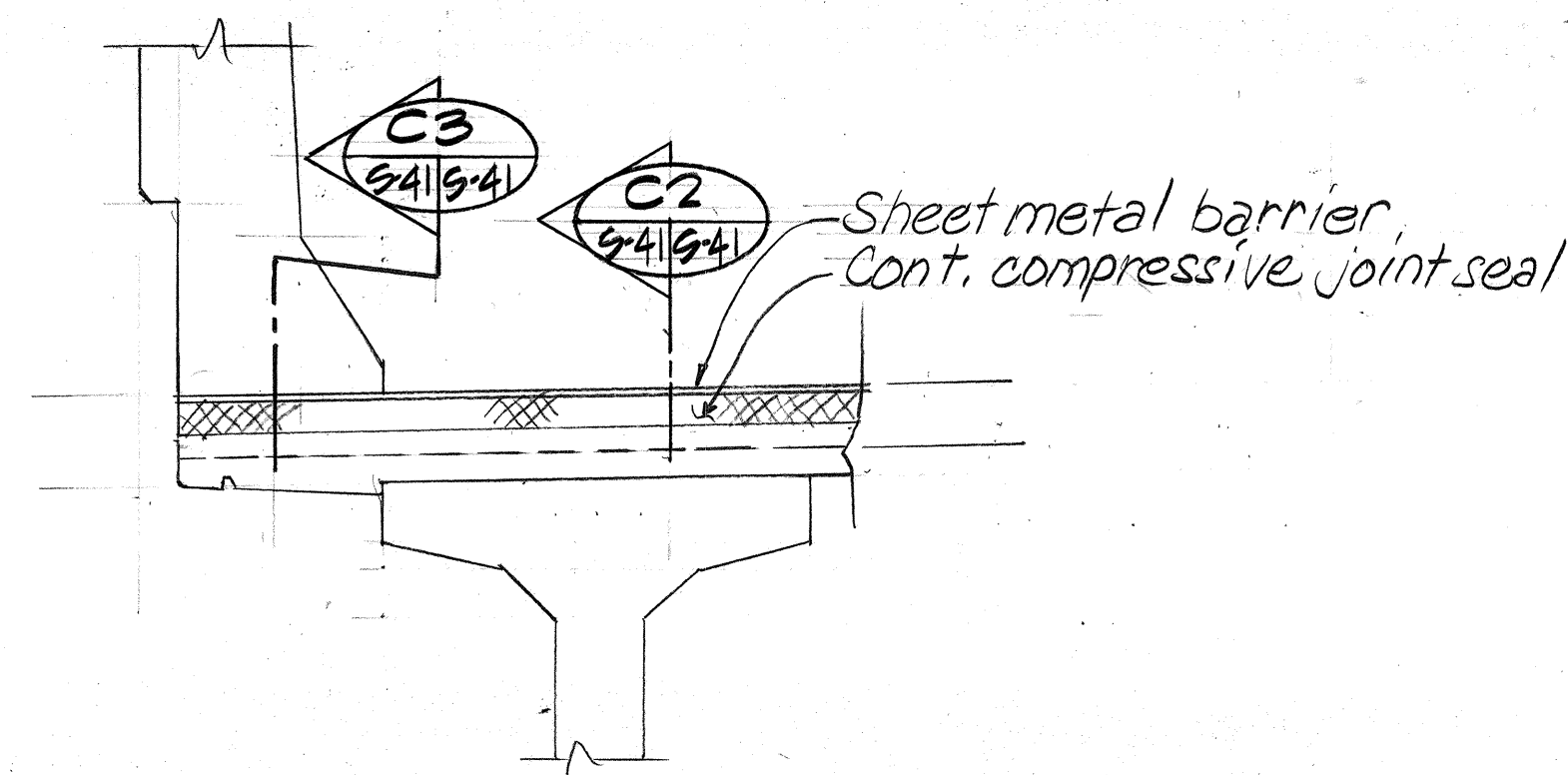
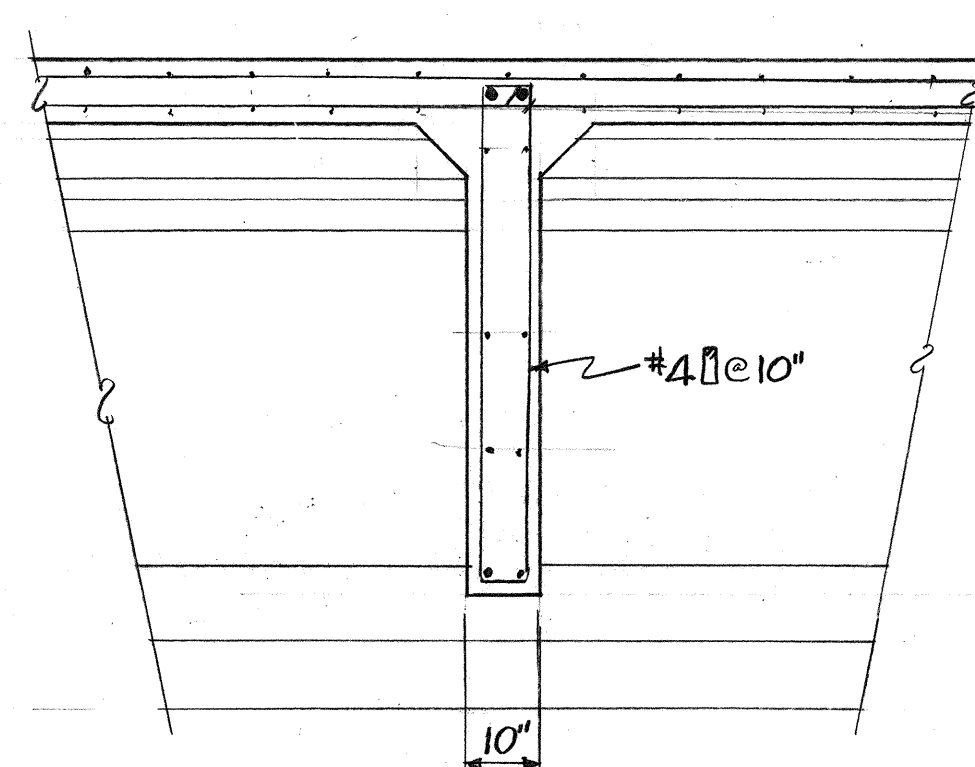


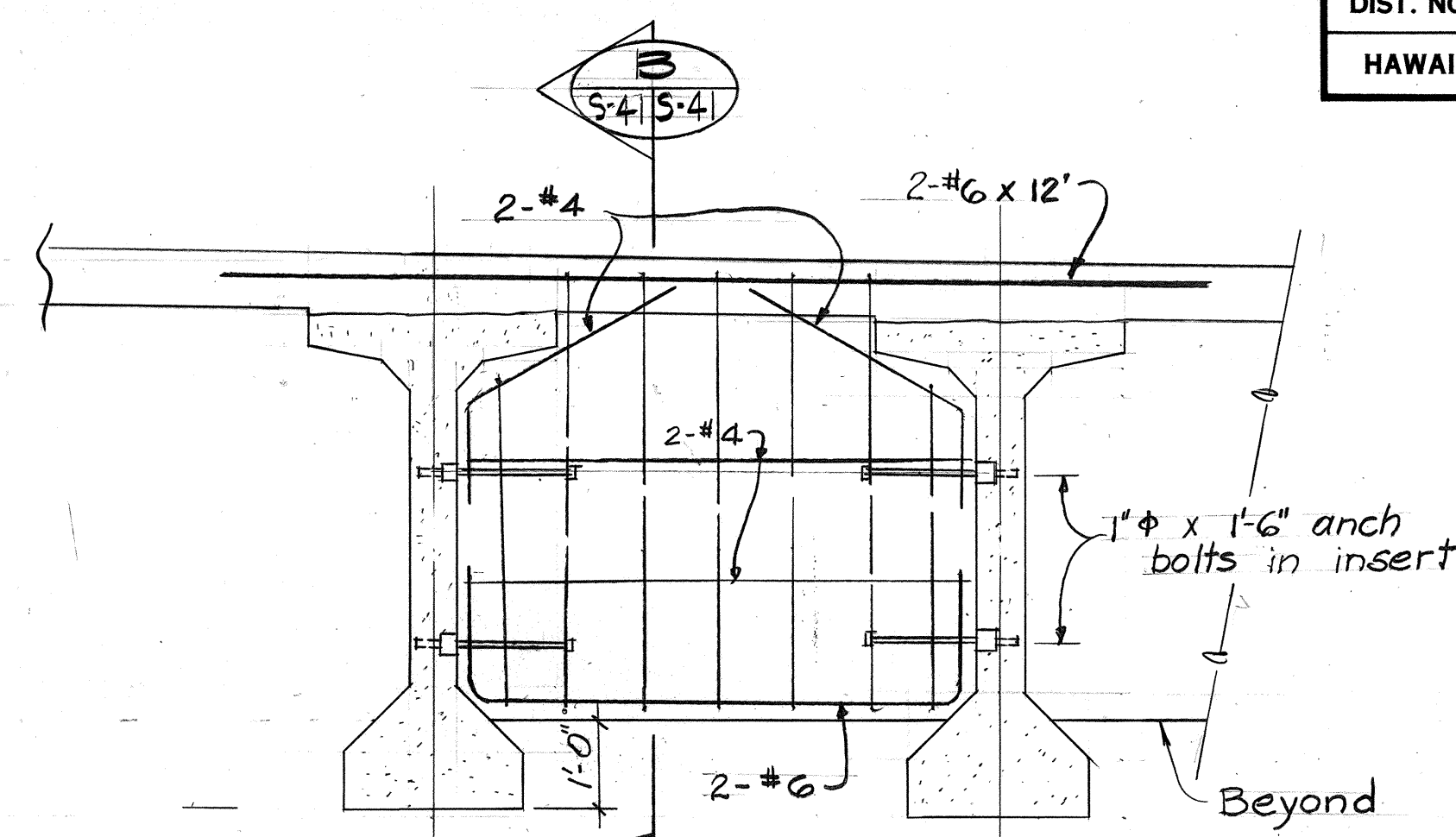
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(24)	1990	28	125



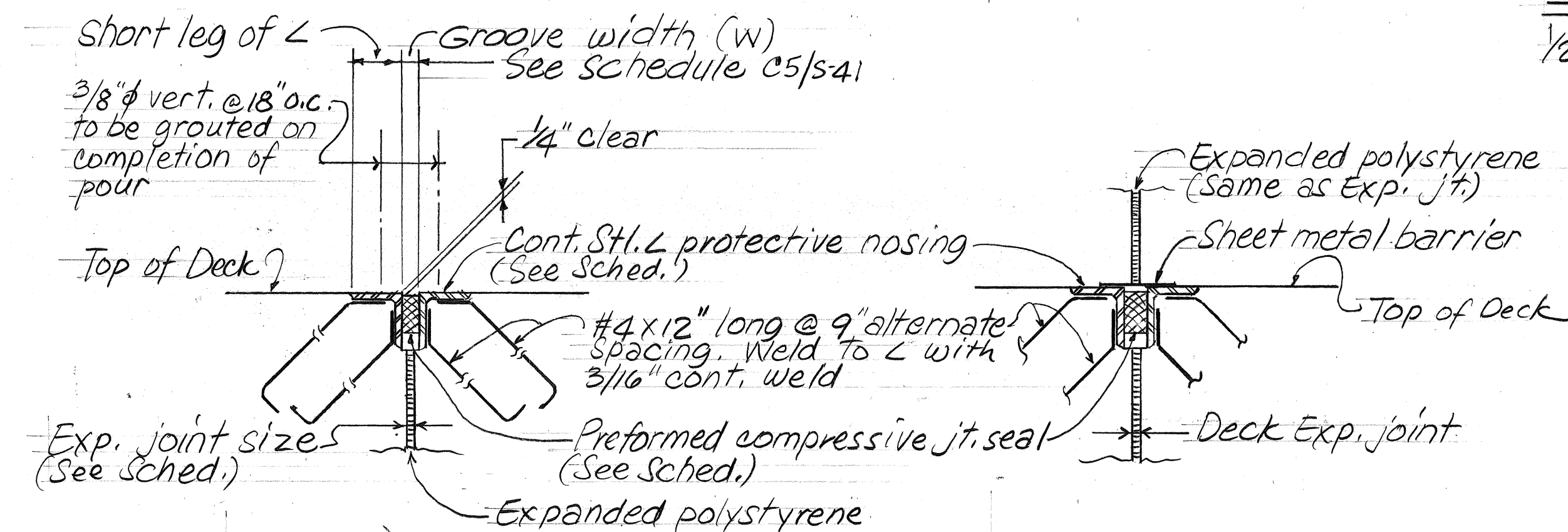
TYP. SECTION C1
5/4 5/4
3/4" = 1'-0"



SECTION B
5/4 5/4
1/2" = 1'-0"

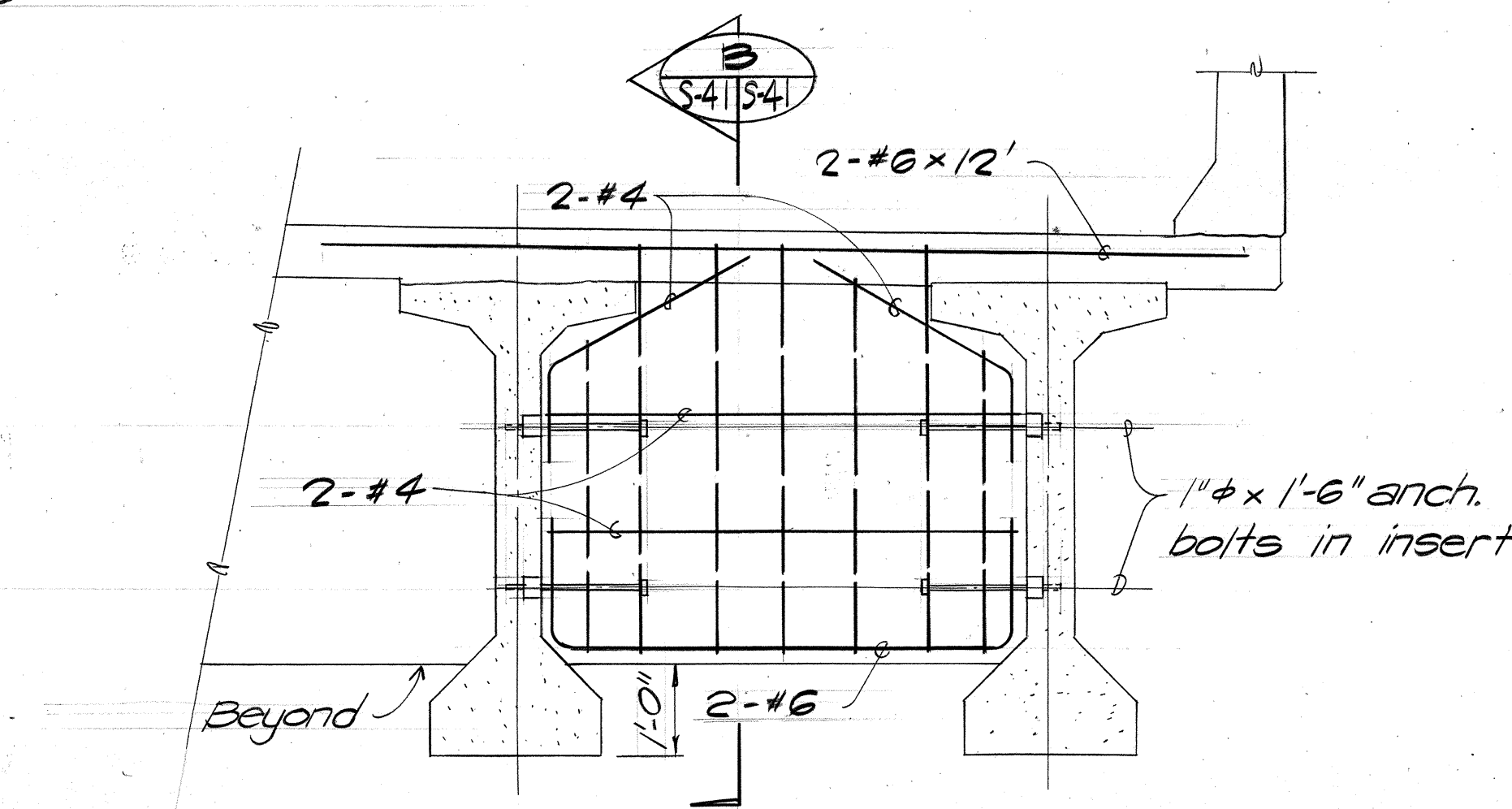


ELEVATION - TRANSVERSE BEAM A
(TYP. INTERIOR)
5/2, 5/3, 5/36 5/4
1/2" = 1'-0"

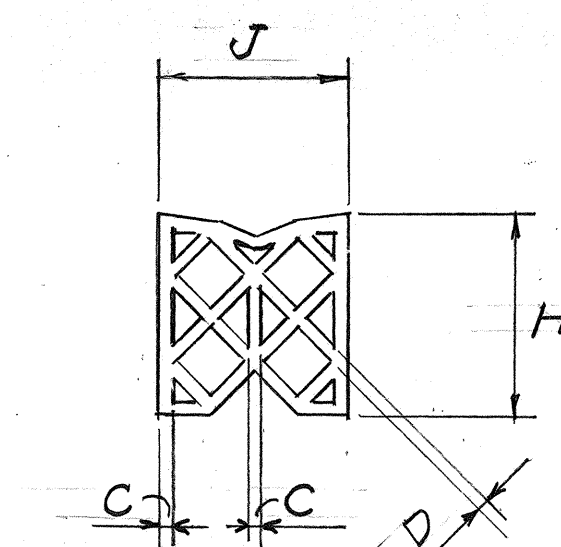


SECTION C2
5/4 5/4
N.T.S.

SECTION C3
5/4 5/4
N.T.S.



ELEVATION - TRANSVERSE BEAM D
(TYP. EXTERIOR)
5/2, 5/3, 5/36 5/4
1/2" = 1'-0"



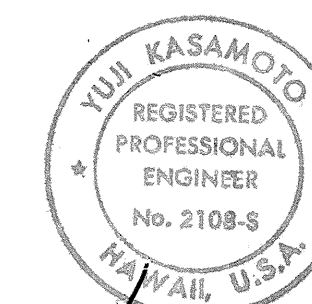
TYPE 'A' SEAL CA
5/4 5/4
N.T.S.

Joint Seal Type	Exp. Joint Size	Steel / Angle Protective Nosing	Groove Size During Construction @ 70°F		Minimum Groove Size During Installation		Joint Seal Dimensions Type and Tolerance				
			W	D	W	D	Type	J	H	C	D
①	3/4"	5 x 3 1/2 x 1/2"	1 1/2"	5"	2"	5"	A	3"	3 3/8"	3/16"	1/8"

SCHEDULE C5
5/4 5/4

TYPICAL EXPANSION JOINT DETAILS C
5/13, 5/20 5/4

DATE	_____
DESIGNED BY	_____
CHECKED BY	_____
NOTED BY	_____
ORIGINAL FILED	_____

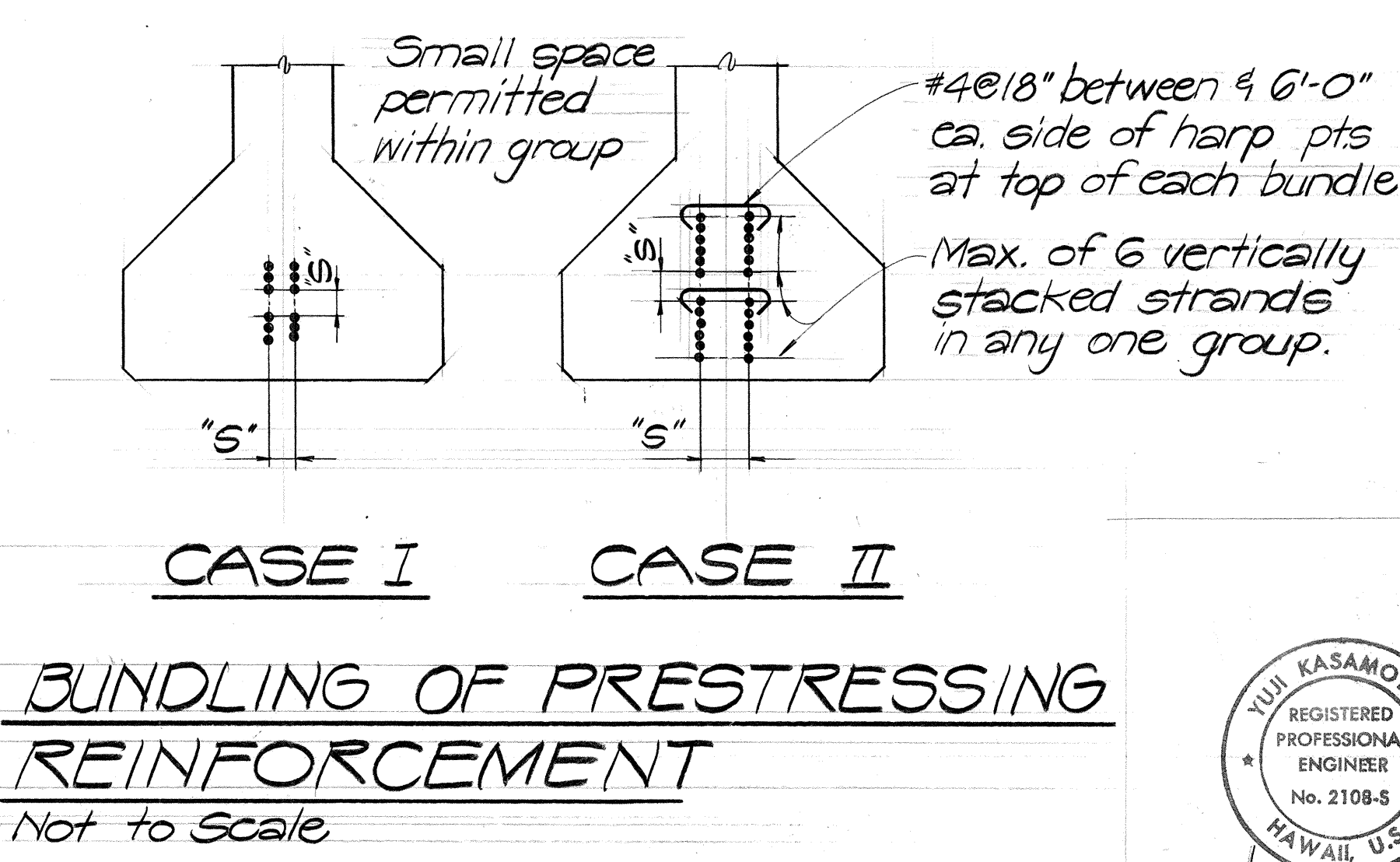
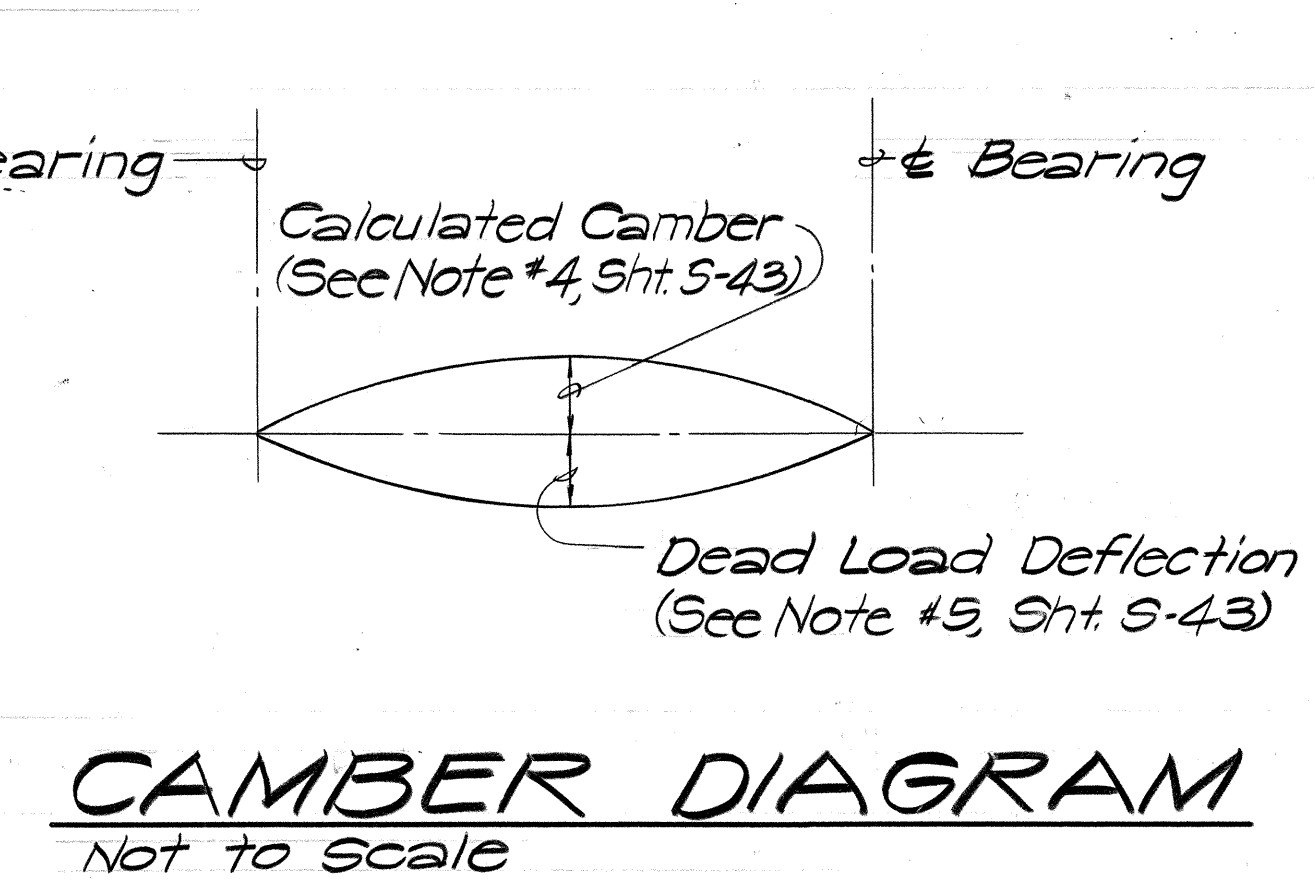
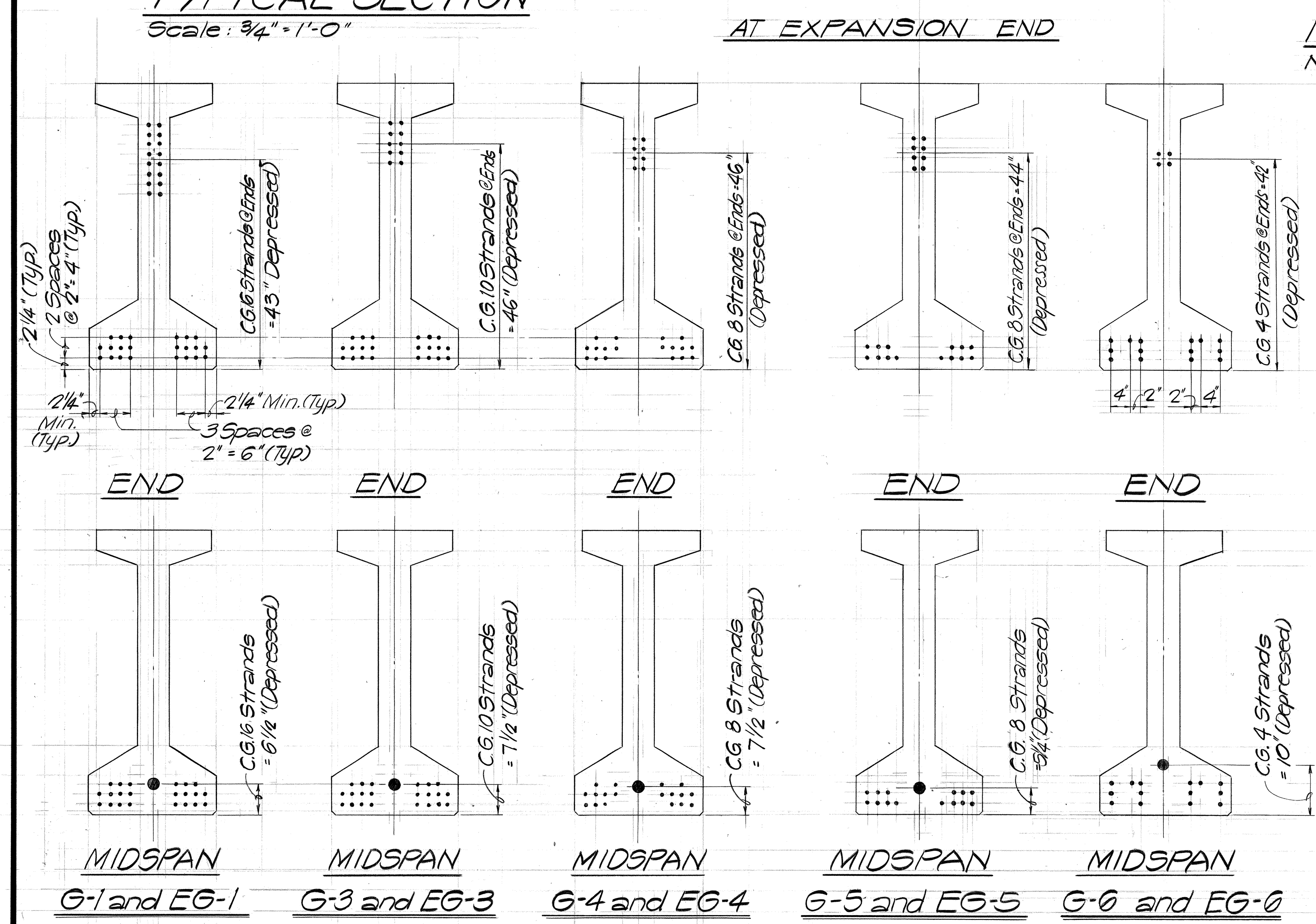
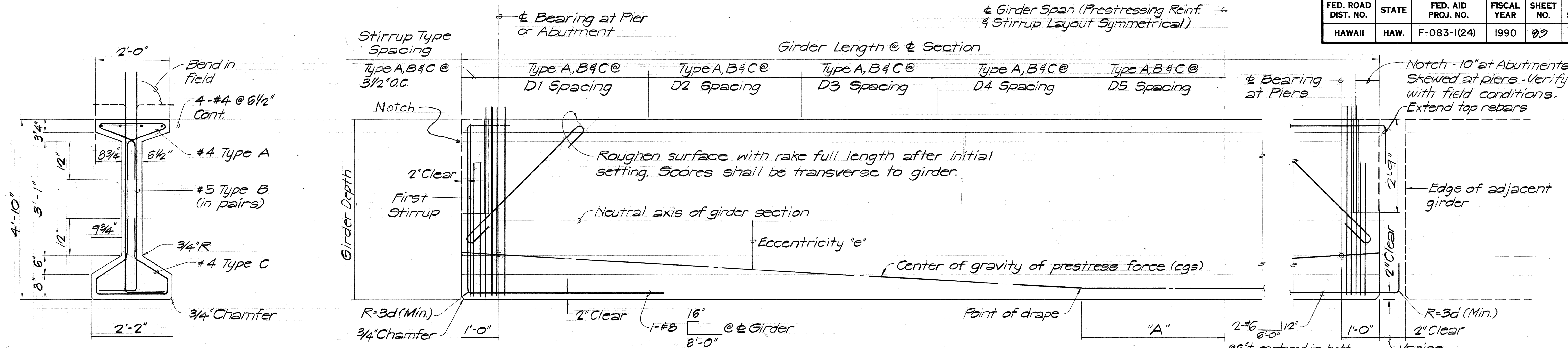


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**HELEMANO STREAM VIADUCT
& OPAEULA STREAM BRIDGE
DETAILS**

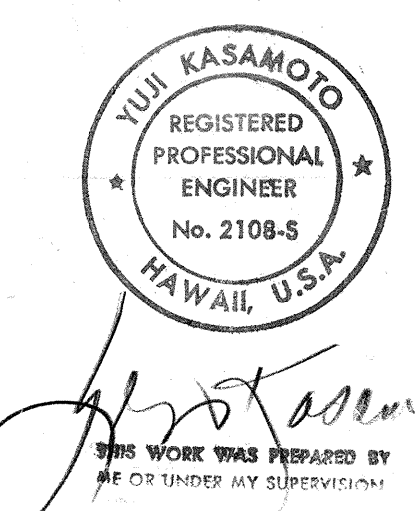
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA
JUNCTION TO HALEIWA BEACH PARK
(STRUCTURES)
FAP NO. F-083-1(24)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(24)	1990	22	125



- SPECIAL NOTES:**
1. Bend Stirrup Type B in field 1 1/2" below top of deck.
 2. Roughen girder top surface with rake full length after initial setting. Minimum penetration shall be 1/4". Scores shall be transverse to girder.
 3. See Sht. S-43 for additional prestressed girder notes.

1. Strands may be bundled in groups as shown.
2. The minimum distance "s" between groups or individual strands: 2" for 1/2" strands.
3. "s" is measured between centers of adjacent strands.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**HELEMANO STREAM VIADUCT
KEEHI IV GIRDER DETAILS**

KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA
JUNCTION TO HALEIWA BEACH PARK
(STRUCTURES)
FAP NO. F-083-1(24)

SHEET No. S-42 OF SHEETS

ORIGINAL PLAN	DATE
DESIGNED BY	
TRACED BY	
NOTED BY	
CHECKED BY	

PRESTRESSED GIRDER SCHEDULE

LOCATION		GIRDER		GIRDER TYPE	INITIAL PRESTRESS FORCE (KIPS)	FINAL PRESTRESS FORCE (AFTER ALL LOSSES, KIPS)	CALCULATED CAMBER (SEE NOTE 4, INCHES)	DEAD LOAD DEFLECTION (SEE NOTE 5, INCHES)	LOCATION OF CENTER OF GRAVITY OF PRESTRESSED FORCE (INCHES)			STIRRUPS TYPE A, B & C SPACING					REQUIRED MINIMUM CONCRETE STRENGTH BEFORE RELEASE OF STRANDS (PSI.)	REMARKS
STRUCTURE	SPANS	GROUP	END TYPE						"e" AT MIDSPAN	"e" AT ENDS	DISTANCE "A" (FEET)	D1 SPACING	D2 SPACING	D3 SPACING	D4 SPACING	D5 SPACING		
HELEMANO VIADUCT	4,5,7,8,10,11,13	G-1	A	KEEHI IV	1098	836	1.69	0.72	20.29	4.92	9.00	38@6"	10@9"	9@12"	BAL@18"		5000	
	6, 9, 12		B															
		G-2			N		O		T		U		S		E		D	NOT USED
	2	G-3	A		925	704	1.26	0.46	20.22	8.19	8.00	30@6"	9@9"	8@12"	BAL@18"		4000	
	1, 3		B															
	2	G-4	A		751	572	0.61	0.30	20.28	8.44	7.25	22@6"	10@9"	7@12"				
	1, 3, 14		B															
	2	G-5	A		636	484	0.48	0.19	21.49	7.40	6.50	17@6"	9@9"	7@12"				
	1, 14		B															
	14	G-6	B	✓	520	396	0.28	0.11	19.63	12.52	6.00	9@6"	10@9"	7@12"			✓	
	4,5,7,8,10,11,13	EG-1	A	KEEHI IV	1098	836	1.69	0.72	20.29	4.92	9.00	64@4"	21@6"	8@9"	5@12"	BAL@18"	5000	
	6, 9, 12		B															
		EG-2			N		O		T		U		S		E		D	NOT USED
	2	EG-3	A		925	704	1.26	0.46	20.22	8.19	8.00	50@4"	21@6"	7@9"	5@12"	BAL@18"	4000	
	1, 3, 14		B															
	3	EG-4	B		751	572	0.61	0.30	20.28	8.44	7.25	37@4"						
	2	EG-5	A		636	484	0.48	0.19	21.49	7.40	6.50	29@4"	18@6"					
	1		B															
	14	EG-6	B	✓	520	396	0.28	0.11	19.63	12.52	6.00	22@6"	6@9"	4@12"	BAL@18"		✓	

NOTES FOR PRESTRESSED GIRDERS (HELEMANO & OPAEULA):

1. Concrete shall have a minimum ultimate 28-day cylinder strength of 6,000 psi.

2. Pretensioned strands shall be 7-wire 1/2" stress-relieved steel strands (area = 0.153 in²) with an ultimate strength of 270ksi. For properties, see State Standard Specifications. Total loss due to creep, shrinkage, elastic shortening and relaxation of steel = 45,000 psi.

3. Non-prestressed reinforcing steel shall be Grade 40, unless otherwise noted. For properties, see State Standard Specifications.

4. 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 an 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.

5. The dead load deflection includes the combined effects of the weight of slab, haunch and diaphragm.

6. Strand pattern shall be symmetrical about the longitudinal centerline of the girder span.

7. Strand release sequence shall not induce any lateral deflection of the girder.

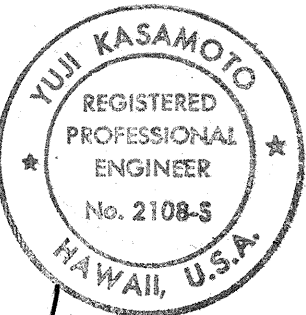
8. Contractor shall submit his proposed strand pattern and releasing sequence to the Engineer for approval.

9. During curing care shall be taken to avoid lateral deflection of the girder due to improper orientation.
10. 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.

11. See Framing Plans for locations of diaphragms, & type mark number.

12. Forms shall be removed and the girders inspected before the prestress strands are cut.

DATE: _____
DESIGNED BY: _____
CHECKED BY: _____
ORIGINAL PLAN: _____
NOTE BOOK: _____
QUANTITIES BY: _____
NO. _____

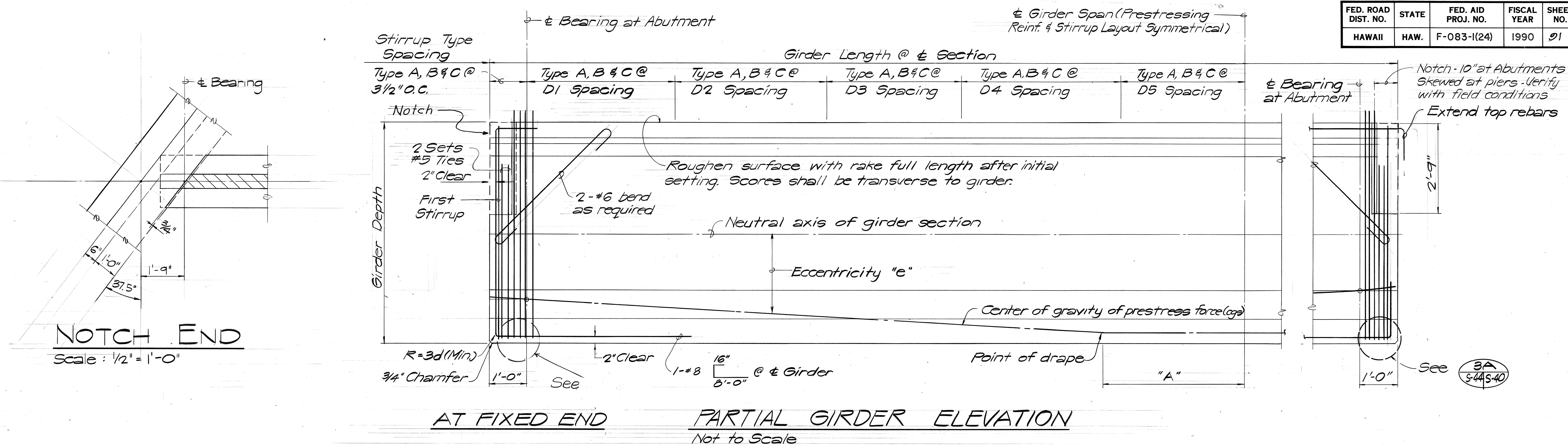


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HELEMANO STREAM VIADUCT
& OPAEULA STREAM BRIDGE
PRESTRESSED GIRDER SCHEDULE
& NOTES

KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA
JUNCTION TO HALEIWA BEACH PARK
(STRUCTURES)
FAP NO. F-083-1(24)

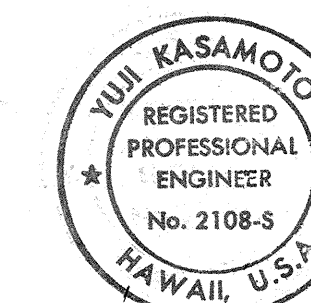
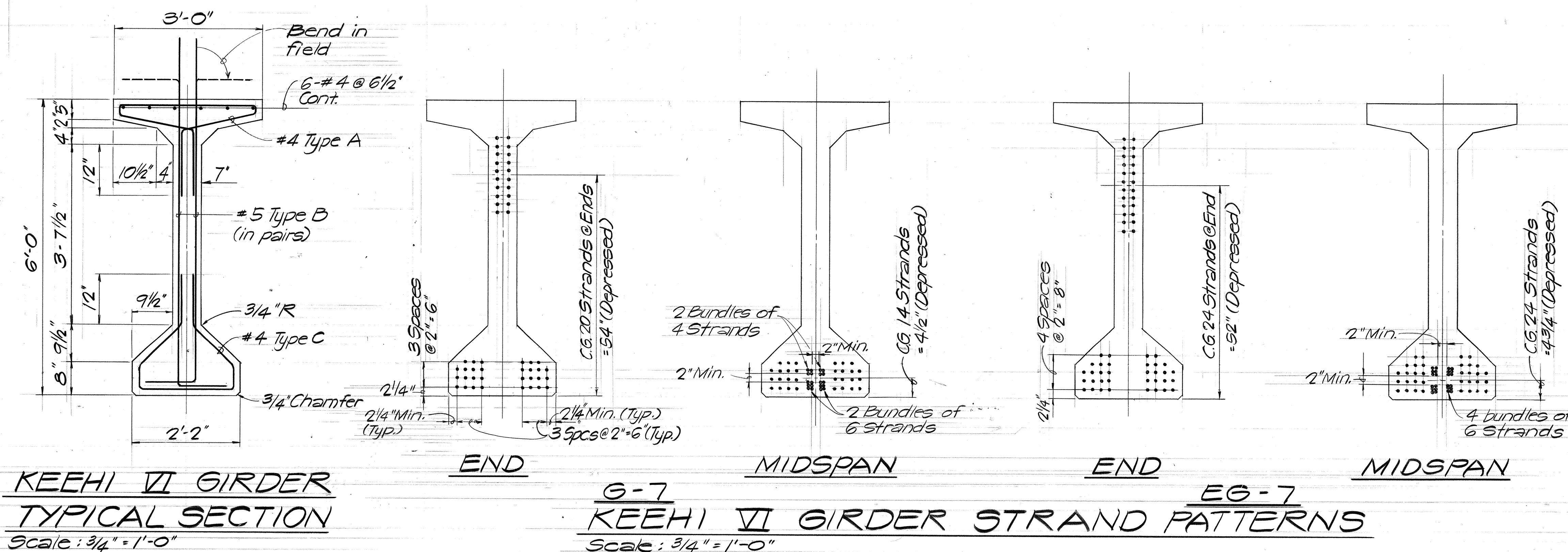
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-083-1(24)	1990	91	125



PRESTRESSED GIRDER SCHEDULE																		
LOCATION		GIRDER		GIRDER TYPE	INITIAL PRESTRESS FORCE (KIPS)	FINAL PRE-STRESS FORCE (AFTER ALL LOSSES, KIPS)	CALCULATED CAMBER (SEE NOTE 4, INCHES)	DEAD LOAD DEFLECTION (SEE NOTE 5, INCHES)	LOCATION OF CENTER OF GRAVITY OF PRESTRESSED FORCE (INCHES)			STIRRUPS - TYPE A, B & C SPACING					MIN. REQ'D. RELEASE STRENGTH (PS.I)	REMARKS
STRUCTURE	SPANS	GROUP	END TYPE						"e" AT MIDSPAN	"e" AT ENDS	DISTANCE "A" (FEET)	D1 SPACING	D2 SPACING	D3 SPACING	D4 SPACING	D5 SPACING		
OPEAULA STREAM BRIDGE	-	G-7	-	KEEHI VI	1445	1100	2.65	2.20	30.44	10.64	12.00	37@6"	16@9"	12@12"	BAL.	@ 18"	4000	
	-	EG-7	-	" "	1676	1276	3.19	2.20	29.99	9.61	12.00	52@4"	34@6"	10@9"	8@12"	BAL@18"	4500	

SPECIAL NOTES:

- Bend Stirrup Type B in field 1 1/2" below top of deck.
- Roughen girder top surface with rake full length after initial setting. Minimum penetration shall be 1/4". Scores shall be transverse to girder.
- See Sht. S-43 for additional prestressed girder notes.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**OPEAULA STREAM BRIDGE
KEEHI VI GIRDER DETAILS &
PRESTRESSED GIRDER SCHEDULE**

KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA
JUNCTION TO HALEIWA BEACH PARK
(STRUCTURES)
FAP NO. F-083-1(24)

SHEET No. S-44 OF SHEETS