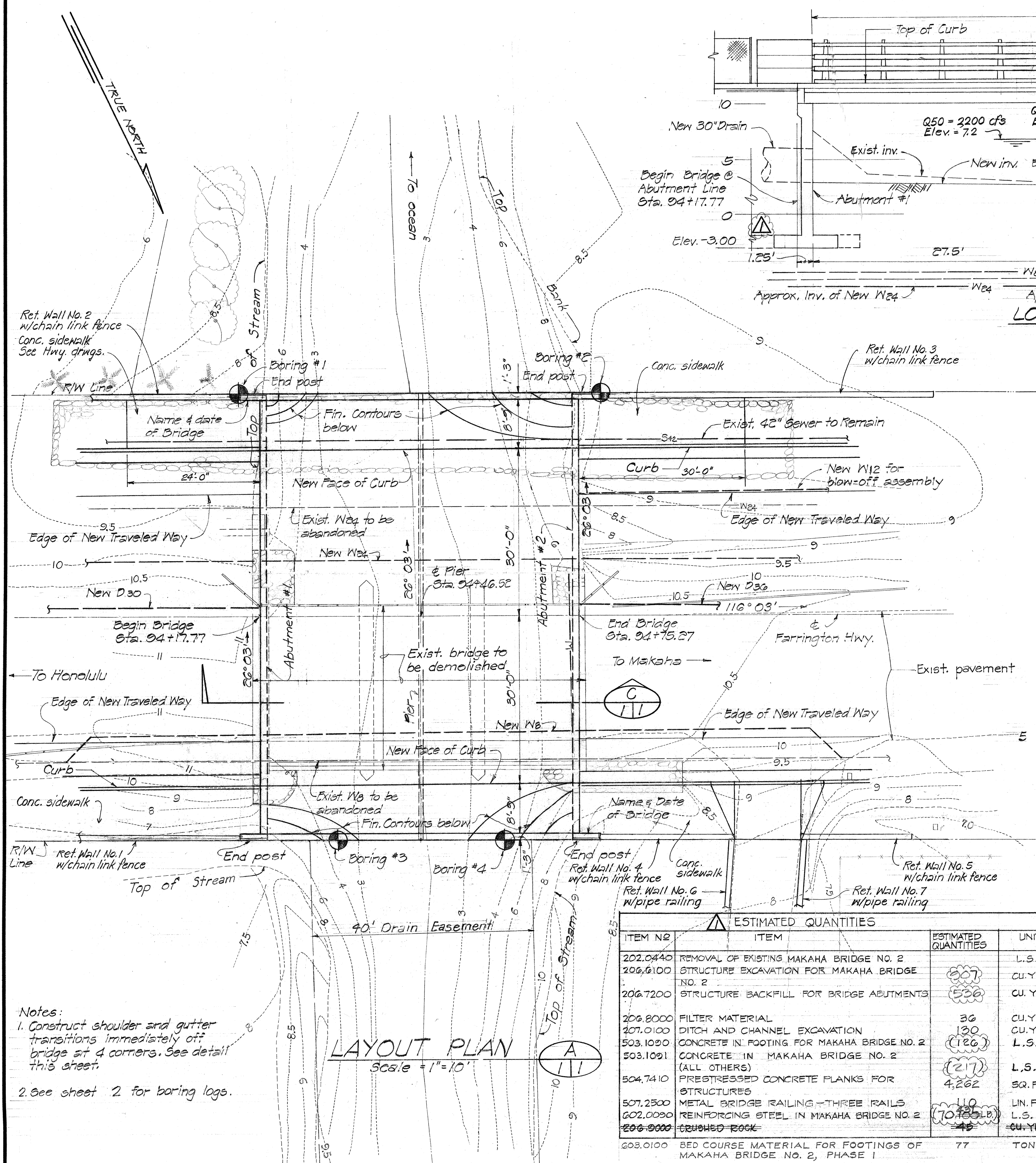
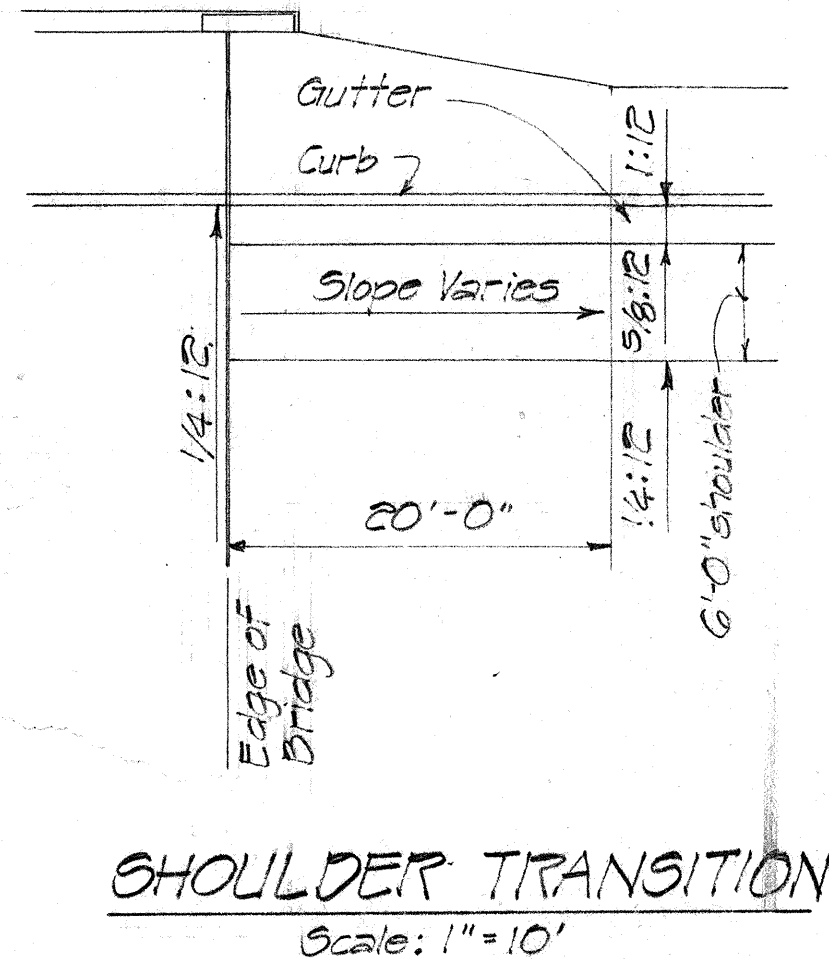
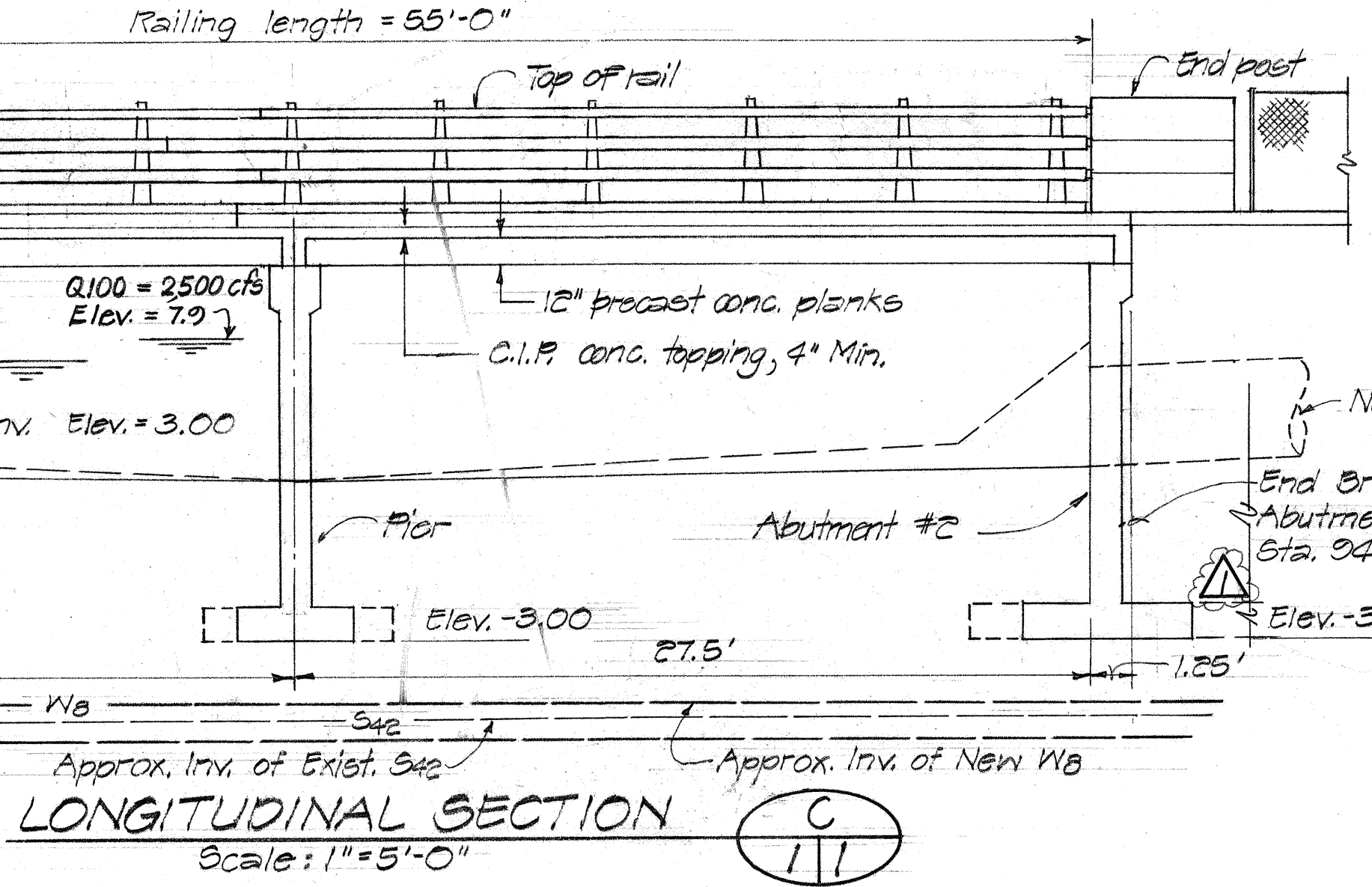


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(10)	1987	13	27



ESTIMATED QUANTITIES				
ITEM NO	ITEM	ESTIMATED QUANTITIES	UNIT	
202.0440	REMOVAL OF EXISTING MAKAHA BRIDGE NO. 2		L.S.	
206.6100	STRUCTURE EXCAVATION FOR MAKAHA BRIDGE NO. 2	307	CU. YD.	
206.7200	STRUCTURE BACKFILL FOR BRIDGE ABUTMENTS	536	CU. YD.	
206.8000	FILTER MATERIAL	36	CU. YD.	
207.0100	DITCH AND CHANNEL EXCAVATION	130	CU. YD.	
503.1020	CONCRETE IN FOOTING FOR MAKAHA BRIDGE NO. 2	126	L.S.	
503.1021	CONCRETE IN MAKAHA BRIDGE NO. 2 (ALL OTHERS)	217	L.S.	
504.7410	PRESTRESSED CONCRETE PLANKS FOR STRUCTURES	4,262	SQ. FT.	
507.2500	METAL BRIDGE RAILING - THREE RAILS	110	LIN. FT.	
602.0090	REINFORCING STEEL IN MAKAHA BRIDGE NO. 2	70,435	L.S.	
206.9000	CRUSHED ROCK	45	CU. YD.	
603.0100	BED COURSE MATERIAL FOR FOOTINGS OF MAKAHA BRIDGE NO. 2, PHASE I	77	TON	



- GENERAL NOTES**
- DESIGN SPECS: Standard Specifications for Highway Bridges, AASHTO, 13th edition, 1983 including subsequent interim specifications.
 - DESIGN LOADING: HS-20-44.
 - Concrete Classes:
 - A. Prestressed Planks: $f'_c = 6,000$ psi ($f_{ci} = 4,000$ psi).
 - B. Cast-in-place concrete in superstructure: Class BD.
 - C. All others: Class A.
 - Reinforcing Steel: $f_y = 40,000$ psi.
 - Prestressing Strands:
 - A. Prestressed Planks: $f'_s = 270$ ksi. Prestress at transfer shall be 0.70 f'_s . Final design stress is based on loss of 45,000 psi.
 - Top of bridge shall conform to finish roadway grades and geometrics.
 - The following work items will not be paid for separately but shall be considered incidental to the various contract items:
 - A. Elastomeric bearing pads (GO Durometer)
 - B. Floor drains and other inserts.
 - C. Bridge name and date.
 - D. Expansion joints, premolded joint filler.
 - E. Neephole.
 - F. Waterproofing, flashing compound.
 - Refer to Standard Detail drawings for details not covered by Project drawings.
 - The following regulations of the U.S. Corps of Engineers shall govern work on this project.
 - A. Fill shall not be placed in proximity of a public water supply intake.
 - B. Fill shall not be placed in an area of concentrated shellfish production.
 - C. Fill shall not disrupt the movement of those species of aquatic life indigenous to the water body.
 - D. Fill will consist of suitable material free from toxic pollutants in other than trace quantities.
 - E. Any fills created shall be properly maintained to prevent erosion and other non-point sources of pollution.
 - F. Discharge shall not destroy a threatened or endangered species as identified under the Endangered Species Act.
 - G. Fill shall not be placed in a component of the National Wild and Scenic River System or in a component of a State wild and scenic river system.
 - Maximum Soil Bearing Pressure:
 - Phase 1: 1,990 psf (GRP I)
 - Phase 2: 3,870 psf (GRP I)
 - Abutment: 2,080 psf (GRP I)
 - 3,730 psf (GRP II)
 - Abutments shall not be backfilled until a minimum of 7 days after superstructure has been completed. Backfill shall be placed equally and simultaneously behind each abutment.

LEGEND:
 E.F. Each Face
 F.F. Front Face
 R.F. Rear Face

APPROVED:
 [Signature] 5/5/87
 CHIEF, PLANNING & ENGINEERING, BWS # DATE

Revisions to Est. Quantities, Abutment, & Group Loading in General Notes
 3/2/88 DATE REVISIONS

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
 [Signature]
 HAWAII, U.S.A.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

REPLACEMENT OF MAKAHA BRIDGE NO. 2
 LAYOUT AND LONGITUDINAL SECTION

FARRINGTON HIGHWAY

PROJECT NO. BR-093-1(10)

SCALE: AS SHOWN DATE: FEB. 1987

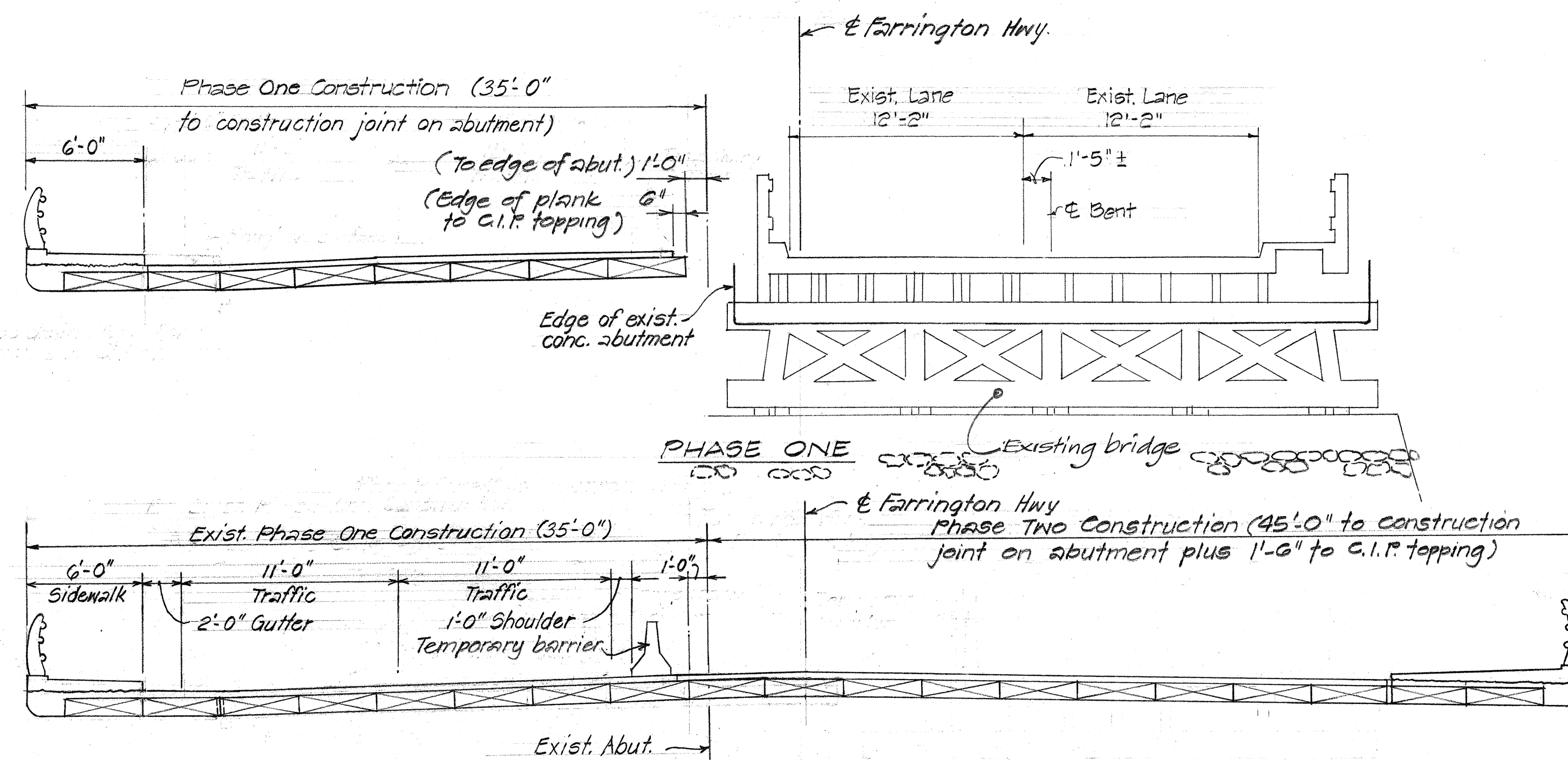
SHEET NO. 1 OF 13 SHEETS

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

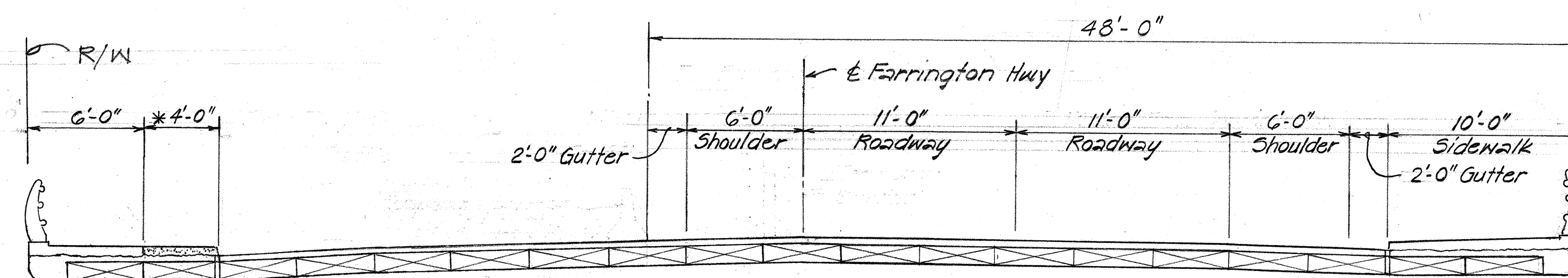
Notes:
 1. Construct shoulder and gutter transitions immediately off bridge at 4 corners. See detail this sheet.
 2. See sheet 2 for boring logs.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(10)	1987	14	27

PROJECT NO. S36-01-75



PHASE TWO

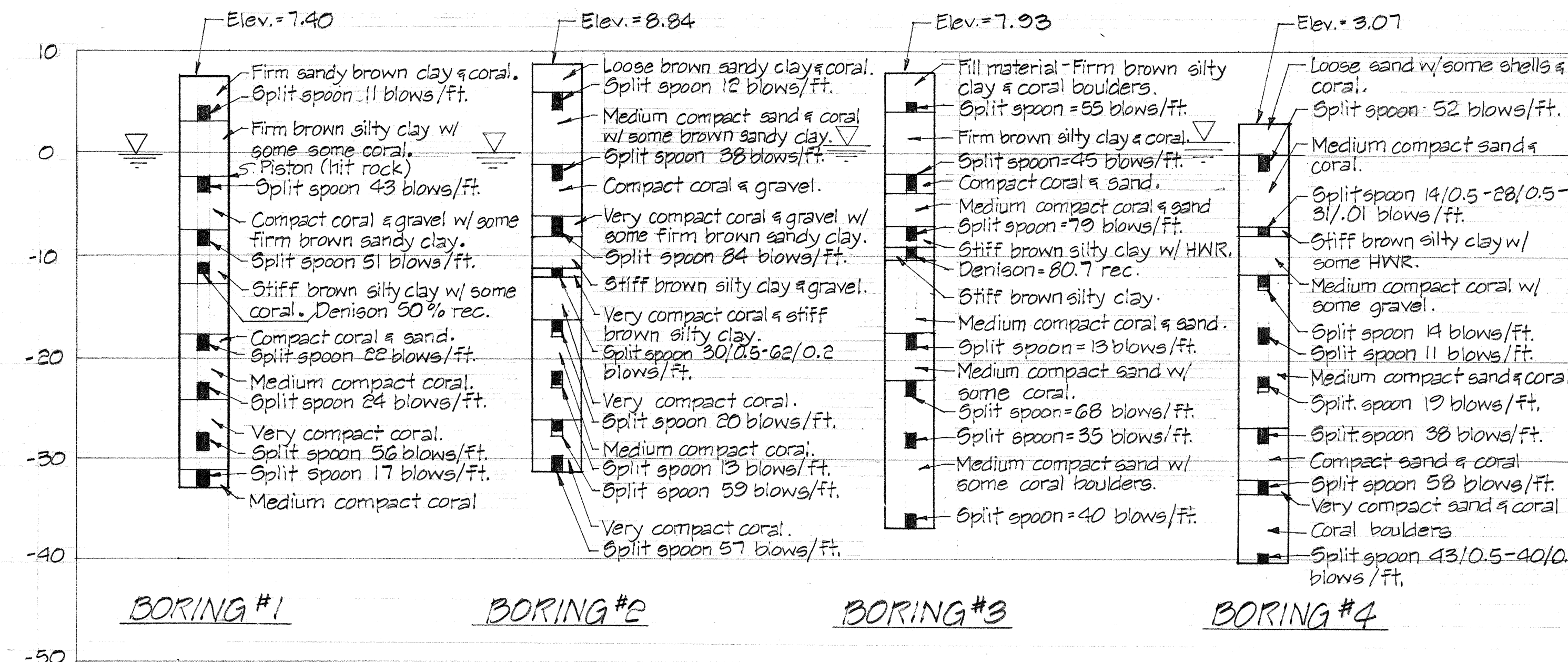


* Construct balance of sidewalk under Phase Three.

PHASE THREE

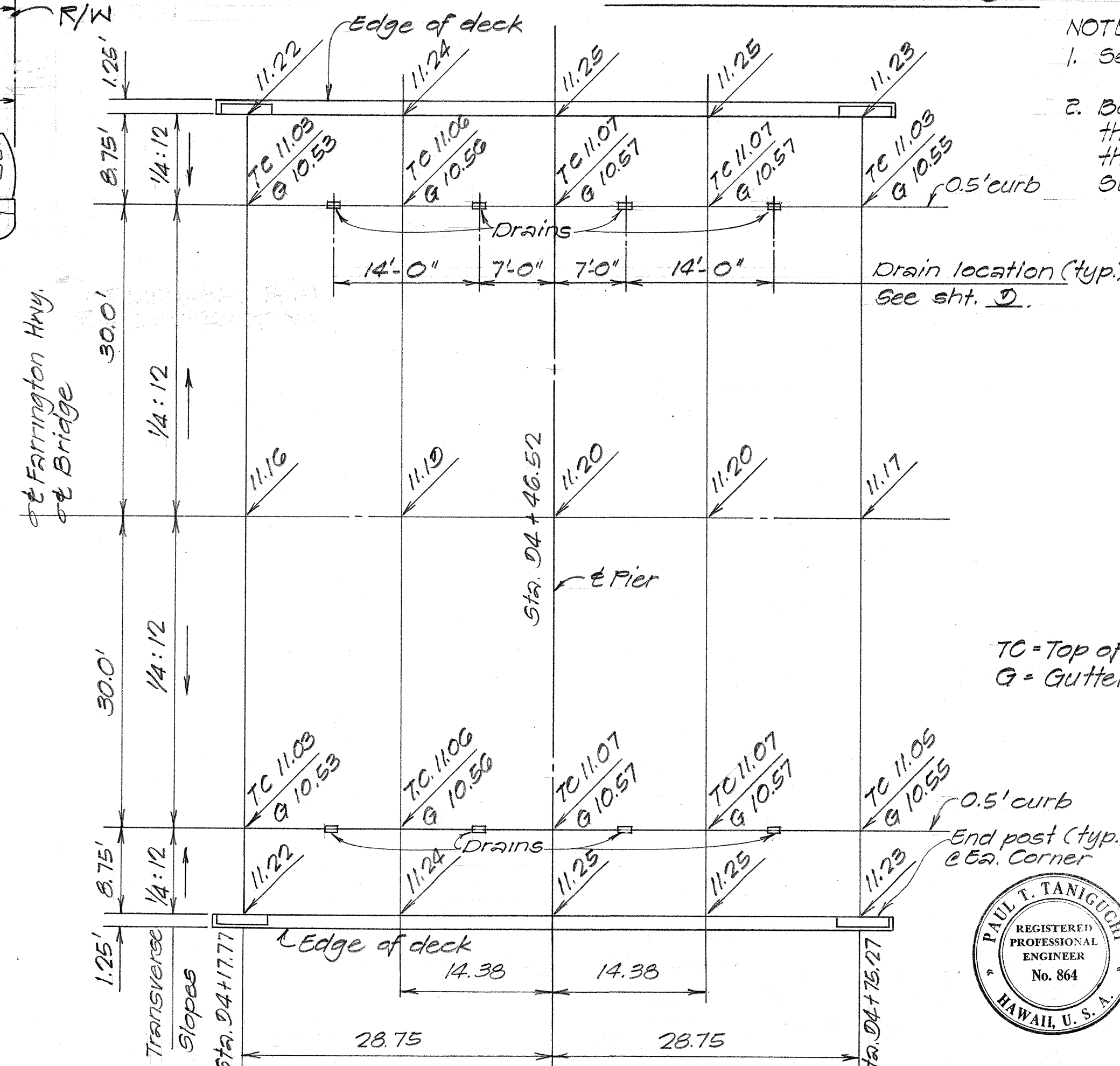
CONSTRUCTION PHASE DIAGRAMS

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



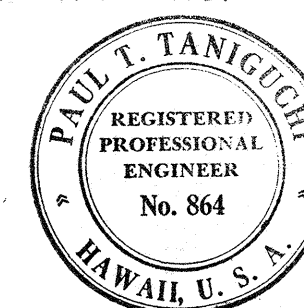
BORING LOGS

- NOTES:
- See sheet 1, Layout Plan, for boring locations.
 - Boring data are provided for the convenience of the bidders only and their use is subject to all the conditions and limitations set forth in subsection 102.05 of the Standard Specifications.



LAYOUT OF BRIDGE DECK SHOWING FINISHED ELEVATIONS

Scale: 1" = 10'-0"

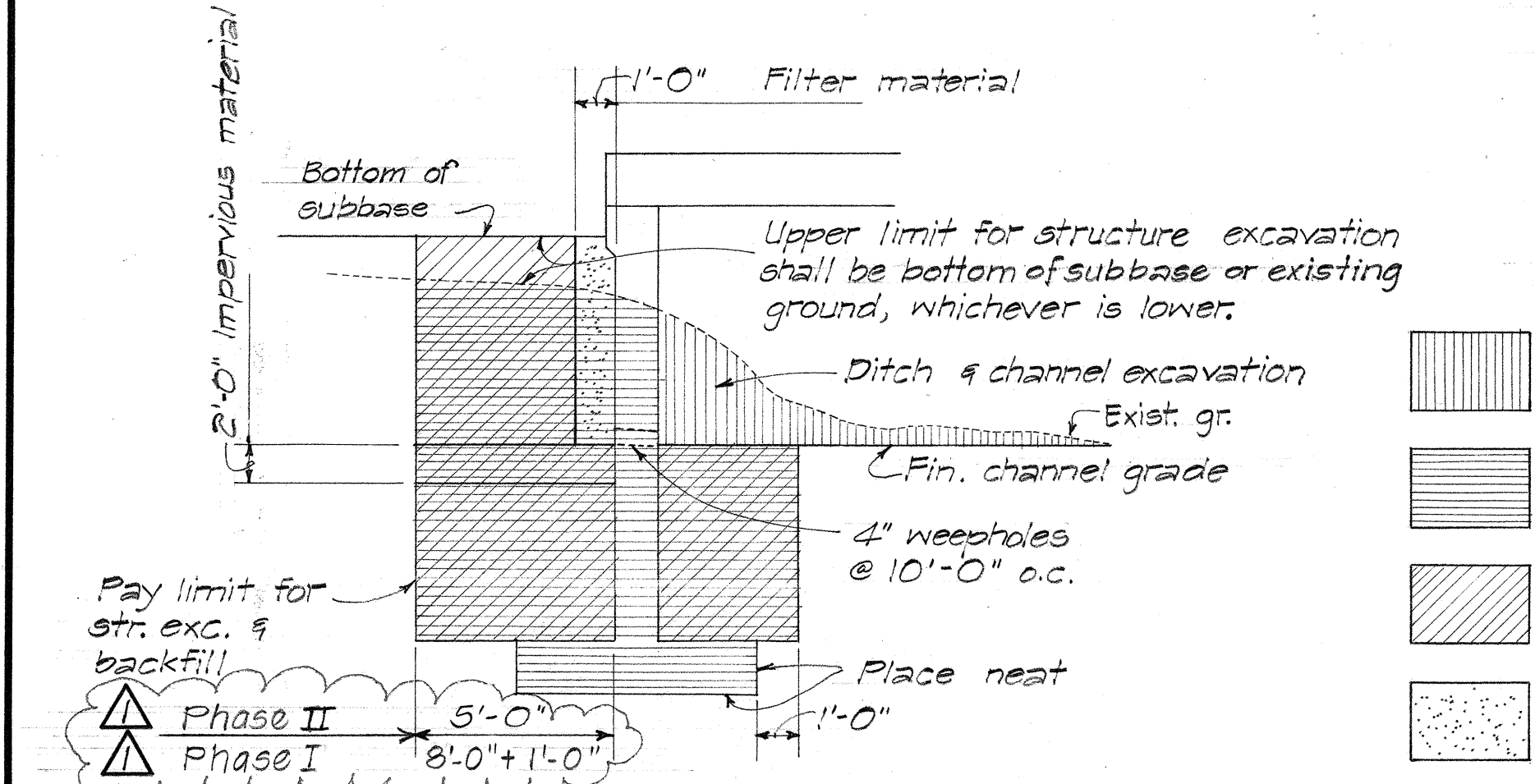
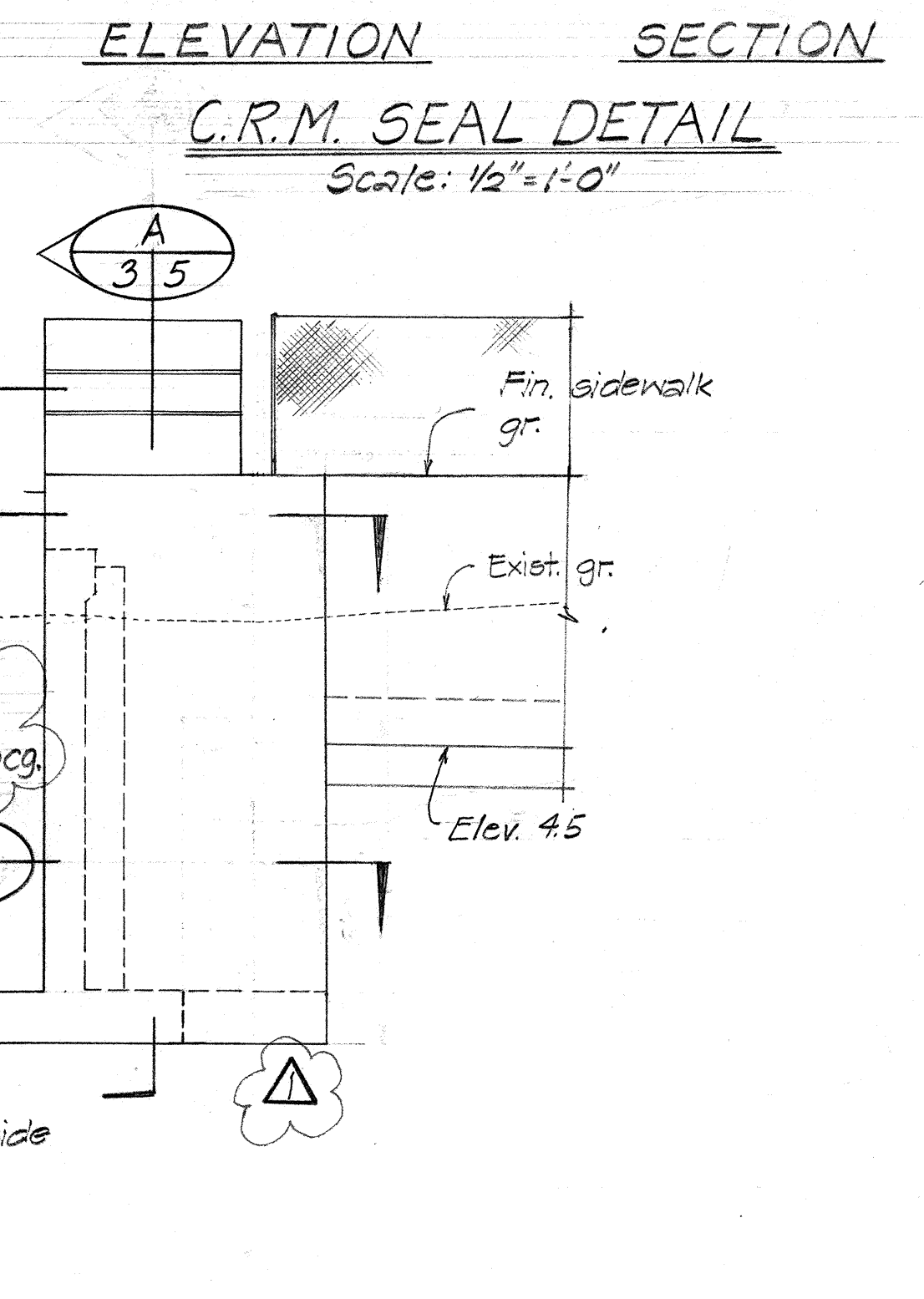
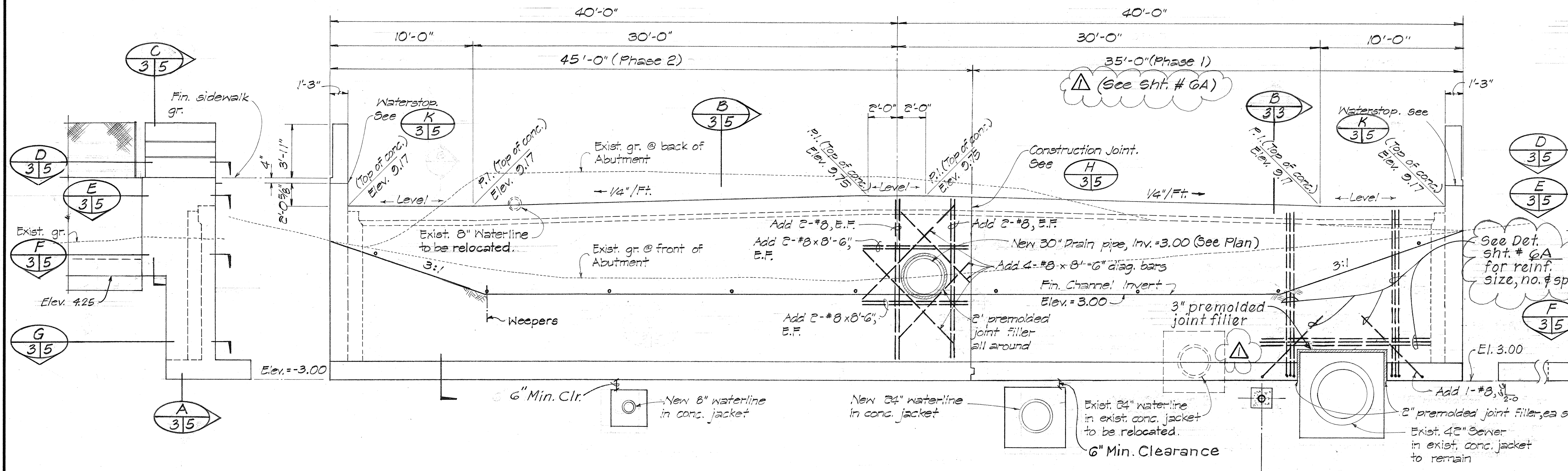
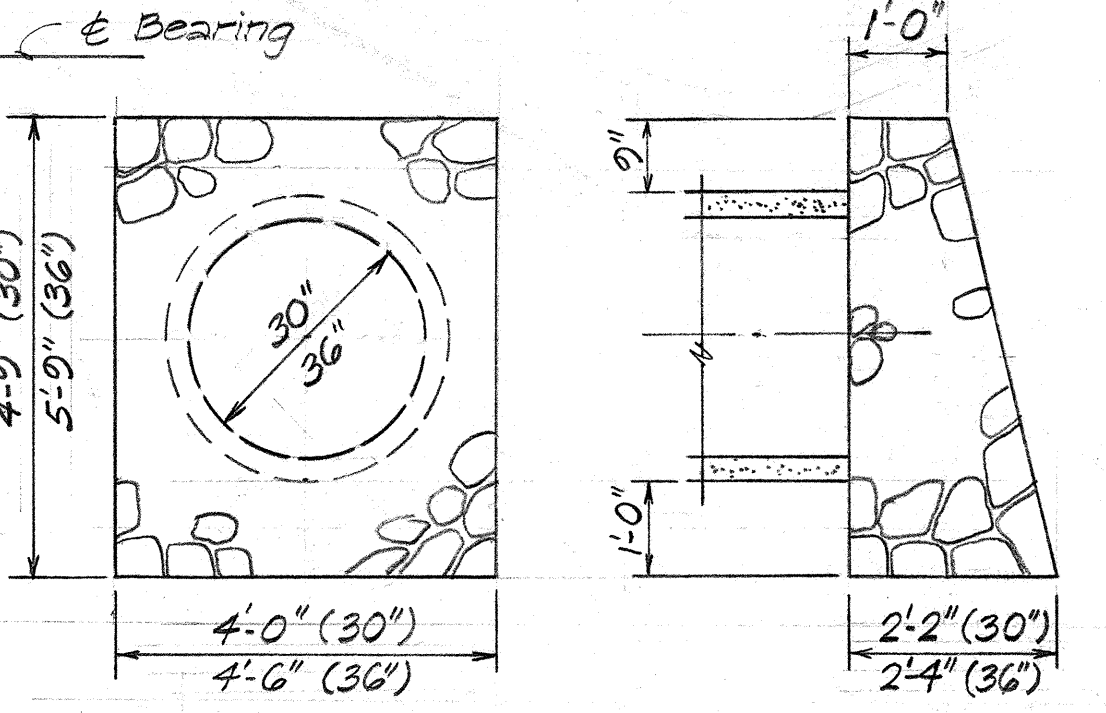
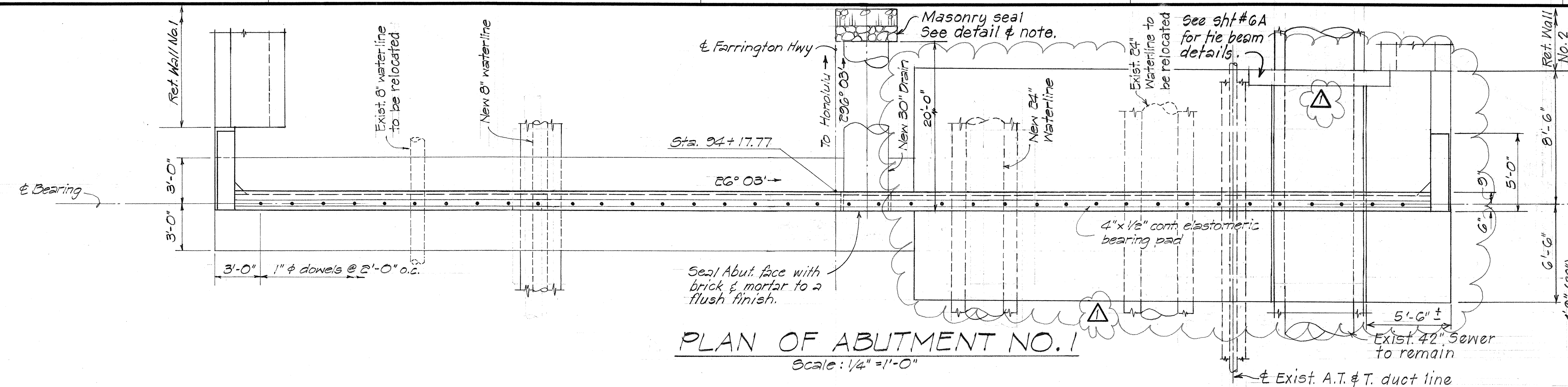


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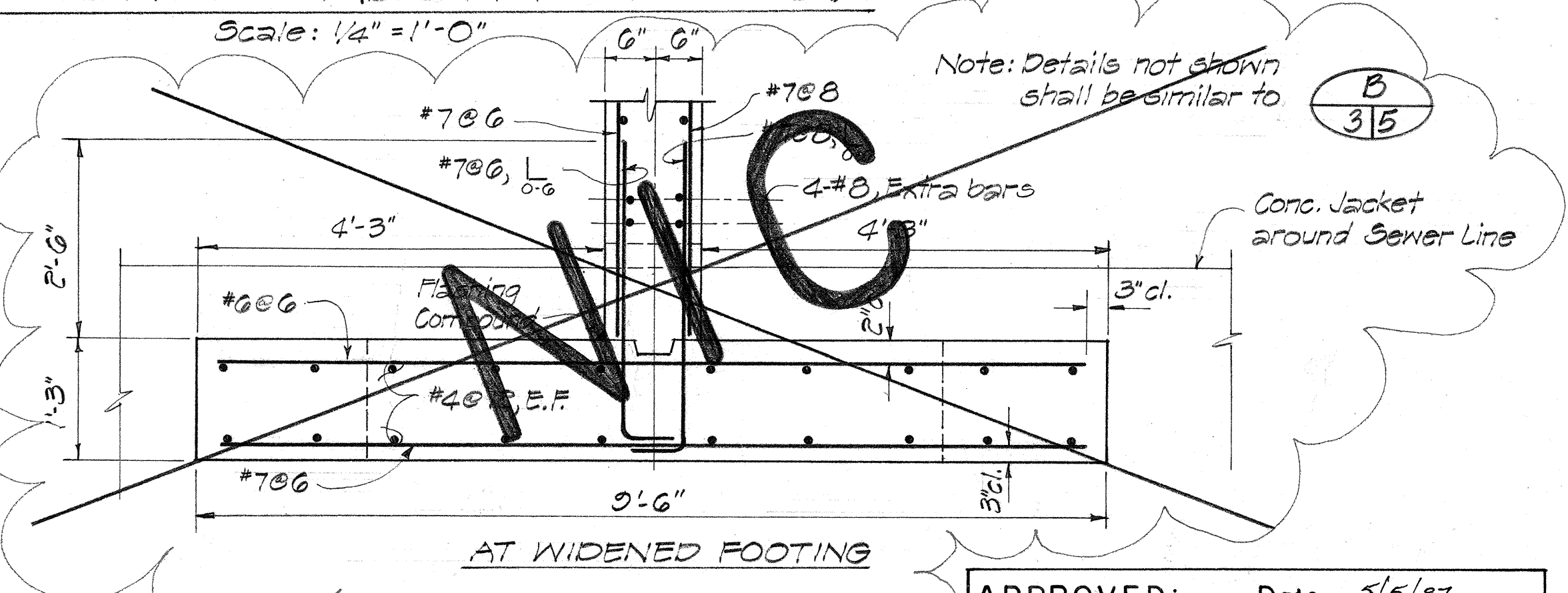
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
REPLACEMENT OF MAKAHA BRIDGE NO. 2	
BORING LOGS AND PHASE DIAGRAMS	
FARRINGTON HIGHWAY	
PROJECT NO. BR-093-1(10)	
SCALE: AS SHOWN	DATE: FEB. 1987
SHEET NO. 2 OF 13 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(10)	1987	15	27

- NOTES:**
- Seals @ both end of drain pipe shall be incidental to pipe
 - In lieu of C.R.M., 12 x 8 x 16" C.M.U. with #5 reinf. in each cell & cells solidly grouted, may be used.



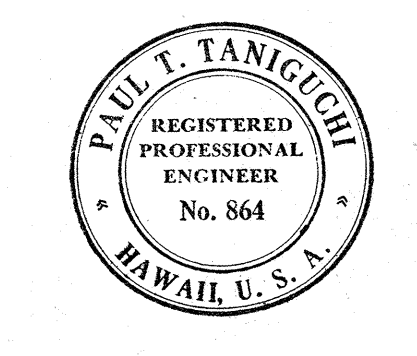
- LEGEND**
- Ditch & Channel Excavation
 - Structure Excavation
 - Structure Backfill for Abutments & Wingwalls
 - Filter Material



STRUCTURE EXCAVATION & BACKFILL DETAIL FOR ABUTMENTS

LEGEND

SECTION AT WIDENED FOOTING



APPROVED: Date 5/5/87
Chief, Planning & Engineering, BWS

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Revisions to Phase I abutment footing, retaining wall & reinforcing & structure excavation & backfill.

DATE 3/2/88

REVISIONS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

REPLACEMENT OF MAKAHA BRIDGE NO. 2

ABUTMENT NO. 1 PLAN & ELEVATION

STRUCTURE EXCAVATION & BACKFILL DETAIL

FARRINGTON HIGHWAY

PROJECT NO. BR-093-1(10)

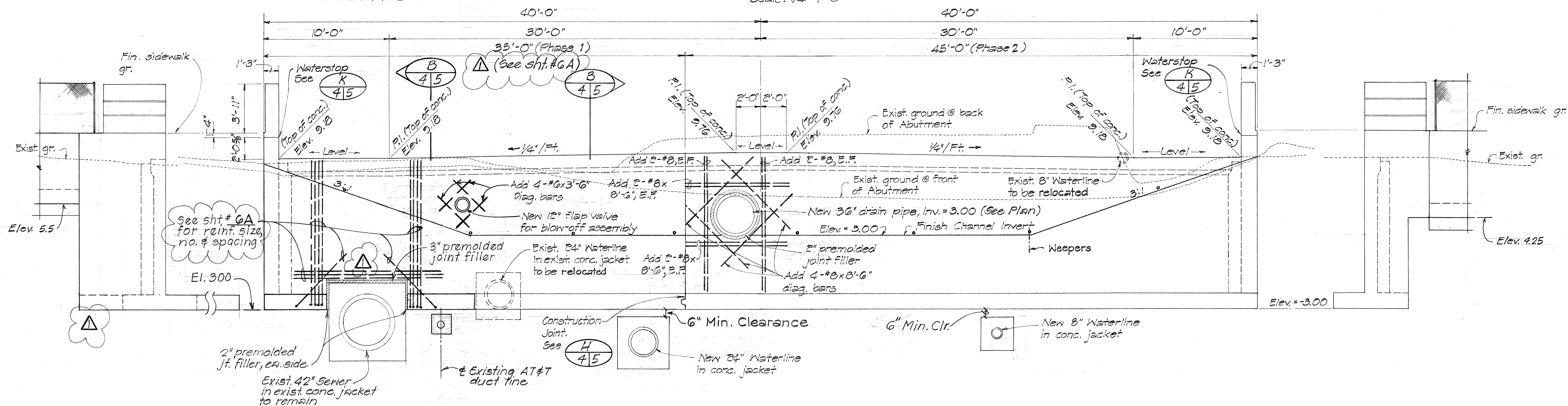
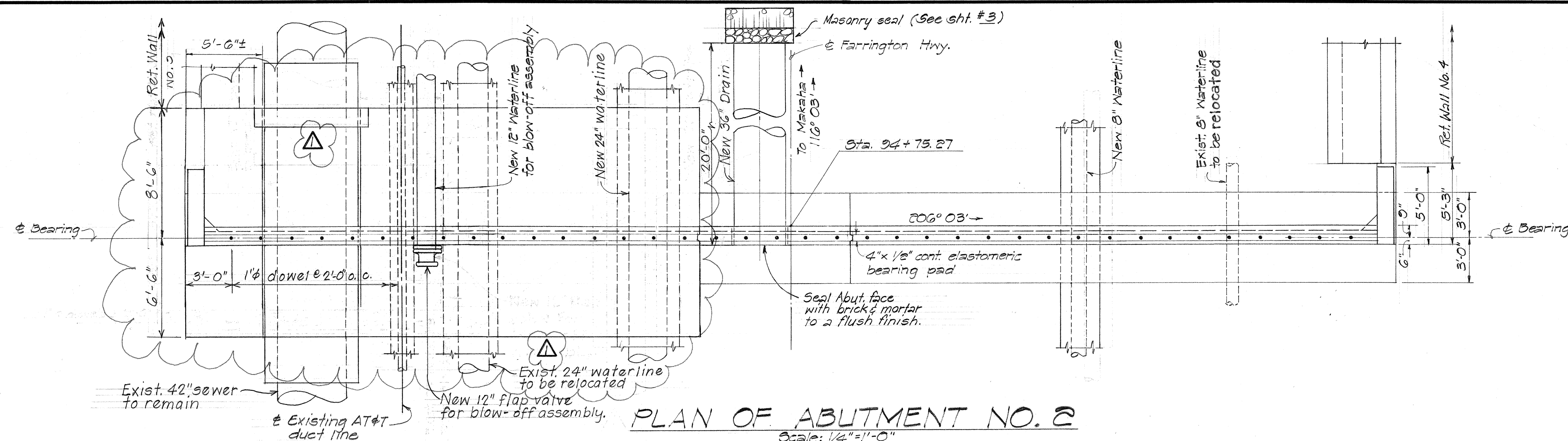
SCALE: AS SHOWN

DATE: FEB. 1987

SHEET NO. 3 OF 13 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR093-1(10)	1987	16	27

PROJECT NO. 930-01-70



ELEVATION OF ABUTMENT NO. 2
Scale: 1/4" = 1'-0"

3/2/88 Revisions to Phase 1 abutment fig, retaining wall & reinf.
DATE REVISIONS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

REPLACEMENT OF MAKAHA BRIDGE NO. 2
ABUTMENT NO. 2 PLAN & ELEVATION

FARRINGTON HIGHWAY
PROJECT NO. BR-093-1(10)
SCALE: AS SHOWN DATE: FEB. 1987
SHEET NO. 4 OF 13 SHEETS



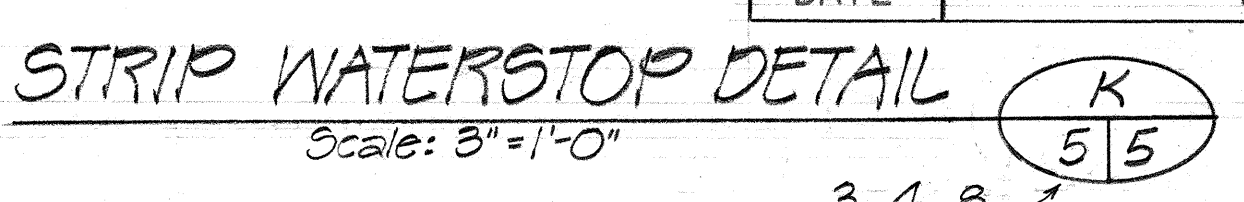
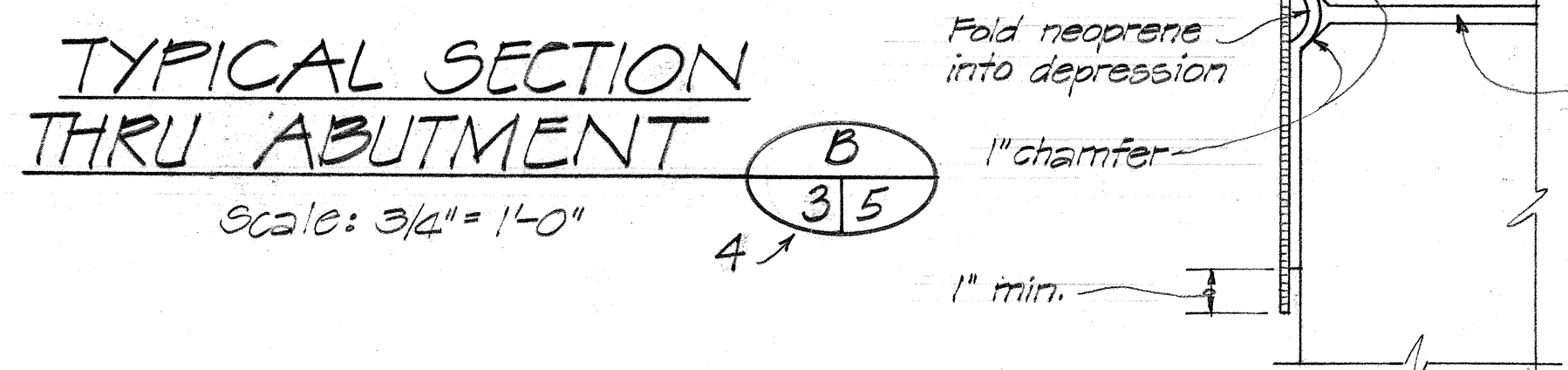
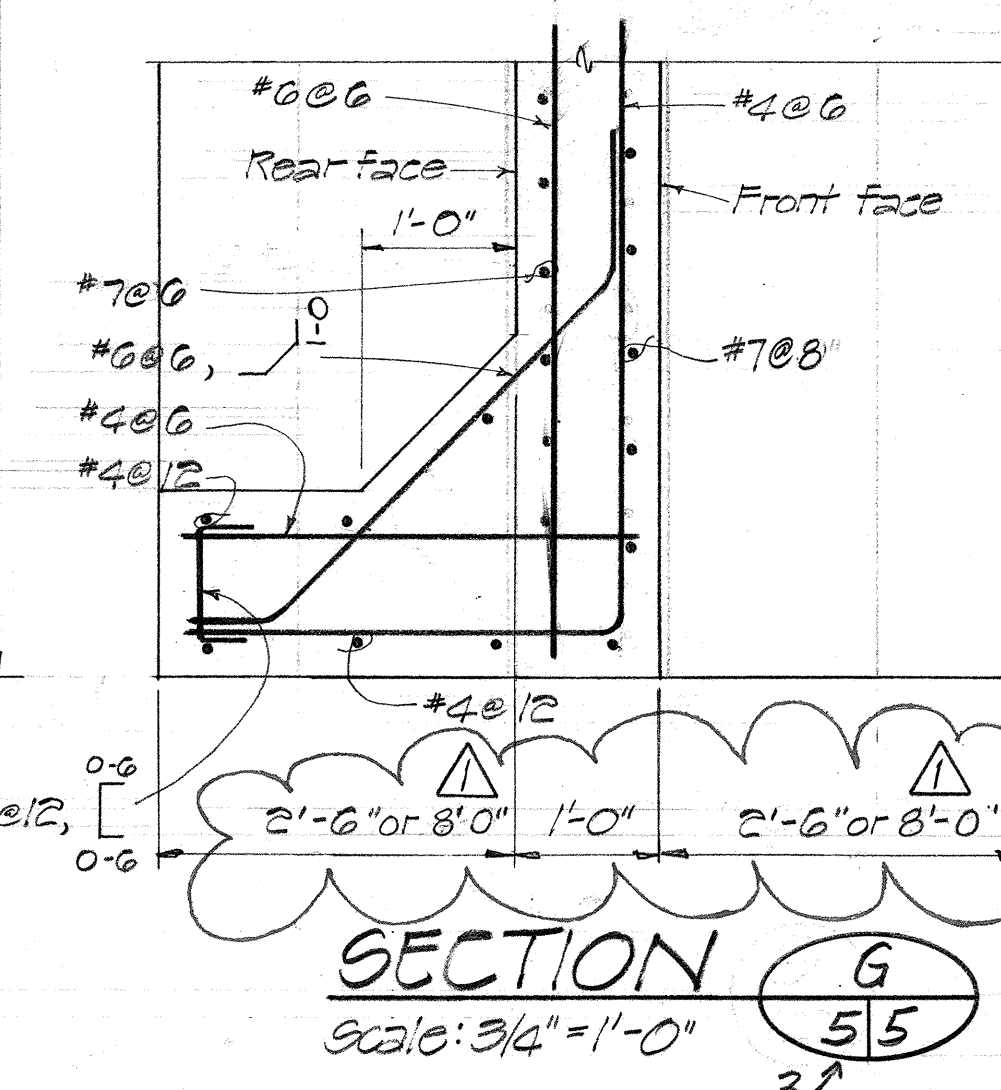
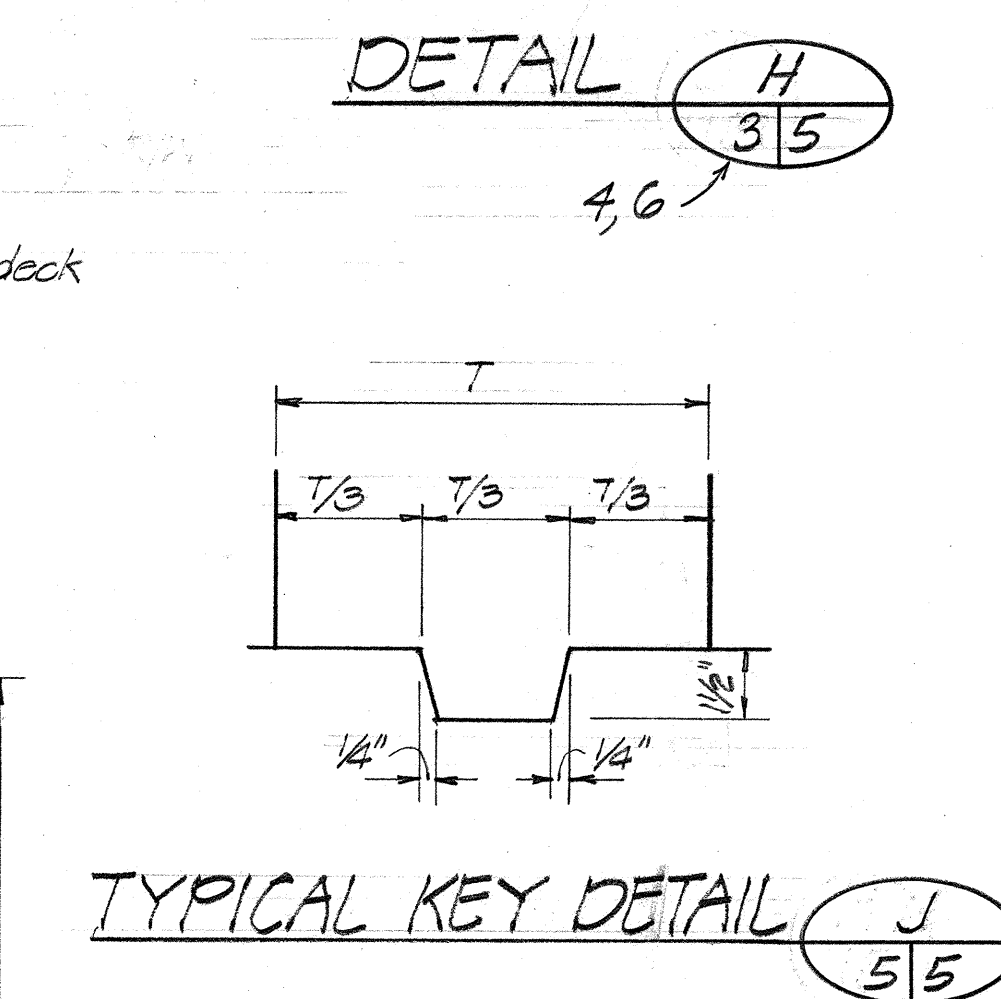
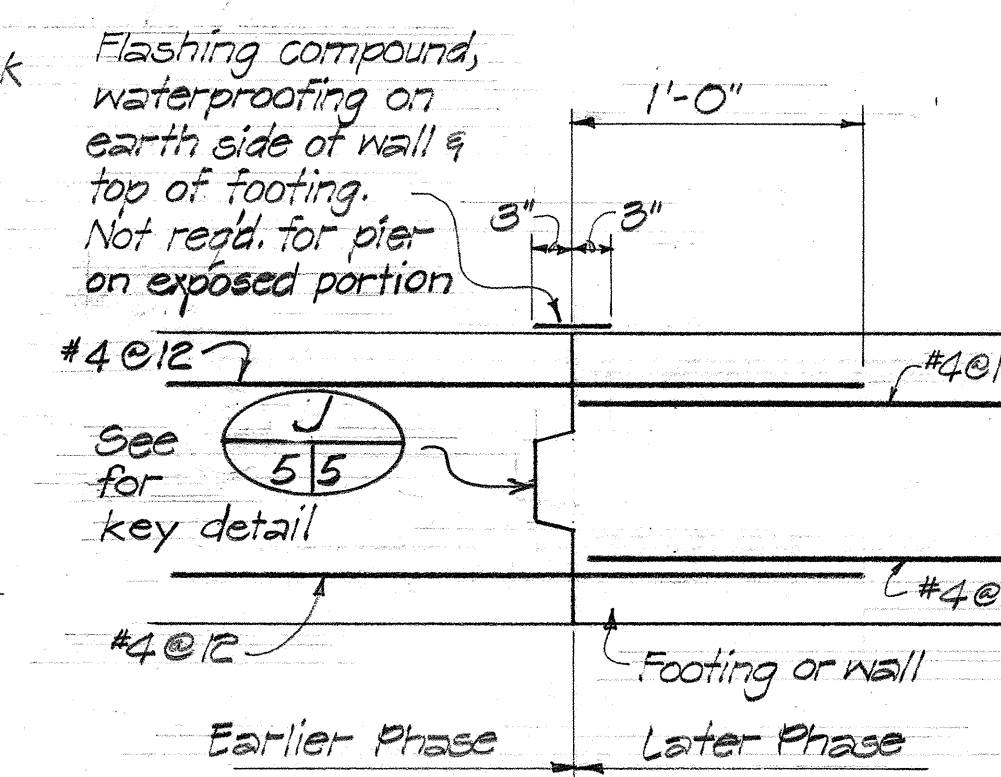
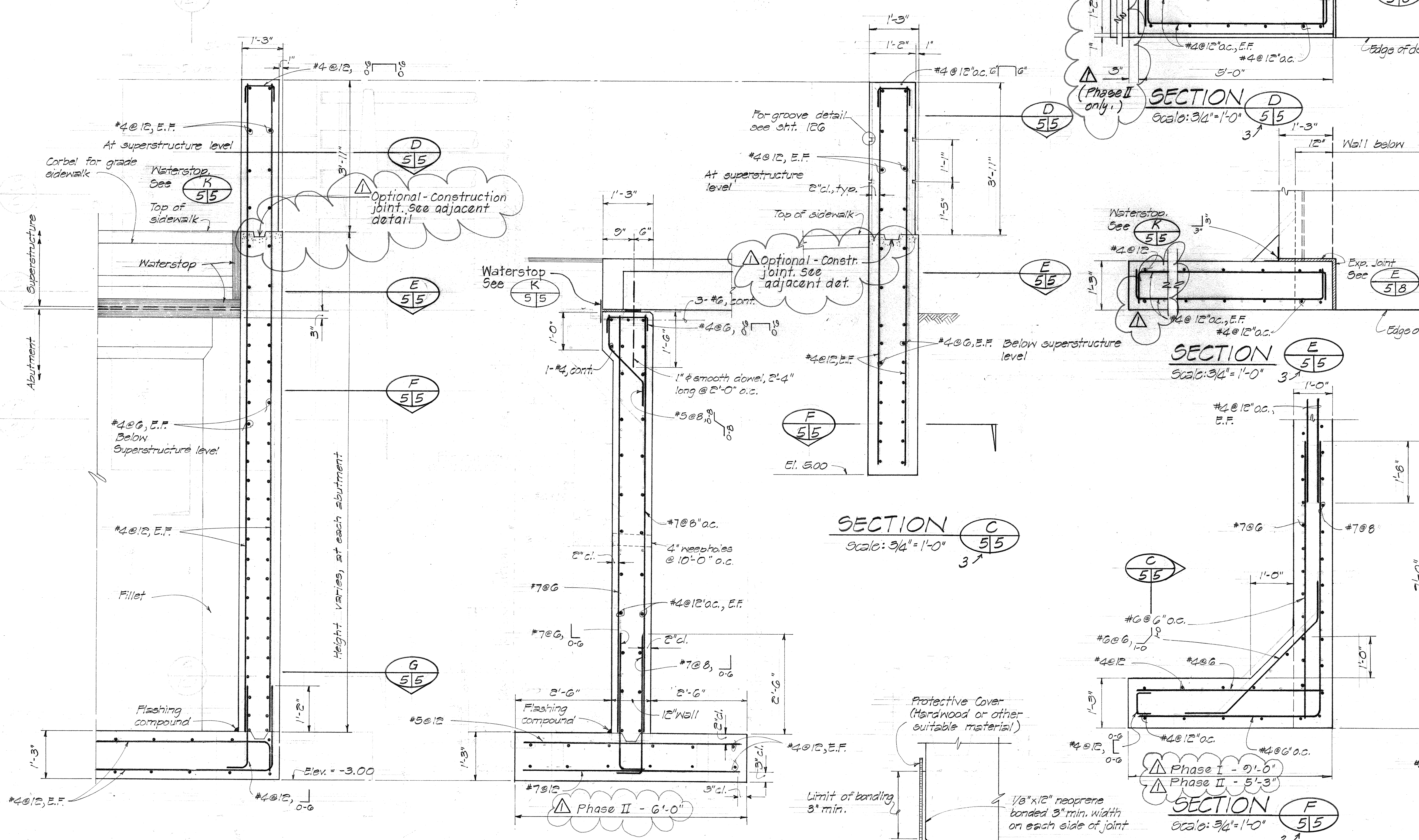
APPROVED: Date 5/5/87
Chief, Planning & Engineering, BWS

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Paul T. Taniguchi

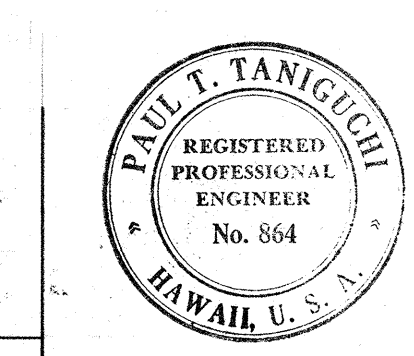
C.O. 16

DATE
SURVEY PLOTTED BY
DRAWN 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.	BR-093-1(10)	1987	17	27



DATE	REVISIONS
3/2/88	Addition of optional construction joint & dimensions.



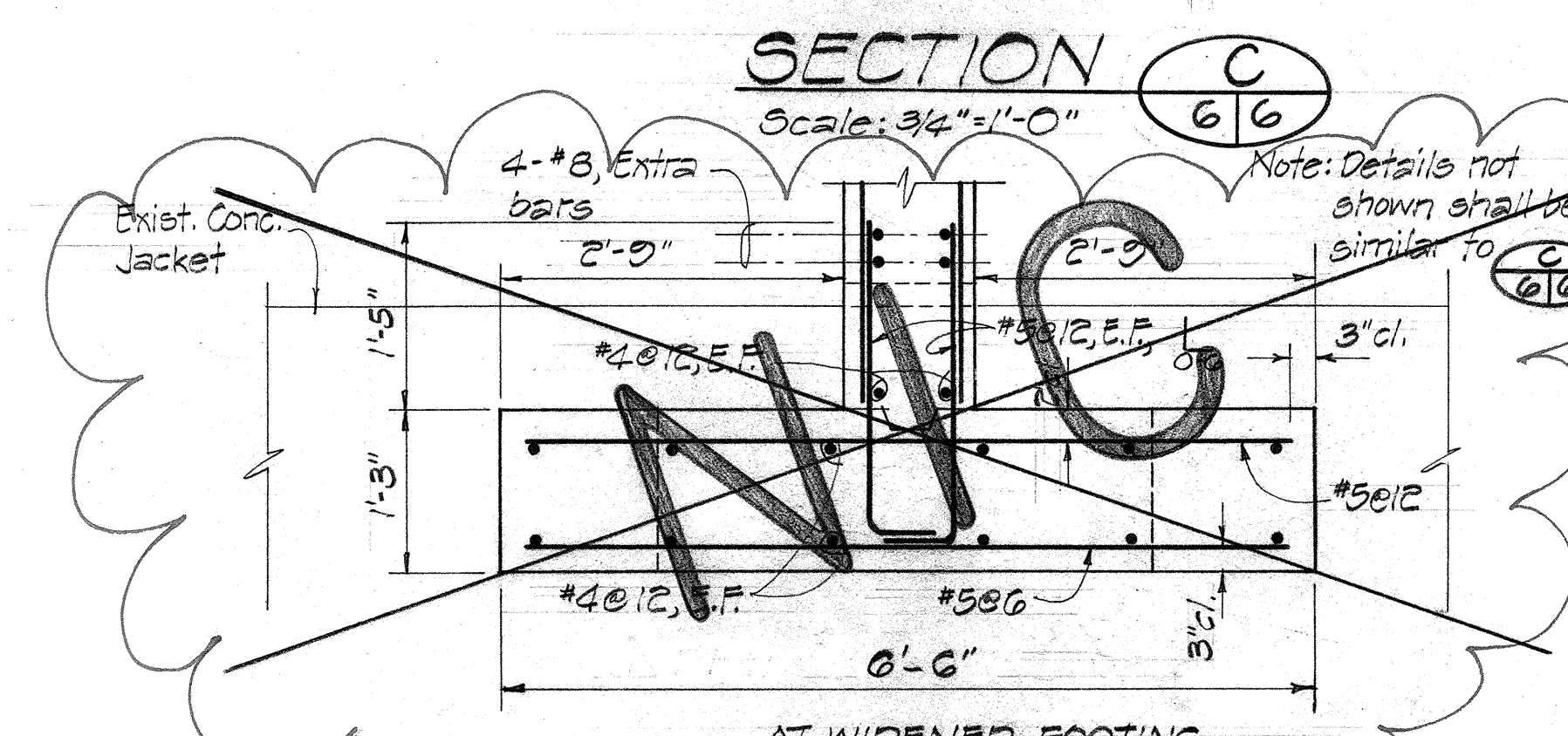
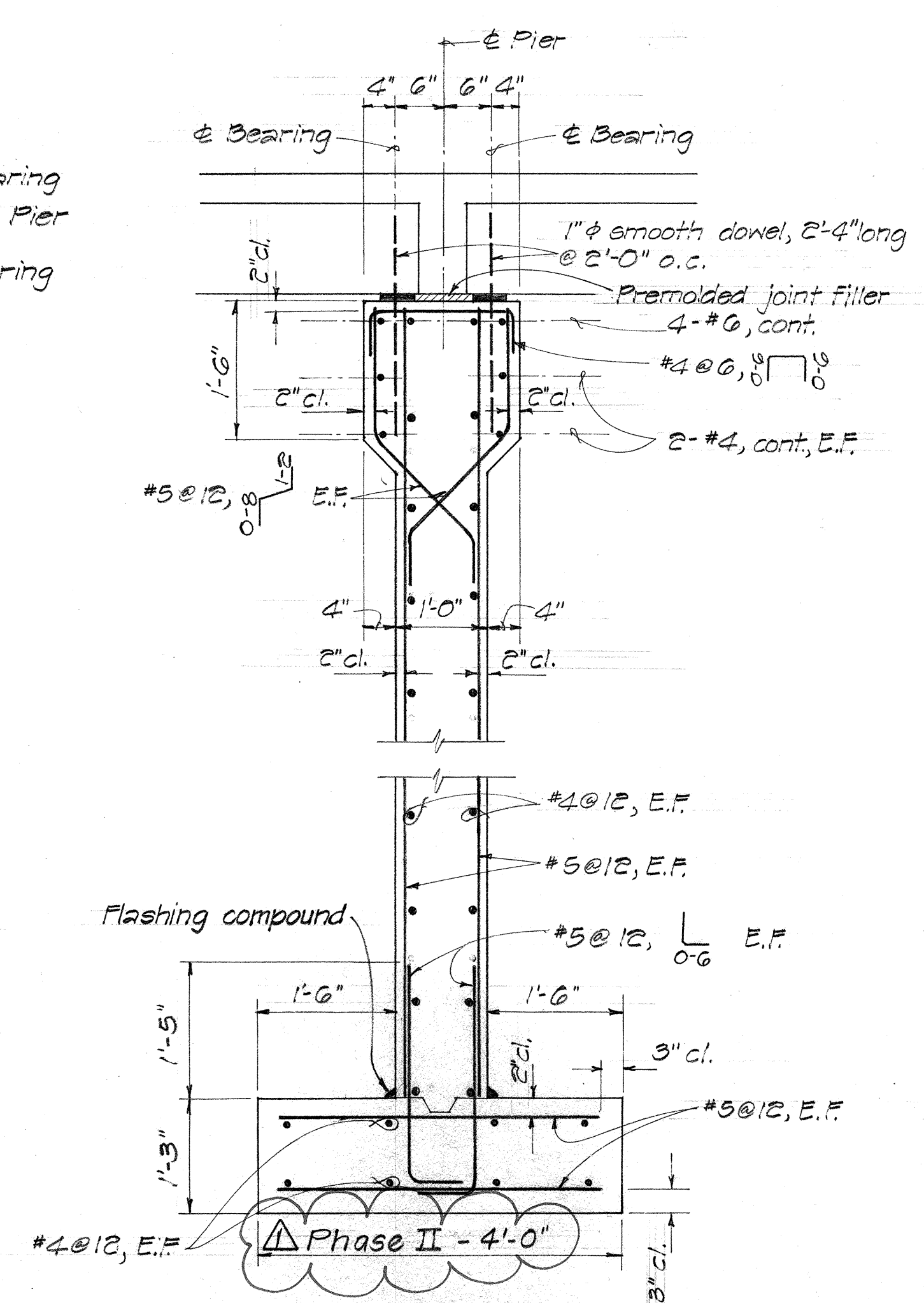
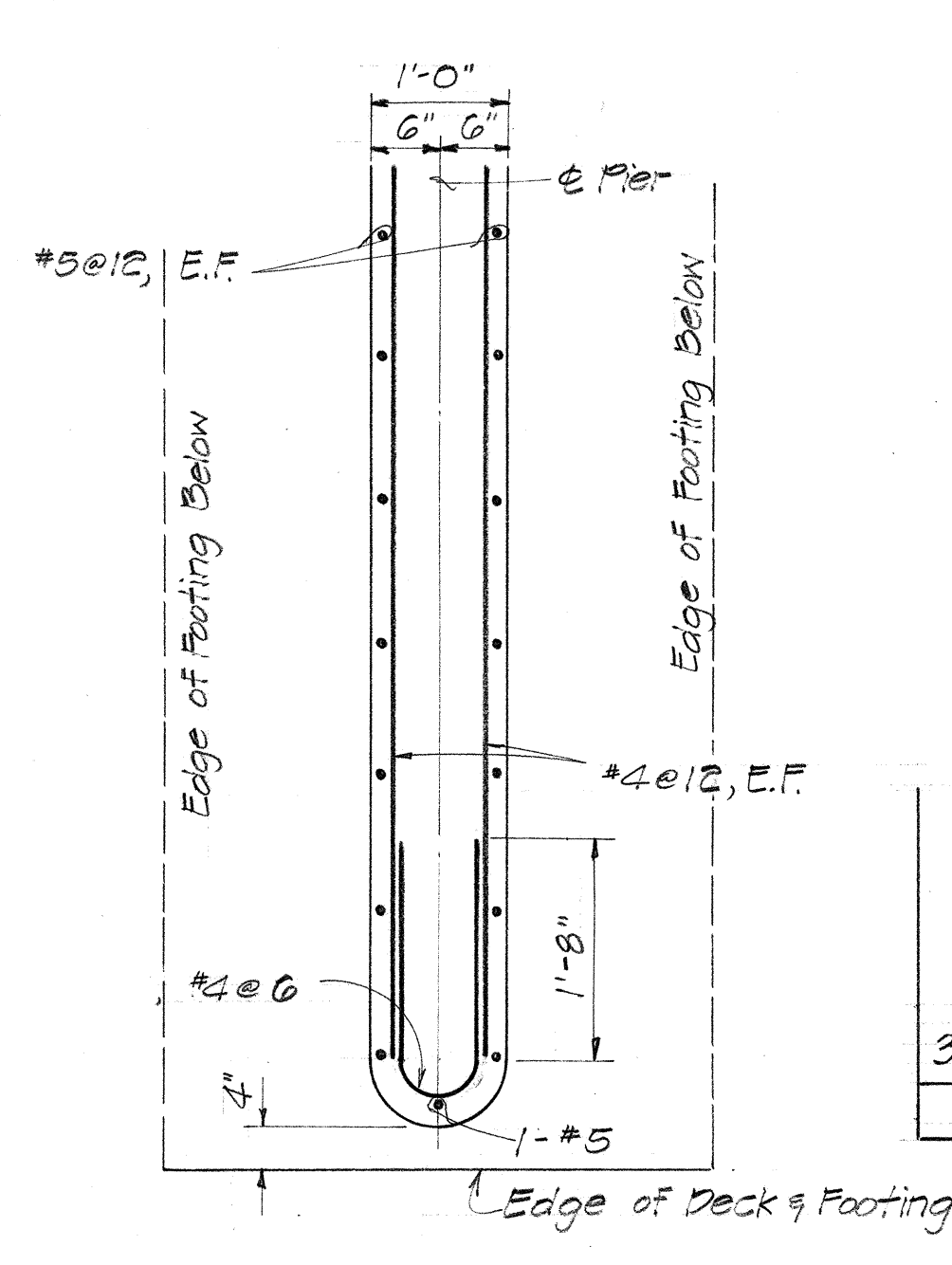
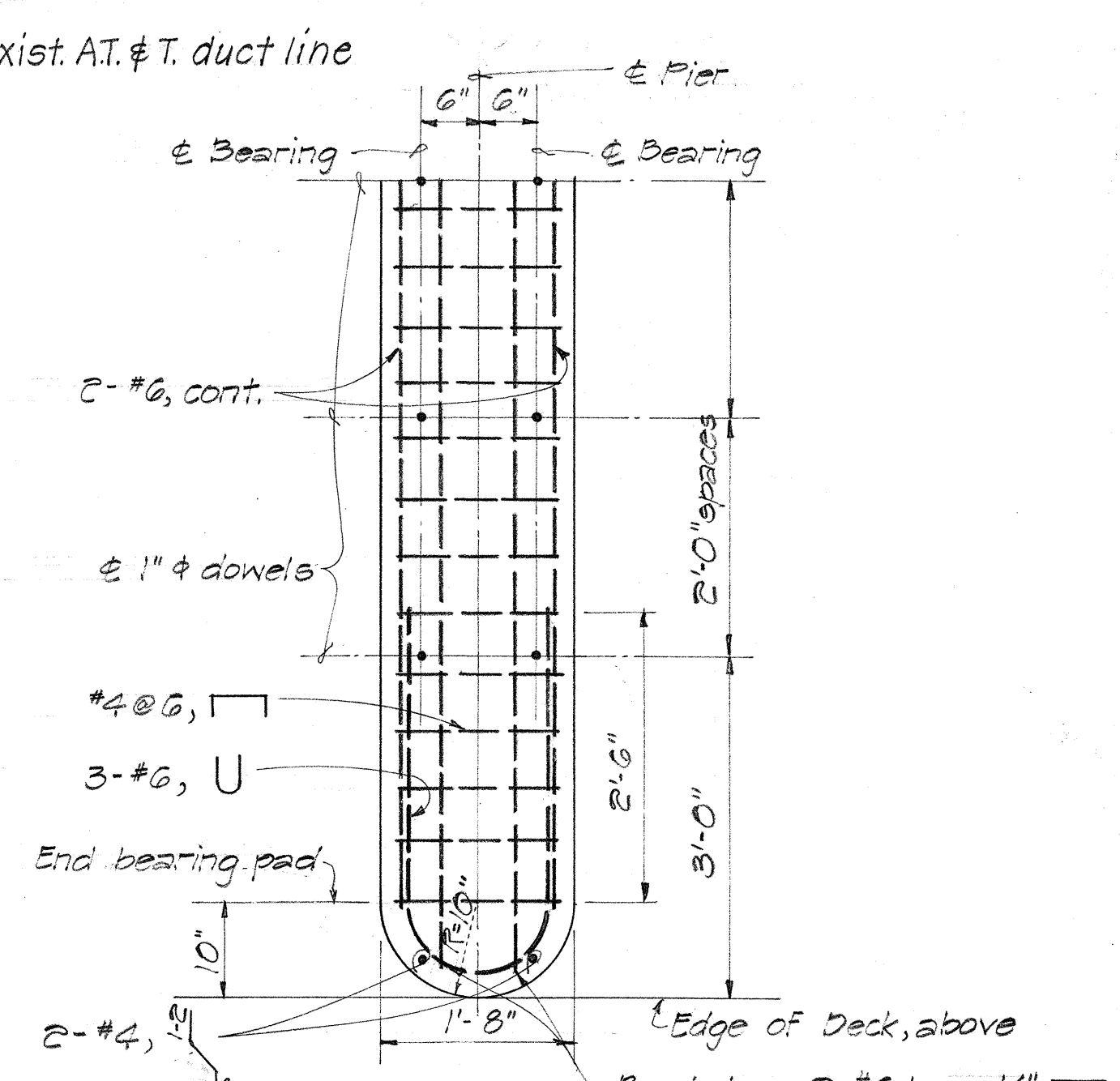
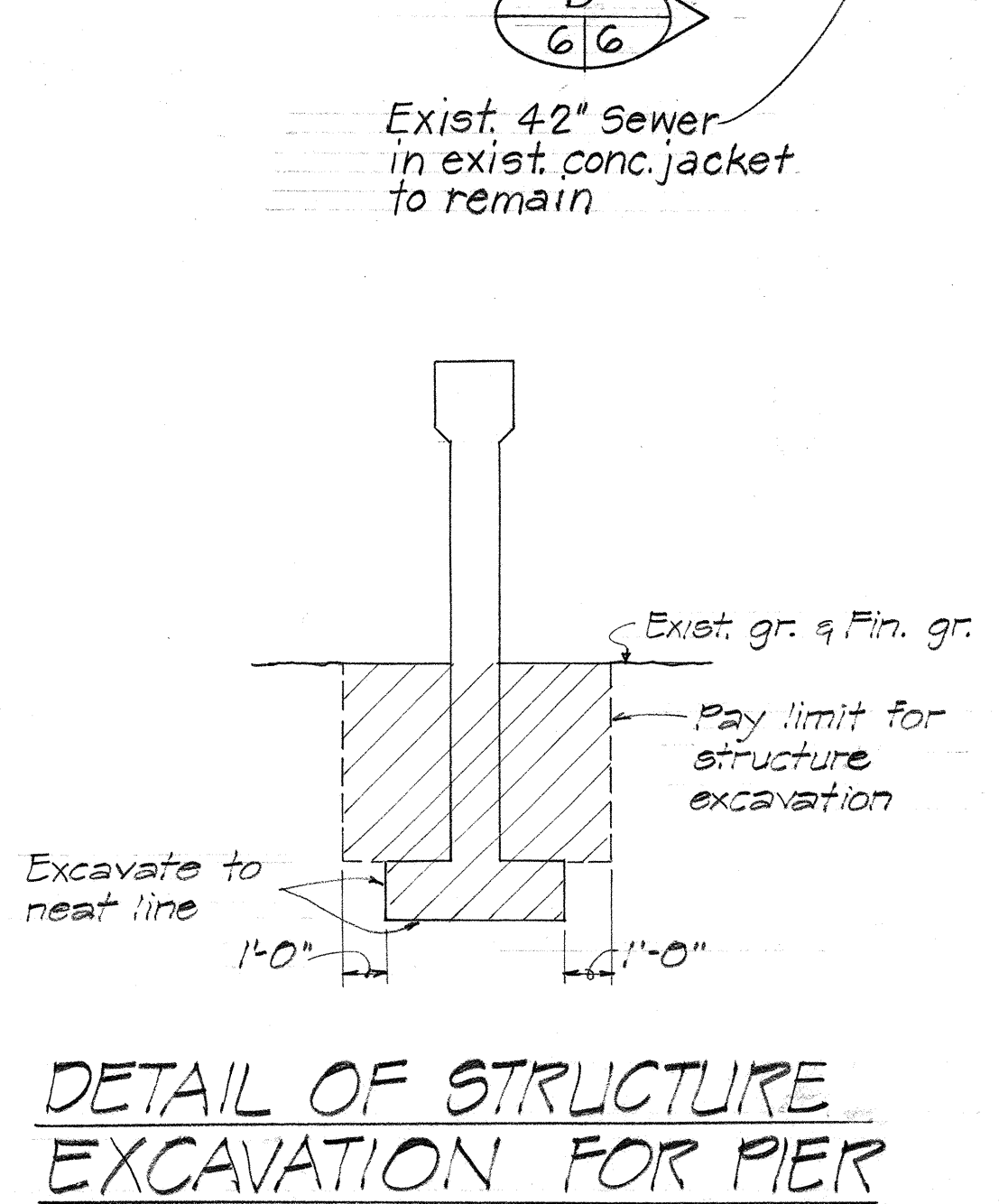
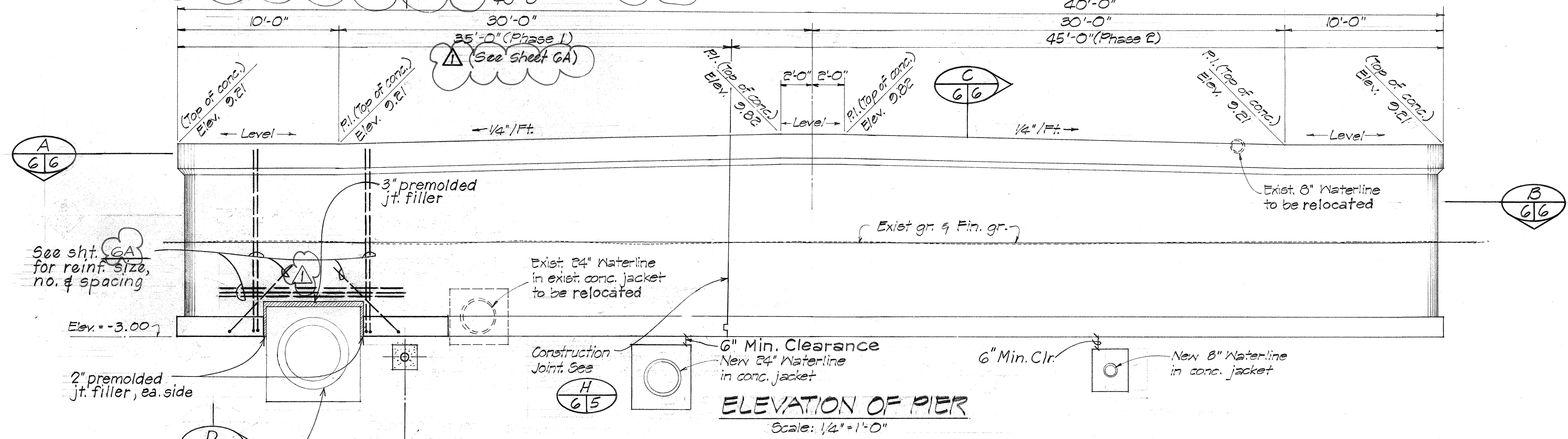
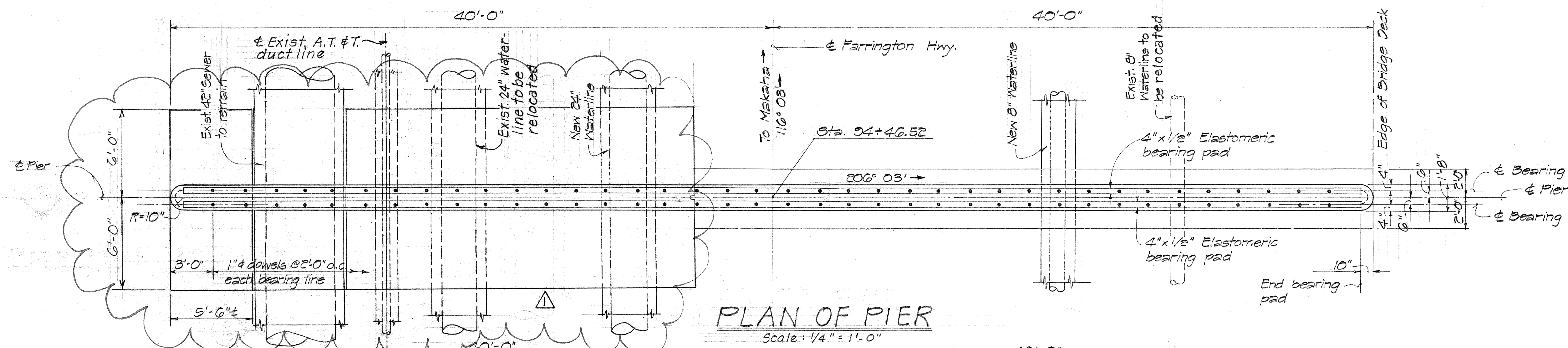
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**REPLACEMENT OF MAKAHA BRIDGE NO. 2
ABUTMENT, END POST & WING WALL DETAILS**

FARRINGTON HIGHWAY
PROJECT NO. BR-093-1(10)
SCALE: AS SHOWN DATE: FEB. 1987

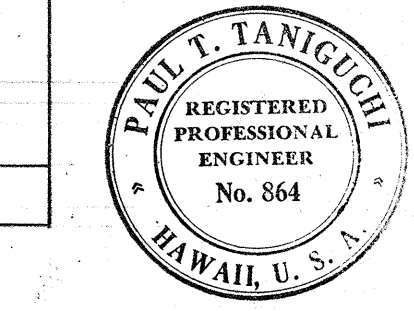
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DRAWN BY: _____
CHECKED BY: _____
ORIGINAL PLAN: _____
NOTE BOOK: _____
NO: _____

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(10)	1987	18	27



DATE	REVISIONS
3/2/88	Revision to Phase I pier footing & pier reinf.

APPROVED: Date 5/5/87
 Chief, Planning & Engineering, BWS



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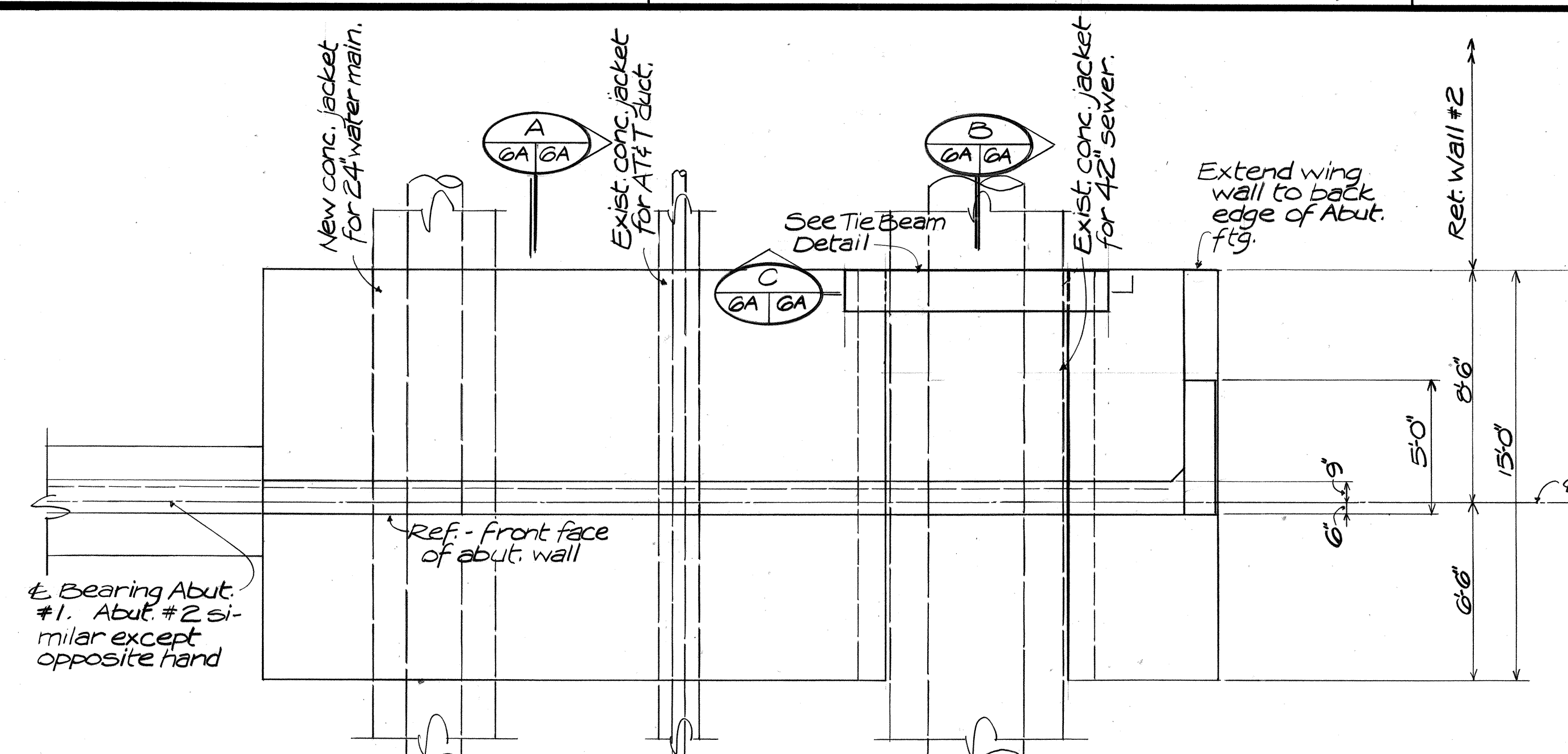
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

REPLACEMENT OF MAKAHA BRIDGE NO. 2
PIER - PLAN ELEVATION & SECTIONS

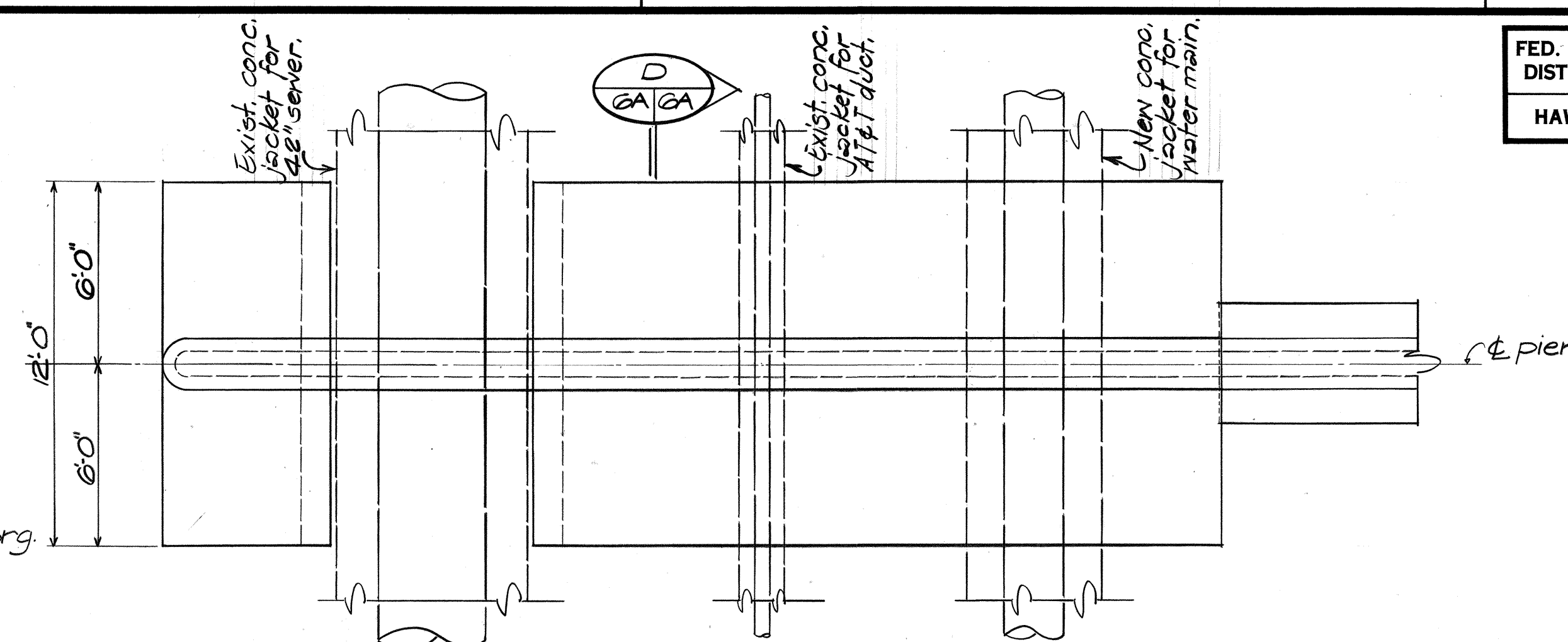
FARRINGTON HIGHWAY
 PROJECT NO. BR-093-1(10)
 SCALE: AS SHOWN DATE: FEB. 1987

SHEET NO. 6 OF 13 SHEETS

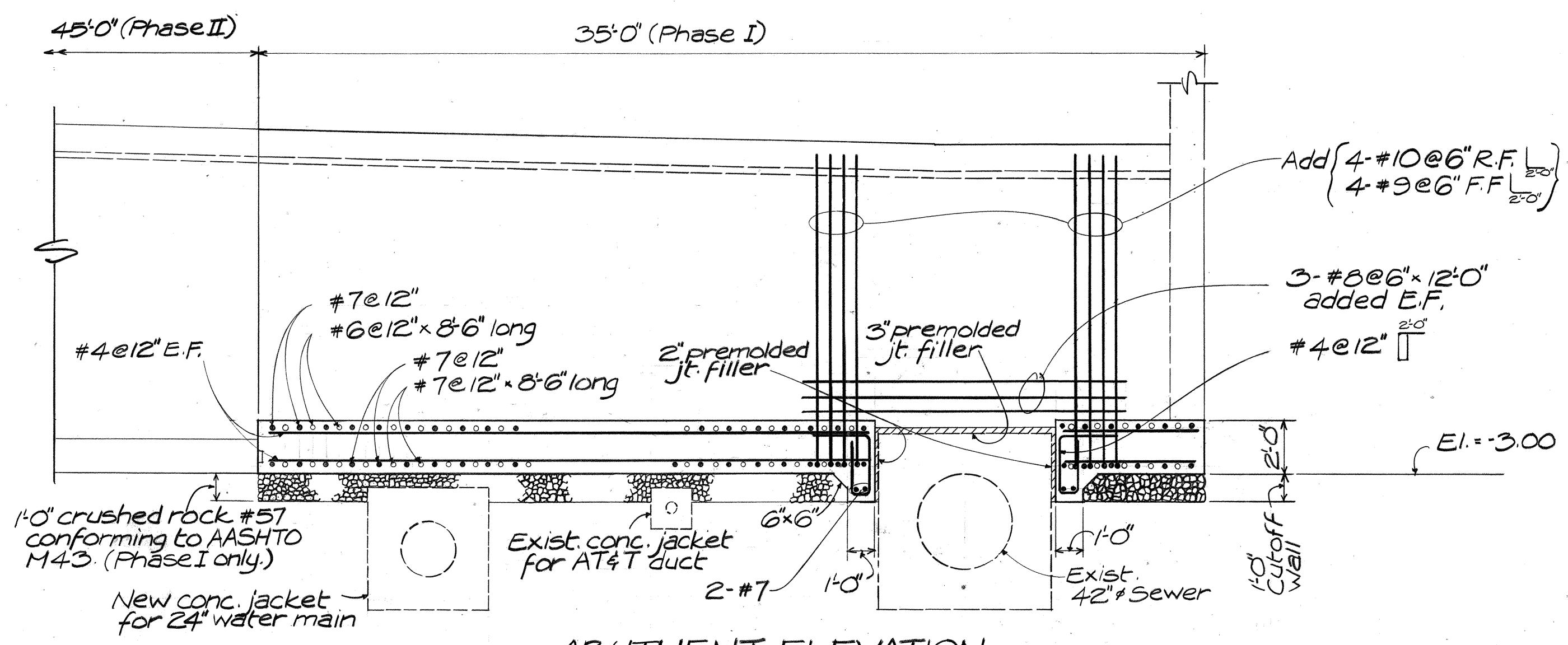
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(10)	1988	185-1	27



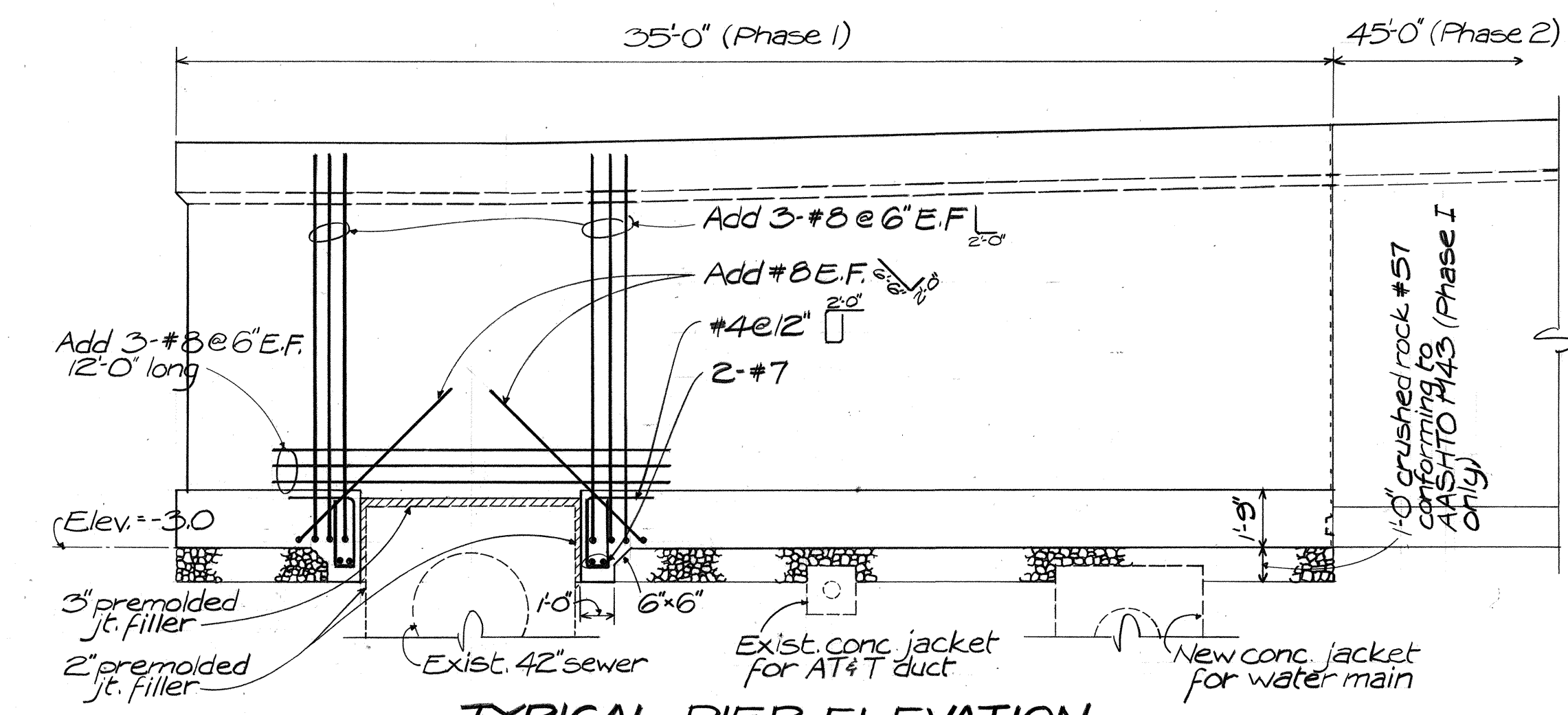
ABUTMENT PLAN
Scale: 1/4" = 1'-0"



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

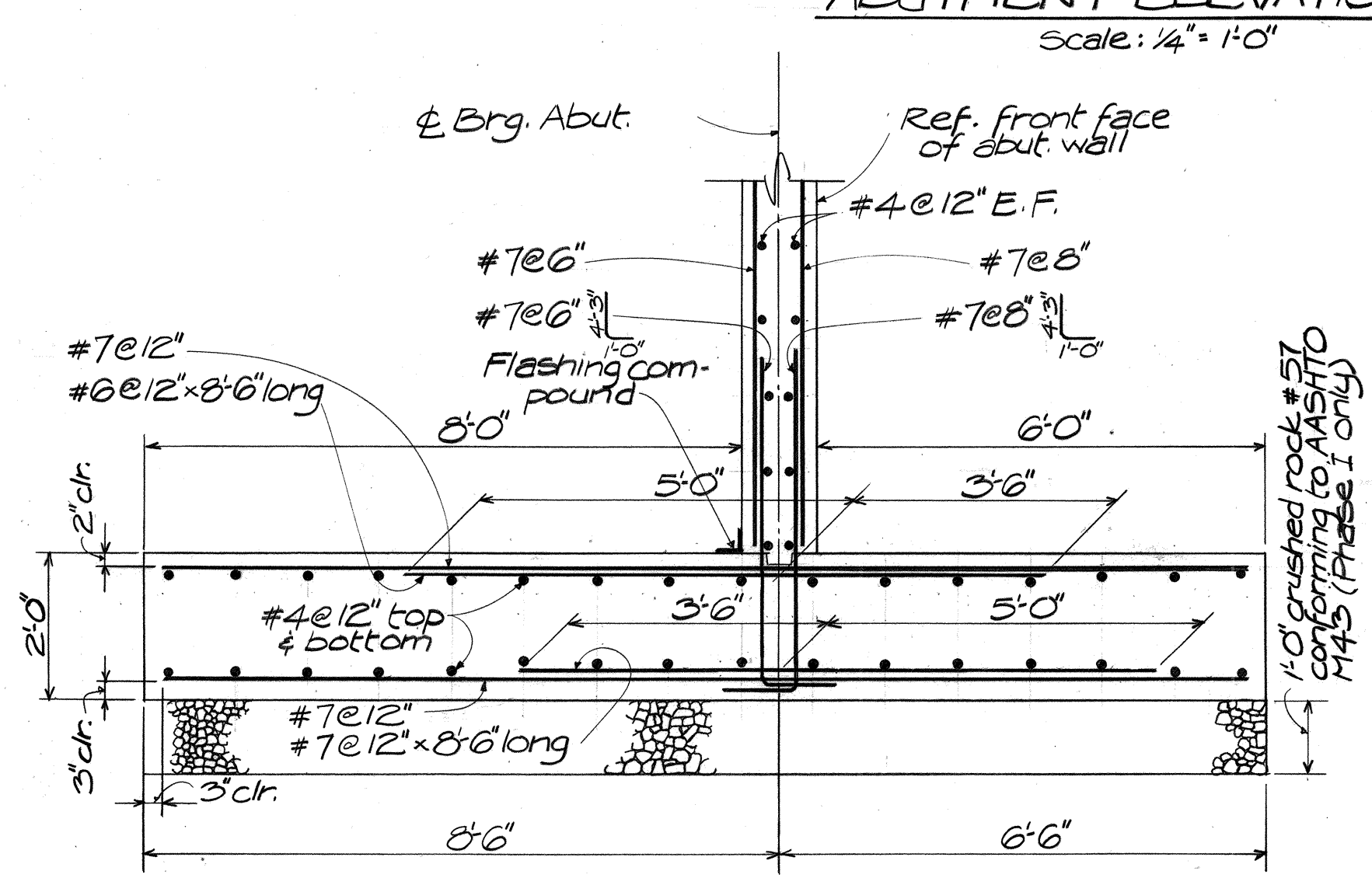


ABUTMENT ELEVATION
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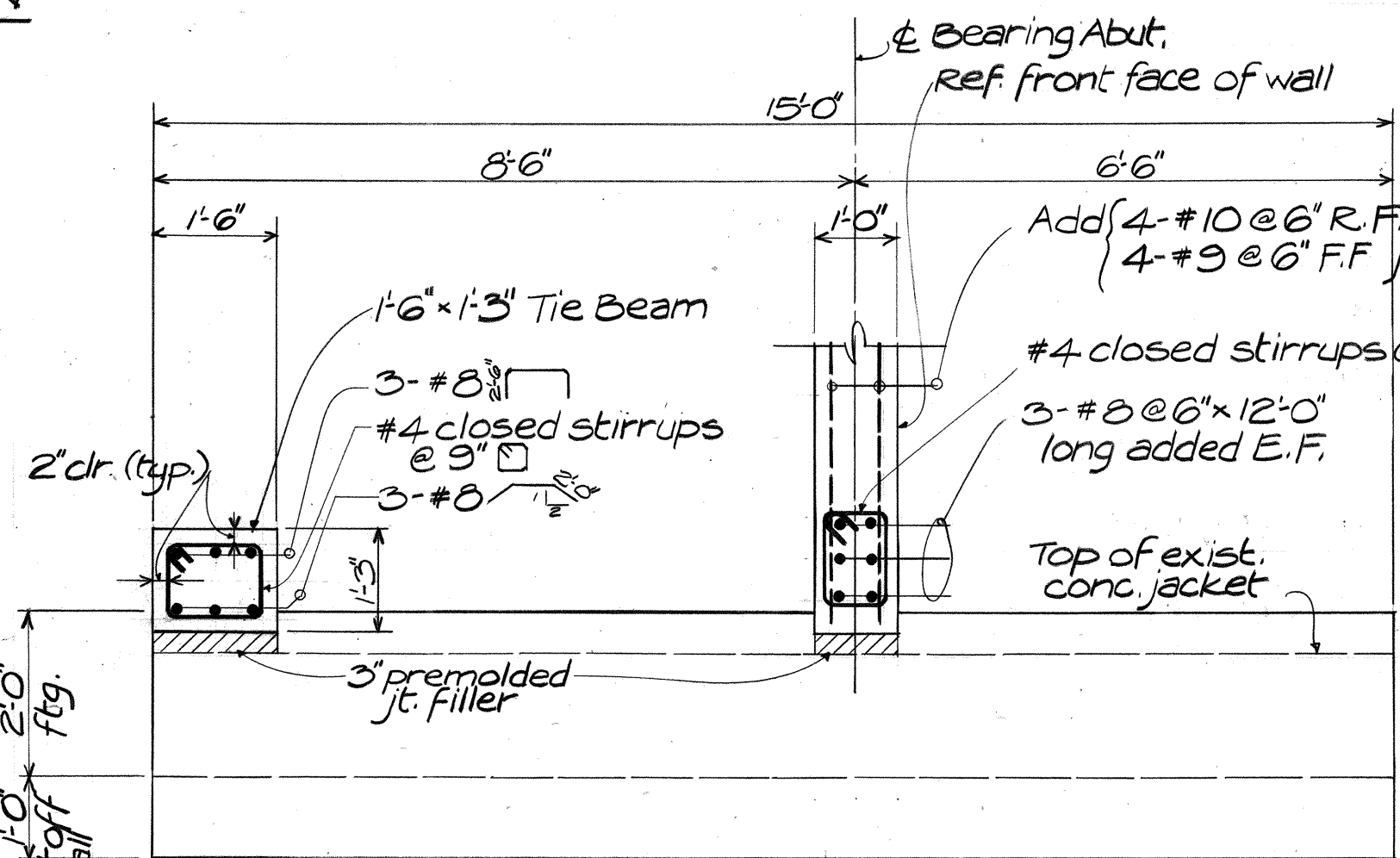


TYPICAL PIER ELEVATION
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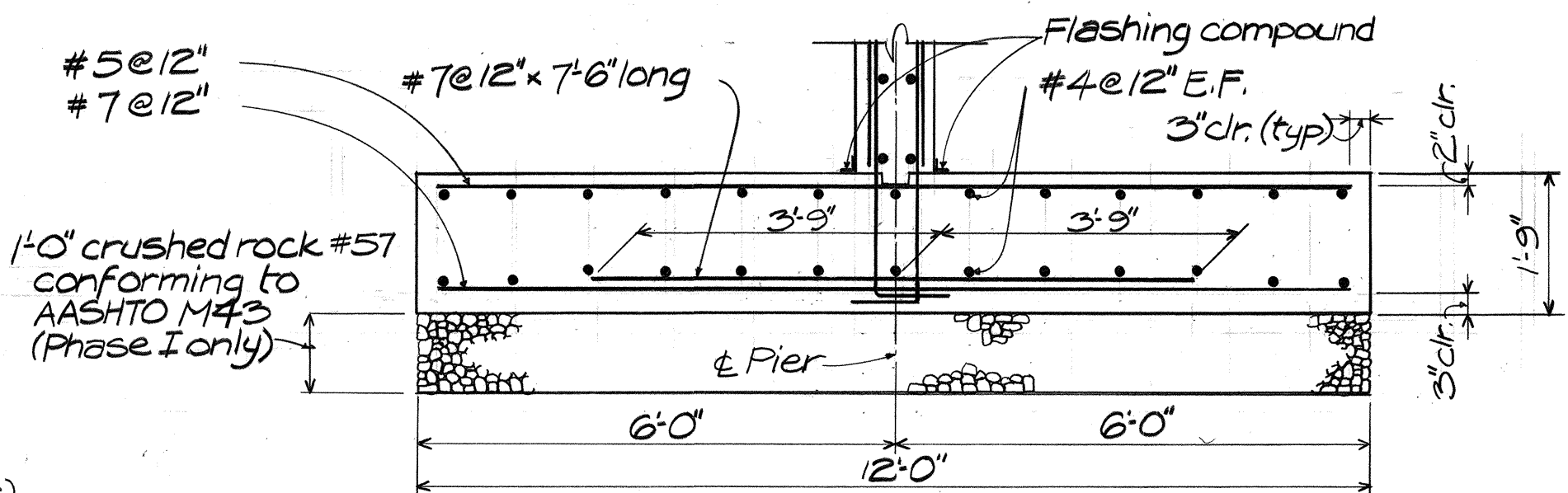
Note
For additional information:
See Shts. 1, 3, 4, 5 & 6.



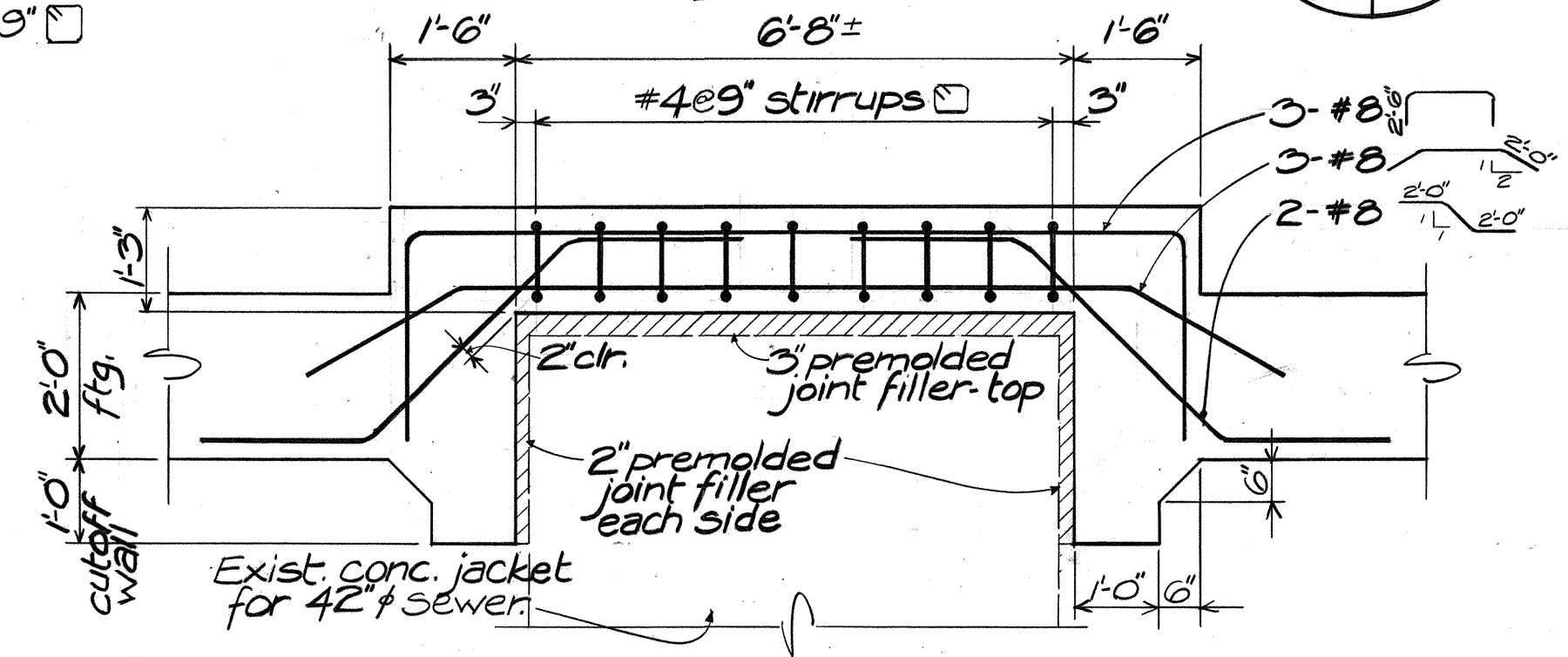
TYPICAL ABUTMENT FOOTING SECTION
Scale: 1/2" = 1'-0"



SECTION @ TIE BEAM
Scale: 1/2" = 1'-0"



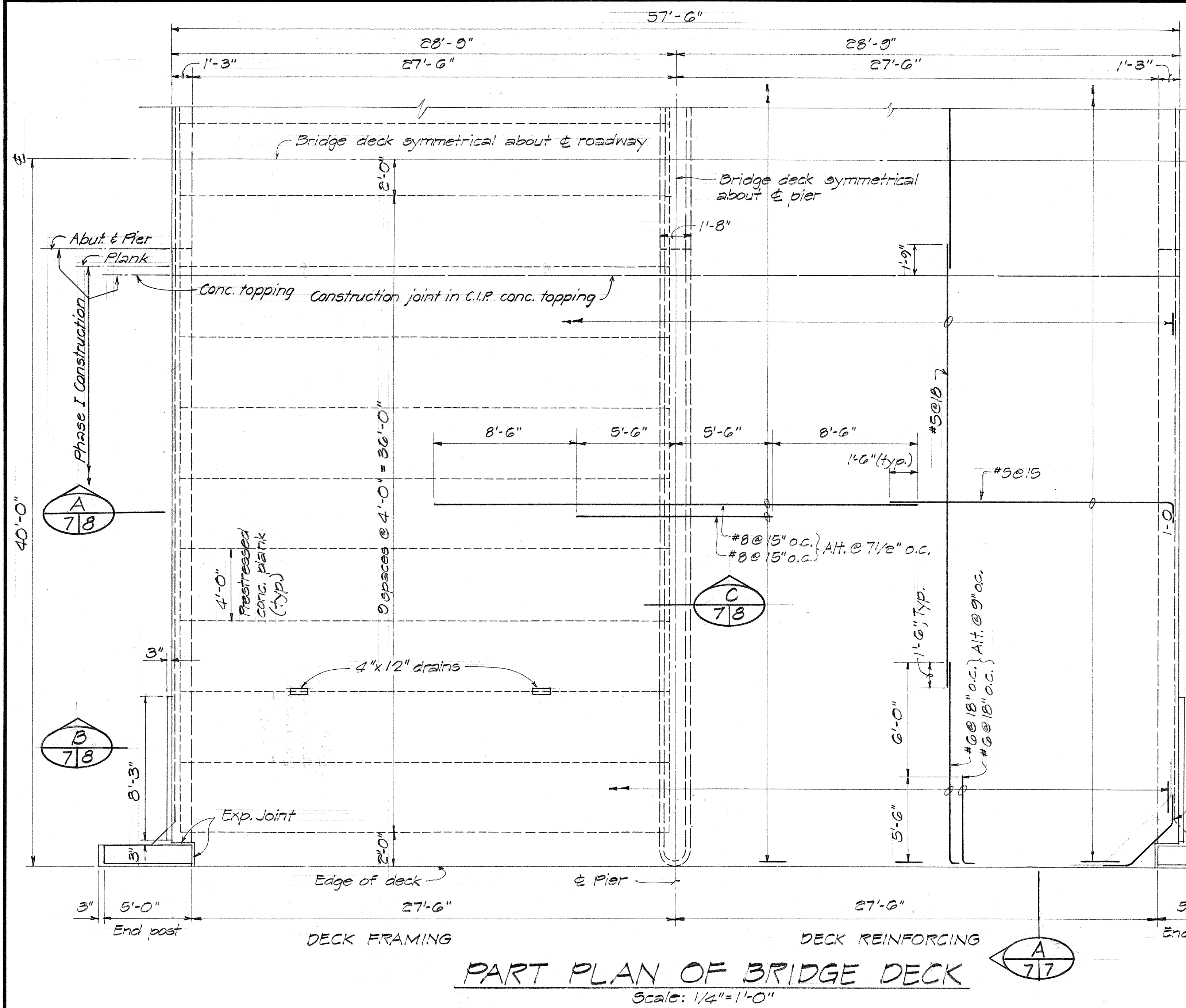
TYPICAL PIER FOOTING DETAIL
Scale: 1/2" = 1'-0"



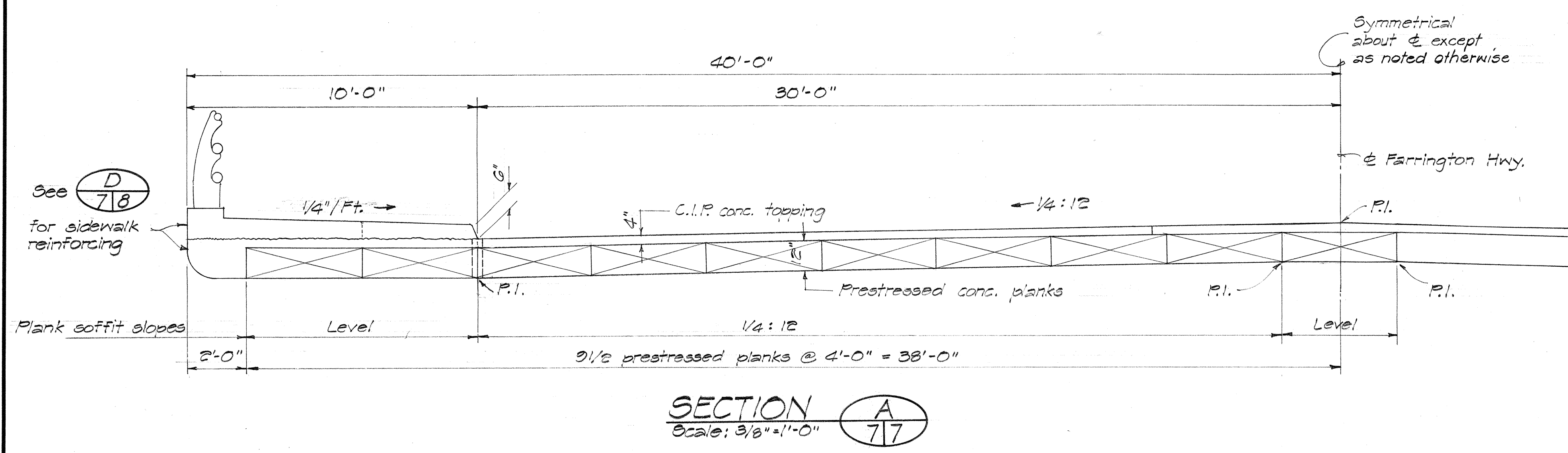
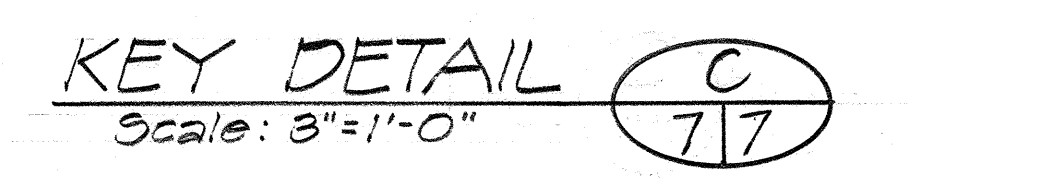
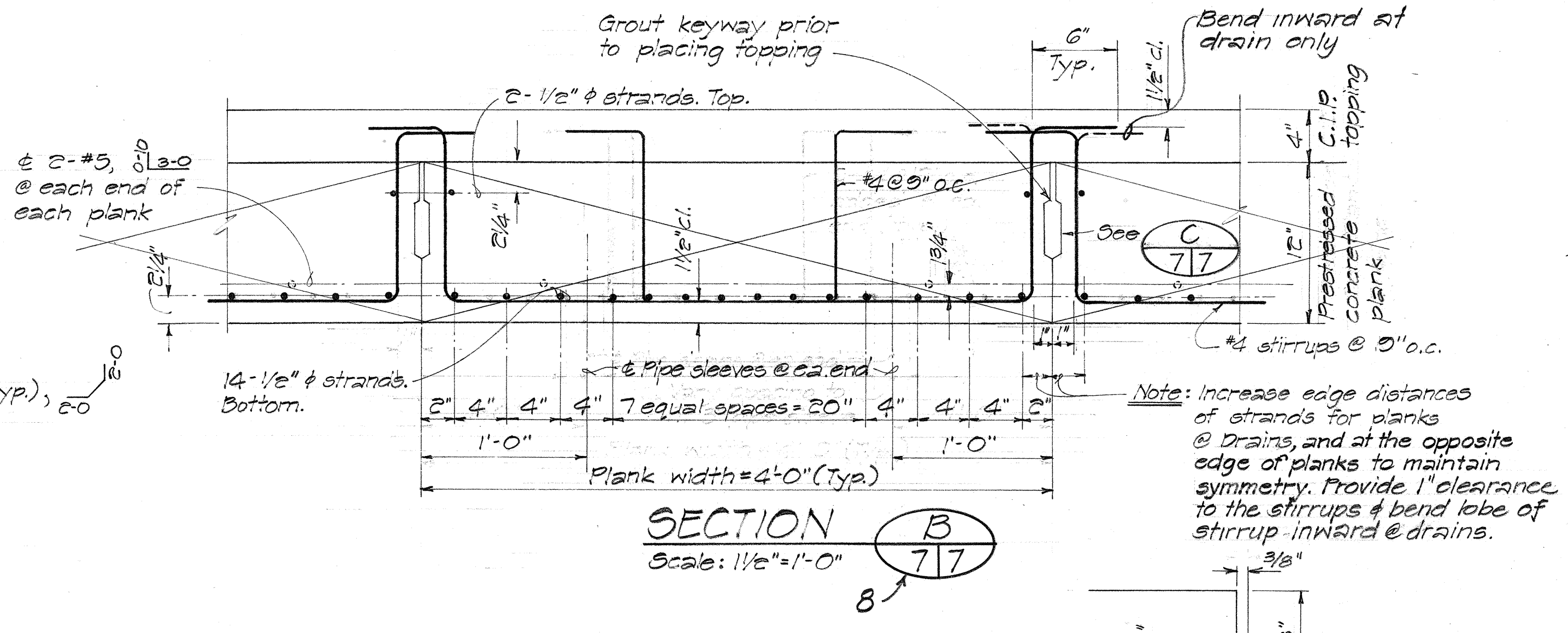
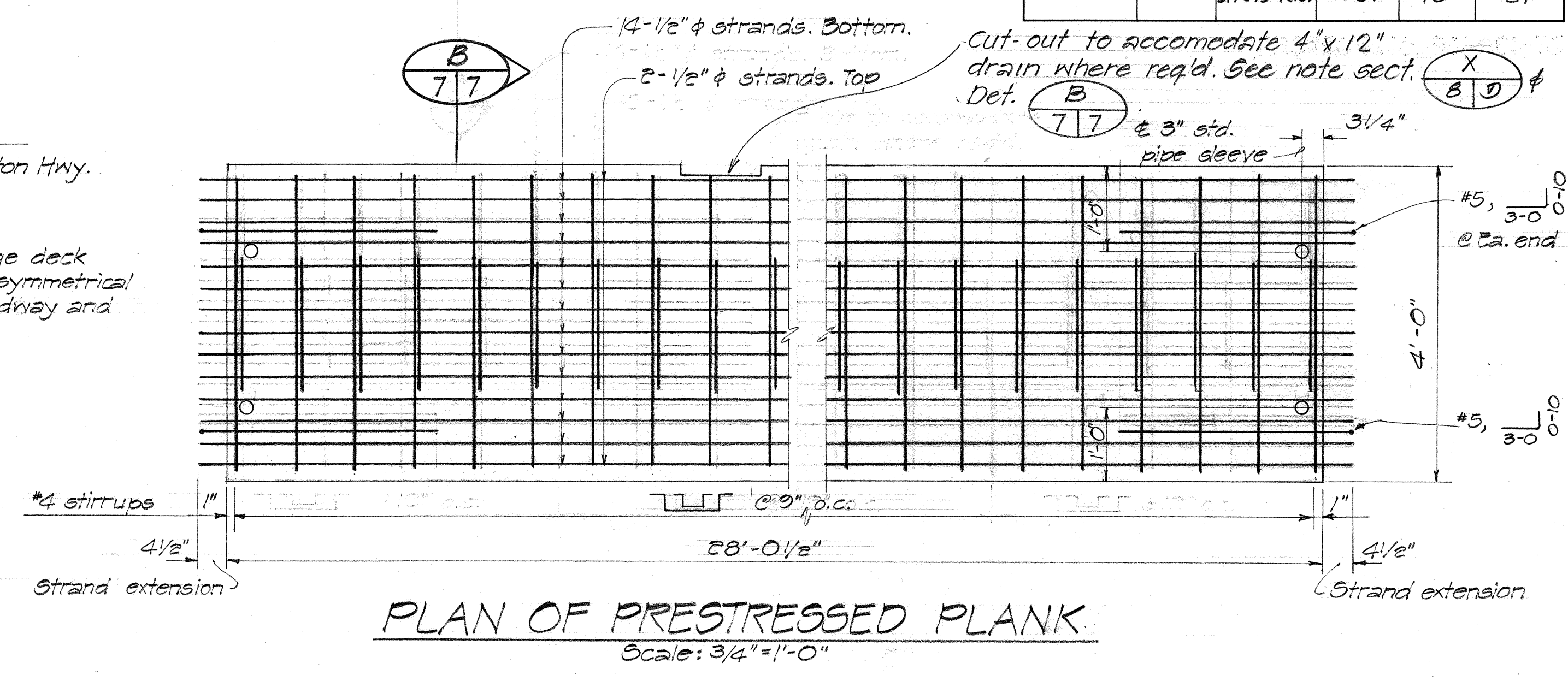
TIE BEAM DETAIL
Scale: 1/2" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
REPLACEMENT OF MAKAHA BRIDGE No. 2
PHASE I - ABUTMENT & PIER
PLANS, ELEVATIONS & SECTIONS
FARRINGTON HIGHWAY
PROJECT NO. BR-093-1(10)
SCALE: AS SHOWN DATE: MAR 1988
SHEET NO. 6A OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(10)	1987	19	27



Note: Bridge deck reinforcing symmetrical about roadway and pier



PAUL T. TANIGUCHI
REGISTERED PROFESSIONAL ENGINEER
No. 864
HAWAII, U. S. A.

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Paul T. Taniguchi

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

REPLACEMENT OF MAKAHA BRIDGE NO. 2

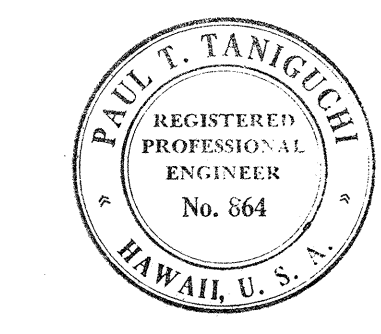
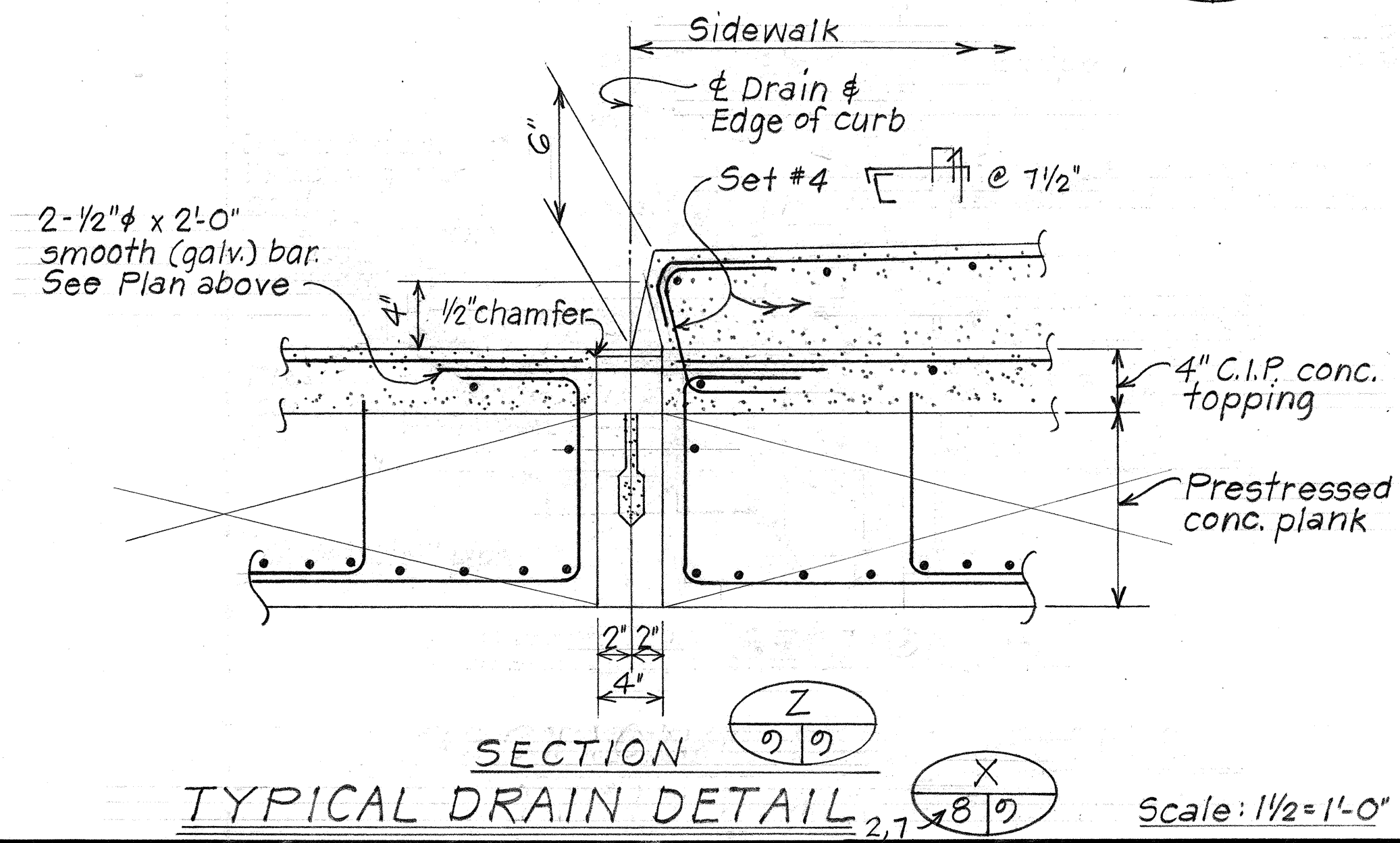
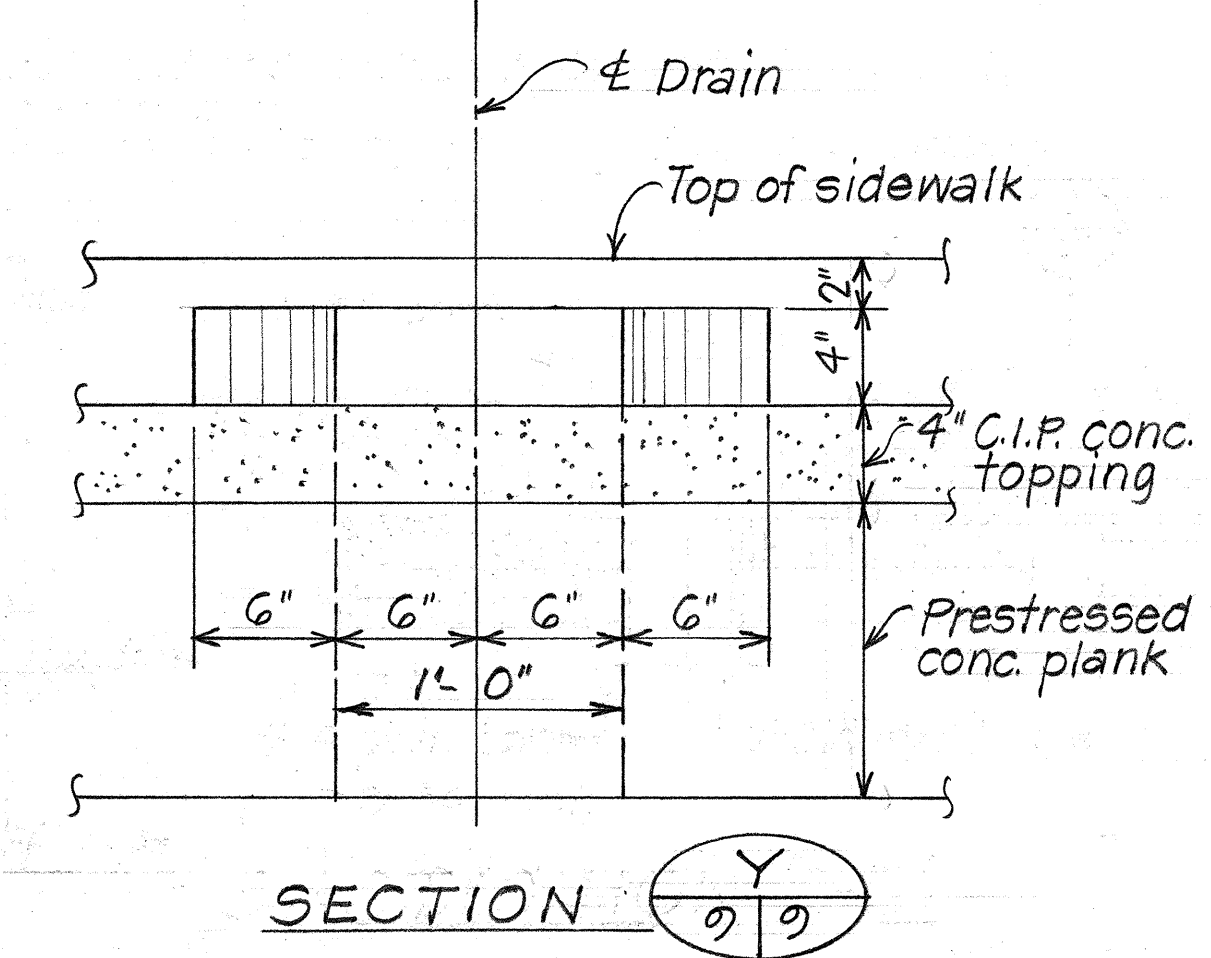
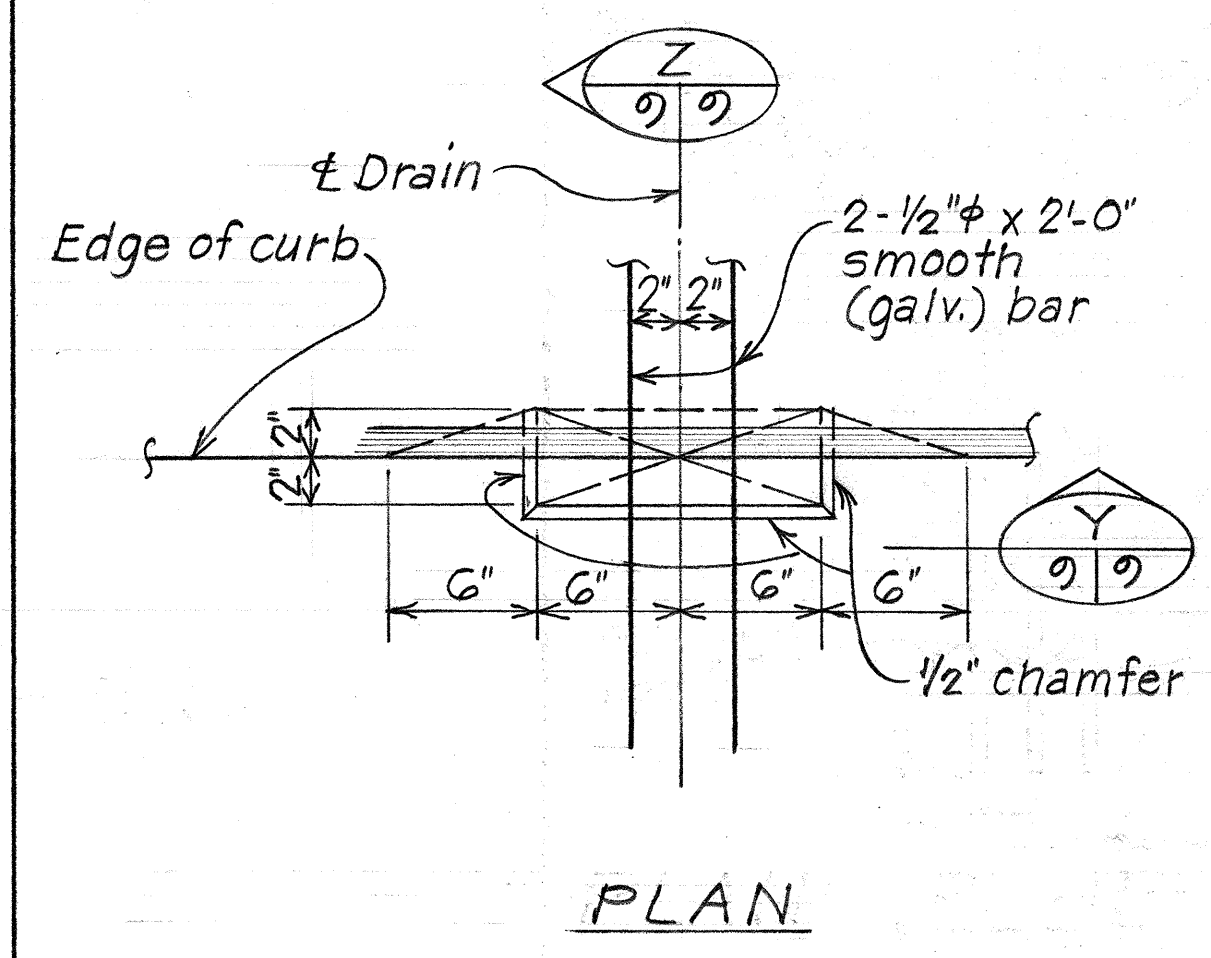
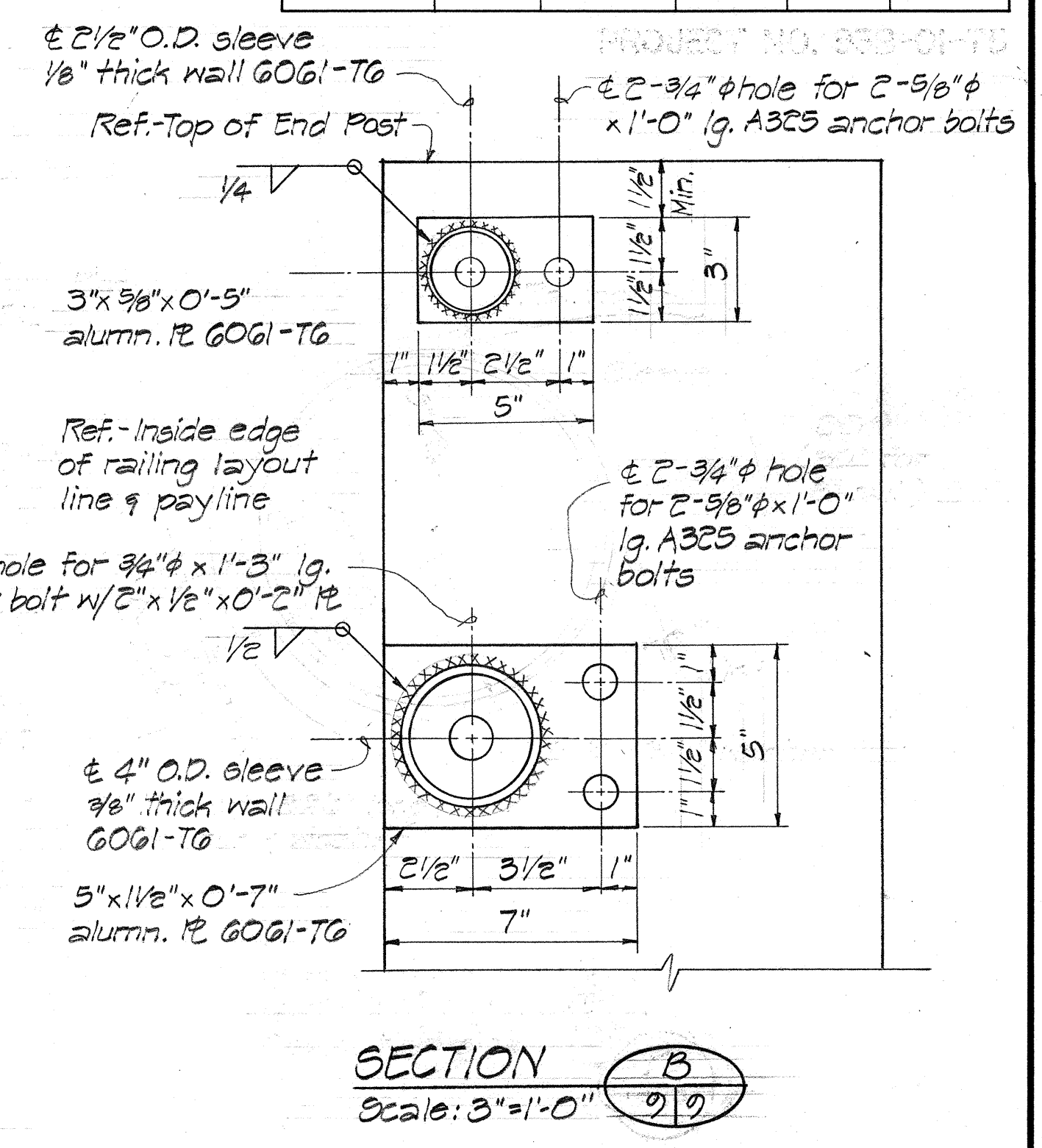
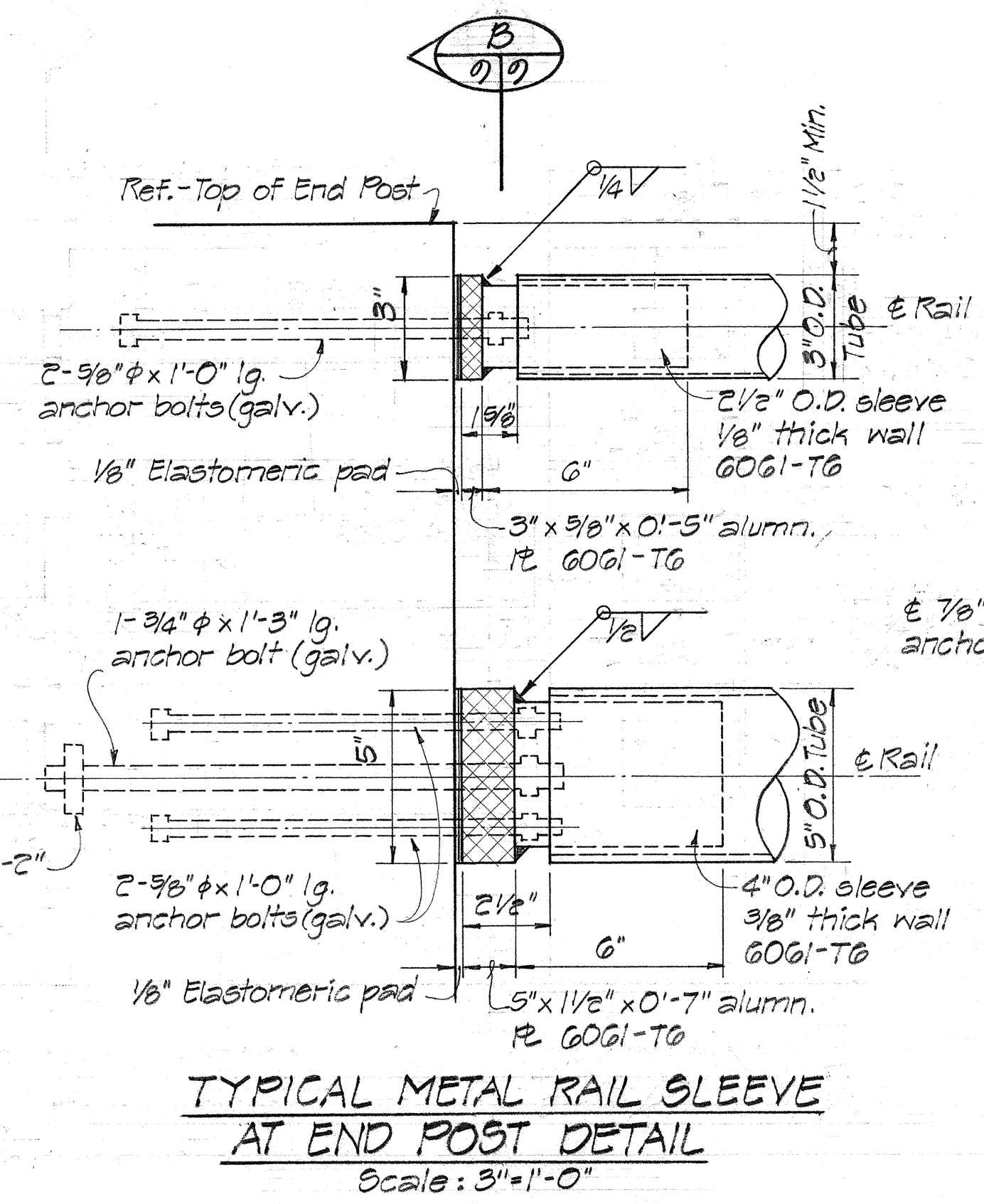
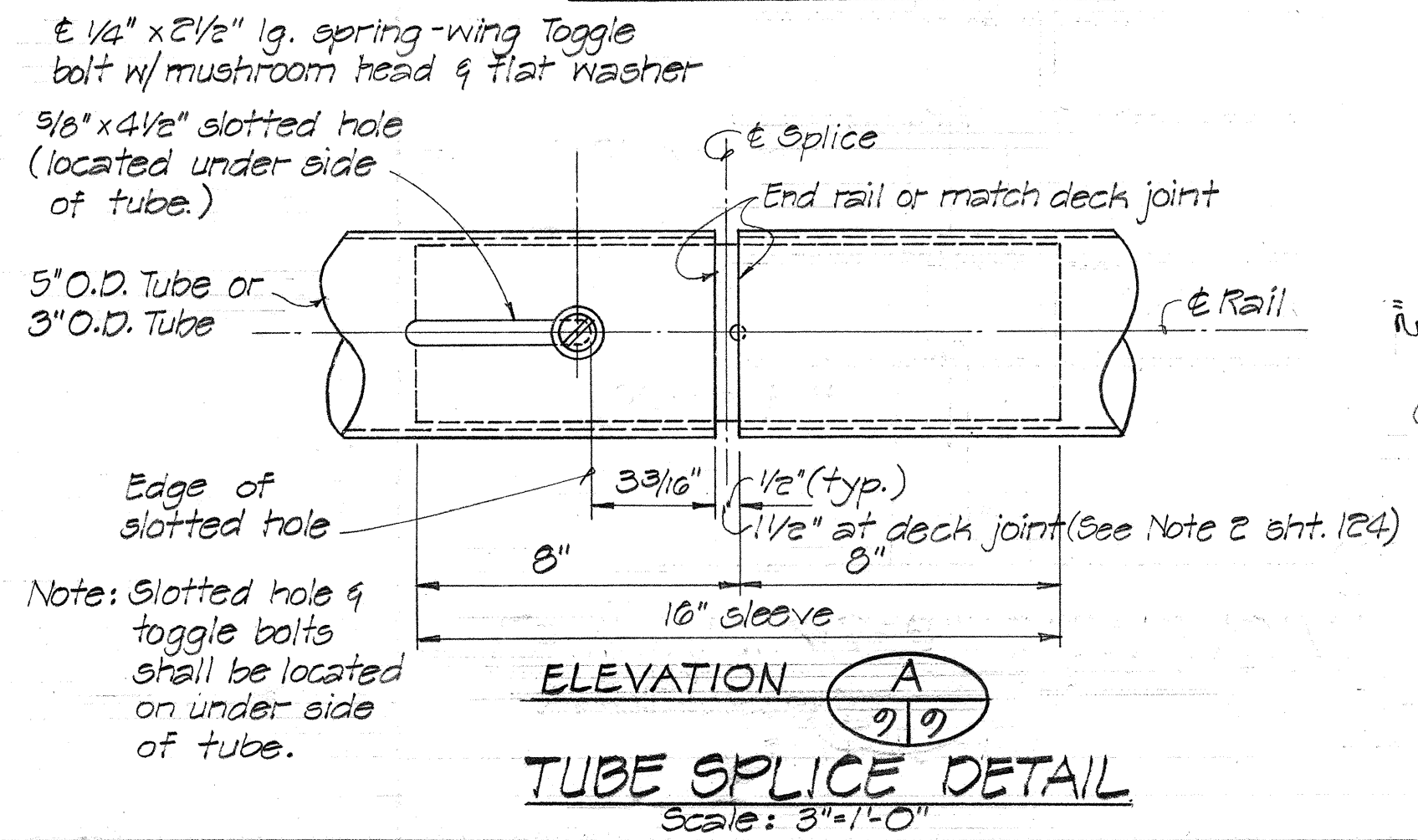
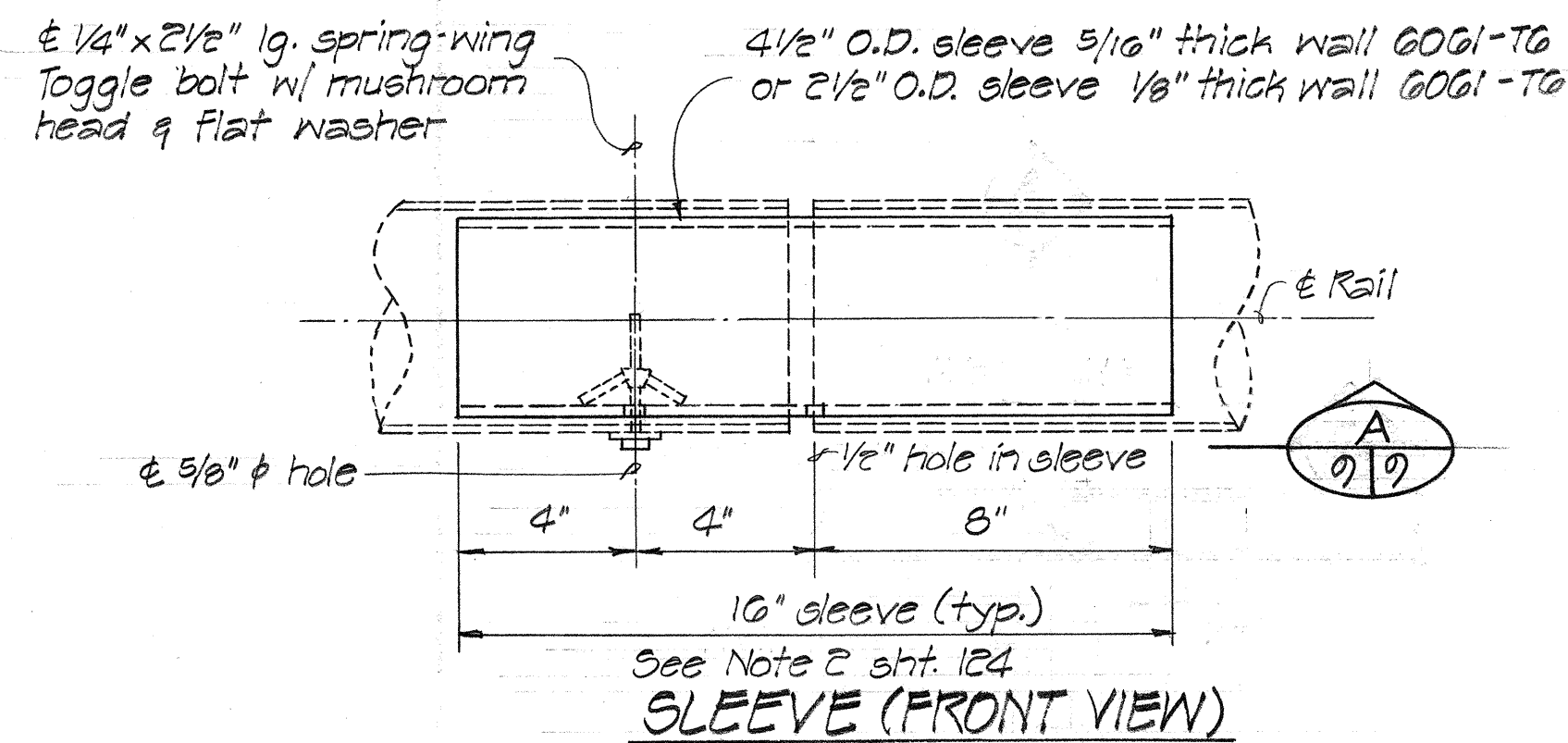
BRIDGE DECK - PART PLAN & SECTION
PRESTRESSED PLANK DETAILS

FARRINGTON HIGHWAY
PROJECT NO. BR-093-1(10)

SCALE: AS SHOWN DATE: FEB. 1987

SHEET NO. 7 OF 13 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(10)	1987	21	27

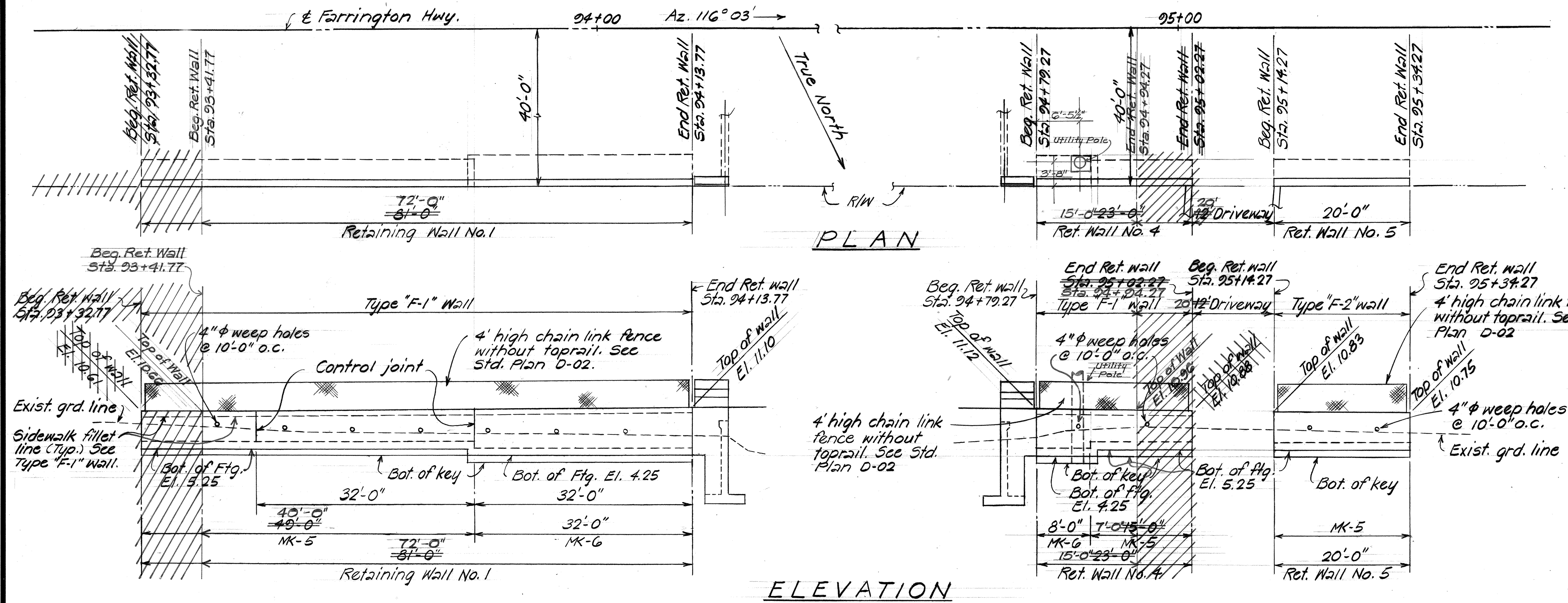


THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
 Paul T. Taniguchi

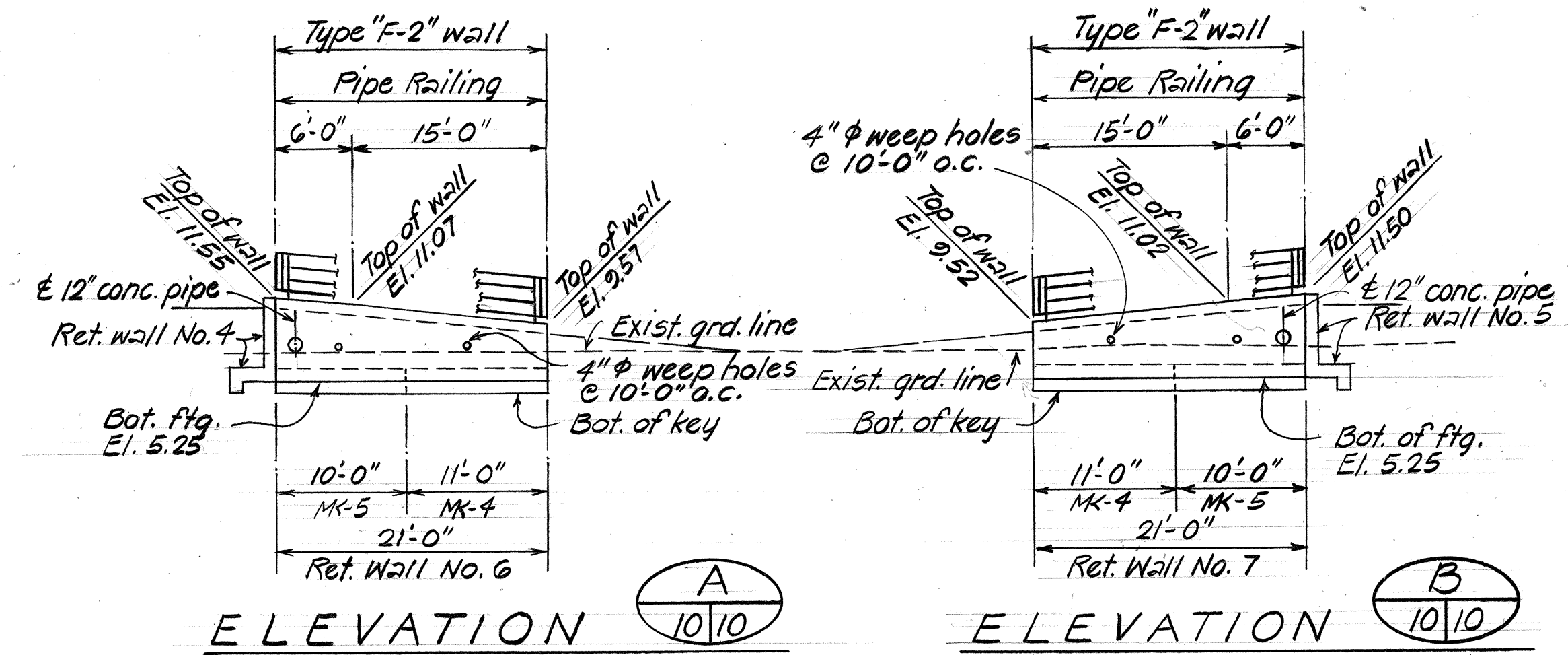
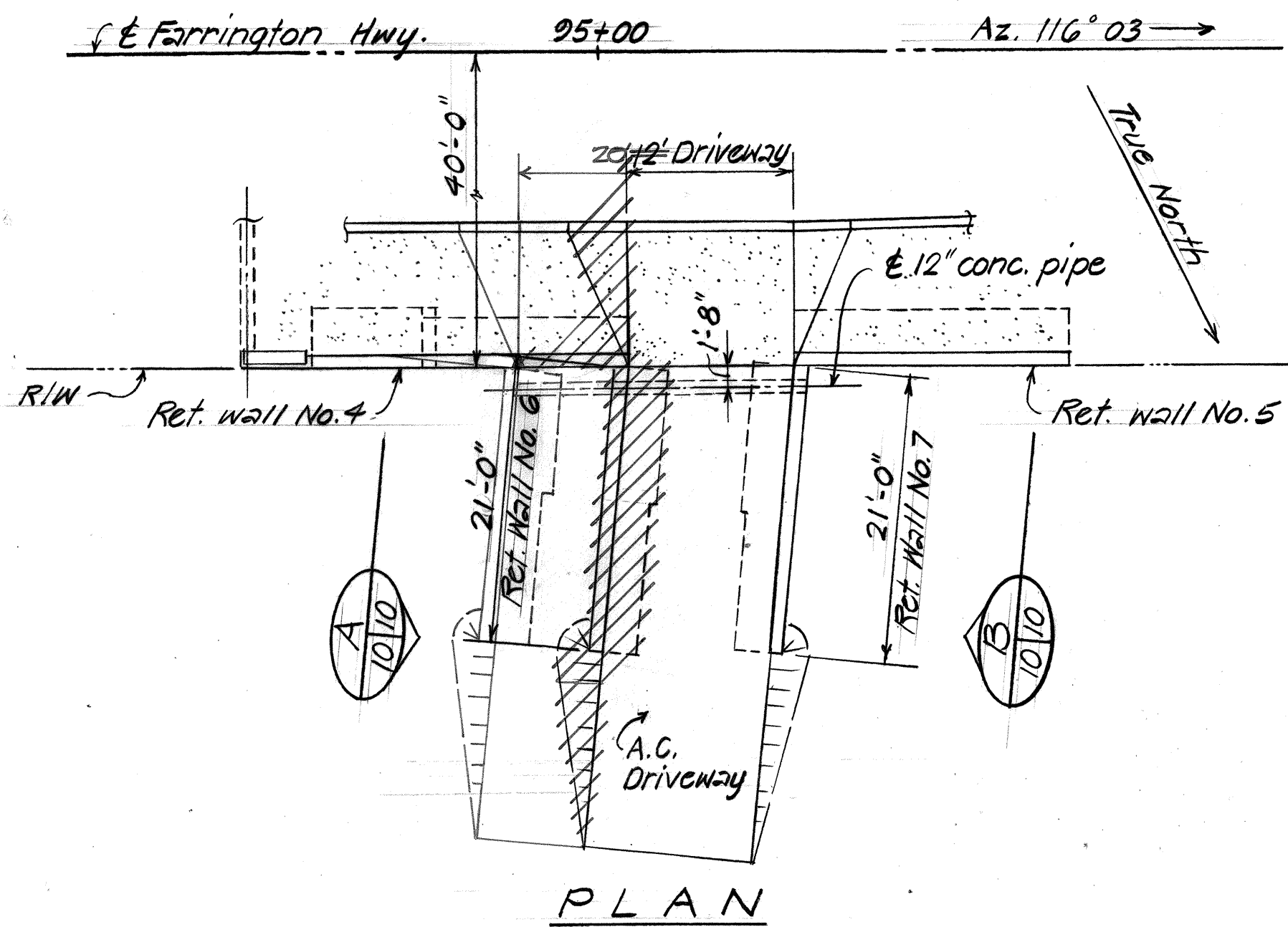
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 REPLACEMENT OF MAKAHA BRIDGE NO. 2
 GENERAL NOTES, METAL RAIL SLEEVE & SPLICE DETAILS & DRAINAGE DETAILS
 FARRINGTON HIGHWAY
 PROJECT NO. BR-093-1(10)
 SCALE: AS SHOWN DATE: FEB. 1987
 SHEET No. 9 OF 13 SHEETS

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

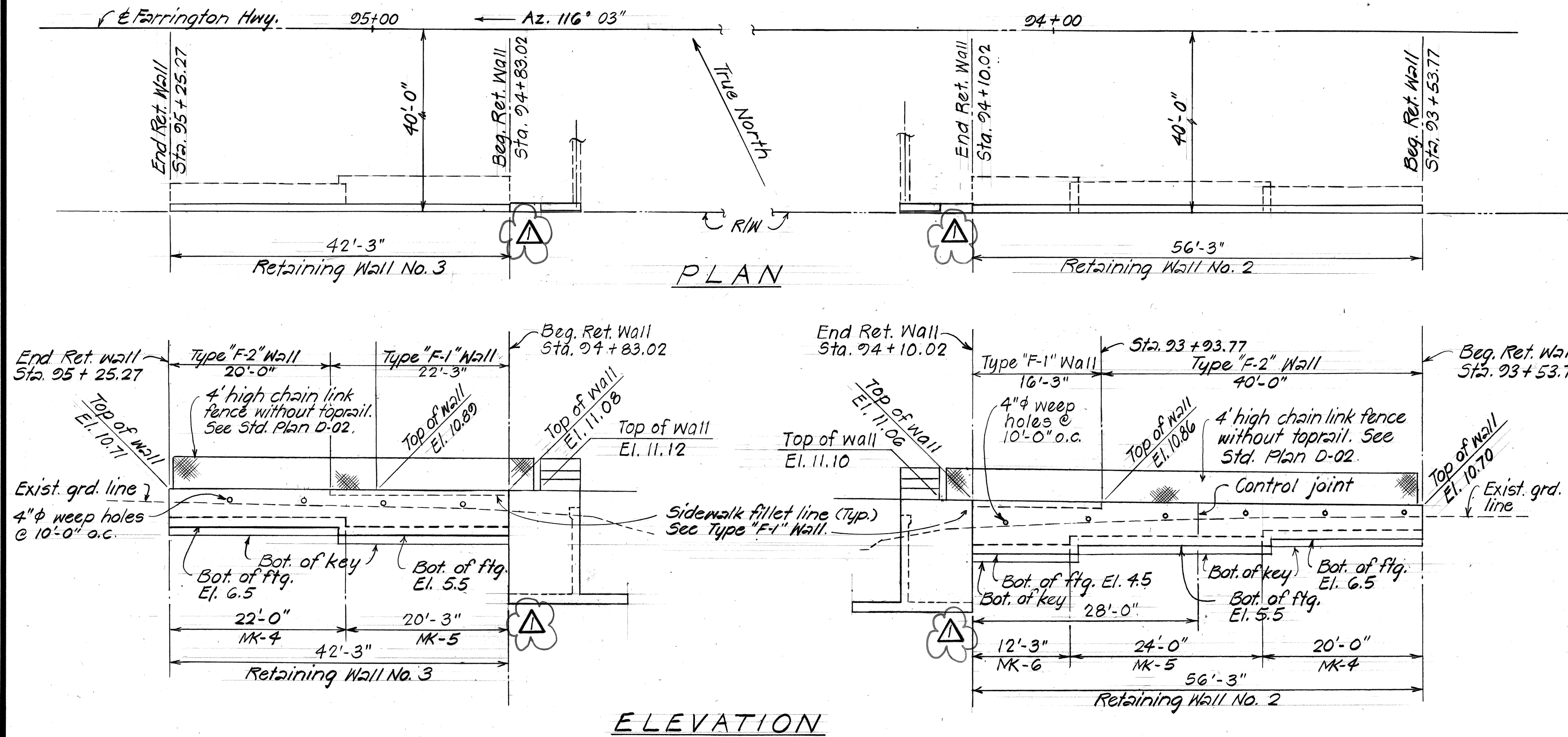
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(10)	1987	22	27



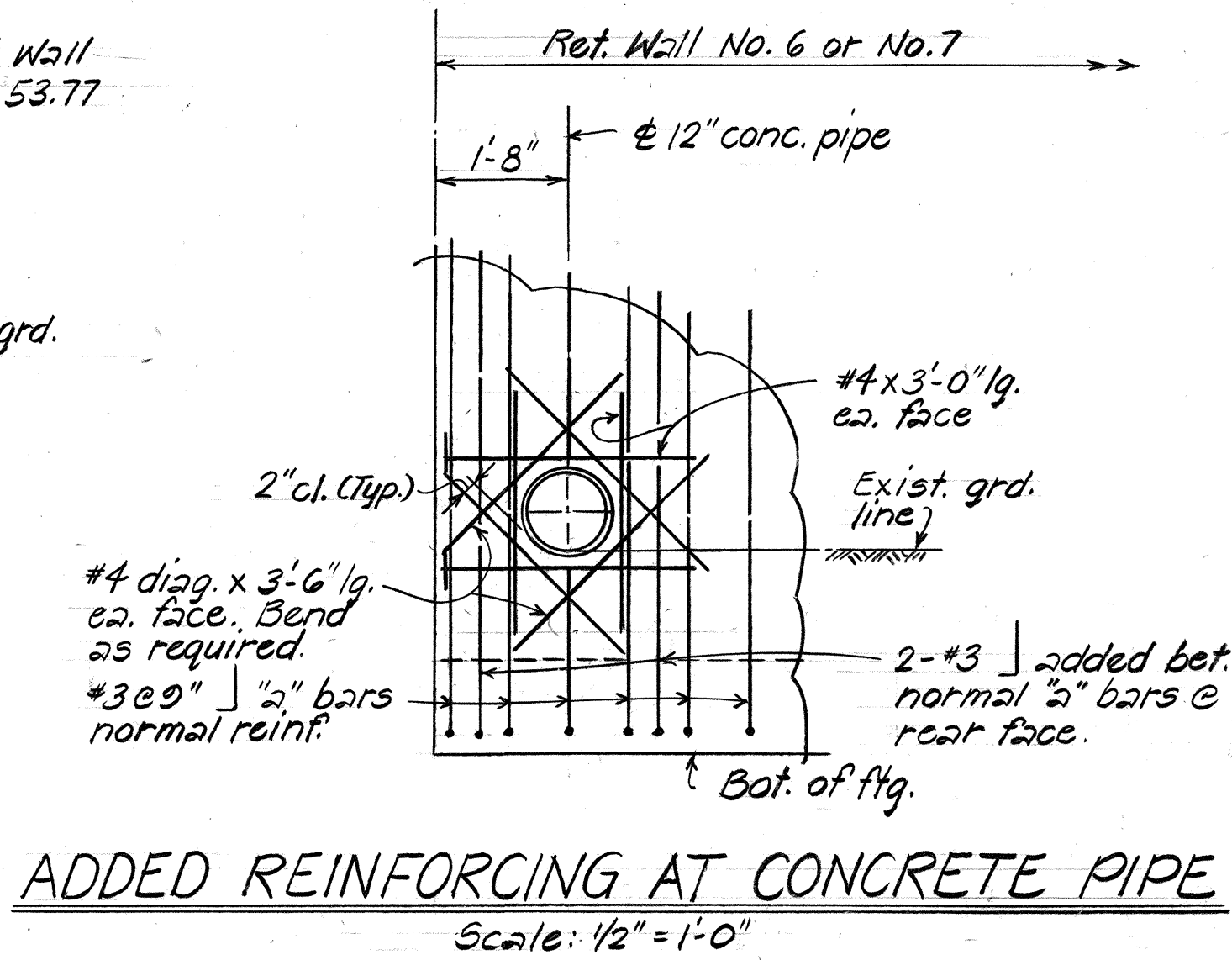
RETAINING WALLS No. 1, No. 4 & No. 5
Scale: 1" = 10'-0"



RETAINING WALLS No. 6 & No. 7
Scale: 1" = 10'-0"



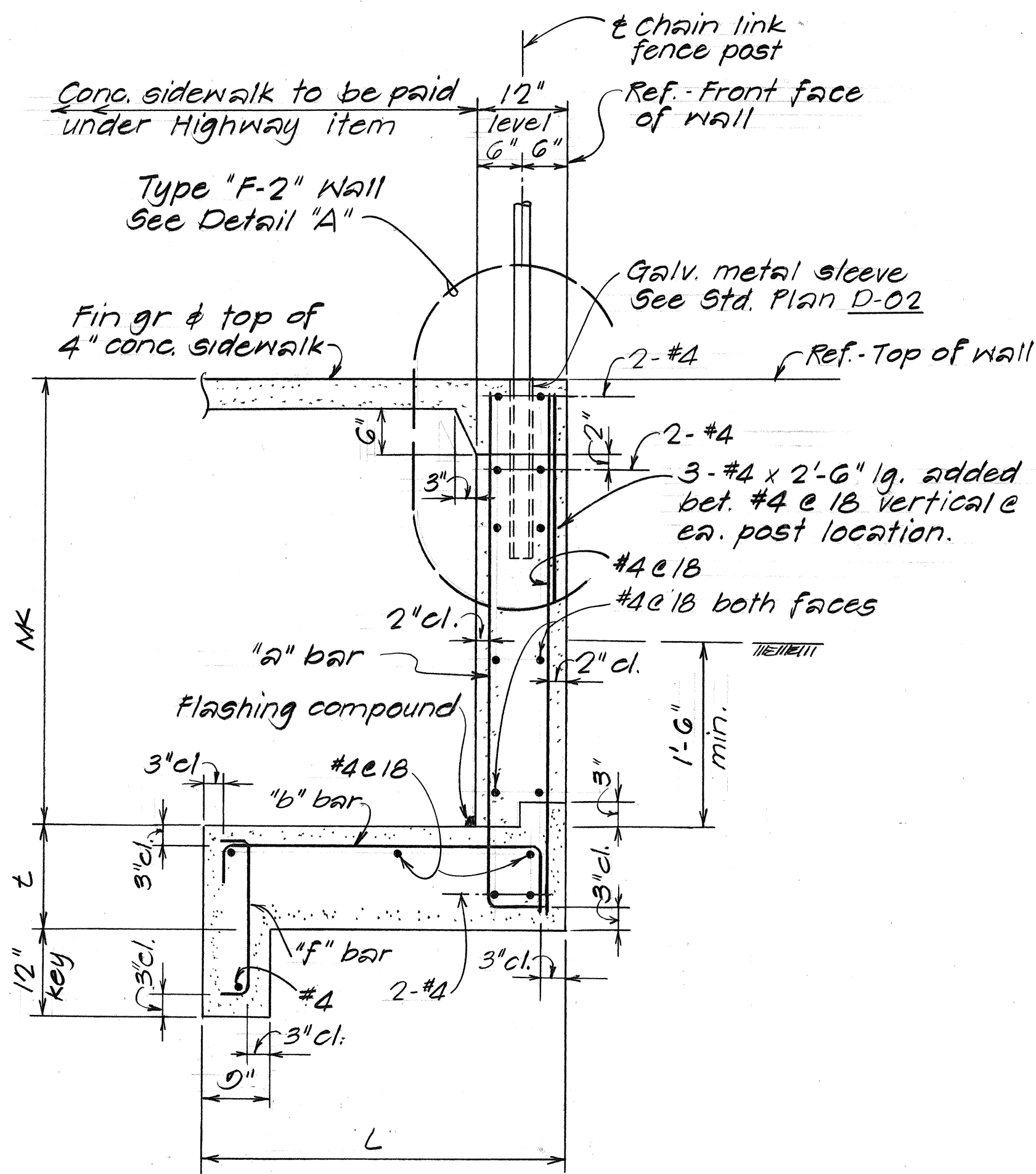
RETAINING WALLS No. 2 & No. 3
Scale: 1" = 10'-0"



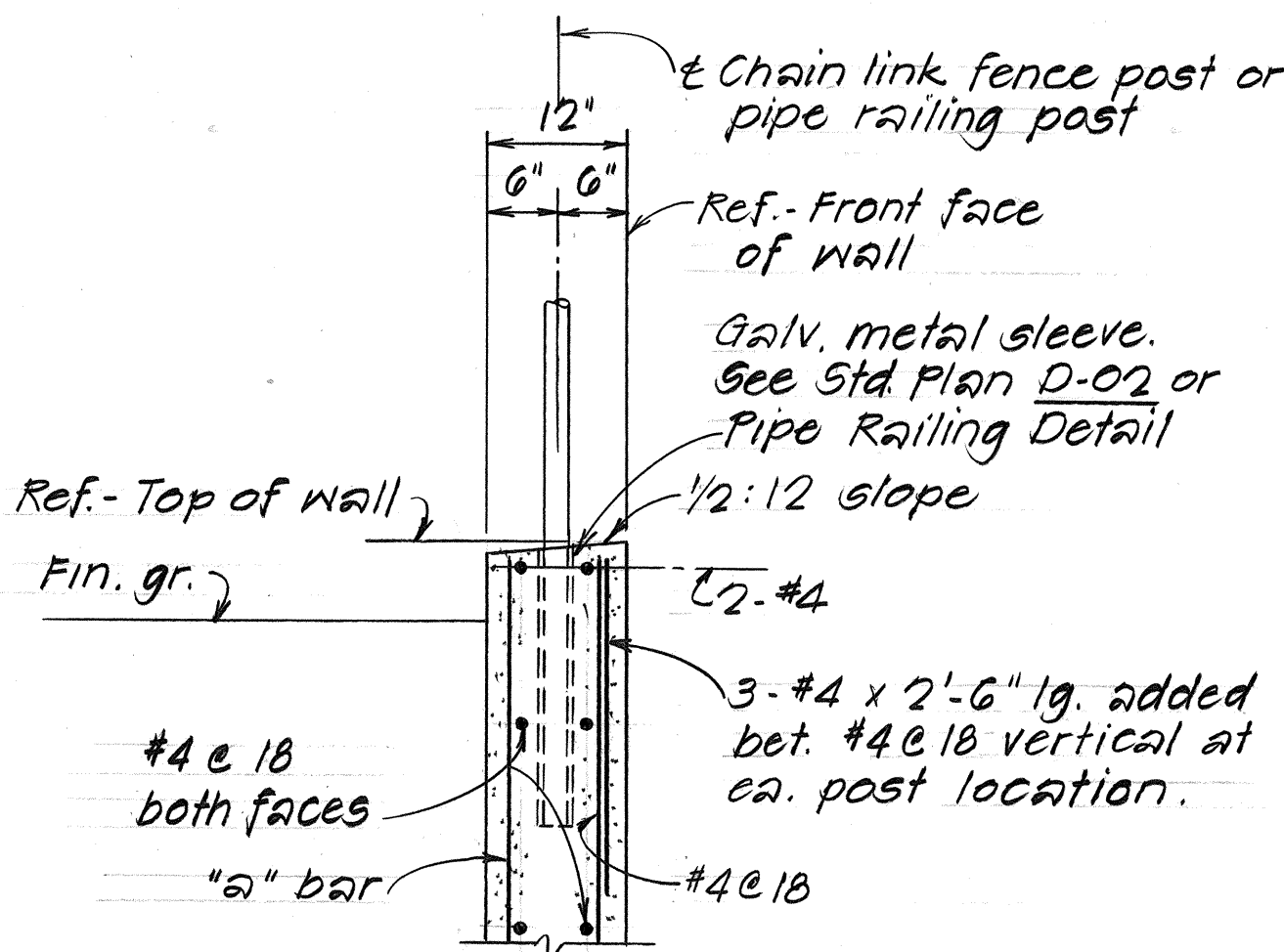
ADDED REINFORCING AT CONCRETE PIPE
Scale: 1/2" = 1'-0"

3/2/88	Revisions to retaining wall.
DATE	REVISIONS
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
REPLACEMENT OF MAKAHA BRIDGE NO. 2	
RETAINING WALLS PLAN & ELEVATION	
FARRINGTON HIGHWAY	
PROJECT NO. BR-093-1(10)	
SCALE: AS SHOWN	DATE: FEB 1987
SHEET NO. 10 OF 13 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(10)	1987	23	27

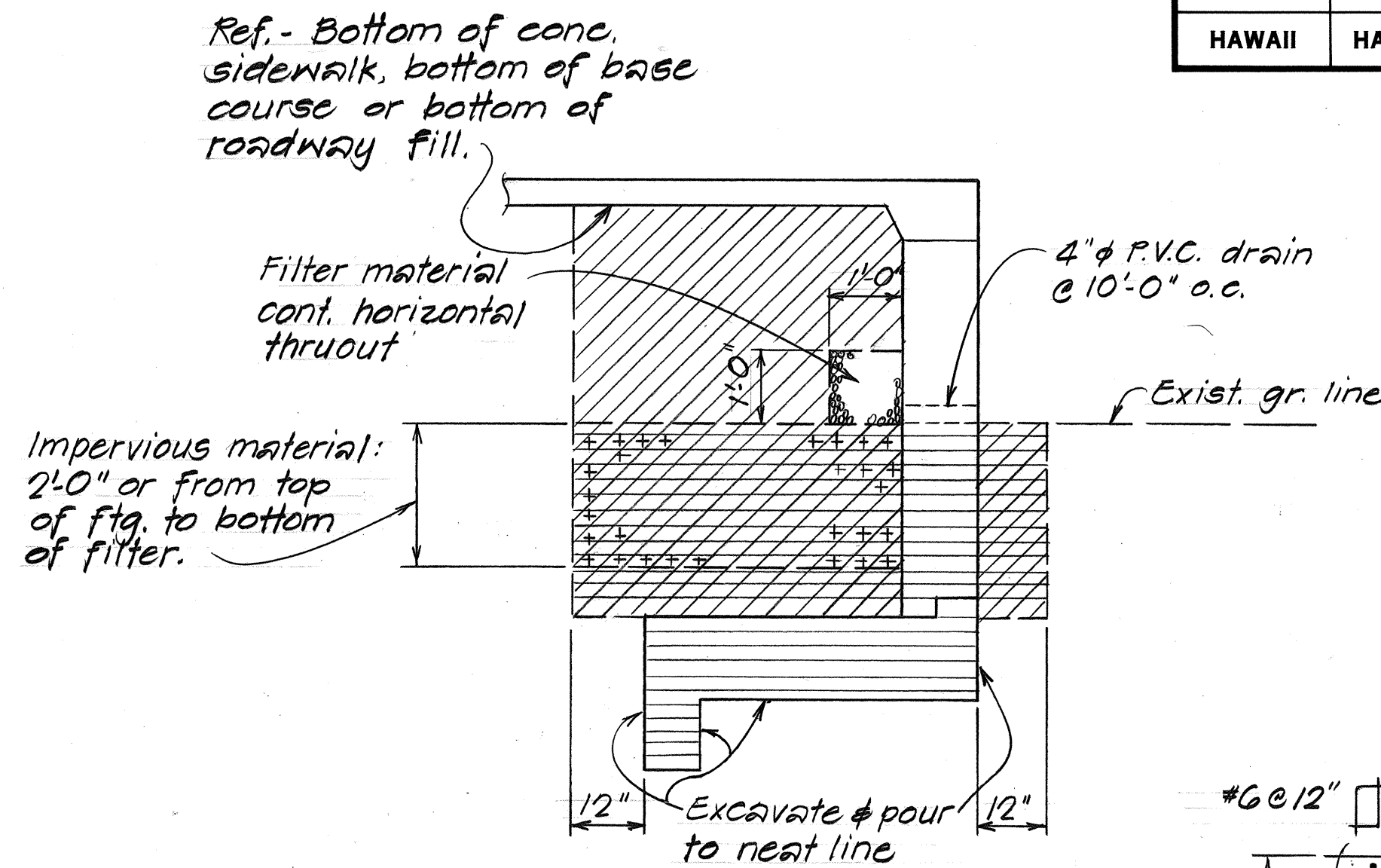


TYPICAL TYPE "F-1" WALL
(TYPE F-2 WALL SIMILAR EXCEPT AS NOTED)
Scale: 3/4"=1'-0"



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

SCHEDULE OF DIMENSIONS & REINFORCING STEEL FOR RETAINING WALL				
Maximum MK	4	5	6	
t	14"	14"	14"	
L	3.5'	4.0'	4.5'	
"a" bar	#3 @ 12	#3 @ 9	#4 @ 10	
"b" bar	#3 @ 12	#3 @ 9	#4 @ 10	
"f" bar	#4 @ 12	#4 @ 9	#4 @ 10	

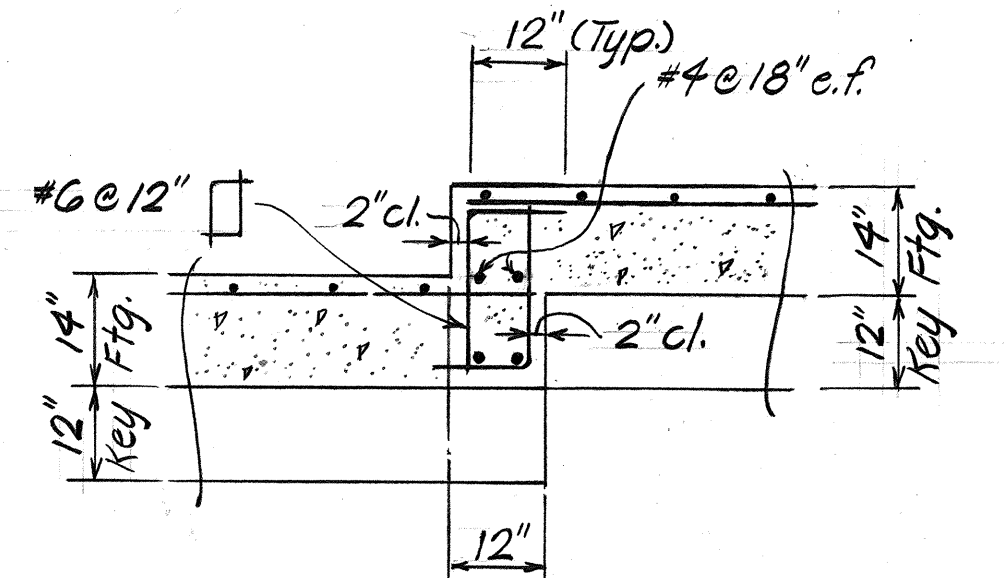


STRUCTURE EXCAVATION & DRAINAGE DETAIL
Scale: 1/2"=1'-0"

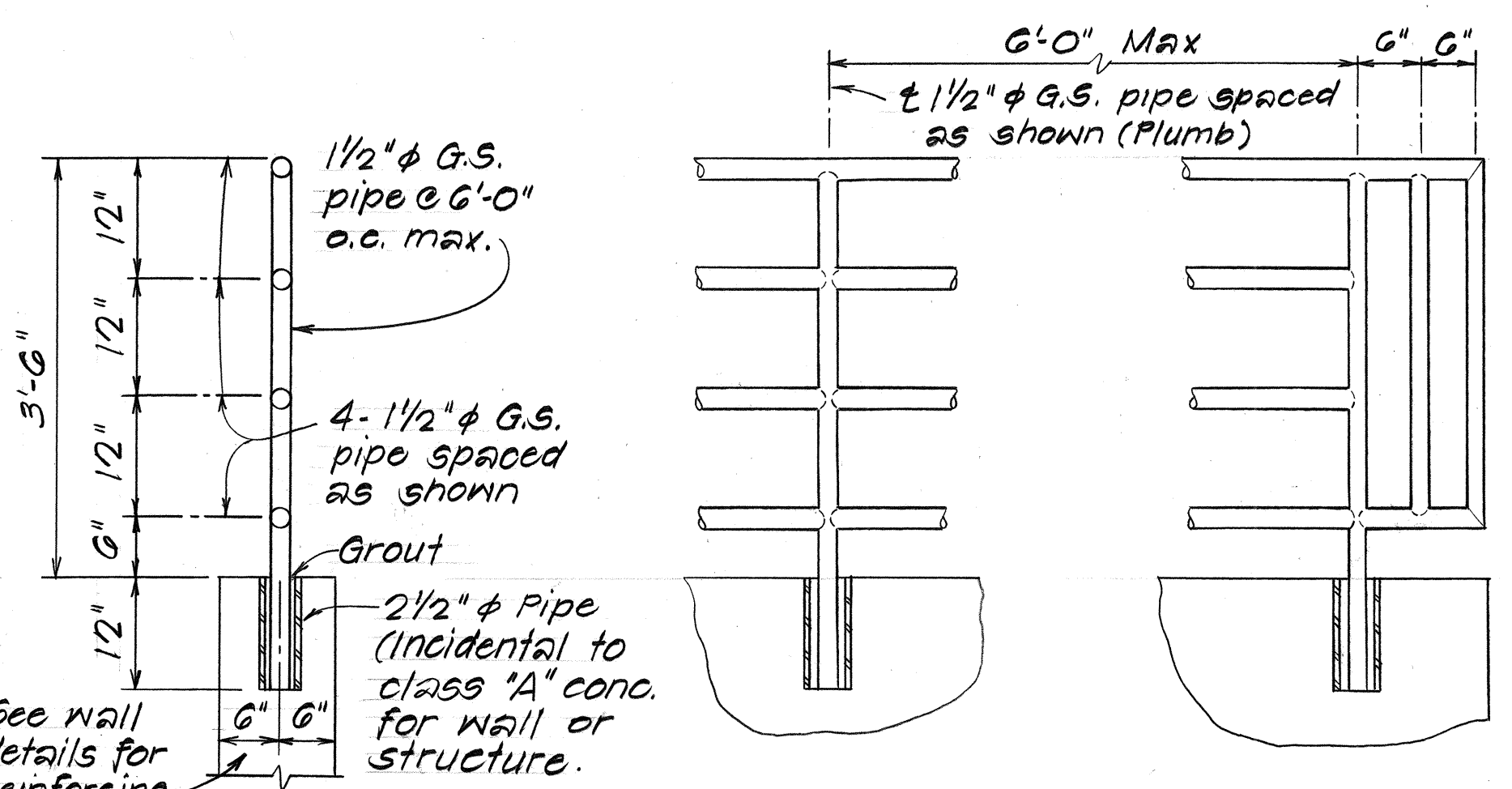
LEGEND

- Structure Excavation
- Structure Backfill
- Impervious Material

Impervious Material as selected by the Engineer shall be incidental to structure excavation. The subgrade upon which filter material is to be placed shall be made as impervious as possible by pneumatic tamping or other approved methods.



FOOTING STEP-UP DETAILS
Not to Scale



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

- NOTES:**
- Cut and shape pipe for neat fit and full welds. Welds on pipes shall be ground smooth. Galvanize after fabrication.
 - Pipe shall conform to A.S.T.M. A-53.
 - Damaged coatings shall be cleaned and repaired in accordance with subsection 501.03 (G) (2) of the Standard Specification.

ESTIMATED QUANTITIES				RET. WALL #1, #4, #5			RETAINING WALL #2 #3			RETAINING WALL #6 #7		
ITEM	ITEM NO.	UNIT	QUANTITY	ITEM NO.	UNIT	QUANTITY	ITEM NO.	UNIT	QUANTITY	ITEM NO.	UNIT	QUANTITY
Pipe Railing	—	—	—	—	—	—	—	—	—	507.4000	L.F.	42 L.F.
Structure Excavation for Retaining Wall	206.5000	C.Y.	79 C.Y.	206.5000	C.Y.	64 C.Y.	206.5000	C.Y.	22 C.Y.	—	—	—
Structure Backfill for Retaining Wall	206.7250	C.Y.	100 C.Y.	206.7250	C.Y.	63 C.Y.	206.7250	C.Y.	26 C.Y.	—	—	—
Filter Material for Retaining Wall	206.8300	C.Y.	5 C.Y.	206.8300	C.Y.	4 C.Y.	206.8300	C.Y.	2 C.Y.	—	—	—
Concrete in Retaining Wall	503.1051	LumpSum	51 C.Y.	503.1052	LumpSum	37 C.Y.	503.1053	LumpSum	15 C.Y.	—	—	—
Reinforcing Steel in Retaining Wall	602.1051	LumpSum	3,100 lbs.	602.1052	LumpSum	2,100 lbs.	602.1053	LumpSum	600 lbs.	—	—	—

Chain link fence to be paid under Highway item.

Revisions to Phase I retaining walls #2 & #3 estimated quantities

3/2/88

DATE

REVISIONS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

REPLACEMENT OF MAKAHA BRIDGE NO. 2

TYPICAL WALL DETAIL, PIPE RAILING
DETAIL & ESTIMATED QUANTITIES

FARRINGTON HIGHWAY

PROJECT NO. BR-093-1(10)

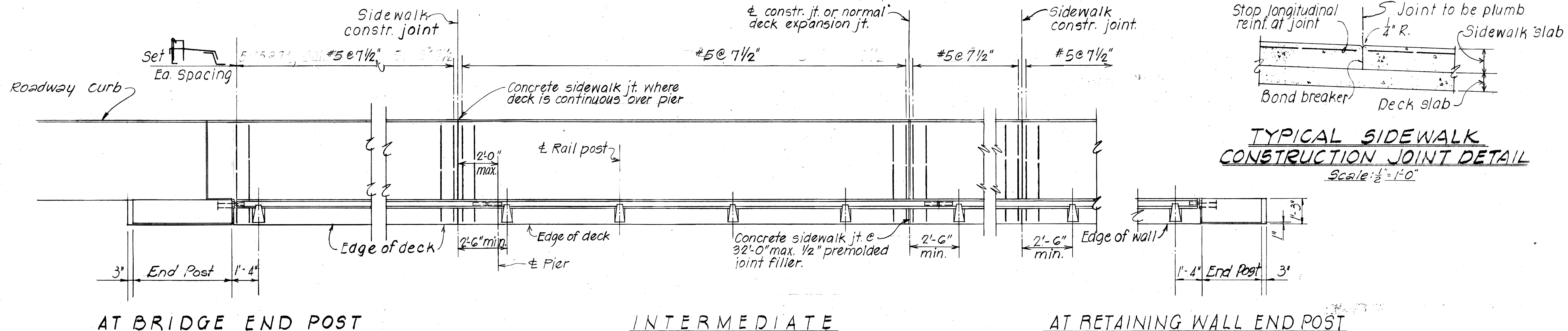
SCALE: AS SHOWN

DATE: FEB. 1987

SHEET NO. 11 OF 13 SHEETS

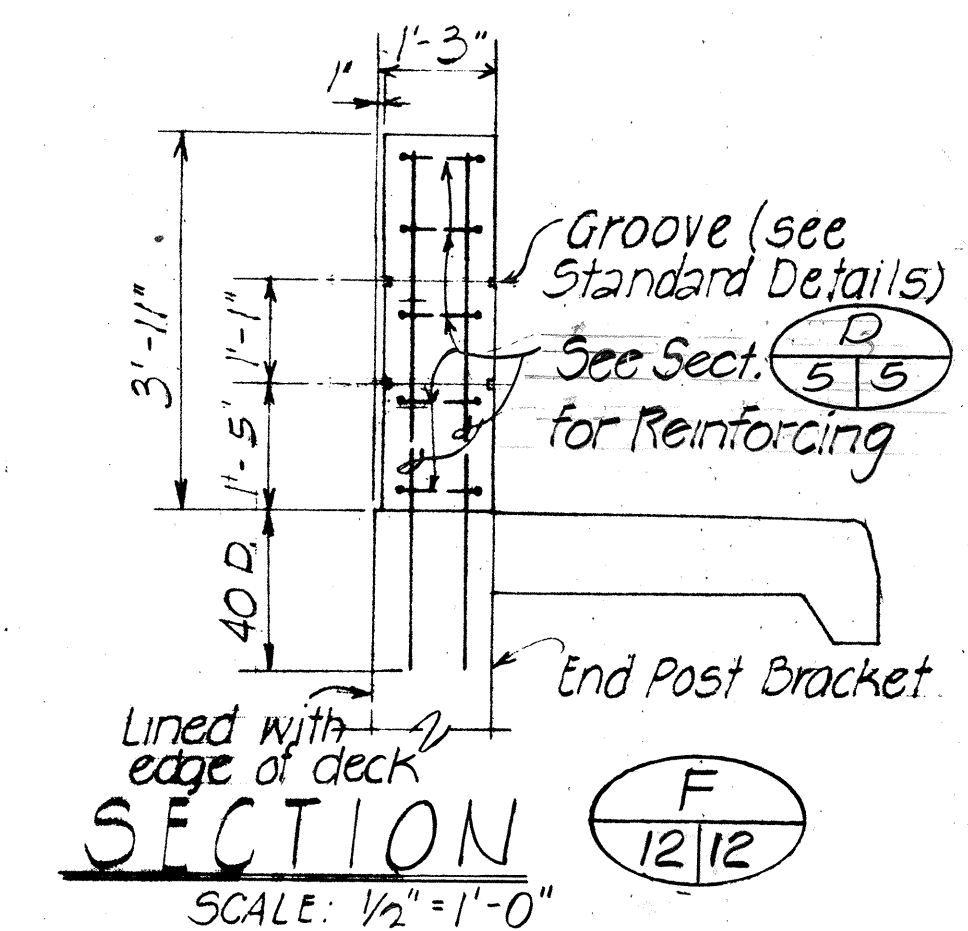
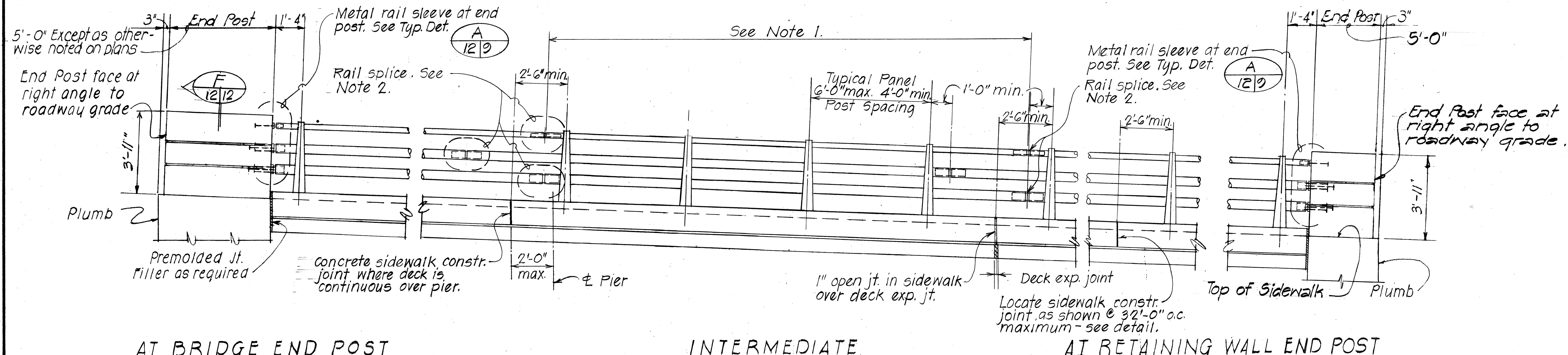
SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	86-099-1(10)	1987	24	27

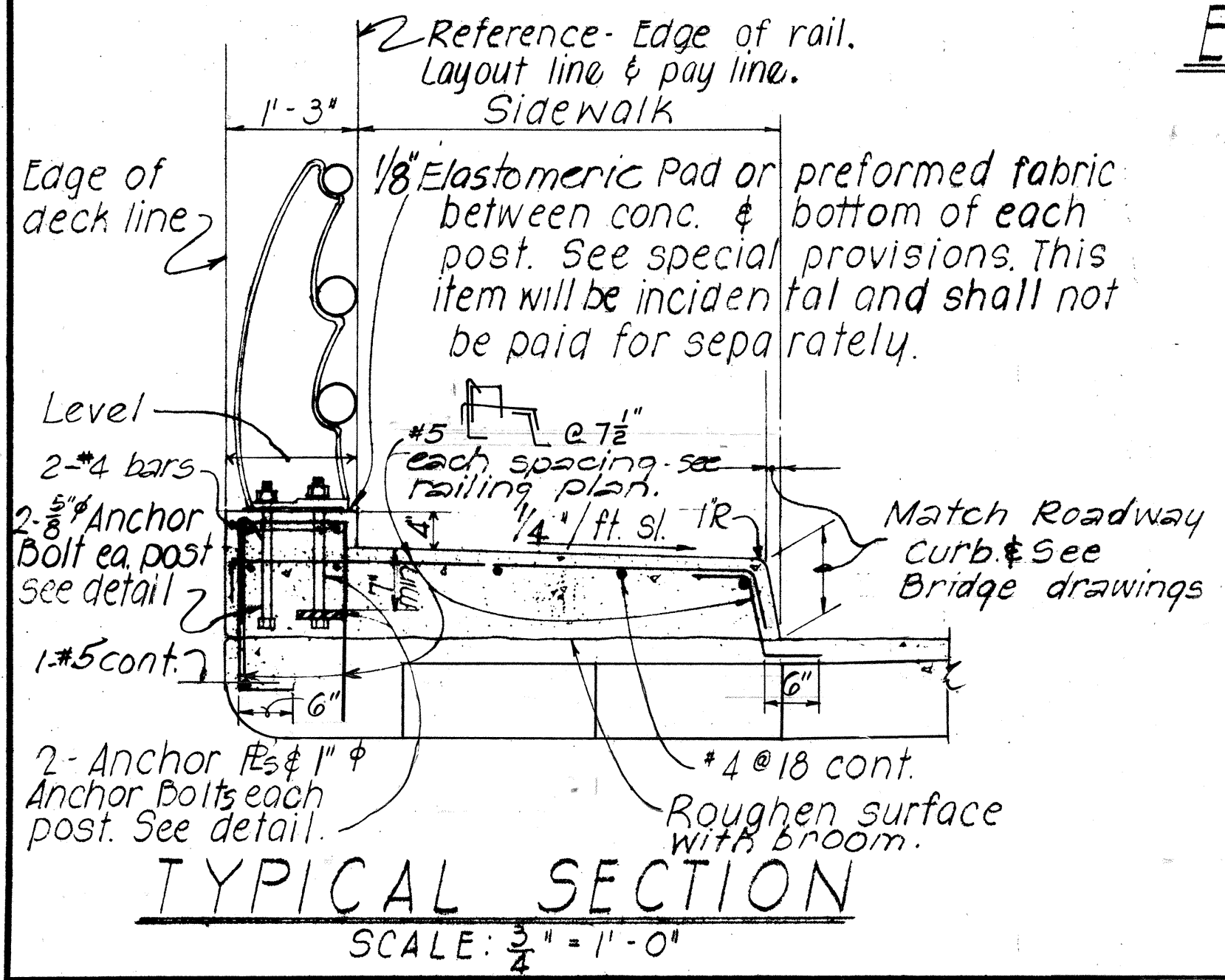


TYPICAL SIDEWALK CONSTRUCTION JOINT DETAIL
Scale: 1/2" = 1'-0"

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



- NOTES**
1. Tubing shall be continuous over not less than 4 post unless noted otherwise.
 2. All rails shall be spliced in the panel spanning deck expansion joints. Increase joint width between tube to 1 1/2" and increase sleeve length by 1". (See tube splice det. sht. #122)
 3. Rail post shall be normal to grade.
 4. No more than one tube splice per panel shall be permitted except as noted.



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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAILS
ALUMINUM BRIDGE RAILING
THREE RAIL COMBINATION TYPE

PROJECT NO. BR-003-1(10)
Date
SHEET No. 12 OF 13 SHEETS

