

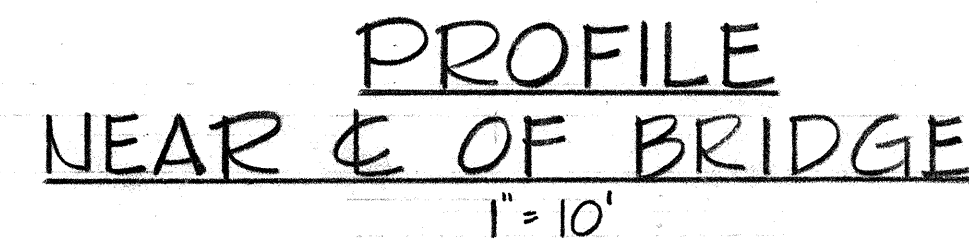
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

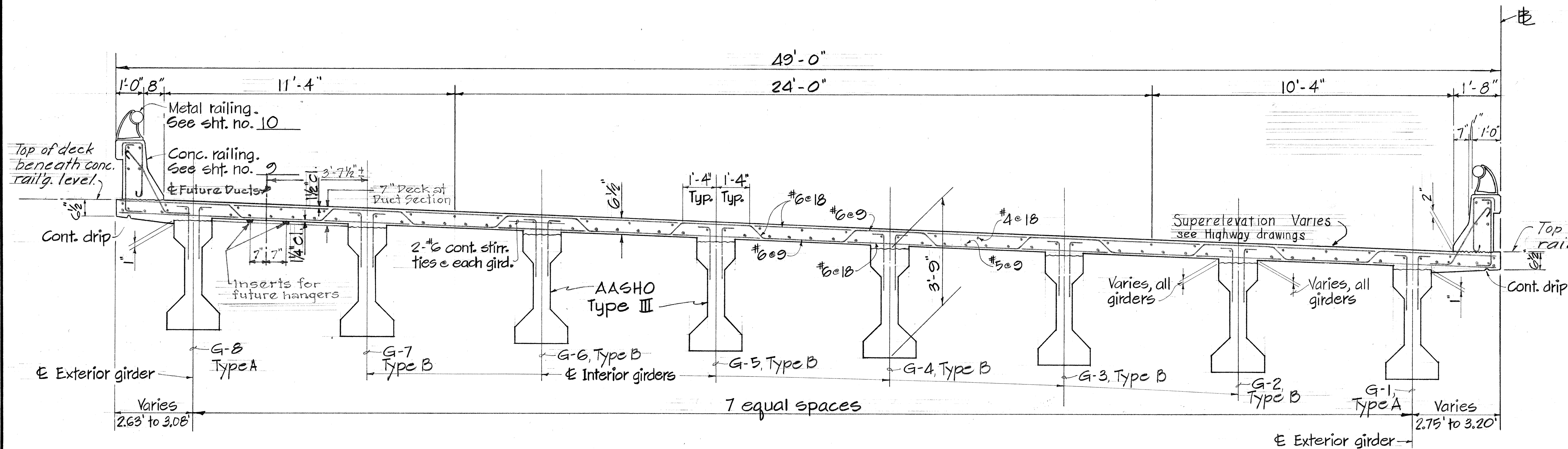
AHUIMANU STREAM BRIDGE
STA. 190+93.80 to STA. 191+80.71

LAYOUT & PROFILE
KAHEKILI HIGHWAY
PROJ. NO. BD 67-320

Scale: As noted Date: Mar. 1969

SHEET No. 1 OF 13 SHEETS

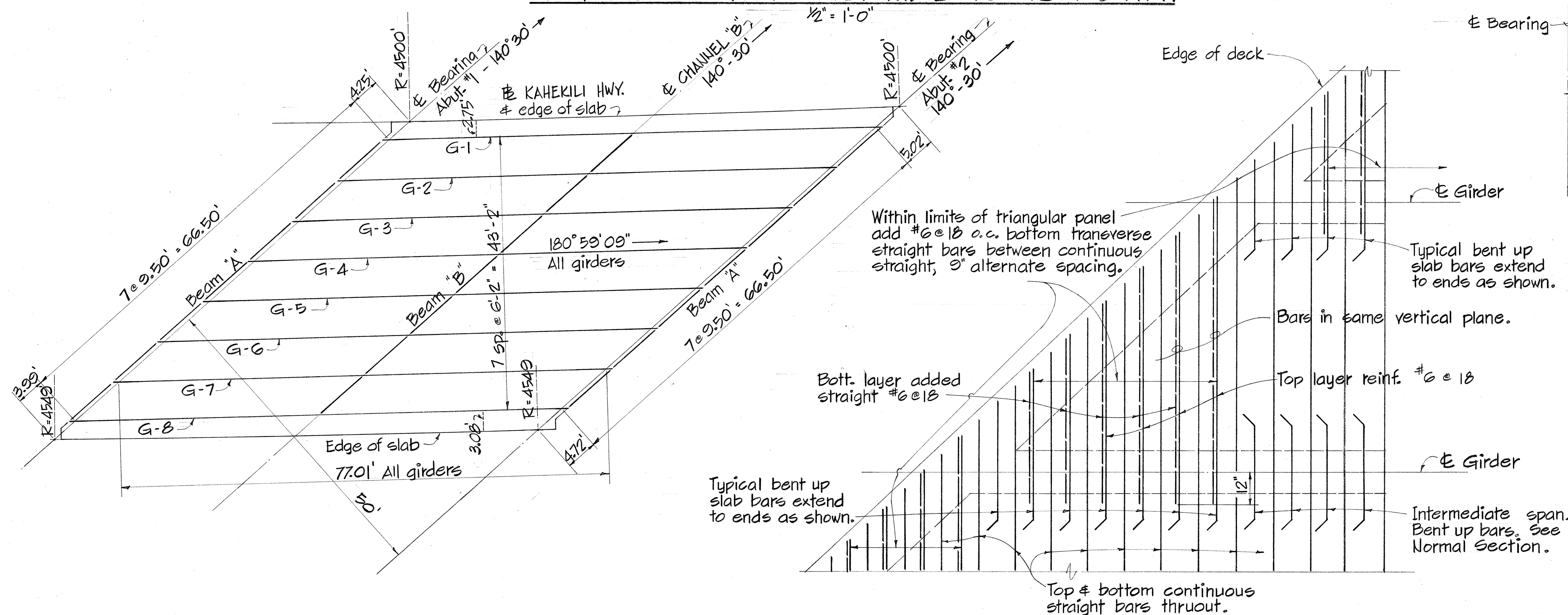




NOTES :

1. Slab reinforcing shall follow the curvatures & slopes of the slab.
2. Manual method of finishing bridge deck, as specified in subarticle 40.3 (0)(3) class 2, of the Special Provisions, will be permitted.

TYPICAL SECTION NORMAL TO ROADWAY

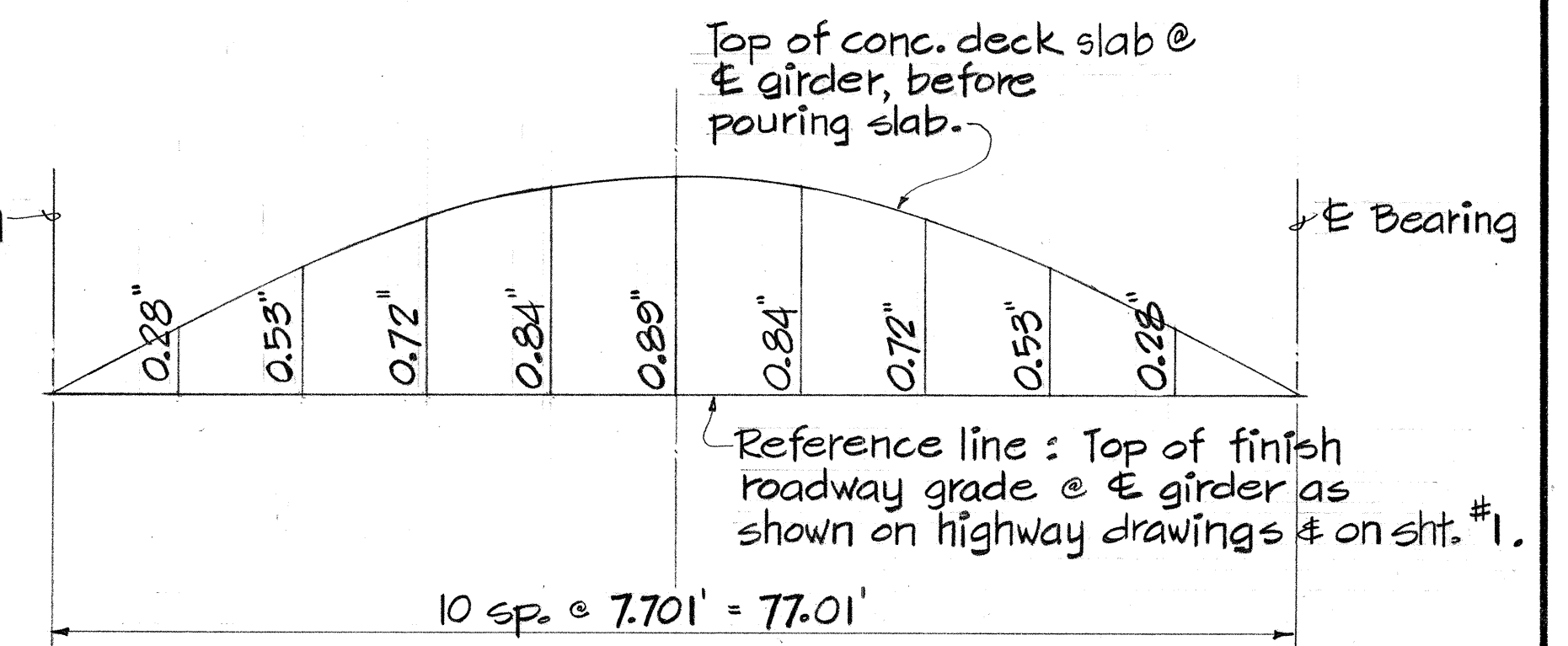


DECK FRAMING PLAN

1"=10'

PART PLAN - TYPICAL ARRANGEMENT OF TOP SLAB REINFORCEMENT AT SKEWED ENDS

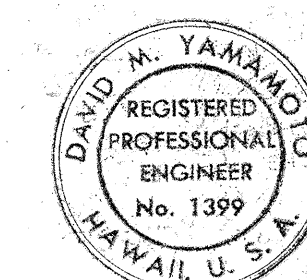
Not to scale



CAMBER DIAGRAM

Scale = Horiz. 1"=10'

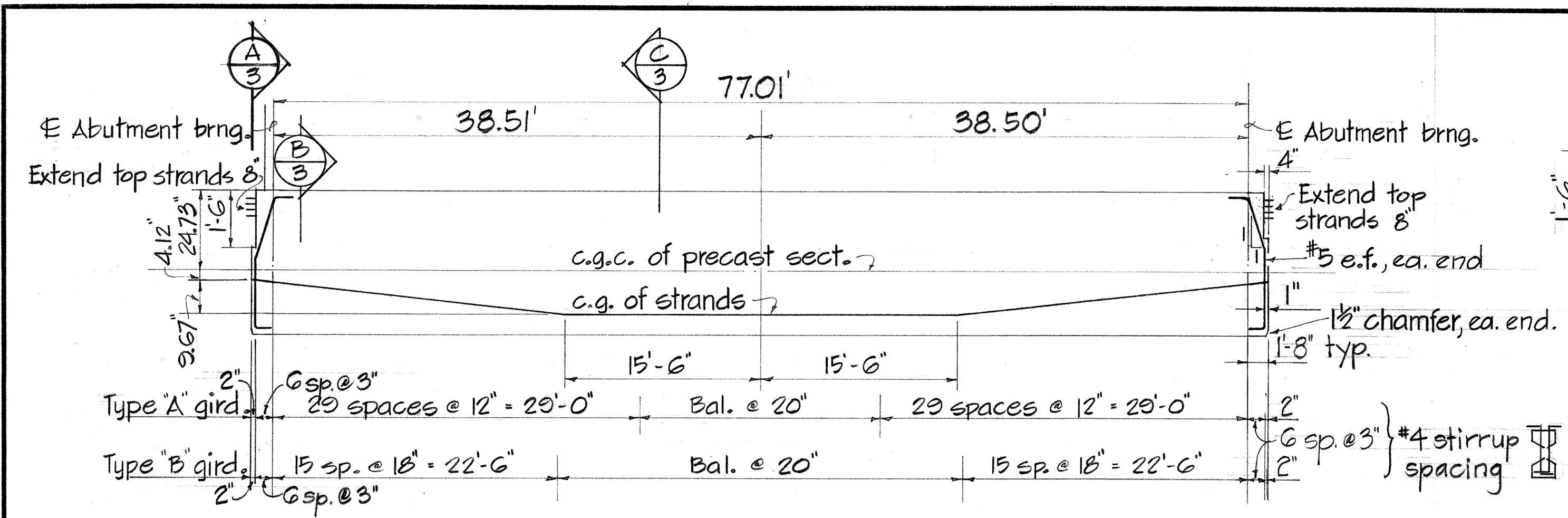
Note :
Camber diagram is based on the assumption that the wet conc. for deck slab & beams are supported entirely by unshored girders.



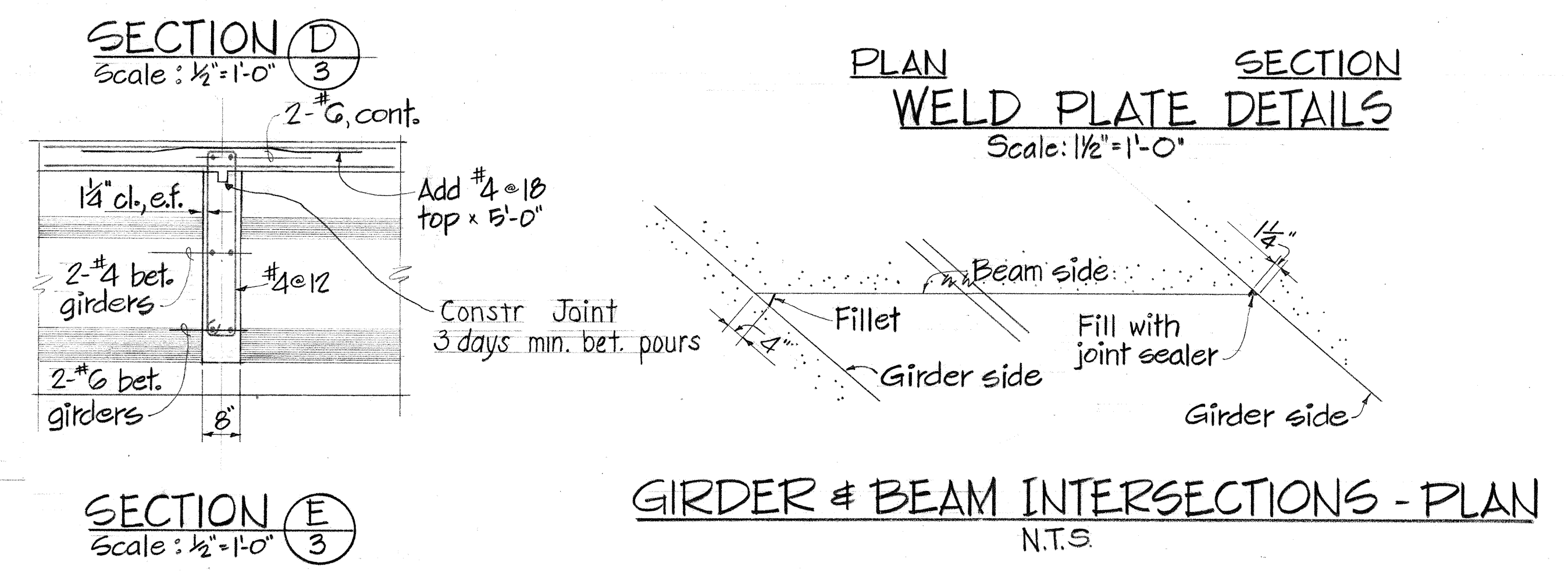
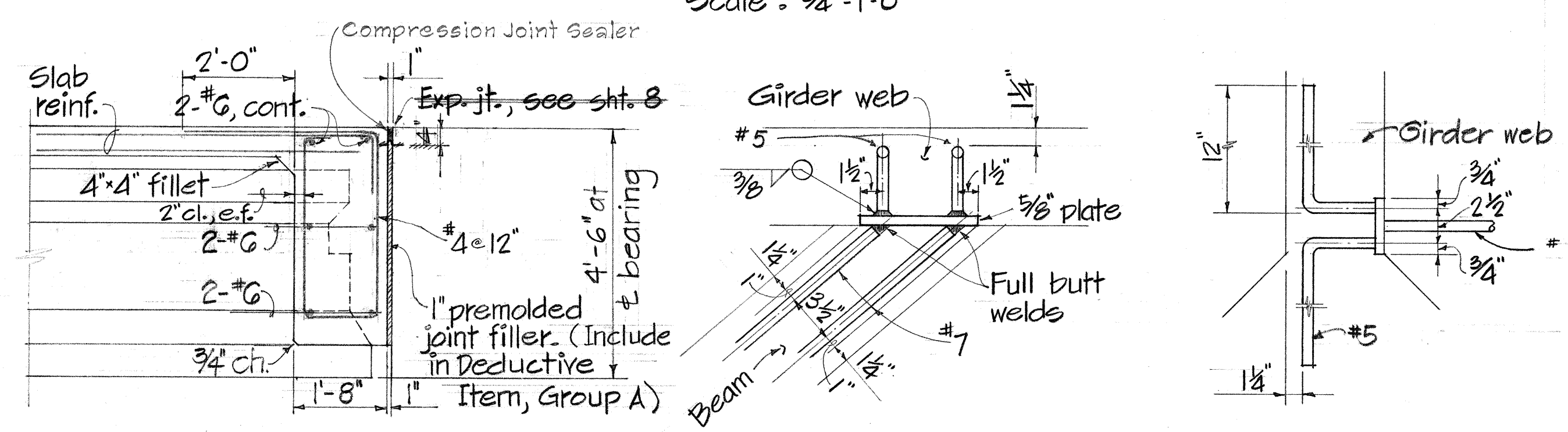
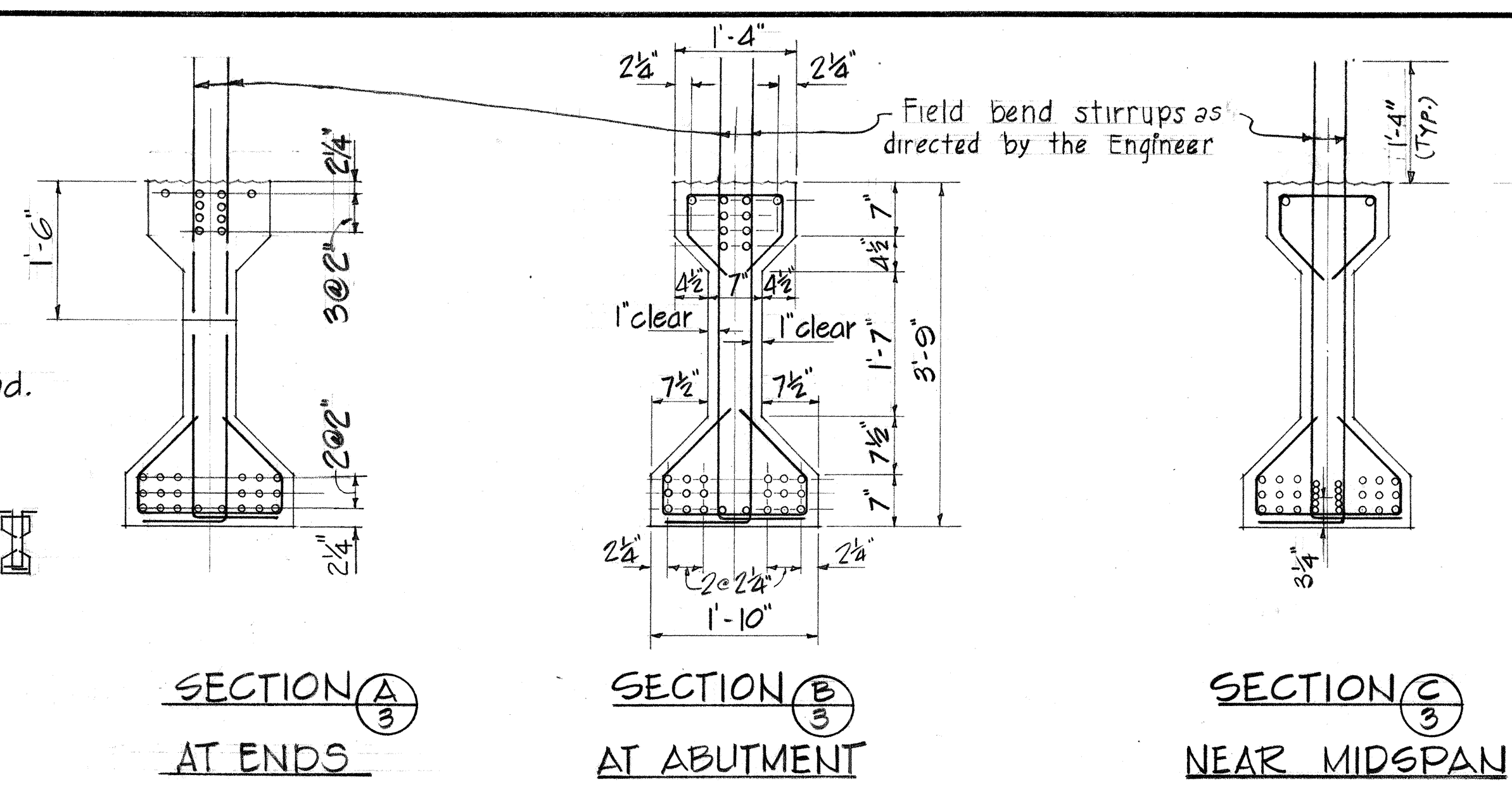
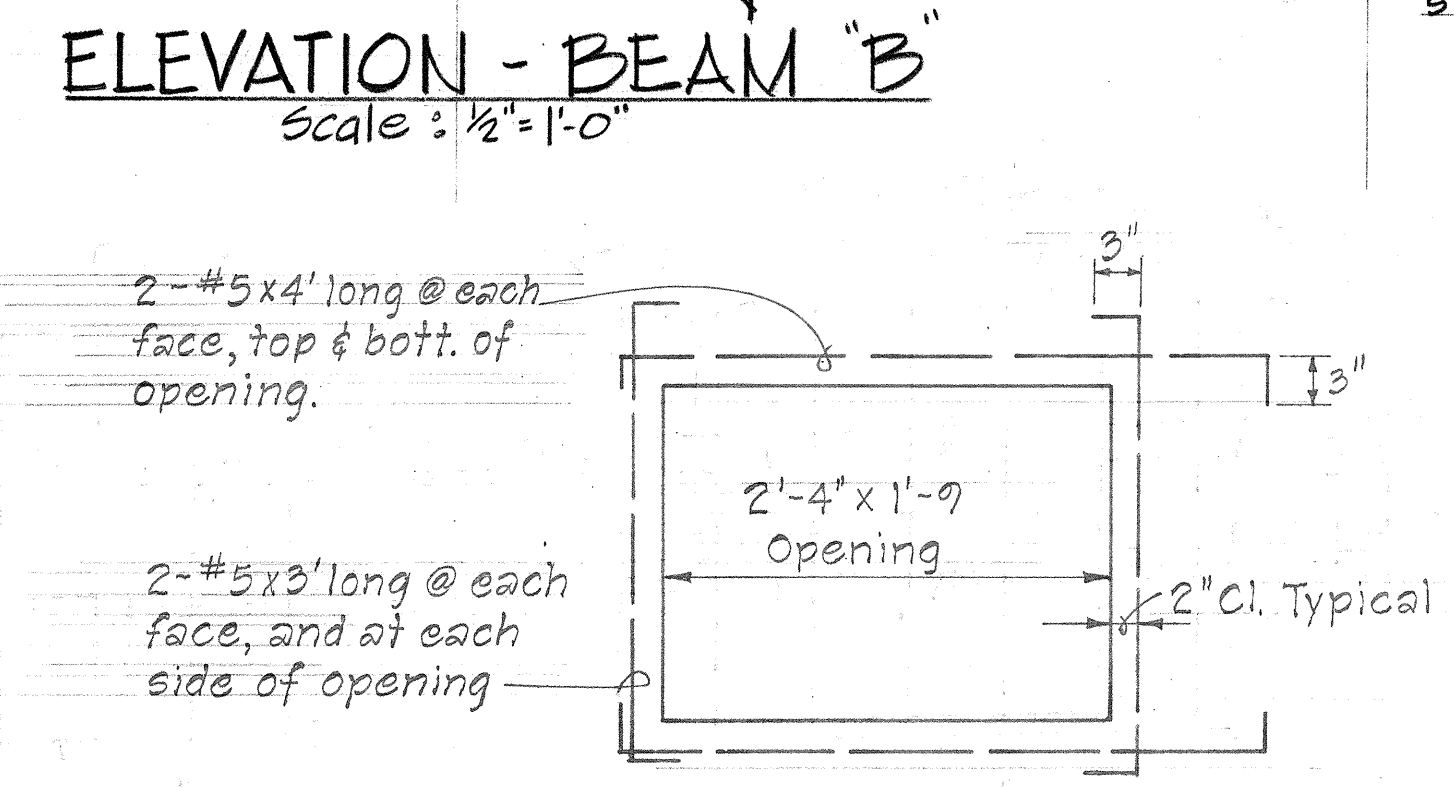
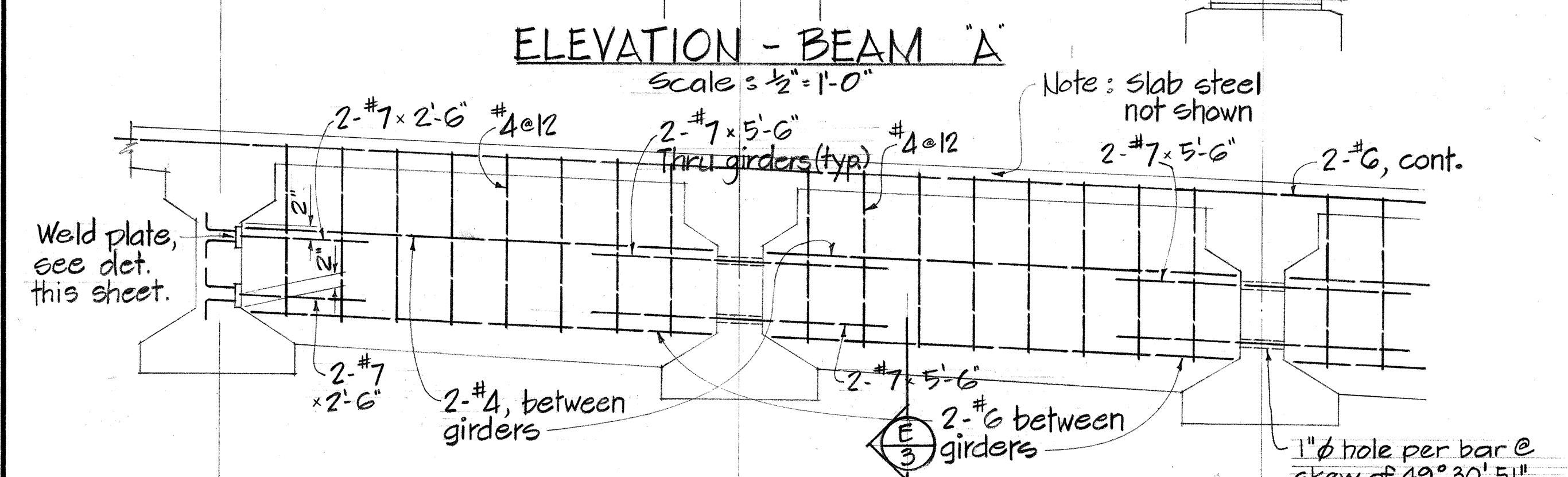
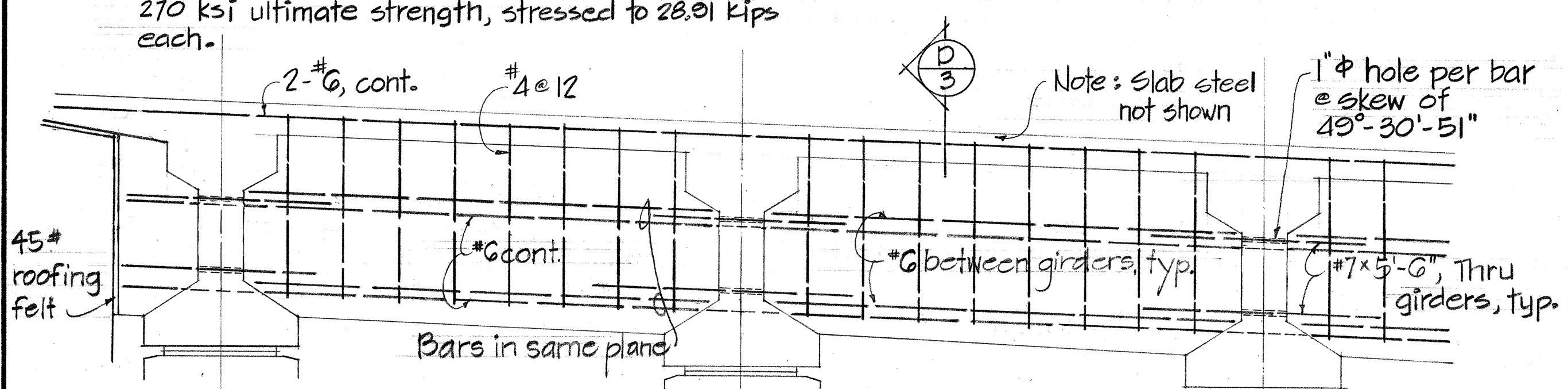
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David M. Yamamoto

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
AHUIMANU STREAM BRIDGE
STA. 190+93.80 to STA. 191+80.71
DECK SECTION, FRAMING & DETAILS
KAHEKILI HIGHWAY
PROJ. NO. BD 67-320
Scale : As noted Date : Mar. 1969
SHEET NO. 2 OF 13 SHEETS

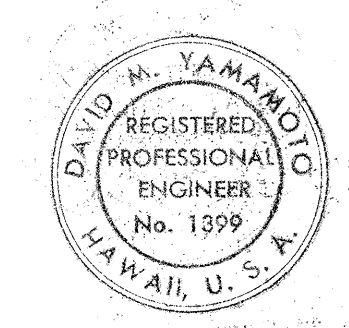


- NOTES :
- For location & details of beam reinf. weld plates, see this sheet.
 - For location & details of anchors & fixed abutment, see sheets 5 & 6.
 - Prestressing per girder : 30 - $\frac{1}{2}"$ dia. strands, 270 ksi ultimate strength, stressed to 28.01 kips each.
 - Concrete strengths : 6,000 psi @ 28 days, 4,500 psi @ transfer of prestress.



GIRDER DESIGN MOMENTS & SHEARS						
Point	0+1	1+4.9	2+4.8	3+7.4	4+6.5	5
MOMENT (Ft.-kips)	Girder	0	166	295	387	443
	Slab & Diaphragm	0	175	316	423	497
	Railing & A.C. pav't.	0	42	75	98	112
	Live load & impact	0	302	526	673	758
SHEARS (kips)	Girder	24.0	19.2	14.4	9.6	4.8
	Slab & Diaphragm	24.9	20.5	16.1	11.7	7.4
	Railing & A.C. pav't.	6.0	4.8	3.6	2.4	1.2
	Live load & impact	44.2	39.5	34.8	29.2	25.0

Notes: 1. For exterior girders, increase shears 30%.



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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

AHIUMANU STREAM BRIDGE
STA. 120+93.80 to STA. 121+80.71

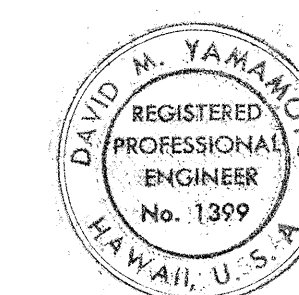
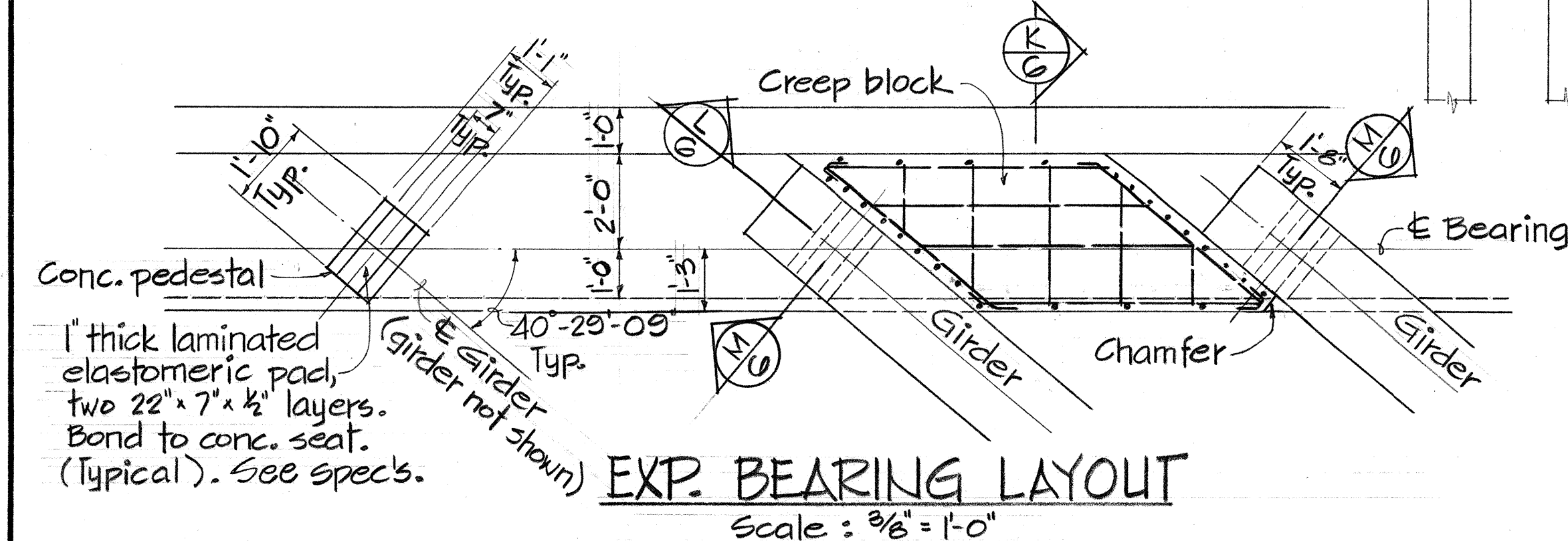
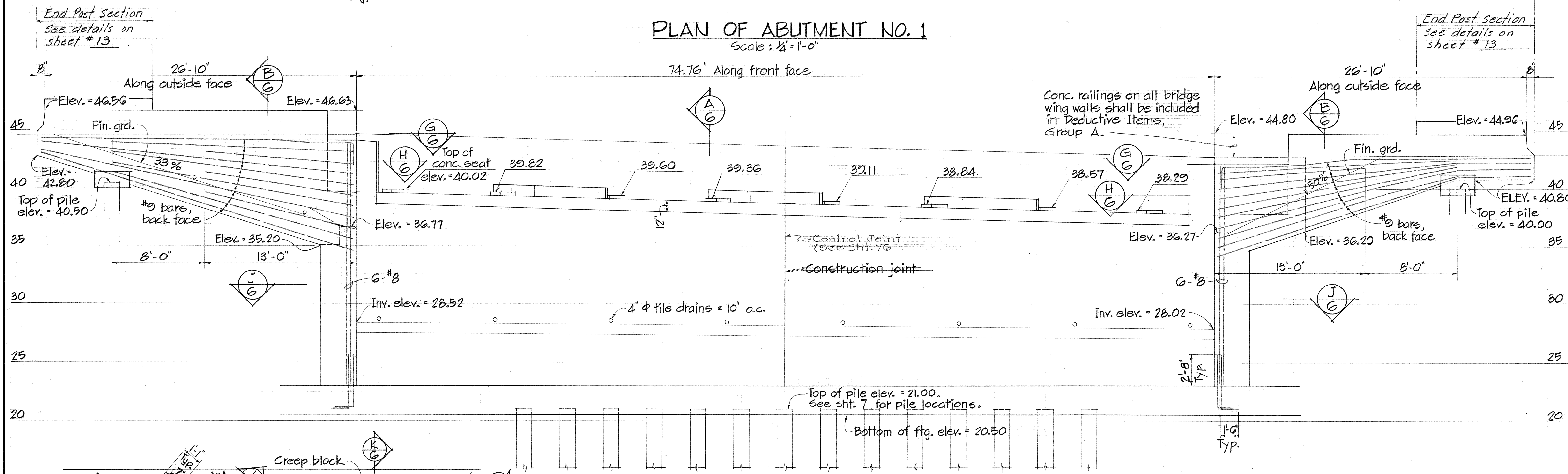
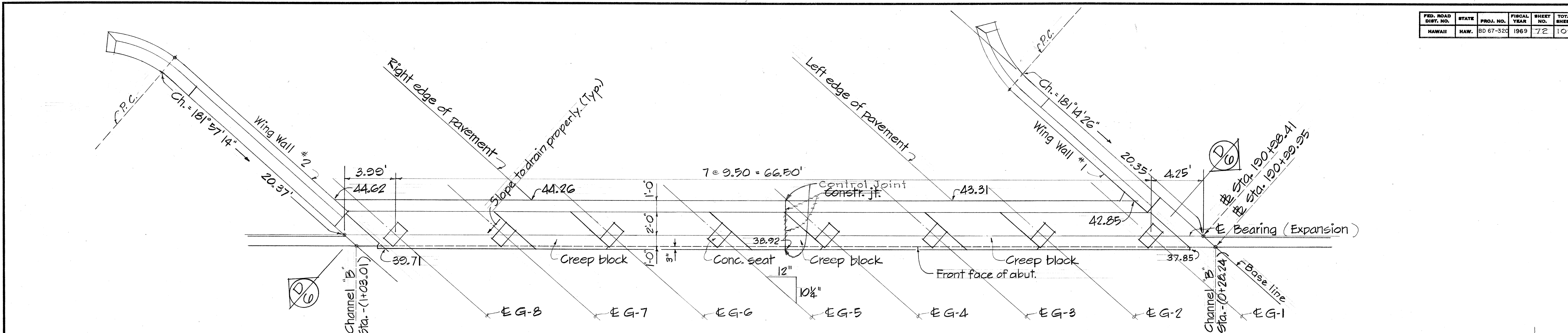
GIRDERS & BEAMS
KAHEKILI HIGHWAY
PROJ. NO. BD 67-320

Scale : As noted Date : Mar. 1969

SHEET No. 3 OF 13 SHEETS

DRAWN BY
CHECKED BY
NOTES BOOK
No.

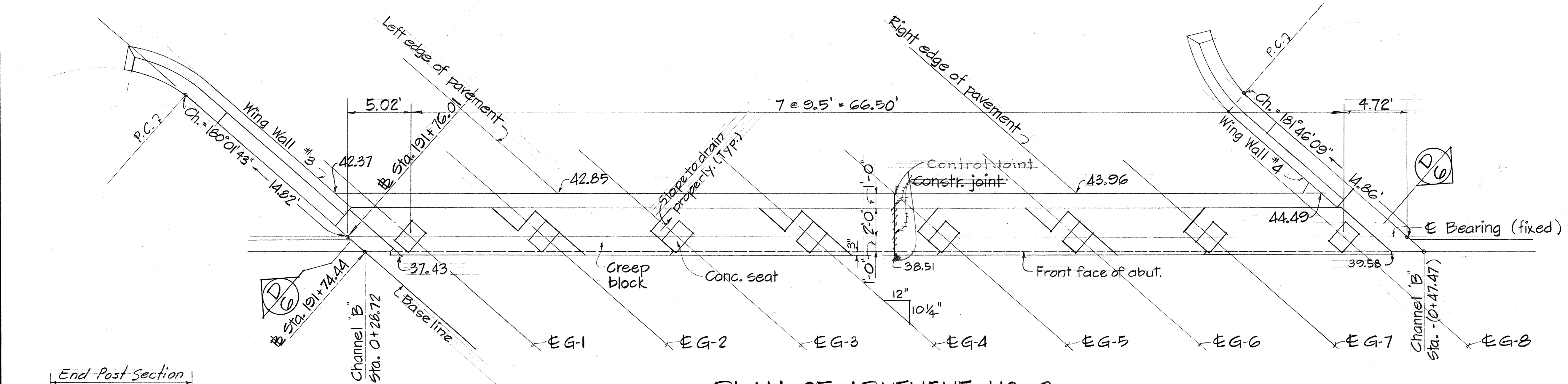
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BD 67-320	1969	72	100



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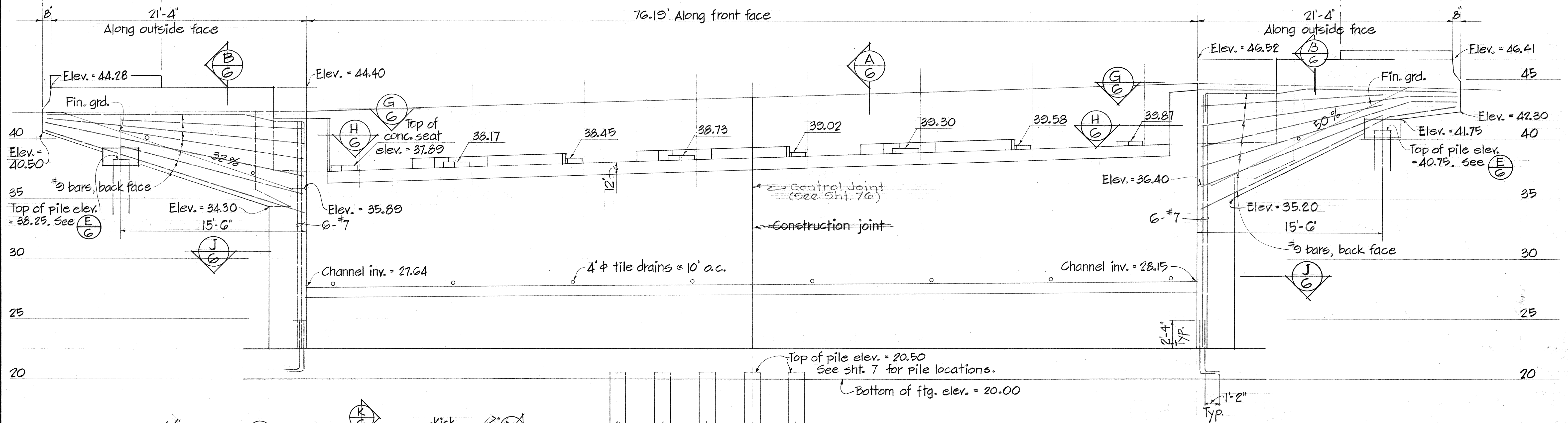
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
AHUIMANU STREAM BRIDGE
STA. 190+93.80 to STA. 191+80.71
ABUTMENT NO. 1
KAHEKILI HIGHWAY
PROJ. NO. BD 67-320
Scale: As noted Date: Mar. 1969
SHEET No. 4 OF 13 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BD 67-320	1969	73	100



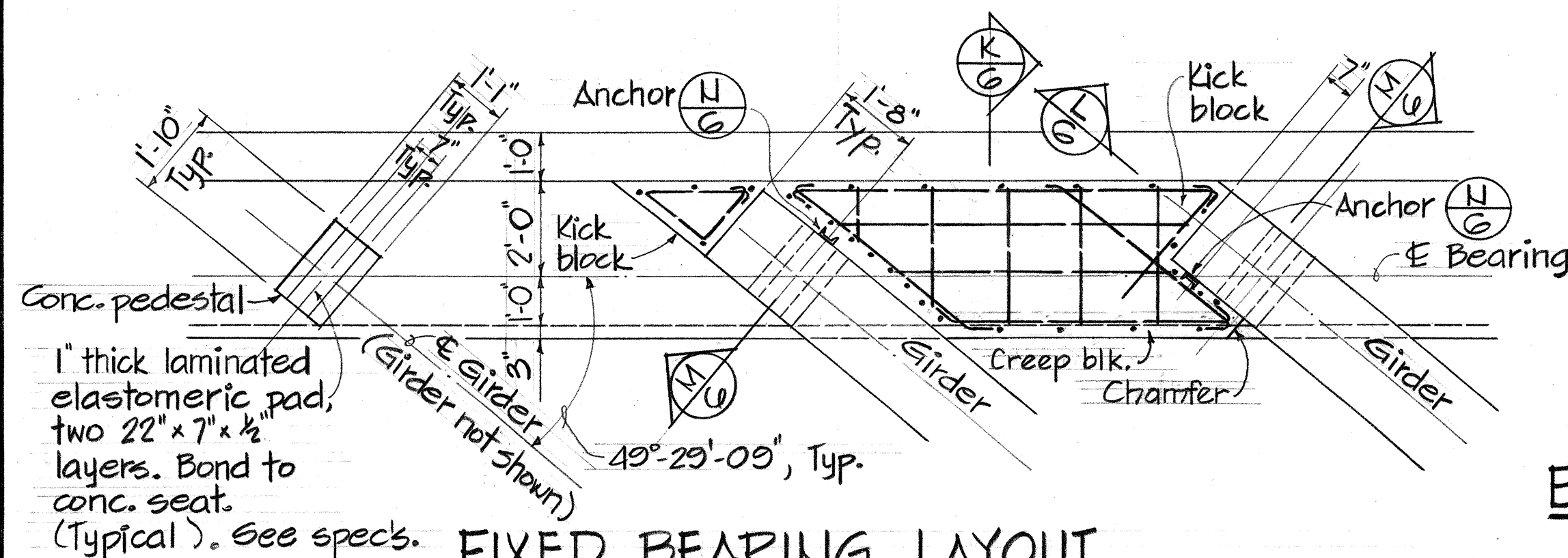
PLAN OF ABUTMENT NO. 2

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



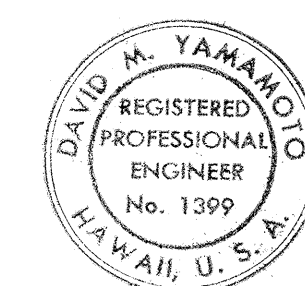
ELEVATION OF ABUTMENT NO. 2

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



FIXED BEARING LAYOUT

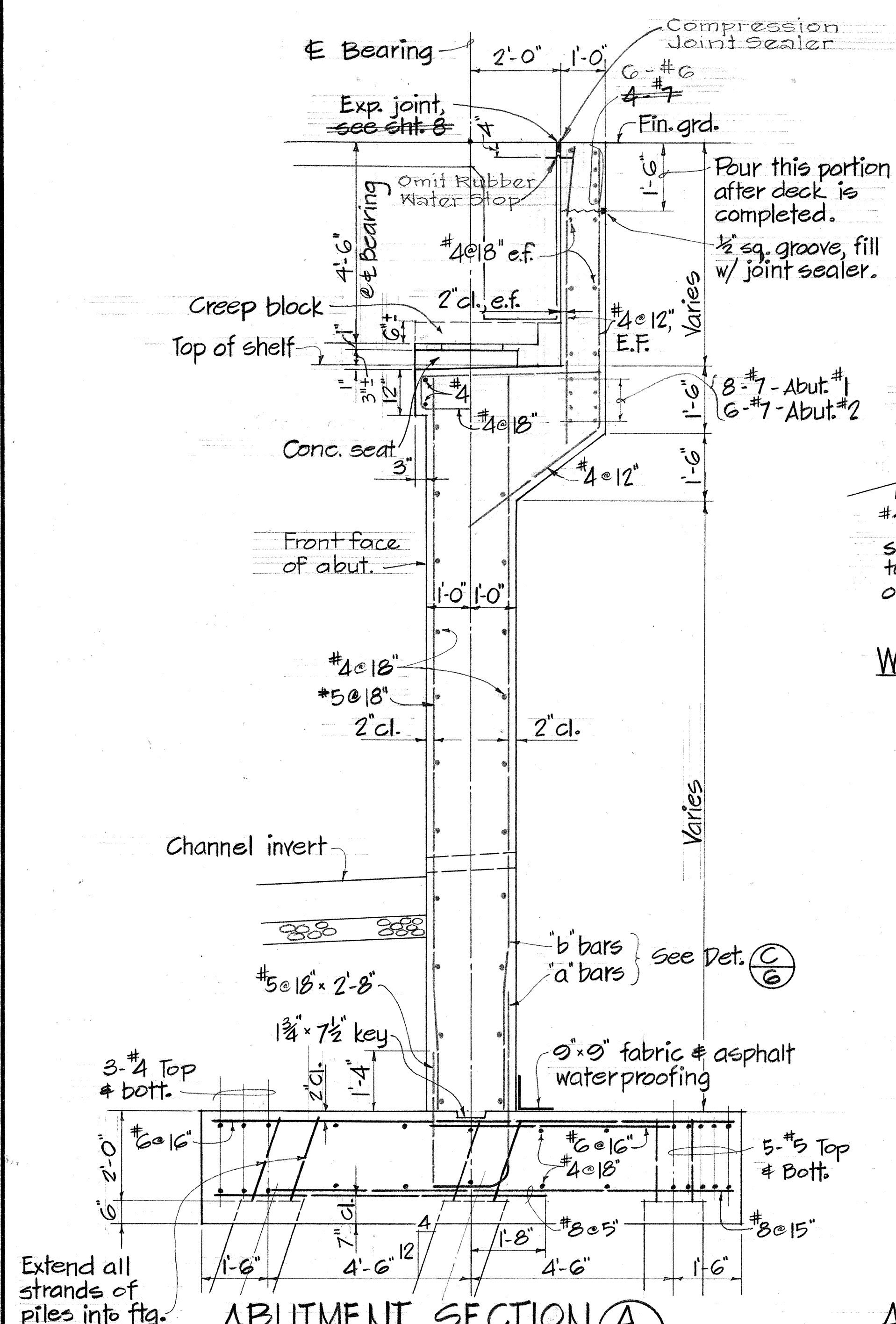
Scale: $\frac{3}{8}'' = 1'-0''$



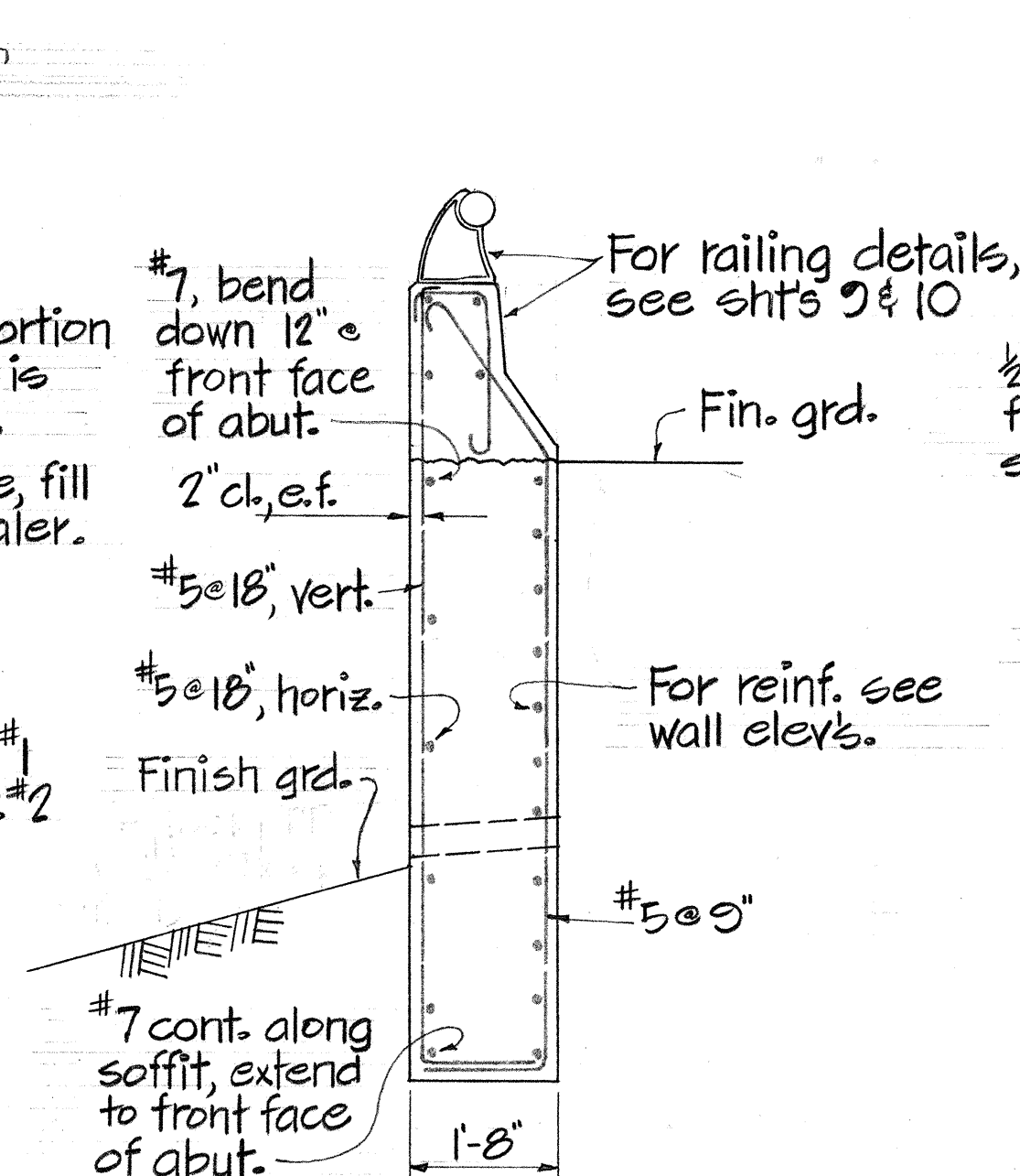
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
AHIUMANU STREAM BRIDGE
STA. 190+93.80 TO STA. 191+80.71
ABUTMENT NO. 2
KAHERILI HIGHWAY
PROJ. NO. BD 67-320
Scale: As noted Date: Mar. 1969
SHEET No. 5 OF 13 SHEETS

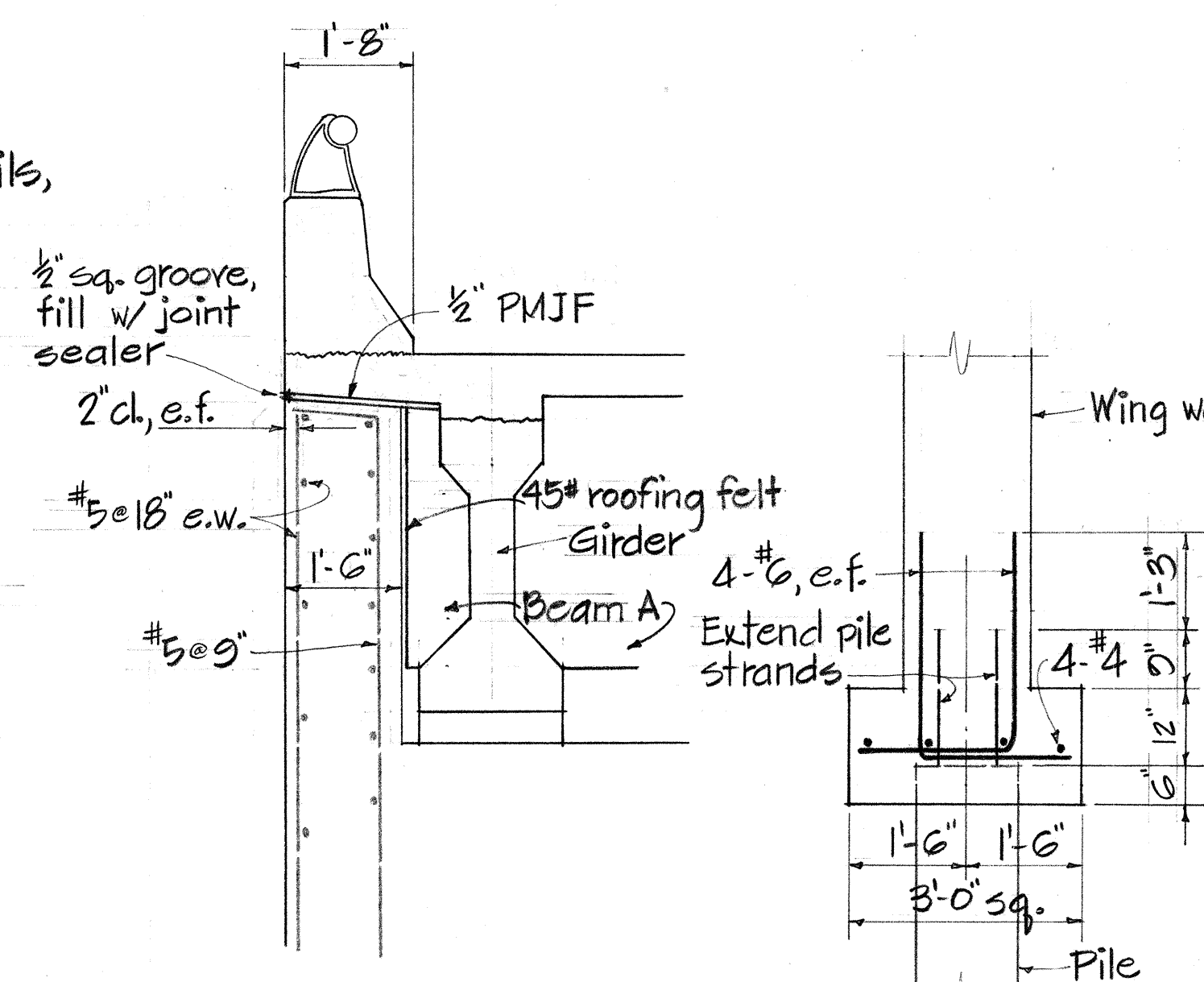
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOT SHEETS
HAWAII	HAW.	BD 67-320	1969	74	10



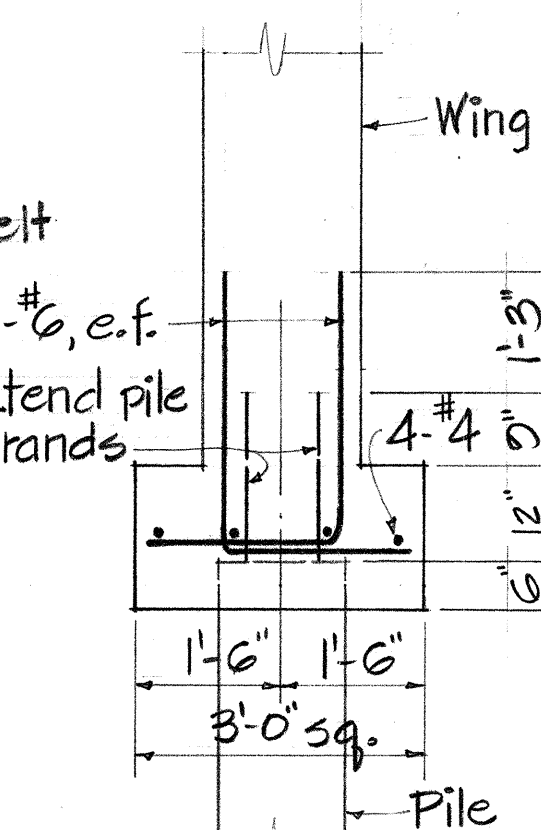
ABUTMENT SECTION (A)
Scale: $\frac{1}{2}" = 1'-0"$
(6)



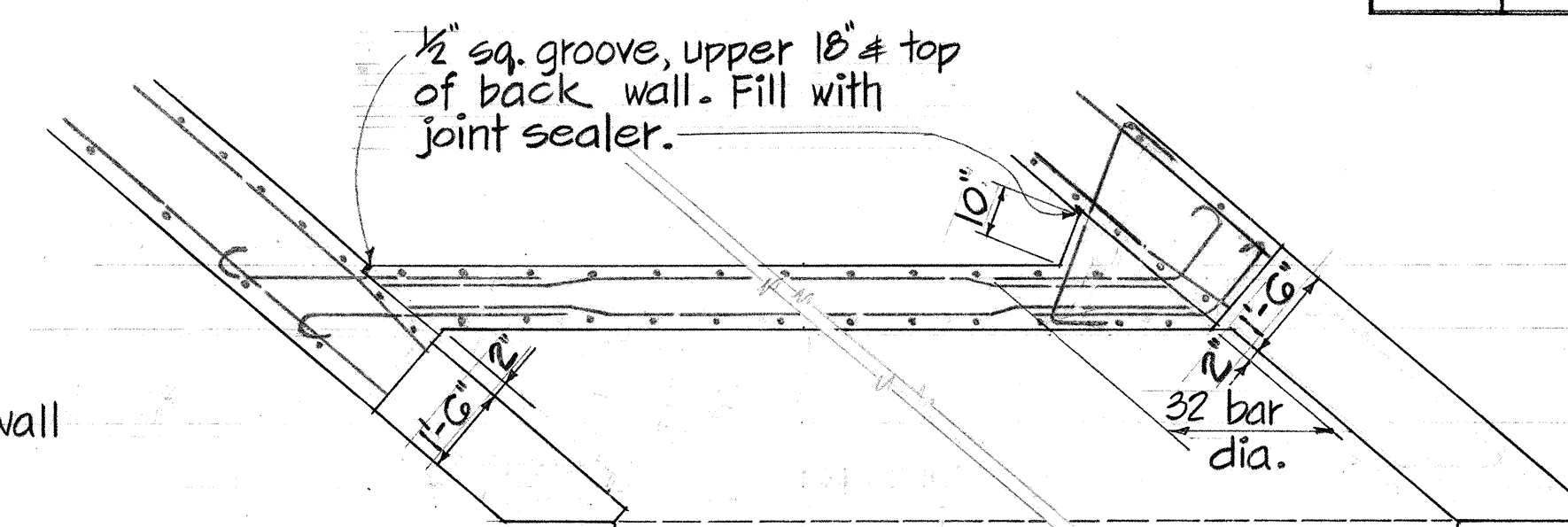
WING WALL SECT. (B)
Scale: $\frac{1}{2}" = 1'-0"$ (6)



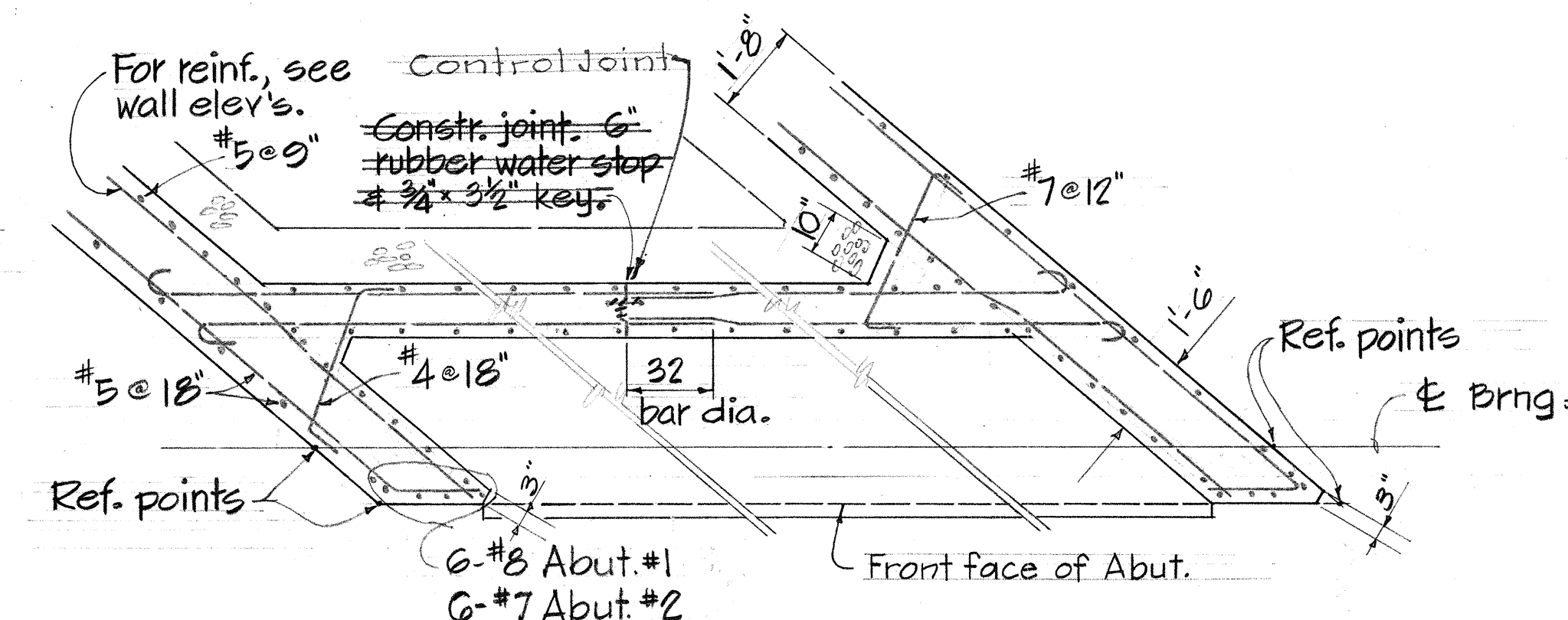
SECTION D
Scale: $\frac{1}{2}" = 1'-0"$



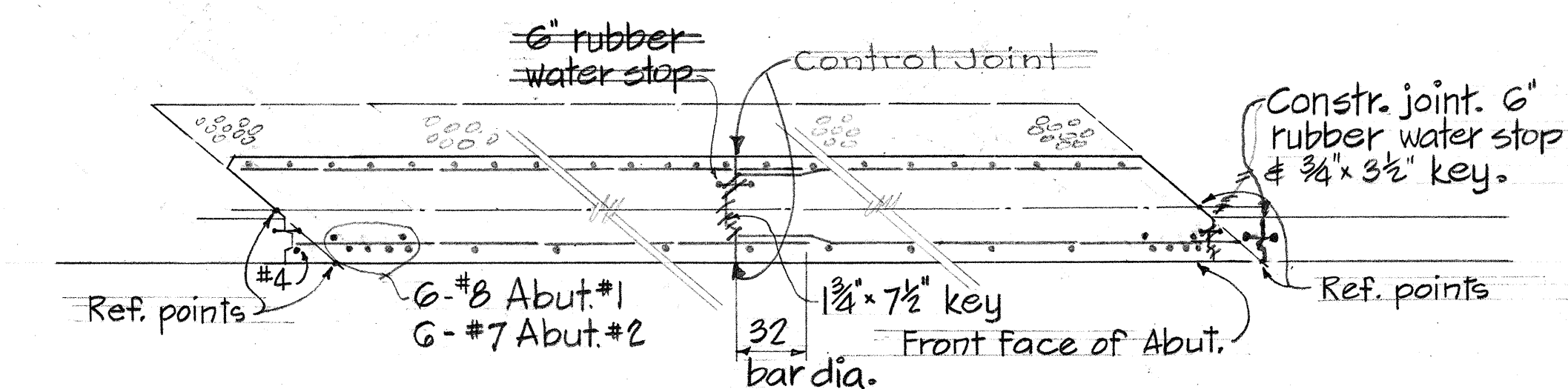
PILE CAP E
G
Scale: $\frac{1}{2}" = 1'-0"$



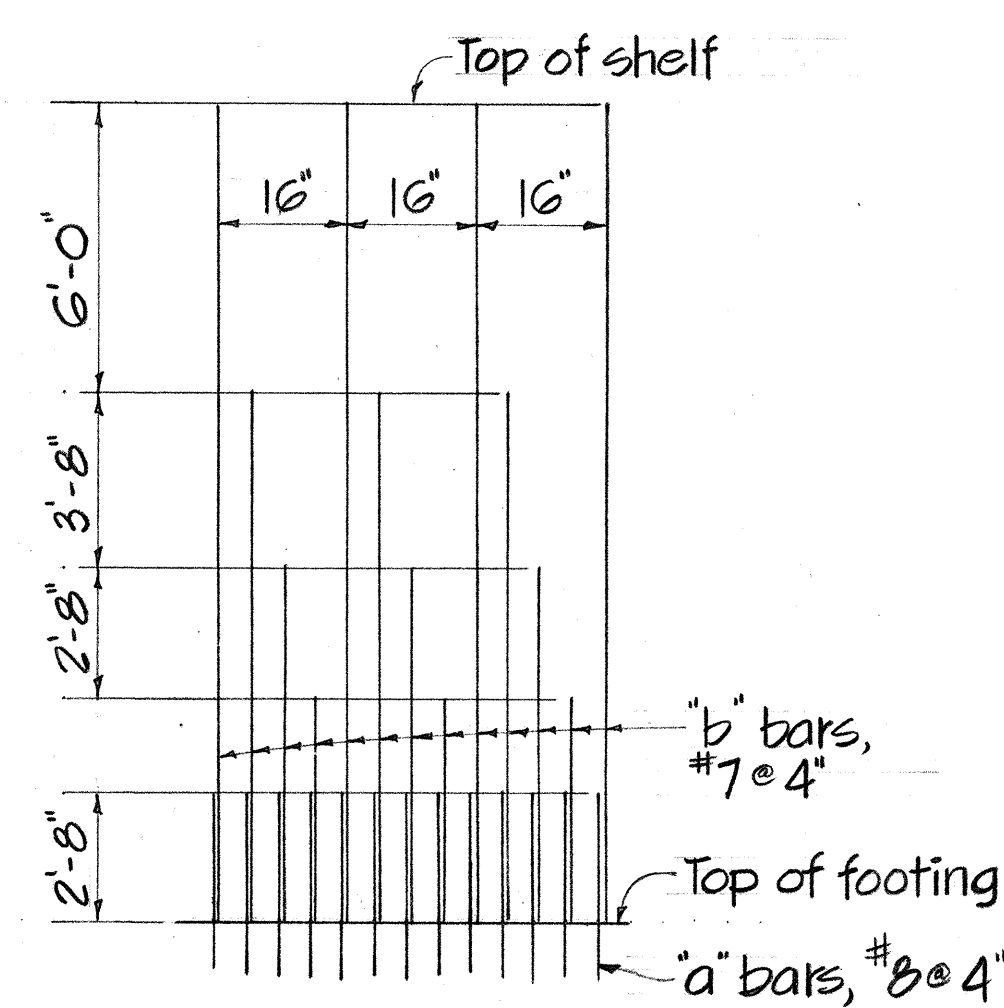
SECTION G
Scale: $\frac{3}{8}'' = 1'-0''$ 6



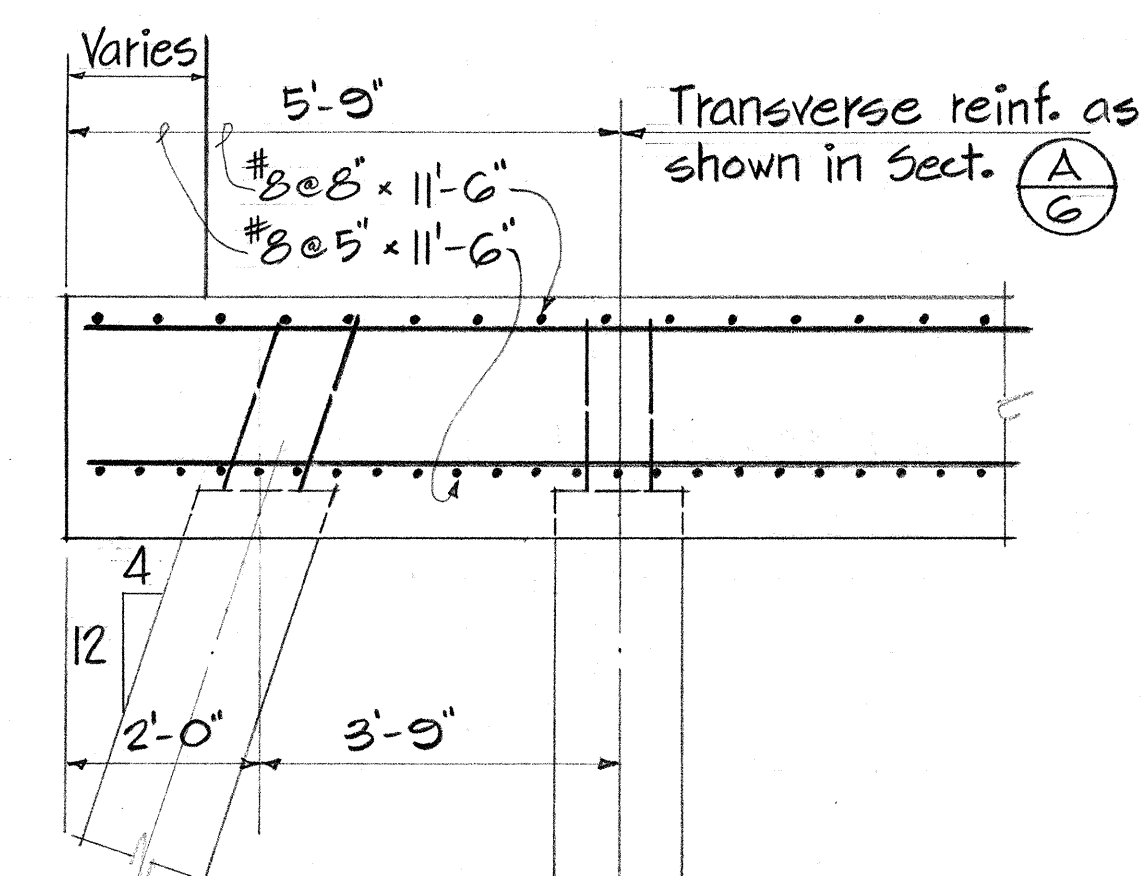
SECTION (H)
Scale: $\frac{3}{8}'' = 1'-0''$ 6



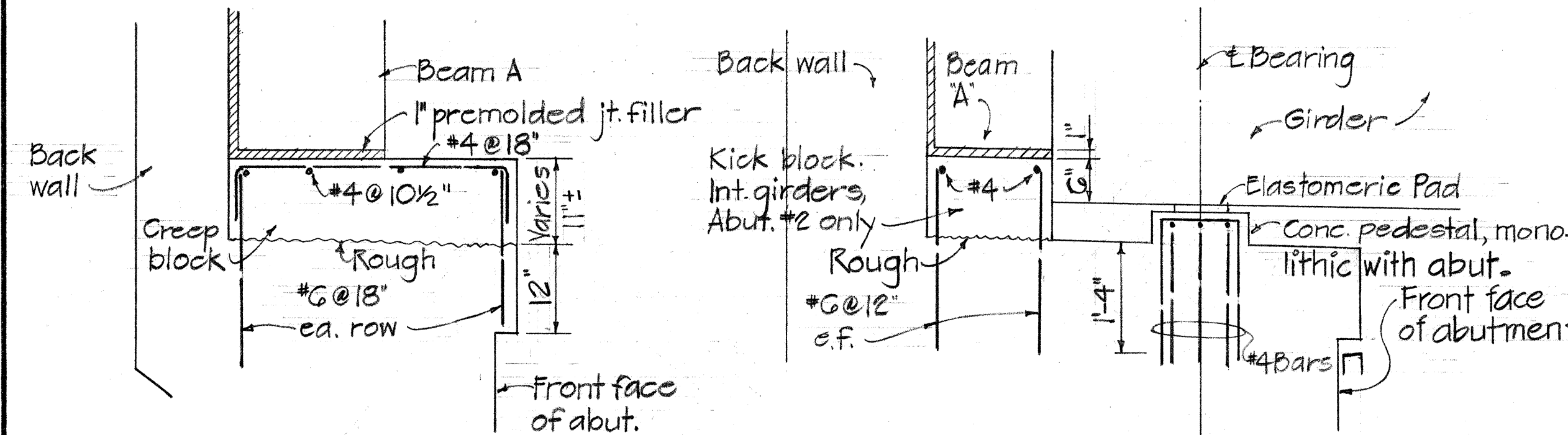
SECTION J
Scale: $\frac{3}{8}'' = 1'-0''$



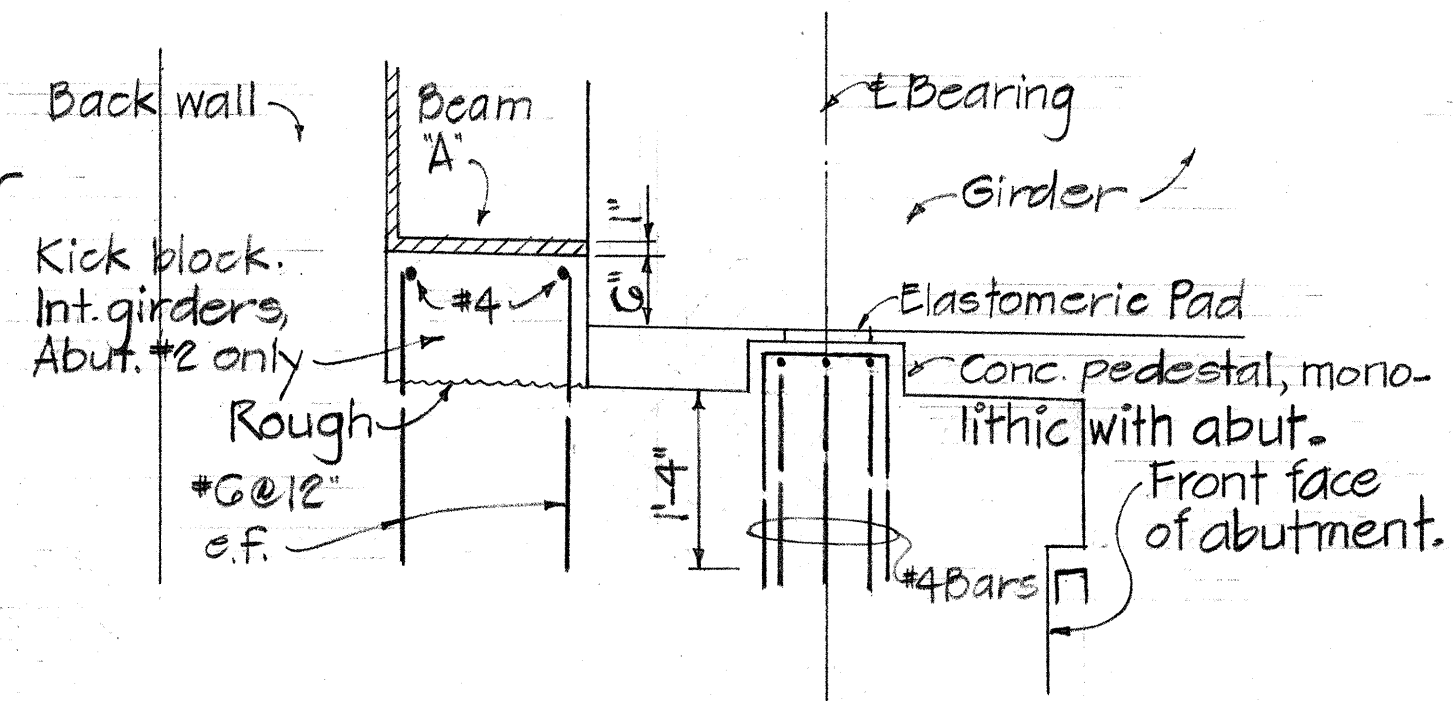
ABUT. VERT. REINF. $\frac{C}{6}$
Not to scale



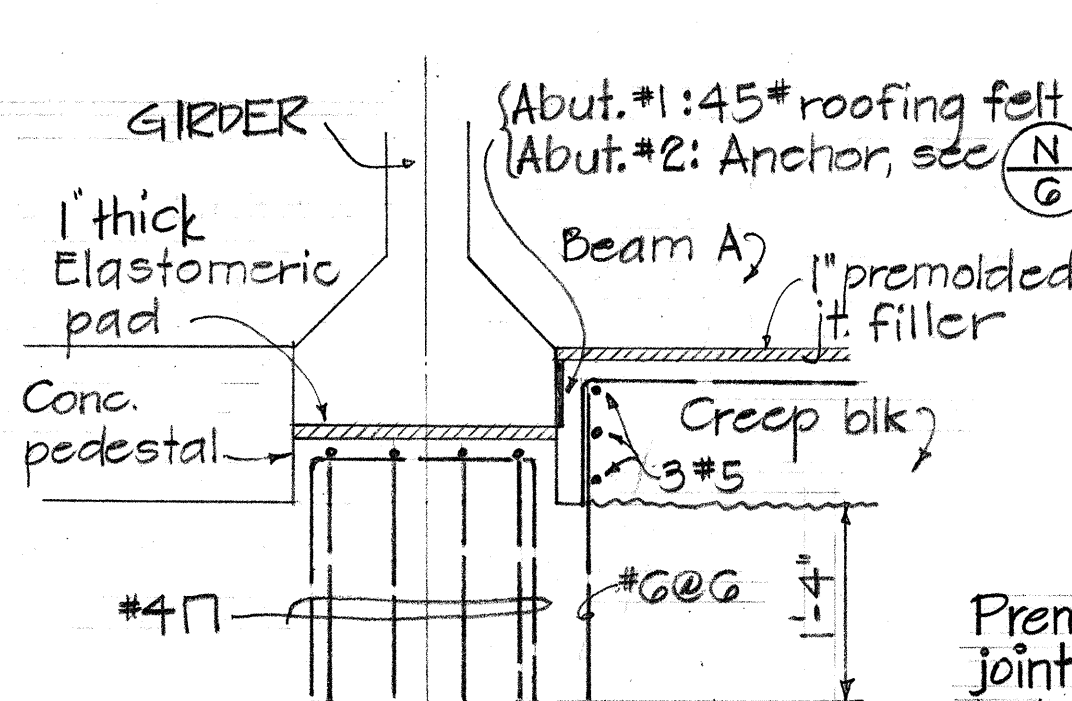
ABUTMENT FOOTING SECT. (F)
Scale: $\frac{1}{2}" = 1'-0"$ (6)



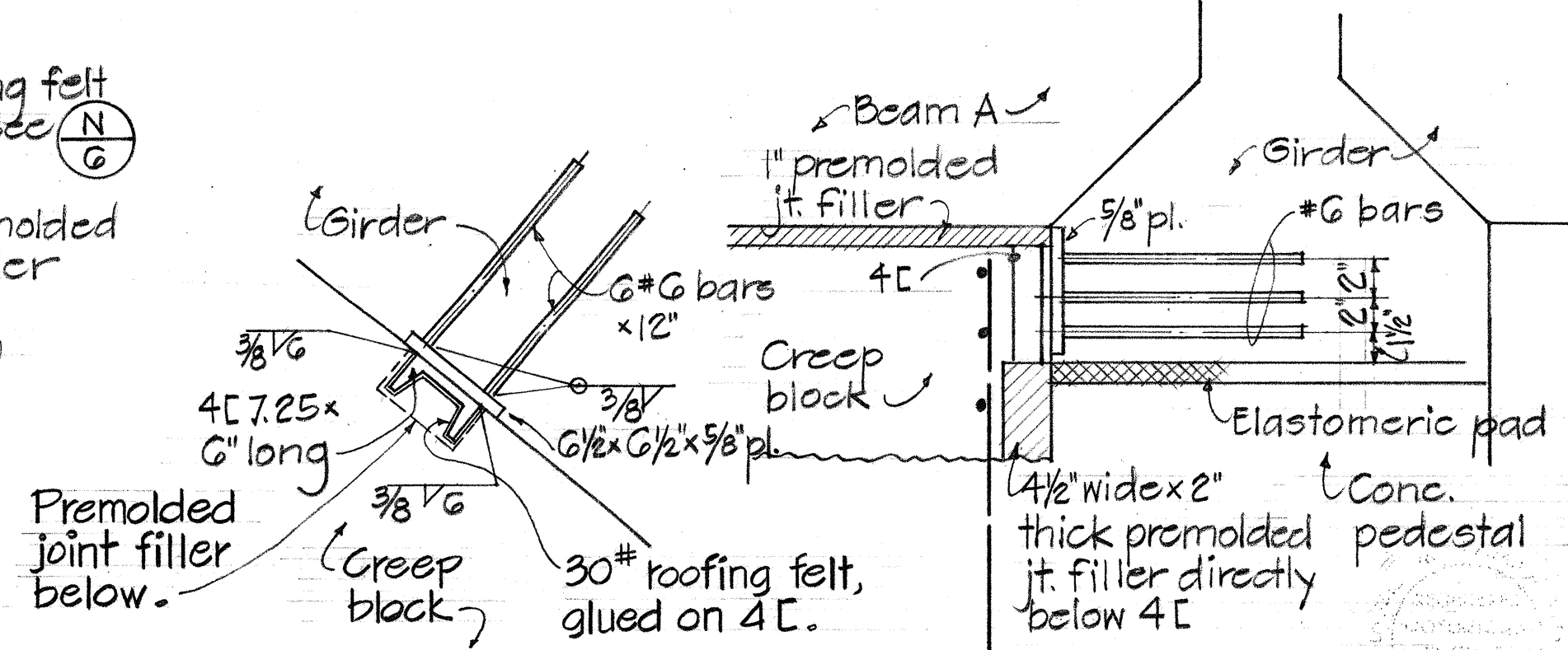
CREEP BLK. SECT. K
6



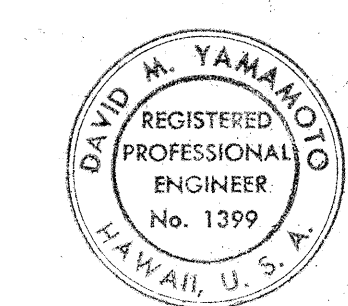
BEARING SECT. L
6
Scale: $\frac{3}{4}" = 1'-0"$



BEARING SECT. M
G



ANCHOR DETAIL (N
6
Scale: 1/2"=1'-0"



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

AHUIMANU STREAM BRIDGE
STA. 190+93.80 to STA. 191+80.71

ABUTMENT DETAILS
KAHEKILI HIGHWAY
PROJ. NO. BD 67-320

Scale : As noted Date : Mar. 1969

SHEET No. 6 OF 13 SHEETS

NOTE: Creep & kick blocks shall be poured after the girders are placed & shall be included in Deductive Items, Group A.

BORING LOGS

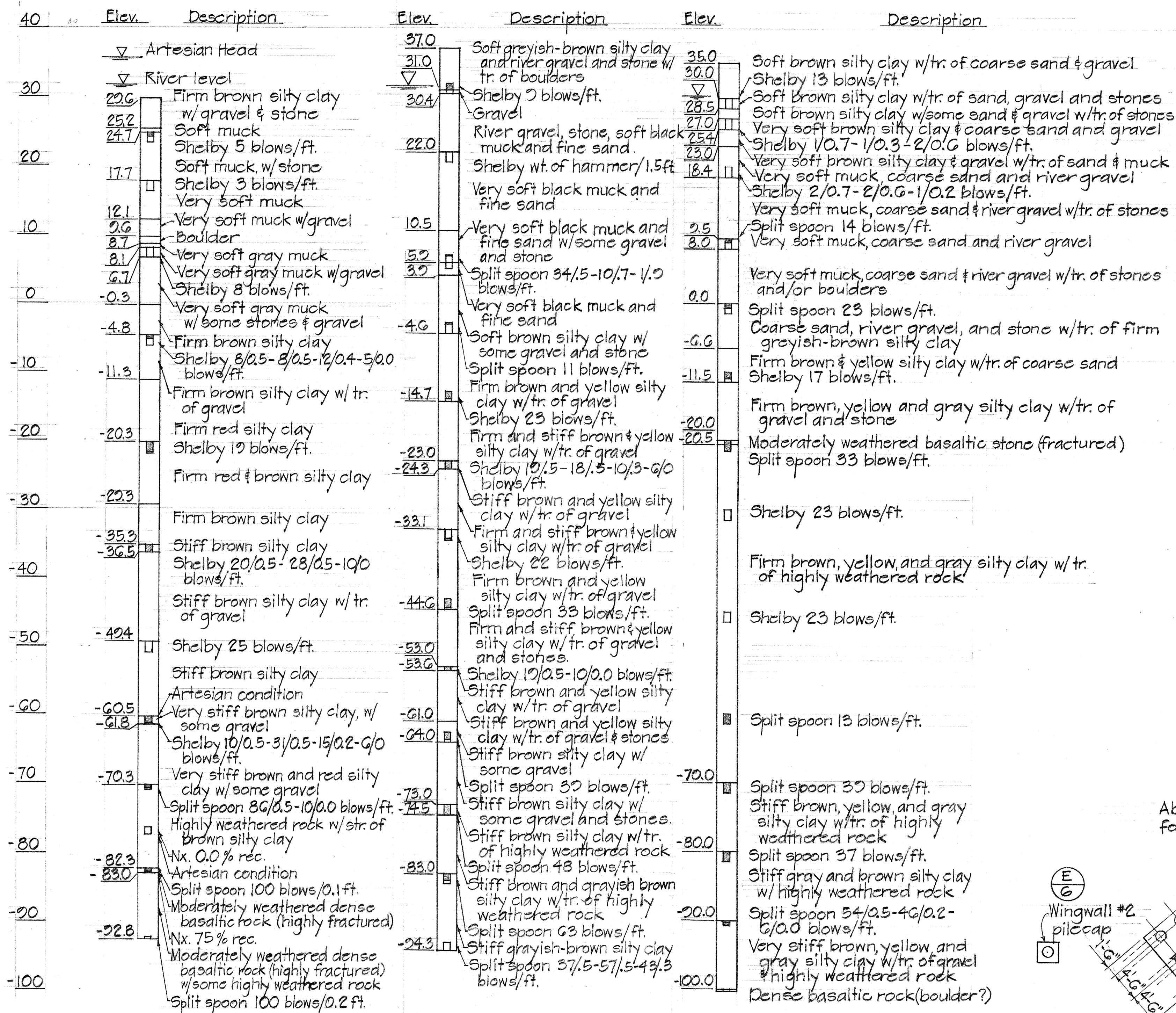
Vert. Scale: 1"=10'

B-2-80

B-3-80

B-4-80

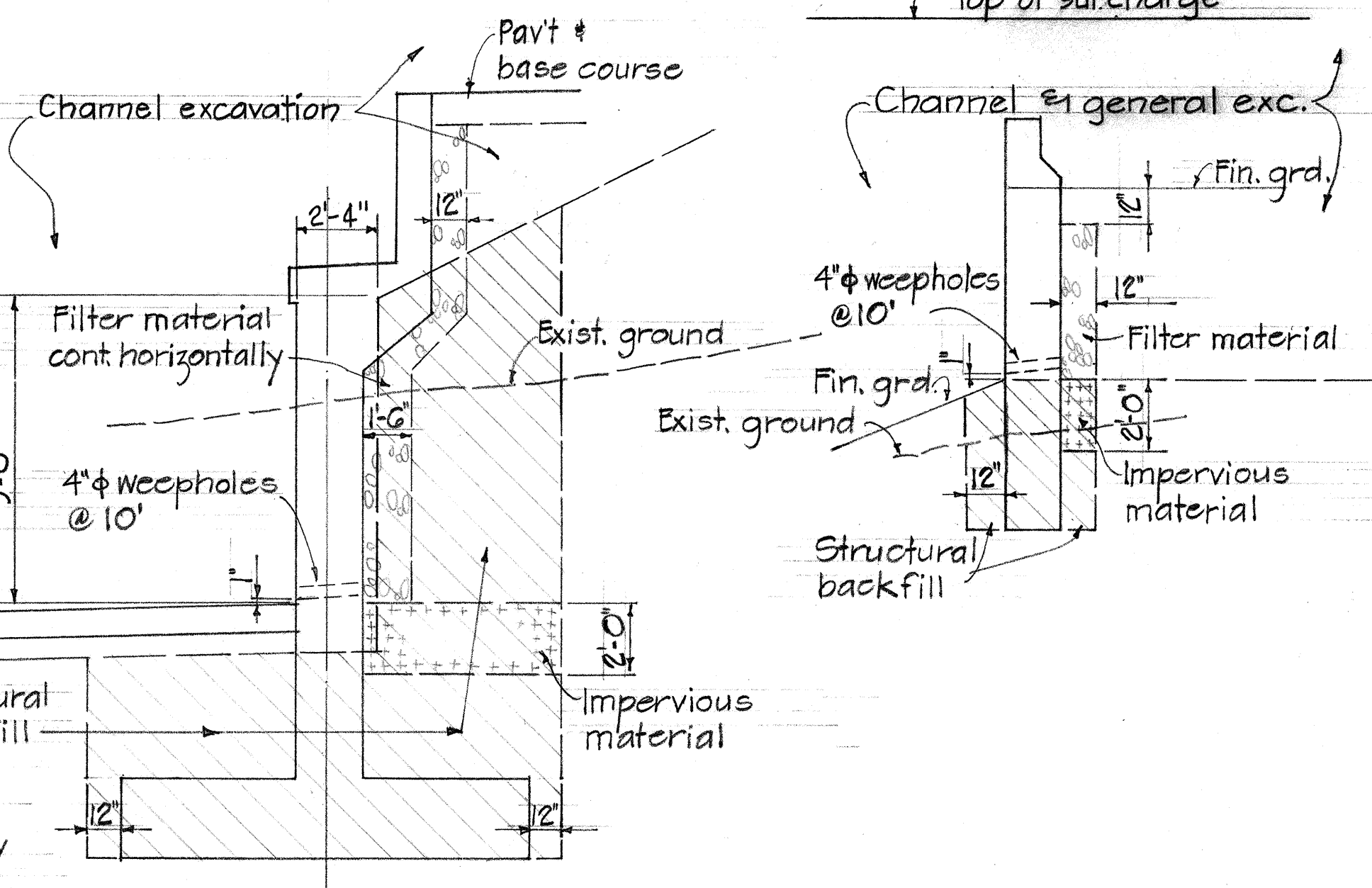
B-5-80



BORING LOGS

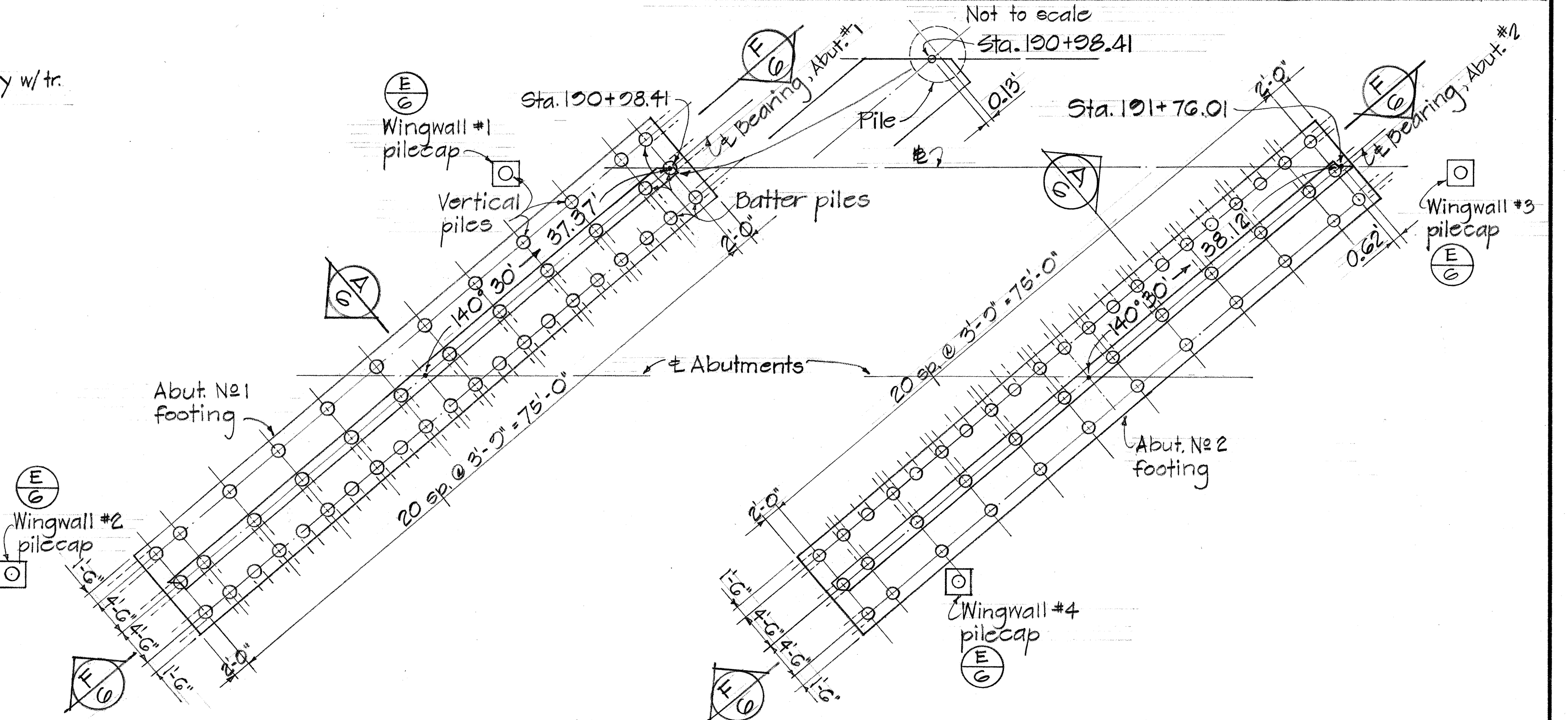
Scale: 1"=10'

Top of surcharge



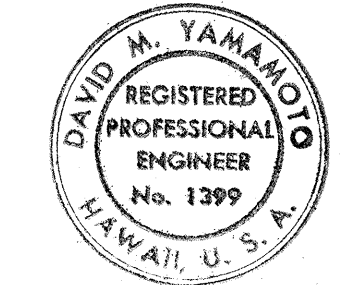
- Notes:
1. Hatched areas denote limits of structural excavation pay line. All other excavation shall be roadway or channel excavation, except as otherwise noted.
 2. Impervious material shall be as selected by the Engineer and shall be incidental to structural excavation.

ABUTMENT WINGWALL STRUCTURAL EXCAVATION & DRAINAGE DETAILS



FOUNDATION PLAN

Scale: 1"=10'



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

AHIUMANU STREAM BRIDGE
STA. 190+93.80 to STA. 191+80.71
FOUNDATION PLAN, EXCAVATION
DETAILS, & BORING LOGS
KAHEKILI HIGHWAY
PROJ. NO. BD 67-320

Scale: As noted Date: Mar. 1969
SHEET No. 7 OF 13 SHEETS

REVISION

Jan. '67
Feb. '67
Apr. '67
Feb. '68

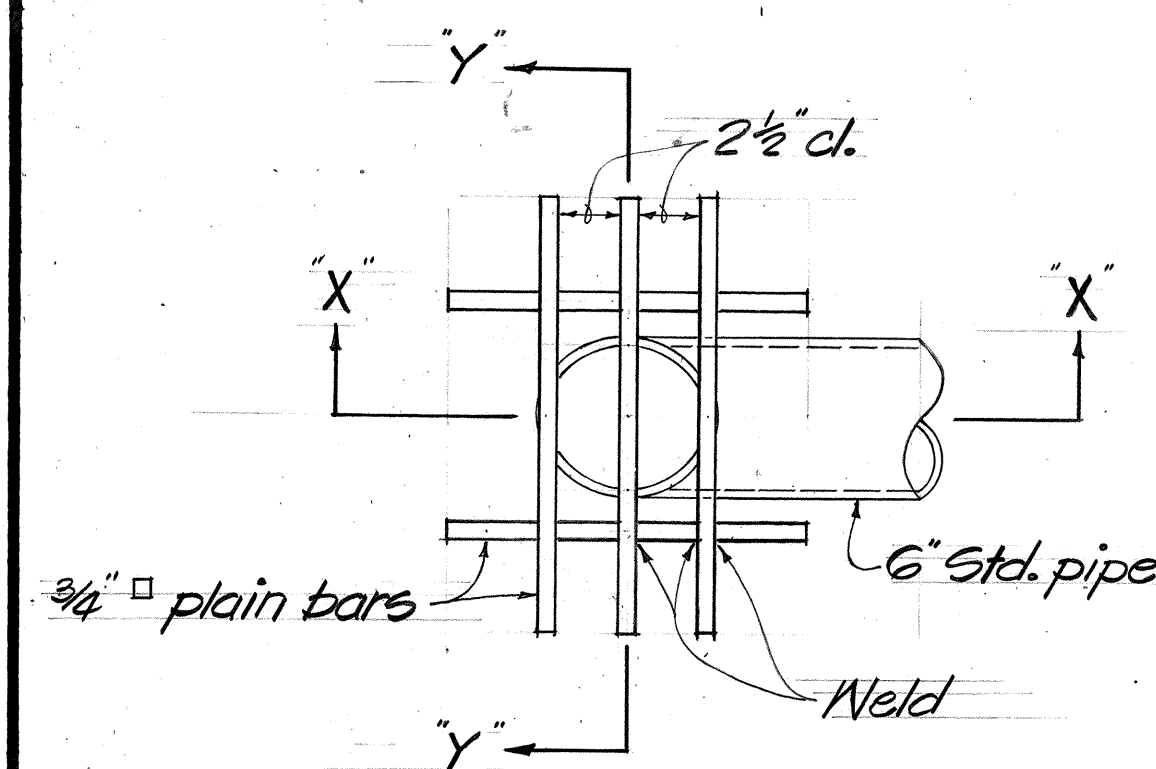
GENERAL NOTES

Elastometric Pads: Top & Bottom of bridge bearing pads shall be secured against displacement with adhesives approved by the Engineer. Pads shall be incidental to concrete and will not be paid for separately.

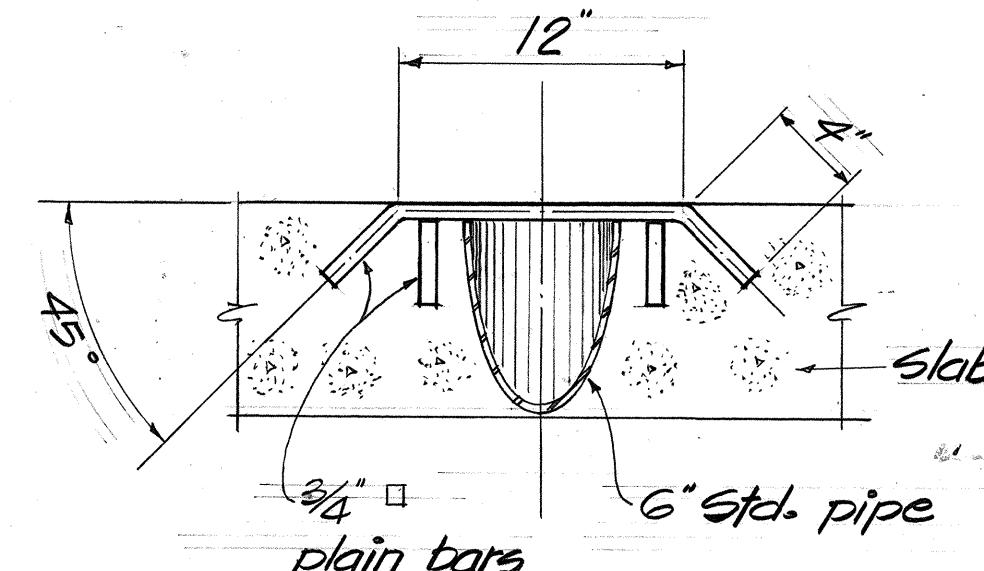
- The Contractor shall verify the location of all existing utility lines and notify the respective owners before commencing work of excavation.
- All concrete shall be Class A-1 unless otherwise noted.
- Clearance for reinforcing bars shall be as follows, unless otherwise noted:
 - 1" for stirrups of beams & pier caps.
 - 2" for ties of columns.
 - 2" for formed walls.
 - 3" for footings.
- Concrete seats receiving steel plates, lead plates or neoprene pads shall be poured monolithically with supporting structures & top surfaces of the concrete seats shall be finished with a steel trowel to a smooth level at the elevation shown on the plans.
- Reinforcing shall be detailed in accordance with A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures unless otherwise noted.
- Reinforcing bars shall be securely tied at all intersections & lap splices & shall be held in place during pouring to maintain their proper locations as shown on plans.
- Splices of reinforcing - See Special Provisions.

- Minimum spacing between parallel bars shall be $2\frac{1}{2}$ times the diameter of bars, but in no case shall the clear distance between the bars be $\frac{1}{2}$ times the maximum size of the coarse aggregate.
- All dimensions relating to reinforcing are to centers of bars unless otherwise noted.
- Forms for all exposed surfaces of separation structures and surfaces of retaining walls visible from a traveled way or from a populated area shall be plywood except that metal forms may be permitted provided a surface finish satisfactory to the Engineer can be obtained and the use of such forms is approved in writing by the Engineer. Forms for round columns shall be made of materials that will give a smooth finish and true dimensions as given in the plans. Forms for prestressed concrete members shall be either metal or plywood.
- Vertical column bars shall be arranged in such a manner as to miss pier cap bars above as directed by the Engineer.
- Except as otherwise noted on drawings, all exterior corners & re-entrant angles in concrete work shall be chamfered $\frac{3}{4} \times \frac{3}{4}$. See Standard Specifications.
- Concrete finish - See Special Provisions.
- All welders and welding procedures shall be qualified according to the requirements of the Special Provisions.
- Gothic letters and figures approximating dimensions shown will be acceptable if approved by the Engineer.

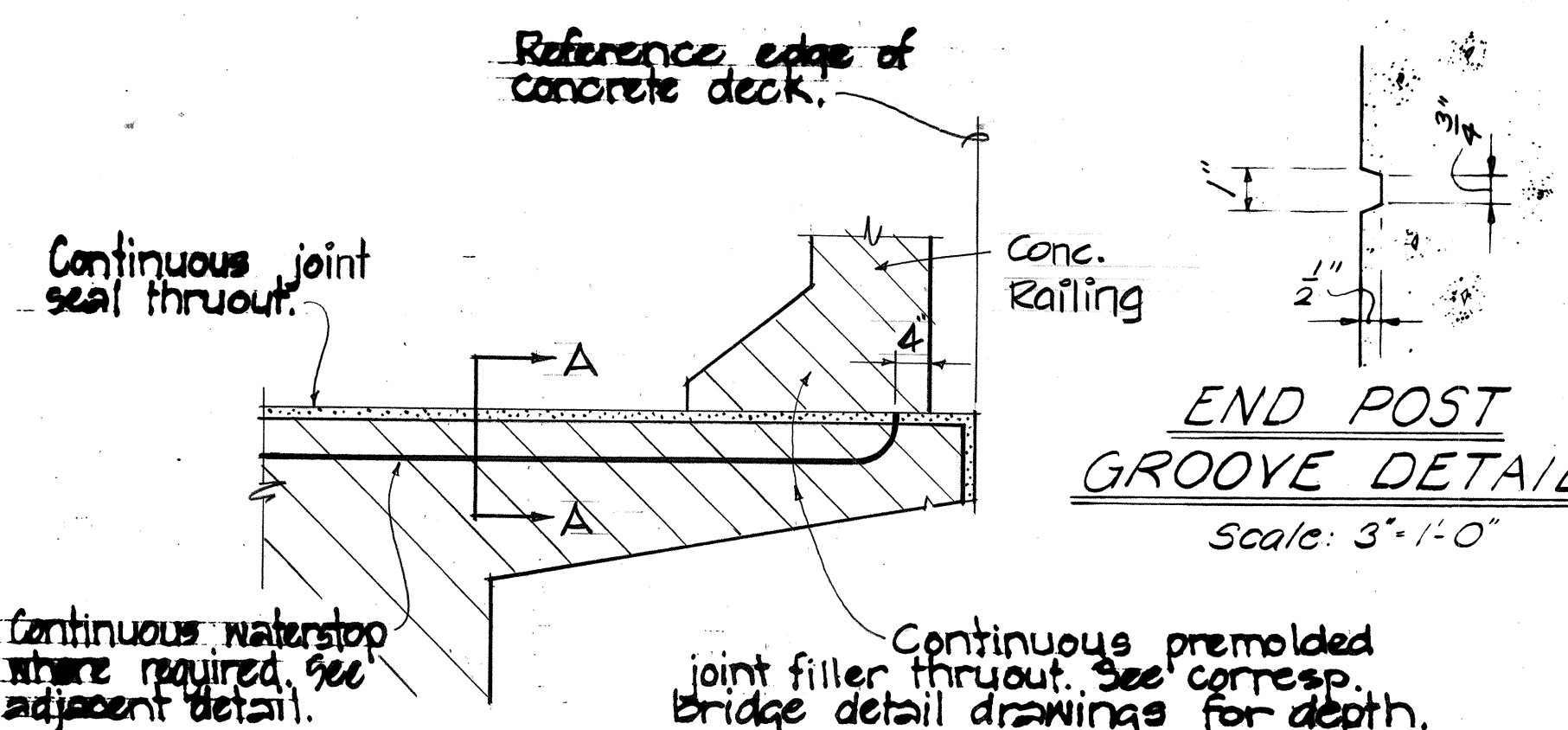
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
AHUIMANU STREAM BRIDGE
STA. 190+93.80 to STA. 191+80.71
GENERAL NOTES & MISC. DETAILS
KAHEKILI HIGHWAY
PROJ. NO. BD 67-320
Scale as Noted Date: Mar. 1969
SHEET No. 8 OF 13 SHEETS



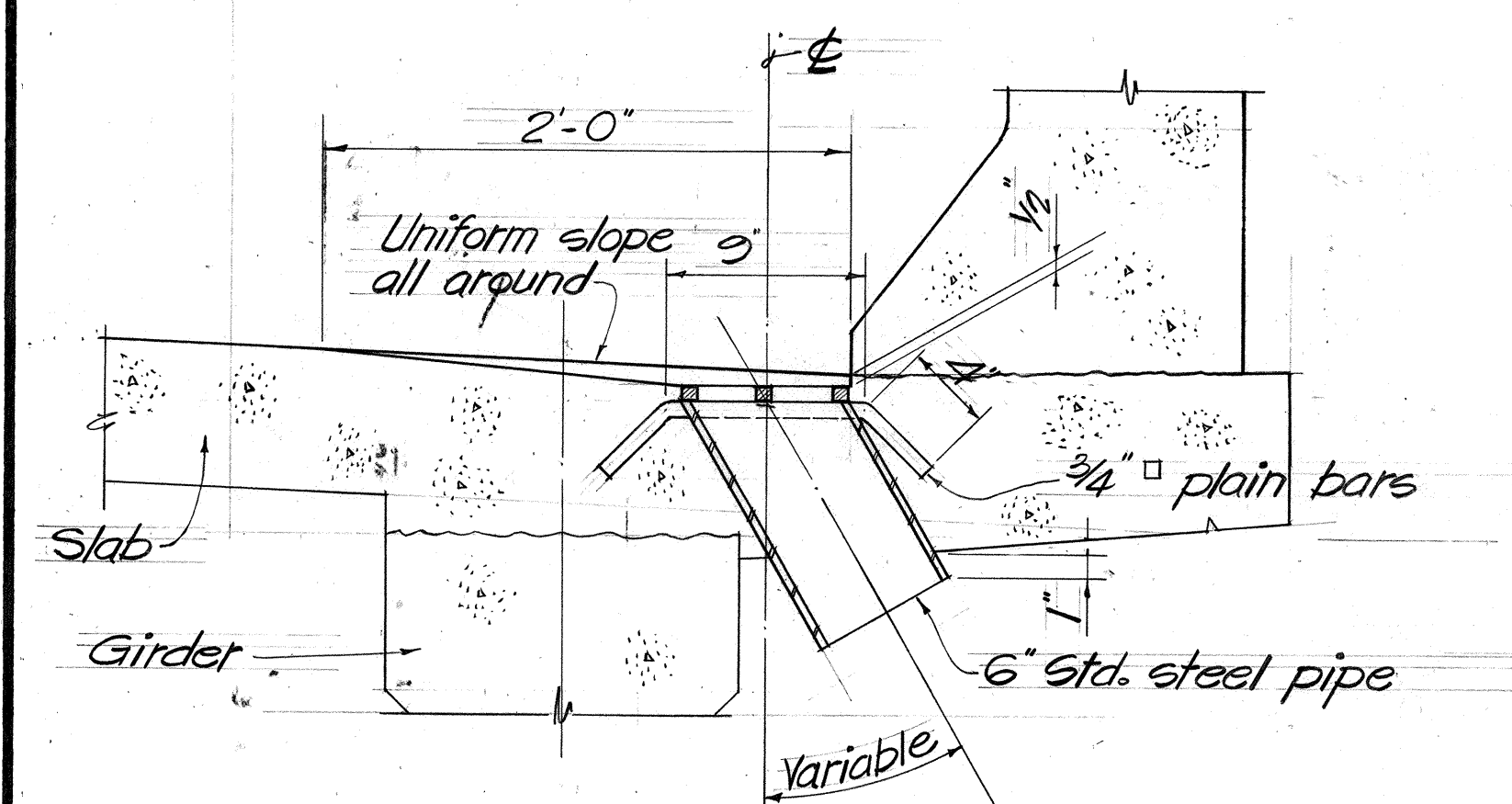
PLAN



SECTION "Y-Y"



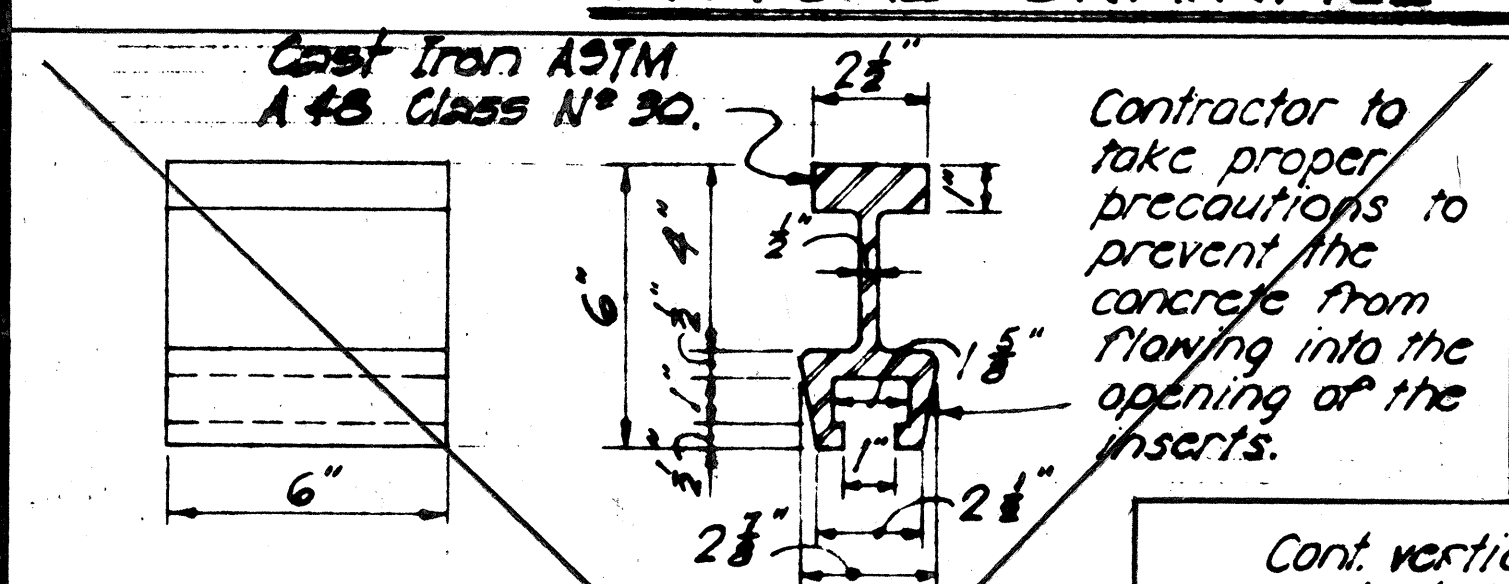
ELEVATION



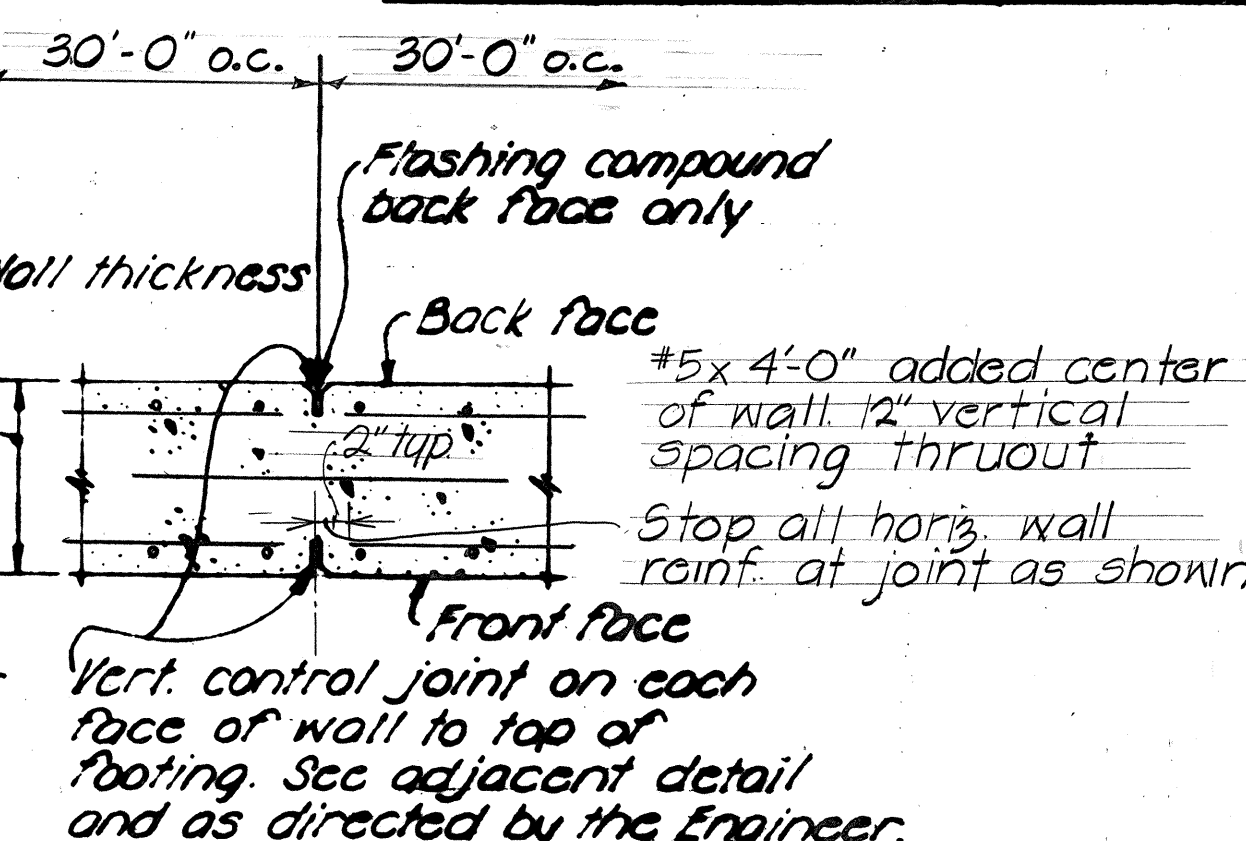
SECTION "X-X"

NOTE: Metal drains shall be considered incidental to Class A-1 Concrete in both concrete and steel bridges and will not be paid for separately. Assembly of grillage and pipe shall be hot-dip galvanized after all welding is completed.

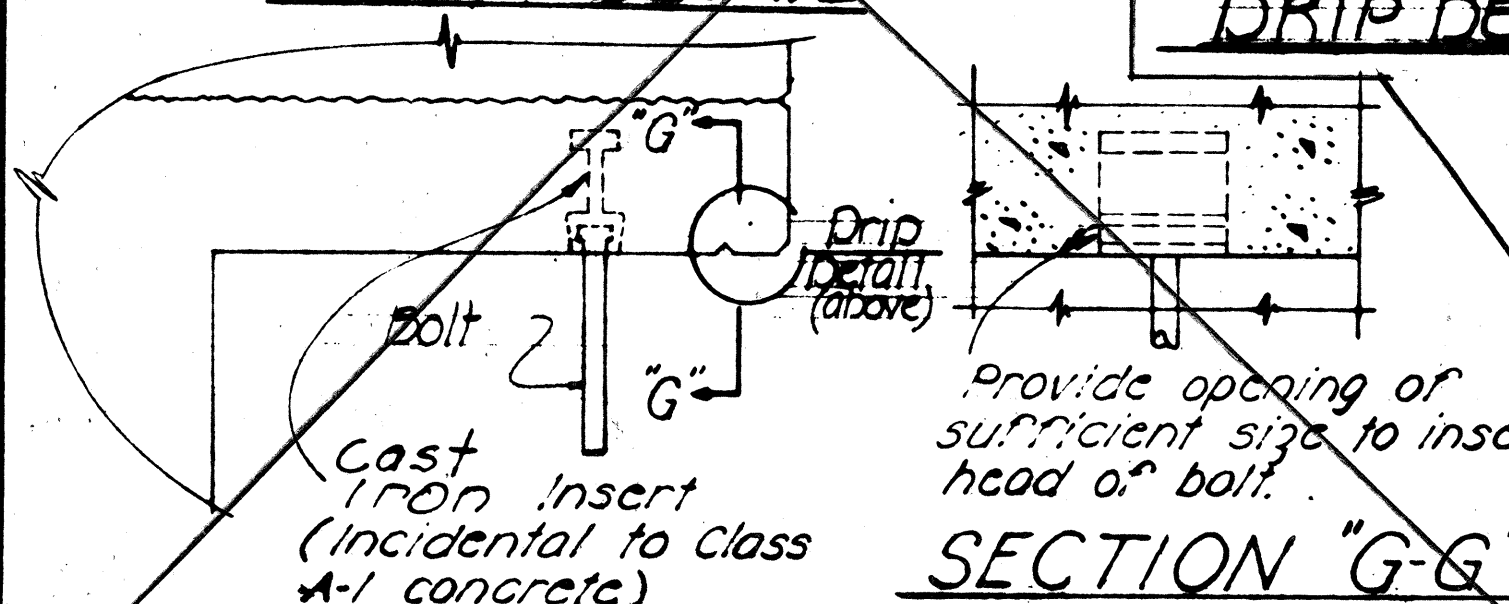
TYPICAL DRAINAGE DETAILS



Contractor to take proper precautions to prevent the concrete from flowing into the opening of the inserts.



CONTROL JOINT DETAIL

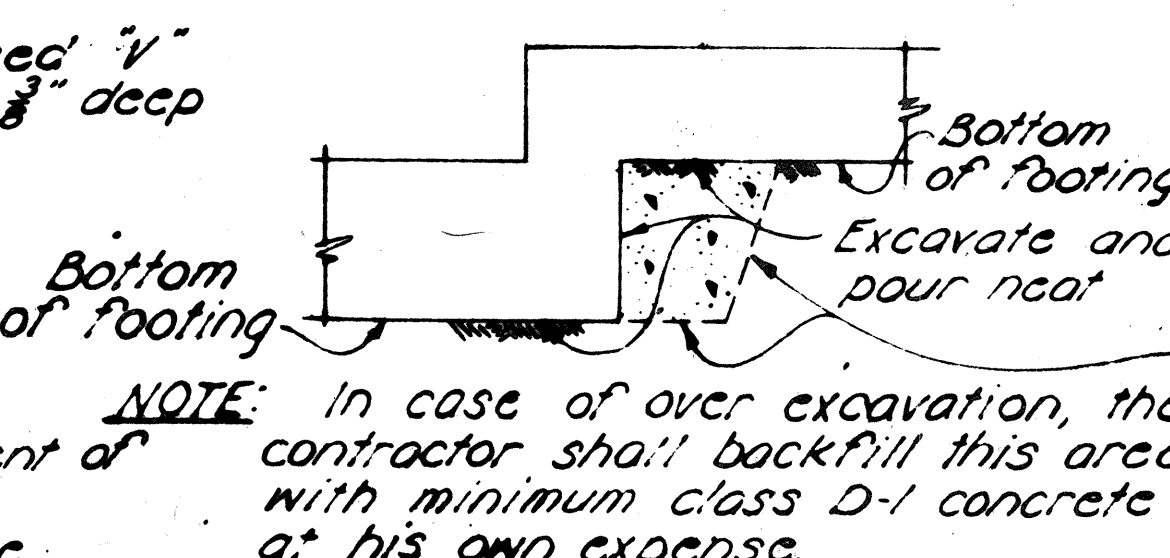


SECTION "G-G"

DETAIL OF PIPE HANGERS & INSERTS

TYPICAL DETAIL OF LETTERS & FIGURES AT CONCRETE END POST

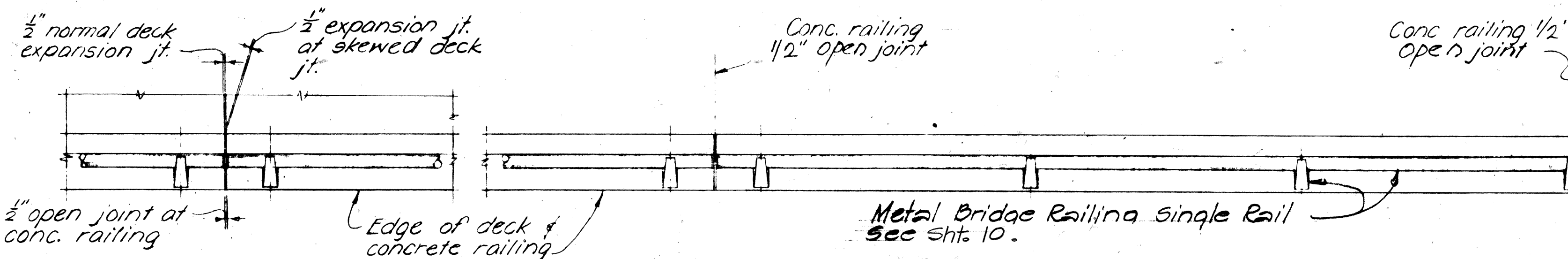
Use correct name of bridge Date of Year built
NOTE: Refer to corresponding detail drawings for placement of such names & dates at end post. Exact details & spacing of letters & figures shall be as directed by the Engineer. See Note #15.



NOTE: In case of over excavation, the contractor shall backfill this area with minimum class D-1 concrete at his own expense.

TYPICAL EXCAVATION FOR CONTINUOUS FOOTING STEP-UP

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BD 67-320	1969	77	109



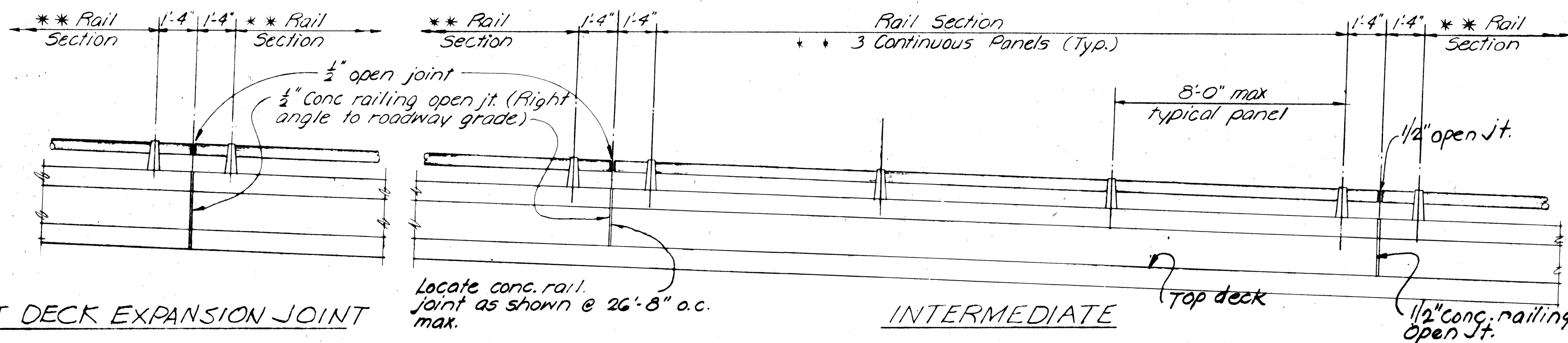
AT DECK EXPANSION JOINT

INTERMEDIATE

NOTE !!

The contractor shall layout the railing to provide 3 cont. panels whenever poss. b/c. 2 or 4 cont. panels will be permitted to complete the layout when 3 cont. panels cannot be made. Single panels will not be permitted. Rail Posts shall be normal to grade. Provide double posts at each expansion jt., fixed bridge jt. and as shown on detailed drawings.

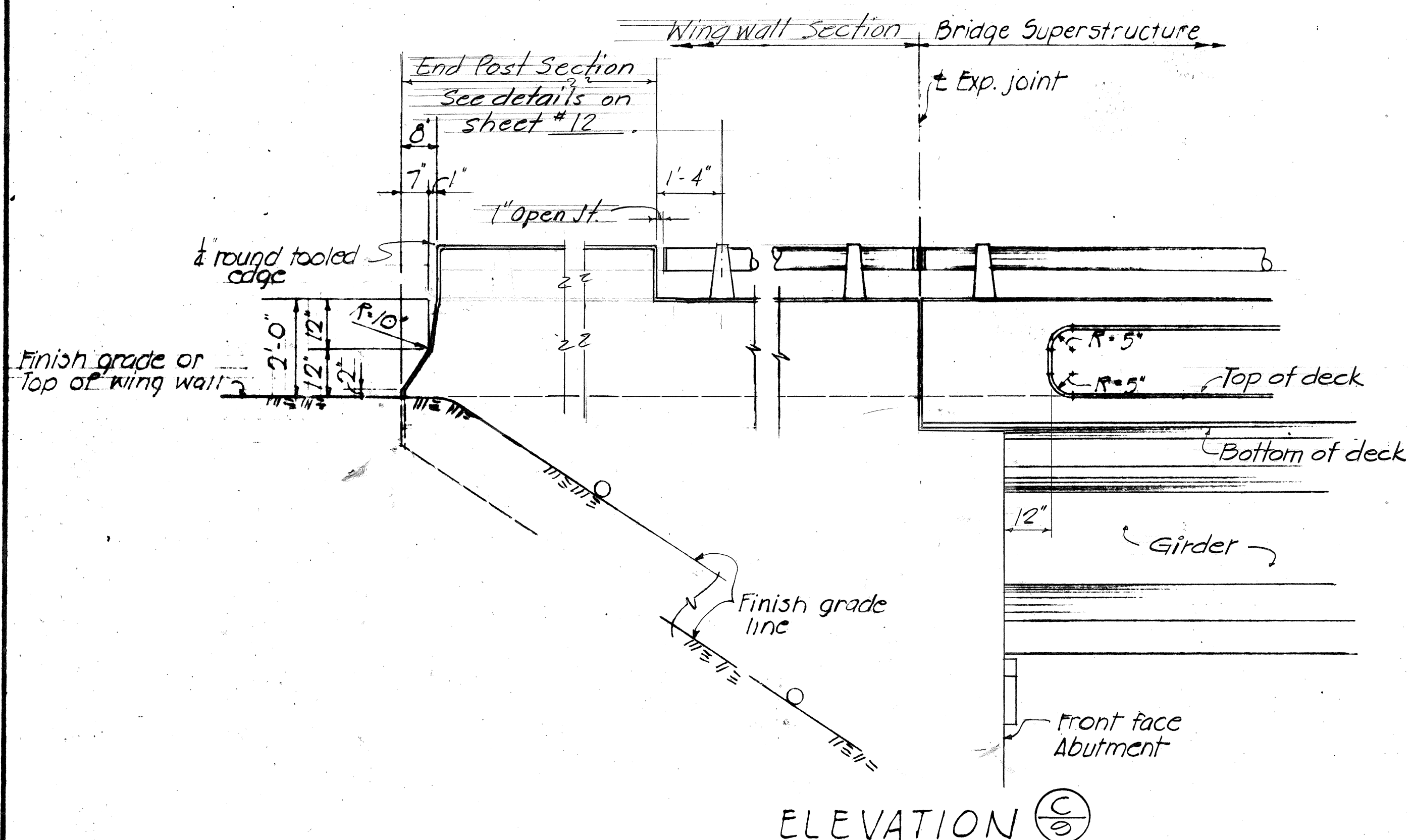
RAILING PLAN Scale: 3/8"=1'-0"



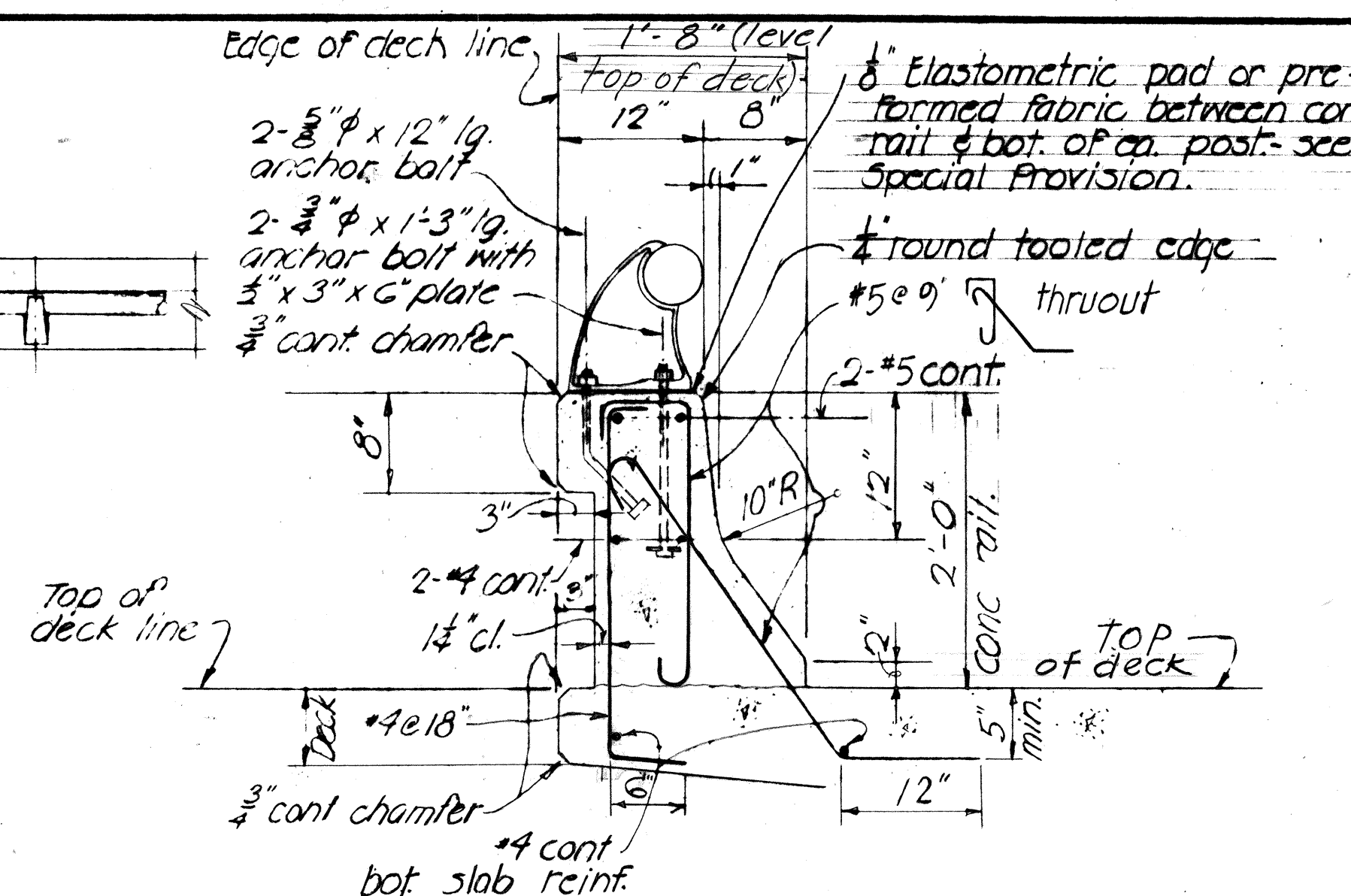
AT DECK EXPANSION JOINT

INTERMEDIATE

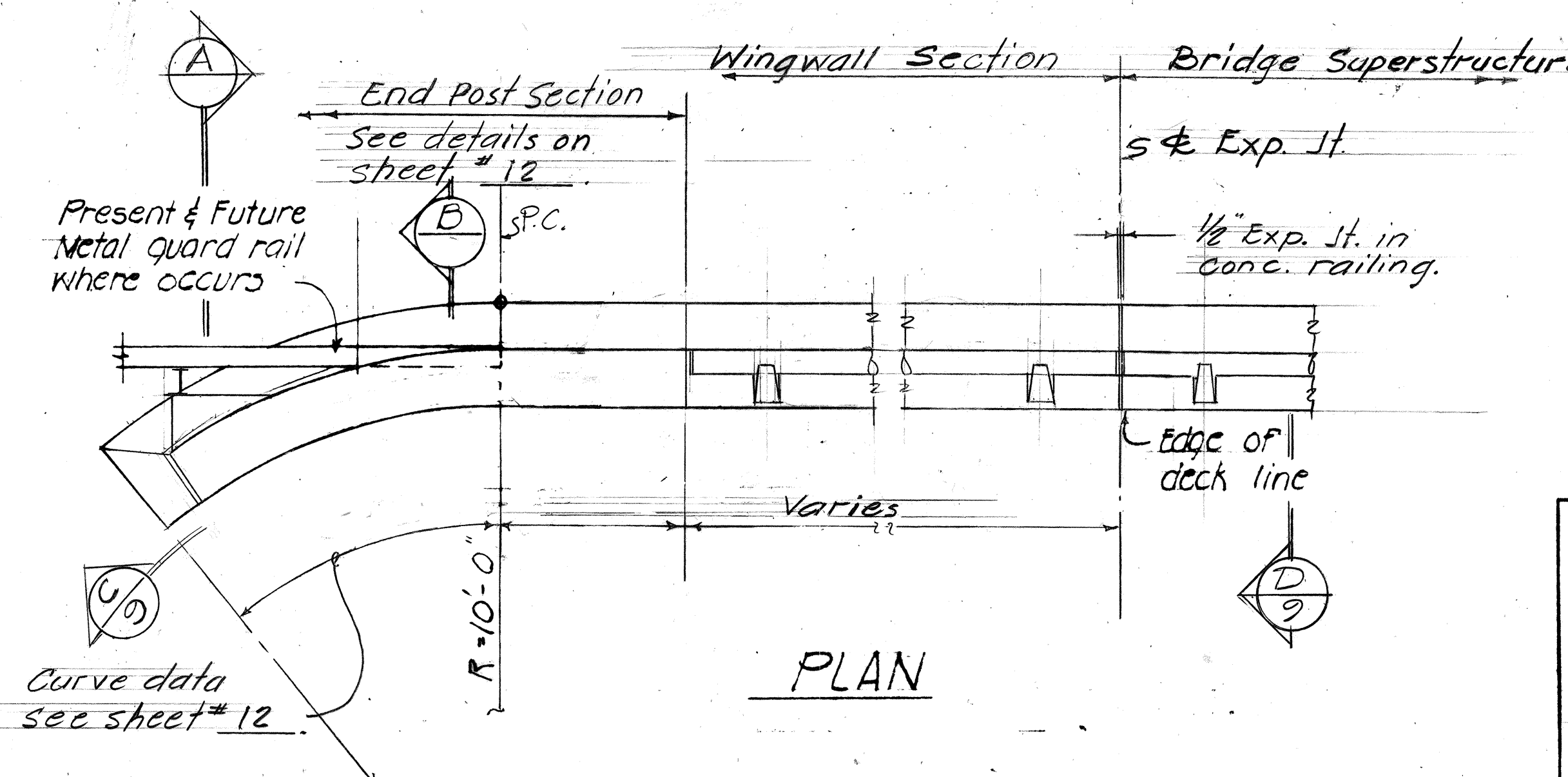
EXTERIOR RAILING ELEVATION Scale: 3/8"=1'-0"



ELEVATION (C)



SECTION (D) Scale: 1"=1'-0"



PLAN

TYPICAL CONCRETE RAILING DETAIL AT END OF BRIDGE Scale: 3/8"=1'-0"

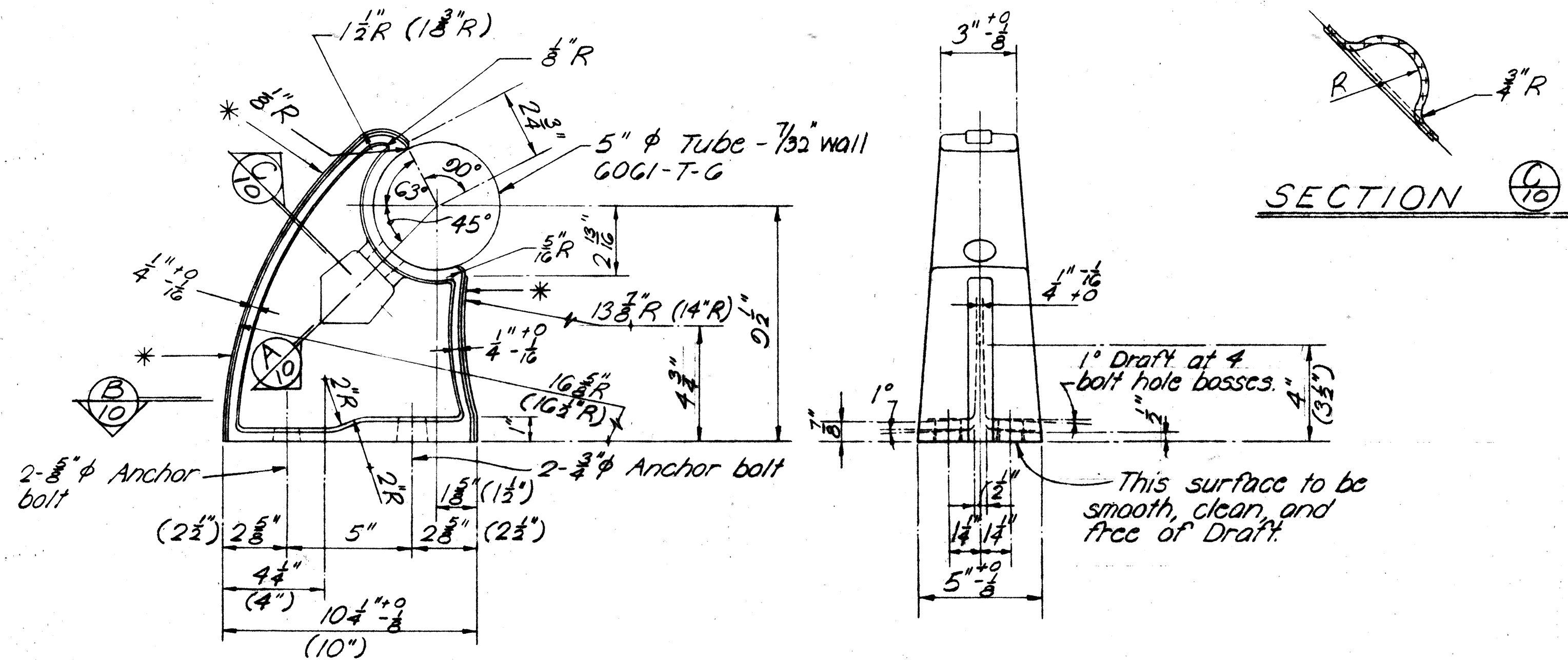
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

AHUIMANU STREAM BRIDGE
STA. 190+93.80 to STA. 191+80.71

BRIDGE RAILING
KAHEKILI HIGHWAY
PROJ. NO. BD 67-320

Scale: As noted Date: Mar. 1969
SHEET No. 9 OF 13 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BD 67-320	1969	78	109



SIDE ELEVATION

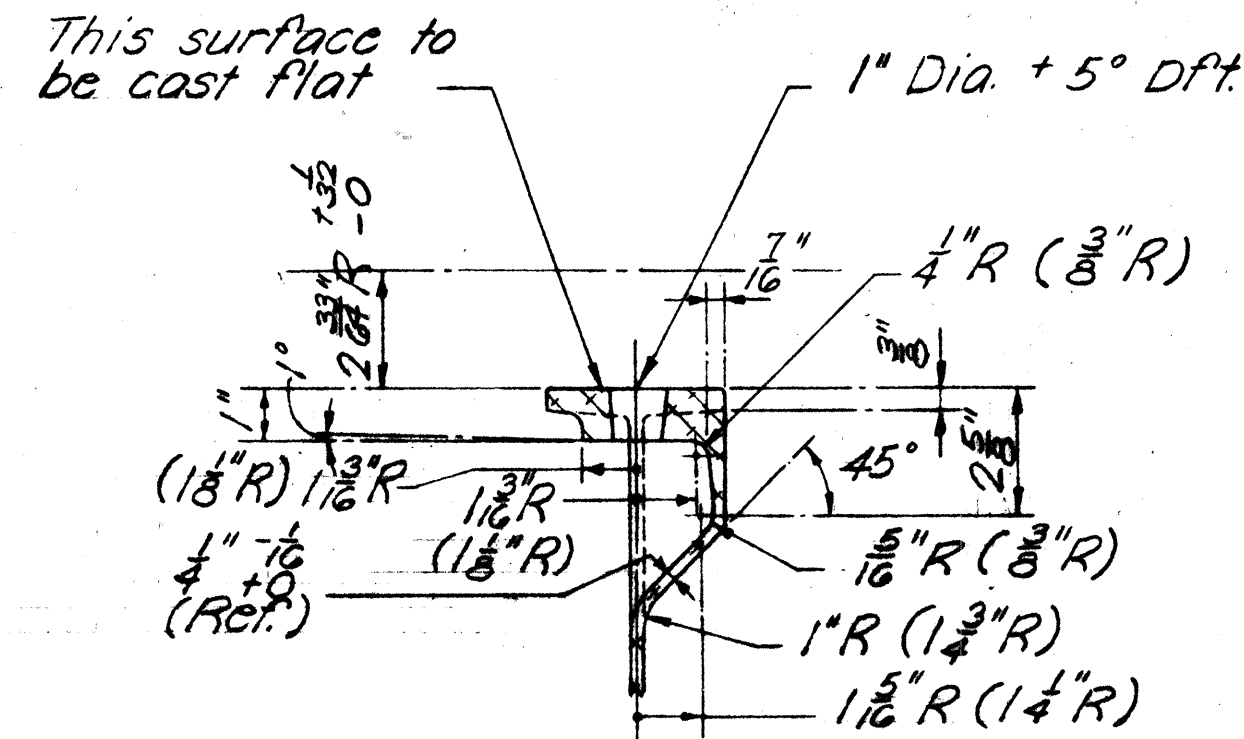
END ELEVATION

NOTE:

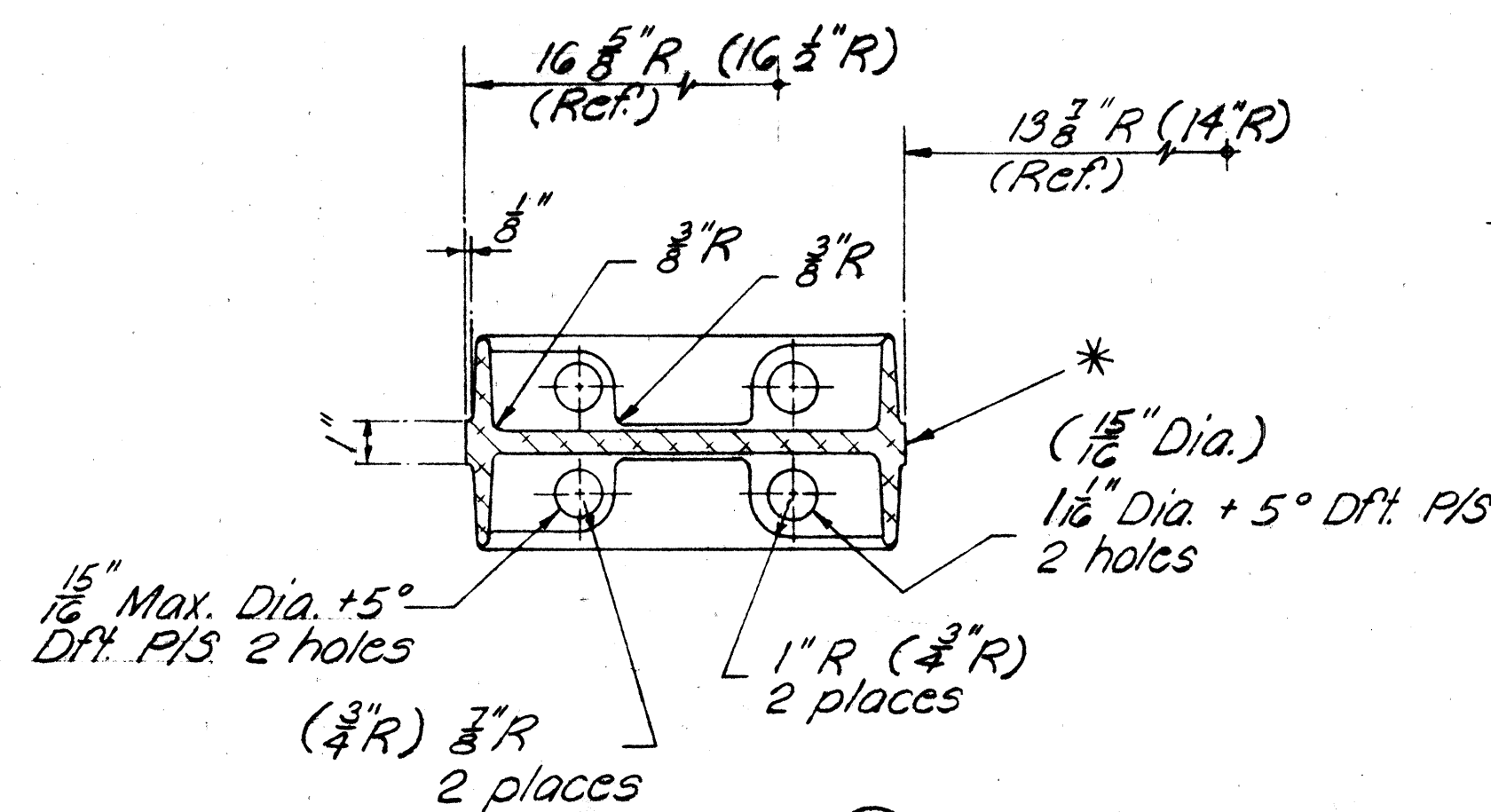
* Casting to be supplied with a standard scratch brush finish on entire gating rib surface and as indicated by an asterisk (*). Finish shall be approved by the Engineer.
Casting to be neatly trimmed and any protruding flash to be broken off.
For cast post specifications, see Special Provisions.
Unless otherwise specified, draft angles to be 3°, corner radii to be 3/32\" R, fillet radii to be 3/32\" R, casting tol. to be ± 1/16\", wall thickness to be ± 1/32\".
Dimensions may be as shown or as shown in parenthesis ().

TYPICAL RAIL POST DETAILS

Scale: 3\" = 1'-0\"



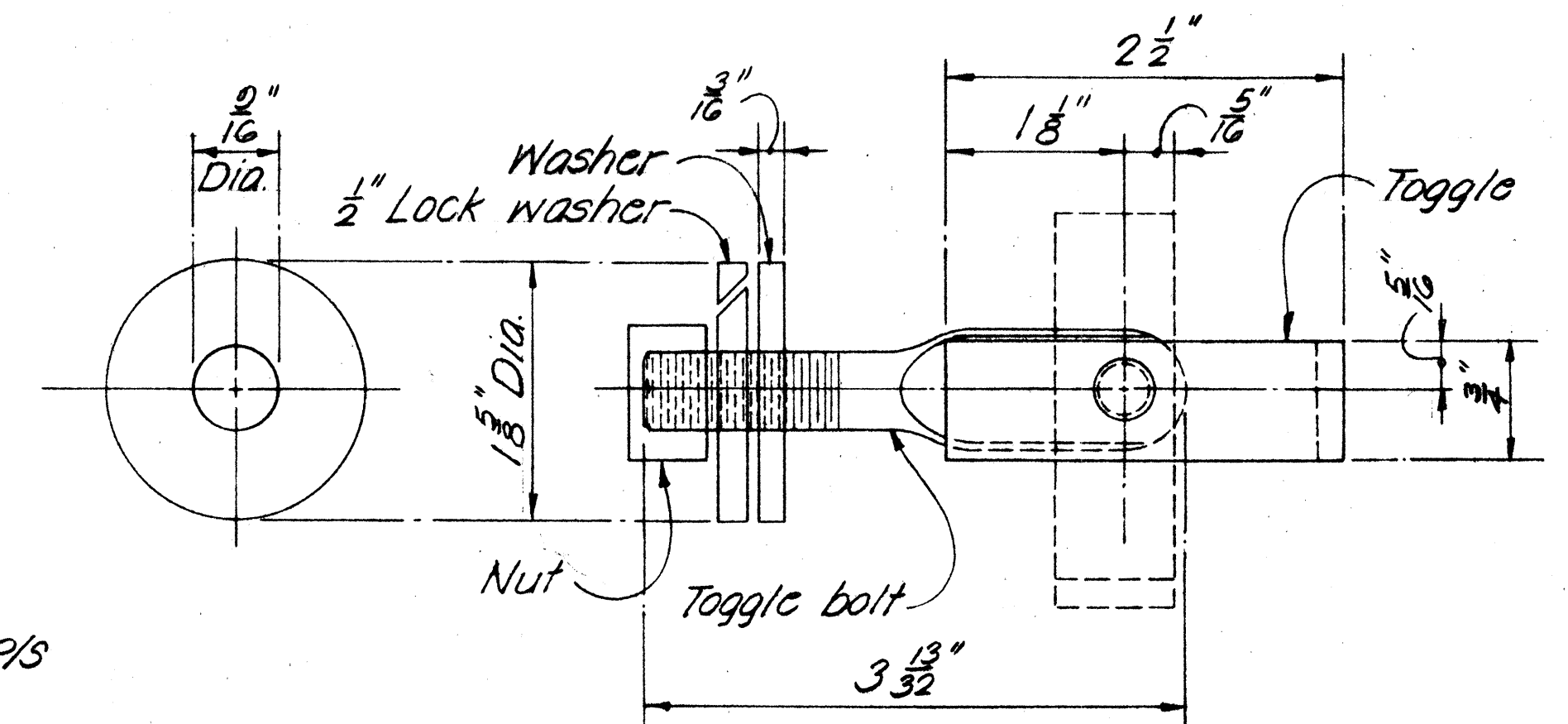
SECTION A-A



SECTION B-B

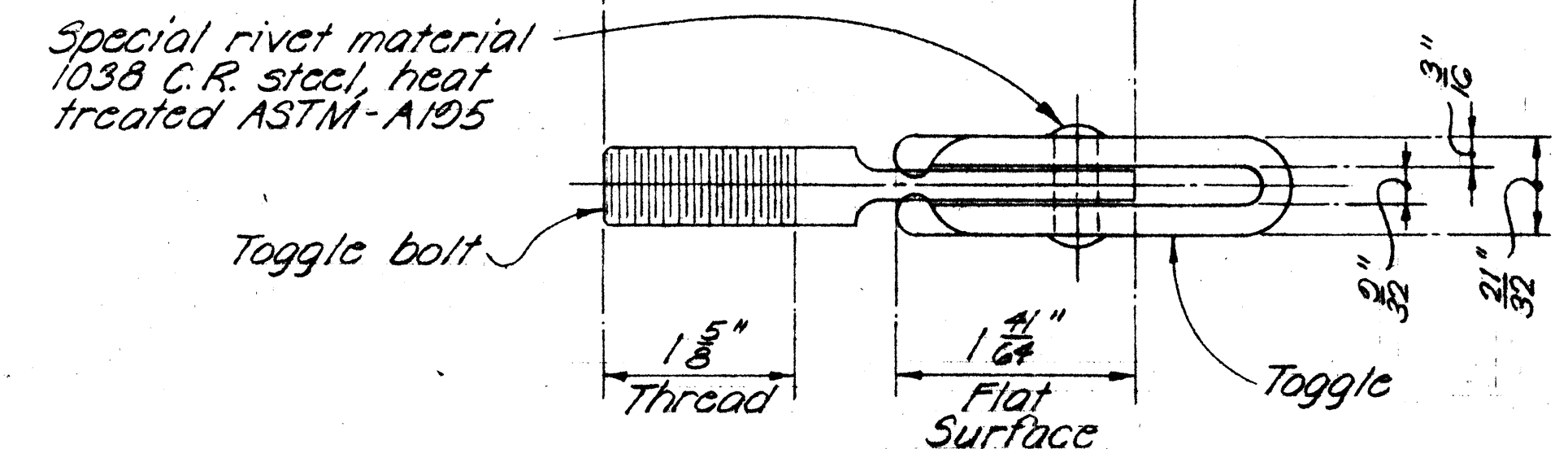
NOTE:

Toggle Bolt Material - 1/2\" - 13 N.C. 1335 C.R. - Steel heat treated R.C. 32-38, ASTM-A354
Toggle Material - 1015 H.R. steel pickled and oiled. Round edges ASTM-A303.
Washer Material - SAE 1020 H.R. steel plates. ASTM-A-7. Break sharp edges.
Nut - 1/2\" - 13 American hex. nut - Heavy Material 1035 C.R. - Steel heat treated ASTM A325 Grade 2H.
Cadmium plating on steel - Type N.S. .0005\" thick ASTM-A165. (all parts).
For cast post specifications, see Special Provisions.



WASHER

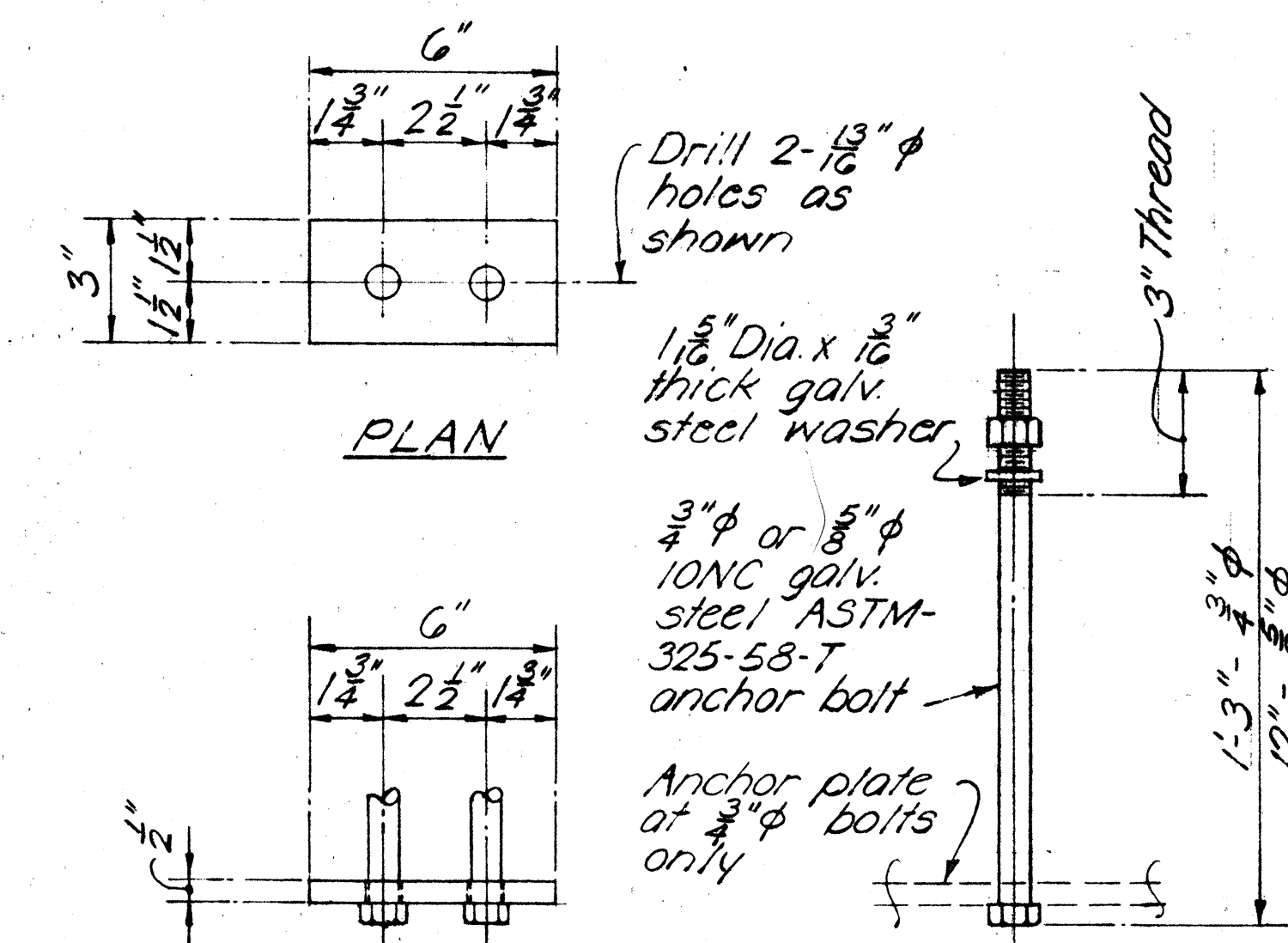
SIDE ELEVATION ASSEMBLY



TOP PLAN

1/2\" TOGGLE BOLT DETAILS

Full Scale

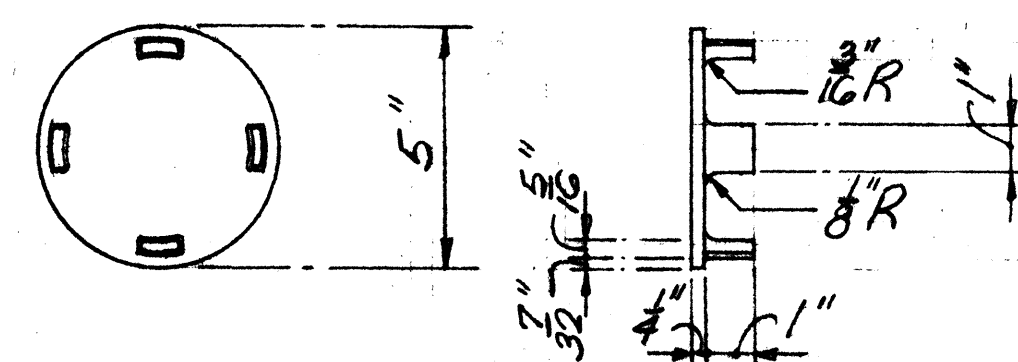


ELEVATION

ANCHOR BOLT DETAIL ANCHOR BOLT

TYPICAL RAIL POST ANCHOR BOLT ASSEMBLY

Scale: 3\" = 1'-0\"



All draft angles = 3°

RAIL CAP DETAIL

Scale: 3\" = 1'-0\"

GENERAL NOTES

Metal bridge railing shown is for Aluminum bridge railing. See Special Provisions for alternate railing in steel.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

AHIUMANU STREAM BRIDGE
STA. 190+93.80 to STA. 191+80.71

METAL BRIDGE RAILINGS

KAHEKILI HIGHWAY

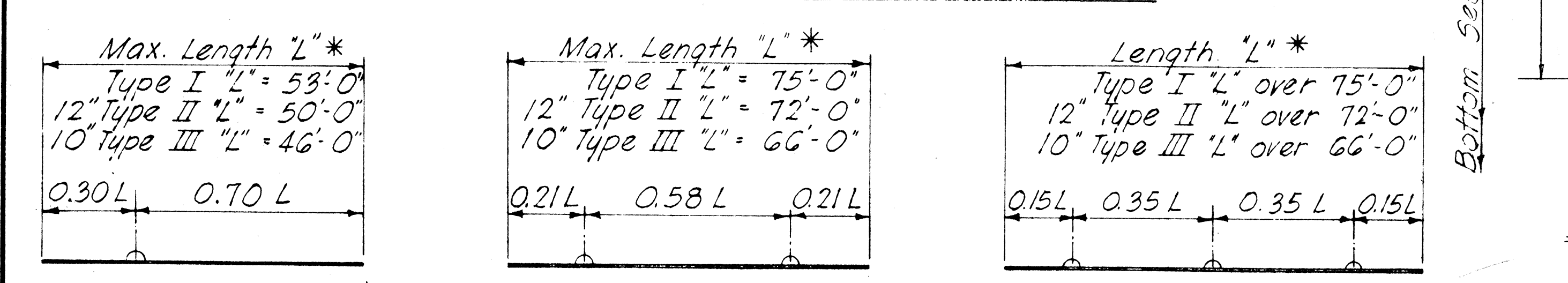
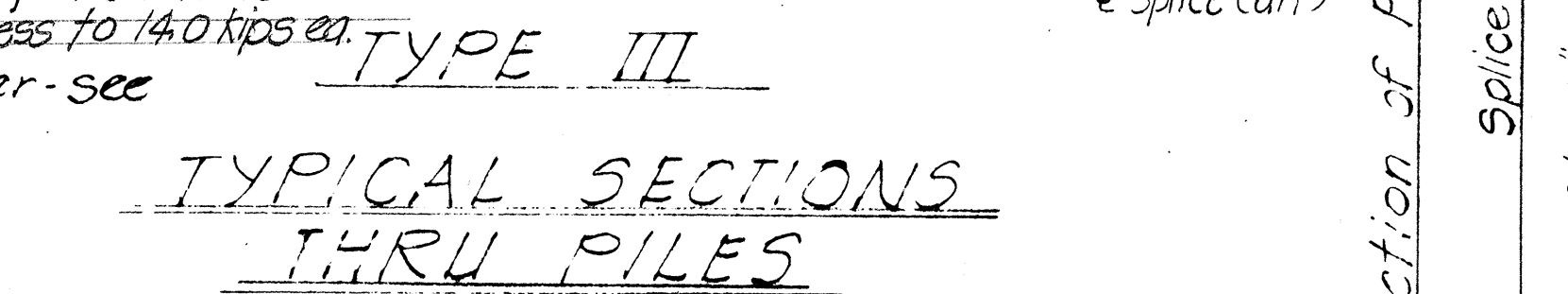
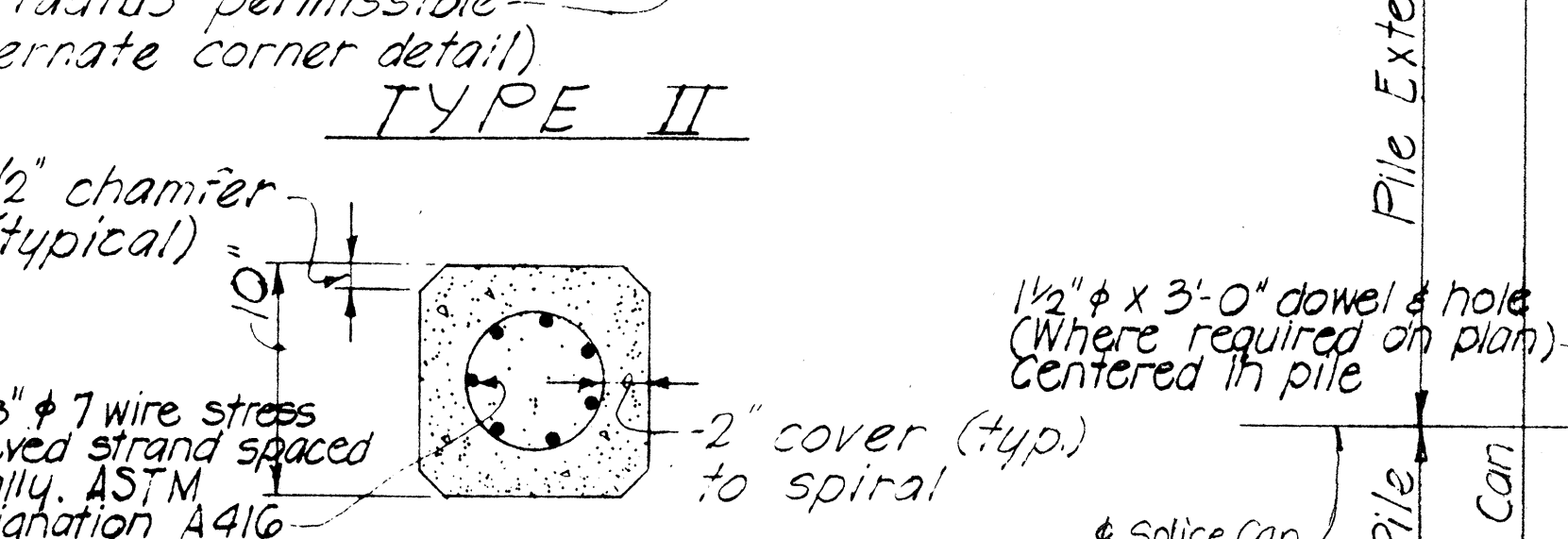
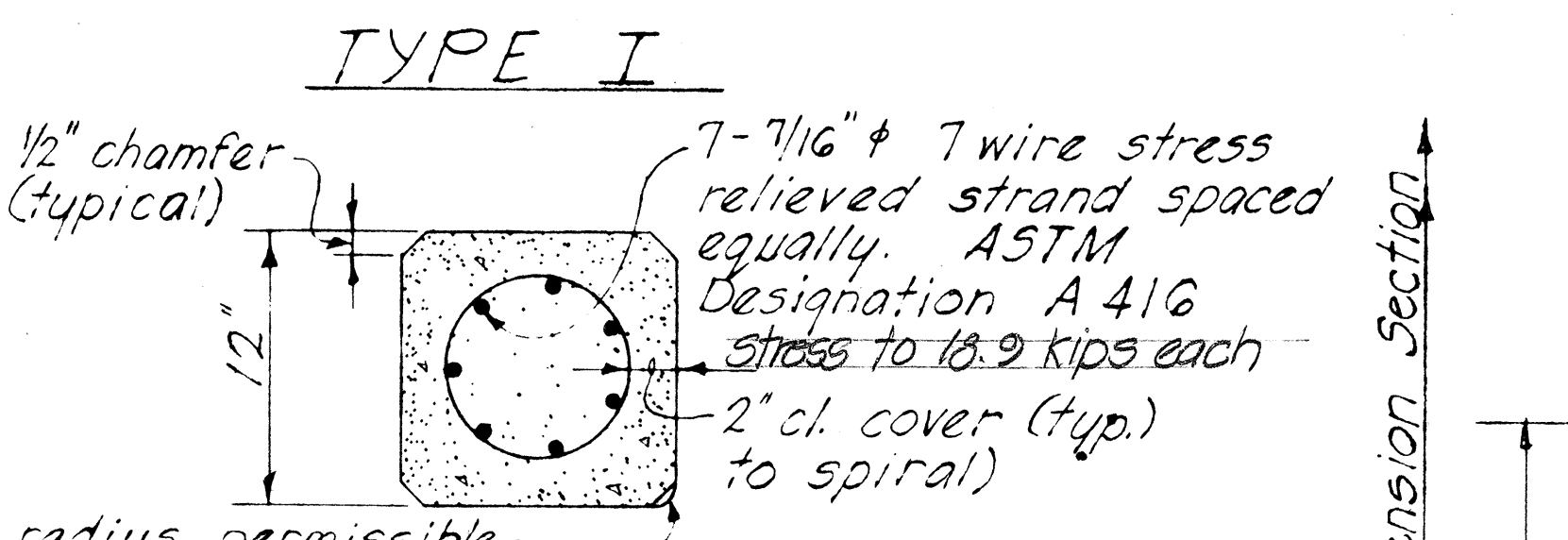
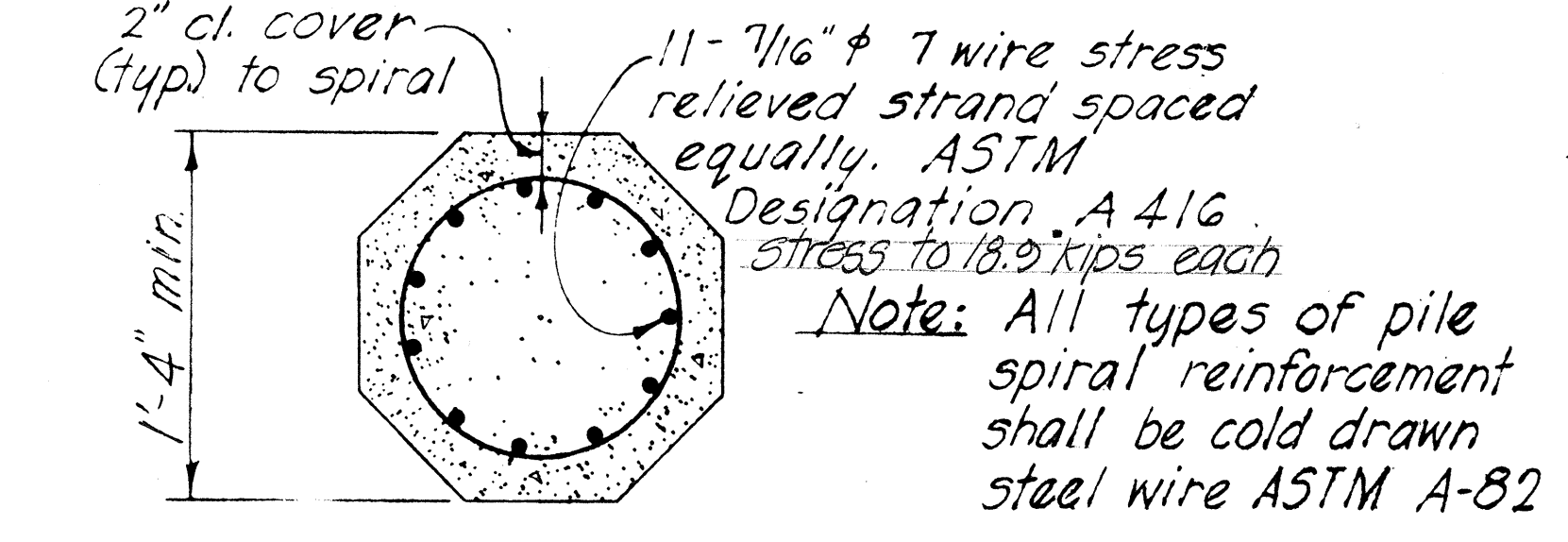
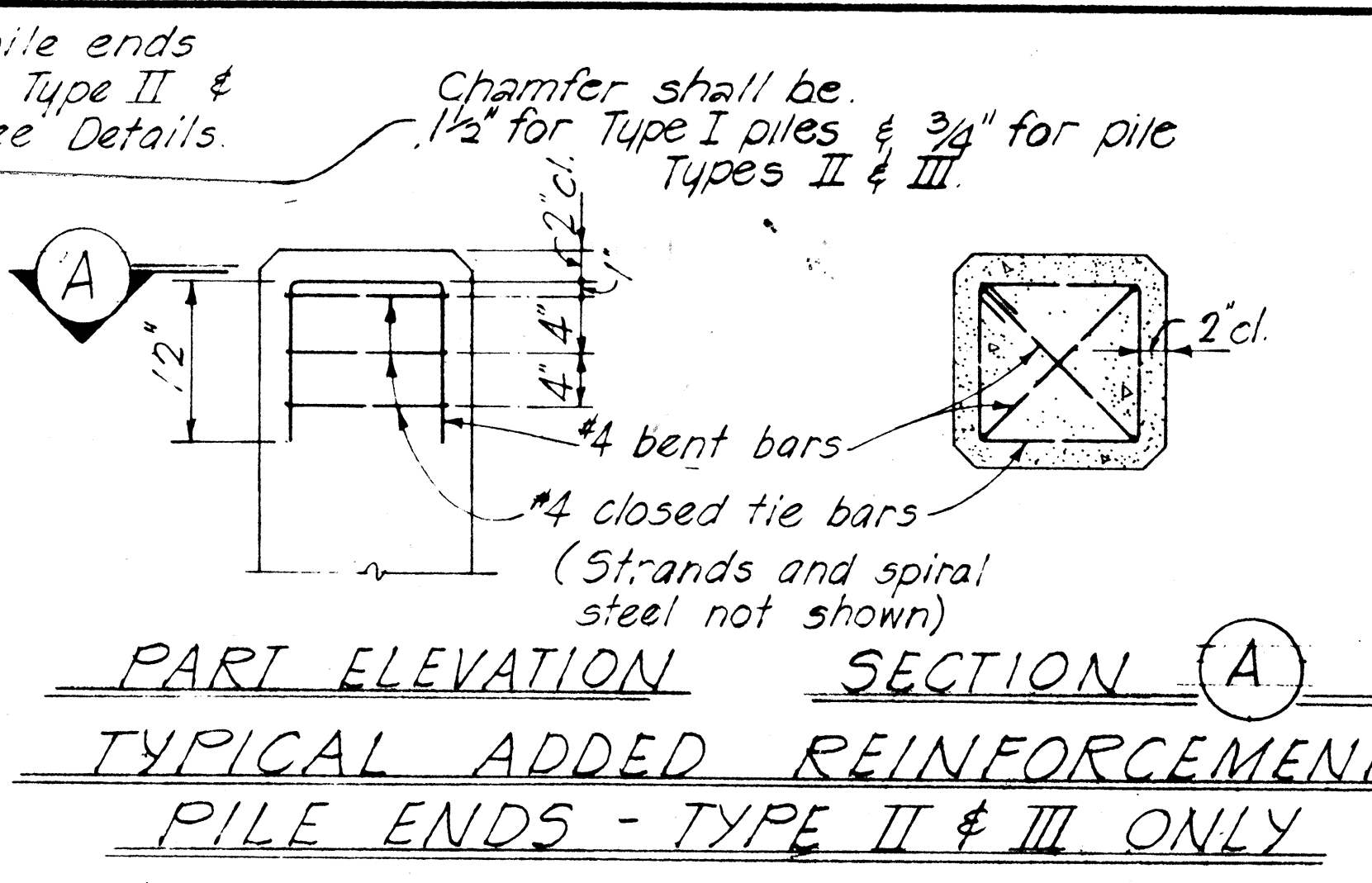
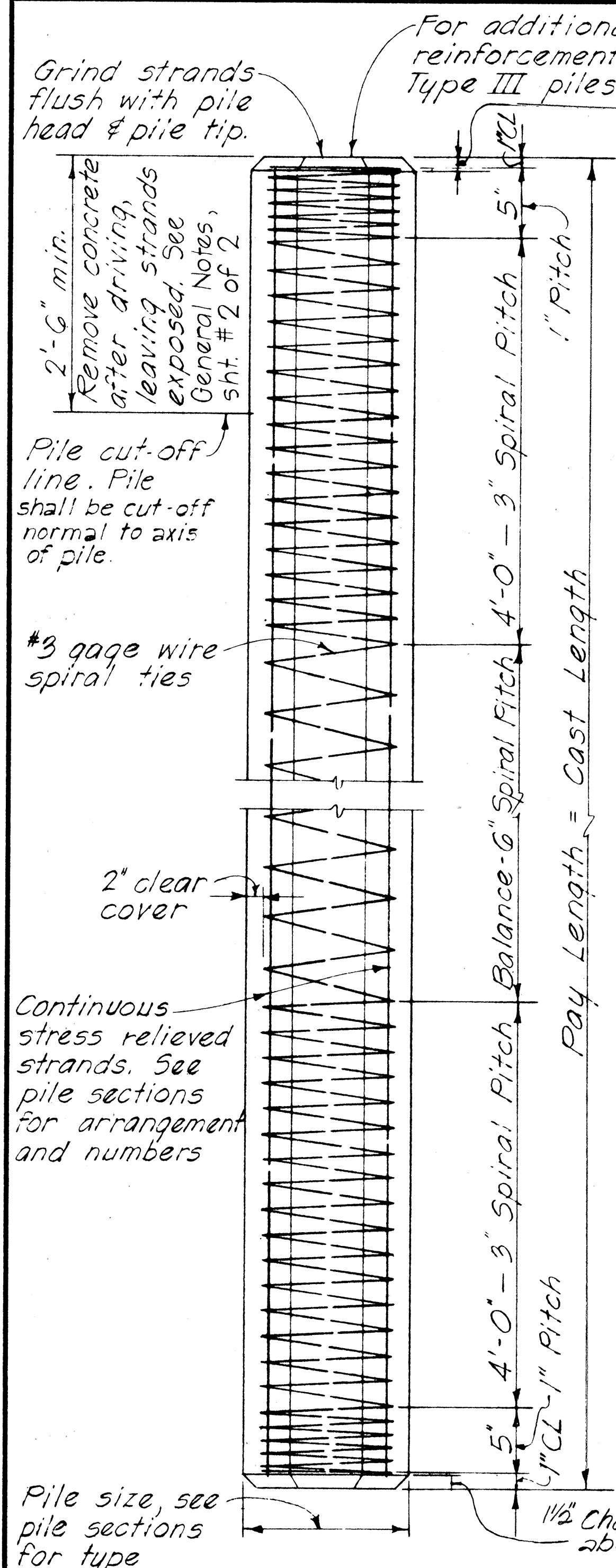
PROJ. NO. BD 67-320

Scale as noted

Date: Mar. 1969

SHEET No. 10 OF 13 SHEETS

78



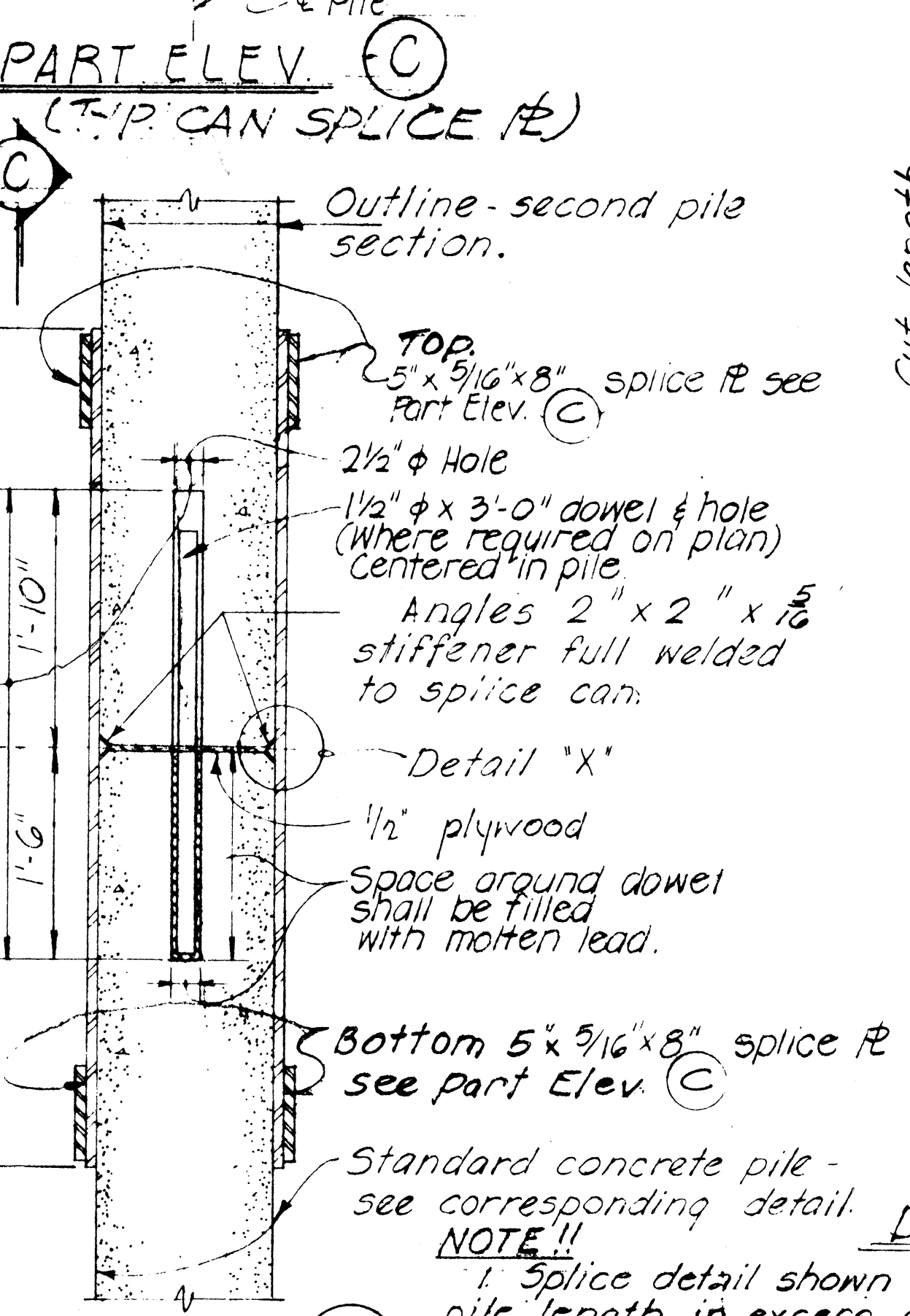
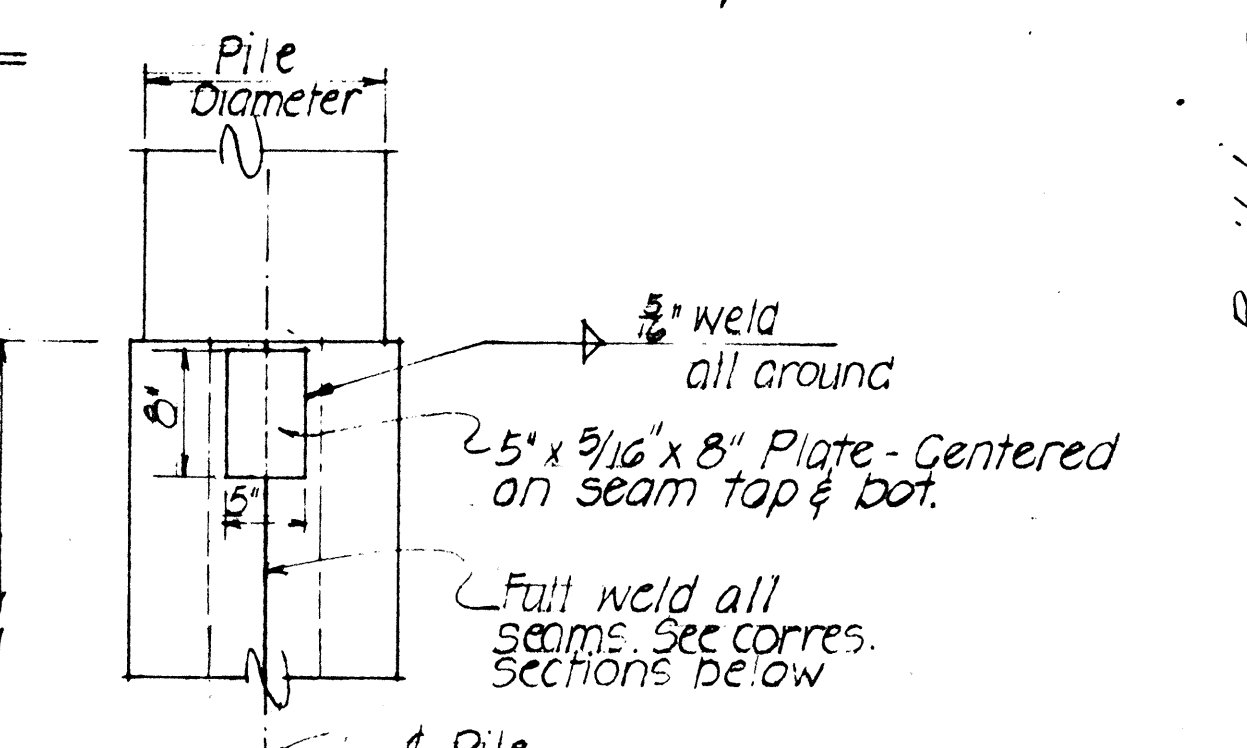
* The length "L" is the distance end to end of pile.

1 POINT PICK-UP 2 POINT PICK-UP 3 POINT PICK-UP

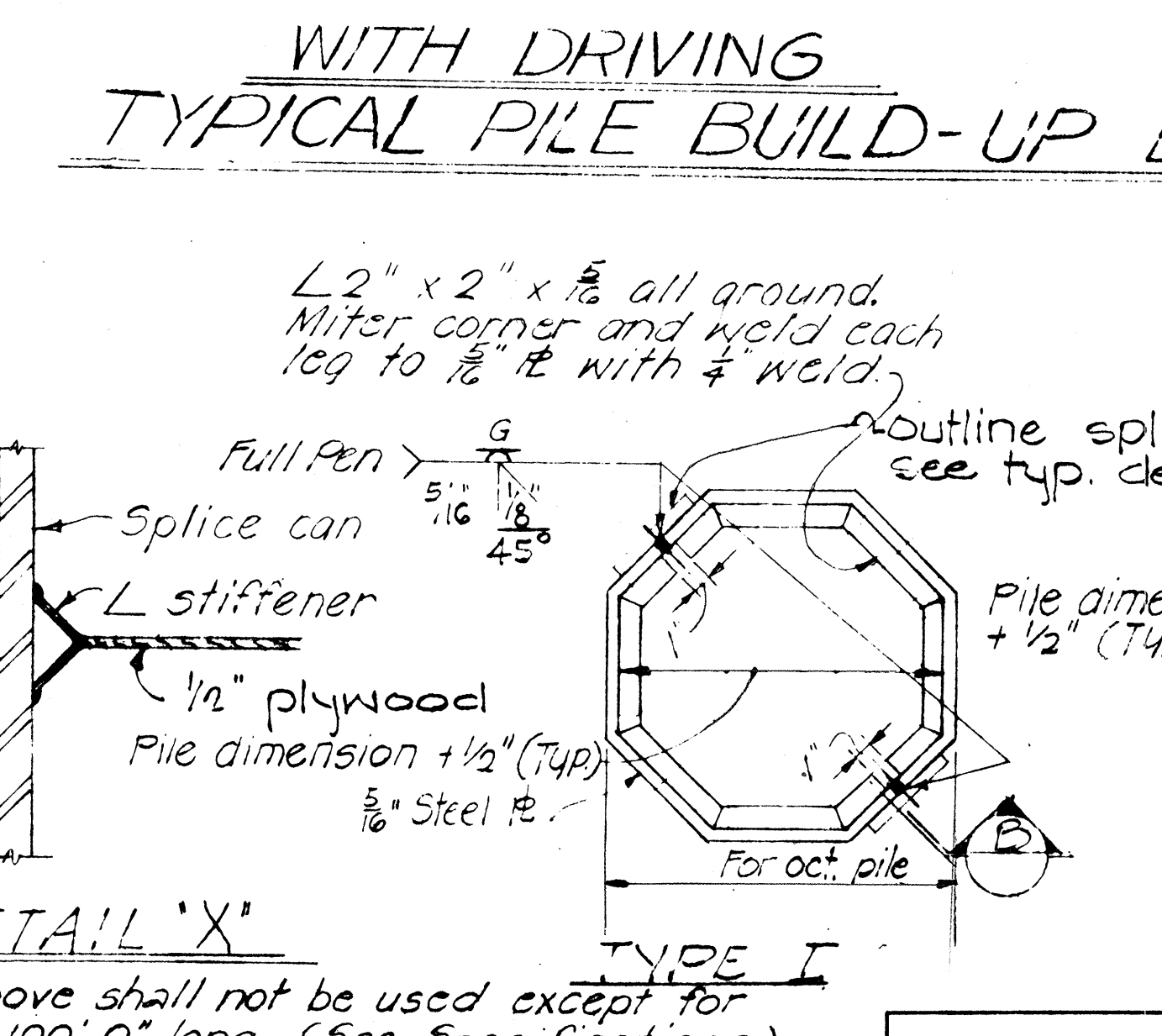
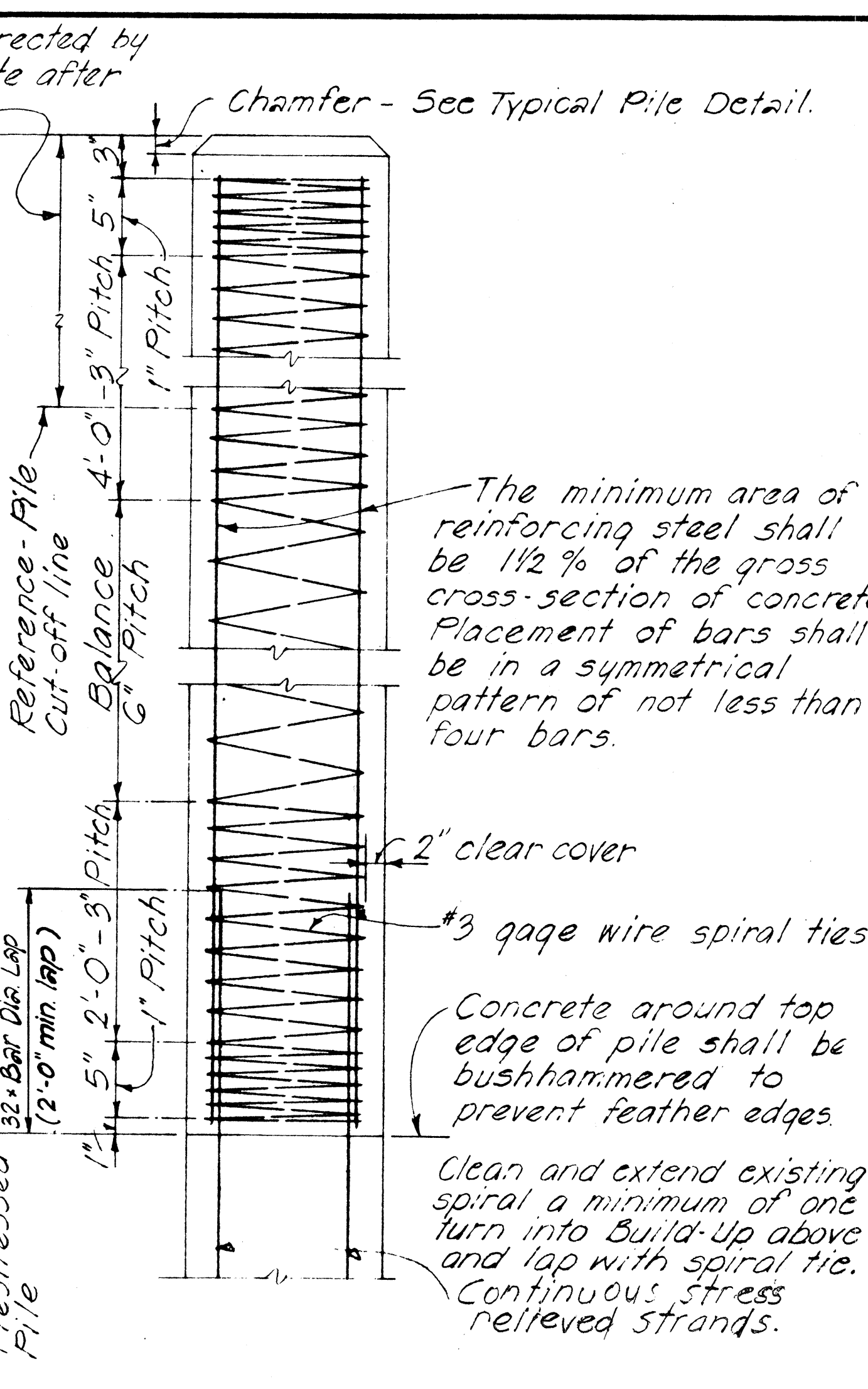
NOTE: Unless special lifting devices are attached for pick-up points, pick-up points shall be plainly marked on all piles after removal of the forms and all lifting shall be done at these points. The use of special embedded or attached lifting devices, the employment of other pick-up points or any other method of pick-up shall be subject to approval by the Engineer.

2'-6" min. unless otherwise directed by the Engineer. Remove concrete after driving, leaving reinf. exposed.

NOTE: Concrete in pile build-ups without driving shall be Class A Concrete. Concrete in pile build-ups with driving shall have a minimum compressive cylinder strength f'_c of 5000 p.s.i. at 28 days. Build-ups may be driven if the specimen of concrete from which the piles were poured develops a strength of at least 3500 p.s.i. but not earlier than 7 days.



NOTE: All welding shall conform to the latest Specifications for Welded Highway & Railway Bridge of the American Welding Society.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
PRESTRESSED CONCRETE PILES

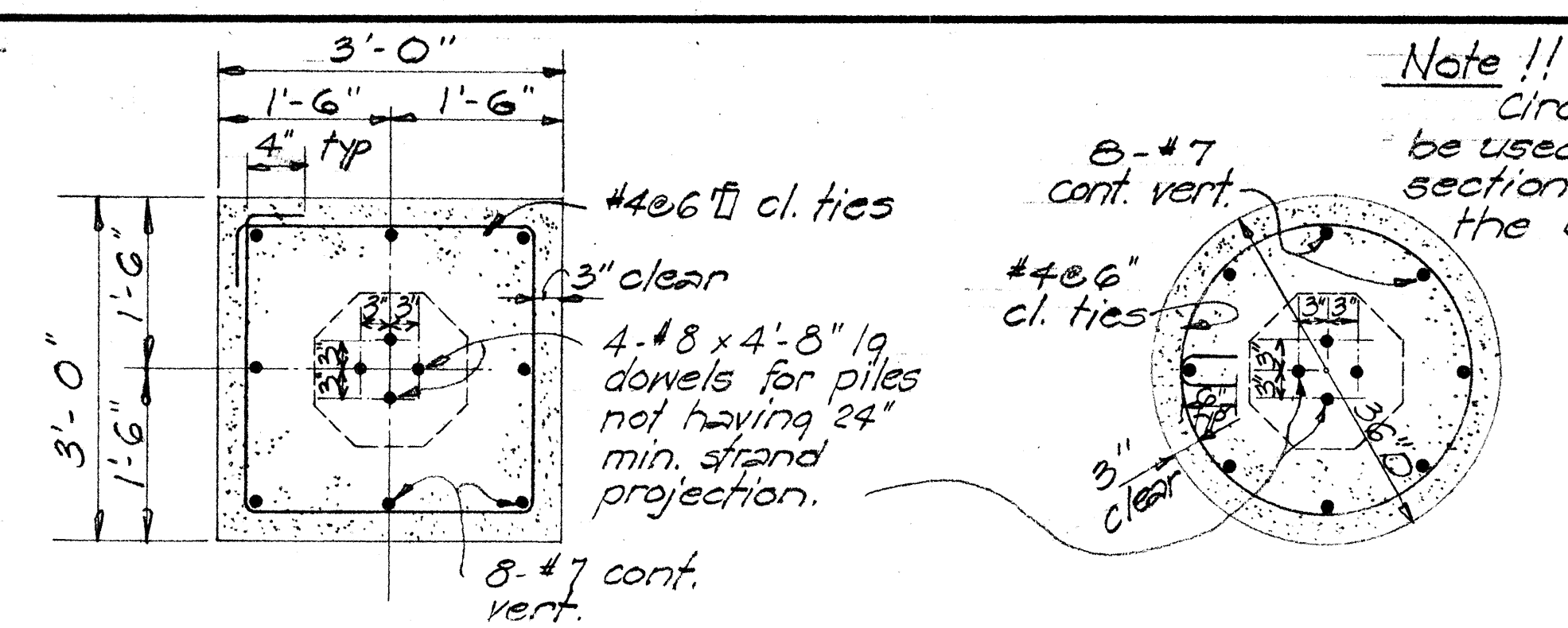
SHEET No. 11 OF 13 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BD 67-320	1969	80	109

Revision : Apr. 69

General Notes

Work of cutting off prestressed concrete piles or concrete build-ups shall be performed in such a manner as to avoid spalling or damaging the pile below cut-off. In case of such damage the pile shall be replaced or repaired by the Contractor at his expense.

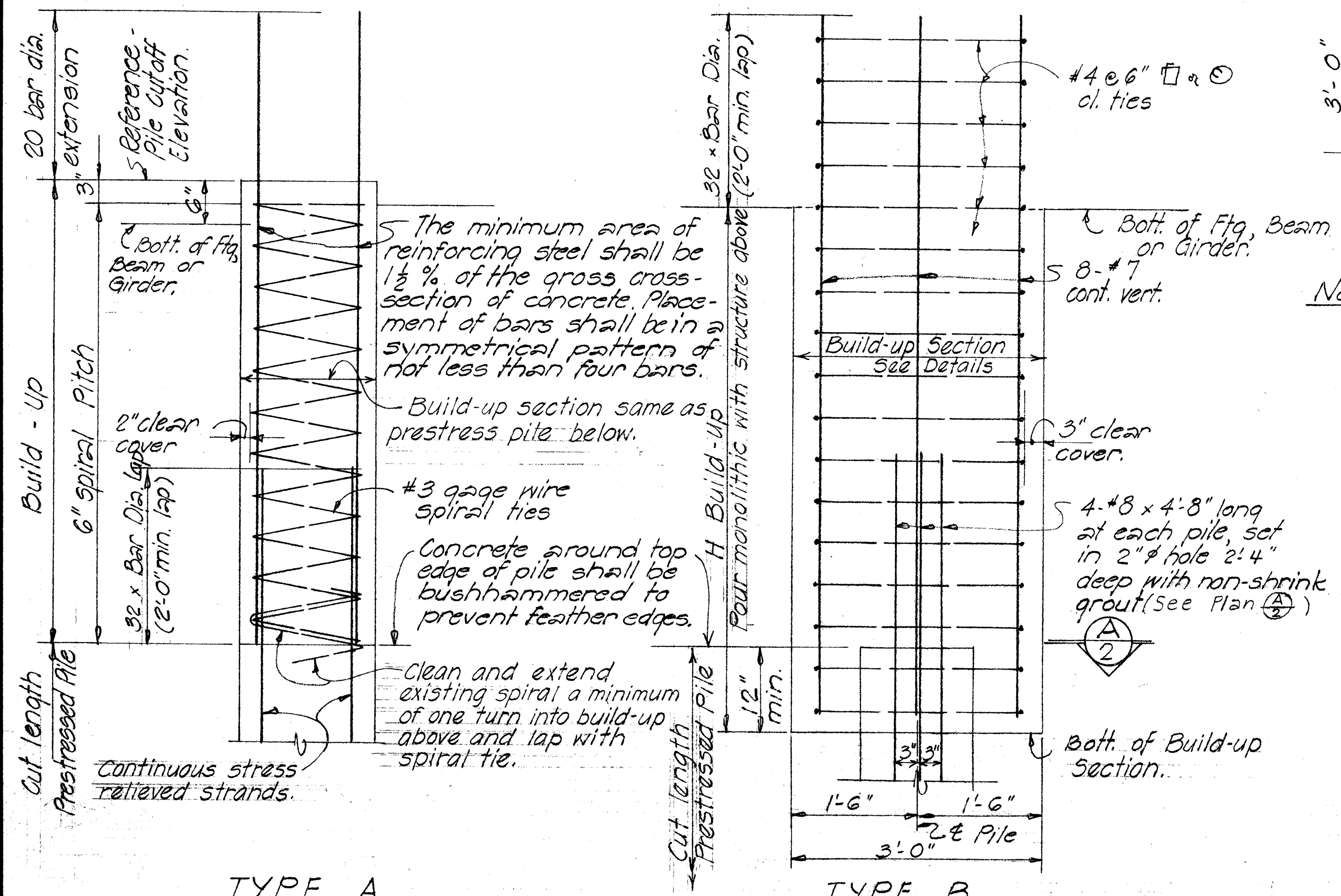


SQUARE BUILD-UP

CIRCULAR BUILD-UP

SECTION A-2

- Notes:**
1. Portion of pile embedded into footing shall be of sound concrete. Damaged portions shall be removed and pile cut-off elev. lowered as required by the Engineer.
 2. When height of depressed portion of footing (H) exceeds 4', the depressed section shall be poured separately from the main body of the footing.
 3. Depressed portion of footing may be omitted for pile heads embedded at least 4" into footing provided at least 90% of the piles in each footing have the minimum embedment into footing as shown in contract plans.



TYPE A

TYPE B

WITHOUT DRIVING - TYPICAL PILE BUILD-UP DETAILS

NOTE: Selection of pile build-up type without driving to be determined by the Engineer.

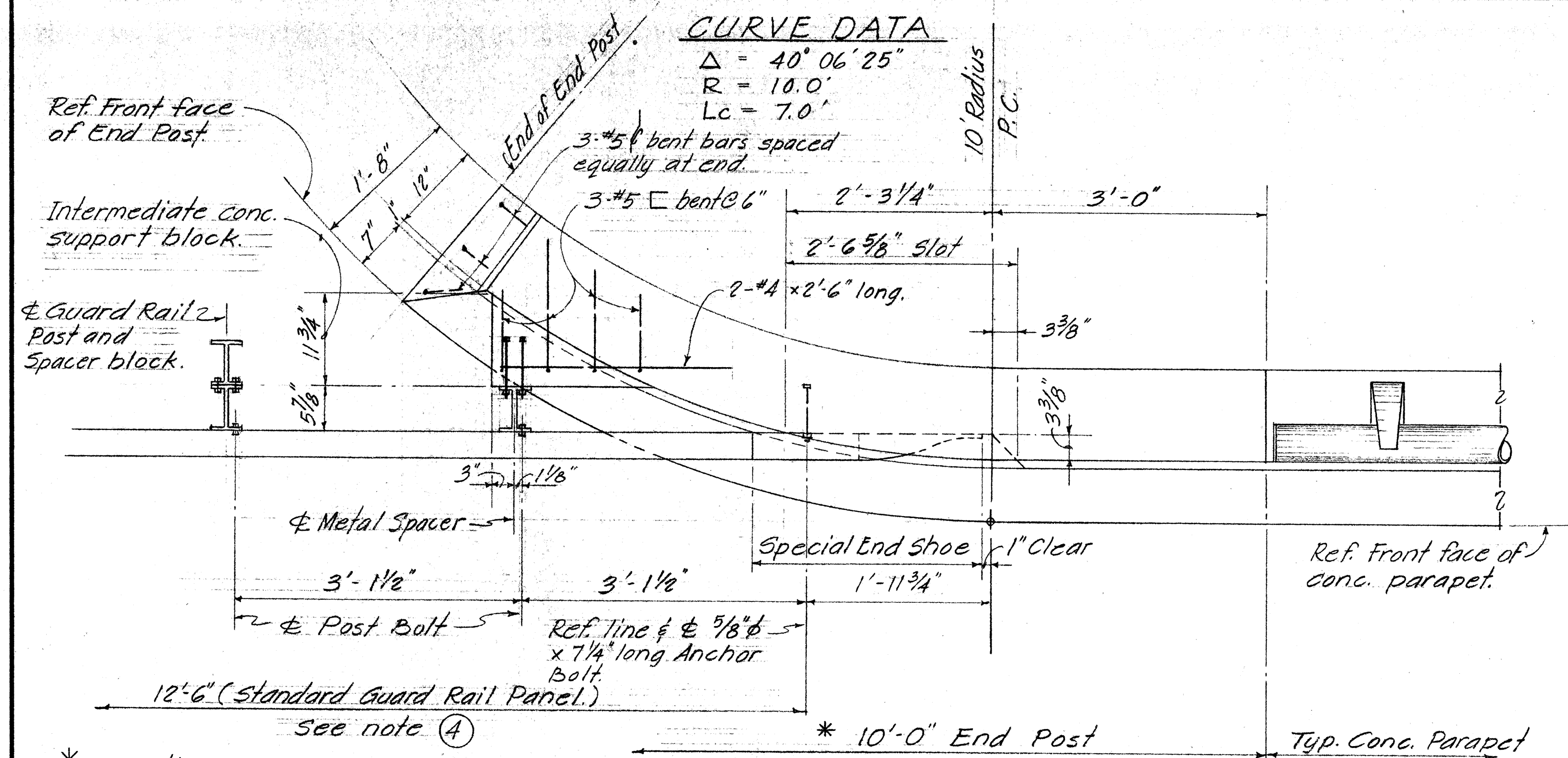
SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

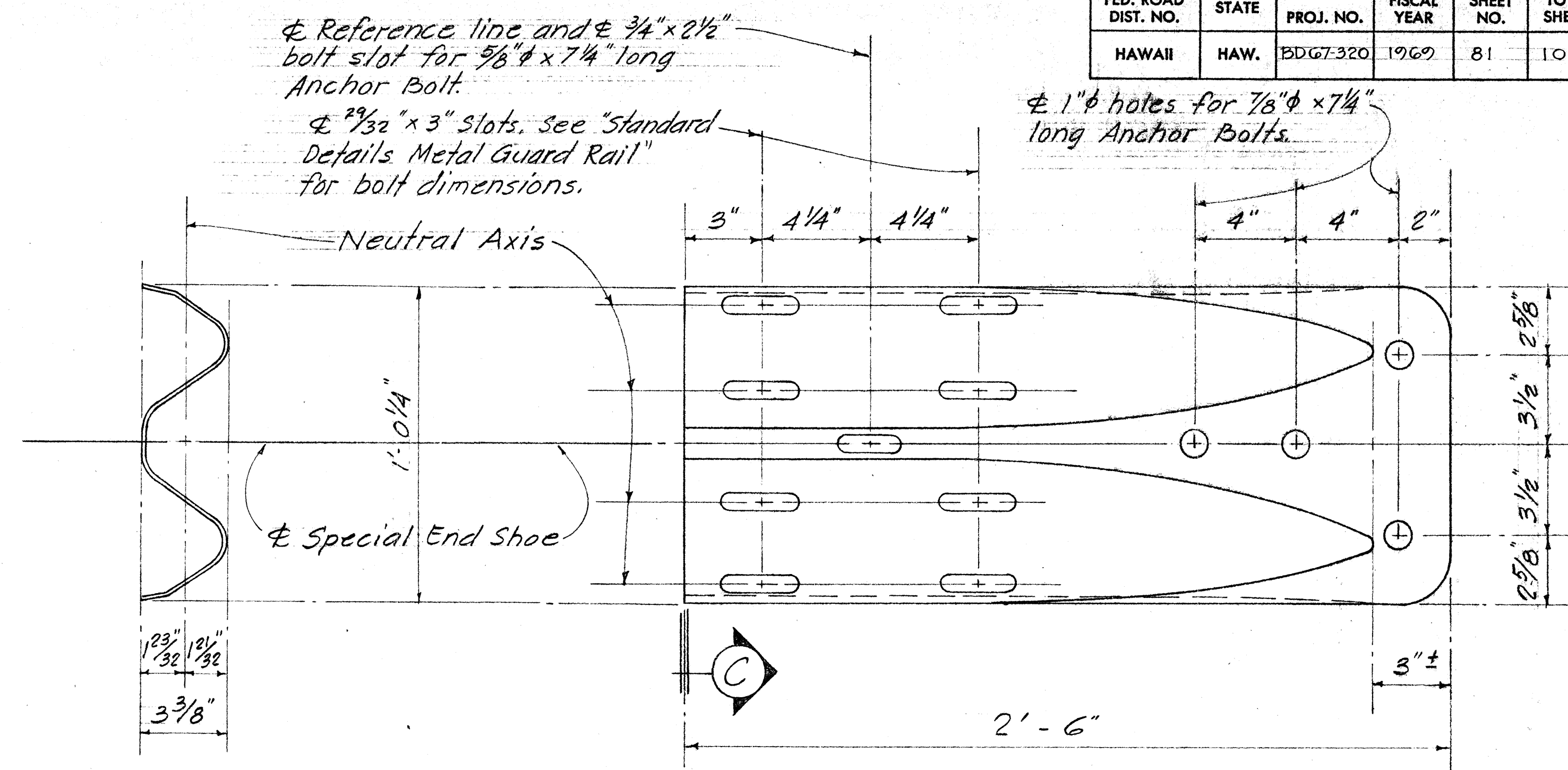
STANDARD DETAILS
PRESTRESSED CONCRETE PILES

Oct. 1968
SHEET No. 12 OF 13 SHEETS

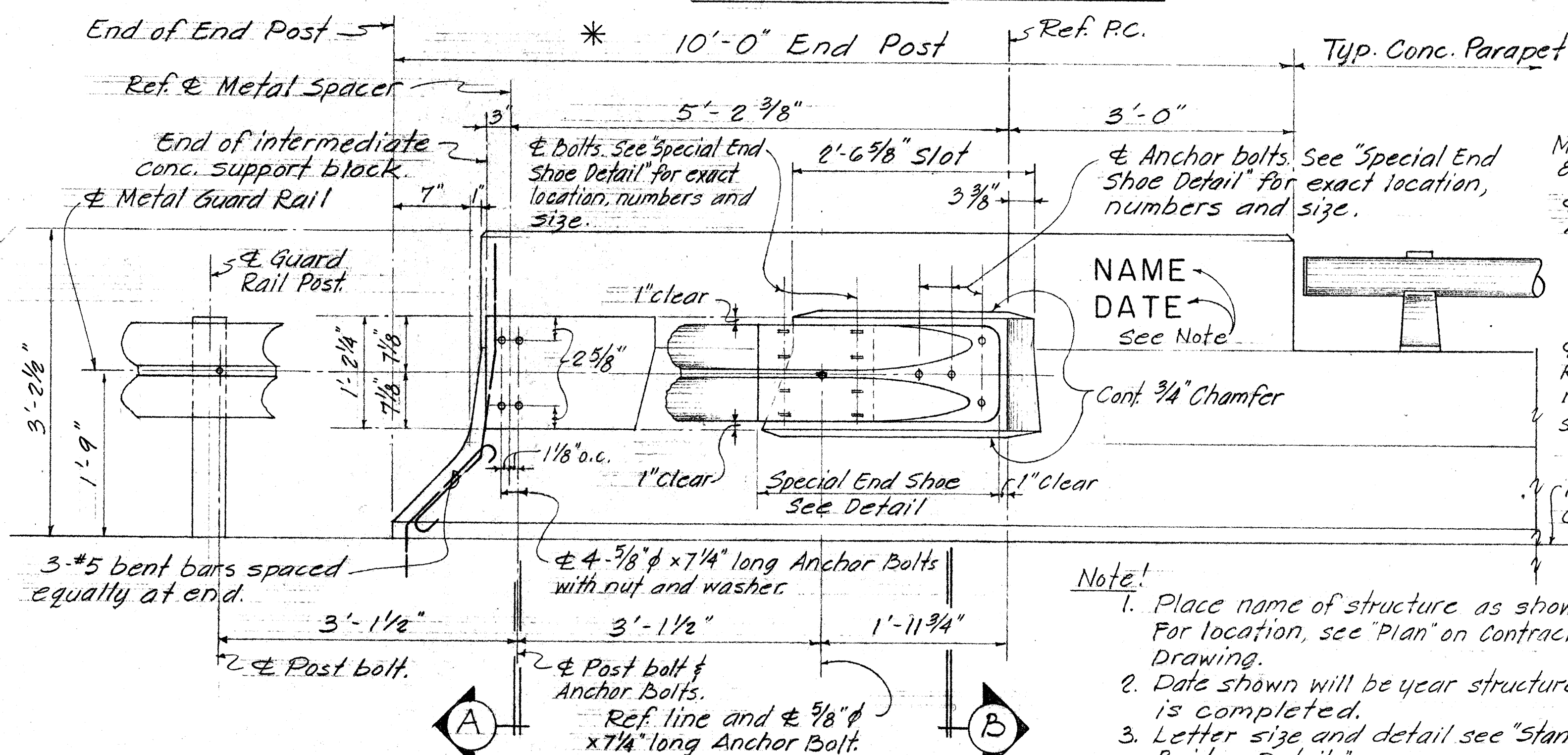
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BDG-320	1969	81	109



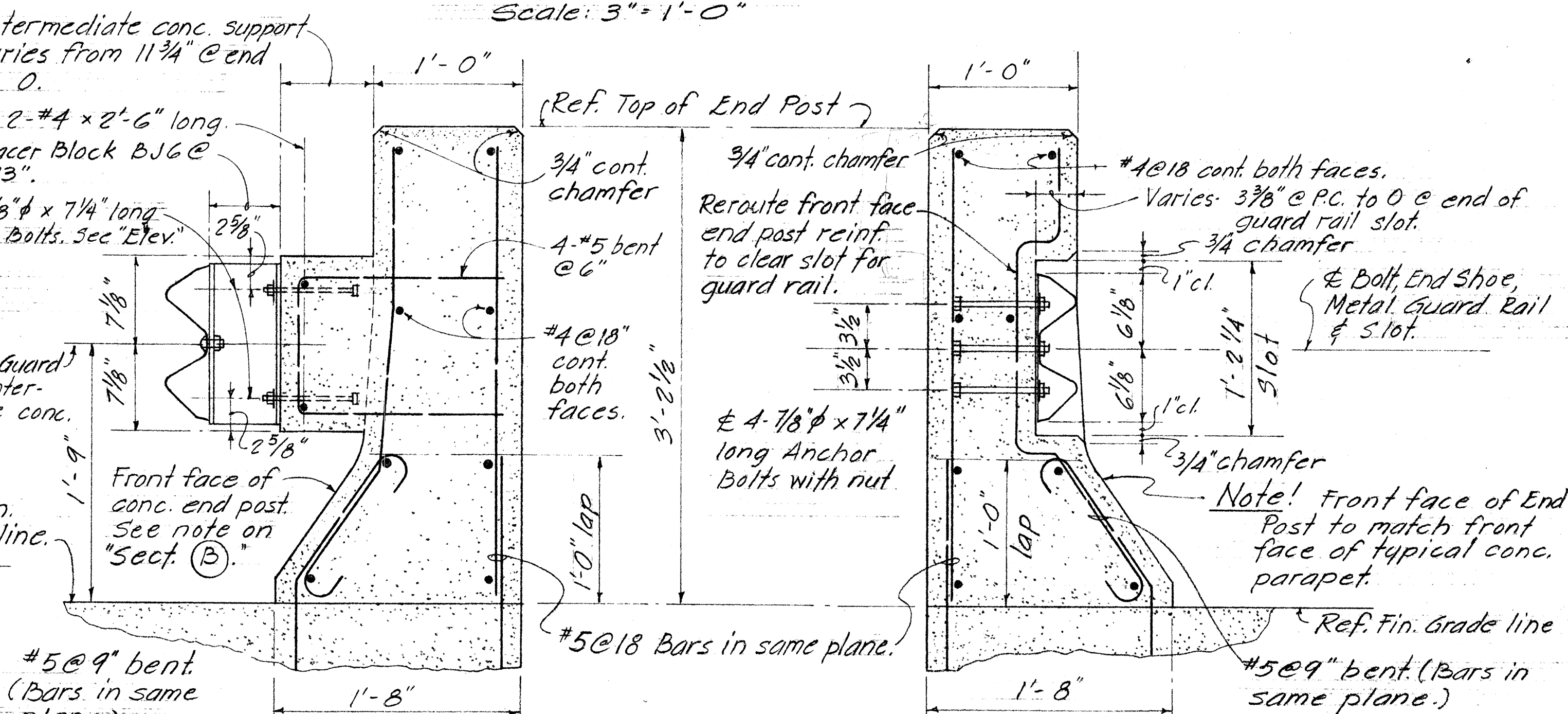
PLAN Scale: 1"=1'-0"



SECTION (C)
SPECIAL END SHOE DETAILS
 Scale: 3"=1'-0"



ELEVATION Scale: 1"=1'-0"



NOTES

- All Anchor Bolts shall be High Strength bolts conforming to the requirements of ASTM A-325.
- All Shoe assembly, including anchor bolts, nuts and washers, shall be galvanized.
- Special End Shoe shall be fabricated from 10 gage steel conforming to the requirements of AASHTO 180.
- First Guard Rail Panel adjoining "Special End Shoe" shall be of galvanized steel. See Special Provisions for requirements.
- Anchor Bolt length given from under bolt head.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

**STANDARD END POST
 CONNECTION TO METAL
 GUARD RAIL DETAILS**
 (SINGLE RAIL TYPE)

SCALE AS SHOWN DATE: MARCH, 1968

SHEET No. 13 OF 13 SHEETS