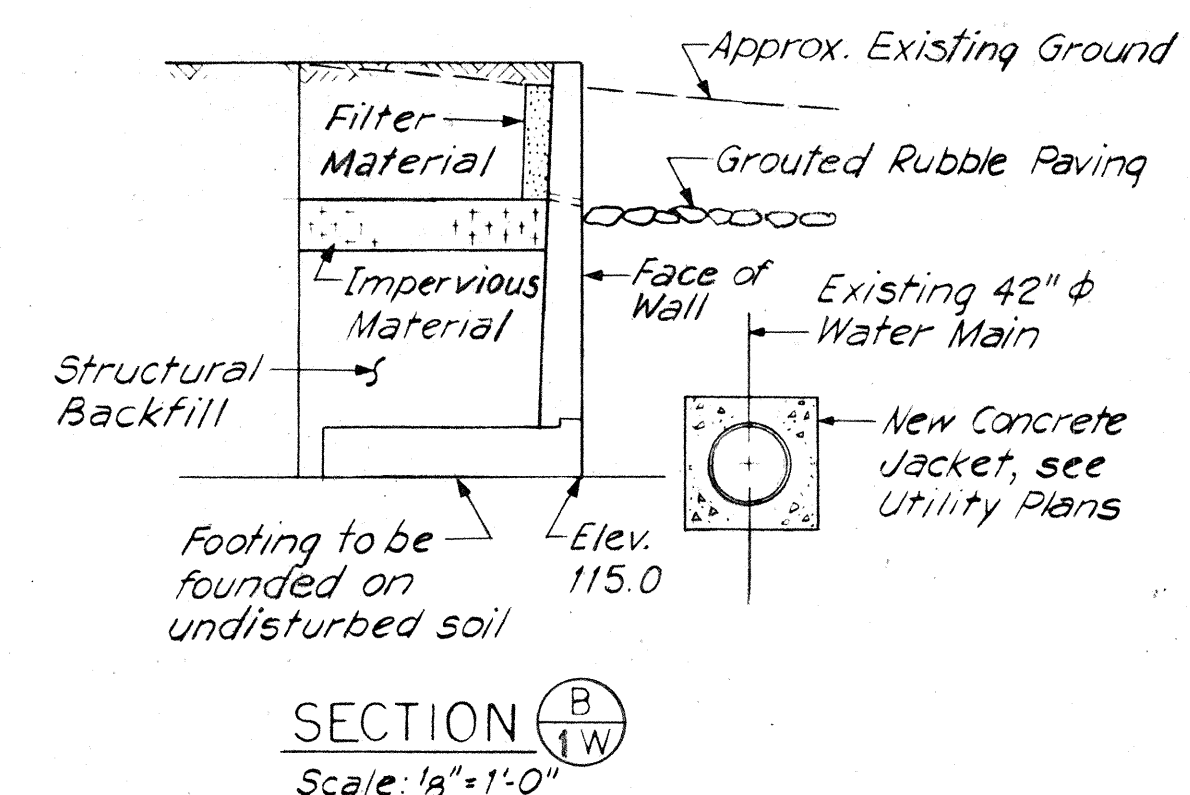
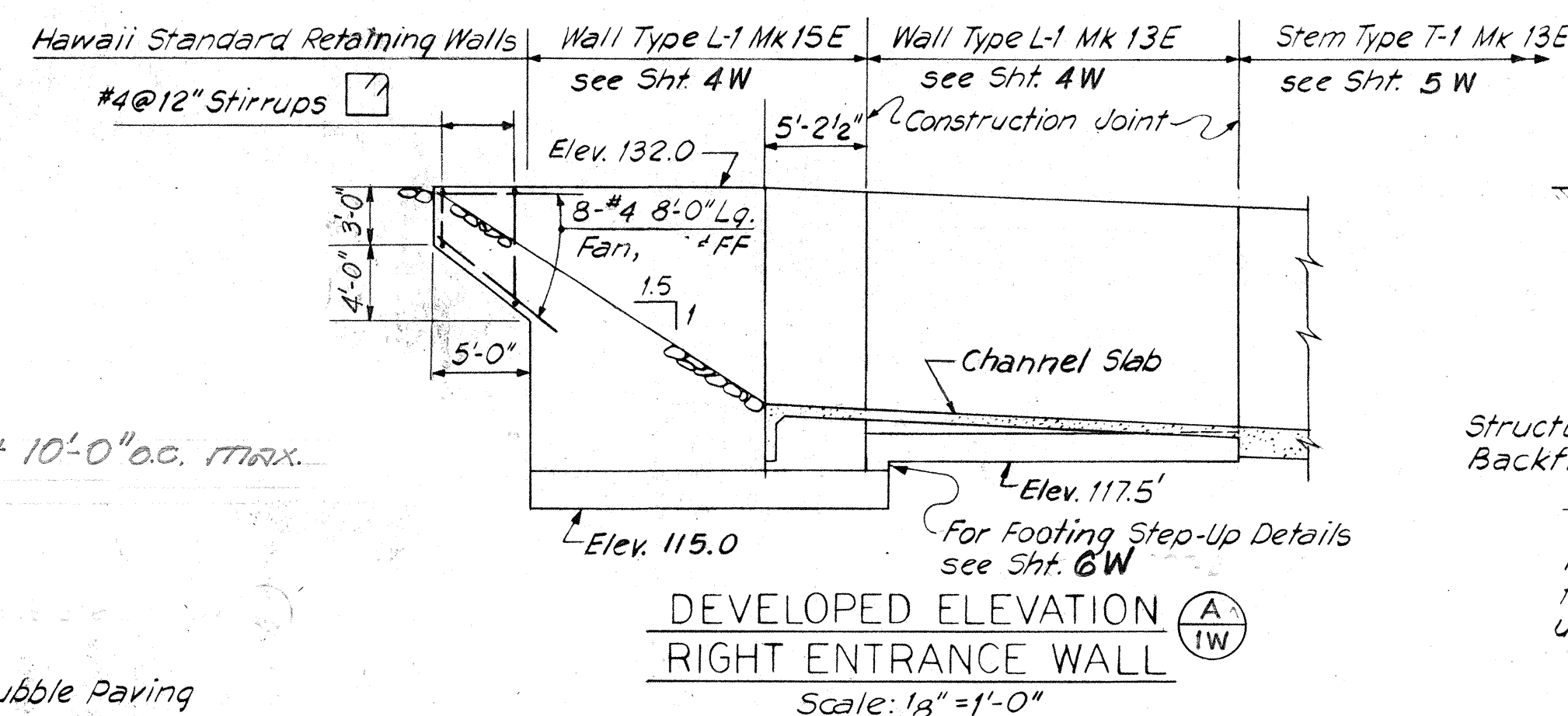
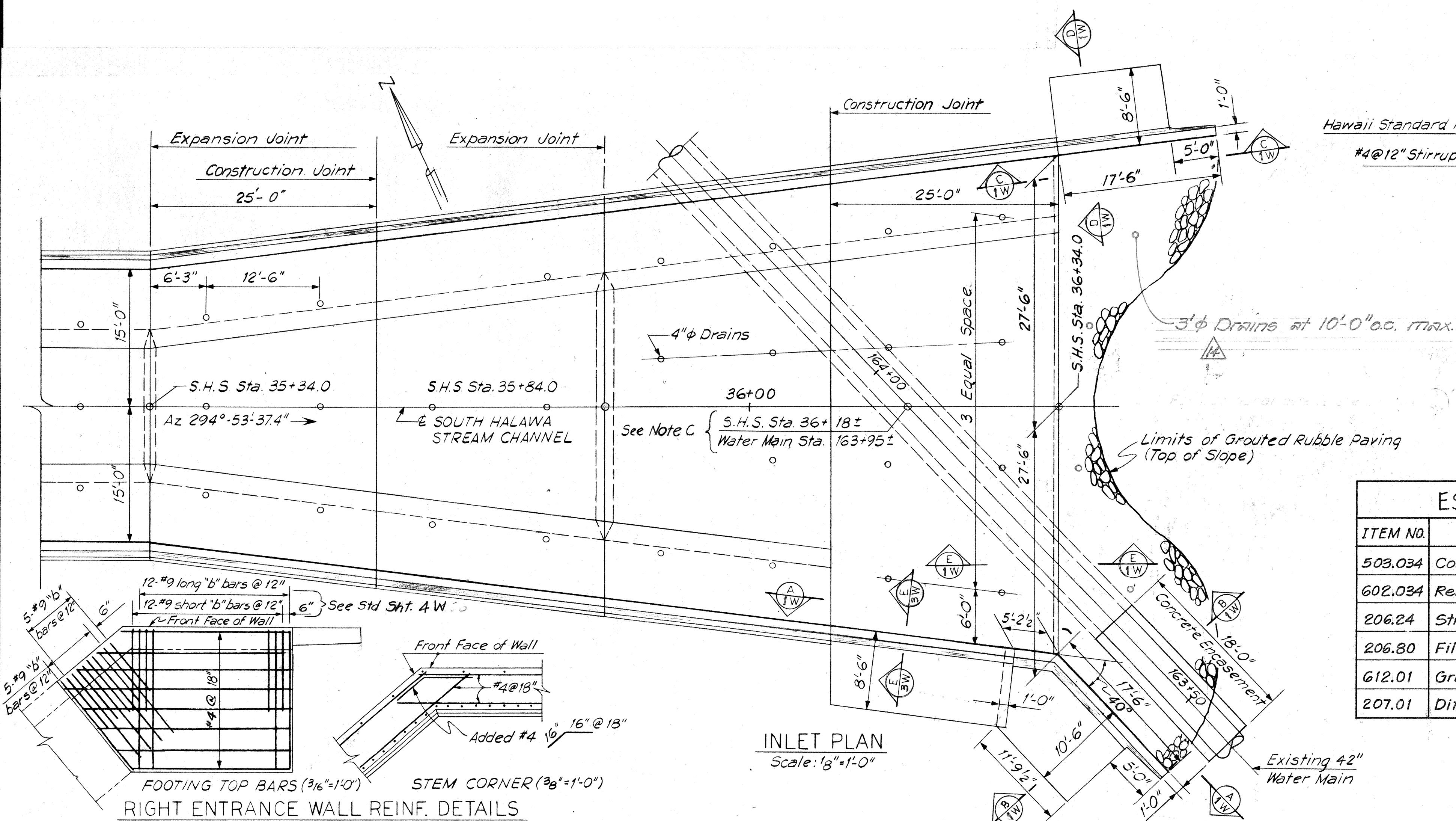
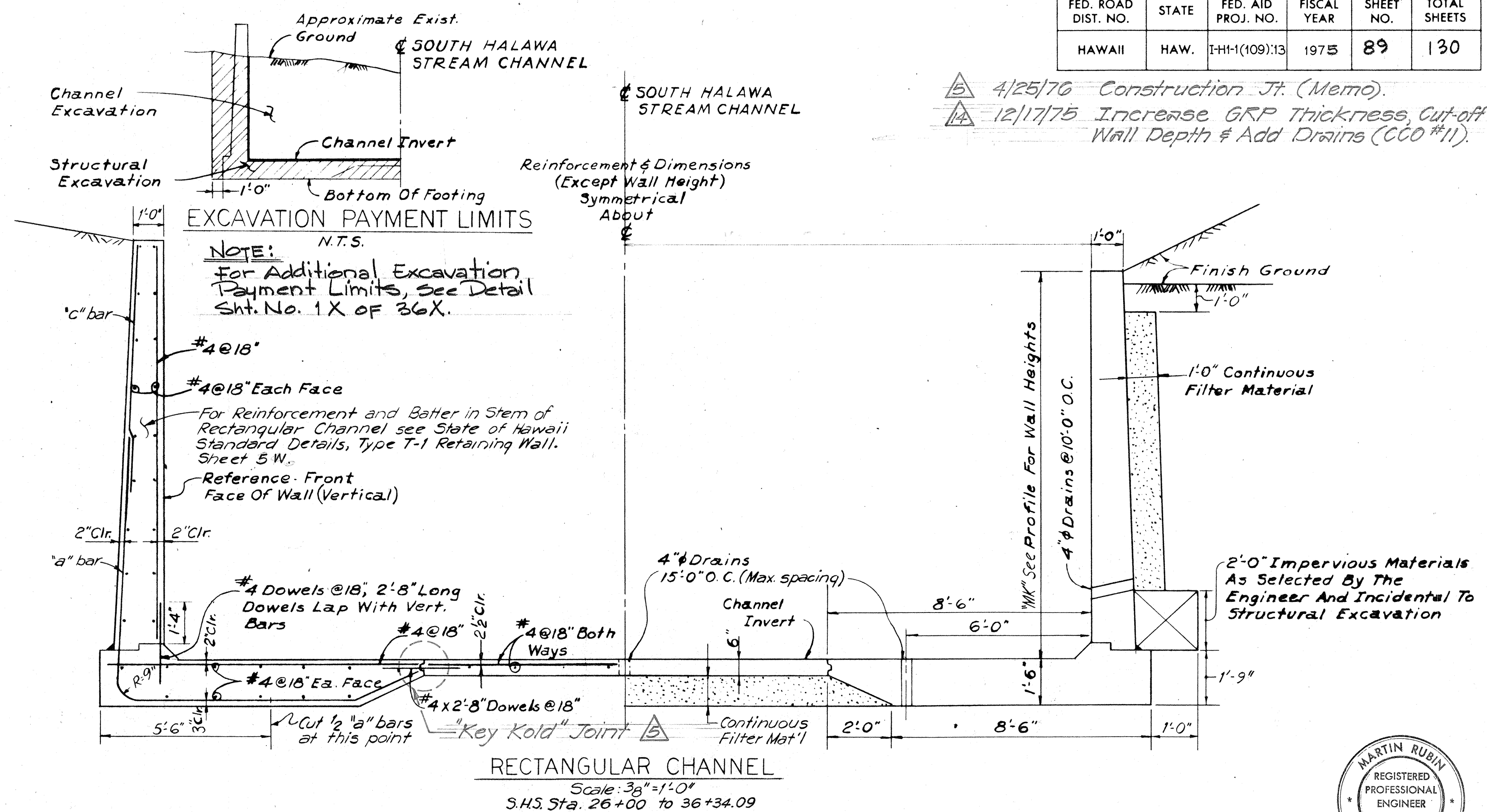
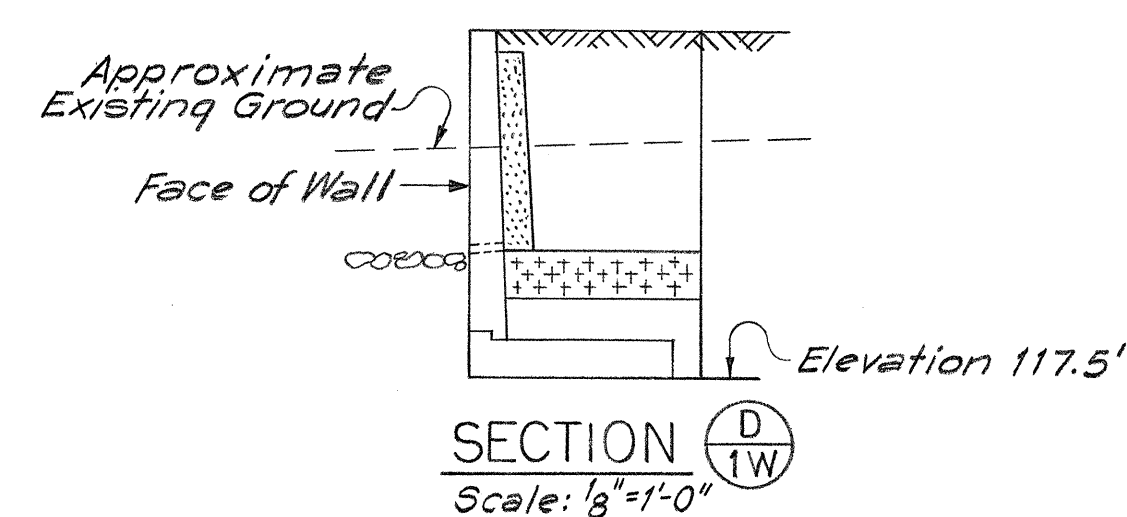
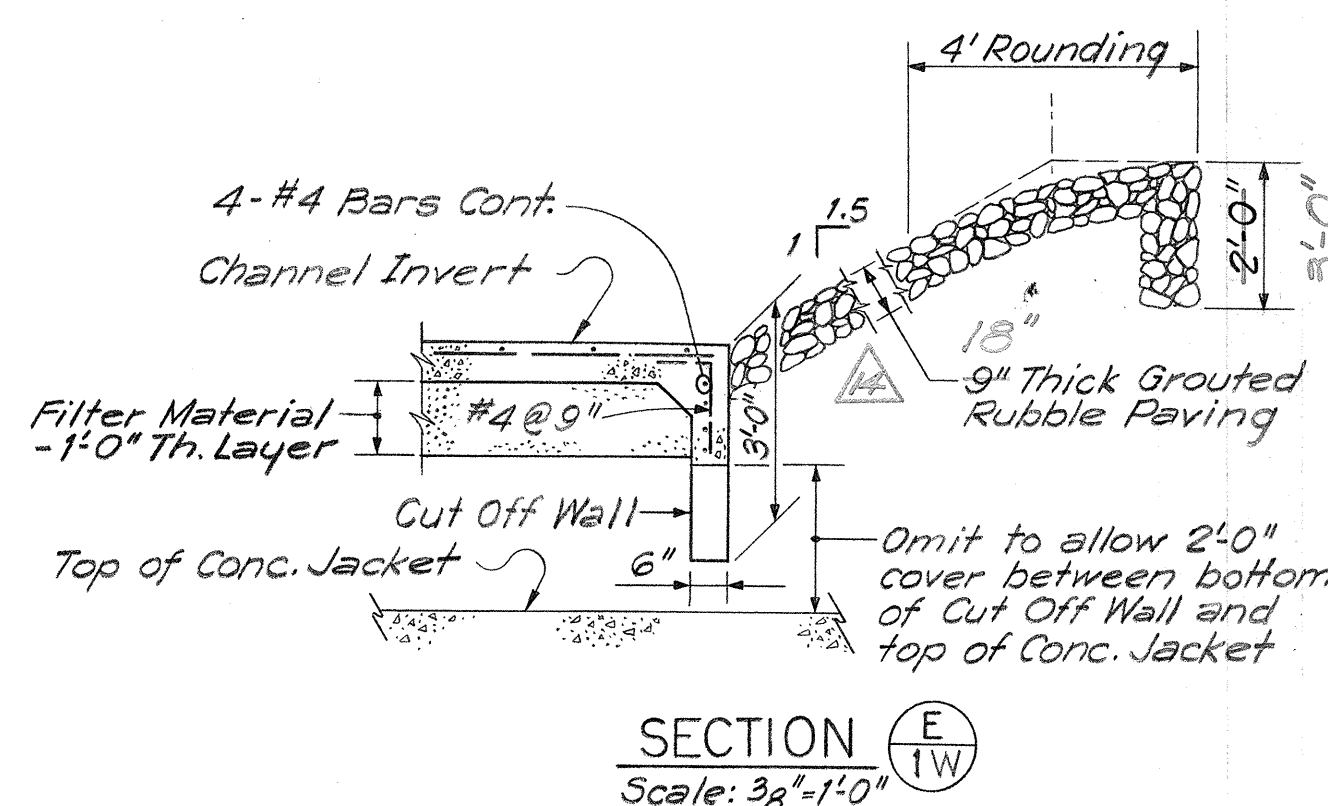
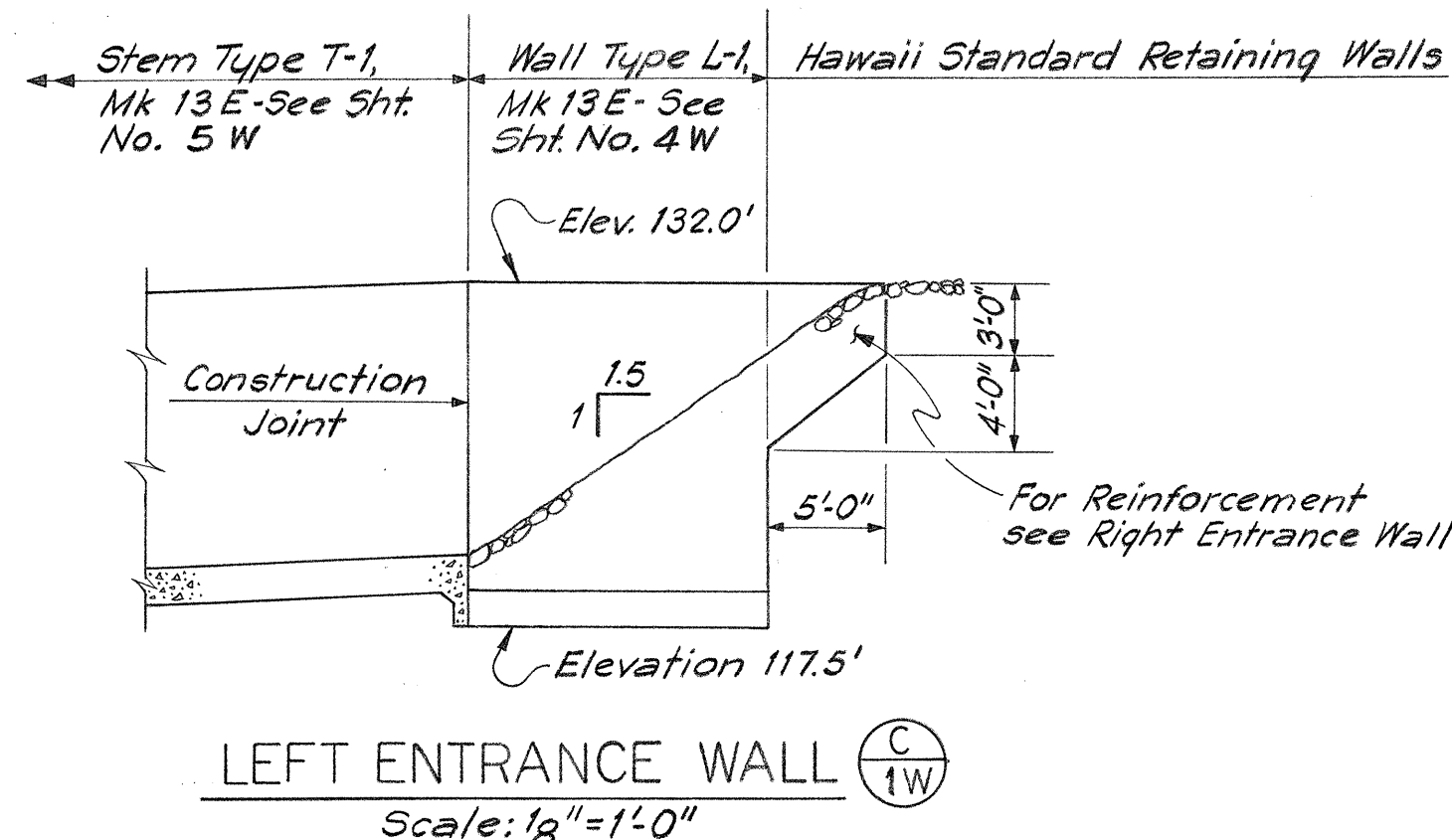


In addition to the joints shown, expansion joints shall be spaced @ 90'-0" o.c. maximum, and construction joints @ 30'-0" o.c. maximum for the Rectangular Channel. For details see Sheet No. 3W.

No backfill shall be placed behind channel walls until concrete in Channel Structure has developed a strength of at least 3,000 psi in compression. Backfilling shall be placed uniformly and simultaneously at opposite walls to avoid unequal lateral pressure.



ESTIMATED QUANTITIES FOR CHANNEL			
ITEM NO.	ITEM	UNIT	QUANTITY
503.034	Concrete in South Halawa Stream Channel	L. S.	3120 C.Y.
602.034	Reinf. Steel in South Halawa Stream Channel	L. S.	229,520 LB.
206.24	Structural Excavation for South Halawa Stream	C. Y.	5250
206.80	Filter Material	C. Y.	1470
612.01	Grouted Rubble Paving	C. Y.	25
207.01	Ditch and Channel Excavation	C. Y.	13,070

NOTE C:
Prior to excavating for the Stream Channel the Contractor shall verify in the field the location of the existing Water Main. For additional General Water Notes see Sheet 111.

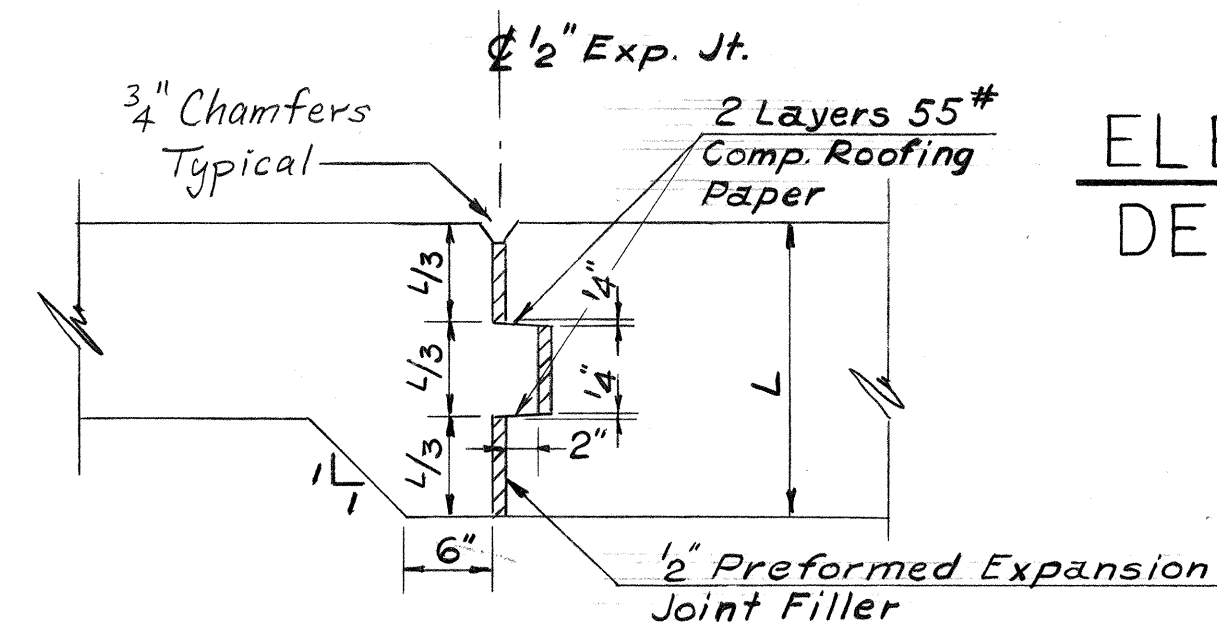
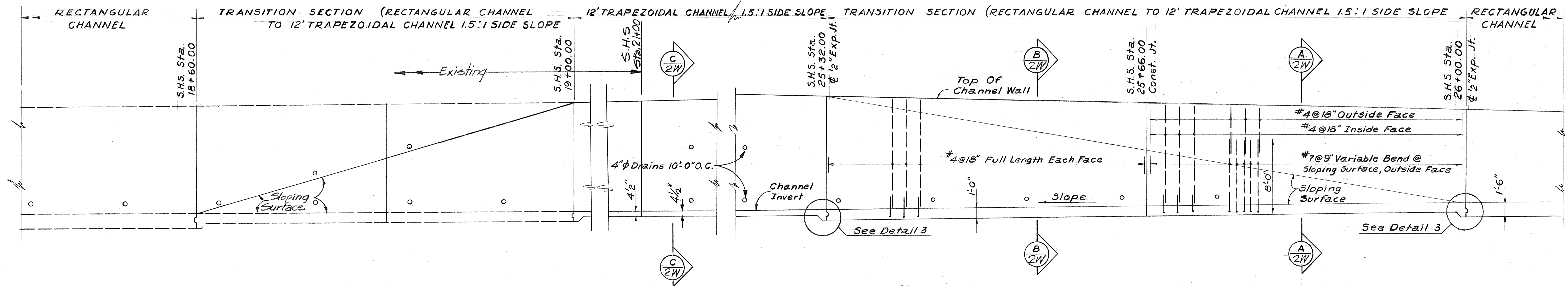
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HALAWA INTERCHANGE
SOUTH HALAWA STREAM CHANNEL
RECTANGULAR CHANNEL
REINFORCEMENT & DETAILS

PROJ. NO. I-HI-1(109):13 DATE: DEC. 29, 1972

SCALE AS SHOWN SHEET No. 1W OF 6 SHEETS

3/3/75 WWF SUBSTITUTION (FIELD REV.)
7/29/75 CONSTRUCTION JOINT (MEMO)

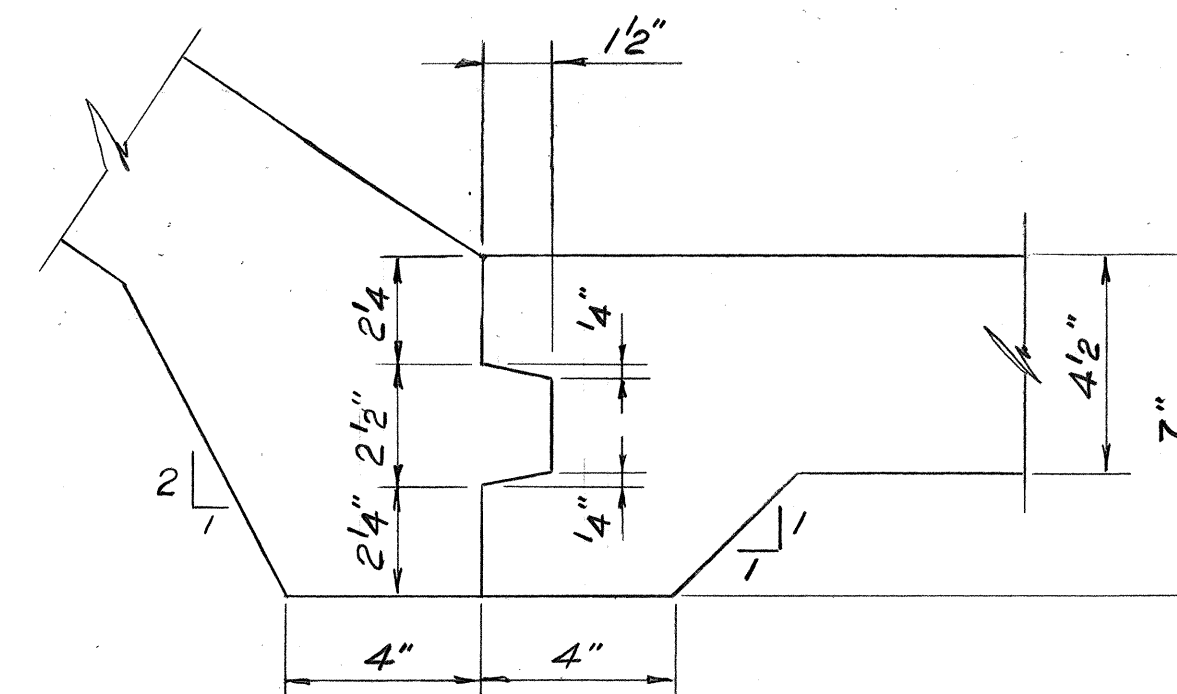
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(109)13	1975	90	130



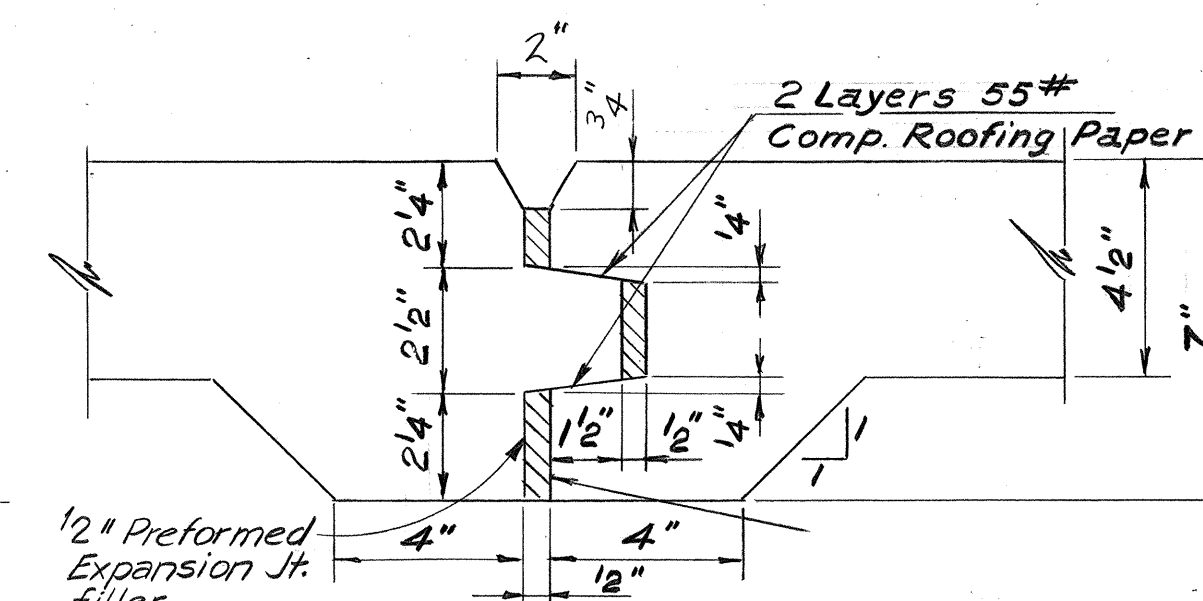
ELEVATION OF NORTH CHANNEL WALL
DEVELOPED ALONG FACE OF WALL
Scale: 3/16" = 1'-0"
(Elevation Of South Channel Wall Similar)

NOTE: TRANSITION SECTION
Expansion Joint shown. Construction joint similar except for preformed joint filler. Detail 3 applies to both sloping wall and bottom slab. Expansion joints are at Stations 25+32 and 26+00. Construction joint is at Station 25+66.

DETAIL 3-TRANSITION SECTION JOINT DETAIL
Scale 3/4" = 1'-0"

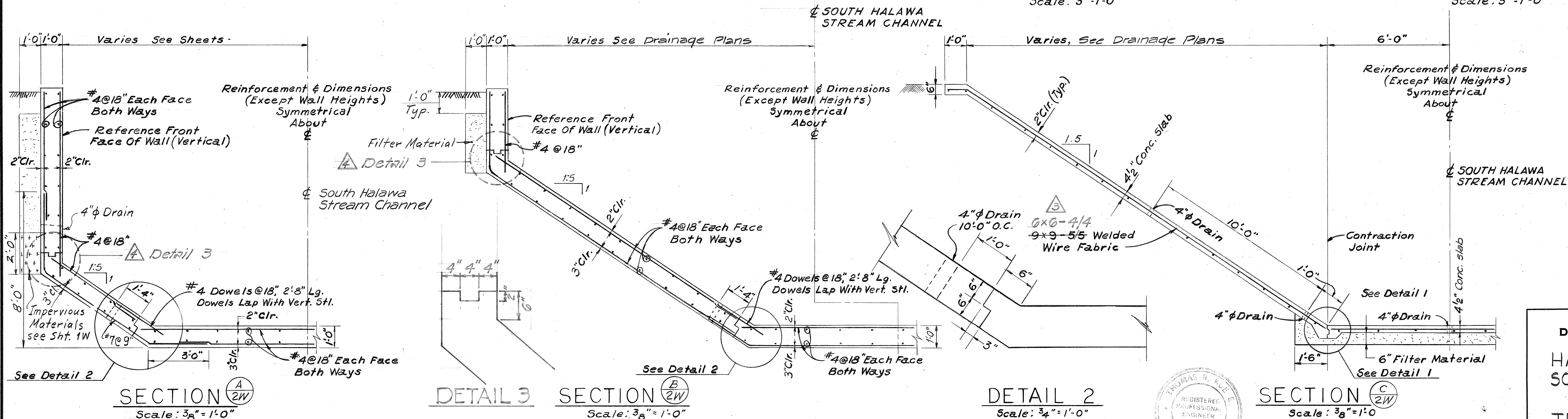


DETAIL 1
Scale: 3" = 1'-0"



TRAPEZOIDAL CHANNEL JOINT DETAIL
Scale: 3" = 1'-0"

NOTE: TRAPEZOIDAL CHANNEL
Expansion Joint Shown. Construction Joint Similar Except For Preformed Joint Filler. Detail also applies for sloped portion of lining. Expansion joints @ 90'-0" Max. Construction Joints @ 30'-0" Max.



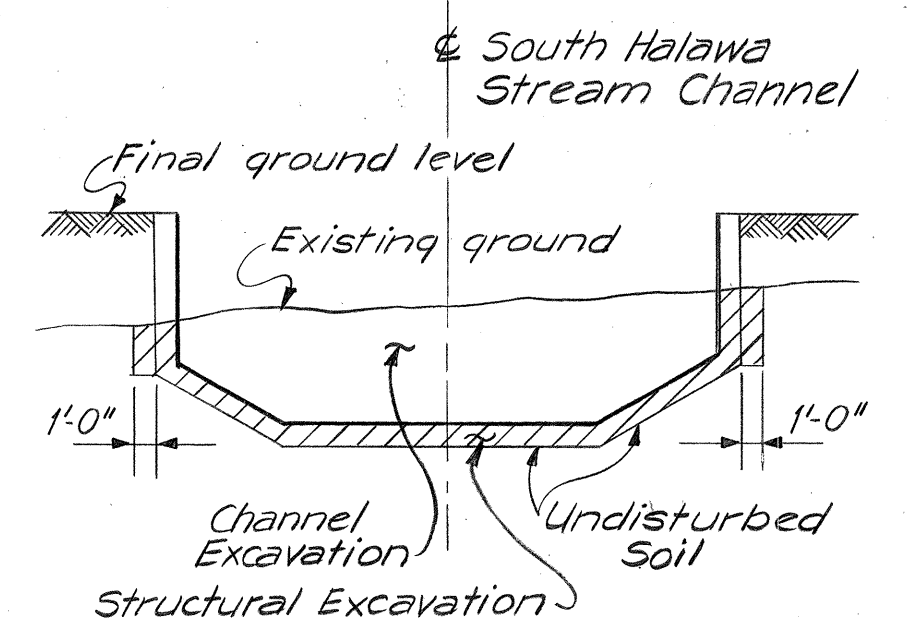
SECTION A
Scale: 3/8" = 1'-0"

DETAIL 3

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

DETAIL 2
Scale: 3/4" = 1'-0"

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



EXCAVATION PAYMENT LIMITS
NOTE:
For Additional Excavation Payment Limits, See Detail Sht. No. 1X of 36X.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HALAWA INTERCHANGE
SOUTH HALAWA STREAM
CHANNEL
TRAPEZOIDAL CHANNEL
REINFORCEMENT & DETAILS
PROJ. No. I-HI-1(109)13 DATE: DEC. 29, 1972
SHEET No. 2 WOF 6 SHEETS

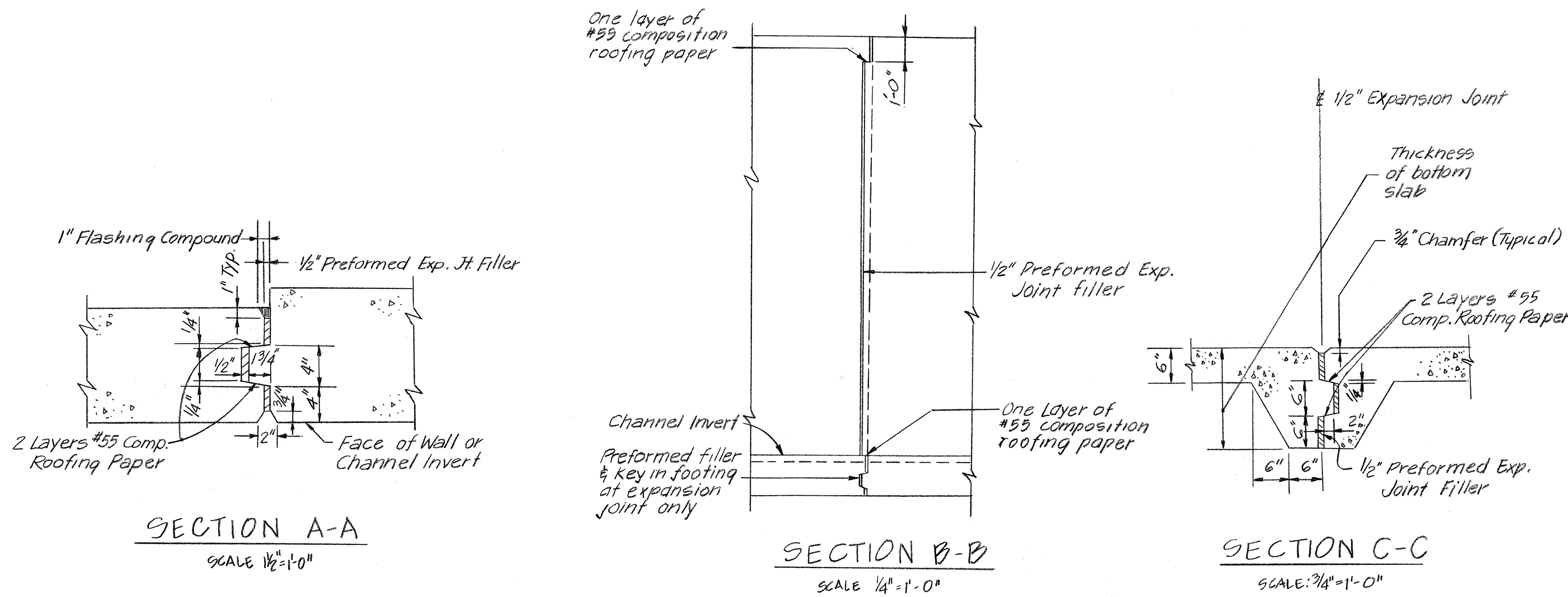
ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	
NO.	



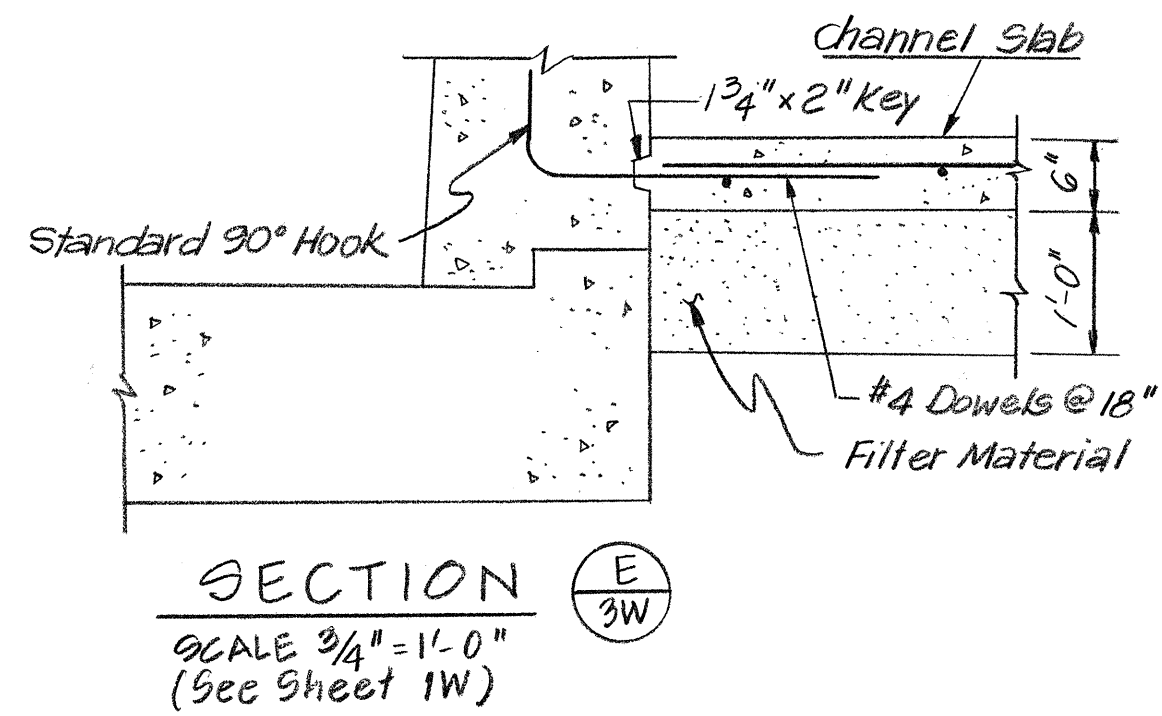
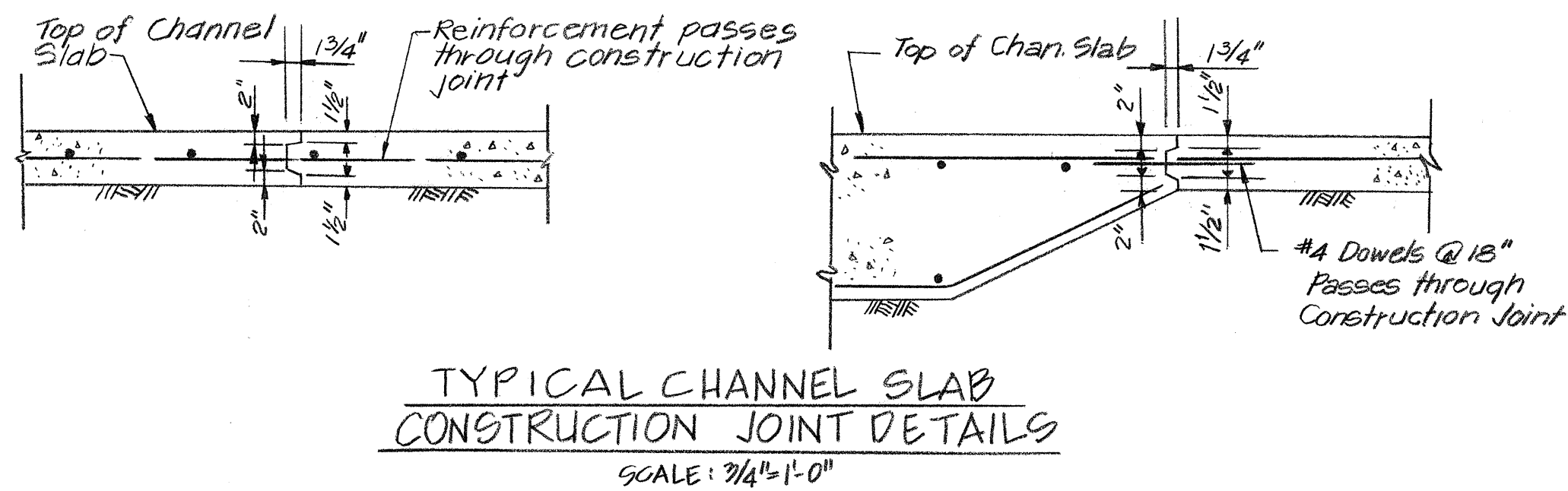
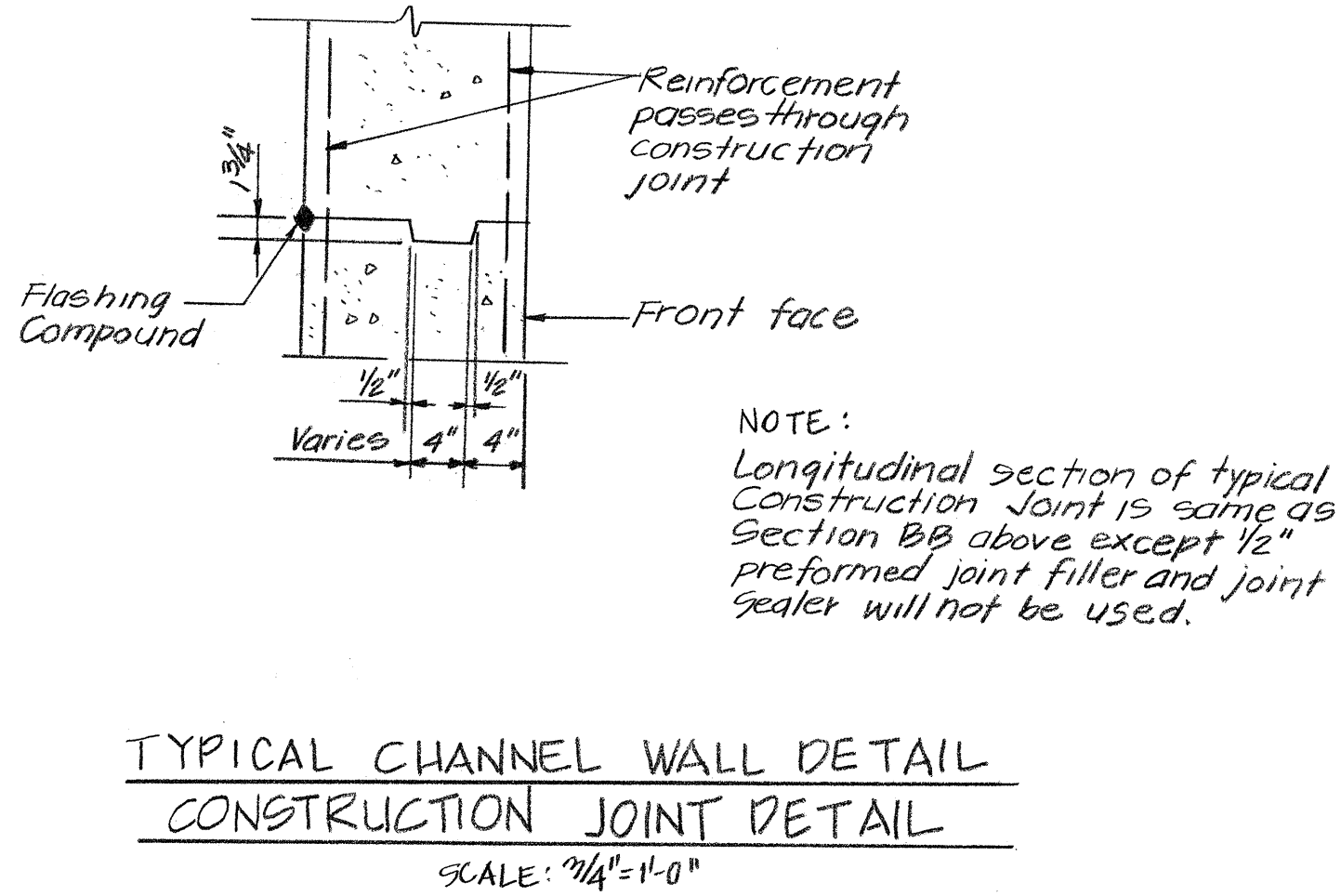
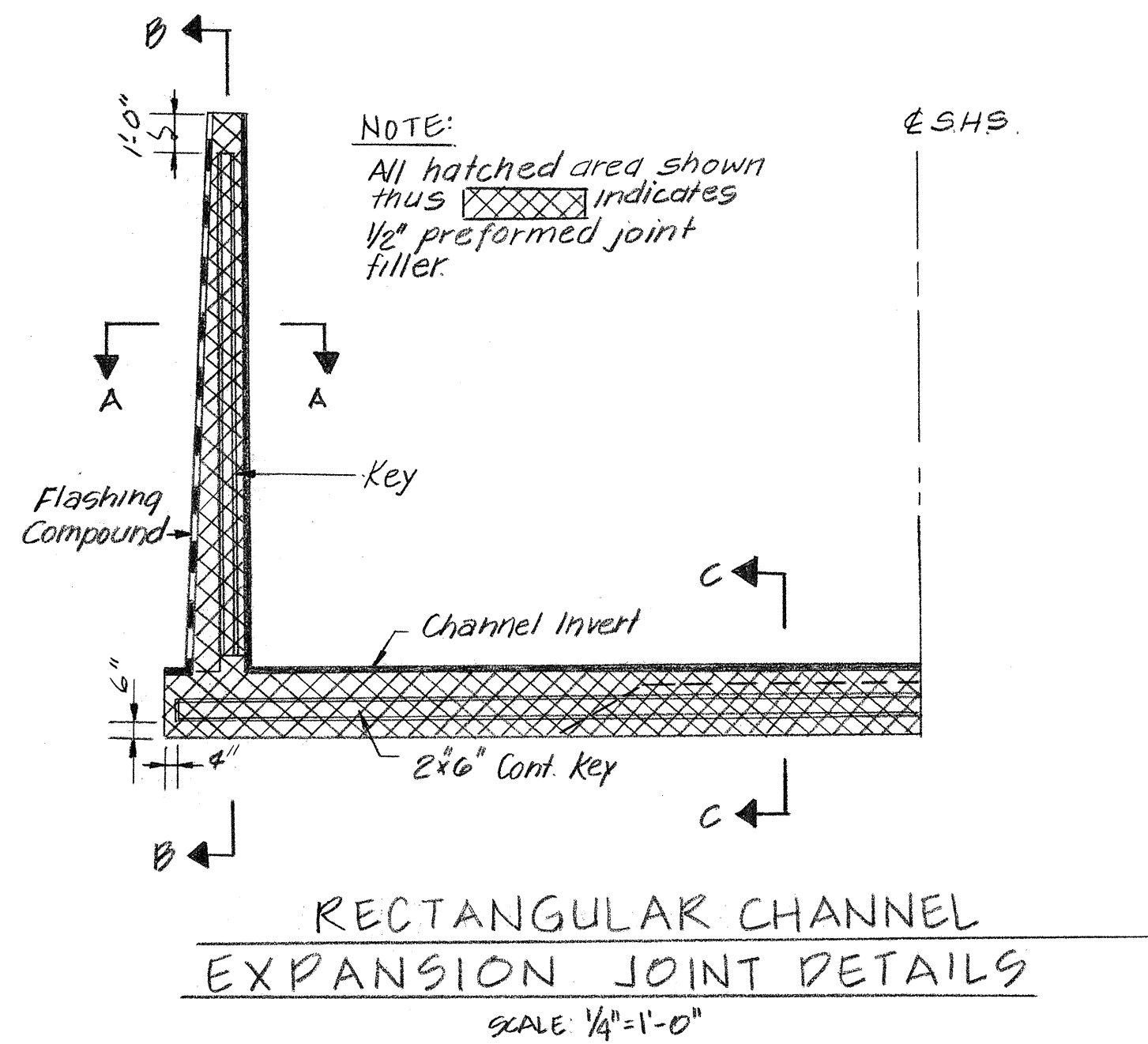
THIS WORK WAS PREPARED BY
THOMAS R. BUEL
REGISTERED PROFESSIONAL ENGINEER
NO. 1855
HAWAII

SCALE: AS SHOWN

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IHI-1(109):13	1975	91	130



TYPICAL EXPANSION JOINT DETAILS
SCALE AS NOTED



MARTIN RUBIN
REGISTERED PROFESSIONAL ENGINEER
No. 1841
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Martin Rubin

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CHANNEL WALL JOINT DETAIL

INTERSTATE ROUTE H-1
PROJECT NO. IHI-1(109):13

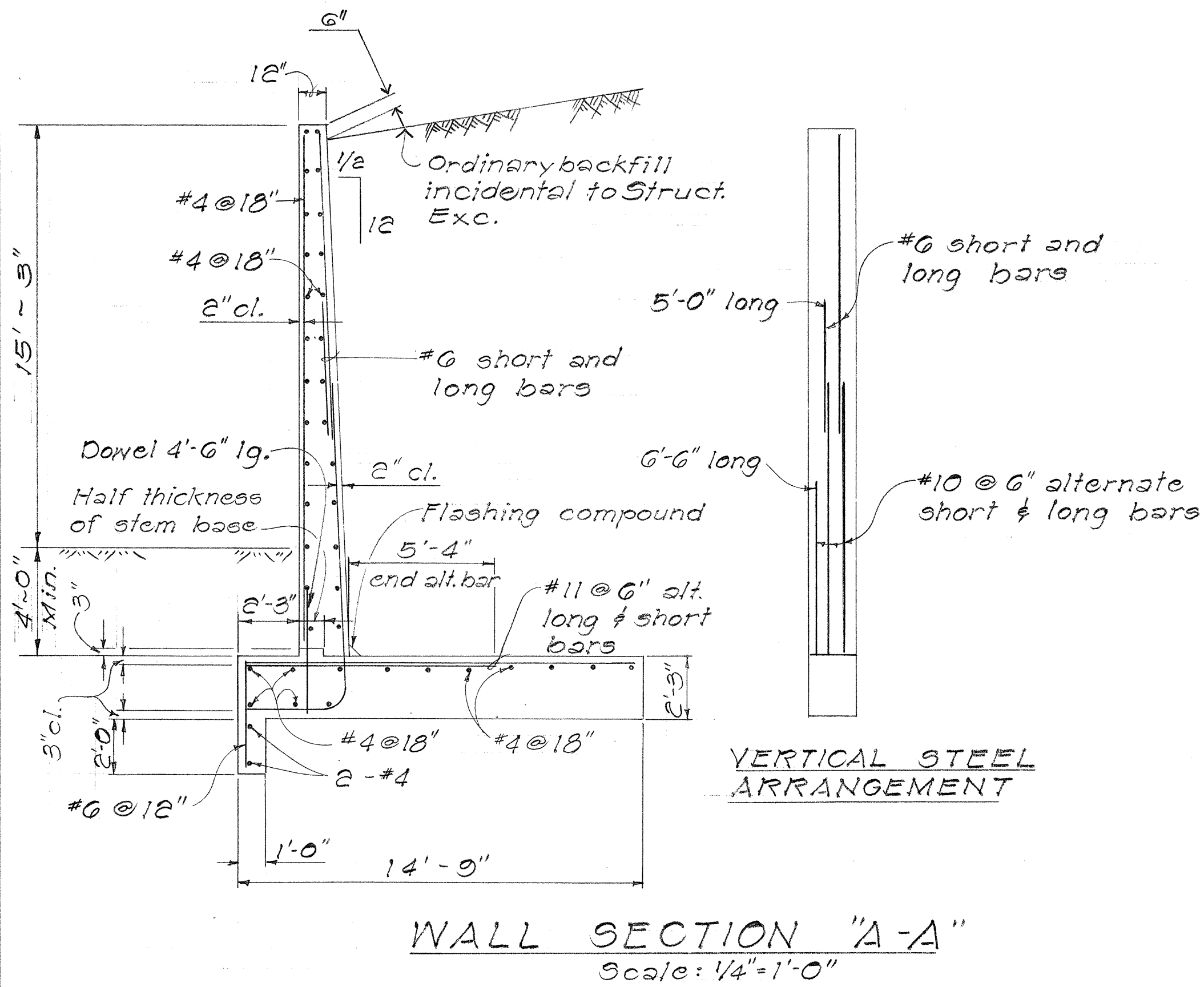
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SHEET No. 3W OF 6 SHEETS

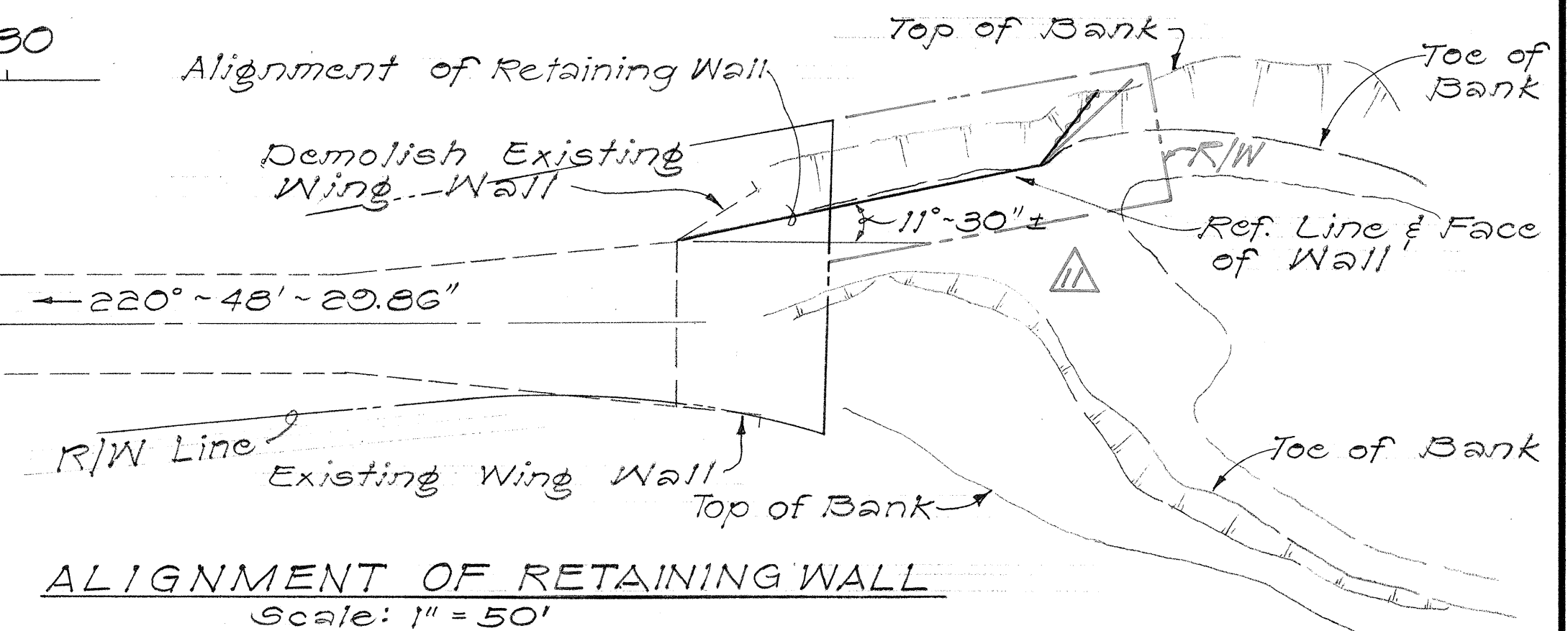
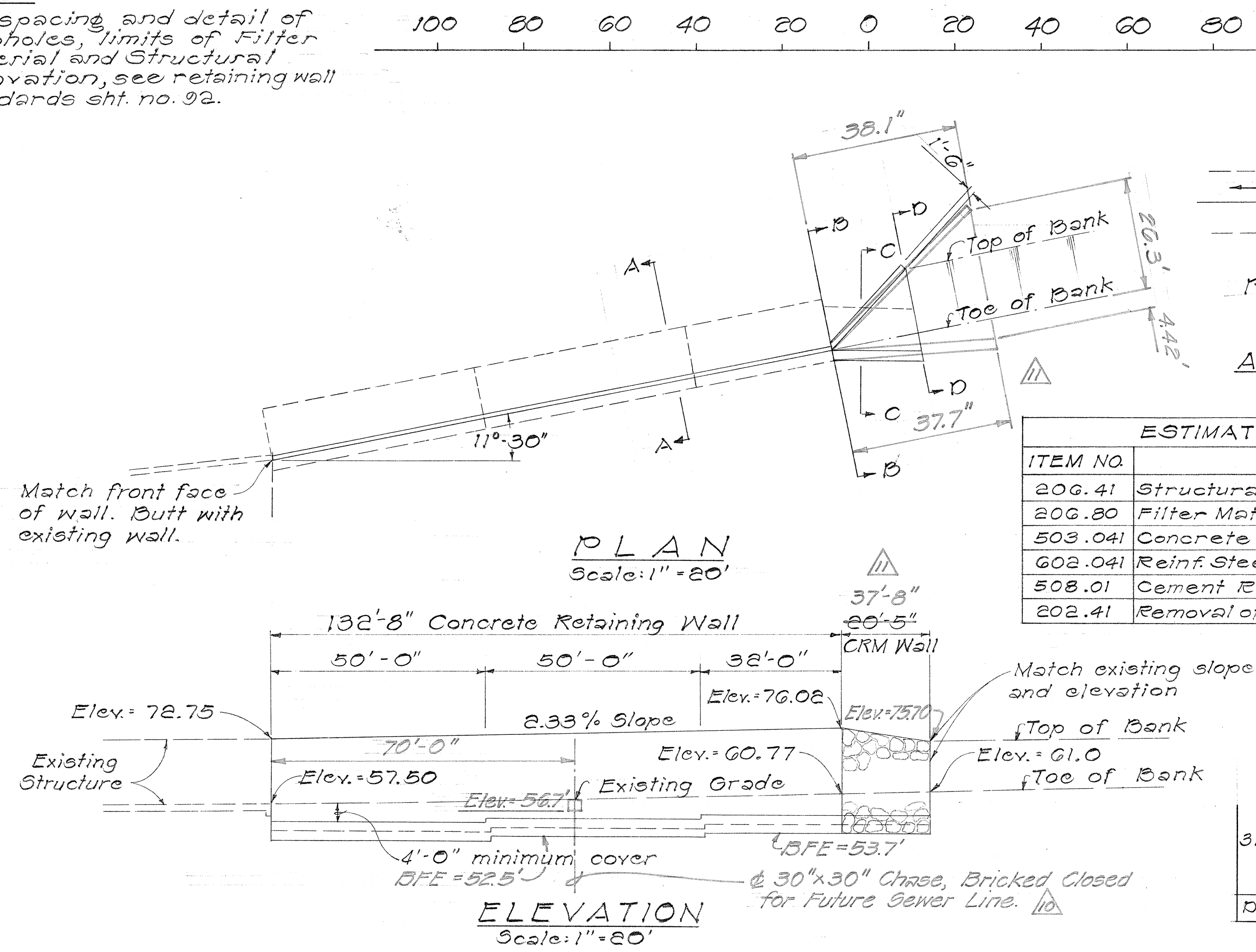
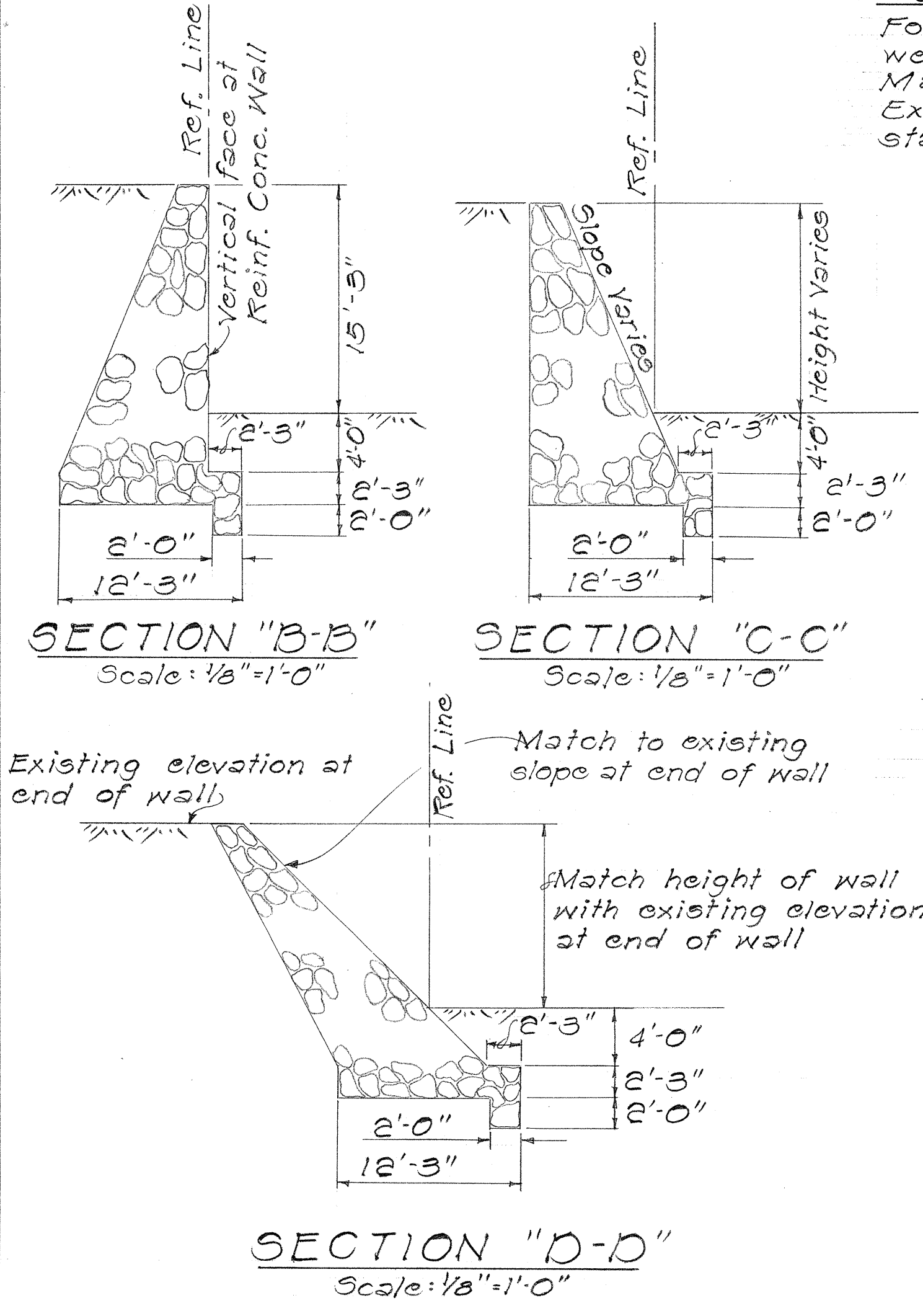
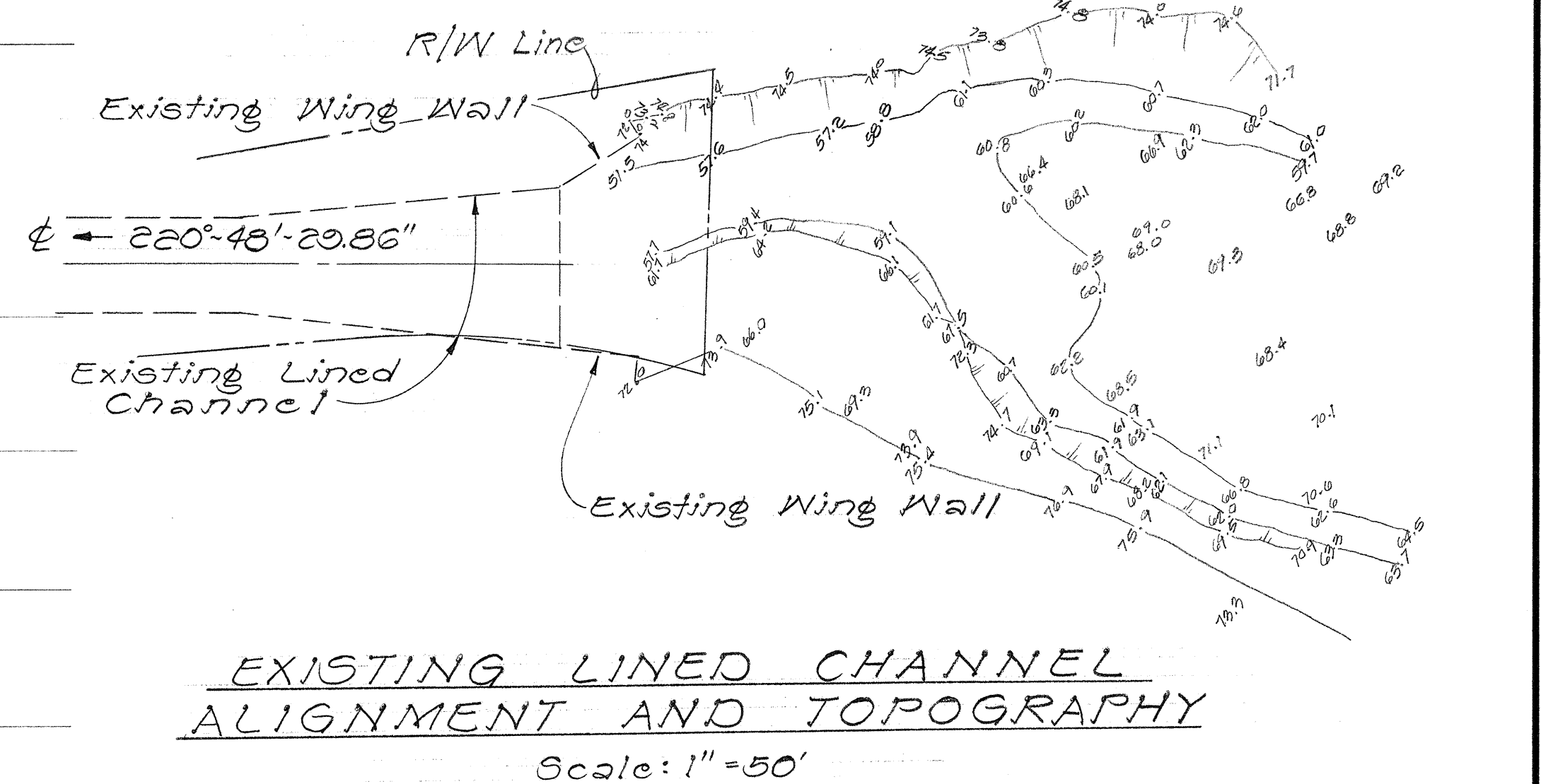
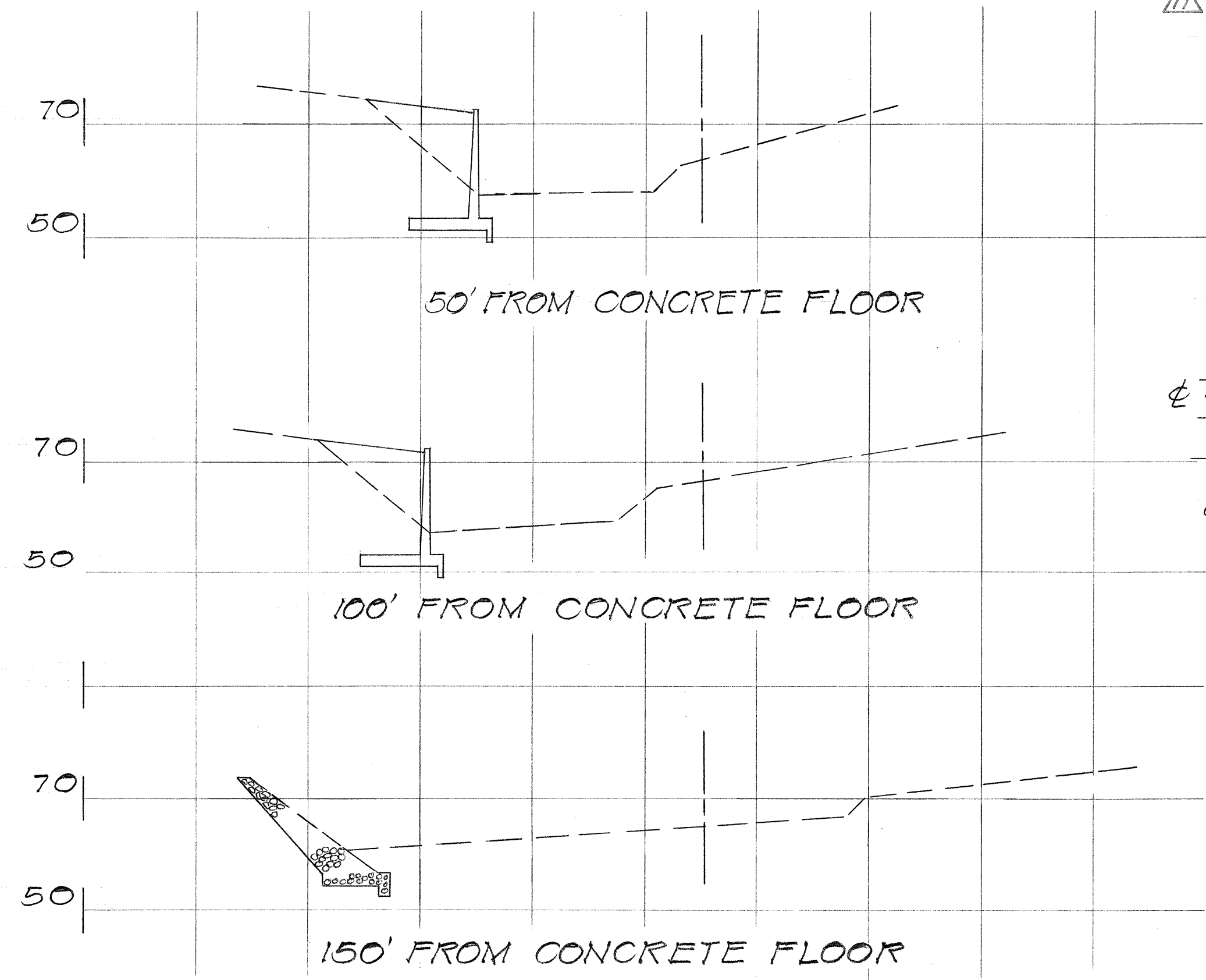
DATE	_____
DESIGNED BY	_____
TRACED BY	_____
NOTED BY	_____
QUANTITIES BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
No.	_____

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(100):13	1975	ADD 91 S-1	130

11/18/75 Bricked Chase for Future Sewer Line (CCO #7)
 11/10/75 Increase Length & Realign CRM Wall (CCO #8)



NOTE:
 For spacing and detail of weepholes, limits of Filter Material and Structural Excavation, see retaining wall standards sht. no. 92.



ITEM NO.	ITEM	UNIT	QUANTITY
206.41	Structural Excavation for North Halawa Stream Wall	C.Y.	1,460
206.80	Filter Material	C.Y.	71
503.041	Concrete in North Halawa Stream Wall	L.S.	315 C.Y.
602.041	Reinf. Steel in North Halawa Stream Wall	L.S.	40700 LB
508.01	Cement Rubble Masonry	C.Y.	415
202.41	Removal of Existing North Halawa Stream Wall	L.S.	42 C.Y.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

RETAINING WALL AT NORTH HALAWA STREAM

INTERSTATE ROUTE H-1
 PROJ. NO. I-HI-1(100):13

SCALE: AS SHOWN DATE: NOV. 1974

SHEET No. 3WA OF 6 SHEETS

DATE	REVISION
3 Feb 75	Retaining wall at entrance of North Halawa Stream Lined Channel

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

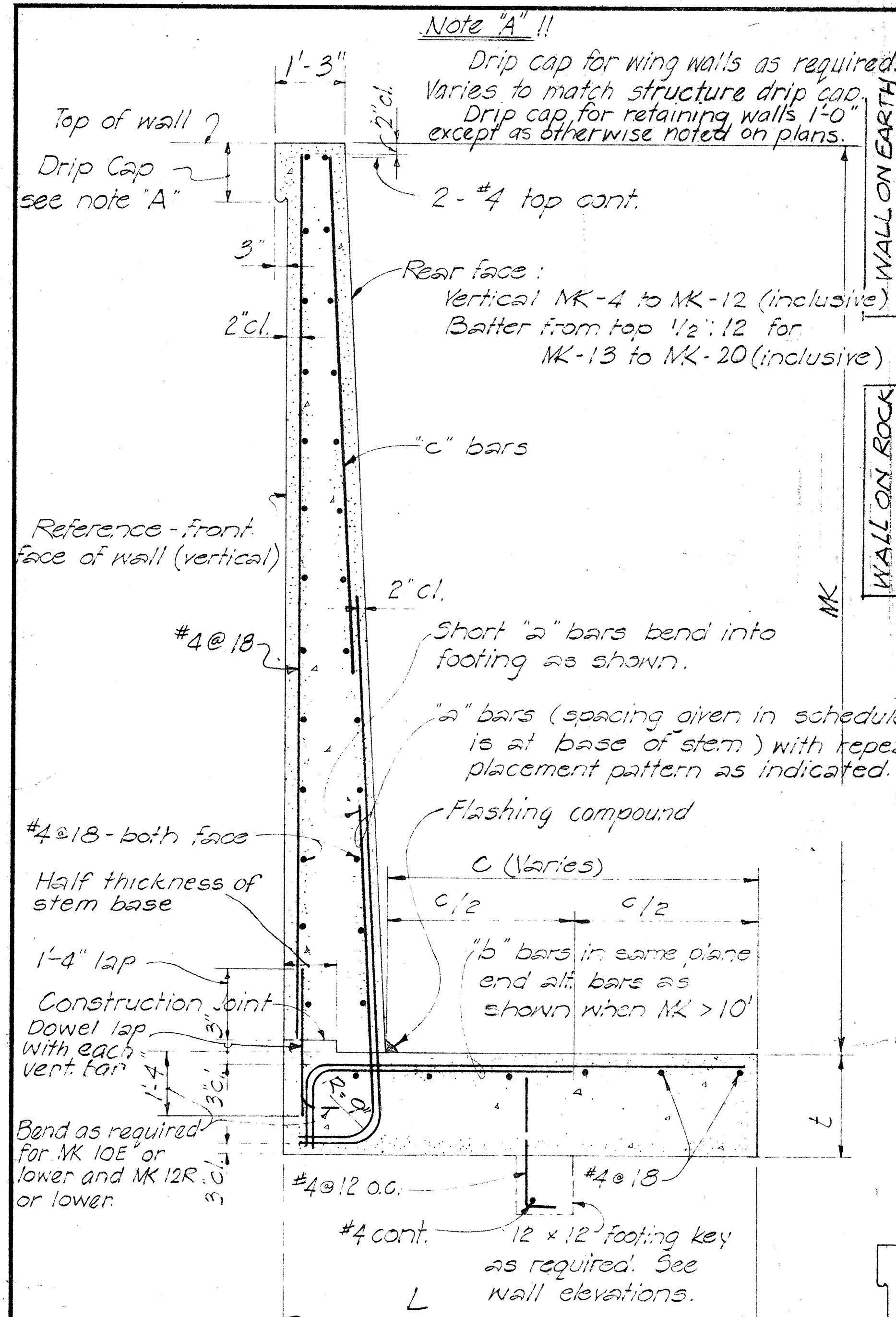
REFERENCE NOTES:
Refer to Standard Drawing Sht DB-207-2 for expansion joint & footing step details.

TYPE "L-1" WALL SCHEDULE OF DIMENSIONS AND REINFORCING STEEL

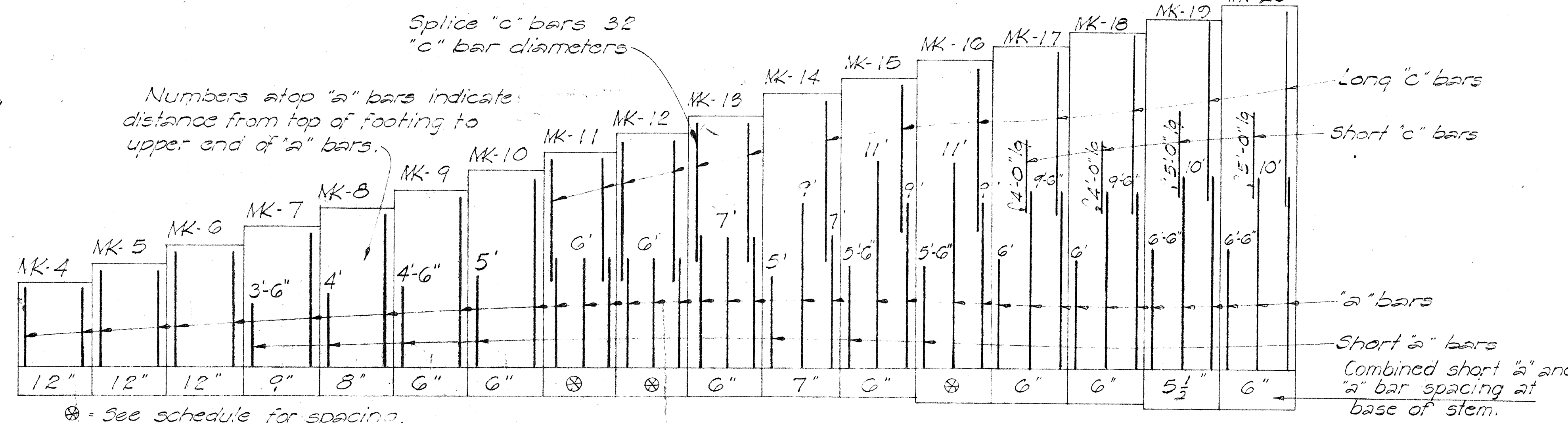
Maximum "MK"	4 E	5 E	6 E	7 E	8 E	9 E	10 E	11 E	12 E	13 E	14 E	15 E	16 E	17 E	18 E	19 E	20 E
L	3.0'	3.25'	3.5'	4.25'	4.75'	5.5'	6.0'	6.75'	7.5'	8.5'	9.25'	10.5'	12.0'	12.75'	14.00'	15.50'	17.00'
t	14"	14"	14"	14"	14"	14"	14"	18"	18"	18"	21"	24"	27"	27"	30"	30"	30"
"a"	#3@12"	#3@12"	#4@12"	#4@9"	#5@8"	#5@6"	#6@6"	#6@6"	#7@6"	#6@6"	#7@7"	#7@6"	#8@5 1/2"	#8@6"	#8@6"	#8@5 1/2"	#9@6"
"b"	#3@12"	#3@12"	#4@12"	#4@9"	#5@8"	#5@6"	#6@6"	#6@6"	#7@6"	#8@6"	#9@7"	#9@6"	#10@5 1/2"	#8@6"	#8@6"	#8@5 1/2"	#9@6"
"c"	—	—	—	—	—	—	—	#4	#4	#4	#4	#4	#5	#5	#5	#5	#5

Maximum "MK"	4 R	5 R	6 R	7 R	8 R	9 R	10 R	11 R	12 R	13 R	14 R	15 R	16 R
L	2.5'	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	6.5'	7.0'	7.5'	8.0'	8.5'
t	14"	14"	14"	14"	14"	14"	14"	14"	18"	18"	18"	18"	18"
"a"	#3@12"	#3@12"	#4@12"	#4@9"	#5@8"	#5@6"	#6@6"	#7@7"	#8@7"	#6@6"	#7@7"	#7@6"	#8@6"
"b"	#3@12"	#3@12"	#4@12"	#4@9"	#5@8"	#5@6"	#6@6"	#7@7"	#8@7"	#7@6"	#8@7"	#8@6"	#9@6"
"c"	—	—	—	—	—	—	—	#4	#4	#4	#4	#4	#5

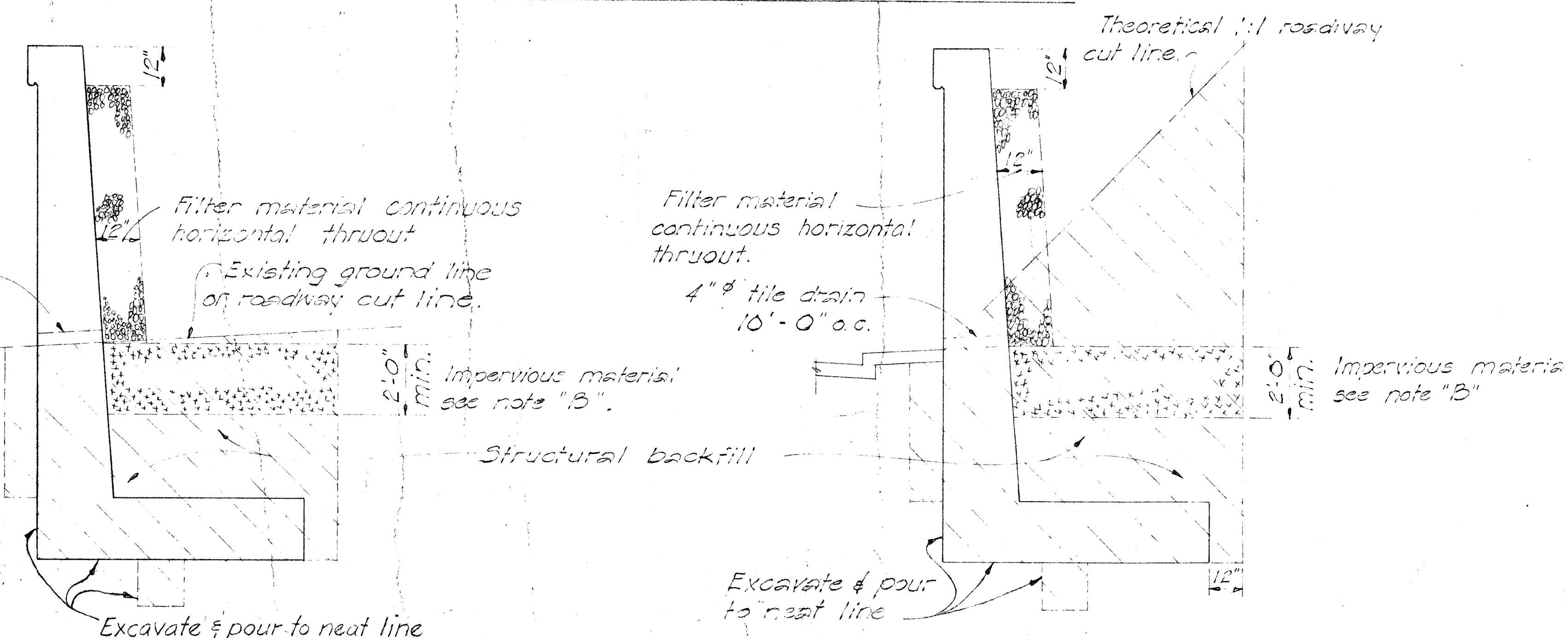
DESIGN LIMITS OF WALL SURCHARGE AND SLOPES



TYPICAL SECTION
TYPE "L-1" WALL



VERTICAL REINFORCING STEEL ARRANGEMENT



STRUCTURAL EXCAVATION & DRAINAGE DETAILS

Note:
Hatched areas denotes limits of structural excavation pay line. All other excavation shall be roadway excavation except as otherwise noted.
Note "B"!!
Impervious material as selected by the Engineer incidental to structural excavation. When "MK" is 2'-0" or less, all backfill below weep hole level shall be impervious material.
The subgrade upon which filter material is to be placed shall be made as impervious as possible by pneumatic tamping or other approved methods.
Impervious material shall be incidental to roadway excavation or imported borrow when used in embankment area.

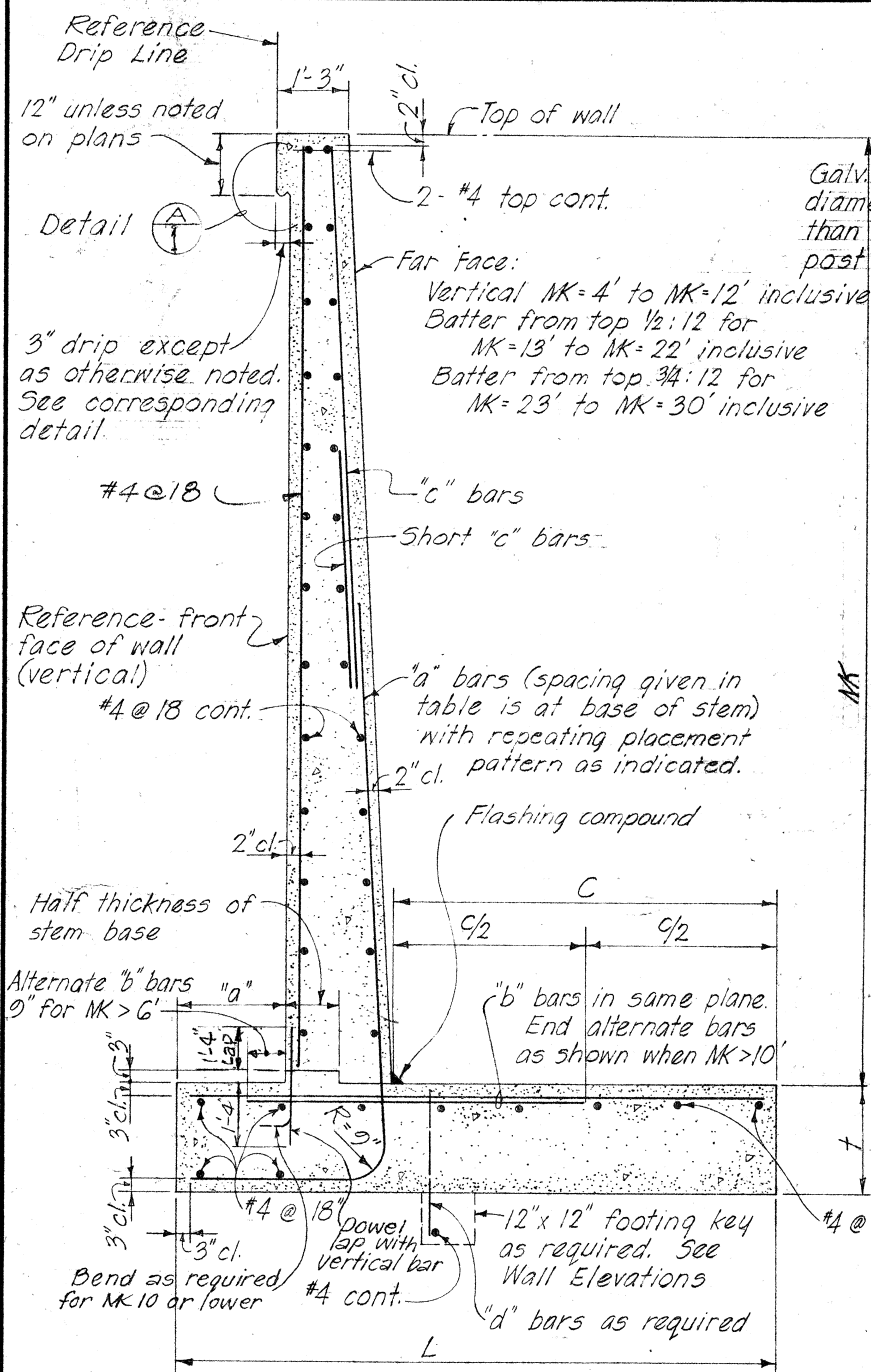
NO.	REVISION	APPROVED BY	DATE

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

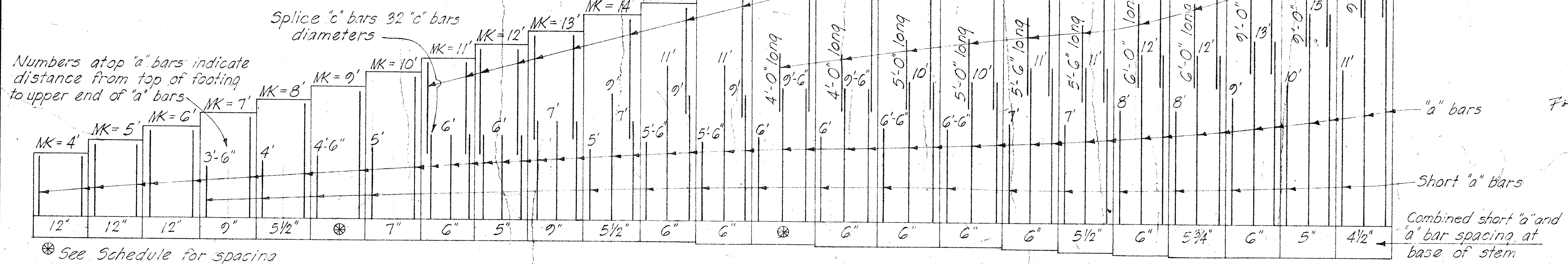
APPROVED
Paul T. Umashita
JH ASSISTANT CHIEF, ENGINEERING 1-24-70
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAIL
RETAINING WALL TYPE L-1

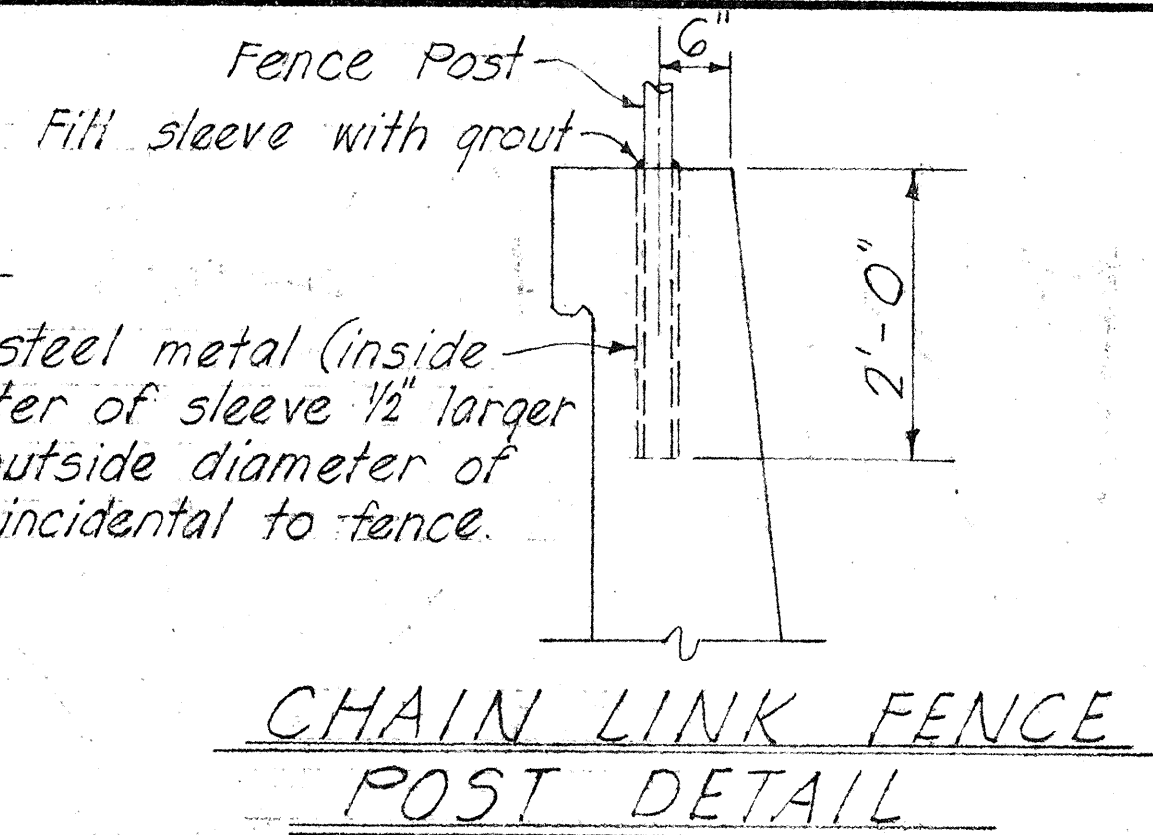
SCALE: AS NOTED DATE: DEC. 29, 1972
SHEET No. 4W OF 6 SHEETS DB-206



WALL SECTION

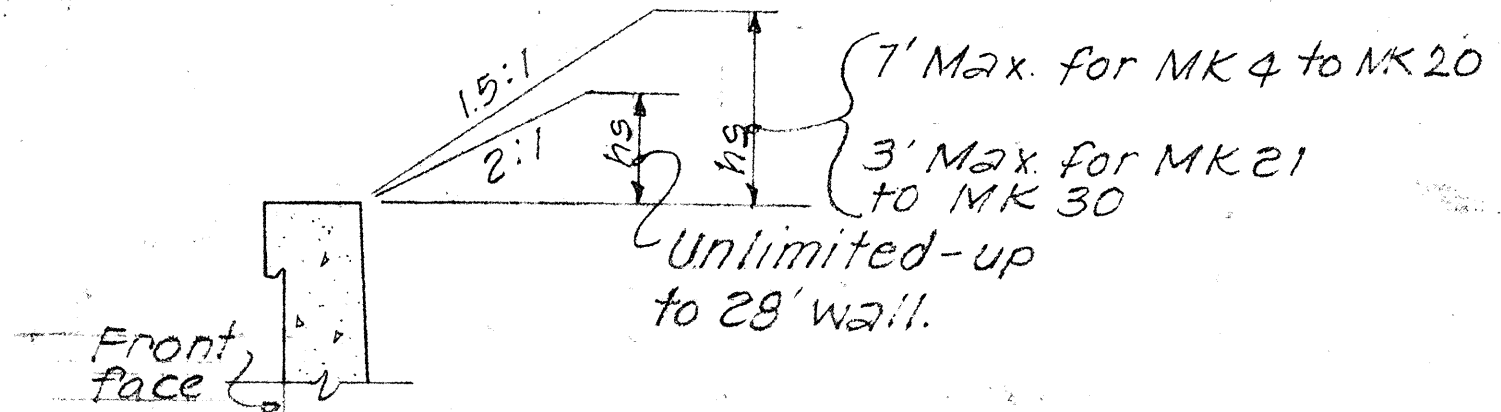


VERTICAL REINFORCING STEEL ARRANGEMENT



DETAIL 1

DESIGN LIMITS OF WALL SURCHARGE AND SLOPES



SCHEDULE OF DIMENSIONS AND REINFORCING STEEL																									
Wall on Earth	Maximum "MK"	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"	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@5½"	#5@7"	#6@7"	#6@6"	#6@5"	#7@9"	#6@5½"	#7@6"	#8@6"	#8@5¾"	#9@6"	#9@6"	#10@6"	#10@6"	#10@5½"	#10@6"	#10@5¾"	#11@6"	#11@5"	#11@4½"
	"b" bars	#3@12"	#3@12"	#3@12"	#3@9"	#4@11"	#4@7"	#5@7"	#5@6"	#5@5"	#7@9"	#6@5½"	#7@6"	#8@6"	#10@5¾"	#8@6"	#9@6"	#10@6"	#10@6"	#10@5½"	#10@6"	#10@5¾"	#11@6"	#11@5"	#11@4½"
	"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@	#7@	#7@6"

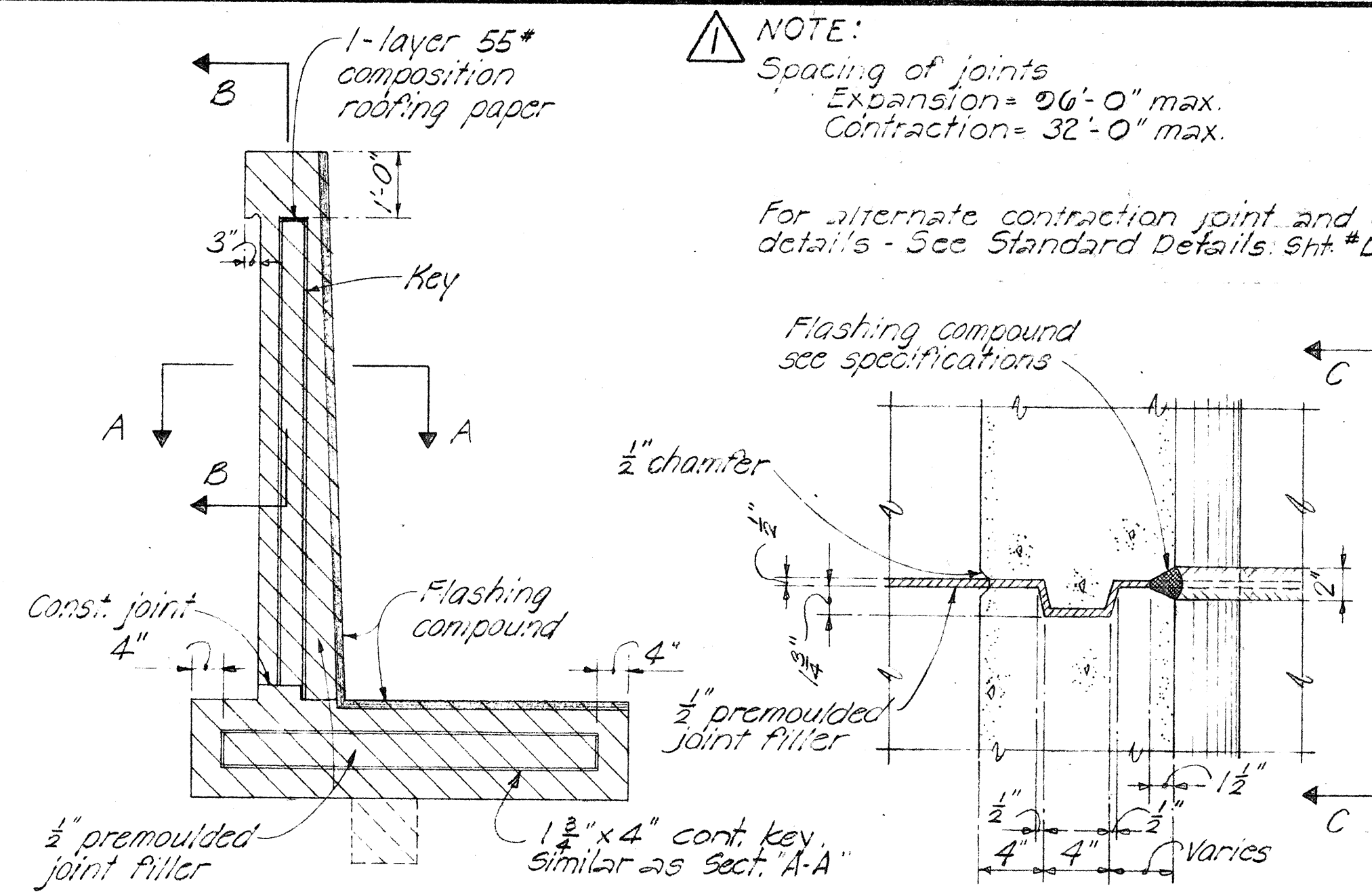
Maximum "MK"	4R	5R	6R	7R	8R	9R	10R	11R	12R	13R	14R	15R	16R	17R	18R	19R	20R	21R	22R	23R	24R	26R	28R	30R	
a	6"	6"	6"	12"	12"	12"	12"	12"	12"	12"	15"	18"	21"	21"	21"	21"	24"	24"	27"	30"	33"	39"	39"	51"	
t	14"	14"	14"	14"	14"	14"	14"	18"	18"	18"	18"	18"	18"	18"	18"	21"	21"	21"	21"	24"	24"	27"	30"	36"	
L	2.5'	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	6.5'	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 @ 9"	#6 @ 5 1/2"	#7 @ 6"	#8 @ 6"	#8 @ 5 3/4"	#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 @ 7"	#5 @ 7"	#5 @ 6"	#5 @ 5"	#7 @ 9"	#6 @ 5 1/2"	#7 @ 6"	#8 @ 6"	#10 @ 5 3/4"	#8 @ 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"	
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. Varnaschita
 BRIDGE DESIGN ENGINEER 1-23-70
 DATE

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

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 STANDARD DETAILS
 RETAINING WALL TYPE T-1
 SCALE AS NOTED DATE DEC 29, 1972
 SHEET No. 5W OF 6 SHEETS DB-207-1



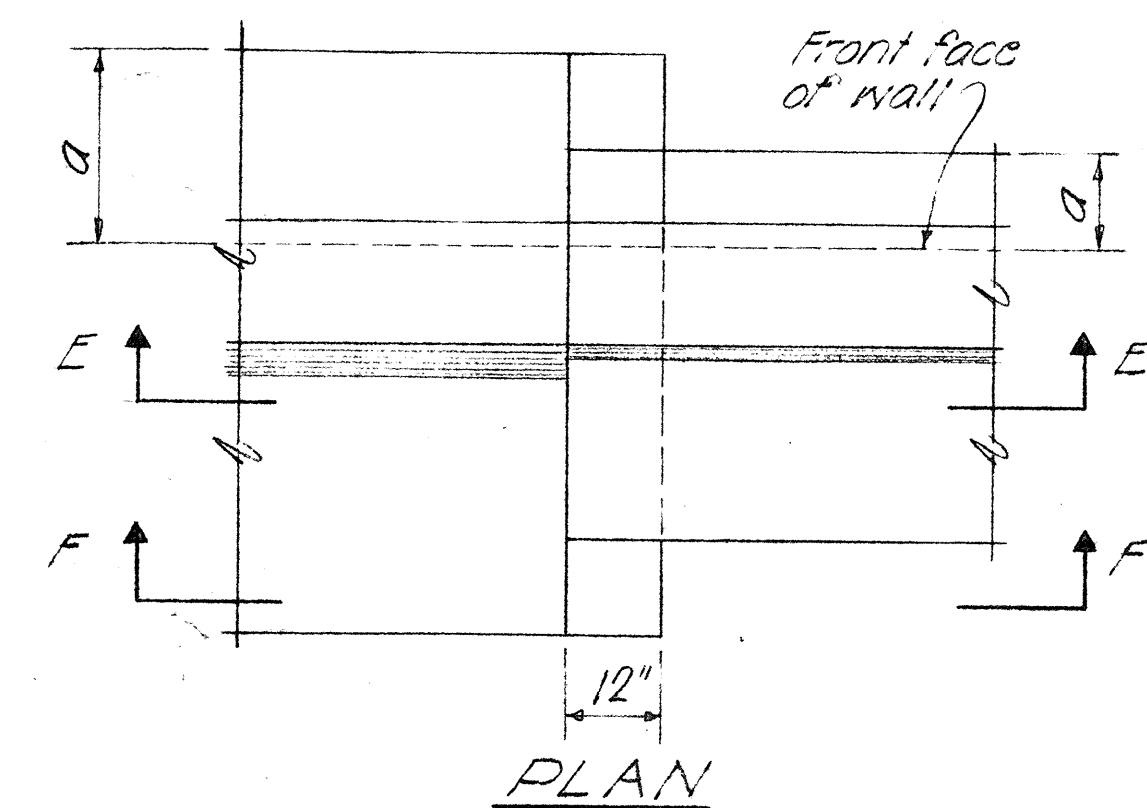
JOINT ELEVATION

SECTION A-A

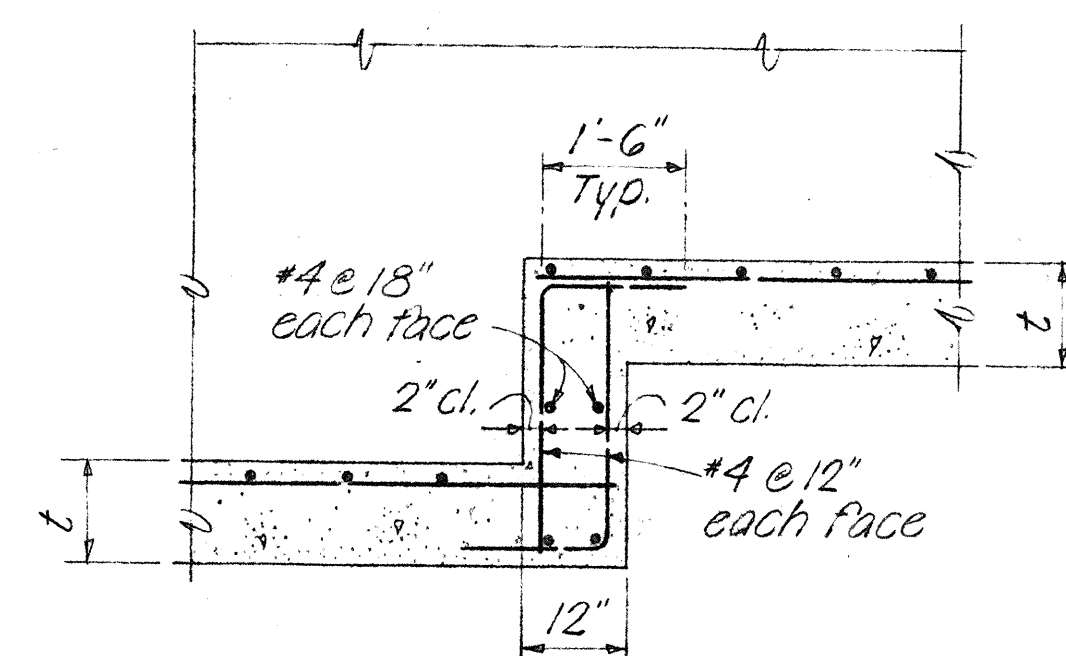
SECTION B-B

SECTION C-C

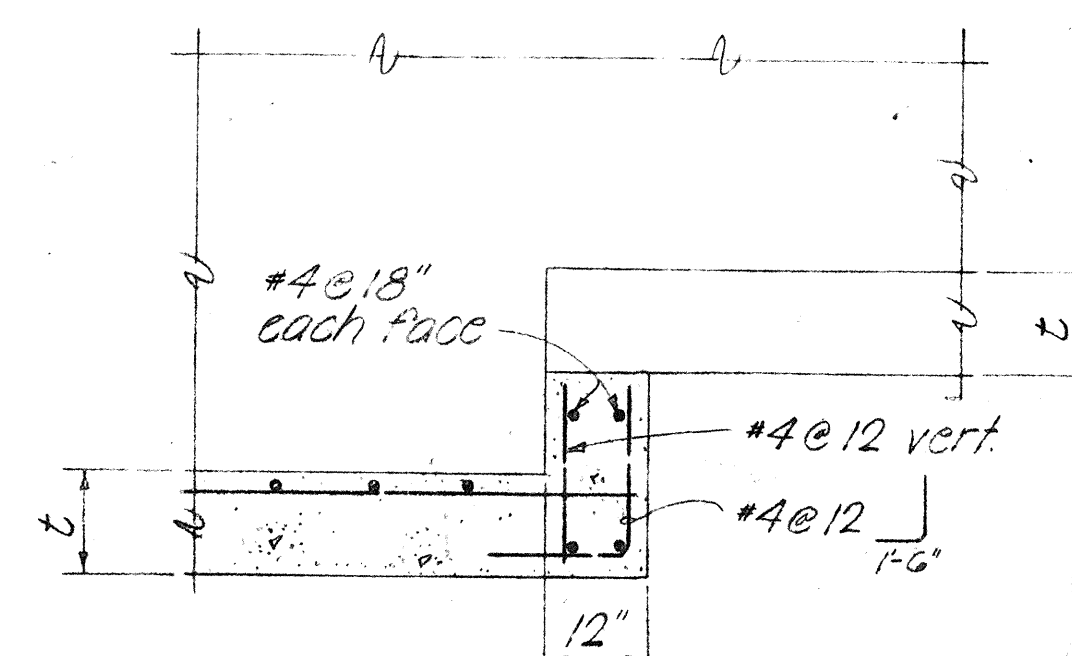
TYPICAL EXPANSION JOINT DETAILS No Scale



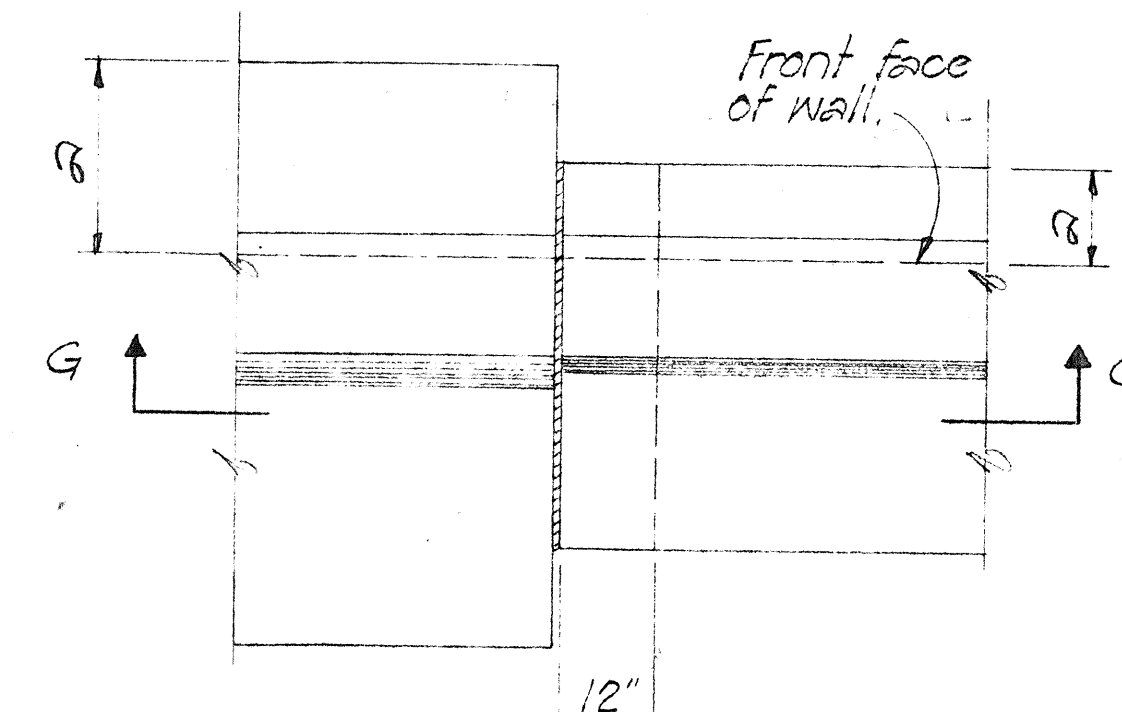
PLAN



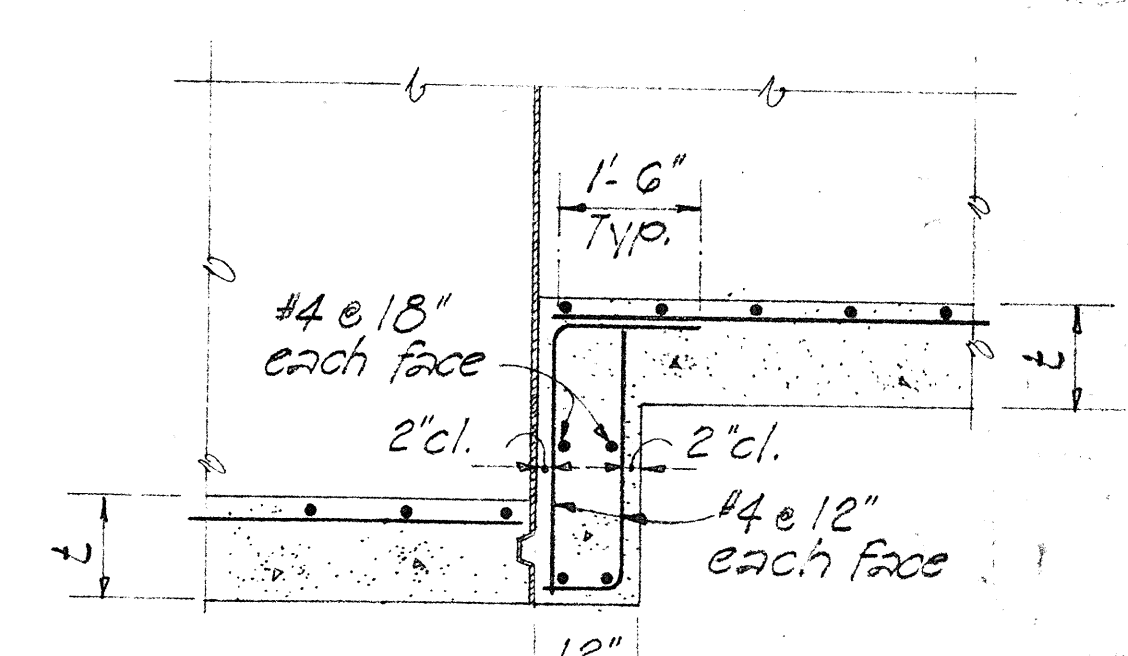
SECTION E-E



SECTION F-F



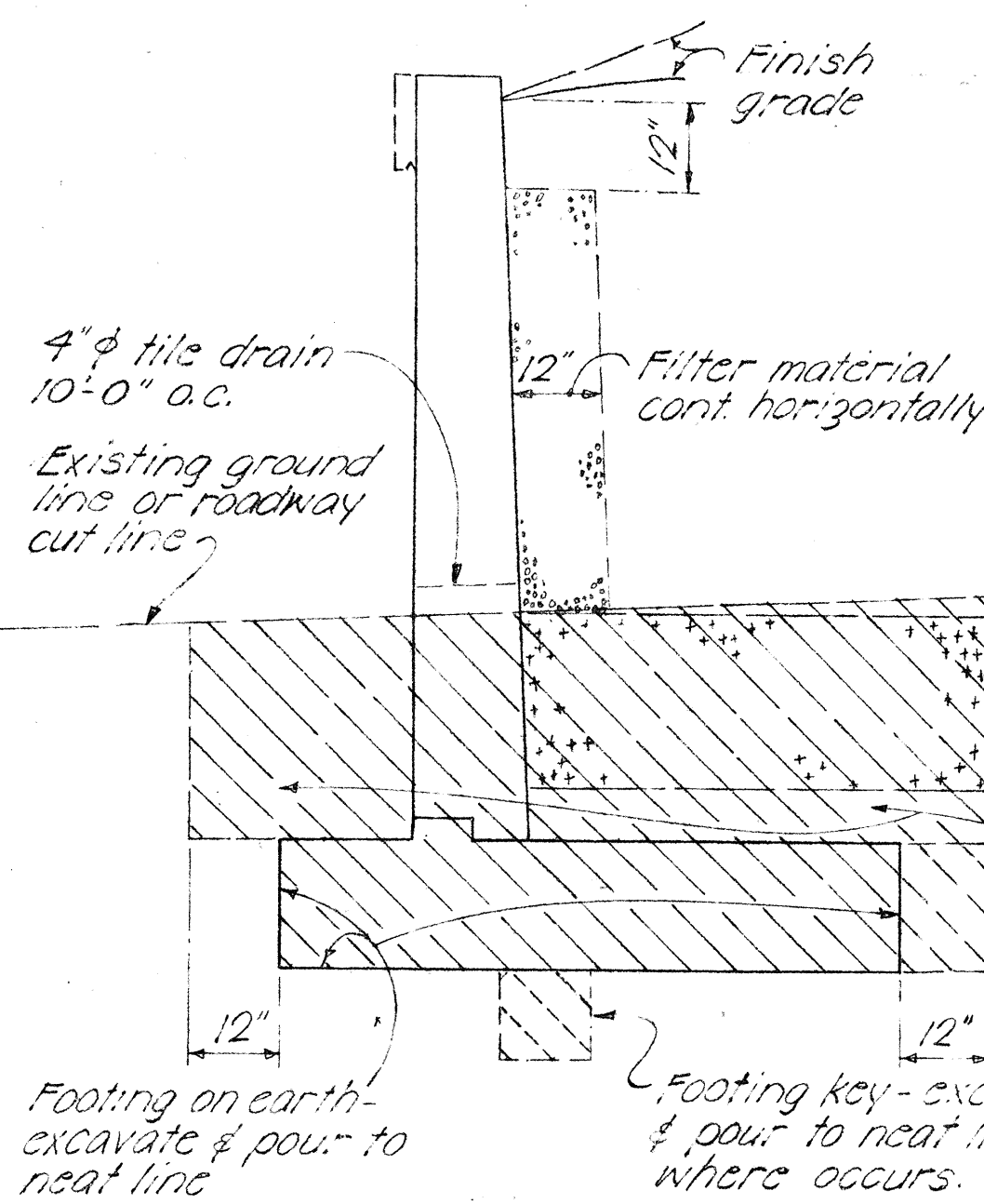
PLAN



SECTION G-G

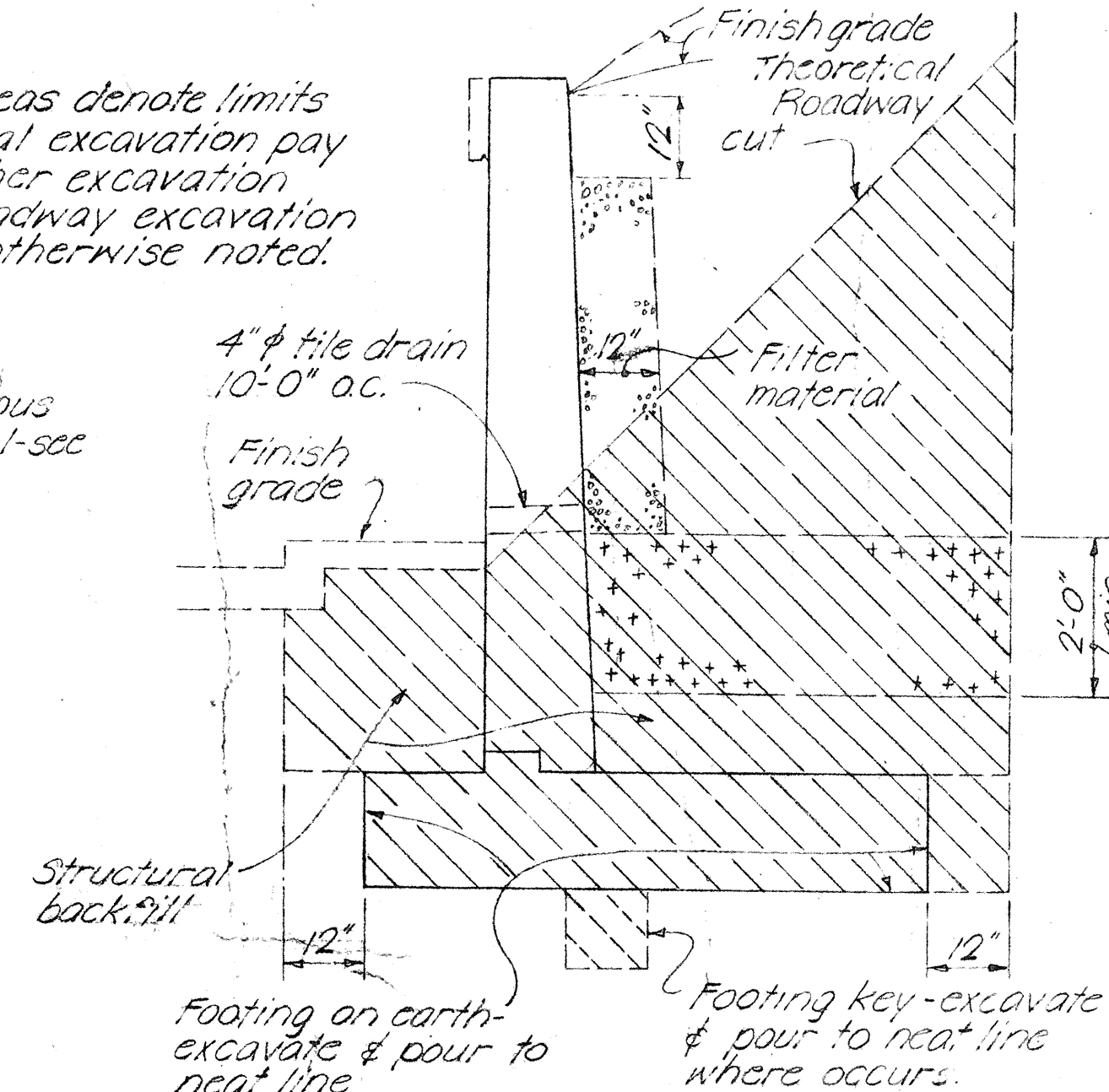
AT EXPANSION JOINT

TYPICAL FOOTING STEP-UP DETAILS No Scale



CASE I

NOTE
Hatched areas denote limits of structural excavation pay line. All other excavation shall be roadway excavation except as otherwise noted.



CASE II

STRUCTURAL EXCAVATION & DRAINAGE DETAILS No Scale

APPROVAL RECOMMENDED:
Paul T. Yamashita
BRIDGE DESIGN ENGINEER 1-23-76 DATE

APPROVED
Paul T. Yamashita
For ASSISTANT CHIEF, ENGINEERING 1-24-76 DATE

NO.	REVISION	APPROVED BY	DATE
1	Change note spacing of joints.	H.T.	9.4.72

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
RETAINING WALL TYPE T-1

SCALE As NOTED DATE: DEC. 29, 1972
SHEET No. 6W OF 6 SHEETS DB-207-2