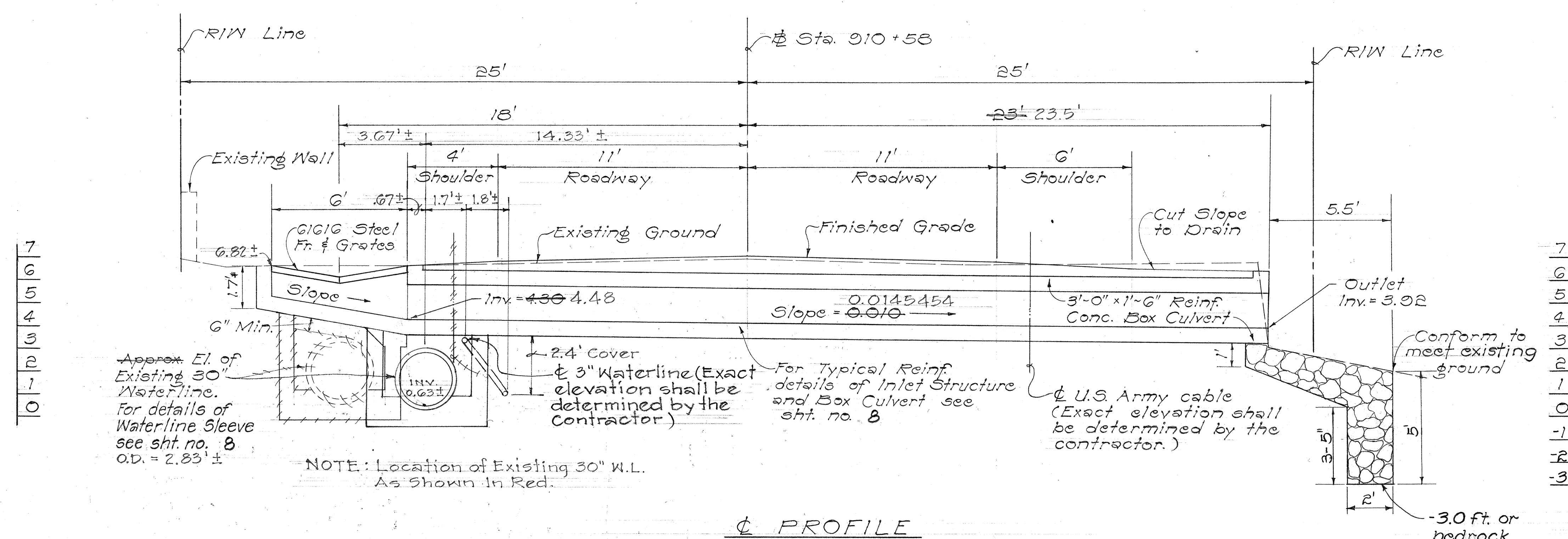
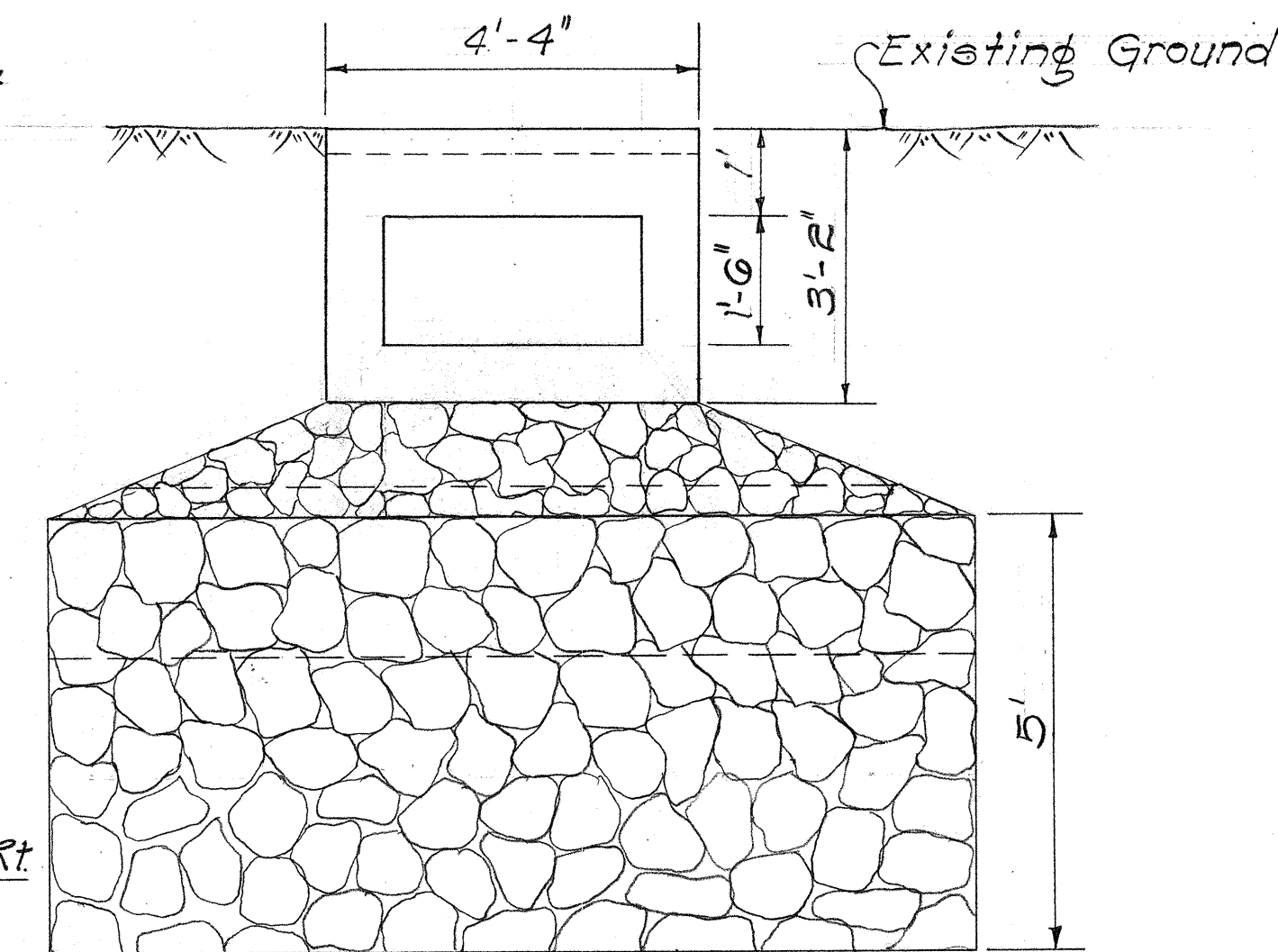
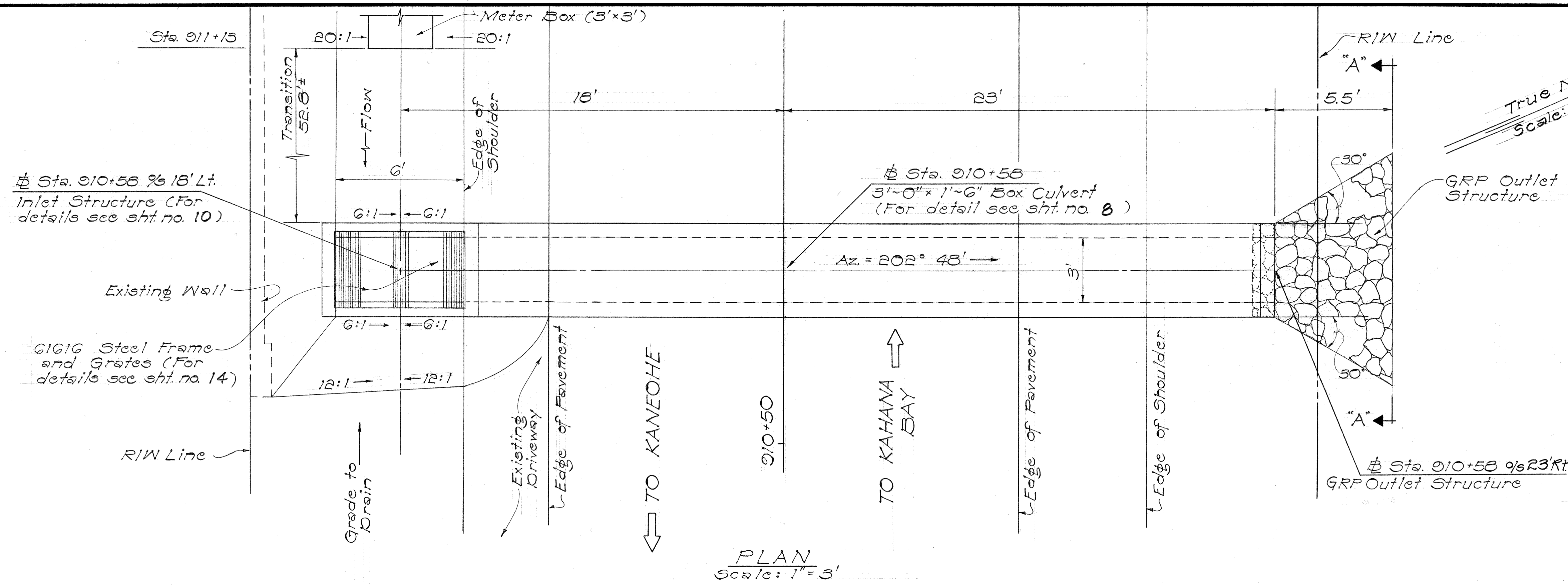


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83D-01-72	1972	5	26



At Sta. 910+58
Construct: Inlet Structure and GRP Outlet Structure.
Install: 3'-0" x 1'-6" Precast Box Culvert Sections.

Estimated Quantities

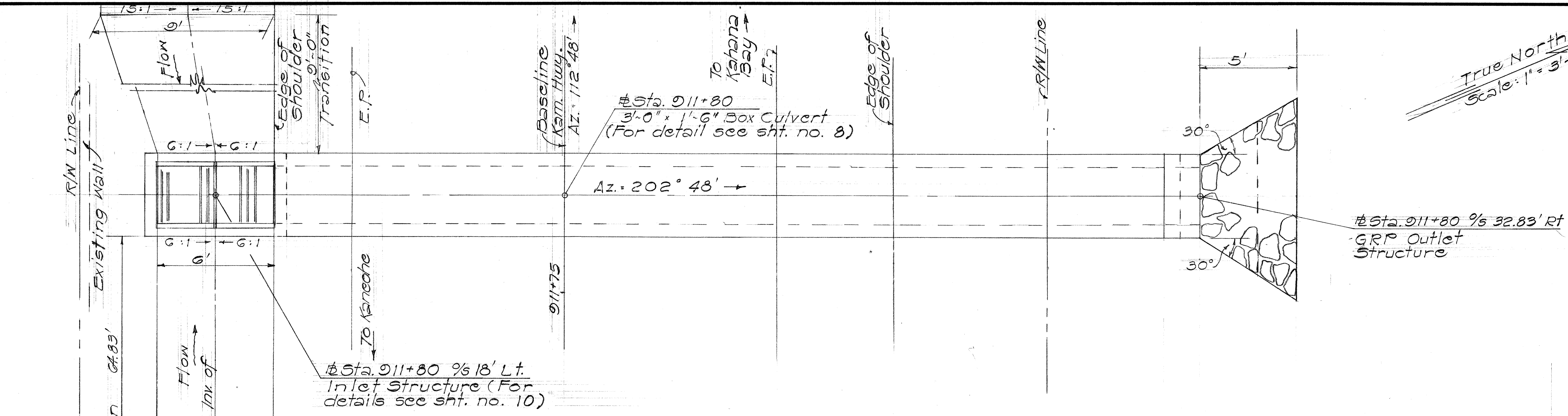
Struc. Exc.	36	c.y.
Concrete	13	c.y.
Type GIGIG Frame & Grates	1	ea.
Reinf. Steel	1,305	lbs.
GRP	6	c.y.

DATE	_____
DESIGNED BY	_____
CHECKED BY	_____
IN CHARGE	_____
APPROVED BY	_____

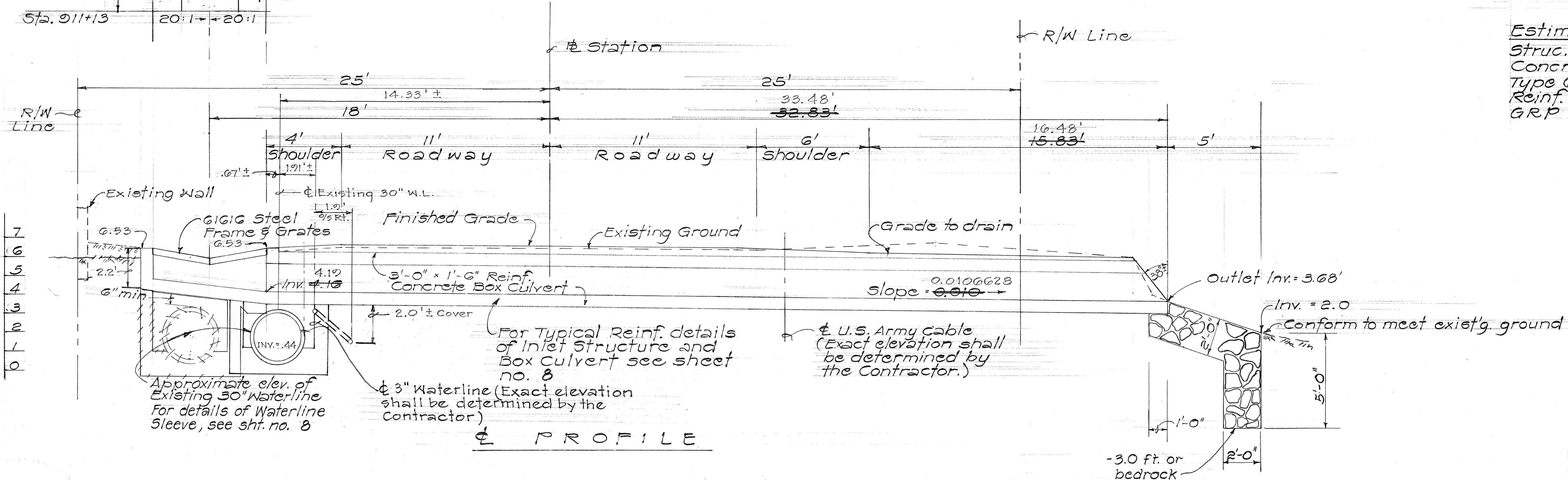
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DETAILS OF INLET STRUCTURE, BOX CULVERT AND GRP OUTLET STRUCTURE @ STA. 910+58
Kamehameha Highway
Kahana Bay
Proj. No. 83 D-01-72
Scale: As Shown Date: June 1978
SHEET No. 1 OF 10 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83D-01-72	1972	6	26

True North
Scale: 1" = 3'-0"



PLAN



PROFILE

Sta. 911+80
Construct: Inlet Structure and GRP Outlet Structure
Install: 3'-0" x 1'-6" Precast Box Culvert Sections.

Estimated Quantities

Struc. Exc.	42	C.Y.
Concrete	15	C.Y.
Type GIG/G Frame & Grates	1	Ea.
Reinf. Steel	1540	Lbs.
GRP	6	C.Y.

DETAILS OF INLET STRUCTURE, BOX CULVERT AND GRP OUTLET STRUCTURE AT STA. 911+80

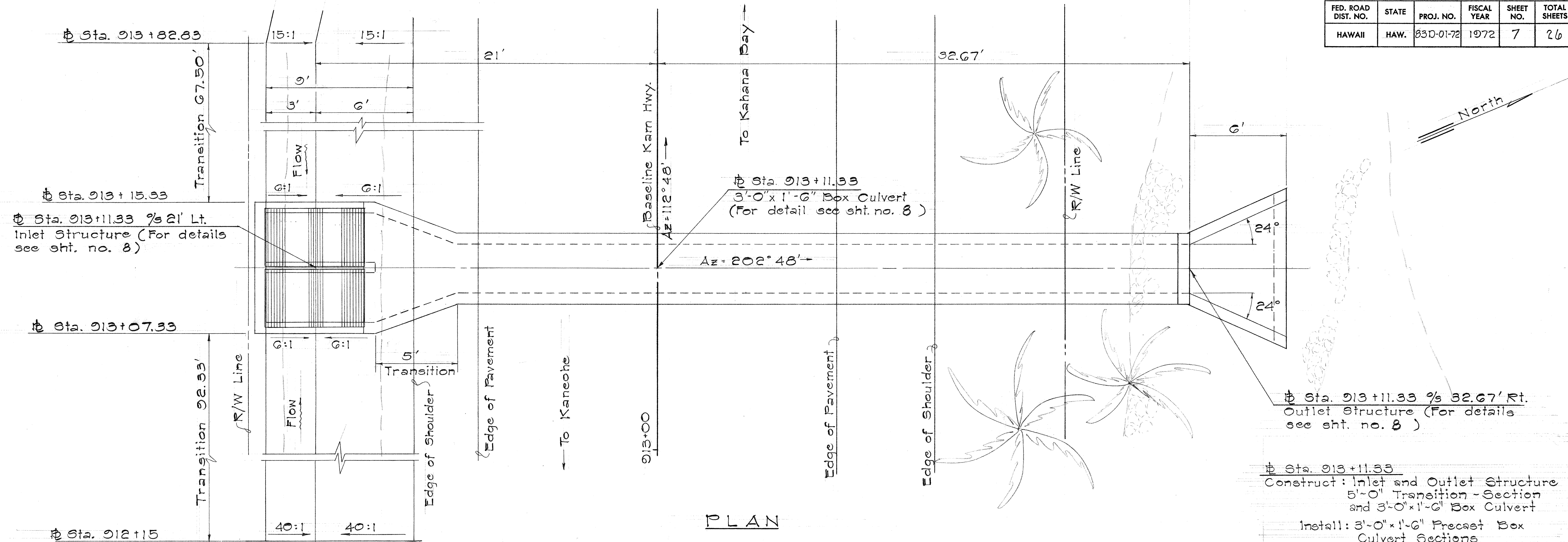
Scale: 1" = 3'-0"

S. Kawakami 9/27/72
Asst. Chief Engineer, BWS Date

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DETAILS OF INLET STRUCTURE,
BOX CULVERT AND GRP
OUTLET STRUCTURE @ STA. 911+80
Kamehameha Highway
Kahana Bay
Proj. No. 83D-01-72
Scale: As Shown Date: June, 1972
SHEET No. 2 OF 10 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83D-01-72	1972	7	26



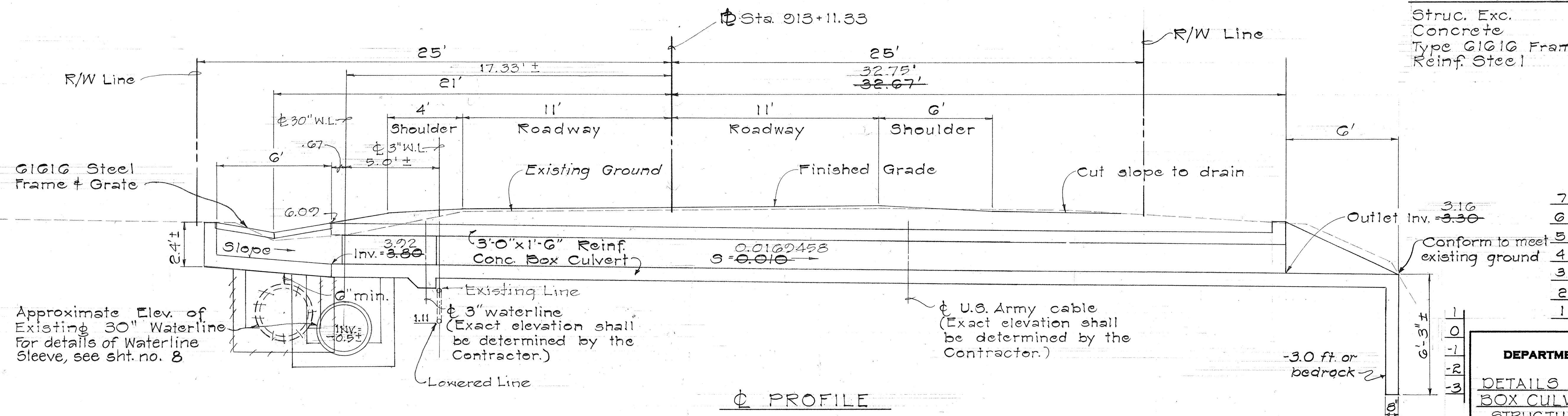
PLAN

Sta. 913+11.33 1/2 32.67' Rt.
Outlet Structure (For details see sht. no. 8)

Sta. 913+11.33
Construct: Inlet and Outlet Structure
5'-0" Transition - Section
and 3'-0" x 1'-6" Box Culvert
Install: 3'-0" x 1'-6" Precast Box
Culvert Sections

Estimated Quantities

Struc. Exc.	56	c.y.
Concrete	21	c.y.
Type G1G16 Frame & Grates	2	ea.
Reinf. Steel	1,830	lbs.



PROFILE

Approximate Elev. of
Existing 30" Waterline
For details of Waterline
Sleeve, see sht. no. 8

Existing Line
3" waterline
(Exact elevation shall
be determined by the
Contractor.)
Lowered Line

U.S. Army cable
(Exact elevation shall
be determined by the
Contractor.)

Outlet Inv. 3.16
Conform to meet
existing ground

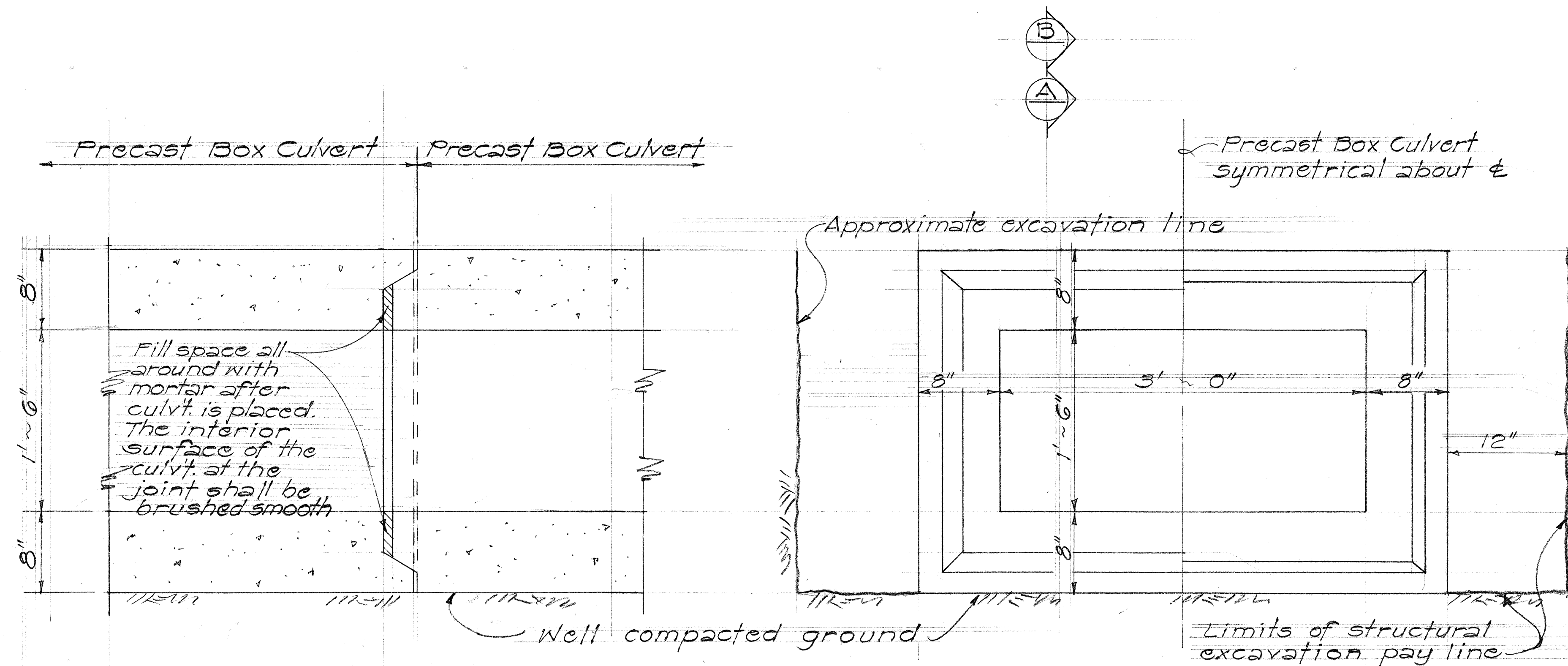
DETAILS OF INLET STRUCTURE, BOX CULVERT AND OUTLET STRUCTURE
AT # STA. 913+11.33
Scale: 1" = 3'-0"

L. Kawakami
Asst. Chief Engineer, BWS # Date 8/7/72

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DETAILS OF INLET STRUCTURE,
BOX CULVERT AND OUTLET
STRUCTURE @ # STA. 913+11.33
Kamehameha Highway
Kahana Bay
Proj. No. 83 D-01-72
Scale: As Shown Date: June 1972
SHEET No. 3 OF 10 SHEETS

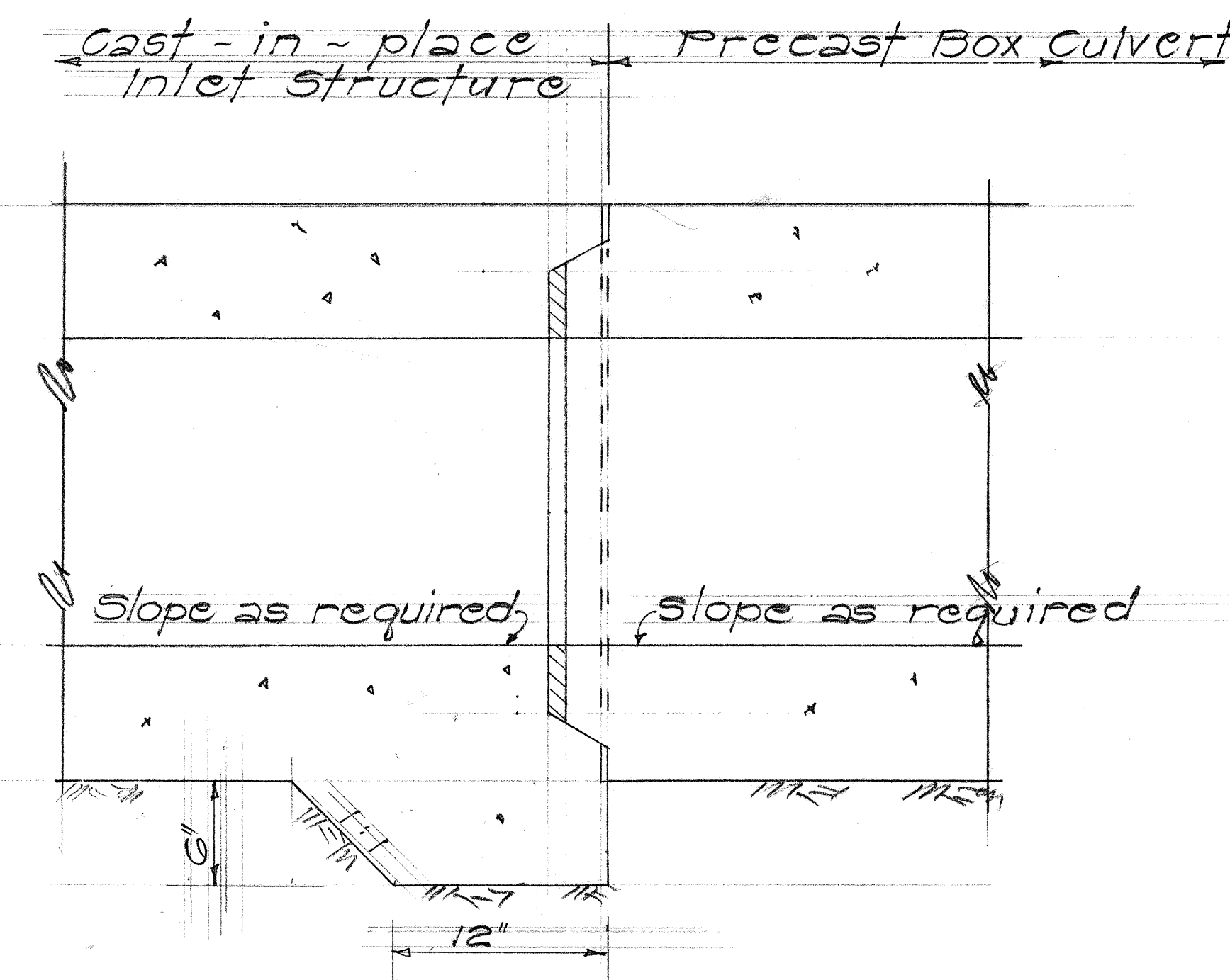
DATE	BY
7	
6	
5	
4	
3	
2	
1	
0	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83D-01-72	1972	10	26

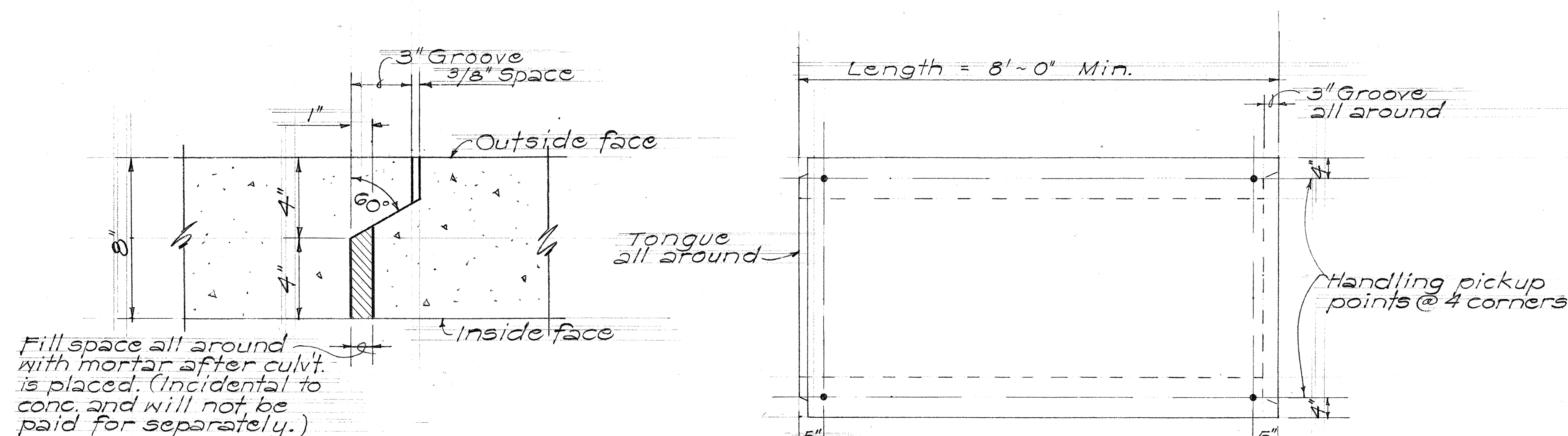


ASSEMBLAGE SECTION A

HALF TONGUE END HALF GROOVE END
TYPICAL END ELEVATION



TYPICAL SECTION B
CONNECTION DETAIL AT
CAST-IN-PLACE CONCRETE



TYPICAL CONNECTION DETAIL C

TOP PLAN-TYPICAL
PRECAST BOX CULVERT

NOTE:

1. Contractor to determine maximum length and pickup points and submit 4 sets of shop drawings for approval by the Engineer.
2. See Sht. No. 8 for Reinforcing details of Inlet Structures and Precast Box Culvert.

DETAILS OF INLET CONNECTION TO 3'-0" x 1'-6" PRECAST BOX CULVERT

Not to scale

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONNECTION DETAILS OF
INLET STRUCTURES TO
PRECAST BOX CULVERT
Kamehameha Highway
Kahana Bay
Proj. No. 83 D-01-72
Scale: As Shown Date: June, 1972
SHEET No. 6 OF 10 SHEETS

ORIGINAL PLAN	DATE
DESIGNED BY	DESIGNED BY
QUANTITIES BY	QUANTITIES BY
CHECKED BY	CHECKED BY

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83D-01-72	1972	11	26

FROM STATION	TO STATION	LENGTH OF GUTTER (L.F.)	WIDTH OF GUTTER (L.F.)	REMARKS
910 + 52	910 + 55.83	3.8	9.0	Gutter transition from 9'to 6' in width
910 + 60.17	911 + 13	52.8	6.0	3x3' Meter Box from Sta. 911+13 to Sta. 911+16
911 + 13	911 + 77.83	64.8	6.0	Box Culvert at Sta. 911+80
912 + 15	913 + 07.33	92.3	9.0	Box Culvert at Sta. 913+11
913 + 15.33	913 + 07.83	82.5	9.0	

General Note:

- Surplus excavation shall become the Contractor's property and shall be removed at his expense.

Sta. 910+52 Lt. to Sta. 913+07.83 Lt.

Construct: A.C. Lined

Estimated Quantities

Ditch and Channel Exc.	30	C.Y.
Aggregate Base	17	C.Y.

Bituminous Gutter Type 7R	120	L.F.
Bituminous Gutter Type 7S	180	L.F.

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

DETAILS OF

GUTTER SECTIONS

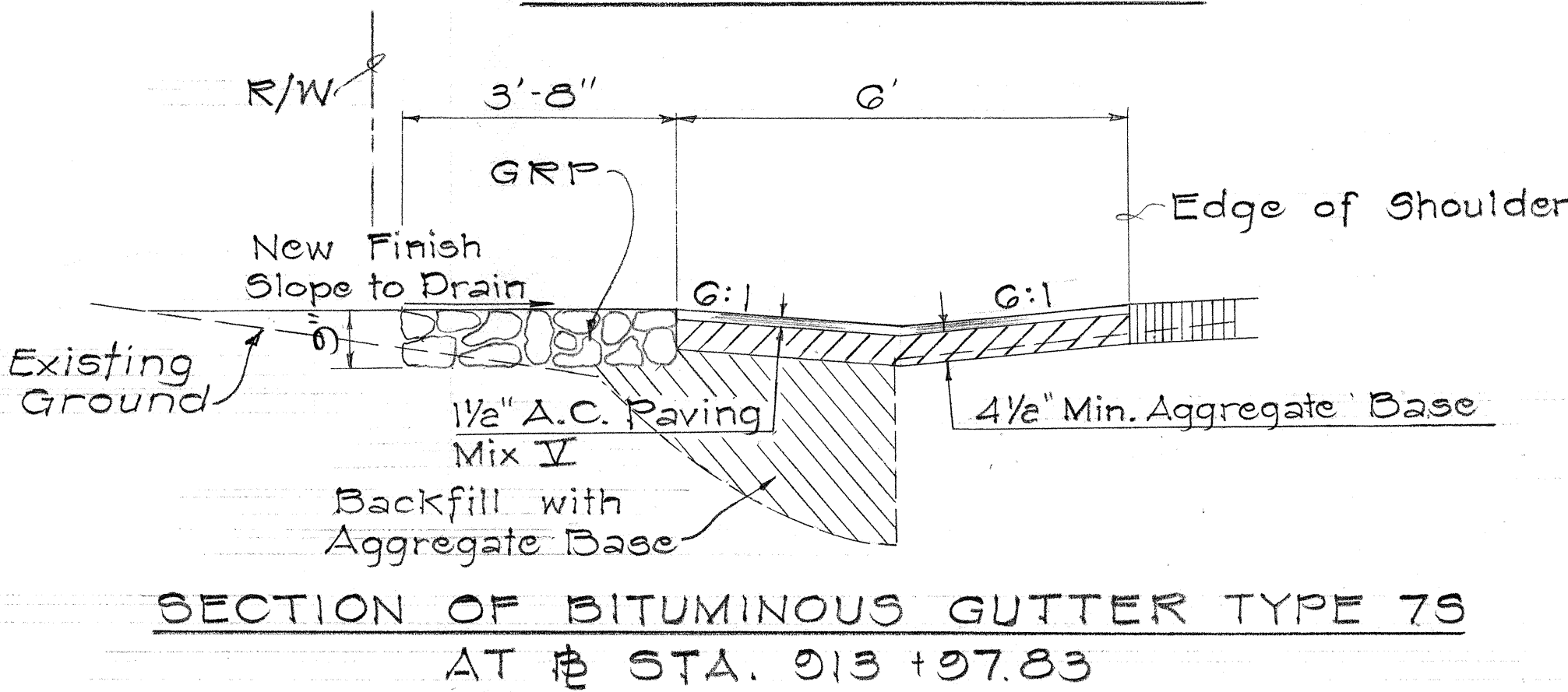
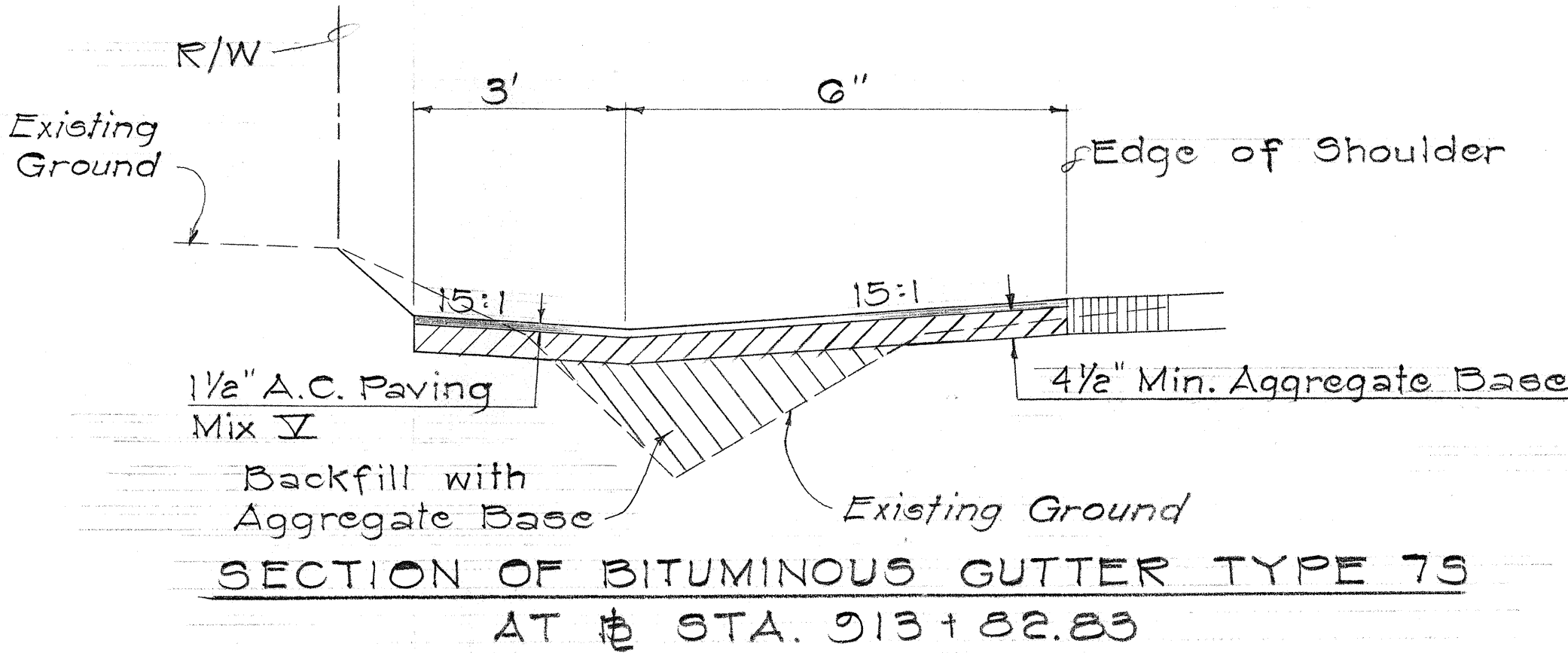
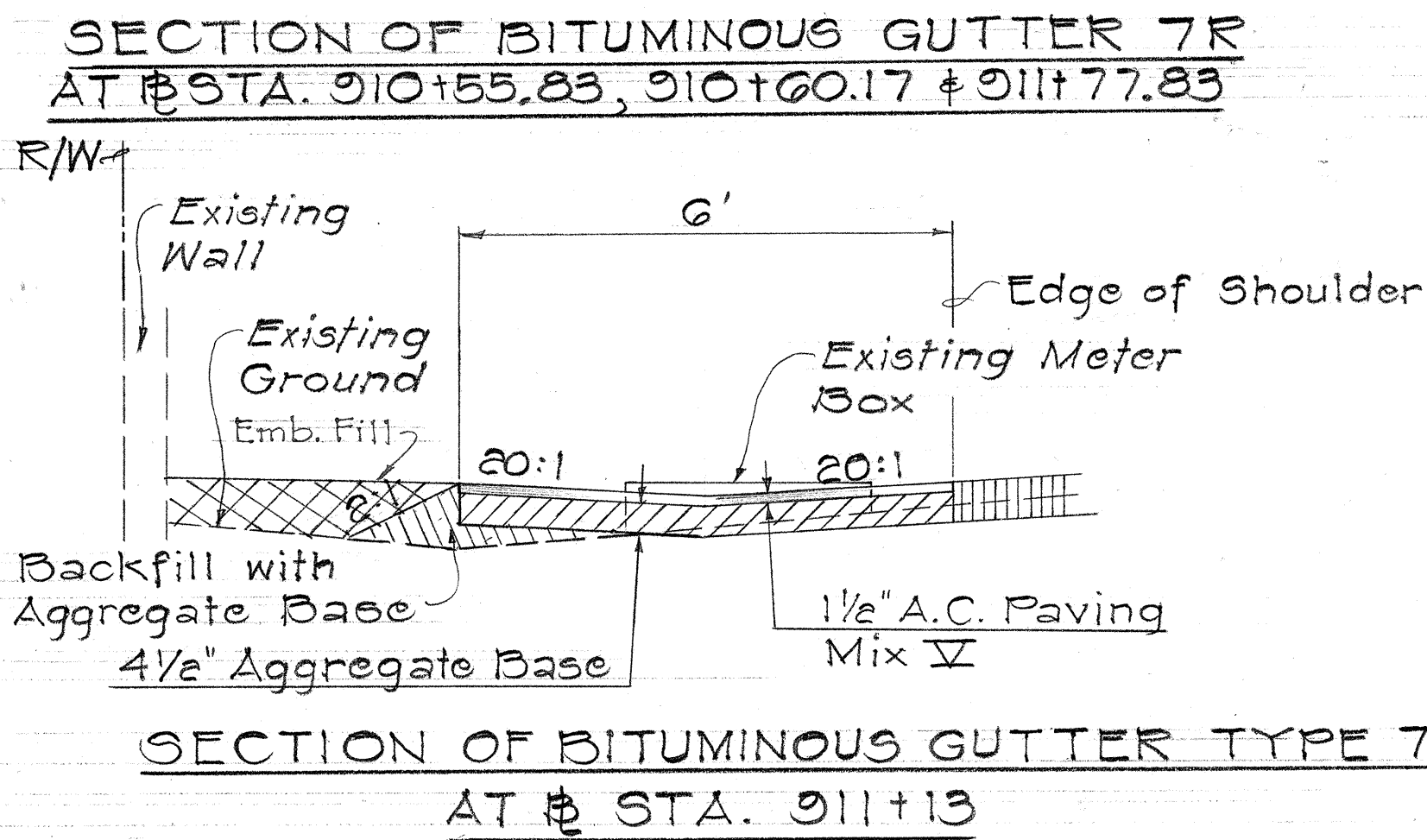
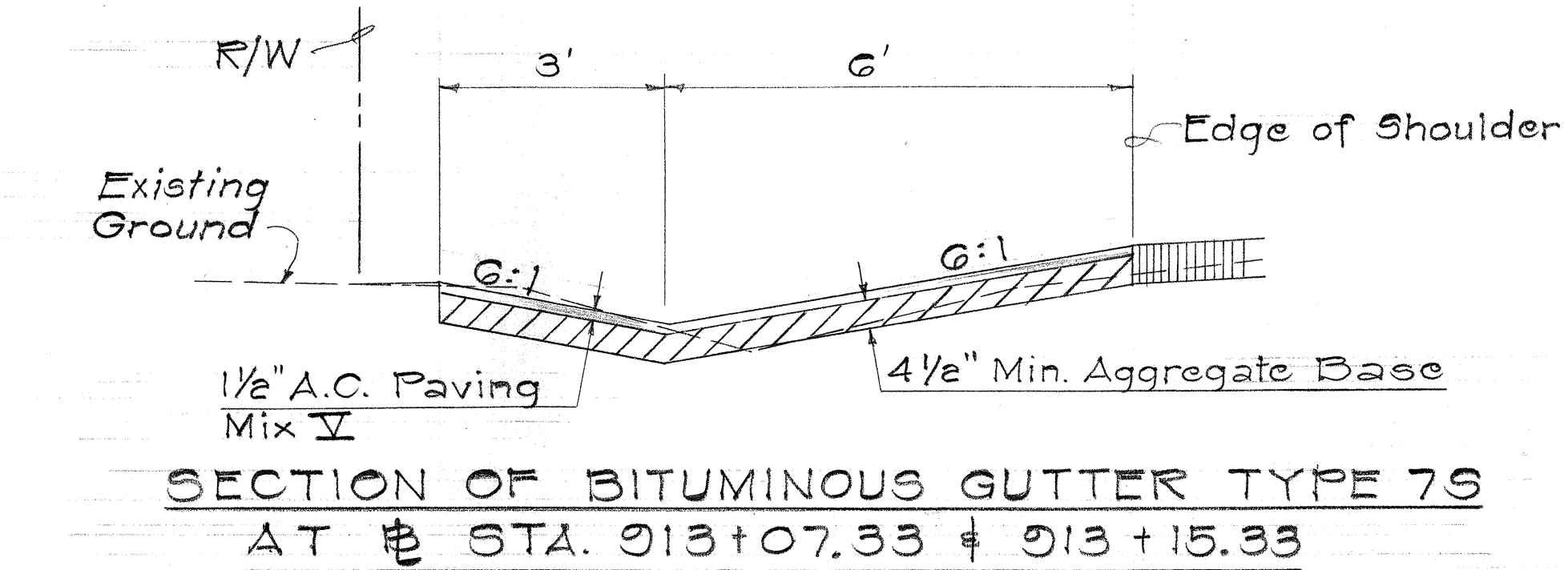
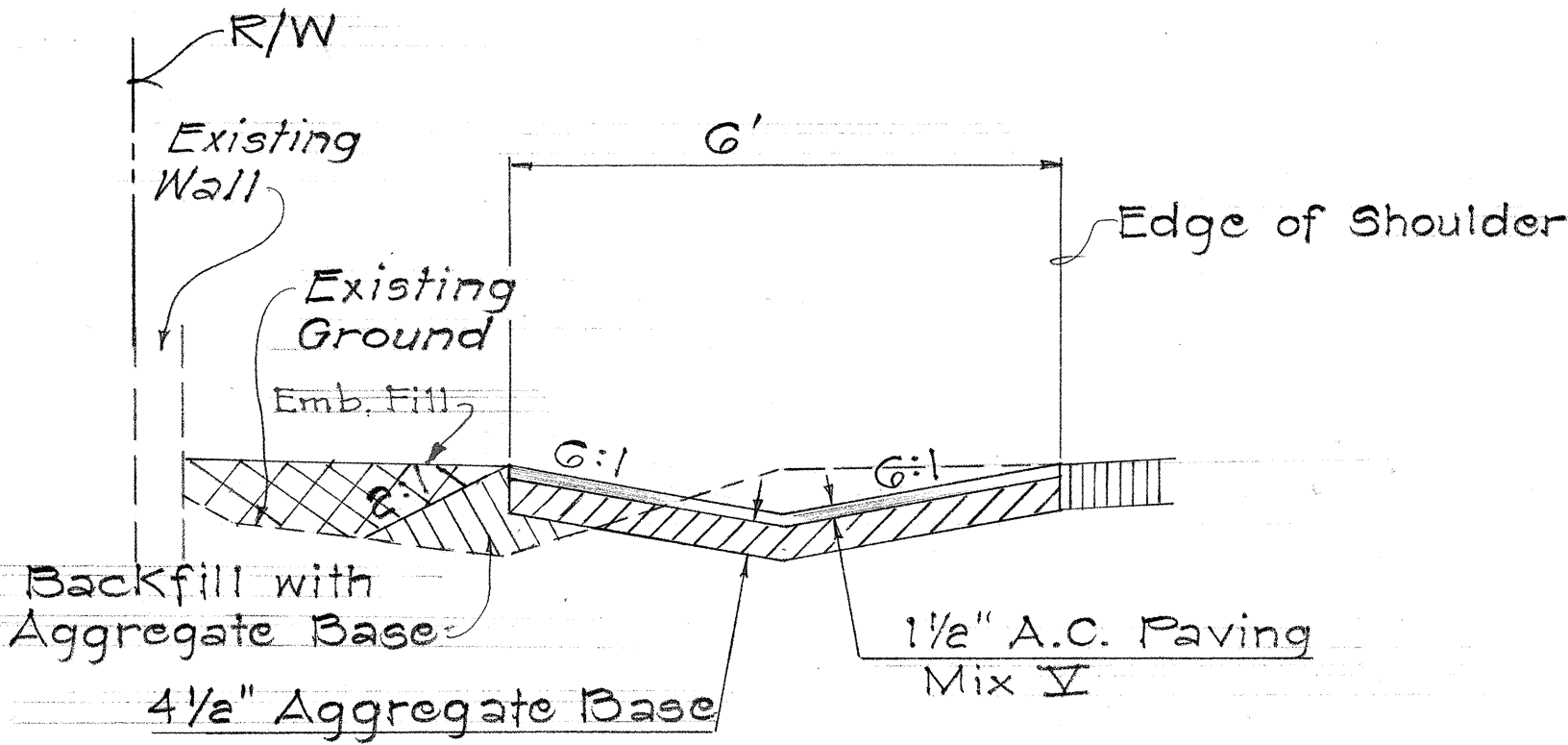
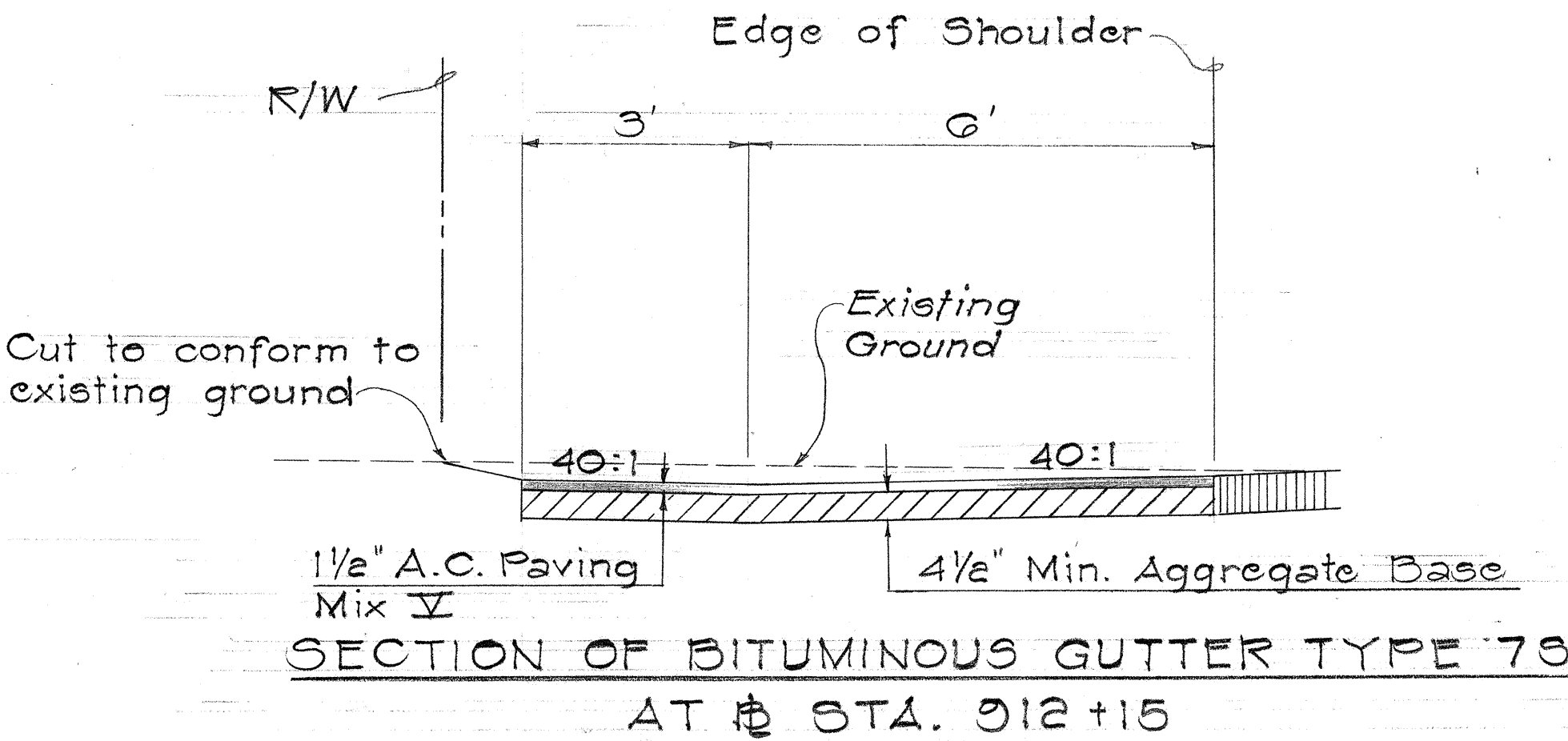
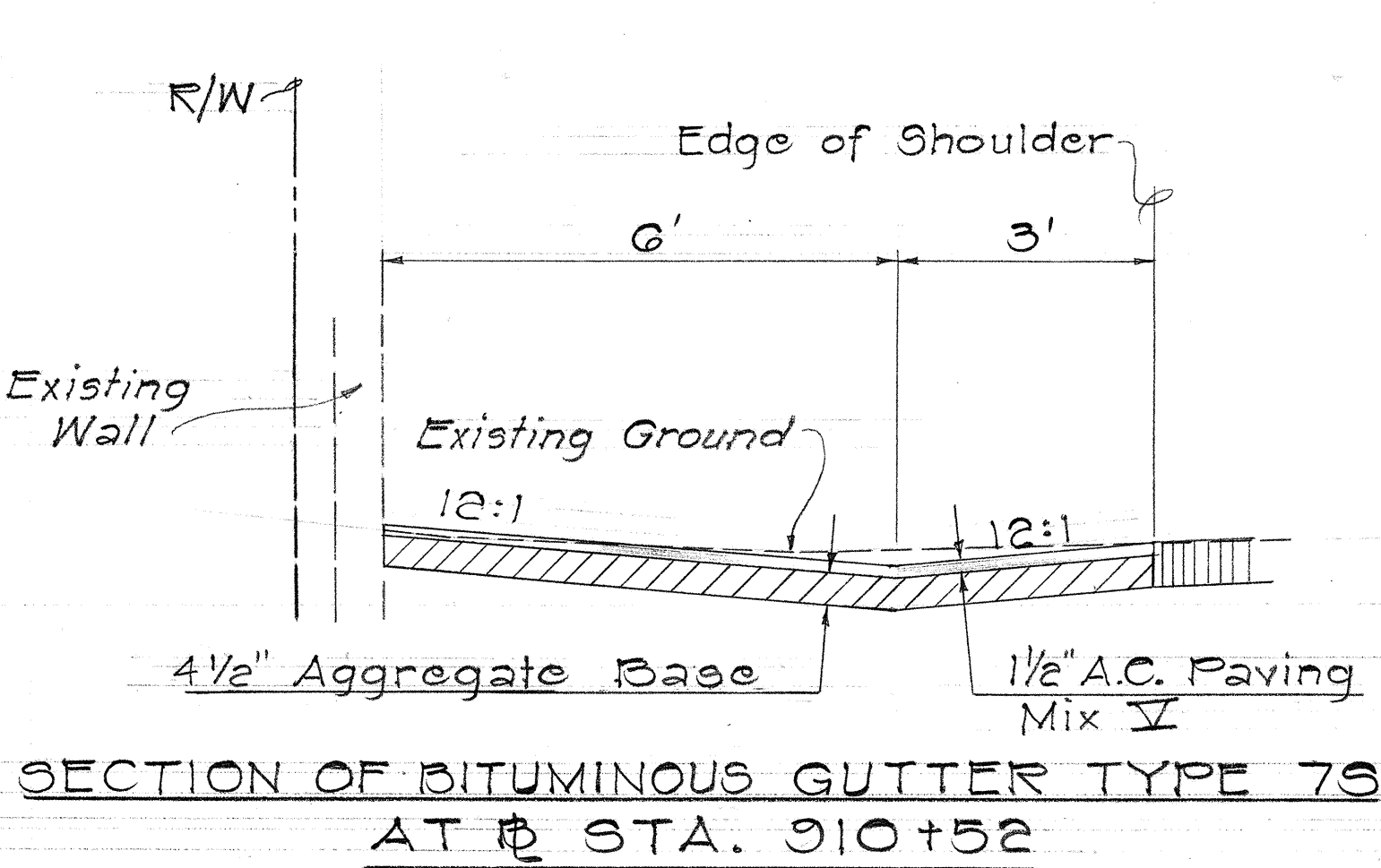
Kamehameh Highway

Kahana Bay

Proj. No. 83D-01-72

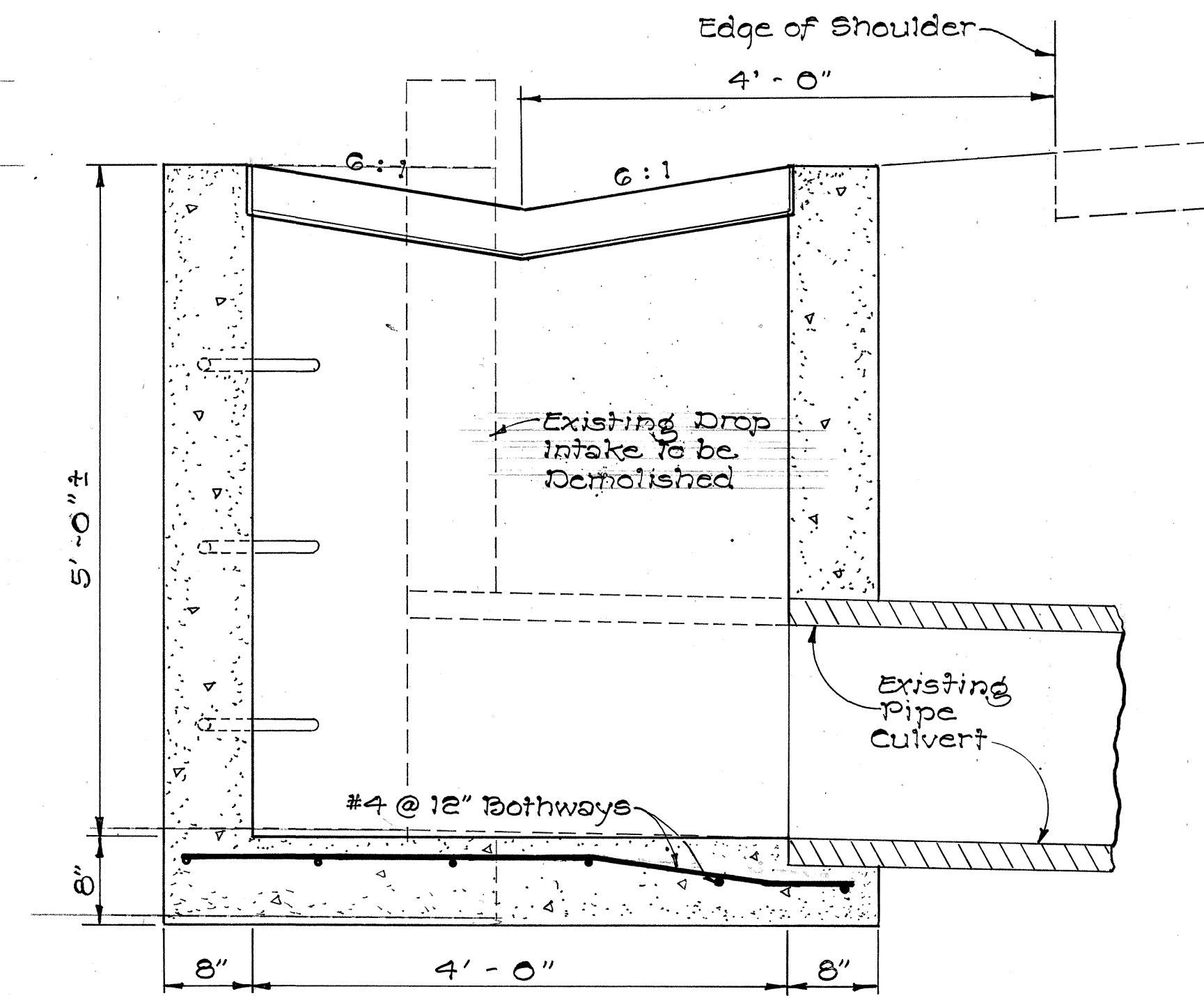
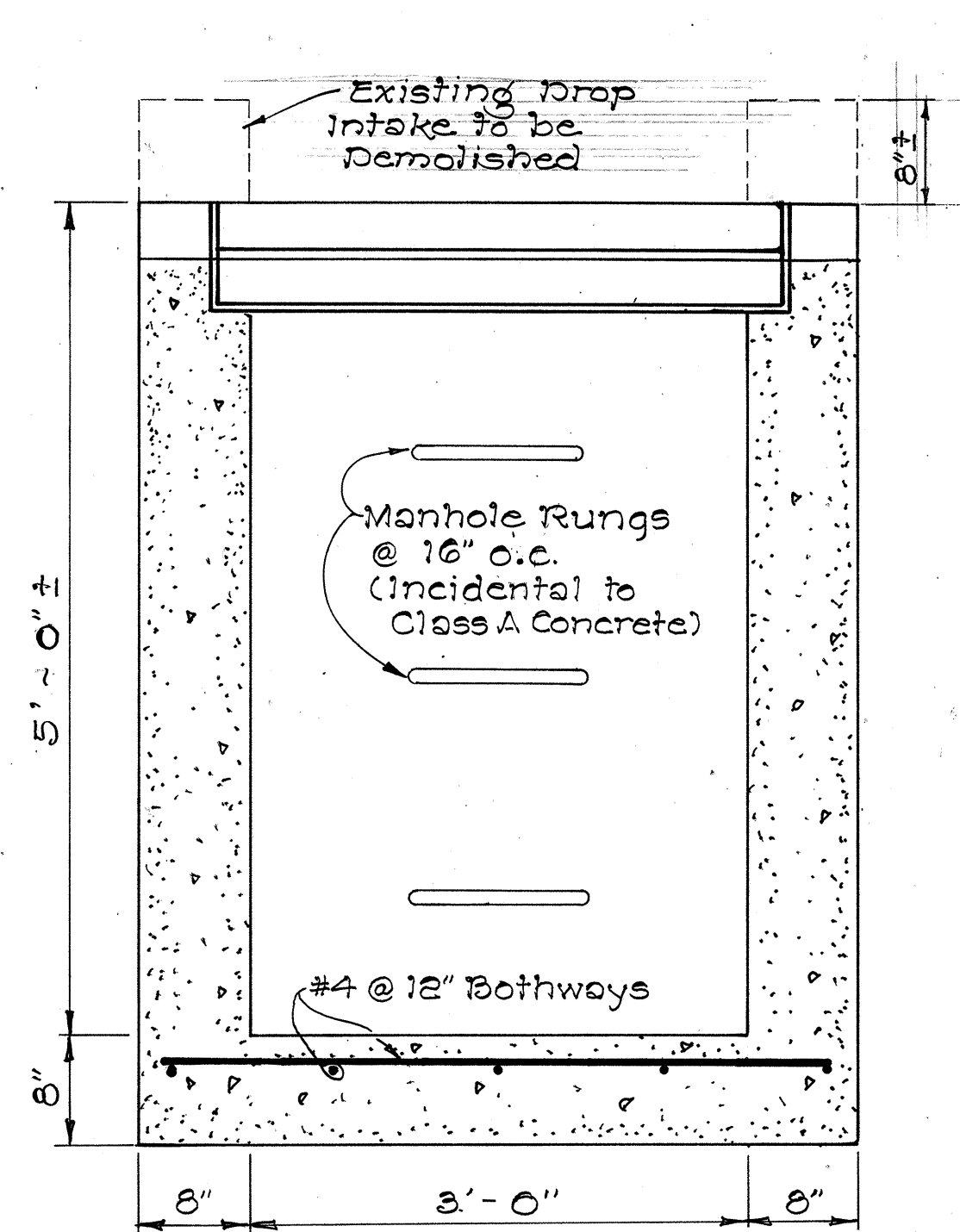
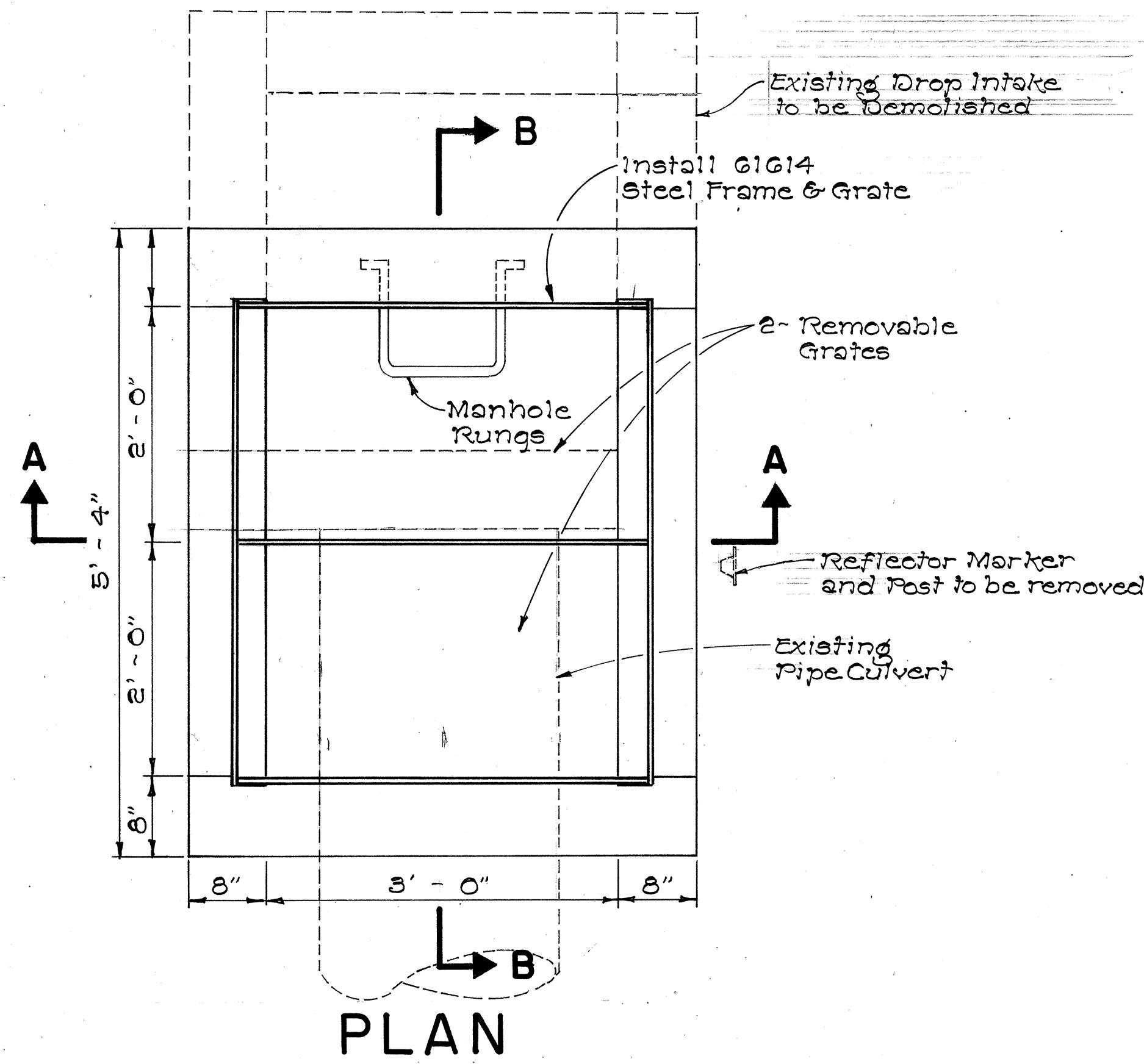
Scale: 1/2"=1'-0" Date: June, 1972

SHEET No. 7 OF 10 SHEETS



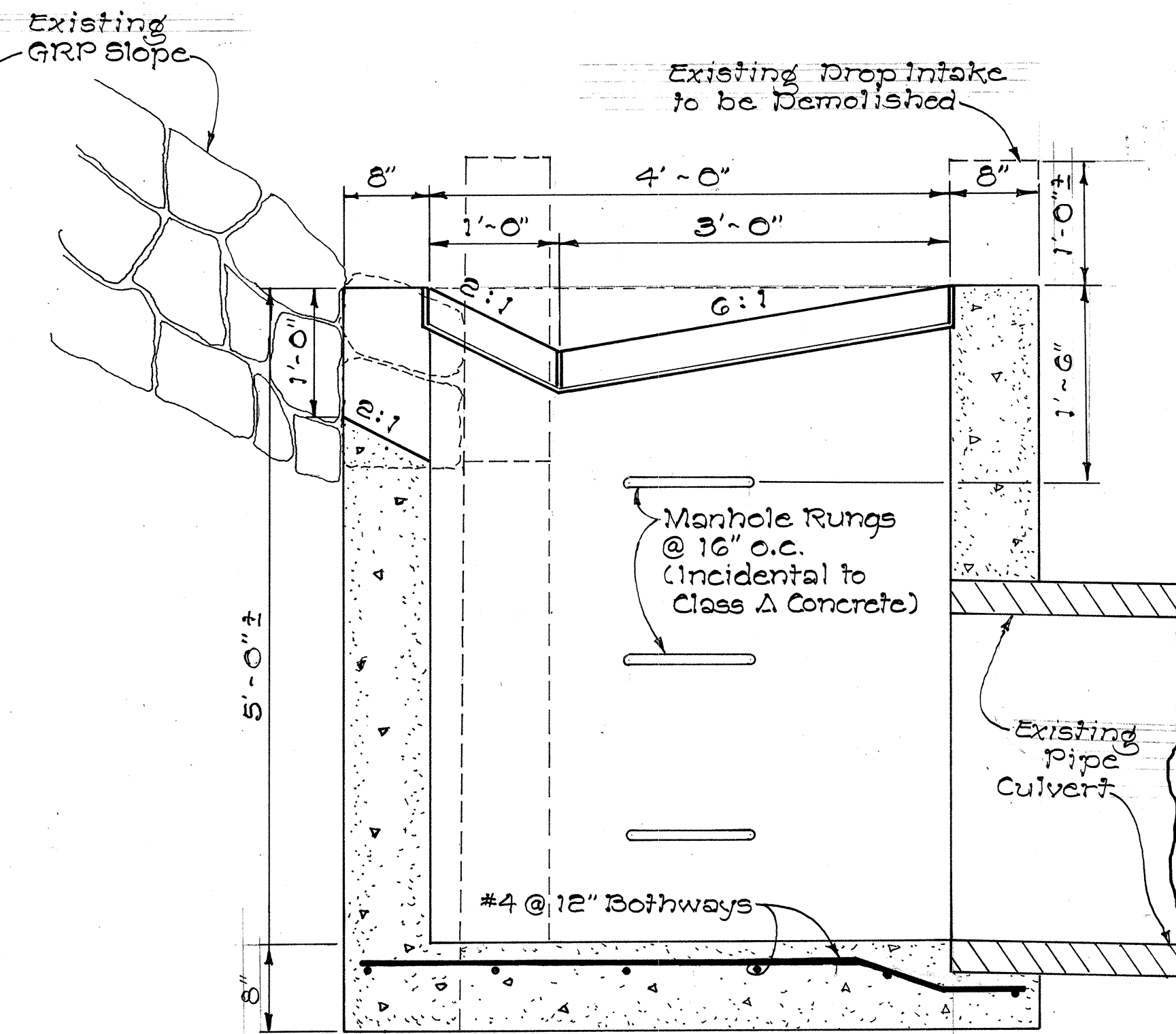
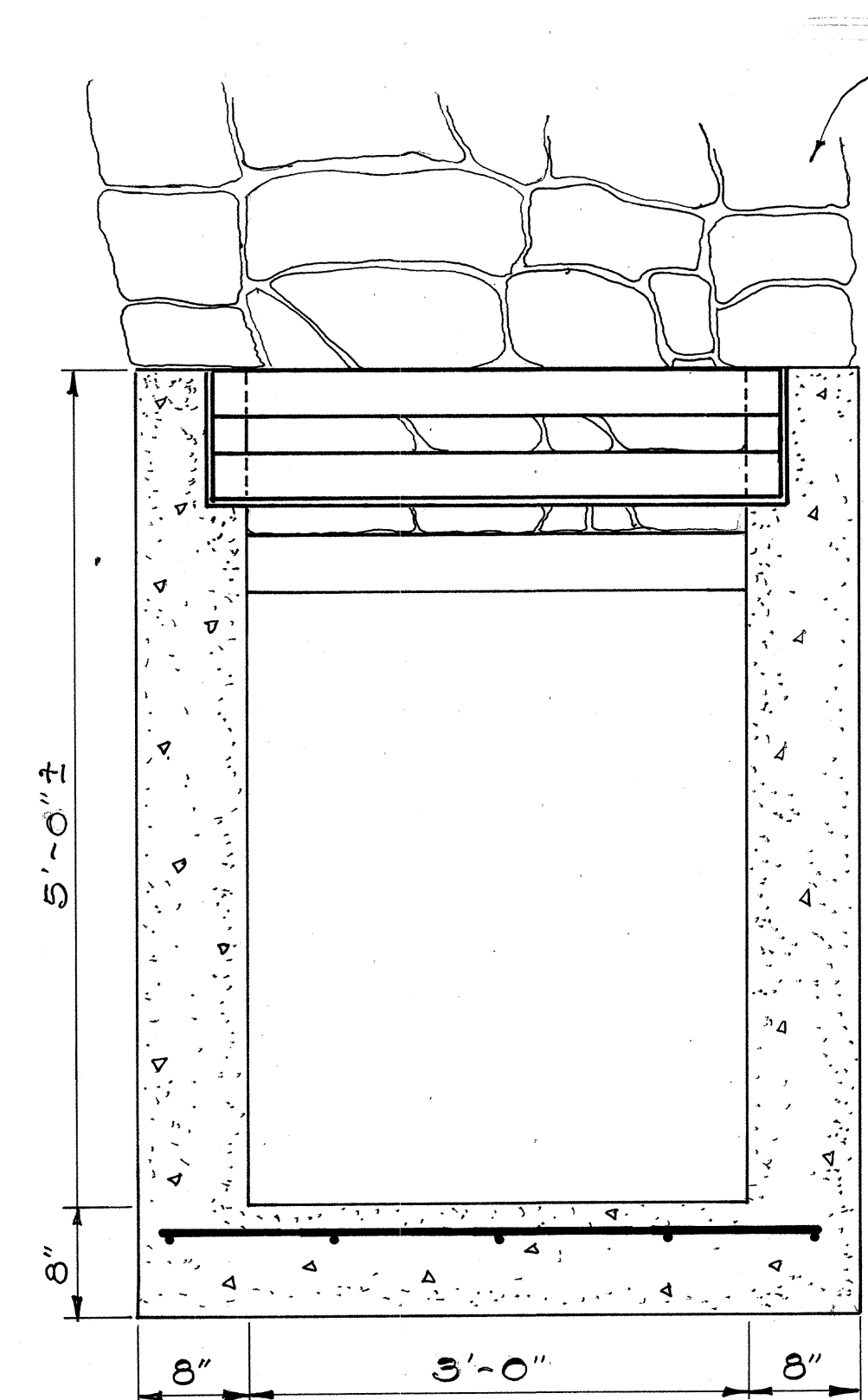
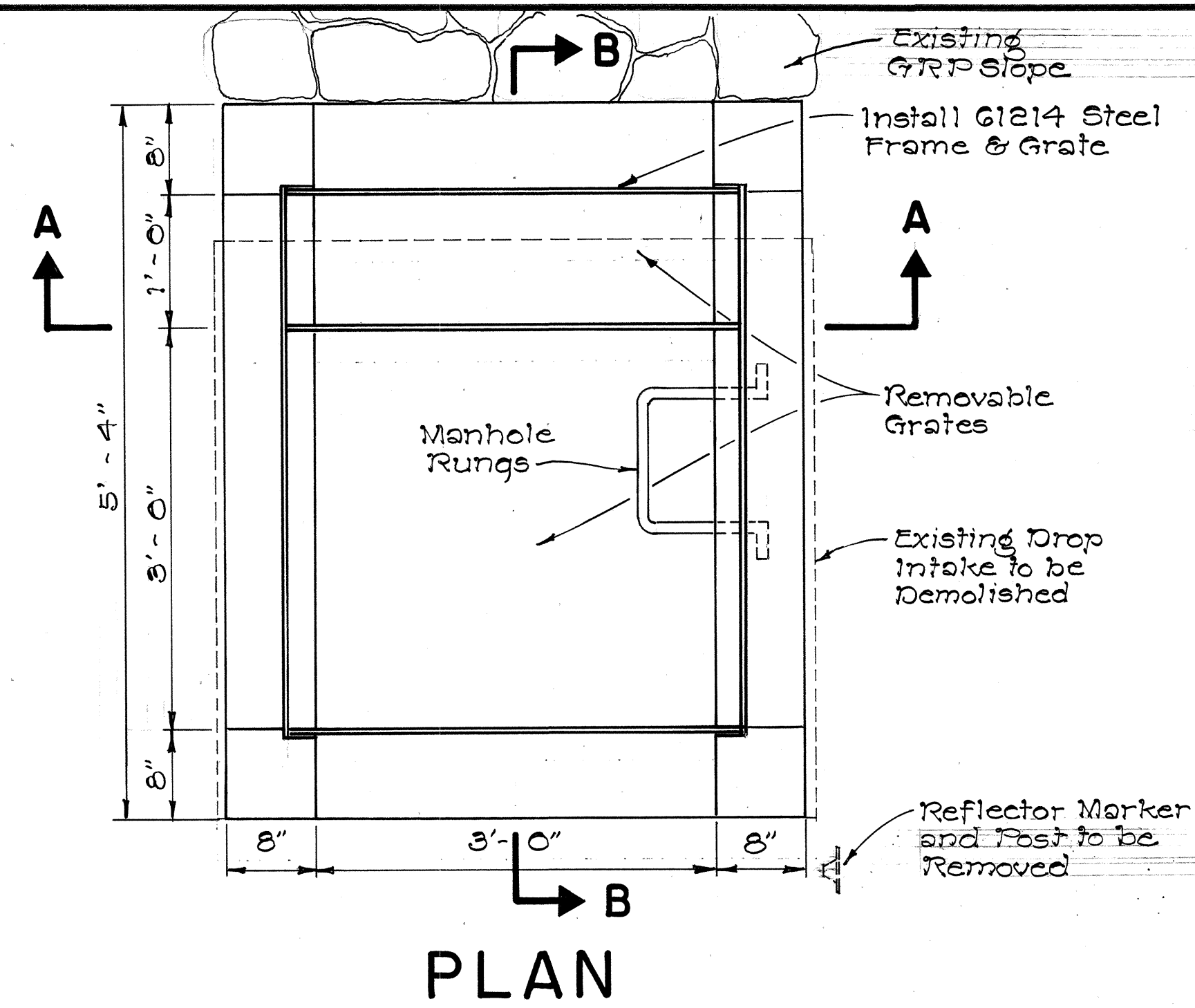
SURVEY PLOTTED BY	DATE
DRAWN BY	*****
TRACED BY	*****
QUANTITIES BY	*****
CHECKED BY	*****
ORIGINAL PLAN	NOTE BOOK
No.	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83D-01-72	1972	12	26



**61614 C.D.I. TO REPLACE
EXISTING D.I. AT $\pm$ STA. 918+00 $\pm$ (L)**

SCALE: 1" = 1'-0"



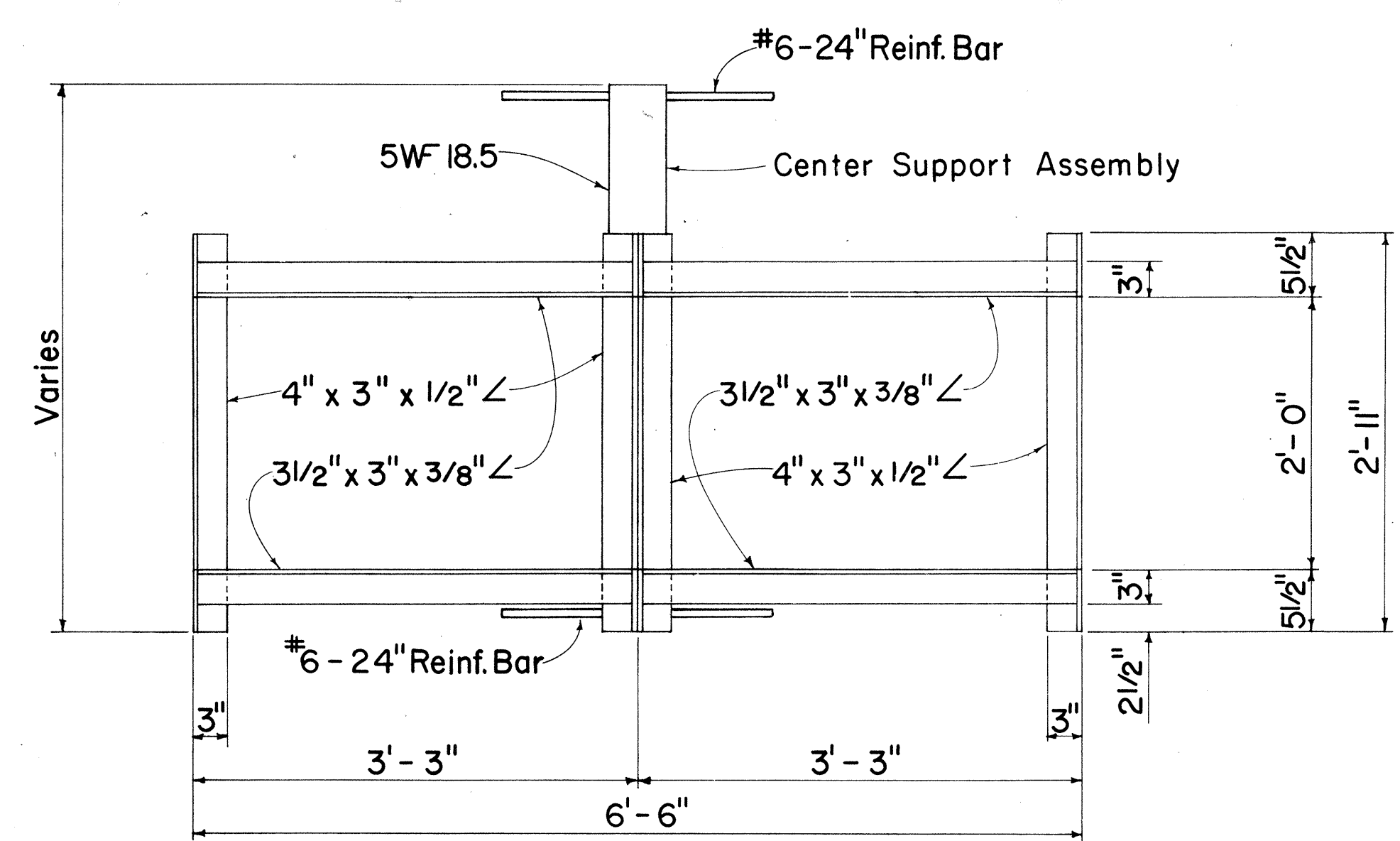
**61214 C.D.I. TO REPLACE
EXISTING D.I. AT $\pm$ STA. 922+54 $\pm$ (L)**

SCALE: 1" = 1'-0"

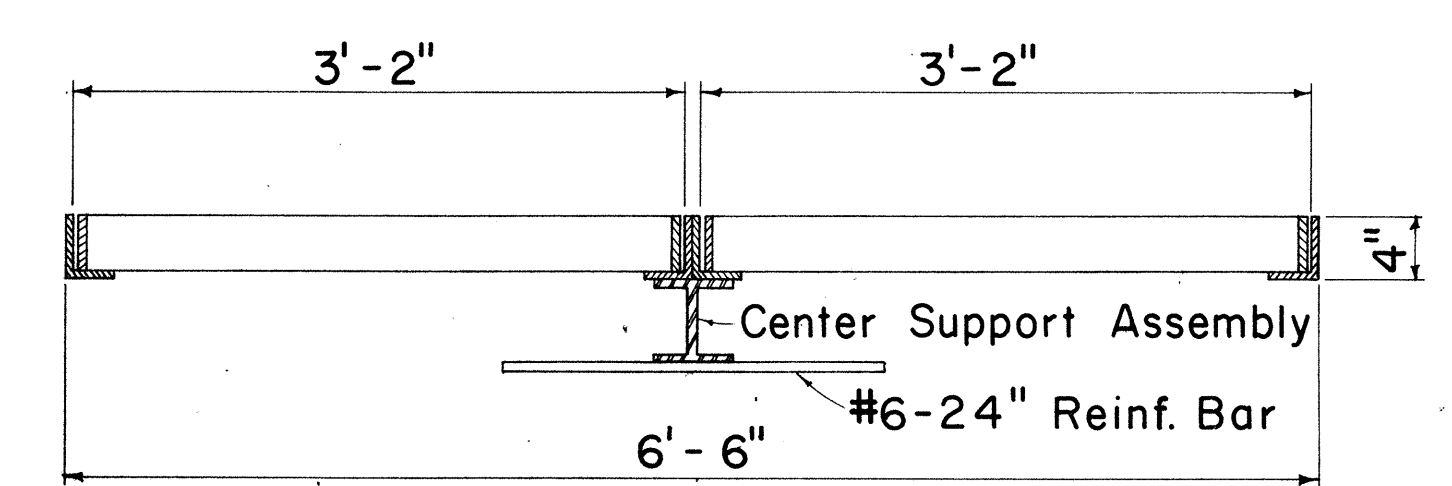
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**DETAILS OF C.D.I.
TO REPLACE EXISTING D.I.
AT STA. 918+00 (L) AND STA. 922+54 (L)**
KAMEHAMEHA HIGHWAY
KAHANA BAY
PROJECT No. 83 D - 01 - 72
Scale: As Shown Date: July, 1972
SHEET No. 8 OF 10 SHEETS

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

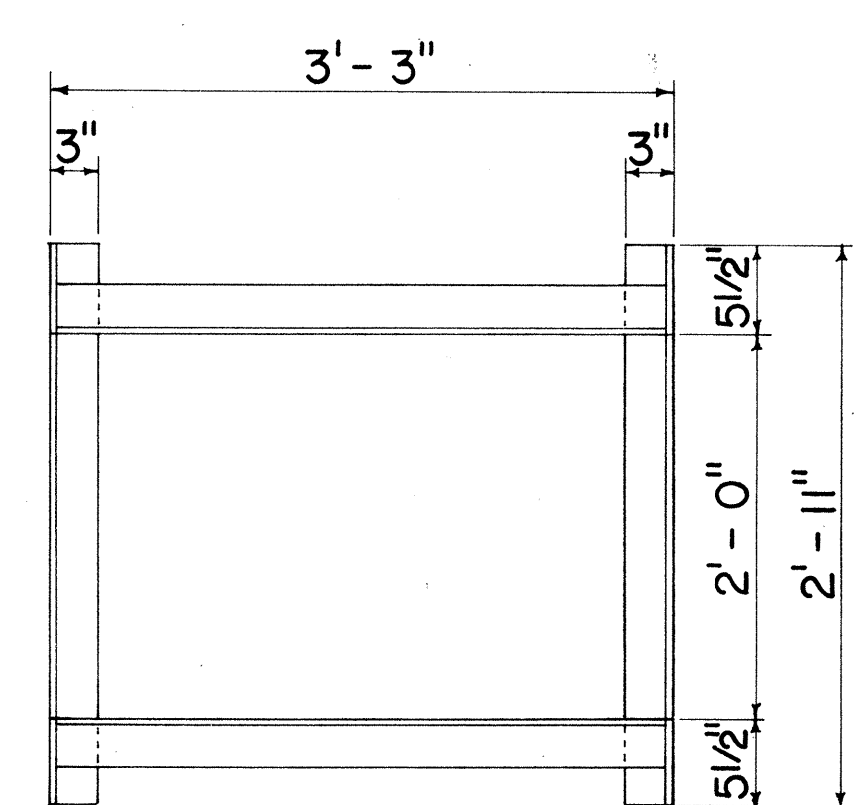
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83D-01-72	1972	13	26



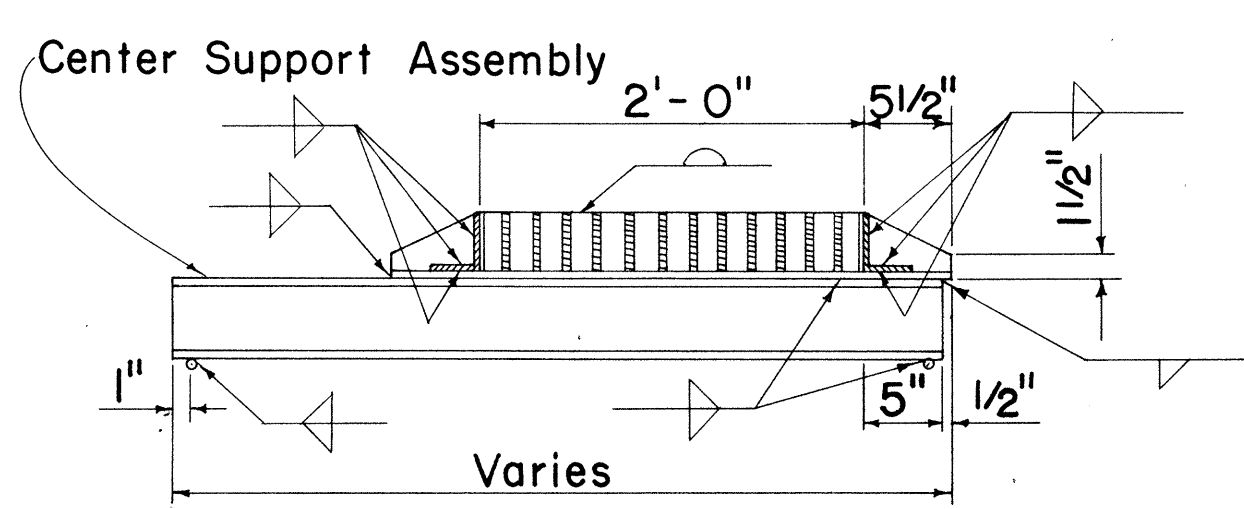
PLAN
(Two or More Grates)



LONGITUDINAL SECTION
(Thru Frame & Grate)

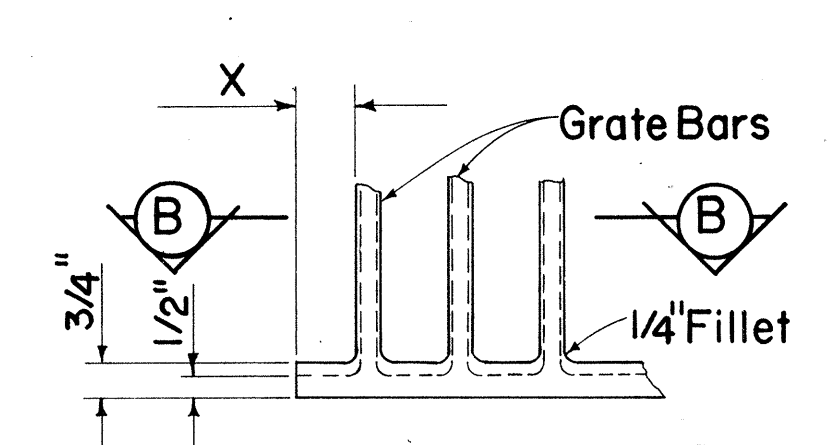


PLAN
(Single Grate)

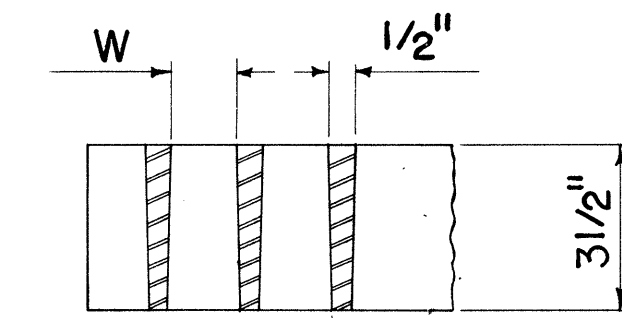


CROSS SECTION
(Thru Frame & Grate)

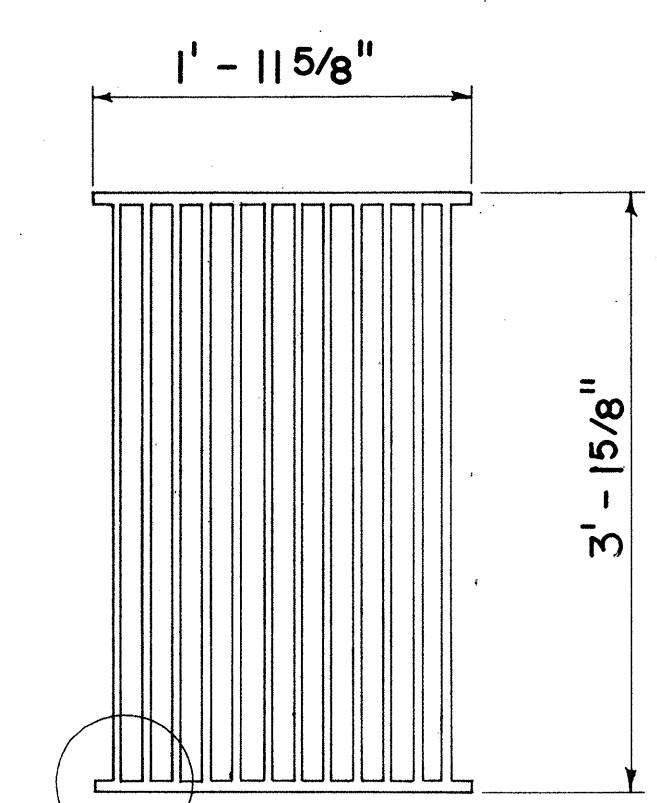
FRAME DETAILS
Scale: 1" = 1' - 0"



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

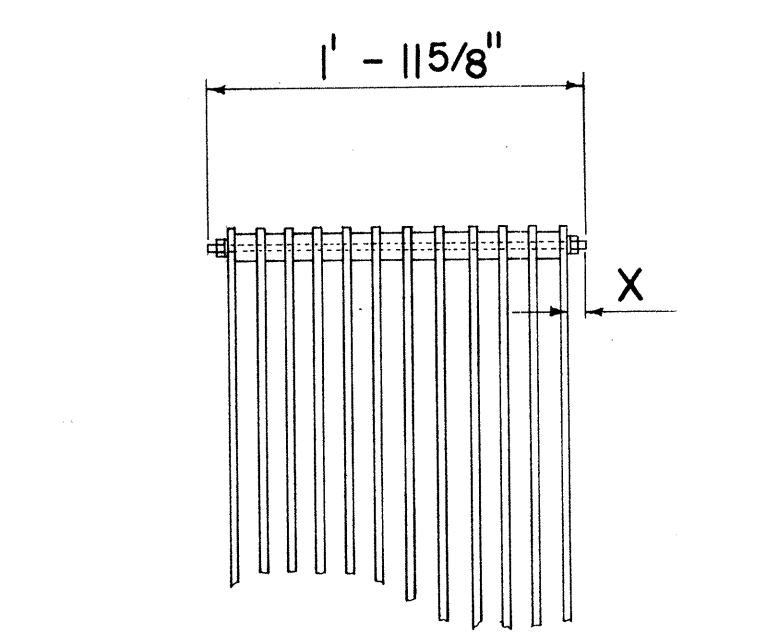


SECTION "B-B"
Scale: 3" = 1' - 0"

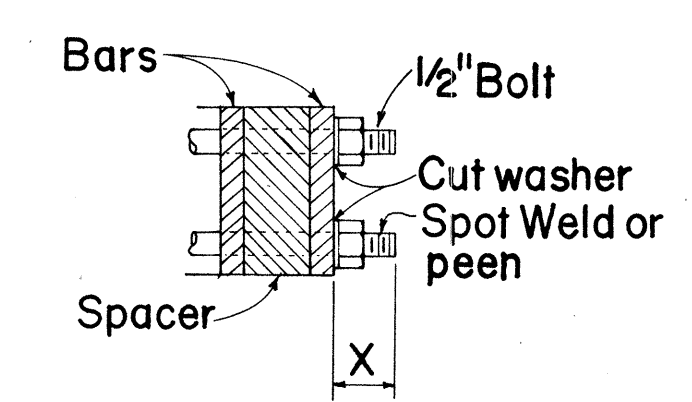


PLAN
Scale: 1" = 1' - 0"

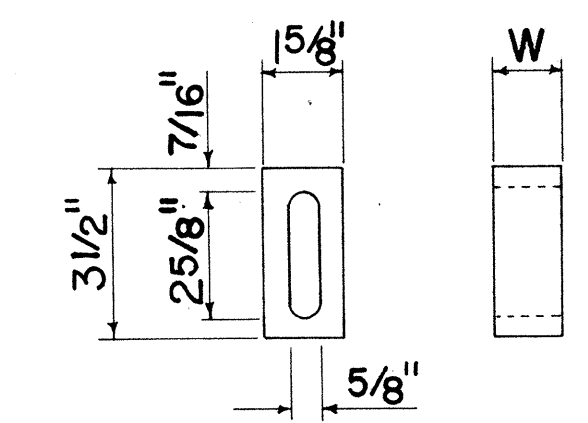
ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL GRATE



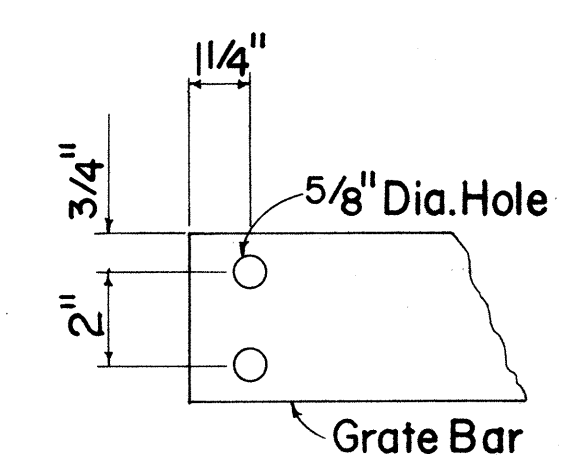
BOLTED END BLOCK
Scale: 1" = 1' - 0"



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

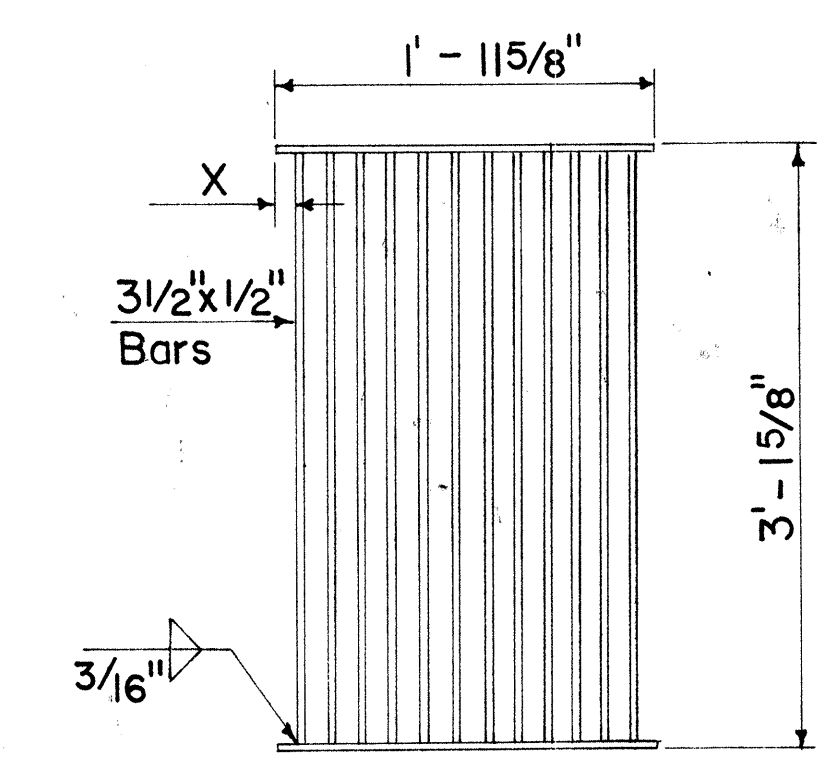


BAR SPACER
Scale: 3" = 1' - 0"

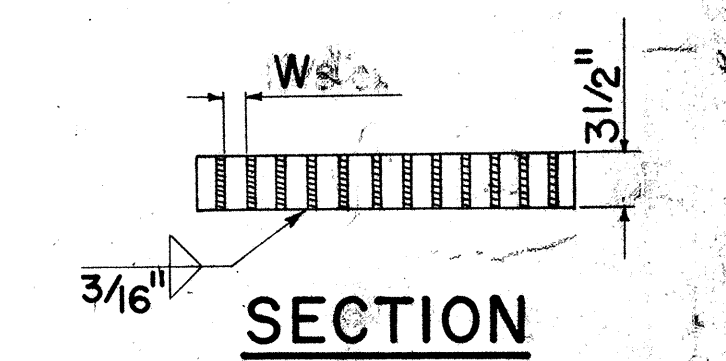


END OF BAR
Scale: 3" = 1' - 0"

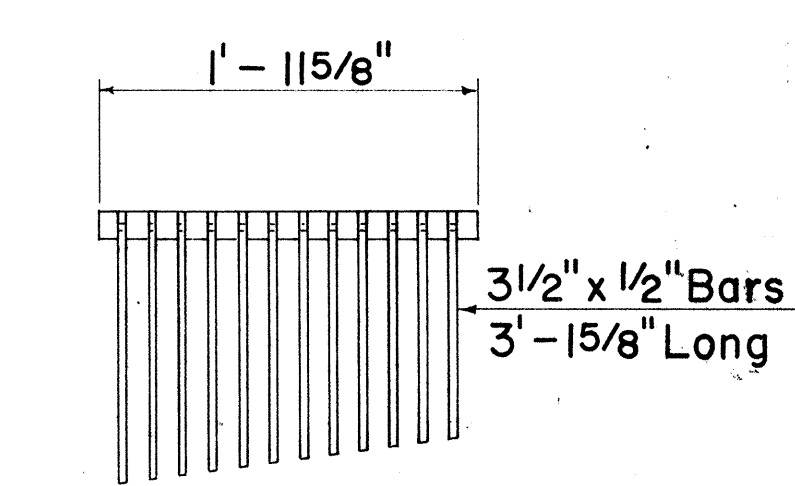
ALTERNATIVE BOLTED GRATE



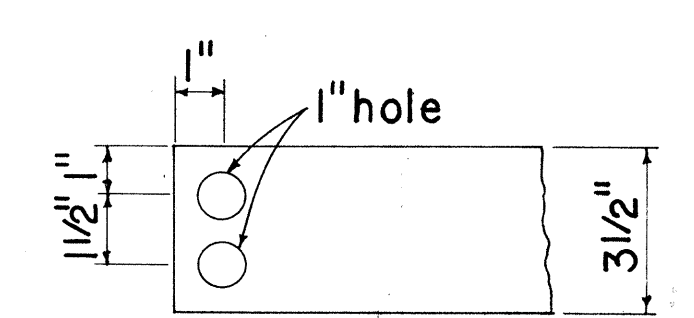
PLAN
ALTERNATIVE WELDED GRATE
Scale: 1" = 1' - 0"



SECTION

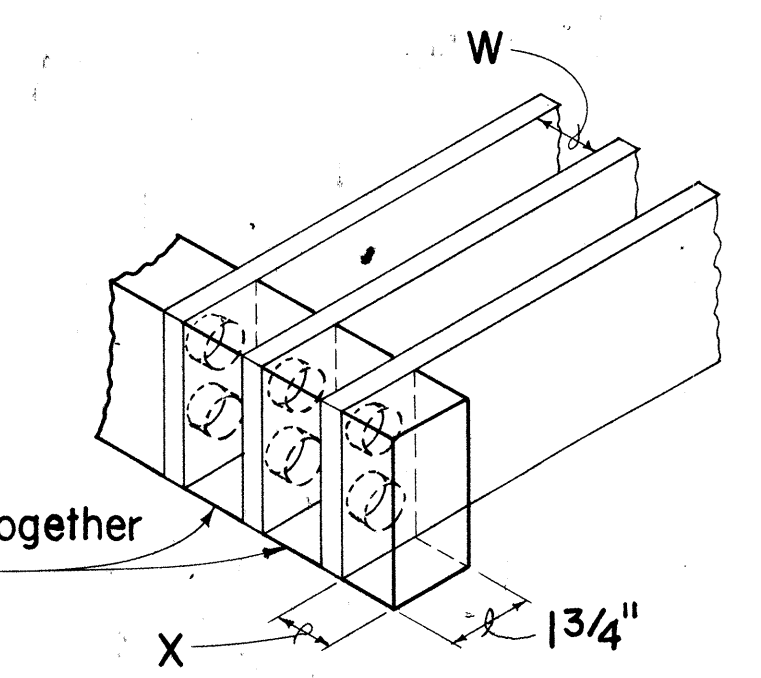


CAST END BLOCK
Scale: 1" = 1' - 0"



END OF BAR
Scale: 3" = 1' - 0"

ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL END BLOCK GRATE



Both ends held together by solid casting

GENERAL NOTES

- Contractor has the option of using cast malleable iron, cast steel, welded, bolted, cast malleable iron end block or cast steel end block grate.
- Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
- All welds 3/8" unless otherwise noted.
- Center support assembly shall be used when two or more grates are specified. Incidental to Types A-9 or A-12 Frame and Grates.
- Refer to "Grate Bar Spacing Table" for Types A-9 and A-12 Grate dimensions.
- 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	A283, Grade D
Cast Steel	A27, Grade 65-35
Malleable Iron Casting	A47, Gr. No. 35018

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"

NOTE:

- Type A-9 - Use in locations off the roadbed on all types of highways.
- Type A-12 - Use within the roadbed on all types of highways.

APPROVAL RECOMMENDED:
 HYDRAULIC DESIGN ENGINEER
 APPROVED:
 ASSISTANT CHIEF, ENGINEERING

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

STANDARD DETAILS

TYPE A-9 AND A-12
 FRAMES AND GRATES

Scales: As Noted Date: Aug. 1968

GENERAL NOTES

- ## SPACING TABLE

NO.	REVISION	APPROVED BY	DATE
1	Curb for Top of Fill Gutters	H.P.	6-5-71

2-11-69
DATE

Scales: As Noted Date: Feb. 1969

SHEET No. 10 OF 10 SHEETS **DH 8**



PLAN

SECTION

SECTION

PLAN



GRATE

SECTION B - B

*For Minimum size box of 3'-0", use 8" and eliminate reinforcing steel shown in the top portion.
 **For Culverts larger than 30", the minimum dimension shall be D.

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