

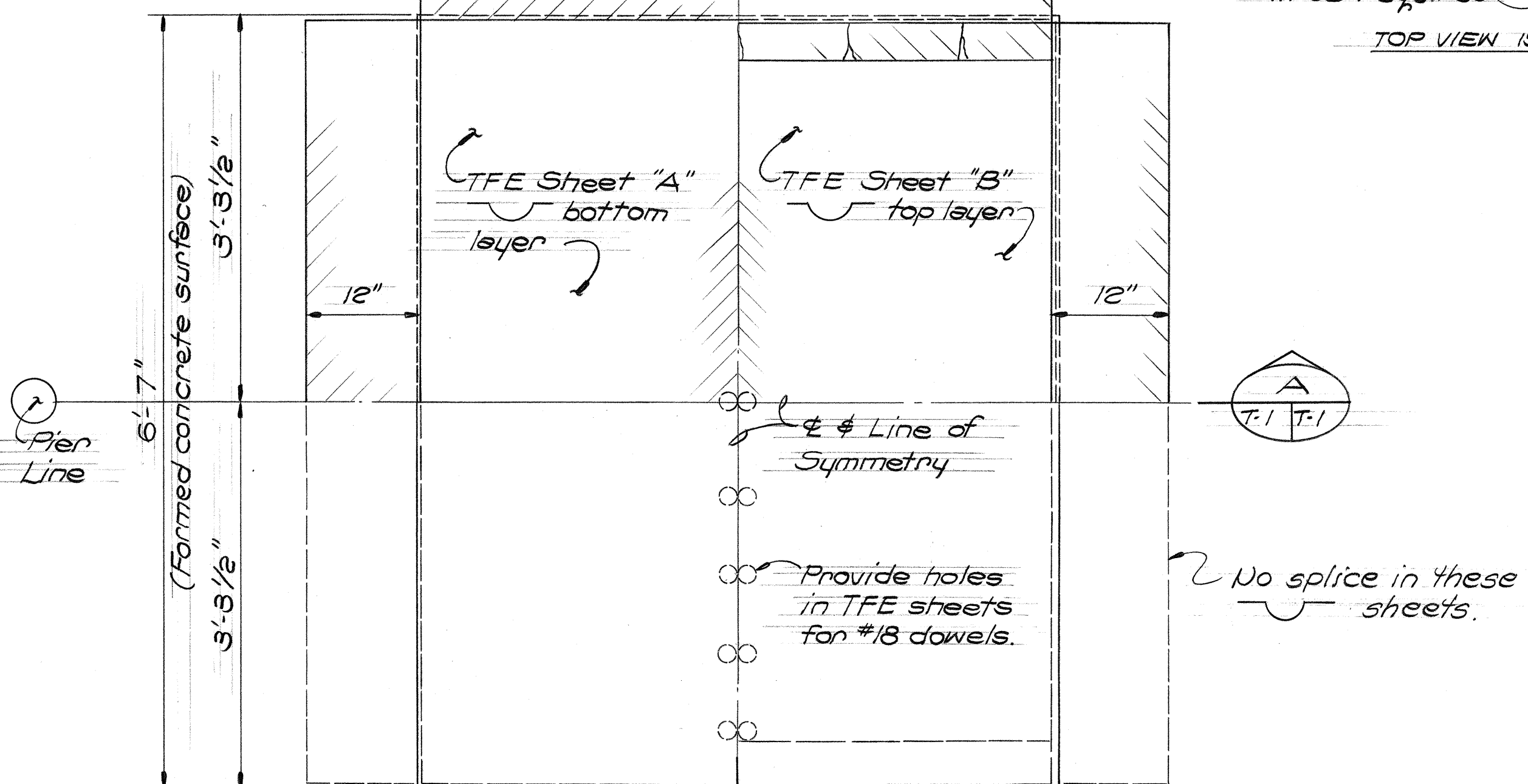
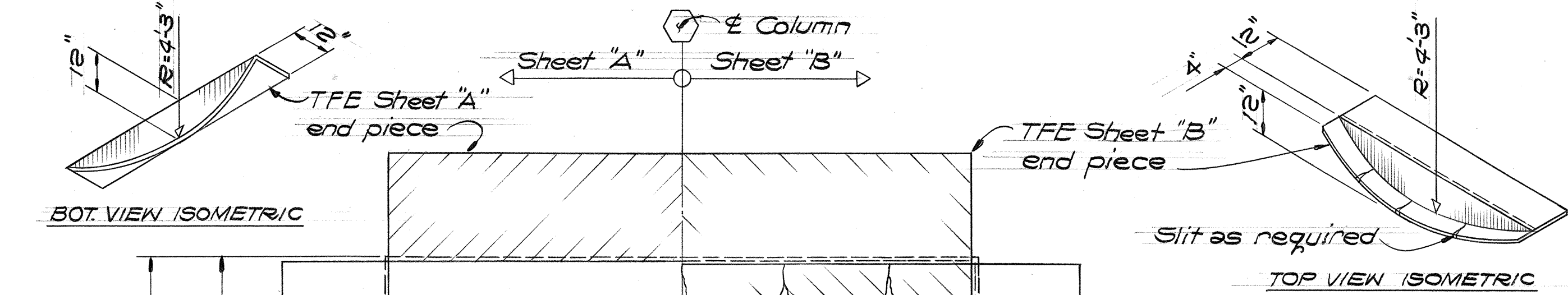
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(84):16	1978	428	466

CONSTRUCTION TOLERANCES
Construction tolerances for concrete curved surface shall be $\frac{1}{16}$ " from any plane, & from plumb & level lines.

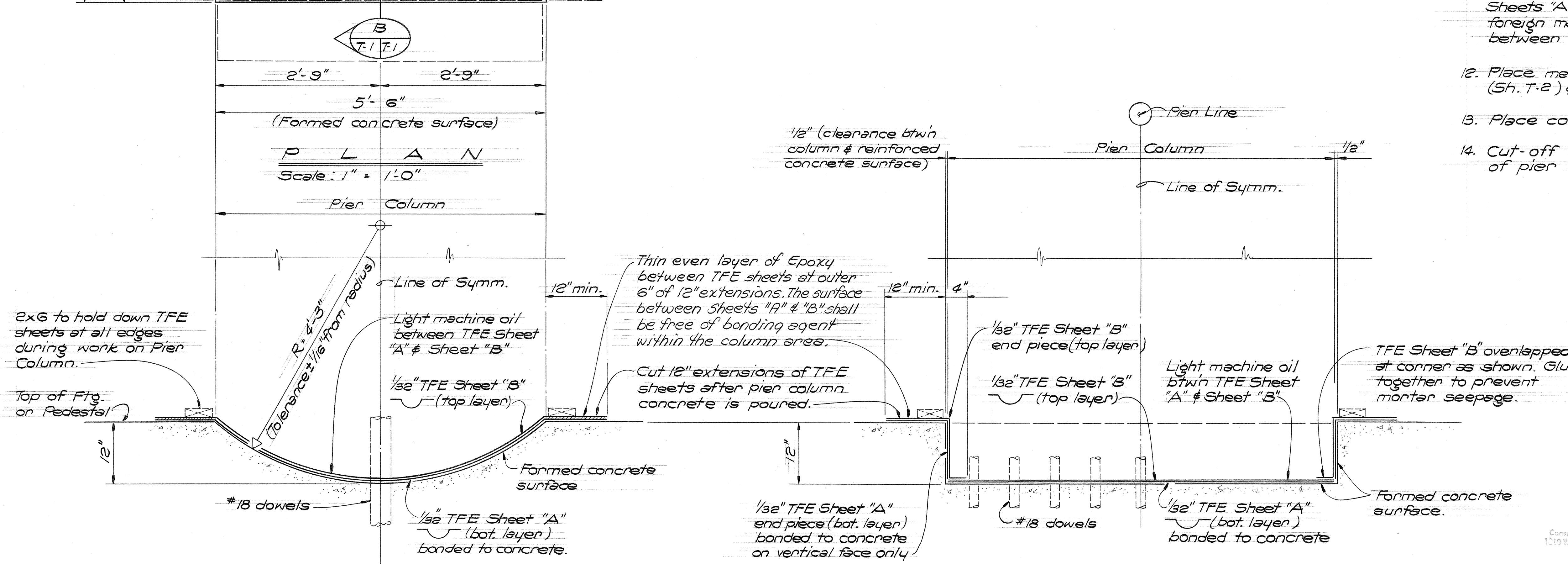
SPECIAL NOTE
At Contractor's option Reinforced TFE may be substituted in lieu of the virgin TFE specified

COLUMN HINGE CONSTRUCTION SEQUENCE & NOTES

1. Install footing on pedestal reinforcing.
2. Install forms for curved formed surface & ends (Column Hinge)
3. Place concrete for foundation (Footing on Pedestal)
4. Remove forms for column hinge
5. Fill all cavities with epoxy & grind curved surface to construction tolerances noted on this sheet.
6. Notify the Engineer for inspection of column hinge curved surface to tolerances noted.
7. Epoxy $\frac{1}{32}$ " TFE Sheet "A" to the formed concrete surface (Column Hinge area). All trapped air bubbles between TFE Sheet "A" & formed concrete surface shall be removed.
8. Apply a thin even layer of light machine oil over TFE Sheet "A"
9. Apply a thin even layer of epoxy over the outer 6" of 12" extension of TFE Sheet "A" (Beyond the limits of the column).
CAUTION: Keep all adhesives away from all sliding interfaces.
10. Place $\frac{1}{32}$ " TFE Sheet "B" over TFE Sheet "A"
11. Place continuous 2x6 around 12" horizontal edges of TFE Sheets "A" & "B" to hold down the TFE sheets & to keep any foreign matter (dust, debris, etc.) from being introduced between the TFE sheets.
12. Place metal tubes over wrapped #18 dowels as detailed (Sh. T-2) & install column reinforcing.
13. Place concrete for column.
14. Cut-off 12" extensions of TFE sheets beyond limits of pier column after forms are stripped.

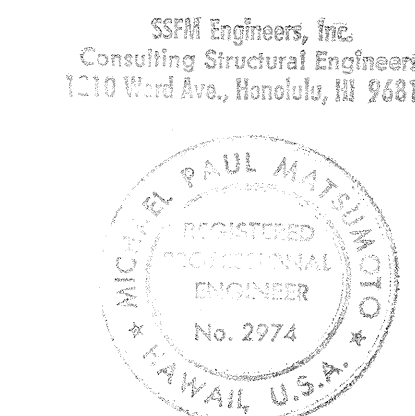


PLAN
Scale: 1" = 1'-0"



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

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



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Michael Matthews

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

H-1 VIADUCT (EB) PART II
TYPICAL DETAILS
COLUMN HINGE DETAILS

AIRPORT VIADUCT
F.A.I. PROJ. No. I-H-1(84):16

Scale: As Shown Date: May 16, 1978

SHEET NO. T-1 OF 18 SHEETS

12 Ga. Sheet Metal Tube x 5'-0" around each pair of bundled #18 dowels. (Typical) See detail this sheet.

10-#9 U (Typical)

Pier Line

6-#9 Place to miss col. vert. bars

12-#18 dowels

16-#18 dowels

18-#18 dowels

For reinf. not shown see 12 dowel plan.

12 DOWELS

16 DOWELS

18 DOWELS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(84)-16	1978	129	466

1/8"x2" continuous neoprene gasket

P L A N

SPECIAL NOTES

1. All column reinforcing shall not bear on TFE sheets. (See Sh. S 8)
2. Paint #18 dowels thoroughly with flashing compound for 5'-0" above 1/32" TFE sheets.
3. All #18 dowels are to be secured during erection and footing or pedestal concrete placement operations to assure

NOTE:

Sheet Metal Tube & Closed Cell Sponge Rods shall be incidental to concrete construction.

Continuous turns of 1/4"

18 DOWELS

SECTION A
Scale: $\frac{3}{4}" = 1'-0"$

SECTION B
Scale: $\frac{3}{4}" = 1'-0"$

SECTION
Scale: $\frac{3}{4}" = 1'-0"$

C O L U M N H I N G E R E I N F O R C I N G D E T A I L S

Technical drawing showing a cross-section of a roofing detail. The drawing includes the following dimensions and labels:

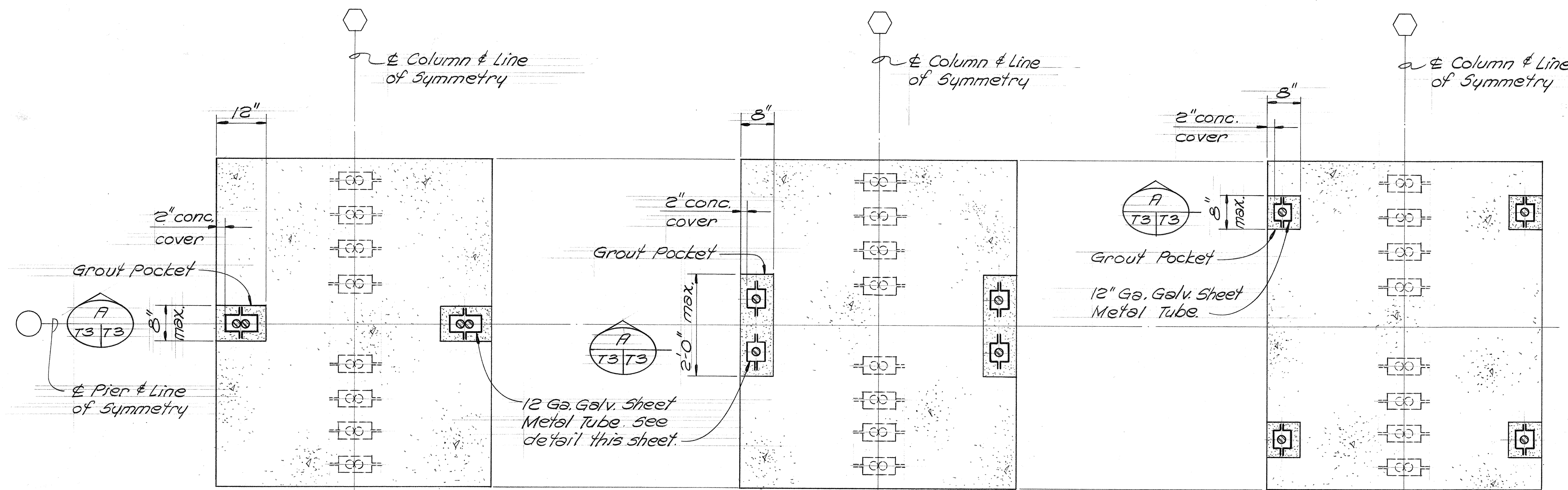
- Dimensions:**
 - 15'-0" (length of #18 bars)
 - 5'-0"
 - 1'-4" E.
 - 6'-0"
 - 4" Cl.
- Labels and Notes:**
 - around w/cont. 55# roofing felt full height of tube
 - 1/32" TFE sheet
 - 1/32" TFE sheet bonded to concrete
 - Seal bottom of tube to prevent concrete from seeping to #18 bars.
 - Bundled #18 dowels
 - Bottom of Footing
- Section Title:** ROOFING DETAIL
- Orientation:** ELEVATION

12 GA. GALV. SHEET METAL TUBE DETAIL
Scale: 1 1/2" = 1'-0"

Scale: As Shown Date: May 16, 1978

SHEET NO. T-2 OF 18 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(84):16	1978	430	466



BUNDLED #18 @ PIER

#18 ADJACENT TO PIER

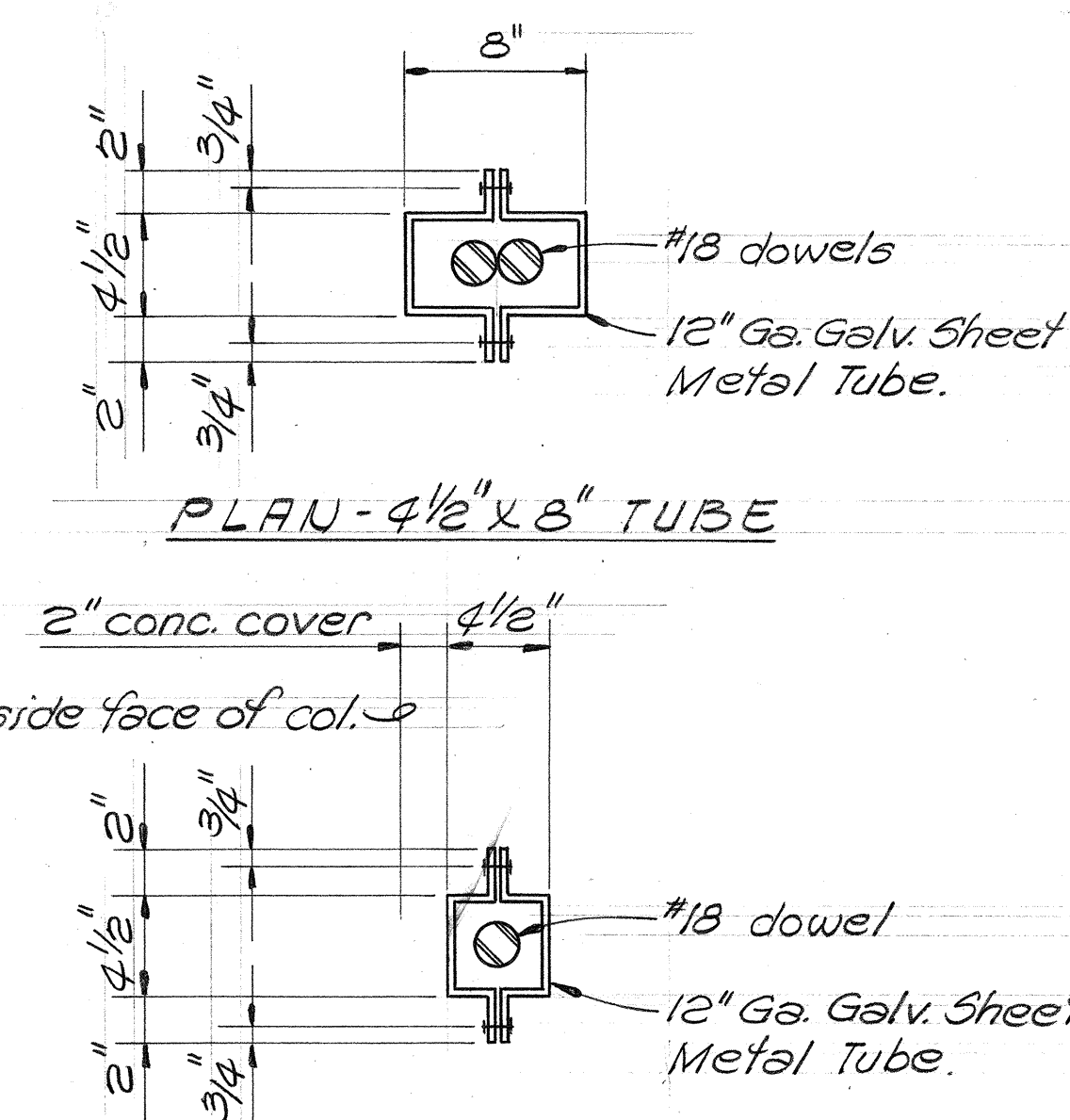
#18 AWAY FROM PIER

COLUMN SECTIONS

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

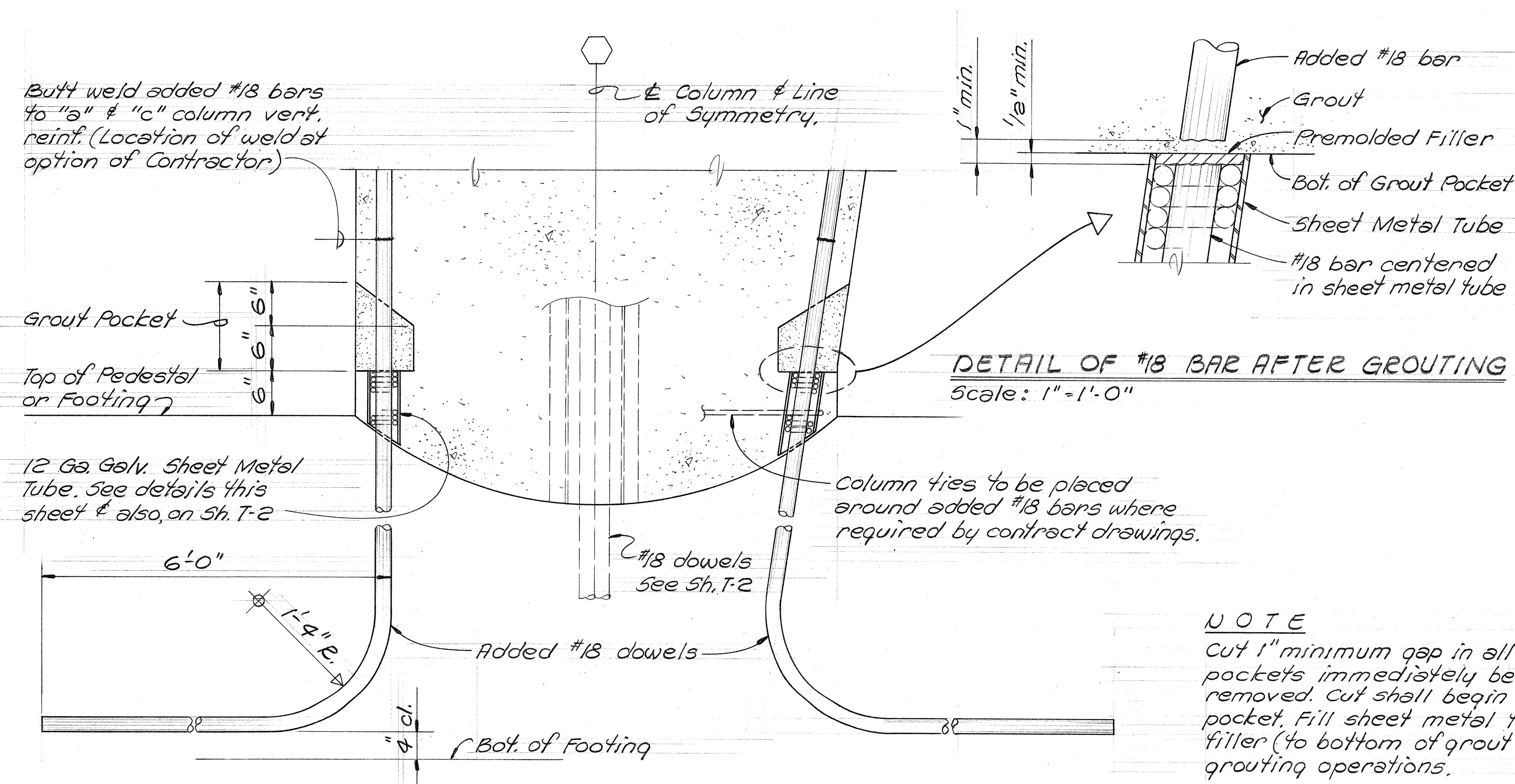
12" GA. GALV. SHEET METAL TUBE DETAIL

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



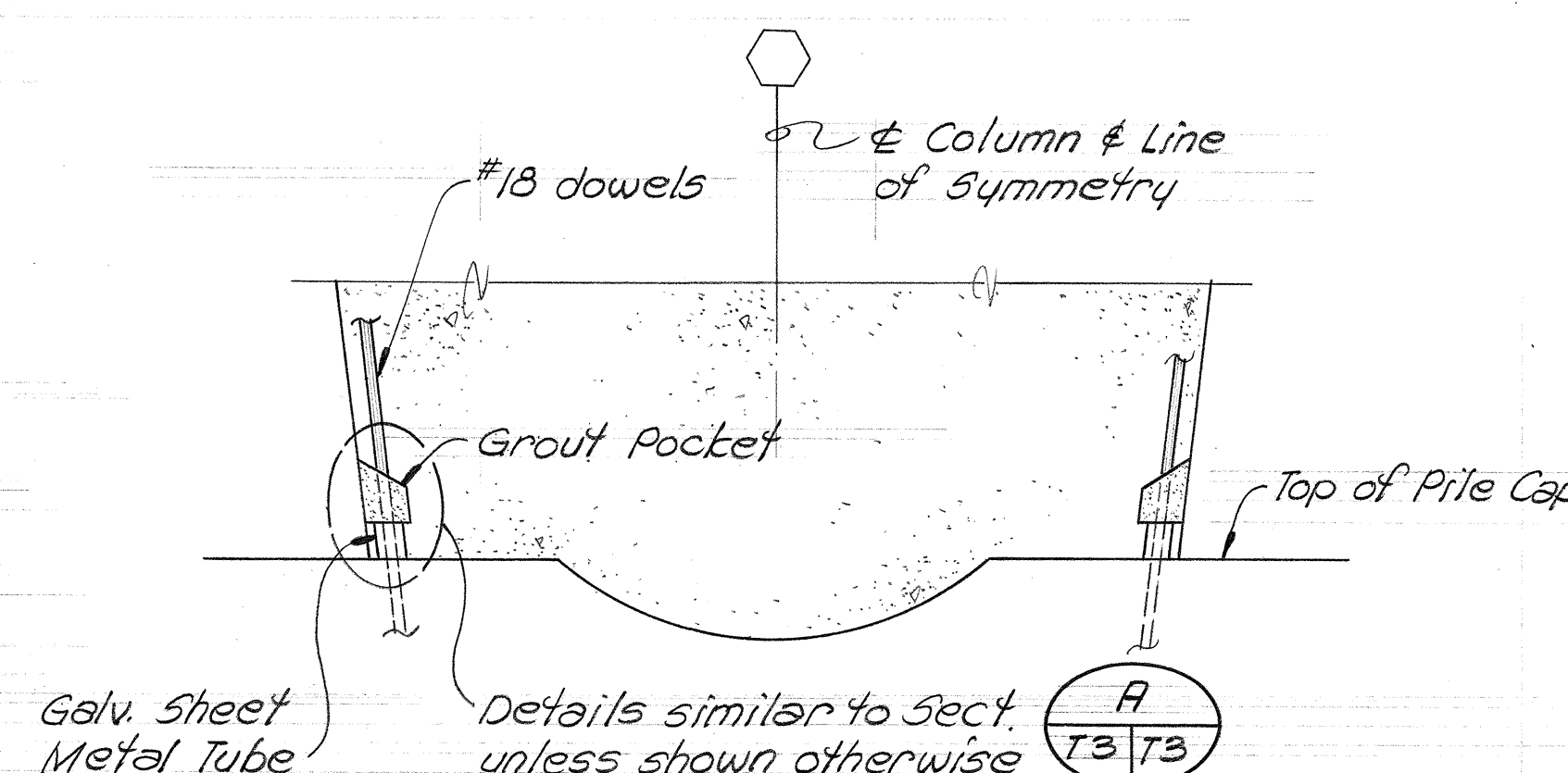
PLAN-4 1/2" X 8" TUBE

PLAN-4 1/2" X 4 1/2" TUBE



SECTION A

Scale: 1" = 1'-0"



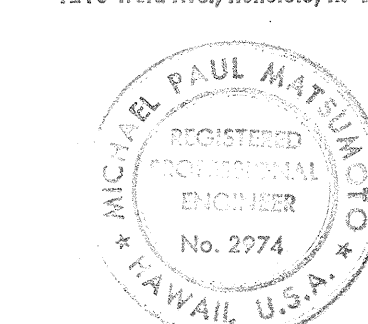
FOR TYPE C3 COLUMN

N.T.S.

NOTES

1. Add 2-#18 dowels each face parallel to column line (4 total per column).
2. Column sections shown above depict various locations of added #18 bars & plan dimensions of grout pockets.
3. Roughen all sides of grout pockets before patching & apply epoxy to roughened surfaces immediately before placing grout.
4. Grout mixture shall be same mix & strength as column concrete.

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STATE OF HAWAII
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HIGHWAYS DIVISION
H-1 VIADUCT (EB) PART II
TYPICAL DETAILS

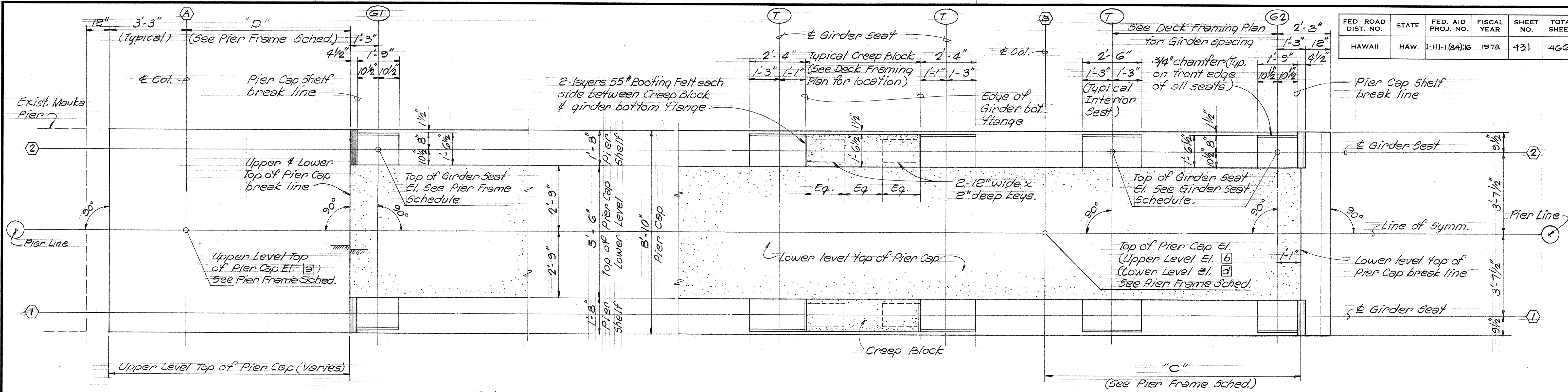
SUGGESTED DETAIL FOR RESISTING 50K HORIZONTAL FORCE @ TOP OF COLUMN

AIRPORT VIADUCT
F.A.I. PROJ. NO. I-HI-1 (84):16

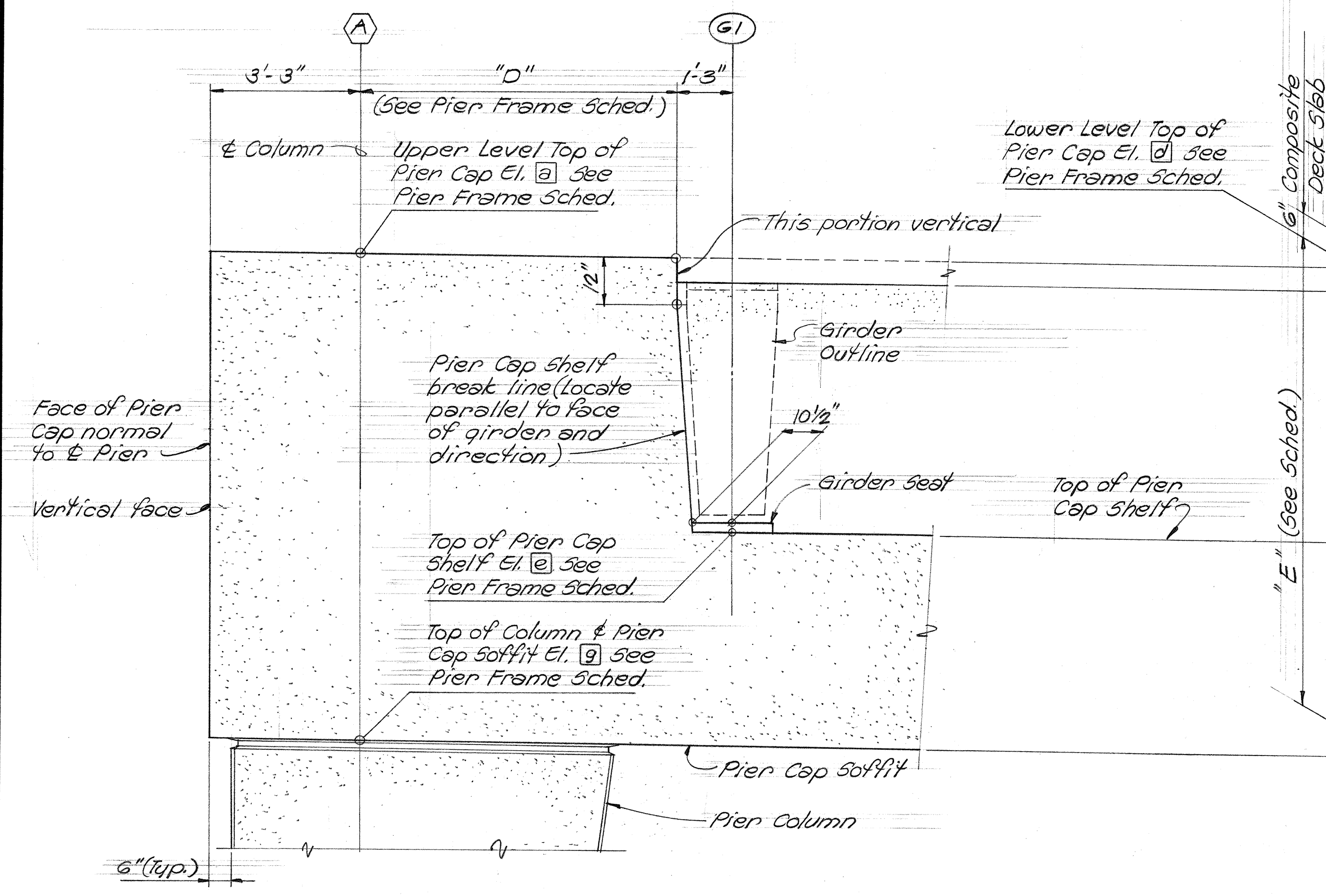
Scale: As Shown Date: May 16, 1978

SHEET NO. 13 OF 13 SHEETS

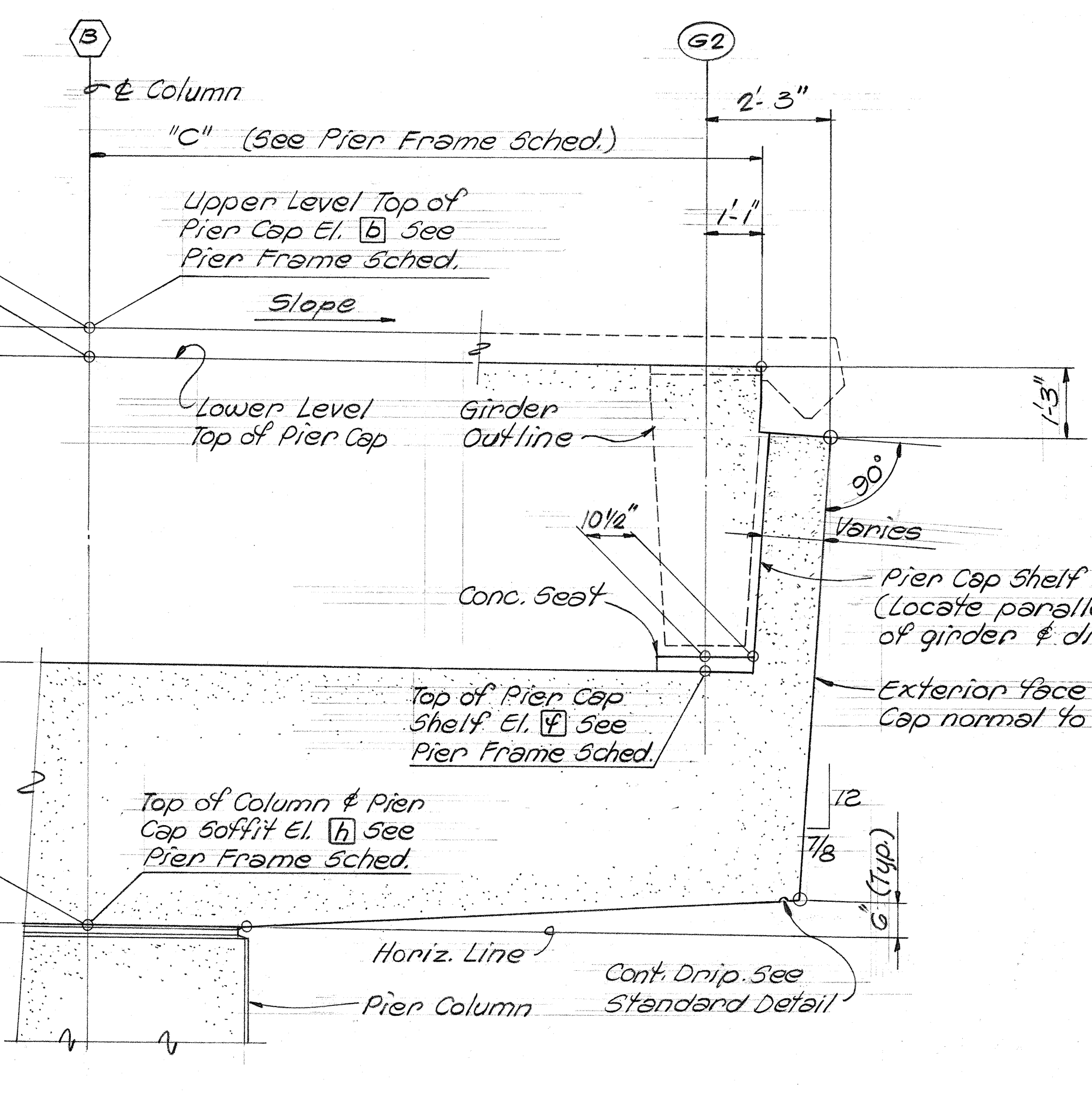
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(84)16	1978	131	466



PARTIAL PLAN - TYPICAL PIER CAP NORMAL TO GIRDER
Scale: 1/2" = 1'-0"



PARTIAL ELEVATION 2
Scale: 1/2" = 1'-0"



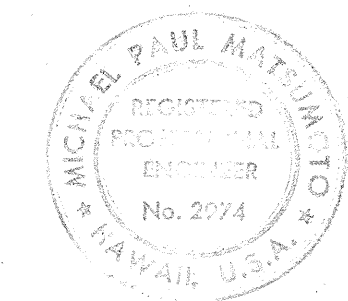
PARTIAL ELEVATION 3
Scale: 1/2" = 1'-0"

NOTES

1. (G1) & (G2) Exterior Girder seat dimensions shown are for Keehi III F girders.
2. (T) Interior Girder seat dimensions shown are for Keehi IV & VII girders.
3. For condition at Pier (2) & (3) at Keehi VII exterior girders, see Sh. T-6 & T-7
4. See Sh. 5-17 for girder schedules.

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
NO.	

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Consulting Structural Engineers
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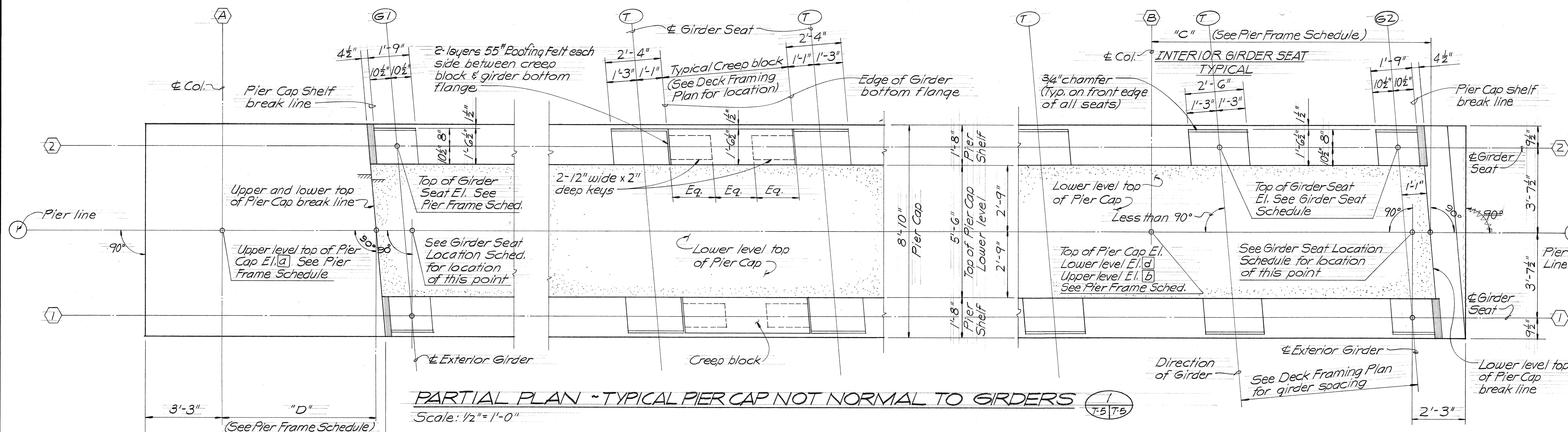


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STATE OF HAWAII
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HIGHWAYS DIVISION
H-1 VIADUCT (EB) PART II
TYPICAL DETAILS
TYPICAL PIER CAP PLAN & ELEVATION

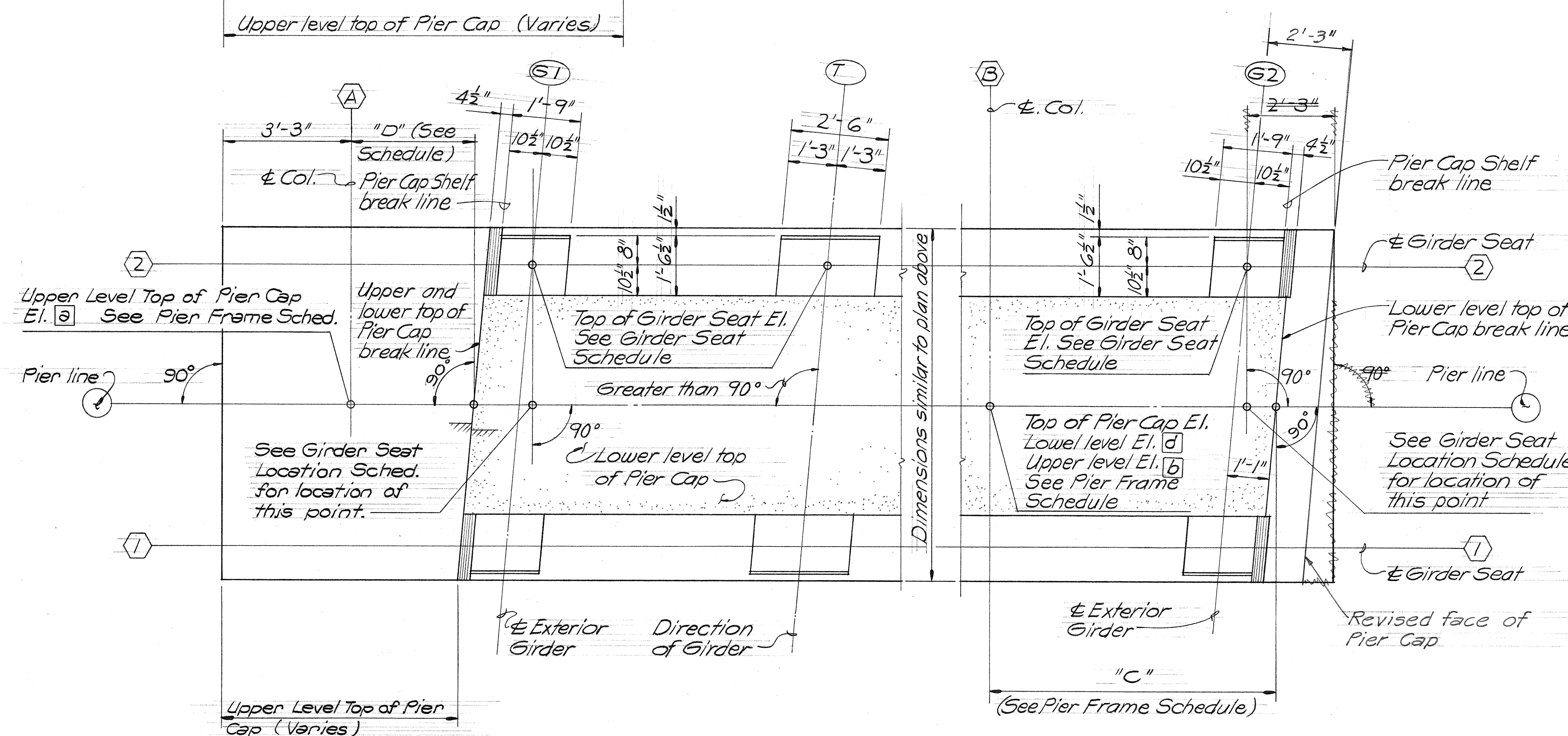
AIRPORT VIADUCT
F.A.I. PROJ. NO. I-H-1(84)16
SCALE: As Shown Date: May 16, 1978

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(84);16	1978	432	466



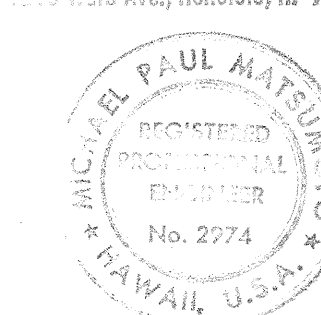
NOTE

See notes on sheet T.4



PARTIAL PLAN ~ TYPICAL PIER CAP NOT NORMAL TO GIRDERS
Scale: $\frac{1}{2}$ " = 1'-0"

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
H-1 VIADUCT (EB) PART II
TYPICAL DETAIL

PLANS ~ PIER CAP NOT
NORMAL TO GIRDERS

AIRPORT VIADUCT
F.A.I. PROJ. No. 1-H-1 (84) 116

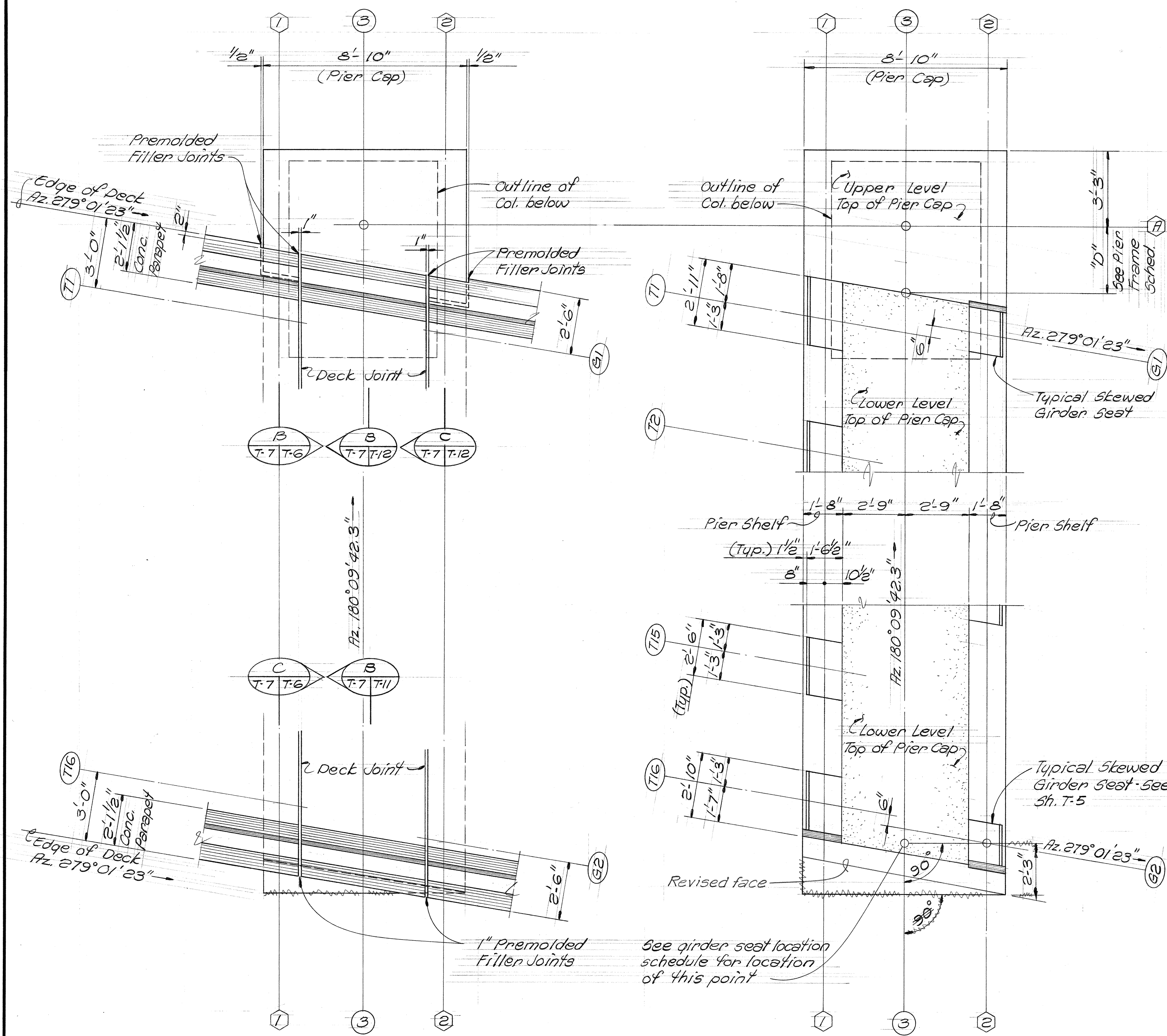
Scale: As Shown Date: May 16, 1978

SHEET No. T-5 OF 18 SHEETS

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

433

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(84)16	1978	134	406



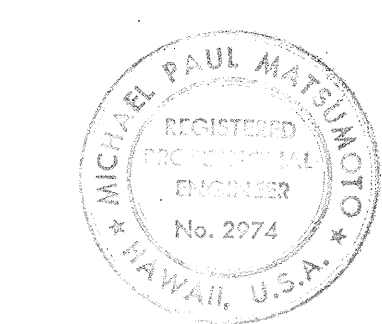
AT CONCRETE PARAPET

AT PIER SHELF

EDGE OF STRUCTURE PLANS AT PIER #3
Scale: 3/8" = 1'-0"

1
5277

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H-1 VIADUCT (EB) PART II
TYPICAL DETAILS

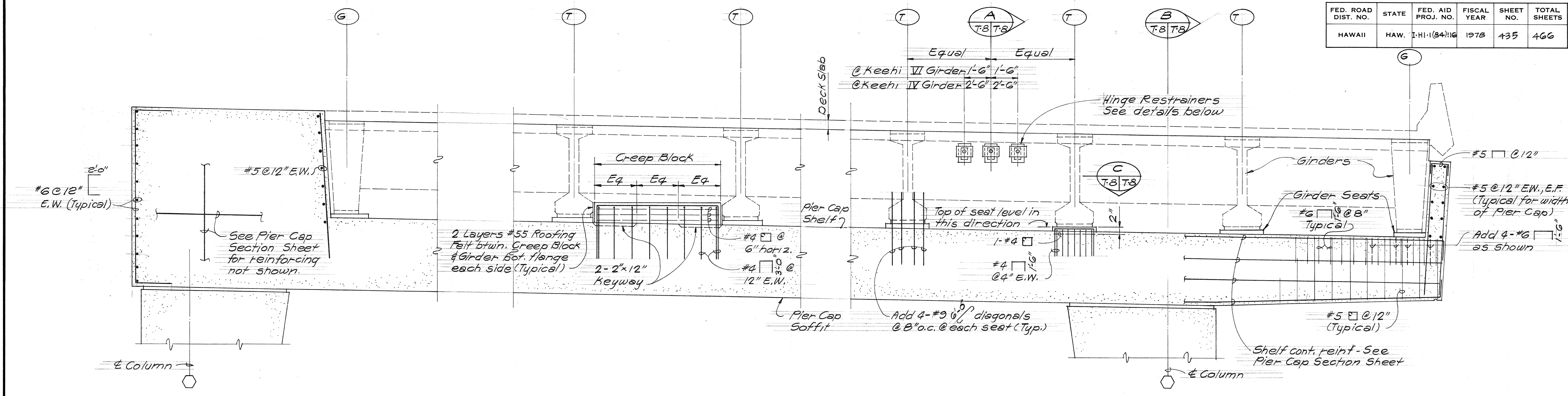
EDGE OF STRUCTURE DETAILS - PIER #3

AIRPORT VIADUCT
F.A.I. PROJ. NO. 1-H-1(84)16

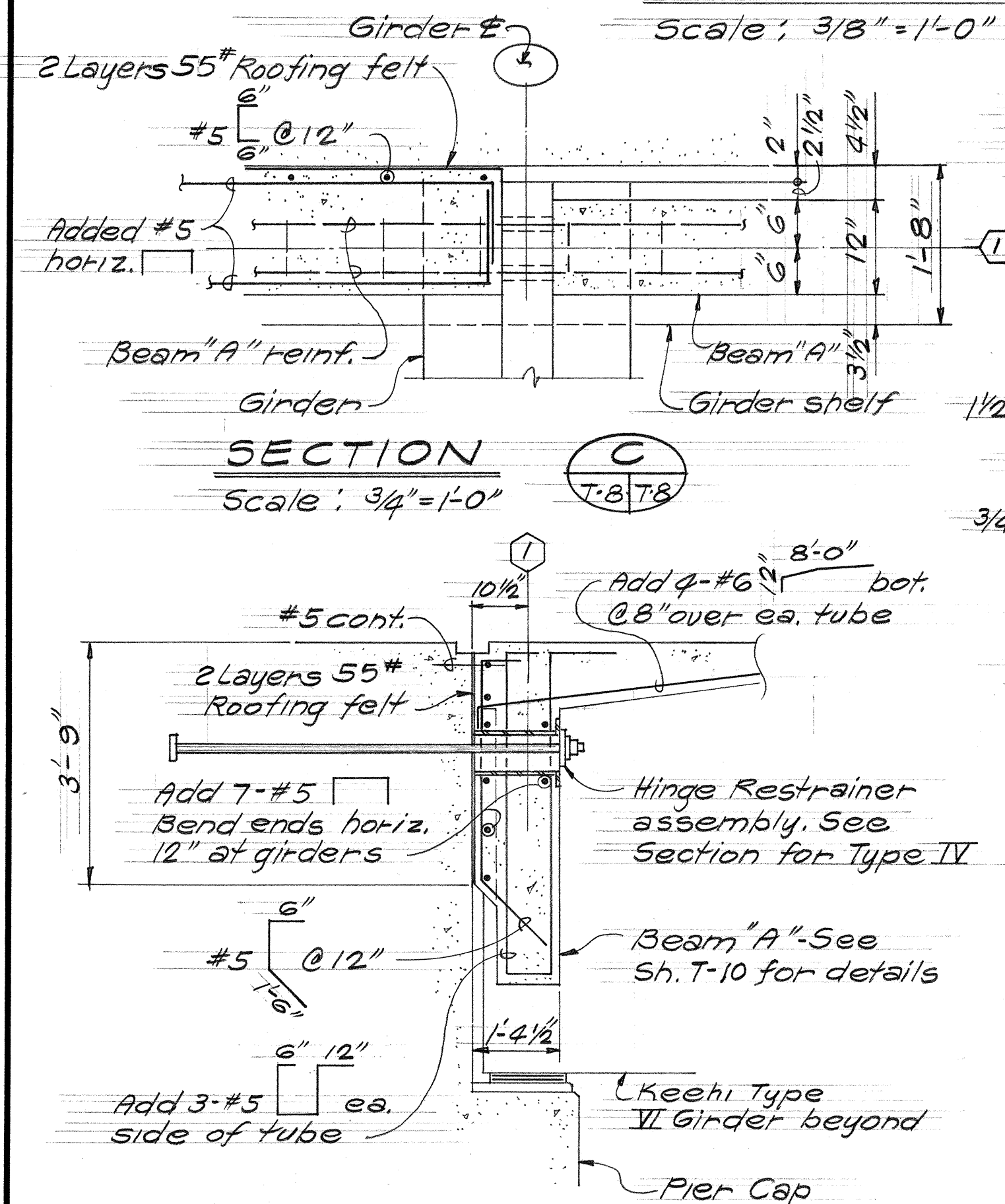
Scale: As Shown Date: May 16, 1978

SHEET NO. 7 OF 18 SHEETS

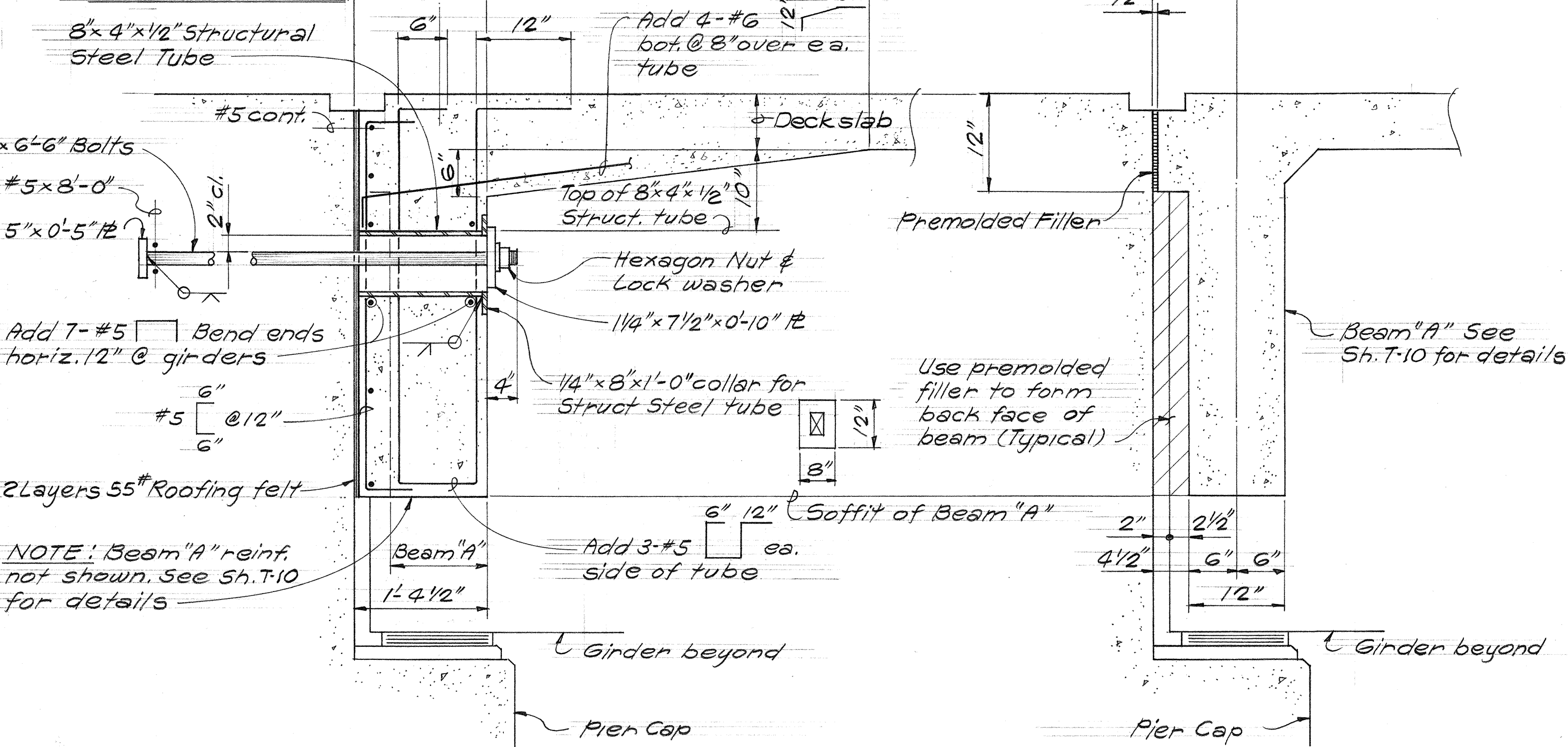
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(84)16	1978	435	466



PARTIAL PIER CAP ELEVATION SHOWING END, SHELF, GIRDER SEAT & CREEP BLOCK REINFORCING



SPECIAL NOTE:
The hinge restrainer detail develops the hinge support behavior of one end of the prestressed girders.



HINGE RESTRAINER LOCATION BTWN. GIRDERS

PIER NO.	SET #1	SET #2	SET #3	SET #4
①	T4 & T5	T5 & T6	T6 & T7	
②	T3 & T4	T5 & T6	T6 & T7	
③	T6 & T7	T7 & T8	T9 & T10	T10 & T11
④	T3 & T4	T4 & T5		

- NOTES:**
- One set of hinge restrainer shall be 3-1/2" φ bolts spaced as shown between 2 adjacent girders.
 - All structural steel plates, shapes, bolts, etc. shall be hot dipped galvanized.
 - Paint all exposed surfaces of hinge restrainer assembly (not embedded in concrete) with neoprene paint.
 - All hinge restrainers are installed on bearing line ① side of Piers.
 - Hinge restrainer cost incidental to concrete.
 - All bolts shall be ASTM A307.
- REFERENCE NOTE:**
- See Deck Framing Plan for girder locations, Sh. 5-19.

BETWEEN KEEHI TYPE VI GIRDERS

BETWEEN KEEHI TYPE IV GIRDERS

TYPICAL SECTION BETWEEN GIRDERS

SECTION BETWEEN GIRDERS AT HINGE RESTRAINER

SECTION B

HINGE RESTRAINER DETAILS

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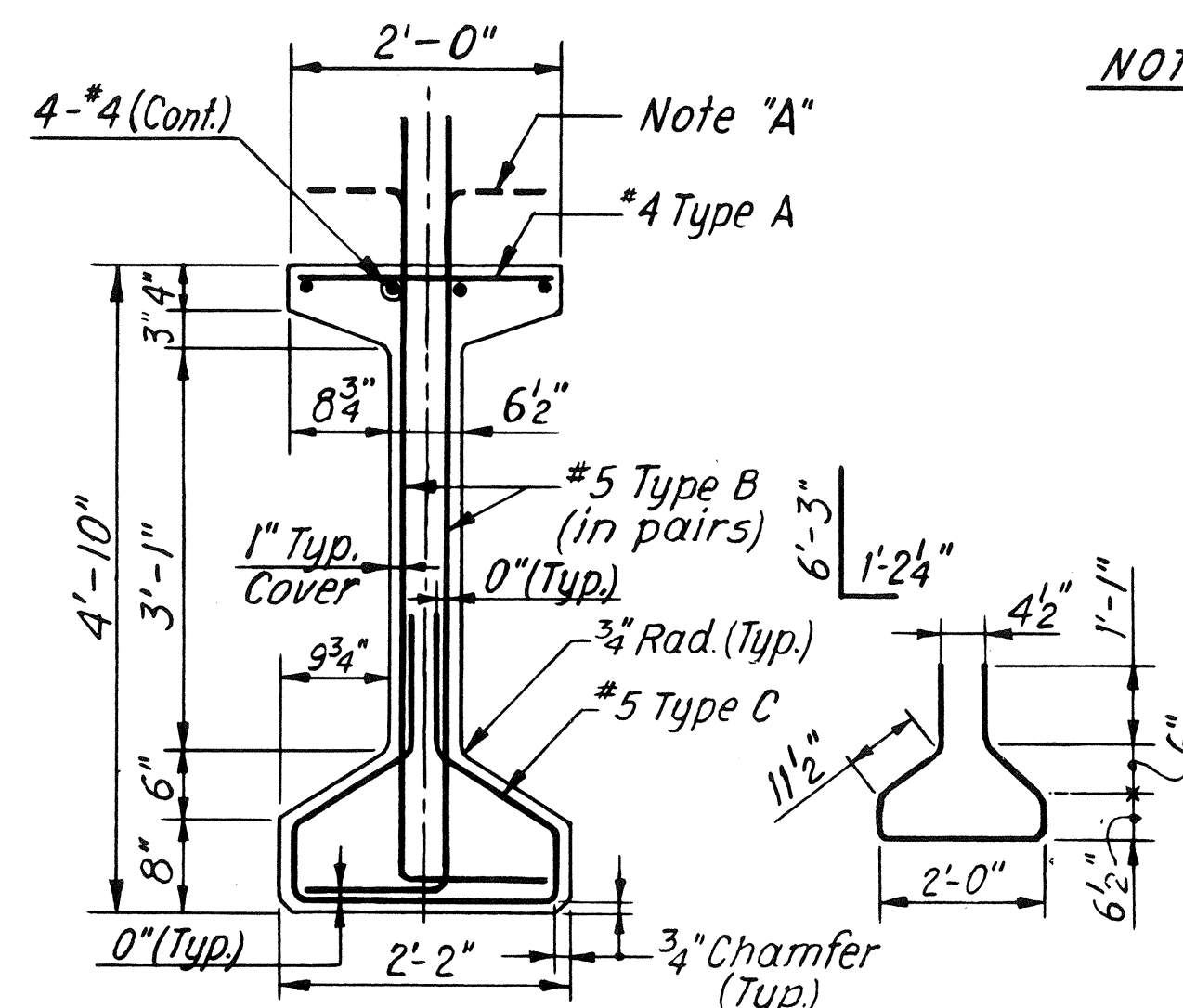
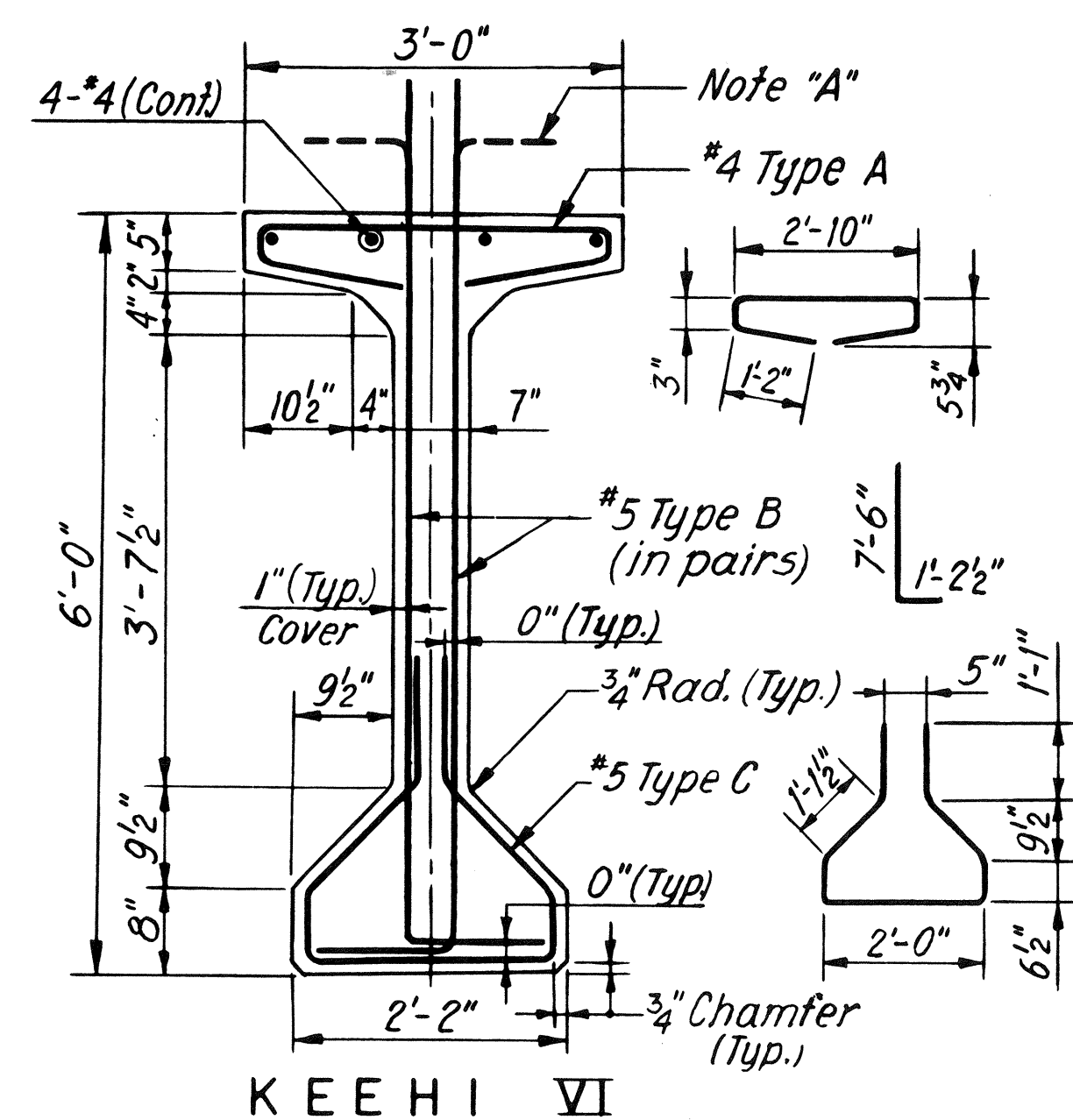
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STATE OF HAWAII
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HIGHWAYS DIVISION
H-1 VIADUCT (EB) PART II
TYPICAL DETAILS

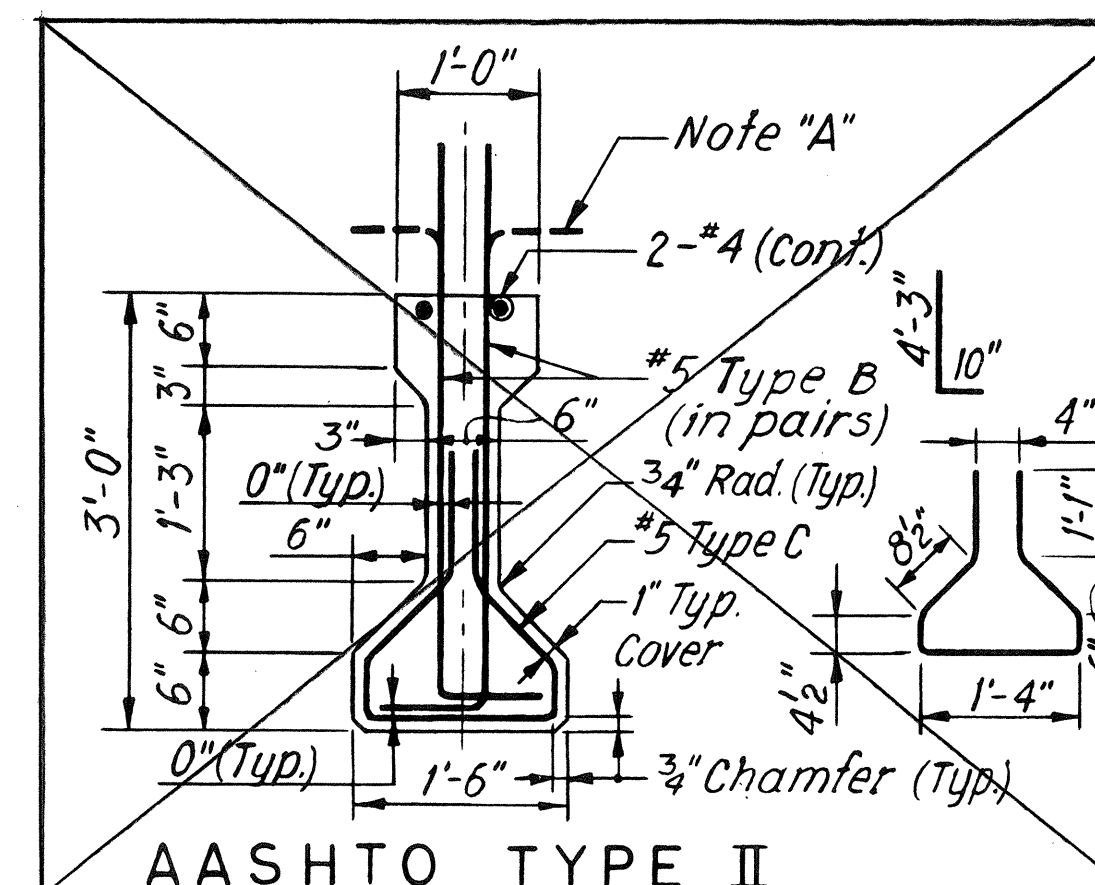
PIER CAP, END SHELF, GIRDER SEAT & CREEP BLOCK, REINF. & HINGE RESTRAINER DETAILS

AIRPORT VIADUCT
F.A.I. PROJ. No. I-HI-1 (84) 16
Scale: As Shown Date: May 16, 1978
SHEET NO. T-8 OF 18 SHEETS

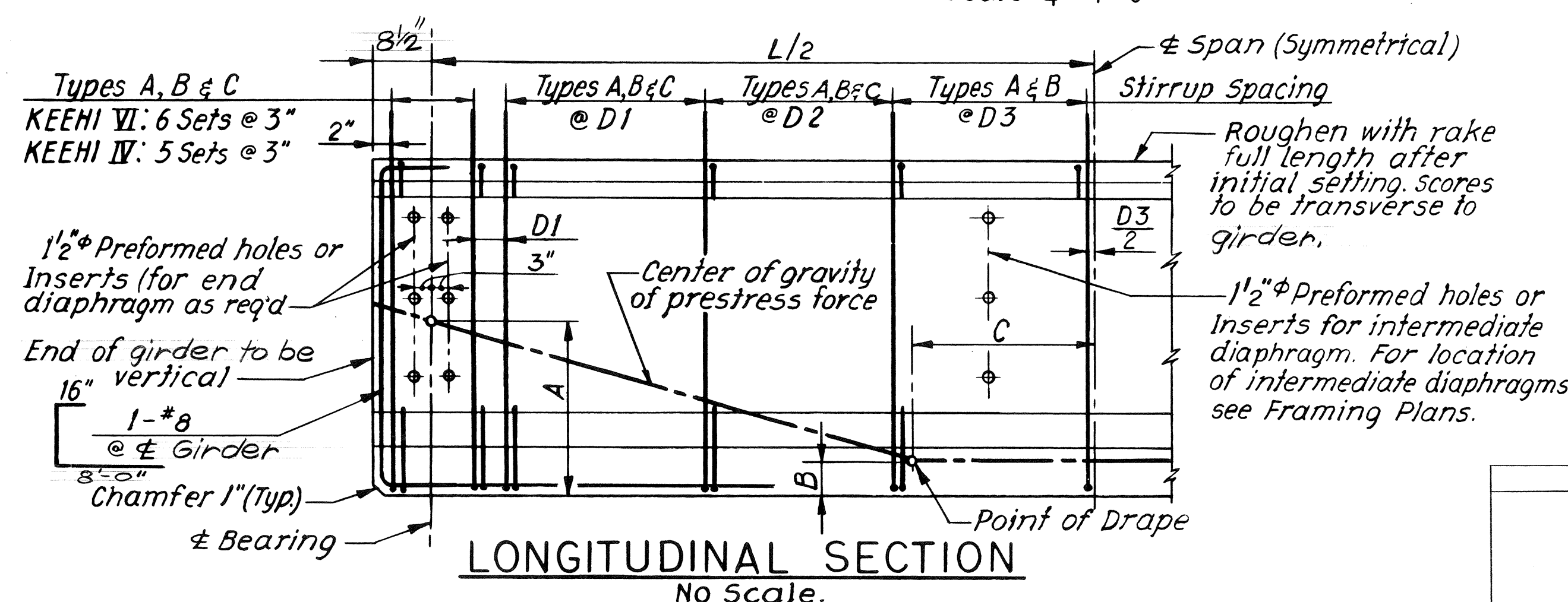
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HAWAII	HAW.	1-HI-1(84)116	1978	436	466



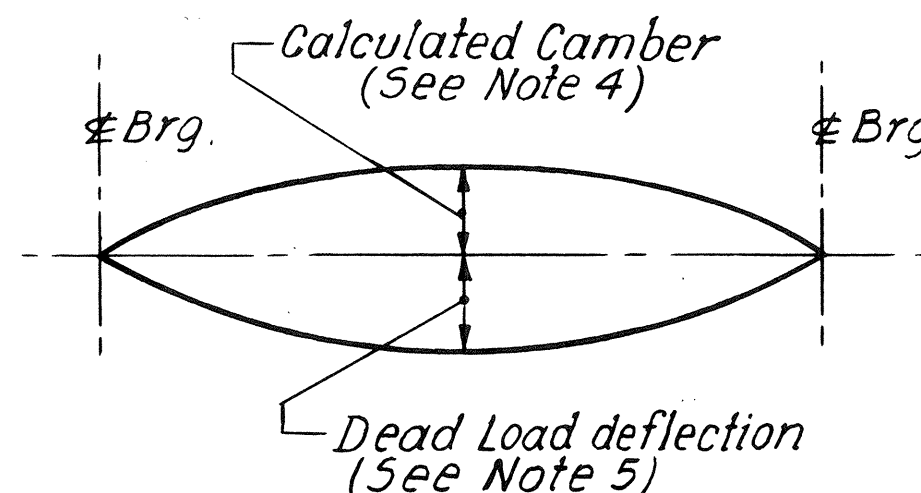
NOTE "A": Bend bars in field 1/2" below top of deck. All reinforcing dimensions are out to out.



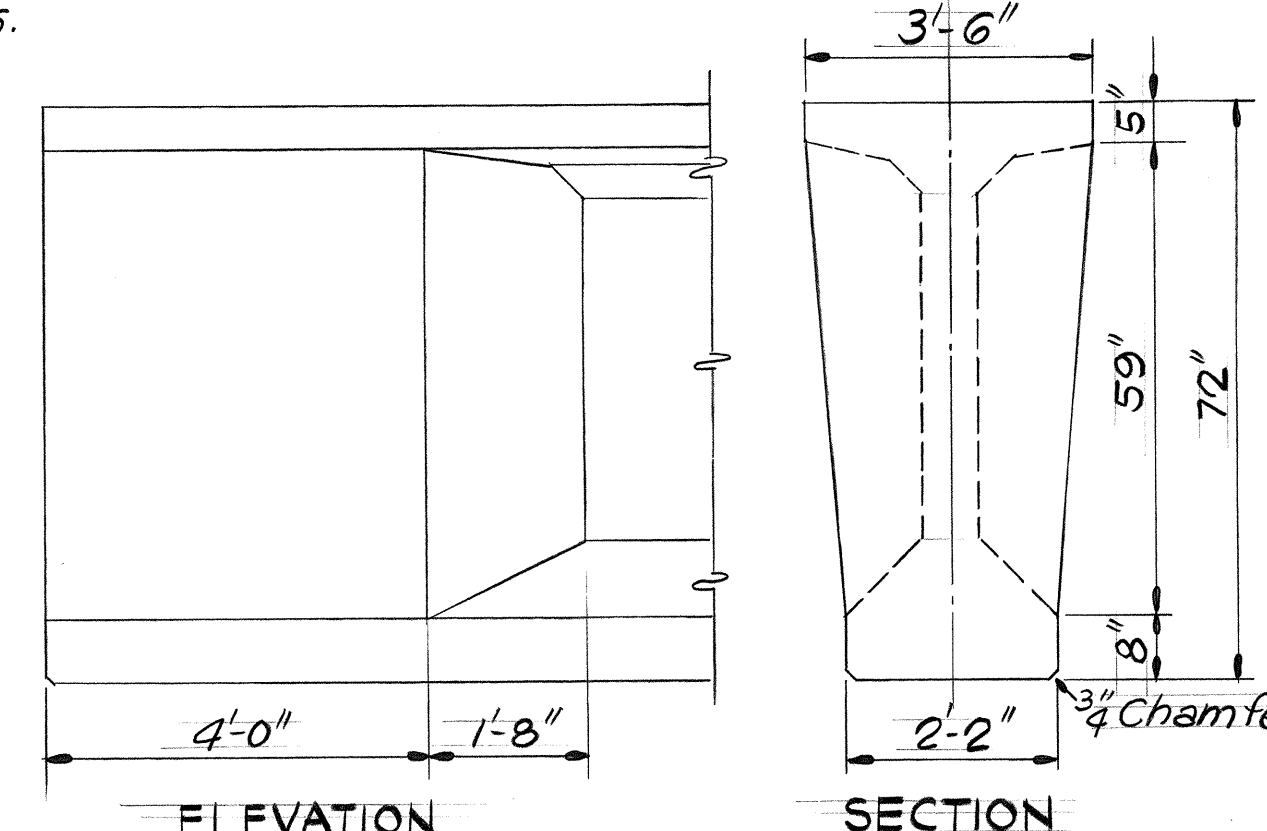
TYPICAL GIRDER SECTIONS
Scale 3/4" = 1'-0"



NOTE: See sheet No. 517 for Prestressed Girder Schedule.



CAMBER DIAGRAM



TYPICAL END BLOCK DETAIL
Scale 1/2" = 1'-0"

(This detail applies to Keehi Type VI girders if post-tensioned.)

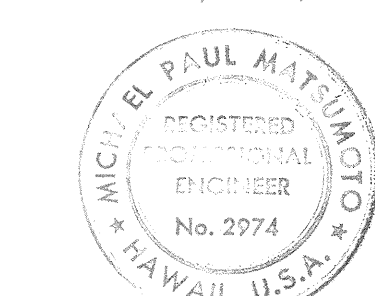
NOTES FOR PRESTRESSED GIRDERS: PRETENSIONING

- Concrete shall have a minimum ultimate 28 day cylinder strength of 6,000 psi.
- Pretensioned strands shall be 7 wire 1/2" stress-relieved steel strands (area = 0.153 in²) with an ultimate strength of 270 ksi. For properties see State Standard Specifications. Initial strand stress (before any losses): 199 ksi; Initial loss = 20,000 psi. Total loss due to creep, shrinkage, elastic shortening and relaxation of steel = 45,000 psi.
- Non-prestressed reinforcing steel shall be Grade 40 unless otherwise noted. For properties see State Standard Specifications.
- The calculated camber includes the effect of the initial prestress force and the weight of the girder after removal from bed. Negative values shown for calculated camber indicate a net upward deflection. Calculated camber values shown do not account for any camber growth of the girder. The actual girder camber shall not exceed the calculated camber shown on the plans by more than 100% at time of installation.
- The dead load deflection includes the combined effects of the weight of slab, haunch & diaphragm.
- Strand pattern shall be symmetrical about the longitudinal $\pm$ of the girder.
- Strand release sequence shall not induce any lateral deflection of the girder.
- Contractor shall submit his proposed strand pattern and releasing sequence to the Engineer for approval.
- During curing care shall be taken to avoid any lateral deflection of the girder due to improper orientation.
- Lifting devices shall be placed as close as possible to the center line of bearings of the girder. Details and locations of lifting devices shall be submitted to the Engineer for approval. Such approval does not relieve the Contractor of his responsibilities if girder is damaged due to failure of the lifting device.
- See Framing Plans for locations of diaphragms, type, mark number and length of individual girders. Lengths shown do not include effect of elastic shortening.
- In lieu of the 7 wire 1/2" dia stress-relieve steel strands (area 0.153 in²) with an ultimate strength of 270 ksi, the Contractor at his option may use 7 wire 0.6" dia stress-relieved steel strands (area 0.217 in²) with an ultimate strength of 270 ksi. For properties of 0.6" dia strand see special provisions. However the final prestress force and its center of gravity, as stated, shall not be revised.

POST-TENSIONING (Contractor's Option for Long Girder)

- The ultimate 28-day cylinder strength of concrete shall be a minimum of 6000 psi.
- Post-tensioning steel shall consist of either 1/2" Φ , 270 ksi S/R multistrand tendons or high strength alloy steel bars. Sheathing shall be galvanized rigid duct (coef. of friction $\mu = 0.25$ and wobble coef. $K = 0.0002$) for strands and galvanized metal sheathing ($\mu = 0.15$ and $K = 0.0002$) for bars.
- Loss due to creep, shrinkage, elastic shortening and relaxation of steel to be assumed = 35,000 psi.
- Contractor shall submit the post-tensioned girder design including elongation, jacking and deflection computation to Engineer for approval. Estimate of losses (apart from that listed above) peculiar to post-tensioning shall be part of the calculations.
- Contractor shall submit the tendon pattern and profile, sequence of stressing and anchorage details to Engineer for approval. Tendons location and post-tensioning shall be symmetrical about the longitudinal $\pm$ of the girder.
- Pretensioning notes 3, 9 10 and 11 also apply to post-tensioning.

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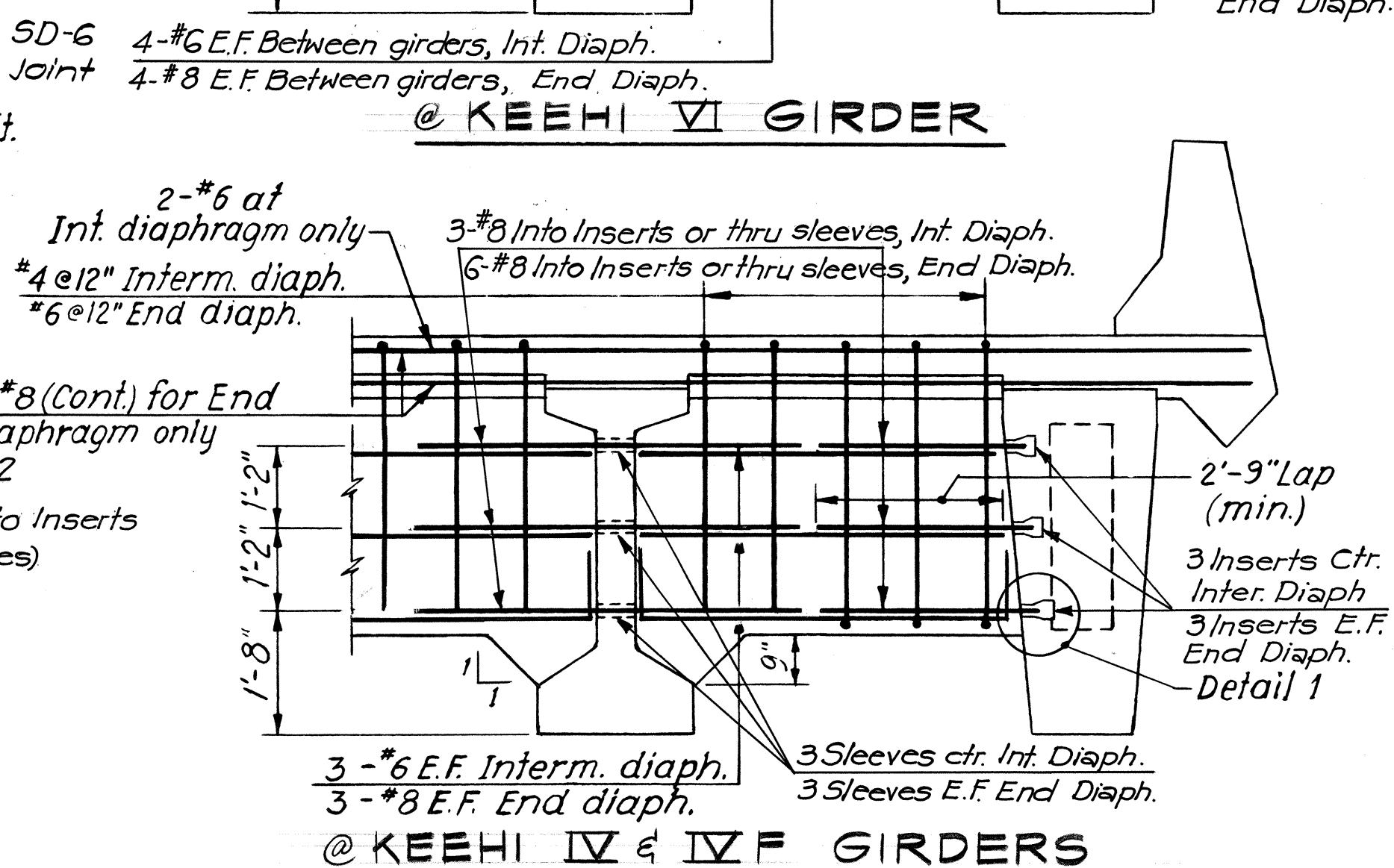
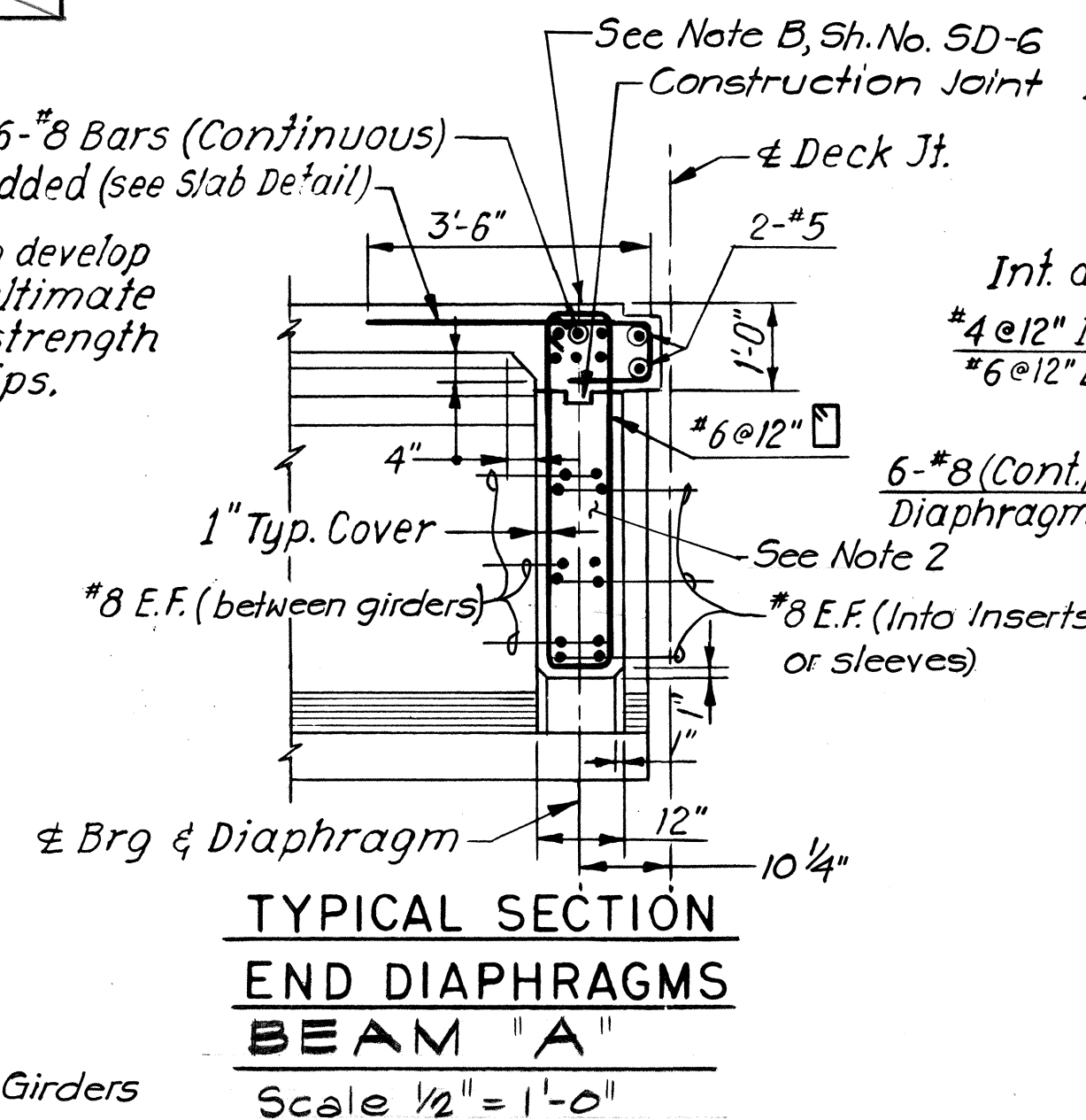
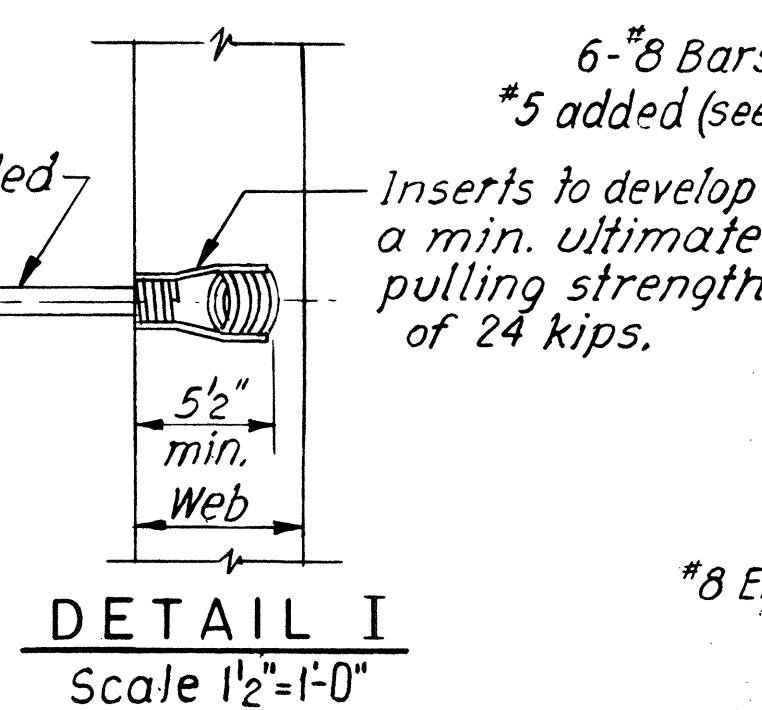
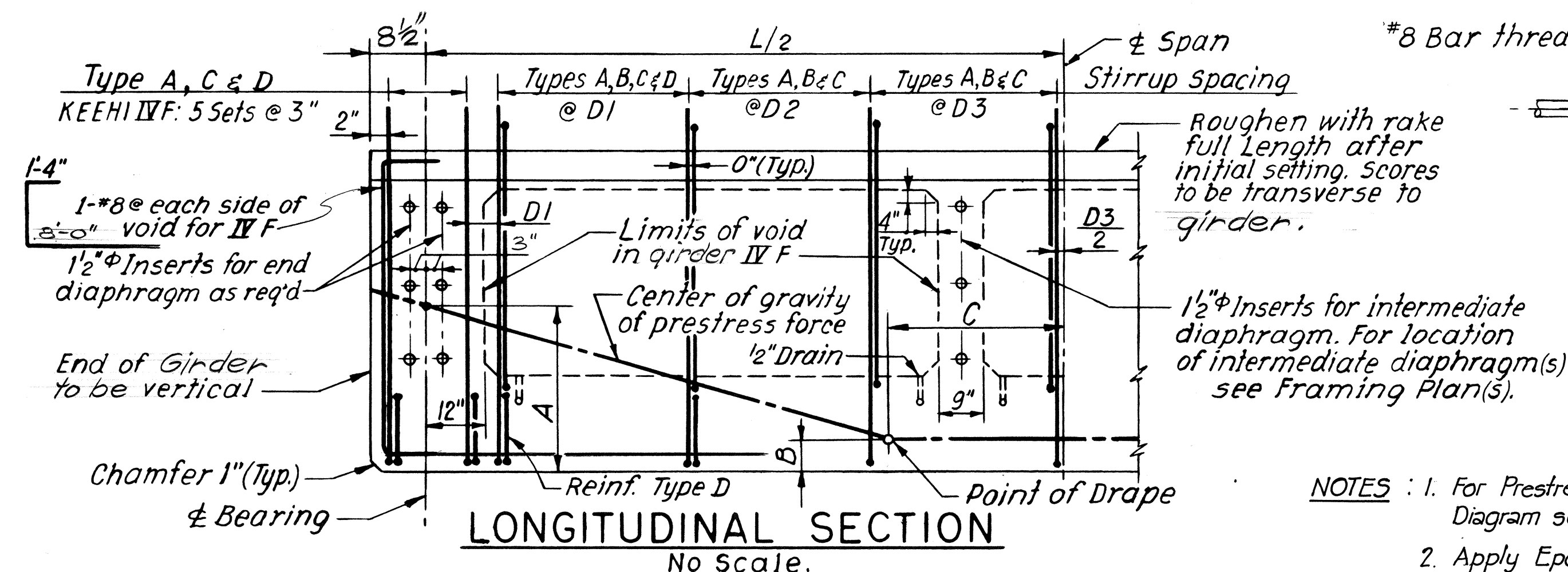
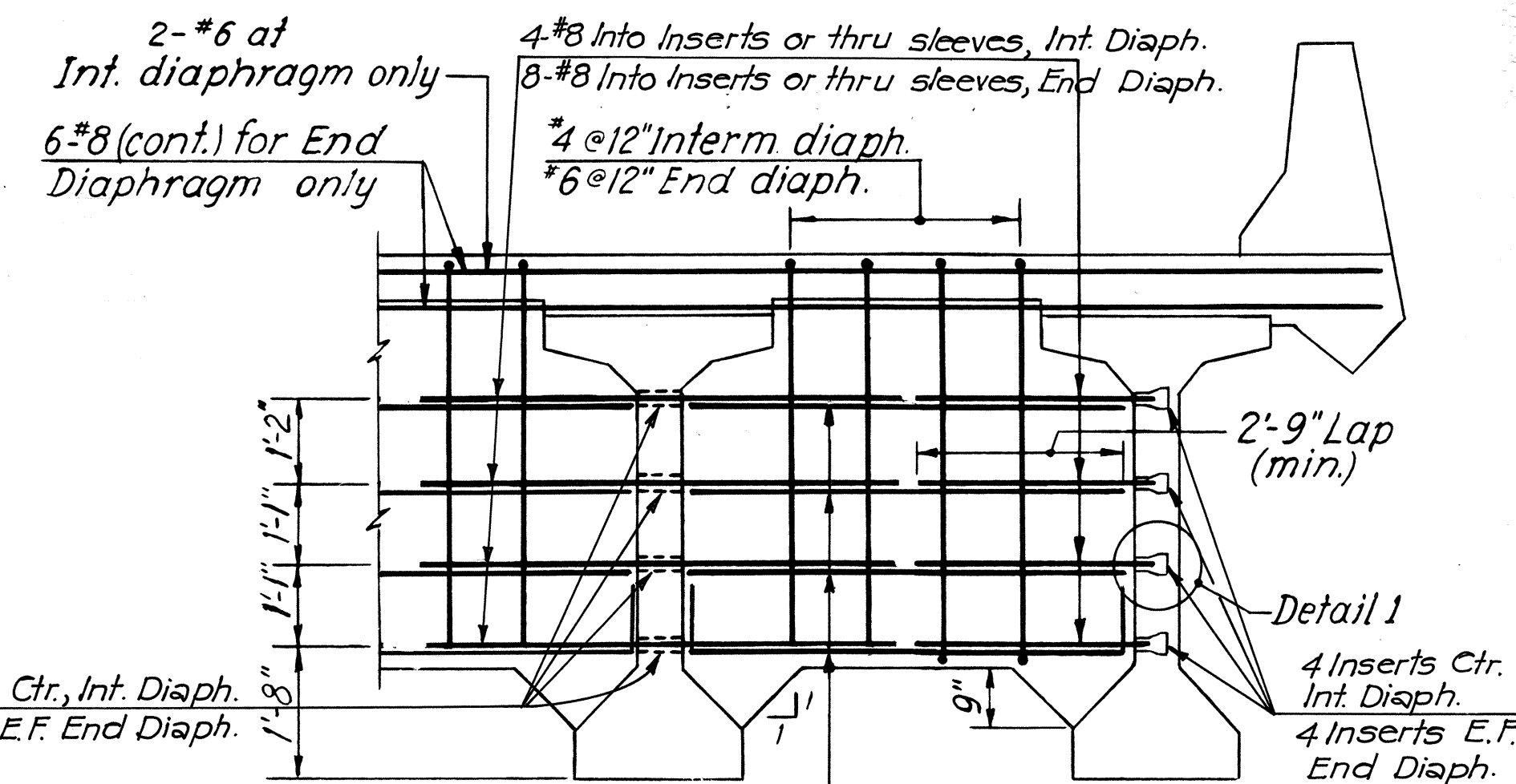
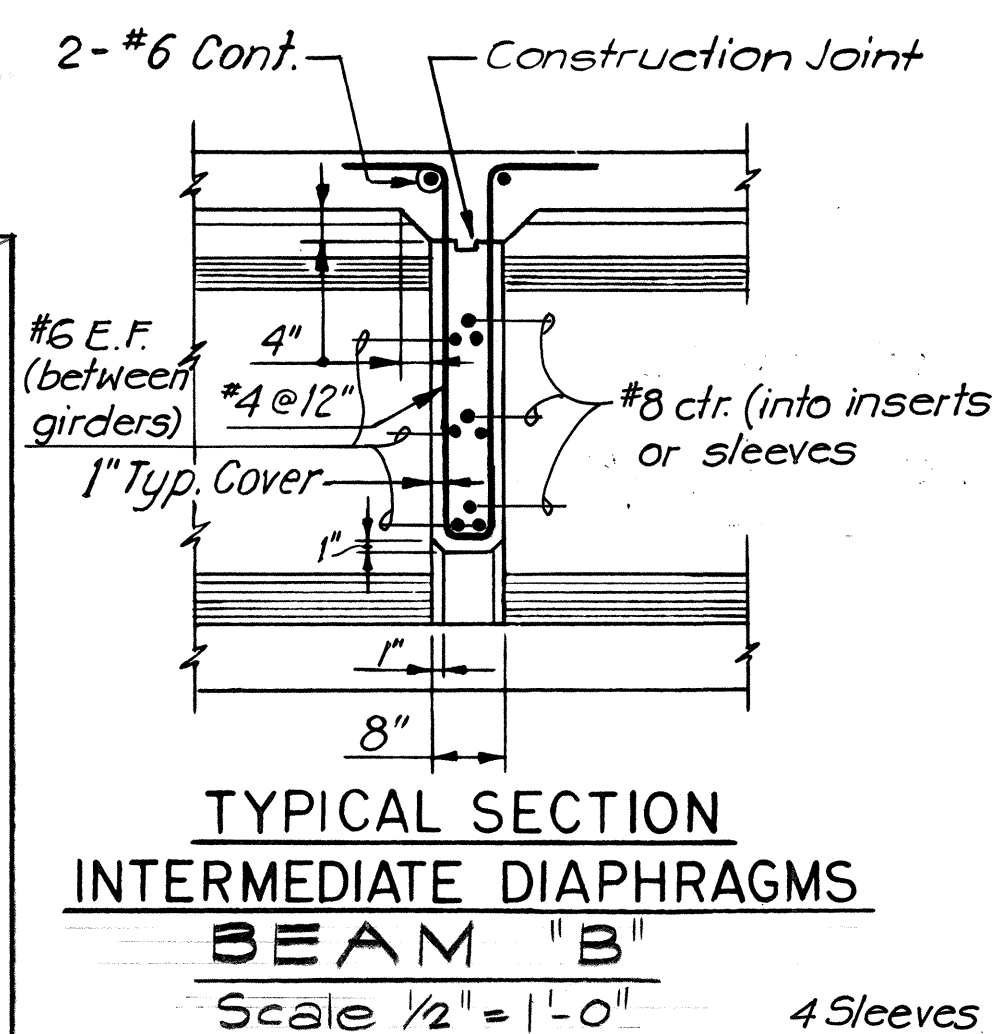
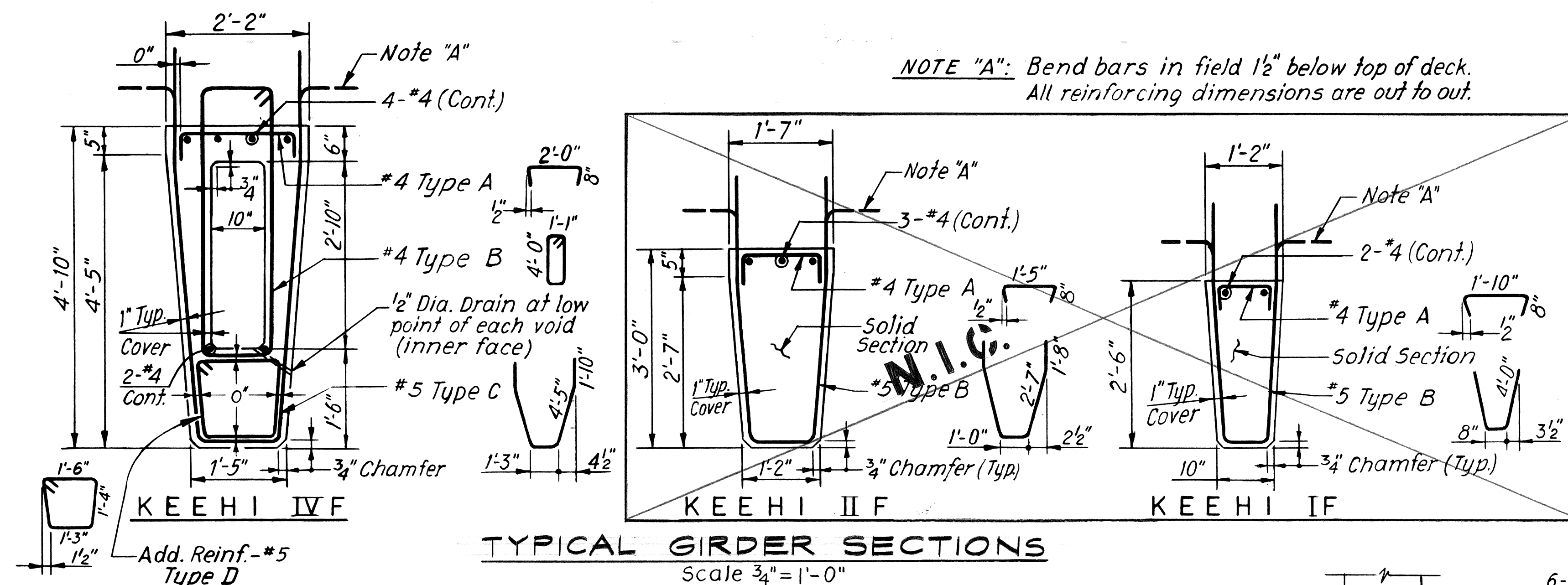
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

H-1 VIADUCT (EB) PART II
PRESTRESS GIRDER DETAILS
SHEET 1 OF 2

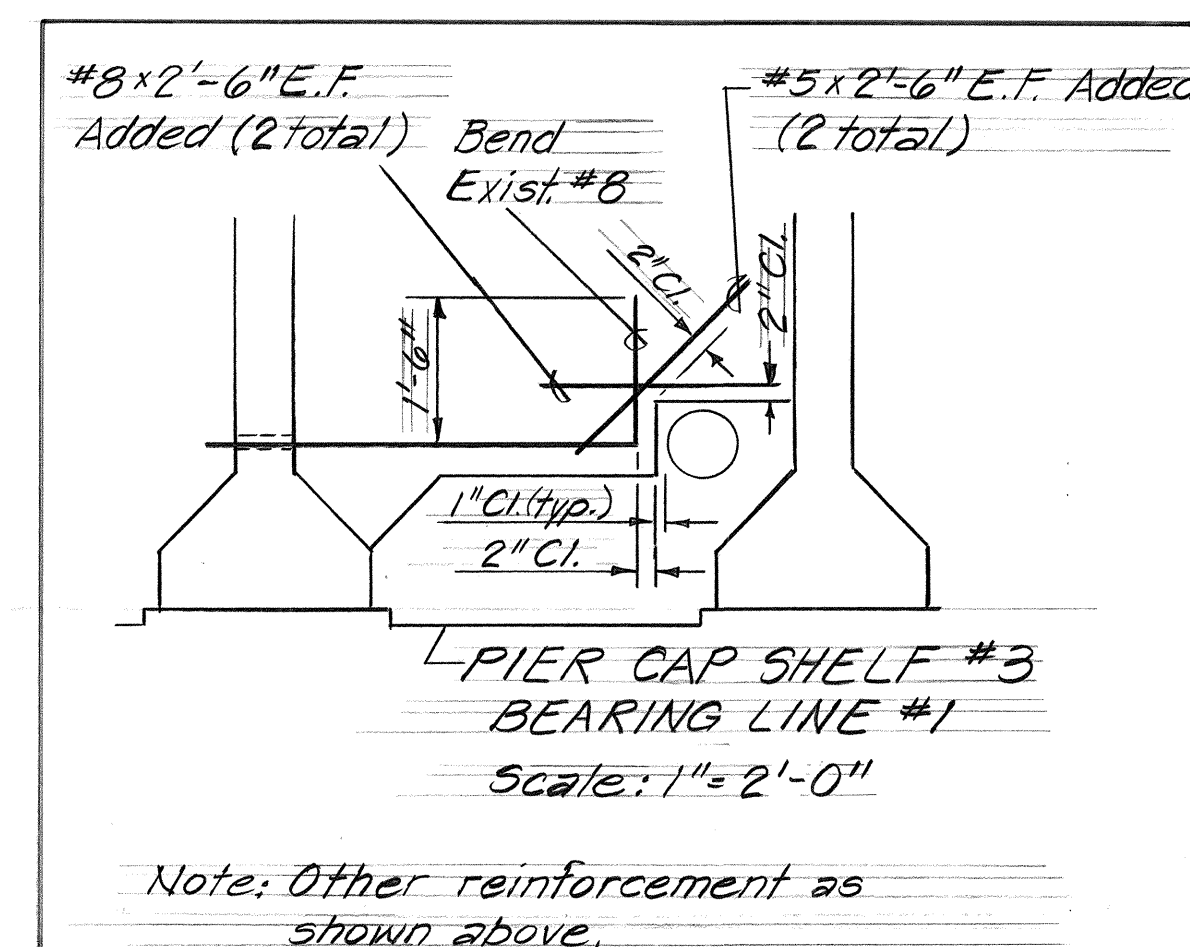
AIRPORT VIADUCT
F.A.I. PROJECT NO. 1-HI-1(84)116
SCALE: DATE: MAY 16, 1978

SHEET NO. 19 OF 18 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-H1-1(24)116	1978	437	466



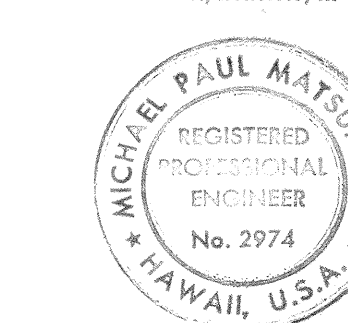
- NOTES:**
- For Prestress Notes and Camber Diagram see Sh. No. T-9
 - Apply Epoxy Bonding Compound to contact area of all Keel IV F Fascia Girders before placing diaphragm concrete. Epoxy Bonding Compound incidental to concrete in bridges.
 - Bars in sleeves shall be grouted in place before pouring the diaphragms concrete.
 - Inserts and sleeves are incidental to prestressed concrete beam.
 - See Sheet No. 5-17 for Prestressed Girder Schedule.



TYPICAL INTERMEDIATE AND END DIAPHRAGMS

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

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Consulting Structural Engineers
1210 Ward Ave., Honolulu, HI 96814

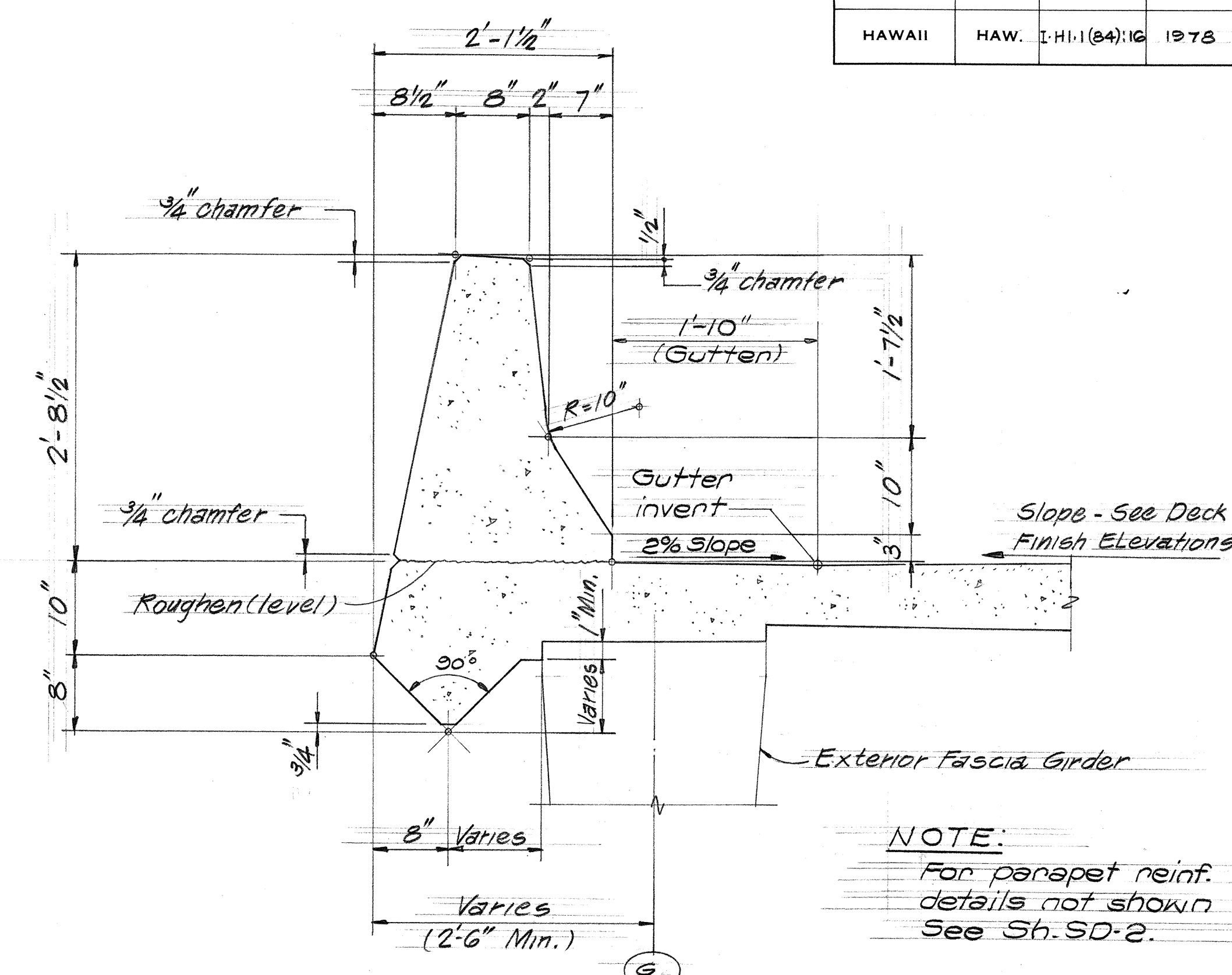
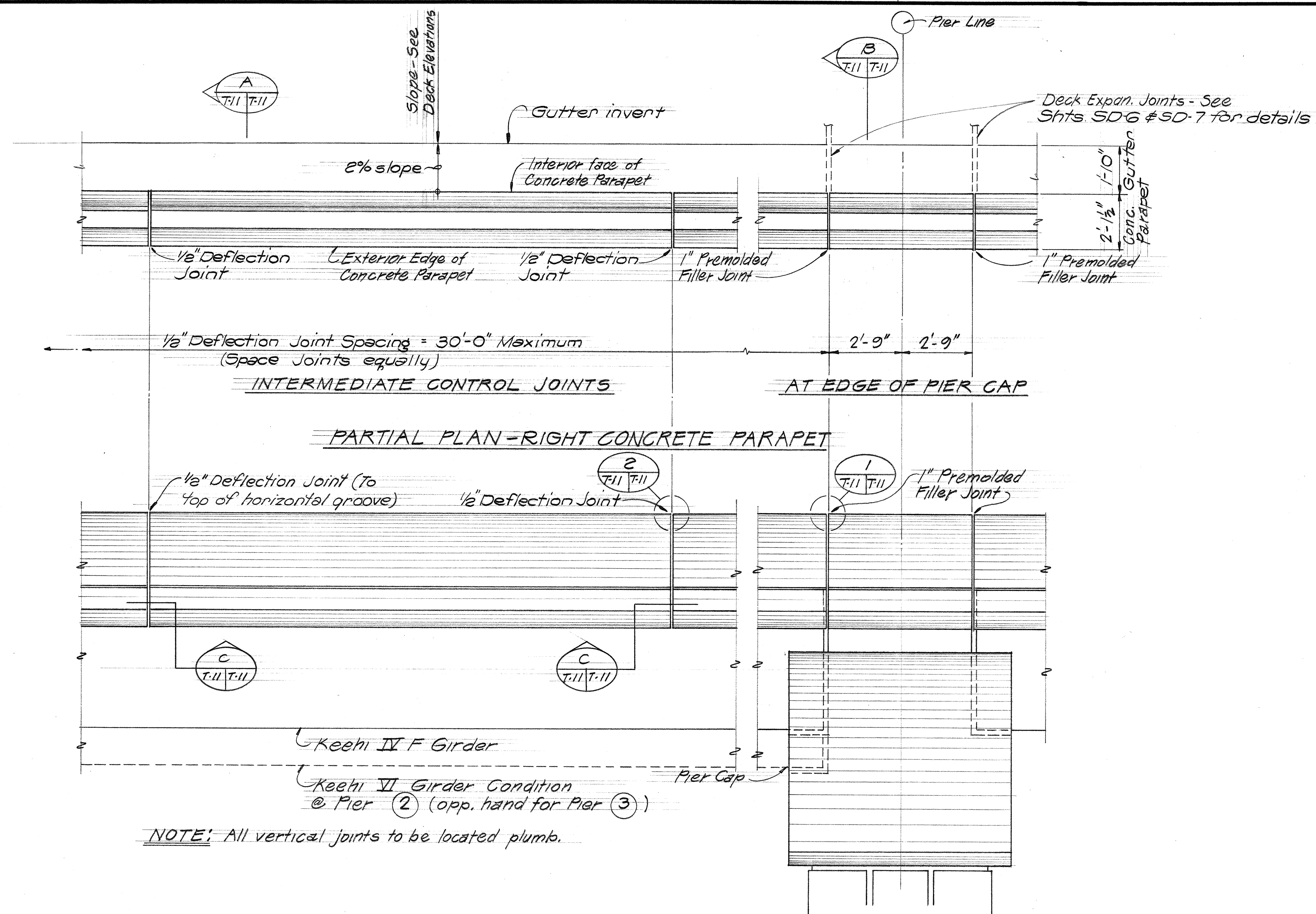


This work was prepared by me or under my supervision.
Michael Paul Matsumoto

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
H-1 VIADUCT (EB) PART II
PRESTRESS GIRDER AND BEAM "A" & "B" DIAPHRAGM DETAILS
SHEET 2 OF

AIRPORT VIADUCT
F.A.I. PROJECT NO. 1-H1-1(24)116
SCALE: DATE: MAY 16, 1978
SHEET NO. T-10 OF 18 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1 (84) 16	1978	438	466

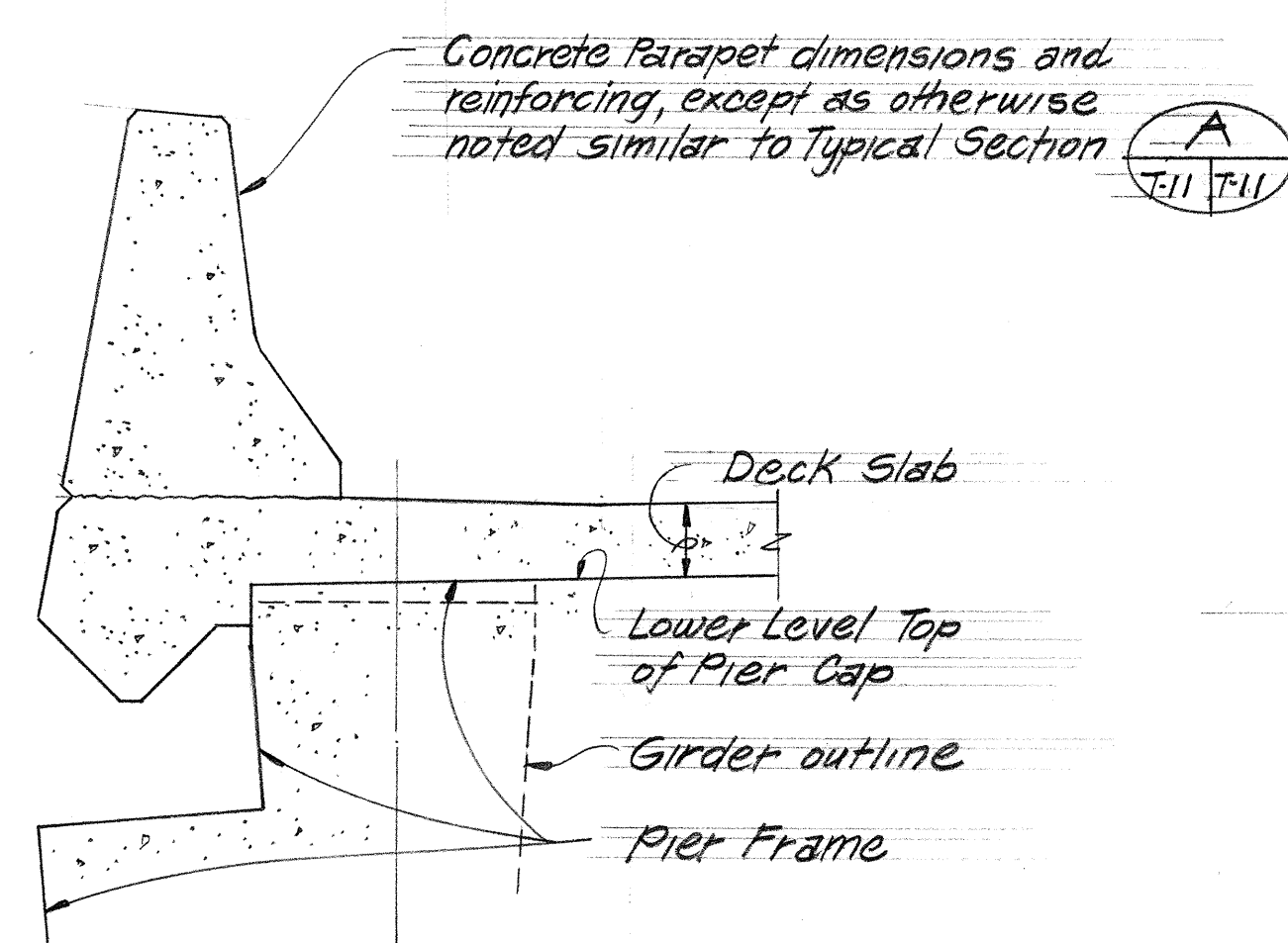


NOTE:
For parapet reinf. & details not shown see Sh. SD-2.

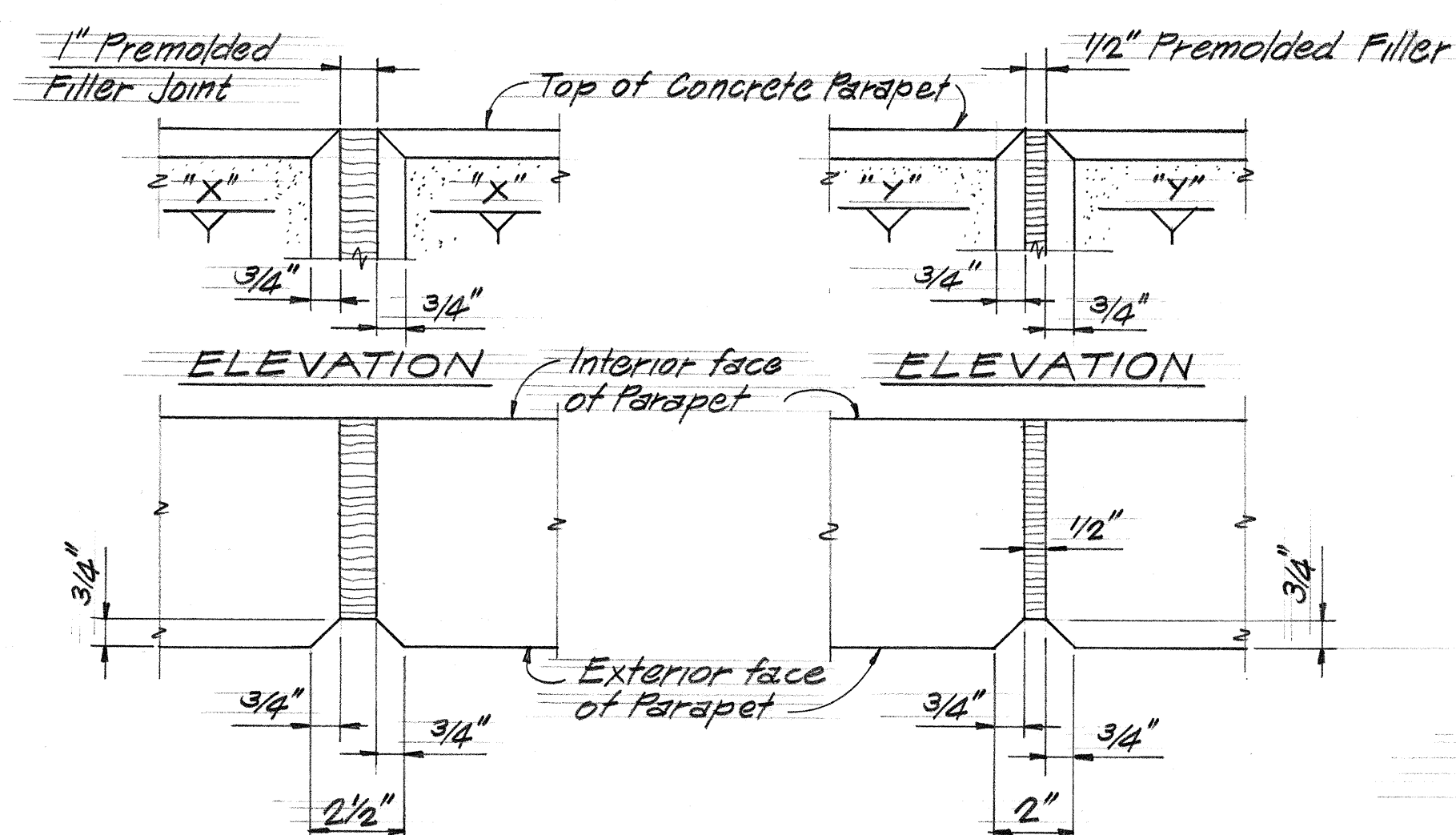
TYPICAL SECTION
Scale: 1'-0"

PARTIAL EXTERIOR ELEVATION-RIGHT CONCRETE PARAPET

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



SECTION
Scale: 3/4" = 1'-0" T-11, T-12

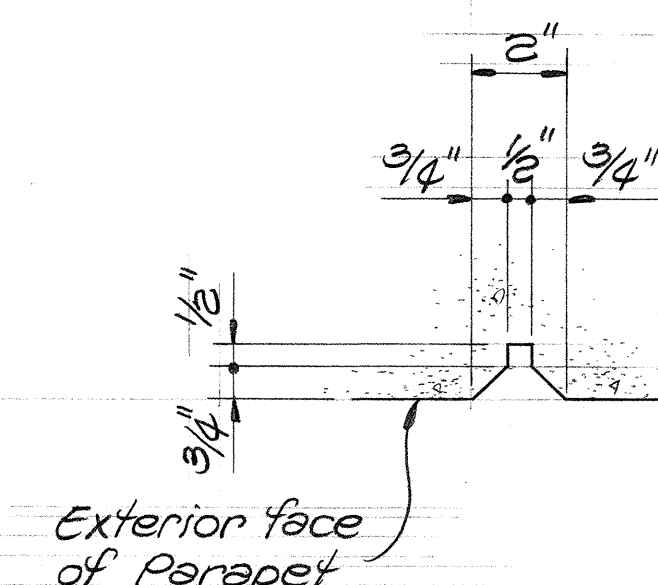


SECTION "X-X"
TYP. 1" PREMOLDED FILLER JOINT

DETAIL
Scale: 3" = 1'-0" T-11 & T-12

SECTION "Y-Y"
TYP. 1/2" DEFLECTION JOINT

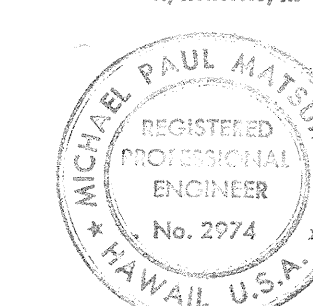
DETAIL
Scale: 3" = 1'-0" T-11 & T-12



TYPICAL 1/2" x 1/2" GROOVE

SECTION
Scale: 3" = 1'-0" T-11 & T-12

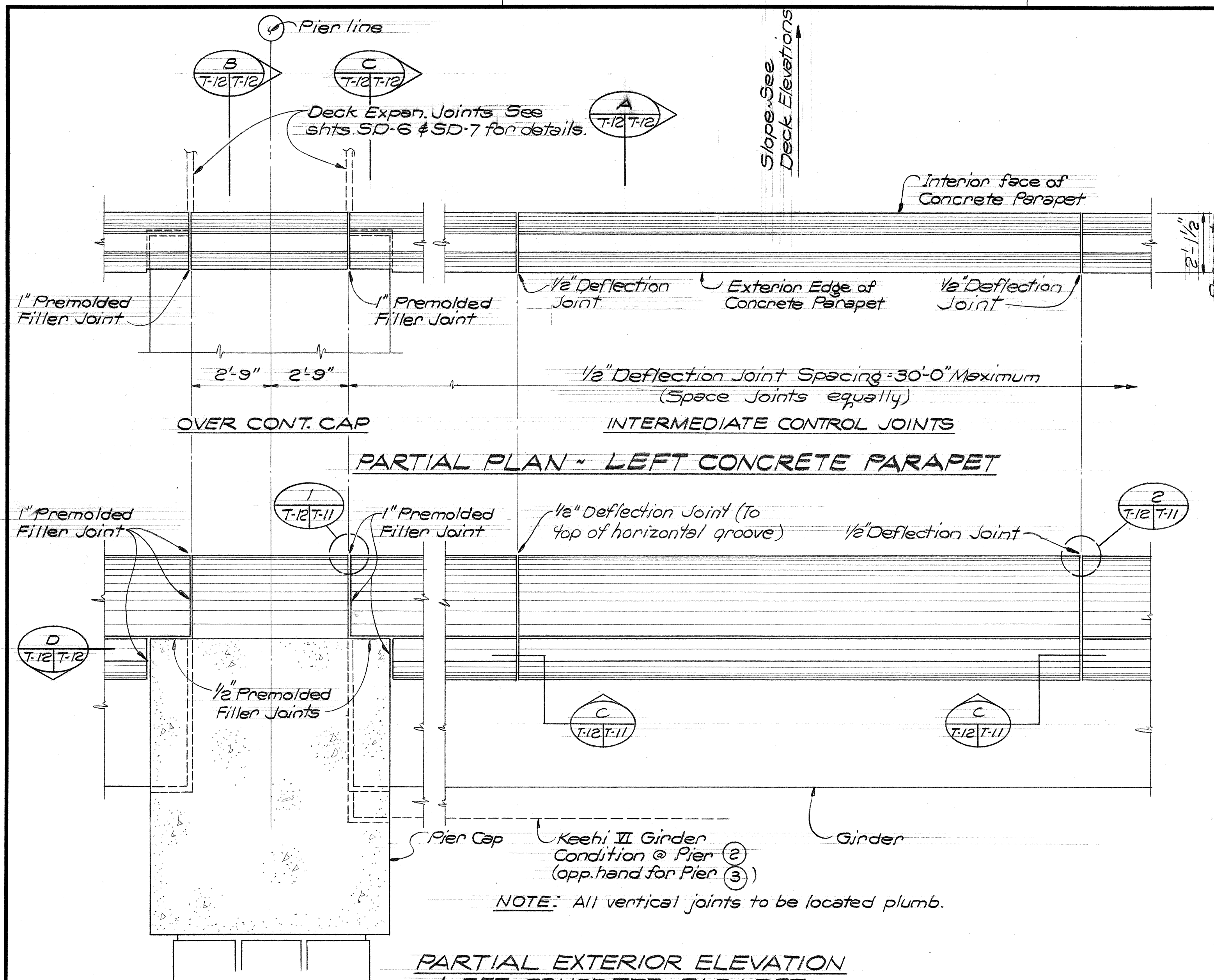
SSFM Engineers, Inc.
Consulting Structural Engineers
1210 Ward Ave., Honolulu, HI 96814



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Michael Paul Matsumoto

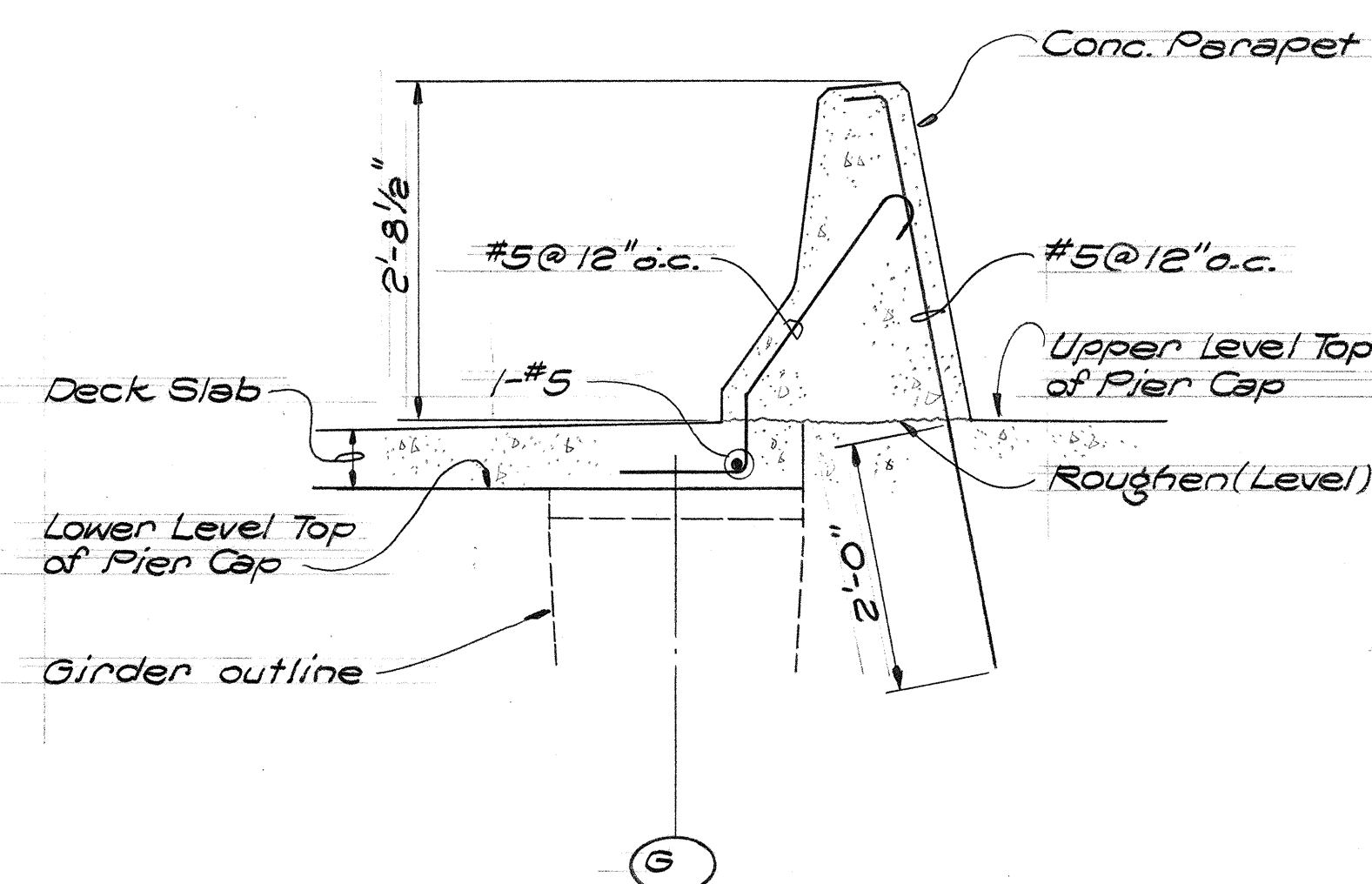
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
H-1 VIADUCT (EB) PART II TYPICAL DETAILS	
RIGHT CONCRETE PARAPET SECTIONS & DETAILS	
AIRPORT VIADUCT F.A.I. PROJ. NO. I-HI-1 (84) 16	
Scale: As shown	Date: May 16, 1978
SHEET NO. T-II OF 18 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I.H.I. (84) 116	1978	439	466

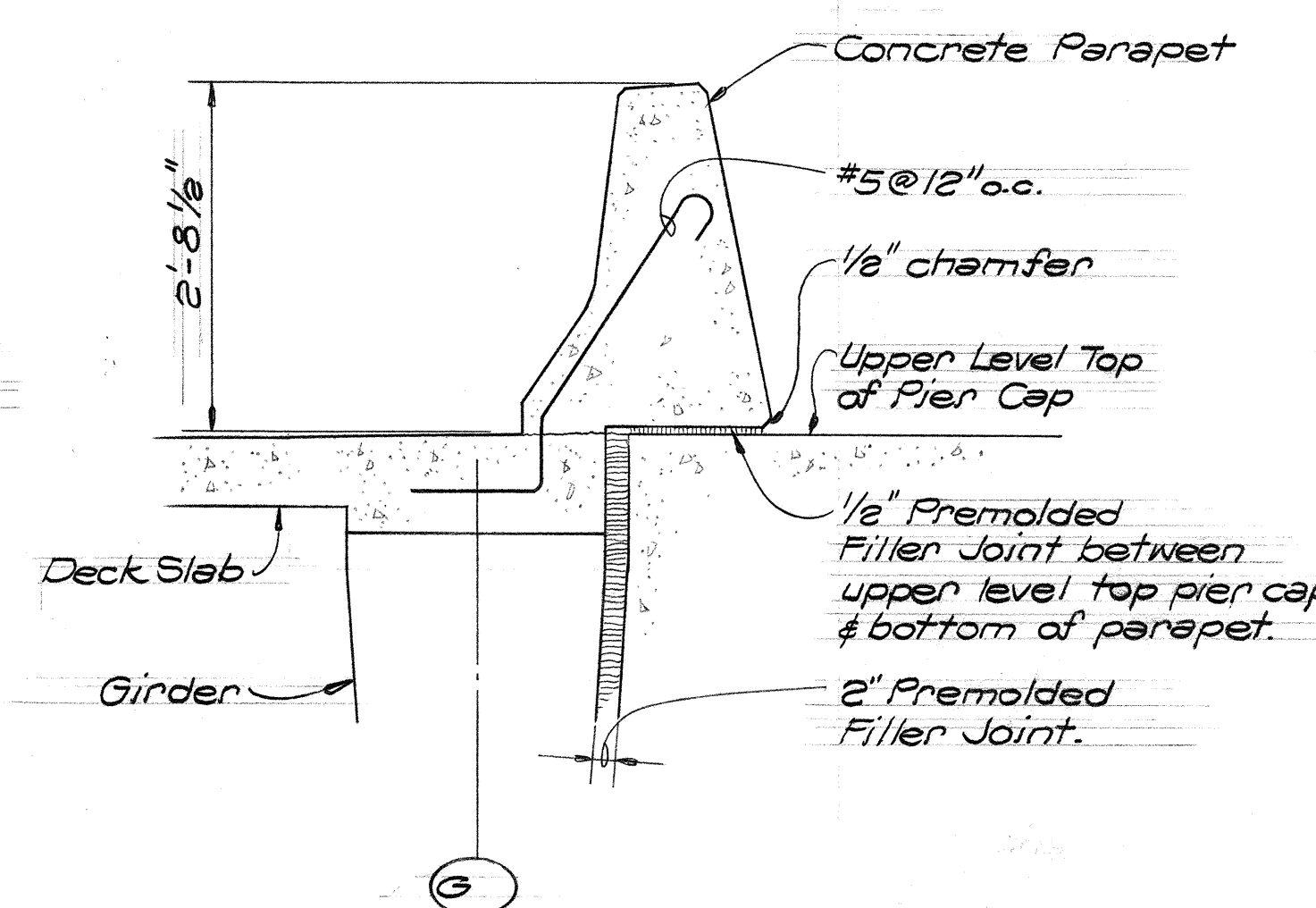


PARTIAL EXTERIOR ELEVATION
~ LEFT CONCRETE PARAPET

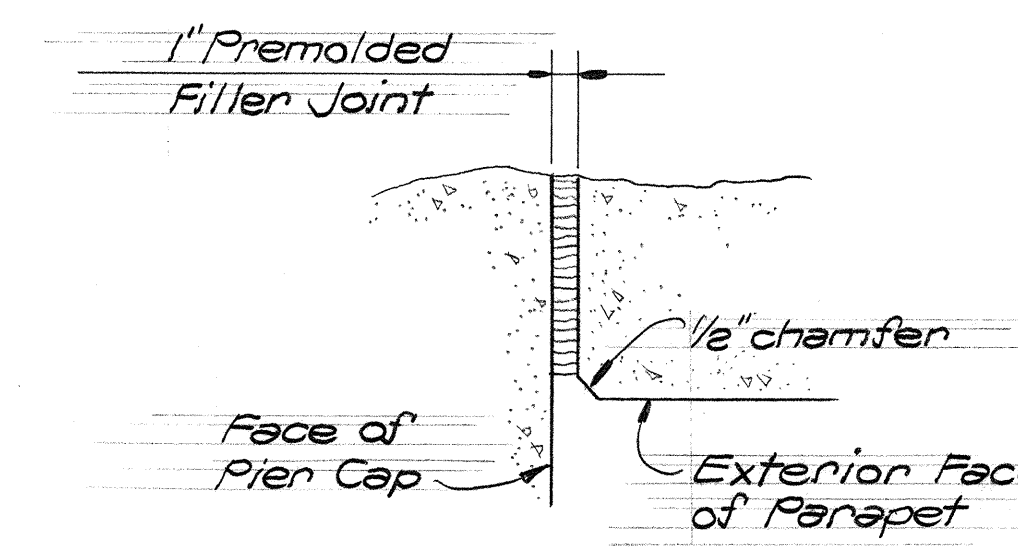
DETAIL 1
Scale: 3/8" = 1'-0"



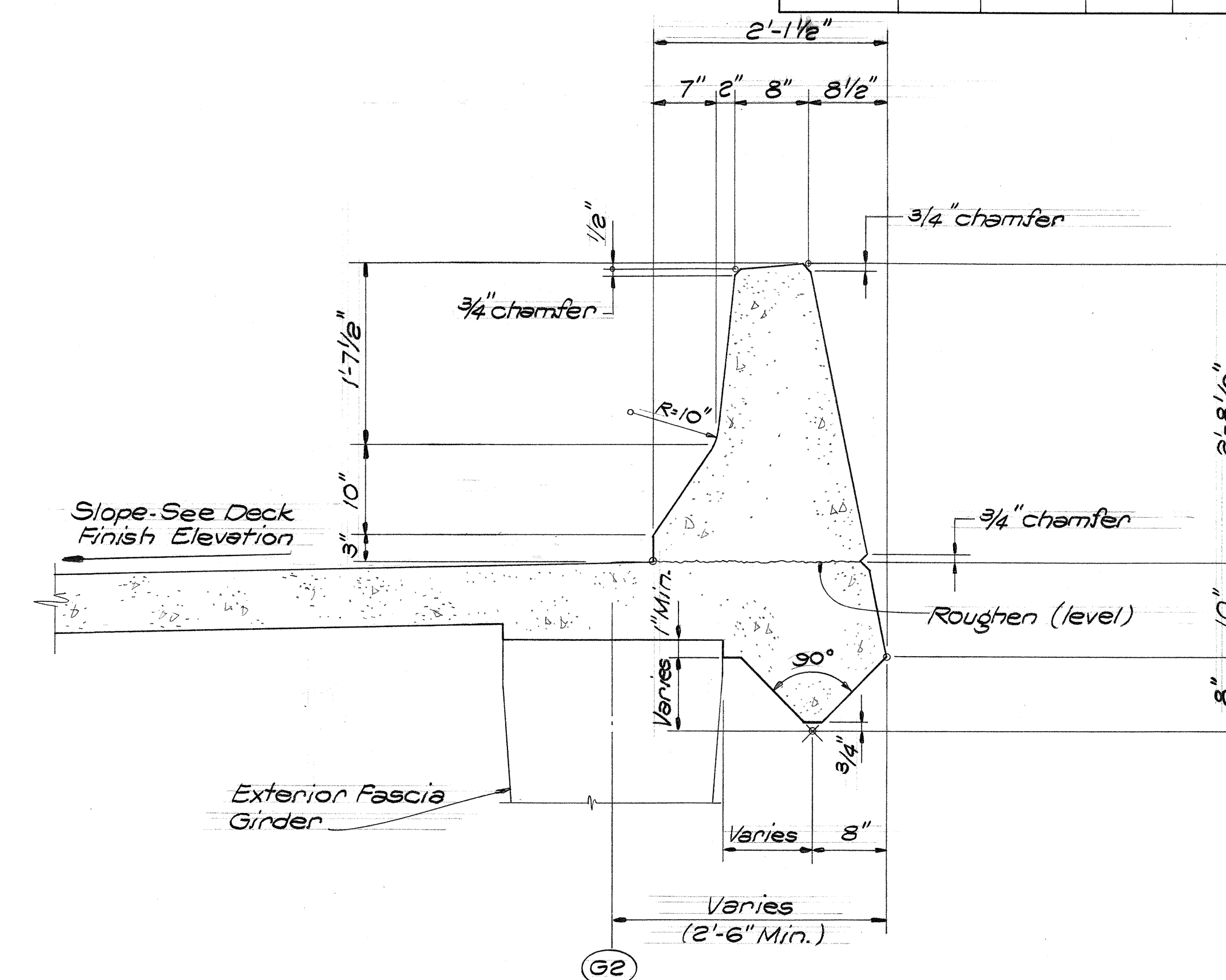
SECTION B
Scale: 3/4" = 1'-0" T-12 T-12



SECTION C
Scale: 3/4" = 1'-0" T-12 T-12

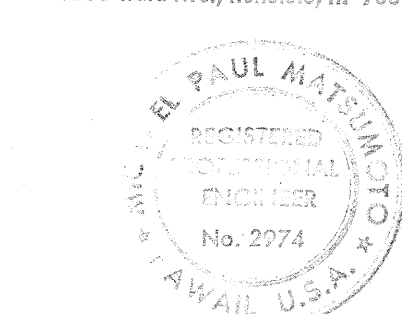


SECTION D
Scale: 3" = 1'-0" T-12 T-12



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

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Michael Matsumoto

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
H-1 VIADUCT (EB) PART II
TYPICAL DETAIL
LEFT CONCRETE PARAPET
SECTION & DETAILS
AIRPORT VIADUCT
F.A.I. PROJ. NO. I-H-1 (84) 116
Scale: As Shown Date: May 16, 1978
SHEET NO. T-12 OF 18 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(84):16	1978	440	466

1. GENERAL SPECIFICATIONS: HAWAII DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 1976, TOGETHER WITH SPECIAL PROVISIONS PREPARED FOR THIS CONTRACT.
2. DESIGN SPECIFICATIONS: A.A.S.H.T.O. 1973 STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES AND ITS SUBSEQUENT INTERIM SPECIFICATIONS.
3. LOADS:
- (A) DEAD LOAD: AN ALLOWANCE OF 18 P.S.F. FOR FUTURE WEARING SURFACE OF ASPHALT CONCRETE HAS BEEN PROVIDED FOR IN THE DESIGN.
- (B) LIVE LOAD: HS20-44 OR INTERSTATE LOADING.
4. MATERIALS:
- (A) ALL CONCRETE SHALL BE CLASS A UNLESS OTHERWISE NOTED.
- (B) ALL REINFORCING STEEL SHALL BE A.S.T.M. A615, GRADE 40 UNLESS OTHERWISE NOTED.
- (C) ALL STRUCTURAL STEEL SHALL BE A.S.T.M. A-36, HOT DIP GALVANIZED, UNLESS OTHERWISE NOTED.
- (D) ALL ANCHOR BOLTS, WASHERS AND NUTS SHALL BE A.S.T.M. A-307, HOT DIP GALVANIZED, UNLESS OTHERWISE SPECIFIED.
- (E) FOR MATERIALS OF PRESTRESSED CONCRETE BEAM SEE PRESTRESSED CONCRETE NOTES.
5. DESIGN STRESSES: SHALL FOLLOW A.A.S.H.T.O. STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES IN ADDITION TO THOSE LISTED BELOW.

CONCRETE	CLASS A OR B D	ALL OTHERS (EXCEPT PRESTRESSED CONCRETE BEAMS AND UNLESS OTHERWISE NOTED ON THE PLANS)
F'C	3000 P.S.I.	5000 P.S.I.
Fc	1200 P.S.I.	2000 P.S.I.
N	9	7

FOR PRESTRESSED CONCRETE BEAMS, SEE PRESTRESSED CONCRETE NOTES.

6. REINFORCEMENT:
- (A) THE MINIMUM COVERING MEASURED FROM THE SURFACE OF THE CONCRETE TO THE FACE OF ANY REINFORCING BARS SHALL BE AS FOLLOWS:
- A.1. DECK SLABS (FOR BOX GIRDERS, T-BEAMS, PRESTRESSED BEAMS)
- A. TOP BARS = 1 1/2"
- B. BOTTOM BARS = 1 1/4"
- A.2. BOX GIRDERS
- A. 1 1/4" TO STIRRUP FROM OUTSIDE FACES
- B. 1" TO STIRRUP FROM INSIDE FACES.
- A.3. FOR PRESTRESSED CONCRETE BEAMS SEE PRESTRESSED CONCRETE BEAM DETAILS.
- A.4. ABUTMENTS, PIERS AND RETAINING WALLS = 2"
- A.5. COLUMNS = 2" TO TIES
- A.6. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH = 3".
- A.7. CONCRETE EXPOSED TO SEA WATER = 4".
- (B) REINFORCING BARS SHALL BE DETAILED IN ACCORDANCE WITH A.C.I. MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE HIGHWAY STRUCTURES UNLESS OTHERWISE NOTED.
- (C) MINIMUM CLEAR SPACING BETWEEN PARALLEL BARS SHALL BE 1 1/2 TIMES THE DIAMETER OF BARS (FOR NON BUNDLED 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.
- (D) ALL DIMENSIONS RELATING TO REINFORCING BARS (EG. SPACING OF BARS, ETC.,) ARE TO CENTERS OF BARS UNLESS OTHERWISE NOTED.
- (E) REINFORCING BARS SHALL BE SECURELY TIED AT ALL INTERSECTIONS AND LAP SPLICES AND SHALL BE HELD IN PLACE DURING POURING TO MAINTAIN THEIR PROPER LOCATIONS AS SHOWN ON THE PLANS.
- (F) VERTICAL COLUMN BARS SHALL BE ARRANGED IN SUCH A MANNER AS TO AVOID INTERFERENCE WITH PIER CAP BARS ABOVE AS DIRECTED BY THE ENGINEER.
7. ELASTOMERIC PADS: BOTTOM OF BRIDGE BEARING PADS SHALL BE SECURED TO THE CONCRETE SEATS, TO PREVENT DISPLACEMENT, WITH ADHESIVES APPROVED BY THE ENGINEER.

8. CONSTRUCTION METHODS.
- (A) SEE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
- (B) IN GENERAL TOP OF CONCRETE DECK SLAB SHALL BE CONSTRUCTED TO FOLLOW THE ROADWAY VERTICAL AND HORIZONTAL CURVES.
- (C) FOR CONCRETE FINISH SEE STANDARD SPECIFICATIONS AND FOR ARCHITECTURAL TREATMENT OF COLUMNS, SEE DETAILS.
- (D) GIRDER CONCRETE SEATS RECEIVING ELASTOMERIC PADS SHALL BE POURED MONOLITHICALLY WITH SUPPORTING STRUCTURE. TOP OF CONCRETE SEATS SHALL BE FINISHED WITH A STEEL TROWEL TO A SMOOTH LEVEL SURFACE TO THE ELEVATION SHOWN ON THE PLANS.
- (E) SPREAD 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 CONTRACTOR'S EXPENSE AND AS DIRECTED BY THE ENGINEER. THE MINIMUM QUALITY OF THE FILL CONCRETE SHALL BE CLASS D.
- (F) IN THE INSTALLATION OF ANCHOR BOLTS FOR BRIDGE BEARINGS, LIGHTING STANDARDS AND EXPRESSWAY BRIDGE SIGN STRUCTURES, THE CONTRACTOR SHALL PROVIDE RIGID TEMPLATES TO MAINTAIN THE PROPER LOCATIONS AND SHALL PROTECT SUCH ANCHOR BOLTS AT ALL TIMES DURING THE PERIOD OF CONSTRUCTION. METHODS SHALL BE APPROVED BY THE ENGINEER.
- (G) EXCEPT AS OTHERWISE NOTED, ALL VERTICAL DIMENSIONS ARE MEASURED PLUMB.

9. GENERAL
- (A) ALL ITEMS NOTED INCIDENTAL WILL NOT BE PAID FOR SEPARATELY.
- (B) THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITY LINES AND NOTIFY THE RESPECTIVE OWNERS BEFORE COMMENCING THE WORK OF EXCAVATION OR THE DRIVING OF PILES, INCLUDING ANY TEMPORARY PILING OR SHEETING.
- (C) ALL STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION UNLESS OTHERWISE NOTED.
- (D) CONSTRUCTION JOINTS MAY BE RELOCATED OR ADDITIONAL ONES ADDED SUBJECT TO THE APPROVAL OF THE ENGINEER.
- (E) UNLESS OTHERWISE NOTED, ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 3/4" x 3/4".
- (F) 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.
- (G) FOR ELECTRICAL CONDUIT LOCATION DETAILS SEE ELECTRICAL DRAWINGS.

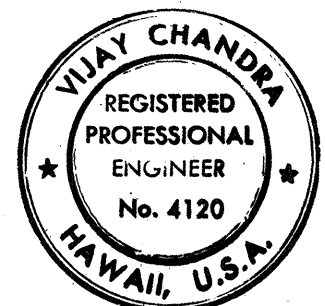
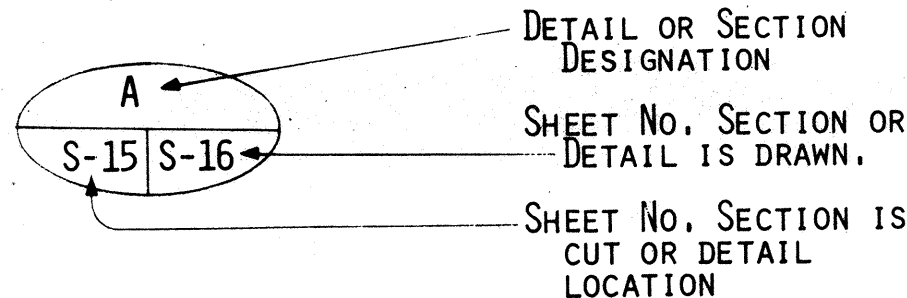
10. FOUNDATION:
- (A) DESIGN LOAD* FOR ALL PILES = TONS, UNLESS OTHERWISE SPECIFIED.
- (B) FOR BORING LOGS AND THEIR LOCATION SEE SHEET NOS. B-1, B-2, ETC.
- (C) THE ESTIMATED PILE TIP ELEVATIONS SHOWN ON THE PLANS ARE BASED ON BORING DATA.
- (D) IN DRIVING EACH GROUP OF PILES, THE CONTRACTOR SHALL START FROM CENTER OF THE GROUP AND PROCEED OUTWARDS, EXCEPT FOR TEST PILES AND LOAD TEST PILES.
- (E) THE CONTRACTOR SHALL VERIFY THE TYPE OF SURFACE SOIL BEFORE STARTING TO DRIVE ANY PILE. WHERE THERE IS A SURFACE CRUST, A TEMPORARY STEEL SLEEVE SHALL BE USED TO PROTECT THE BITUMEN COATING ON PILES. THE SLEEVE SHALL EXTEND THROUGH THE DEPTH OF THE CRUST. THE SLEEVE SHALL BE REMOVED AFTER THE PILE IS DRIVEN AND THE ANNULAR SPACE AROUND THE PILE SHALL BE BACKFILLED AS SPECIFIED IN THE SPECIAL PROVISIONS.

* DESIGN LOAD FOR PILES EXCLUDES PILE WEIGHT AND ESTIMATED DOWNDRAG.

11. REFERENCES:
- (A) FOR PRESTRESSED CONCRETE NOTES, SEE DRAWINGS FOR PRESTRESSED BEAM DETAILS.
- (B) FOR SIGN STRUCTURE NOTES, SEE DRAWING NO. ES-1.
- (C) FOR ADDITIONAL PILE NOTES SEE DRAWING NO. SD-10.

12. SYMBOLS AND ABBREVIATIONS

(E) OR (EXP.)	- EXPANSION	O.C.	- ON CENTERS
(H)	- HINGE	O/S	- OFFSET
ALT.	- ALTERNATE	STR.	- STRAIGHT OR STRINGER
AZ.	- AZIMUTH	STIRR.	- STIRRUP
CL	- CENTERLINE	TYP.	- TYPICAL
B	- BASELINE	(T) OR T.	- TOP
E.F.	- EACH FACE	(B) OR B.	- BOTTOM
B.F.	- BOTH FACES	BRG.	- BEARING
F.F.	- FAR FACE	T.O.D.	- TOP OF DECK
N.F.	- NEAR FACE	W.P.	- WORKING POINT
C.J.	- CONSTRUCTION JOINT	a	- AT
CL.	- CLEAR	Ø OR DIA.	- DIAMETER
EL., ELEV.	- ELEVATION	P	- PLATE
E.P.	- EDGE OF PAVEMENT		
EB	- EAST BOUND		
FIN. GR.	- FINISHED GRADE		
WB	- WEST BOUND		
INV.	- INVERT		
JT.	- JOINT		
N.T.S.	- NOT TO SCALE		



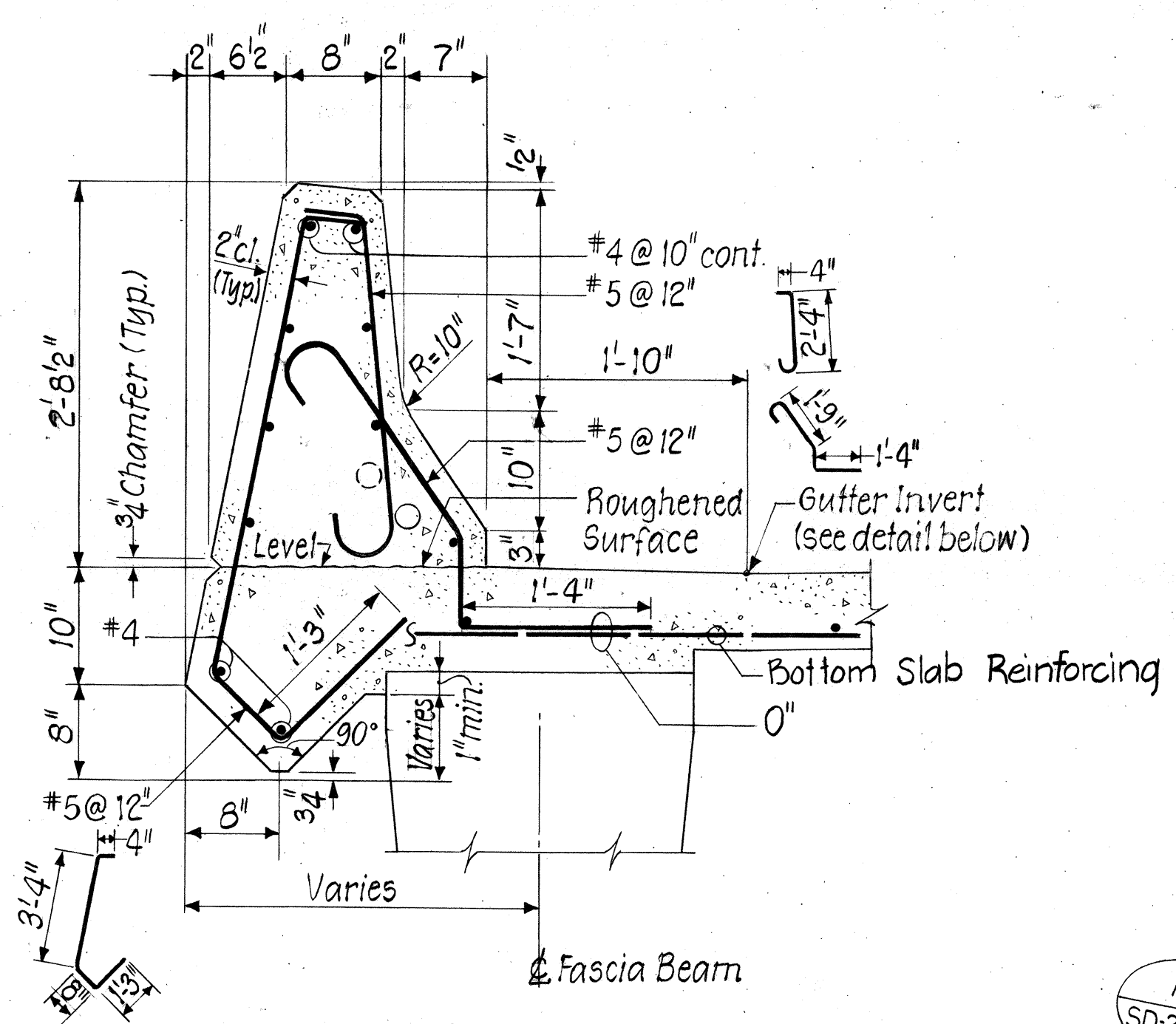
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.
Jaiy Chandra
Signature

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

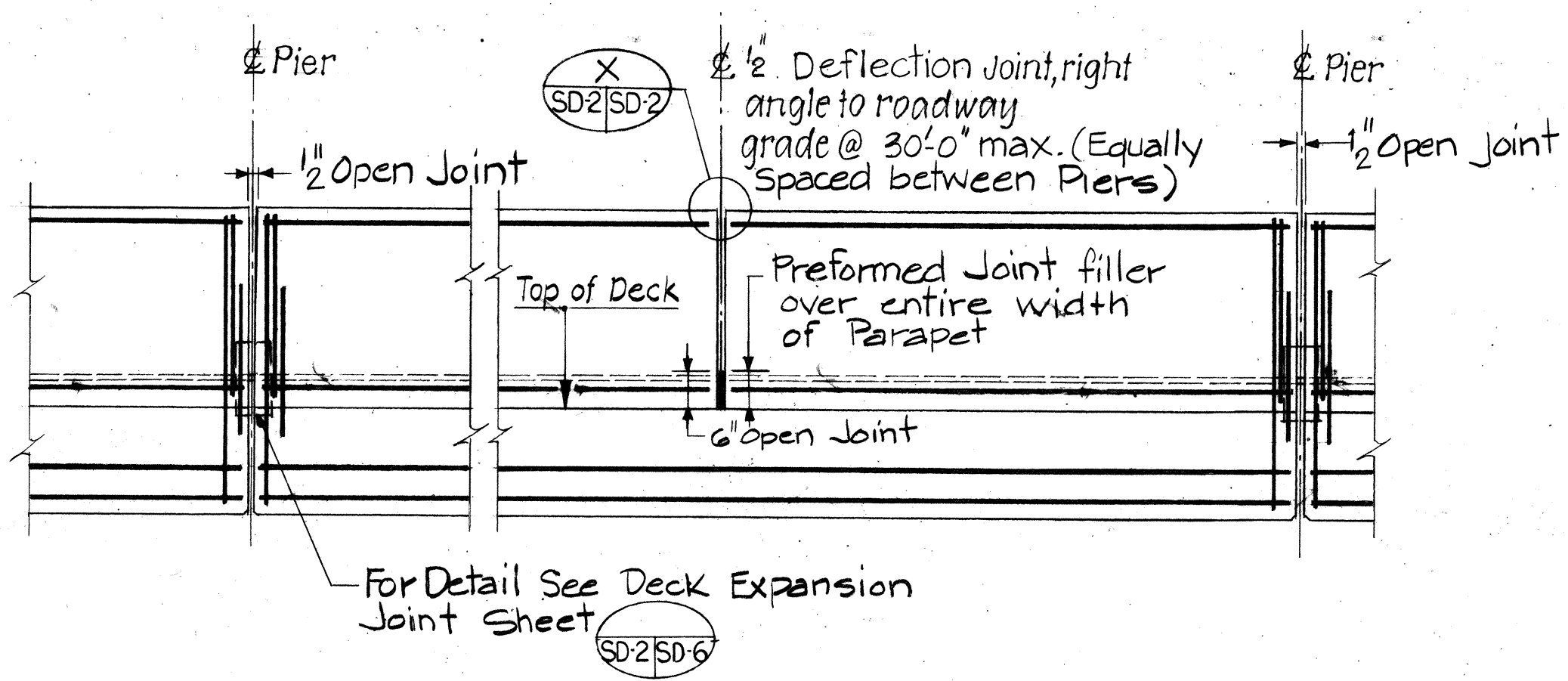
H-1 VIADUCT (EB) PART II GENERAL NOTES

AIRPORT INTERCHANGE
F.A.I. PROJECT NO. I-HI-1 (84):16
SCALE: DATE: MAY 16, 1978
SHEET NO. 7-13 OF 18 SHEETS SD-1

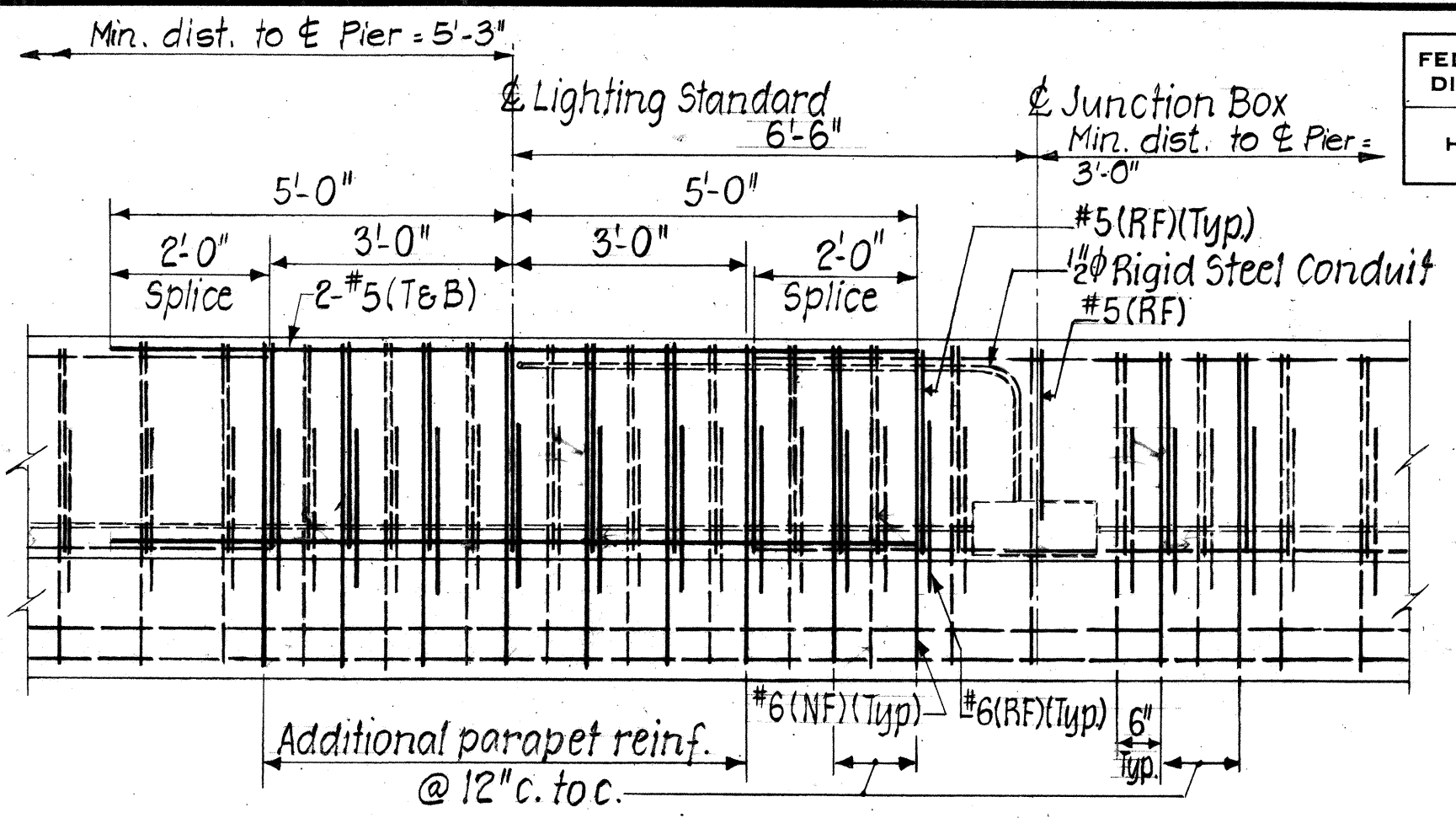
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-184:16	1978	441	466



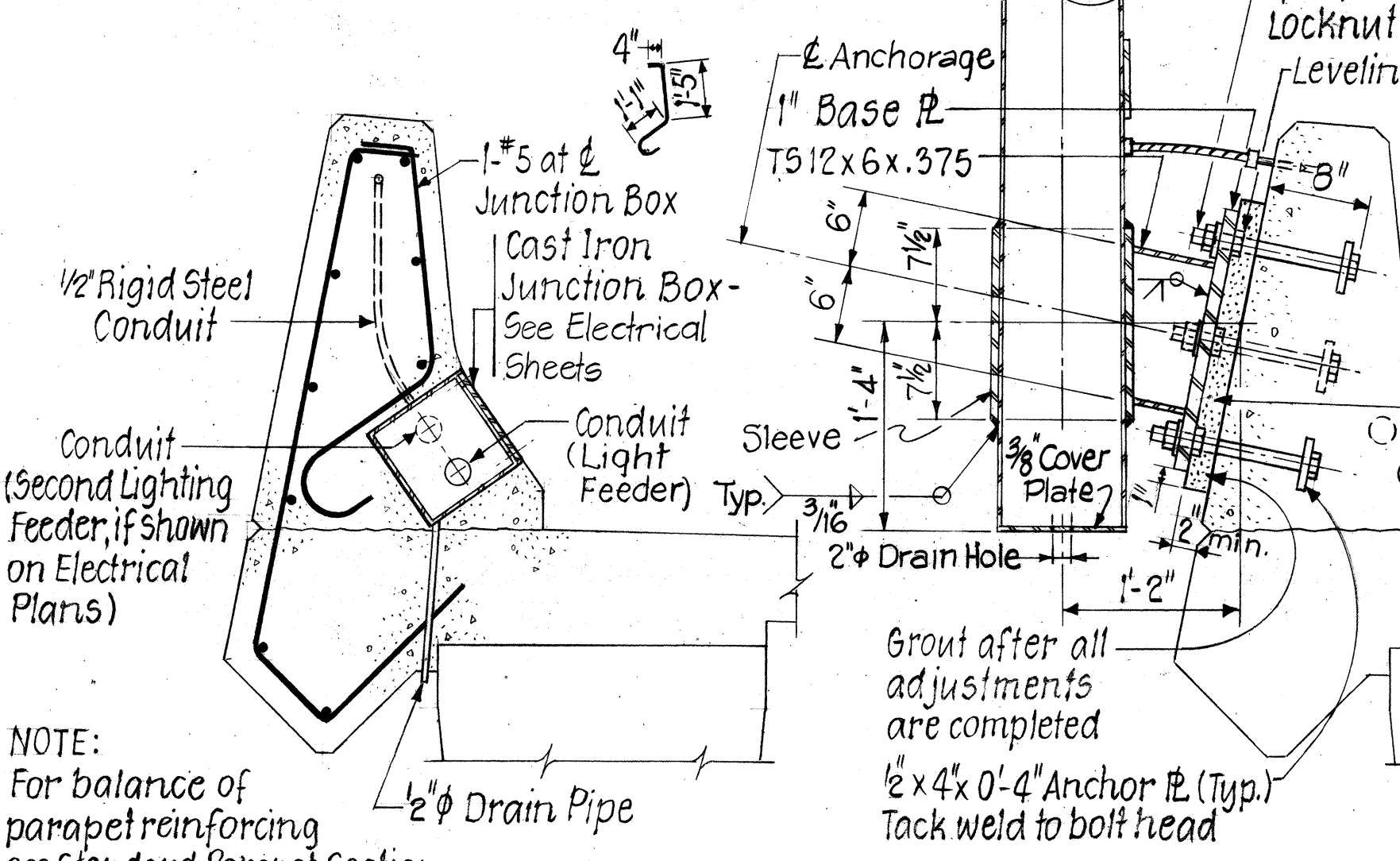
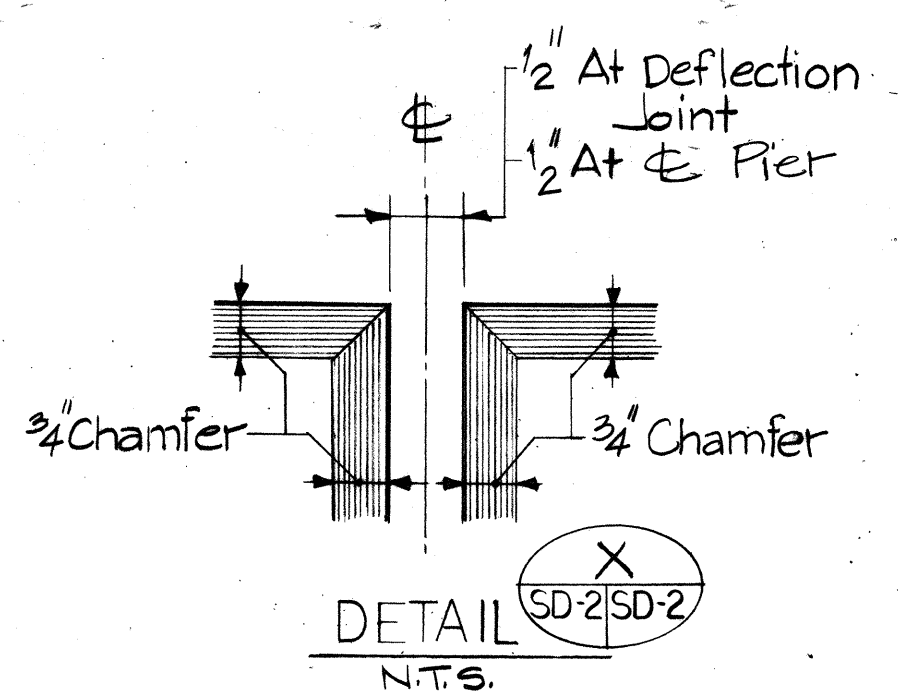
STANDARD PARAPET SECTION
Scale: 1" = 1'-0"



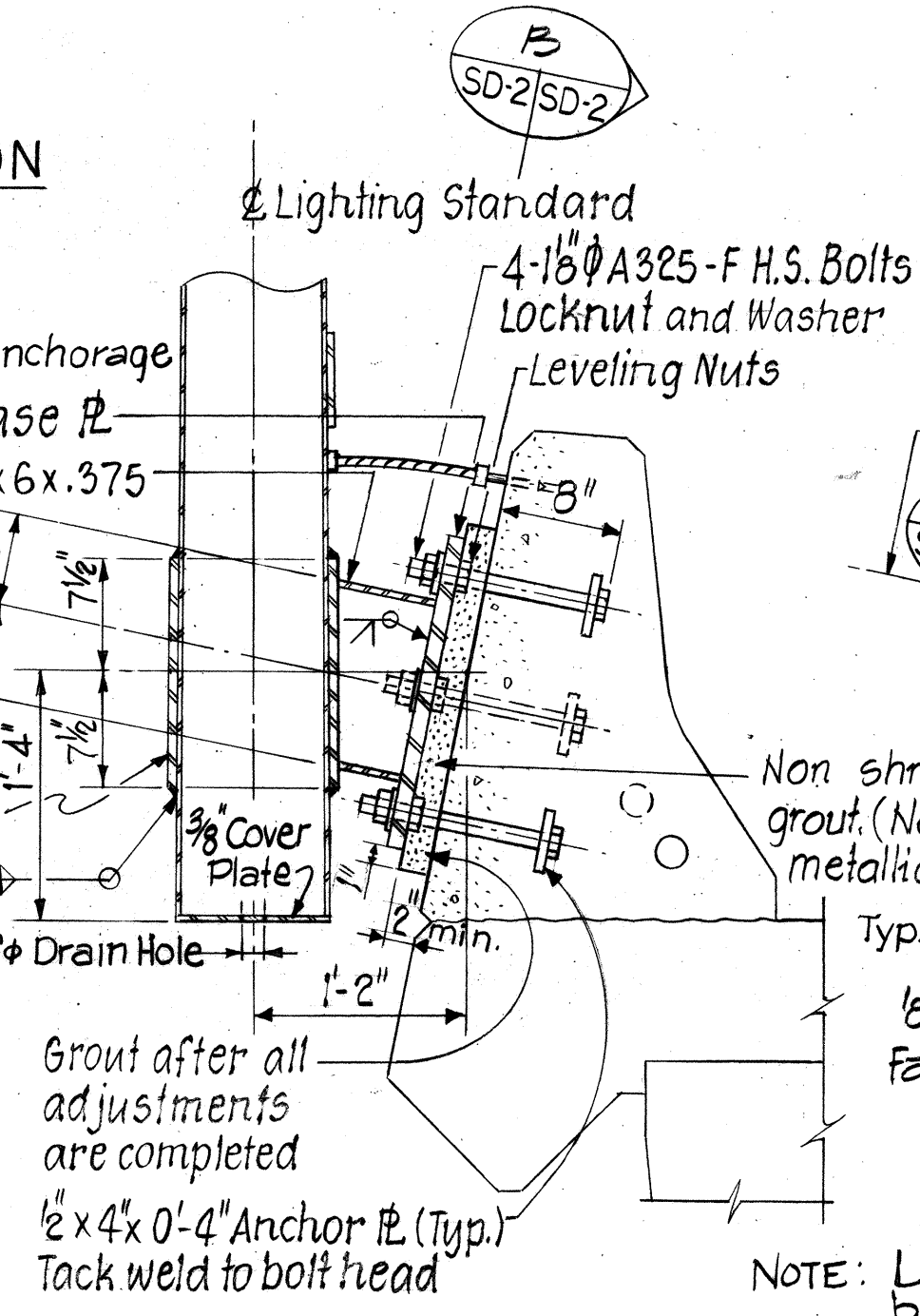
STANDARD PARAPET
TYPICAL LONGITUDINAL SECTION
Scale: 1/2" = 1'-0"



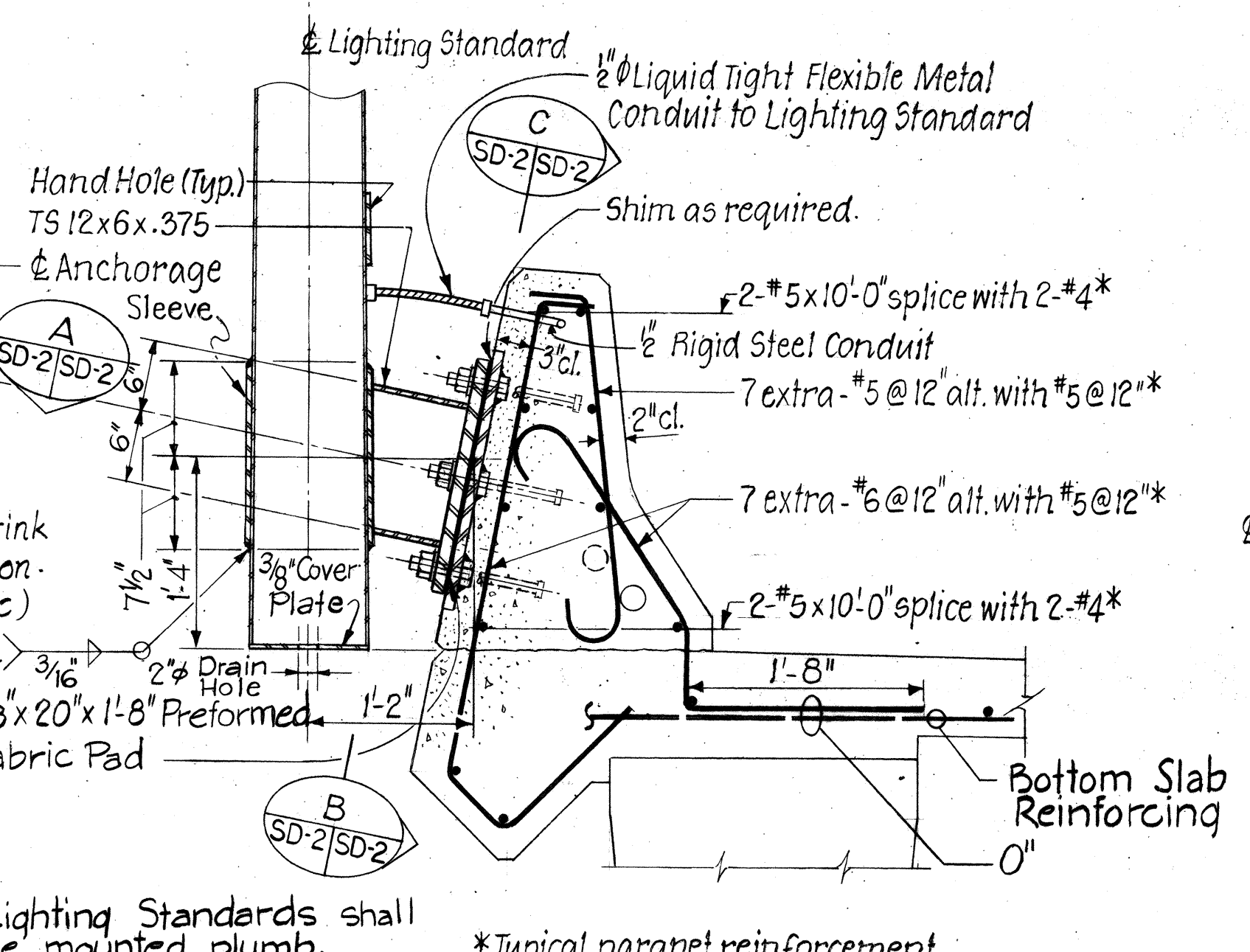
PARAPET REINF. AT LIGHTING STANDARD & JUNCTION BOX
TYPICAL LONGITUDINAL SECTION
Scale: 1/2" = 1'-0"



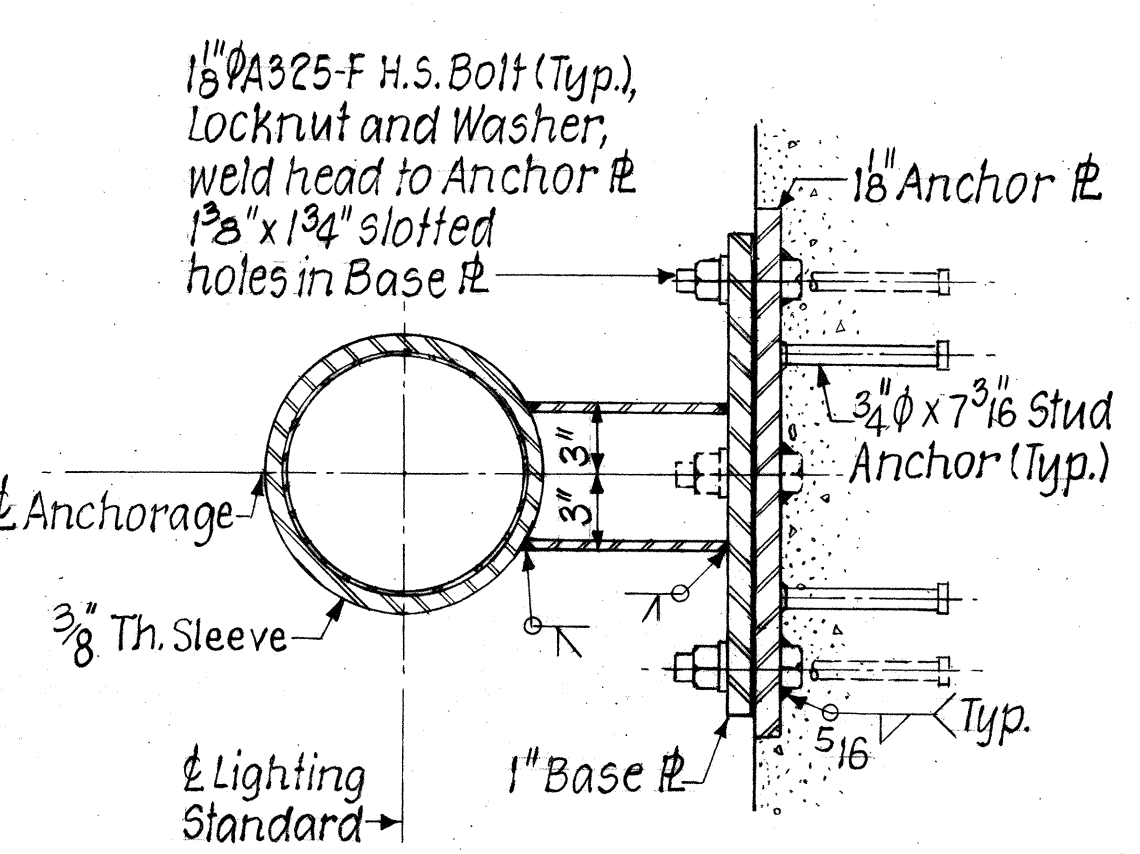
PARAPET DETAIL AT JUNCTION BOXES
Scale: 1" = 1'-0"



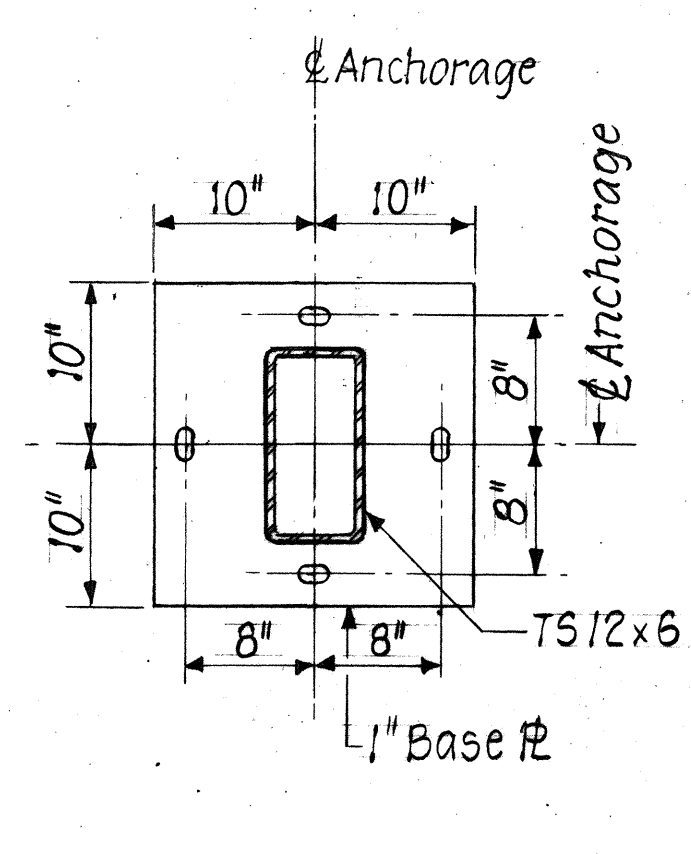
ALTERNATE METHOD
LIGHTING STANDARD ATTACHMENT
Scale: 1" = 1'-0"



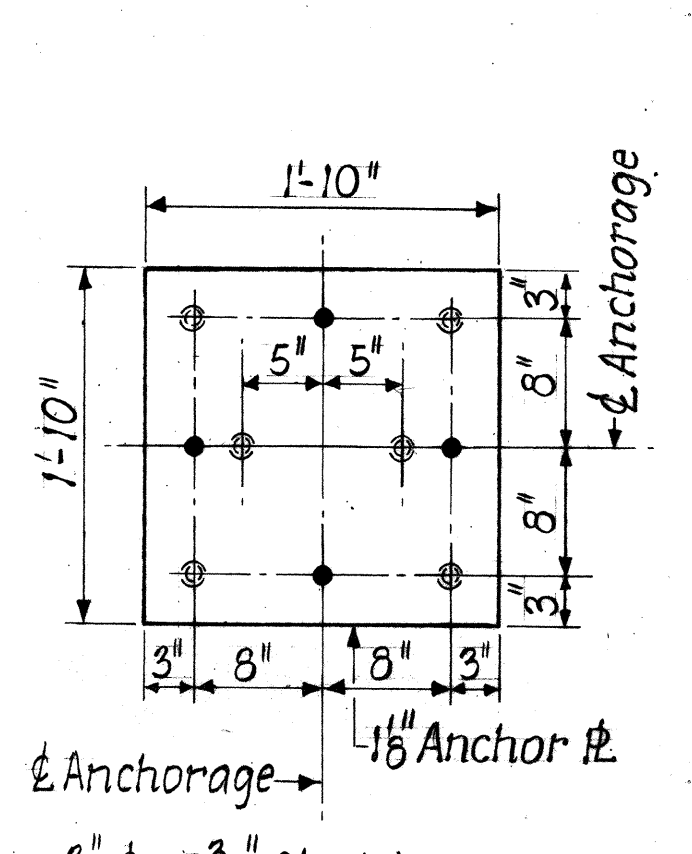
PARAPET DETAIL AT LIGHTING STANDARD
Scale: 1" = 1'-0"



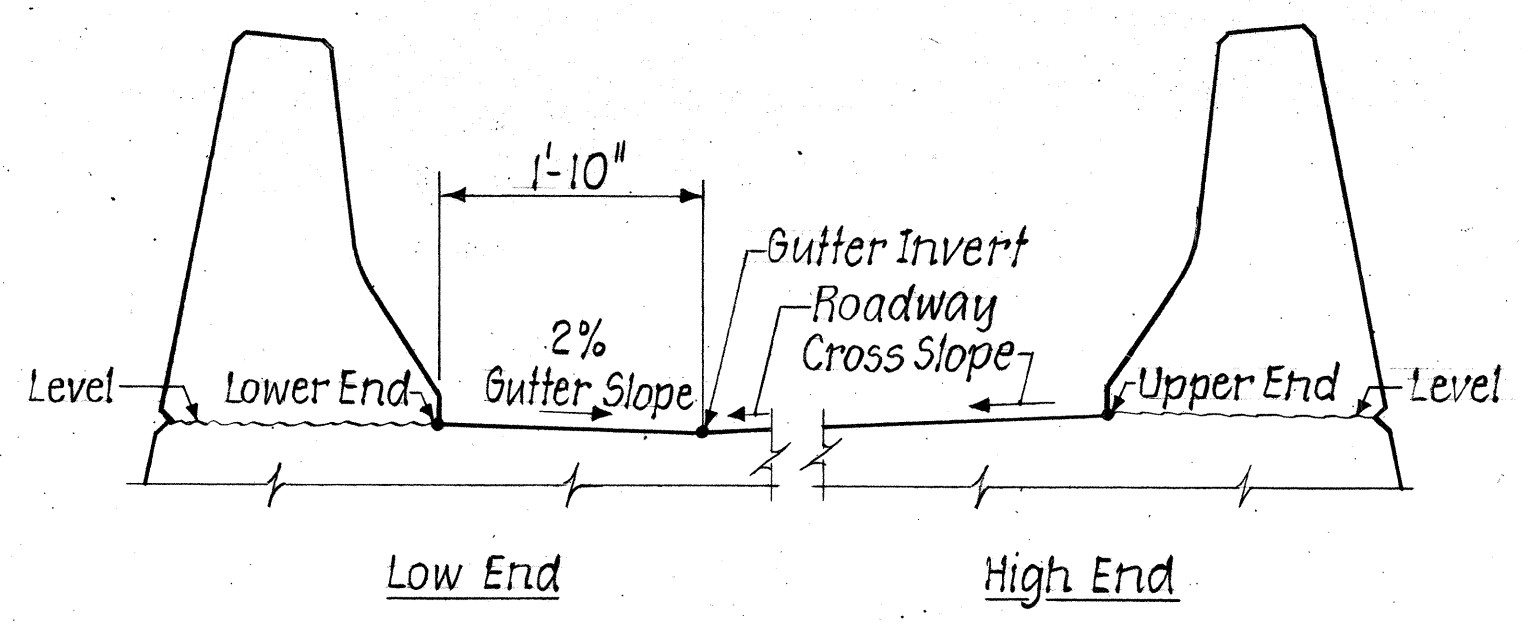
SECTION A
Scale: 1/2" = 1'-0"



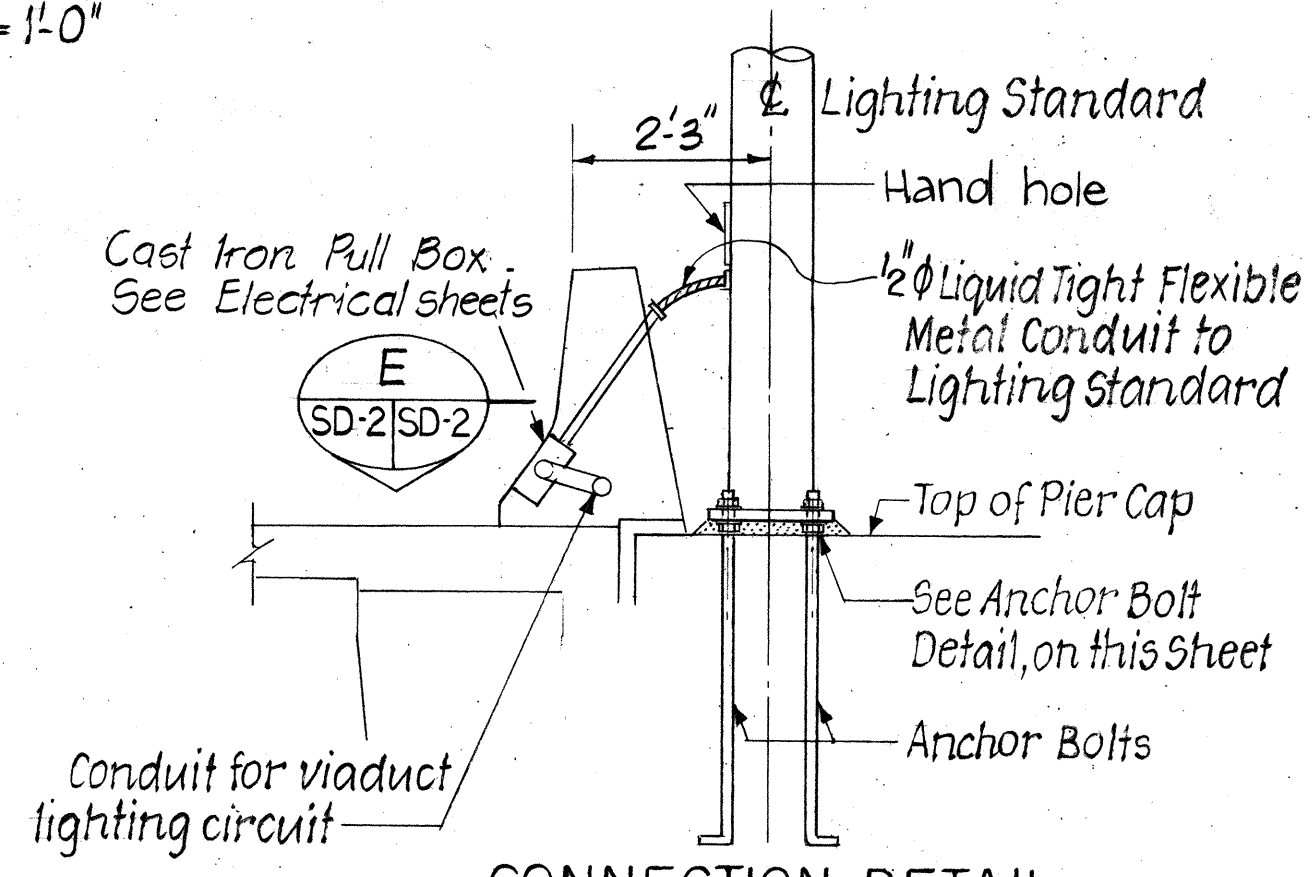
SECTION B
Scale: 1" = 1'-0"



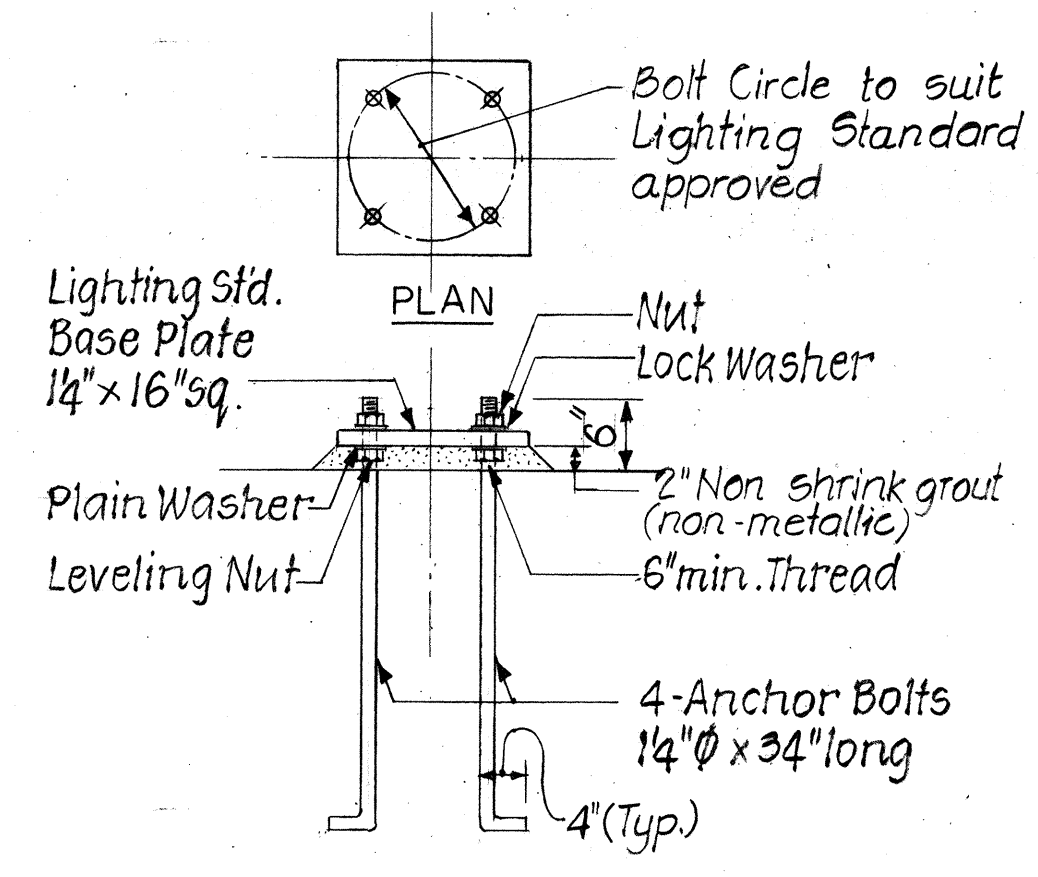
SECTION C
Scale: 1" = 1'-0"



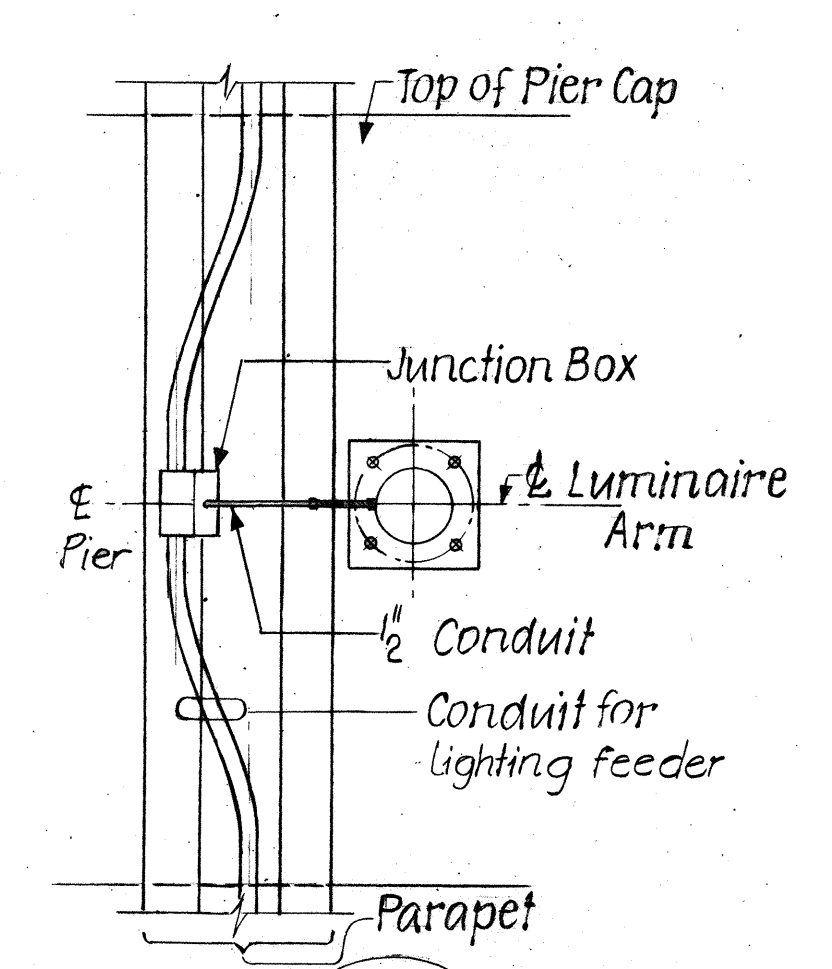
TYPICAL CROSS SLOPE DETAIL FOR DRAINAGE
Scale: 3/4" = 1'-0"



CONNECTION DETAIL
Scale: 1/2" = 1'-0"

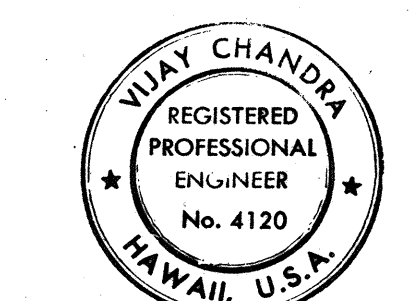


PIER MOUNTED LIGHTING STANDARD
Scale: 3/4" = 1'-0"



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

NOTE: Anchorage system for Lighting Standard shall be hot-dip galvanized.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

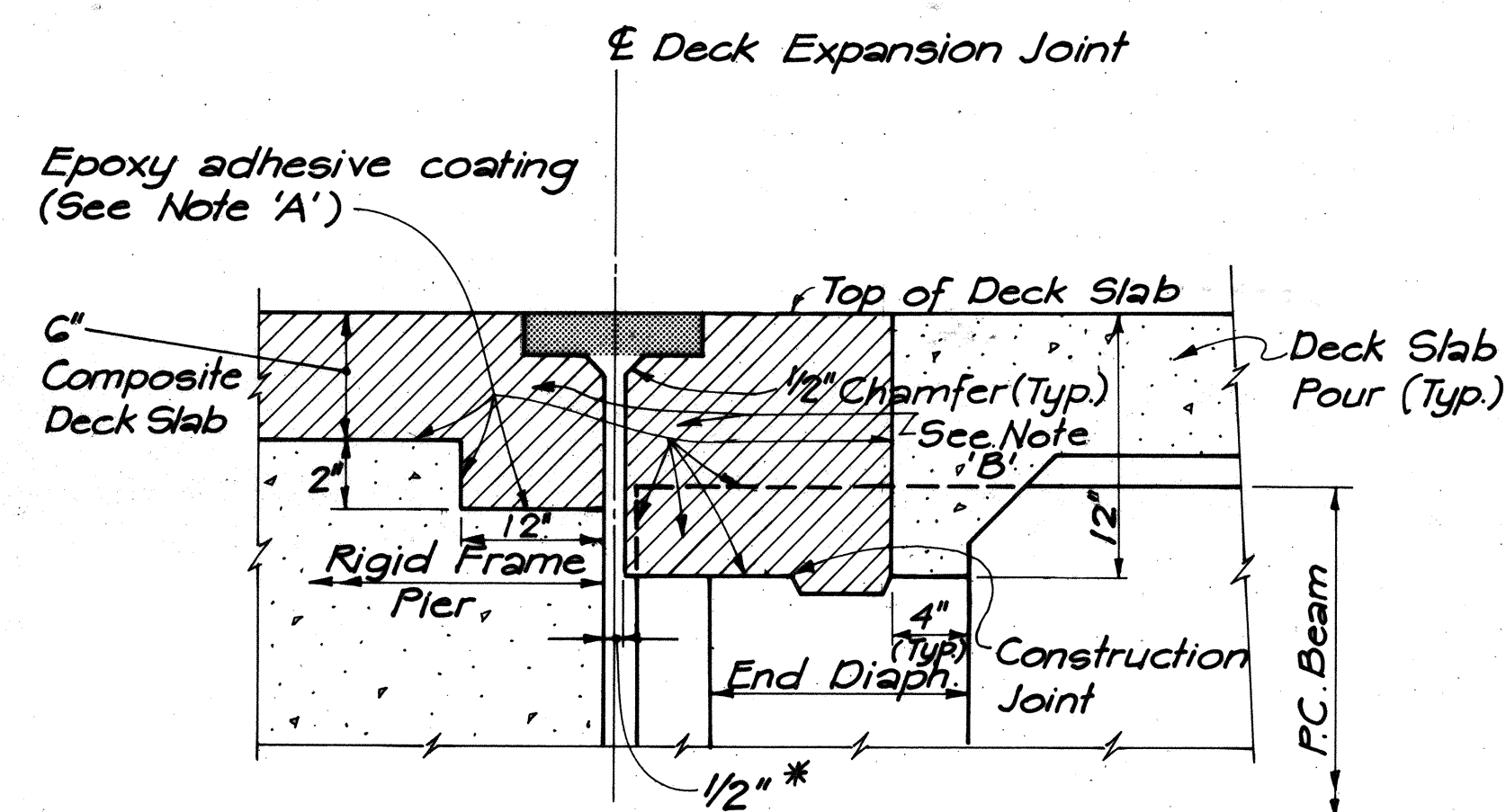
H-1 VIADUCT (EB) PART II

STANDARD PARAPET DETAILS

AIRPORT INTERCHANGE
F.A.J. PROJECT NO. 1-HI-1(84):16
SCALE: AS SHOWN DATE: MAY 16, 1978

SHEET No. T-14 OF 18 SHEETS SD-2

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-(84)16	1978	442	466

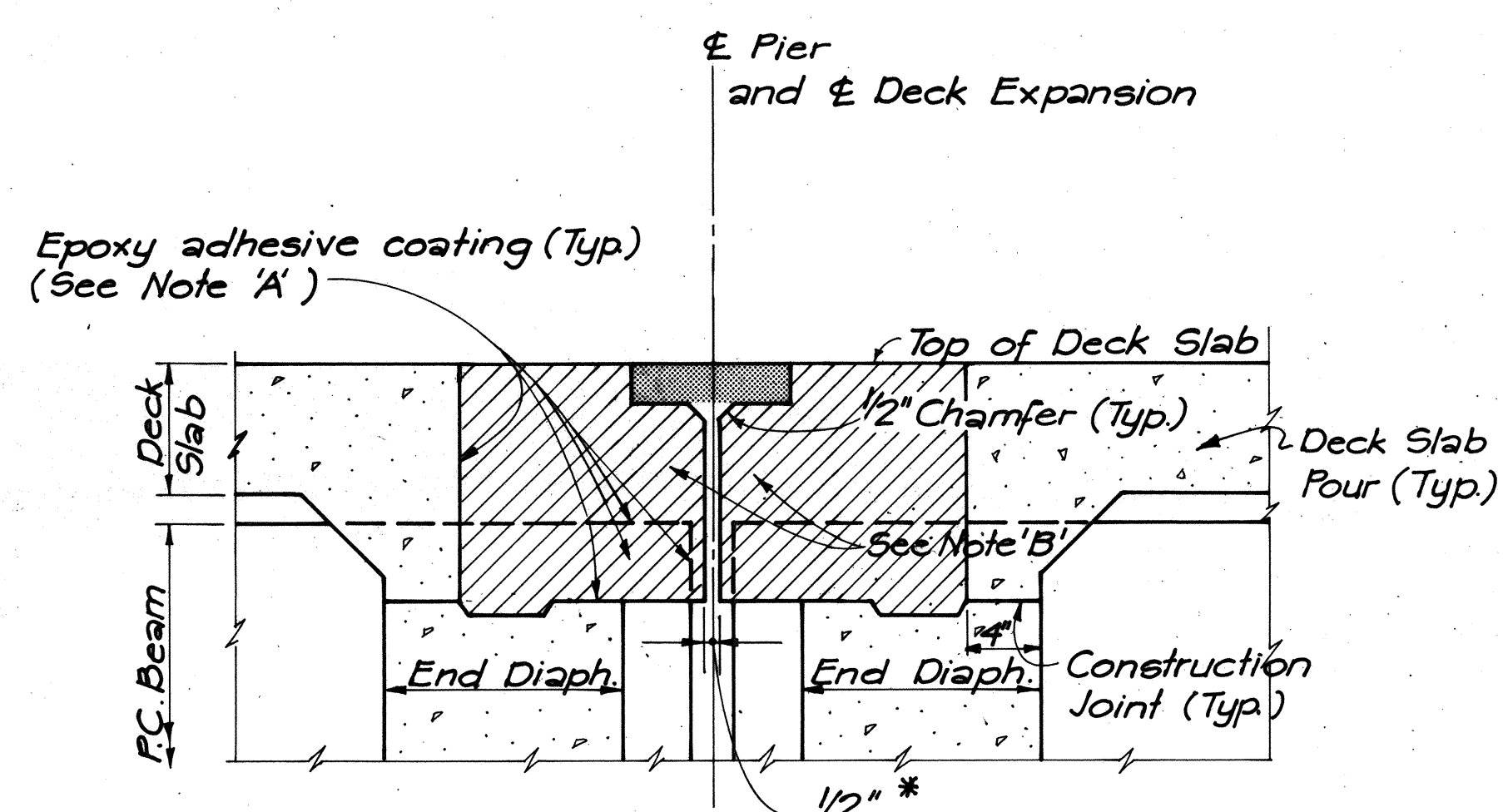


TYPICAL DECK SECTION AT RIGID FRAME
N.T.S.

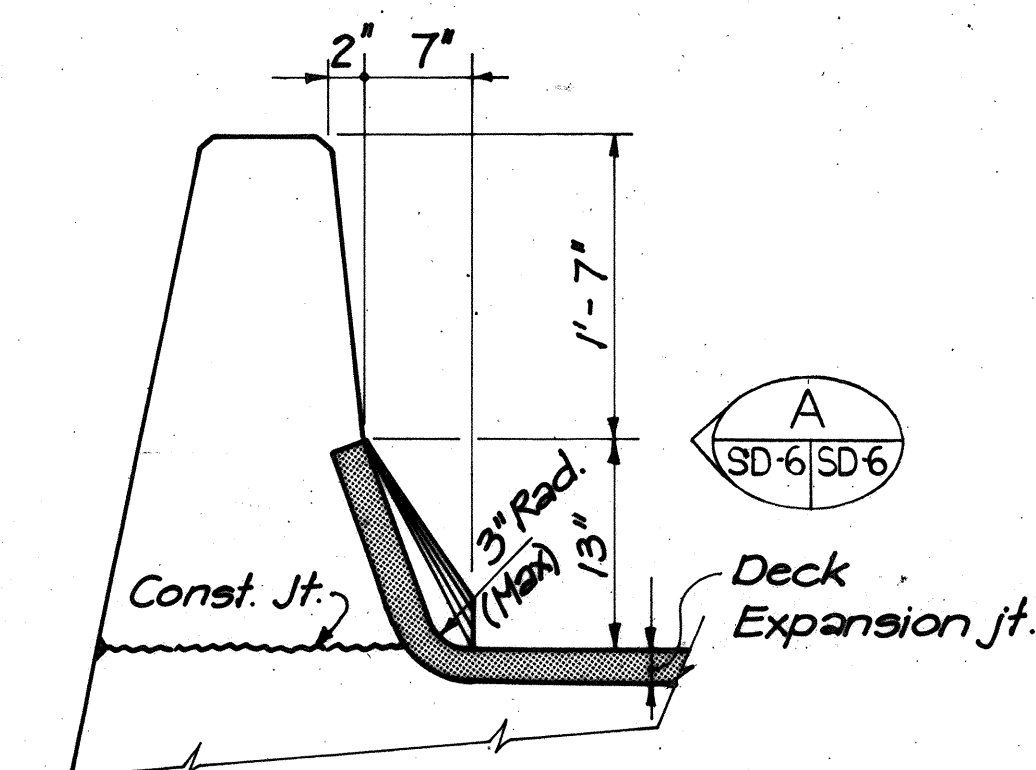
NOTE 'A': Just prior to concreting of the hatched areas, coat the indicated surfaces with an epoxy adhesive. (See Special provision Sec.705.13)

NOTE 'B': Hatched Areas shall be concreted after 28 days of deck slab pour. Anchor devices shall be located and held in their final position, as per Manufacturer's requirement, during the concreting of the hatched areas.

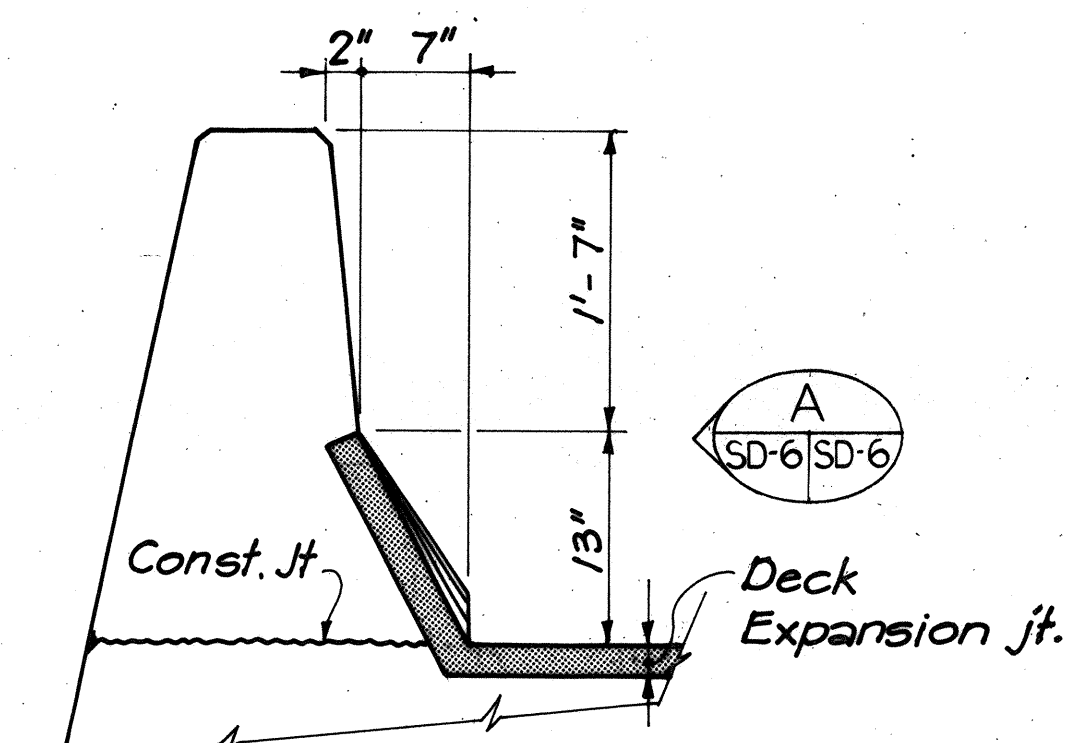
* Joint opening at time of installation of joint joint to be formed by Premolded filler.



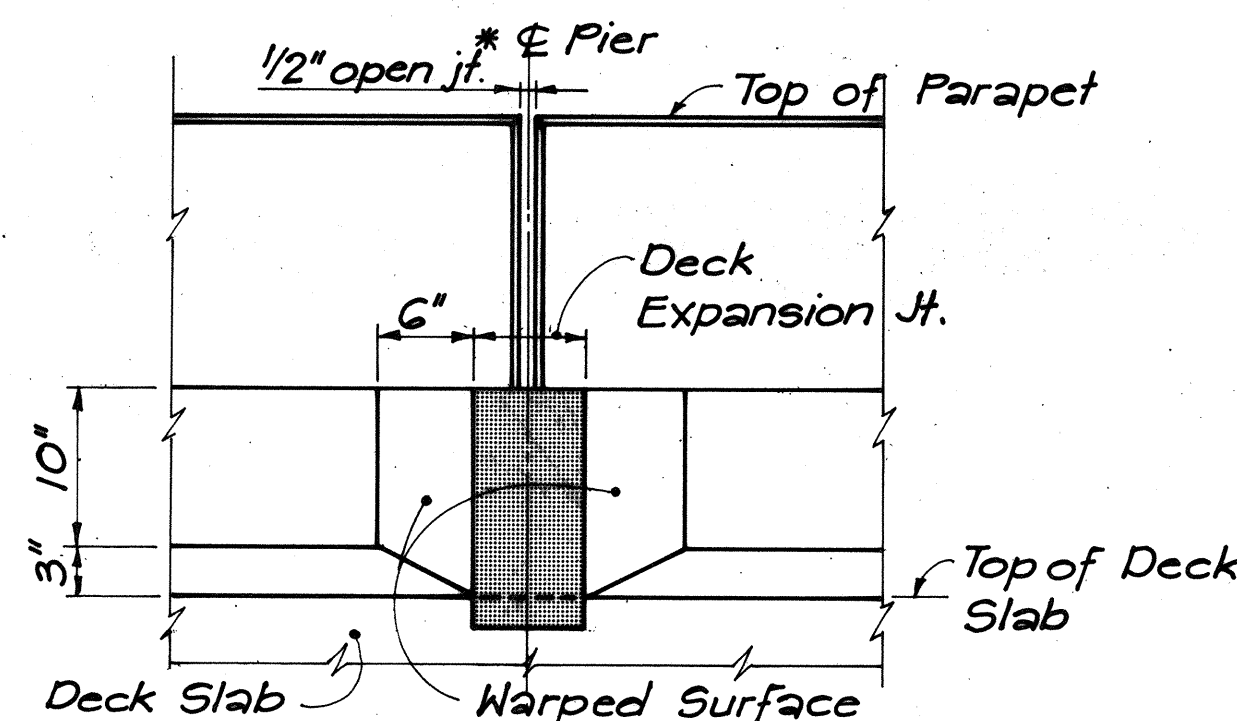
TYPICAL DECK SECTION
(AT ALL PIERS EXCEPT RIGID FRAMES)
N.T.S.



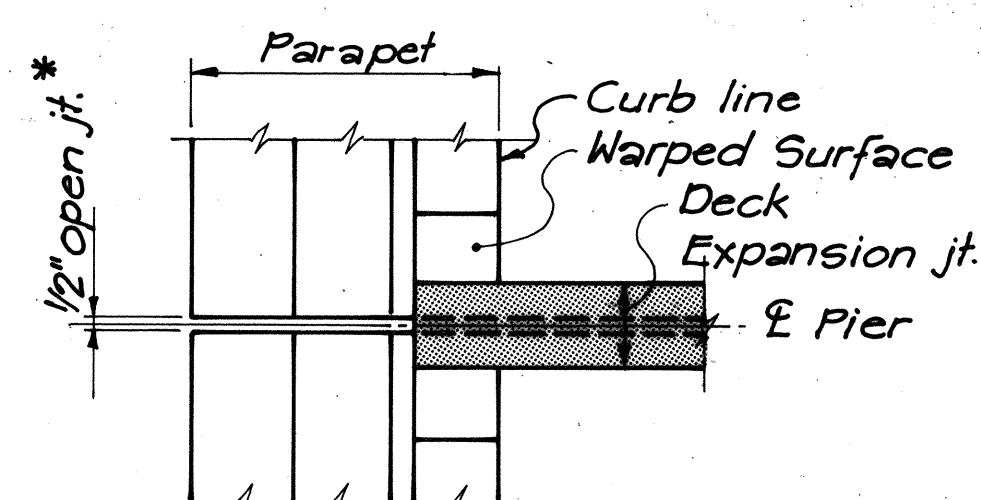
TYPICAL SECTION AT STANDARD PARAPET



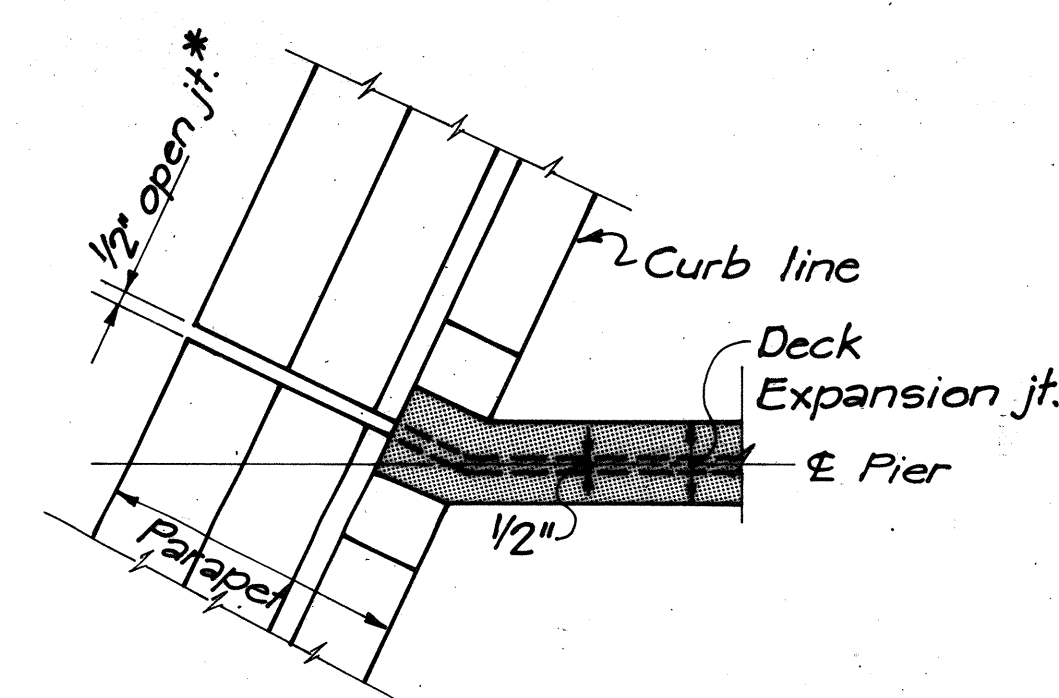
ALTERNATE DETAIL AT PARAPET
N.T.S.



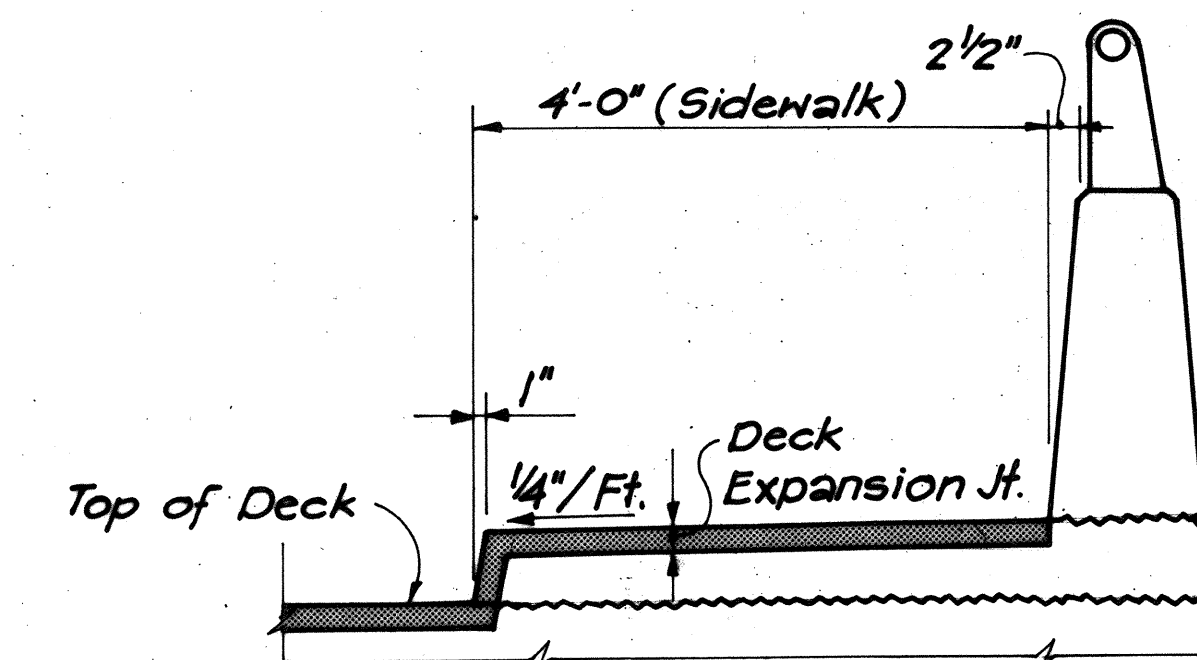
VIEW A
N.T.S. SD-6/SD-6



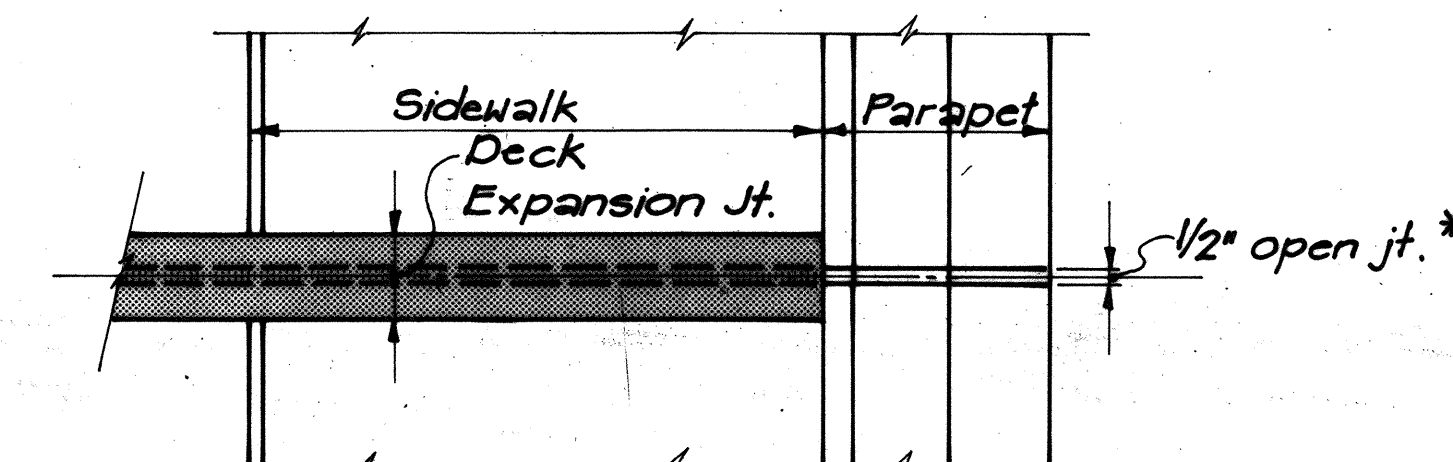
TYPICAL PLAN - SKEW ANGLE = 0°-15°
N.T.S.



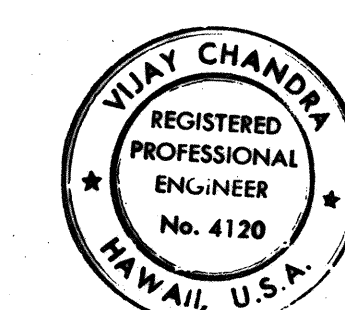
TYPICAL PLAN - SKEW ANGLE = OVER 15°
N.T.S.



TYPICAL SECTION AT SIDEWALK PARAPET
N.T.S.



TYPICAL PLAN
N.T.S.



THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.
Vijay Chandra
Signature

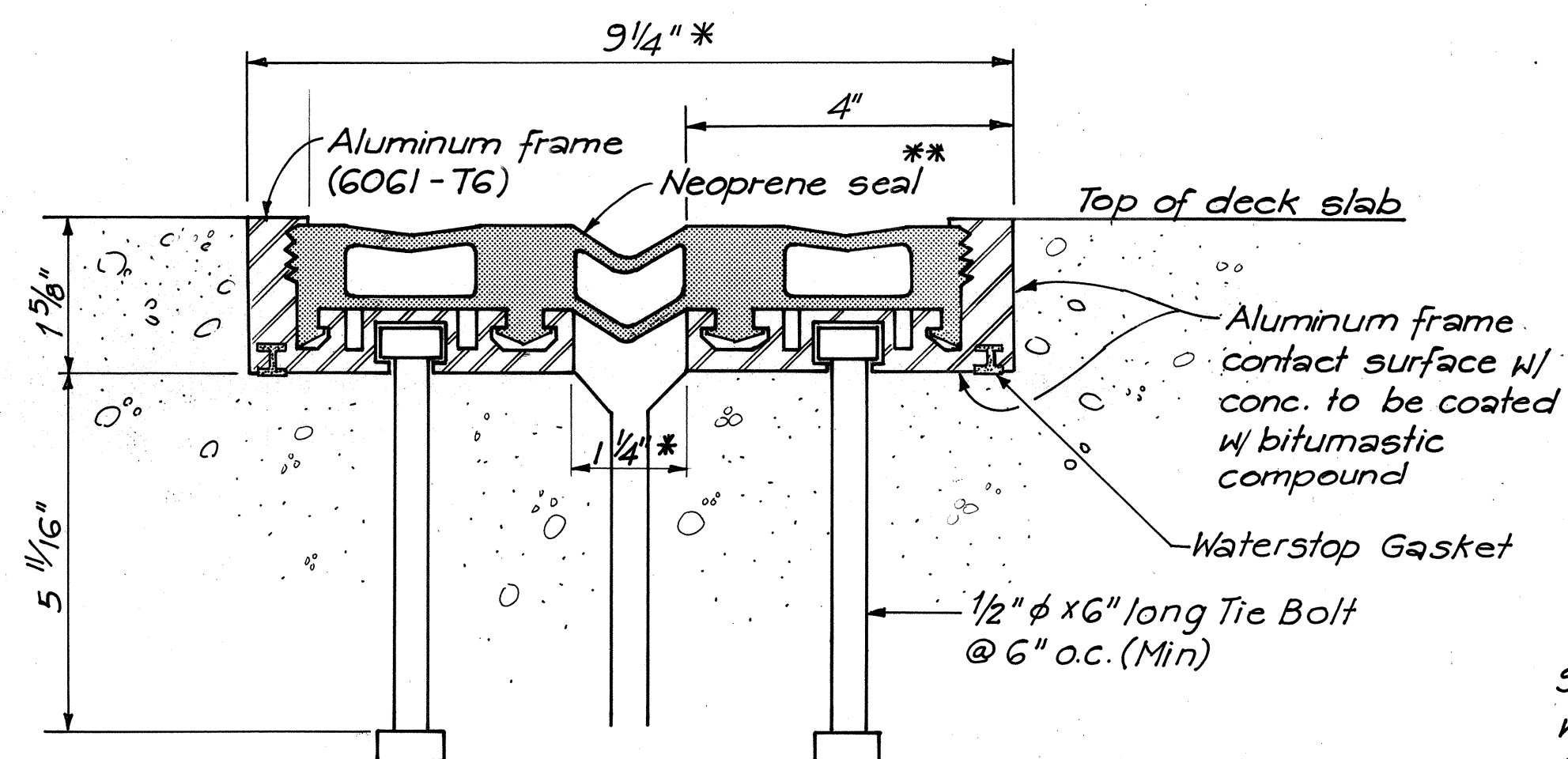
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

H-1 VIADUCT (EB) PART II
DECK EXPANSION JOINT
SHEET 1 OF 2

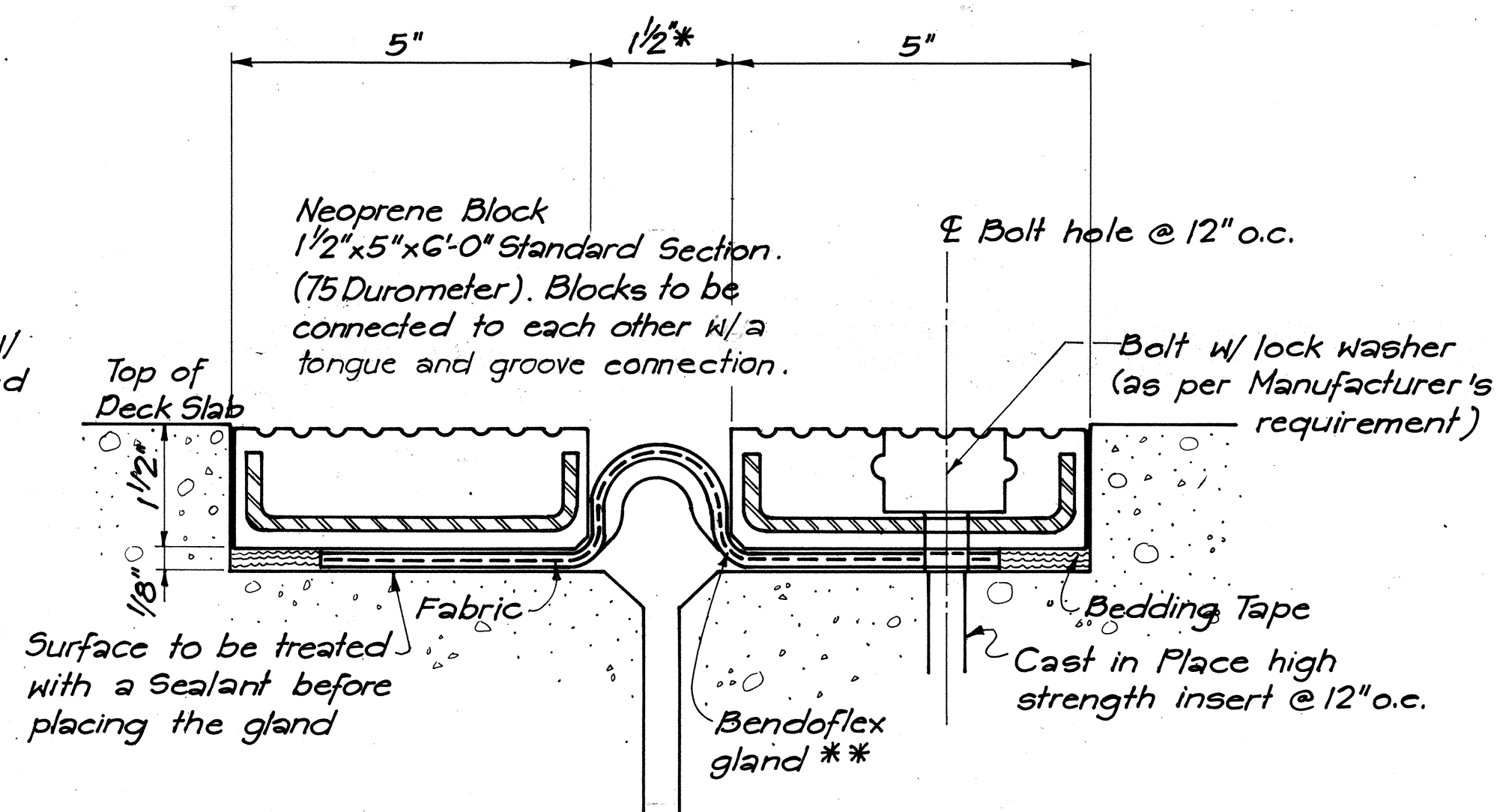
AIRPORT INTERCHANGE
F.A.I. PROJECT NO. I-HI-1 (84): 16
SCALE: DATE: MAY 16, 1978

SHEET NO. T-15 OF 18 SHEETS SD-6

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(84)16	1978	443	466

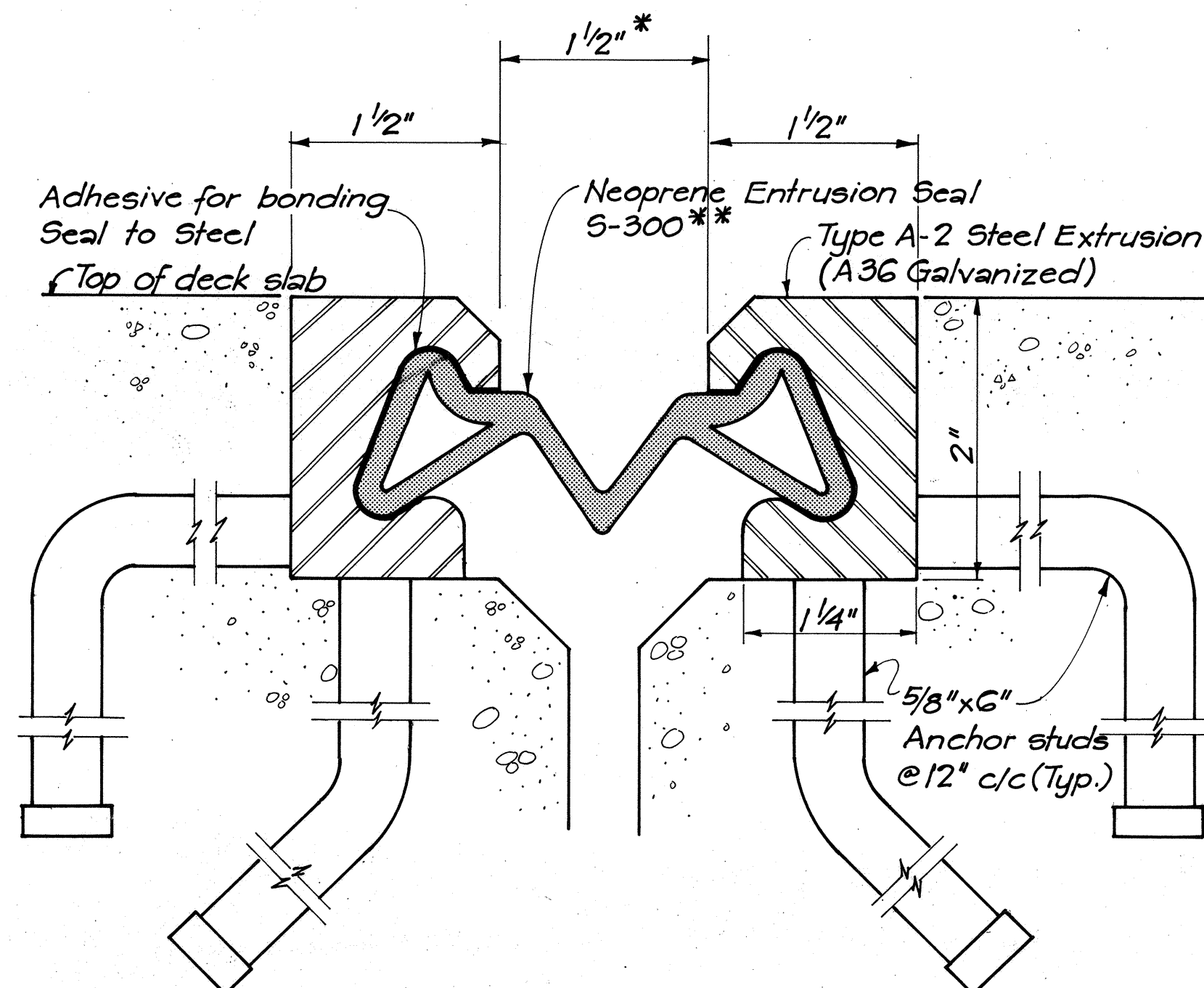


DELASTIFLEX TYPE SM 200
(Manufacturer: D.S. Brown & Co.)

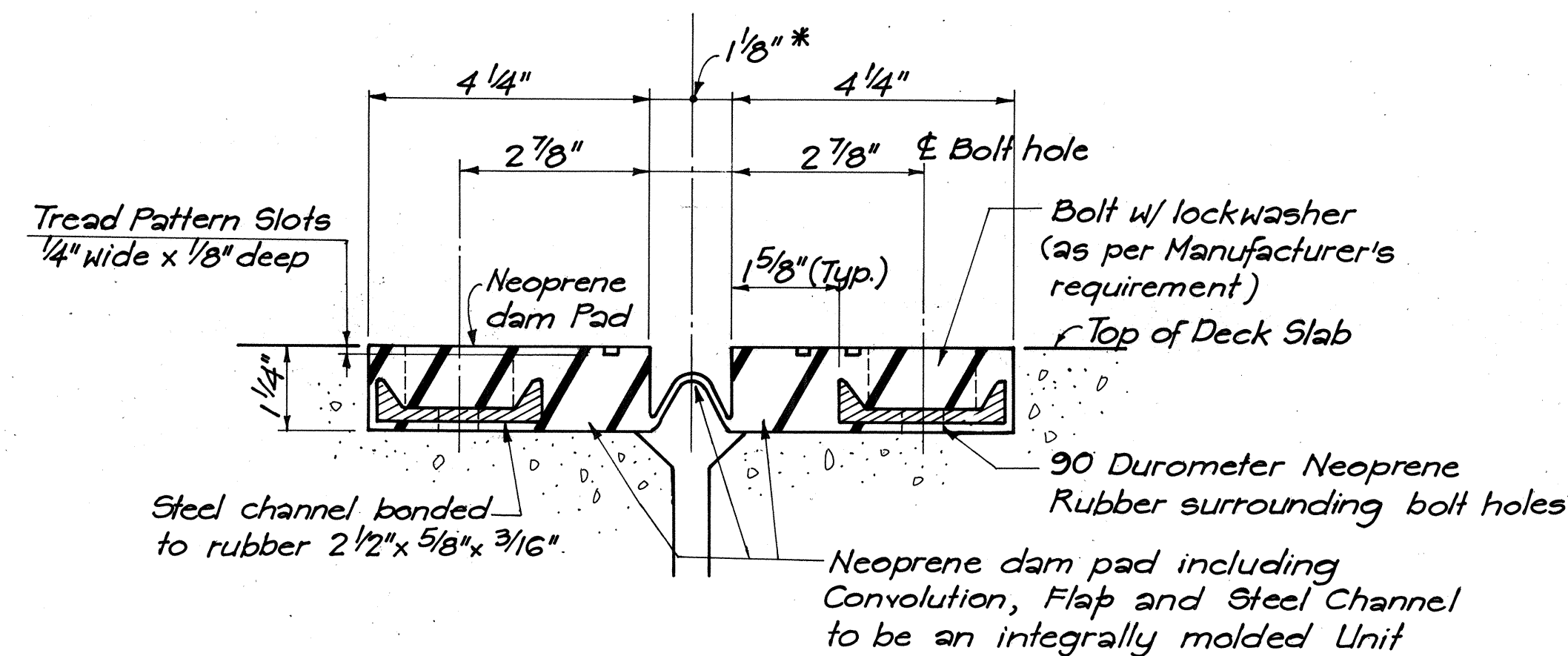


WABO BENDOFLEX SYSTEM
(Manufacturer: Watson Bowman Ass. Inc.)

* = Installation width @ 75°F
** = Seal/Gland shall be continuous across the full width of the structure



WABO-MAURER STRIP SEAL
(Manufacturer: Watson - Bowman Ass. Inc.)



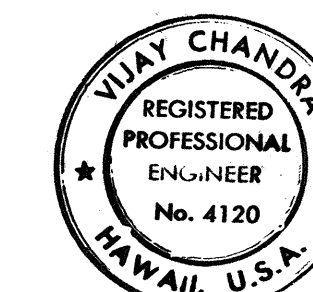
FEL-SPAN TYPE T-20
(Manufacturer: FEL-PRO Incorporated)

NOTE: The entire assembly to be factory vulcanized into 8'-0" (Min.) long units before shipping. The convolution flap between units to be lapped and field vulcanized.

NOTES

- Four alternative Deck Expansion Joint Systems are shown. Contractor has the option of selecting any one of the systems. The Contractor shall submit detailed shop drawings of the selected joint to the Engineer for approval.
- The Contractor also has the option of using an alternative Deck Expansion Joint System provided it complies with the requirements of the Plans and Specifications.

DATE	_____
SURVEY PLOTTED BY	_____
DRAWN BY	_____
NOTED BY	_____
CHECKED BY	_____



THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.
Vijay Chandra
Signature

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

H-1 VIADUCT (EB) PART II
DECK EXPANSION JOINT
SHEET 2 OF 2

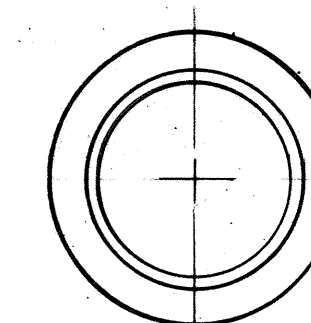
AIRPORT INTERCHANGE
F.A.I. PROJECT NO. I-HI-1(84):16
SCALE: _____ DATE: MAY 16, 1978

SHEET NO. T-16 OF 18 SHEETS SD-7

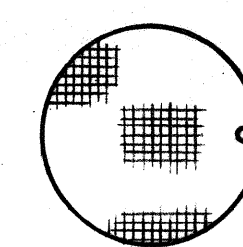
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(84):16	1978	415	466

GENERAL NOTES:

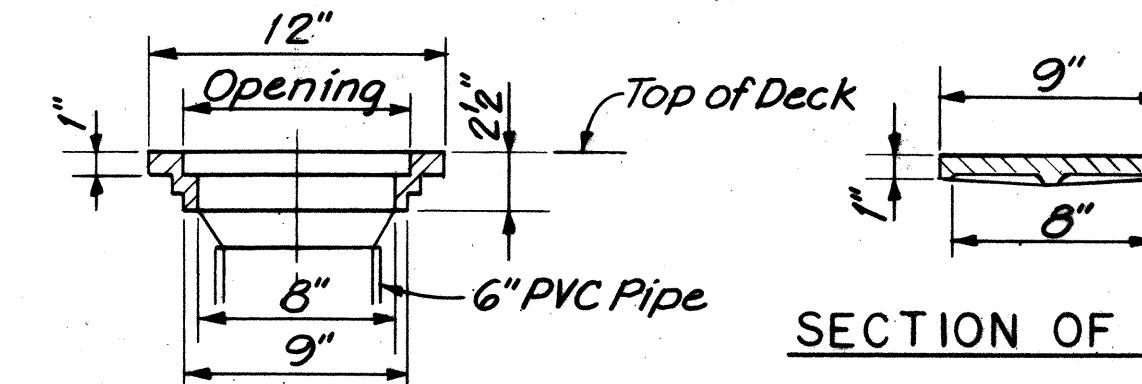
1. All Pipe Slopes shall be maximized to the greatest extent possible without extending below the bottom of the Beams.
2. All PVC Pipes shall be Type I Schedule 40.
3. Deck Drain Cleanout Metal Frame and Cover Casting shall be Ductile Iron. Designed for Highway Traffic Wheel Loads of 16,000Lbs And shall conform with ASTM Designation A 536.
4. For Location of Scuppers and Outfall Type, See General Plan(or Layout Plan) of Structure.



PLAN OF FRAME



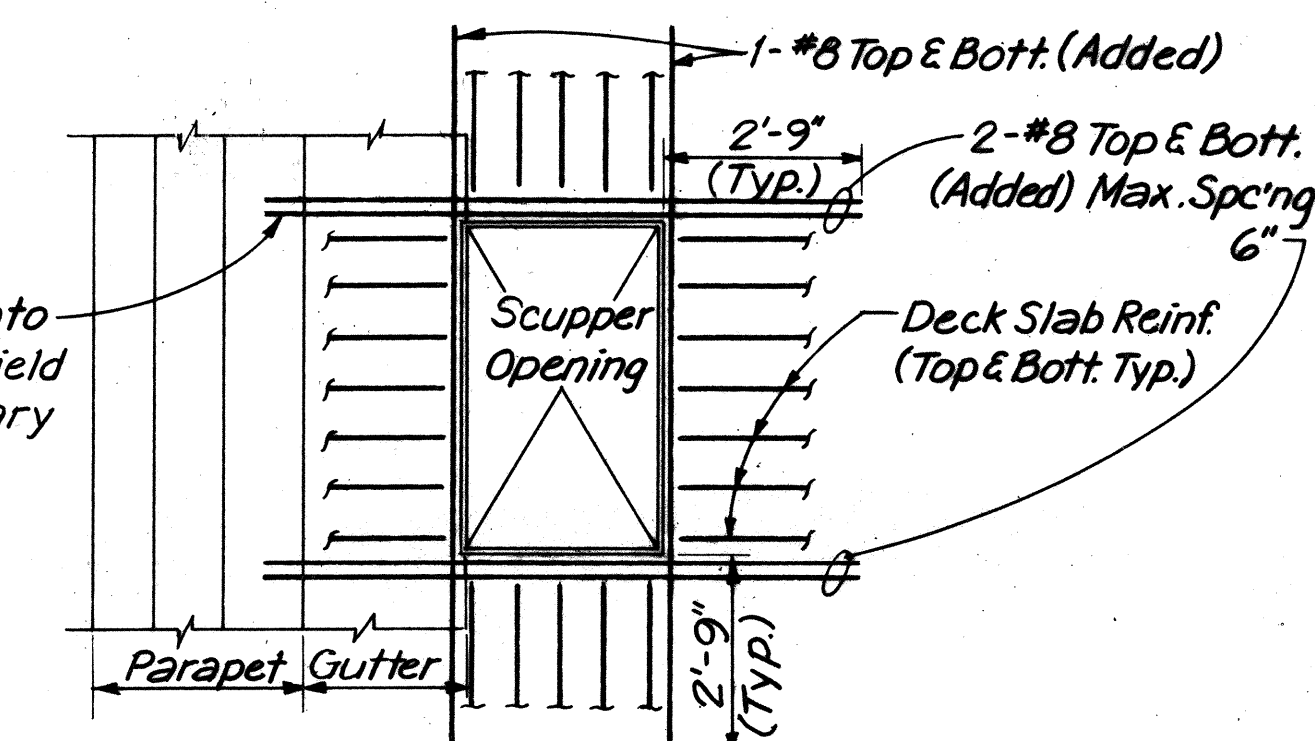
TOP VIEW OF COVER



SECTION OF COVER

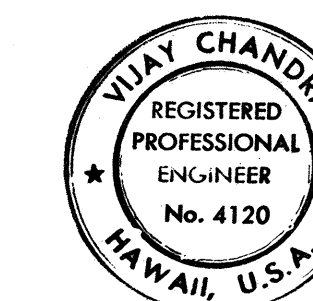
SECTION OF FRAME

TYPICAL DECK DRAIN CLEANOUT FRAME AND COVER



PLAN-SCUPPER

Bend Bar into Slab in the field as necessary



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

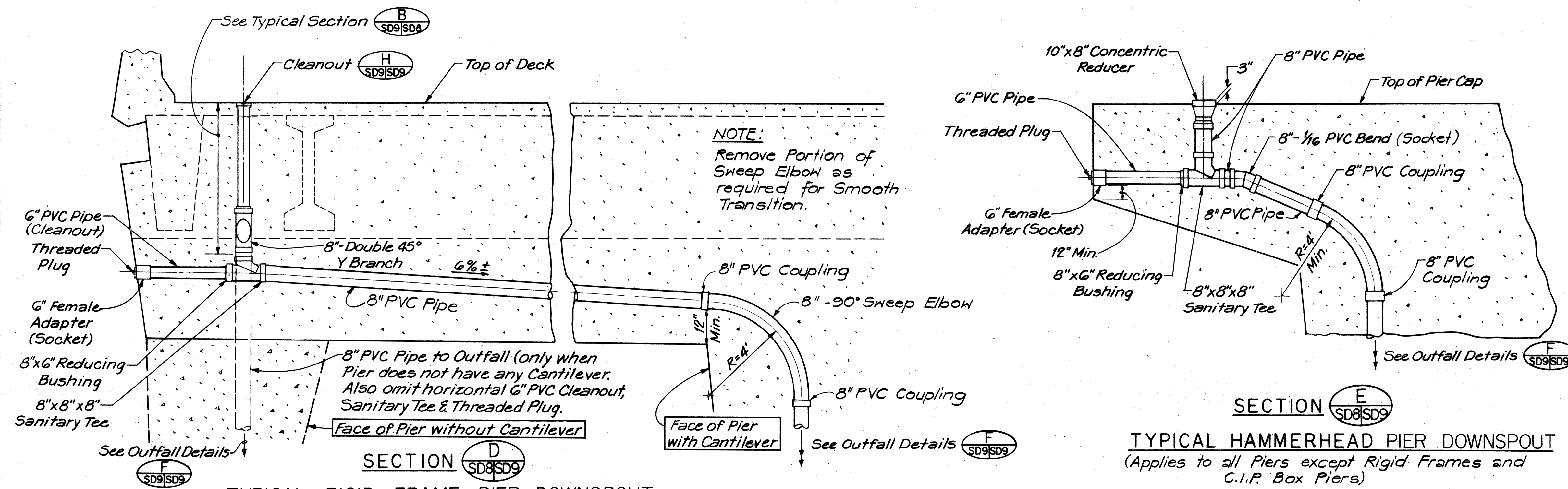
Vijay Chandra
Signature

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

H-1 VIADUCT (EB) PART II
STRUCTURE DRAINAGE DETAILS
SHEET 2 OF 2

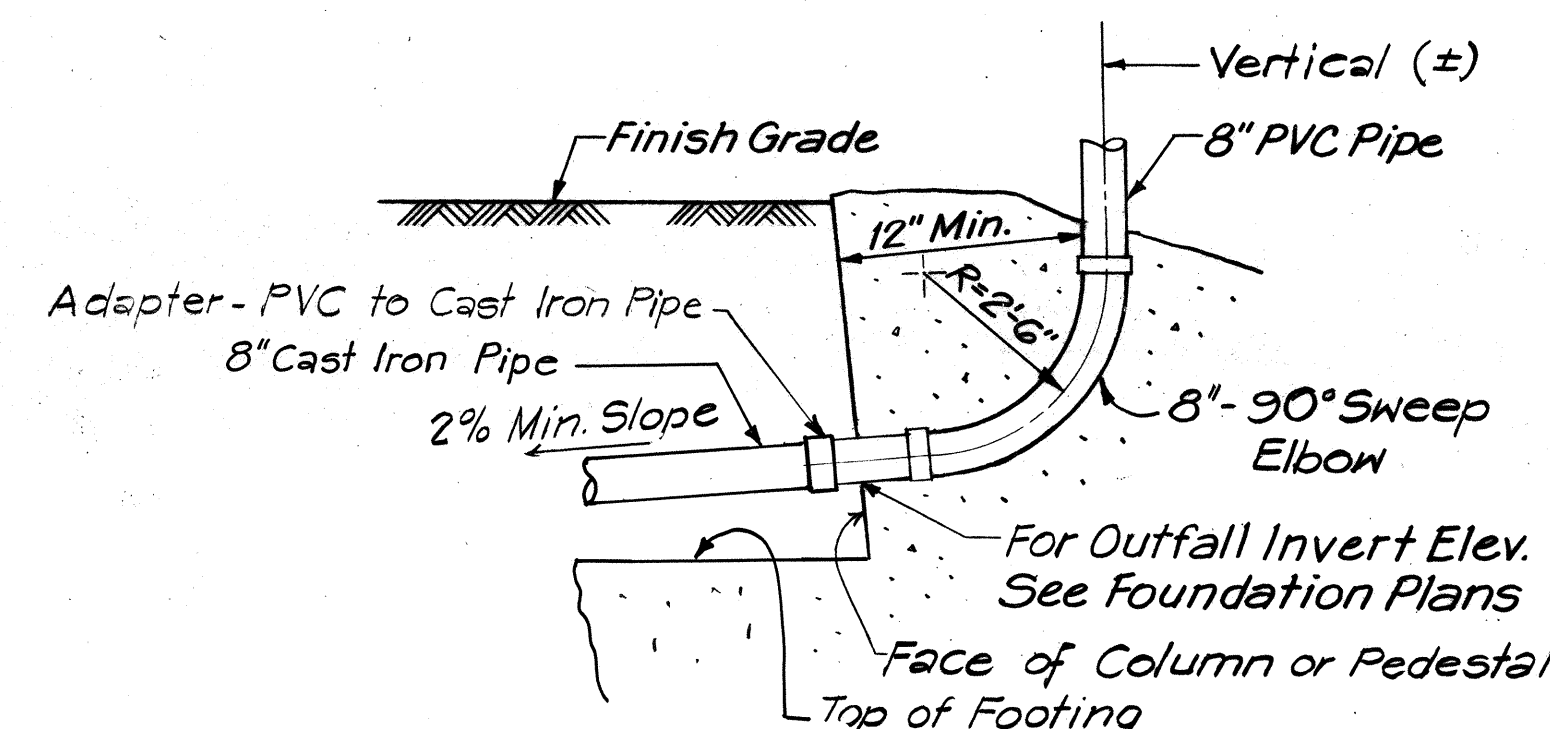
AIRPORT INTERCHANGE
F.A.I. PROJECT NO. I-HI-1(84):16
SCALE: N.T.S. DATE: MAY 16, 1978

SHEET NO. T-18 OF 18 SHEETS SD-9

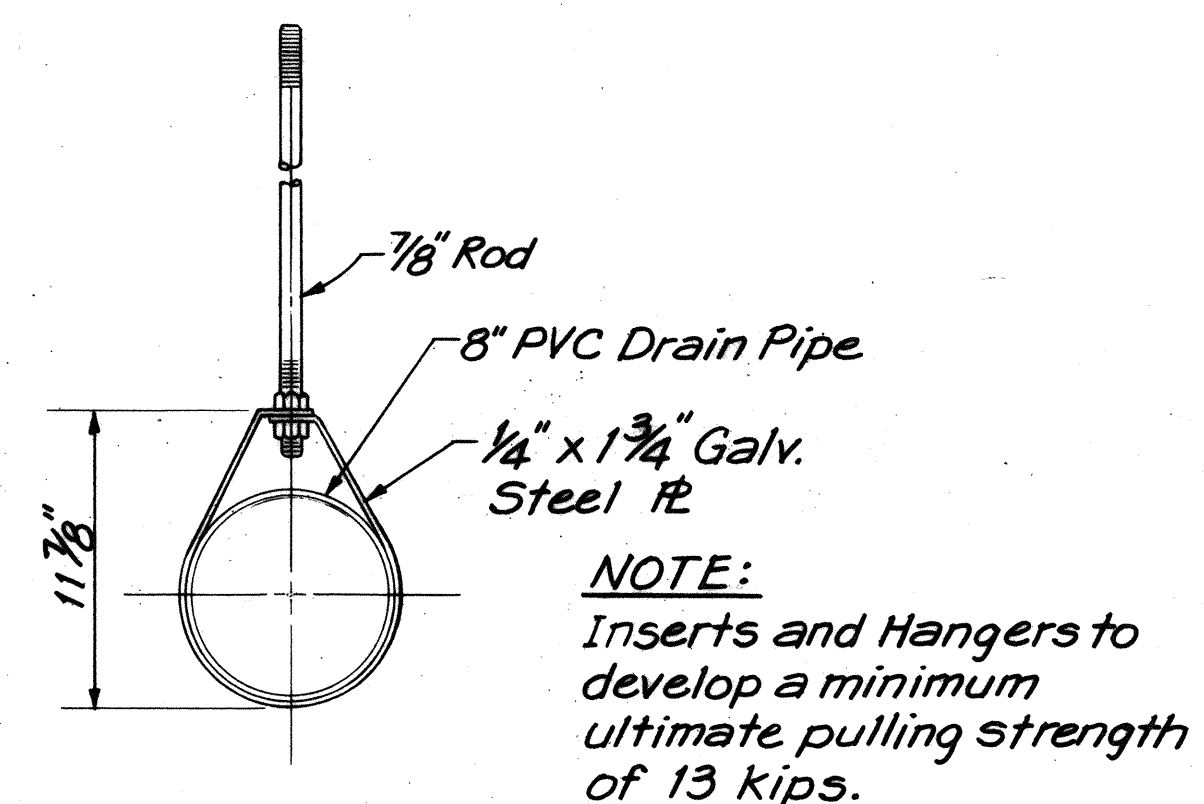


TYPICAL RIGID FRAME PIER DOWNSPOUT

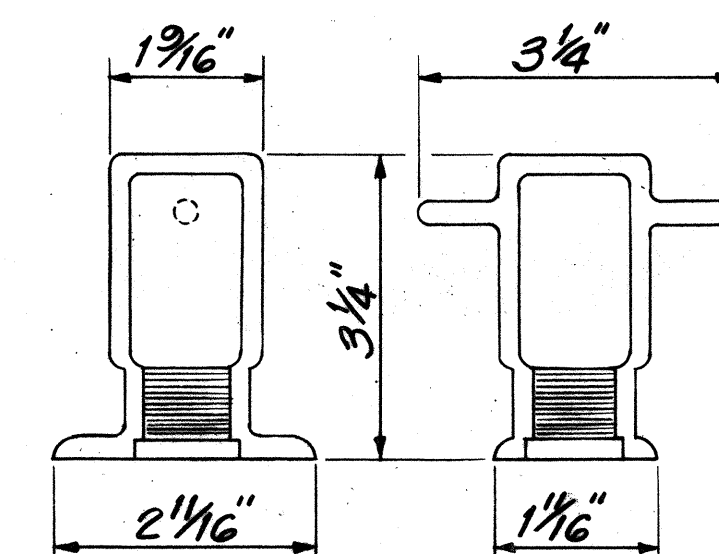
SECTION E
TYPICAL HAMMERHEAD PIER DOWNSPOUT
(Applies to all Piers except Rigid Frames and C.I.P. Box Piers)



OUTFALL TYPE 1

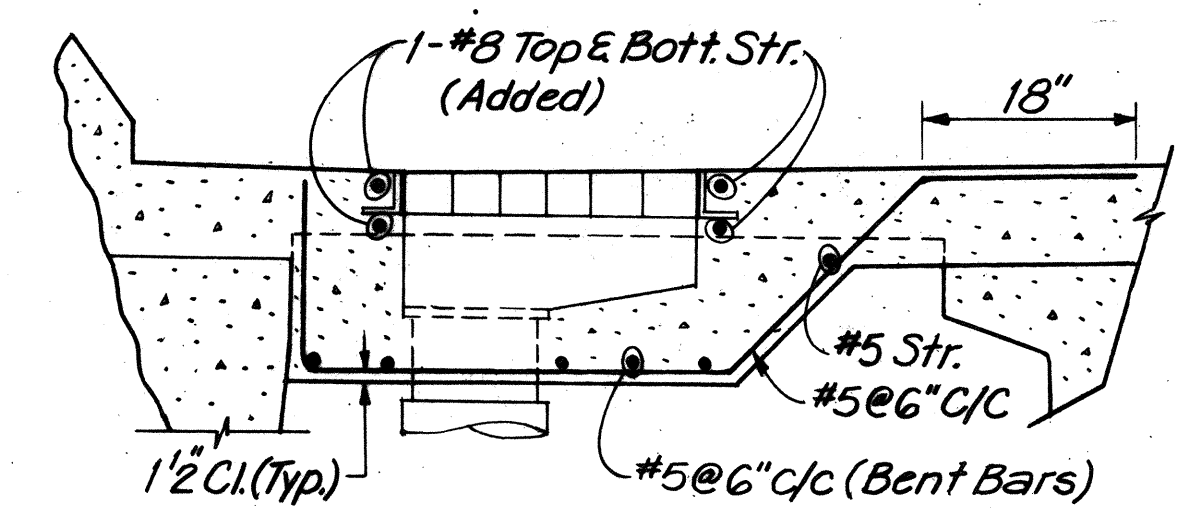


HANGER DETAIL

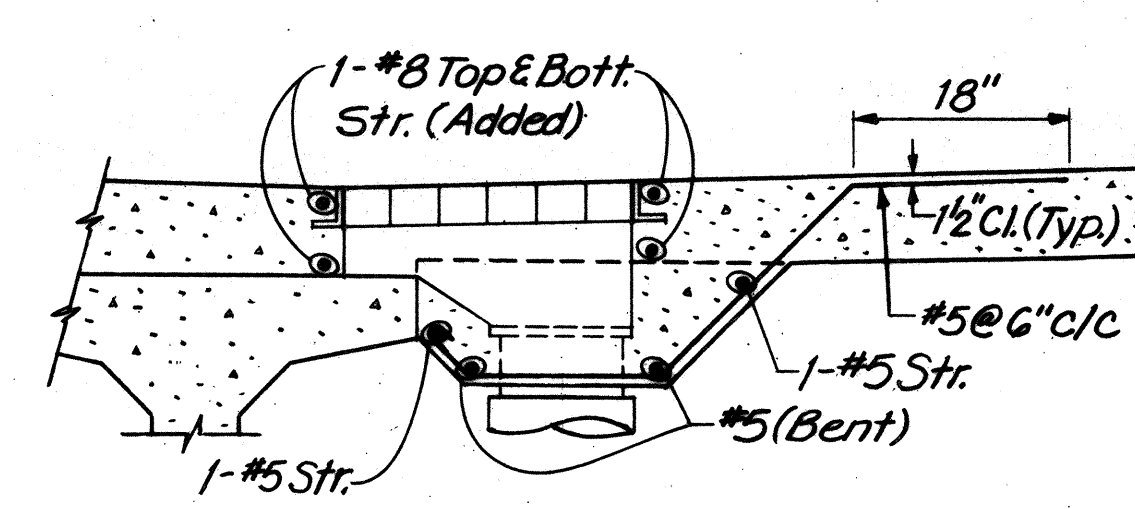


INSERT DETAIL

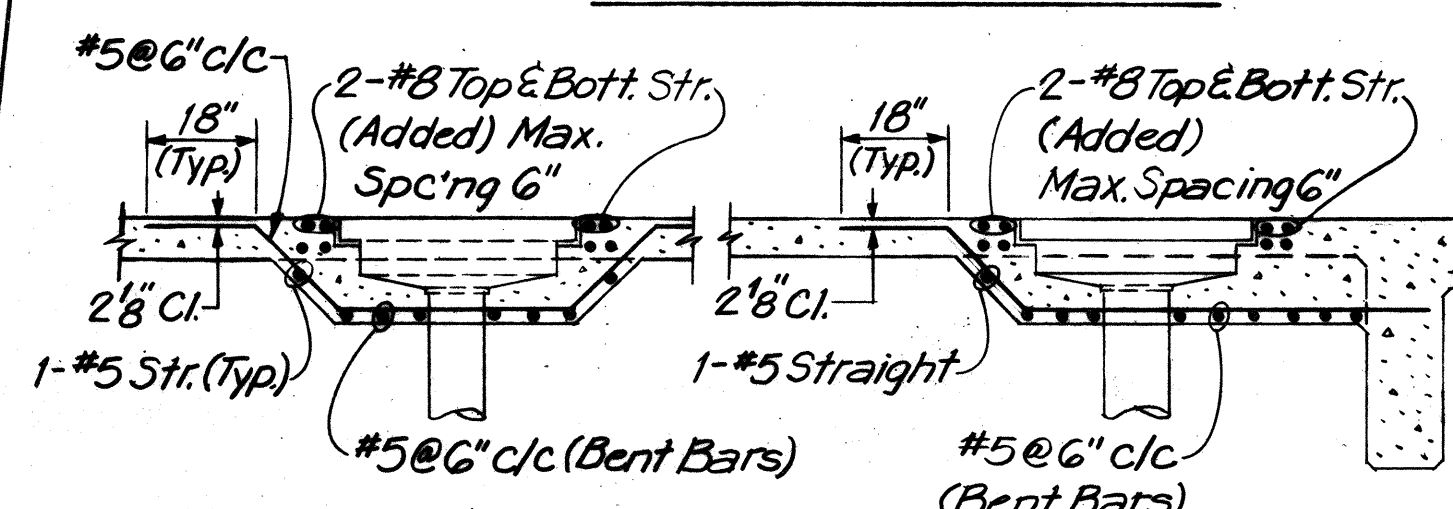
DETAIL OF PIPE HANGERS AND INSERTS



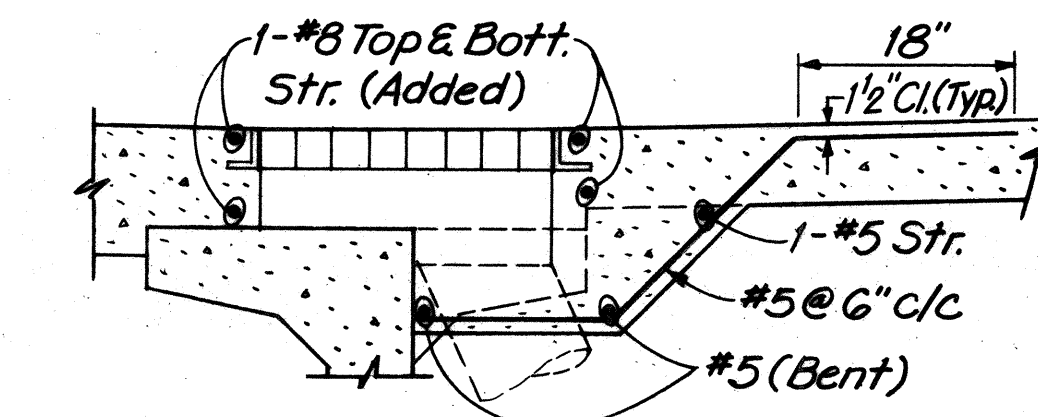
SCUPPER TYPE 'A' & 'C'



SCUPPER TYPE 'B' & 'E'

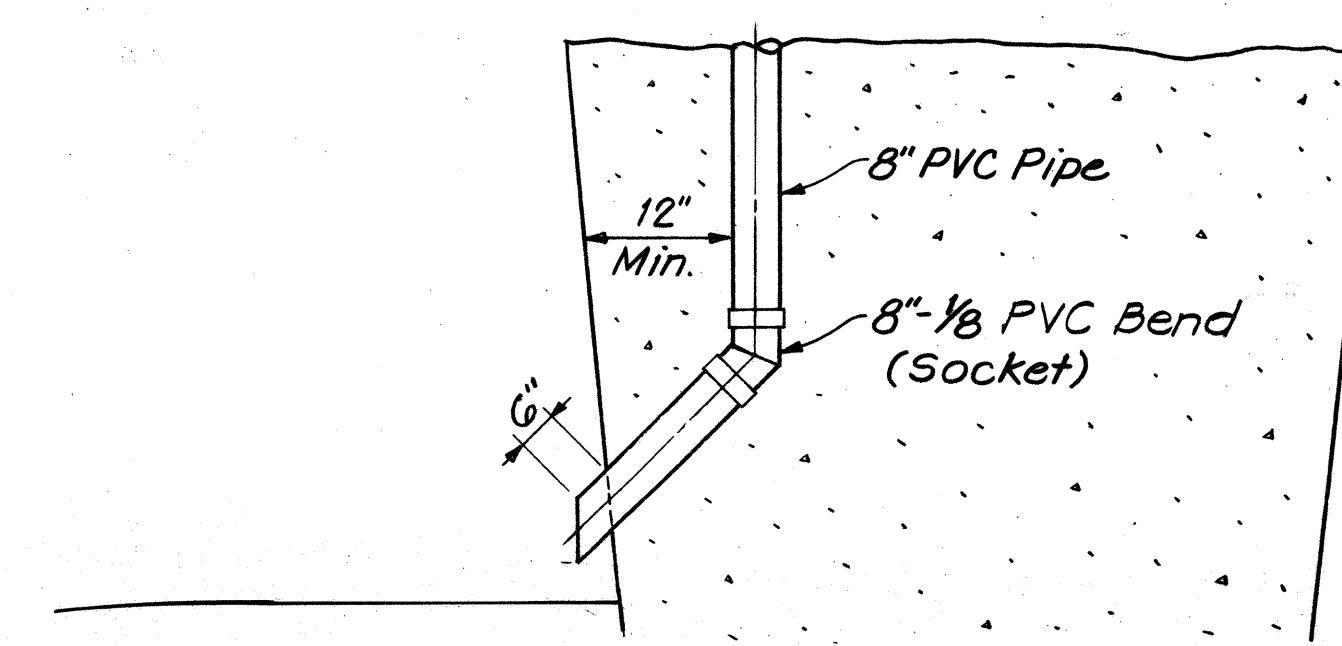


TYPICAL LONGITUDINAL SECTIONS



SCUPPER TYPE 'D'

REINFORCEMENT DETAILS AT SCUPPERS



OUTFALL TYPE 2

OUTFALL DETAILS

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