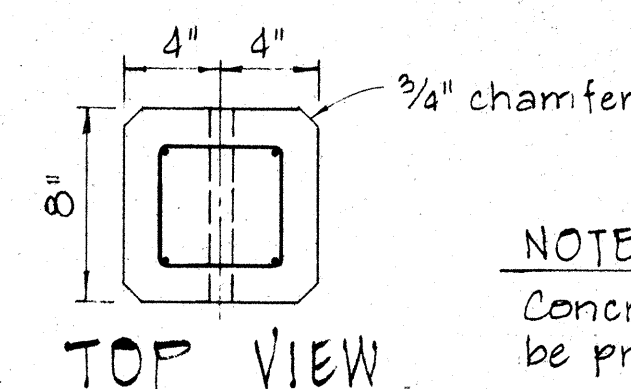
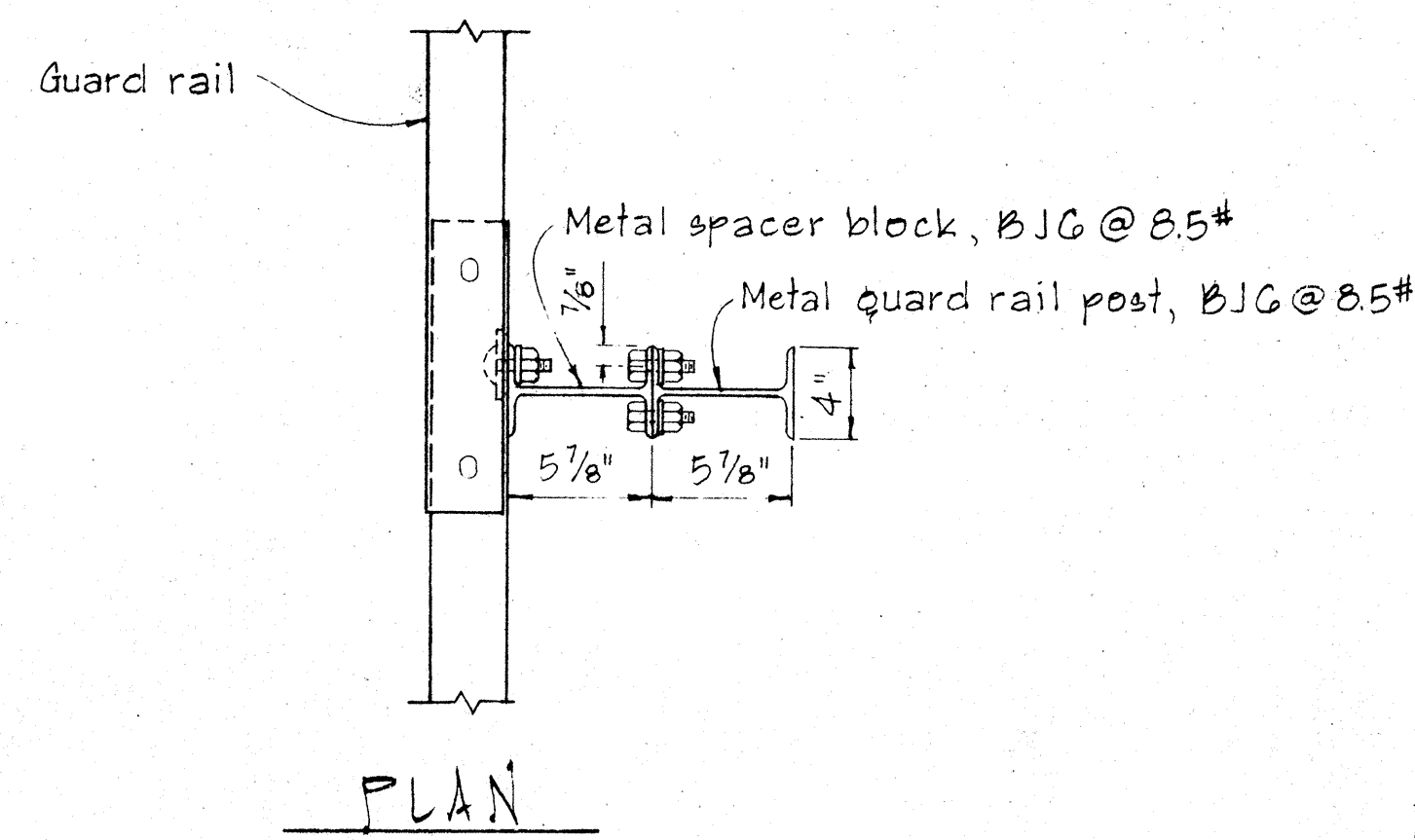
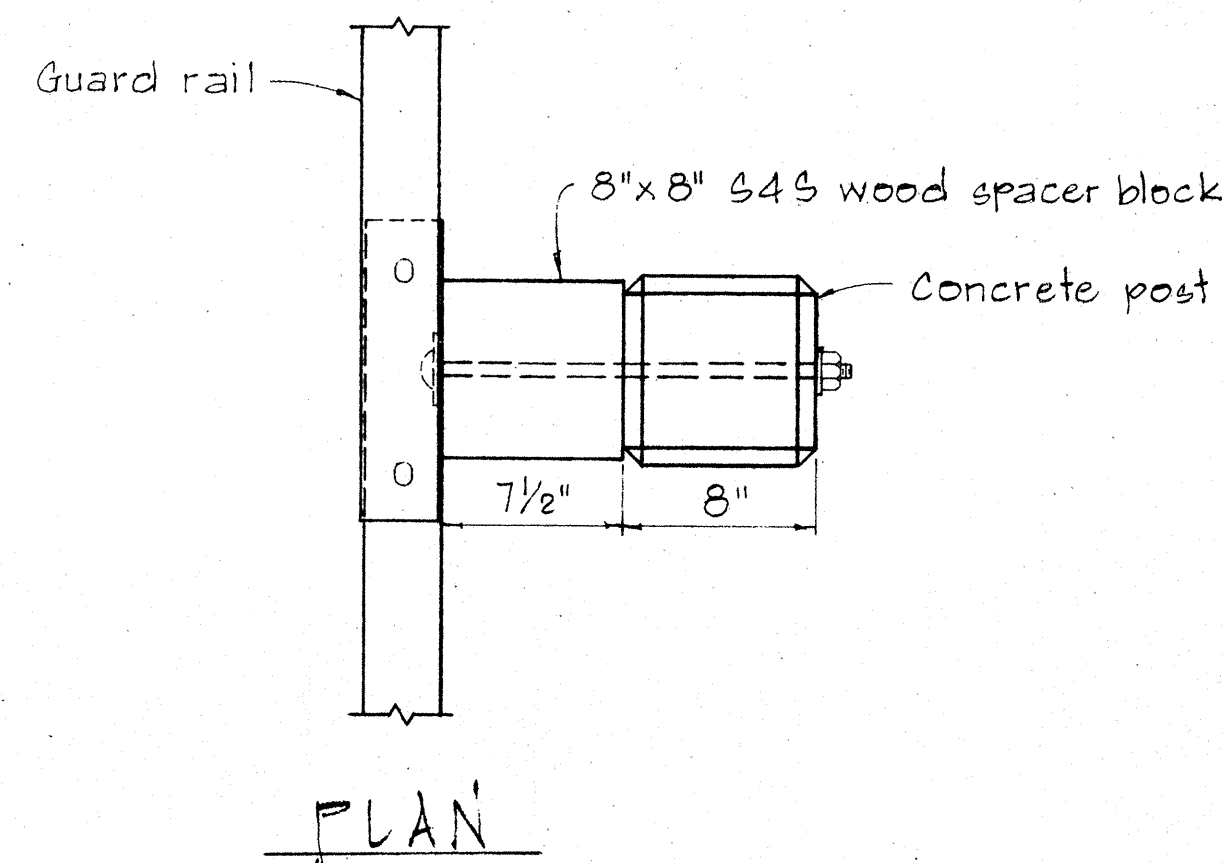
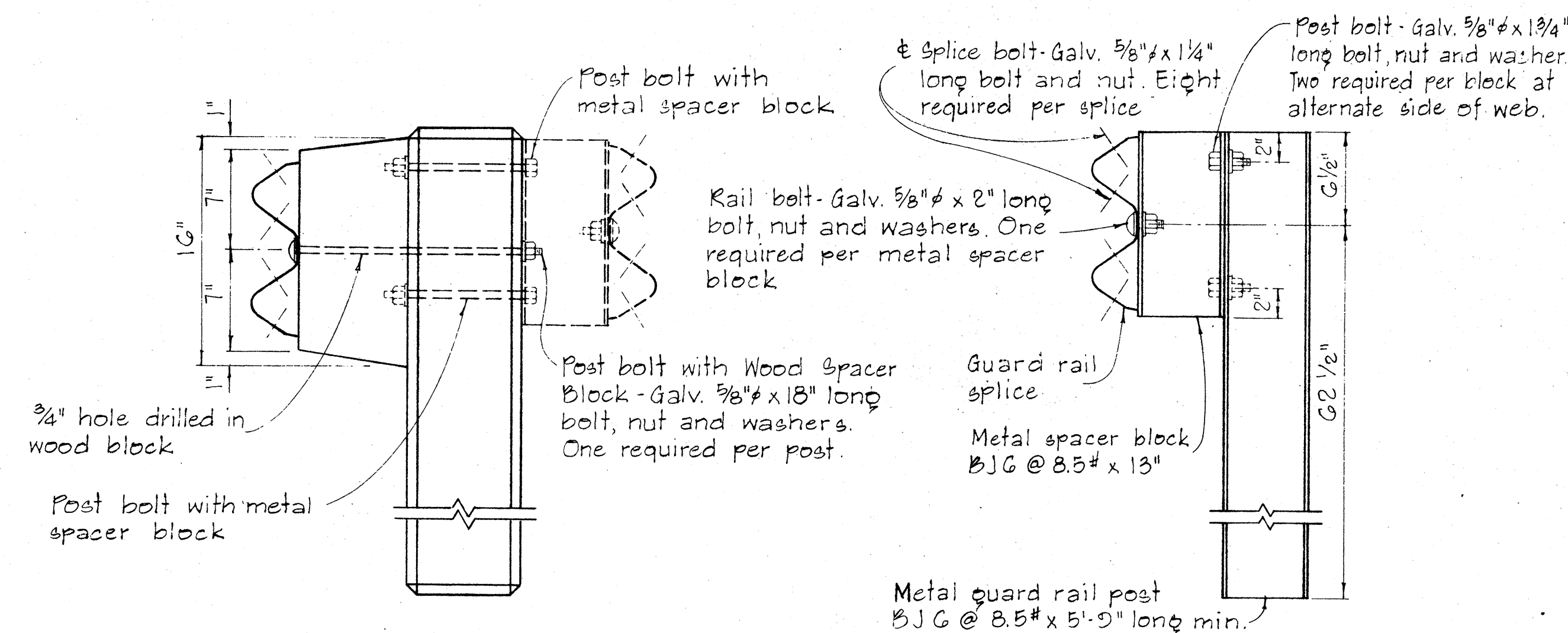
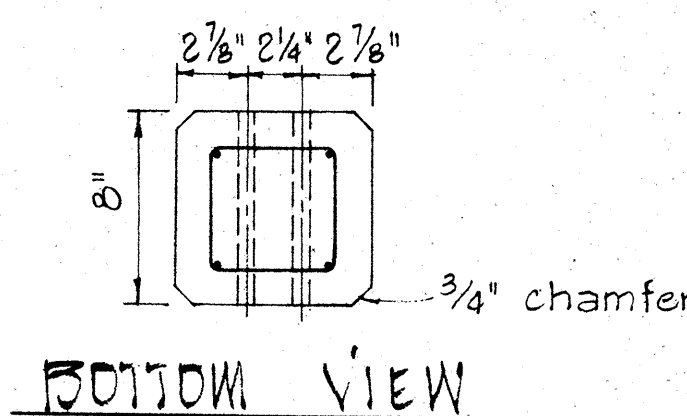
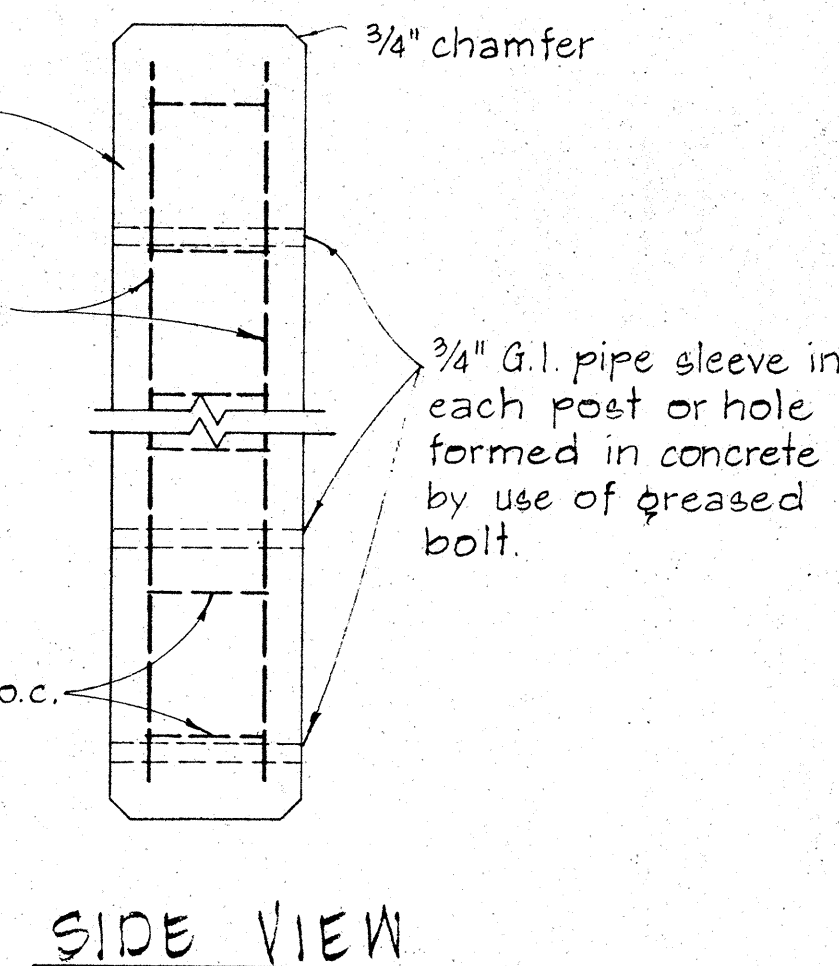
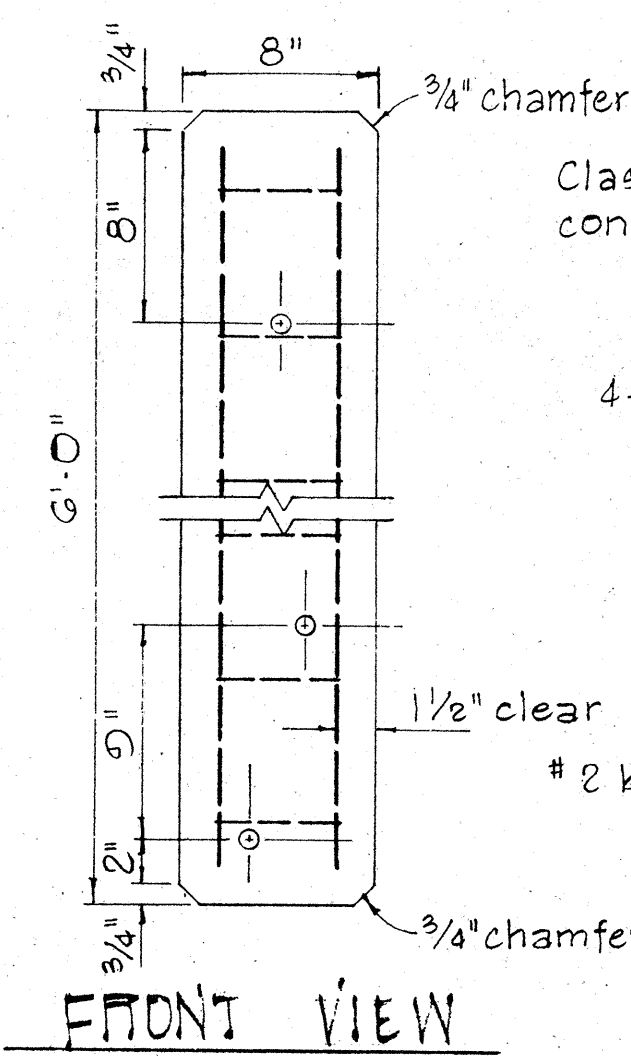


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	72A-01-71	1975	26	42

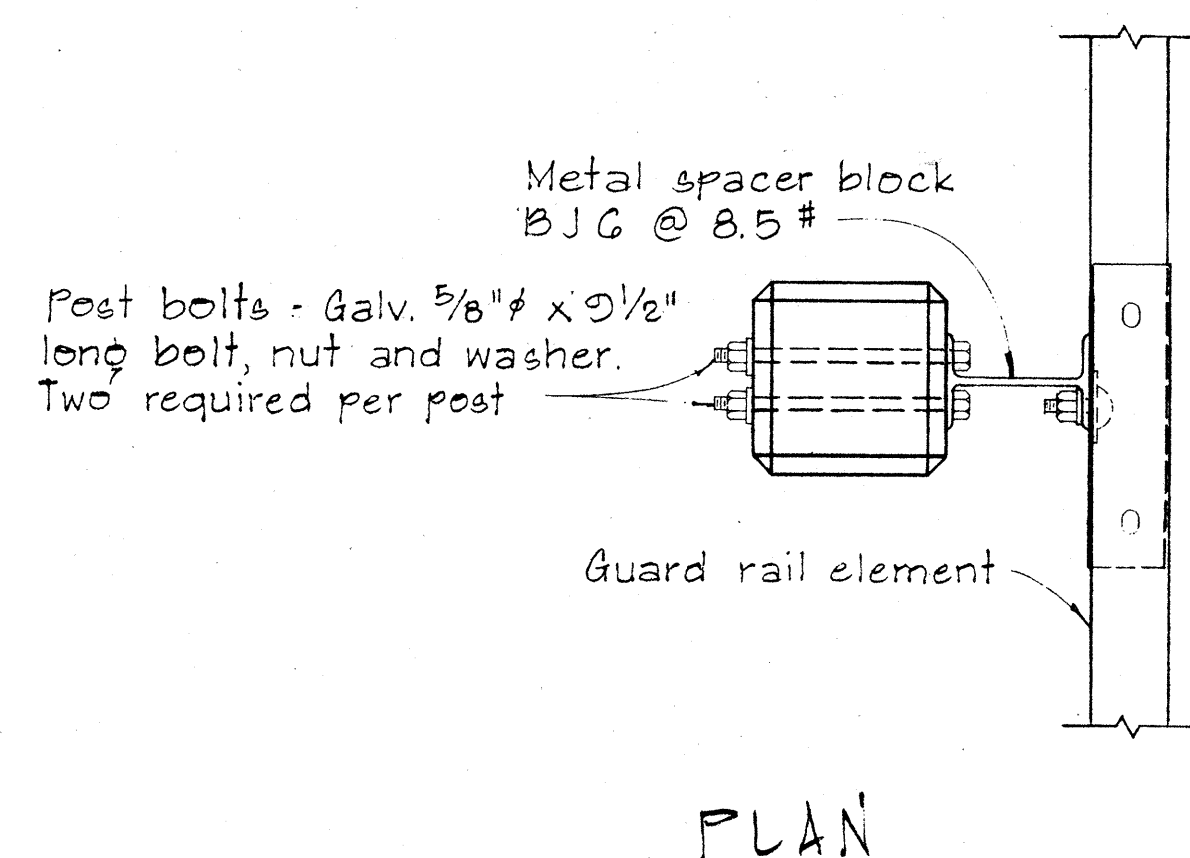


NOTE:
Concrete post shall be precast

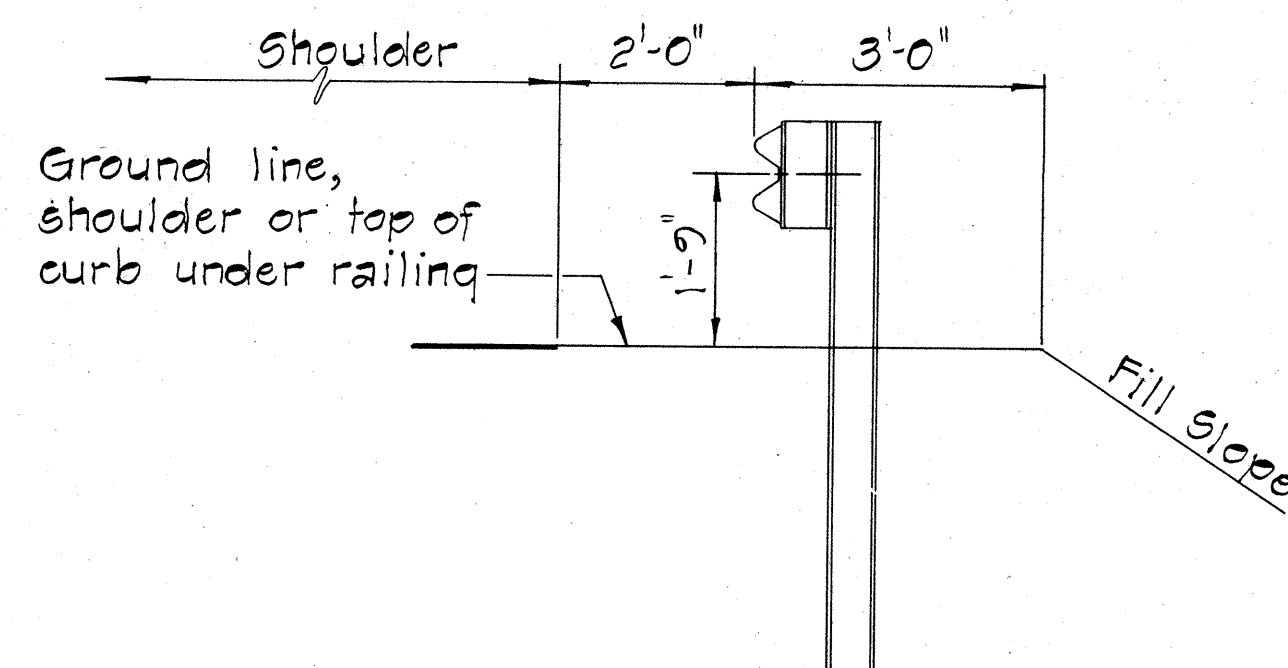


SINGLE METAL GUARD RAIL ON METAL POST WITH METAL SPACER BLOCK
SCALE: 1 1/2" = 1'-0"

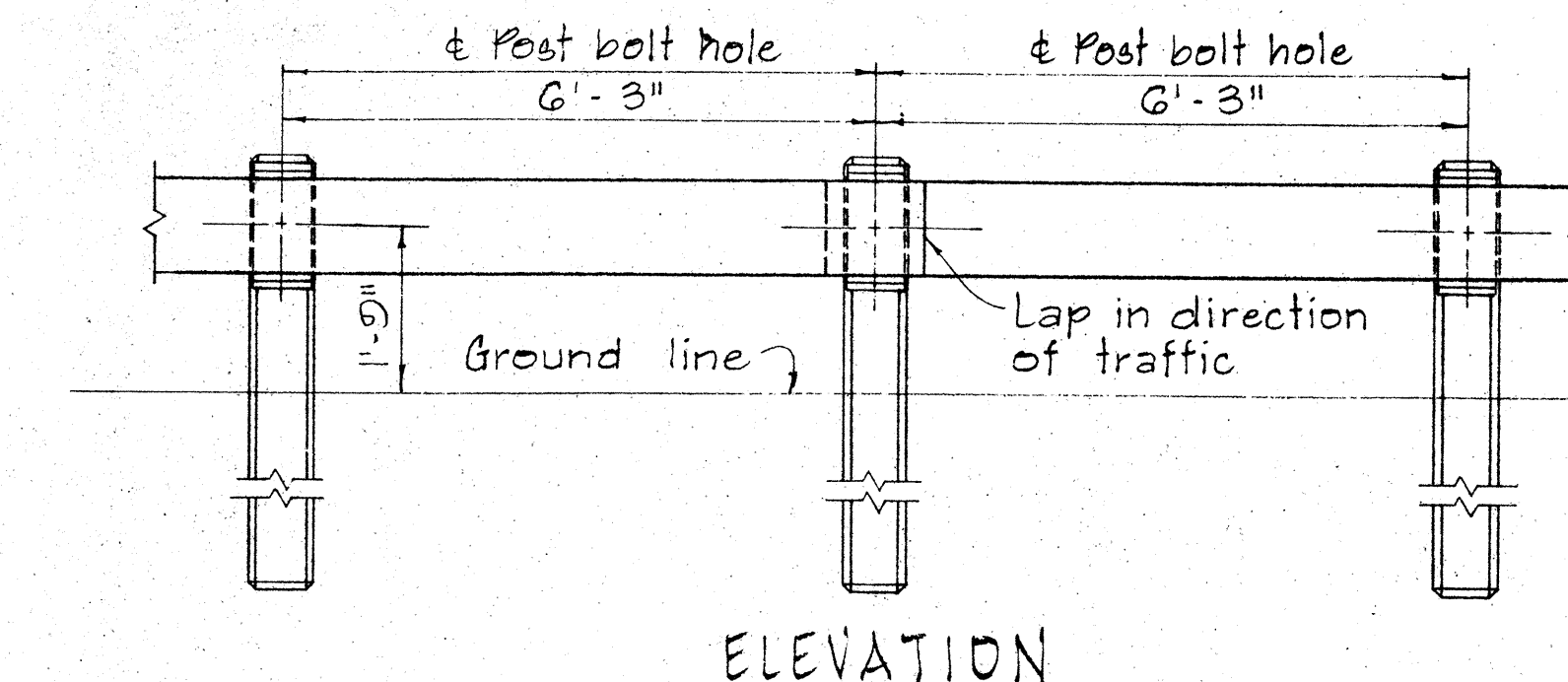
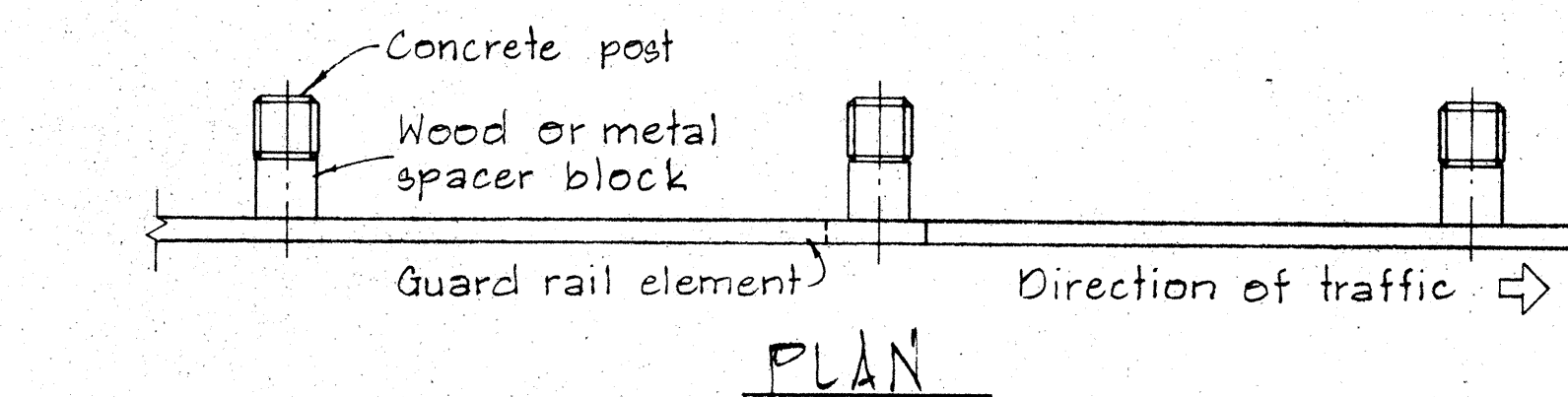
DETAIL OF CONCRETE POST
SCALE: 1 1/2" = 1'-0"



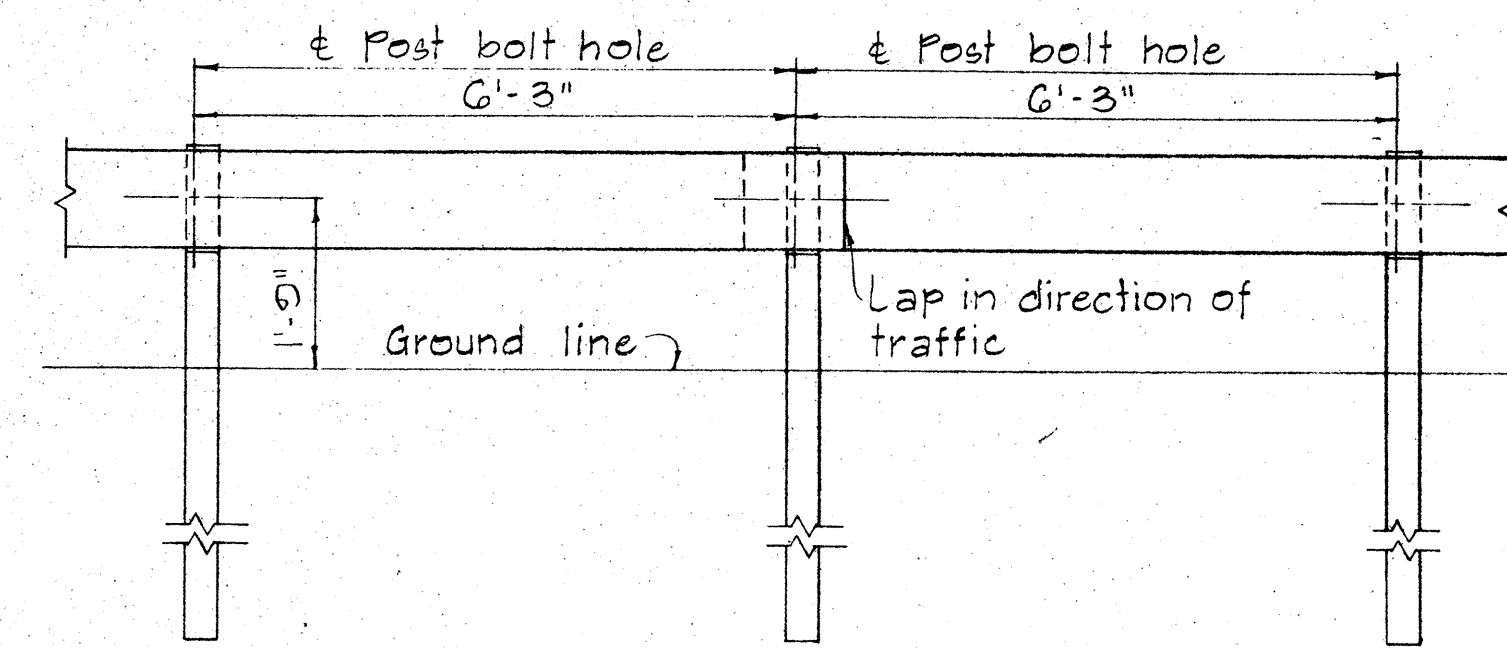
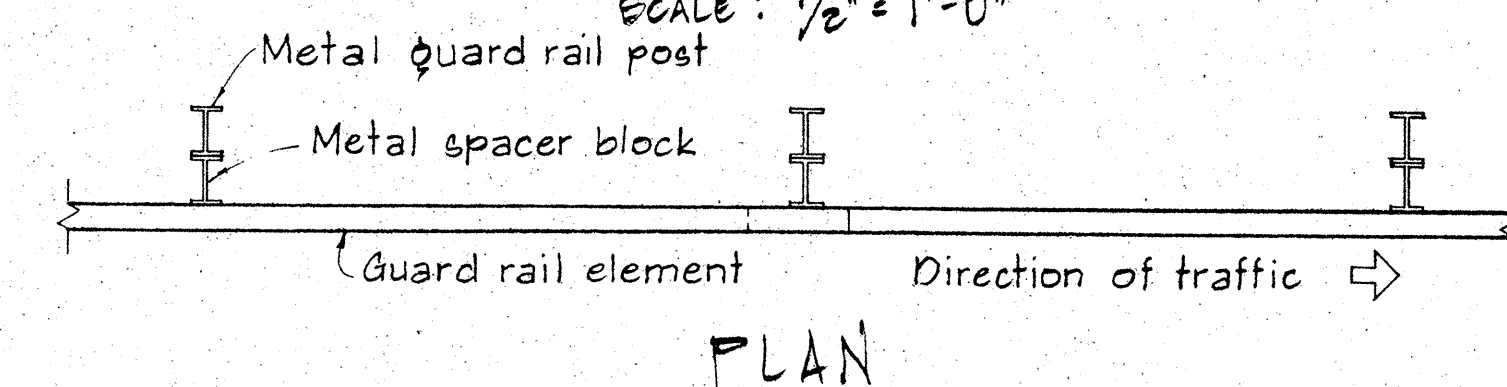
SINGLE METAL GUARD RAIL ON PRECAST CONCRETE POST WITH WOOD OR METAL SPACER BLOCK
SCALE: 1 1/2" = 1'-0"



TYPICAL METAL GUARD RAIL DETAIL
SCALE: 1/2" = 1'-0"



METAL GUARD RAIL ON CONCRETE POST WITH WOOD OR METAL SPACER BLOCK
SCALE: 1/2" = 1'-0"



METAL GUARD RAIL ON METAL POST WITH METAL SPACER BLOCK
SCALE: 1/2" = 1'-0"

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
METAL GUARD RAIL

SCALE: AS SHOWN NOV. 1968

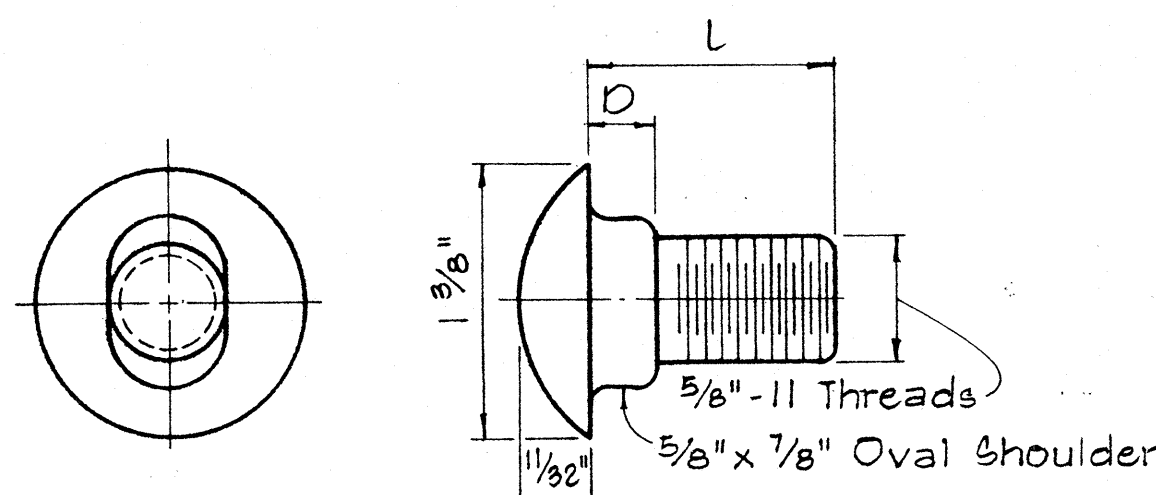
SHEET No. 1 OF 9 SHEETS DT 500

DESIGNED BY	DATE
CHECKED BY	
APPROVED BY	
NOTED BY	
ORIGINAL	

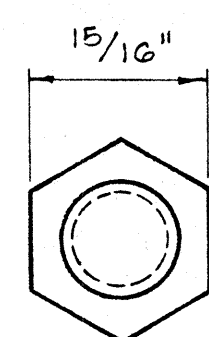
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	72A-01-71	1975	27	42

BOLT DIMENSIONS		
TYPE A BOLT		
	D	L
Splice Bolt	5/16"	1 1/4"
Post Bolt for Conc. Post w/ Double Wood Blocks	3/32"	24"
Post Bolt for Conc. Post w/ Single Wood Block	3/32"	18"
Rail Bolt for Metal Block	3/32"	2"

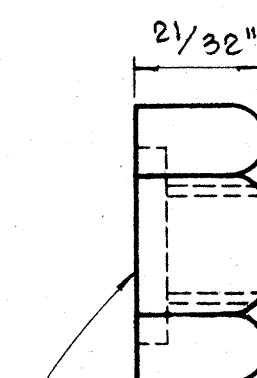
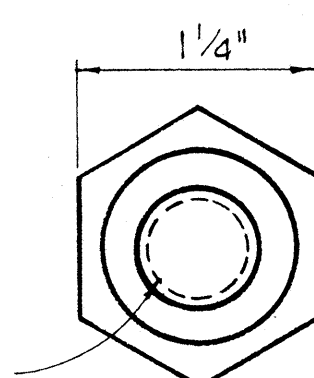
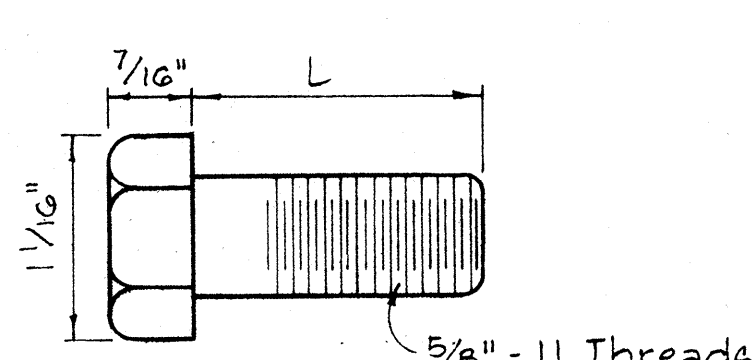
BOLT DIMENSIONS		
TYPE B BOLT		
		L
Post Bolt for Conc. Post w/ Metal Blocks		2 1/2"
Post Bolt for Metal Post w/ Metal Block		1 3/4"



TYPE A BOLT



TYPE B BOLT



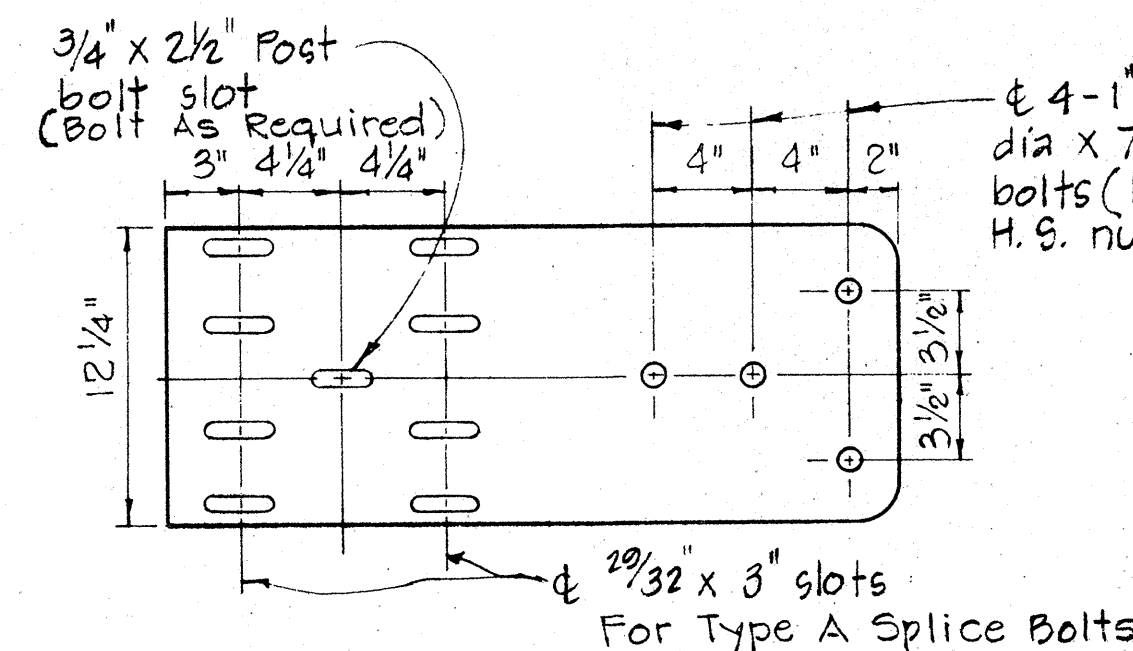
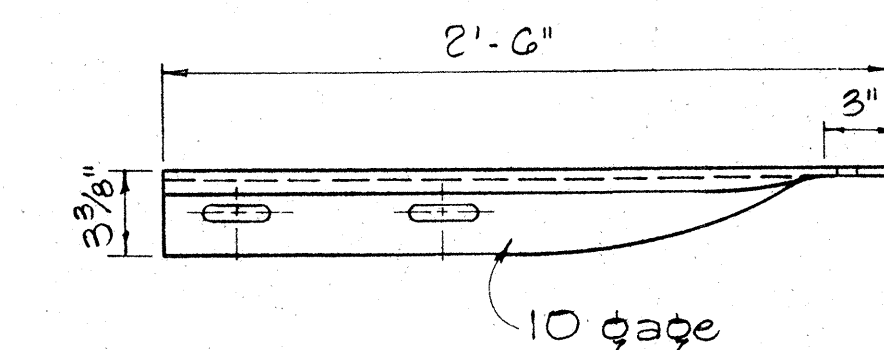
5/32" Deep x 1 5/16" Dia. C' Bore for Type A Bolt only.
Plain nut for Type B Bolt.

SPICE RAIL AND POST BOLTS

Scale: Full Size

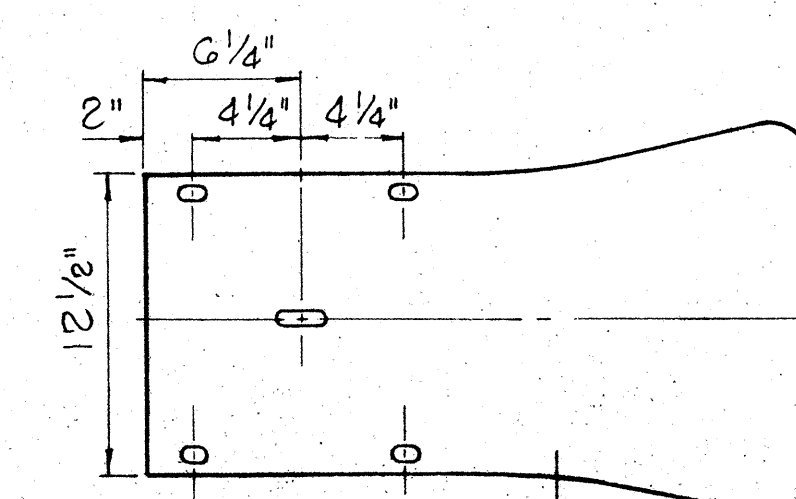
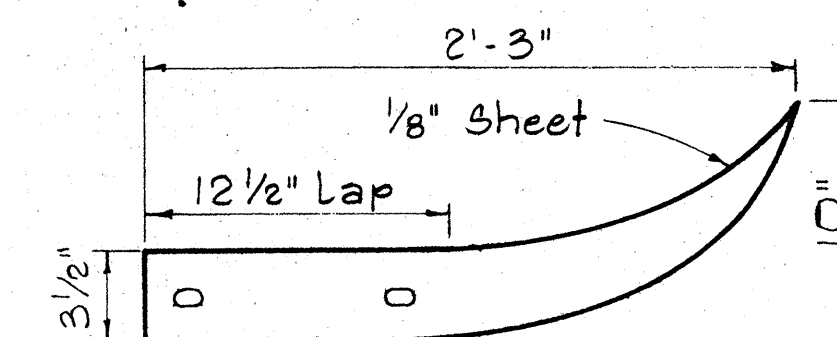
HEXAGON NUT

Scale: Full Size



SPECIAL END SHOE

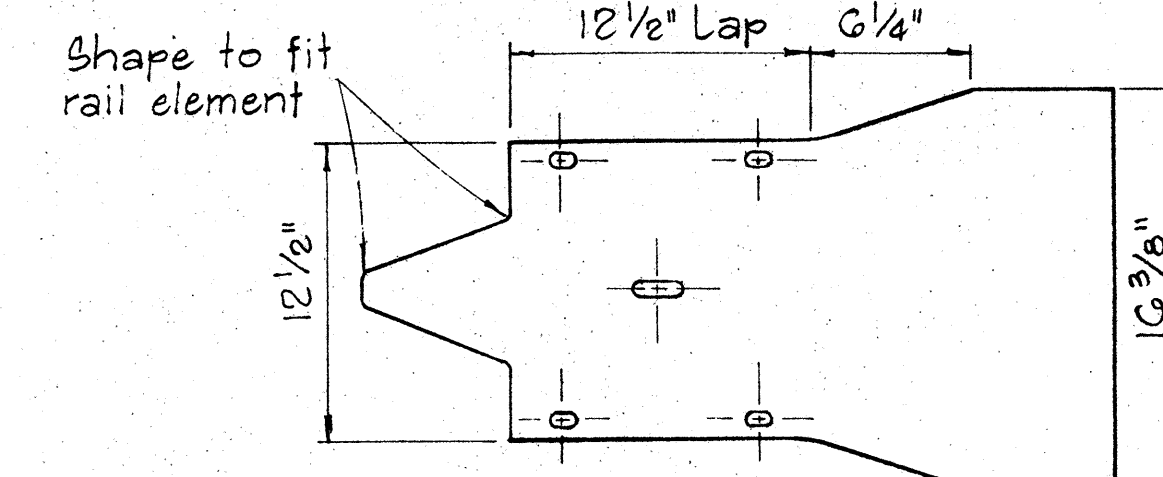
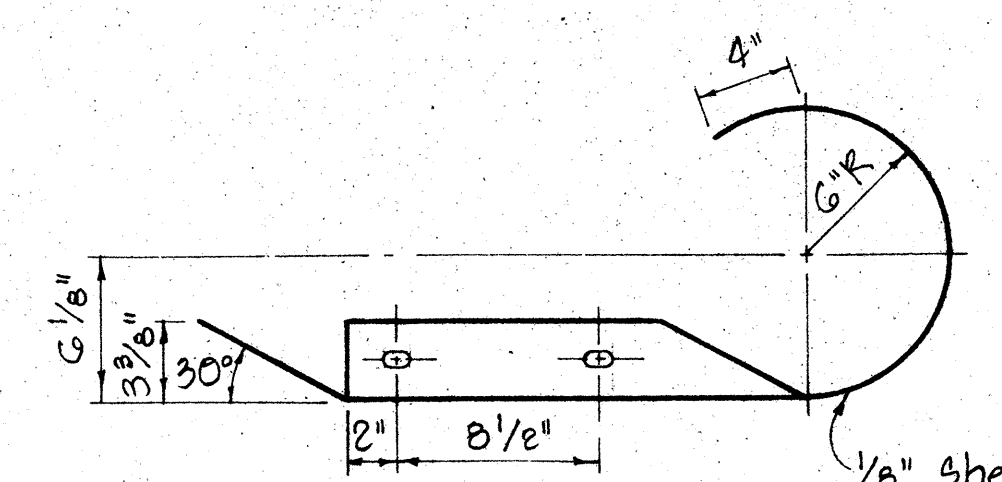
Scale: 1 1/2" = 1'-0"



Same as rail element section

FLARED END

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



CURVED END

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

APPROVAL RECOMMENDED:

TRAFFIC ENGINEER

APPROVED:

ASSISTANT CHIEF, ENGINEERING

12/23/69

DATE

12-20-69

DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

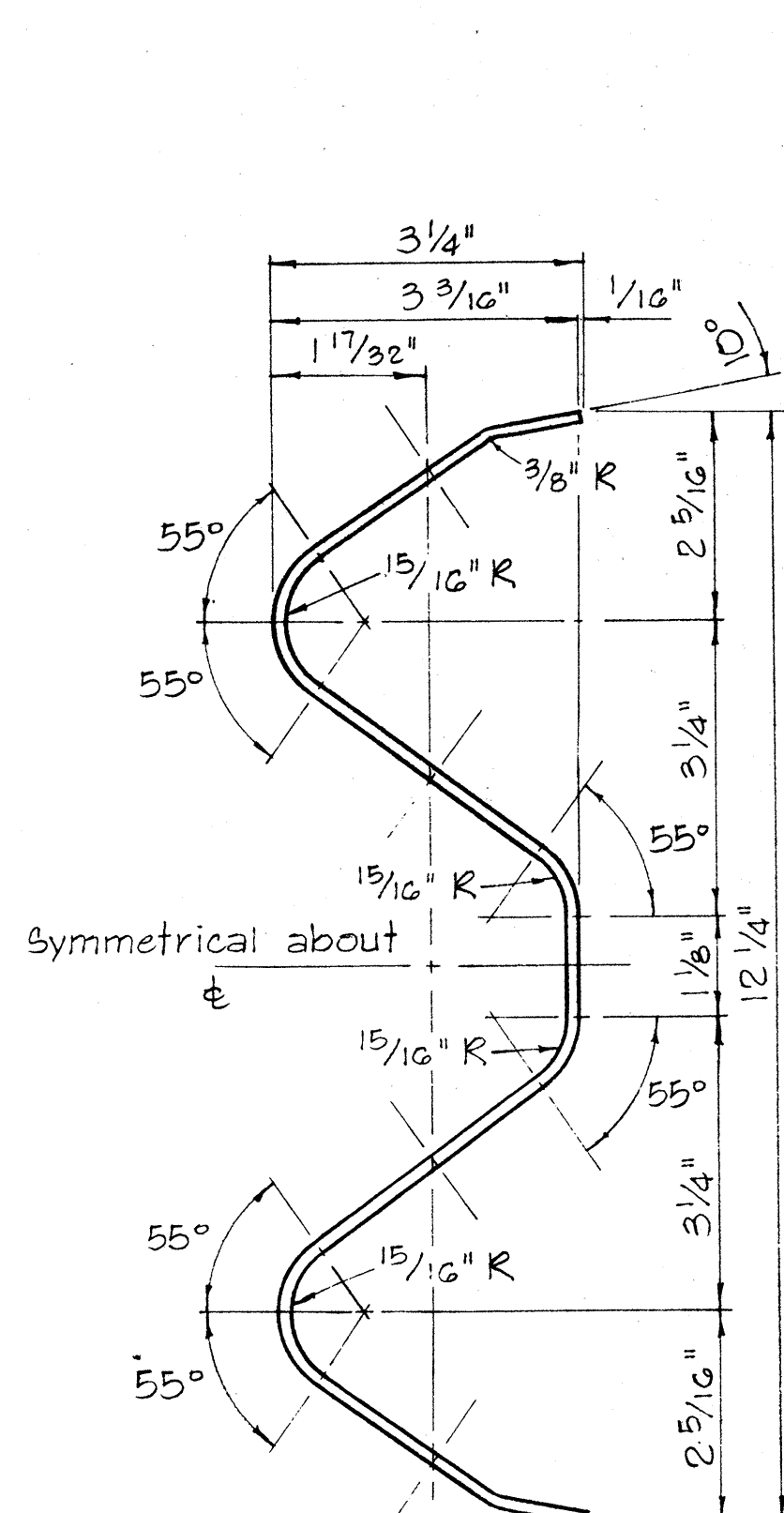
STANDARD DETAILS
METAL GUARD RAIL

Scale: As Noted

August, 1968

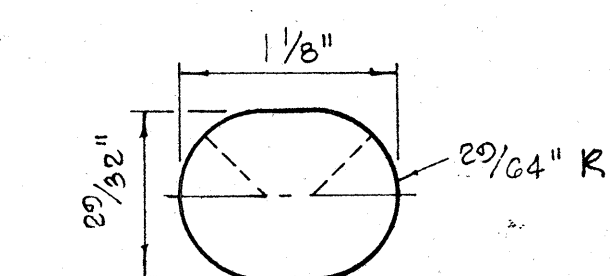
SHEET No. 2 OF 9 SHEETS

DT 501



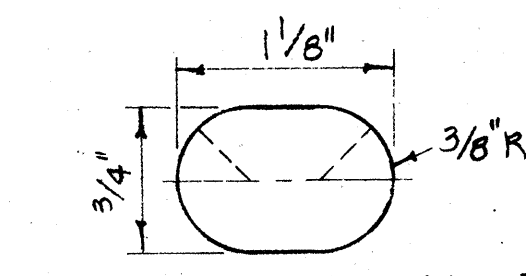
RAIL ELEMENT SECTION

Scale: 6" = 1'-0"

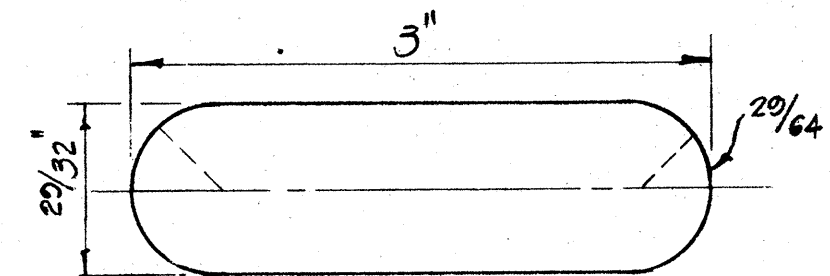


SPICE BOLT SLOT

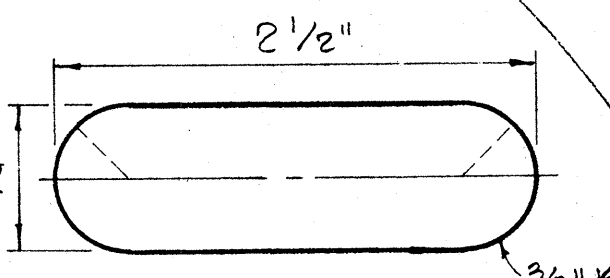
Scale: Full Size



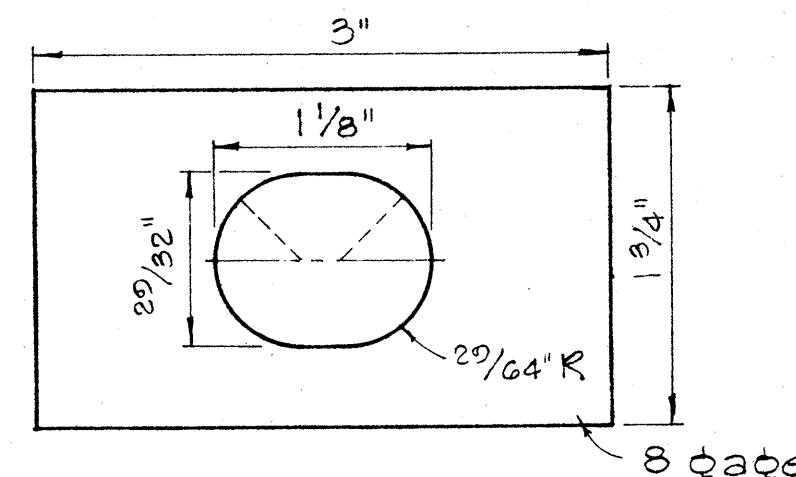
SPICE BOLT SLOT FOR ALL ENDS



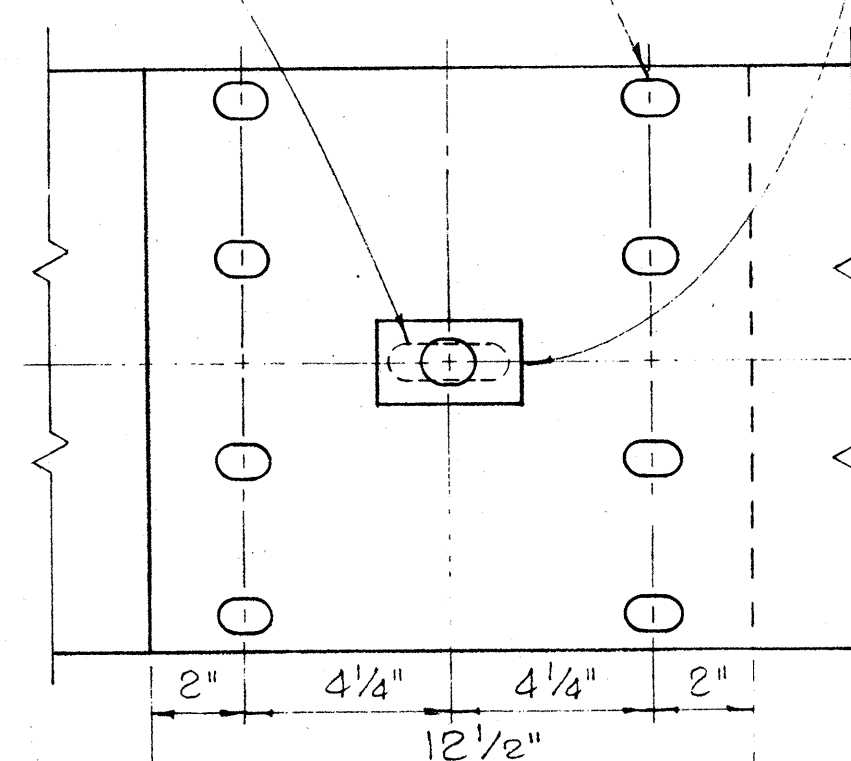
SPICE BOLT SLOT FOR SPECIAL END SHOE



POST BOLT SLOT



RAIL WASHER



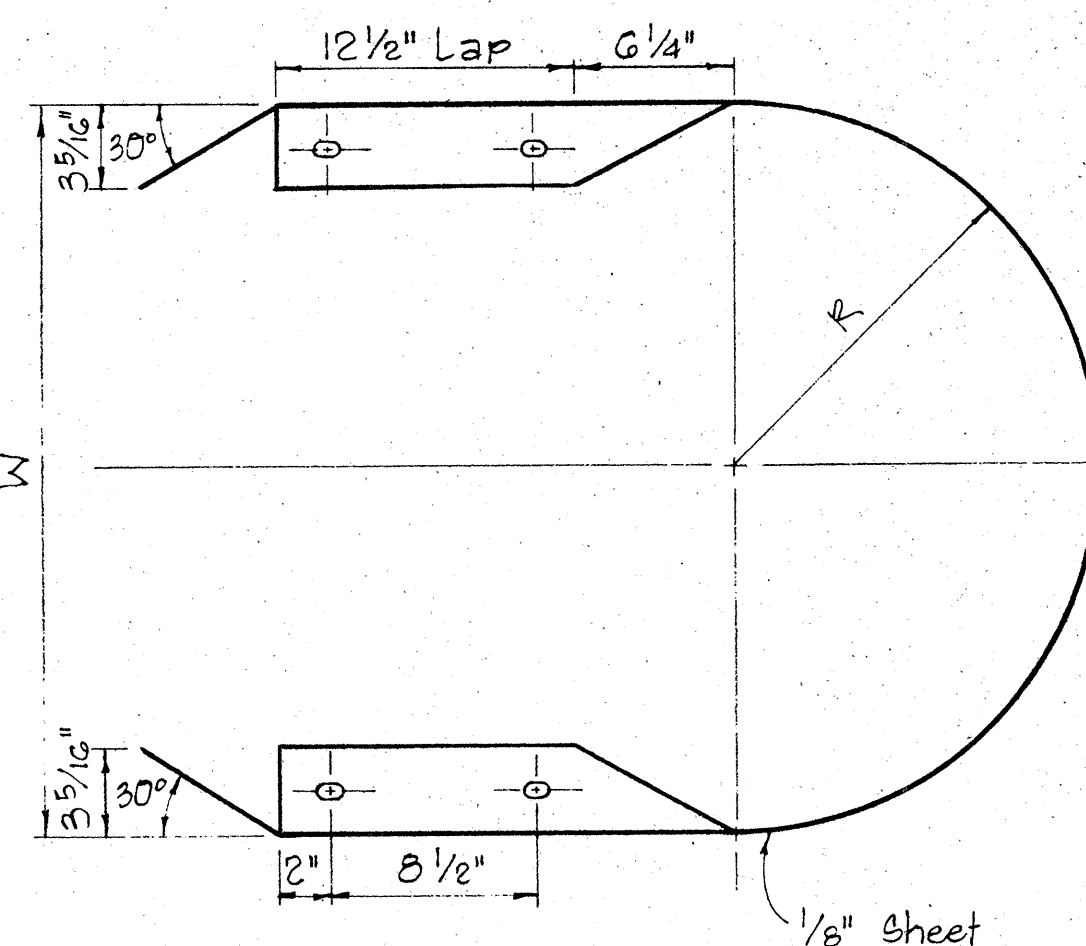
RAIL SPICE

Scale: 3" = 1'-0"

NOTES:

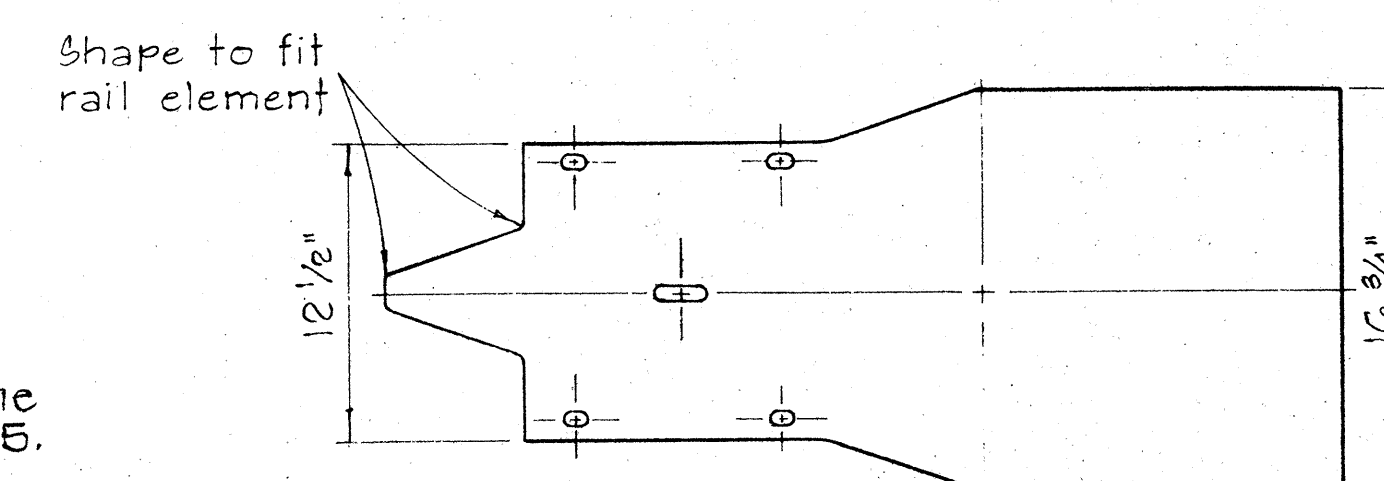
- H.S. Bolts shall conform to the requirements of ASTM A 325.
- Special End Shoe shall be fabricated from 10 Gage steel conforming to the requirements of AASHTO 180.

MEDIAN END DIMENSIONS		
TYPE OF POST AND BLOCK	W	R
Double Metal Guard Rail on Concrete Post with Wood Blocks	29 3/4"	14 7/8"
Double Metal Guard Rail on Concrete Post with Metal Blocks (BJG)	26 1/2"	13 1/4"
Double Metal Guard Rail on Metal Post with Metal Blocks (BJG)	24 3/8"	12 3/16"



MEDIAN END

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



NO.	REVISION	APPROVED BY	DATE

DATE	
DESIGNED BY	
DRAWN BY	
CHECKED BY	
NOTED BY	
NO.	

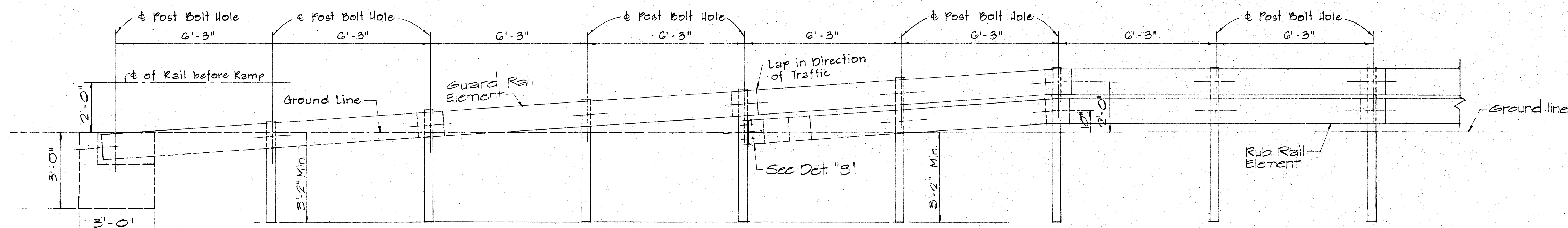
PLAN

Labels in the plan view include:

- Post Bolt Hole
- 6'-3"
- Spacer Block B/G @ 8.5'
- Guard Rail Post B/G at 8.5'
- Sec Det. "B"
- Guard Rail Element
- Rub Rail Element

Dimensions shown include 1'-0" for the total width and 1'-6" for the individual rail widths.

PLAN



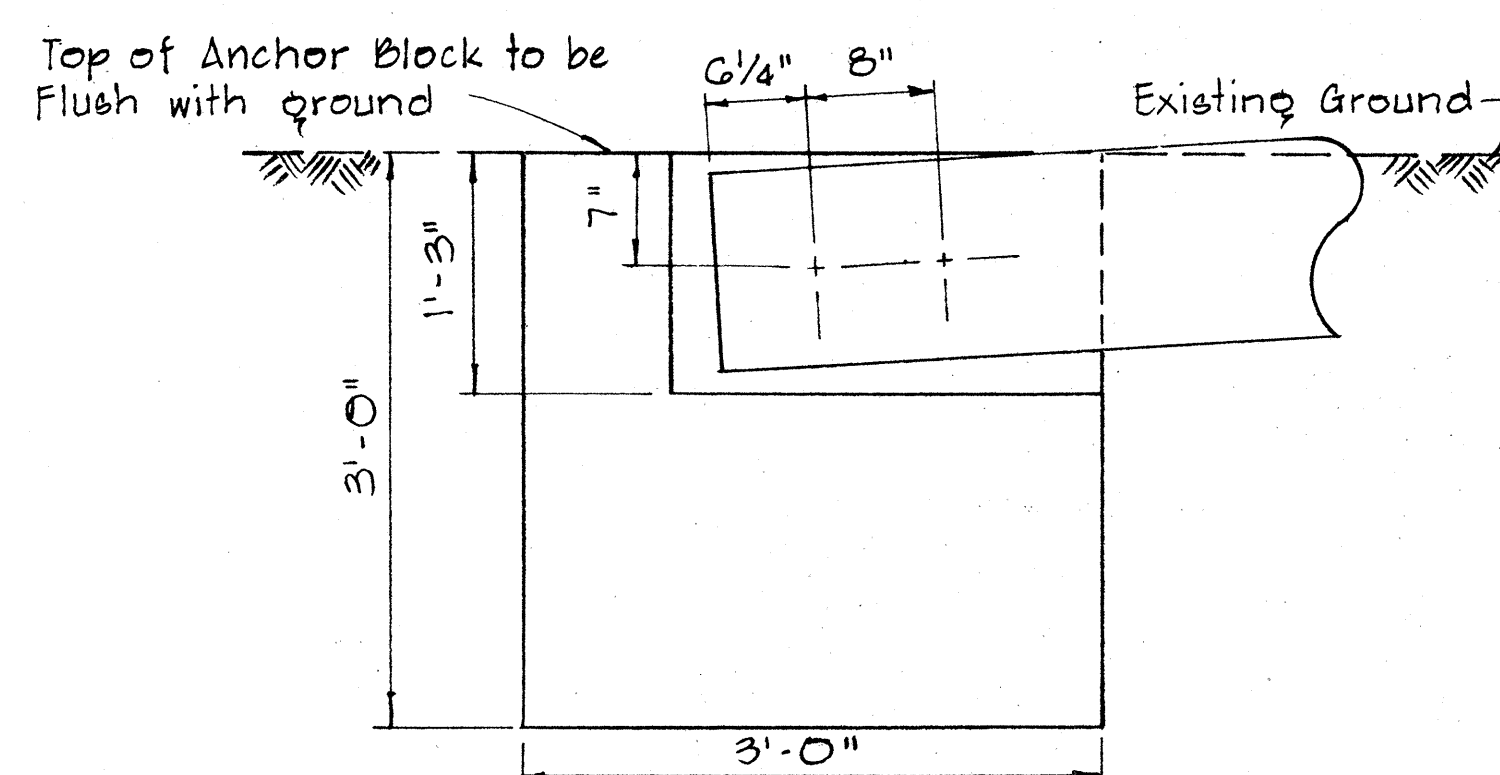
ELEVATION

STRAIGHT APPROACH - RAMP END ANCHORAGE (MEDIAN)

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

Diagram illustrating the dimensions for a slot for guard rail. The slot is 2'-0" high and 3'-0" wide. The distance from the left edge to the center of the slot is 9". The distance from the center of the slot to the right edge is 3'-0". The slot is labeled "Slot for Guard Rail". The diagram also shows a cross-section of the rail with a 3/2" dimension and a note "Rail, All shall be".

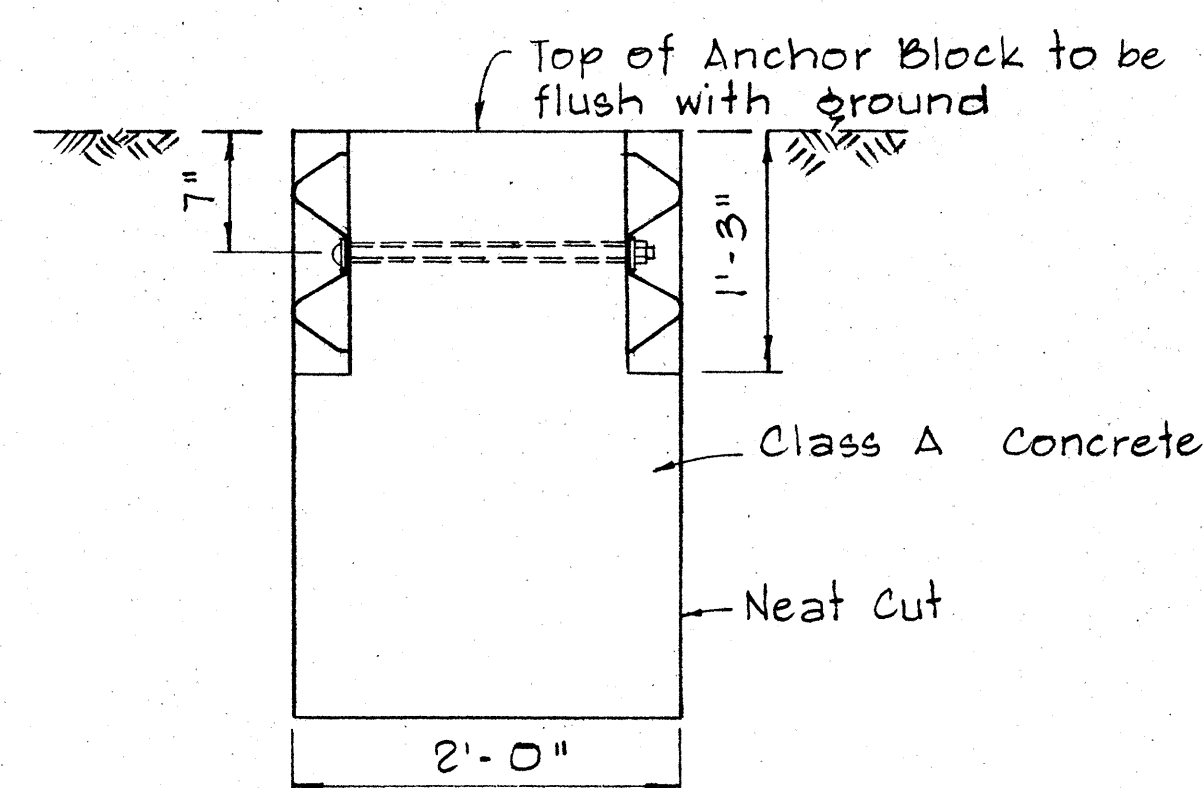
PLAN



ELEVATION

CONCRETE ANCHOR BLOCK FOR RAMP END

Scale: 1" = 1'-0"

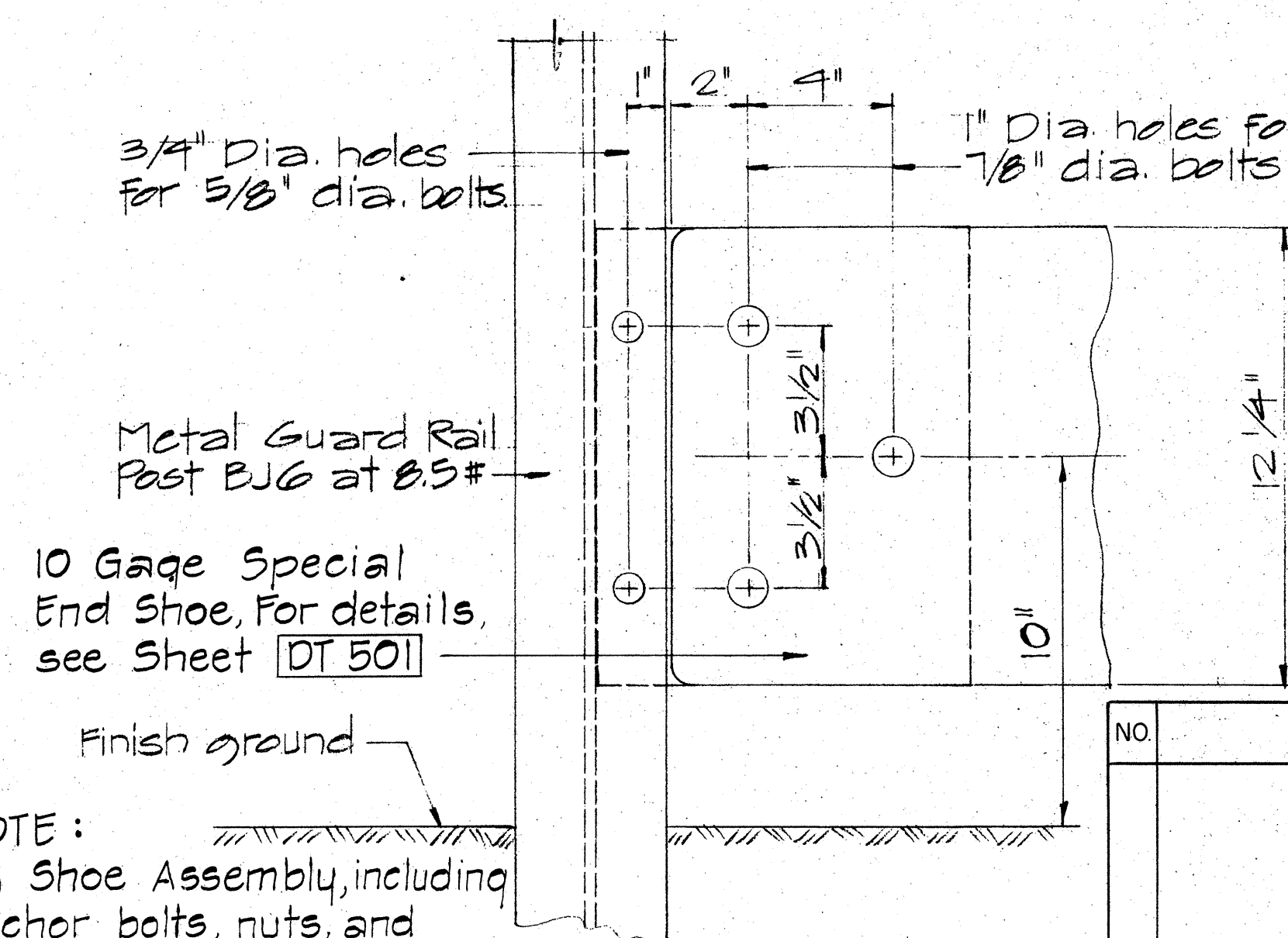


SECTION A-A

NOTE: Concrete, Excavation, and Miscellaneous Appurtenances necessary to anchor the Guard Rail Ends, Shall be incidental to the Metal Guard Rail.

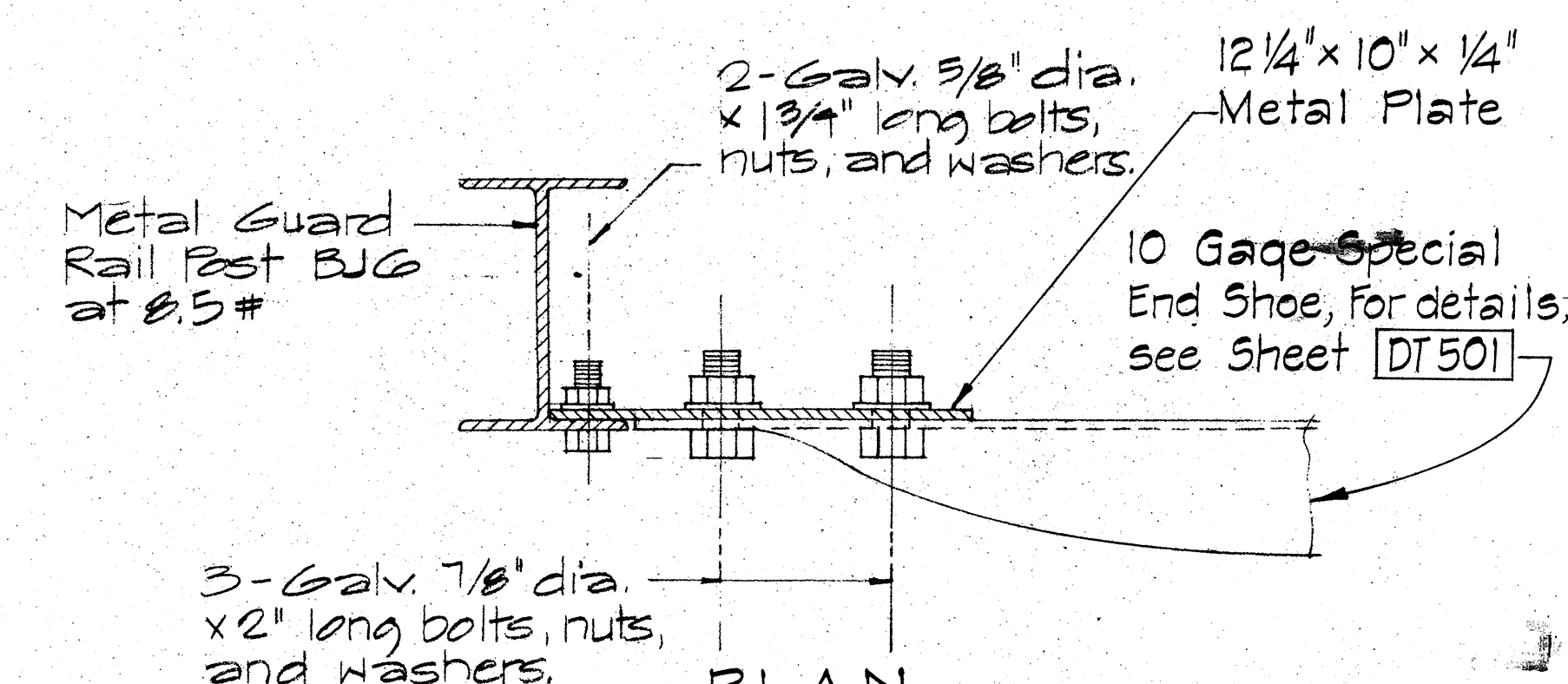
NOTE: 

All Shoe Assembly, including anchor bolts, nuts, and washers, shall be galvanized.



ELEVATION

DETAIL "B"

$$Sc, 3'' = 1 - 0'$$


PLAN

APPROVAL RECOMMENDED:
Eisaku Tanaka
TRAFFIC ENGINEER

12/29/06
DATE

APPROVED: Hulim 22641
ASSISTANT CHIEF, ENGINEERING

12-30-60
DATE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
<u>STANDARD DETAIL</u> <u>GUARD RAIL</u> <u>RAMP END ANCHORAGE</u>	
Scale: as Noted	August, 1968
SHEET No. 3 OF 4 SHEETS	

Scale: as Noted

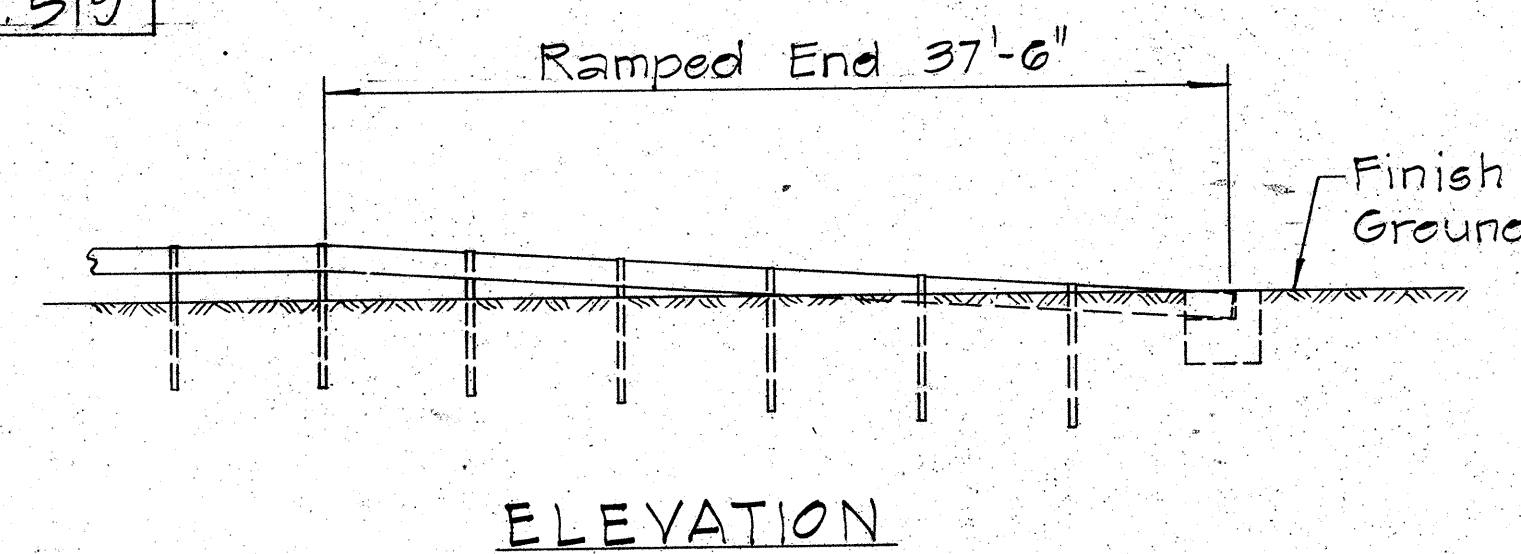
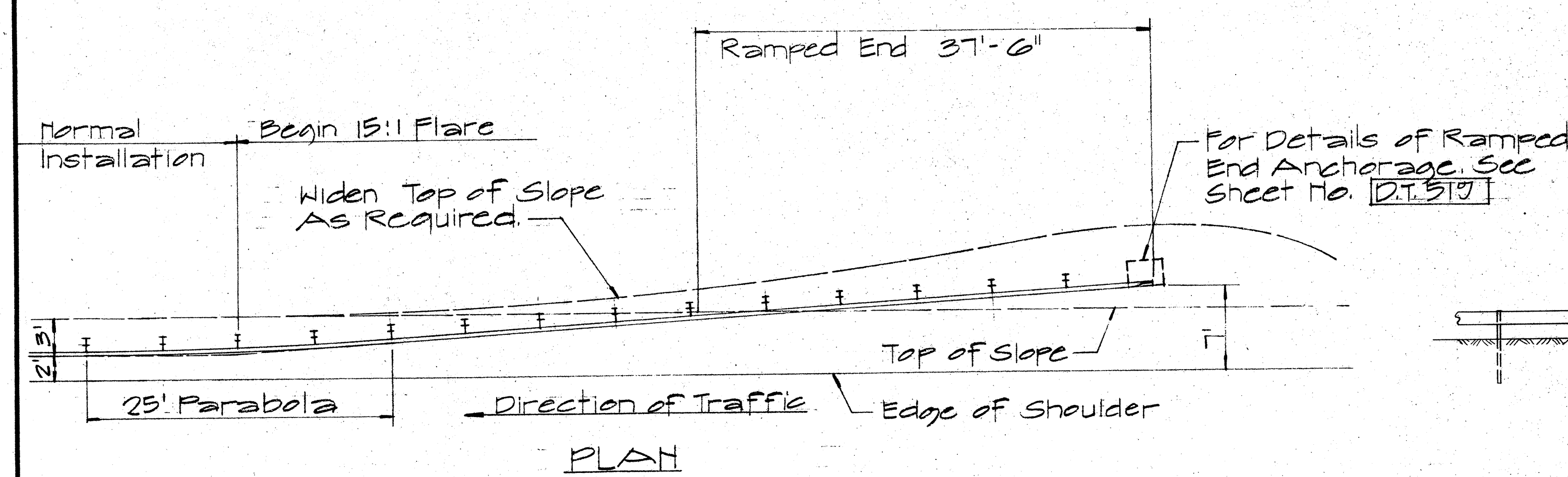
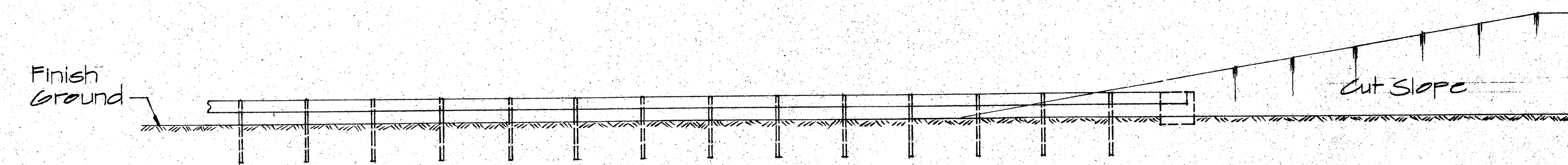
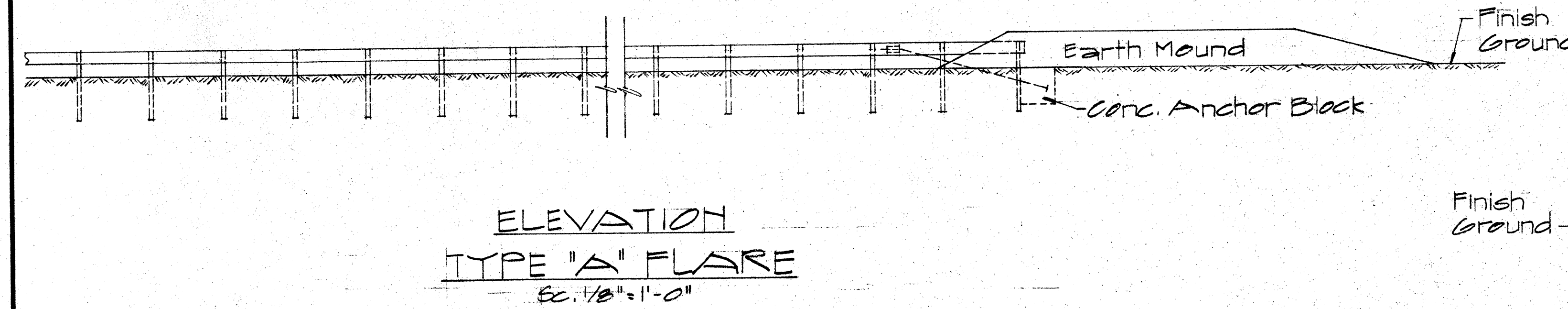
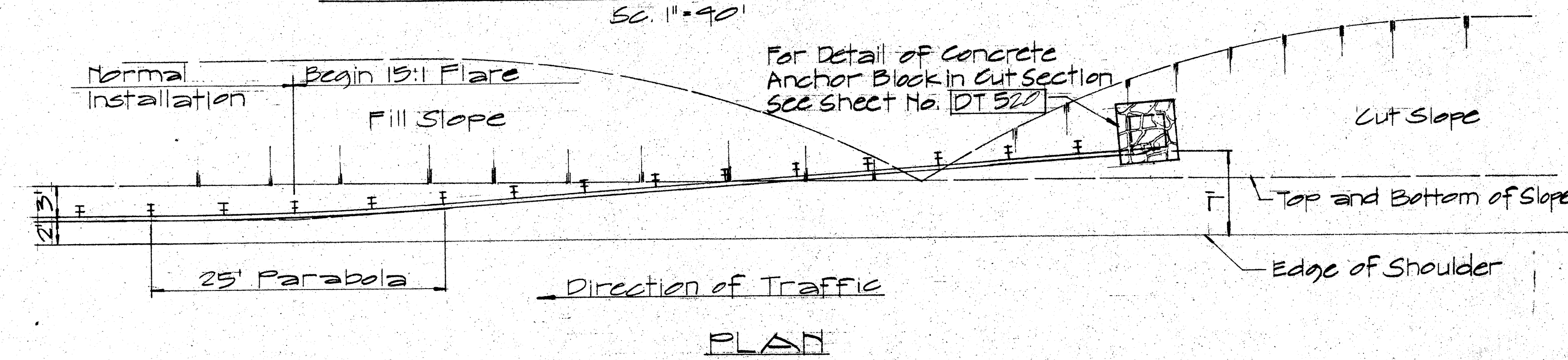
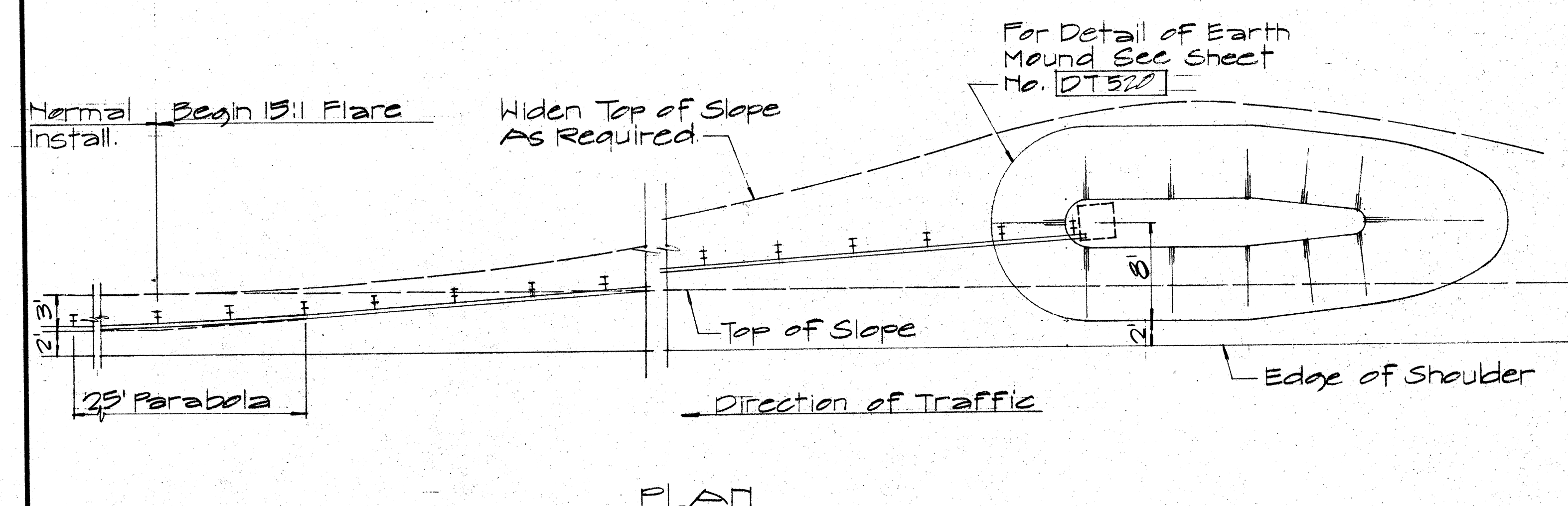
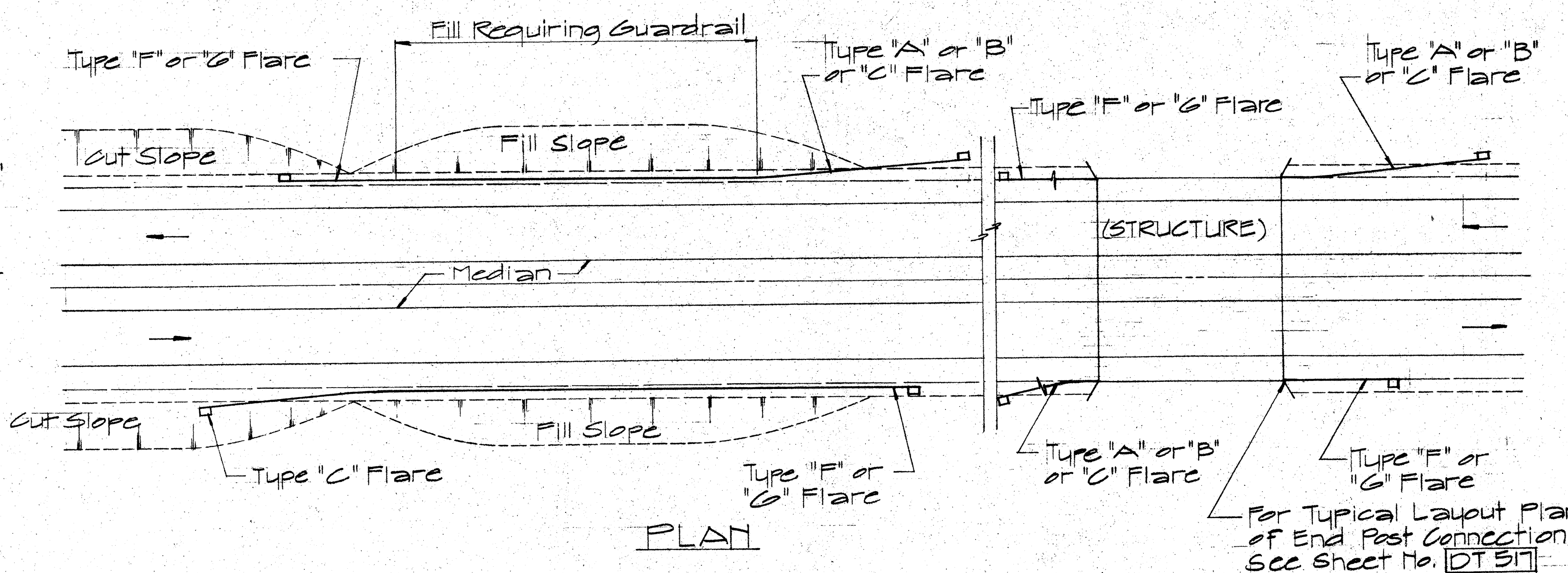
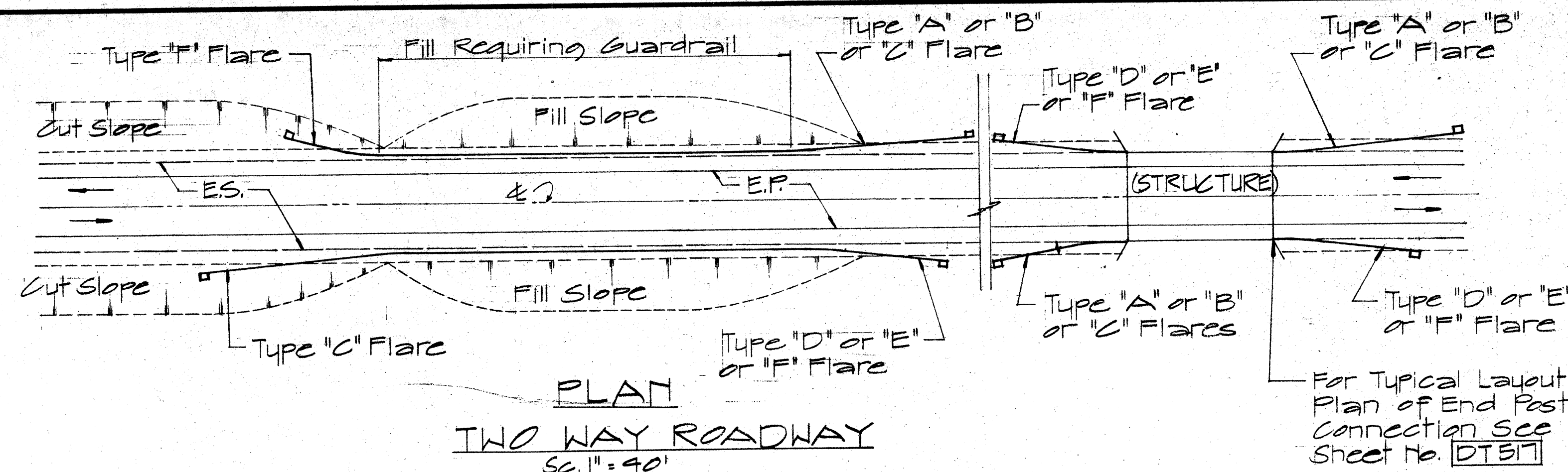
August, 1968

SHEET No. 3 OF 9 SHEETS DT 502

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	72A-01-71	1975	29	42

NOTE:

Metal guard rail connection to structures requires End Post Connection. See structure Plans.



ELEVATION
TYPE "C" FLARE
Sc. 1/8" = 1'-0"

NO.	REVISION	APPROVED BY	DATE

APPROVAL RECOMMENDED:
Eishi Tanaka
TRAFFIC ENGINEER
12/29/63
DATE

APPROVED:
Assistant Chief, Engineering
12-30-69
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

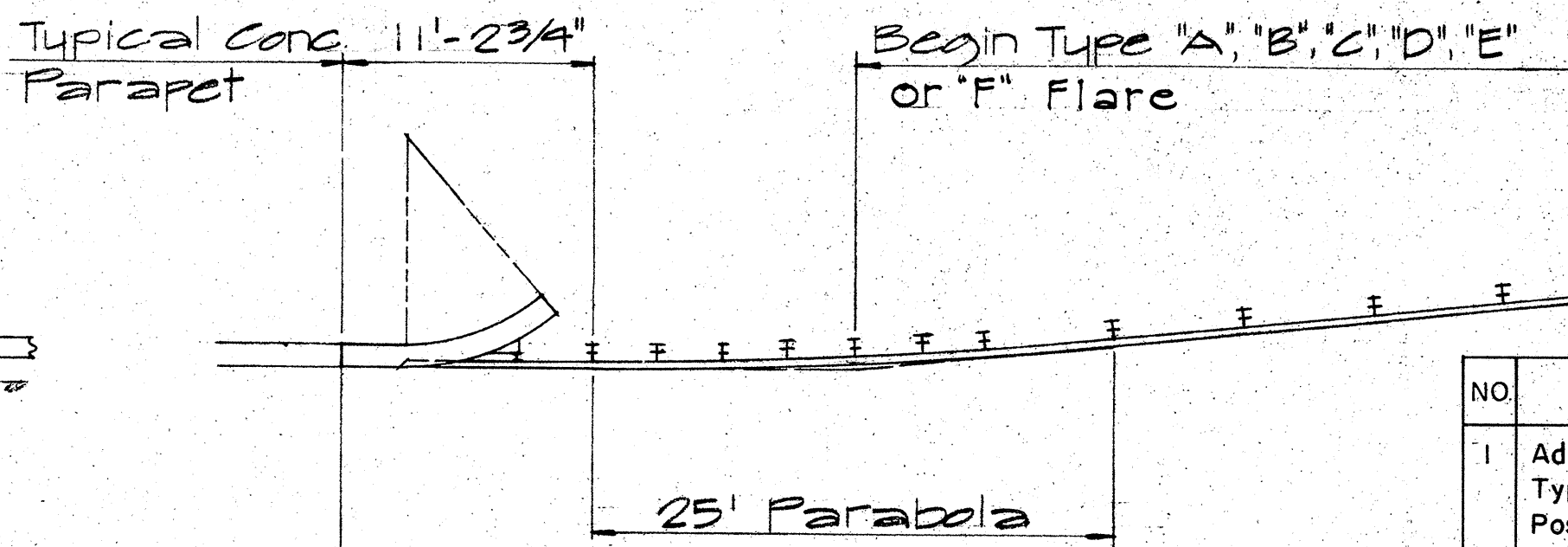
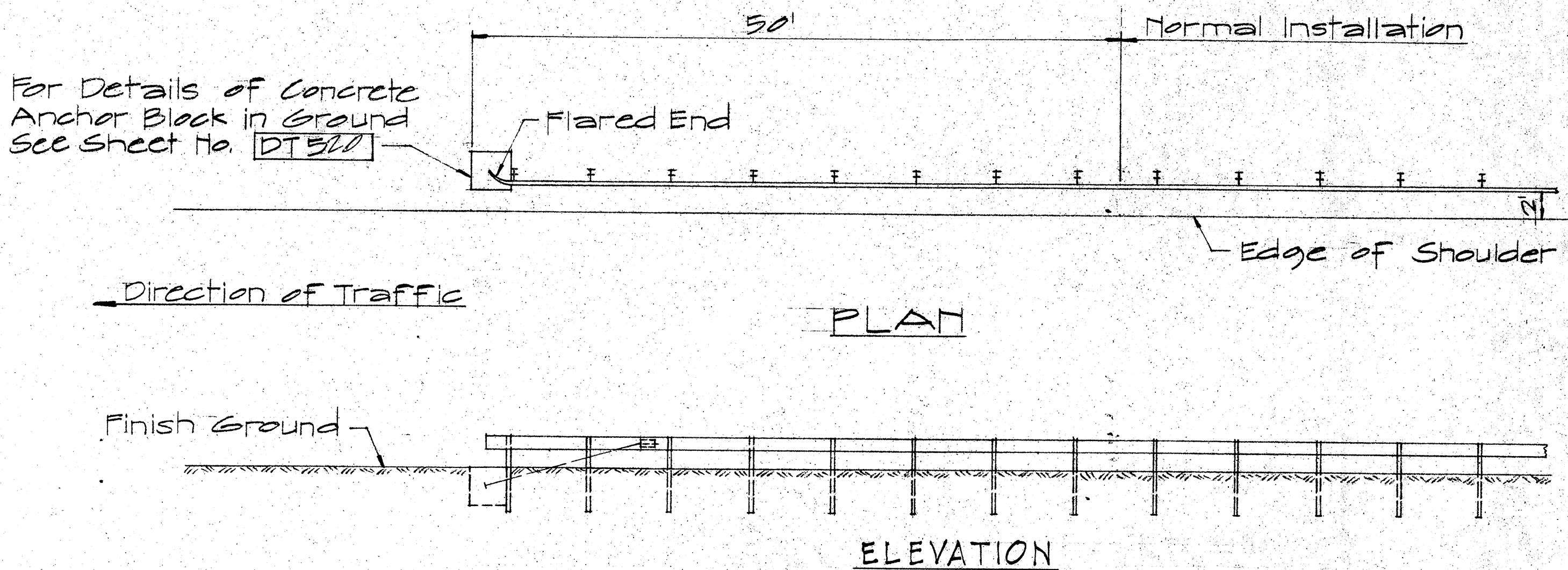
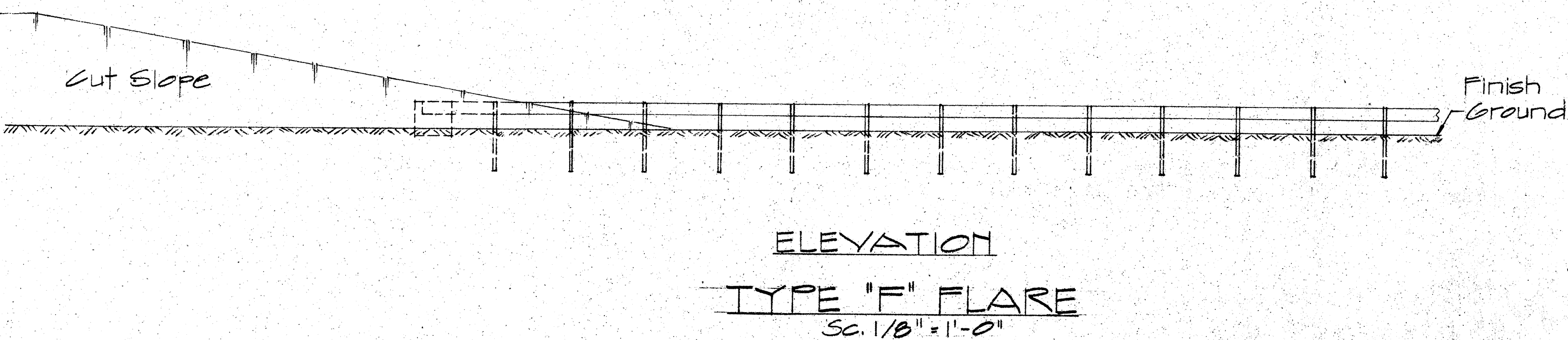
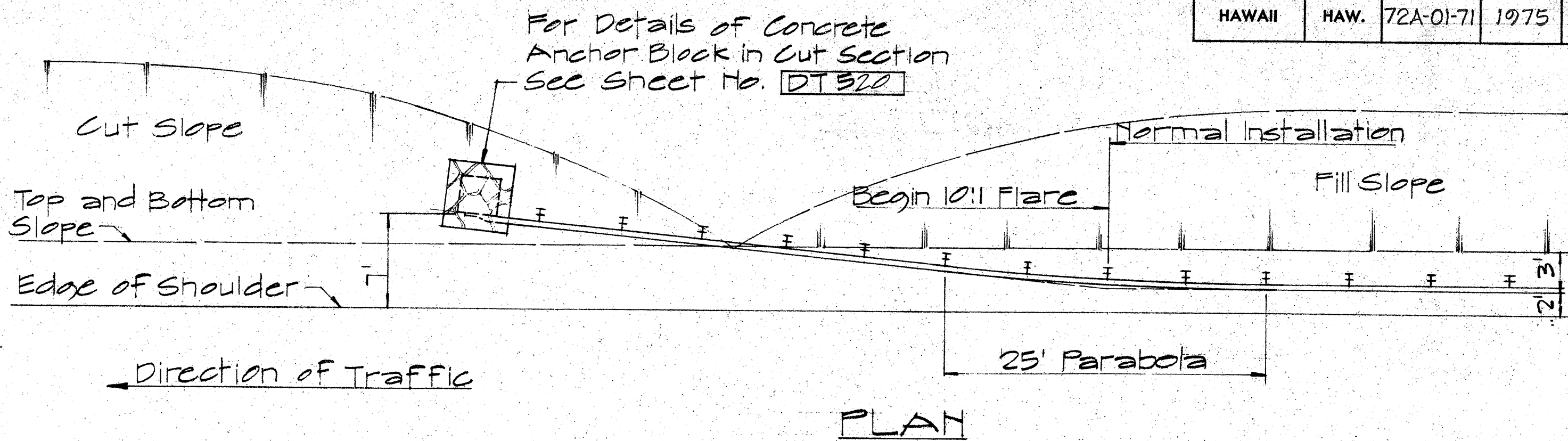
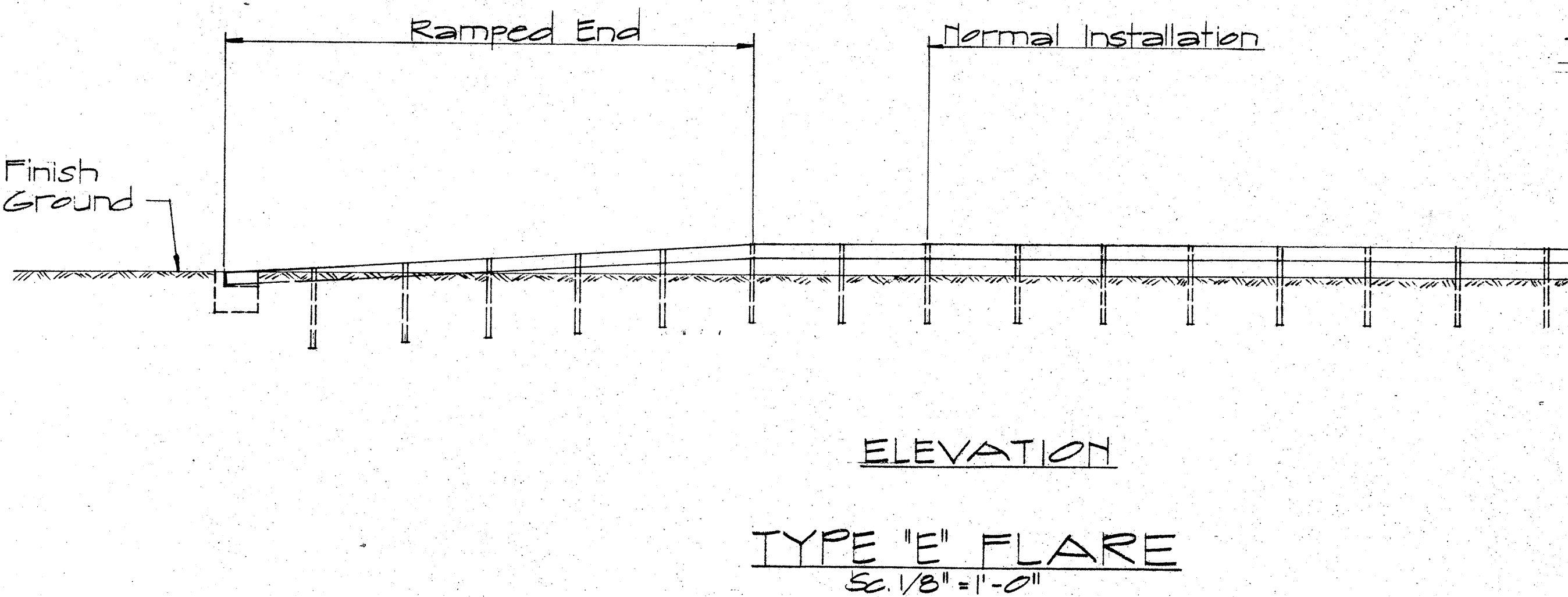
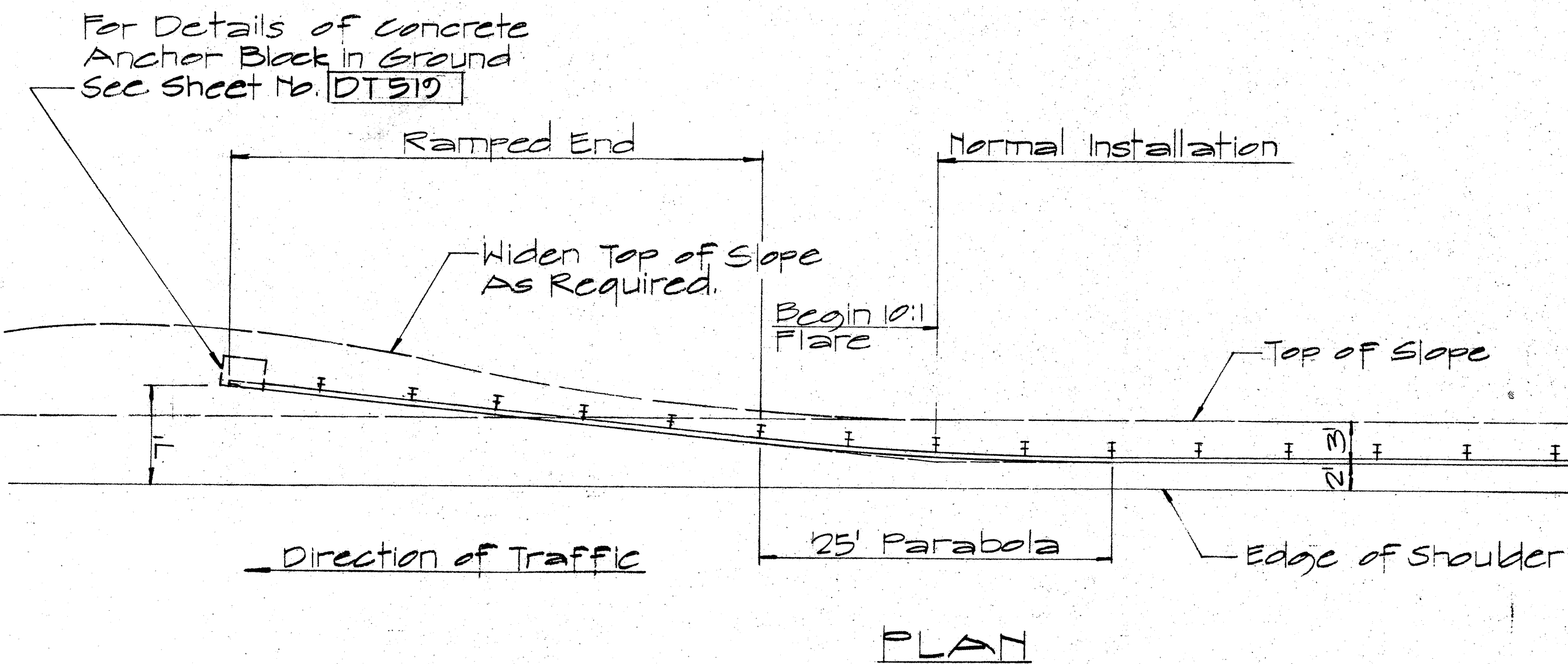
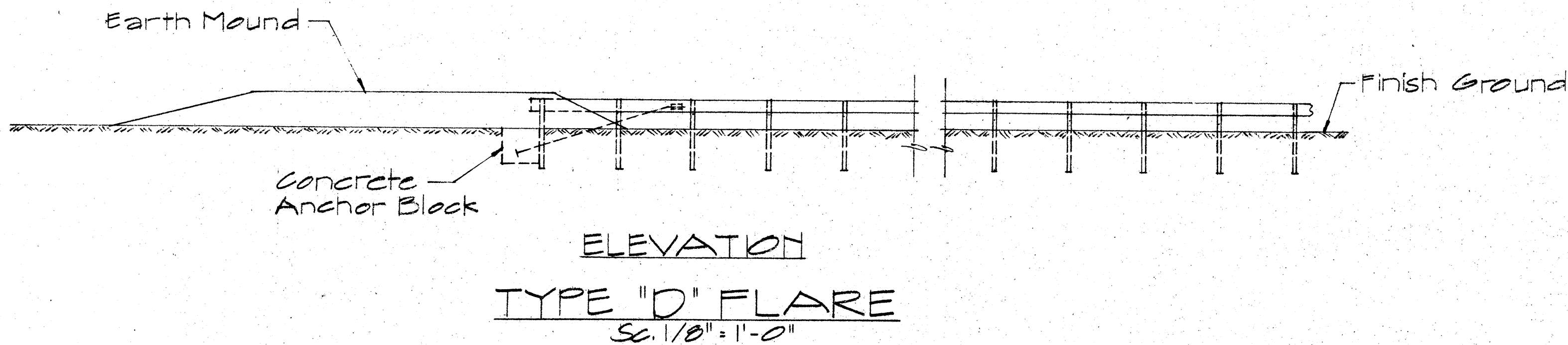
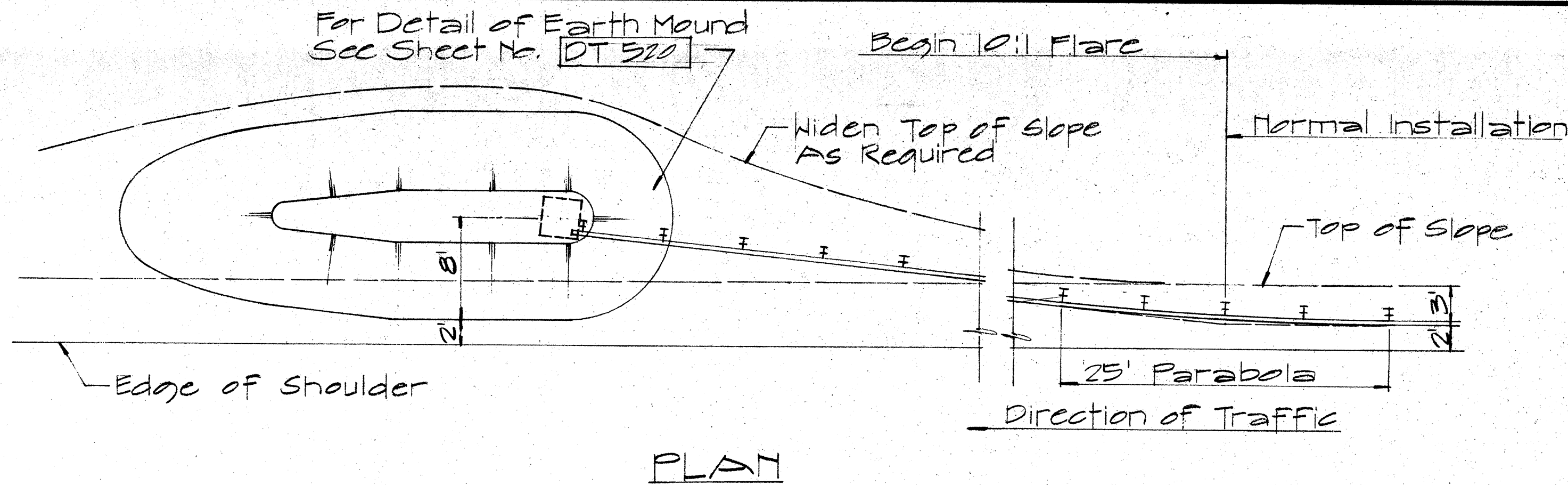
**STANDARD DETAILS
OF APPROACH END
FLARE - ONE & TWO
WAY ROADWAY**

Sc. As Noted April 1967

SHEET No. 4 OF 9 SHEETS DTB16

DATE
SURVEY PLANNED BY
DRAWN BY
DESIGNED BY
NOTED BY
CHECKED BY
ORIGINAL PLAN
NO. 1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	72A-01-71	1975	30	42



APPROVAL RECOMMENDED:	<i>Erich Tanaka</i>	12/29/69
TRAFFIC ENGINEER		DATE
APPROVED:	<i>W. J. Sal</i>	12-30-69
ASSISTANT CHIEF, ENGINEERING		DATE

NO.	REVISION	APPROVED BY	DATE
1	Additional Posts Added to Typical Layout Plan Of End Post Connection	H.T.	4-12-72

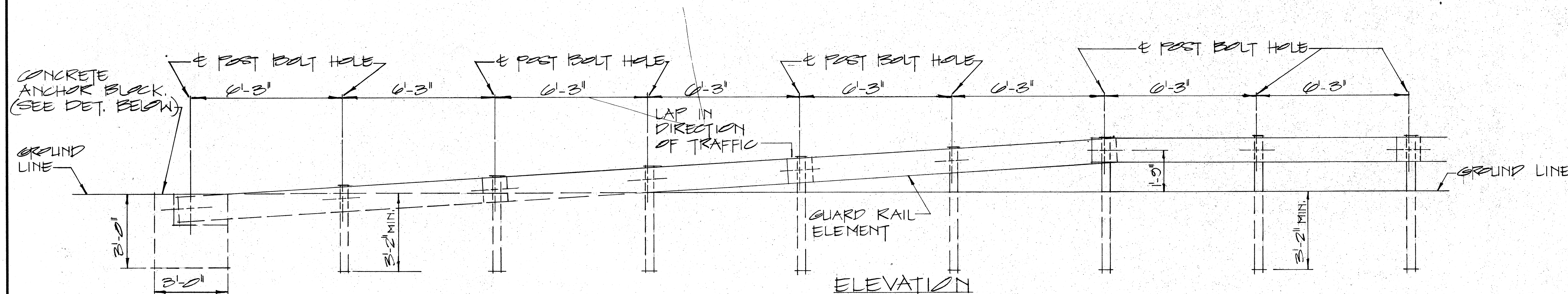
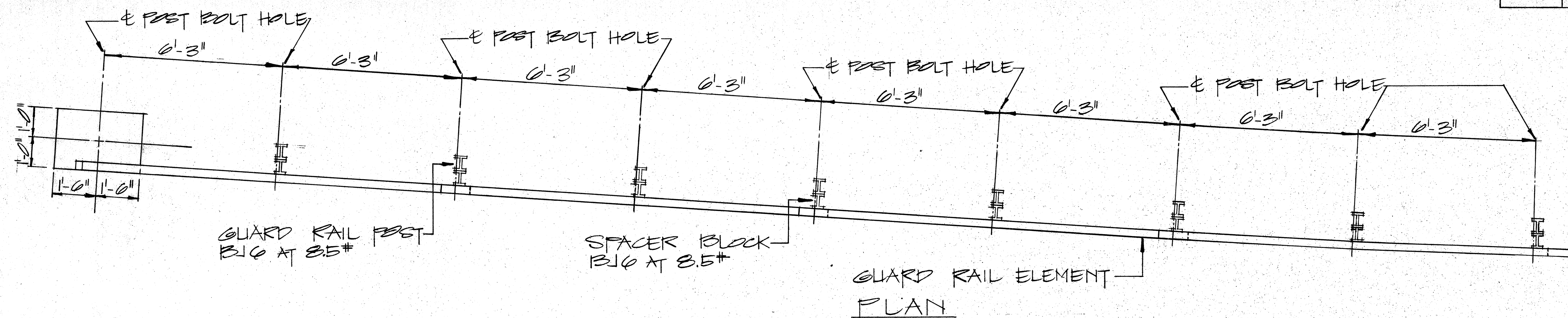
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
TRAILING END
FLARE - ONE & TWO
WAY ROADWAY
Scale: As Noted April 1969

SHEET No. 5 OF 9 SHEETS DT 517

DATE	
DESIGNED BY	
TRACED BY	
DESIGNED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

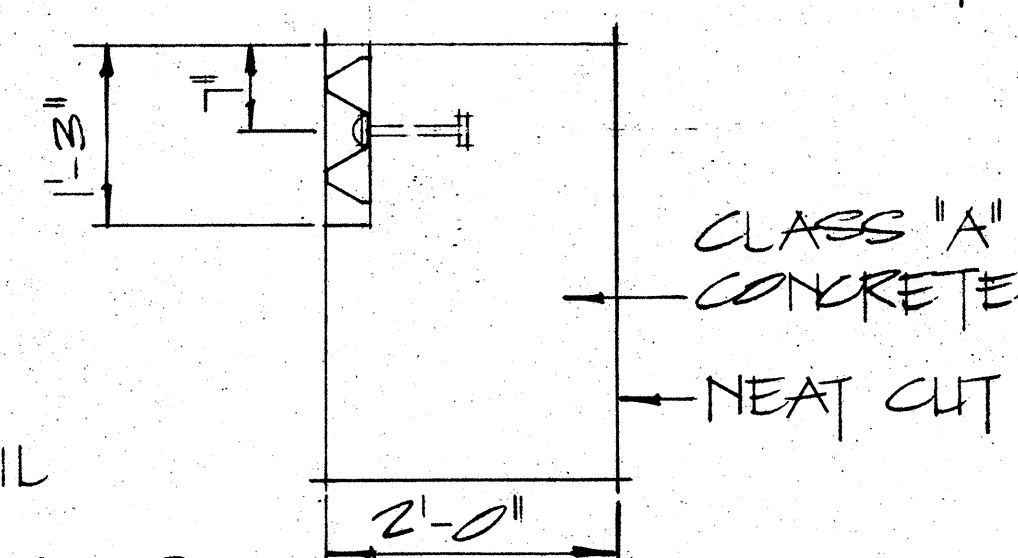
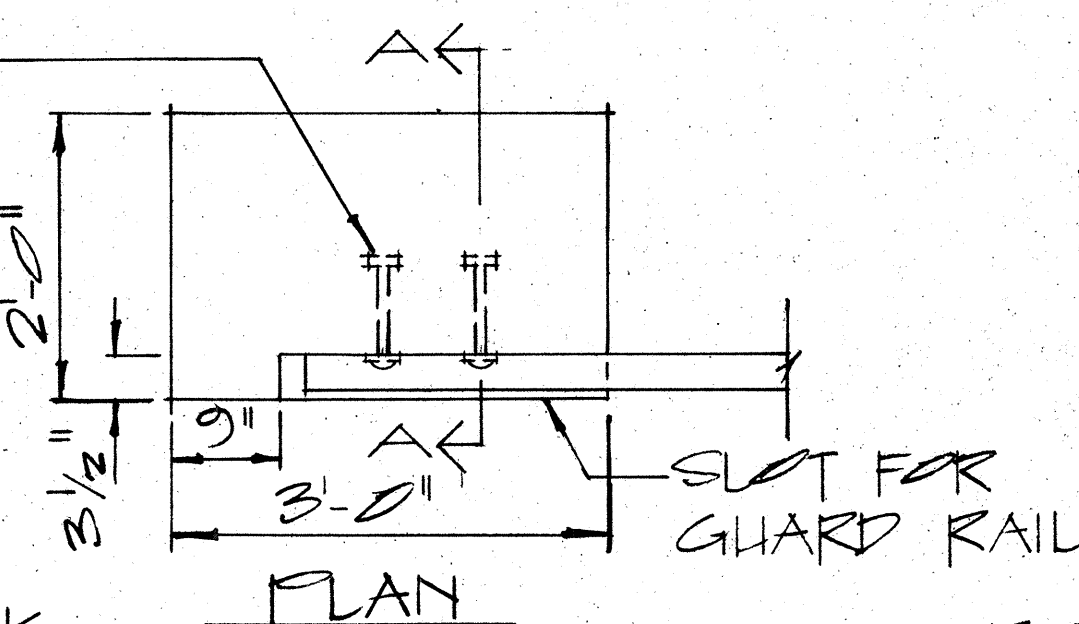
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	72A-01-71	1975	31	42



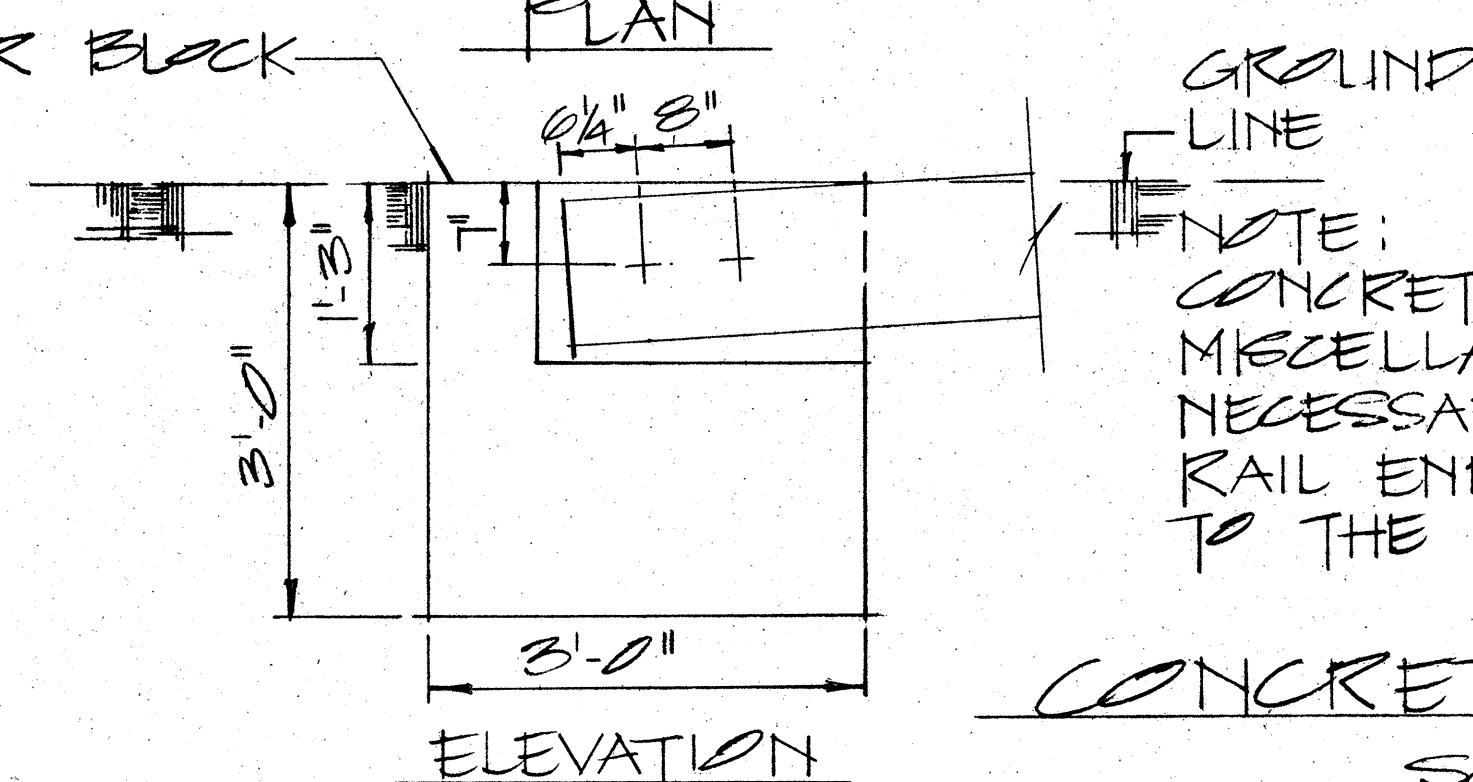
RAMP END ANCHORAGE

SCALE: 1/2" = 1'-0"

2-5/8" x 7/4" LONG BOLTS
W/ NUTS & WASHERS
INCIDENTAL TO METAL
GUARD RAIL. ALL
METAL PIECES SHALL
BE GALVANIZED.



TOP OF ANCHOR BLOCK
TO BE FLUSH
W/ GROUND.



CONCRETE ANCHOR BLOCK

SCALE: 3/4" = 1'-0"

APPROVAL RECOMMENDED:
Emilio Tanaka
TRAFFIC ENGINEER
12/29/69
DATE

APPROVED:
John J. Del...
ASSISTANT CHIEF, ENGINEERING
12-30-69
DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

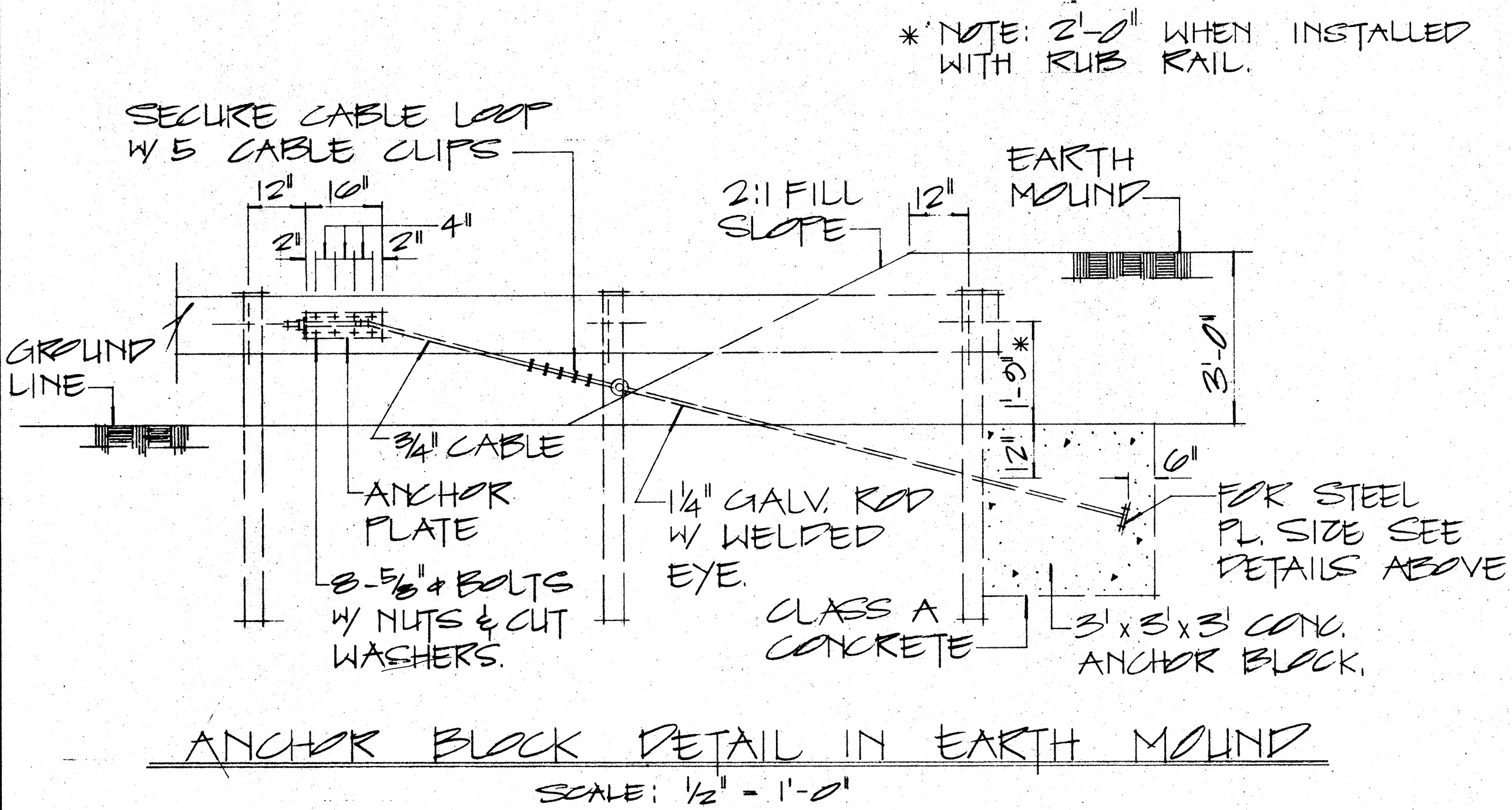
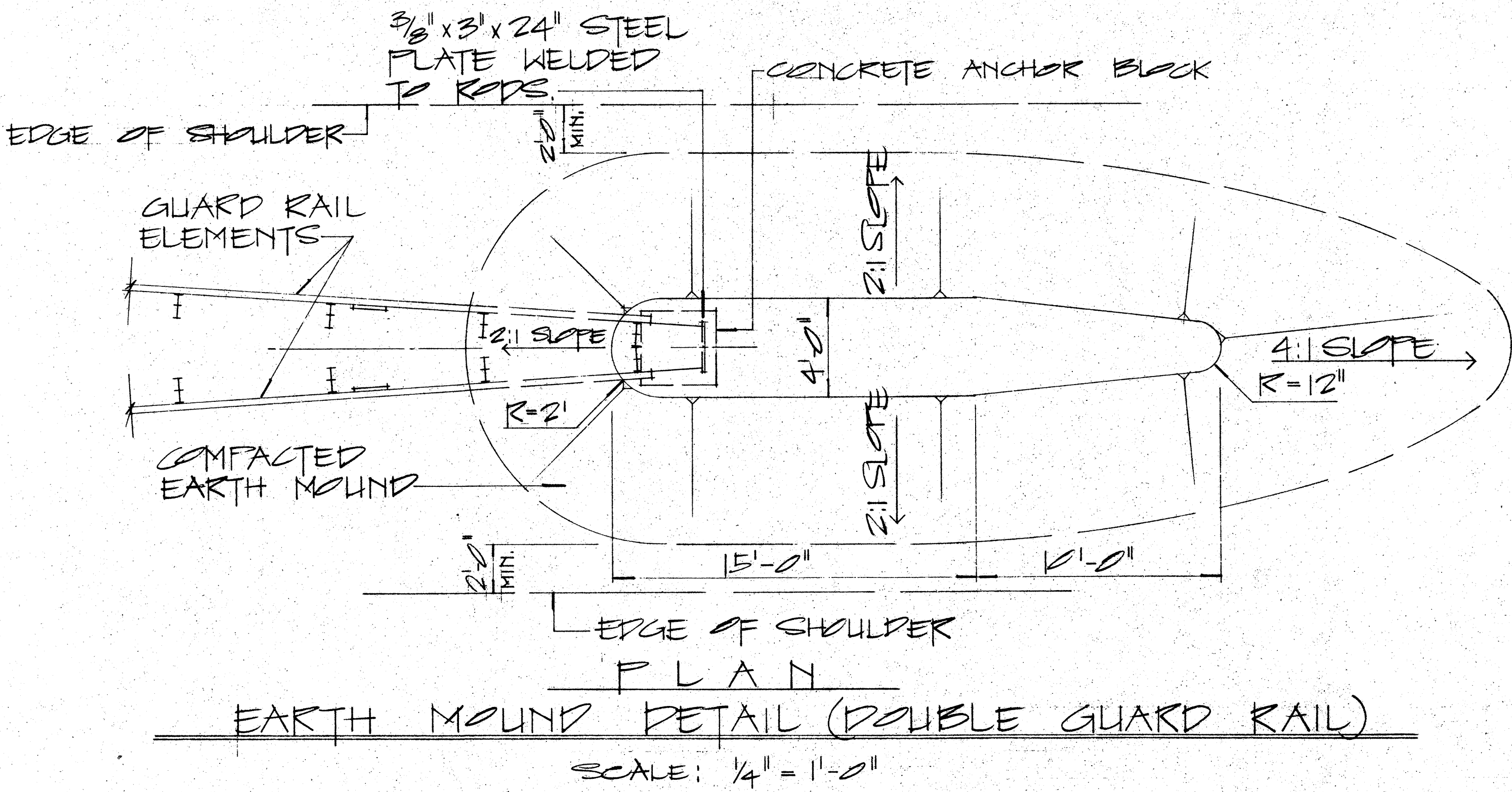
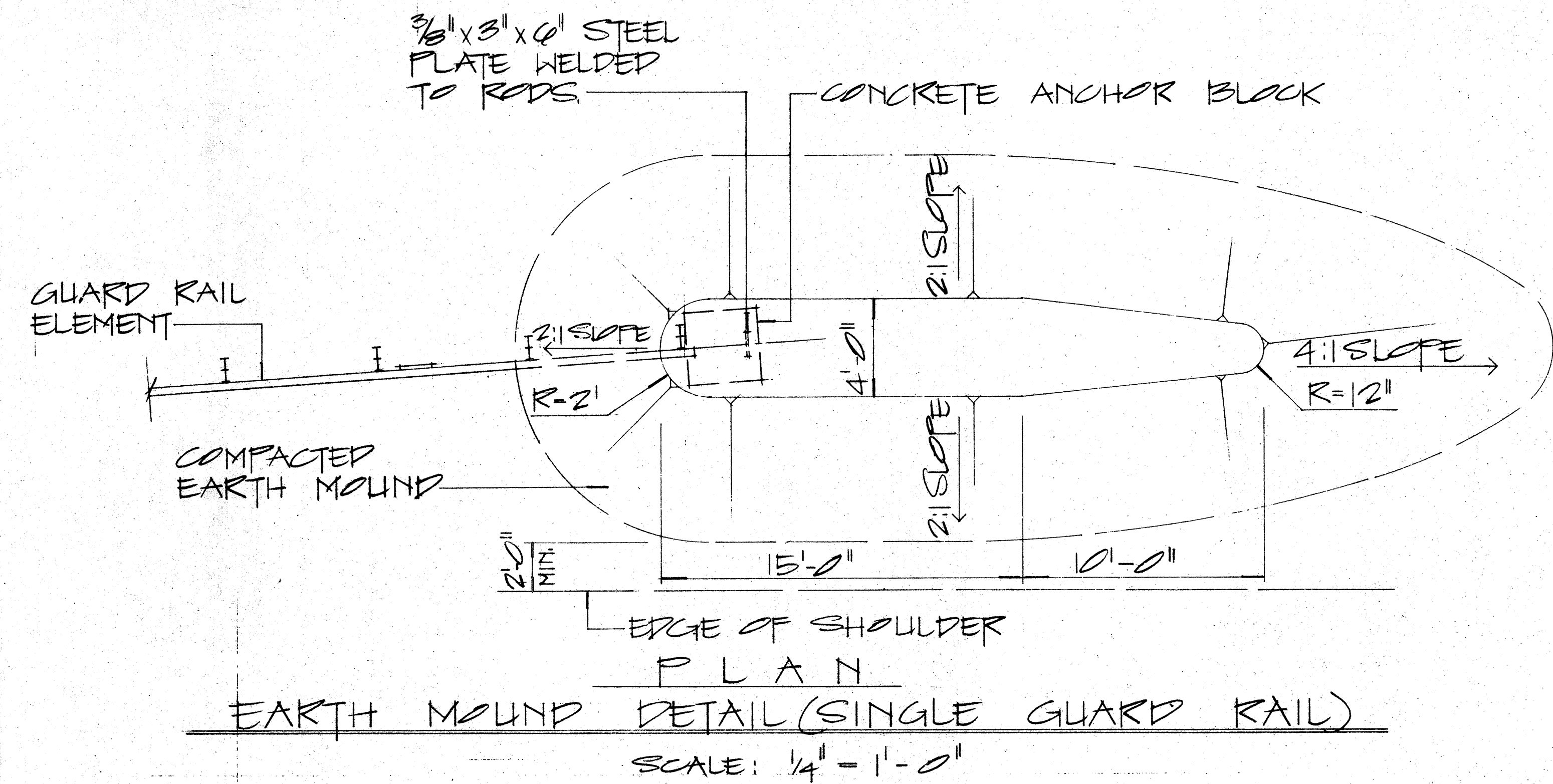
STANDARD DETAILS
GUARD RAIL, TYPE 3
RAMP END ANCHORAGE

SCALE: AS SHOWN

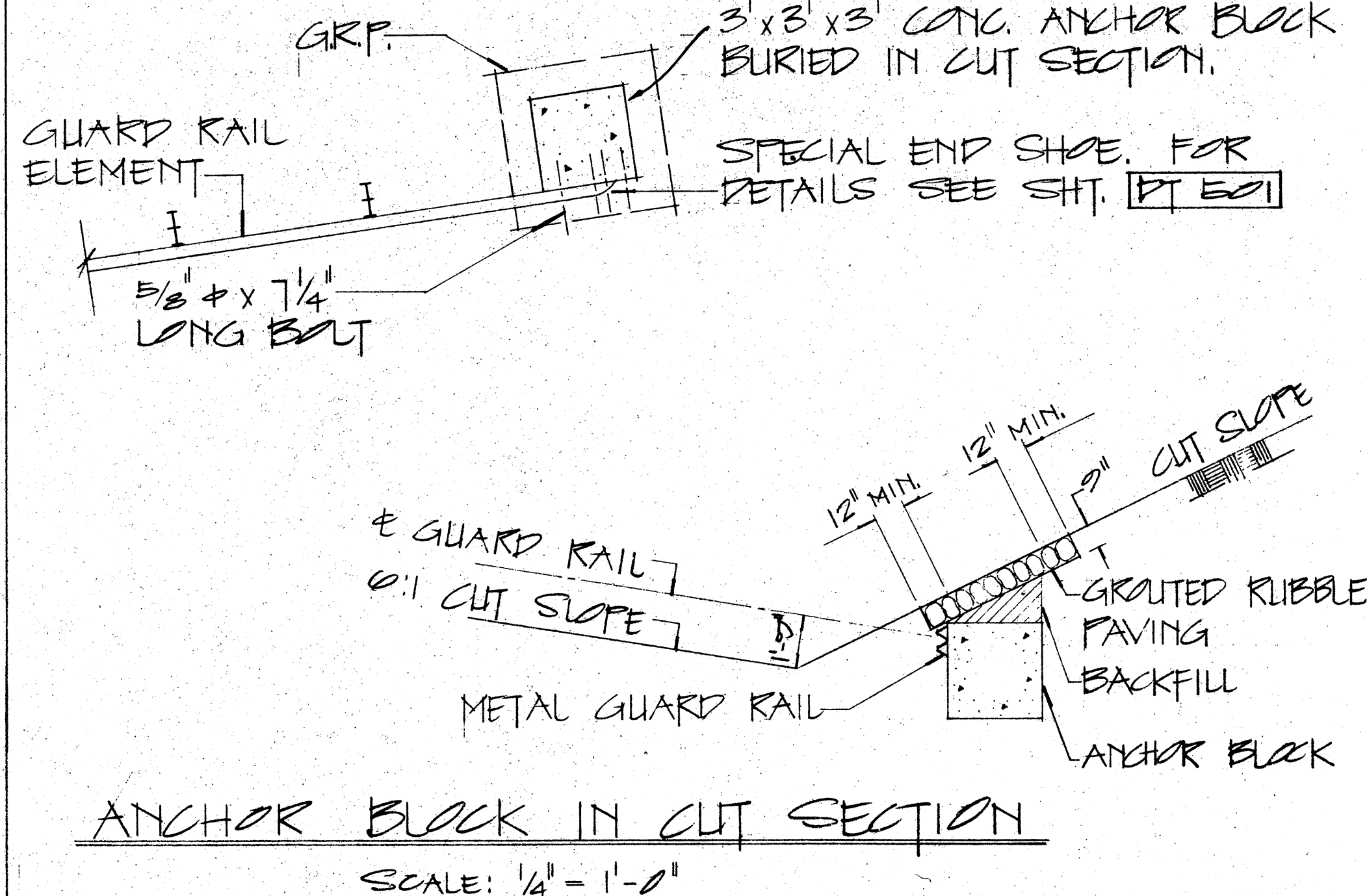
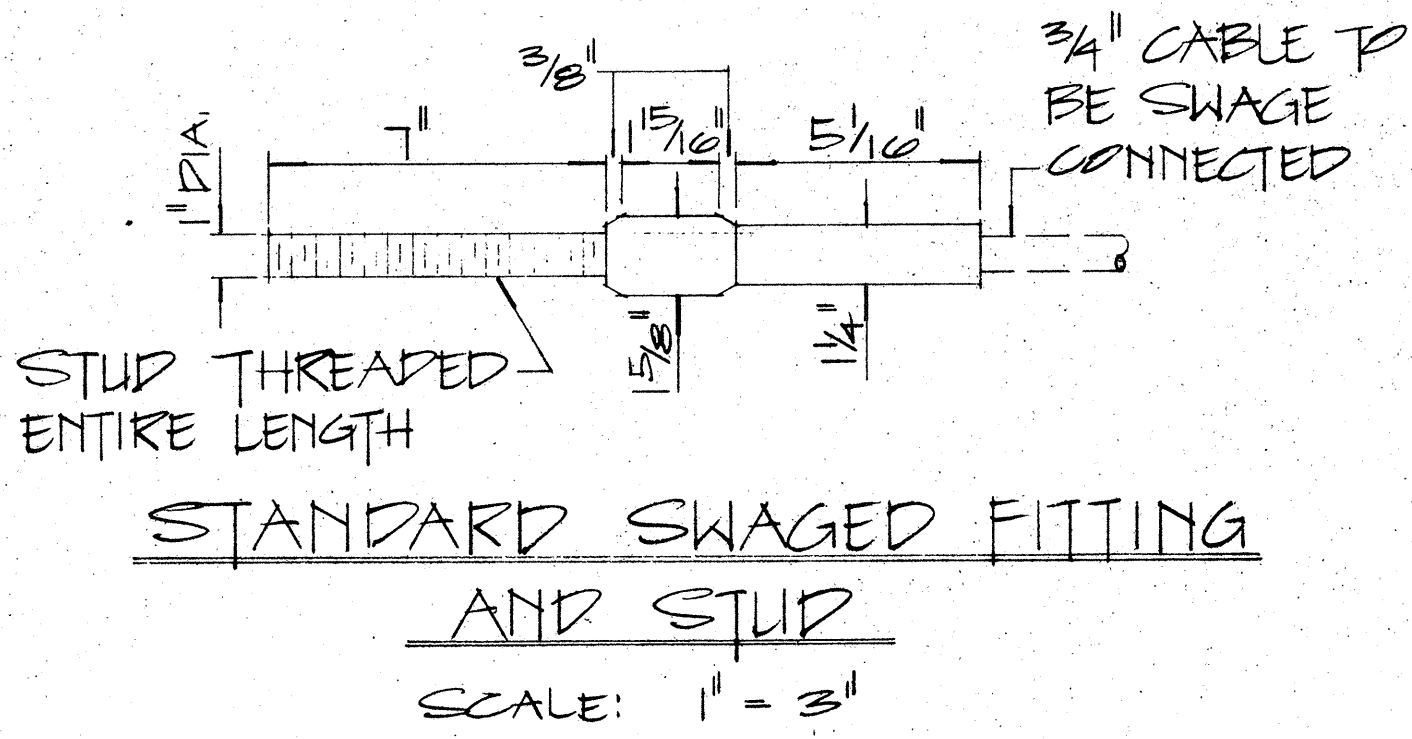
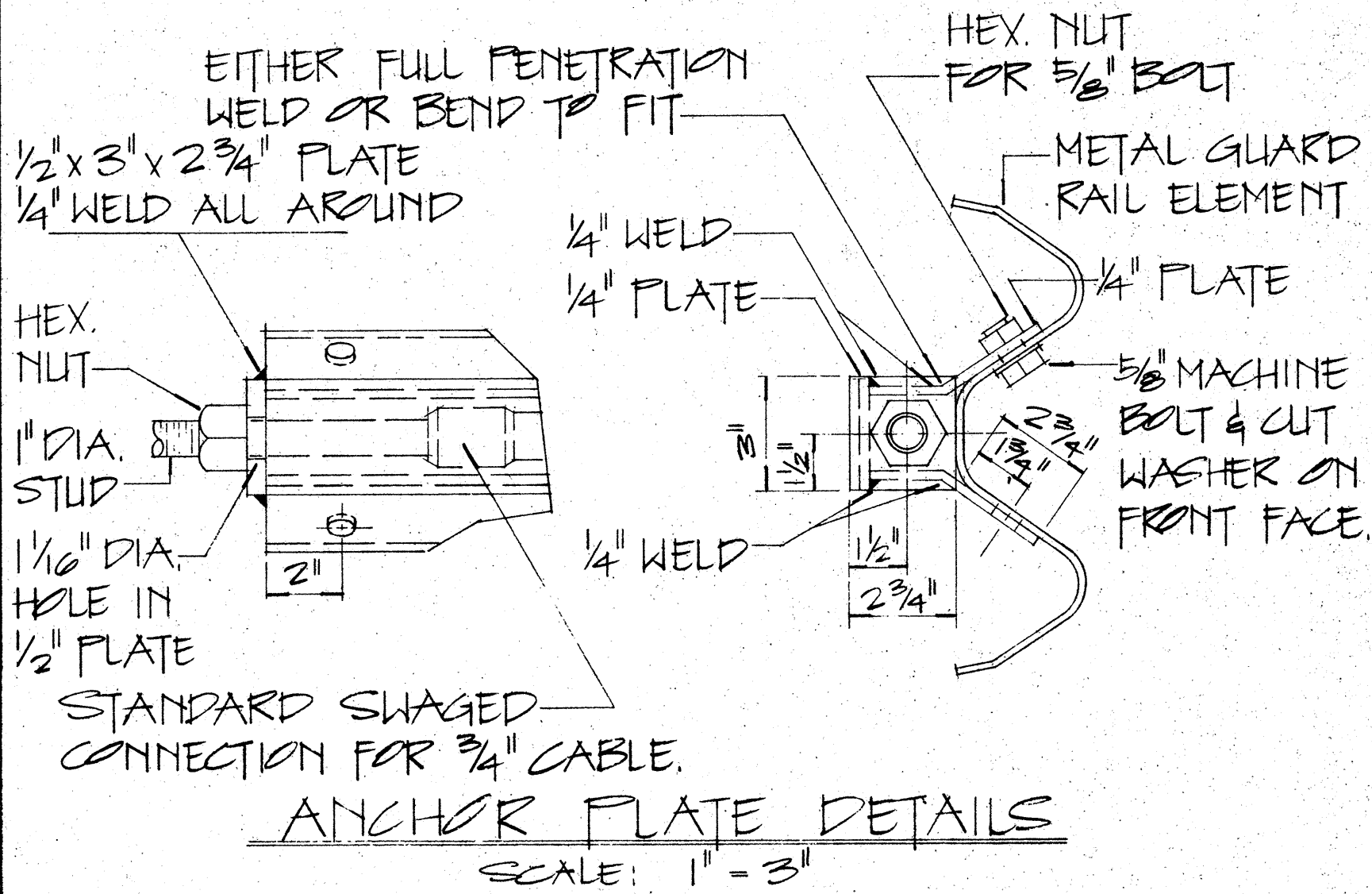
SHEET NO. 6 OF 9 SHEETS PT512

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
NO.	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	72A-01-71	1975	32	42



- NOTE:
1. GALVANIZED ANCHOR ROD, METAL GUARD RAIL AND POST BURIED IN GROUND SHALL BE COVERED WITH A MIN. 20-MIL THICKNESS OF COAL TAR ENAMEL, CONFORMING TO AWWA STANDARD: C 203
 2. CONCRETE, GRP, EXCAVATION, EARTH MOUND, ANCHOR RODS AND MISCELLANEOUS APPURTENANCES NECESSARY TO ANCHOR THE GUARD RAIL ENDS SHALL BE INCIDENTAL TO THE METAL GUARD RAIL.



APPROVAL RECOMMENDED:

Eiichi Tanaka 12/22/62

TRAFFIC ENGINEER DATE

APPROVED:

W. J. Sals 12-30-69

ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

EARTH MOUND AND ANCHOR BLOCK DETAILS

SCALE: AS SHOWN OCT 1969

SHEET No. 7 OF 9 SHEETS PT 520

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

6"

1/2" Ø Steel Plunger Bar, 39" long

12" O.C.

8"

12"

10" Dia.

Class D Concrete

Imbed 3/4" I.D. Galv. Pipe

Fin. Grade

[illegible]

Diagram illustrating the connection of a roof structure to a wall, showing dimensions and components:

- Roof Slope: 8'-0" (on both sides).
- Roof Ridge: 9" Min. to 22" Max. (width).
- Brace: Indicated on the roof structure.
- Ground Line: Horizontal line separating the roof from the wall.
- Wall Section: 4'-6" (height above ground), 3'-6" (height below ground), and 2" (thickness).
- Class D Conc. Footing: Foundation for the wall.
- Neat Excavation: Area around the footing.
- 18" sq. or 20" dia. Minimum: Dimension for the footing.
- 2" Min.: Dimension for the footing base.
- 4" Min.: Dimension for the footing base.
- 1/2" Min.: Dimension for the footing base.

15/8" O.D. Pipe
2.27 #/ft.

1/8"

1/2" ϕ

3/8" ϕ

1 3/8"

5/8"

3/8"

Top Strand of Fence

1/2" ϕ Bolt, USS Thread,
2" long, Hex. Head w/ Nut

7/8" 7/8"

DETAIL

of Fence

read,
d w/Nut

DETAIL "A"

9" Min.
22" Max.

Brace

4'-0"

4'-6"

18" Min.

4" Min.

2" Min.

Neat Excavation

Neat Excavation

3'-6"

18" sq. or 20" dia.
Minimum

7' or 10'

7 Ga. G.S. Wire
@ 10" o.c.

DETAIL "B"

#/ft.

1. Gate Hinge Blades and Plunger bar guides shall be chamfered $\frac{1}{32}$ " all around and as required to prevent conflict between moving parts.
2. All parts of Gates shall be galvanized after fabrication.
3. All holes shall be reamed as necessary to admit hinge bolts or plunger bars.
4. Gate panels shall be strung with 7 ga. smooth fence wire spaced to conform to spacing of adjacent fence strands.
5. One plunger bar required per set of double-hung gates. None required for single-hung gate.

Gate Post, 8' long,
2 7/8" O.D. @ 5.79 #/ft.

Drill 1 7/32" Ø for
1/2" Ø Bolt

1/4

5/8" R

2

1/4

TYPICAL SECTIONS OF METAL POSTS
Not To Scale

APPROVAL RECOMMENDED:
Mr. Jones 12-4-69
HIGHWAY DESIGN ENGINEER DATE

APPROVED:
Walter B. Deid 12-10-69
ASSISTANT CHIEF. ENGINEERING DATE

Scale: As Noted

SHEET No. 8 OF 9 SHEETS DD 607.3

