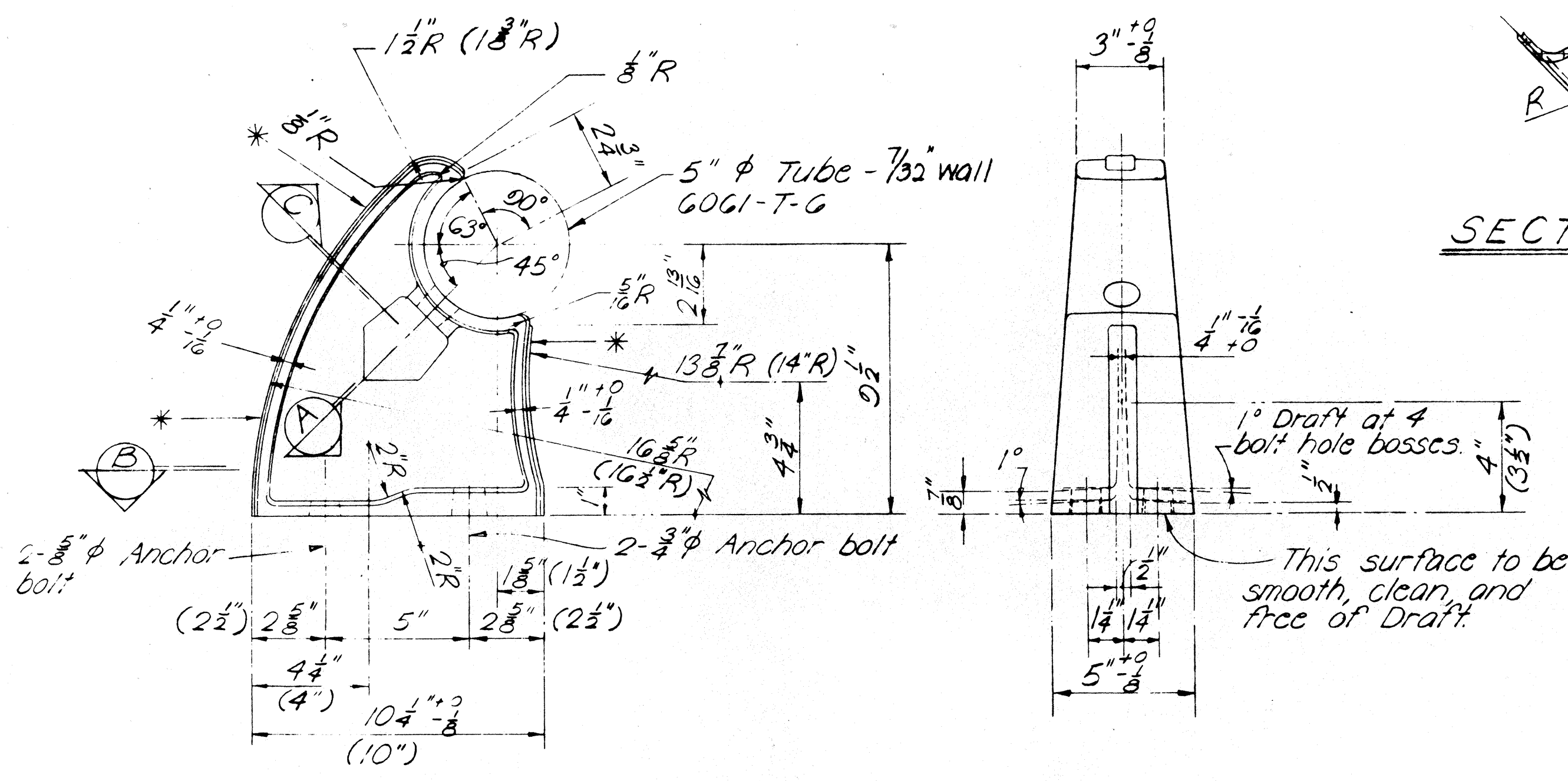




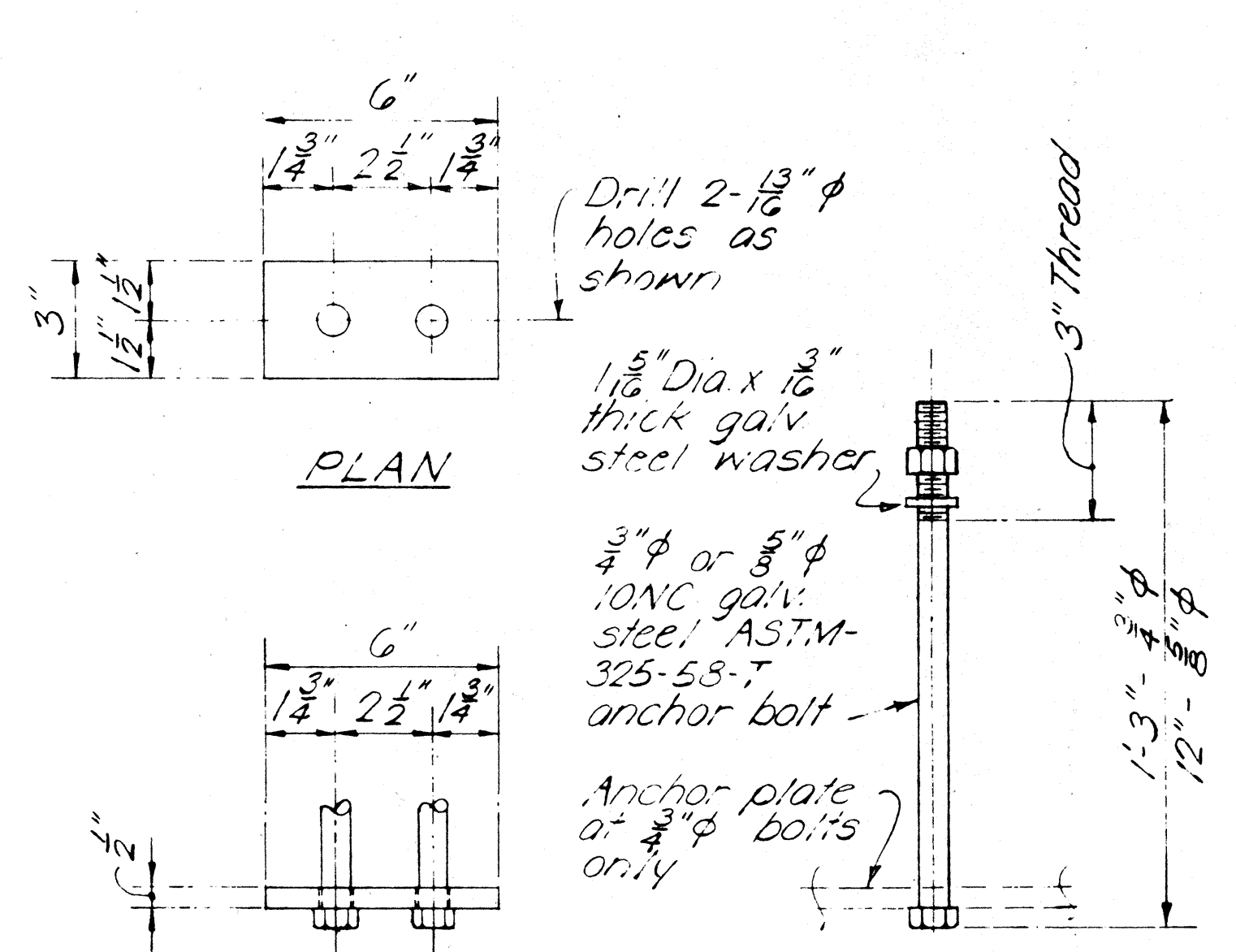
SIDE ELEVATION

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\"/>

TYPICAL RAIL POST DETAILS

Scale: 3\"/>

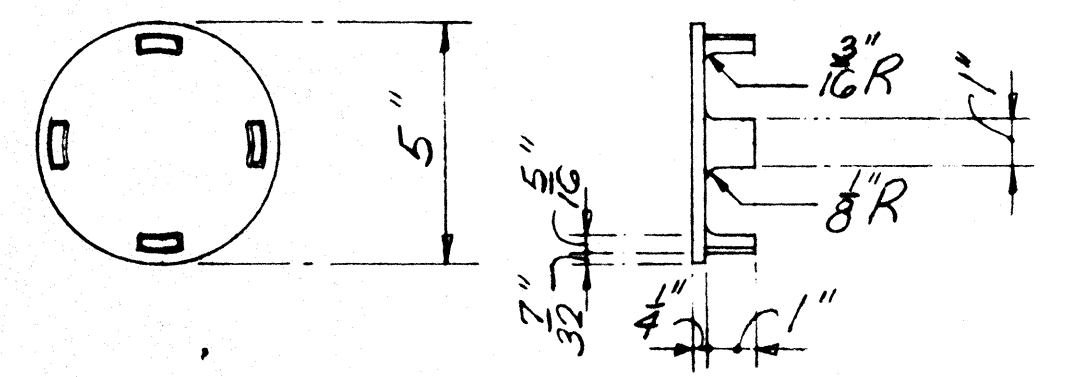


PLAN

ELEVATION

ANCHOR BOLT DETAIL
ANCHOR BOLT ASSEMBLY

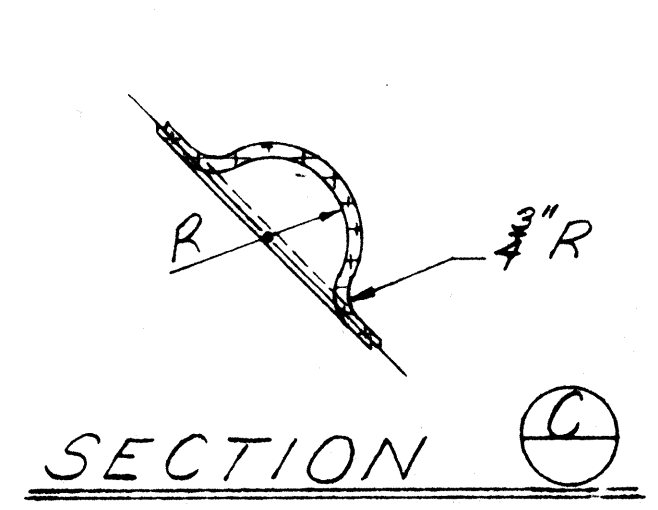
Scale: 3\"/>



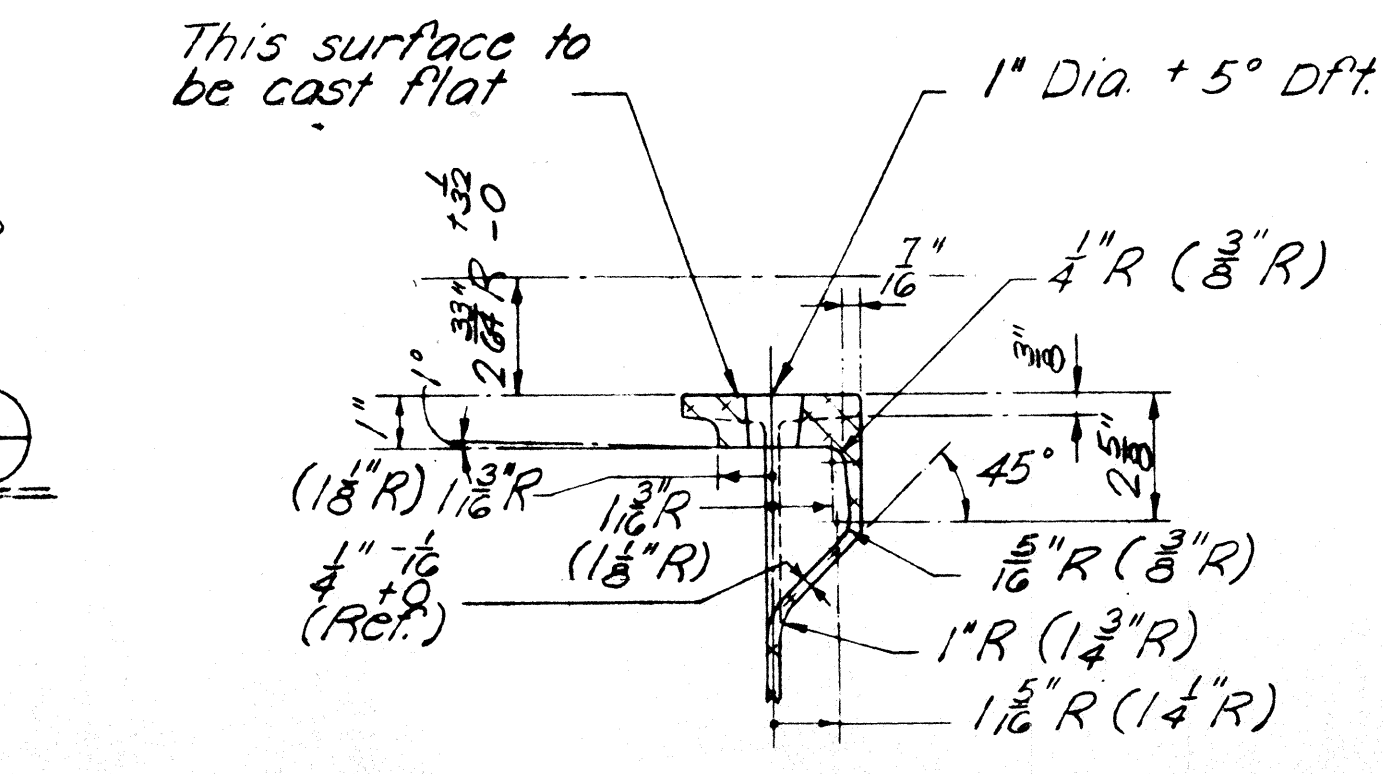
All draft angles = 3°

RAIL CAP DETAIL

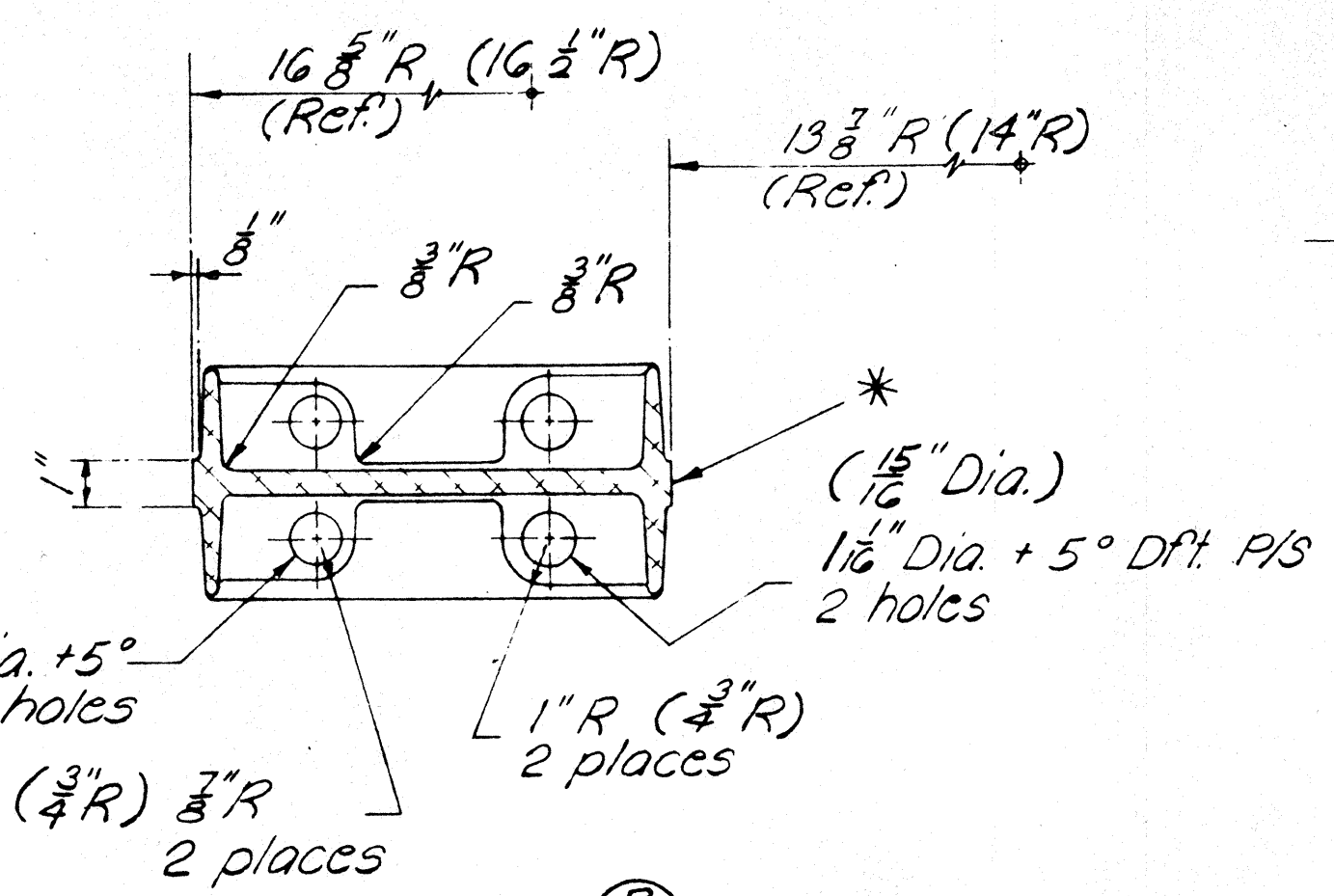
Scale: 3\"/>



SECTION C

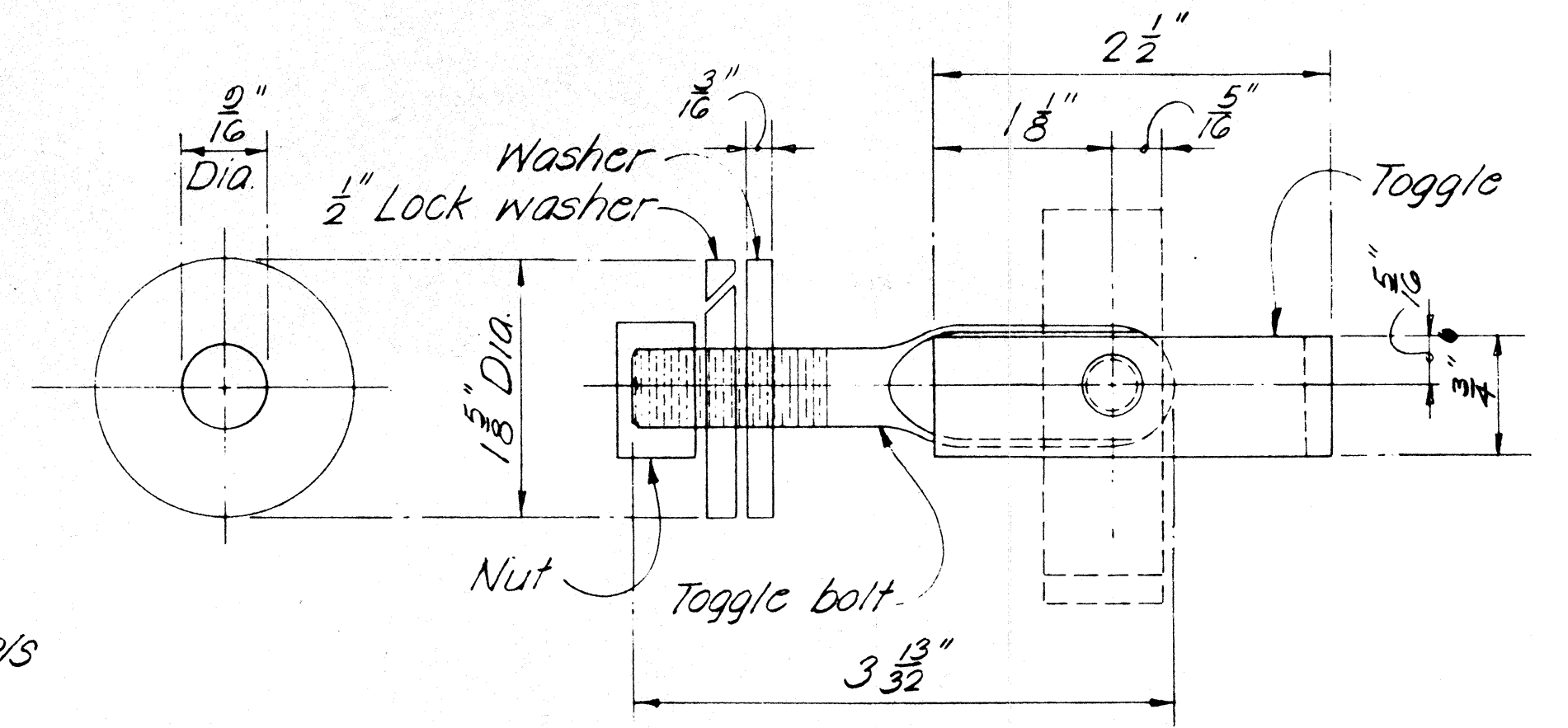


SECTION A



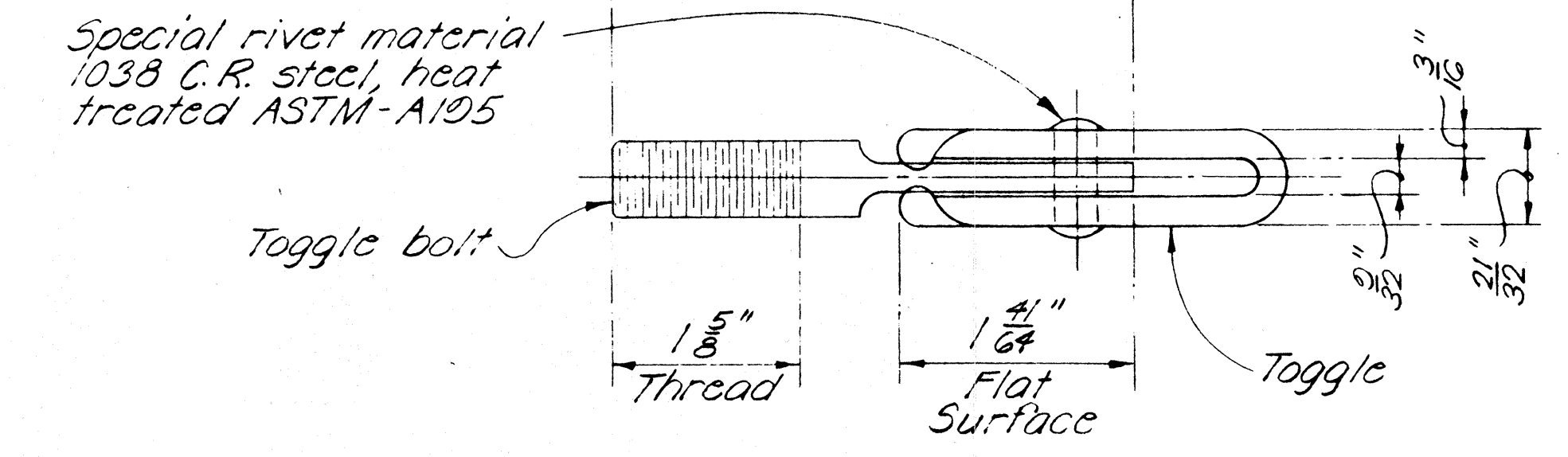
SECTION B

NOTE:
 Toggle Bolt Material - 1/2\"/>



WASHER

SIDE ELEVATION ASSEMBLY



TOP PLAN

1/2\"/>

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

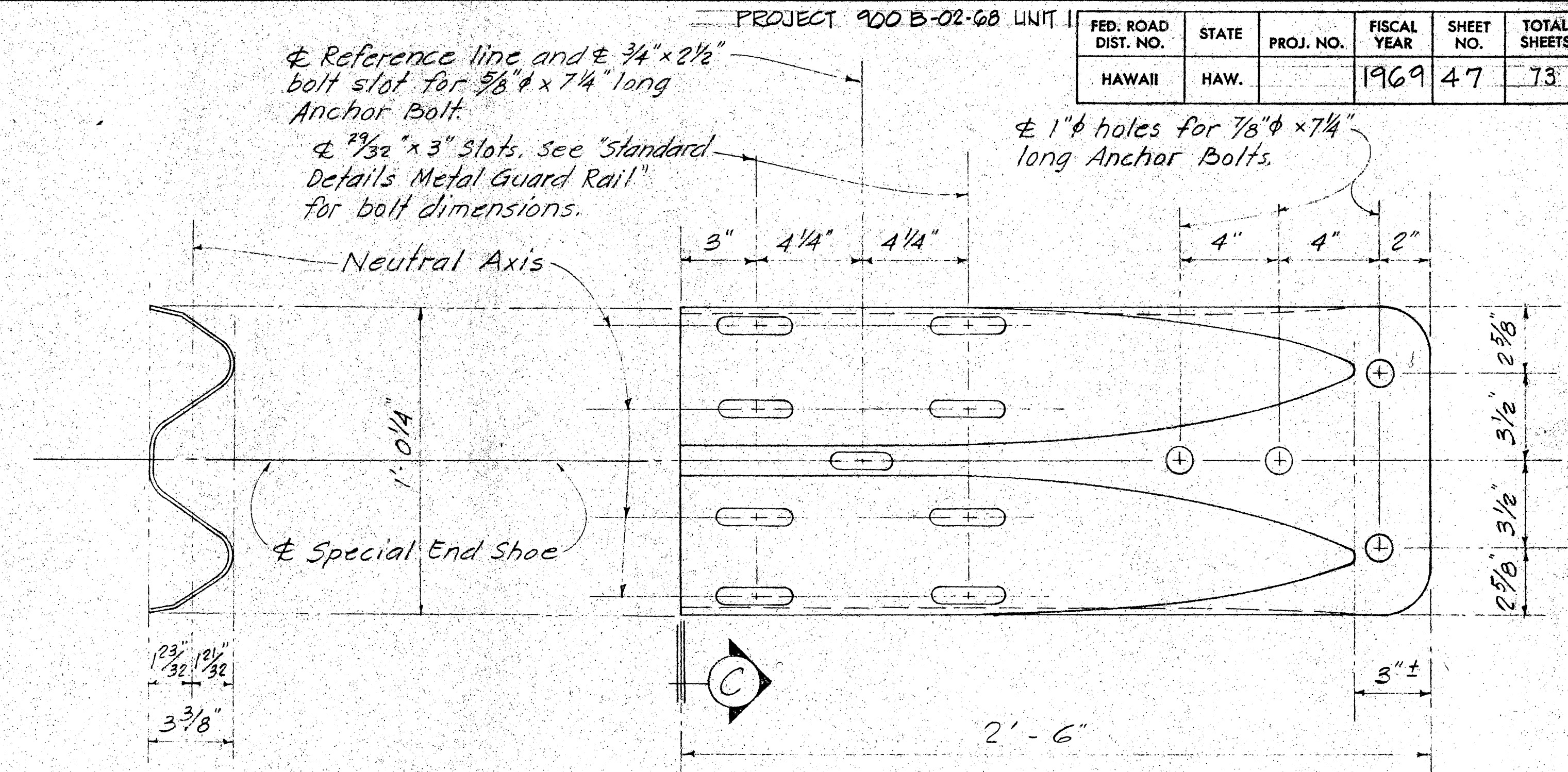
STANDARD DETAILS
METAL BRIDGE RAILINGS
SINGLE RAIL

Scale as noted
Date:

SHEET No. 1 OF 5 SHEETS

ORIGINAL PLAN	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
INCHES	

ORIGINAL PLAN	SURVEY PLOTTED BY _____	DATE _____
NOTE BOOK	DRAWN BY _____	_____
	TRACED BY _____	_____
	DESIGNED BY _____	_____
	QUANTITIES BY _____	_____
	CHECKED BY _____	_____
N _o _____		



Scale: 3" = 1'-0"

SECTION (A)

SECTION (B)

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

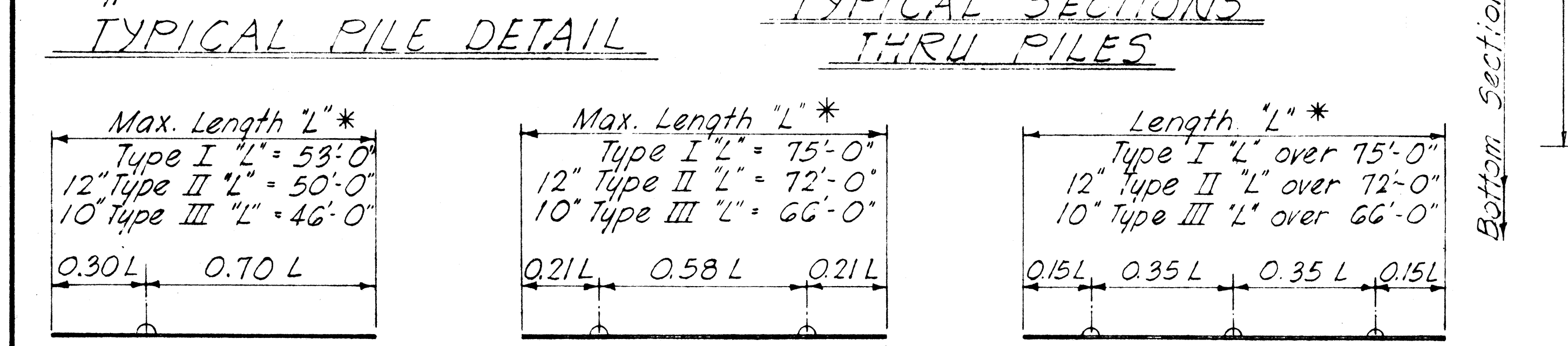
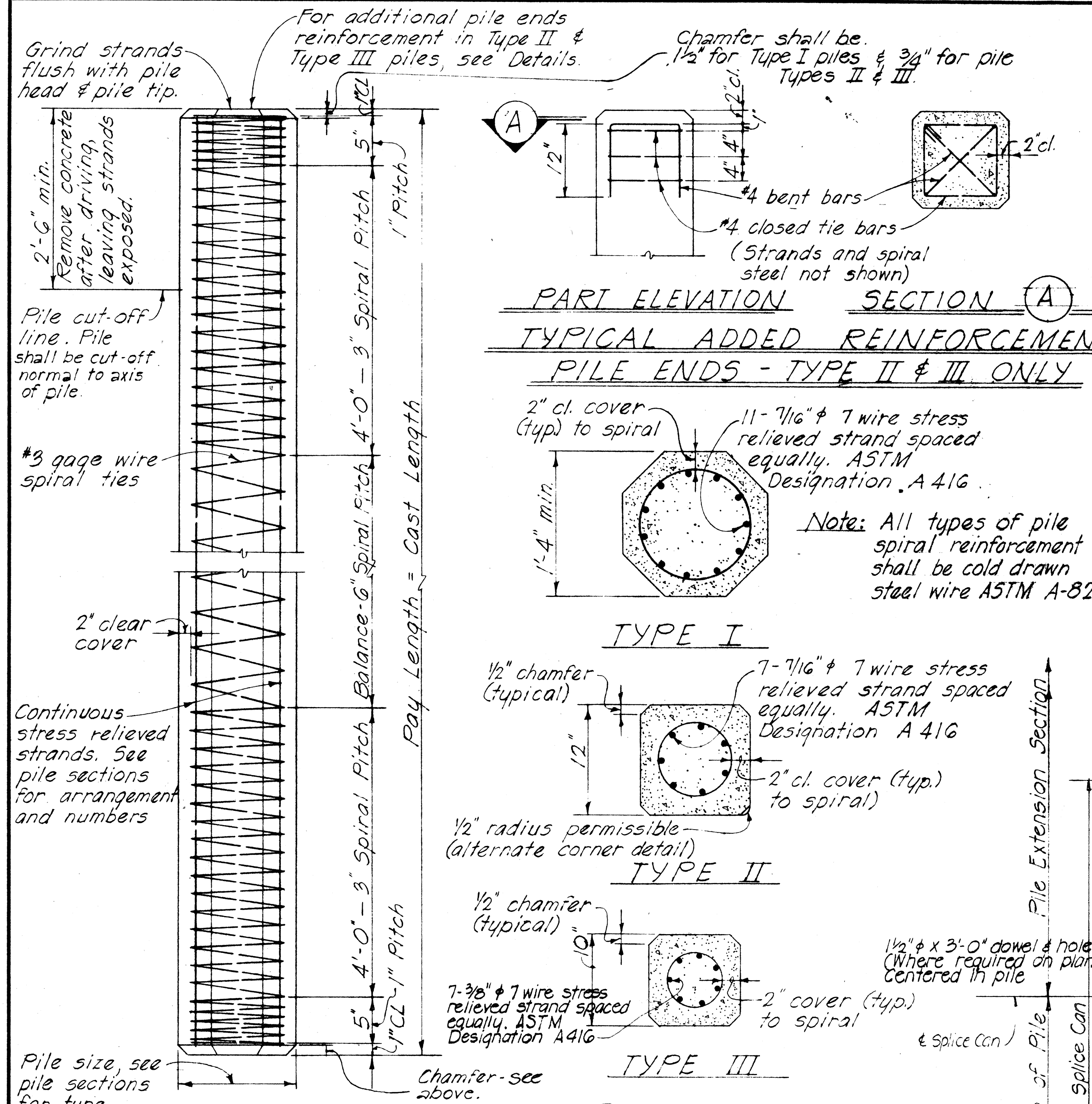
SHEET No. 2 OF 5 SHEETS

NOTES

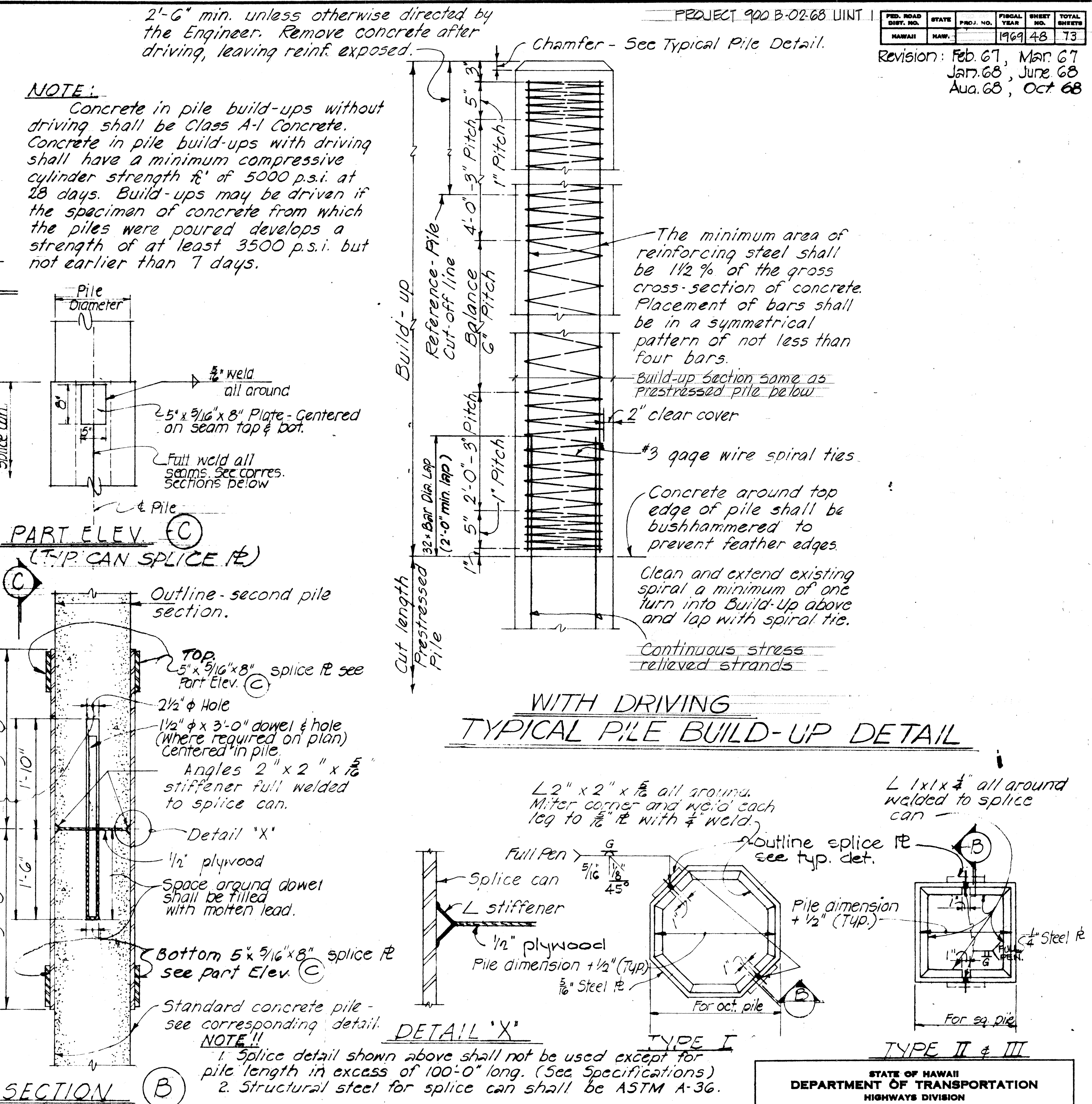
- ① All Anchor Bolts shall be High Strenght bolts conforming to the requirements of ASTM A-325.
- ② All Shoe assembly, including anchor bolts, nuts and washers, shall be galvanized.
- ③ Special End Shoe shall be fabricated from 10 gage steel conforming to the requirements of AASHTO 180
- ④ First Guard Rail Panel adjoining "Special End Shoe" shall be of galvanized steel. See Special Provisions for requirements.
- ⑤ Anchor Bolt length given from under bolt head.

Notes:

1. Place name of structure as shown.
For location, see "Plan" on Contract Drawing
2. Date shown will be year structure is completed.
3. Letter size and detail see "Standard Bridge Details".

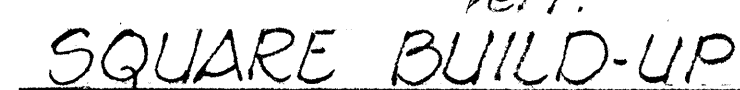


NOTE: Unless special lifting devices are attached for pick-up points, pick-up points shall be plainly marked on all piles after removal of the forms and all lifting shall be done at these points. The use of special embedded or attached lifting devices, the employment of other pick-up points or any other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



PROJECT 900 B-02-68 UNIT

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



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 B

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

**STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION**

STANDARD DETAILS

PRESTRESSED CONCRETE PILES

Oct. 1968

SHEET No. 4 OF 5 SHEETS

REVISION

Jan. '67
Feb. '67
Apr. '67
June '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 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.

END POST
GROOVE DETAIL
Scale: 3"=1'-0"

Waterstop to have 5 or more pairs of raised ribs to provide 0.1 sq. in. min. rib cross-section area on each half of the waterstop. Height of ribs to be 3/32" min.

Nailing Strip:
Nail or staple to form or premolded joint filler.

Holes will be permitted in the outer 1/2" of the web for wires, rings, etc. Tie web to #3 reinforcing bars at 12" max. intervals to support the waterstop in proper position during concrete placement. Alternative detail may be submitted for approval of the Engineer.

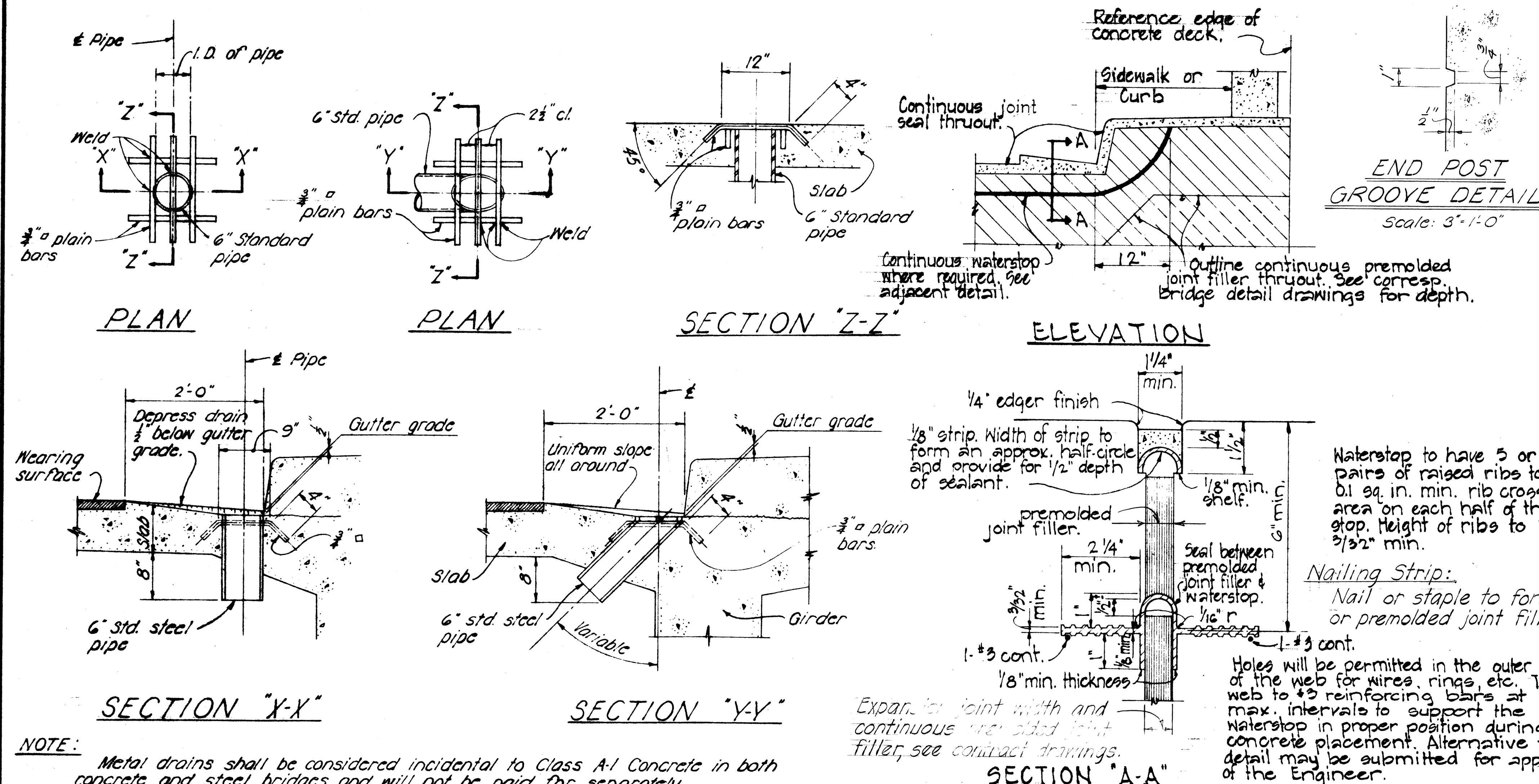
SECTION "A-A"
TYPICAL EXPANSION JOINT DETAIL

- 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 1/4 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.
- Gothic letters and figures approximating dimensions shown will be acceptable if approved by the Engineer.

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

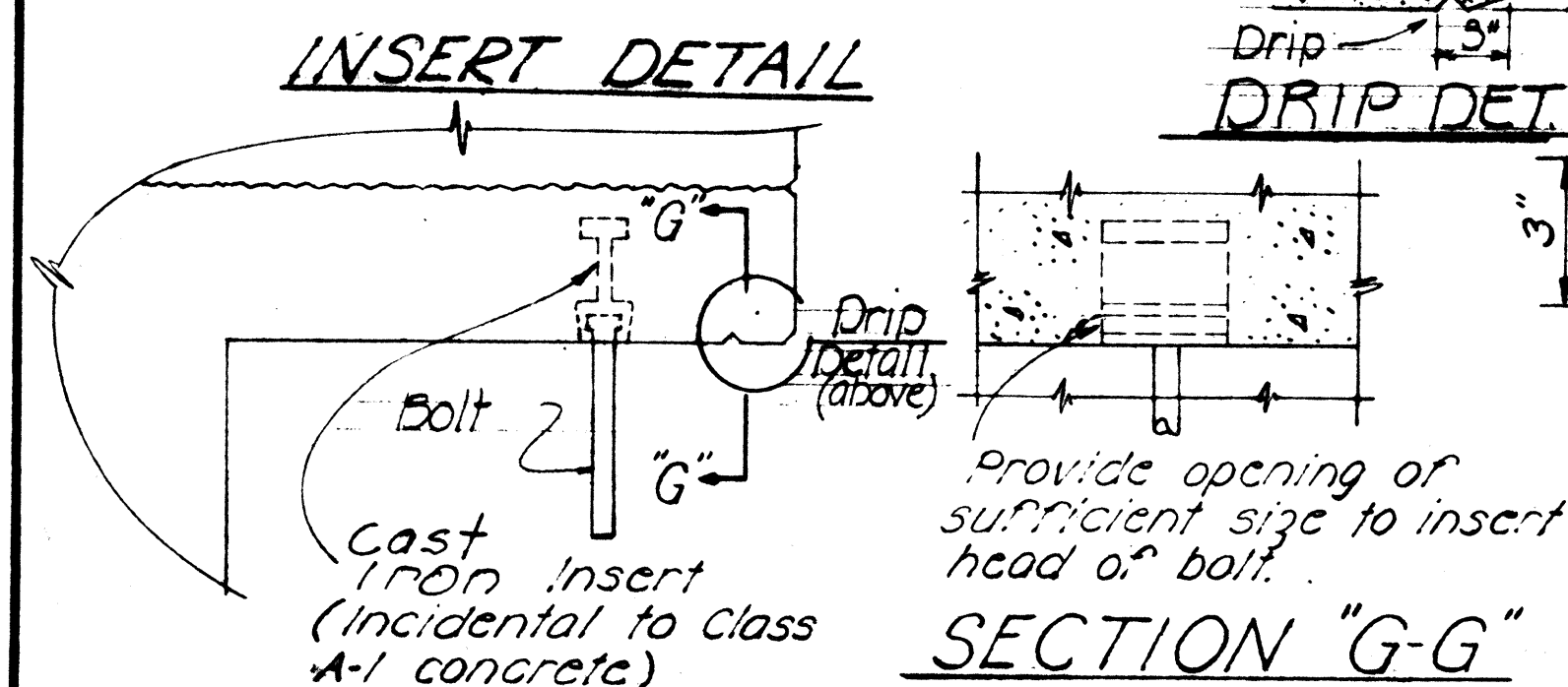
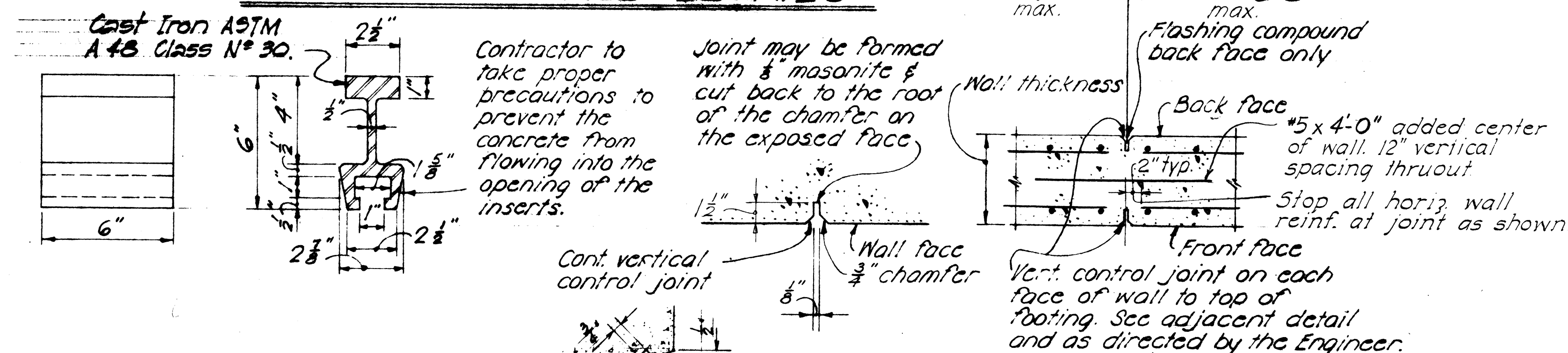
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD BRIDGE DETAILS

Scale as Noted Date:
SHEET No. 5 OF 5 SHEETS

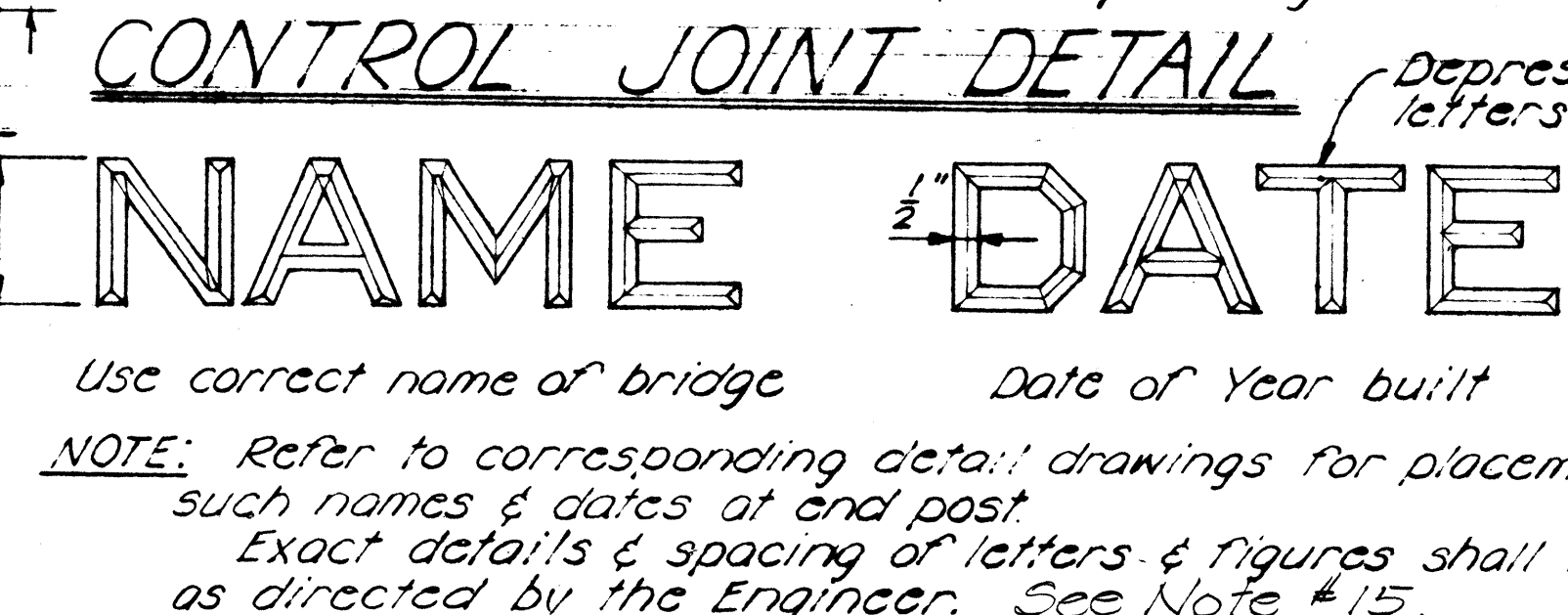


NOTE:
Metal drains shall be considered incidental to Class A-1 Concrete in both concrete and steel bridges and will not be paid for separately. Assembly of grillage and pipe shall be hot-dip galvanized after all welding is completed.

TYPICAL DRAINAGE DETAILS



SECTION "G-G"



TYPICAL EXCAVATION FOR CONTINUOUS FOOTING STEP-UP

DETAIL of PIPE HANGERS & INSERTS