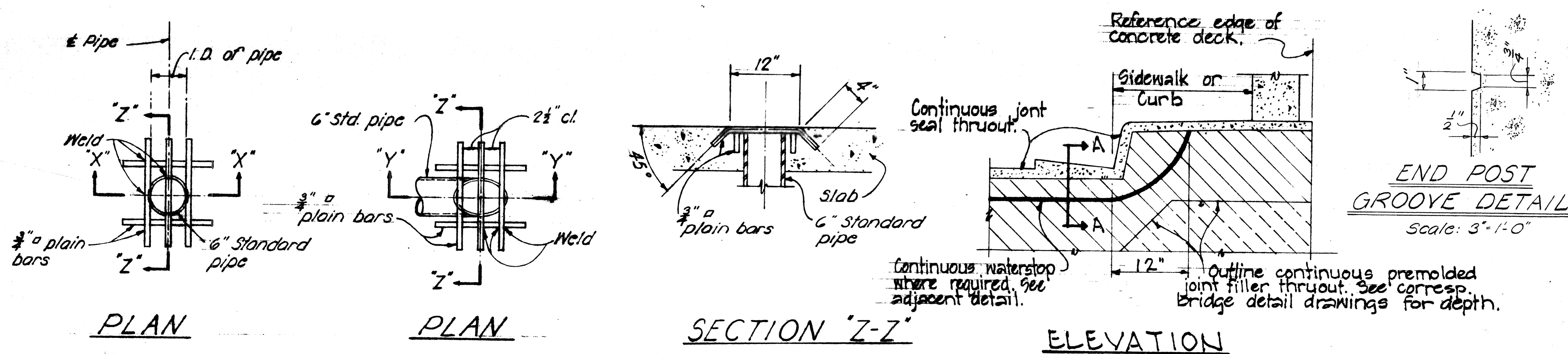


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	S-0130(7)	1967	29	53

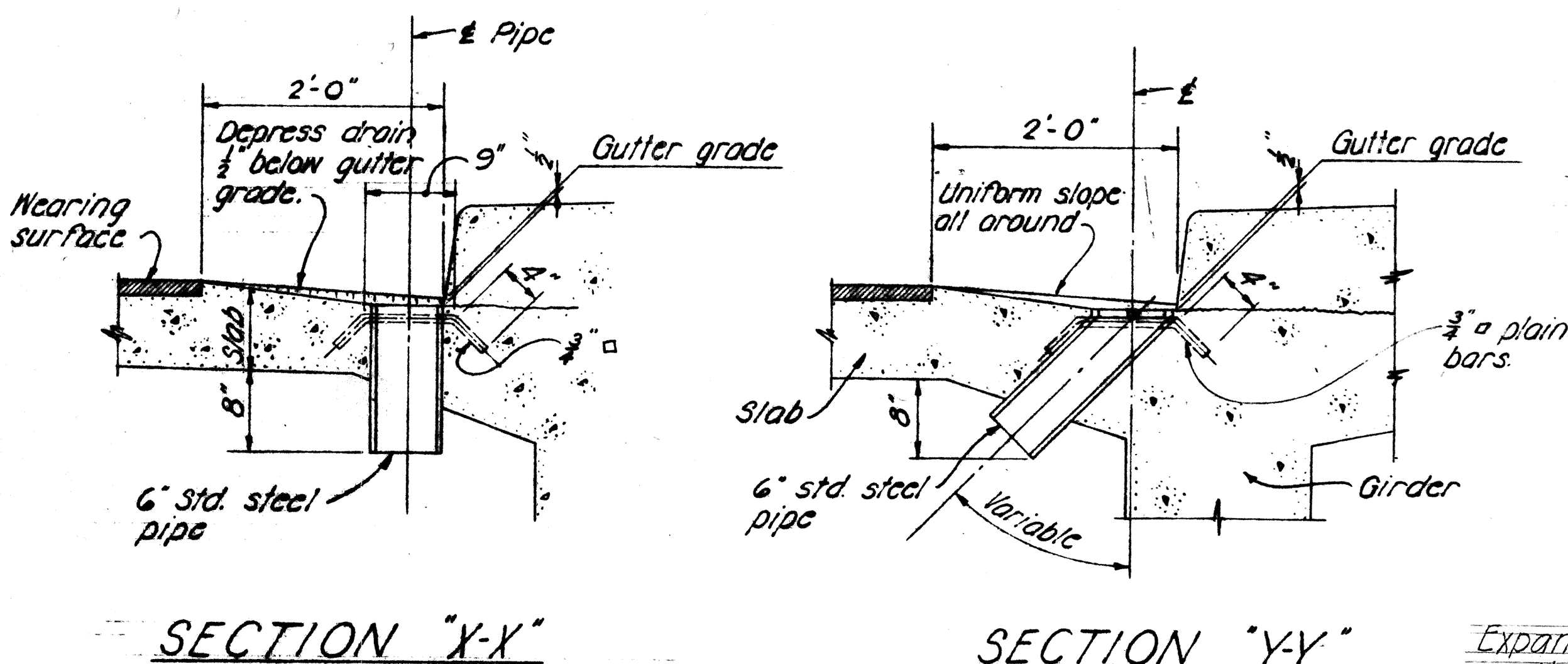
REVISIONS: Jan. '67
Feb. '67
Apr. '67



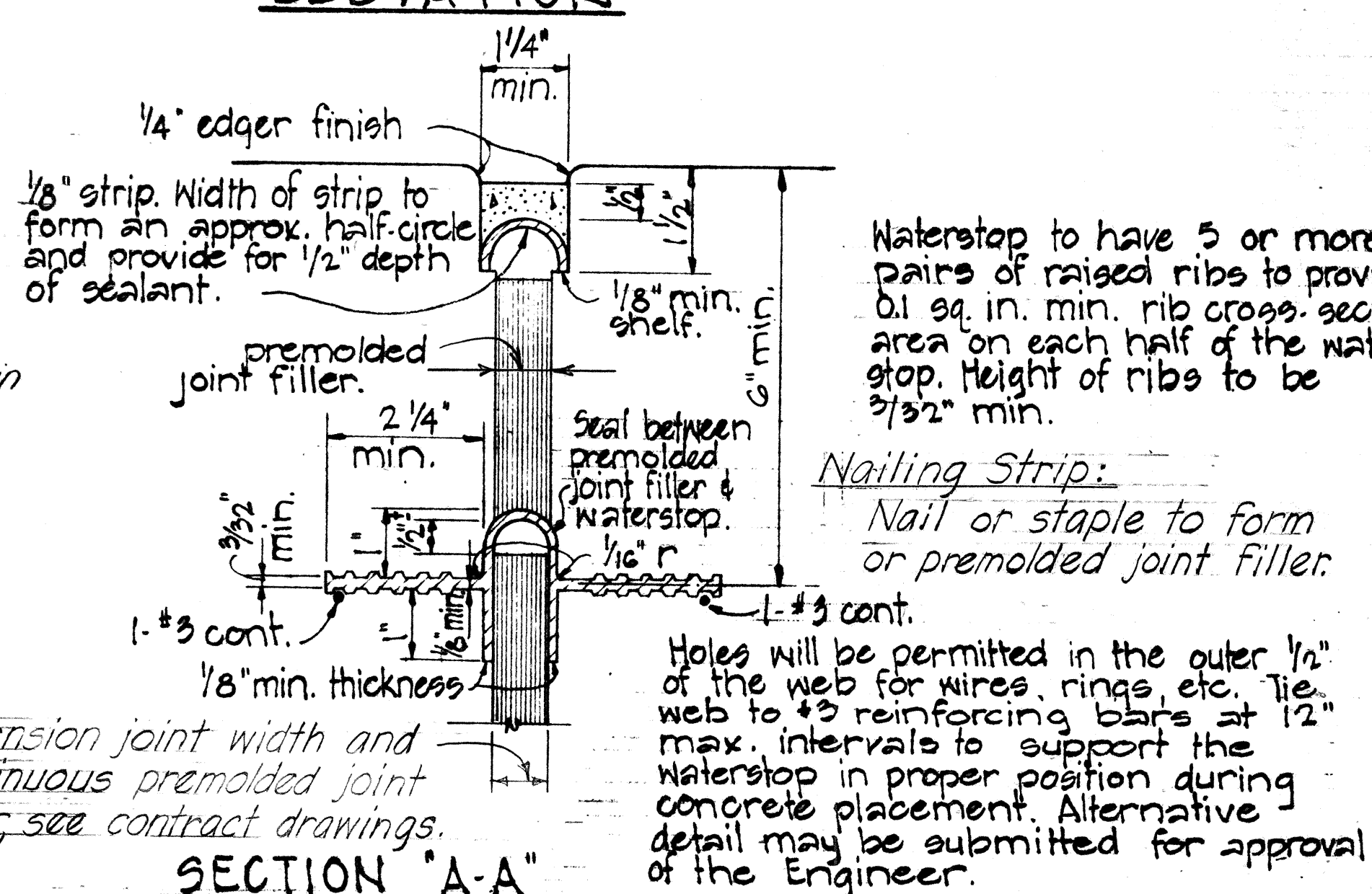
GENERAL NOTES

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.

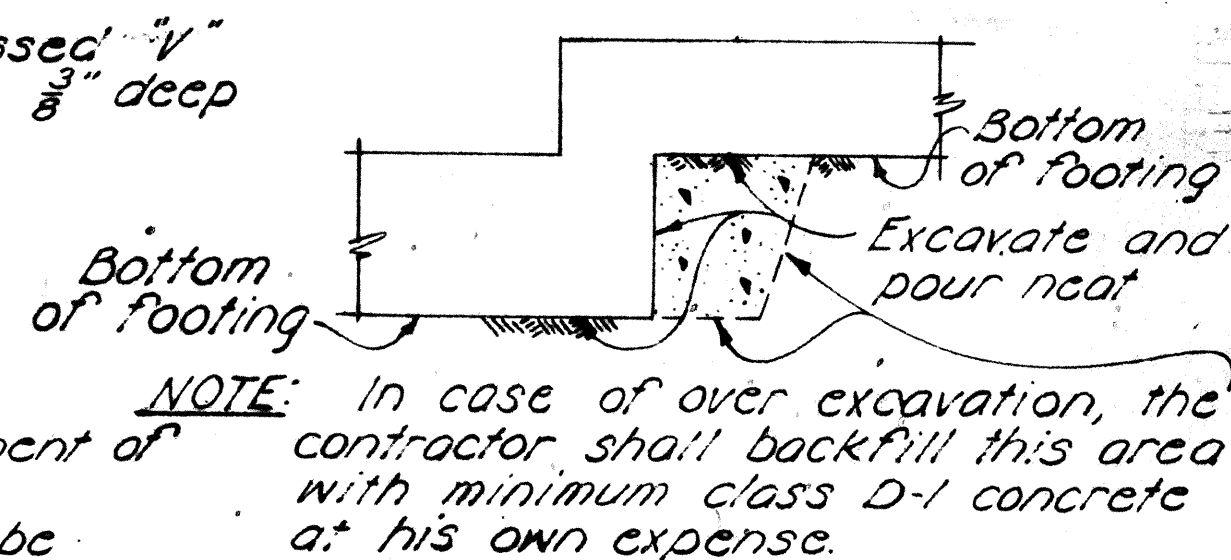
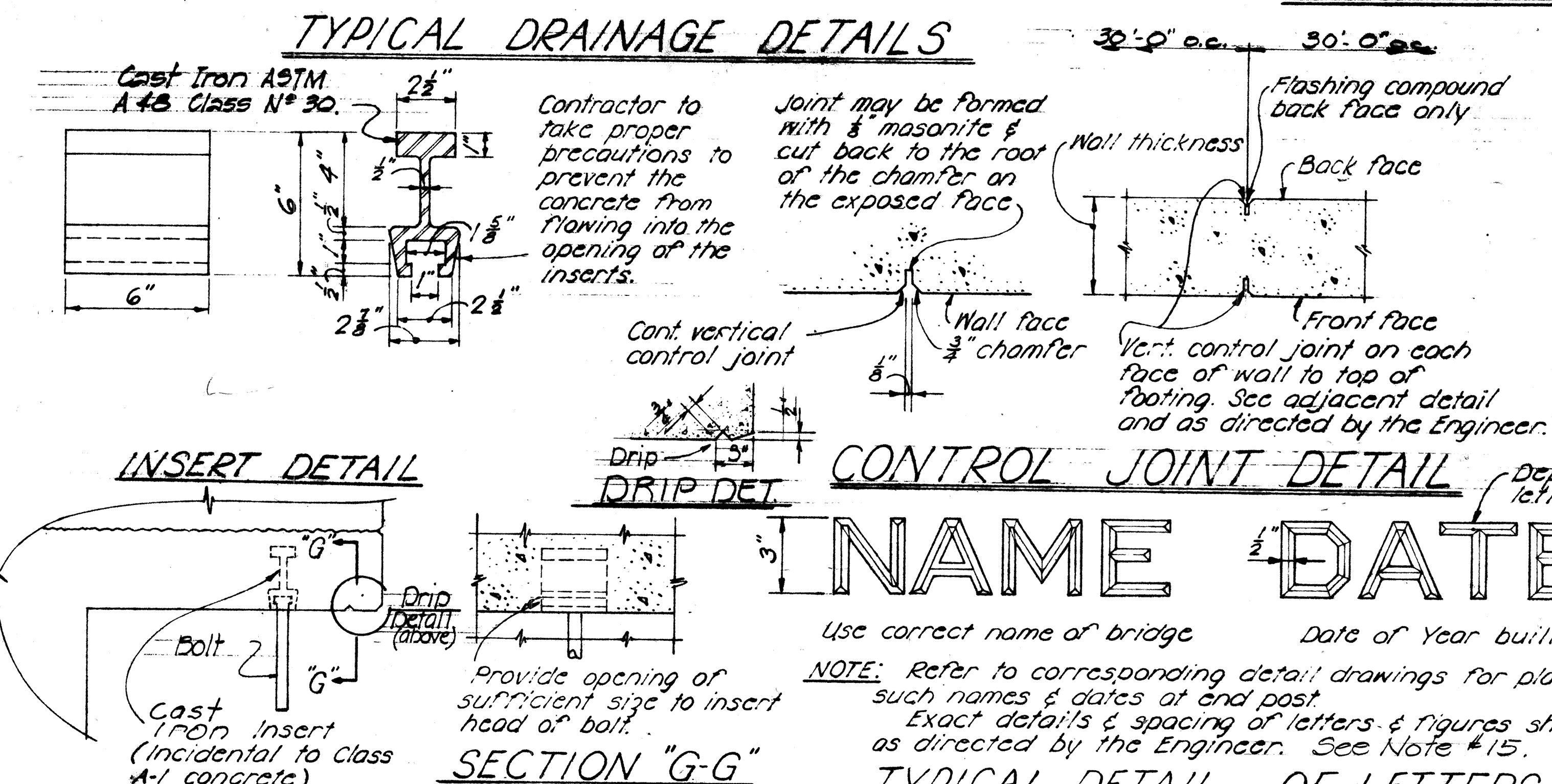
- The Contractor shall verify the location of all existing utility lines and notify the respective owners before commencing work of excavation.
- All concrete shall be Class A-1 unless otherwise noted.
- Clearance for reinforcing bars shall be as follows, unless otherwise noted:
 - 1" For stirrups of 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.



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.



- 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 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.
- 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. 51 OF 5 SHEETS

Technical drawing of a 30-degree cone. The drawing shows a side view of the cone with a 30-degree angle indicated. Dimensions include a total height of $2\frac{1}{2}"$, a base diameter of $2\frac{1}{8}"$, and a top radius of $1\frac{19}{32}" R + \frac{3}{32}" - 0$. The cone is labeled as $3\frac{1}{2}" \phi$ Tube .156" wall.

$1\frac{1}{2}''$ (Ref.) $\pm 5^\circ$ Diff. P/S
4 slots

SIDE ELEVATION ASSEMBLAGE

ANCHOR BOLT

Scale: 3" = 1'-0"

All Draft angles 3°

Scale: 6" = 1'-0"

Technical drawing of a Toggle Bolt. The drawing shows a side view of the bolt with various dimensions and labels. The material is specified as C.R. steel, heat treated ASTM A195. The dimensions are as follows:

- Total length: $3 \frac{13}{32}$ "
- Thread length: $1 \frac{5}{8}$ "
- Flat Surface length: $1 \frac{41}{64}$ "
- Toggle length: $2 \frac{1}{8}$ "
- Toggle diameter: $\phi 1/8$
- Toggle hole diameter: $\phi 1/8$
- Toggle hole depth: $2 \frac{1}{8}$ "

$\frac{1}{2}$ " ϕ TOGGLE BOLT DETAIL
Scale: 3" = 1'-0"

END ELEVATION

Scale: 6" = 1'-0"

$1\frac{1}{16} \times \frac{25}{32} + \frac{1}{16}$
core 4 slots

Scale: 6" = 1'-0"

$1\frac{1}{16}'' \times \frac{25}{32}'' + 10$
core 4 slots

Scale: 6" = 1'-0"

Scale: 6" = 1'-0"

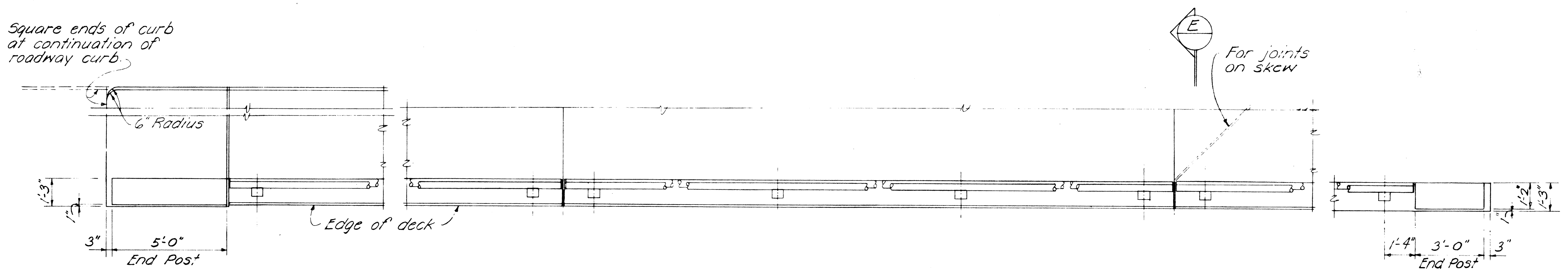
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
METAL BRIDGE RAILING
DOUBLE RAIL COMBINATION TYPE
ON PARAPET

SHEET No. 52 OF 5 SHEETS

30

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	9-0190(7)	1967	31	53



AT BRIDGE END POST

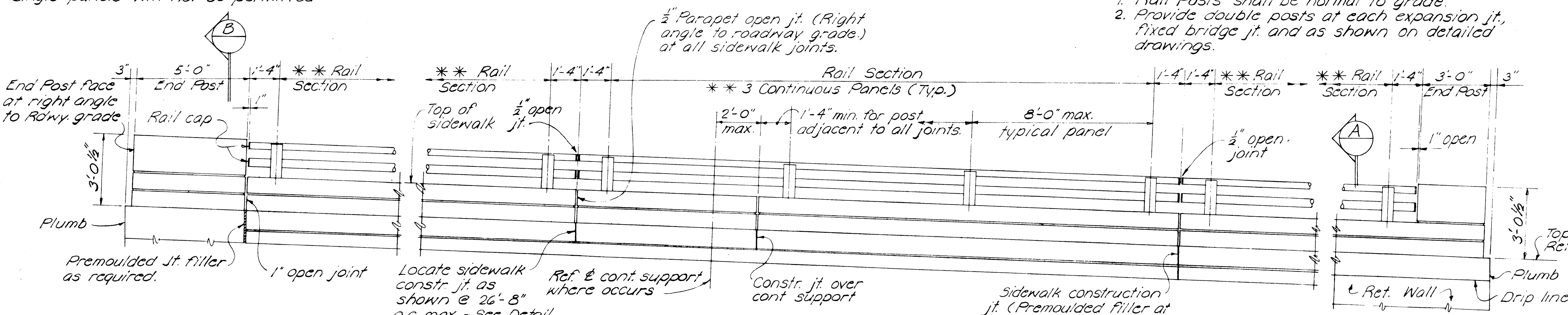
INTERMEDIATE

AT RETAINING WALL OR WING WALL END POST

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

**** NOTE !!**
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.

- NOTES !!**
1. Rail Posts shall be normal to grade.
 2. Provide double posts at each expansion jt., fixed bridge jt. and as shown on detailed drawings.

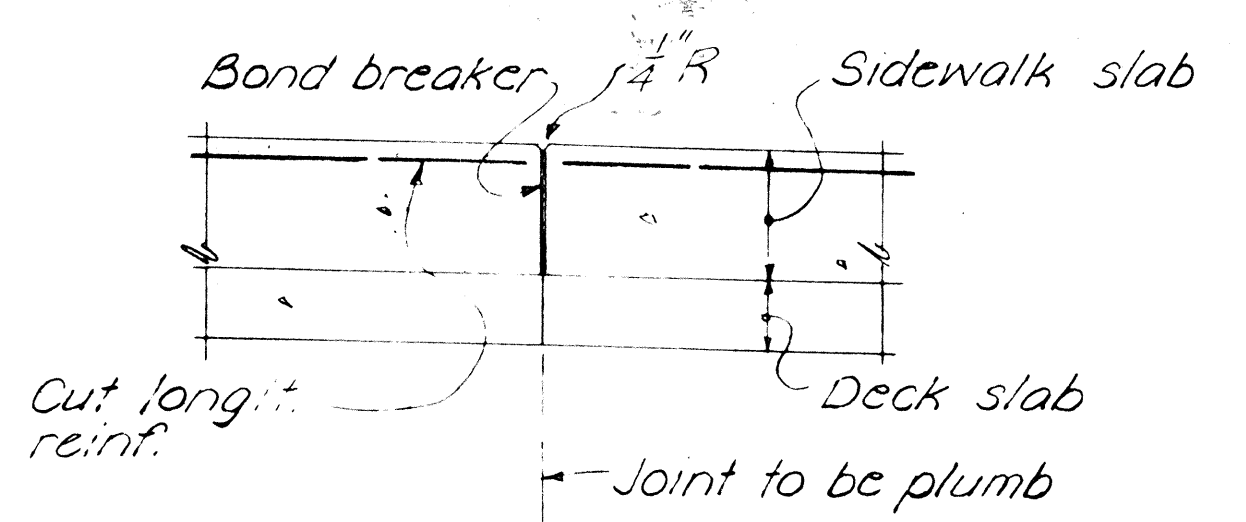


AT BRIDGE END POST

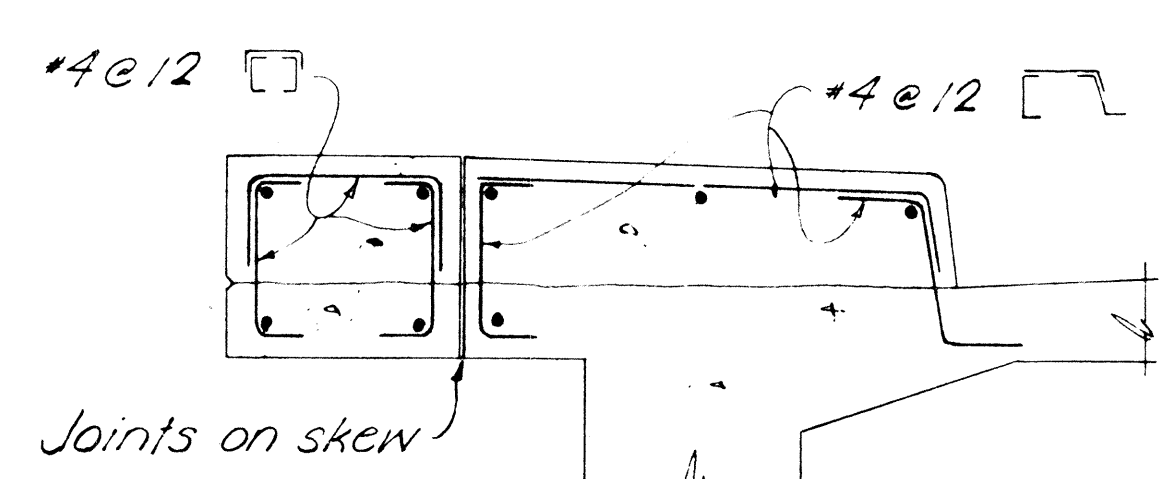
INTERMEDIATE

AT RETAINING WALL OR WING WALL END POST

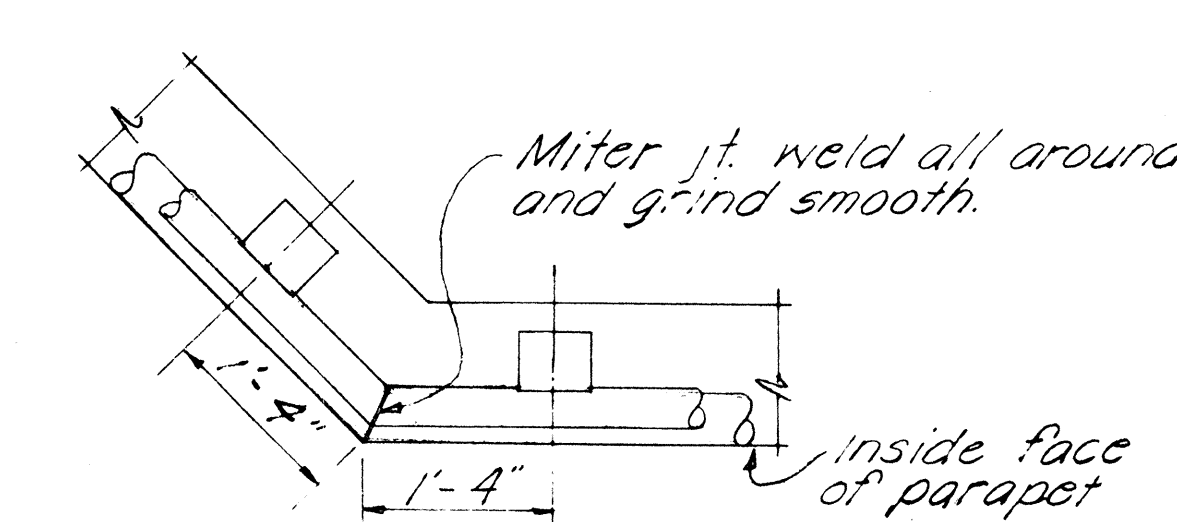
RAILING SECTION Scale: 3/8" = 1'-0"



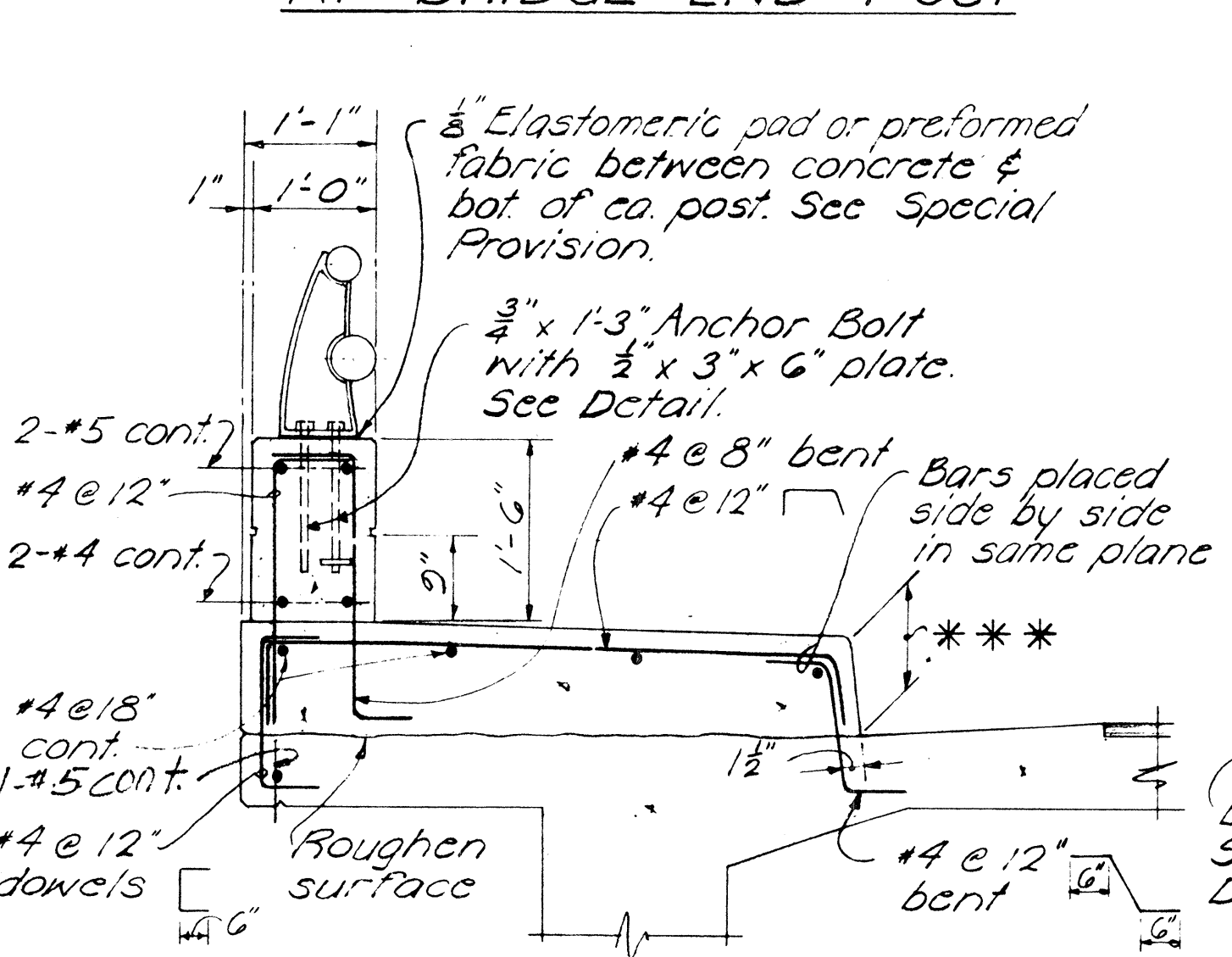
SIDEWALK CONSTRUCTION JOINT DETAIL Scale: 3/8" = 1'-0"



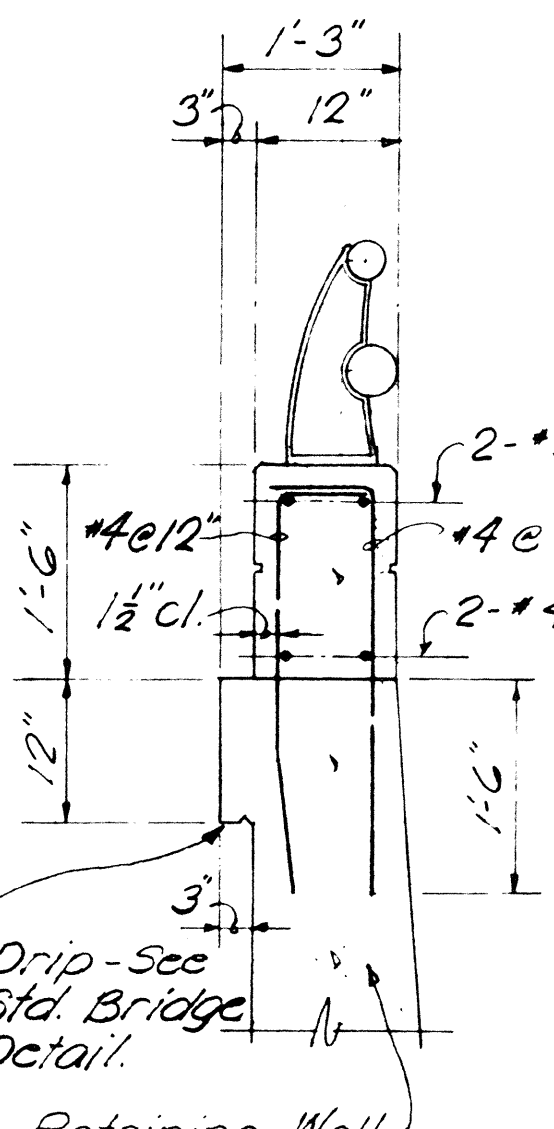
SECTION E AT SKEW Scale: 3/8" = 1'-0"



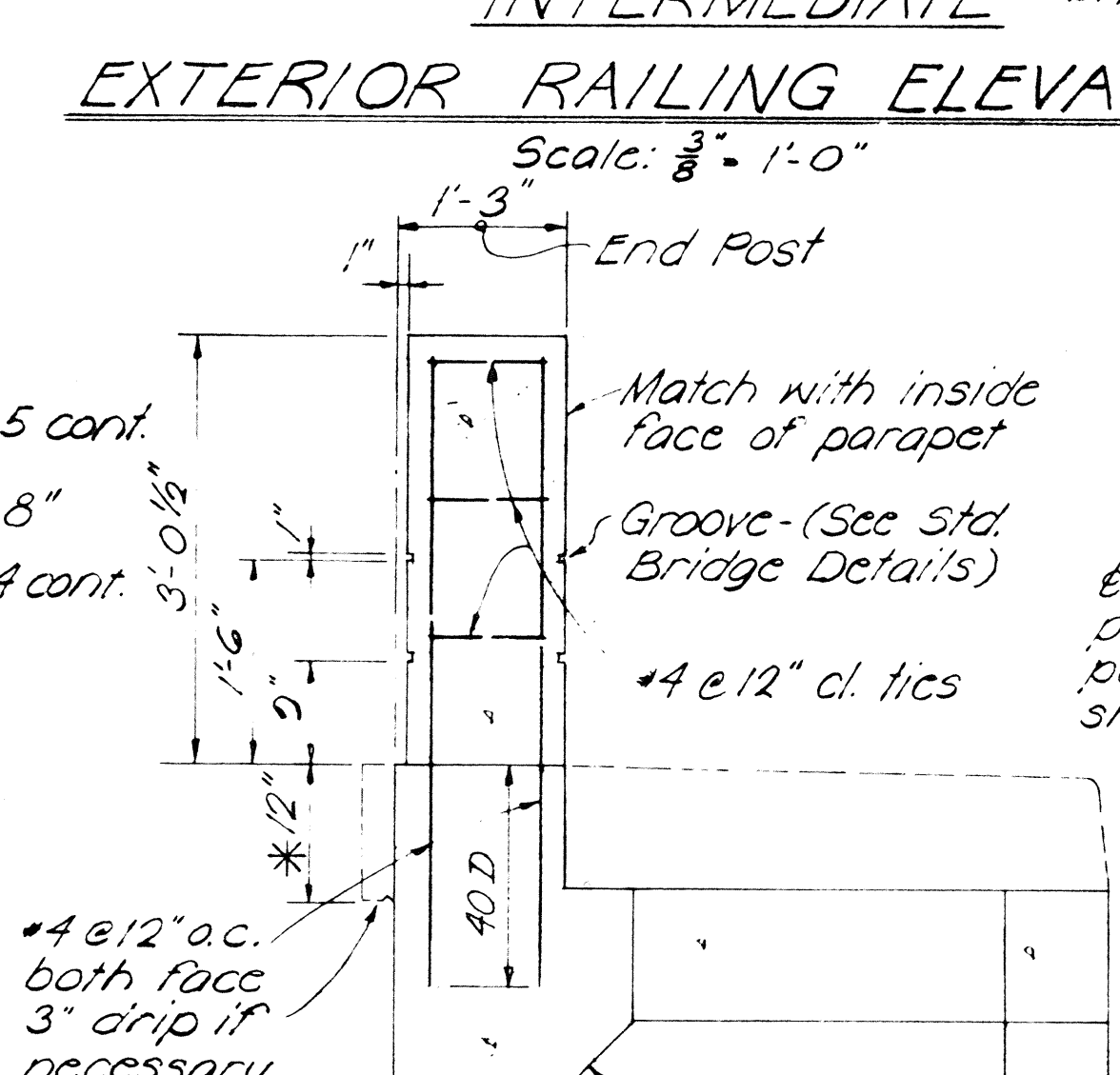
PLAN TREATMENT OF RAILING AT SKEWED ENDS Scale: 3/8" = 1'-0"



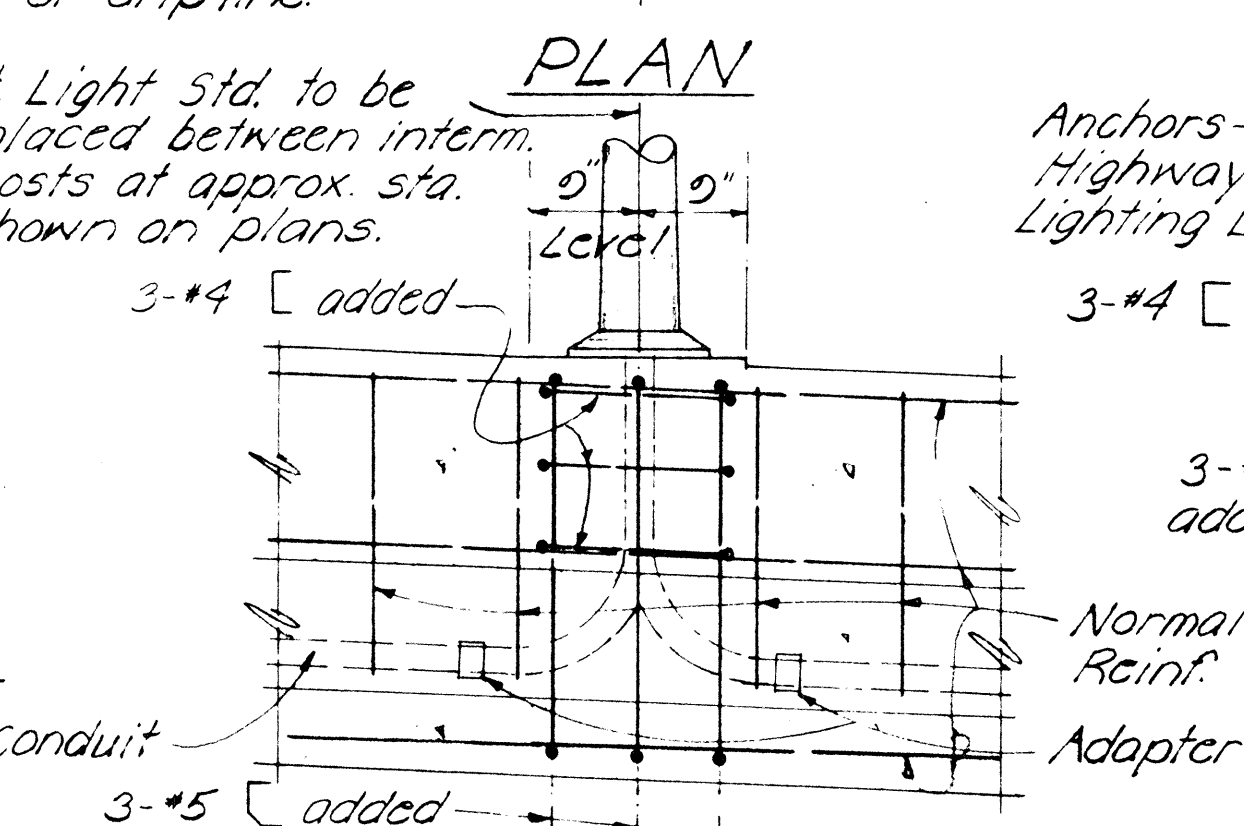
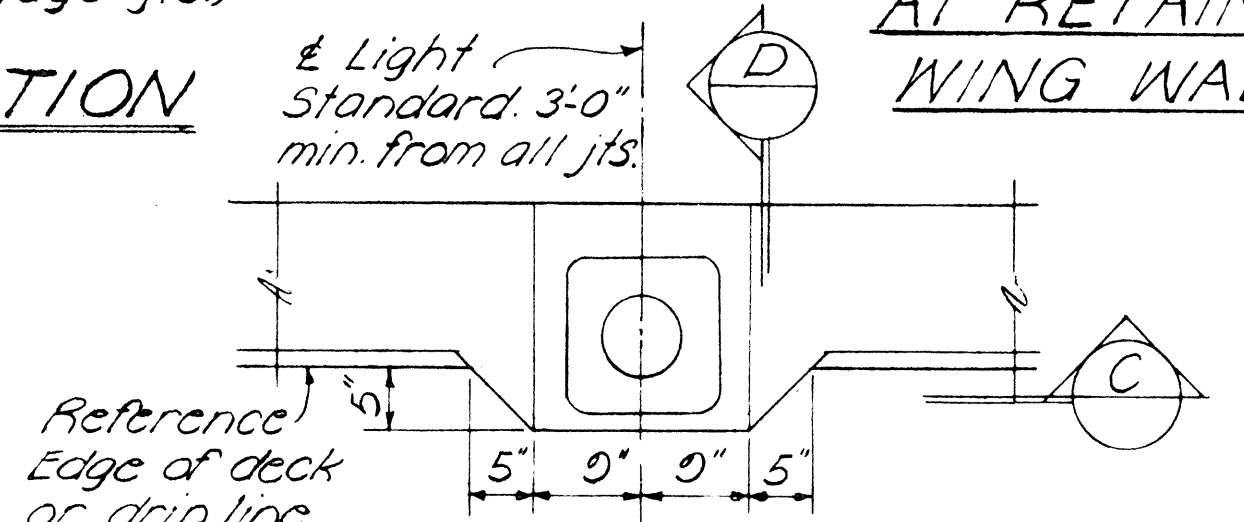
TYPICAL SECTION Scale: 3/8" = 1'-0"



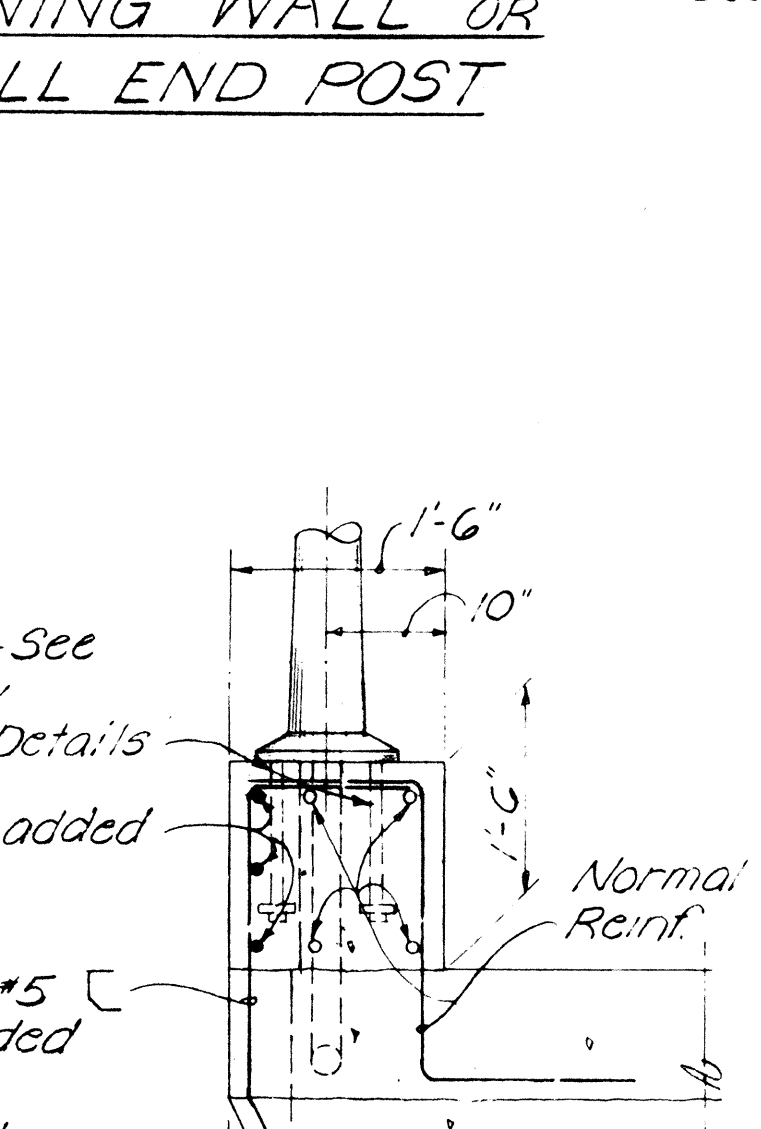
SECTION A Scale: 3/8" = 1'-0"



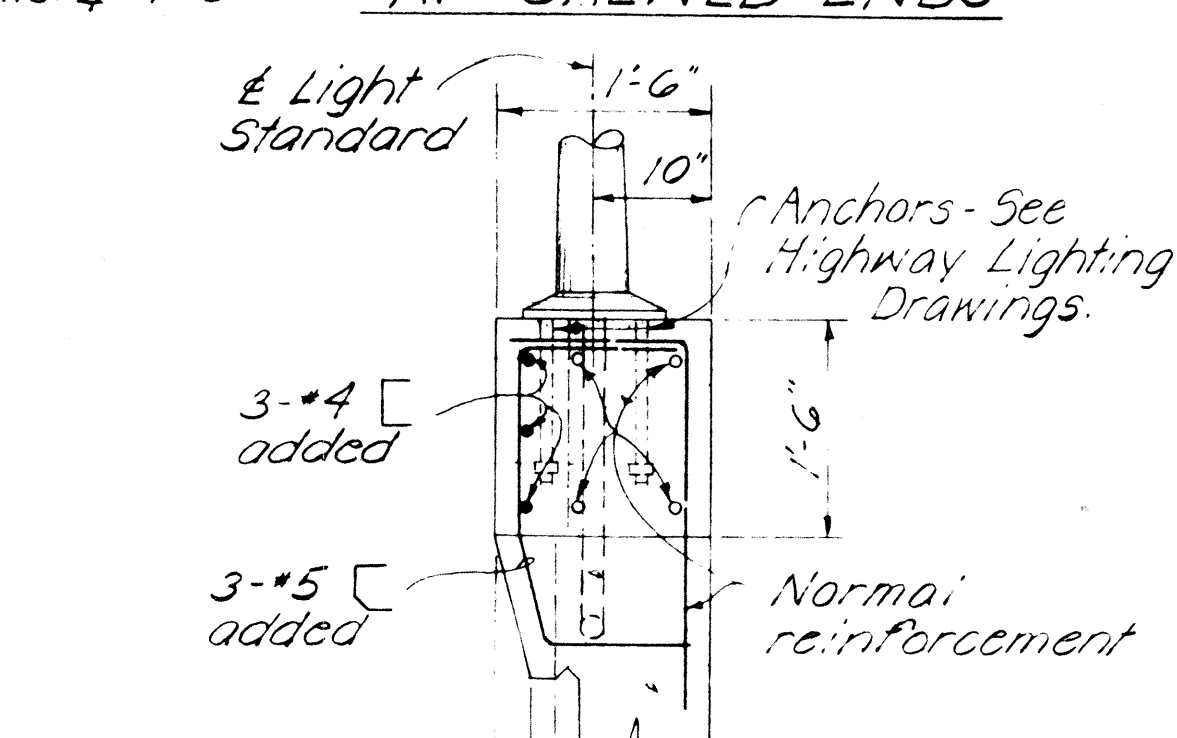
SECTION B Scale: 3/8" = 1'-0"



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



SECTION D AT BRIDGE Scale: 3/8" = 1'-0"



SECTION D AT WING WALL Scale: 3/8" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
METAL BRIDGE RAILING
DOUBLE RAIL COMBINATION TYPE
ON PARAPET

SHEET No. 33 OF 5 SHEETS

SURVEY PLOTTED BY	DATE
DESIGNED BY	
TRAINED BY	
NOTED BY	
CHECKED BY	

