

ORIGINAL
PLAN
NO.

SURVEY PLOTTED BY
DATE

DRAWN BY
DATE

TRACED BY
DATE

QUANTITIES BY
DATE

CHECKED BY
DATE

DRAINAGE SUMMARY

PROJECT: MAUNALOA HIGHWAY, REPLACEMENT OF CULVERTS BETWEEN
MAUNALOA VILLAGE AND KAUNAKAKAI - PHASE II
PROJECT NO. RS-0460(3)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	27R	40

ITEM NO.		203.	206.	207.	401.	503.	602.	603.	603.	603.	603.	603.	603.	603.	603.	603.	603.	603.	603.	603.	603.	603.	603.	603.	604.	604.	612.				
		0210	1000	0100	0500	0000	1000	0010	1010	2110	4000	4055	4062	6002	7000	7071	7074	7084	7735	7737	7803	7817	7820	7833	7834	7841	2360	2370	0100		
UNIT USED		C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	LBS.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	EA.	EA.	C.Y.			
CULVERT NO.	STATION	Imported Borrow	Structure Excavation Other Than At Bridges	Ditch and Channel Excavation	Asphalt Pavement Mix V	Class 'A' Concrete Other Than At Bridges	Reinforcing Steel Other Than At Bridges	Bedcourse Material For Culvert	48" RCP, Cl. III	60" CSP, t=0.138"	72" Steel Liner Plate, t=0.105"	78" Steel Liner Plate, t=0.135"	96" Steel Liner Plate, t=0.135"	42" RCP, Cl. III or 42" CAP, t=0.075" (3x1)	30" RCP, Cl. III or 30" ACP, Cl. III or 30" CAP, t=0.105"	36" RCP, Cl. III or 36" ACP, Cl. III or 36" CAP, t=0.075"	36" RCP, Cl. IV or 36" ACP, Cl. IV or 36" CAP, t=0.105"	36" RCP, Cl. II or 36" ACP, Cl. II or 42" CAP, t=0.075" (3x1)	60" RCP, Cl. II or 60" CAP, t=0.075" (3x1) or 60" CSP, t=0.138"	60" RCP, Cl. II or 60" CAP, t=0.075" (3x1) or 60" CSP, t=0.168"	24" RCP, Cl. II or 24" ACP, Cl. II or 24" CAP, t=0.075" or 24" CSP, t=0.109"	30" RCP, Cl. II or 30" ACP, Cl. II or 30" CAP, t=0.075" or 30" CSP, t=0.079"	30" RCP, Cl. II or 30" ACP, Cl. II or 36" CAP, t=0.075" or 36" CSP, t=0.079"	36" RCP, Cl. II or 36" ACP, Cl. II or 36" CAP, t=0.075" or 36" CSP, t=0.138"	36" RCP, Cl. II or 36" ACP, Cl. II or 42" CAP, t=0.075" (3x1) or 42" CSP, t=0.138"	Type 2-3" Pipe Grate & Frame	Single 3½" Pipe Grate	Grouted Rubble Paving			
1	2 + 10		114		3	55	305	14																							
2	7 + 68	22	143		3	65	495	15																							
3	13 + 04		336	6	9	245	907	38																							
4	16 + 59		84		3	50	330	11							63																
5	32 + 00		185	9	7	140	756	24									150														
6	41 + 42		282		4	120	196	13												68										25	
7	70 + 25		181	12	3	85	142	13						70																10	
8	72 + 64		288	16	4	115	196	15												76										10	
9	93 + 20		143		3	65	124	12											66												
10	107 + 35		76		3	75	543	10								53														2	
11	116 + 24		48		-	320	1315						148																	20	
12	126 + 50		111		3	50	286	10																						10	
13	151 + 25		189	10	4	115	196	12												62										25	
14	161 + 30.76	8	67	3	-	255	376					107																		30	
15	186 + 50	328	113		-	85	98			51																					
16	213 + 15		62	35	-	225	2194				115																			45	
17	224 + 17		87		3	50	328	13																							
18	229 + 50		76	3	2	30	186	9													59										
19	280 + 50	180	99		-	110	262	9	40																						
	TOTAL	538	2684	94	54	2255	9235	218	40	51	115	107	148	70	63	53	150	66	138	68	59	88	73	56	59	240	3	5	19		
	ROUNDED TOTAL	550	2700	100	60	230	9250	220	40	52	116	108	148	70	64	54	150	66	138	68	60	88	74	56	60	240	3	5	20		

LEGEND: RCP - Reinforced Concrete Pipe
ACP - Asbestos Concrete Pipe
CAP - Corrugated Aluminum Pipe
CSP - Corrugated Steel Pipe

10/23/84 Per Addendum No.1
Changed the following culverts from:
42" CAP, t=0.105" to 42" CAP, t=
0.075" (3x1), 60" CAP, t=0.135"
to 60" CAP, t=0.075" (3x1), and
60" CAP, t=0.164" to 60"
CAP, t=0.075" (3x1)
DATE REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE SUMMARY

MAUNALOA HIGHWAY

Replacement of Culverts bet. Maunaloa
Village and Kaunakakai - Phase II

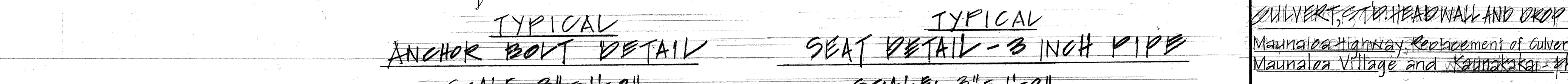
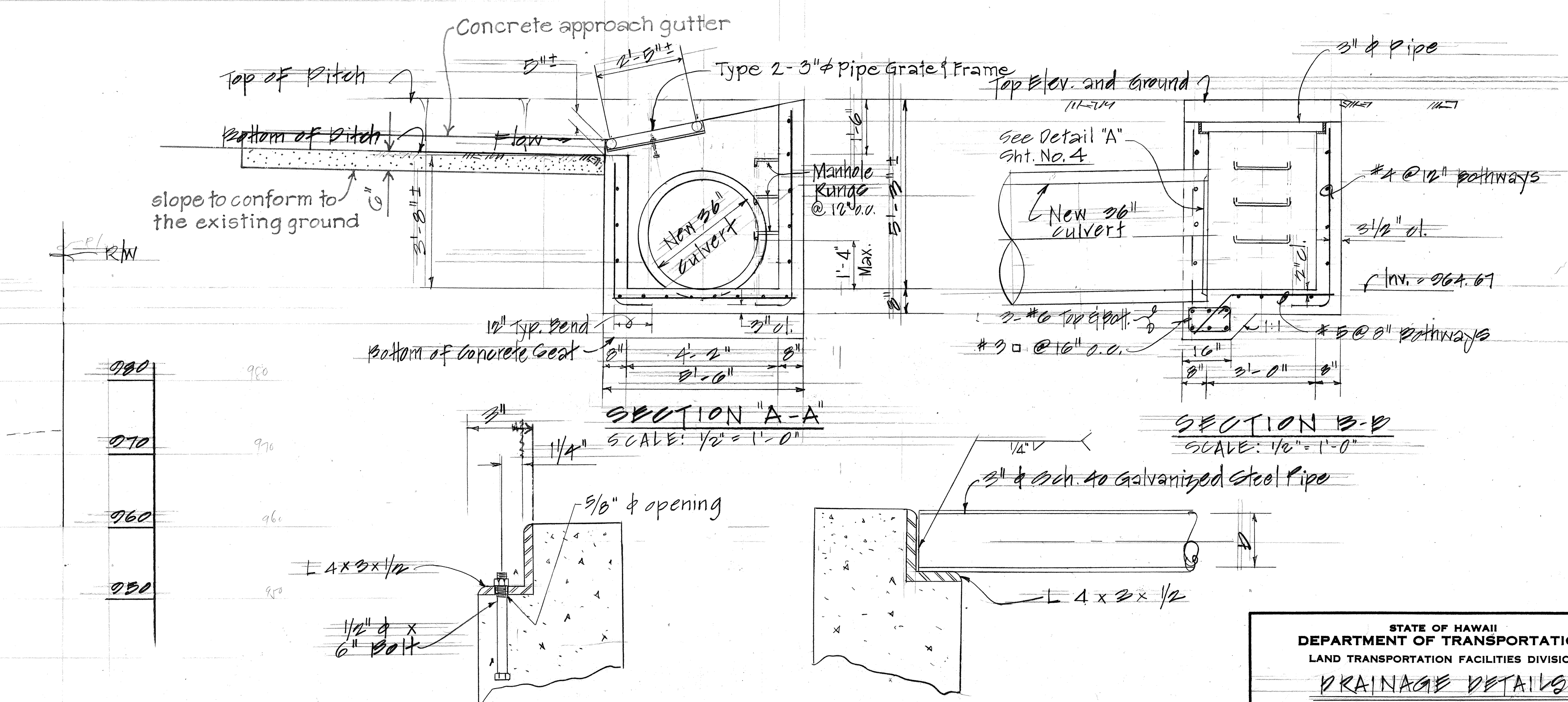
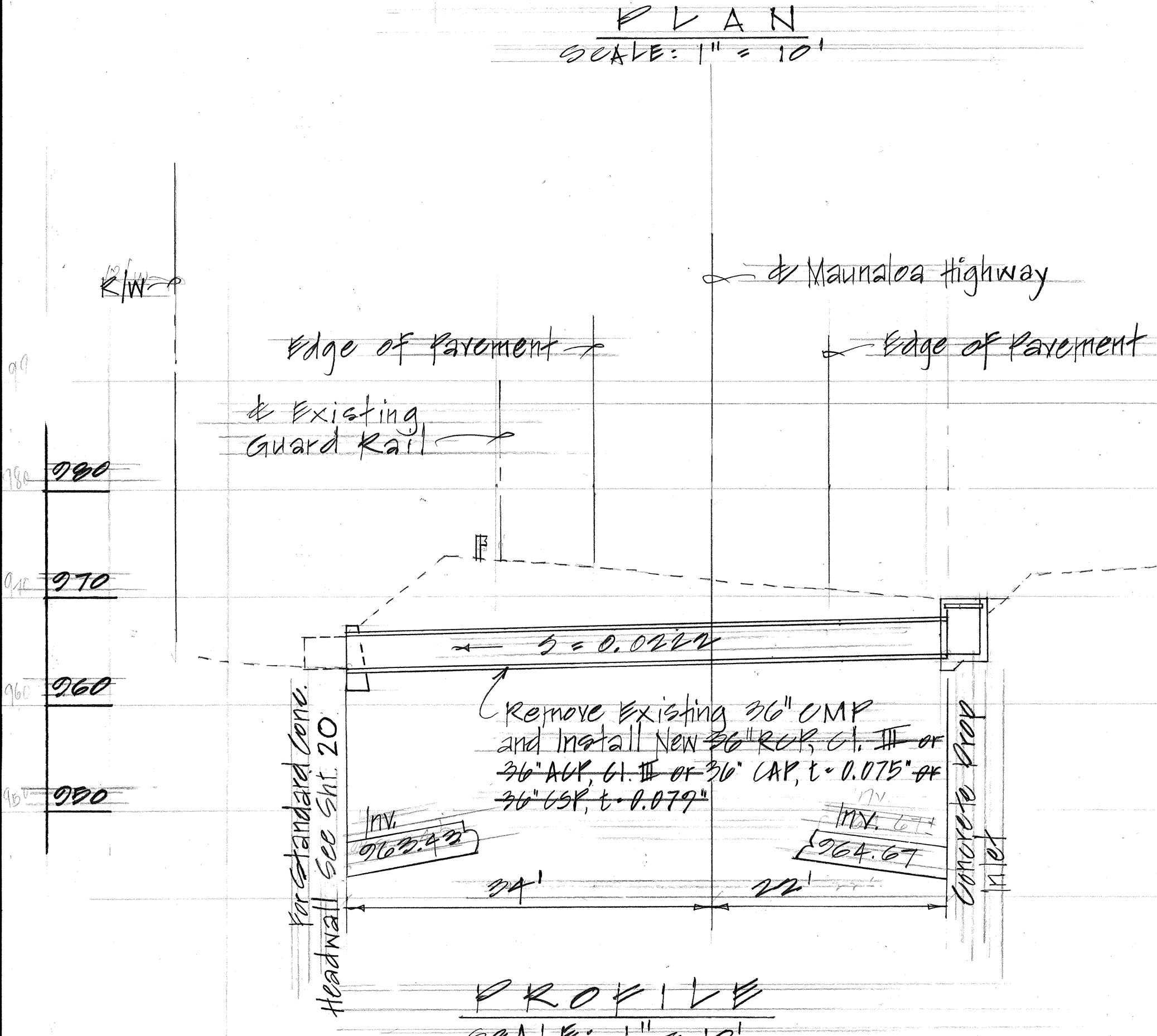
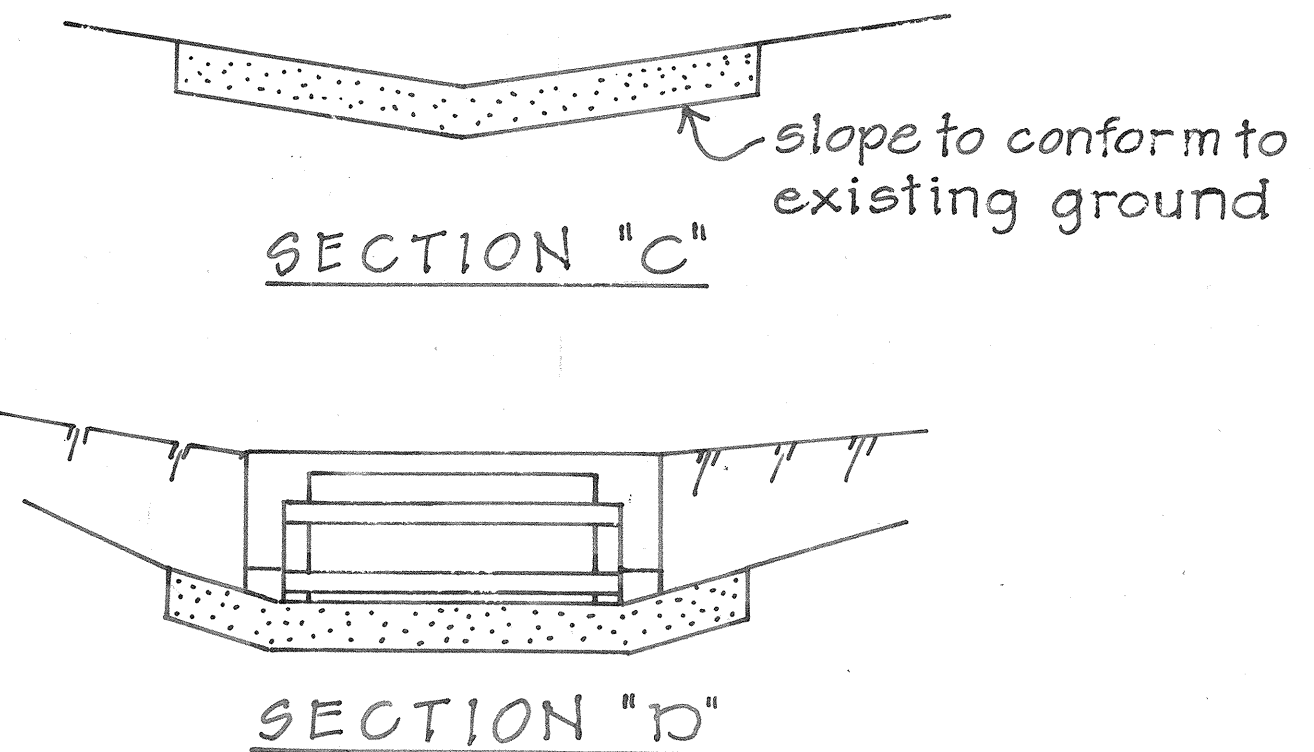
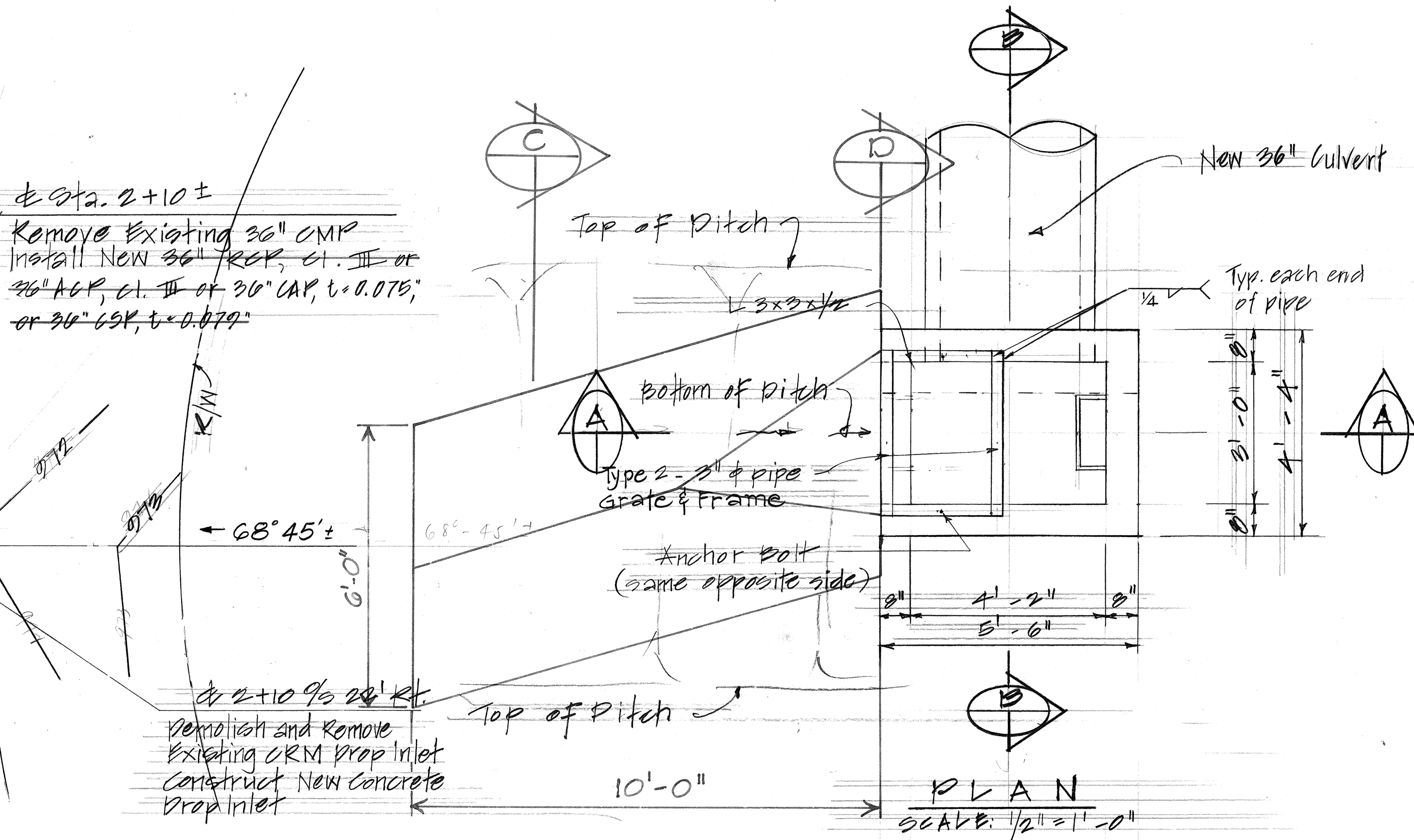
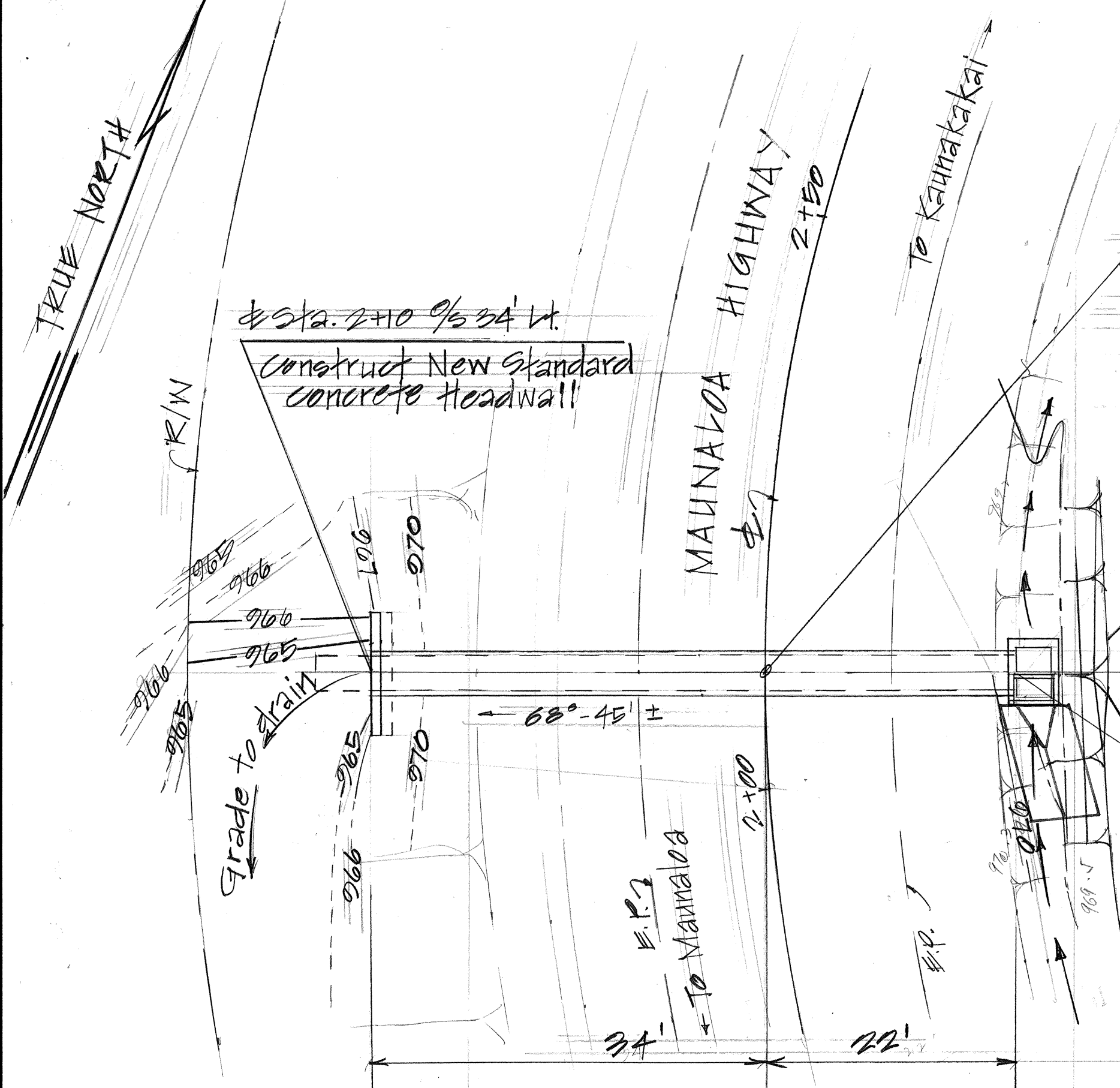
PROJ. No. RS-0460(5)

DATE: Aug. 1984

SHEET No. 1 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	28	40

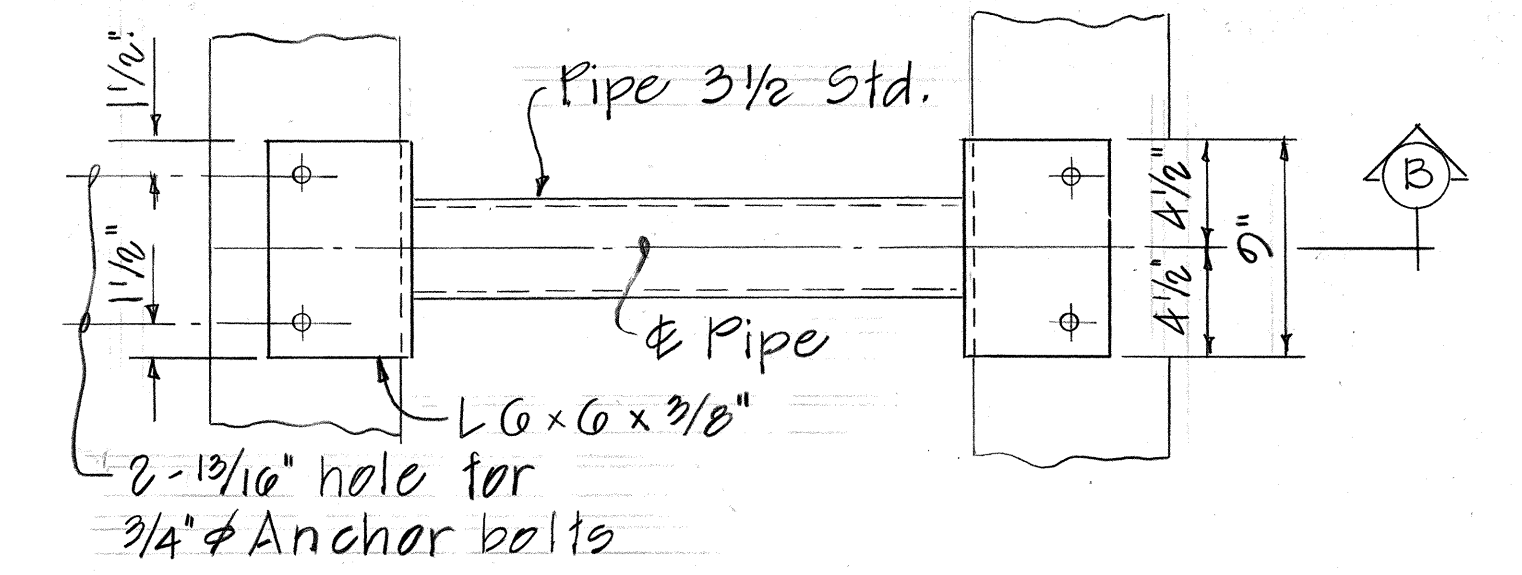
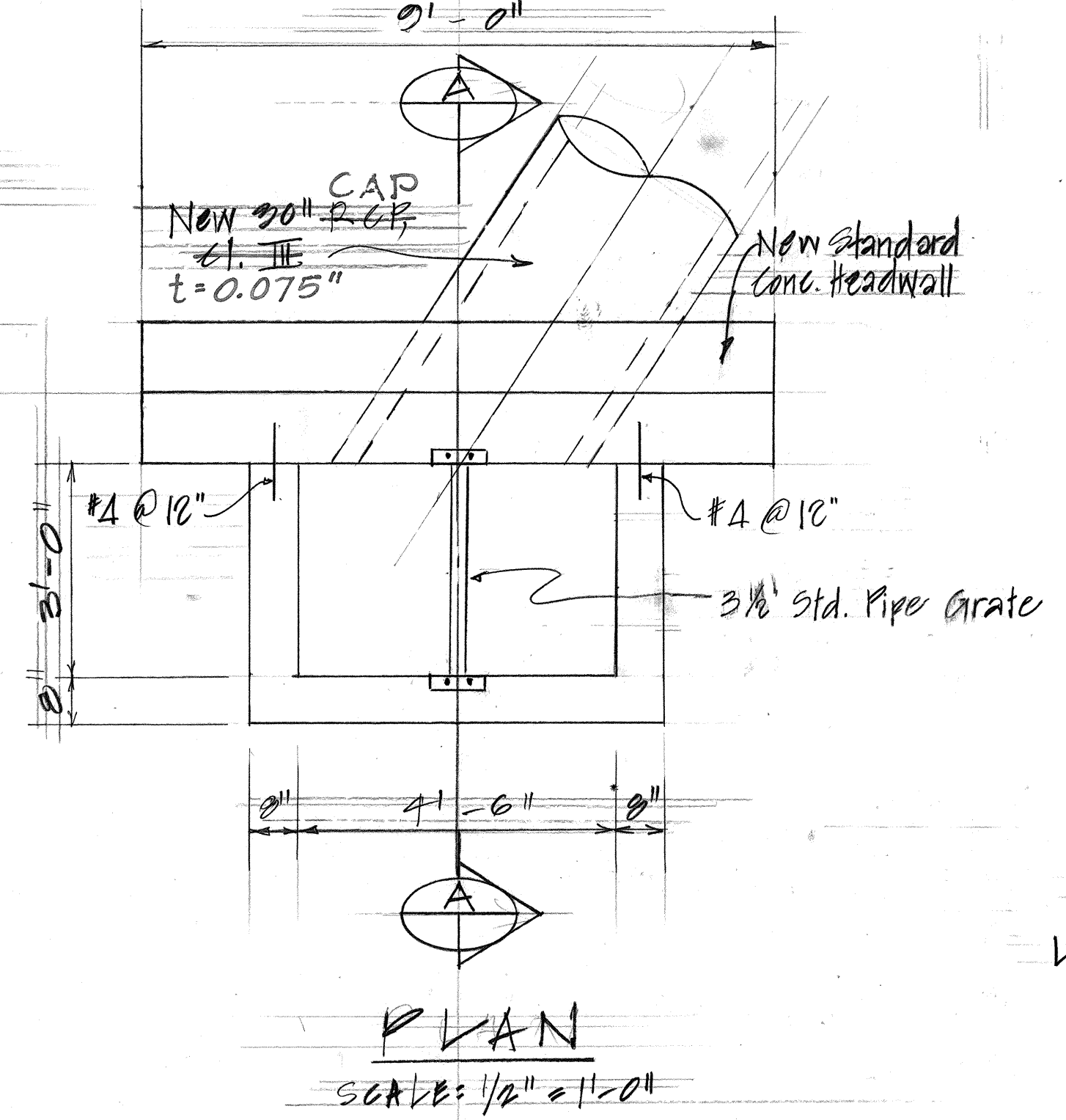
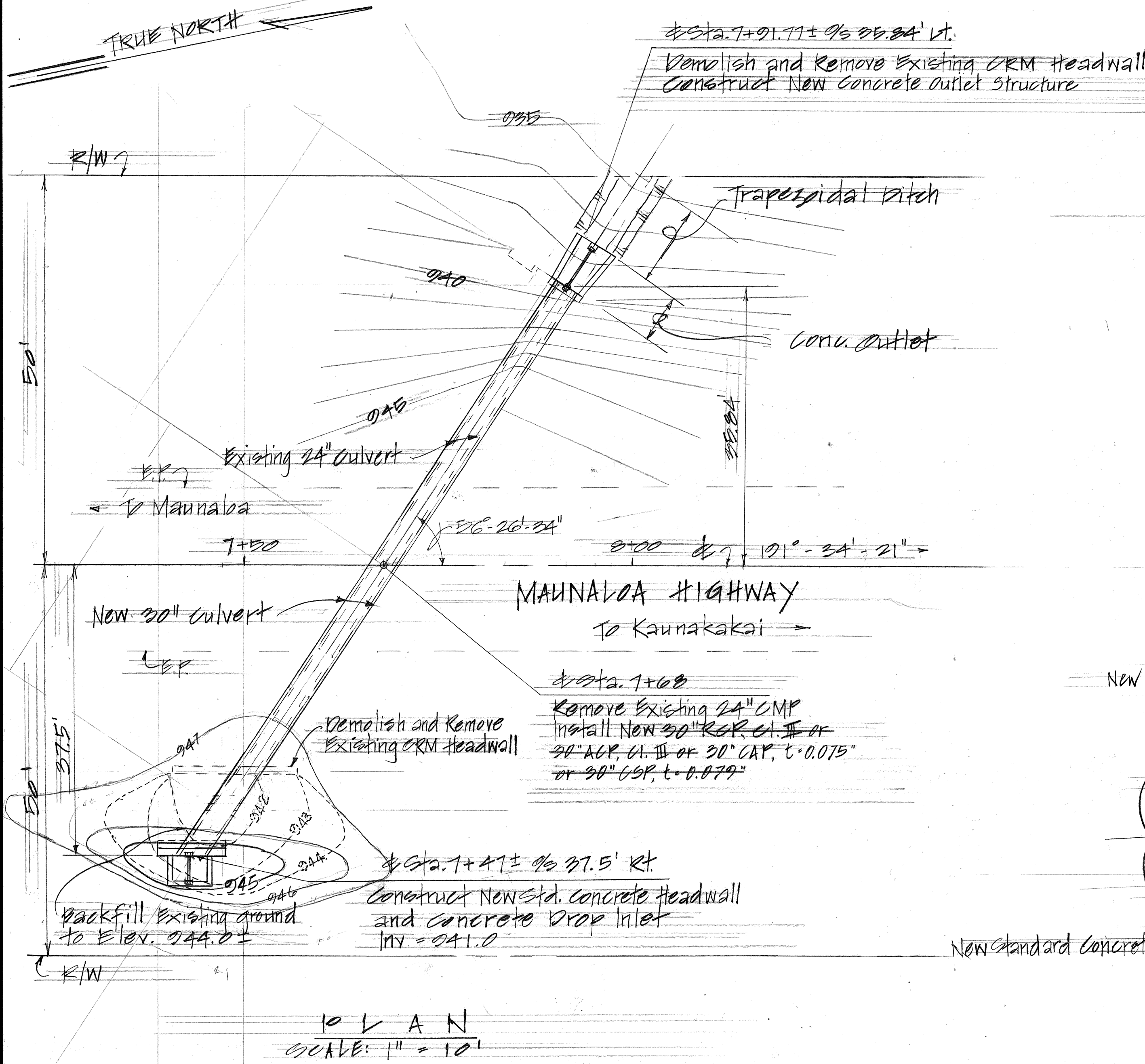
- Notes:
- Concrete for all drop intakes shall be of Class "A" concrete.
 - Manhole rungs shall be considered incidental to Item 503.0000 Class "A" concrete other than at Bridges.
 - 3" ϕ 4" x 3" x 1/2" angles and 1/2" ϕ anchor bolts shall be paid under Item No. 604.2300 2-3" ϕ pipe grate & frame



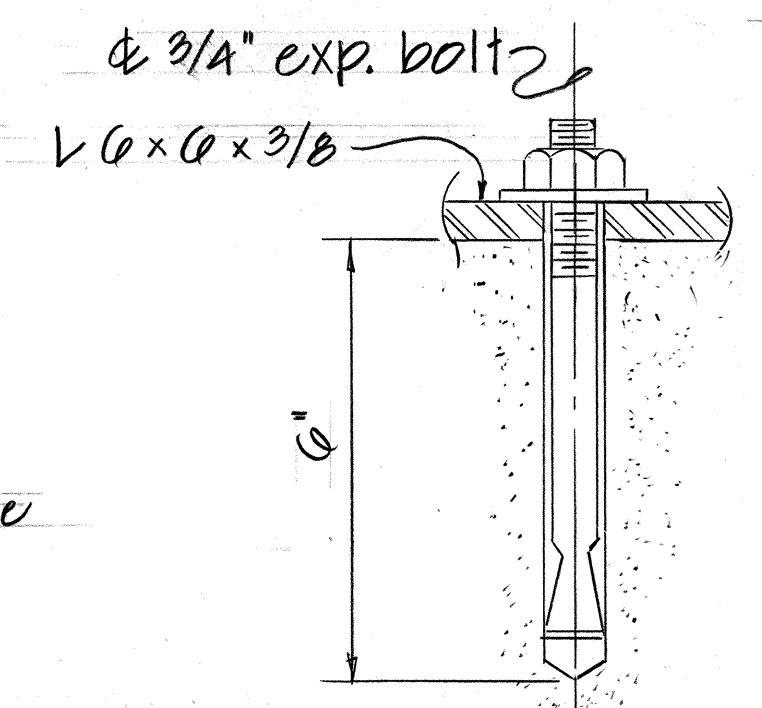
DETAILS OF 30 INCH CULVERT AT STA. 2+10 - MAUNALOA HIGHWAY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
CULVERT, STRUCTURE HEADWALL AND DROP INLET
Maunaloa Highway, Replacement of Culverts bet.
Maunaloa Village and Kaunakakai Phase I
Proj. No. RS-0460 (5)
SCALE: As Noted DATE: May 1985
SHEET NO. 2 OF 20 SHEETS

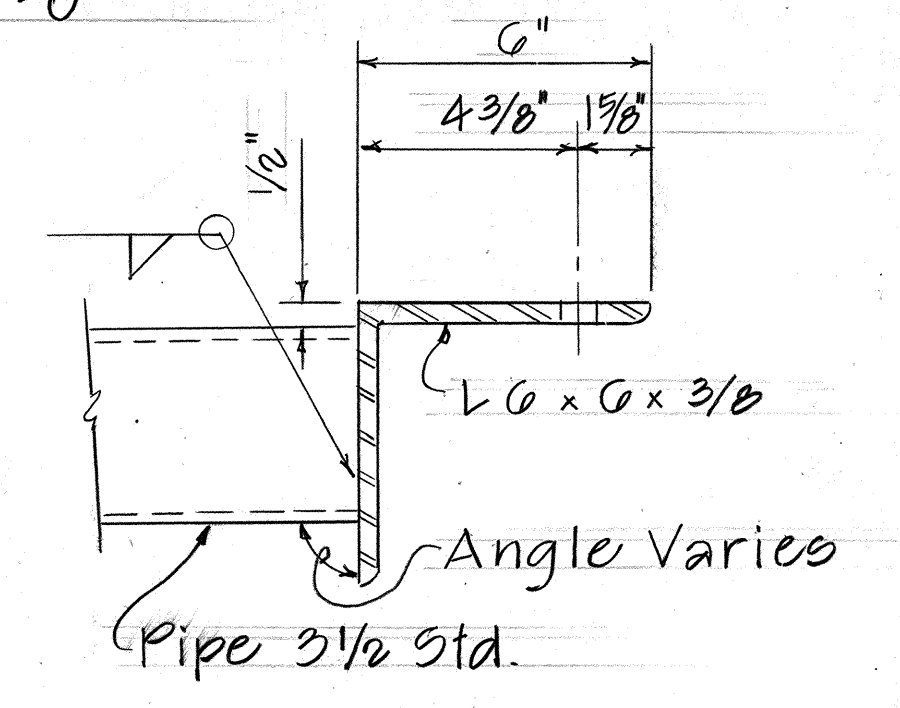
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460 (5)	1985	29	46



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



ANCHOR BOLT DETAIL
Scale: 3" = 1'-0"
Not to Scale

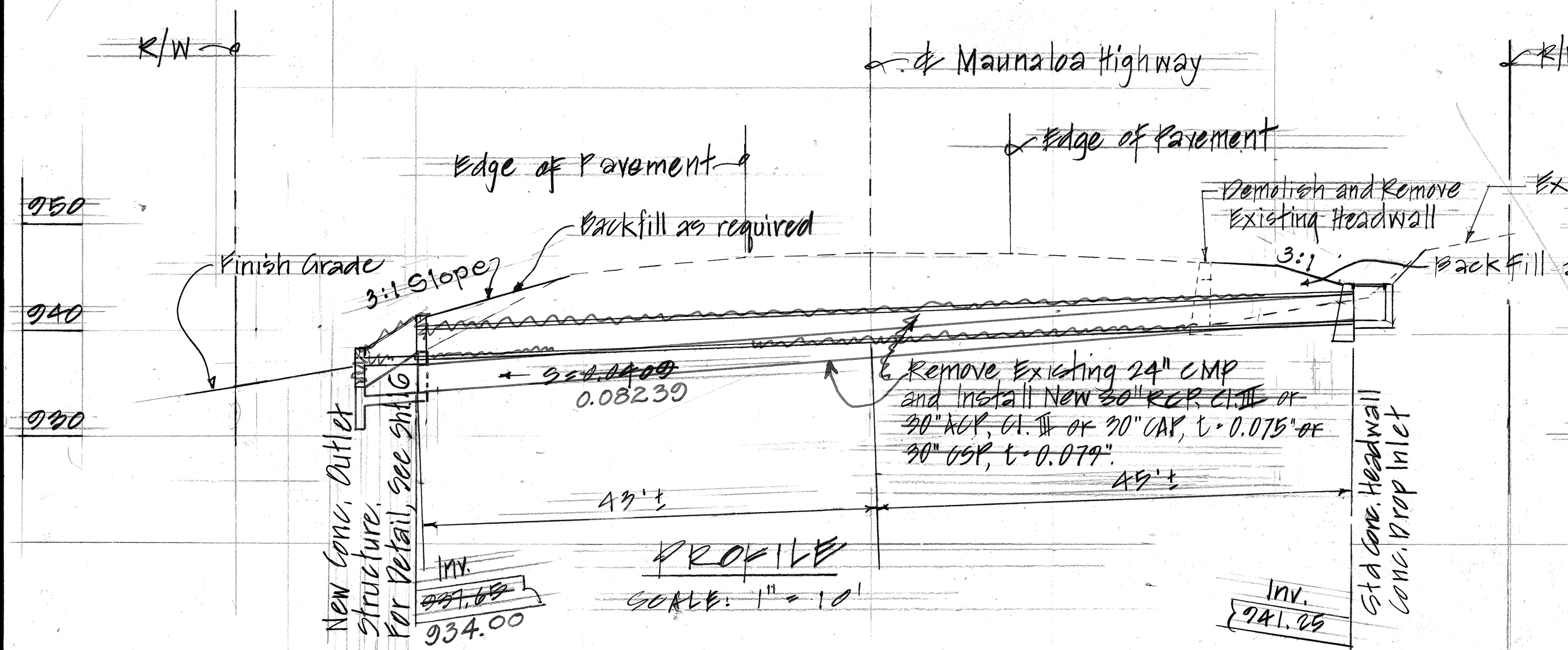


PLAN
Scale: 1 1/2" = 1'-0"

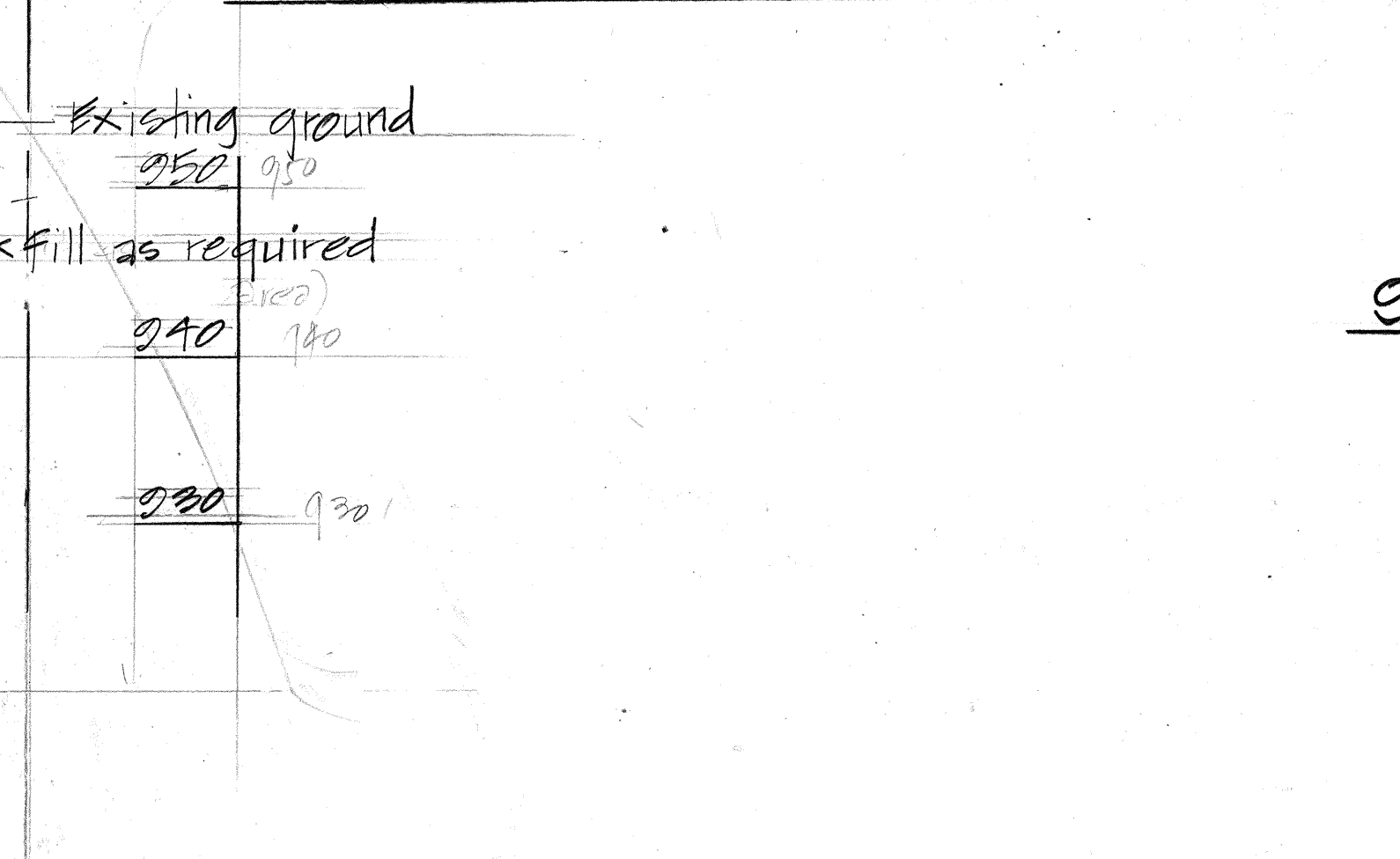
GENERAL NOTES:

1. Structural steel shapes and plates shall conform to ASTM A-36.
2. Structural pipe shall conform to ASTM A-53 Grade B.
3. Electrodes shall be E60XX, and welds shall be 3/16" fillet welds unless noted otherwise.
4. All dimensions shall be verified by the Contractor before fabrication and any discrepancy shall be promptly reported to the Engineer.
5. All structural steel assemblies and hardware shall be hot dip galvanized after fabrication.
6. No percussion or impact drills shall be permitted in drilling holes in the existing structure.
7. Expansion bolts shall be considered incidental to the various contract items.

SINGLE 3 1/2" PIPE GRATING DETAIL



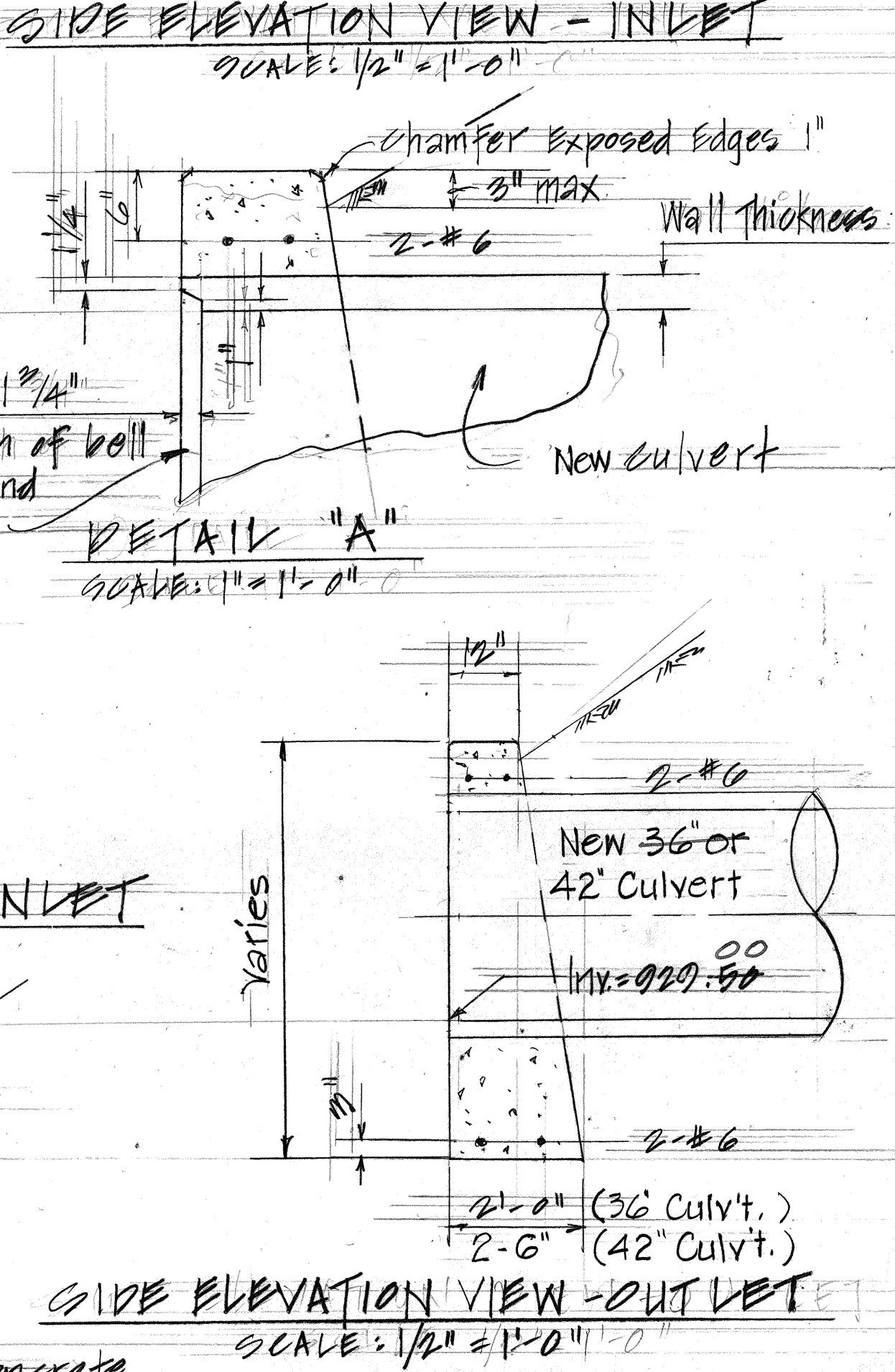
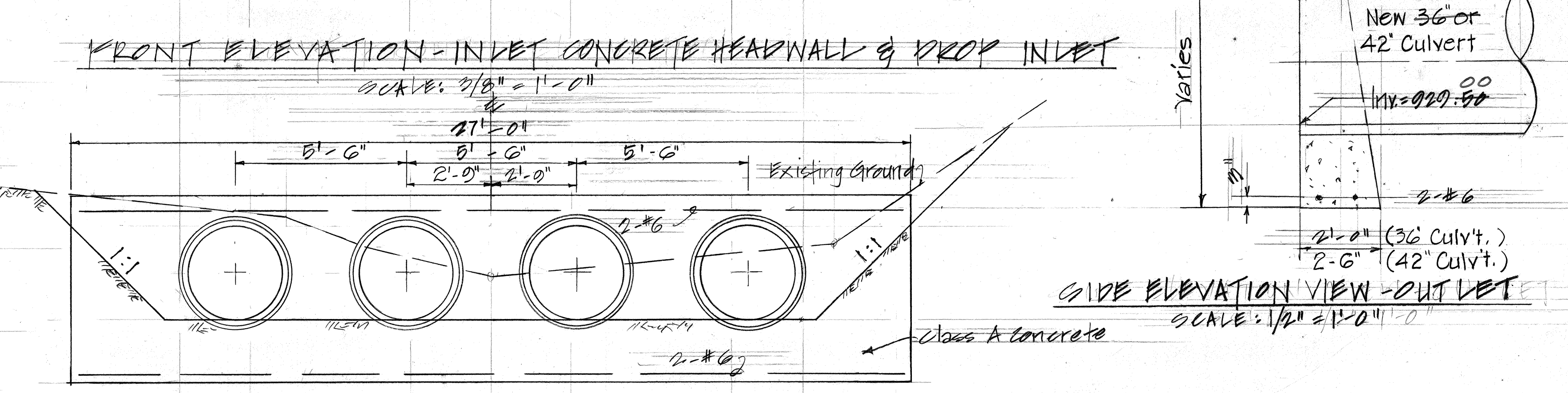
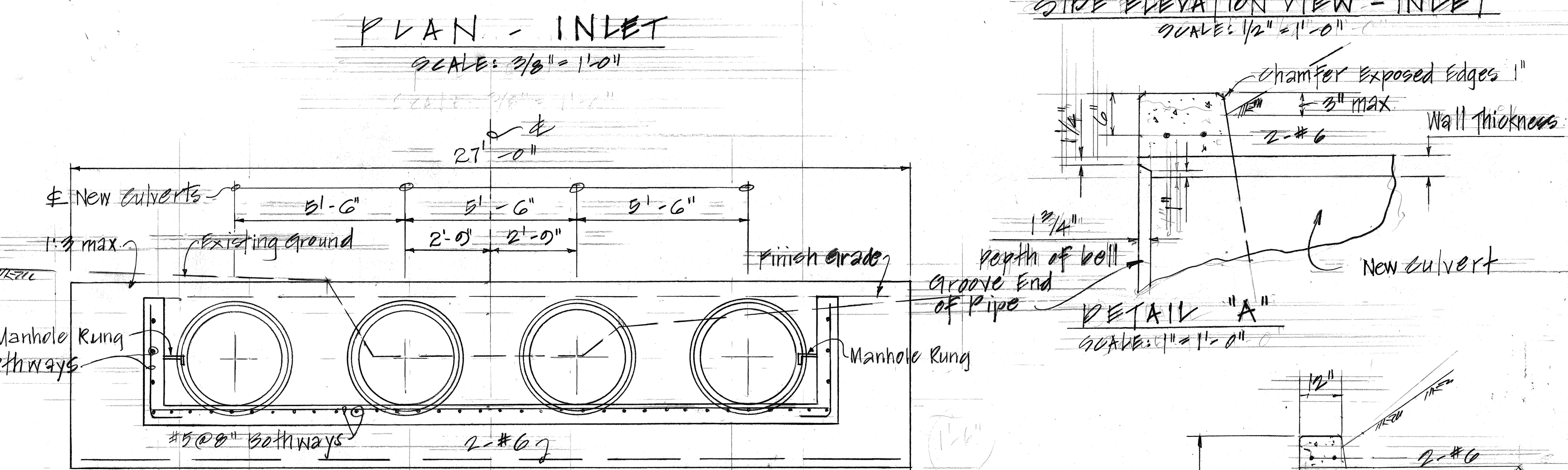
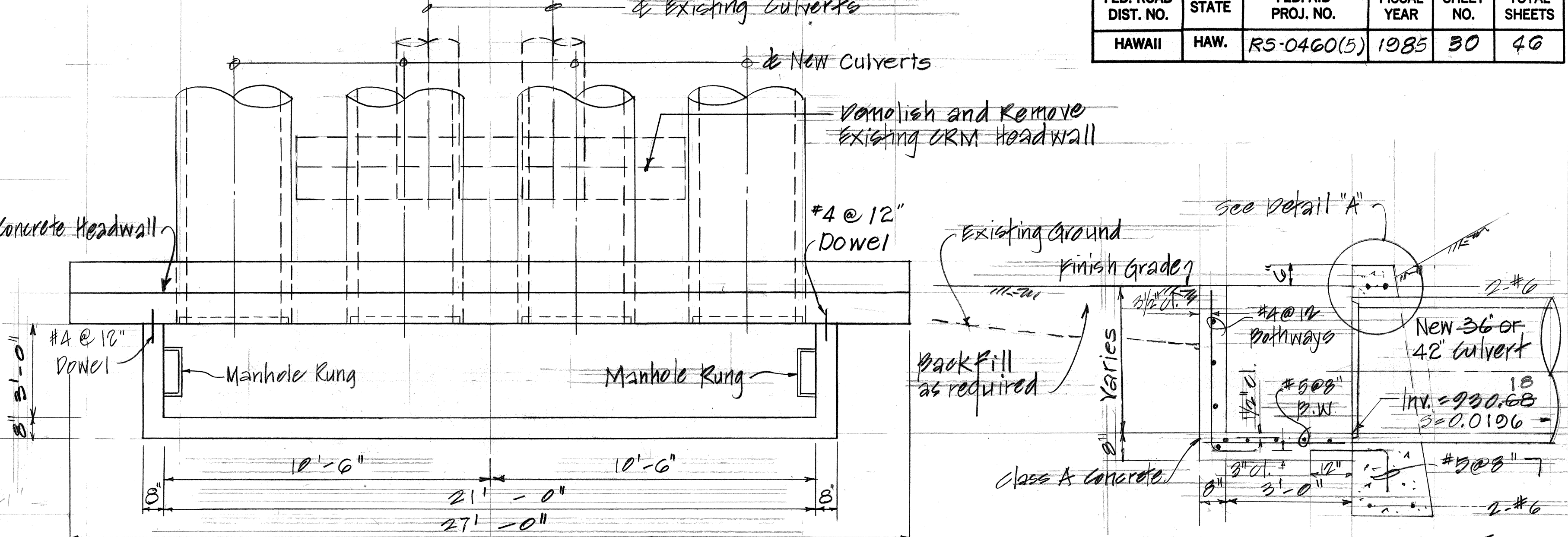
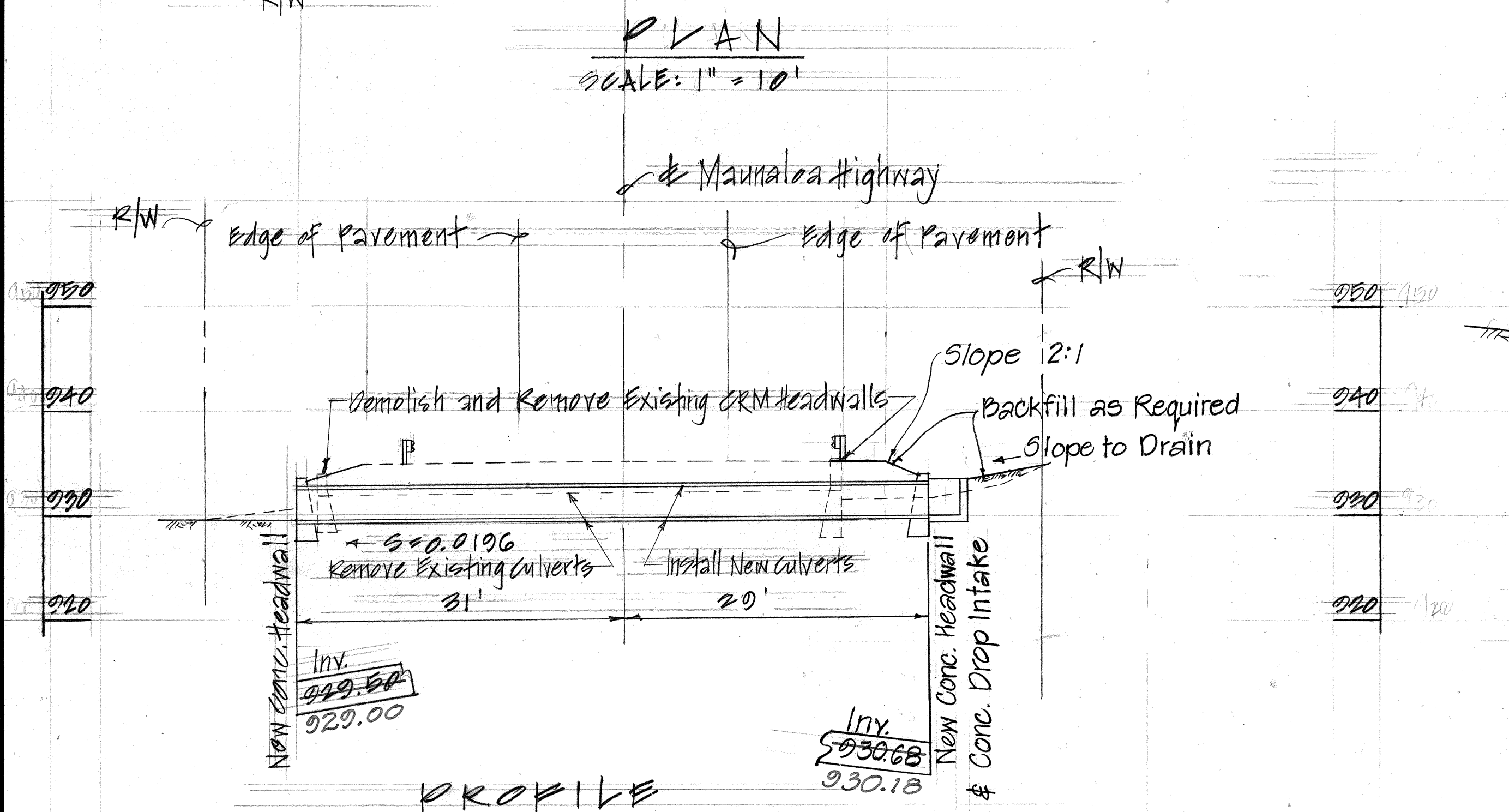
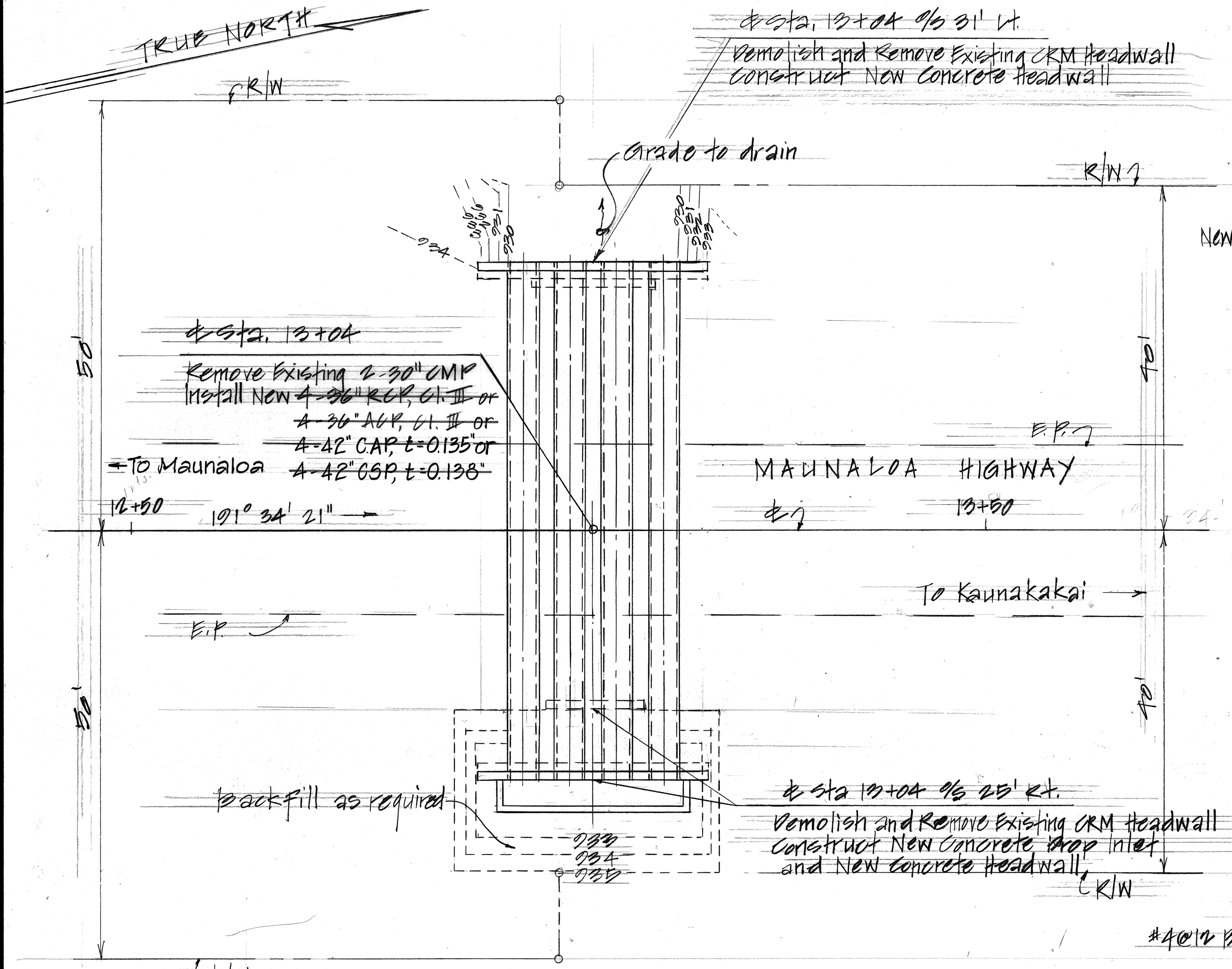
DETAILS OF CONCRETE DROP INLET



DETAILS OF 30 INCH CULVERT AT STA. 7+00 - MAUNALO A HIGHWAY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
CULVERT, GRP OUTLET AND DROP INLET
AND PIPE GRATING
Maunaloa Highway Replacement of Culverts bet.
Maunaloa Village and Kaunakakai - Phase II
Proj. No. RS-0460 (5)
SCALE: As Noted DATE: May 1985
SHEET No. 3 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	30	40



DETAILS OF 4-36 INCH CULVERTS AT STA. 13+04 - MAUNALO A HIGHWAY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS

CULVERTS, CONC. HEADWALLS & DROP INLET

Maunaloa Highway, Replacement of Culverts bet. Maunaloa Village towards Kaunakakai - Phase II

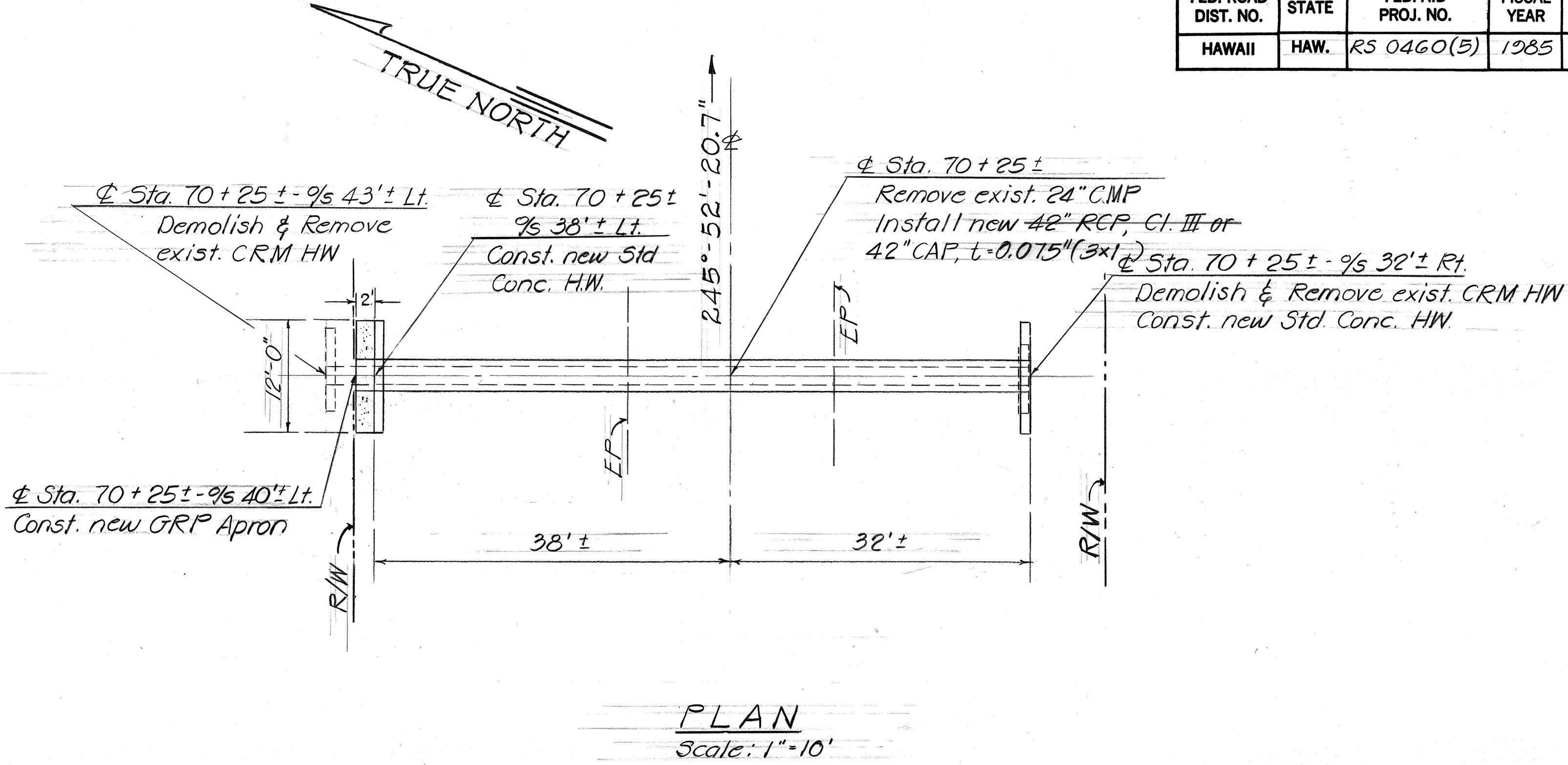
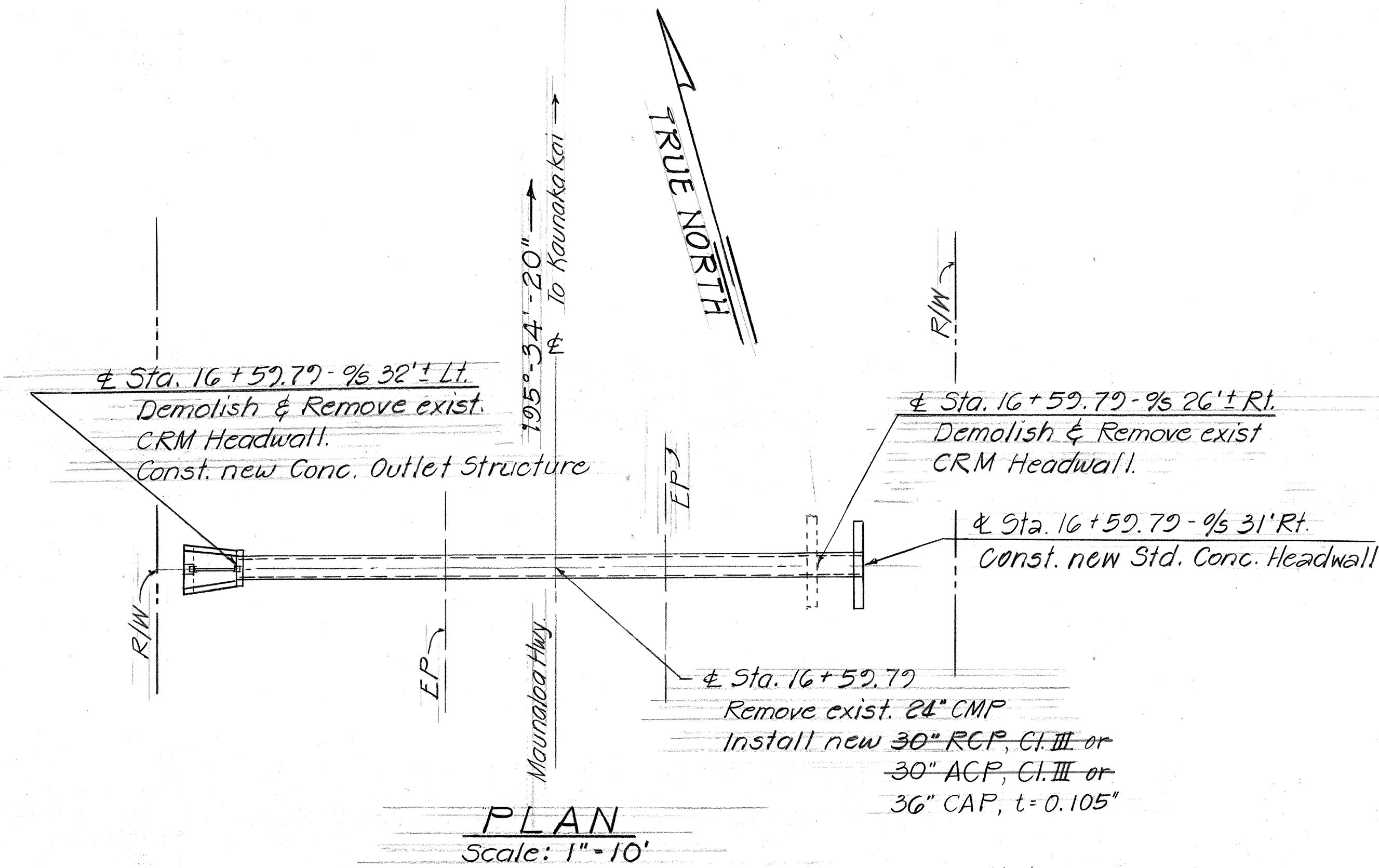
Proj. No. RS-0460 (5)

SCALE: As Noted DATE: May 1985

SHEET NO. 4 OF 20 SHEETS

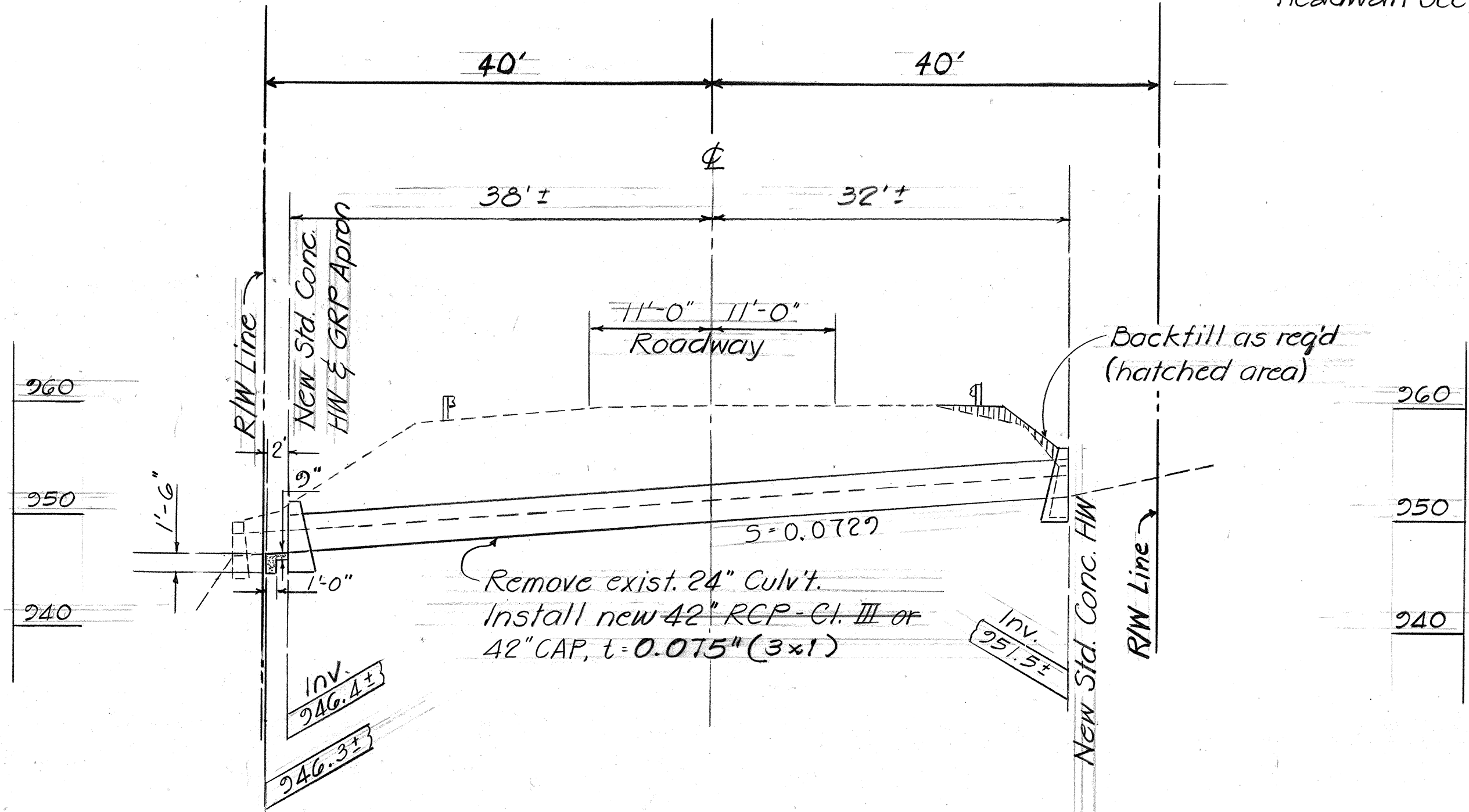
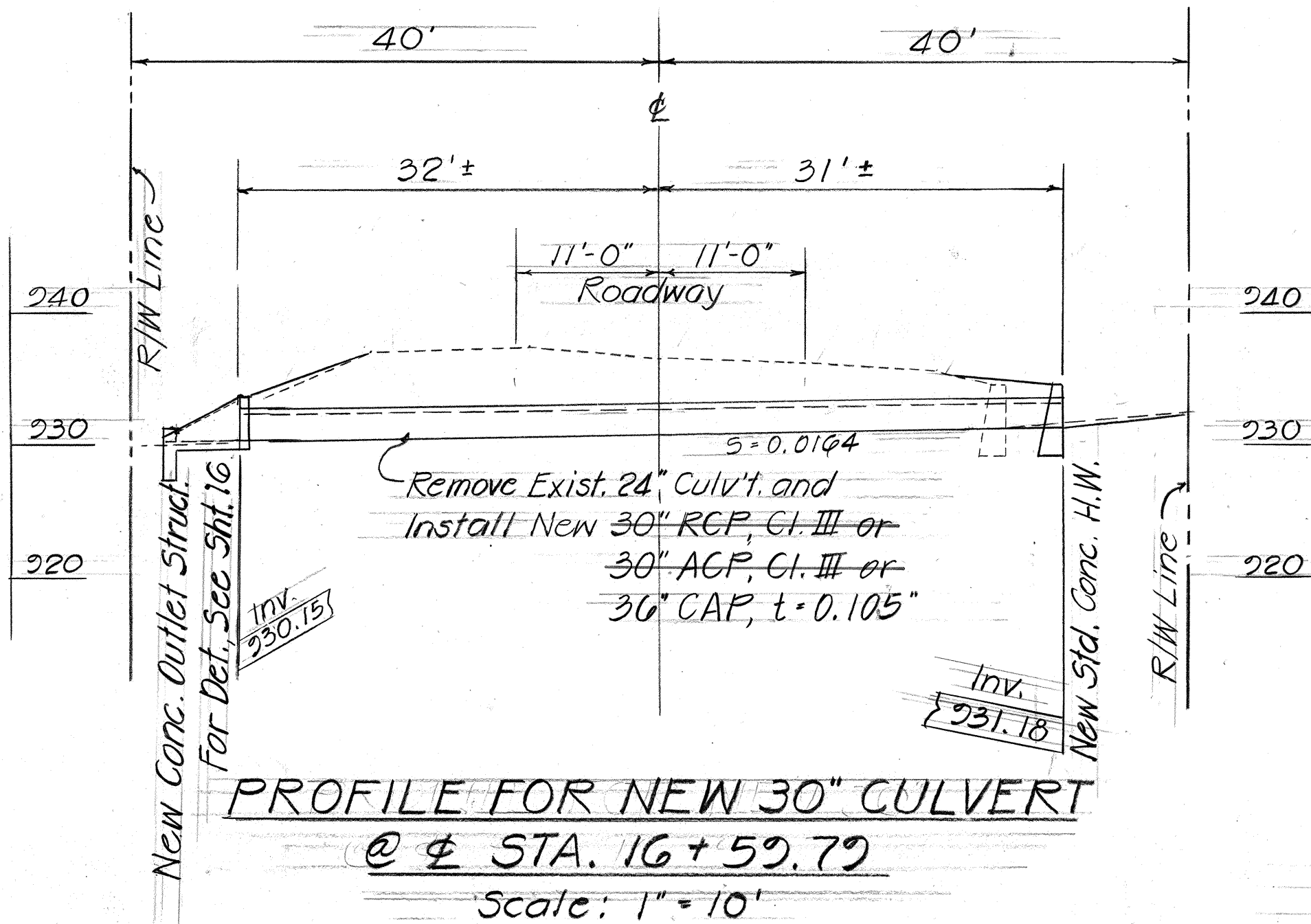
DATE	DESIGNED BY	CHECKED BY
PLAN	TRACED BY	
NOTE BOOK	DESIGNED BY	
QUANTITIES BY		

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS 0460(5)	1985	31R	46



Note:
For Standard Conc.
Headwall see Sht. 20

Note:
For Standard Conc.
Headwall see Sht. 20

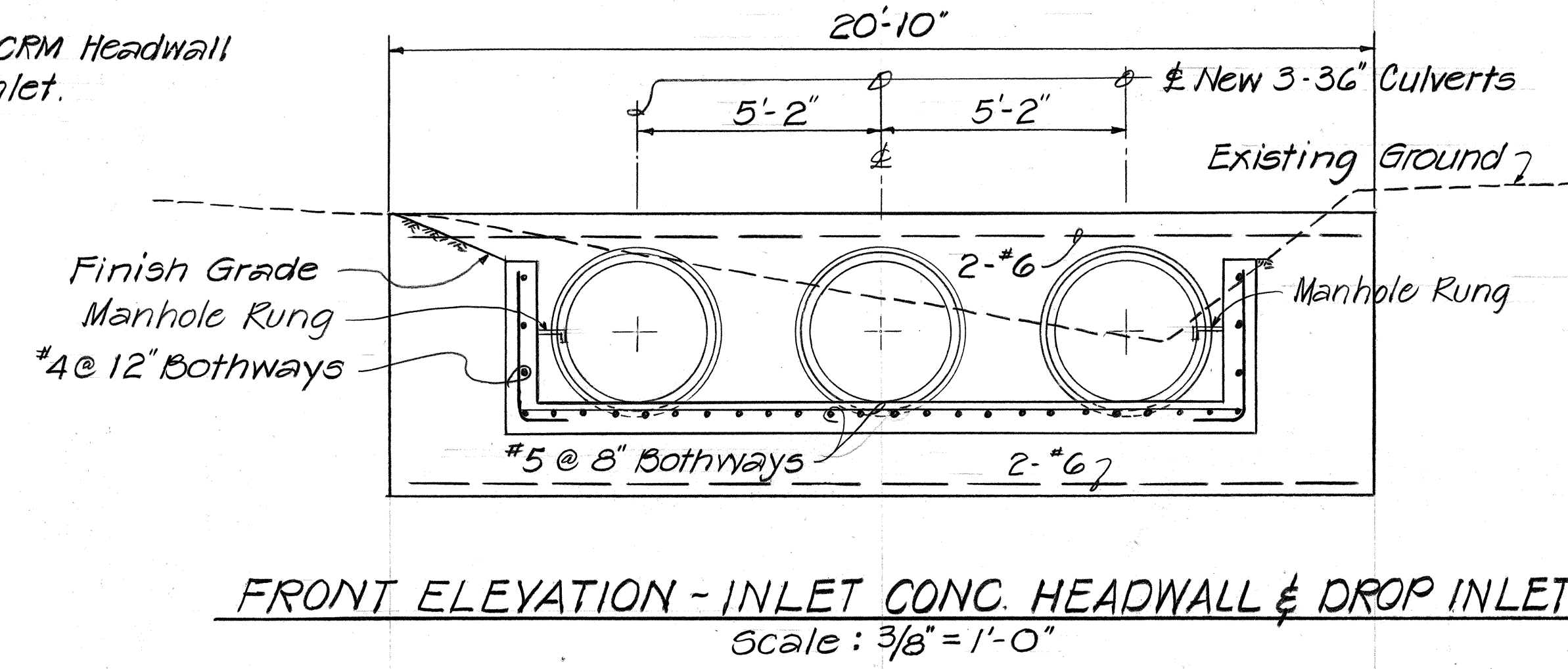
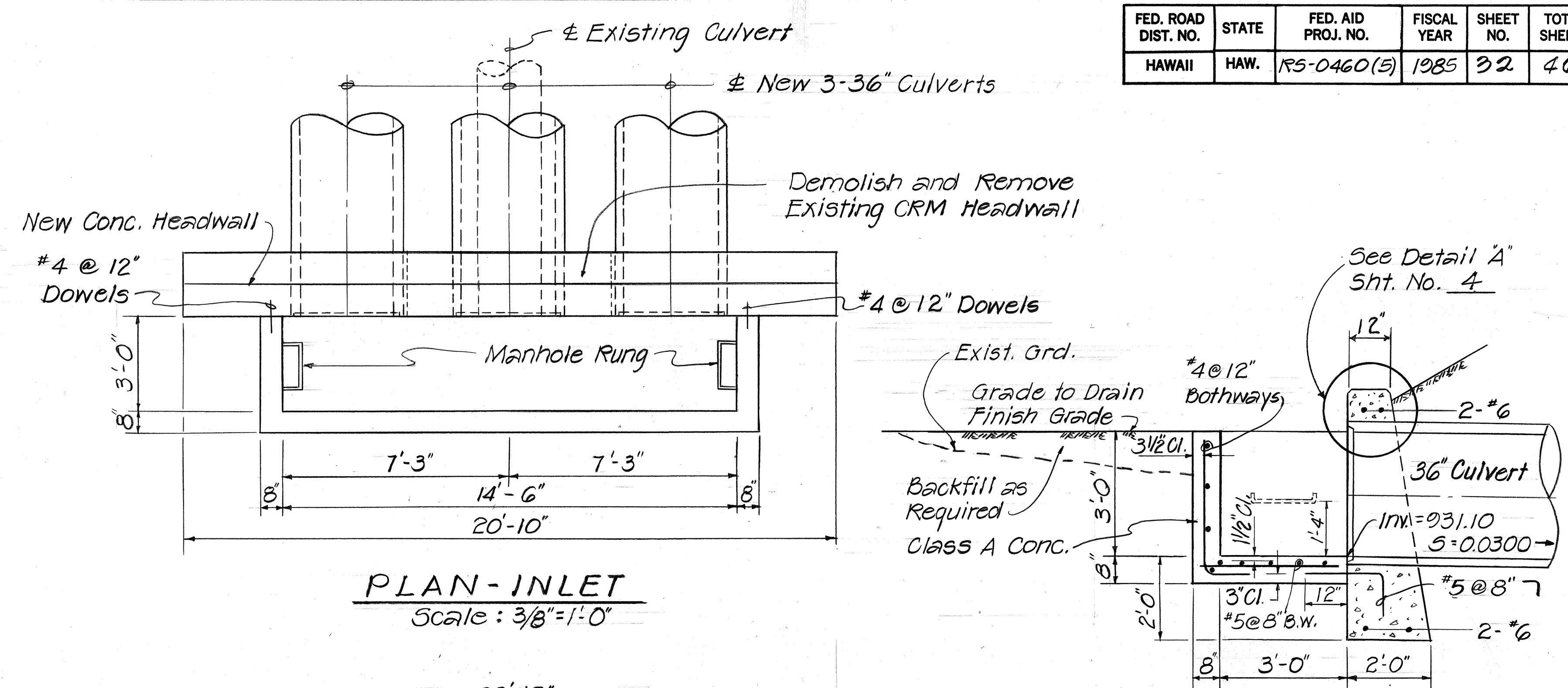
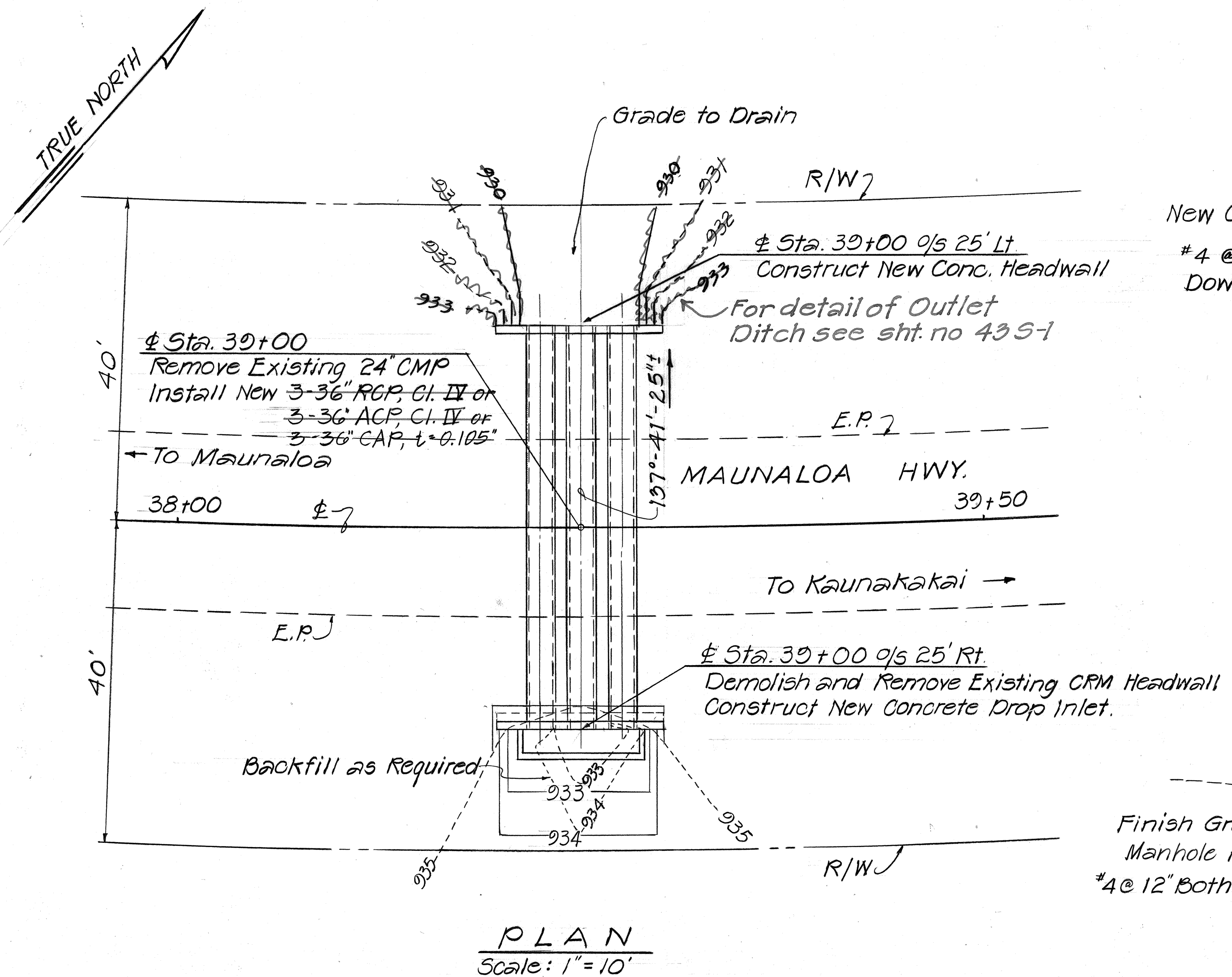


DETAILS OF 30 AND 42 INCH CULVERTS AT STA. 16+59.79 AND STA. 70+25

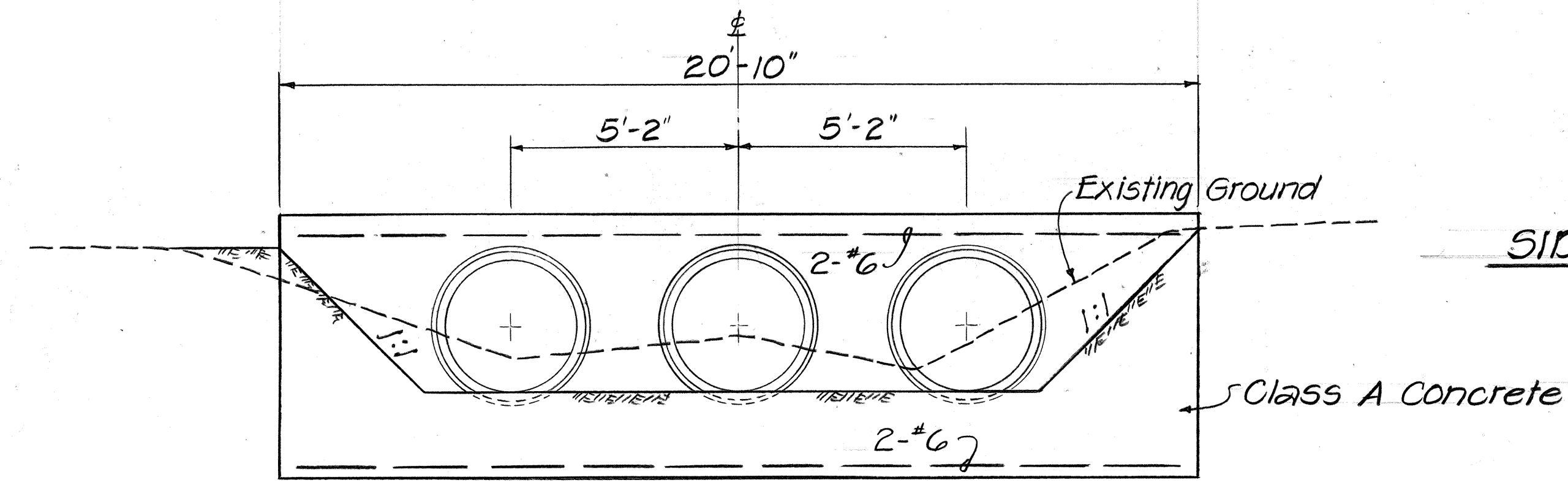
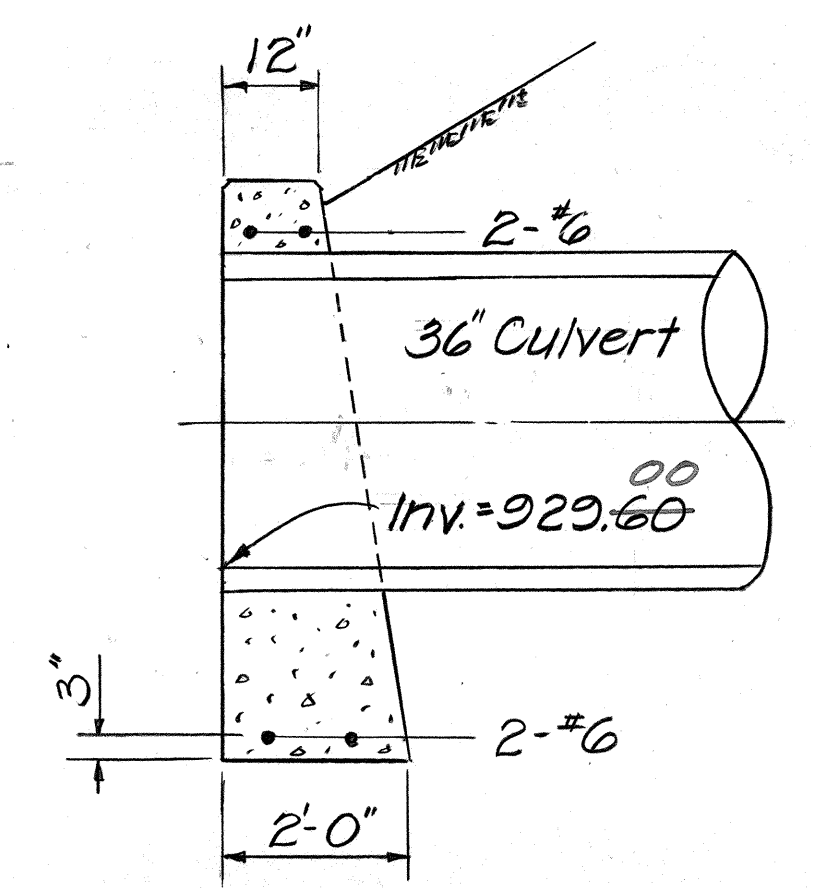
10/23/84	Per Addendum No. 1 Change 42" CAP t=0.105" to 42" CAP, t=0.075" (3x1)
DATE	REVISION

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION DRAINAGE DETAILS CULVERT, STD. HEADWALL AND APRON Maunaloa Highway, Replacement of Culverts bet. Maunaloa Village and Kaunakakai - Phase II Proj. No. RS-0460(5) Scale: As Noted Date: Nov. 1983 SHEET No. 5 OF 20 SHEETS

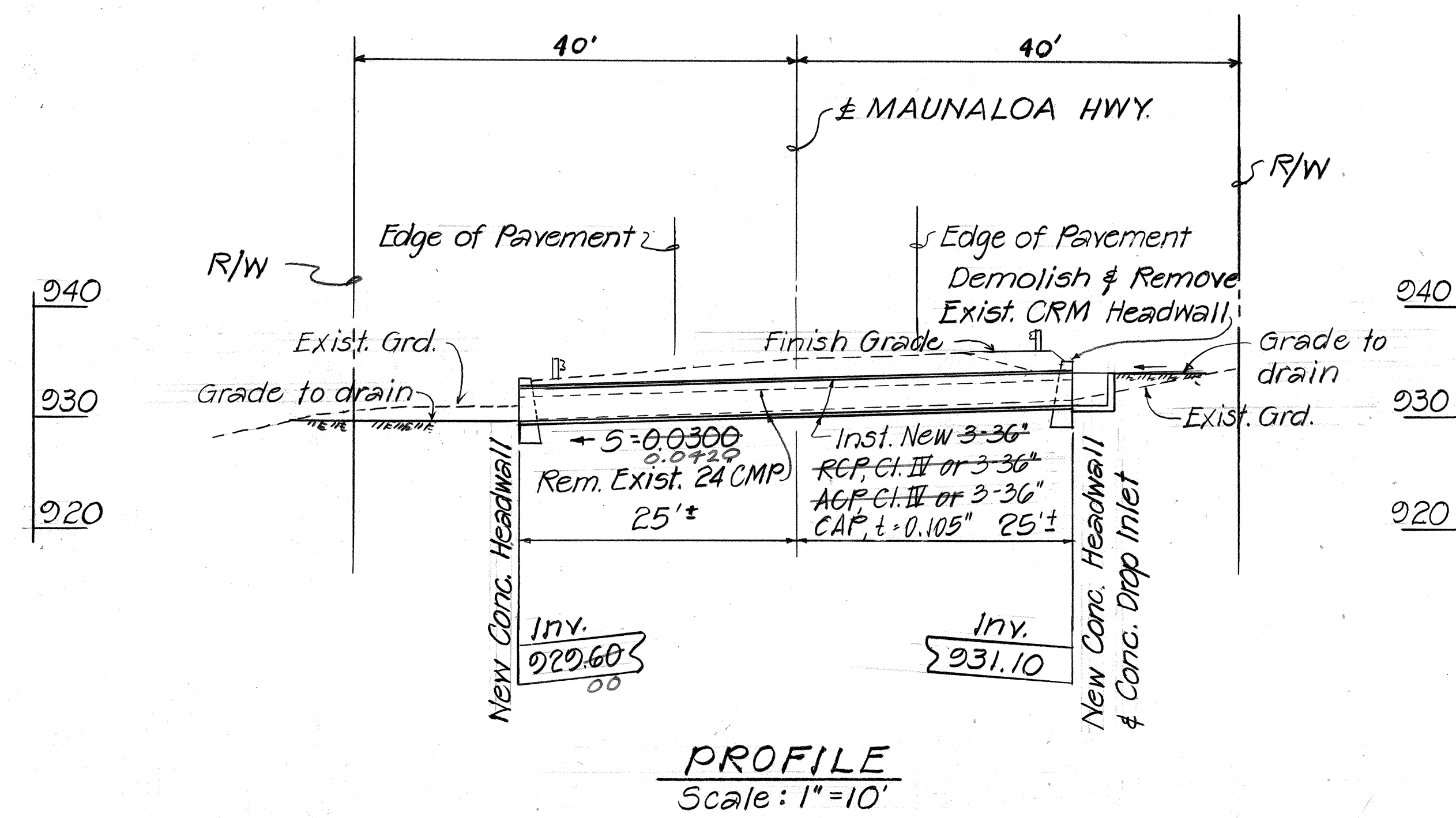
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	32	46



SIDE ELEVATION VIEW - INLET Scale: 1/2"=1'-0"



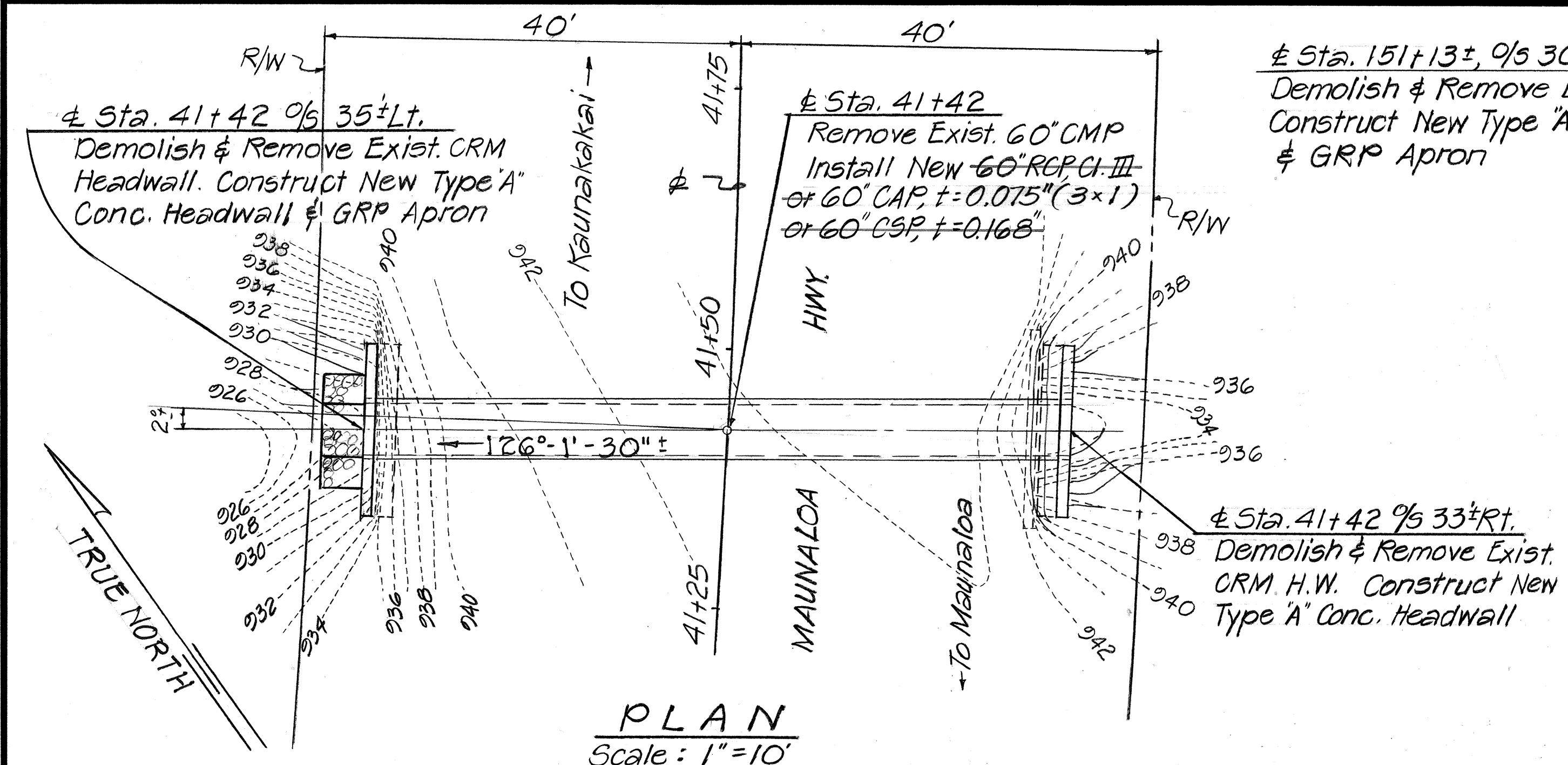
FRONT ELEVATION - OUTLET CONCRETE HEADWALL Scale: 3/8"=1'-0"



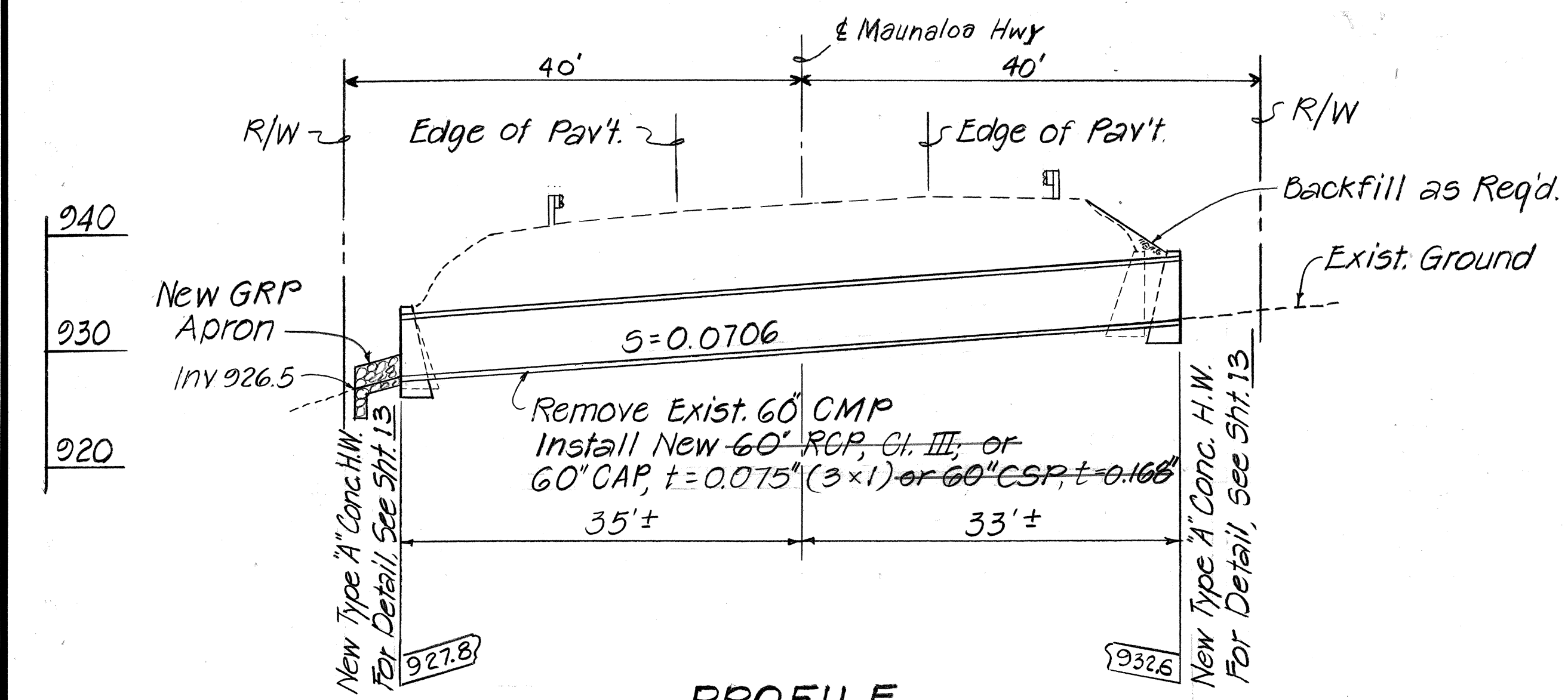
DETAILS OF 3-36" CULVERTS @ STA. 39+00

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
CULVERTS, CONC. HEADWALLS & DROP INLET
Maunaloa Hwy. Replacement of Culverts
bet. Maunaloa Village & Kaunakakai - Phase II
PROJ. No. RS-0460(5)
SCALE: AS NOTED DATE: NOV. 1983
SHEET NO. 6 OF 20 SHEETS

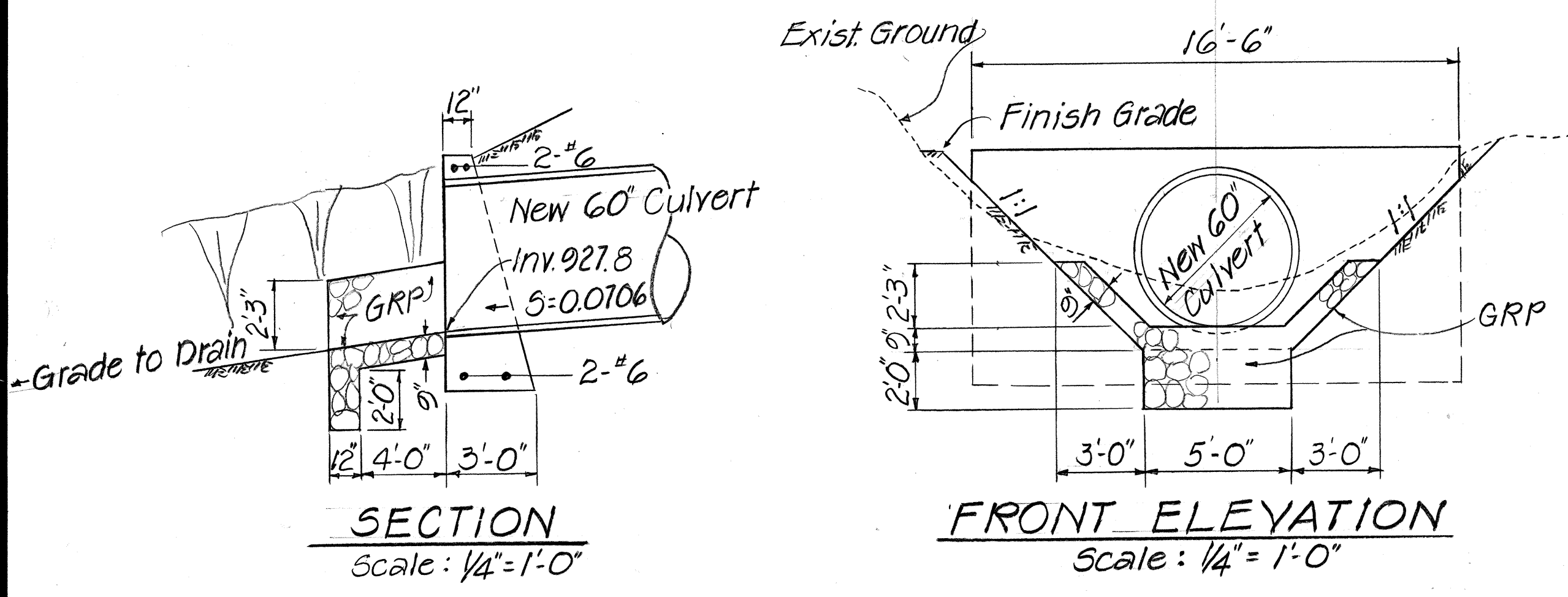
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	33R	46



PLAN
Scale: 1"=10'



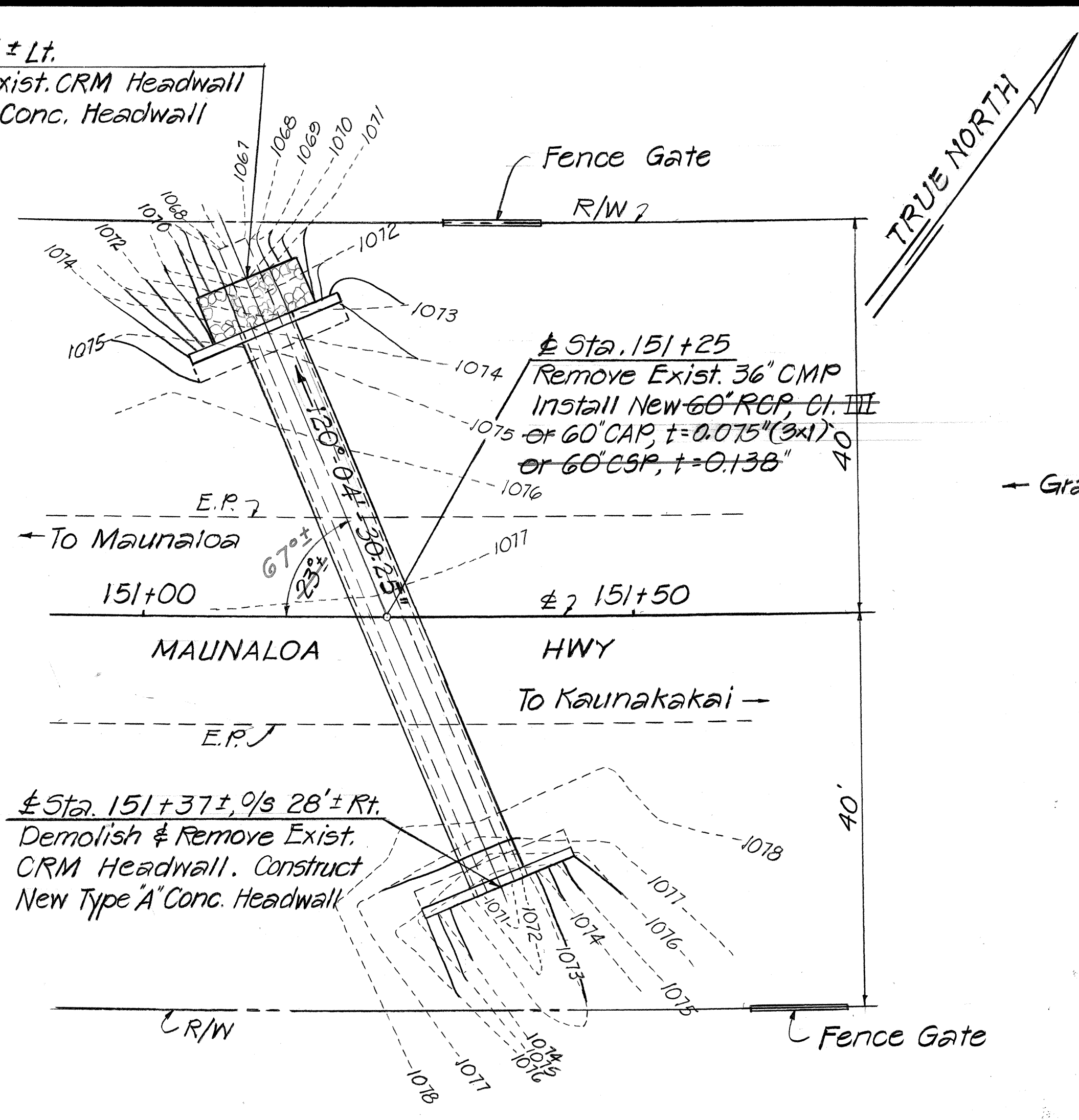
PROFILE
Scale: 1"=10'



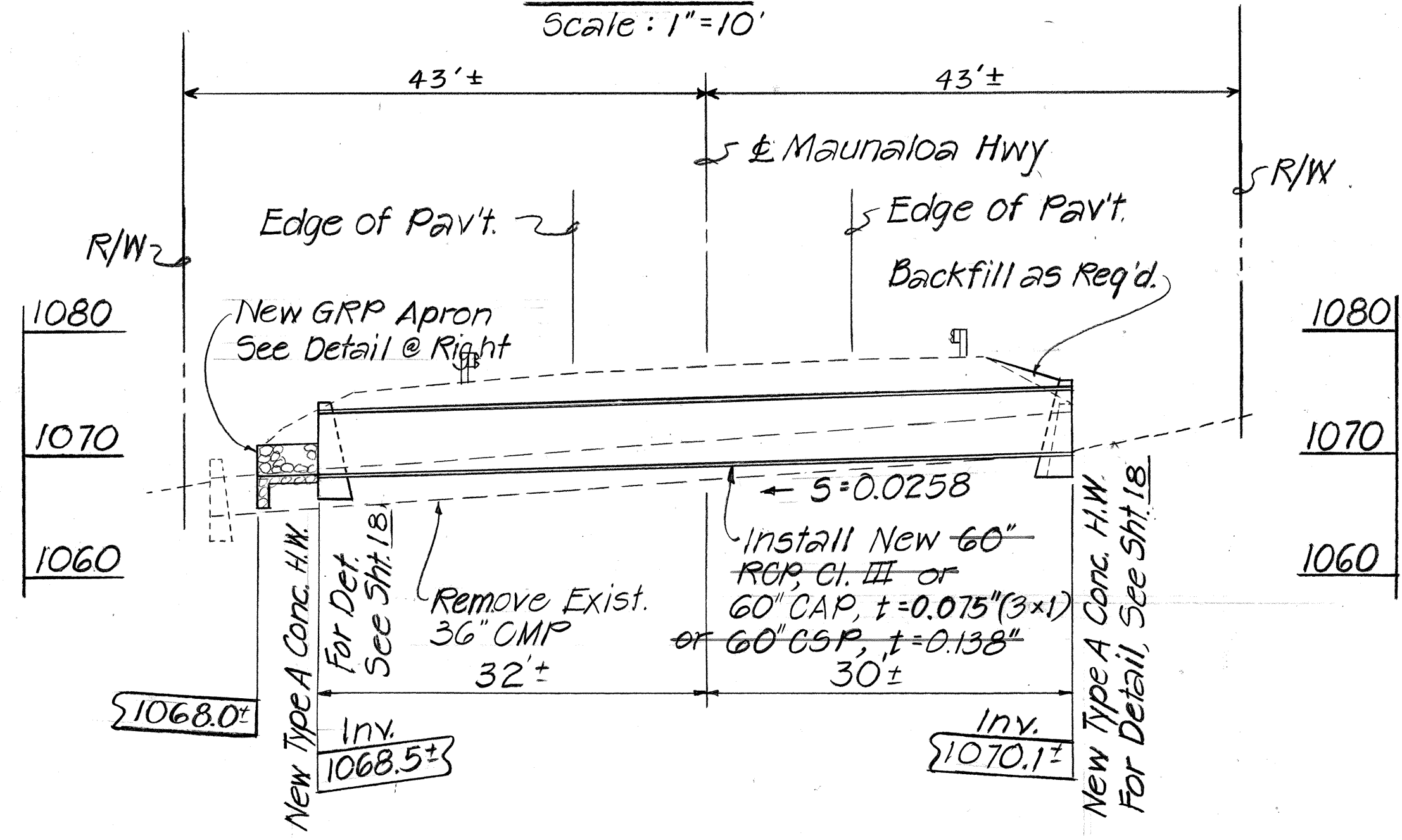
SECTION
Scale: 1/4"=1'-0'

FRONT ELEVATION
Scale: 1/4"=1'-0'

DETAILS OF 60" CULVERT AT STA. 41+42

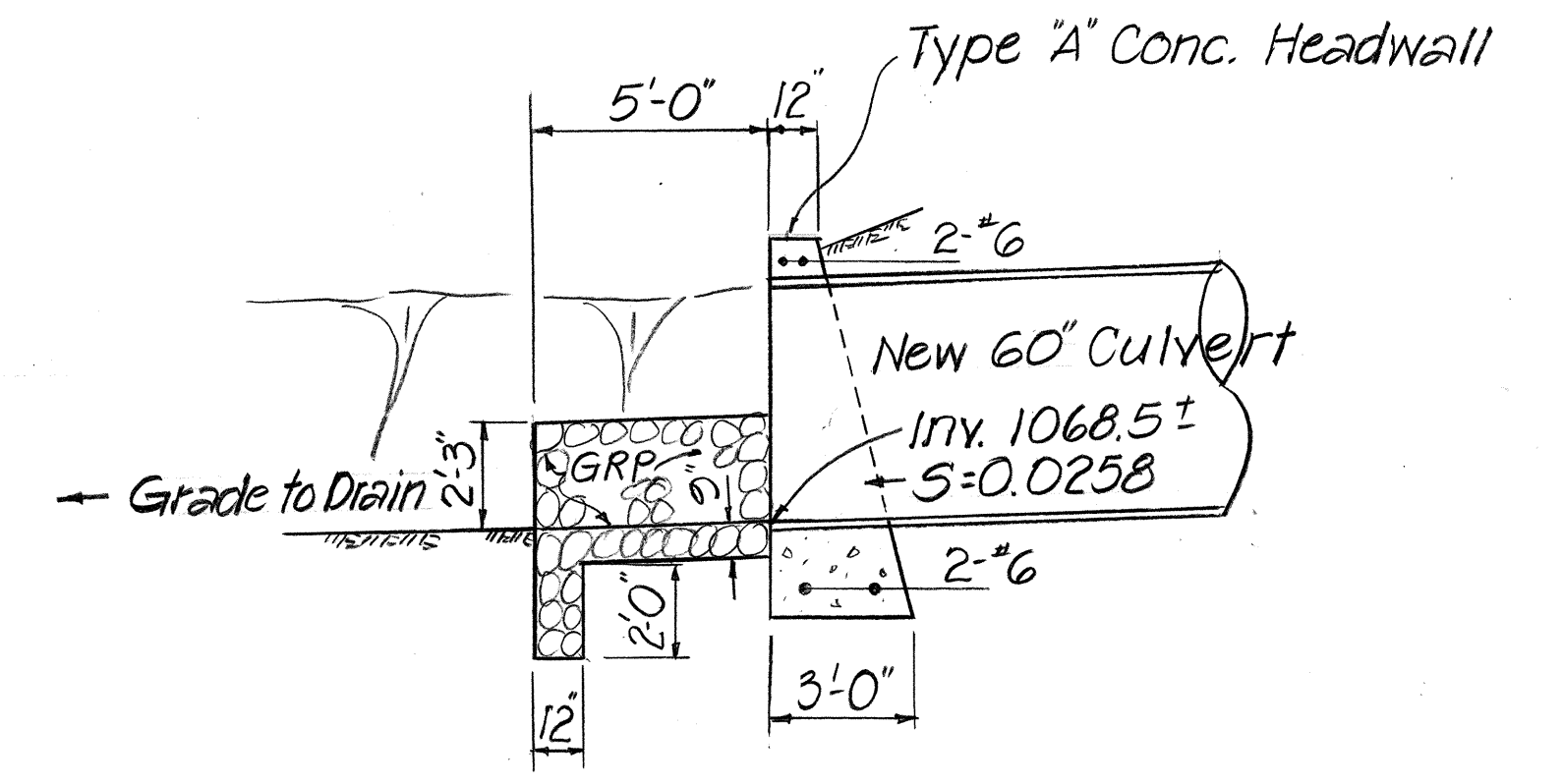


PLAN
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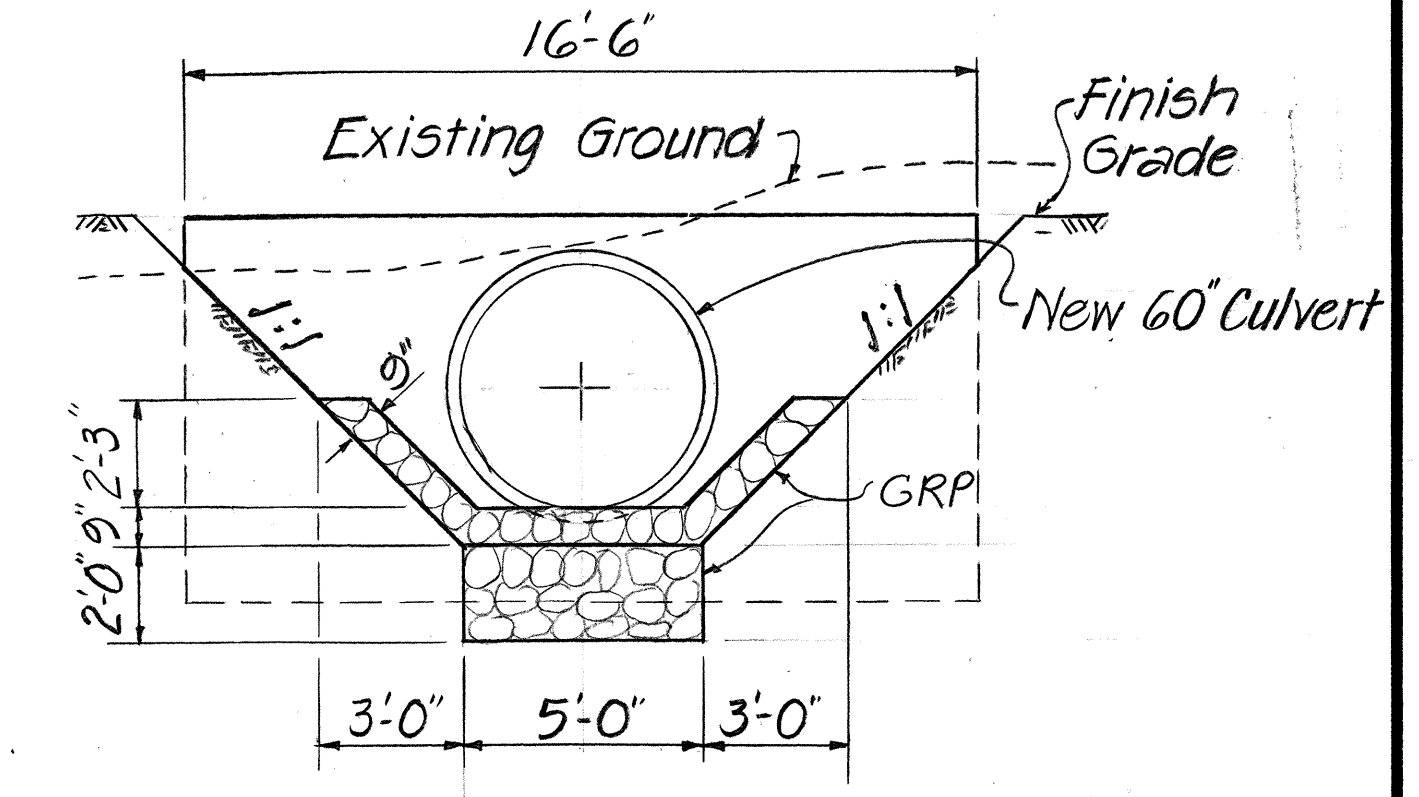


PROFILE
Scale: 1"=10'

DETAILS OF 60" CULVERT AT STA. 151+25



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



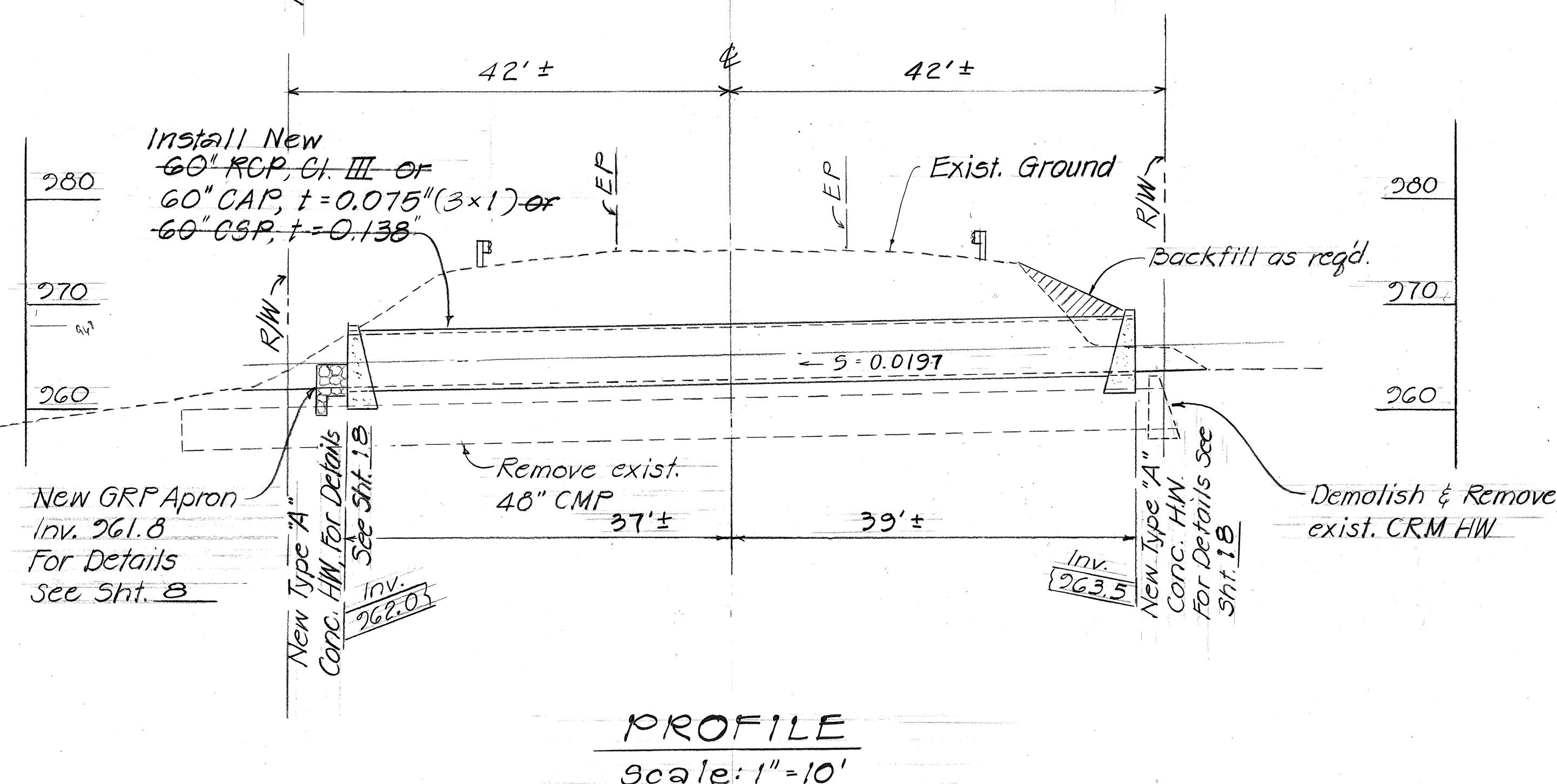
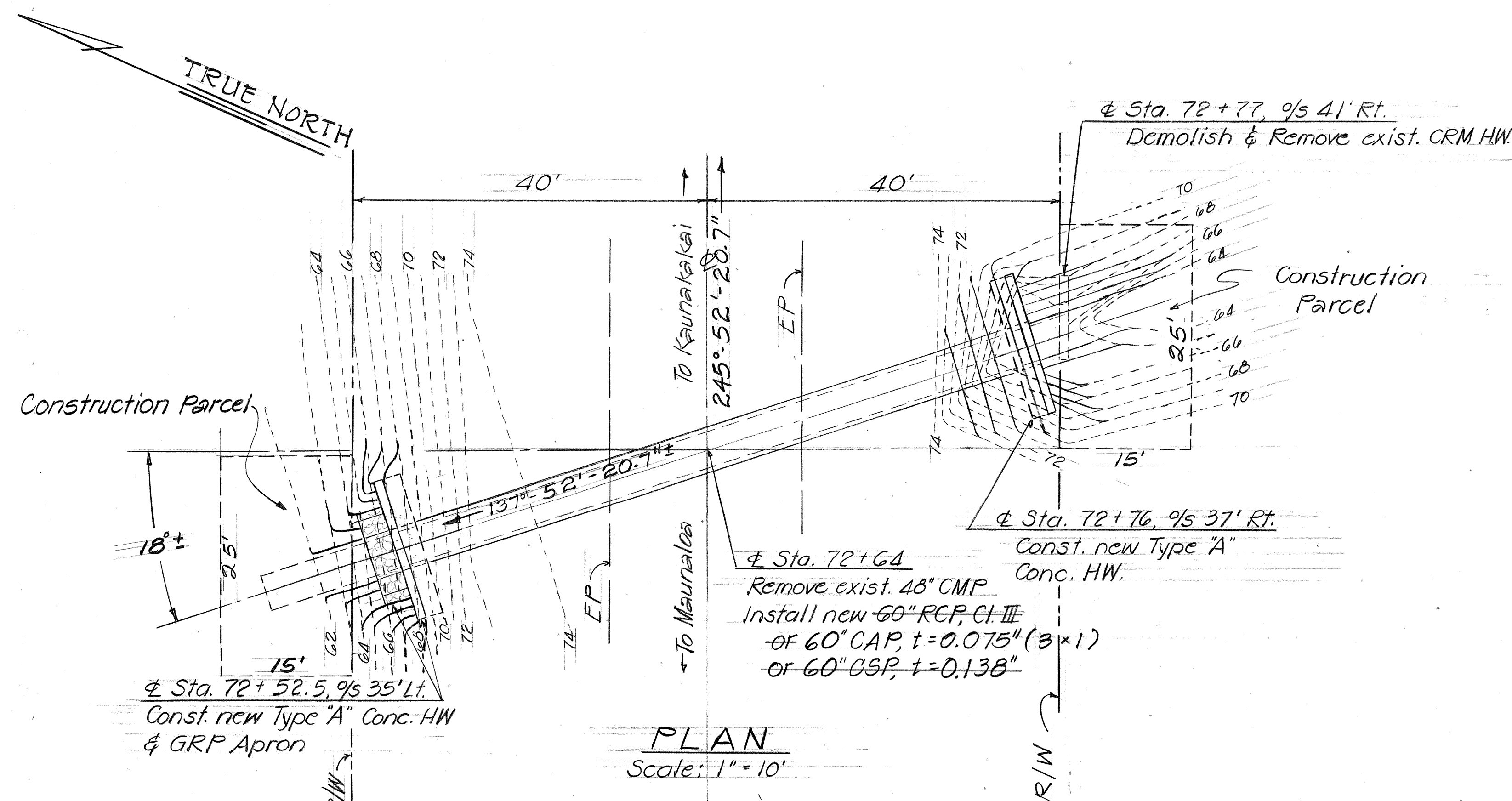
FRONT ELEVATION
Scale: 1/4"=1'-0'

GROUTED RUBBLE PAVING @ OUTLET

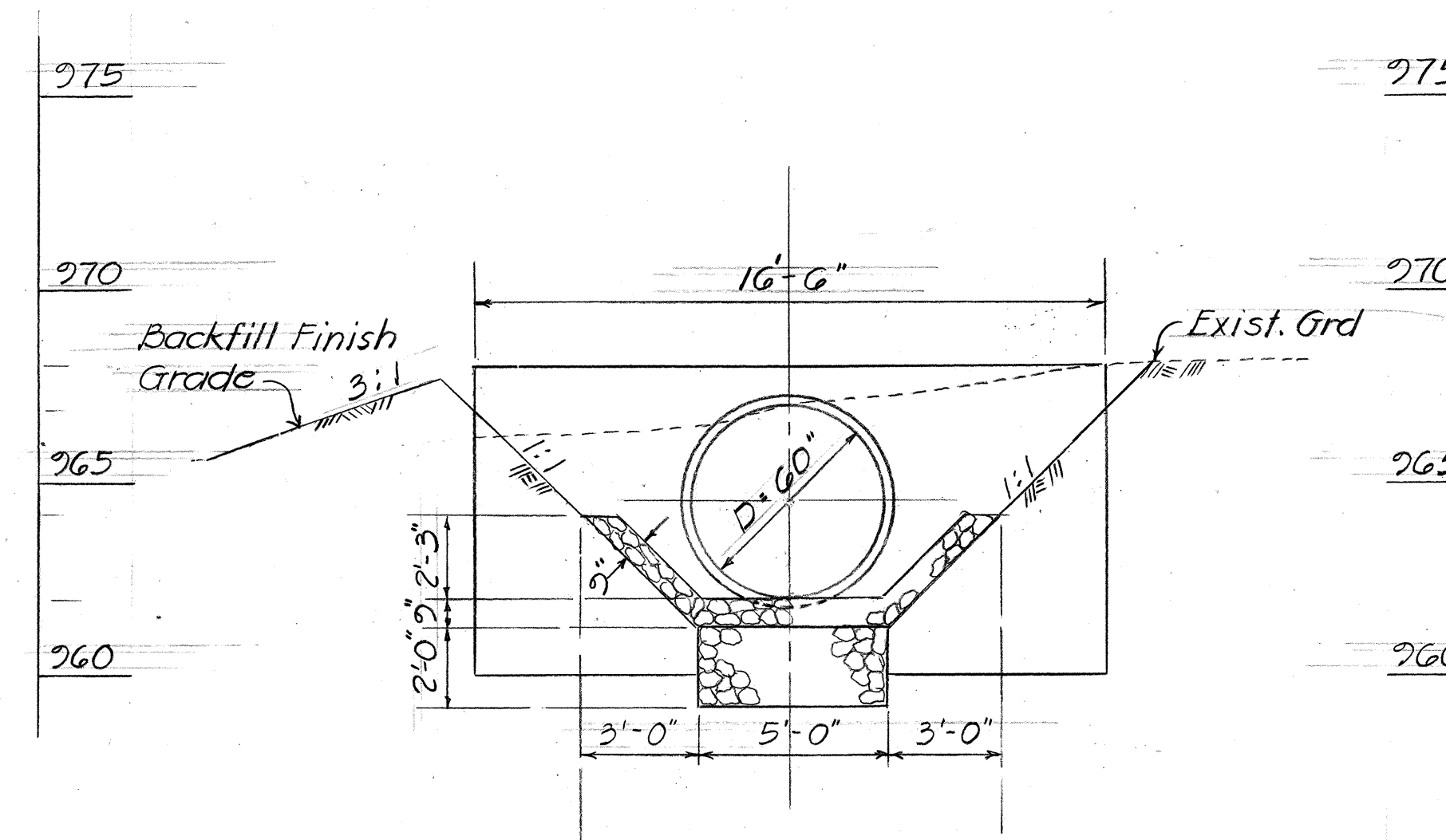
DATE	REVISION
10/23/84	Per Addendum No. 1 Changed 60" CAP t=0.135" to 60" CAP t=0.075" (3x1) and 60" CAP t=0.164" to 60" CAP t=0.075" (3x1)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
CULVERTS, CONC. HEADWALLS & GRP APRON
Maunaloa Hwy, Replacement of Culverts bet. Maunaloa Village towards Kaunakakai - Phase II
PROJ. NO. RS-0460(5)
SCALE: AS NOTED DATE: NOV. 1983
SHEET NO. 7 OF 20 SHEETS

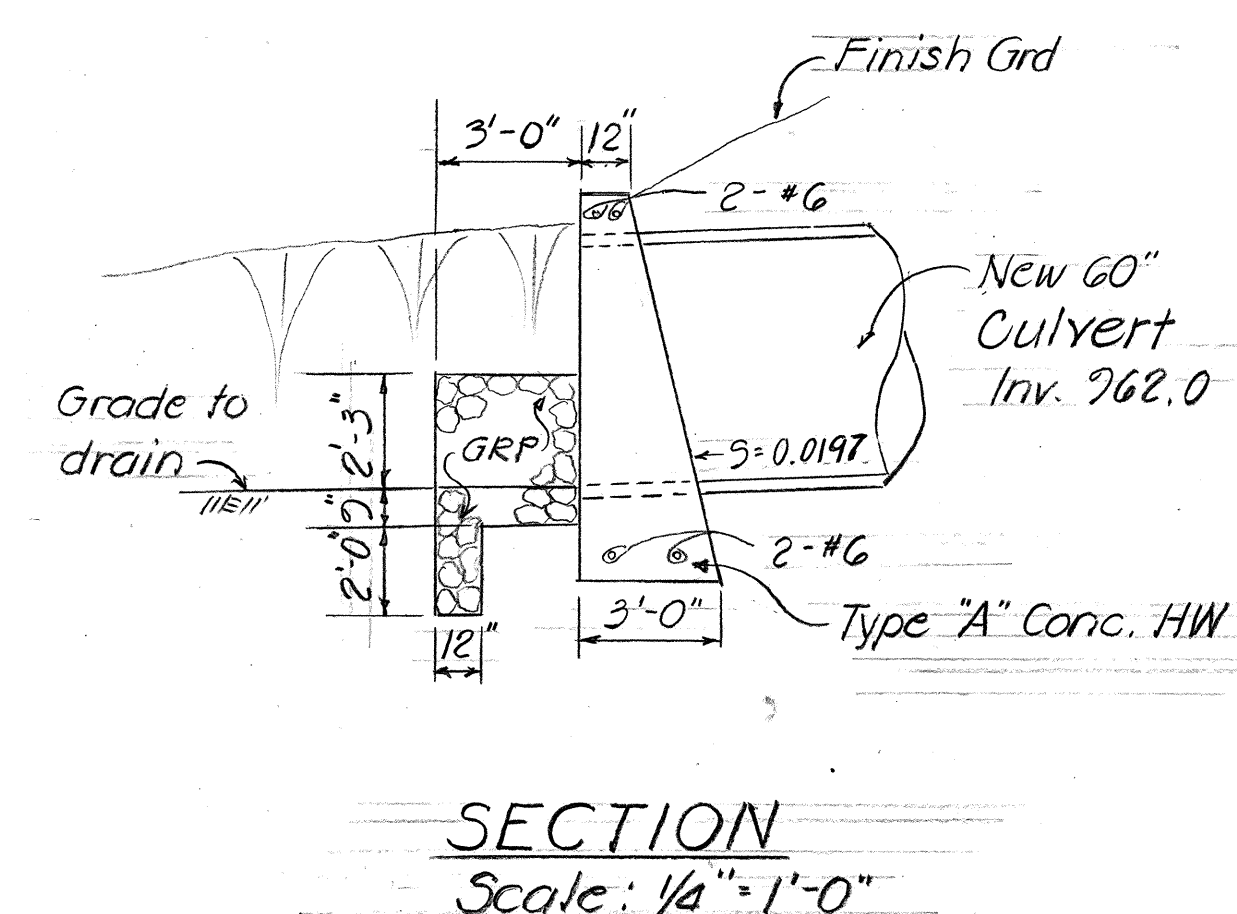
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	34R	46



DETAILS OF NEW 60" CULVERT AT STA. 72+64



FRONT ELEVATION
Scale: 1/4" = 1'-0"



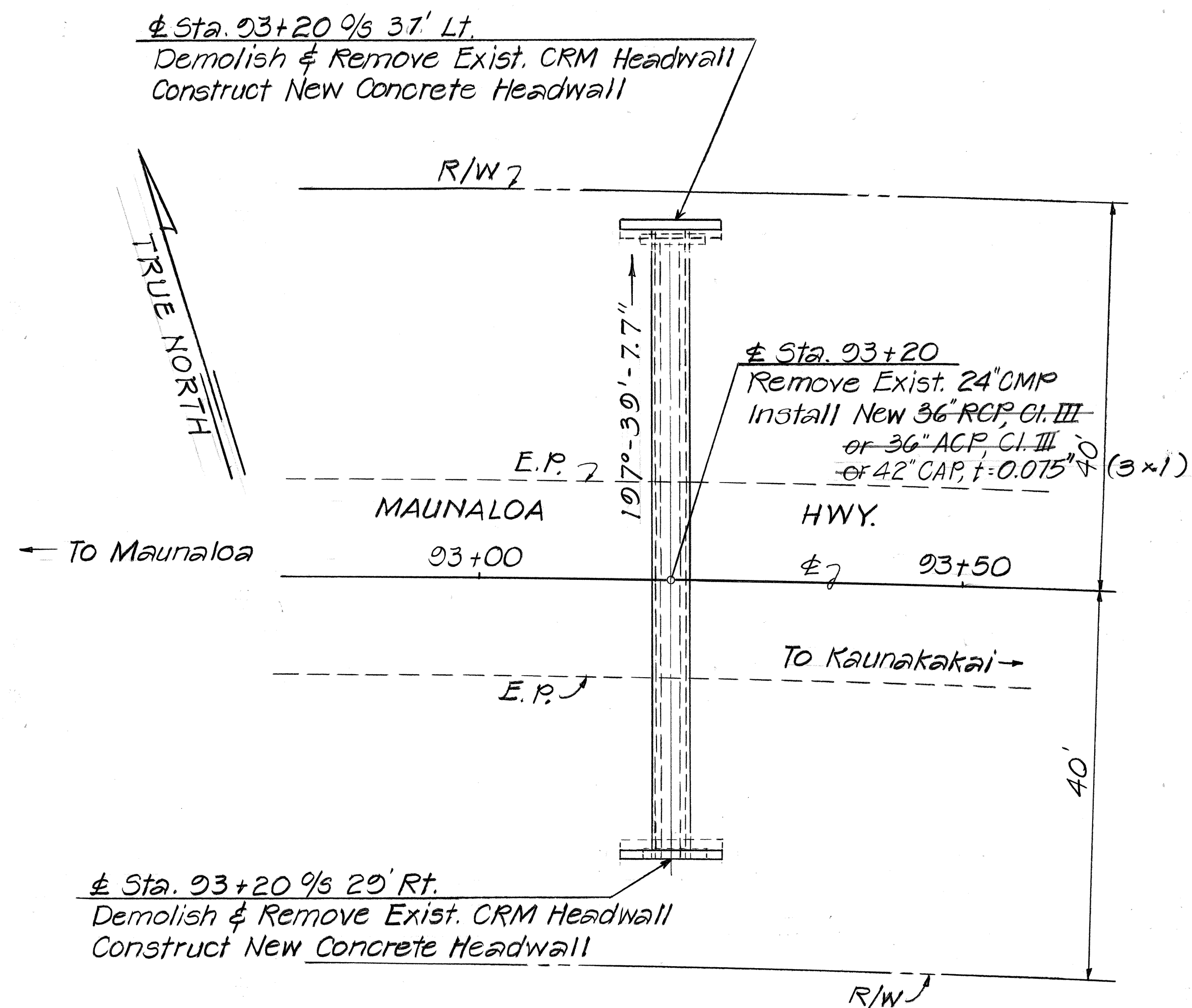
SECTION
Scale: 1/4" = 1'-0"

GROUTED RUBBLE PAVING @ STA. 72+64 OUTLET

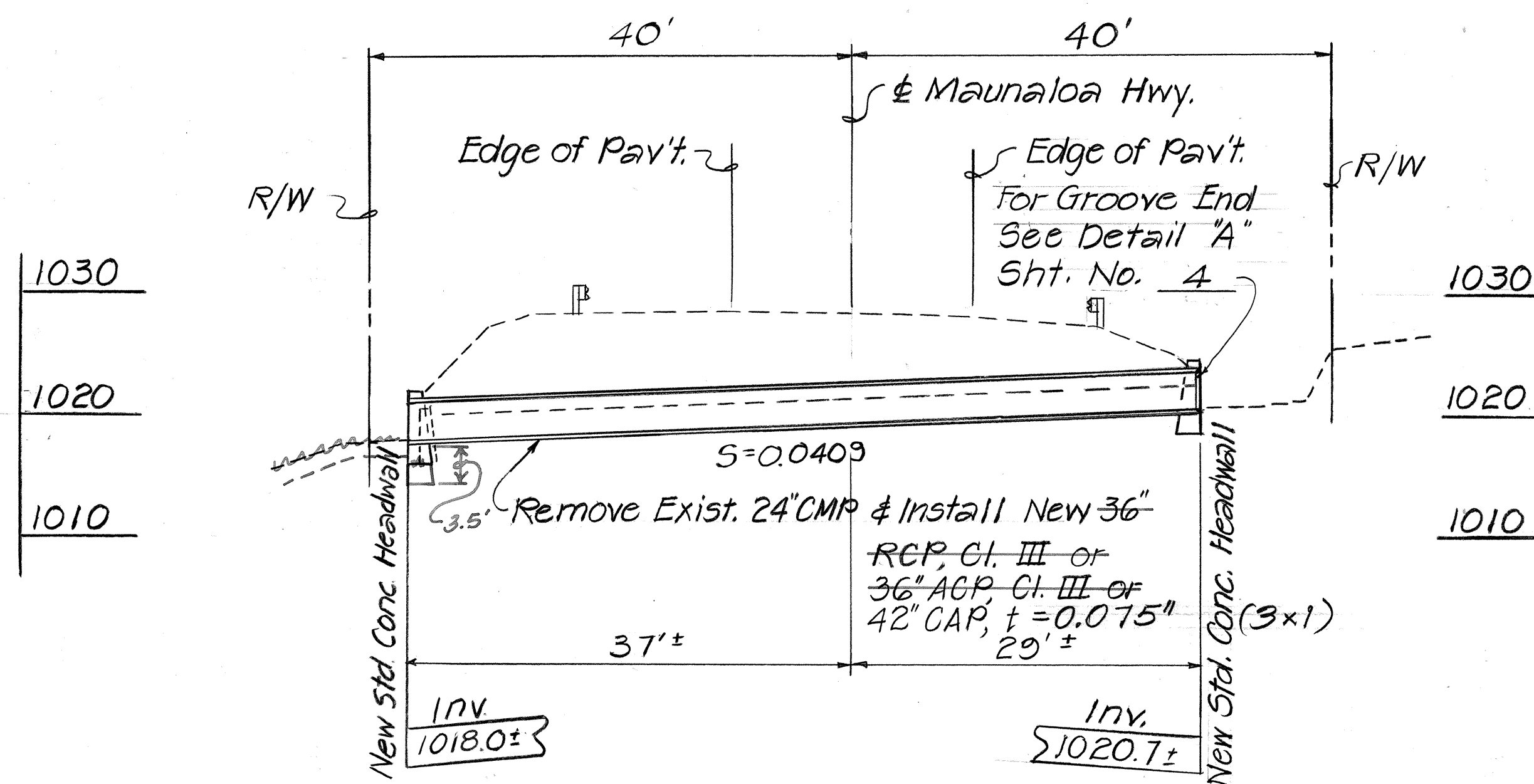
10/23/84	Per Addendum No. 1 Changed 60" CAP, t=0.135" to 60" CAP, t=0.075" (3x1)
DATE	REVISION

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION DRAINAGE DETAILS CULVERT, STD. HEADWALL AND APRON Maunaloa Highway Replacement of Culverts bet Maunaloa Village and Kaunakakai-Phase II Proj. No. RS-0460(5) Scale: As Noted Date: Dec. 1983 SHEET NO. 8 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	35R	40

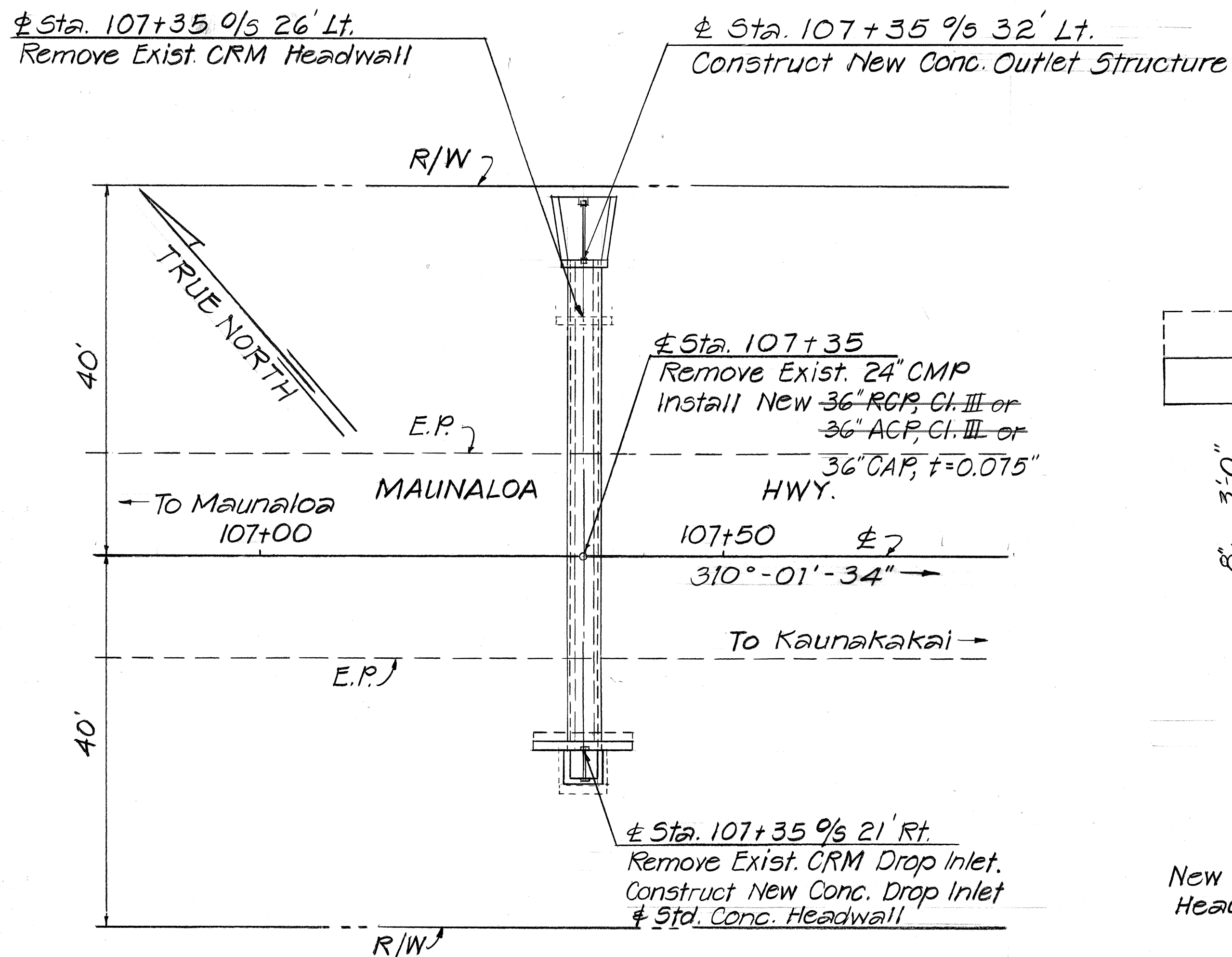


PLAN
Scale: 1"=10'

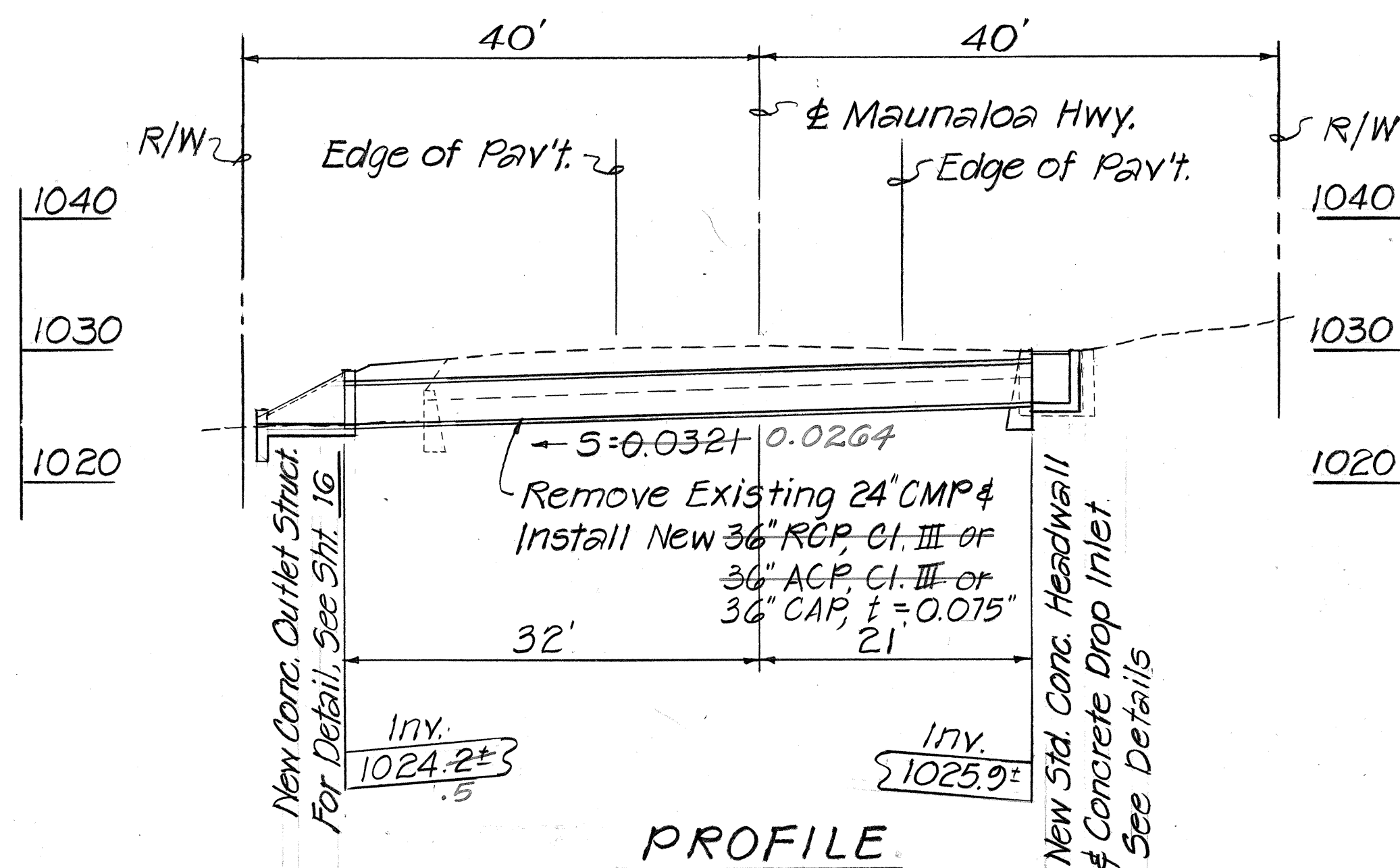


PROFILE
Scale: 1"=10'

DETAILS OF 36" CULVERT @ ± STA. 93+20

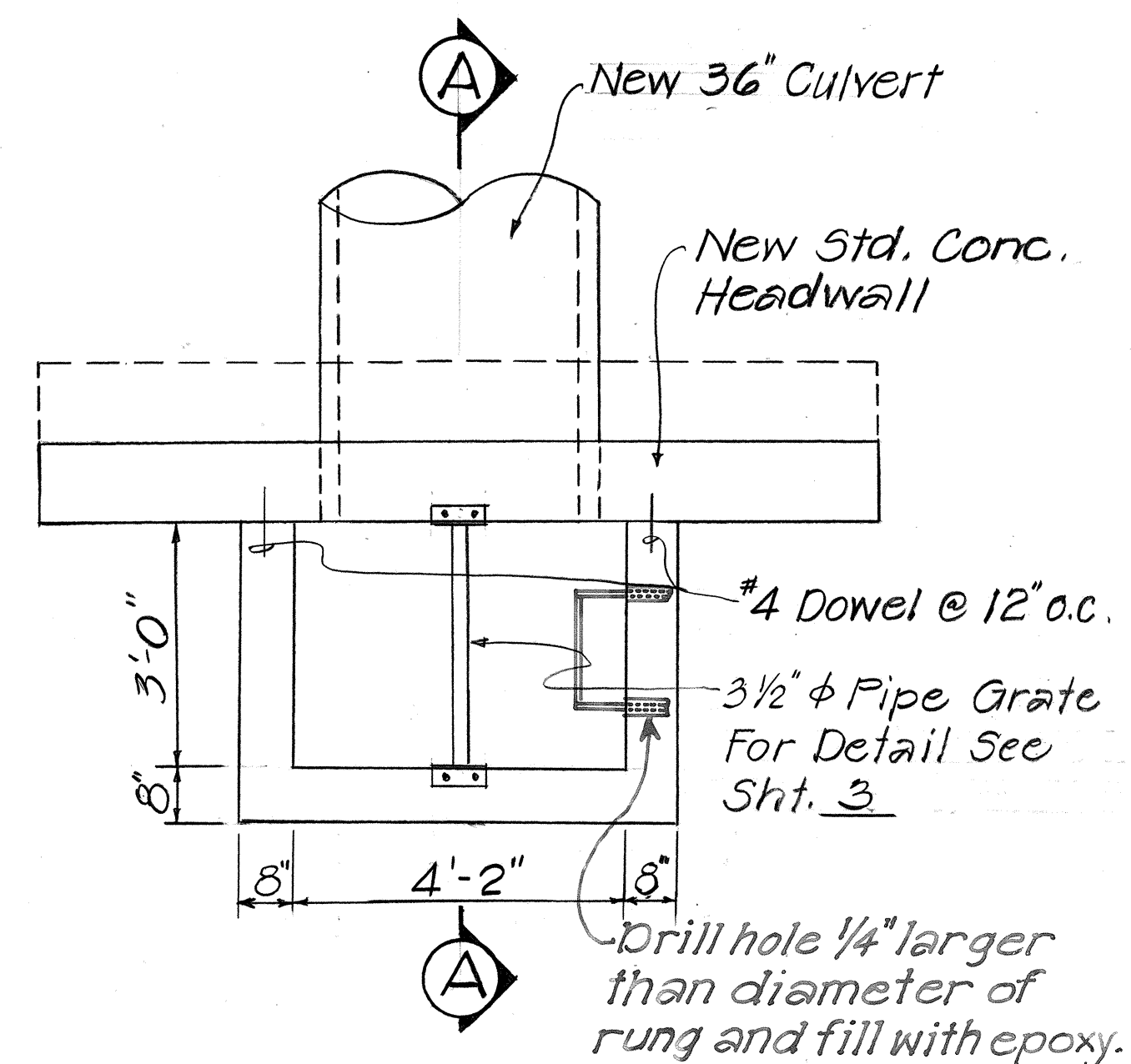


PLAN
Scale: 1"=10'

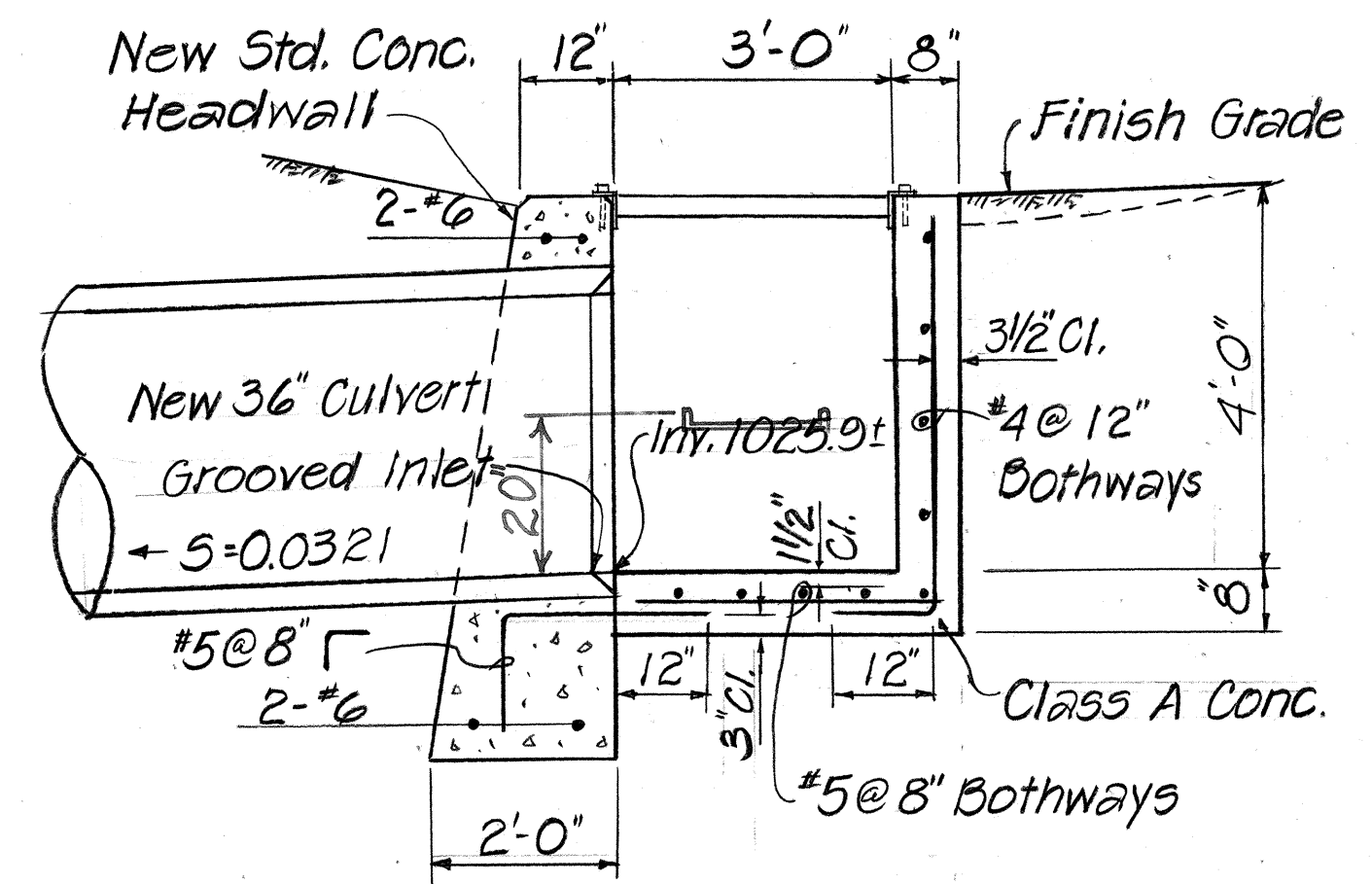


PROFILE
Scale: 1"=10'

DETAILS OF 36" CULVERT @ ± STA. 107+35



PLAN - INLET



SECTION A-A

DETAILS OF CONC. DROP INLET

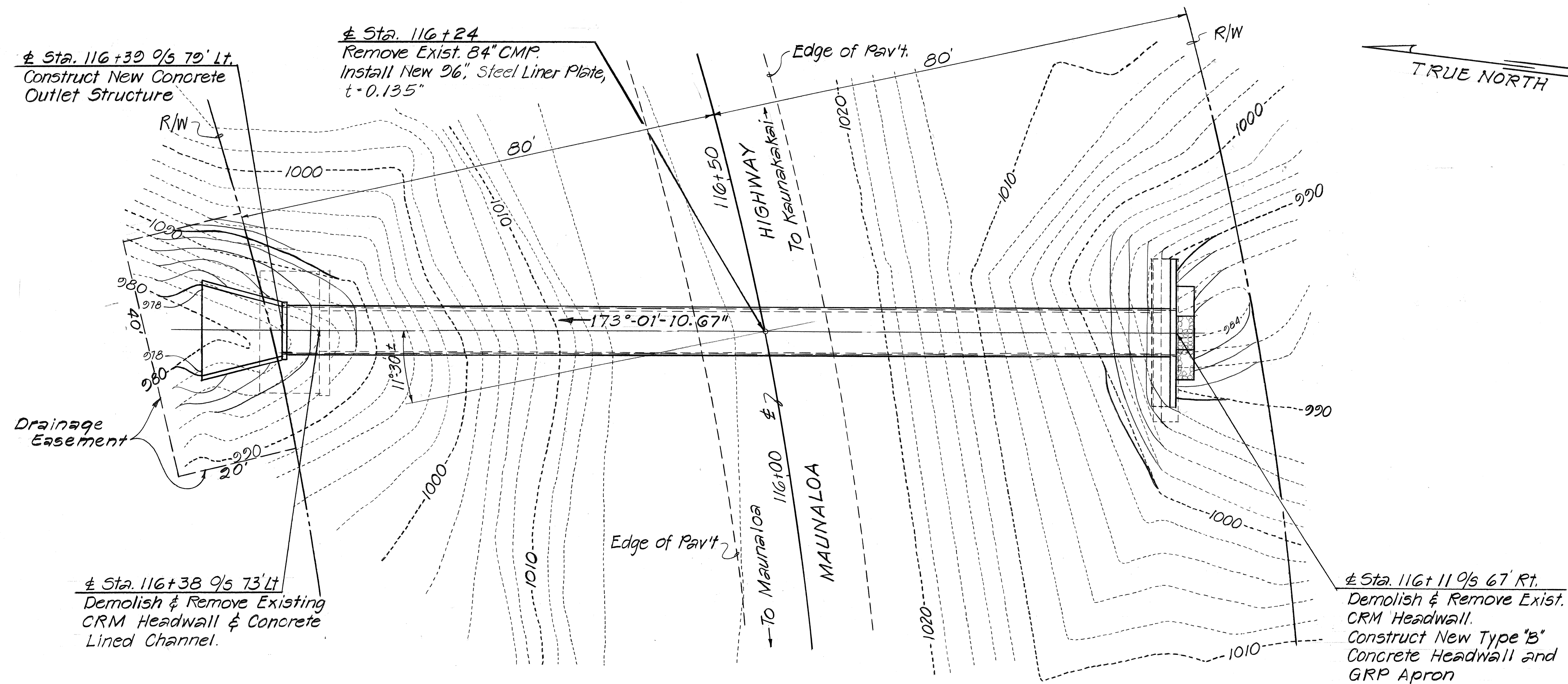
Scale: 1/2"=1'-0"

10/23/84 Per Addendum No. 1
Changed 42" CAP, t=0.105" to 42" CAP, t=0.075" (3x1)

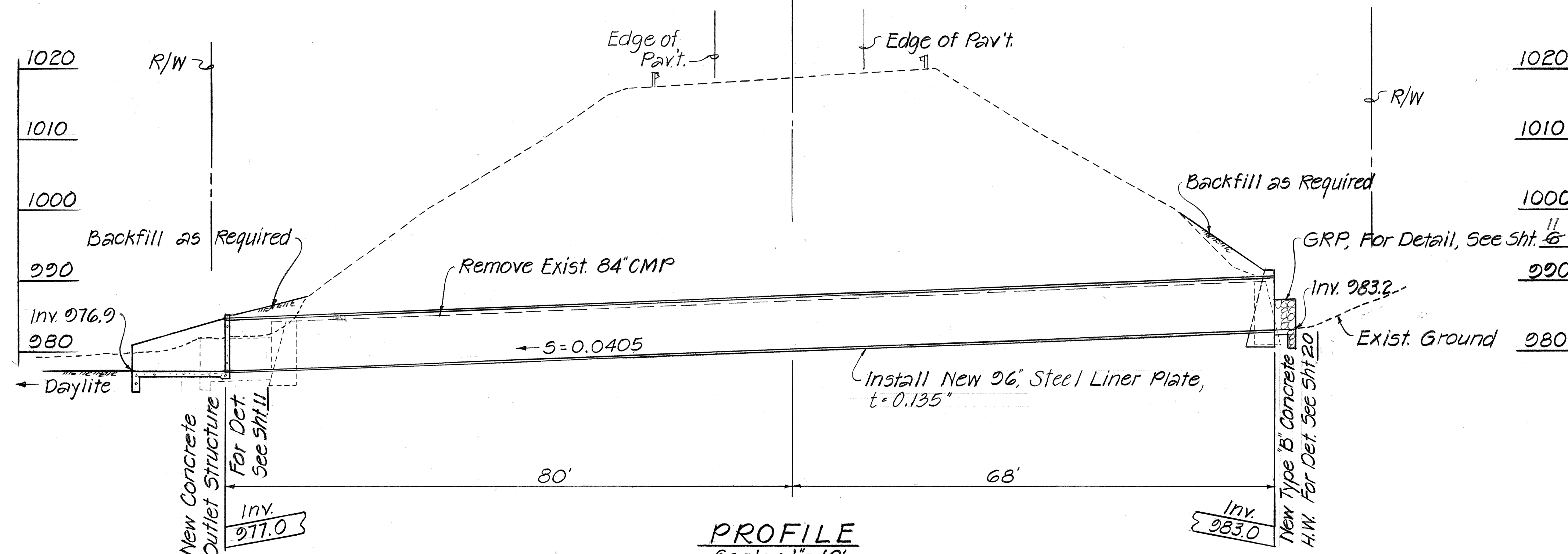
DATE REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
CULVERTS, CONC. HEADWALLS & DROP INLET
Maunaloa Hwy., Replacement of Culverts bet. Maunaloa Village towards Kaunakakai - Phase II
PROJ. No. RS-0460 (5)
SCALE: AS NOTED DATE: NOV. 1983
SHEET NO. 2 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	36	46



PLAN
Scale: 1" = 10'



PROFILE
Scale: 1" = 10'

DETAILS OF 96" LINER PLATE @ ± STA. 116+24

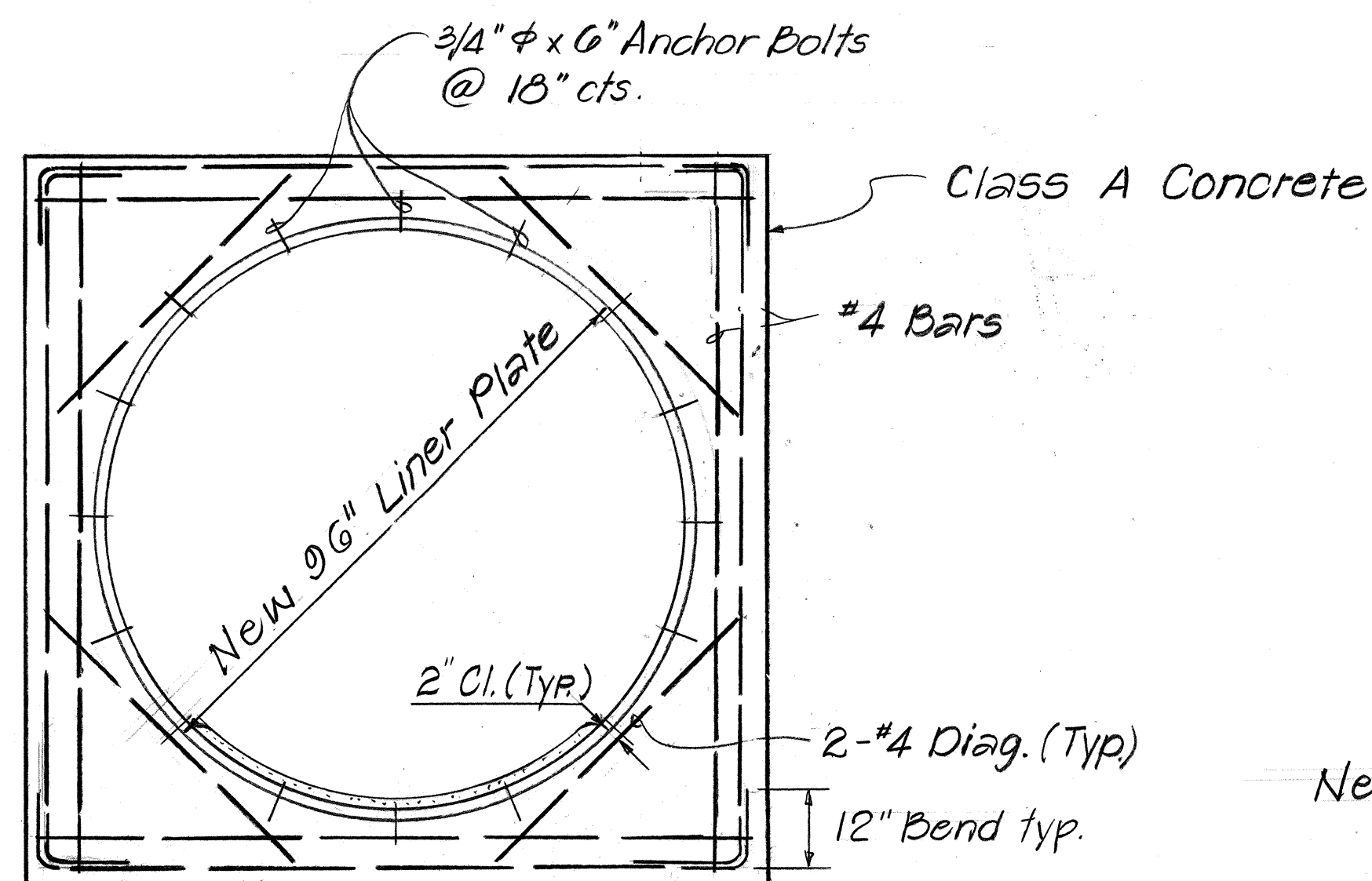
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS
CULVERT, PLAN AND PROFILE

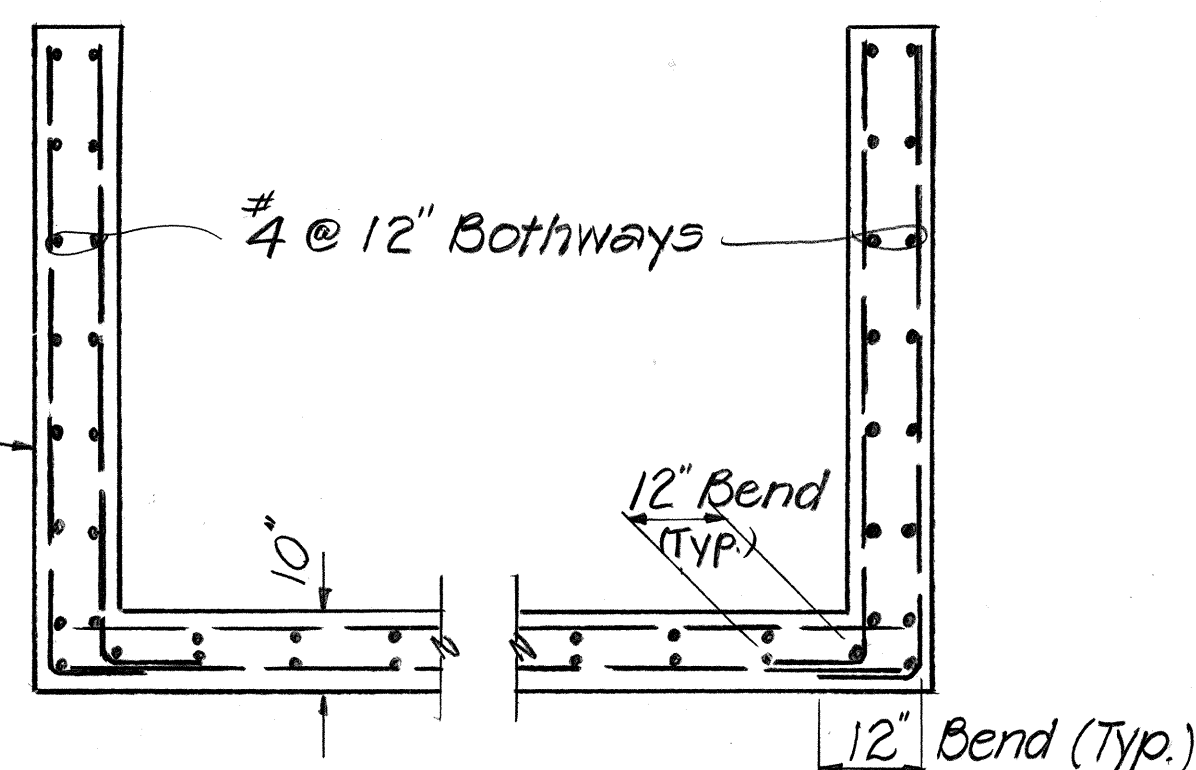
Maunaloa Hwy., Replacement of Culverts bet.
Maunaloa Village and Kaunakakai - Phase II

PROJ. NO. RS-0460(5)
SCALE: AS NOTED DATE: DEC. 1983
SHEET NO. 10 OF 20 SHEETS

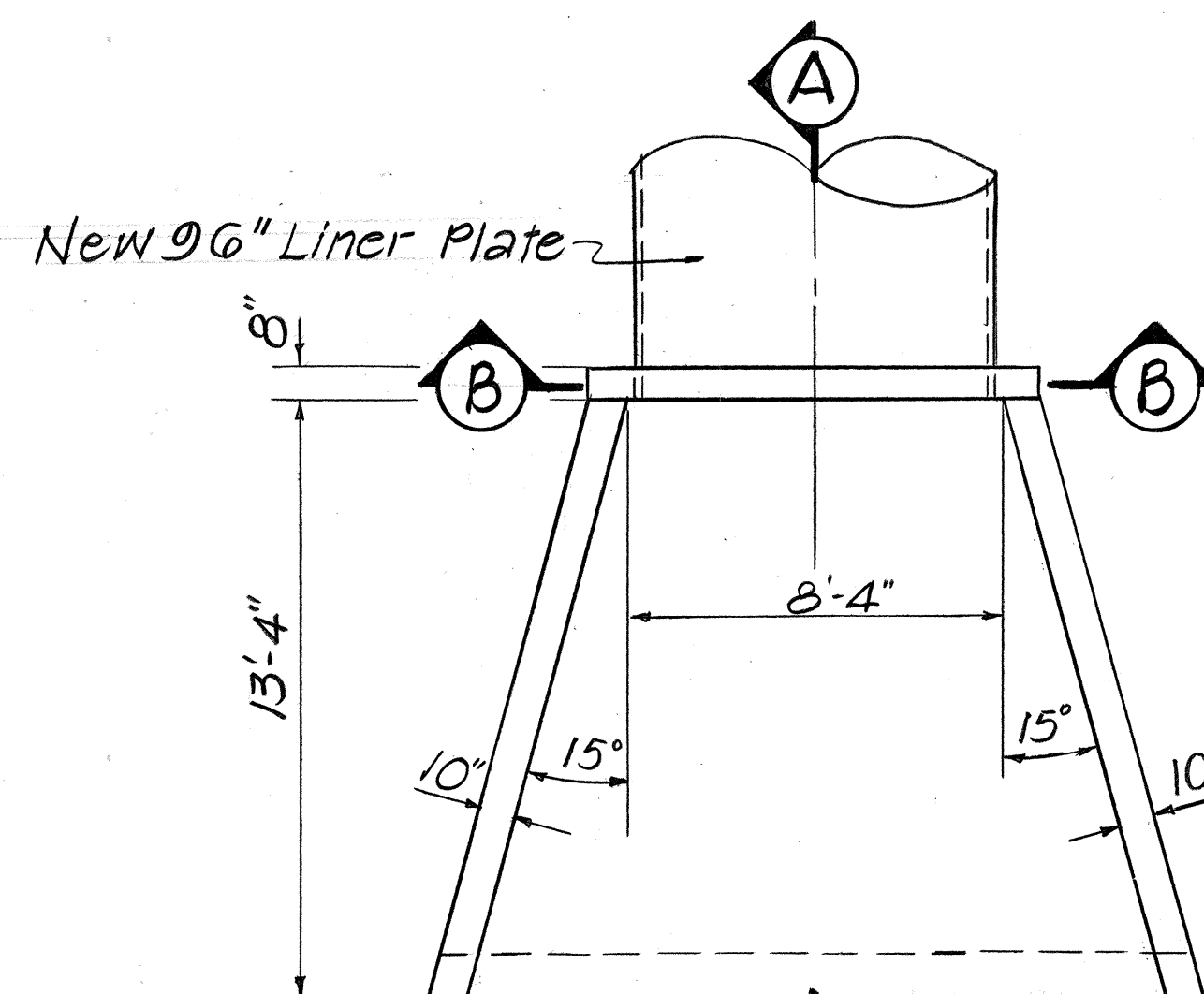
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	37	46



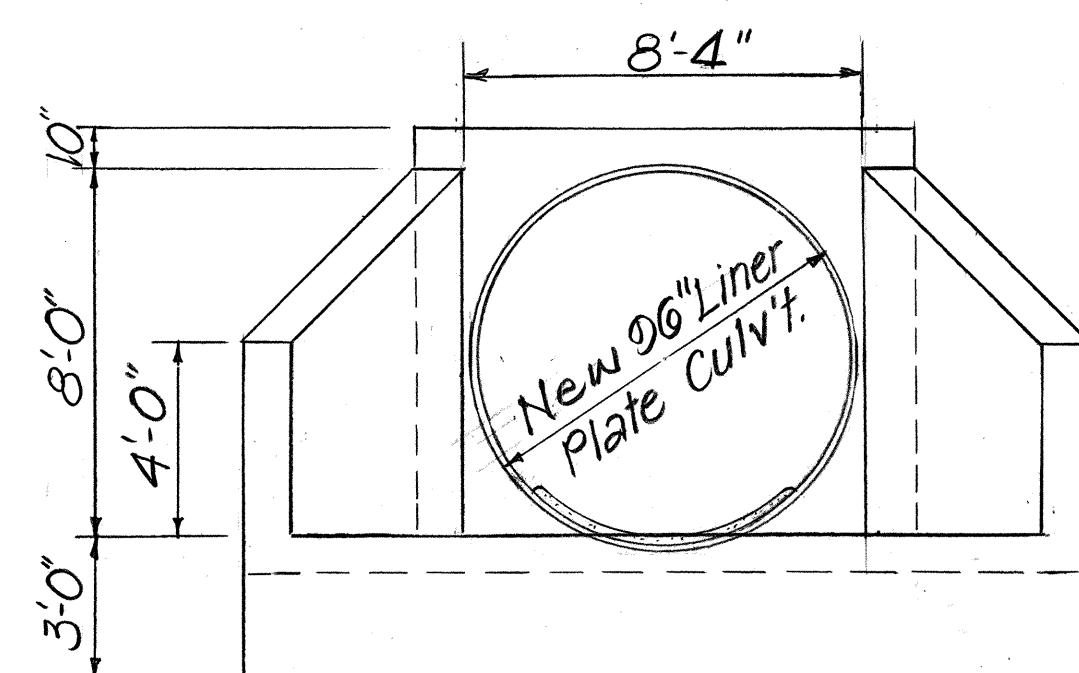
SECTION B-B
Scale: 1/2" = 1'-0"



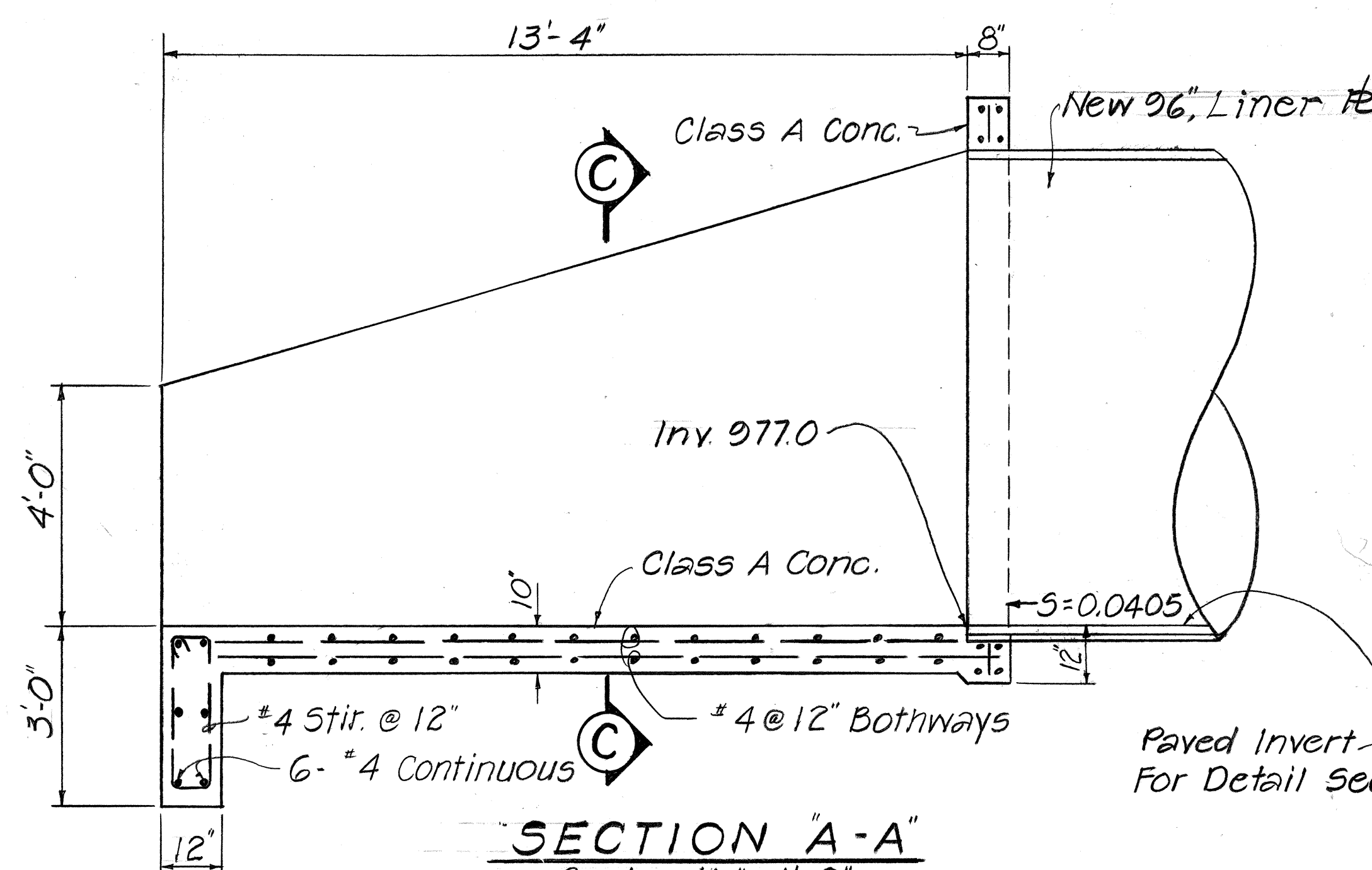
SECTION C-C
Scale: 1/2" = 1'-0"



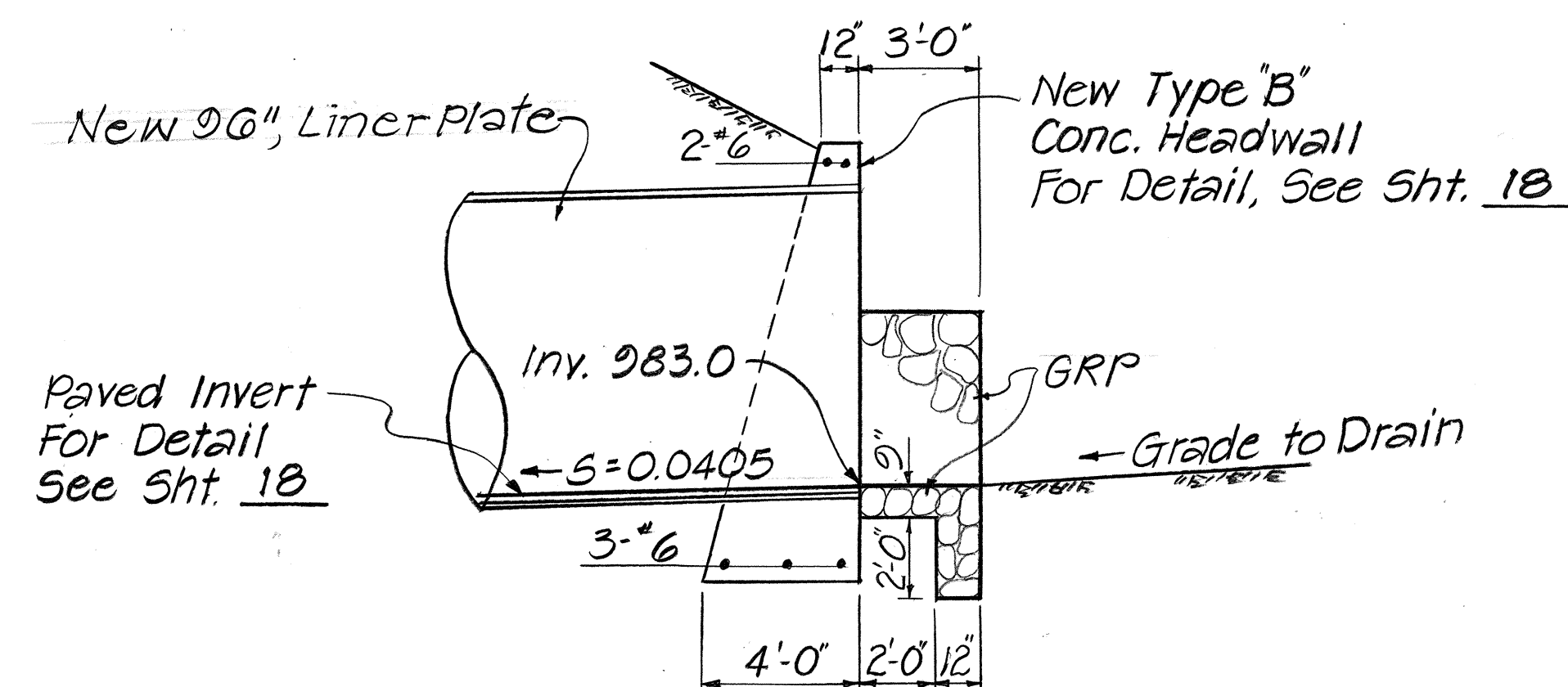
PLAN
Scale: 1/4" = 1'-0"



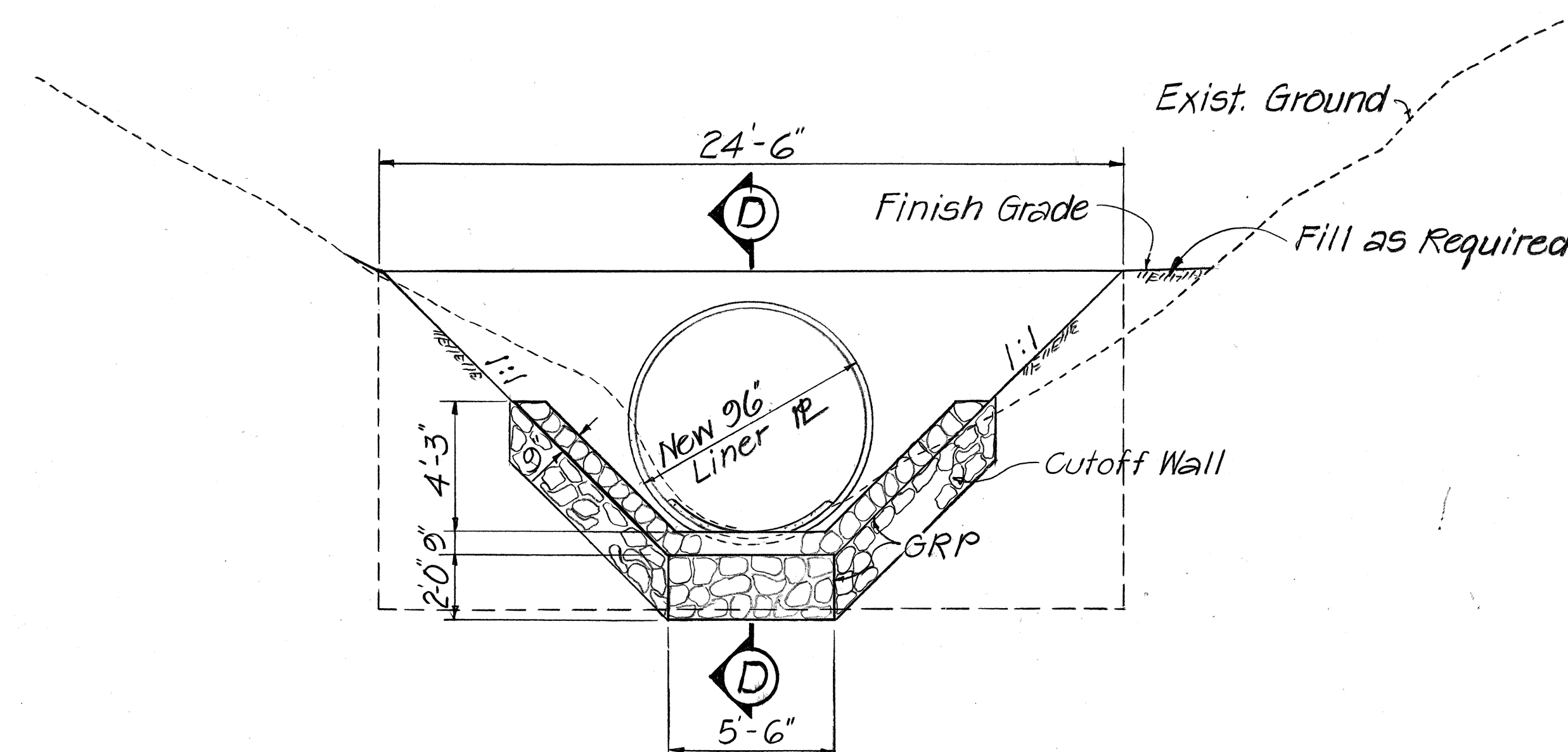
FRONT ELEVATION
Scale: 1/4" = 1'-0"



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



SECTION D-D
Scale: 1/4" = 1'-0"



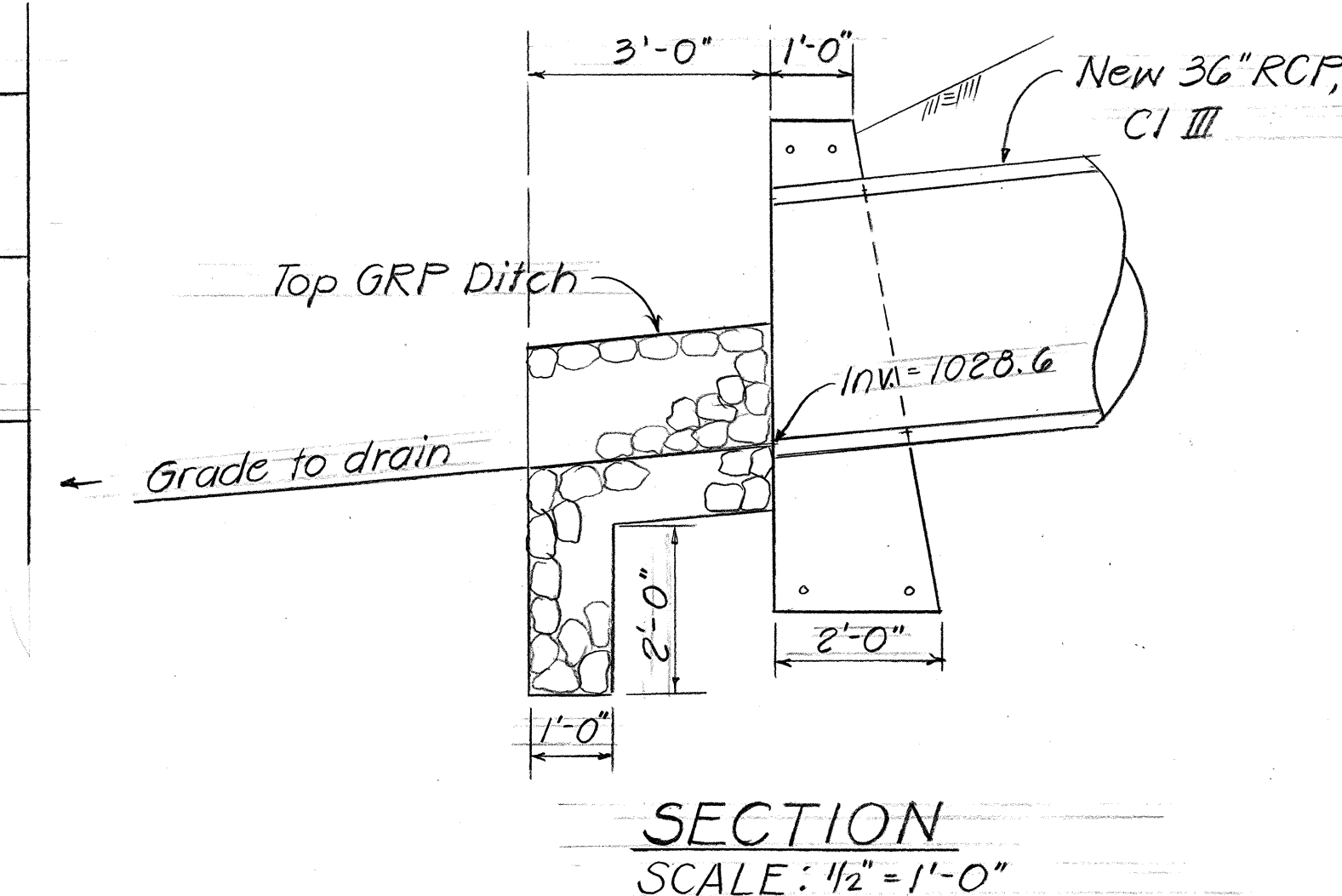
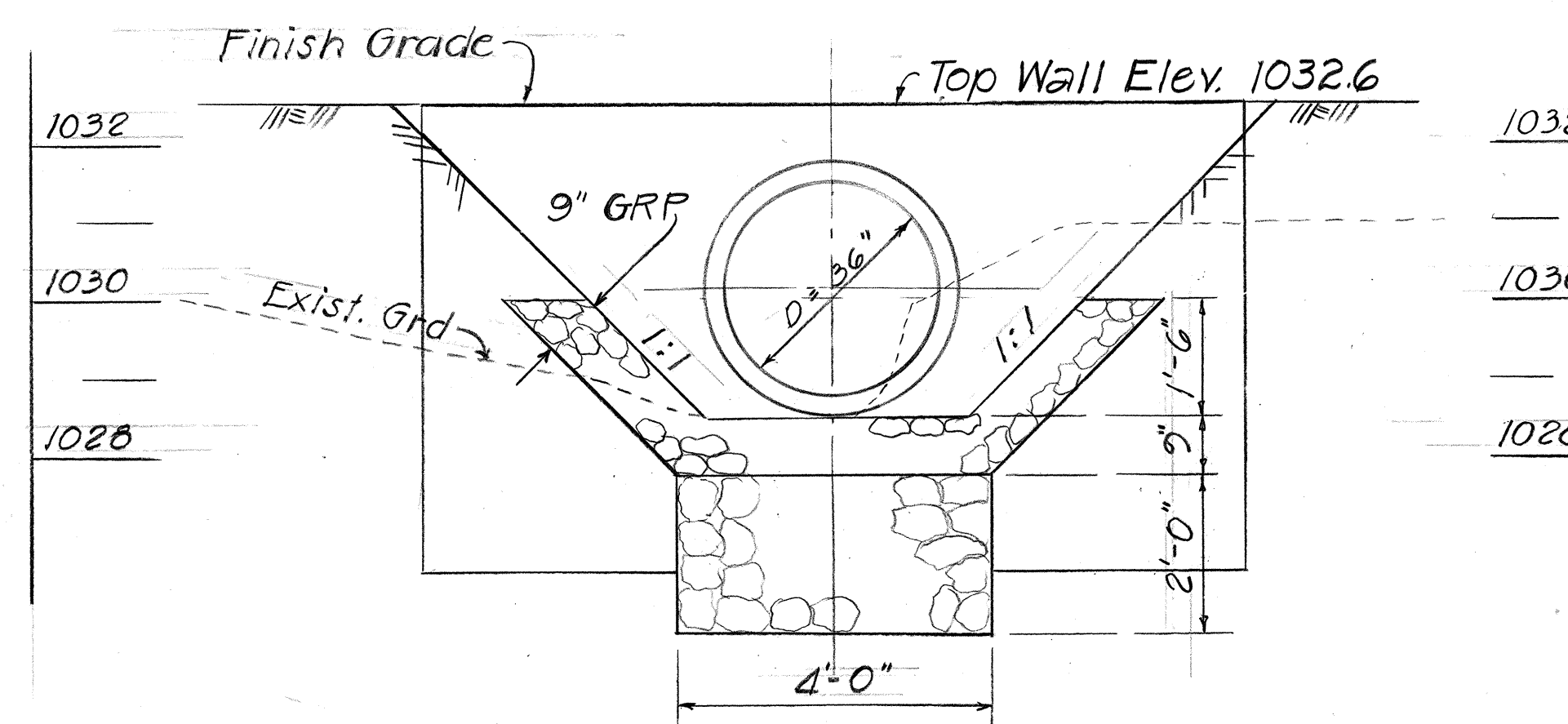
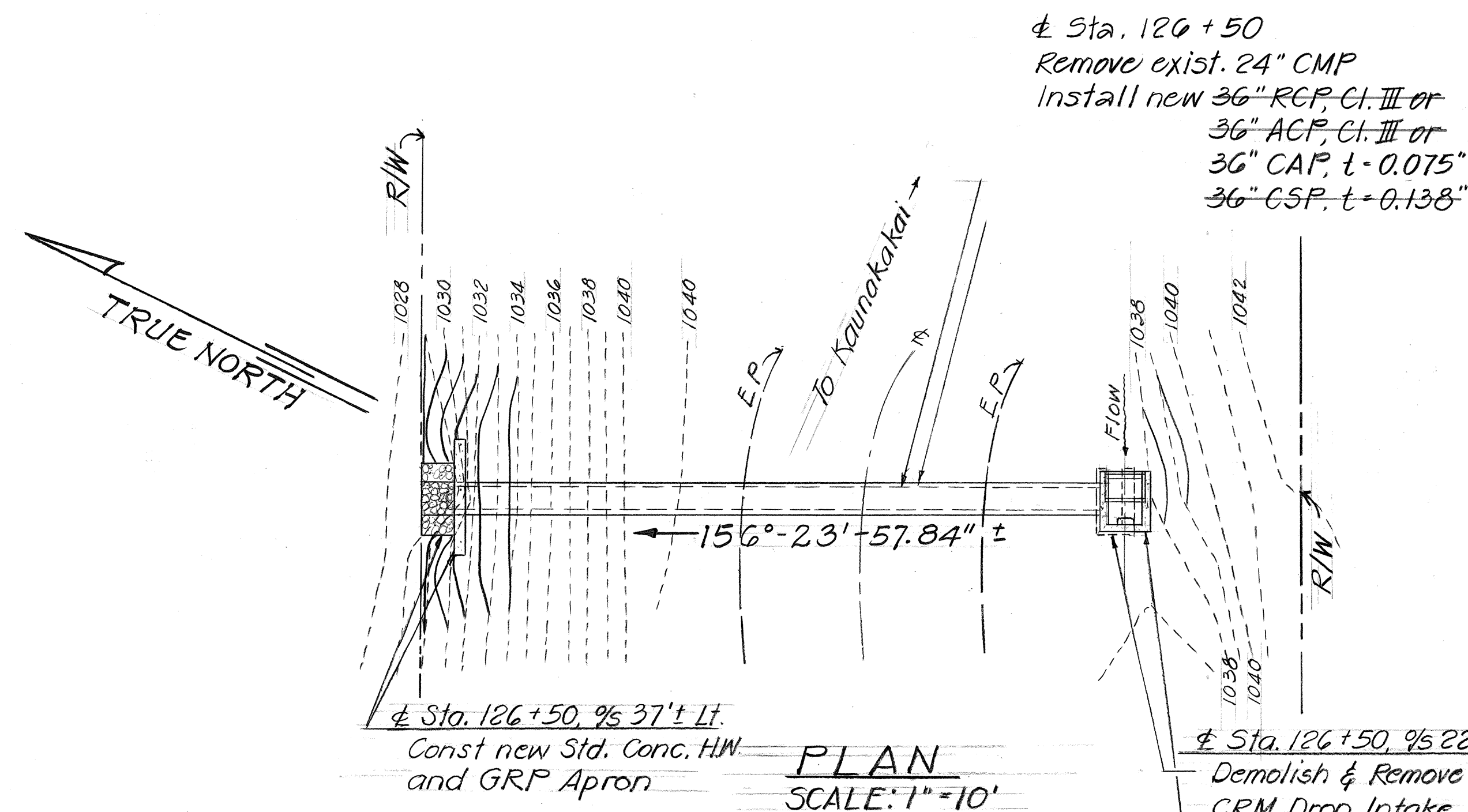
FRONT ELEVATION
Scale: 1/4" = 1'-0"

DETAILS OF GROUTED RUBBLE PAVING INLET
@ STA. 116+11, 0/5 67' RT.

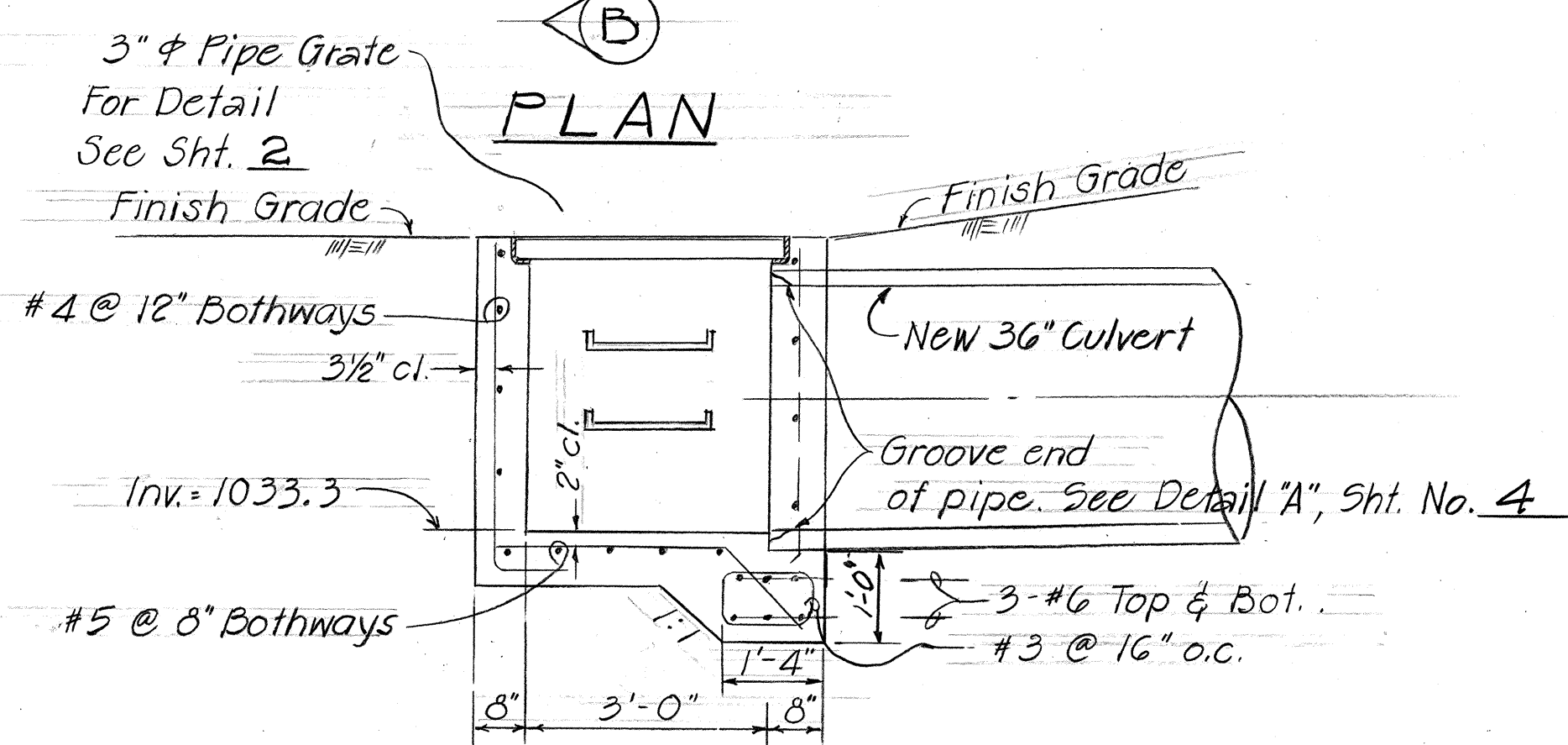
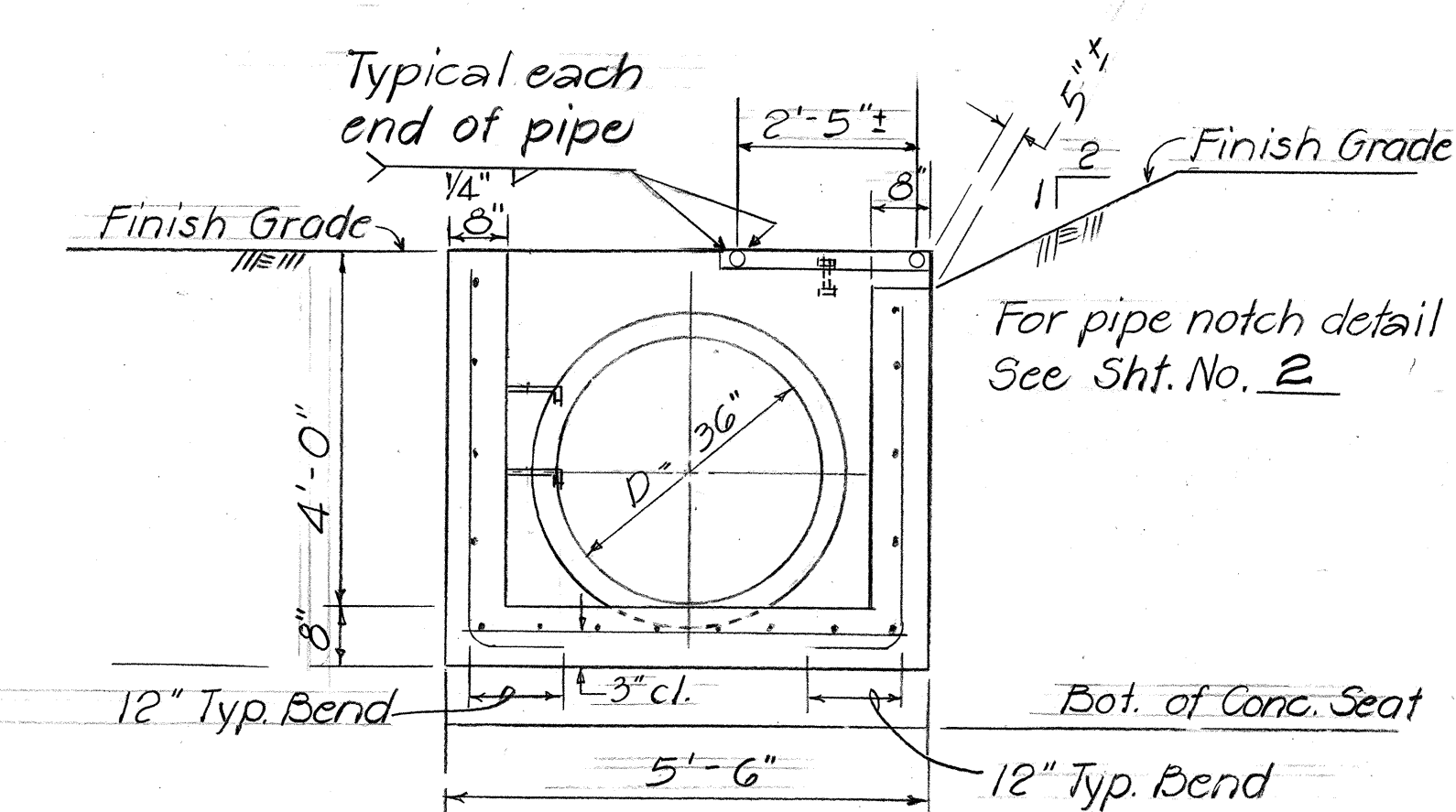
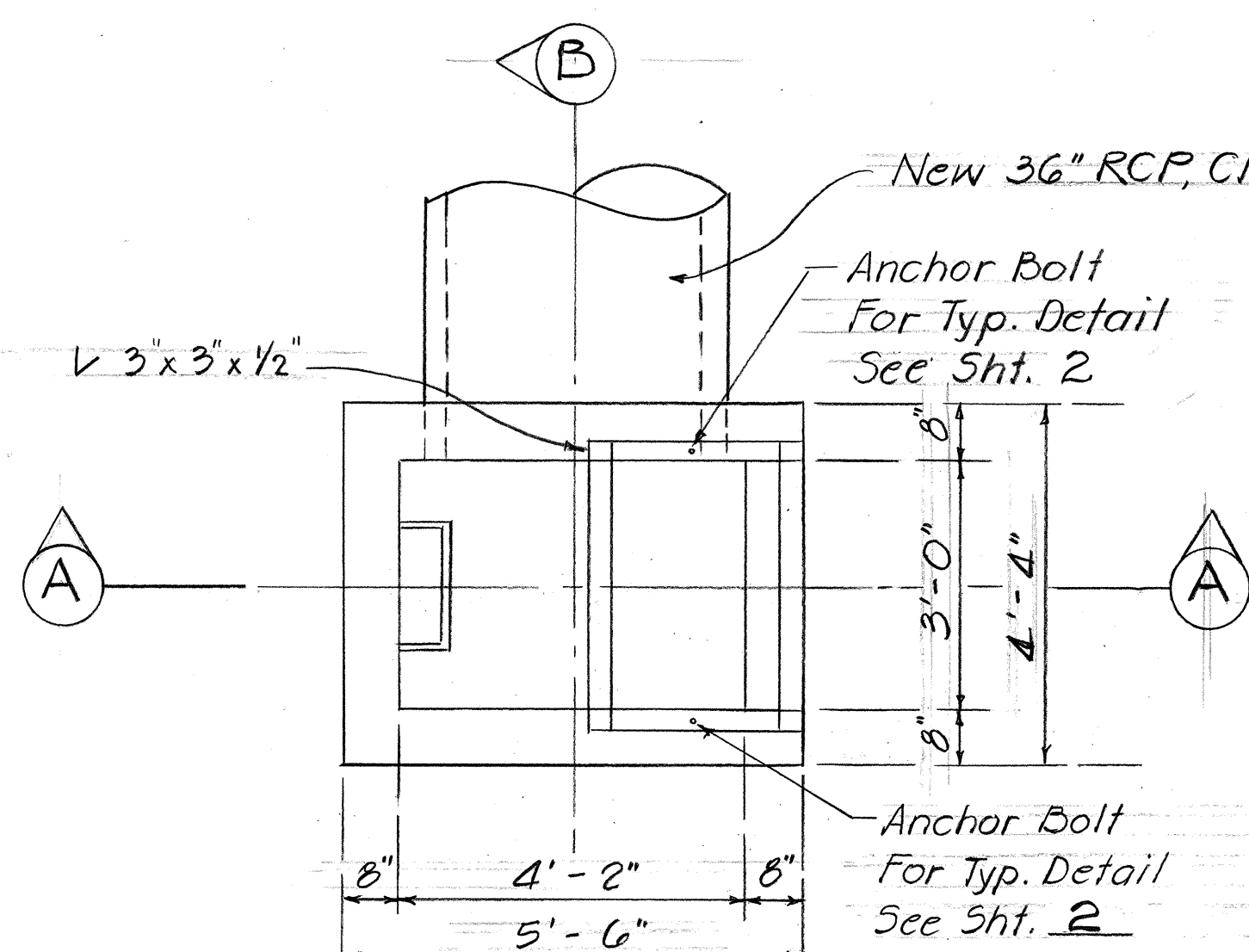
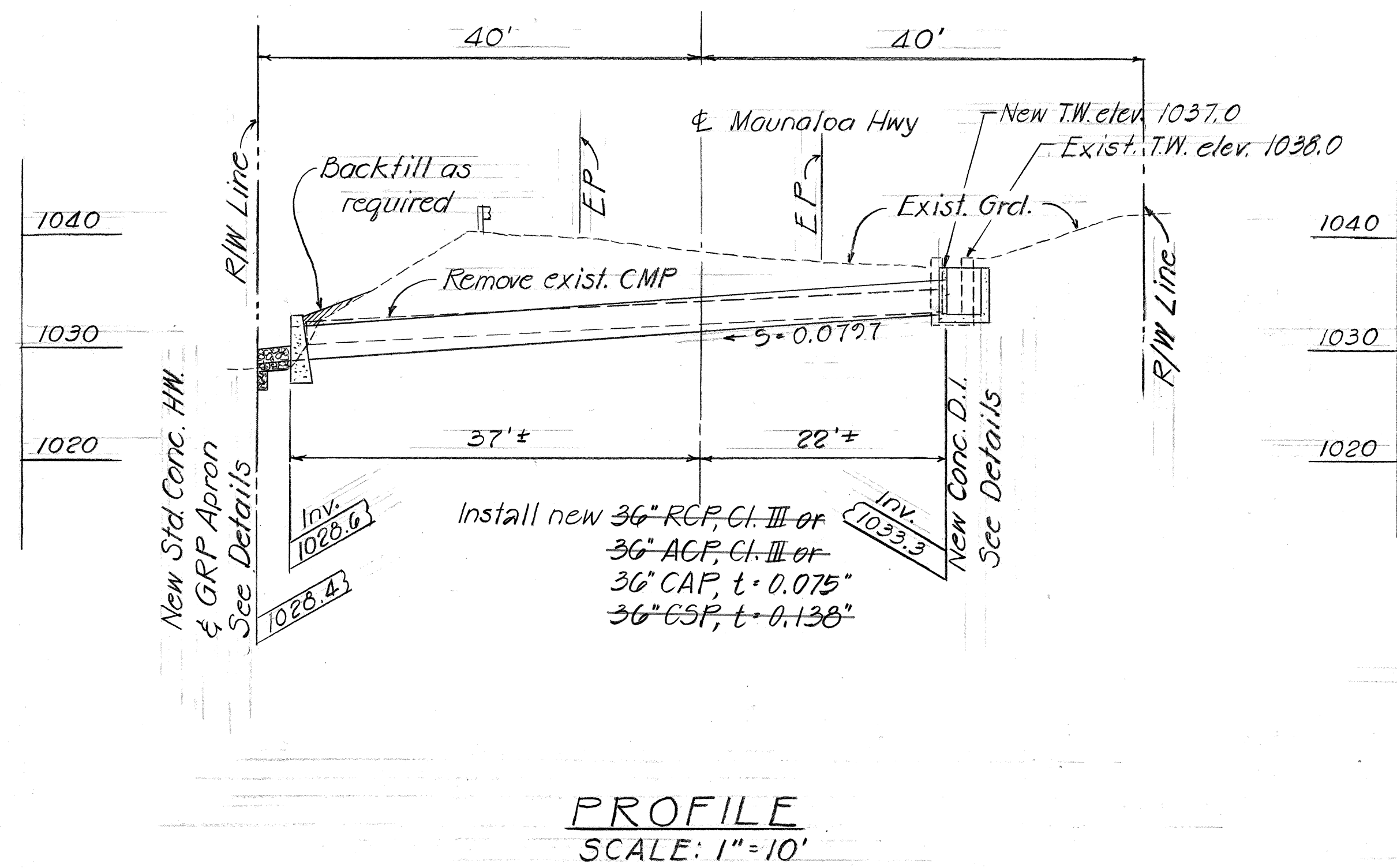
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION DRAINAGE DETAILS CONC. OUTLET STRUC. AND GRP INLET Maunaloa Hwy., Replacement of Culverts bet. Maunaloa Village and Kaunakakai - Phase II PROJ. NO. RS-0460 (5) SCALE: AS NOTED DATE: DEC. 1983 SHEET No. 11 OF 20 SHEETS
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DETAILS OF CONCRETE OUTLET STRUCTURE @ ± STA. 116+39, 0/5 78' LT.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS 0460(5)	1985	38	46



GROUTED RUBBLE PAVING @ OUTLET @ STA. 126+50

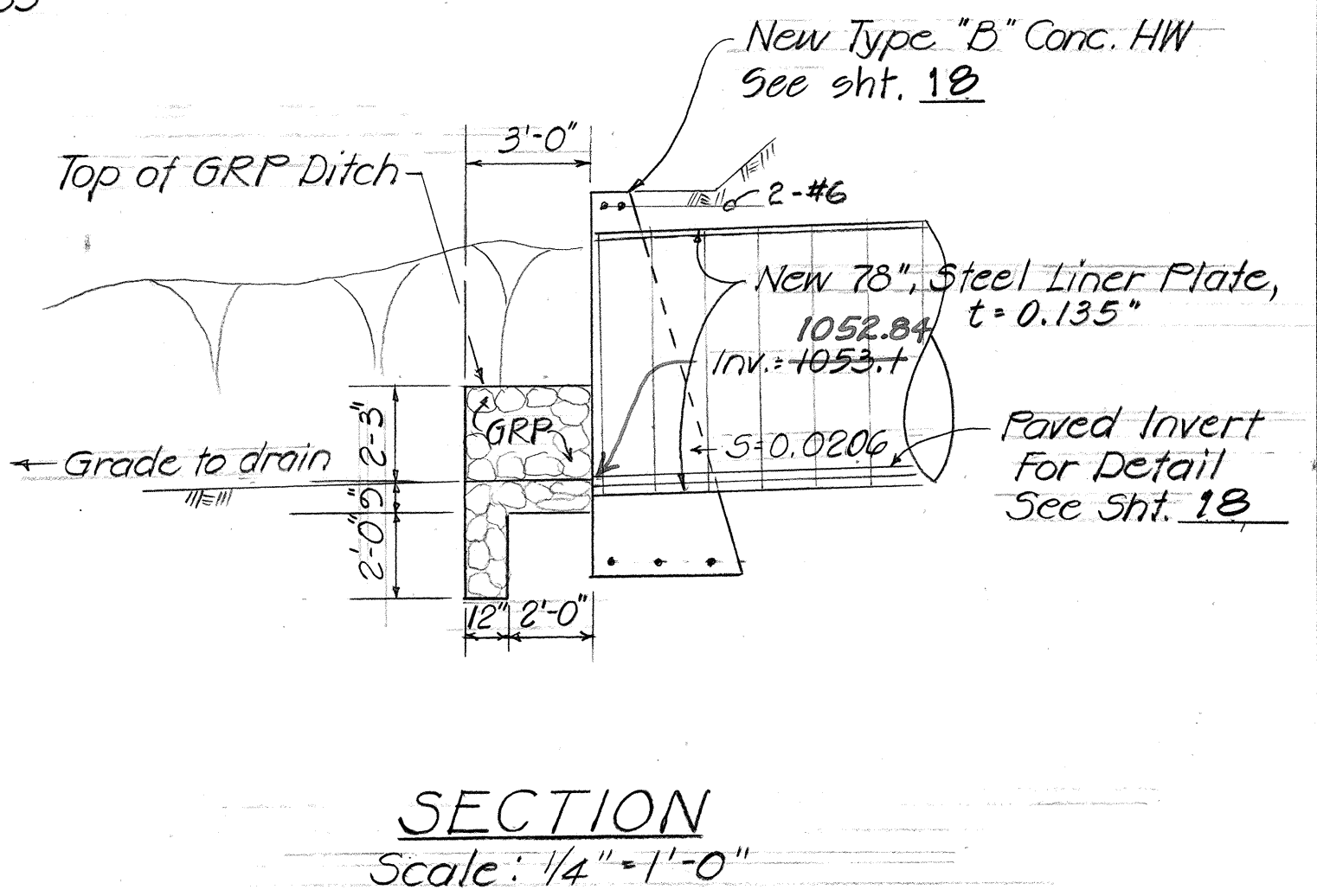
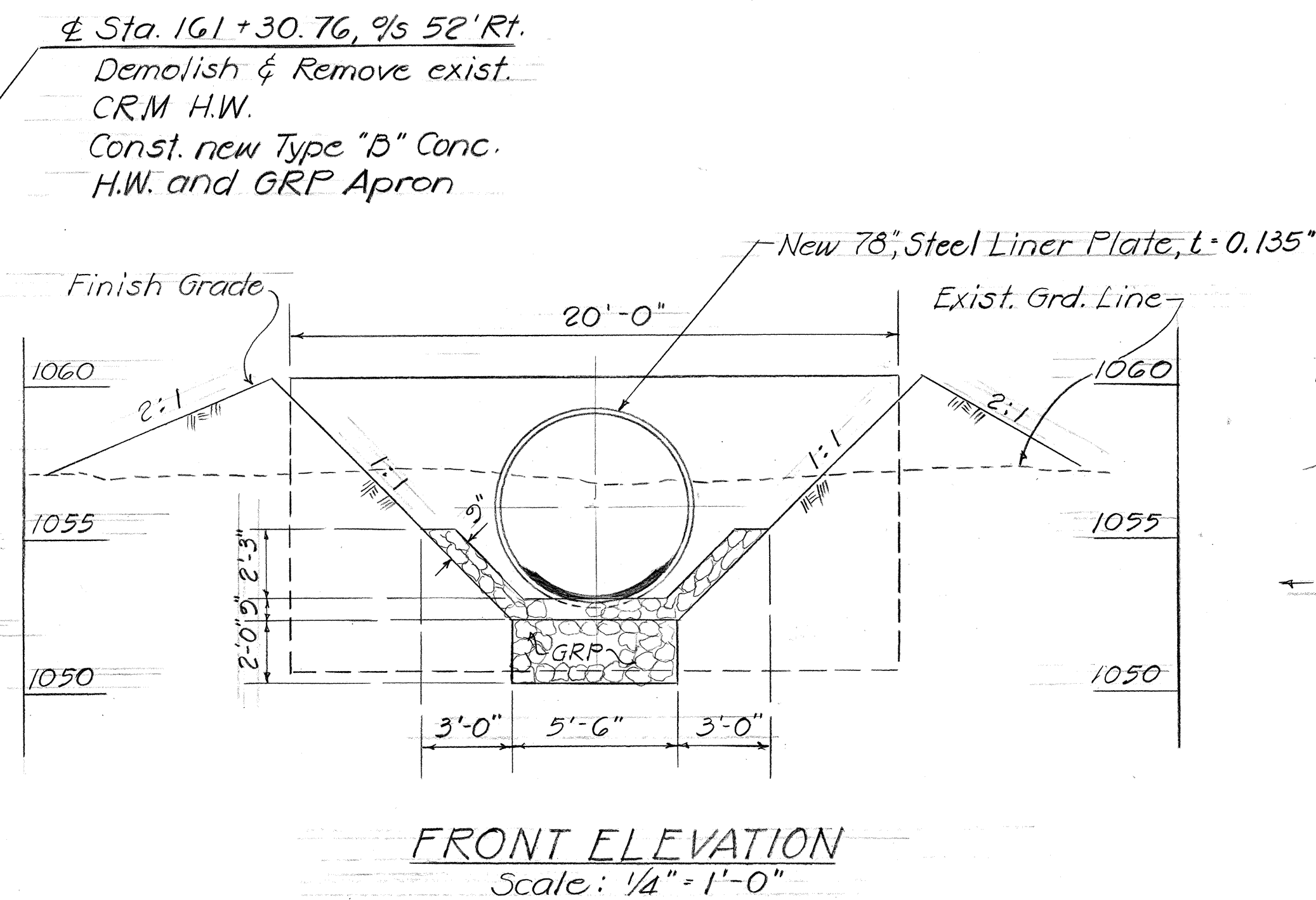
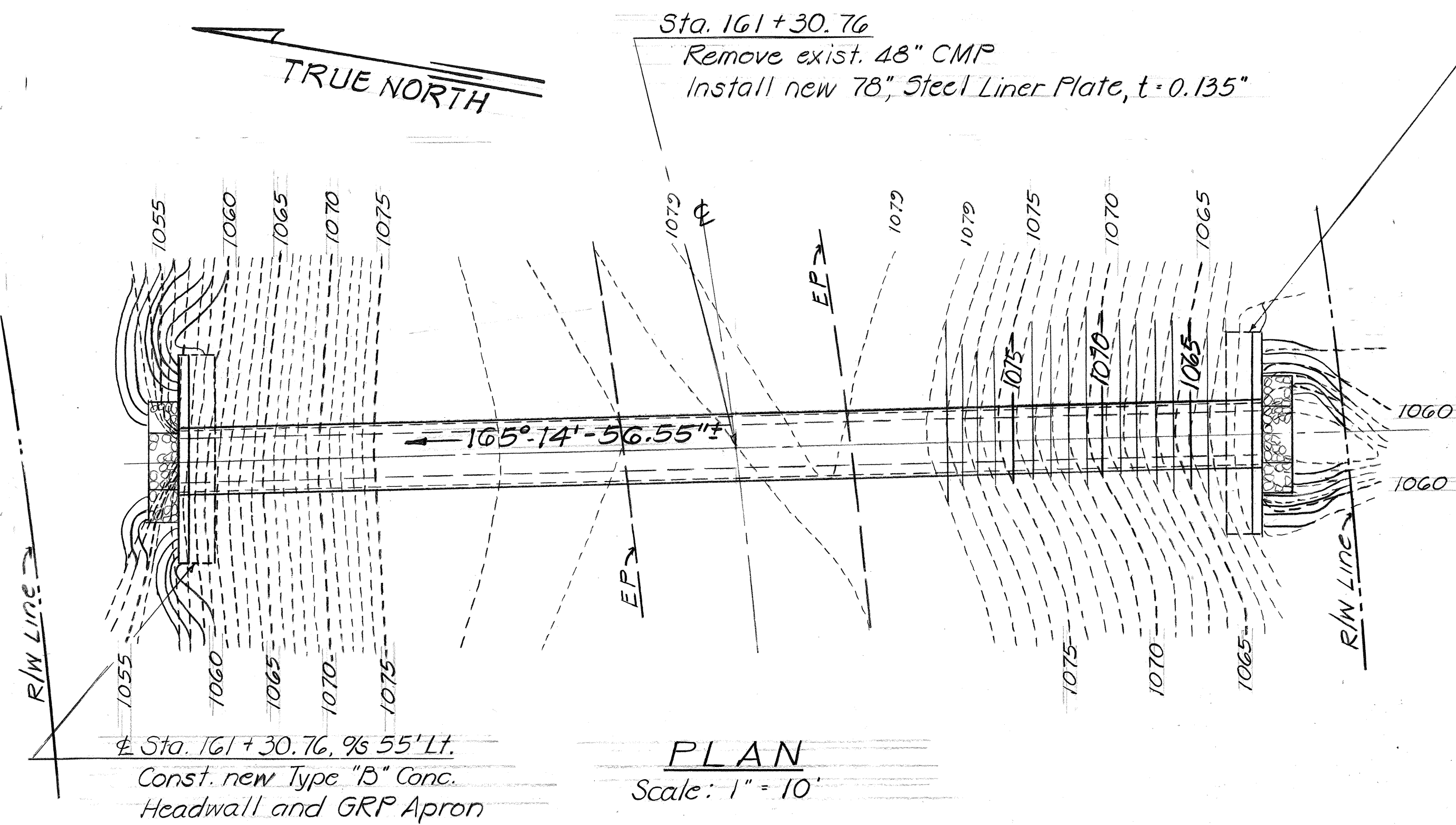


DETAILS OF 36" CULVERT @ ± STA. 126+50

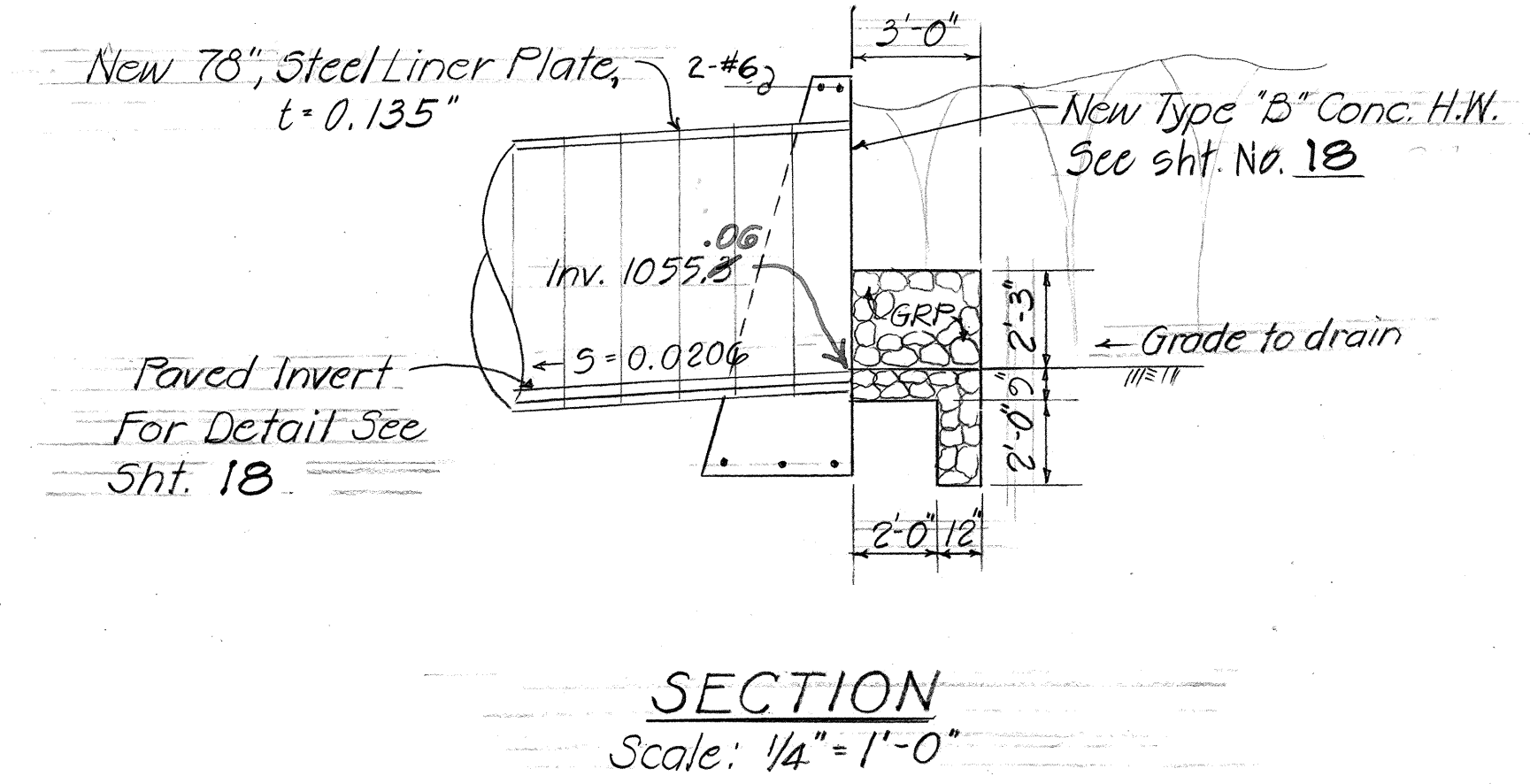
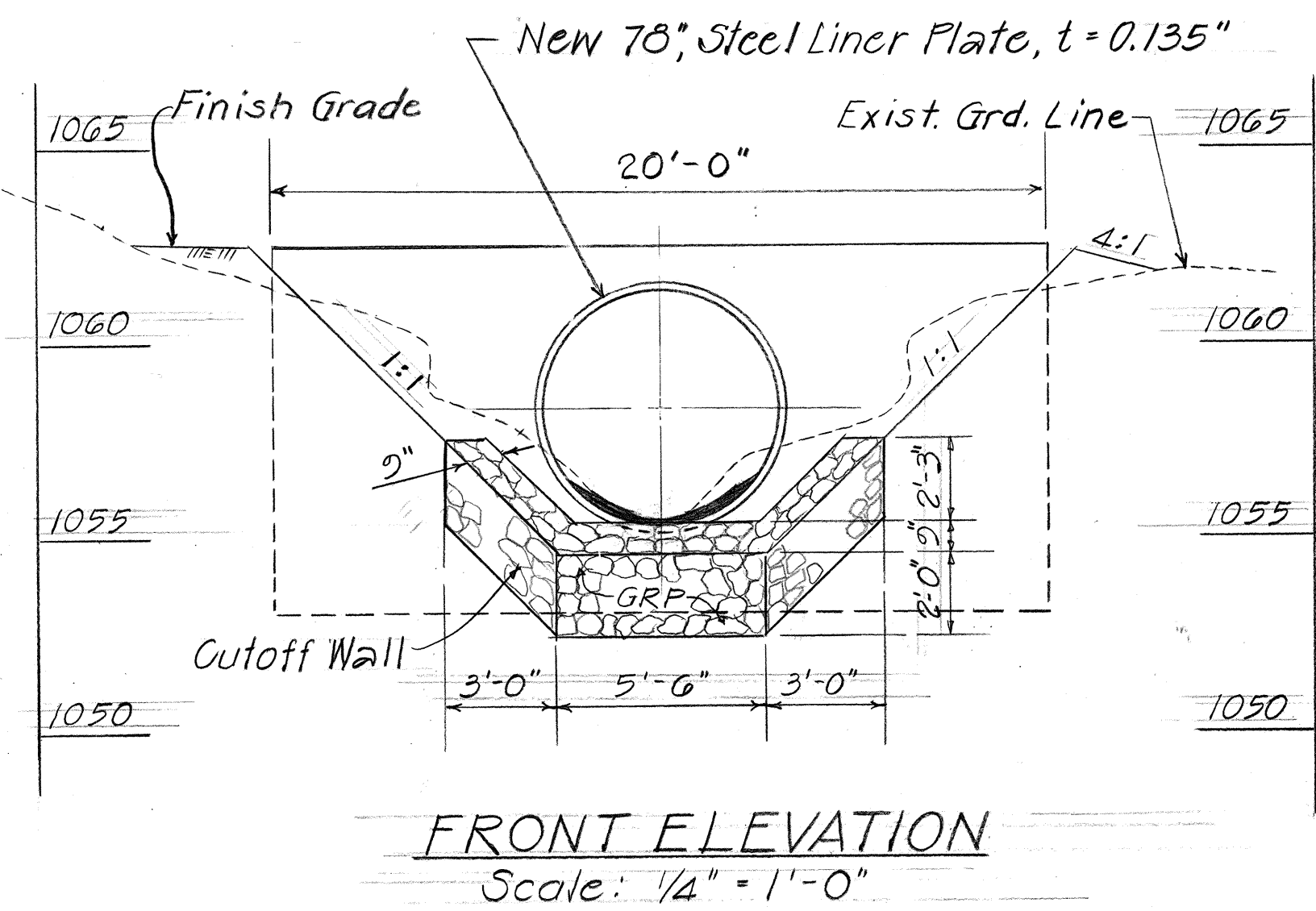
DETAILS OF CONC. DROP INTAKE @ ± STA. 126+50

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
 CULVERT, STD. HEADWALL, GRP
 APRON AND DITCH
 Maunaloa Highway, Replacement of Culverts bet
 Maunaloa Village and Kaunakakai- Phase II
 PROJ. NO. RS-0460(5)
 Scale: As Noted Date: Nov. 1983
 SHEET NO. 12 OF 20 SHEETS

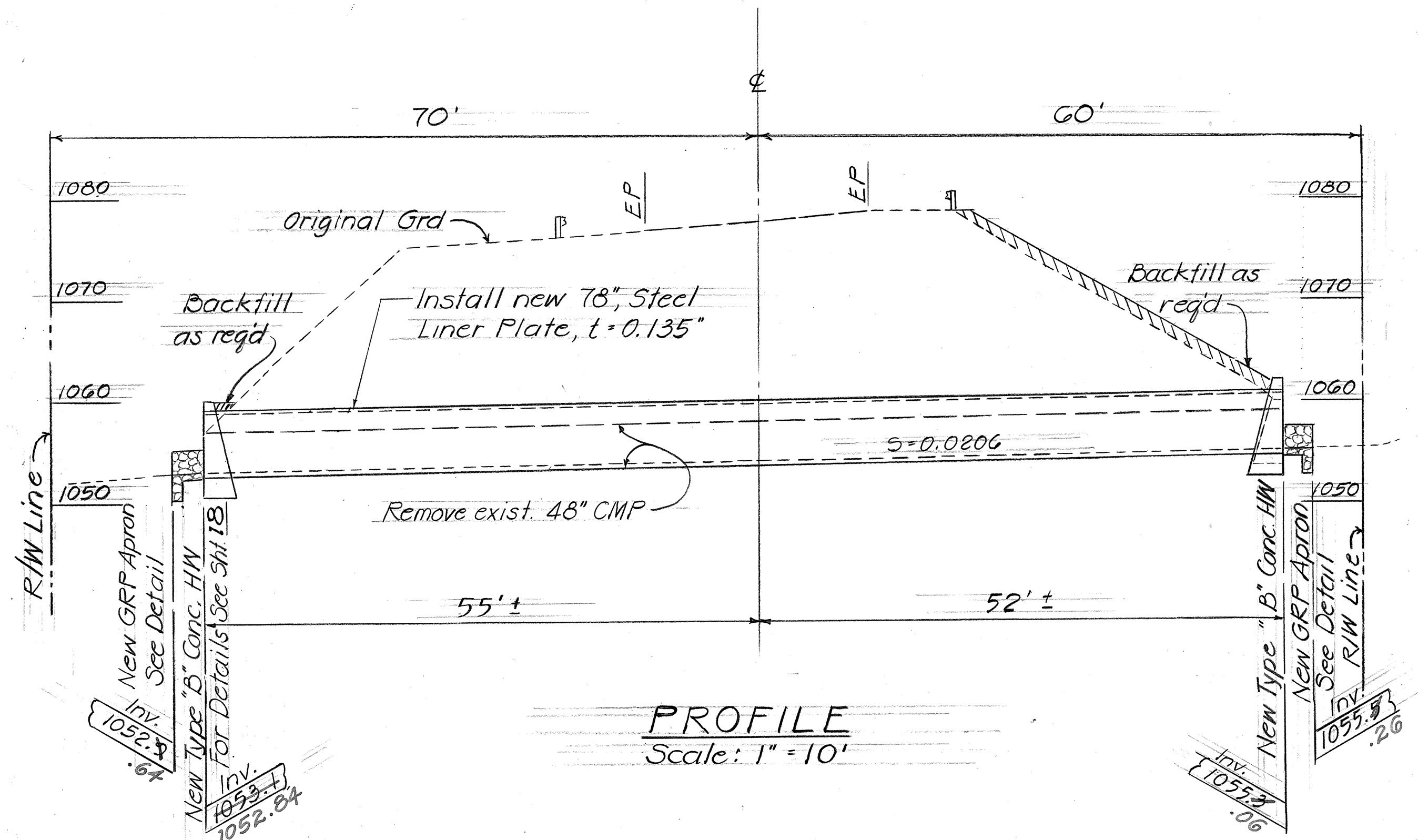
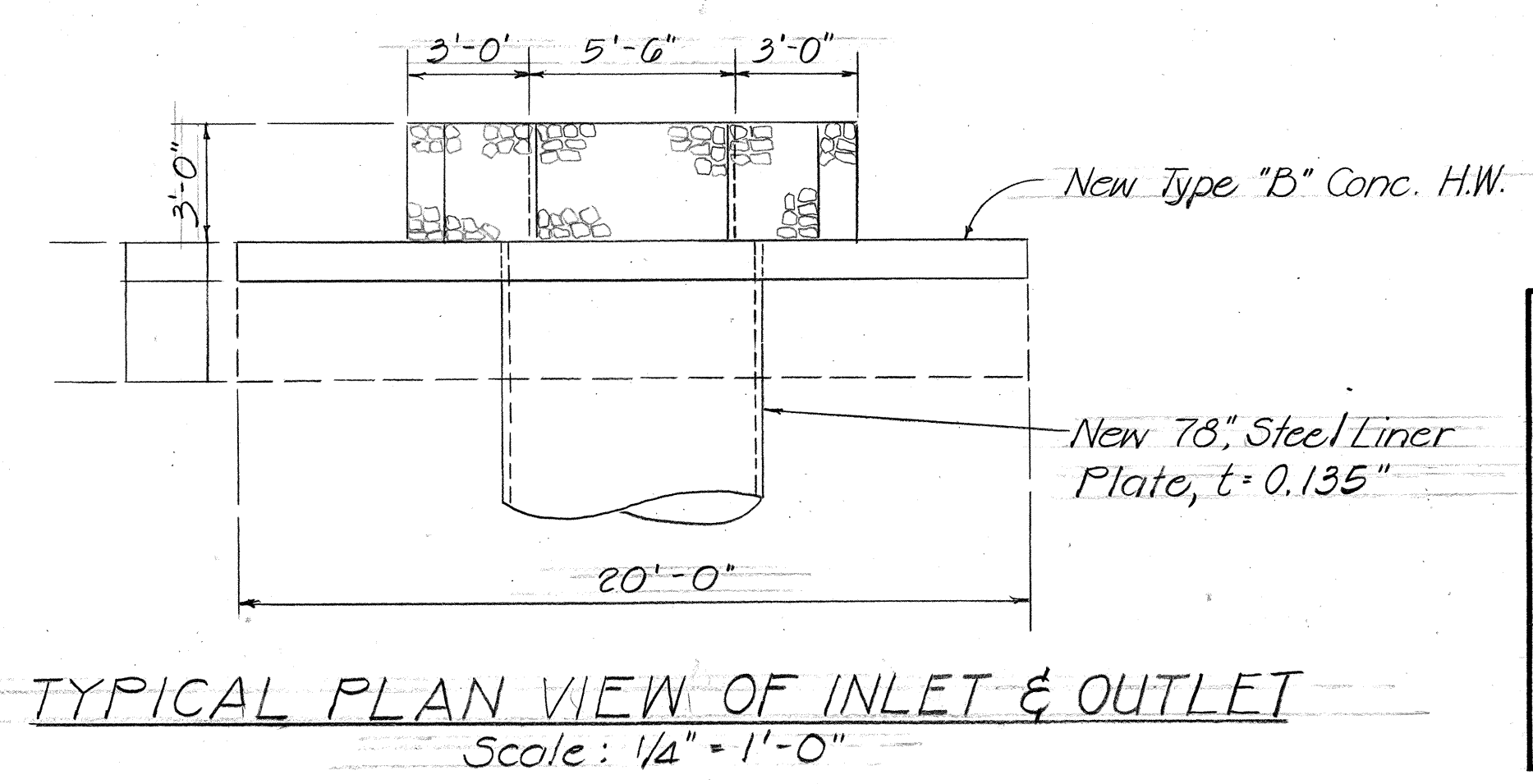
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	30	46



DETAILS OF GROUTED RUBBLE PAVING AT OUTLET



DETAILS OF GROUTED RUBBLE PAVING AT INLET



DETAILS OF NEW 78" STEEL LINER PLATE AT STA. 161+30.76

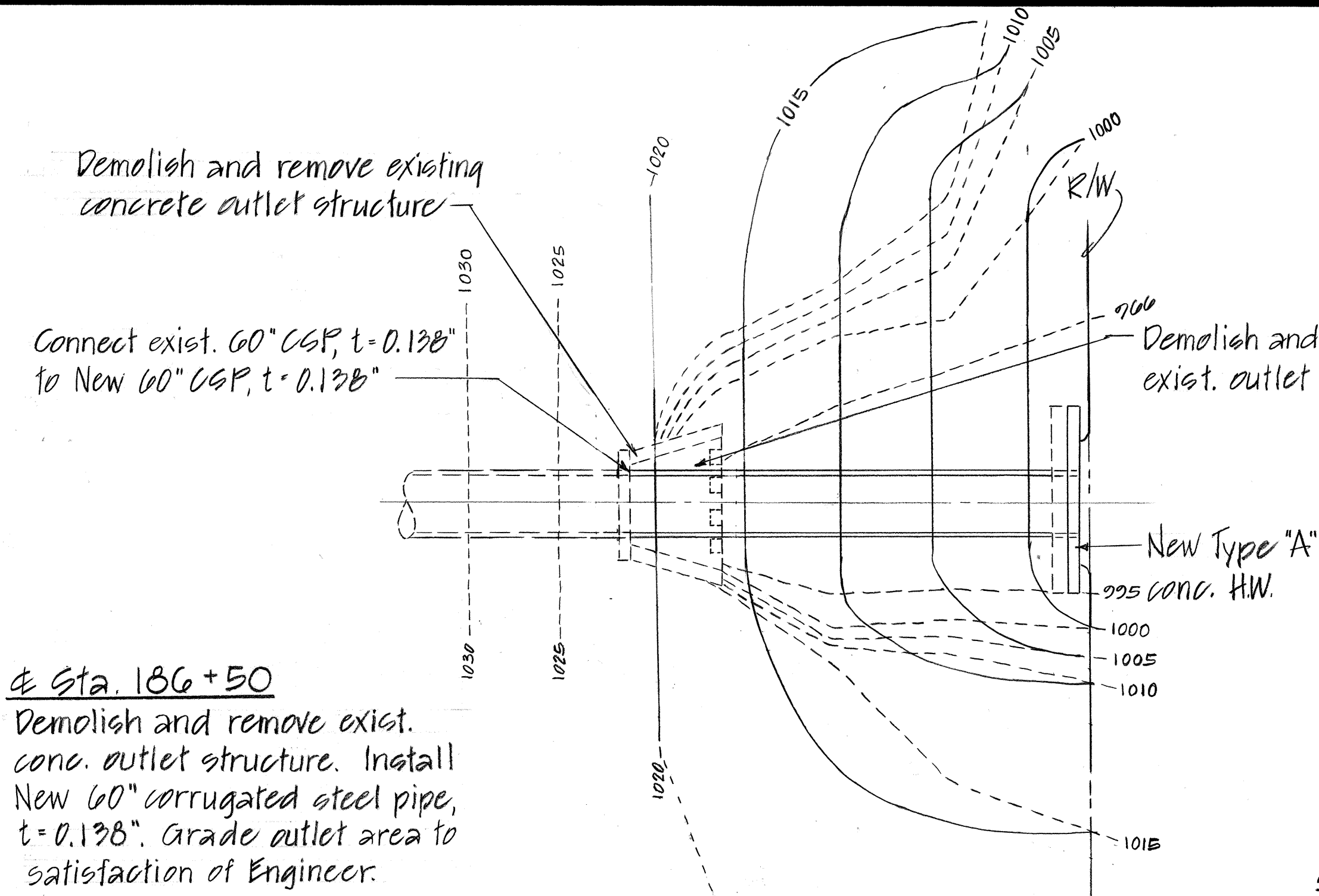
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS
CULVERT, STD. HEADWALL AND APRON
Maunaloa Highway, Replacement of Culverts bet.
Maunaloa Village and Kounakakai-Phase II

Proj. No. RS-0460(5)
Scale: As Noted Date: Dec. 1983

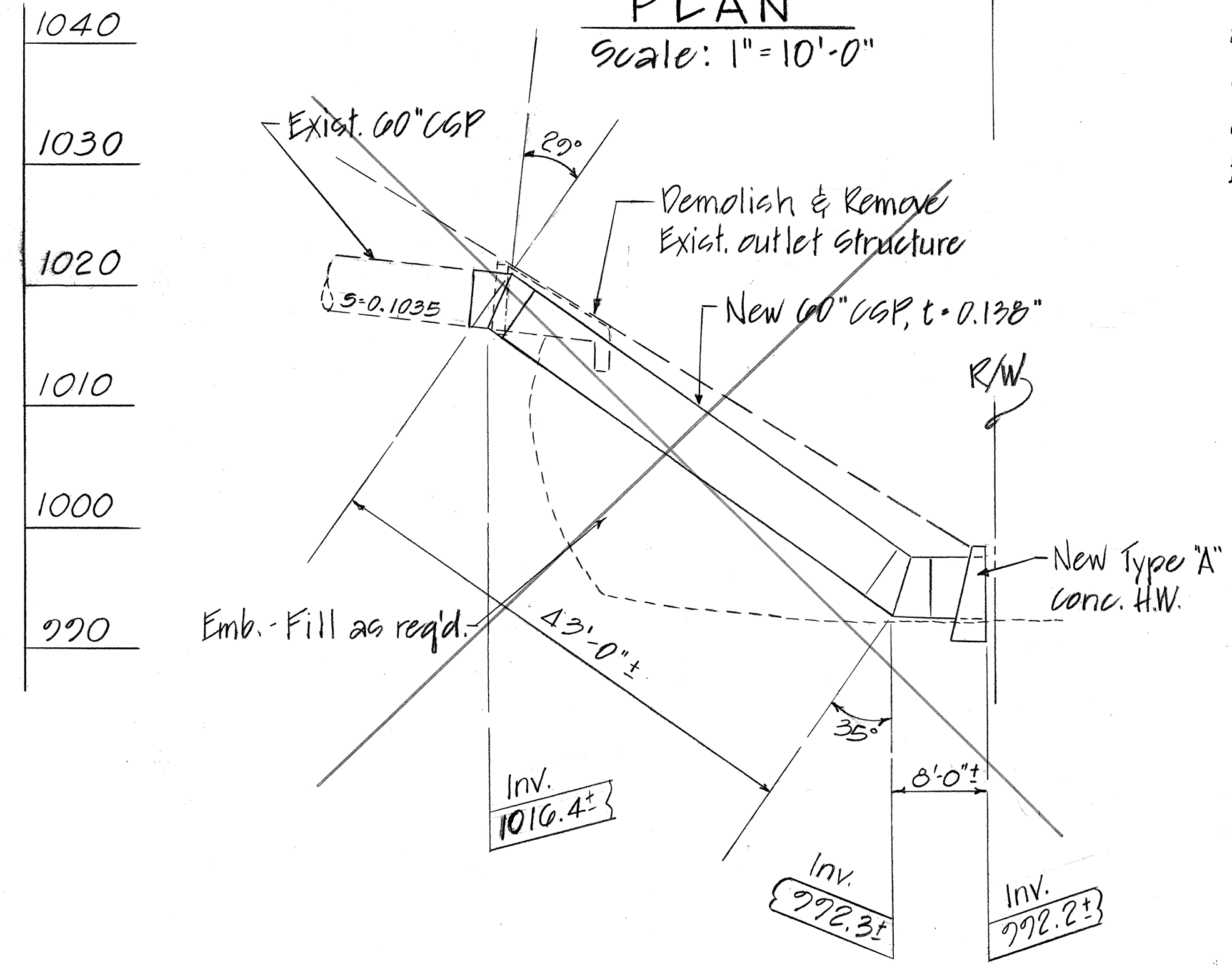
SHEET NO. 13 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	40	40



At Sta. 186+50
Demolish and remove exist. conc. outlet structure. Install New 60 inch corrugated steel pipe, t=0.138 inch. Grade outlet area to satisfaction of Engineer.

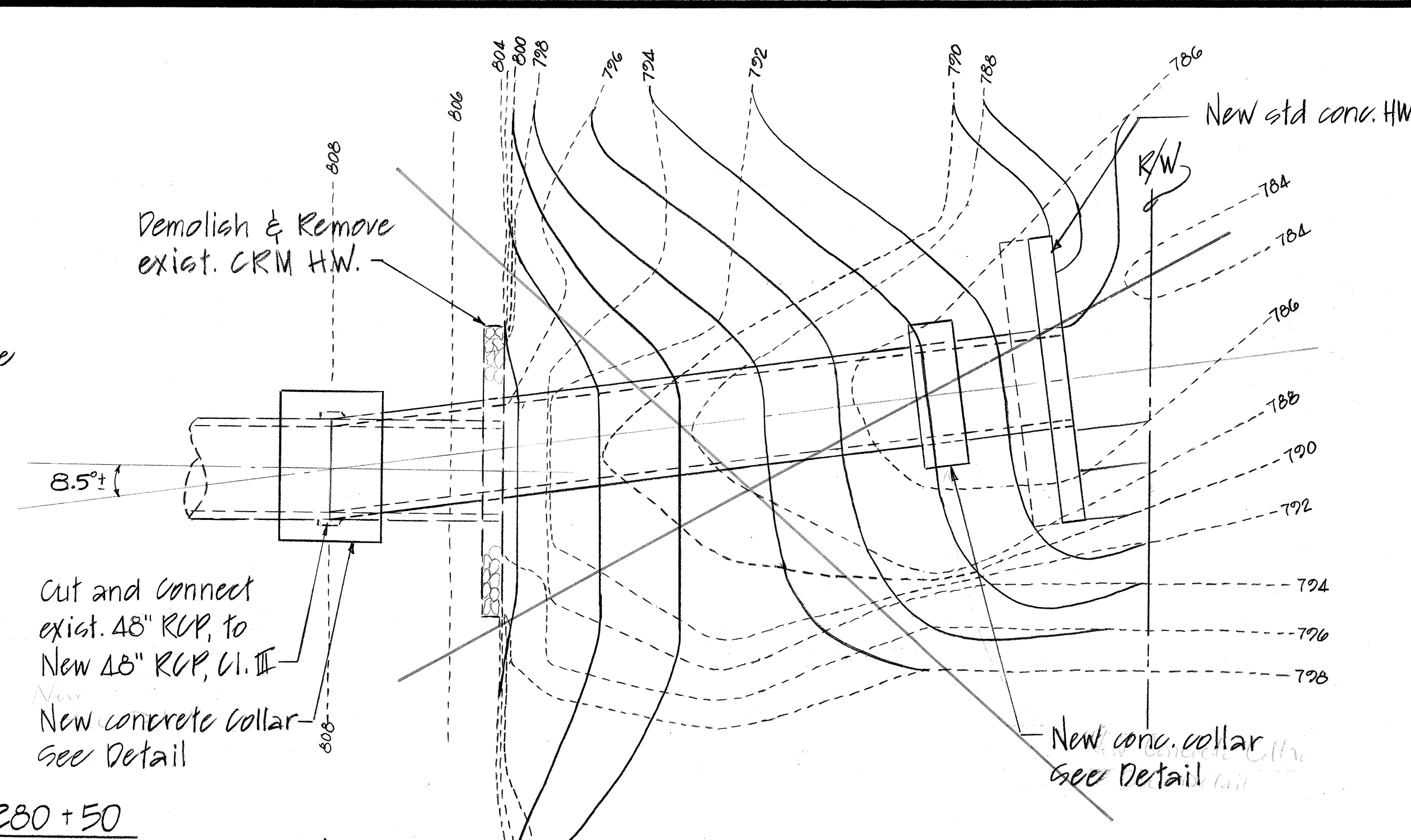
PLAN
Scale: 1"=10'-0"



PROFILE
Scale: 1"=10'-0"

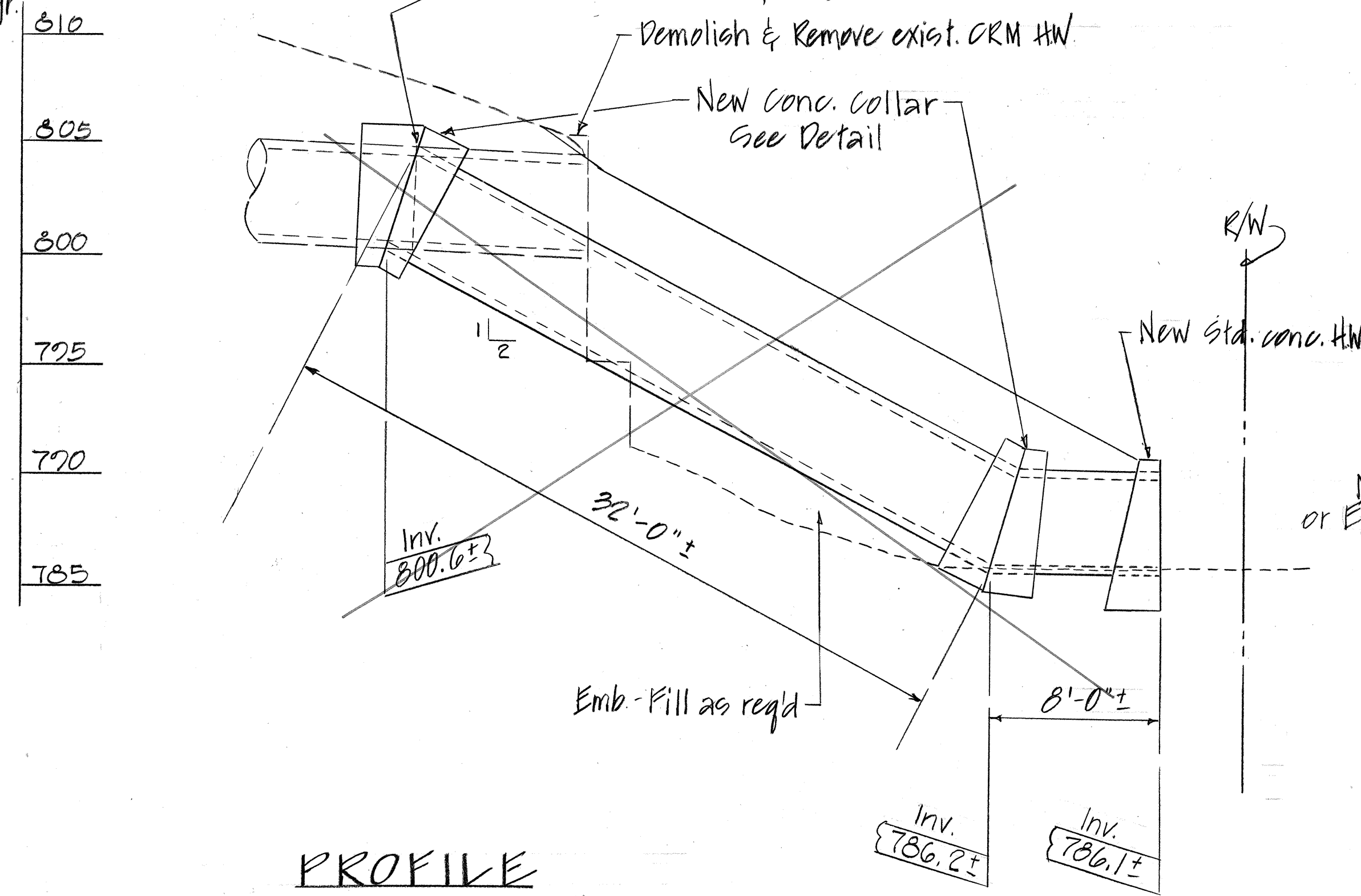
NOTE: For Profile see sh. no. 40 S-1

DETAILS OF 60" CULVERT OUTLET
AT STA. 186+50



At Sta. 280+50
Demolish & remove exist. CRM HW. & conc. apron. Install New 48 inch RCP, Cl. III. Construct New std. conc. HW. Grade outlet area to satisfaction of Engr.

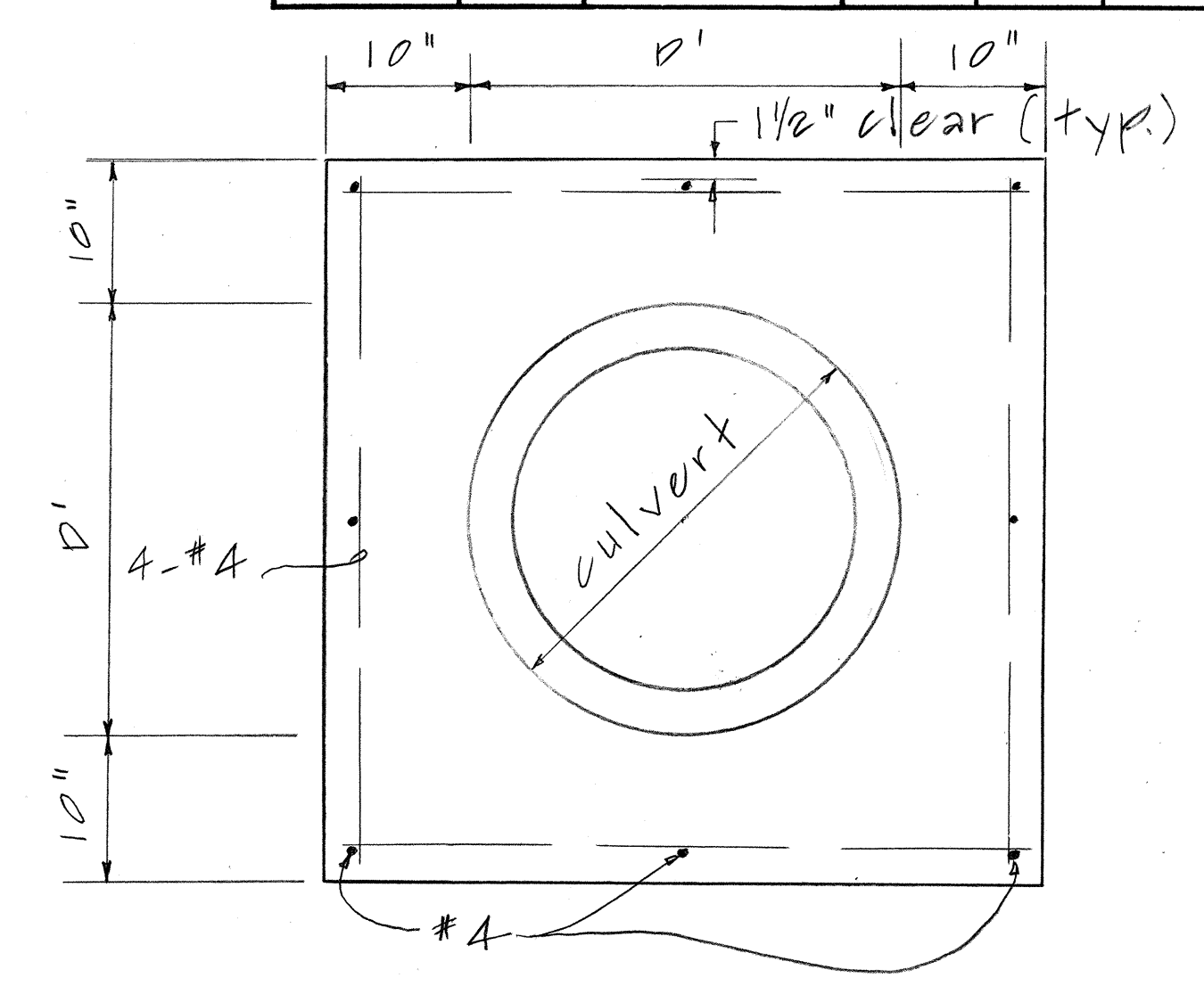
PLAN
Scale: 1"=5'-0"



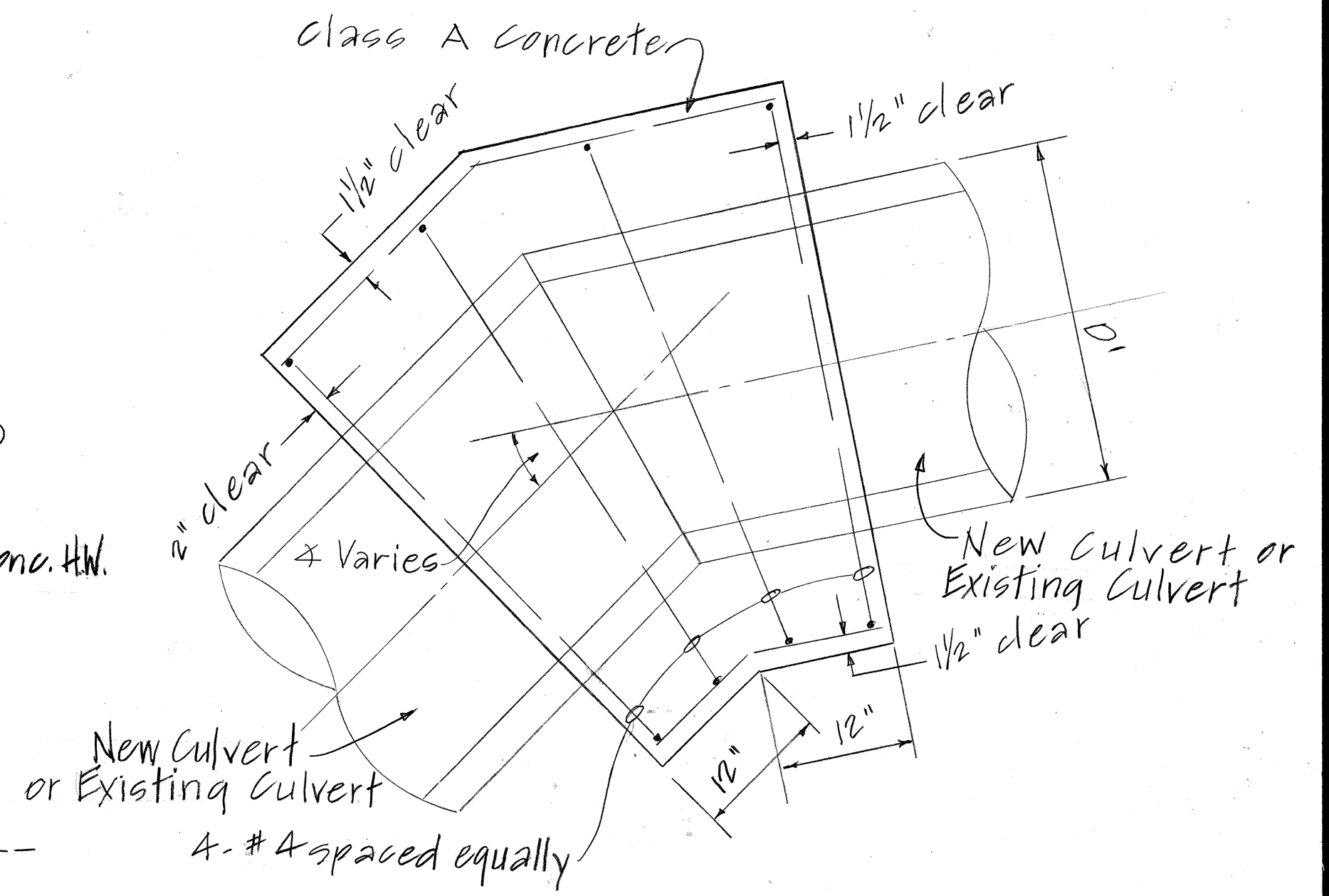
PROFILE
Scale: 1"=5'-0"

DETAILS OF 48" CULVERT OUTLET
AT STA. 280+50

NOTE: For details of 48 inch culvert outlet see sh. no. 40 S-1



FRONT VIEW



SIDE VIEW

DETAIL OF CONCRETE COLLAR
Scale: 1"=1'-0"

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS

CULVERT OUTLET AND CONC. COLLAR

Maunaloa Hwy., Replacement of Culverts bet. Maunaloa Village and Kaunakakai - Phase II

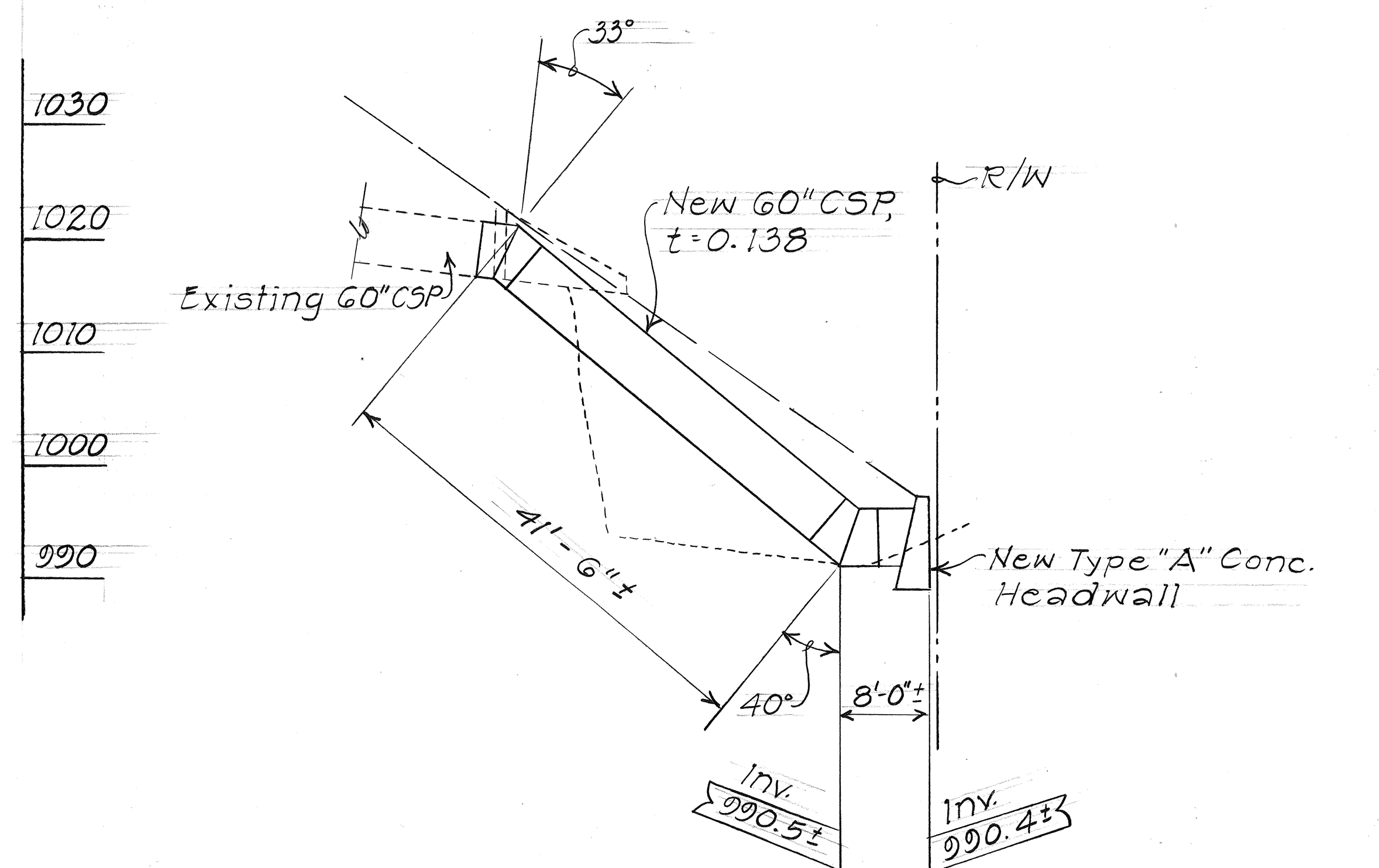
PROJ. No. RS-0460(5)

SCALE: AS NOTED DATE: APR. 1984

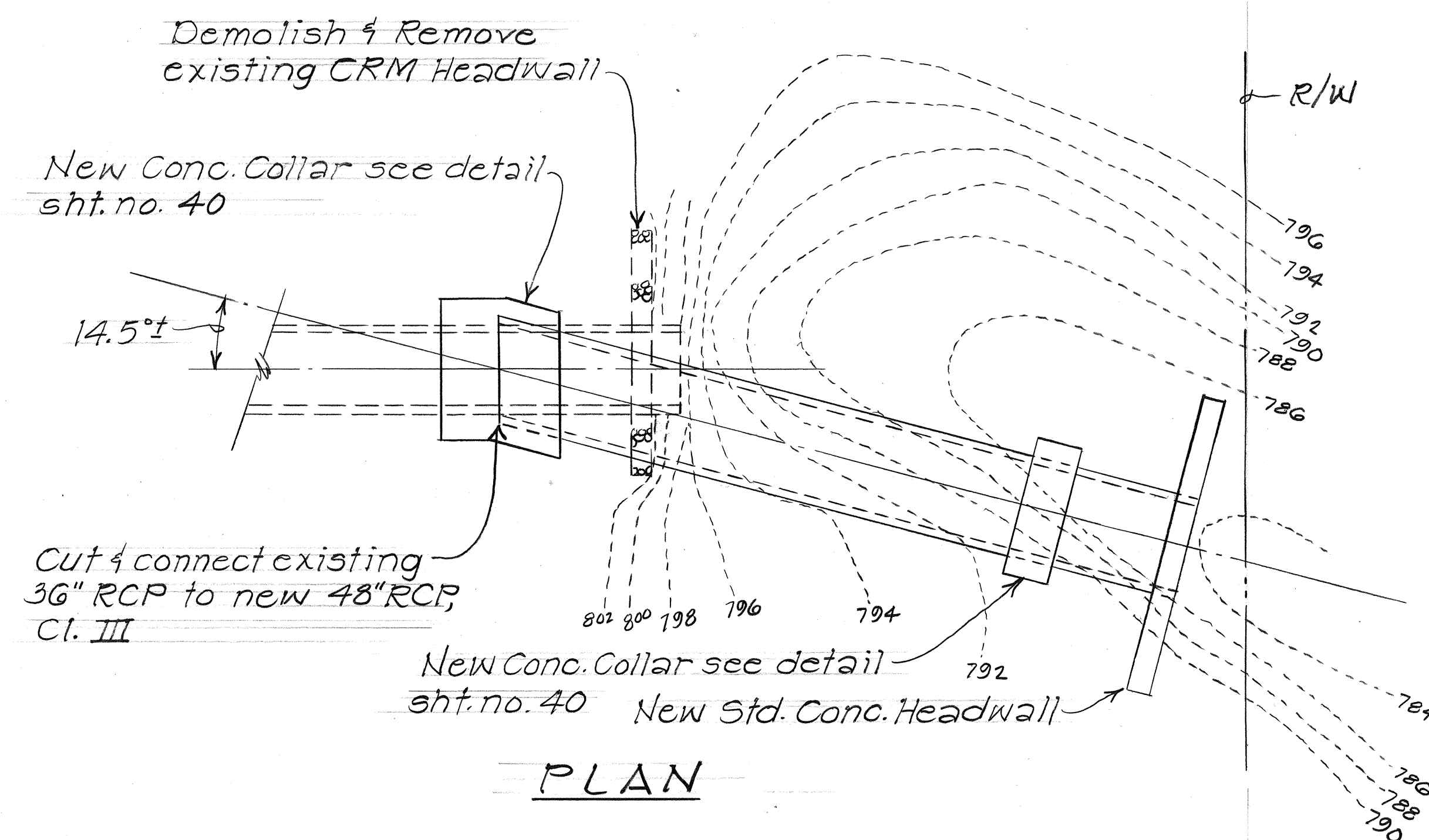
SHEET No. 14 OF 20 SHEETS

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

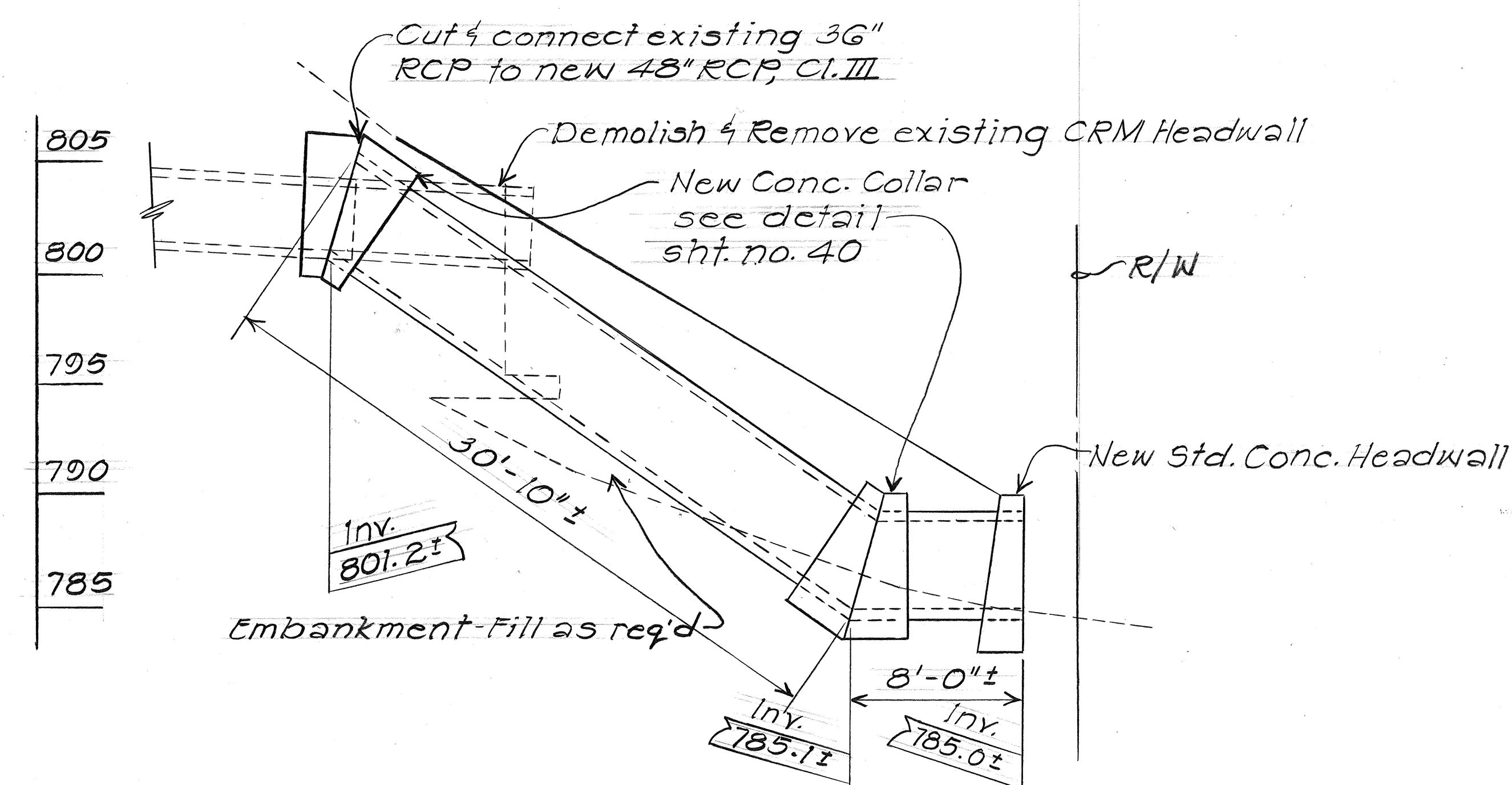
ORIGINAL PLAN	SURVEY PLOTTED BY _____ DATE _____
NOTE BOOK	DRAWN BY _____
	TRACED BY _____
	DESIGNED BY _____
	QUANTITIES BY _____
No. _____	CHECKED BY _____



PROFILE OF 60" CULVERT OUTLET AT STA. 186+50
Scale: 1" = 10'



PLAN



PROFILE

DETAILS OF 48" CULVERT OUTLET AT ± STA. 280+50
Scale: 1" = 5'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

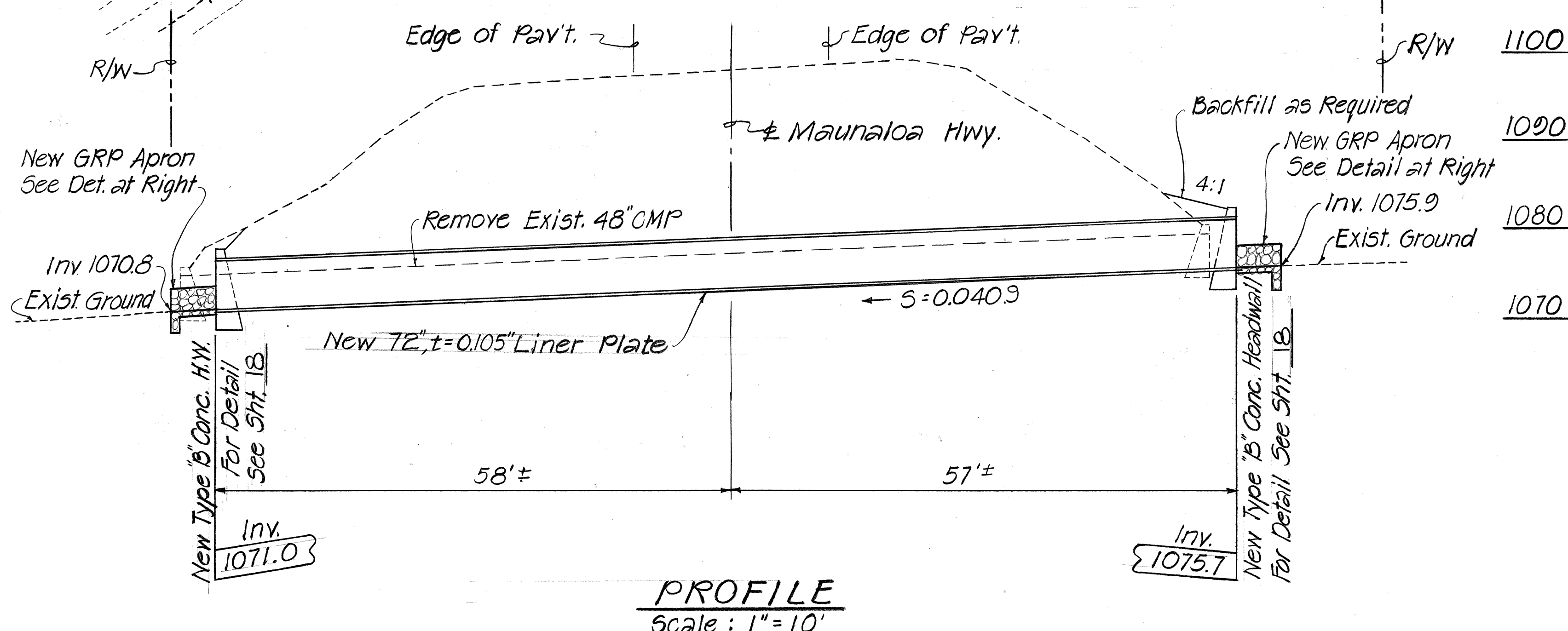
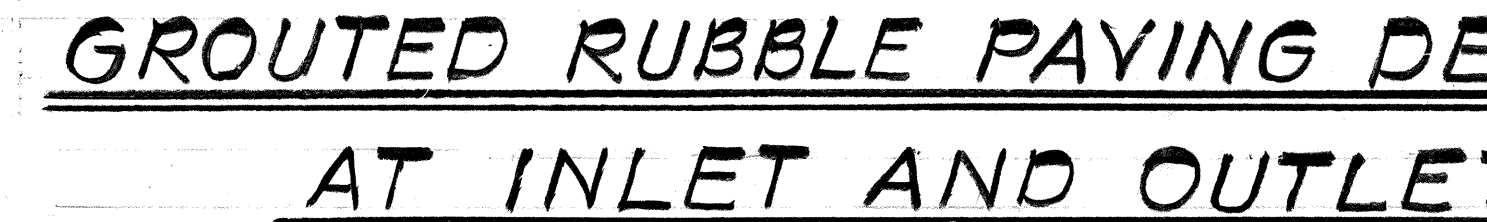
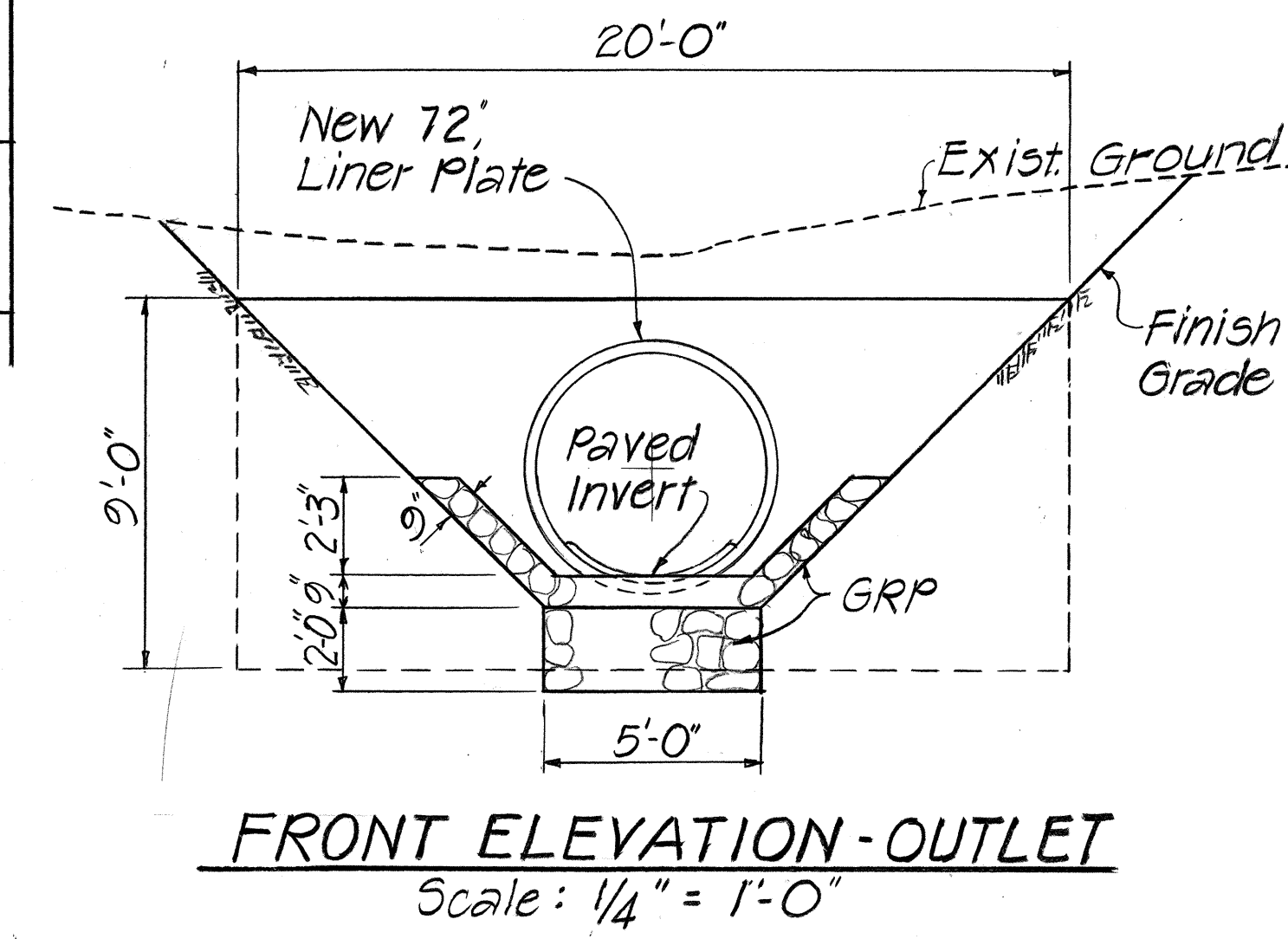
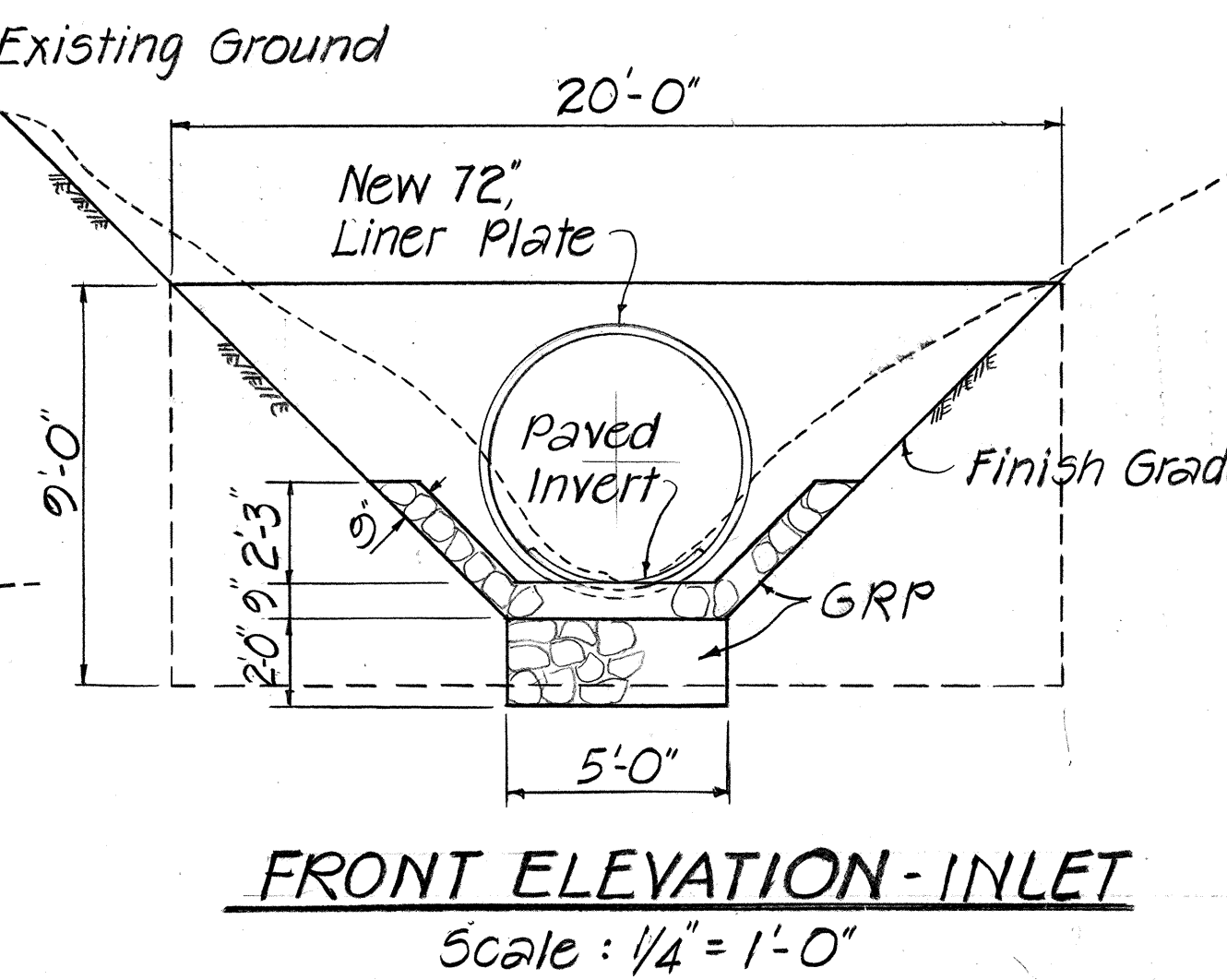
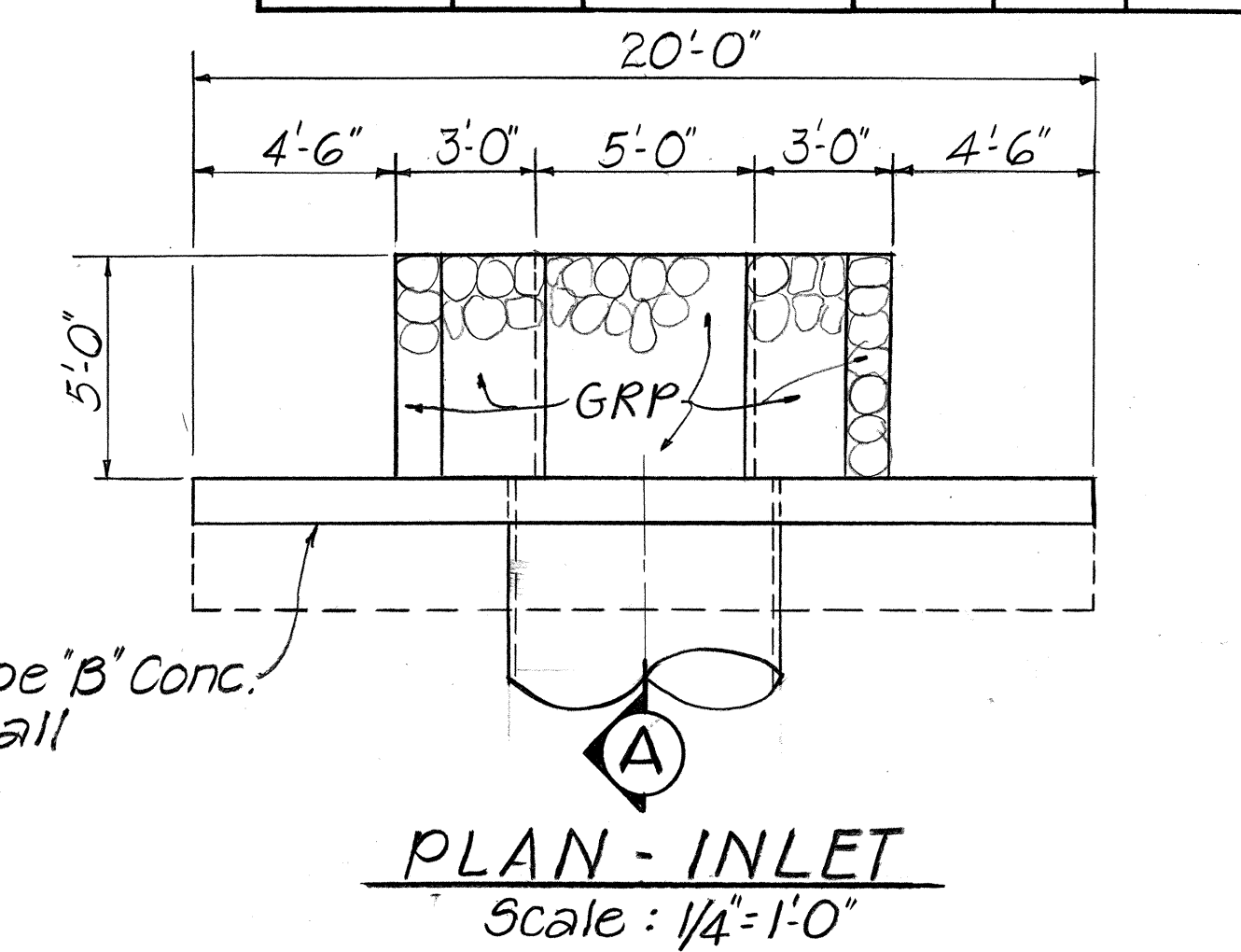
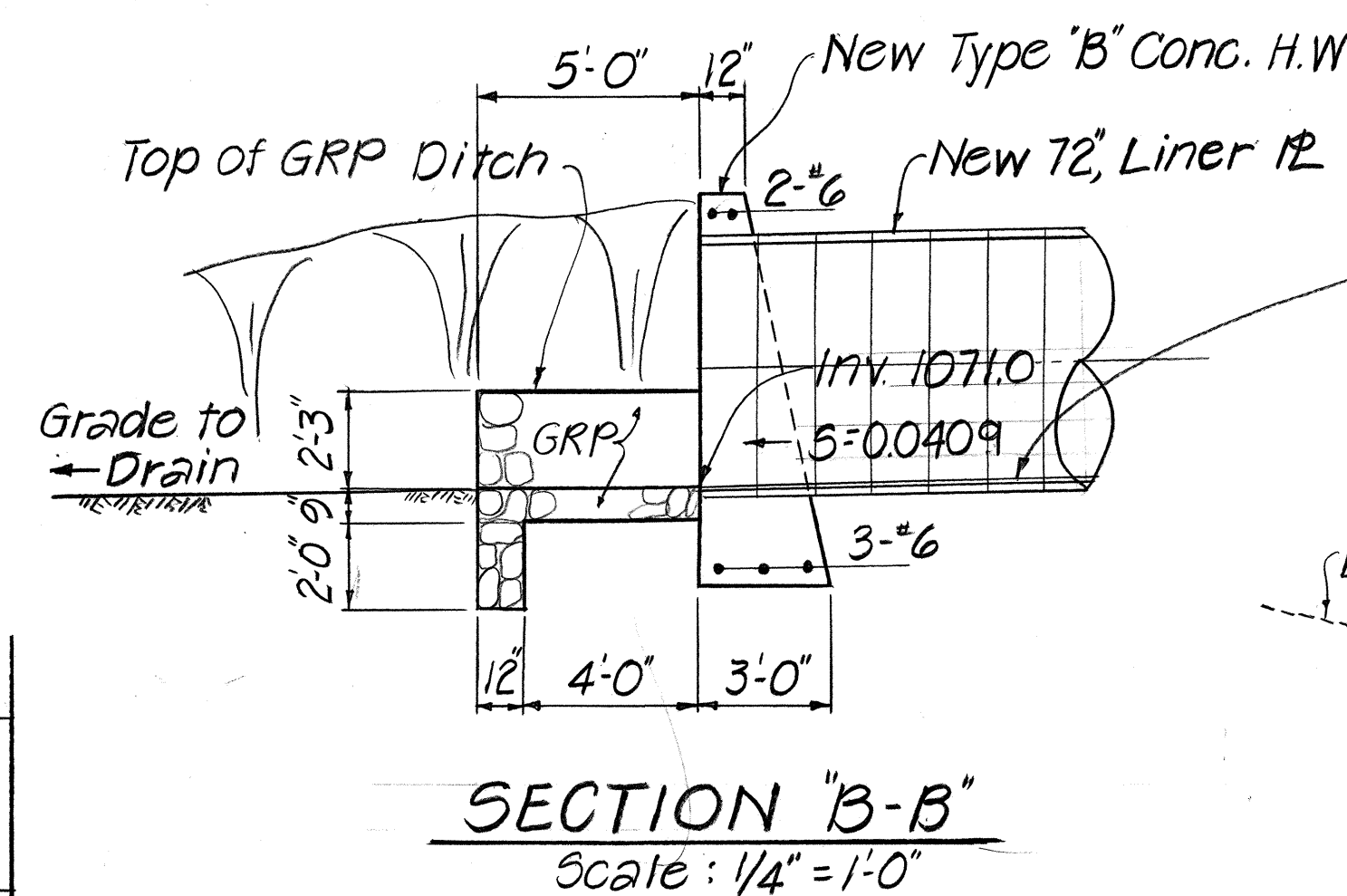
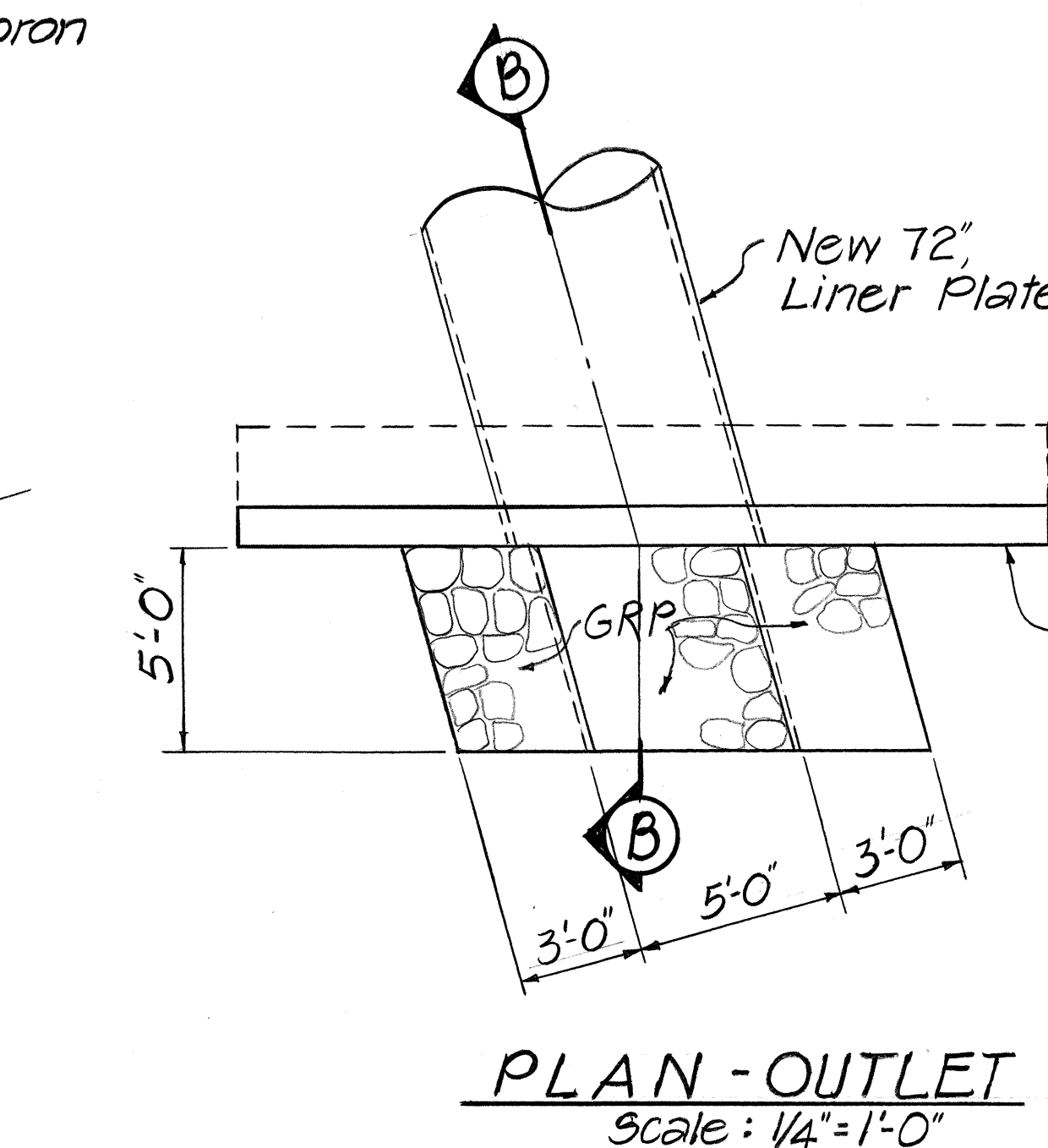
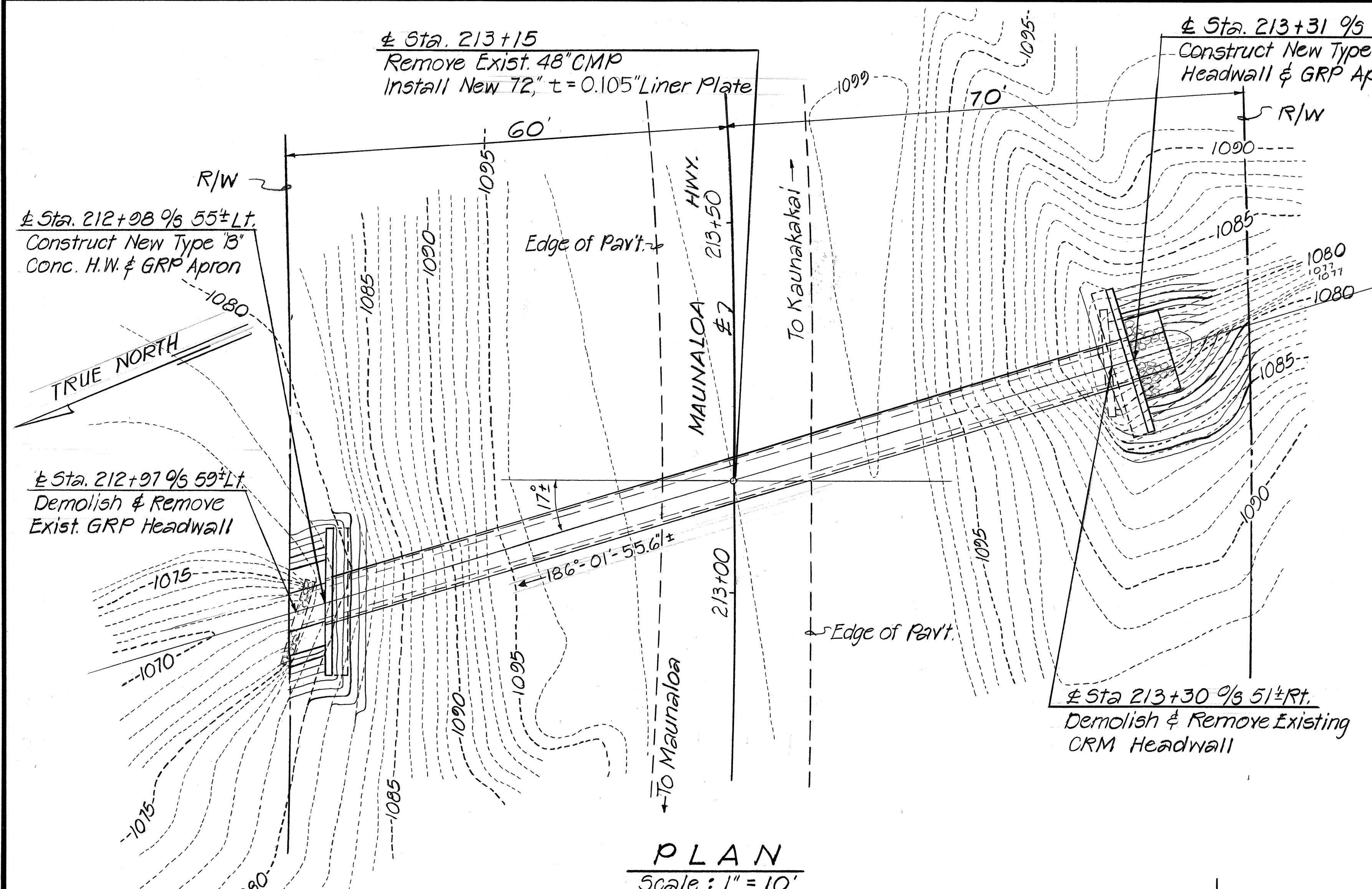
Maunaloa Highway Replacement of Culverts b
Maunaloa Village and Kaunakakai- Phase I

PROJ. No. RS-0460(5)

SCALE: AS NOTED DATE: FEB. 1980

SHEET No. 14A OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	41	46



DETAILS OF 72" LINER PL @ STA. 213+15

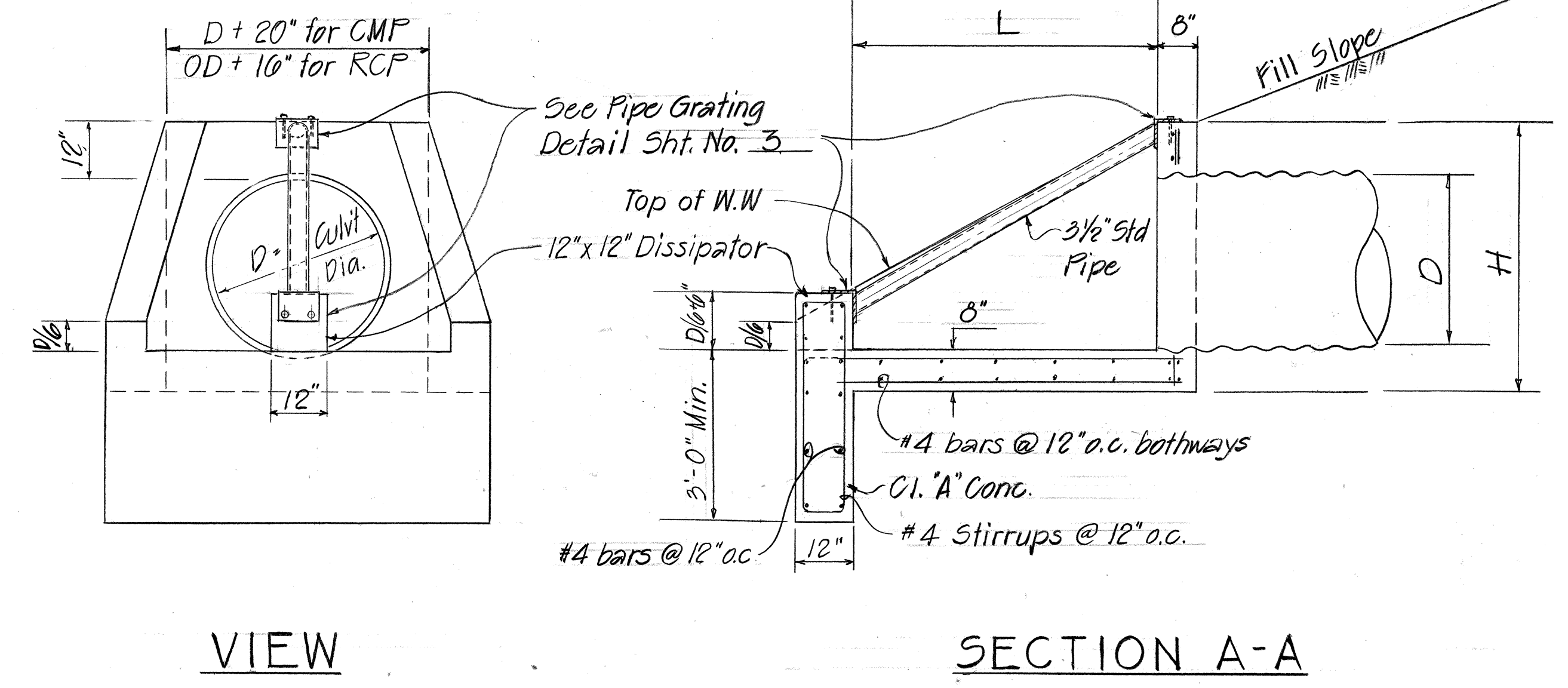
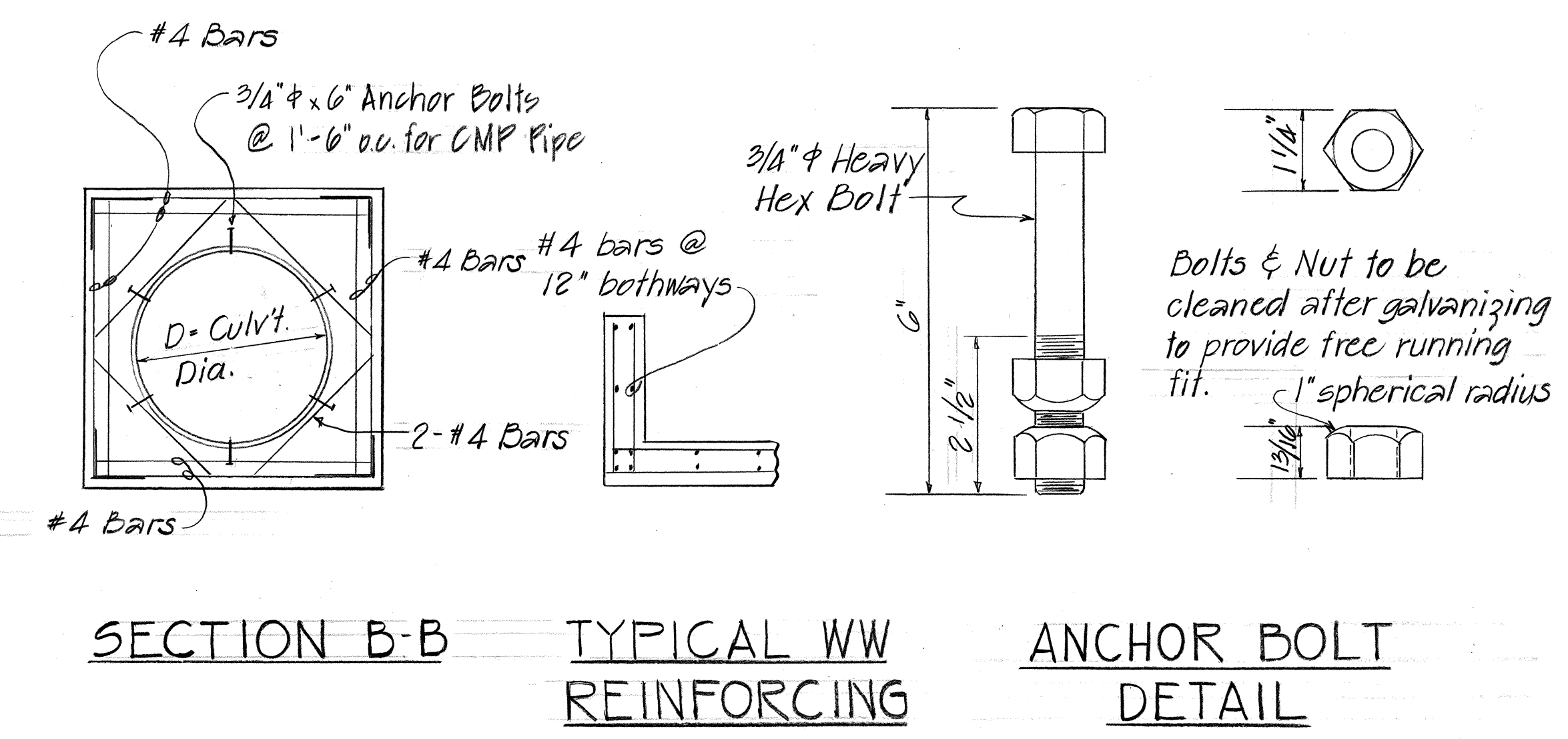
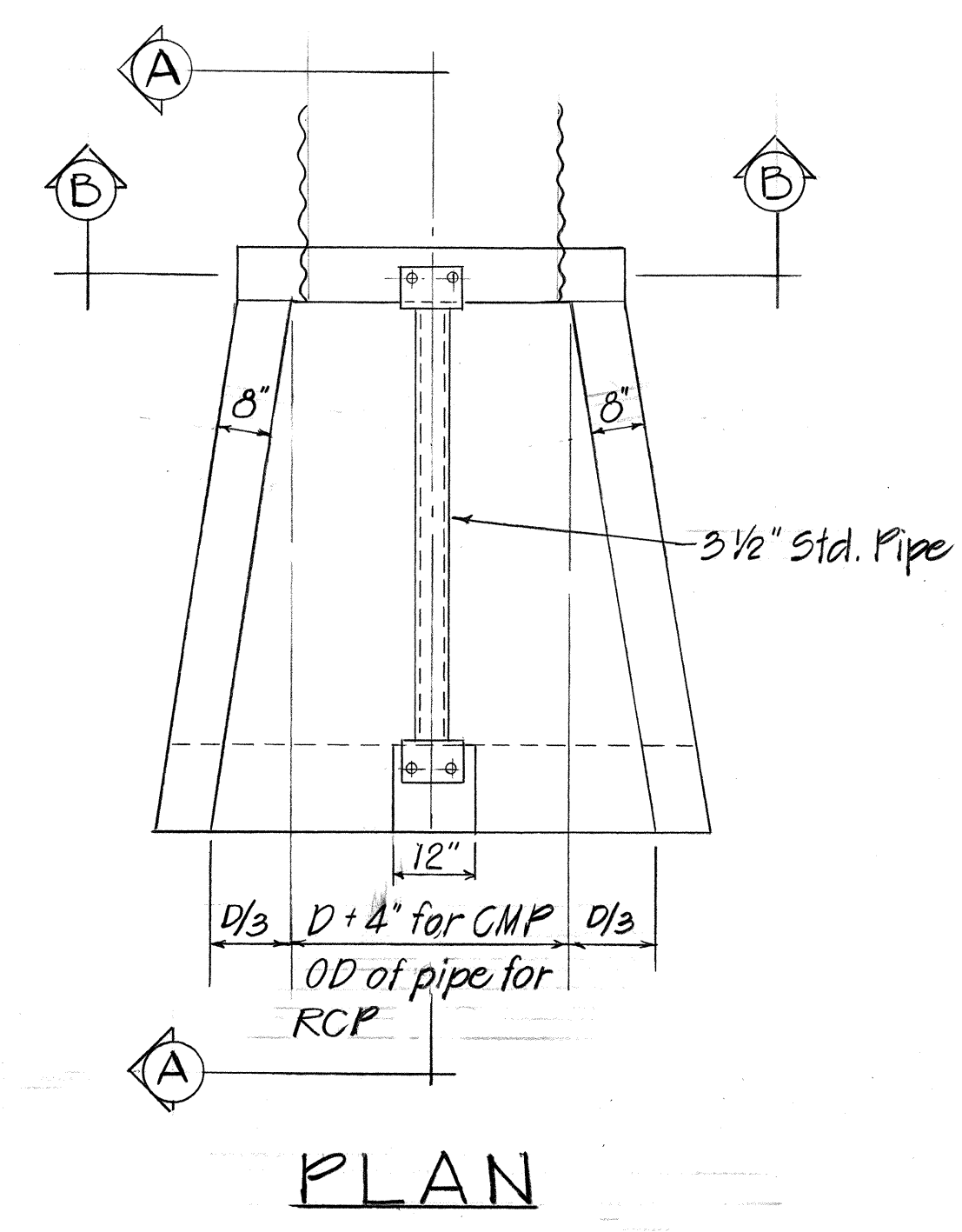
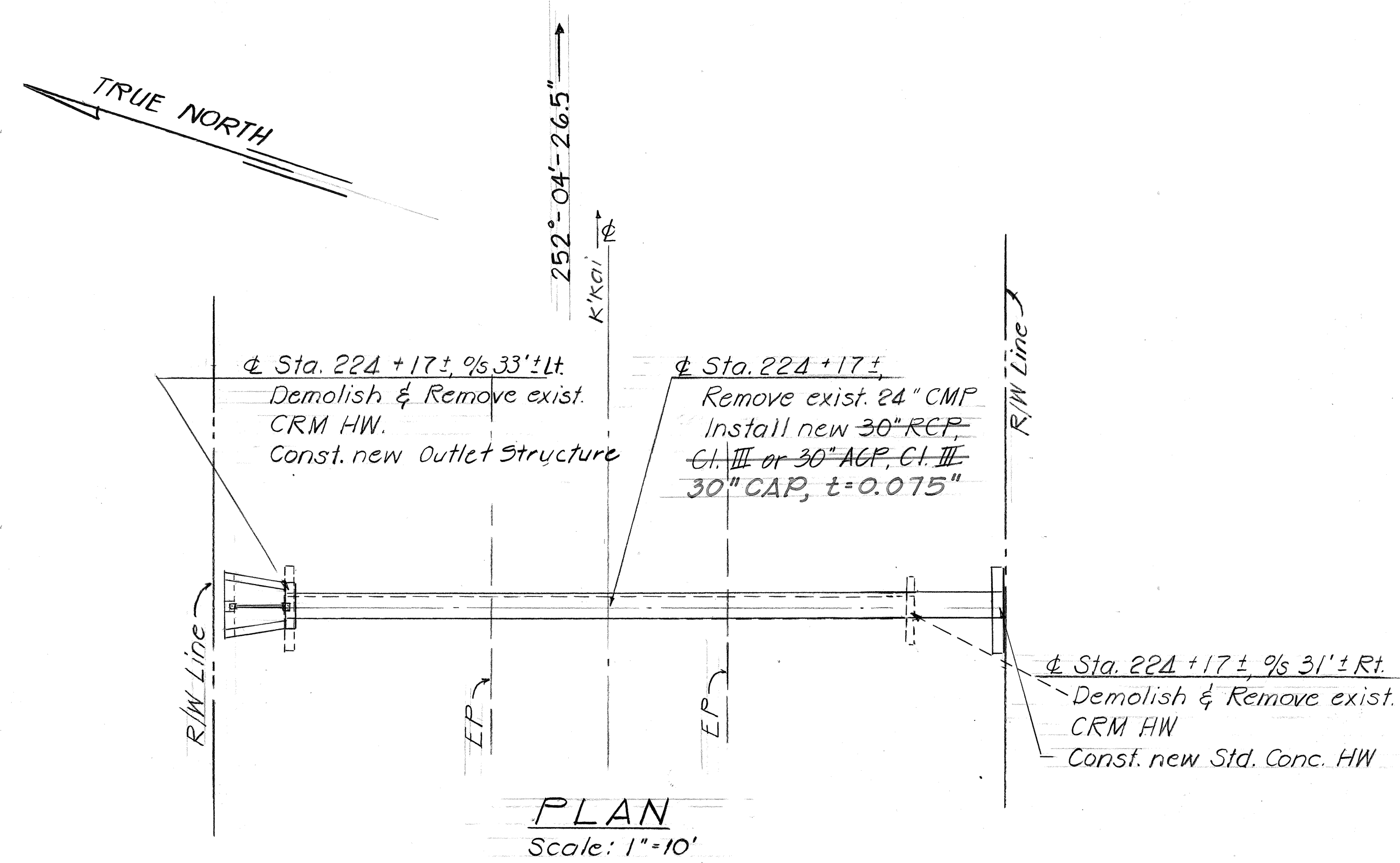
GRouted RUBBLE PAVING DETAILS AT INLET AND OUTLET

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

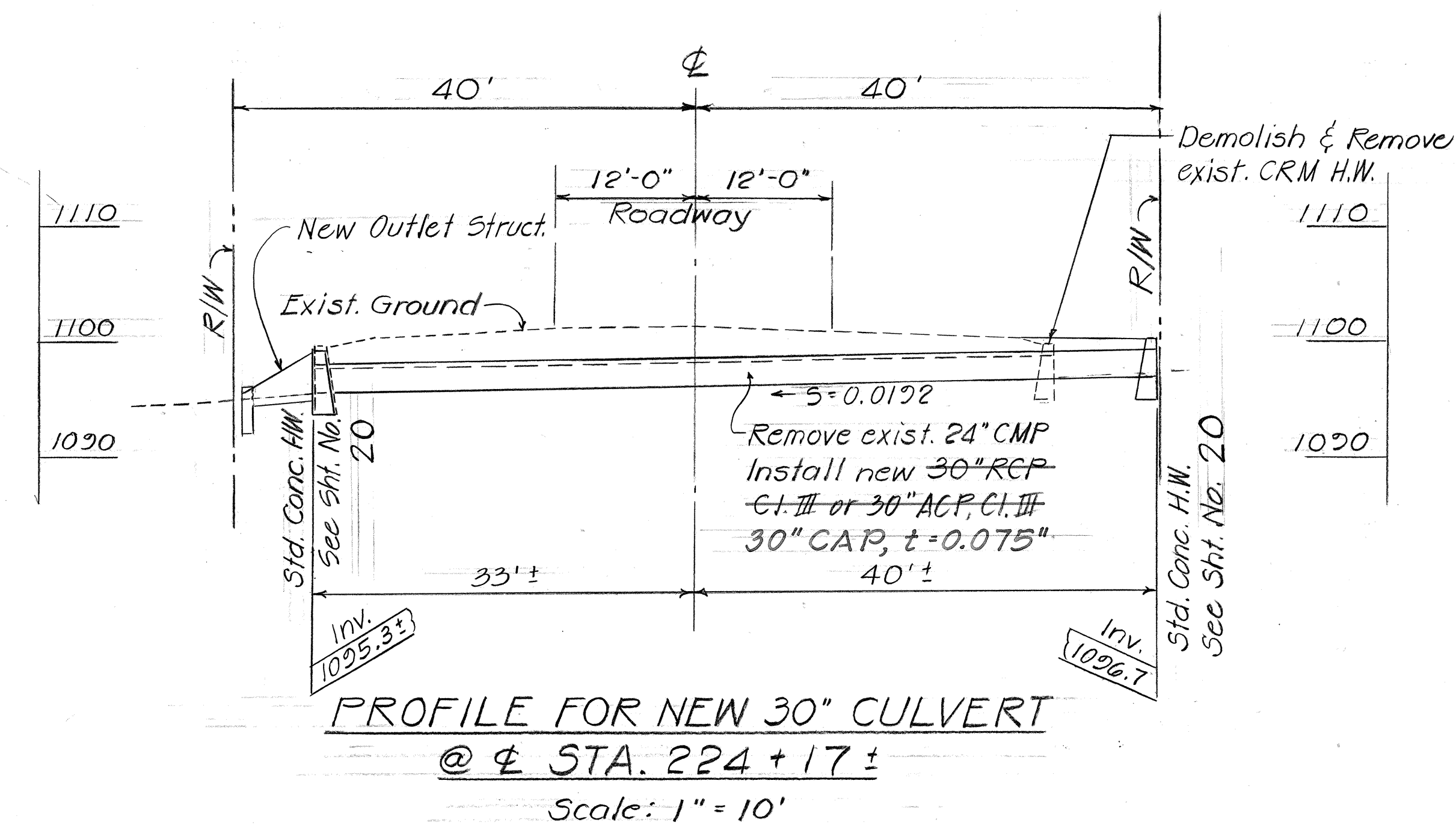
DRAINAGE DETAILS

CULVERT, GRP INLET AND OUTLET
Maunaloa Highway, Replacement of Culverts bet. Maunaloa Village and Kaunakakai - Phase II
PROJ. No. RS-0460(5)
SCALE: AS NOTED DATE: DEC. 1983
SHEET No. 15 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	42	46



D	H	L
30"	4'-2"	5.16'
36"	4'-8"	6.0'

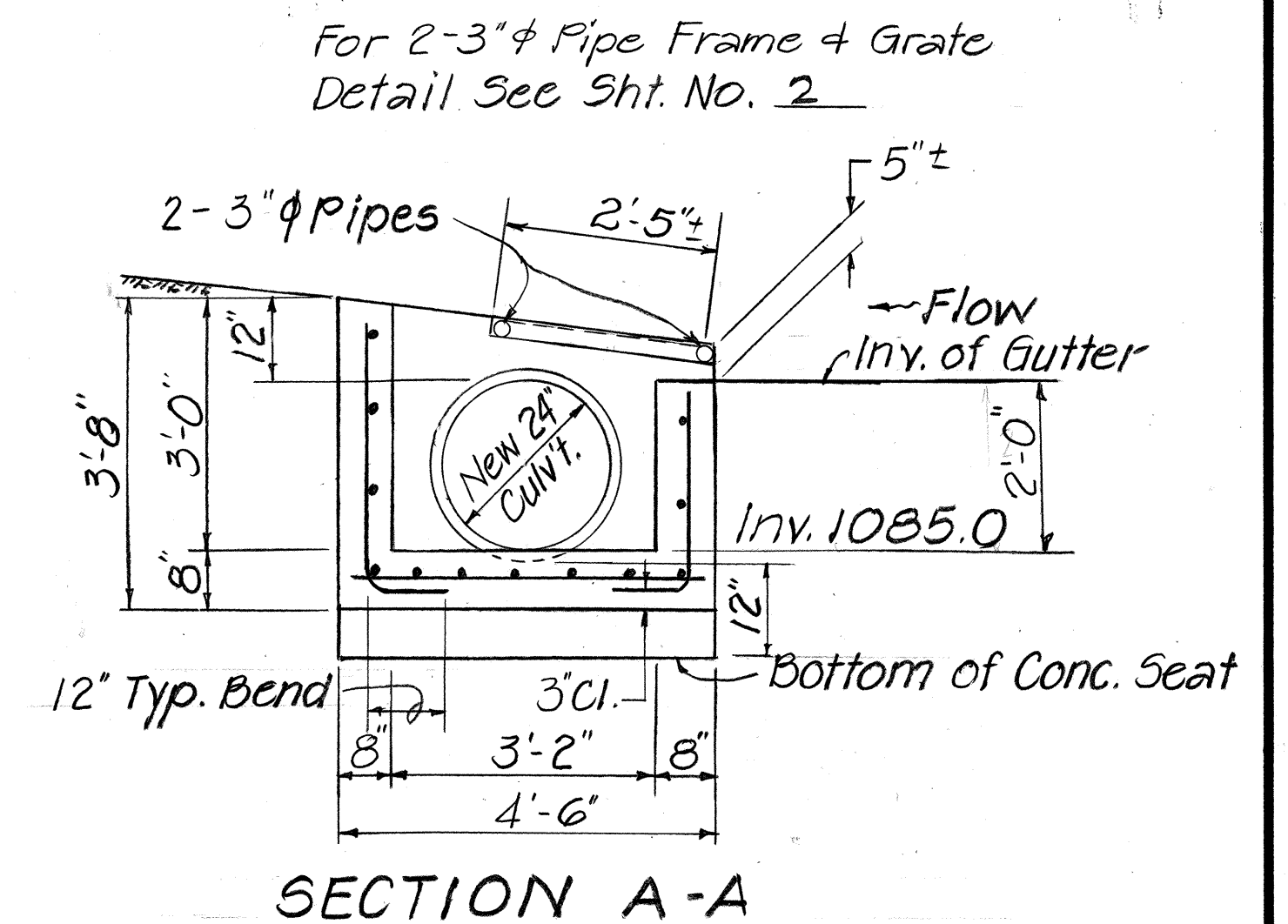
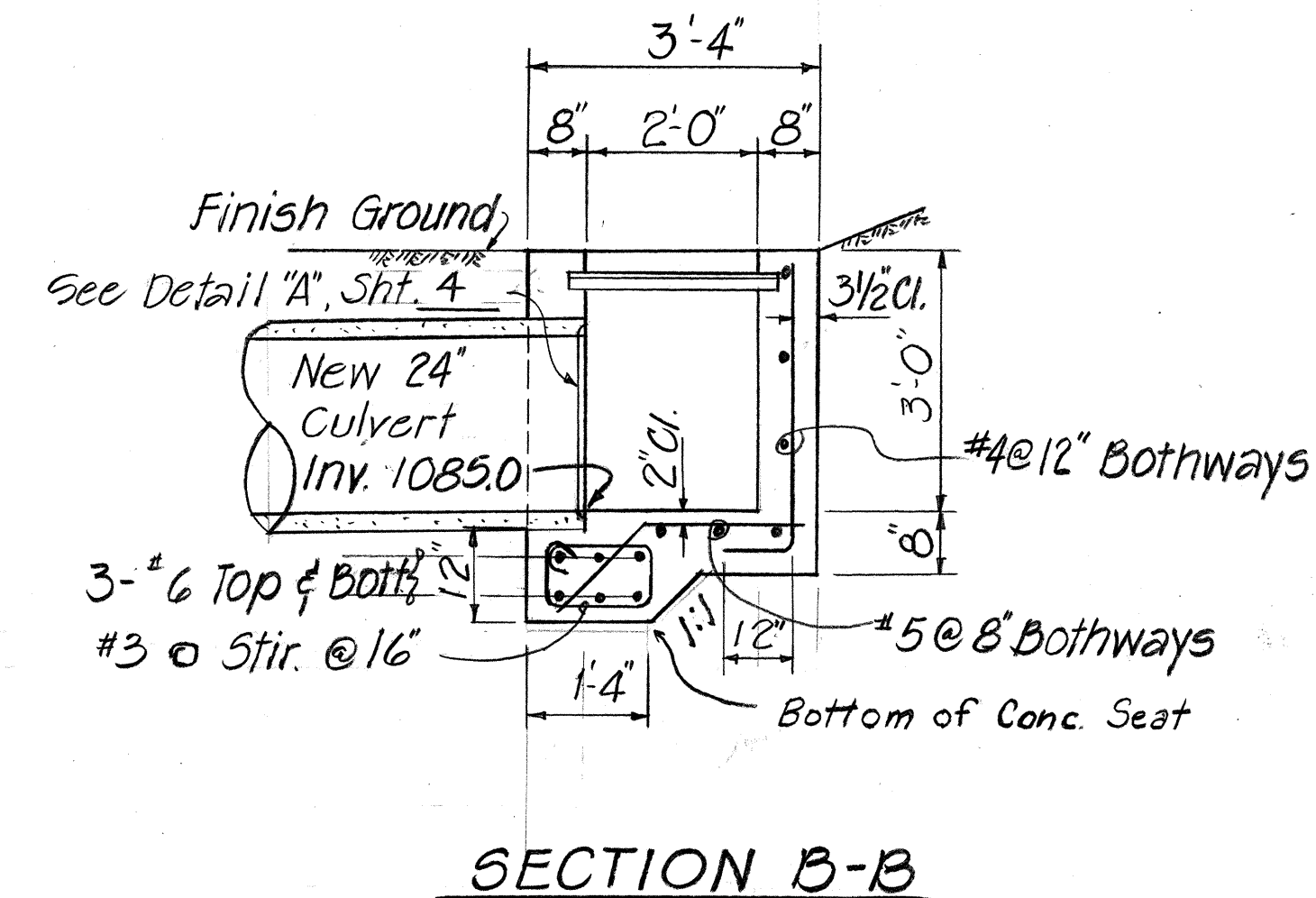
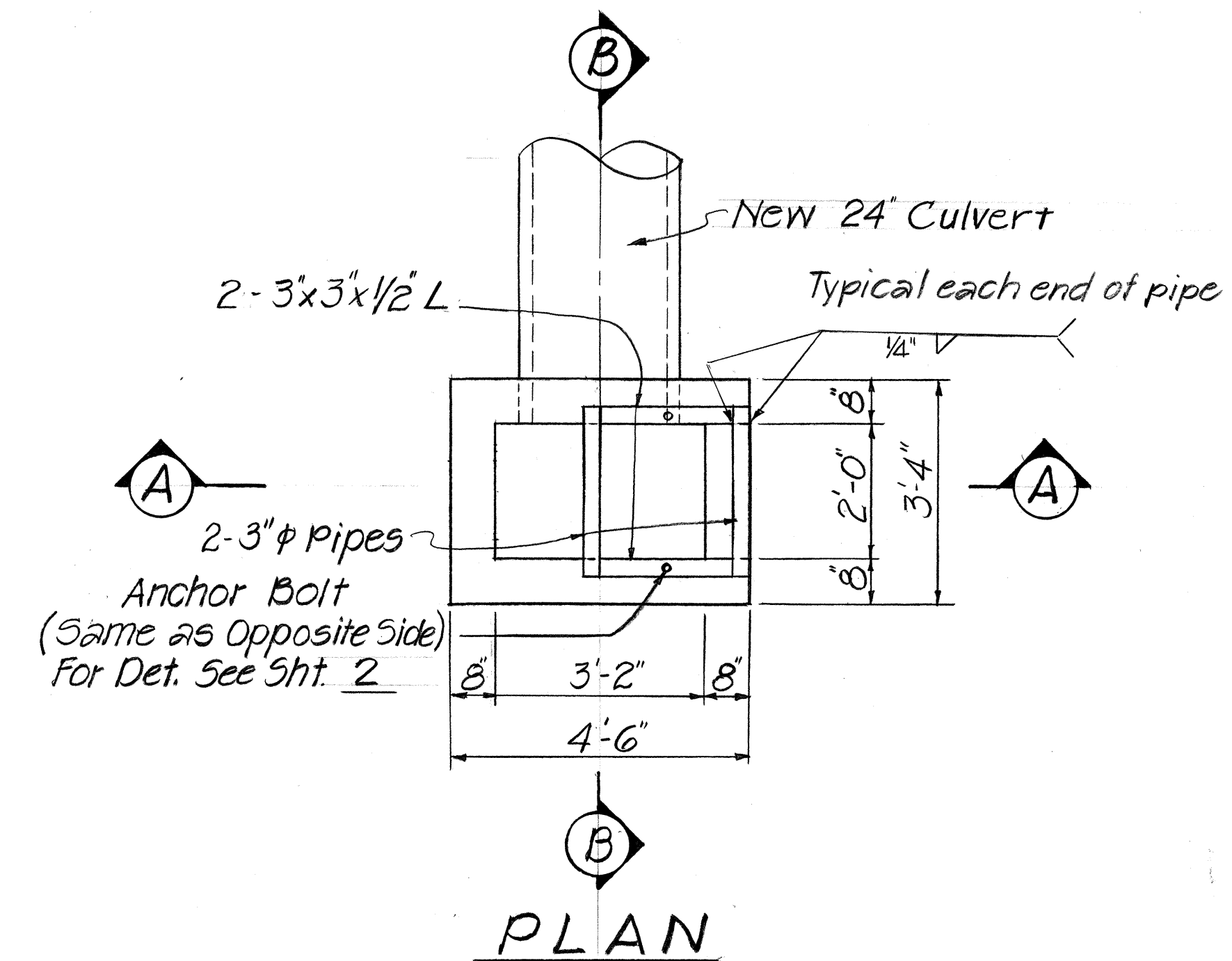
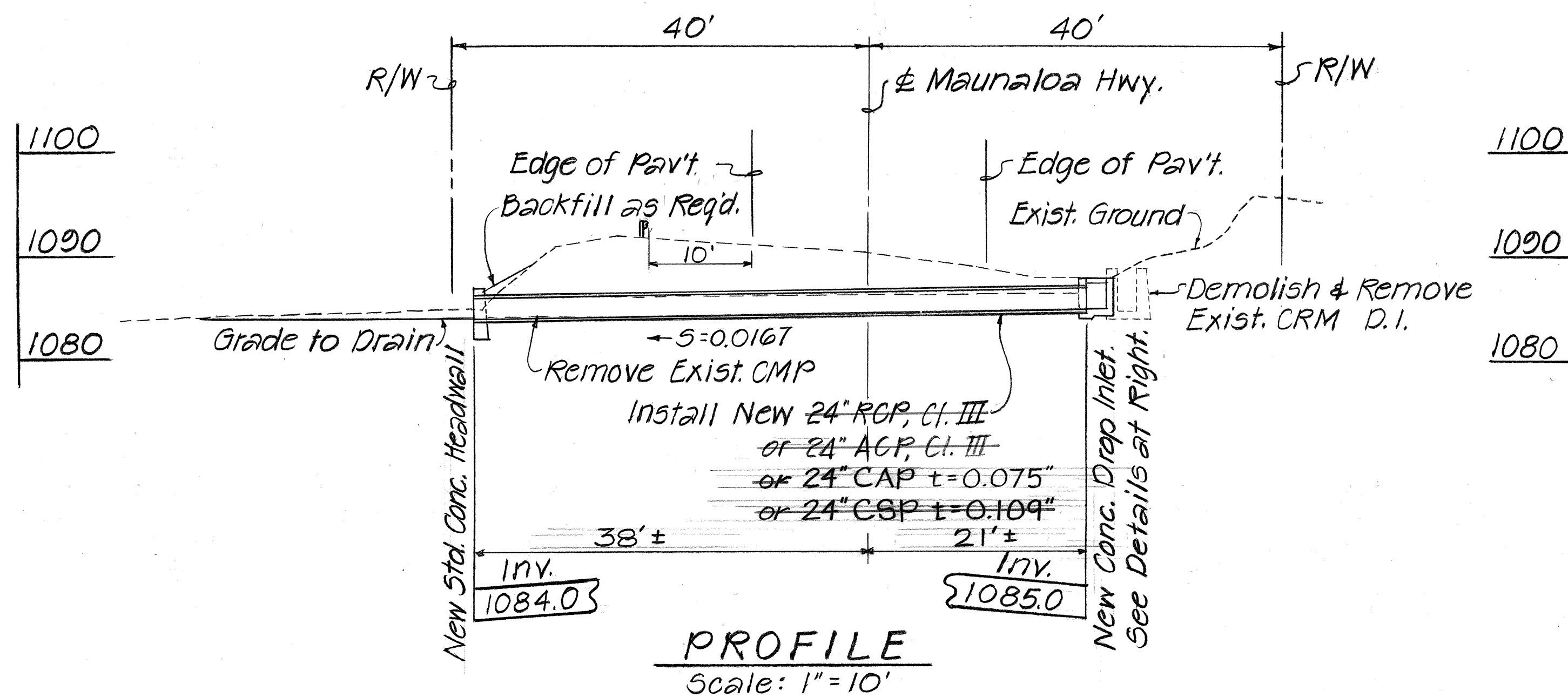
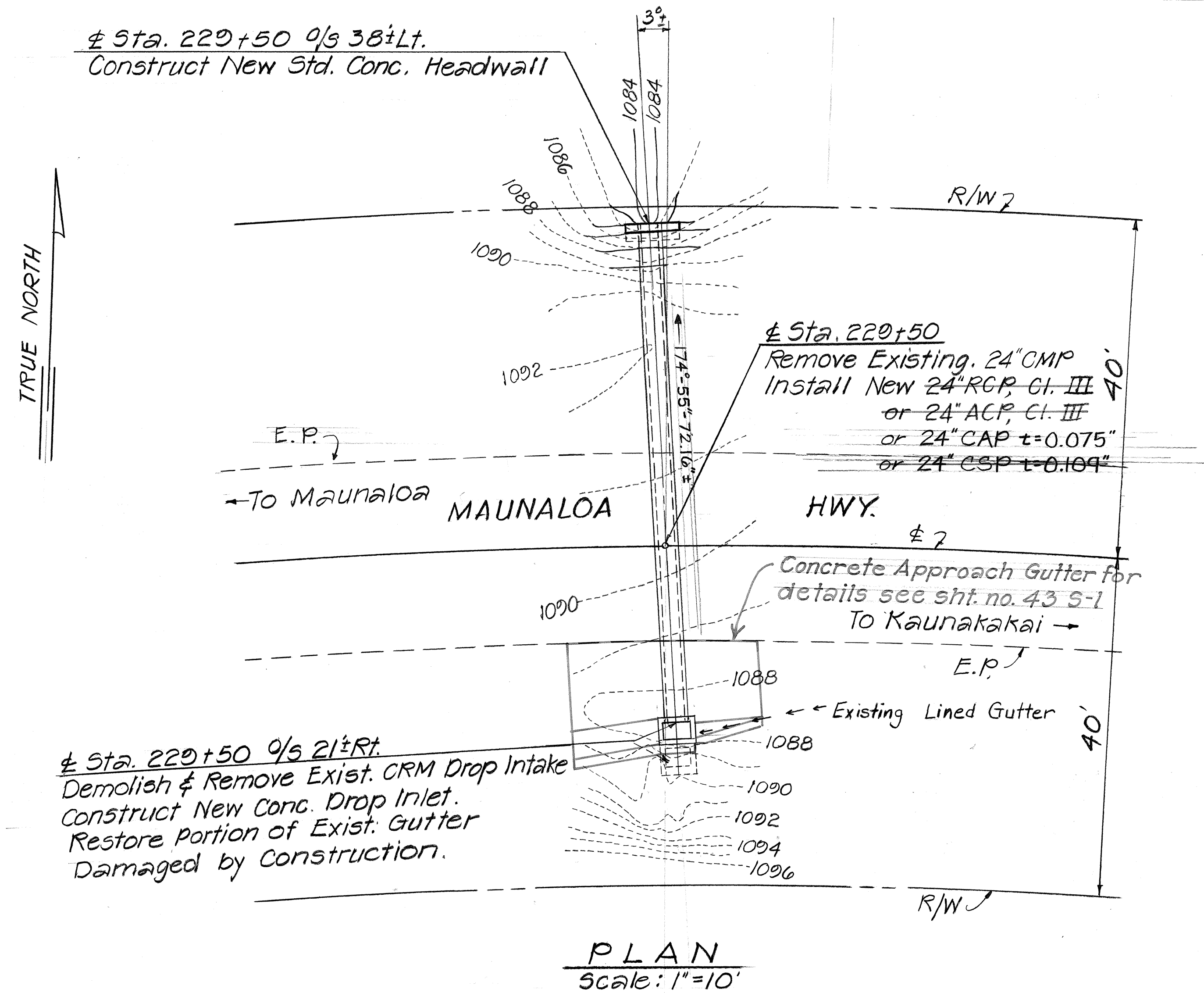


OUTLET STRUCTURE FOR CULVERT - SIZES 30" & 36" DIA.
SCALE: 1/2" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
DRAINAGE DETAILS
30" CULVERT AT STA. 224+17 ± & OUTLET
STRUCTURE FOR CULVERTS - 30" & 36" DIA.
Maunaloa Highway, Replacement of Culverts bef.
Maunaloa Village and Kaunakakai - Phase II
Proj. No. RS-0460(5)
Scale: As Noted Date: Nov. 1983
SHEET No. 16 OF 20 SHEETS

DETAILS OF 30 INCH CULVERT AT STA. 224+17 ±

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	43	46



DETAILS OF CONC. DROP INLET
Scale: 1/2"=1'-0"

DETAILS OF 24" CULVERT @ ± STA. 229+50

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS

CULVERTS, CONC. HEADWALL & DROP INLET

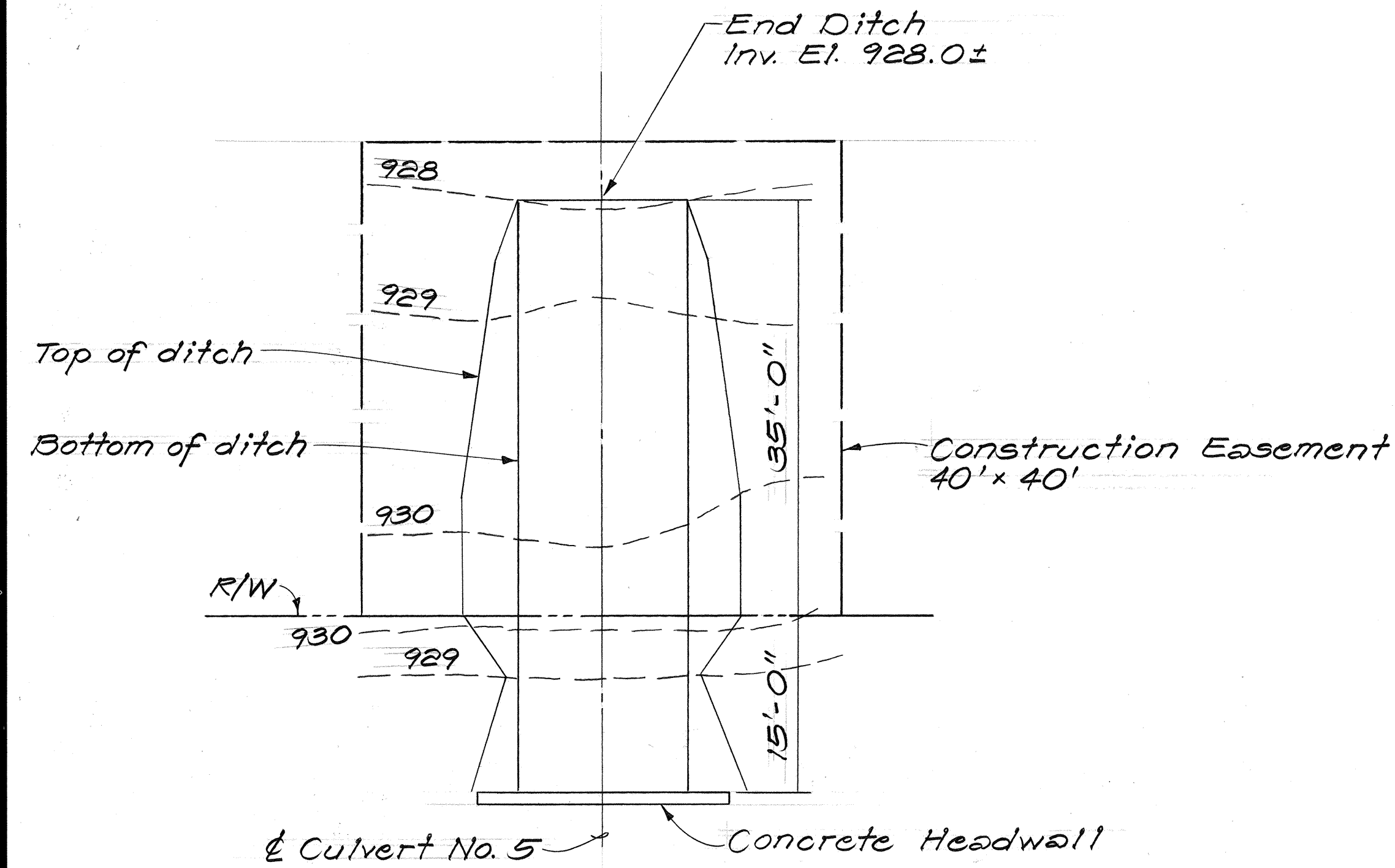
Maunaloa Hwy., Replacement of Culverts bet. Maunaloa Village and Kaunakakai-Phase II

PROJ. NO. RS-0460 (5)

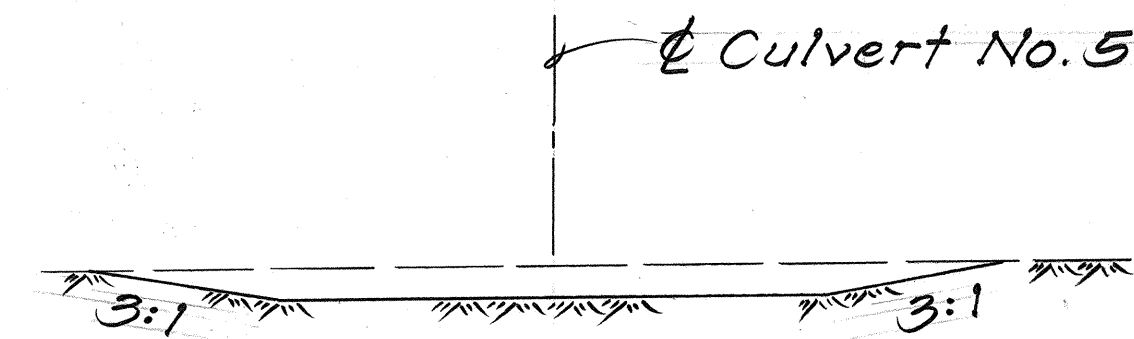
SCALE: AS NOTED DATE: NOV. 1983

SHEET No. 17 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	43 S-1	46

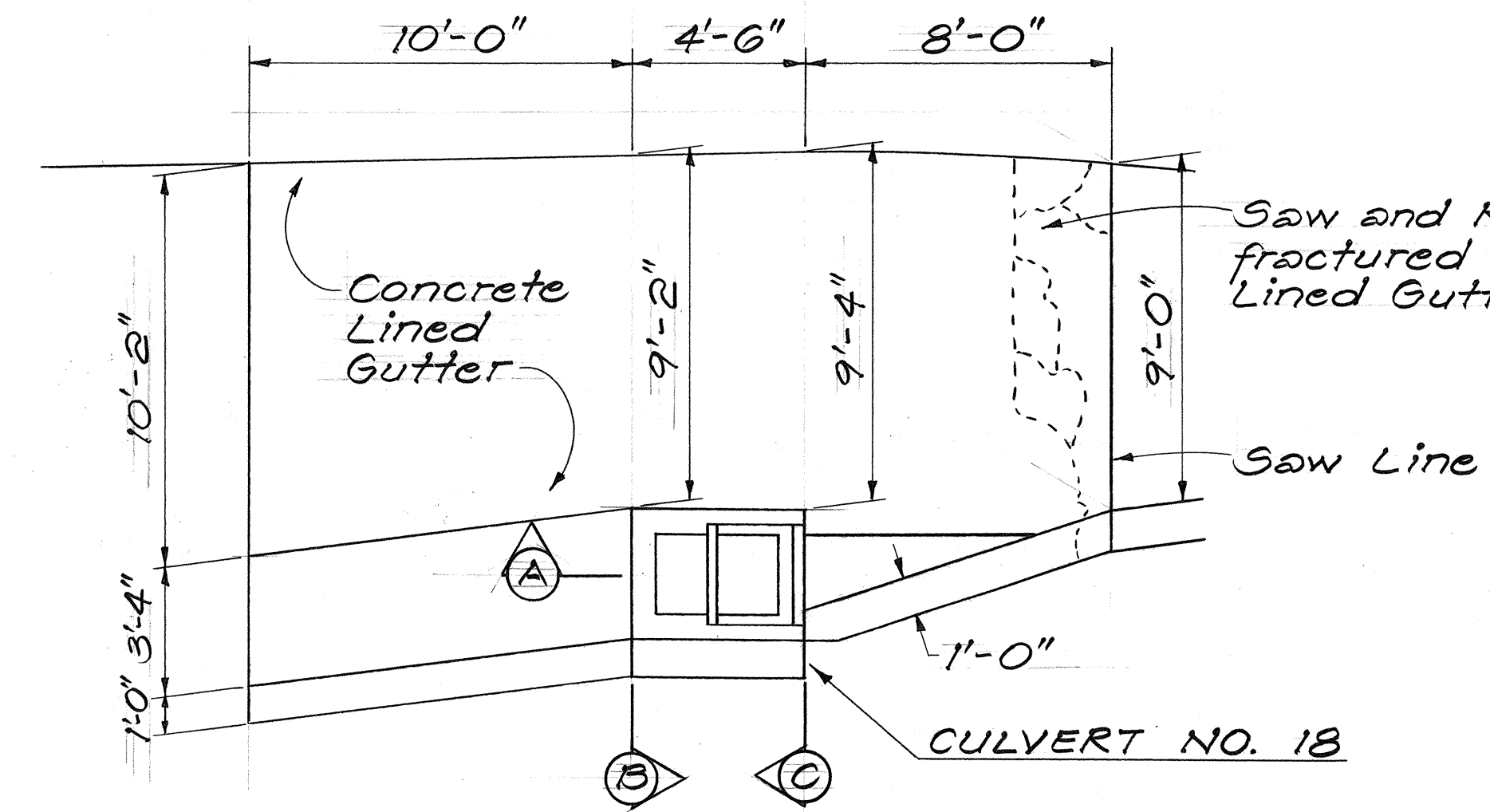


PLAN
Scale: 1"=10'-0"

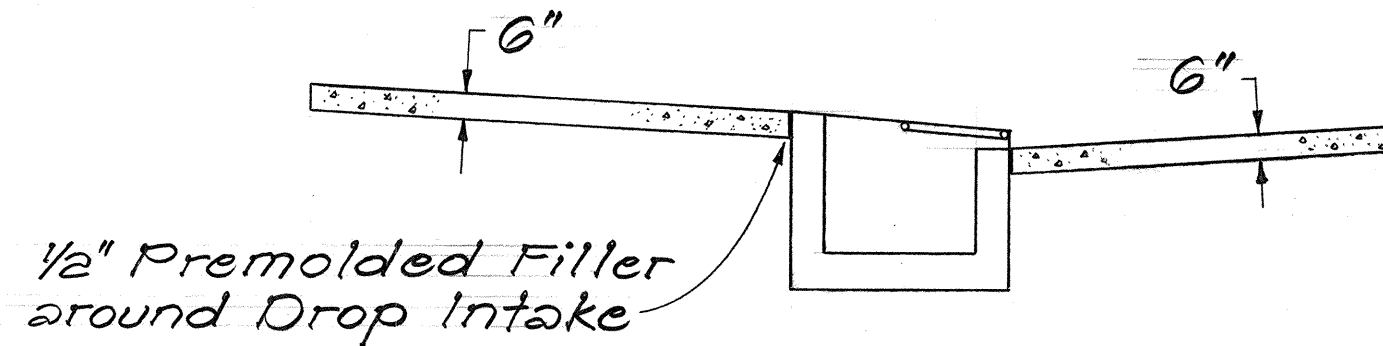


TYPICAL DITCH SECTION
Scale: 1"=5'-0"

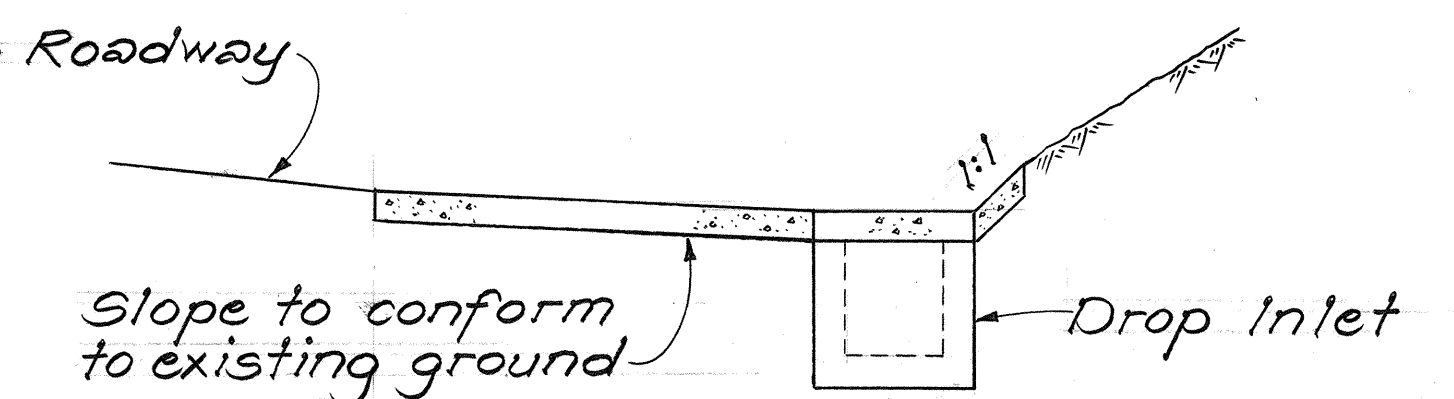
DETAIL OF OUTLET DITCH
AT STA. 39+00 LT.



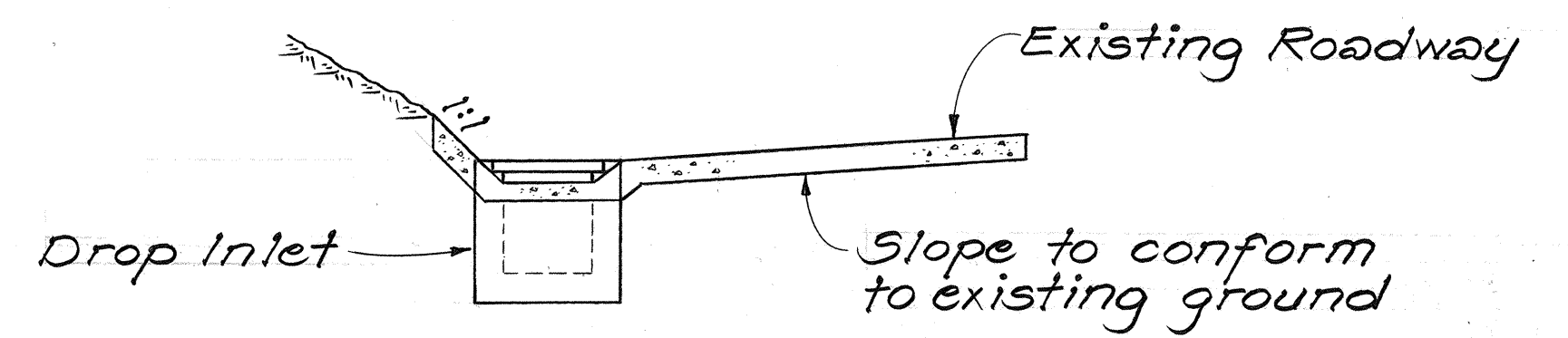
PLAN
Scale: 1/4"=1'-0"



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



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



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

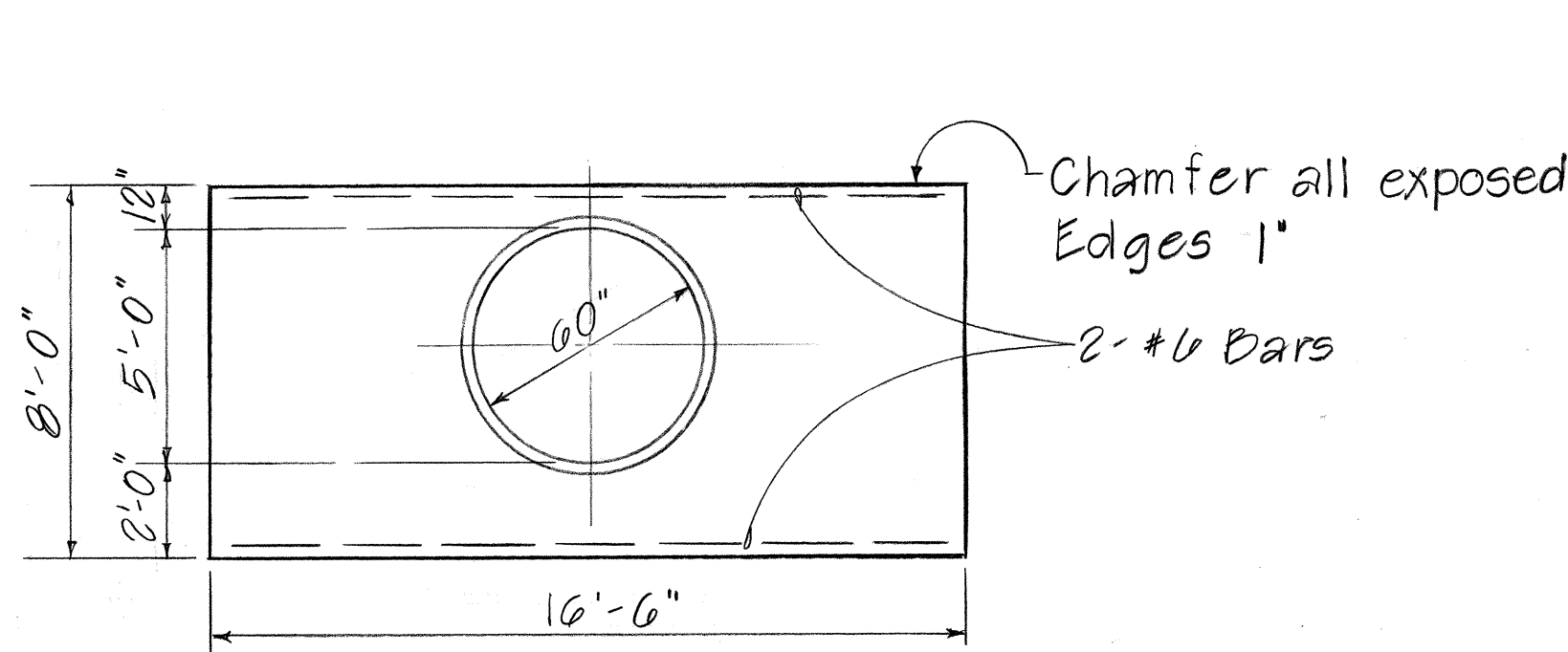
DETAIL OF CONCRETE APPROACH GUTTER AT STA. 229+50 RT.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

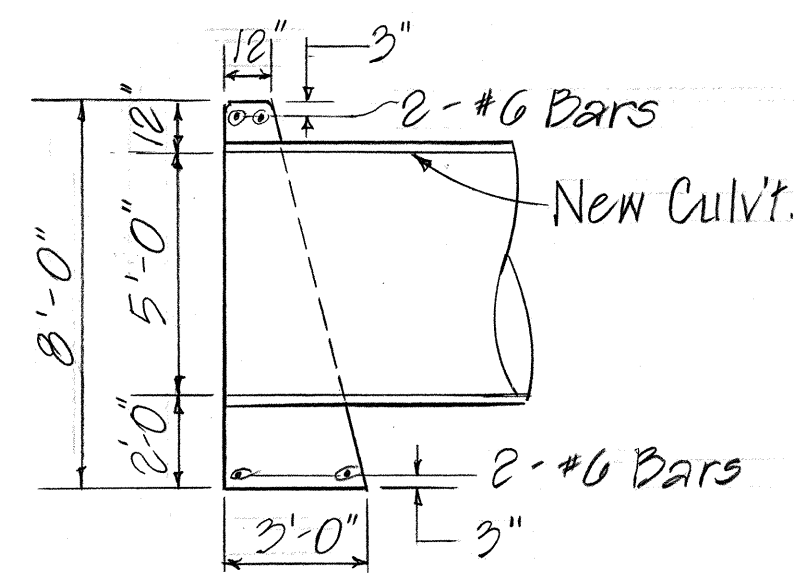
DRAINAGE DETAILS

Maunaloa Highway Replacement of Culverts bet
Maunaloa Village and Kaunakakai - Phase II
PROJ. No. RS-0460(5)
SCALE: AS NOTED DATE: FEB. 1986
SHEET No. 17A OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	44	46

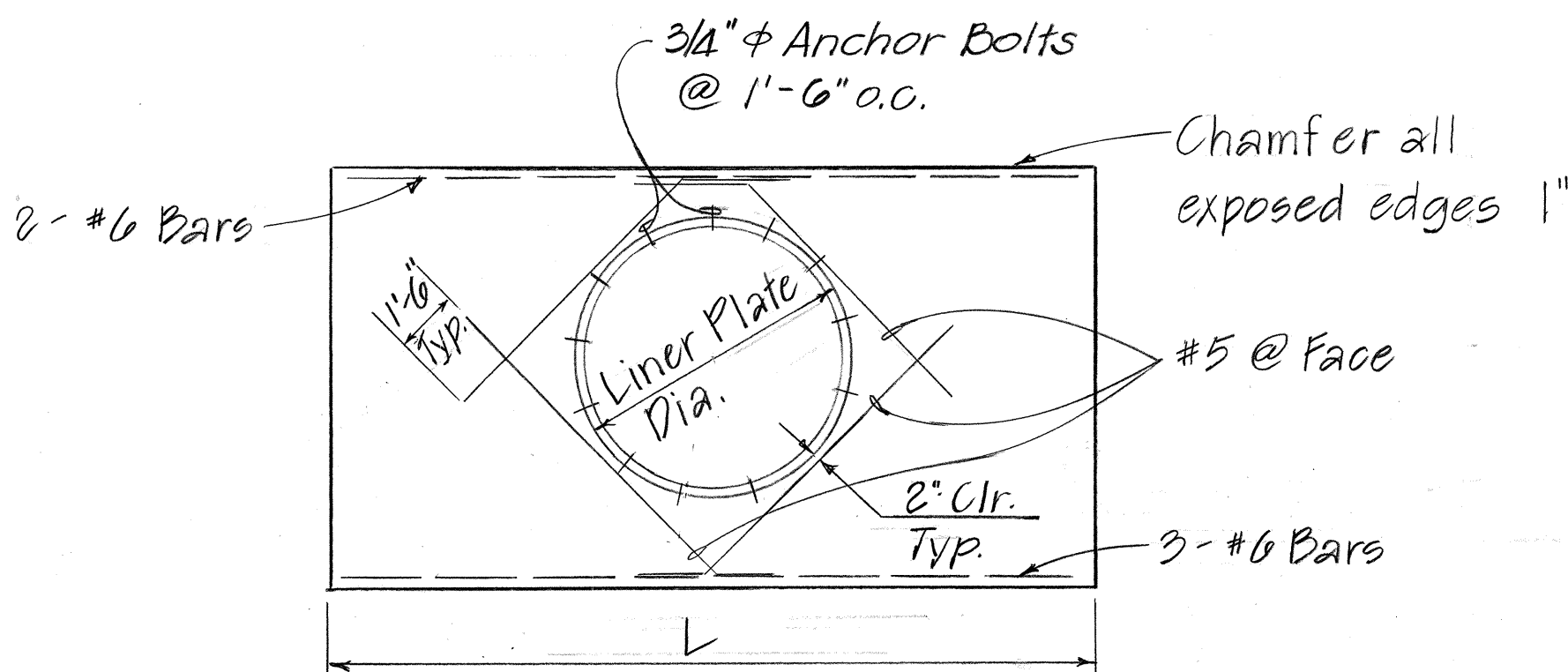


ELEVATION
Scale: 1/4" = 1'-0"

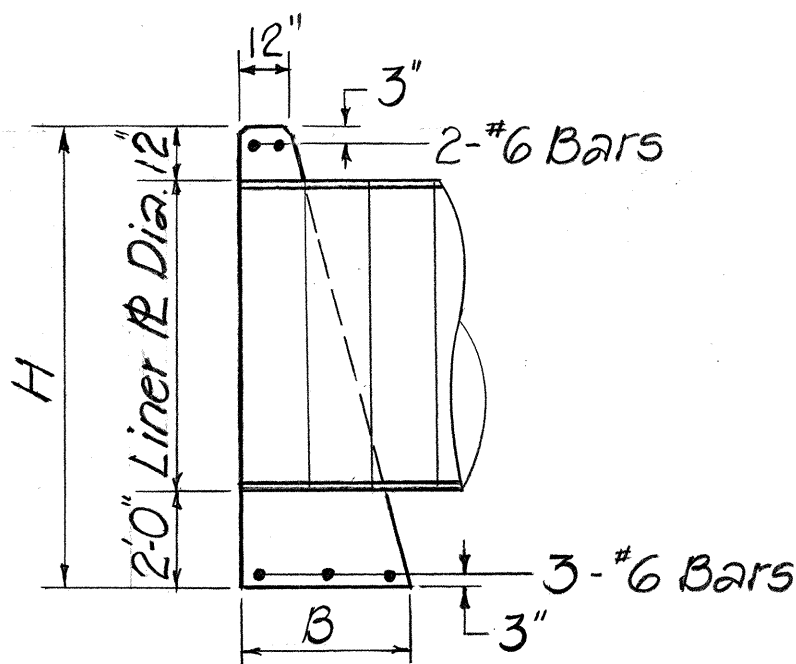


SECTION
Scale: 1/4" = 1'-0"

- Notes:
- Concrete shall be Cl. "A"
 - For grooved end detail @ inlet, see Detail "A" on sheet 4



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



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

Station	Culvert Size	Remarks
41+42	60"	
72+77	60"	Grooved end of pipe @ inlet
151+25	60"	Grooved end of pipe @ inlet
186+50	60"	

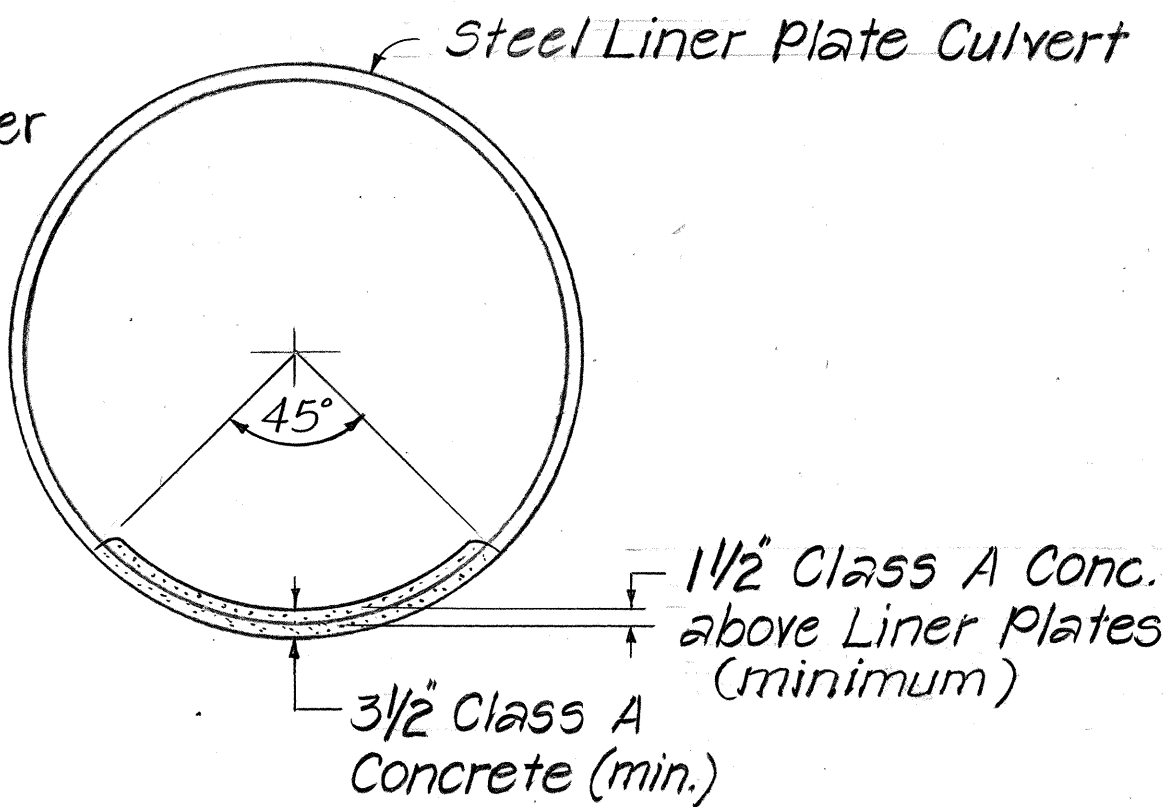
DETAILS FOR TYPE "A" CONCRETE HEADWALL

DATA FOR TYPE "B" CONCRETE HEADWALL				
Sta.	Liner Pl. Size	B	L	H
116+24	96"	4'-0"	24'-6"	11'-0"
161+30.76	78"	3'-6"	20'-0"	9'-6"
213+15	72"	3'-0"	20'-0"	9'-0"

DETAILS FOR TYPE "B" CONC. HEADWALL

NOTES:

- The bottom circumferential quarter of liner plate culvert shall be lined with 3/2" of class A concrete as directed.
- A minimum clear distance 1 1/2" cover of class A concrete shall be constructed above the liner plate at the culvert invert.
- This work shall not be paid for separately but shall be considered incidental to liner plates.

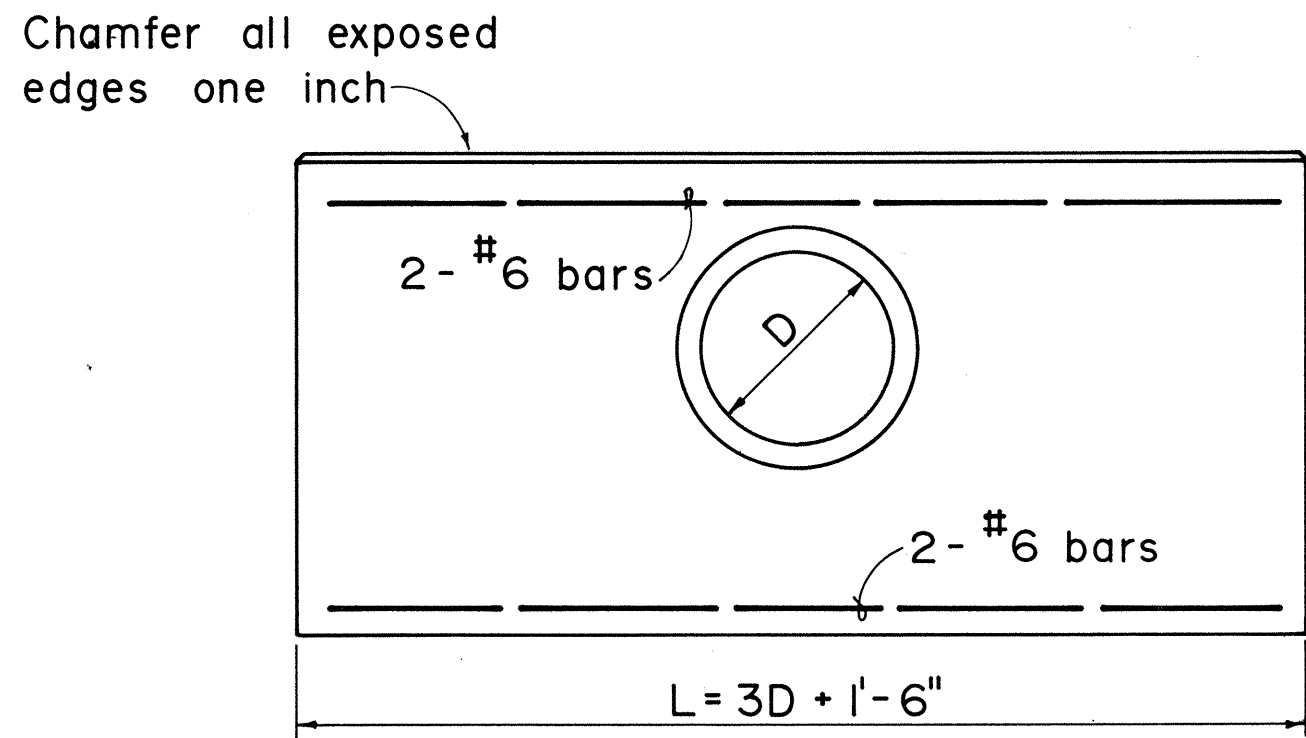


TYPICAL PAVED INVERT DETAIL FOR LINER PLATE CULVERTS @ STA. 116+24, STA. 161+30.76 & STA. 213+15
Not to Scale

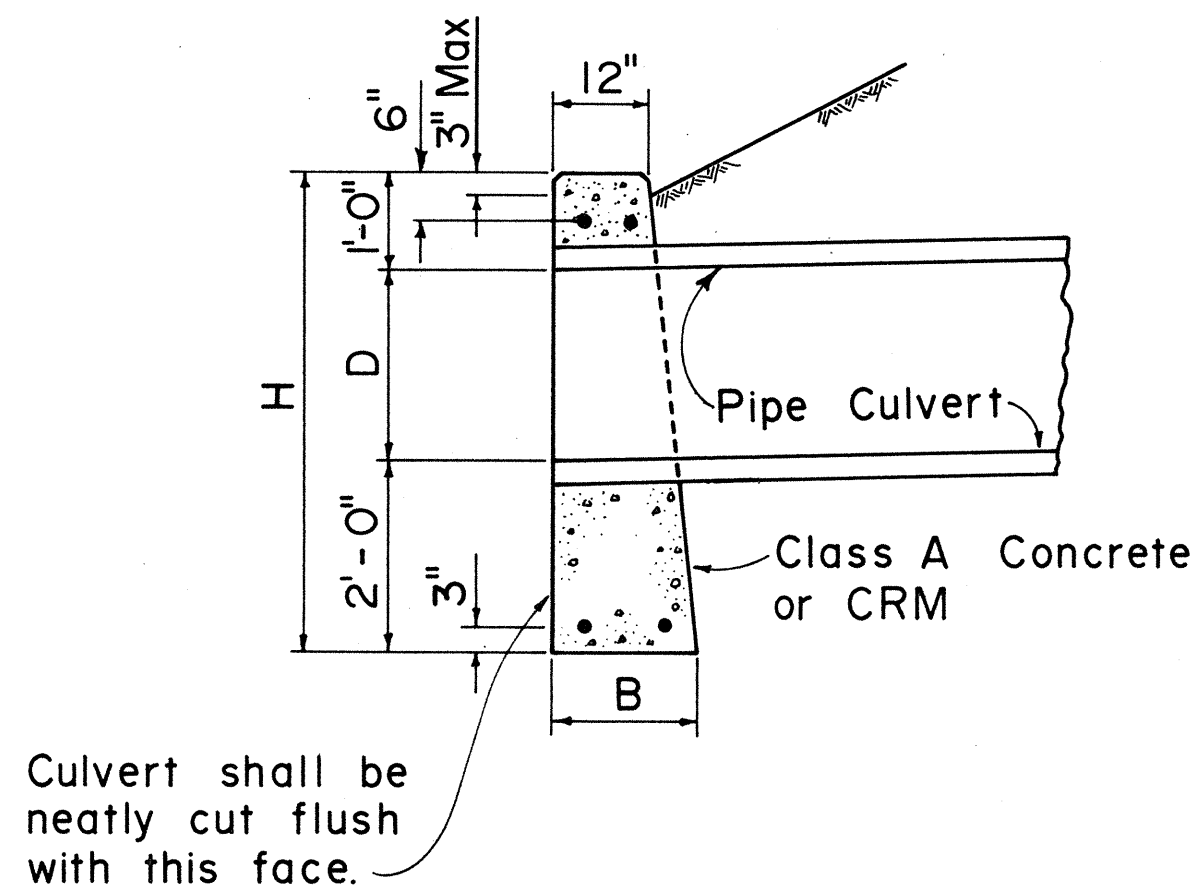
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS
HEADWALL, CONC. COLLAR & PAVED INVERT
Maunaloa Hwy., Replacement of Culverts bet. Maunaloa Village and Kaunakakai-Phase II
PROJ. NO. RS-0460 (5)
SCALE: AS NOTED DATE: DEC. 1983
SHEET NO. 18 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	R5-0460(5)	1985	40	40



ELEVATION



SECTION

DATA FOR CONC. HDWL.			
D	B	L	H
18"	1'-6"	6'-0"	4'-6"
24"	1'-6"	7'-6"	5'-0"
30"	2'-0"	9'-0"	5'-6"
36"	2'-0"	10'-6"	6'-0"
42"	2'-6"	12'-0"	6'-6"
48"	2'-6"	13'-6"	7'-0"

DATA FOR CRM HDWL.			
D	B	L	H
18"	1'-9"	6'-0"	4'-6"
24"	2'-0"	7'-6"	5'-0"
30"	2'-3"	9'-0"	5'-6"
36"	2'-6"	10'-6"	6'-0"

CONCRETE OR CRM HEADWALL

APPROVAL RECOMMENDED:
T. Takano 6-19-79
HYDRAULIC DESIGN ENGINEER DATE

APPROVED:
Harbert Zaleski 6-22-79
ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 10 approved 12-17-69	H.T.	6/22/69
2.	Change Class of concrete	H.T.	12/4/80

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CONCRETE OR CEMENT
RUBBLE MASONRY HEADWALLS

Not To Scale
Date: June 1979

SHEET No. 20 OF 20 SHEETS DH 10