

DRAINAGE SUMMARY

PROJECT : KAMEHAMEHA HIGHWAY IMPROVEMENT

PROJECT NO. : (LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE)
F-083-1(10)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	88	160

ITEM NO.		206	503	503	602	603	603	603	603	603	604	604	604	604	604
		2020	0020	2020	1020	0010	1002	1006	7200	7320	1421	0370	2150	2160	2170
UNIT USED		CU.YD.	CU.YD.	CU.YD.	LB.	CU.YD.	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	EACH	LIN.FT.	EACH	EACH	EACH
TYPE OF STRUCTURE	STATION (FROM - TO)	STRUCTURE EXCAVATION FOR DRAINAGE SYSTEM	CLASS "A" CONCRETE FOR DRAINAGE SYSTEM	CLASS "B" CONCRETE FOR DRAINAGE SYSTEM	REINFORCING STEEL FOR DRAINAGE SYSTEM	BED COURSE MATERIAL FOR CULVERT	12-INCH REINFORCED CONCRETE PIPE, CLASS III	18-INCH RCP CLASS III	24-INCH CMP SHEET THICKNESS 0.079 INCH, OR 24-INCH RCP CLASS III, OR 24-INCH ACP CLASS III	30-INCH CMP SHEET THICKNESS 0.079 INCH, OR 30-INCH RCP CLASS III, OR 30-INCH ACP CLASS III	EXISTING CATCH BASIN OR CDI TO BE COMPLETELY DEMOLISHED	PRECAST CONCRETE STORM DRAIN MANHOLE	TYPE A CAST IRON FRAME AND COVER	TYPE B CAST IRON FRAME AND COVER	TYPE P CAST IRON FRAME AND COVER
DRAIN LINE	2+03 - 2+32	42				5.4			48						
DRAIN LINE	2+32 - 2+37	7		.3	4	0.9		12							
TYPE "B" C.B.	2+32	22	6		108								1		
DRAIN LINE	3+52 - 4+15	90				6.5			64						
TYPE "C" C.B.	3+65	25	7		108								1		
TYPE "B" C.B.	4+15	26	7.3		108								1		
DRAIN LINE	6+14 - 6+15	115				7.4			84						
TYPE "C" C.D.I.	6+15	5.6		3.4	12										1
DRAIN LINE	7+30 - 7+25	71				5.2			52						
DRAIN LINE	7+25 - 8+70	182				14				132					
TYPE "C" C.D.I.	7+30	5		3	11										1
TYPE "D" C.B.	7+30	18	5.4		77								1		
TYPE "A" C.B.	7+25	20	8.4		145								1		
EXISTING C.D.I.	8+13										1				
MODIFY EXISTING C.D.I.	8+68			2.2	124										
DRAIN LINE	8+70 - 10+40	151				15			168						
TYPE "D" C.B.	8+70	19	5.6		77								1		
DRAIN LINE	8+96					1.0	28								
TYPE "D" C.B.	10+40	17	5		77								1		
DRAIN LINE	11+32 - 14+40	45				26			296						
TYPE "B" C.B.	12+00	23	6.5		108								1		
TYPE "B" C.B.	14+40	26	7.3		108								1		
MODIFY EXISTING C.D.I.	11+32	1.7	0.5		52										
MODIFY TYPE "D" C.B.	11+96	26	13		380								1		
MODIFY EXISTING C.D.I.	16+02			0.9	106										
CONSTRUCT NEW CONC. TOP SLAB OVER EXISTING C.B.	16+06		0.5		83										

ITEM NO.		206	503	503	602	603	603	603	603	603	604	604	604	604	604
		2020	0020	2020	1020	0010	1002	1006	7200	7320	1421	0370	2150	2160	2170
UNIT USED		CU.YD.	CU.YD.	CU.YD.	LB.	CU.YD.	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	EACH	LIN.FT.	EACH	EACH	EACH
TYPE OF STRUCTURE	STATION (FROM - TO)	STRUCTURE EXCAVATION FOR DRAINAGE SYSTEM	CLASS "A" CONCRETE FOR DRAINAGE SYSTEM	CLASS "B" CONCRETE FOR DRAINAGE SYSTEM	REINFORCING STEEL FOR DRAINAGE SYSTEM	BED COURSE MATERIAL FOR CULVERT	12-INCH REINFORCED CONCRETE PIPE, CLASS III	18-INCH RCP CLASS III	24-INCH CMP SHEET THICKNESS 0.079 INCH, OR 24-INCH RCP CLASS III, OR 24-INCH ACP CLASS III	30-INCH CMP SHEET THICKNESS 0.079 INCH, OR 30-INCH RCP CLASS III, OR 30-INCH ACP CLASS III	EXISTING CATCH BASIN OR CDI TO BE COMPLETELY DEMOLISHED	PRECAST CONCRETE STORM DRAIN MANHOLE	TYPE A CAST IRON FRAME AND COVER	TYPE B CAST IRON FRAME AND COVER	TYPE P CAST IRON FRAME AND COVER
DEMOLISH EXISTING C.B.	16+85										1				
DRAIN LINE	16+85 - 16+85	31				2.6			26						
TYPE "C" C.B.	16+85	24	6.7		108								1		
TYPE "B" C.B.	16+85	22	6.1		108								1		
DRAIN LINE	19+26 - 19+30	41				4			36						
TYPE "C" C.B.	19+30	23	6.5		108								1		
TYPE "IB" C.B.	19+30	18	4.5		436							1			
DRAIN LINE	21+30 - 21+30	144				4.7			50						
SDMH	21+30	11.5		2.3	102						3				1
TYPE "B" C.B.	21+30	24	6.7		108								1		
DRAIN LINE	23+24 - 24+10	129				9.4			96						
TYPE "C" C.B.	23+40	23	6.5		108								1		
TYPE "B" C.B.	24+10	25	6.9		108								1		
DRAIN LINE	28+02 - 37+00	954				80			904						
TYPE "C" C.B.	28+50	26	7.1		108								1		
TYPE "B" C.B.	28+90	23	6.3		108								1		
EXISTING C.B.	29+15										1				
TYPE "B" C.B.	30+83	27	7.5		108								1		
DRAIN LINE	33+30 - 33+30	42				3			30						
TYPE "D" C.B.	33+30	20	5.8		77								1		
TYPE "B" C.B.	33+30	26	7.3		108								1		
TYPE "B" C.B.	35+94	23	6.3		108								1		
TYPE "B" C.B.	37+00	23	6.3		108								1		
DRAIN LINE	36+05 - 36+51	37				4.3			46						
TYPE "B" C.B.	36+05	20	5.7		108								1		
DRAIN LINE	36+95 - 40+80	283				36.6			404						
TYPE "C" C.B.	37+00	19	5.3		108								1		

S U M M A R Y

PROJECT : KAMEHAMEHA HIGHWAY IMPROVEMENT

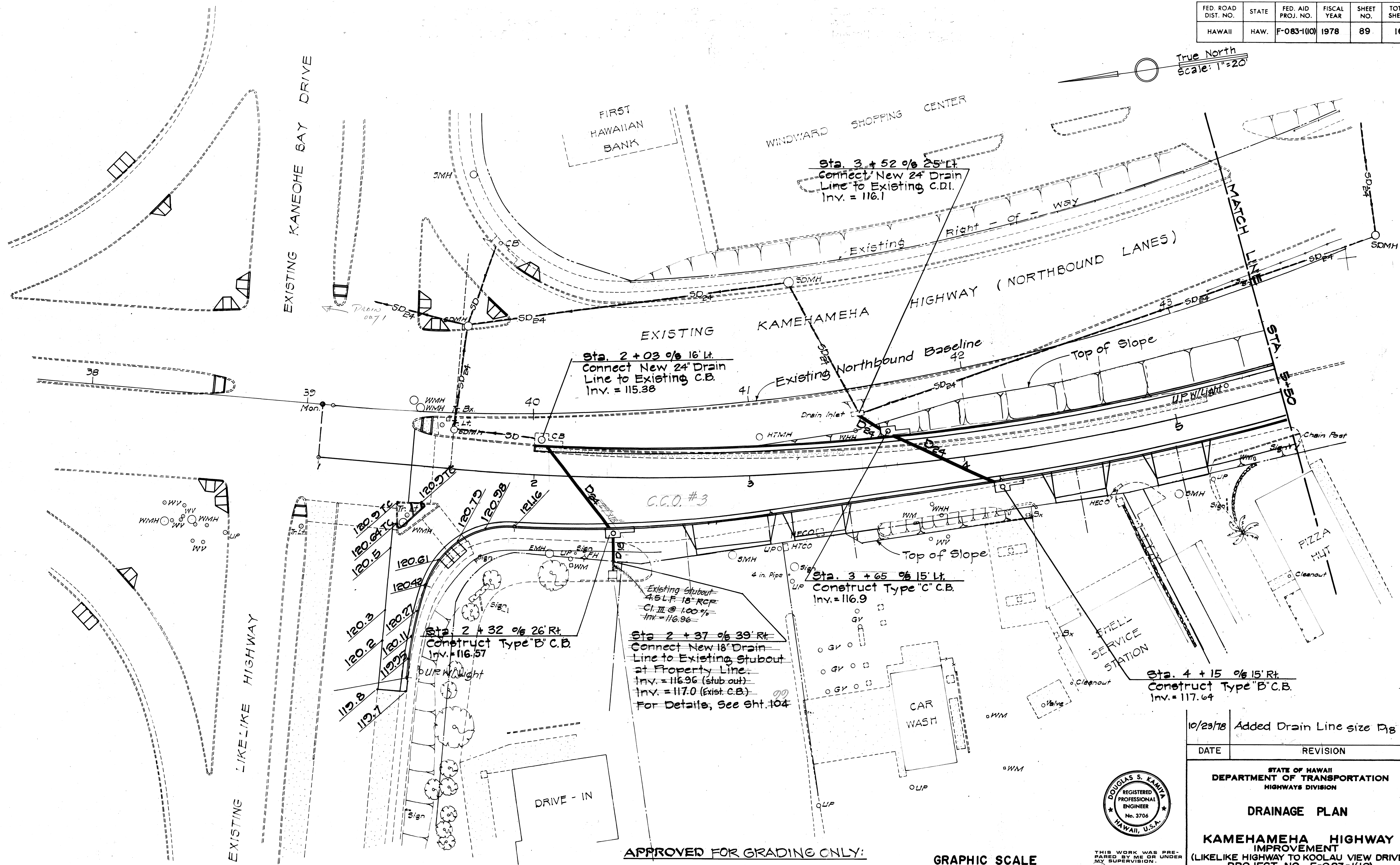
PROJECT NO.: (LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE)
F-083-1(10)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	87	160

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	89	160

True North
Scale: 1"=20'



APPROVED FOR GRADING ONLY:

GRAPHIC SCALE

Chief, Division of Engineering DPW

9/26/78
Date



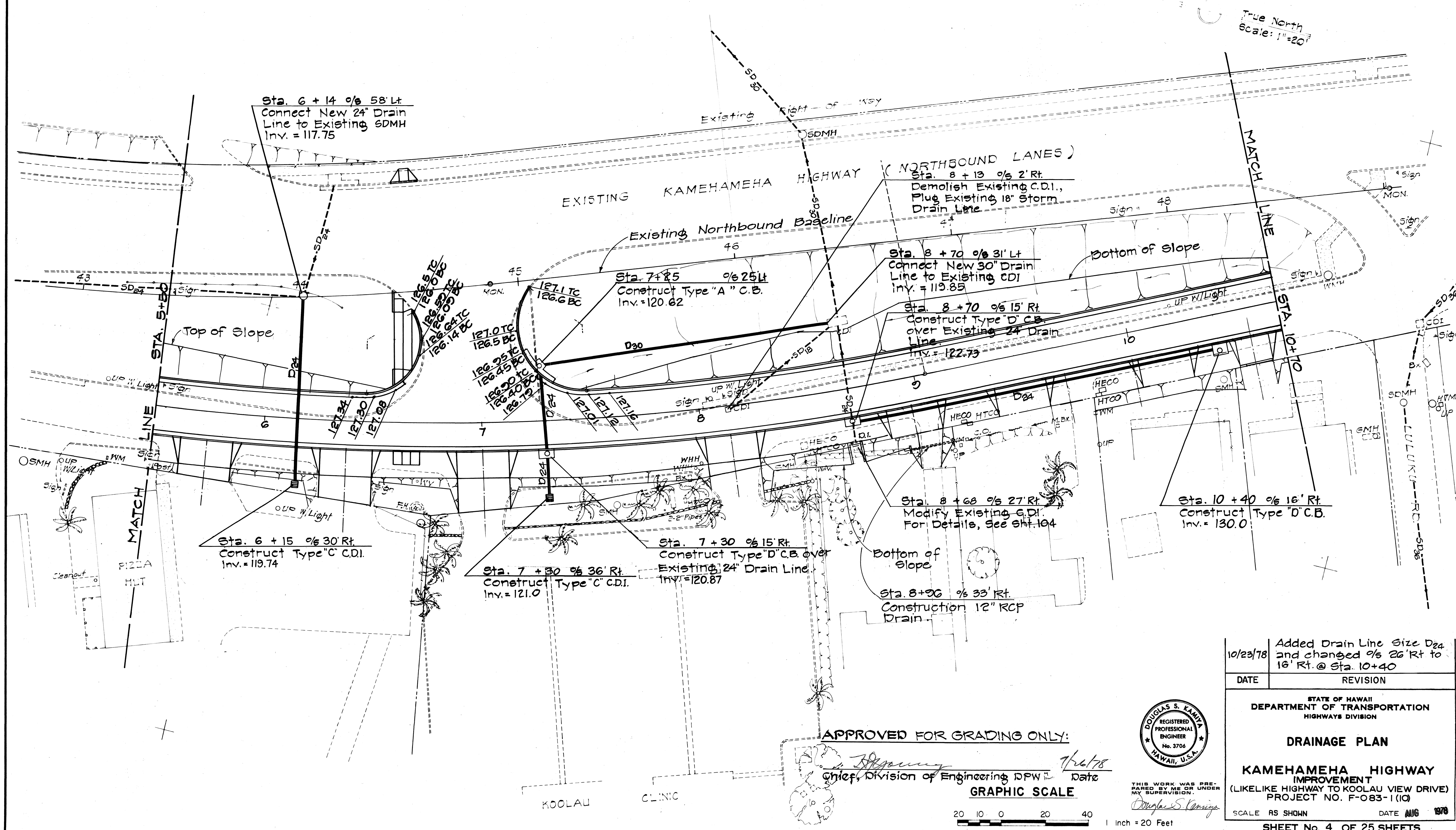
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Douglas S. Kania
REGISTERED PROFESSIONAL ENGINEER
No. 3704
HAWAII, U.S.A.

10/23/78	Added Drain Line size D ₃
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
DRAINAGE PLAN	
KAMEHAMEHA HIGHWAY IMPROVEMENT (LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE) PROJECT NO. F-083-1(10)	
SCALE AS SHOWN	DATE AUG 1978
SHEET No. 3 OF 25 SHEETS	

ADD. 891

ORIGINAL PLAN	DATE
DESIGNED BY	
NOTED BY	
CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	90	160



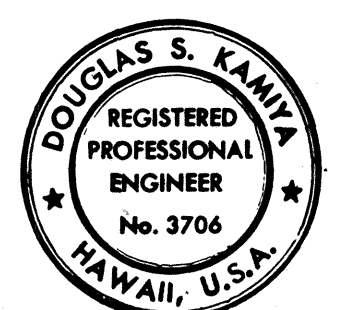
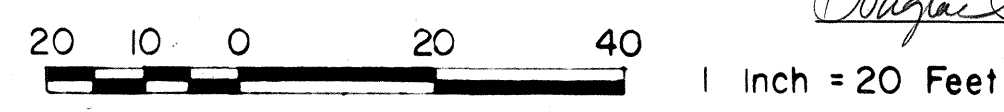
True North
Scale: 1"=20'

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

APPROVED FOR GRADING ONLY:

Chief, Division of Engineering DPW Date 7/6/78

GRAPHIC SCALE

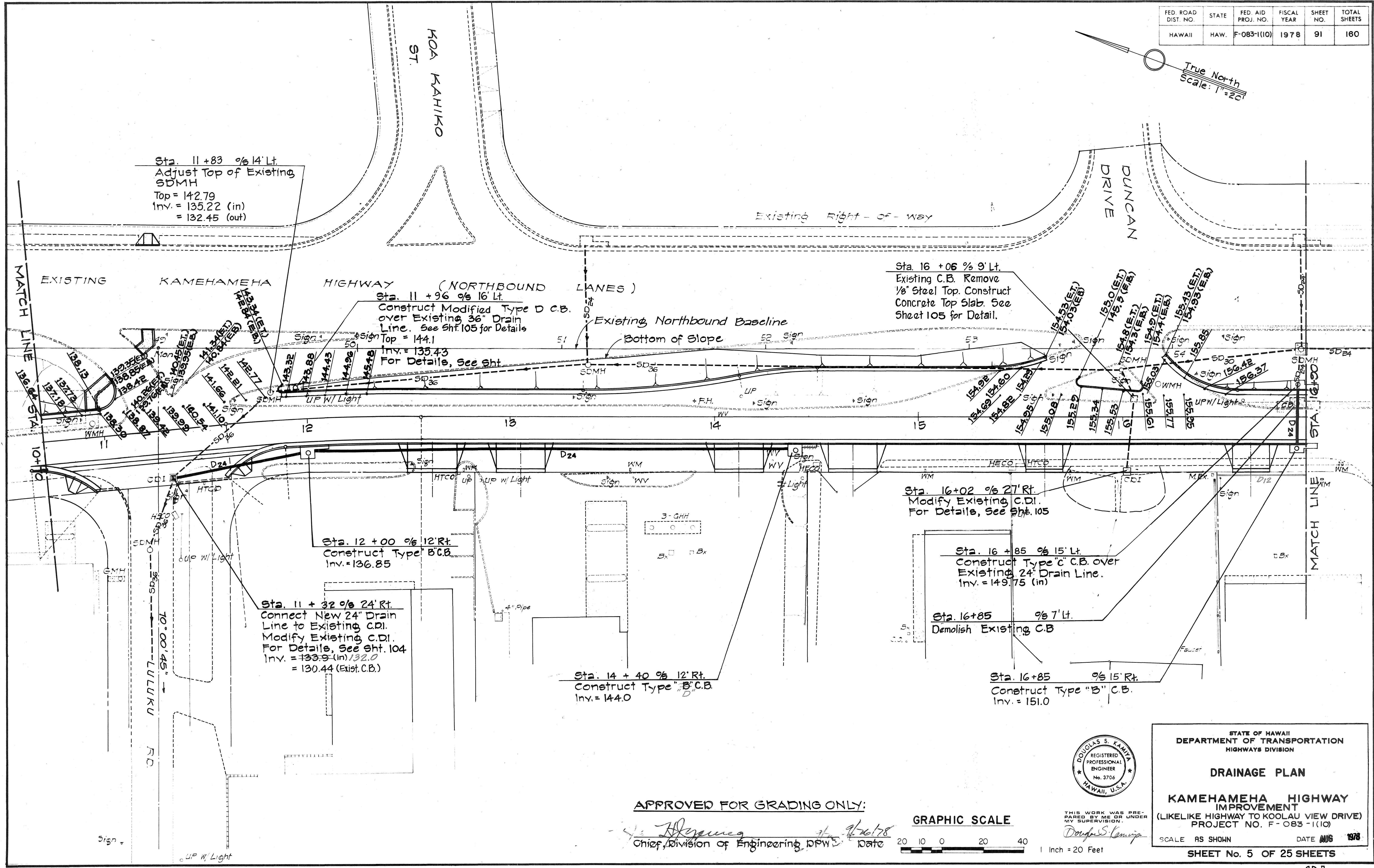
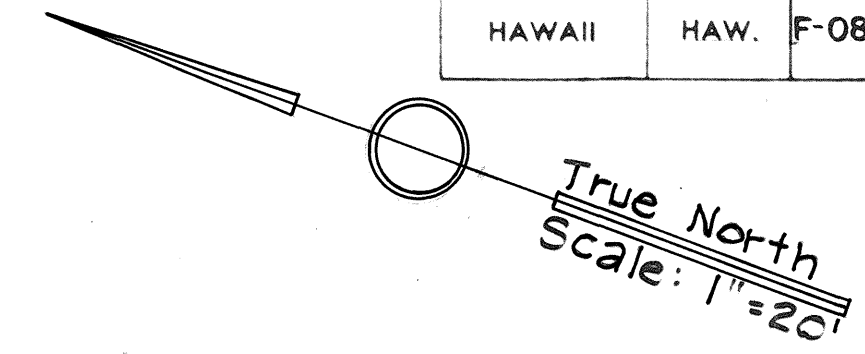


THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Douglas S. Kaniga

10/23/78	Added Drain Line Size D24 and changed 9/8 26' Rt to 16' Rt @ Sta. 10+40
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
DRAINAGE PLAN	
KAMEHAMEHA HIGHWAY IMPROVEMENT (LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE) PROJECT NO. F-083-1(10)	
SCALE AS SHOWN	DATE AUG 1978
SHEET No. 4 OF 25 SHEETS	

ADD. 90R

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	91	160



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

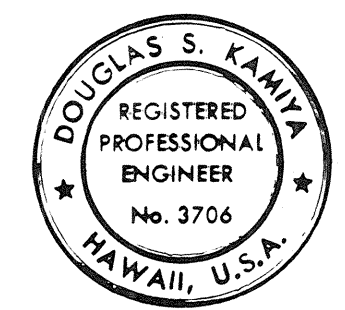
APPROVED FOR GRADING ONLY:

[Signature]
Chief, Division of Engineering, DPW Date 9/26/78

GRAPHIC SCALE



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[Signature]
Douglas S. Kamia
HAWAII, U.S.A.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

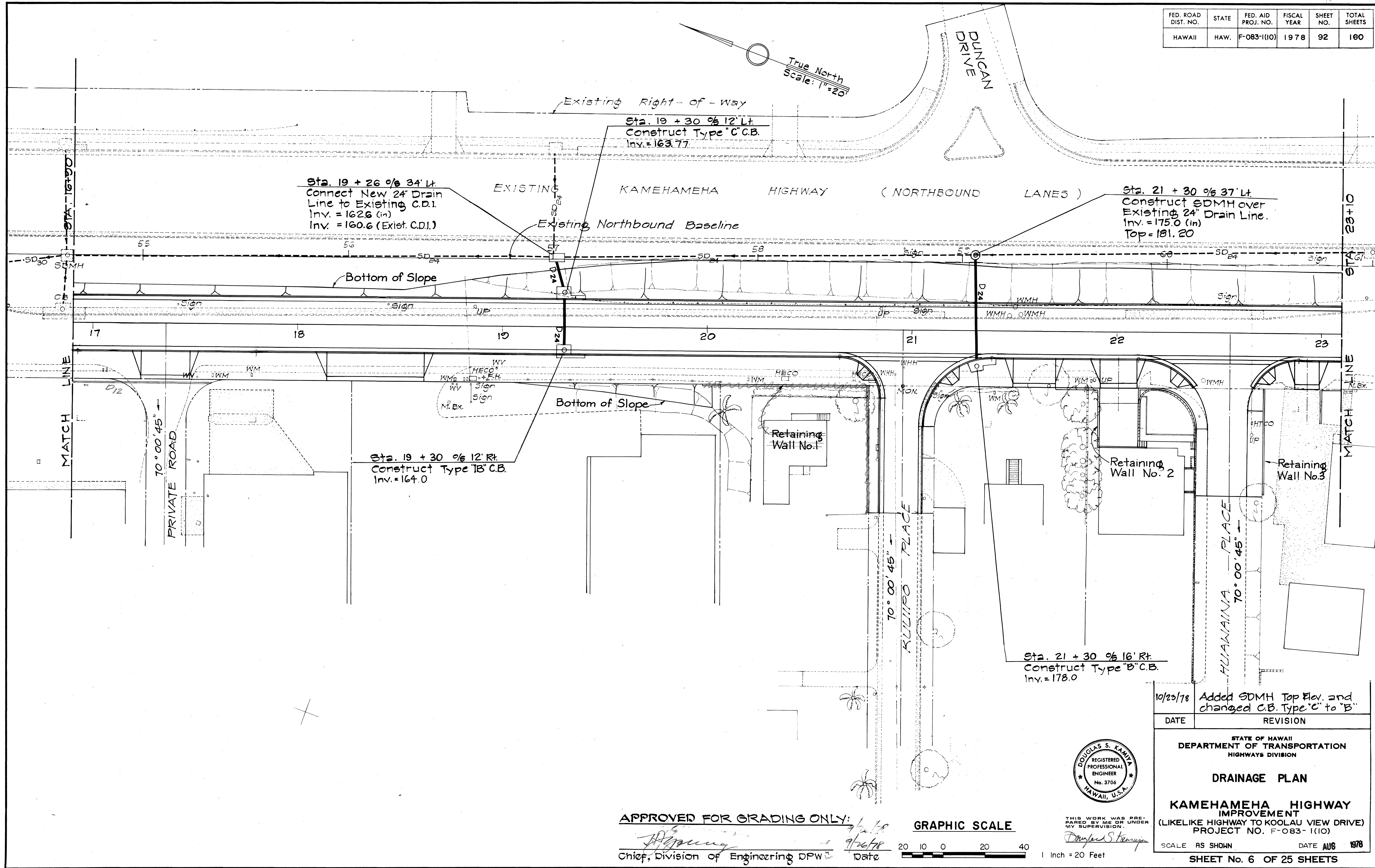
DRAINAGE PLAN

KAMEHAMEHA HIGHWAY IMPROVEMENT
(LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE)
PROJECT NO. F-083-1(10)

SCALE AS SHOWN DATE AUG 1978

SHEET No. 5 OF 25 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	92	160



ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	

APPROVED FOR GRADING ONLY:

Chief, Division of Engineering DPW Date 9/26/78

GRAPHIC SCALE



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Douglas S. Kania
REGISTERED PROFESSIONAL ENGINEER
No. 3704
HAWAII, U.S.A.

10/23/78	Added SDMH Top Elev. and changed C.B. Type 'C' to 'B'
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
DRAINAGE PLAN	
KAMEHAMEHA HIGHWAY IMPROVEMENT (LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE) PROJECT NO. F-083-1(10)	
SCALE AS SHOWN	DATE AUG 1978
SHEET No. 6 OF 25 SHEETS	

ADD. 9212

Sta. 23+24 0/6 40' Lt.
Connect New 24" Drain
Line to Existing C.B.
Inv. = 188.0 (in)
= 186.5 (C.B.)

Sta. 23+40 0/6 15' Lt.
Construct Type "C" C.B.
Inv. = 192.2

Sta. 28+02 0/6 69' Lt.
Connect New 24" Drain
Line to Existing C.B.
Inv. = 217.95

Sta. 28+50 0/6 18' Lt.
Construct Type "C" C.B.
Inv. = 224.47 (in)
= 223.25 (out) 222.0

EXISTING KAMEHAMEHA HIGHWAY
Existing Northbound Baseline

Bottom of Slope

Bottom of Slope

Retaining Wall No. 4

Retaining Wall No. 5

Retaining Wall No. 7

Retaining Wall No. 6

Sta. 24+10 0/6 15' Rt.
Construct Type "B" C.B.
Inv. = 194.3

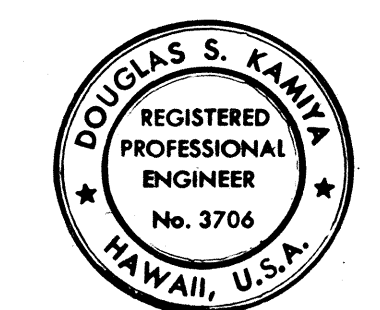
Sta. 29+15 0/6 31' Rt.
Demolish Existing C.B.
& Cap 18" Storm Drain at Curb.

Sta. 28+90 0/6 15' Rt.
Construct Type "B" C.B.
Inv. = 226.5 (in)
Inv. = 226.0 (out)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	93	160

True North
Scale: 1" = 20'

10/23/78	Added Drain Line Size D ₂₄
DATE	REVISION



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[Signature]
Chief, Division of Engineering DPW

[Signature]
Date

GRAPHIC SCALE



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[Signature]
Date

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLAN

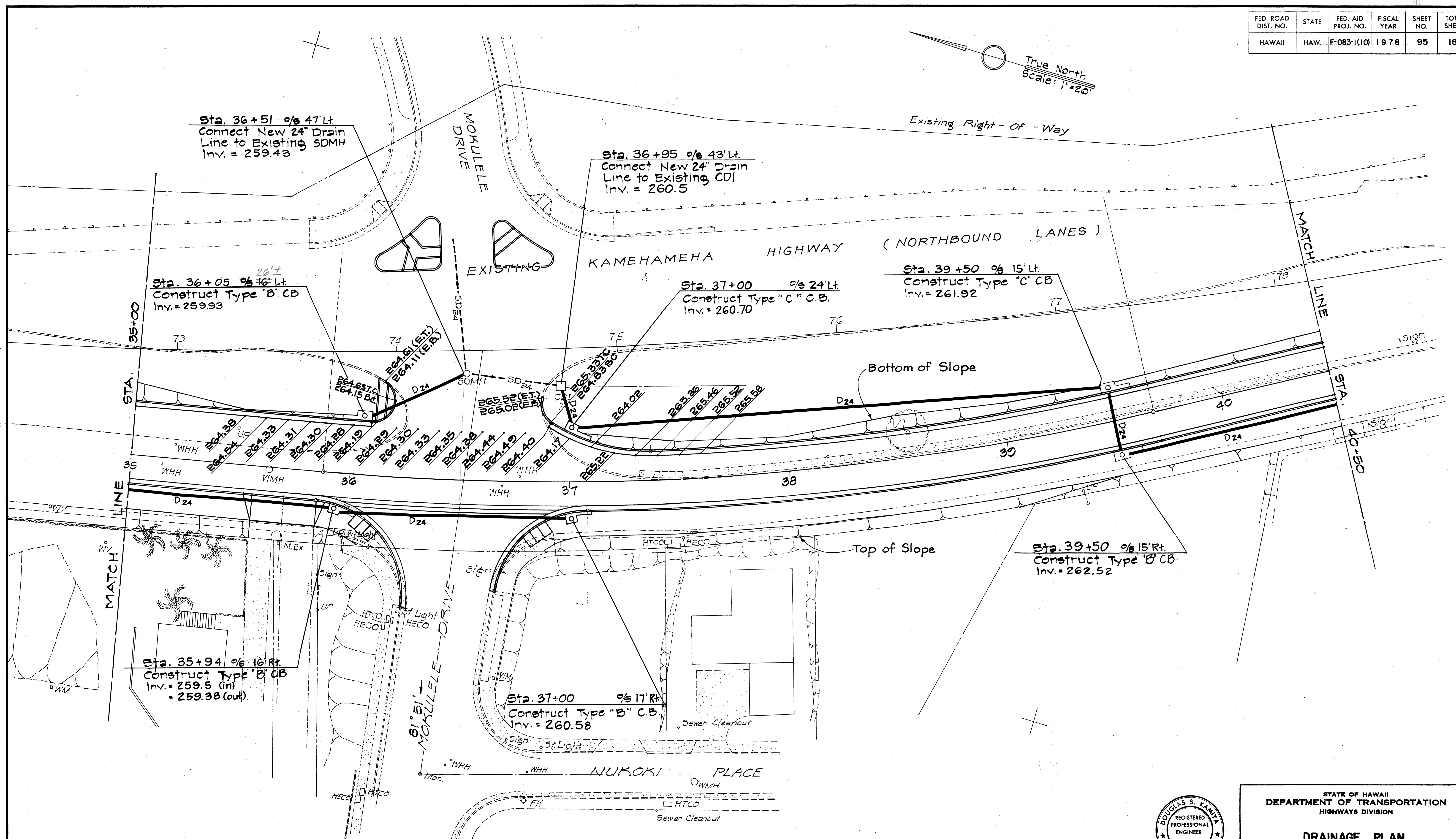
**KAMEHAMEHA HIGHWAY
IMPROVEMENT**
(LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE)
PROJECT NO. F-083-1(10)

SCALE AS SHOWN DATE AUG 1978

SHEET No. 7 OF 25 SHEETS

ADD. 93 R

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	95	160

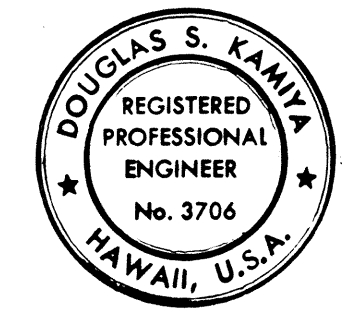


SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

APPROVED FOR GRADING ONLY

[Signature]
 Chief, Division of Engineering DPW Date *4/26/78*

GRAPHIC SCALE



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[Signature]

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLAN

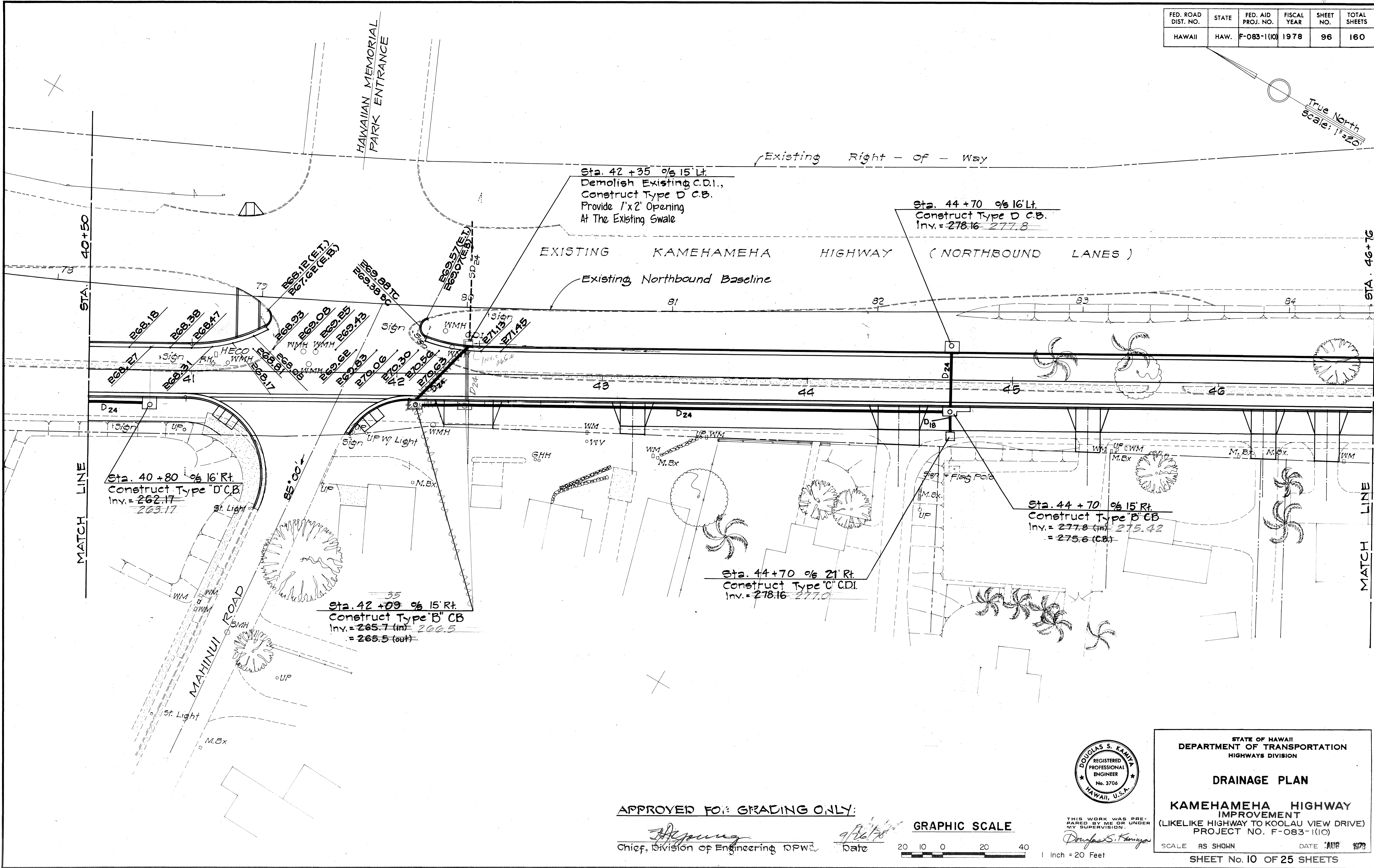
KAMEHAMEHA HIGHWAY
IMPROVEMENT
(LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE)
PROJECT NO. F-083-1(10)

SCALE AS SHOWN DATE *4/26/78*

SHEET No. 9 OF 25 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	96	160

True North
Scale: 1"=20'



DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
DATE	

APPROVED FOR GRADING ONLY:

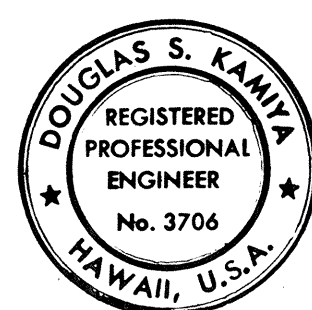
[Signature]
Chief, Division of Engineering DPWA

Date 9/26/78

GRAPHIC SCALE



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[Signature]
Douglas S. Kania

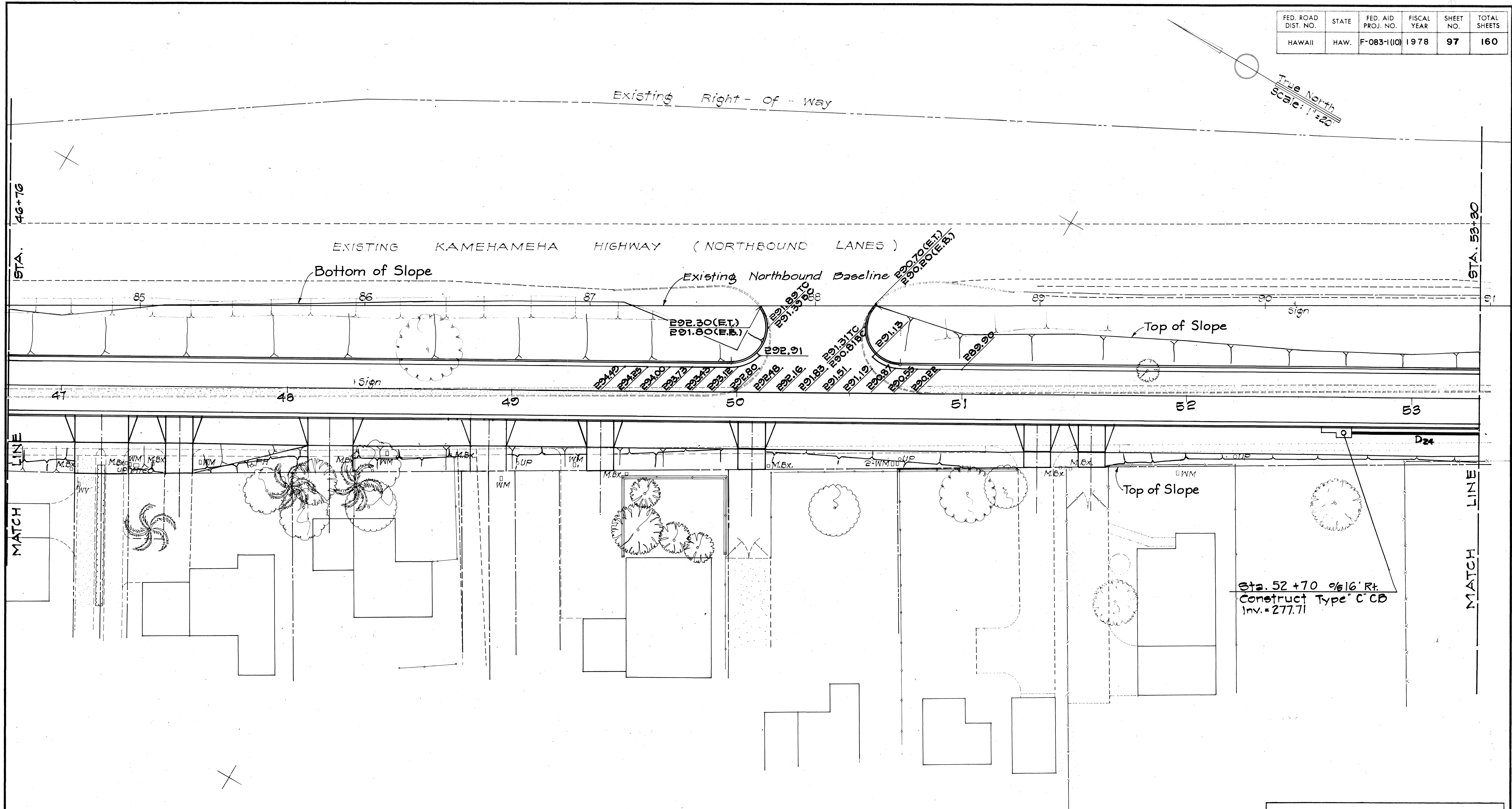


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLAN

KAMEHAMEHA HIGHWAY
IMPROVEMENT
(LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE)
PROJECT NO. F-083-1(10)
SCALE AS SHOWN DATE AUG 1978
SHEET No. 10 OF 25 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	97	160



Sta. 52+70 0%16' Rt.
Construct Type "C" CB
Inv. = 277.71

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

APPROVED FOR GRADING ONLY:

[Signature]
Chief, Division of Engineering DPW Date 7/26/78

GRAPHIC SCALE



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
[Signature]
Douglas S. Kanaga
REGISTERED PROFESSIONAL ENGINEER
No. 3706
HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

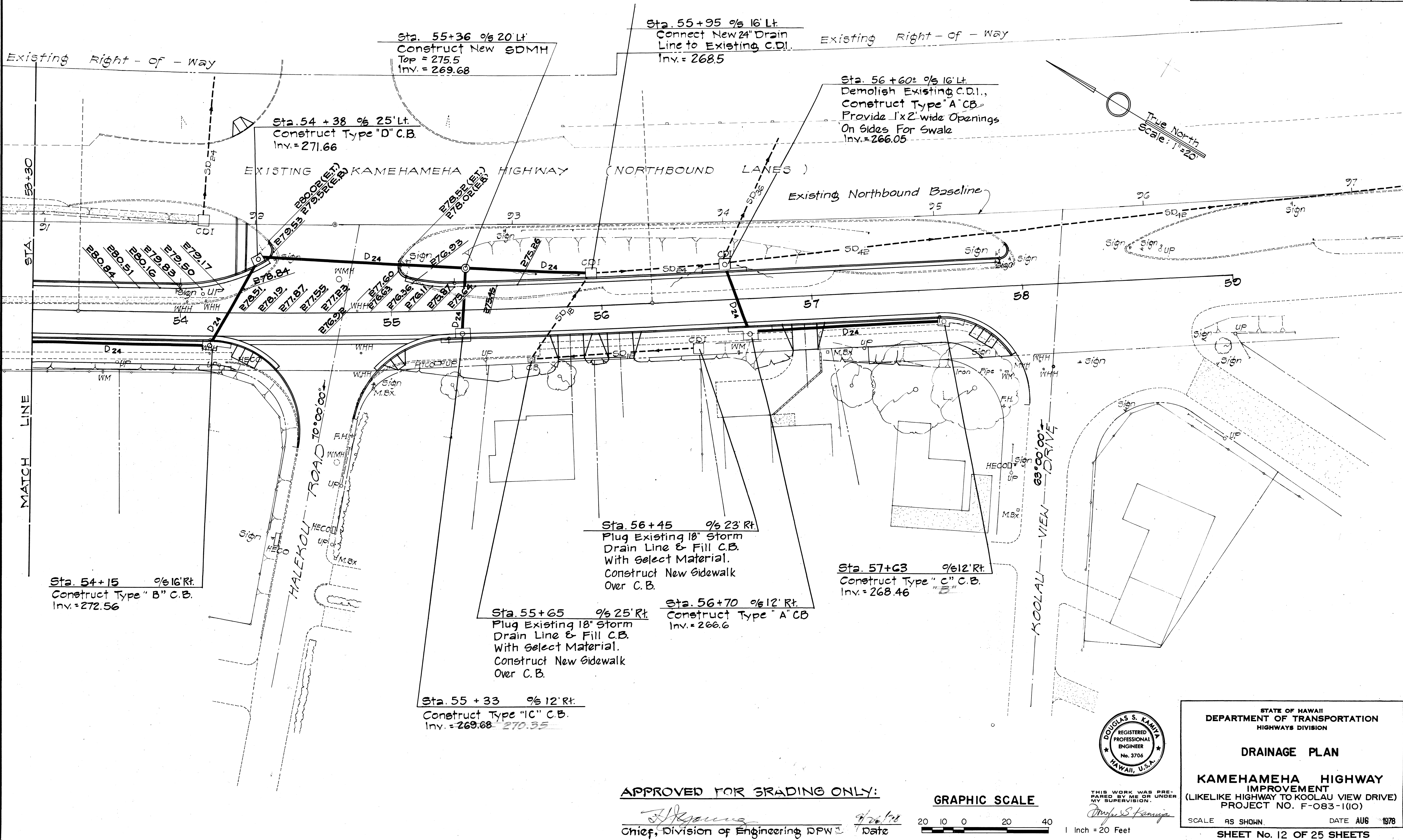
DRAINAGE PLAN

KAMEHAMEHA HIGHWAY IMPROVEMENT
(LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE)
PROJECT NO. F-083-1(10)

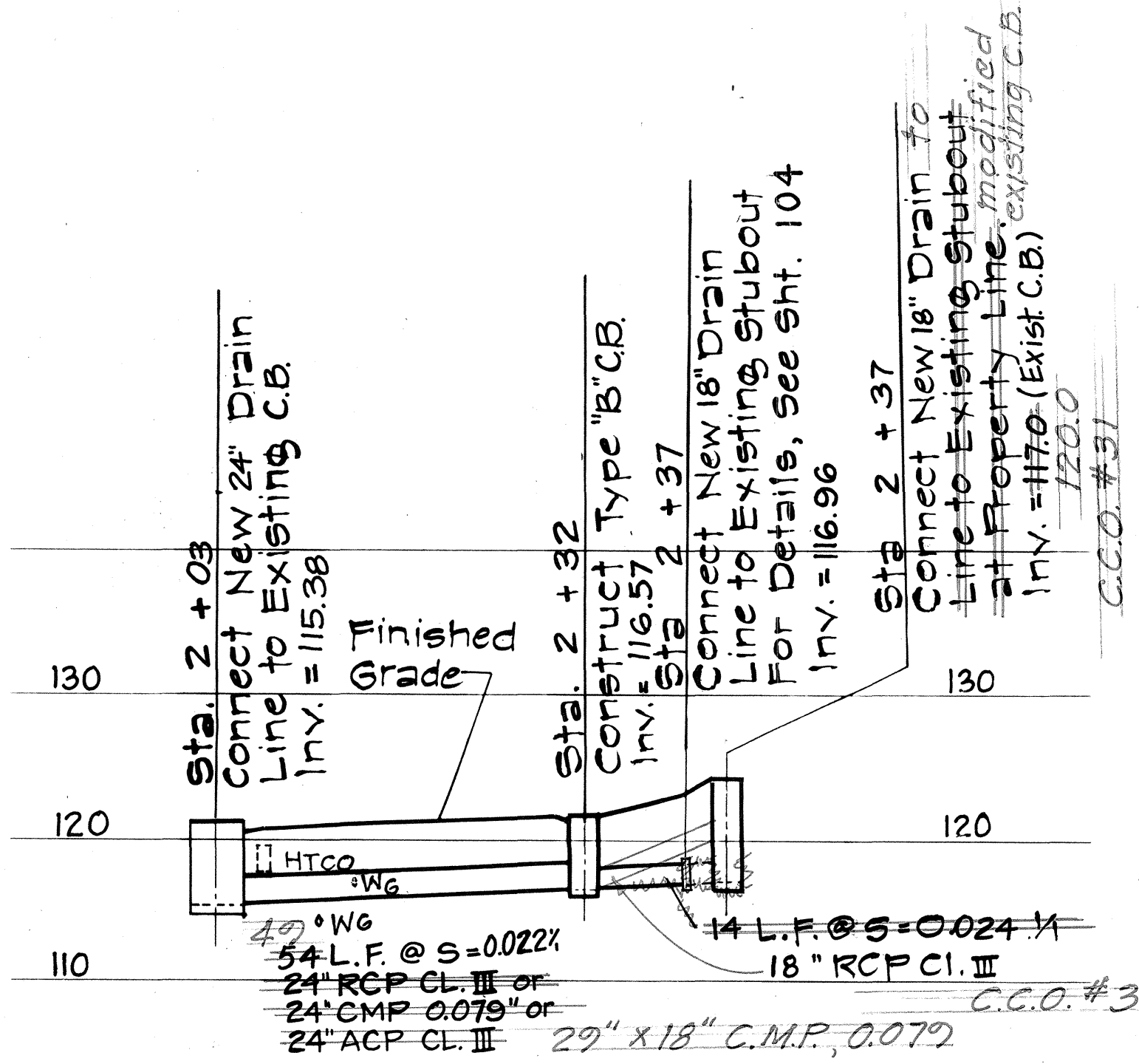
SCALE AS SHOWN DATE AUG 1978

SHEET No. 11 OF 25 SHEETS

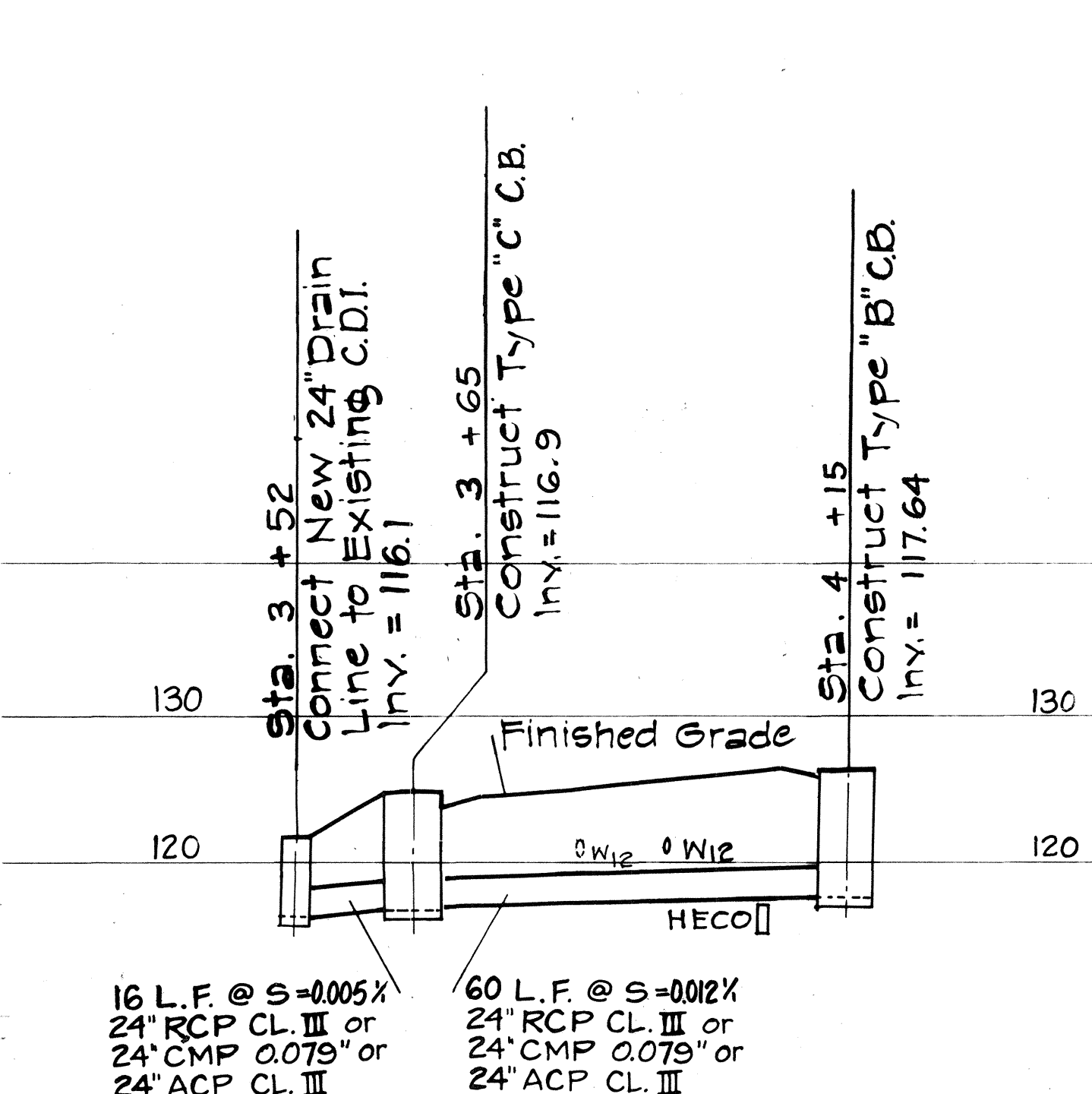
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	98	160



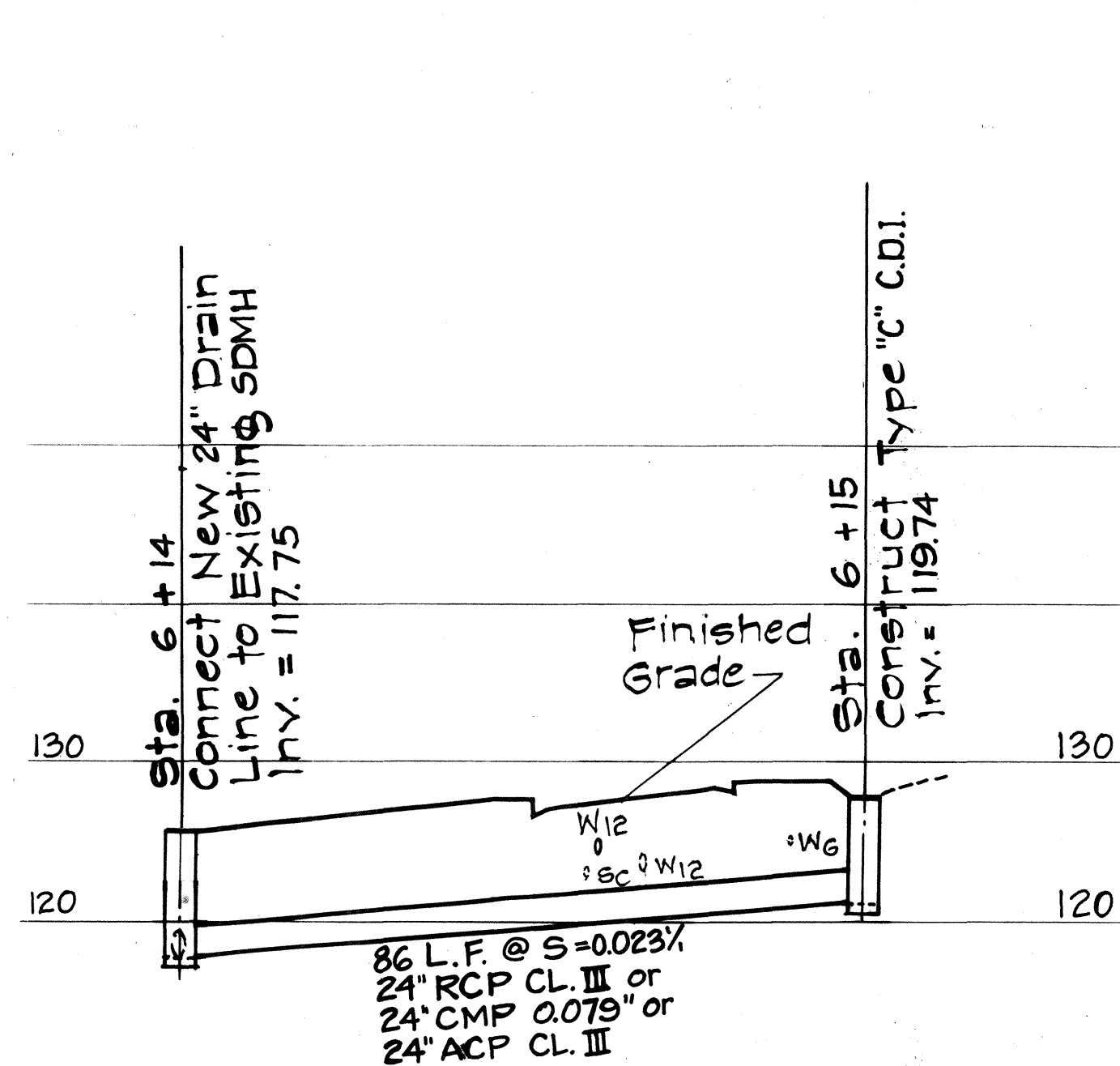
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-K(10)	1978	99	160



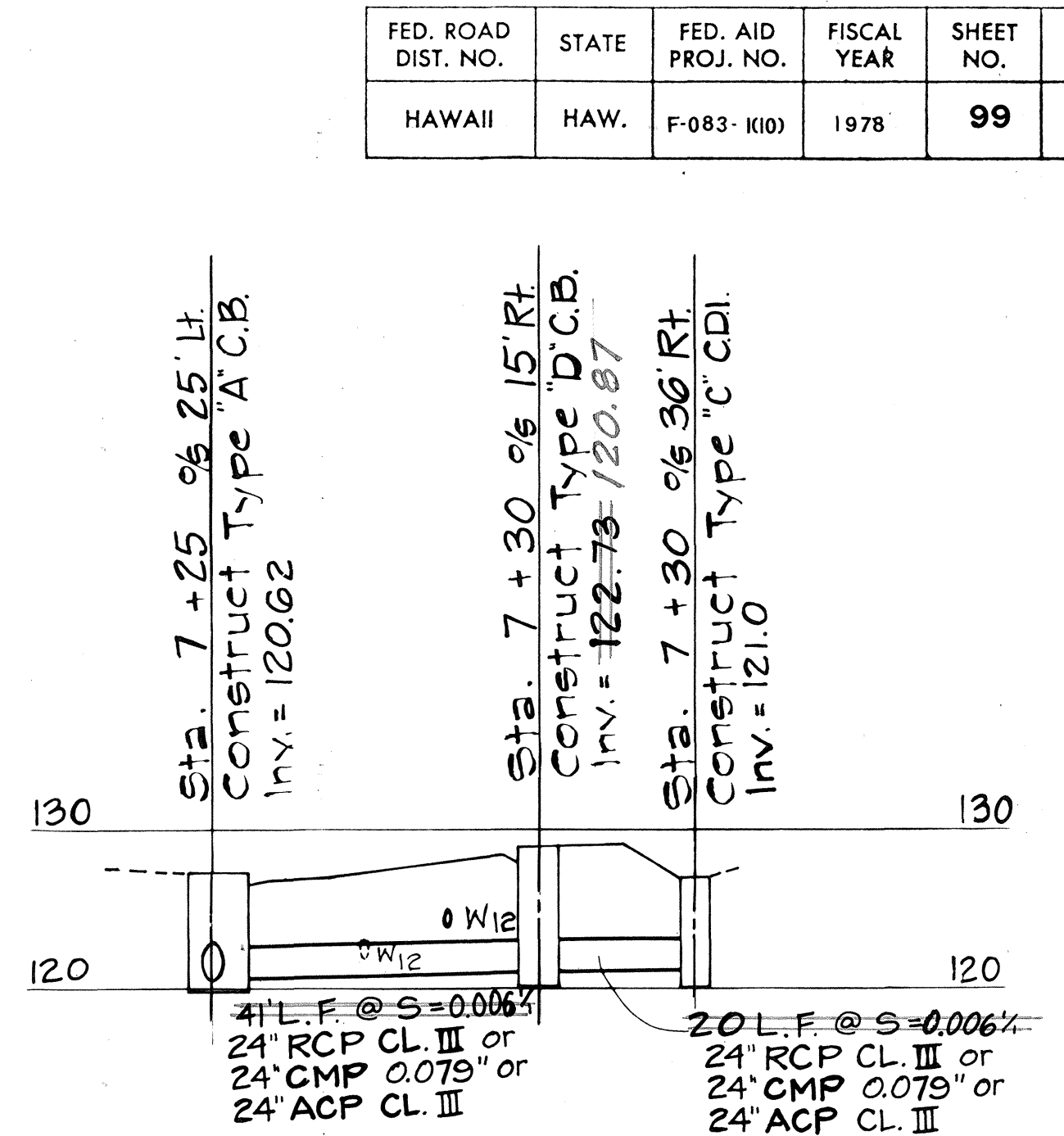
DRAINAGE PROFILE FROM STA. 2 + 03 TO STA. 2 + 37
Scale: Horiz. 1"=20'
Vert. 1"=10'



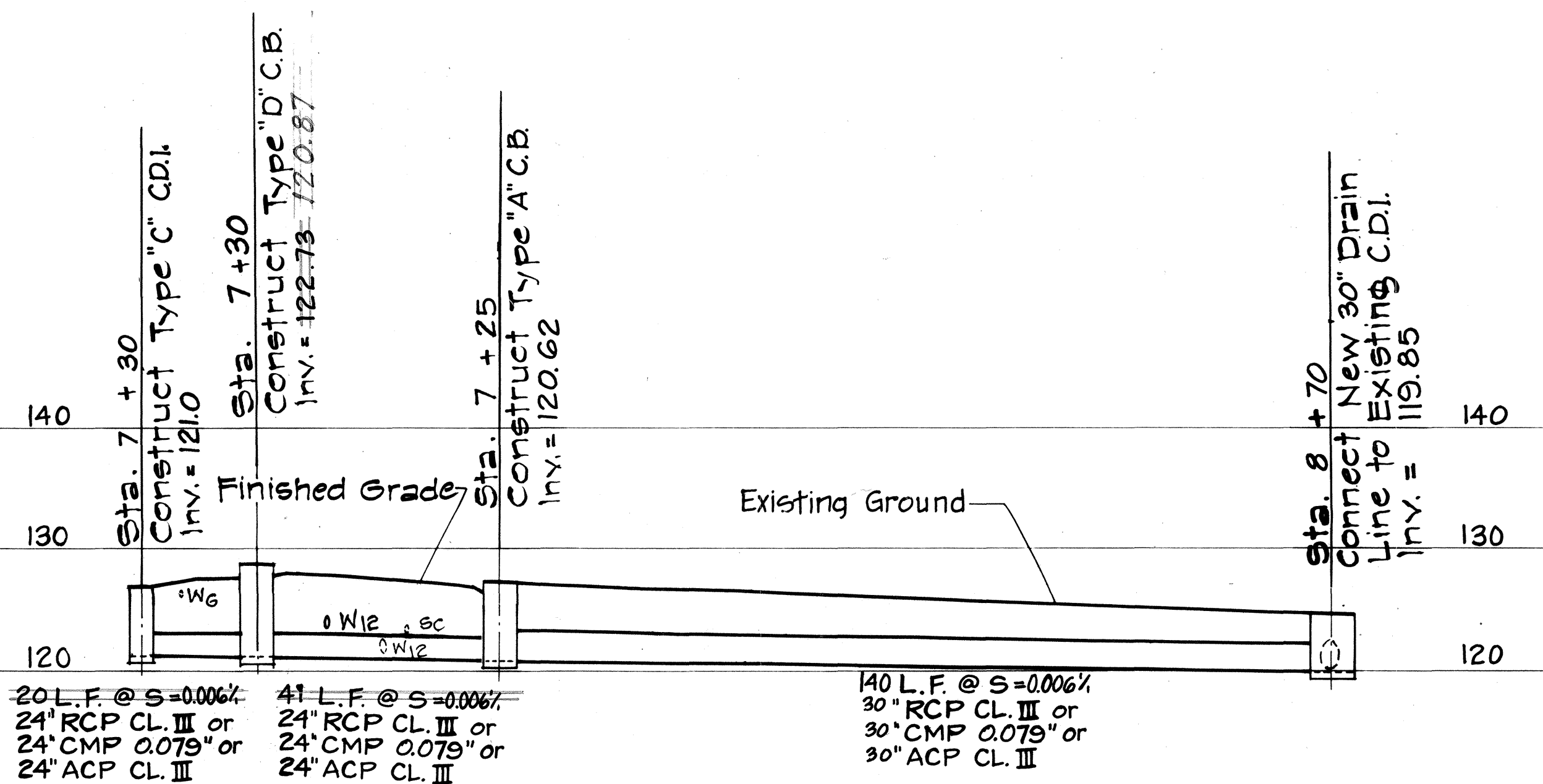
DRAINAGE PROFILE FROM STA. 3 + 52 TO STA. 4 + 15
Scale: Horiz. 1"=20'
Vert. 1"=10'



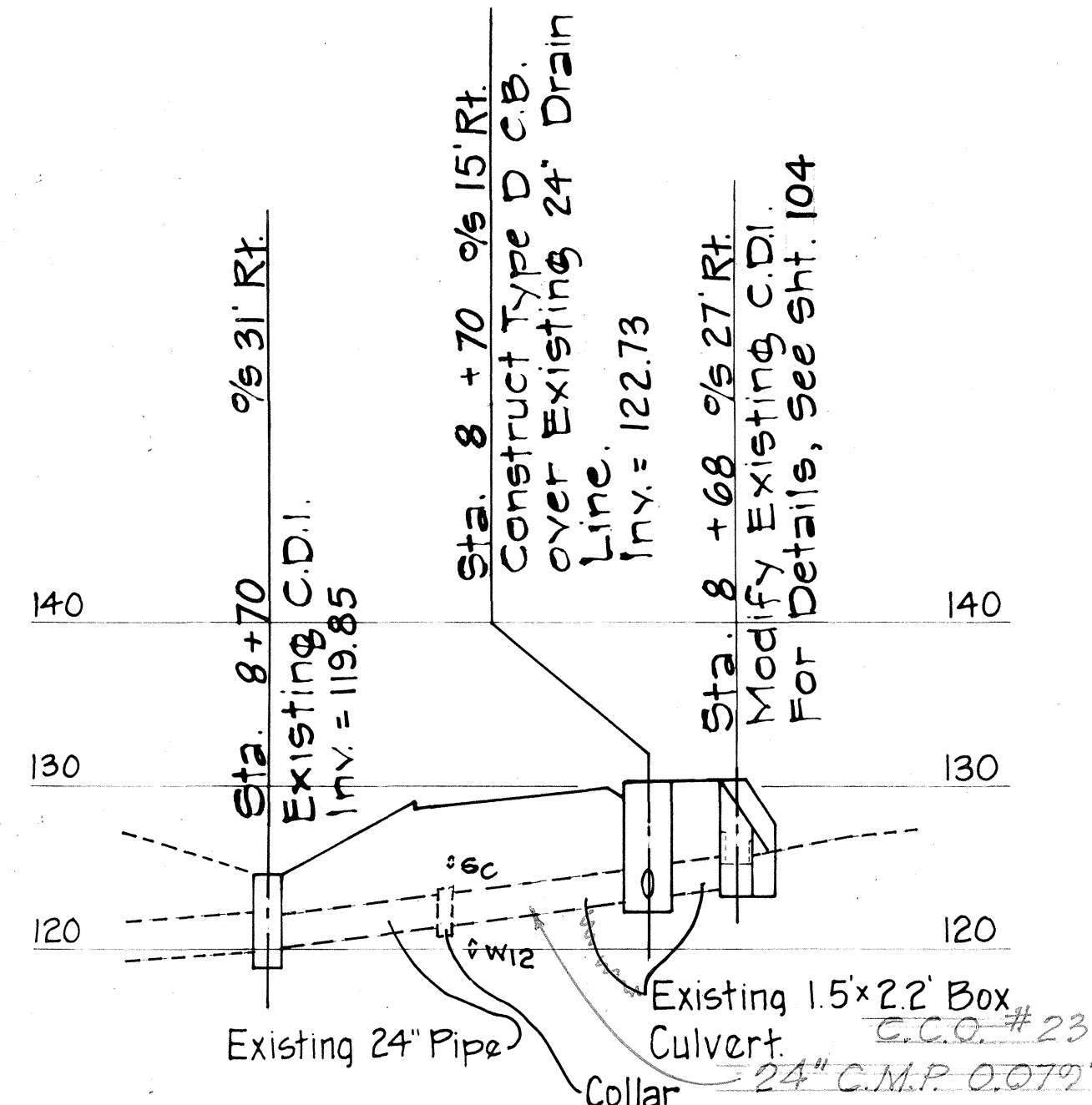
DRAINAGE PROFILE FROM STA. 6 + 14 TO STA. 6 + 15
Scale: Horiz. 1"=20'
Vert. 1"=10'



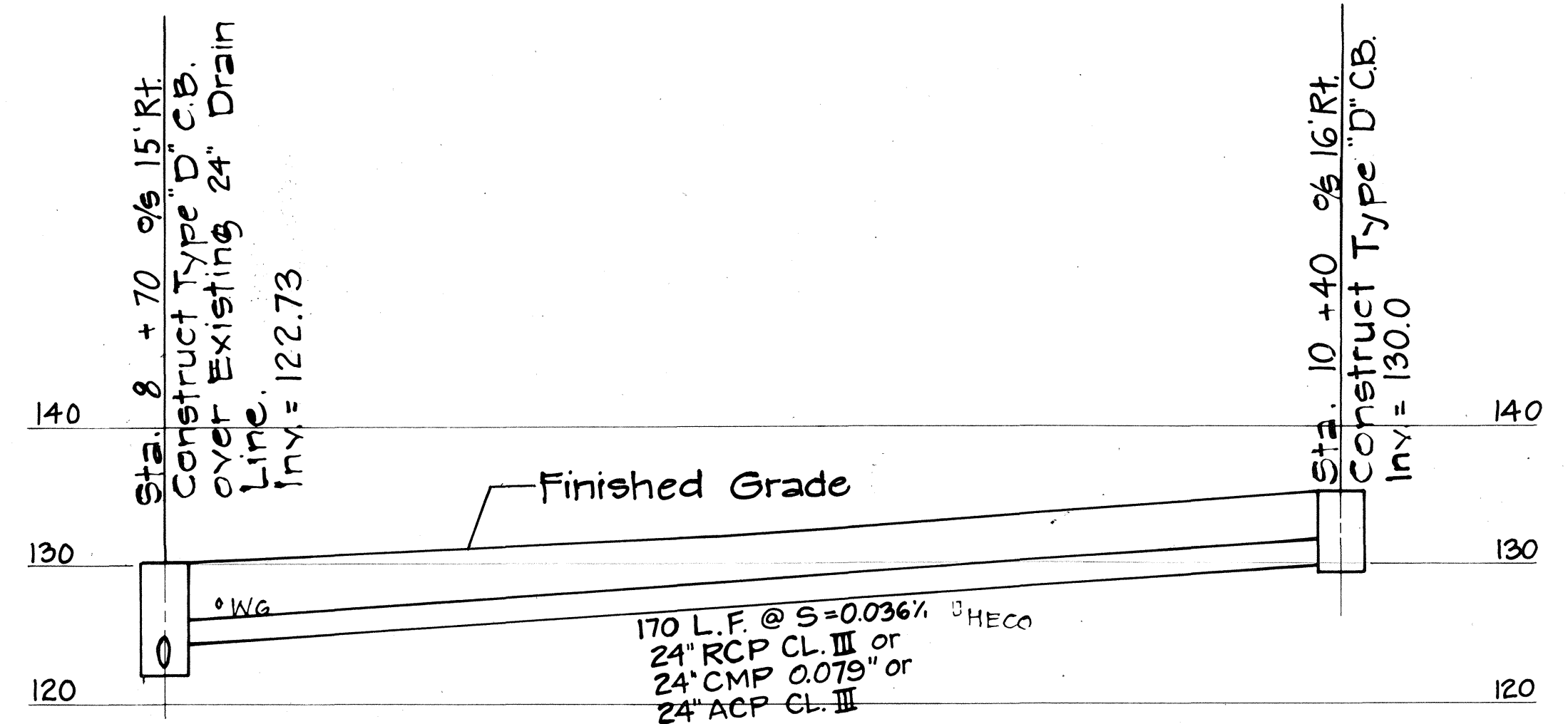
DRAINAGE PROFILE FROM STA. 7 + 25 TO STA. 7 + 30
Scale: Horiz. 1"=20'
Vert. 1"=10'



DRAINAGE PROFILE FROM STA. 7 + 30 TO STA. 8 + 70
Scale: Horiz. 1"=20'
Vert. 1"=10'

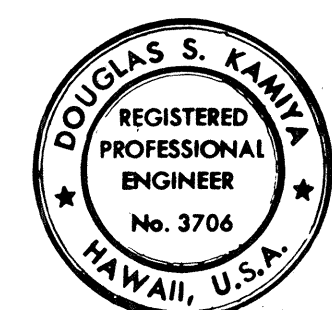


DRAINAGE PROFILE FROM STA. 8 + 68 TO STA. 8 + 70
Scale: Horiz. 1"=20'
Vert. 1"=10'



DRAINAGE PROFILE FROM STA. 8 + 70 TO STA. 10 + 40
Scale: Horiz. 1"=20'
Vert. 1"=10'

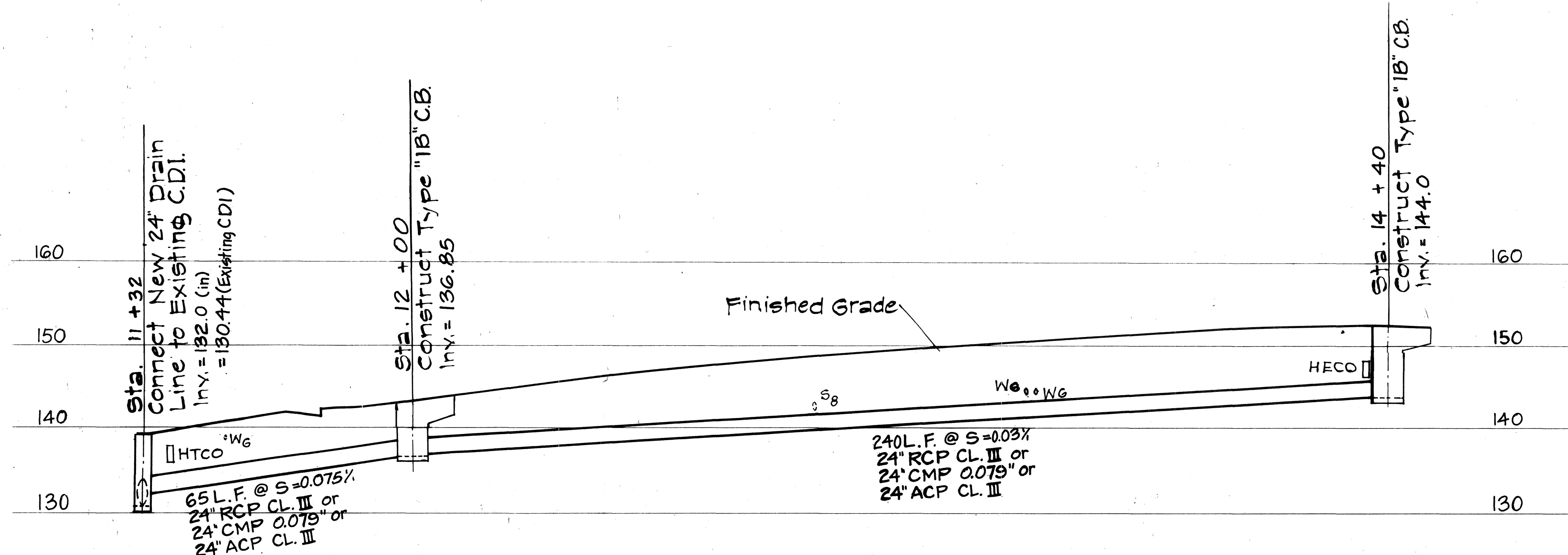
NOTE:
DRAINAGE PROFILE STATIONING ARE REFERRED TO SOUTHBOUND BASELINE STATIONS.



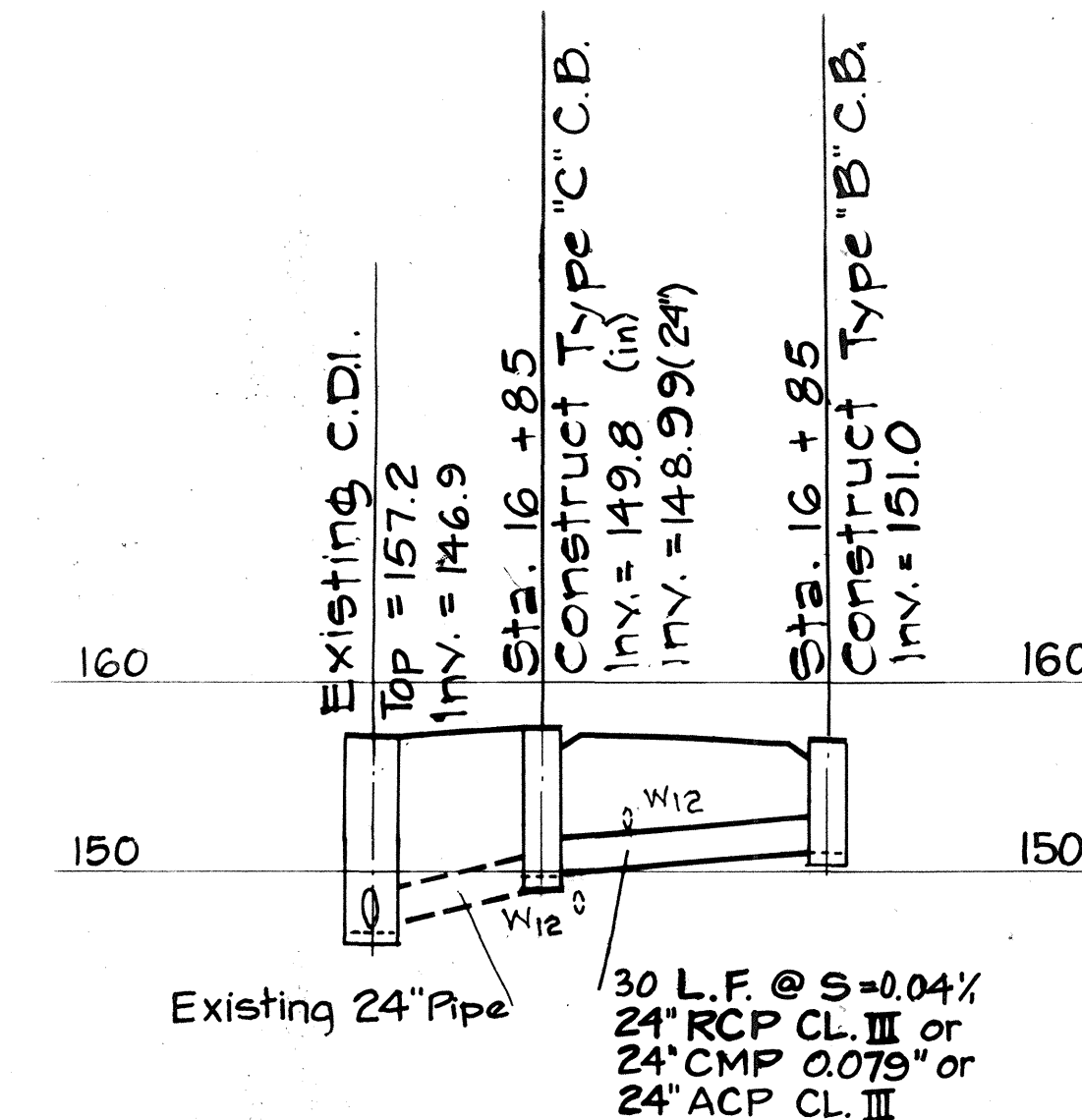
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Douglas S. Kanaya

DATE	10/23/79	REVISION	Changed 40 L.F. to 41 L.F. & Added Finished Grade.
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION			
DRAINAGE PROFILES			
KAMEHAMEHA HIGHWAY IMPROVEMENT (LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE) PROJECT NO. F-083-1(10)			
SCALE: As Shown	DATE	AUG	1978
SHEET No. 13 OF 25 SHEETS			

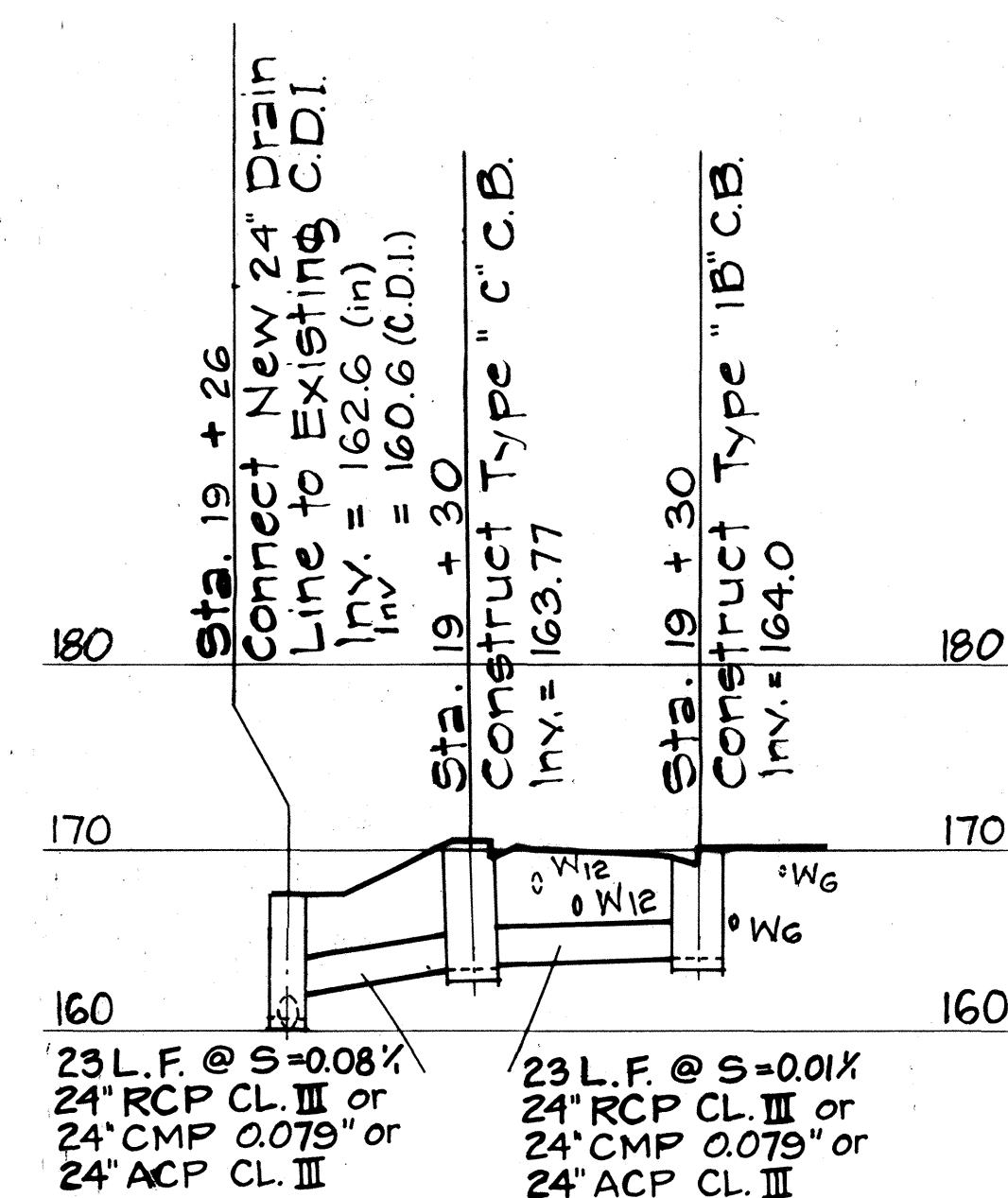
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	100	160



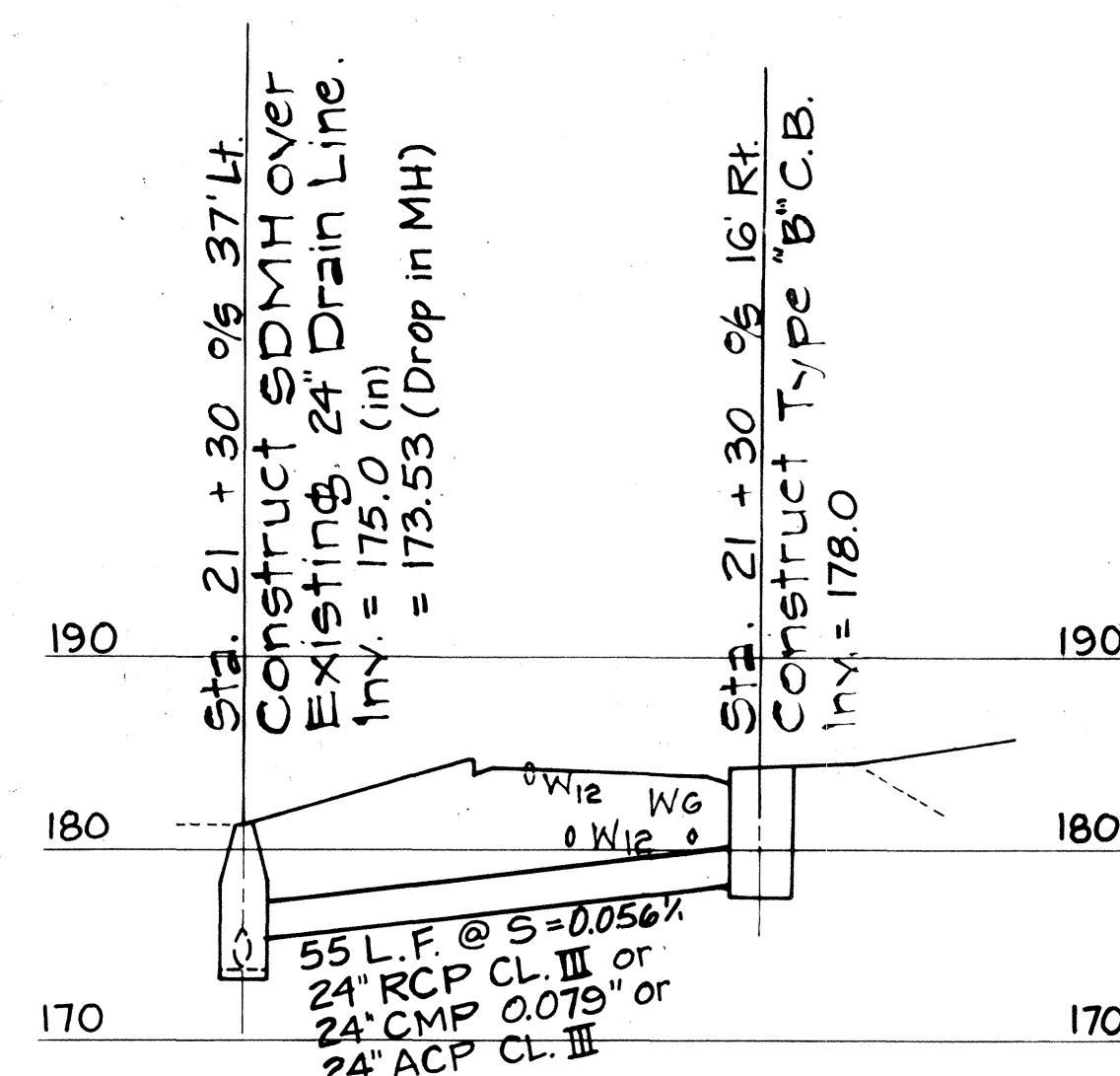
**DRAINAGE PROFILE FROM
STA. 11+32 TO STA. 14+40**
Scale: Horiz. 1"=20'
Vert. 1"=10'



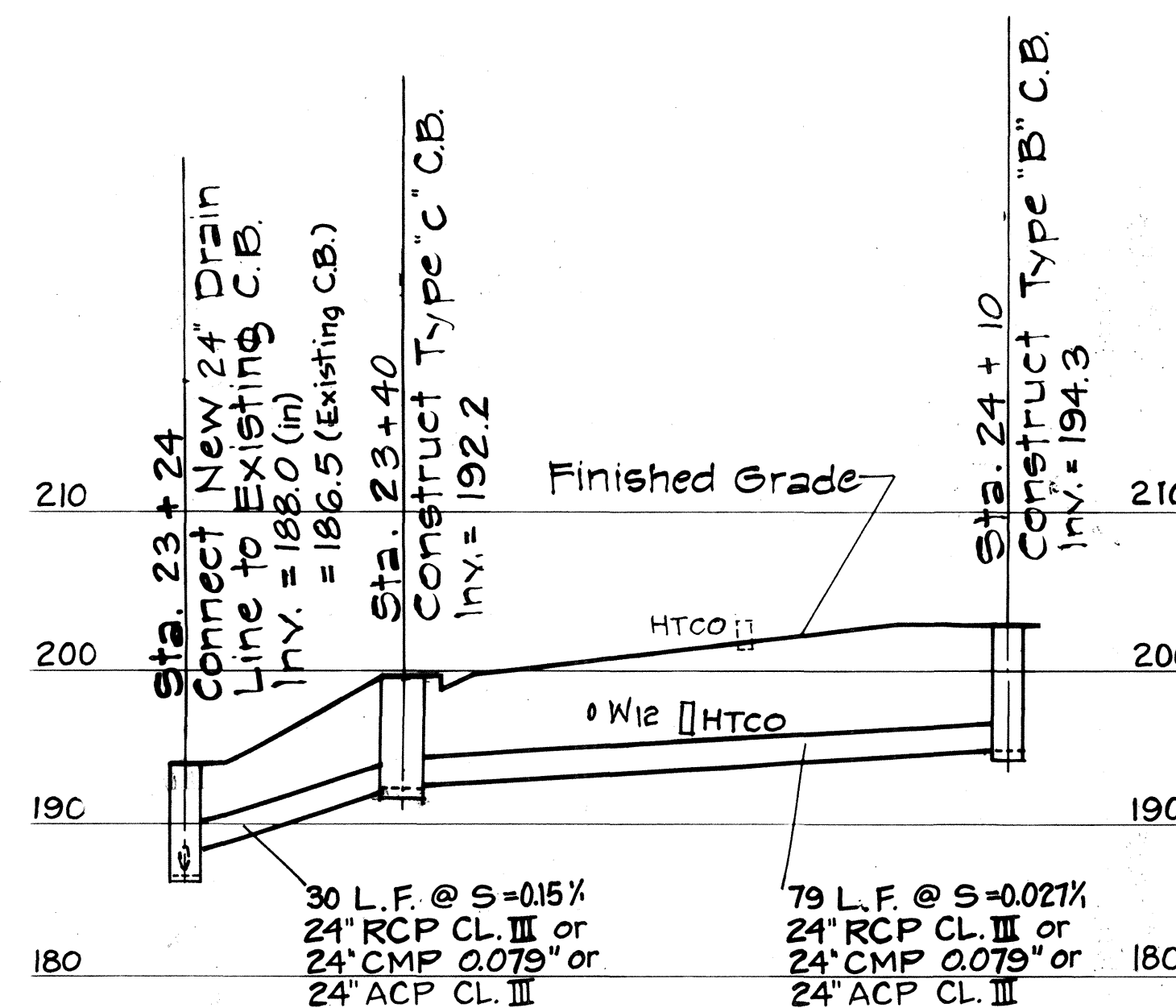
**DRAINAGE PROFILE FROM
STA. 16+85 TO STA. 16+85**
Scale: Horiz. 1"=20'
Vert. 1"=10'



**DRAINAGE PROFILE FROM
STA. 19+26 TO STA. 19+30**
Scale: Horiz. 1"=20'
Vert. 1"=10'

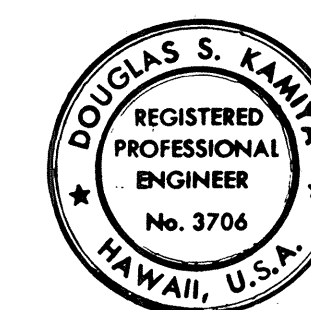


**DRAINAGE PROFILE FROM
STA. 21+30 TO STA. 21+30**
Scale: Horiz. 1"=20'
Vert. 1"=10'



**DRAINAGE PROFILE FROM
STA. 23+24 TO STA. 24+10**
Scale: Horiz. 1"=20'
Vert. 1"=10'

NOTE:
DRAINAGE PROFILE STATIONING ARE REFERRED
TO SOUTHBOUND BASELINE STATIONS.

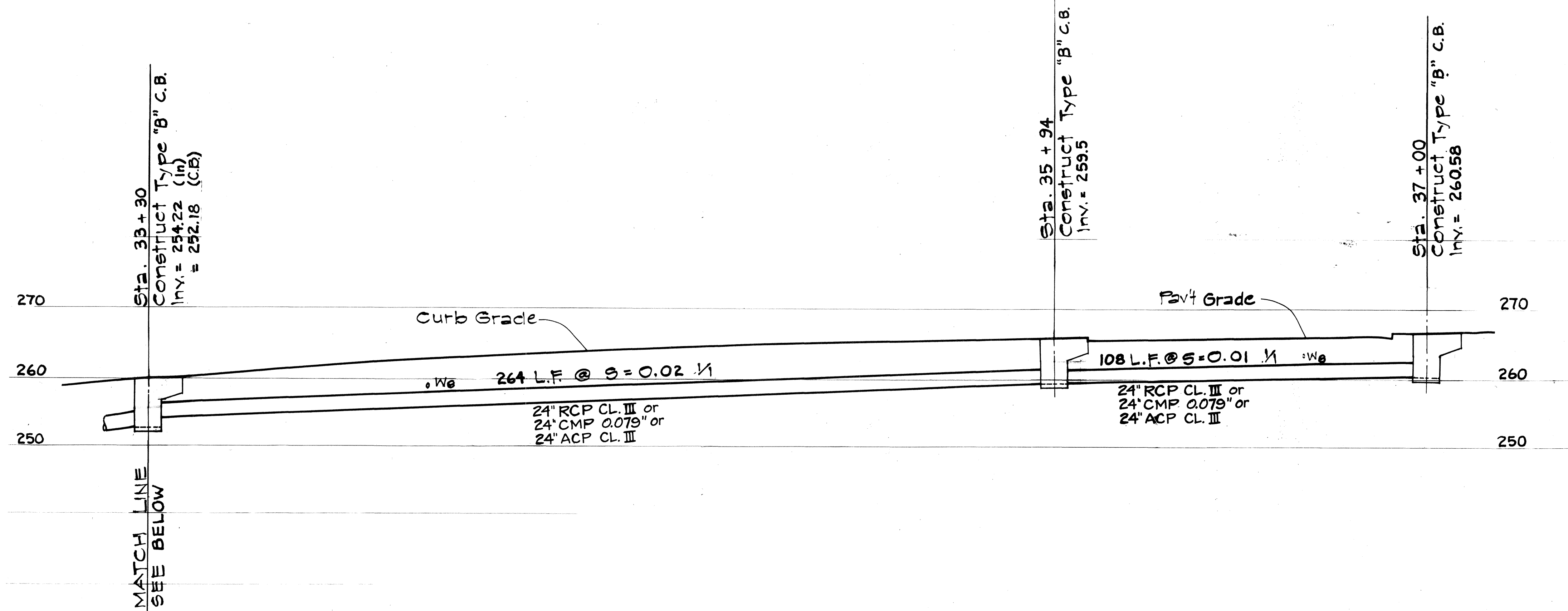
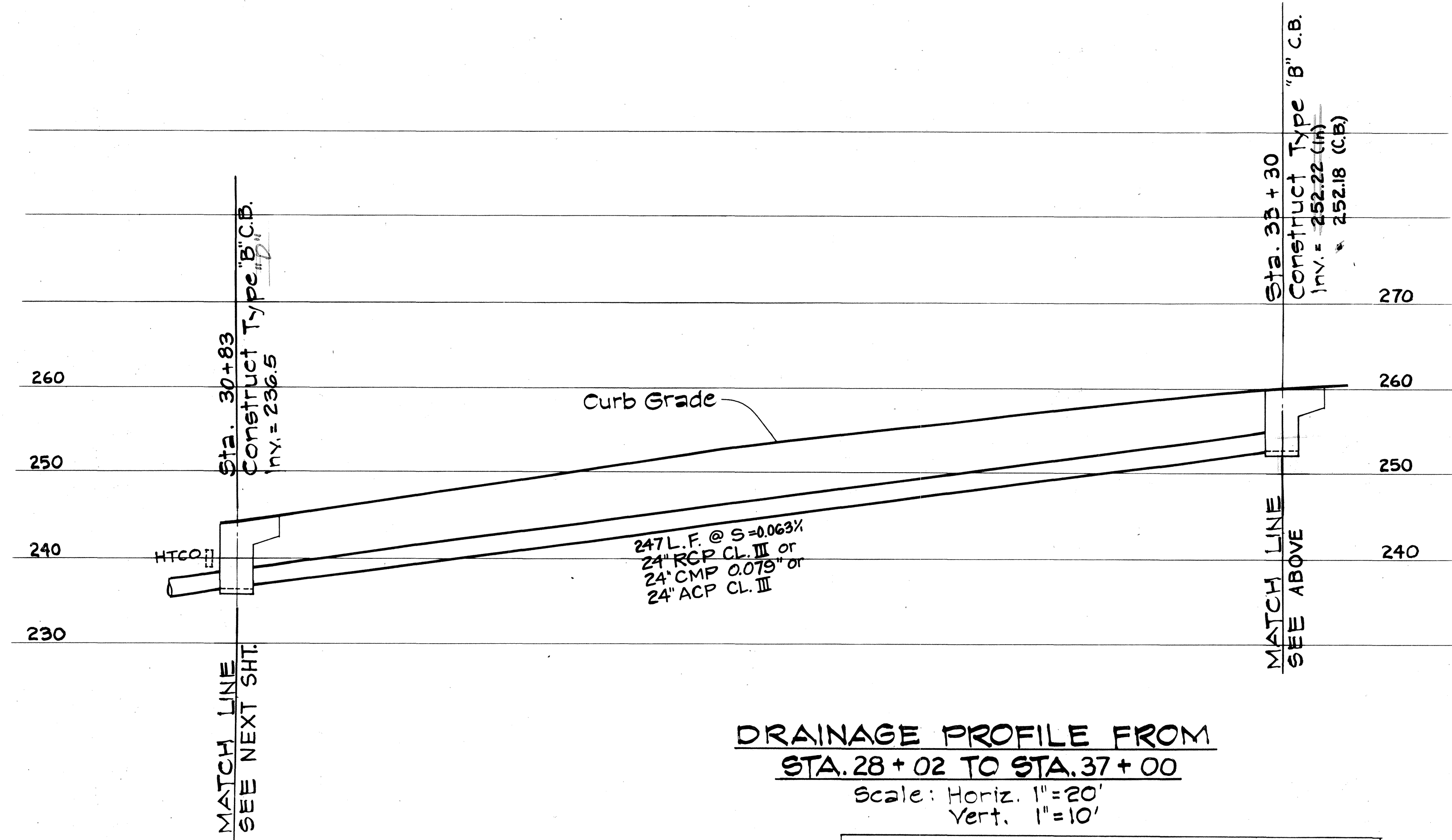


THIS WORK WAS PRE-
PARED BY ME OR UNDER
MY SUPERVISION.
Douglas S. Kamia

10/23/78	Changed C.B. Type "C" to Type "B" @ Sta. 21+30
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION	
DRAINAGE PROFILES	
KAMEHAMEHA HIGHWAY IMPROVEMENT (LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE) PROJECT NO. F-083-1(10)	
SCALE: As Shown	DATE AUG 1978
SHEET No. 14 OF 25 SHEETS	

ADD. 10012

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-K(10)	1978	101	160

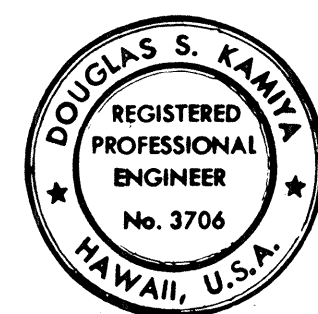


DRAINAGE PROFILE FROM STA. 28 + 02 TO STA. 37 + 00

Scale: Horiz. 1"=20'
Vert. 1"=10'

NOTE:

DRAINAGE PROFILE STATIONING ARE REFERRED
TO SOUTHBOUND BASELINE STATIONS.



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PARED BY ME OR UNDER
MY SUPERVISION.
Douglas S. Kanija

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE PROFILES

KAMEHAMEHA HIGHWAY
IMPROVEMENT
(LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE)
PROJECT NO. F-083-1(10)

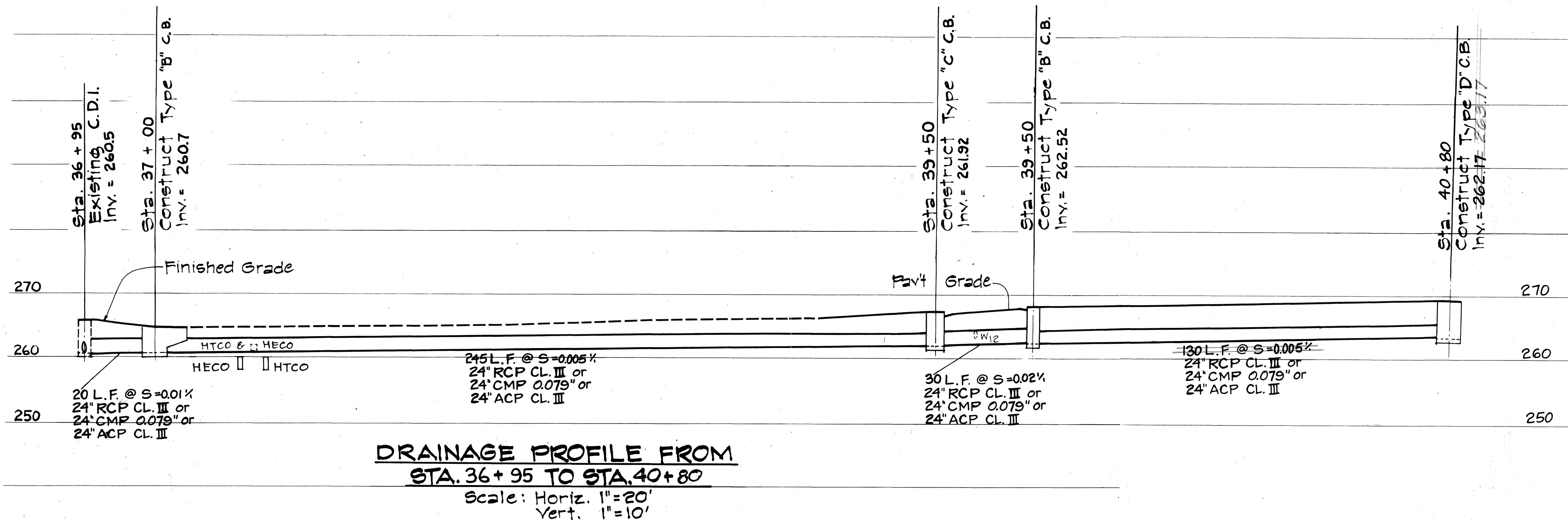
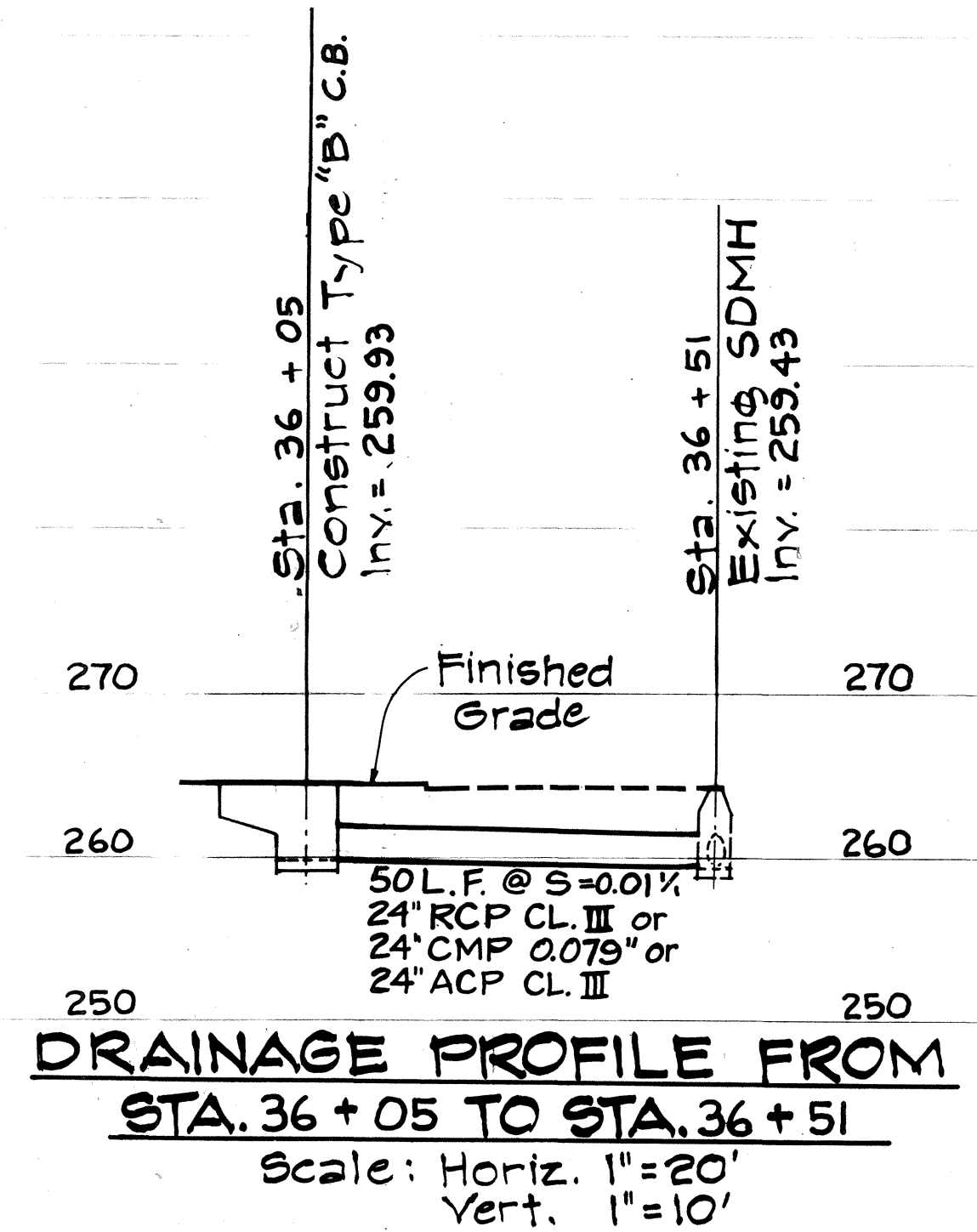
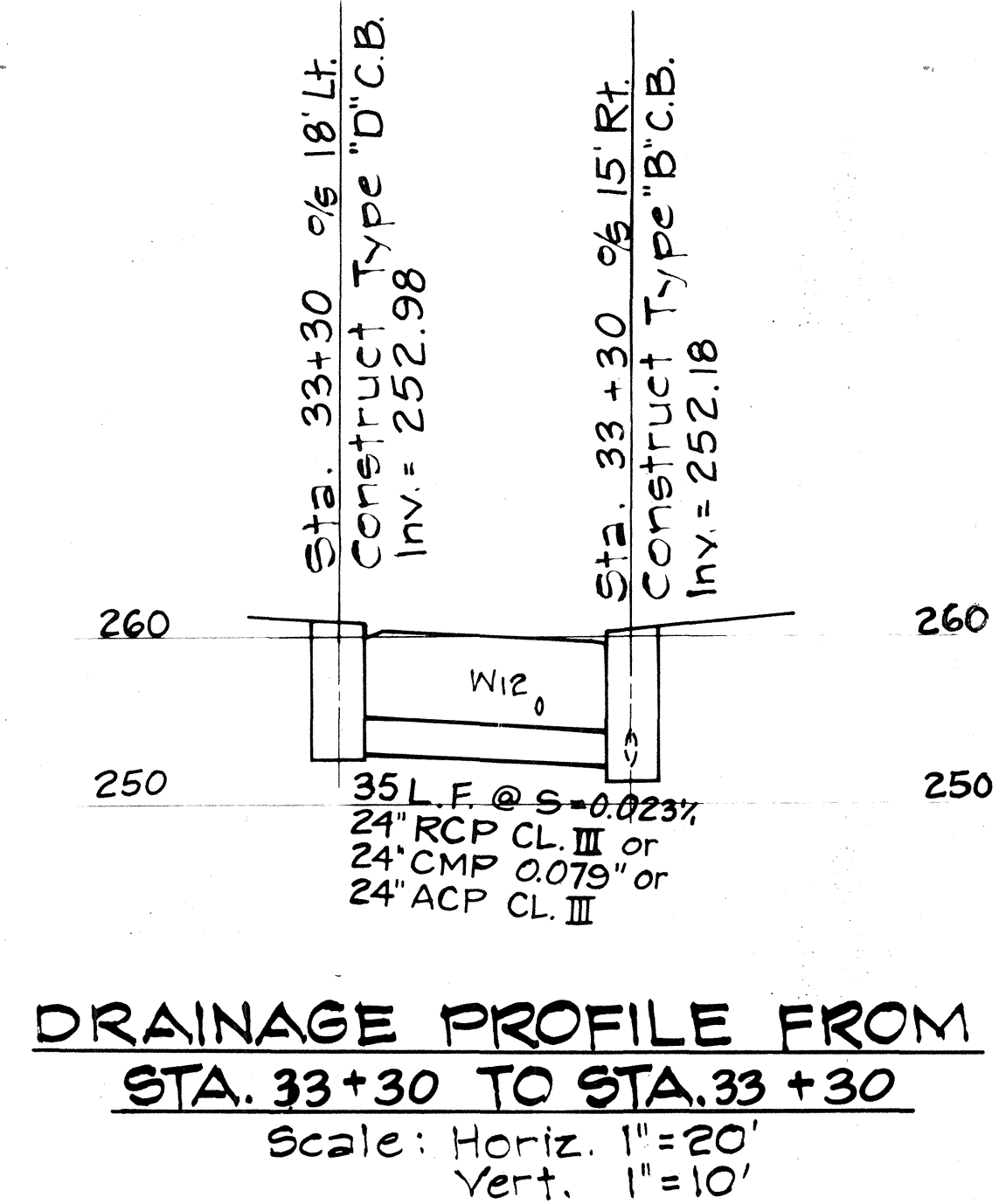
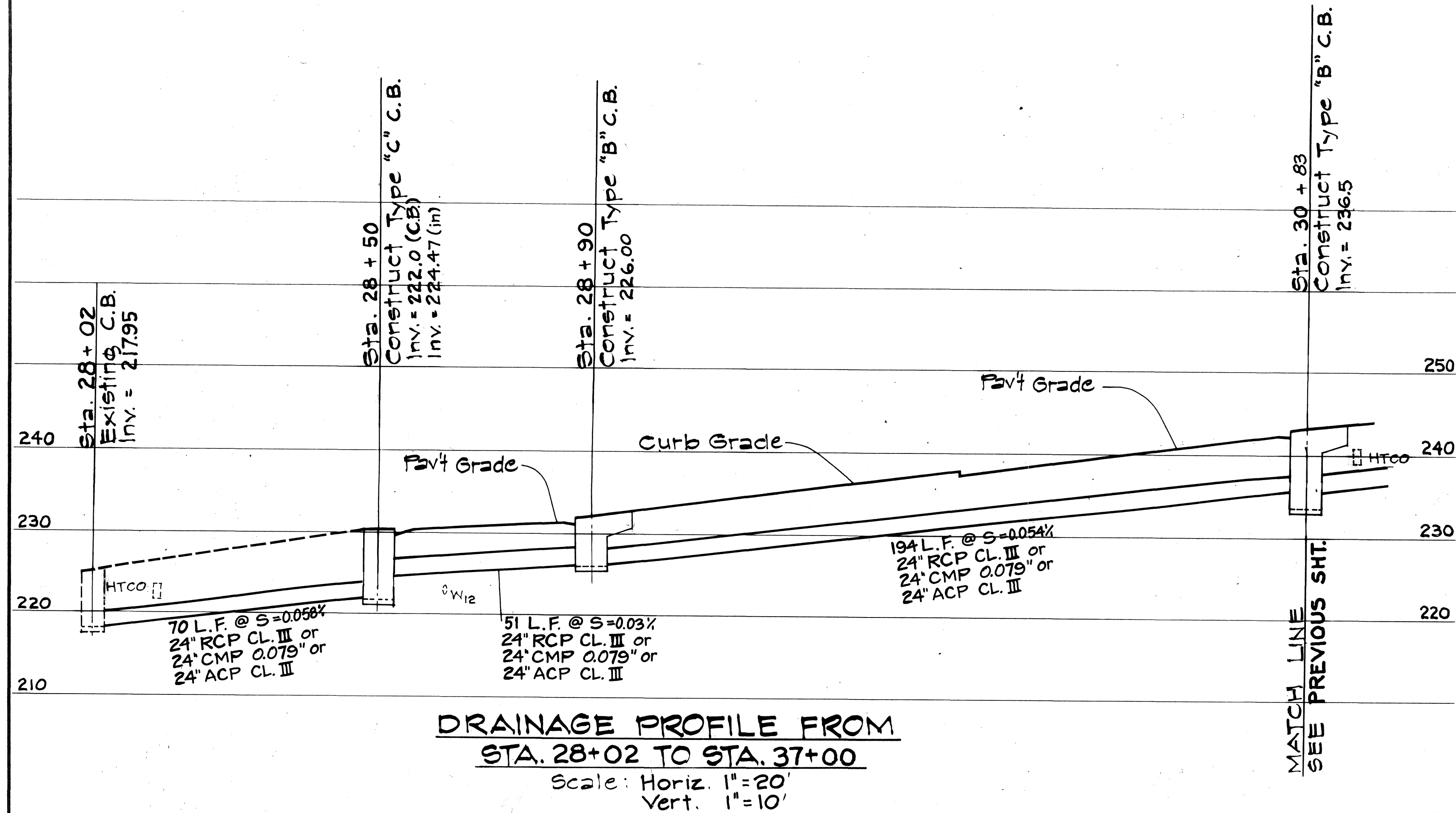
SCALE: As Shown

DATE AUG 1978

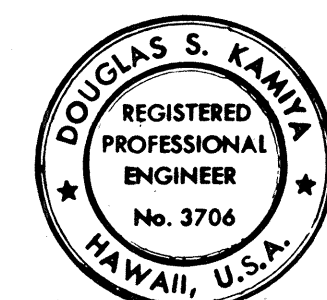
SHEET No. 15 OF 25 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	102	160



NOTE:
DRAINAGE PROFILE STATIONING ARE REFERRED TO SOUTHBOUND BASELINE STATIONS.

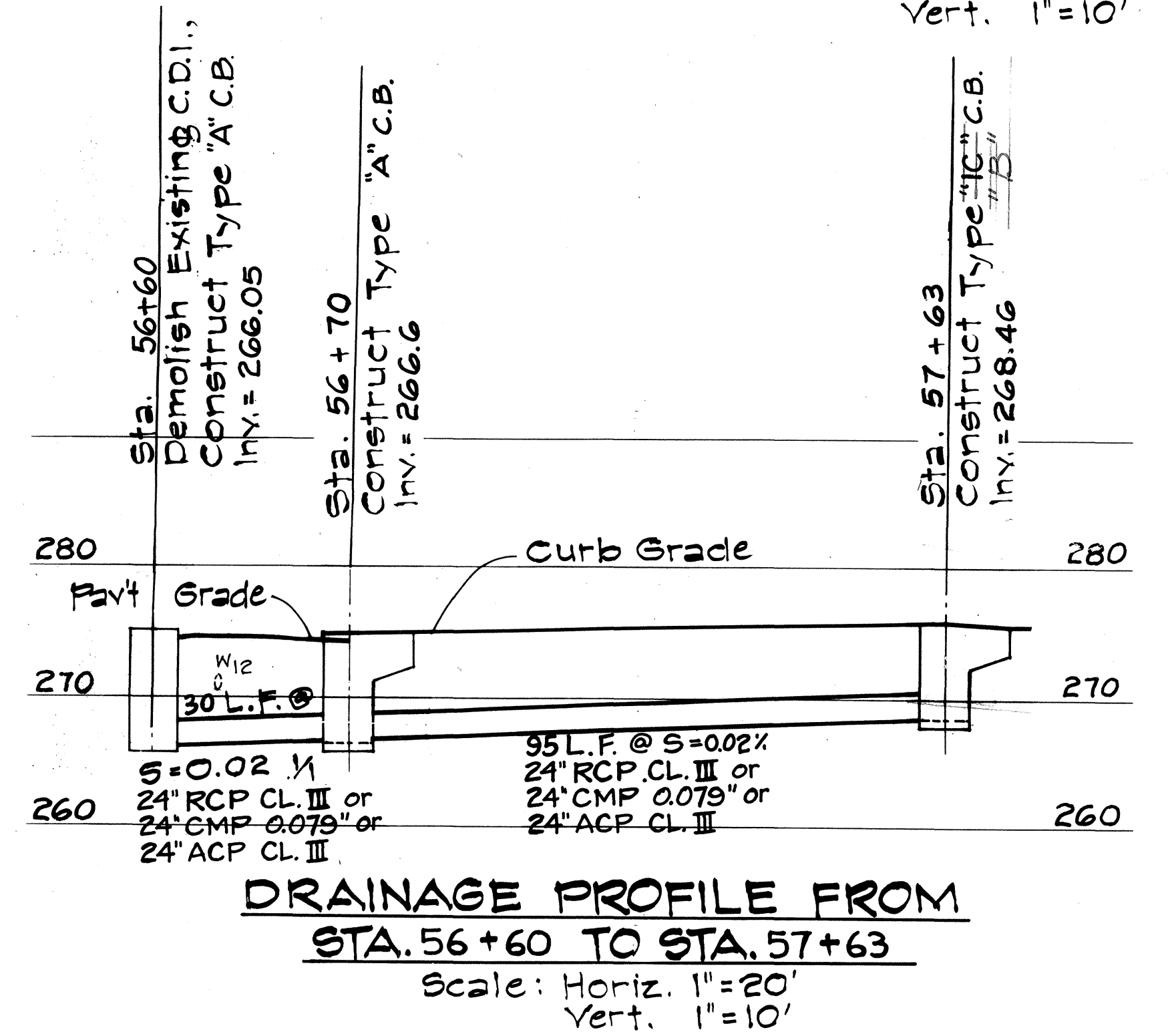
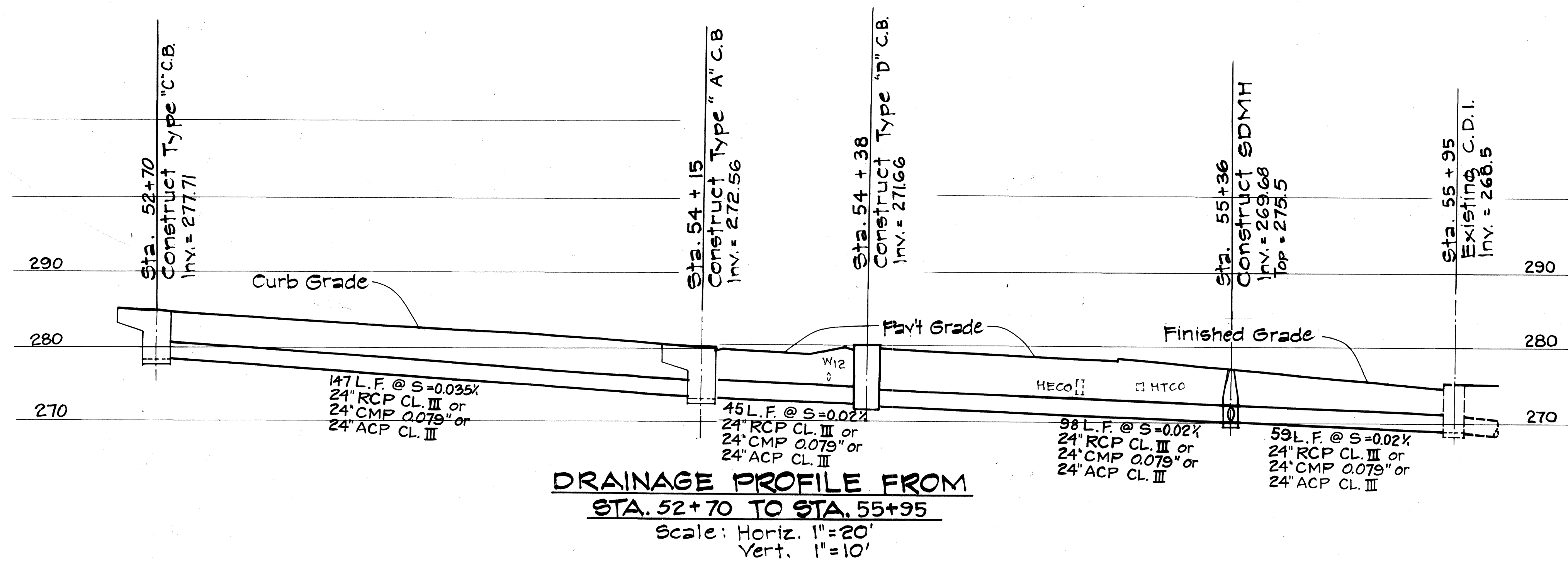
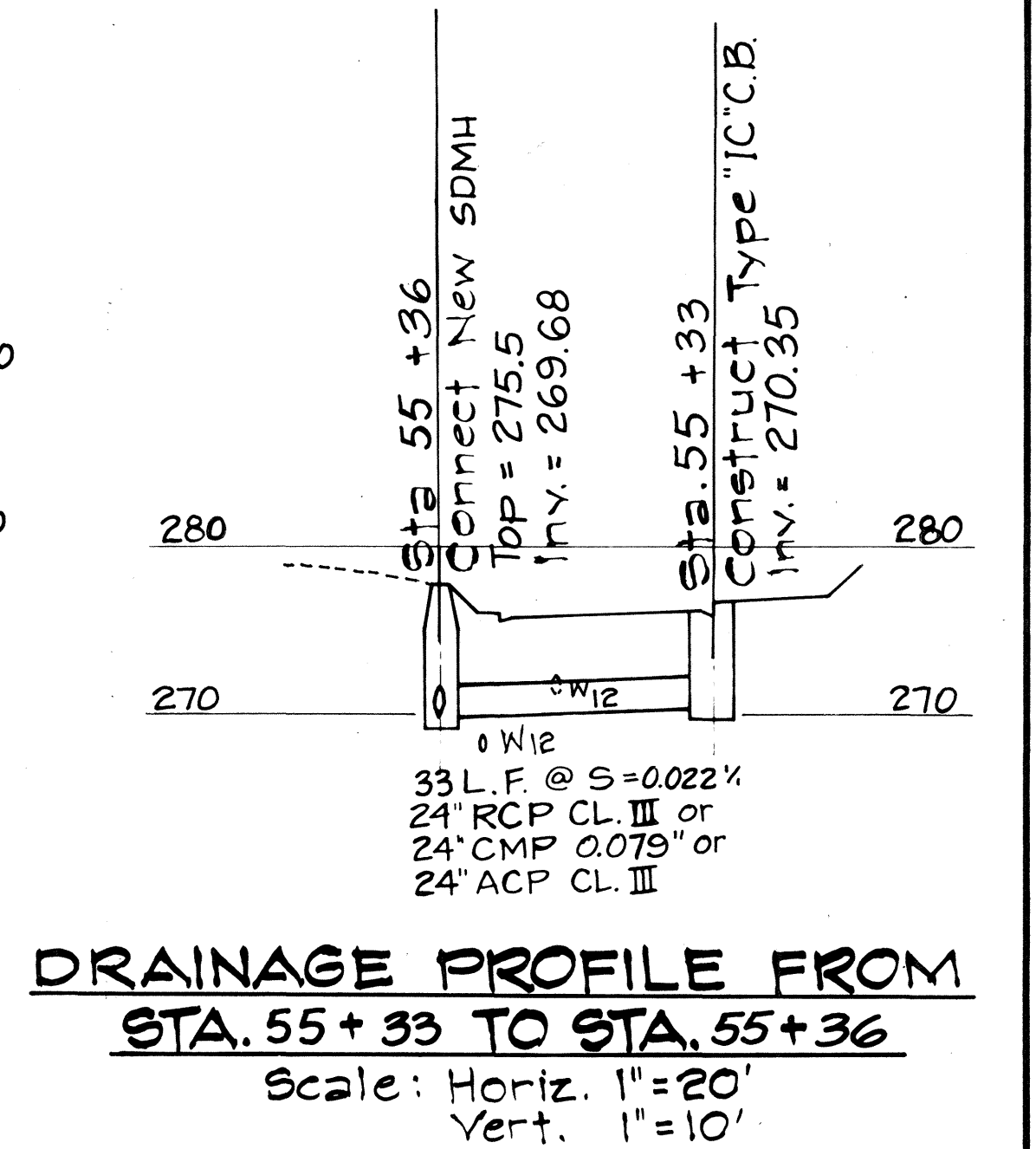
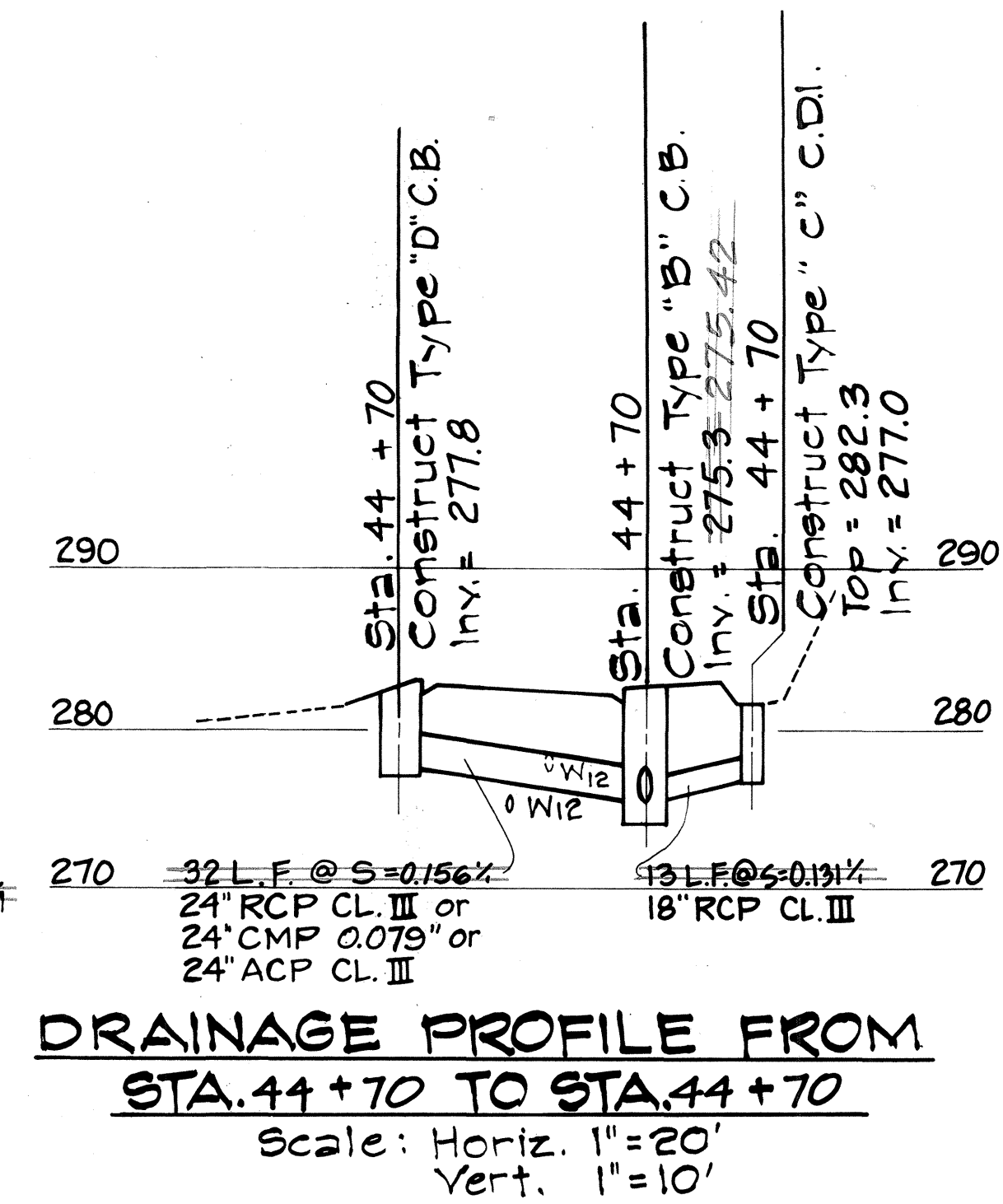
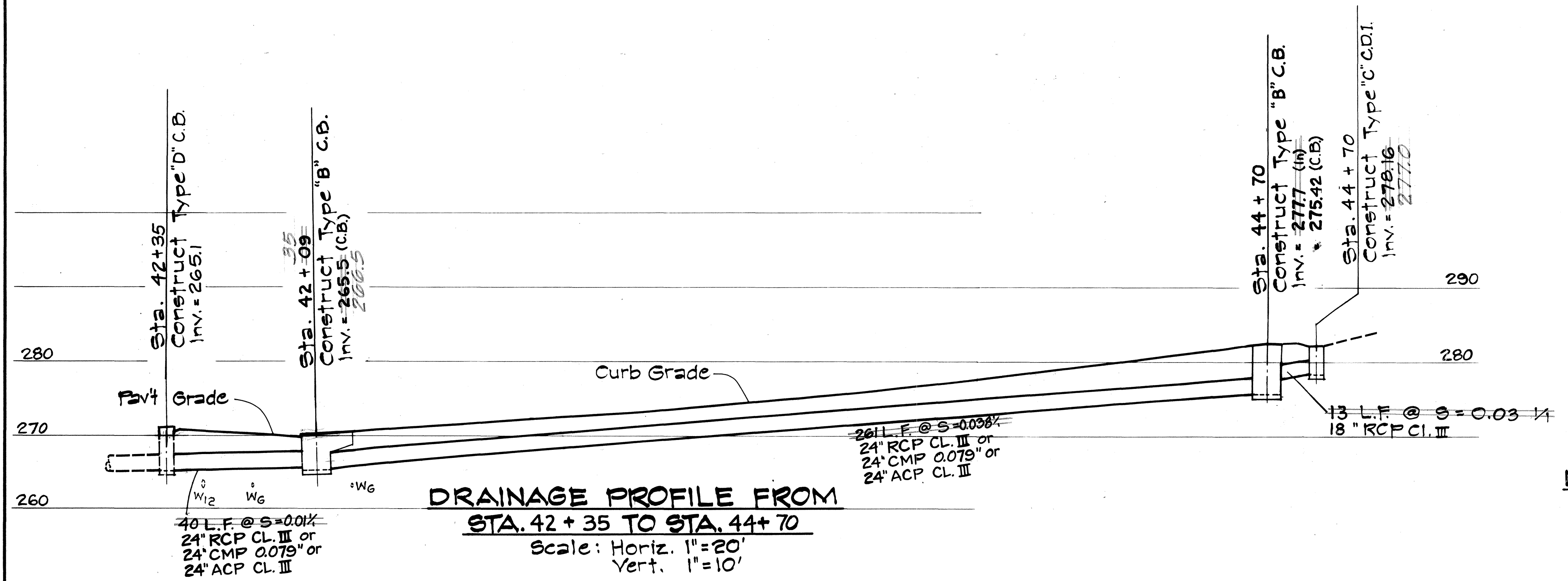


THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Douglas S. Kanaka

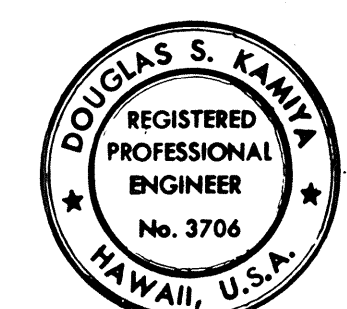
10/23/78	Changed Sta. 39+50 to Sta. 40+80
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION	
DRAINAGE PROFILES	
KAMEHAMEHA HIGHWAY IMPROVEMENT (LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE) PROJECT NO. F-083-1(10)	
SCALE: As Shown	DATE AUG 1978
SHEET No. 16 OF 25 SHEETS	

A111. 10212

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083- (10)	1978	103	160



NOTE:
DRAINAGE PROFILE STATIONING ARE REFERRED TO SOUTHBOUND BASELINE STATIONS.



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Douglas S. Kanika

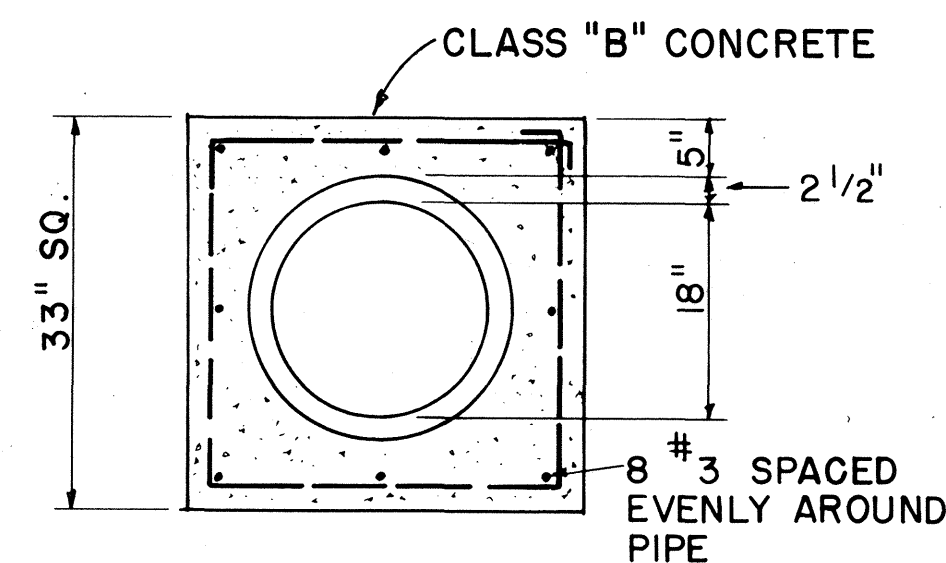
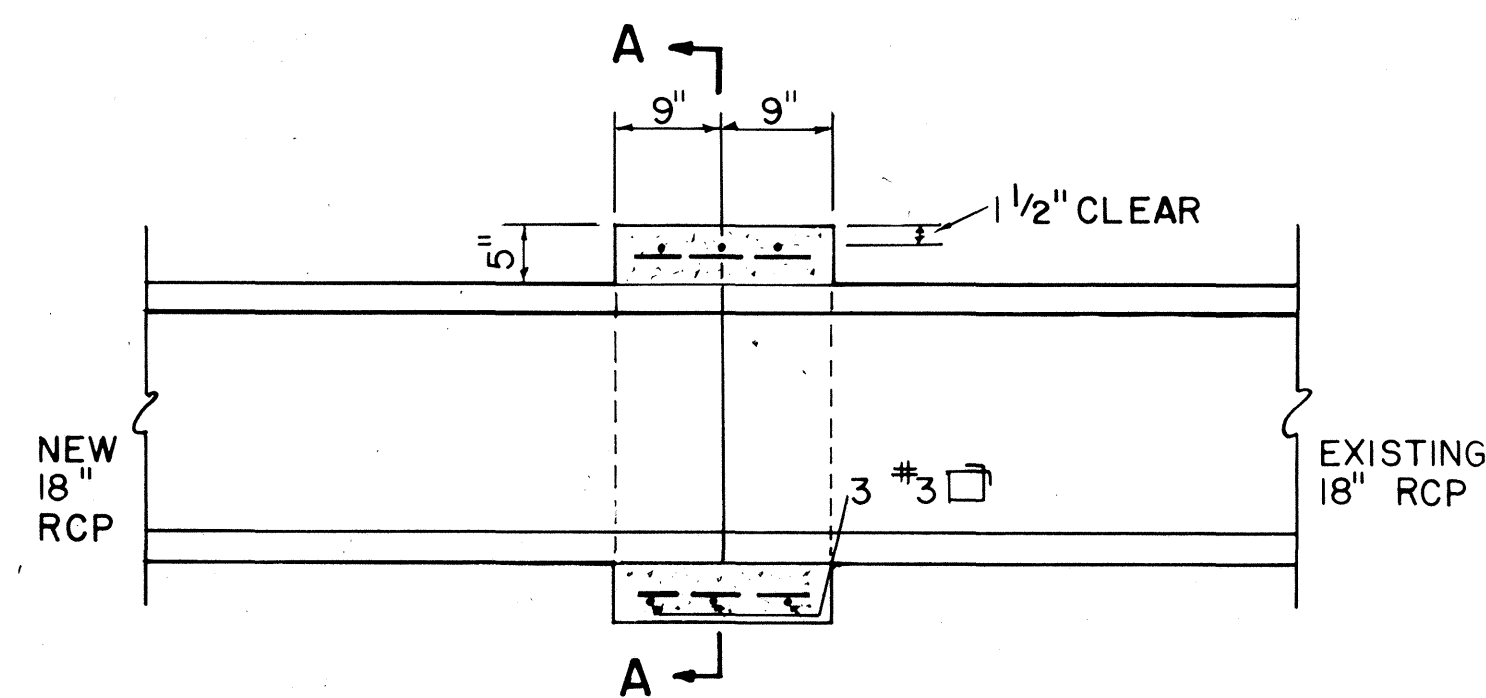
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE PROFILES

KAMEHAMEHA HIGHWAY IMPROVEMENT
(LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE)
PROJECT NO. F-083-1(10)

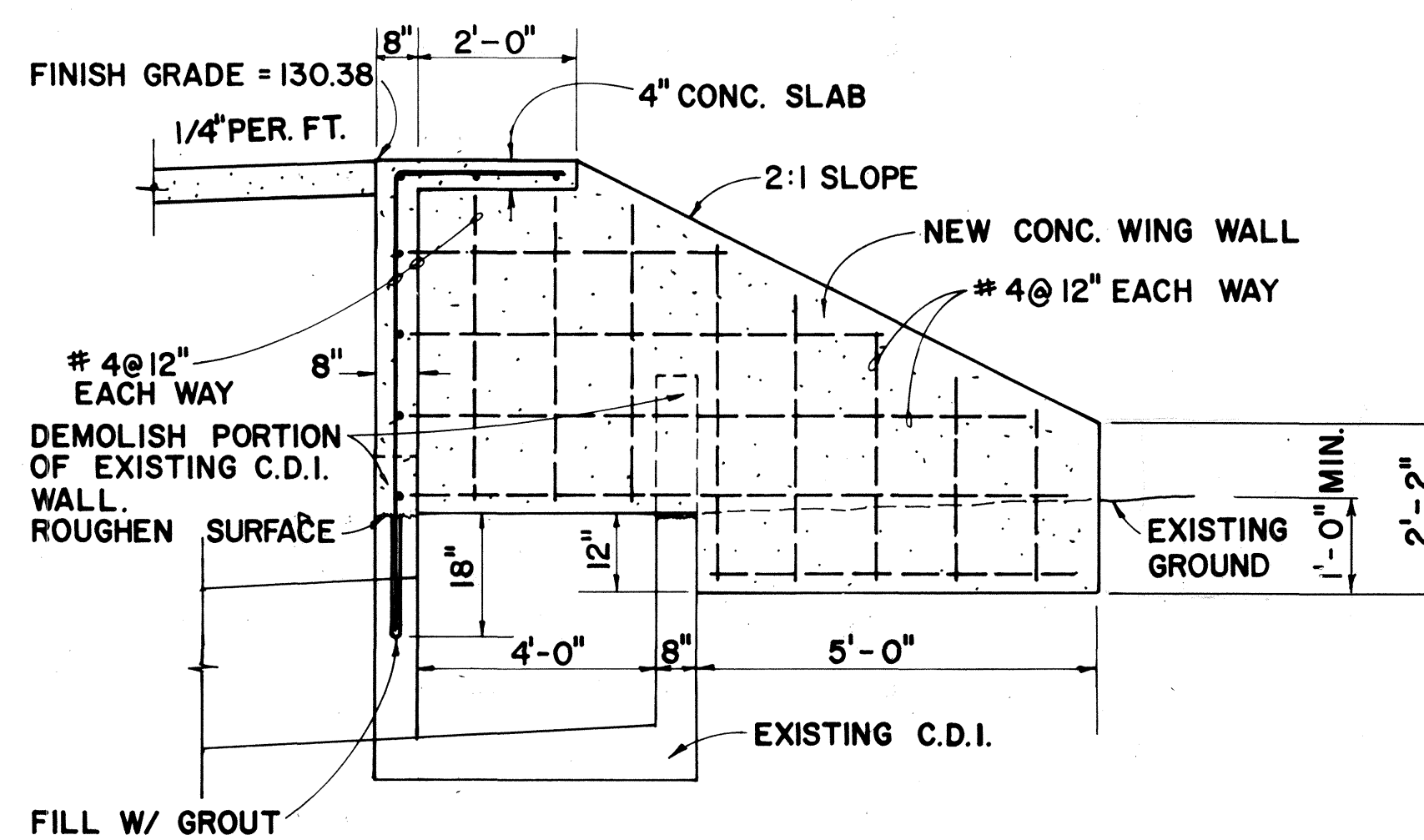
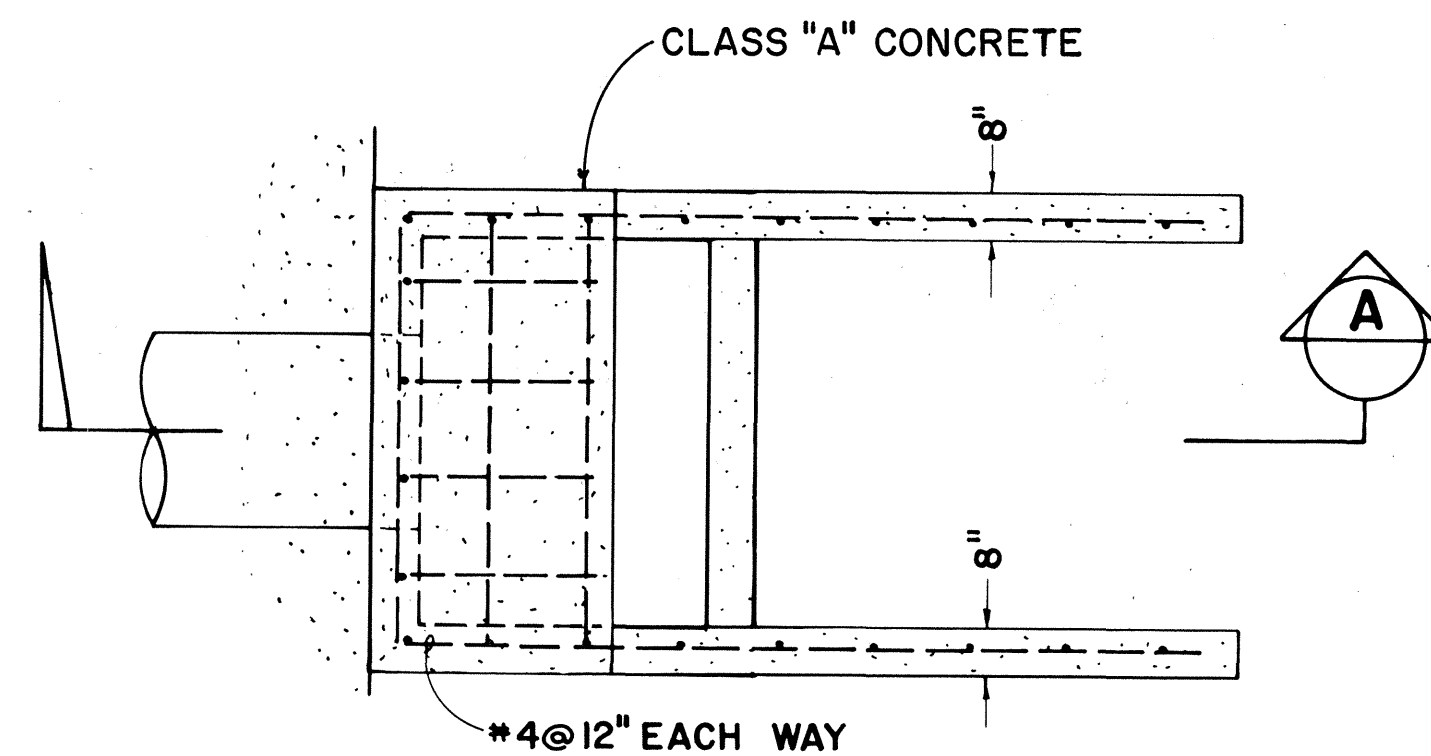
SCALE: As Shown
DATE AUG 1978
SHEET No. 17 OF 25 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	104	160



SECTION A-A

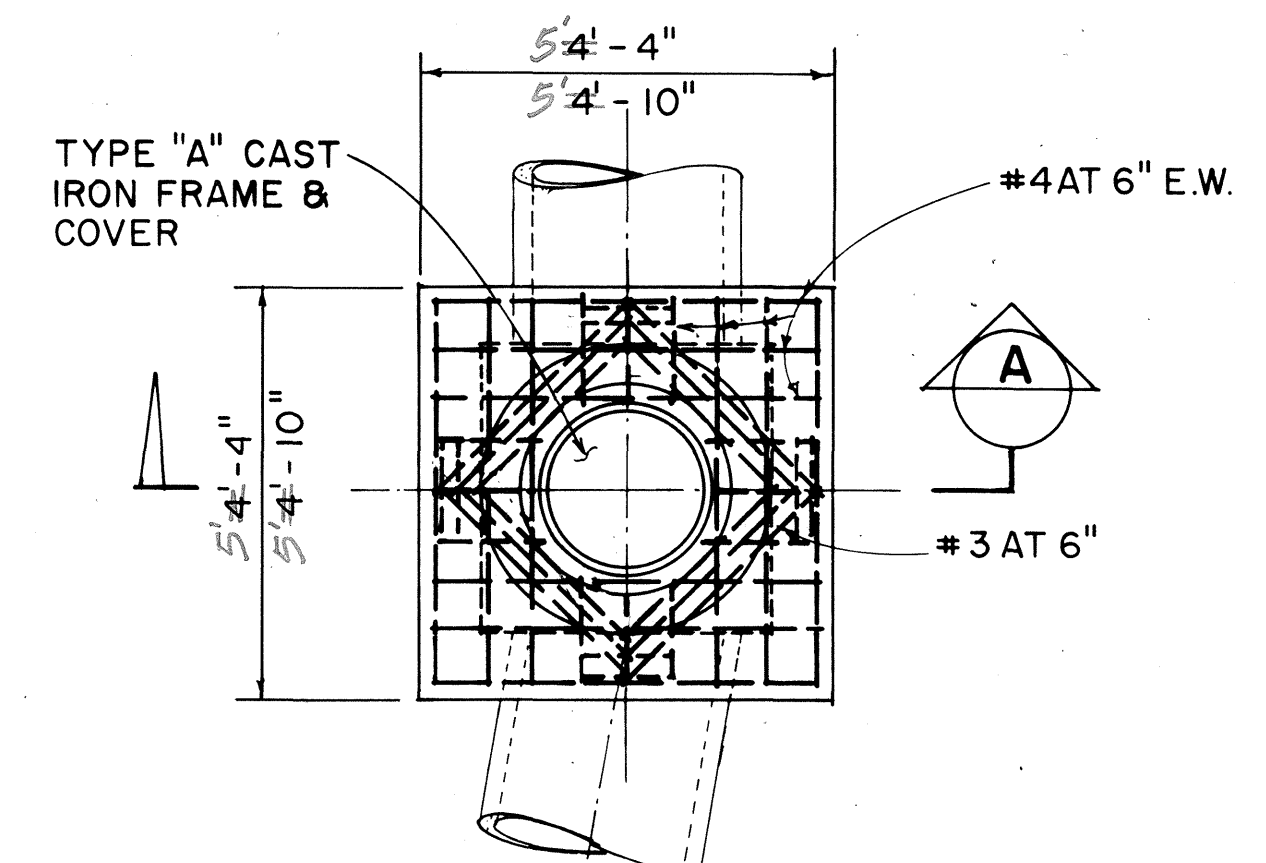
STA. 2 + 37
CONCRETE COLLAR DETAILS
SCALE: 3/4" = 1'-0"



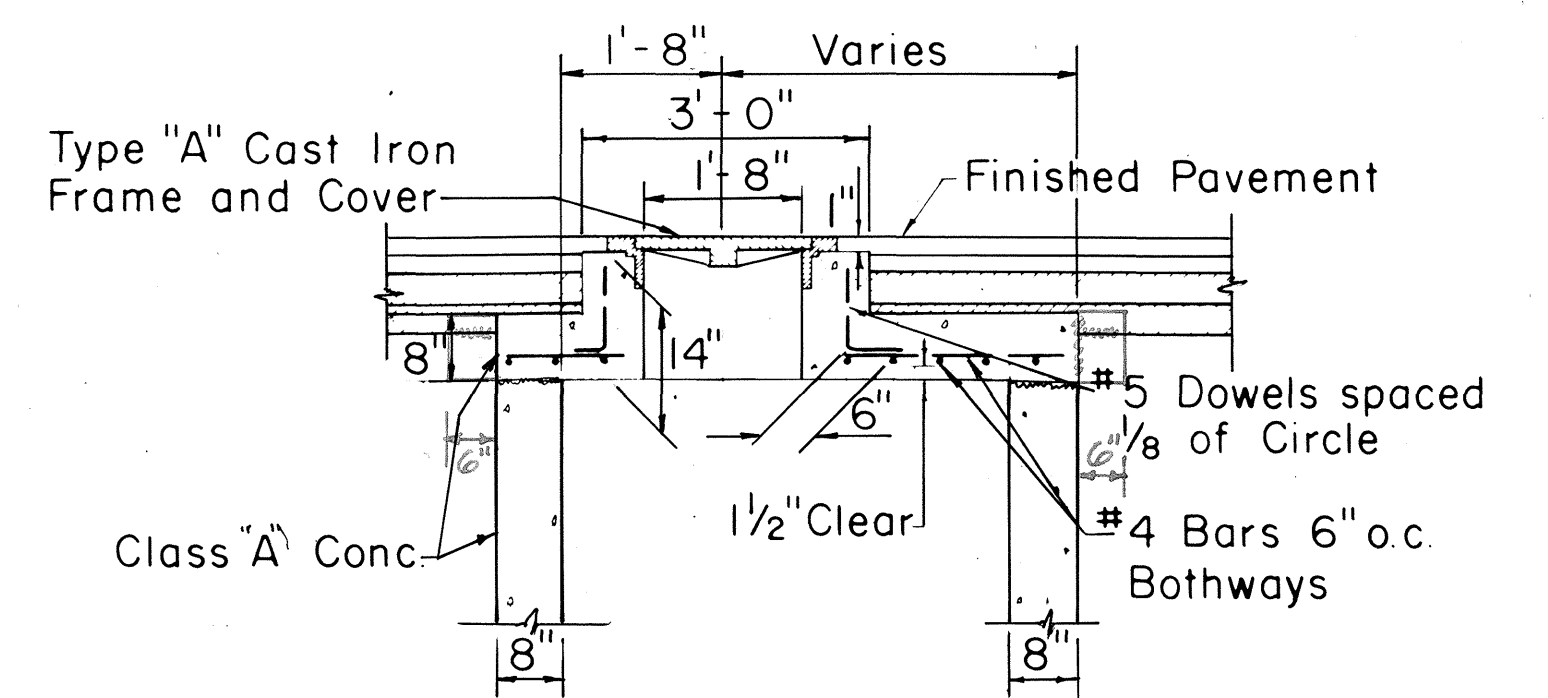
SECTION A

TYPE A

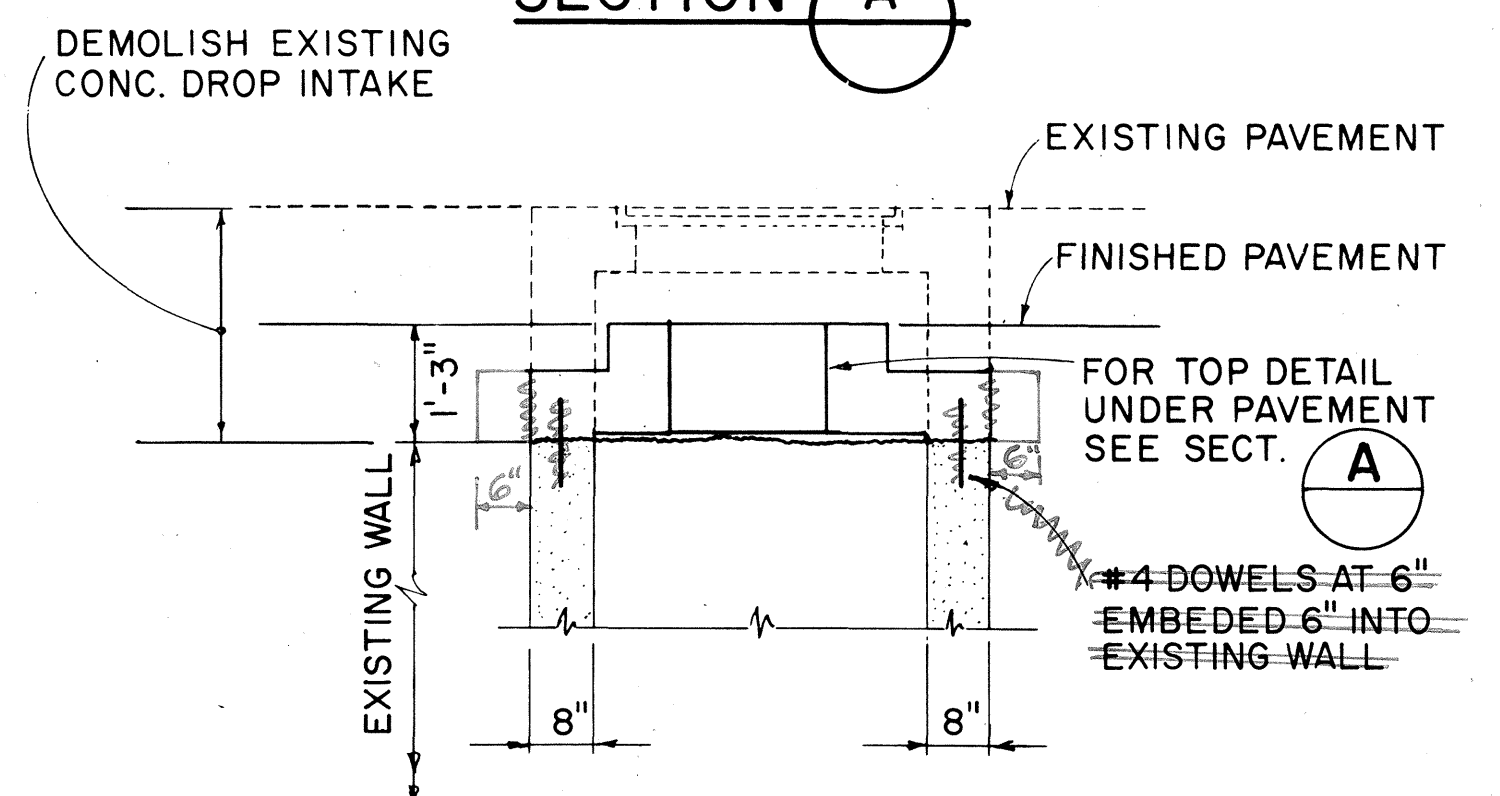
MODIFIED EXISTING C.D.I. AT STA. 8 + 68
NOT TO SCALE



PLAN

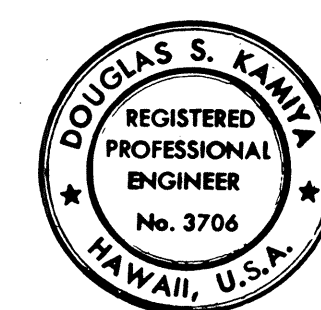


SECTION A



TYPE A

MODIFICATION OF EXISTING CONCRETE
DROP INTAKE TO STORM DRAIN MANHOLE
AT LULUKU RD. STA. 11 + 32 o/s 24' RT.
NOT TO SCALE



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STORM DRAIN DETAILS

KAMEHAMEHA HIGHWAY
IMPROVEMENT
(LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE)
PROJECT NO. F-083-1(10)

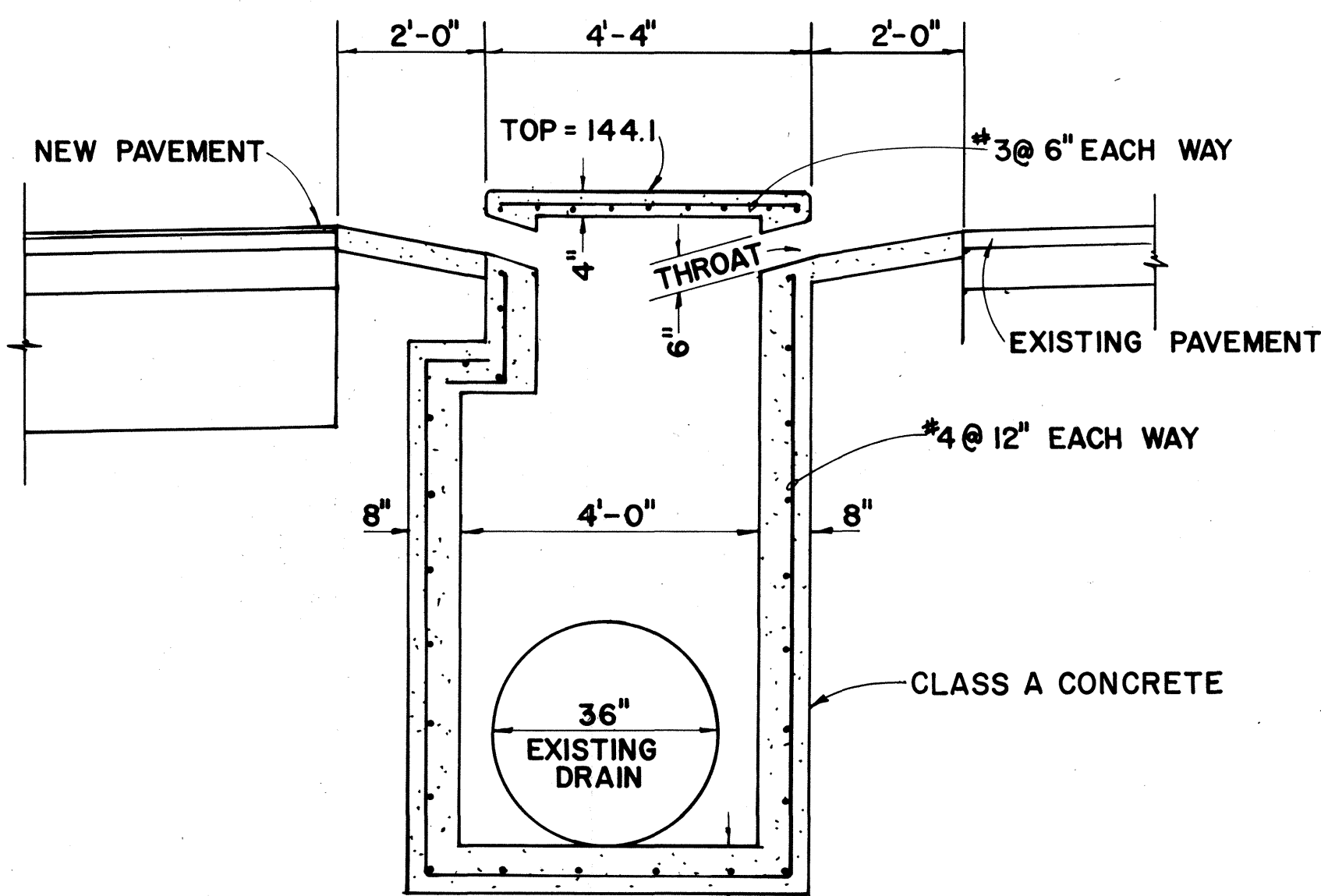
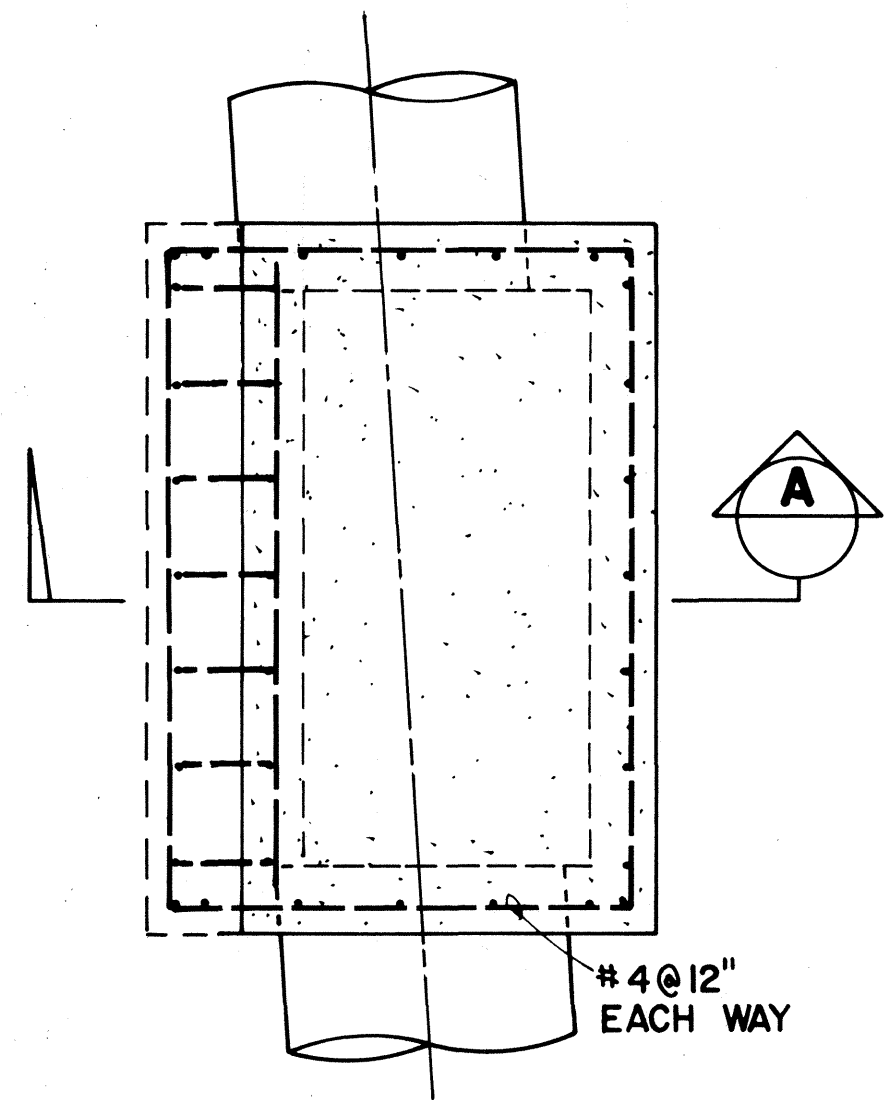
SCALE: As Shown DATE AUG 1978
SHEET No. 18 OF 25 SHEETS

10/24/78	Clarified SDMH & CDI Type, Materials & Dimension.
DATE	REVISION

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Douglas S. Kameha

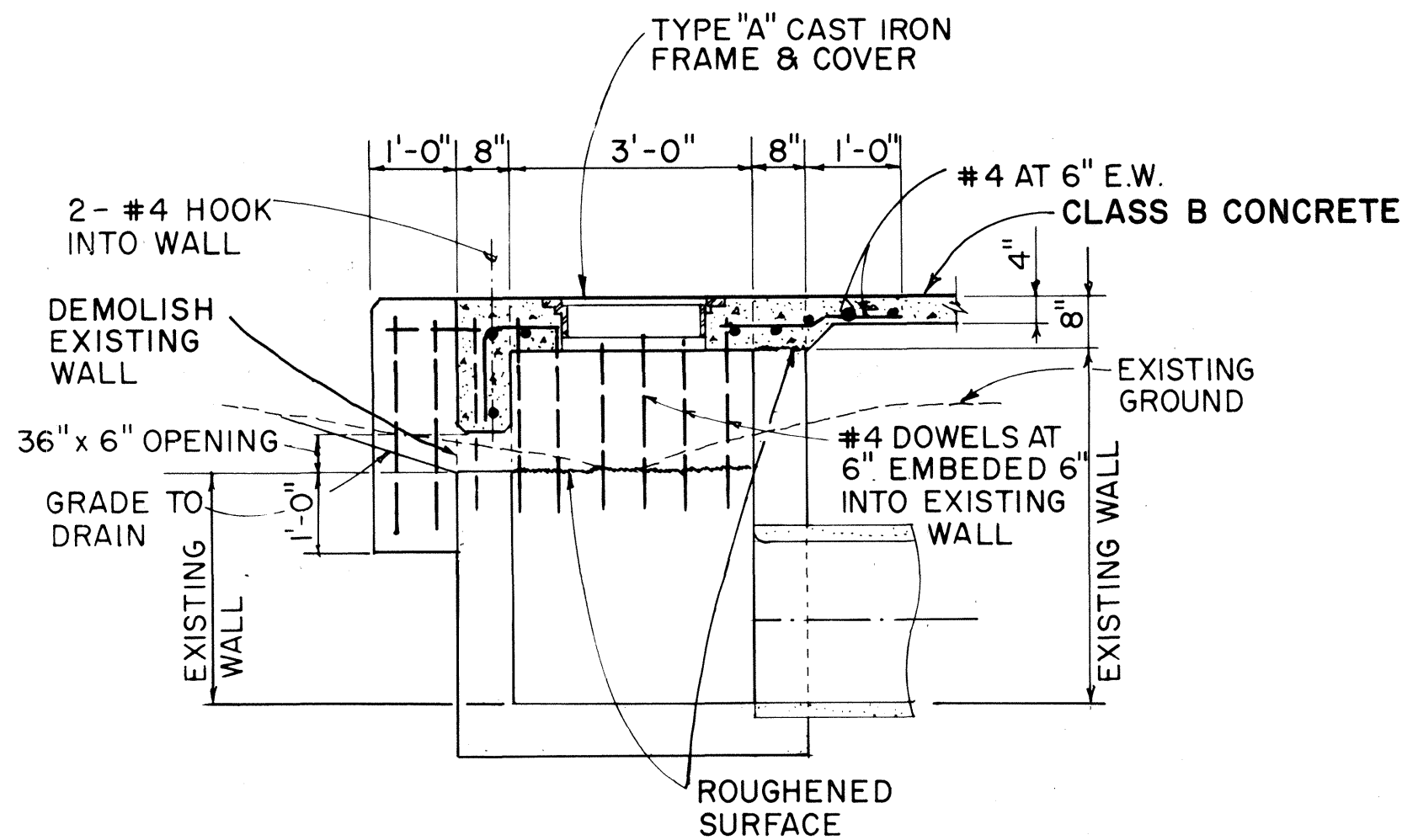
ADD. 104 R

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	105	160

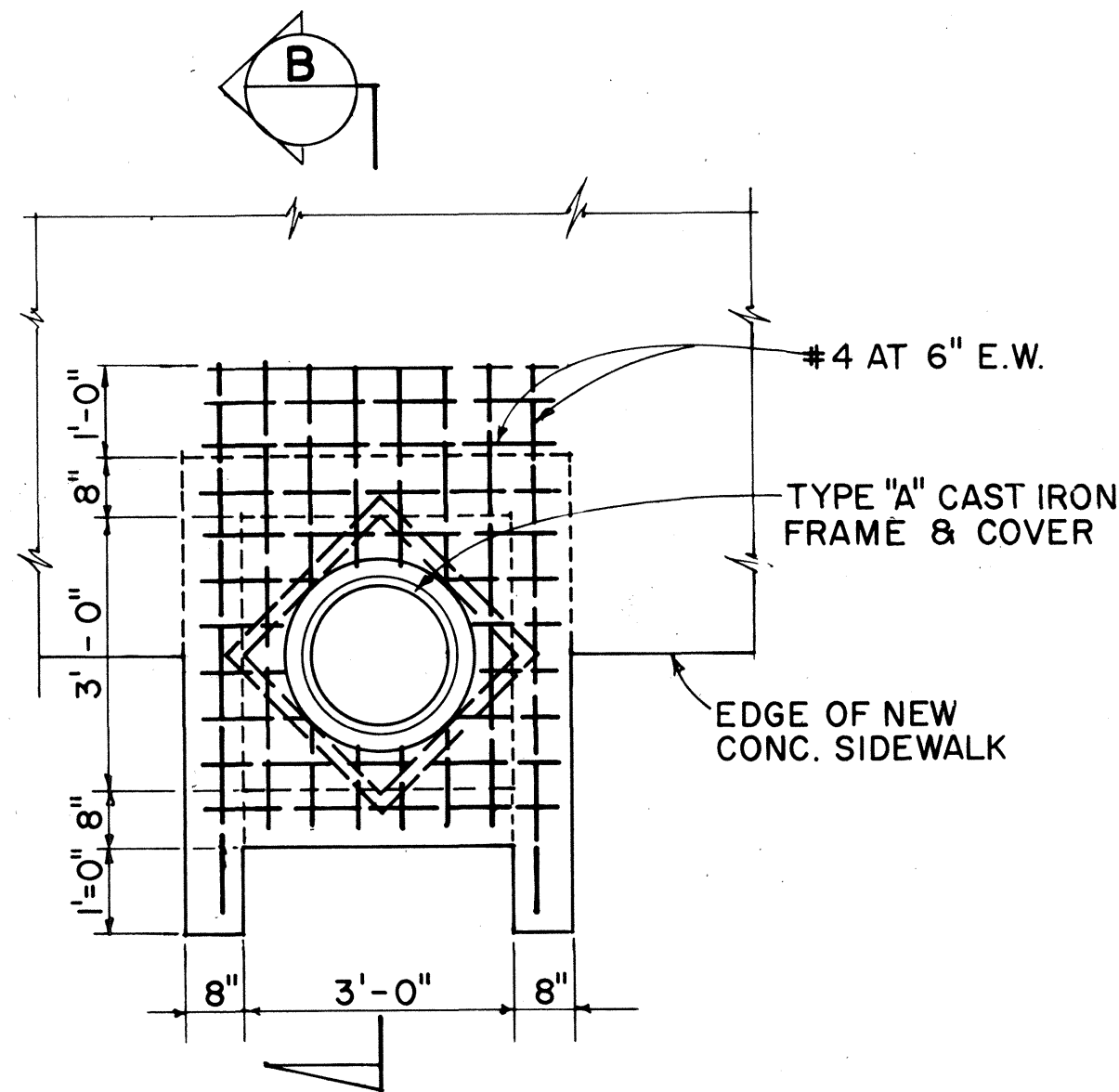


SECTION A
TYPE A

MODIFIED TYPE "D" C.B. AT STA. 11+96
NOT TO SCALE

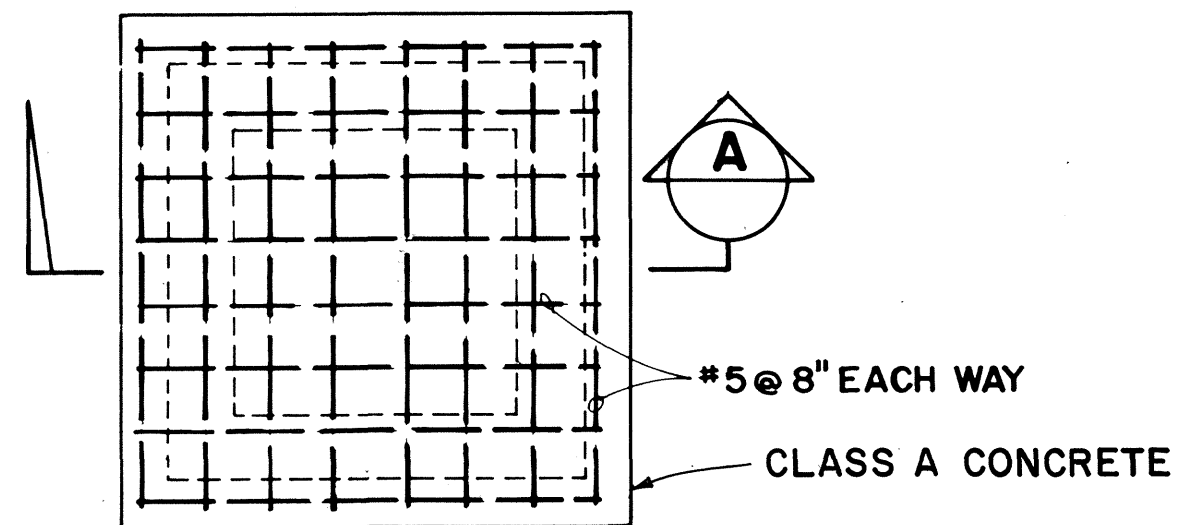


TYPE B
SECTION B
SCALE: 1/2" = 1'-0"

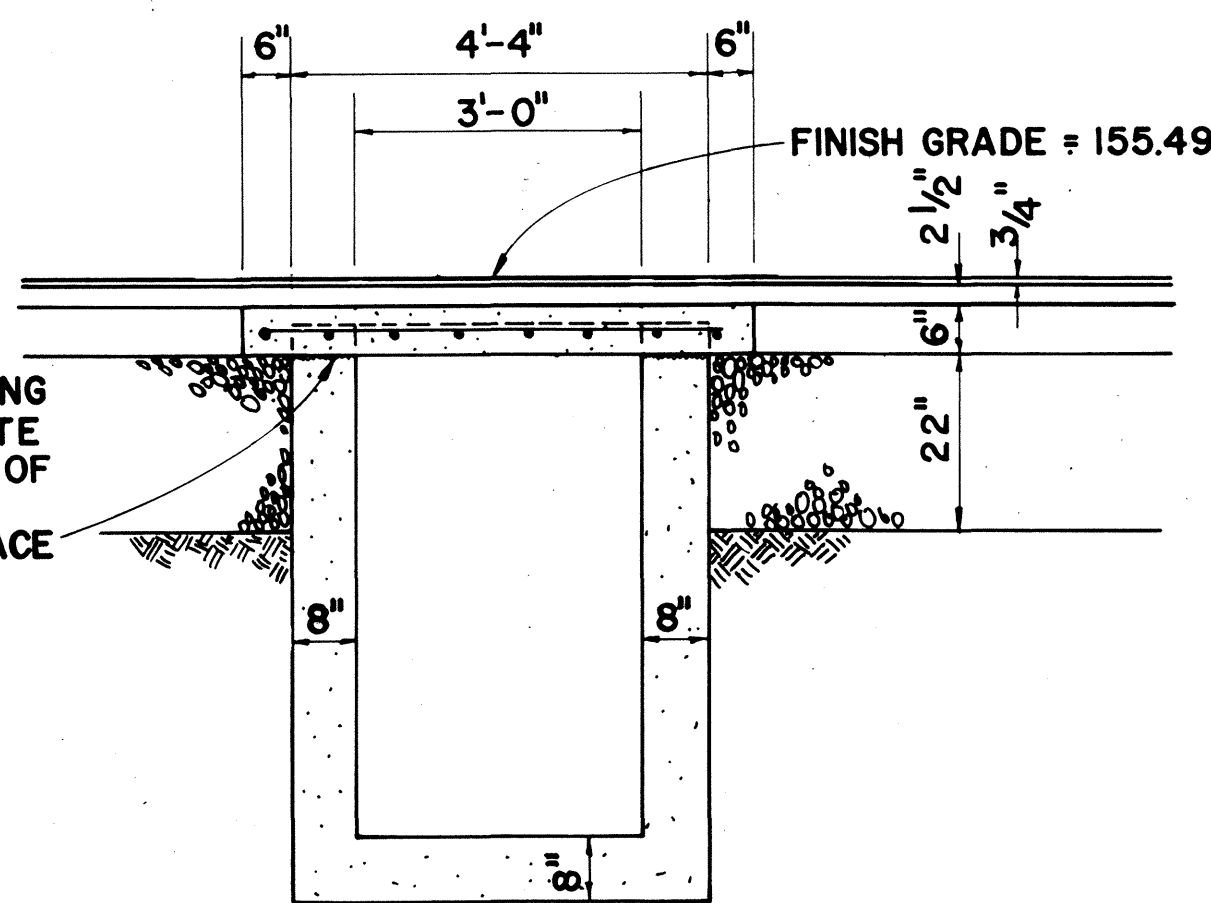


PLAN
SCALE: 1/2" = 1'-0"

MODIFICATION OF EXISTING
CONCRETE DROP INTAKE
AT STA. 16+02 o/s 27' RT.



PLAN
TYPE A

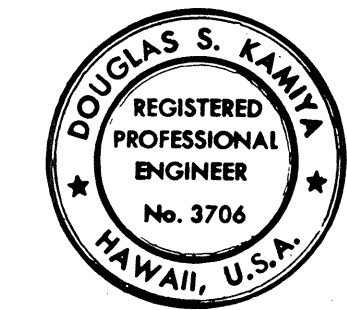


SECTION A

MODIFIED EXISTING C.B. AT STA. 16+06
NOT TO SCALE

SURVEY PLATTED BY	DATE
DRAWN BY	
TRACED BY	
NOTED BY	
CHECKED BY	
ORIGINAL PLAN	
NO. 1	

10/24/78	Clarified SDMH & CDI Type & Materials
DATE	REVISION

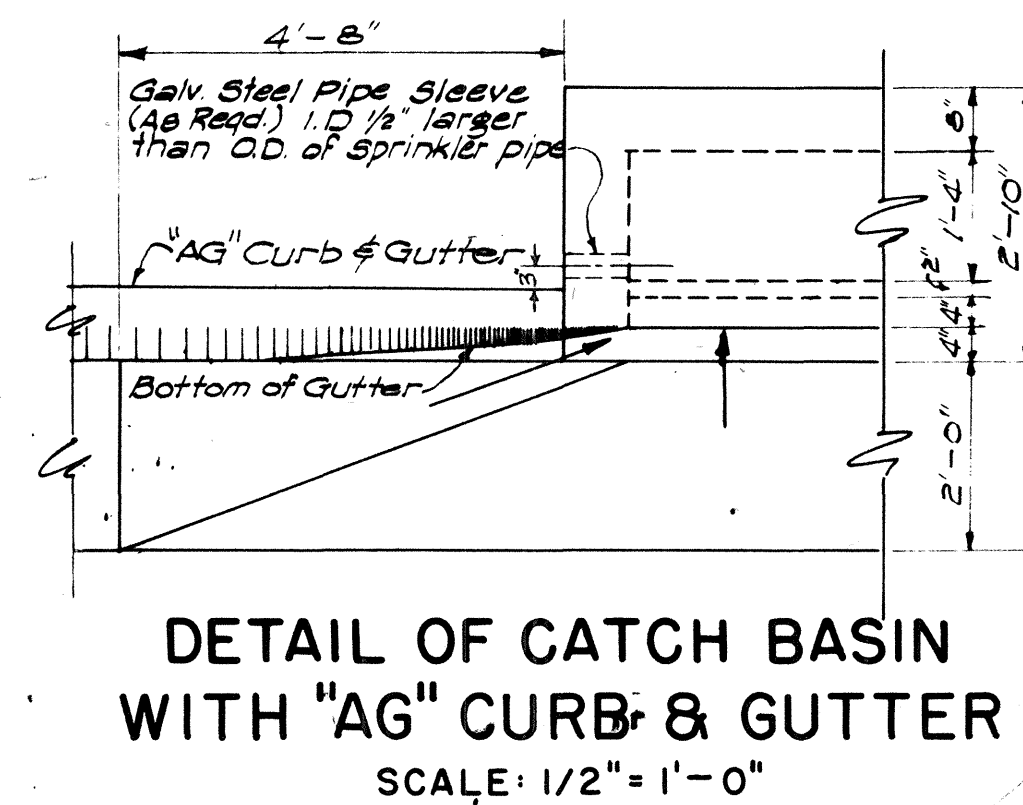
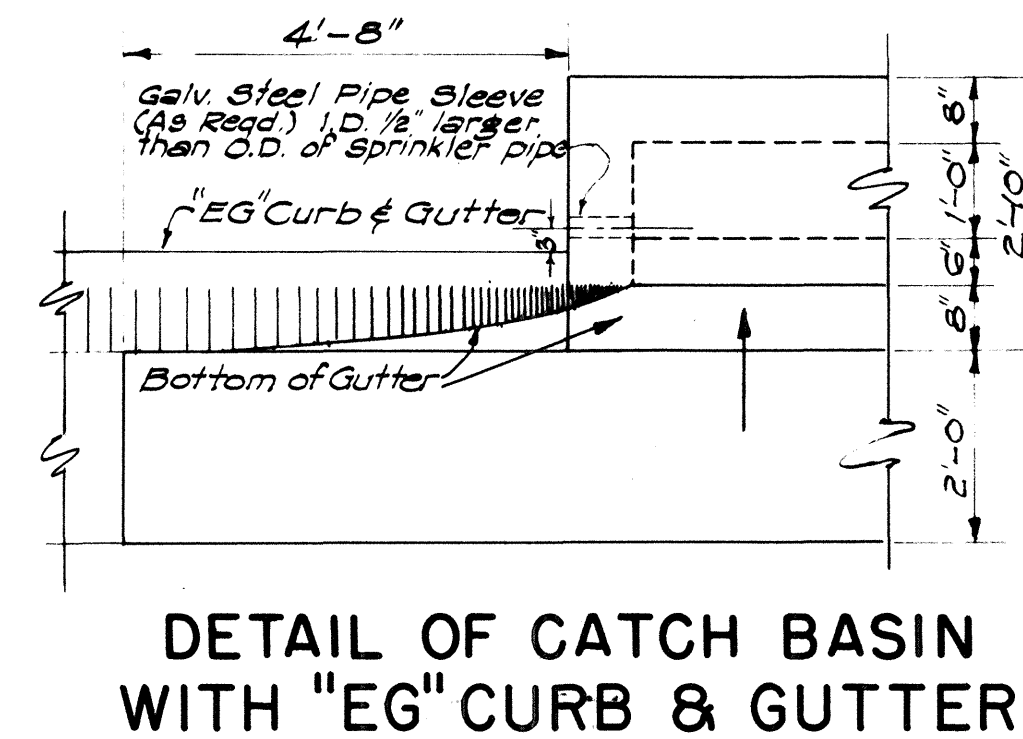
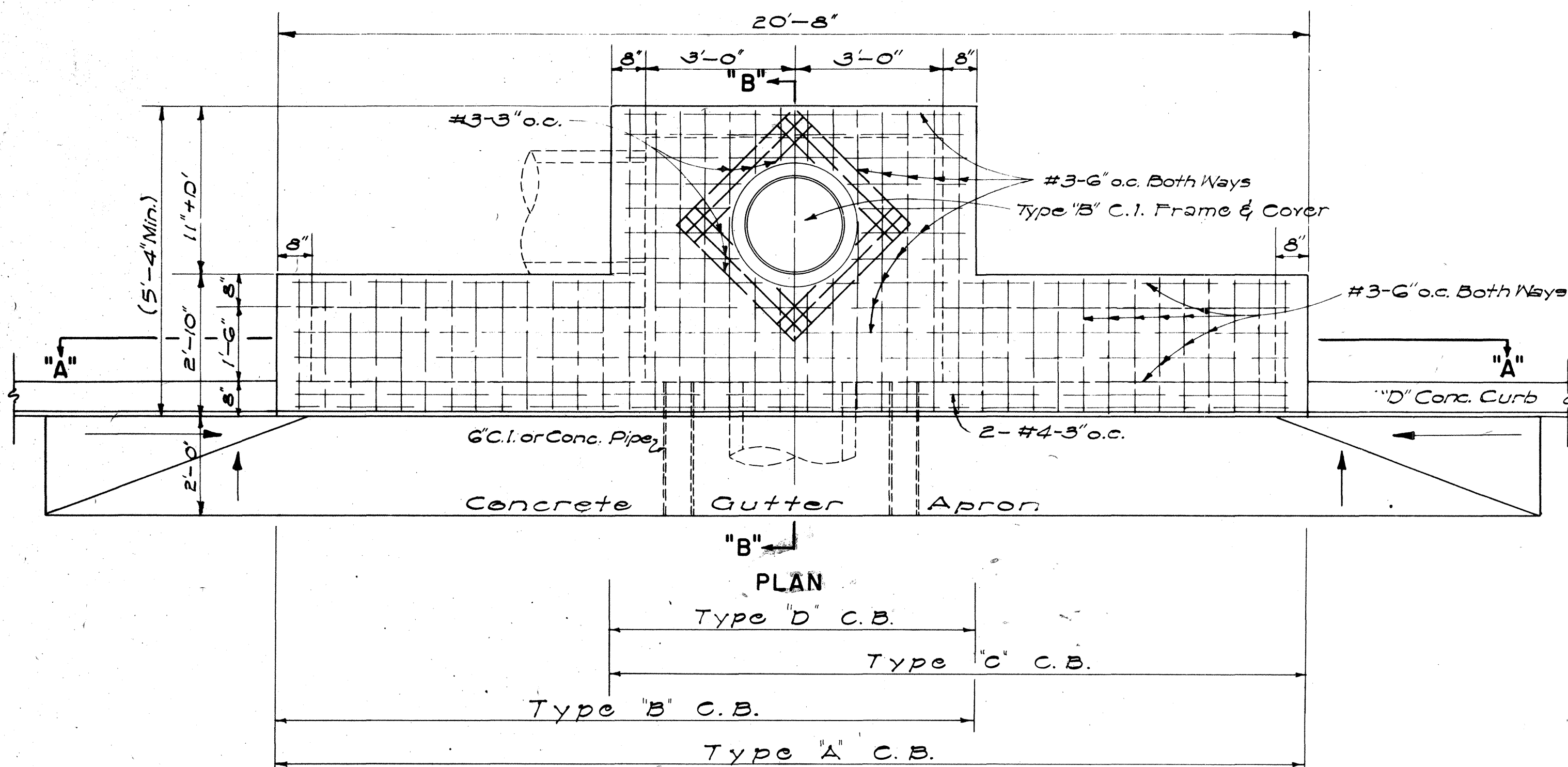
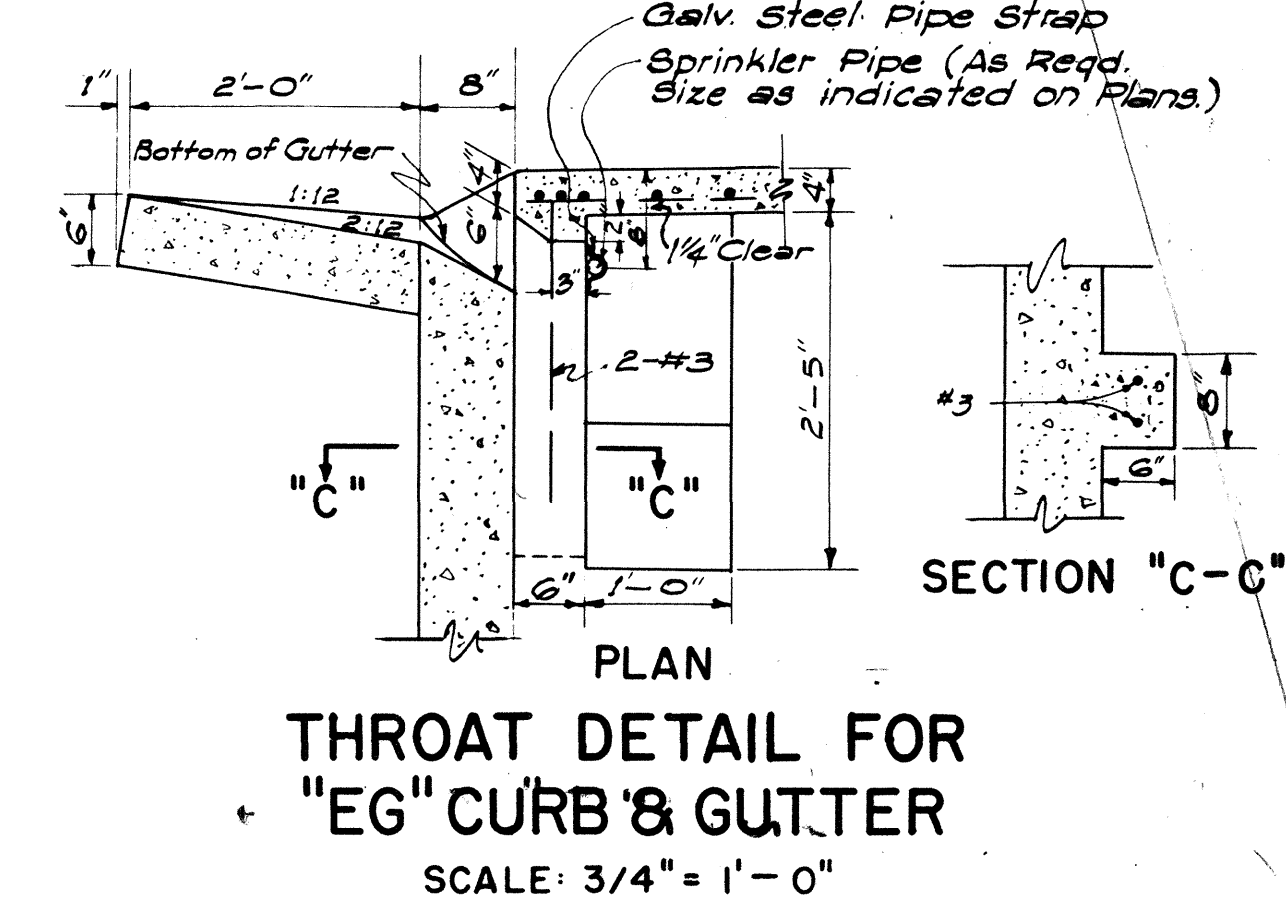
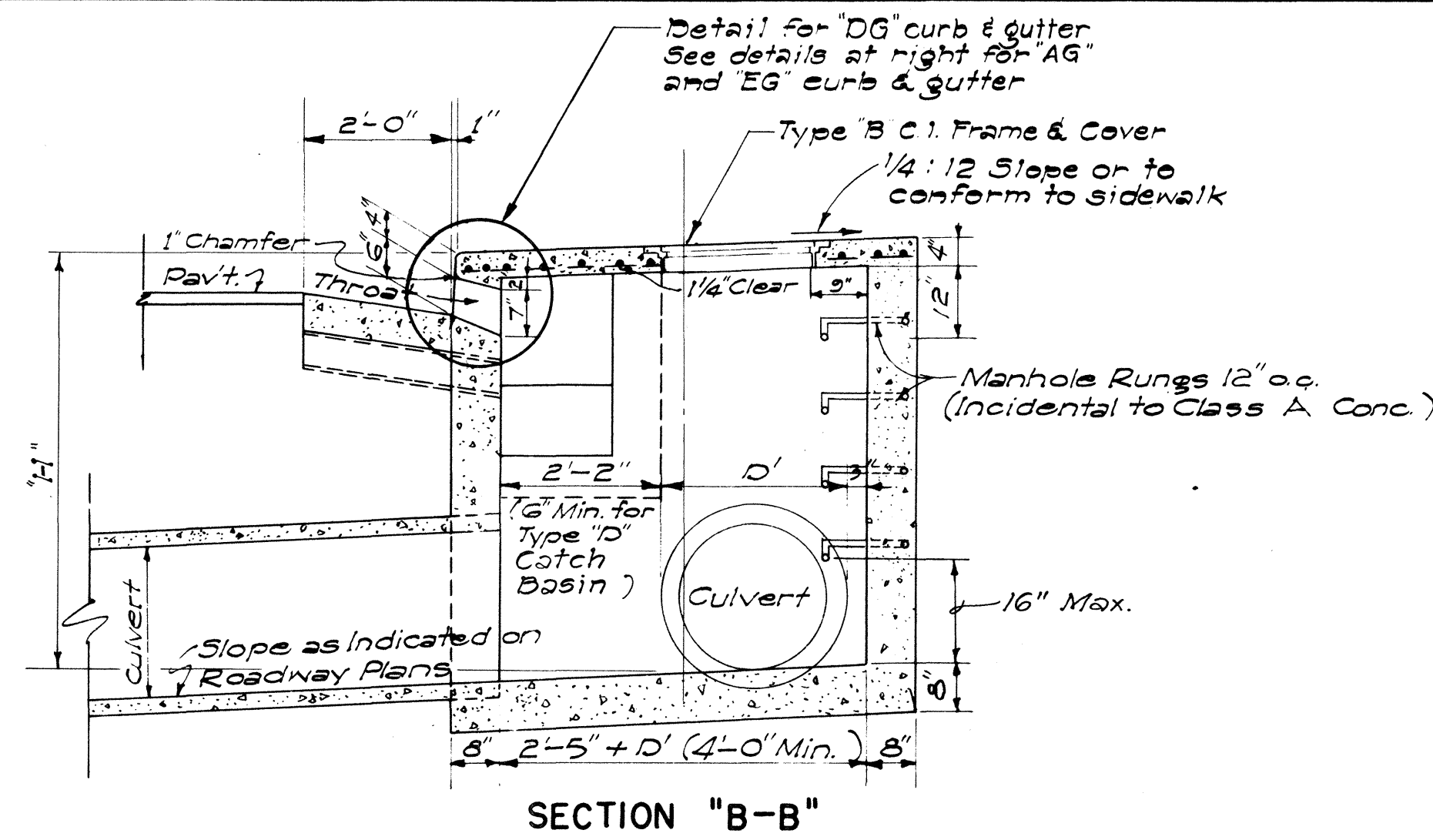
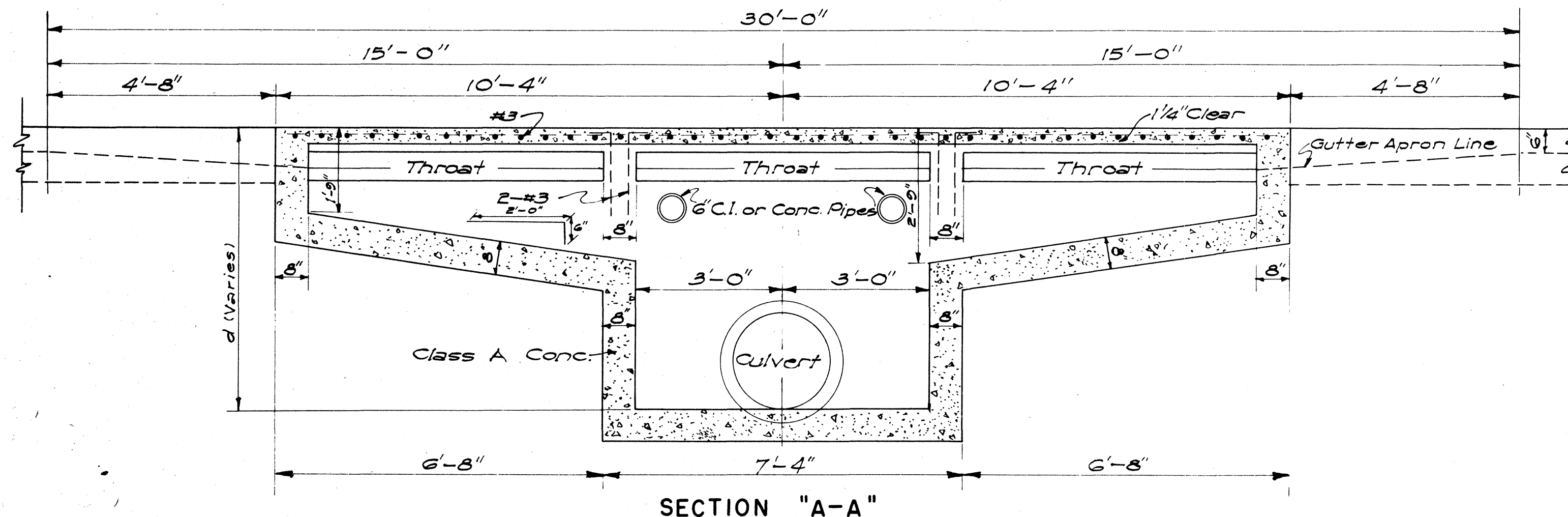


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Douglas S. Kameha

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION	
STORM DRAIN DETAILS	
KAMEHAMEHA HIGHWAY IMPROVEMENT (LIKELIKE HIGHWAY TO KOOLAU VIEW DRIVE) PROJECT NO. F-083-1(10)	
SCALE: As Shown	DATE AUG 1978
SHEET No. 19 OF 25 SHEETS	

2/17/59

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	106	160



DETAILS OF TYPES "A", "B", "C" AND "D" CATCH BASINS
SCALE: 1/2" = 1'-0"

GENERAL NOTES

- Quantities based on $d = 5.75'$ and $D' = 30'$.
- Quantities do not include concrete for Gutter Apron.
- The Contractor shall install two 6" Cast Iron or Concrete Pipes as incidental to Class A Concrete for Construction Drainage. The Engineer shall determine the exact location in the field.
- Culvert shall leave C.B. from any position and any direction indicated by plans or ordered by the Engineer. Culvert may both enter and leave C.B. so that C.B. will also act as Manhole.
- The Contractor shall install Galvanized Steel Pipe Sleeves and Straps as incidental to Sprinkler System.
- The type of curb and/or gutter (Type 1, 2, 3, etc.) shall conform to the type specified on the roadway plans.
- 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. Type 'B' Cast Iron Frame and Cover and Manhole Rungs may be placed at any location as ordered by the Engineer.

ESTIMATED QUANTITIES

Type	Class A Conc	Struct. Exc.	Reinf. Steel	Gutter Length
"A"	7.5 cy.	24.7 cy.	145 lb.	30'-0"
"B"	6.0 cy.	21.5 cy.	108 lb.	23'-4"
"C"	6.0 cy.	21.5 cy.	108 lb.	23'-4"
"D"	4.9 cy.	16.5 cy.	77 lb.	16'-8"

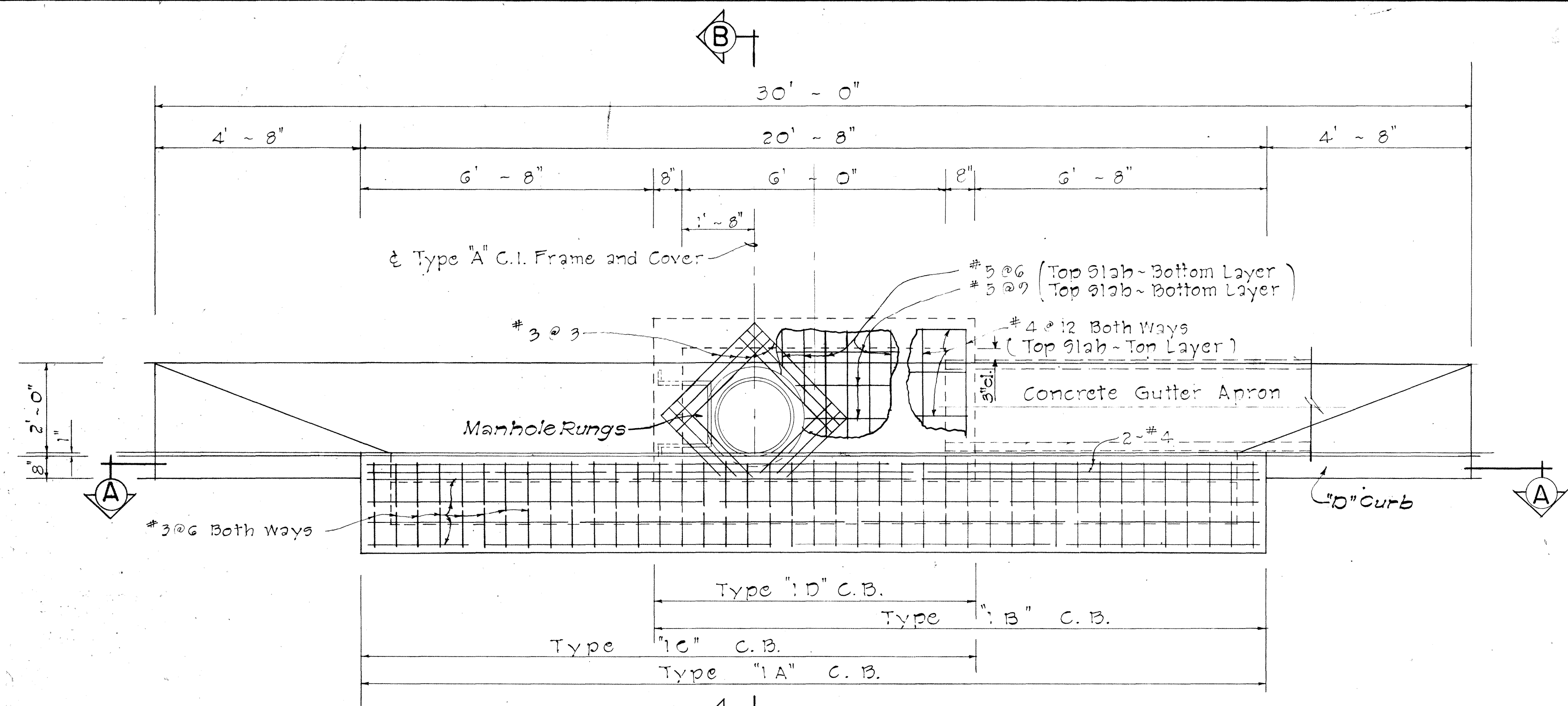
APPROVAL RECOMMENDED:
HYDRAULIC DESIGN ENGINEER
DATE: 12-17-69

APPROVED:
ASSISTANT CHIEF, ENGINEERING
DATE: 12-17-69

NO.	REVISION	APPROVED BY	DATE
1	Spacing on Manhole Rungs to conform to OSHA.	H.T.	1-21-75

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CATCH BASINS
Scale: As Noted
Date: July, 1969
SHEET NO 20 OF 25 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	107	160

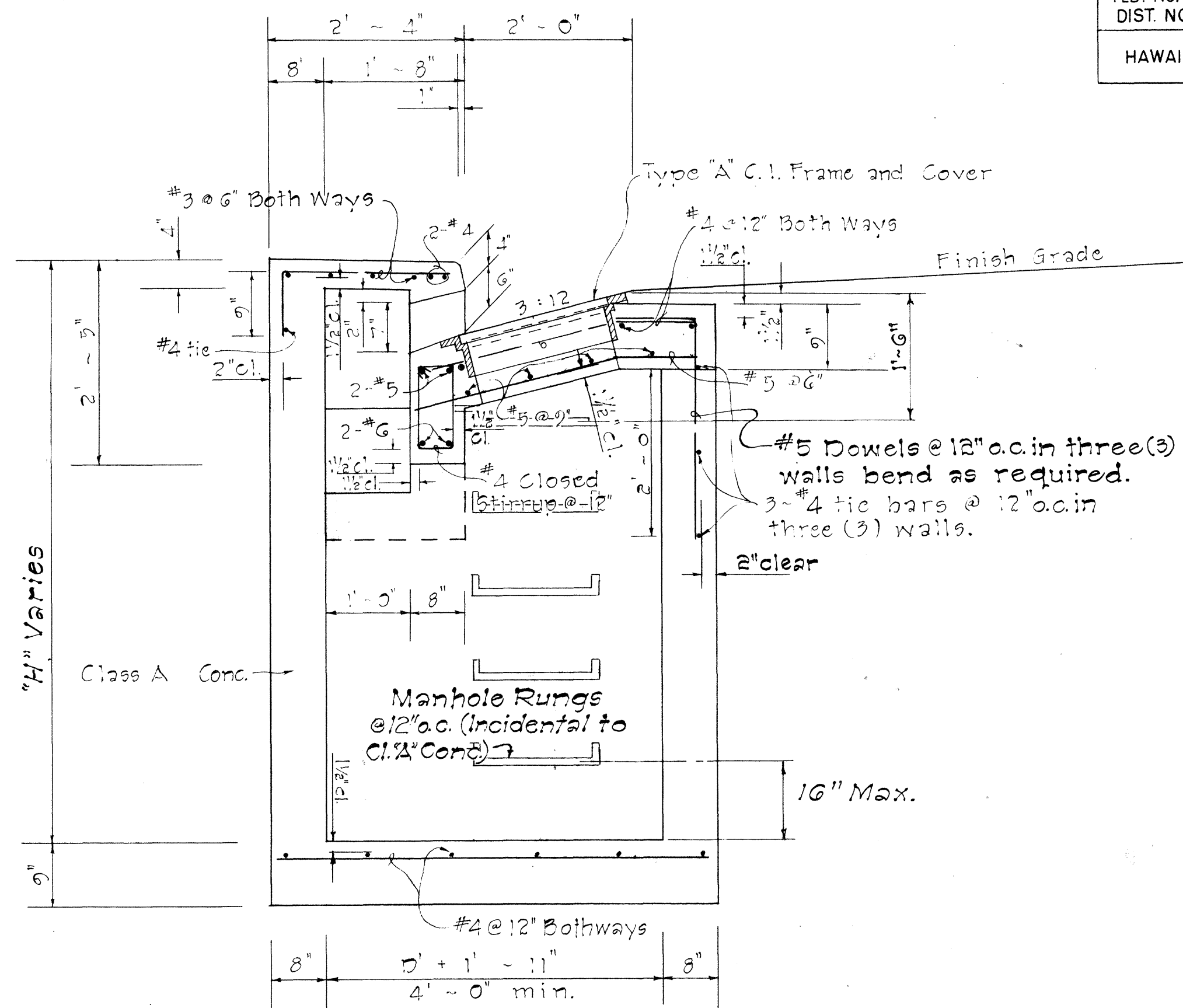


GENERAL NOTES

- Culvert shall enter and leave C.B. from any position and in the direction indicated by the plans or ordered by the Engineer.
- B shall be the maximum outside dimension of the culvert at the C.B. wall.
- The type of curb and/or gutter (Type 1, 2, 3, etc.) shall conform to the type specified on the roadway plans.
- 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. Type "A" C.I. Frame & Cover and Manhole Rungs may be placed at any location as ordered by the Engineer.

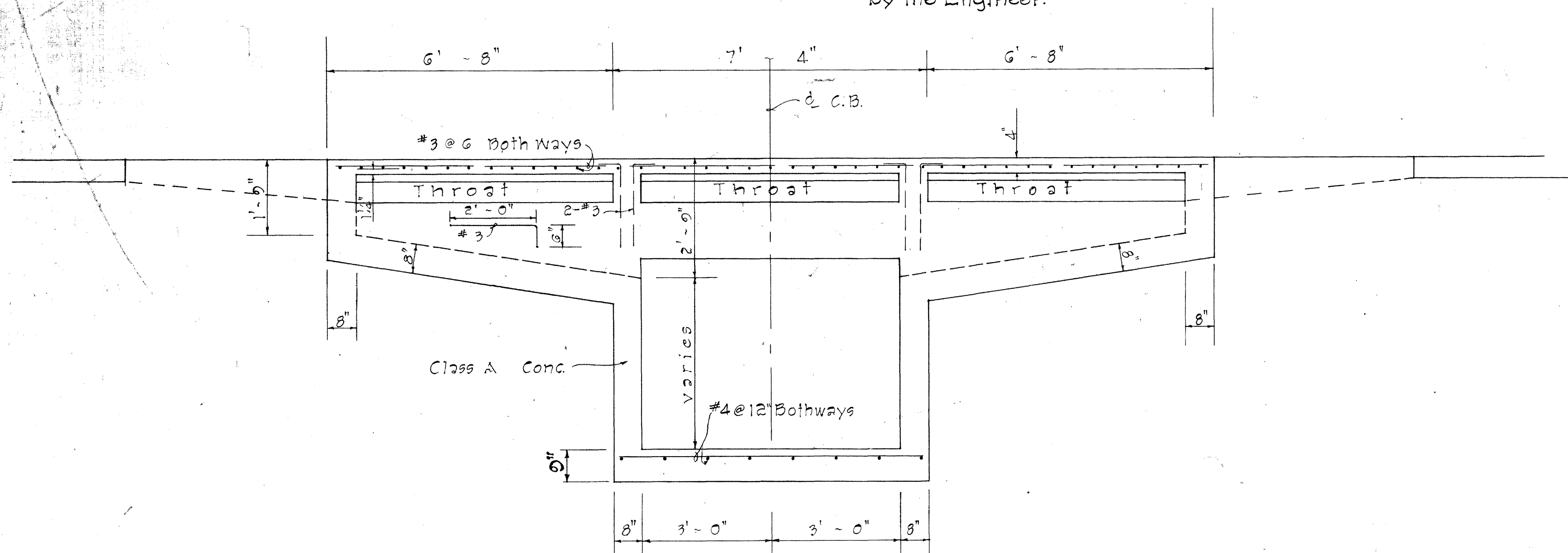
PLAN

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



SECTION "B-B"

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



SECTION "A-A"

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

DETAILS OF TYPE "IA", "IB", "IC" AND "ID" CATCH BASIN

APPROVAL RECOMMENDED:

P. Nakano
HYDRAULIC DESIGN ENGINEER - 12-17-69
DATE

APPROVED:

W. S. S. S.
ASSISTANT CHIEF, ENGINEERING - 12-17-69
DATE

NO.	REVISION	APPROVED BY	DATE
1	Spacing on Manhole Rungs to conform to OSHA.	HT.	1-21-75

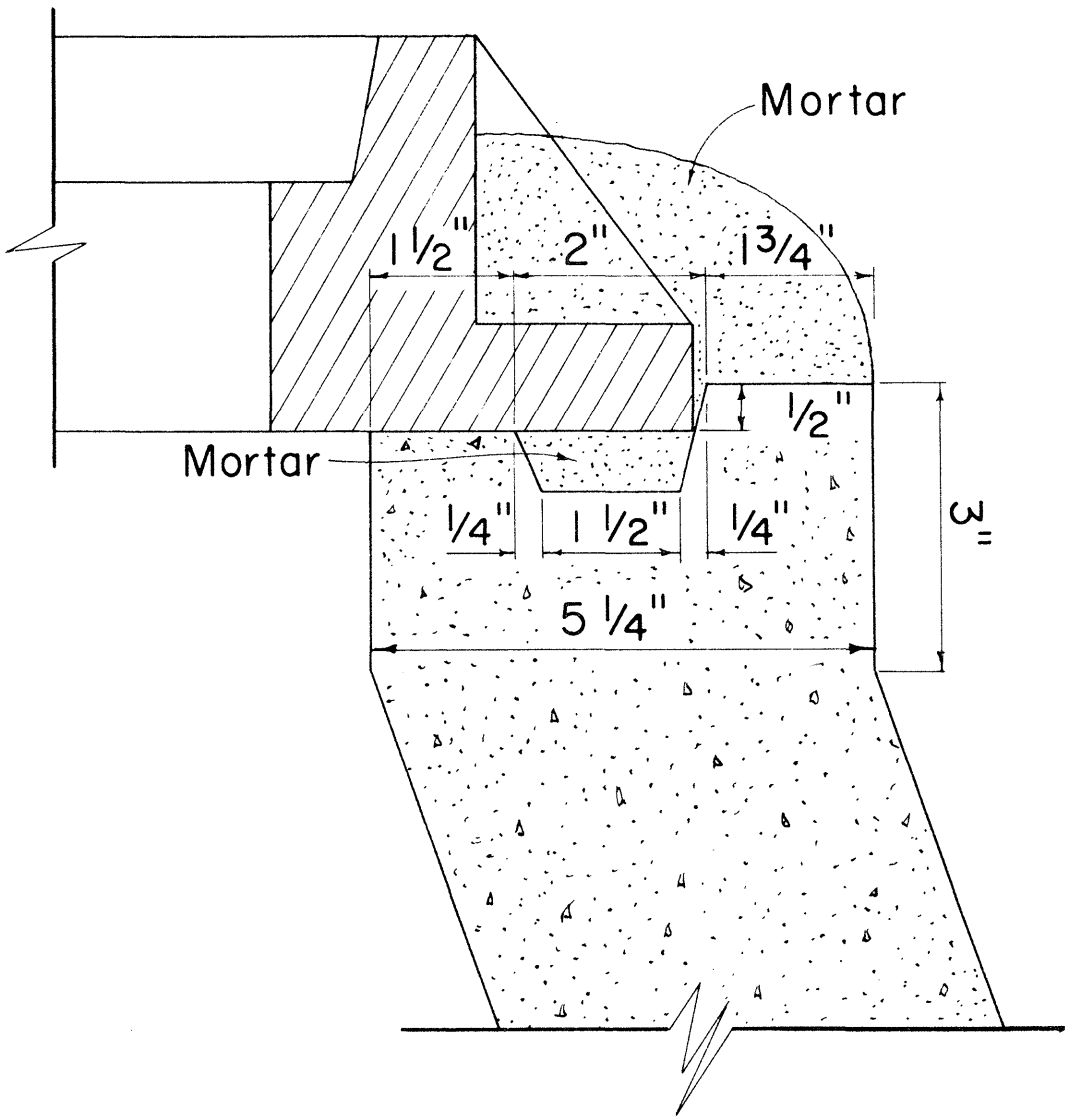
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
STANDARD DETAILS TYPE "IA", "IB", "IC", AND "ID" CATCH BASINS
Scale: As Noted Date: July, 1969

SHEET No. 21 OF 25 SHEETS DH 3

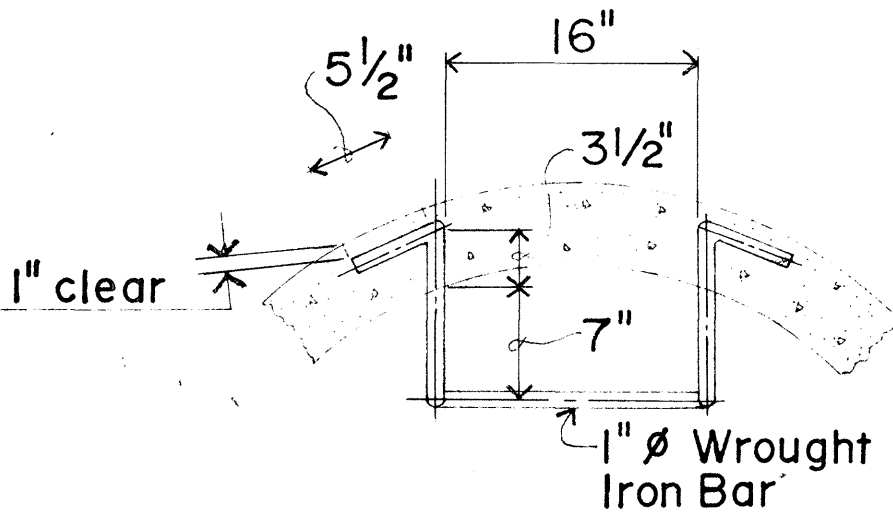
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1(10)	1978	108	160

GENERAL NOTES

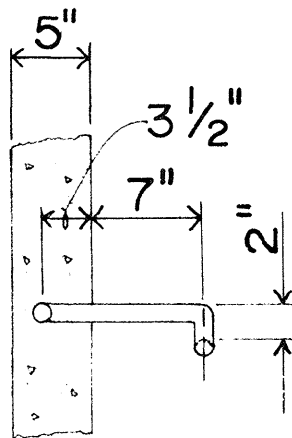
- Manhole Rungs to be placed at 12" o.c. (Manhole Rungs incidental to Class B Concrete)
- Select appropriate combination of risers and grade rings for required height.
- All joints to be grouted as set.
- The precast sections shall be constructed in accordance with the details shown on the plans and to the requirements of ASTM C 478
- Manufacturers may submit to the Engineer for approval, prior to manufacturing, designs other than those shown on this sheet.
- Reinforcing steel for precast sections shall be placed in accordance with the requirements of ASTM C 478
- All Class C Concrete to be incidental to Class B Concrete.



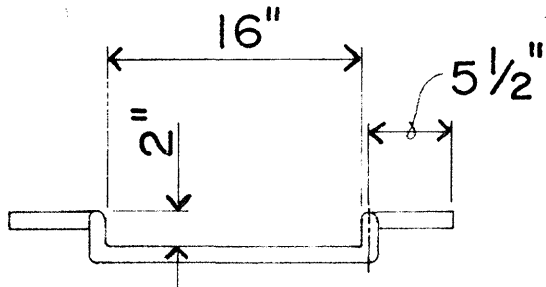
DETAIL "B"
Not to Scale



PLAN VIEW

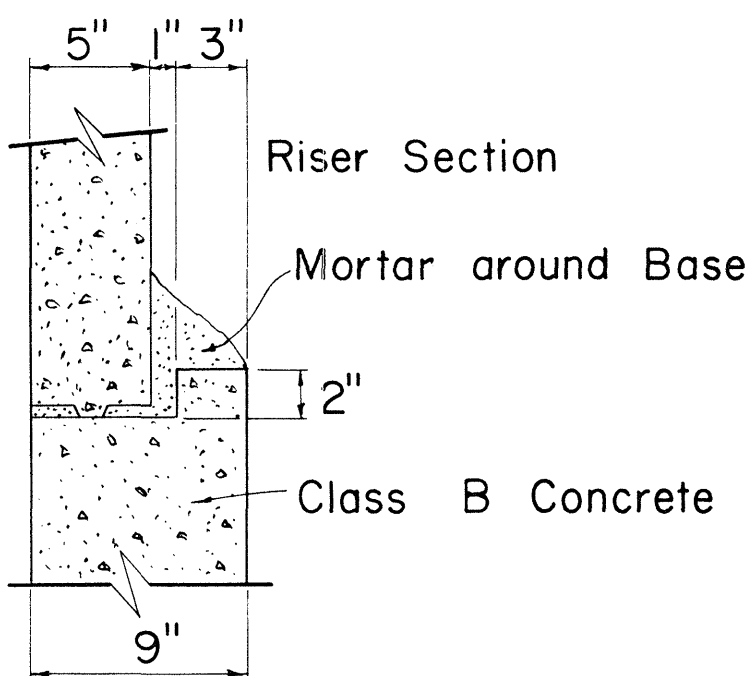


SIDE VIEW

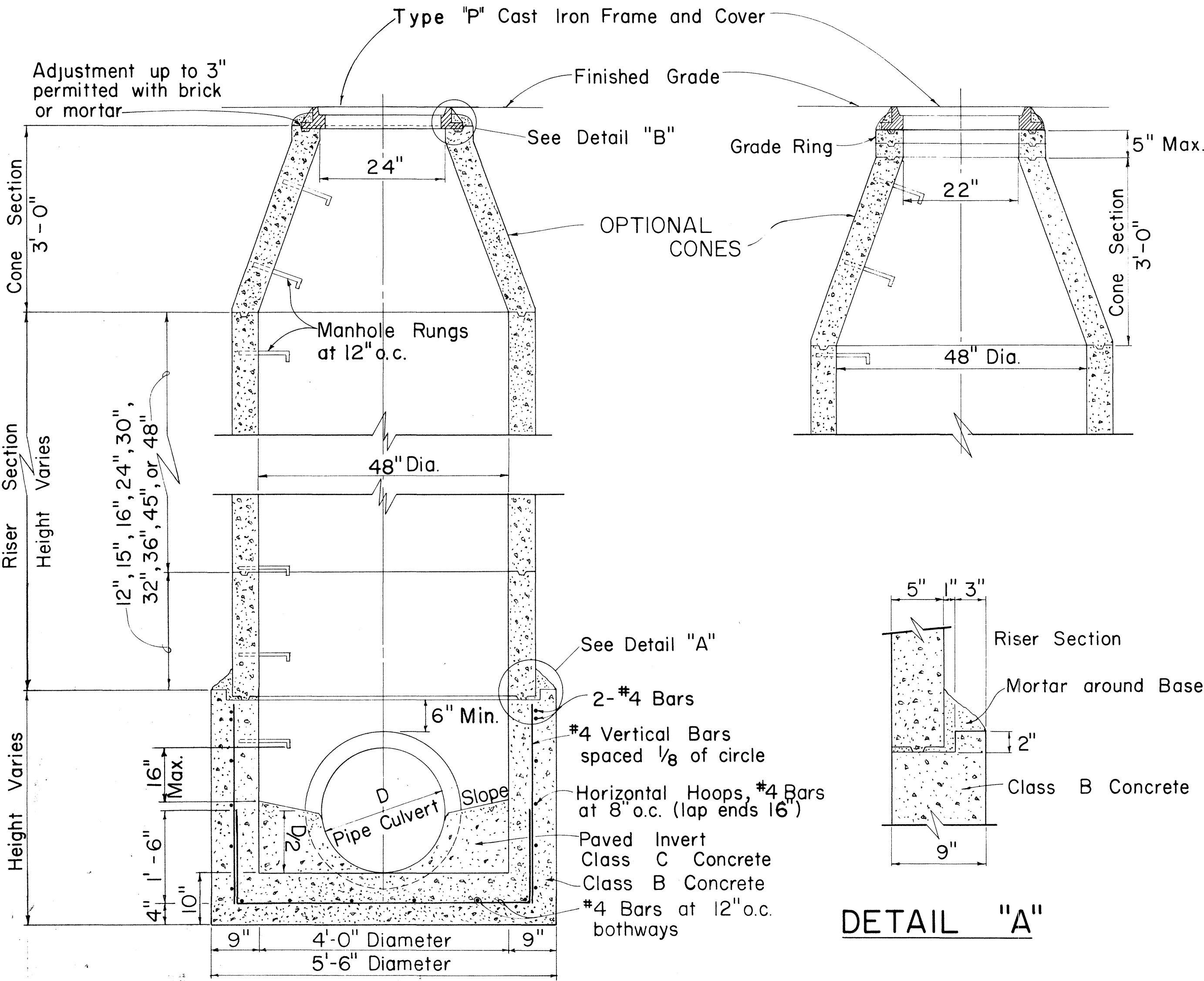


FRONT VIEW

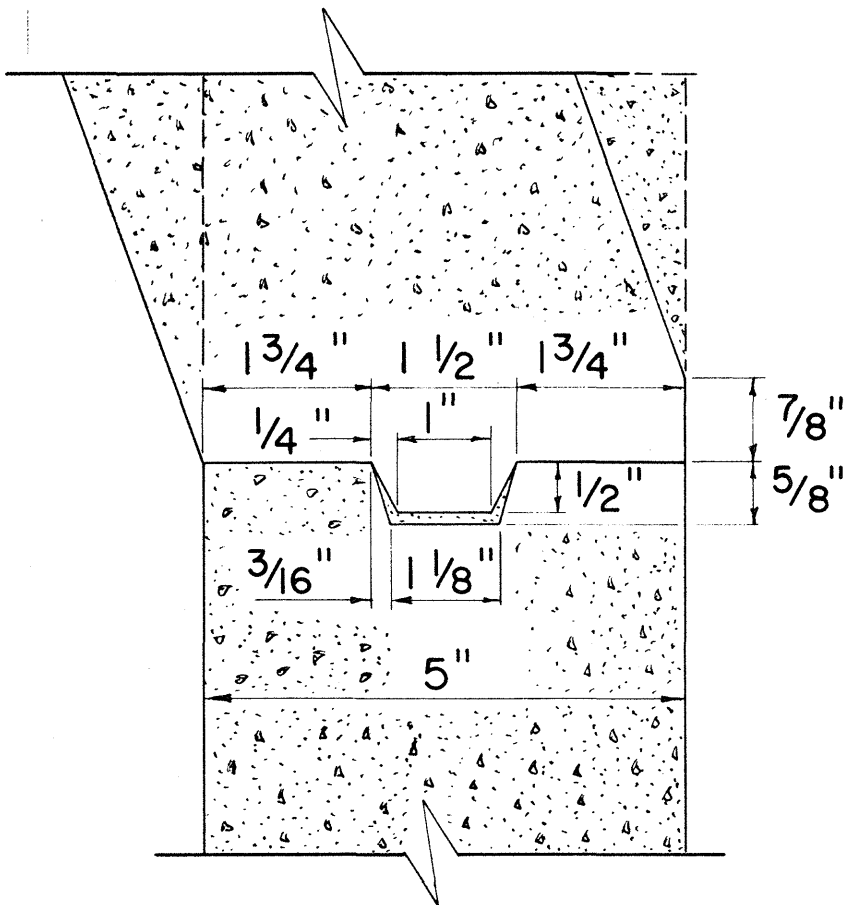
DETAIL OF MANHOLE RUNGS
Not to Scale



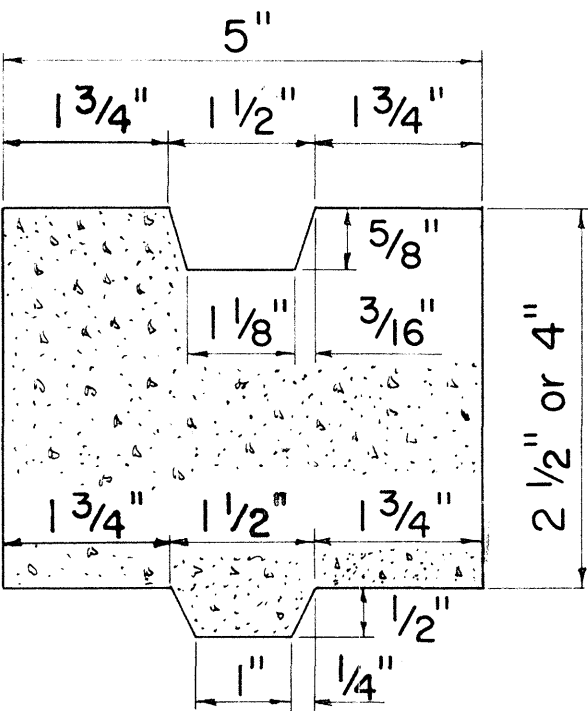
DETAIL "A"



TYPICAL SECTIONS PRECAST CONCRETE MANHOLE
Not to Scale



DETAIL FOR RISER JOINTS
Not to Scale



GRADE RING DETAIL
Not to Scale

APPROVAL RECOMMENDED:
 [Signature]
 HYDRAULIC DESIGN ENGINEER
 DATE: 2-2-71
 APPROVED:
 [Signature]
 ASSISTANT CHIEF, ENGINEERING
 DATE: 2-22-71

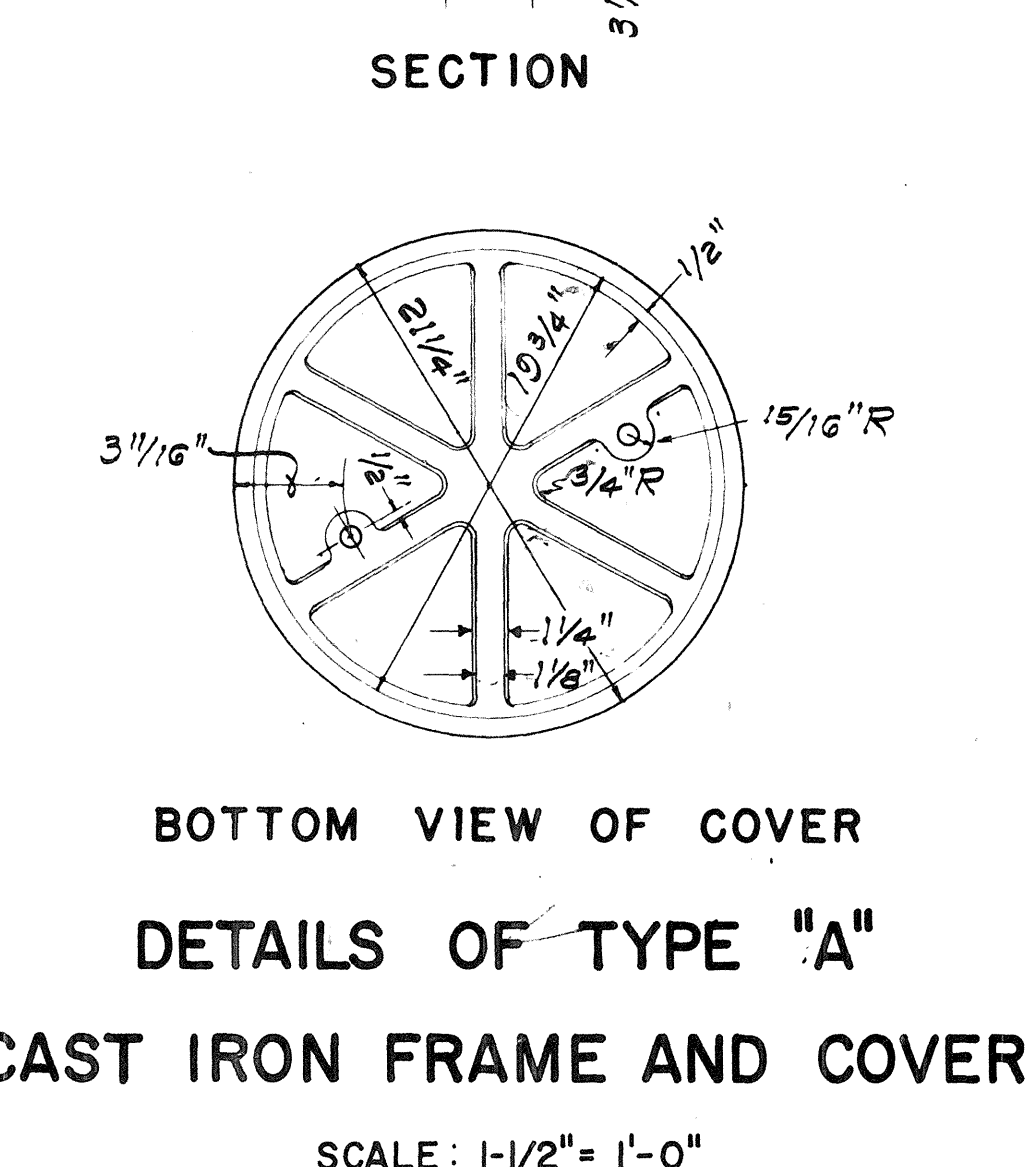
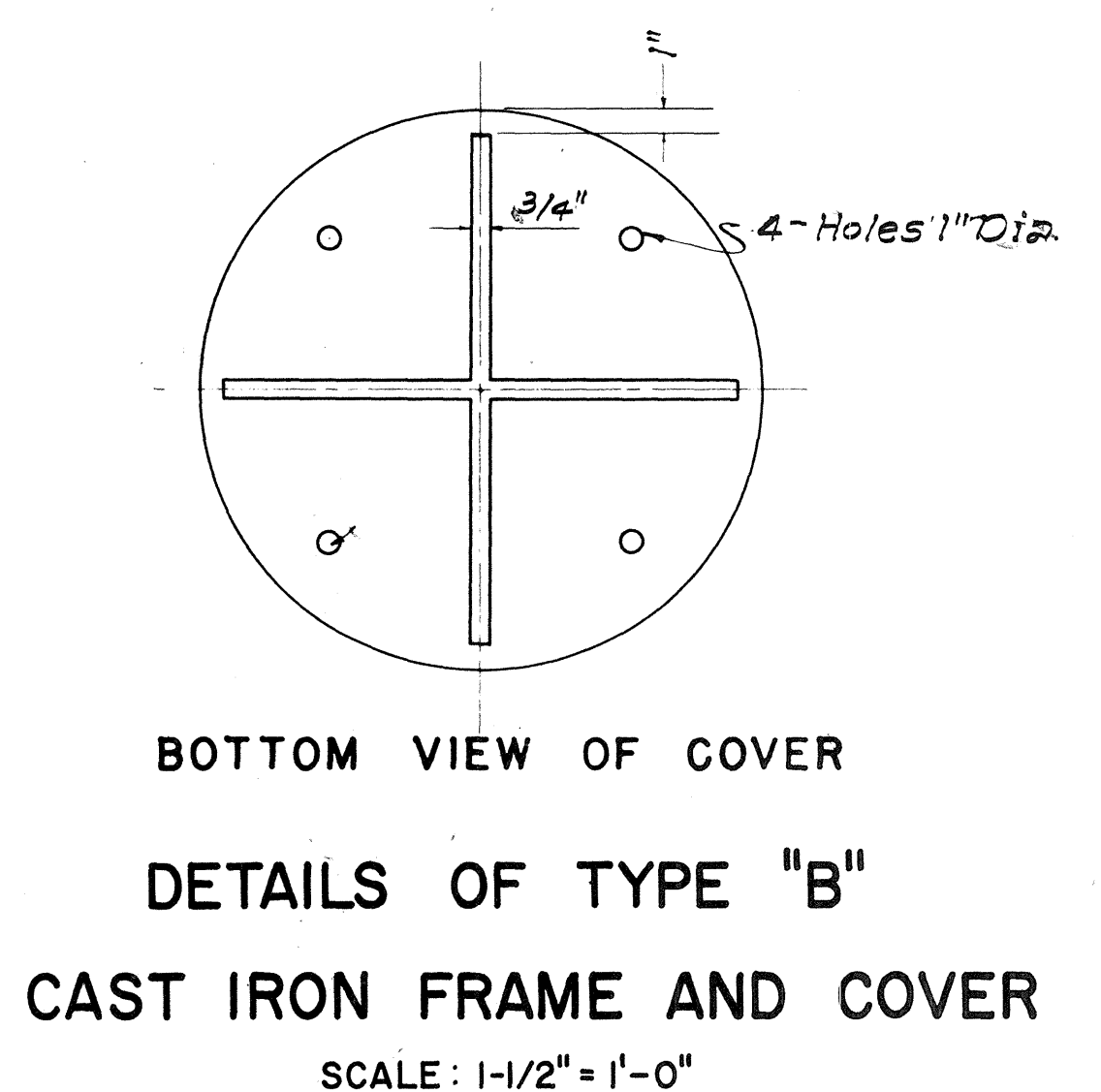
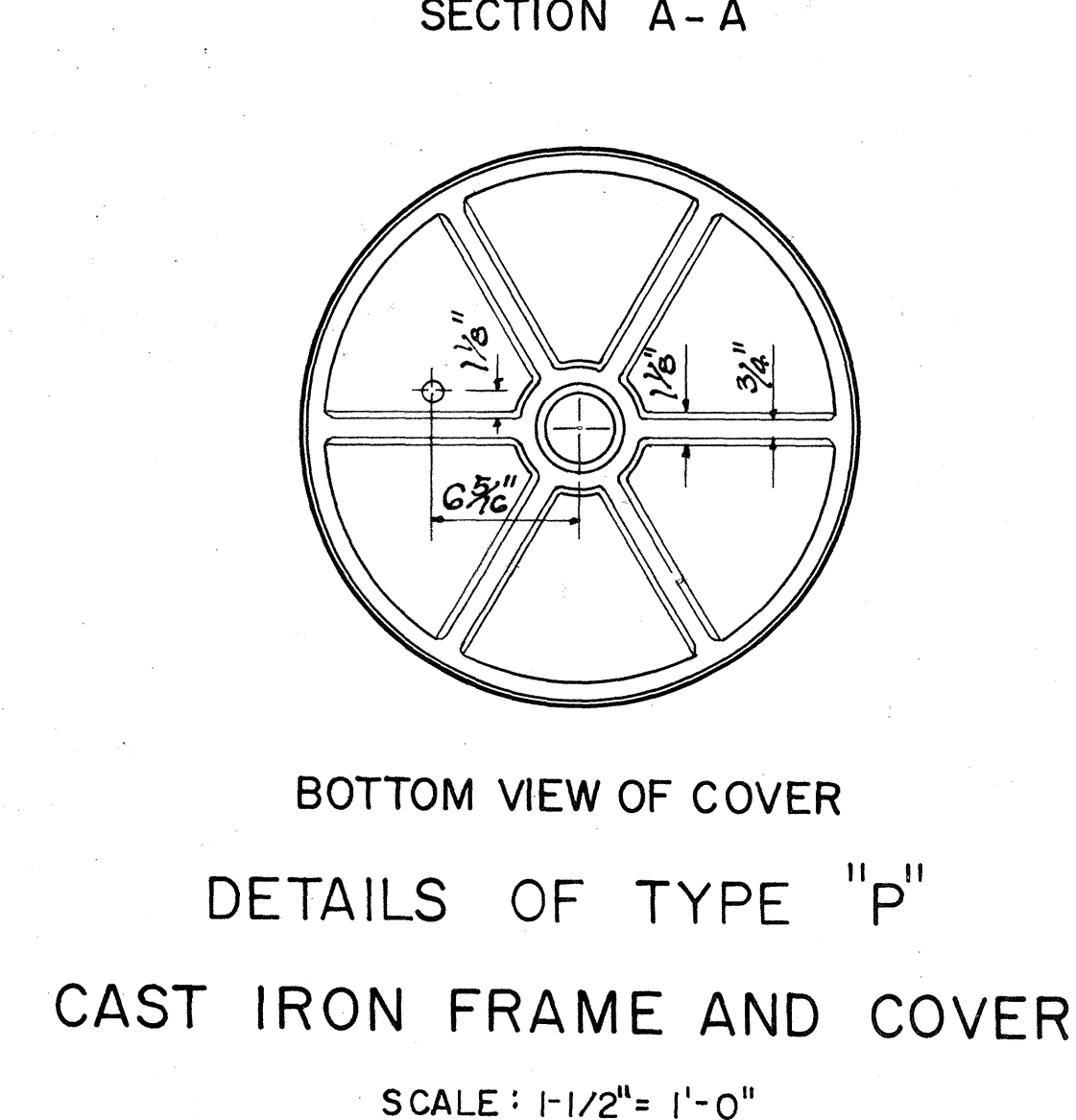
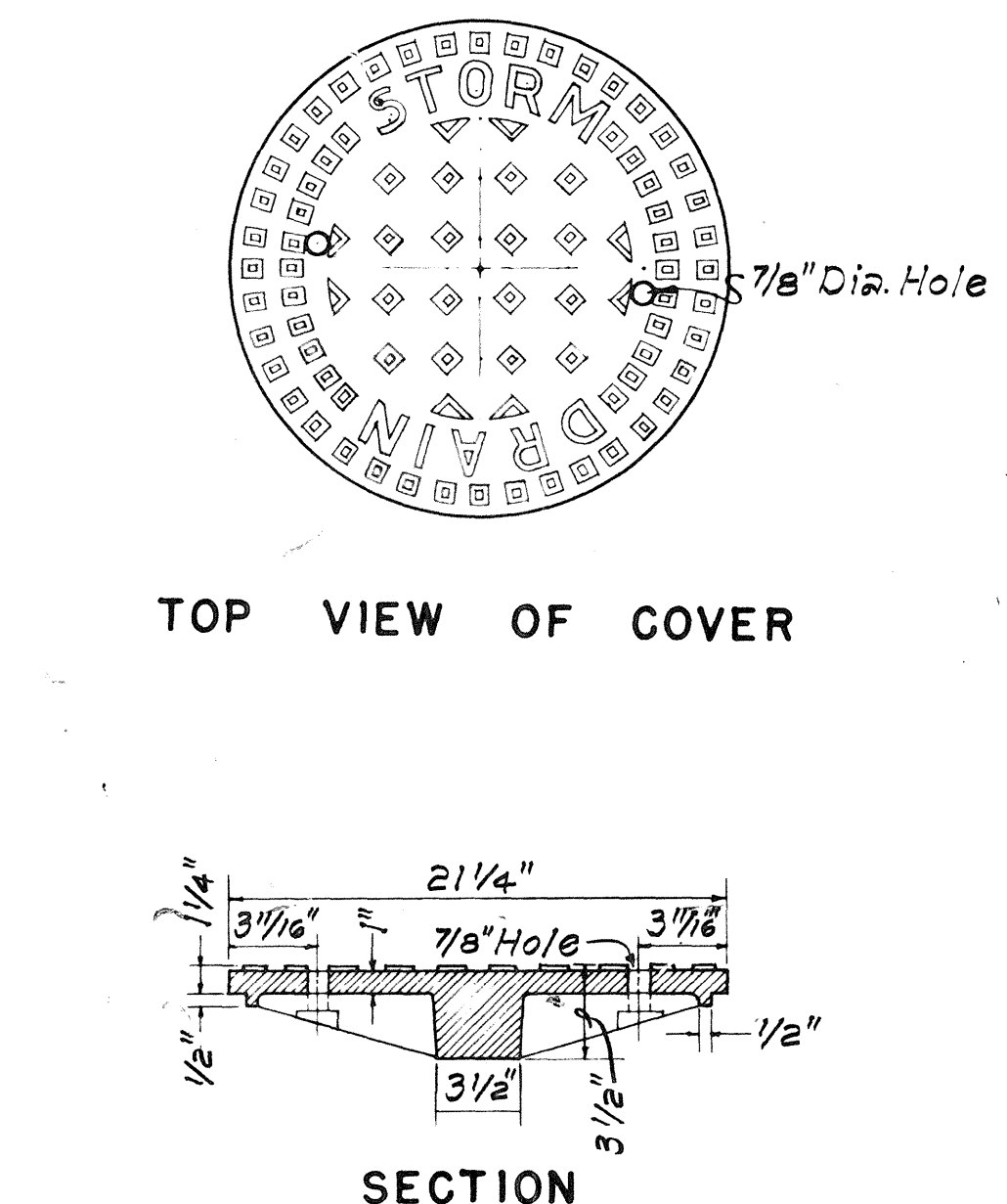
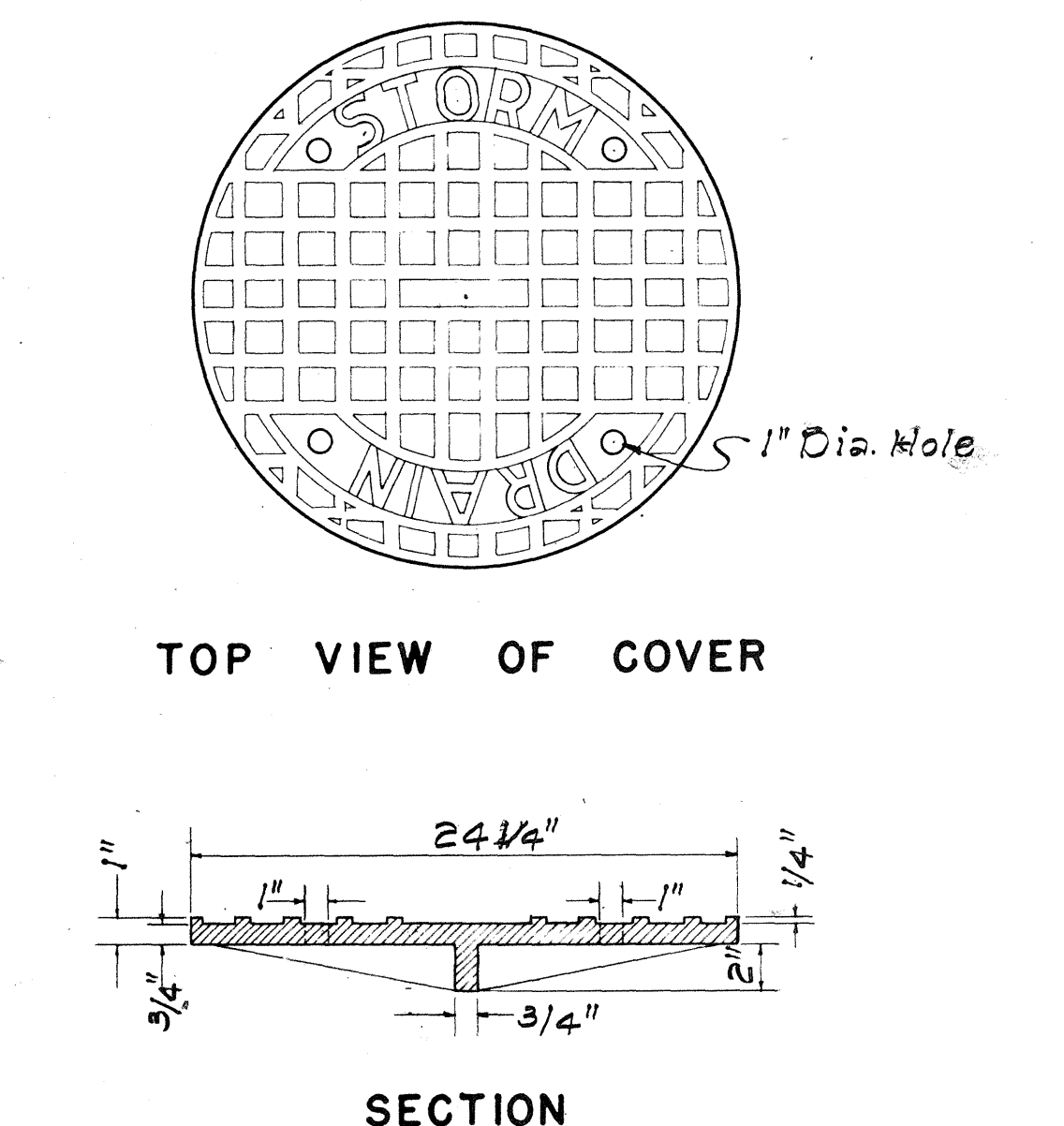
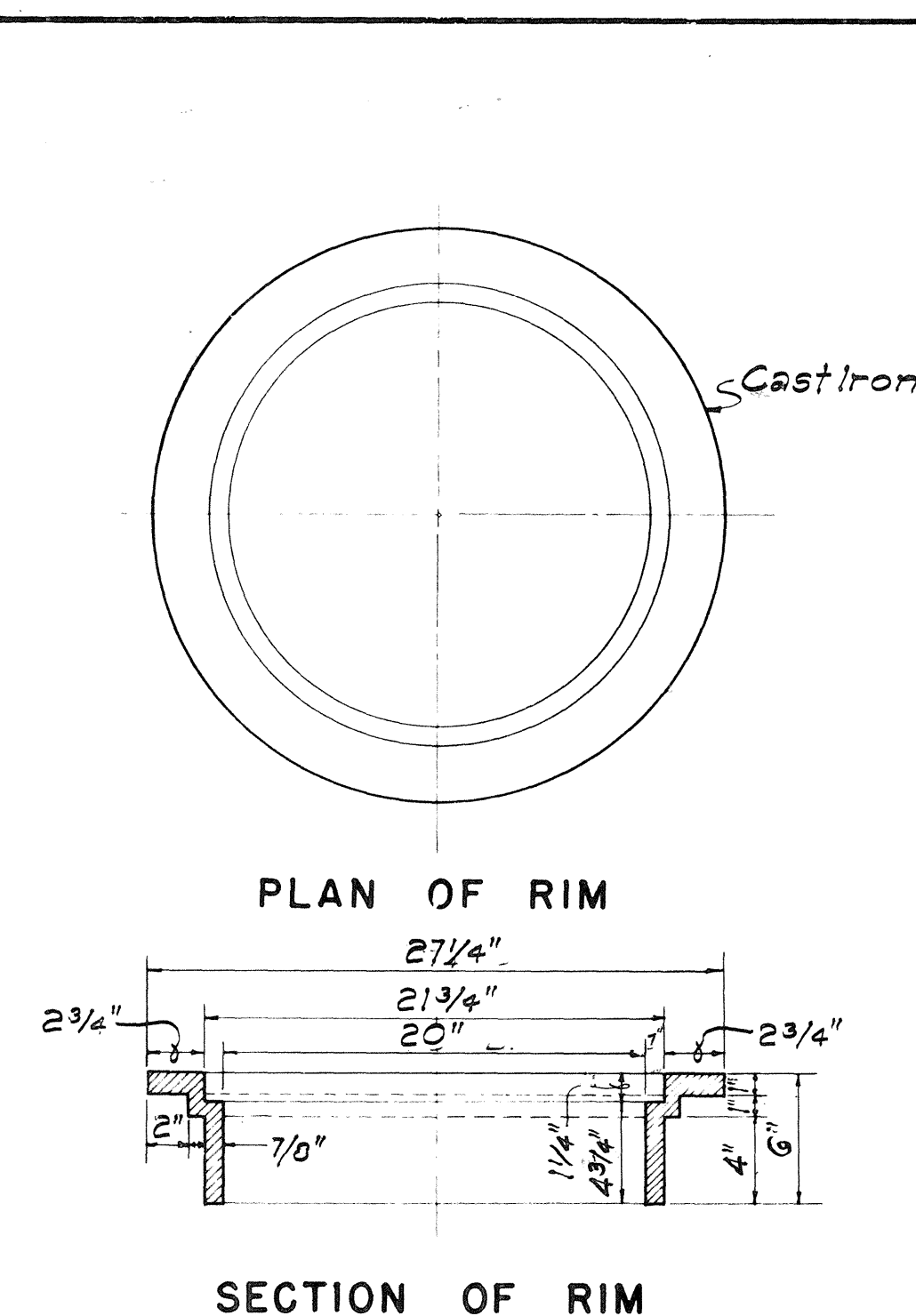
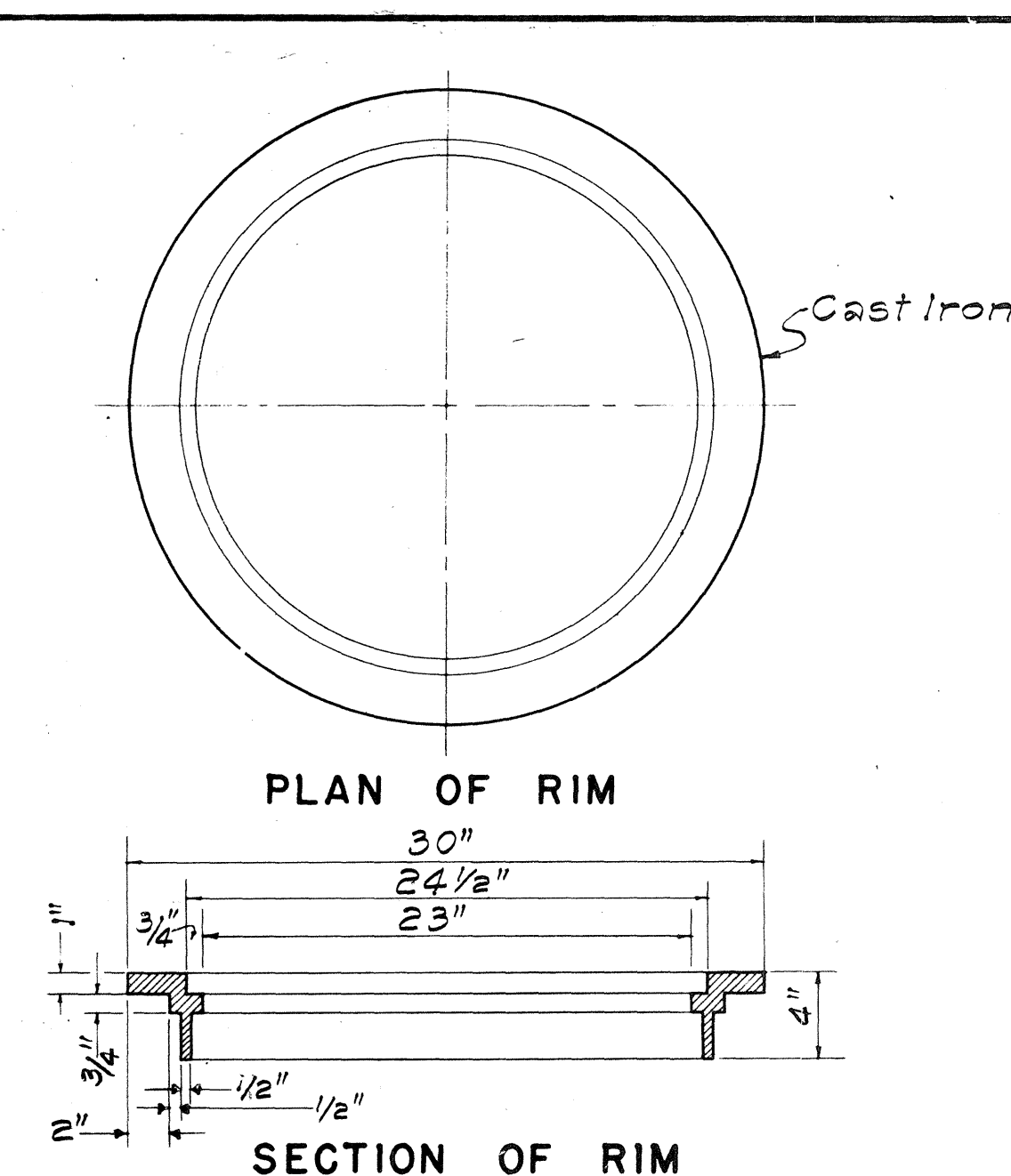
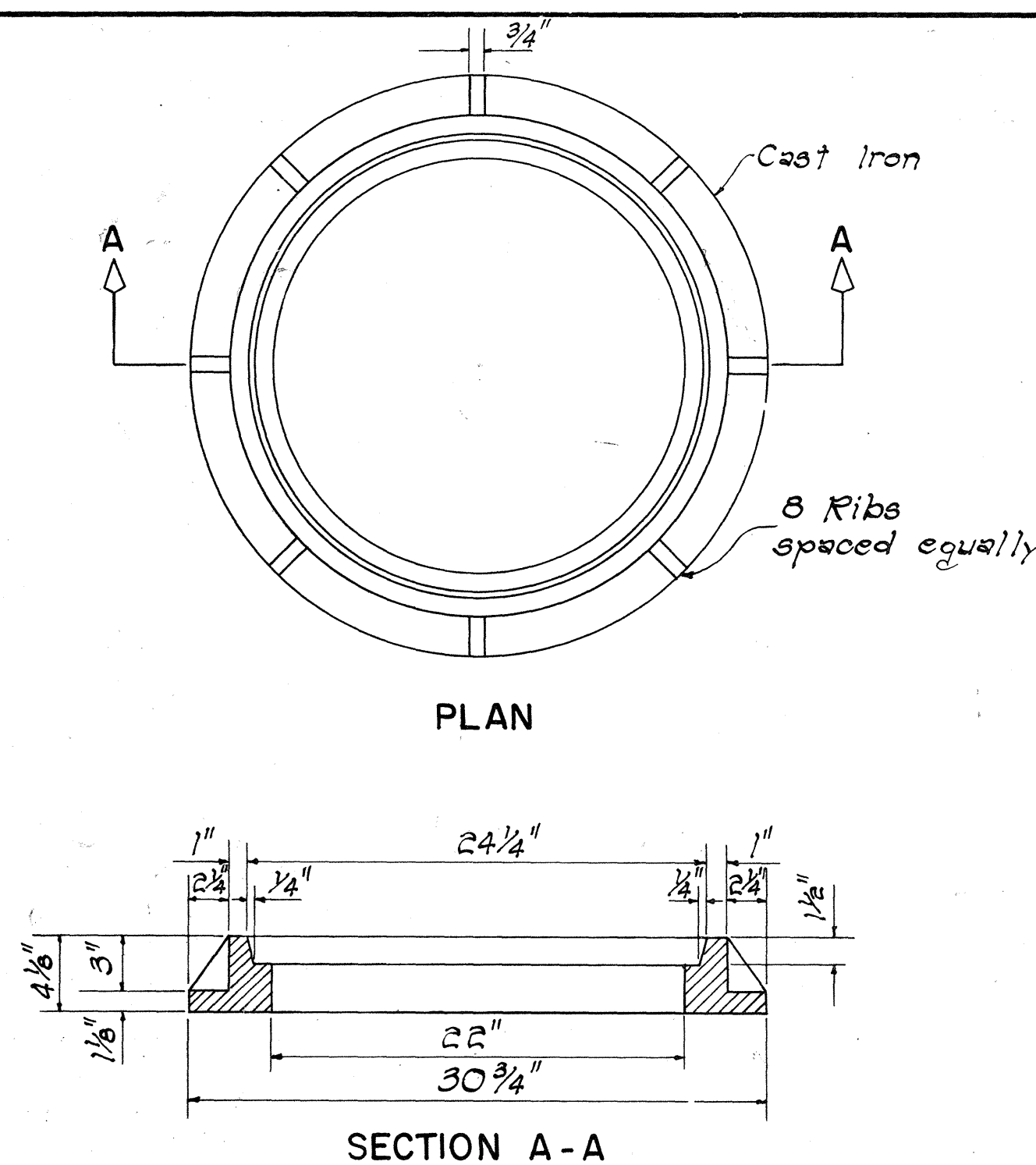
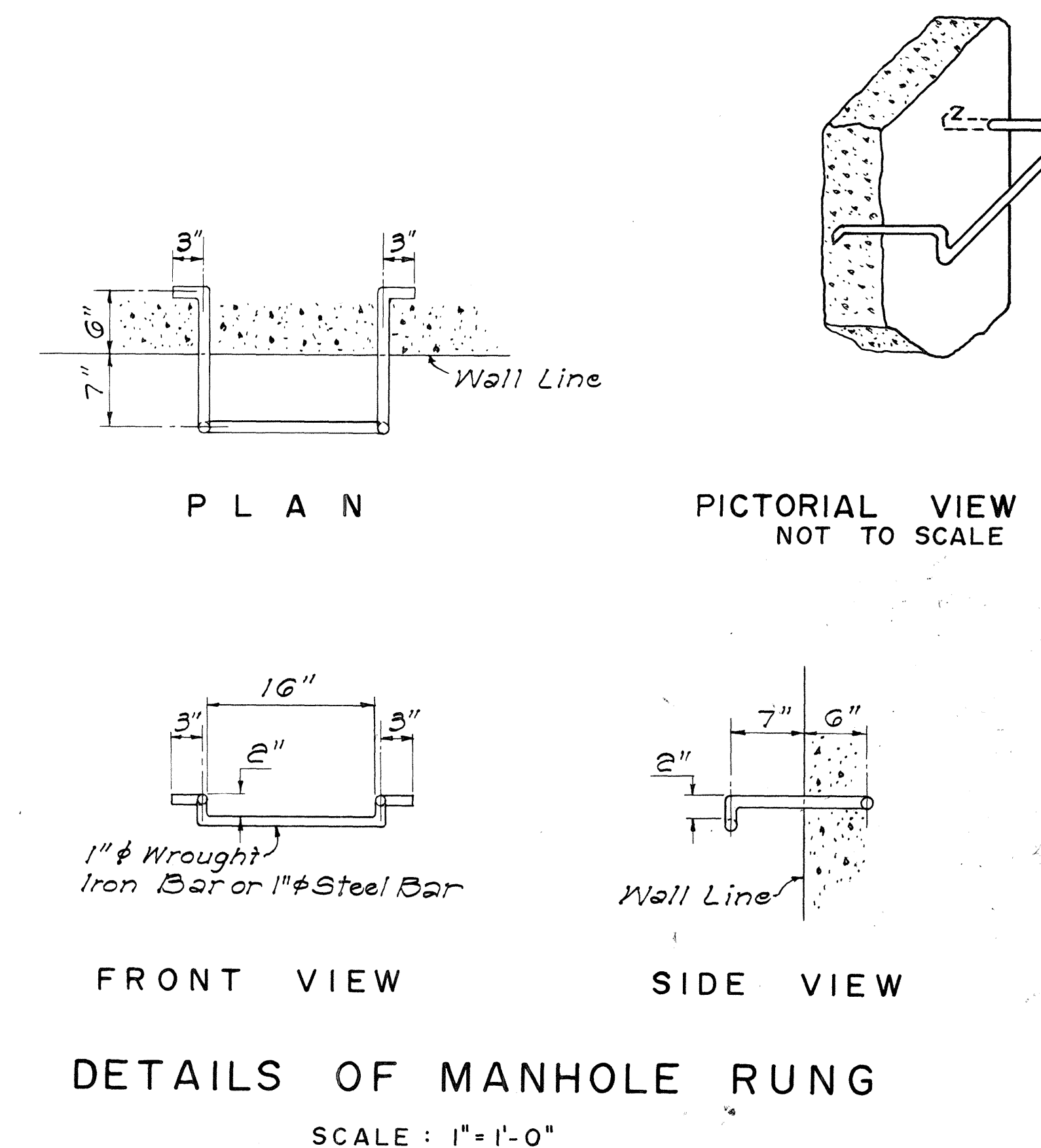
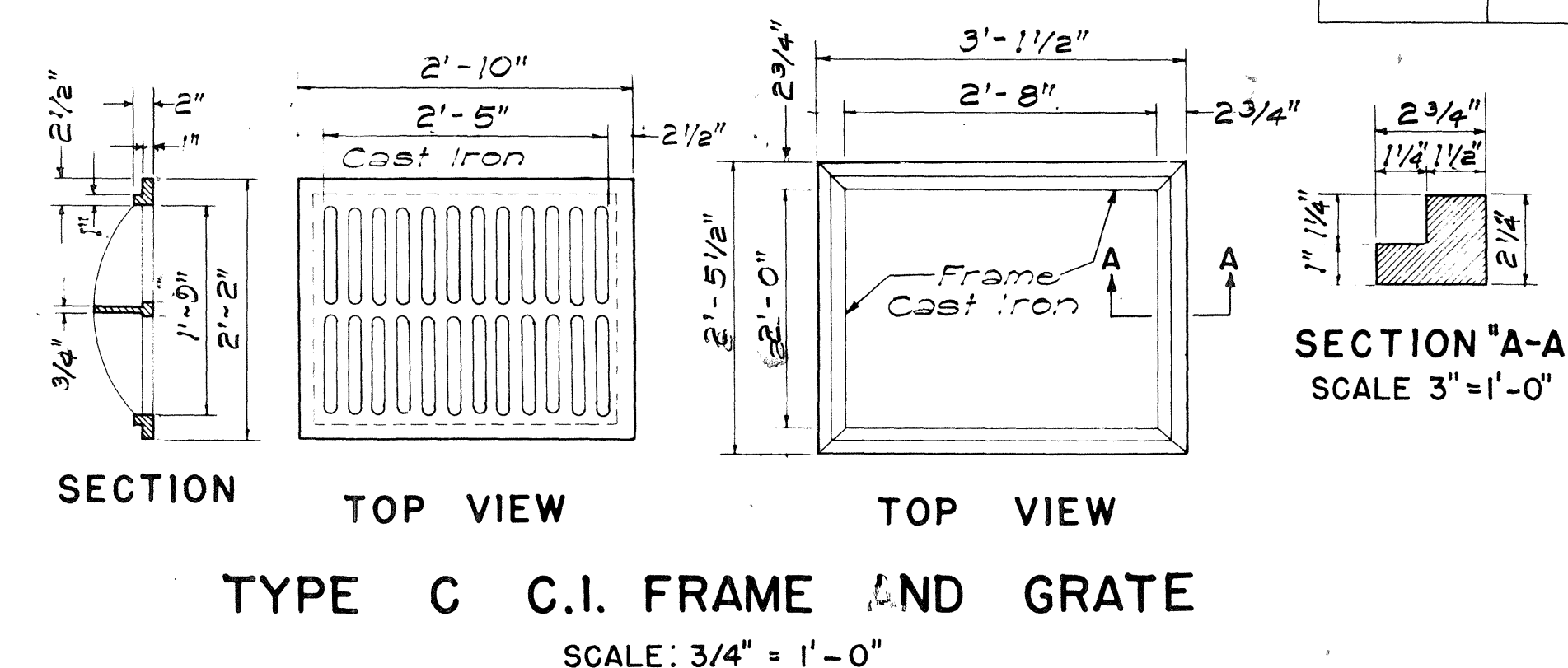
NO.	REVISION	APPROVED BY	DATE
1	Spacing and details of Manhole Rungs to conform to OSHA	H.T.	1/28/75

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
PRECAST CONCRETE
STORM DRAIN MANHOLES

Not to Scale
Date: Nov. ,1970
SHEET No. 22 OF 25 SHEETS
DH 5A

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	109	160



APPROVAL RECOMMENDED:
HYDRAULIC DESIGN ENGINEER
DATE 12-17-69

APPROVED:
ASSISTANT CHIEF, ENGINEERING
DATE 12-17-69

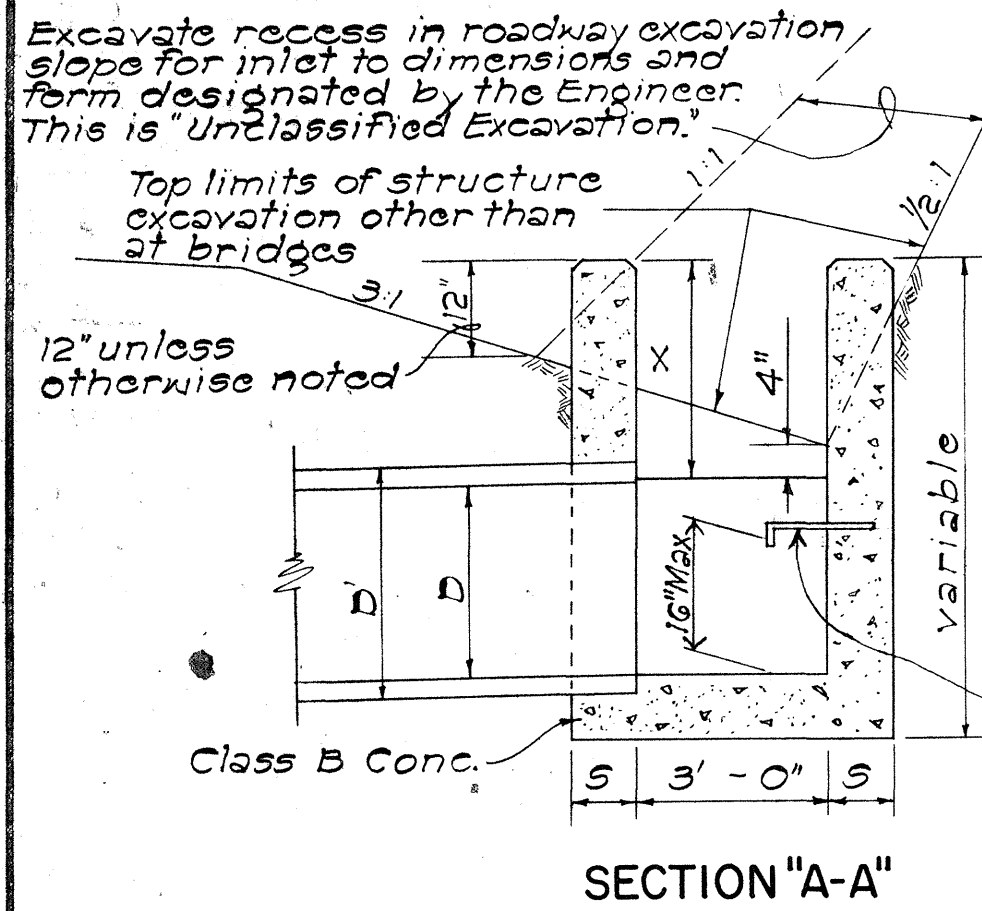
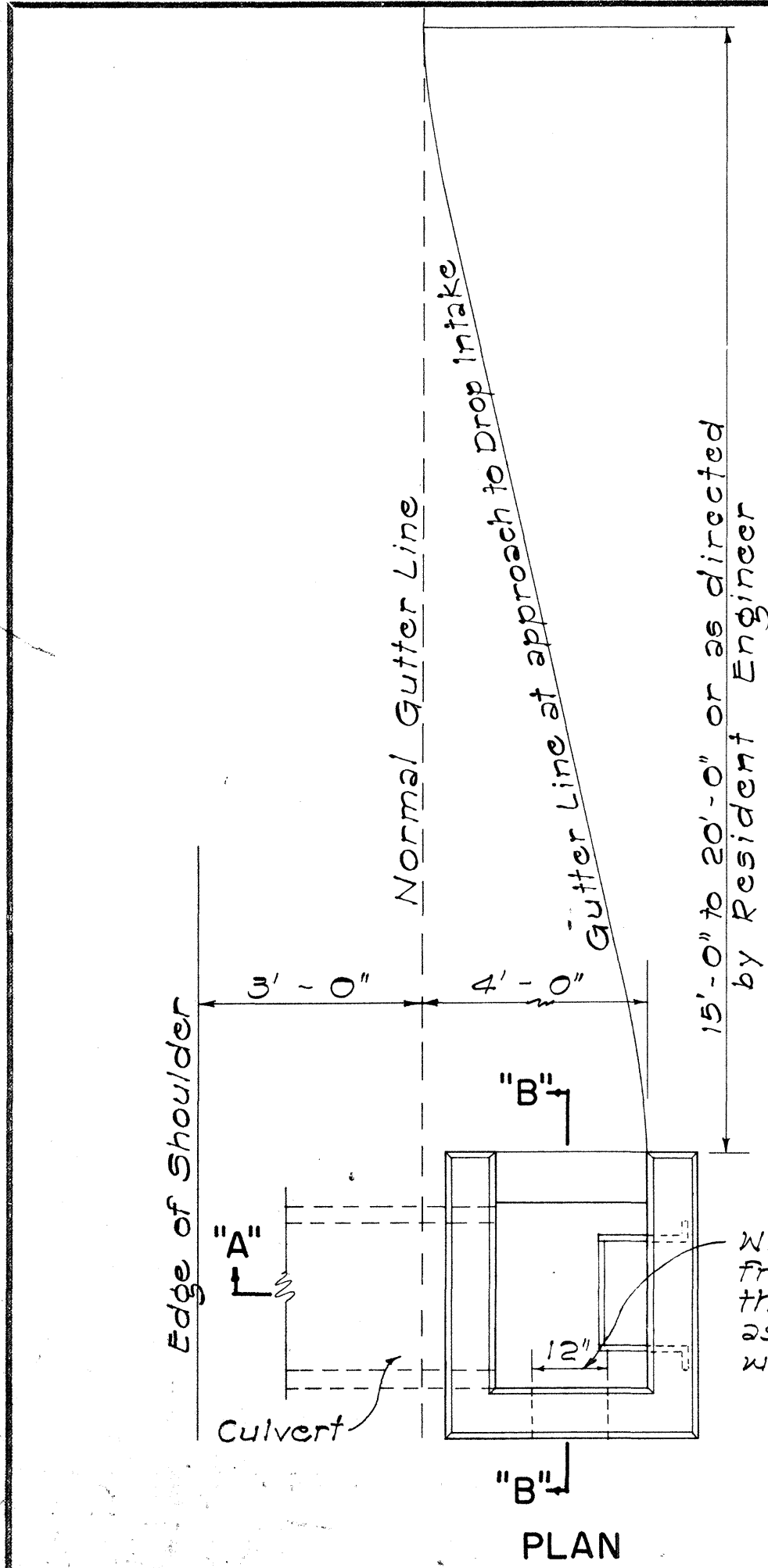
NO.	REVISION	APPROVED BY	DATE
1.	Detail of Type "P" Cast Iron Frame and Cover	H.T.	1-6-71
2.	Details of Manhole Rungs to conform to OSHA.	H.T.	1-21-75
3.	Option for Manhole Rungs	H.T.	1-13-76

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CATCH BASIN AND
MANHOLE CASTINGS

Scale: As Noted Date: July, 1969
SHEET No 23 OF 25 SHEETS DH 6

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	110	160



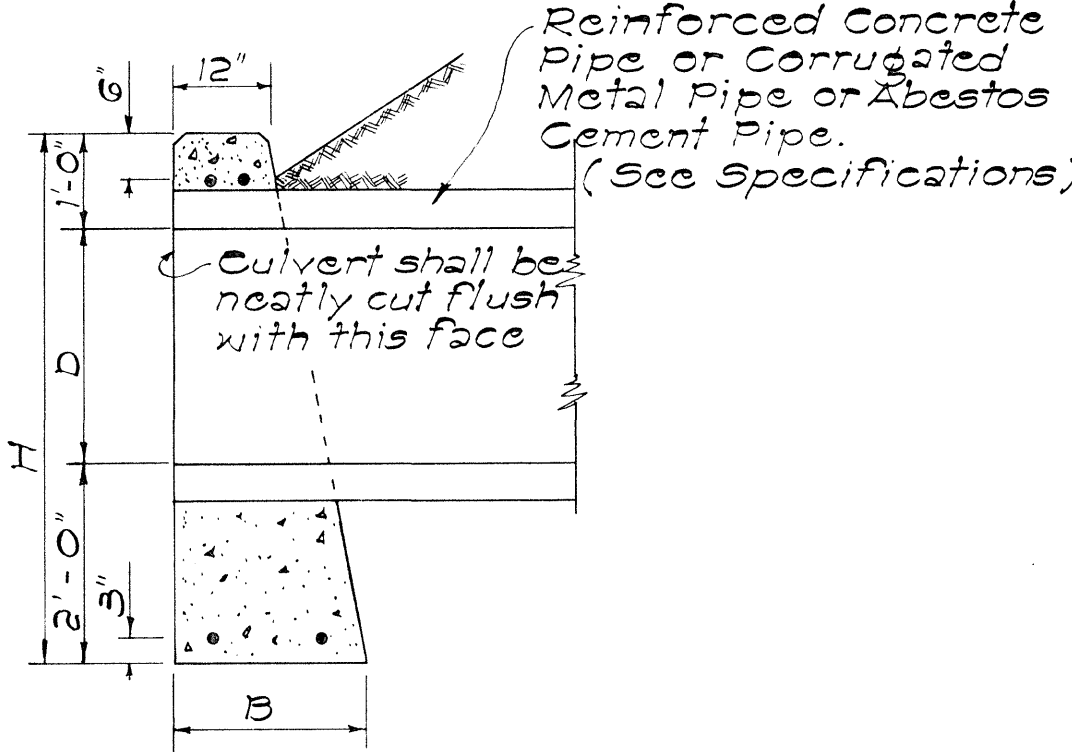
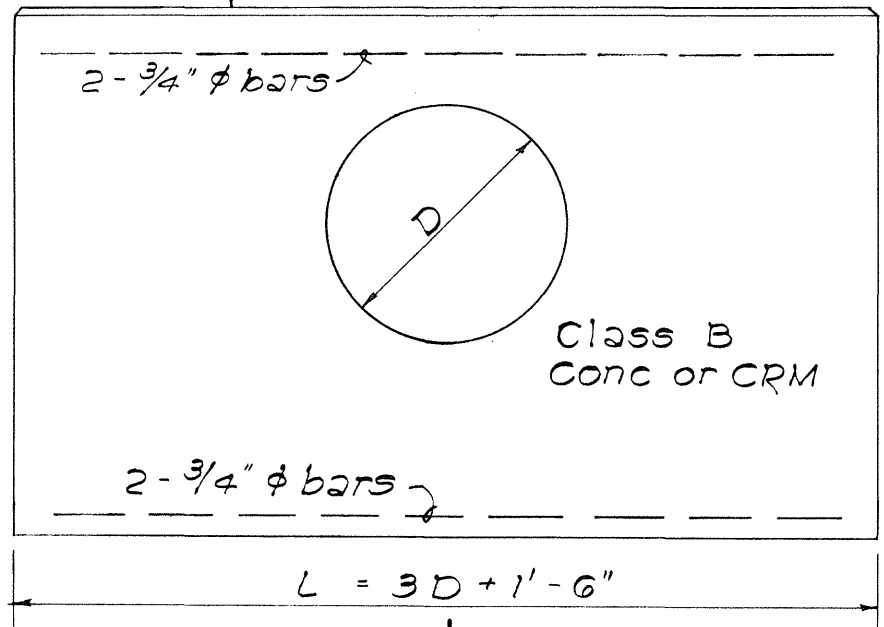
DETAIL OF CONCRETE DROP INTAKE
Scale: 1/2" = 1'-0"

- GENERAL NOTES**
- Culvert shall enter and leave Drop Intake from any position and in the direction indicated by the plans or ordered by the Engineer.
 - D' shall be the maximum outside dimension of the culvert at the Drop Intake wall.
 - 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.

DATA - CONC. DROP INTAKE					Where Variable Equals
D	D'	L	H	S	Cu. Yds.
23"	18"	2'-5"	8"	1.41	4'-6"
30"	24"	3'-0"	8"	1.72	5'-0"
37"	30"	3'-7"	9"	2.32	5'-6"
44"	36"	4'-2"	9"	2.73	6'-0"
51"	42"	4'-9"	10"	3.54	6'-6"
58"	48"	5'-4"	10"	4.01	7'-0"

Note: Dimension "X" is assumed as 2'-4" in figuring the above quantities.

Chamfer all exposed edges one inch.

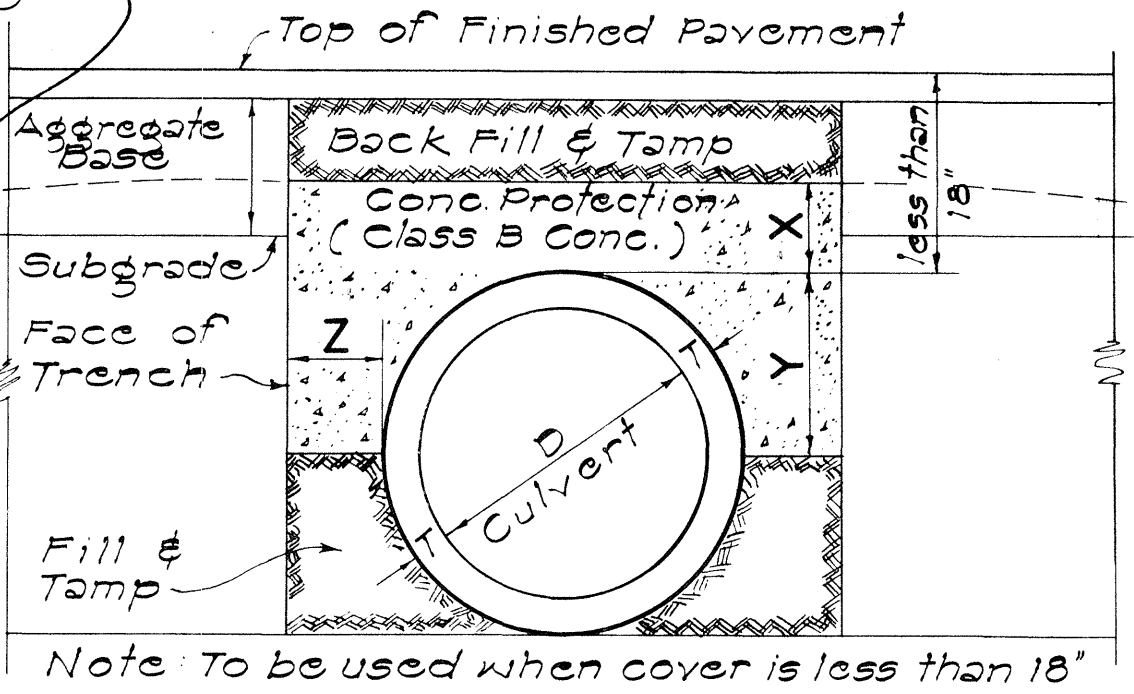


DATA FOR CONC. HEADWALL				CL. B CONC. FOR R.C.P.	CL. B CONC. FOR C.M.P.	Steel For One Headwall		
D	B	L	H	Cu. Yd.	Cu. Yd.	No. of Bars	Size	Length
18"	1'-9"	6'-0"	4'-6"	1.12	1.17	4	3/4"	5'-6"
24"	1'-9"	7'-6"	5'-0"	1.52	1.60	4	3/4"	7'-0"
30"	2'-0"	9'-0"	5'-6"	2.36	2.49	4	3/4"	8'-6"
36"	2'-0"	10'-6"	6'-0"	2.94	3.13	4	3/4"	10'-0"
42"	2'-3"	12'-0"	6'-6"	4.19	4.47	4	3/4"	11'-6"
48"	2'-6"	13'-6"	7'-0"	5.01	5.36	4	3/4"	13'-0"

DATA - MASONRY HEADWALL				CRM FOR R.C.P.	CRM FOR C.M.P.
D	B	L	H	Cu. Yd.	Cu. Yd.
18"	1'-9"	6'-0"	4'-6"	1.24	1.29
24"	2'-0"	7'-6"	5'-0"	1.83	1.92
30"	2'-3"	9'-0"	5'-6"	2.56	2.70
36"	2'-6"	10'-6"	6'-0"	3.45	3.66

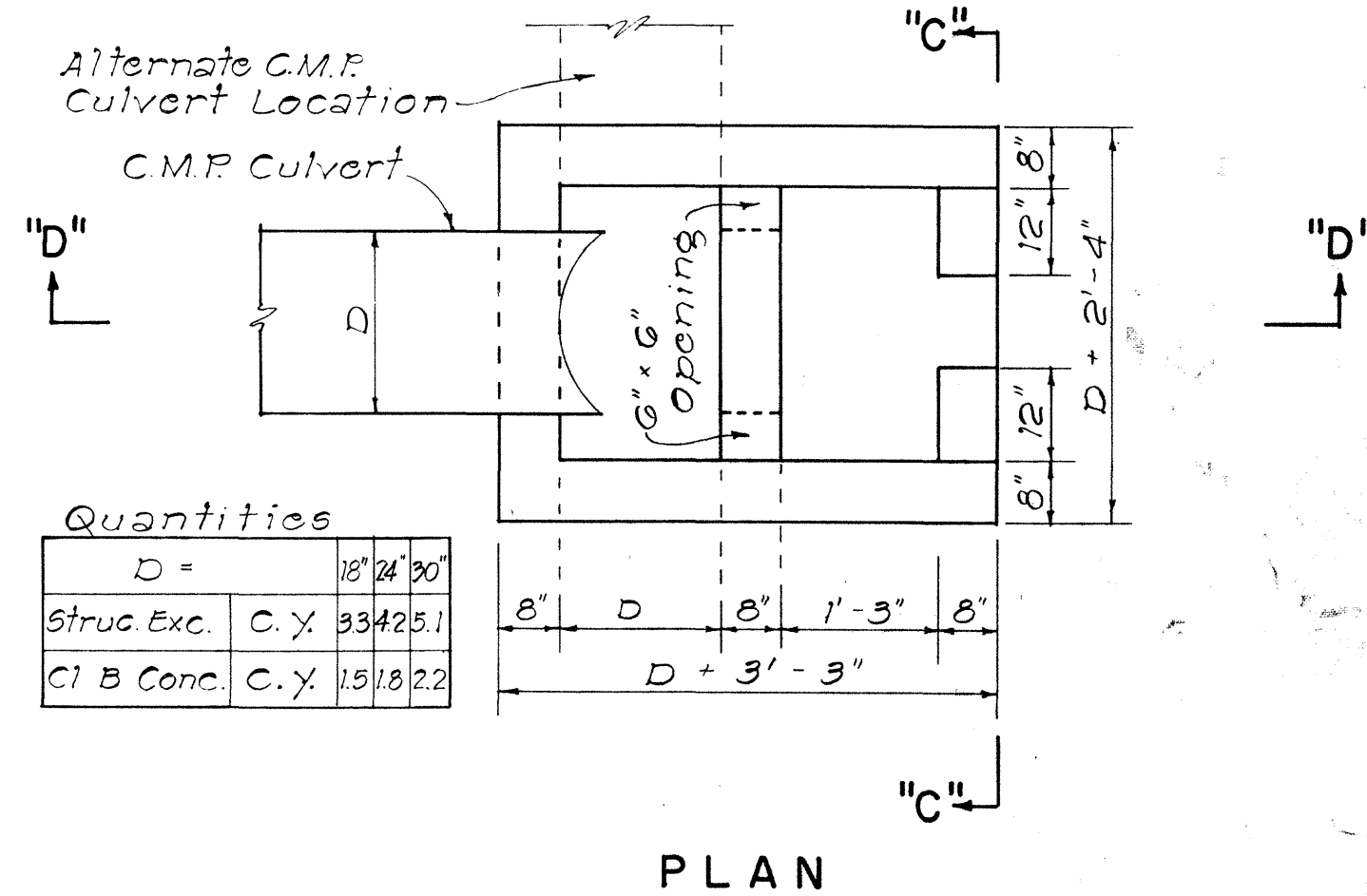
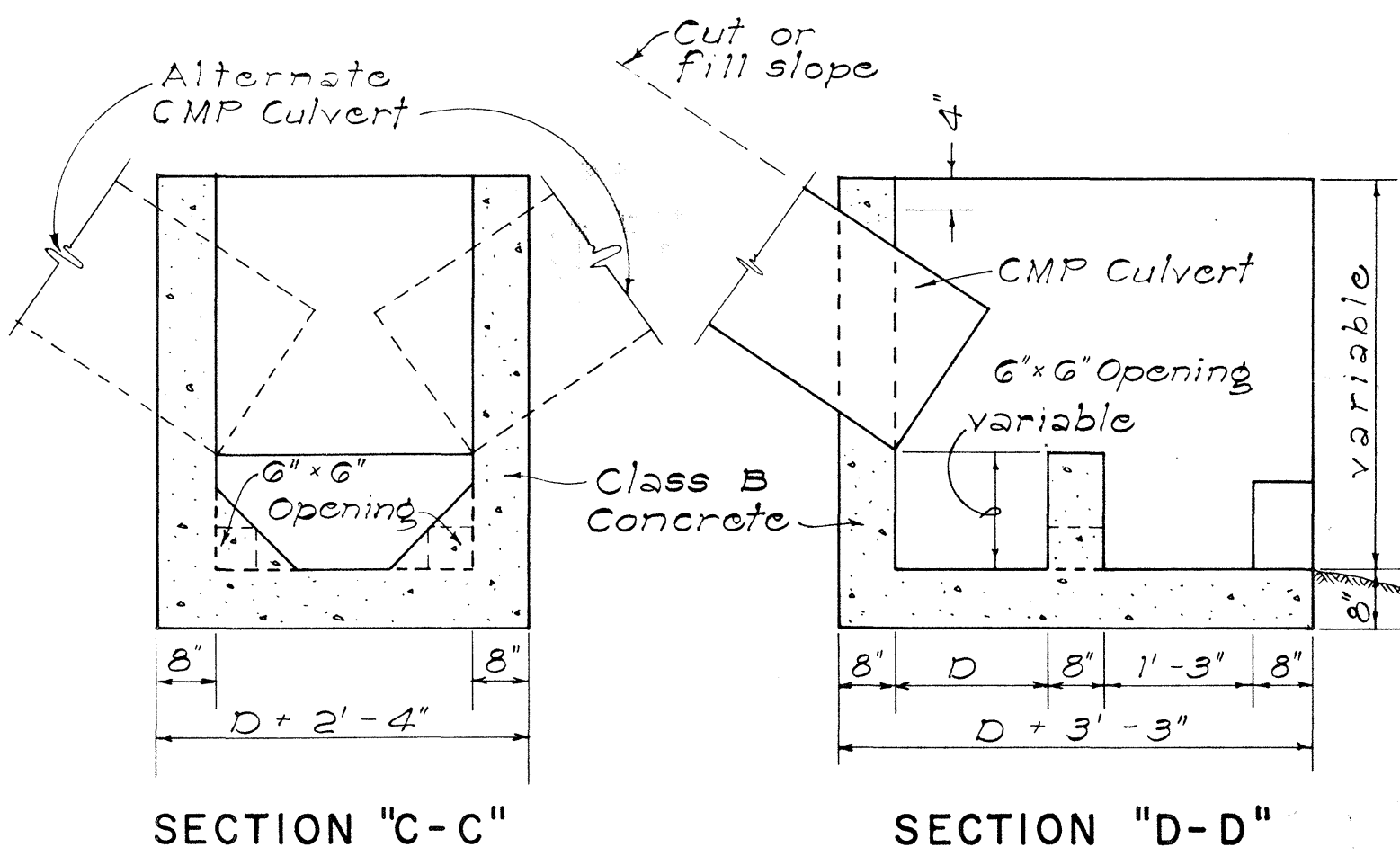
DETAIL OF HEADWALL
Scale: 1/2" = 1'-0"

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



DATA FOR CONCRETE PROTECTION OVER CULVERTS		
X	Y	Z
6" for 18" D	D/2 + T	Z must be from pipe to face of trench
7" for 24" D		
8" for 30" D		
9" for 36" D		Minimum = X
10" for 42" D		Maximum pay quantity will be Z = 12"
11" for 48" D		
12" for 54" D		

SECT. OF CULVERT WITH CONC. PROTECTION
Scale: 1" = 1'-0"



DETAILS OF CONC. DROP BOX AT
OUTLET OF CULVERT PIPE
NOT TO SCALE

APPROVAL RECOMMENDED:
[Signature] 12-17-69
HYDRAULIC DESIGN ENGINEER DATE

APPROVED:
[Signature] 12-17-69
ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE
1	Spacing on Manhole Rungs to conform to OSHA.	H.T.	1-21-75

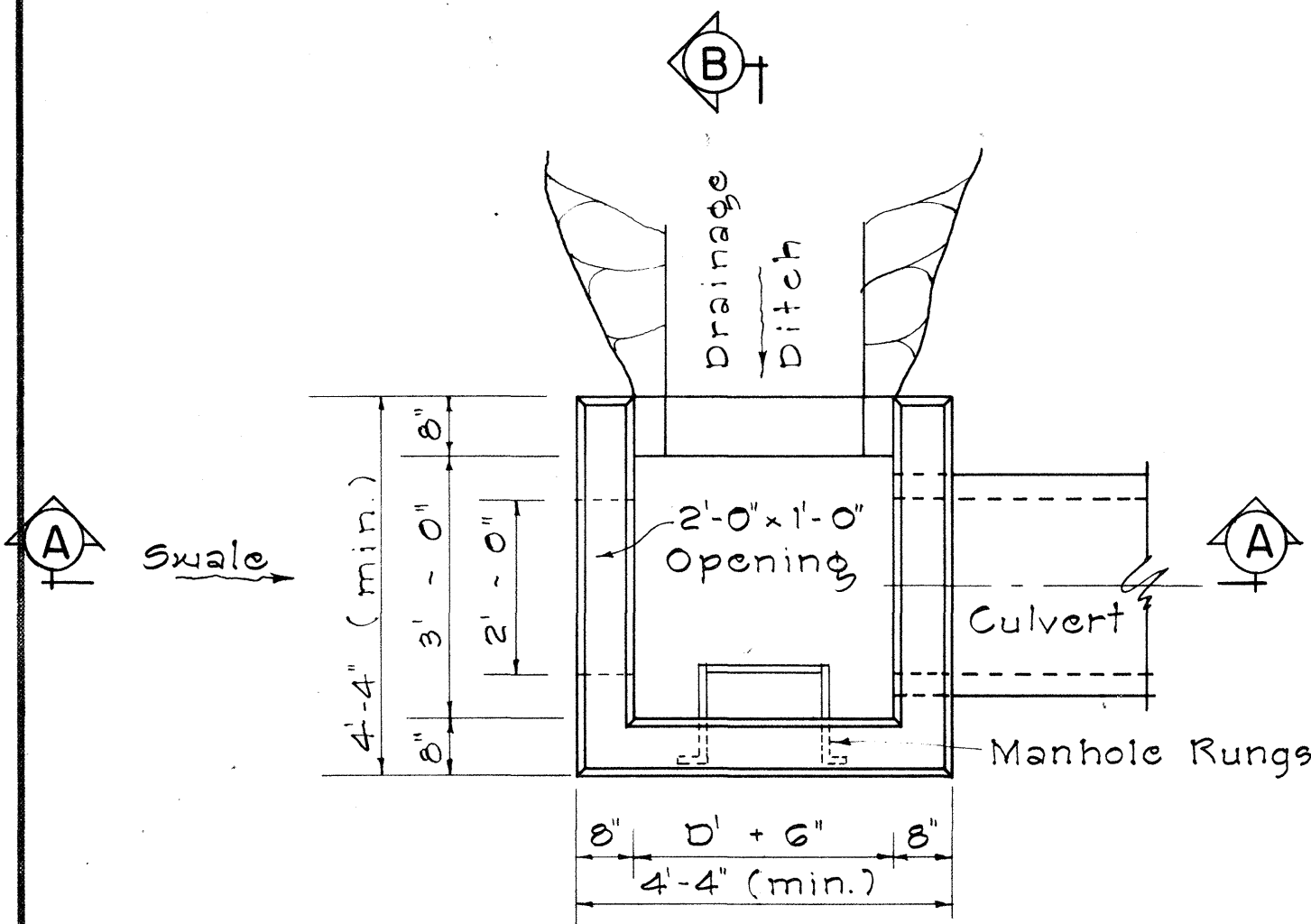
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
DROP INTAKE, HEADWALL &
CONCRETE PROTECTION

Scale: As Noted Date: Aug. 1967
SHEET No. 24 OF 25 SHEETS DH 10

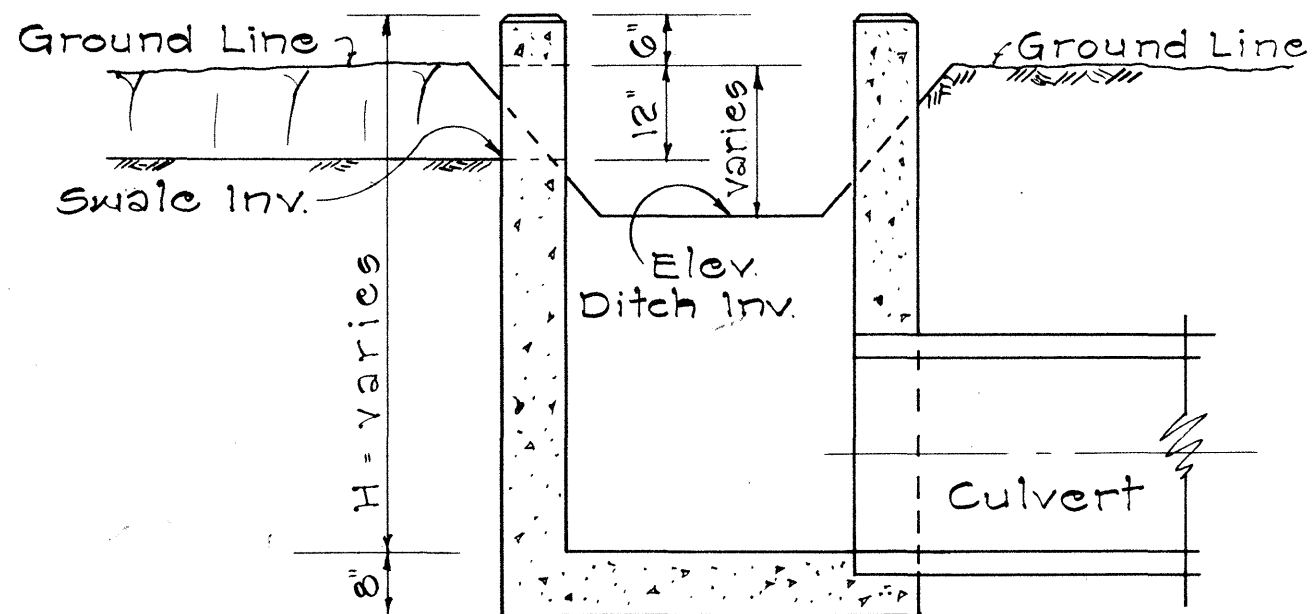
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(10)	1978	III	160

GENERAL NOTES

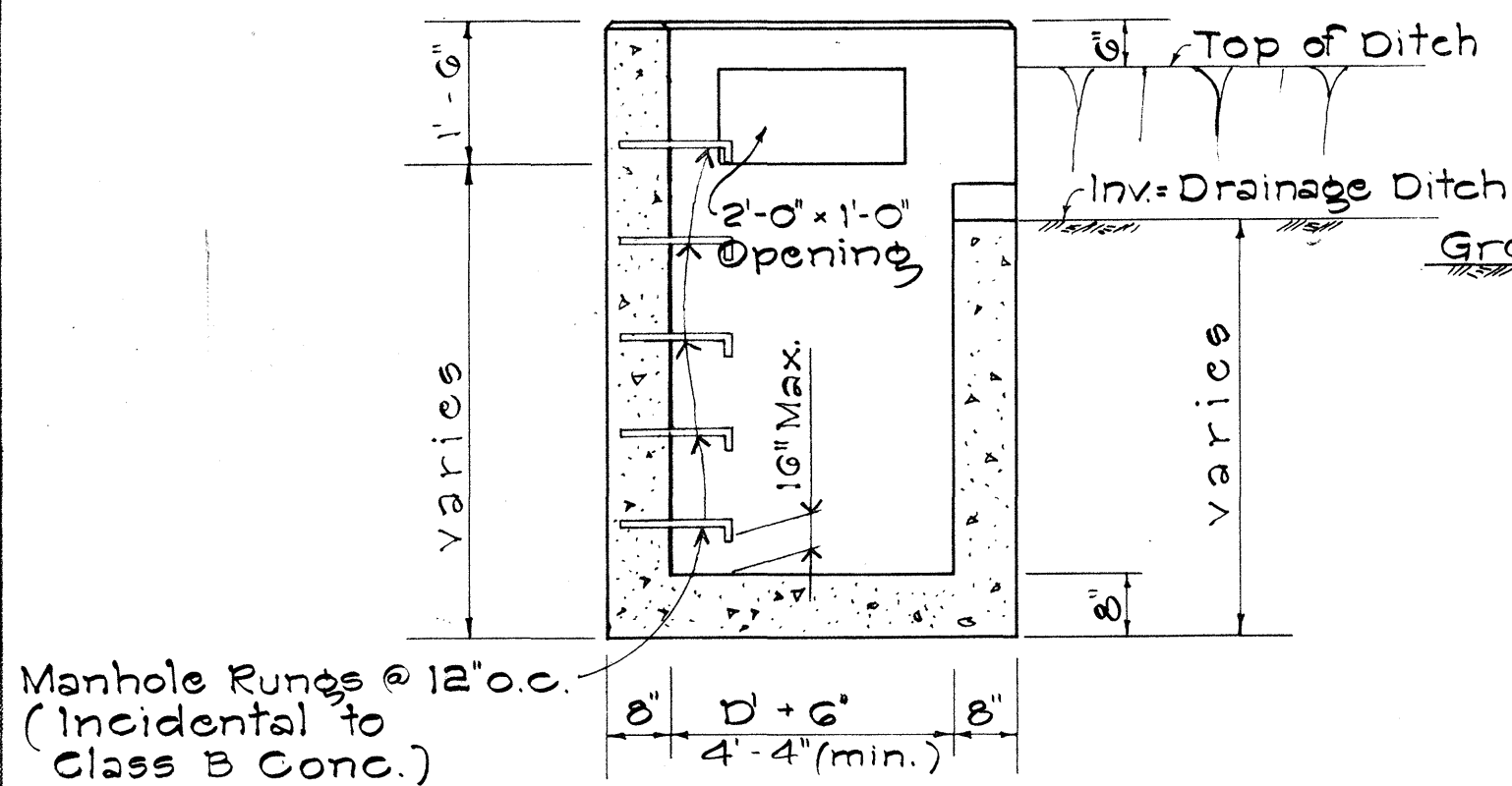
- All concrete shall be Class "B" unless otherwise noted.
- Exposed edges of all drainage structures shall be chamfered one inch.
- Culvert shall enter and leave Drop Intake from any position and in the direction indicated by the plans or ordered by the Engineer.
- Manhole Rungs (12" o.c.) are req'd. when "H" is greater than 4'-6". Only one rung (16 inches from the bottom) is required if "H" is 4'-6" or less. Manhole Rungs may be placed at any location as ordered by the Engineer.



PLAN



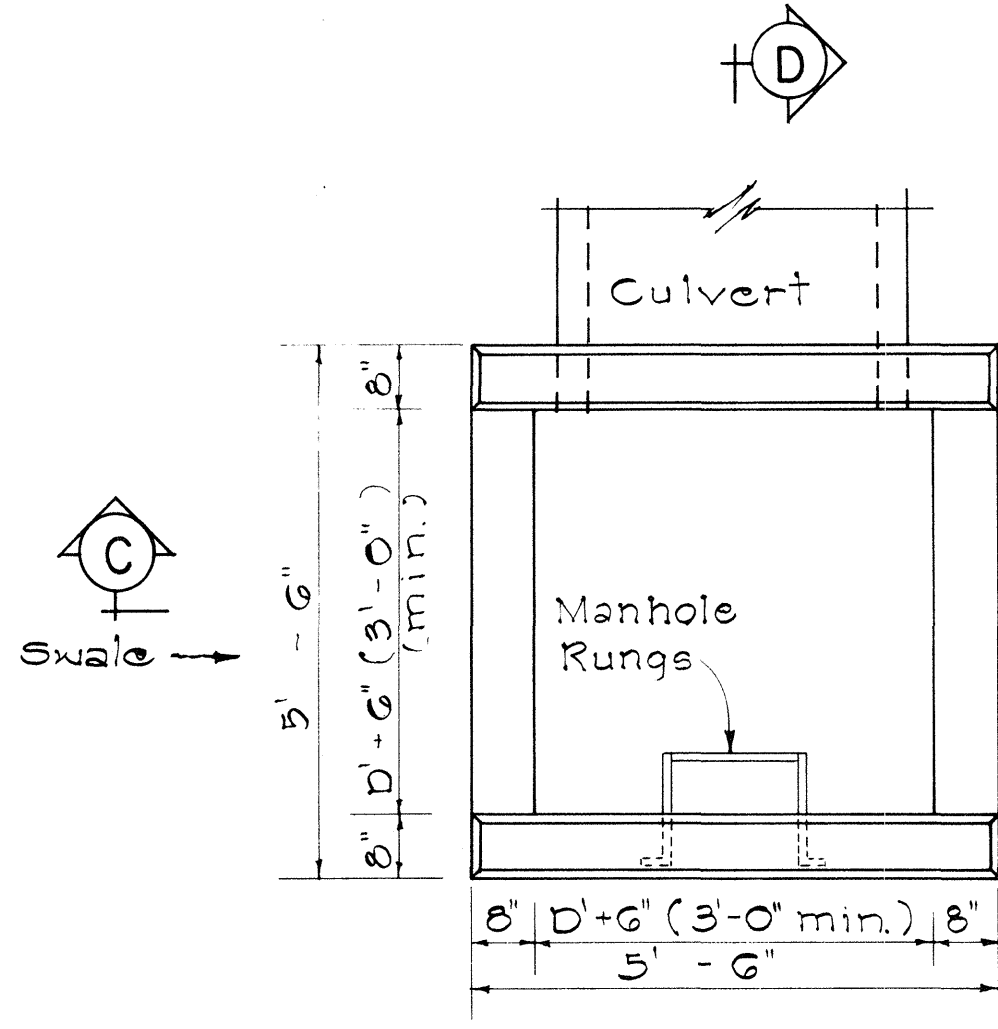
SECTION "A-A"



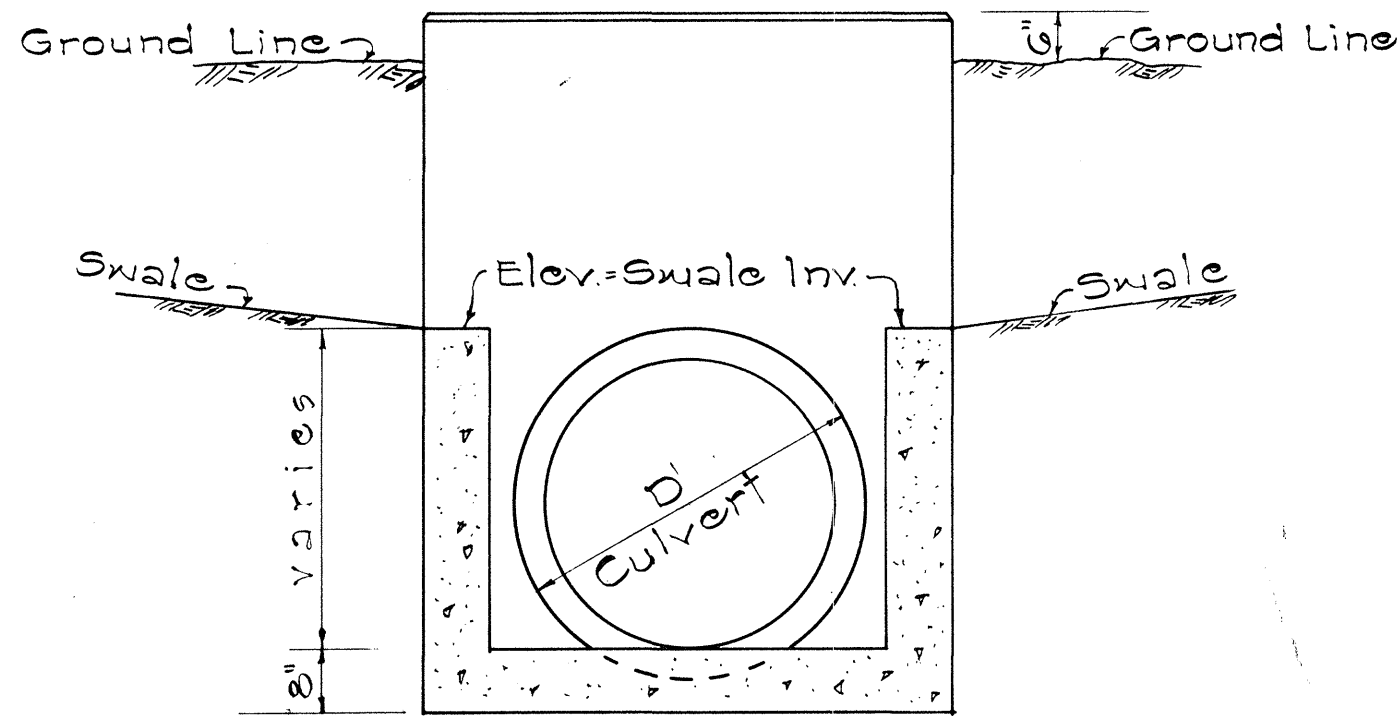
SECTION "B-B"

TYPE "A" CONCRETE DROP INTAKE

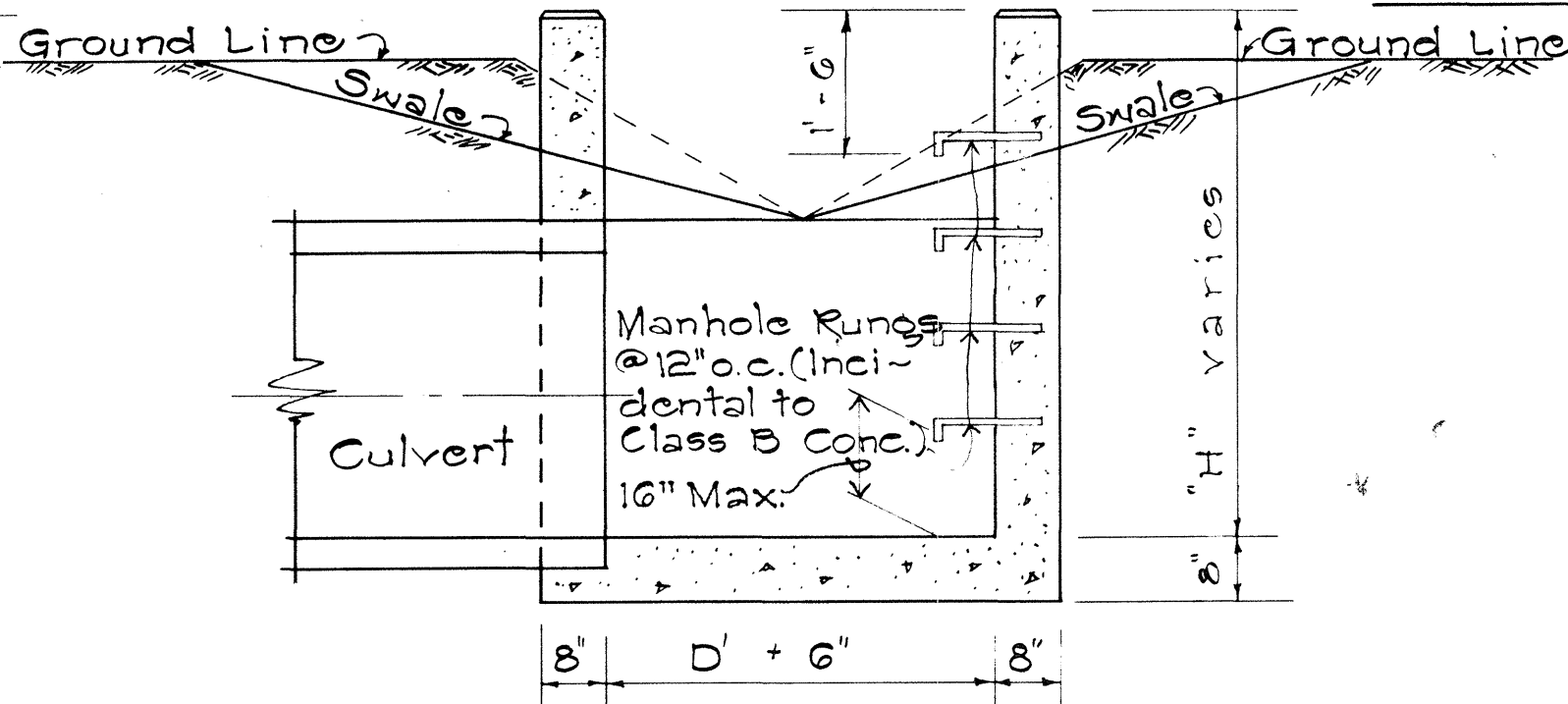
Scale: 1/2" = 1'-0"



PLAN



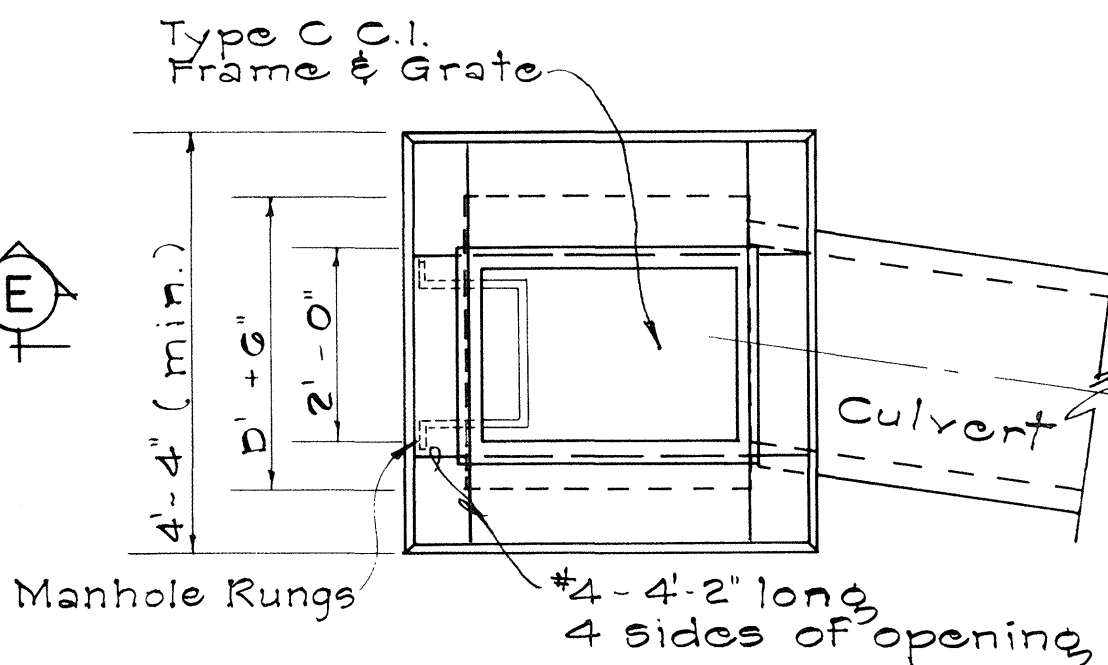
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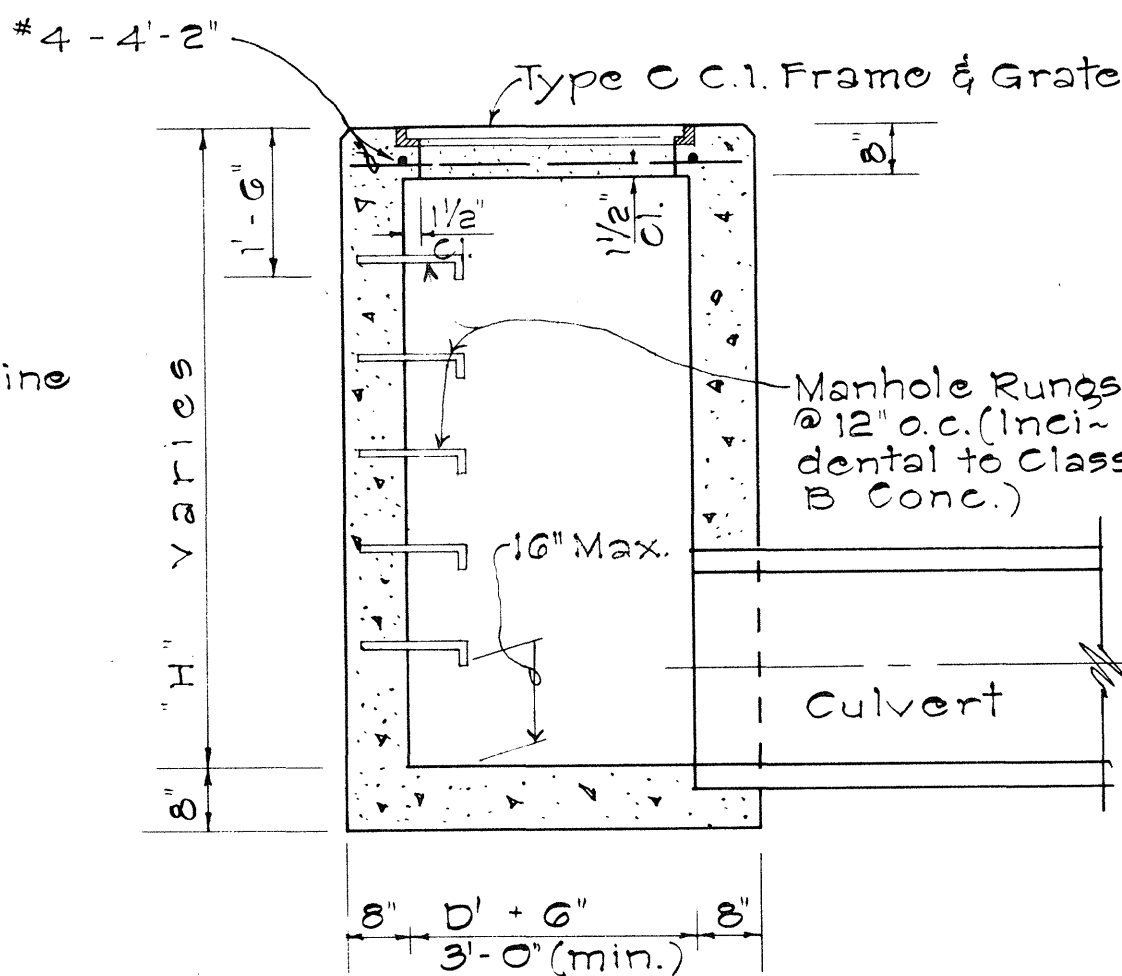
SECTION "D-D"

TYPE "B" CONCRETE DROP INTAKE

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



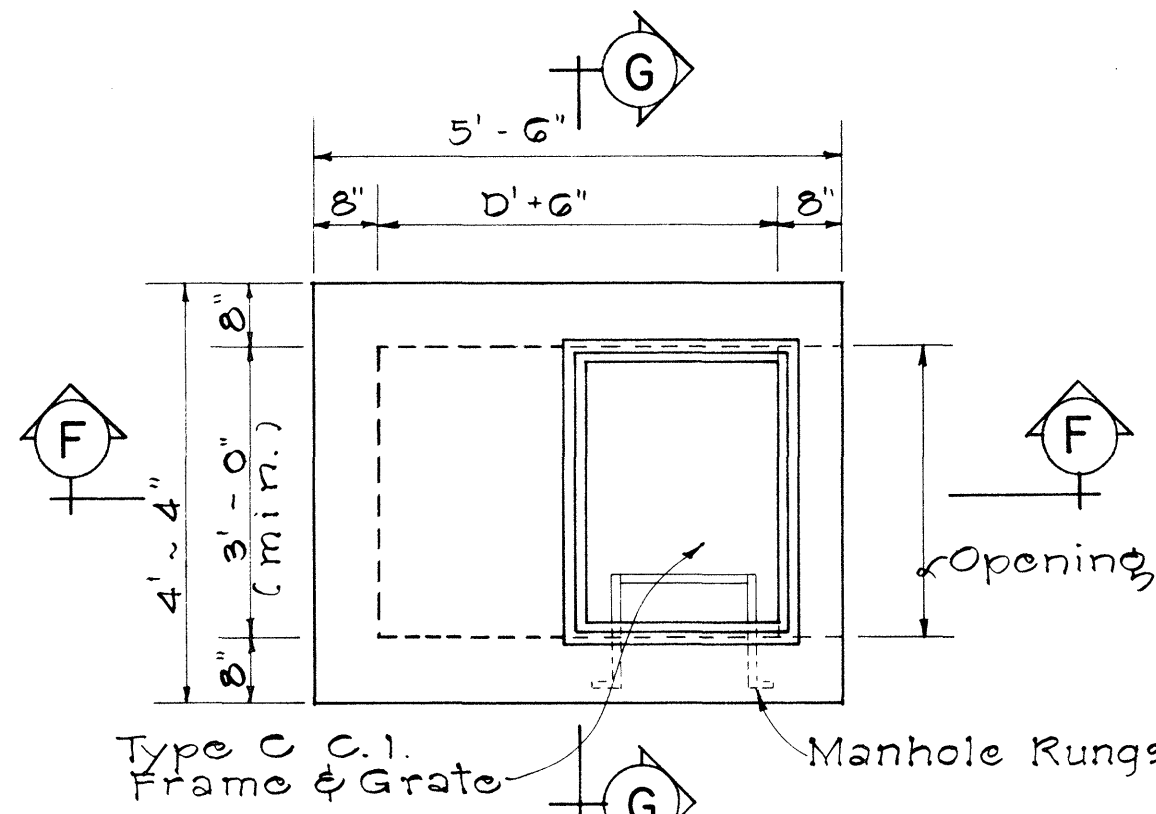
PLAN



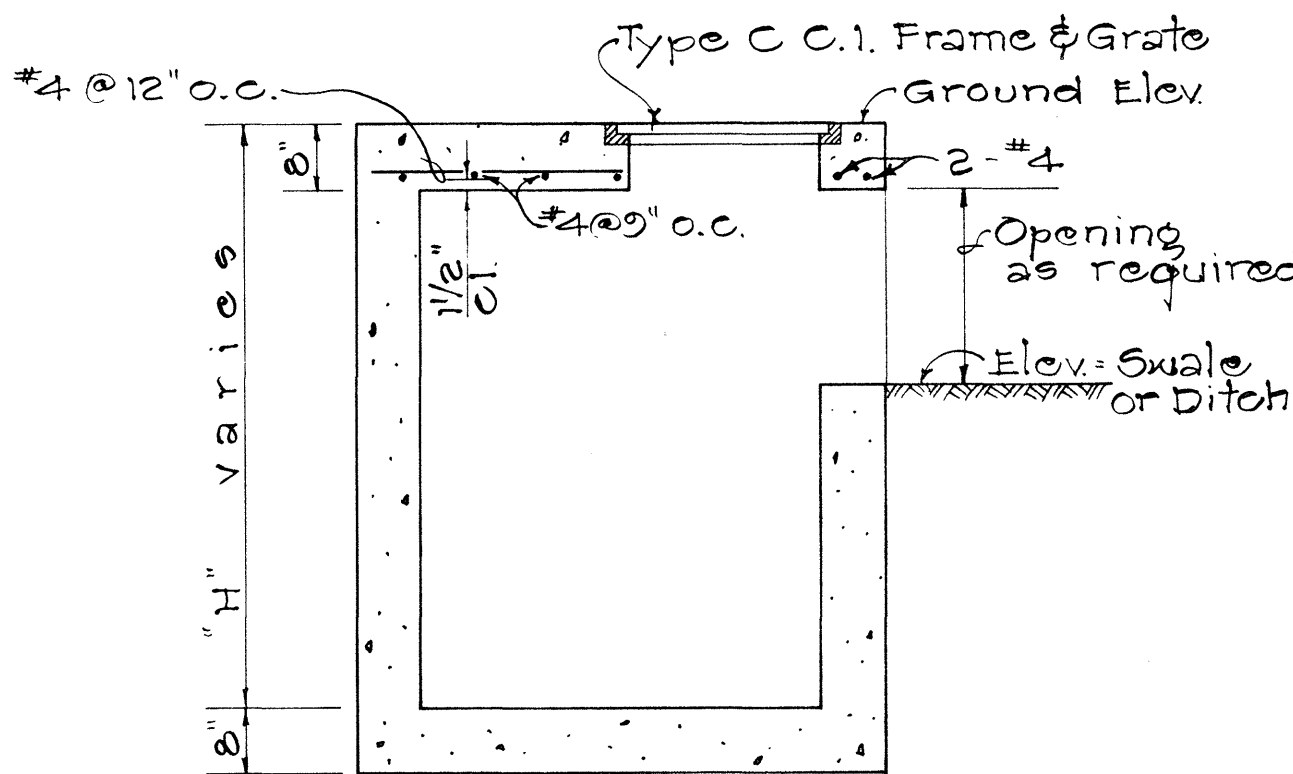
SECTION "E-E"

TYPE "C" GRATED CONCRETE DROP INTAKE

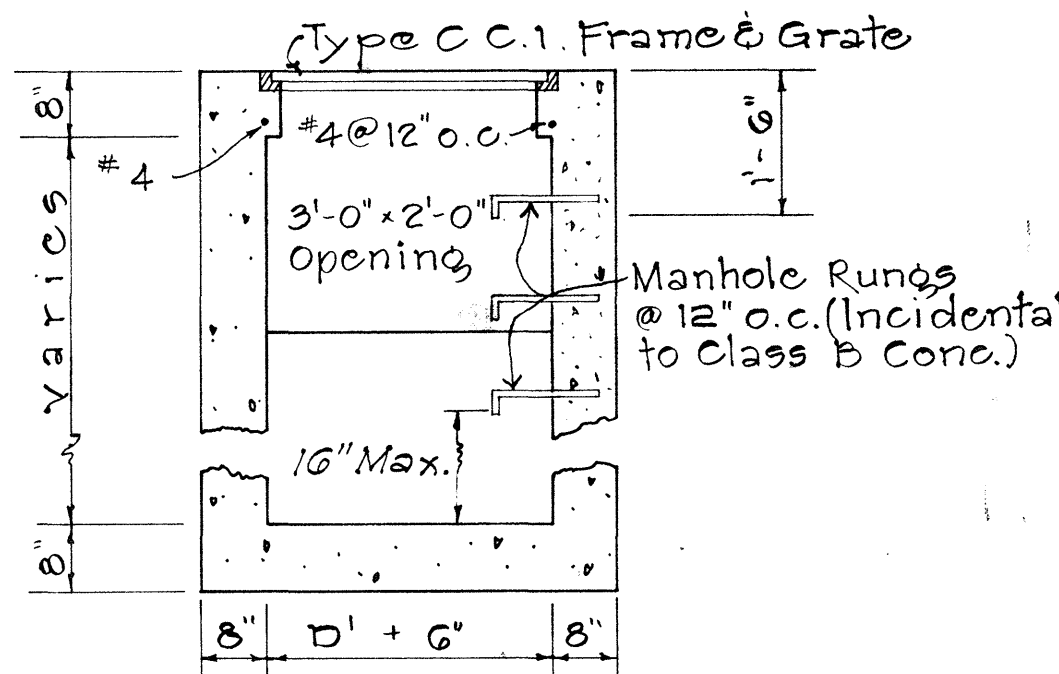
Scale: 1/2" = 1'-0"



PLAN



SECTION "F-F"



SECTION "G-G"

TYPE "D" GRATED CONCRETE DROP INTAKE

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

APPROVAL RECOMMENDED:
HYDRAULIC DESIGN ENGINEER
12-17-69
DATE

APPROVED:
ASSISTANT CHIEF, ENGINEERING
12-17-69
DATE

NO.	REVISION	APPROVED BY	DATE
1	Spacing on Manhole Rungs to conform to OSHA.	H.C.	1-24-75

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
TYPE "A", "B", "C", AND "D"
CONCRETE DROP INTAKE

Scale: As Noted
Date: July, 1969
SHEET No. 25 OF 25 SHEETS
DH19