

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(54)	1989	115	157

1. GENERAL SPECIFICATIONS: HAWAII DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 1985, TOGETHER WITH SPECIAL PROVISIONS PREPARED FOR THIS CONTRACT.
2. DESIGN SPECIFICATIONS: A.A.S.H.T.O. 1983 STANDARD SPECIFICATIONS FOR HIGHWAYS BRIDGES AND ITS SUBSEQUENT INTERIM SPECIFICATIONS. GUIDE SPECIFICATION FOR SEISMIC DESIGN FOR HIGHWAY BRIDGES 1983.
3. LOADS:

- (A) DEAD LOAD: AN ALLOWANCE OF 20 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. SEE NOTES ON APPROPRIATE SHEETS.
 - (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 AFTER FABRICATION, UNLESS OTHERWISE SPECIFIED.
 - (E) FOR MATERIALS OF PRESTRESSED CONCRETE BEAMS & PILES SEE APPLICABLE 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	CLASS B0	ALL OTHERS
			(EXCEPT PRESTRESSED CONCRETE BEAMS AND UNLESS OTHERWISE NOTED ON THE PLANS)
F'C	3,000 P.S.I.	3,750 P.S.I.	5,000 P.S.I.
Fc	1,200 P.S.I.	1,200 P.S.I.	2,000 P.S.I.
n	9	9	7

FOR PRESTRESSED CONCRETE BEAMS, SEE PRESTRESSED CONCRETE NOTES.

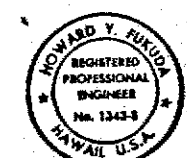
6. REINFORCEMENT:
 - (A) THE MINIMUM COVERING MEASURED FROM THE SURFACE OF THE CONCRETE TO THE FACE OF ANY REINFORCING BARS SHALL BE AS FOLLOWS:
 - (1) DECK SLABS (FOR BOX GIRDERS, T-BEAMS, PRESTRESSED BEAMS)
 - A. TOP BARS - 1-1/2"
 - B. BOTTOM BARS - 1-1/4"
 - (2) BOX GIRDERS
 - A. 1-1/4" TO STIRRUP FROM OUTSIDE FACES
 - B. 1" TO STIRRUP FROM INSIDE FACES.
 - C. INSIDE FACE BOTTOM SLAB AND WALLS - 1-1/2"
 - (3) FOR PRESTRESSED CONCRETE BEAMS SEE PRESTRESSED CONCRETE BEAM DETAILS.
 - (4) ABUTMENTS, PIERS AND RETAINING WALLS - 2".
 - (5) COLUMNS - 2" TO TIES.
 - (6) CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH - 3".
 - (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 EXCEPT WHERE THE SPACING OF INTERSECTIONS IS LESS THAN ONE FOOT IN EACH DIRECTION, IN WHICH CASE ALTERNATE INTERSECTIONS SHALL BE TIED.
 - (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. BEARING PADS:
 - (A) CONCRETE PAD FOR GIRDER: BEARING AREA DEVIATION FROM PLANE SHALL NOT EXCEED 1/16-INCH. THE PAD SHALL BE CONSTRUCTED HIGHER THAN SHOWN ON PLANS AND SHALL THEN BE GROUND DOWN TO THE REQUIRED ELEVATION. PAD SHALL BE MONOLITHIC WITH STRUCTURE.
 - (B) 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) 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.
 - (D) IN THE INSTALLATION OF ANCHOR BOLTS FOR 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.
 - (E) 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) FOR CONCRETE FINISH SEE STANDARD SPECIFICATIONS AND FOR ARCHITECTURAL TREATMENT OF COLUMNS, SEE DETAILS.
 - (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 PILES - 50 TONS.
 - (B) ALLOWABLE SOIL BEARING PRESSURE AT SPREAD FOOTINGS - 5000 P.S.F.
 - (C) FOR BORING LOGS AND THEIR LOCATIONS SEE SHEET NOS. 38 THRU 40.
 - (D) THE PILE TIP ELEVATIONS SHOWN ON THE PLANS ARE BASED ON BORING DATA.
 - (E) 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.
 - (F) THE CONTRACTOR SHALL VERIFY THE TYPE OF SURFACE SOIL BEFORE STARTING TO DRIVE ANY PILE.
11. REFERENCES:
 - (A) FOR PRESTRESSED CONCRETE NOTES, SEE DRAWINGS FOR PRESTRESSED BEAM DETAILS.
 - (B) FOR SIGN STRUCTURE NOTES, SEE DRAWING NO. 122.
 - (C) FOR ADDITIONAL PILE NOTES, SEE DRAWINGS NO. 14.

13. SYMBOLS AND ABBREVIATIONS:
 - (E) OR (EXP.) - EXPANSION
 - (H) - HINGE
 - ALT. - ALTERNATE
 - AZ. - AZIMUTH
 - CL - CENTERLINE
 - BL - BASELINE
 - E.F. - EACH FACE
 - B.F. - BOTH FACES
 - F.F. - FAR FACE
 - N.F. - NEAR FACE
 - C.J. - CONSTRUCTION JOINT
 - CL. - CLEAR
 - EL., ELEV. - ELEVATION
 - E.P. - EDGE OF PAVEMENT
 - FIN. GR. - FINISHED GRADE
 - INV. - INVERT
 - JT. - JOINT
 - N.T.S. - NOT TO SCALE
 - N.I.C. - NOT IN CONTRACT
 - H.W.L. - HIGH WATER LINE

- O.C. - ON CENTERS
 - O/S - OFFSET
 - STR. - STRAIGHT OR STRINGER
 - STIRR. - STIRRUP
 - TYP. - TYPICAL
 - (T) OR T. - TOP
 - (B) OR B. - BOTTOM
 - BRG. - BEARING
 - T.O.D. - TOP OF DECK
 - W.P. - WORKING POINT
 - AT - AT
 - OR DIA. - DIAMETER
 - PL - PLATE
- SECTION "A," "B,"
DETAIL "1," "2"
- 52 54
- DETAIL OR SECTION DESIGNATION
SHEET NO. SECTION OR
DETAIL IS DRAWN
SHEET NO. SECTION IS
CUT OR DETAIL
LOCATION

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

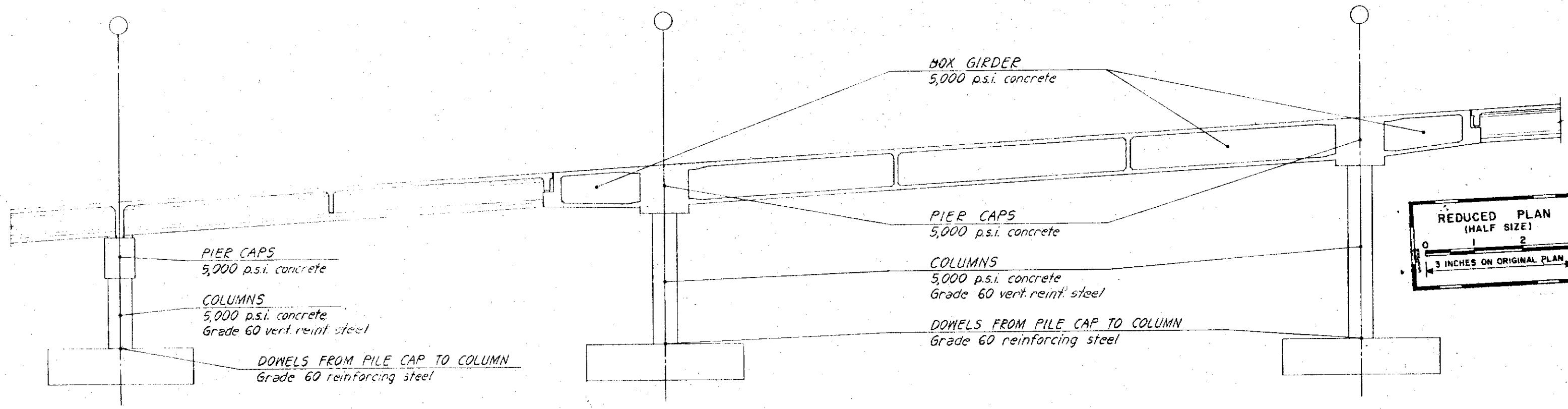
GENERAL NOTES

INTERSTATE ROUTE H-3
F.A.I. PROJ. NO. I-H3-1(54)

DATE: SEPT. 1989

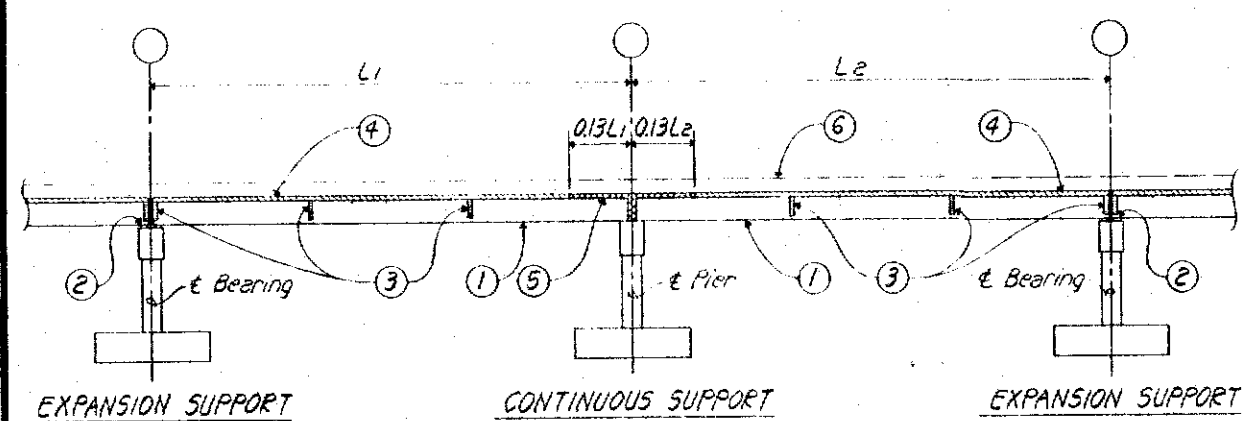
SHEET No. 71 OF 23 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(54)	1989	116	137



TYPICAL VIADUCT LONGITUDINAL SECTION
 Not to scale
 (Showing cast-in-place concrete other than Classes A & BD
 & grade of reinforcing steel other than Grade 40)

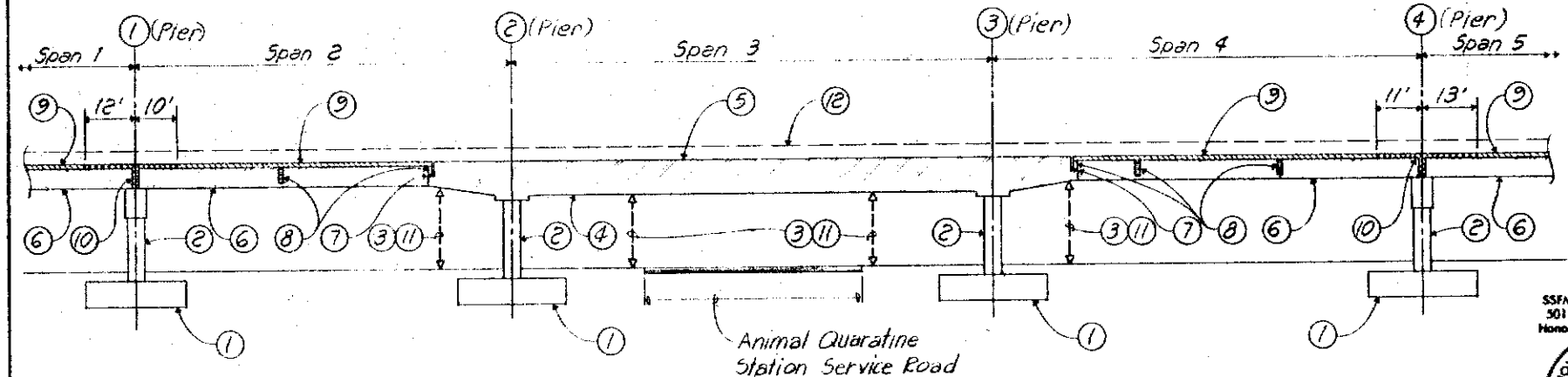
1-25-89	Added Notes
Date	Revision



SEQUENCE OF CONSTRUCTION FOR TWO SPAN CONTINUOUS PORTION OF VIADUCT

- After constructing piers, install prestress girders. Girders to be supported at piers only.
- Pour creep blocks at expansion supports.
- Pour diaphragms (beams "B" & "D") except at continuous support and cure for 7 days minimum.
- Pour deck slab and cure for 14 days minimum.
- Pour beam "A" (diaphragm at continuous pier), balance of deck slab, and cure for 21 days minimum.
- Pour concrete railing.

Note: See construction Schedule on Sht. 137 S-1 and Animal Quarantine Station Reference Drawings for further requirements of construction sequence.



SEQUENCE OF CONSTRUCTION FOR BOX GIRDER

- Construct footings.
- Construct cols (for Piers 1-4) & pier caps for Piers 1 & 4.
- Install formworks and shorings for box girder. Shorings at ends of box girder shall be designed to safely support a line load of 32.5 kips per foot at each end.
- Pour box girder pier cap, bottom slab and webs.
- Pour top slab of box girder and cure for 7 days minimum.
- Install prestressed girders for spans 2 and 4. Support girders at piers #1 & #4 and box girder shoring only.
- Pour creep block at expansion supports.
- Pour diaphragms "D" & "F" and cure for 7 days minimum.
- Pour deck slab over prestressed girders and cure for 14 days minimum.
- Pour beam "A" (diaphragm over piers #1 & #4) and balance of deck slab. Cure for 21 days minimum.
- Remove all shorings simultaneously.
- Construct concrete railings.

Note: Contractor shall maintain two 12' wide x 12' clear height Lanes at Animal Quarantine Station Service Road.

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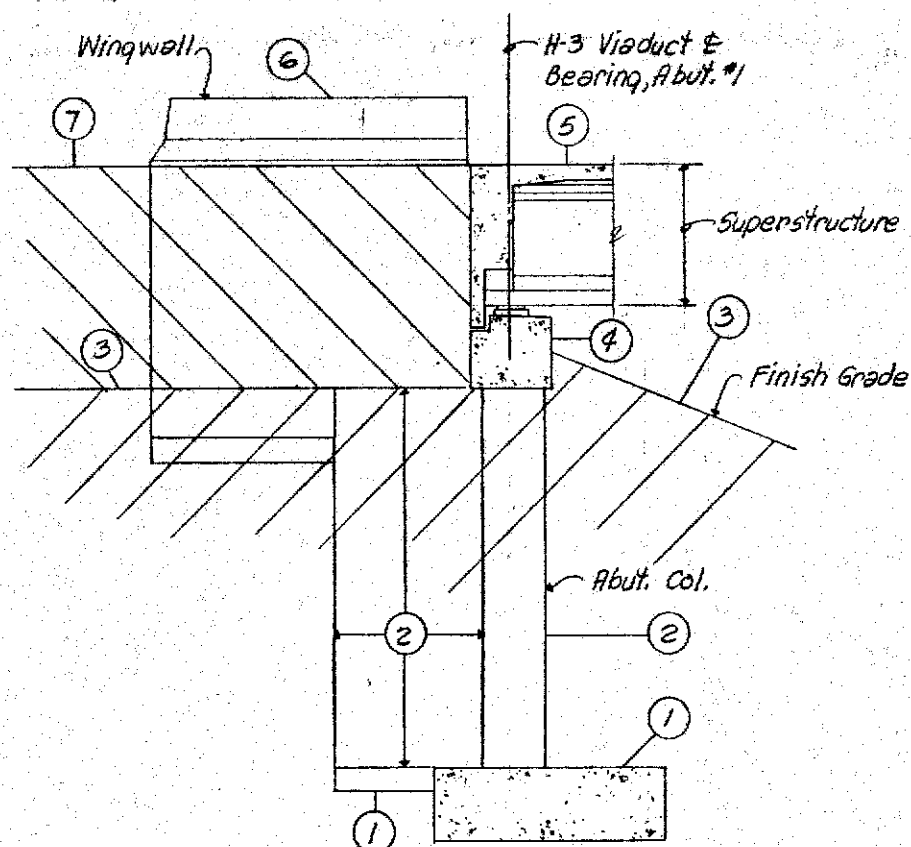
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SPECIAL CONCRETE & REINFORCING AND CONSTRUCTION SEQUENCE

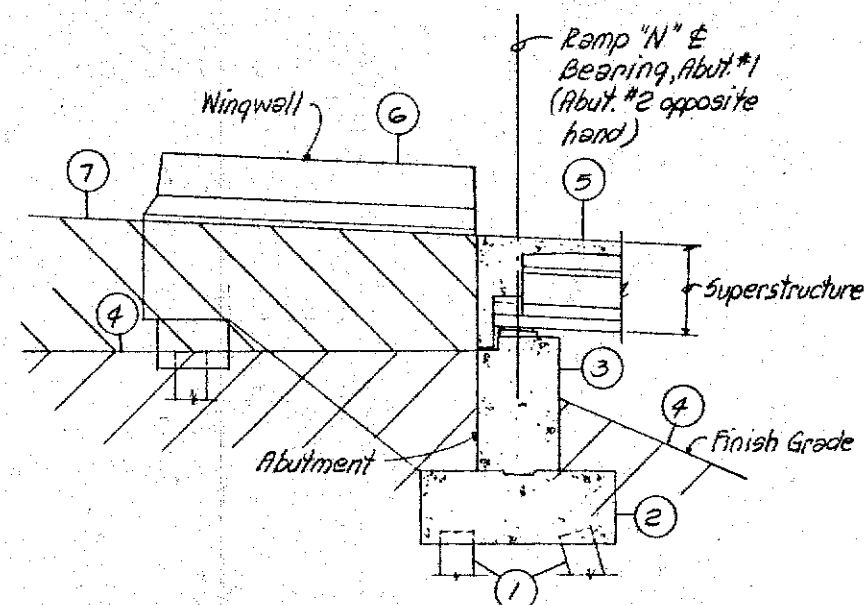
INTERSTATE ROUTE H-3
 F.A.I. PROJ. NO. I-H3-1(54)
 SCALE: AS NOTED DATE: SEPT. 1989
 SHEET NO. 72 OF 23 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-H3-1(54)	1989	117	137



Construction Sequence for H-3 Viaduct Abutment #1

- 1 Construct footing
- 2 Construct columns & portion of wingwalls
- 3 Backfill abutment. Backfill material shall be placed in uniform horizontal layers not exceeding 8" in loose thickness before compaction. Compact each layer to a minimum of 95% of the maximum dry density.
- 4 Construct pier cap.
- 5 Follow construction sequence for two span continuous portion of viaduct.
- 6 Excavate portion of wingwall & construct wingwall.
- 7 Place remaining backfill to elevation specified.

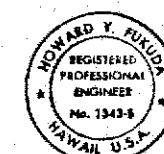


Construction sequence for Ramp "N" abutments

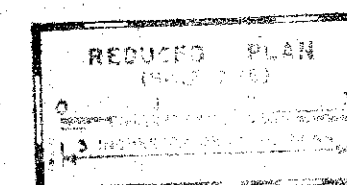
- 1 Install piles
- 2 Construct pile cap
- 3 Construct abutment
- 4 Backfill abutment. Backfill material shall be placed in uniform horizontal layers not exceeding 8" in loose thickness before compaction. Compact each layer to a minimum of 95% of maximum dry density, stop short of pier elevation.
- 5 Follow construction sequence for simple span portion of viaduct. (See Special Notes for construction sequence of two span continuous portion)
- 6 Construct wingwall
- 7 Place remaining backfill to elevation specified.

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
QUANTITY BY	
CHECKED BY	

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**CONSTRUCTION SEQUENCE
FOR ABUTMENTS**

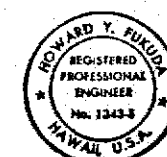
INTERSTATE ROUTE H-3
F.A.I. PROJ. NO. I-H3-1(54)

SCALE: AS NOTED DATE: SEPT. 1988

SHEET No. 13 OF 23 SHEETS

GENERAL NOTES:

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SHEET 1 OF 2

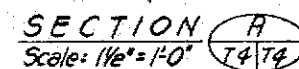
INTERSTATE ROUTE H-3
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SCALE: AS NOTED DATE: SEPT. 1988

SHEET No. 74 OF 23 SHEETS



Not to scale



Maximum Length *

(1-Point Pick-Up = 53'-0")

(2-Point Pick-Up = 75'-0")

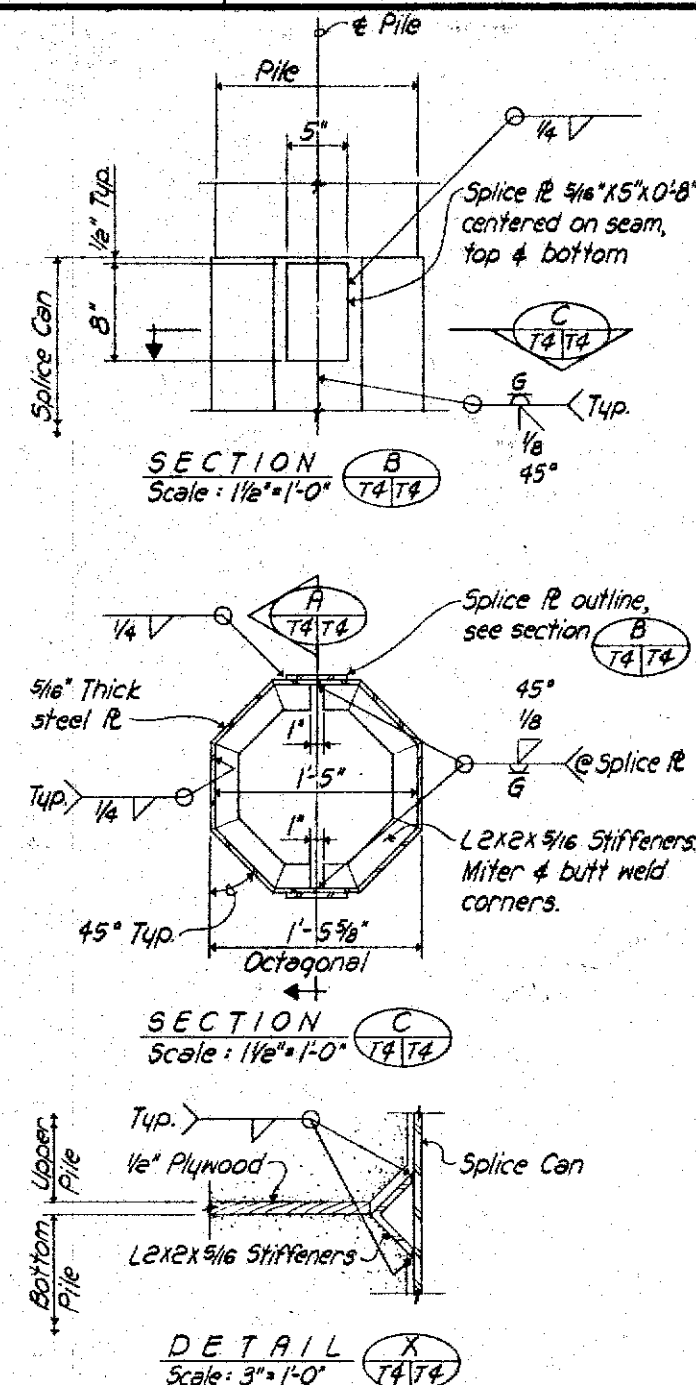
(3-Point Pick-Up = 100'-0")

Pick-Up Points	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5
1-Point Pick-Up	0.30 L	0.70 L			
2-Point Pick-Up	0.21 L	0.58 L	0.21 L		
3-Point Pick-Up	0.15 L	0.35 L	0.35 L	0.15 L	

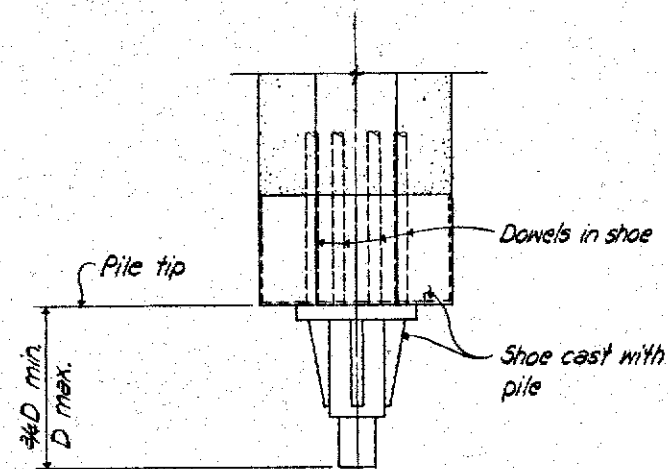
* The length "L" is the

* The length "L" is the distance end to end of pile.

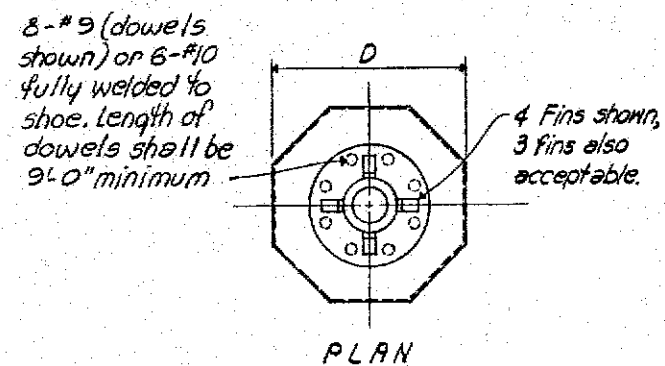
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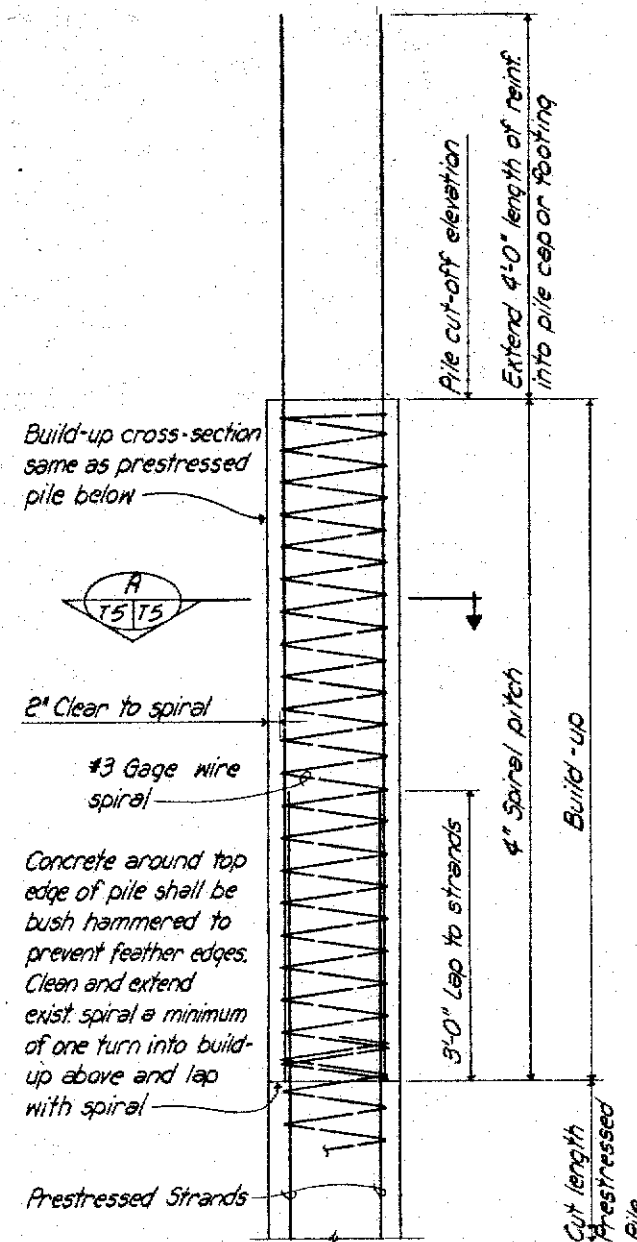


ELEVATION

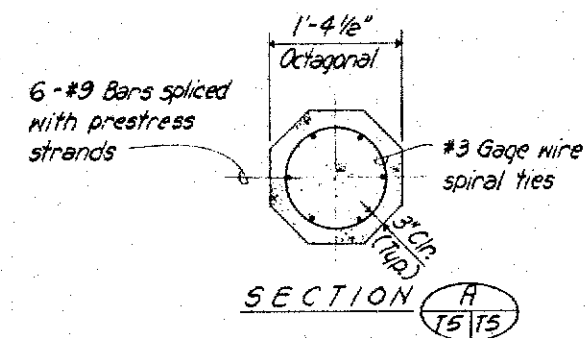


PILE ROCK DRIVING SHOE DETAIL
Not to scale

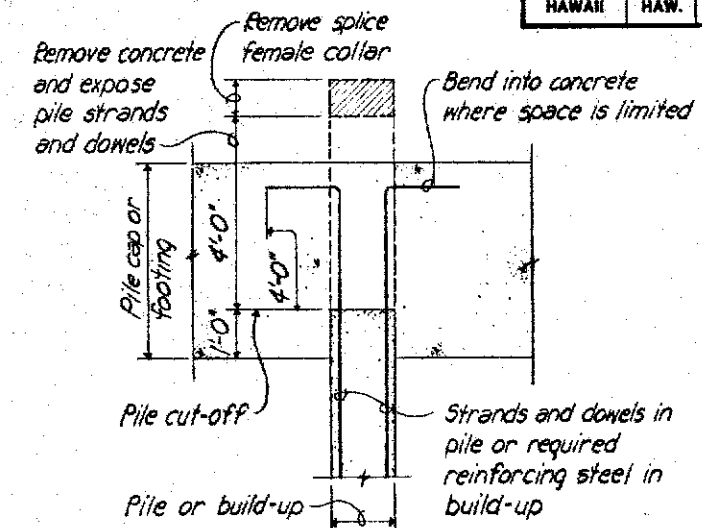
- NOTES:
- Concrete in pile build-ups shall have a minimum 28 day compressive cylinder strength $f'_c = 5,000$ p.s.i.
 - Build-ups may be driven after the concrete attains a compressive strength of 4,000 p.s.i. but not earlier than 7 days after concrete is poured.



WITHOUT DRIVING ELEVATION



TYPICAL PILE BUILD-UP DETAILS
Not to scale



PILE REINFORCEMENT
EXTENSION DETAIL
Scale: 1/2" = 1'-0"

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PILE DETAILS
SHEET 2 OF 2

INTERSTATE ROUTE H-3
F&I PROJ. NO. I-H3-H54)

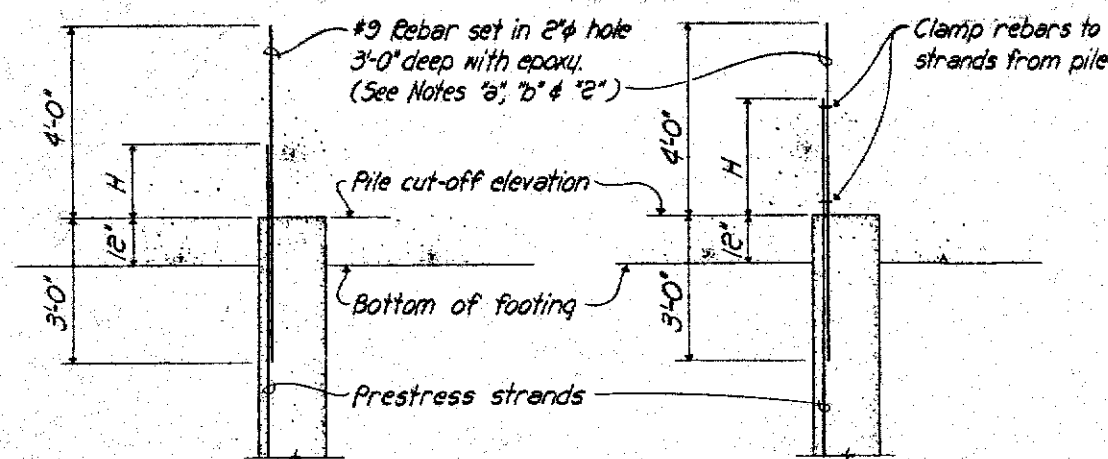
SCALE: AS NOTED DATE: SEPT 1989

SHEET NO. 75 OF 23 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(54)	1989	120	187

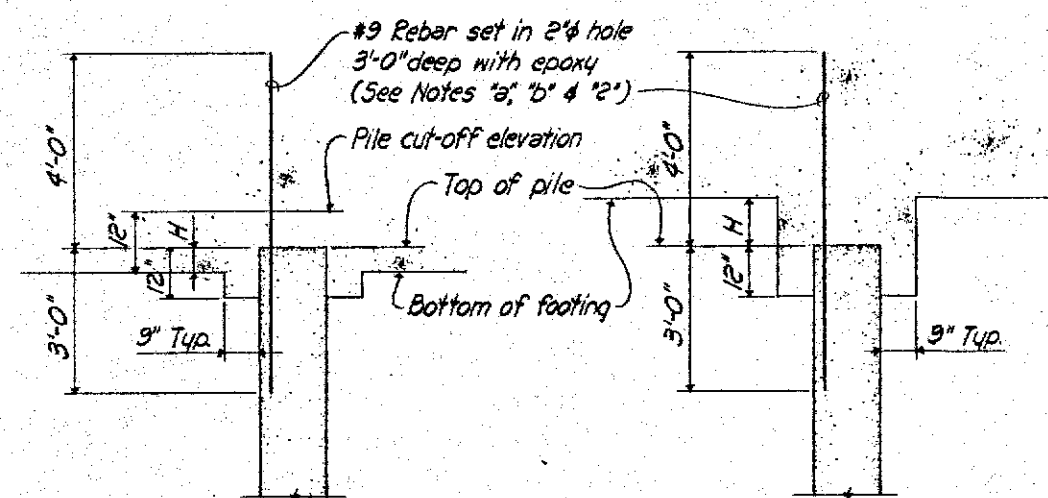
NOTES:

- Selection of pile build-up shall be determined by the Engineer. When height of depressed portion of footing (D) exceeds 5'-0" this alternative pile build-up shall not be allowed.
- Use same number of rebars (ASTM A615 Grade 60) as number of prestress strands.
- Detail "X" shall be used only for piles already driven to desired tip elevation. Driving on pile build-ups shall not be permitted.
- Concrete in Detail "X" shall be Class A, same strength as footing.
- Top of existing pile shall be roughened to 1/4" amplitude.
- Circular section may be used instead of square section if approved by the Engineer.



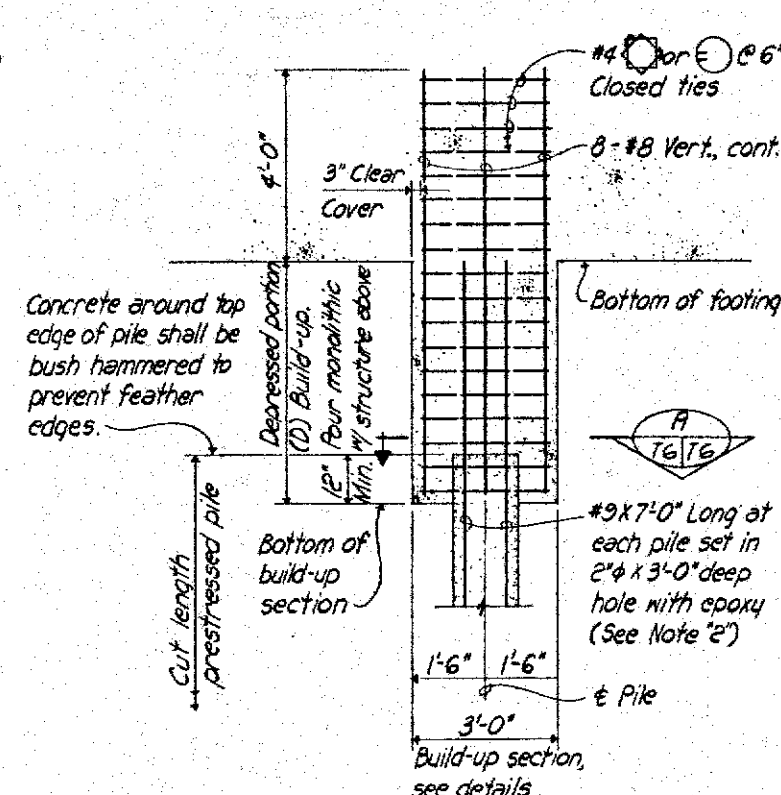
CASE ① $H \leq 2'-0"$

CASE ② $2'-0" < H \leq 4'-0"$



CASE ③ $H < 12"$
See Detail "X"

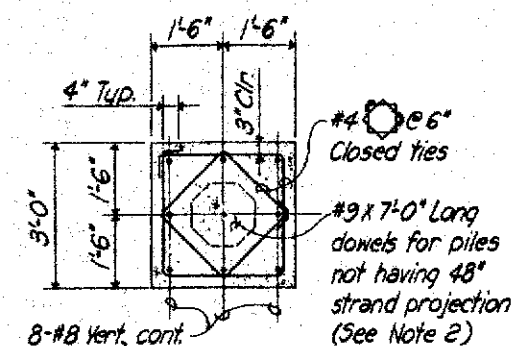
CASE ④ $0 < H < 4'-0"$
See Detail "X"



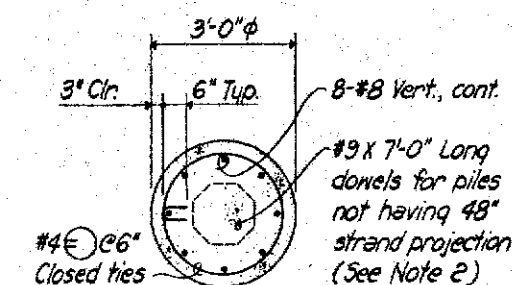
DETAIL "X"
(Without Driving)

NOTES:

- The hole to receive dowel shall be clean, dry and not oily prior to application of epoxy.
- The strength of epoxy shall be equal to or greater than that of pile concrete. The epoxy shall be non-shrink.



Square Build-Up

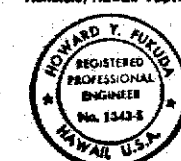


Circular Build-Up

SECTION A
T6/T6

ALTERNATIVE PILE BUILD-UP DETAILS Not to scale

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HIGHWAYS DIVISION

PILE BUILD-UP DETAILS

INTERSTATE ROUTE H-3
F.A.I. PROJ. NO. I-H3-1(54)

SCALE: AS NOTED DATE: SEP. 1988

SHEET NO. 76 OF 83 SHEETS

LOAD FRAME NOTES:

- The Loading Frame shall be designed to support load required to permit the Test Pile to be axially loaded to 225 Tons. Loading blocks to be provided by Contractor.
- Design of Frame shall conform to the latest Edition of the Manual of Steel Construction by the American Institute of Steel Construction. Allowable stresses in this manual may be increased by 20% for main structural members. This increase in allowable stresses will not be allowed for Connections, Bolts and Welds.
- At the option of the Contractor, the Loading Frame may be fabricated from new or used structural steel shapes, or loading frames previously used in other projects may be used provided the design and construction of the frame to be furnished conforms to the requirements in Notes 1 and 2 above.
- Load test site shall be enclosed with a 5 ft. high temporary fence (wire mesh on wood poles). Payment shall be considered incidental to "Pile Load Test."
- Timber Cribbing and Platform may be of new or used sound timber and shall be of adequate size and grade to safely carry the loads imposed upon them resulting from the Load Tests.
- Surfaces of all bearing plates shall be planed or milled smooth to provide full surface contact. Top and bottom of Load Transfer Assembly to be planed after welding.

TABLE OF PILE LOAD TESTS & APPLICABLE FOOTINGS	
PILE LOAD TEST AT PIER NUMBER	NUMBER OF LOAD TESTS
PIER N1	1
PIER N2	1
ABUT N1	1
This table is subject to change by the Engineer, depending on results of test driving pile.	

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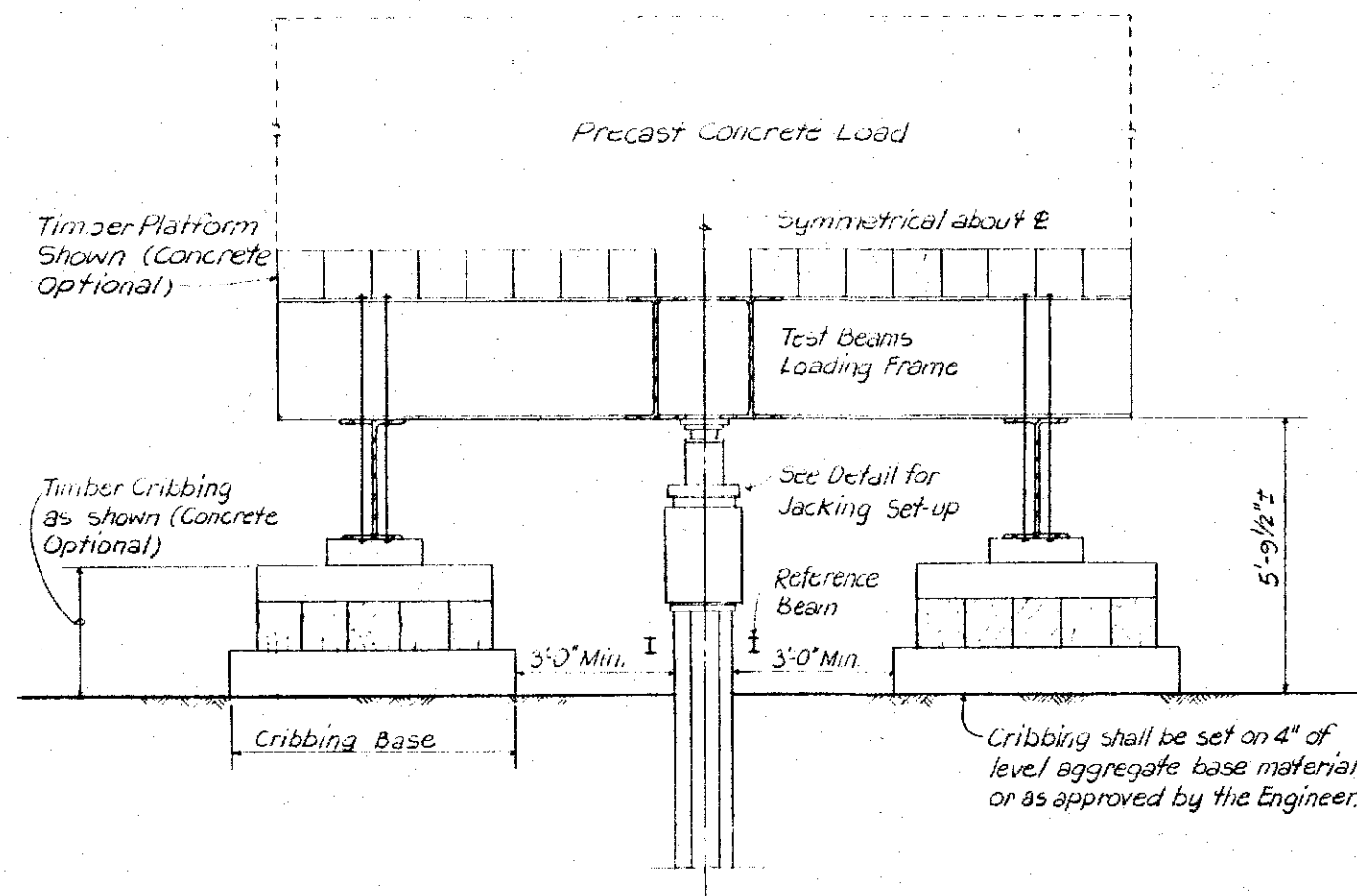
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PILE LOAD TEST DETAILS

INTERSTATE ROUTE H-3
F.A.I. PROJ. NO. I-H3-1(54)

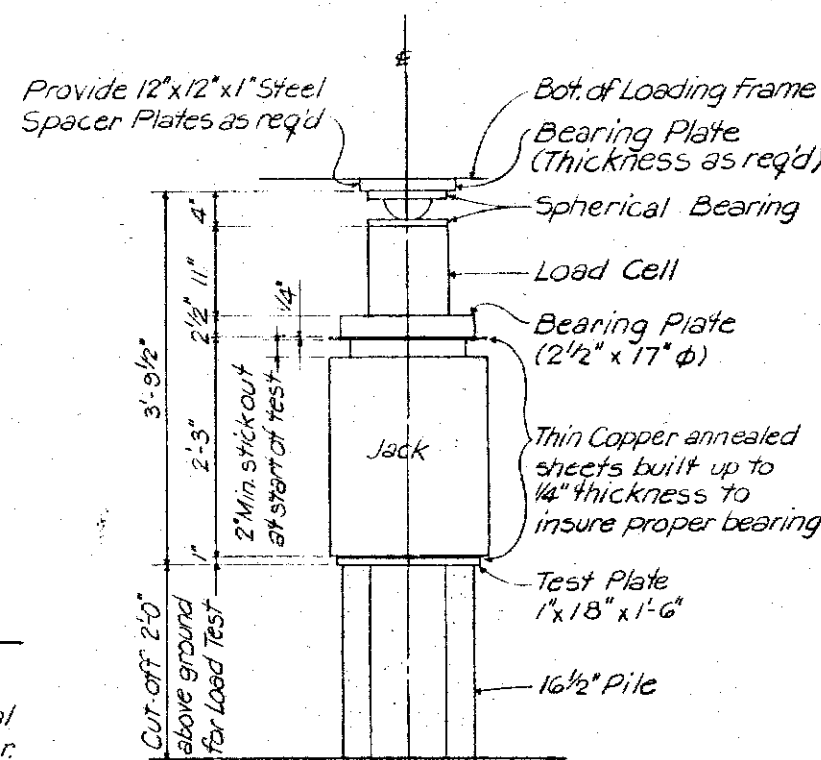
SCALE: AS NOTED DATE: SEPT. 1988
SHEET NO. 77 OF 23 SHEETS



SCHEMATIC SET-UP FOR APPLYING LOADS TO TEST PILE
Scale: 1/2"=1'-0"

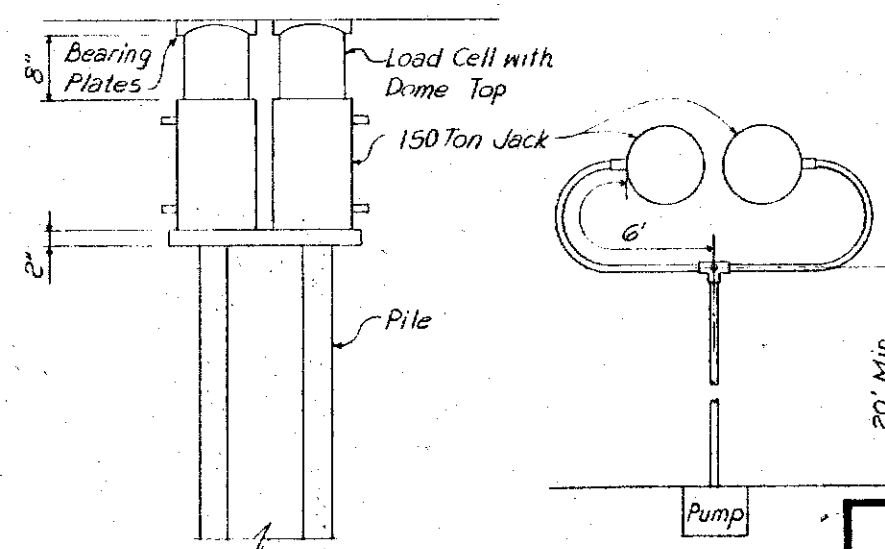
NOTES:

- The apparatus for applying known compressive loads to the pile shall be assembled so that the loads are applied axially to minimize eccentric loading.
- Where necessary, the unsupported length of the pile shall be braced to prevent buckling.
- The steel test plate shall be set in high-strength quick-setting grout. Full bearing must be achieved between the plate and grout, that is, no voids should exist between them.
- Two reference beams, one on each side of the pile shall be oriented perpendicular to the direction of the test beams of the load frame. Two dial gages shall be mounted approximately equidistant from the center of and on opposite sides of the pile with stems parallel to the direction of the load application.
- The reference beams shall be independently supported with supports firmly embedded in the ground at a clear distance of not less than 10 feet from the cribbing.
- Reference beams shall be of sufficient stiffness to prevent excessive deflections and should be cross connected to provide additional rigidity.
- One end of each reference beam shall be free to move as the lengths of beams change with temperature variations.
- Smooth bearing surfaces perpendicular to the direction of measurement shall be provided for the gage stems. These surfaces shall be of glass or hard metal. No wood shall be allowed in the measurement systems.
- Provisions, such as a protective canopy, shall be made to protect the instrumentation, measuring system and reference system from adverse wind, rain and temperature variations or other disturbances.
- The lateral movements of the pile shall be measured using two dial gages mounted on the reference beams 90 degrees apart with their stems horizontal & bearing against smooth bearing plates or surfaces.

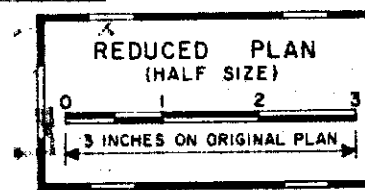


Note:
Set Test Plate in non-shrink non-metallic grout set on Pile so as to obtain full bearing. Plate surfaces receiving grout need not be planed.

DETAIL FOR JACKING SET-UP
Scale: 1"=1'-0"



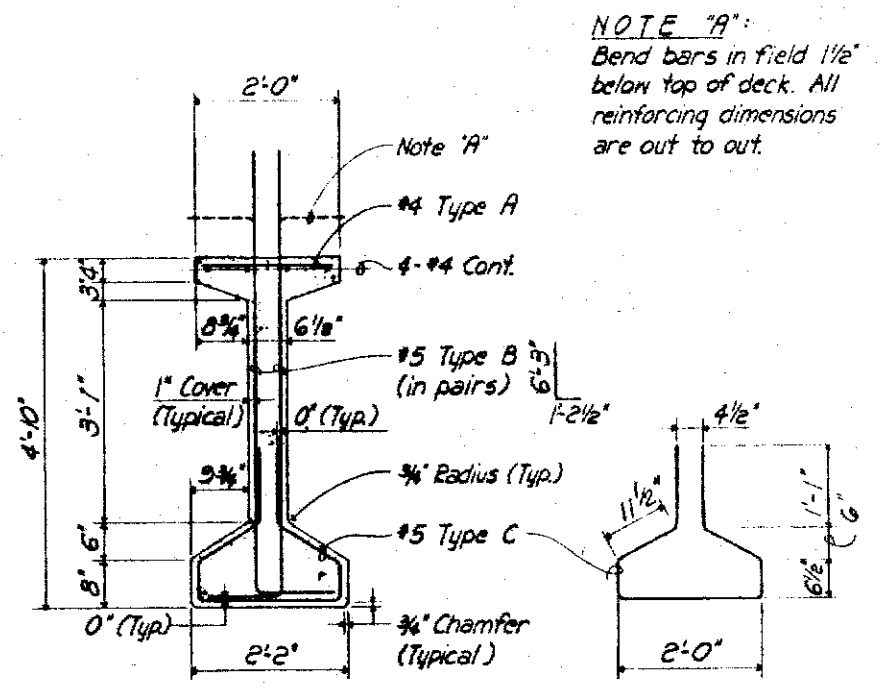
ALTERNATE LOAD TEST SET-UP
Not to Scale



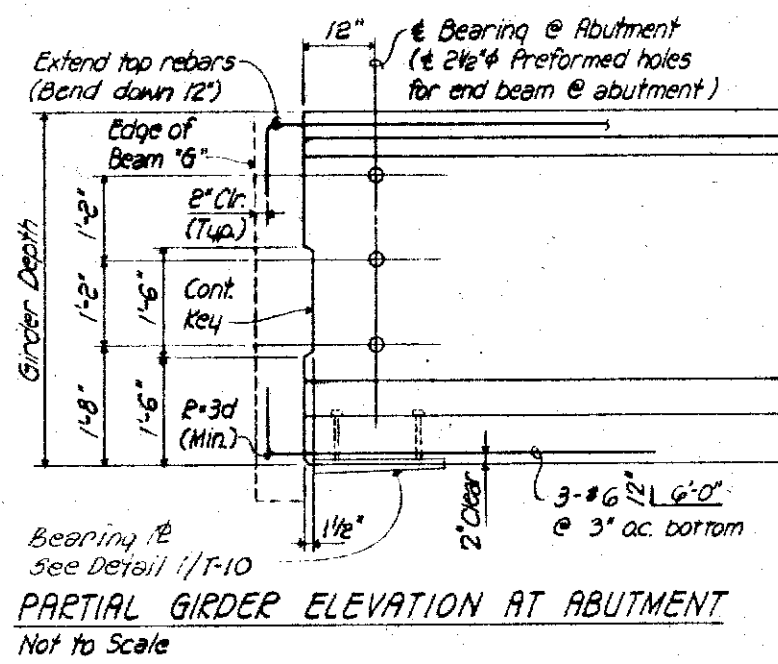
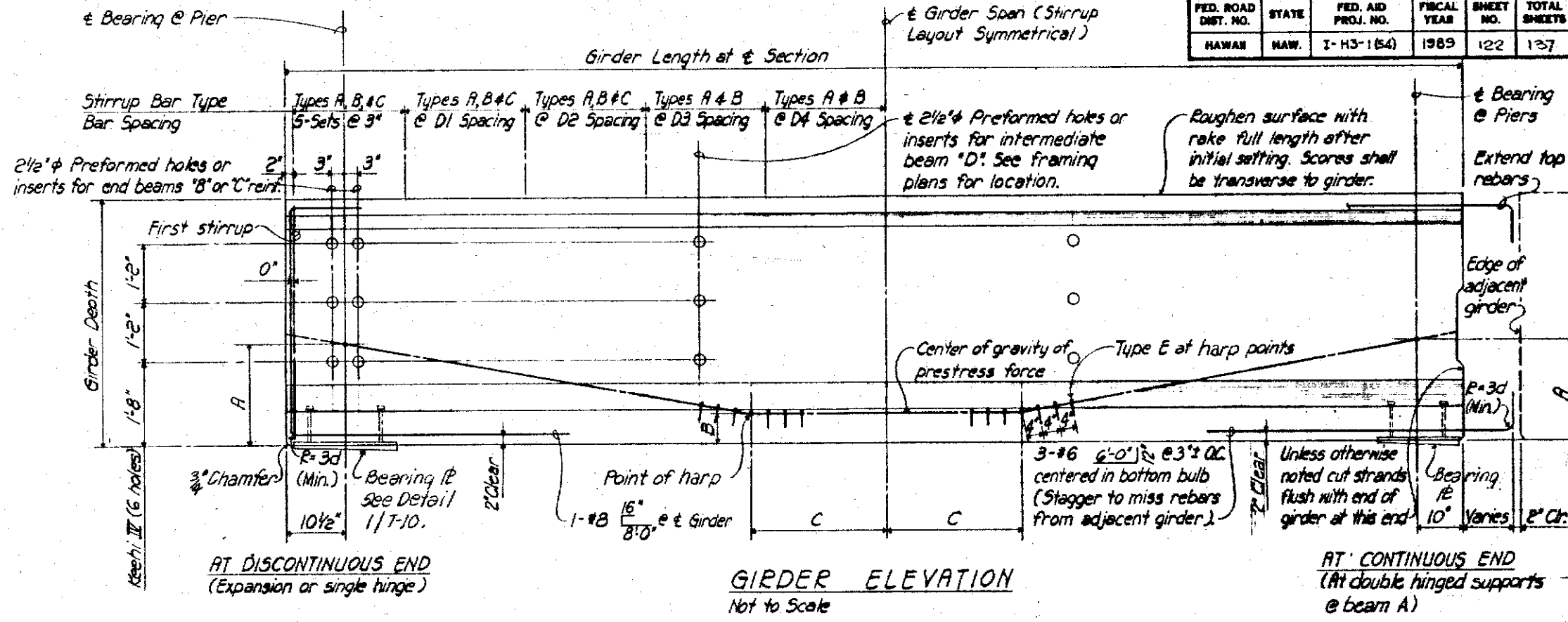
1/25/89 Revised Load Test Set-up
Date Revision

DATE	BY
DESIGNED BY	
CHECKED BY	
NOTES	
NO.	

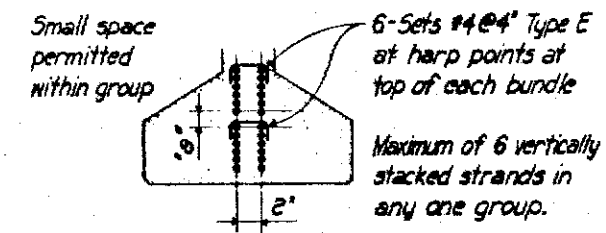
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	MAW	I-H3-1(54)	1989	122	137



KEEHI IV GIRDER SECTION
Scale: 3/4" = 1'-0"



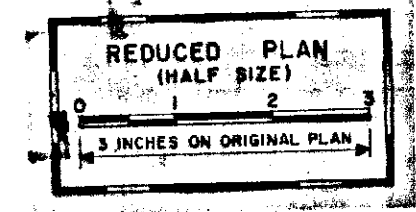
- NOTES:**
1. Inserts & preformed holes are incidental to prestressed Girders.
 2. Unless noted otherwise, ends of girders shall be vertical in-place.



- ARRANGEMENT & CLEARANCE FOR PRESTRESSING STRANDS**
1. Strands may be bundled in groups as shown.
 2. The minimum distance "a" between groups or individual strands is 2" for 16 strands.
 3. "a" is measured between centers of adjacent strands.

BUNDLING OF PRESTRESSING REINFORCEMENT
Not to scale

- REFERENCE DRAWINGS:**
1. Girder dapped and fixed end connections details - Sht. T/2
 2. Girder schedule - Sht. T/1



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

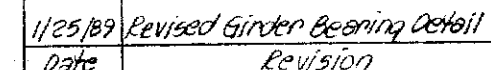
PRESTRESSED GIRDER DETAILS
KEEHI IV GIRDER

INTERSTATE ROUTE H-3
F.A.I. PROJ. NO. I-H3-1(54)

SCALE: AS NOTED DATE: SEPT. 1988

SHEET NO. 122 OF 23 SHEETS

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



G I R D E R S C H E D U L E

GIRDER TYPE	WORKING PRESTRESS FORCE (AFTER ALL LOSSES) KIPS	CALCULATED CAMBER (SEE NOTE 4 THIS SHEET) INCHES	DEAD LOAD DEFLECTION (SEE NOTE 5 THIS SHEET) INCHES	LOCATION OF CENTER OF GRAVITY OF PRESTRESS FORCE						STIRRUPS NUMBER & SPACING				REQUIRED MINIMUM CONCRETE STRENGTH BEFORE RELEASE OF STRANDS (PSI)	REMARKS
				DISTANCE A (INCHES)	DISTANCE B (INCHES)	DISTANCE C	MASKED STRAND DATA			@ D1 SPACING	@ D2 SPACING	@ D3 SPACING	@ D4 SPACING		
							EFFECTIVE PRESTRESS FORCE	DISTANCE A*	DISTANCE M						
II-1	485	+0.81	-0.55	13.45	6.84	L/10				15 @ 9"	15 @ 12"	Bal. @ 16"		4500	
II-2	441	+0.59	-0.39	14.20	6.83	L/10				20 @ 6"	20 @ 8"	10 @ 12"	Bal. @ 16"	4500	
II-F-1	617	+0.86	-0.34	14.86	8.98	L/10				5 @ 12"	Bal. @ 16"			4500	
II-F-2	617	+0.67	-0.32	14.86	9.98	L/10				12 @ 10"	5 @ 12"	Bal. @ 16"		4500	
IV-1	882	+1.03	-1.19	23.40	6.83	L/10				20 @ 6"	30 @ 8"	10 @ 12"	Bal. @ 16"	4500	
IV-2	926	+1.23	-1.14	19.52	7.24	L/10				25 @ 6"	12 @ 8"	15 @ 10"	Bal. @ 16"	4500	
IV-3	662	+0.62	-0.51	19.73	7.38	L/10				20 @ 6"	18 @ 9"	6 @ 12"	Bal. @ 16"	4500	
IV-4	838	+0.96	-0.8	20.95	7.38	L/10				18 @ 6"	24 @ 9"	9 @ 12"	Bal. @ 16"	4500	
IV-5	617	+0.41	-0.30	21.14	9.43	L/10				28 @ 6"	9 @ 9"	7 @ 12"	Bal. @ 16"	4500	
IV-F-1	1103	+1.38	-1.09	27.20	8.01	L/10				30 @ 6"	15 @ 8"	10 @ 12"	Bal. @ 16"	4500	
IV-F-2	1235	+1.28	-1.26	26.86	11.86	L/10				20 @ 6"	15 @ 8"	12 @ 10"	Bal. @ 16"	4500	
IV-F-3	882	+0.77	-0.54	22.60	11.80	L/10				20 @ 6"	14 @ 9"	10 @ 12"	Bal. @ 16"	4500	
IV-F-4	1103	+1.19	-0.30	26.32	10.91	L/10				40 @ 5 1/2"	17 @ 9"	9 @ 12"	Bal. @ 16"	4500	
IV-F-5	794	+0.47	-0.33	23.40	14.21	L/10				14 @ 6"	11 @ 8"	9 @ 10"	Bal. @ 16"	4500	
	</														

PLAN AT GIRDER SKEWED END
Not to scale

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(54)	1989	125	137

Web Beyond 5 1/2" Min.

Inserts to develop a minimum ultimate pulling strength of 24 kips

#8 Threaded bar

INSERT DETAIL
Not to scale

CAMBER DIAGRAM
Not to scale

NOTES FOR PRESTRESSED GIRDERS:

- Concrete shall have a minimum ultimate 28-day cylinder strength of 6000 psi.
- Pretensioned strands shall be 7-wire 1/2" stress-relieved steel strands (area = 0.153 in.²) with an ultimate strength of 270 ksi. For properties see State Standard Specifications. Total loss due to creep, shrinkage, elastic shortening and relaxation of steel = 45000 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. Positive values shown for calculated camber indicate a net upward deflection. Calculated camber values shown do not account for any camber growth of the girders. 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 and diaphragm. Negative values shown for DL deflection indicate a net downward deflection.
- Strand pattern shall be symmetrical about the longitudinal centerline of the girder span.
- 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.
- At exposed end of girders, remove strands from concrete surface & fill void space with epoxy.

01/25/89 Revised camber & deflection sign convention

Date Revision

REDUCED PLAN (HALF SIZE)

0 1 2 3

3 INCHES ON ORIGINAL PLAN

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PRESTRESSED GIRDER SCHEDULE

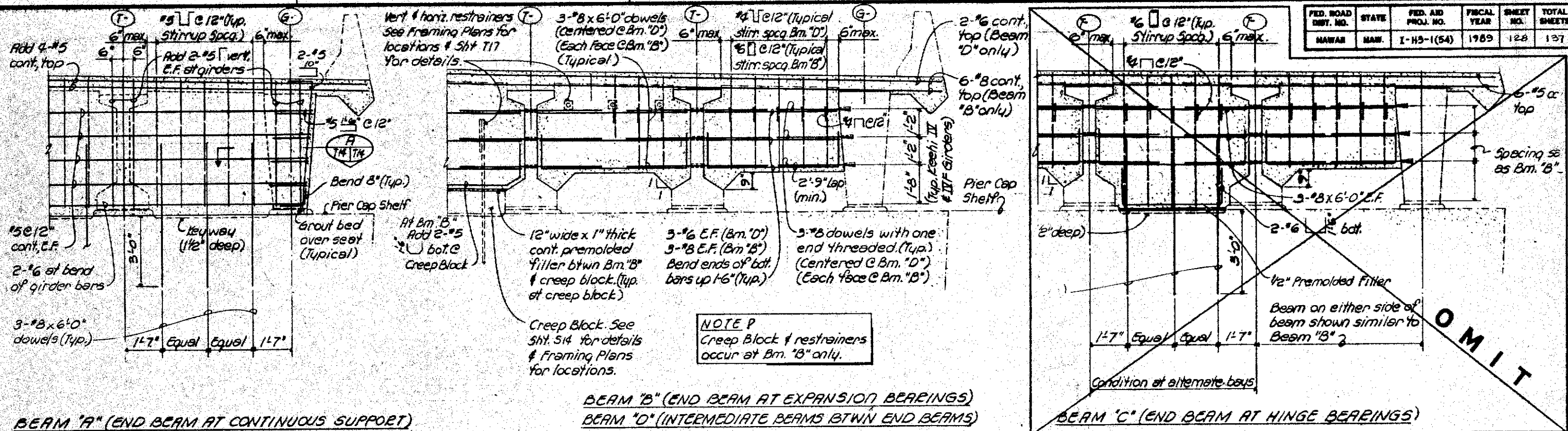
INTERSTATE ROUTE H-3
F.A.I. PROJ. NO. I-H3-1(54)

SCALE: AS NOTED DATE: SEPT. 1988

SHEET NO. 111 OF 23 SHEETS

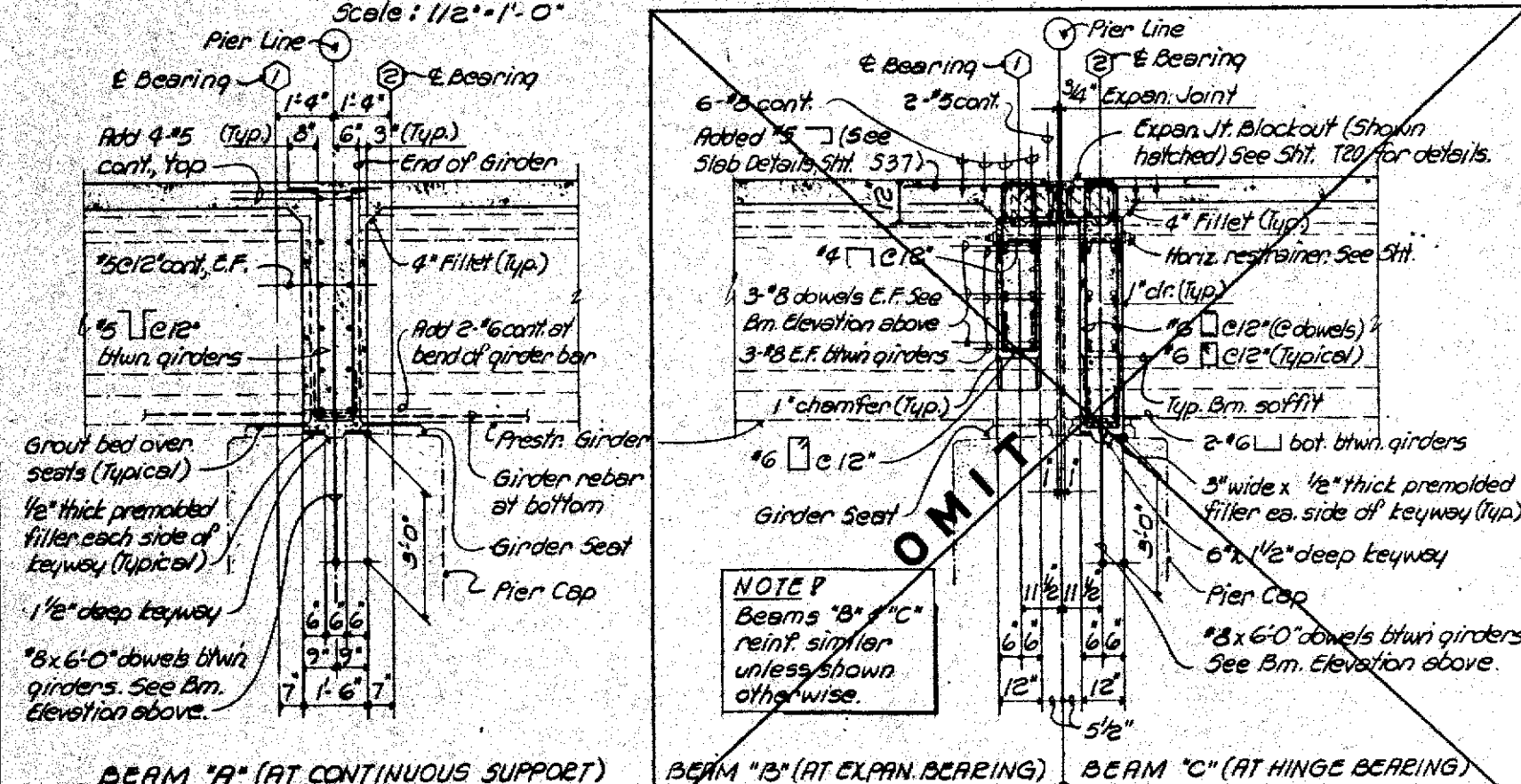
ADD. 125

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(54)	1989	128	137



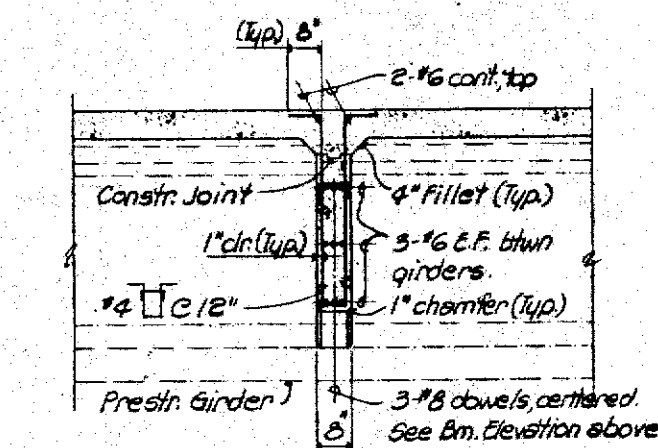
PARTIAL ELEVATIONS OF END BEAMS AT SUPPORTS SHOWING REINFORCING

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

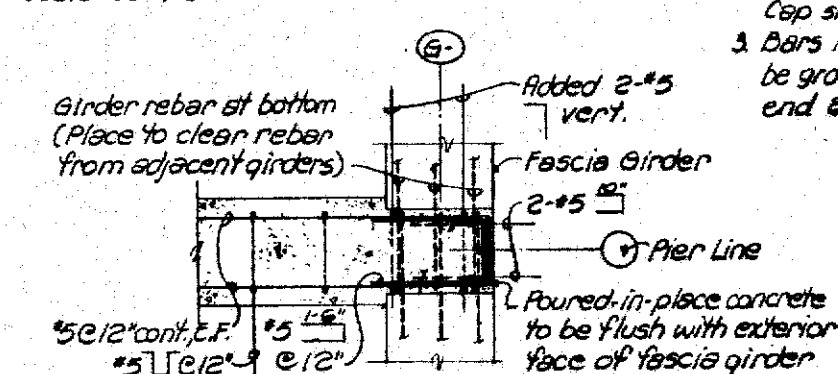


END BEAM SECTIONS

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

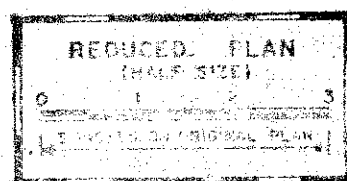


Scale: 1/2" = 1'-0"



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

- NOTES:**
- Beams B, C, D, E, F & G shall be poured at least 7 days prior to pouring deck slab.
 - See SH. 514 for top of Pier Cap shelf details.
 - Bars in preformed holes shall be grouted in place before pouring end & intermediate beams.



BEAM ENGINEERS INC.
501 Summer St., #502
Honolulu, Hawaii 96817



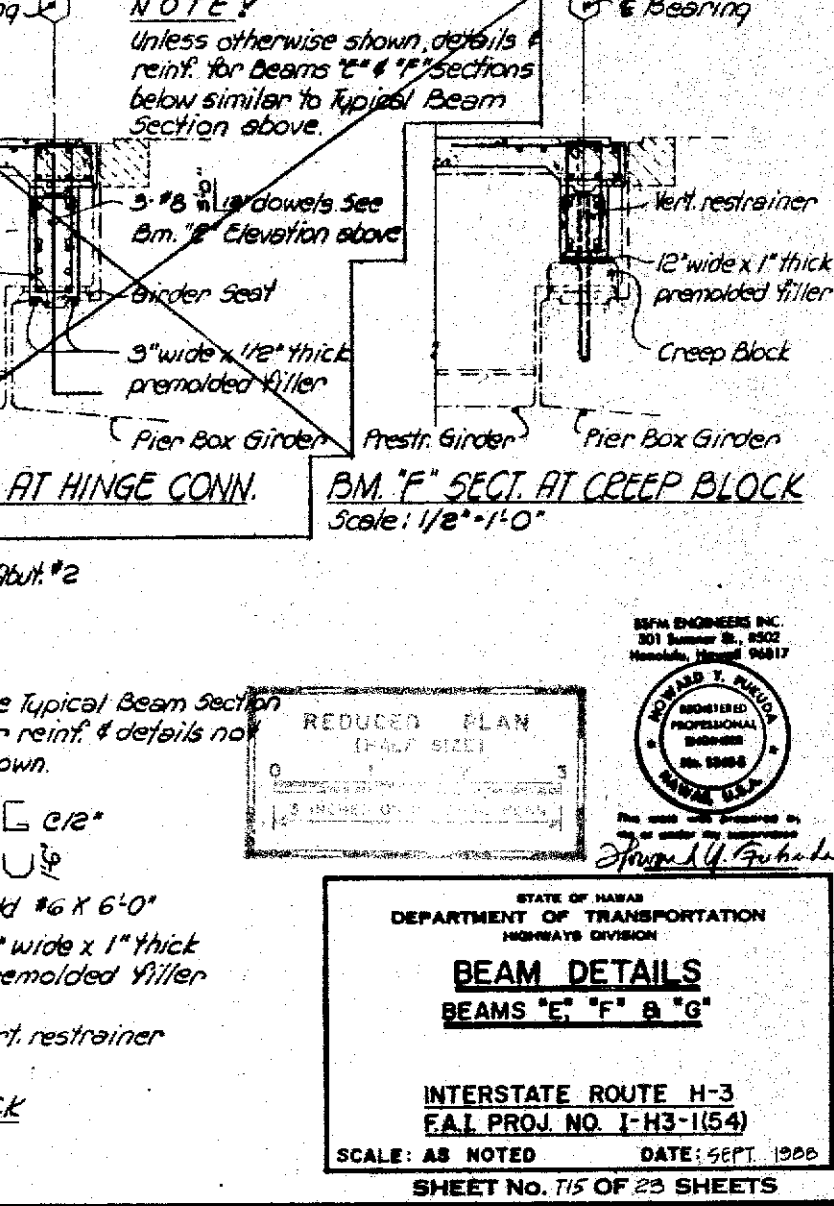
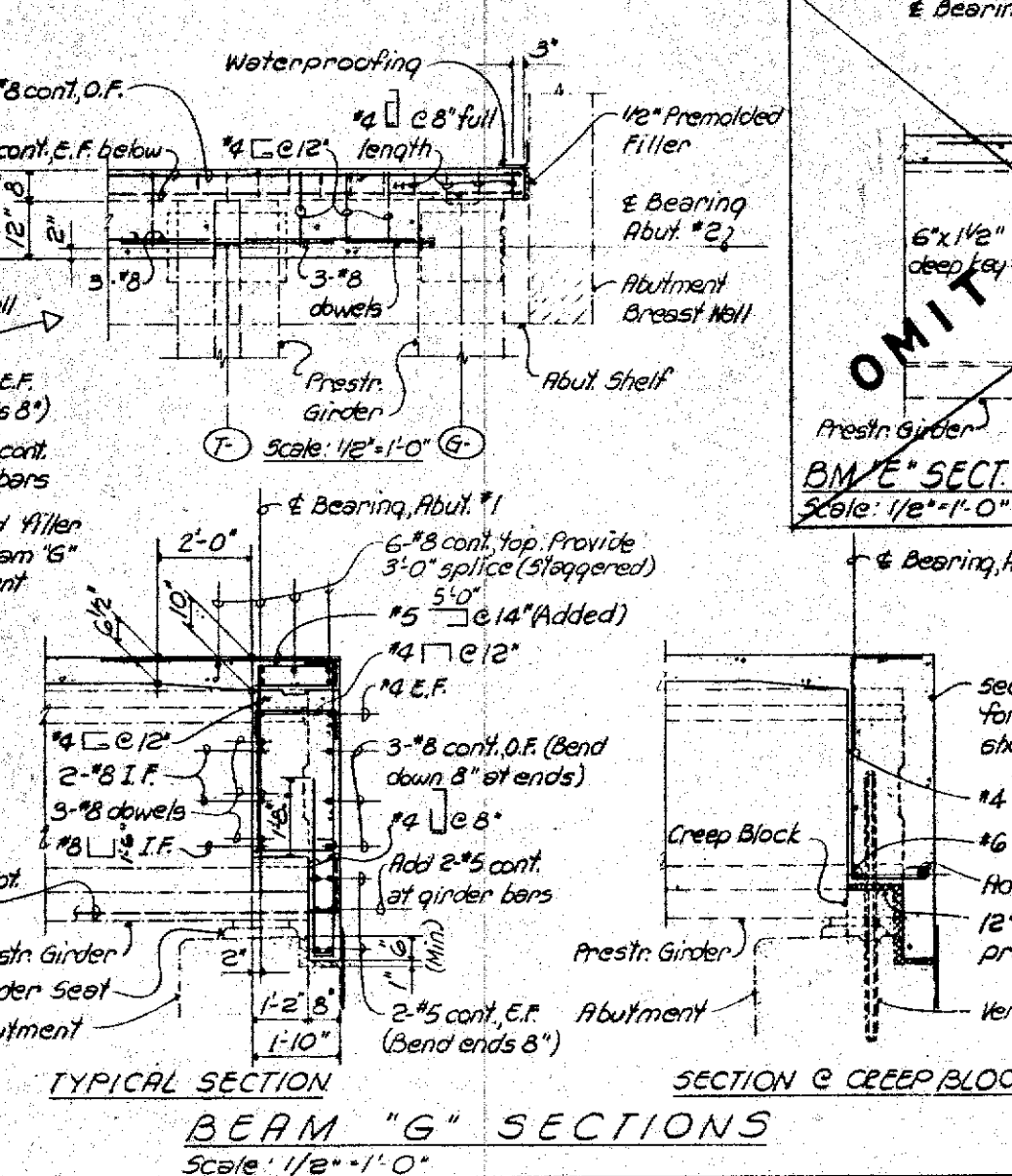
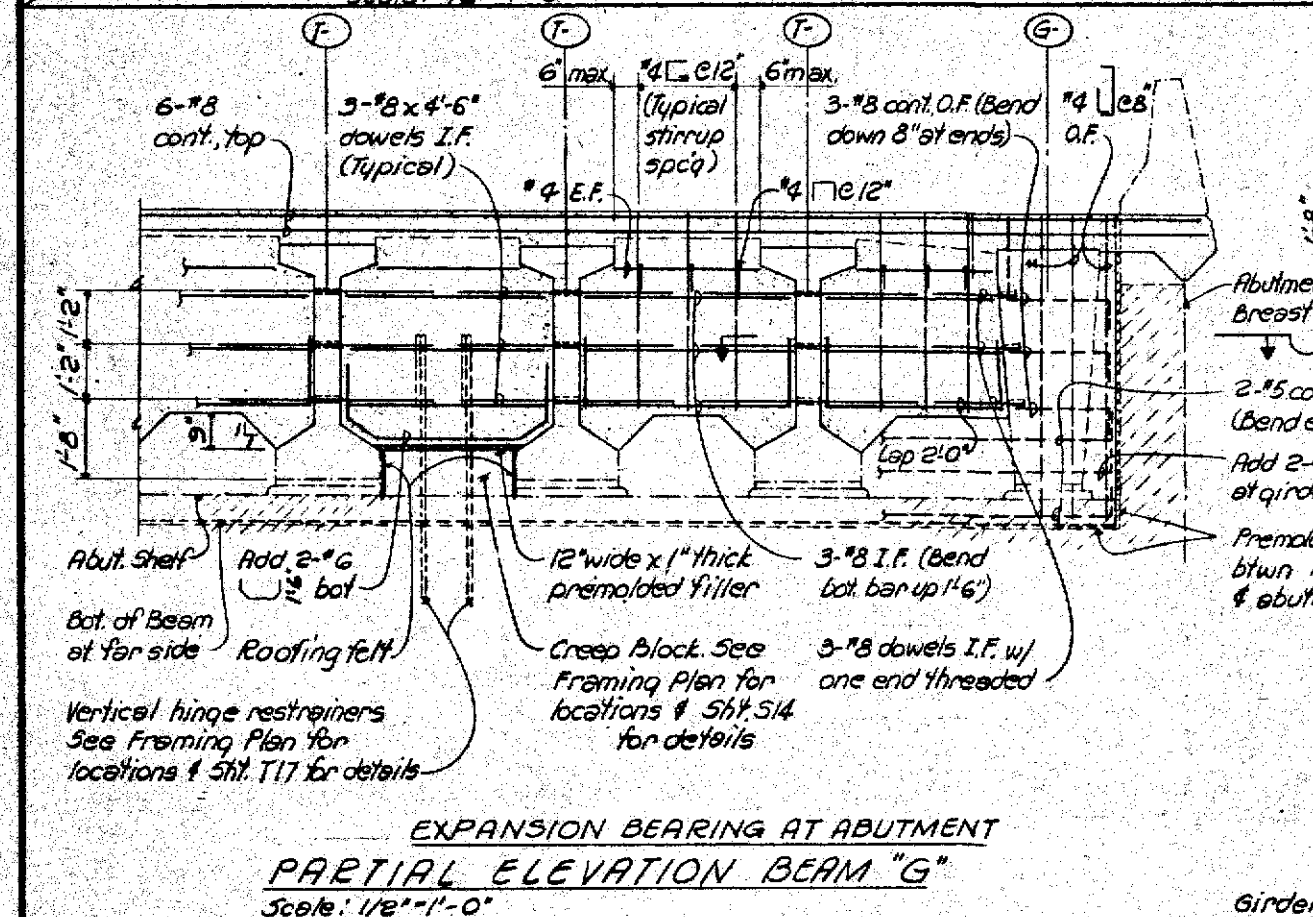
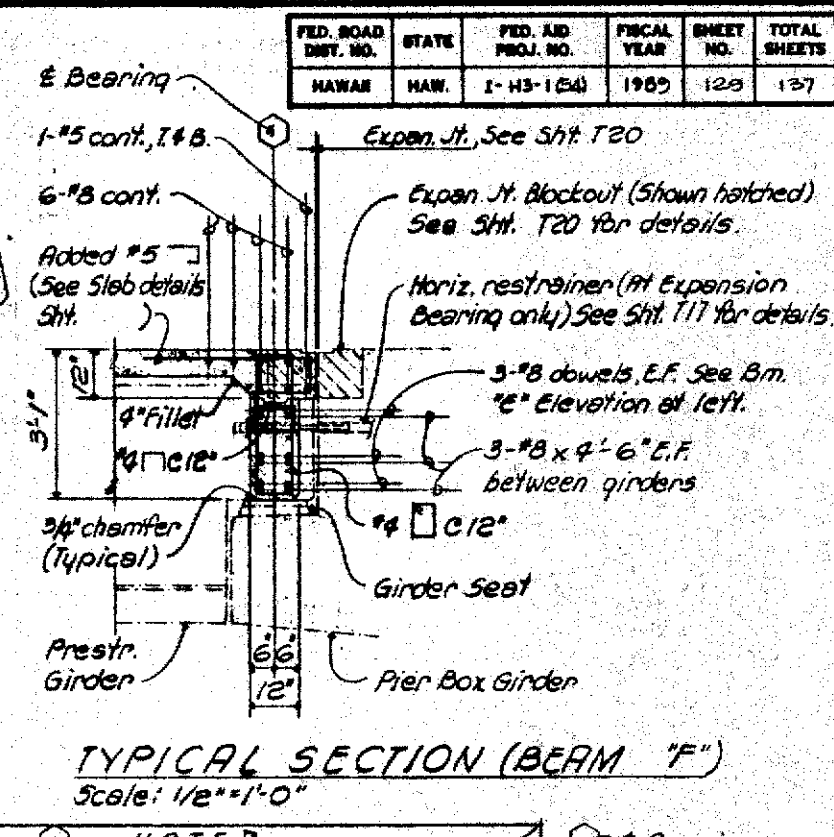
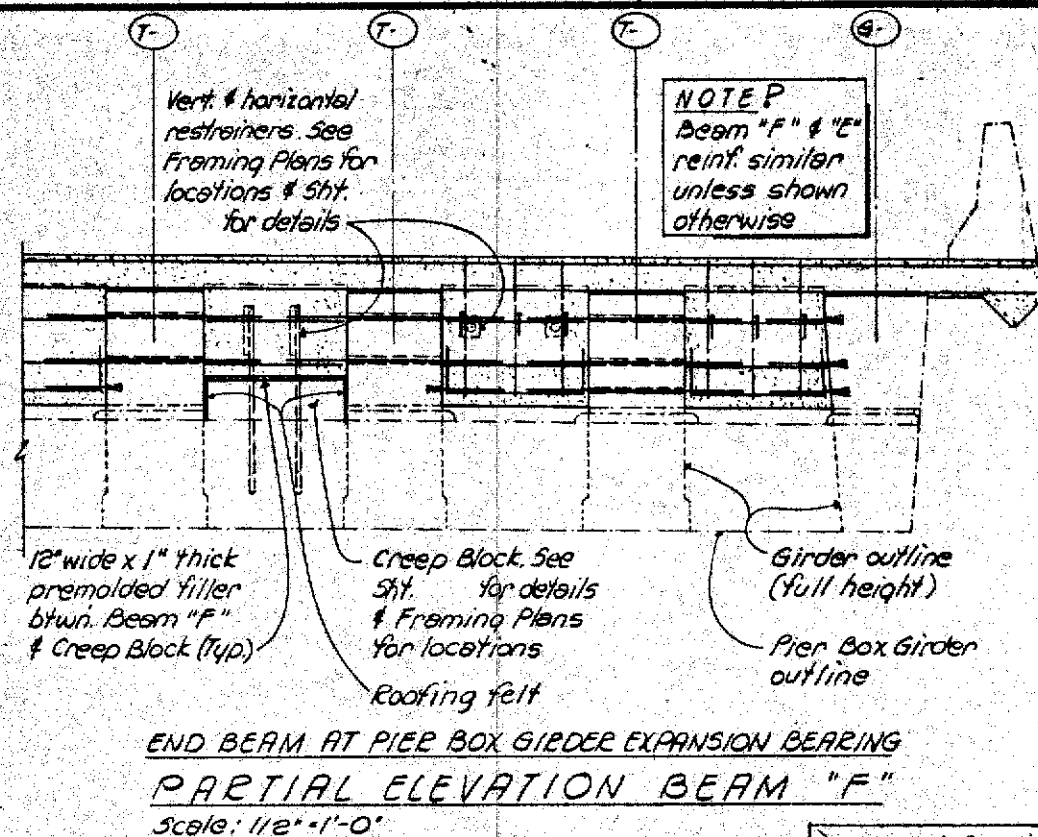
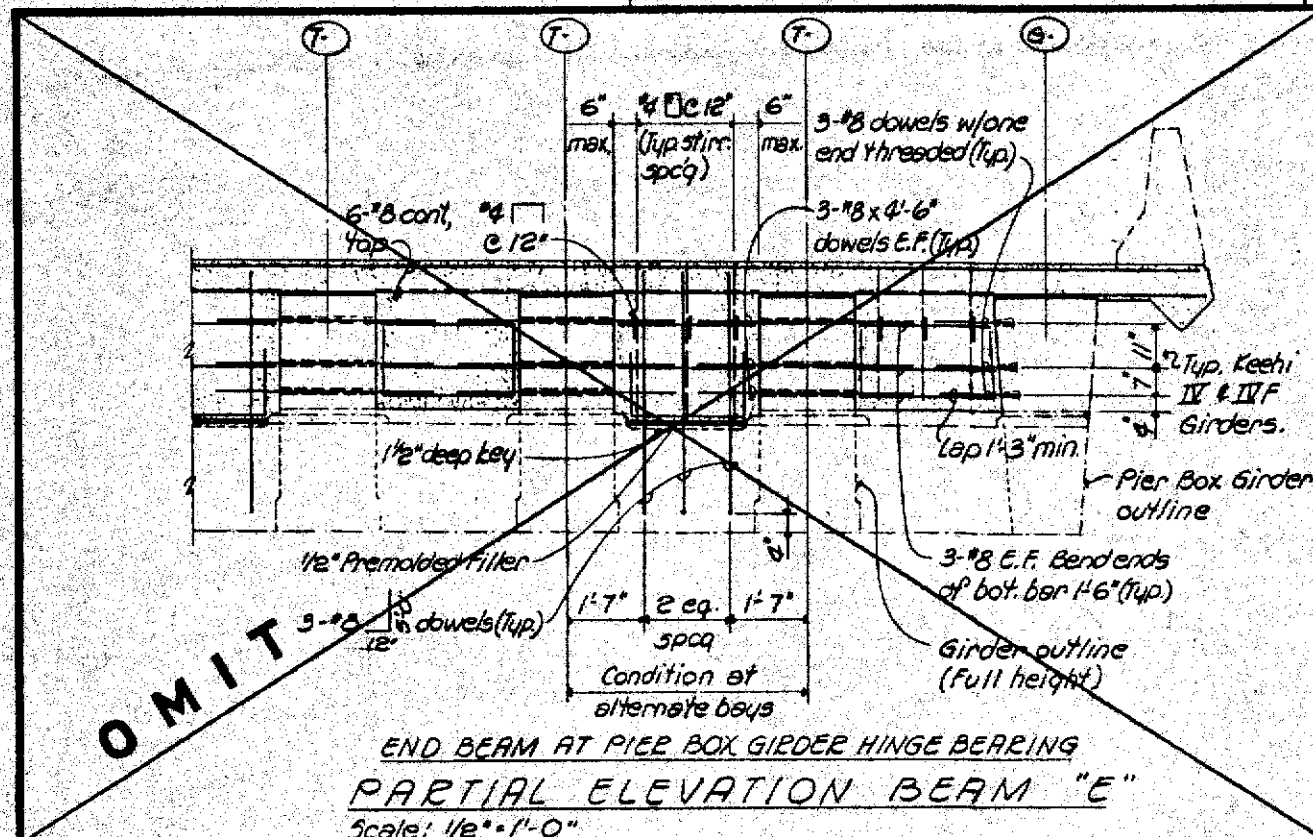
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BEAM DETAILS BEAMS "A", "B", "C" & "D"

INTERSTATE ROUTE H-3
FAL PROJ. NO. I-H3-1(54)

SCALE: AS NOTED DATE: SEPT 1988
SHEET NO. 114 OF 23 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-13-1(54)	1985	125	137



DATE	
DESIGNED BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
ORIGINAL PLAN	

REDUCED PLAN (1/4" = 1'-0")
0 3
1 2
3 2
2 1
1 1
0 1

BSM ENGINEERS INC.
 301 Summer St., #502
 Honolulu, Hawaii 96817



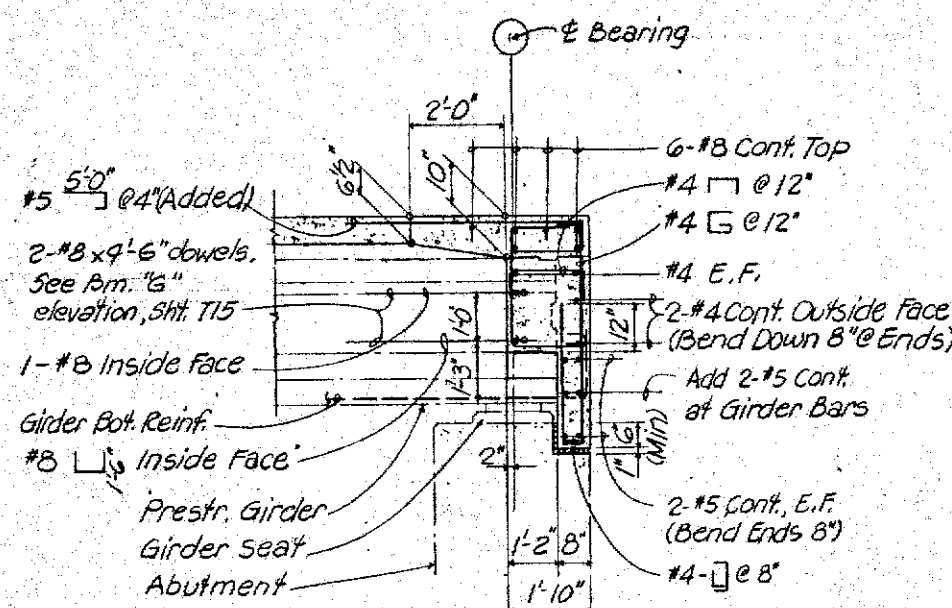
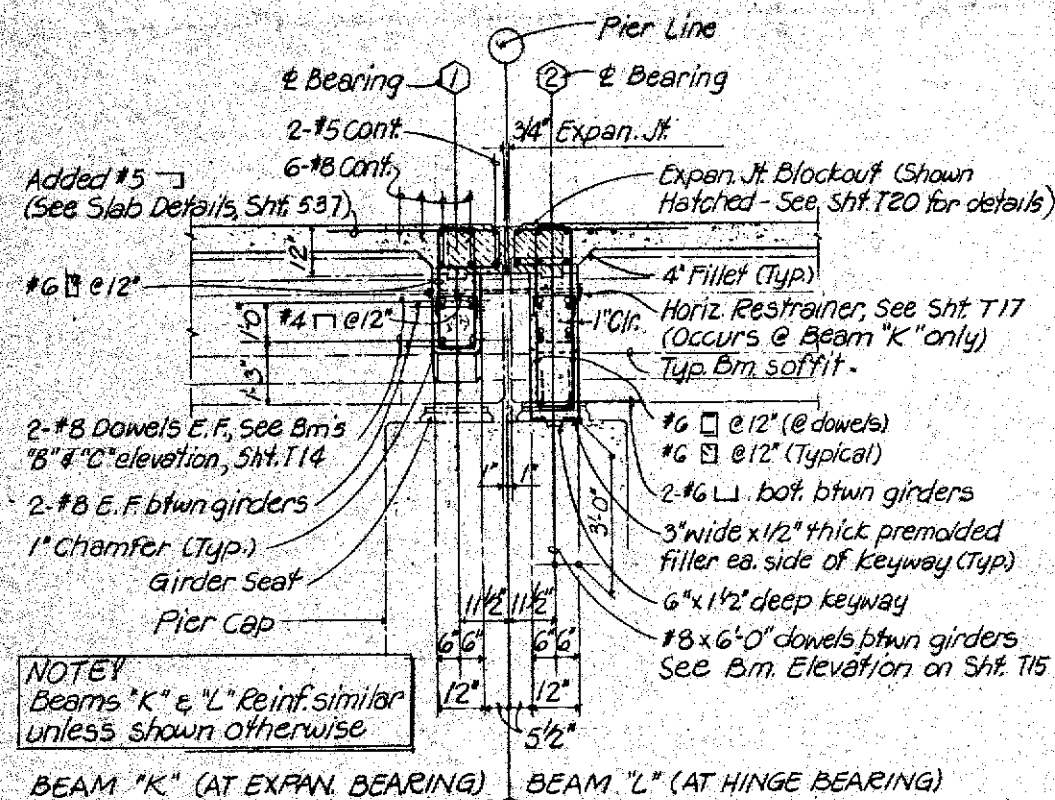
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

BEAM DETAILS
 BEAMS "E", "F" & "G"

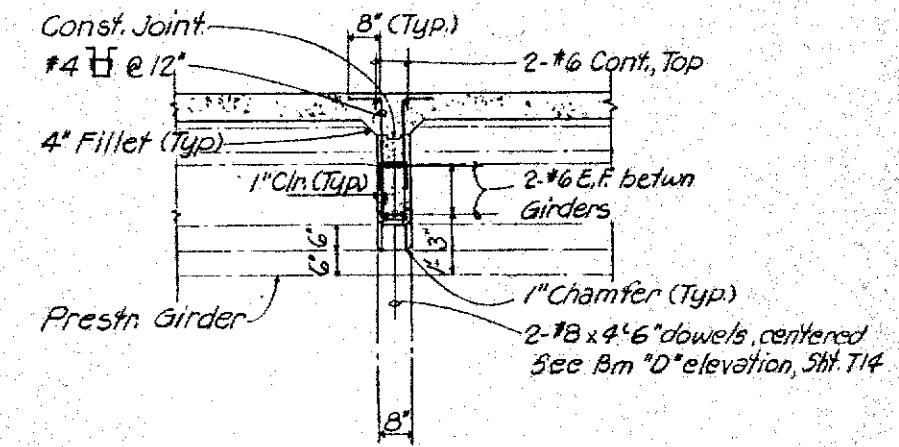
INTERSTATE ROUTE H-3
 F.A.I. PROJ. NO. I-13-1(54)

SCALE: AS NOTED DATE: SEPT. 1985
 SHEET NO. 115 OF 23 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(54)	1989	130	157



TYPICAL BEAM 'N' SECTION
Scale: 1/2" = 1'-0"



BEAM "M" SECTION (Intermediate Bm.)
Scale: 1/2" = 1'-0"

NOTE:
Beams for Ramp "N" similar to beams for #3 Viaduct. See Table below:

RAMP "N" BEAM	SIMILAR H-3 VIADUCT BEAM
K	B
L	—
M	D
N	G

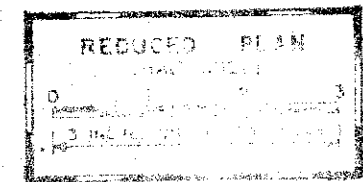
FOR RAMP "N"

DATE	
BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	
ORIGINAL PLAN	
TRACED BY	
NOTE BOOK	

SSFM ENGINEERS INC.
501 Summer St., #502
Honolulu, Hawaii 96817

HOWARD Y. FUKUDA
REGISTERED PROFESSIONAL ENGINEER
No. 13434
HAWAII U.S.A.

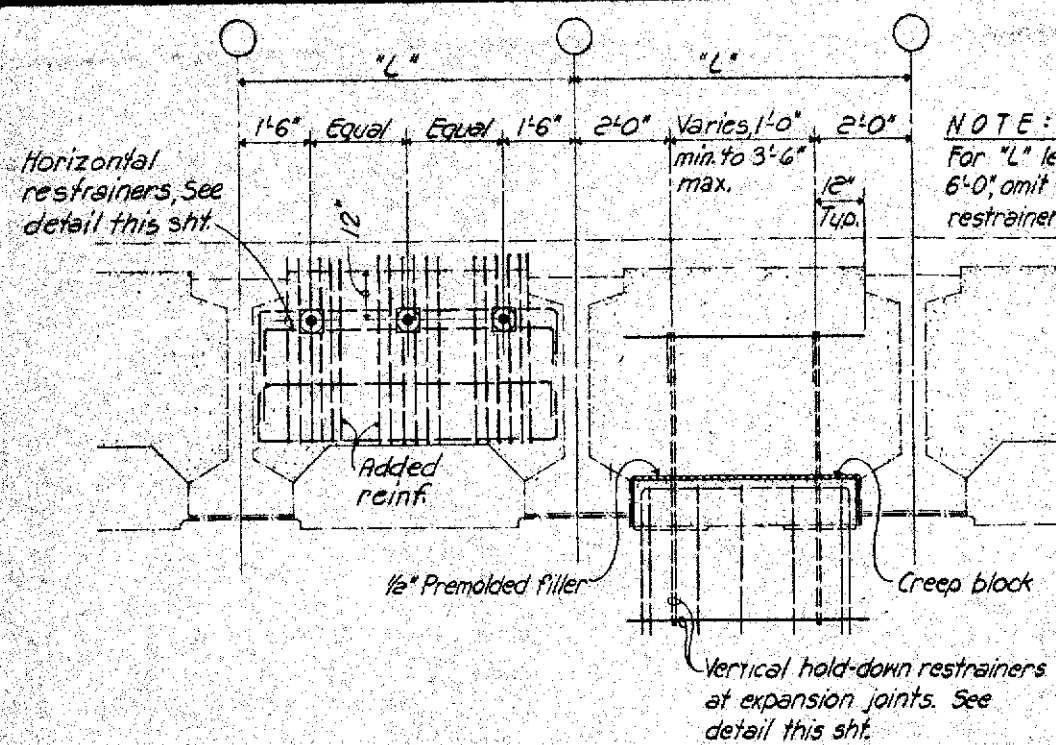
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Howard Y. Fukuda



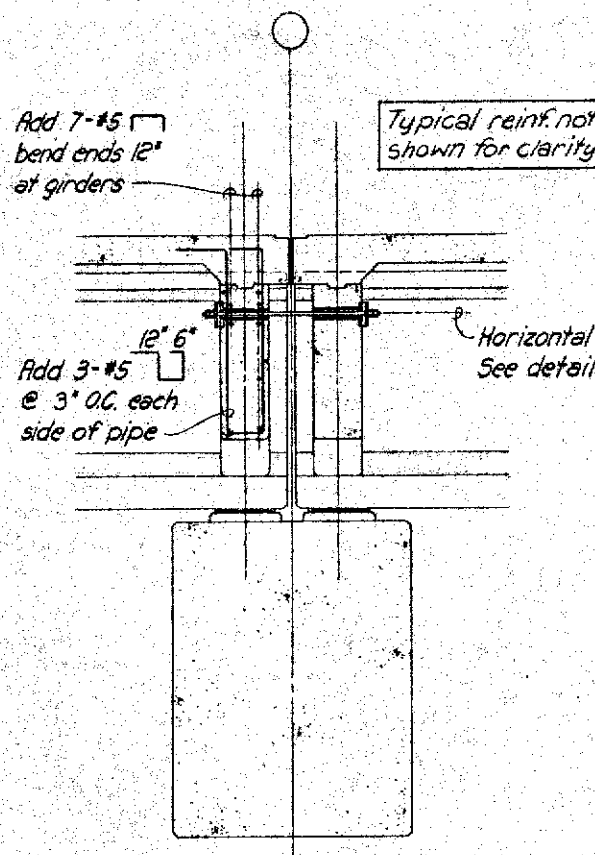
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BEAM DETAILS
BEAMS "K", "L", "M" & "N"

INTERSTATE ROUTE H-3
F.A.I. PROJ. NO. I-H3-1(54)
SCALE: AS NOTED DATE: SEPT. 1988
SHEET NO. 716 OF 23 SHEETS

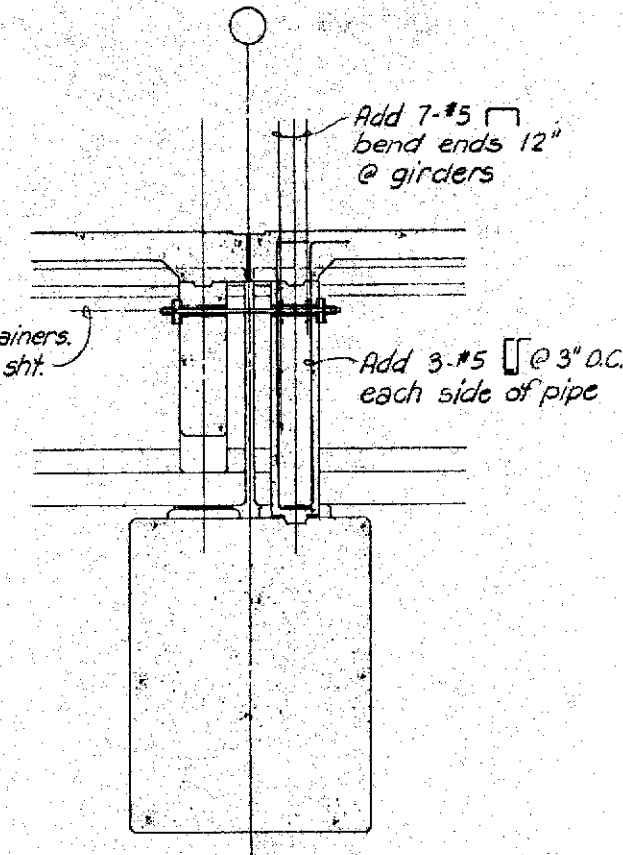
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(54)	1989	131	137



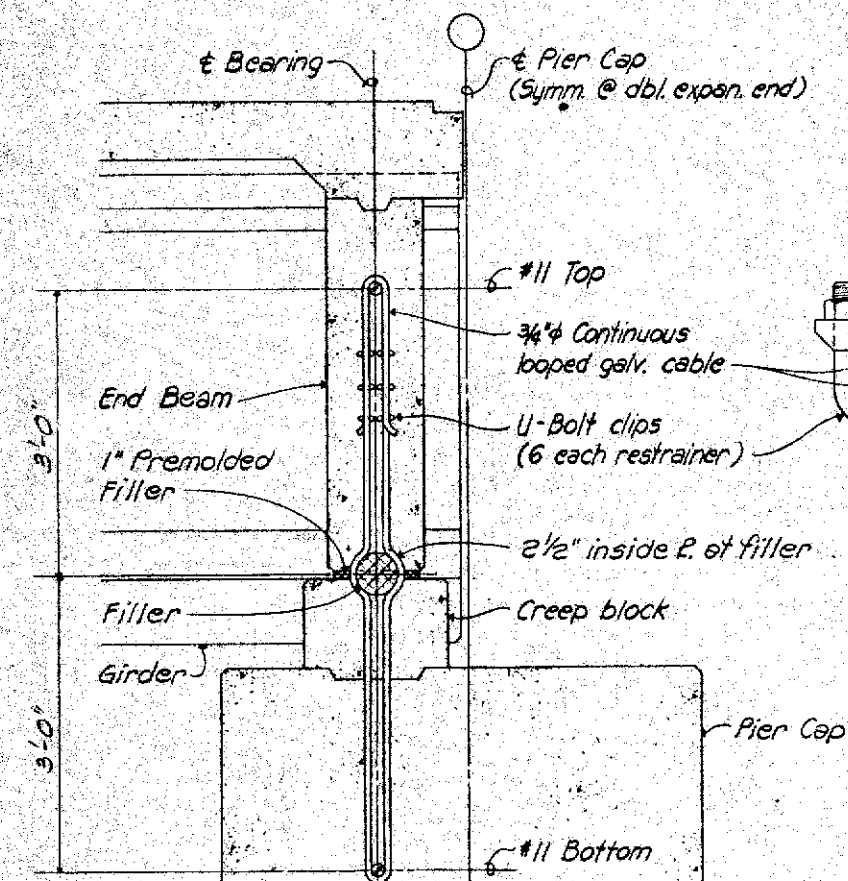
END BEAM ELEVATION AT EXPANSION JOINT
Scale: 1/2" = 1'-0"



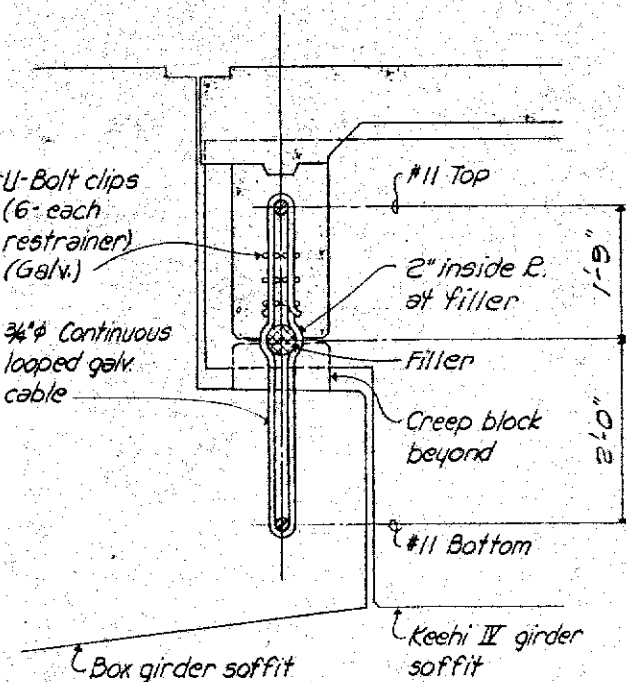
END BEAM SECTION AT DOUBLE EXPANSION END
Scale: 1/2" = 1'-0"



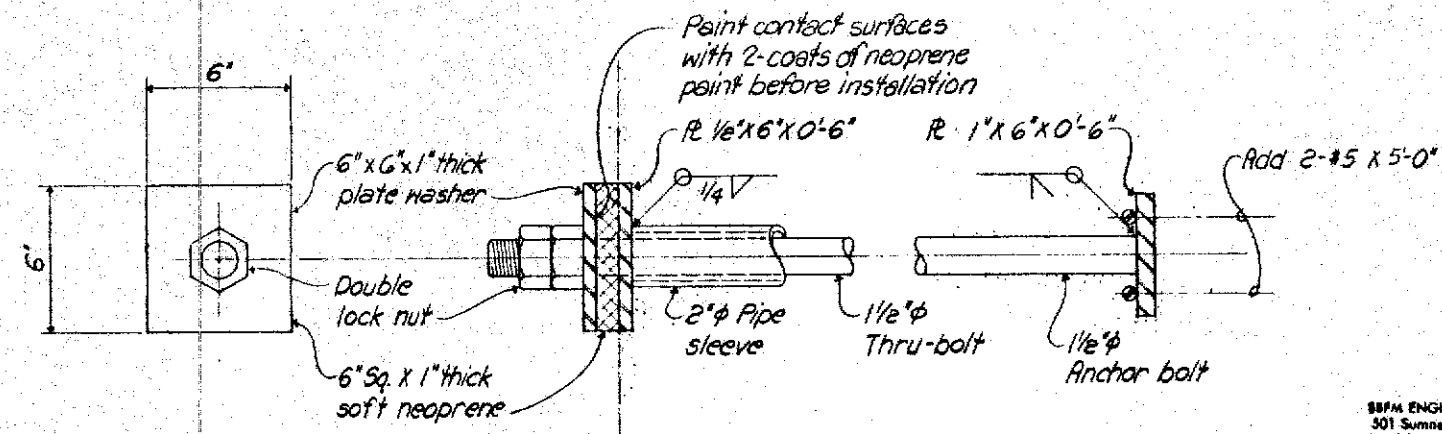
END BEAM SECTION AT EXPANSION & HINGE END
Scale: 1/2" = 1'-0"



TYPICAL VERTICAL RESTRAINER DETAIL
Scale: 1" = 1'-0"



VERTICAL RESTRAINER AT GIRDER DAPPED END
Scale: 1" = 1'-0"



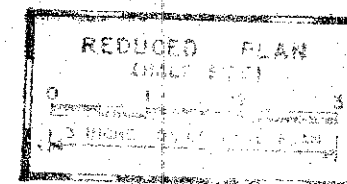
FRONT ELEVATION

TYPICAL END SECTION

SECTION AT EMBEDDED END AT BOX GIRDER

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

- NOTES:
- Galv. all hardware after fabrication.
 - Paint all exposed surfaces with 2 coats of neoprene paint after installation.



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501 Summer St., #502
Honolulu, Hawaii 96817



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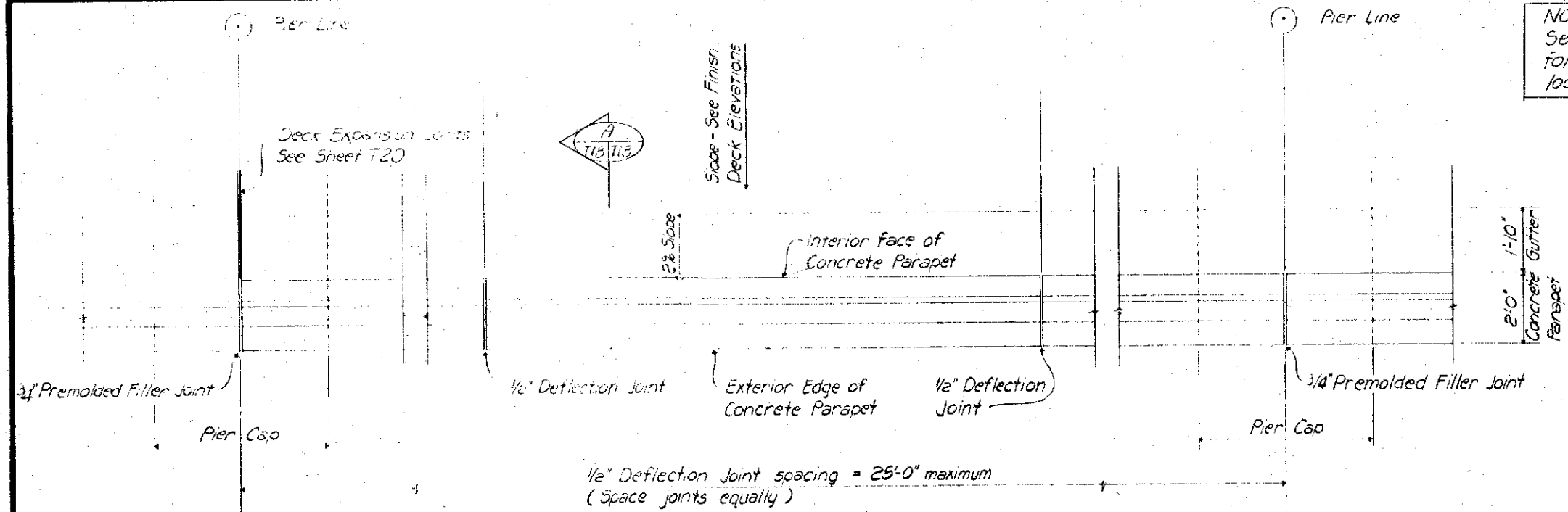
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HINGE RESTRAINER DETAILS

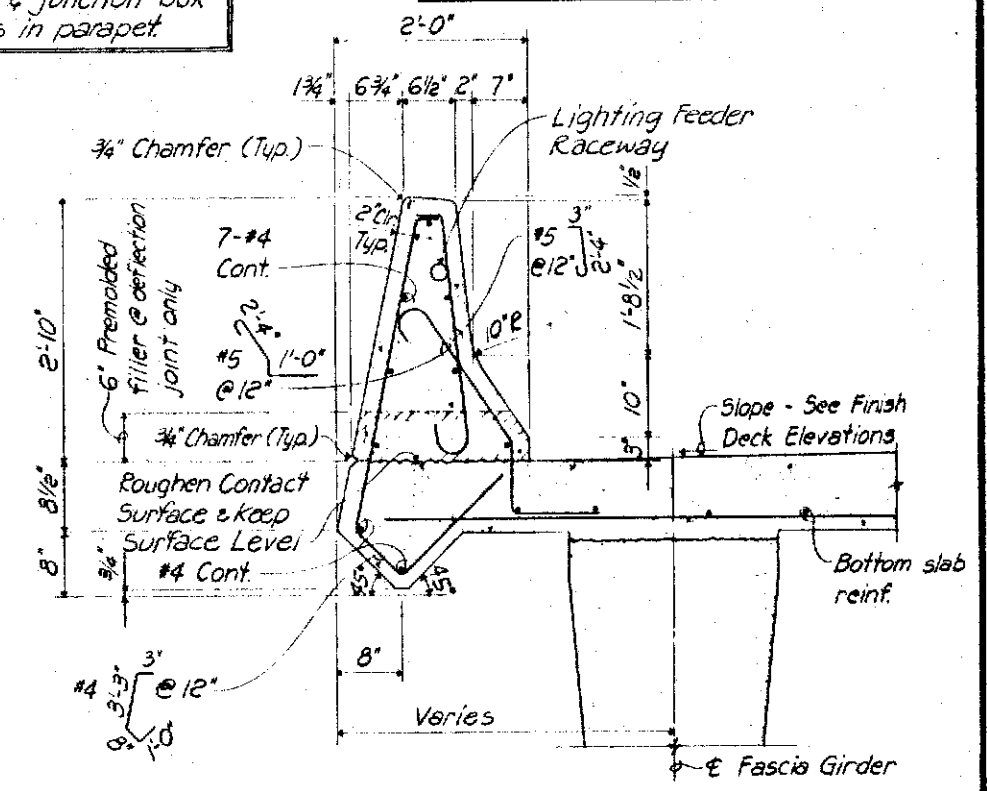
INTERSTATE ROUTE H-3
FAI PROJ. NO. I-H3-1(54)
SCALE: AS NOTED DATE: SEPT. 1989
SHEET NO. 71 OF 23 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I- H3-1(54)	1989	132	137

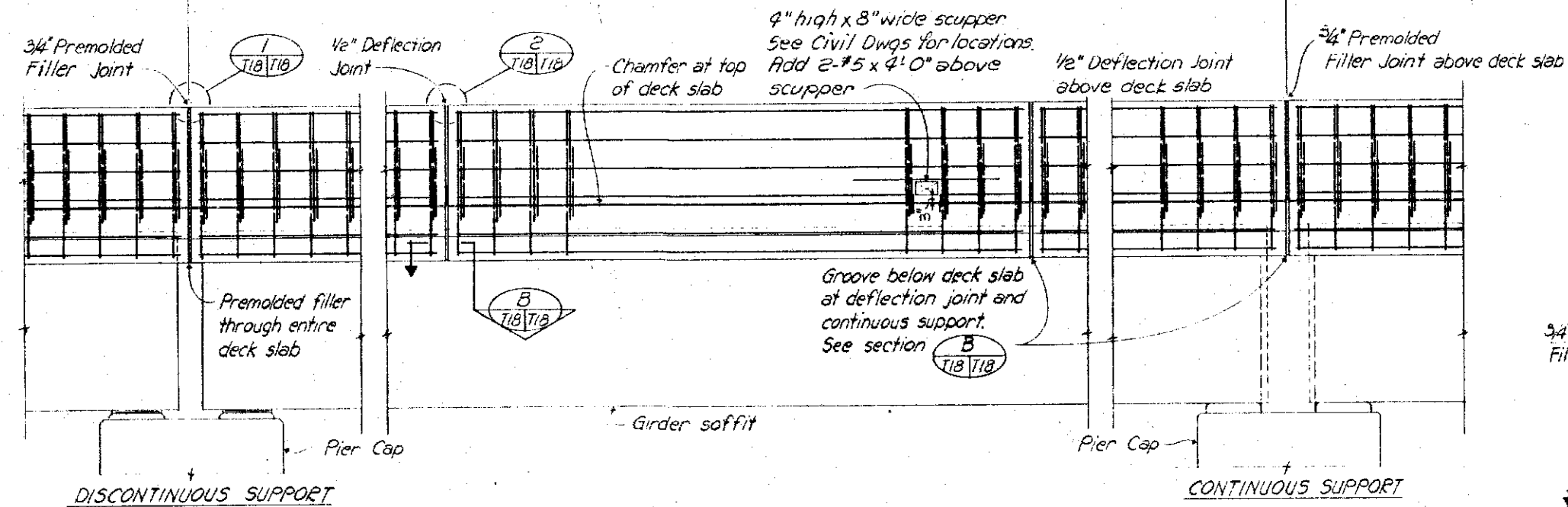
NOTE:
See Electrical Drawings for duct & junction box locations in parapet



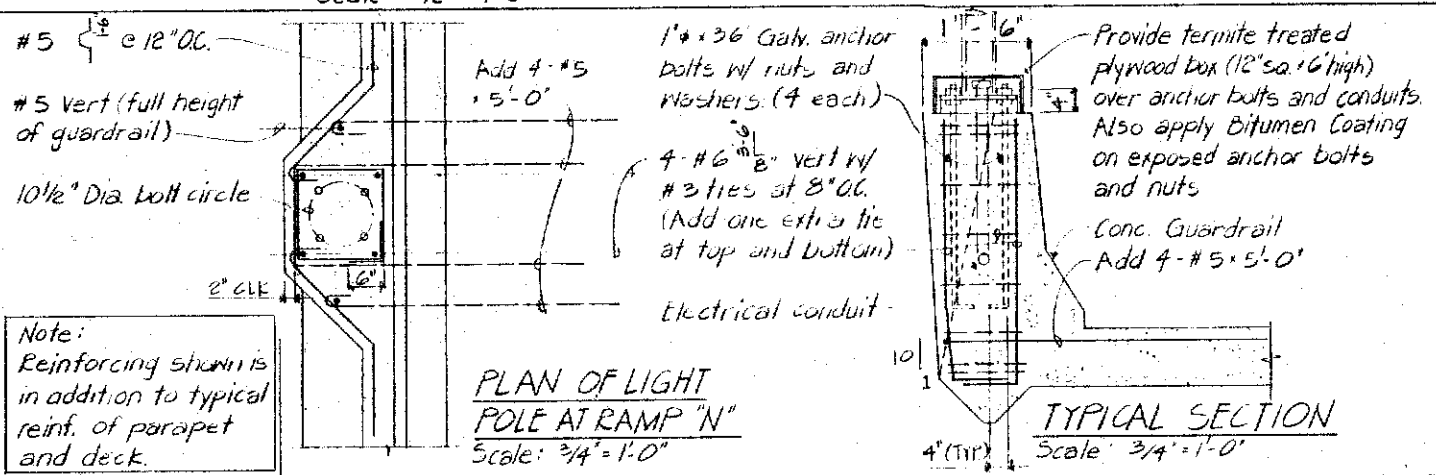
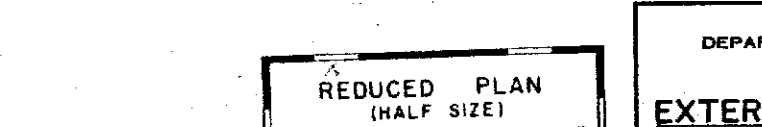
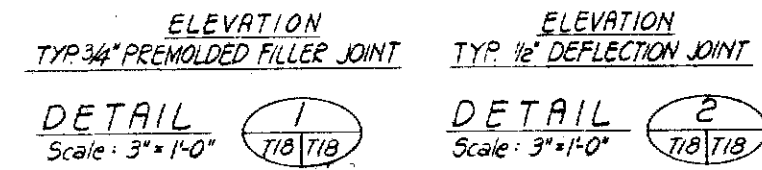
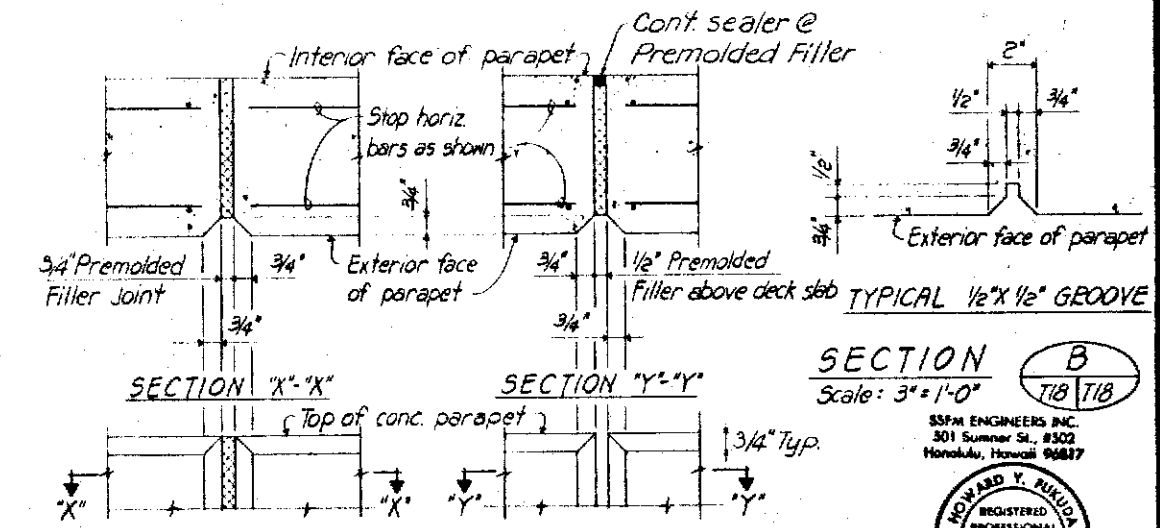
PARTIAL PLAN - EXTERIOR CONCRETE PARAPET
Scale: 1/2" = 1'-0"



TYPICAL EXTERIOR CONCRETE PARAPET SECTION A
Scale: 1" = 1'-0"



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



Note:
Reinforcing shown is in addition to typical reinf. of parapet and deck.

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HOWARD Y. KUKUA
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No. 1242-1
HAWAII U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXTERIOR PARAPET DETAILS

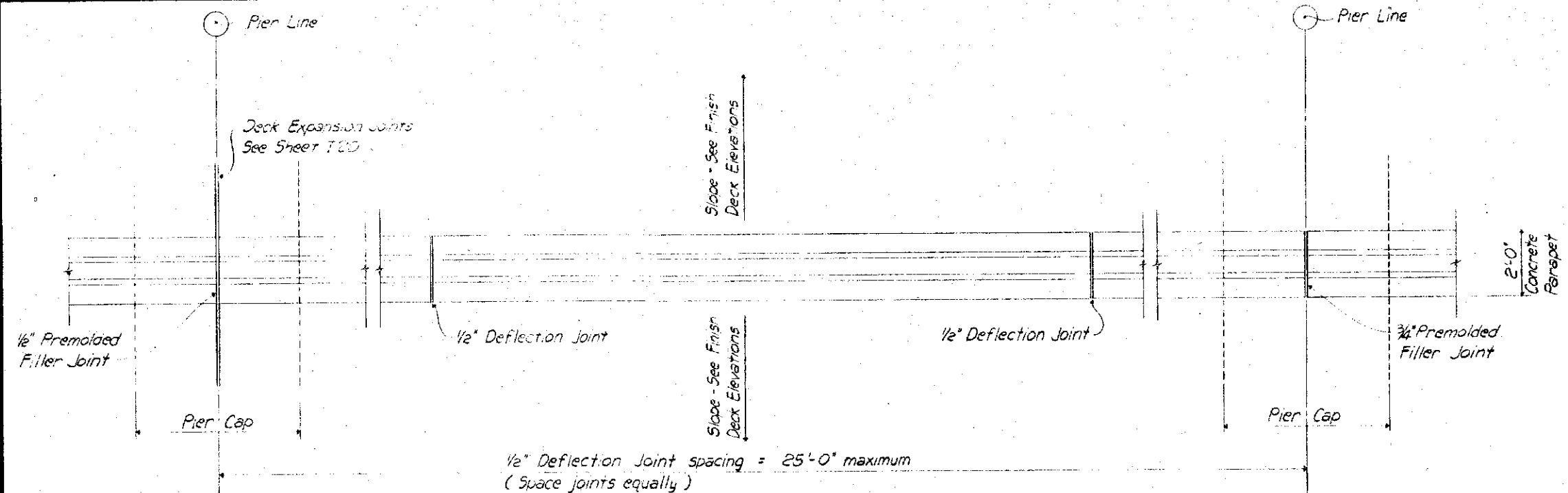
INTERSTATE ROUTE H-3
F.A.I. PROJ. NO. I-H3-1(54)

SCALE: AS NOTED DATE: SEPT 1988

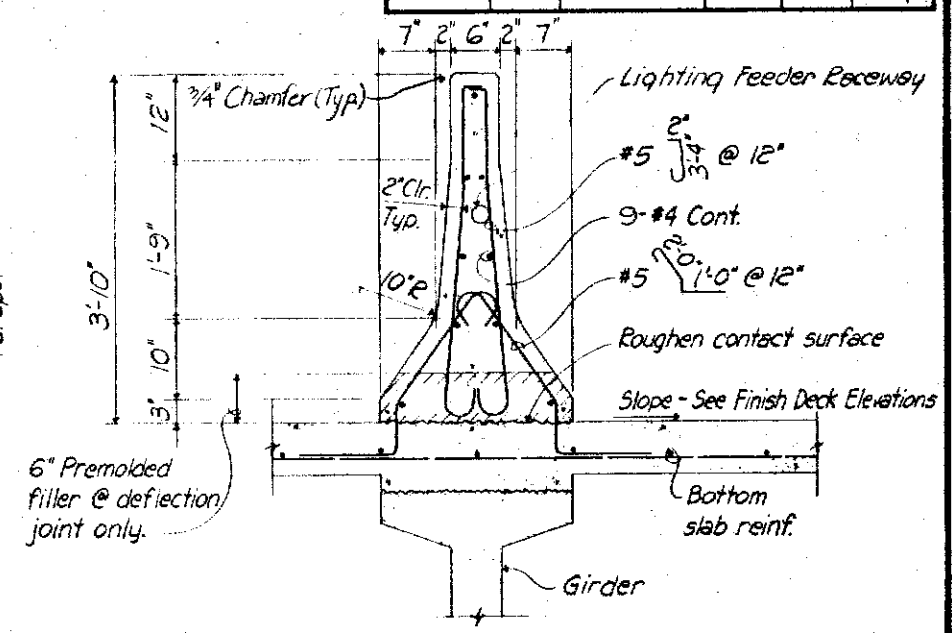
SHEET NO. T18 OF 23 SHEETS

1-25-89	Added light pole detail
Date	Revision

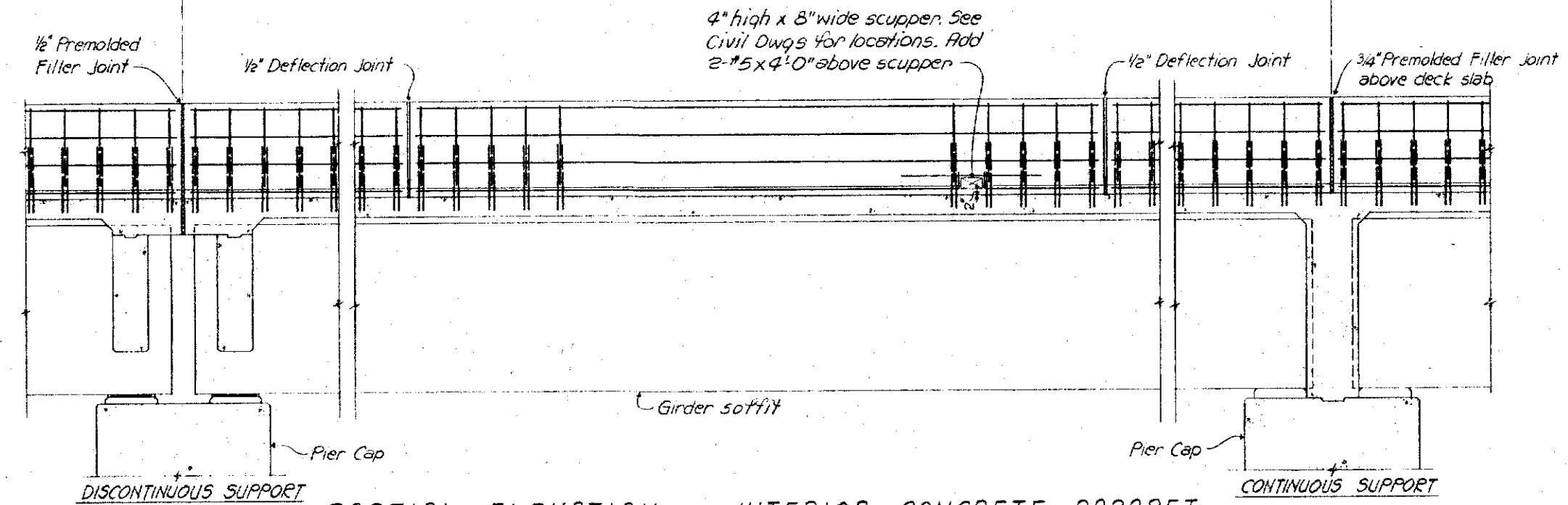
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(54)	1989	133	137



PARTIAL PLAN - INTERIOR CONCRETE PARAPET
Scale: 1/2" = 1'-0"



TYPICAL INTERIOR CONCRETE PARAPET SECTION
Scale: 1" = 1'-0"



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

- REFERENCE DRAWINGS:**
- 1. Premolded filler & deflection joint details ----- Sht T18
 - 2. Expansion joint detail ----- Sht T20



1-25-89	Revised Median Dimension
Date	Revision

SSPM ENGINEERS INC.
301 Sumner St., #302
Honolulu, Hawaii 96817



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Howard Y. Fukuda

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

INTERIOR PARAPET DETAILS

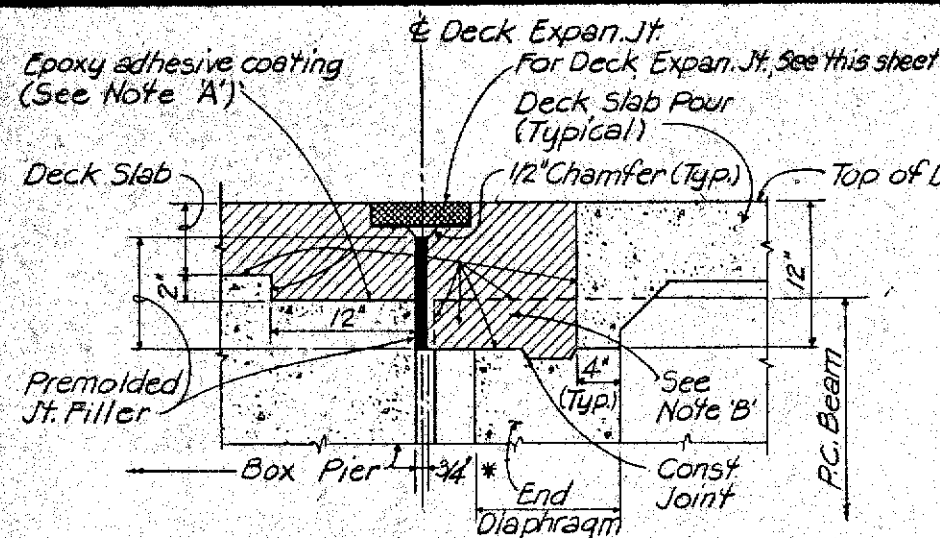
INTERSTATE ROUTE H-3
F.A.I. PROJ. NO. I-H3-1(54)

SCALE: AS NOTED DATE: SEPT. 1988

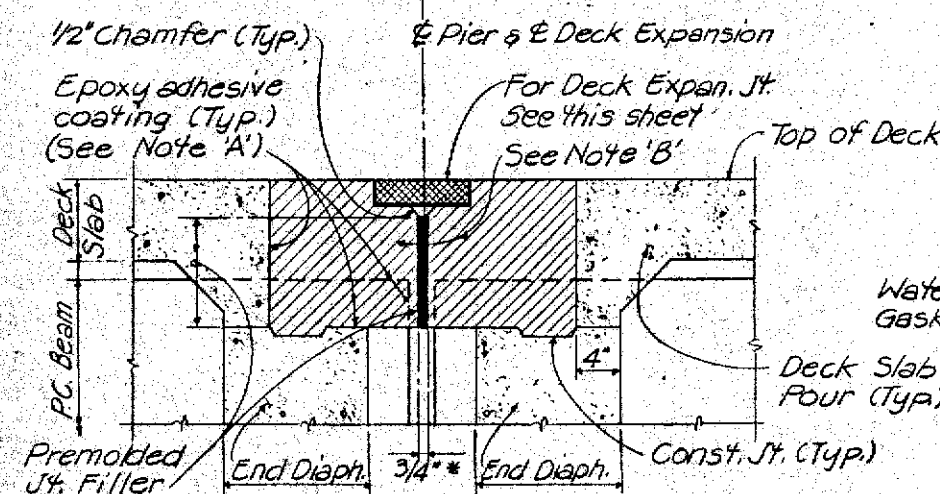
SHEET NO. 119 OF 23 SHEETS

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

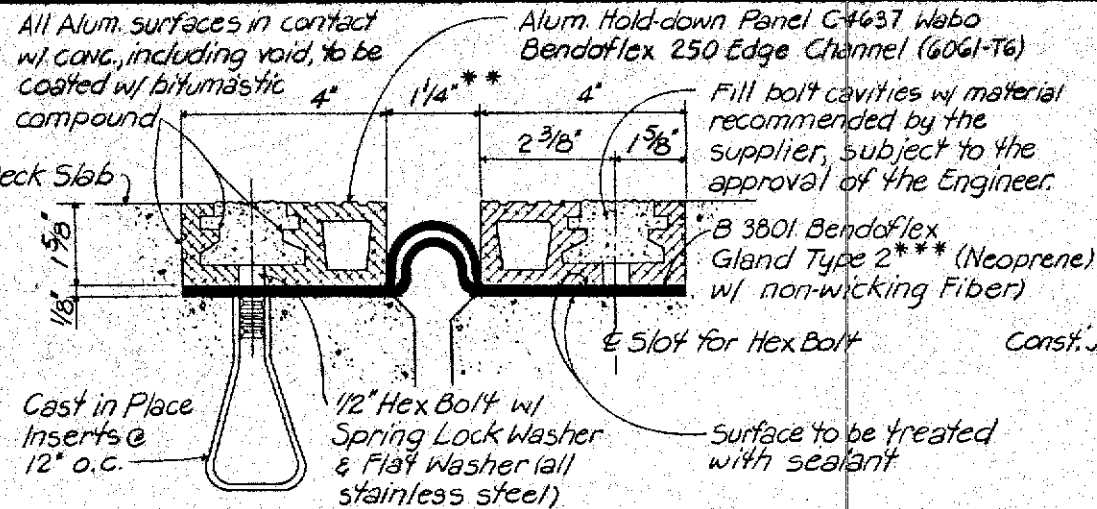
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(54)	1985	134	137



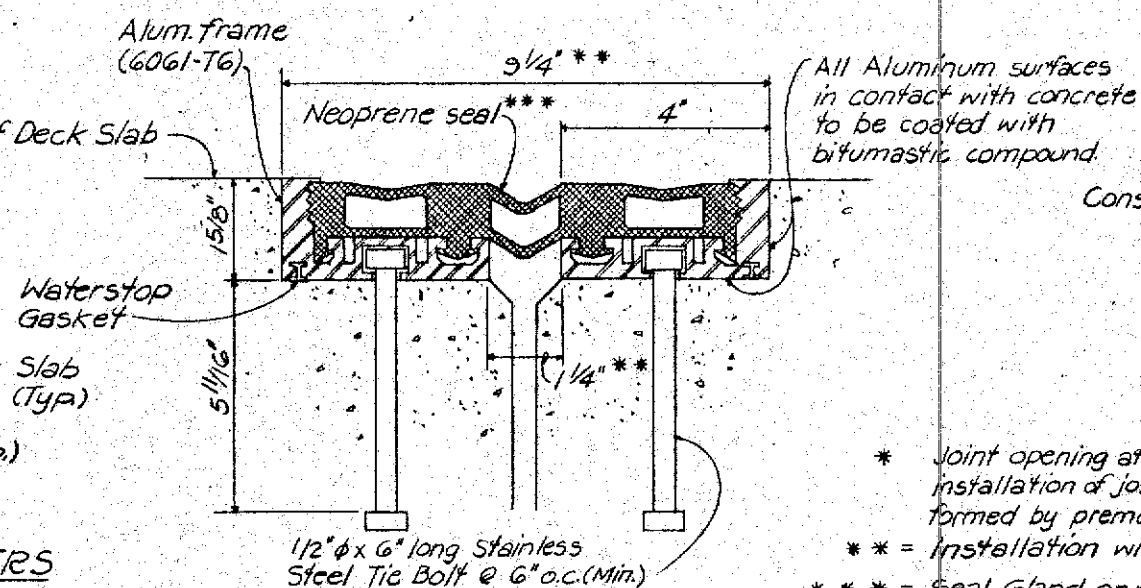
TYPICAL DECK SECTION AT BOX PIER
Not to Scale



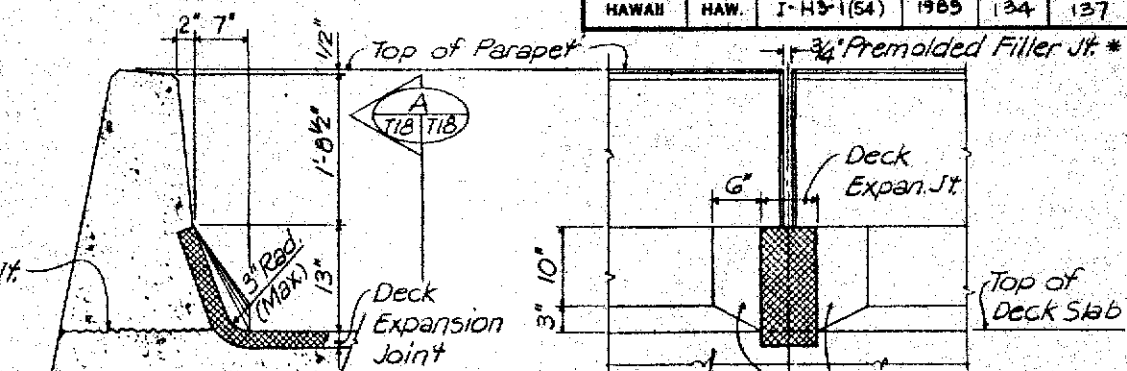
TYPICAL DECK SECTION AT TYPICAL PIERS
Not to Scale



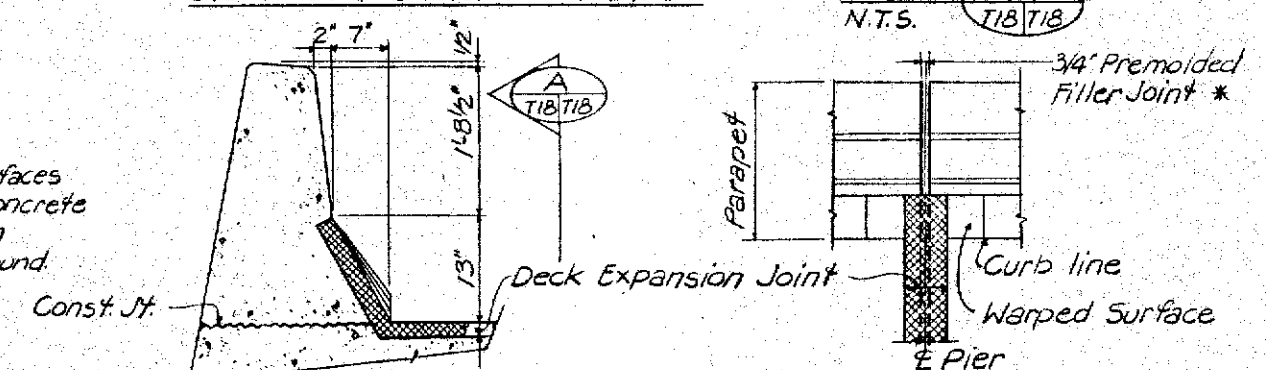
WABO BENDOFLEX 250
(Mfr.: Watson Bowman Assoc. Inc.)



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



TYPICAL SECTION AT STD. PARAPET (SIM. @ MEDIAN)



TYPICAL PLAN - SKEW ANGLE 0°-15°
NOT TO SCALE

ALTERNATE DETAIL AT PARAPET
(Similar detail at interior parapet)

- NOTES:**
- Four alternative Deck Expansion Joint Systems are shown. Contractor has the option of selecting any one of the systems. The contractor shall verify dimensions and 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.

- * Joint opening at time of installation of joint to be formed by premolded filler.
- ** = Installation width @ 75°F
- *** = Seal Gland or membrane shall be continuous across the full width of the structure.

NOTE 'A'

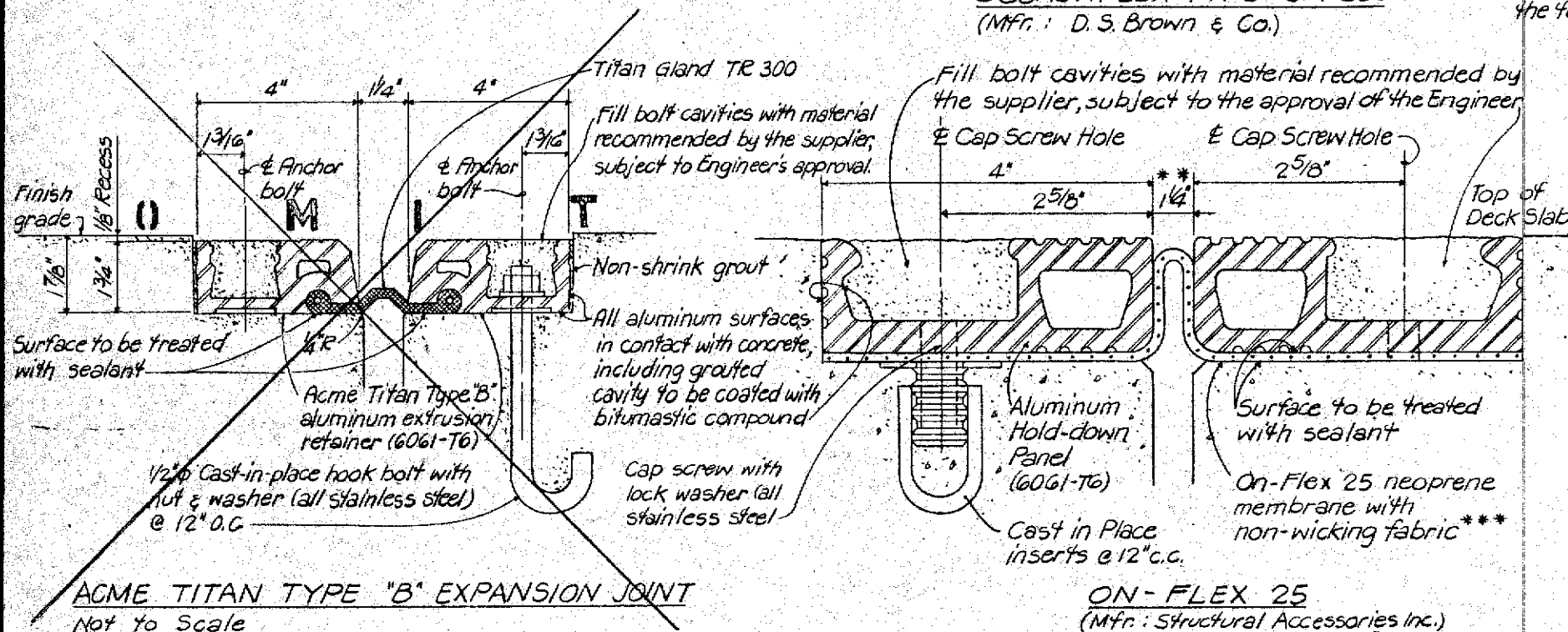
Just prior to concreting of the hatched areas, coat the indicated surfaces with an epoxy adhesive. (See Special Provision, Sec. 705.13)

NOTE 'B'

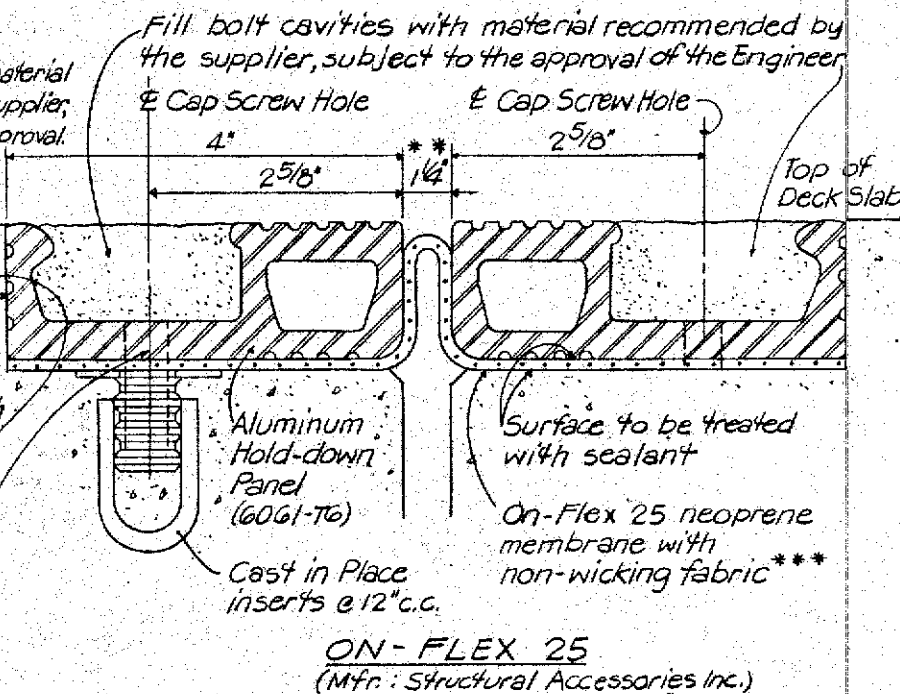
Hatched areas shall be concreted after 14 days of deck slab pour. Anchor devices shall be located and held in their final position, as per Manufacturer's requirement, during the concreting of the hatched areas.

NOTE 'C'

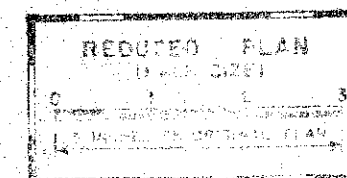
The closure pour (hatched areas) for deck expansion joint installation is required for spans with Keeshi Type II F, Type IV, Type IV F, & AASHTO Type II.



ACME TITAN TYPE 'B' EXPANSION JOINT
Not to Scale



ON-FLEX 25
(Mfr.: Structural Accessories Inc.)



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DECK EXPANSION JOINT DETAILS

INTERSTATE ROUTE H-3
F.A.I. PROJ. NO. I-H3-1(54)

SCALE: AS NOTED DATE: SEPT. 1988

SHEET NO. 720 OF 23 SHEETS

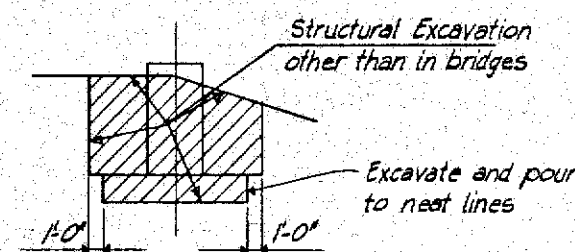
SSFM ENGINEERS INC
301 Summer St., #502
Honolulu, Hawaii 96817



This work was prepared by me or under my supervision
Howard Y. Fukuda

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(54)	1989	135	137

Foundation Schedule						
FTG	Rectangle footing on earth		Pedestal Vertical Reinforcements	ELEV. 'A'	ELEV. 'B'	P Post Spacing
	Size (W×T×L)	Long Reinforcents (Bottom)				
L	5'-0"×2'-0"×14'-0"	*7 Bars @12"	8-#7 Bars	78.79	71.12	5'-2"
R	5'-0"×2'-0"×14'-0"	*7 Bars @12"	8-#7 Bars	79.02	71.35	5'-2"

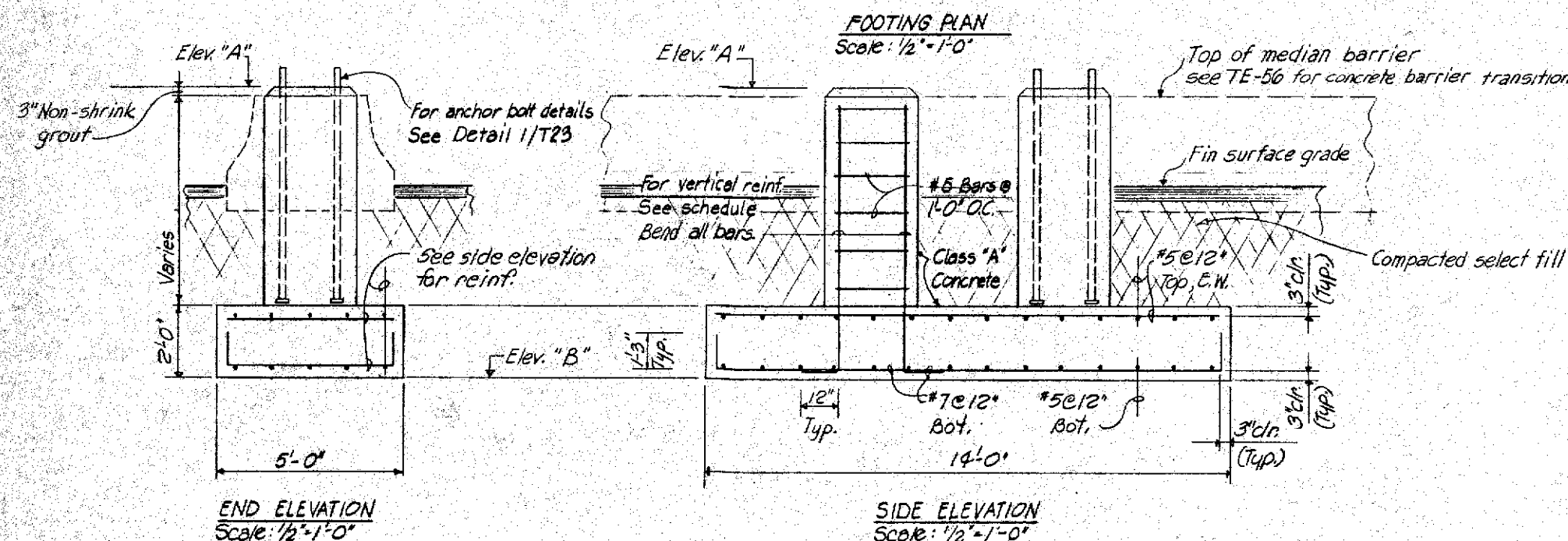
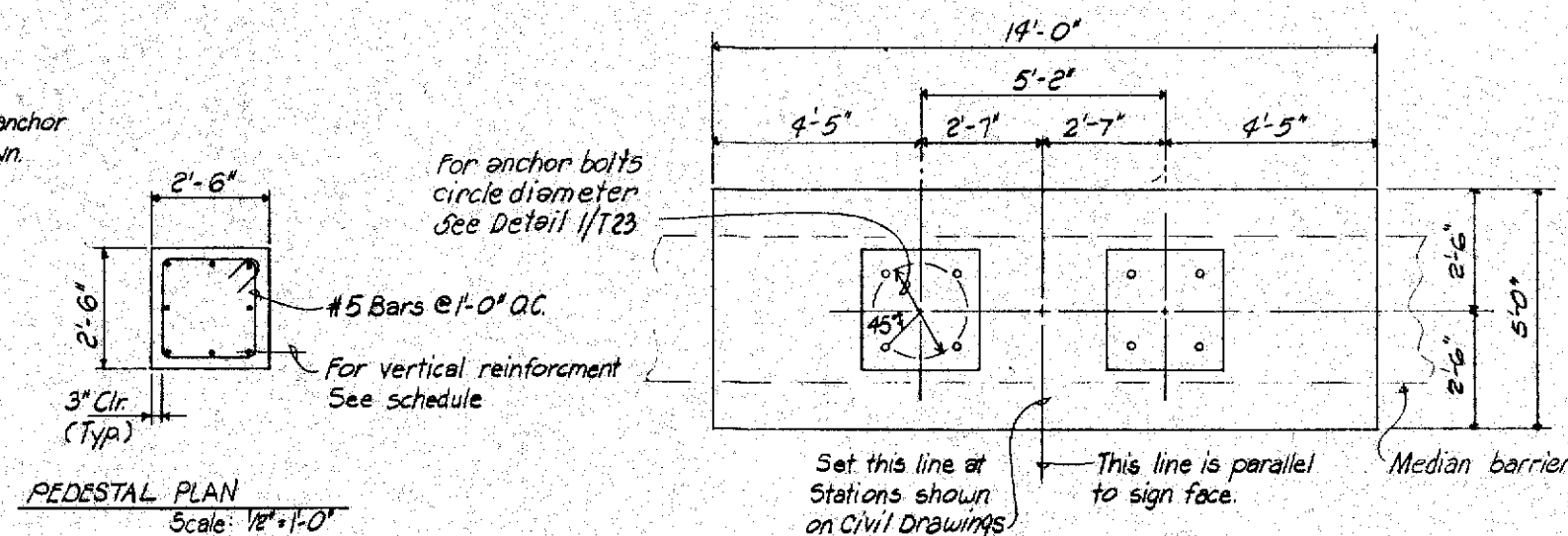


EXCAVATION PAYMENT LIMITS

Note:
Upper limit for payment of structural excavation shall be the lower of existing ground, finished ground, or subgrade of roadway.

L and R refer to left and right footing when viewing signs as viewed by approaching traffic.

Conduits and anchor bolts not shown.



SSFM ENGINEERS INC.
501 Summer St., #502
Honolulu, Hawaii 96817



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Howard T. Fukuda

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

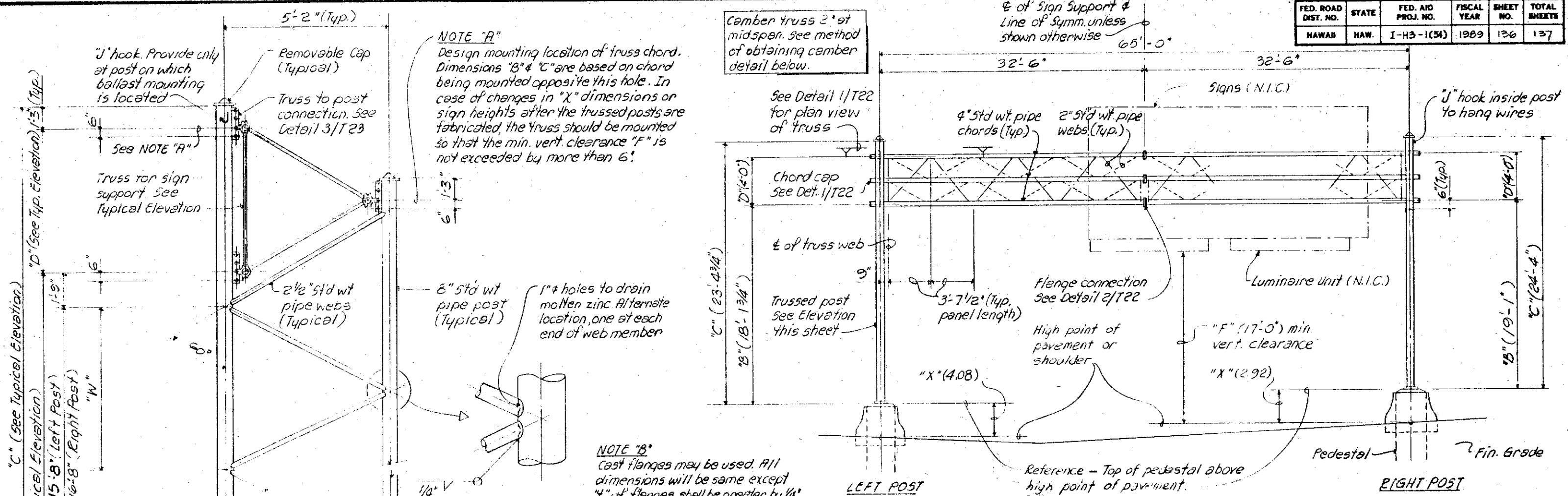
SIGN STRUCTURE FOUNDATION DETAIL

INTERSTATE ROUTE H-3
E.A.I. PROJ. NO. I-H3-1(54)

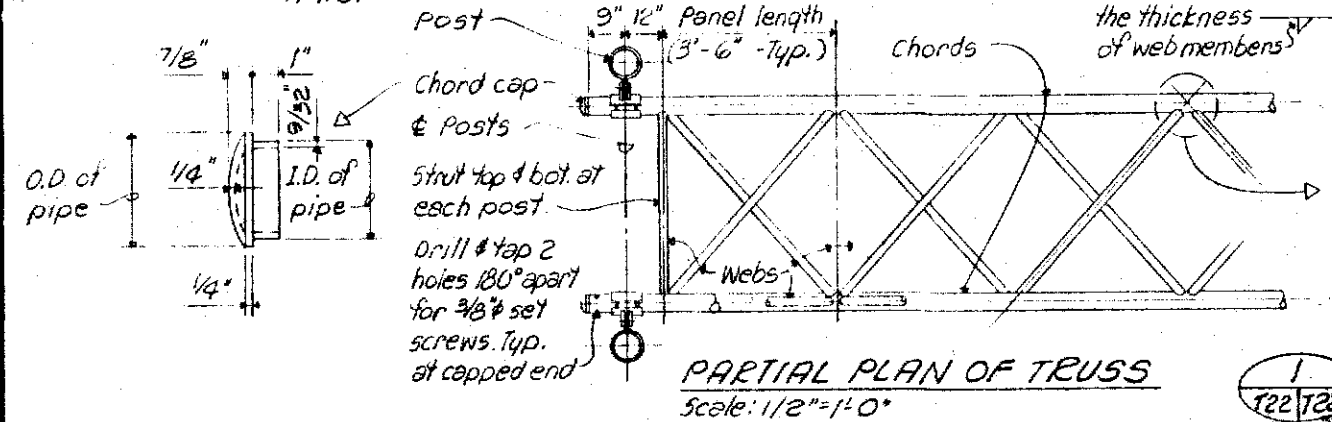
SCALE: AS NOTED DATE: SEPT. 1988

SHEET NO. 721 OF 23 SHEETS

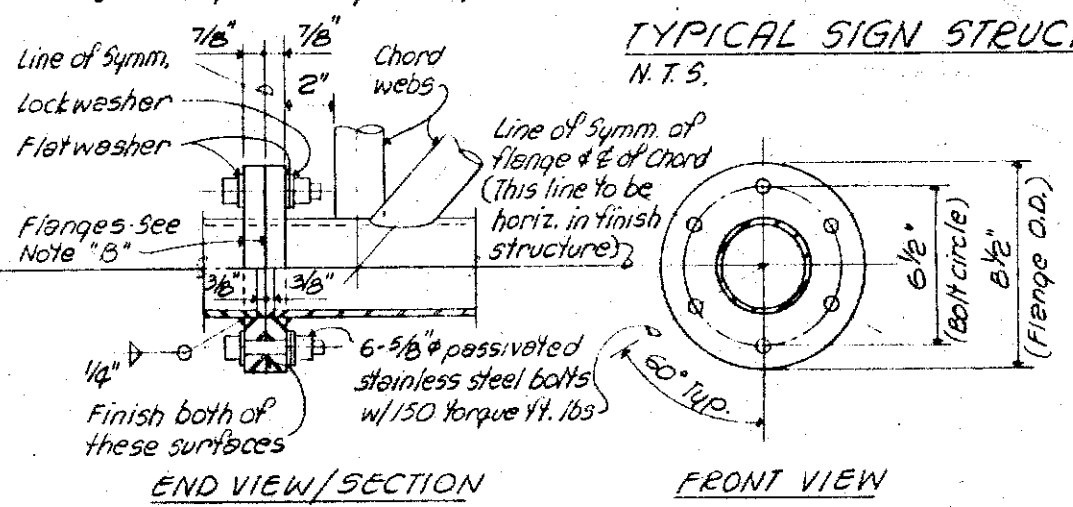
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(54)	1989	136	137



TRUSSED POST END ELEVATION
N.T.S.



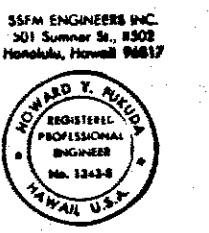
FLANGE CONNECTION DETAIL
Scale: 3"=1'-0"



NOTES:

- The number & arrangement of panels in each section must be such that the web members in each face of the truss form continuous trussing in the structure from post to post.
- Single & double posts, base plates & post to plate connections are fabricated of galvanized steel.
- Galvanized steel in contact with aluminum must be separated by "Fabco or Fabreka Pads."
- Stainless steel bolts shall conform to the Standard Specification for Alloy-Steel Bolting Materials for High Temperature Service, ASTM Designation A193, current edition, Type B6 (AISI Type 410 with a minimum yield of 85000 p.s.i.). Nuts shall conform to the Standard Specification for Carbon & Alloy Steel Nuts for High Pressure & High Temperature Service, ASTM Designation A194, current edition, Type 6 (AISI Type 416). Flat washers & lock washers shall conform to the Standard Specification for Corrosion-Resisting Chromium-Nickel Steel Plate, Sheet & Strip, ASTM Designation A167, current edition, Type 304. After heat treatment all stainless steel hardware must be descaled & cleaned to conform to ASTM Designation A380-57, Descaling & Cleaning Stainless Steel Surfaces, & then passivated.
- All bolts & washers except stainless steel shall be galvanized.
- See specifications for painting.

METHOD OF OBTAINING CAMBER
(washers having the same O.D. as flanges & with holes punched for bolts may be used.)



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SIGN STRUCTURE TRUSS DETAILS

INTERSTATE ROUTE H-3
F.A.I. PROJ. NO. I-H3-1(54)

SCALE: AS NOTED DATE: SEPT. 1988

SHEET No. 122 OF 23 SHEETS

DATE	
DESIGNED BY	
CHECKED BY	
NOTED BY	
INCHES	

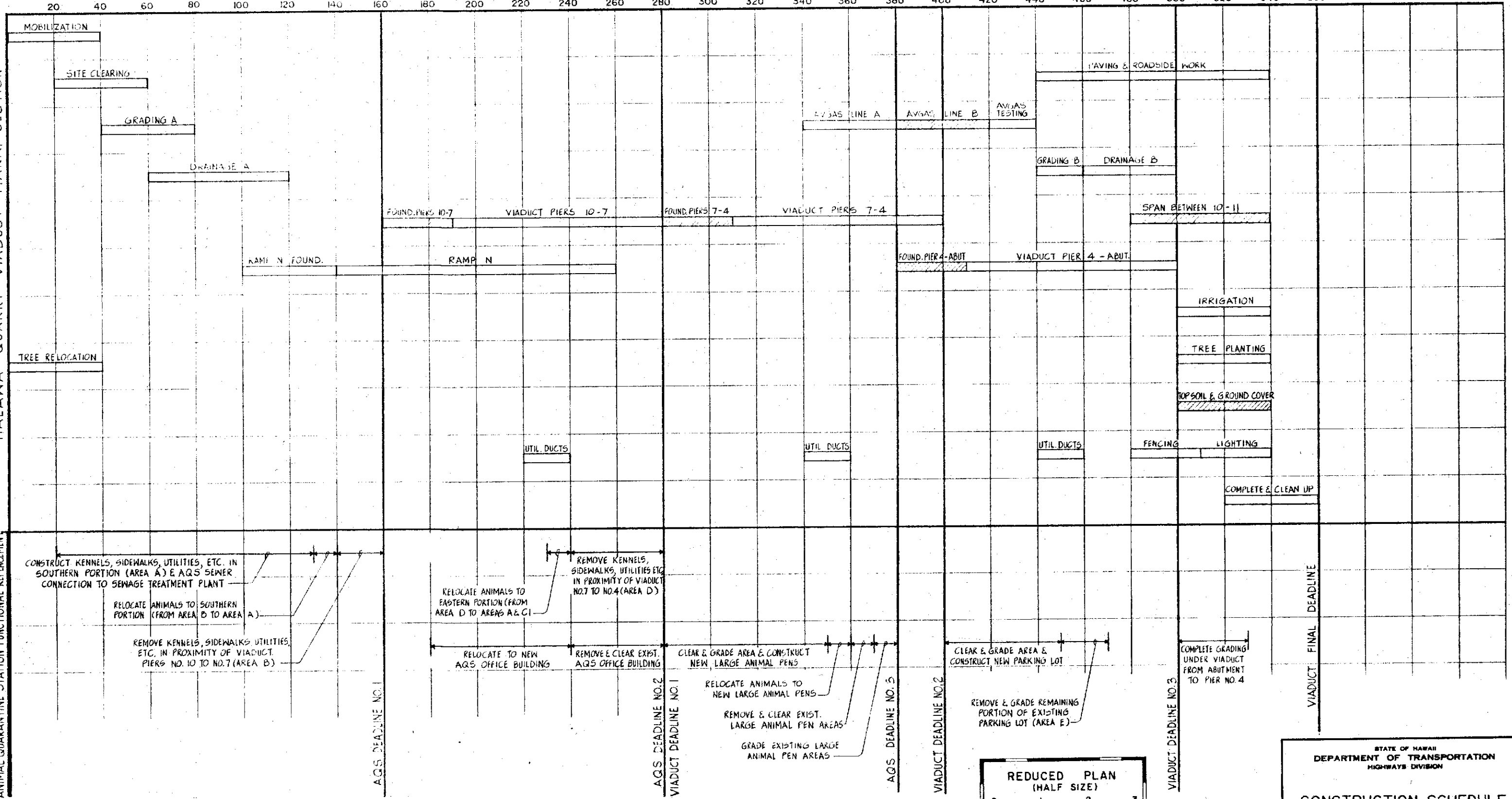
Date	Revision
12-5-89	Revised Left Post Dimensions

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1 (54)	1989	137 S-1	137

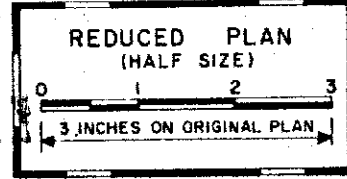
N.T.P.

HALAWA QUARRY VIADUCT MAKAI SECTION

ANIMAL QUARANTINE STATION FUNCTIONAL REPLACEMENT



NOTE:
SEE ANIMAL QUARANTINE STATION REFERENCE SHEETS FOR LOCATION OF AREAS MENTIONED IN THIS SCHEDULE.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONSTRUCTION SCHEDULE

INTERSTATE ROUTE H-3
F.A.I. PROJ. NO. I-H3-1 (54)

SCALE: NONE DATE: JAN 25, 1989

SHEET No. OF SHEETS

1-25-89	ADDED THIS SHEET
DATE	REVISION

ADD. 137 S-1