

ORIGINAL PLAN

NOTE BOOK

No.

SURVEY PLOTTED BY

DRAWN BY

DESIGNED BY

QUANTITIES BY

CHECKED BY

DATE

DRAINAGE SUMMARY											
ITEM NUMBER		206.	503.	602.	603.	604.	604.	604.	604.	612.	
		1000	0000	1000	7220	2310	2354	2355	3300	0200	
UNIT USED		C.Y.	C.Y.	Lb.	L.F.	Ea.	Ea.	Ea.	Ea.	C.Y.	
STRUCTURE	STATION	Structure Excavation other than at Bridges	Class A Concrete other than at Bridges	Reinforcing Steel other than at Bridges	24-inch CMP Sht. I or 24-inch RCP Class III or 24-inch ACP Class III	Type A-9 Steel Frame/Grate	11:6:1 x 5'-1/2" - (45°) Steel Frame and Grate	11:6:1 x 7'-1/2" - (45°) Steel Frame and Grate	Removing/Cleaning and Returning Type "A" Cast Iron Frame and Cover	Grouted Rubble Slope Protection	
Type "F" Catch Basin	Sta. 85+50 Lt.	19.5	6.8	339				3	1		
Type "F" Catch Basin	Sta. 88+00 Lt.	14.0	5.6	195				2	1		
Type "F" Catch Basin	Sta. 94+50 Lt.	27.6	8.6	676				3	1		
Type "F" Catch Basin	Sta. 97+50 Lt.	18.0	6.9	370				3	1		
Type "E" Catch Basin	Sta. 111+70 Lt.	11.1	4.4	254			3		1		
Type "E" Catch Basin	Sta. 115+20 Lt.	20.9	6.3	341			3		1		
Type "E" Catch Basin	Sta. 118+80 Lt.	15.1	5.9	237			2		1		
Type "E" Catch Basin	Sta. 136+50 Lt.	14.4	4.6	310			2				
Type "A-9" C. D. I.	Sta. 168+00	36.0	3.0		42	2				2	
Type "E" Catch Basin	Sta. 25+18 Rt.	19.2	5.5	349			2		1		
Spillway	Sta. 33+50 Rt.	14.9	5.9	317	10		2				
TOTAL		210.7	63.5	3388	52	2	14	11	8	2	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HE5-063-1(13)	1979	3	20

GENERAL NOTES:

- Demolishing and removing a portion of the entire existing structure shall not be paid for separately, but shall be incidental to the various contract items in the proposal.
- Manhole rungs (12" o.c.) are required when "H" is greater than 4 feet 6 inches. Only one rung (16 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. Manhole rungs shall be considered incidental to Item No. 503.0000-Class A Concrete other than at Bridges.
- Reconstruction of existing concrete channel and transition shall be considered incidental to the various contract items in the proposal.
- 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 2 inches; and voids after installing dowels shall be filled with mortar as directed by the Engineer. The work (Drilling 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 stockpiled in a neat and orderly manner at the project site as directed by the Engineer and shall remain the property of the State.
- The Contractor's attention is directed to Subsection 107.13 - "Public Convenience and Safety", and Subsection 107.14 - "Barricades and Warning Signs" of the Special Provisions pertaining to hours of operations, detouring, submitting a traffic control plan and other requirements necessary to maintain traffic safety through the project areas.
- Where removal of guard rails are necessary to reconstruct drainage structures, the guard rails shall be reconstructed upon completion of drainage structure reconstruction. Reconstruction of guard rails shall be considered incidental to the various contract items in the proposal.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS

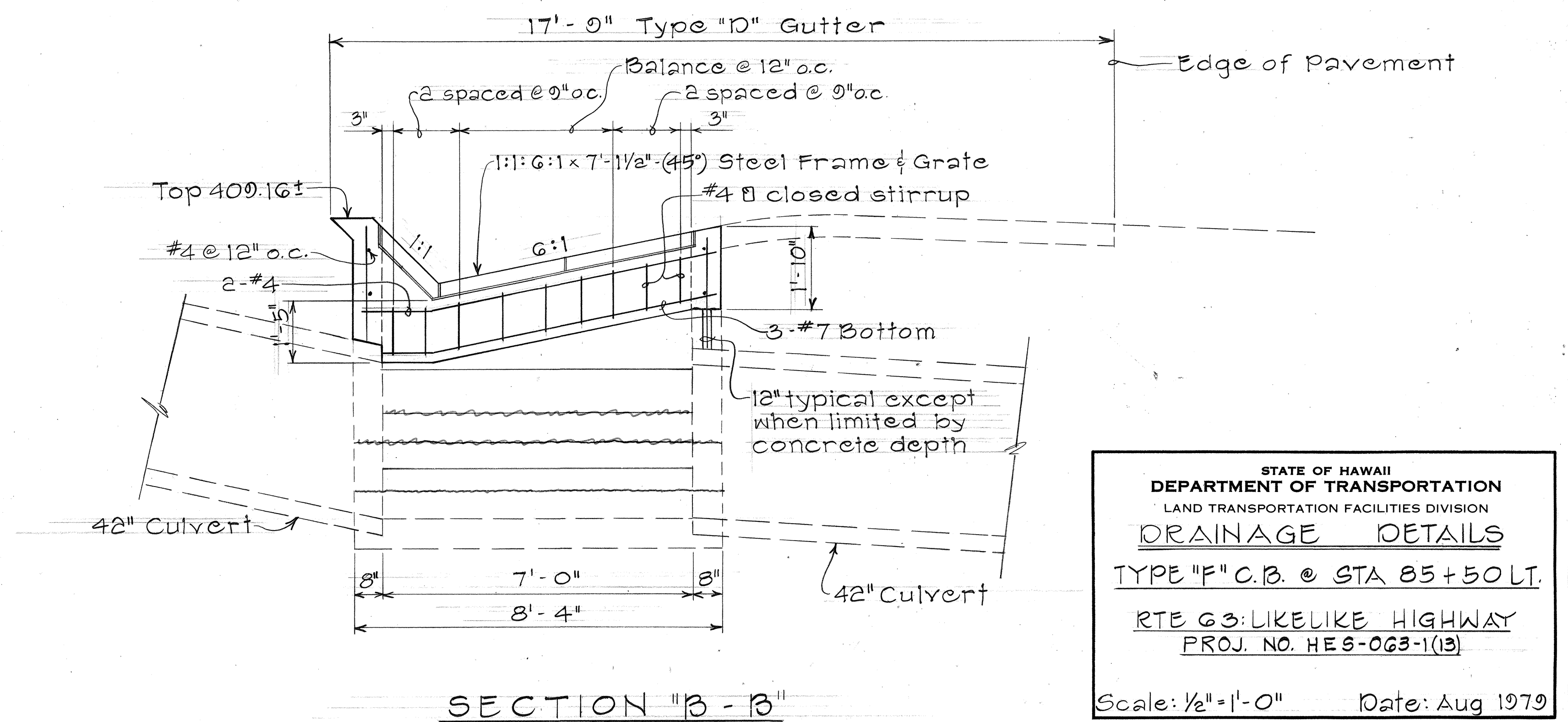
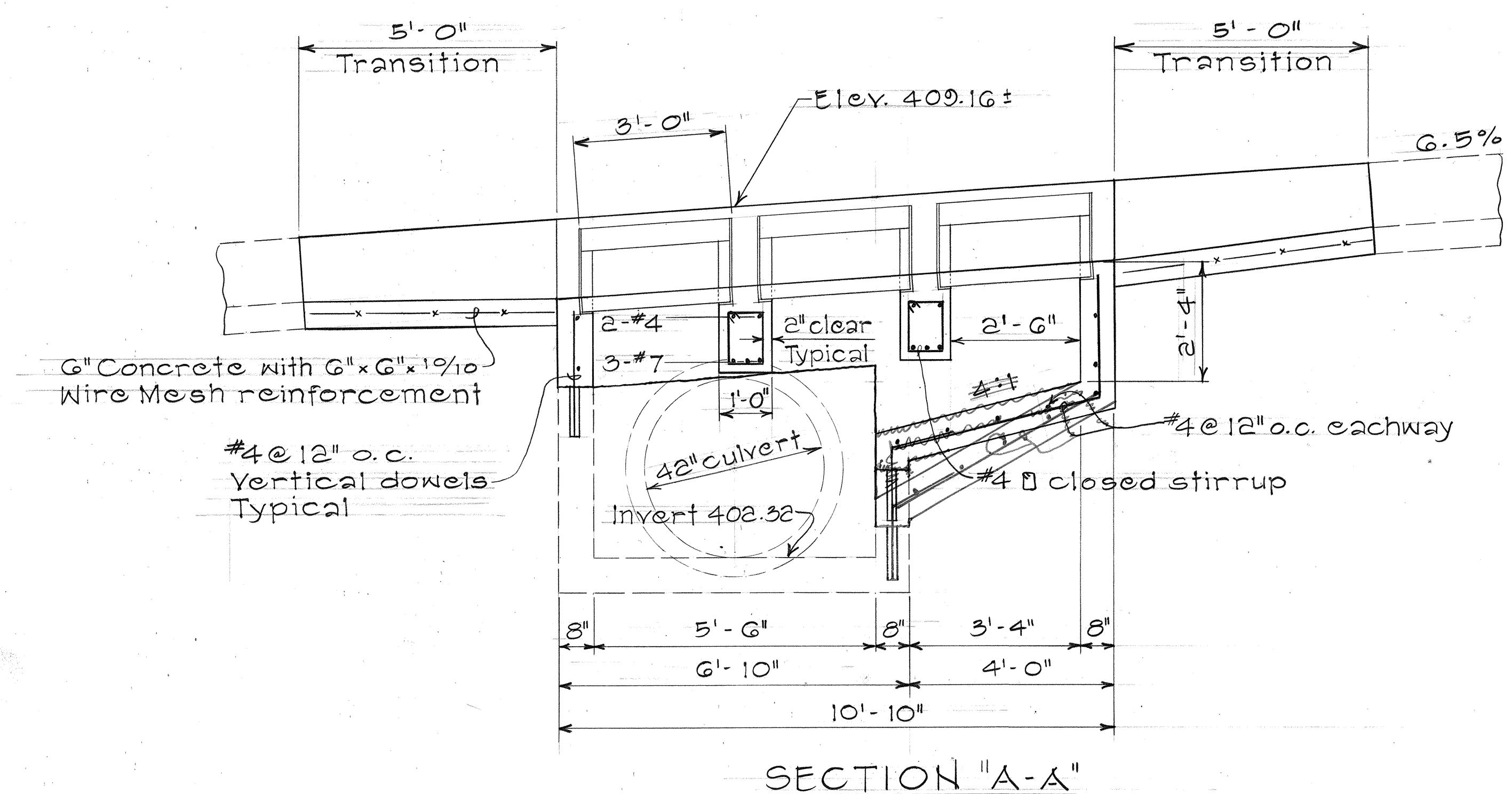
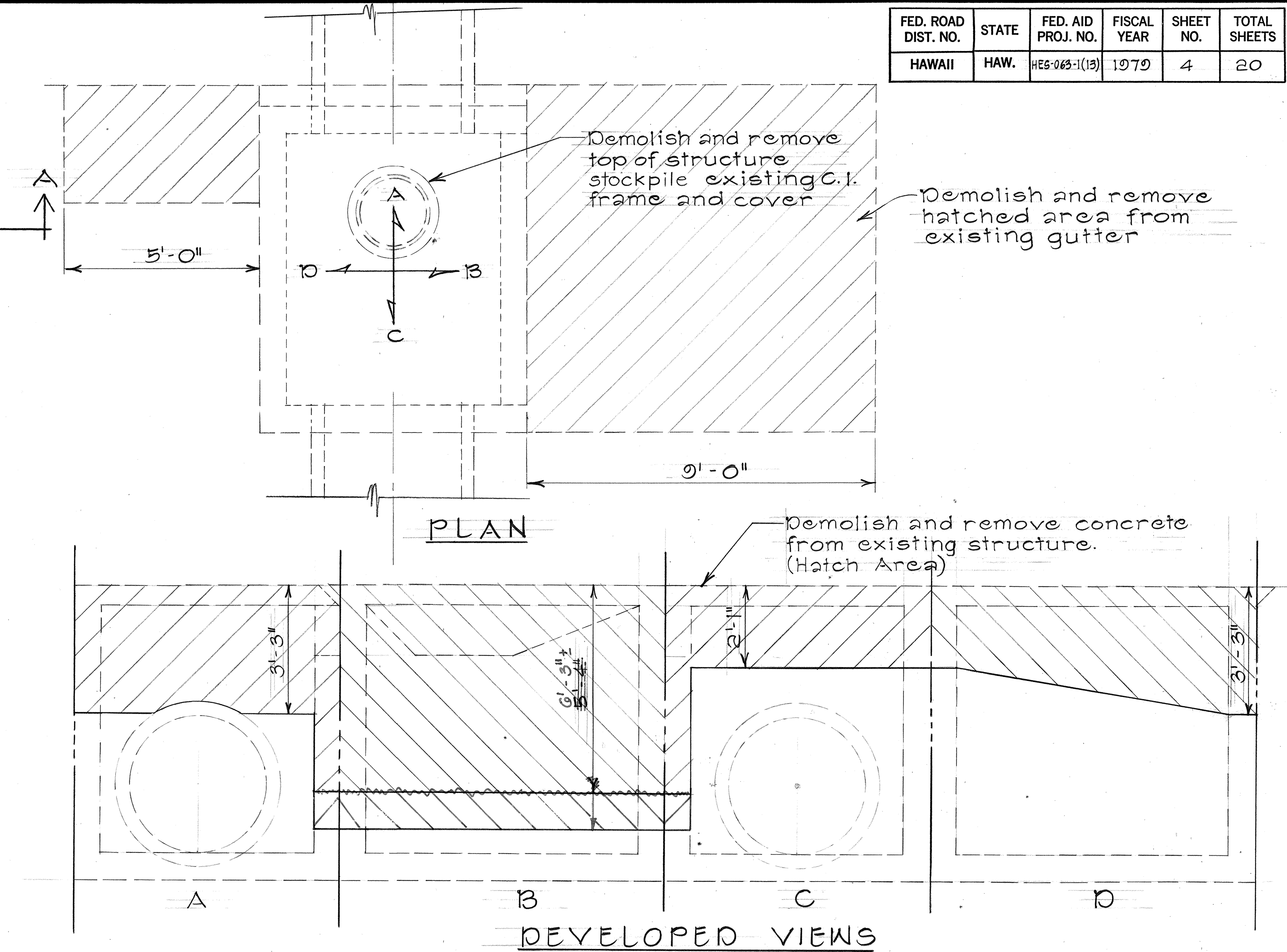
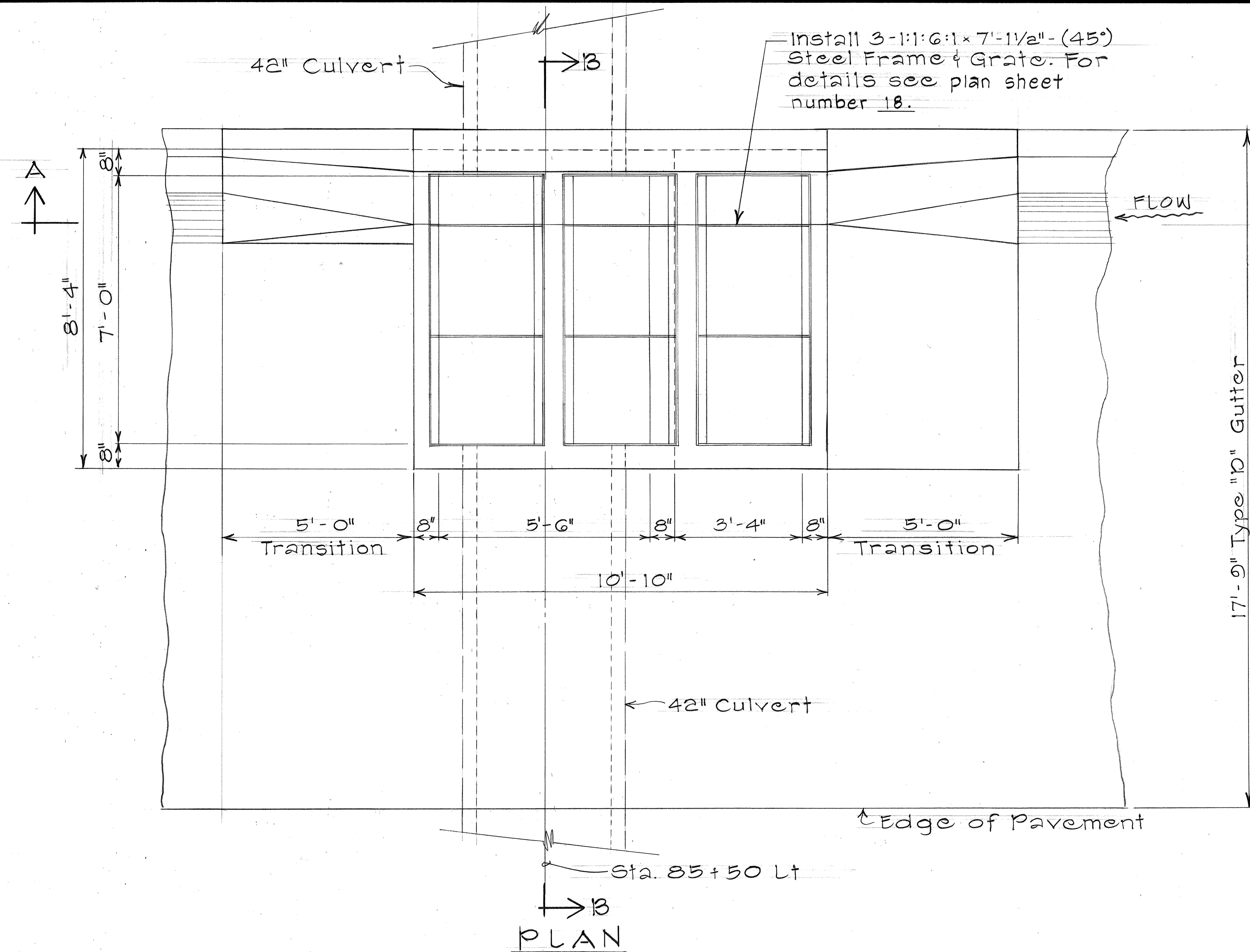
SUMMARY

RTE 63: LIKELIKE HIGHWAY
PROJ. NO. HE5-063-1(13)

Date: Aug 1979

SHEET NO. 1 OF 18 SHEETS

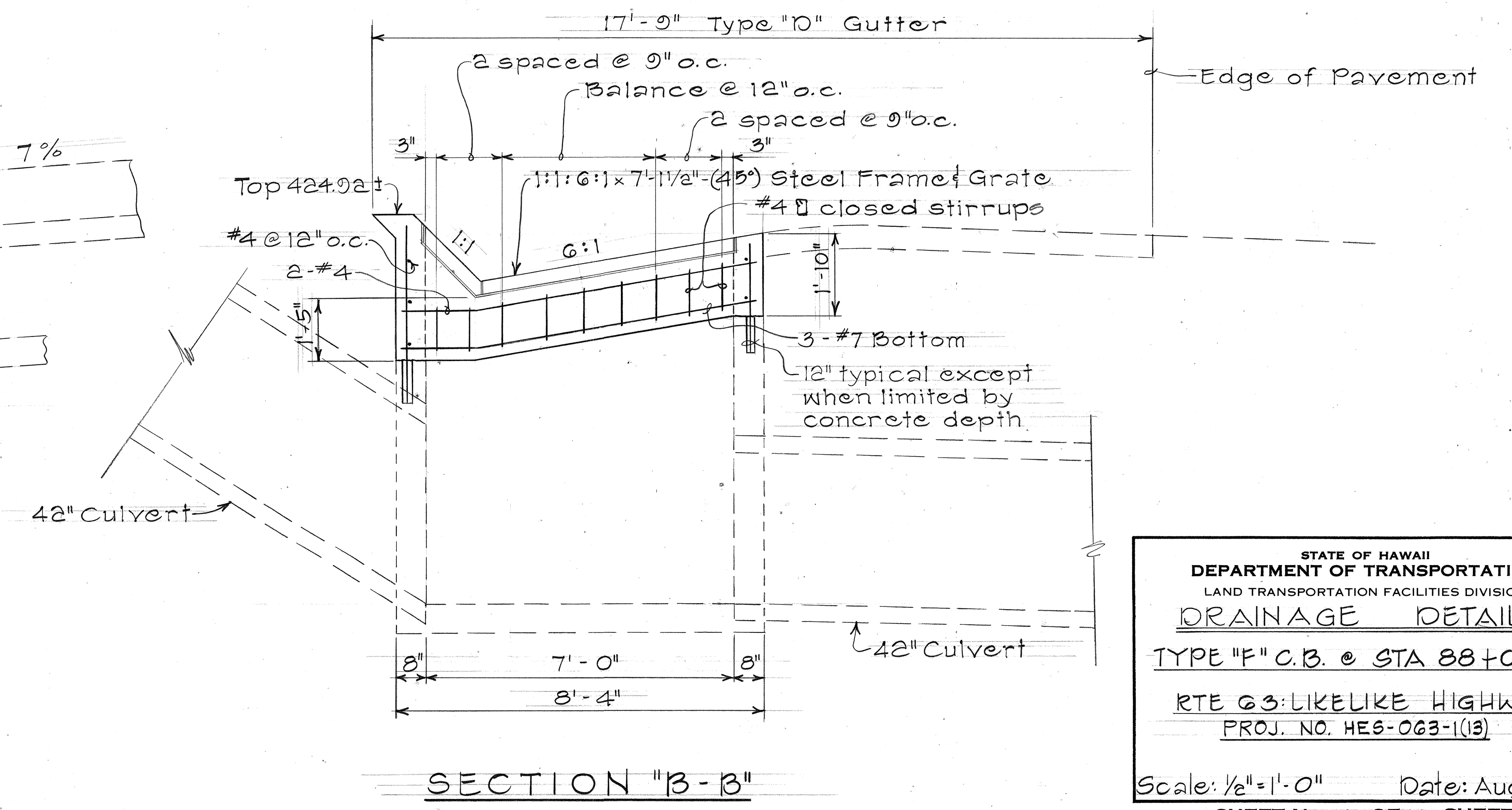
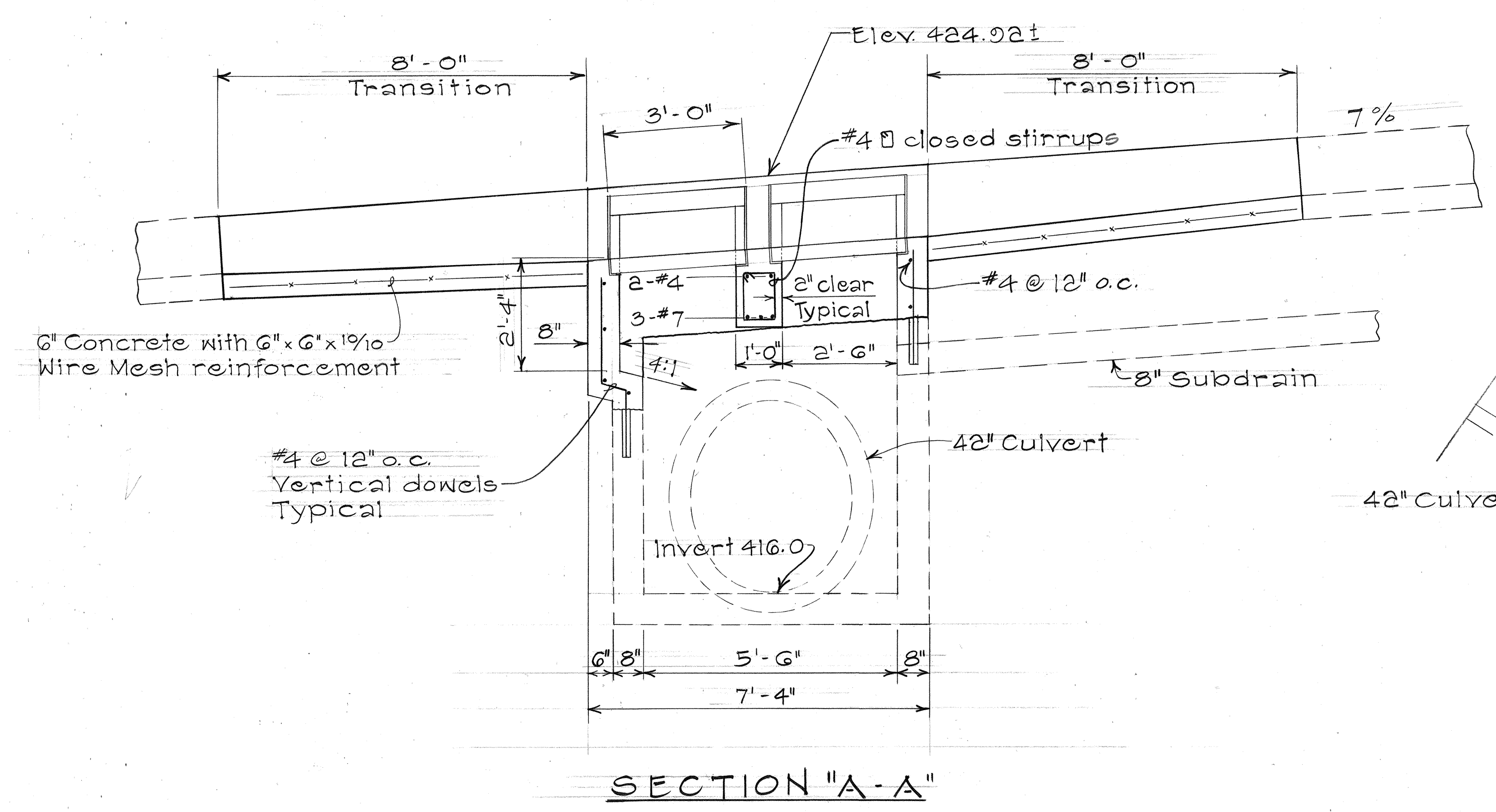
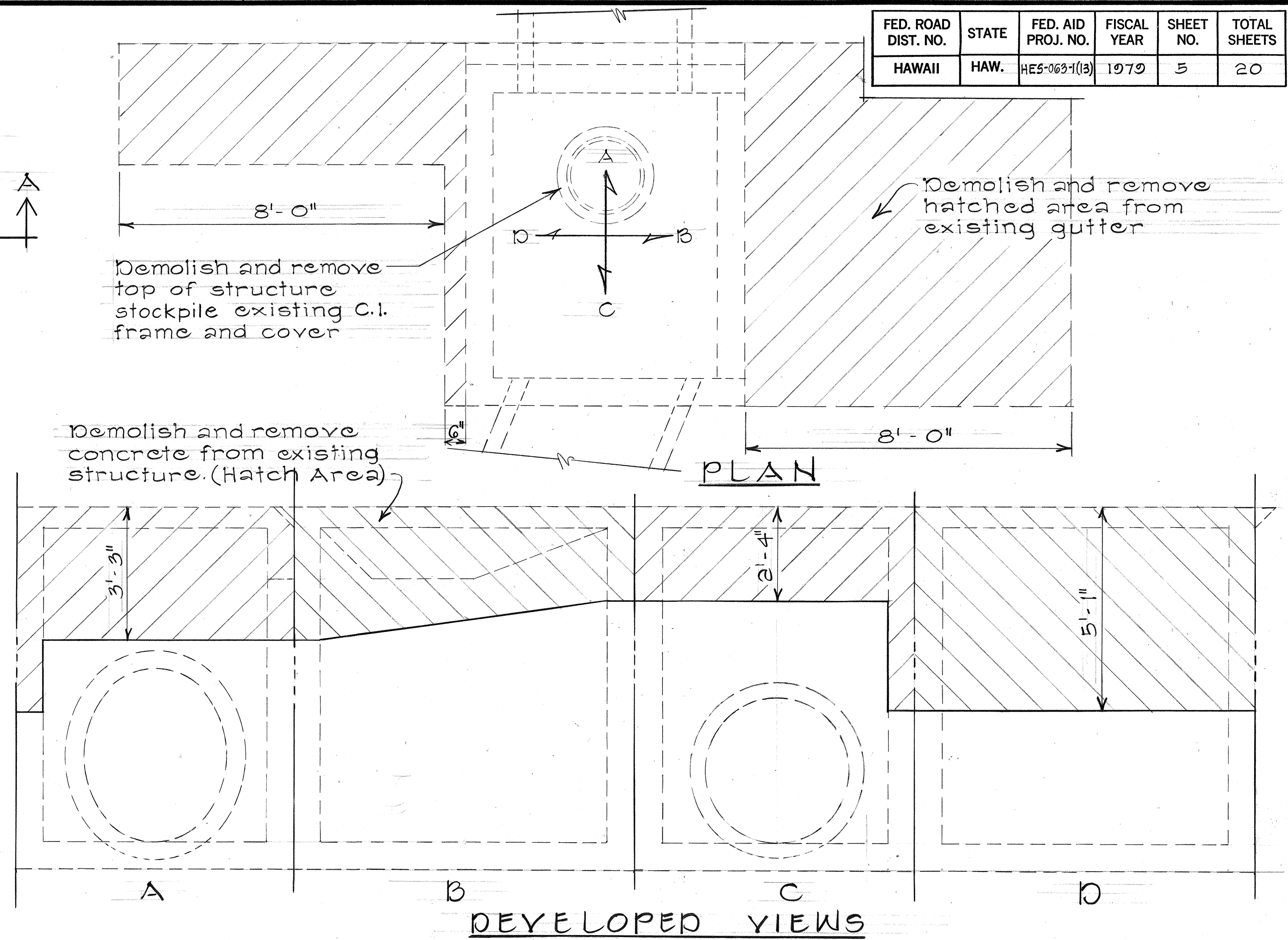
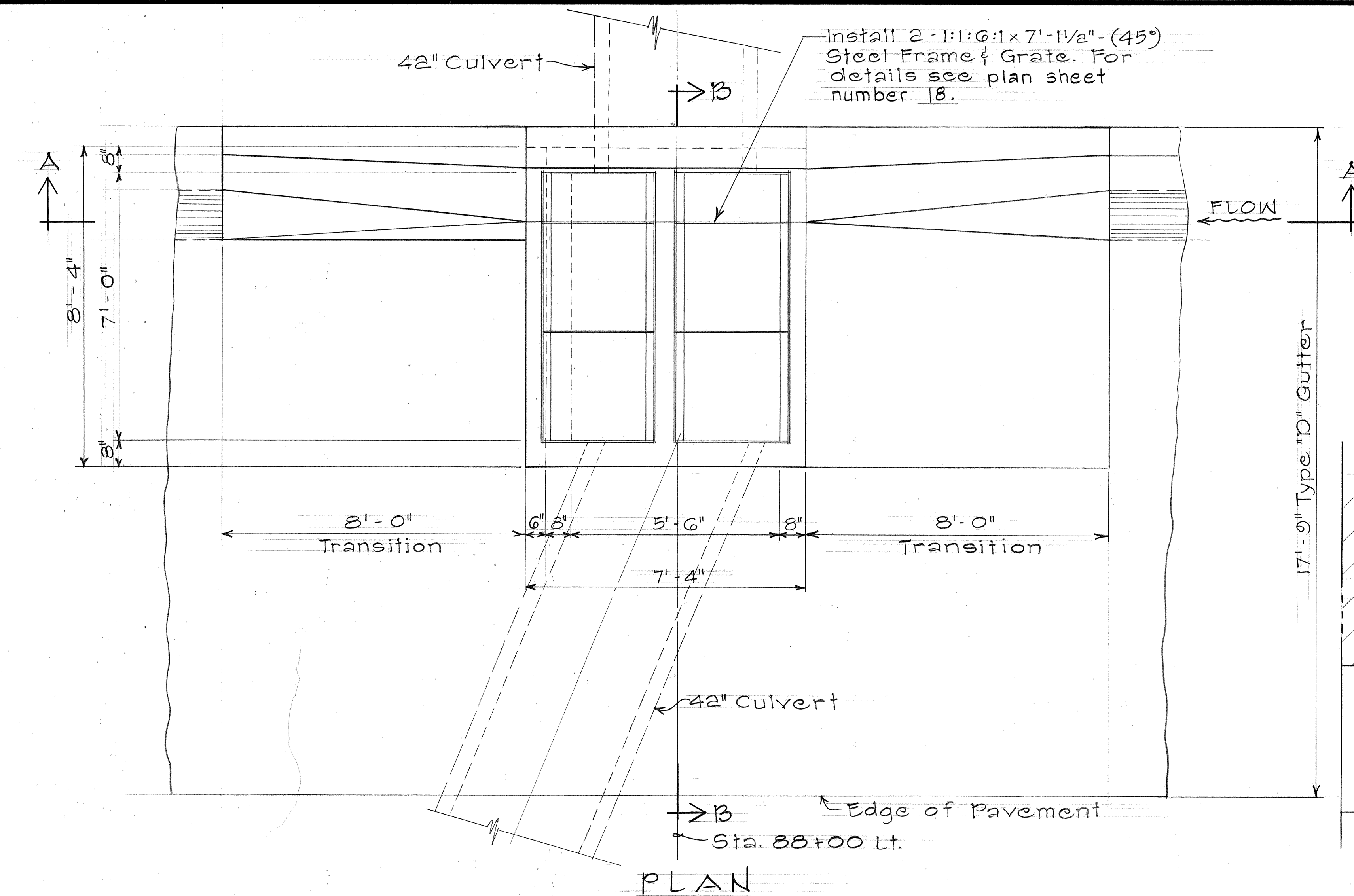
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HE5-063-1(13)	1979	4	20



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
TYPE "F" C.B. @ STA 85+50 LT.
RTE 63: LIKELIKE HIGHWAY
PROJ. NO. HE5-063-1(13)
Scale: 1/2" = 1'-0" Date: Aug 1979
SHEET NO. 2 OF 18 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NO. 1	DRAWN BY	
NO. 2	CHECKED BY	
NO. 3	QUANTITIES BY	
NO. 4	CHECKED BY	

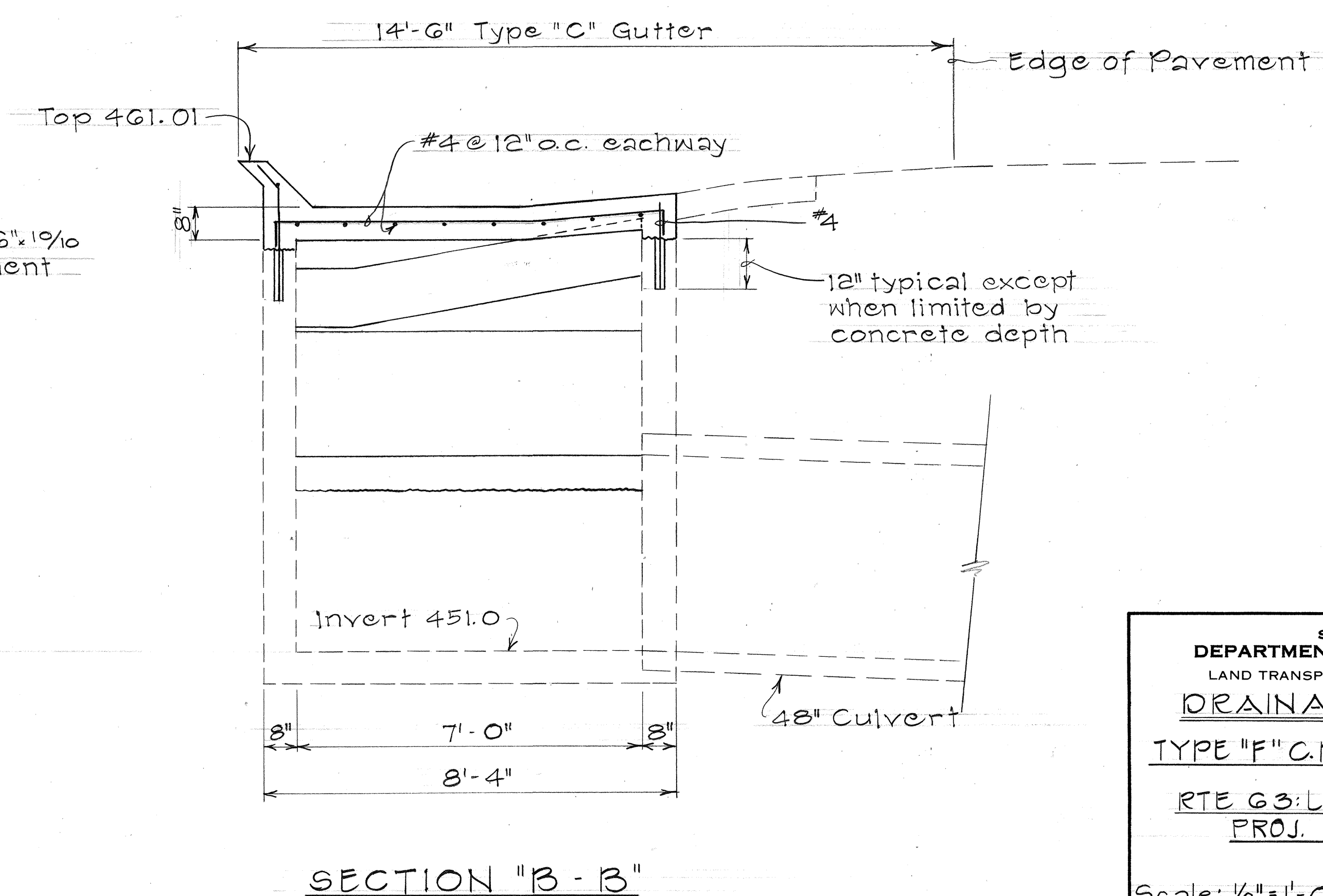
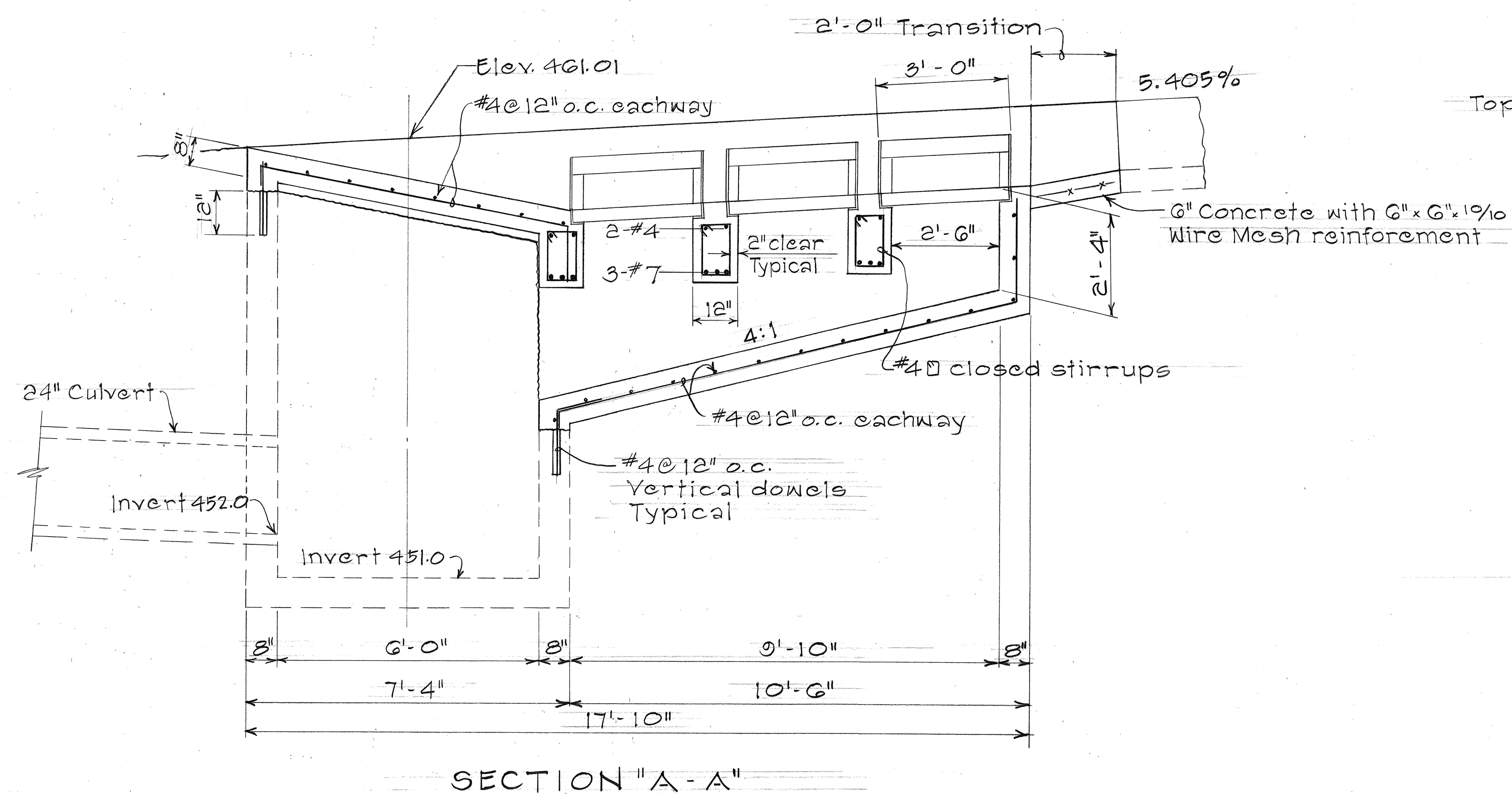
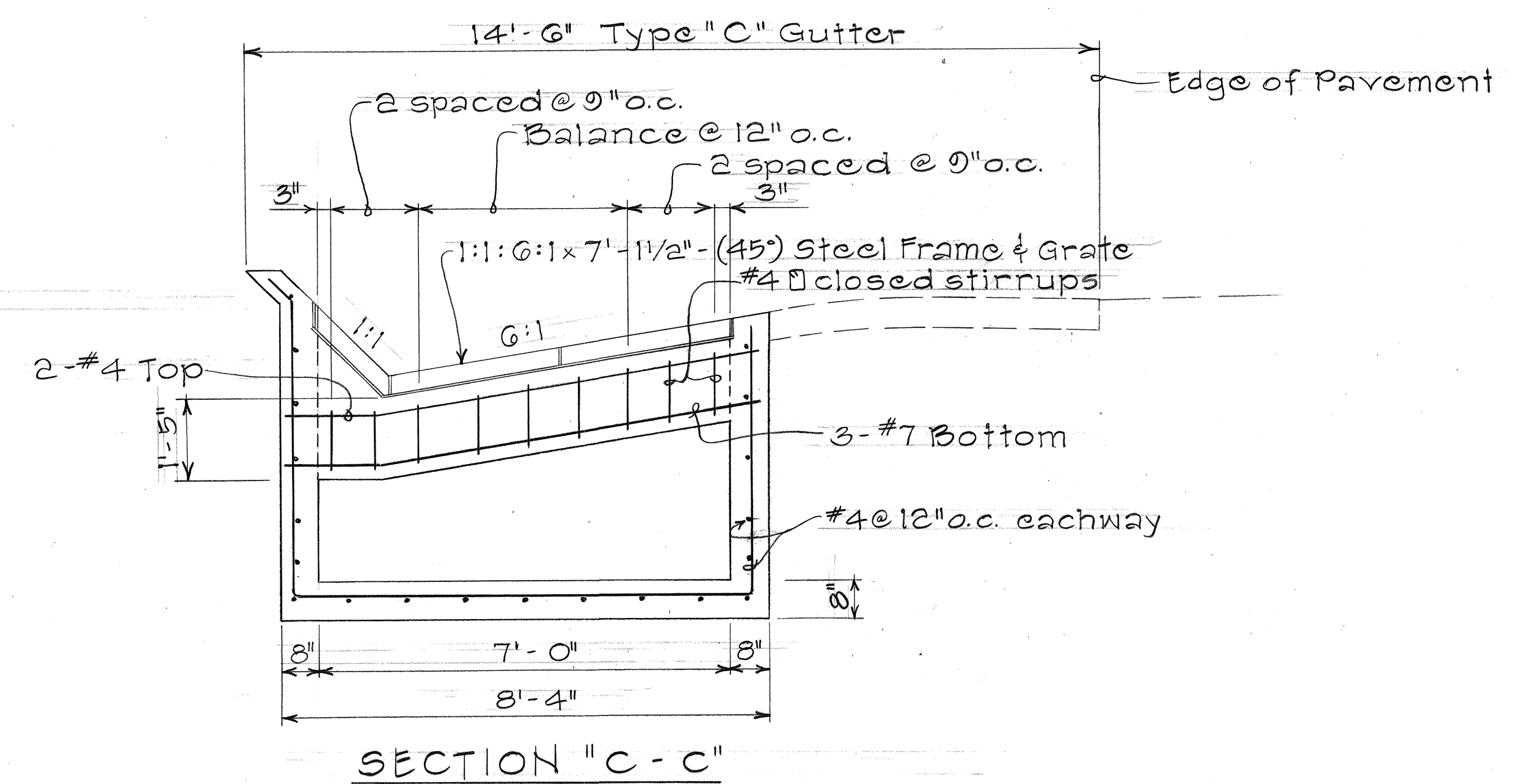
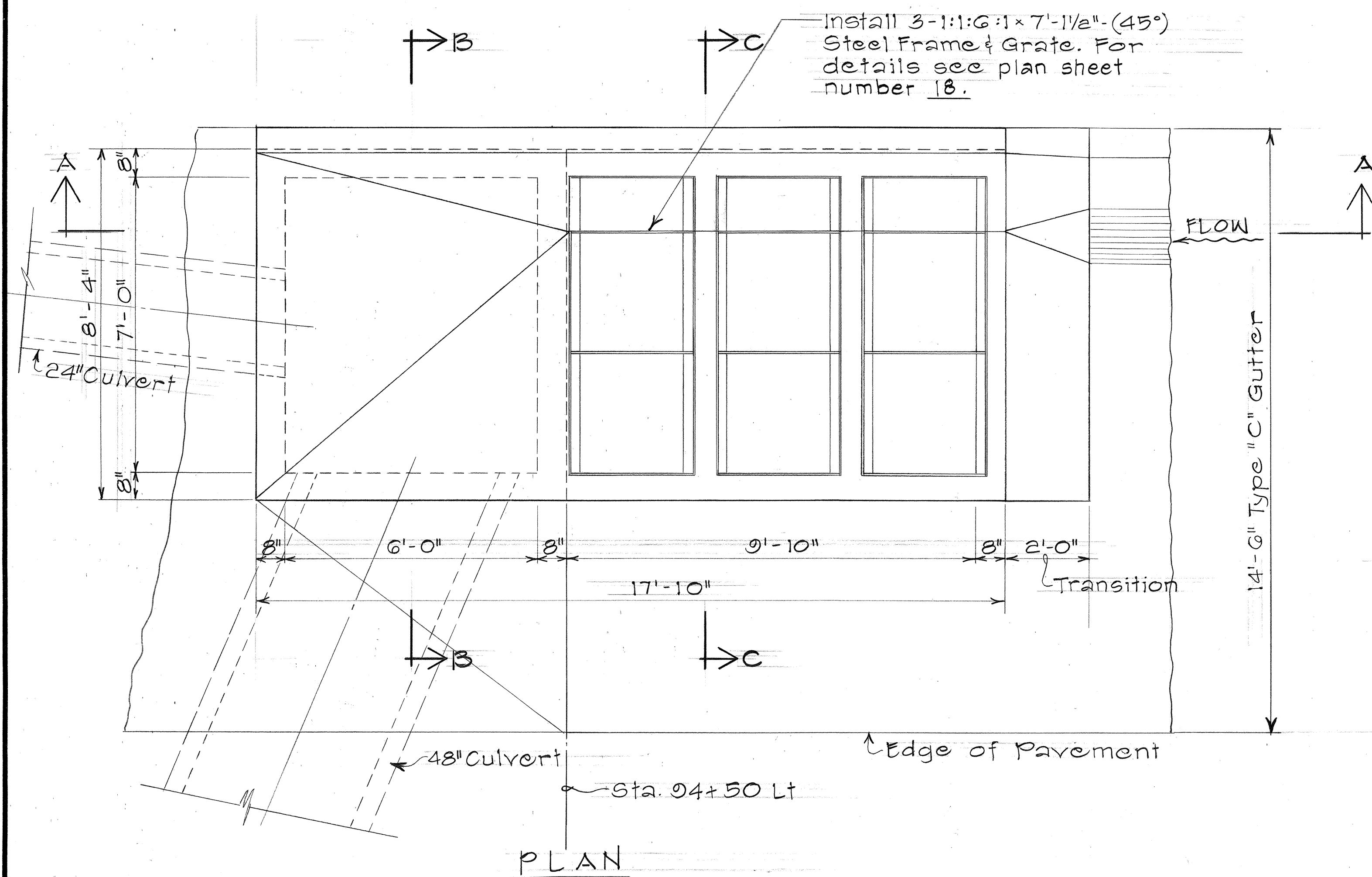
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HE5-063-1(13)	1979	5	20



SURVEY PLOTTED BY	DATE
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CHECKED BY	
NOTE BOOK	
No.	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
TYPE "F" C.B. @ STA 88+00 LT.
RTE 63: LIKELIKE HIGHWAY
PROJ. NO. HE5-063-1(13)
Scale: 1/2" = 1'-0" Date: Aug 1979
SHEET NO. 3 OF 18 SHEETS

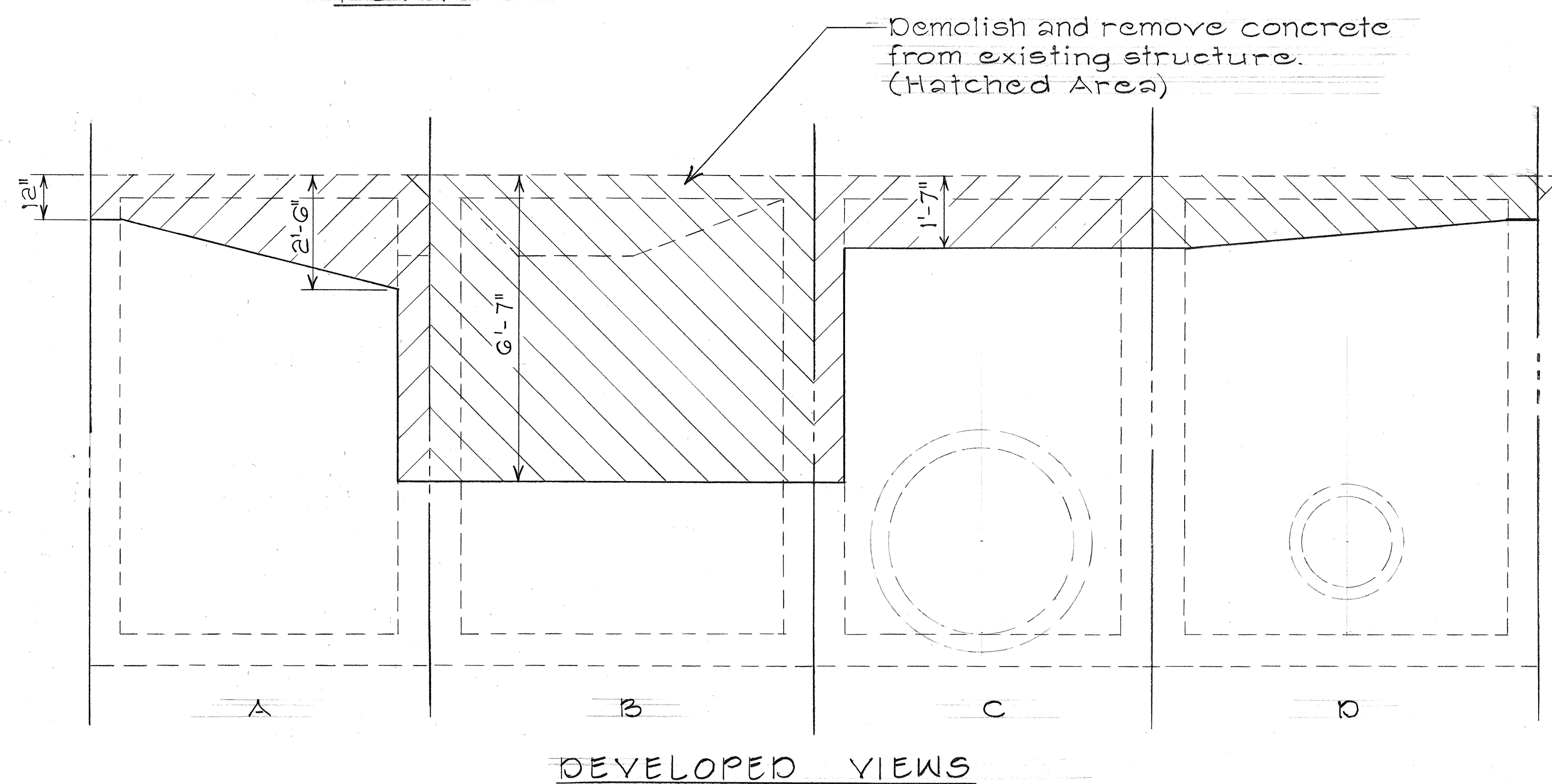
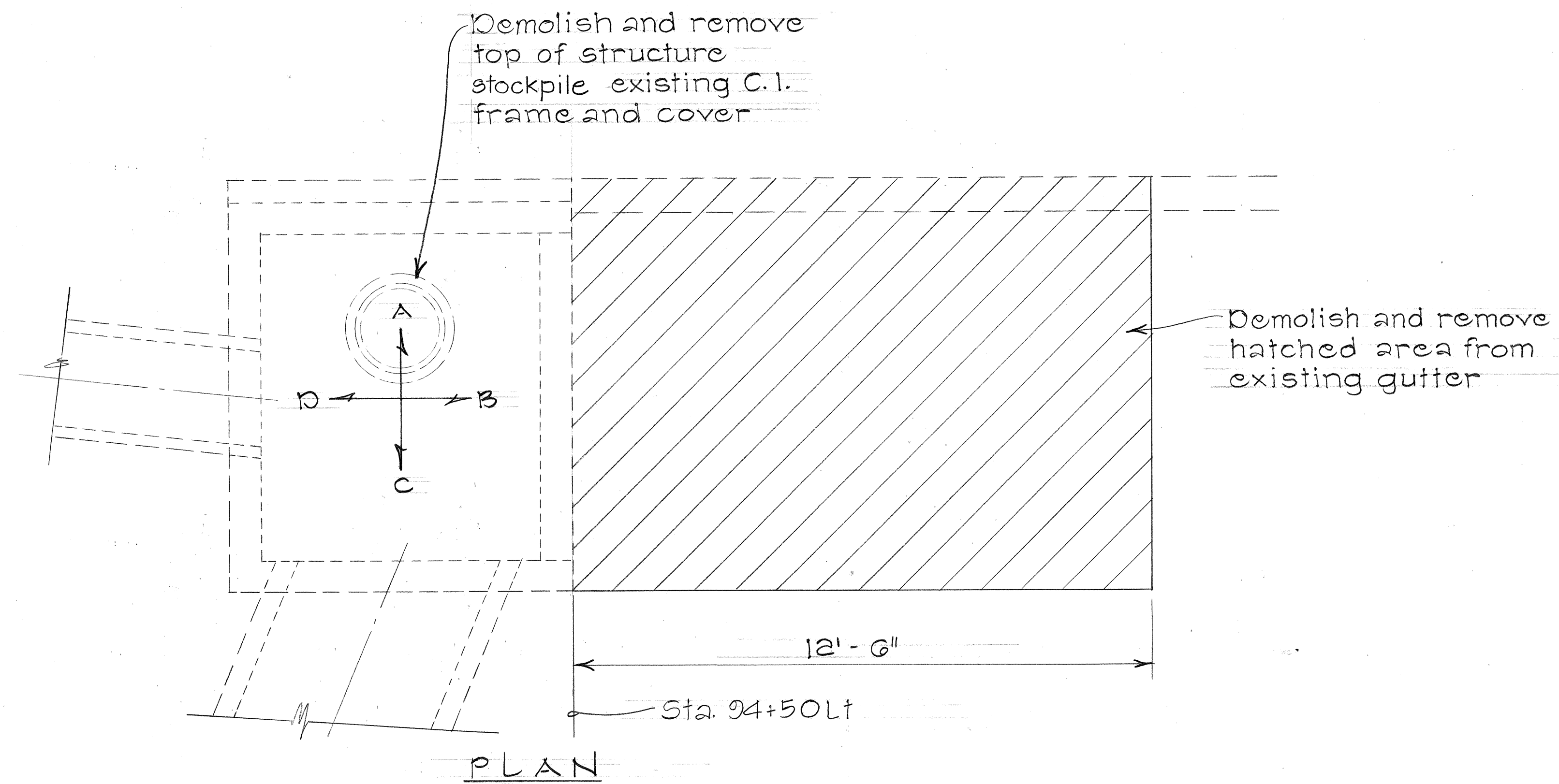
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HE5-063-1(13)	1970	6	20



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
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
TYPE "F" C.B. @ STA 94+50 LT.
RTE 63: LIKELIKE HIGHWAY
PROJ. NO. HES-063-1(13)
Scale: 1/2" = 1'-0" Date: Aug 1979
SHEET NO. 4 OF 18 SHEETS

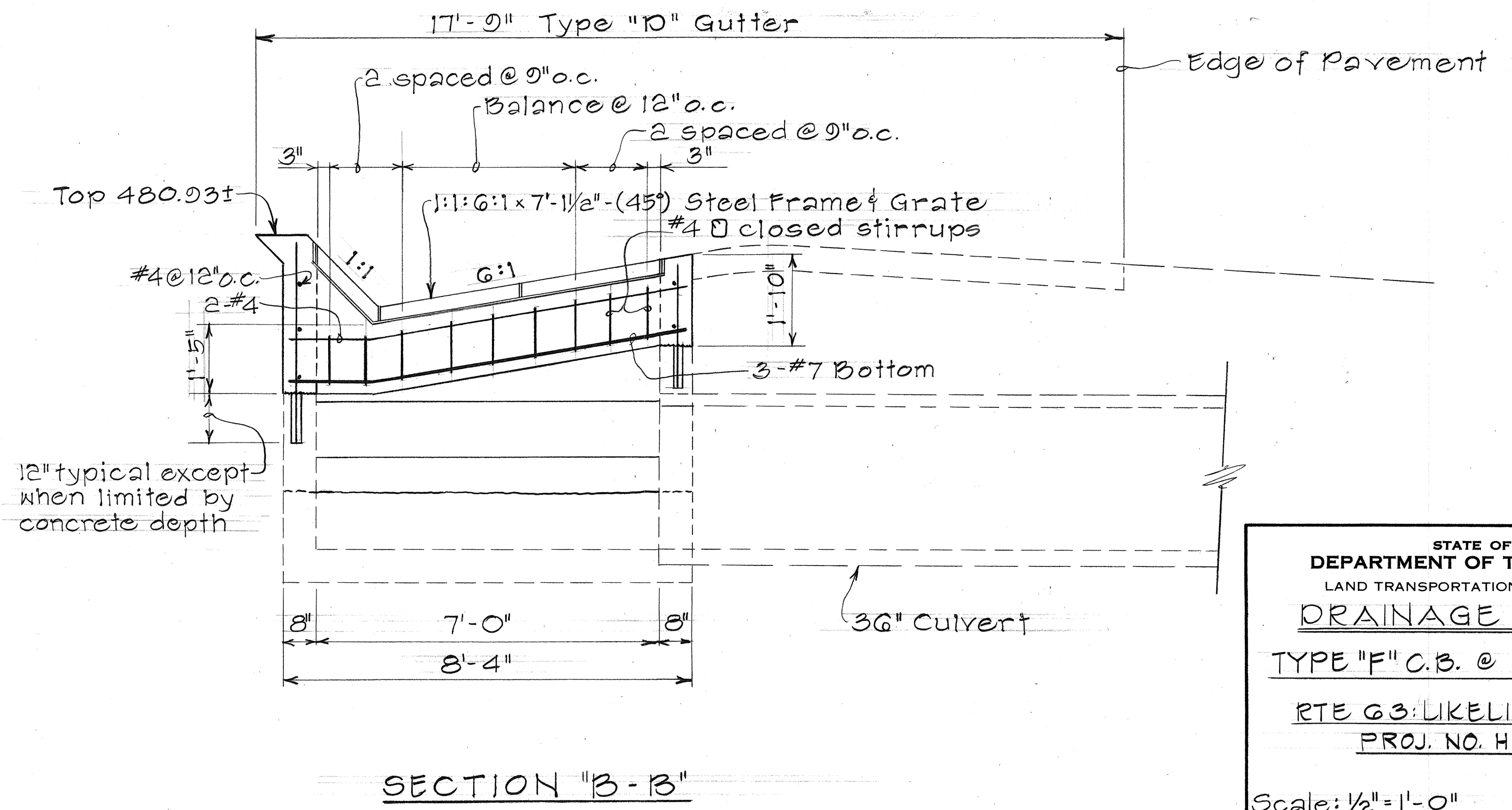
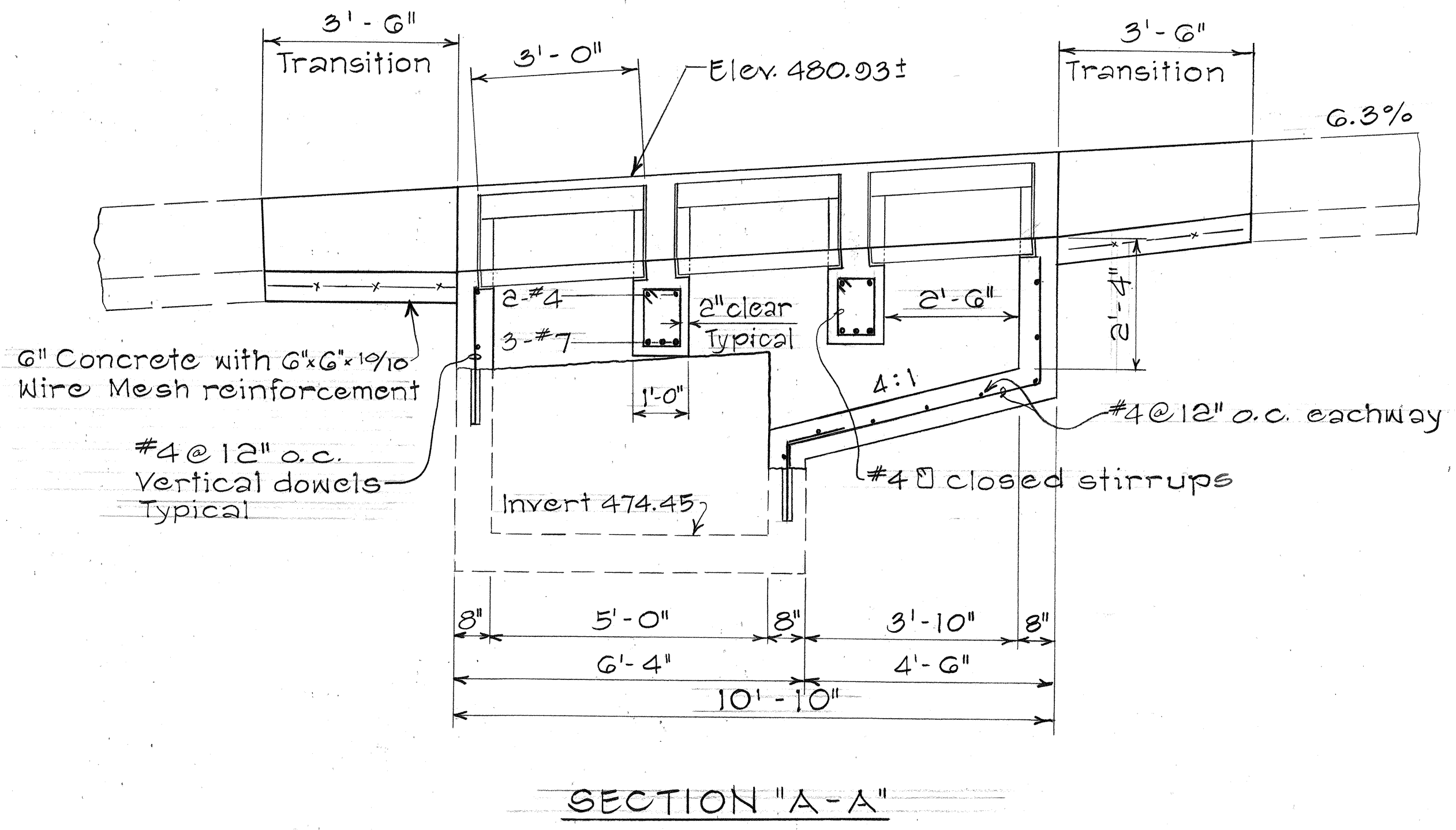
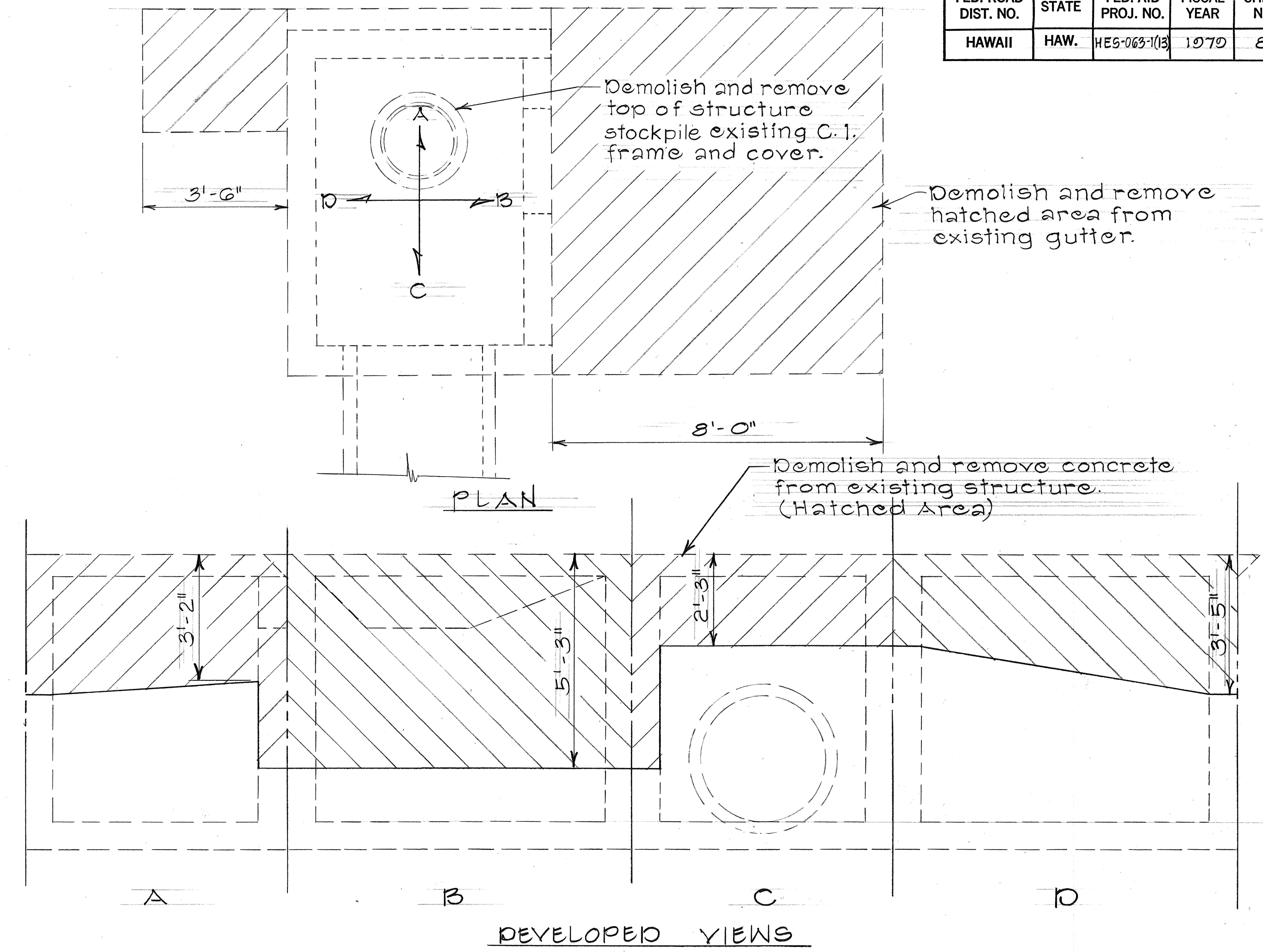
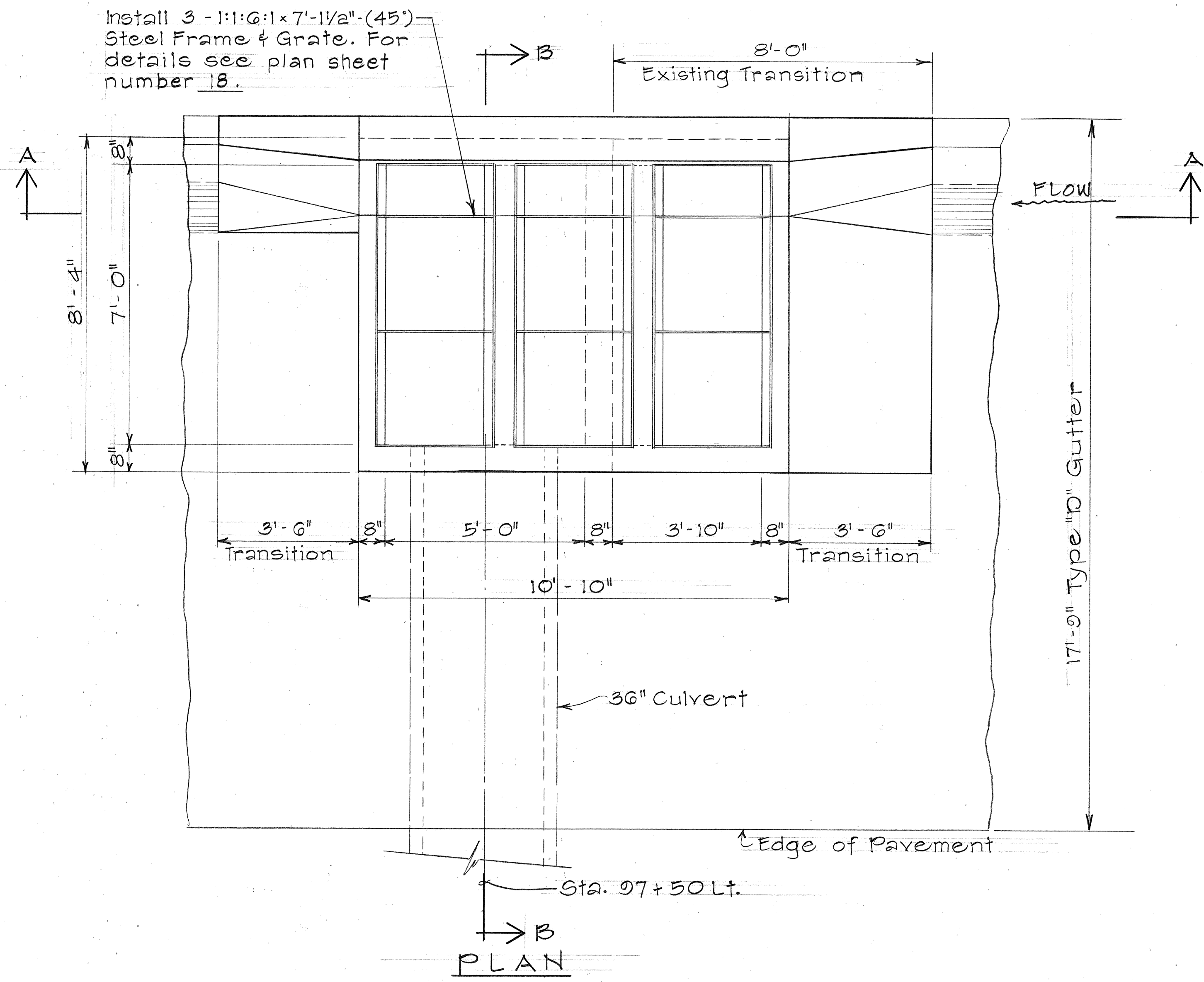
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-063-1(13)	1979	7	20



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTED BY	DRAWN BY	"
NOTED BY	TRACED BY	"
NOTED BY	QUANTITIES BY	"
NOTED BY	CHECKED BY	"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
TYPE "F" C.B. @ STA 94+50 LT.
RTE 63: LIKELIKE HIGHWAY
PROJ. NO. HES-063-1(13)
Scale: 1/2" = 1'-0" Date: Aug 1979
SHEET NO. 5 OF 18 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-063-1(13)	1979	8	20



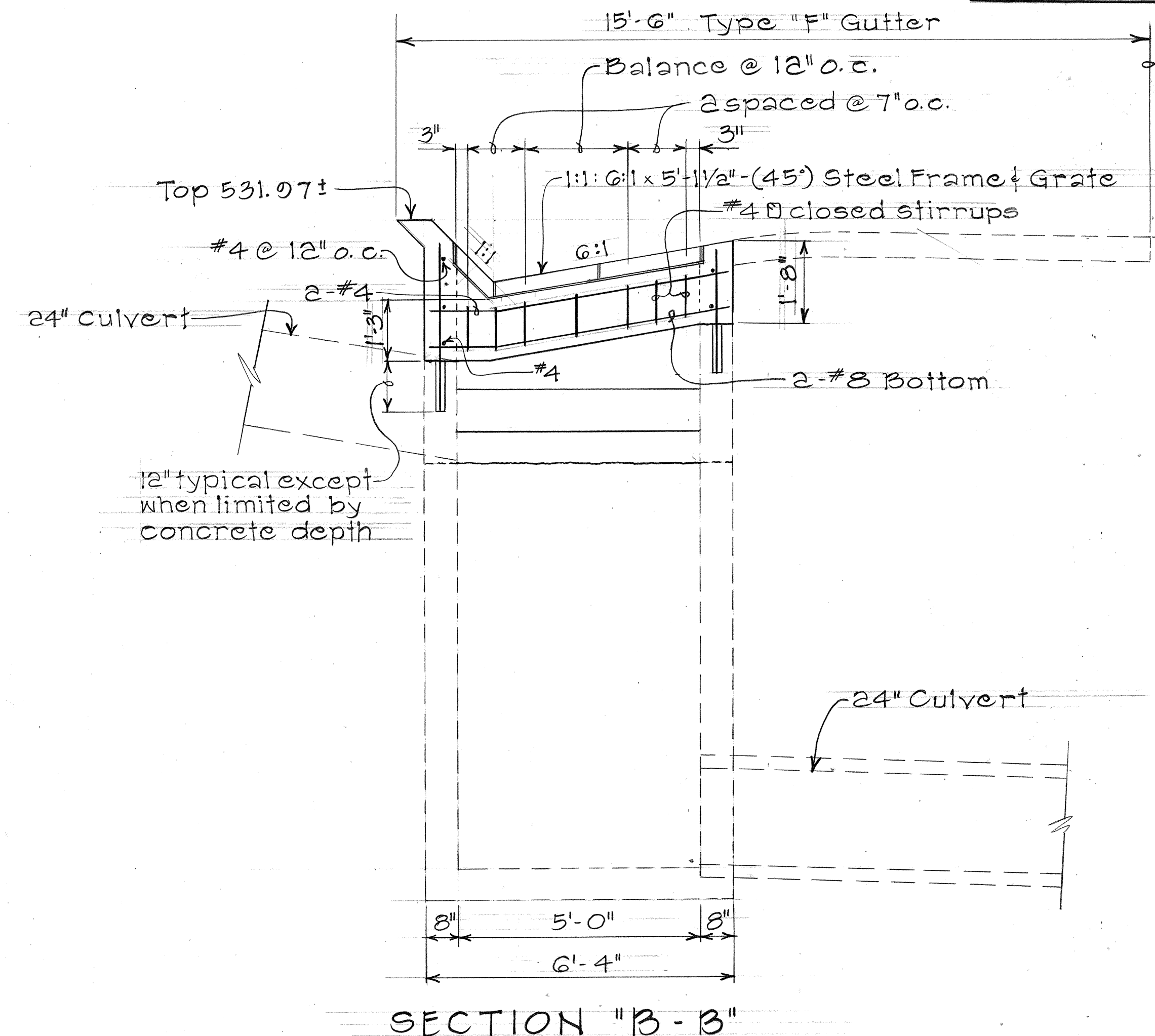
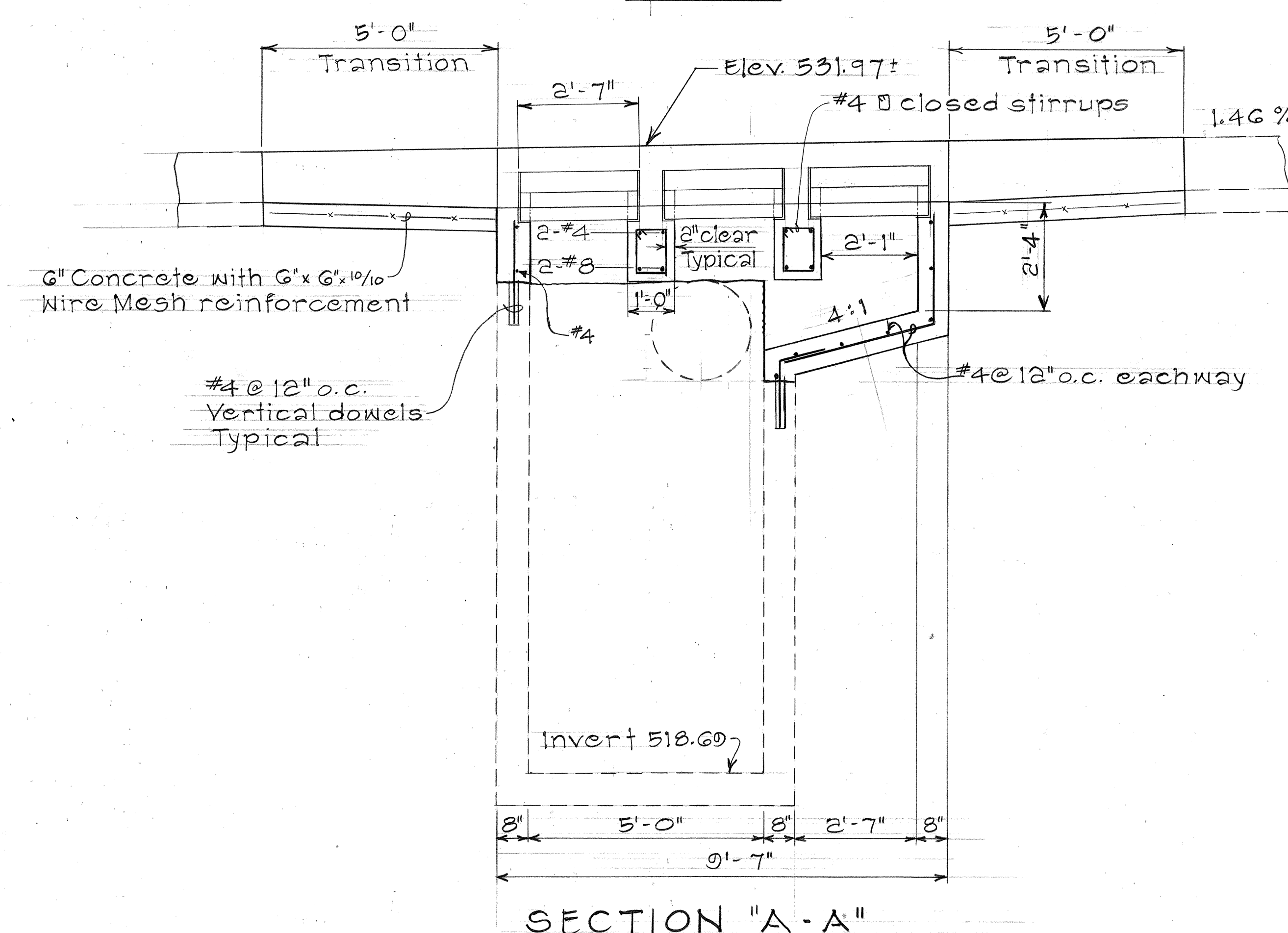
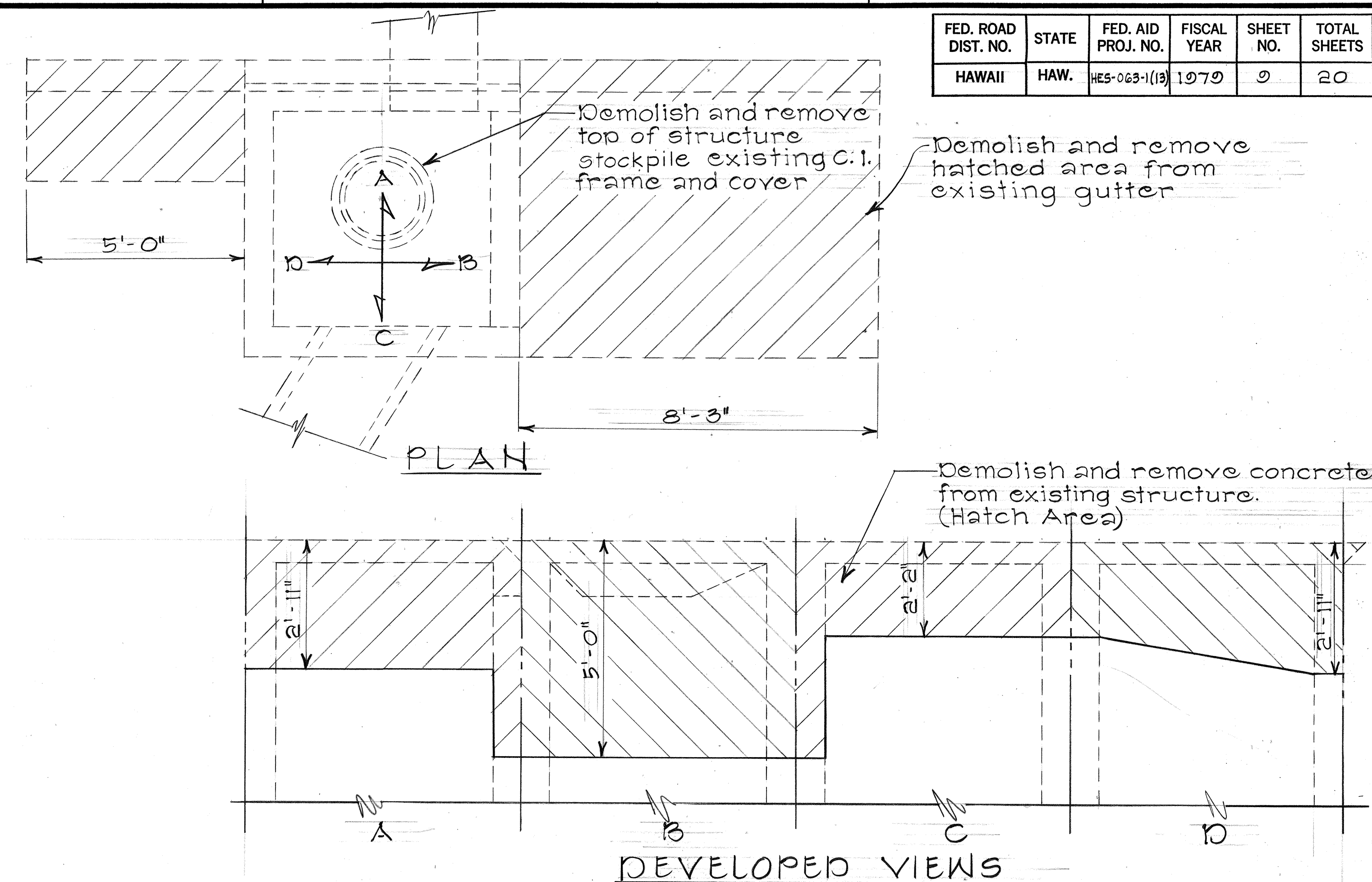
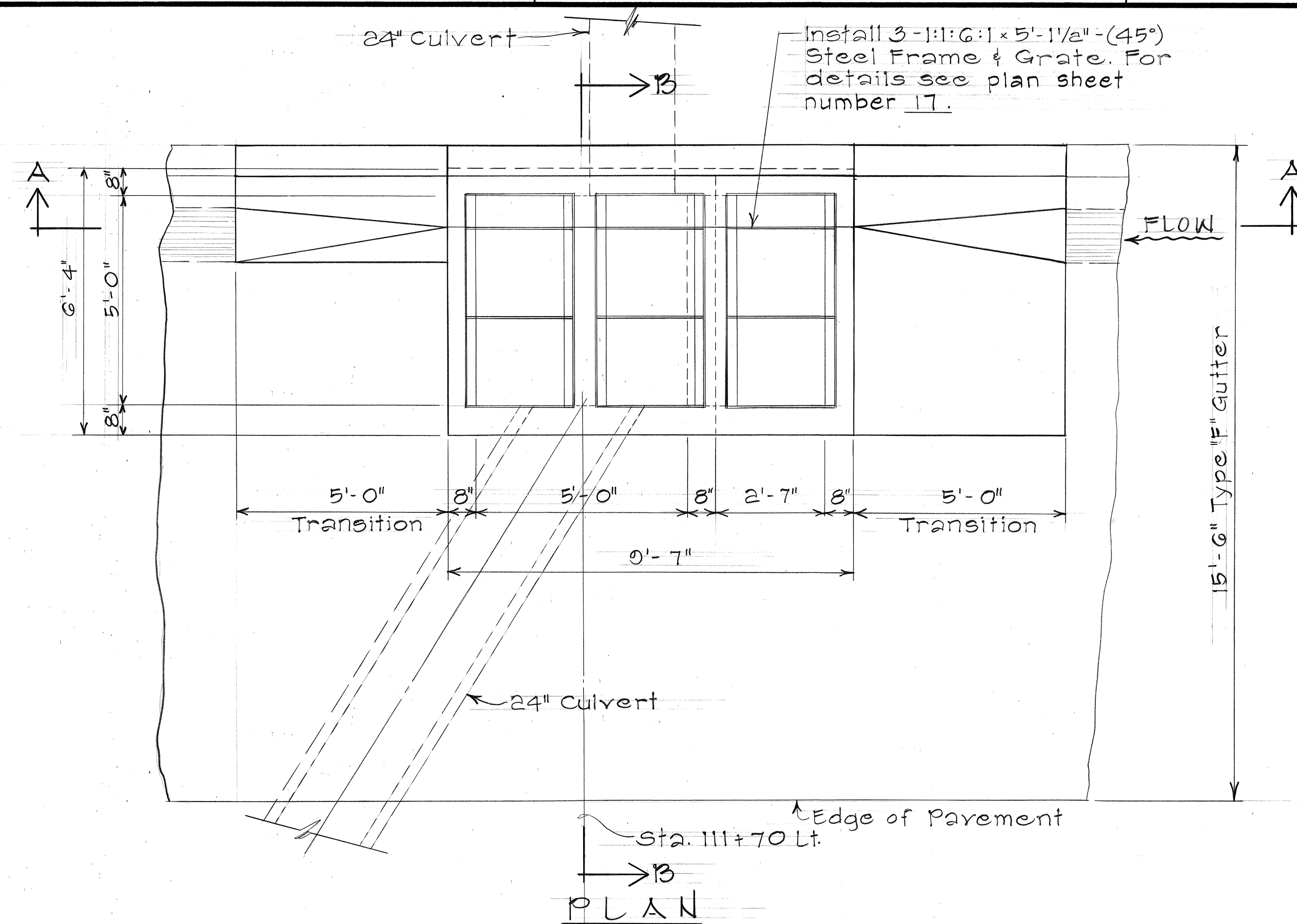
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SURVEY PLOTTED BY	_____
DRAWN BY	_____
TRACED BY	_____
QUANTITIES BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
No.	_____

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS
TYPE "F" C.B. @ STA 97+50 LT.
RTE 63: LIKELIKE HIGHWAY
PROJ. NO. HES-063-1(13)

Scale: 1/2" = 1'-0" Date: Aug 1979
SHEET NO. 6 OF 18 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HE5-063-1(13)	1979	9	20



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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	CHECKED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS

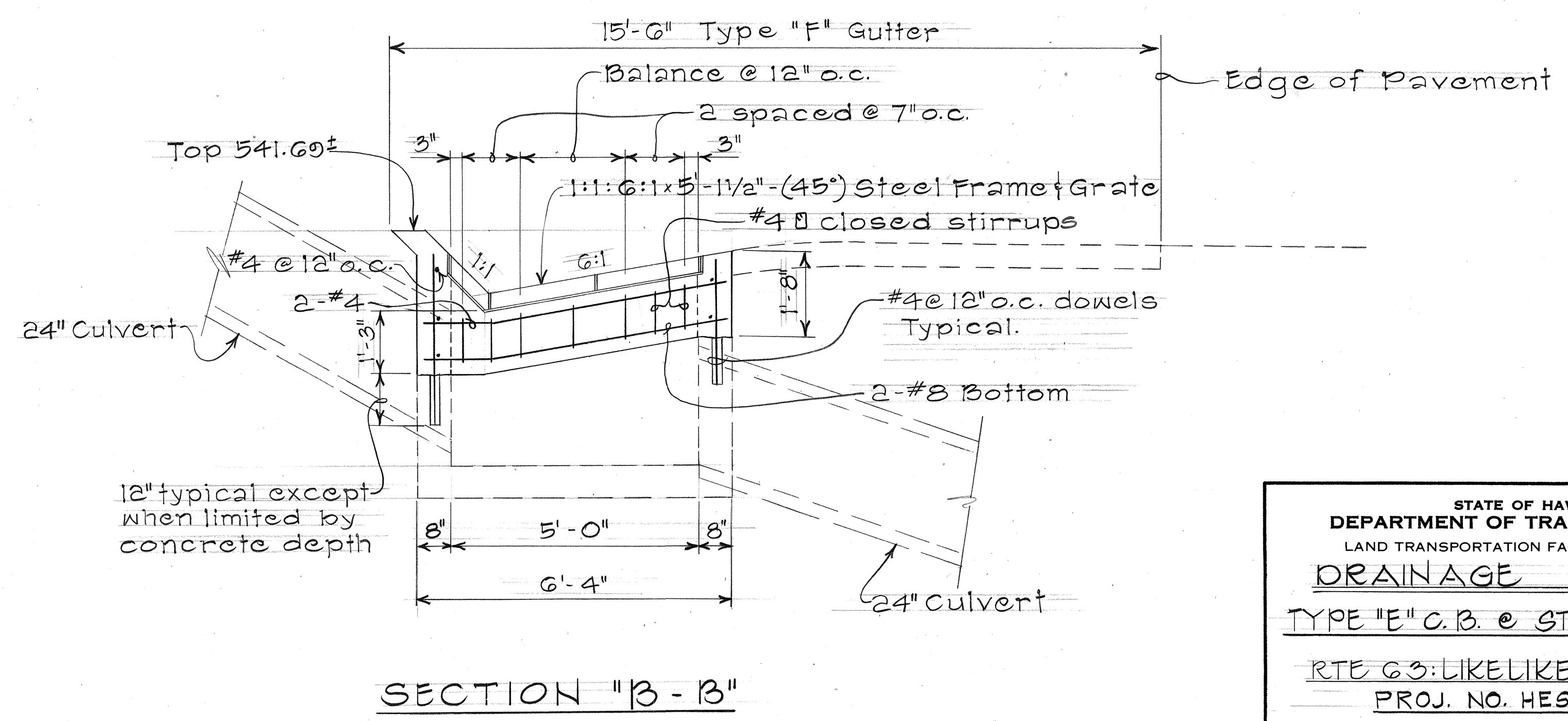
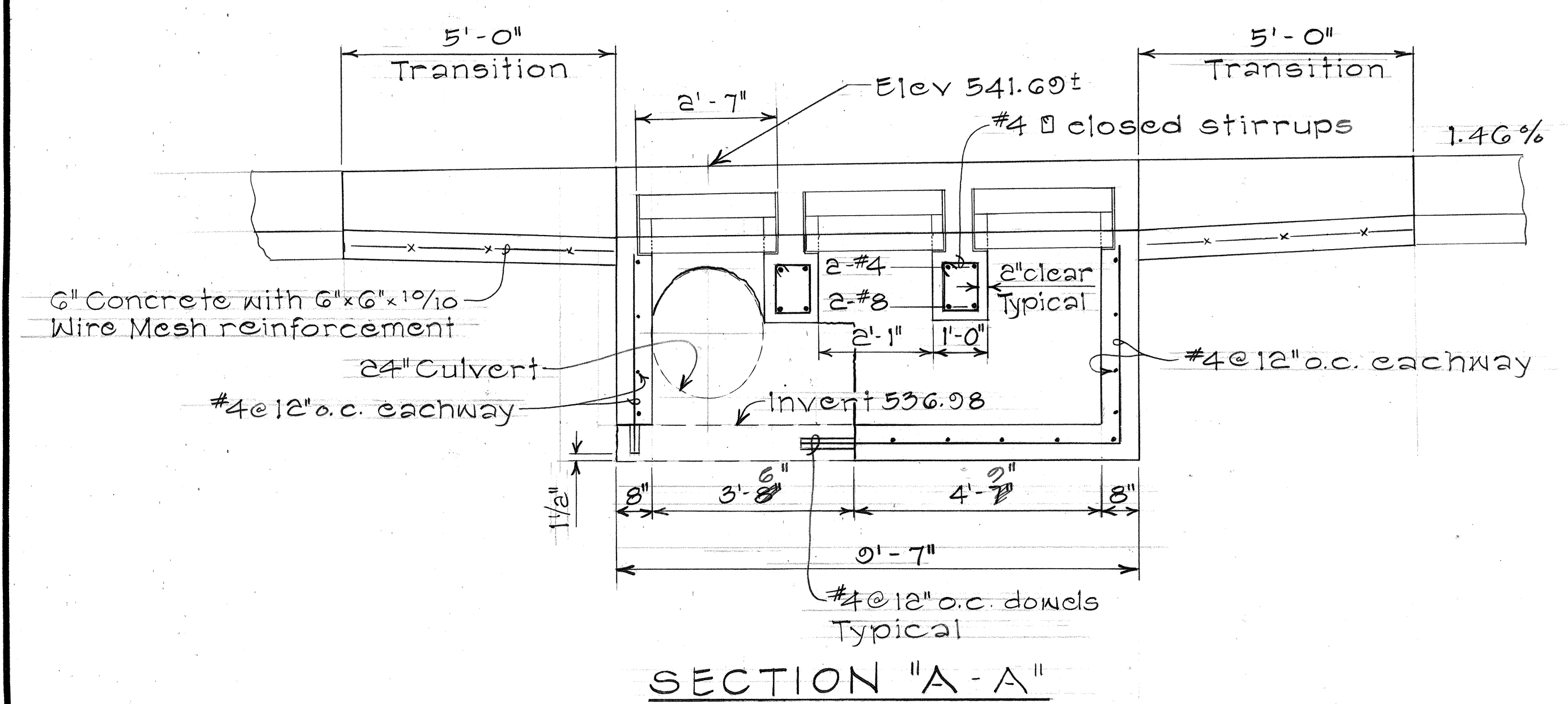
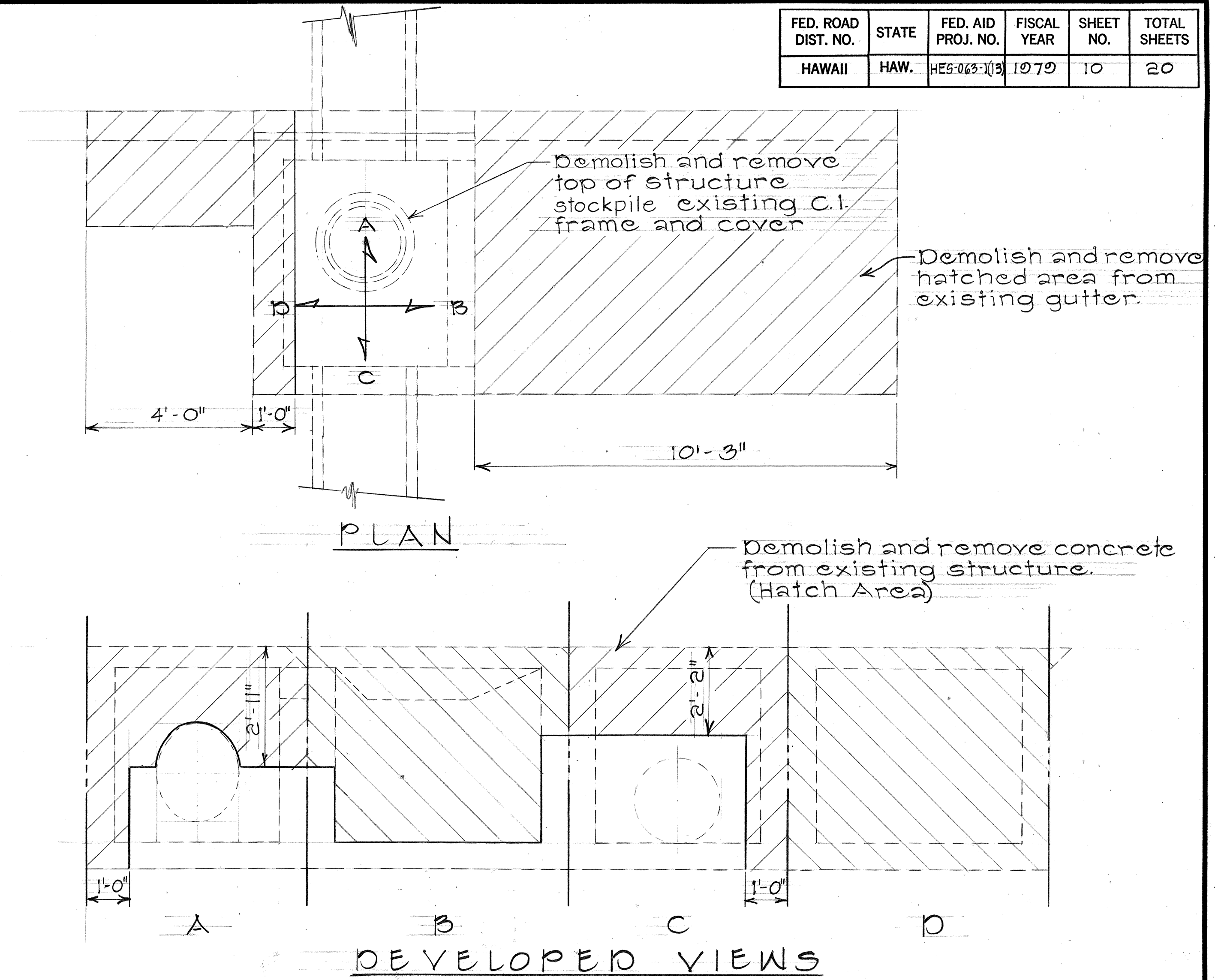
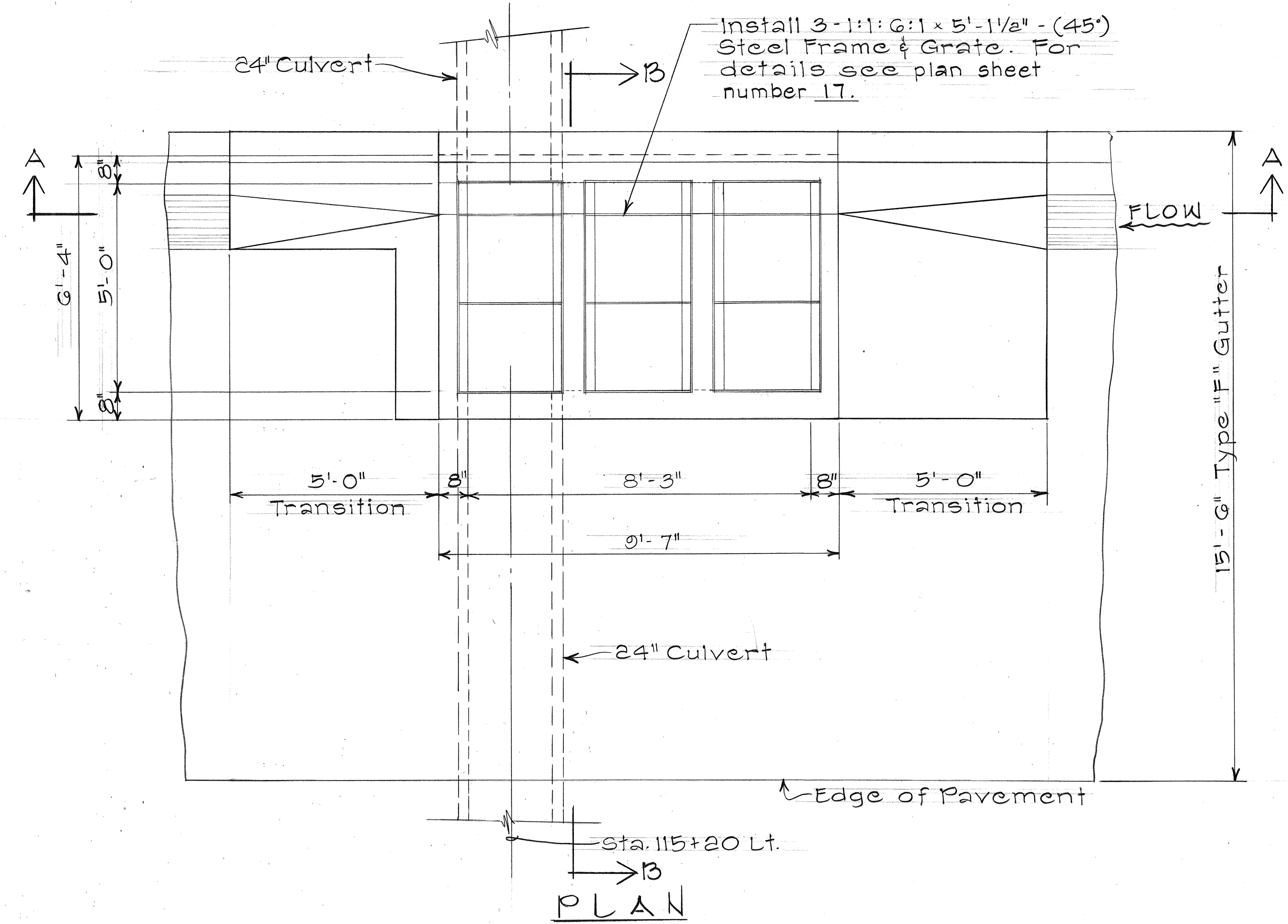
TYPE "E" C.B. @ STA 111+70 LT.

RTE 63: LIKELIKE HIGHWAY
PROJ. NO. HE5-063-1(13)

Scale: 1/2" = 1'-0" Date: Aug 1979

SHEET NO. 7 OF 18 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-063-1(13)	1979	10	20



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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS

TYPE "E" C.B. @ STA 115+20 LT.

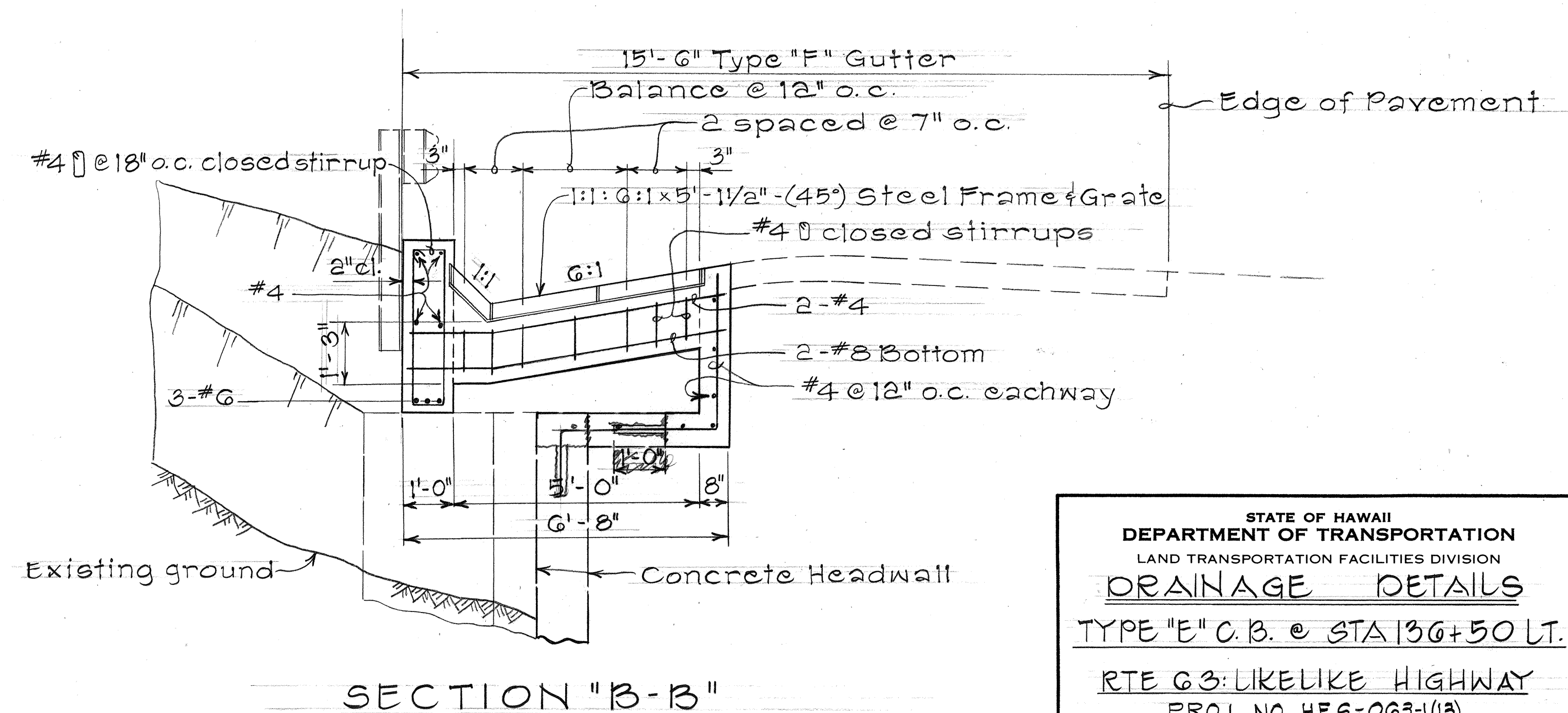
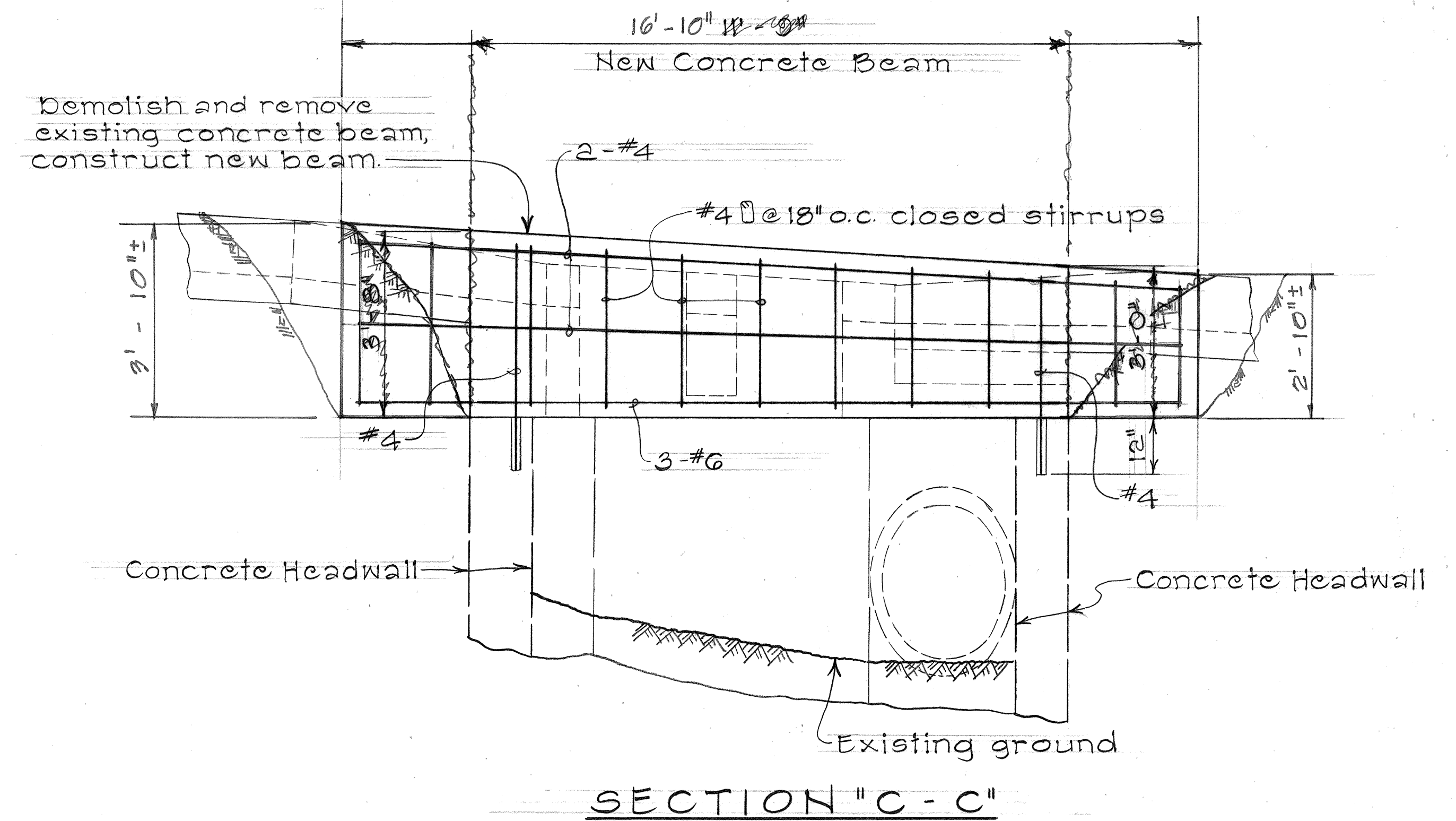
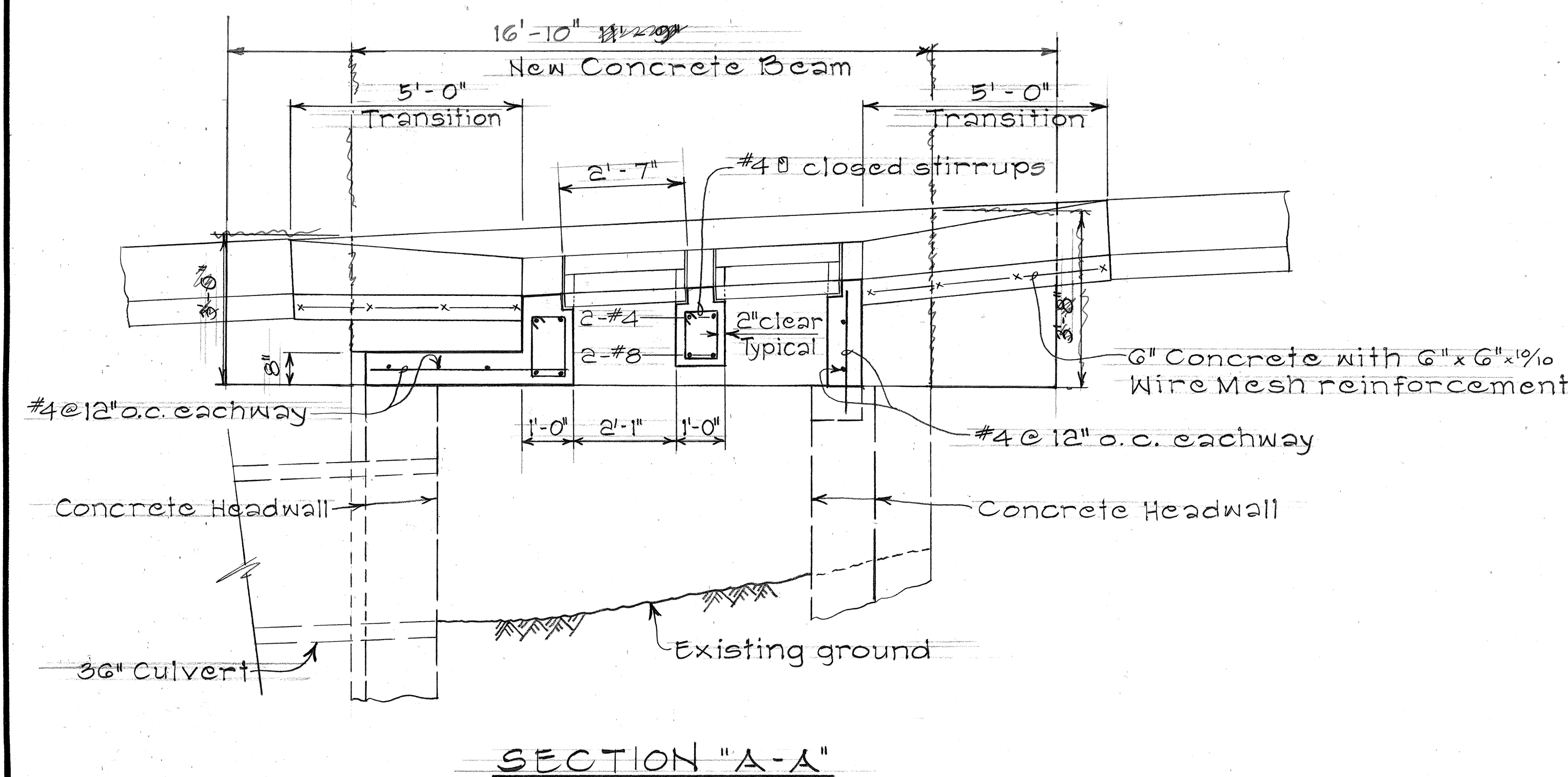
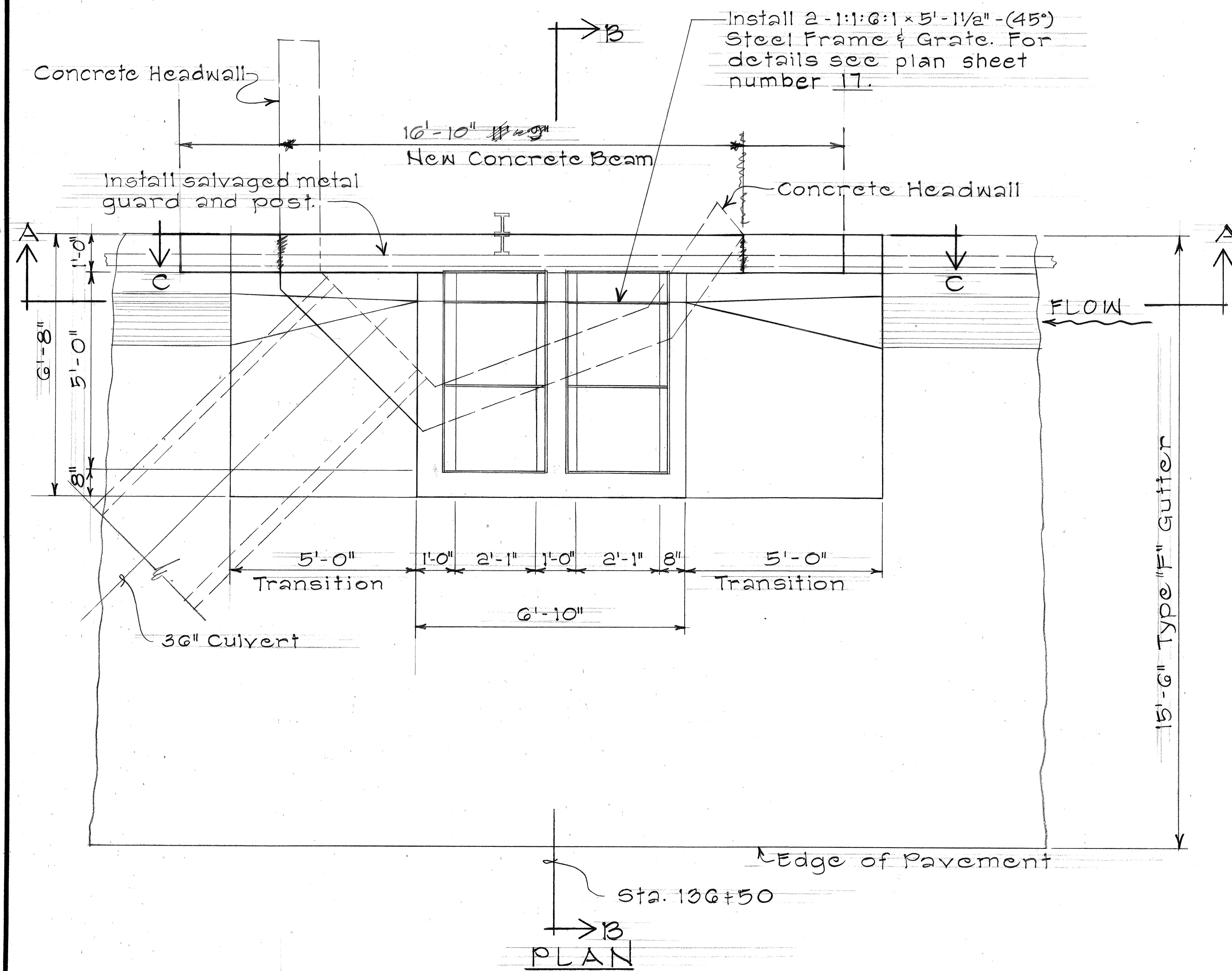
RTE 63: LIKELIKE HIGHWAY

PROJ. NO. HES-063-1(13)

Scale: 1/2" = 1'-0" Date: Aug 1979

SHEET NO. 8 OF 18 SHEETS

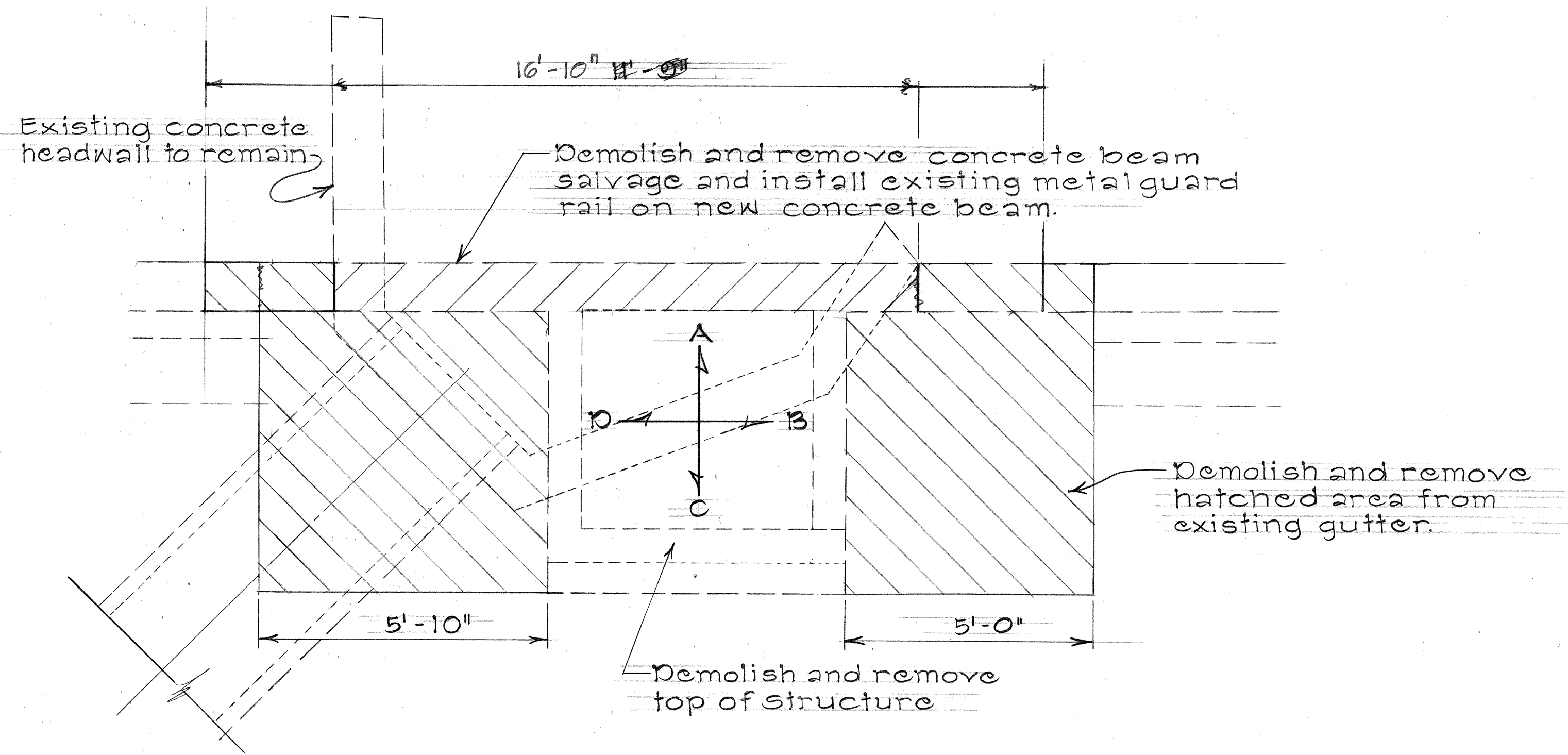
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HE5-063-1(13)	1979	12	20



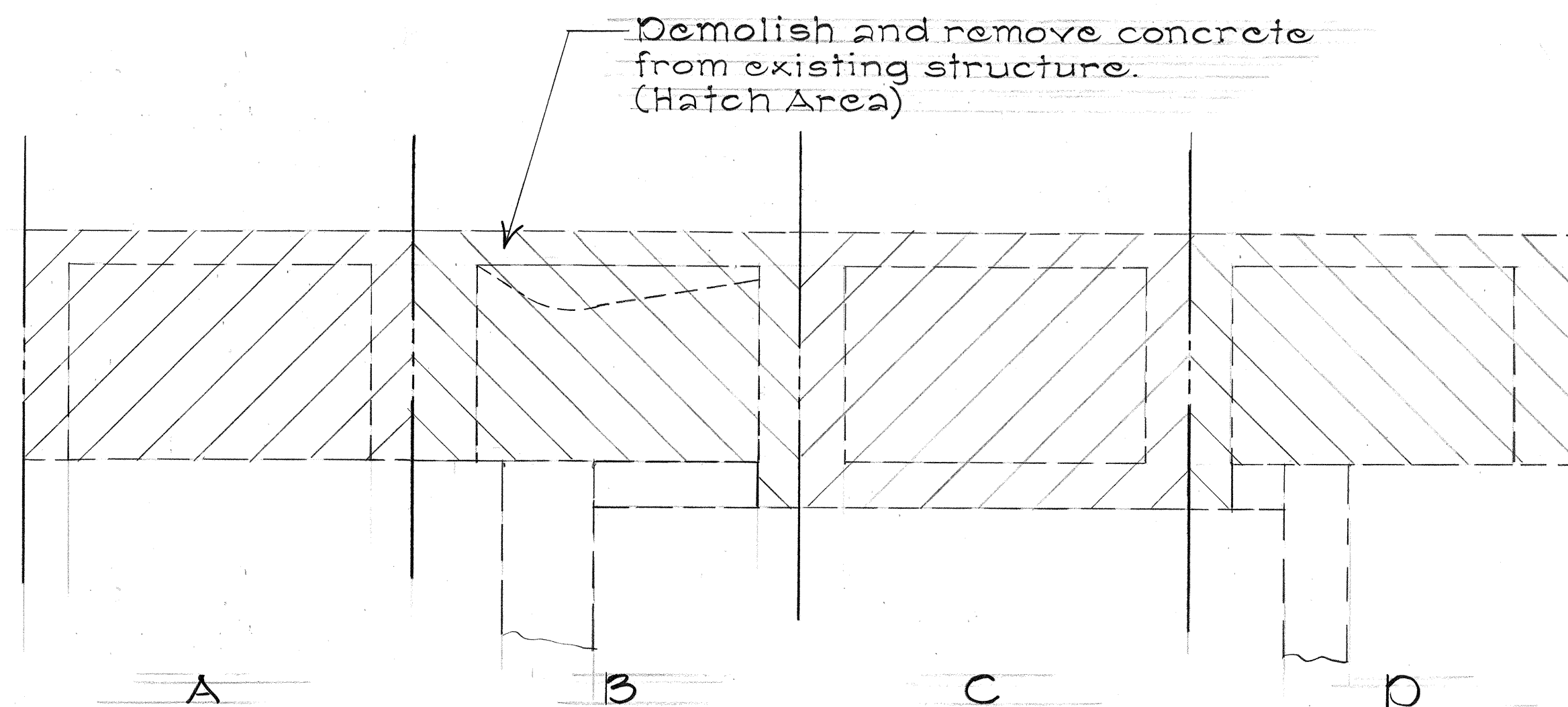
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
TYPE "E" C.B. @ STA 136+50 LT.
RTE 63 LIKELIKE HIGHWAY
PROJ. NO. HE5-063-1(13)
Scale: 1/2" = 1'-0" Date: Aug 1979
SHEET NO. 10 OF 18 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTED BY	DRAWN BY	
NOTED BY	TRACED BY	
NOTED BY	QUANTITIES BY	
NOTED BY	CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-063-1(13)	1979	13	20



PLAN

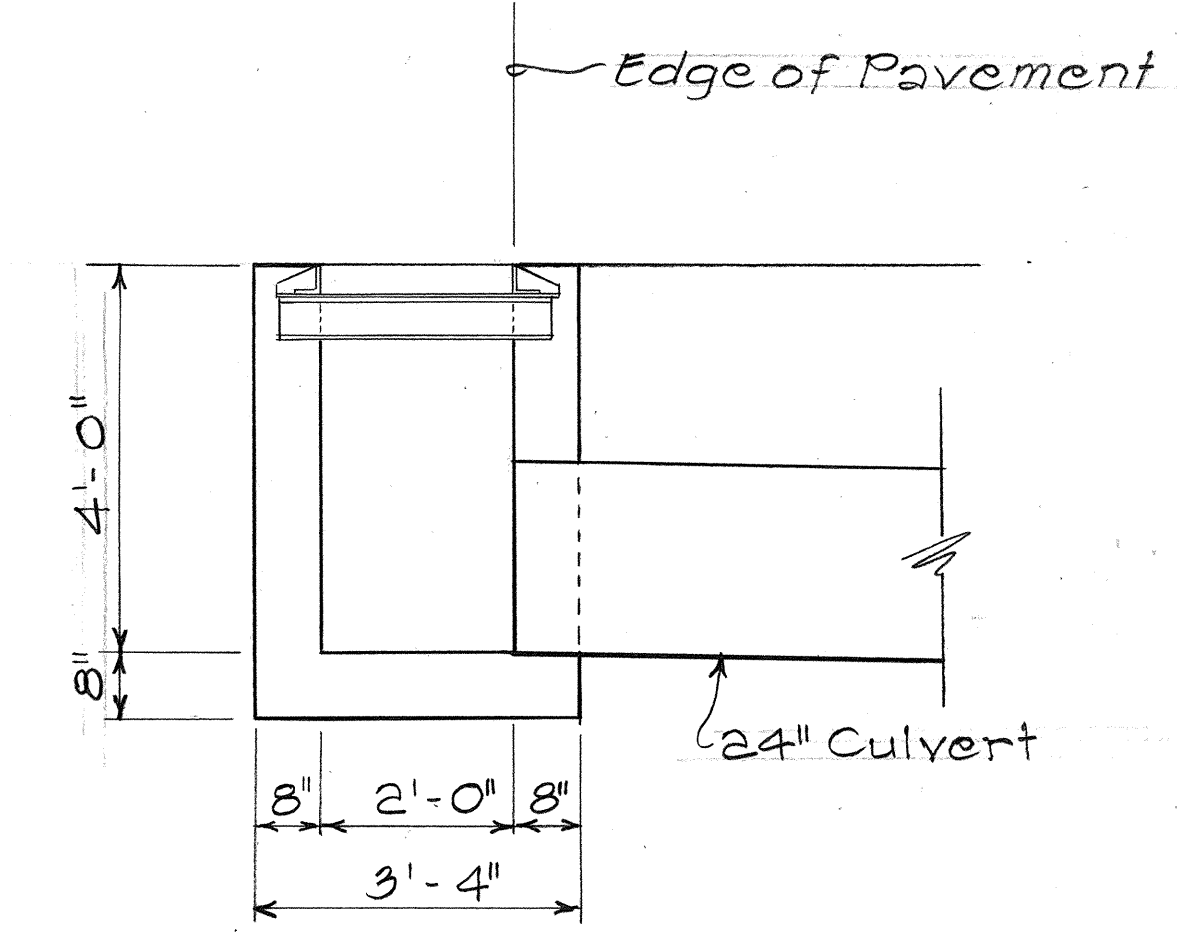
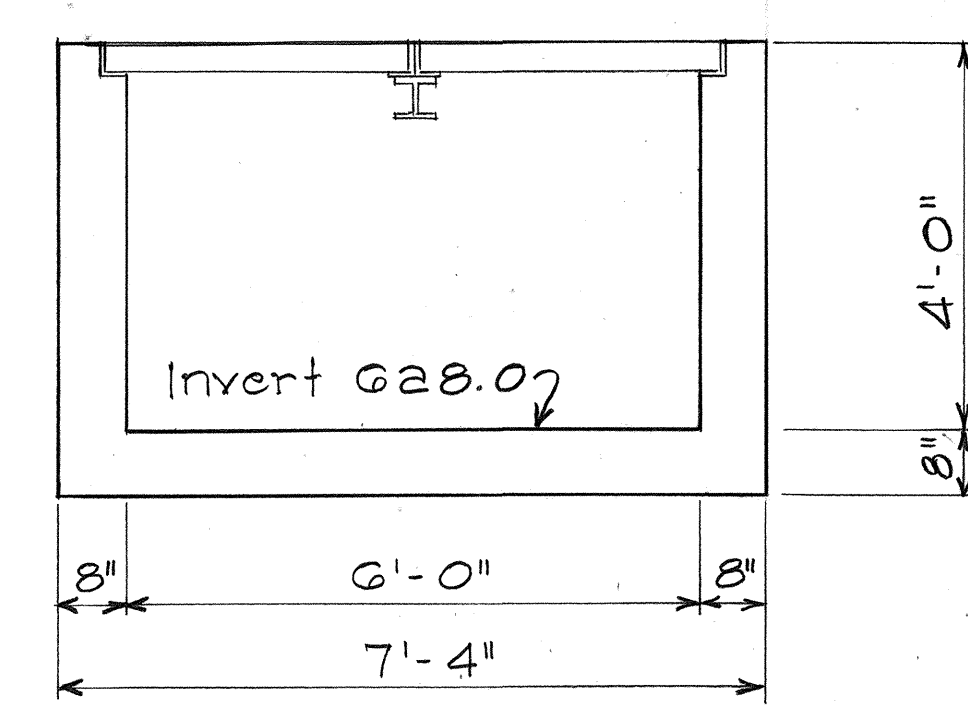
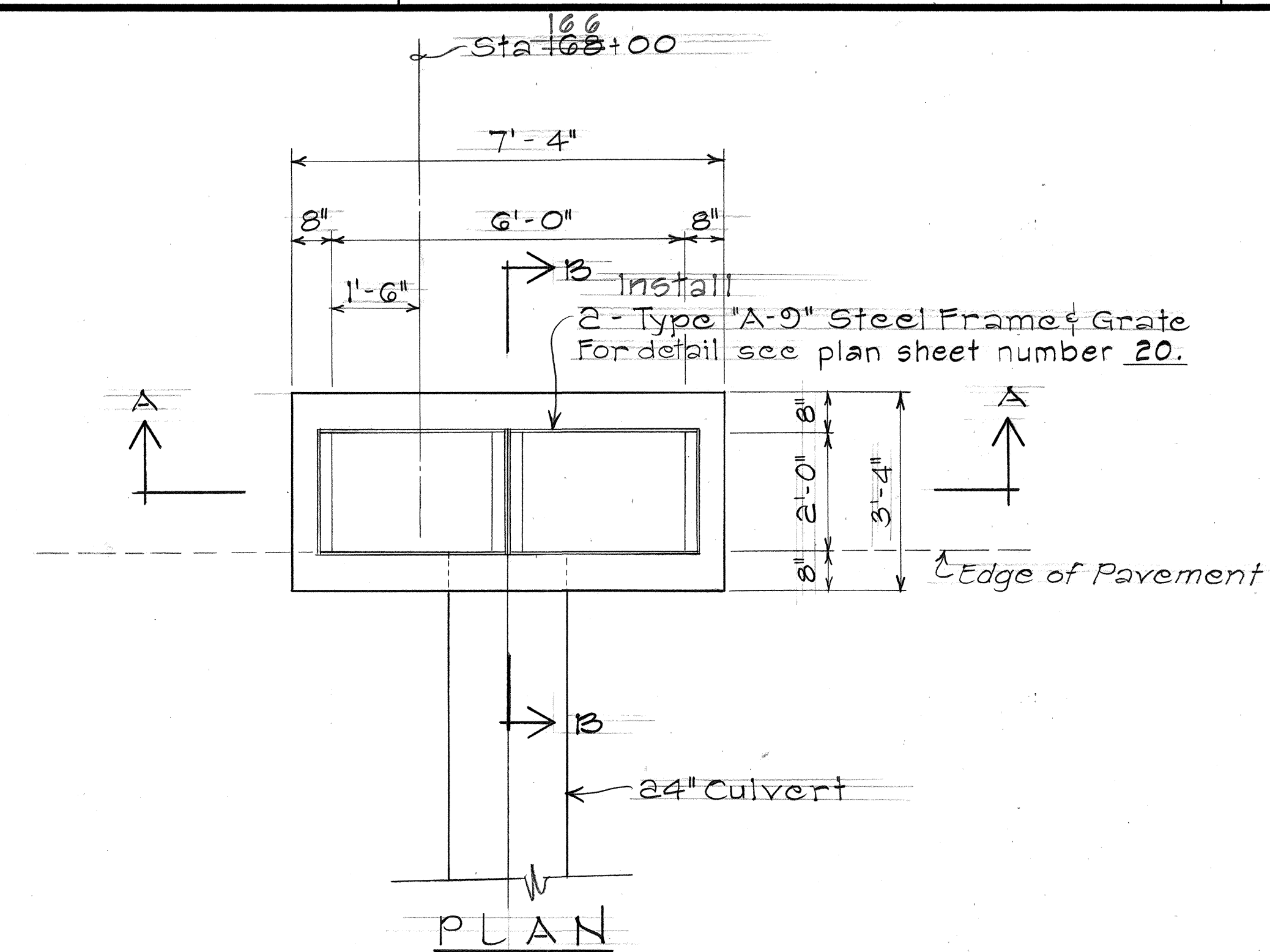
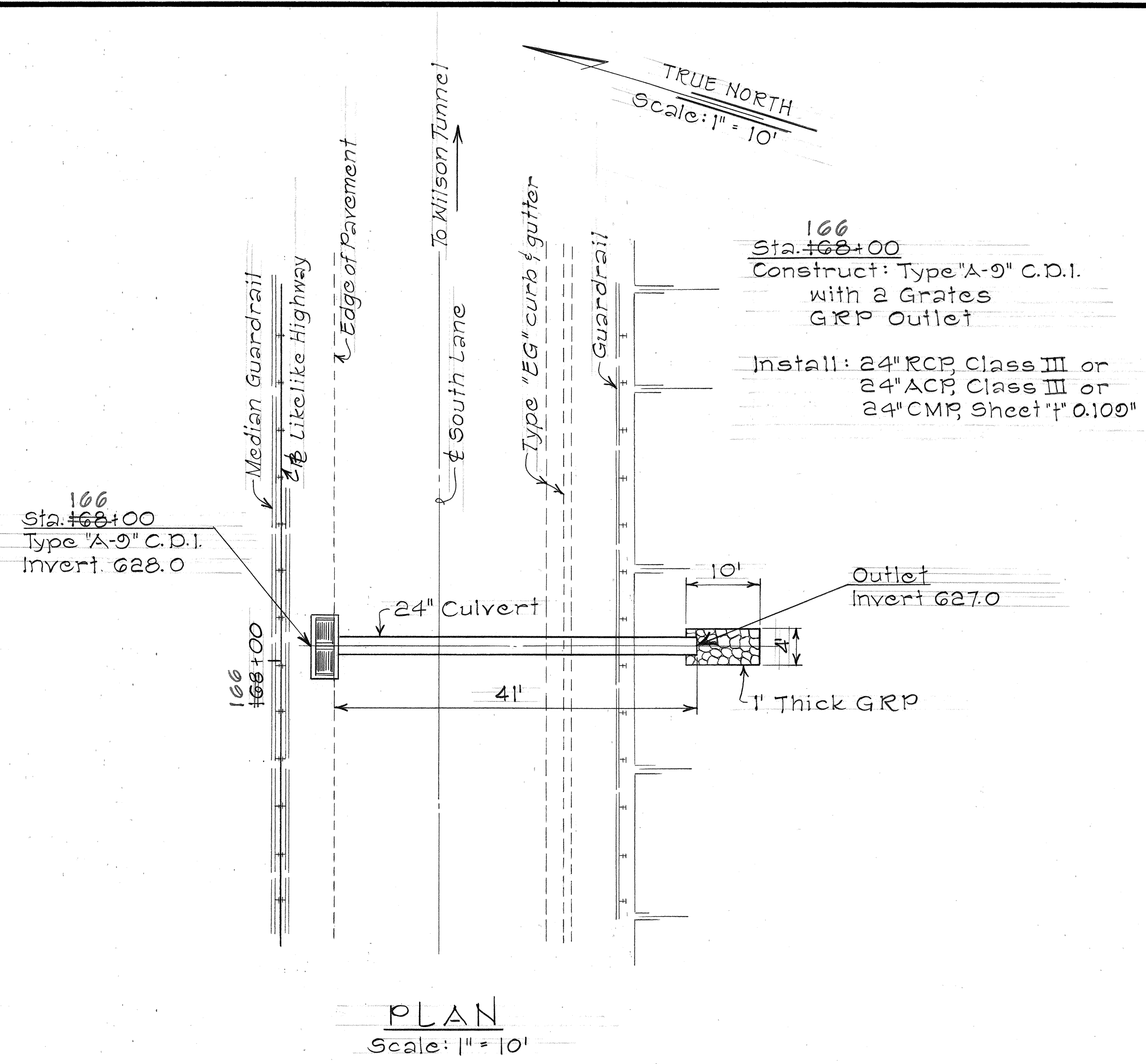


DEVELOPED VIEWS

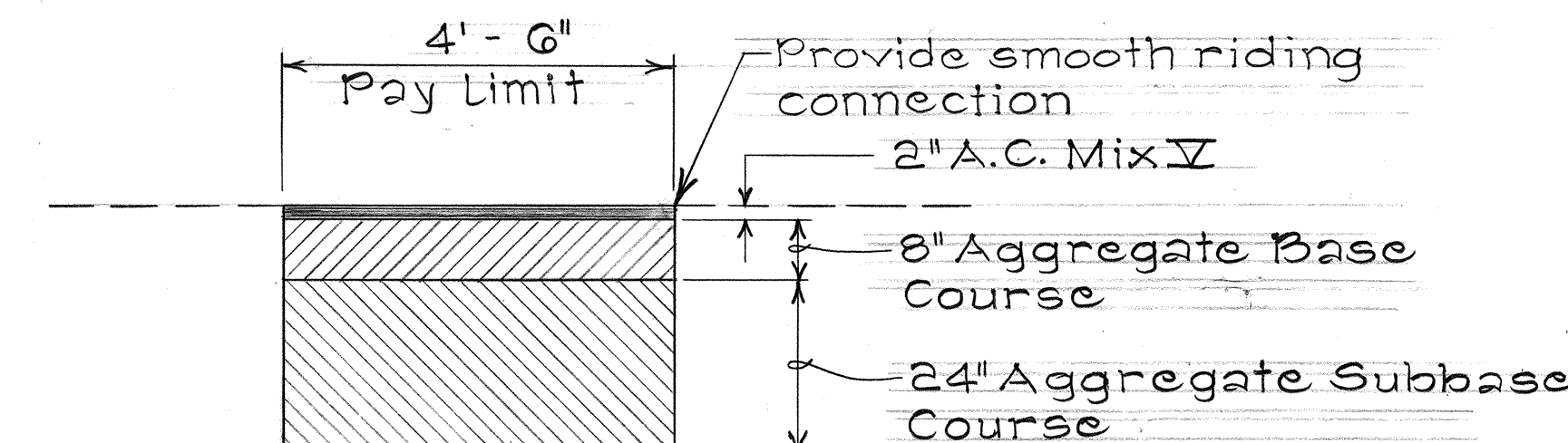
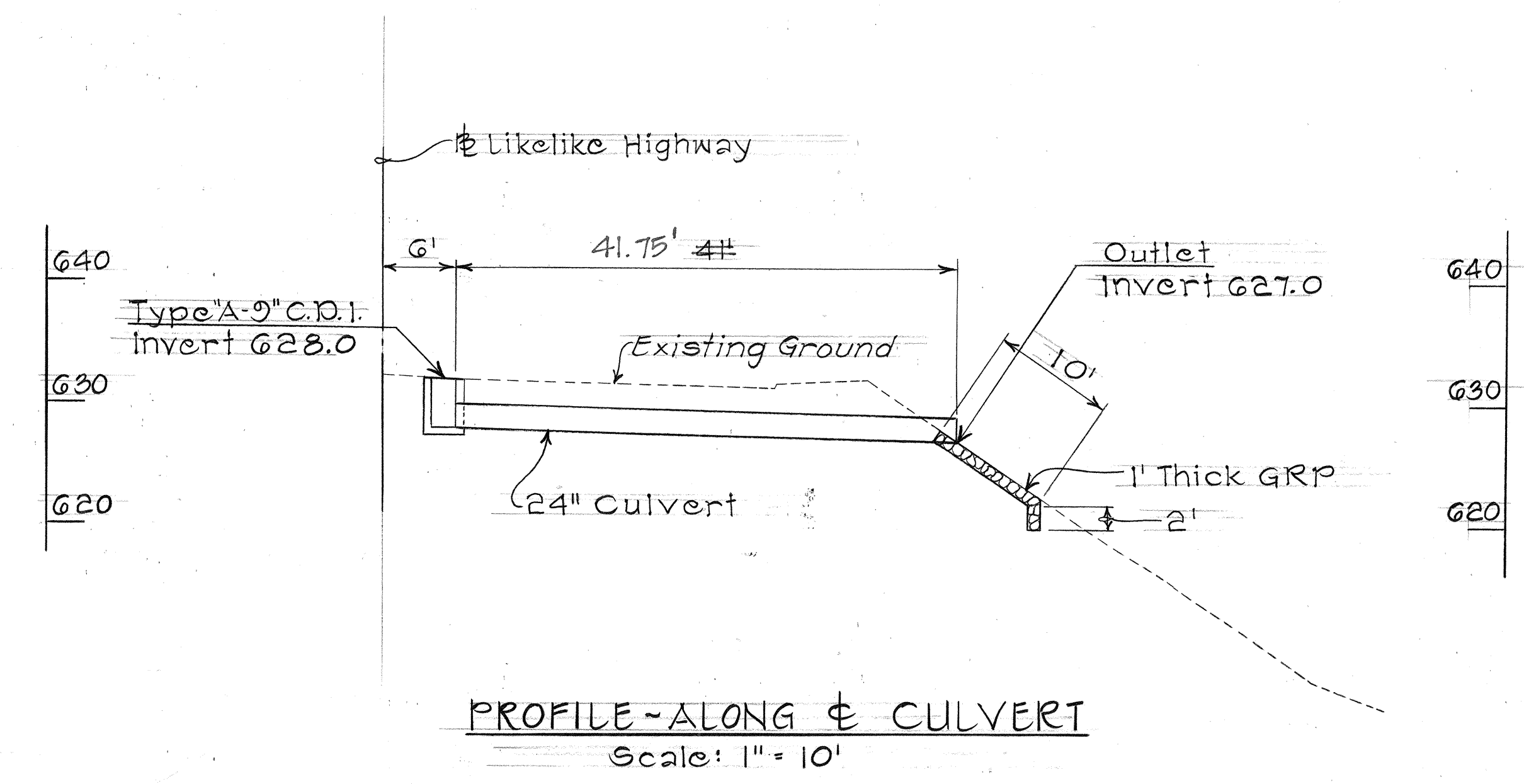
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
TYPE "E" C.B. @ STA 130+50 LT.
RTE 63: LIKELIKE HIGHWAY
PROJ. NO. HES-063-1(13)
Scale: 1/2" = 1'-0" Date: Aug 1979
SHEET NO. 11 OF 18 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-063-1(13)	1979	14	20



DETAILS OF TYPE "A-9" CONCRETE DROP INTAKE
Scale: 1/2" = 1'-0"

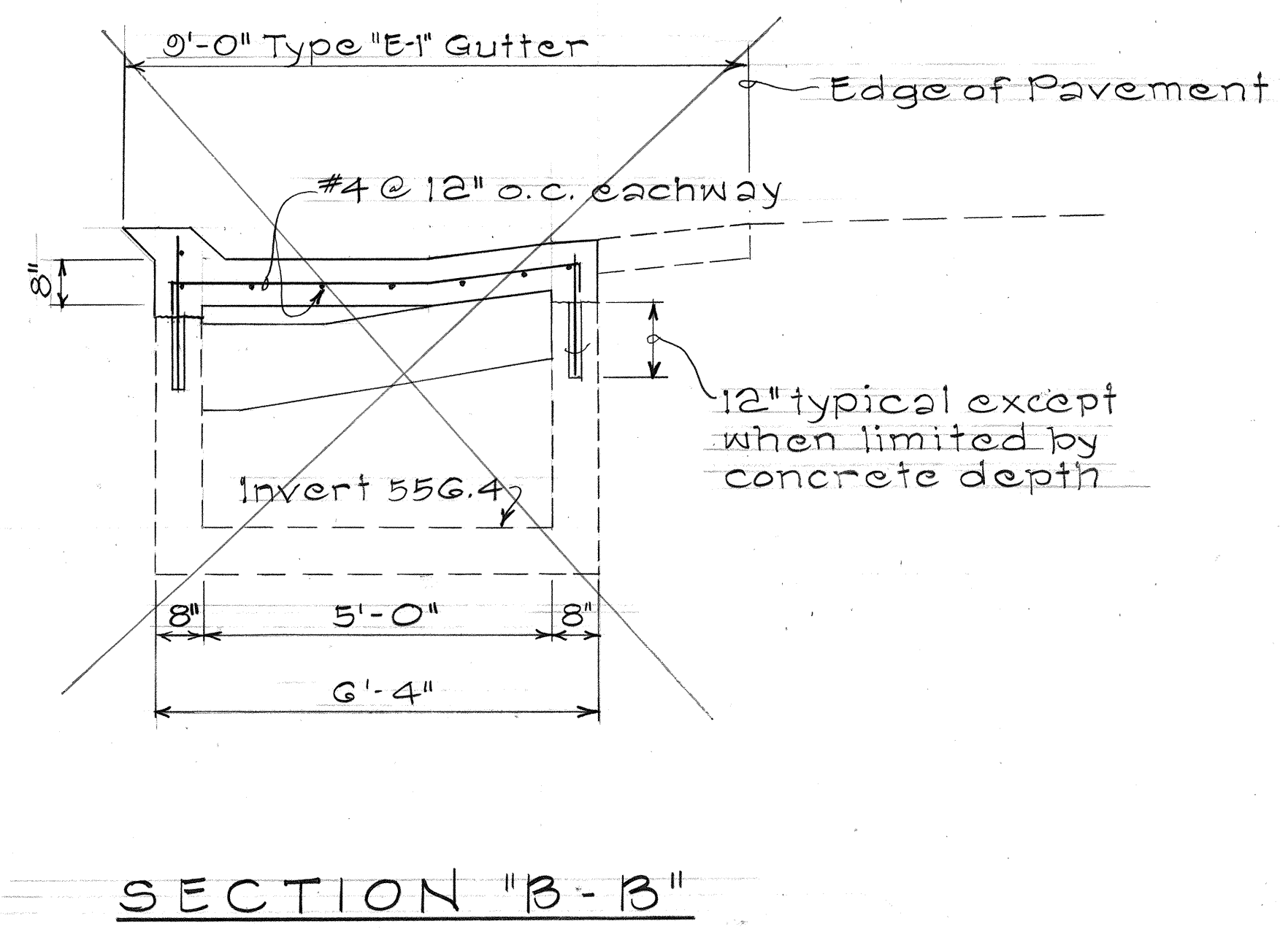
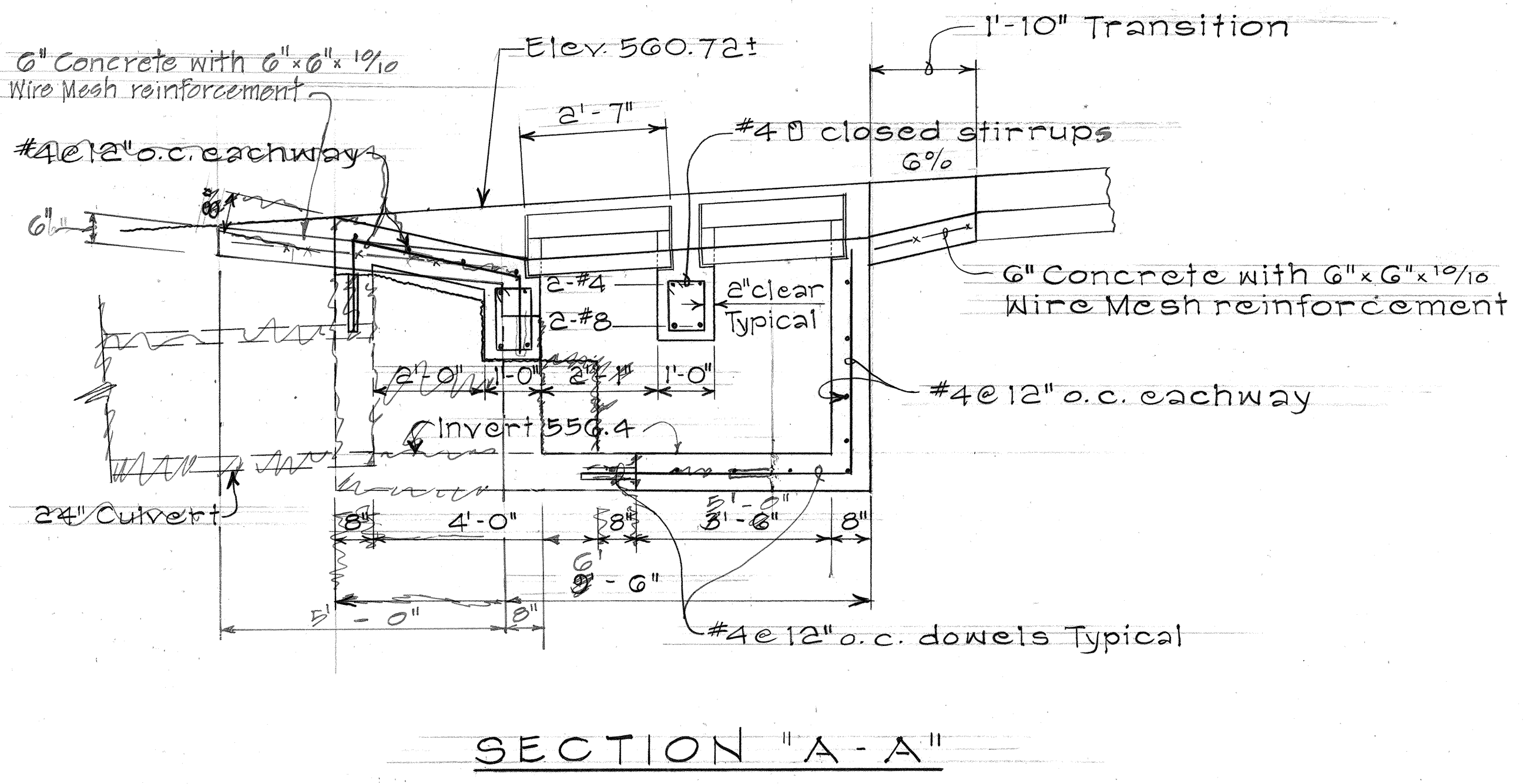
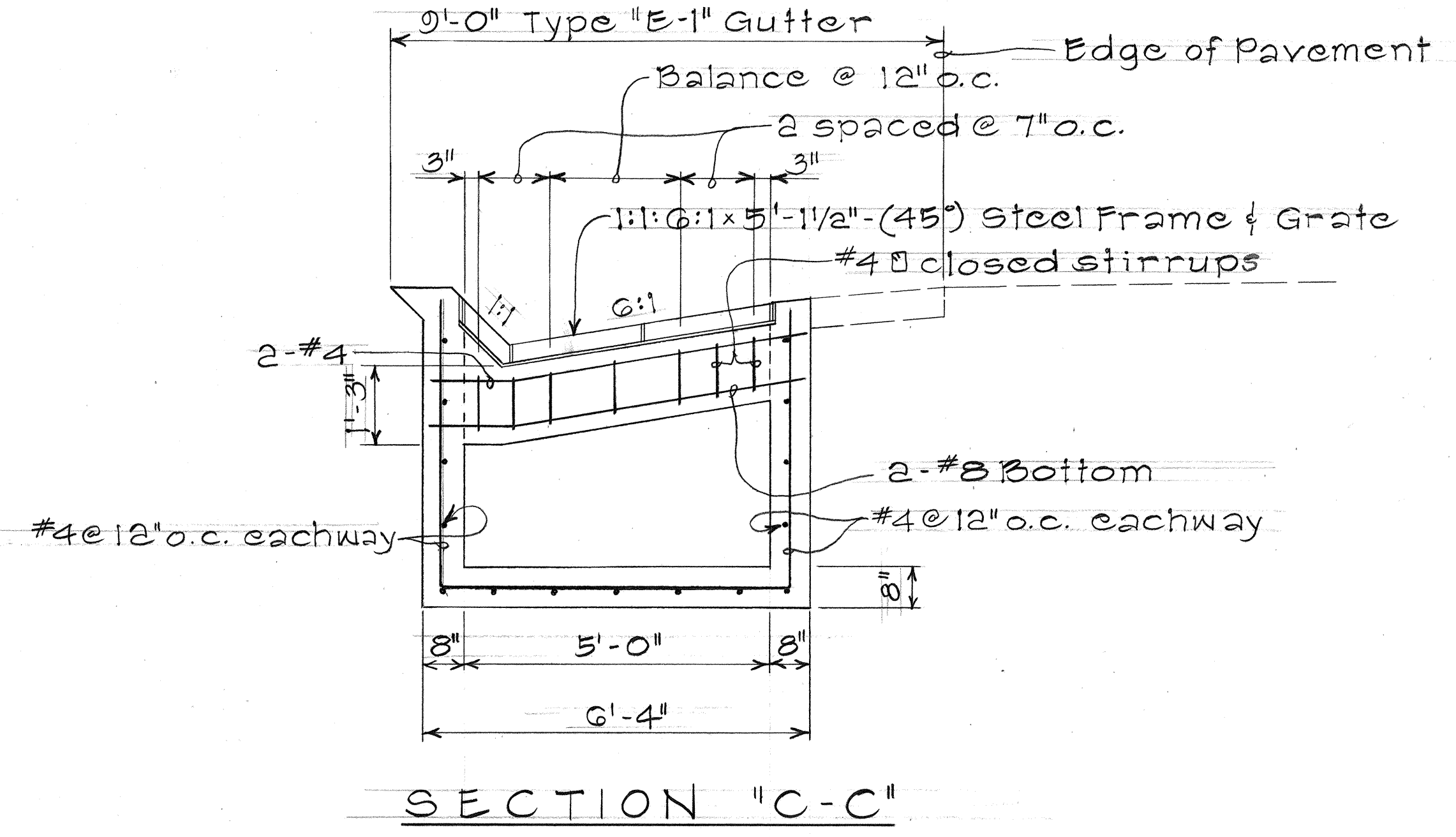
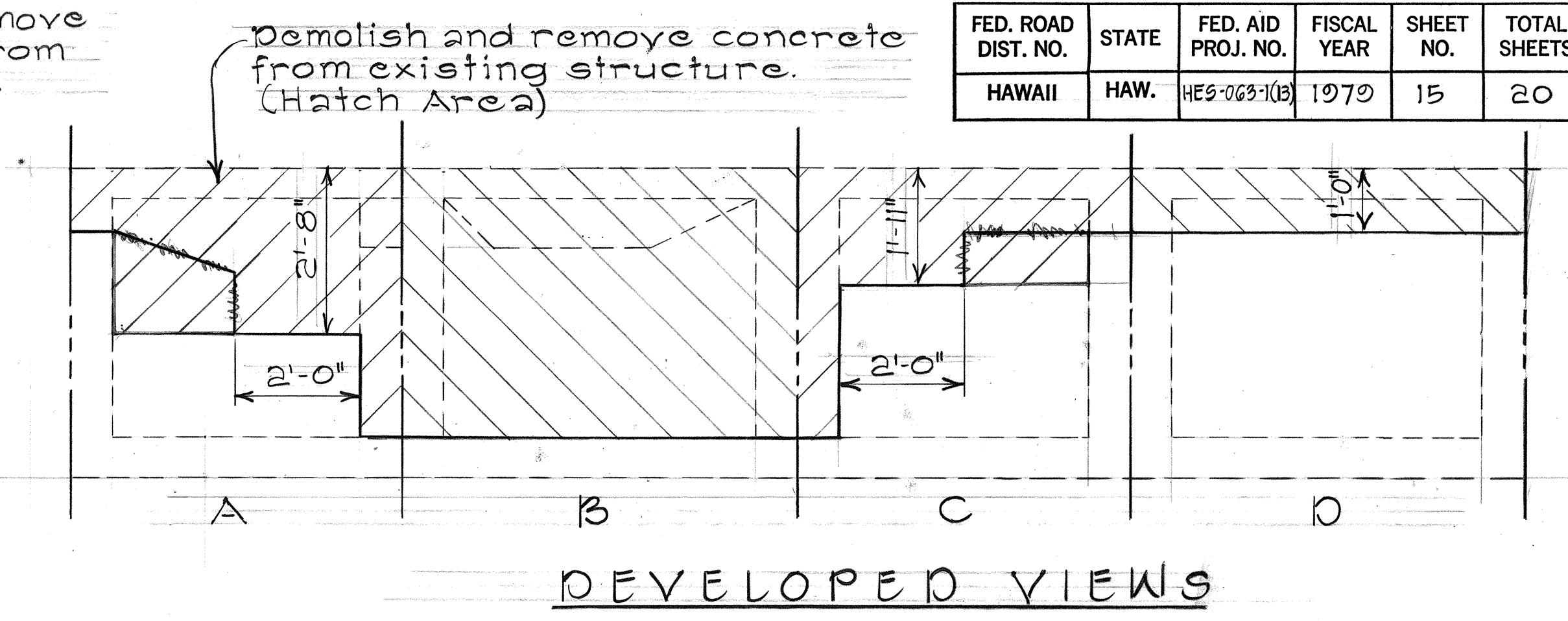
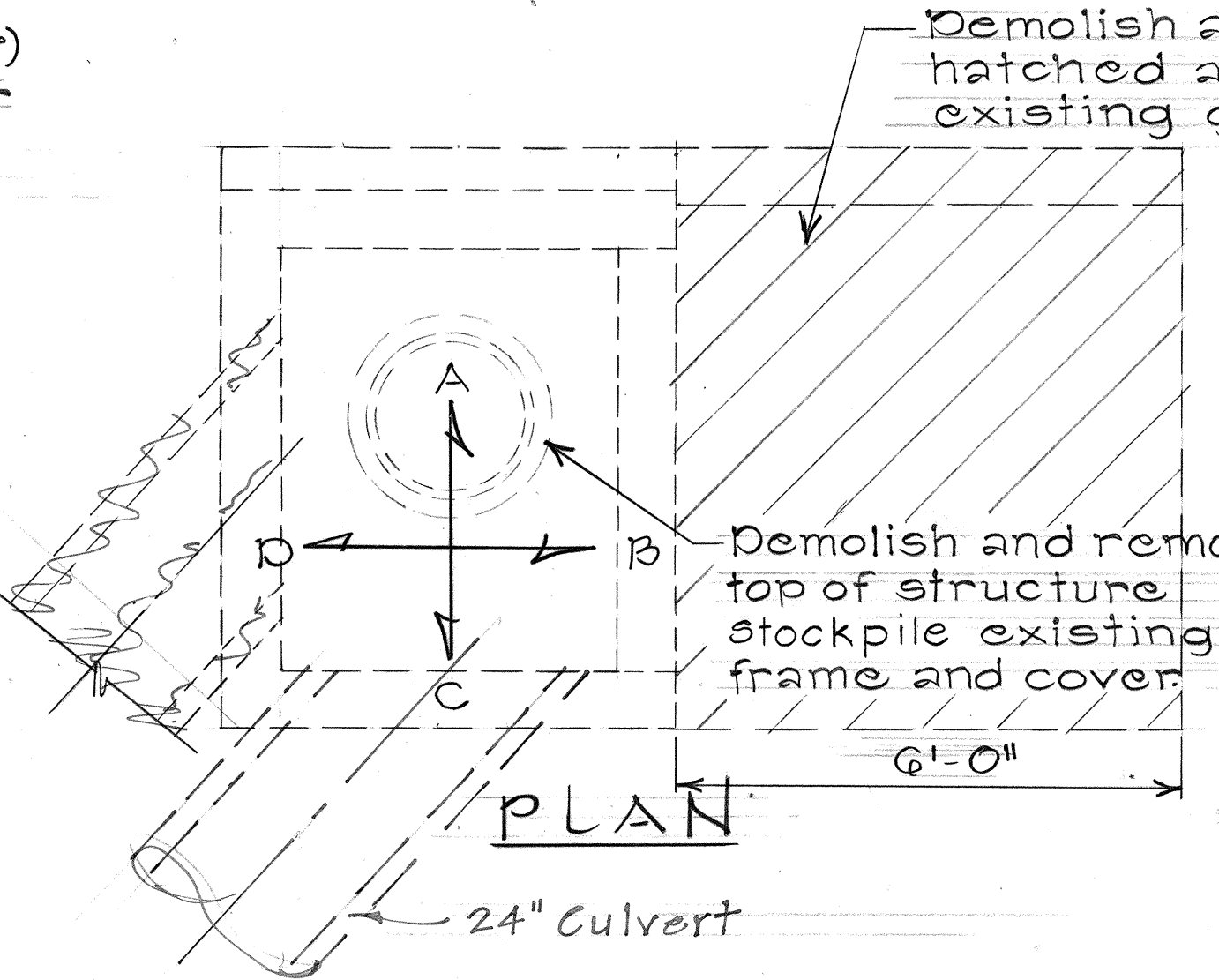
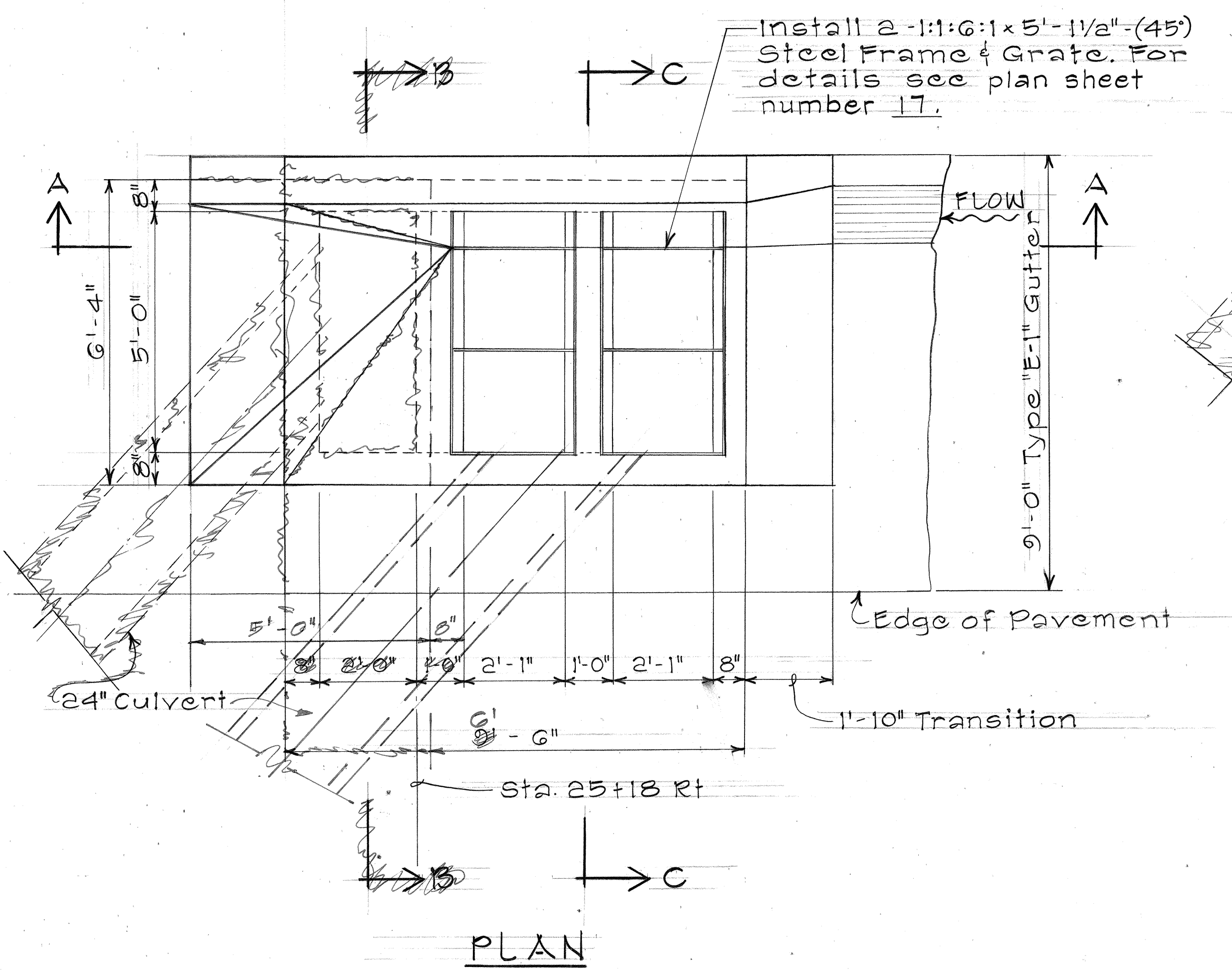


Note: The materials and construction requirements for pavement restoration shall conform to the applicable sections of the Standard Specifications. Payment for pavement restoration and other improvements shall be considered incidental to the various contract items.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
TYPE "A-9" C.D.I. @ STA. 166+00
RTE 63: LIKELIKE HIGHWAY
PROJ. NO. HES-063-1(13)
Scale: As Noted Date: Aug 1979
SHEET NO. 12 OF 18 SHEETS

SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
QUANTITIES BY	
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ORIGINAL PLAN	
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No.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HE3-063-1(B)	1979	15	20



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS

TYPE "E" C.B. @ STA 25+18 RT.

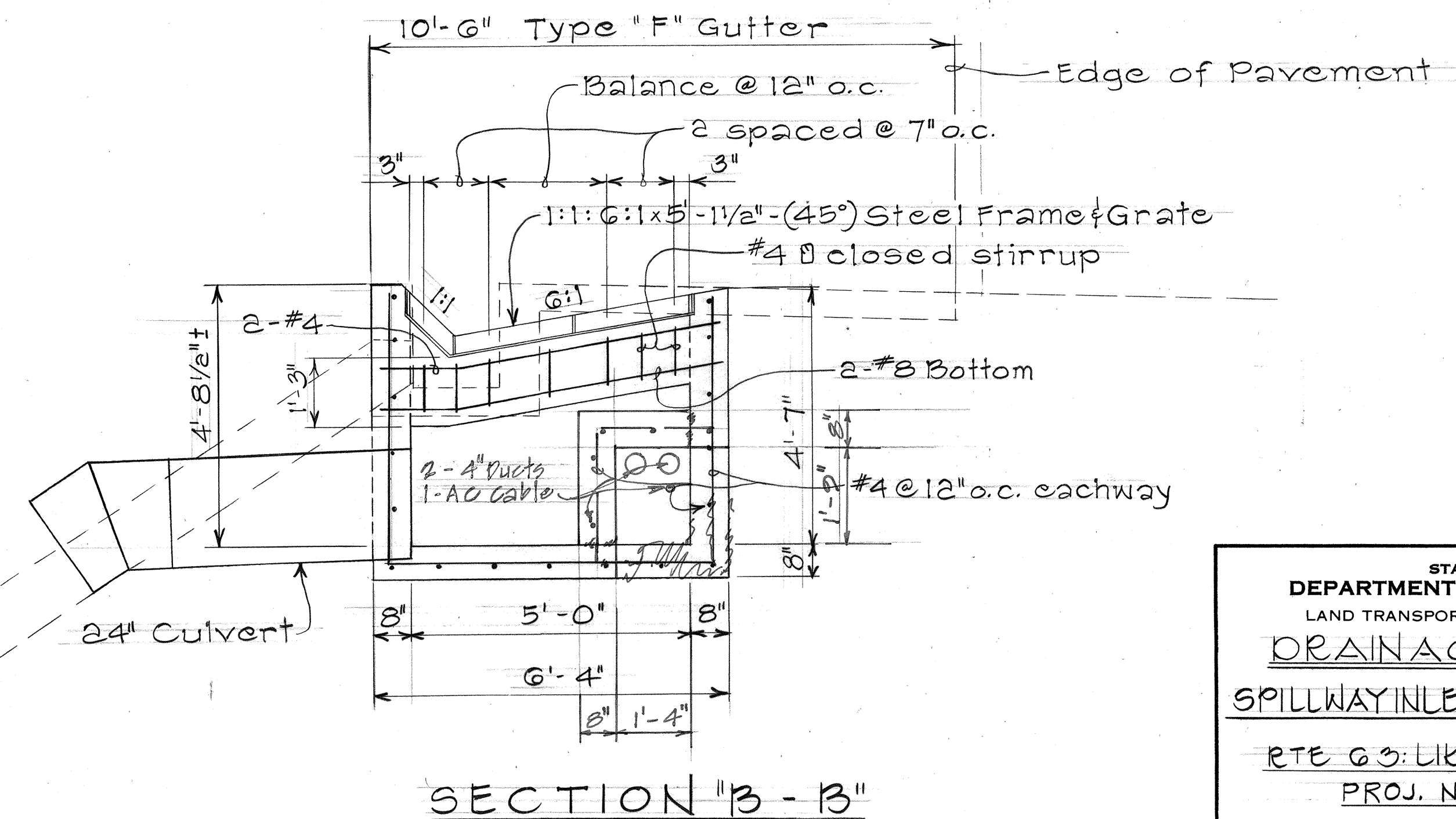
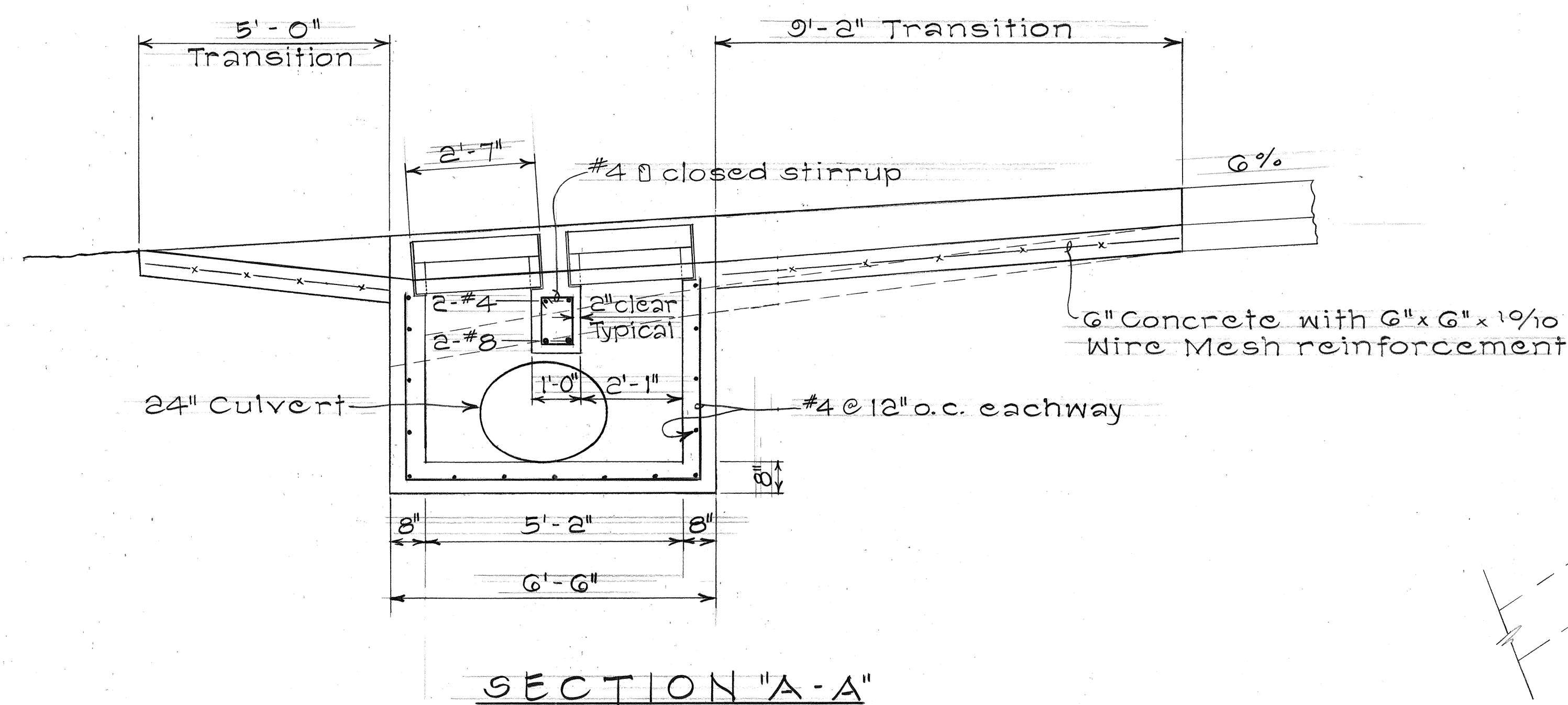
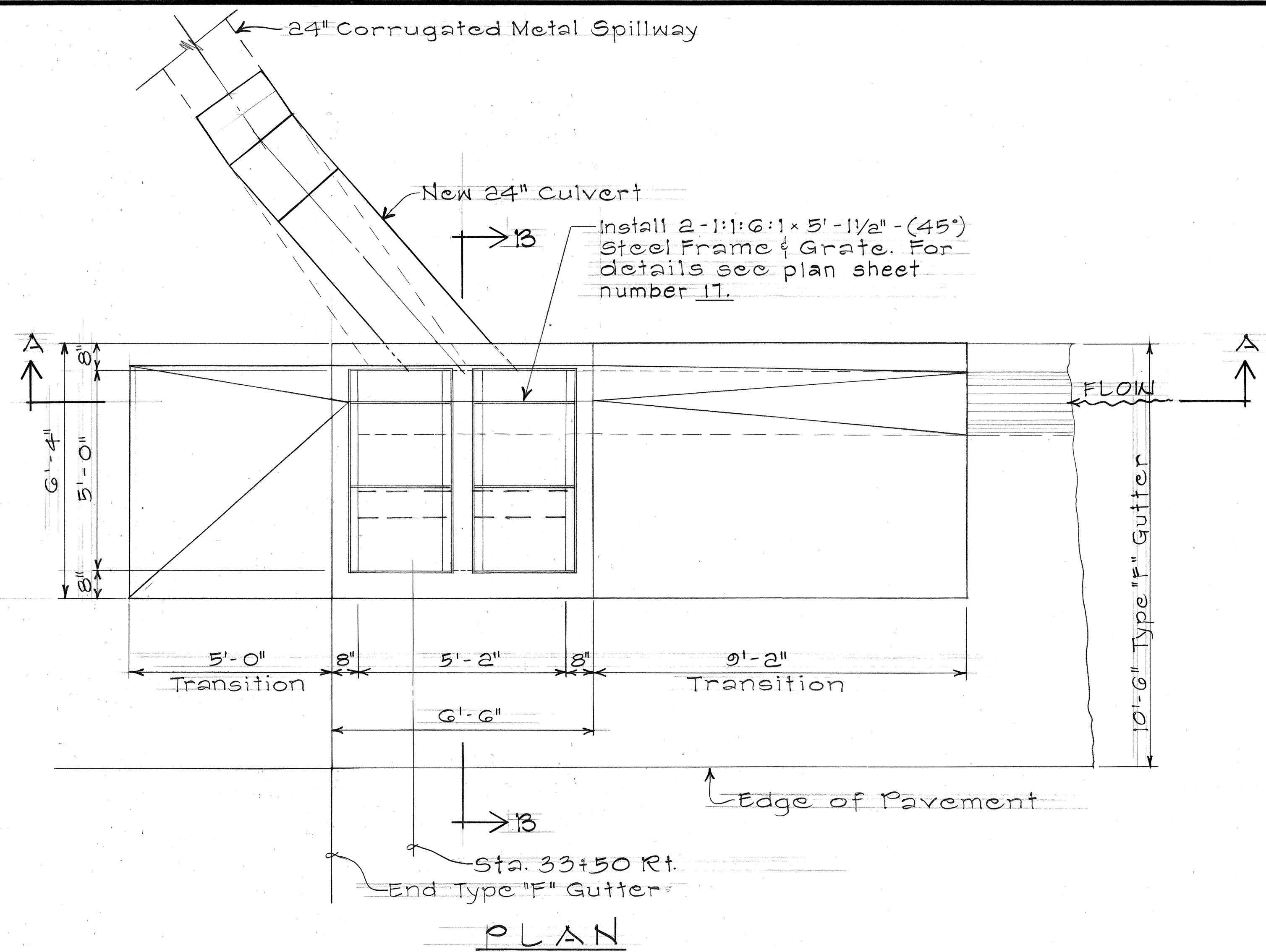
RTE 63: LIKELIKE HIGHWAY

PROJ. NO. HE3-063-1(13)

Scale: 1/2" = 1'-0" Date: Aug 1979

SHEET NO. 13 OF 18 SHEETS

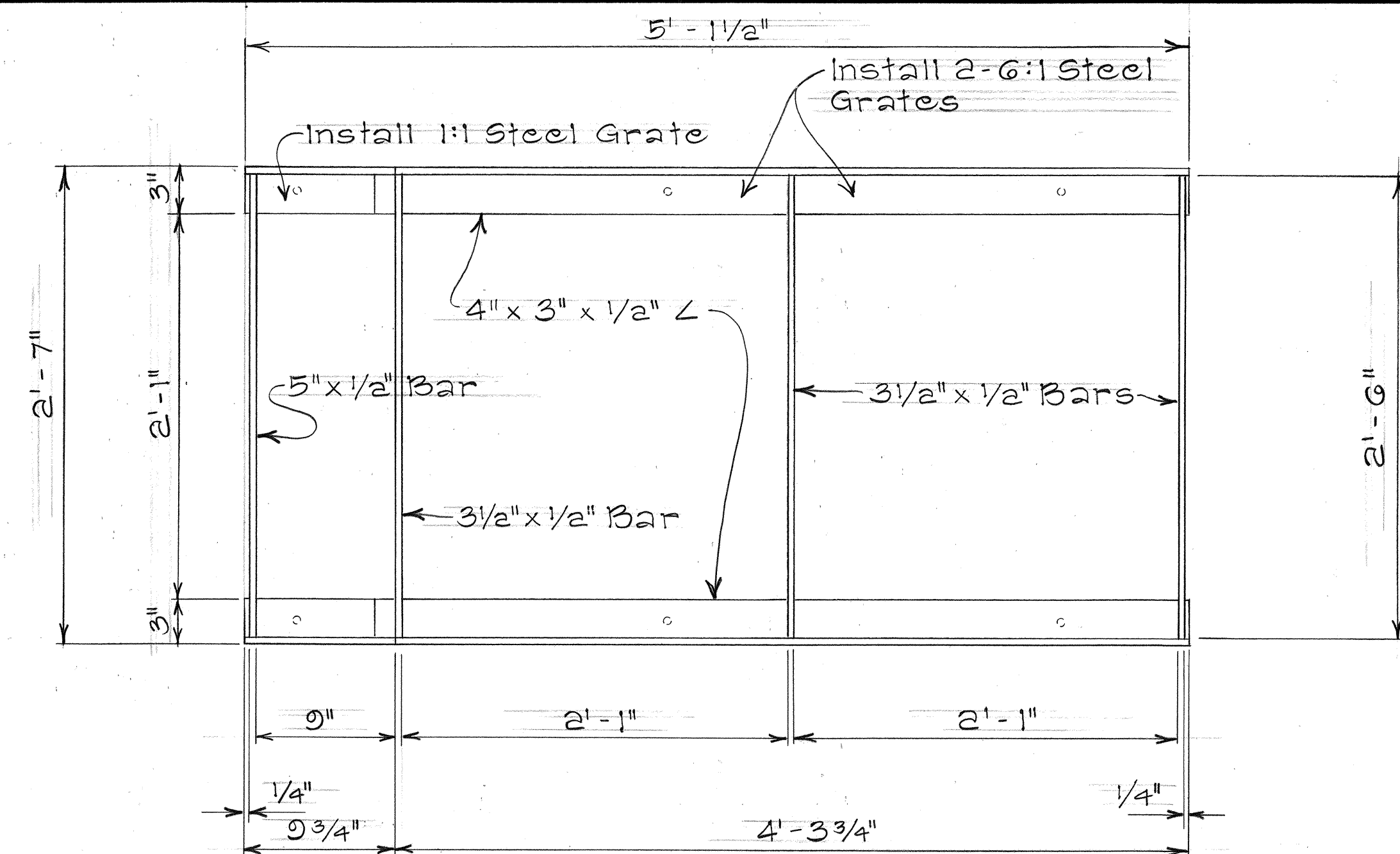
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-063-1(13)	1979	16	20



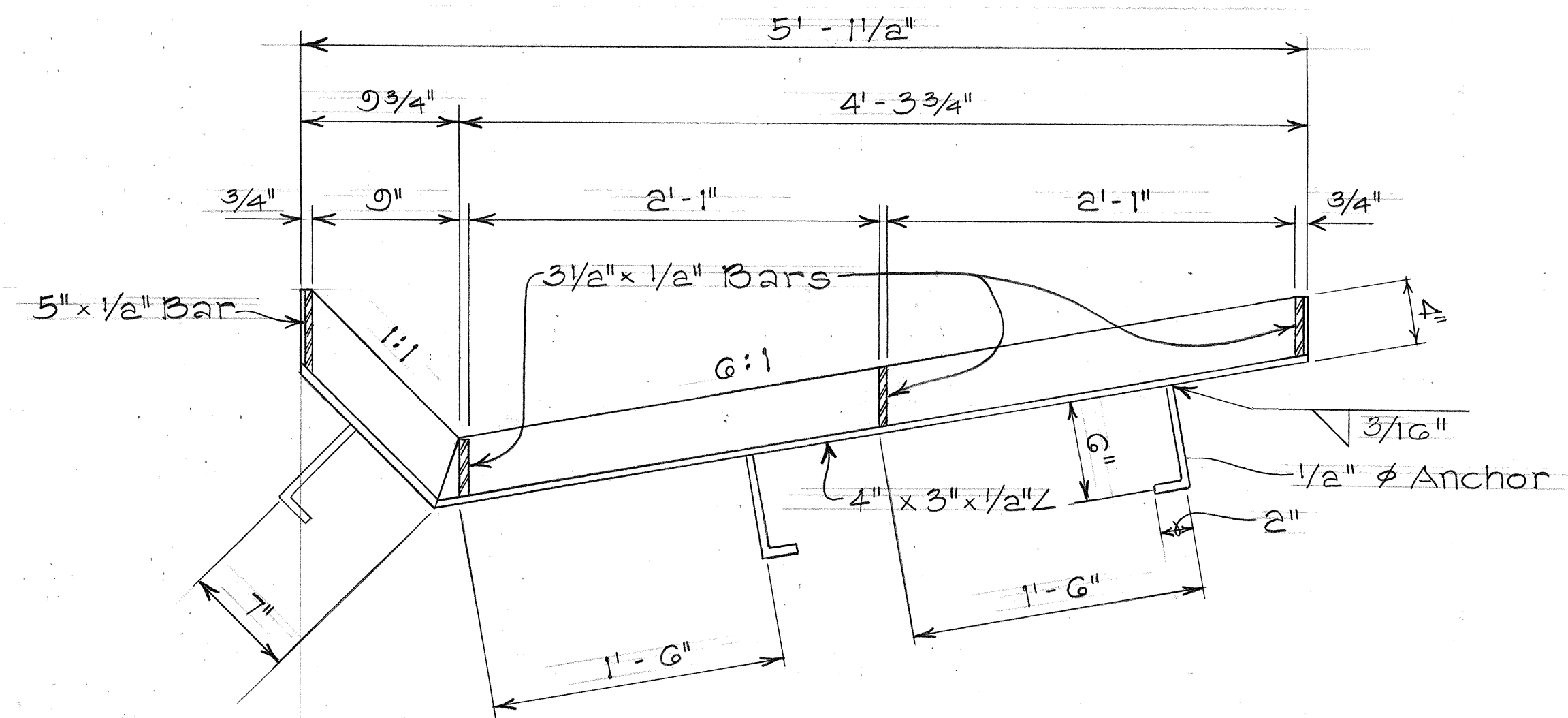
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
SPILLWAY INLET @ STA 33+50 RT.
RTE 63: LIKELIKE HIGHWAY
PROJ. NO. HES-063-1(13)
Scale: 1/2" = 1'-0" Date: Aug 1979
SHEET NO. 14 OF 18 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-063-1(13)	1979	17	20



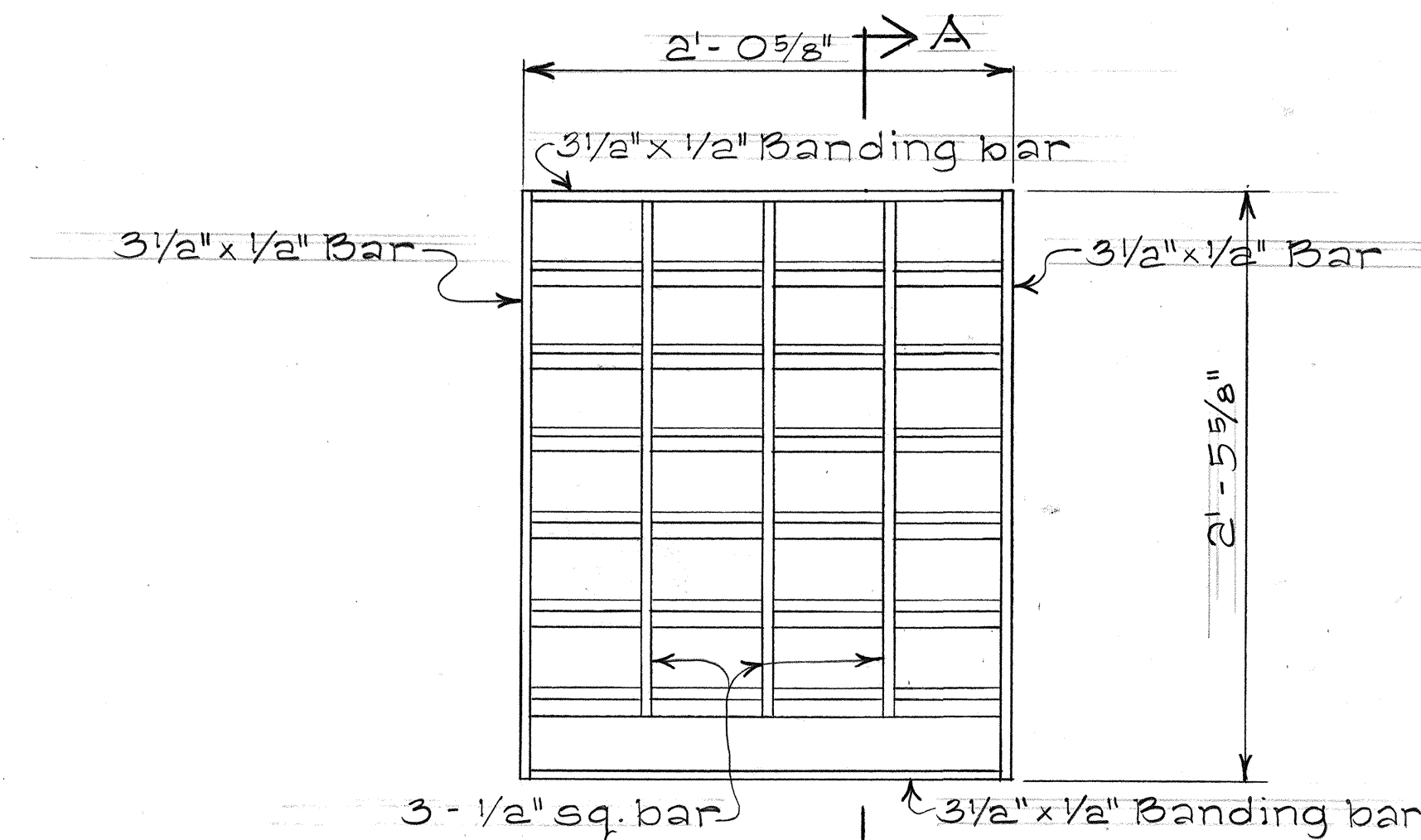
PLAN



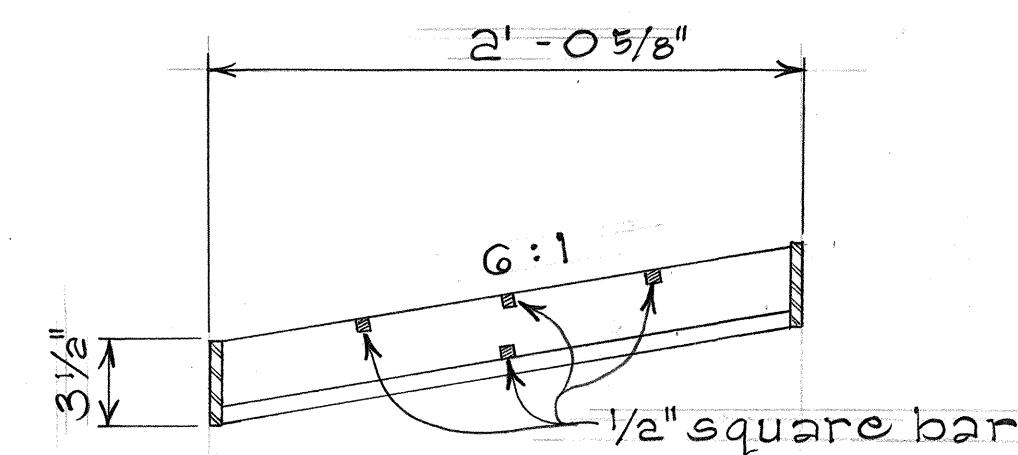
CROSS SECTION
FRAME DETAILS

GENERAL NOTES:

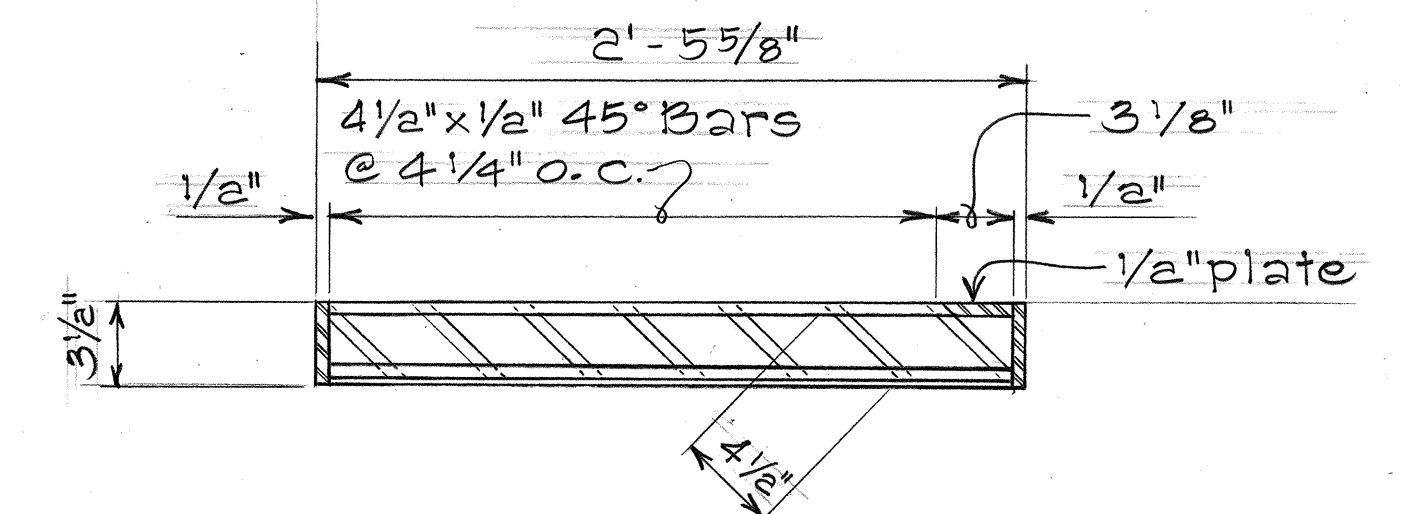
1. Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
2. All welds 3/8" unless otherwise noted.
3. The Frame & Grate materials shall conform to the specifications of ASTM Designation Structural Steel A283, Grade D and the Standard Specifications.



PLAN

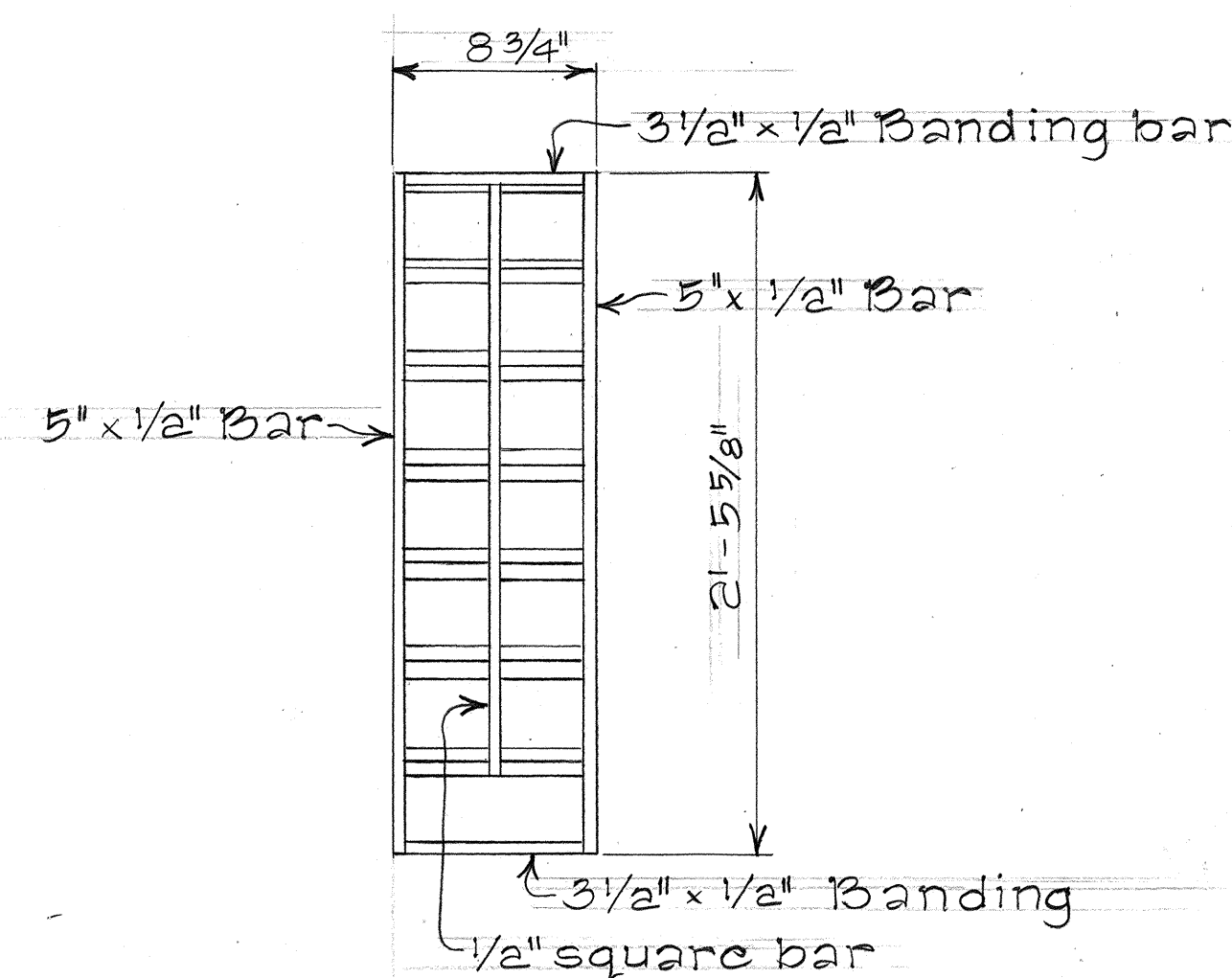


CROSS SECTION

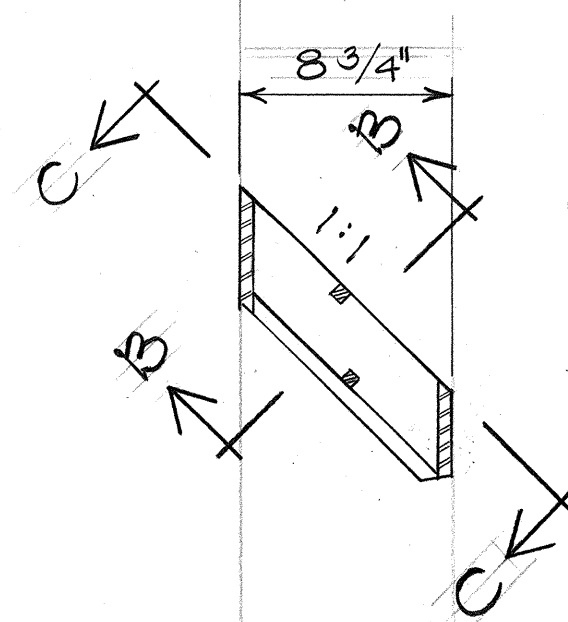


SECTION "A-A"

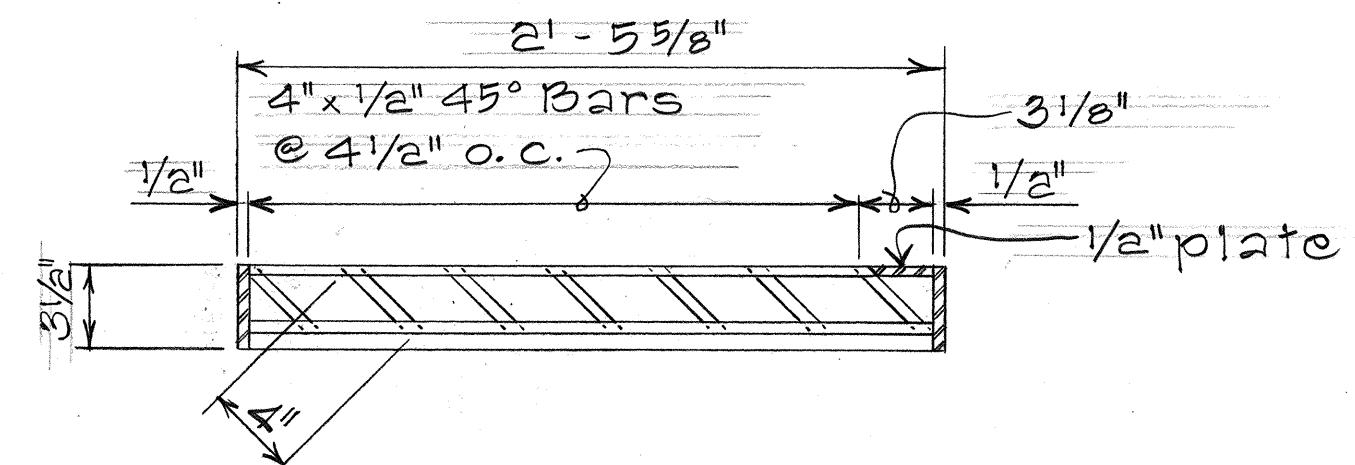
6:1 GRATE DETAILS



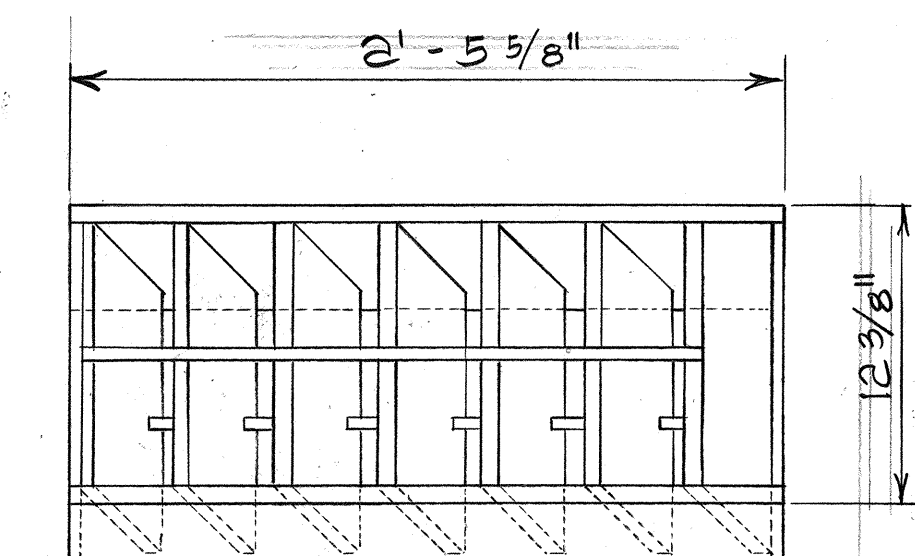
PLAN



CROSS SECTION



SECTION "B-B"

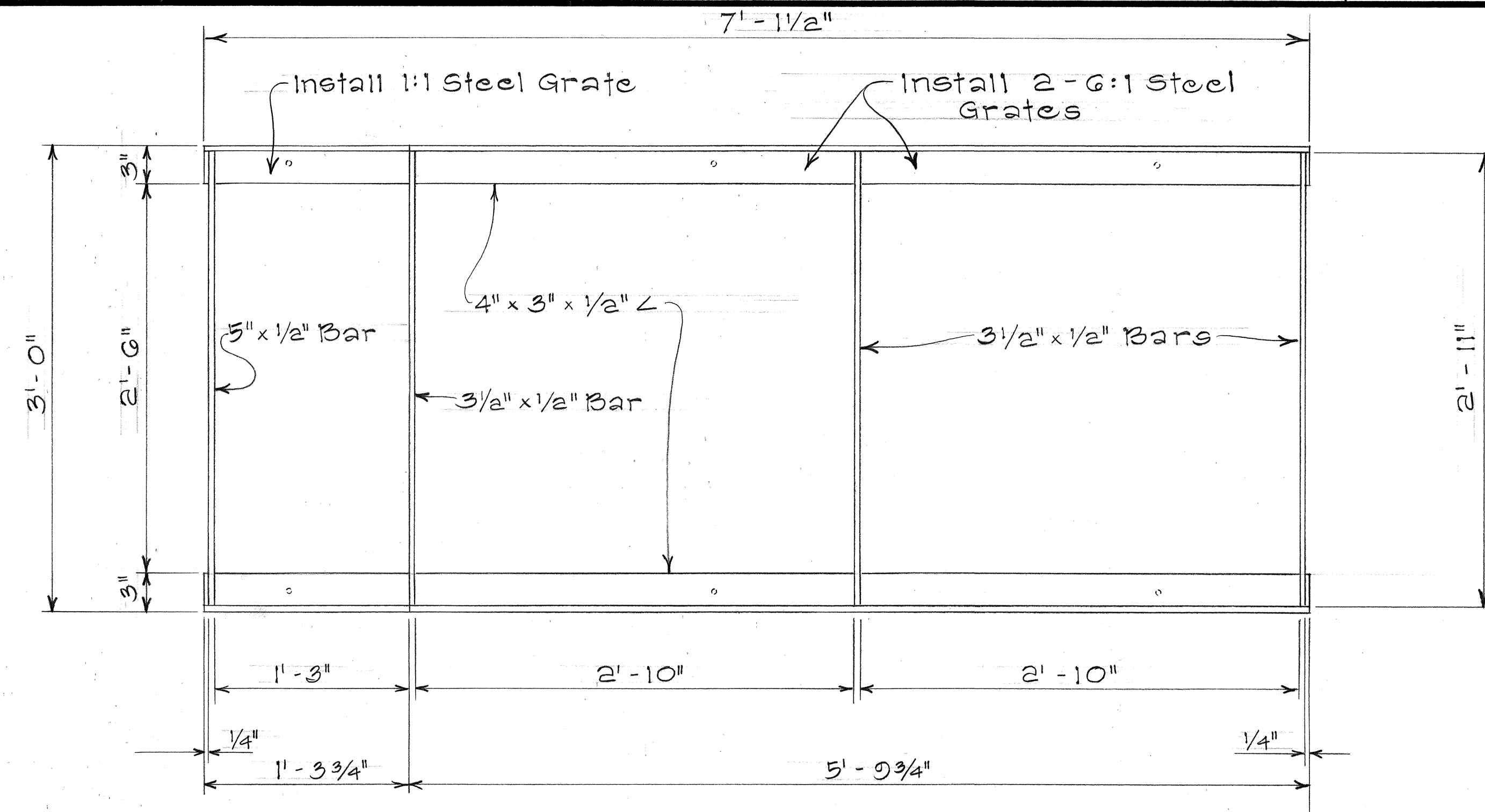


SECTION "C-C"

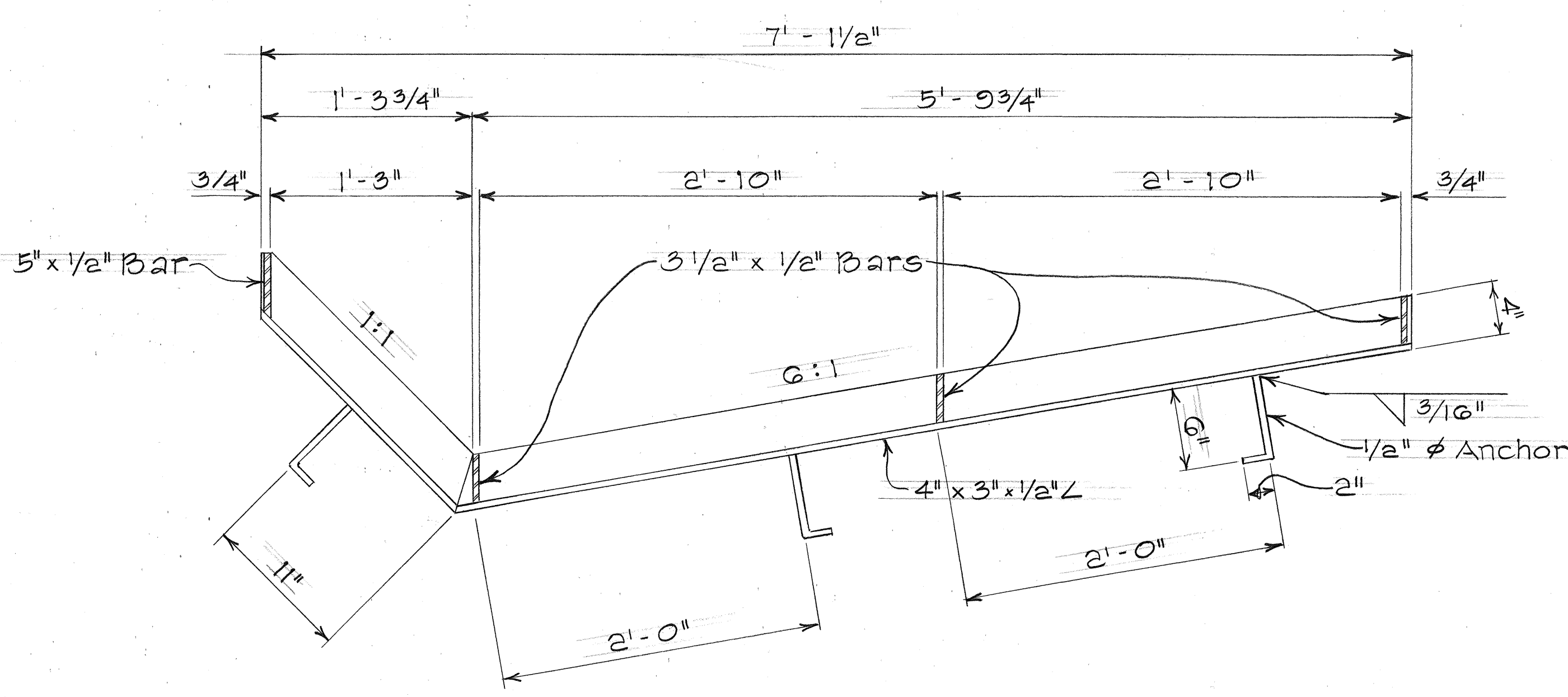
1:1 GRATE DETAILS

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION					
DRAINAGE DETAILS					
1:1 6:1 x 5'-1 1/2" STEEL FRAME & GRATE					
RTE 63 LIKELIKE HIGHWAY					
PROJ. NO. HES-063-1(13)					
Scale: 1/2" = 1'-0" Date: Aug 1979					
SHEET NO. 15 OF 18 SHEETS					

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HE5-063-1(13)	1979	18	20



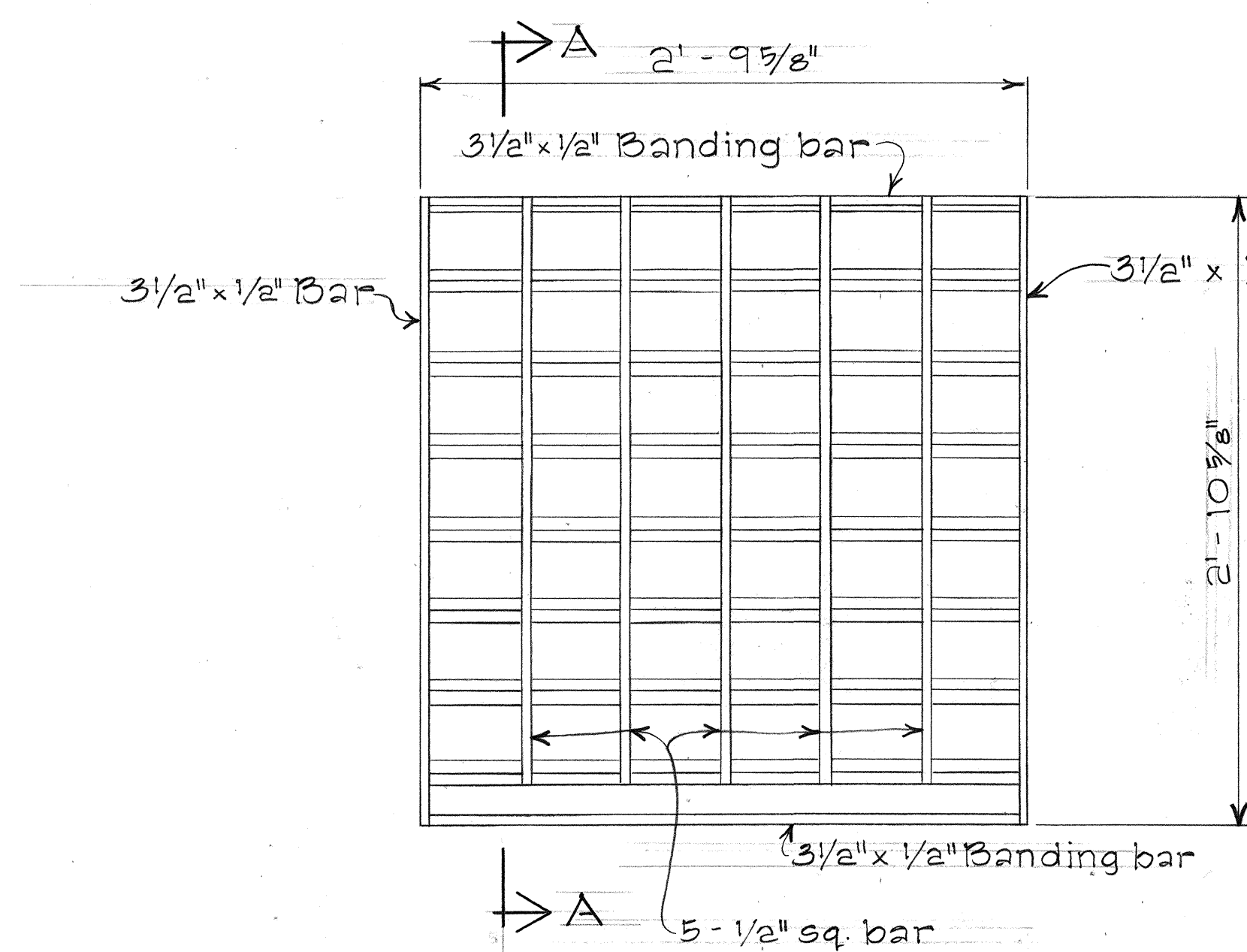
PLAN



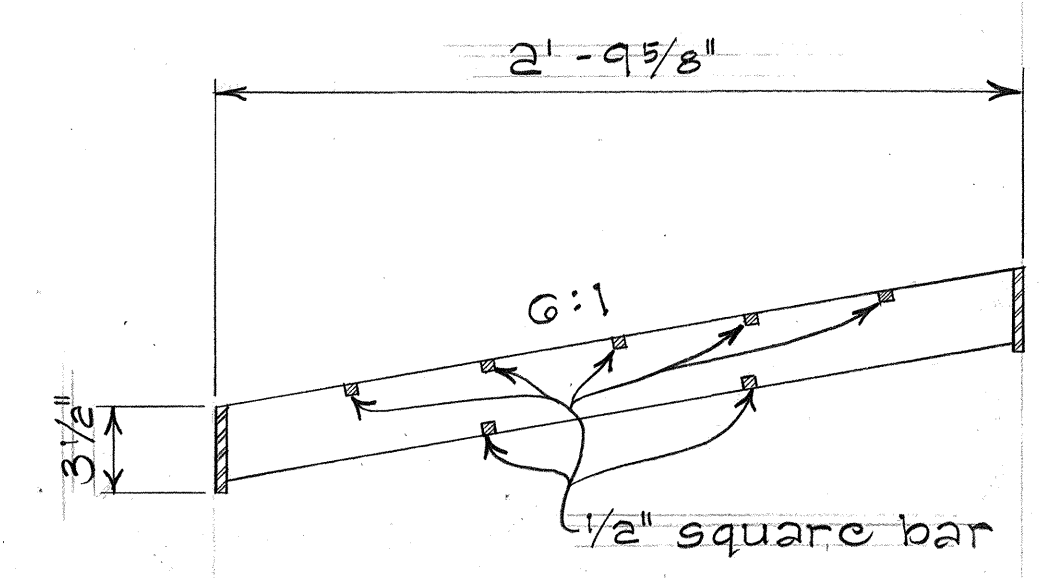
CROSS SECTION
FRAME DETAILS

GENERAL NOTES:

- Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
- All welds 3/8" unless otherwise noted.
- The Frame & Grate materials shall conform to the specifications of ASTM Designation Structural Steel A283, Grade D and the Standard Specifications.

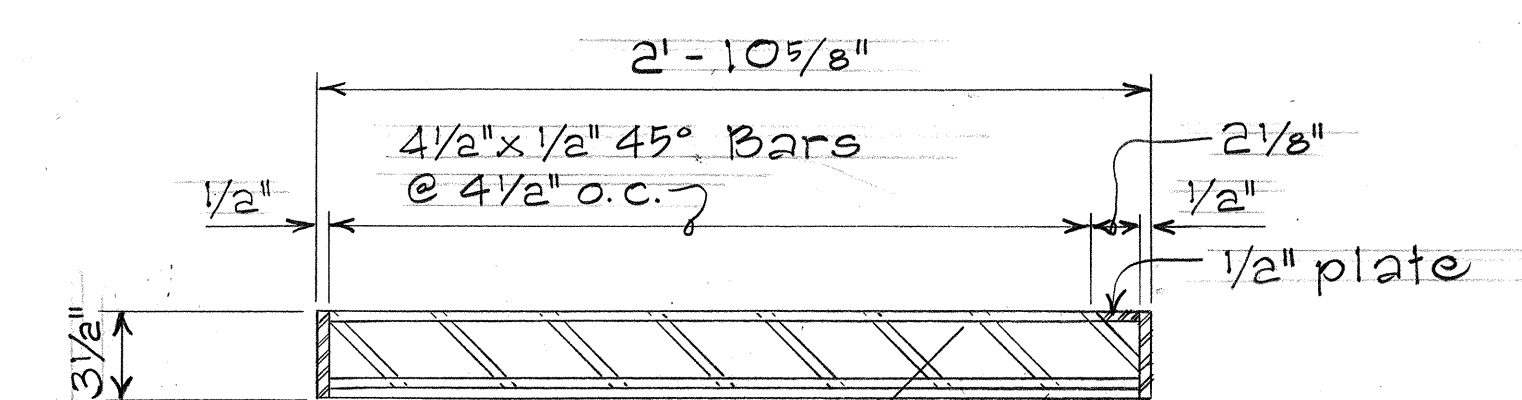


PLAN

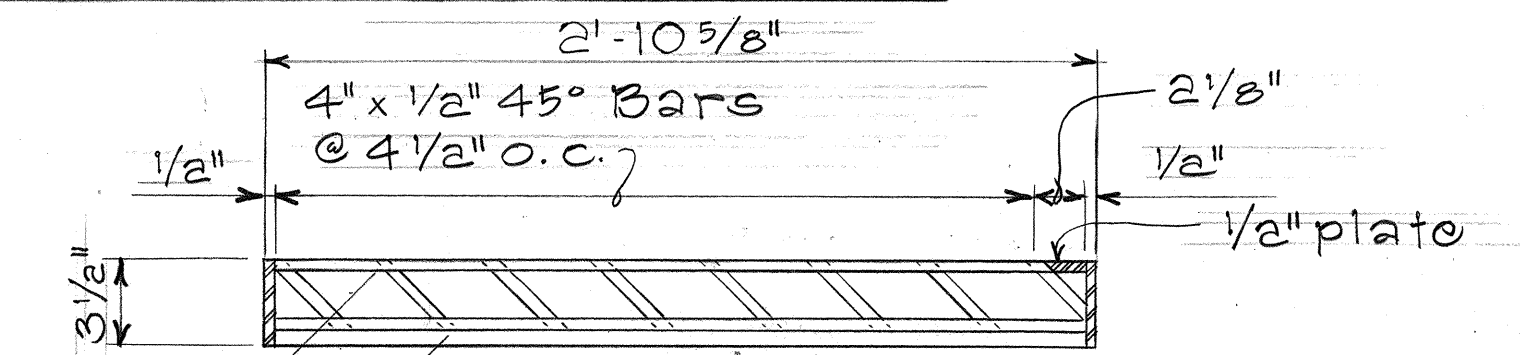


CROSS SECTION

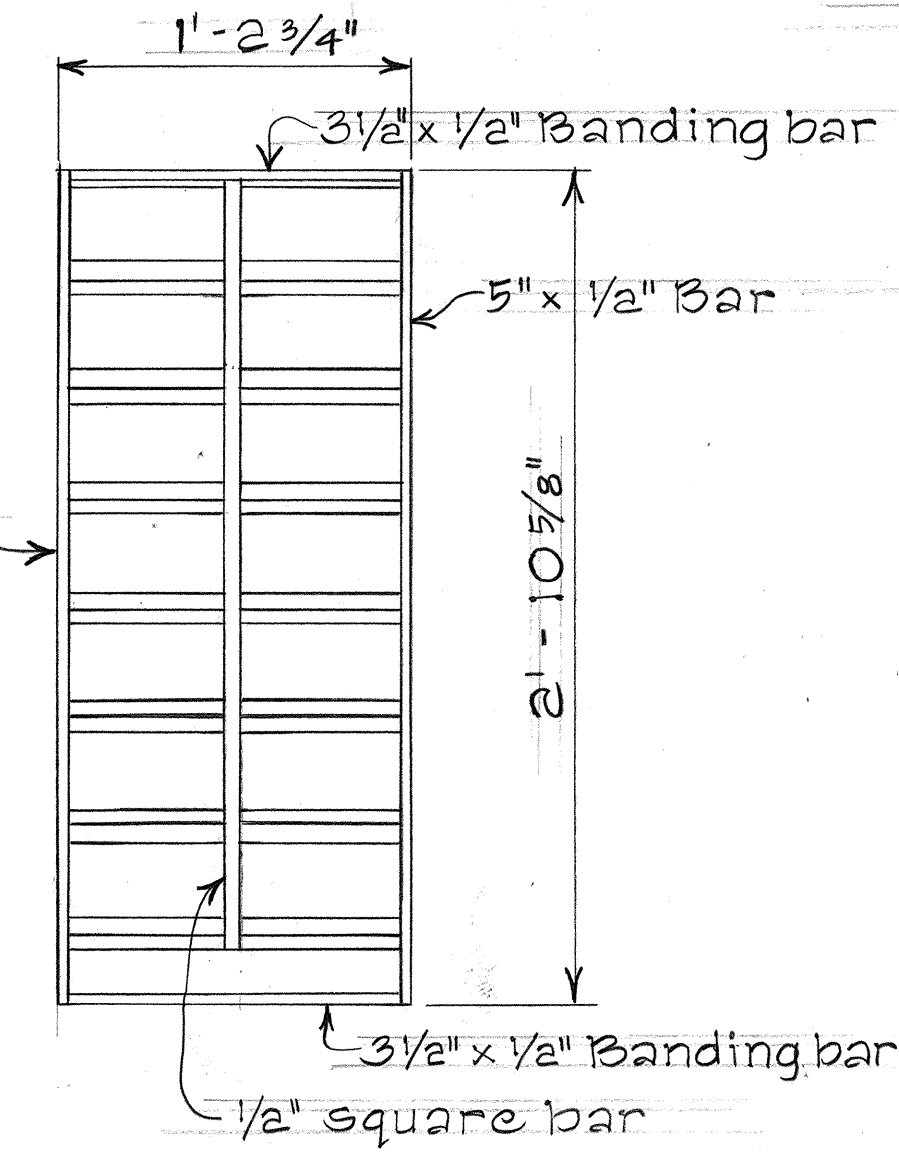
6:1 GRATE DETAILS



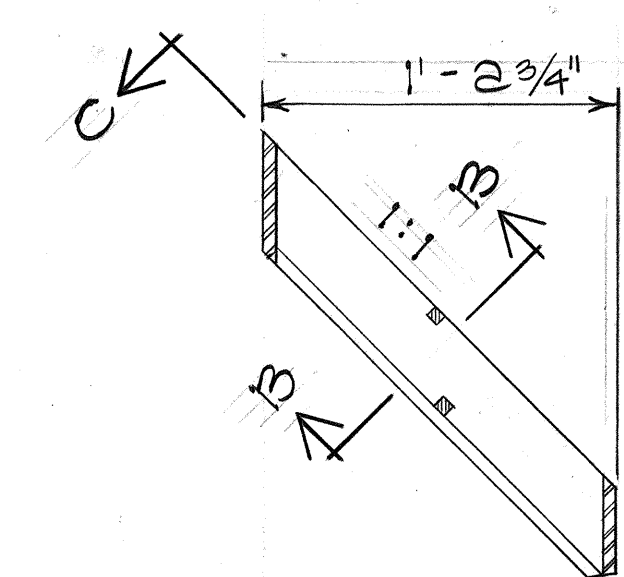
SECTION "A-A"



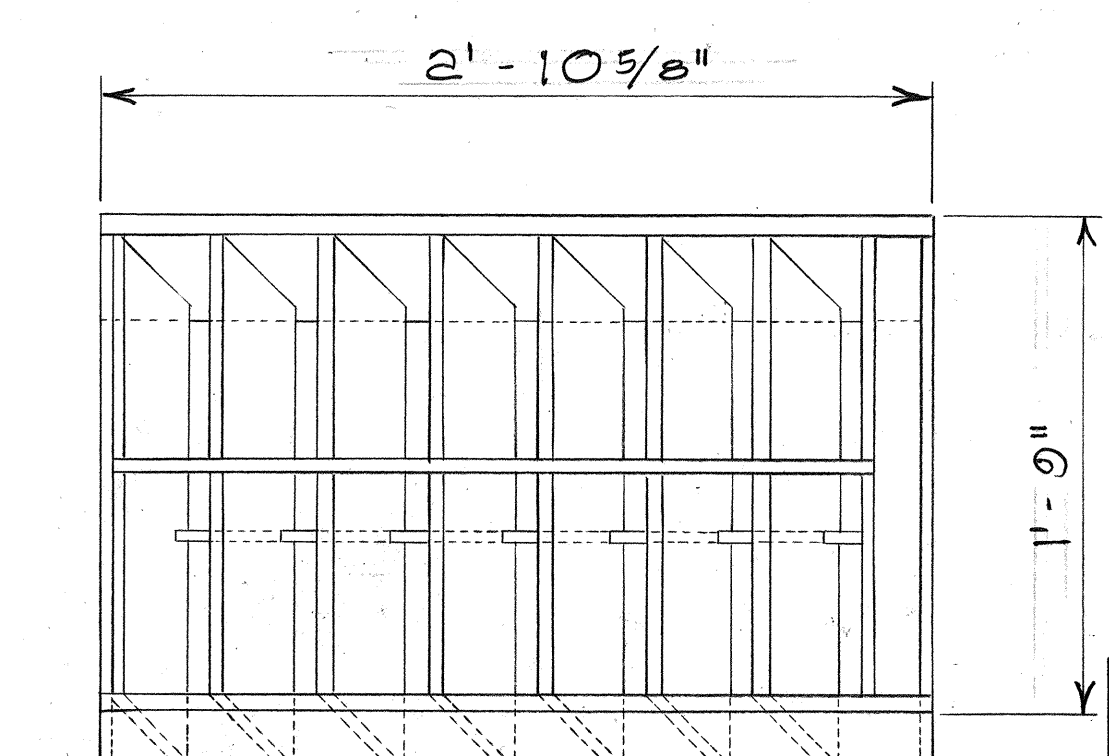
SECTION "B-B"



PLAN



CROSS SECTION

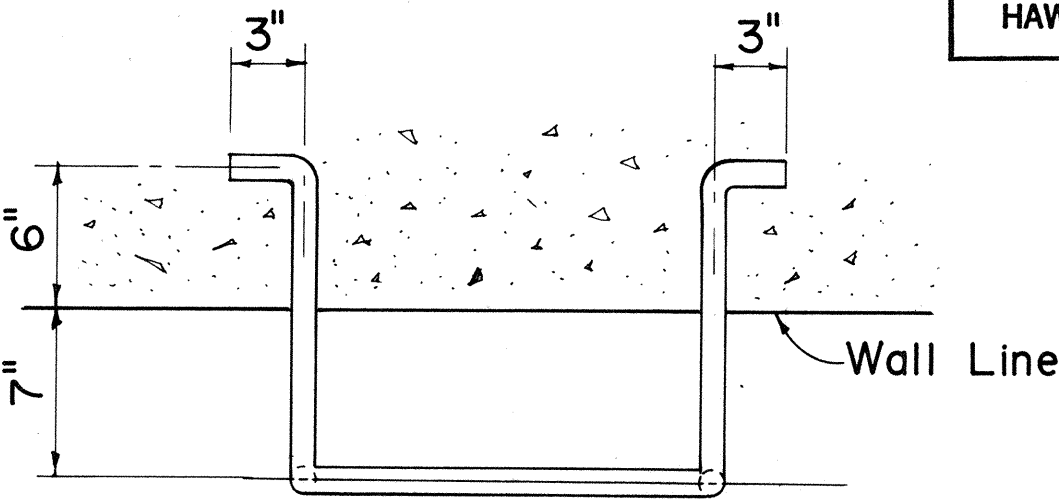


SECTION "C"

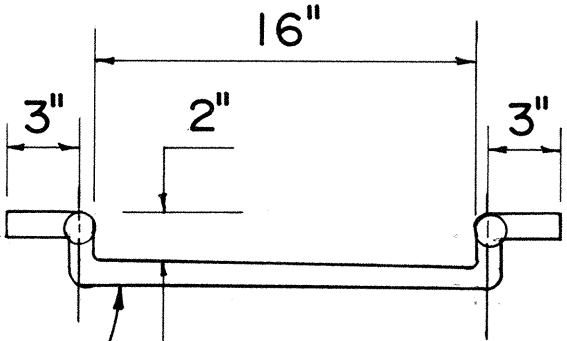
1:1 GRATE DETAILS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
1:1 6:1 x 7'-1 1/2" STEEL FRAME & GRATE
RTE 63: LIKELIKE HIGHWAY
PROJ. NO. HES-063-1(13)
Scale: 1/2" = 1'-0" Date: Aug 1979
SHEET NO. 18 OF 18 SHEETS

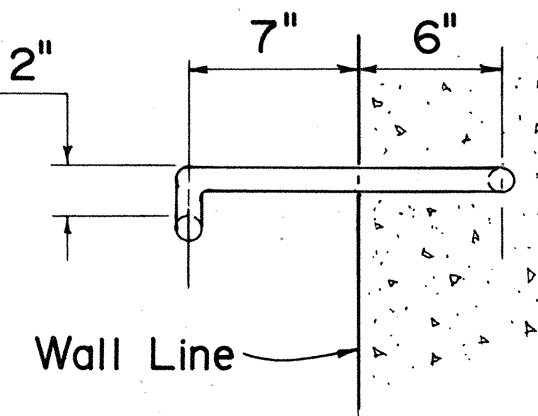
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HEB-063-1(13)	1979	19	20



PLAN

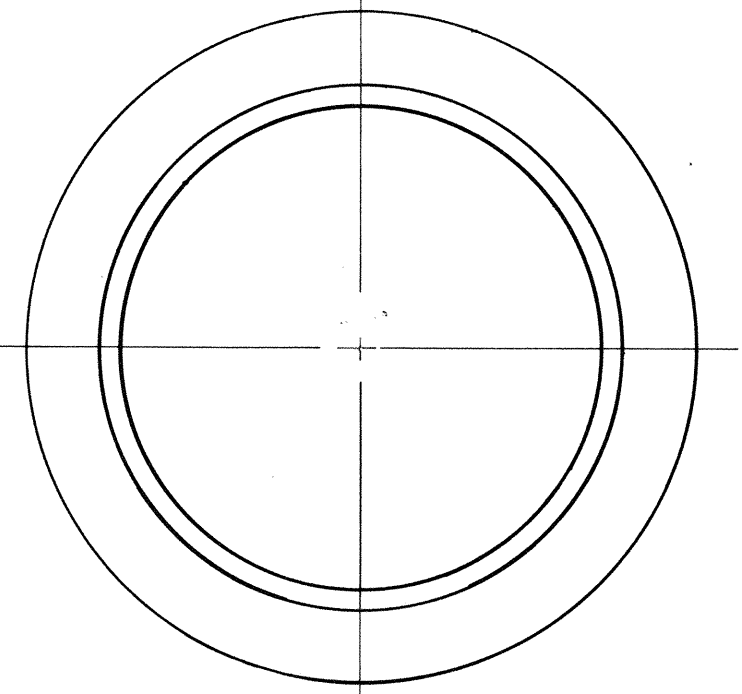


FRONT VIEW

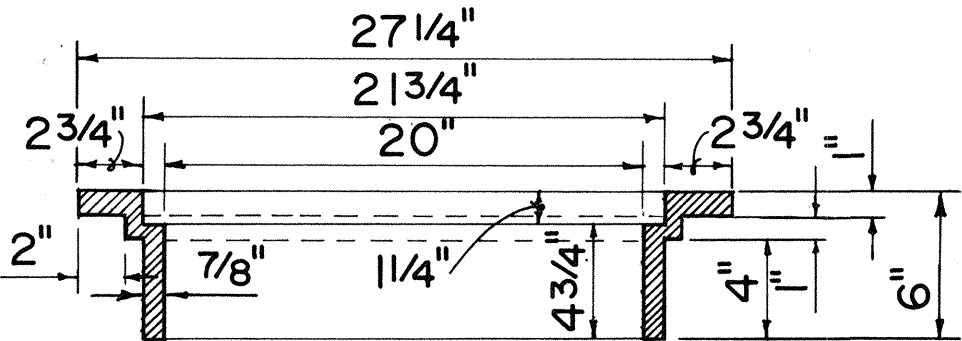


SIDE VIEW

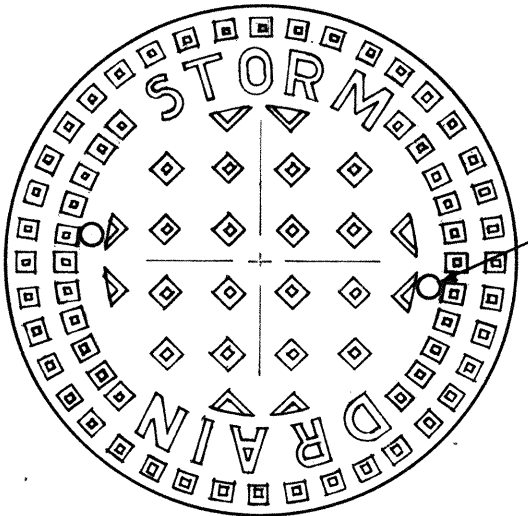
MANHOLE RUNG



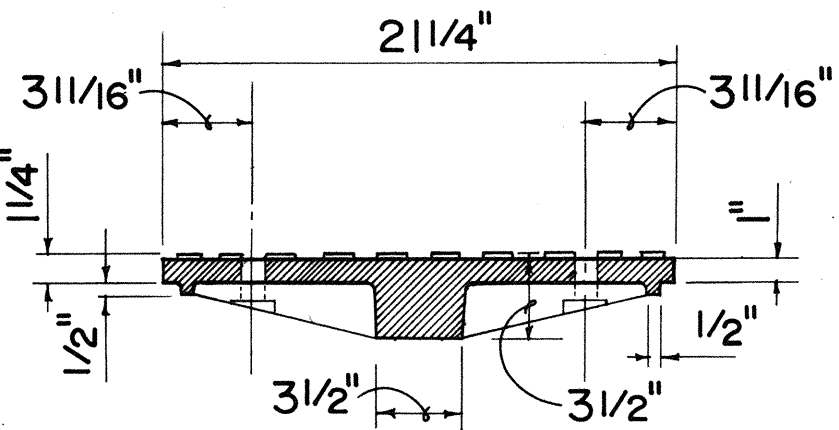
PLAN OF FRAME



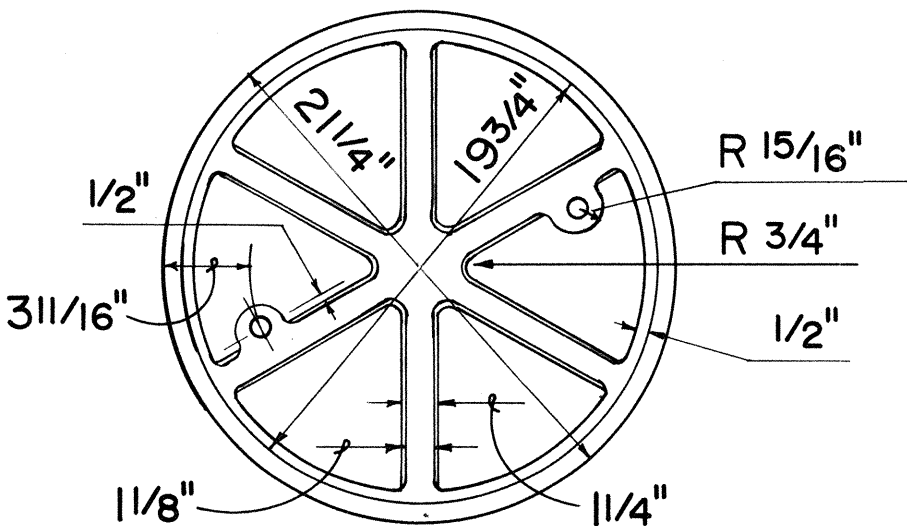
SECTION OF FRAME



TOP VIEW OF COVER

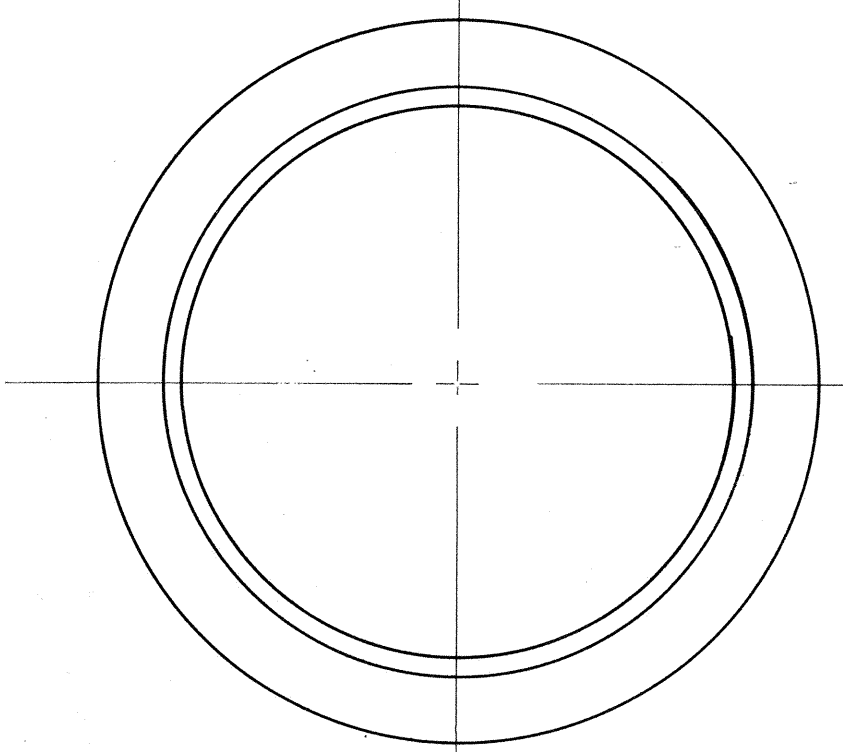


SECTION

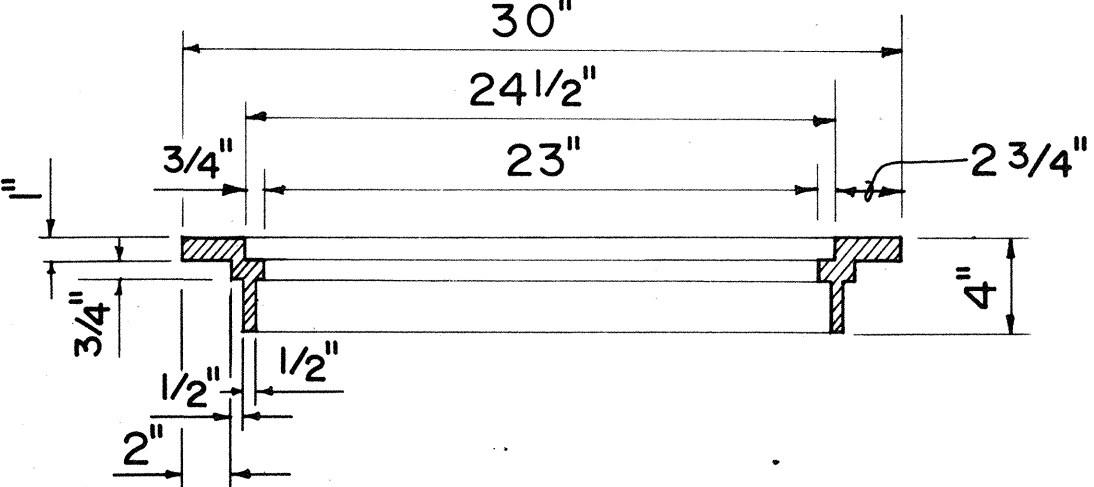


BOTTOM VIEW OF COVER

TYPE "A" CAST IRON
FRAME AND COVER



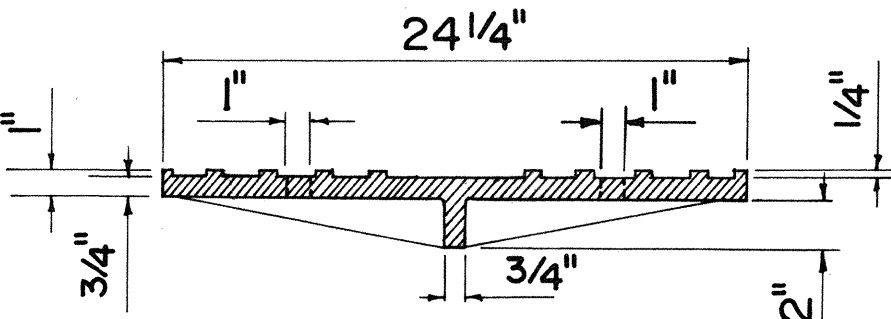
PLAN OF FRAME



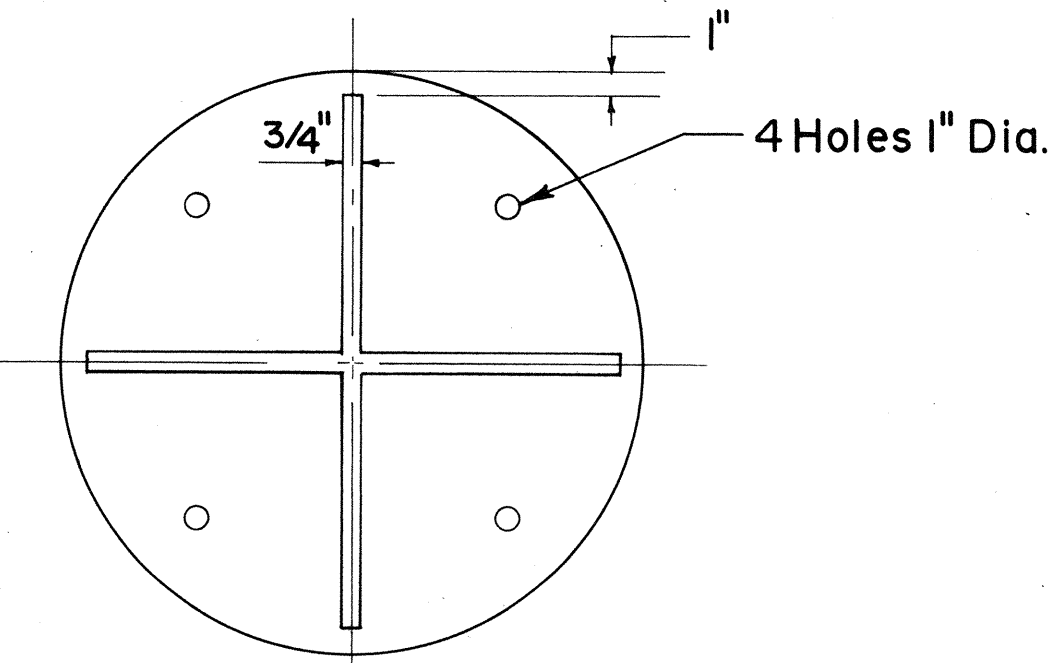
SECTION OF FRAME



TOP VIEW OF COVER

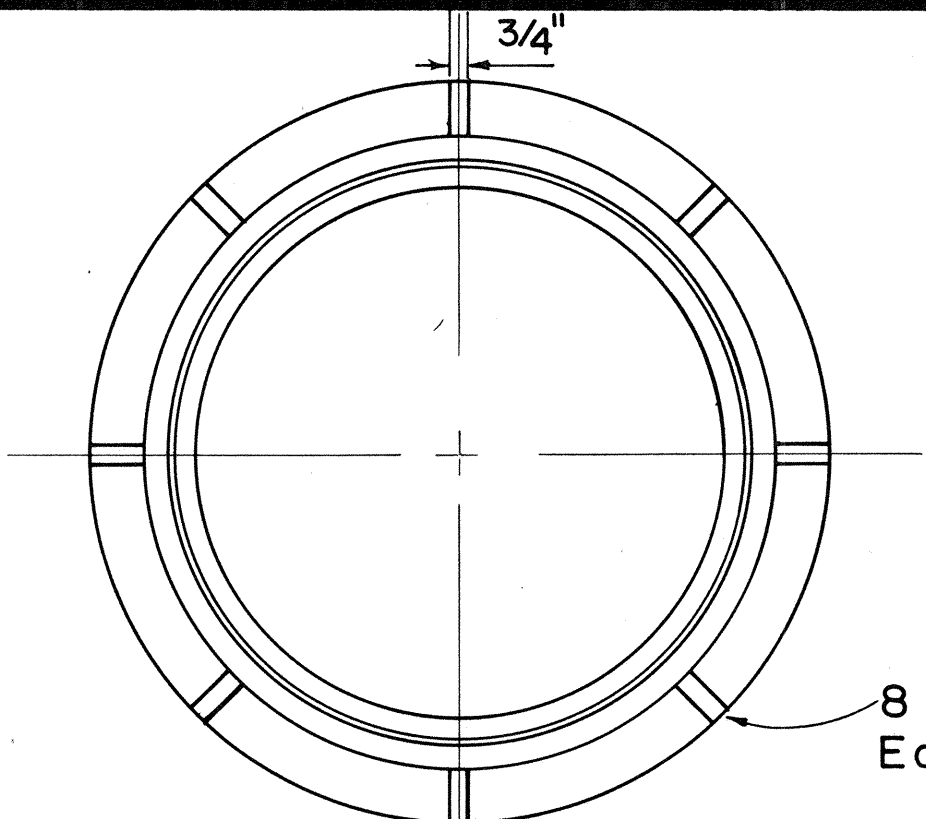


SECTION

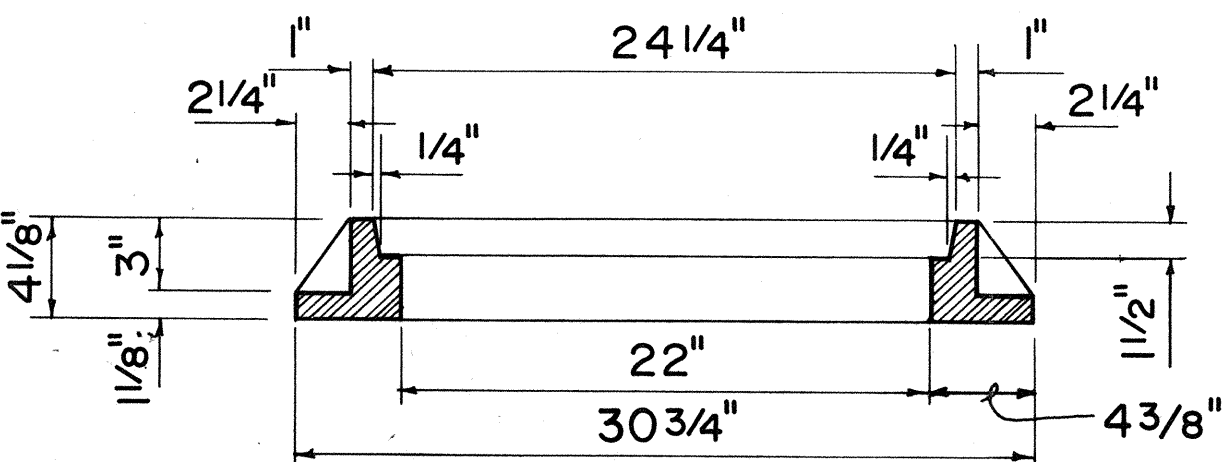


BOTTOM VIEW OF COVER

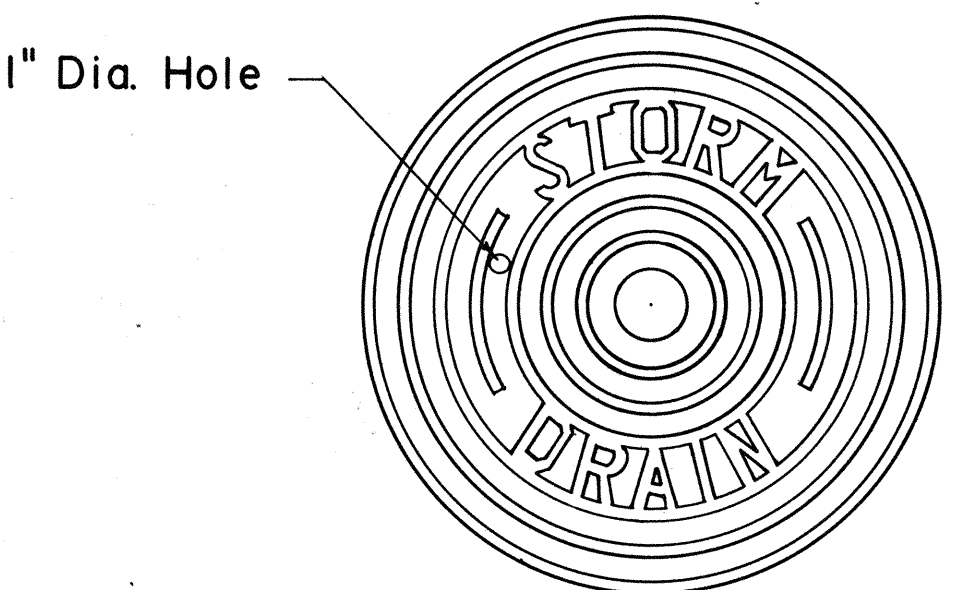
TYPE "B" CAST IRON
FRAME AND COVER



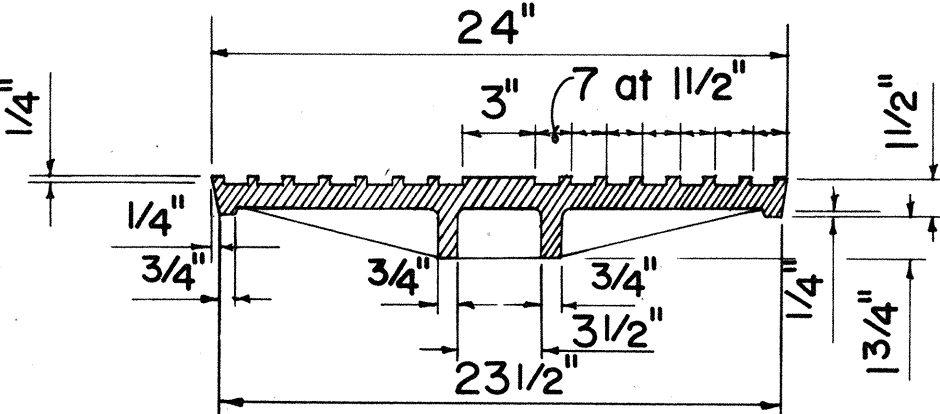
PLAN OF FRAME



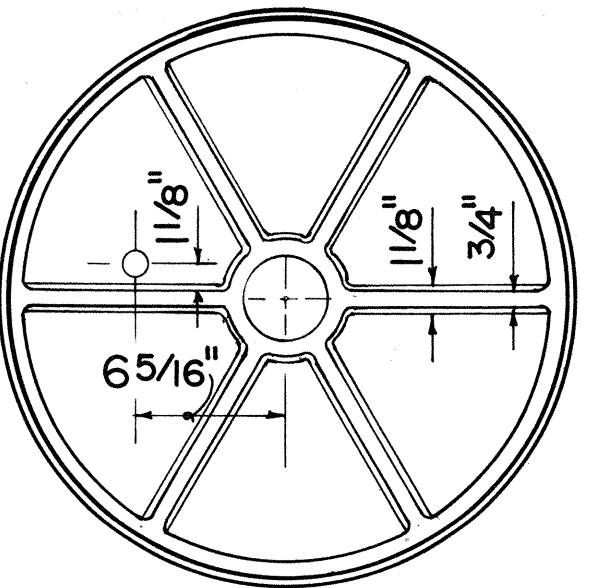
SECTION OF FRAME



TOP VIEW OF COVER



SECTION



BOTTOM VIEW OF COVER

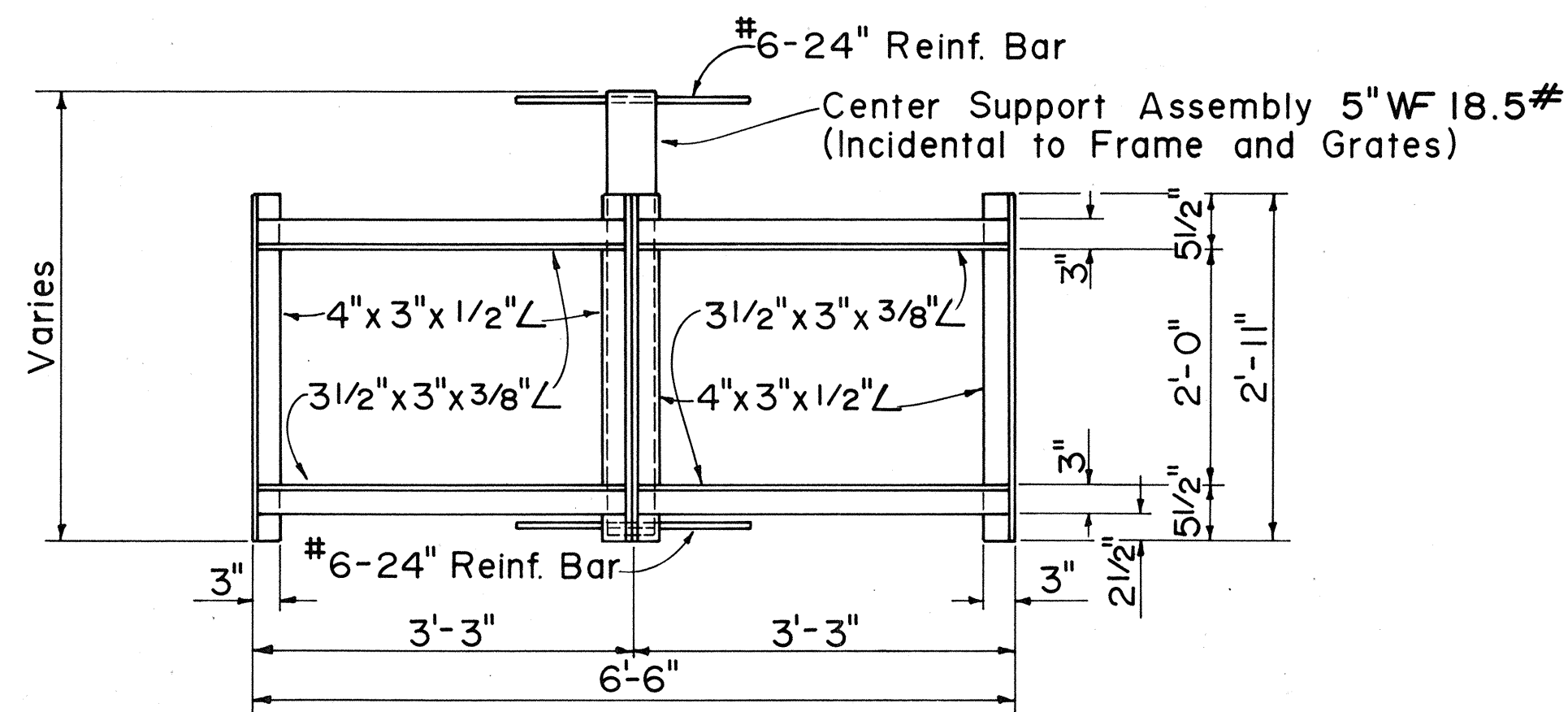
TYPE "P" CAST IRON
FRAME AND COVER

APPROVAL RECOMMENDED:
P. Takano 6-19-79
 HYDRAULIC DESIGN ENGINEER DATE
 APPROVED:
Harold Zalewski 6-22-79
 ASSISTANT CHIEF, ENGINEERING DATE

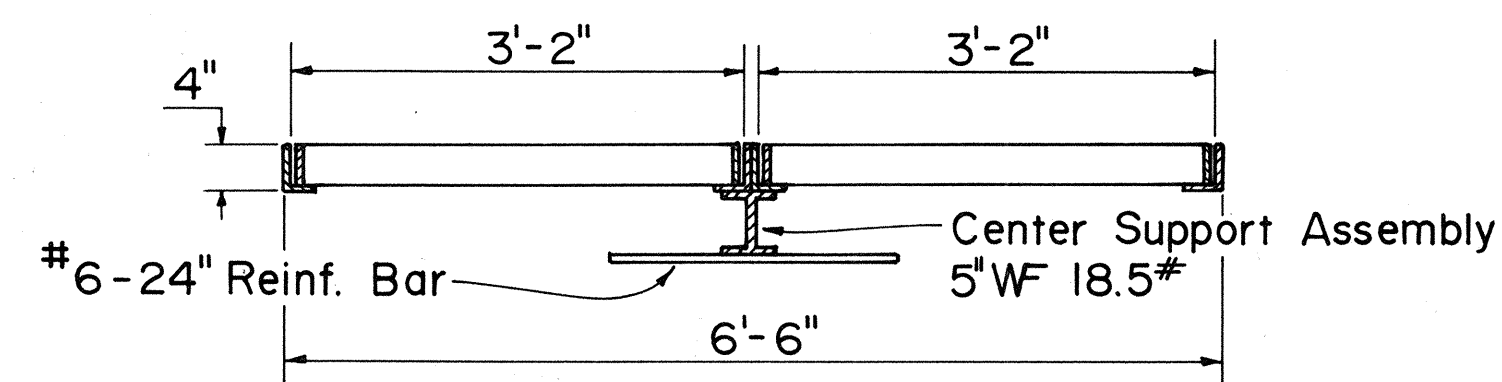
NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 6 approved 12-17-69	H.F.	6/22/79

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION
STANDARD DETAILS CATCH BASIN AND MANHOLE CASTINGS
Not To Scale Date: Dec. 1977
SHEET NO. 17 OF 18 SHEETS DH 6

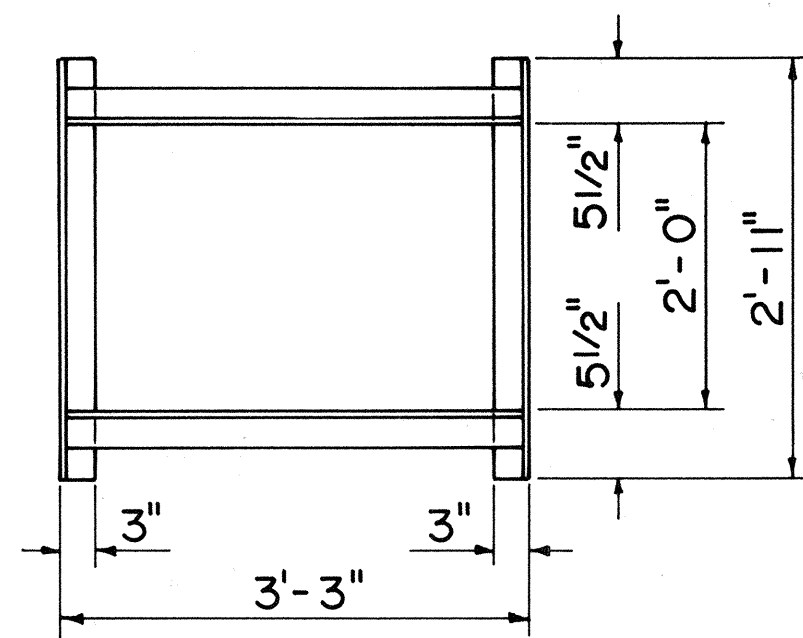
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-063-1(13)	1979	20	20



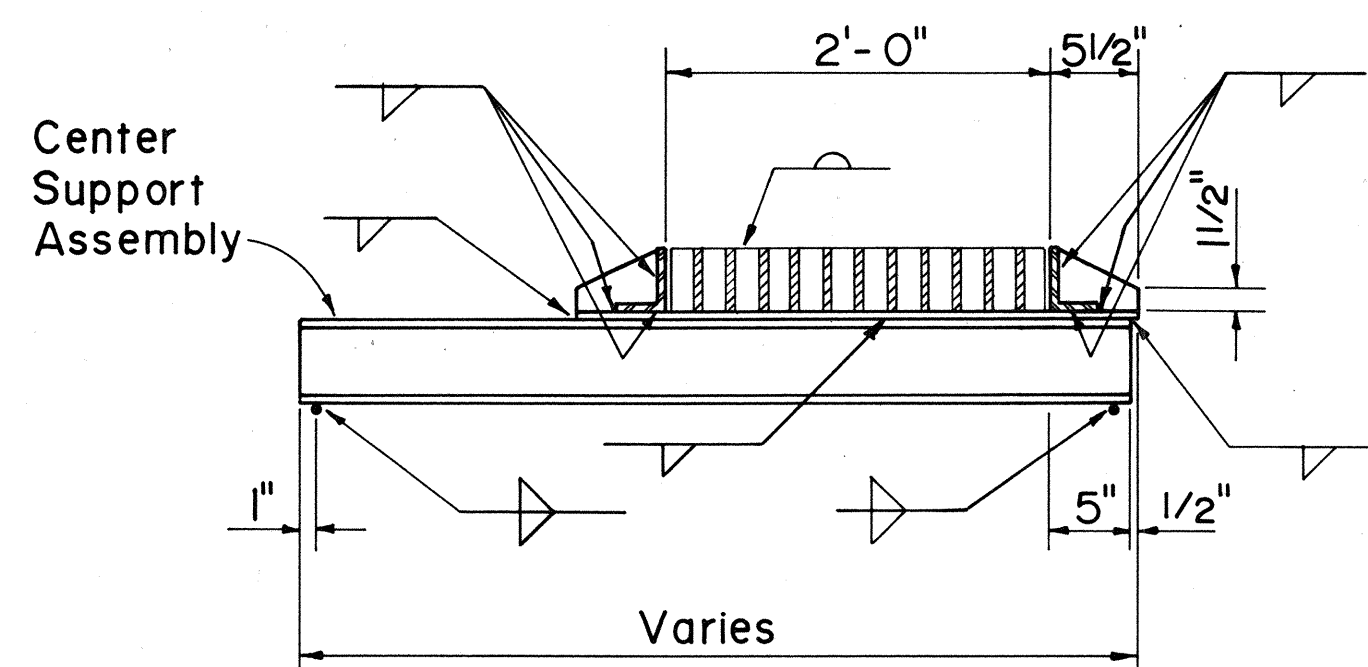
PLAN
(Two or More Grates)



LONGITUDINAL SECTION
(Thru Frame & Gate)

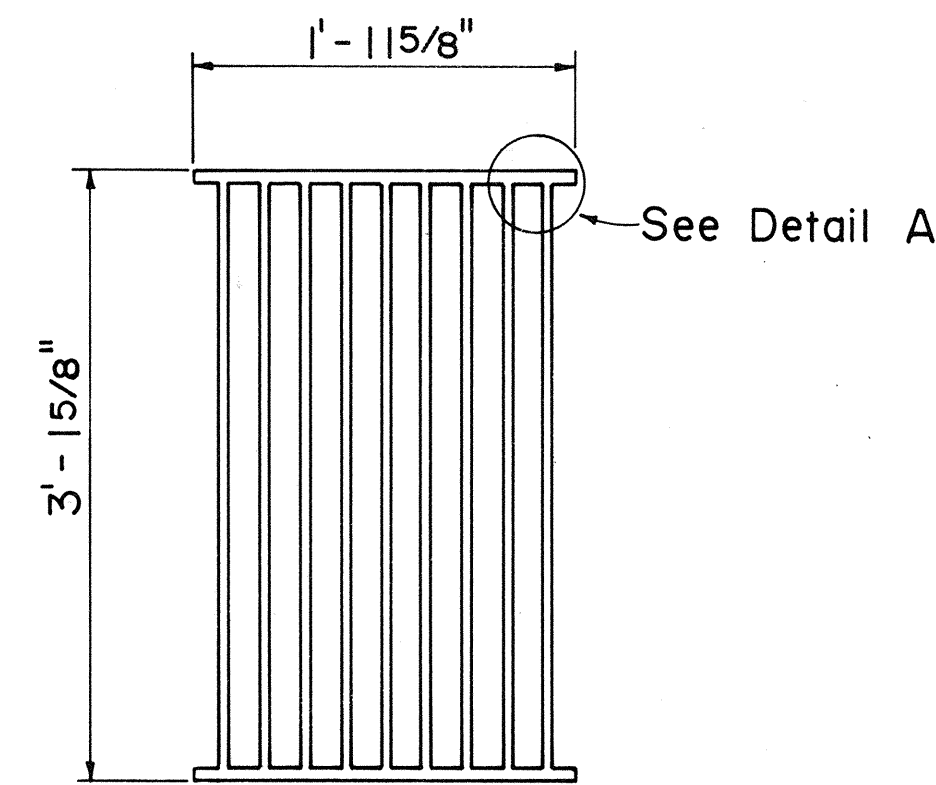


PLAN
(Single Gate)

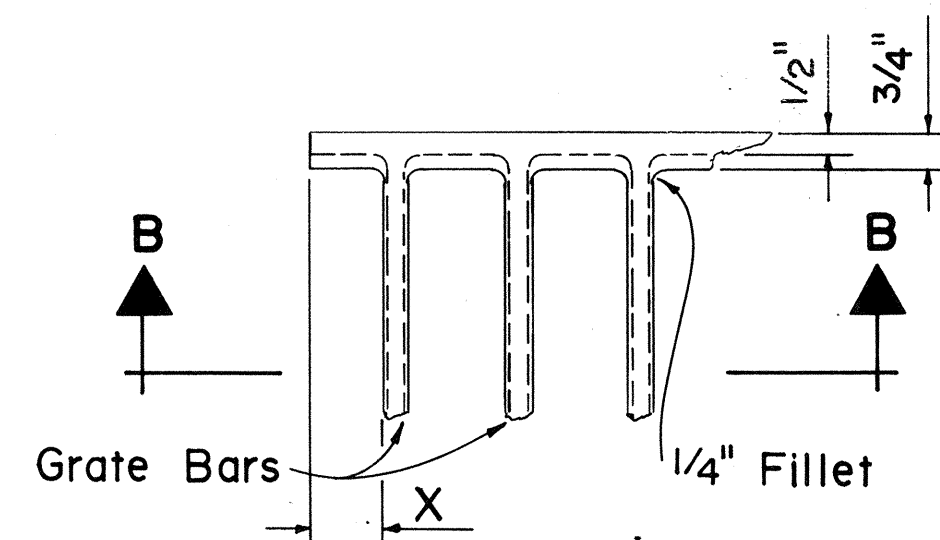


CROSS SECTION
(Thru Frame & Gate)

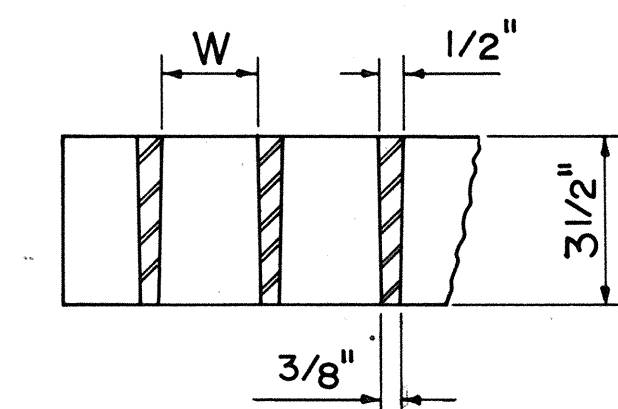
FRAME DETAILS



PLAN

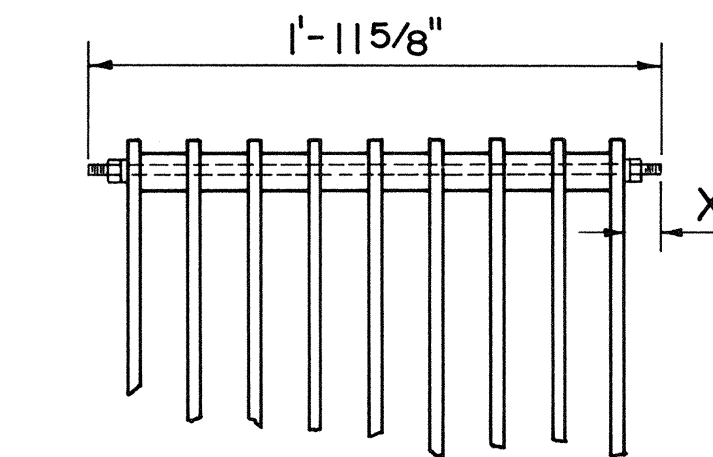


DETAIL A

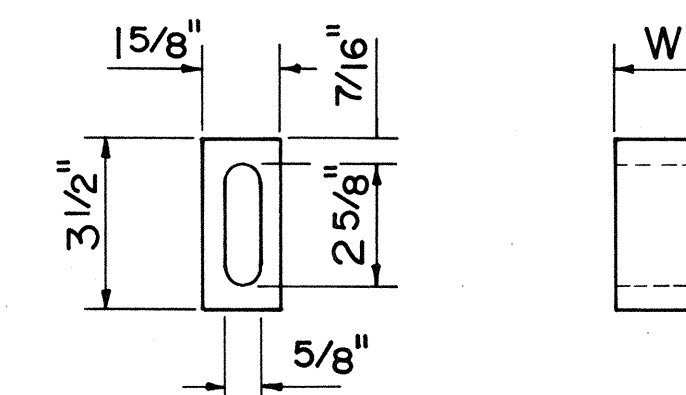


SECTION B-B

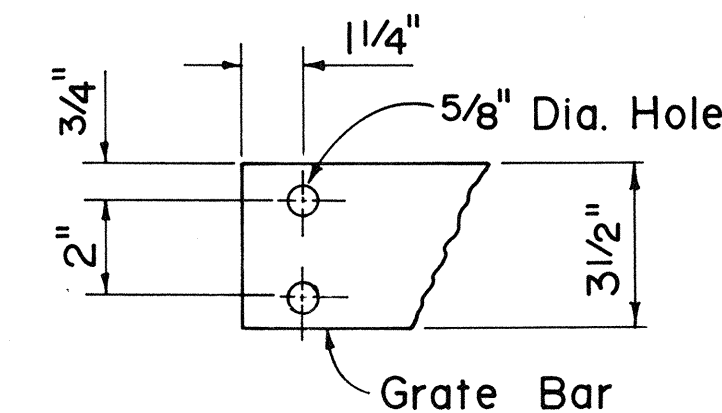
ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL GRATE



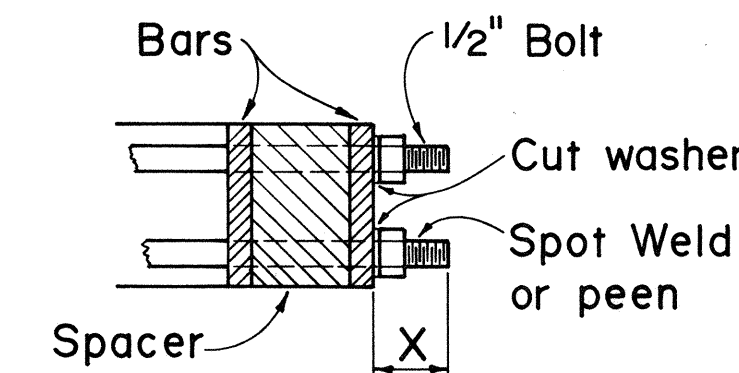
BOLTED END BLOCK



BAR SPACER

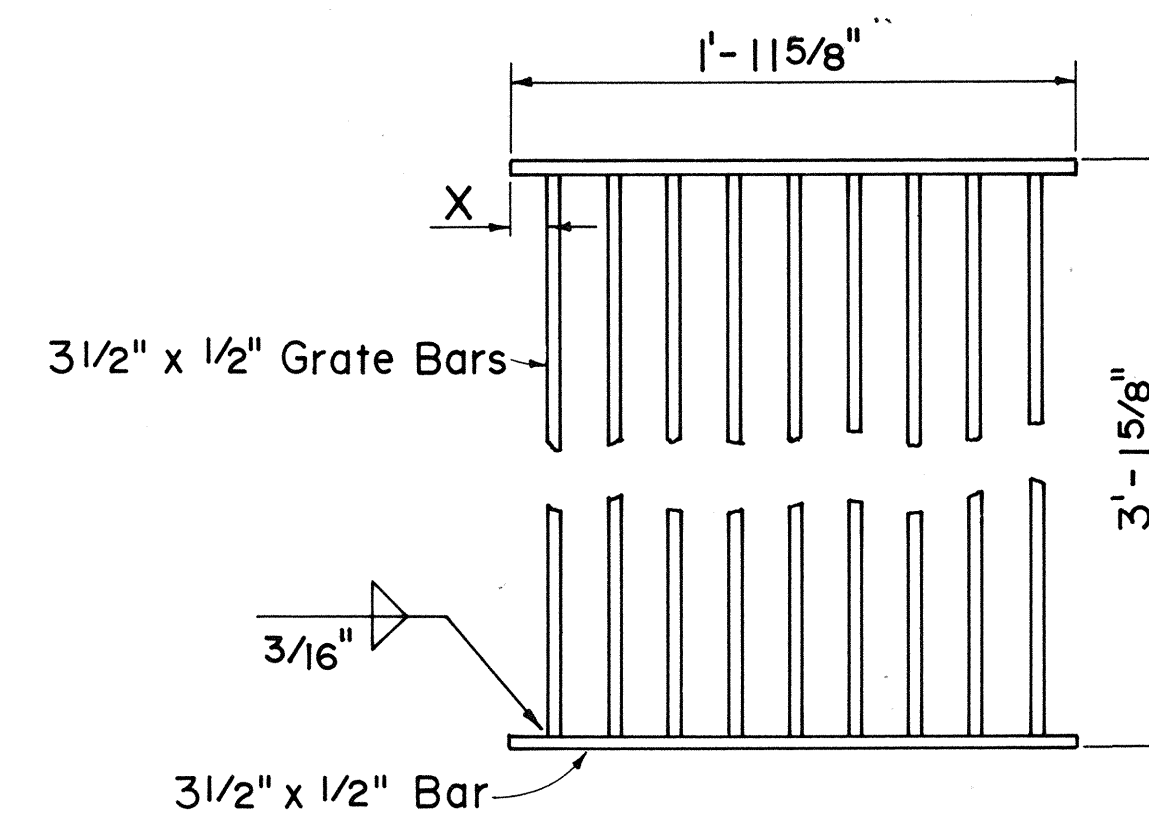


END OF BAR

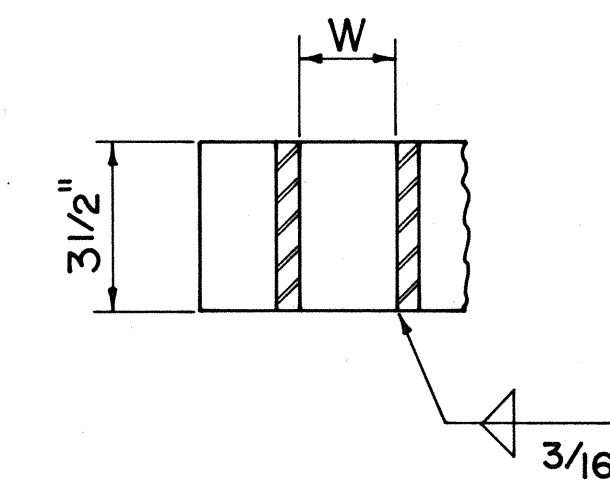


BOLTING DETAIL

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAILS

TYPE A-9 AND A-12
FRAMES AND GRATES

Not To Scale Date: Dec. 1977

SHEET No. 18 OF 18 SHEETS DH 7