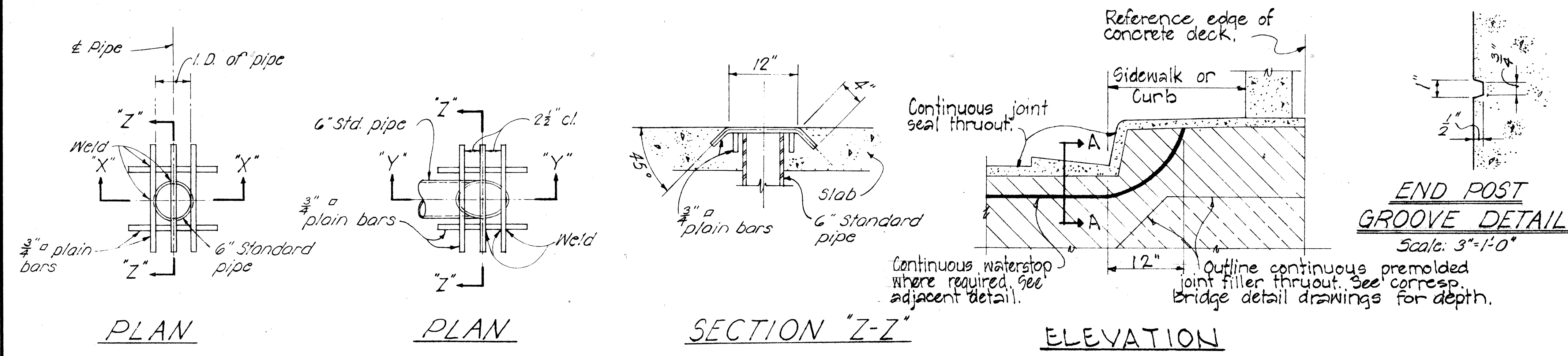
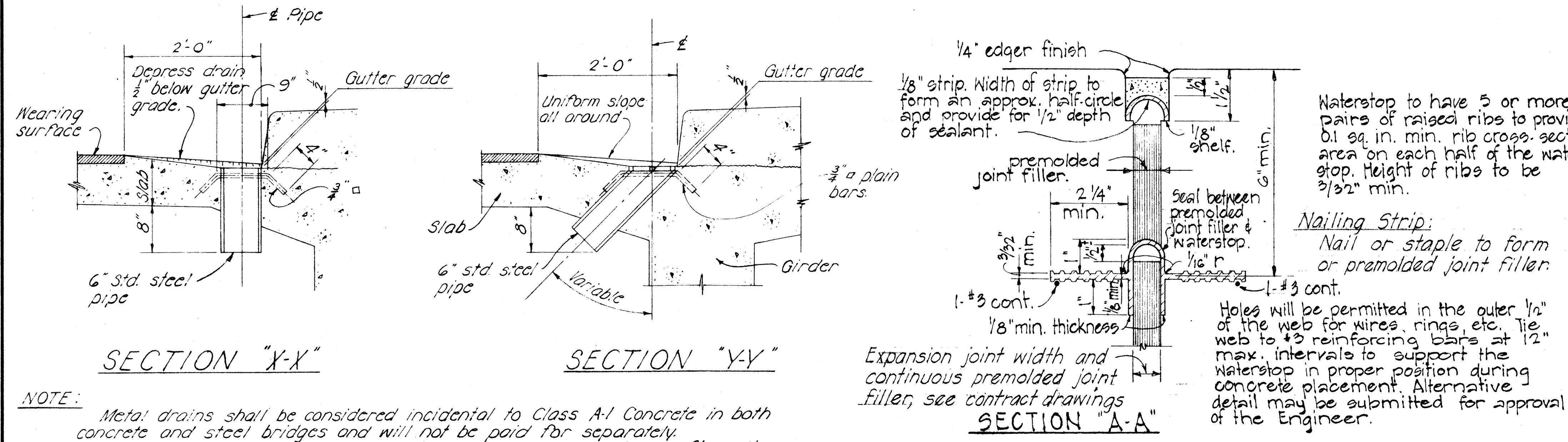


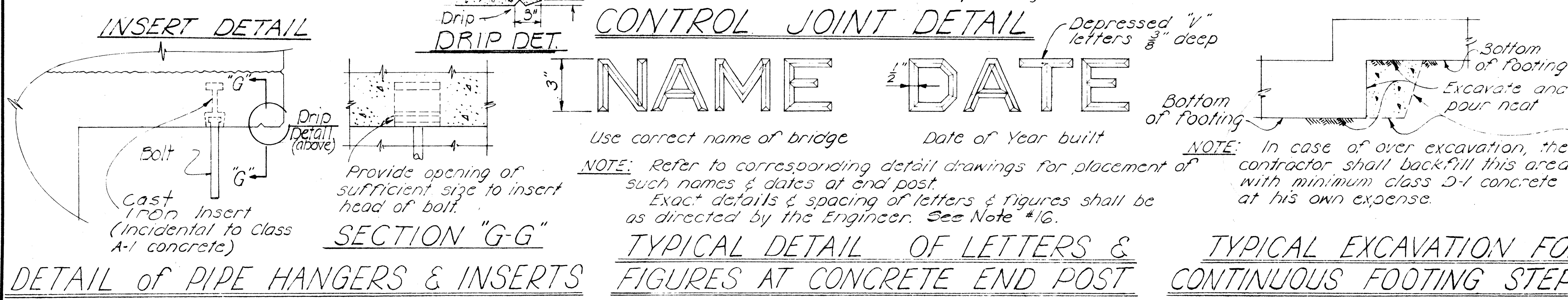
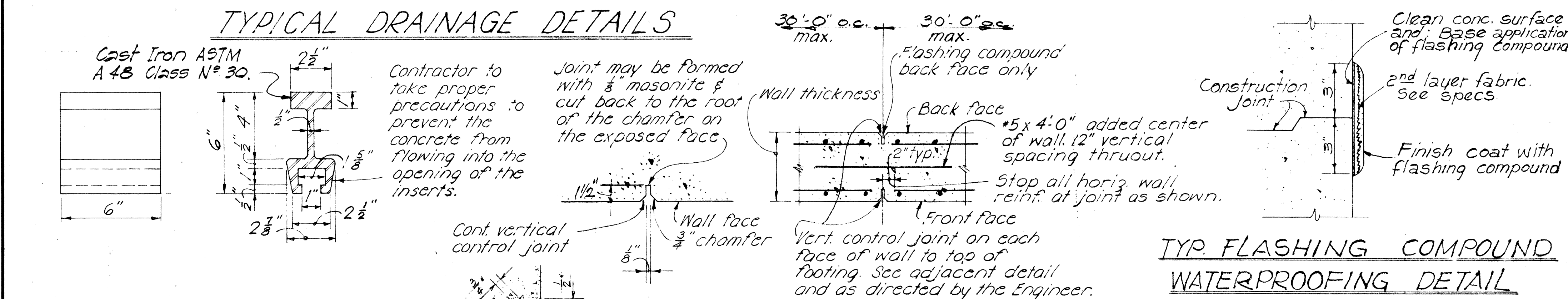
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	503806	1969	56	87



GENERAL NOTES



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. Assemblage of grillage and pipe shall be hot-dip galvanized after all welding is completed.



- 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 unless otherwise noted.
- Clearance for reinforcing bars shall be as follows, unless otherwise noted:
 - 1 1/2" 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. Except as otherwise noted, all reinforcement bars are continuous bars.
- Minimum spacing between parallel bars shall be 2 1/2 times the diameter of bars, but in no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate.
- All dimensions relating to reinforcing are to centers of bars unless otherwise noted.
- 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 3/4" x 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.
- Elastomeric pads: Bottom of bridge bearing pads shall be secured against displacement, with adhesives approved by the Engineer. Pads shall be incidental to concrete and will not be paid for separately.
- Gothic letters and figures approximating dimensions shown will be acceptable if approved by the Engineer.

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

STANDARD BRIDGE DETAILS

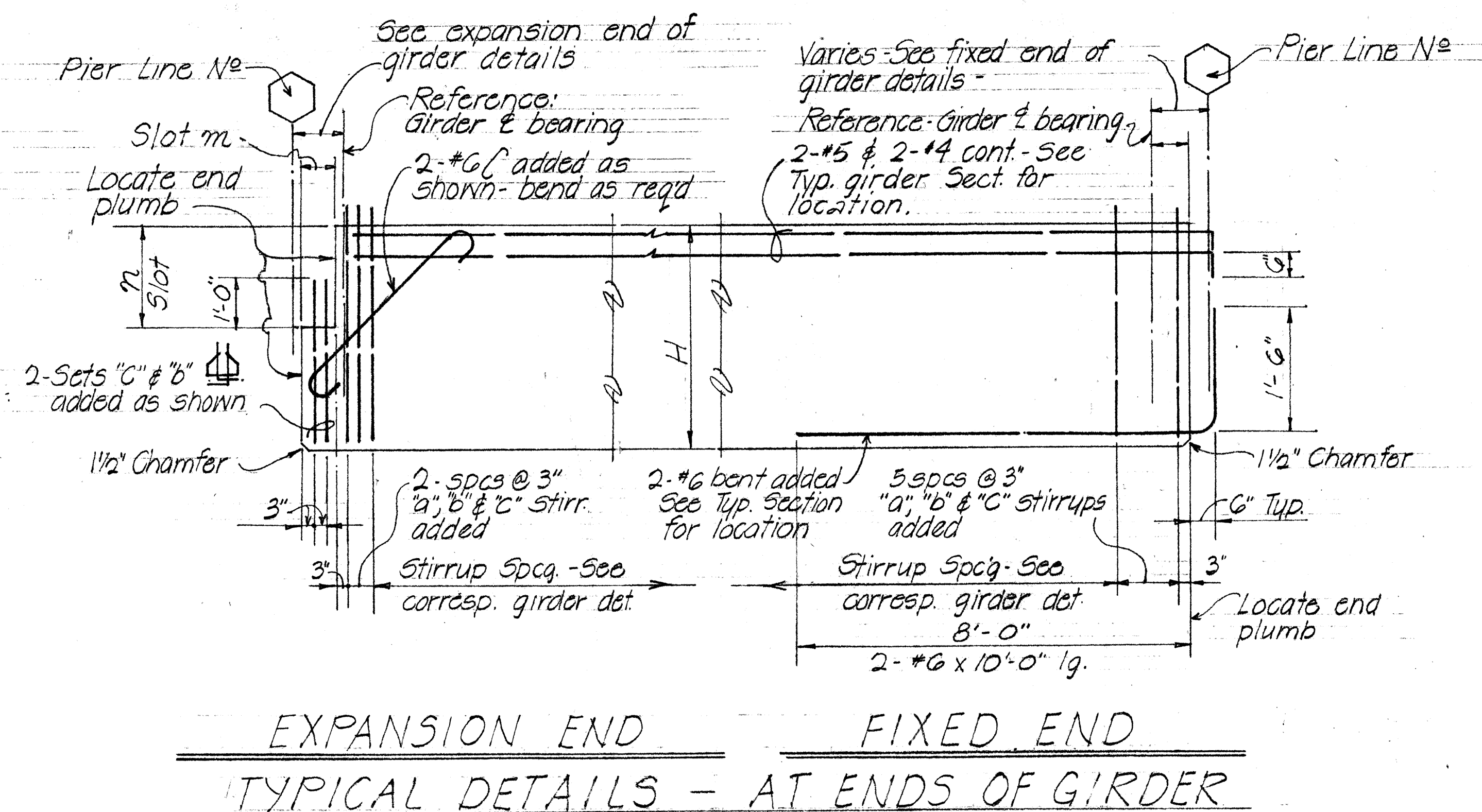
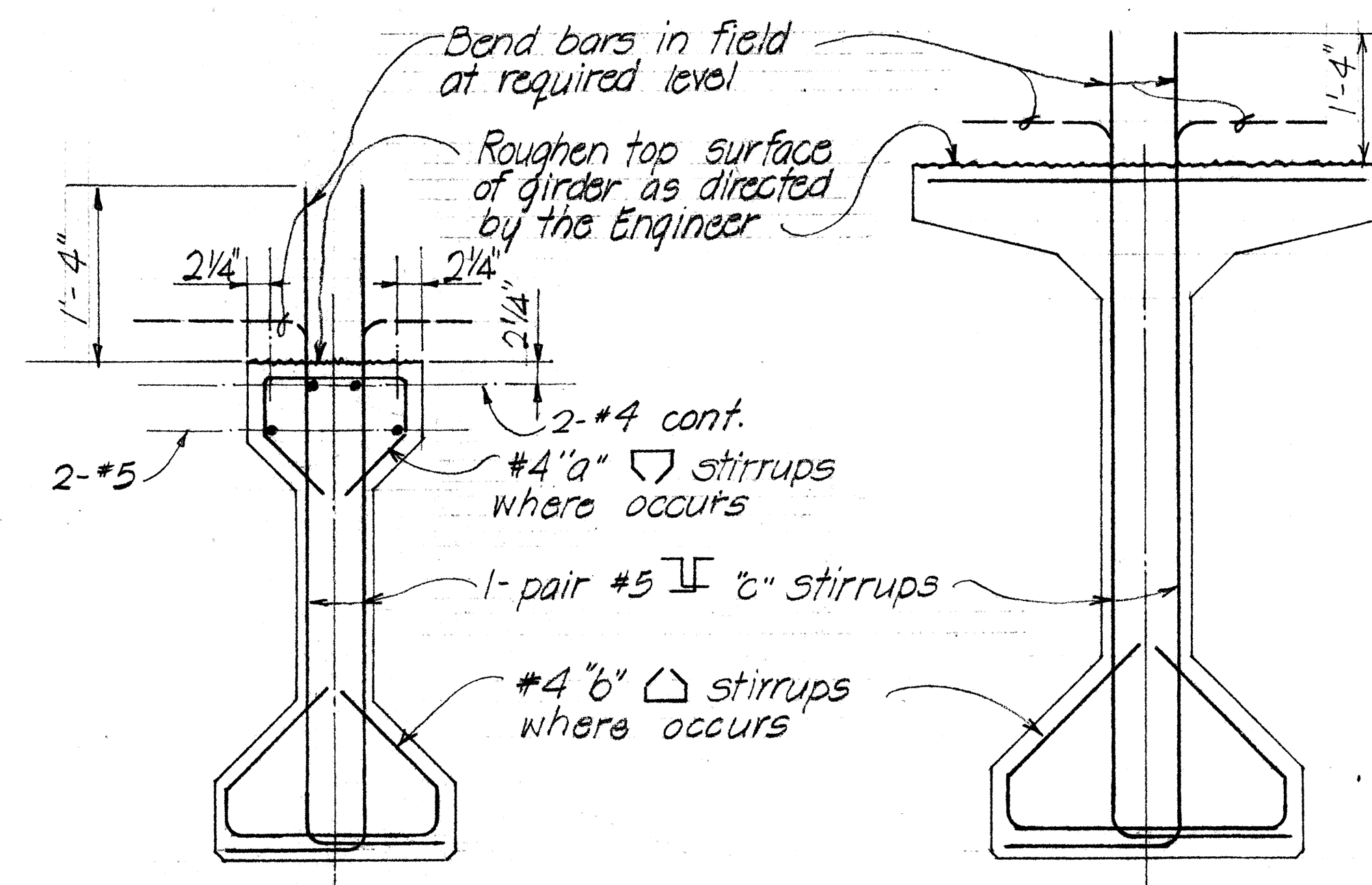
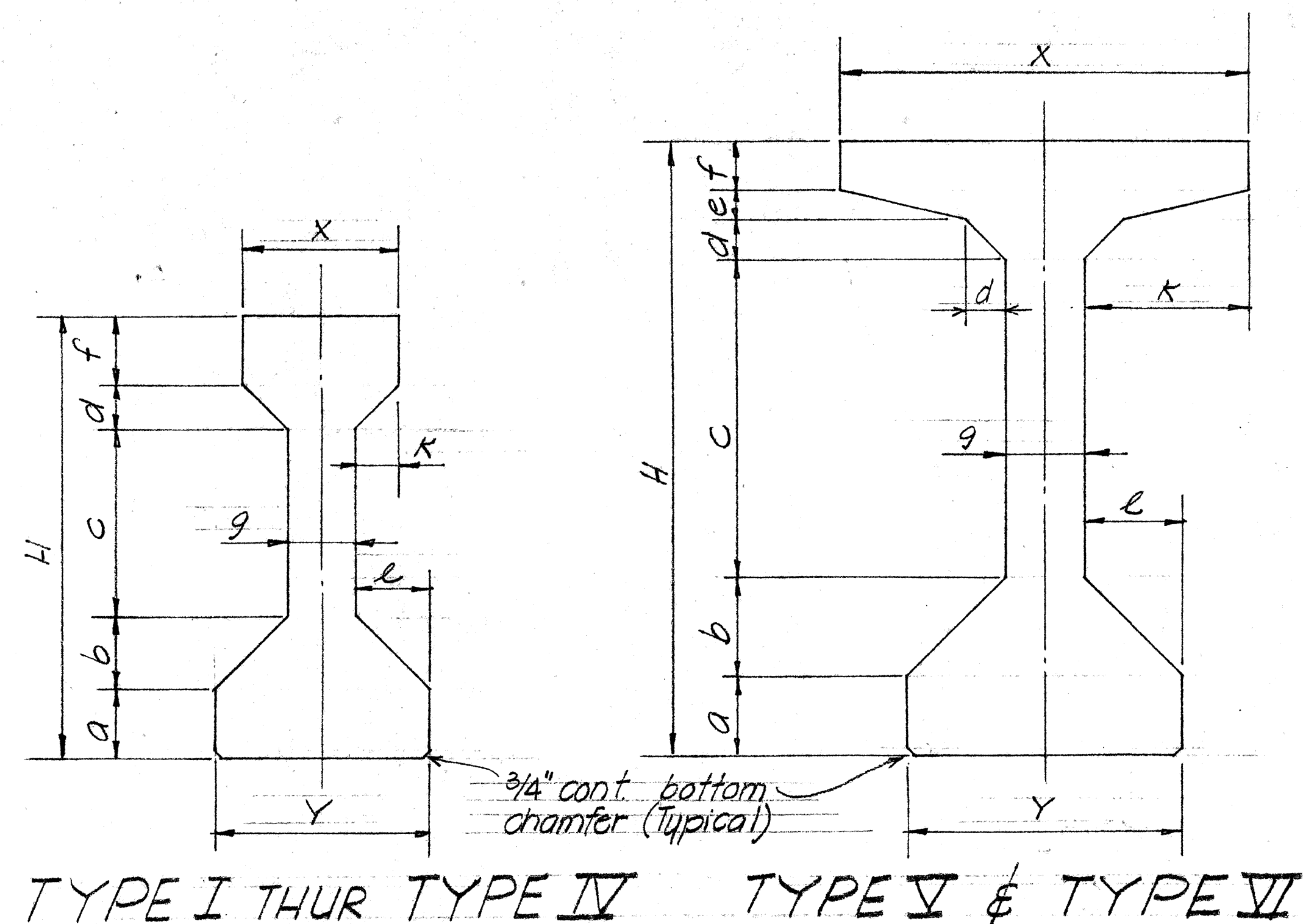
October 1969

SHEET No. 51 OF 7 SHEETS

DATE	
SURVEY PLOTTED BY	
DRAWN BY	
CHECKED BY	
NOTE BOOK	
QUANTITIES	
NO.	

AASHTO-PCI STANDARD BRIDGE GIRDER DIMENSION

GIRDER TYPE	H	X	Y	a	b	c	d	e	f	g	J	K	L	m	n
I	2'-4"	1'-0"	1'-4"	5"	5"	11"	3"	—	4"	6"	—	3"	5"		
II	3'-0"	1'-0"	1'-6"	6"	6"	1'-3"	3"	—	6"	6"	—	3"	6"		
III	3'-9"	1'-4"	1'-10"	7"	7 1/2"	1'-7"	4 1/2"	—	7"	7"	—	4 1/2"	7 1/2"		
IV	4'-6"	1'-8"	2'-2"	8"	9"	1'-11"	6"	—	8"	8"	—	6"	9"		
V	5'-3"	3'-6"	2'-4"	8"	10"	2'-9"	4"	3"	5"	8"	4"	1'-1"	10"		
VI															

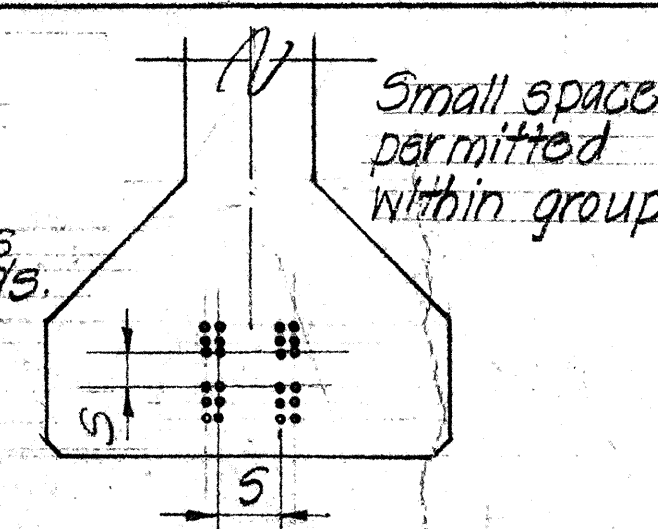


TYPE I THRU TYPE IV TYPE V & TYPE VI TYPICAL SECTION PRESTRESSED CONC. GIRDERS

BUNDLING OF PRESTRESSING REINFORCEMENT

- ARRANGEMENT AND CLEARANCE FOR POST TENSIONED UNITS
- Horizontal clearance between units equals 2" min.
 - Units may be bundled vertically in groups of 3 maximum.
 - Vertical clearance between bundled units equal 3" minimum.
 - Approval of the Engineer is required for deviation.

- ARRANGEMENT AND CLEARANCE FOR PRETENSIONED STRANDS
- Strands may be bundled in groups as shown or in groups consisting of a maximum of 6 strands and separated at the ends.
 - The minimum distance "S" between groups or individual strands is 2" for 1/2 inch strands.
 - "S" is measured between centers of adjacent strands.
 - Approval of the Engineer is required for deviation.

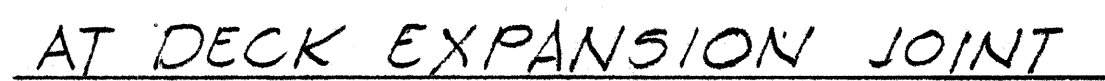


GENERAL NOTES

DESIGN LOADS: HS-20-44 or Interstate Loading
 1- Prestressed Girders -
 $f'_c = 4000$ psi $f_y = 60000$ psi 1/2 inch diam. wire strands
 Tensioning Load = 25,200 lbs. per strand.
 Design Load = 20,160 lbs. per strand.
 Forms must be removed and the beams inspected before the strands are cut.

se Light Standard Metal railing

Ref. - Top of conc. railing



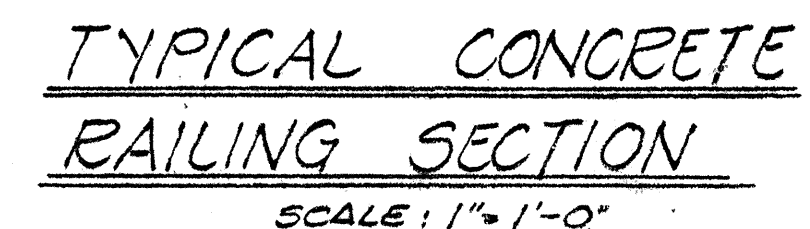
1. The contractor shall layout the railing to provide 3 cont. panels whenever possible. 2 or 4 cont. panels will be permitted to complete the layout when 3 cont. panels cannot be made. Single panels will not be permitted.

INTERMEDIATE

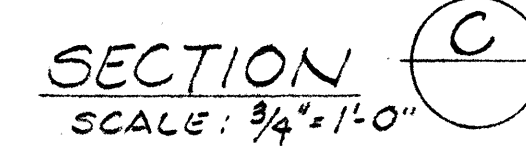
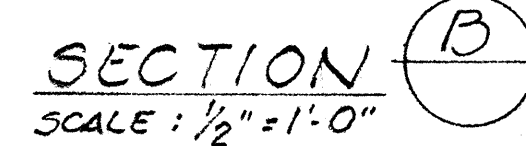
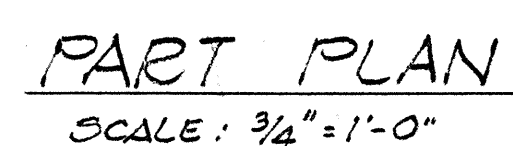
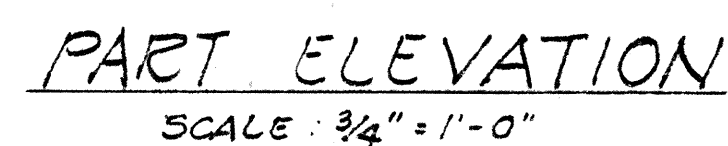
2. Rail Posts shall be normal to grade.
3. Provide double posts at each expansion jt., fixed bridge jt., continuous support, and as shown on detailed drawing.



Provide 6"x1/2" cont. premoulded filler between each conc. rail-open joint at lower end of deck.



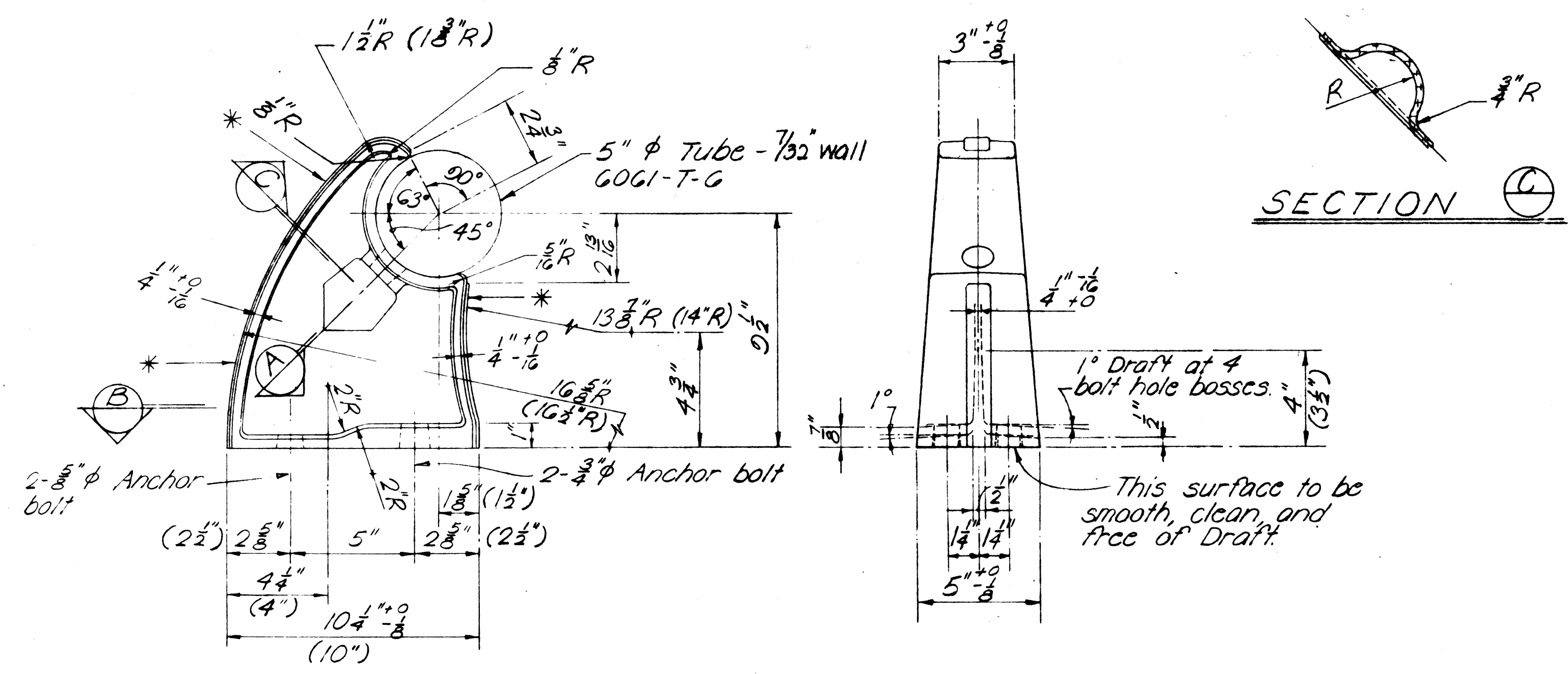
ELEVATION (A) SHOWING SPECIAL
REINFORCEMENT AT JUNCTION BOX
SCALE: 1" = 1'-0"



DETAILS OF RAILING AT LIGHT STANDARD
SCALE AS NOTED

October 1969

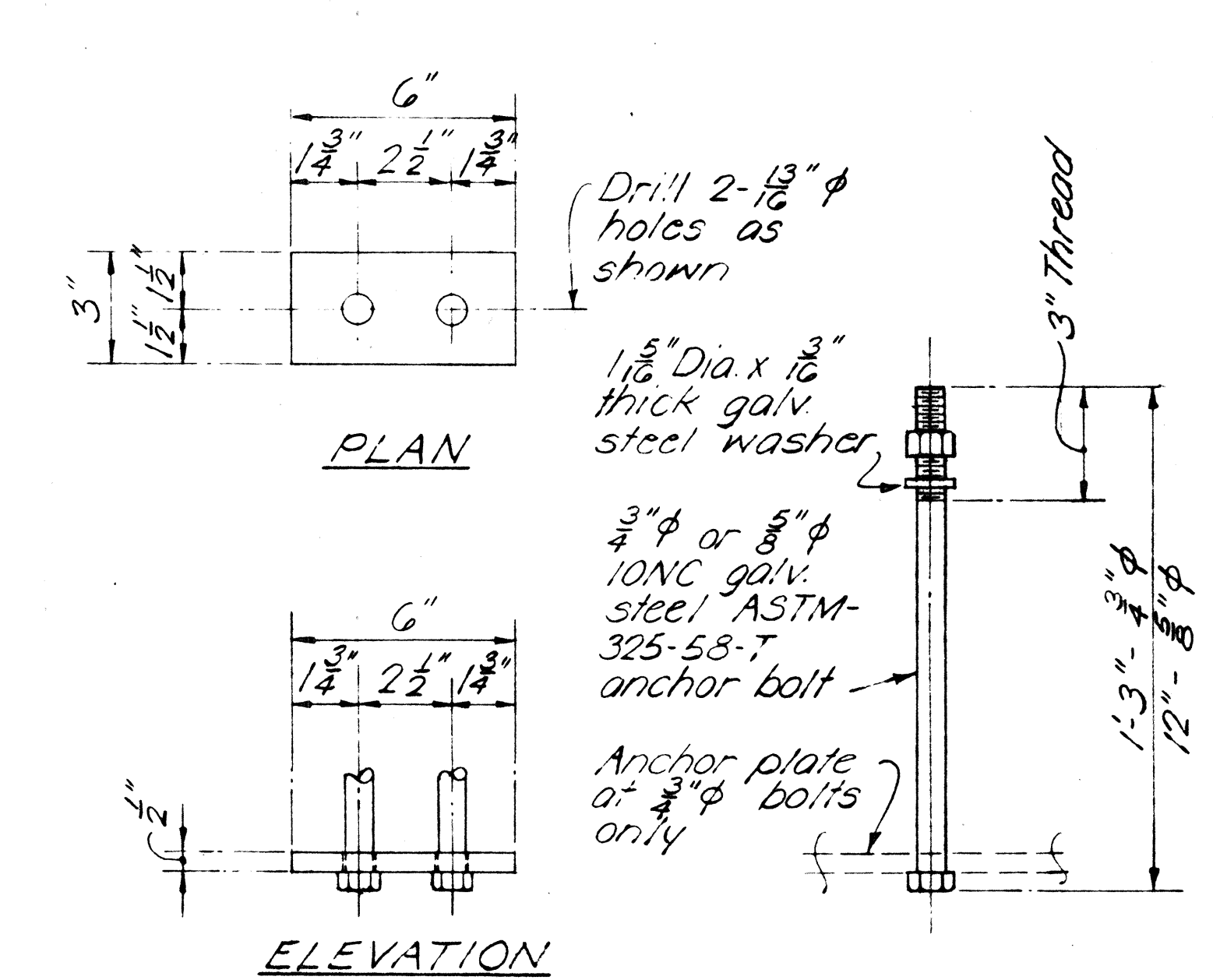
SHEET No. 53 OF 7 SHEETS



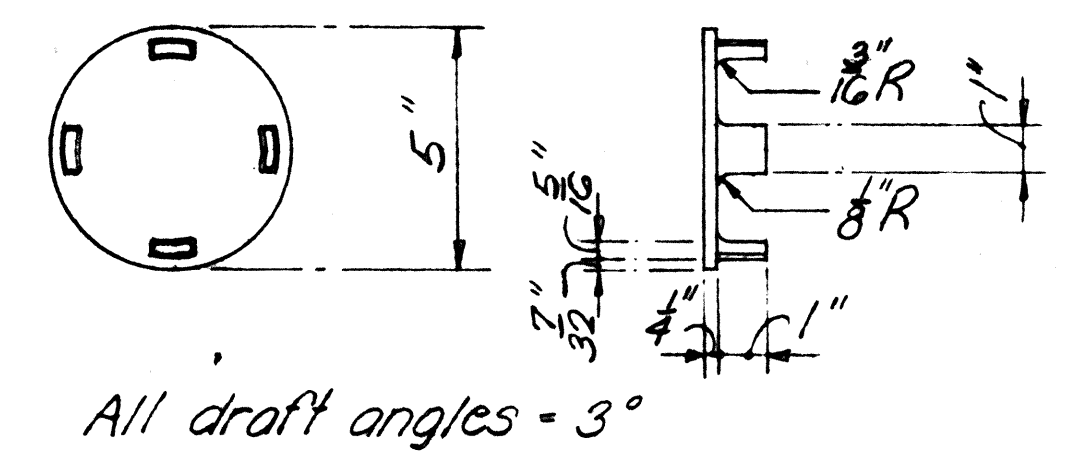
NOTE:

- * 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 3/8" R, casting tol. to be ± 1/16", wall thickness to be ± 1/32".
- Dimensions may be as shown or as shown in parenthesis ().

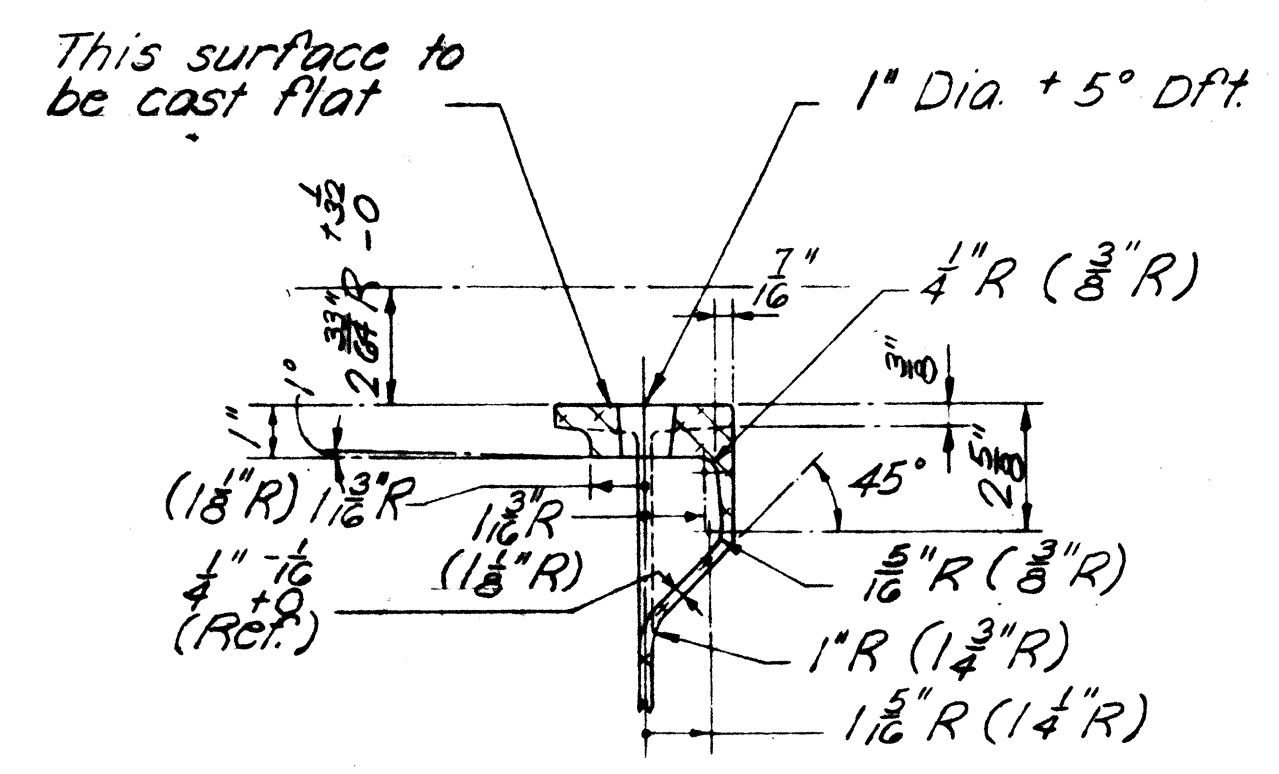
TYPICAL RAIL POST DETAILS
Scale: 3" = 1'-0"



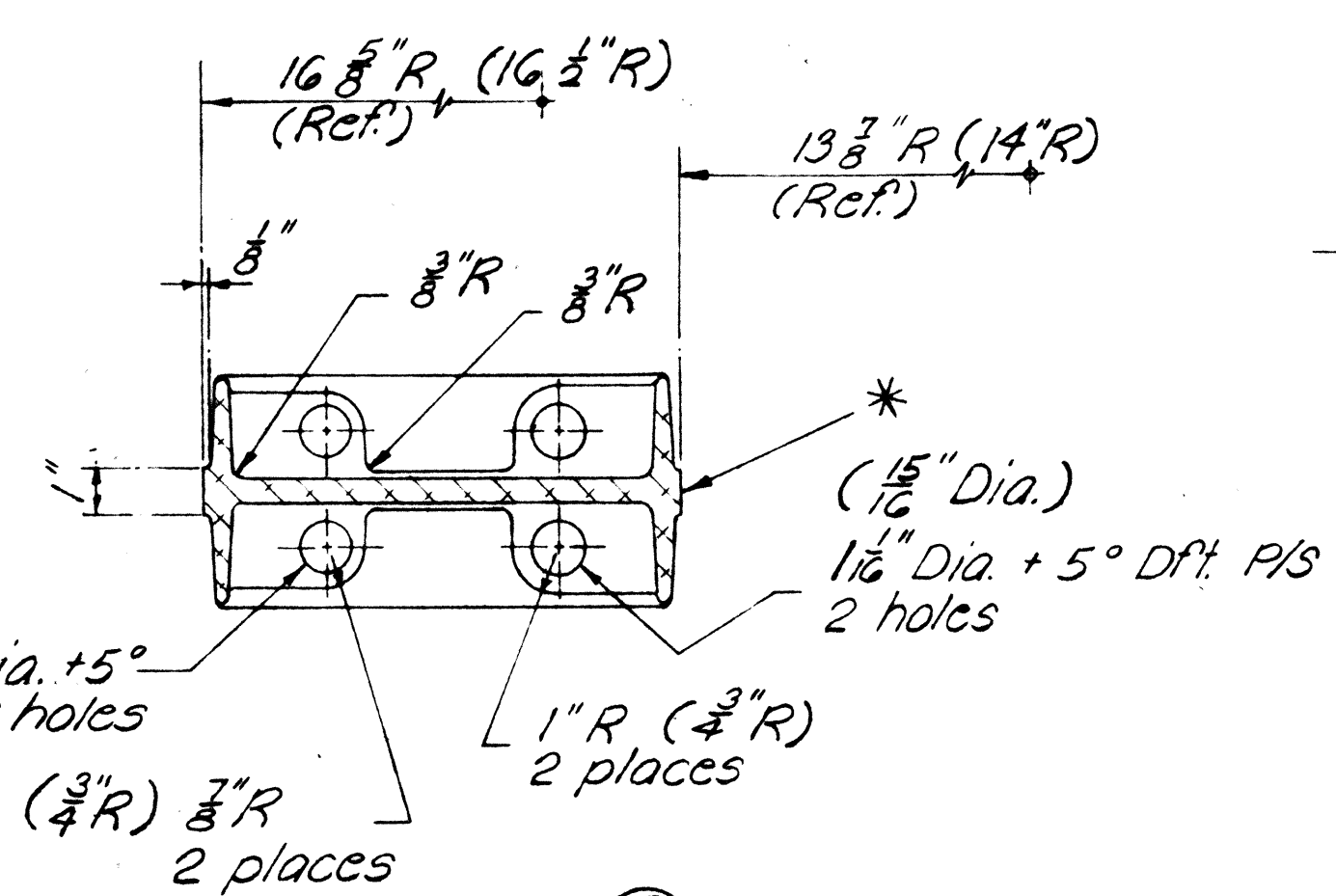
ANCHOR BOLT DETAIL ANCHOR BOLT
TYPICAL RAIL POST ANCHOR BOLT ASSEMBLY
Scale: 3" = 1'-0"



RAIL CAP DETAIL
Scale: 3" = 1'-0"



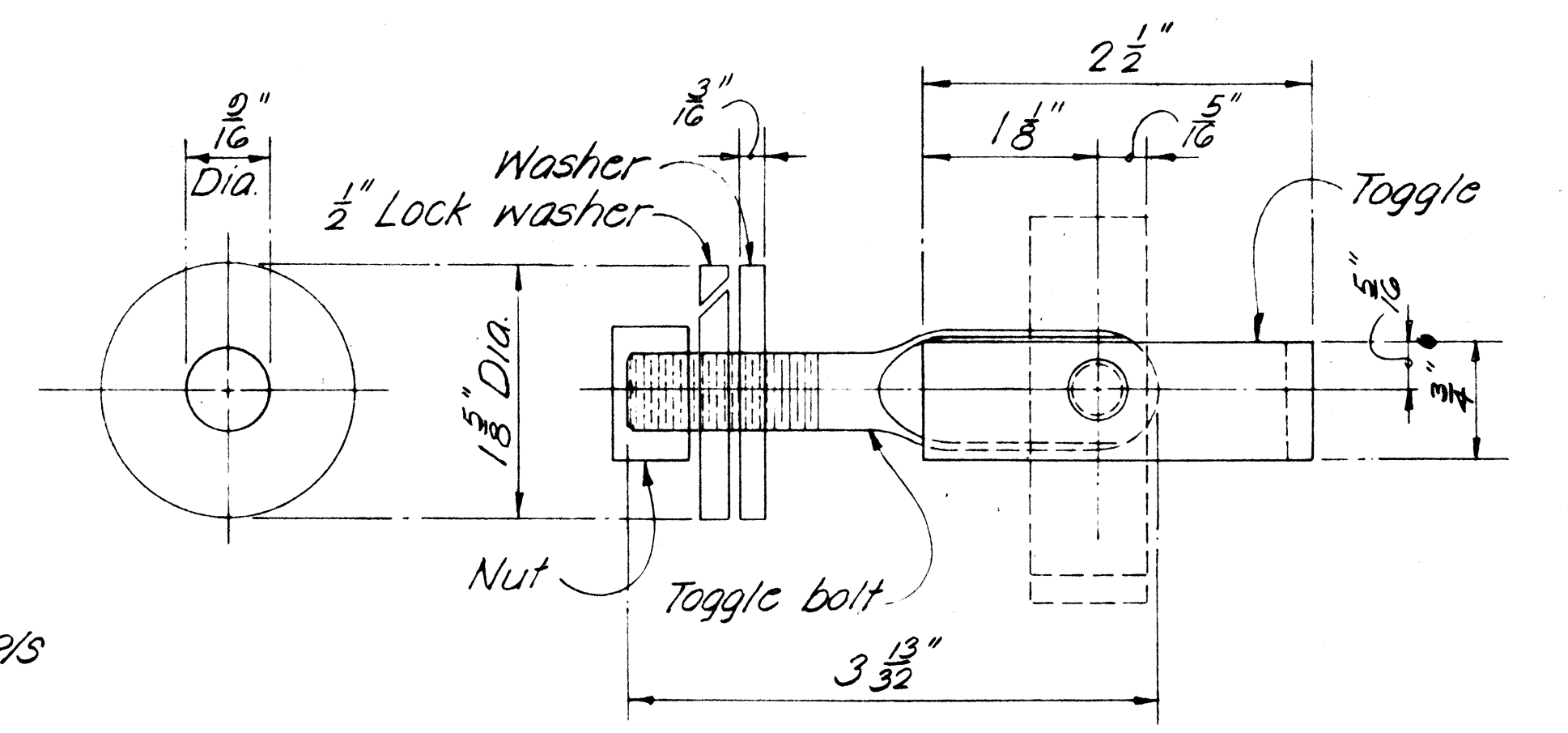
SECTION A



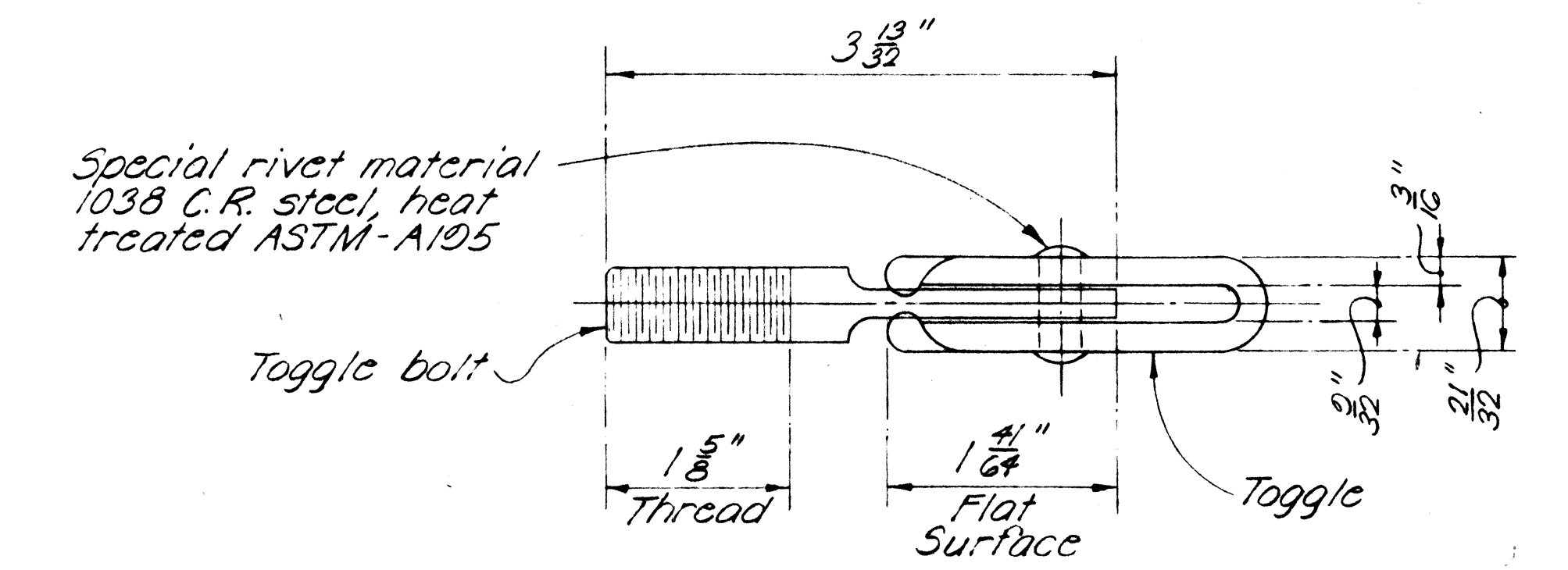
SECTION B

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 ASSEMBLAGE



1/2" φ TOGGLE BOLT DETAILS
Full Scale

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

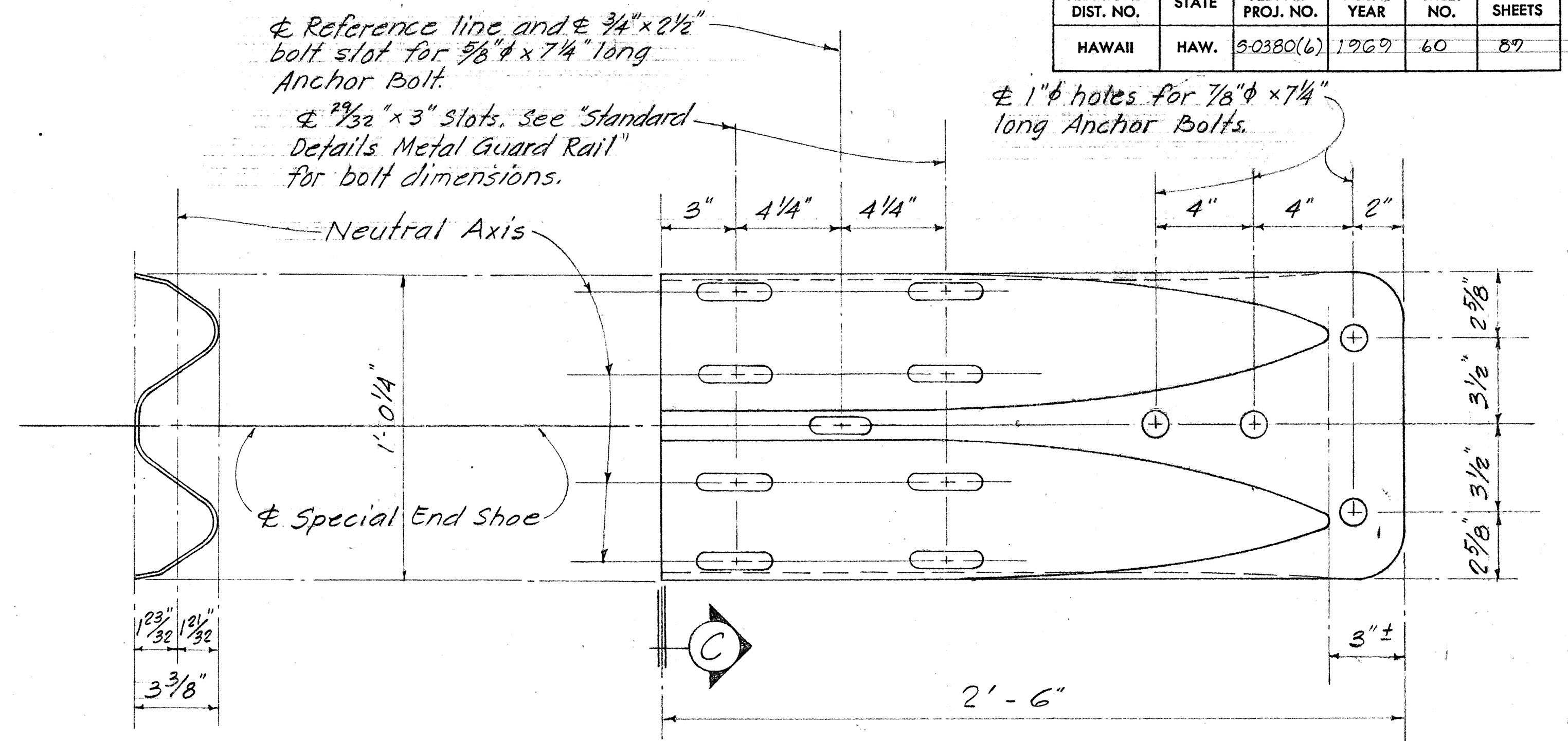
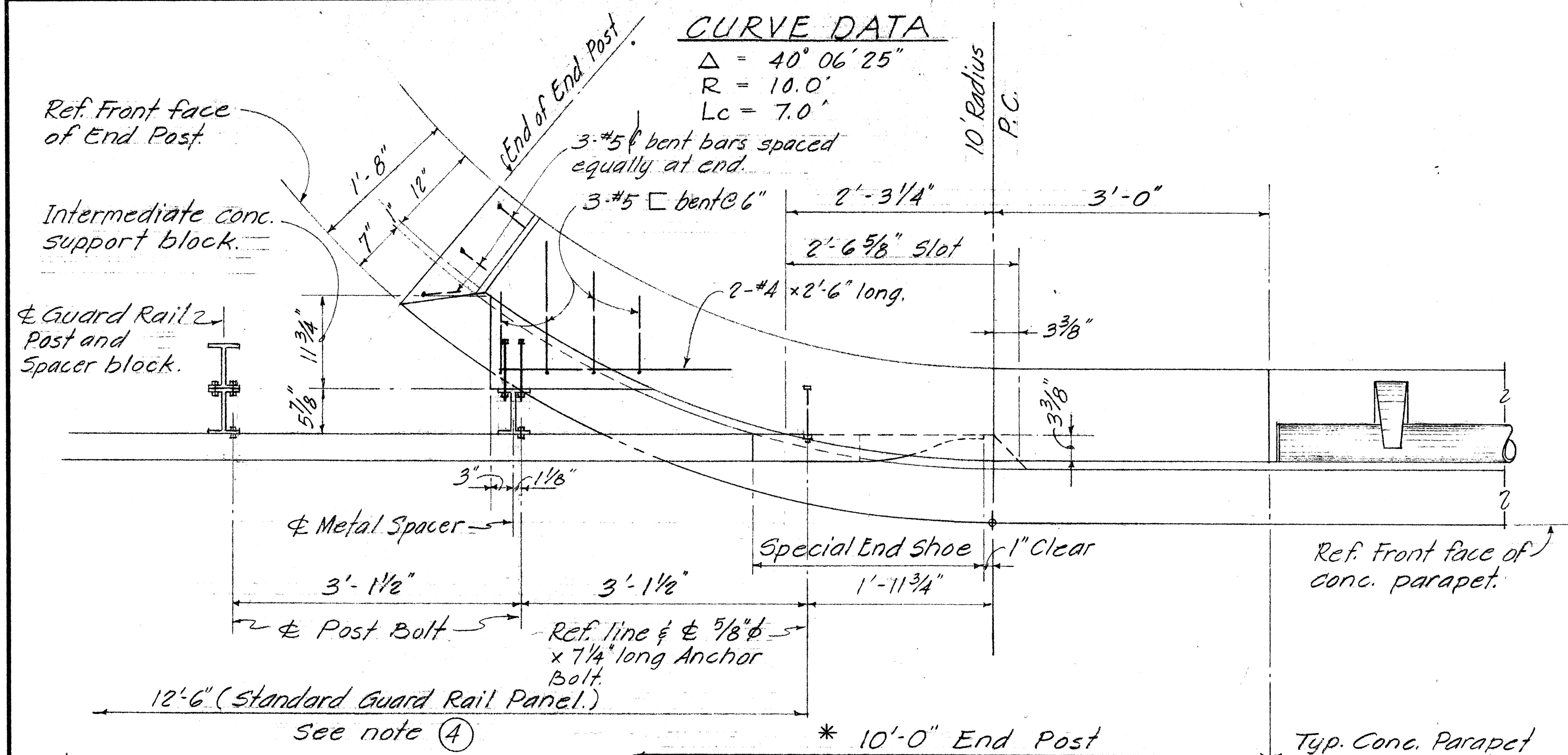
STANDARD DETAILS
METAL BRIDGE RAILINGS
SINGLE RAIL

Scale as noted
Date:

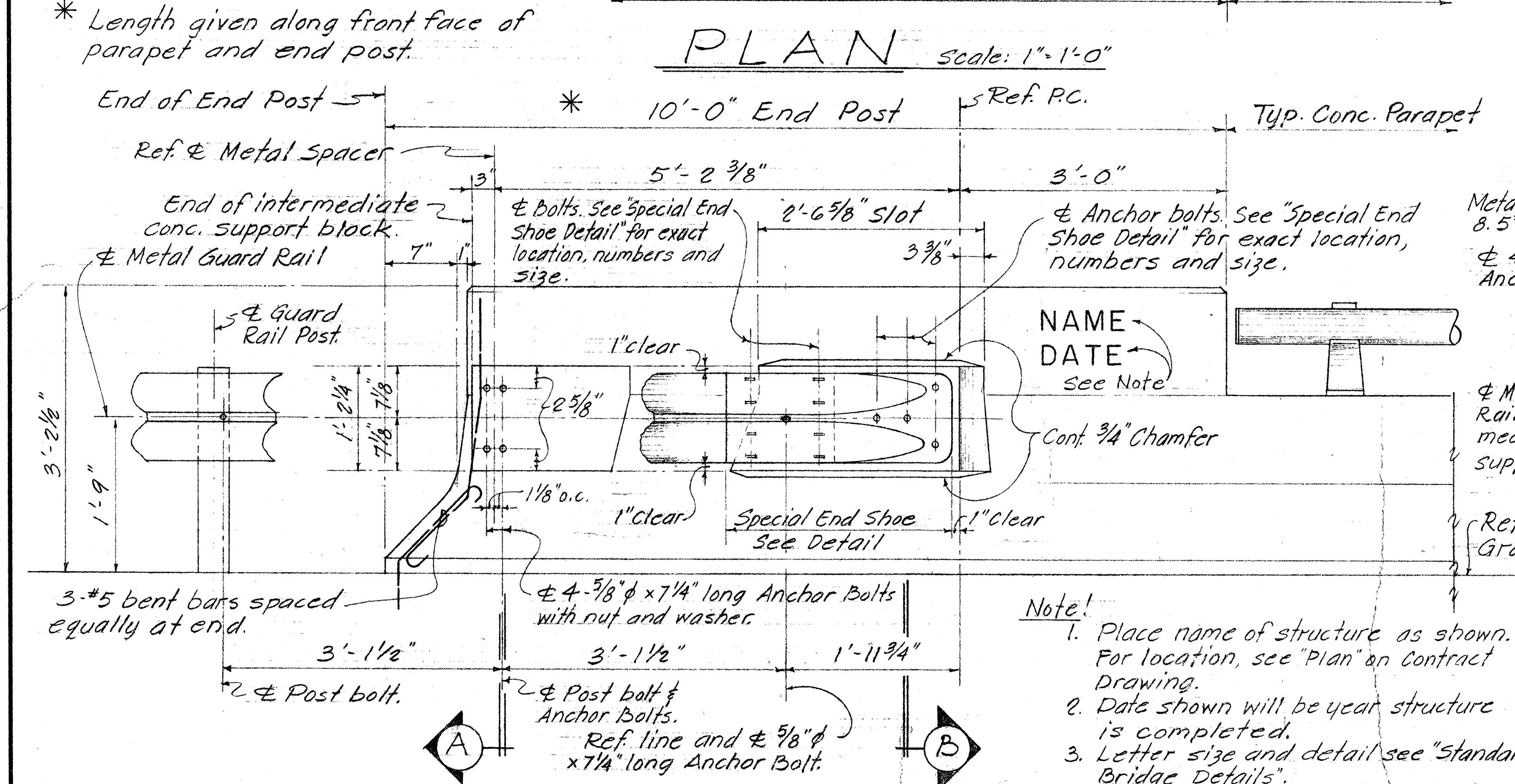
SHEET No. 54 OF 7 SHEETS

DESIGNED BY	DATE
CHECKED BY	
NOTED BY	
QUANTITIES BY	
TRACED BY	
ORIGINAL PLAN	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	5-0380(6)	1969	60	89



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



ELEVATION
 Scale: 1" = 1'-0"

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

SECTION B
 Scale: 1 1/2" = 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 DETAILS
METAL GUARD RAIL
CONNECTION TO CONC. END POST

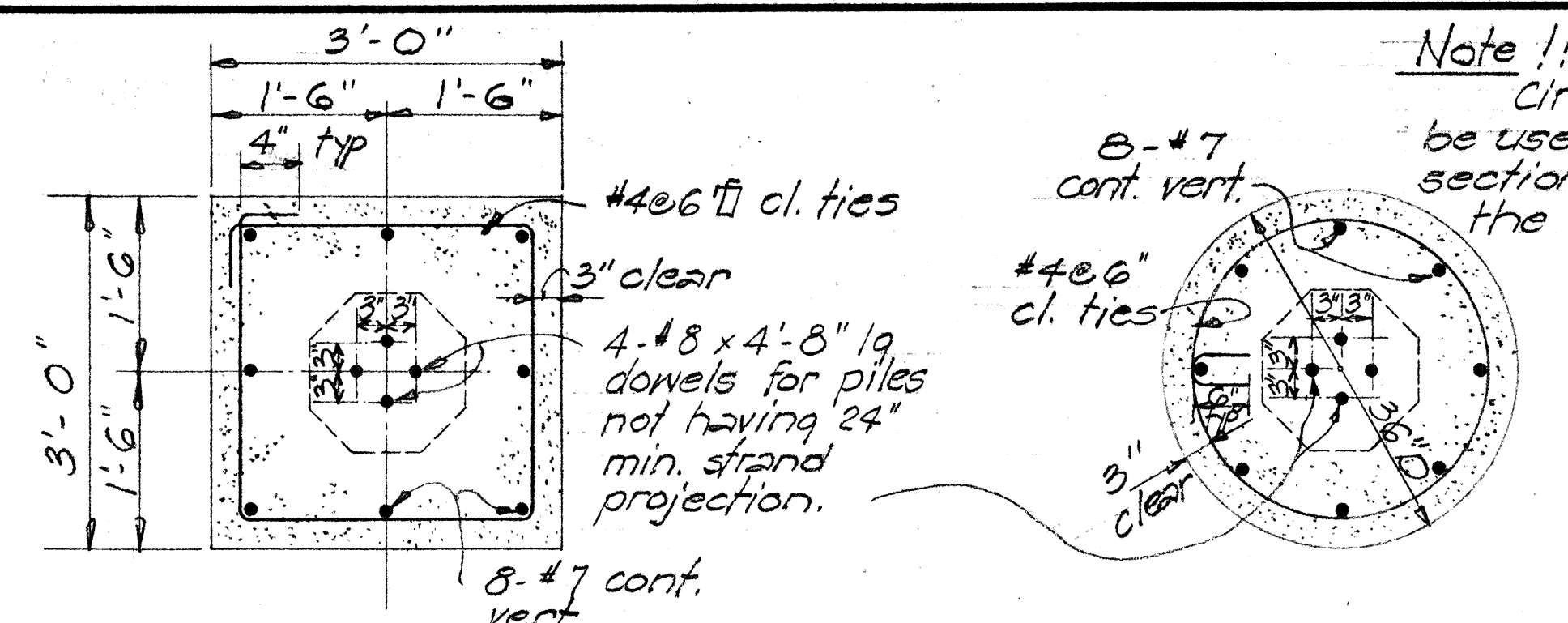
DATE: MARCH, 1969
 SHEET No. 55 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	5-0380(6)	1967	62	87

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.



Note !!

Circular section may be used instead of square section if approved by the Engineer.

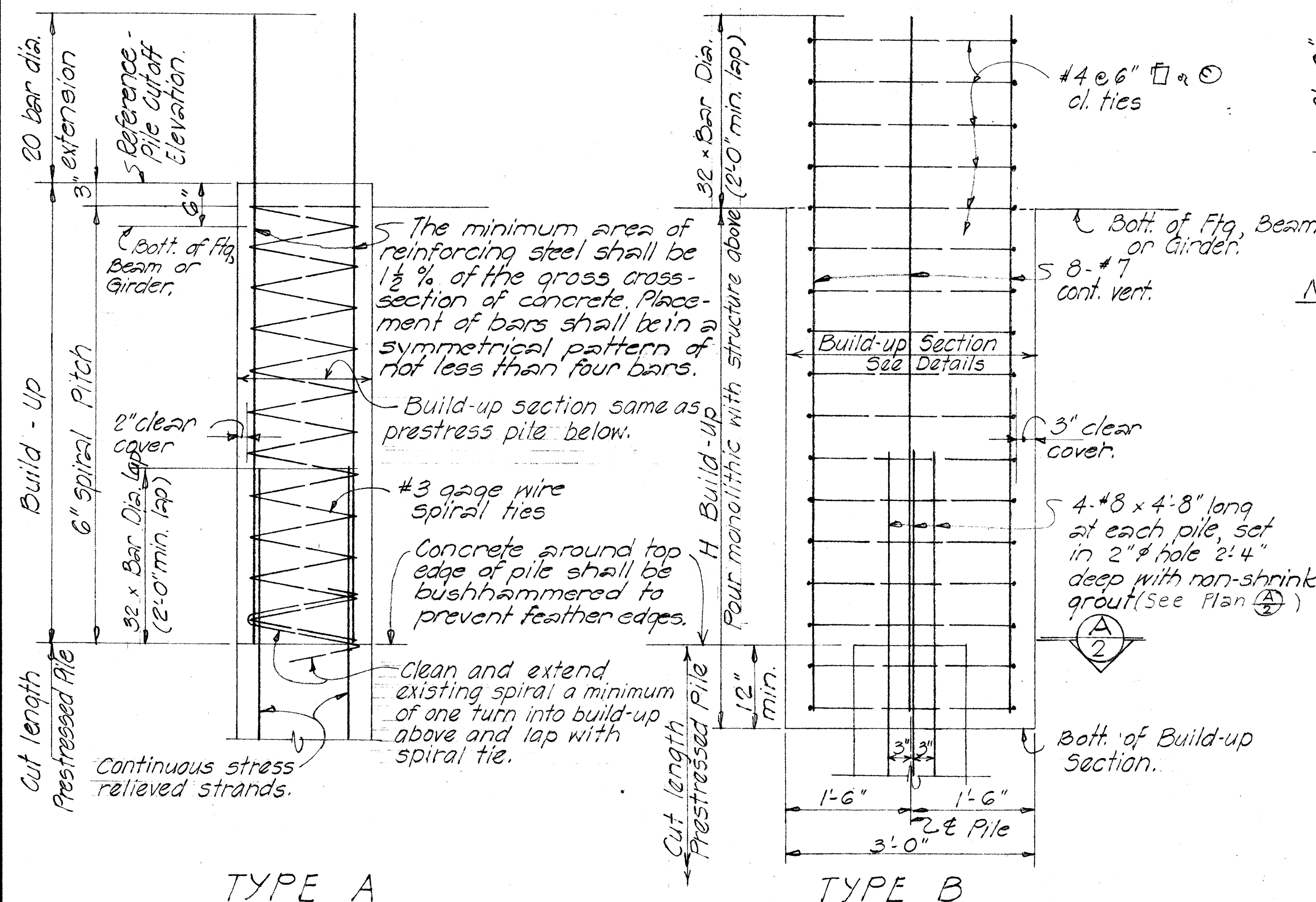
SQUARE BUILD-UP

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	
DESIGNED 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. 57 OF 7 SHEETS

62