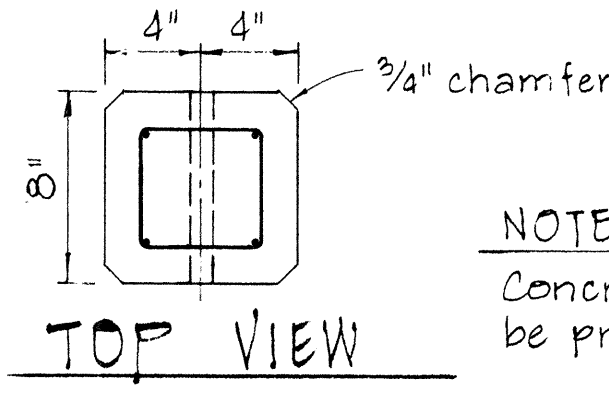
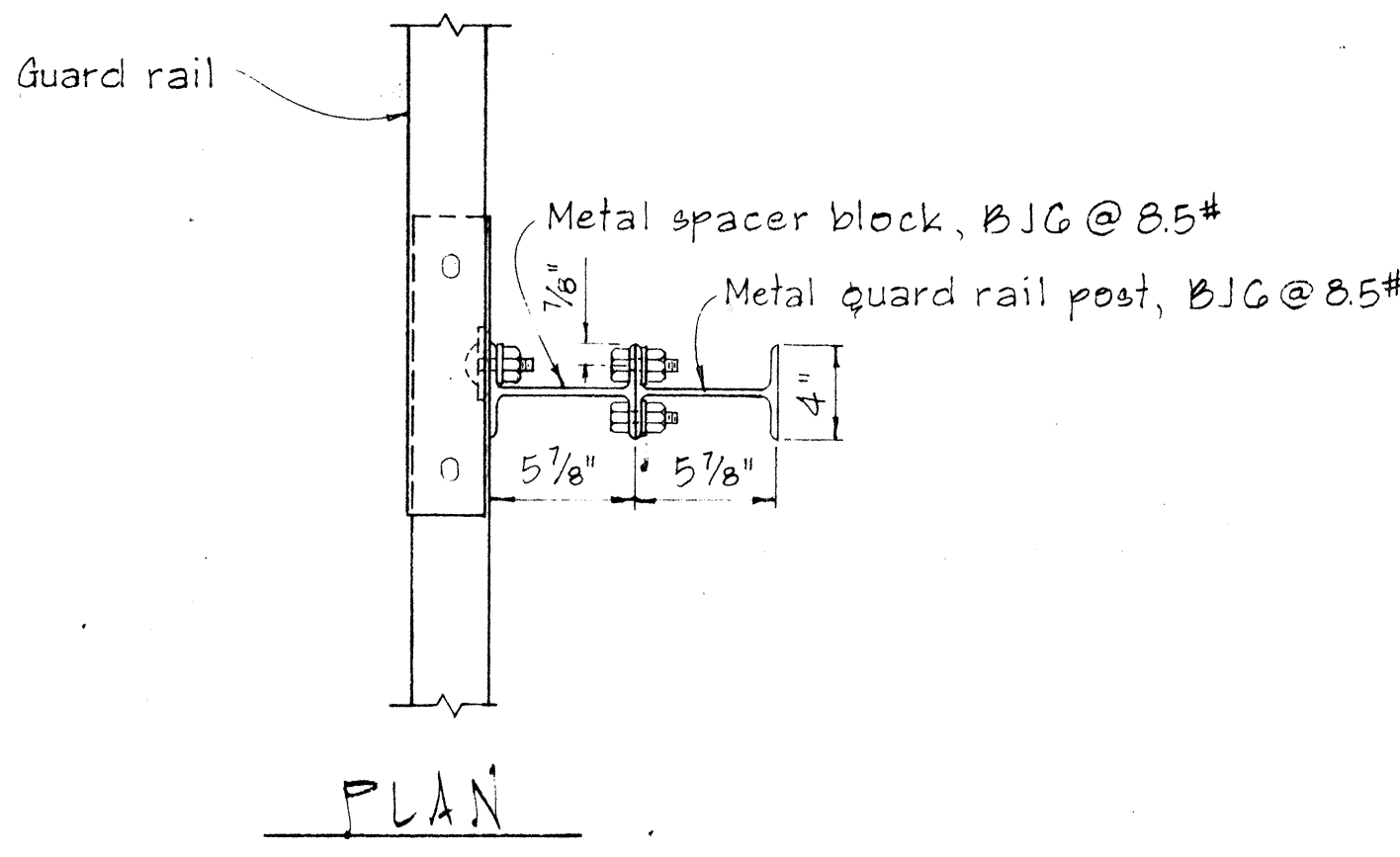
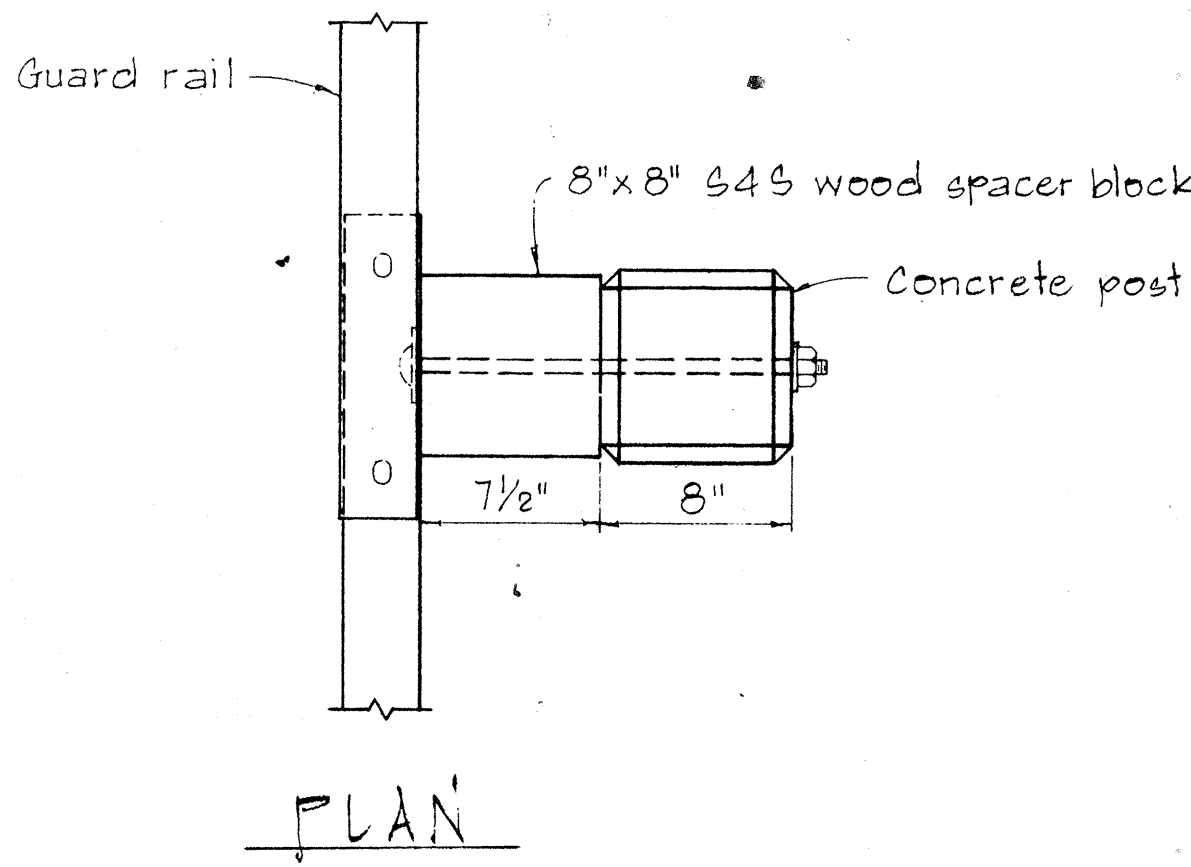
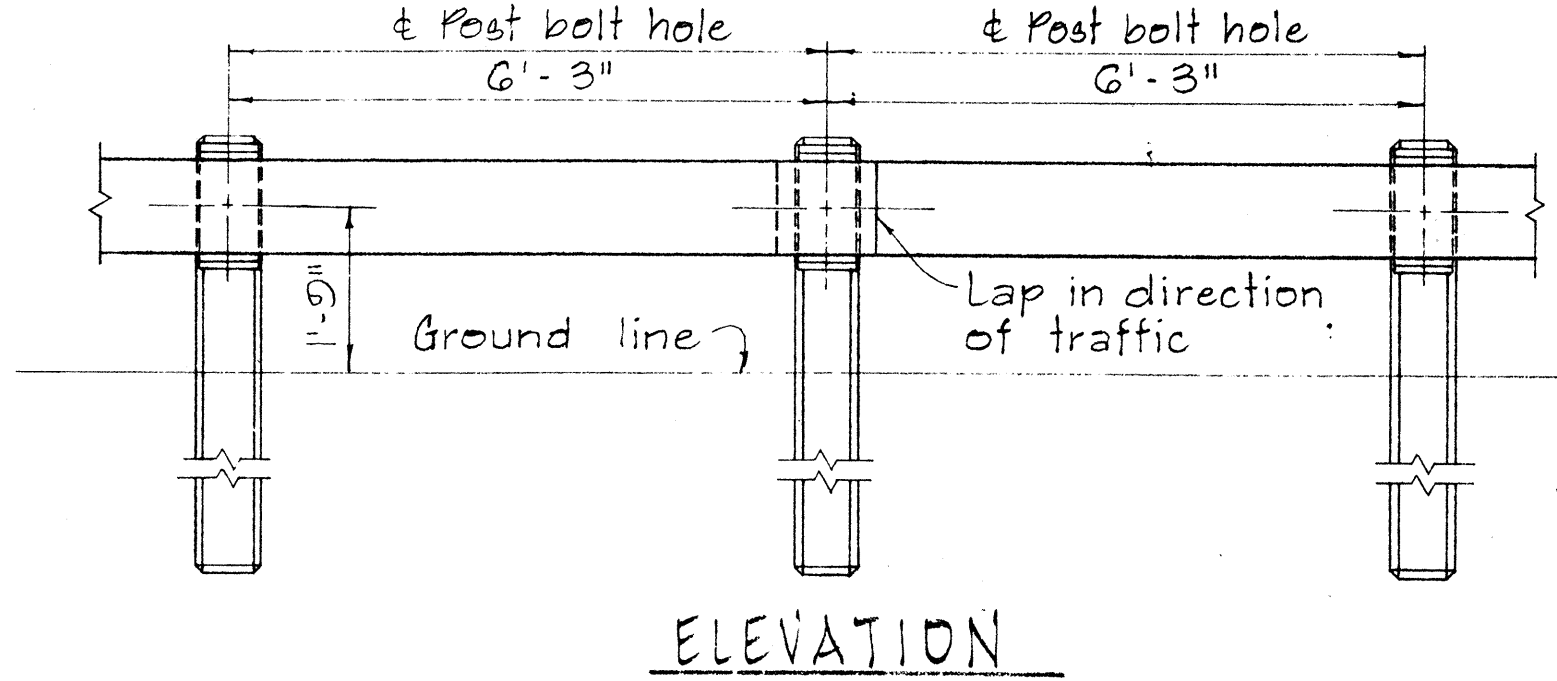
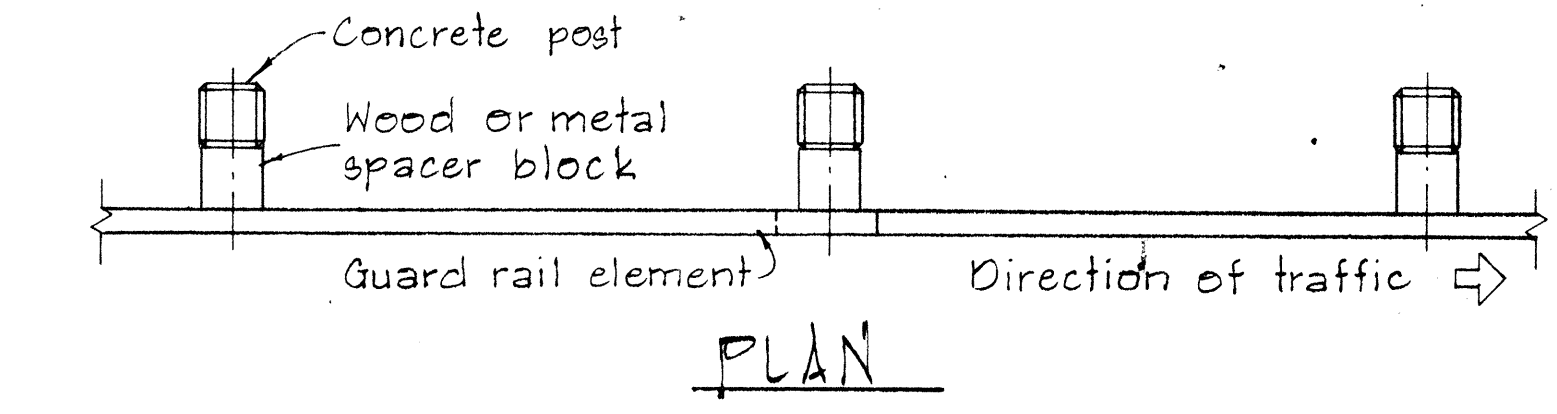
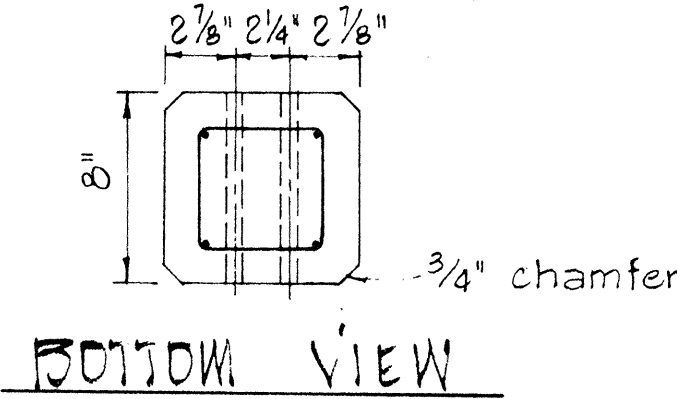
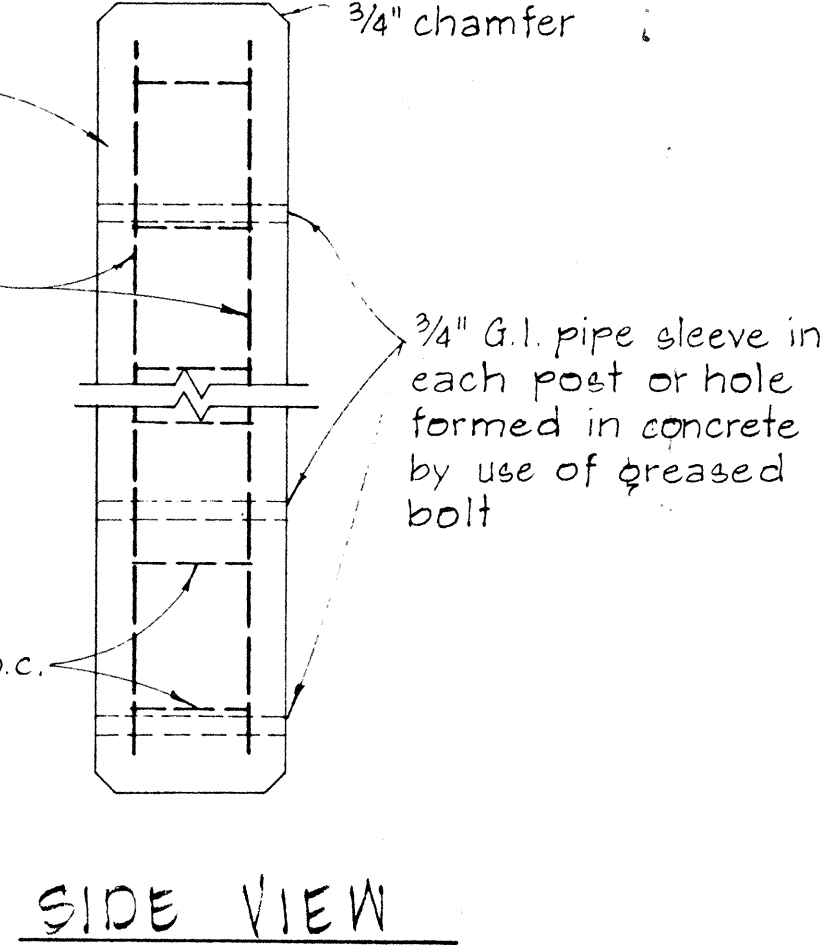
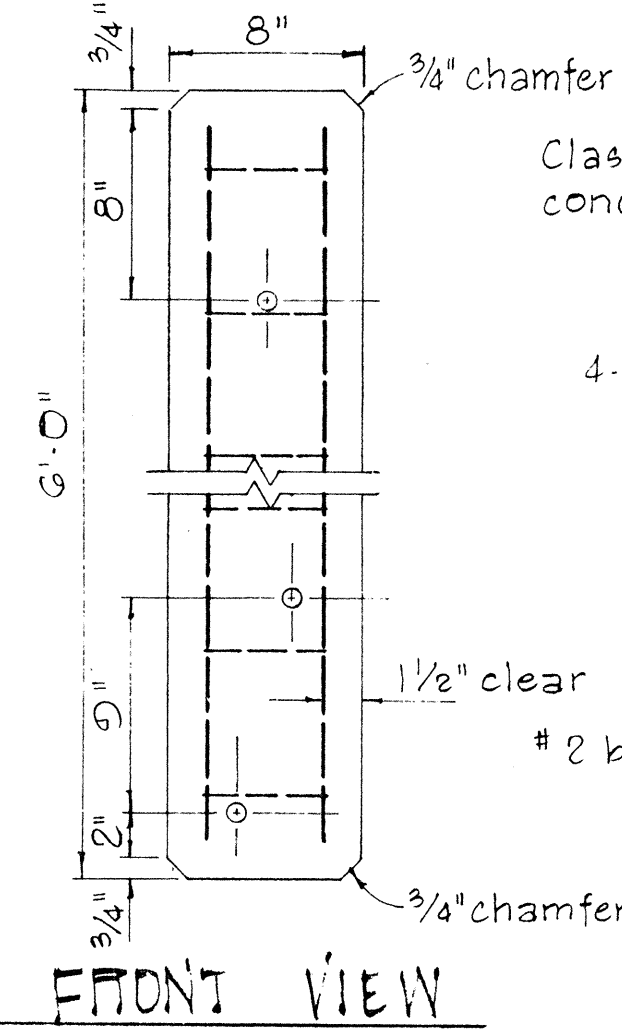


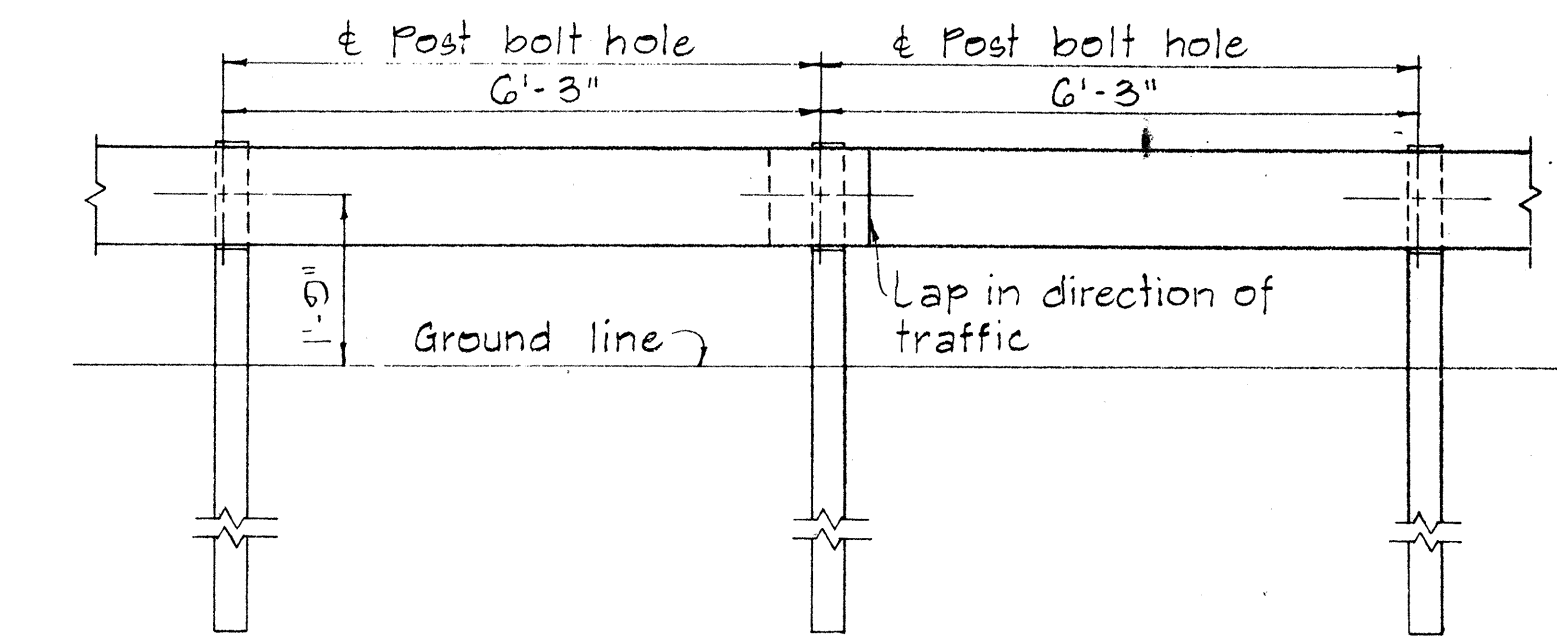
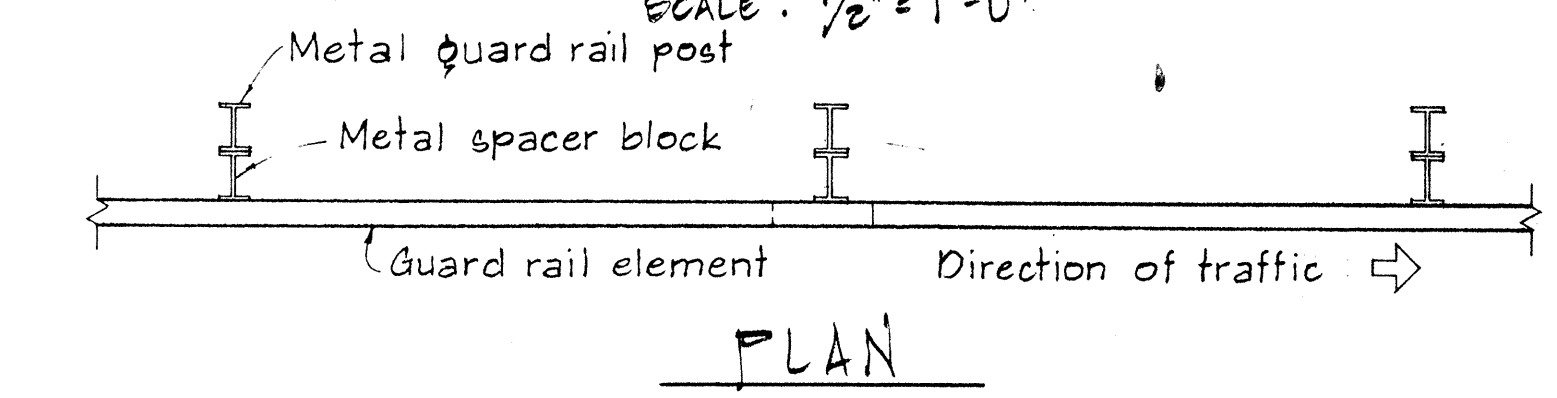
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	05-0900(10)	1978	17	23



NOTE:
Concrete post shall be precast

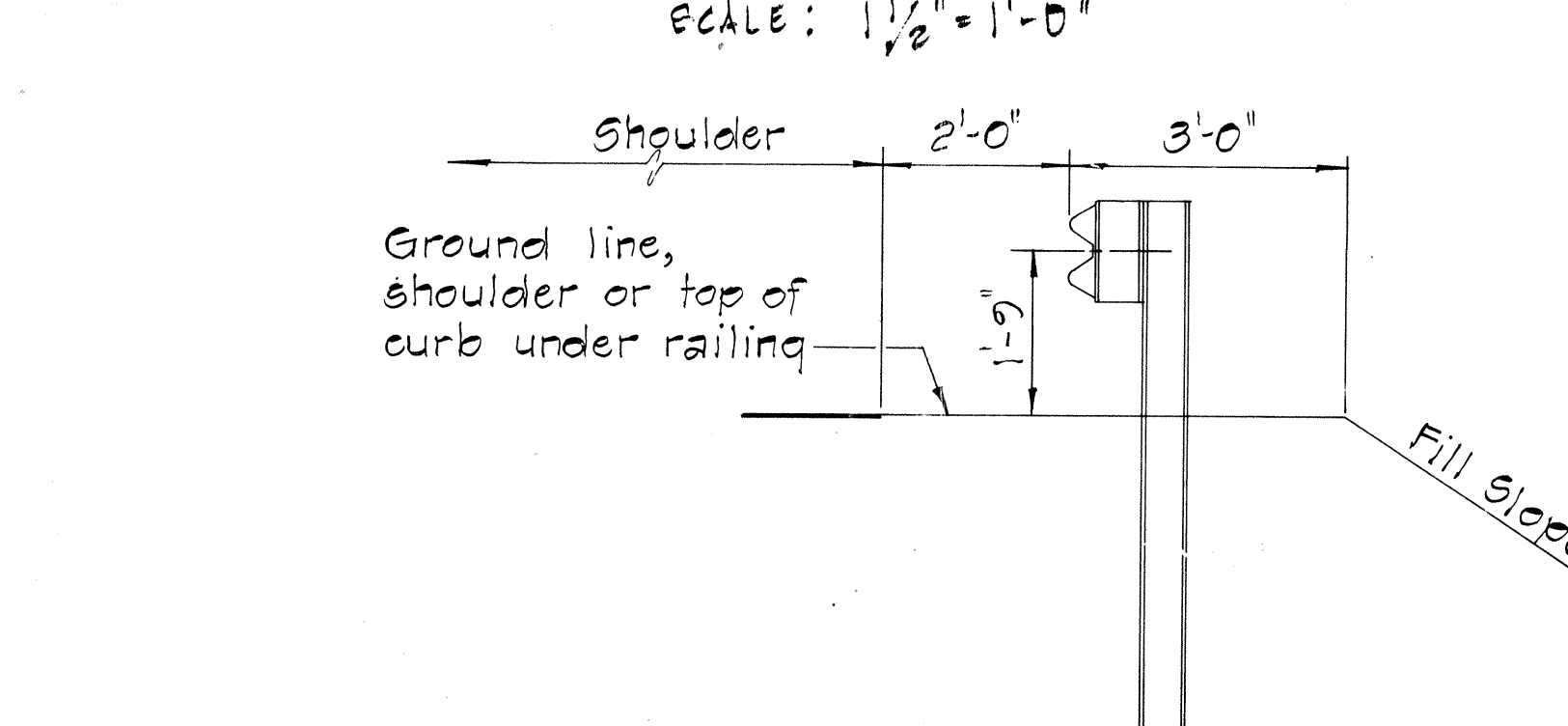


METAL GUARD RAIL ON CONCRETE POST WITH WOOD OR METAL SPACER BLOCK.



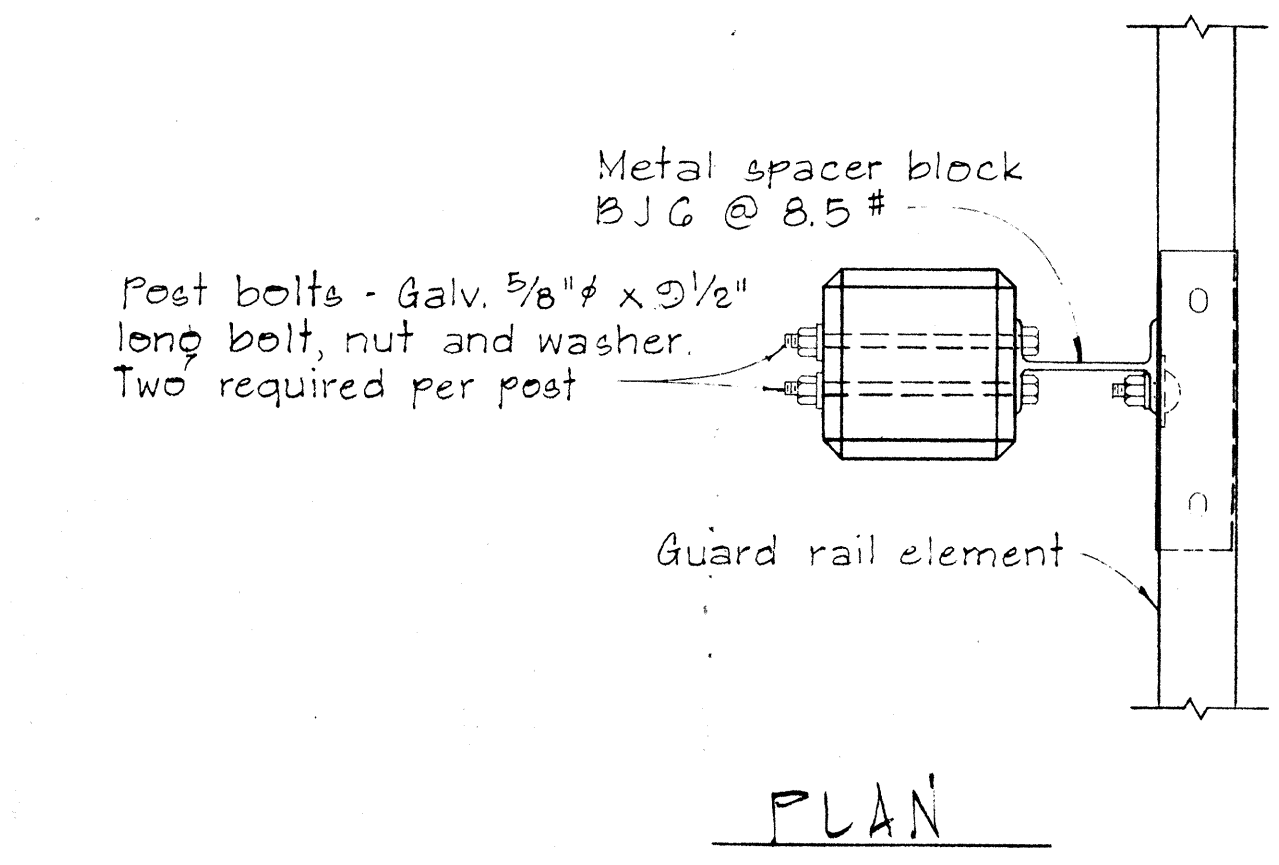
METAL GUARD RAIL ON METAL POST WITH METAL SPACER BLOCK

SINGLE METAL GUARD RAIL ON METAL POST WITH METAL SPACER BLOCK



TYPICAL METAL GUARD RAIL DETAIL

SINGLE METAL GUARD RAIL ON PRECAST CONCRETE POST WITH WOOD OR METAL SPACER BLOCK



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

APPROVED:
Richard J. Seiden
ASSISTANT CHIEF, ENGINEERING
12-30-69
DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAILS
METAL GUARD RAIL

SCALE: AS SHOWN
NOV. 1968

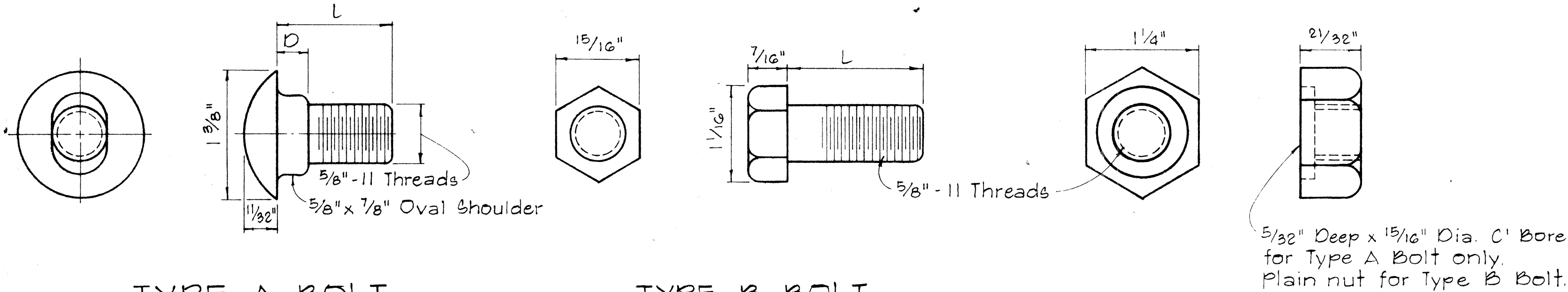
SHEET No. 1 OF 7 SHEETS DT 500

DATE	
SURVEY PLOTTED BY	
DRAWN BY	
TRACED BY	
CHECKED BY	
NOTED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	05-0300(10)	1978	18	23

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

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



TYPE A BOLT

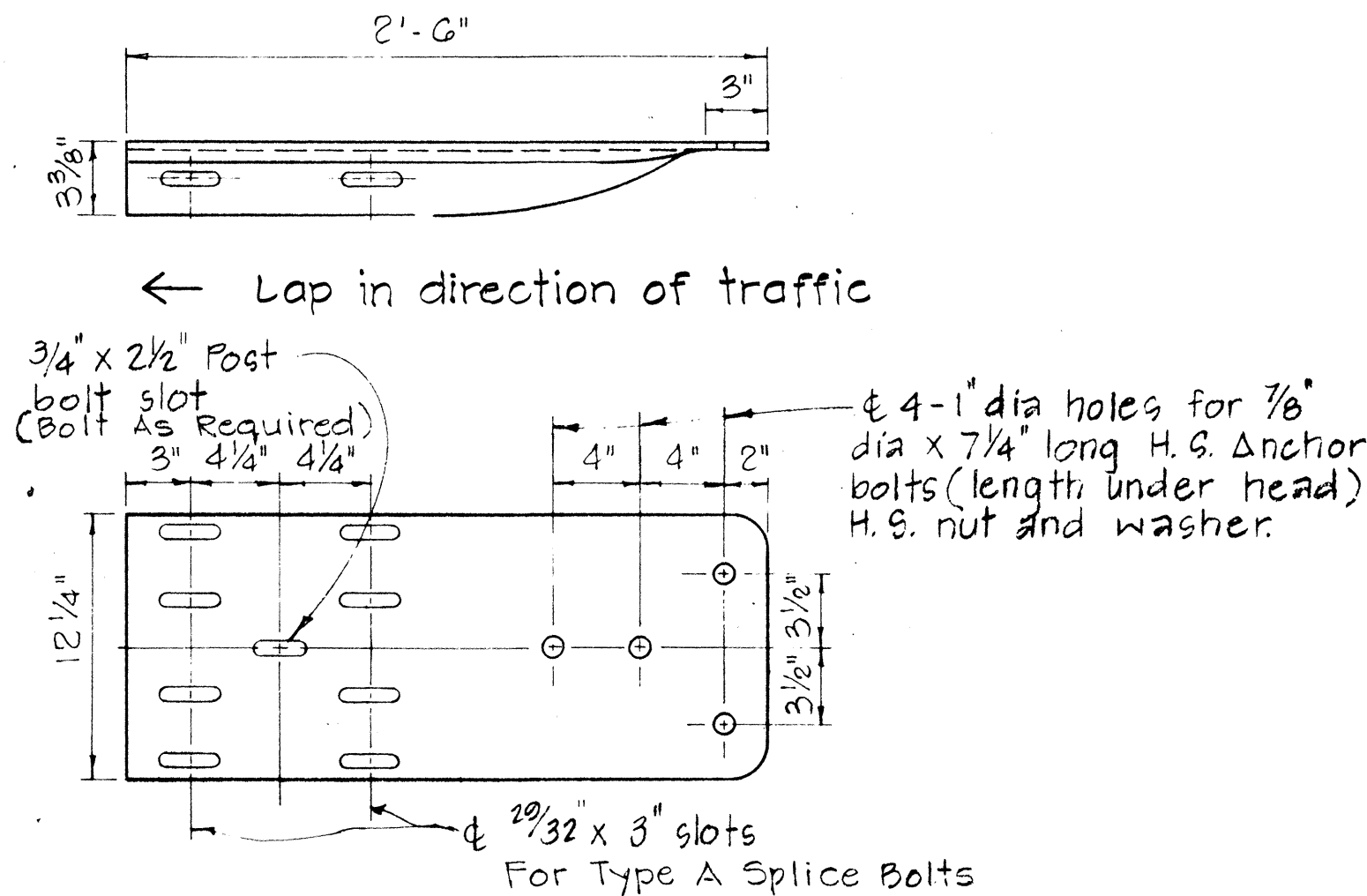
TYPE B BOLT

SPUCE RAIL AND POST BOLTS

Scale: Full Size

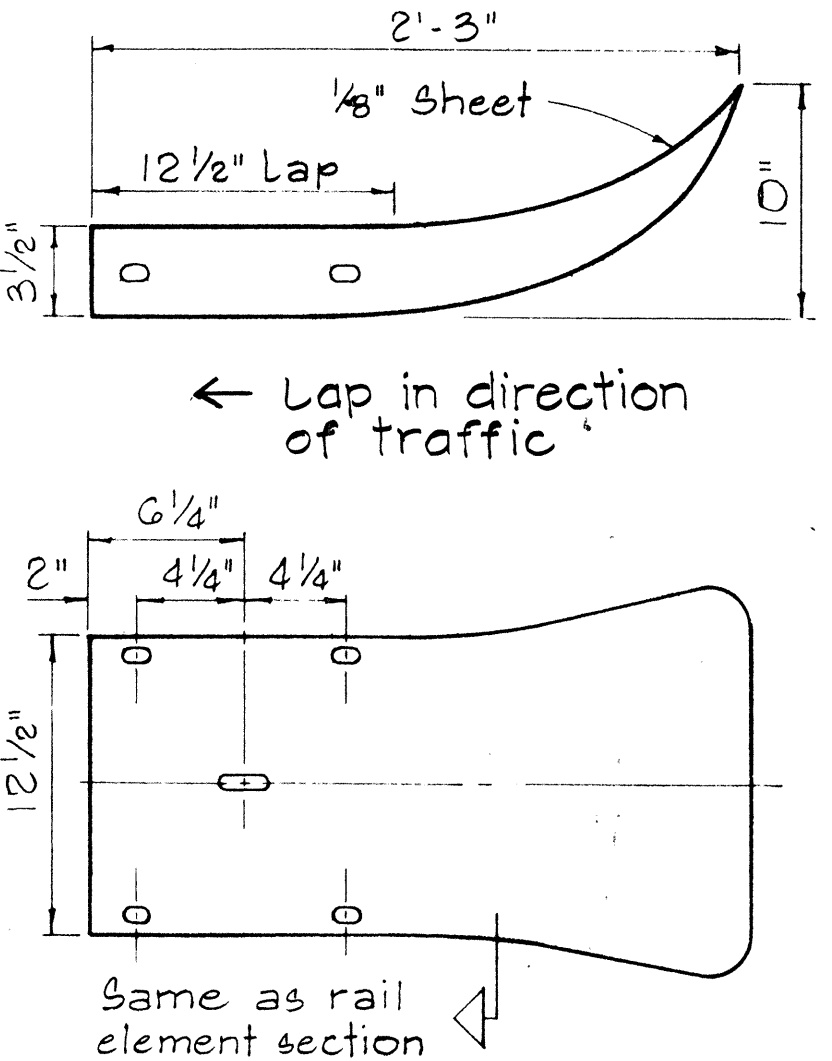
HEXAGON NUT

Scale: Full Size



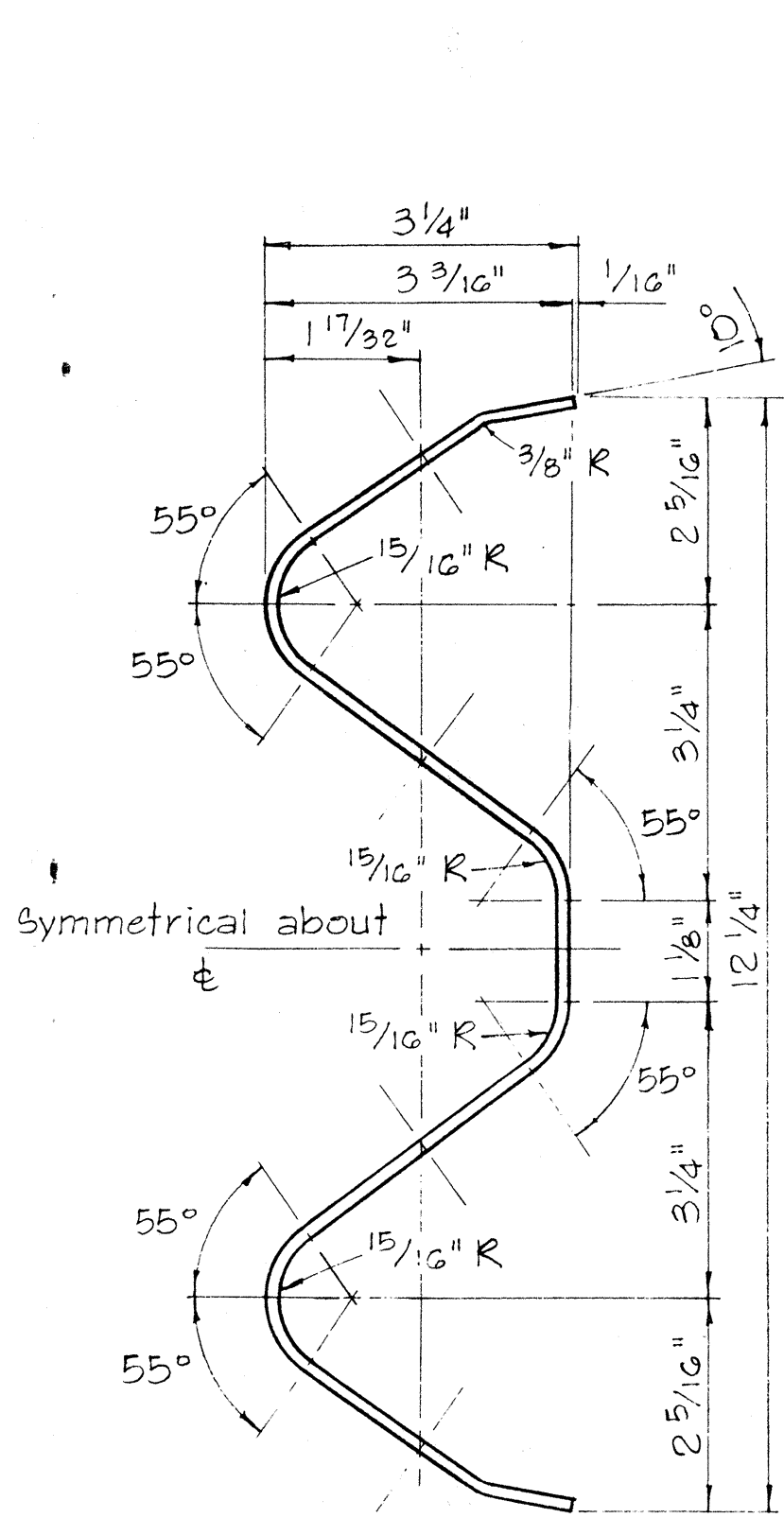
SPECIAL END SHOE

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



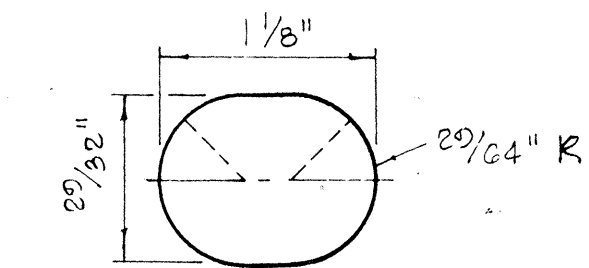
FLARED END

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



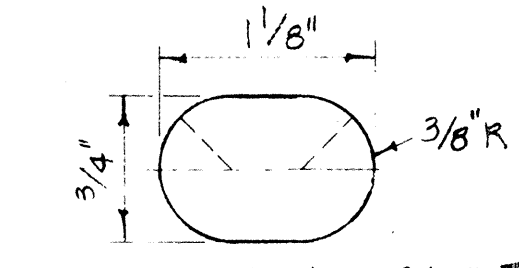
RAIL ELEMENT SECTION

Scale: 6\" = 1'-0"

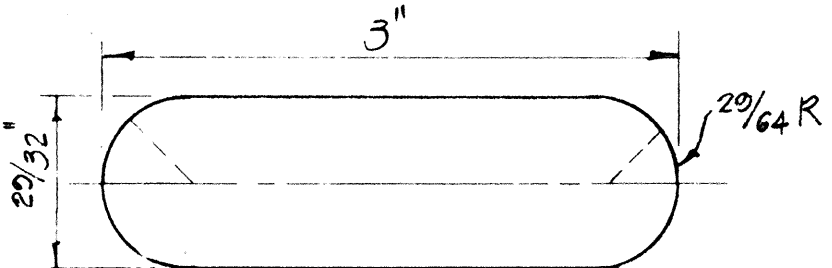


SPUCE BOLT SLOT

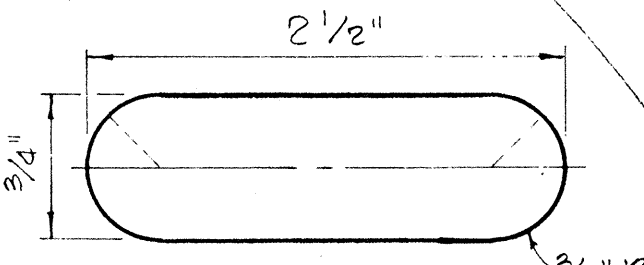
Scale: Full Size



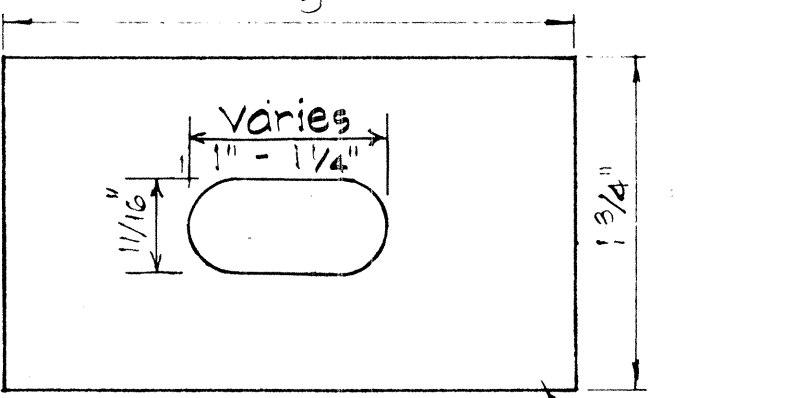
SPUCE BOLT SLOT FOR SPECIAL END SHOE



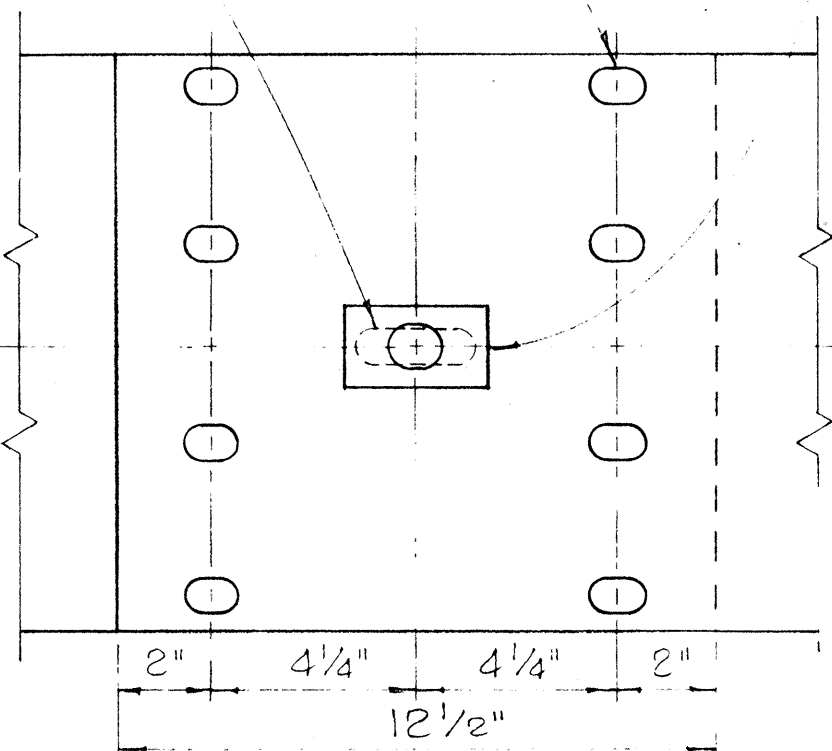
SPUCE BOLT SLOT FOR SPECIAL END SHOE



POST BOLT SLOT



RAIL WASHER

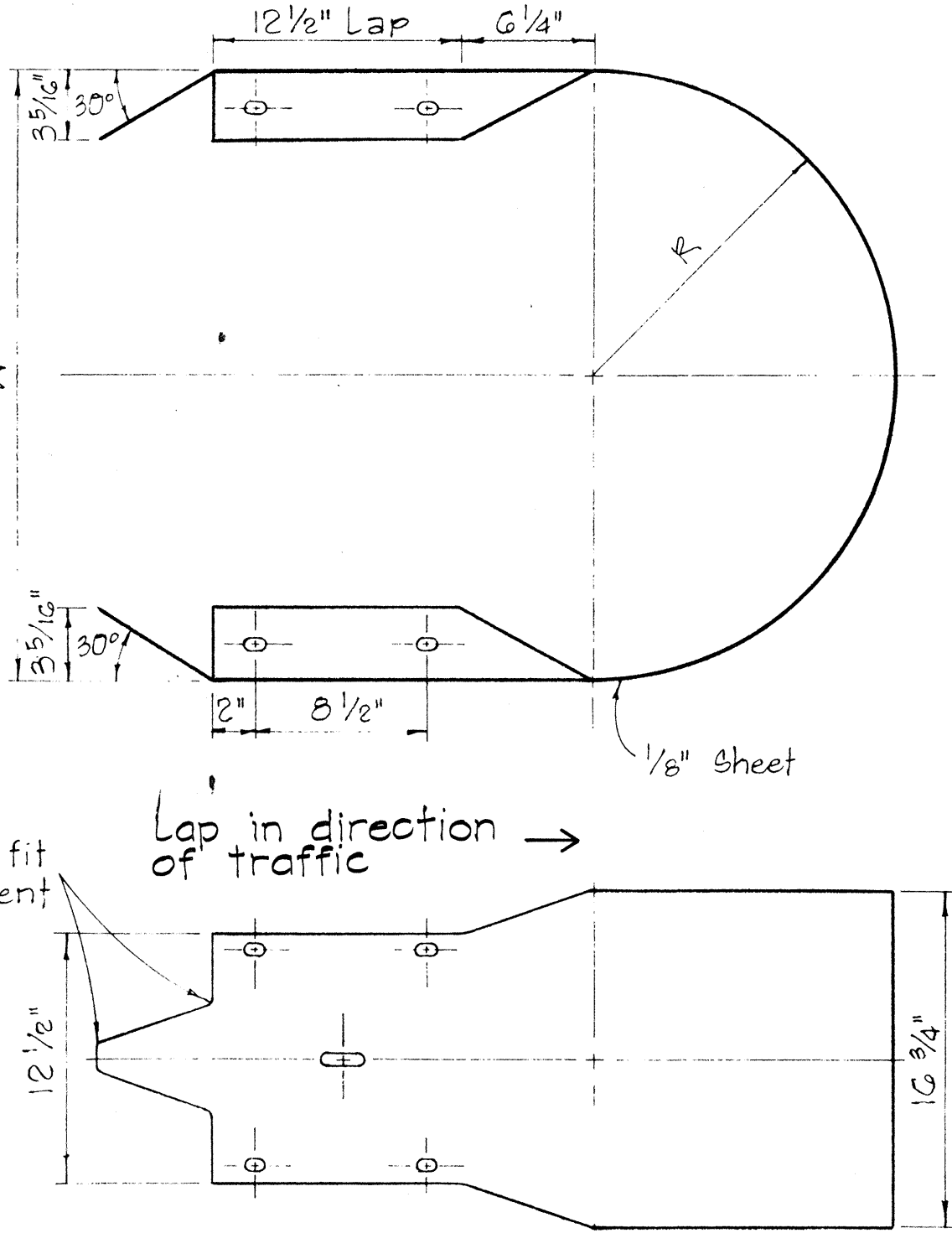


RAIL SPLICE

Scale: 3\" = 1'-0"

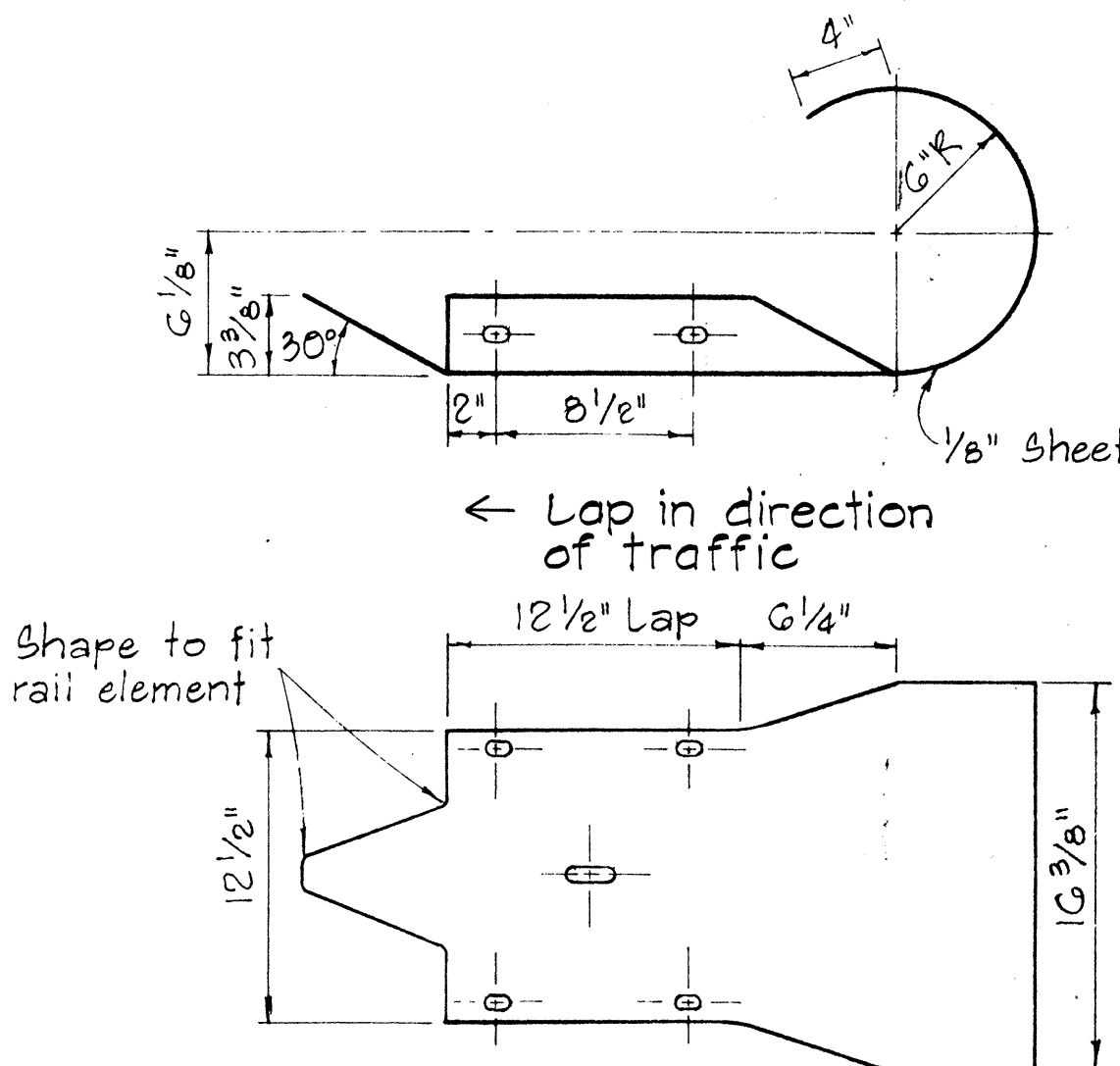
- NOTES:
- H.S. Bolts shall conform to the requirements of ASTM A 325.
 - Special End Shoe shall be fabricated from 10 Gage steel conforming to the requirements of AASHTO 180.

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 3/8"



MEDIAN END

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



CURVED END

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

APPROVAL RECOMMENDED:
Eishi Tanaka
 TRAFFIC ENGINEER
 APPROVED:
John J. Del
 ASSISTANT CHIEF, ENGINEERING

12/29/63
 DATE

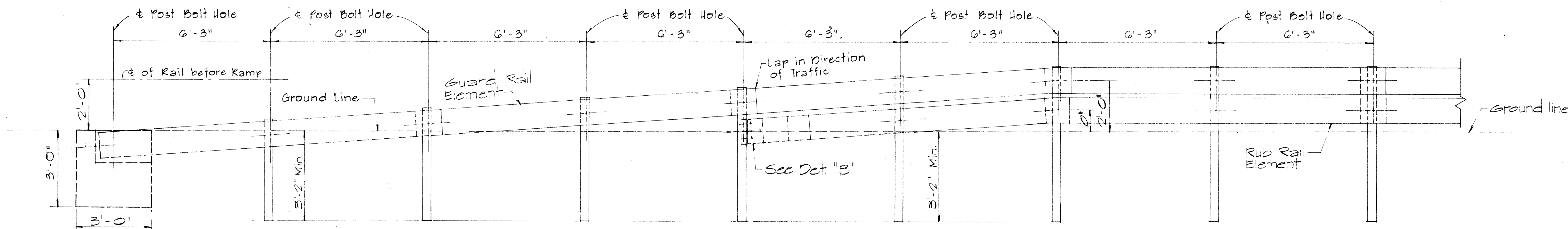
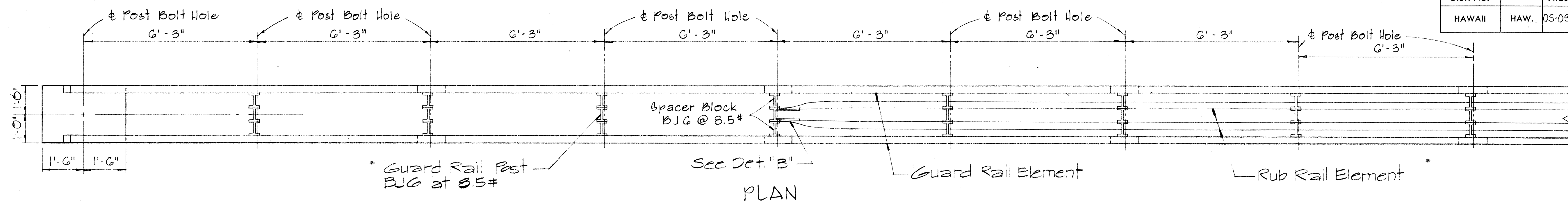
12-30-63
 DATE

NO	REVISION	APPROVED BY	DATE
1	Revised Hole Size for Rectangular Rail Washer	H.T.	8/16/77

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 LAND TRANSPORTATION FACILITIES DIVISION
 STANDARD DETAILS
 METAL GUARD RAIL
 Scale: As Noted
 August, 1968
 SHEET No. 2 OF 7 SHEETS DT 501

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	05-0900(10)	1978	19	23

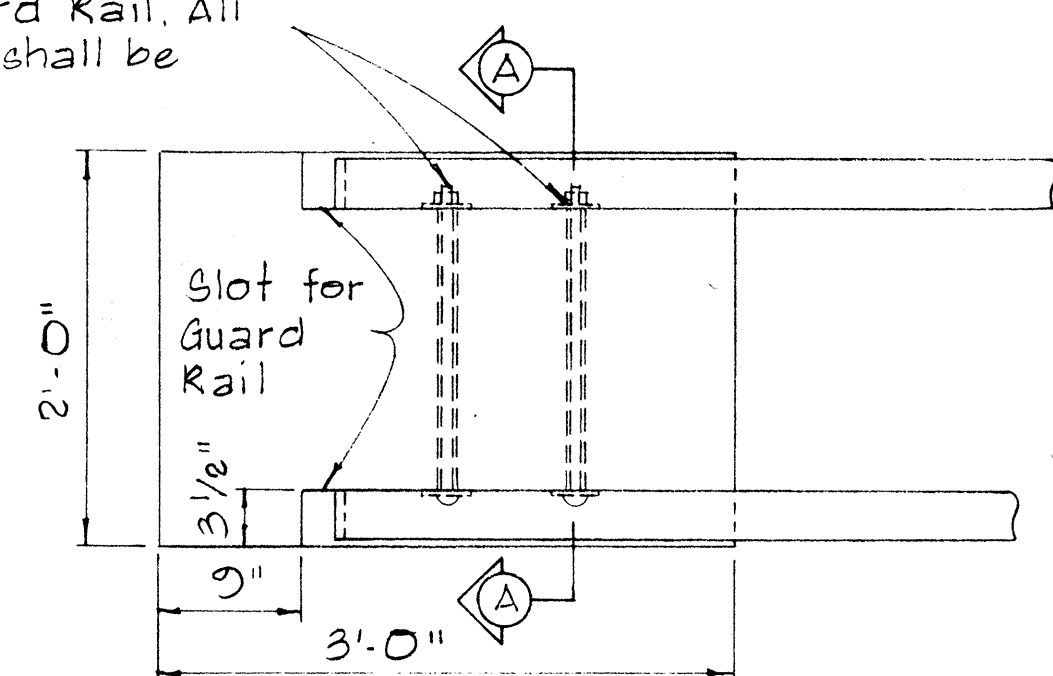


ELEVATION

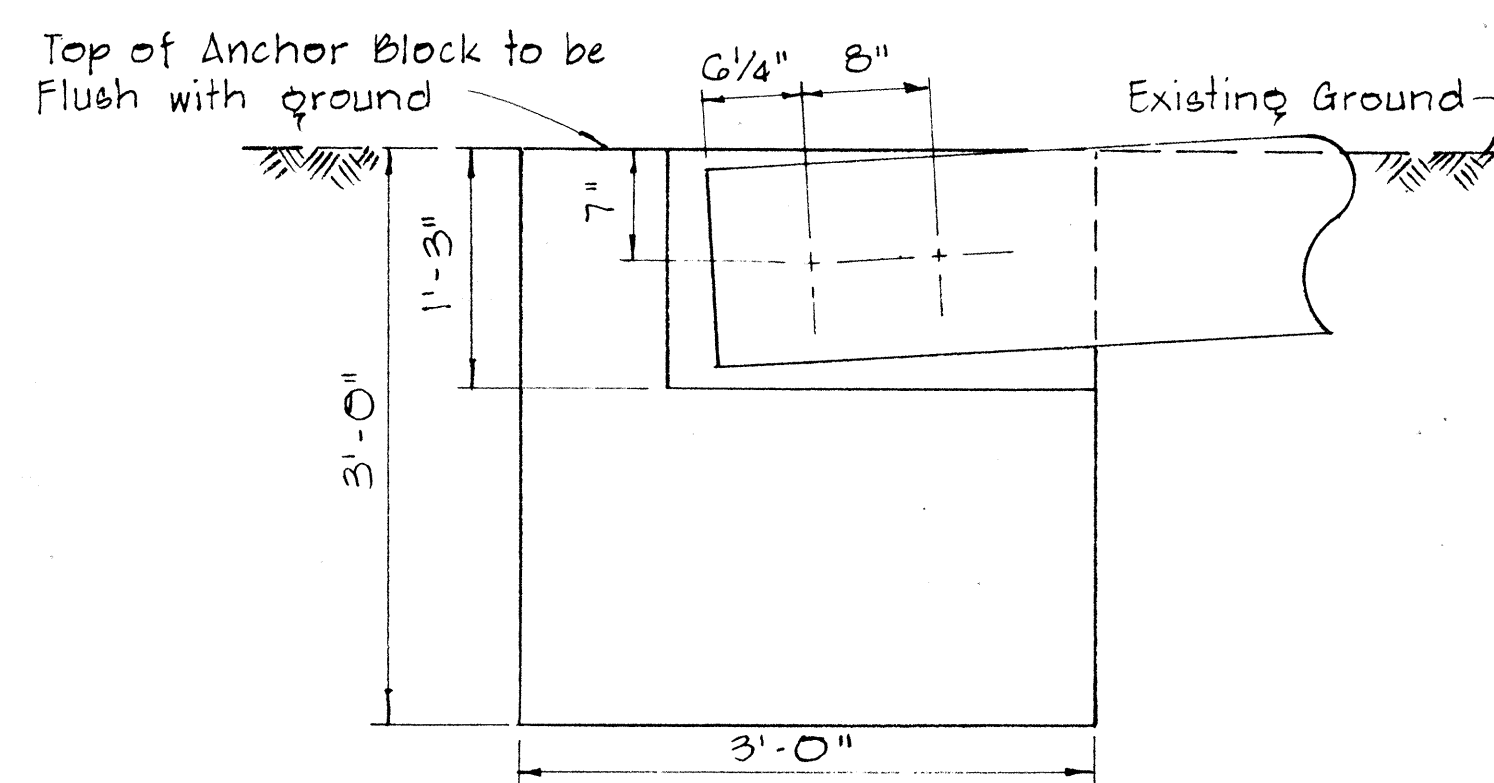
STRAIGHT APPROACH - RAMP END ANCHORAGE (MEDIAN)

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

5/8" Bolts with 3/4" G.I. Pipe Sleeve in each hole incidental to Metal Guard Rail. All Metal Pieces shall be Galvanized.



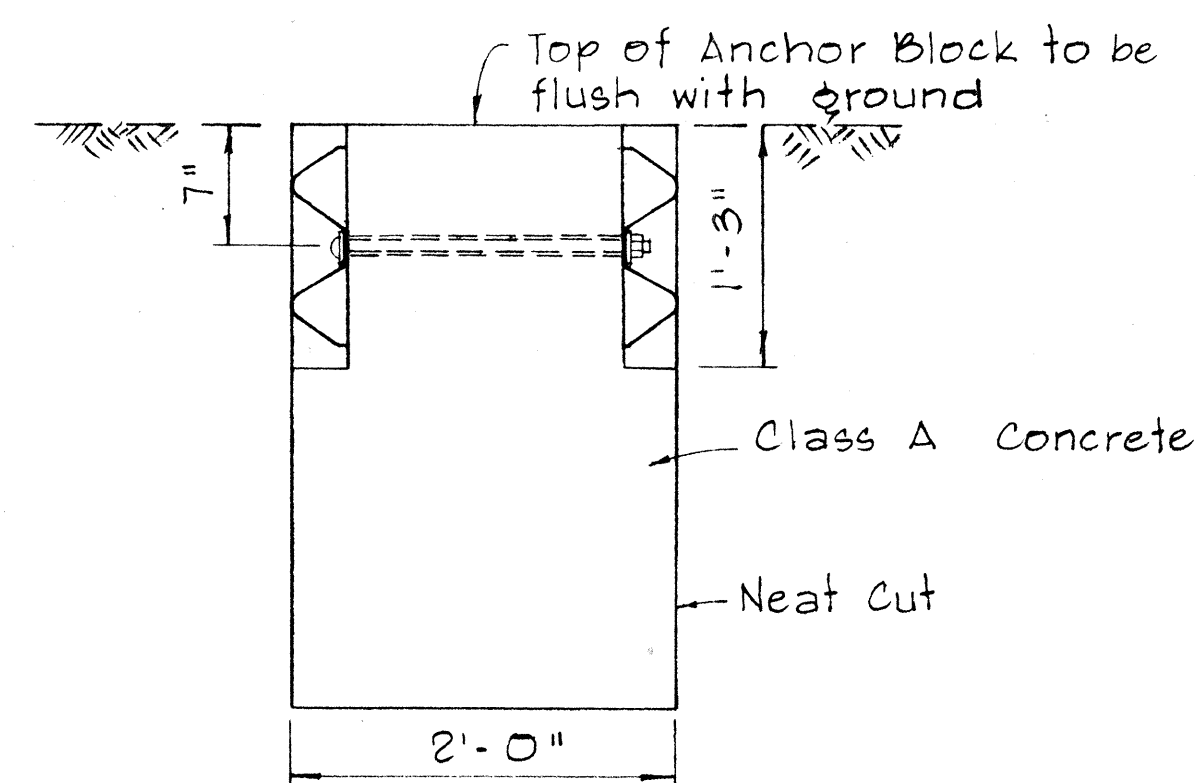
PLAN



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.

Top of Anchor Block to be flush with ground

3/4" Dia. holes for 5/8" dia. bolts

1" Dia. holes for 7/8" dia. bolts

Class A Concrete

Neat Cut

2'-0"

1'-3"

7"

3'-0"

11'-3"

Existing Ground

Top of Anchor Block to be flush with ground

6 1/4" x 8"

3'-0"

11'-3"

Existing Ground

Top of Anchor Block to be flush with ground

6 1/4" x 8"

3'-0"

11'-3"

Existing Ground

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3'-0"

11'-3"

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Existing Ground

Top of Anchor Block to be flush with ground

6 1/4" x 8"

3'-0"

11'-3"

Existing Ground

Top of Anchor Block to be flush with ground

6 1/4" x 8"

3'-0"

11'-3"

Existing Ground

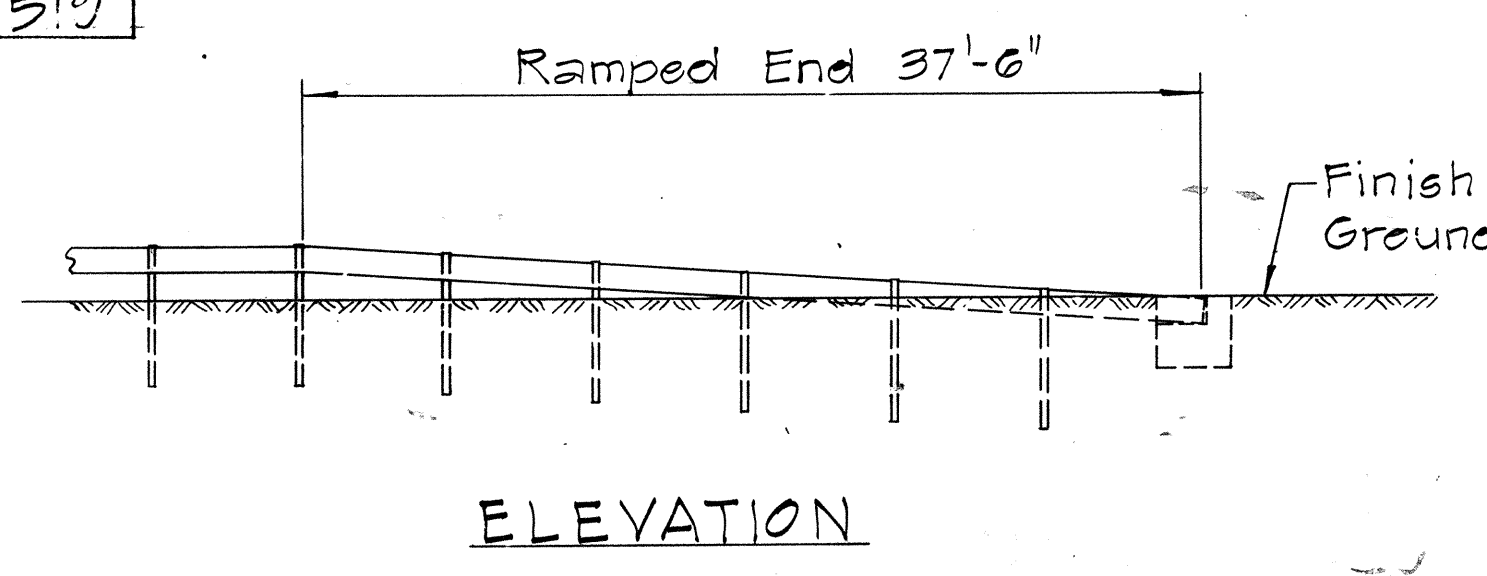
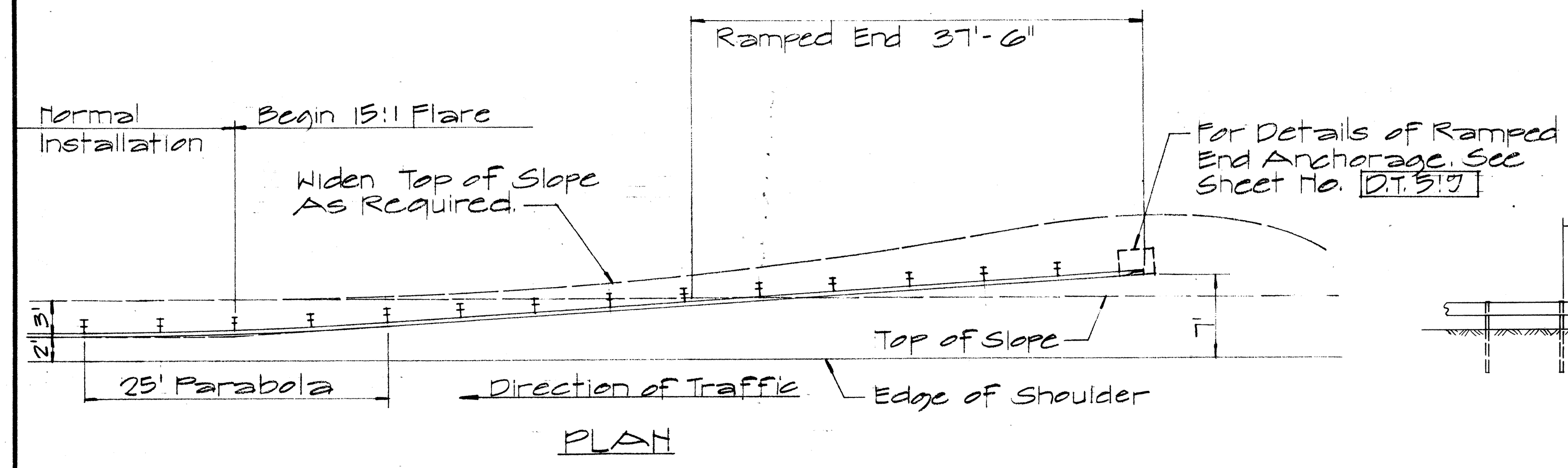
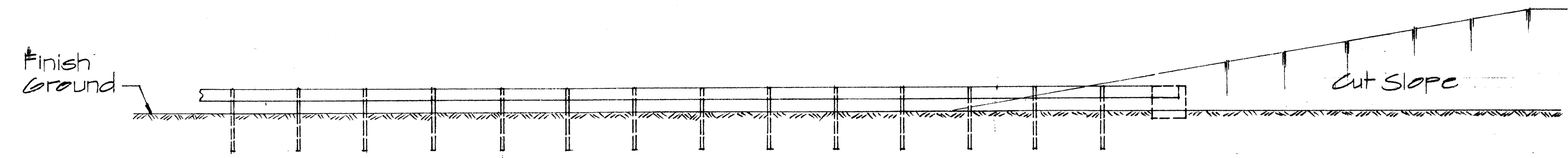
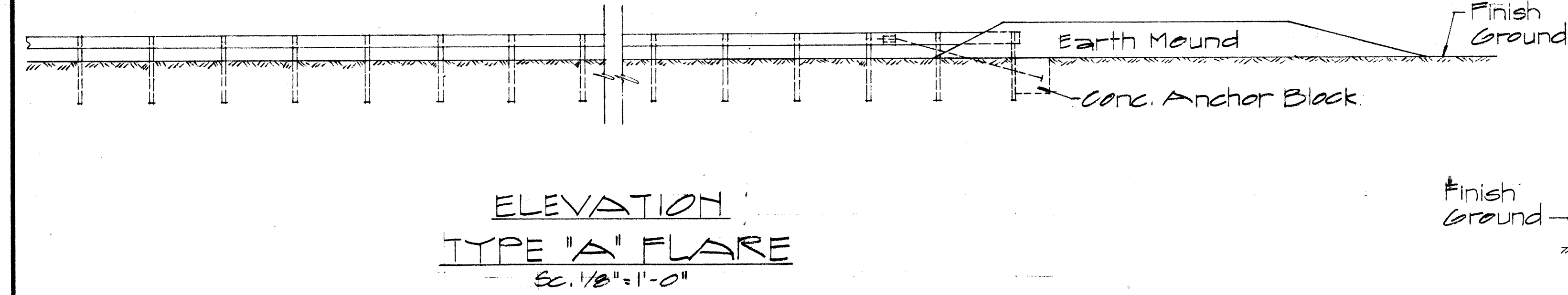
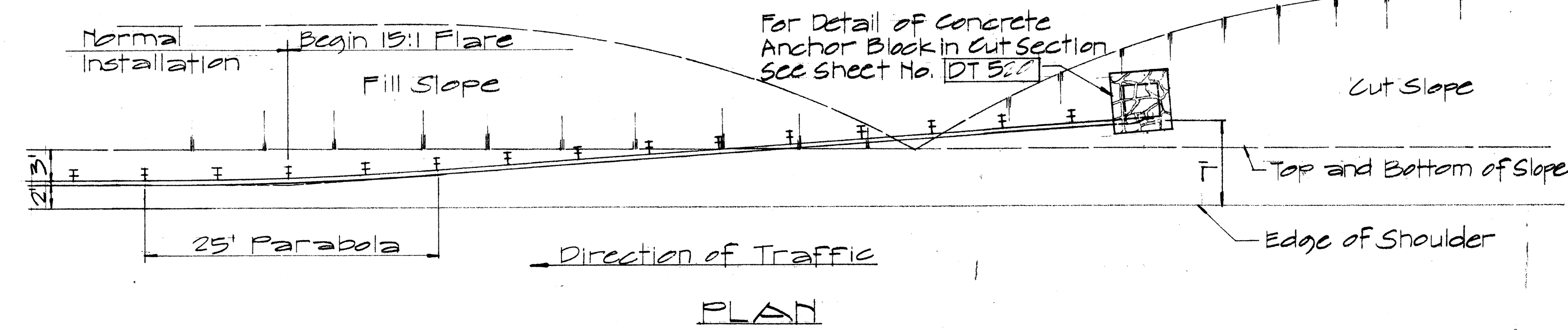
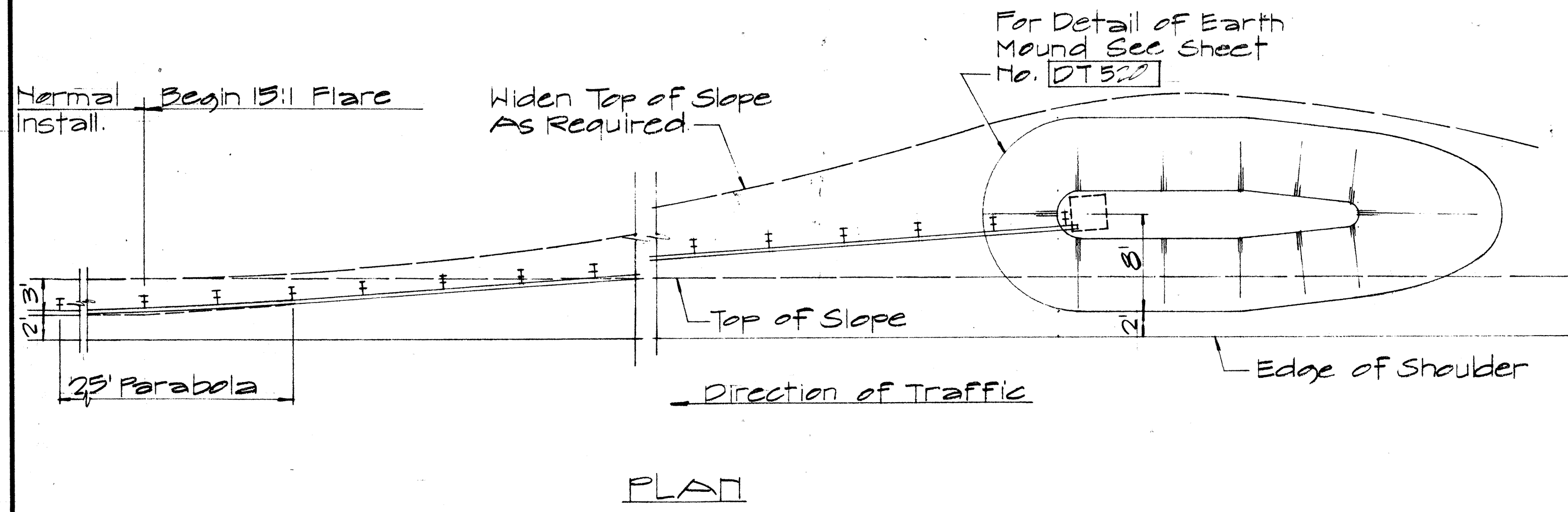
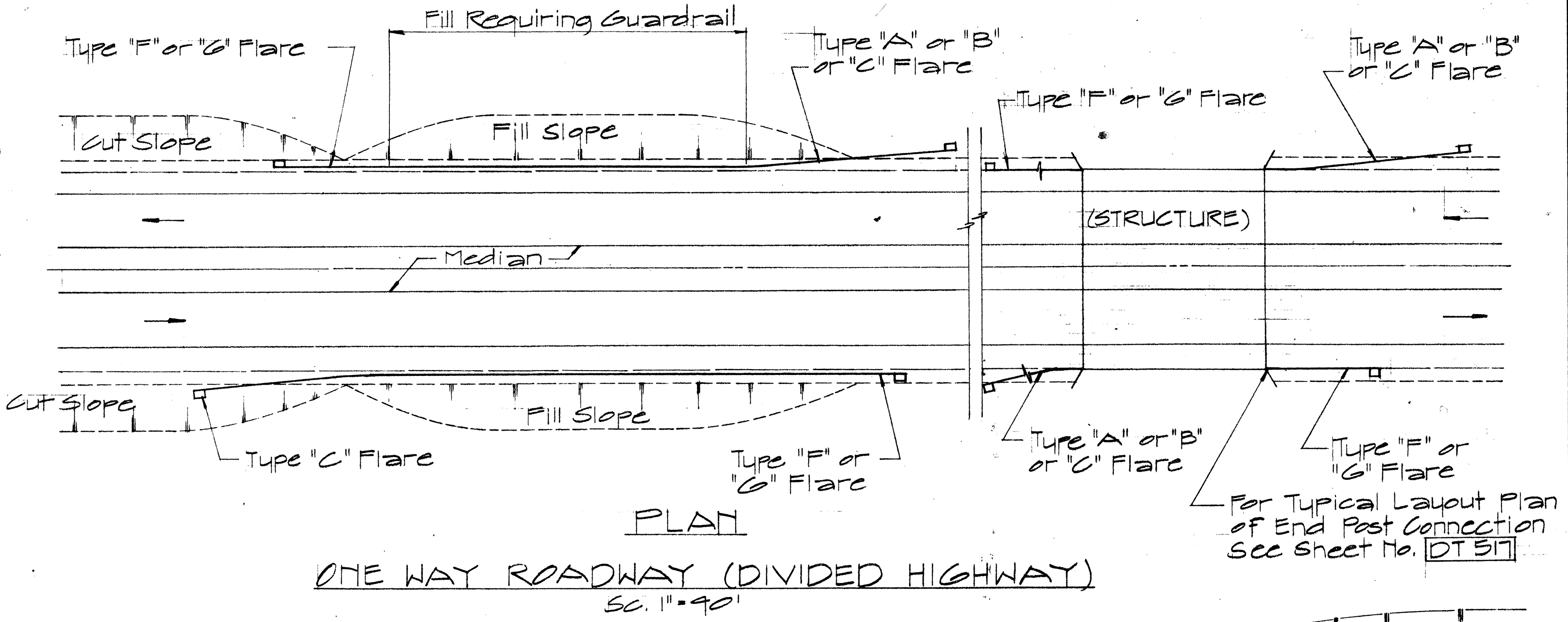
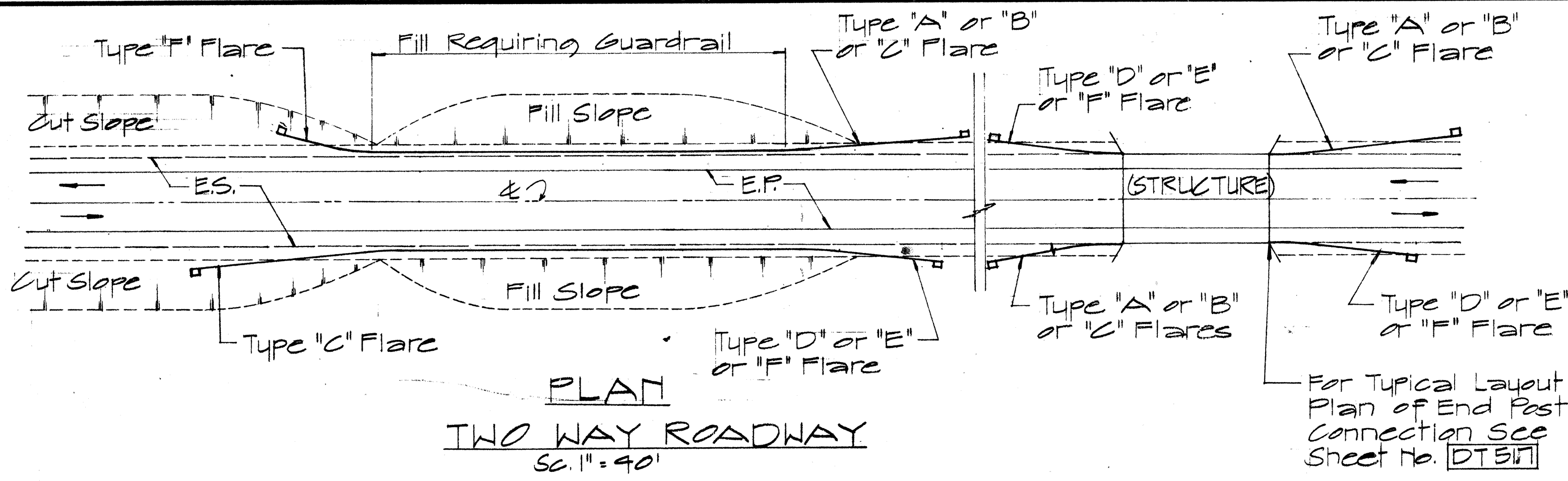
Top of Anchor Block to be flush with ground

6 1/4" x 8"

3'-0"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	05-0900(10)	1978	20	23

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

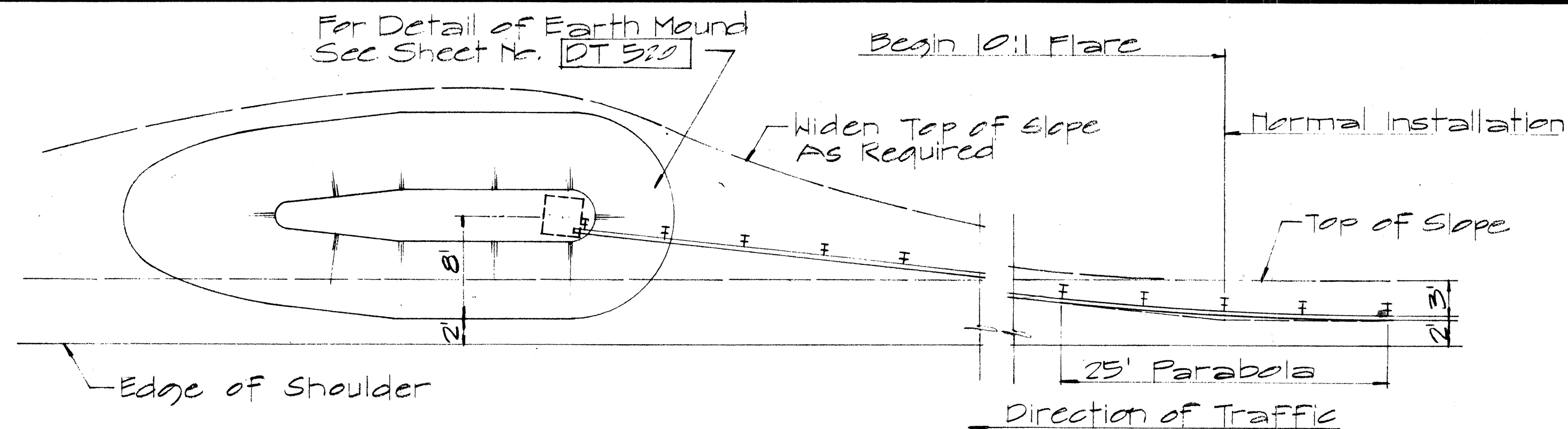
APPROVAL RECOMMENDED:
Ericki Tanaka 12/29/69
TRAFFIC ENGINEER DATE

APPROVED:
Andrew B. [Signature] 12-30-69
ASSISTANT CHIEF, ENGINEERING DATE

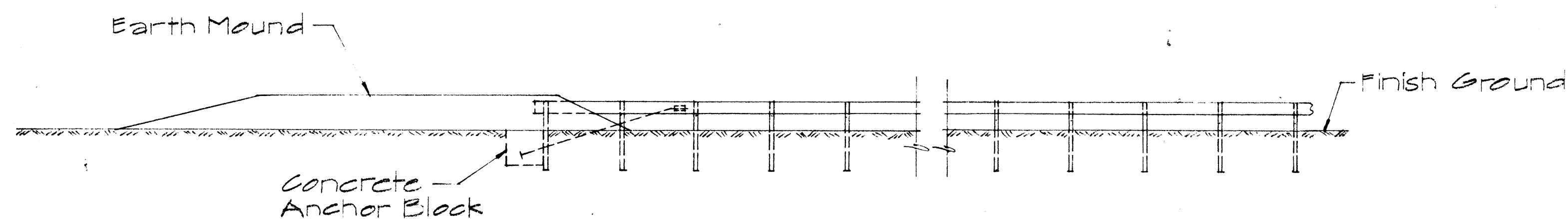
STATE OF HAWAII
LAND TRANSPORTATION FACILITIES DIVISION
**STANDARD DETAILS
OF APPROACH END
FLARE - ONE & TWO
WAY ROADWAY**
Sc. As Noted April 1969
SHEET No. 4 OF 7 SHEETS DT 516

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	OS-0000(10)	1978	21	23



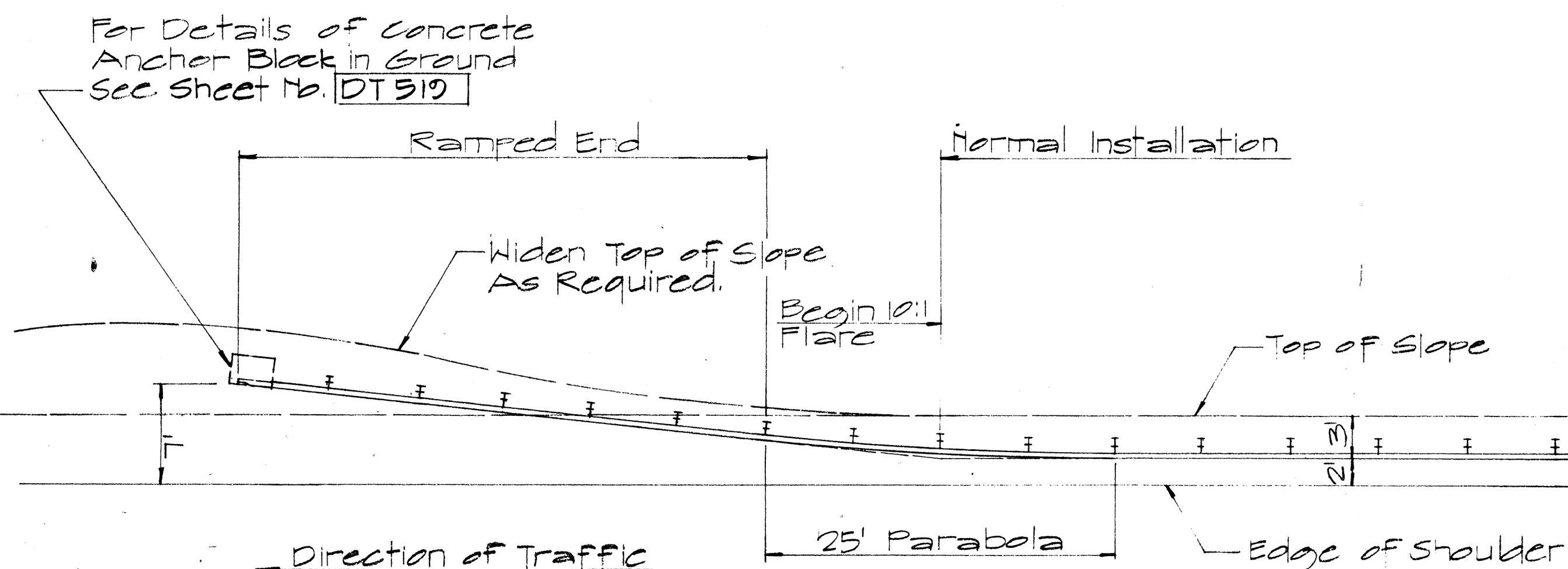
PLAN



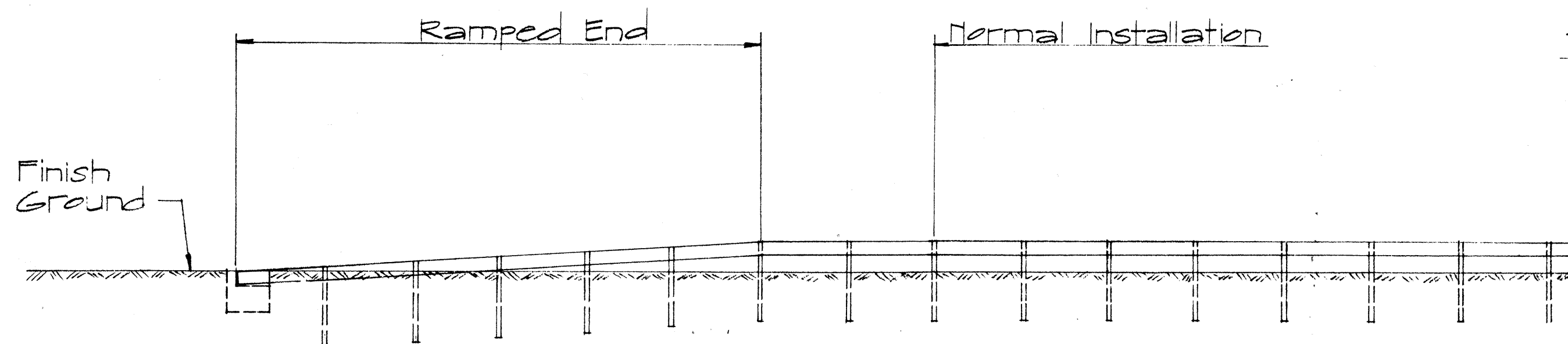
ELEVATION

TYPE "D" FLARE

Sc. 1/8" = 1'-0"



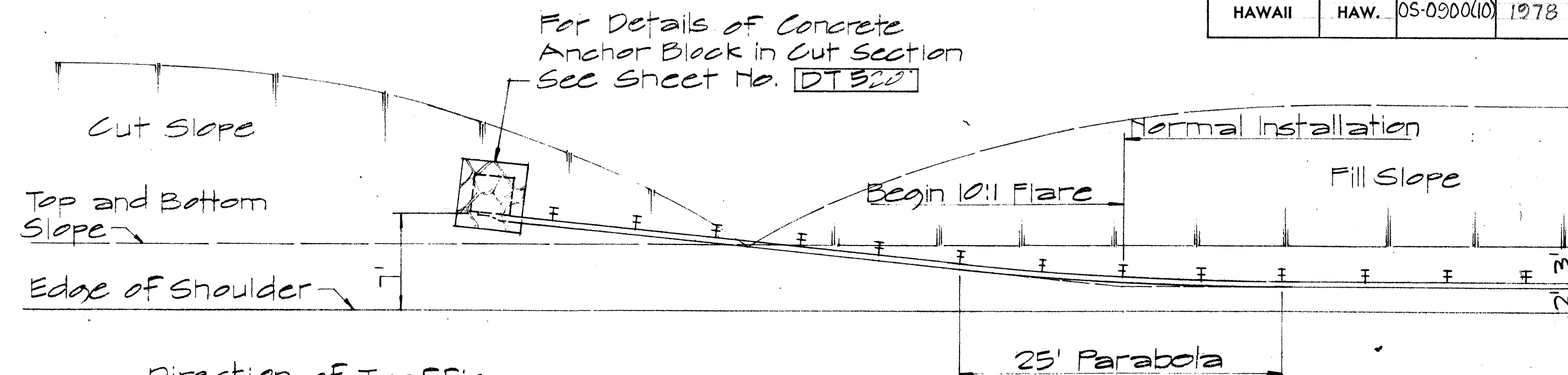
PLAN



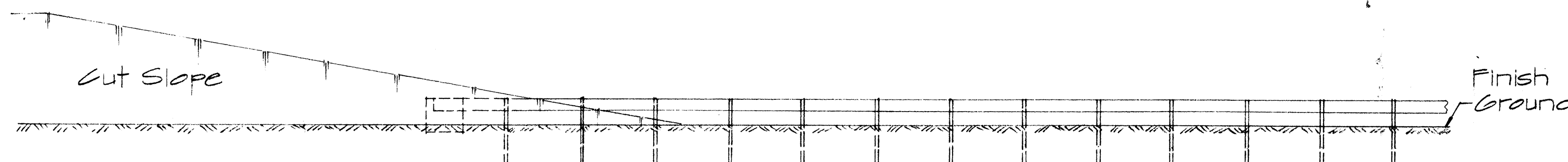
ELEVATION

TYPE "E" FLARE

Sc. 1/8" = 1'-0"



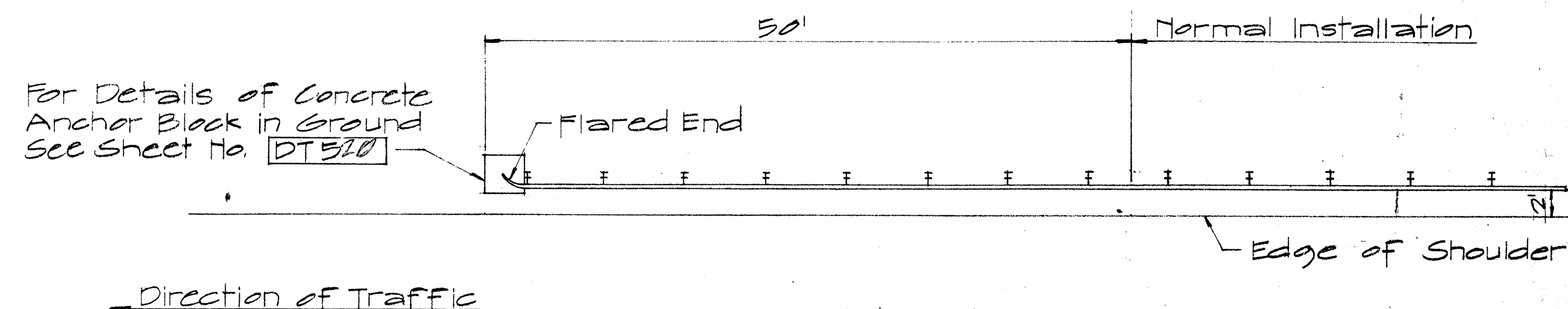
PLAN



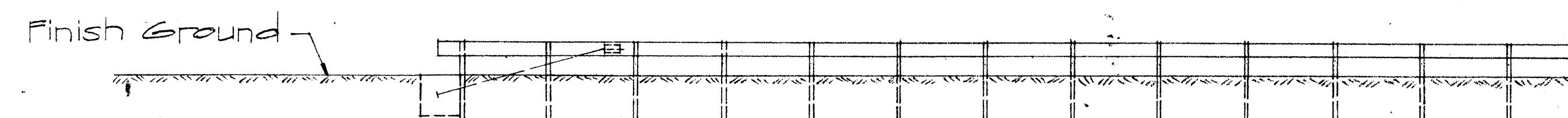
ELEVATION

TYPE "F" FLARE

Sc. 1/8" = 1'-0"



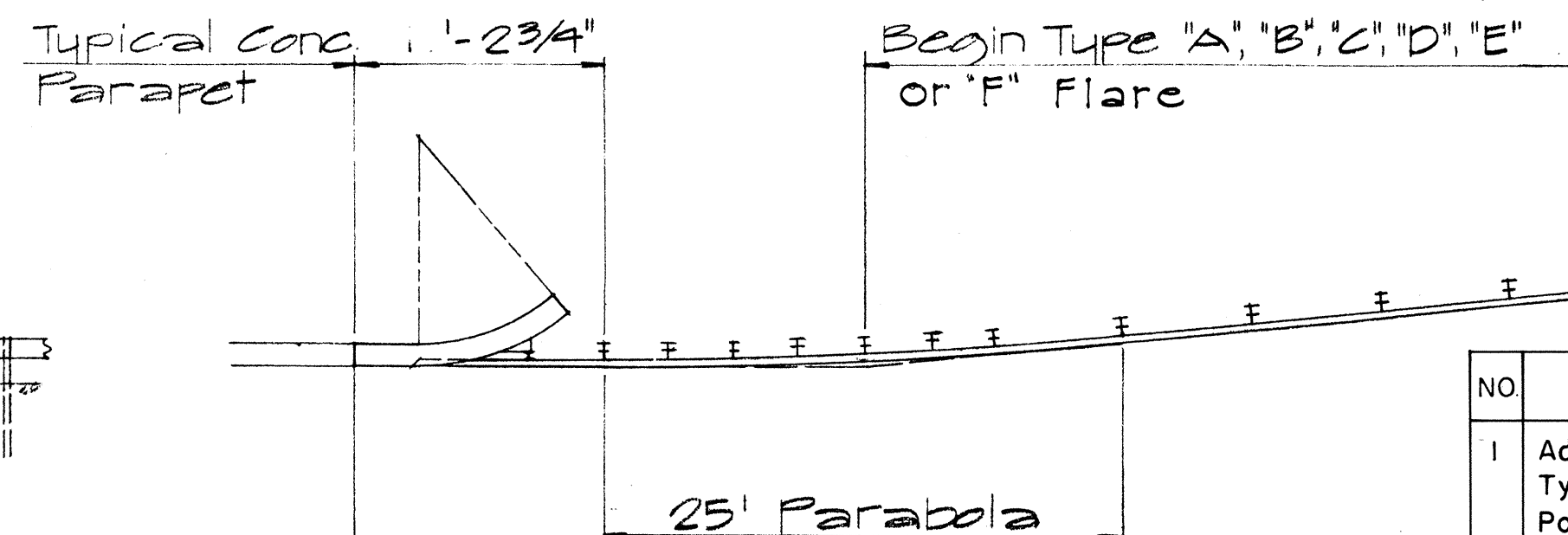
PLAN



ELEVATION

TYPE "G" FLARE

Sc. 1/8" = 1'-0"



TYPICAL LAYOUT PLAN OF END POST CONNECTION

Sc. 1/8" = 1'-0"

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

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

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

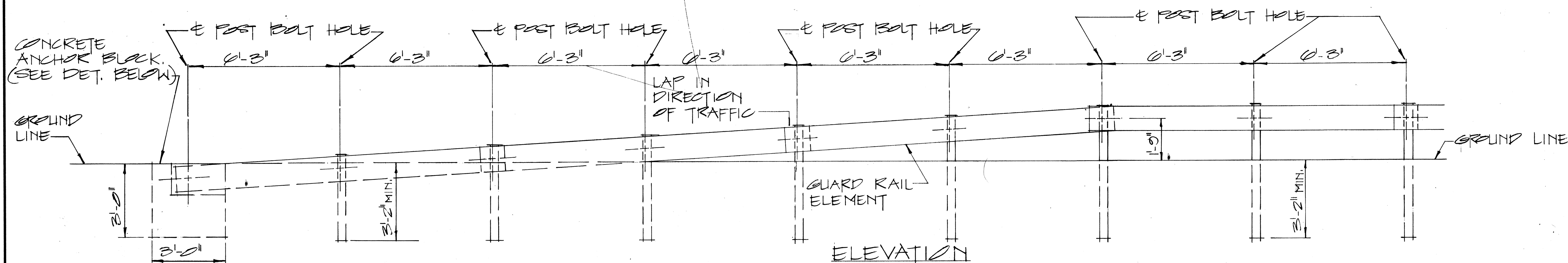
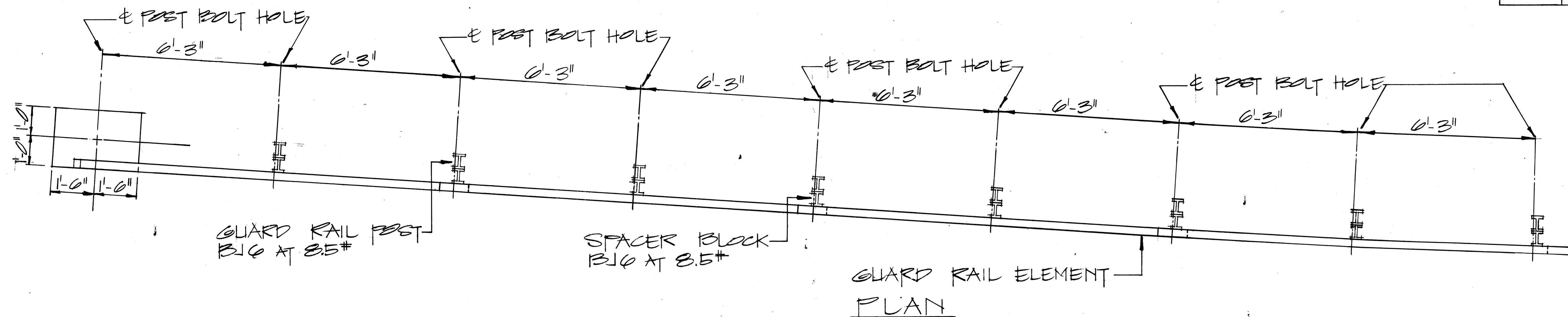
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAILS
TRAILING END
FLARE - ONE & TWO
WAY ROADWAY

Scale: As Noted April 1969

SHEET NO. 5 OF 7 SHEETS DT 517

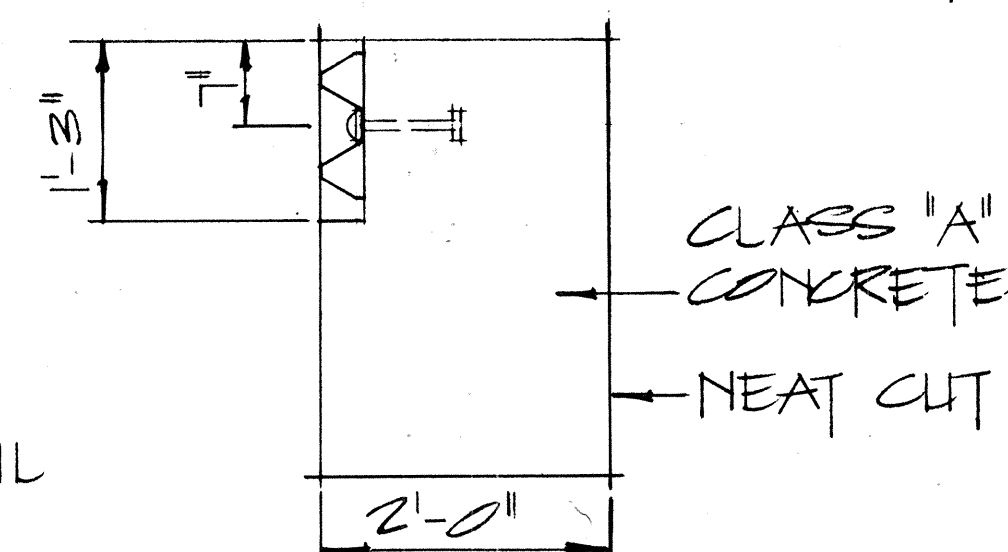
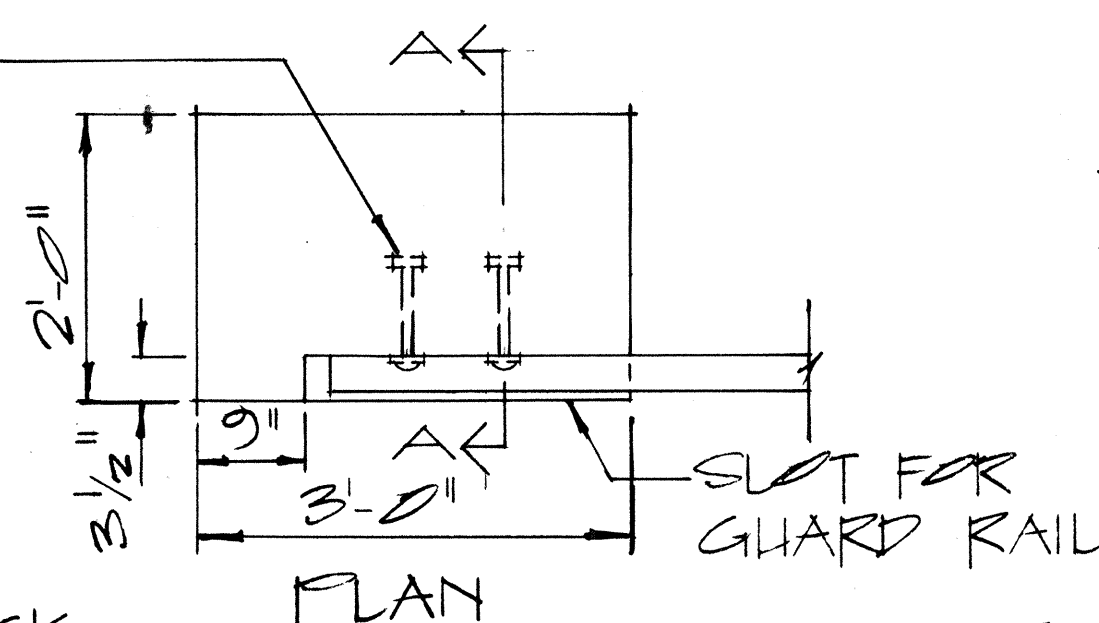
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	05-0900(10)	1978	22	23



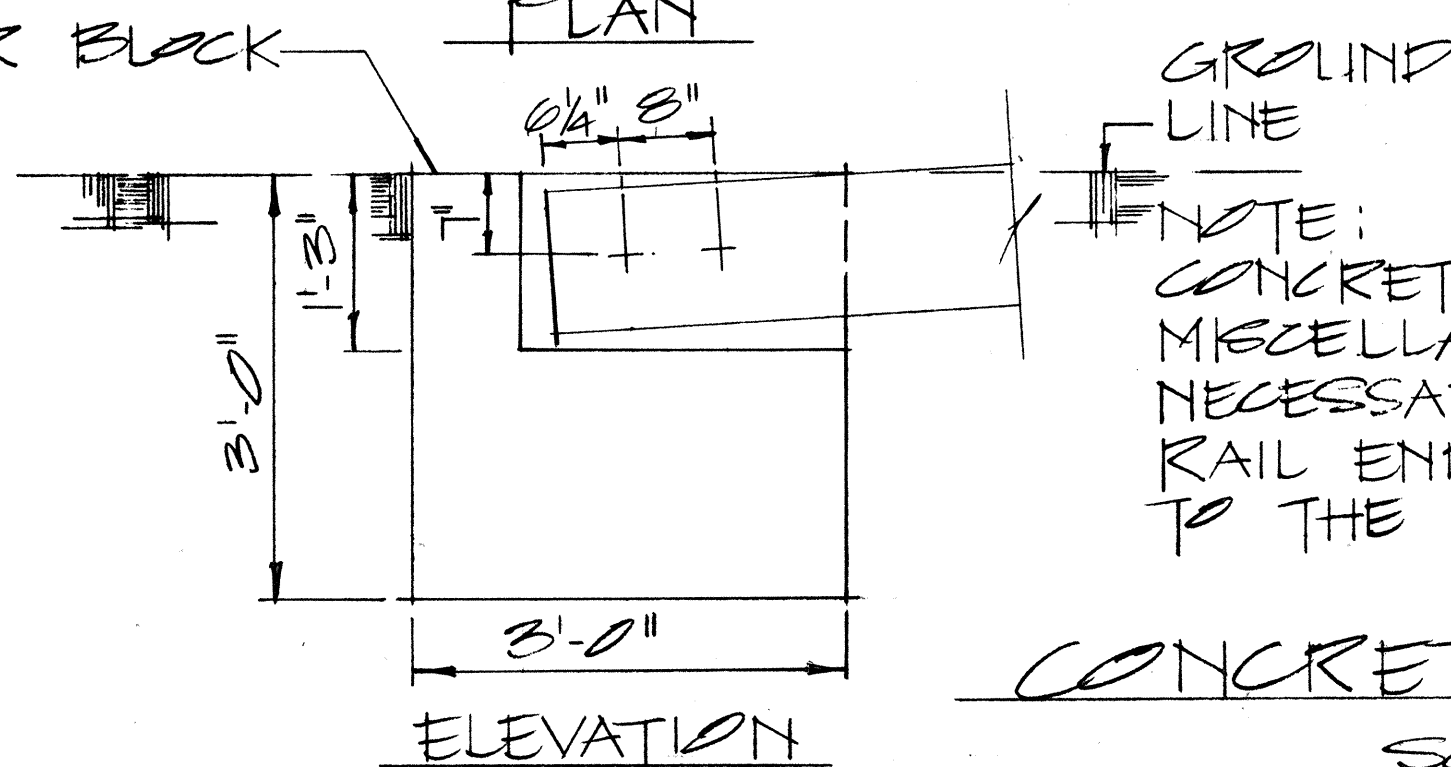
RAMP END ANCHORAGE.

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

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.



NOTE: CONCRETE, EXCAVATION AND MISCELLANEOUS APPURTENANCES NECESSARY TO ANCHOR THE GUARD RAIL ENDS, SHALL BE INCIDENTAL TO THE METAL GUARD RAIL.

CONCRETE ANCHOR BLOCK

SCALE: $\frac{3}{4}'' = 1'-0''$

APPROVAL RECOMMENDED:
Enishi Tanaka
TRAFFIC ENGINEER

12/29/69
DATE

APPROVED:
22 del
ASSISTANT CHIEF, ENGINEERING

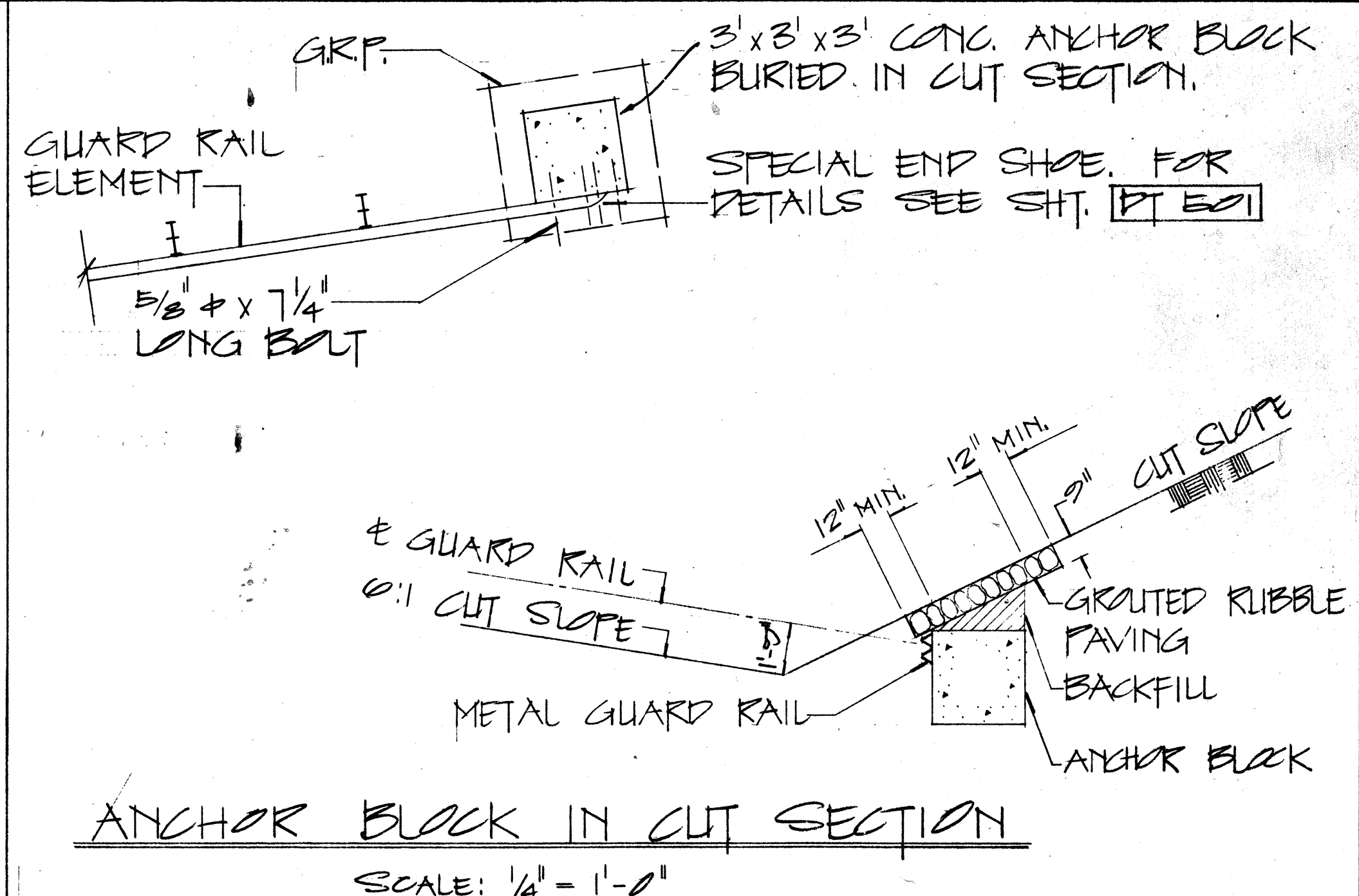
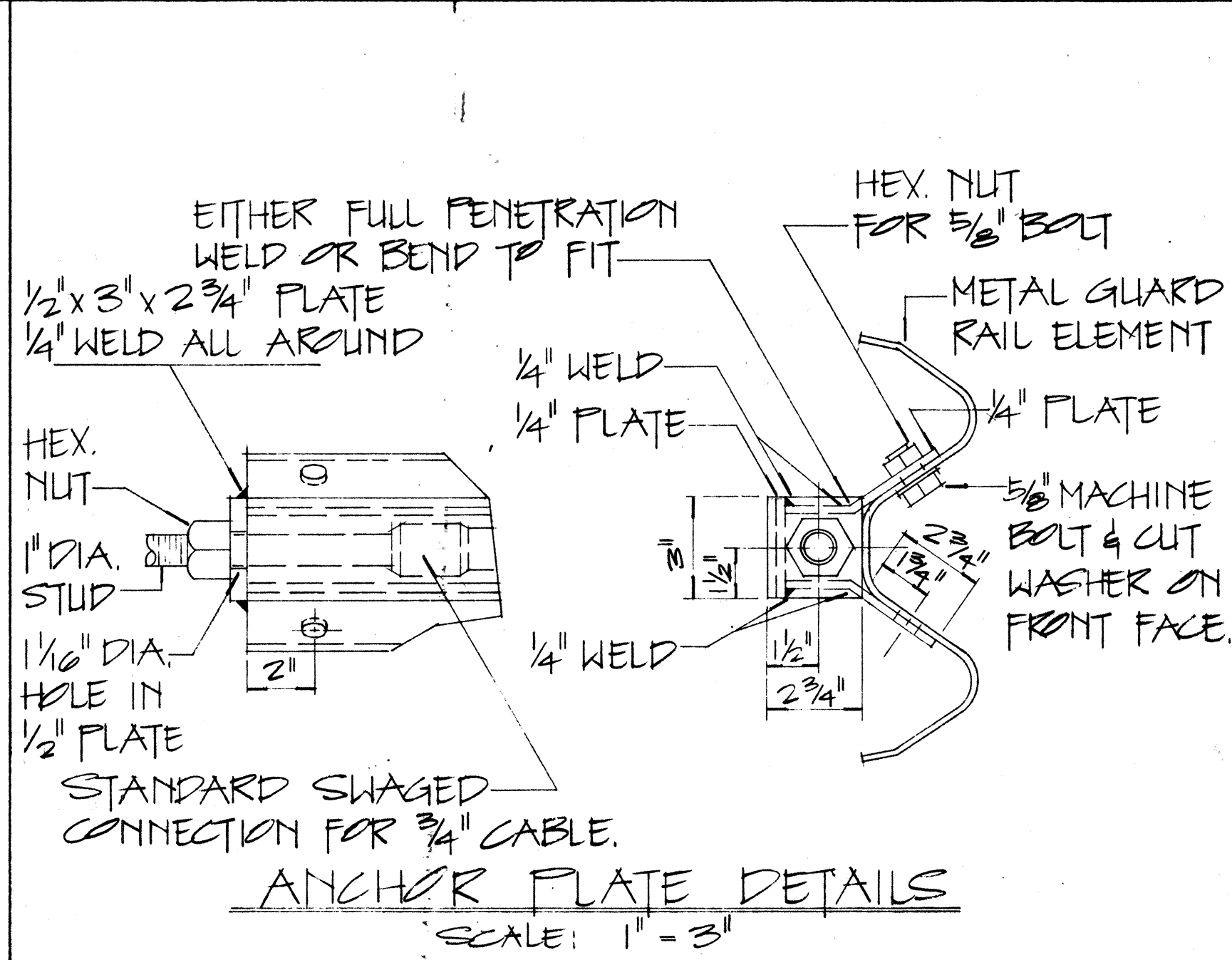
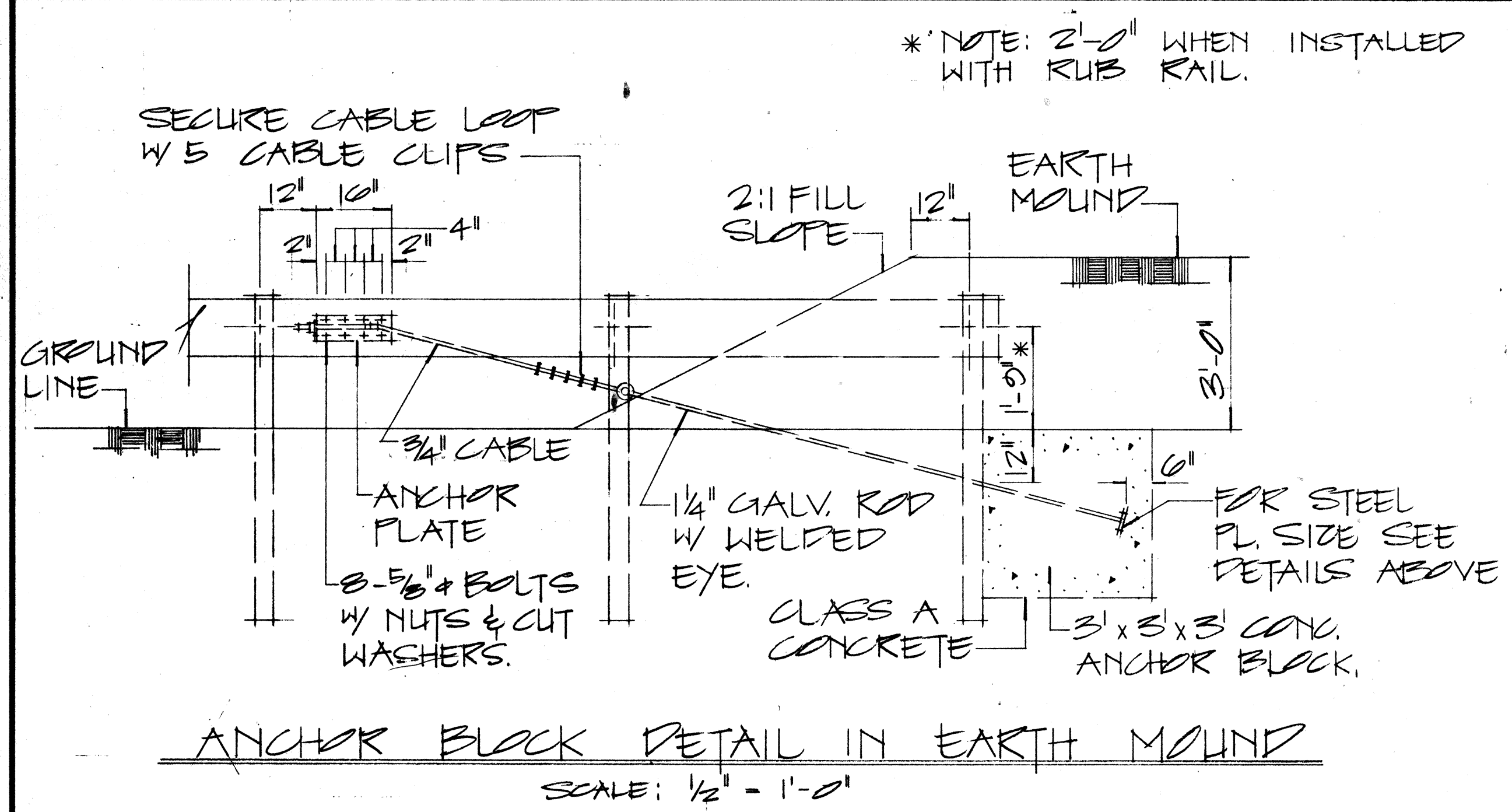
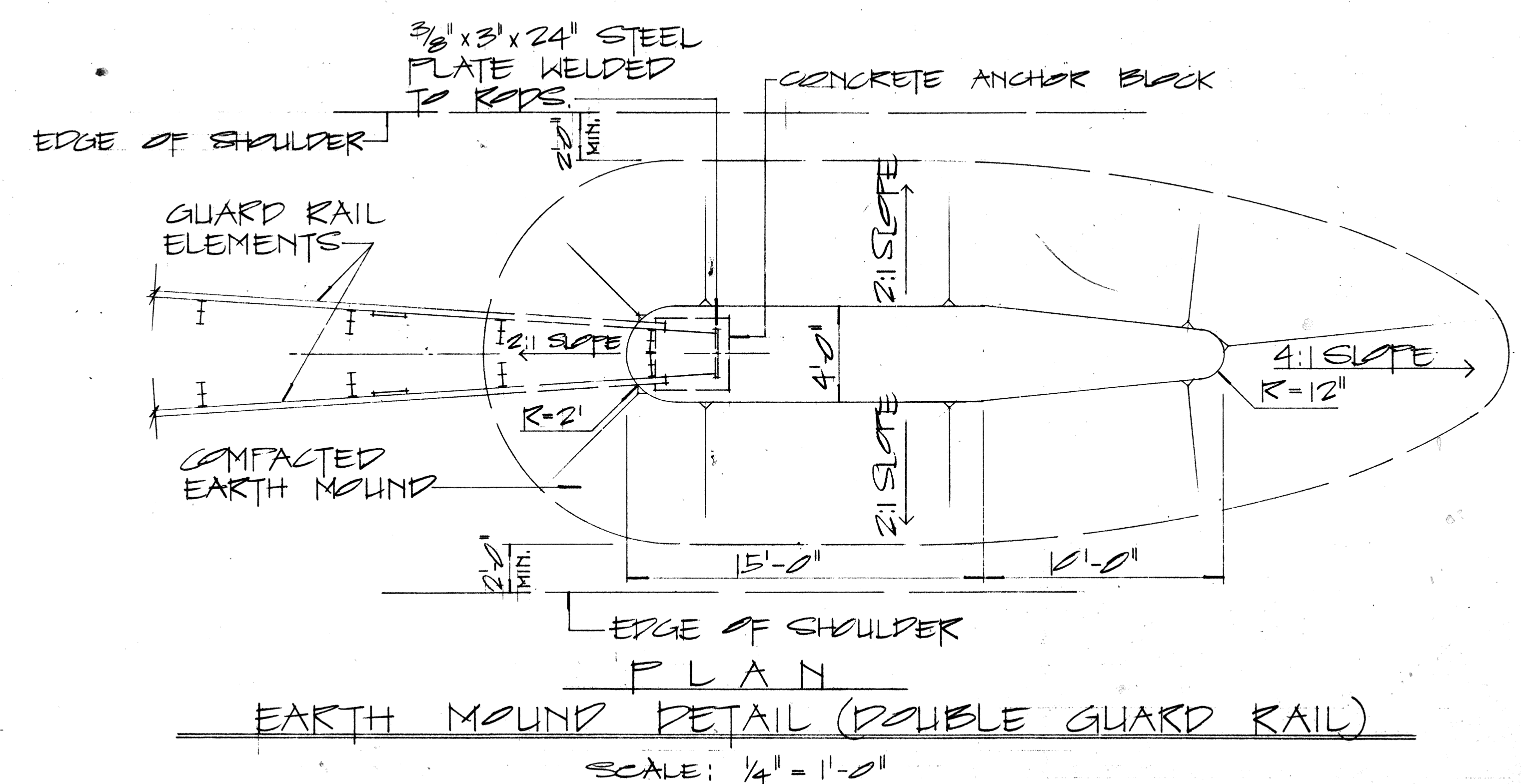
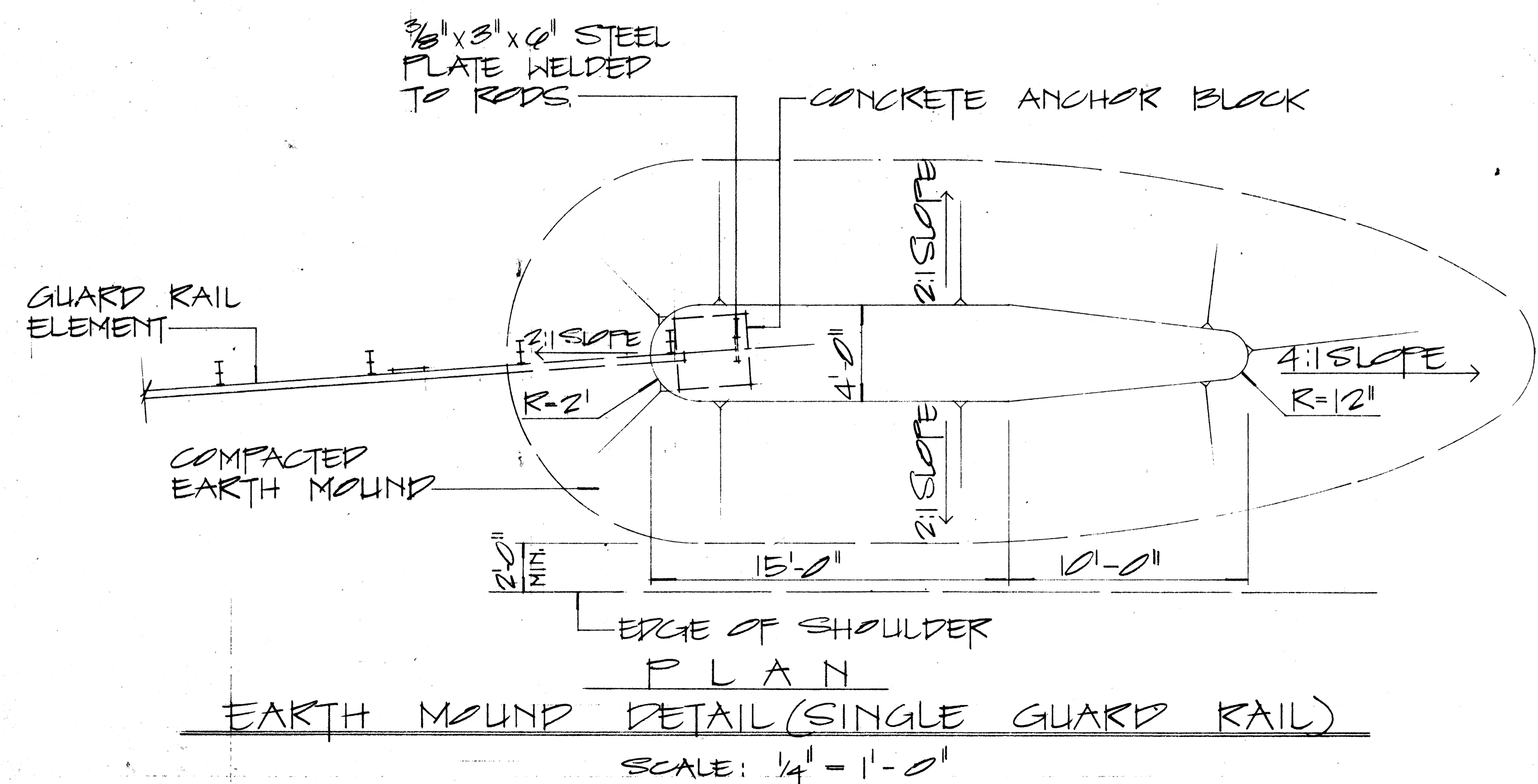
12-30-69
DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
STANDARD DETAILS
GUARD RAIL, TYPE 3
RAMP END ANCHORAGE
SCALE: AS SHOWN

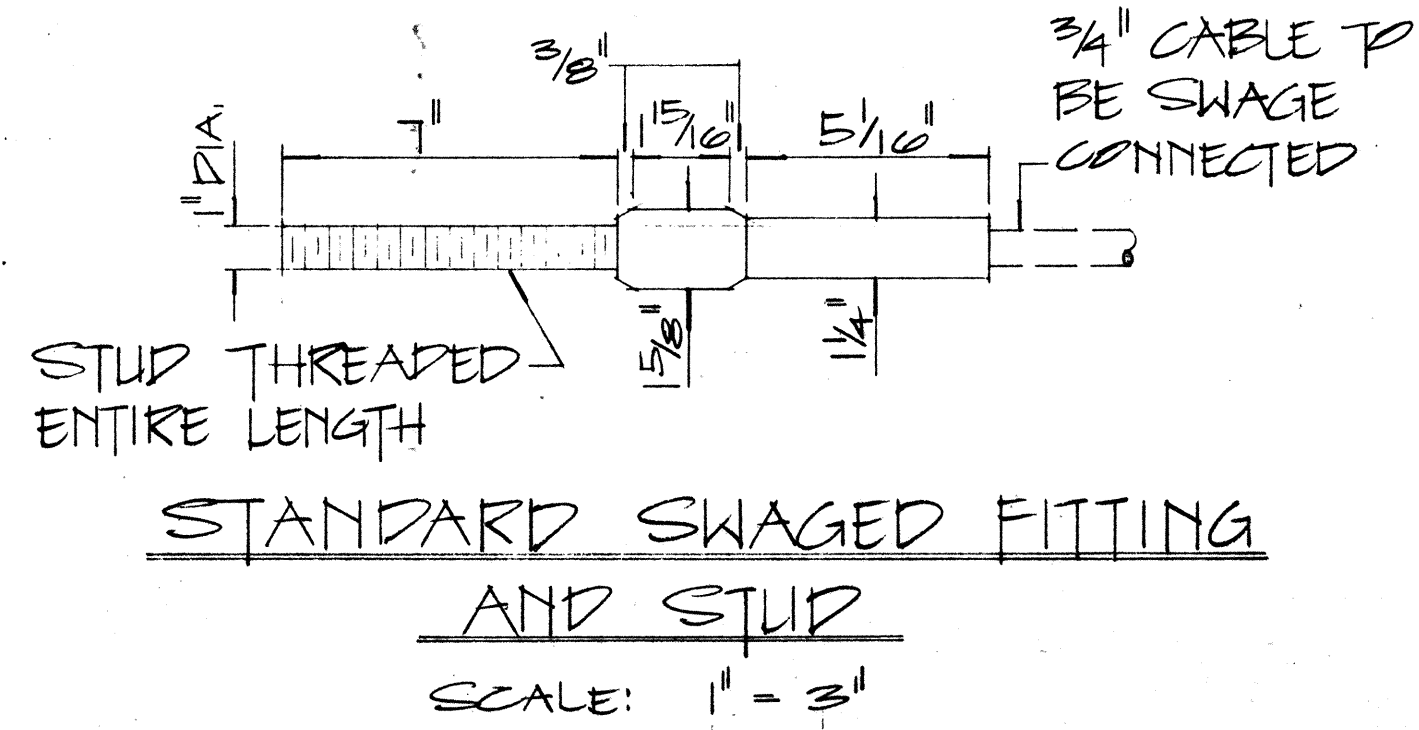
SHEET No. 6 OF 7 SHEETS DT512

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	05-0000(10)	1978	23	23



NOTE:

1. GALVANIZED ANCHOR ROD, METAL GUARD RAIL AND FAST 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:			
E. J. Tanaka		12/29/62	
TRAFFIC ENGINEER		DATE	
APPROVED:			
A. J. Balala		12-30-69	
ASSISTANT CHIEF, ENGINEERING		DATE	
NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAILS

EARTH MOUND AND ANCHOR BLOCK DETAILS

SCALE: AS SHOWN

SHEET No. 7 OF 7 SHEETS

DATE	
DESIGNED BY	
CHECKED BY	
QUANTITIES BY	
NOTE BOOK	
ORIGINAL PLAN	