

INDEX TO STRUCTURAL DRAWINGS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-FF-078-1(6)	1976	96	142

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SYMBOLS AND ABBREVIATIONS

SHEET No. - SECTION IS CUT OR DETAIL LOCATION

DETAIL OR SECTION DESIGNATION

SHEET No. - DETAIL OR SECTION IS DRAWN

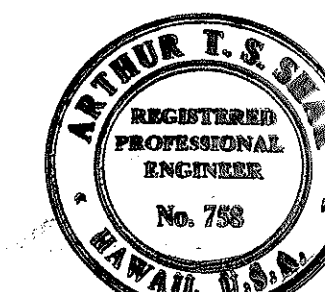
- ① LOCATION CONCRETE SEAT LINE NUMBER
- ⊙ BORING NUMBER AND DESIGNATION
- (00.00) BOTTOM FOOTING ELEVATION
- ↓ → DECK SLAB MAIN REINFORCEMENT DIRECTION BETWEEN SUPPORTS
- (F) FIXED
- (E) EXPANSION
- (H) HINGED

- A. ABUT. ADJ. ALT. & APPROX. @ AZ. ABUTMENT ADJACENT ALTERNATE AND APPROXIMATE AT AZIMUTH
- B. BAL. & BM. B.F. BOT, BOT. BALANCE BASE LINE BEAM BOTH FACES BOTTOM
- C. CL, CLR. COL. CS-2 CONT. CONSTR. JT. CENTER LINE CLEAR COLUMN CONCRETE SEAT TYPE CONTINUOUS CONSTRUCTION JOINT
- D. DET. D, DIA, ∅ DETAIL DIAMETER
- E. EA. E.F. E.W. E.P. EL, ELEV. EQ. EACH EACH FACE EACH WAY EDGE OF PAVEMENT ELEVATION EQUAL

- E. EXP. EXT. EXPANSION EXTERIOR
- F. F-1 F.F. FIN. FTG. SPREAD FOOTING TYPE FAR FACE FINISH FOOTING
- G. G-1 GR. GRP. GIRDER NUMBER GROUND GROUTED RUBBLE PAVING
- H. H. HORIZ. HIGH HORIZONTAL
- I. I.B. INT. INBOUND INTERIOR
- J. JT. JOINT
- L. LT. LG, L. LONGIT. LEFT LONG LONGITUDINAL
- M. MAX. MIN. MAXIMUM MINIMUM
- N. N.F. No, # NTS. NEAR FACE NUMBER NOT TO SCALE

- O. O.B. O.C, % OP'NG. OUTBOUND ON CENTERS OPENING
- P. P. PT. P.I. PLATE POINT POINT OF INTERSECTION
- R. R. REF. REINF. REQ'D. RT. RADIUS REFERENCE REINFORCEMENT REQUIRED RIGHT
- S. SECT. SHT. S.E. SP, SPC. ST. STA. SECTION SHEET SUPERELEVATION SPACES STATION LINE STANDARD STATION
- O/S OFF SET

- S. STIRR. STR. SYMM. STIRRUP STRAIGHT SYMMETRICAL
- T. T.P. T.(T) TRANS. TYP. TURNING POINT TOP TRANSVERSE TYPICAL
- V. VERT. VERTICAL
- W. W. W.P. W.W.F. WIDE WORKING POINT WELDED WIRE FABRIC



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

INDEX TO STRUCTURAL DRAWINGS,
SYMBOLS AND ABBREVIATIONS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT I
EA. PROJ. No. U-FF-078-1(6)

SCALE: NONE DATE: JUNE 25, 1976

SHEET No. 96 OF 41 SHEETS

GENERAL STRUCTURAL NOTES

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-PP-078-1(6)	1976	97	142

DESIGN SPECIFICATIONS:

- AASHTO, STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES (11TH EDITION), INCLUDING INTERIM SPECIFICATIONS BRIDGES, 1974 AND 1975.

DESIGN LOADS:

HS-20-44

MATERIAL (EXCEPT AS OTHERWISE NOTED ON PLANS):

- CONCRETE: 28-DAY CONCRETE STRENGTHS
SUPERSTRUCTURE - NON-POST TENSIONED $f_c = 3,000$ psi
SUPERSTRUCTURE - POST TENSIONED $f_c = 5,000$ psi
PIER $f_c = 3,000$ psi
PIER FOOTINGS $f_c = 3,000$ psi
ABUTMENTS, WINGWALLS, RETAINING WALLS, AND OTHER FOOTINGS $f_c = 3,000$ psi
CULVERTS AND OTHER CONCRETE STRUCTURES $f_c = 3,000$ psi
- REINFORCING STEEL FOR CAST-IN-PLACE CONCRETE: ASTM A615, GRADE 40
- PRESTRESSING STRANDS: 270ksi ULTIMATE STRENGTH, 1/2-INCH DIAMETER, 7 WIRE STRESS-RELIEVED STRANDS.
- SEE SPECIAL PROVISIONS FOR ADMIXTURE IN CONCRETE.
- ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 AND BE HOT DIPPED GALVANIZED AFTER FABRICATION.
- ALL ANCHOR BOLTS AND NUTS FOR BASE OF LIGHTING STANDARD AND OVERHEAD SIGN POSTS SHALL CONFORM TO ASTM A-307.
- ALLOWABLE FOUNDATION PRESSURES (FORT SHAFTER OVERPASS):
WINGWALLS AND ABUTMENTS 4,000 psf
PIER 5,000 psf

CONSTRUCTION METHODS:

- SEE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (HAWAII 1976) AND SPECIAL PROVISIONS.
- ALL FOOTINGS SHALL BE EXCAVATED AND POURED NEAT AGAINST UNDISTURBED GROUND. IN CASE OF OVER EXCAVATION, SPACE BETWEEN FOOTING AND GROUND SHALL BE FILLED WITH CONCRETE AT THE CONTRACTORS EXPENSE AND AS DIRECTED BY THE ENGINEER. THE MINIMUM QUALITY OF THE FILL CONCRETE SHALL BE CLASS D.
- IN GENERAL, TOP OF CONCRETE DECK OF STRUCTURE SHALL BE CONSTRUCTED TO FOLLOW THE FINISH ROADWAY VERTICAL AND HORIZONTAL CURVES AND GRADES.

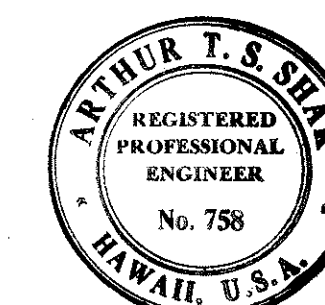
CONSTRUCTION METHODS: (CON'T.)

- GIRDER CONCRETE SEATS AND CREEP BLOCKS SHALL BE POURED MONOLITHICALLY WITH THE ABUTMENTS AND PIER CAP. TOP SURFACES OF CONCRETE SEATS SHALL HAVE HARD STEEL TROWEL FINISH.
- SEE PLANS FOR SPECIAL SURFACE FINISH.
- EXCEPT AS OTHERWISE NOTED, ALL VERTICAL DIMENSIONS ARE MEASURED PLUMB.
- VERTICAL PIER BARS SHALL BE ARRANGED IN SUCH A MANNER AS TO MISS PIER CAP REINFORCING.
- FOR LOCATION OF RAIL LIGHTING, SEE HIGHWAY LIGHTING DRAWINGS. RAIL LIGHT MOUNTING SHALL BE AS PER MANUFACTURER'S RECOMMENDATION, AND SHALL BE APPROVED BY THE ENGINEER.
- SEE SHEET S-21 FOR POST TENSION NOTES.
- BACKFILL BEHIND ABUTMENT TO SHELF LEVEL SHALL BE COMPLETE IN PLACE, BEFORE SUPERSTRUCTURE POUR. (FORT SHAFTER OVERPASS ONLY)
- MINIMUM WIDTH OF FALSEWORK TRAFFIC OPENING AT FORT SHAFTER OVERPASS AND STRUCTURE "E" WIDENING SHALL BE 30'. MINIMUM VERTICAL CLEARANCE SHALL BE 13.5'.

GENERAL:

- ALL ITEMS NOTED INCIDENTAL WILL NOT BE PAID FOR SEPARATELY. ALL BEARING PADS AND PRE-MOLDED JOINT FILLER SHALL BE INCIDENTAL TO CONCRETE.
- THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL EXISTING UTILITY LINES AND NOTIFY THE RESPECTIVE OWNERS BEFORE COMMENCING WITH WORK. REFER TO UTILITY PLAN FOR VARIOUS ADDITIONAL CONDUITS IN DECK AND PIER CAP.
- THE CONTRACTOR SHALL FURNISH SHOP PLACEMENT AND DETAIL DRAWINGS FOR ALL STRUCTURAL STEEL WORK.
- MINIMUM COVER FOR REINFORCING BARS (UNLESS NOTED OTHERWISE ON PLANS):
SLABS: TOP BARS : 1/2"
BOTTOM BARS : 1/4"
BOX GIRDERS: 1/4" TO STIRRUP FOR OUTSIDE FACES
1" TO STIRRUP FOR INSIDE FACES
ABUTMENTS, PIERS AND RETAINING WALLS : 2"
COLUMNS AND PIERS : 2" TO TIES
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH : 3"
BOX CULVERTS : OUTSIDE FACE : 2"
INSIDE FACE TOP : 1/4"
INSIDE FACE BOTTOM SLAB AND WALLS : 1/2"

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

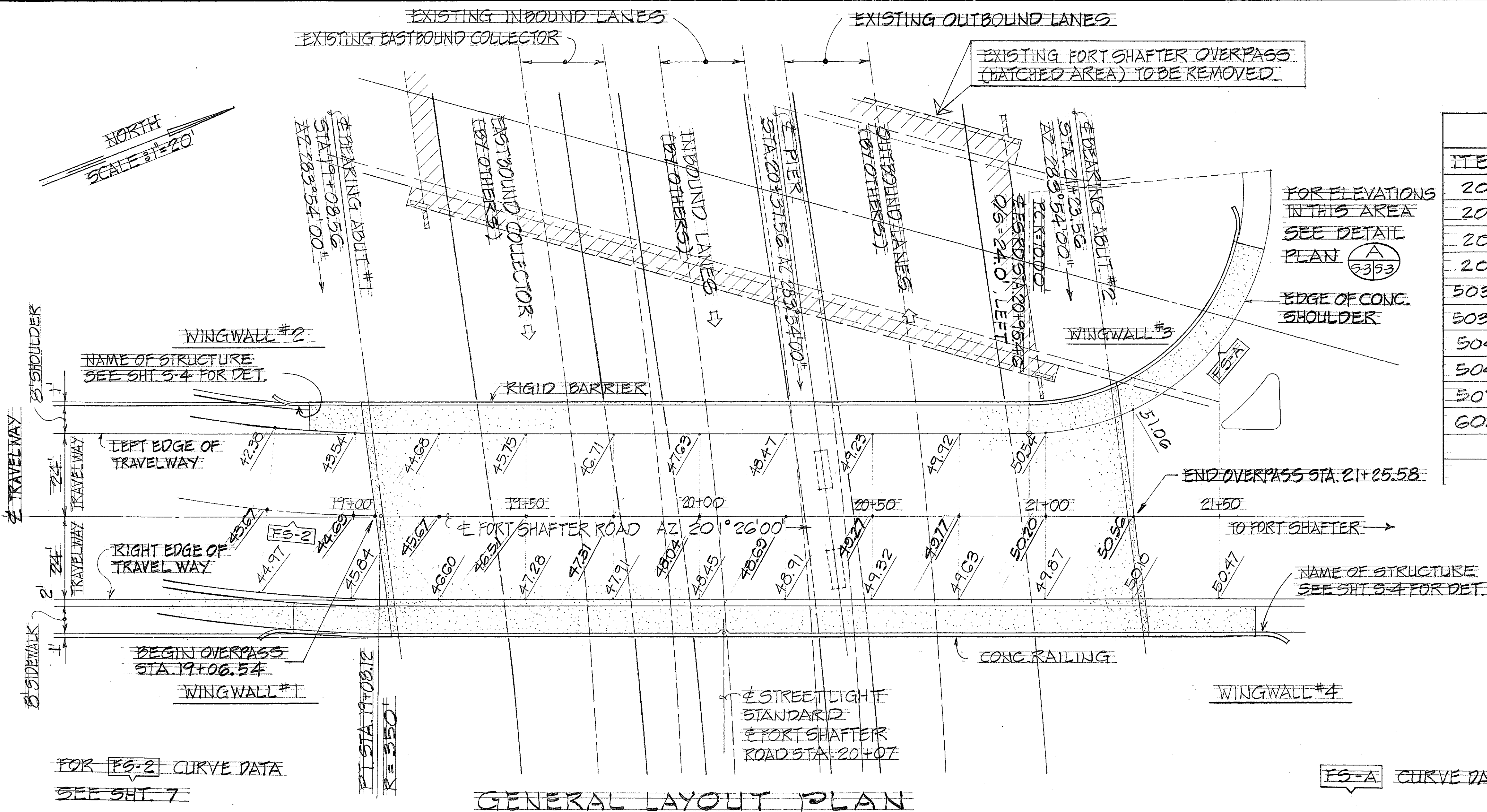


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11/5/76	ADDED MIN. VERT. CLR. TO NOTE II
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
GENERAL STRUCTURAL NOTES	
MOANALUA ROAD PUELOA I.C. TO MIDDLE ST. - UNIT I P.A. Proj. No. U-PP-078-1(6)	
SCALE: NONE	DATE: JUNE 25, 1976
SHEET No. 5-2 OF 41 SHEETS	

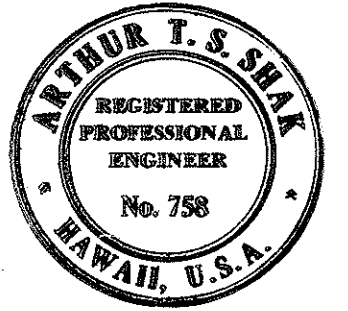
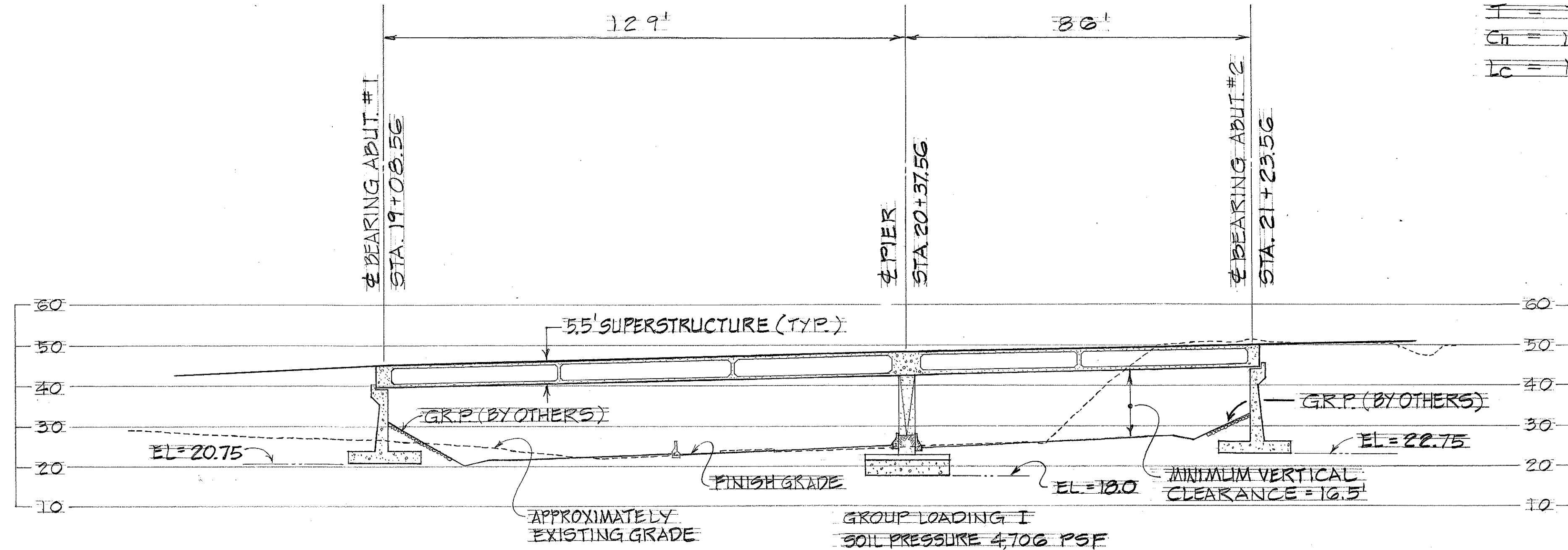
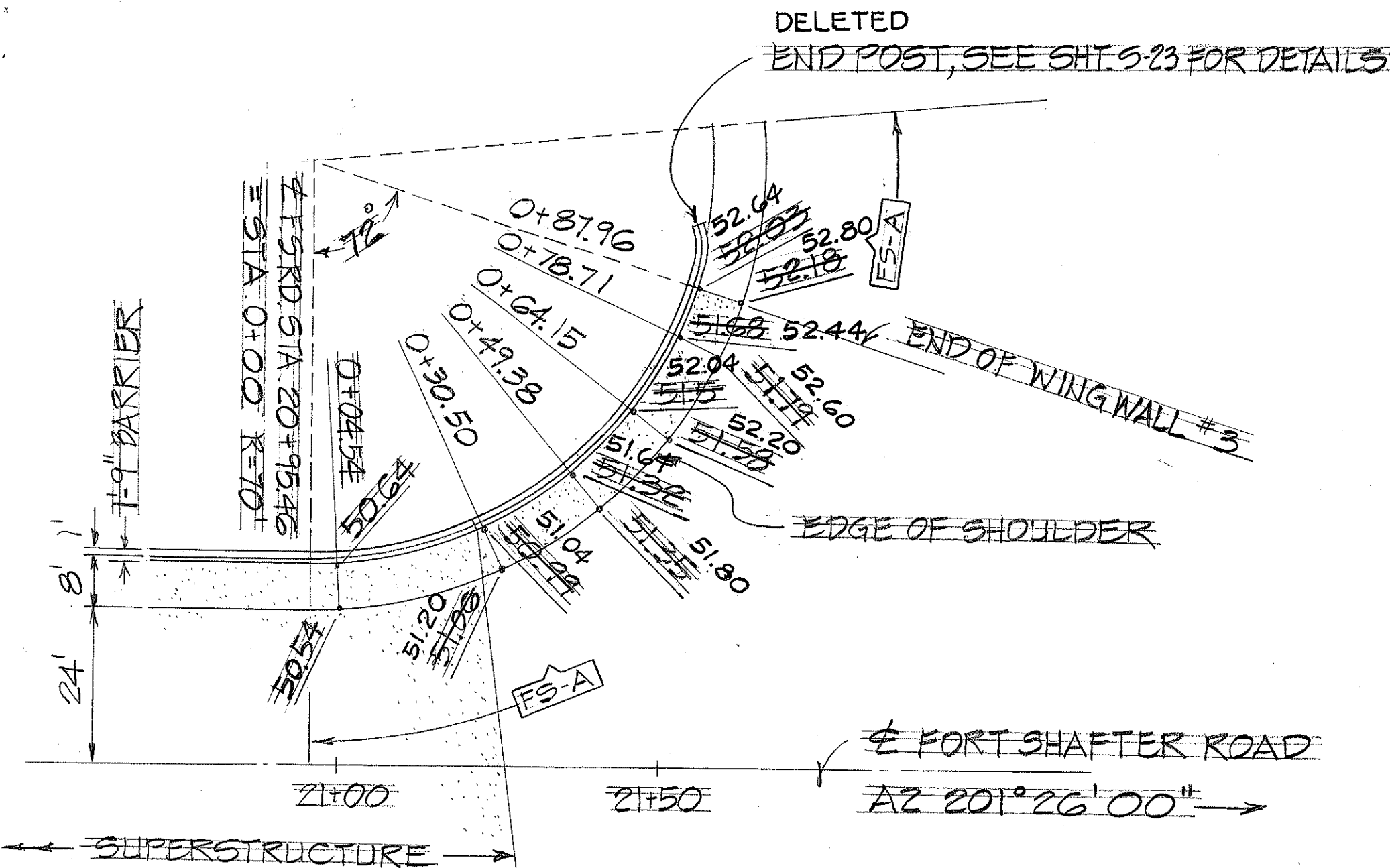
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-FF-078-1(6)	1976	98	142

BRIDGE ESTIMATED QUANTITIES				
ITEM NO.	ITEM	UNIT	QUANTITIES	
202.12	DEMOLITION & REMOVAL OF EXISTING FSOP	L.S.		
206.60	STRUCTURAL EXCAVATION FOR BRIDGE	CY	3105	
206.65	STRUCTURAL BACKFILL FOR BRIDGE	CY	1340	
206.80	FILTER MATERIAL	CY	153	
503.0702	CONCRETE IN BRIDGE (INCLUDE SIDEWALK)	CY	616	
503.0712	CONCRETE IN BRIDGE FOOTING	CY	476	
504.52	POST TENSIONING OPERATION FOR CAST-IN-PLACE STRUCTURE	lb	73823	
504.62	CONCRETE FOR PRESTRESS CAST-IN-PLACE STRUCTURE	CY	1084	
507.70	CONCRETE BRIDGE PARAPET & END POST	LF	599	
602.012	REINFORCING STEEL IN BRIDGE	lb	390163	



FS-A CURVE DATA

$\Delta = 95^{\circ}26'00''$
$\Delta/2 = 47^{\circ}43'00''$
$R = 70.00'$
$T = 76.97'$
$Ch = 103.58'$
$Lc = 116.59'$



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FORT SHAFTER OVERPASS
GENERAL LAYOUT PLAN, TYPICAL LONGITUDINAL SECTION ALONG & TRAVELWAY AND BRIDGE ESTIMATED QUANTITIES

MOANALUA ROAD
PUHLOA I.C. TO MIDDLE ST. - UNIT I
F.A. PROJ. NO. U-FF-078-1(6)
SCALE: AS SHOWN DATE: JUNE 25, 1976

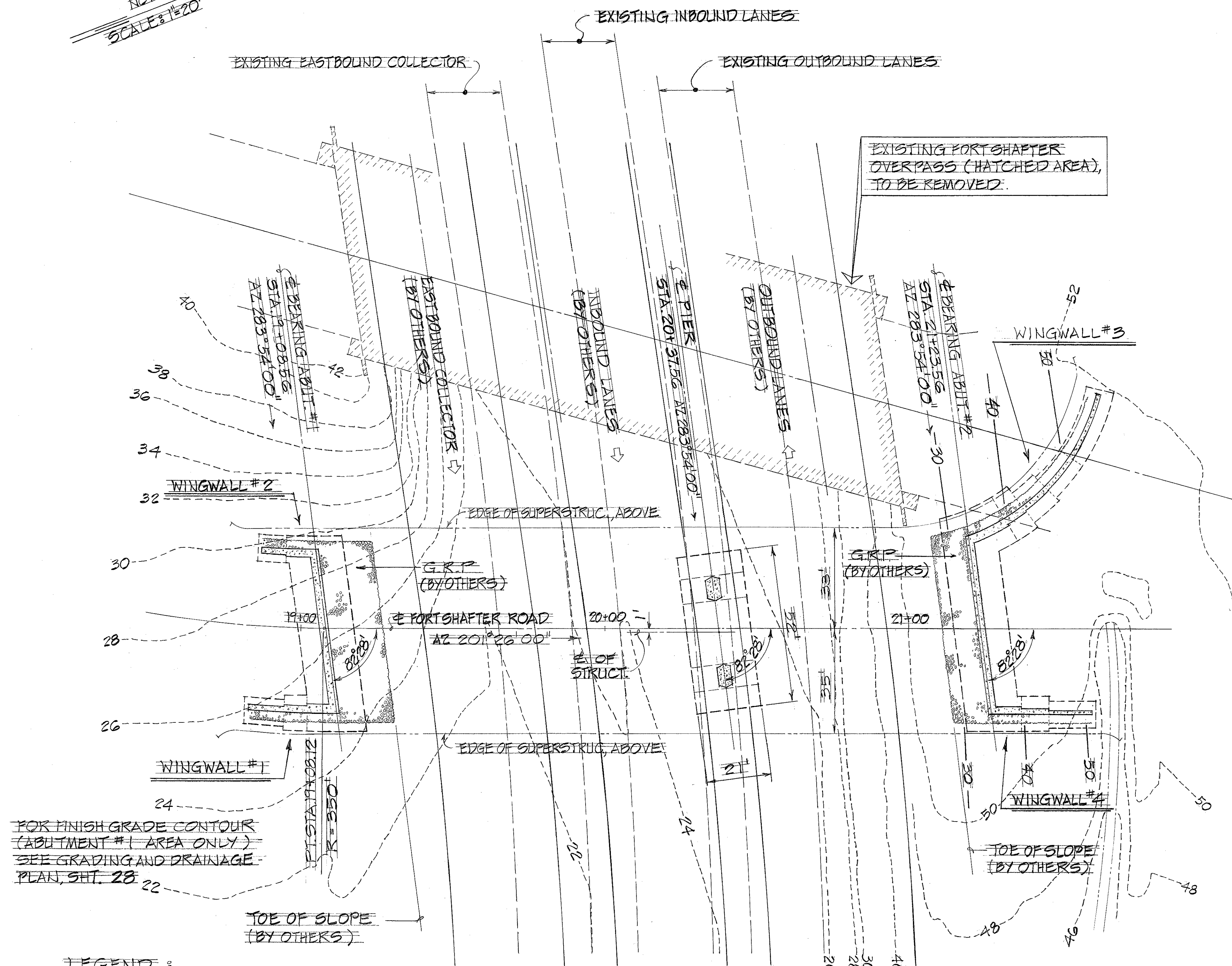
SHEET NO. 9-3 OF 41 SHEETS

11/5/76	REVISED QUANTITY
DATE	ITEM NO. 503.0702
	REVISION

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-PF-078-1(6)	1976	99	142

NORTH
SCALE: 1"=20'



FOR FINISH GRADE CONTOUR (ABUTMENT #1 AREA ONLY) SEE GRADING AND DRAINAGE PLAN, SHT. 28

LEGEND:

- 40 --- EXISTING GRADE CONTOUR
- 40 --- FINISH GRADE CONTOUR (BY OTHERS)

FOUNDATION LAYOUT PLAN

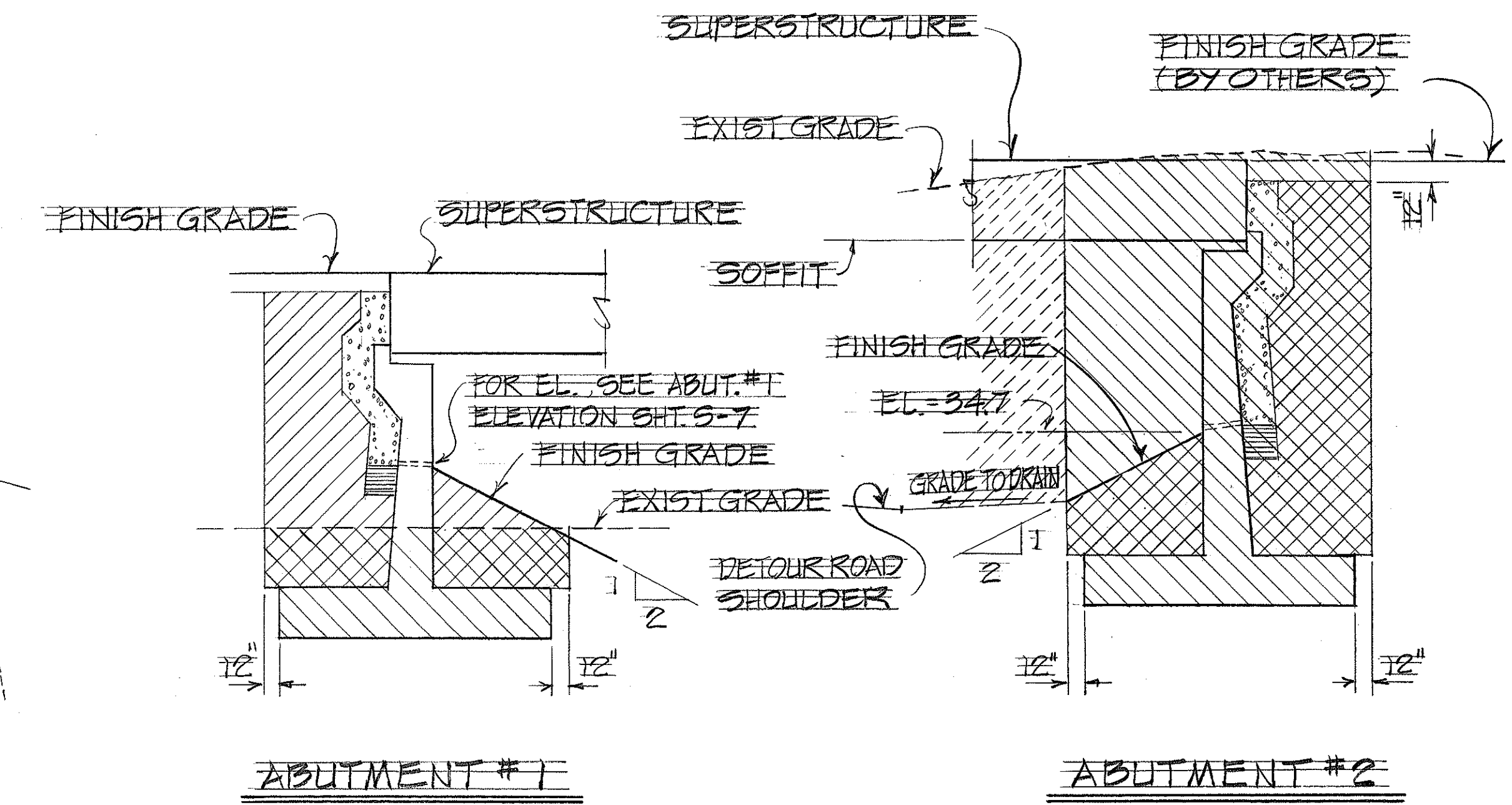
SCALE: 1"=20'

FORT SHAFTER OVERPASS

NAME AND DATE OF STRUCTURE

NOTES:

- FOR LETTER SIZE AND DETAILS, SEE STANDARD DETAILS SHEET 5-32
- DATE SHOWN SHALL BE THE YEAR STRUCTURE IS COMPLETED



STRUCTURAL EXCAVATION & BACKFILL DETAIL

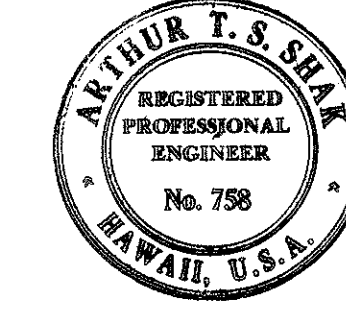
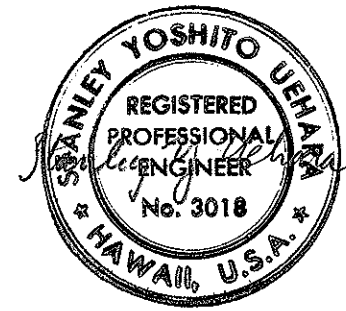
NOT TO SCALE

LEGEND:

- STRUCTURE BACKFILL
- STRUCTURE EXCAVATION
- ROADWAY EXCAVATION

REFERENCE DRAWINGS

- ABUTMENT #1 FOUNDATION SHT. 5-5
- ABUTMENT #2 FOUNDATION SHT. 5-8
- PIER FOUNDATION SHT. 5-15



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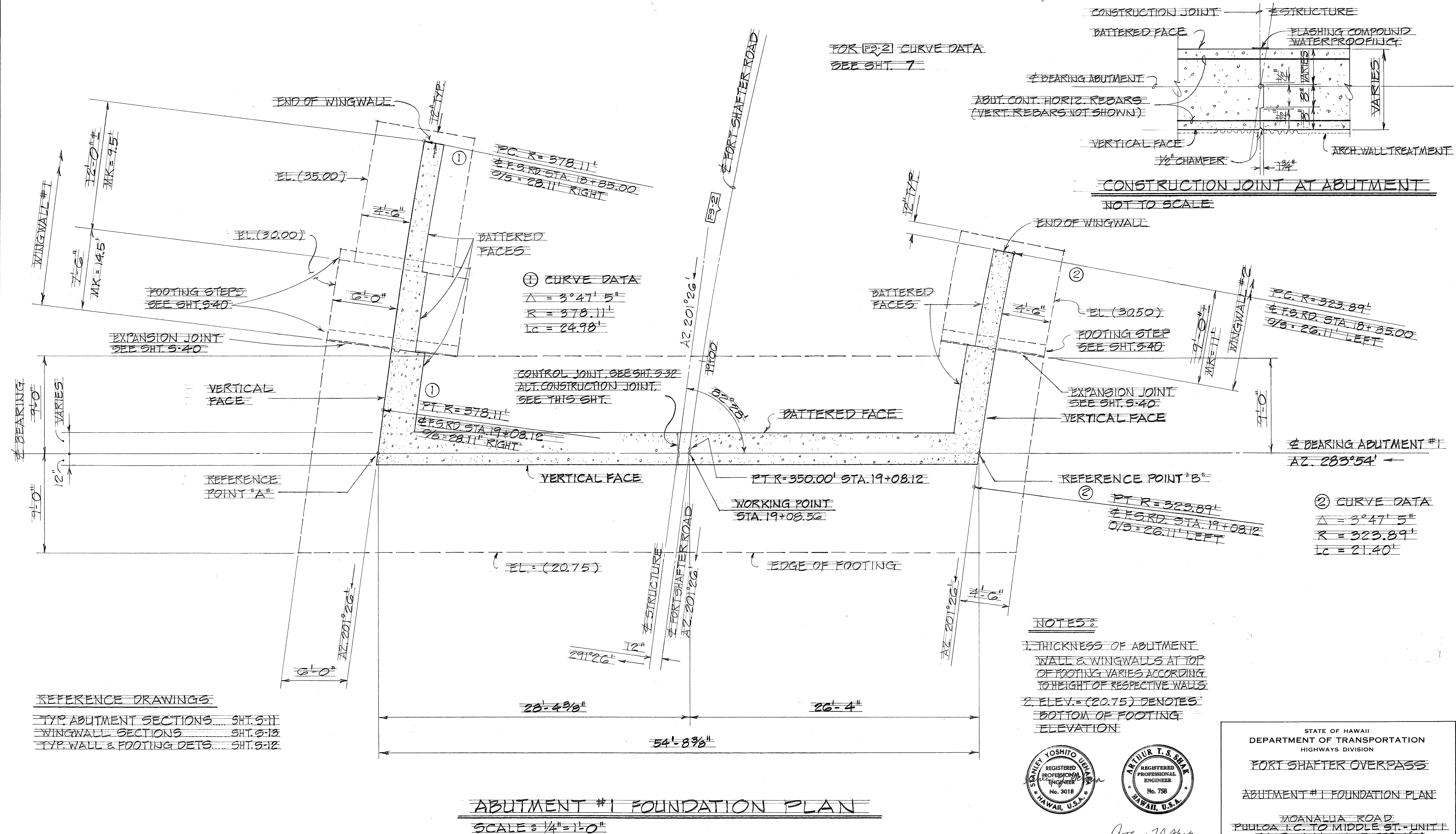
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FORT SHAFTER OVERPASS
FOUNDATION LAYOUT PLAN AND
STRUCTURAL EXCAVATION &
BACKFILL DETAIL

MOANALUA ROAD
PULLOA I.C. TO MIDDLE ST. - UNIT 1
EA Proj. No. U-PF-078-1(6)
SCALE: AS SHOWN DATE: JUNE 25, 1976

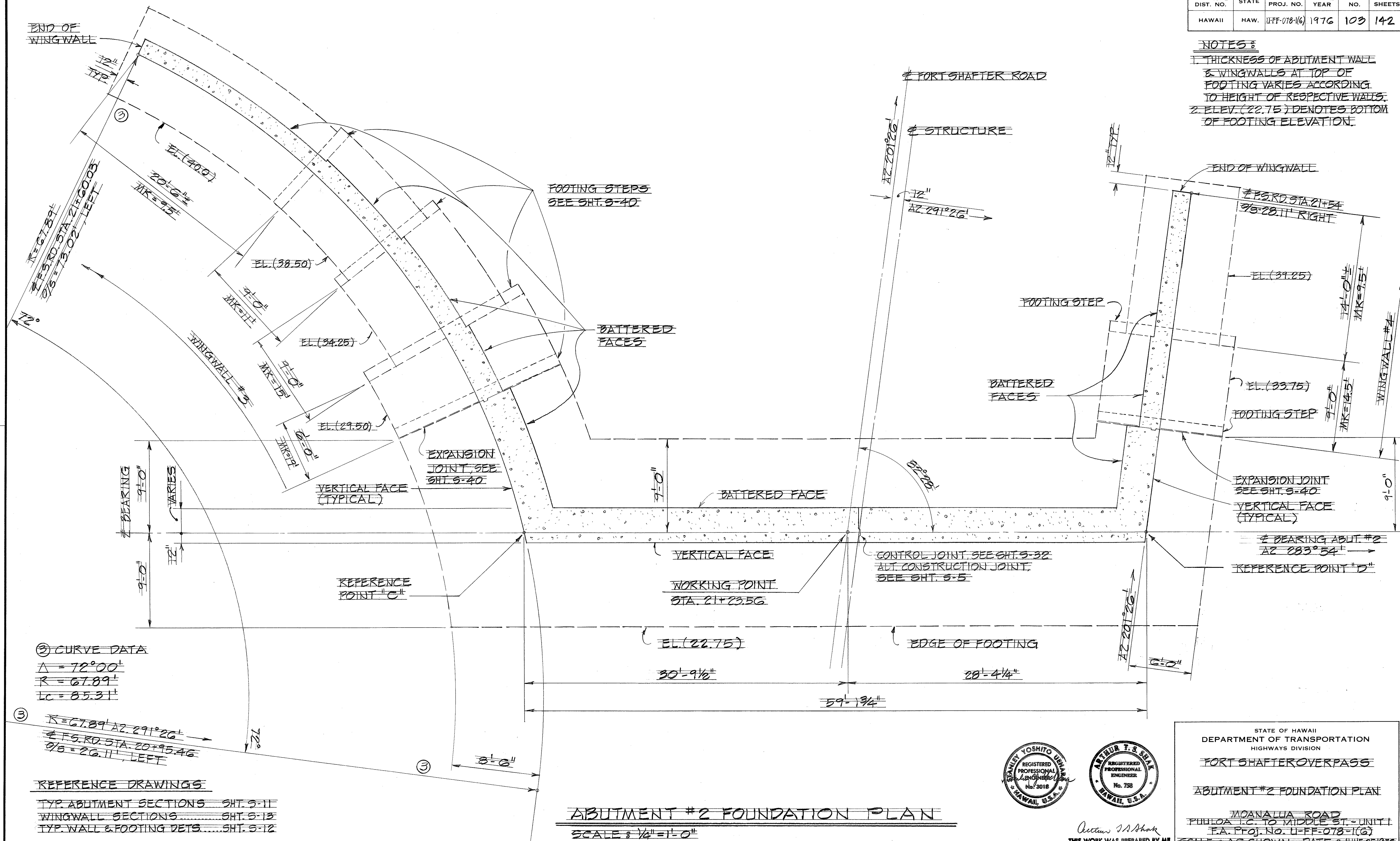
SHEET No. 3-4 OF 41 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-FF-078-1(6)	1976	100	142



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-FF-078-1(6)	1976	103	142

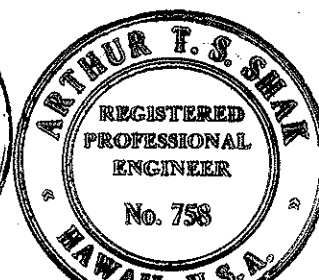
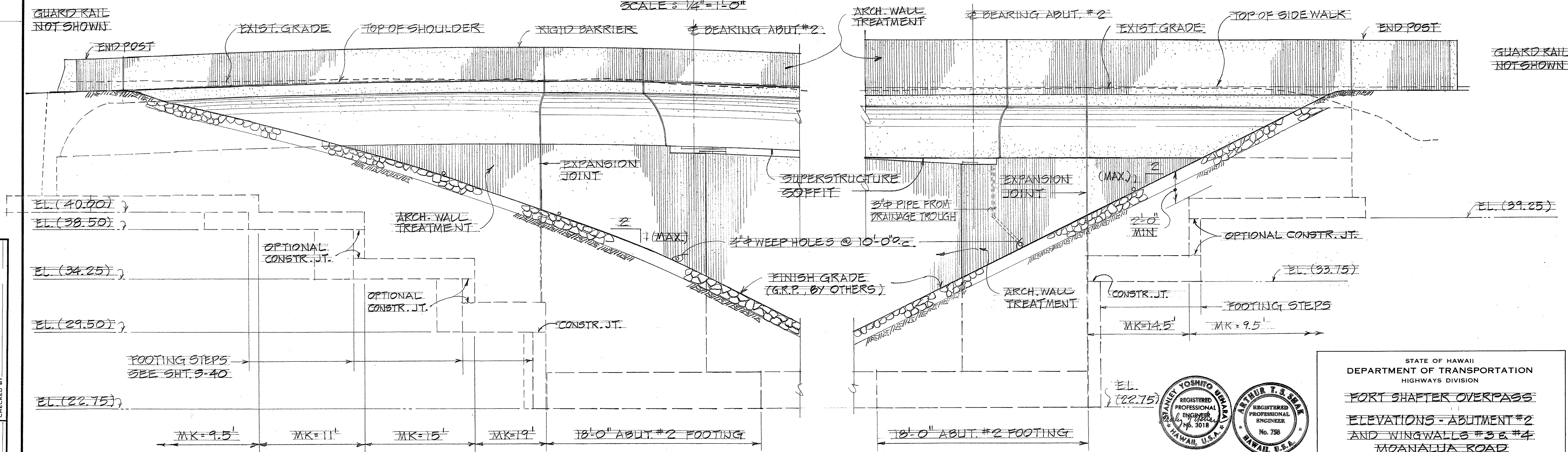
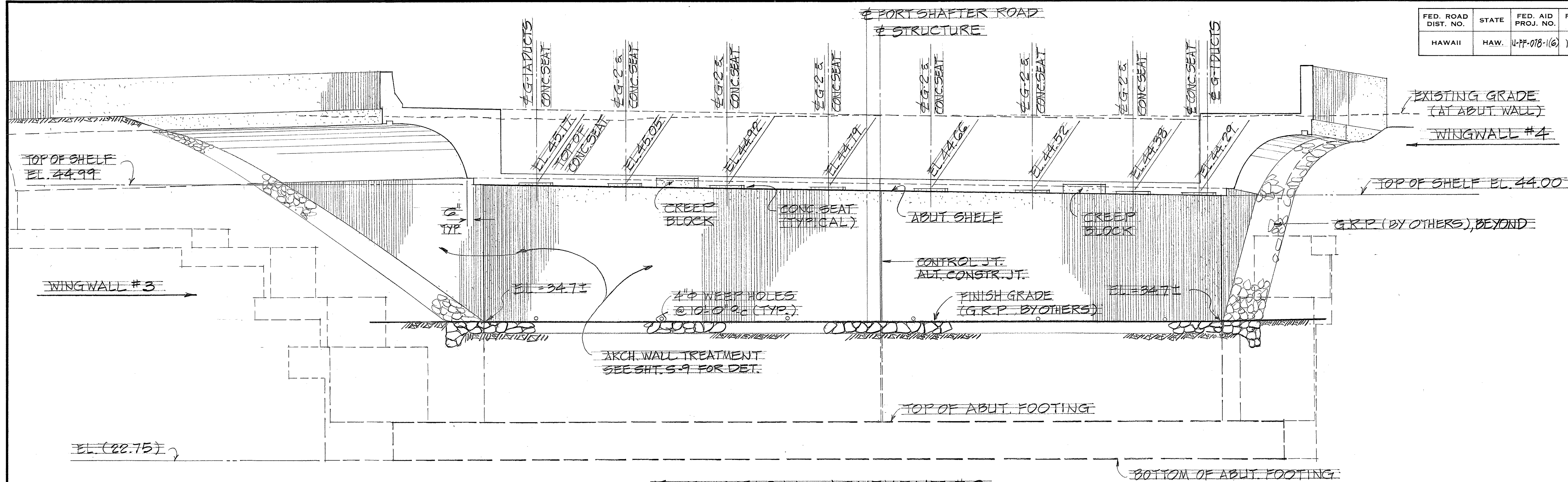
NOTES:
 1. THICKNESS OF ABUTMENT WALL & WINGWALLS AT TOP OF FOOTING VARIES ACCORDING TO HEIGHT OF RESPECTIVE WALLS.
 2. ELEV. (22.75) DENOTES BOTTOM OF FOOTING ELEVATION.



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STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
FORT SHAFTER OVERPASS
ABUTMENT #2 FOUNDATION PLAN
 MOANALUA ROAD
 PULUOA I.C. TO MIDDLE ST. - UNIT I
 P.A. PROJ. NO. U-FF-078-1(6)
 SCALE: AS SHOWN DATE: JUNE 25, 1976
 SHEET NO. 3-8 OF 41 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-PP-018-1(6)	1976	105	142



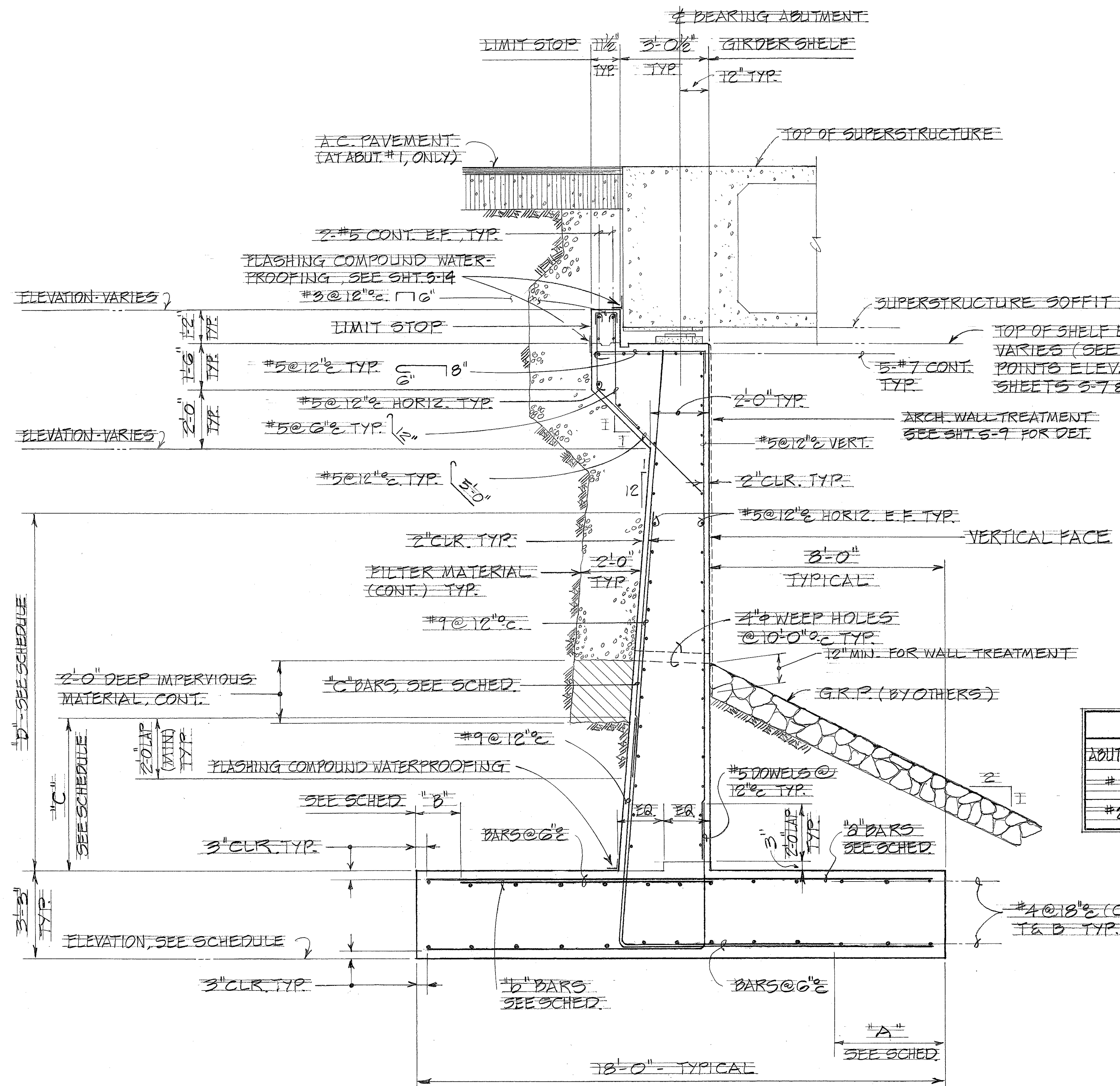
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FORT SHAFTER OVERPASS

ELEVATIONS - ABUTMENT #2
AND WINGWALLS #3 & #4
MOANALUA ROAD
PULOA I.C. TO MIDDLE ST. - UNIT I
E.A. Proj. No. U-PP-018-1(6)
SCALE AS SHOWN DATE: JUNE 25, 1976
SHEET No. 9-10 OF 41 SHEETS

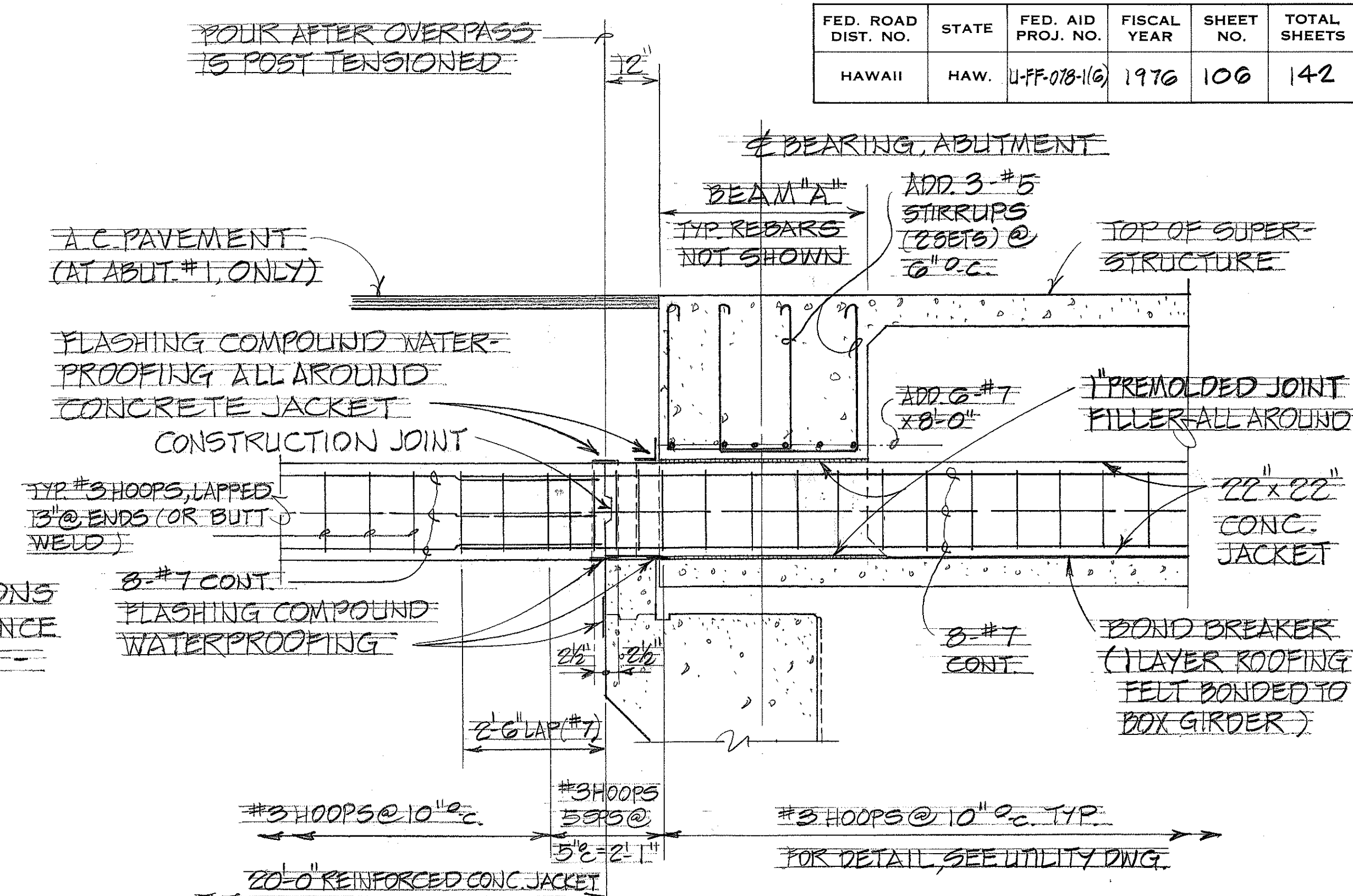
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-FF-078-1(6)	1970	106	142



TYPICAL SECTION - ABUTMENTS #1 & #2

SCALE: $\frac{1}{2}'' = 1'-0''$

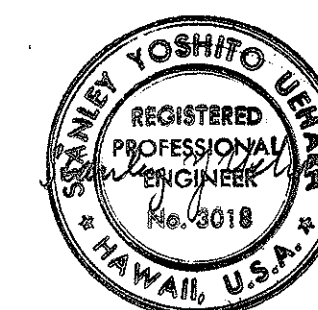


DETAIL - CONCRETE JACKET @ BEAM "A"

SCALE: $\frac{1}{2}'' = 1'-0''$

SCHEDULE									
ABUTMENT	"A"	"B"	"C"	"D"		ELEVATION	"a" BARS	"b" BARS	"c" BARS
#1	2'-9"	2'-3"	3'-6"	11'-0"		(20.75)	#8@12"	#8@12"	#5@12"
#2	2'-9"	2'-0"	5'-3"	12'-3"		(22.75)	#8@12"	#8@12"	#6@12"

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



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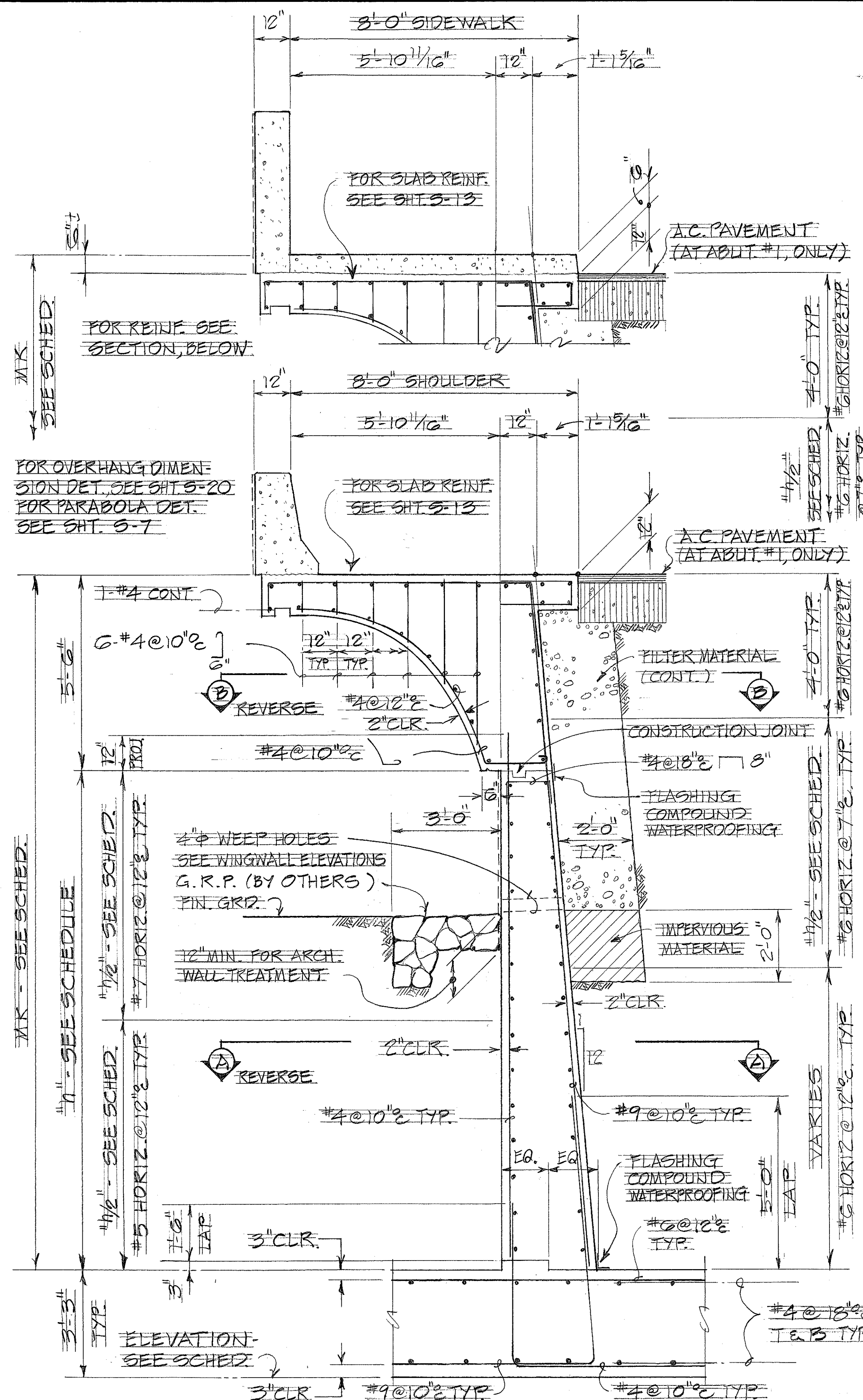
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

~~FORT SHAFTER OVERPASS~~

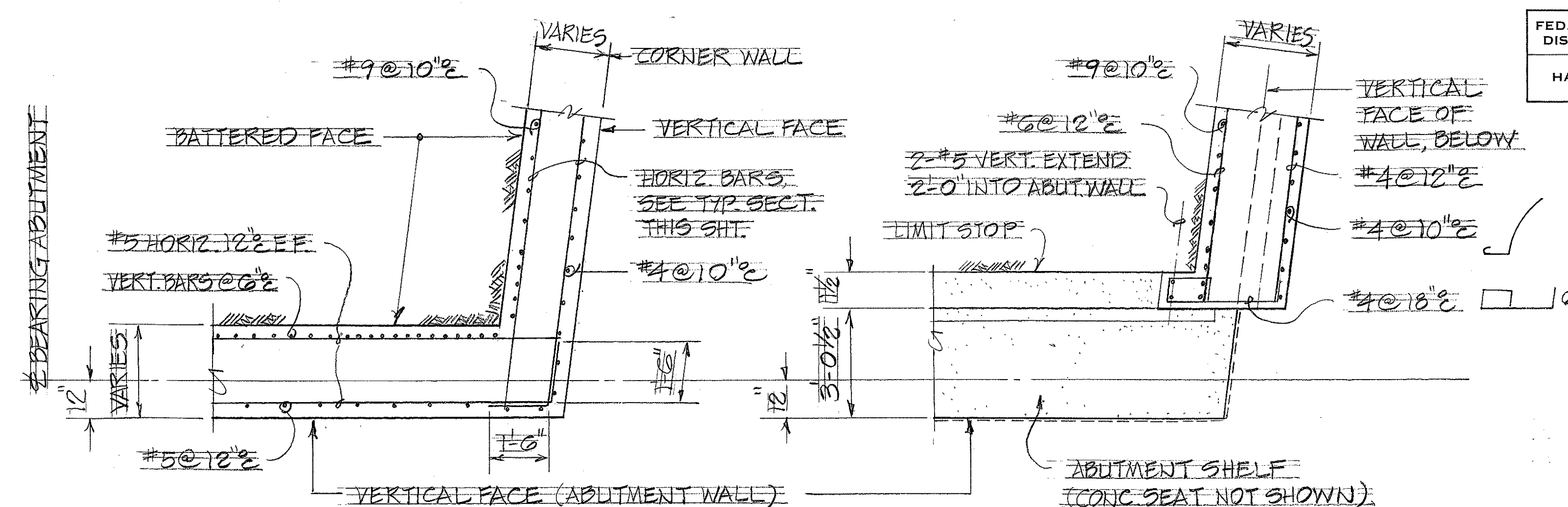
~~TYPICAL SECTION~~
~~ABUTMENTS #1 & 2~~
~~MOANALUA ROAD~~
~~PULUOA I.C. TO MIDDLE ST. - UNIT 1~~
~~E.A. Proj. No. U-FF-078-(6)~~
~~SCALE: AS SHOWN DATE: JUNE 25, 1976~~

SHEET NO. 9-11 OF 41 SHEETS

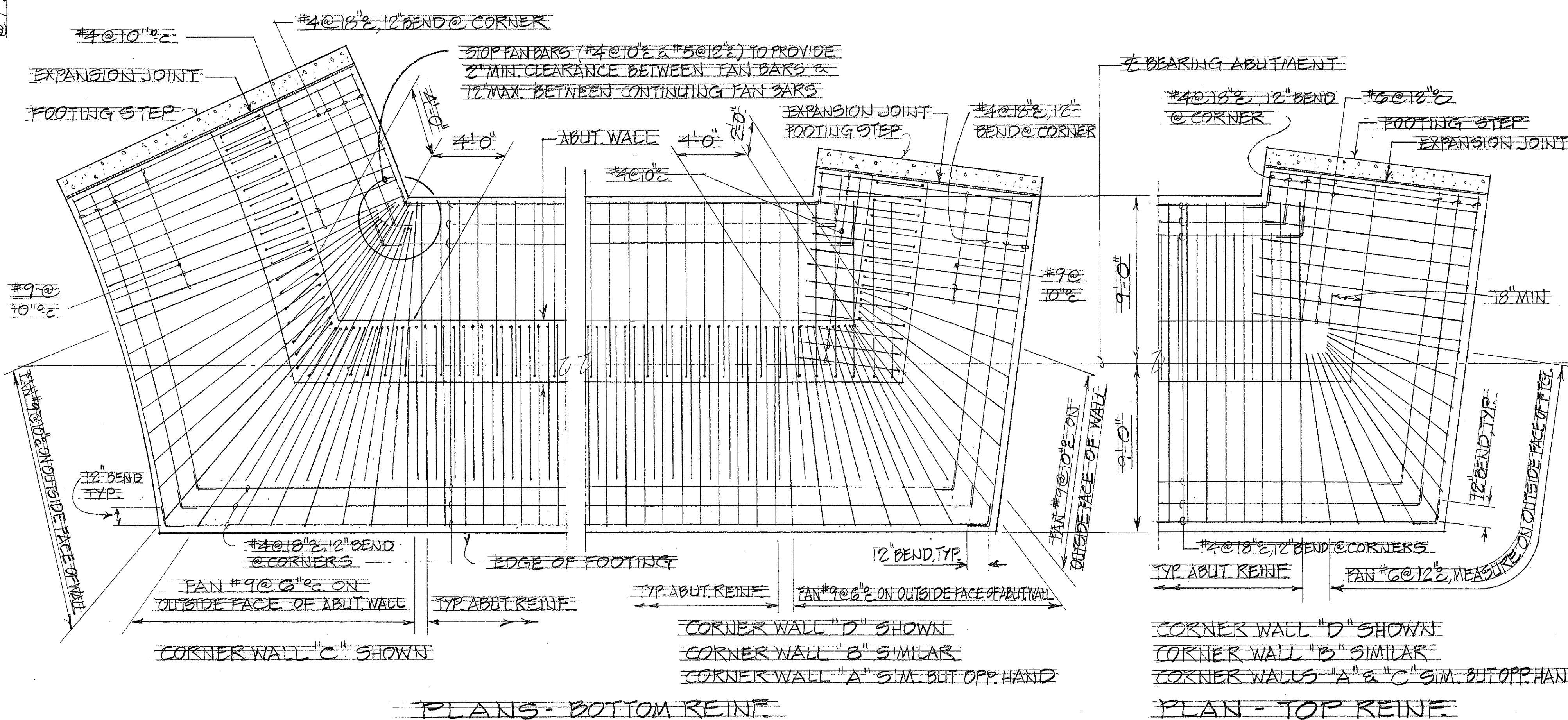
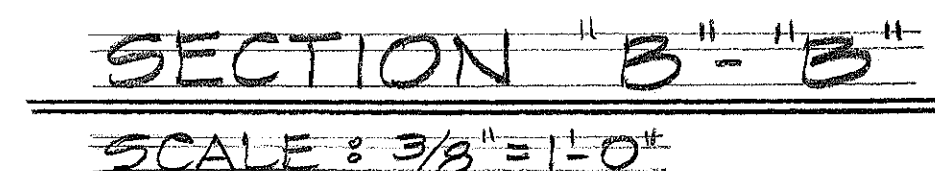
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEET
HAWAII	HAW.	U-FF-078-1(6)	1976	107	142



TYPICAL SECTIONS - CORNER WALLS "A", "B", "C" & "D"
SCALE: $\frac{1}{2}" = 1'-0"$



TYP. CORNER WALL SECTION "A" - "A"



CORNER WALL FOOTING REINFORCING DETAILS

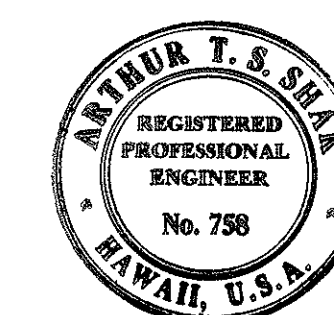
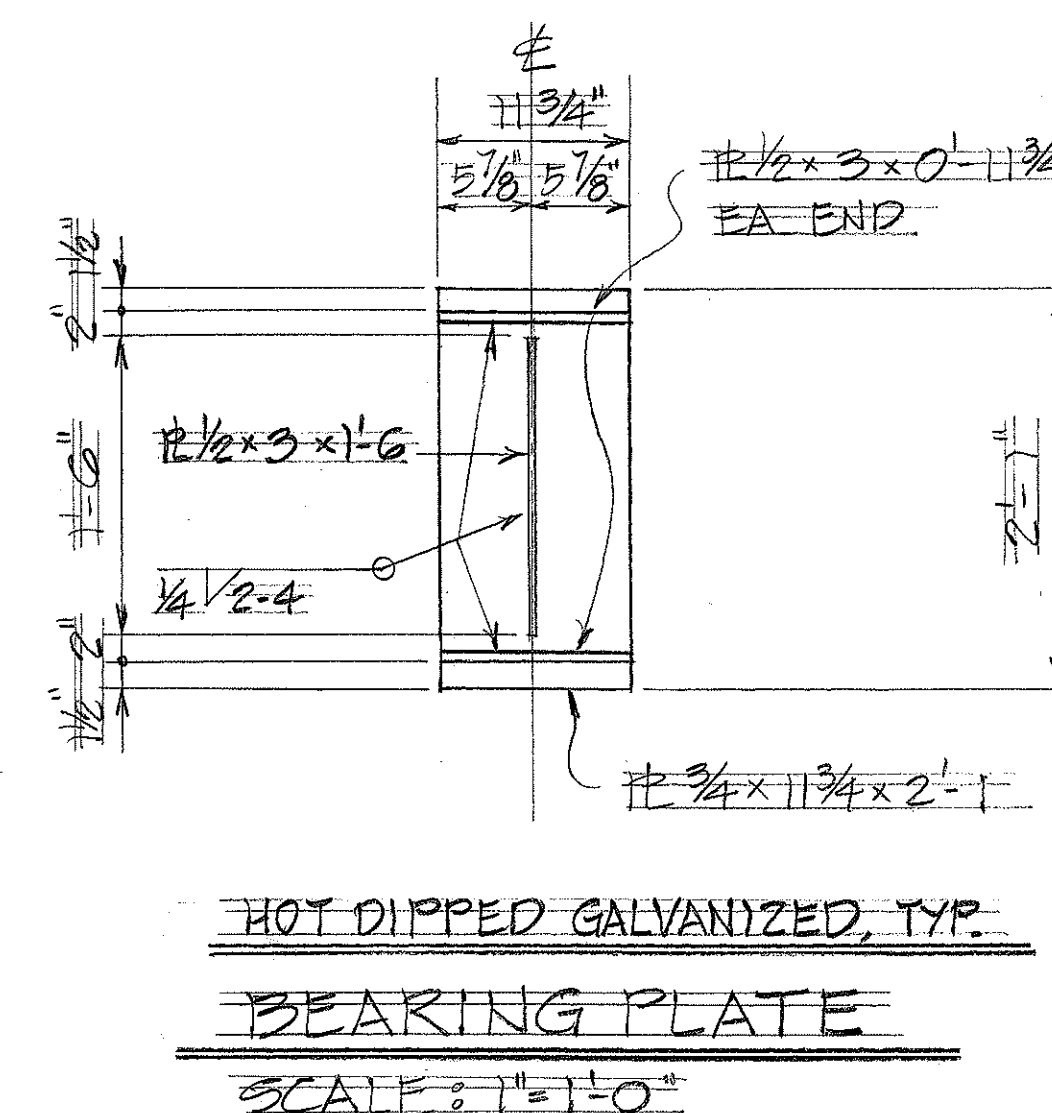
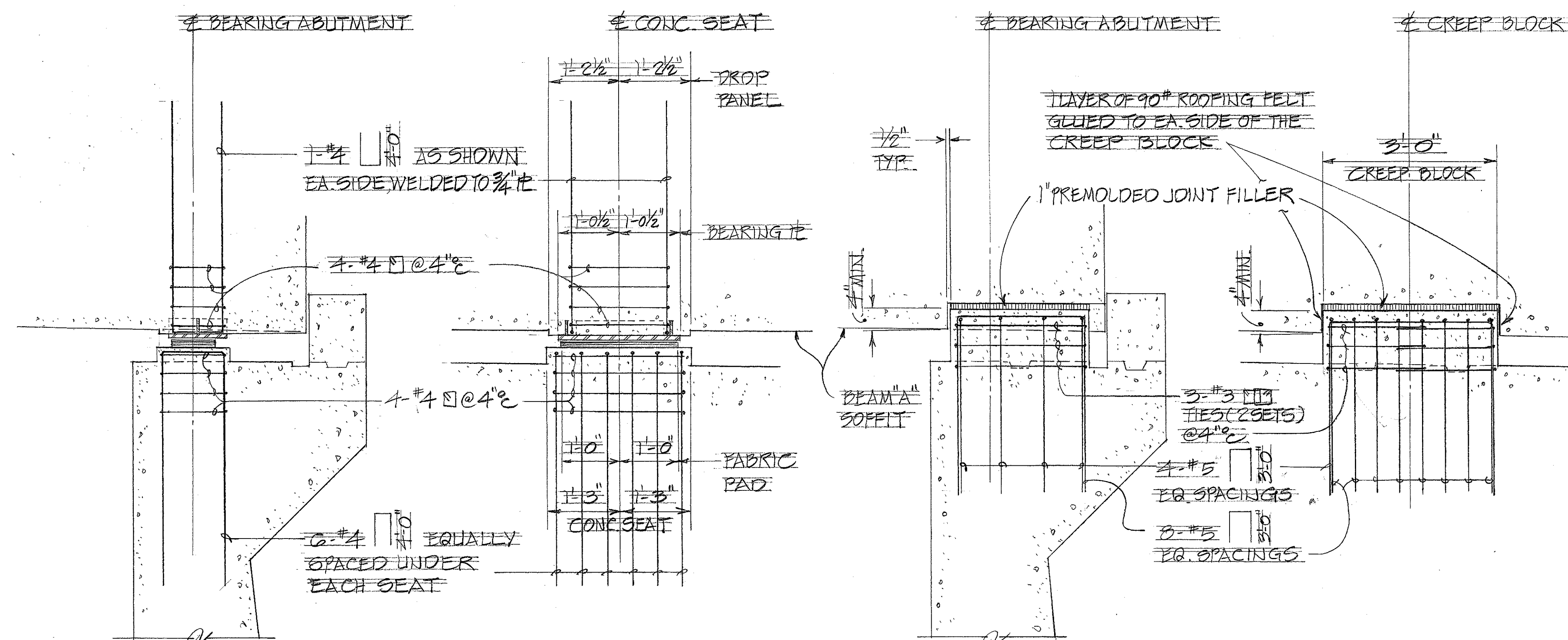
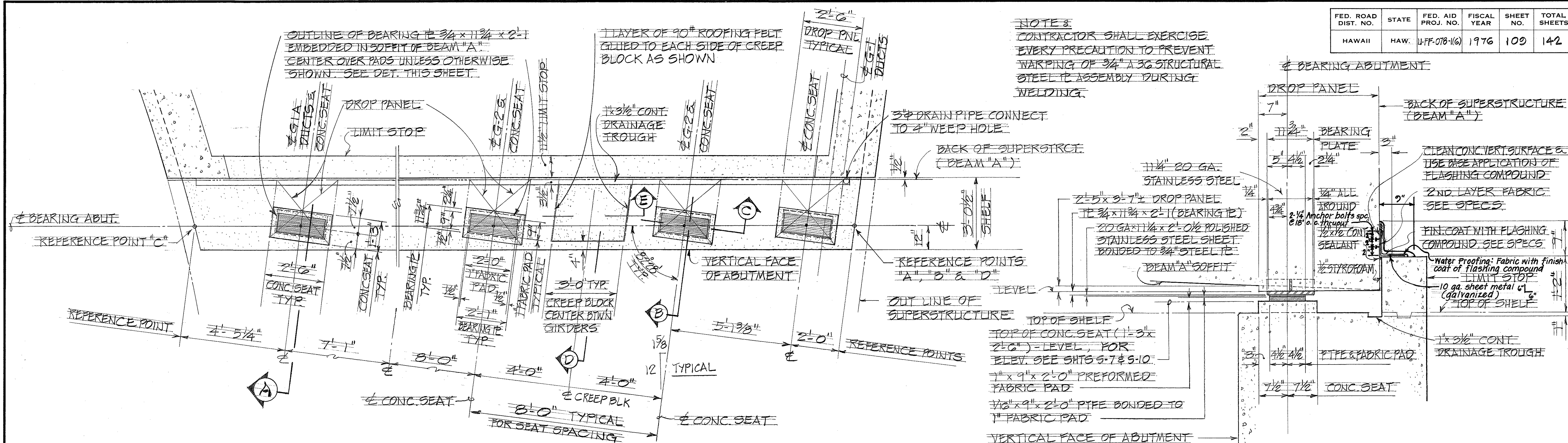
<u>SCHEDULE</u>				
CORNER WALL	MK	" h "	" h/2 "	ELEVATION
"A" AT ABUT. #1 2 WINGWALL #1	23'	17'-6"	8'-9"	(20.75)
"B" AT ABUT. #1 2 WINGWALL #2	19.5'	14'-0"	7'-0"	(20.75)
"C" AT ABUT. #2 2 WINGWALL #3	25'	19'-6"	9'-9"	(22.75)
"D" AT ABUT. #2 2 WINGWALL #4	25'	19'-6"	9'-9"	(22.75)



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
FORT SHAFTER OVERPASS
TYPICAL CORNER (ABUTMENT
E WINGWALL) WALL DETAILS
MOANALUA ROAD
PULLOA I.C. TO MIDDLE ST. - UNIT F
EA Proj. No. U-FF-078-1(6)
SCALE : AS SHOWN DATE : JUNE 25, 1976
SHEET NO. 5 OF 41 SHEETS

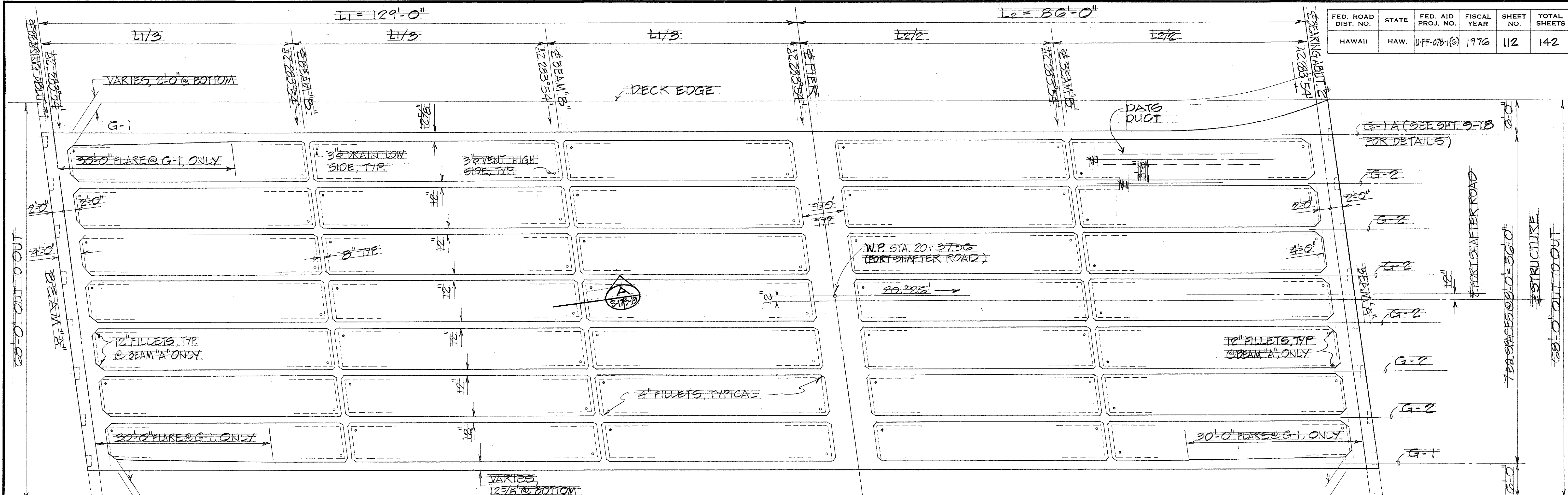
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-F-078-1(6)	1976	109	142



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
FORT SHAFTER OVERPASS
ABUTMENT SHELF
PLAN AND DETAILS
MOANALUA ROAD
PUBLICA I.C. TO MIDDLE ST. UNIT I
F.A. PROJ. NO. U-F-078-1(6)
SCALE: AS SHOWN DATE: JUNE 25, 1976
SHEET No. 3-14 OF 41 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-FF-078-1(6)	1976	112	142

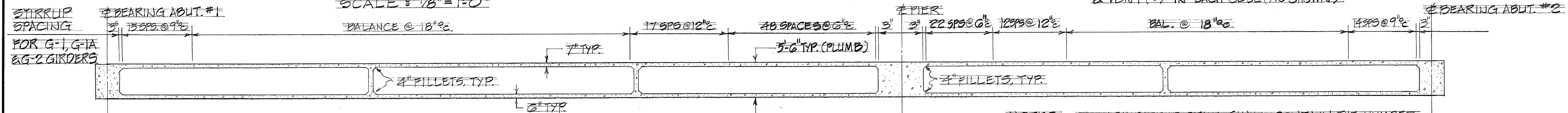


DECK FRAMING PLAN (SHOWN 2'-9" ABOVE GIRDER SOFFIT)

SCALE: 1/8" = 1'-0"

NOTES:

- 3" DIA. NON-RUSTING MATERIAL DRAIN (○)
- 6" VENT (○) IN EACH CELL (AS SHOWN)

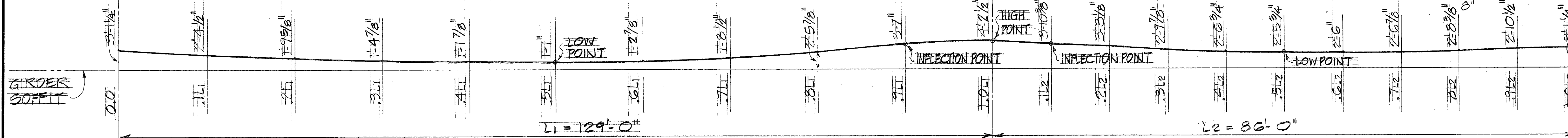


ELEVATION SHOWING GIRDER STIRRUP SIZE & SPACING

SCALE: 1/8" = 1'-0"

NOTES:

1. EACH GIRDER STEM SHALL CONTAIN THE NUMBER AND SPACING OF STIRRUPS AS SHOWN.
2. ALL STIRRUPS SHALL BE #5 8" 8"



CENTER OF GRAVITY OF POST TENSION FORCES

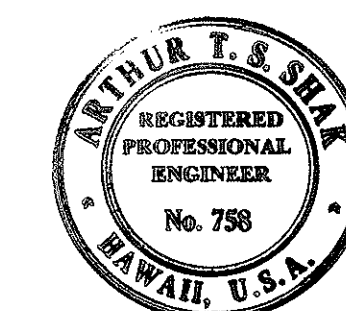
SCALE: 1/8" = 1'-0"

NOTE:

- ALL POST TENSION DUCTS IN EACH STEM SHALL BE PLACED TO SATISFY THE LOCATIONS SHOWN FOR THE C.G. OF POST TENSION FORCES.

REFERENCE DRAWINGS:

POST TENSIONING	SHT. 9-21
BOX GIRDER SECTION	SHT. 9-20
BEAM "A"	SHT. 9-22
BEAM "B"	SHT. 9-19
PIER CAP	SHT. 9-16



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
PORT SHAFTER OVERPASS
DECK FRAMING PLAN, ELEVATION SHOWING GIRDER
STIRRUP SIZE & SPACING, CENTER OF GRAVITY OF
POST TENSION FORCES AND CAMBER DIAGRAM
MOANALUA ROAD
PUBLOA I.C. TO MIDDLE ST. UNIT I
FA Proj. No. U-FF-078-1(6)
SCALE: AS SHOWN DATE: JUNE 25, 1976
SHEET NO. 5-17 OF 41 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-PP-078-1(6)	1976	114	142

NOTES:

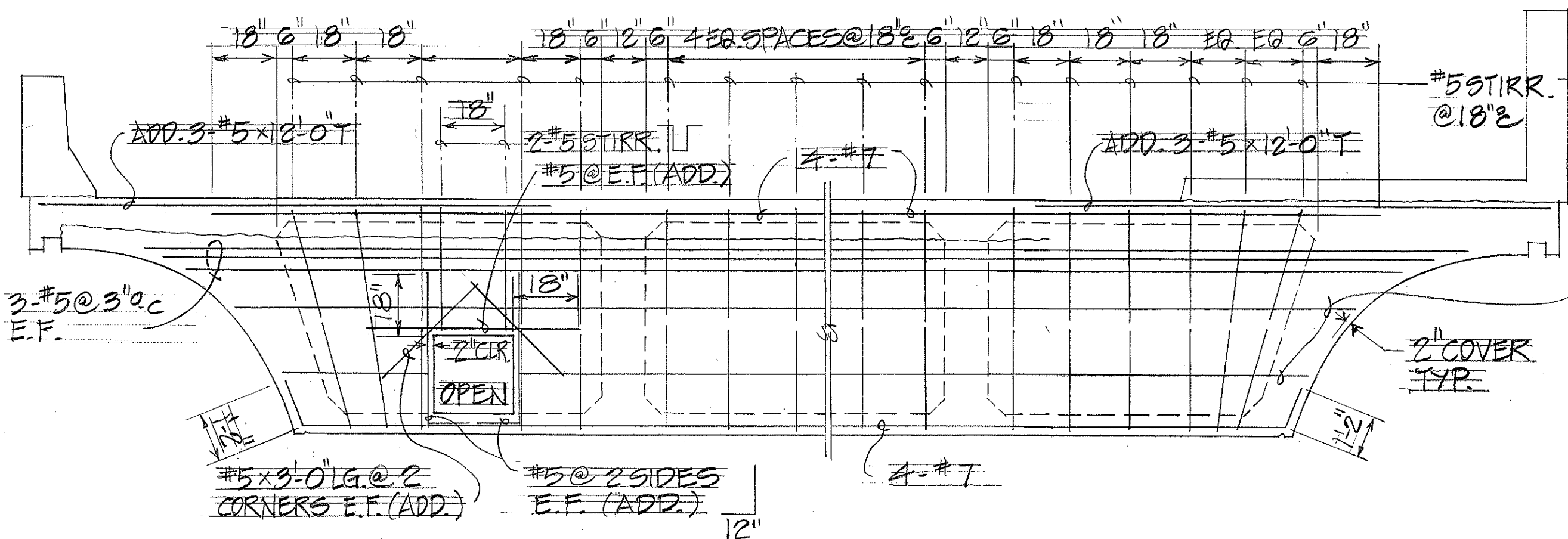
1. SPLICES FOR CONT. #10 BARS SHALL BE STAGGERED @10'-0" MIN. DO NOT SPLICE WITHIN 10'-0" ON EITHER SIDE OF MID-SPAN. ONLY ONE BAR SHALL BE SPLICED AT ANY POINT PER GIRDER.
2. DO NOT SPLICE CONT. #5 BARS (LONGIT.) WITHIN 10'-0" FROM # ABUTMENT BEARING.
3. #5 TRANSVERSE BARS SHALL BE PLACED PARALLEL TO BEAMS "A" & "B" OR PIER CAP.

REFERENCE DRAWINGS

BOX GIRDER SECTION	SHT. 5-20
BEAM "A"	SHT. 5-22
BEAM "B"	SHT. 5-19
PIER CAP	SHT. 5-16

TYPICAL ARRANGEMENT OF BOTTOM SLAB BOTTOM LAYER LONGITUDINAL & TRANSVERSE DECK REINFORCEMENT

SCALES - HORIZ. 3/32" = 1'-0", VERT. 3/16" = 1'-0"



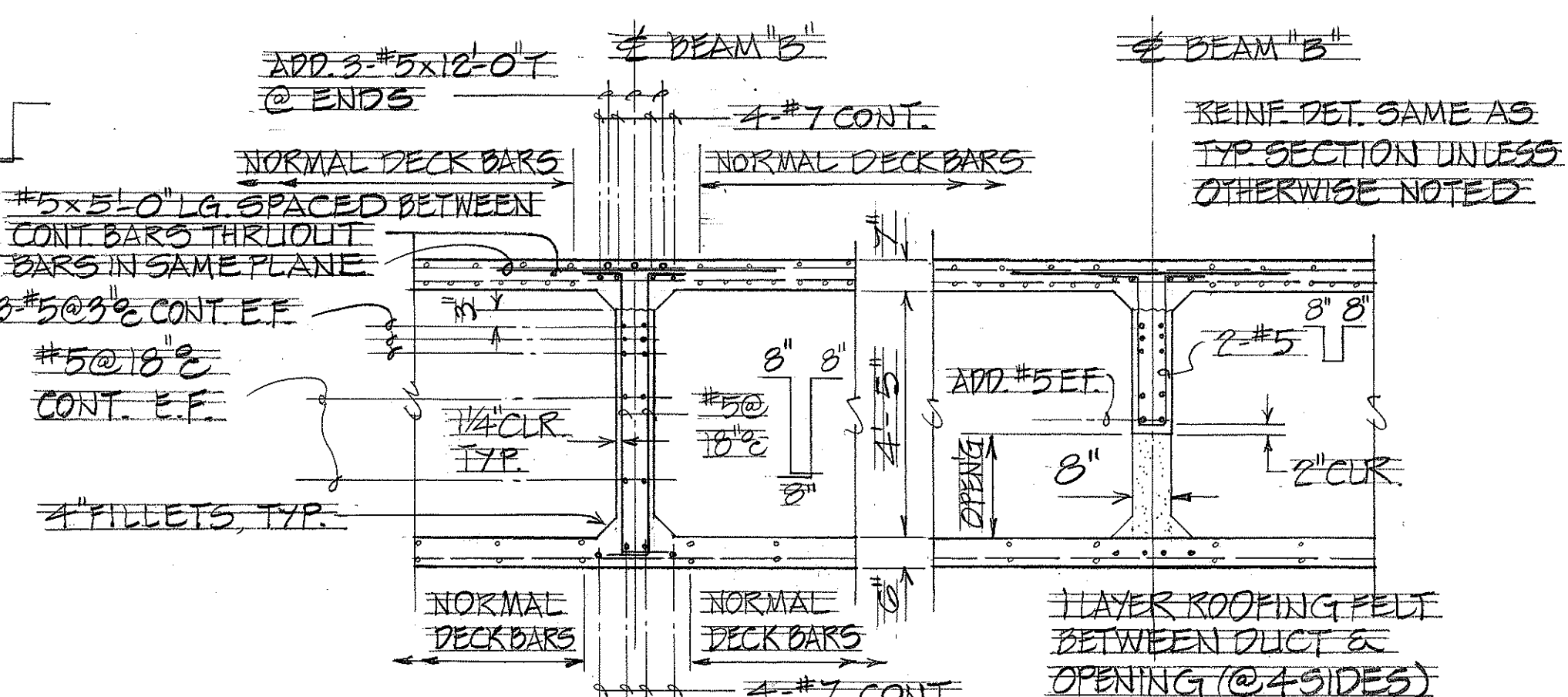
AT DATA DUCT BAY AT TYP. BAY AT TYP. END BAY

NORMAL DECK & GIRDER REINFORCING BARS NOT SHOWN

ELEVATIONS

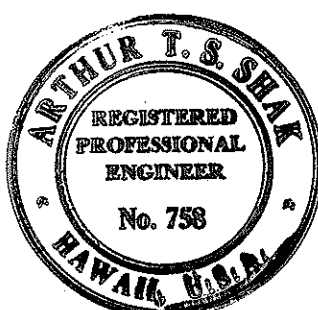
BEAM "B" DETAILS

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



AT TYP. & END BAYS AT DATA DUCT BAY

SECTIONS



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

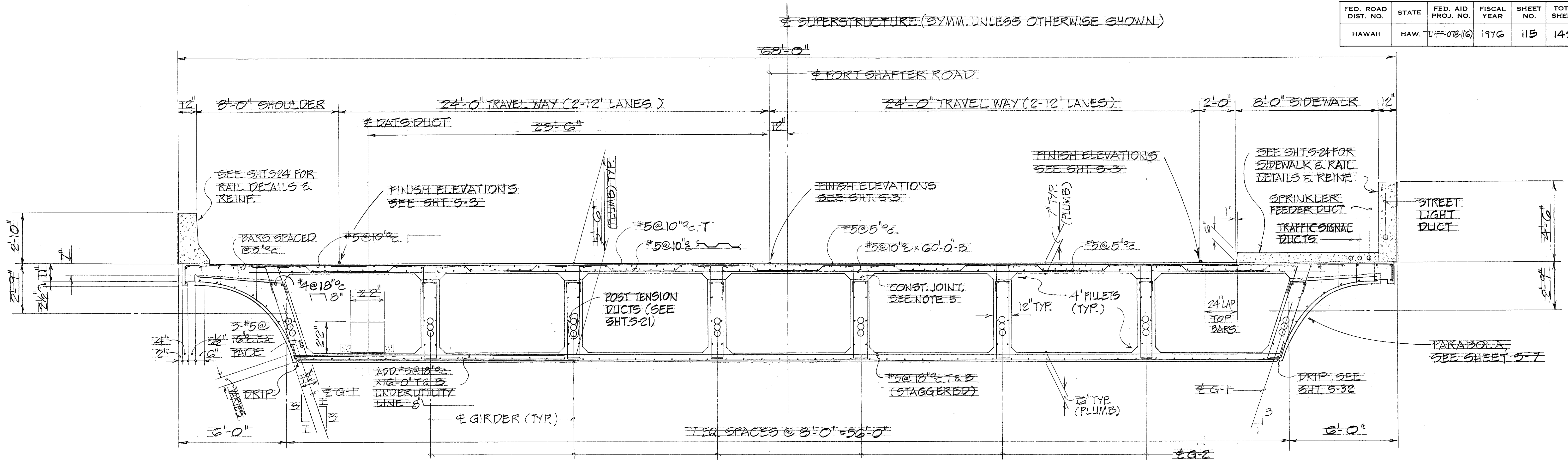
FORT SHAFTER OVERPASS

TYPICAL ARRANGEMENT OF BOTTOM SLAB
BOTTOM LAYER LONGITUDINAL & TRANSVERSE
DECK REINFORCEMENT AND BEAM "B" DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT I
F.A. PROJ. NO. U-PP-078-1(6)
SCALE: AS SHOWN DATE: JUNE 25, 1976

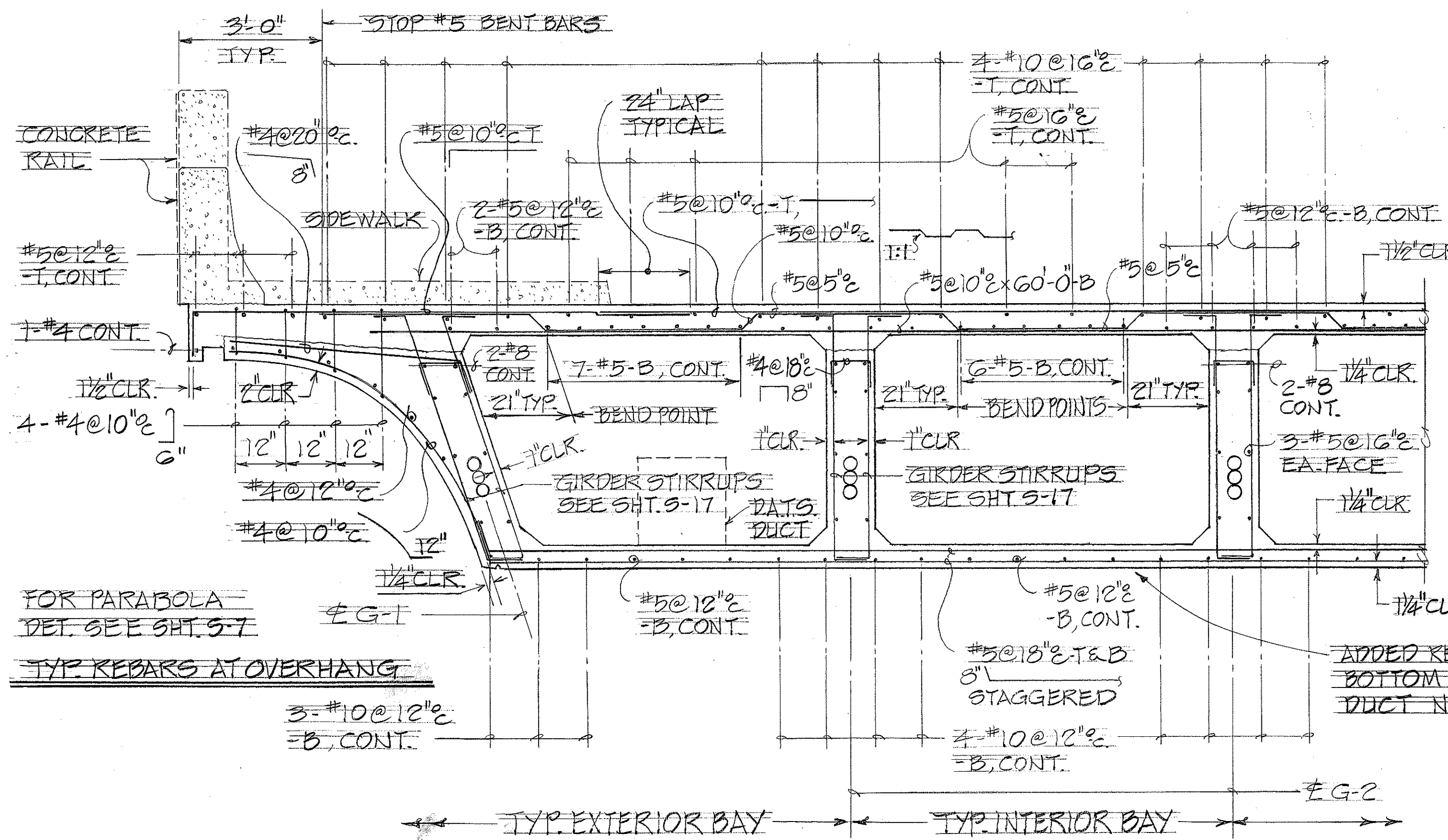
SHEET No. 5-19 OF 41 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-PP-078-1(6)	1976	115	142



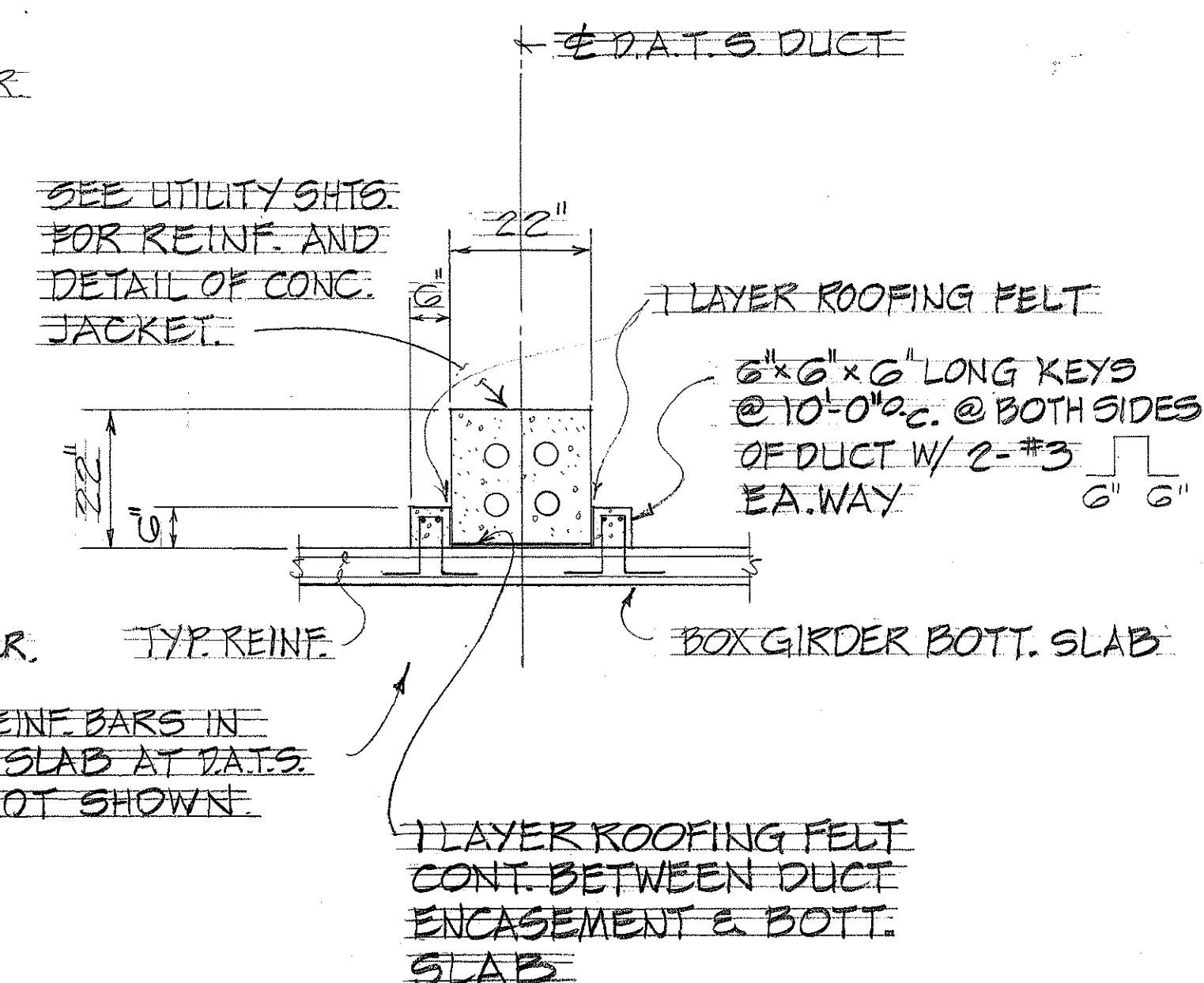
TYPICAL POST TENSIONED BOX GIRDER SECTION (LOOKING MAUKA)

SCALE: 3/8" = 1'-0" (HORIZ. DIMENSIONS SHOWN ARE AT RIGHT ANGLES TO C OF ROAD)



TYPICAL REINFORCING DETAIL

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



UTILITY DETAIL

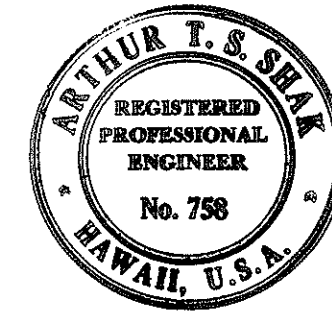
SCALE: 1/2" = 1'-0"

NOTES:

1. ALL VERTICAL DIMENSIONS ARE MEASURED PLUMB.
2. ALL TRANSVERSE SLAB REINF. SHALL BE PLACED PARALLEL TO THE PIER & ABUTMENTS.
3. LONGITUDINAL DECK REINF. ALONG EDGE OF DECK SHALL FOLLOW CURVATURE OF DECK EDGE.
4. DECK SLOPE NOT SHOWN. SEE GENERAL LAYOUT PLAN SHT. 5-3 FOR FINISH ELEVATIONS.
5. THE ENTIRE SURFACE OF THE JOINT SHALL BE THOROUGHLY CLEANED OF SURFACE LANTANCE, CURING COMPOUND, AND OTHER MATERIAL FOREIGN TO THE CONCRETE AND CLEAN AGGREGATE BE EXPOSED BY ABRASIVE BLAST CLEANING AFTER THE CURING PERIOD OR IMMEDIATELY BEFORE PLACING CONCRETE AT THE JOINT.

REFERENCE DRAWINGS

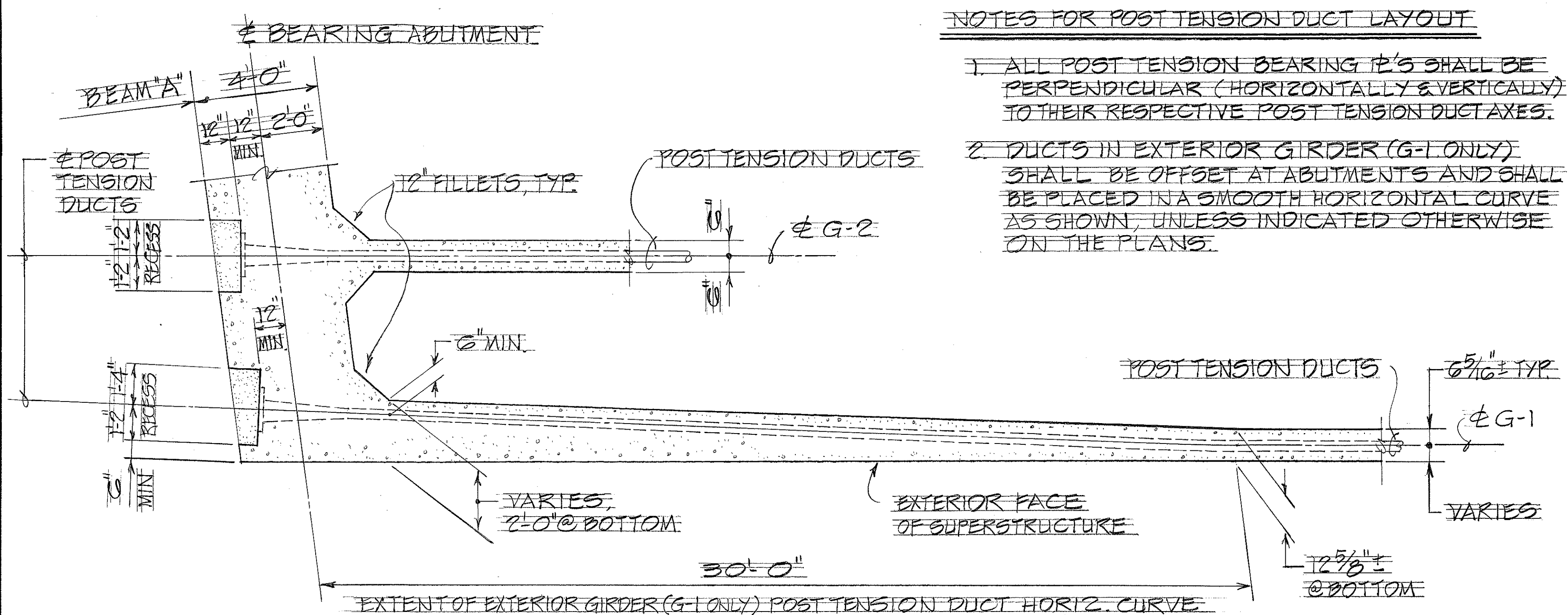
POST TENSIONING	SHT. 5-21
STIRRUP SIZE & SPACING	SHT. 5-17
TOP SLAB ADDED REINF. PLAN	SHT. 5-10
CONC. RAILING & SIDEWALK	SHT. 5-24



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
FORT SHAFTER OVERPASS
TYPICAL POST TENSIONED BOX GIRDER SECTION AND DETAILS
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT I
FA PROJ. NO. U-PP-078-1(6)
SCALE: AS SHOWN DATE: JUNE 25, 1976
SHEET NO. 5-20 OF 41 SHEETS

Arthur T. S. Shaw
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-FF-078-1(6)	1976	116	142



PLAN-POST TENSION DUCT LAYOUT IN EXTERIOR & INTERIOR GIRDER

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

POST TENSION NOTES

- SEE SPECIFICATIONS FOR OTHER POST TENSION REQUIREMENTS.
- ALL DUCTS SHALL BE RIGID FERROUS METAL GALVANIZED, MORTAR TIGHT AND SHALL BE SECURELY ANCHORED AT ALL TIMES DURING CONSTRUCTION TO PREVENT ANY DAMAGE. CONTRACTOR SHALL EXERCISE THE MAXIMUM AMOUNT OF CARE DURING PLACEMENT OF DUCTS, REINFORCING & CONCRETE IN ORDER TO PROTECT THE DUCTS FROM DAMAGE.
- 1/2" & 270K STRANDS SHALL BE USED FOR POST TENSIONING.
- ALL STRAND SHALL BE PLACED AND TENSIONED AFTER THE SUPERSTRUCTURE CONCRETE HAS ATTAINED A COMPRESSIVE STRENGTH EQUAL TO 4000 P.S.I. & A MINIMUM OF 10 DAYS MUST HAVE ELAPSED SINCE ITS LAST PLACEMENT.
- CONTRACTOR SHALL TAKE STEPS NECESSARY TO ALLOW THE SUPERSTRUCTURE TO CONTRACT DURING TENSIONING OPERATIONS. DURING TENSIONING OPERATIONS THE BOX GIRDER SOFFIT FORMS WILL BE SUBJECT TO THE SAME COMPRESSIVE FORCE AS THE CONCRETE BOX GIRDER UNLESS COMPRESSIBLE JOINTS &/OR BOND BREAKERS ARE PROVIDED TO RELIEVE THIS FORCE.
- ALL DUCTS SHALL BE CLEANED OUT BEFORE PLACING STRANDS.
- THE MAXIMUM JACKING STRESS (ACTUAL) FOR ALL STRANDS SHALL BE 75% OF ULTIMATE.
- STRANDS SHALL BE END ANCHORED AT A MAXIMUM EQUIVALENT ANCHOR SET OF 5/8".
- THE SEQUENCE OF POST TENSIONING SHALL BE DETERMINED BY THE CONTRACTOR AND SHALL BE APPROVED BY THE ENGINEER.
- NO TENSIONING OR GROUTING SHALL BE PERFORMED IN THE ABSENCE OF THE ENGINEER.
- AFTER ALL POST TENSION OPERATIONS & TESTING ARE COMPLETED, ALL DUCTS SHALL BE GROUTED IN ACCORDANCE WITH THE SPECIFICATIONS.
- AFTER GROUTING IS COMPLETED, THE ANCHORAGE ASSEMBLY SHALL BE REINFORCED & PROTECTED AS SHOWN.
- THE QUANTITY OF PRESTRESSING STEEL TO BE FURNISHED SHALL BE BASED ON A MAXIMUM STRESS OF 70% OF ULTIMATE.

ANCHORAGE ASSEMBLY PROTECTION NOTES

- AFTER ALL POST TENSION WORK IS COMPLETED, CLEAN POST TENSION HARDWARE AS REQUIRED IN ORDER TO PROVIDE GOOD BONDING SURFACE.
- BEND DOWELS AND PLACE ADDED REINFORCING AS SHOWN.
- PAINT ENTIRE ANCHORAGE ASSEMBLY (INCLUDING POST TENSION HARDWARE) WITH TWO COMPONENT EPOXY (COST INCIDENTAL TO CONCRETE).
- JUST BEFORE NEW CONCRETE IS PLACED AGAINST POST TENSION ANCHOR PLATES, APPLY A NEW COAT OF EPOXY FOR BOND WITH CONCRETE.
- 7 DAYS AFTER PLACING CONCRETE OVER ANCHORAGE ASSEMBLY PLACE WATERPROOFING MEMBRANE AS SHOWN.

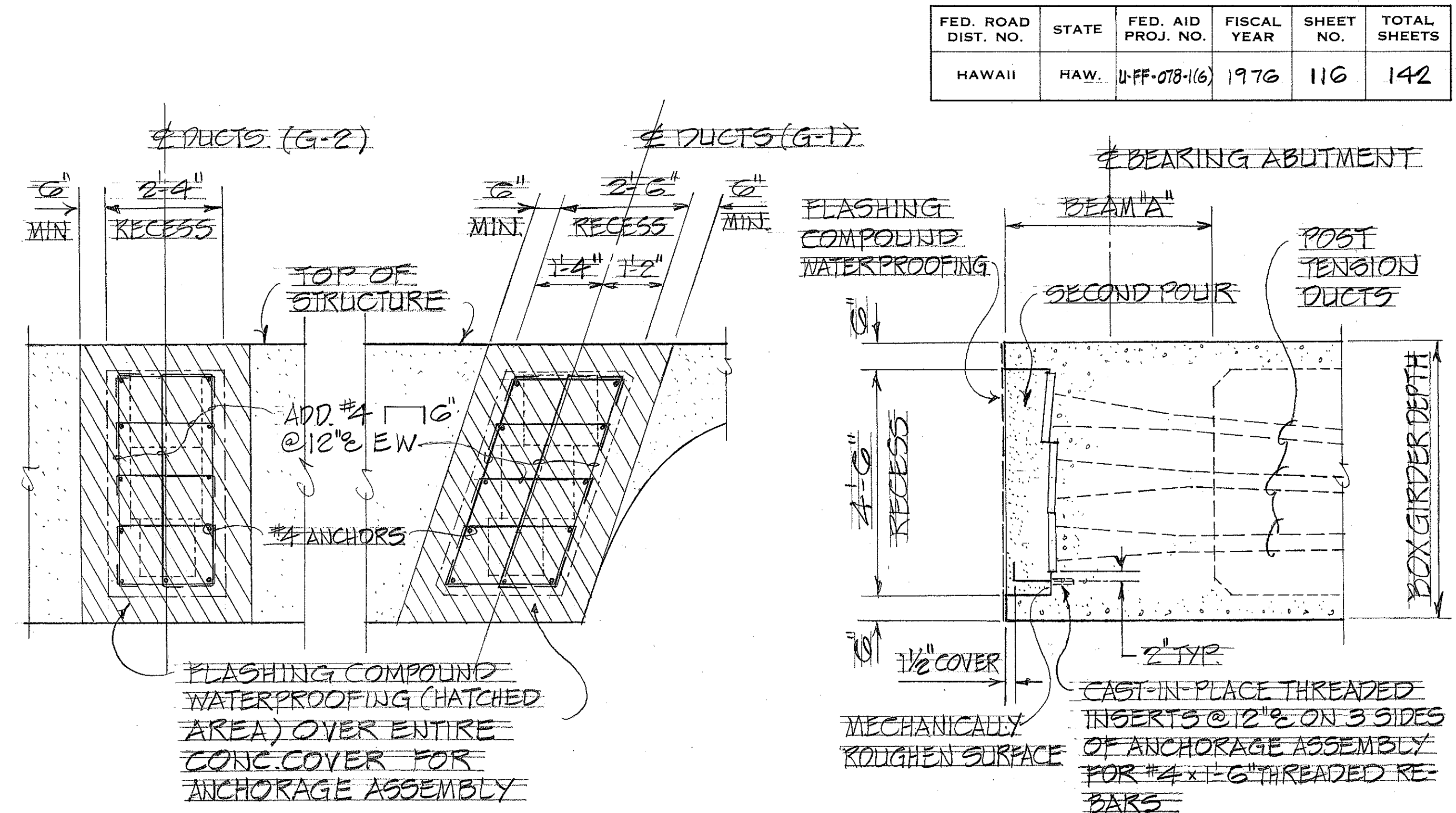
POST TENSION DESIGN NOTES

- DESIGN IS BASED ON $K = .0002$ (FRICTION WOBBLE COEFFICIENT) & $\mu = 0.25$ (CURVATURE FRICTION COEFFICIENT).
- MINIMUM CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS FOR THE CONCRETE BOX GIRDER SHALL BE 5,000 P.S.I.
- PRESTRESS LOSSES (EXCEPT FRICTION AND ANCHOR SET) IS BASED ON AN ASSUMED LOSS OF 33,000 P.S.I.

SPECIAL POST TENSION NOTES

- ALL STRANDS SHALL BE POST TENSIONED FROM ABUT.#1 (MAKAI), ONLY UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
- EACH GIRDER SHALL CONTAIN A MAXIMUM OF 3 DUCTS.
- EFFECTIVE POST TENSION FORCE AFTER ALL LOSSES IN EACH GIRDER SHALL BE:

LOCATION	ABUT.#1	0.41	PIER	0.61	ABUT.#2	1.01
EFFECTIVE FORCE KIPS/GIRDER	1598	1622	1731	1716	1602	

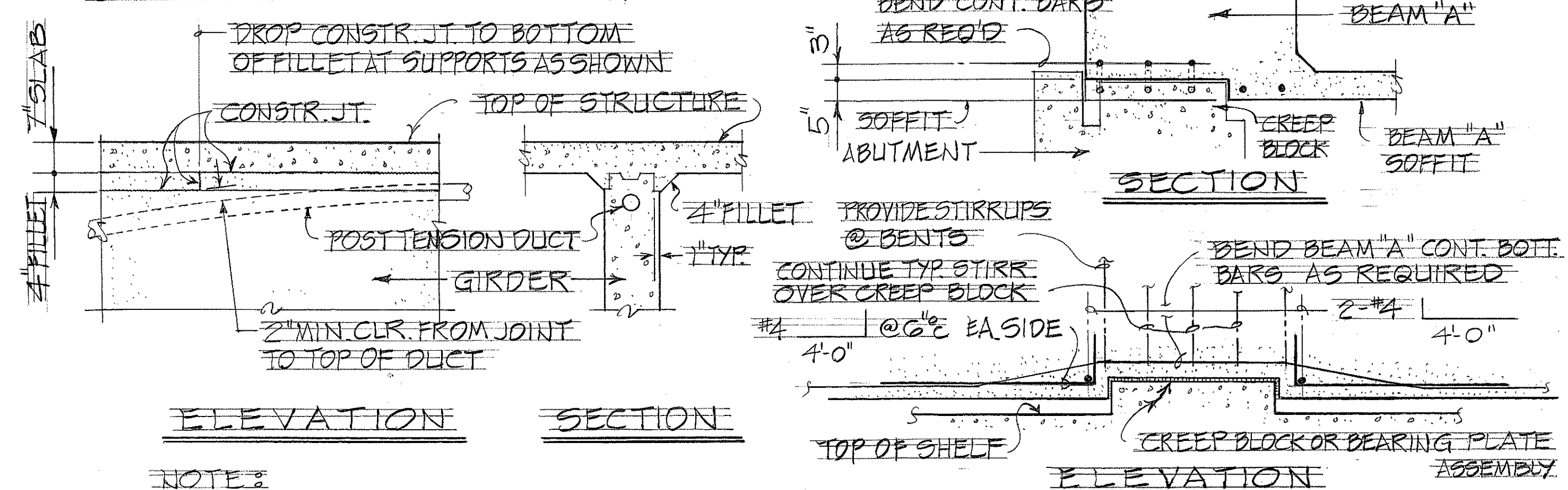


ELEVATIONS

SECTION

POST TENSION DUCT ANCHORAGE GROUTING DETAILS

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



ELEVATION

SECTION

NOTE:

FOR DETAILS NOT SHOWN SEE STANDARD DETAIL SHEETS.

STEM CONSTRUCTION JOINT DETAIL

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

TYP. DET. @ CREEP BLOCK & BEARING PLATE

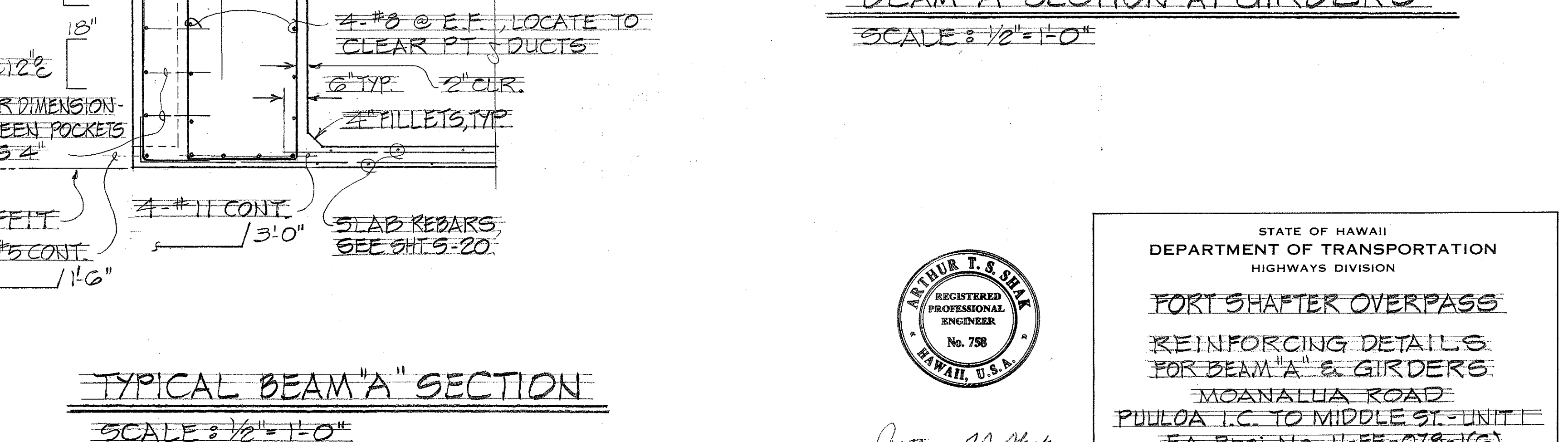
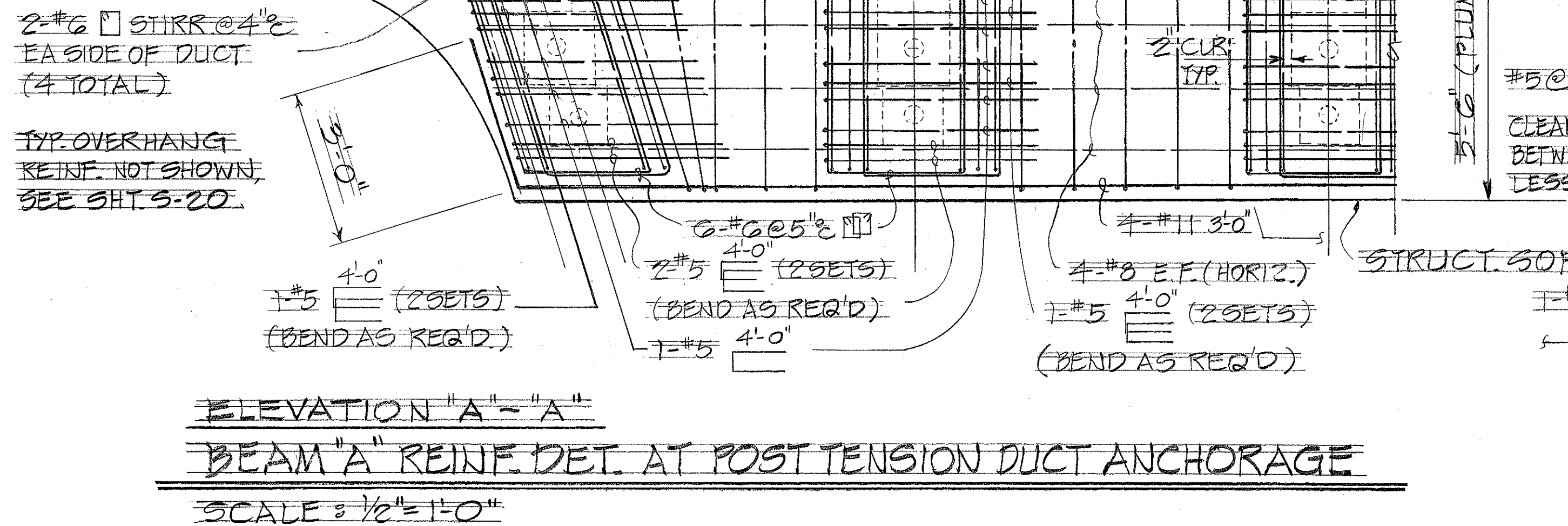
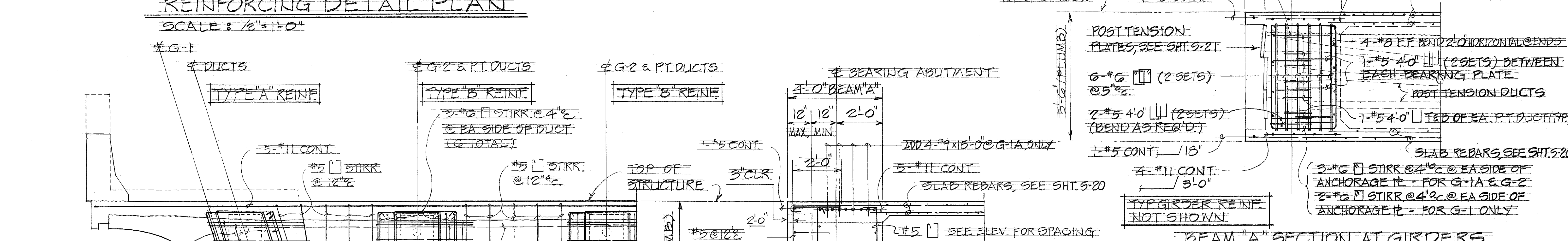
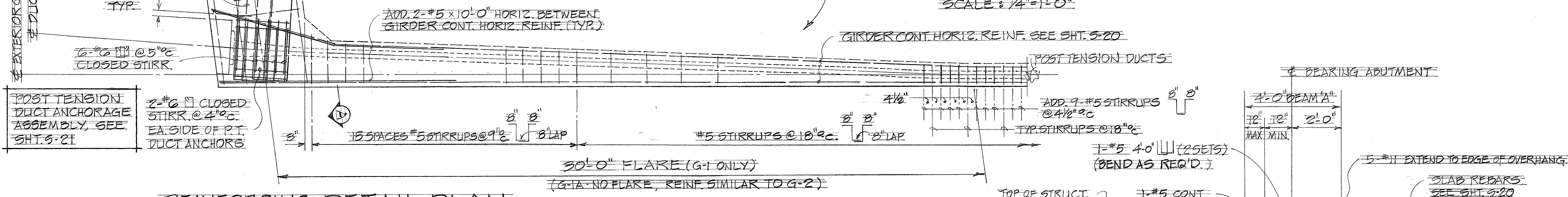
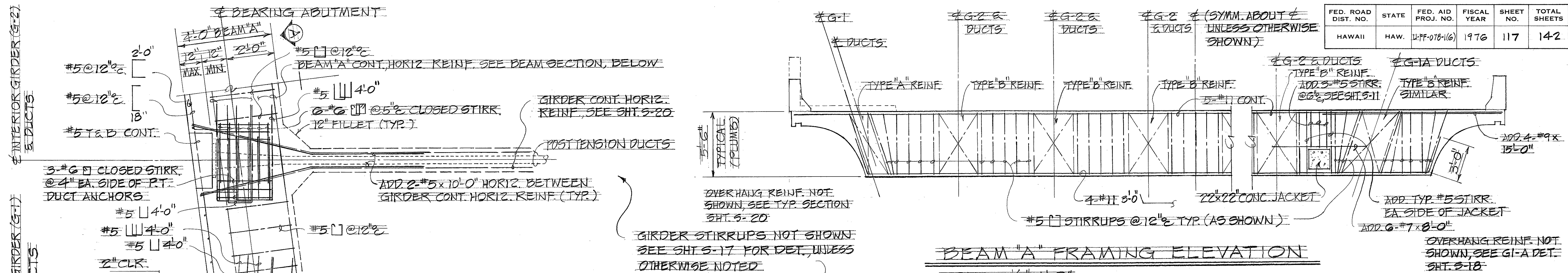
SCALE: 1/2"=1'-0"



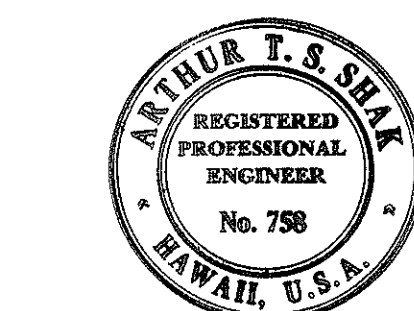
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
FORT SHAFTER OVERPASS
POST TENSION DUCT LAYOUT
DETAILS AND NOTES AT BEAM "A"
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. UNIT I
EA PROJ. No. U-FF-078-1(6)
SCALE: AS SHOWN DATE: JUNE 25, 1976
SHEET No. 5-21 OF 41 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-PF-078-1(6)	1976	117	142



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



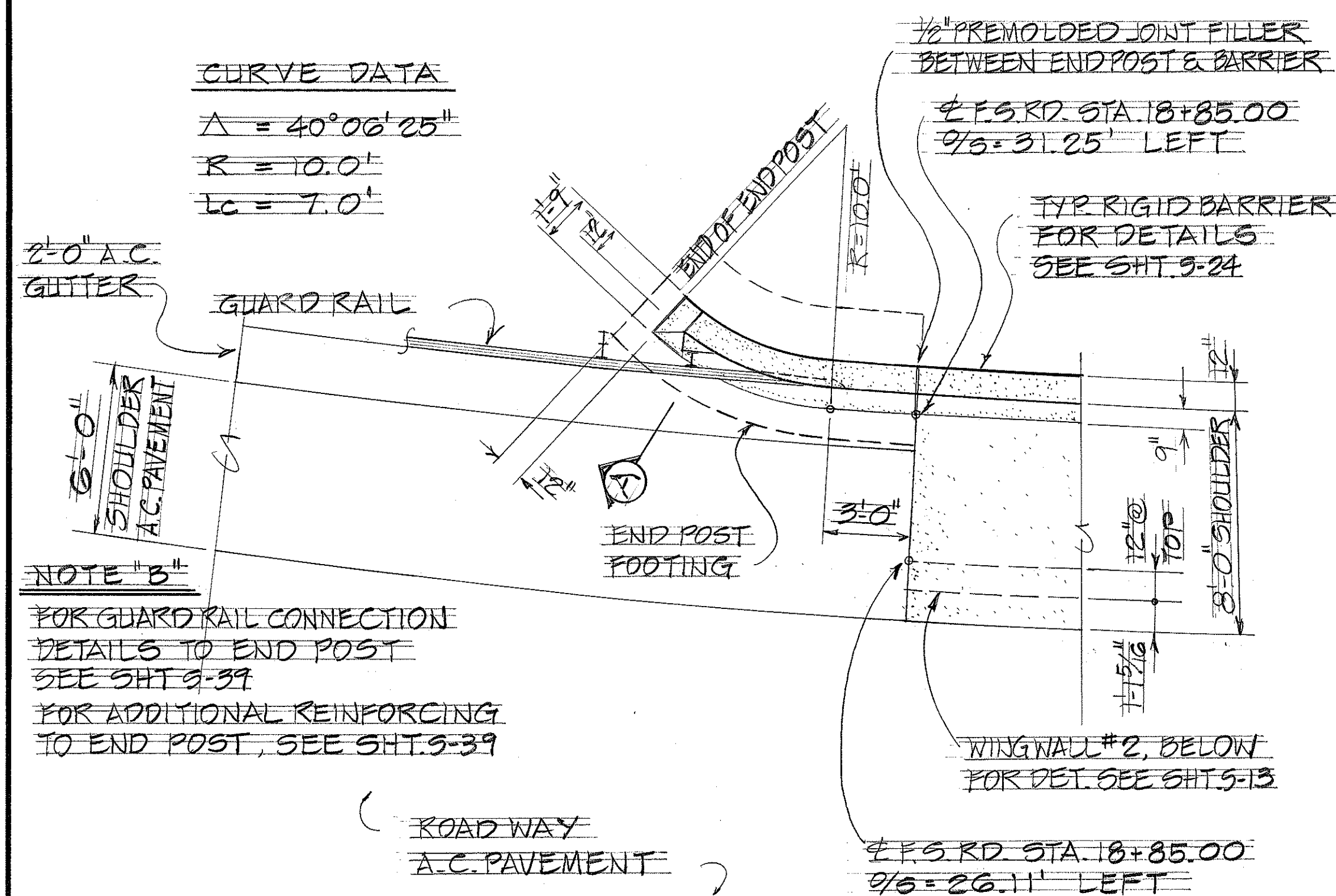
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FORT SHAFTER OVERPASS

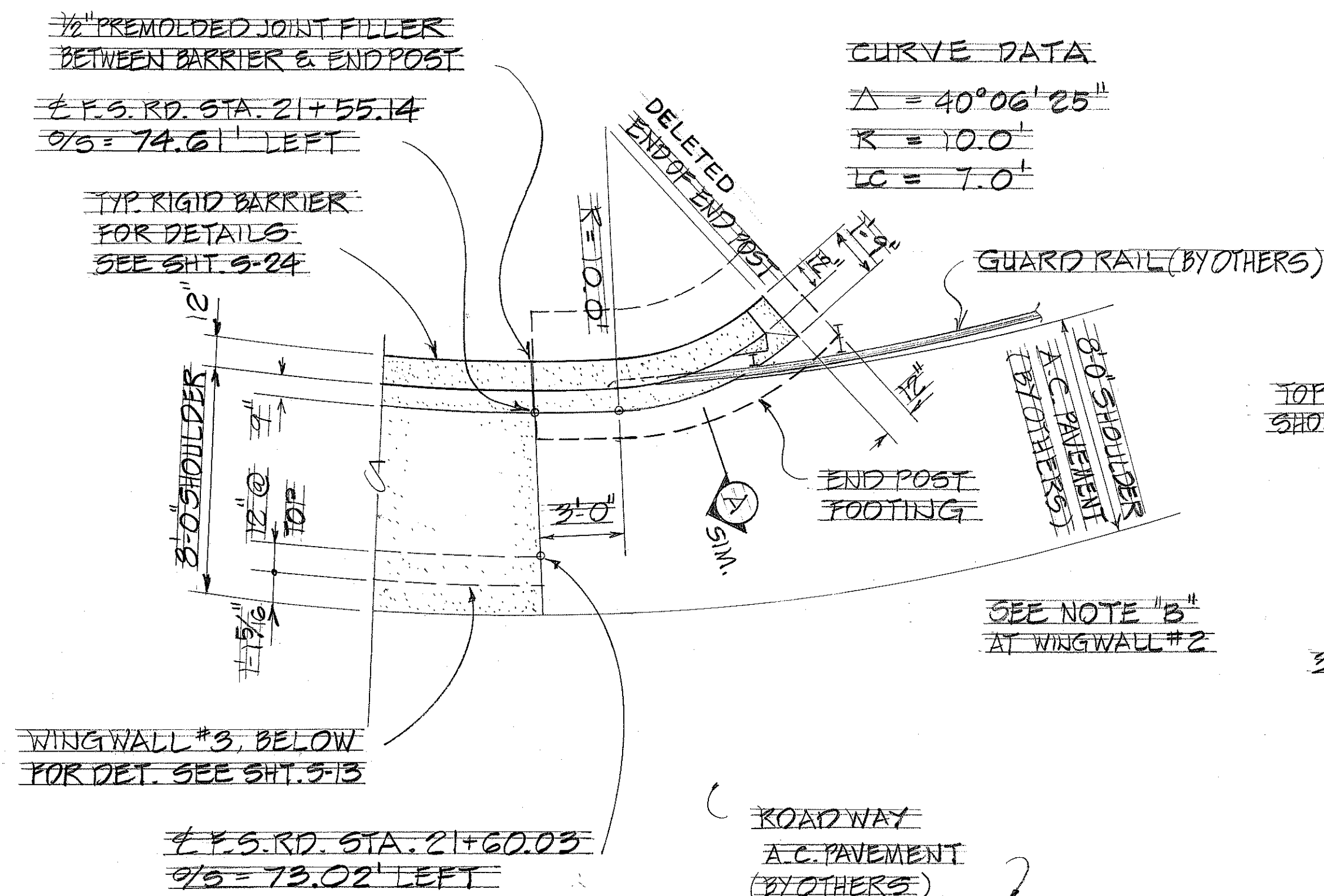
REINFORCING DETAILS
FOR BEAM "A" & GIRDERS
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. UNIT I
EA. PROJ. NO. U-PF-078-1(6)
SCALE: AS SHOWN DATE: JUNE 25, 1976
SHEET NO. 5-22 OF 41 SHEETS

Arthur T. S. Spak
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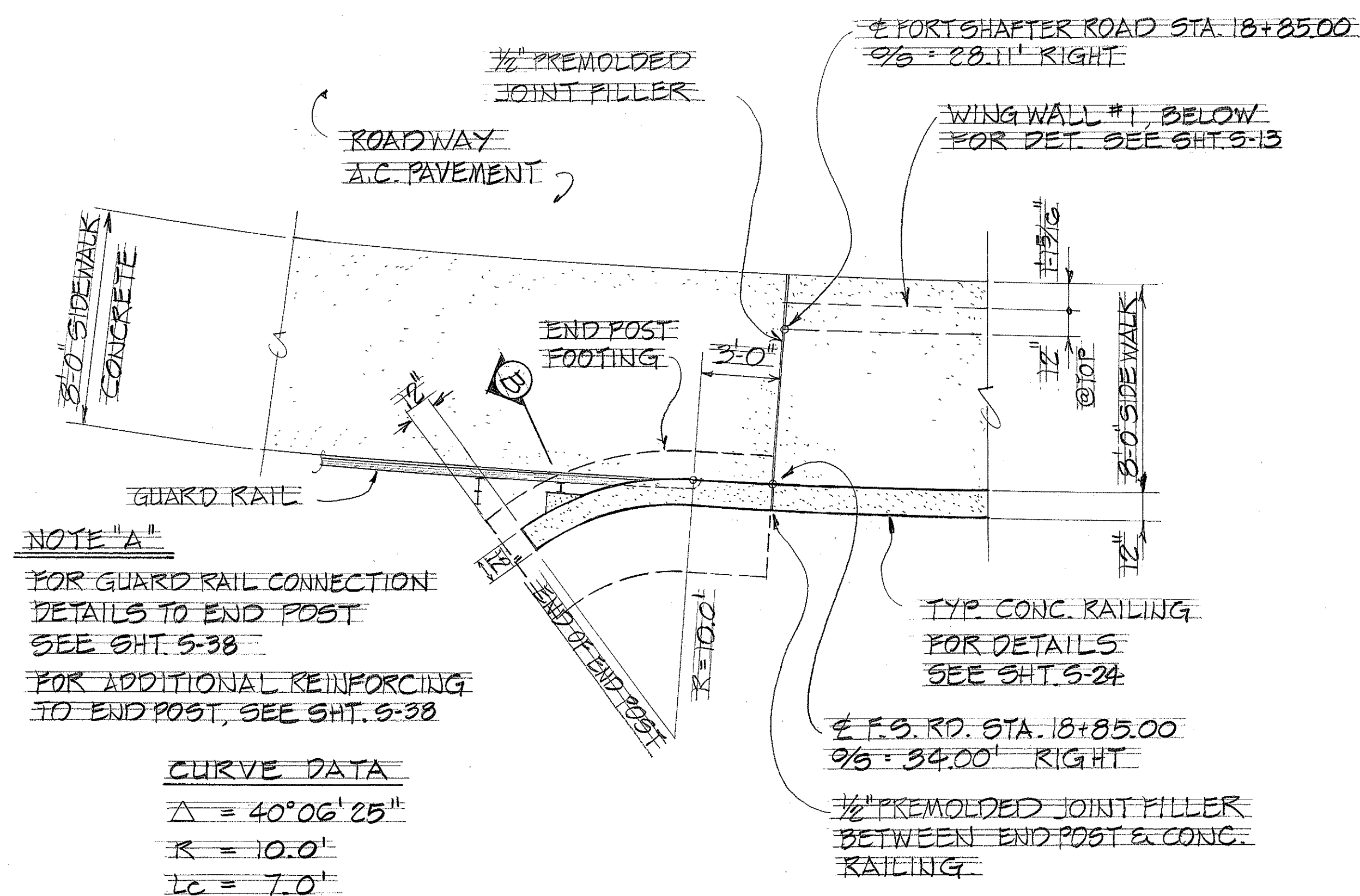
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-FF-078-1(6)	1976	118	142



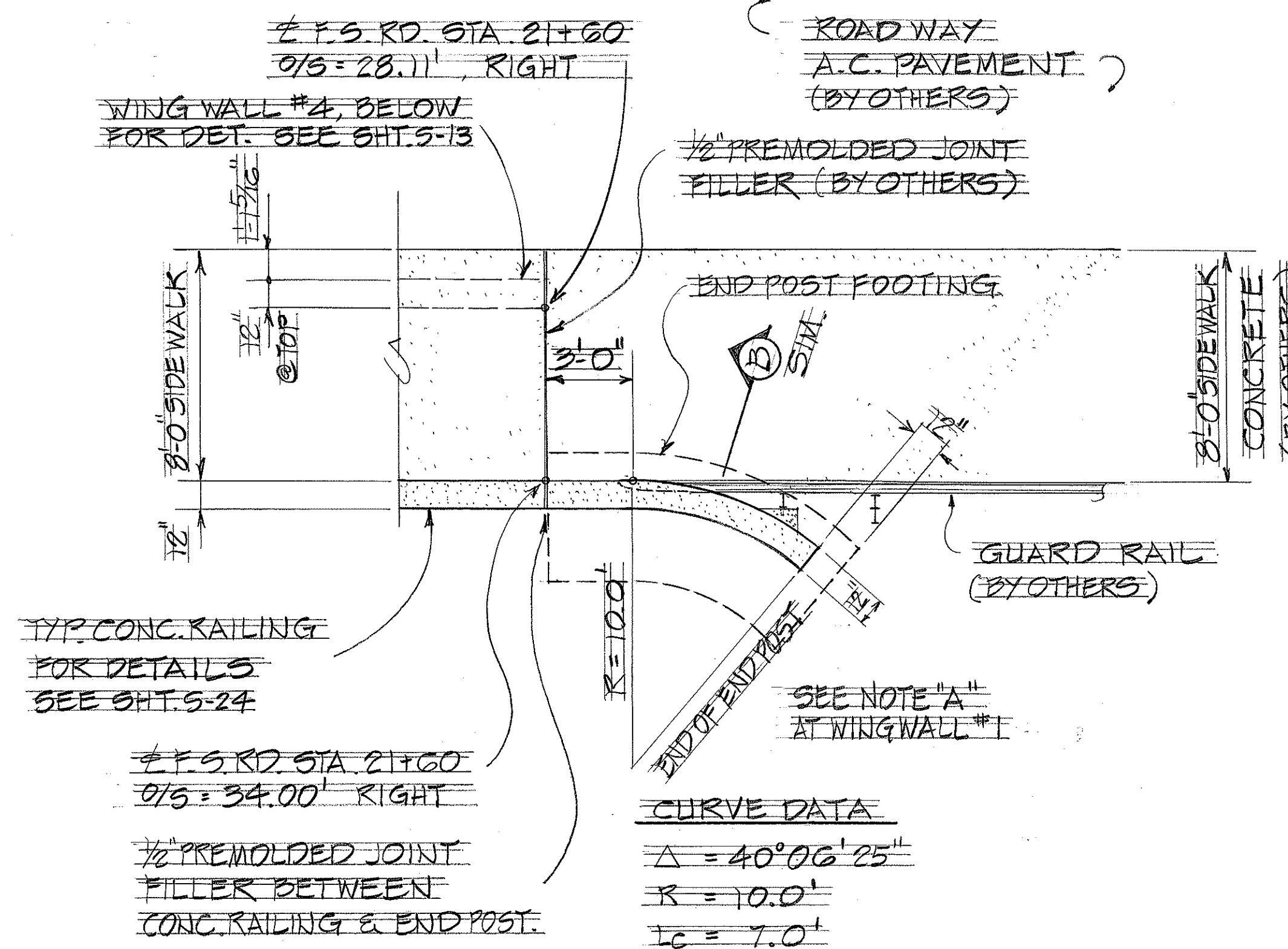
AT WINGWALL #2



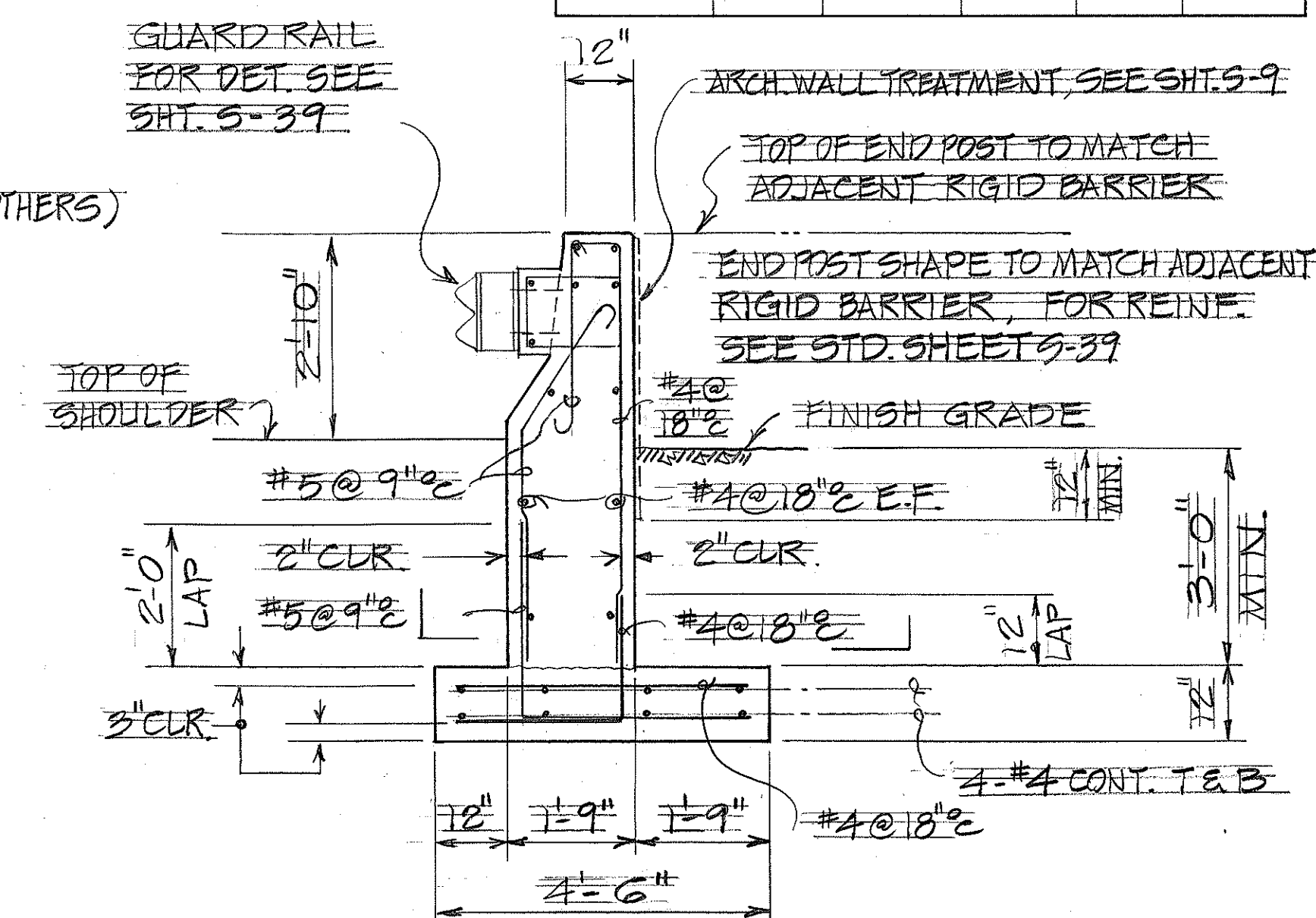
AT WINGWALL #3



AT WINGWALL #1

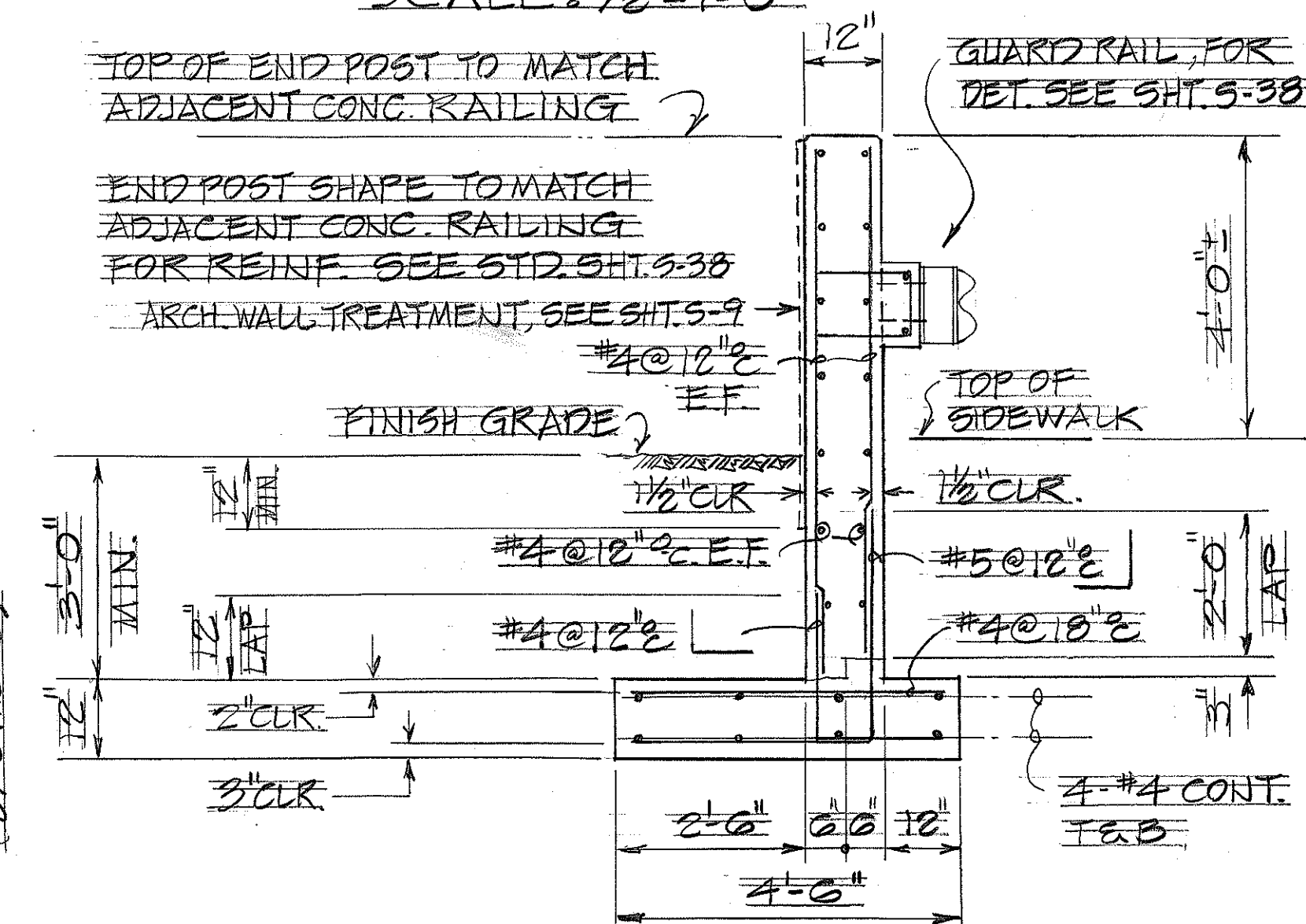


AT WING WALL #4



SECTION "A"

SCALE: $\frac{1}{2}'' = 1'-0''$



SECTION "B"

SCALE: $\frac{1}{2}'' = 1'-0''$

NOTE "A"

FOR GUARD RAIL CONNECTION
DETAILS TO END POST
SEE SHT. 5-38

FOR ADDITIONAL REINFORCING
TO END POST, SEE SHT. 5-38

TYP. CONC. RAILING
FOR DETAILS
SEE SHT. S-24

SEE NOTE "A"
AT WINGWALL #



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

FORT SHAFTER OVERPASS

END POST DETAILS

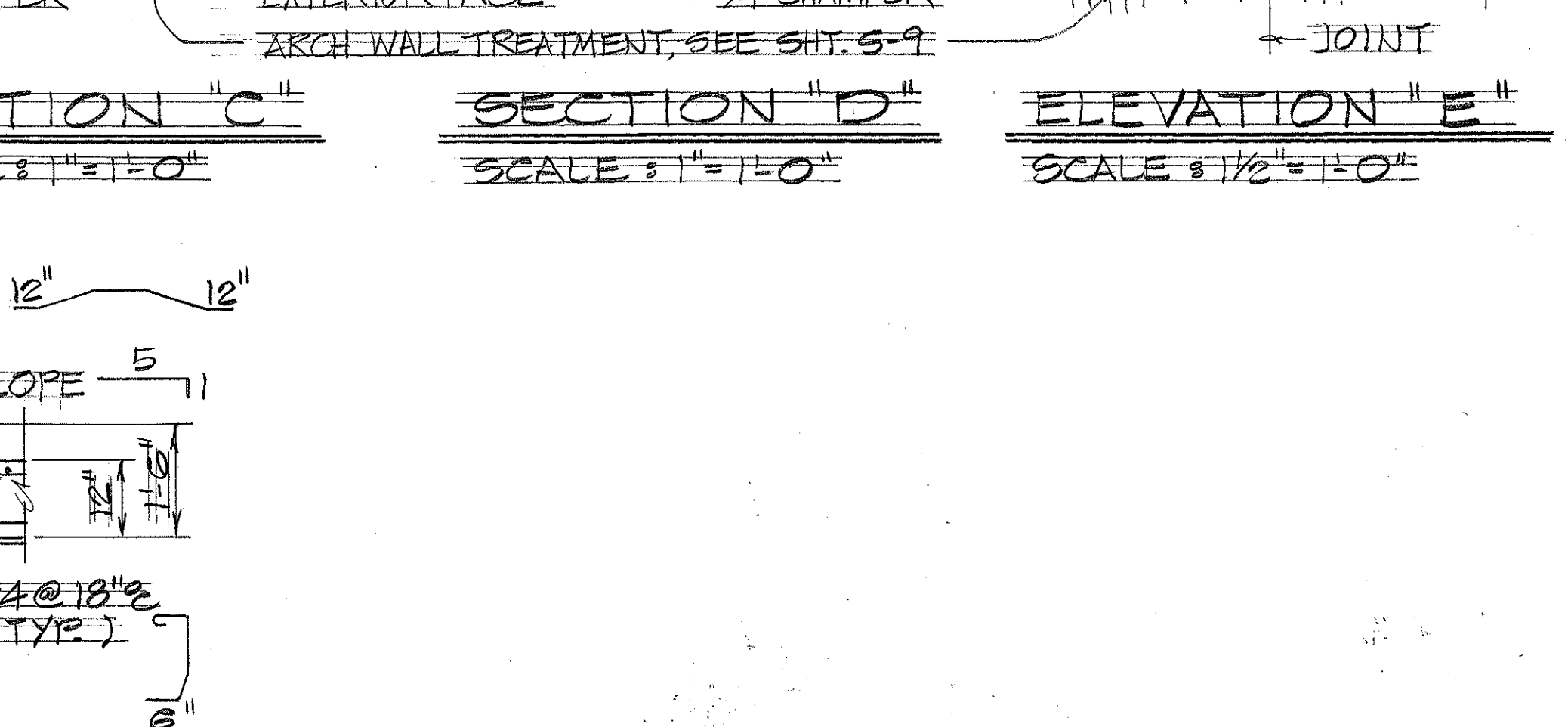
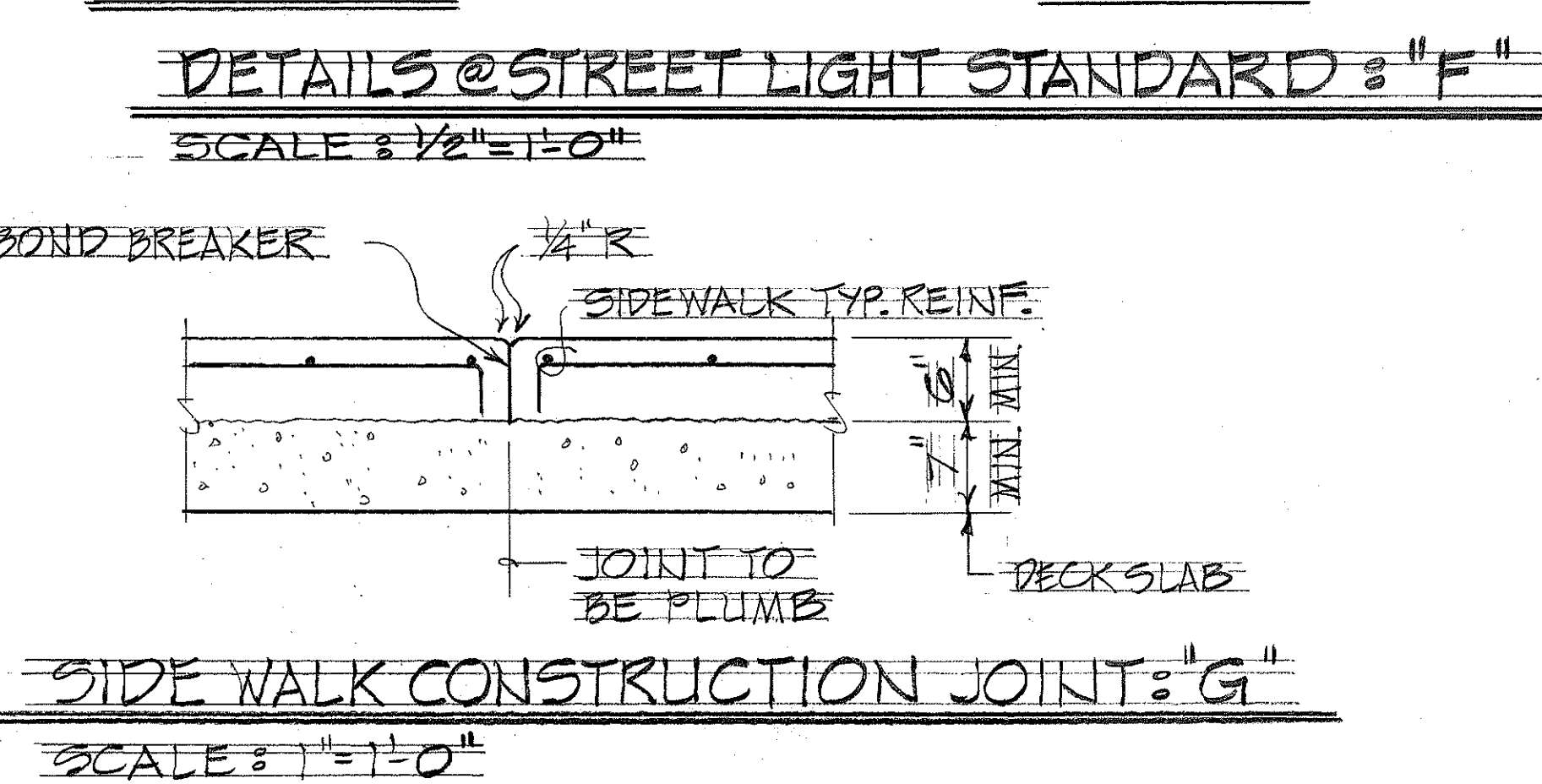
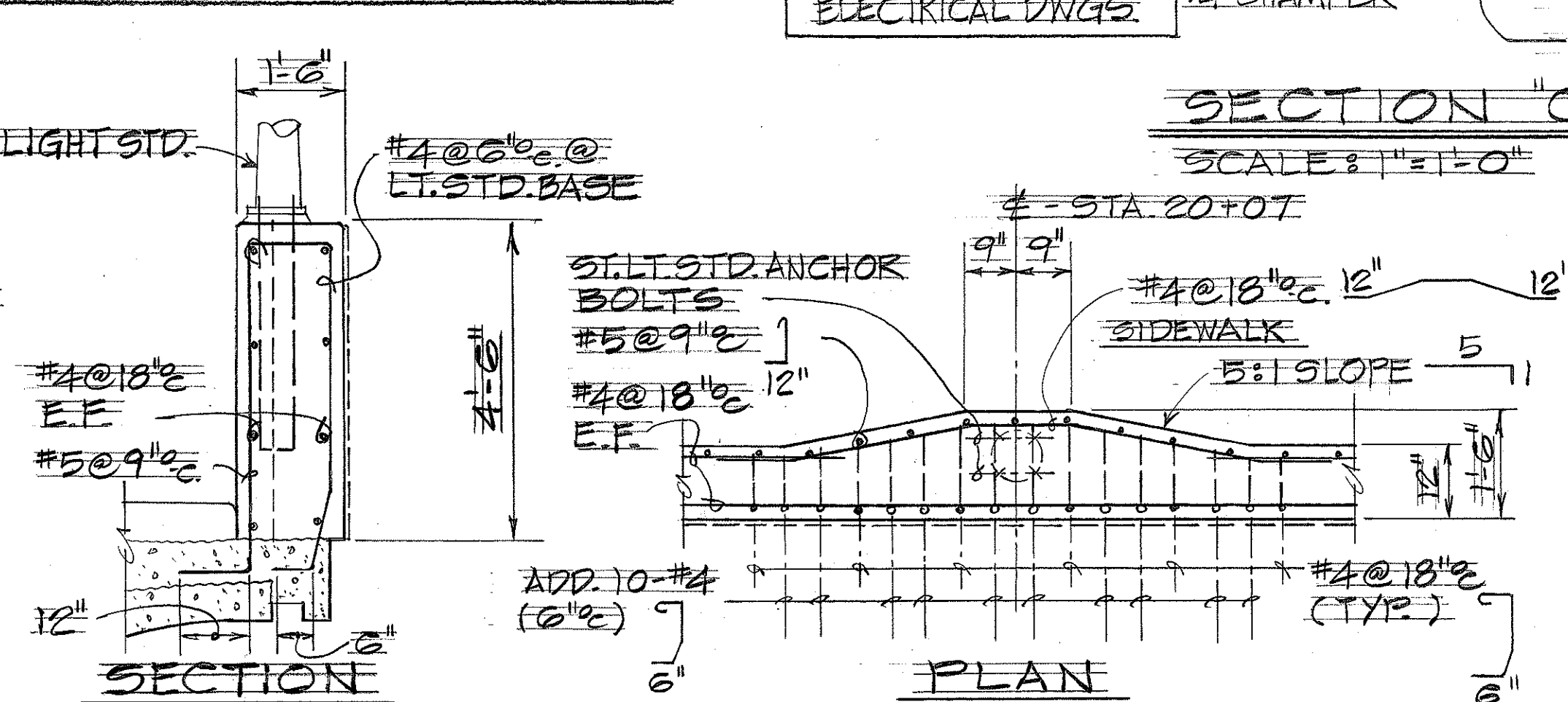
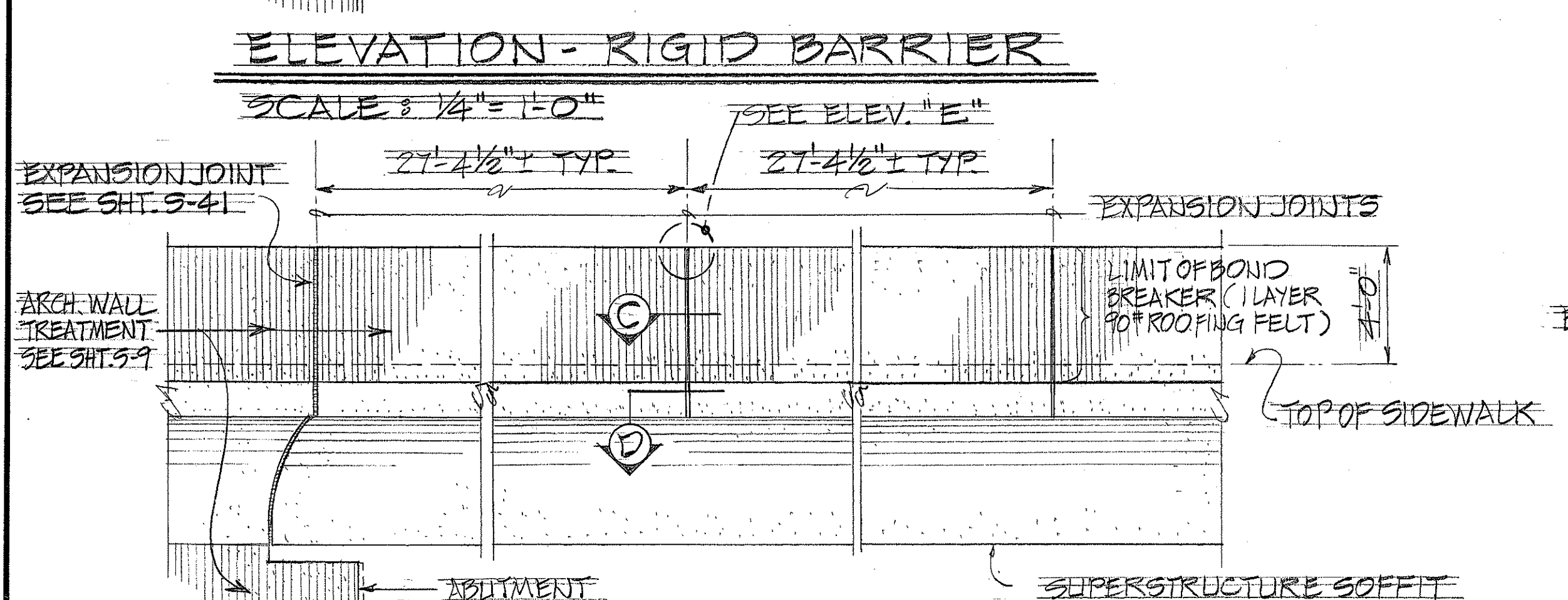
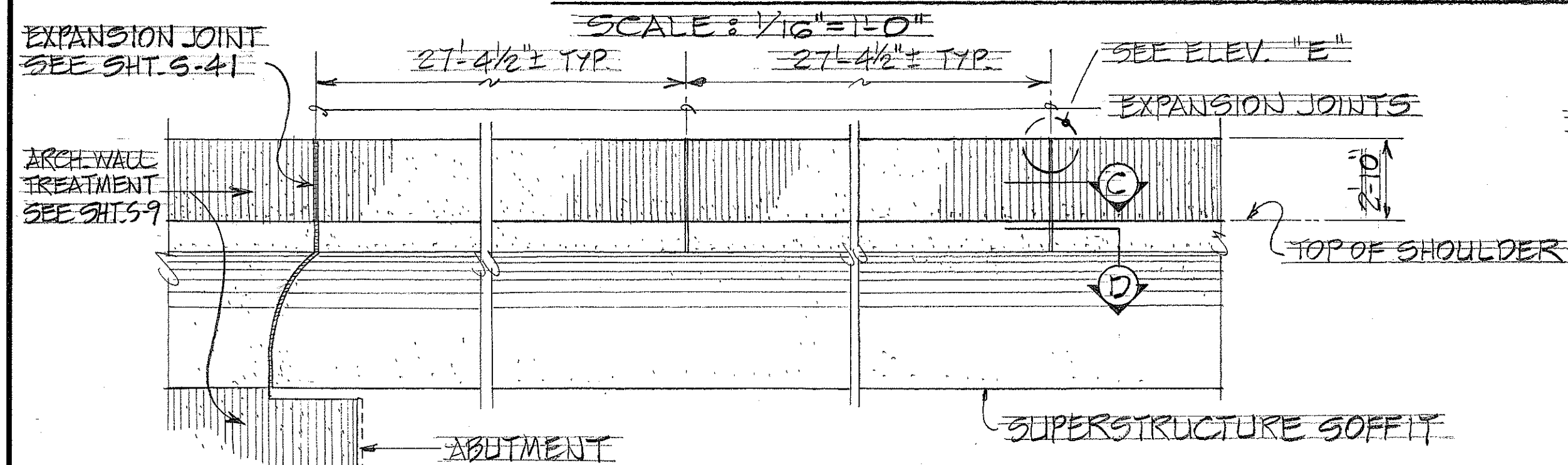
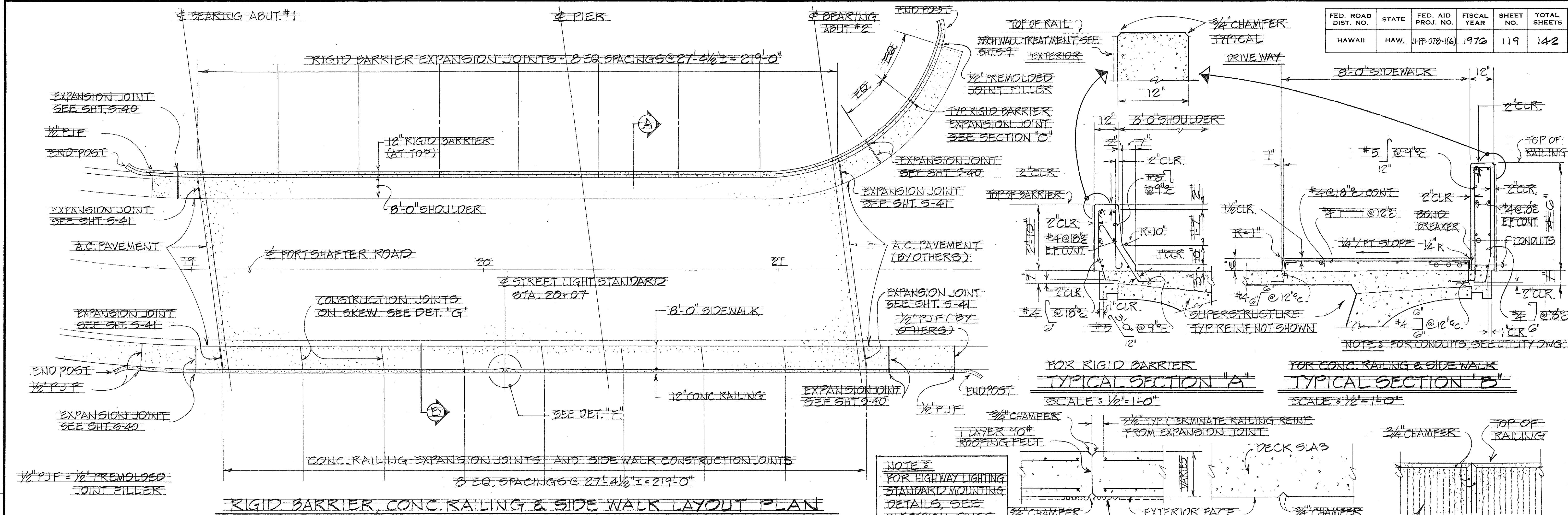
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT I
EA Proj. No. U-FF-078-(6)

SCALE : AS SHOWN DATE : JUNE 25 1971

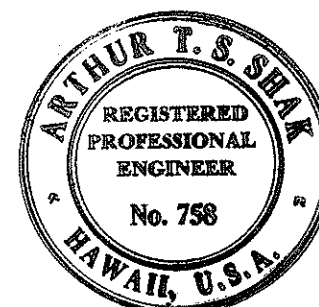
SHEET No. 5-23 OF 41 SHEETS

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-FF-078-1(6)	1976	119	142



DATE: _____
SURVEY PLOTTED BY: _____
ORIGINAL DRAWN BY: _____
TRACED BY: _____
NOTE BOOK DESIGNED BY: _____
CHECKED BY: _____
NO. _____

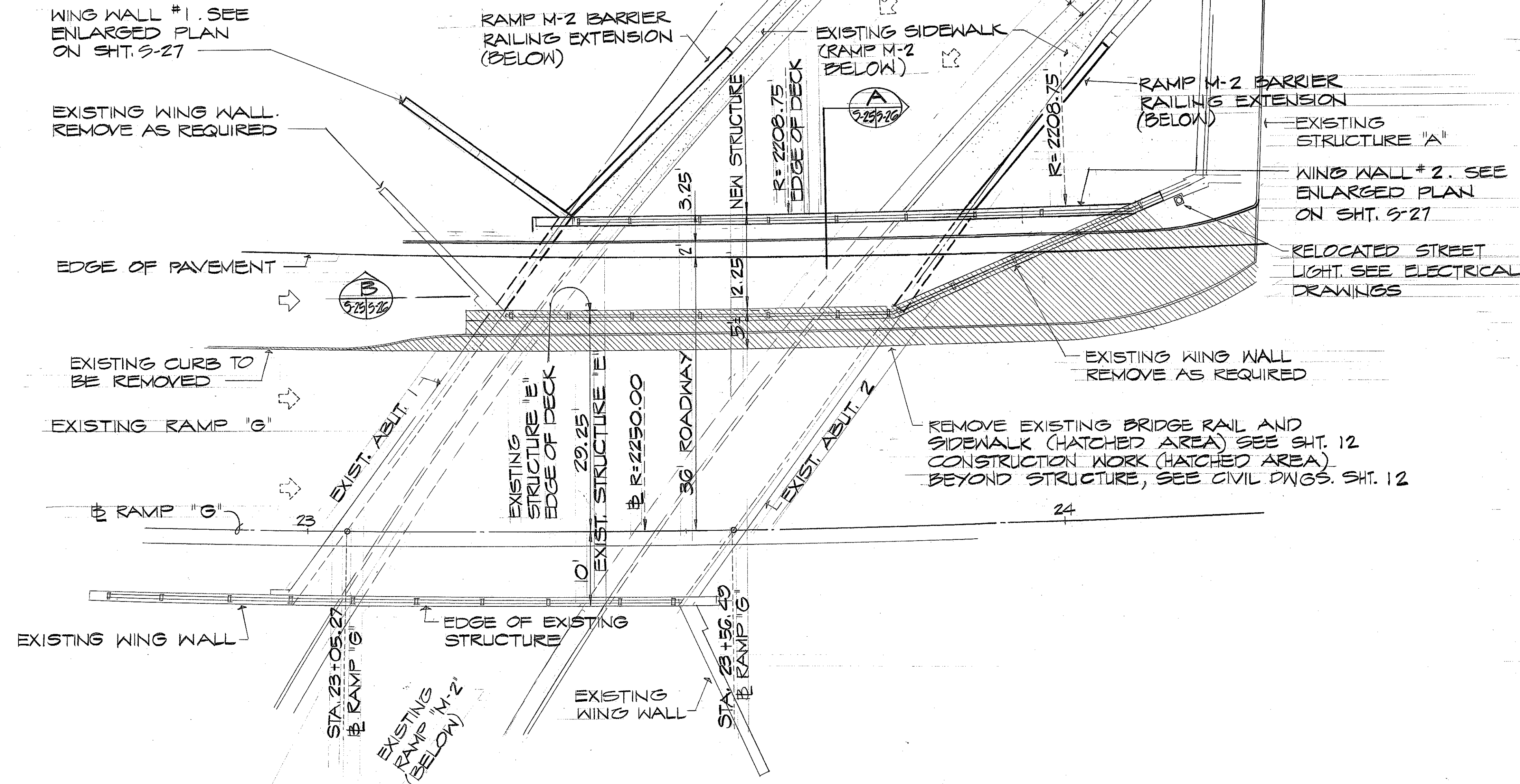


Arthur T. S. Shuk
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
FORT SHAFTER OVERPASS
RIGID BARRIER, CONCRETE
RAILING AND SIDEWALK DETAILS
MOANALUA ROAD
PULOA I.C. TO MIDDLE ST. UNIT
PA PROJ. NO. U-FF-078-1(6)
SCALE: AS SHOWN DATE: JUNE 25, 1976
SHEET No. 5-24 OF 4-1 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	4-PP-078(6)	1976	120	142

- NOTES:**
- CONTRACTOR SHALL VERIFY EXISTING AS-BUILT AZIMUTHS AND ELEVATIONS SHOWN. ADJUSTMENTS SHALL BE MADE AS NECESSARY TO MATCH EXISTING STRUCTURE.
 - REFER TO HIGHWAY DRAWINGS FOR BASELINE RAMP "G" CONTROLS.
 - REFER TO SUBSECTION 104.04 "MAINTENANCE OF TRAFFIC" OF THESE SPECIFICATIONS.
 - WEEPHOLE PIPES, IMPERVIOUS MATERIAL, WATERPROOFING & ROOFING FELT CONSIDERED INCIDENTAL TO VARIOUS CONTRACT ITEMS.
 - ABUTMENTS BACKFILLING OPERATION SHALL BEGIN NO EARLIER THAN 10 DAYS AFTER DECK POUR AND BE COMPLETED PRIOR TO REMOVAL OF DECK SHORING.

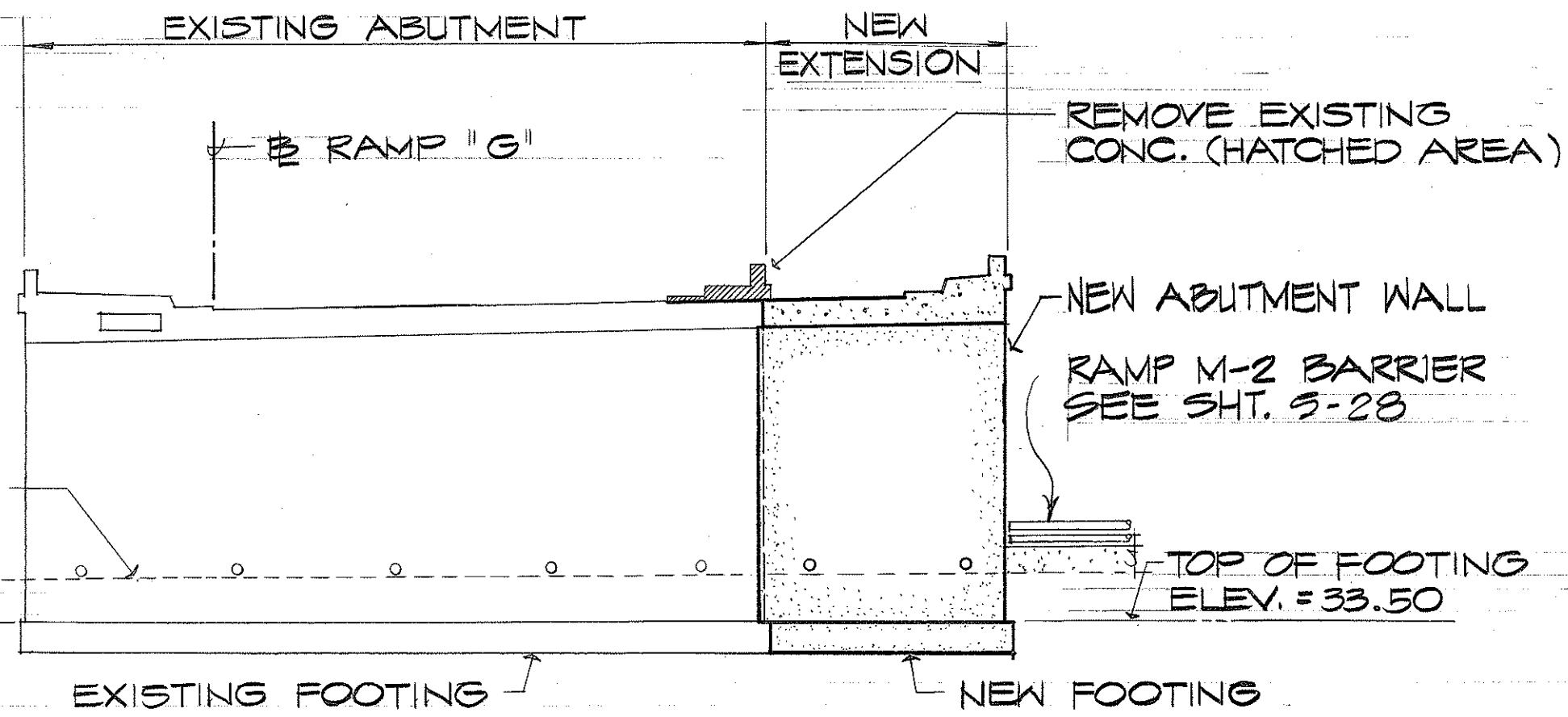


GENERAL LAYOUT PLAN
SCALE: 1" = 10'

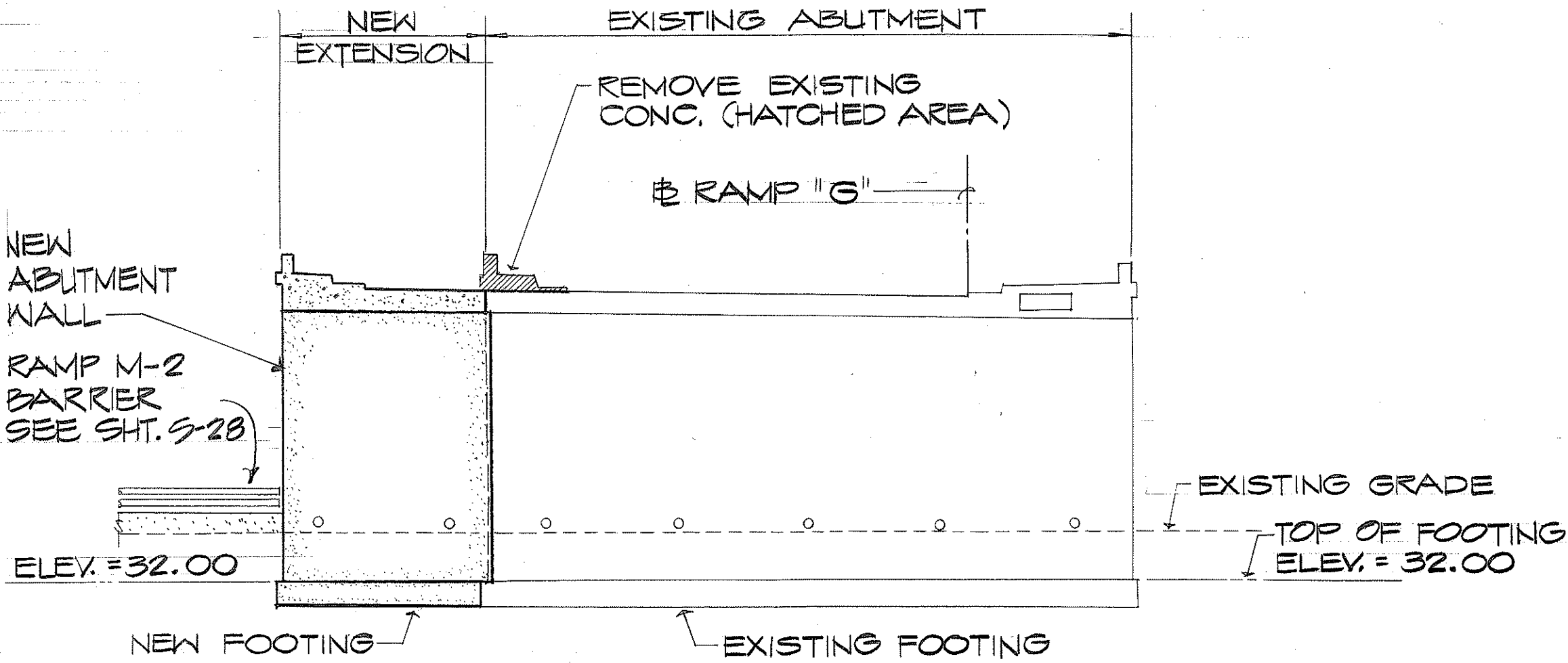
DESIGN CRITERIA:

- LOADS: HS 20-44
- SPECIFICATIONS: STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, AASHTO 1973, 11TH EDITION, WITH SUBSEQUENT INTERIM SPECIFICATIONS.
- REINFORCING STEEL: ASTM A615, GRADE 40
- 28 DAY CONCRETE STRENGTH: REINFORCED CONCRETE DECK AND ABUTMENTS - $f'_c = 3000$ PSI
FOOTINGS: $f'_c = 3000$ PSI
WING WALLS: $f'_c = 3000$ PSI
- ALLOWABLE FOUNDATION PRESSURE: 14,000 PSF
- SIMULTANEOUSLY BACKFILL BOTH ABUTMENTS.

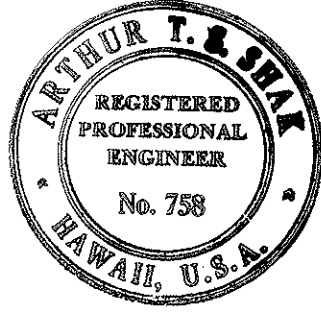
BRIDGE QUANTITY ESTIMATES			
ITEM NO.	ITEM	UNIT	QUANTITY
202.21	REMOVAL OF PORTION OF EXIST. STRUCTURE "E"	L.S.	-
206.60	STRUCTURE EXCAVATION FOR BRIDGES	CU. YD.	25
206.80	FILTER MATERIAL	CU. YD.	33
303.070	CONCRETE IN BRIDGES - STRUCTURE "E"	CU. YD.	99
307.70	CONC. BRIDGE PARAPET, INCLUDING END POST	LN. FT.	85
602.011	REINFORCING STEEL IN BRIDGES - STRUCTURE "E"	LB	24,600



ABUTMENT 1 ELEVATION
SCALE: 1" = 10'



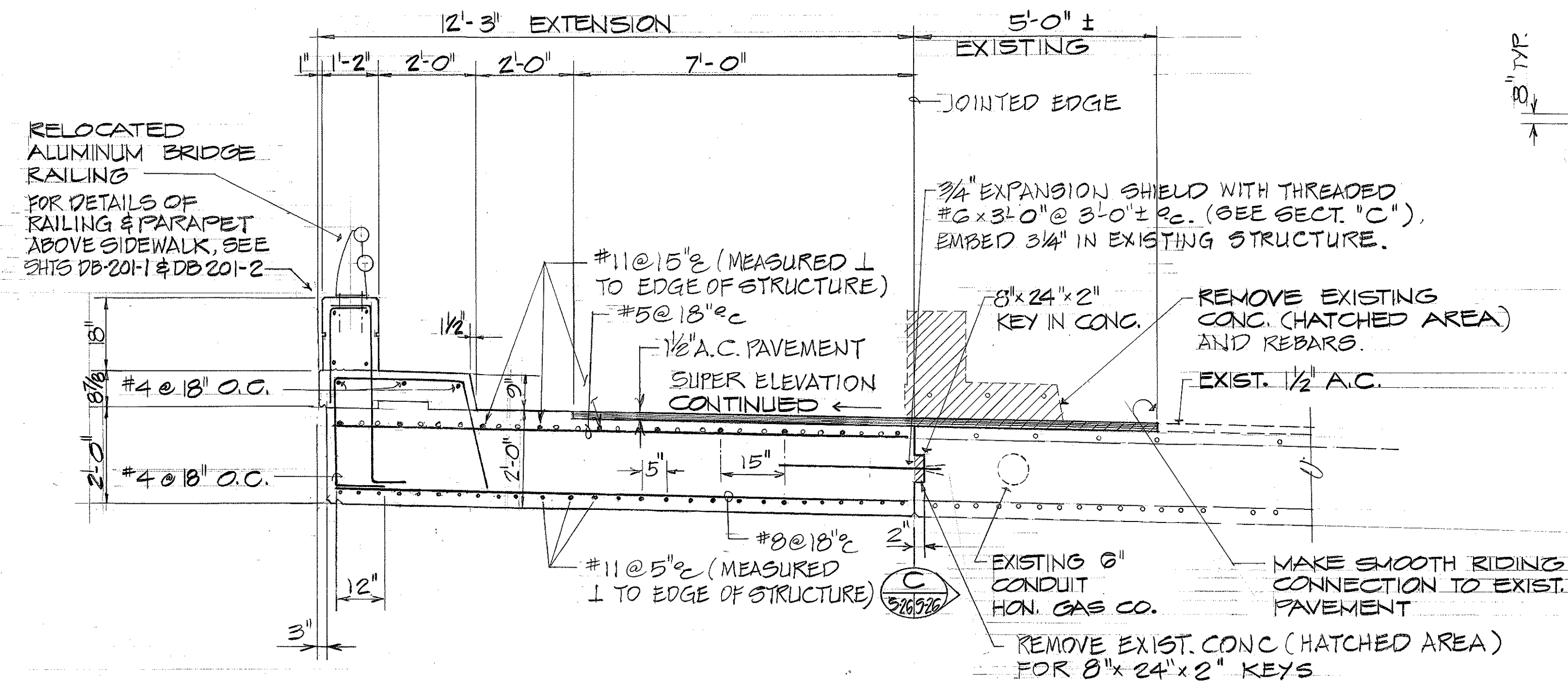
ABUTMENT 2 ELEVATION
SCALE: 1" = 10'



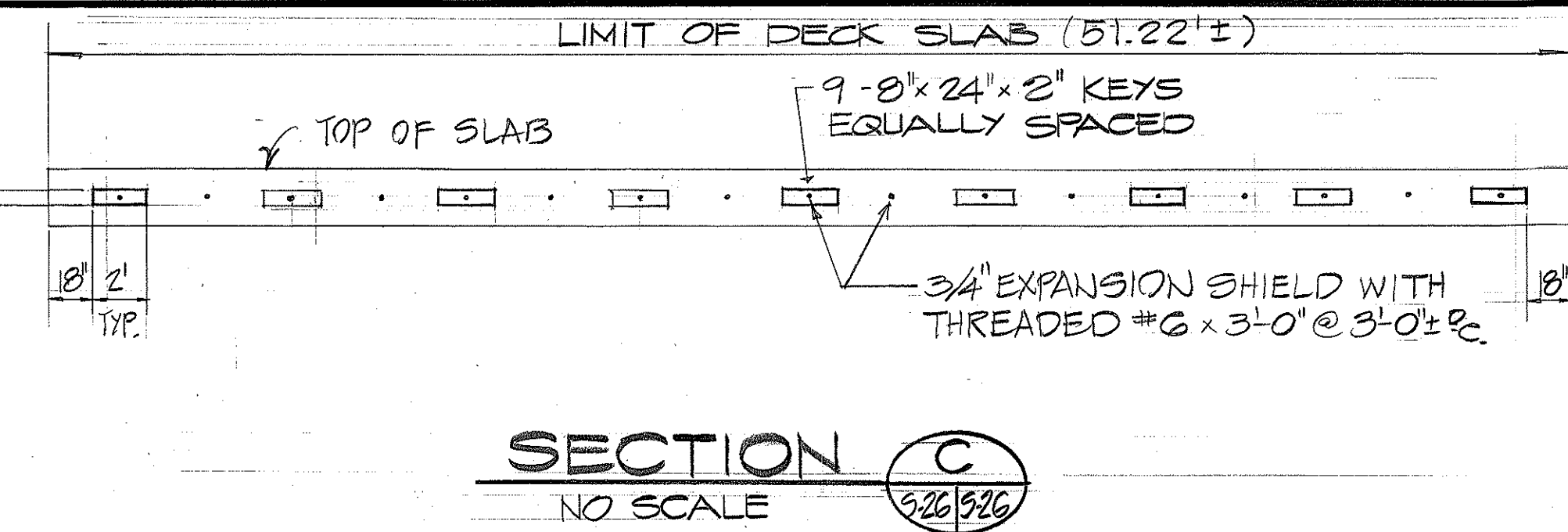
THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**STRUCTURE "E" WIDENING
GENERAL LAYOUT PLAN
AND ABUTMENT ELEVATIONS**
MOANALUA ROAD
PULLOA I.C. TO MIDDLE ST. - UNIT 1
F.A. Proj. No. 4-PP-078-1(6)
SCALE: AS SHOWN DATE: JUNE 23, 1976
SHEET NO. 5-25 OF 41 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-PP-078-1(6)	1976	121	142

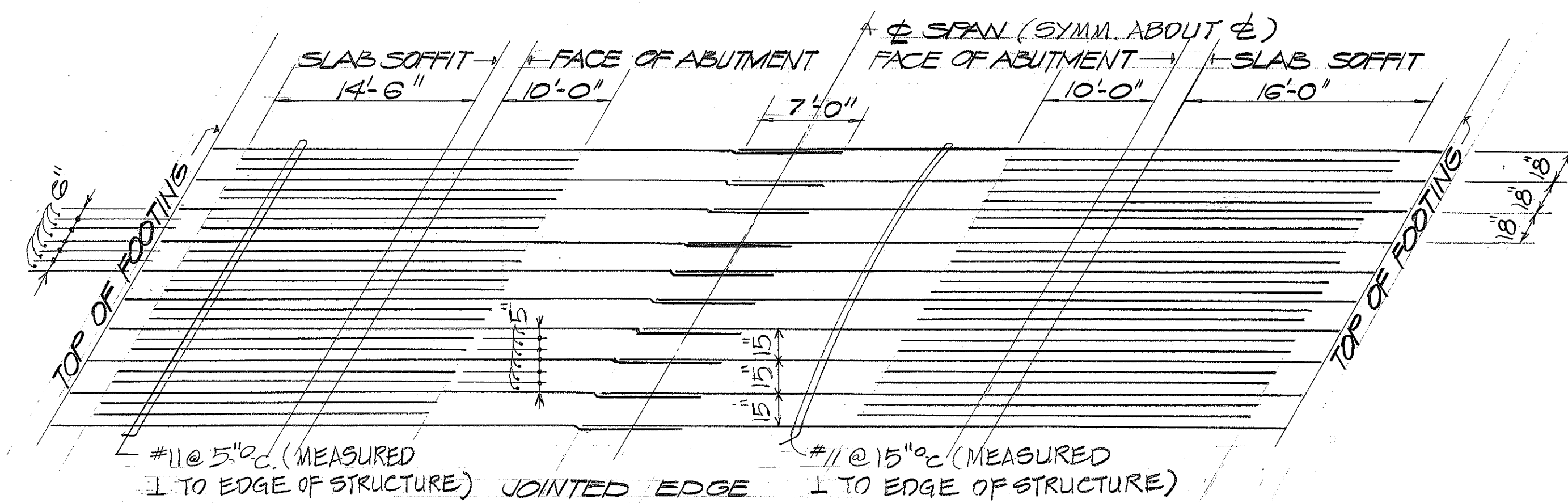


TYPICAL DECK SLAB SECTION A
SCALE: 1/2" = 1'-0"
525 526

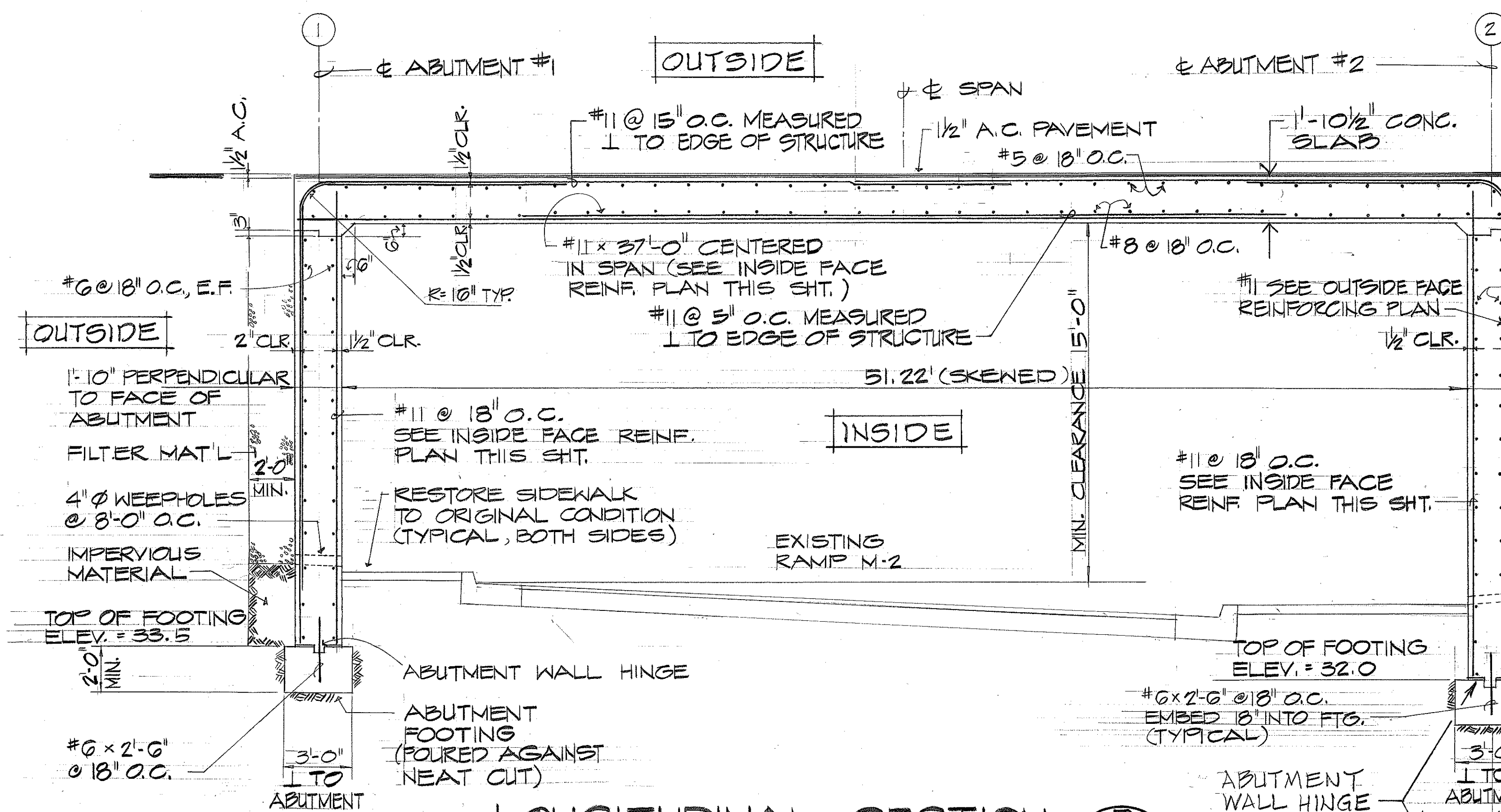


NOTE 3

1. COAT EXISTING CONCRETE AT JOINTED FACE WITH EPOXY BONDING COMPOUND.



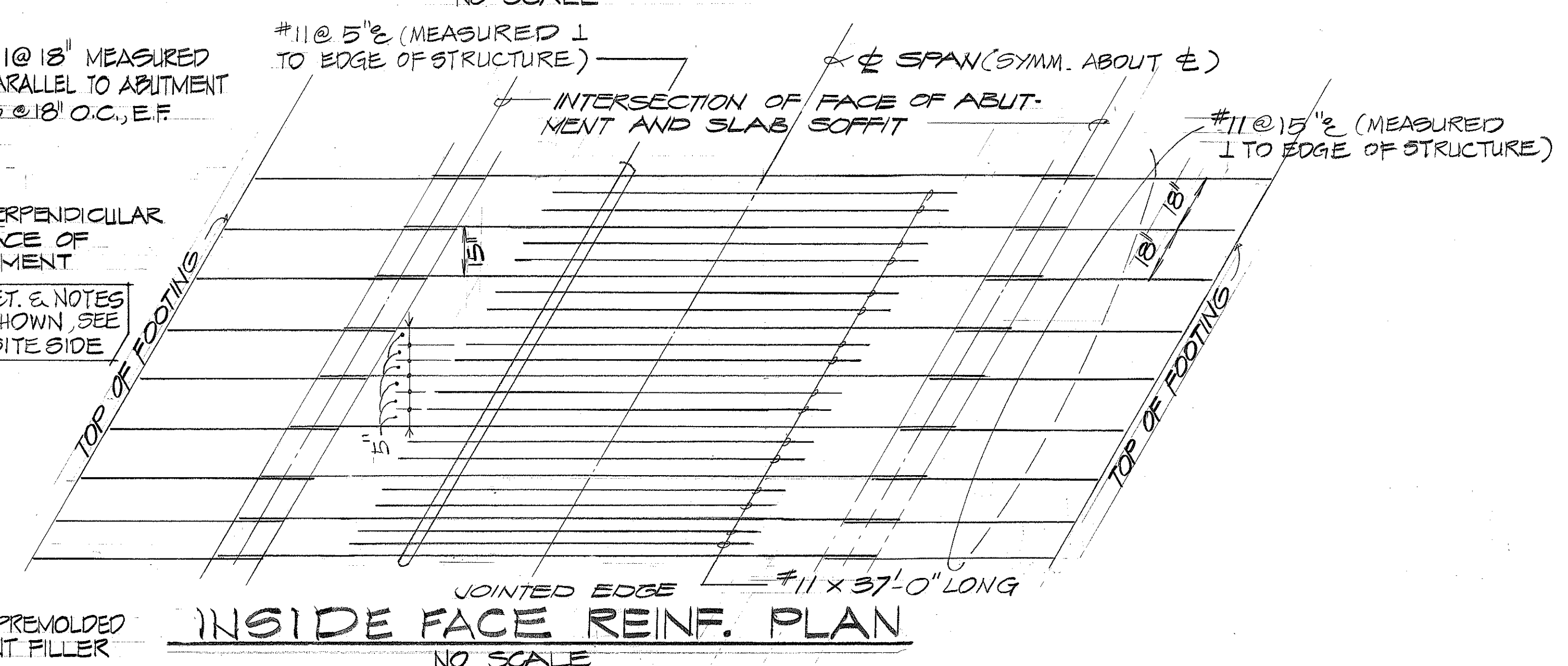
OUTSIDE FACE REINF. PLAN
NO SCALE



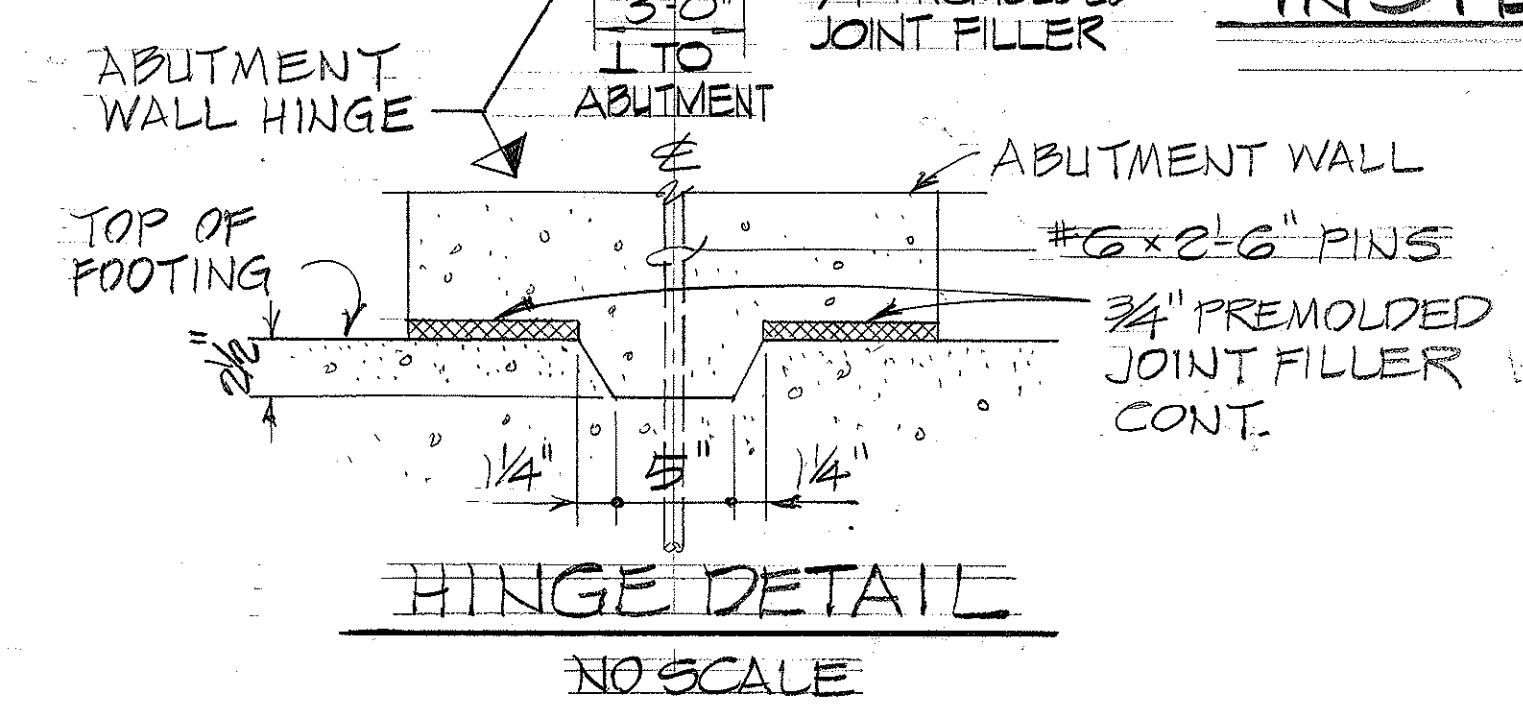
LONGITUDINAL SECTION B
SCALE: 1/4" = 1'-0"
525 526

NOTES:

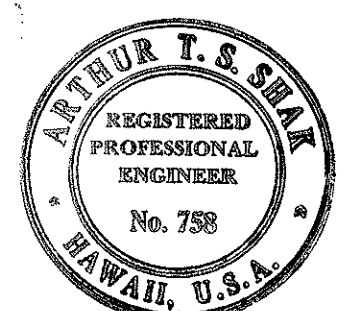
1. ALL SLAB LONGITUDINAL REINFORCING BARS SHALL BE PLACED PARALLEL TO EDGE OF STRUCTURE.
2. ALL SLAB TRANSVERSE REINFORCING BARS SHALL BE PLACED PARALLEL TO ABUTMENT.
3. ABUTMENT WALL VERTICAL REINFORCING BARS #11 @ 18" BECOMES #11 @ 15" ± CONTINUOUS LONGITUDINAL REINF. BARS IN SLAB BECAUSE OF SLAB SKEW ANGLE.



INSIDE FACE REINF. PLAN
NO SCALE



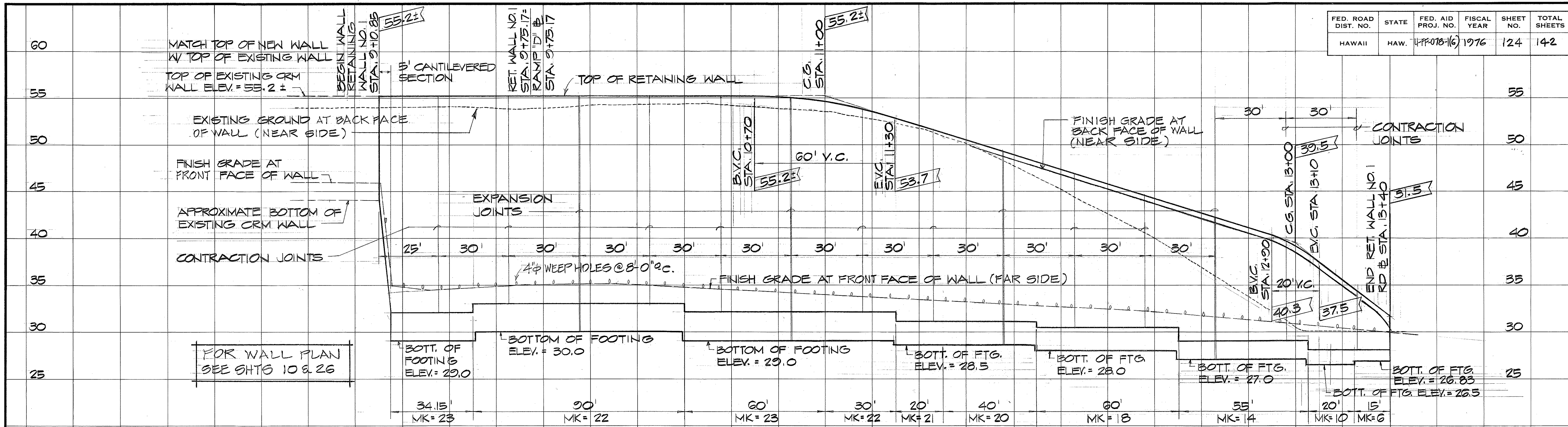
HINGE DETAIL
NO SCALE



Arthur T. S. Sear
THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**STRUCTURE "E" WIDENING
TYPICAL SECTIONS
AND REINFORCING PLANS**
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 1
F.A. Proj. No. U-PP-078-1(6)
SCALE: AS SHOWN DATE: JUNE 25, 1976
SHEET NO. 9-26 OF 41 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-PP-078-1(6)	1976	124	142

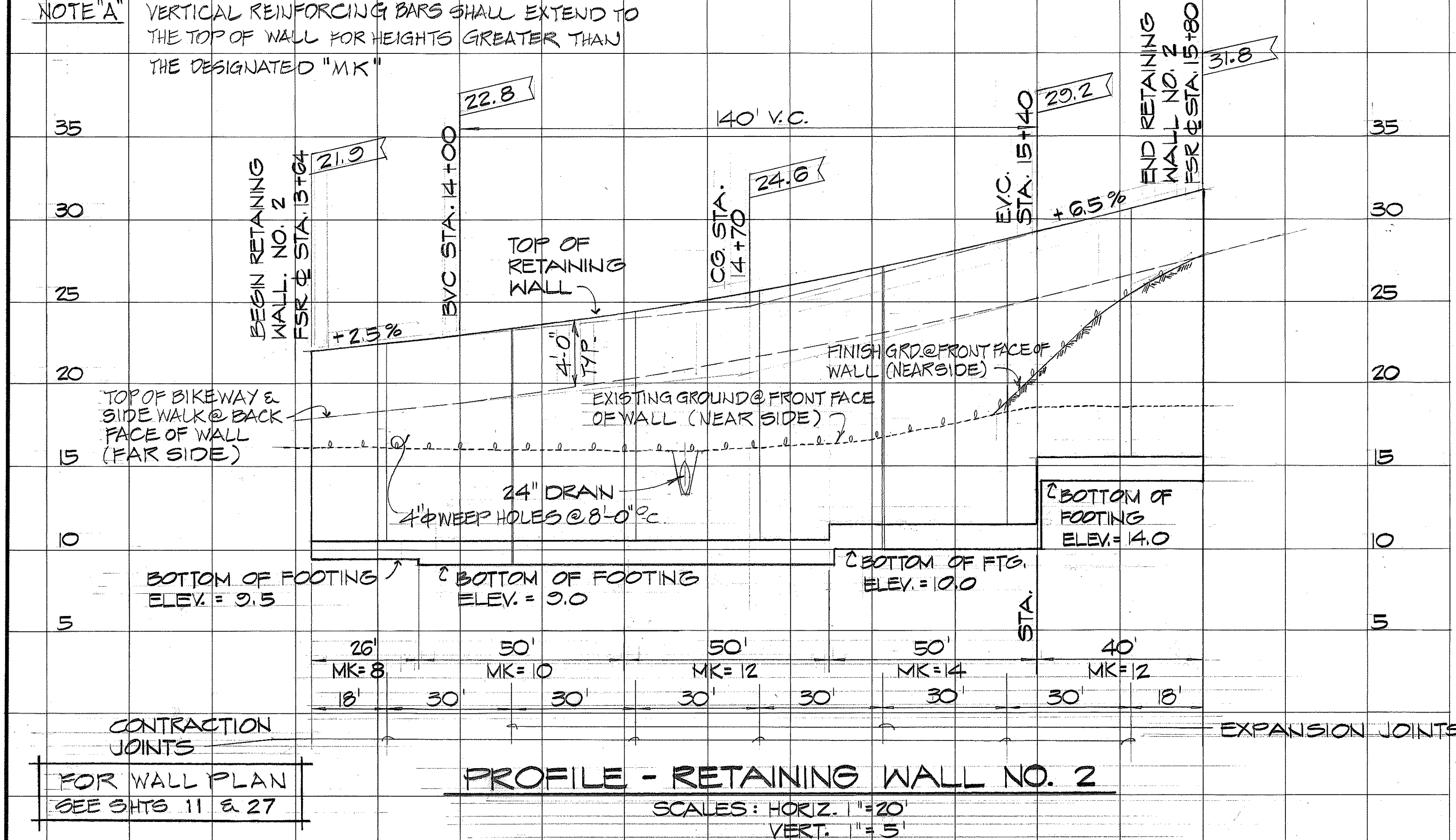


PROFILE - RETAINING WALL NO. 1

SCALES: HORIZ. 1" = 20'
VERT. 1" = 5'

LIMIT OF RETAINING WALL W/ SLOPING BACKFILL
REFER TO SHT. 5-31 FOR TABLE OF REINFORCING
STEEL DIMENSIONS AND DATA

NOTE "A" VERTICAL REINFORCING BARS SHALL EXTEND TO THE TOP OF WALL FOR HEIGHTS GREATER THAN THE DESIGNATED "MK"



PROFILE - RETAINING WALL NO. 2

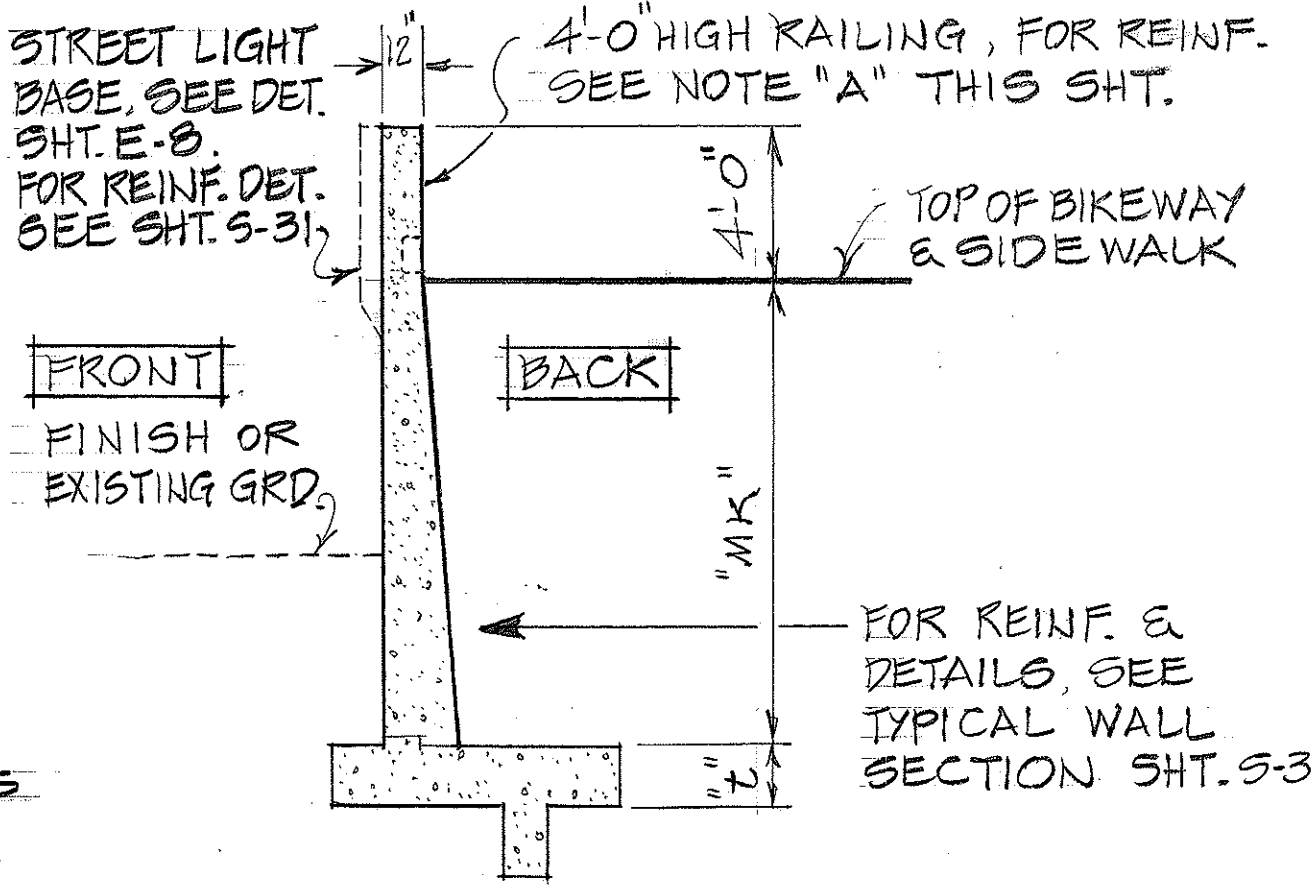
SCALES: HORIZ. 1" = 20'
VERT. 1" = 5'

RETAINING WALL NO. 1 QUANTITY ESTIMATES

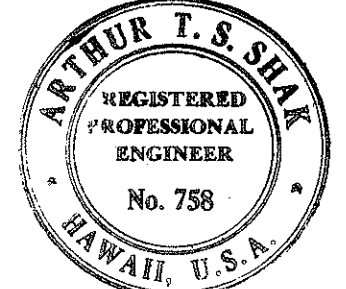
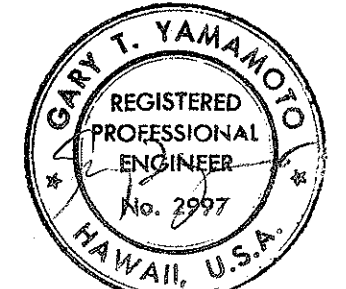
ITEM NO.	ITEM	UNIT	QUANTITY
206.40	STRUCTURE EXCAVATION FOR RETAINING WALLS	Cu.Yd.	2305
206.45	STRUCTURE BACKFILL FOR RETAINING WALLS	Cu.Yd.	2496
206.80	FILTER MATERIAL	Cu.Yd.	461
203.05	CONCRETE IN RETAINING WALL NO. 1	Cu.Yd.	1,095
602.05	REINFORCING STEEL IN RETAINING WALL NO. 1	Lb.	117,022
602.01	GROUTED RUBBLE PAVING	Cu.Yd.	4

RETAINING WALL NO. 2 QUANTITY ESTIMATES

ITEM NO.	ITEM	UNIT	QUANTITY
206.40	STRUCTURE EXCAVATION FOR RETAINING WALLS	Cu.Yd.	497
206.45	STRUCTURE BACKFILL FOR RETAINING WALLS	Cu.Yd.	287
206.80	FILTER MATERIAL	Cu.Yd.	51
203.05	CONCRETE IN RETAINING WALL NO. 2	Cu.Yd.	254
602.05	REINFORCING STEEL IN RETAINING WALL NO. 2	Lb.	18,077



RETAINING WALL No. 2
TYPICAL SECTION
NO SCALE

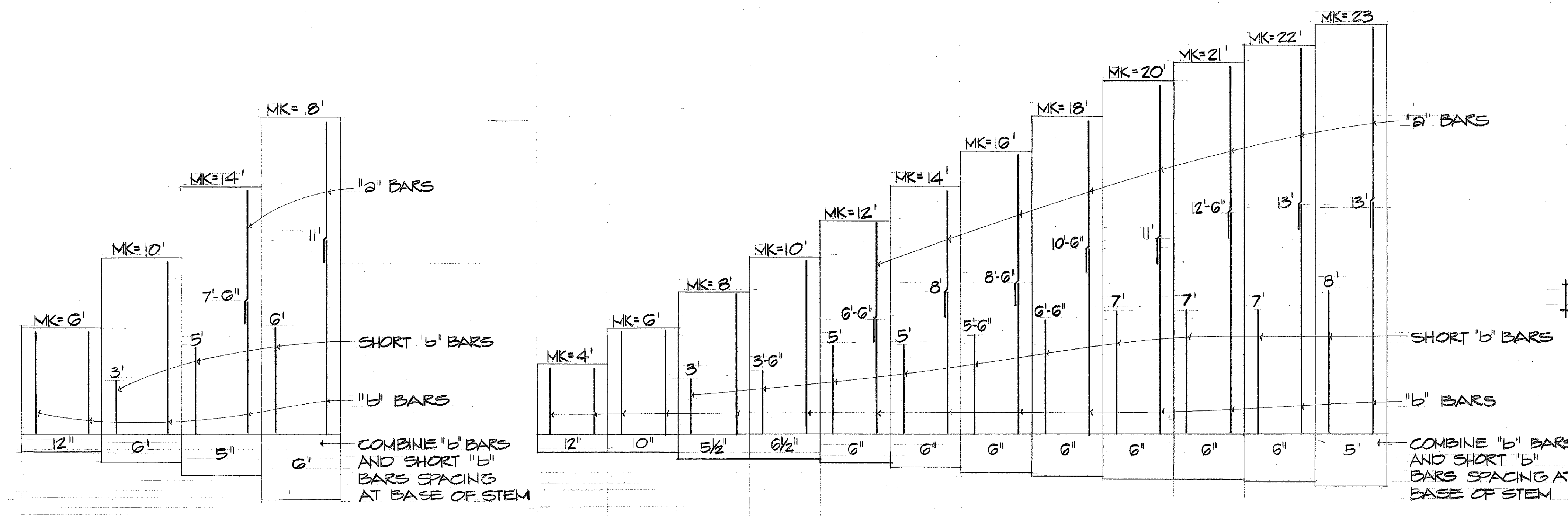


Arthur T. S. Shak
THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RETAINING WALLS NO. 1 & NO. 2
PROFILES

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 1
F.A. Proj. No. U-PP-078-1(6)
SCALE: AS SHOWN DATE: JUNE 25, 1976
SHEET NO. 5-29 OF 41 SHEETS

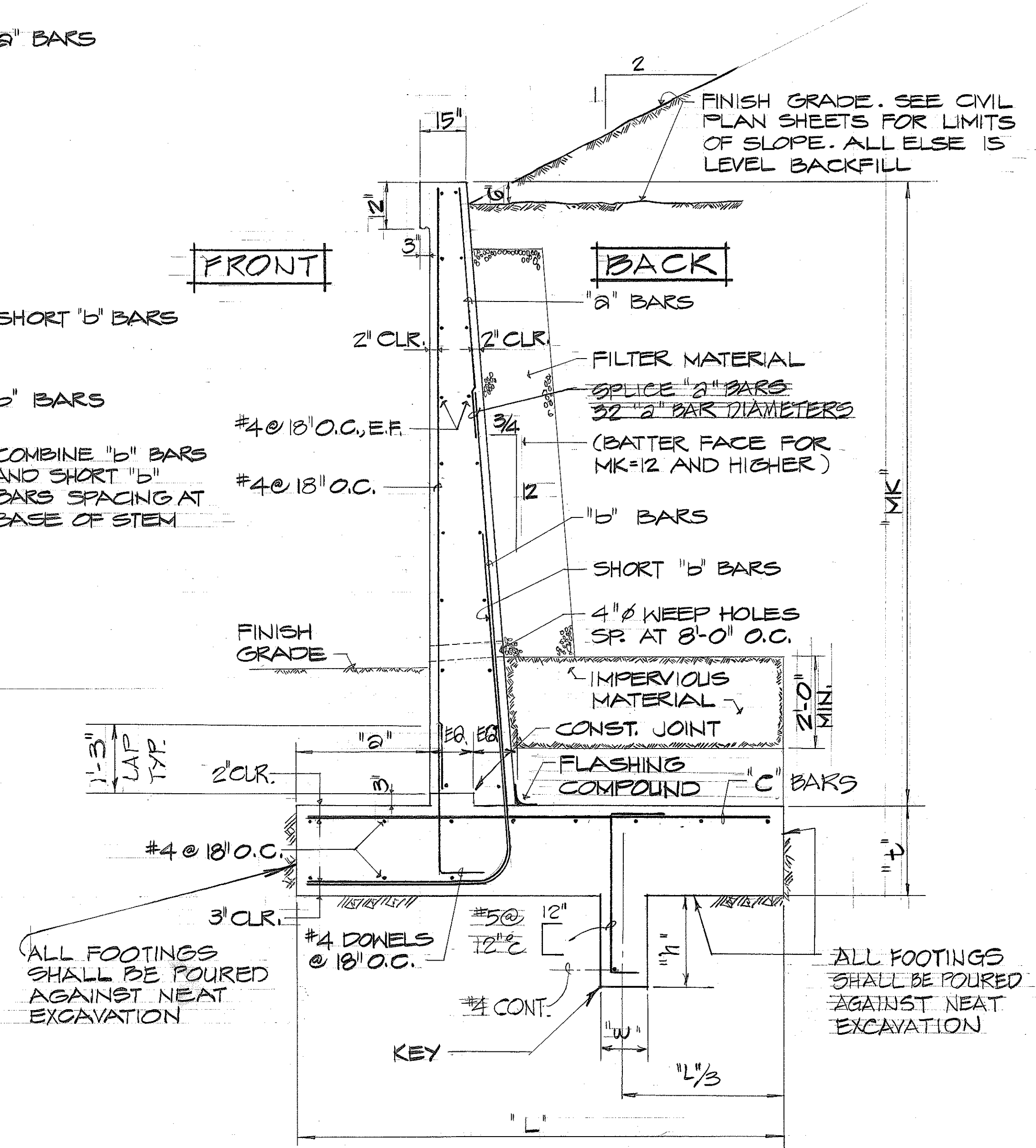


ELEVATION
RAMP "D" RETAINING WALL
WITH 2:1 SLOPING BACKFILL
 NO SCALE

ELEVATION
RETAINING WALLS WITH LEVEL BACKFILL
 NO SCALE

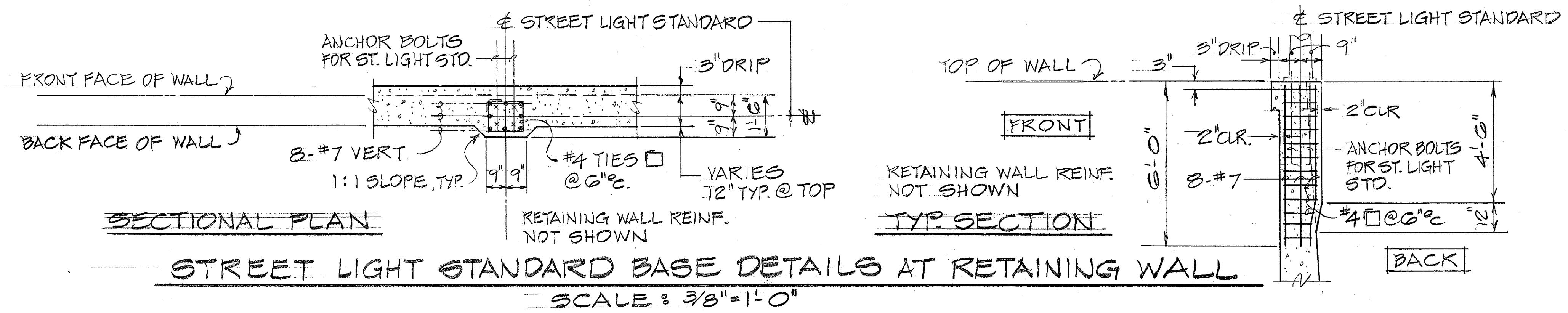
TABLE OF REINF. STEEL, DIMENSIONS AND DATA				
MAX. "MK"	6'	10'	14'	18'
"L"	4'-6"	7'-0"	10'-0"	14'-0"
"a"	6"	12"	2'-0"	2'-6"
"t"	14"	18"	2'-0"	2'-9"
"a" BARS	—	—	#4@10"	#5@12"
"b" BARS	#4@12"	#6@6"	#6@5"	#9@6"
"c" BARS	#4@10"	#6@7"	#9@9"	#9@6"
KEY (h x w)	12" x 12"	2' x 12"	3' x 12"	3' x 12"
BATTER	NONE	NONE	3/4:12	3/4:12

TABLE OF REINF. STEEL, DIMENSIONS AND DATA												
MAX. "MK"	4'	6'	8'	10'	12'	14'	16'	18'	20'	21'	22'	23'
"L"	3'-6"	4'-6"	5'-6"	6'-6"	7'-6"	8'-6"	10'-0"	11'-0"	12'-6"	12'-6"	14'-0"	15'-0"
"a"	6"	6"	12"	12"	15"	1'-9"	2'-0"	2'-3"	2'-6"	2'-6"	2'-9"	3'-0"
"t"	14"	14"	14"	18"	18"	18"	1'-9"	2'-0"	2'-6"	2'-6"	3'-0"	3'-0"
"a" BARS	—	—	—	—	#4@12"	#4@12"	#5@12"	#5@12"	#6@12"	#6@12"	#6@12"	#7@12"
"b" BARS	#3@12"	#4@10"	#4@5½"	#6@6½"	#5@6"	#6@6"	#7@6"	#8@6"	#9@6"	#10@6"	#10@6"	#10@6"
"c" BARS	#3@12"	#4@9"	#5@9"	#5@6"	#6@5"	#7@6"	#8@6"	#9@6"	#10@6"	#10@6"	#10@6"	#10@5"
KEY (h×w)	6"×6"	12"×12"	12"×12"	18"×12"	2'×12"	2'×12"	2'×12"	2'×12"	2'×12"	2'×12"	2'×12"	2'×12"
BATTER	NONE	NONE	NONE	NONE	¾:12	¾:12	¾:12	¾:12	¾:12	¾:12	¾:12	¾:12

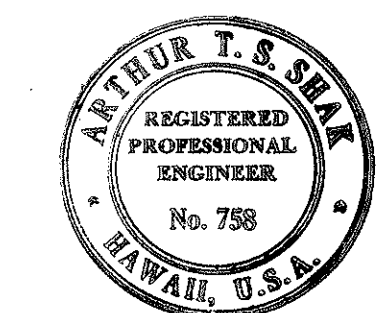


TYPICAL WALL SECTION
 NO SCALE

NOTE:
 REFER TO CIVIL DRAWINGS GRADING PLANS FOR LOCATION AND LIMITS OF RETAINING WALLS.



SECTIONAL PLAN
STREET LIGHT STANDARD BASE DETAILS AT RETAINING WALL
 SCALE: 3/8" = 1'-0"



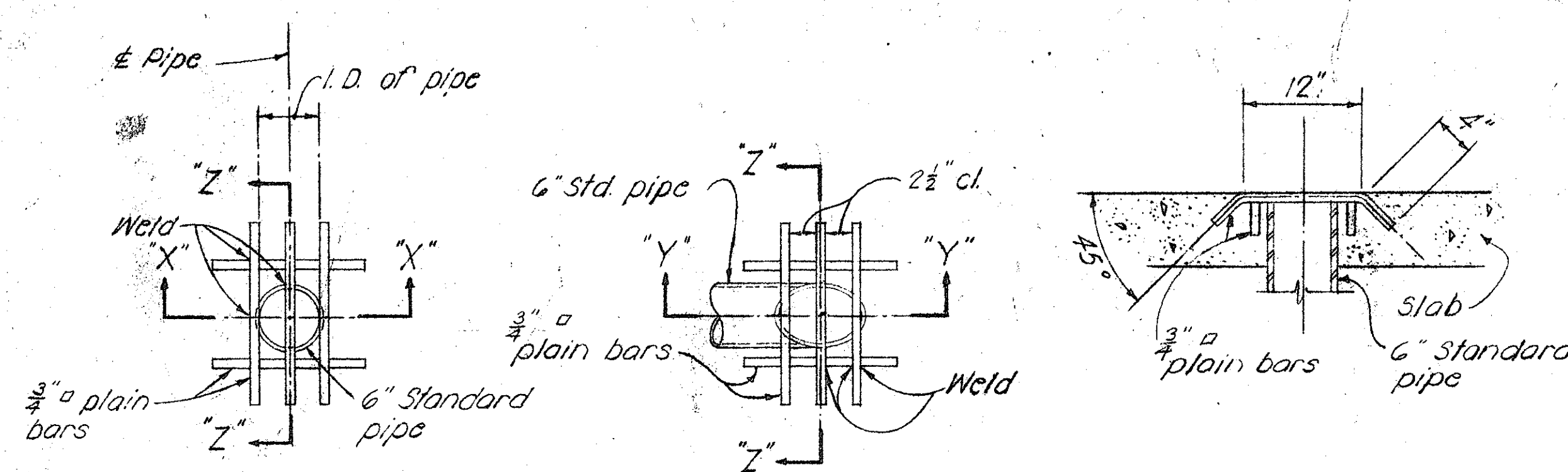
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

TYPICAL RETAINING WALL DETAILS

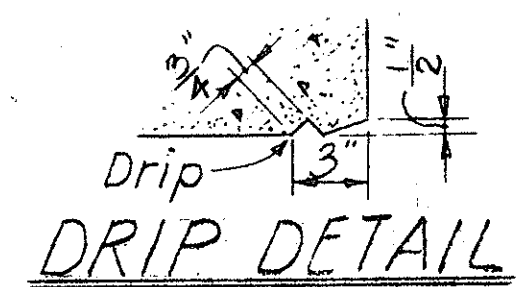
MOANALUA ROAD
 PUULOA I.C. TO MIDDLE ST. - UNIT 1
 P.A. Proj. No. U-FF-078-1(6)
 SCALE: AS SHOWN DATE: JUNE 25, 1976
 SHEET NO. 126 OF 141 SHEETS

GENERAL NOTES

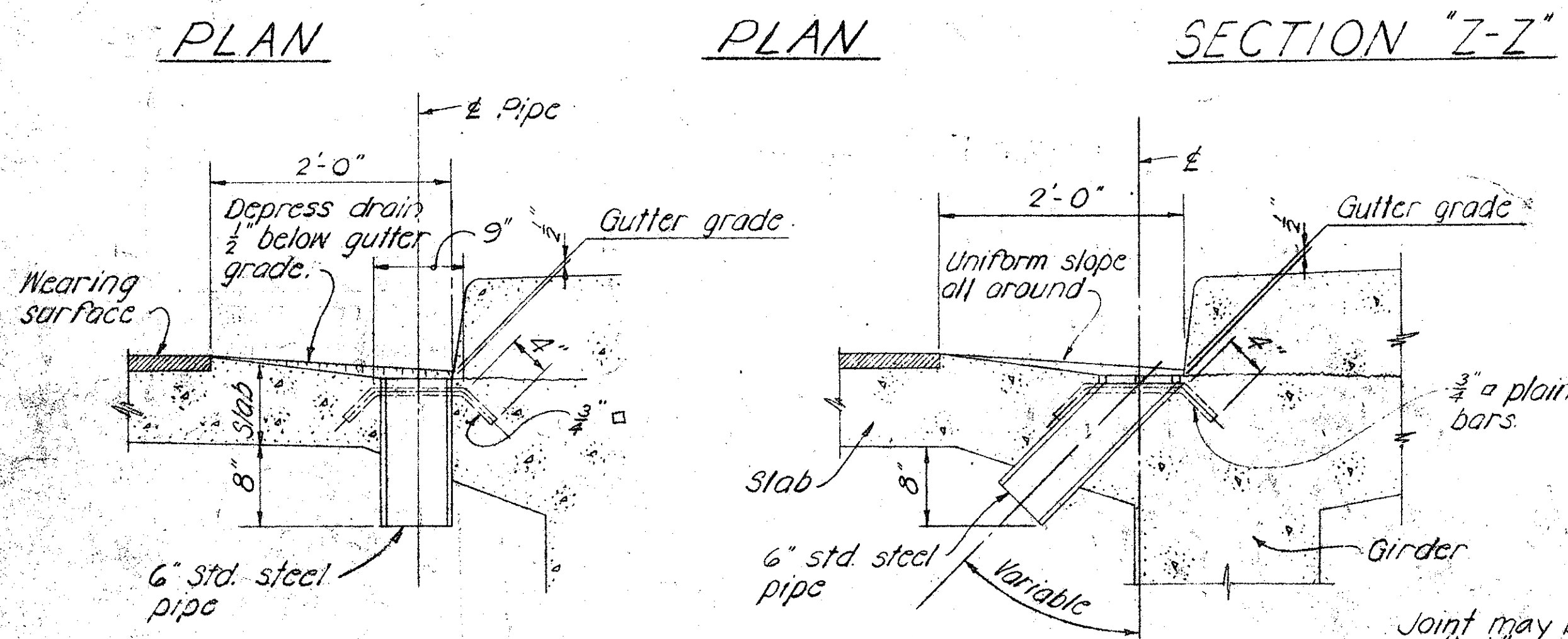
- All concrete shall be Class A unless otherwise noted.
- Reinforcing shall be detailed in accordance with A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures unless otherwise noted.
- Clearance for reinforcing bars shall be as follows, unless otherwise noted.
 - a - 1 1/2" For stirrups of beams & pier caps.
 - b - 2" For ties of columns.
 - c - 2" For formed walls.
 - d - 3" For footings.
- Minimum spacing between parallel bars shall be 2 1/2 times the diameter of bars, but in no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate.
- All dimensions relating to reinforcing are to centers of bars unless otherwise noted.
- Reinforcing bars shall be securely tied at all intersections & lap splices & shall be held in place during pouring to maintain their proper locations as shown on plans.
- Vertical column bars shall be arranged in such a manner as to miss pier cap bars above as directed by the Engineer.
- Except as otherwise noted on drawings, all exterior corners & re-entrant angles in concrete work shall be chamfered 3/4" x 3/4".
- Concrete seats receiving steel plates, lead plates or neoprene pads shall be poured monolithically with supporting structures & top of concrete seats shall be finished with a steel trowel to a smooth level surface at the elevation shown on the plans.
- Elastomeric Pads: Bottom of bridge bearing pads shall be secured against displacement with adhesives approved by the Engineer. Pads shall be incidental to concrete and will not be paid for separately.
- Forms for all exposed surfaces of separation structures and surfaces of retaining walls visible from a traveled way or from a populated area shall be plywood except that metal forms may be permitted provided a surface finish satisfactory to the Engineer can be obtained and the use of such forms is approved in writing by the Engineer. Forms for round columns shall be made of materials that will give a smooth finish and true dimensions as given in the plans. Forms for prestressed concrete members shall be either metal or plywood.
- Gothic letters and figures approximating dimensions shown will be acceptable if approved by the Engineer.
- The contractor shall verify the location of all existing utility lines and notify the respective owners before commencing work of excavation or driving of piles.
- Standard Detail Drawings refer to all structures in general, except for modifications as may be required for special conditions. For such modifications refer to the corresponding detailed drawings.



TYPICAL CONCRETE GROOVE DETAIL



DRIP DETAIL

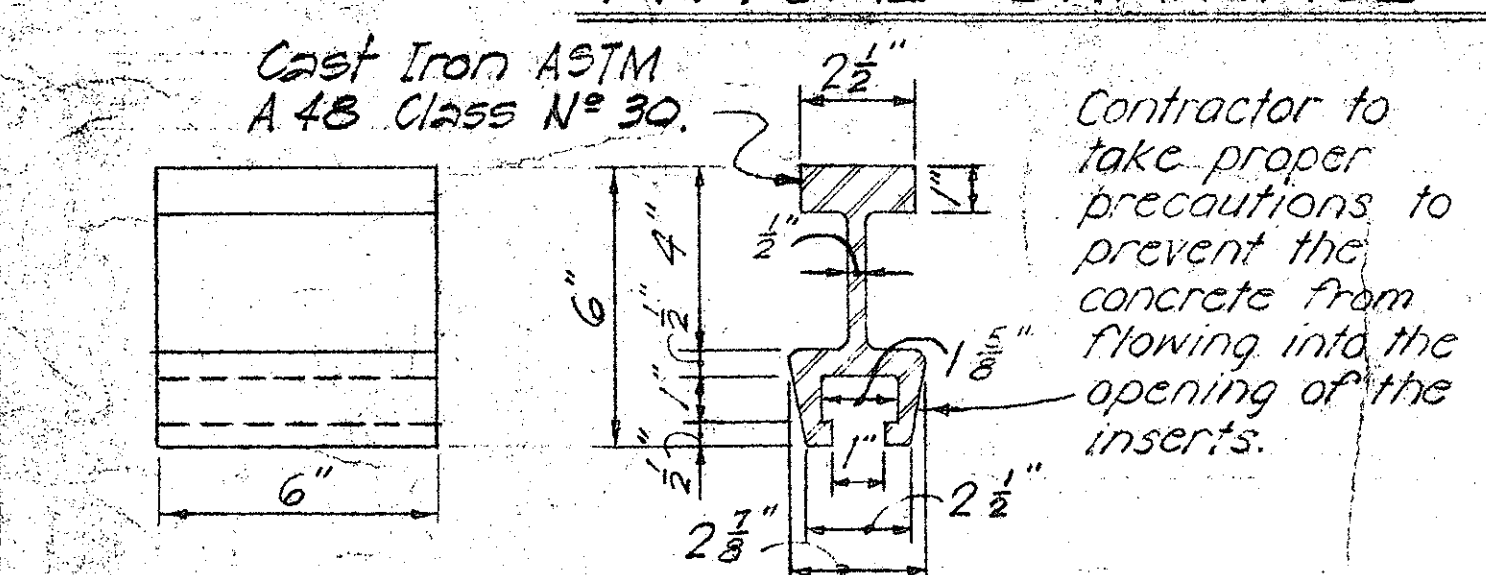


SECTION "X-X"

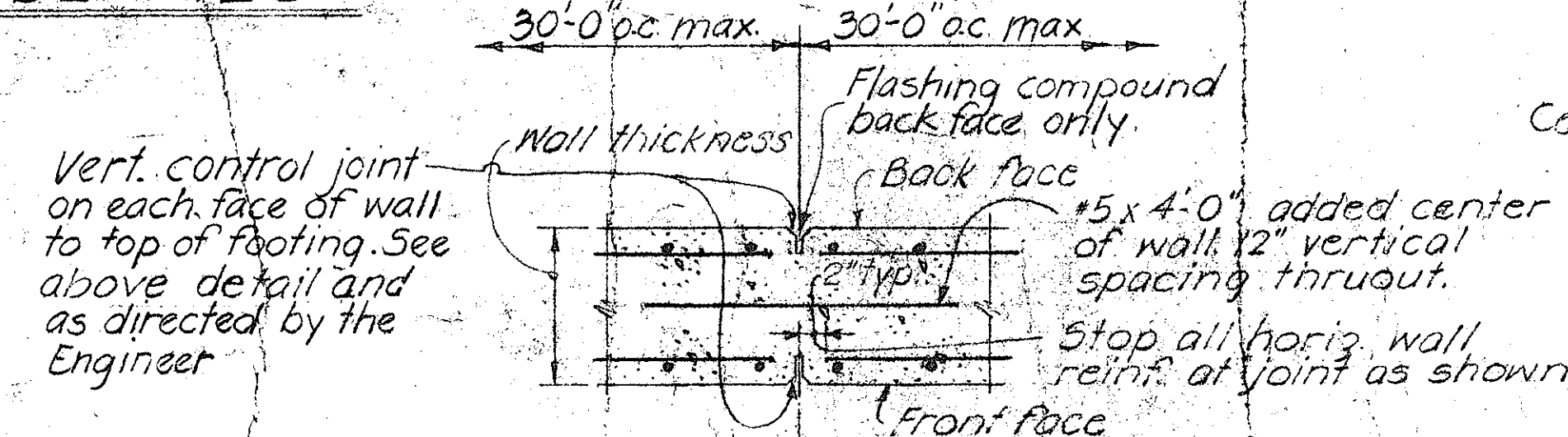
SECTION "Y-Y"

NOTE: Metal drains shall be considered incidental to Class A Concrete in both concrete and steel bridges and will not be paid for separately. Assembly of grillage and pipe shall be hot-dip galvanized after all welding is completed.

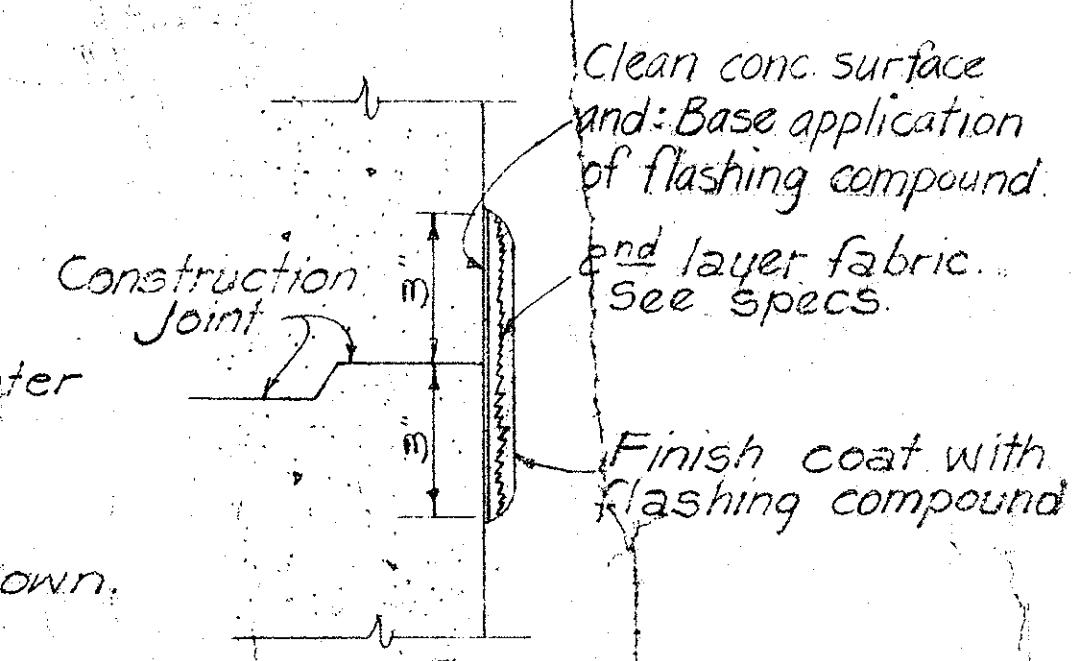
TYPICAL DRAINAGE DETAILS



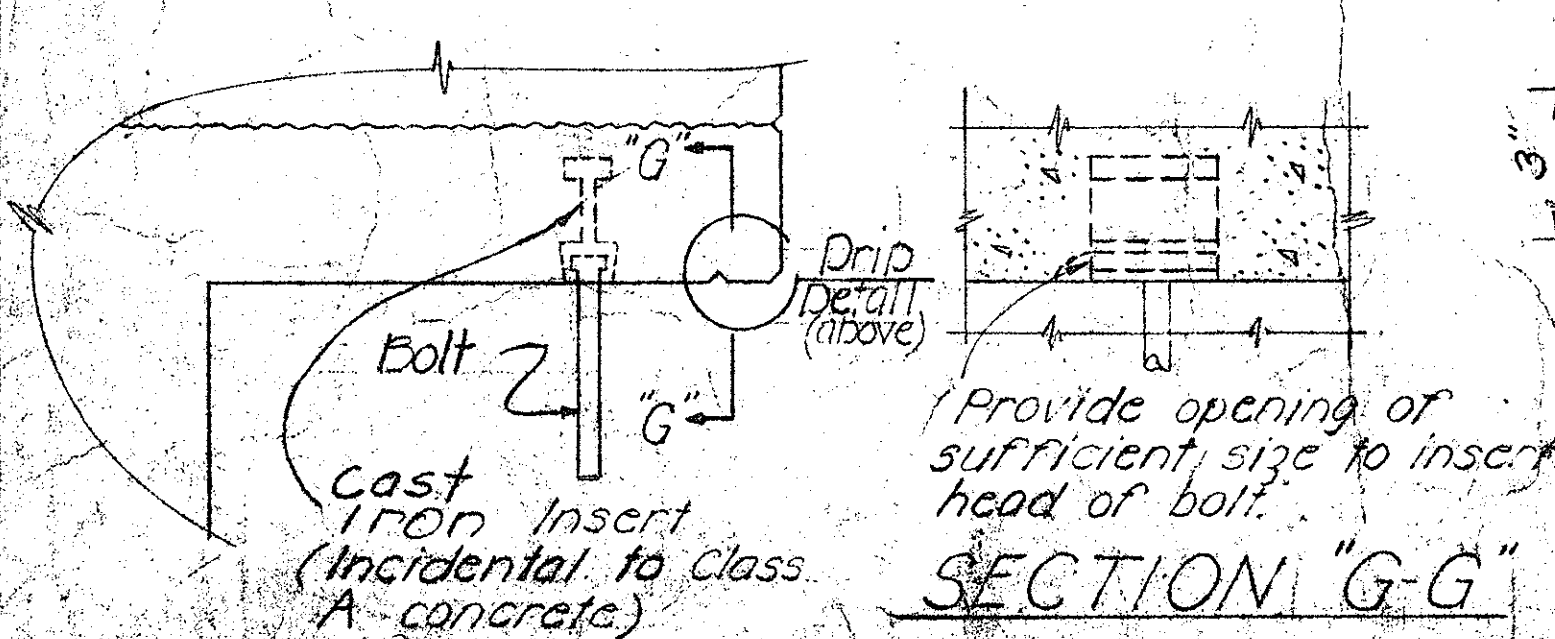
INSERT DETAIL



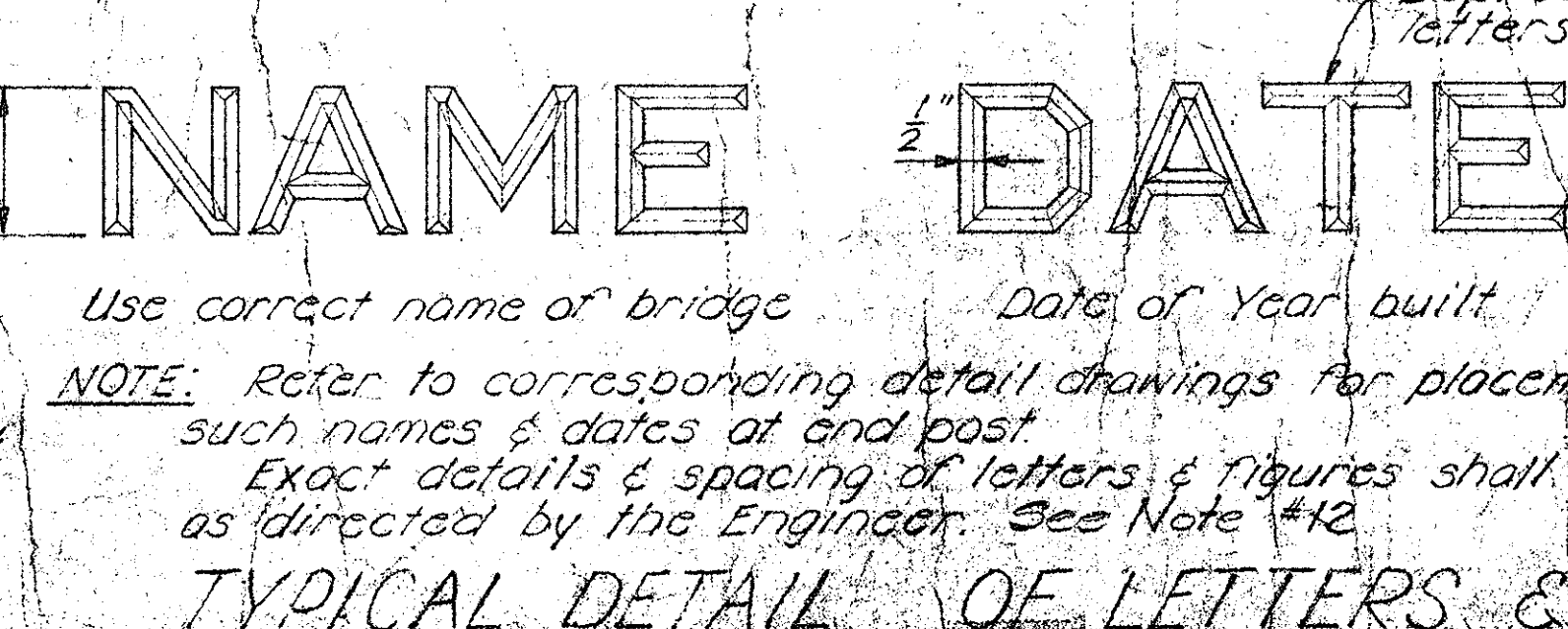
CONTROL JOINT DETAILS



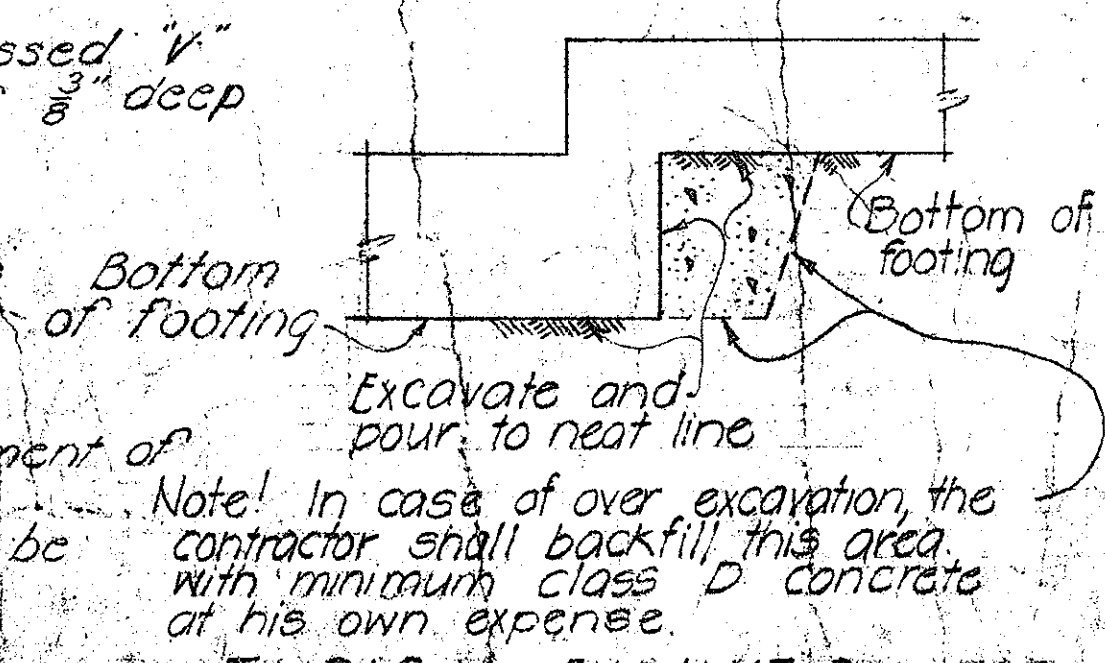
TYP. FLASHING COMPOUND WATERPROOFING DETAIL



DETAIL OF PIPE HANGERS & INSERTS



TYPICAL DETAIL OF LETTERS & FIGURES AT CONCRETE END POST



TYPICAL EXCAVATION FOR CONTINUOUS FOOTING STEP-UP

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

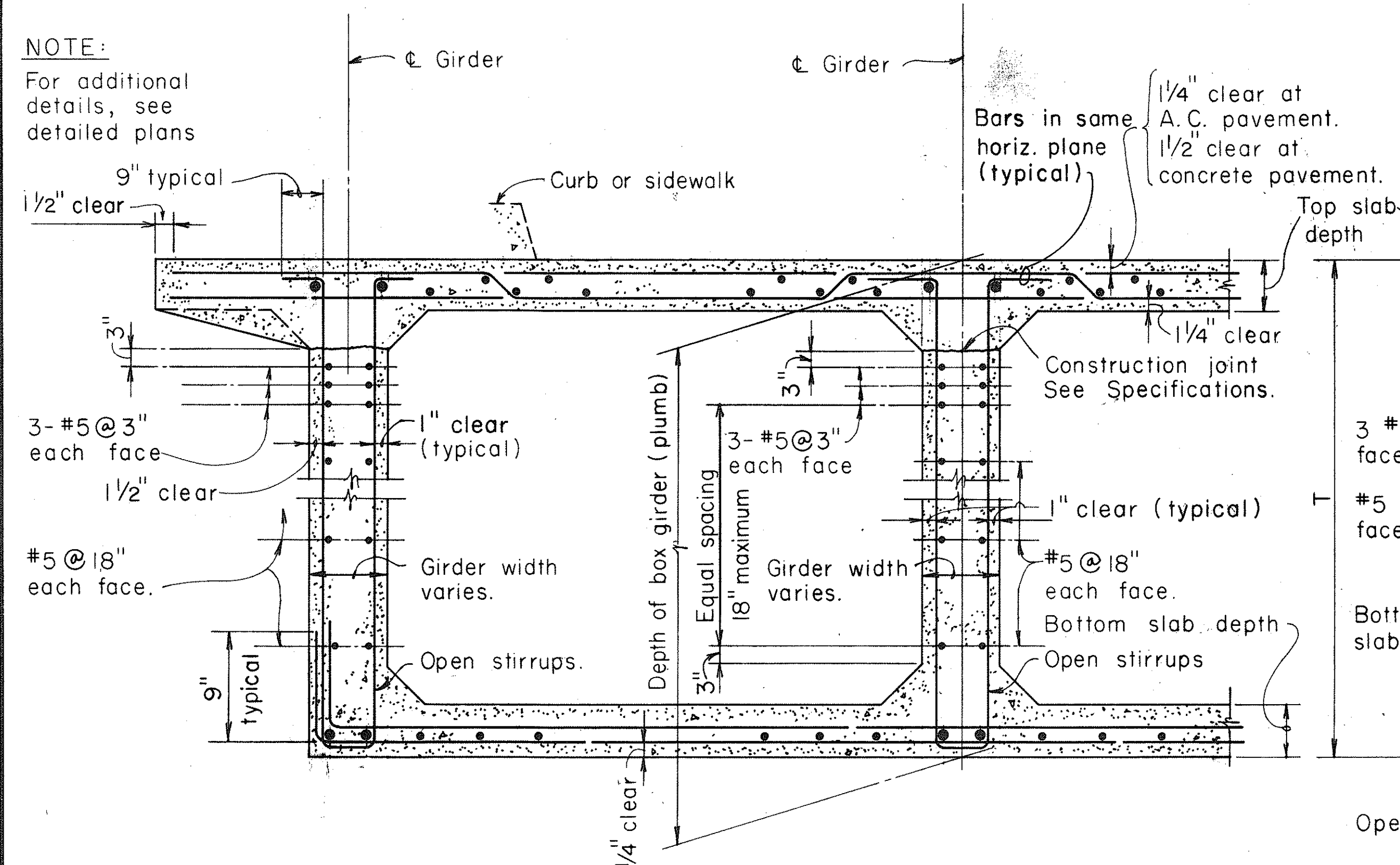
APPROVED
Paul T. Yamashita
ASSISTANT CHIEF, ENGINEERING
DATE 1-28-70

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
NOTES AND MISCELLANEOUS
DETAILS
Date: October 1969
SHEET No. 22 OF 41 SHEETS DB-100

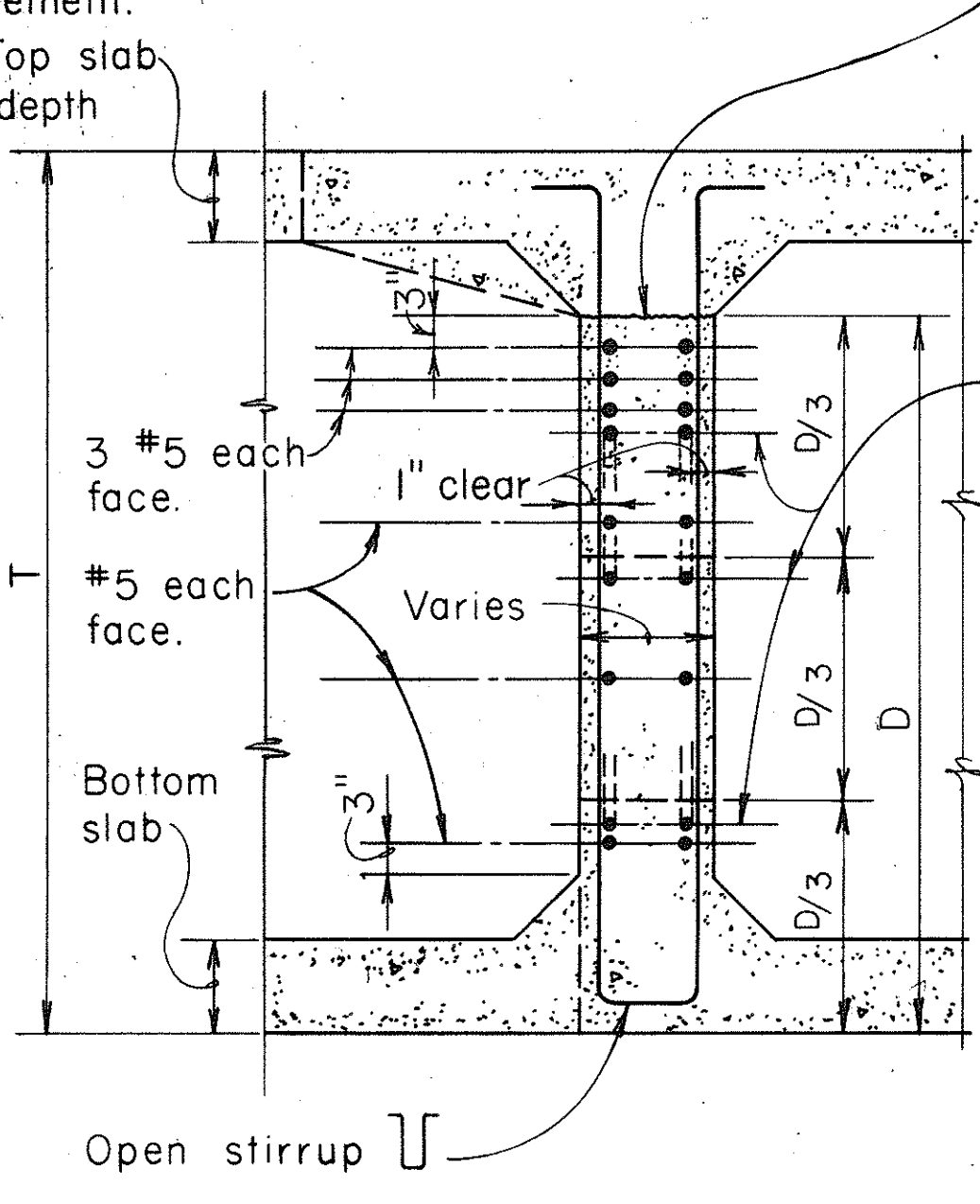
DESIGNED BY
CHECKED BY
DATE
ORIGINAL
PLAN
NOTE BOOK

NOTE:
For additional details, see detailed plans

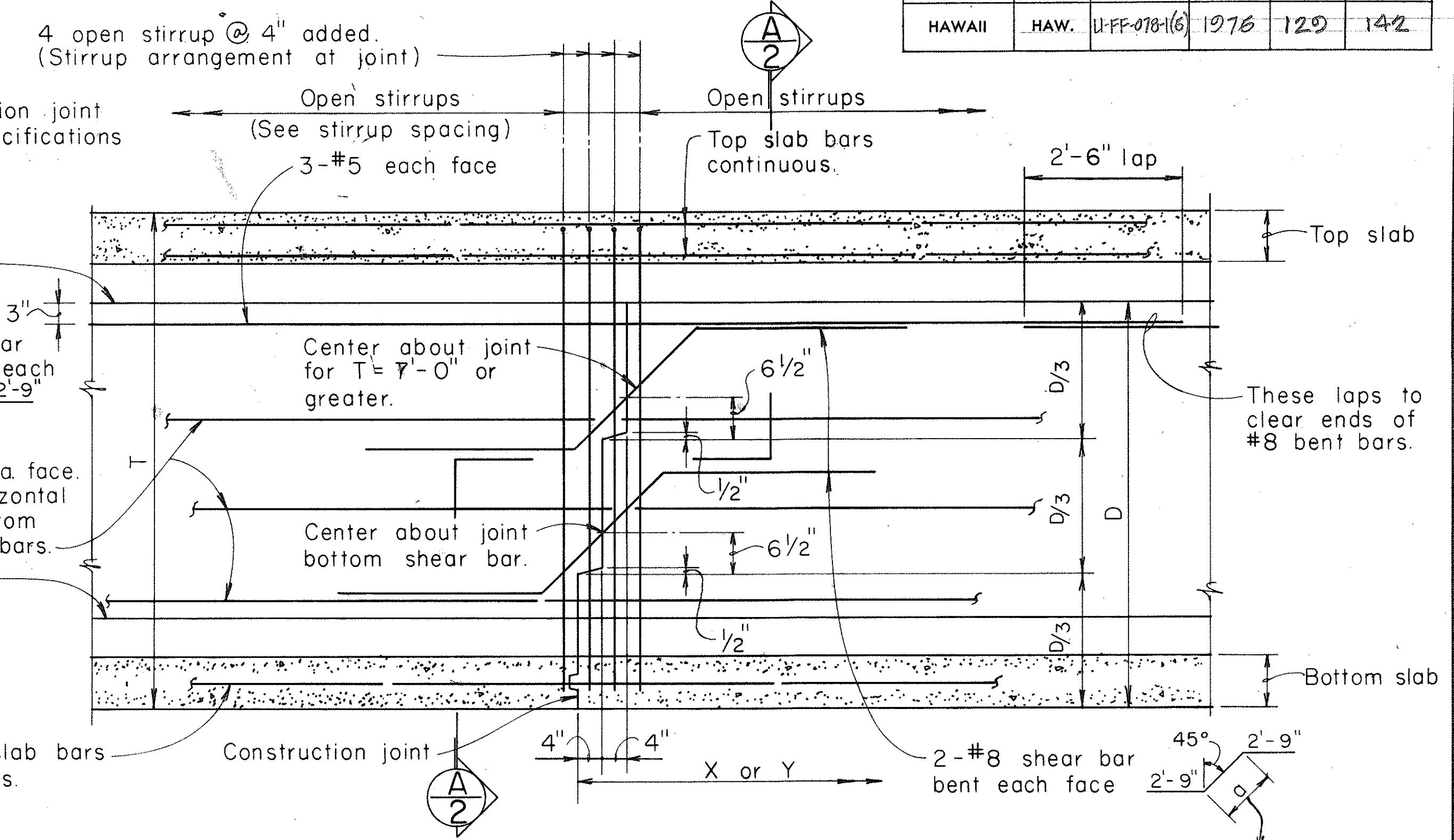


EXTERIOR GIRDER
INTERIOR GIRDER
TYPICAL NORMAL BOX GIRDER SECTION

NOTE:
D = Depth of girder stem to bottom of slab.
For additional details see Normal Section of the Plans.

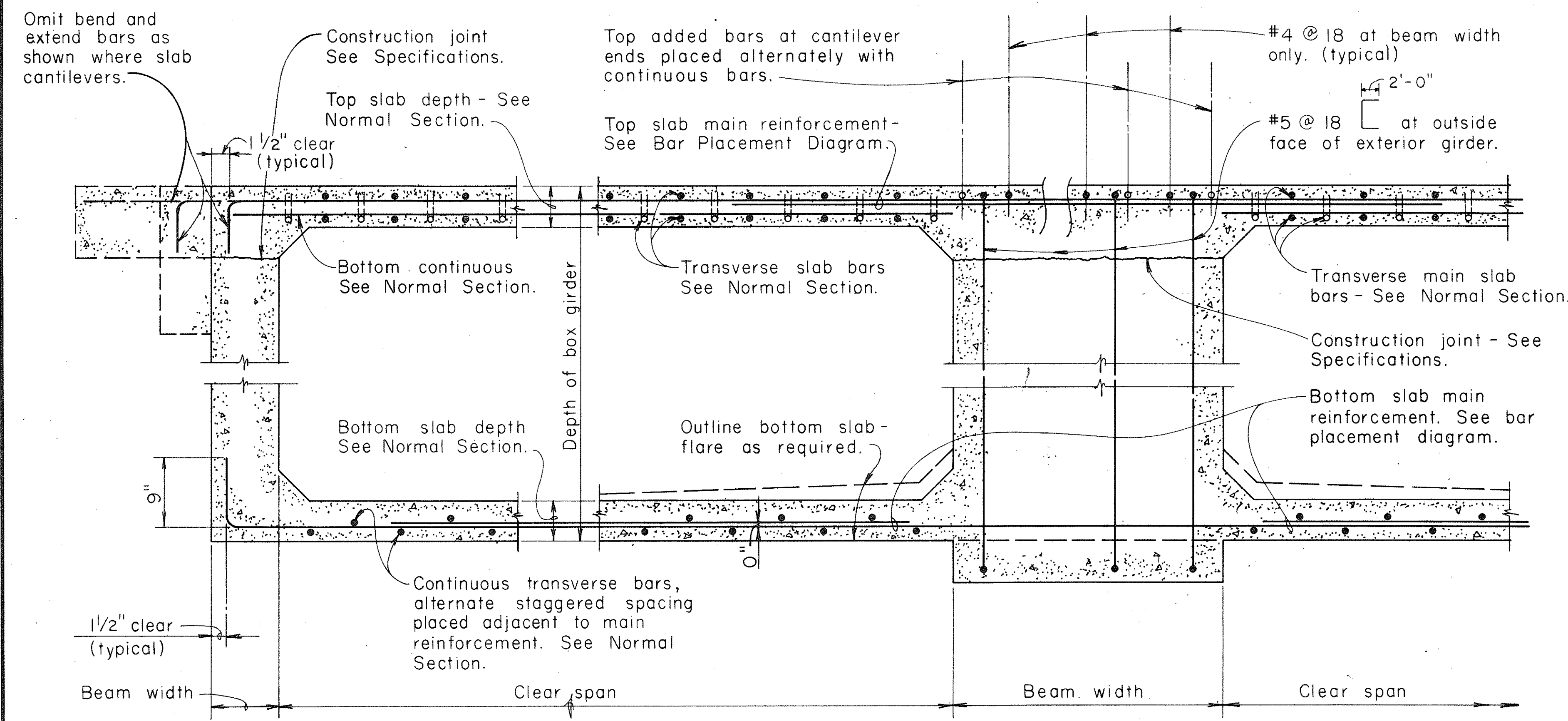


SECTION A-2



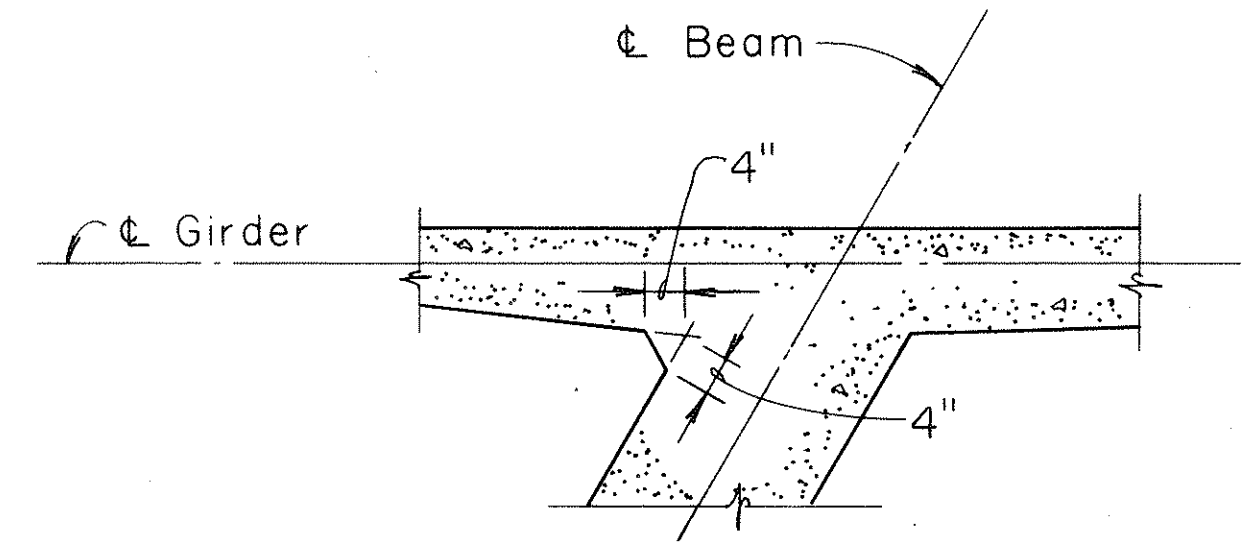
GIRDER STEM CONSTRUCTION JOINT

Depth T	a
4'-11" and smaller	1'-9"
5'-0" to 5'-11"	2'-0"
6'-0" to 6'-11"	2'-3"
7'-0" and greater	3'-0"



AT NON-CONTINUOUS END
AT CONTINUOUS SUPPORT

**TYPICAL LONGITUDINAL DECK SECTION
ALONG GIRDER AT NORMAL OR RADIAL SUPPORTS**



**TYPICAL DETAIL OF VERTICAL
CHAMFER AT ACUTE INTERSECTION
OF SKEWED CONCRETE MEMBER**

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

APPROVAL RECOMMENDED:
Chaim R. Yamamoto 6-1-76
BRIDGE DESIGN ENGINEER DATE

APPROVED
Harold Sato 6-2-76
ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE

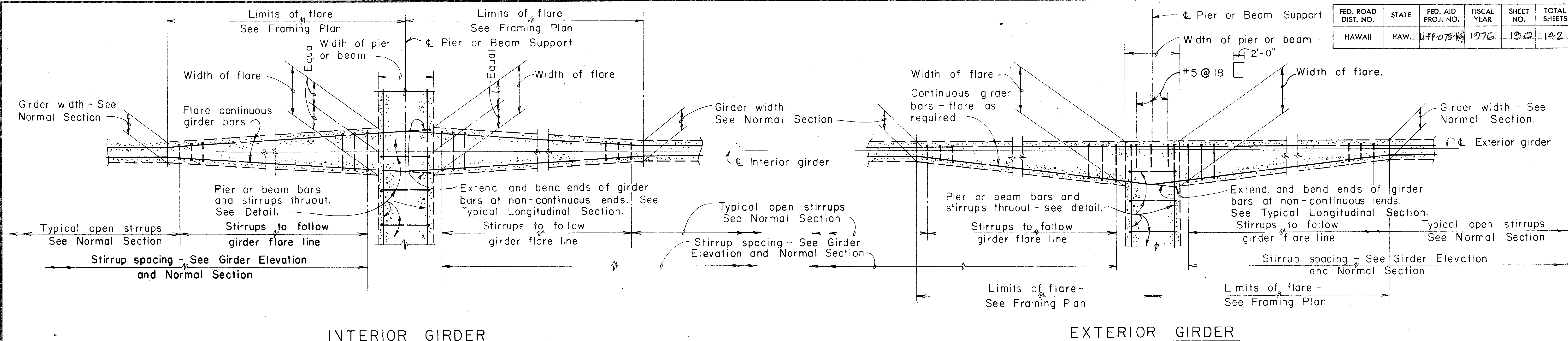
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CONCRETE BOX GIRDER

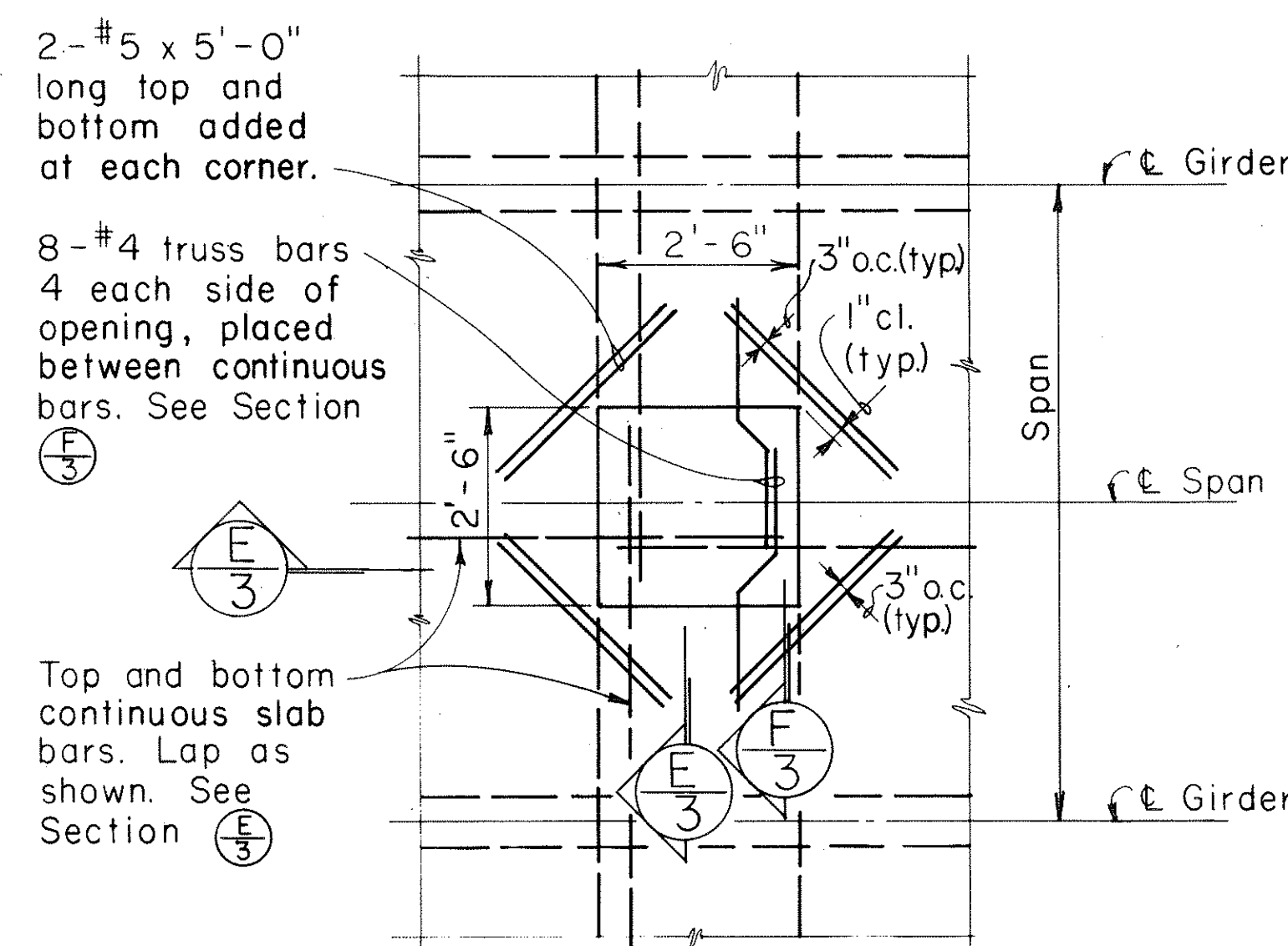
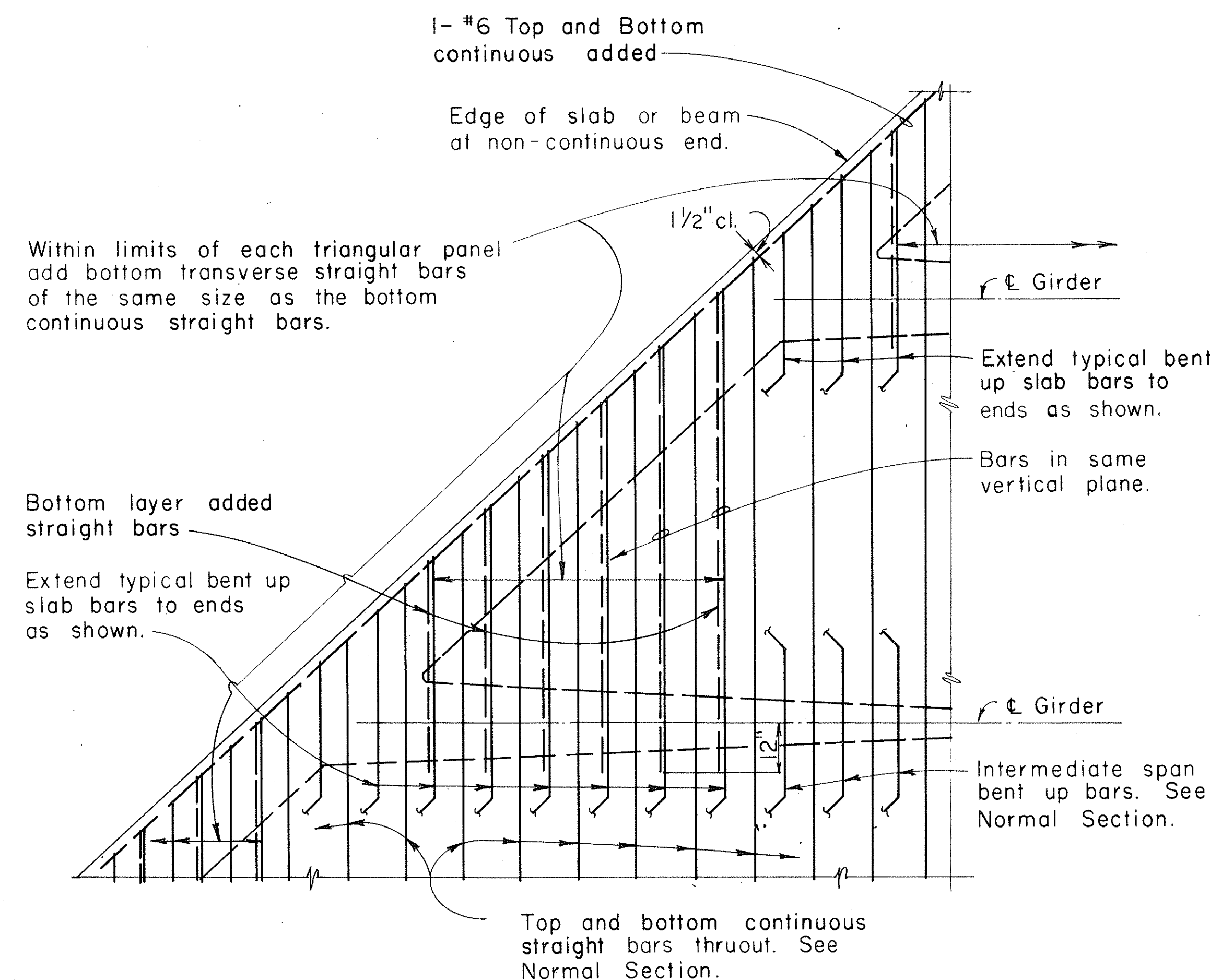
Not To Scale Date: May 1976

SHEET No. 534 OF 41 SHEETS DB-10-2

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	11F-078-16	1976	130	142

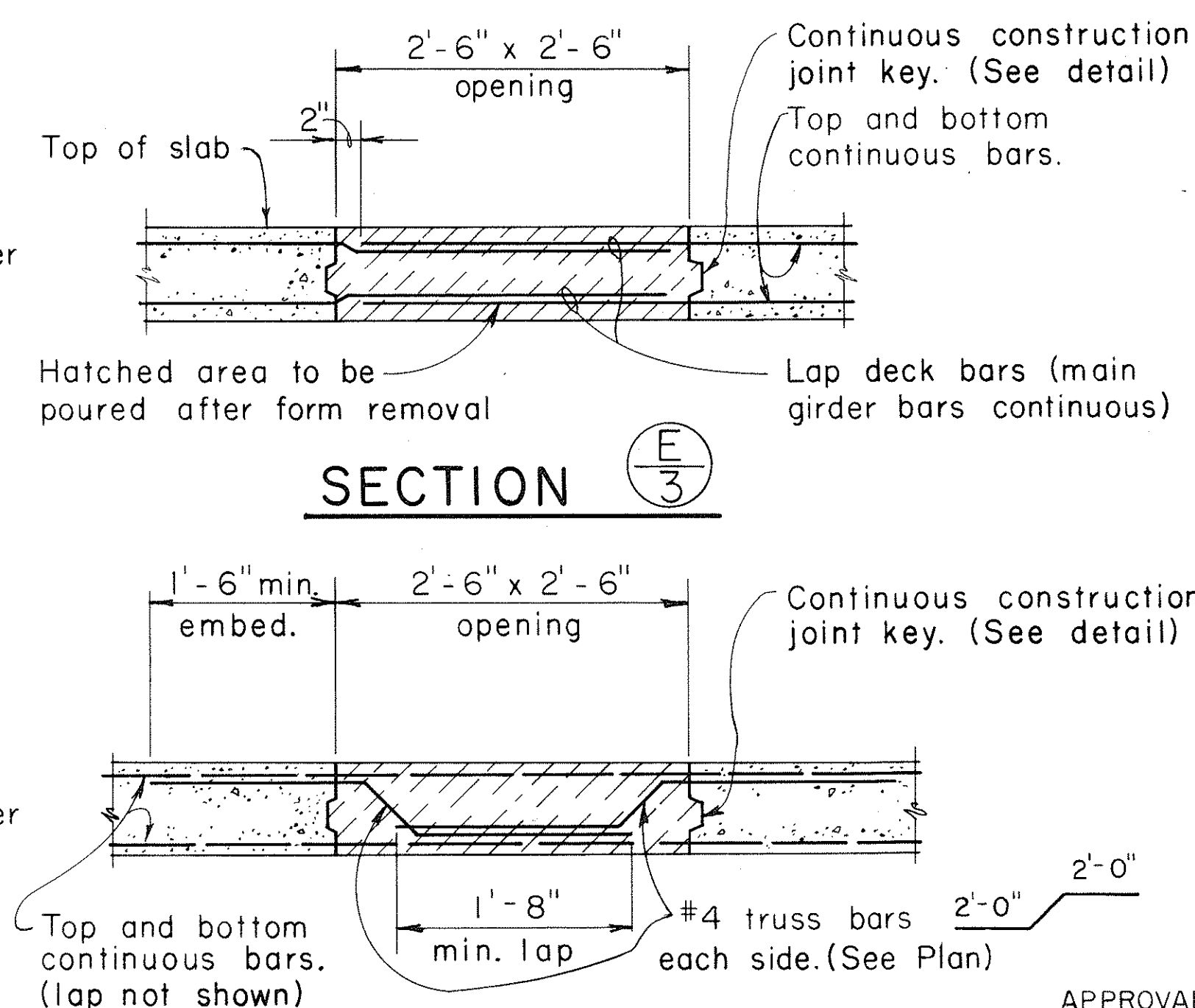


TYPICAL DETAILS OF GIRDER FLARE AT NORMAL OR RADIAL SUPPORTS - CONTINUOUS ENDS AS SHOWN
(NON-CONTINUOUS ENDS SIMILAR EXCEPT AS OTHERWISE NOTED)



NOTES

- Final location of opening shall be determined by the Engineer.
- Form removal opening at top slab shall not be located where main girder bars occur.
- Form removal opening may extend from edge of deck.



APPROVAL RECOMMENDED
Colman R. Yamant C-1-76
 BRIDGE DESIGN ENGINEER DATE

APPROVED
Robert R. Salas C-2-76
 ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

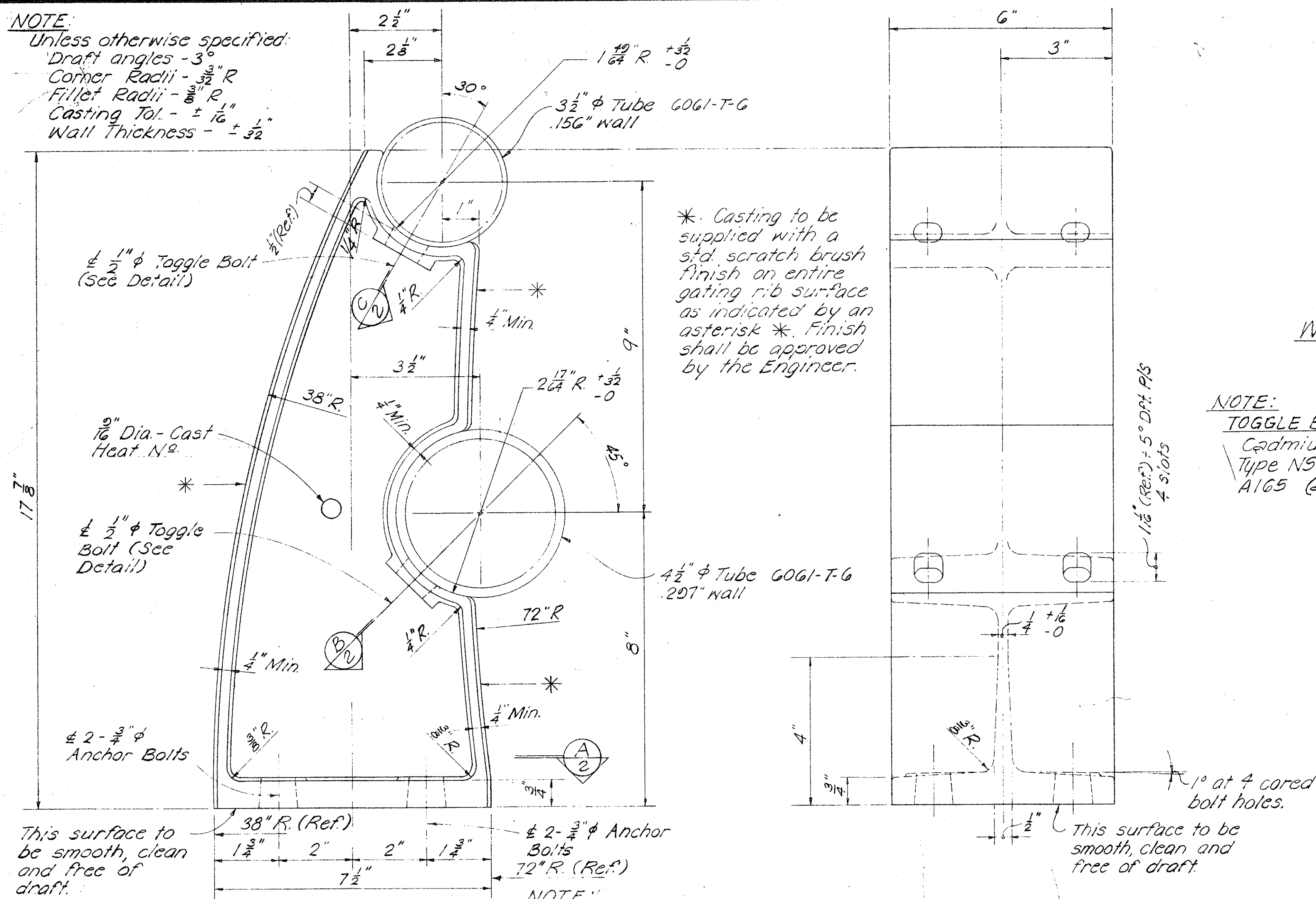
STANDARD DETAILS
CONCRETE BOX GIRDER

Not To Scale: Date: May 1976

SHEET No. 93 OF 41 SHEETS DB-101-3

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

NOTE:
Unless otherwise specified:
Draft angles - 3°
Corner Radii - $\frac{3}{32}$ " R
Fillet Radii - $\frac{1}{16}$ " R
Casting Tol. - $\pm \frac{1}{16}$ "
Wall Thickness - $\pm \frac{1}{32}$ "

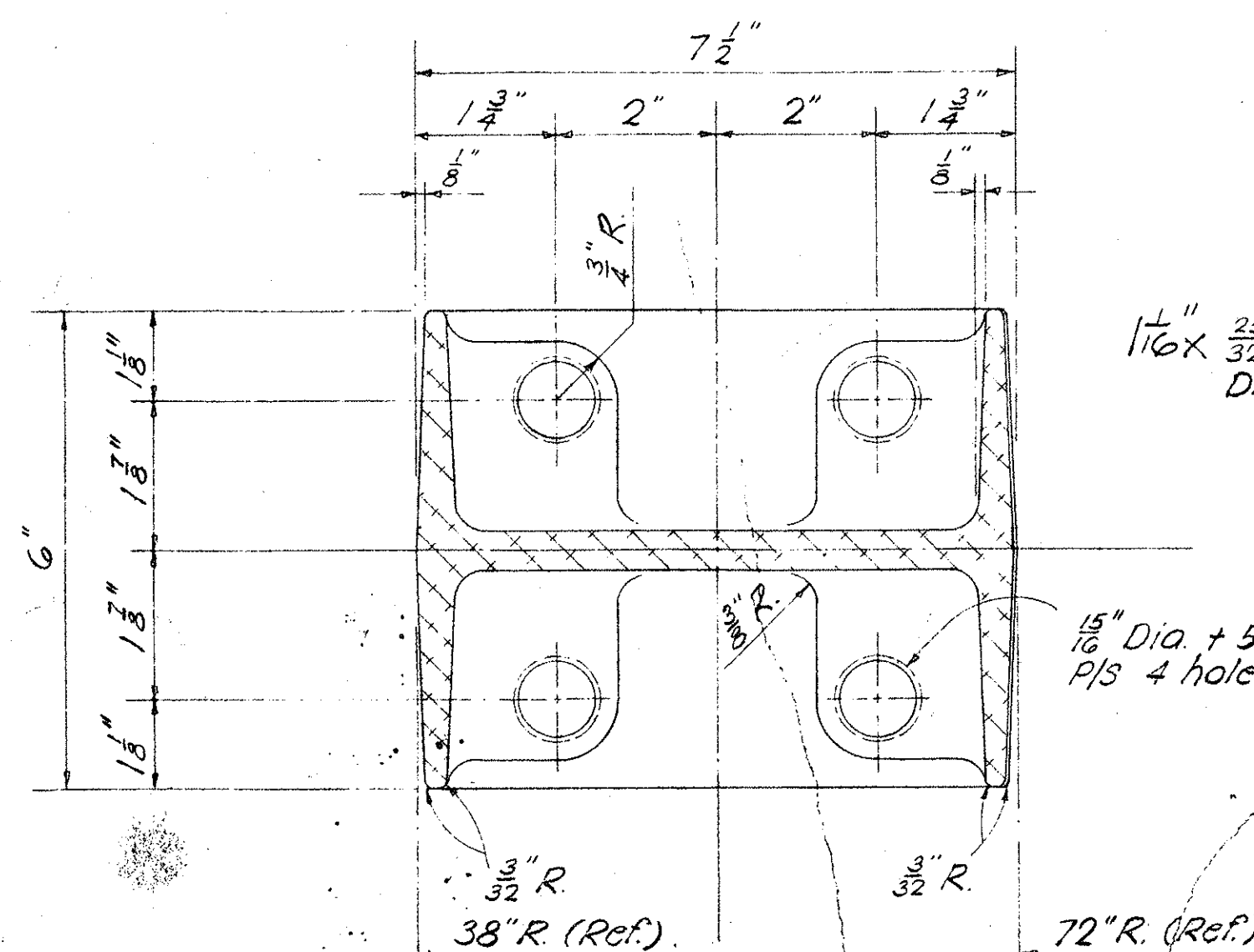


SIDE ELEVATION

END ELEVATION

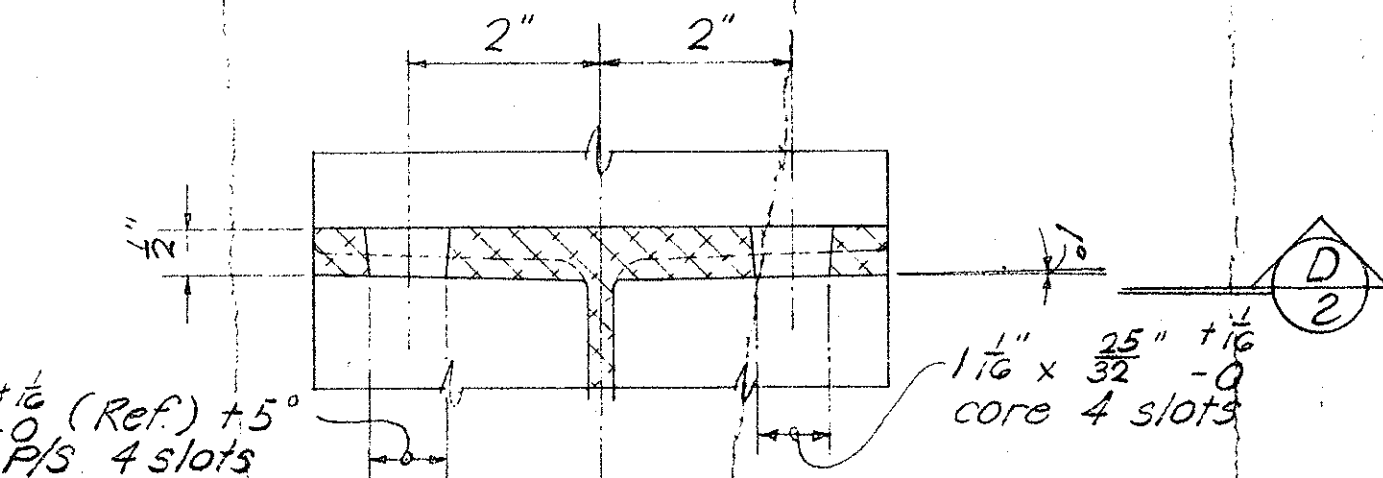
TYPICAL RAIL POST DETAILS

Scale: 6" = 1'-0"



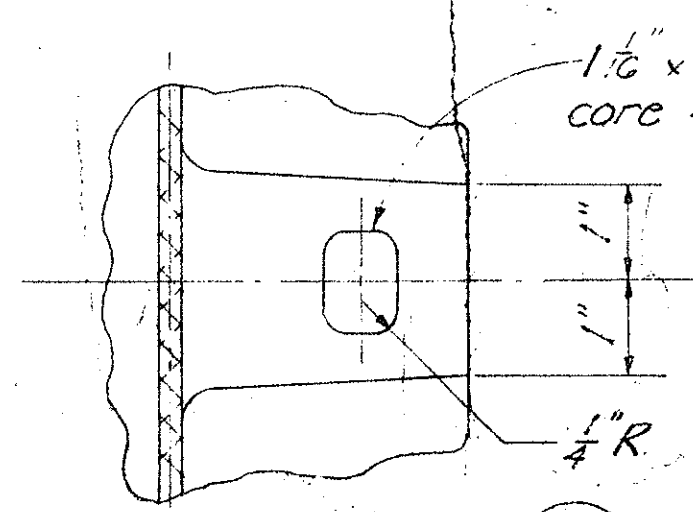
SECTION A-A

Scale: 6" = 1'-0"



SECTION B-B (SECTION C-C SIMILAR)

Scale: 6" = 1'-0"



SECTION C-C

Scale: 6" = 1'-0"

WASHER

SIDE ELEVATION ASSEMBLY

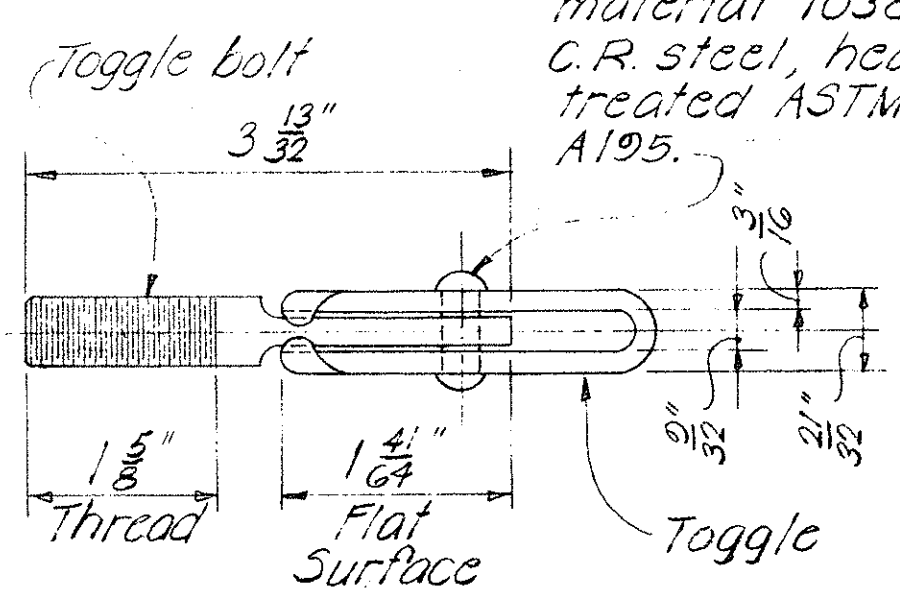
ELEVATION

ANCHOR BOLT

NOTE:

TOGGLE BOLT

Cadmium plating on steel - Type N5 0.0005" thick ASTM-A165 (all parts).



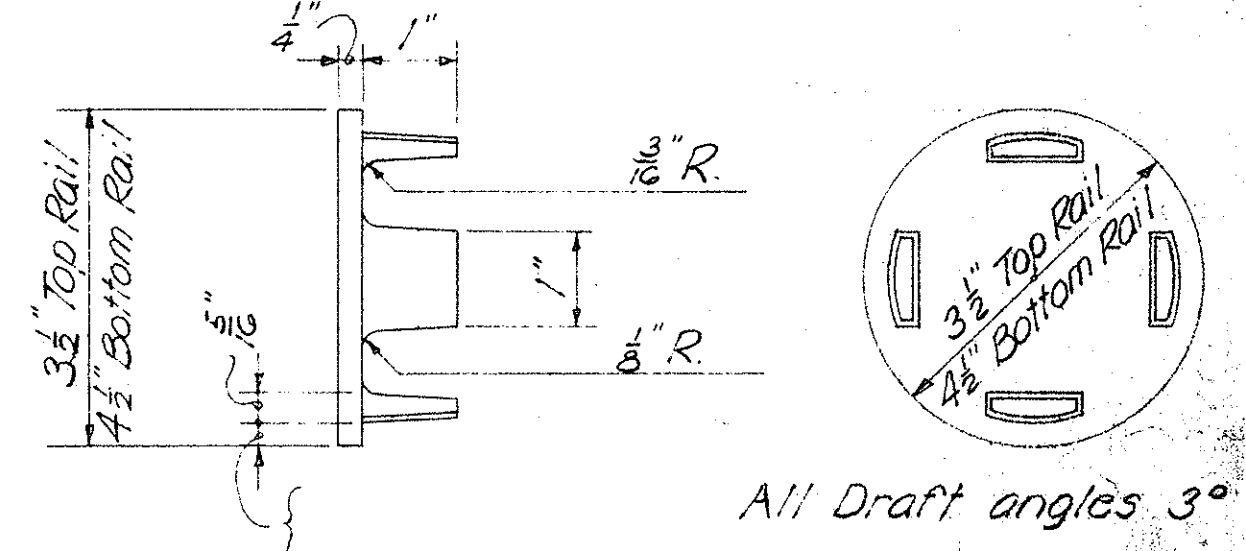
TOP PLAN

1/2" φ STEEL TOGGLE BOLT DETAIL

Scale: 3" = 1'-0"

TYPICAL RAIL POST STEEL ANCHOR BOLT ASSEMBLY

Scale: 3" = 1'-0"



RAIL CAP DETAIL

Scale: 6" = 1'-0"

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
1	Change title block rail designation. Delete note.	H.S.	2-4-72

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
ALUMINUM BRIDGE RAILING
DOUBLE RAIL COMBINATION TYPE
ON PARAPET

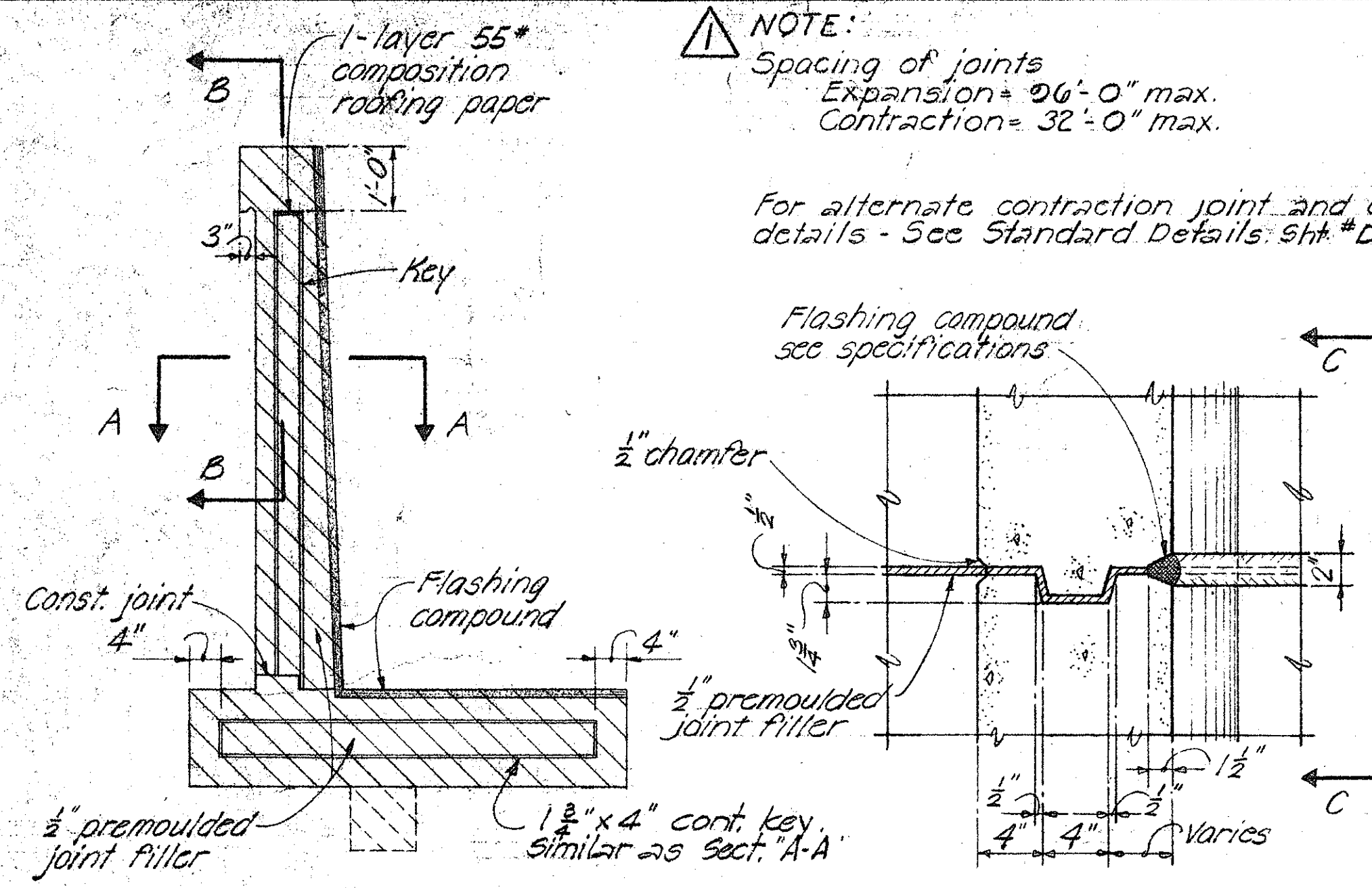
Date

SHEET No. 9-37 OF 41 SHEETS DB-201-2

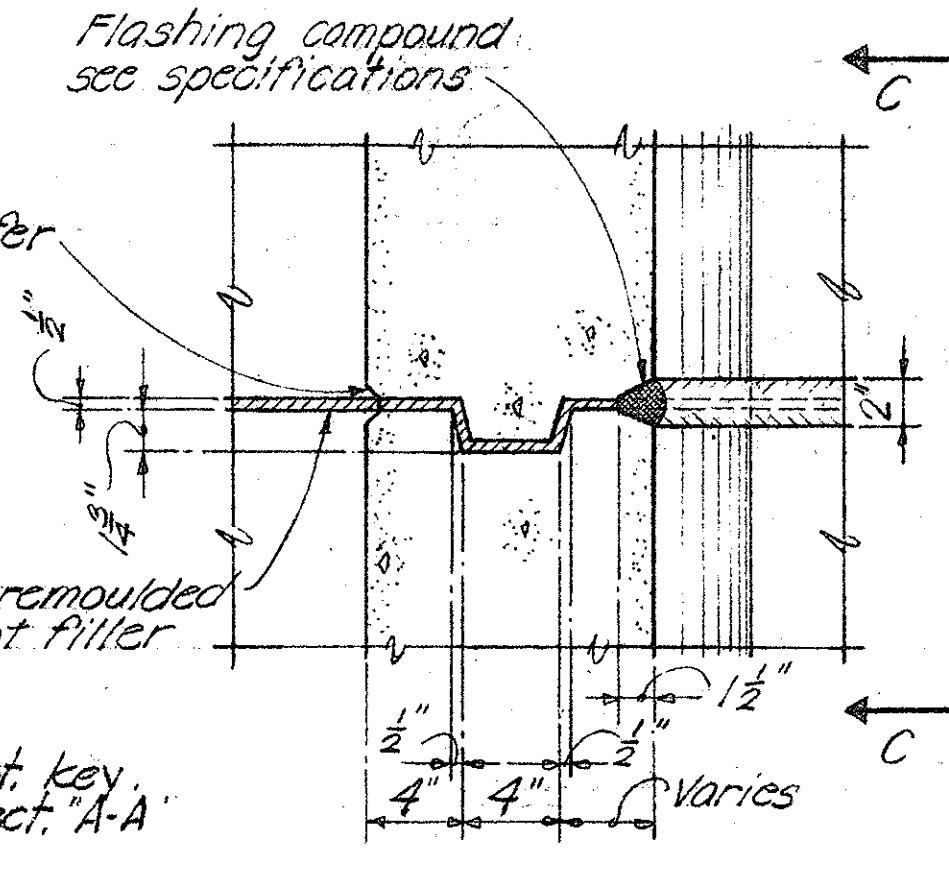
DATE	
SURVEY PLOTTED BY	
PLAN	
DESIGNED BY	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	
NO.	

NOTE:
Spacing of joints
Expansion = 26'-0" max.
Contraction = 32'-0" max.

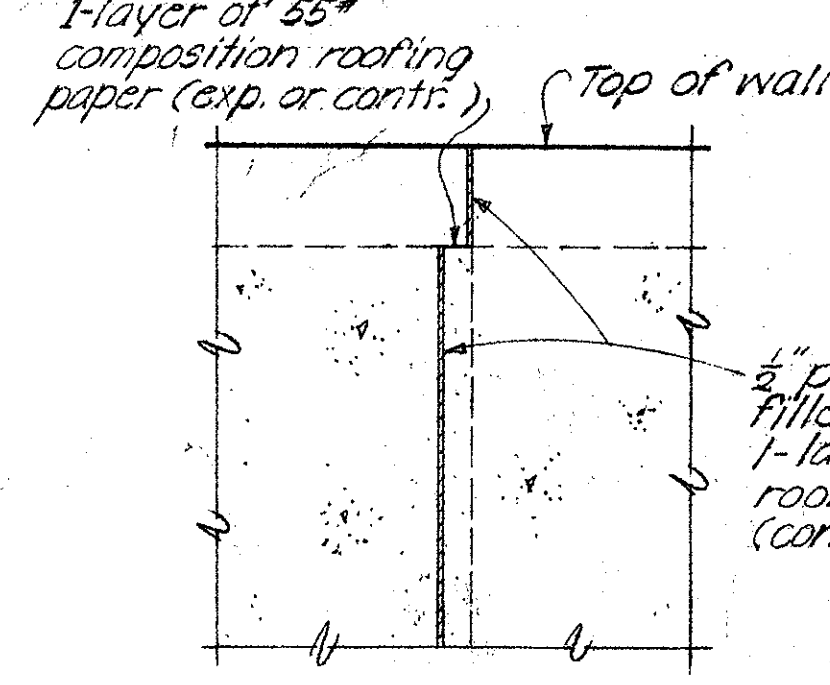
For alternate contraction joint and control joint details - See Standard Details, Sht. # DB-100



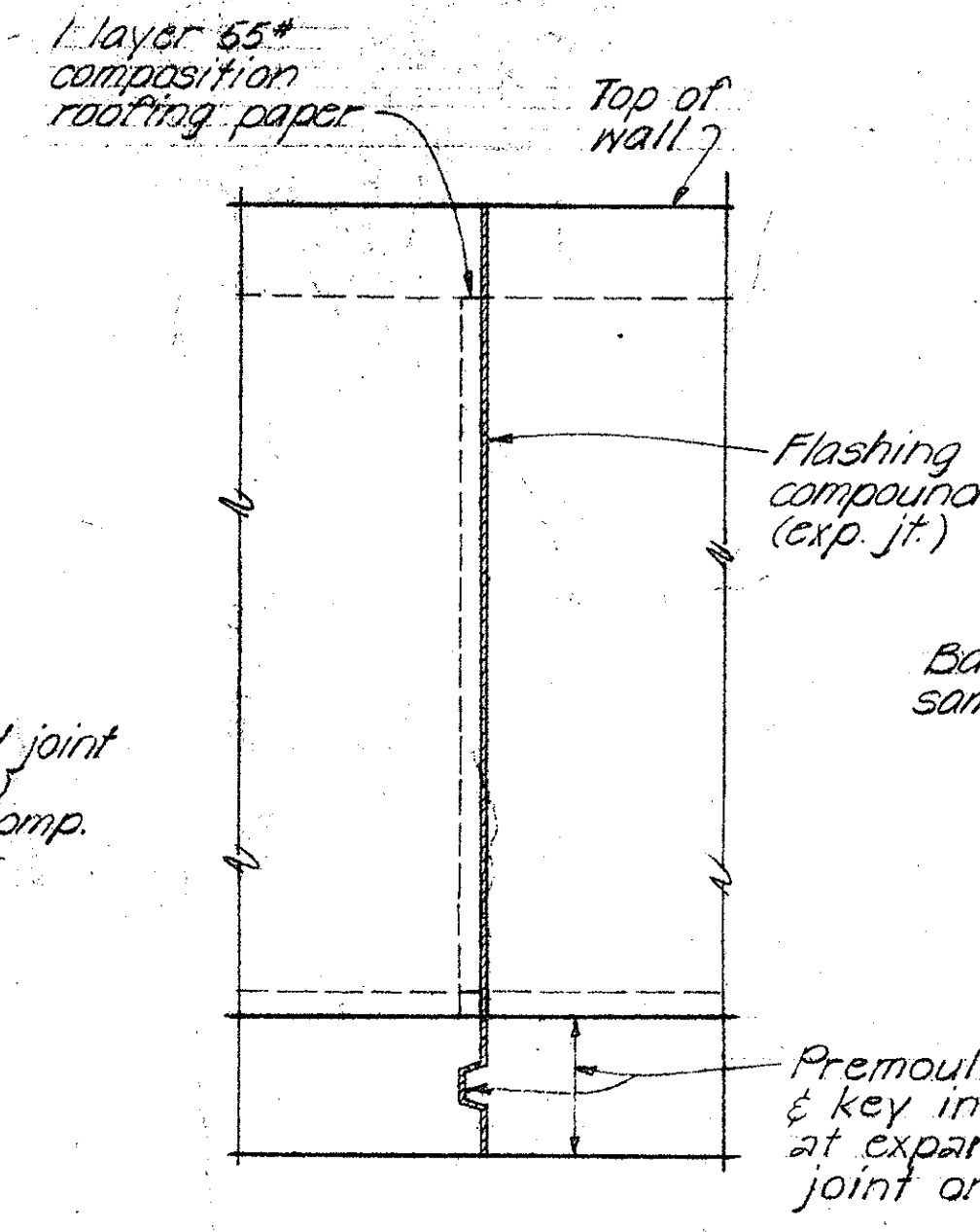
JOINT ELEVATION



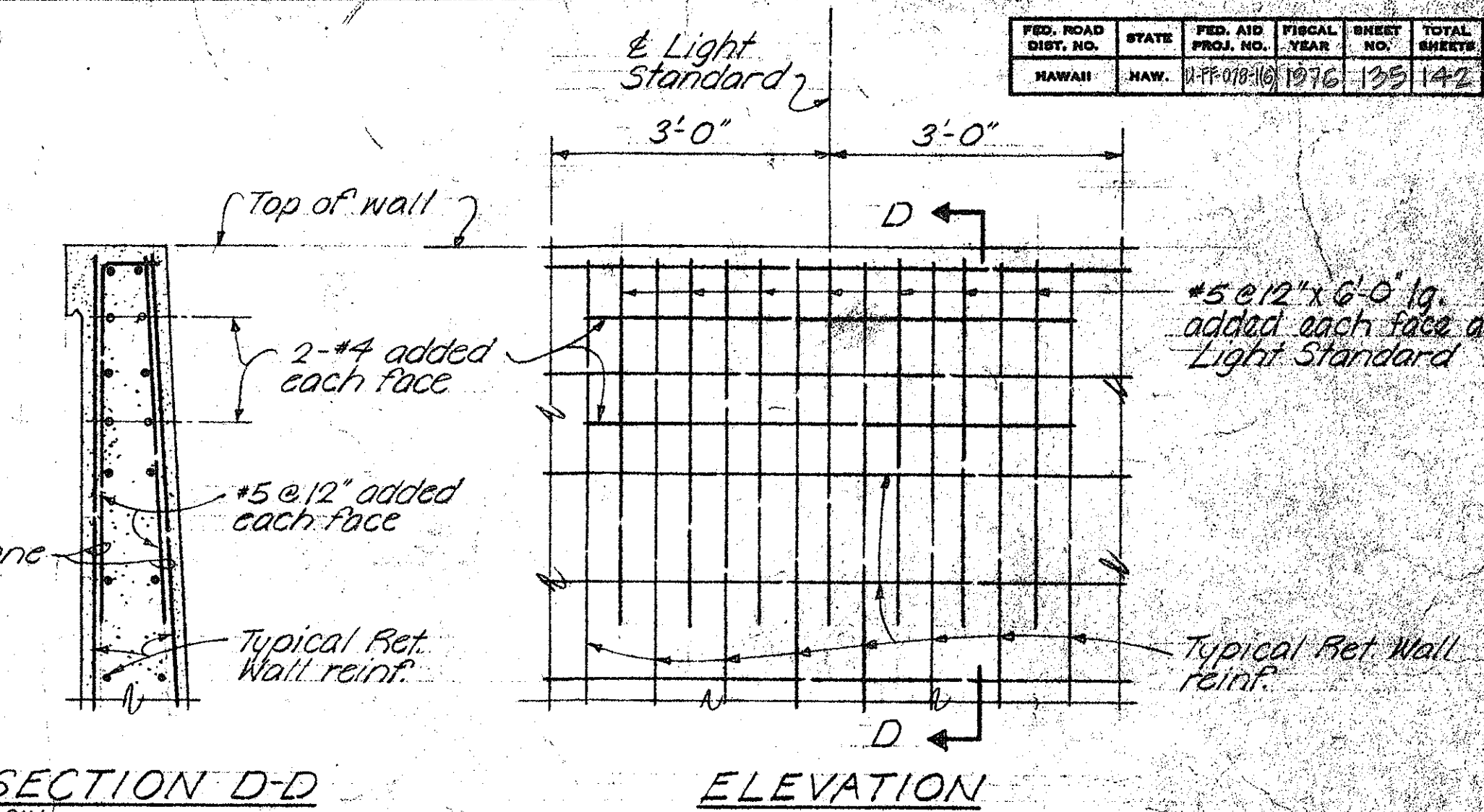
SECTION A-A



SECTION B-B



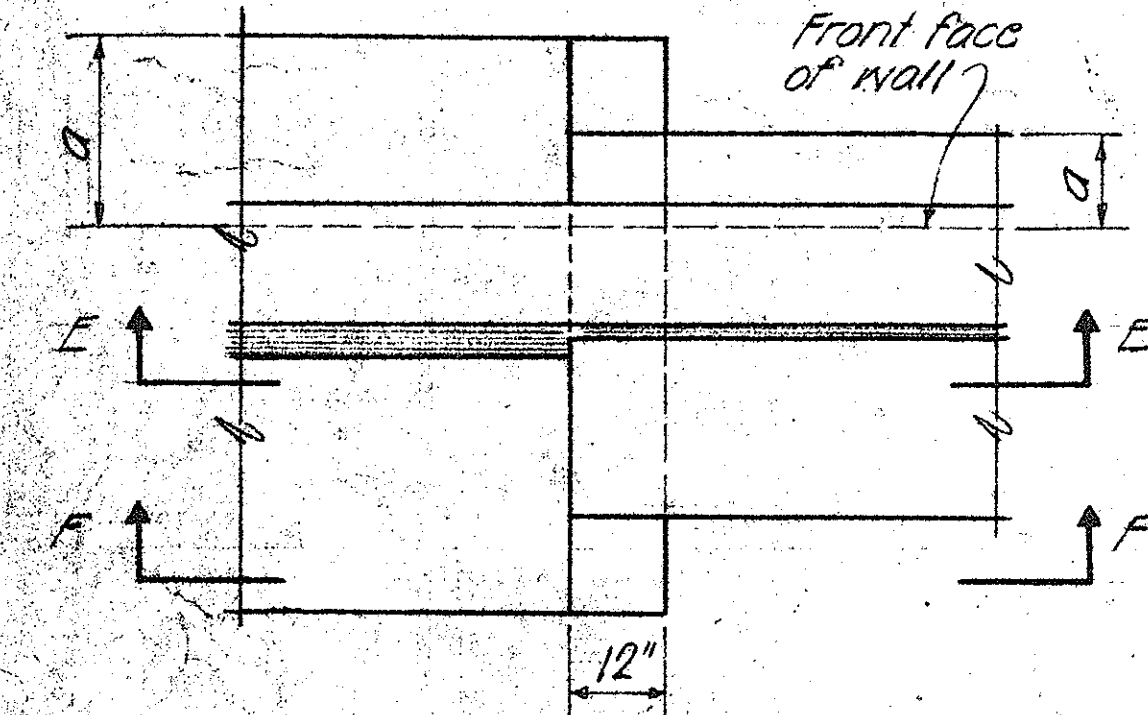
SECTION C-C



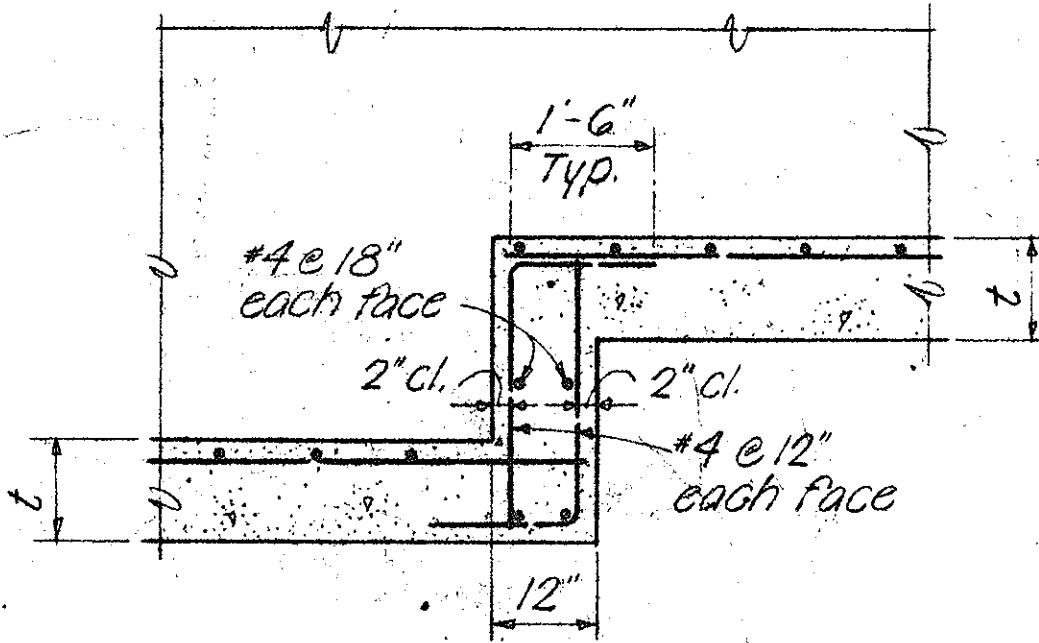
SECTION D-D

ELEVATION

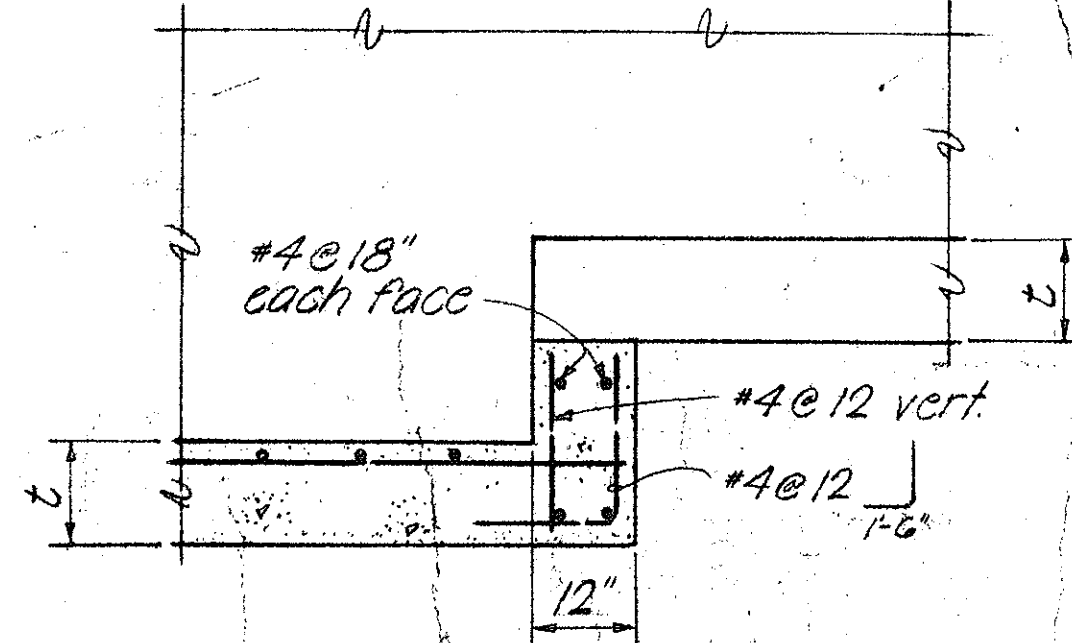
TYPICAL ADDED REINFORCEMENT
AT LIGHT STANDARD BASE No Scale



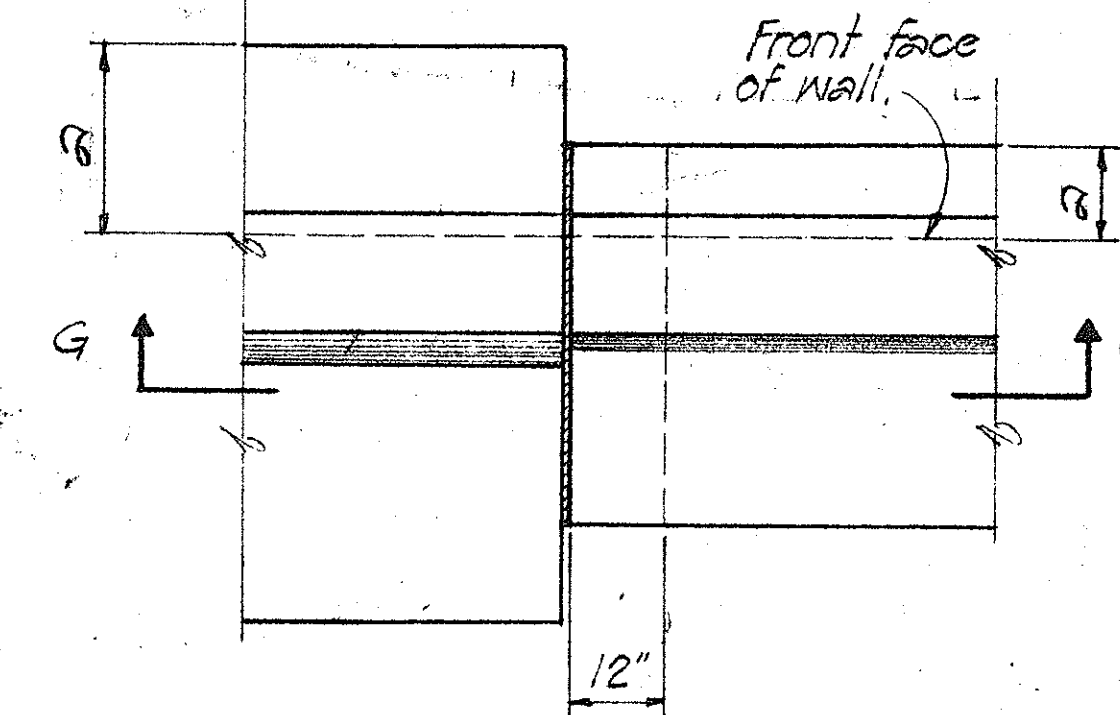
PLAN



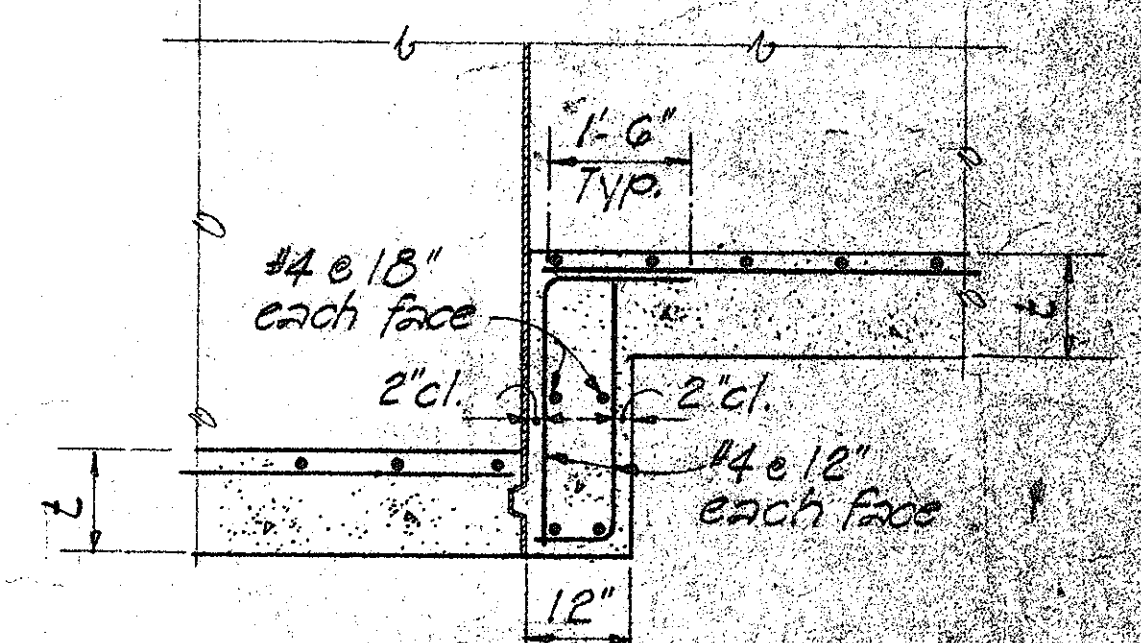
SECTION E-E
AT CONTINUOUS FOOTING



SECTION F-F

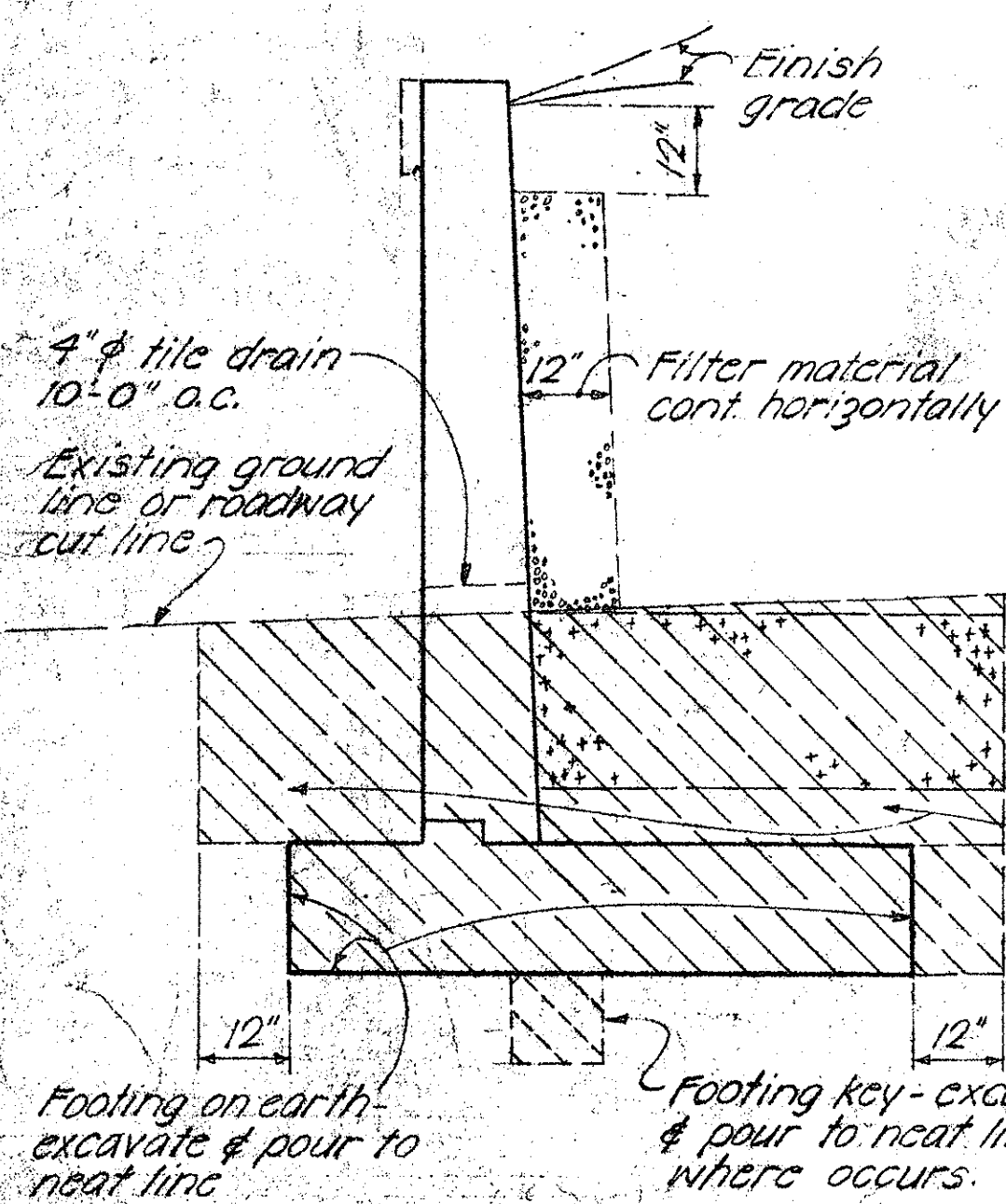


PLAN



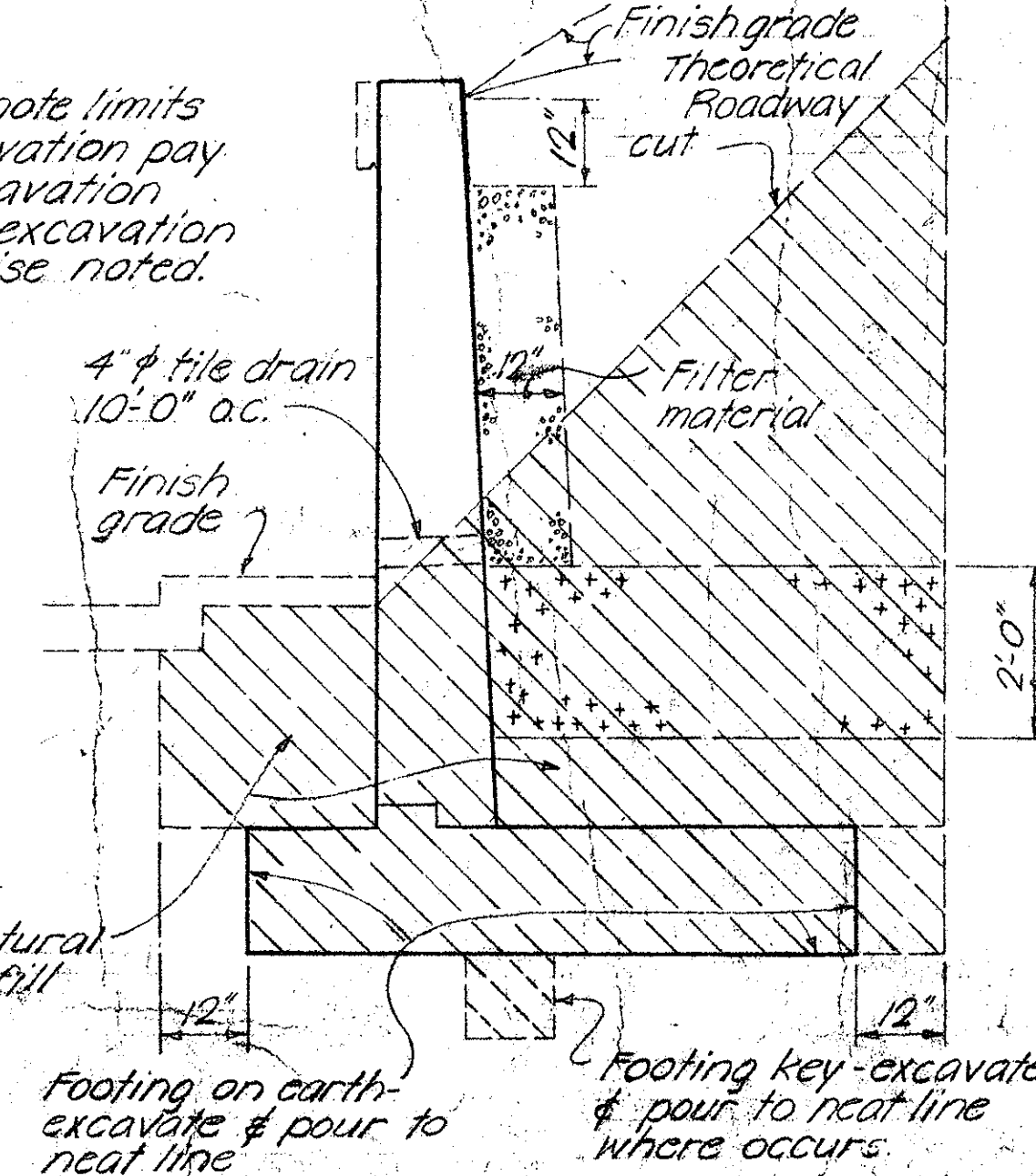
SECTION G-G

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.	2-4-72

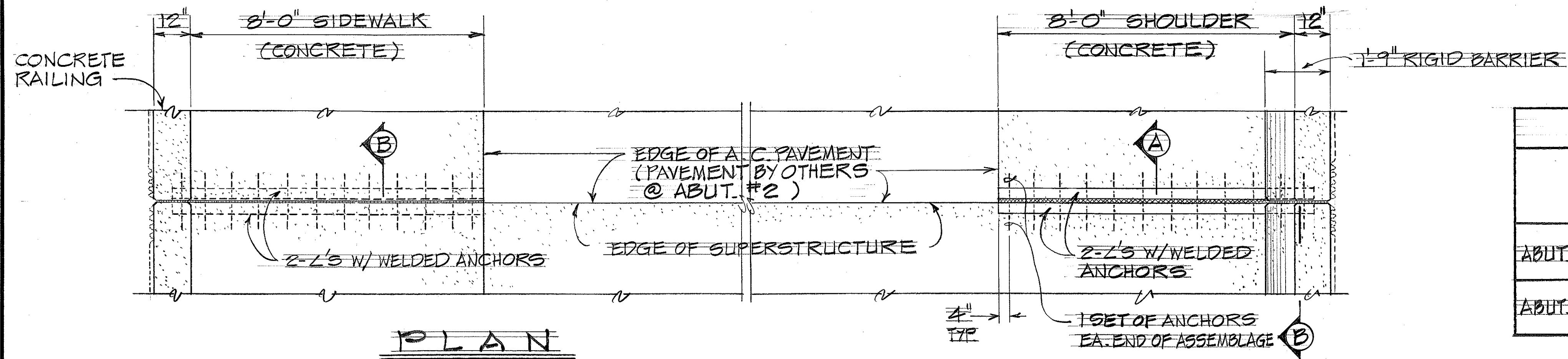
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
RETAINING WALL TYPE T-1

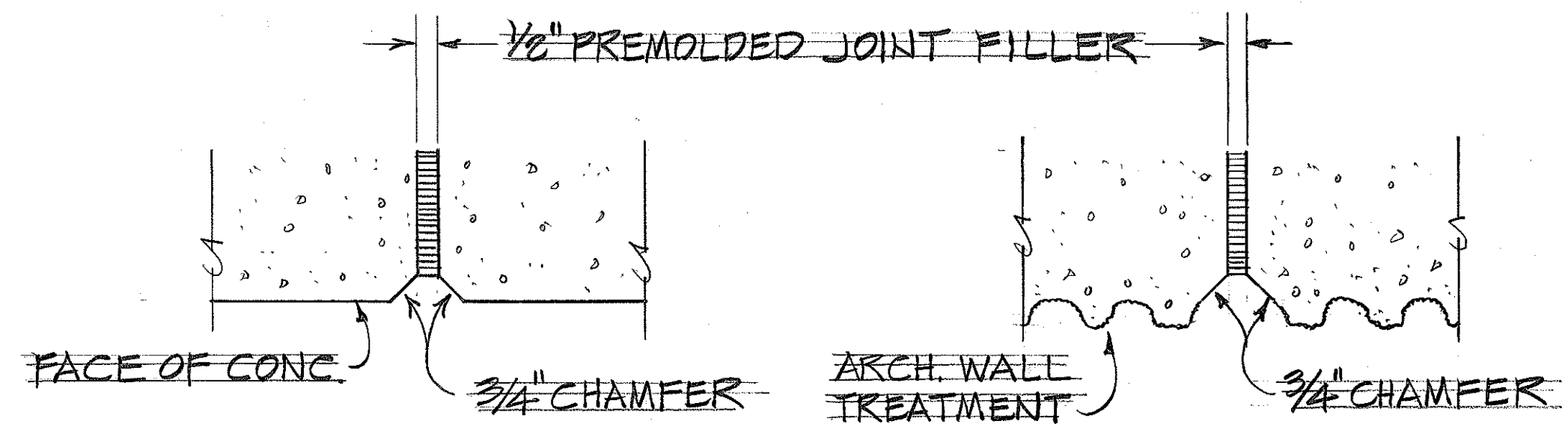
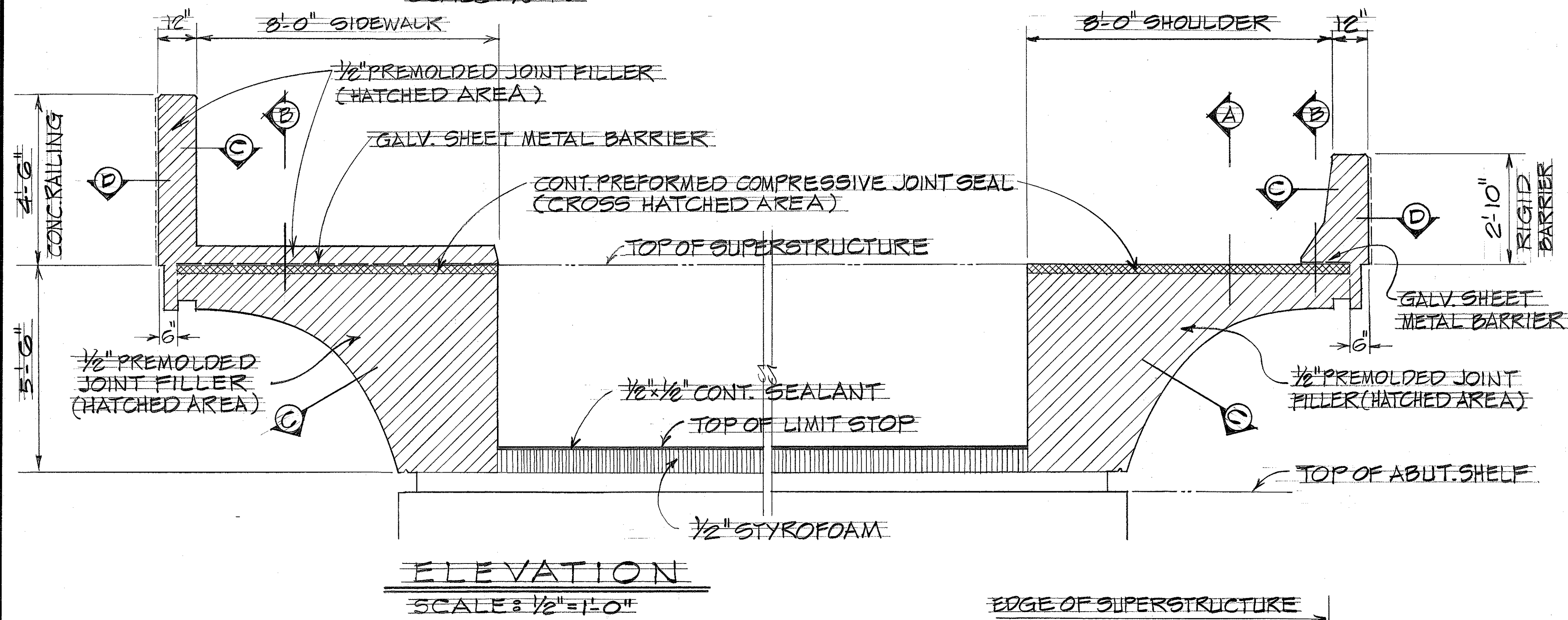
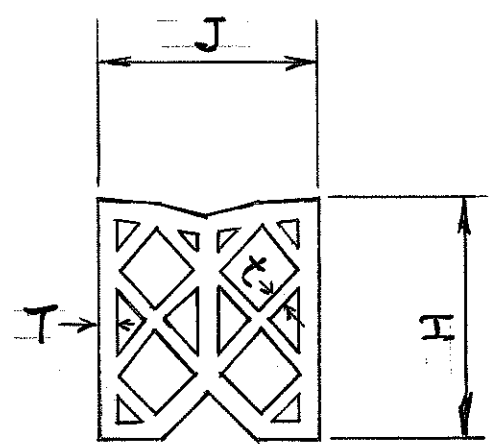
SCALE AS NOTED DATE
SHEET No. 40 OF 41 SHEETS DB-207-2

DESIGNED BY
CHECKED BY
NOTED BY
QUANTITY BY
ORIGINAL PLAN
DATE
SHEET NO.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-FF-078-1(6)	1976	136	142



	GROOVE WIDTH (W)	JOINT SEALER DIMENSIONS				STEEL ANGLE PROTECTIVE NOSING	GROOVE DIM. D
		J	H	THICKNESS T	E		
ABUT. #1	7/8"	2 1/4"	2 3/4"	1/8"	3/32"	15 x 3 x 3/8 (LLV)	5"
ABUT. #2	3/4"	2"	2"	3/32"	5/64"	13 1/2 x 3 x 3/8 (LLV)	3 1/2"

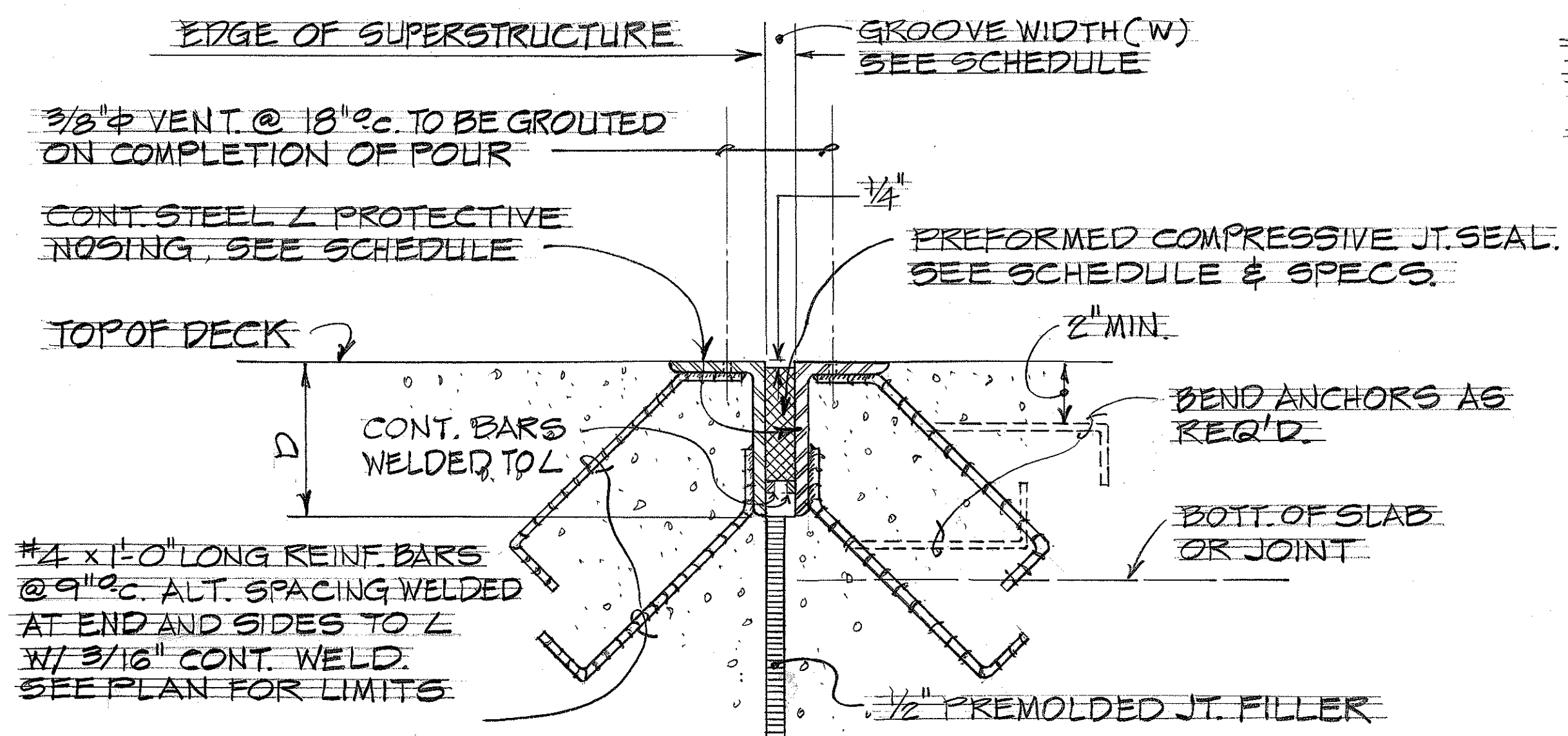


SECTION "C"
SCALE: 3" = 1'-0"

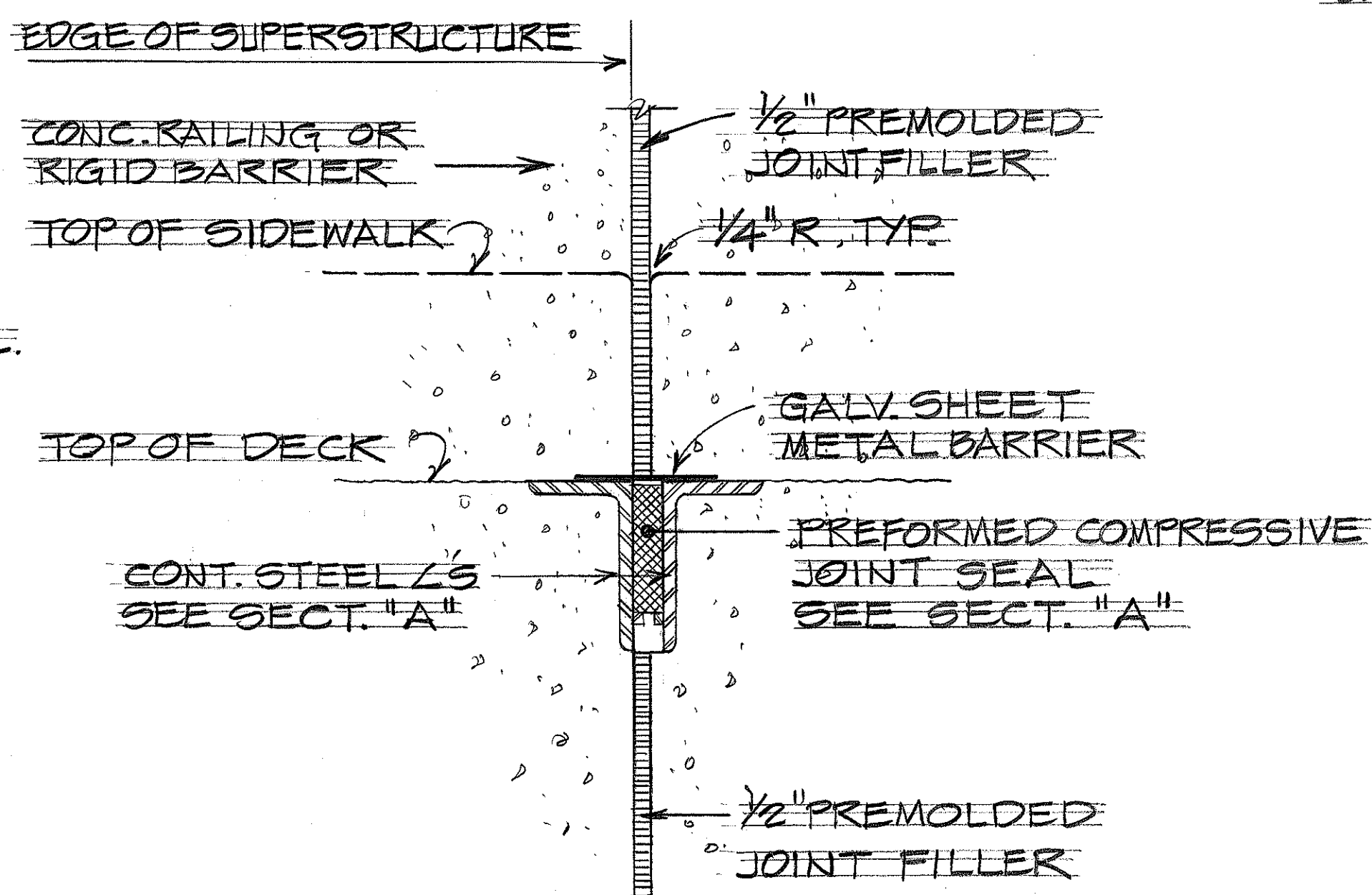
SECTION "D"
SCALE: 3" = 1'-0"

NOTES:

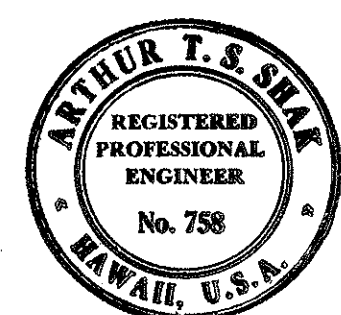
1. STEEL ANGLE PROTECTIVE NOSING ASSEMBLY SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.
2. STEEL ANGLE PROTECTIVE NOSING ASSEMBLY AND JOINT SEALER INCIDENTAL TO CONCRETE.



SECTION "A"
SCALE: 3" = 1'-0"



SECTION "B"
SCALE: 3" = 1'-0"



Arthur T.S. Skae
THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
TYPICAL DETAILS
EXPANSION JOINT PREFORMED COMPRESSIVE
JOINT SEALER WATERPROOFING DETAILS
MOANALUA ROAD
PULOA I.C. TO MIDDLE ST. - UNIT 1
F.A. Proj. No. U-FF-078-1(6)
SCALE: AS SHOWN DATE: JUNE 25, 1976
SHEET NO. 41 OF 41 SHEETS