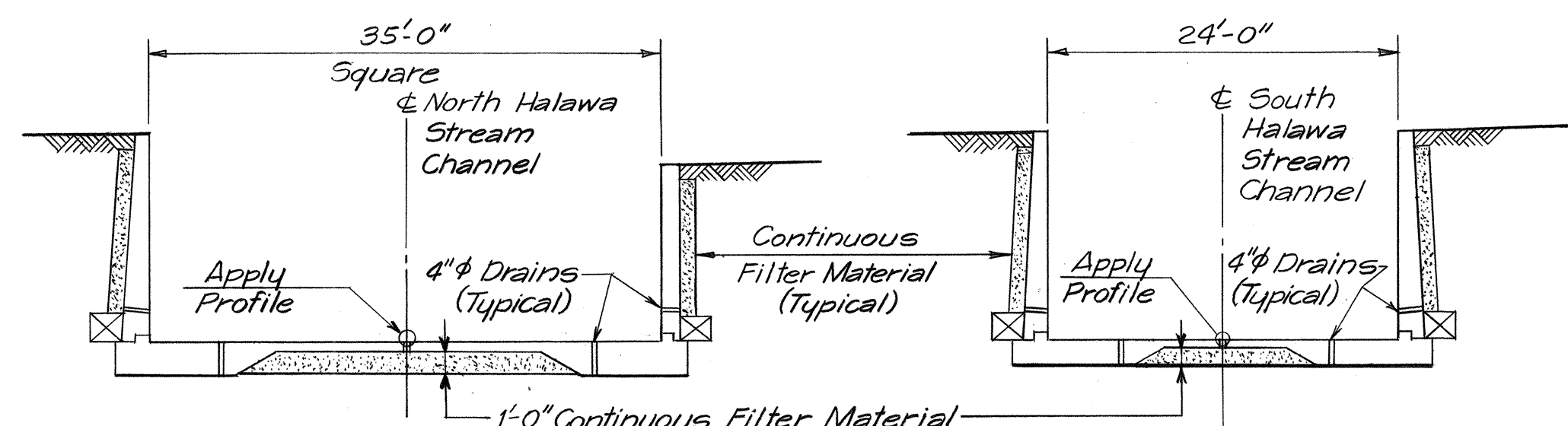


Design Stresses:

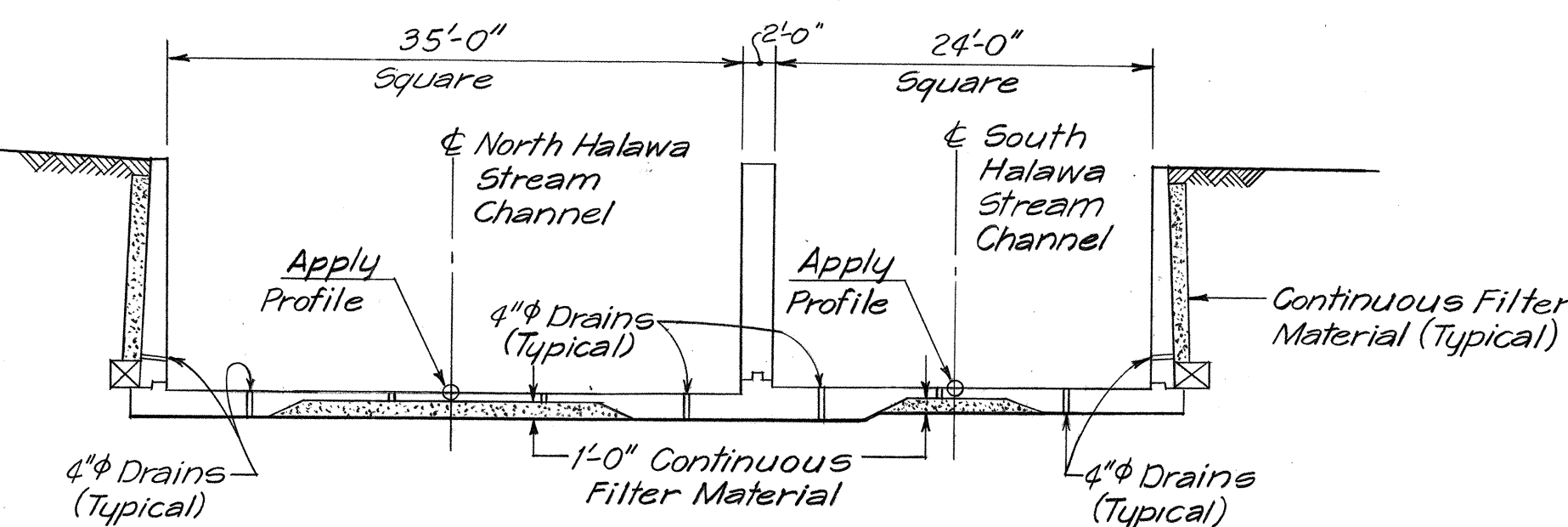
$f'_c = 3000 \text{ psi}$
 $f_c = 1200 \text{ psi}$
 $n = 10$
 $f_s = 20,000 \text{ psi (tension)}$
 All reinforcing steel to be ASTM
 Designation A615 Grade 40

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(90)-13	1972	150	202

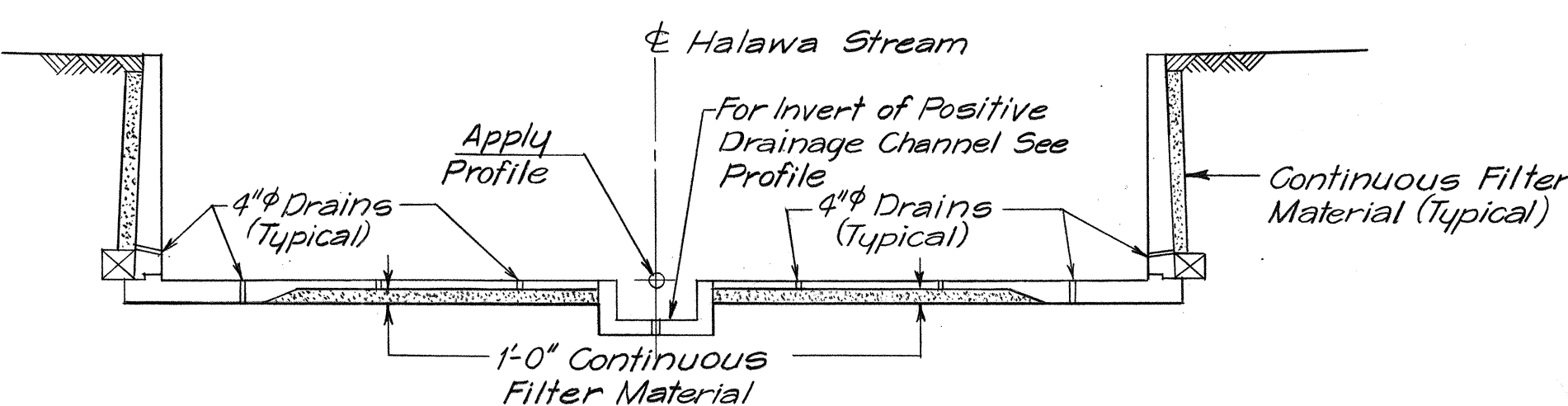


SECTION A-IW
Scale: 1"=10'-0"

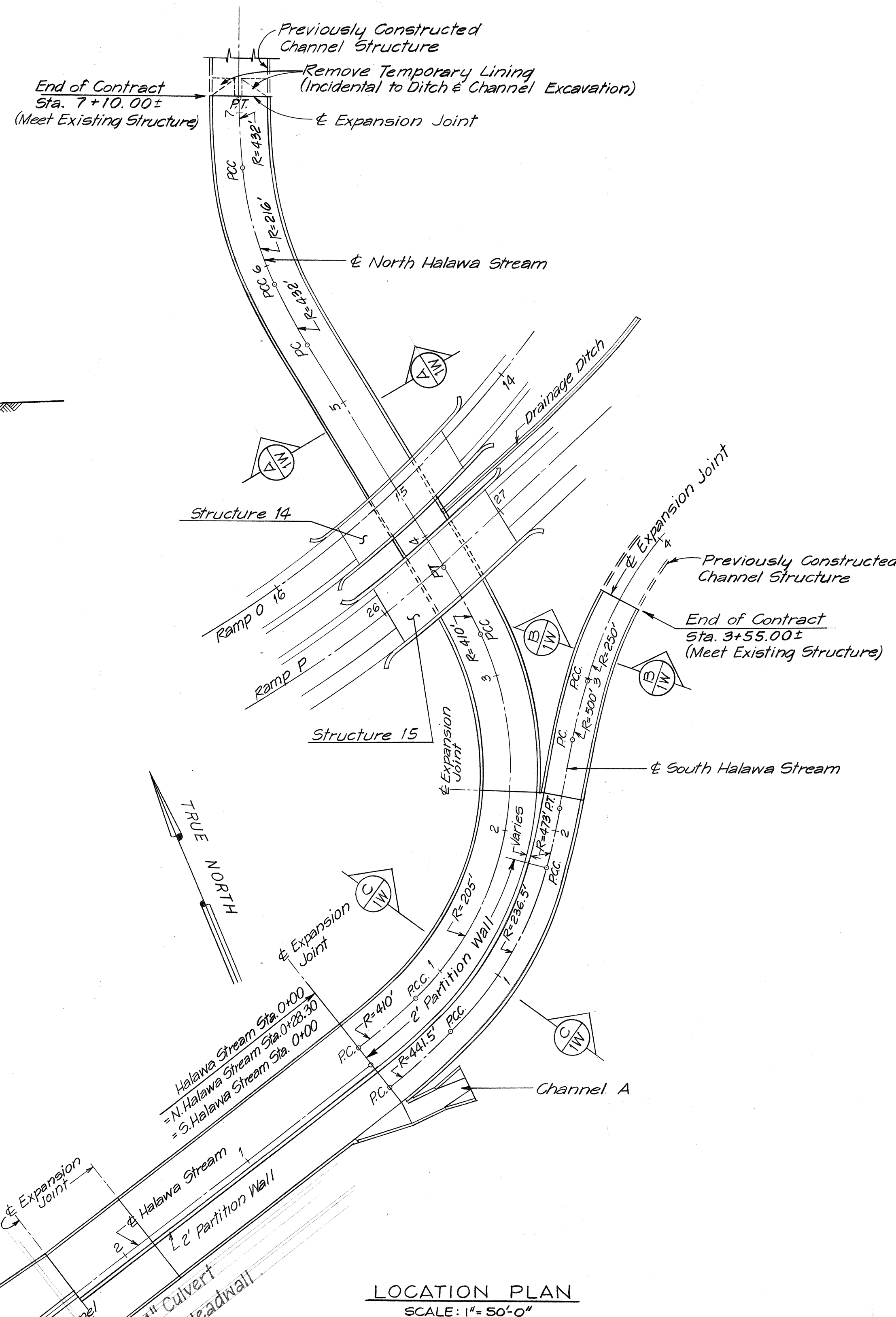
SECTION B-IW
Scale: 1"=10'-0"



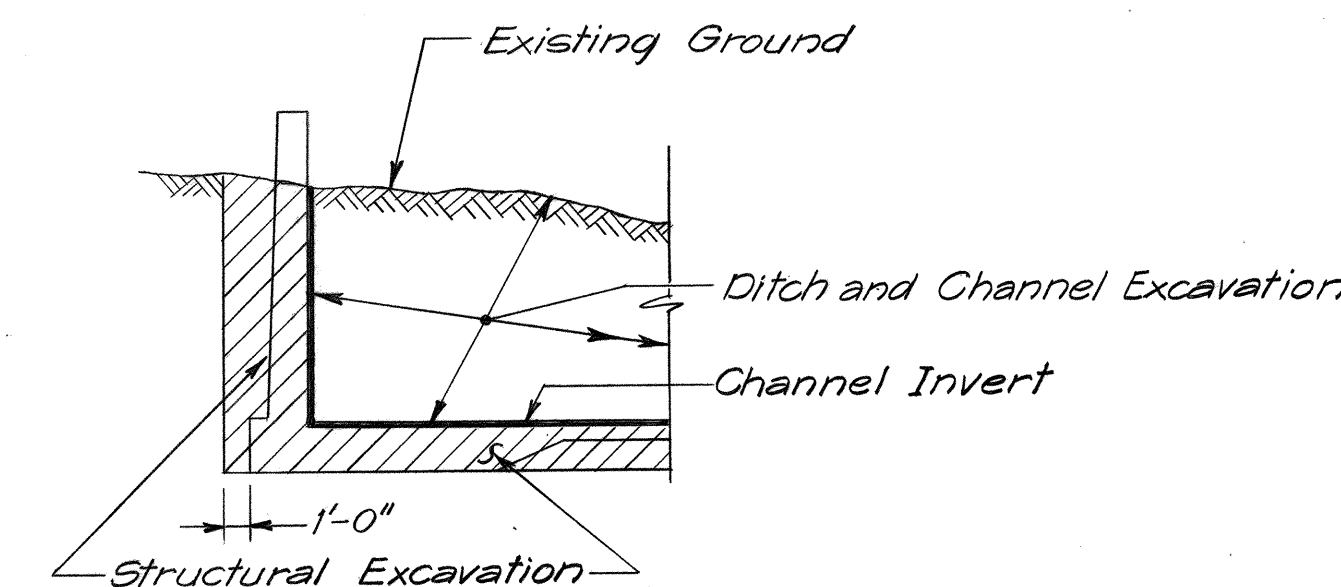
SECTION C-IW
Scale: 1"=10'-0"



SECTION D-IW
Scale: 1"=10'-0"



LOCATION PLAN
SCALE: 1"=50'-0"

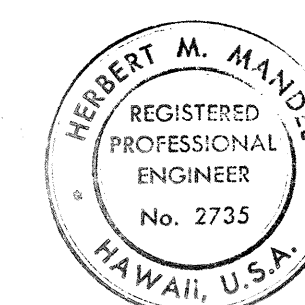


EXCAVATION PAYMENT LIMITS
For Backfill Details See Sheet 5W

ITEM NO.	ITEM	UNIT	QUANTITY
206.22	Struct. Excavation For Halawa Stream Structure	C.Y.	6010
503.032	Concrete In Halawa Stream Structure	L.S.	(4230 C.Y.)
602.032	Reinforcing Steel In Halawa Stream Structure	L.S.	(328,000 lb.)
206.80	Filter Material	C.Y.	2120
207.01	Ditch and Channel Excavation	C.Y.	13,000
612.01	Grouted Rubble Paving	C.Y.	215
634.03	Exploratory Work at Structure Footings, Halawa Stream Structure	F.A.	

GENERAL NOTES

- No backfill shall be placed behind channel walls until concrete in channel slab has developed a strength of at least 3000 PSI in compression. Backfilling shall be placed uniformly and simultaneously at opposite walls to avoid unequal lateral earth pressure.
- For Finished Ground Line elevations behind channel walls see Grading & Drainage Plans.
- All concrete shall be class A
- For Invert Elevation and width of Drainage Ditch Inlet see Drainage Plans.
- For profile of North & South Halawa Stream see Drainage Plans.
- For horizontal geometry see alignment plans.
- In addition to the joints shown, expansion joints shall be spaced @ 90'-0" o.c. maximum, and construction joints @ 30'-0" o.c. maximum, unless otherwise directed by the Engineer. For details see Sheet 5W.



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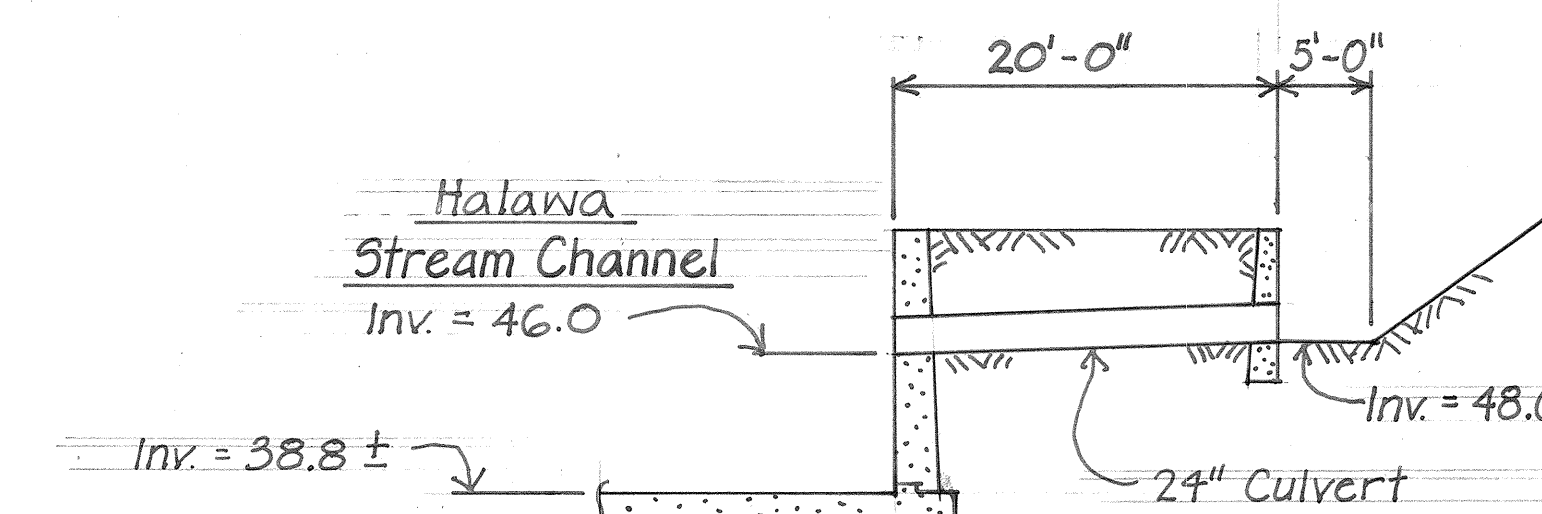
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HALAWA STREAM STRUCTURE LOCATION PLAN

INTERSTATE ROUTE H-1
PROJECT NO I-HI-1(90)-13

SCALE: AS SHOWN DATE: DEC. 24, 1970
SHEET No. 1W OF 7W SHEETS

SECT. AT CULVERT Sta. 2+50.0 ± Scale: 1"=10'-0"

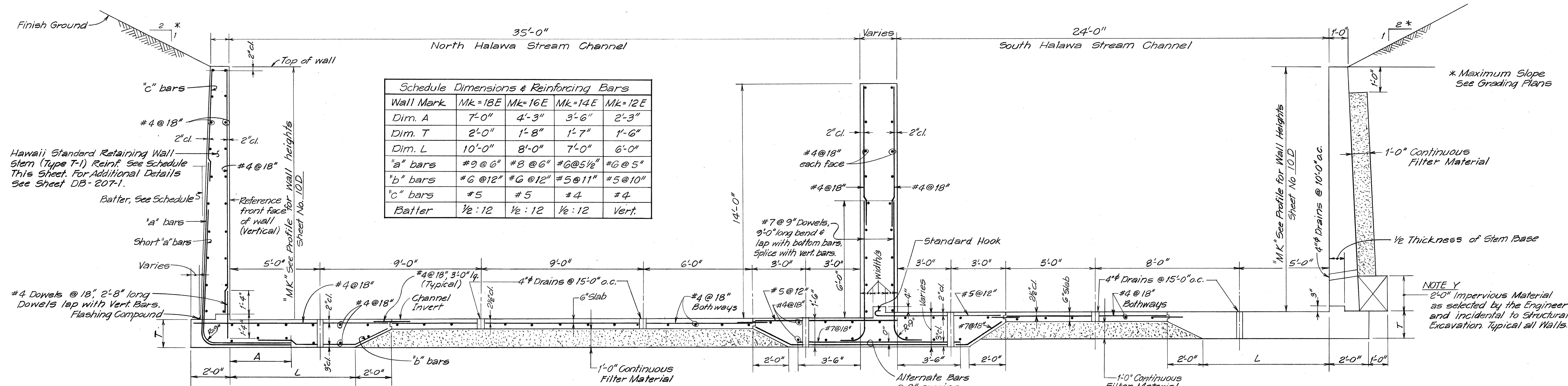


Class "B" conc. paving
For limits of Grouted Rubble
Paving see Drainage Plans

Halawa Stream
Station 3+90.00

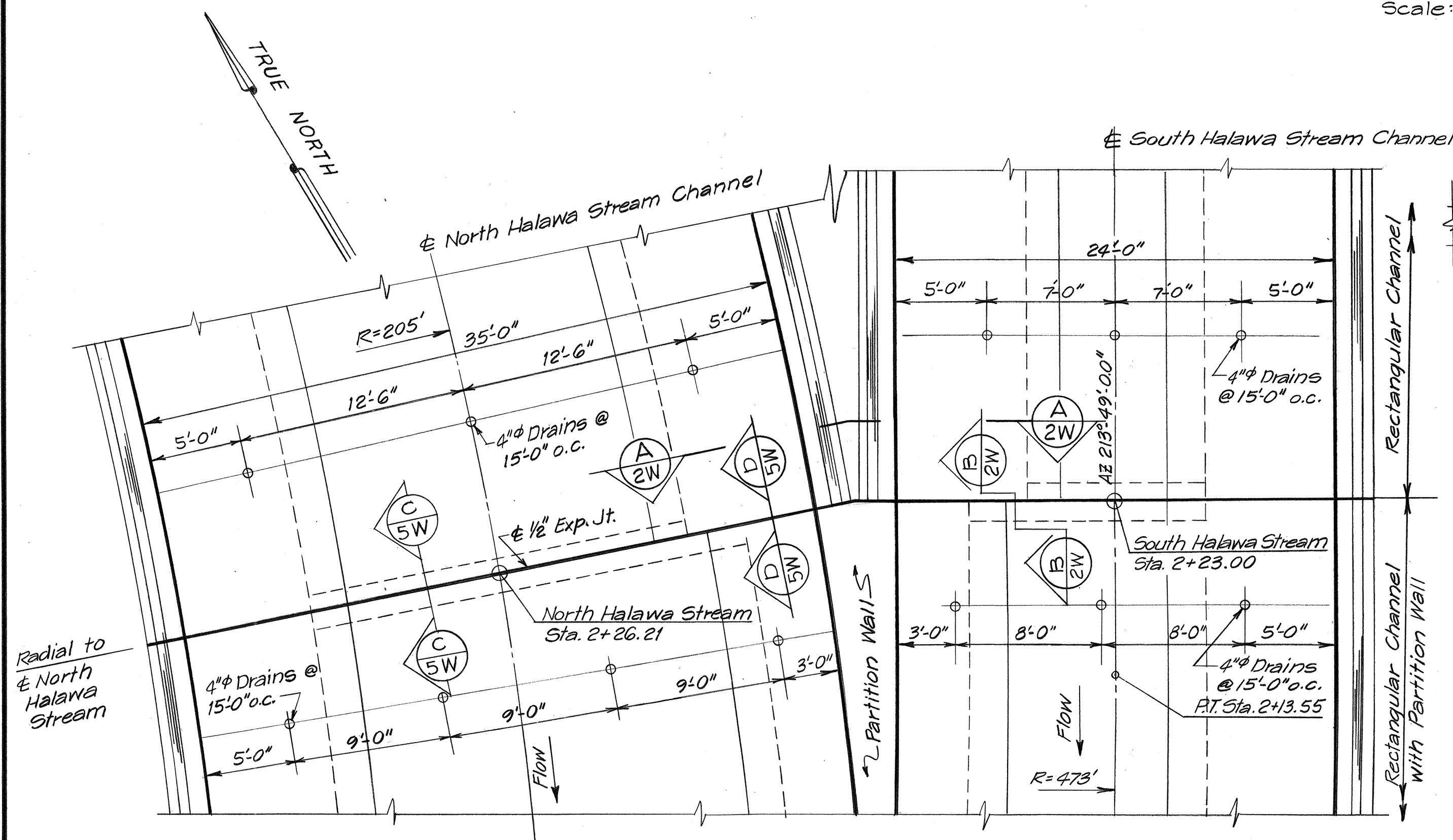
SURVEY PLOTTED BY	DATE
DESIGNED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(90)-13	1972	151	202



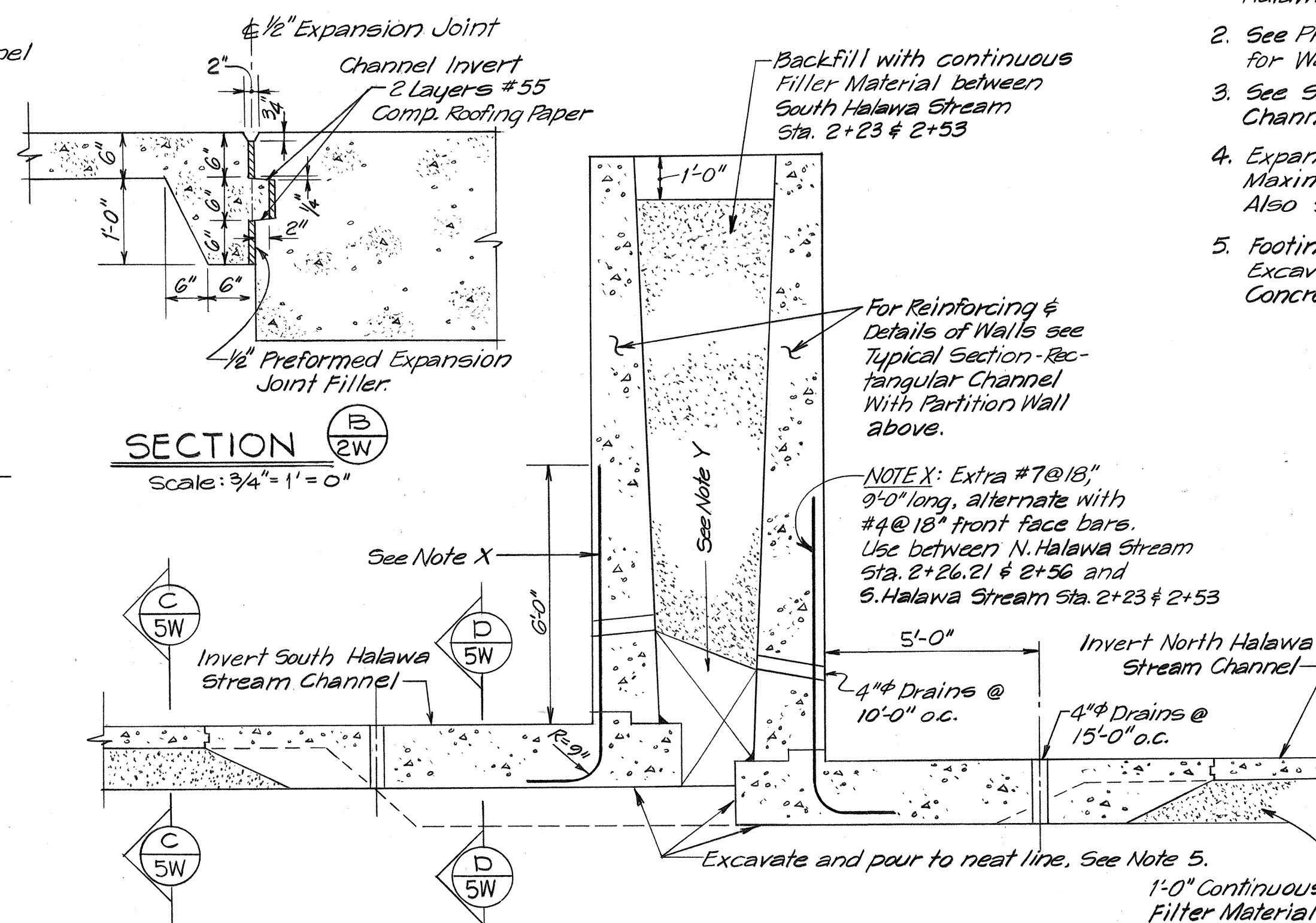
TYPICAL SECTION - RECTANGULAR CHANNEL WITH PARTITION WALL

Scale: 3/8" = 1'-0"



NORTH & SOUTH HALAWA STREAM CHANNEL JUNCTION - PLAN

Scale: 3/16" = 1'-0"

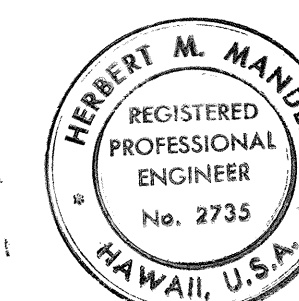


SECTION A-A

Scale: 3/8" = 1'-0"

NOTES:

- All Dimensions shown in Sections are normal to either North Halawa Stream & or South Halawa Stream &.
- See Profile of North & South Halawa Stream (Drainage Plans) for Wall Stem "MK" sizes.
- See Sheet 5W for Elevation View of Construction Joint. Transverse Channel Construction Joint spacing 30'-0" Maximum.
- Expansion Joints for the Rectangular Channel to occur at 90'-0" Maximum Spacing. See Sheet 5W for Expansion Joint Details. Also See Section B-B this Sheet for Channel Slab Expansion Joint.
- Footings are to be on undisturbed ground. In case of over Excavation the Contractor shall Backfill this area with Class "D" Concrete at his own expense.

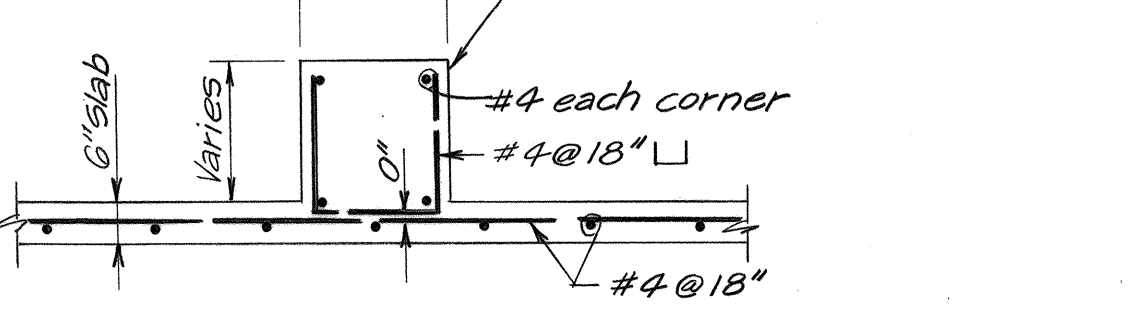


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Herbert M. Mandel

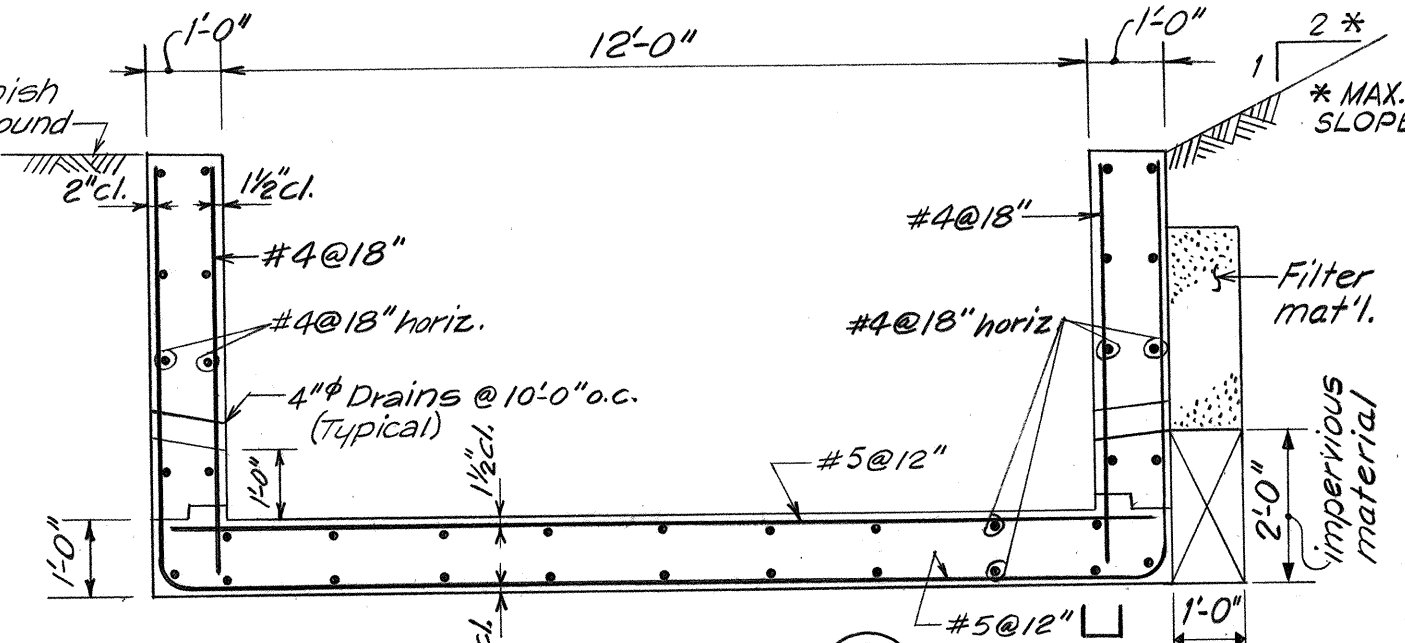
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HALAWA STREAM STRUCTURE
TYPICAL SECTIONS
& DETAILS I
INTERSTATE ROUTE H-1
PROJECT NO. I-HI-1(90)-13
SCALE: AS SHOWN DATE: DEC. 24, 1970
SHEET No. 2W OF 7W SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(90):13	1972	152	202

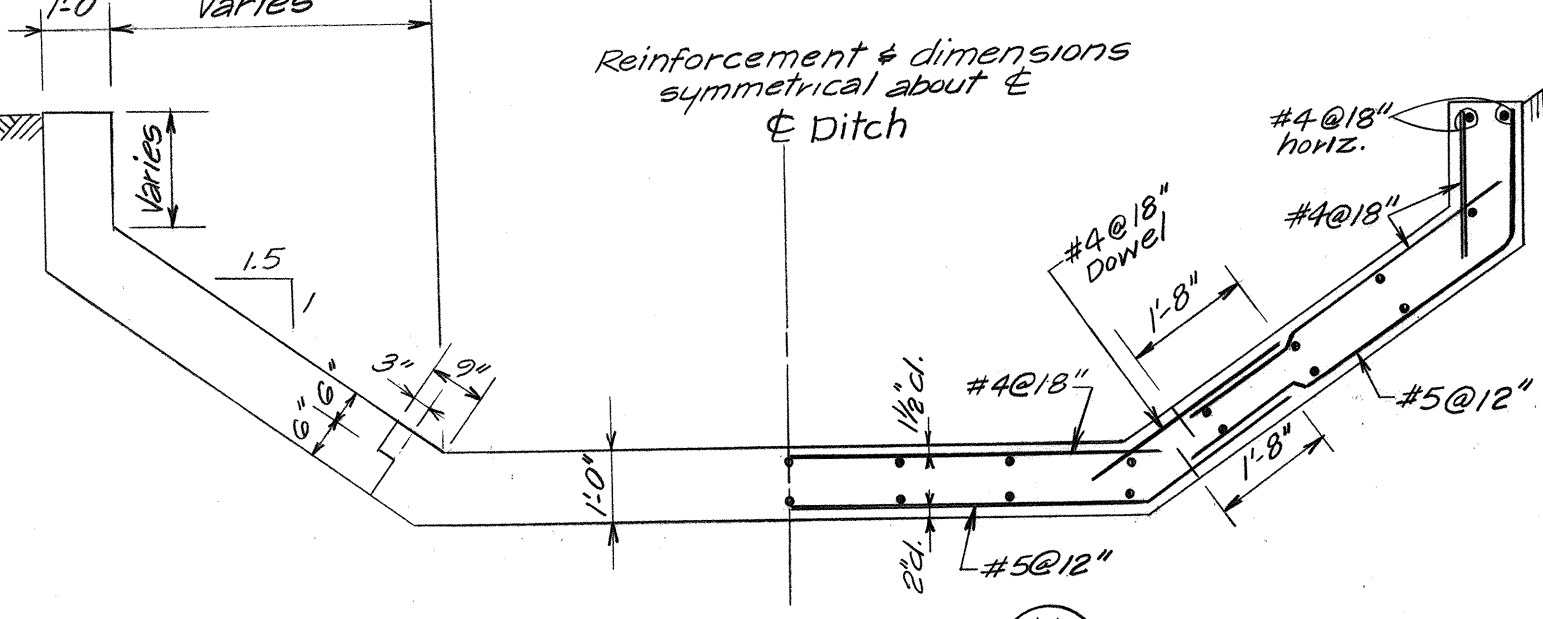
NOTE: Partition Wall stem is to be monolithic with channel slab between Sta. 1+80 & 2+40.



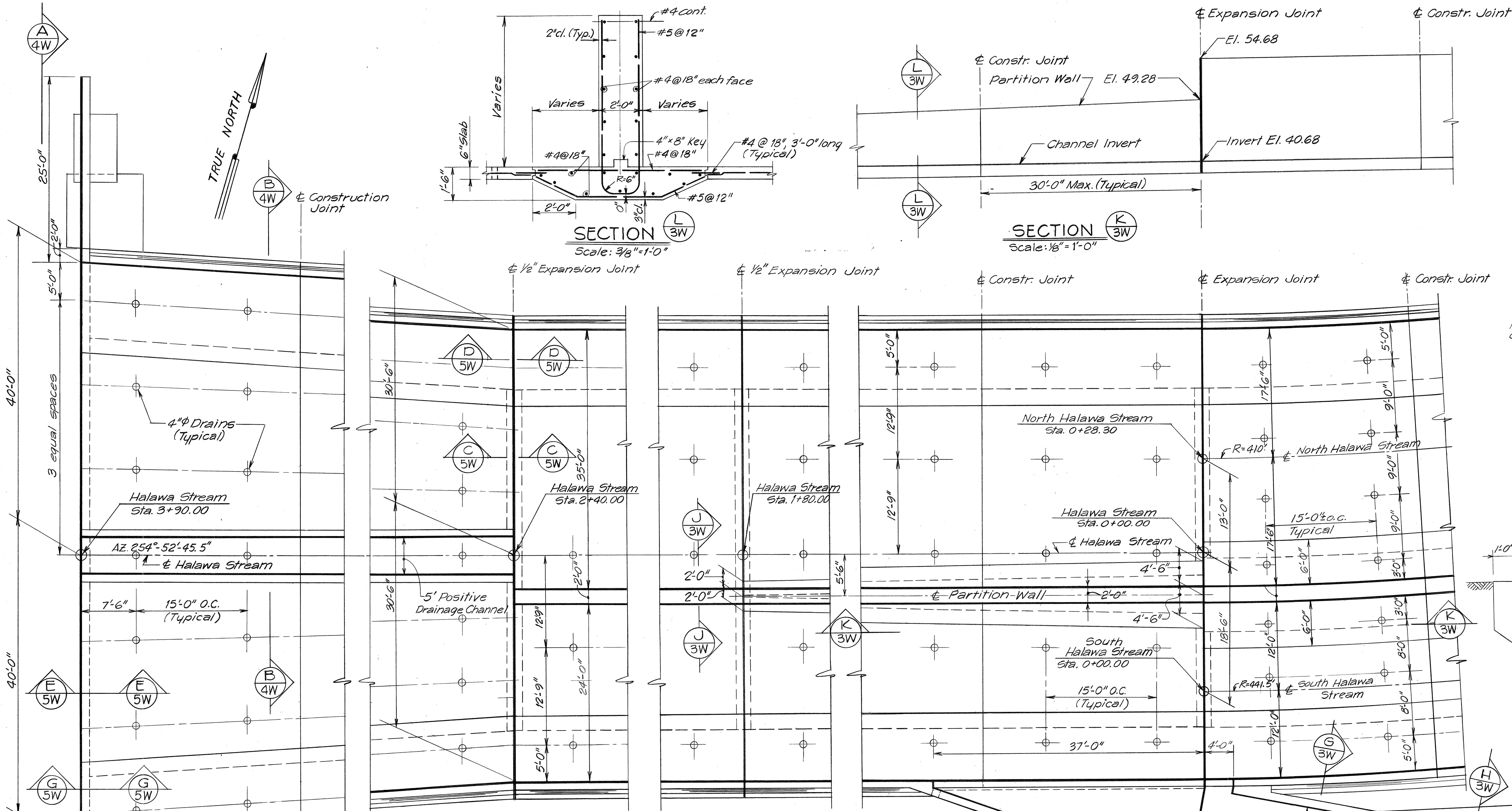
SECTION J 3W
Scale: 3/8"=1'-0"



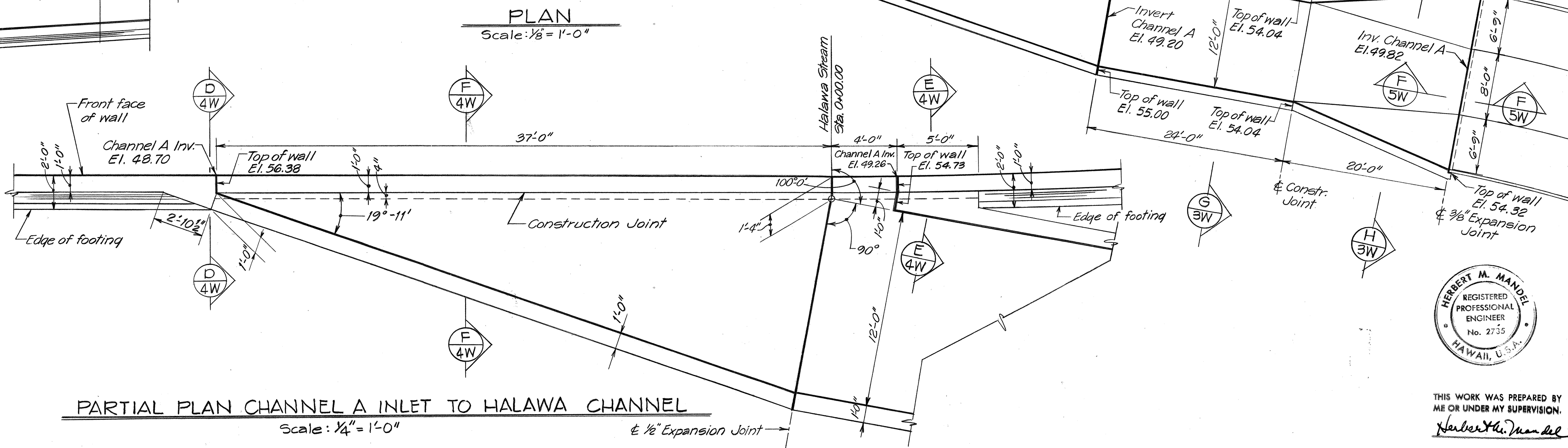
SECTION G 3W
Scale: 3/8"=1'-0"



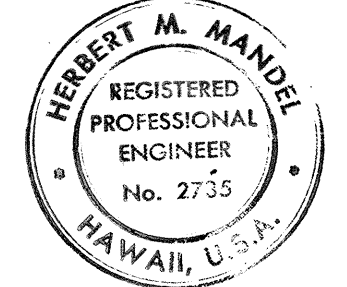
SECTION H 3W
Scale: 3/8"=1'-0"



PLAN
Scale: 1/8"=1'-0"



PARTIAL PLAN CHANNEL A INLET TO HALAWA CHANNEL
Scale: 1/4"=1'-0"

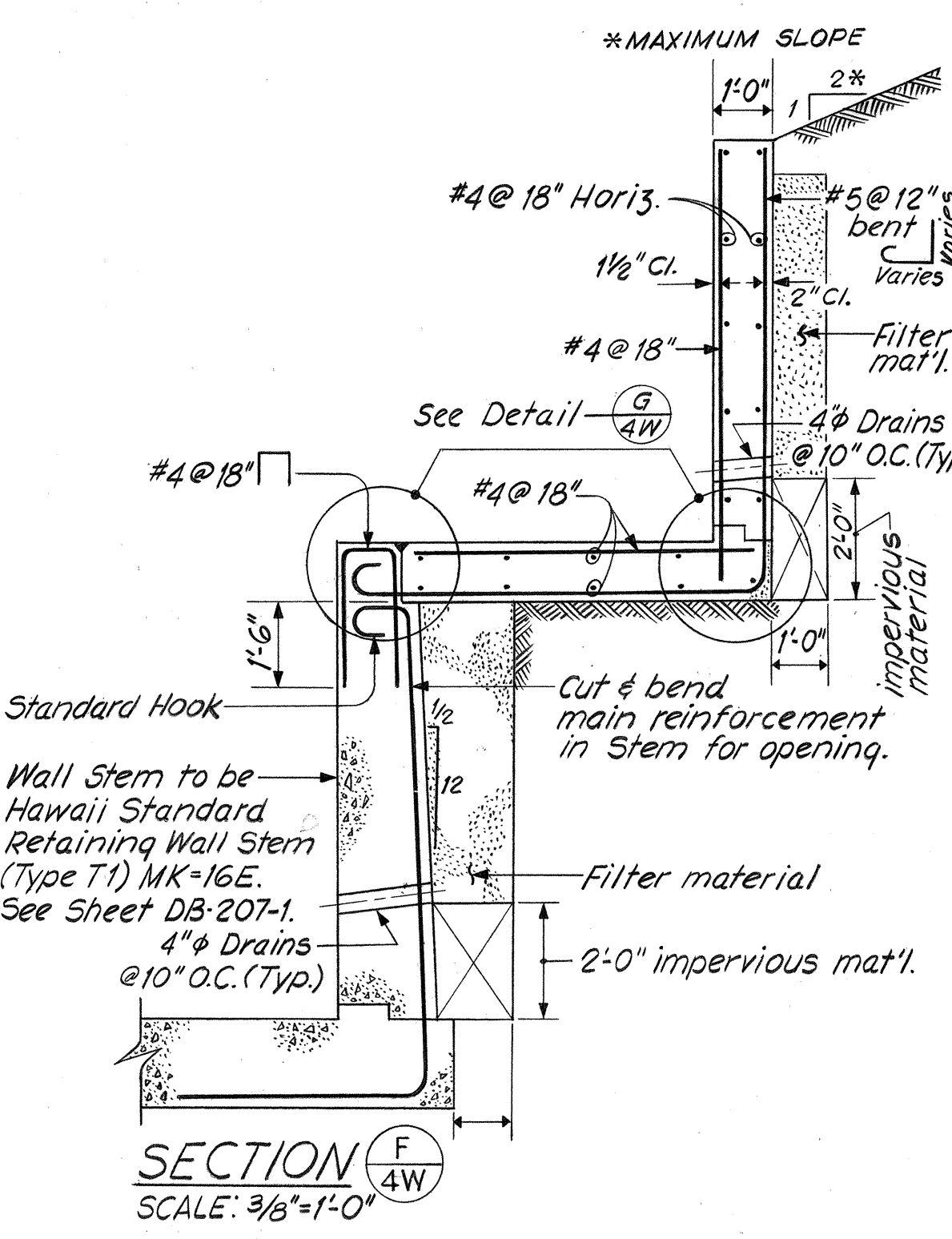
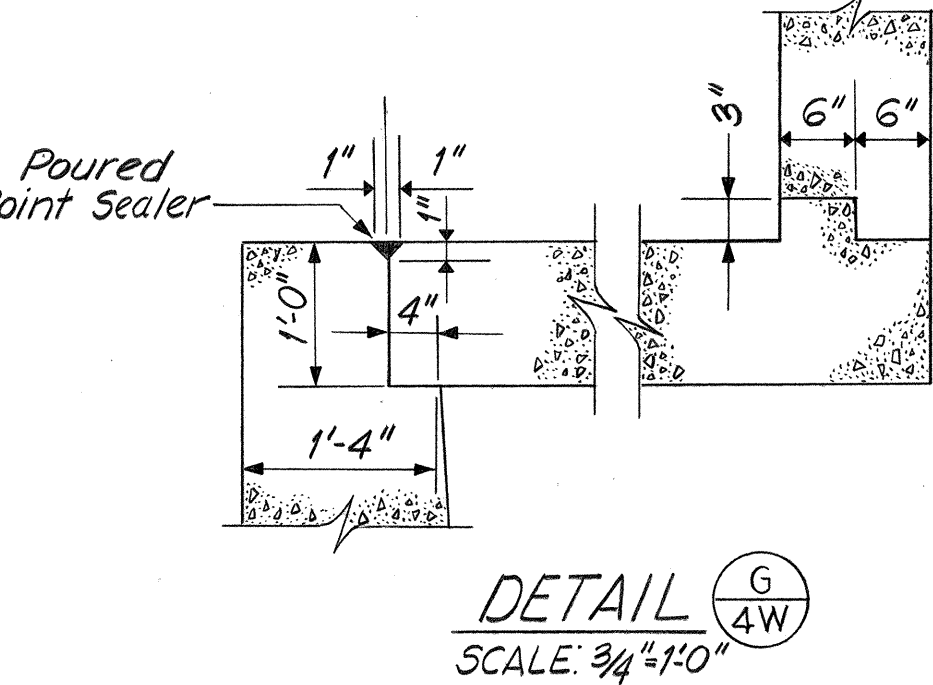
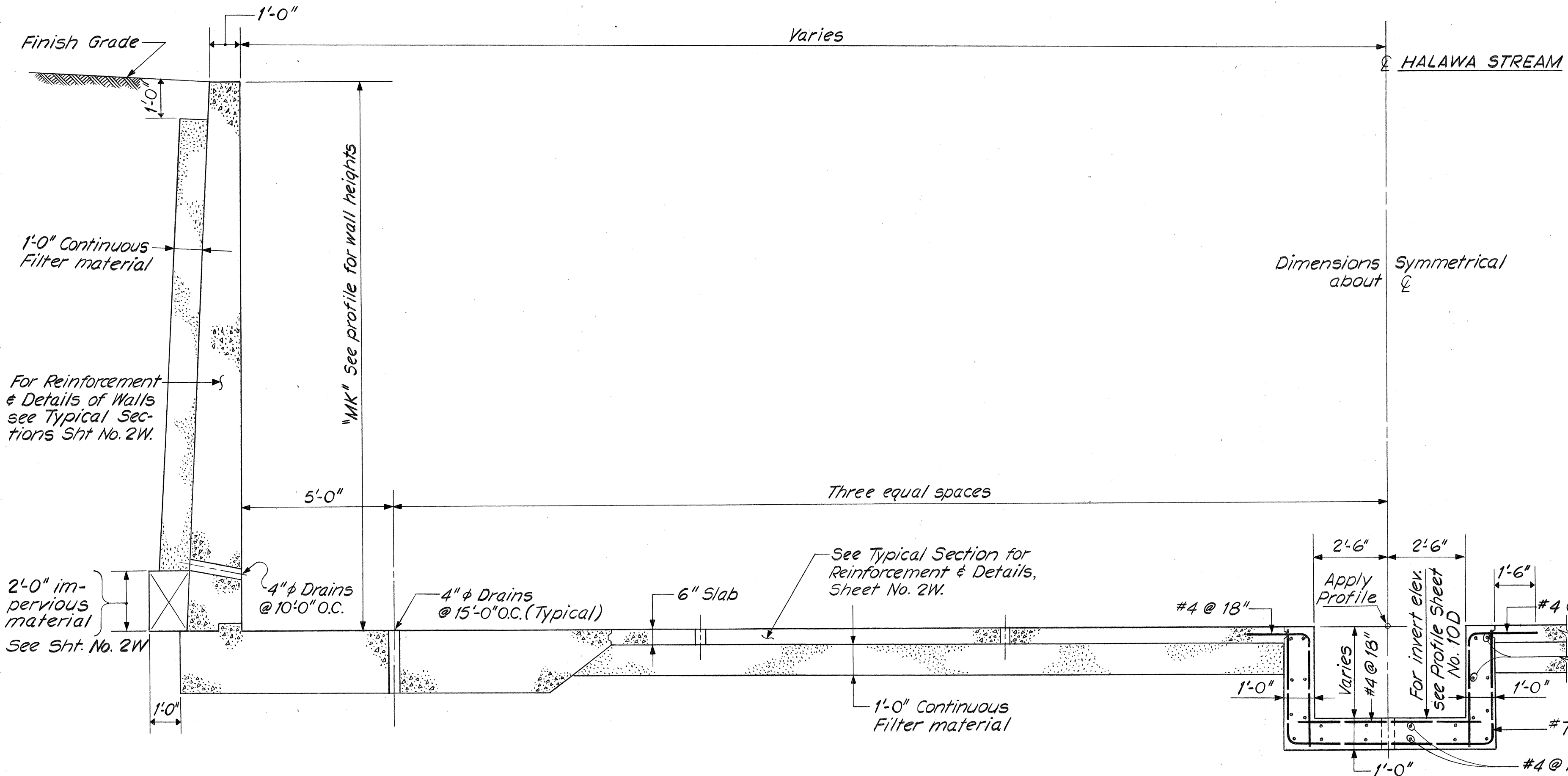
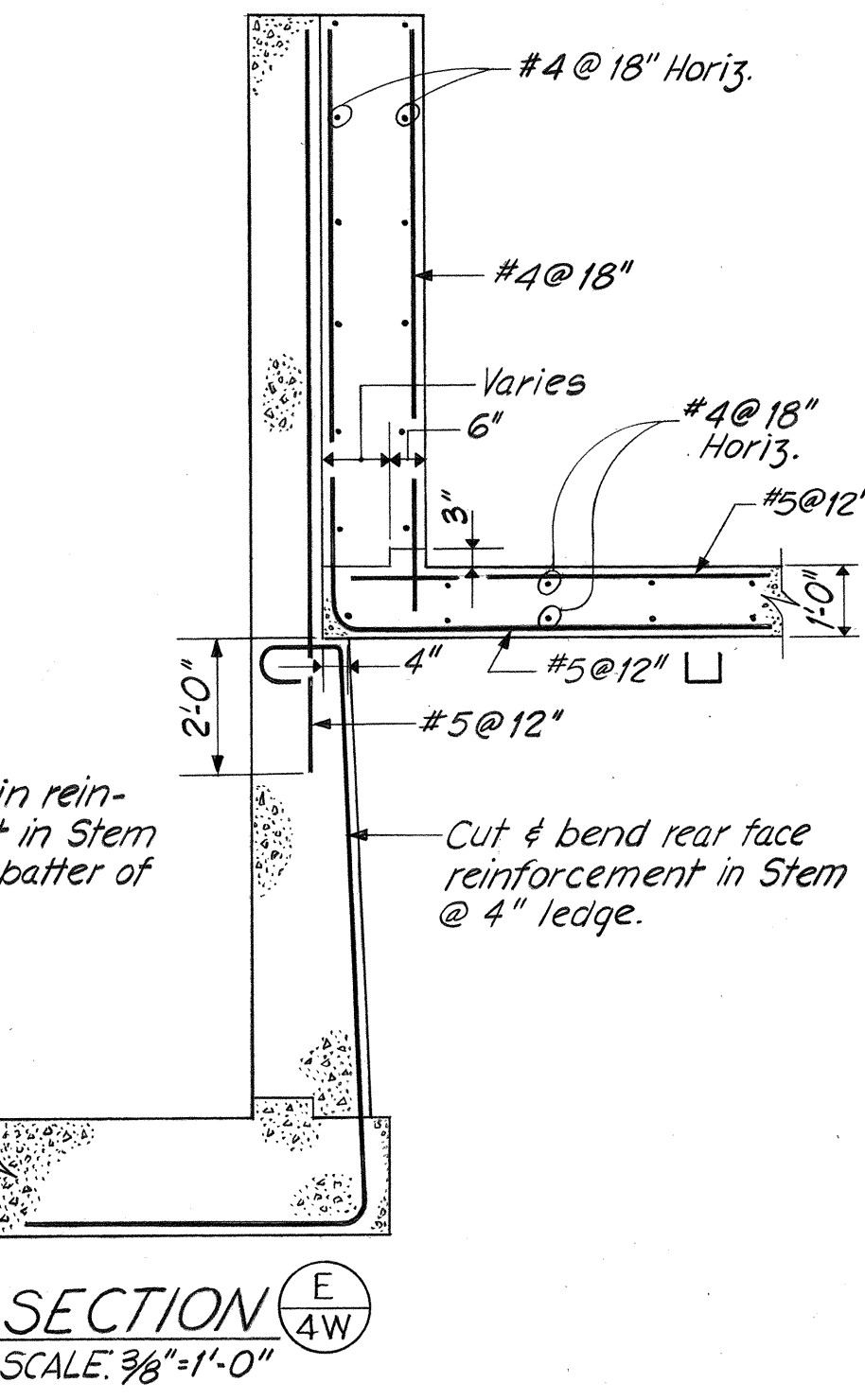
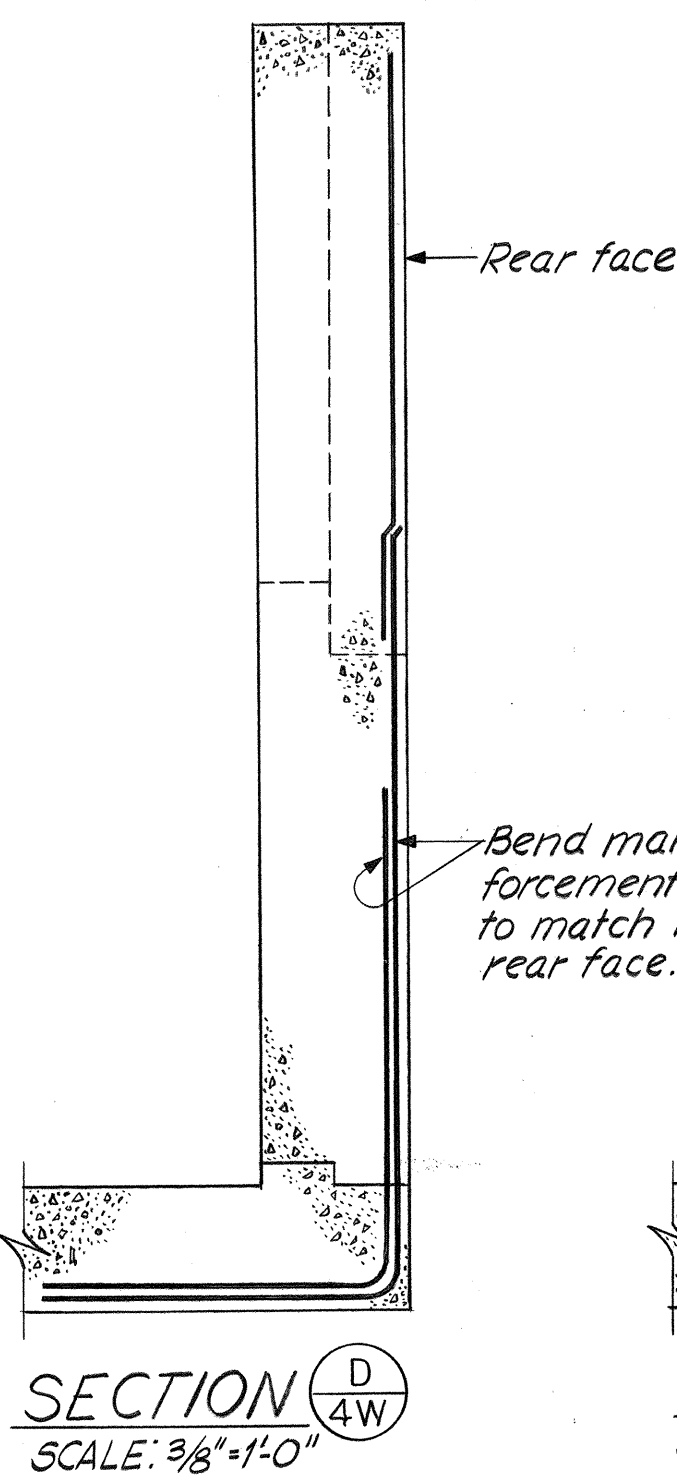
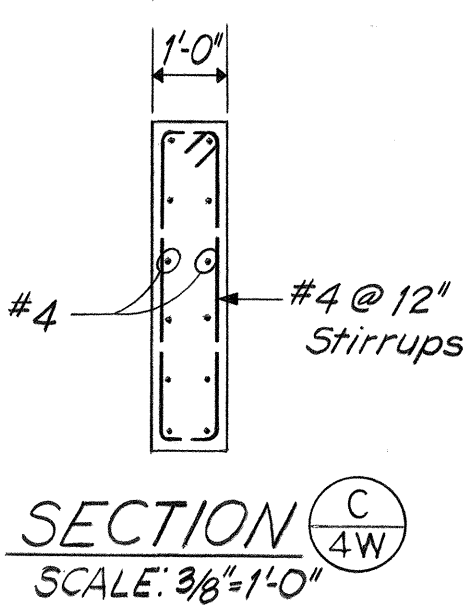
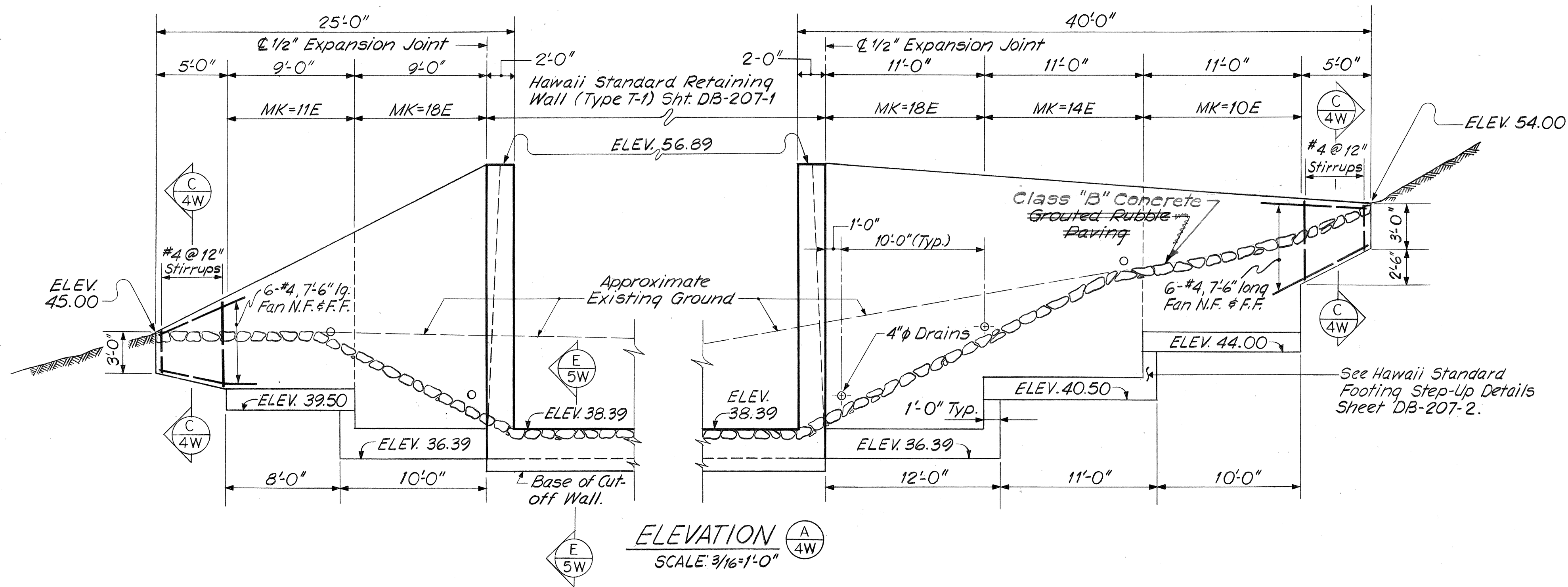


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Herbert M. Mandel

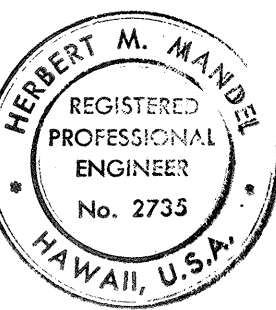
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**HALAWA STREAM STRUCTURE
OUTLET TRANSITION & CHANNEL A**
INTERSTATE ROUTE H-1
PROJECT NO I-HI-1(90):13
SCALE: AS SHOWN DATE: DEC. 24, 1970
SHEET No. 3W OF 7W SHEETS

SURVEY PLOTTED BY	DATE
DESIGNED BY	
CHECKED BY	
NOTE BOOK	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(90)13	1972	153	202



Note
For locations of Elevation A & Sections B, D, E & F see Sh. 3W.

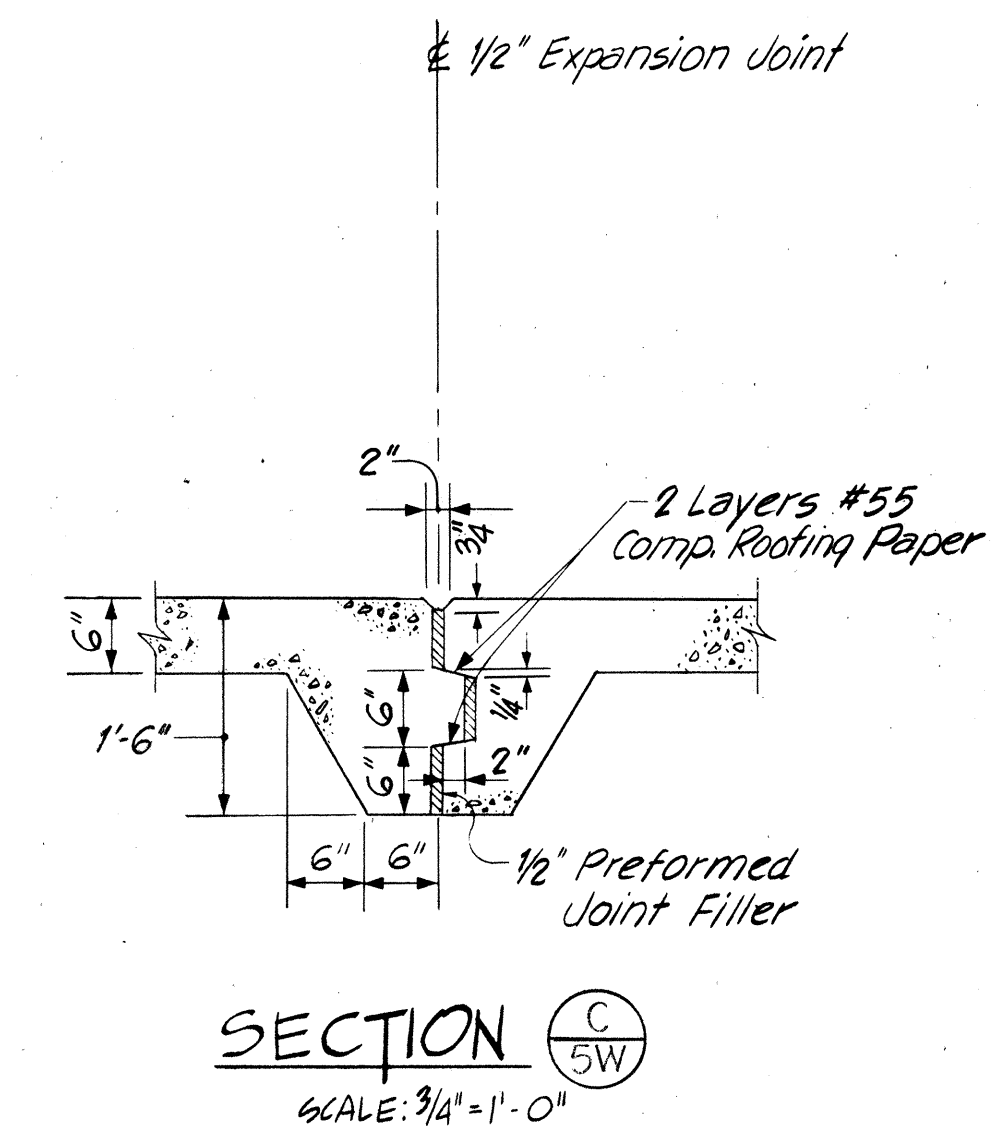
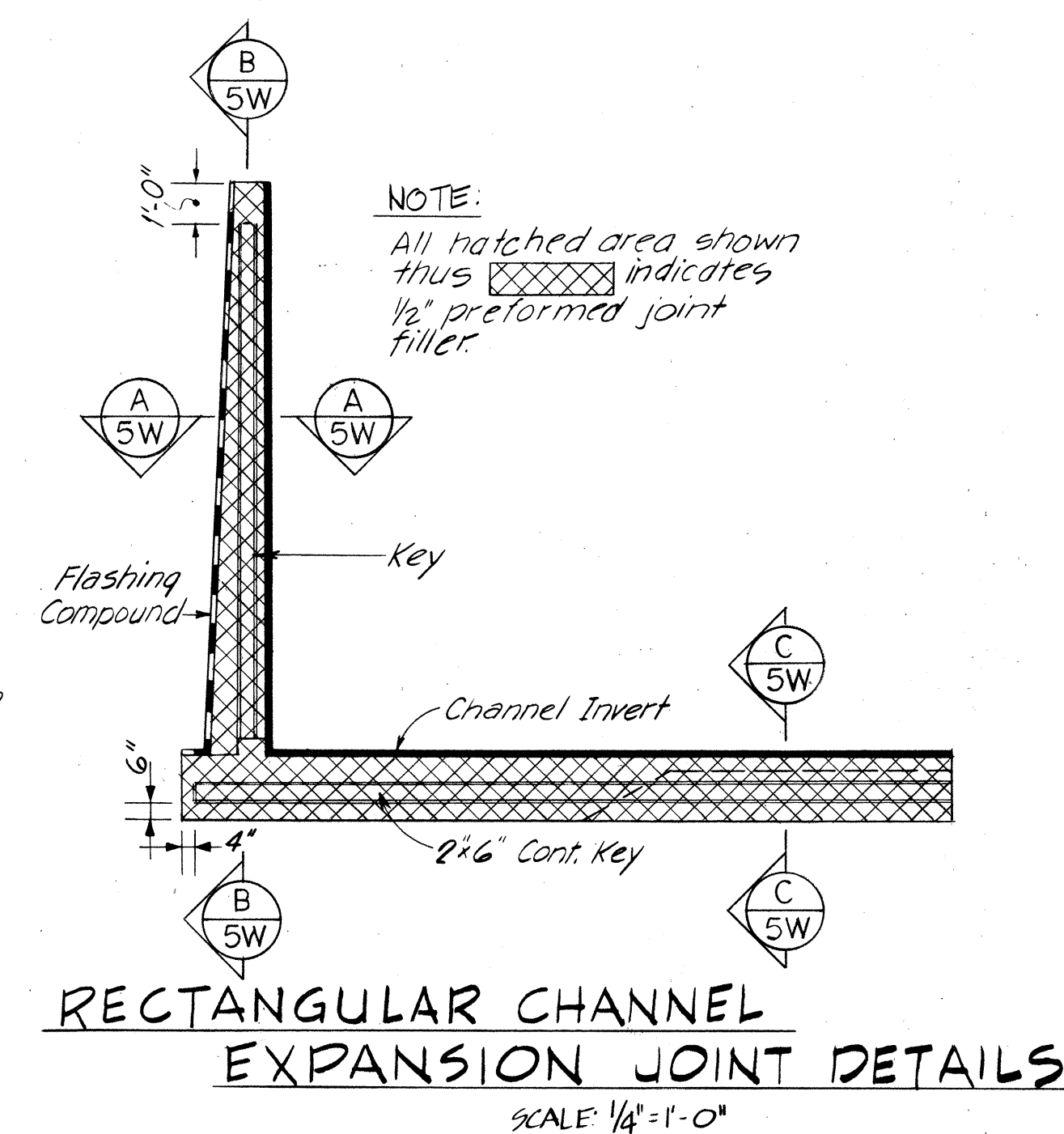
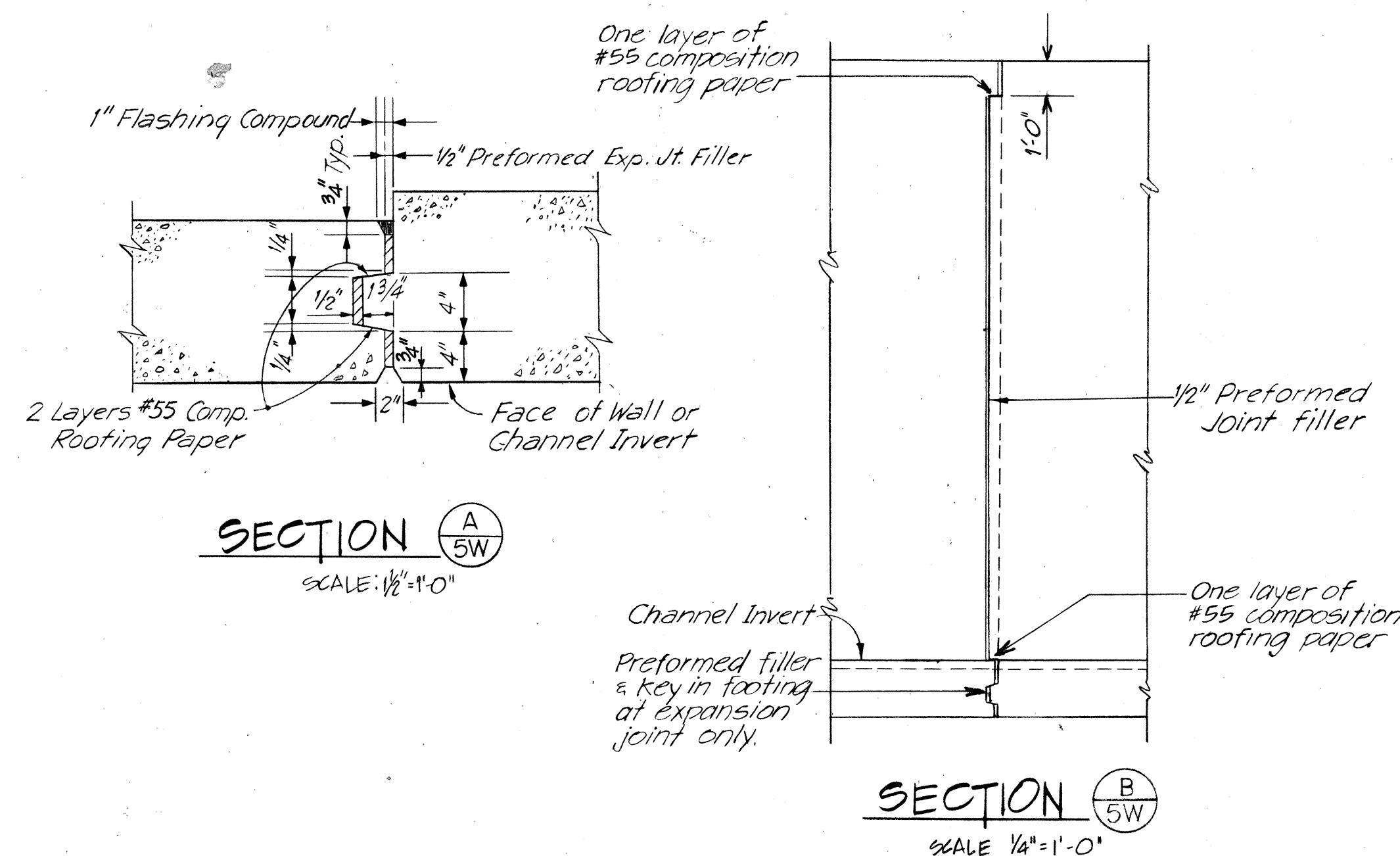
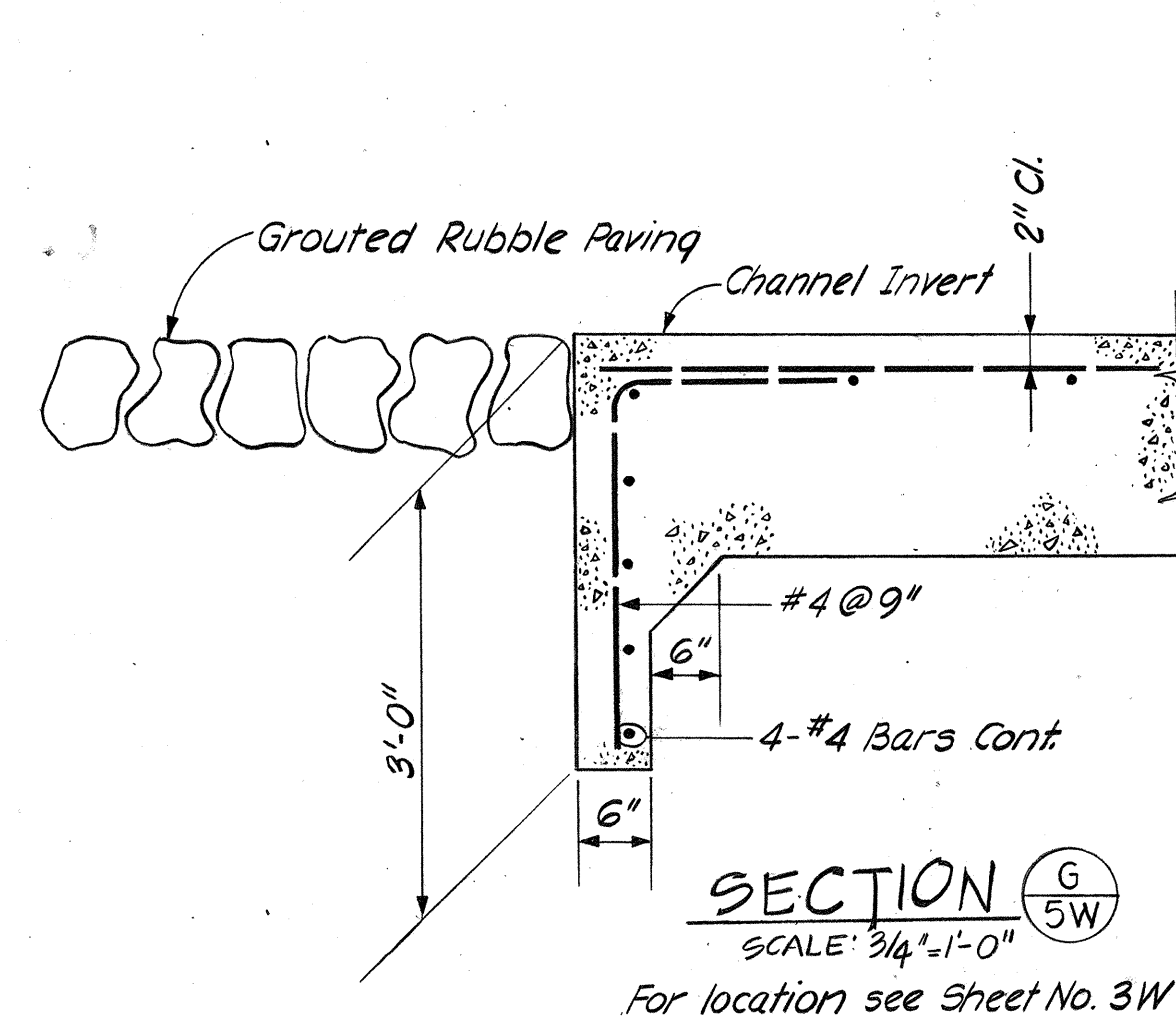


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HALAWA STREAM STRUCTURE
TYPICAL SECTION & DETAILS II
INTERSTATE ROUTE H-1
PROJECT NO. I-H-1(90)13
SCALE: AS SHOWN DATE: DEC. 24, 1970
SHEET No. 4W OF 7W SHEETS

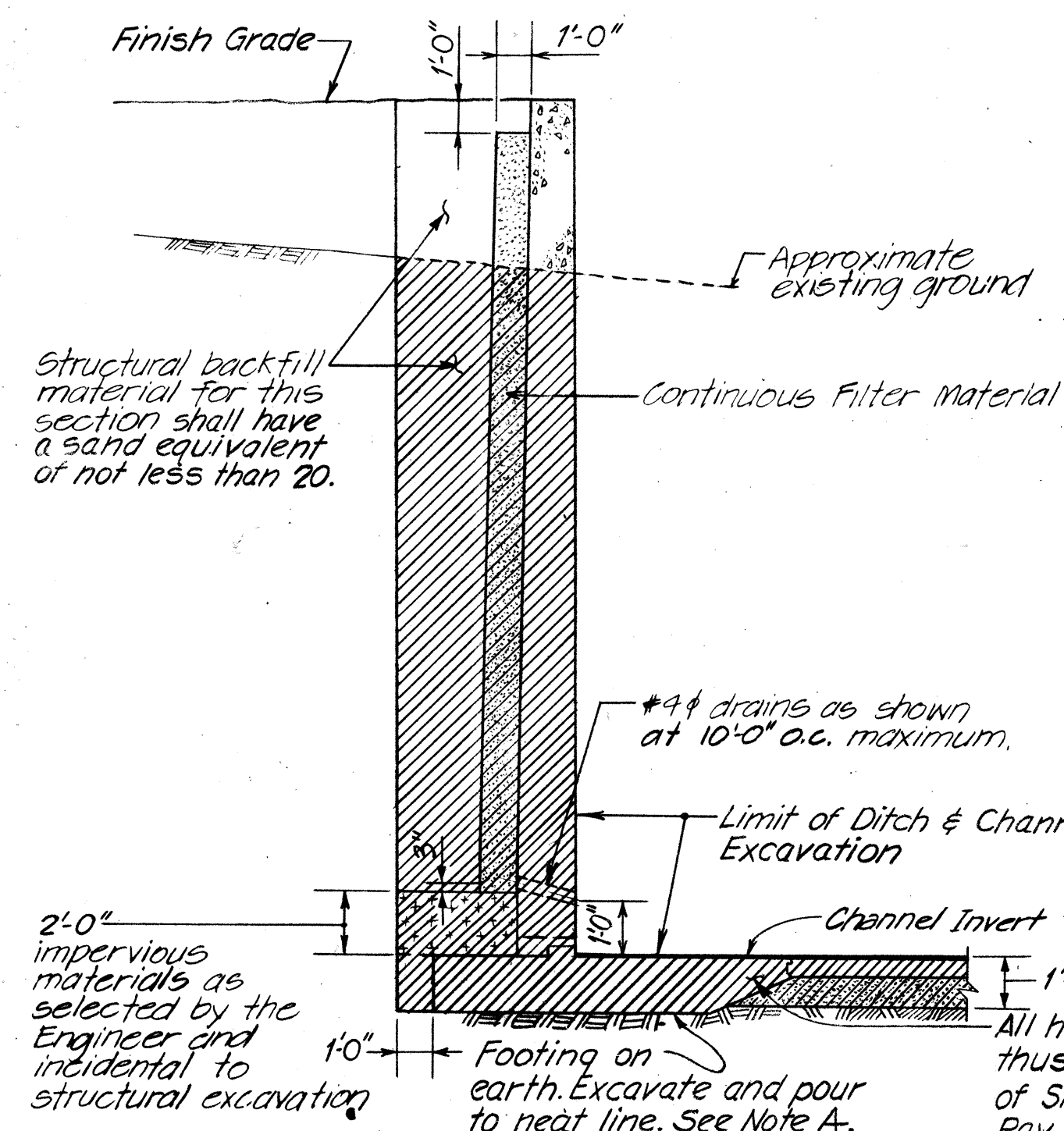
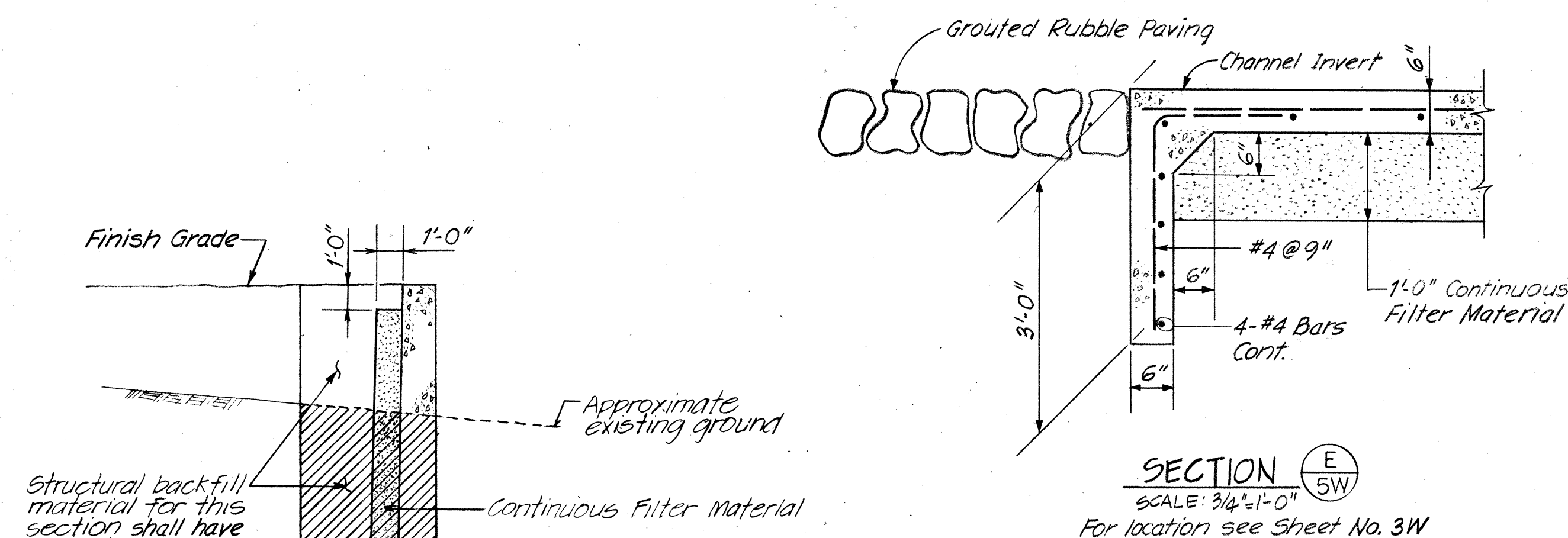
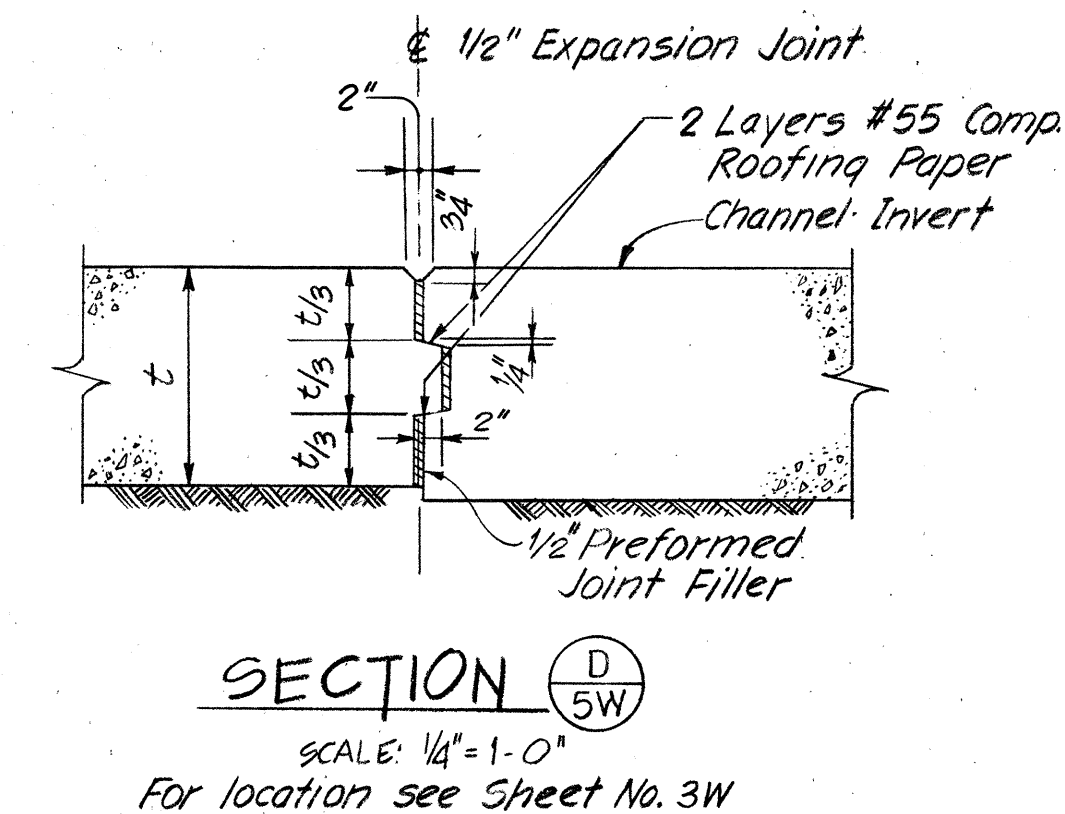
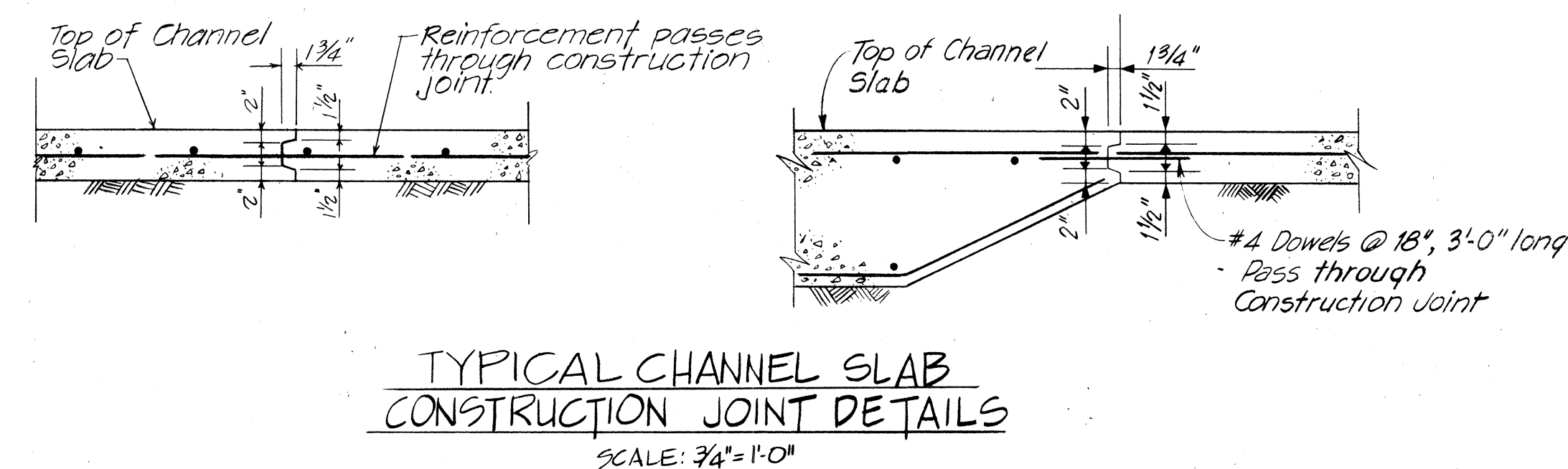
DATE	12/24/70
DESIGNED BY	H.M.M.
DRAWN BY	H.M.M.
CHECKED BY	H.M.M.
NOTED BY	H.M.M.
ORIGINAL PLAN	NO

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(90):13	1972	154	202



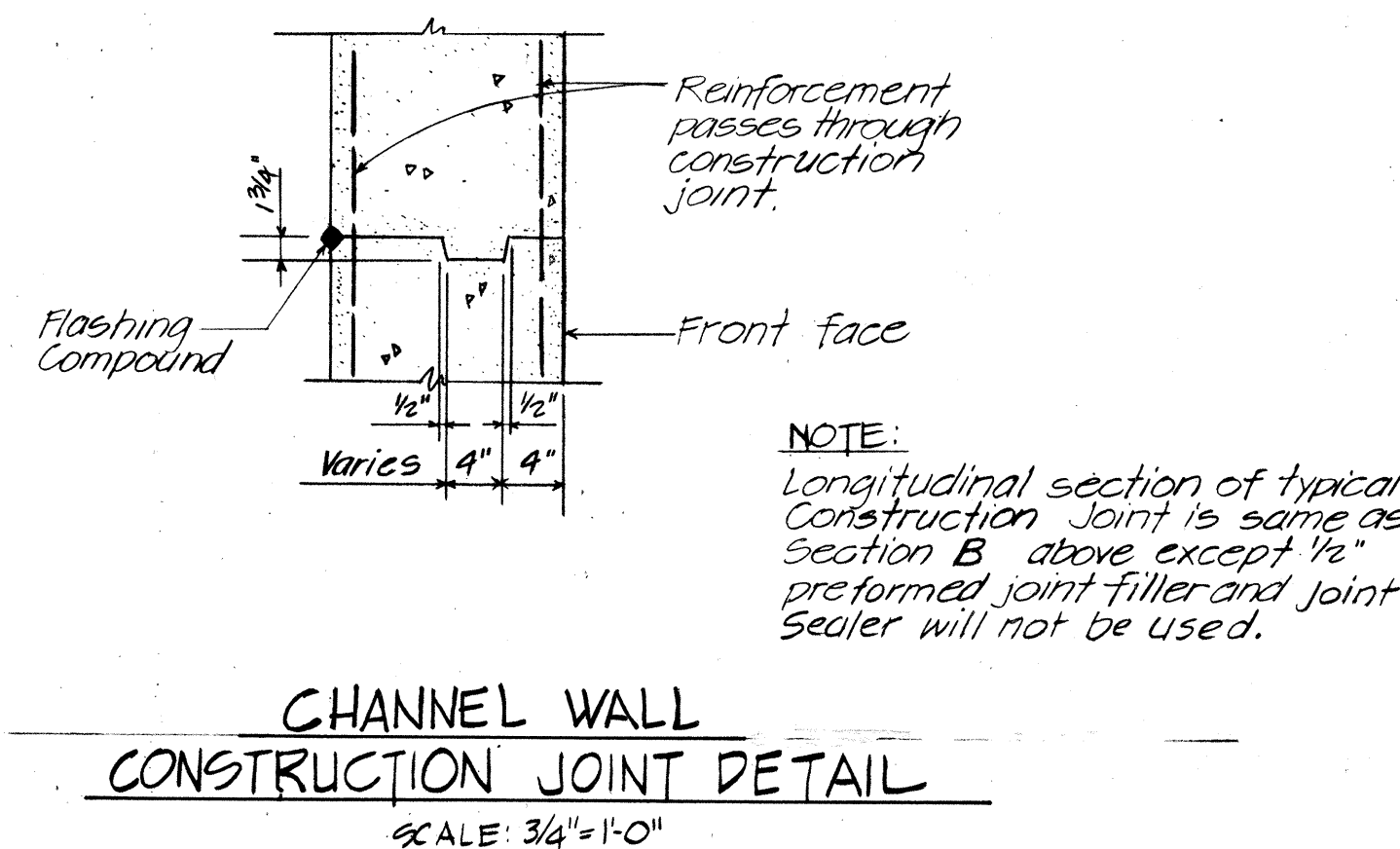
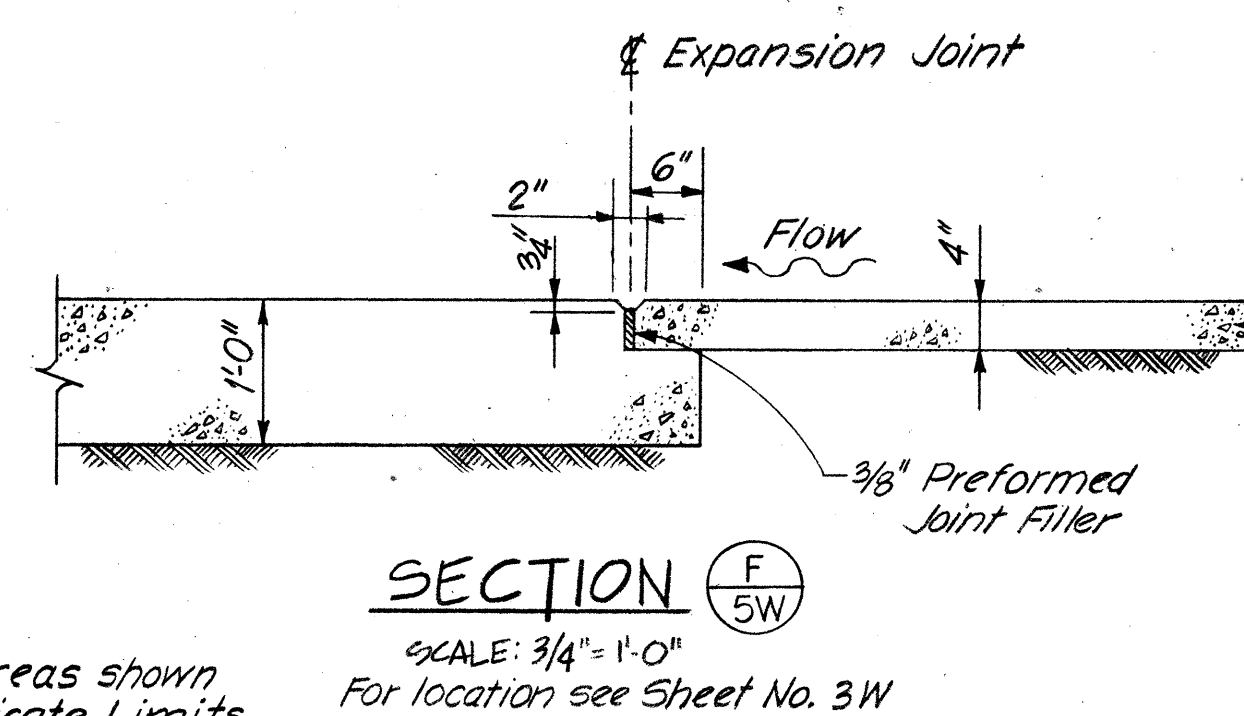
TYPICAL EXPANSION JOINT DETAILS

SCALE AS NOTED



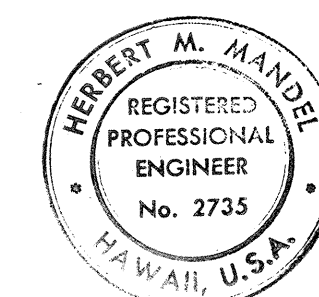
NOTE A

In case of over-excavation the Contractor shall backfill with minimum Class D concrete at his own expense.



NOTE:

Longitudinal section of typical construction joint is same as Section B above except 1/2 inch preformed joint filler and joint sealer will not be used.



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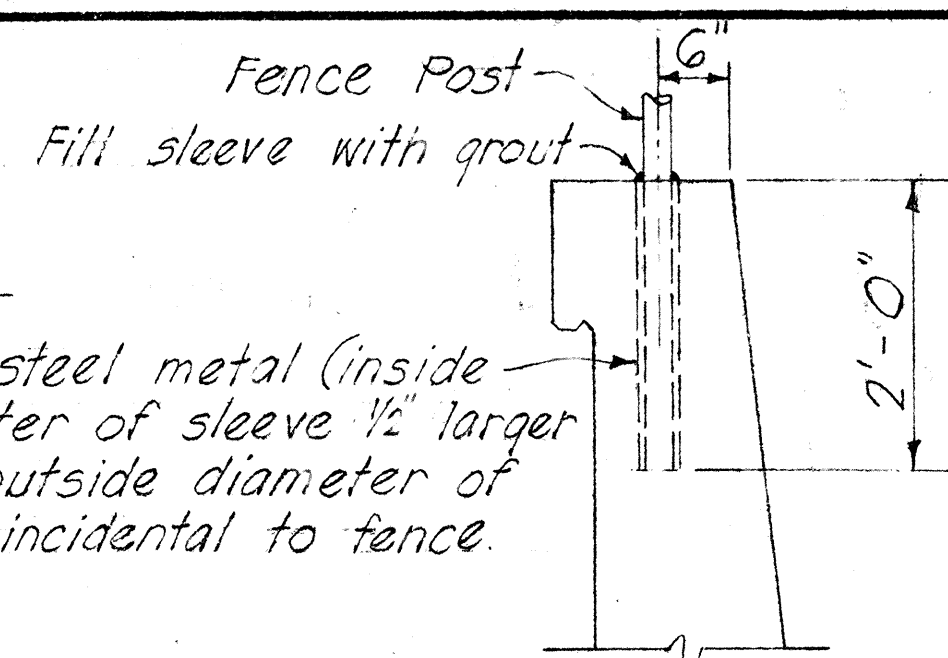
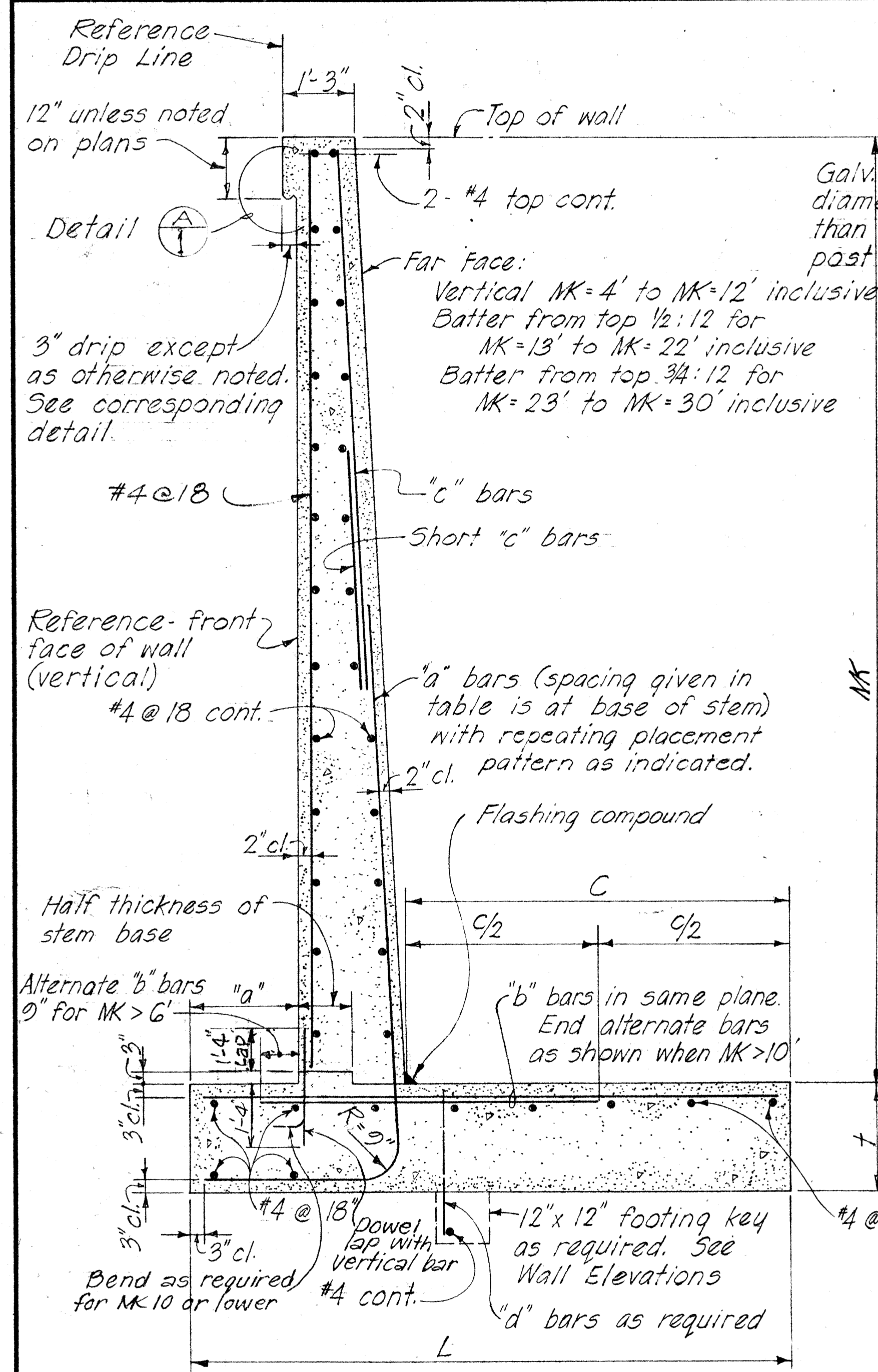
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HALAWA STREAM STRUCTURE
JOINT DETAILS & PAY LIMITS

INTERSTATE ROUTE H-1
PROJECT NO. I-H-1(90):13

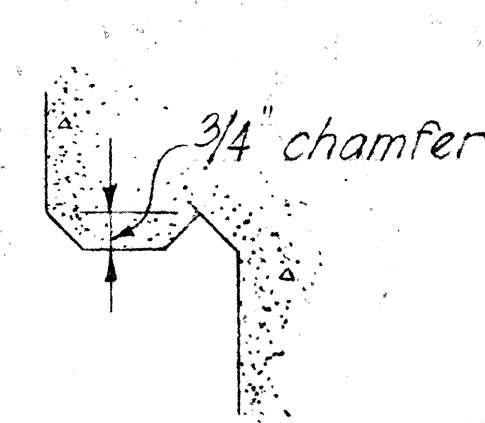
SCALE: AS SHOWN DATE: DEC. 24, 1970

SHEET No. 5W OF 7W SHEETS

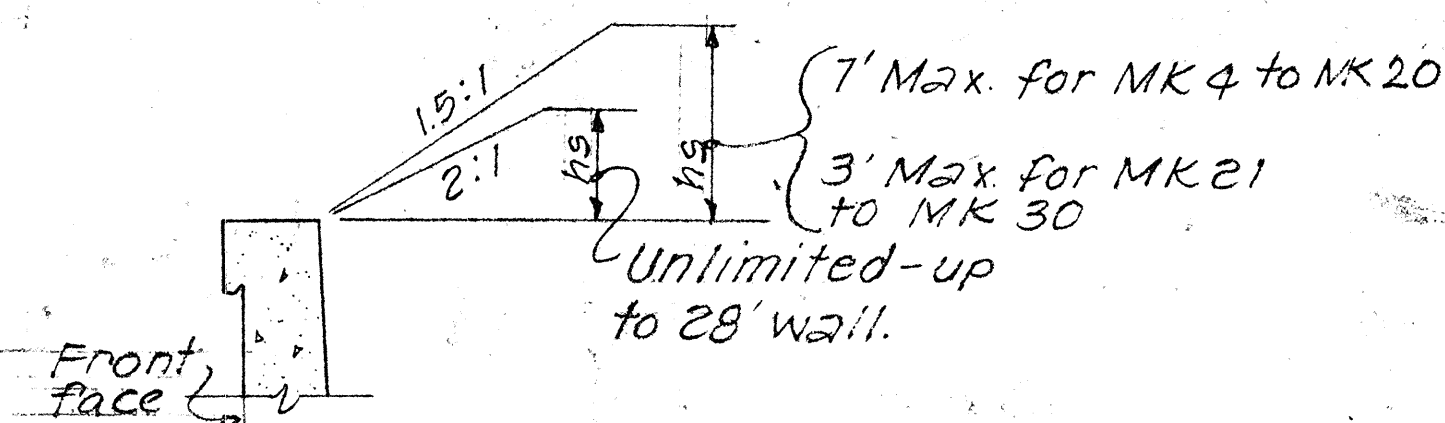
154



CHAIN LINK FENCE
POST DETAIL



DETAIL 1



DESIGN LIMITS OF WALL SURCHARGE AND SLOPES

SCHEDULE OF DIMENSIONS AND REINFORCING STEEL

SCHEDULE OF DIMENSIONS AND REINFORCING STEEL																									
Wall on Earth	Maximum "K"	4E	5E	6E	7E	8E	9E	10E	11E	12E	13E	14E	15E	16E	17E	18E	19E	20E	21E	22E	23E	24E	26E	28E	30E
	a	6"	6"	6"	12"	12"	12"	12"	12"	12"	15"	18"	21"	24"	24"	24"	27"	30"	33"	36"	39"	54"	60"	72"	
	t	14"	14"	14"	14"	14"	14"	14"	18"	18"	18"	18"	18"	21"	21"	24"	24"	24"	27"	30"	31"	33"	36"	39"	42"
	L	2.5'	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	6.5'	7.0'	7.75'	8.25'	9.0'	9.75'	10.5'	11.5'	12.5'	13.5'	14.5'	15.25'	16.0'	18.0'	20.0'	21.0'
	"a" bars	#3@12"	#3@12"	#4@12"	#4@9"	#4@5 1/2"	#5@7"	#6@7"	#6@6"	#6@5"	#7@7"	#6@5 1/2"	#7@6"	#8@6"	#8@5 3/4"	#7@6"	#7@6"	#10@6"	#10@6"	#10@5 1/2"	#10@6"	#10@5 3/4"	#11@6"	#11@5"	#11@4 1/2"
	"b" bars	#3@12"	#3@12"	#3@12"	#3@9"	#4@11"	#4@7"	#5@7"	#5@6"	#5@5"	#7@7"	#6@5 1/2"	#7@6"	#8@6"	#7@5 3/4"	#8@6"	#7@6"	#10@6"	#10@6"	#10@5 1/2"	#10@6"	#10@5 3/4"	#11@6"	#11@5"	#11@4 1/2"
"c" bars									#4	#4	#4	#4	#4	#5	#5	#5	#6	#6	#6	#7	#7	#7	#7	#7	
"d" bars	#3@12"	#3@12"	#3@12"	#3@12"	#4@18"	#4@15"	#4@15"	#4@12"	#4@11"	#4@9"	#5@12"	#5@12"	#5@10"	#5@9"	#5@9"	#5@8"	#6@10"	#6@9"	#7@12"	#7@11"	#7@10"	#7@	#7@	#10@	

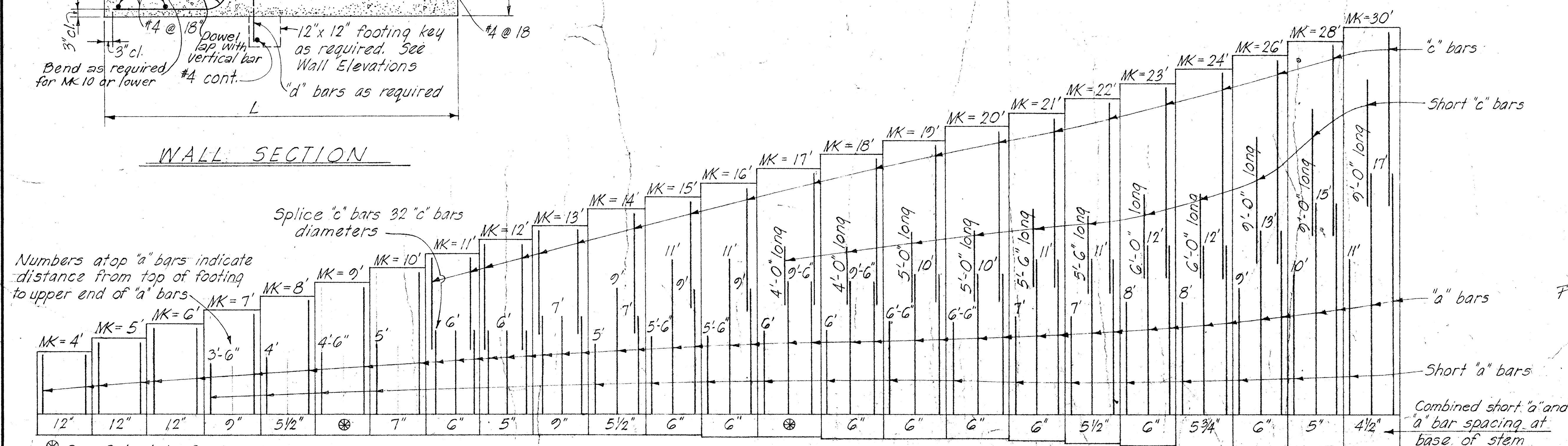
Wall on Rock	Maximum "WK"	4R	5R	6R	7R	8R	9R	10R	11R	12R	13R	14R	15R	16R	17R	18R	19R	20R	21R	22R	23R	24R	26R	28R	30R
	a	6"	6"	6"	12"	12"	12"	12"	12"	12"	15"	18"	21"	21"	21"	21"	24"	24"	27"	30"	33"	39"	39"	51"	
	f	14"	14"	14"	14"	14"	14"	14"	18"	18"	18"	18"	18"	18"	18"	18"	21"	21"	21"	21"	24"	24"	27"	30"	36"
	L	2.5'	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	6.5'	6.75'	7.25'	7.75'	8.25'	8.75'	9.25'	9.75'	10.25'	10.5'	11.0'	11.5'	12.0'	13.0'	14.0'	15.0'
	"a" bars	#3 @ 12"	#3 @ 12"	#4 @ 12"	#4 @ 9"	#4 @ 5 1/2"	#5 @ 6"	#6 @ 7"	#6 @ 6"	#6 @ 5"	#7 @ 7"	#6 @ 5 1/2"	#7 @ 6"	#8 @ 6"	#8 @ 6"	#9 @ 6"	#9 @ 6"	#10 @ 6"	#10 @ 6"	#10 @ 5 1/2"	#10 @ 6"	#10 @ 5 3/4"	#11 @ 6"	#11 @ 5"	#11 @ 4 1/2"
	"b" bars	#3 @ 12"	#3 @ 12"	#3 @ 12"	#3 @ 9"	#4 @ 11"	#4 @ 6"	#5 @ 7"	#5 @ 6"	#5 @ 5"	#7 @ 7"	#6 @ 5 1/2"	#7 @ 6"	#7 @ 6"	#8 @ 6"	#9 @ 6"	#9 @ 6"	#10 @ 6"	#10 @ 6"	#10 @ 5 1/2"	#10 @ 6"	#10 @ 5 3/4"	#10 @ 6"	#10 @ 5"	#9 @ 4 1/2"
	"c" bars								#4	#4	#4	#4	#4	#5	#5	#5	#6	#6	#6	#7	#7	#7	#7	#7	#7
	"d" bars	#3 @ 12"	#3 @ 12"	#3 @ 12"	#3 @ 12"	#4 @ 18"	#4 @ 15"	#4 @ 15"	#4 @ 12"	#4 @ 11"	#4 @ 9"	#5 @ 12"	#5 @ 12"	#5 @ 10"	#5 @ 9"	#5 @ 9"	#5 @ 8"	#6 @ 10"	#6 @ 9"	#7 @ 12"	#7 @ 11"	#7 @ 10"	#7 @ 10"	#7 @ 10"	#7 @ 10"

NO.	REVISION	APPROVED BY	DATE

APPROVAL RECOMMENDED
Paul T. Yamashita
BRIDGE DESIGN ENGINEER

1-23-76
DATE

APPROVED Paul T. Yamasaki 1-28-76
For ASSISTANT CHIEF, ENGINEERING DATE



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

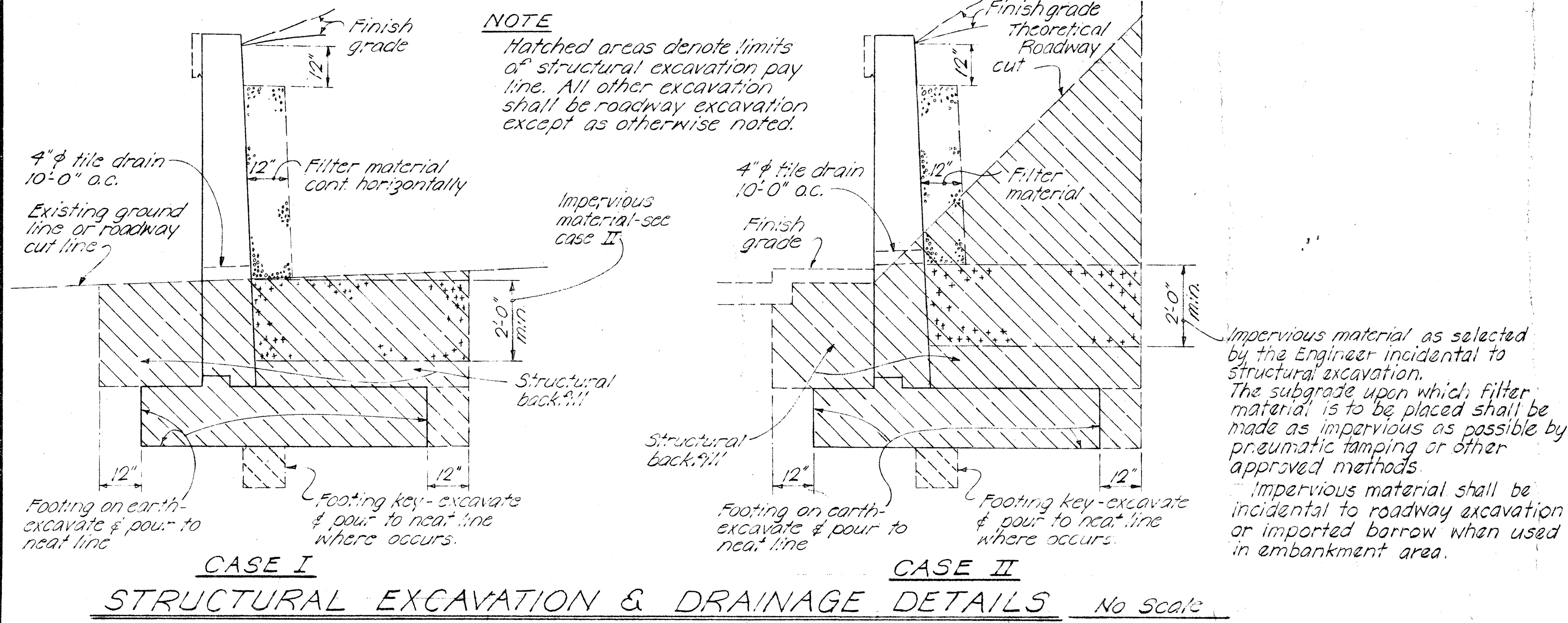
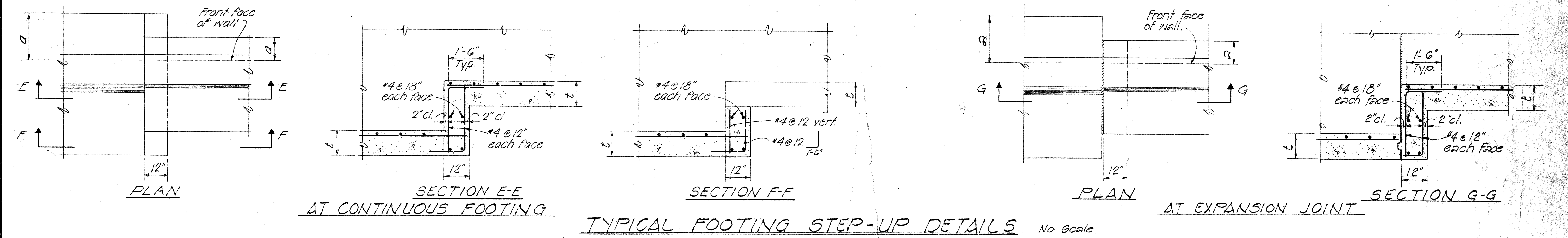
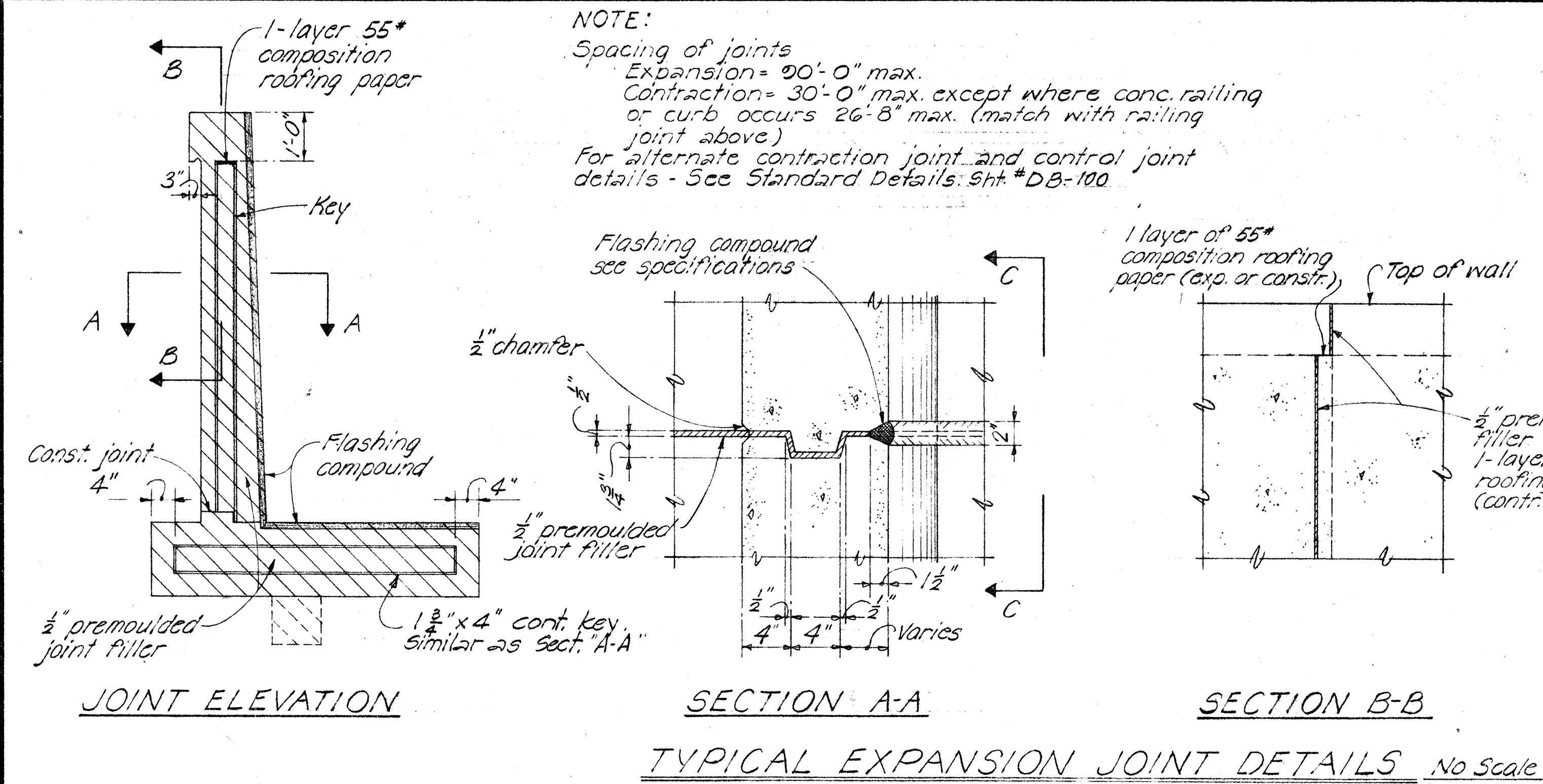
STANDARD DETAILS
RETAINING WALL TYPE T-1

INTERSTATE ROUTE H-1
PROJECT NO I-HI-1(90):13

SCALE AS NOTED DATE: DEC. 24, 1970

SHEET No. 6W OF 7W SHEETS DB-207-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(90):13	1970	156	202



APPROVAL RECOMMENDED:
Paul T. Yamashita
BRIDGE DESIGN ENGINEER
1-23-70
DATE

APPROVED
Paul T. Yamashita
For ASSISTANT CHIEF, ENGINEERING
1-28-70
DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
RETAINING WALL TYPE T-1

INTERSTATE ROUTE H-1
PROJECT NO I-HI-1(90):13

SCALE AS NOTED DATE DEC. 29, 1970
SHEET No. 7 WOF 7 W SHEETS DB-201-2

DATE	
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
NOTE BOOK	
CHECKED BY	