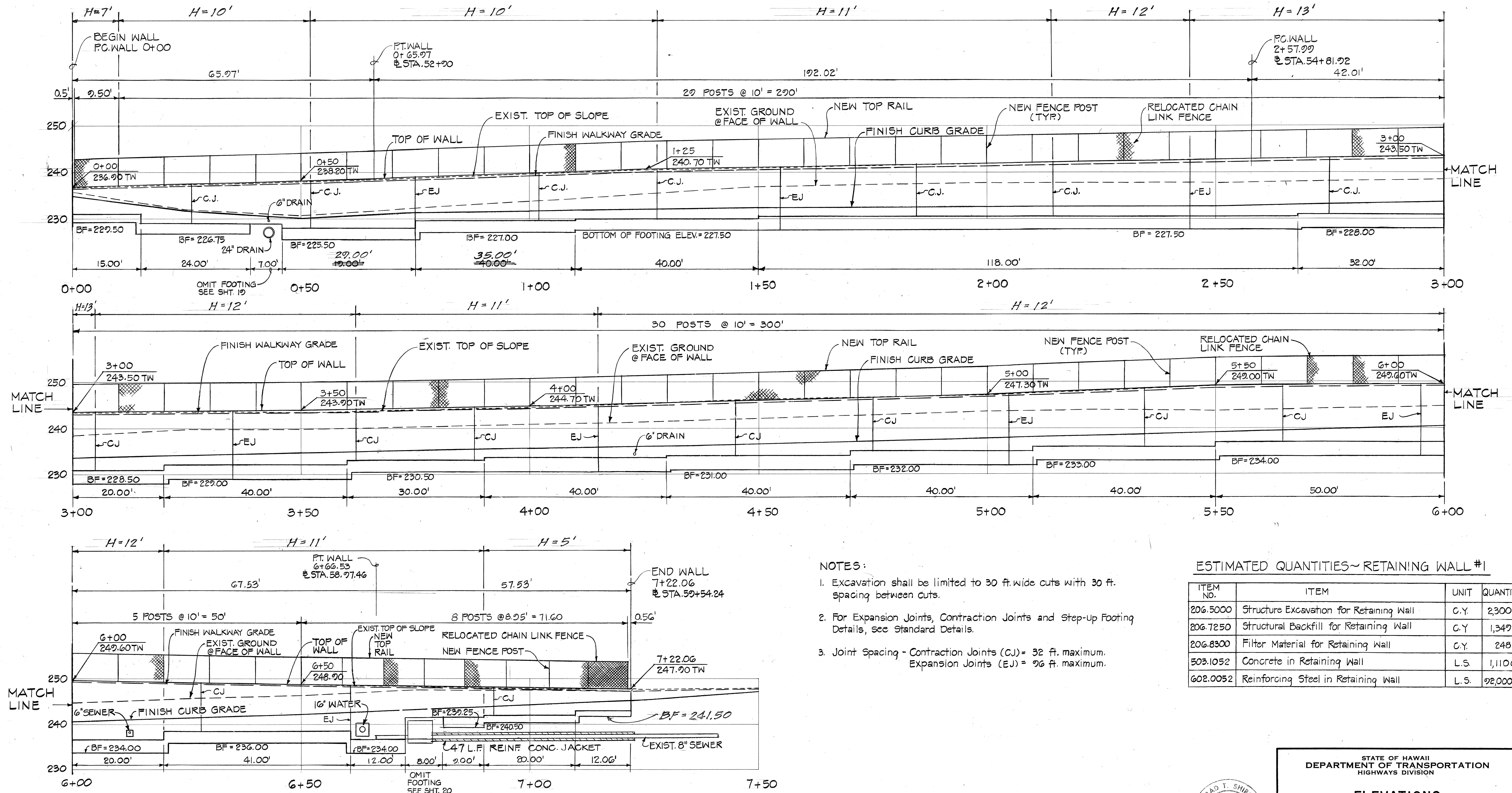


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1(16)	1984	15	156



NOTES:

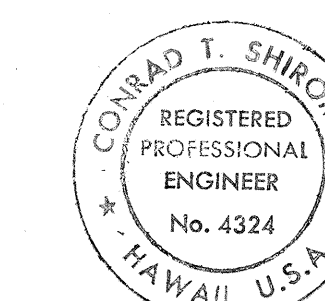
- Excavation shall be limited to 30 ft. wide cuts with 30 ft. spacing between cuts.
- For Expansion Joints, Contraction Joints and Step-up Footing Details, see Standard Details.
- Joint Spacing - Contraction Joints (CJ) = 32 ft. maximum.
Expansion Joints (EJ) = 96 ft. maximum.

ESTIMATED QUANTITIES - RETAINING WALL #1

ITEM NO.	ITEM	UNIT	QUANTITY
206.5000	Structure Excavation for Retaining Wall	C.Y.	2,300
206.7250	Structural Backfill for Retaining Wall	C.Y.	1,342
206.8300	Filter Material for Retaining Wall	C.Y.	248
503.1052	Concrete in Retaining Wall	L.S.	1,110 C.Y.
602.0052	Reinforcing Steel in Retaining Wall	L.S.	92,000 LB.

ELEVATIONS - RETAINING WALL #1

SCALE: 1" = 10'



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Conrad T. Shirima
Signature

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELEVATIONS RETAINING WALL #1

LIKELIKE HIGHWAY IMPROVEMENTS
(VICINITY OF KULA KOLEA DRIVE TO KAM IV ROAD)

PROJECT NO. F-063-1 (16)

SHEET NO. 3 OF SHEETS

ELEVATION - RETAINING WALL NO. 2
Scale: Horiz. & Vert. 1" = 10'

ESTIMATED QUANTITIES - RETAINING WALL NO. 2

ITEM NO.	ITEM
206.5000	Structure Excavation for Retaining Wall
206.7250	Structural Backfill for Retaining Wall
206.8300	Filter Material for Retaining Wall
503.1052	Concrete in Retaining Wall
602.0052	Reinforcing Steel in Retaining Wall

REVISIONS

DATE	REVISION
4/15/85	Revised Top of Wall elev. & chain link fence height

C.O.16

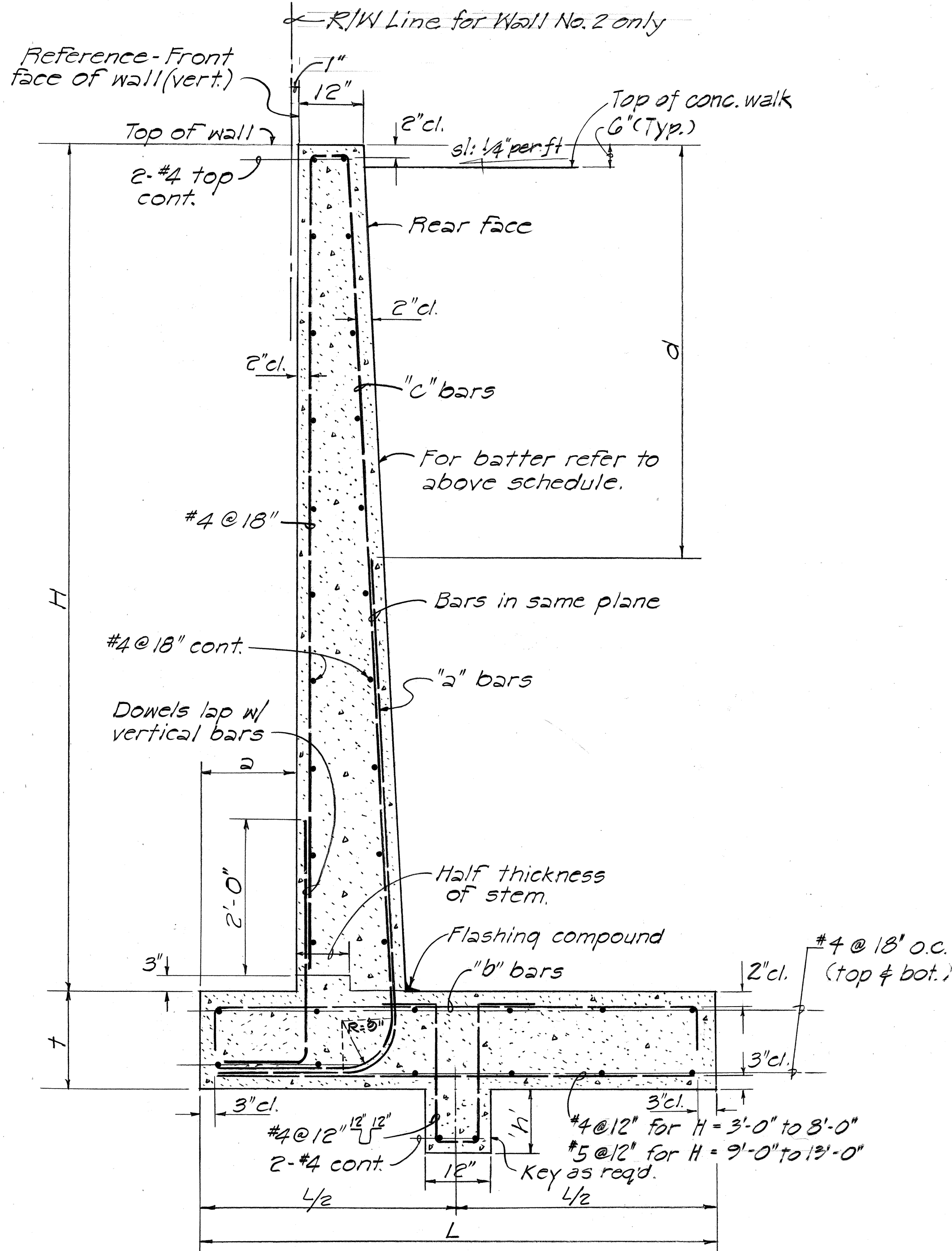
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.

Conrad J. Spencer
Signature

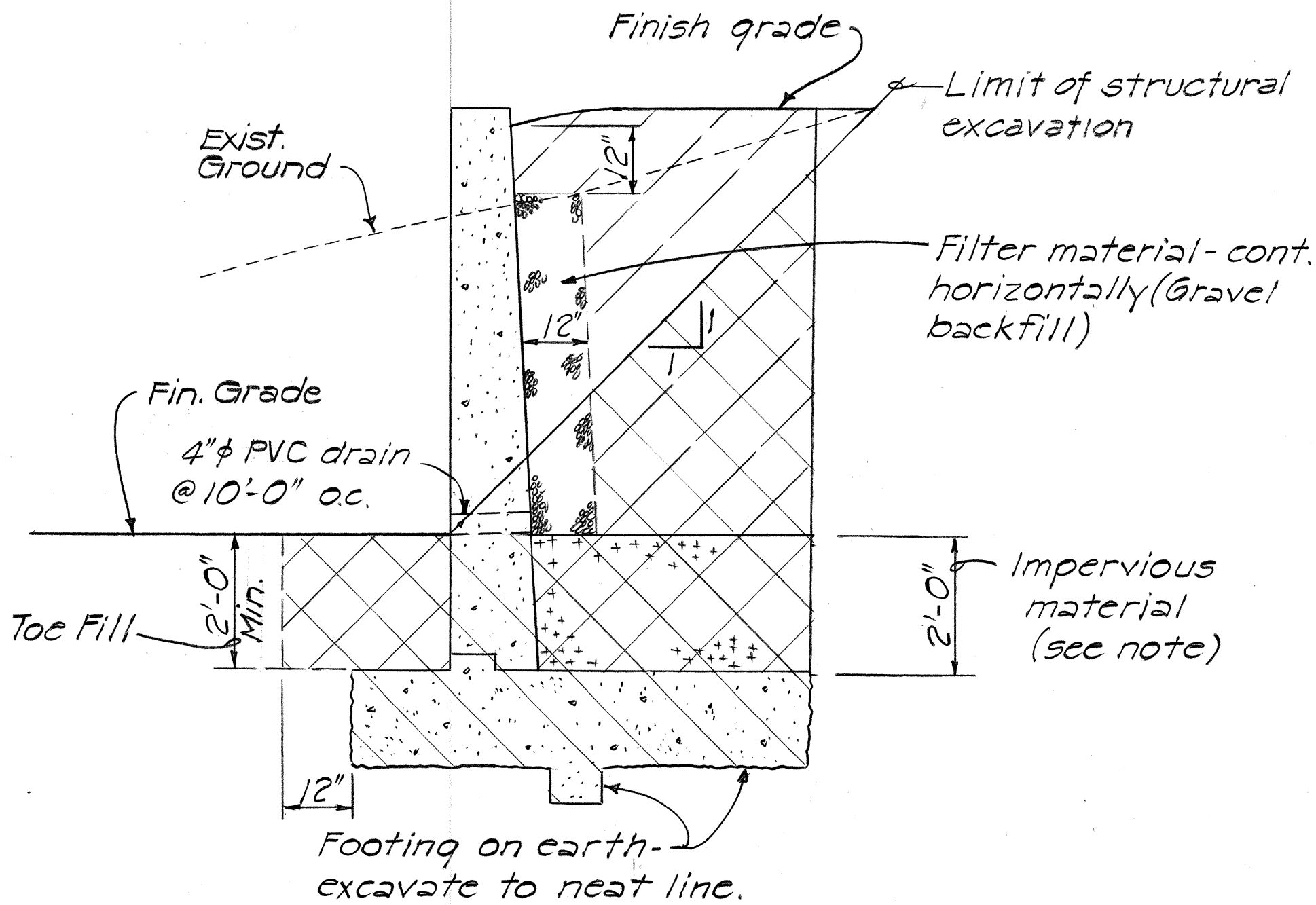
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1(16)	1984	17	156

Maximum H	3'-0"	4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"	13'-0"
a	1'-0"	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-0"	2'-6"	2'-6"	3'-0"	3'-6"
L	3'-0"	3'-6"	4'-6"	5'-6"	6'-6"	7'-0"	7'-6"	8'-0"	9'-0"	10'-0"	10'-6"
t	1'-0"	1'-0"	1'-3"	1'-6"	1'-9"	2'-0"	2'-3"	2'-6"	2'-6"	3'-0"	3'-0"
Batter in/ft.	0	0	0	0	0	0	1/2	1/2	1/2	1/2	1/2
Key 'h'	—	0'-6"	0'-6"	1'-0"	1'-0"	1'-6"	1'-6"	2'-0"	2'-0"	2'-0"	2'-0"
"a" bars	#4@8"	#4@8"	#4@8"	#5@12"	#5@7 1/2"	#5@5"	#6@8"	#6@12"	#6@10"	#7@12"	#7@11"
"c" bars	—	—	—	—	—	—	—	#6@12"	#6@10"	#7@12"	#7@11"
"b" bars	#4@16"	#4@16"	#4@16"	#4@12"	#4@7 1/2"	#5@10"	#5@8"	#6@12"	#6@10"	#7@12"	#7@11"
d	0	0	0	0	0	0	0	3'-0"	3'-0"	4'-0"	4'-0"

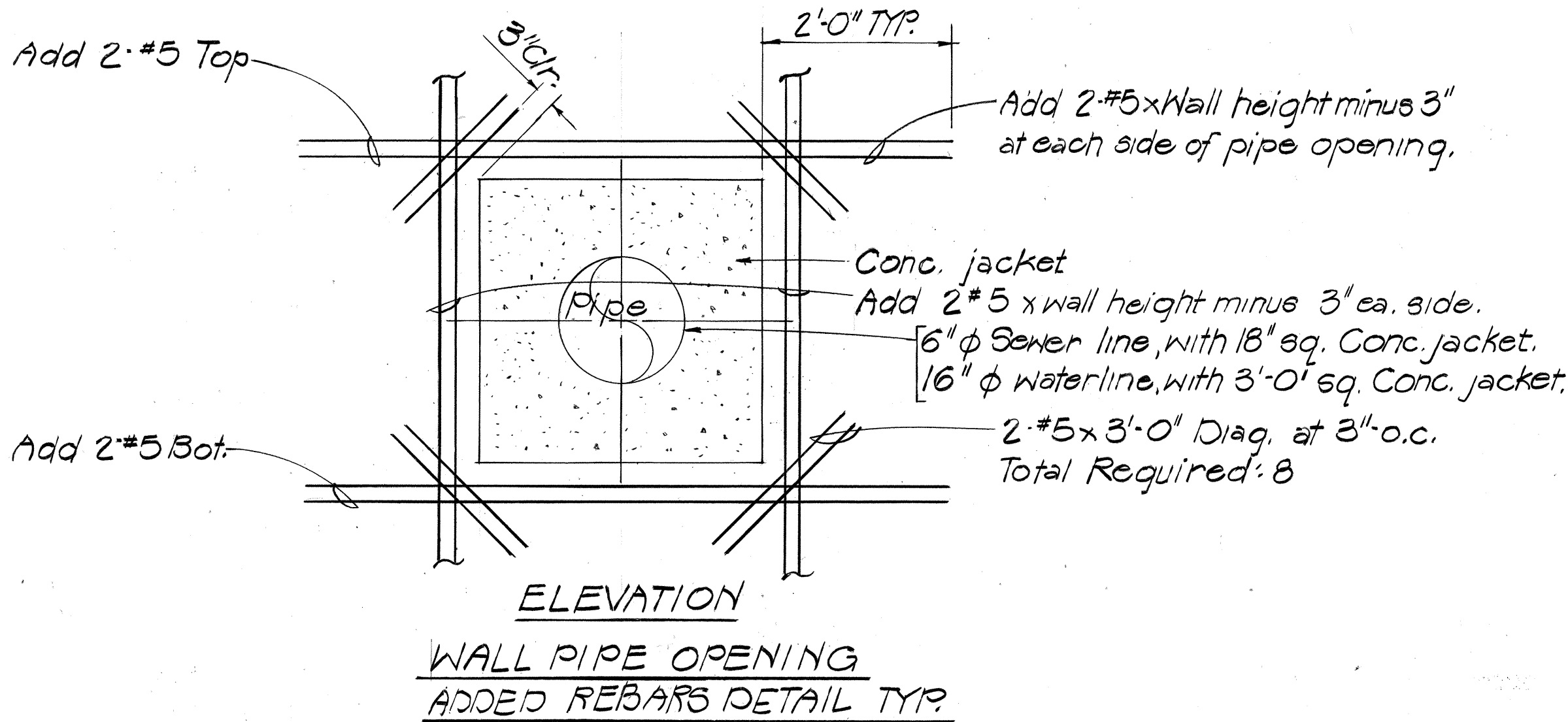
SCHEDULE OF RETAINING WALL SECTION & REINFORCEMENT-RETAINING WALL NO.1 & NO.2



TYPICAL SECTION RETAINING WALL NO.1 & NO.2 (Not to scale)

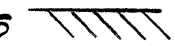


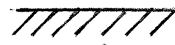
STRUCTURE EXCAVATION & DRAINAGE DETAILS (Not to scale)



NOTE:

HATCHED AREA

1. Hatched area shown thus  denotes limits of structure excavation payline. All other excavation shall be roadway excavation.

2. Hatched area shown thus  denotes limits of structure backfill or ordinary backfill.

IMPERVIOUS MATERIAL

1. Impervious material as selected by the Engineer shall be incidental to structure excavation.

2. The subgrade upon which filter material is to be placed shall be made as impervious as possible by pneumatic tamping or other approved methods.

3. Impervious material shall be incidental to roadway excavation or imported borrow when used in embankment area.

DATE	_____
SURVEY PLOTTED BY	_____
PLAN	_____
DRAWN BY	_____
DESIGNED BY	_____
QUANTITIES BY	_____
CHECKED BY	_____
NO.	_____

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

RETAINING WALL NO. 1 & 2

TYP. SECTION, SCHEDULE & NOTES

LIKELIKE HIGHWAY IMPROVEMENTS

(VICINITY OF KULA KOLEA DRIVE TO KAM IV ROAD)

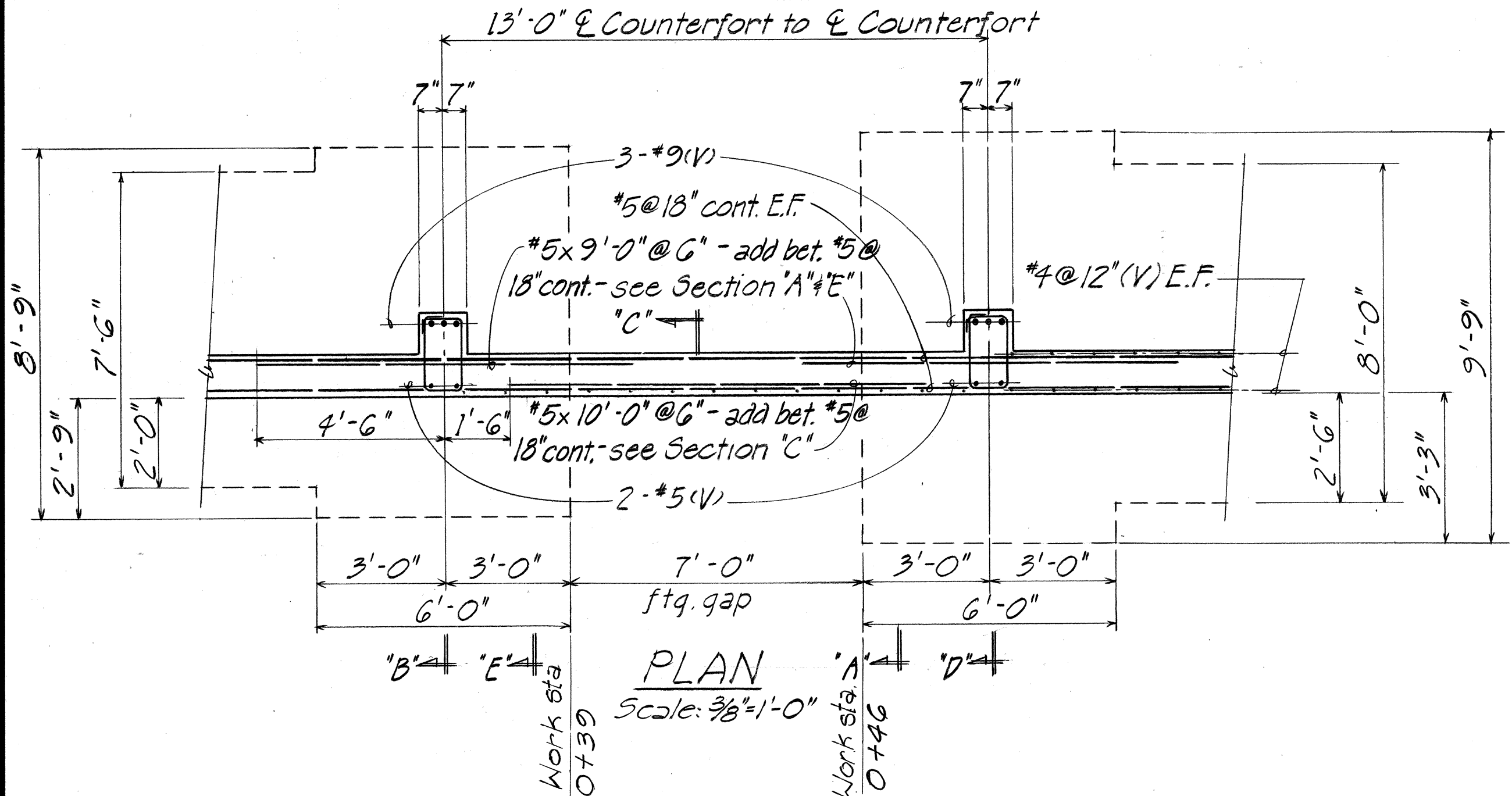
PROJECT NO. F-063-1 (16)

SHEET NO. 1 OF 3 SHEETS

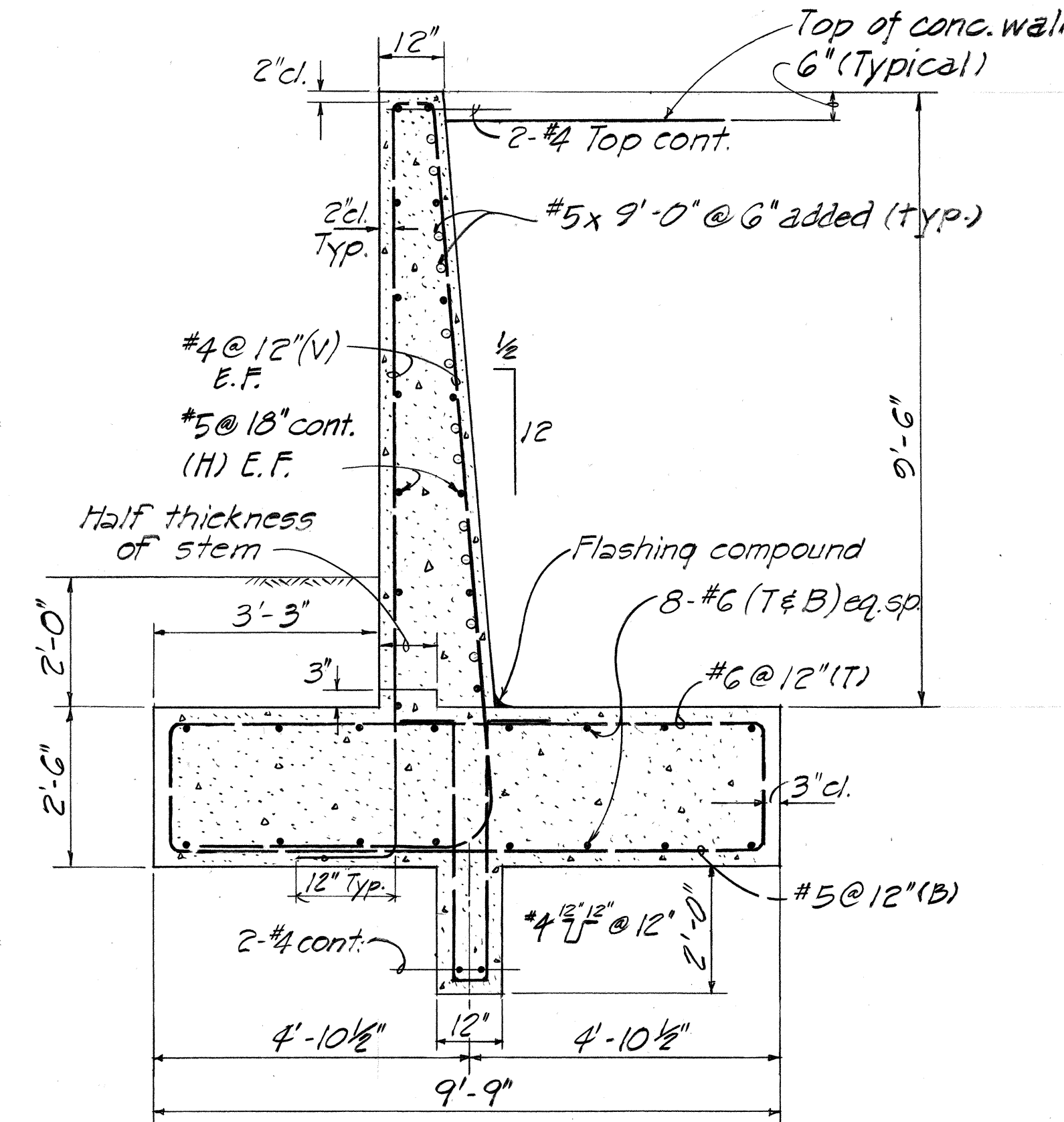
17

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1(16)	1984	18	156

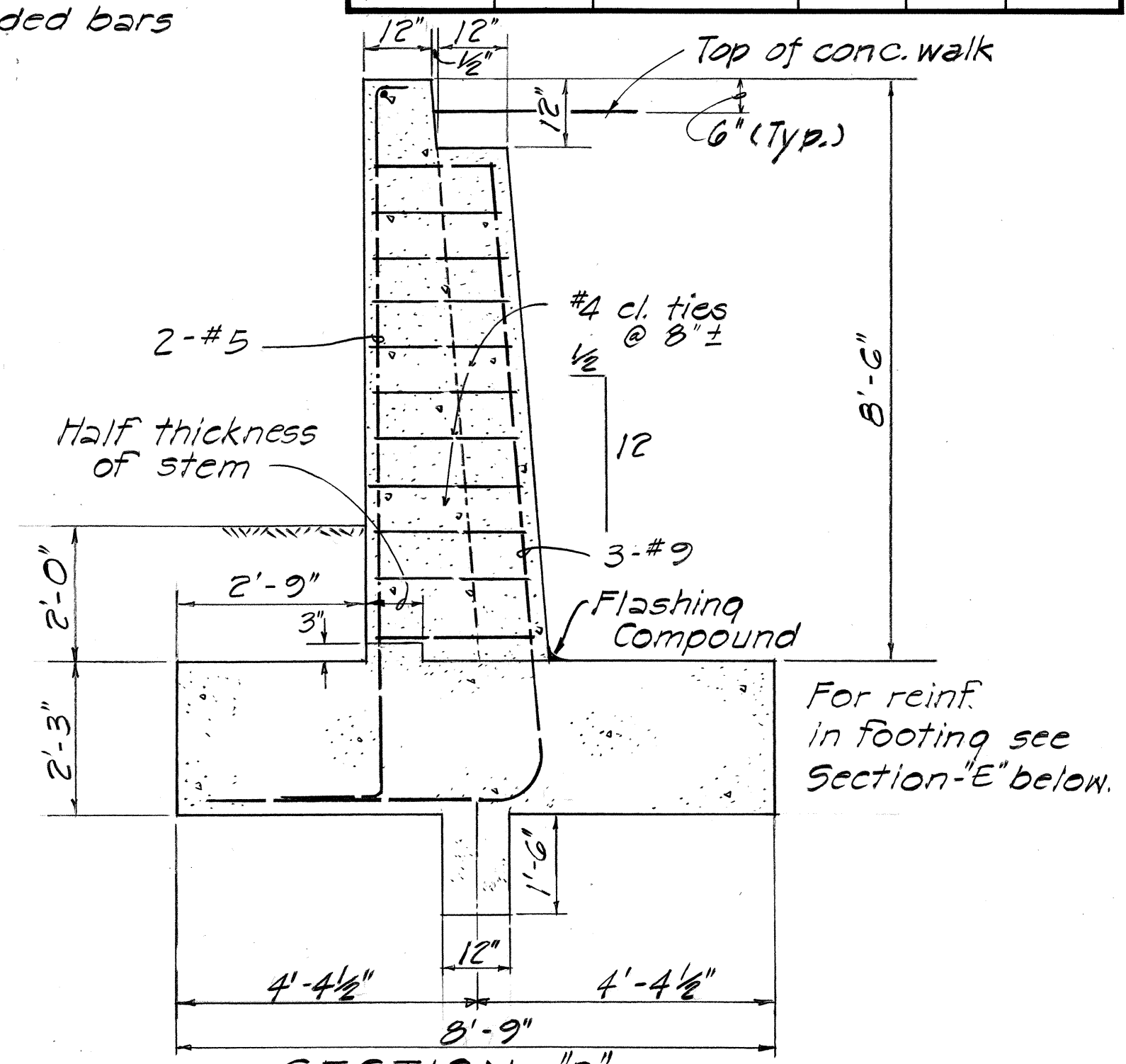
LEGEND
 • = Continuous bars
 ◦ = Added bars



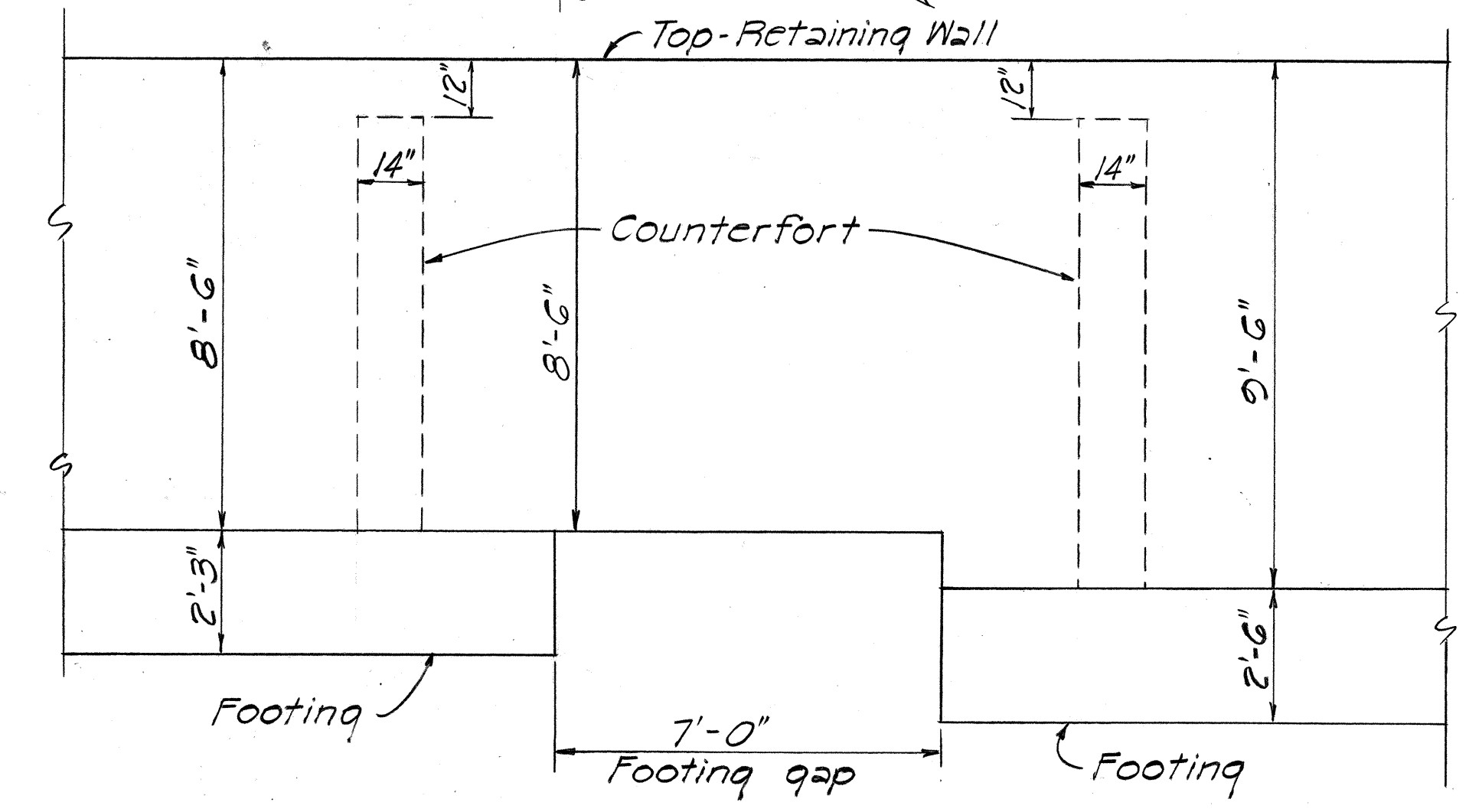
PLAN
 Scale: 3/8" = 1'-0"



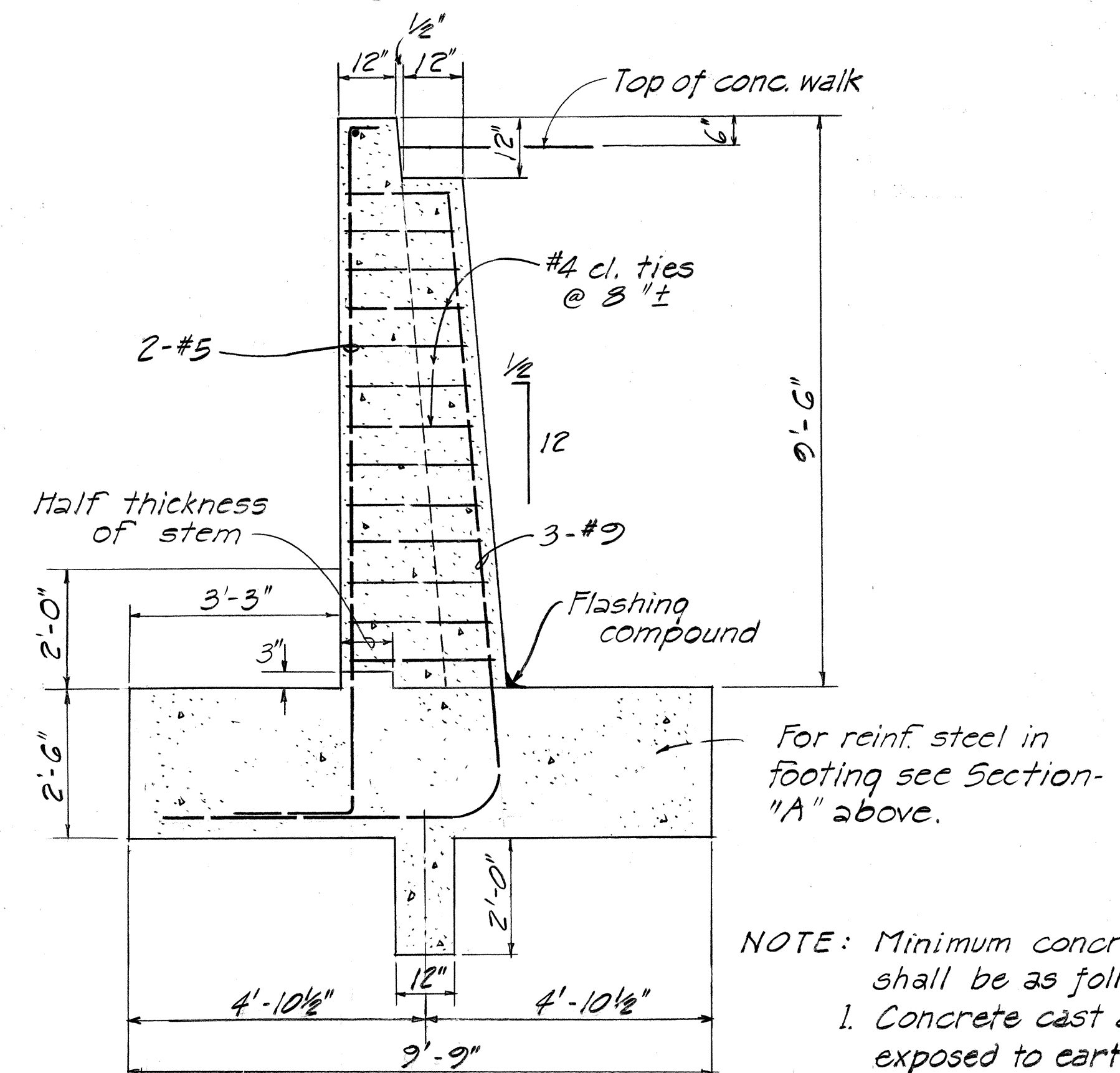
SECTION 'A'
 Scale: 1/2" = 1'-0"



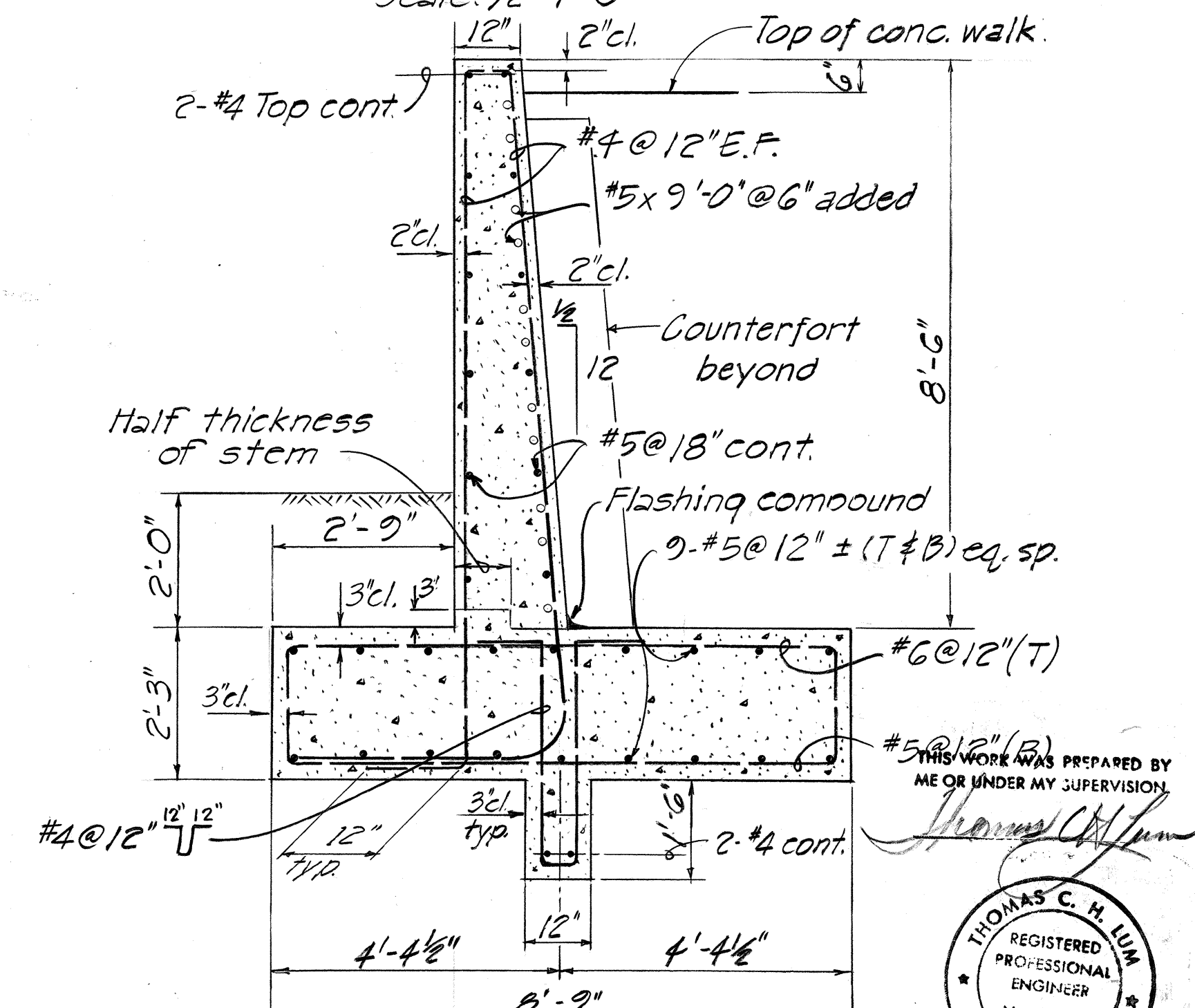
SECTION 'B'
 Scale: 1/2" = 1'-0"



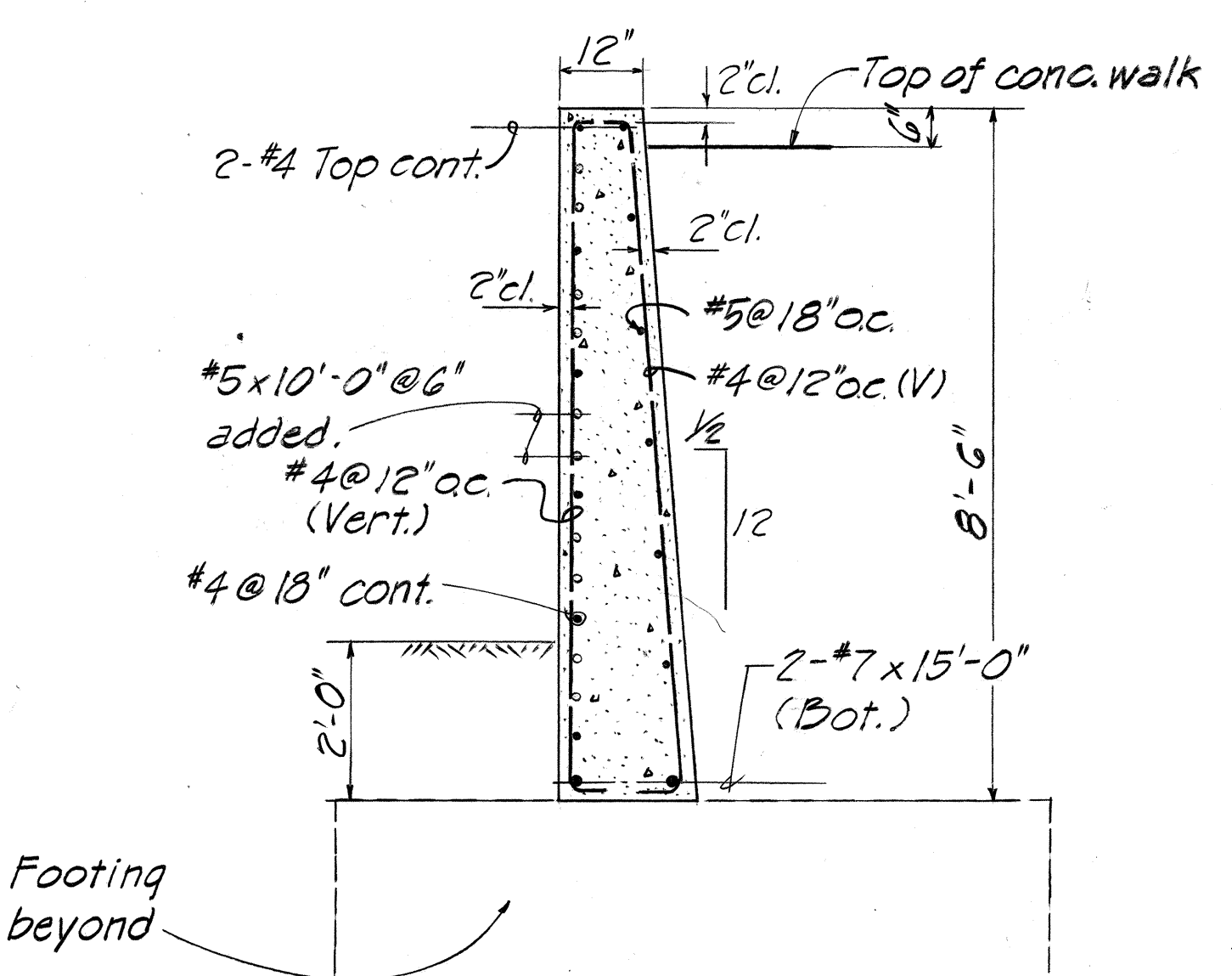
ELEVATION
 Scale: 3/8" = 1'-0"



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



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



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

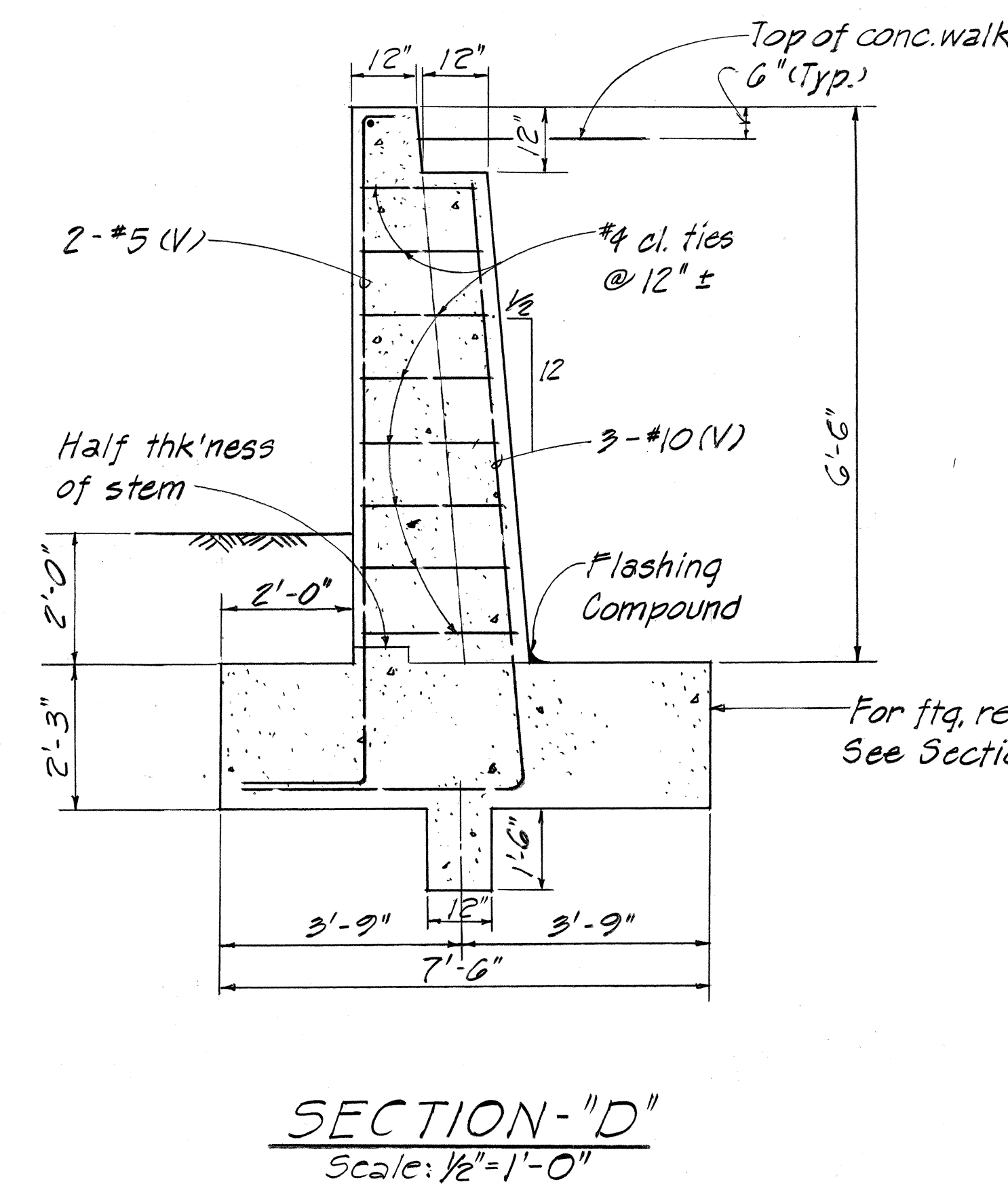
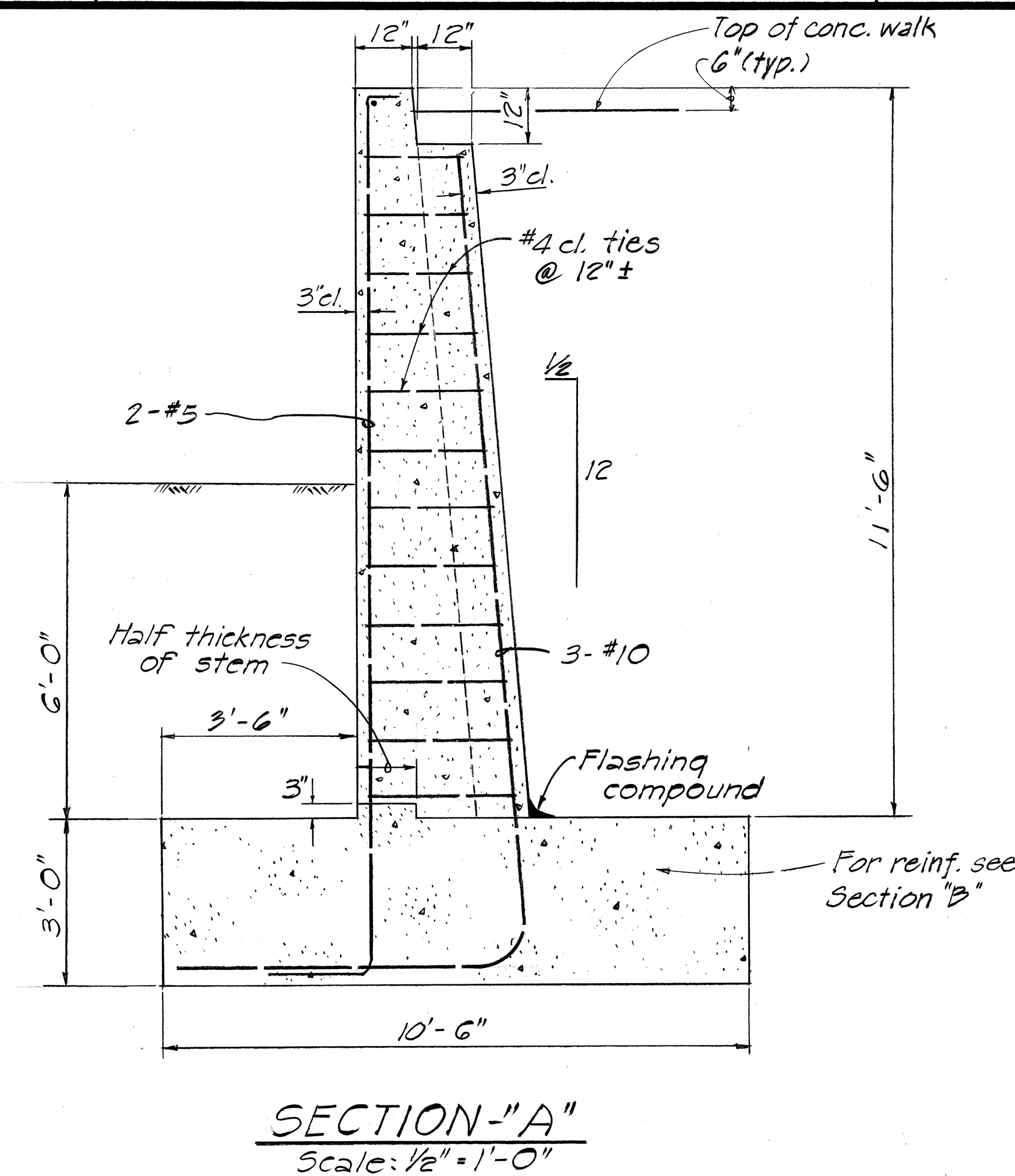
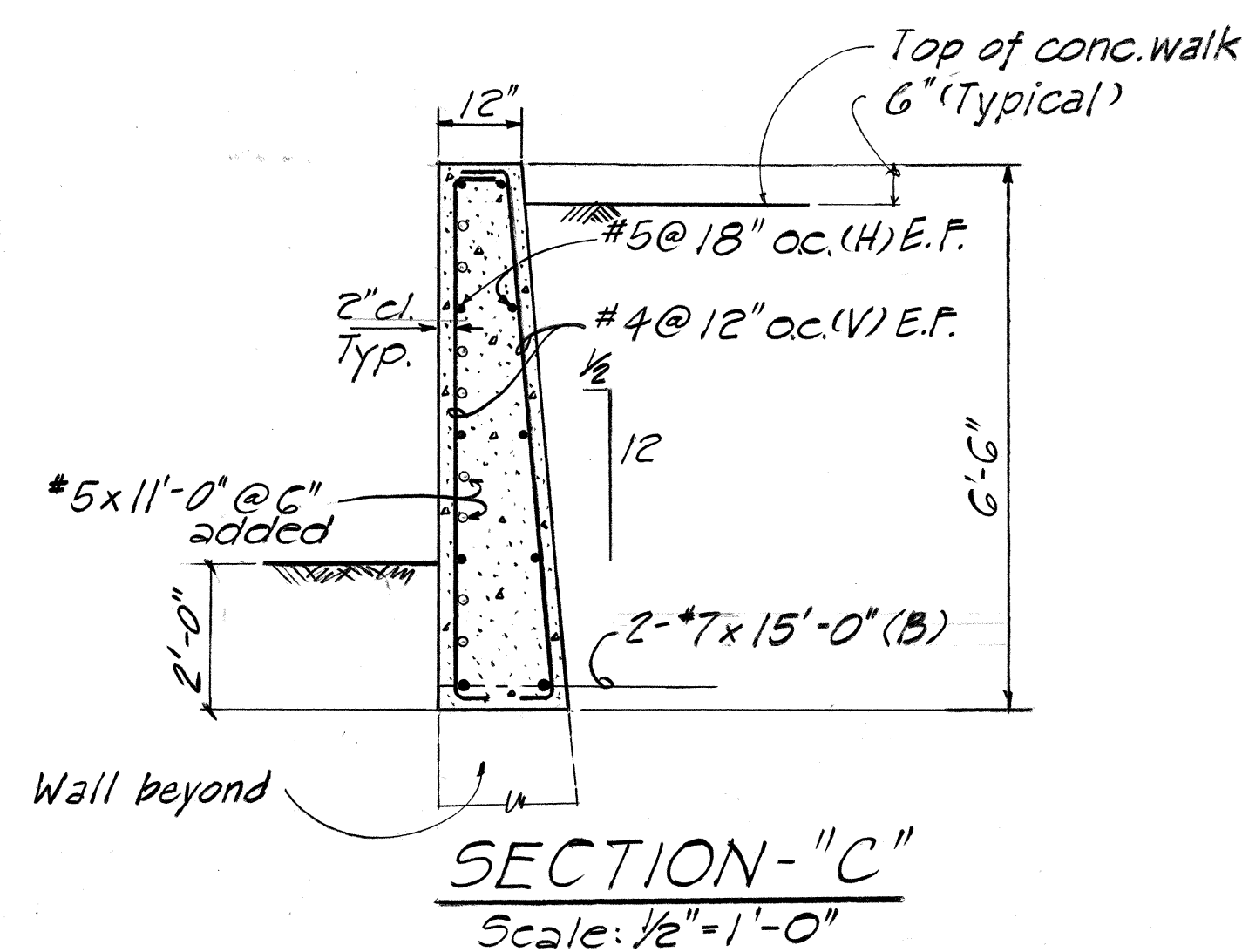
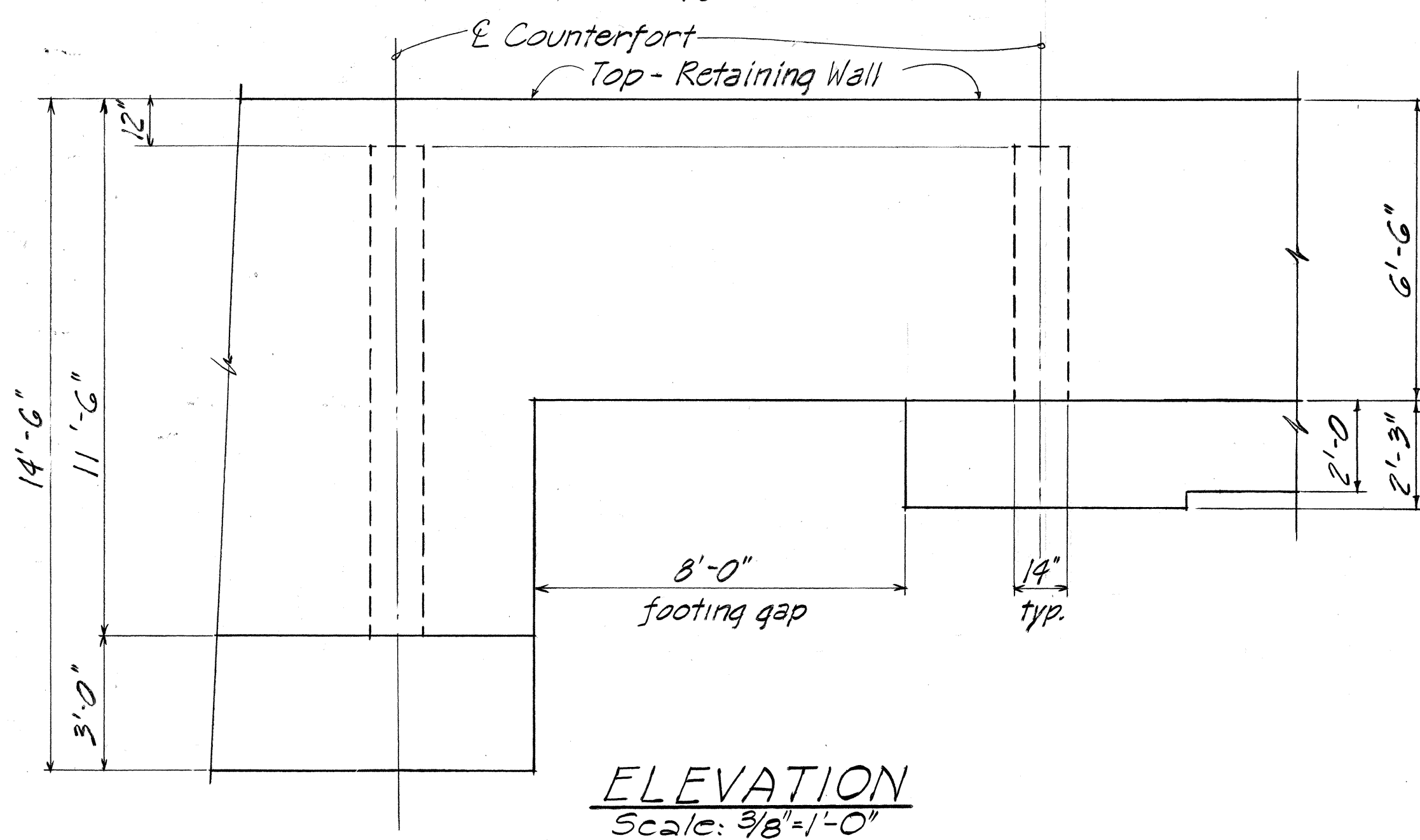
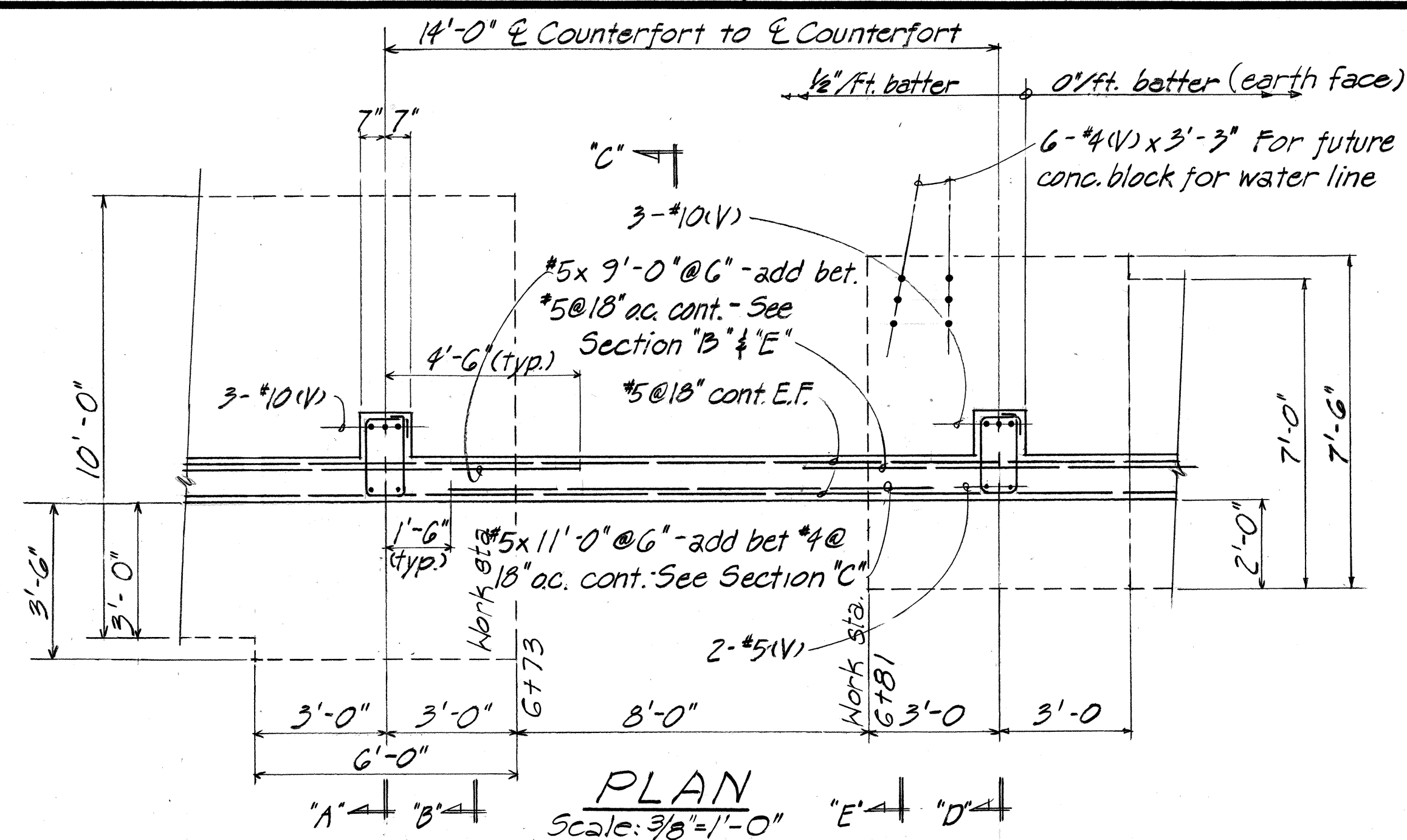
- NOTE:** Minimum concrete clear cover to reinf. shall be as follows:
1. Concrete cast against and permanently exposed to earth: 3"
 2. Concrete exposed to earth: 2"
 3. Concrete not in contact with ground: 2"
 4. Ties and stirrups: 1 1/2"

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
THOMAS C. H. LIM
 REGISTERED PROFESSIONAL ENGINEER
 No. 1213-S
 HAWAII, U.S.A.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
RETAINING WALL DETAILS
WALL STA. 0+39 TO STA. 0+46
 LIKELIKE HIGHWAY IMPROVEMENTS
 (VICINITY OF KULA KOLEA DRIVE TO KAM IV ROAD)
 PROJECT NO. F-063-1(16)

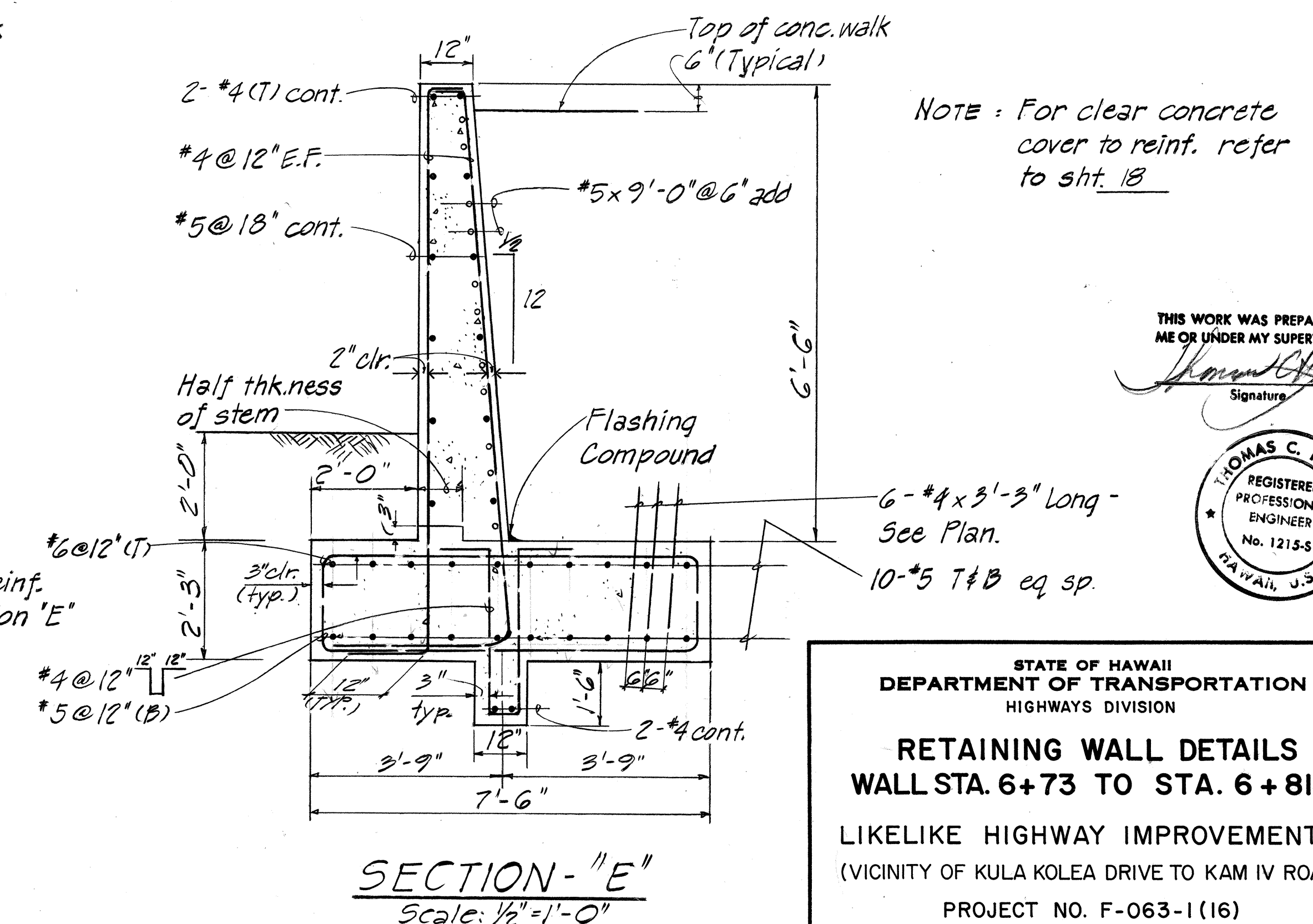
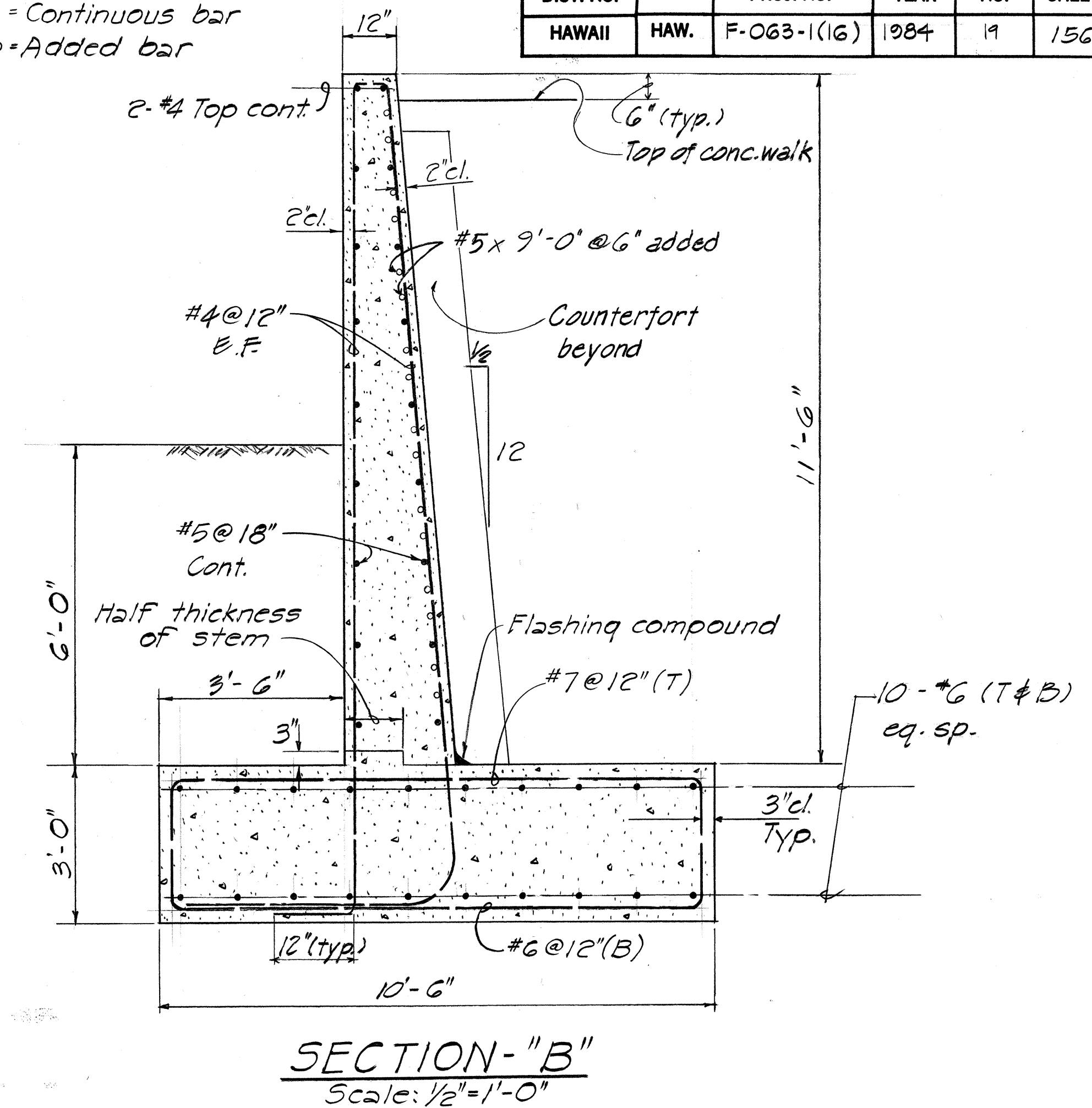
DATE	_____
SURVEY PLOTTED BY	_____
DRAWN BY	_____
DESIGNED BY	_____
QUANTITIES BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
No.	_____

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1(16)	1984	19	156



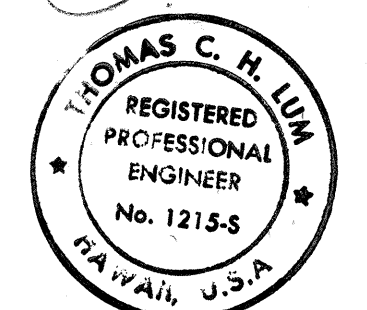
LEGEND

- = Continuous bar
- = Added bar

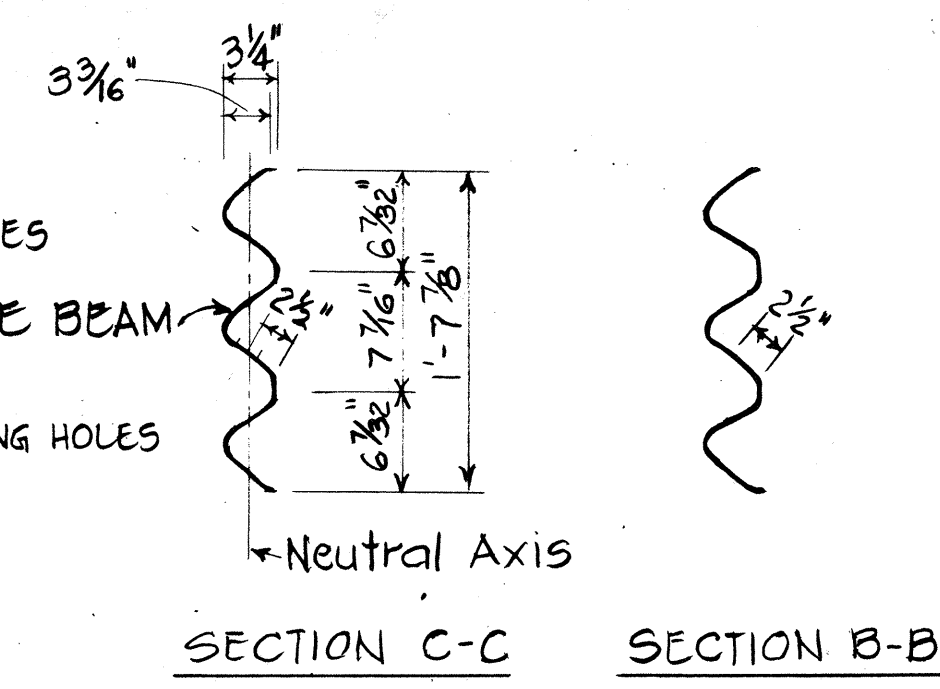
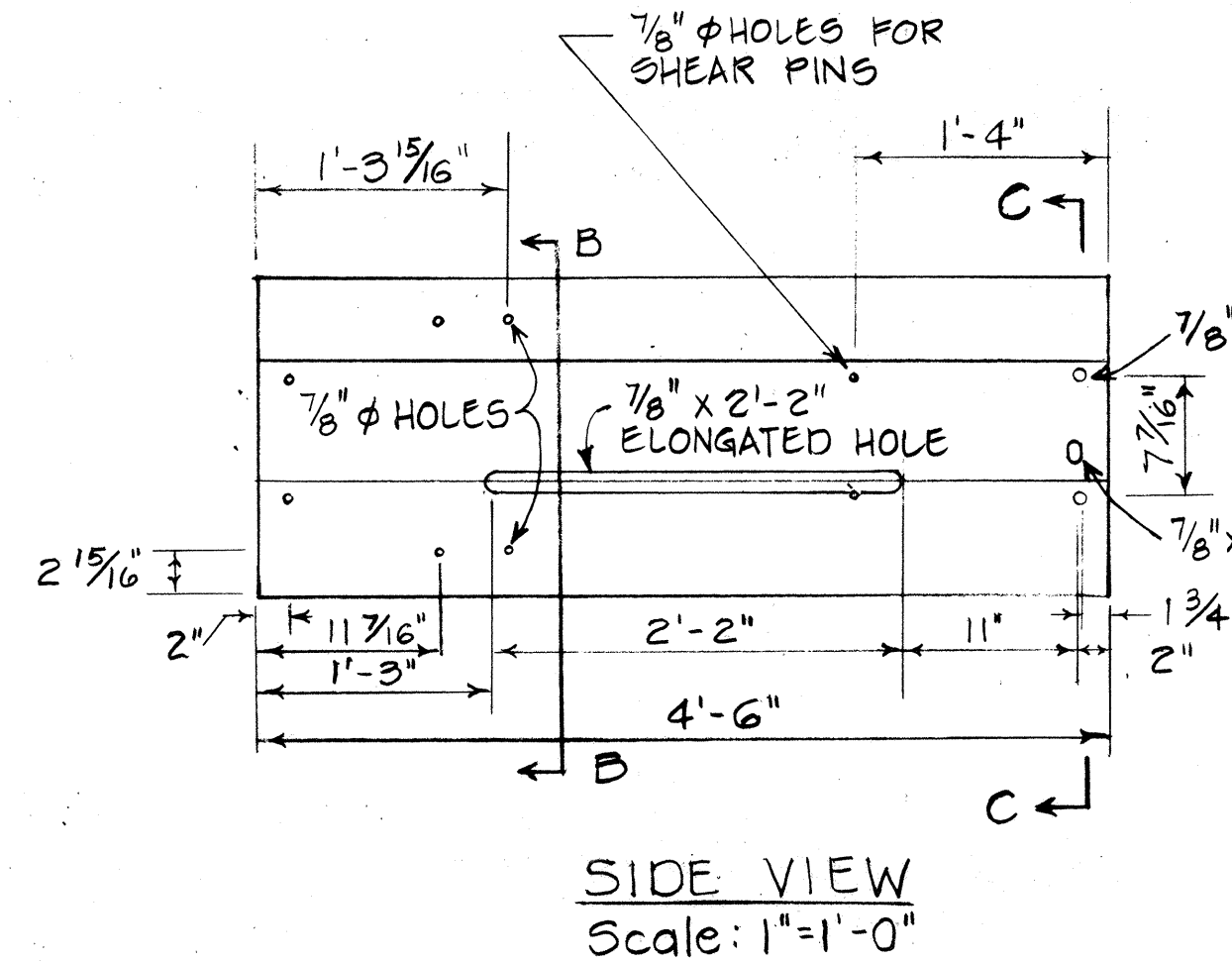
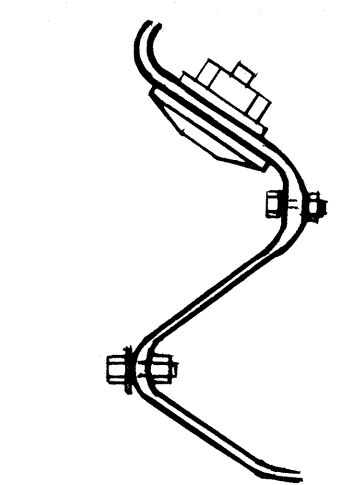
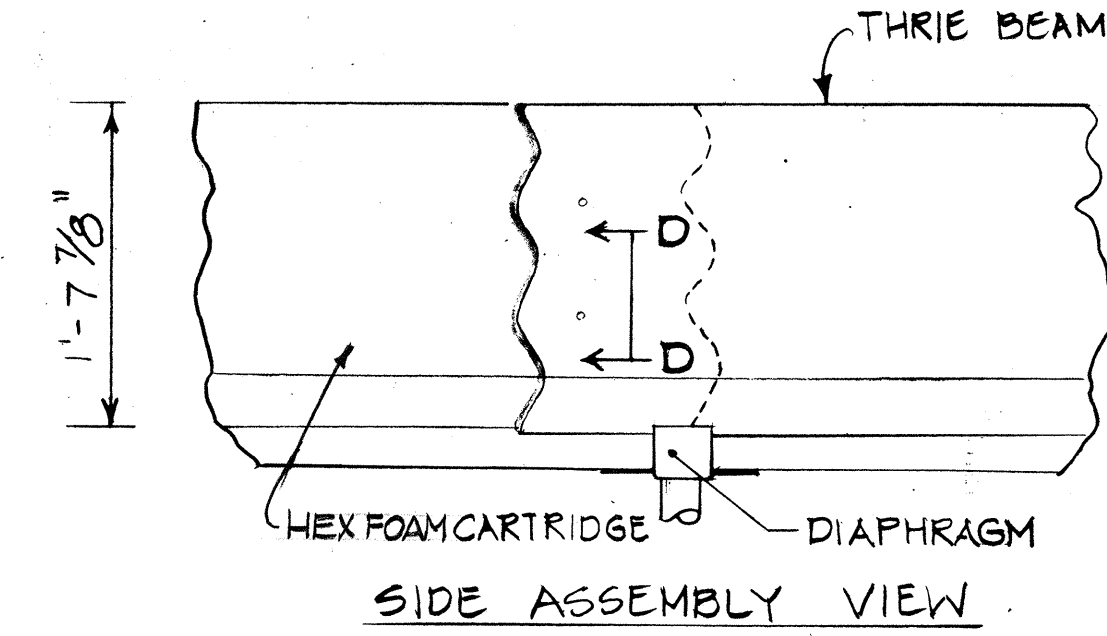
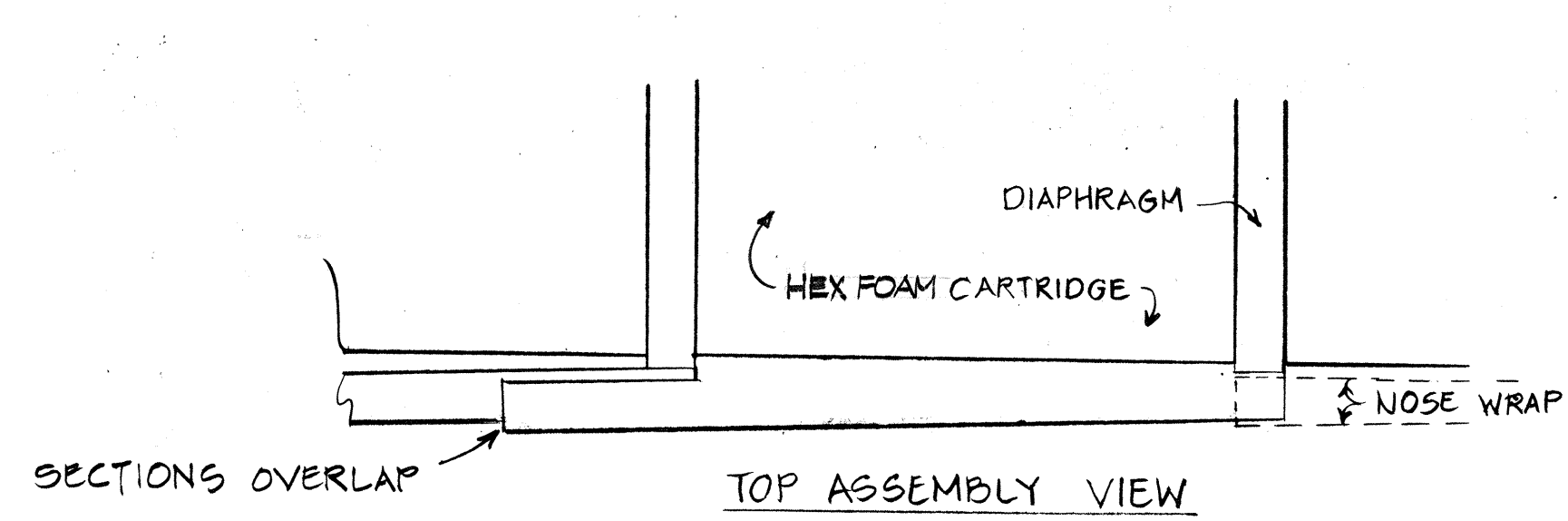
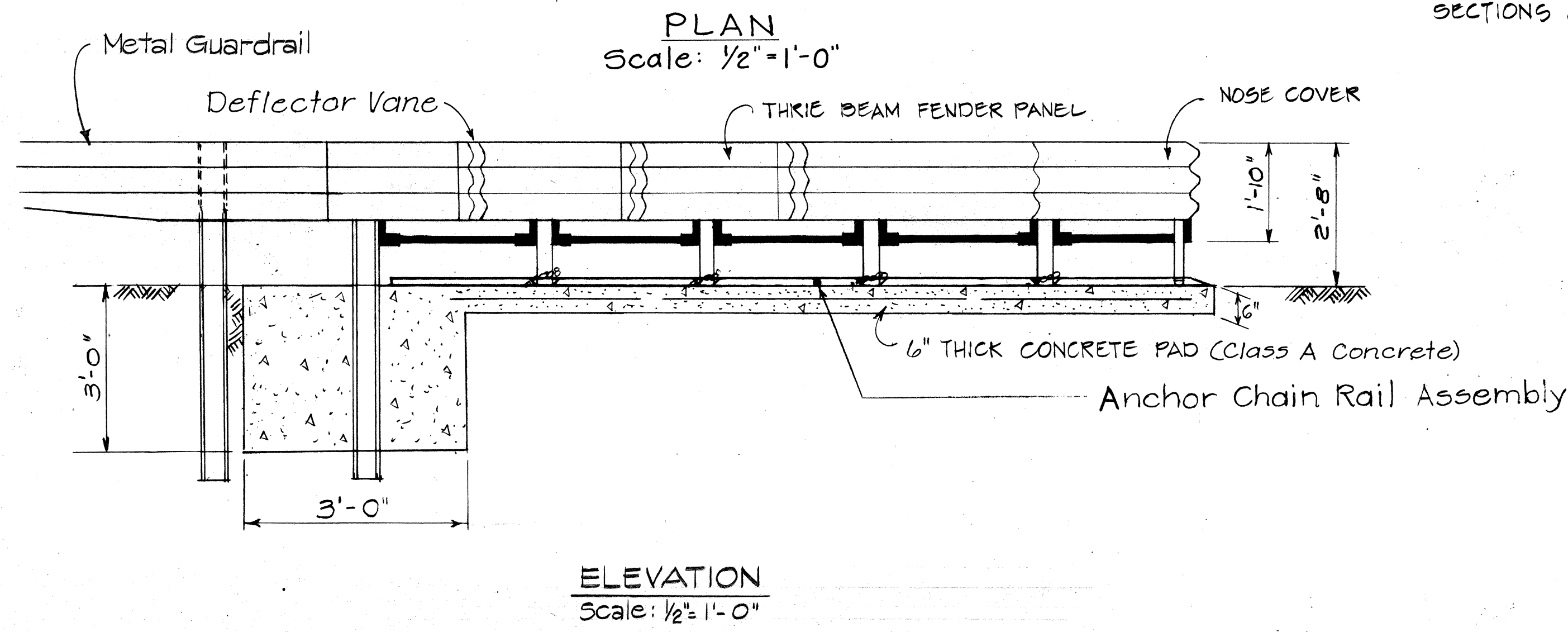
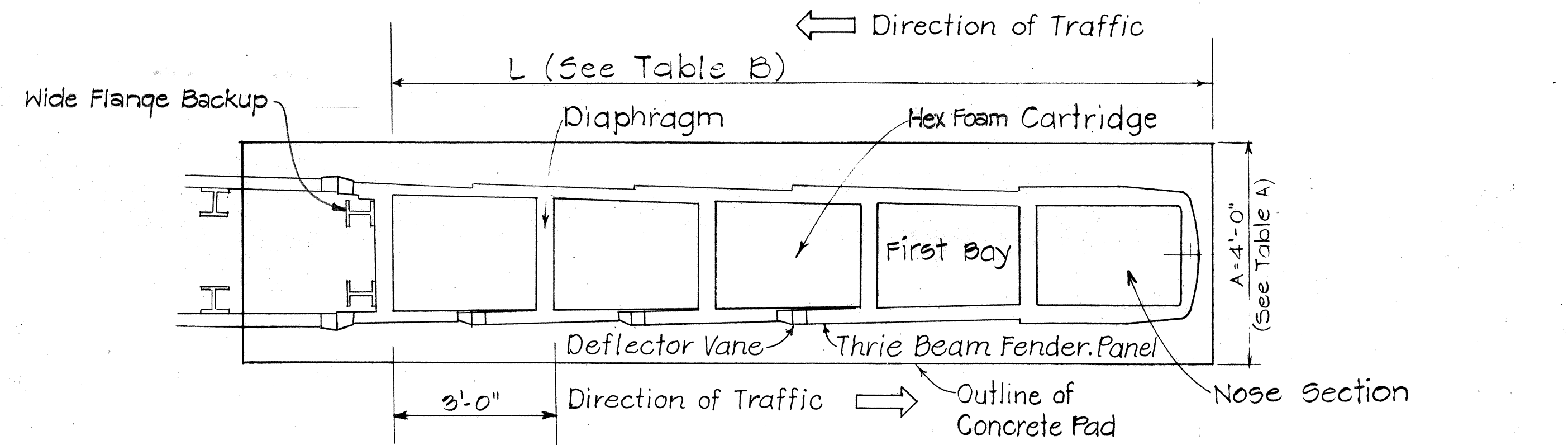


NOTE: For clear concrete cover to reinf. refer to sht. 18

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
RETAINING WALL DETAILS
WALL STA. 6+73 TO STA. 6+81
LIKELIKE HIGHWAY IMPROVEMENTS
(VICINITY OF KULA KOLEA DRIVE TO KAM IV ROAD)
PROJECT NO. F-063-1(16)
SHEET NO. 3 OF 3 SHEETS



- NOTE:
1. The Contractor shall verify with the manufacturer, any amendments or revisions thereof as may be made from time to time, shall be used in this project.
 2. Constant longitudinal and transverse slope throughout Concrete Pad.
 3. Concrete Pad cross slope shall not exceed 3%.
 4. Outline of concrete pad shall match grades with surrounding median area.

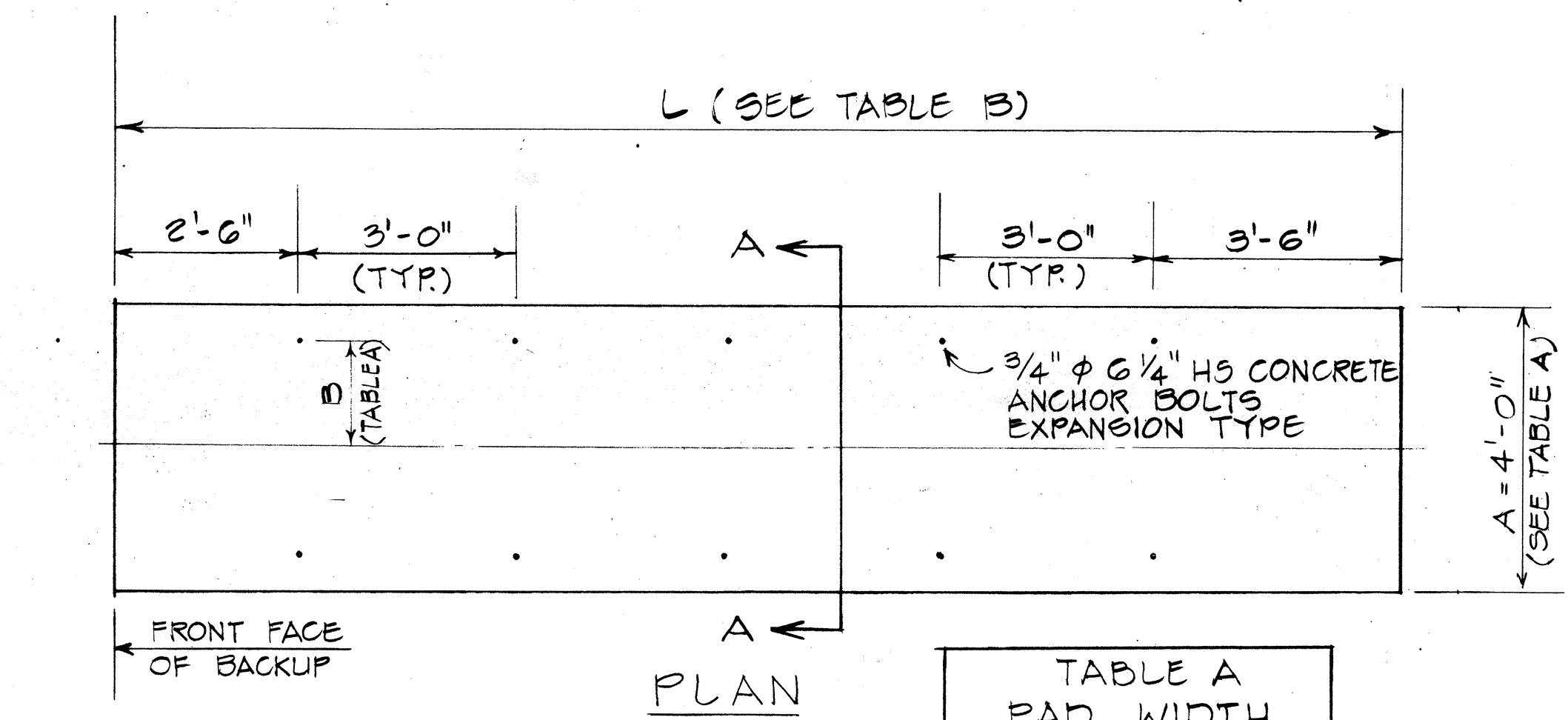
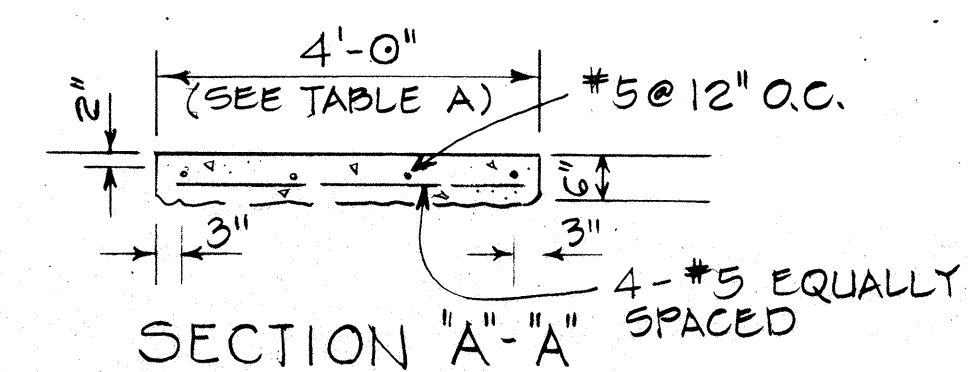
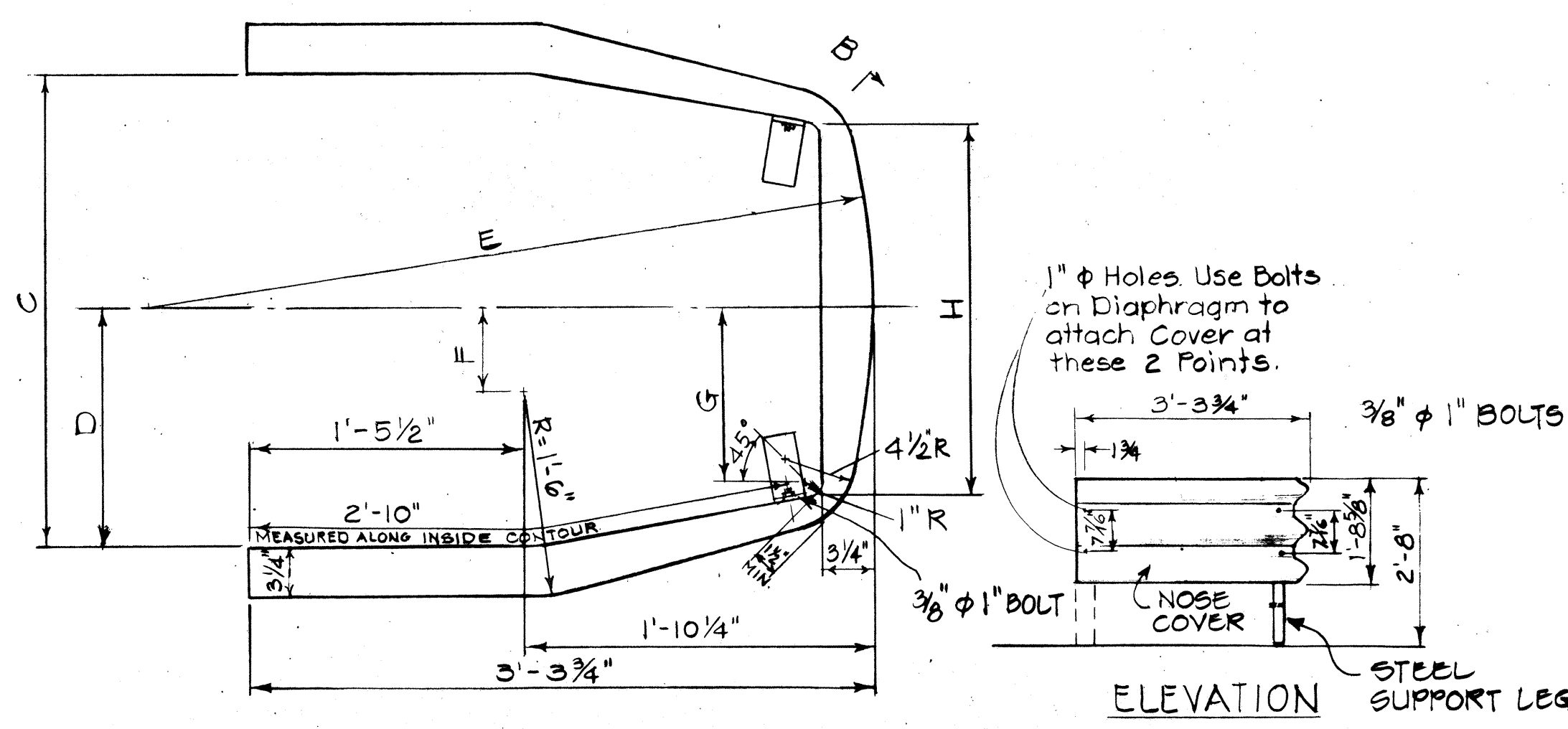


TABLE A PAD WIDTH		
MODEL NO.	A	B
200200	4'-0"	1'-0"
206206	4'-0"	1'-3"
300300	4'-0"	1'-6"

TABLE B PAD LENGTH		
NO. OF BAYS	L	ANCHOR BOLTS QUAN.
4	15'-6"	14
5	18'-6"	16
6	21'-6"	20
7	24'-6"	22
8	27'-6"	24
9	30'-6"	26
10	33'-6"	30
3	12'-6"	12

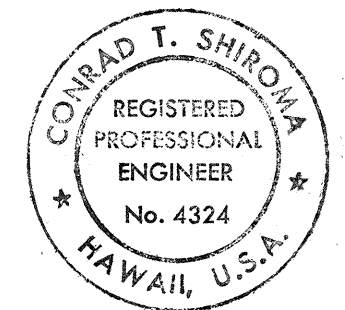


CONCRETE PAD DETAILS
Scale: 1/2" = 1'-0"



PLAN
N.T.S.

TABLE C							
UNIT SIZE	ASST. NO.	C	D	E	F	G	H
2'-0"	35-02-031	2'-0"	1'-0"	2'-1 3/8"	3 1/4"	8"	1'-6"
2'-6"	35-02-032	2'-6"	1'-3"	3'-10"	6 1/4"	11"	2'-0"
3'-0"	35-02-032	2'-6"	1'-3"	3'-10"	6 1/4"	11"	2'-0"



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Conrad T. Shiroma
Signature

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

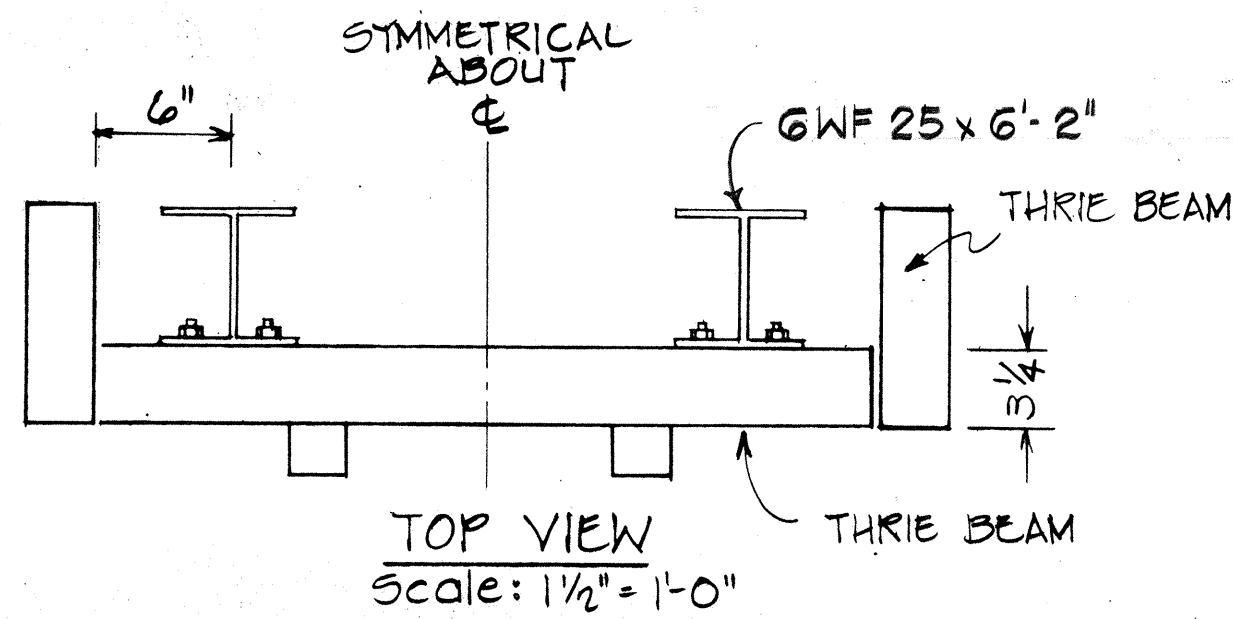
**DETAILS OF GUARD RAIL
ENERGY ABSORBING TERMINAL**

LIKELIKE HIGHWAY IMPROVEMENTS
(VICINITY OF KULA KOLEA DRIVE TO KAM IV ROAD)

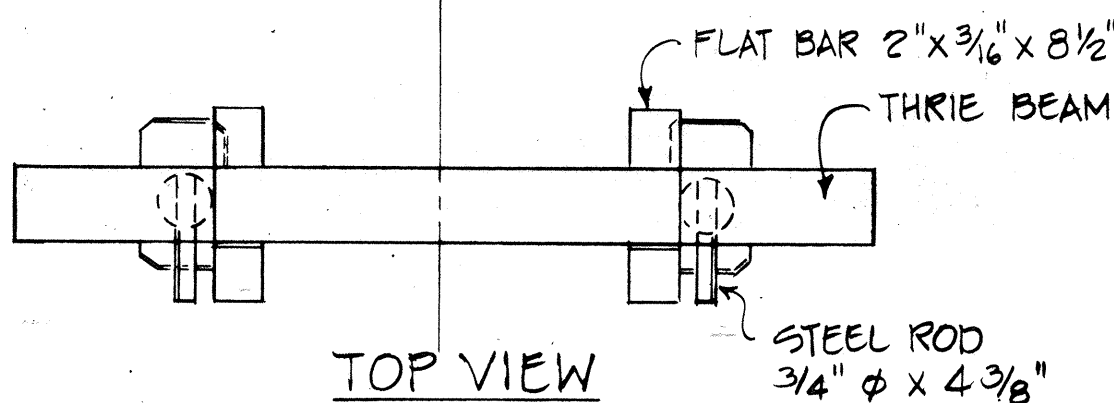
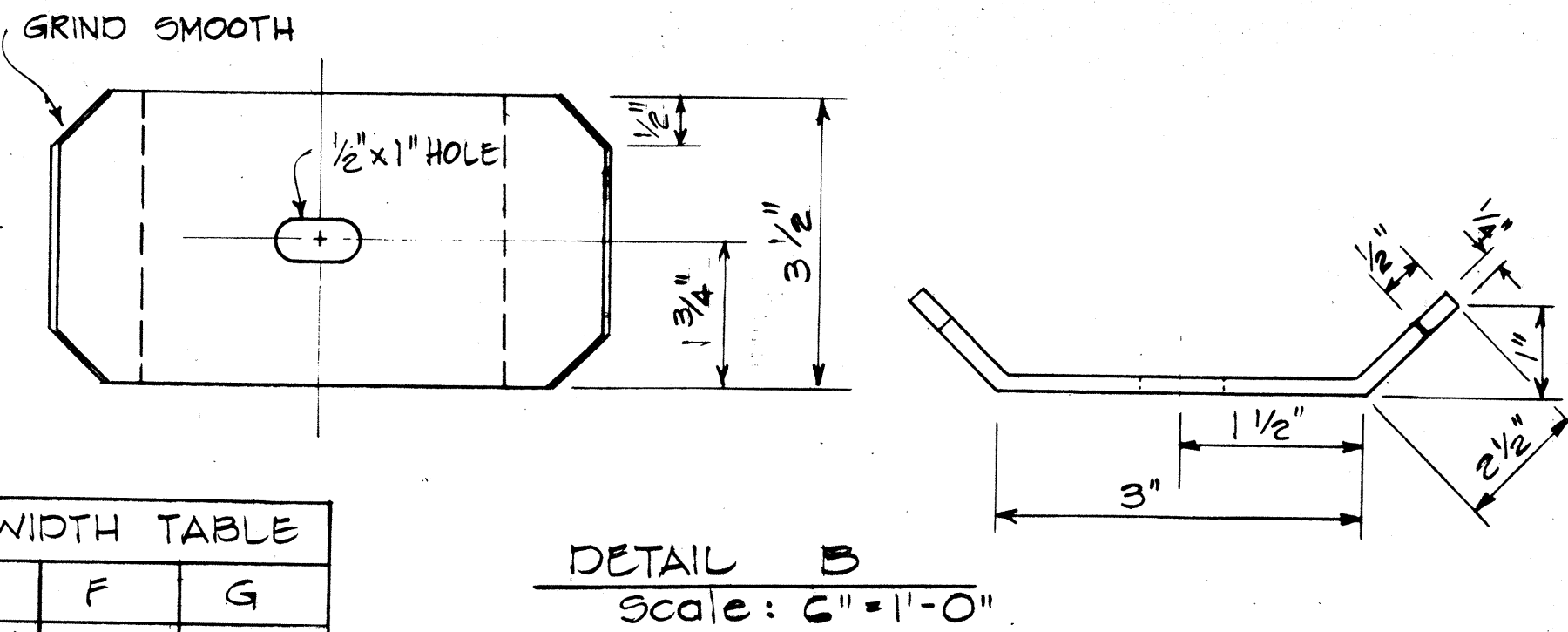
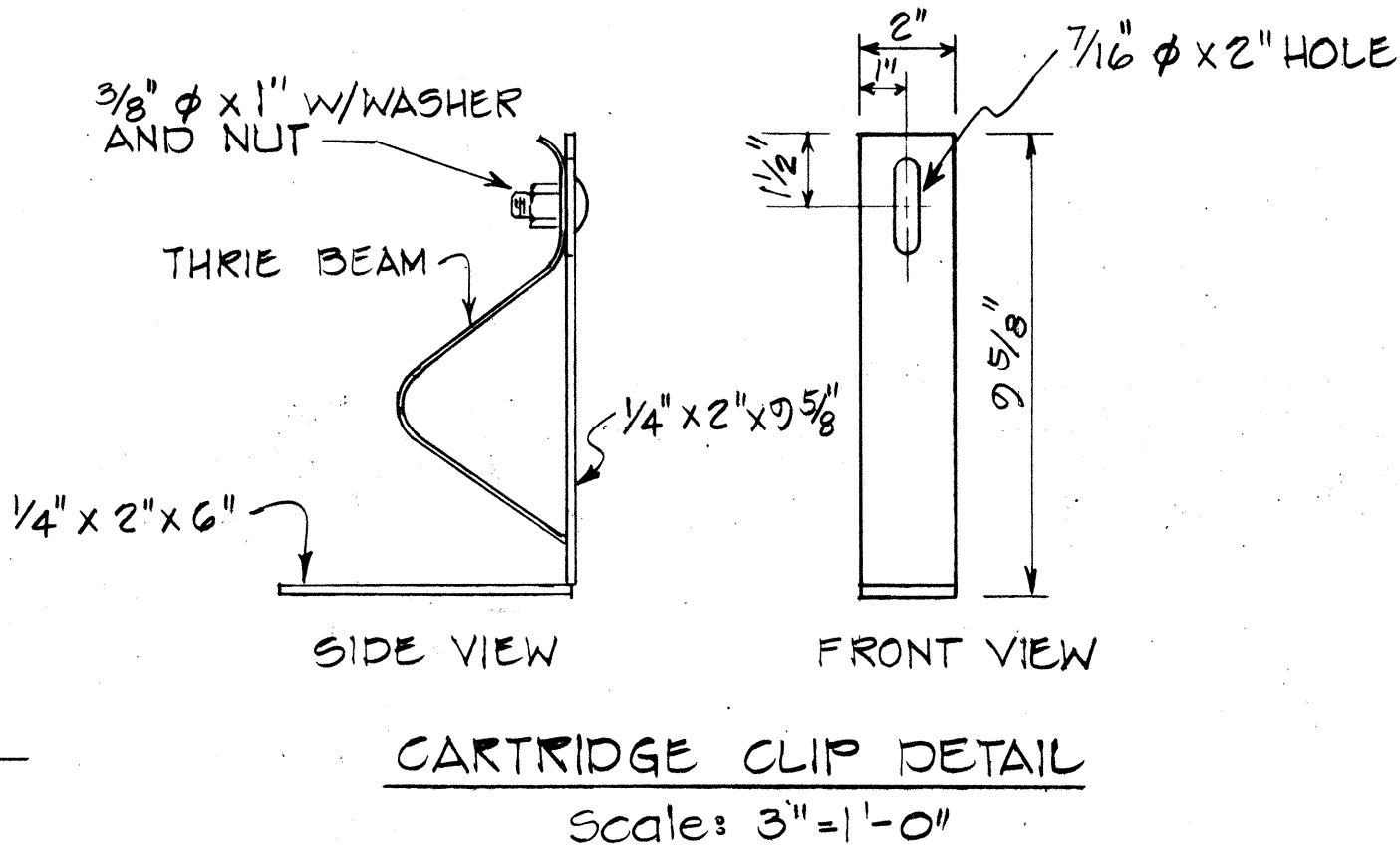
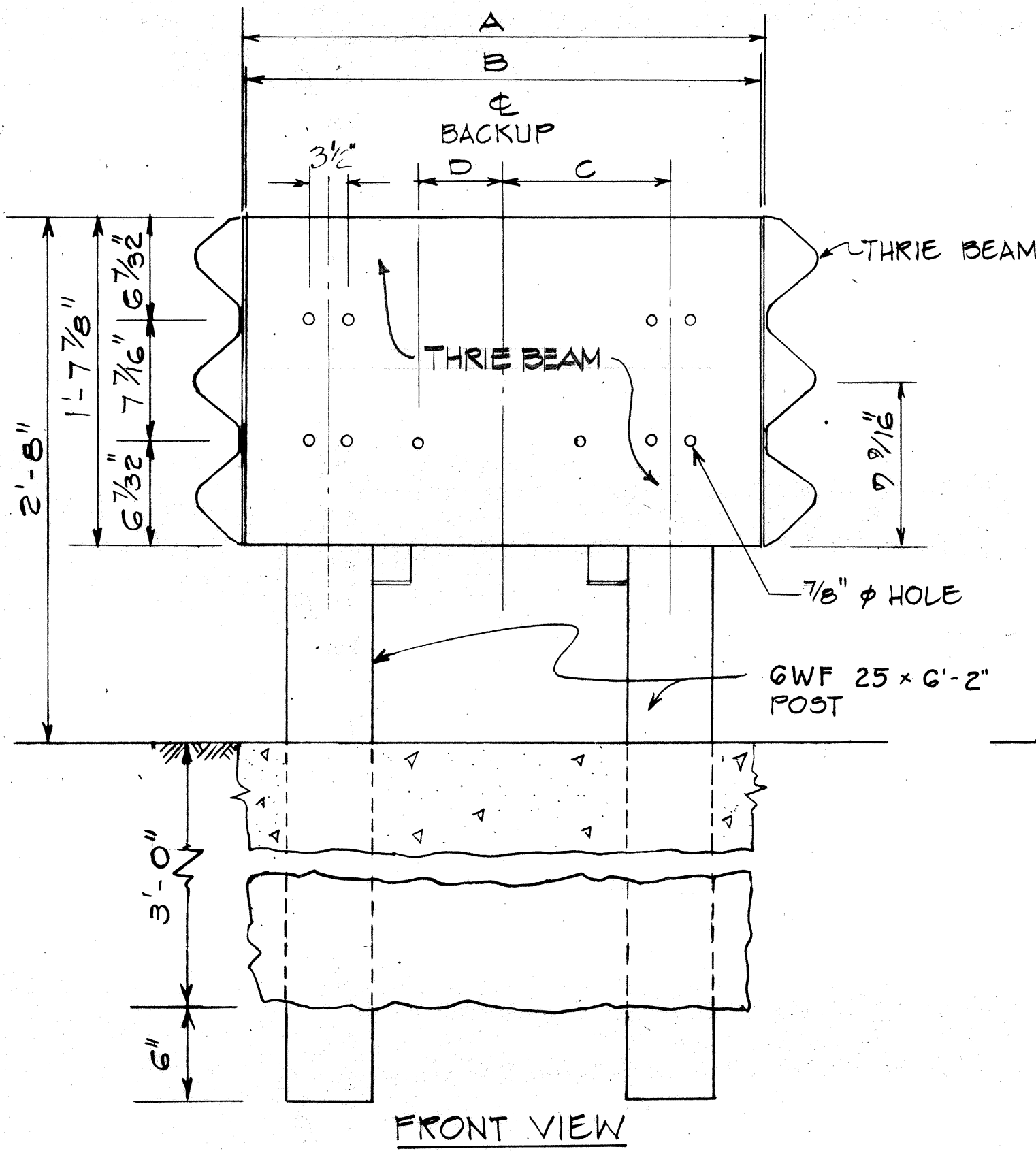
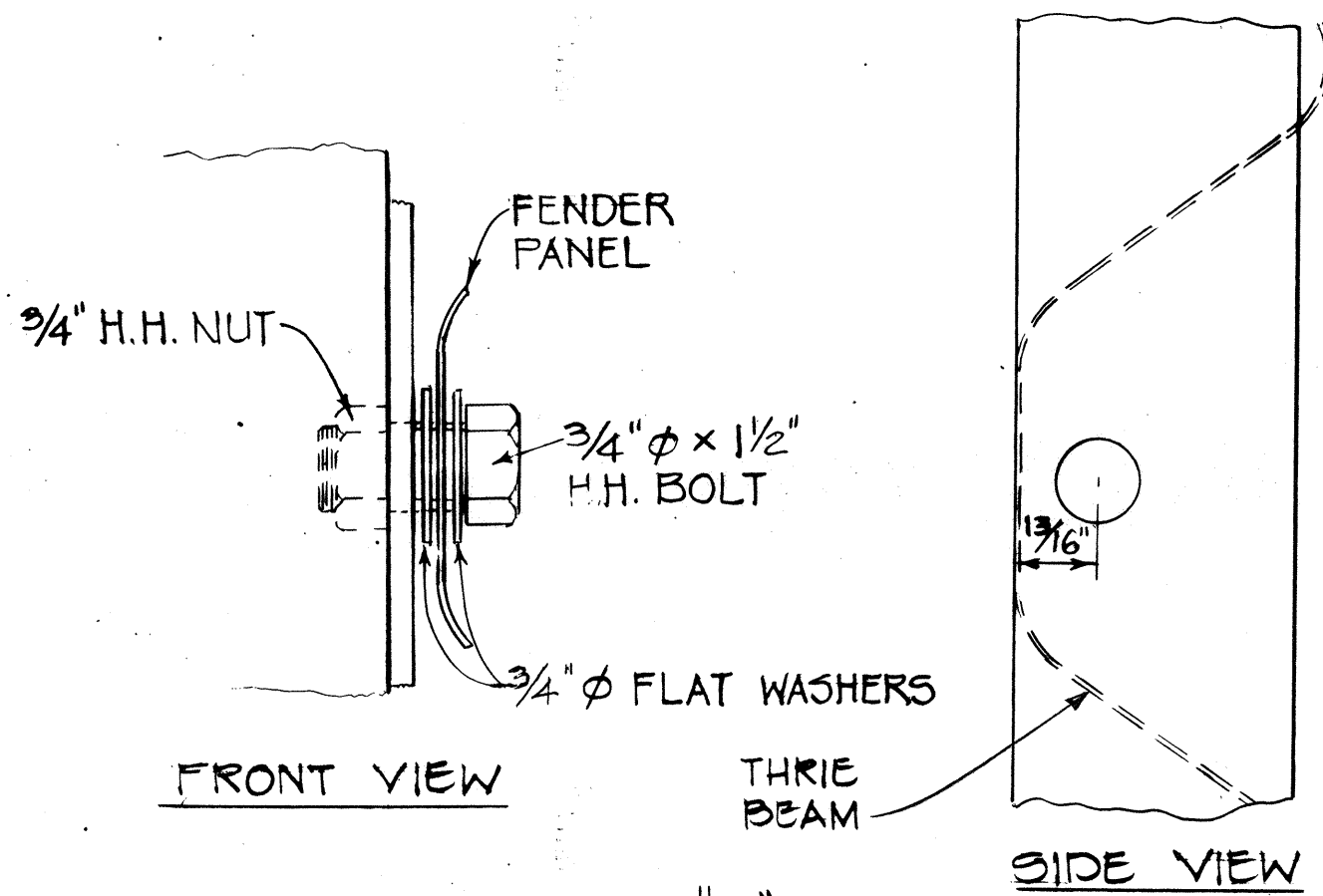
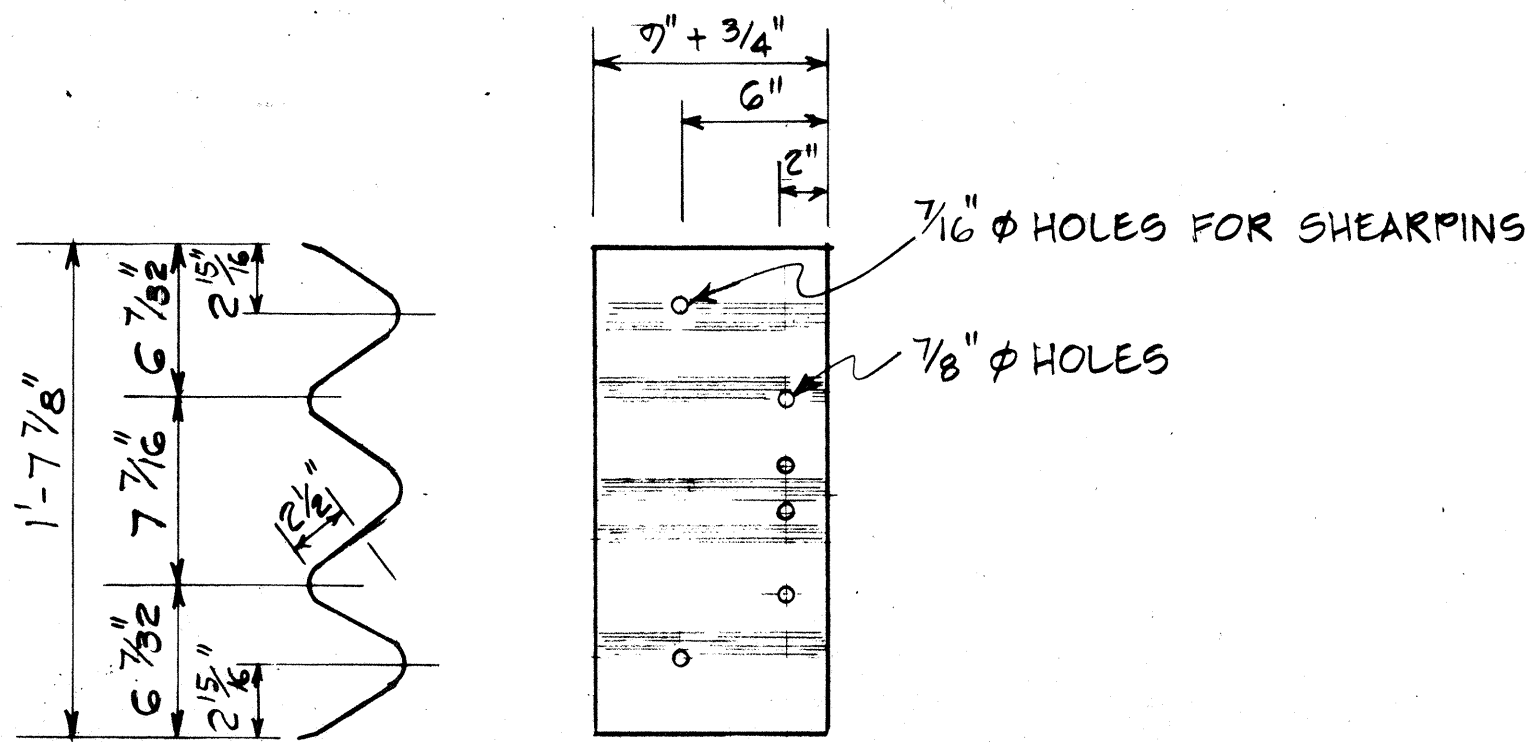
PROJECT NO. F-063-1 (16)
Scale: As Shown Date: 1978

SHEET NO. OF SHEETS

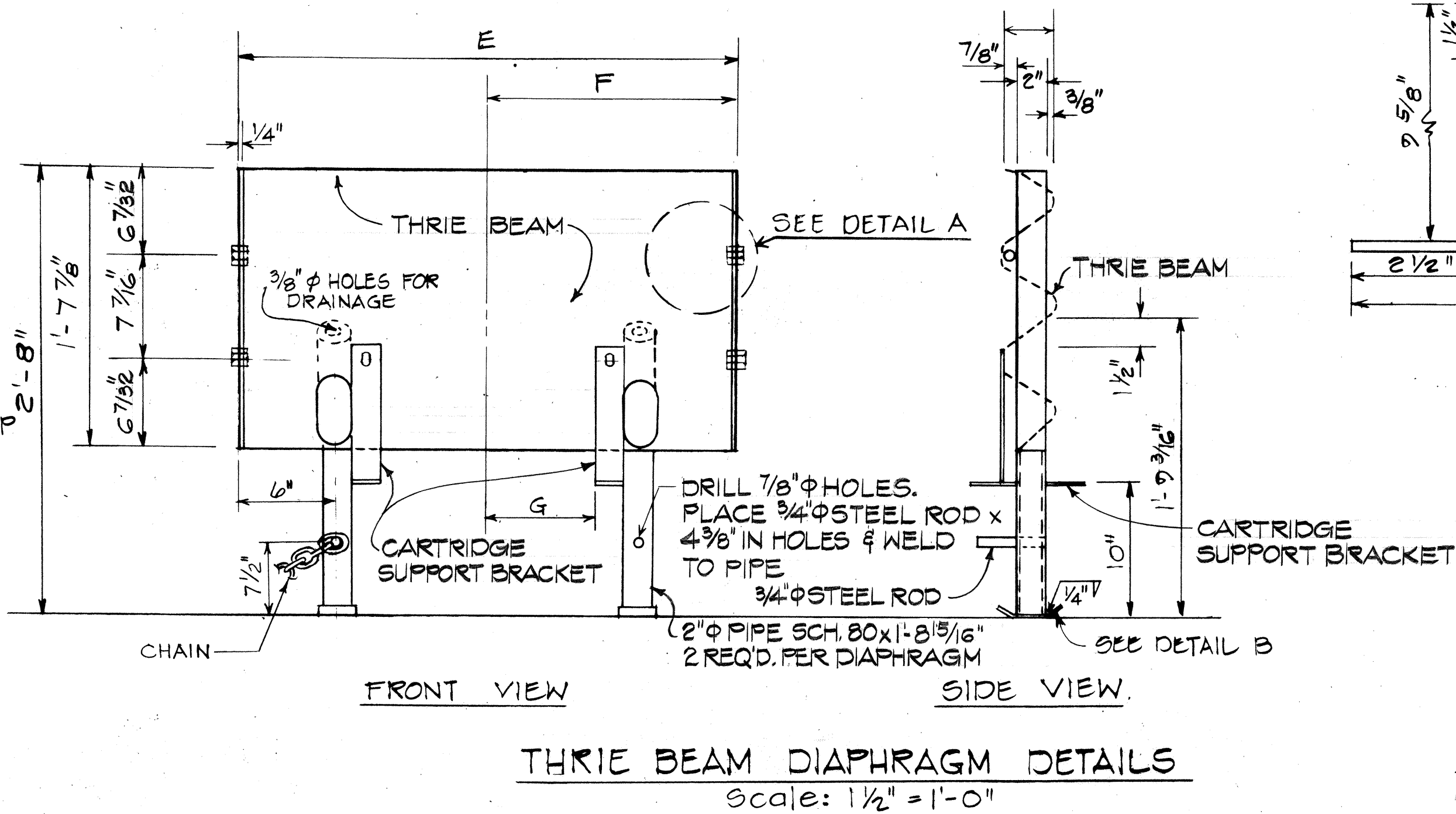
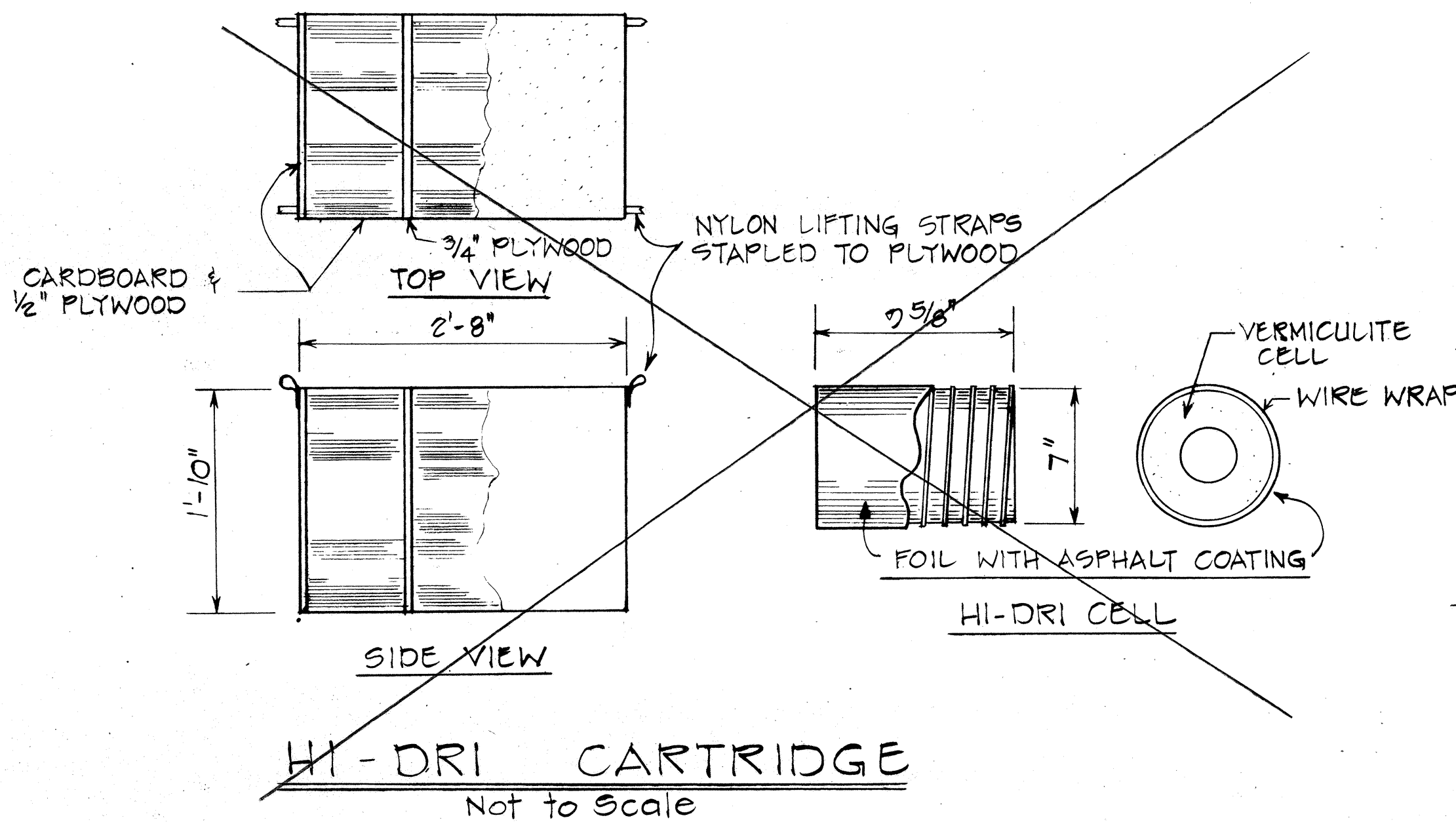
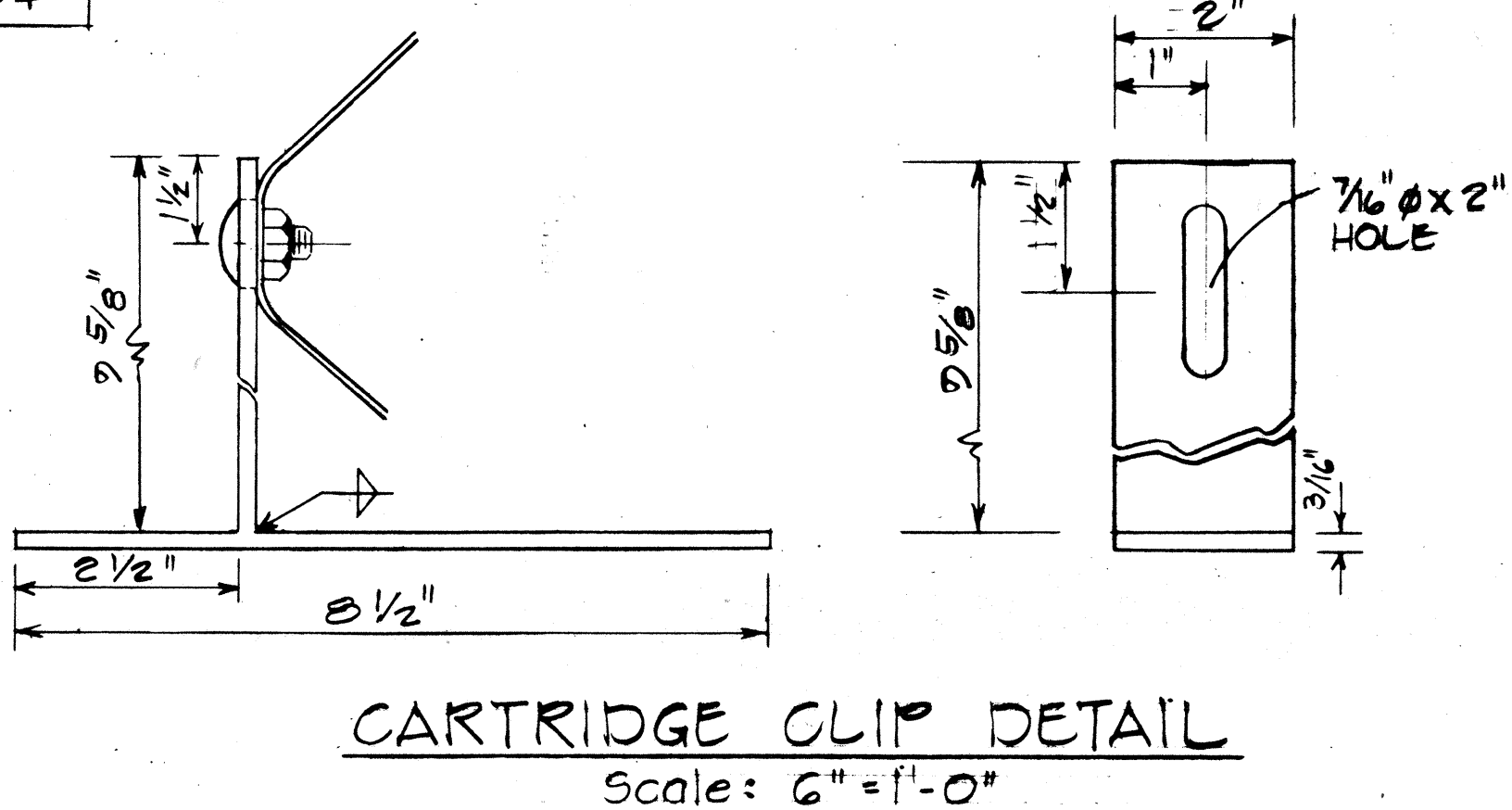
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1(16)	1984	21	156



BACKUP WIDTH TABLE				
UNIT WIDTH	A	B	C	D
2'-0"	2'-0"	1'-11 1/2"	0'-6"	2"
2'-6"	2'-6"	2'-5 1/2"	0'-9"	5"
3'-0"	3'-0"	2'-11 1/2"	1'-0"	8"



DIAPHRAGM WIDTH TABLE			
MODEL NO	E	F	G
200200 S	2'-0"	1'-0"	2 1/2"
206206 S	2'-6"	1'-8"	5 3/4"
300300 S	3'-0"	1'-6"	8 3/4"



CONRAD T. SHIROMA
REGISTERED PROFESSIONAL ENGINEER
No. 4324
HAWAII, U.S.A.

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Conrad T. Shiroma
Signature

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAILS OF GUARD RAIL
ENERGY ABSORBING TERMINAL

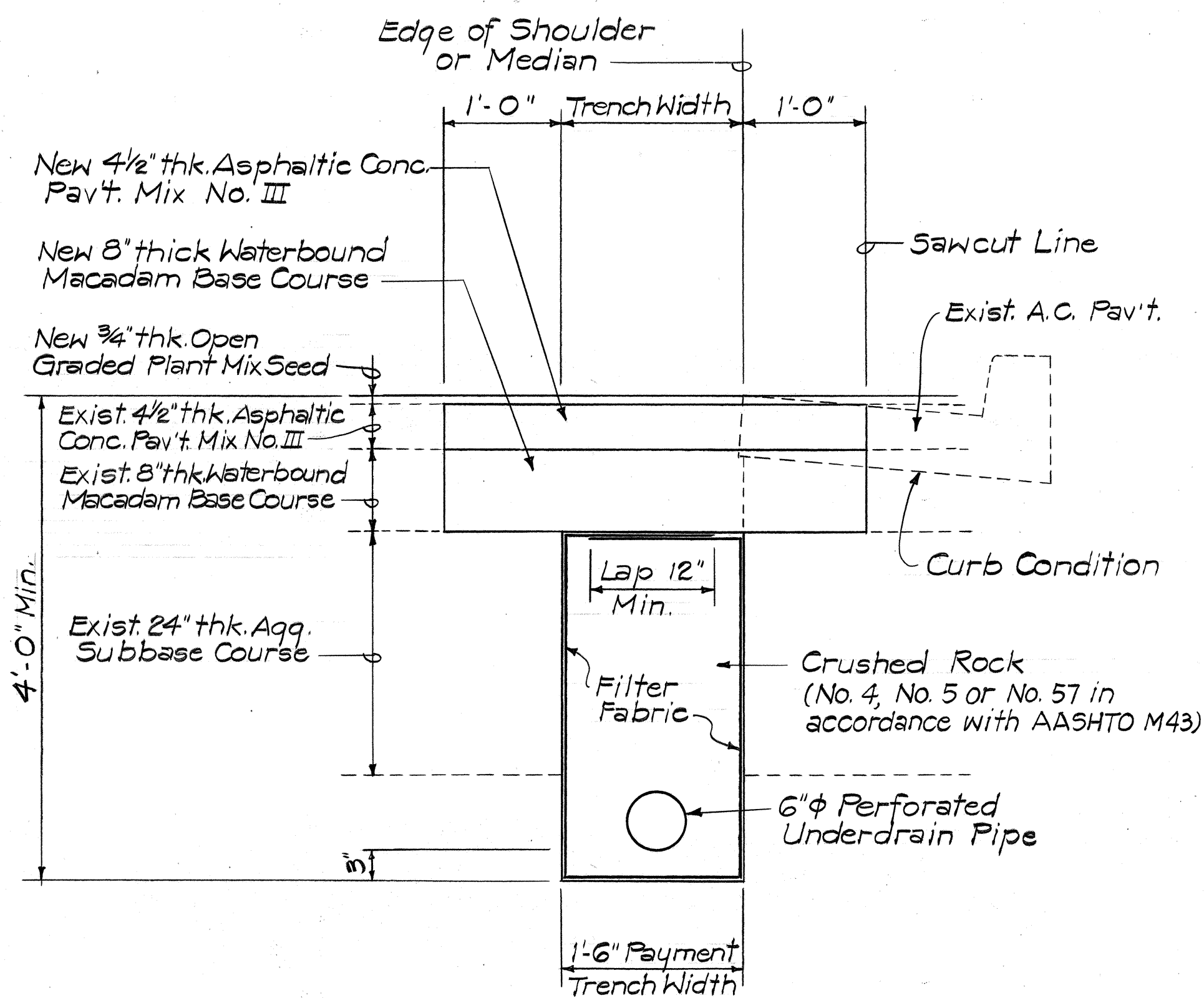
LIKELIKE HIGHWAY IMPROVEMENTS
(VICINITY OF KULA KOLEA DRIVE TO KAM IV ROAD)

PROJECT NO. F-063-1(16)
Scale: As Shown Date: 1978

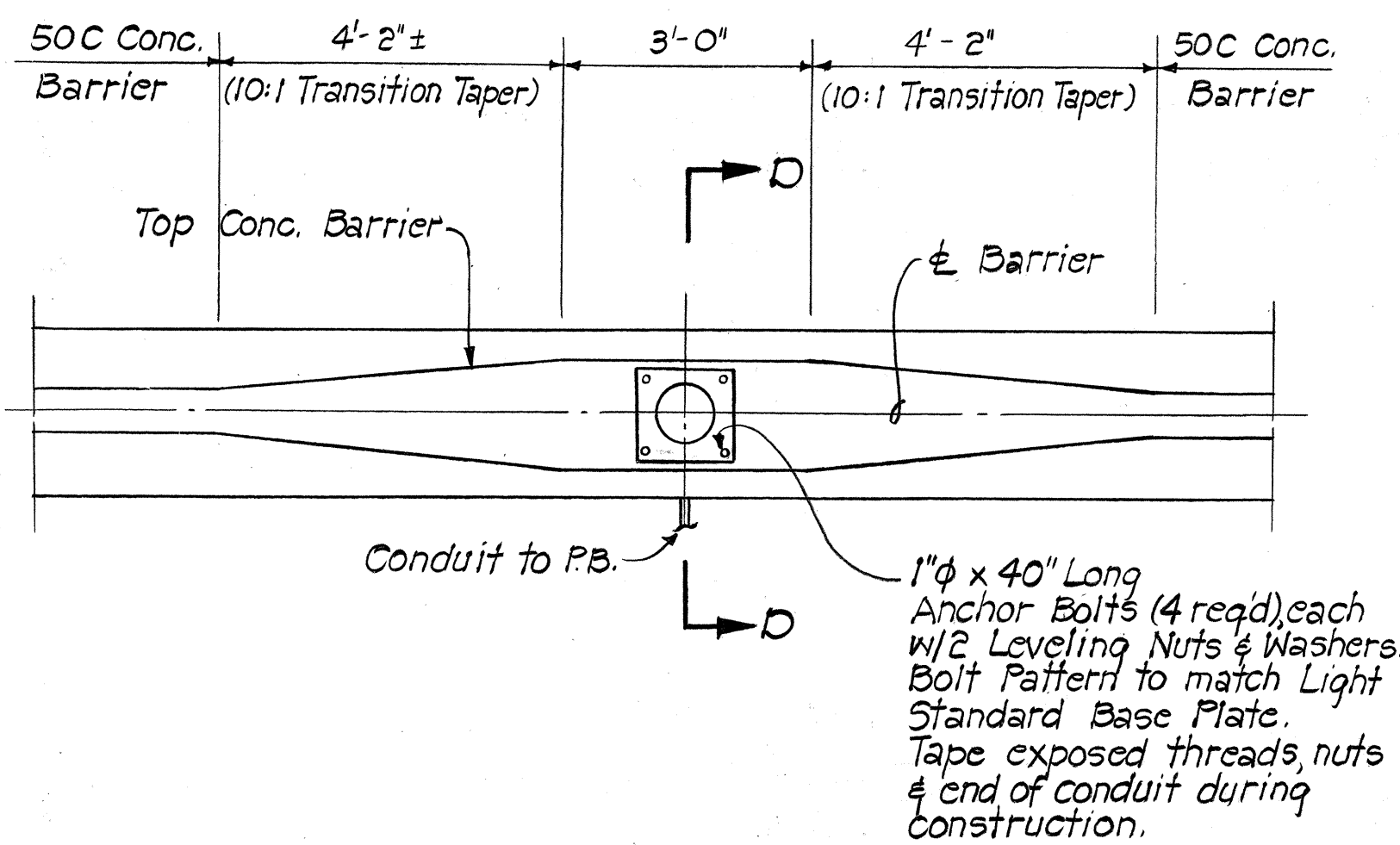
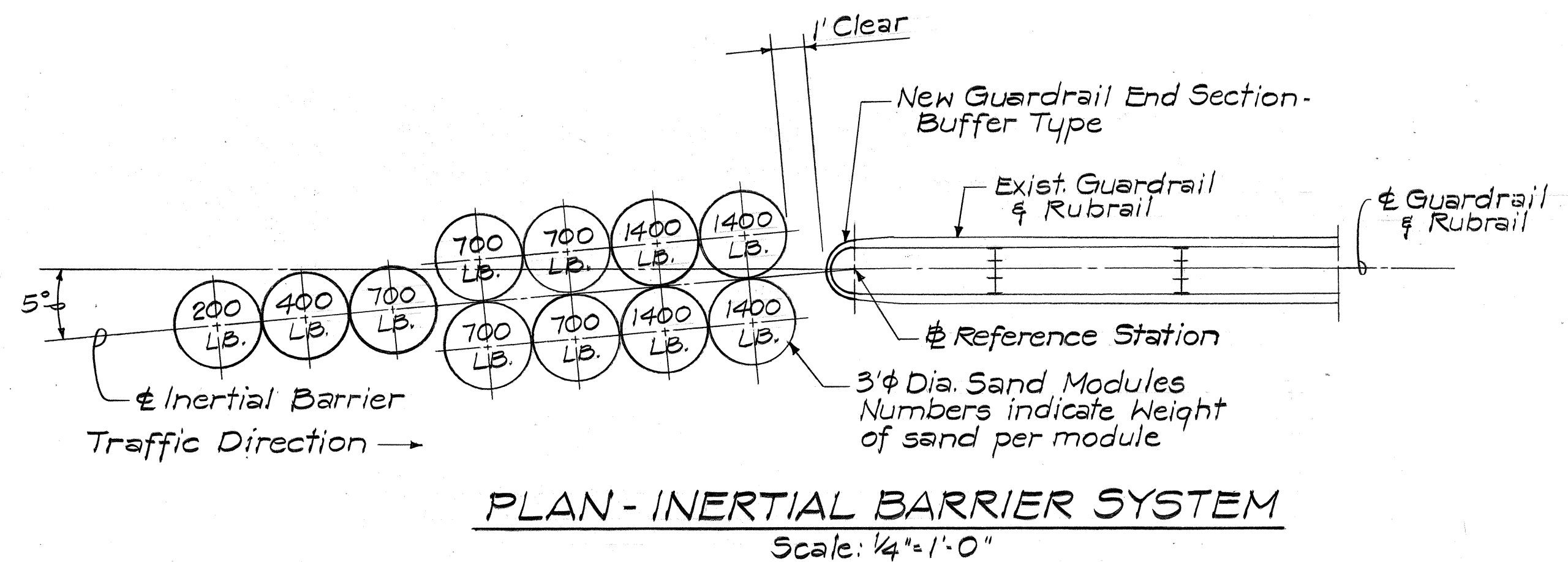
SHEET NO. OF SHEETS

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

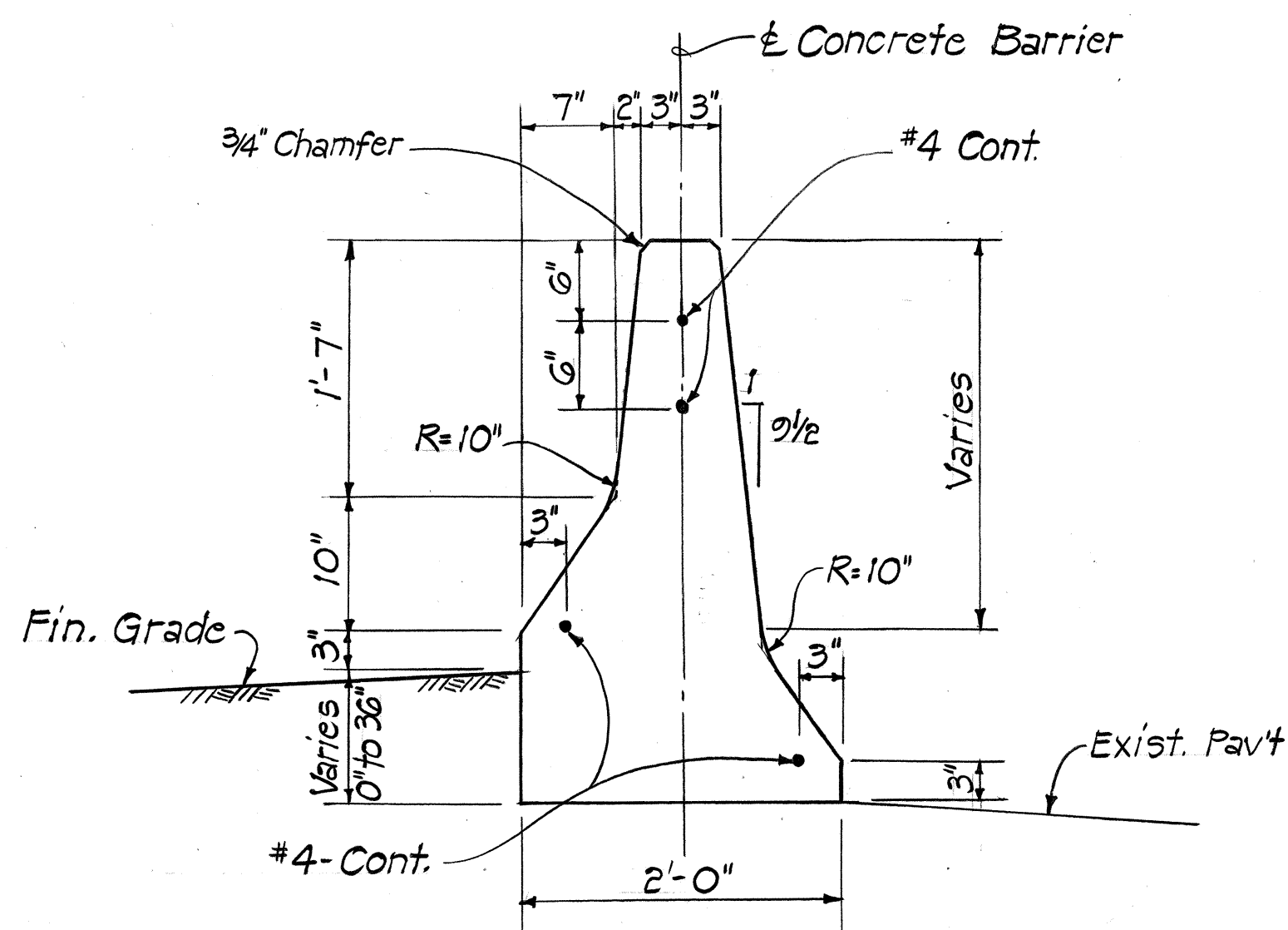
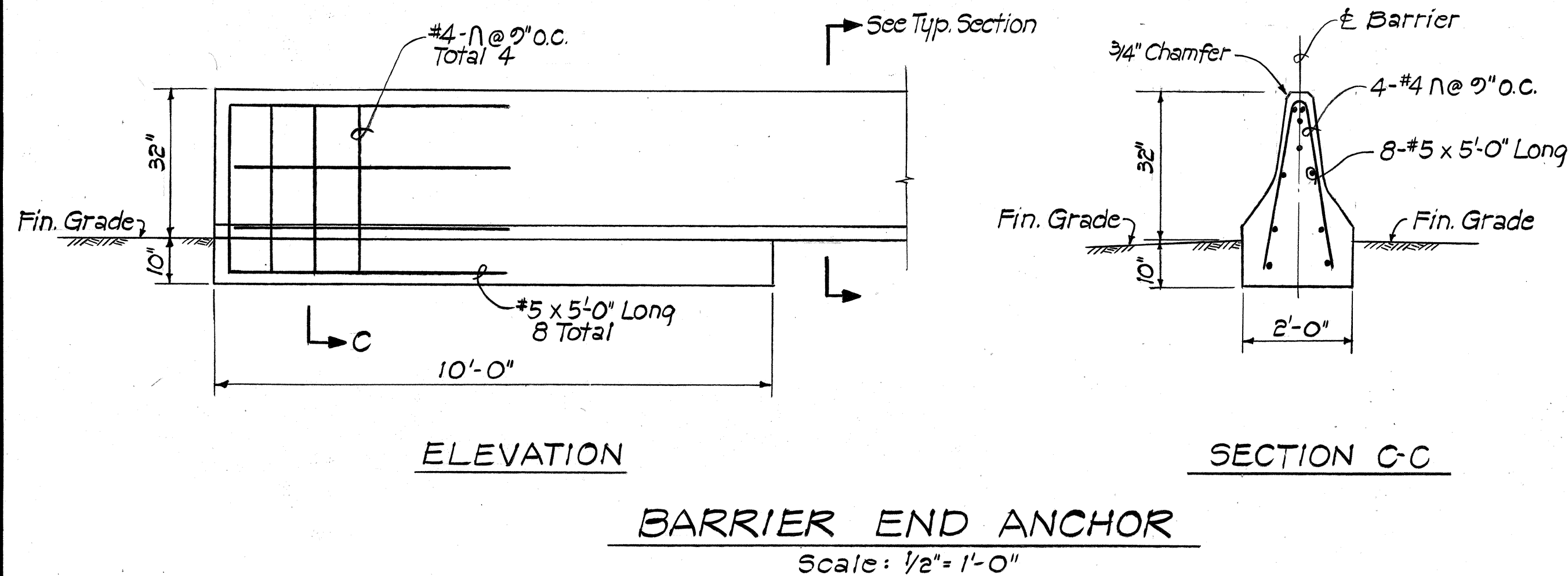
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1 (16)	1984	22	156



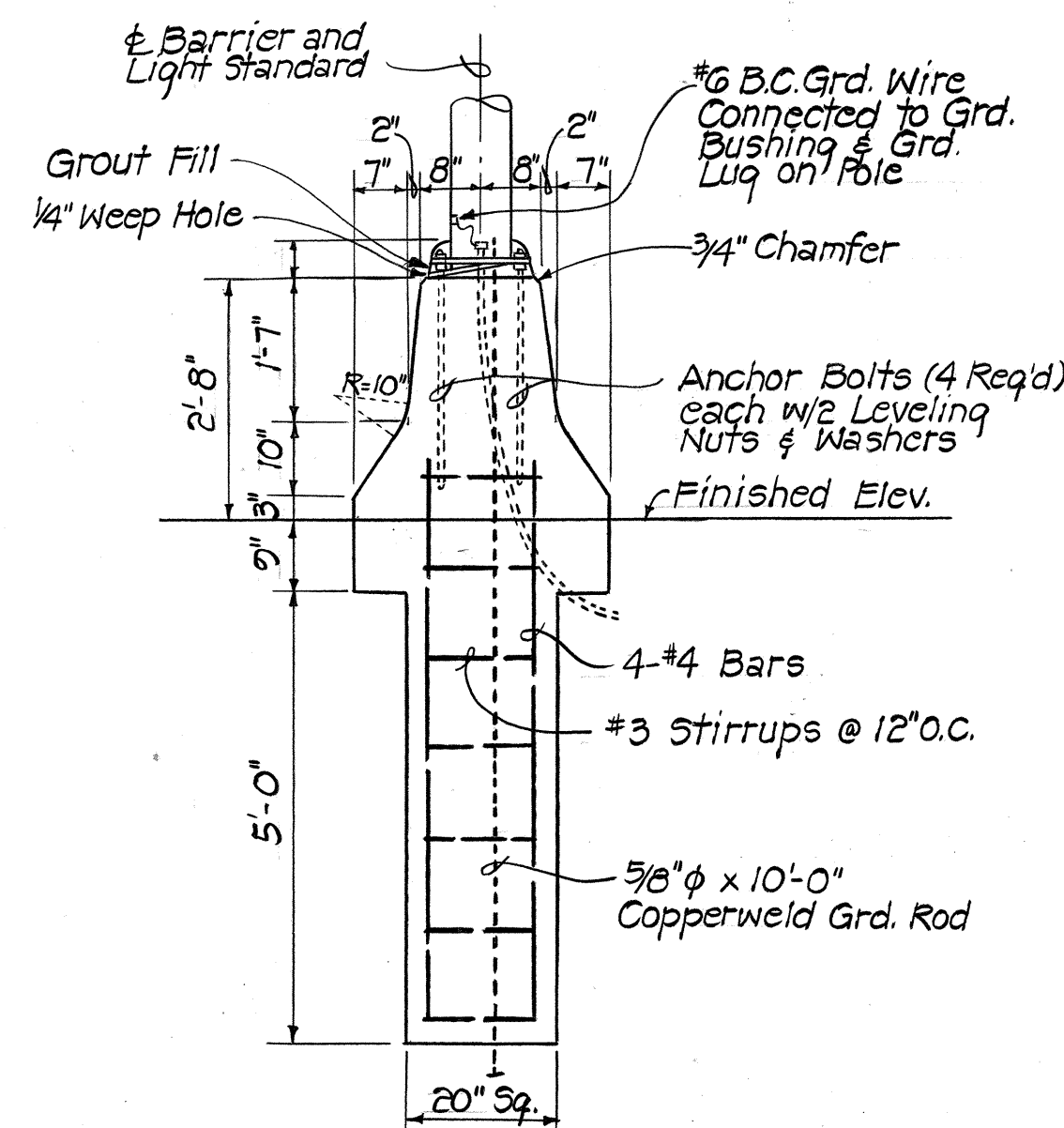
TYPICAL SECTION - UNDERDRAIN
Scale: 1" = 1'-0"



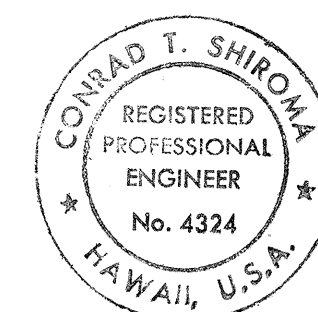
PLAN
Scale: 1/2" = 1'-0"
MOUNTING DETAIL - HIGHWAY LIGHTING STANDARD ON 50C CONCRETE BARRIER
Scales as Shown



TYPICAL SECTION CONCRETE BARRIER-TYPE 50C
Scale: 1" = 1'-0"



SECTION D-D
Not to Scale



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Conrad T. Shiroma
Signature

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

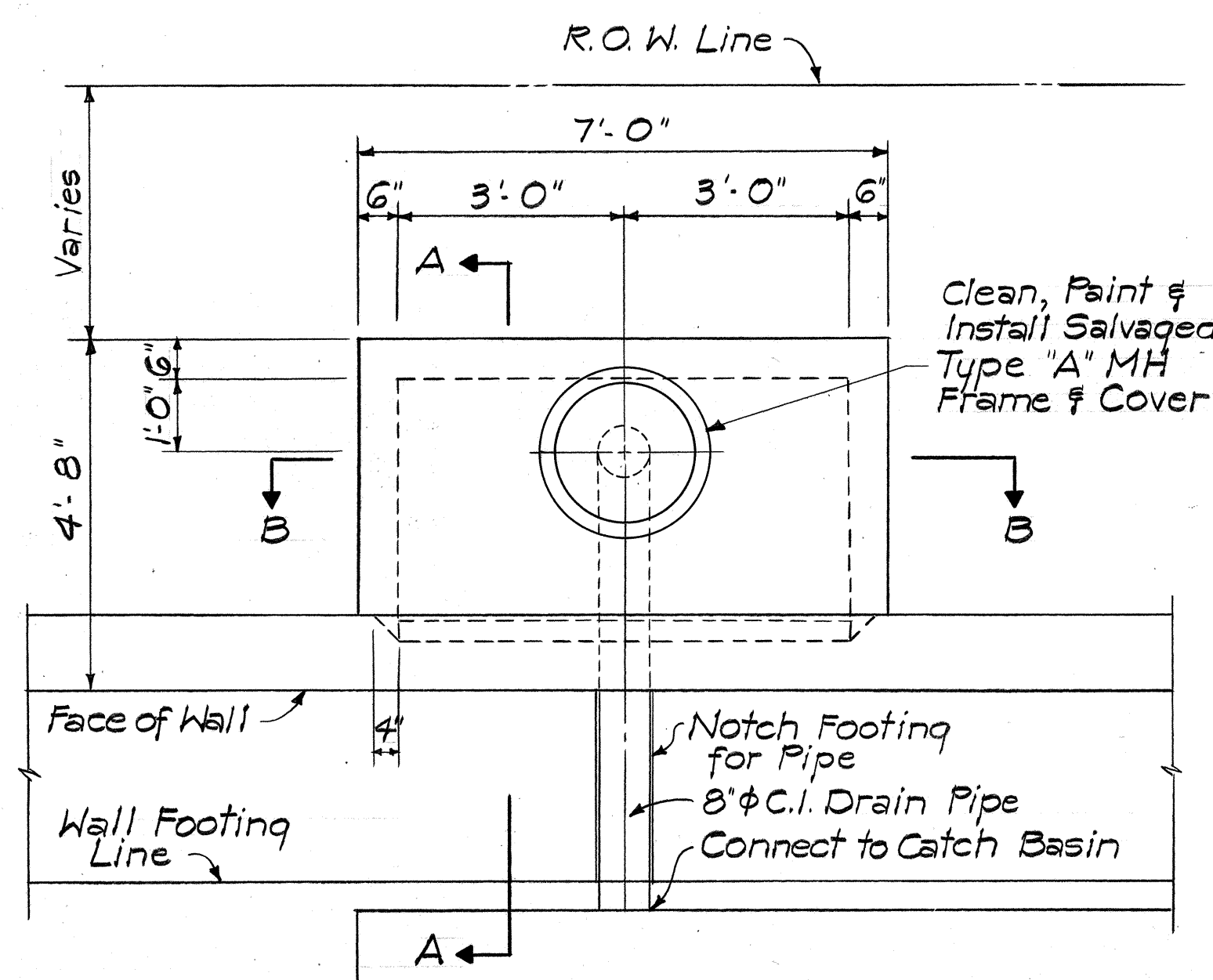
MISCELLANEOUS DETAILS

LIKELIKE HIGHWAY IMPROVEMENTS
(VICINITY OF KULA KOLEA DRIVE TO KAM IV ROAD)
PROJECT NO. F-063-1 (16)

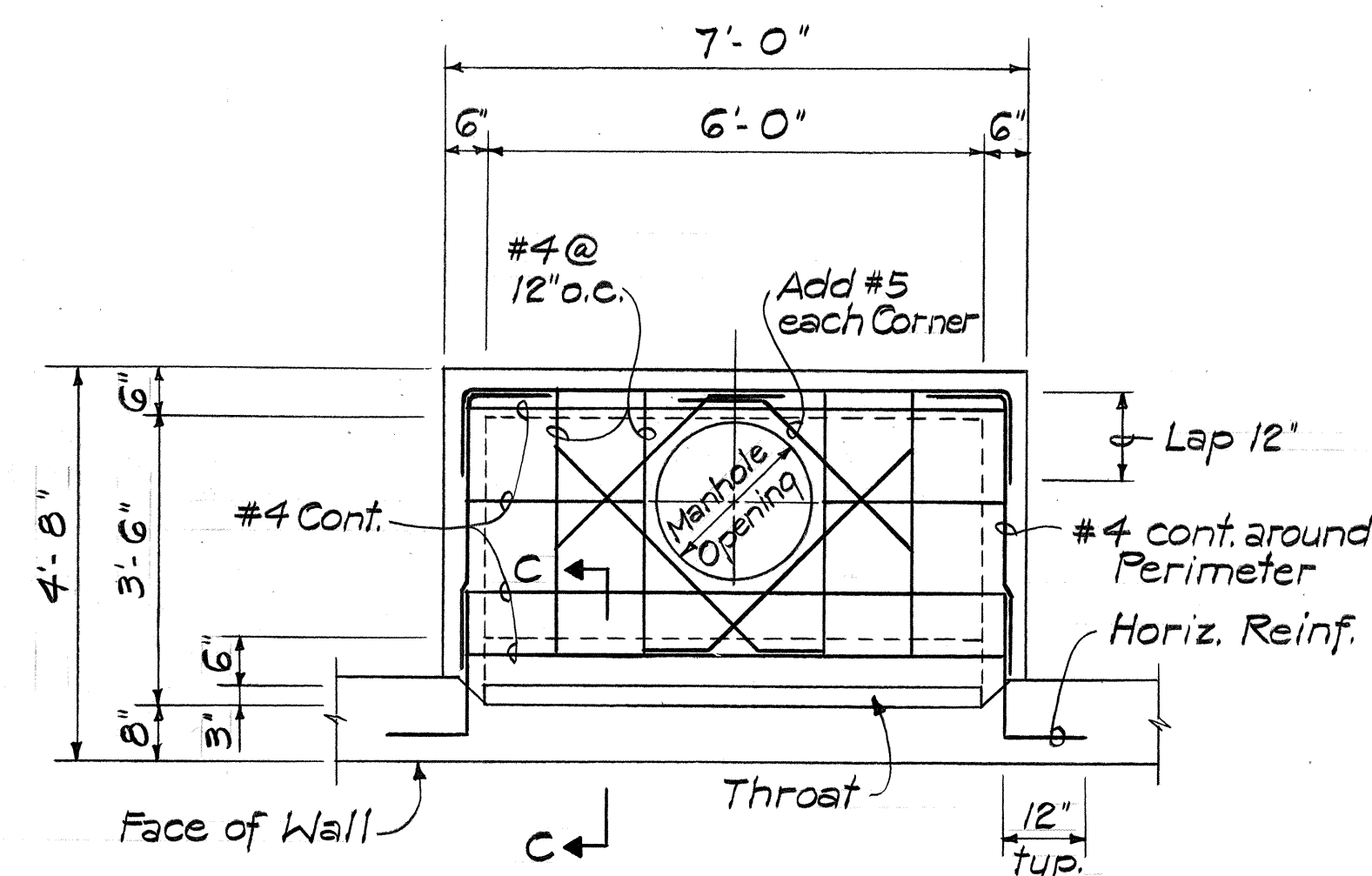
SHEET NO. OF SHEETS

DATE	DESIGNED BY	CHECKED BY
PLANNED BY	NOTED BY	QUANTITIES BY
ORIGINAL	NOTE BOOK	NO.

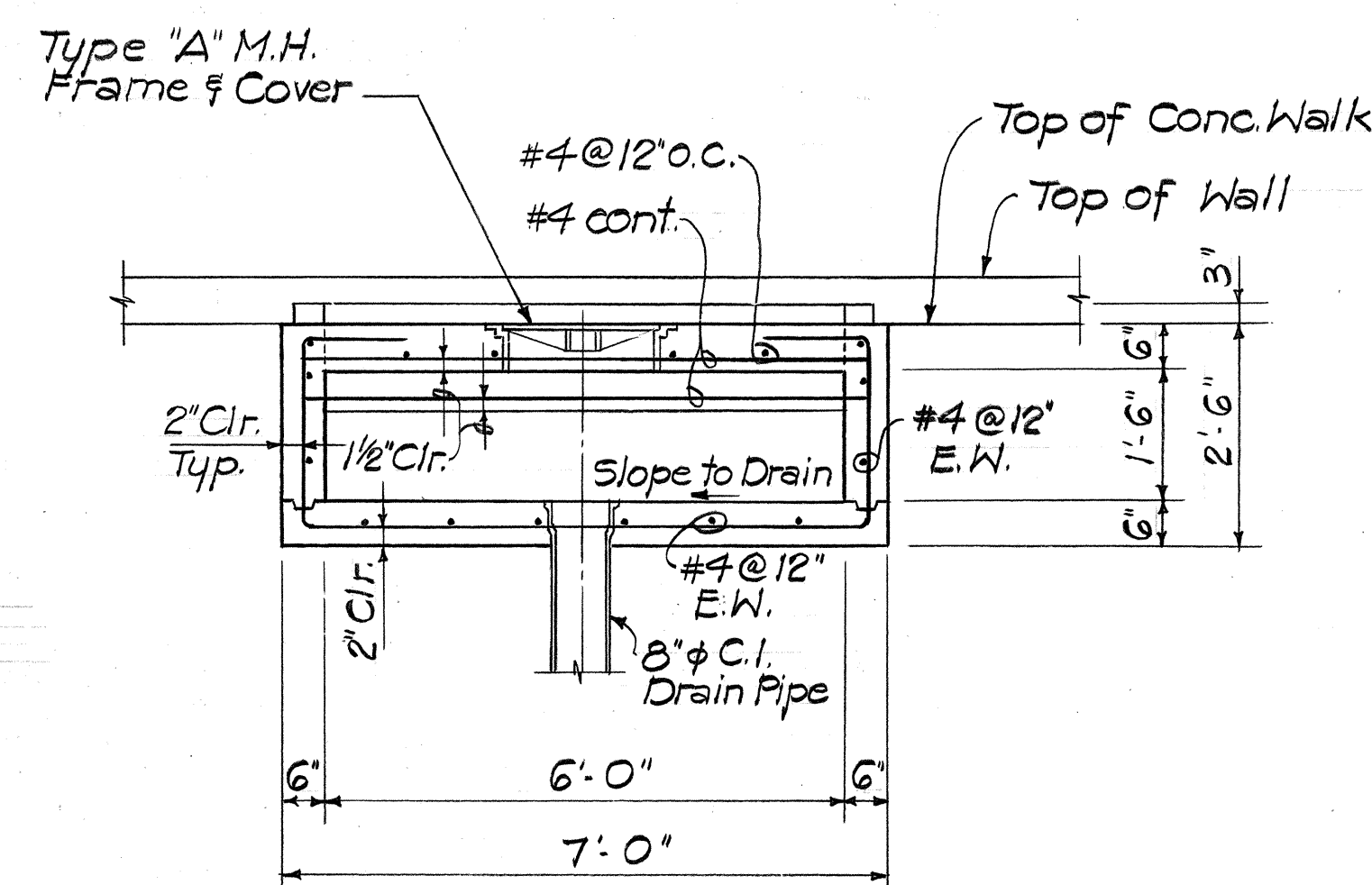
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HAWAII	HAW.	F-063-1 (16)	1984	23	156



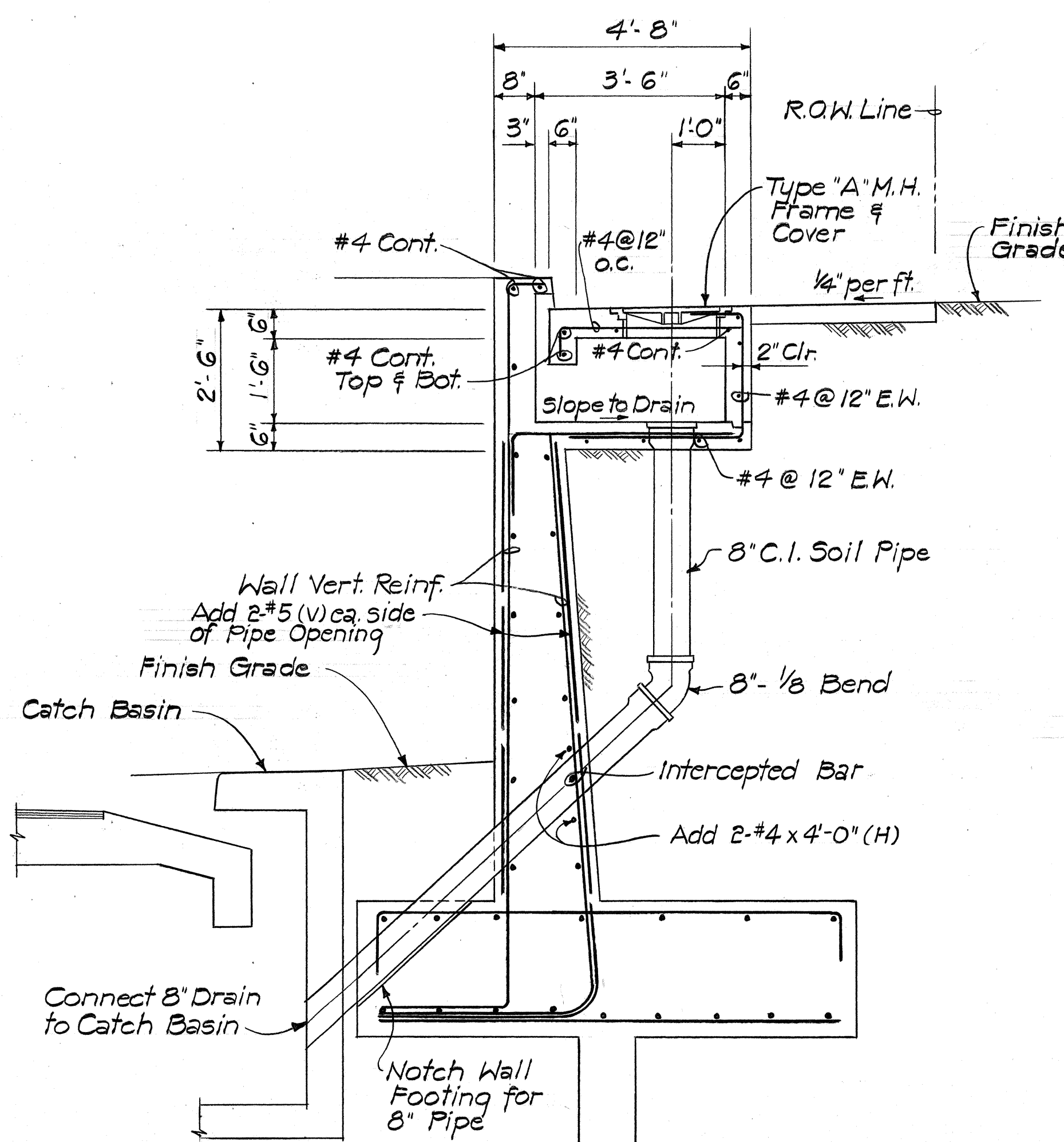
PLAN - WALKWAY CATCH BASIN
Scale: 1/2" = 1'-0"



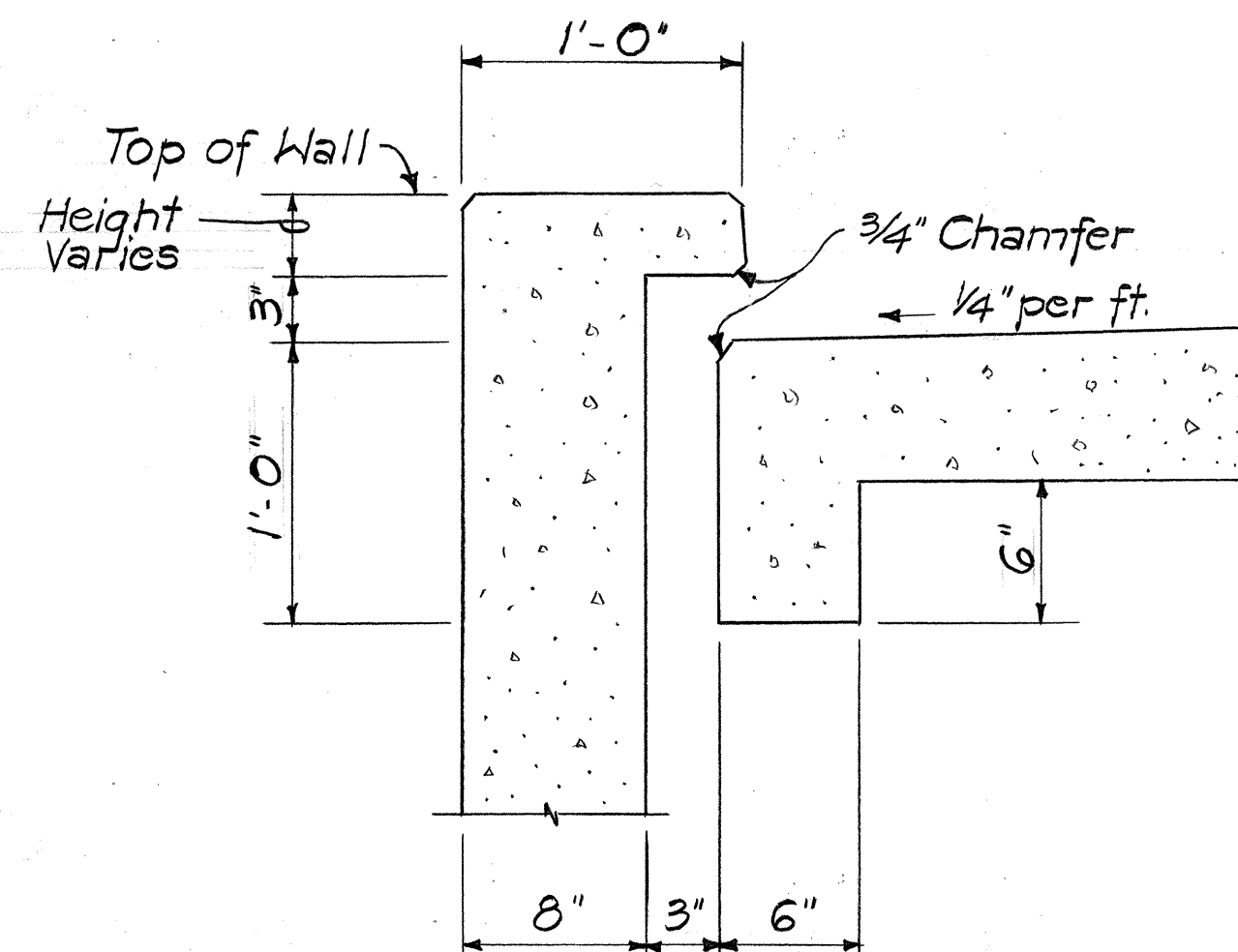
TOP SLAB REINFORCEMENT
Scale: 1/2" = 1'-0"



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



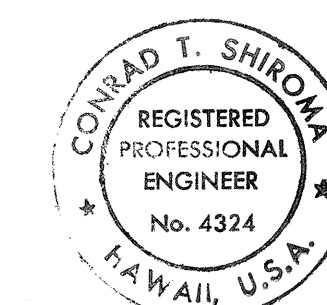
SECTION A-A
Scale: 1/2" = 1'-0"



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

DRAINAGE NOTES

- Existing drainage system will be functional at all times during construction. Contractor is to furnish materials, equipment, labor, tools and incidentals necessary to accomplish maintenance of flow, the cost of which shall be incidental to the various contract items.
- Demolishing and removing a portion or the entire existing structure shall not be paid for separately, but shall be considered incidental to the various contract items.
- Culverts within the catch basins, grated drop intakes and storm drain manholes shall be cut flush with the inside face of the wall. Above work shall be considered incidental to the various contract items.
- Manhole rungs (12" o.c.) are required when height is greater than 4 feet 6 inches. Only one rung (16 inches from the bottom) is required if height is 4 feet 6 inches or less. Manhole rungs may be placed at any location as ordered by the Engineer. Manhole rungs shall be considered incidental to Class "A" Concrete.
- Location of C.I. frame and cover for drain manholes or catch basins shall be determined by the Engineer in the field.
- Contractor shall verify the locations of all culverts in the field. Any culvert damaged during construction shall be repaired or replaced by the Contractor at his expense.
- Only non-pneumatic type of drill as approved by the Engineer will be permitted for drilling holes in concrete. Where indicated on plans, the approximate diameter of drilled holes for installation of dowels shall be 1 inch; after installing dowels, the voids shall be epoxy grouted as directed by the Engineer. Above work shall be considered incidental to the various contract items.
- Concrete for grated drop intakes, drain manholes and catch basins shall be Class "A".
- Premolded joint filler shall be considered incidental to Class "A" Concrete.
- Quantities for concrete gutter aprons shall be considered as part of structure.
- Existing cast iron frame and covers shall be cleaned and painted before installation. Above work shall be considered incidental to the various contract items.
- Salvaged frame and covers shall be cleaned, painted and returned to 727 Koko Street, Honolulu, Hawaii 96819.



THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.

Conrad T. Shiroka
Signature

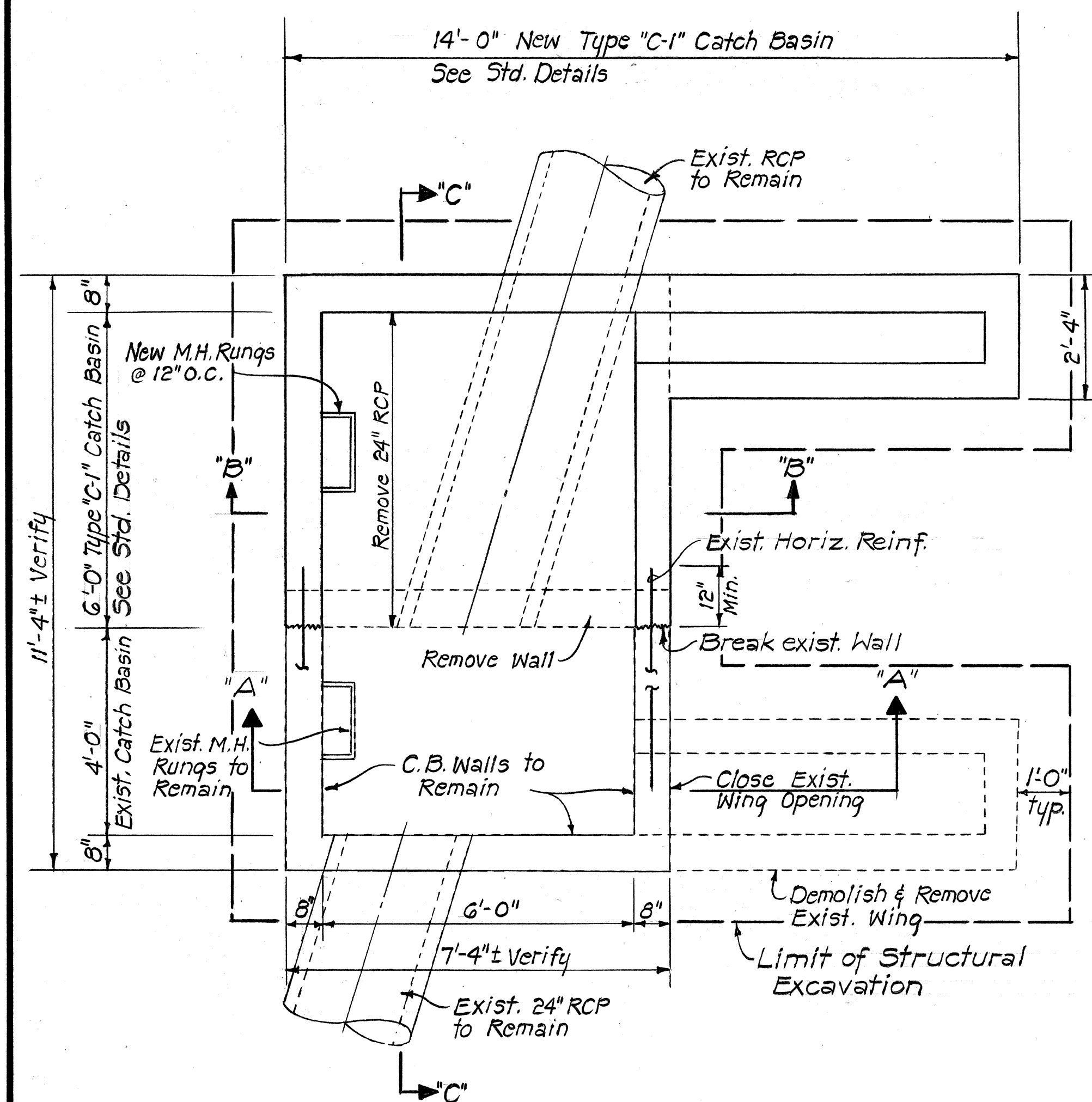
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WALKWAY CATCH BASIN DETAILS

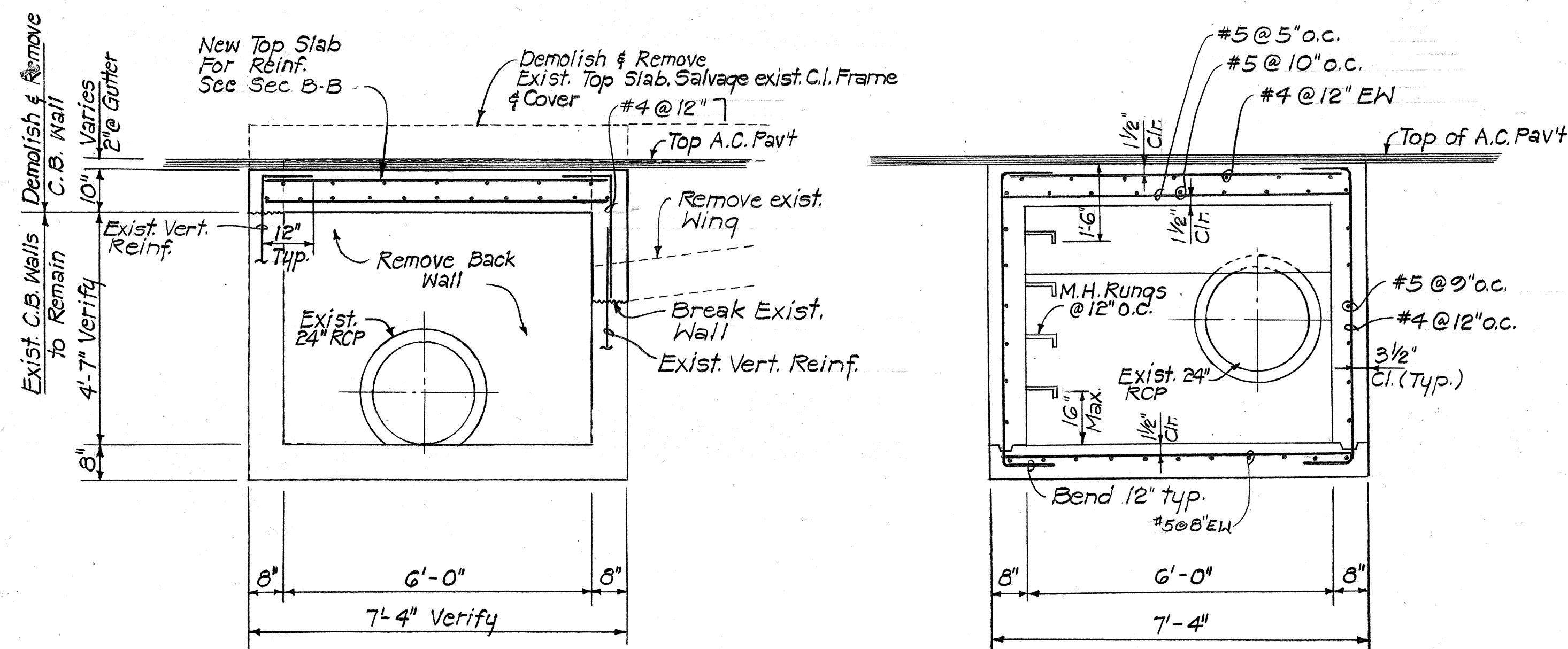
LIKELIKE HIGHWAY IMPROVEMENTS
(VICINITY OF KULA KOLEA DRIVE TO KAM IV ROAD)
PROJECT NO. F-063-1 (16)

SHEET NO. OF SHEETS

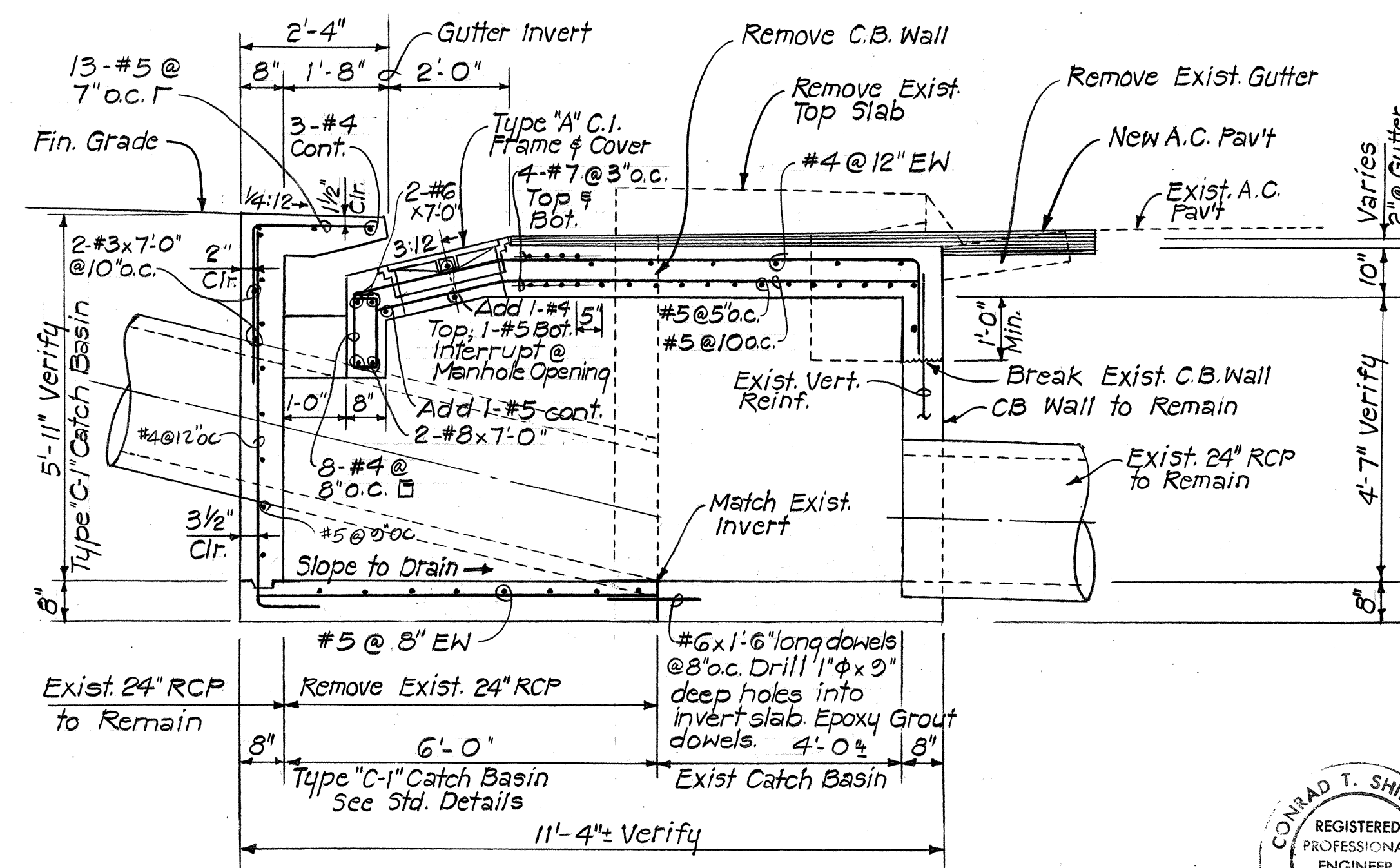
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HAWAII	HAW.	F-063-1(16)	1984	24	156



PLAN ~ CATCH BASIN @ B.L. STA. 49+07
Scale: 1/2" = 1'-0"



SECTION "A-A"
Scale: $\frac{1}{2}" = 1'-0"$



SECTION "C-C"
Scale: $\frac{1}{2}" = 1'-0"$



CONRAD T. SHIROMA
REGISTERED
PROFESSIONAL
ENGINEER
No. 4324
HAWAII, U.S.A.

THIS WORK WAS PREPARED FOR ME OR UNDER MY SUPERVISION

Conrad T. Shiroma
Signature

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**CATCH BASIN RECONSTRUCTION
& STA. 49+07**

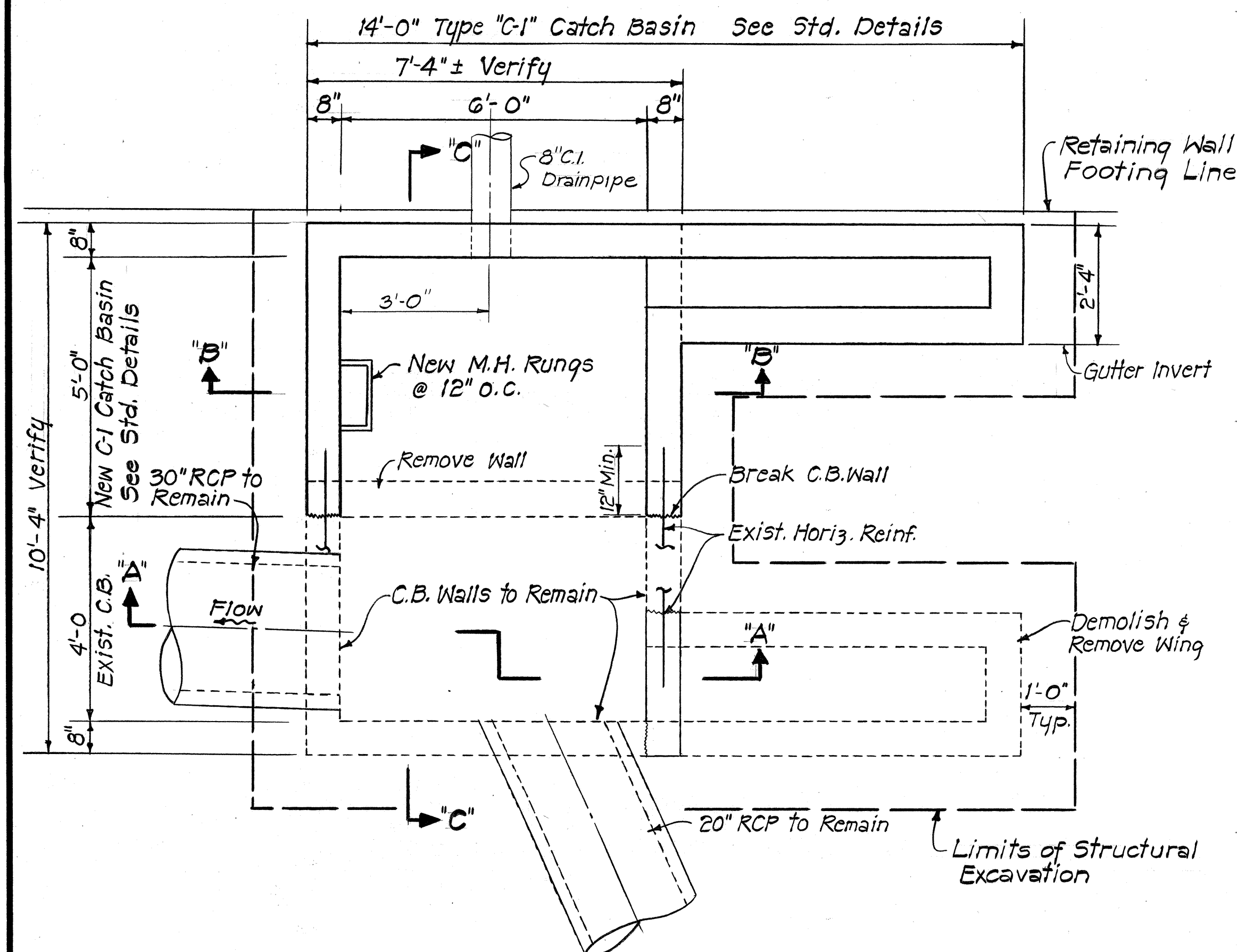
LIKELIKE HIGHWAY IMPROVEMENTS
(VICINITY OF KULA KOLEA DRIVE TO KAM IV ROAD)

PROJECT NO. F-063-1 (16)

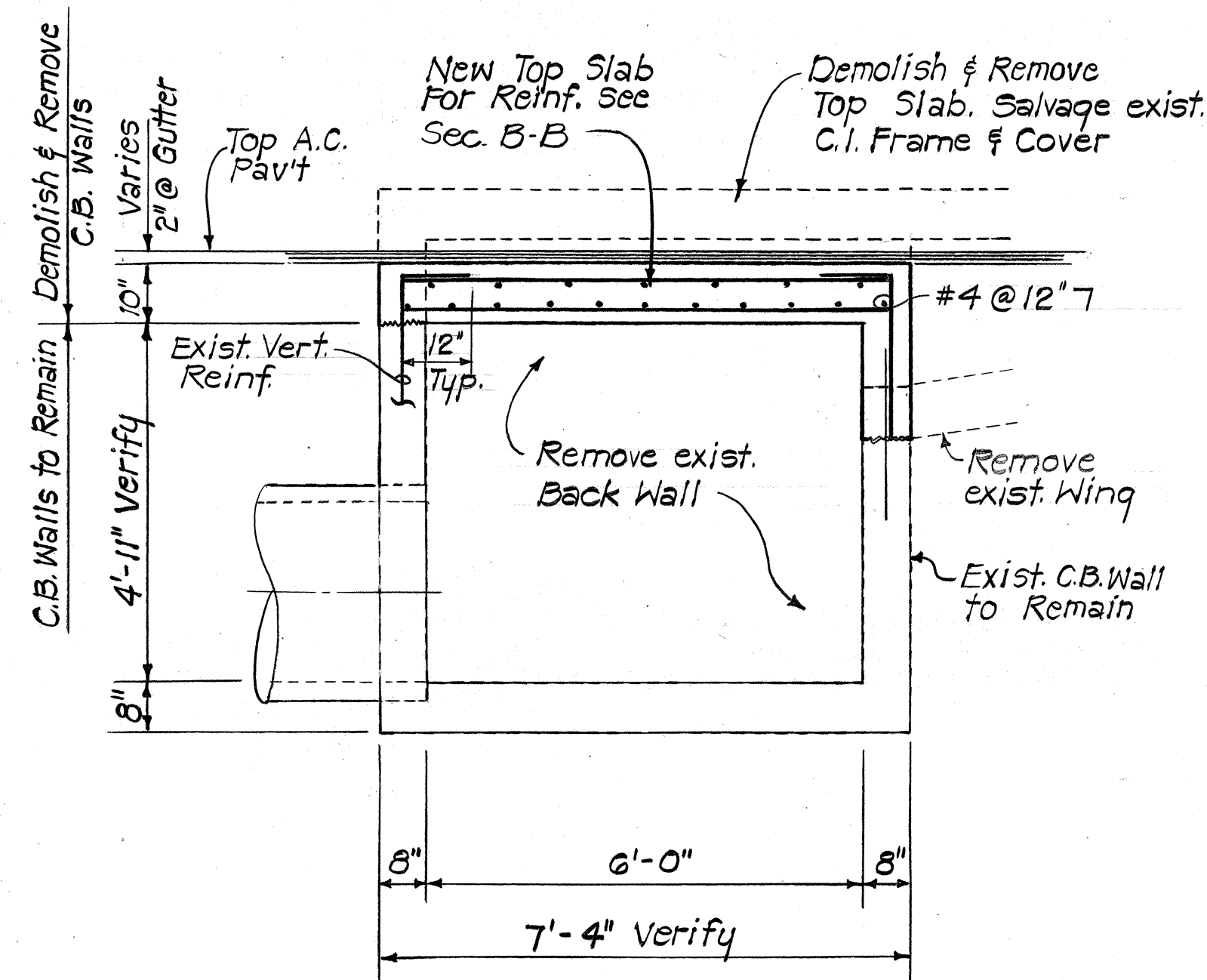
SHEET No. OF SHEETS

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

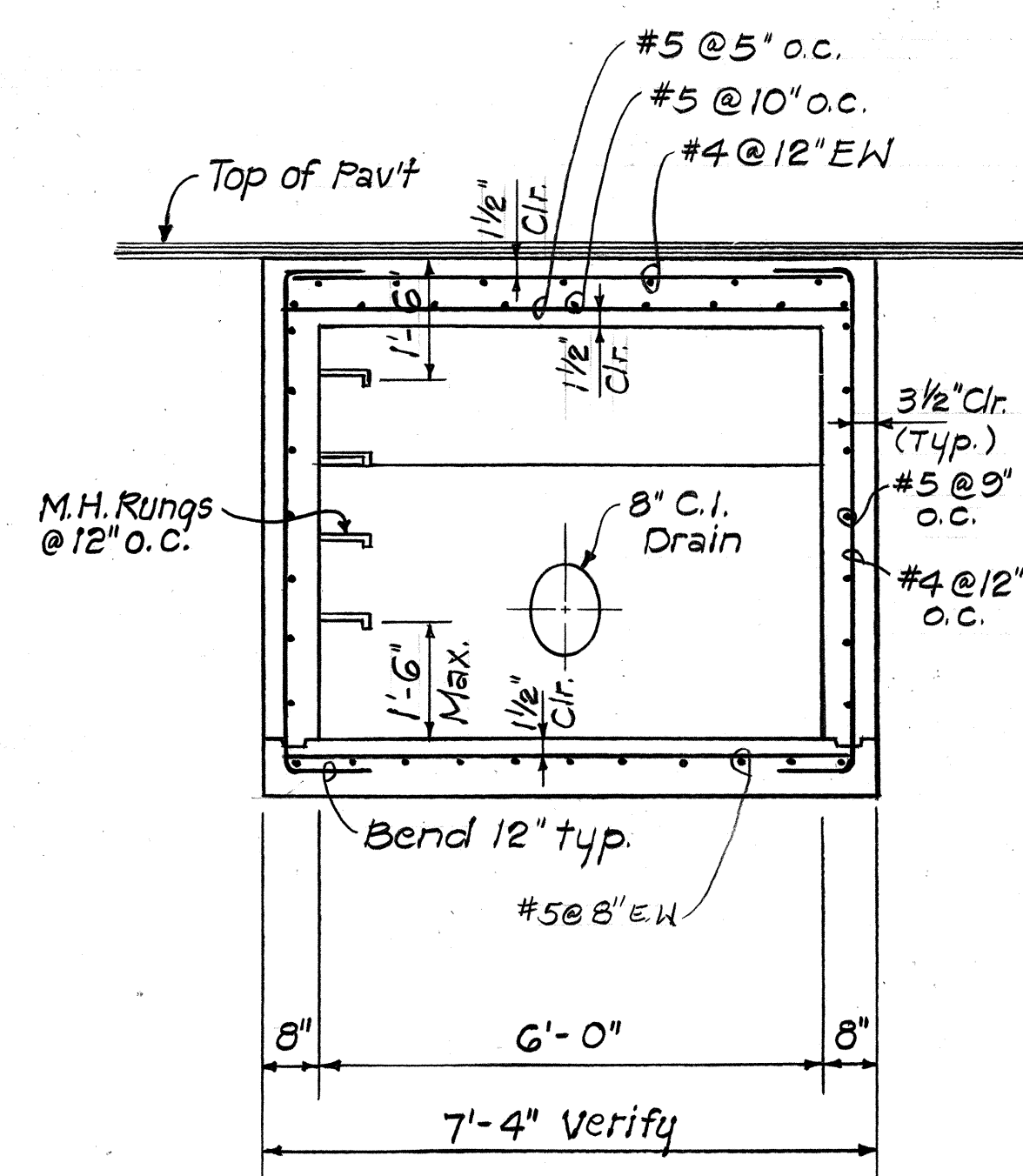
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HAWAII	HAW.	F-063-1(16)	1984	25	156



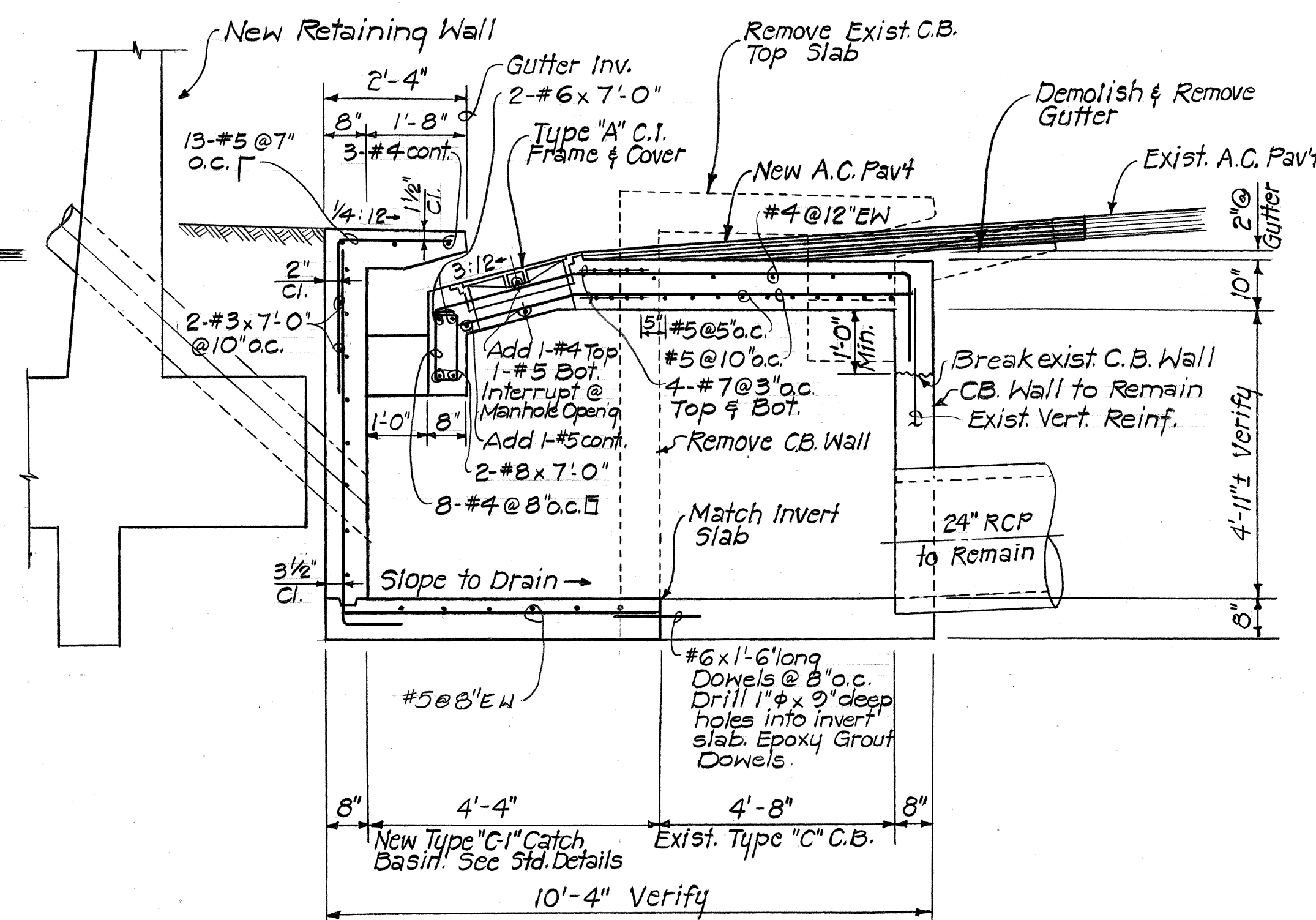
PLAN ~ CATCH BASIN @ B.L. STA. 56+50
Scale: 1/2" = 1'-0"



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



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

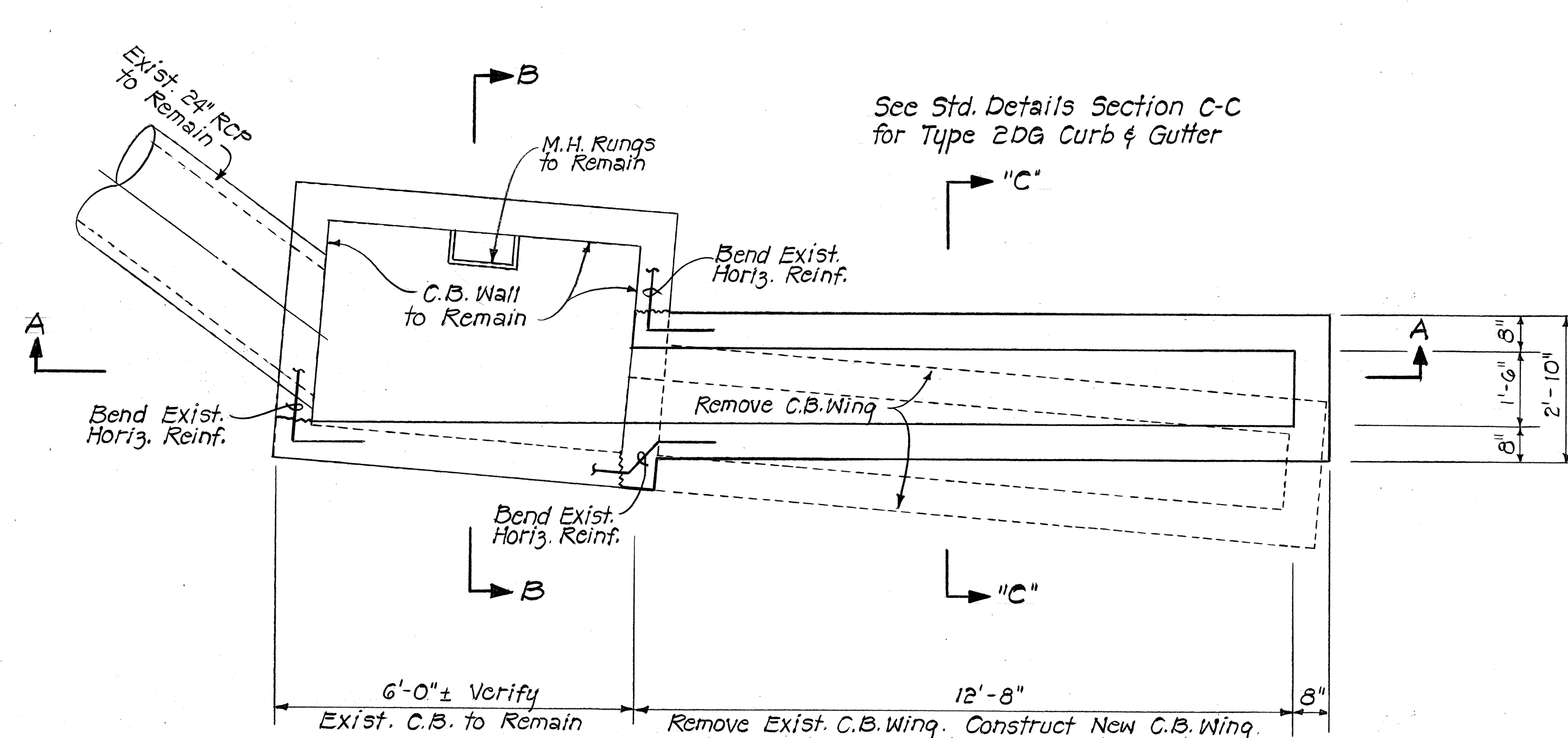


SECTION "C-C"
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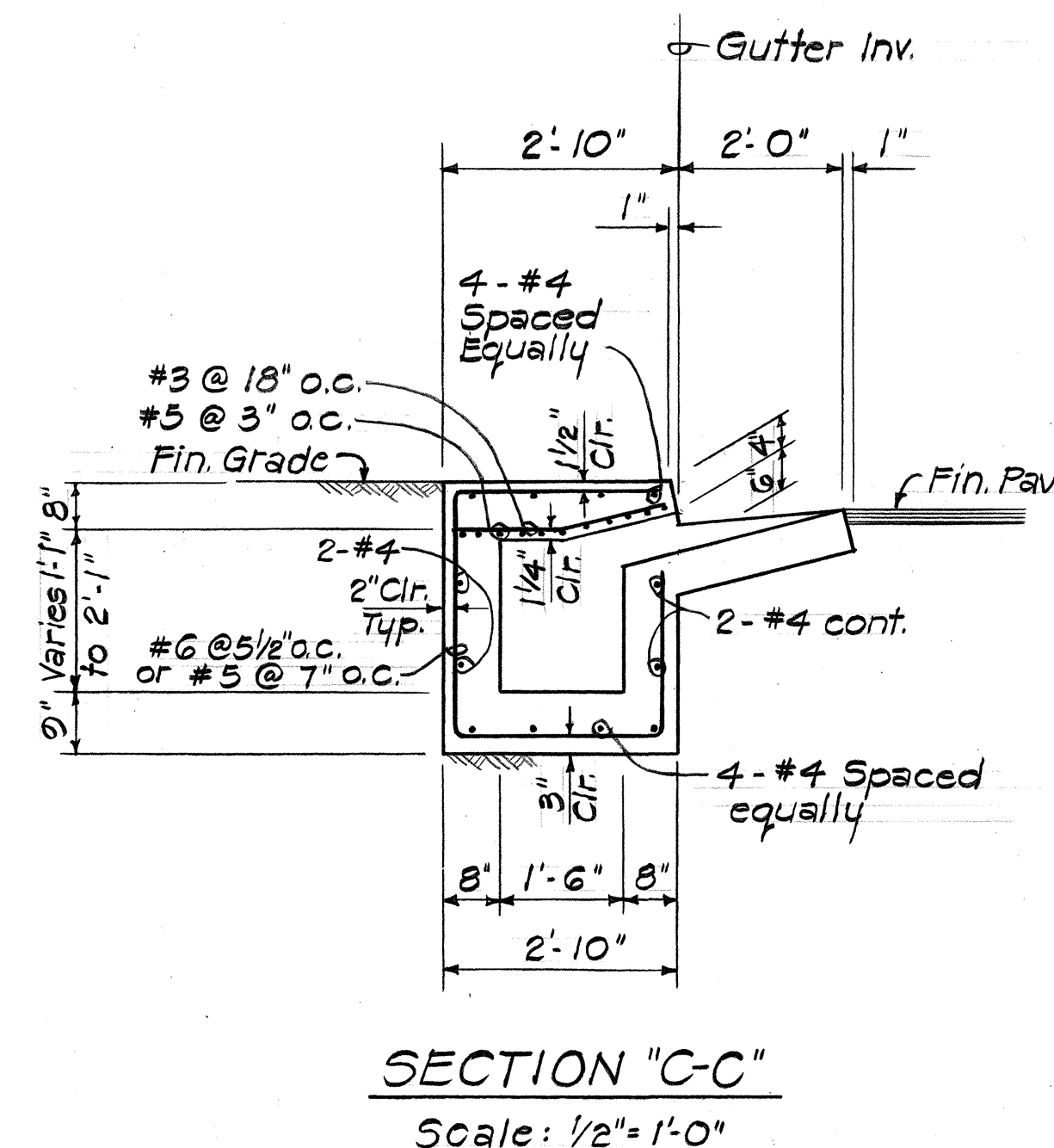
CONRAD T. SHIROKA
REGISTERED
PROFESSIONAL
ENGINEER
No. 4324
HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**CATCH BASIN RECONSTRUCTION
@ STA. 56+50**
LIKELIKE HIGHWAY IMPROVEMENTS
(VICINITY OF KULA KOLEA DRIVE TO KAM IV ROAD)
PROJECT NO. F-063-1(16)
SHEET NO. OF SHEETS

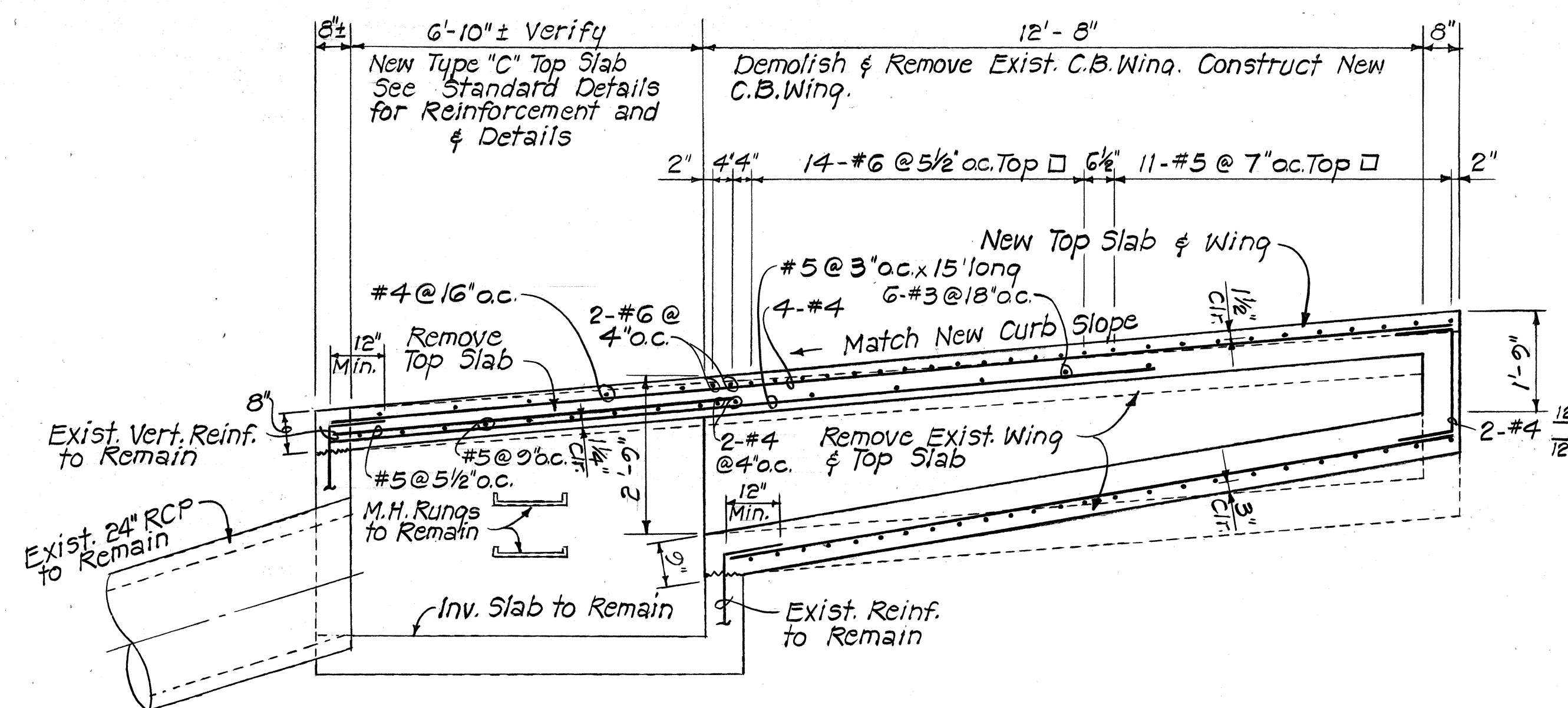
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HAWAII	HAW.	F-063-1 (16)	1984	26	156



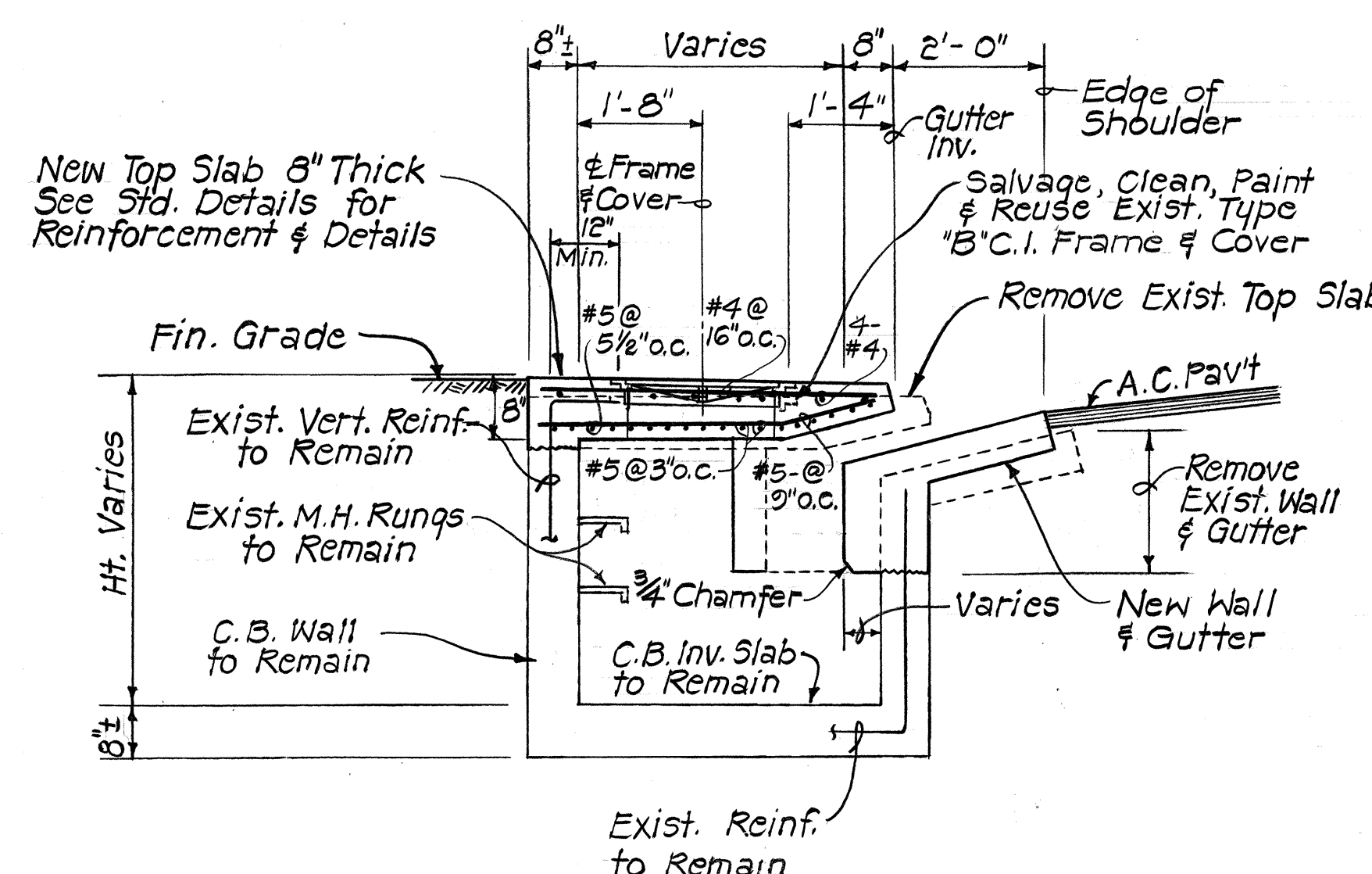
PLAN ~ CATCH BASIN @ B.L. STA. 62+03
Scale: 1/2" = 1'-0"



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



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



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

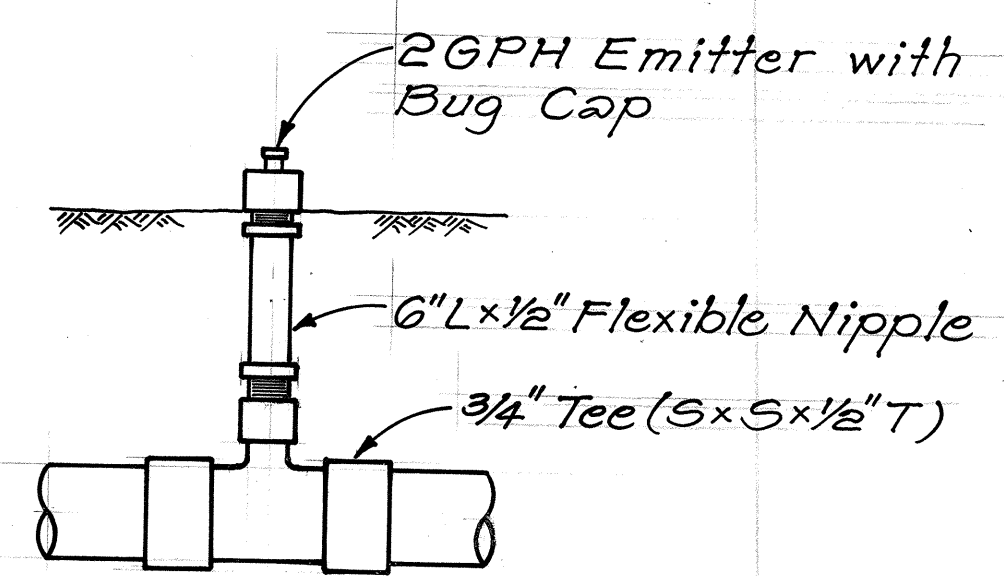
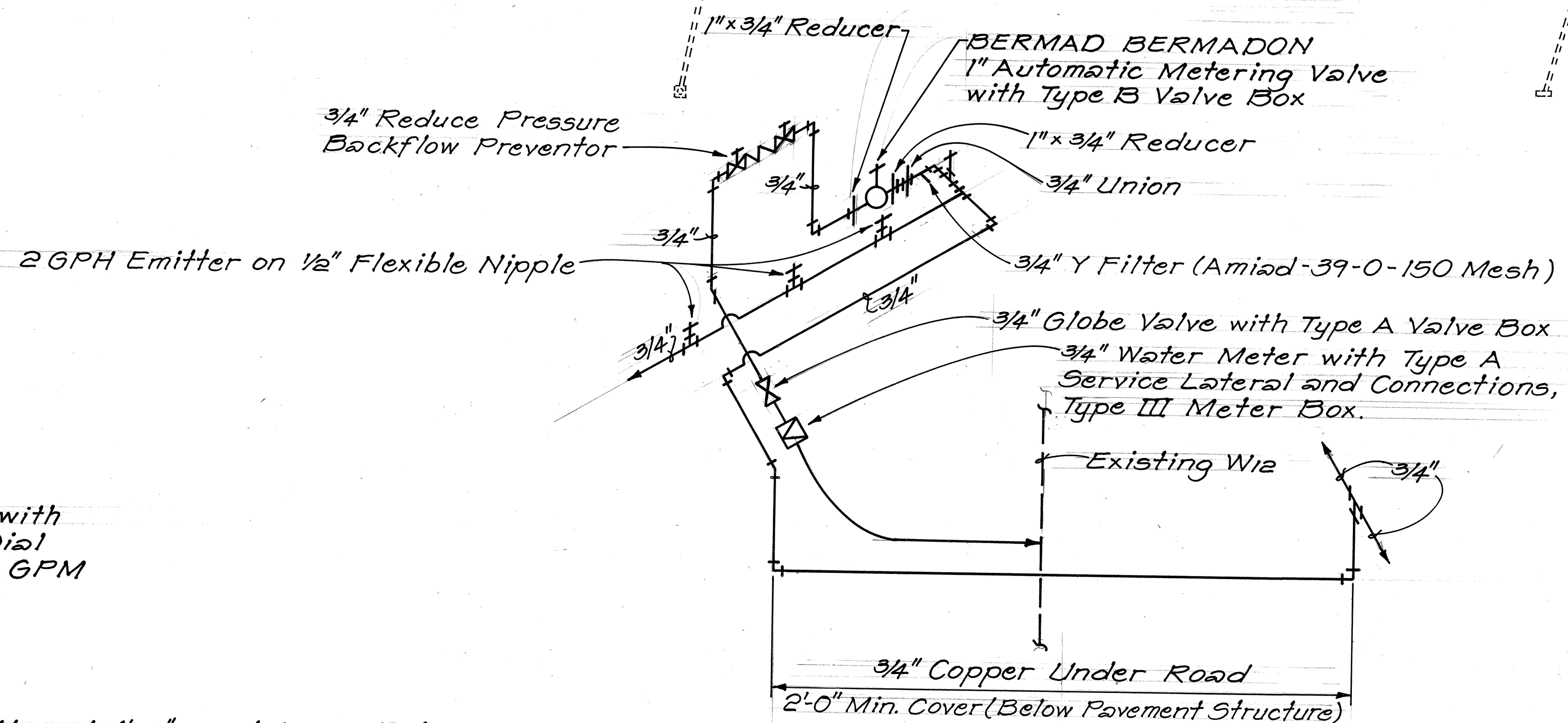
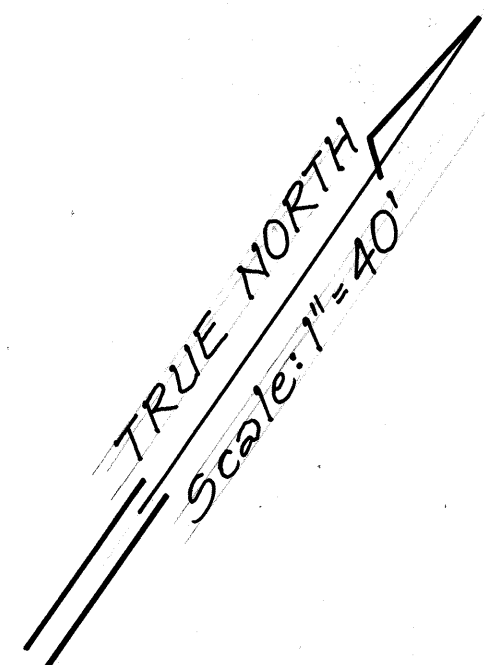
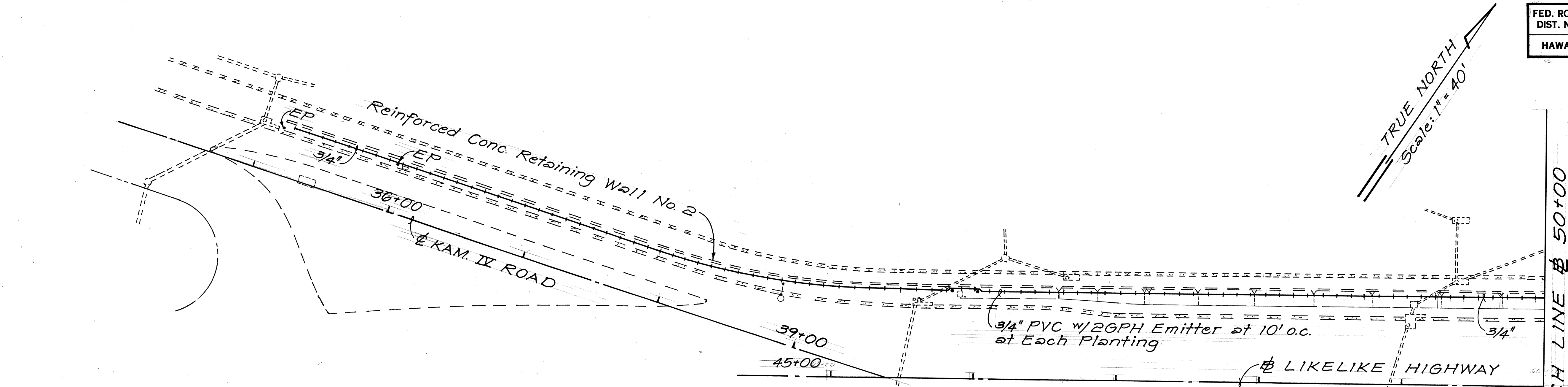
DATE	_____
DESIGNED BY	_____
CHECKED BY	_____
NOTED BY	_____
QUANTITIES BY	_____
NO.	_____

CONRAD T. SHIROMA
REGISTERED
PROFESSIONAL
ENGINEER
No. 4324
HAWAII, U.S.A.

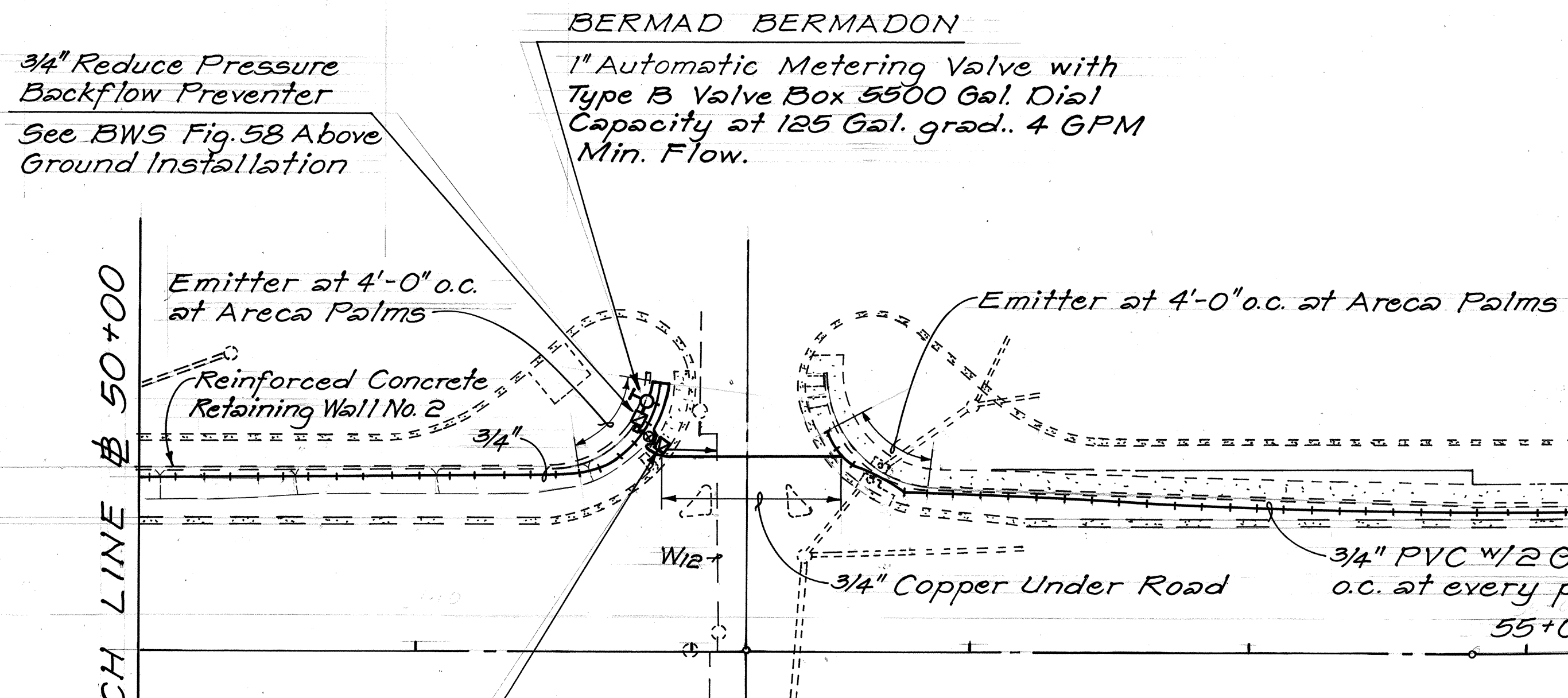
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**CATCH BASIN RECONSTRUCTION
@ STA. 62+93**
LIKELIKE HIGHWAY IMPROVEMENTS
(VICINITY OF KULA KOLEA DRIVE TO KAM IV ROAD)
PROJECT NO. F-063-1 (16)

SHEET NO. OF SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1(16)	1984	C026S1	156



TYPICAL EMITTER DETAIL



3/4" WATER METER With Type A Service Laterals and Connections, Type X Meter Box and 3/4" Globe Valve and Type A Valve Box. See BWS Fig. 30 & 31. Static Pressure 67 psi.

ORIGINAL PLAN	DATE
DRAWN BY	
TRACED BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
No.	

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION LANDSCAPE IRRIGATION PLAN LIKELIKE HIGHWAY IMPROVEMENTS Vicinity of Kula Koea Drive to Kam II Road Project No. F-063-1(16) Scale: As Noted Date: Dec. 1985	
12/16/85	This sheet added to show landscape irrigation details.
DATE	REVISION
SHEET No. 1 OF 1 SHEETS	