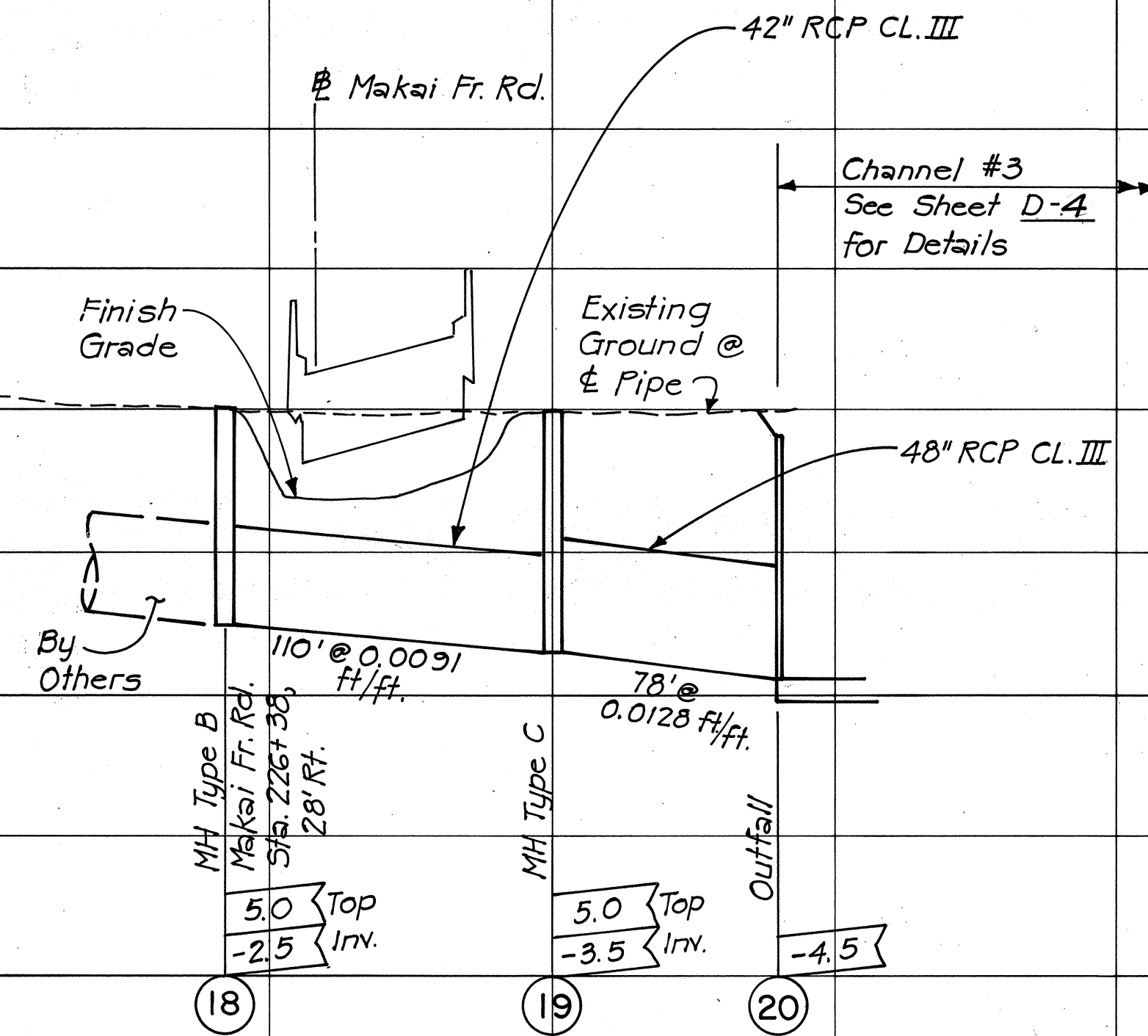
Reinforcing Steel Detail
 For Drainline #8G
 Not To Scale

2/29/84	Added pavement construction and typical sections for Makai Fr. Rd. & Detour G. Added Drainline #8G and detail for concrete protection of culvert.
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION ROADWAY CONSTRUCTION, DRAINAGE & GRADING INTERSTATE ROUTE H-1 PROJECT NO. I - HI - I (132) 17 SCALE: 1" = 50' DATE: 11/16/81 SHEET NO. D-1 OF D-9 SHEETS	

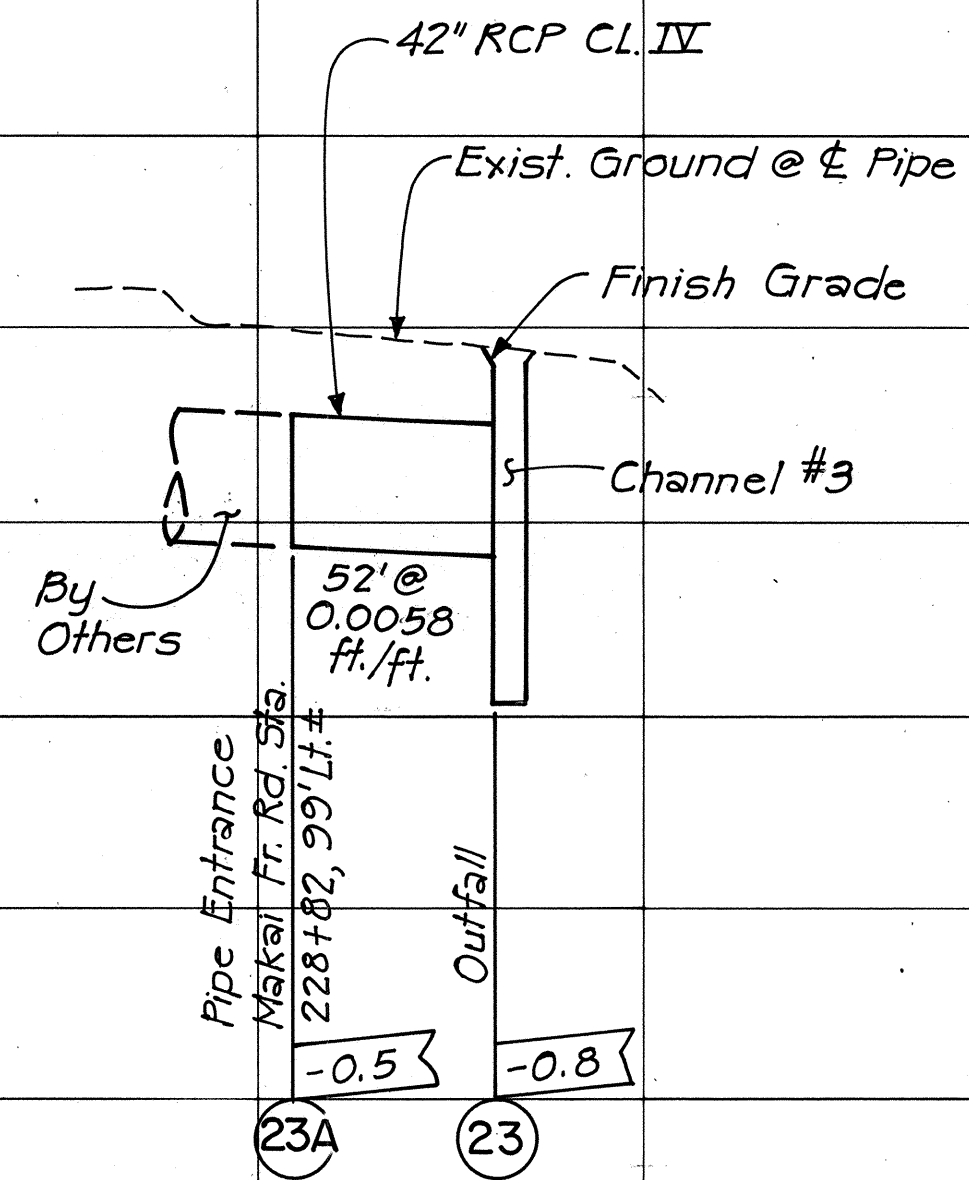


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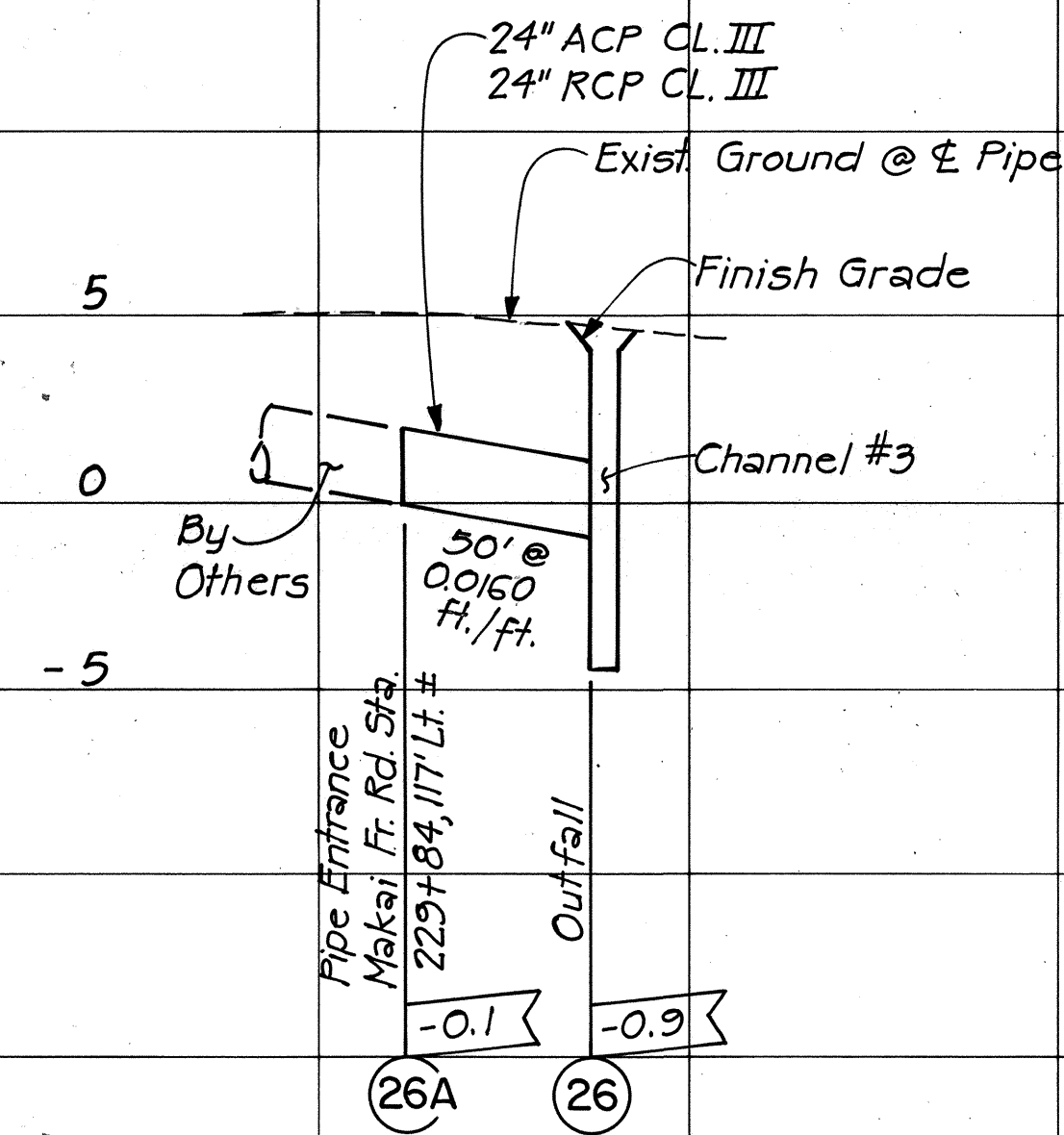
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(132):17	1983	12	192



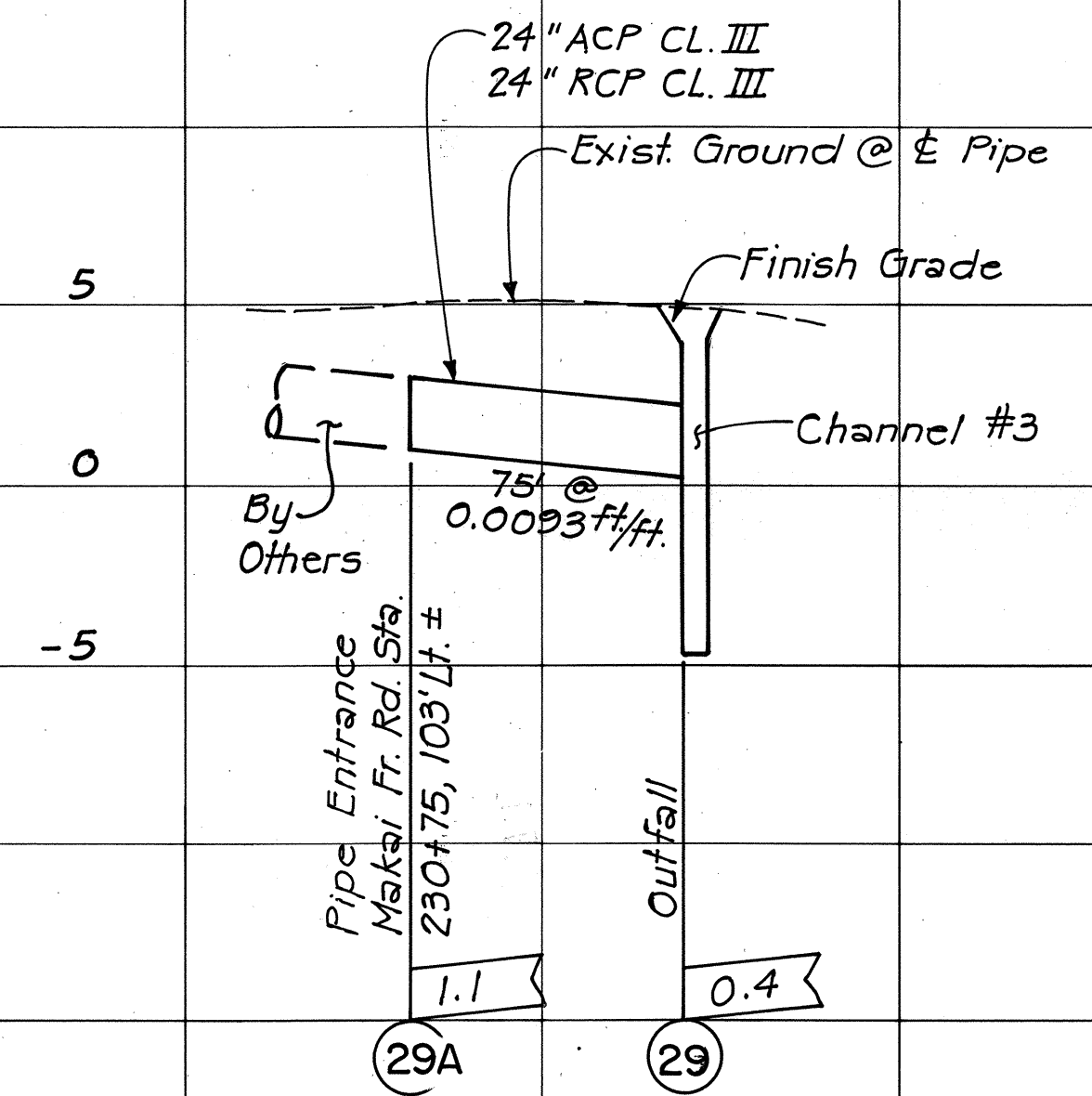
DRAINLINE #4



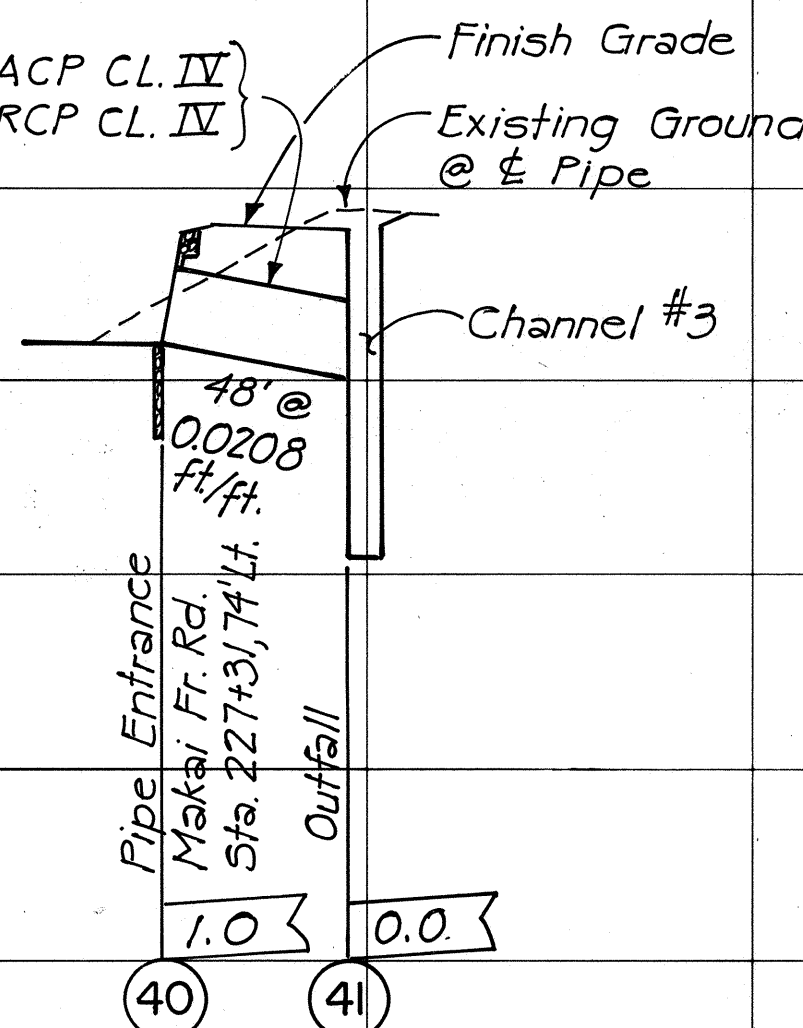
DRAINLINE #5



DRAINLINE #6



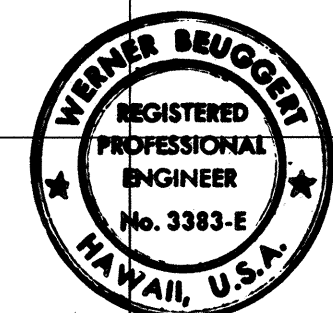
DRAINLINE #7



DRAINLINE #10

GENERAL NOTES:

- Unless noted or directed otherwise, existing pavement within 6" of the finished grade shall be removed. All other existing pavement shall be rooted, plowed, pulverized or scarified to a min. depth of 6". Payment for removal of existing pavement will be made under "Roadway Excavation." Payment for scarifying, etc. of existing pavement shall be considered incidental to various Contract Items.
- Payment for removal & disposal of existing structures, concrete slabs, manholes, drain pipes, trees and bushes, etc. shall be considered incidental to various contract items, except as otherwise provided in Special Provisions, Subsection 202.06.
- Existing pavement which is damaged through excavation or other work shall be restored to its original condition if necessary for the maintenance of traffic, or directed by the Engineer.
- Ground Protection Material (6" crushed rock) shall be placed under the Makai Frontage Road Bridge Structure. See Detail Sheet D-3.
- Contractor shall provide and maintain, as is necessary, temporary water diversion facilities with equal or larger capacity than the existing drainage facilities. Payment shall be considered incidental to various contract items.
- ~~Grates and manhole covers of drain structures to be demolished shall become the property of the Contractor.~~
- Revisions to drainline profiles shall be approved by the Engineer.
- Contractor shall coordinate grading work with Contractors of Proj. No. I-HI-1(170):17 & Proj. No. I-HI-1(168):17.
- Plug viaduct scupper drains at pipe entrance on bridge deck and at pipe outfall at Piers (21) & (22). Payment for plugs shall be considered incidental to the various contract items.
- Plug both pipe ends of Drainline Nos. 5, 6 & 7 and provide pipe markers at Dr. Str. Nos. (23A), (26A) & (29A). Costs shall be considered incidental to cost of pipe. Dr. Str. (23A), (26A) & (29A) shall be terminated at a bell or groove end to allow for convenient future connection.
- Drainline Nos. 5, 6 & 7 and Channel #3 shall be constructed in Phase II.
- Drainline #4 between Drainage Structure (19) and (20), and Drainline #10 shall be constructed during Phase III on a Sunday. Detour 'G' may be closed to traffic during construction of these facilities. Cost of labor on a weekend and providing all materials & labor necessary to close the detour road, such as signs, barricades, etc., shall be considered incidental to the cost of the various drainage items.
- Provide minimum 12' level area between existing pier and top of channel slope for vehicle access at Channel #3 Sta. 16+10, left.
- Knockouts in Manholes shall consist of brick and mortar. Payment will be considered incidental to Manhole.



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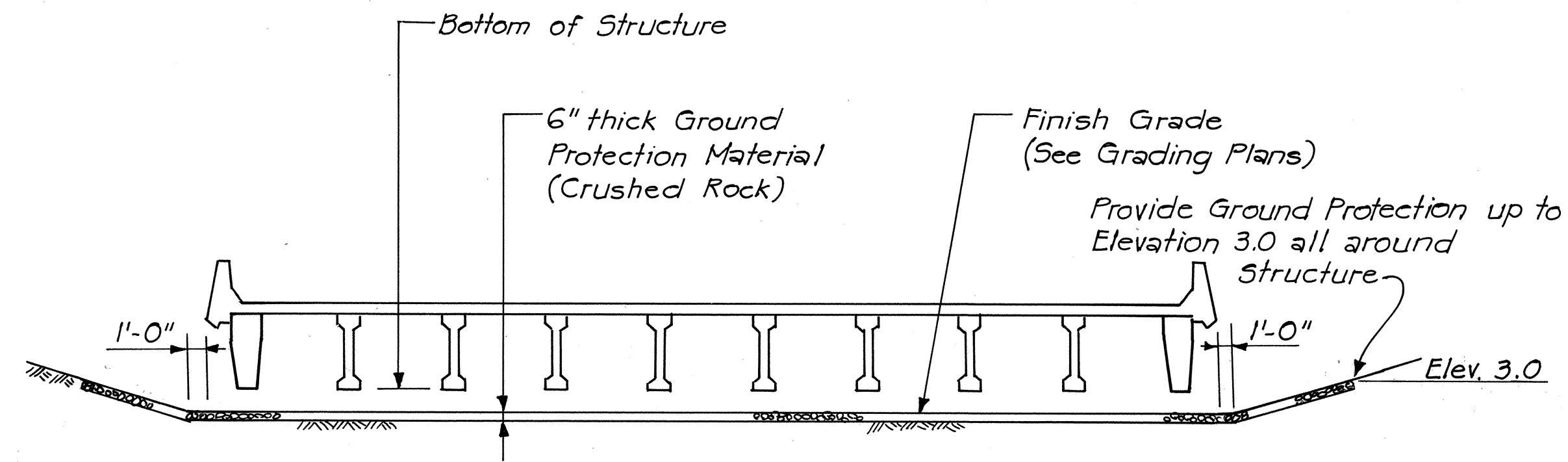
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PROFILES

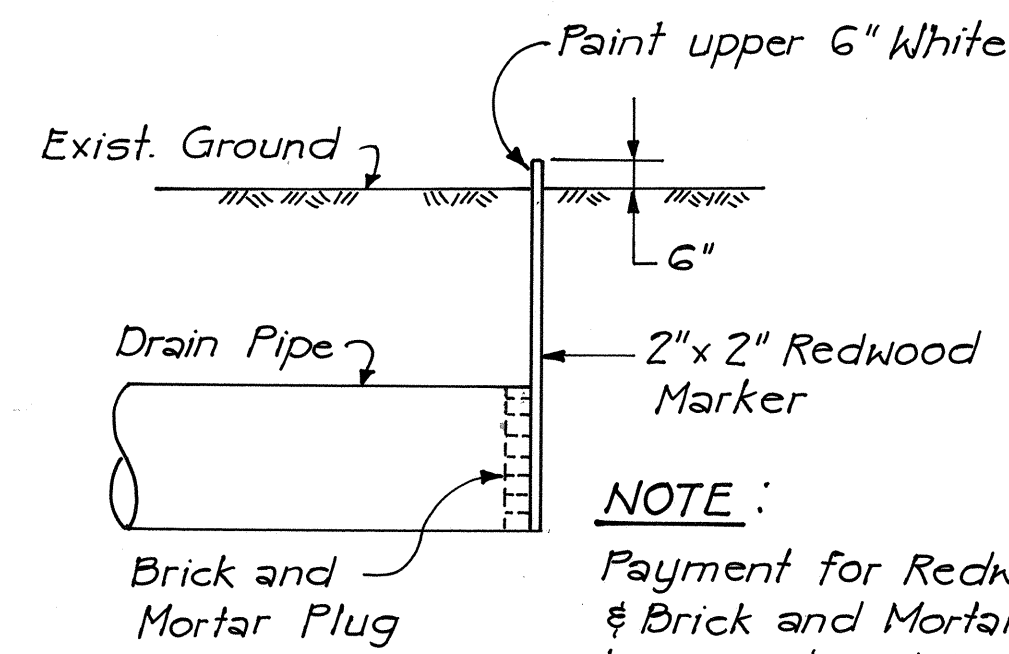
INTERSTATE ROUTE H-1
PROJECT NO. I-HI-1(132):17
SCALE: HORIZ.: 1"=50'
VERTICAL: 1"=5'
DATE: 11/16/81
SHEET No. D-2 OF D-9 SHEETS

DATE	
SURVEY PLOTTED BY	
DESIGNED BY	
TRACED BY	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(132)	17 1983	13	192

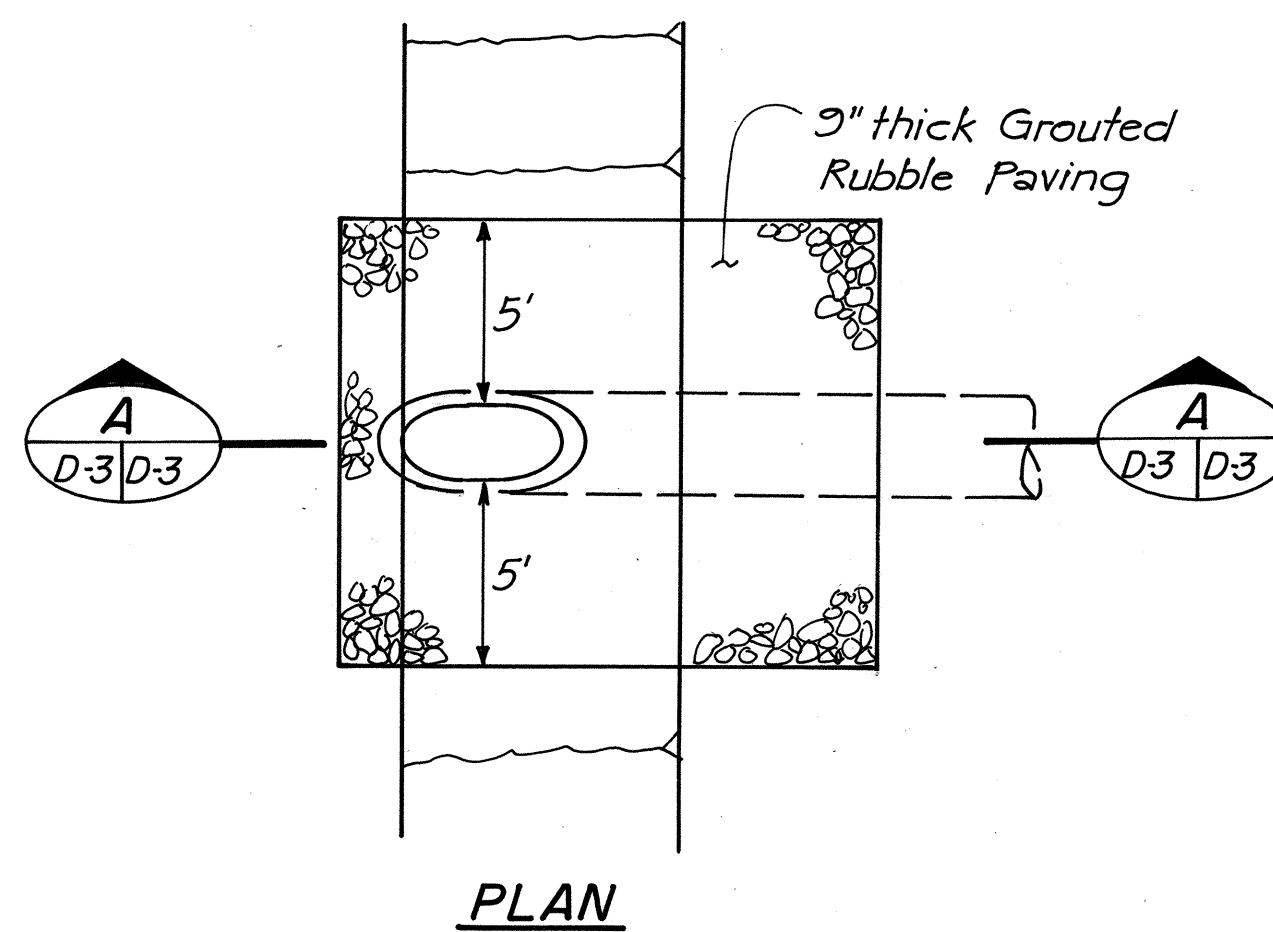


GROUND PROTECTION UNDER MAKAI FRONTAGE RD. STRUCTURE
N.T.S.

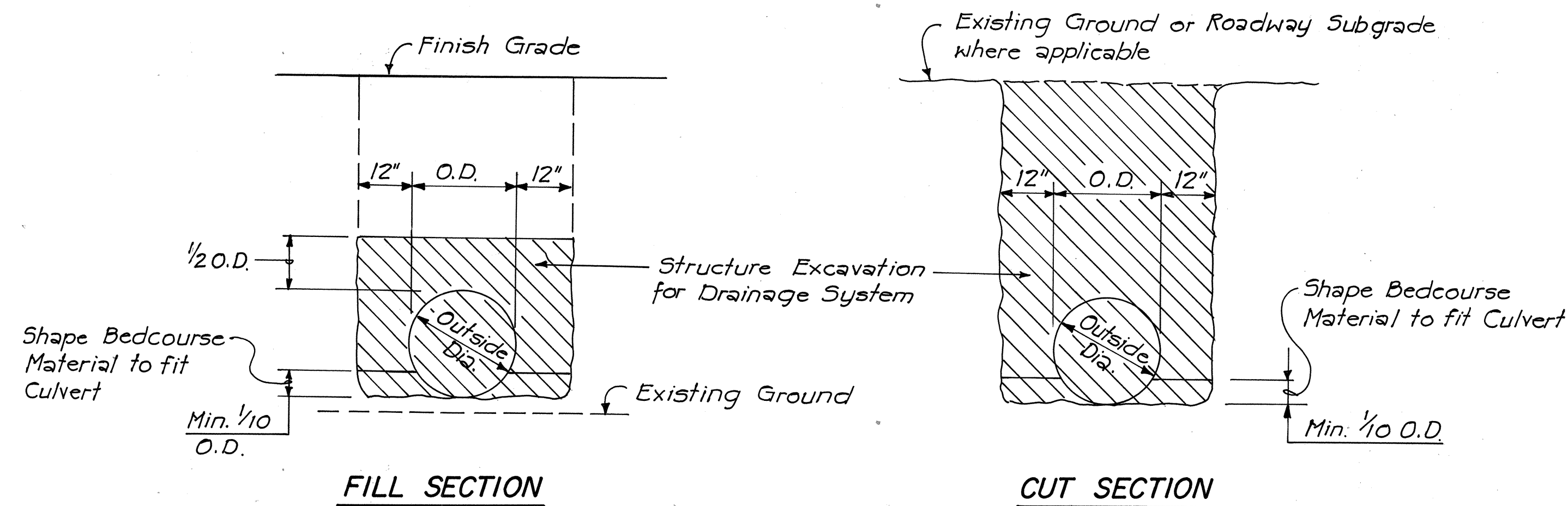


NOTE:
Payment for Redwood Marker & Brick and Mortar Plug shall be considered incidental to the Cost of Pipe.

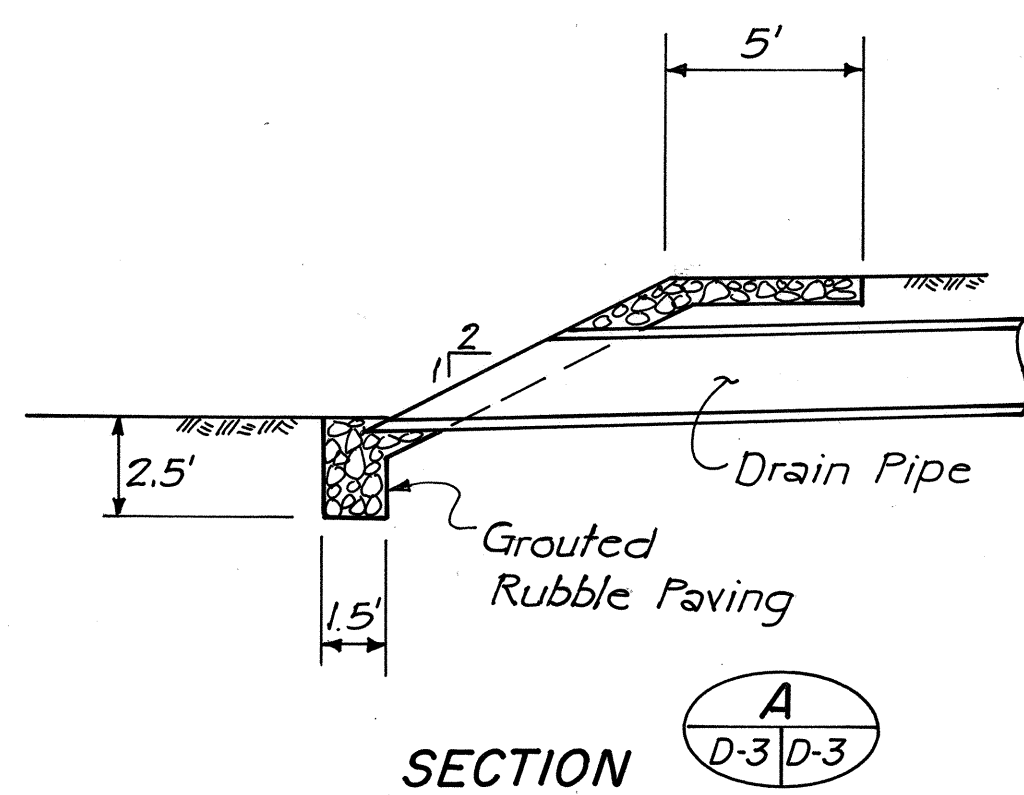
PIPE MARKER & PLUG DETAIL
N.T.S.



PLAN

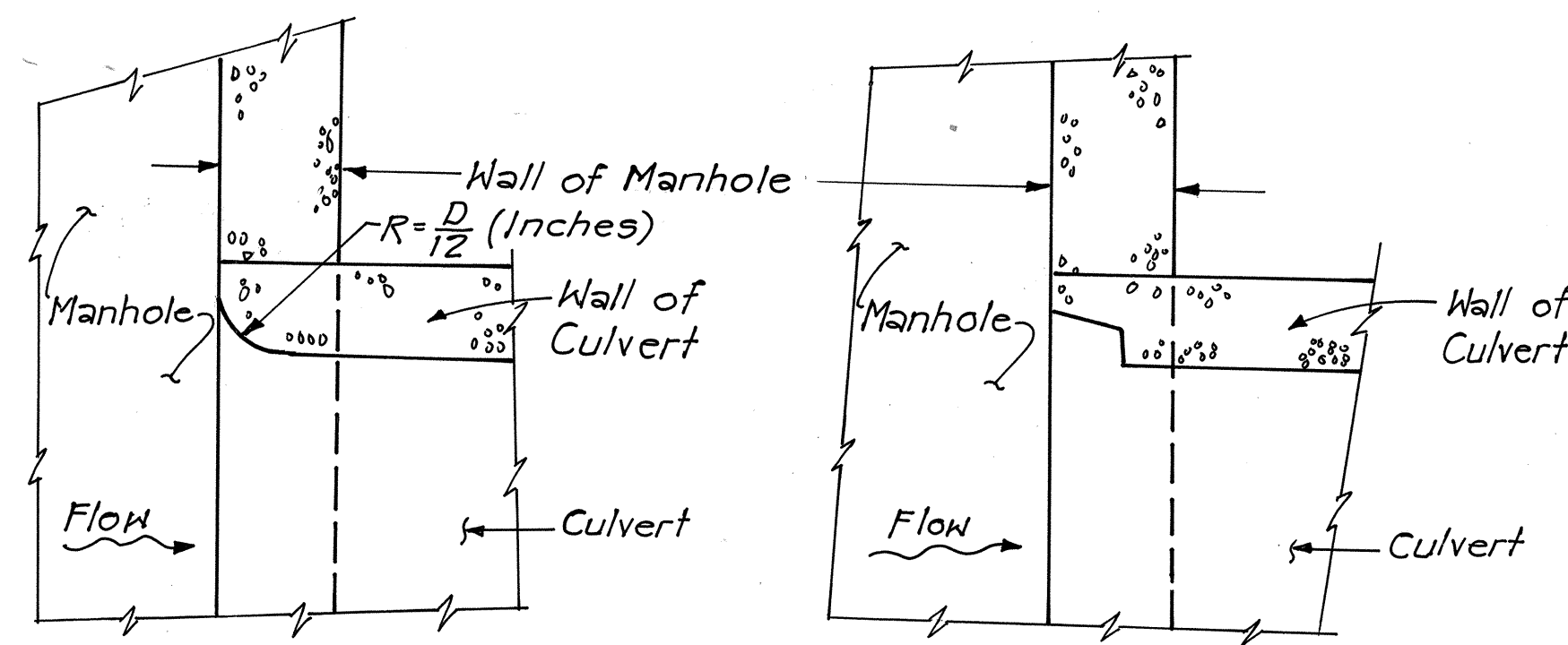


TRENCH EXCAVATION PAY LIMIT
N.T.S.

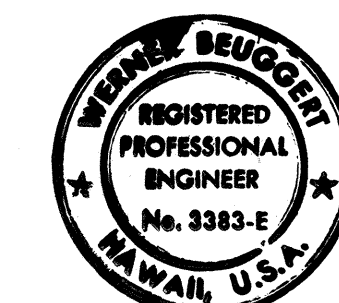


SECTION

MITERED PIPE ENTRANCE AT DR. STR. (40)
N.T.S.



PIPE CULVERT ENTRANCE DETAILS
N.T.S.



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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

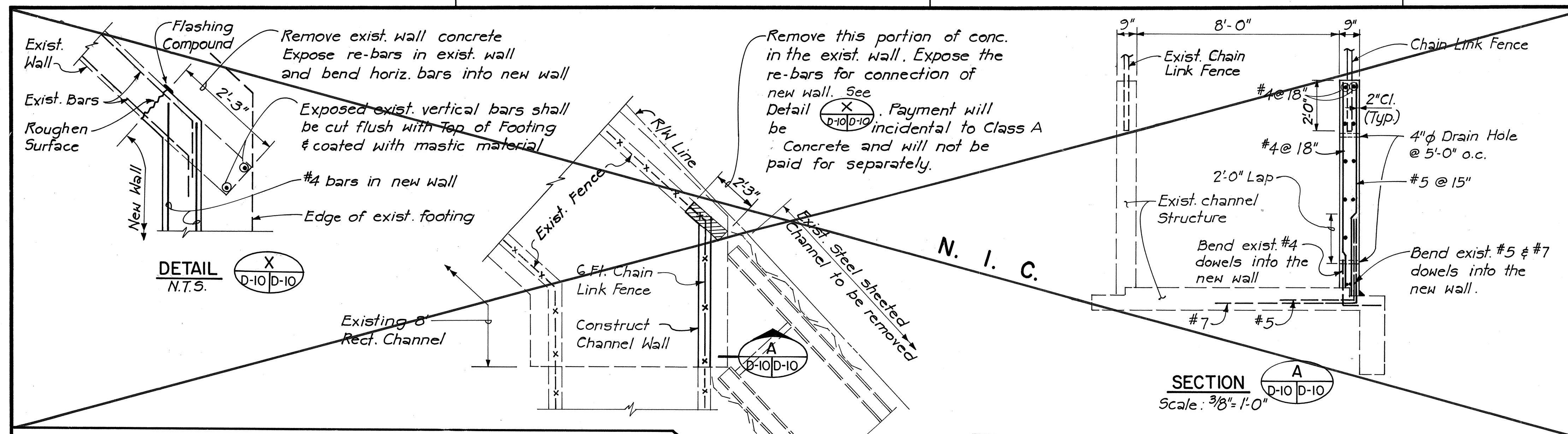
INTERSTATE ROUTE H-1
PROJECT NO. I-HI-1(132):17

SCALE: AS SHOWN DATE: 11/16/81
SHEET No. D-3 OF D-9 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(132):17	1983	14	192

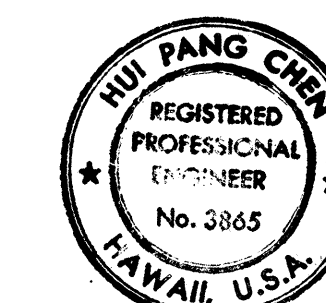
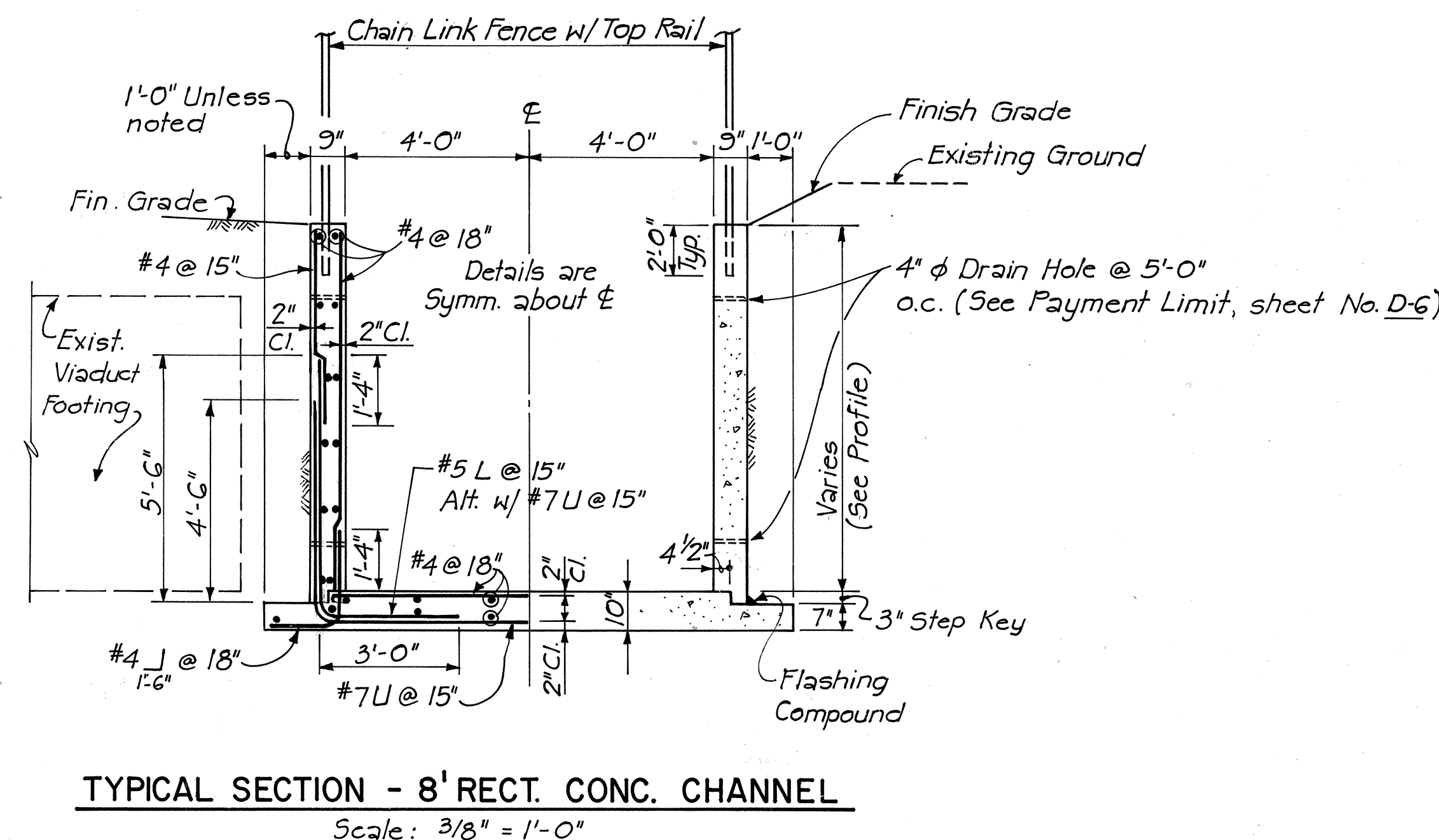
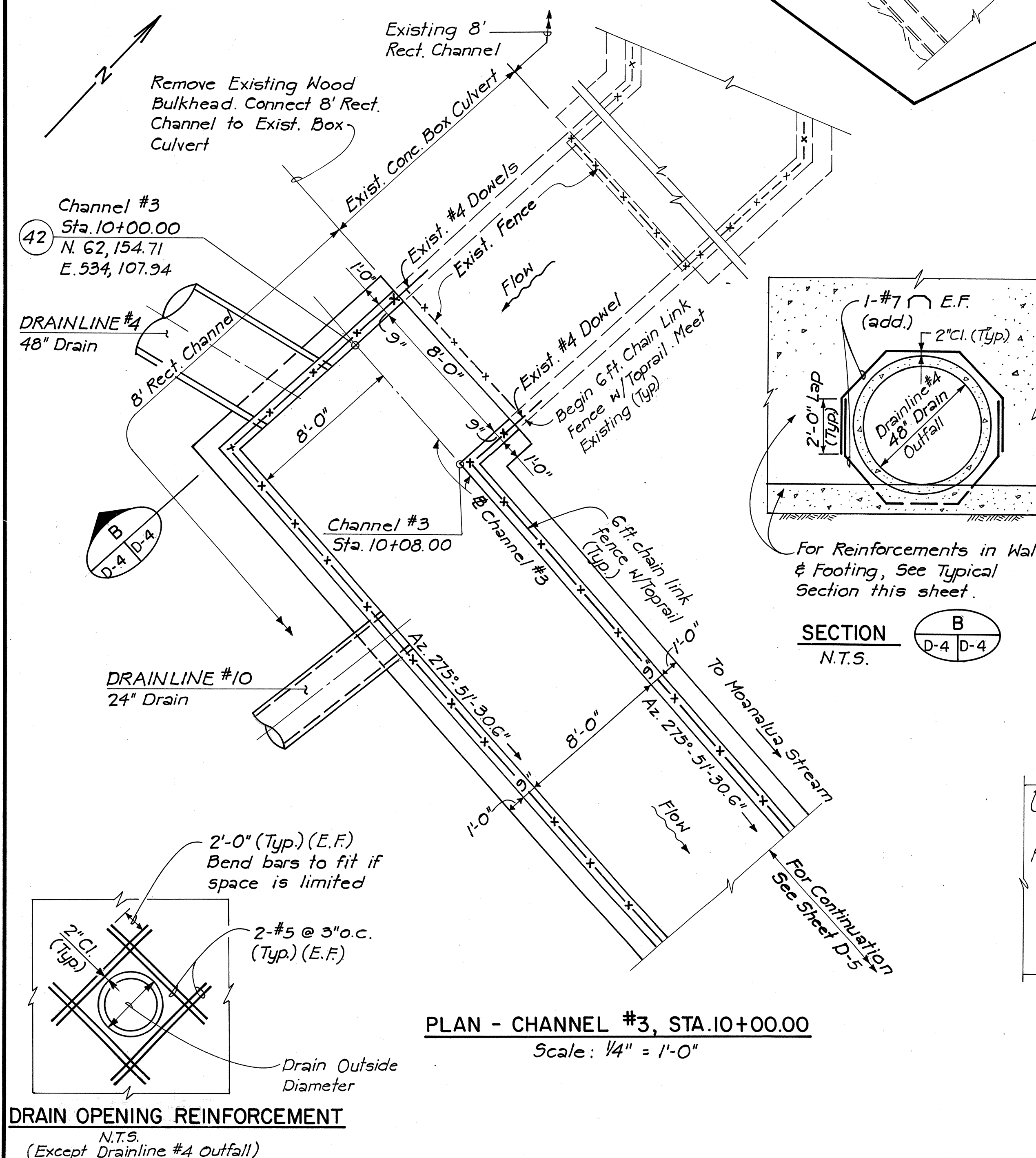
GENERAL NOTES FOR CHANNEL #3

- Design Specifications :
Standard Specifications for Highway Bridges" AASHTO Specifications and Interim Specifications of current edition.
- Design Stresses : $f_c' = 3000$ psi, $f_c = 1200$ psi $n = 10$ for concrete
 $f_s = 20,000$ psi for Reinf. Steel
- Material :
(a) All Reinf. Steel shall be ASTM Designation A615 Grade 40.
(b) All concrete shall be Class A, unless otherwise noted.
- Dowels in existing concrete box culvert shall be cleaned by wire brushing and/or sand-blasting prior to casting channel walls.
- For Chain Link Fence & Gate Details see Standard Drawing Sheet C-2.
Provide 9' wide Chain Link Gate on South Wall at Channel #3 Sta. 12+00
- For Structural Excavation Payment Limits and Joint Details see Sheet No. D-6
- The Contractor shall verify the Locations and Elevations of all existing utility lines and notify the respective owners before commencing work on excavation.
- Except as otherwise noted all exterior corners & re-entrant angles in concrete work shall be chamfered $\frac{3}{4}" \times \frac{3}{4}"$.
- All dimensions relating to Reinforcing are to centers of bars unless otherwise noted.
- 8' Rectangular Channel shall have joints as follows
Expansion Joint = 96'-0" Maximum and
Control Joint = 32'-0" Maximum.
- For Invert and Wall Elevations see Sheet No. D-5



ESTIMATED QUANTITIES FOR CHANNEL #3

ITEM No.	ITEMS	UNIT	QUANTITY
206.2021	Structure Excavation for Channel #3	C.Y.	2305
206.7120	Structure Backfill for Channel #3	C.Y.	320
206.8000	Filter Material	C.Y.	262
206.8600	Bed Course Material for Channel #3	C.Y.	110
503.0140	Class A Concrete for Channel #3	L.S.	(364 C.Y.)
602.0032	Reinforcing Steel for Channel #3	L.S.	(45,600 Lbs)
607.0260	6' Chain Link Fence with Top Rail on Concrete Structure	L.F.	868
607.6090	Chain Link Gate 6' high & 9' wide	EA	1
650.1000	Filter Fabric	S.Y.	573
650.2000	Sand Pad	C.Y.	96
650.3000	Riprap	C.Y.	191



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LAND TRANSPORTATION FACILITIES DIVISION

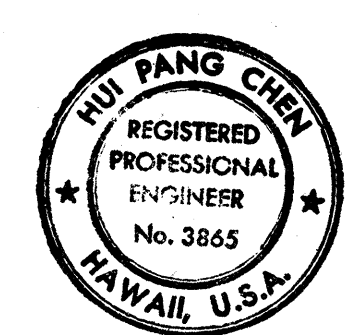
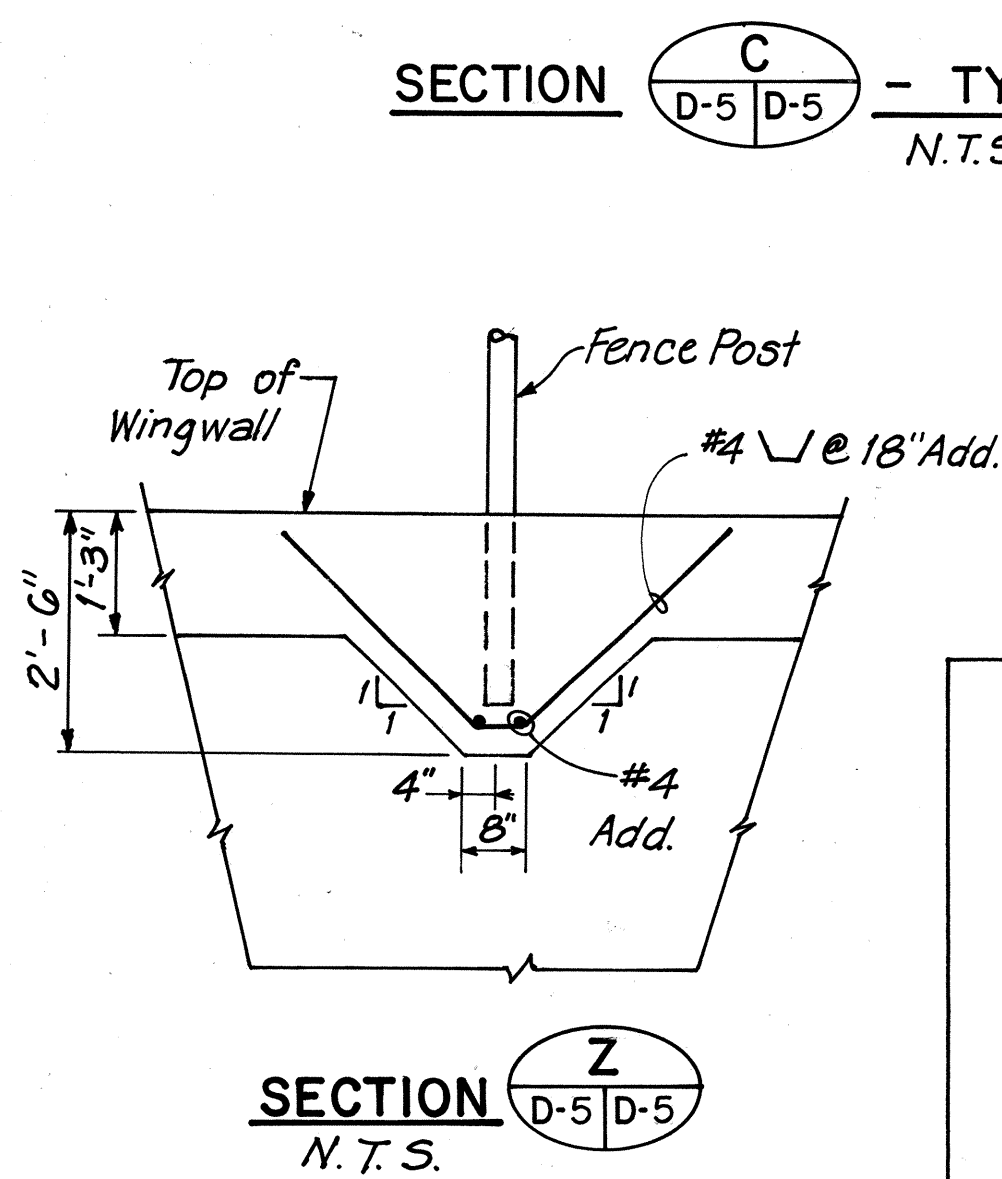
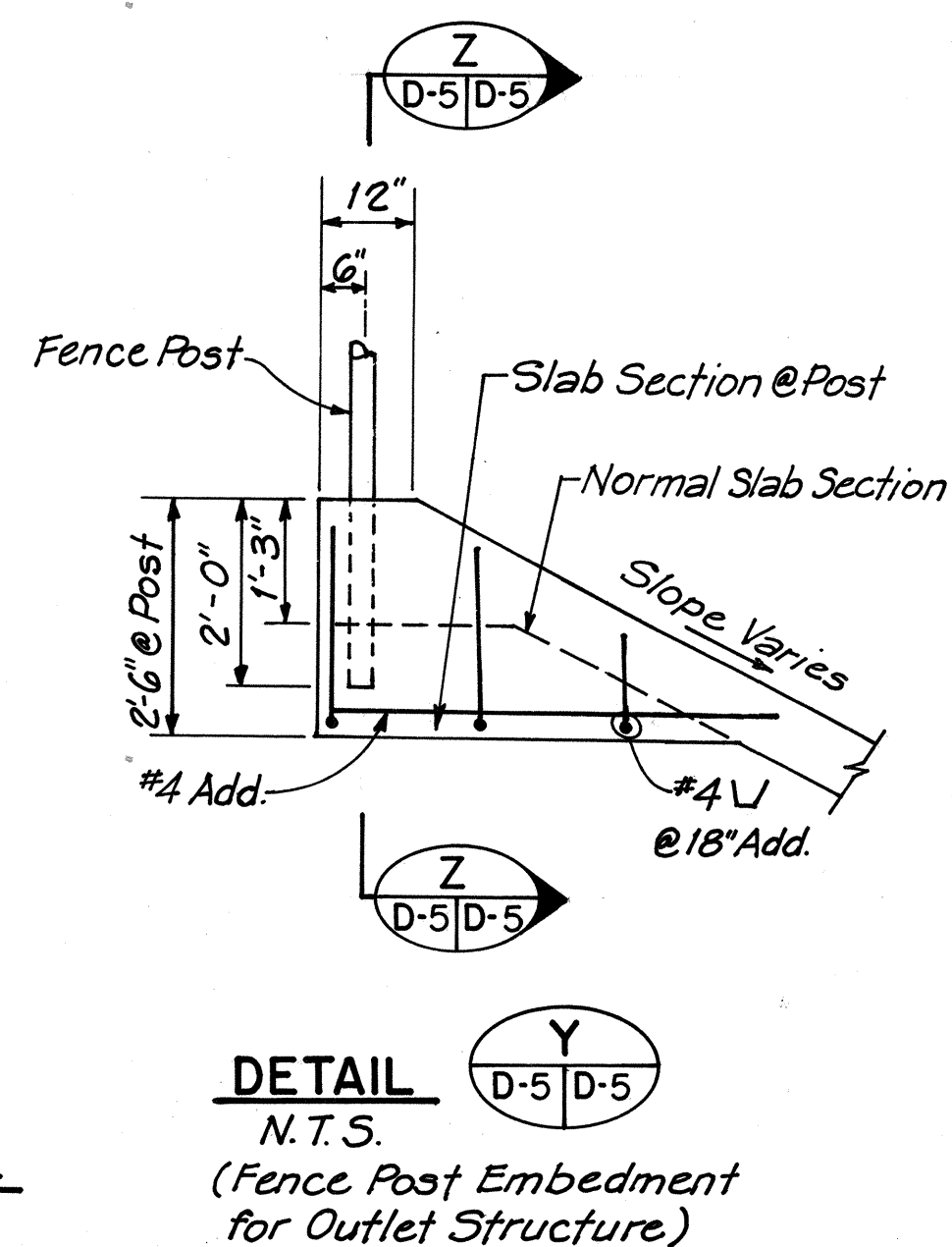
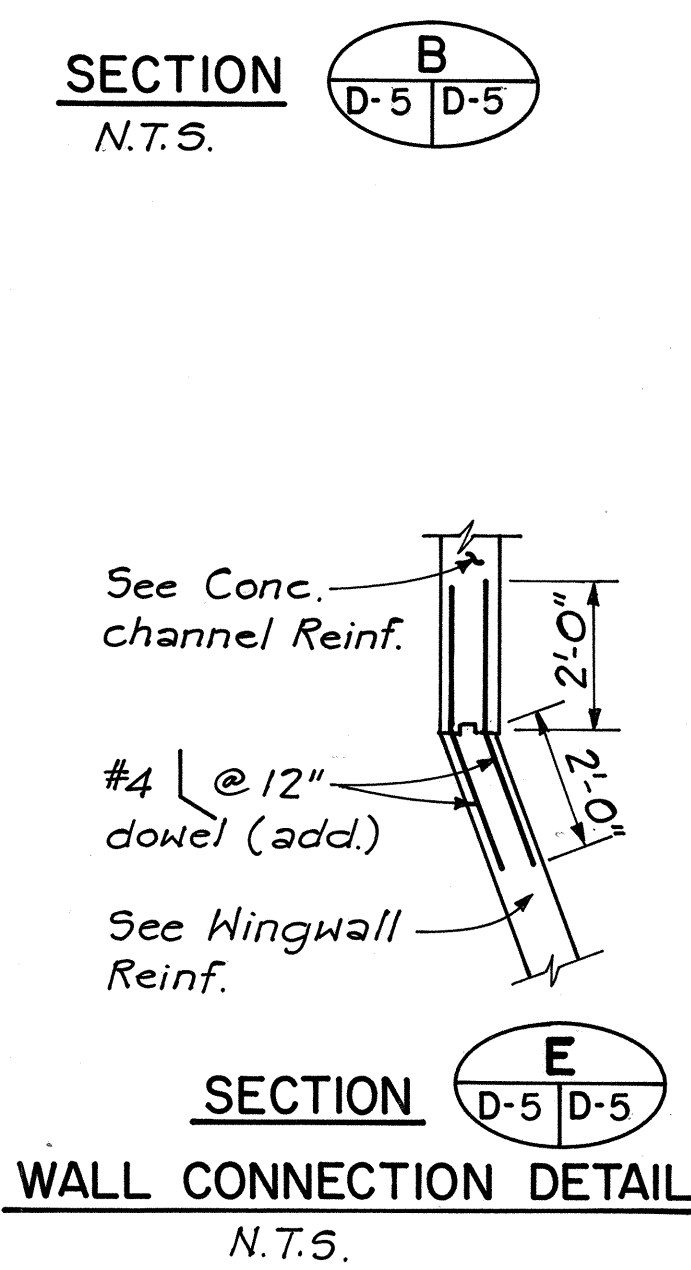
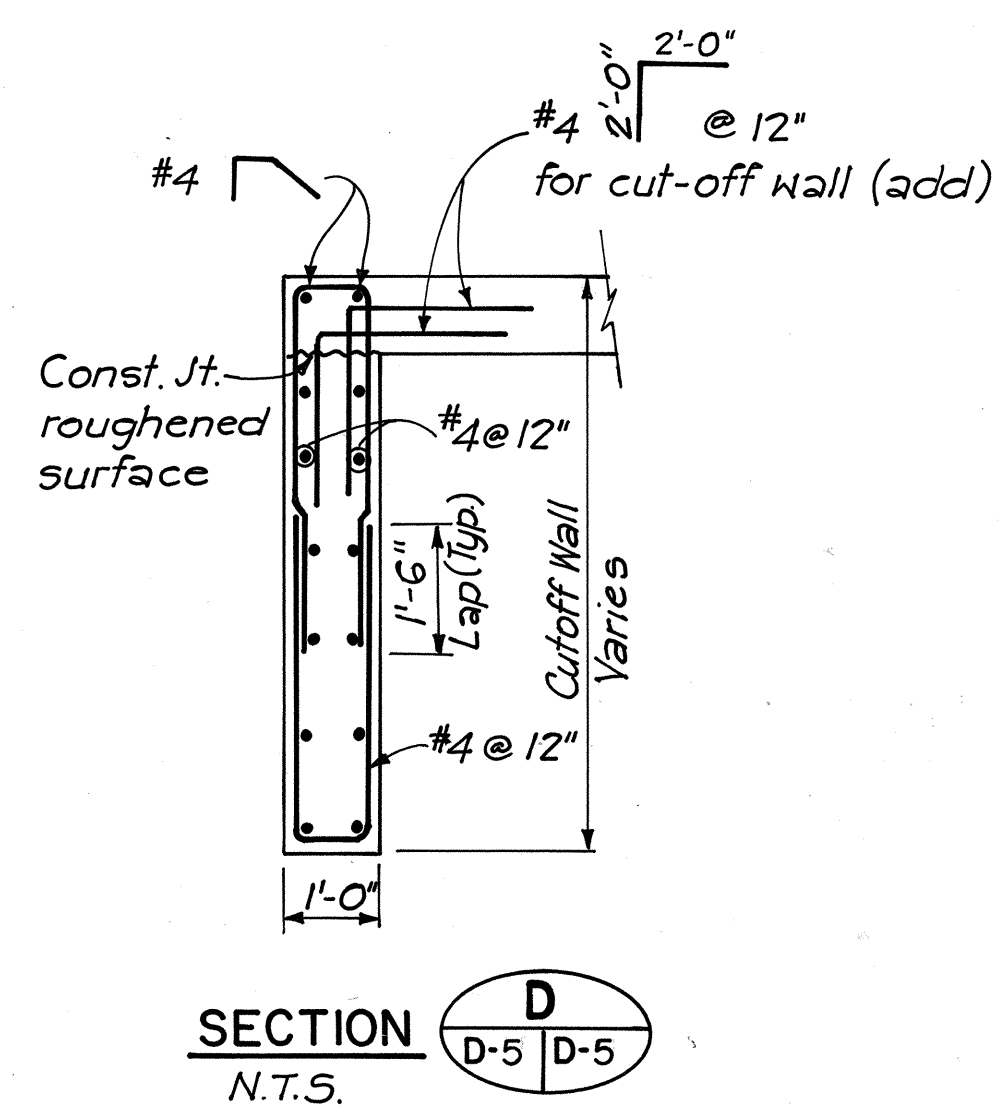
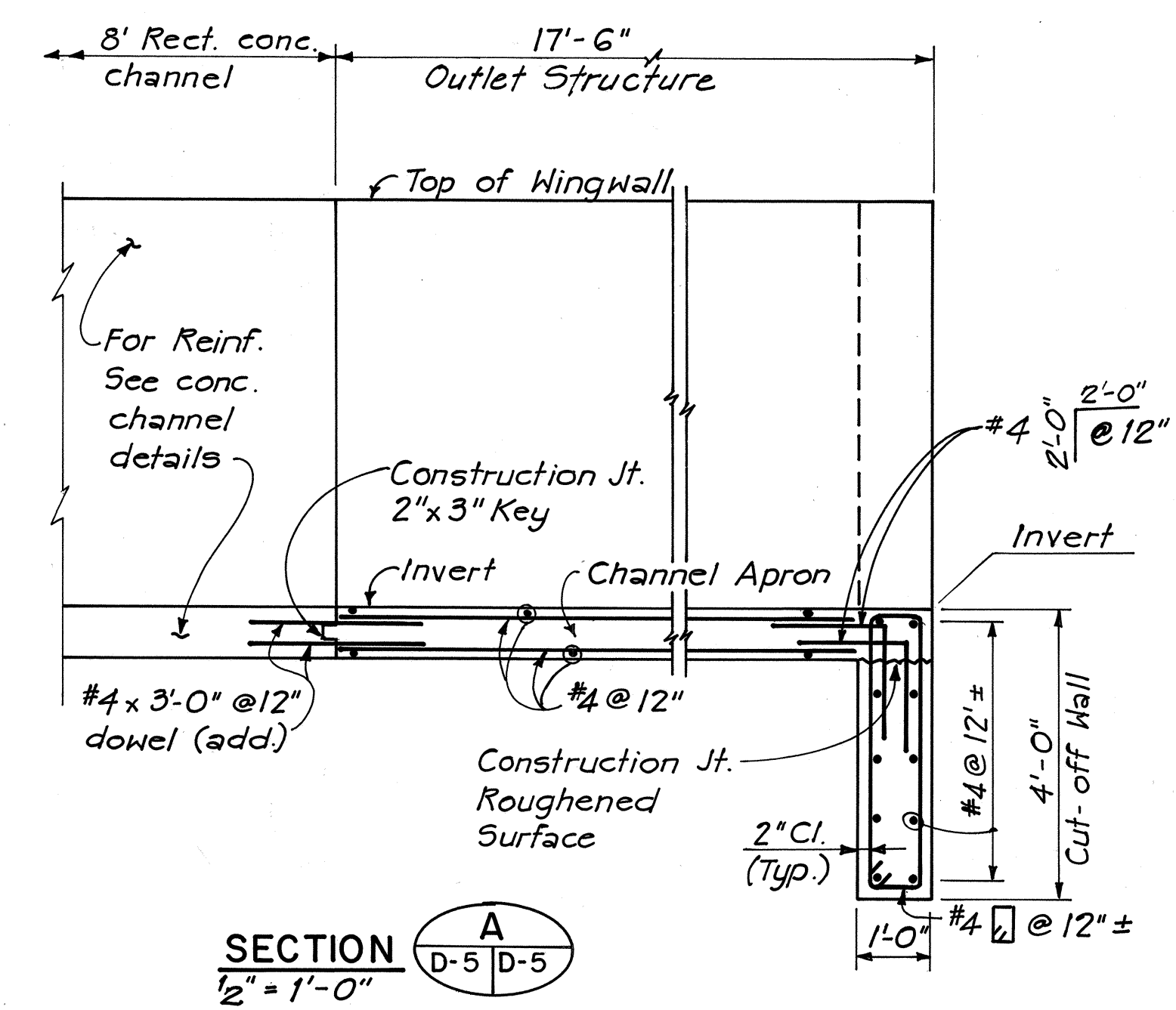
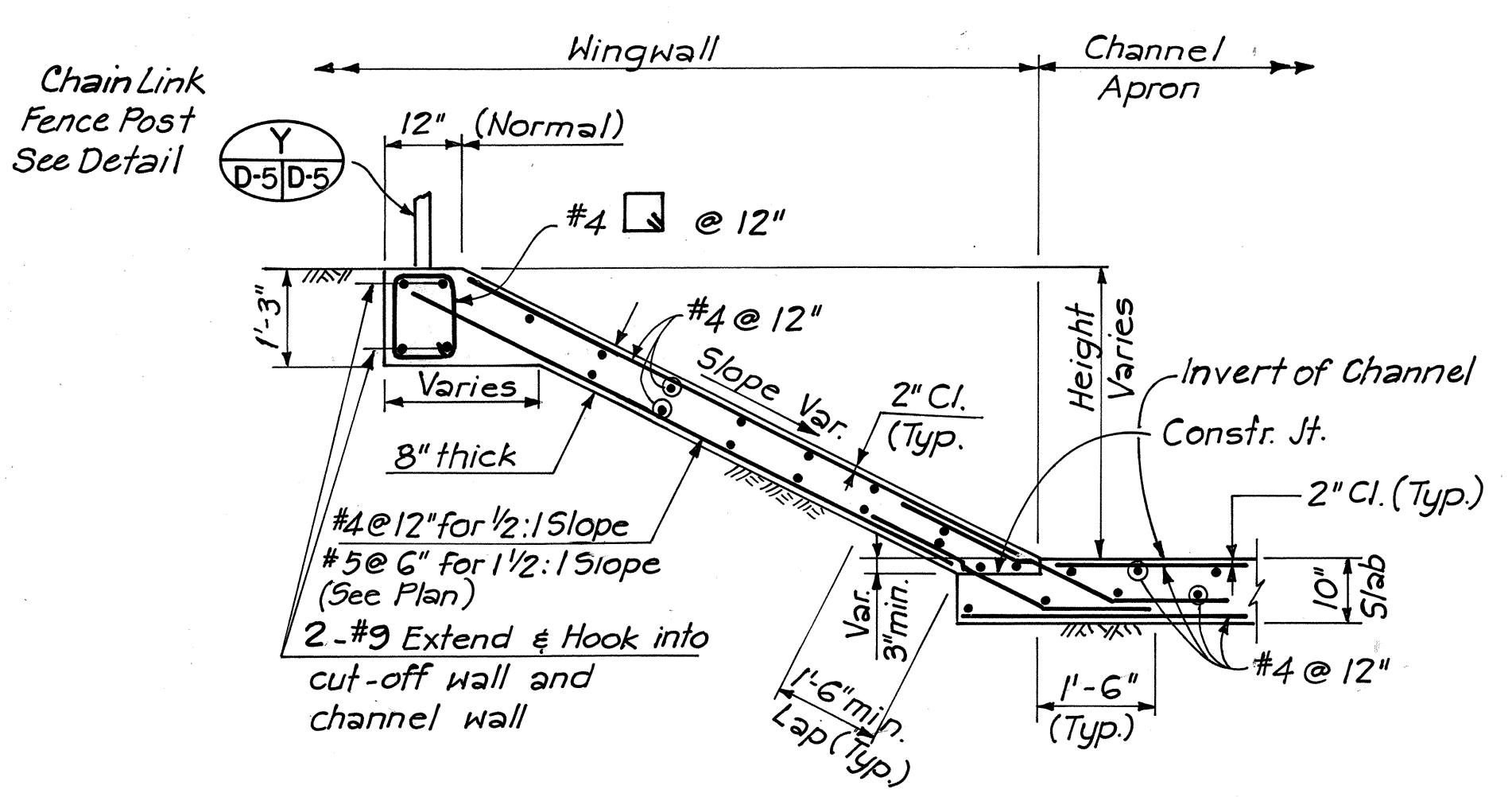
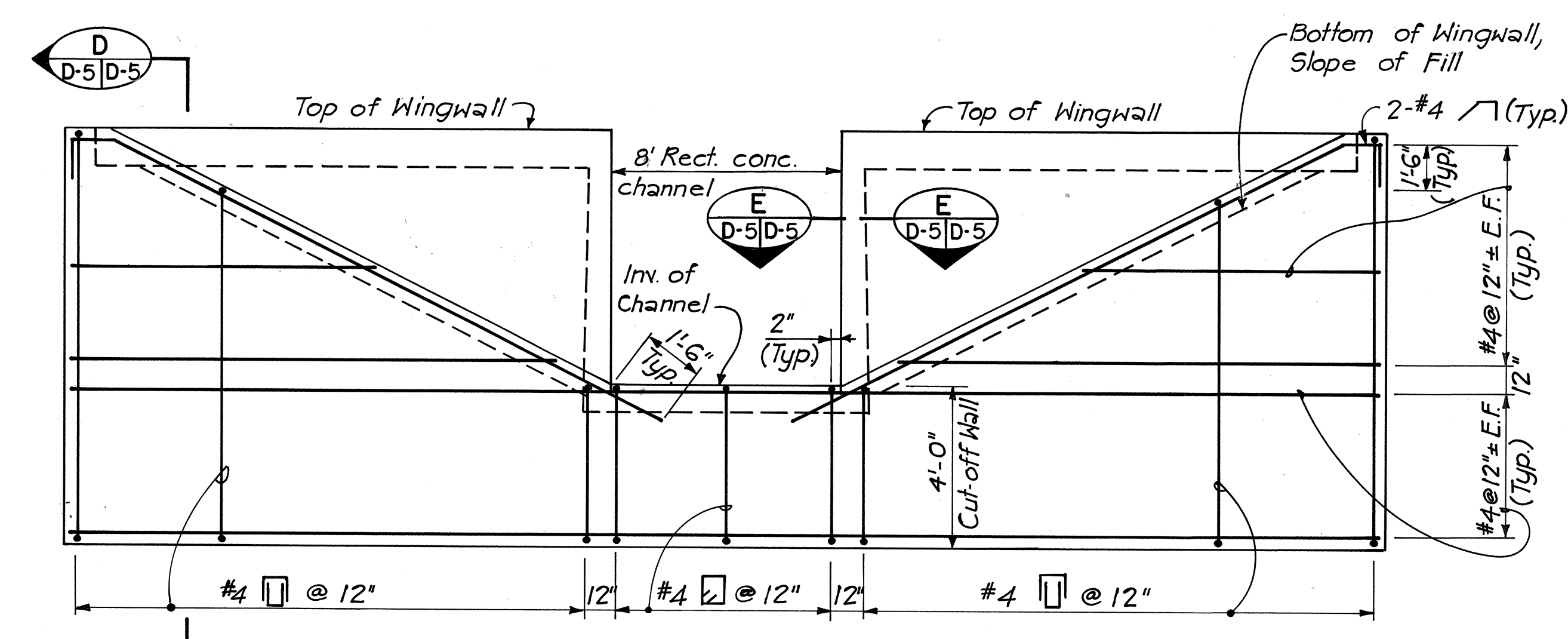
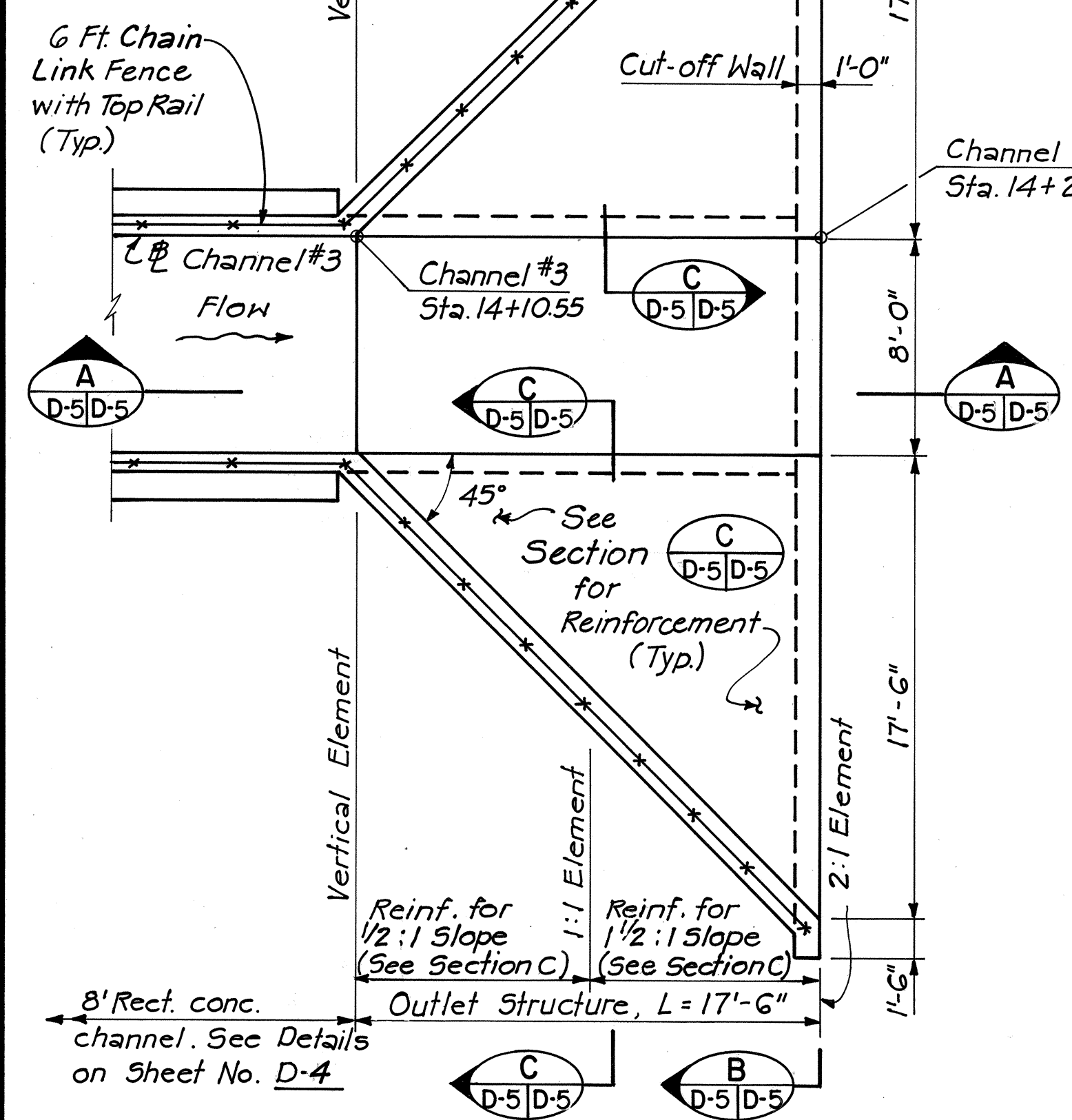
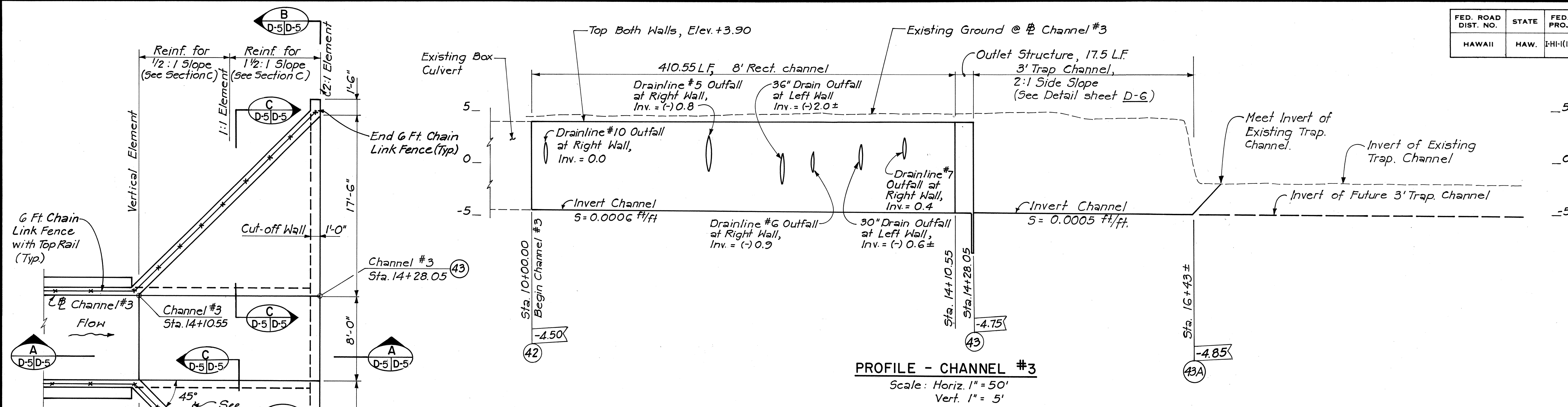
CHANNEL #3 DETAILS

INTERSTATE ROUTE H-1
PROJECT NO. I-HI-1(132):17

SCALE: AS SHOWN DATE: 11/16/81

SHEET No. D-4 OF D-9 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HI-1(132):17	1983	15	192



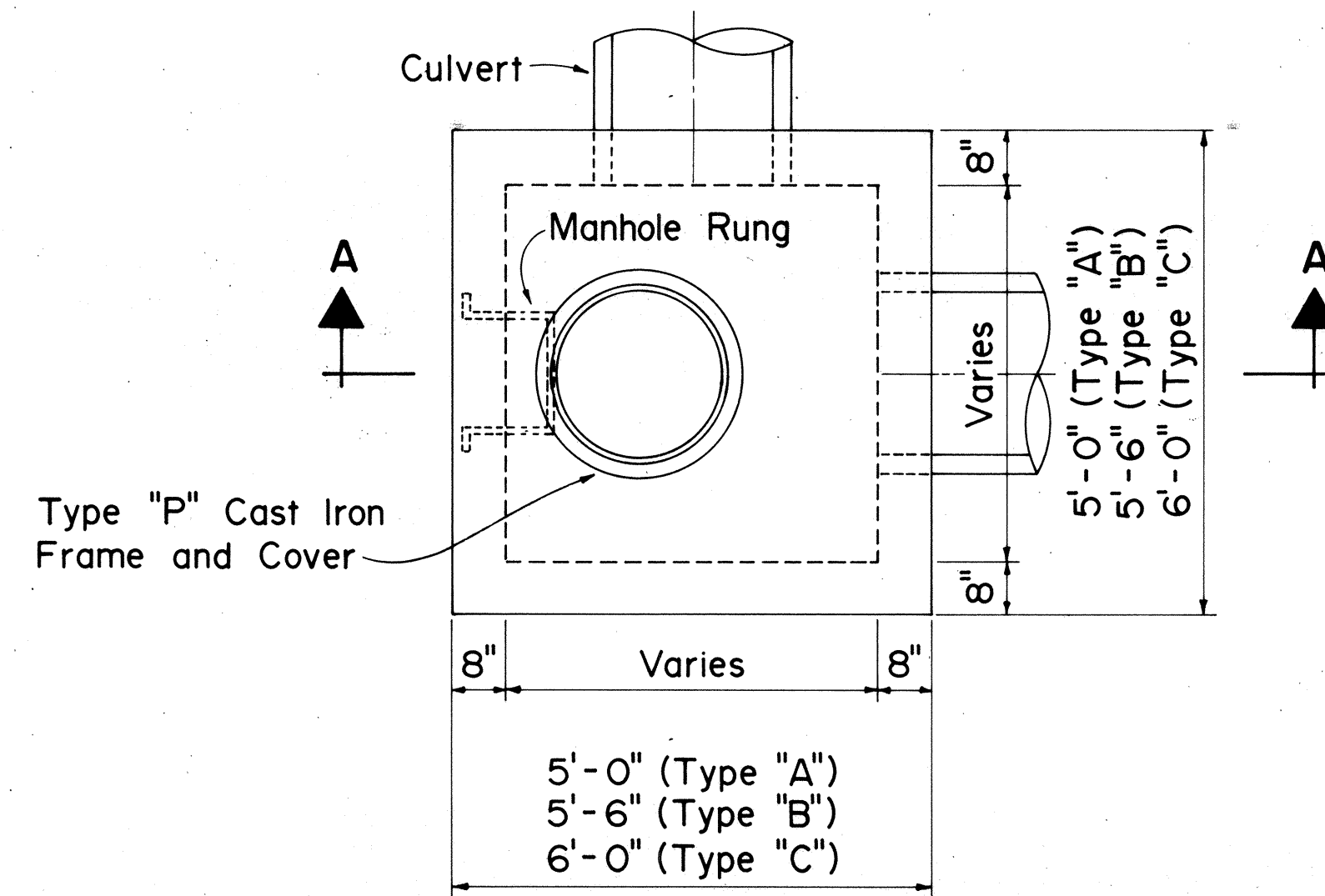
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

CHANNEL #3 DETAILS
INTERSTATE ROUTE H-1
PROJECT NO. I-HI-1 (132):17

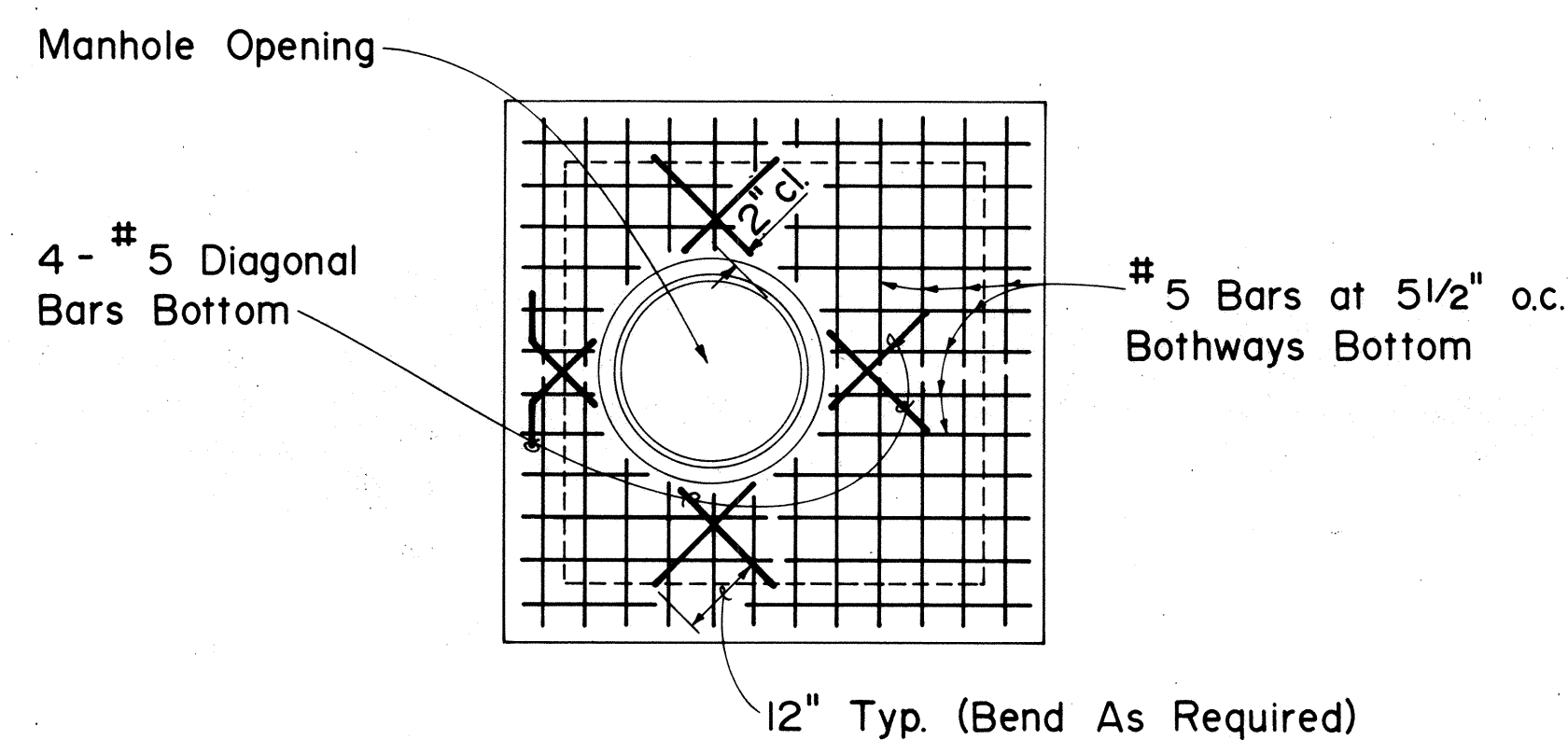
SCALE: AS SHOWN DATE: 11/16/81
SHEET NO. D-5 OF D-9 SHEETS

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

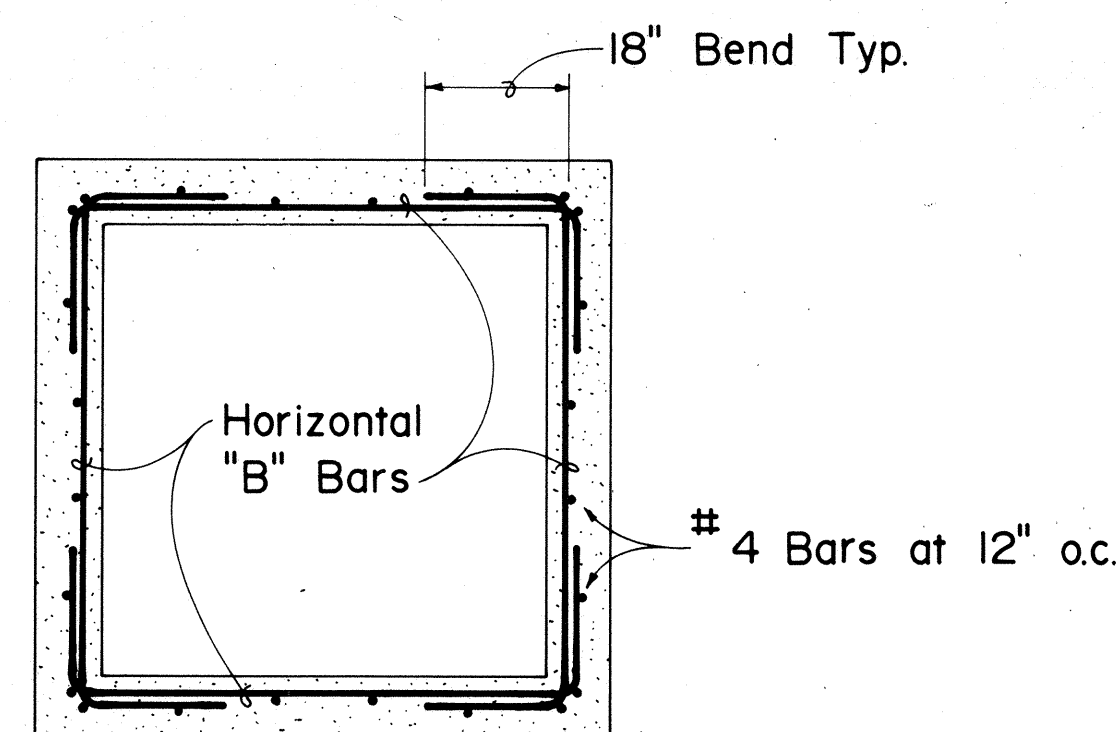
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HAWAII	HAW.	1-HI-1(132)17	1983	17	192



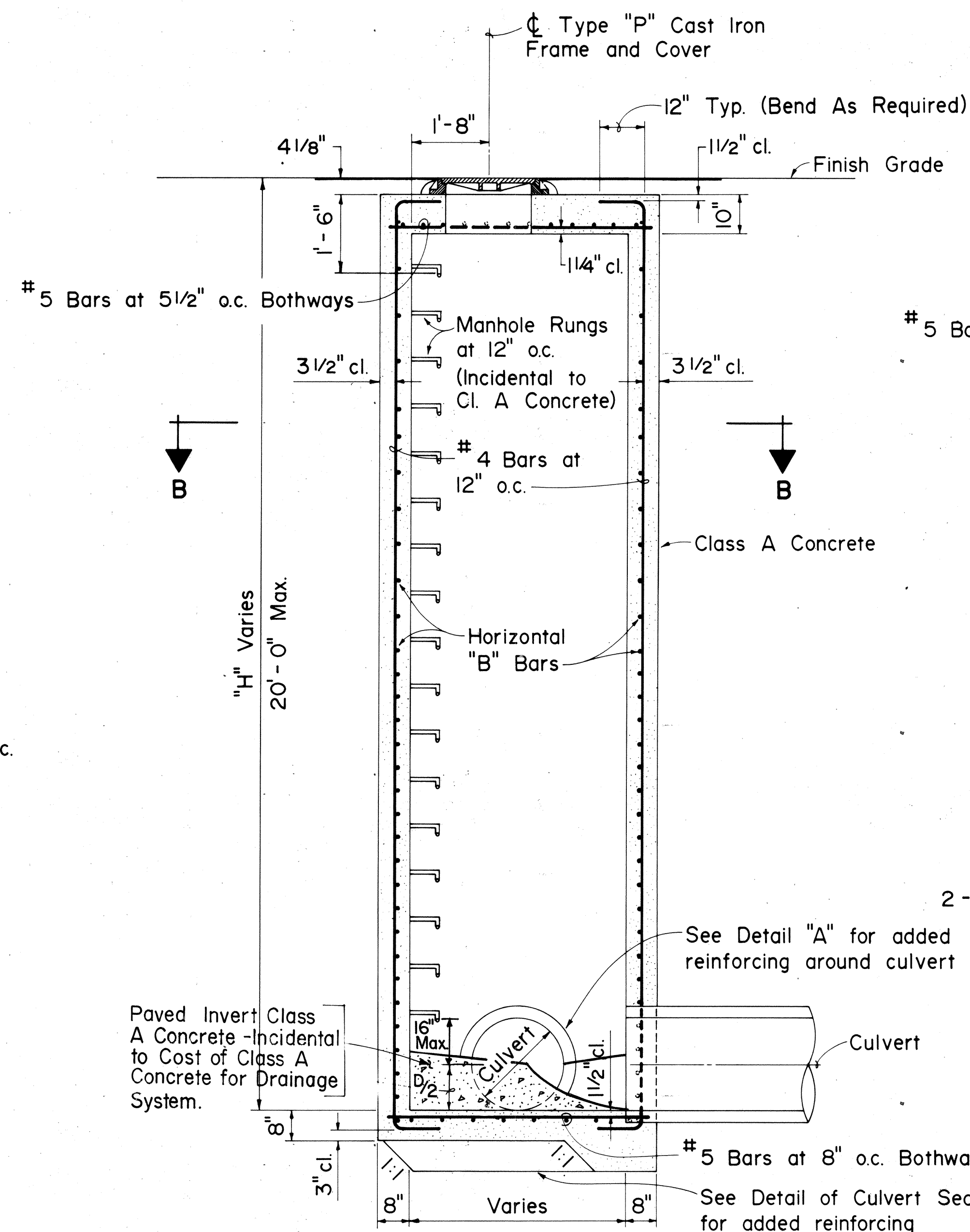
PLAN



PLAN
(Top Slab Reinforcing)

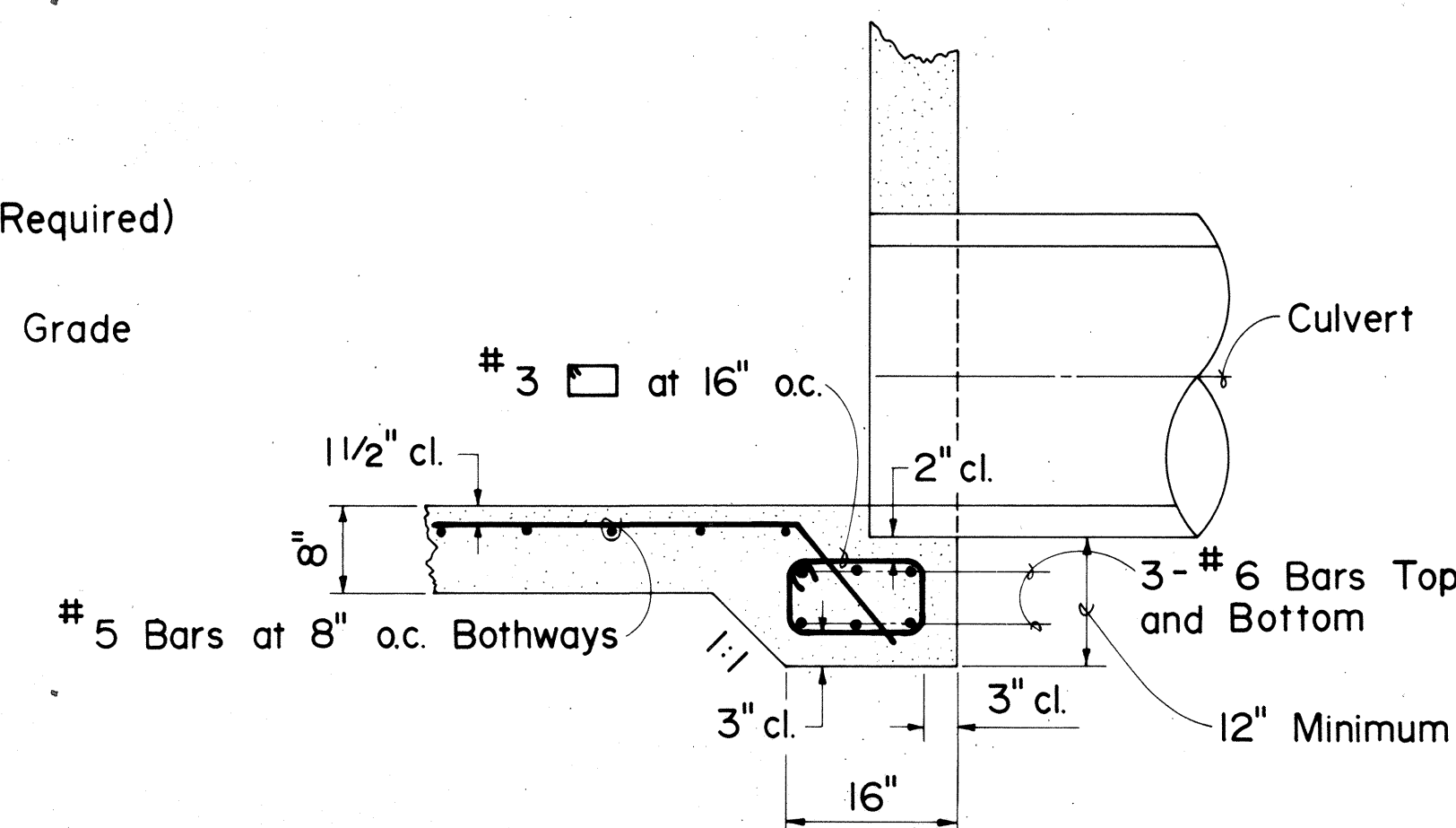


SECTION "B-B"

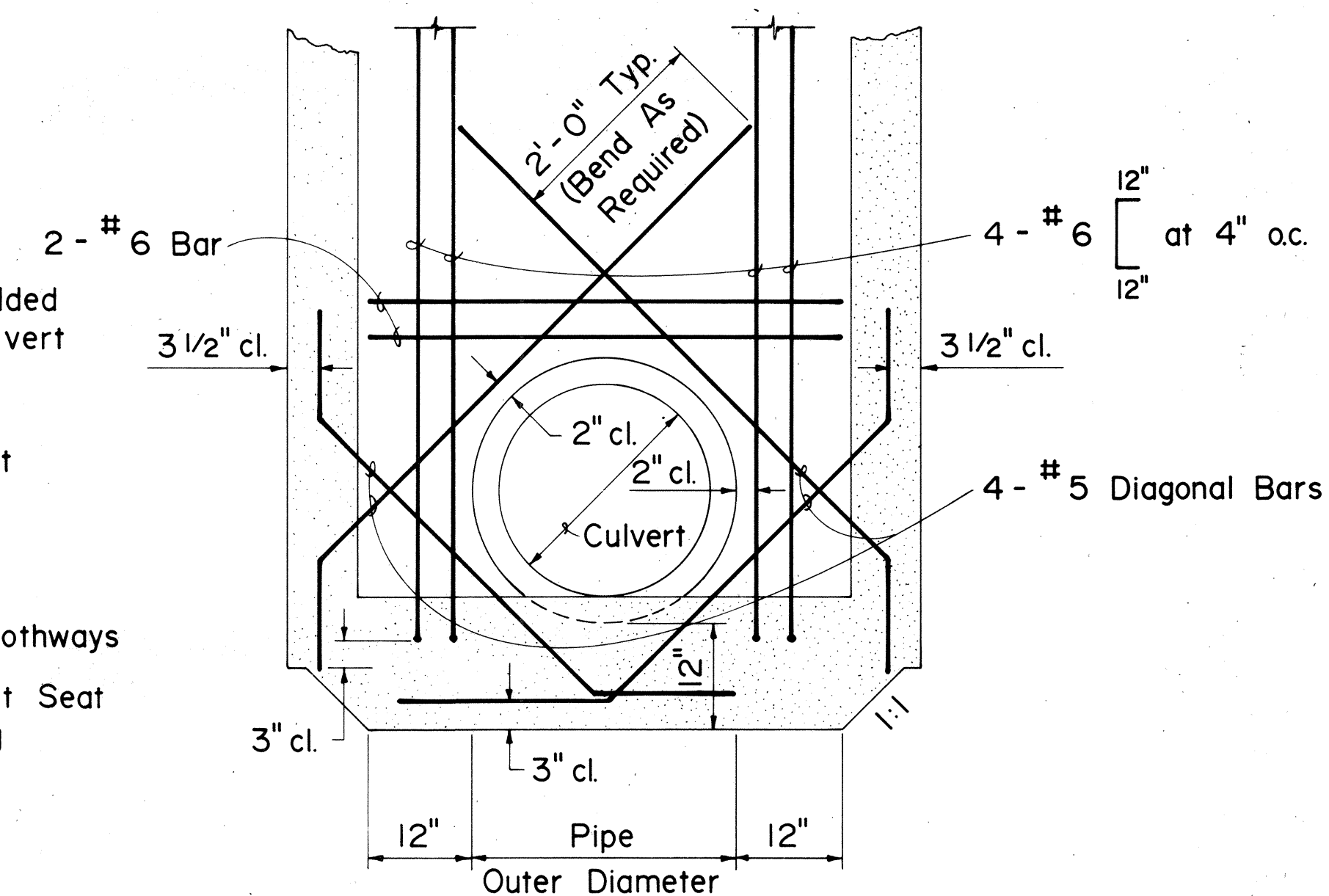


SECTION "A-A"

"H" MAX. (FT)	HORIZONTAL "B" BARS
0'-0" to 5'-0"	# 4 at 12" o.c.
5'-1" to 10'-0"	# 4 at 9" o.c.
10'-1" to 15'-0"	# 4 at 6" o.c.
15'-1" to 20'-0"	# 5 at 6" o.c.

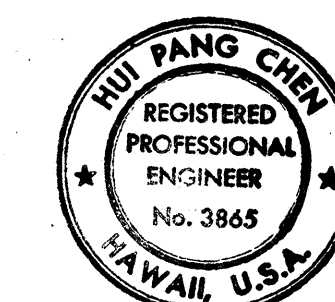


TYPICAL DETAIL OF CULVERT SEAT



DETAIL "A"

TYPE "A", "B", & "C" STORM DRAIN MANHOLE



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NO.	REVISION	APPROVED BY	DATE

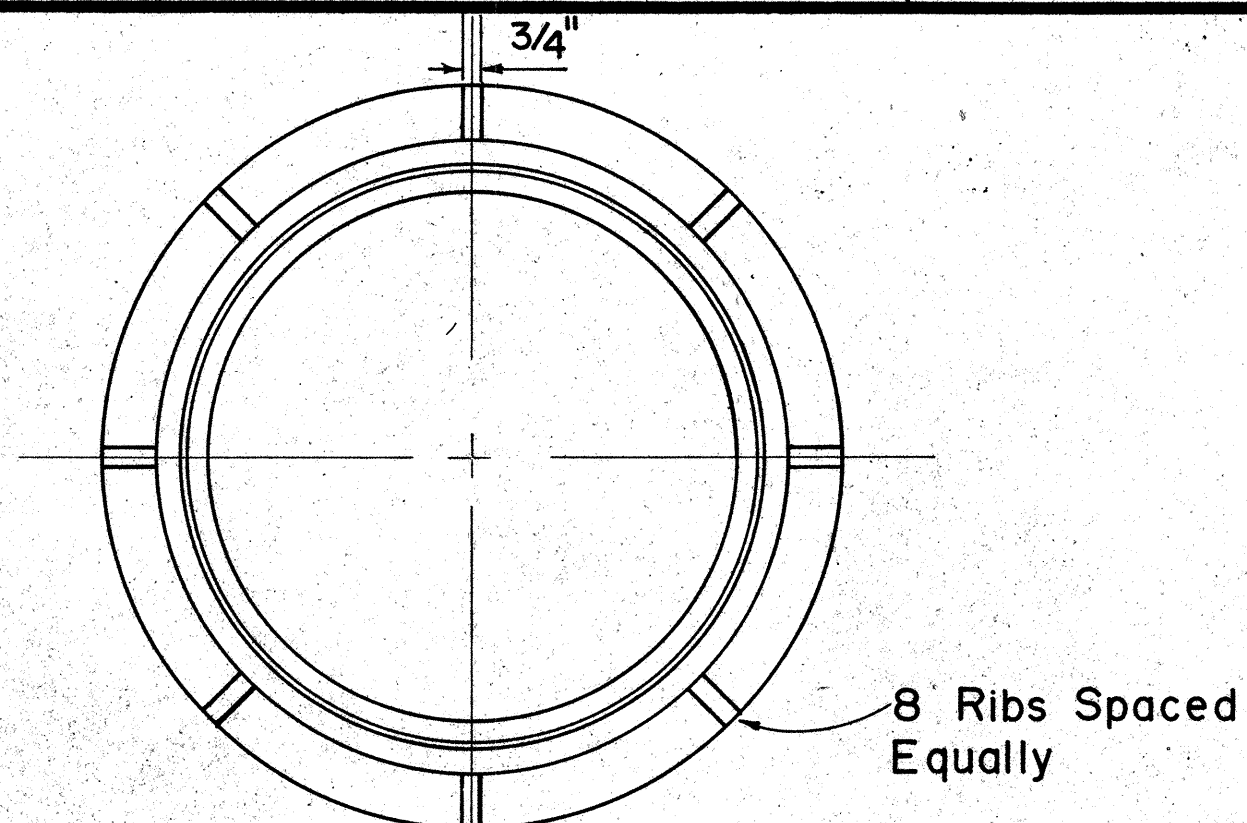
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE A, B, AND C
STORM DRAIN MANHOLE

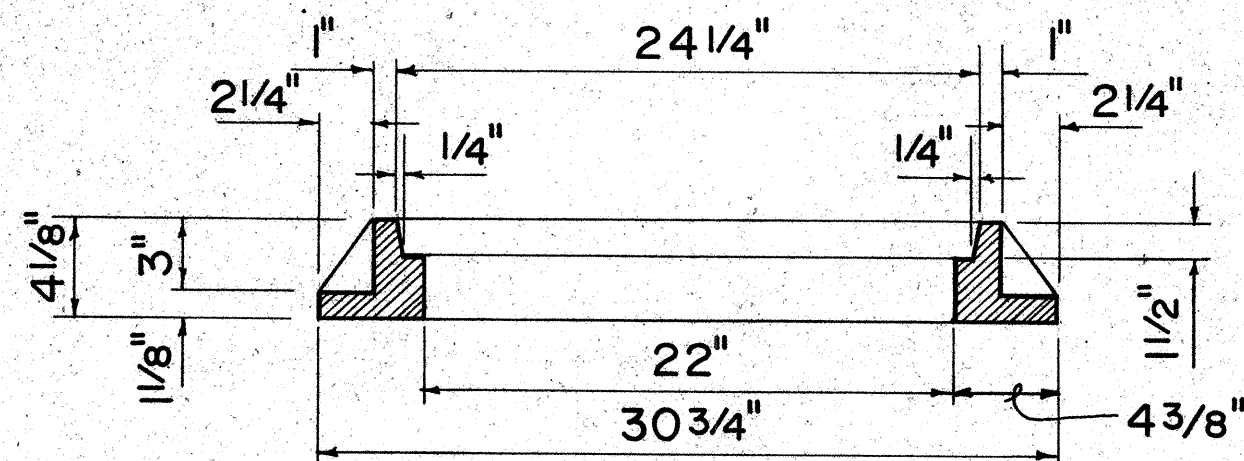
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SHEET No. D-7 OF D-9 SHEETS

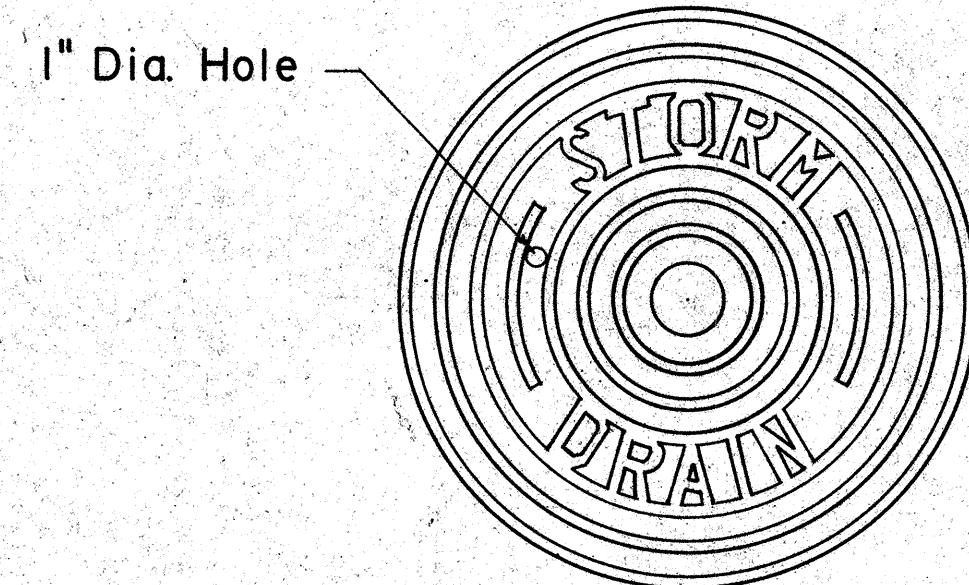
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	111-1(182)-17	1983	18	192



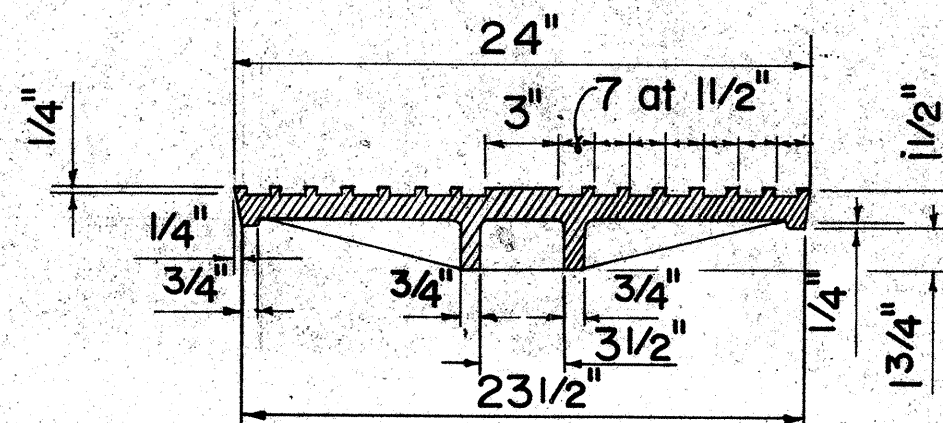
PLAN OF FRAME



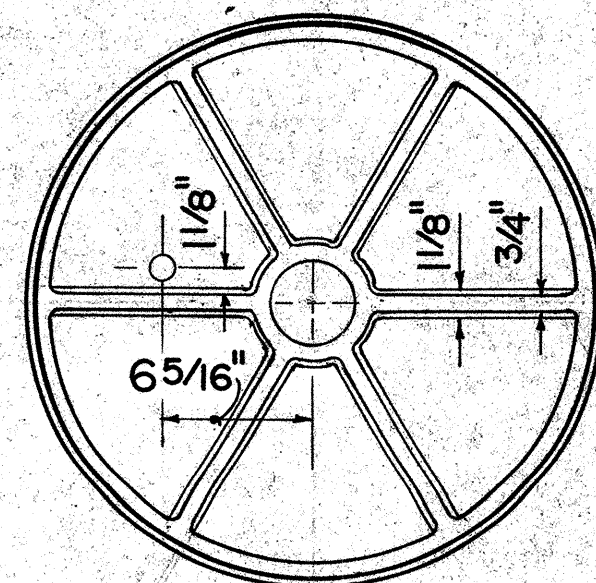
SECTION OF FRAME



TOP VIEW OF COVER

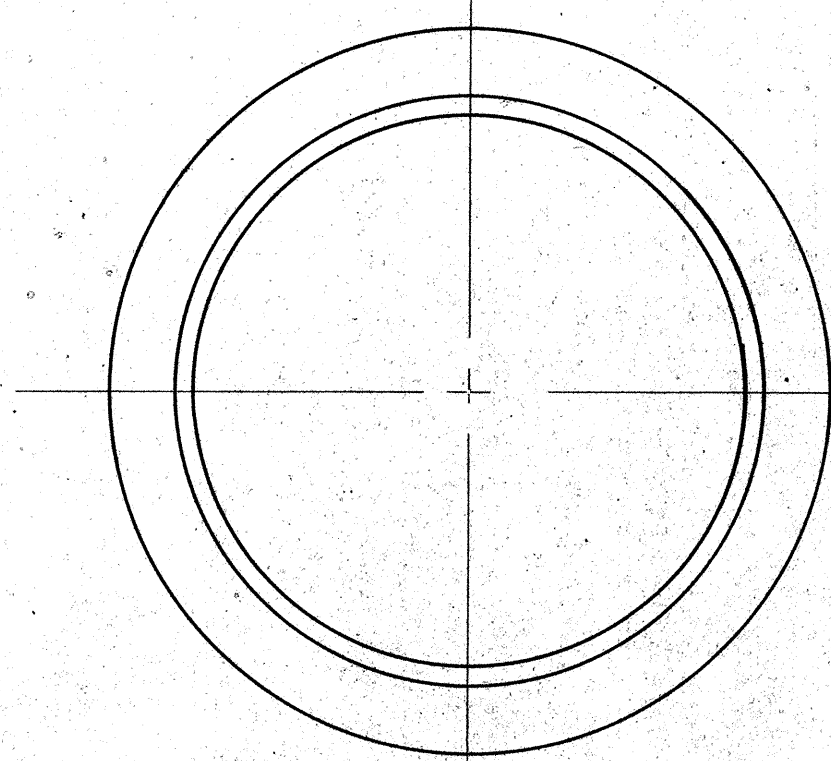


SECTION

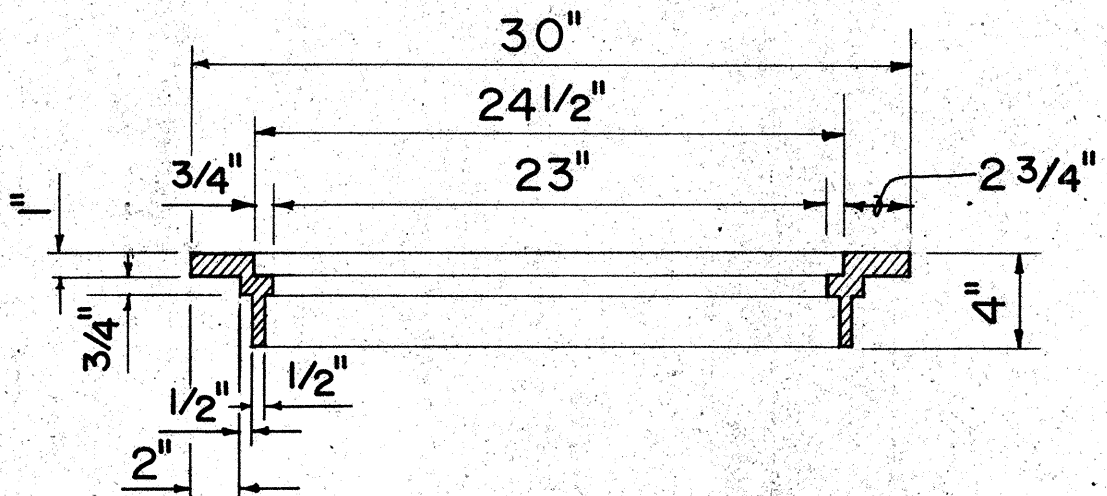


BOTTOM VIEW OF COVER

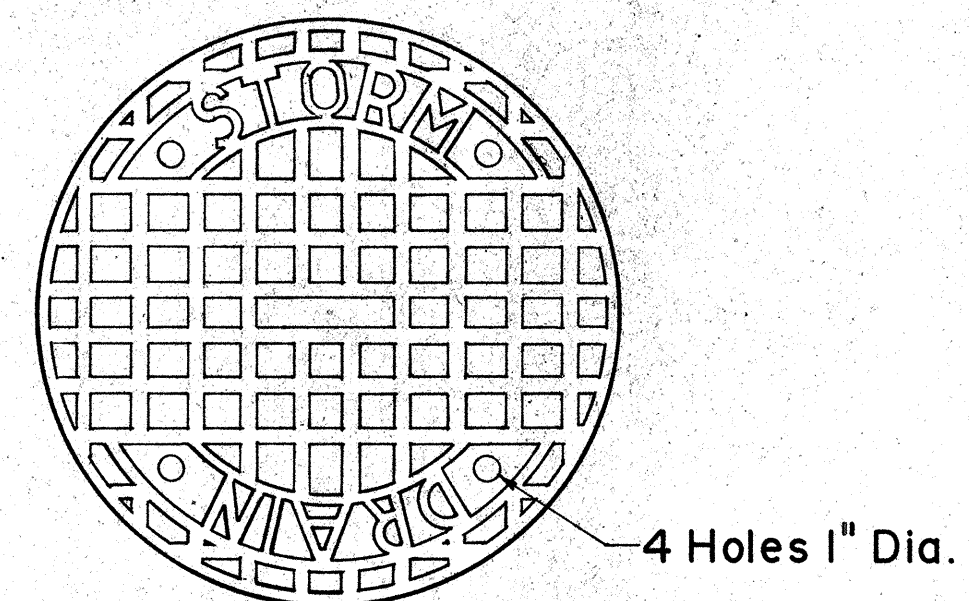
TYPE "P" CAST IRON
FRAME AND COVER



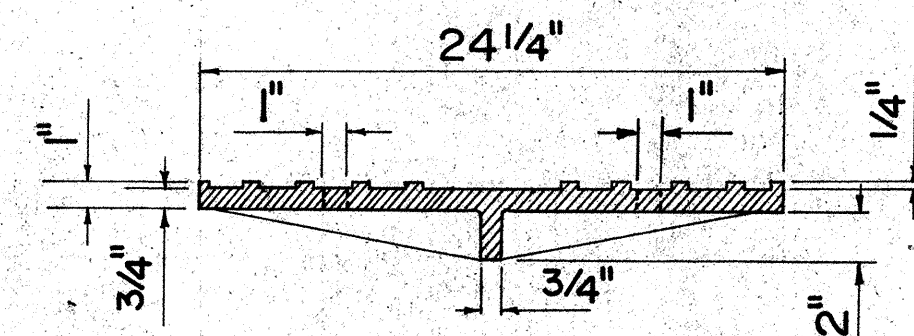
PLAN OF FRAME



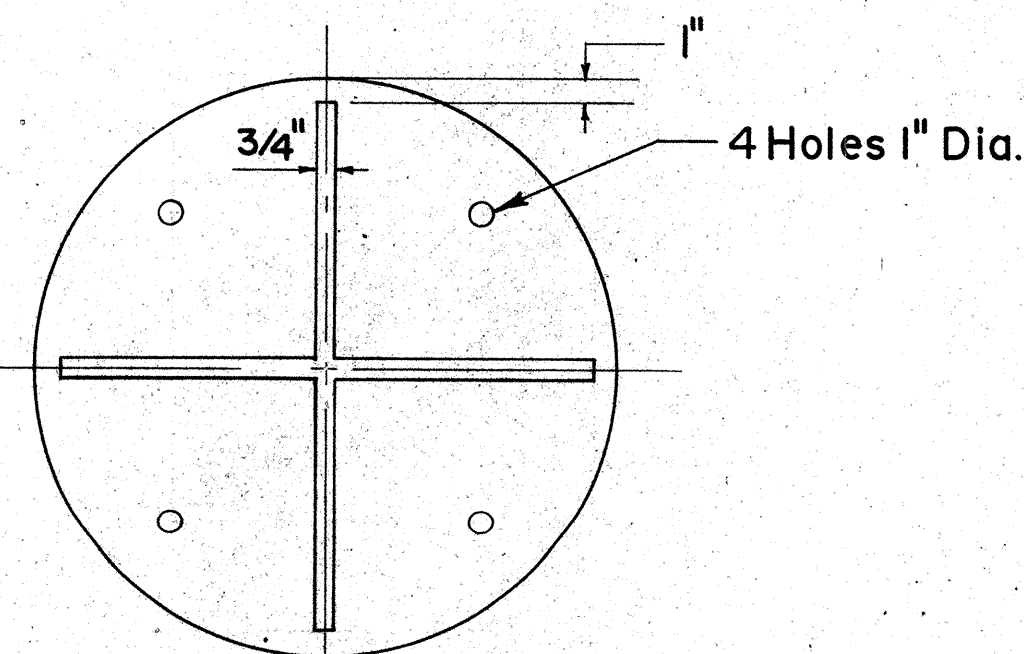
SECTION OF FRAME



TOP VIEW OF COVER

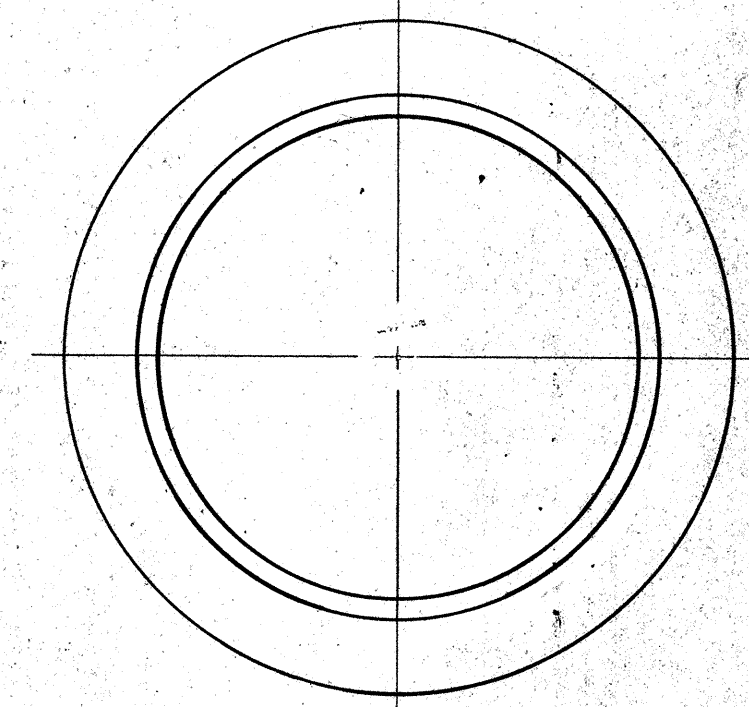


SECTION

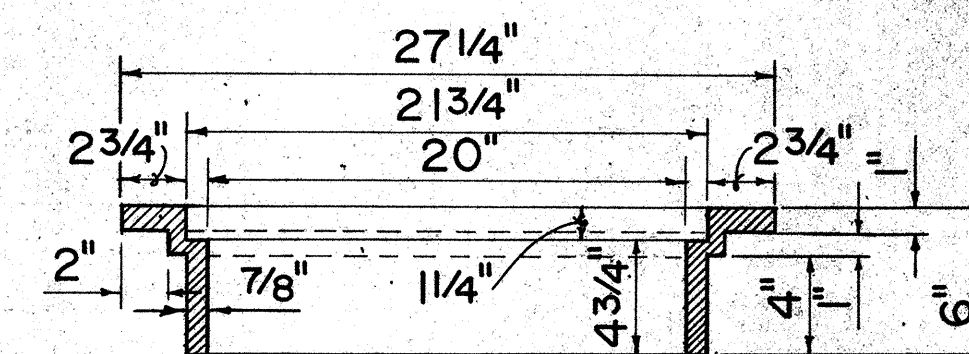


BOTTOM VIEW OF COVER

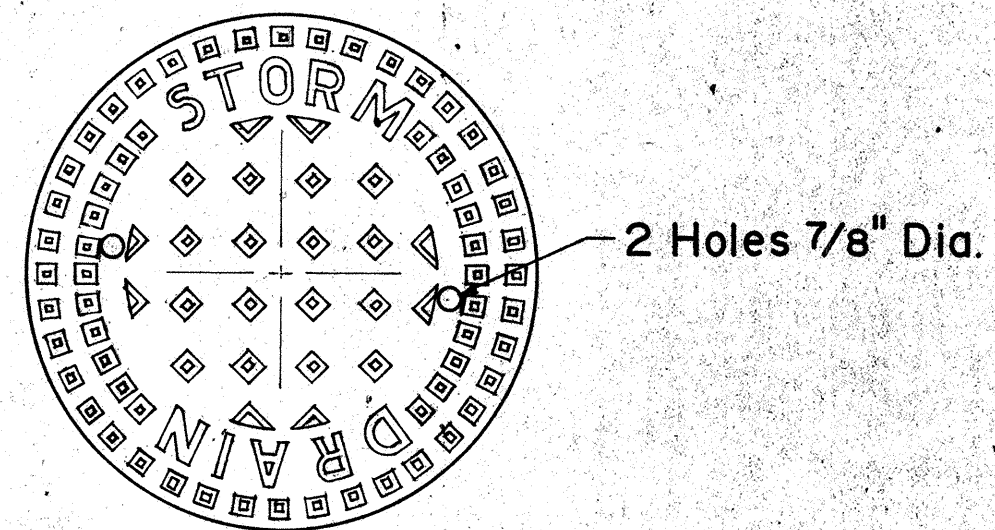
TYPE "B" CAST IRON
FRAME AND COVER



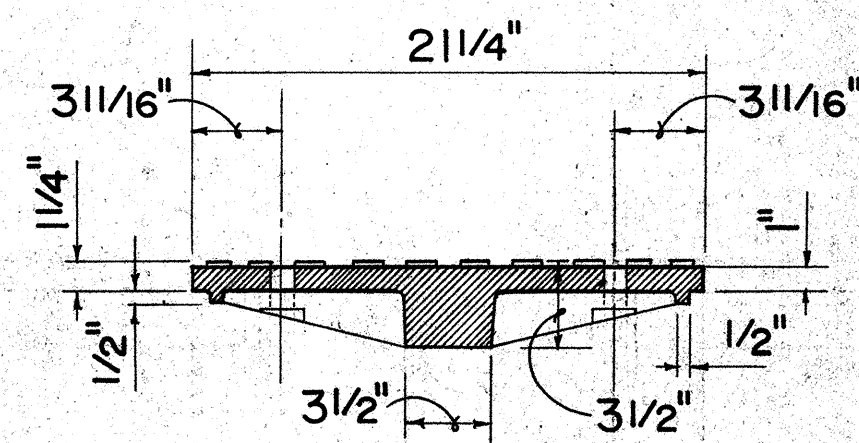
PLAN OF FRAME



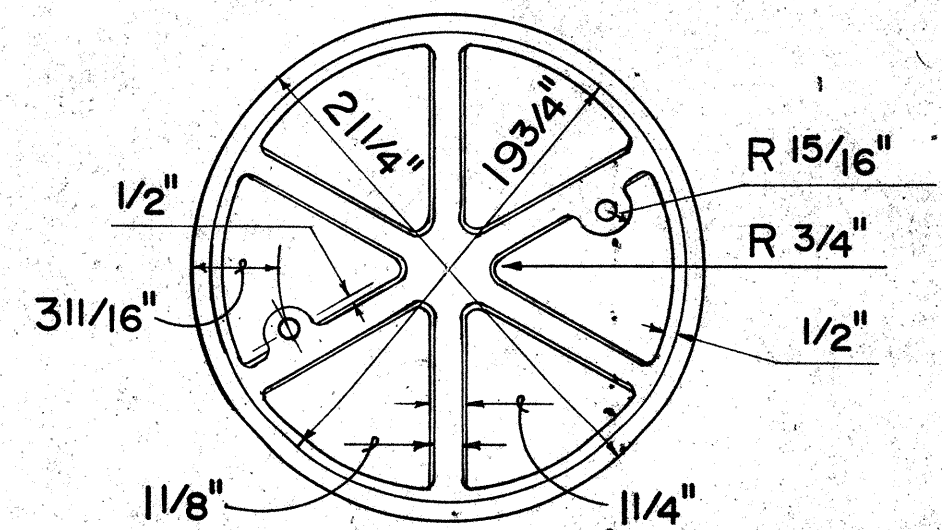
SECTION OF FRAME



TOP VIEW OF COVER

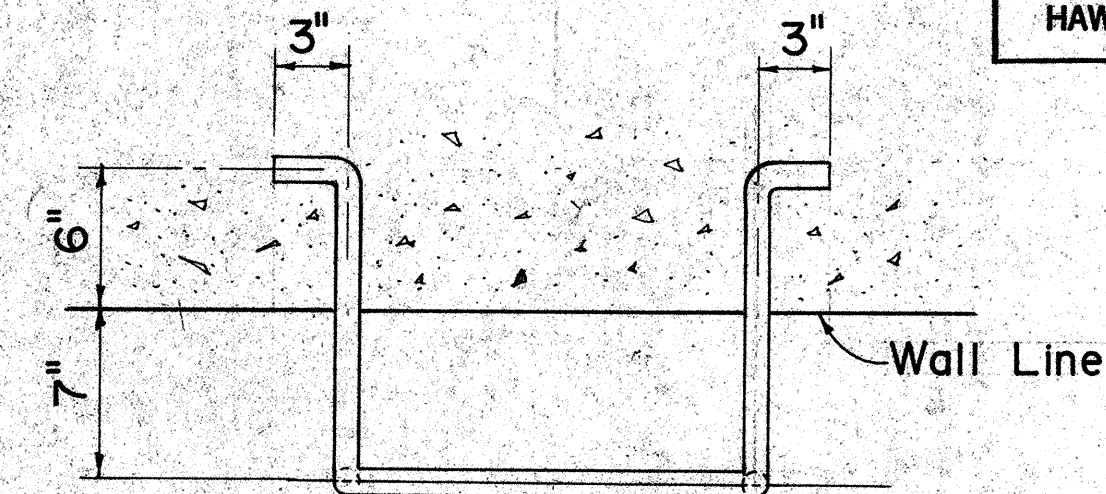


SECTION

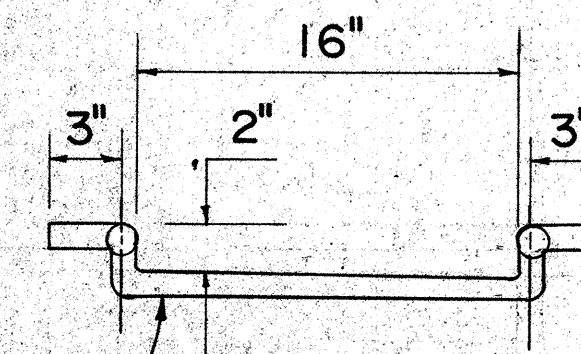


BOTTOM VIEW OF COVER

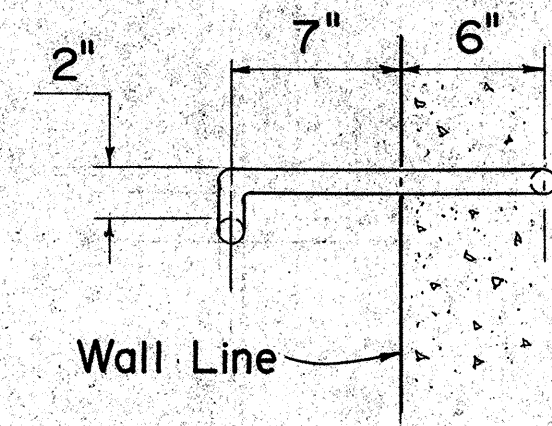
TYPE "A" CAST IRON
FRAME AND COVER



PLAN



FRONT VIEW



SIDE VIEW

MANHOLE RUNG

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

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

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

DRAINAGE SUMMARY

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-HH(132)-17	1983	19	192

STRUCTURES			CULVERTS		ESTIMATED																				QUANTITIES																							
DRAINAGE SHEET	STRUCTURE NUMBER	T Y P E	FROM STRUCTURE NO.	TO STRUCTURE NO.	ITEM NO.		206	206	206	206	206			503								603	603	603	603	603	603	604	604		607	607			612	650	650	650										
					DRAINLINE NO.		2020	2021	7120	8000	8600			0140										0010	1016	1018	1054	5040	5044	6100	6200		0260	6090			0100	1000	2000	3000								
						STRUCTURE EXCAVATION FOR DRAINAGE SYSTEM	STRUCTURE EXCAVATION FOR CHANNEL #3	STRUCTURE BACKFILL FOR CHANNEL #3	FILTER MATERIAL	BEDCOURSE MATERIAL FOR CHANNEL #3			CLASS A CONCRETE FOR CHANNEL #3					REINFORCING STEEL FOR CHANNEL #3						BEDCOURSE MATERIAL FOR CULVERT	42-INCH RCP CL.III	48-INCH RCP CL.III	42-INCH RCP CL.IV	24-INCH ACP CL.III OR 24-INCH RCP CL.III	24-INCH ACP CL.IV OR 24-INCH RCP CL.IV	TYPE 'B' MANHOLE	TYPE 'C' MANHOLE		6 FT. CHAIN LINK FENCE WITH TOP RAIL ON CONCRETE STRUCTURE	CHAIN LINK GATE 6' HIGH & 9' WIDE			GROUTED RUBBLE PAVING	FILTER FABRIC	SAND PAD	RIPRAP								
																																												UNIT		CU.YD.	CU.YD.	CU.YD.
DI	18	MH TYPE B			4																						1																					
		42" PIPE	18	19			156.4															8.3	110																									
	19	MH TYPE C																										1																				
		48" PIPE	19	20			167.4															6.9		78																								
	20	OUTFALL			↓																																											
	23A	PIPE ENTRANCE			5																																											
		42" PIPE	23 A	23			74.0															3.9			52																							
	23	OUTFALL			↓																																											
	26A	PIPE ENTRANCE			6																																											
		24" PIPE	26 A	26			46.9															1.7				50																						
	26	OUTFALL			↓																																											
	29A	PIPE ENTRANCE			7																																											
		24" PIPE	29A	29			63.9															2.5				75																						
	29	OUTFALL			↓																																											
	40	PIPE ENTRANCE			10																																											
		24" PIPE	40	41			28.6															1.6				48																						
	41	OUTFALL			↓																																											
	42	CHANNEL #3 STA. 10+00 8' CONC. RECT. CHANNEL & OUTLET	42	43	CHANNEL #3									(364) (C.Y.)																																		
	43	CHANNEL #3 STA. 14+28.05																																														
		3" TRAP CHANNEL	43	43A			—																																									
DI	43A	CHANNEL #3 STA. 16+43 ±			↓									(364) (C.Y.)																																		
		TOTAL					537.2	2302	320	262	108			(364) (C.Y.)								24.9	110	78	52	125	48	1	1		868	1			6.3	573	96	191										
		ROUNDED TOTAL					540	2305	320	262	110			L.S.								25	110	78	52	125	48	1	1		868	1			7	573	96	191										

DATE _____
SURVEY PLOTTED BY _____
DRAWN BY _____
DESIGNED BY _____
NOTED BY _____
CHECKED BY _____
No. _____