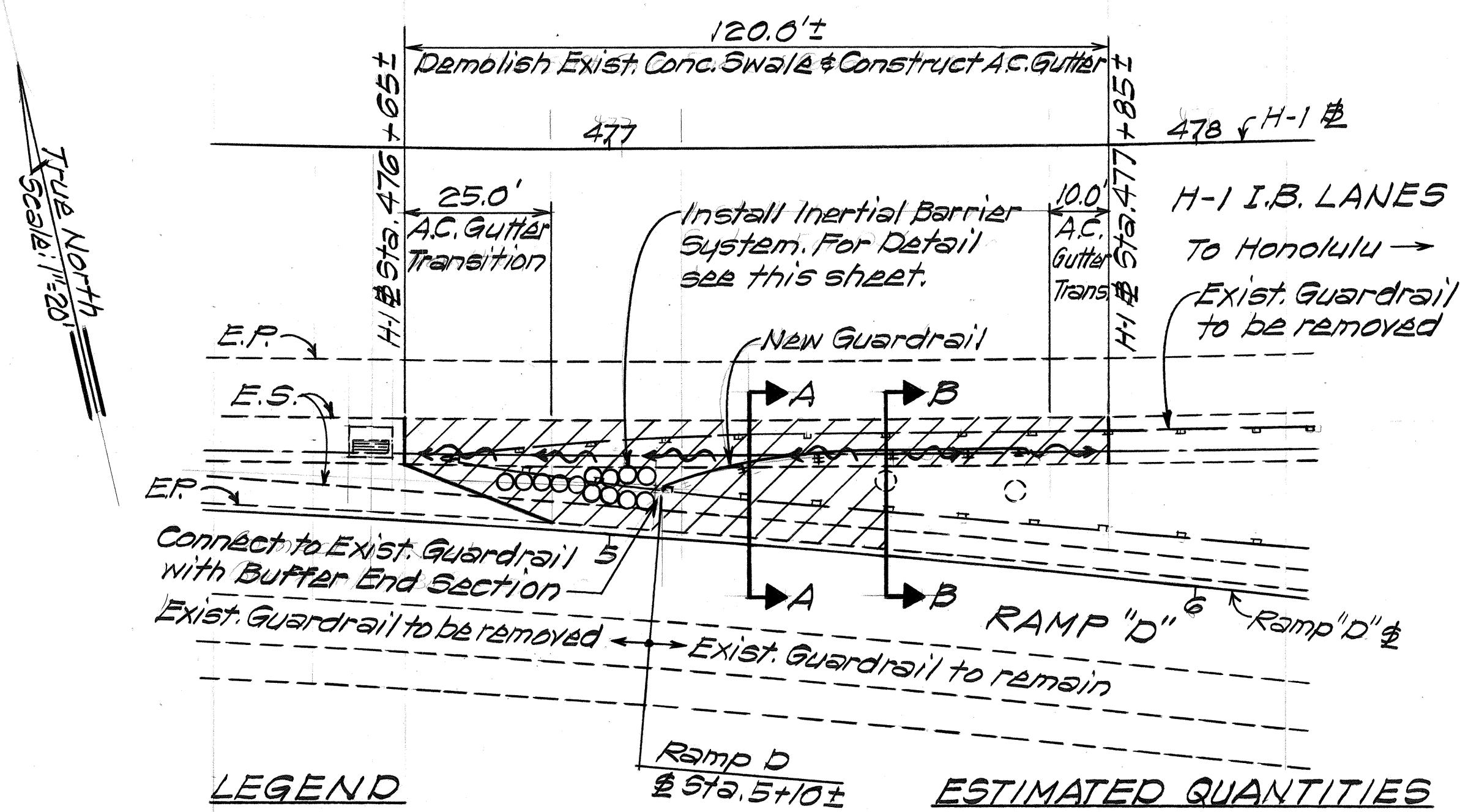


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1 (181)	1986	13	67



LEGEND

- Limits of New A.C. Gutter
- Direction of Drainage

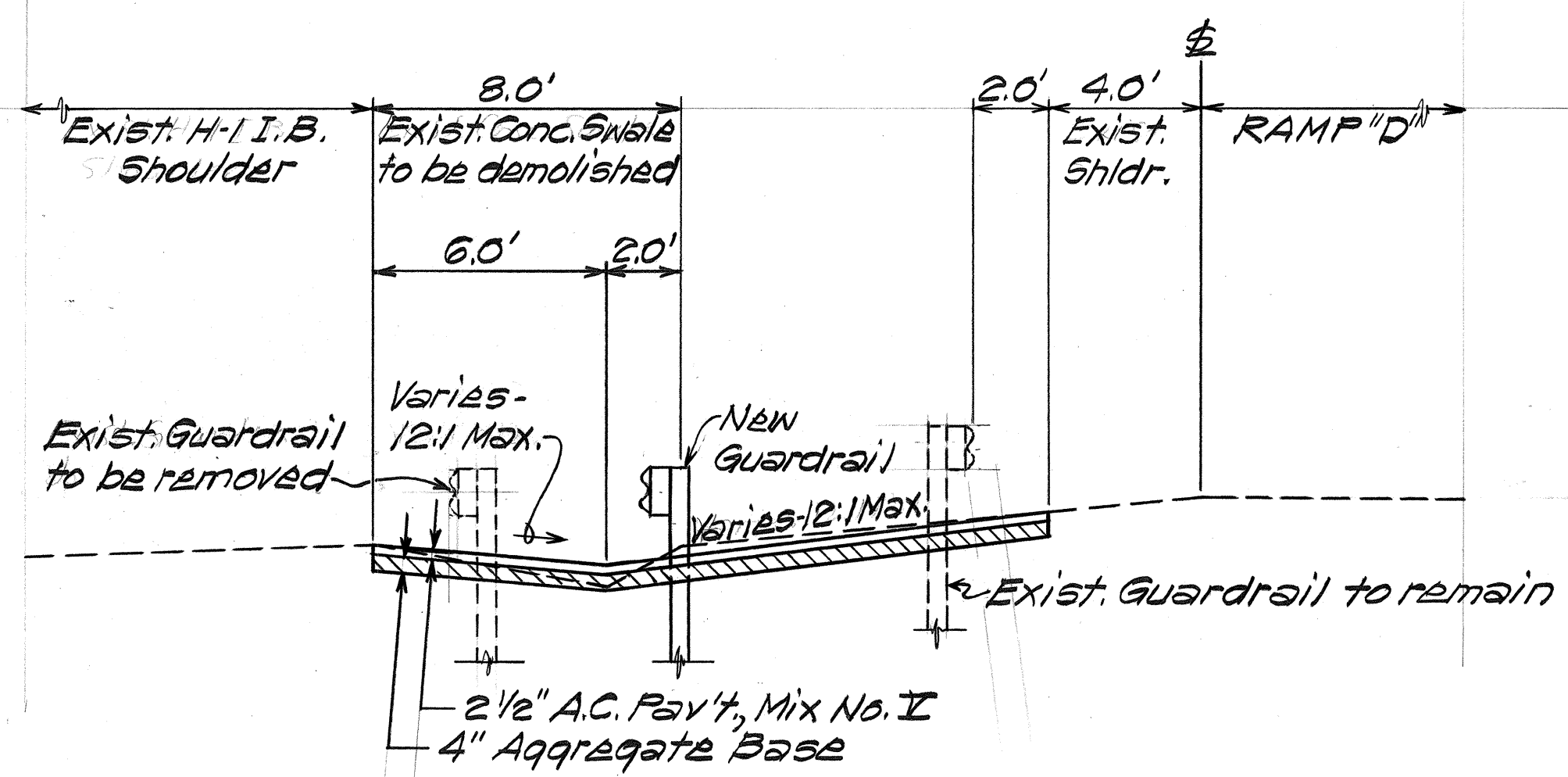
ESTIMATED QUANTITIES

- Aggregate Base Course = 18 Cu. Yd.
- A.C. Pavement, Mix No. I = 22 Tons
- Metal Guardrail, Type 3 - Single w/ Steel Post = 62.5 Lin. Ft.
- Inertial Barrier System = 1.5
- Unassem. Repl. Iner. Barr. Mod. = 13 Ea.

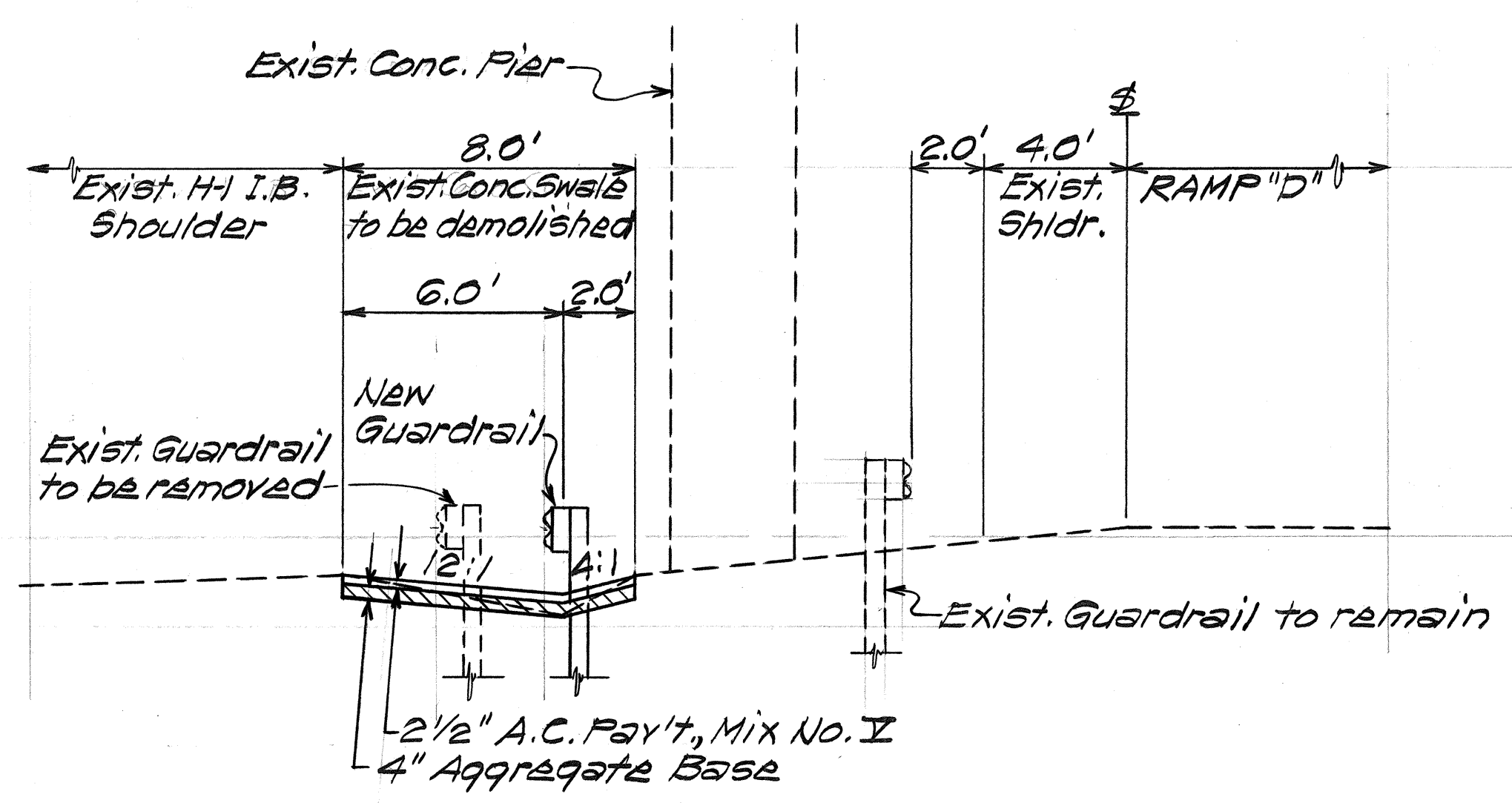
PLAN
Scale: 1" = 20'

NOTES

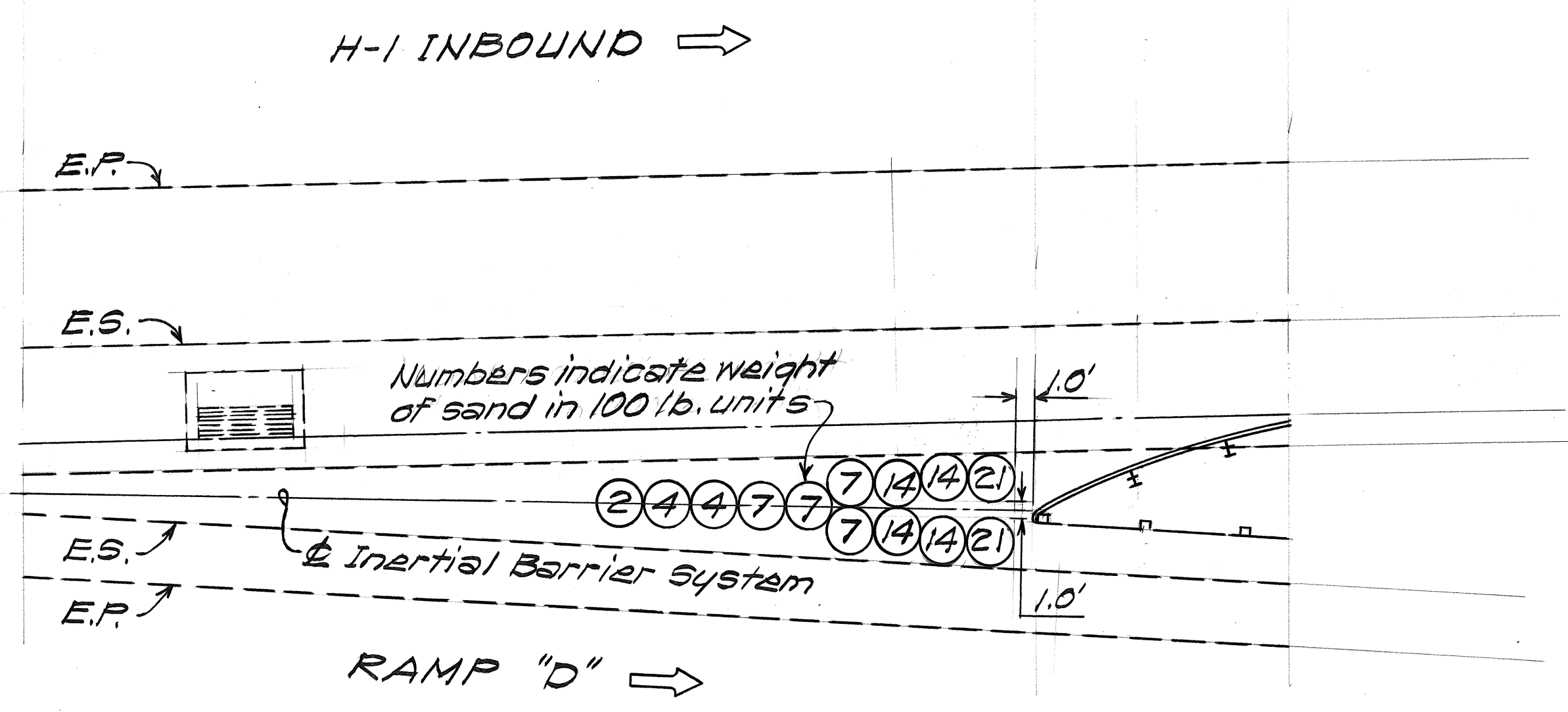
- The exact limits of the new A.C. gutter will be determined in the field by the Engineer. Removing the existing concrete swale, grading and backfilling will not be paid for separately and shall be considered incidental to various contract items. A.C. gutter will be paid for under Item No. 304.1110-Aggregate Base Course and Item No. 401.0500-A.C. Pavement, Mix No. I.
- The Contractor shall construct the new A.C. gutter with the high point near Section B-B, as directed by the Engineer.
- Connection to the existing guardrail will not be paid for separately and shall be considered incidental to new guardrail.



SECTION A-A
Scale: 1/4" = 1'-0"



SECTION B-B
Scale: 1/4" = 1'-0"



**INSTALLATION OF INERTIAL BARRIER SYSTEM
AT RAMP "D" GORE**
Not to Scale

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**GUARDRAIL & INERTIAL BARRIER
SYSTEM DETAILS**

INTERSTATE ROUTE H-1 RESURFACING
Kunia I.C. to Waiawa I.C.
F.A.I. Proj. No. IR-HI-1 (181)

Scale: As Shown Date: Aug. 1985

SHEET NO. 1 OF 10 SHEETS

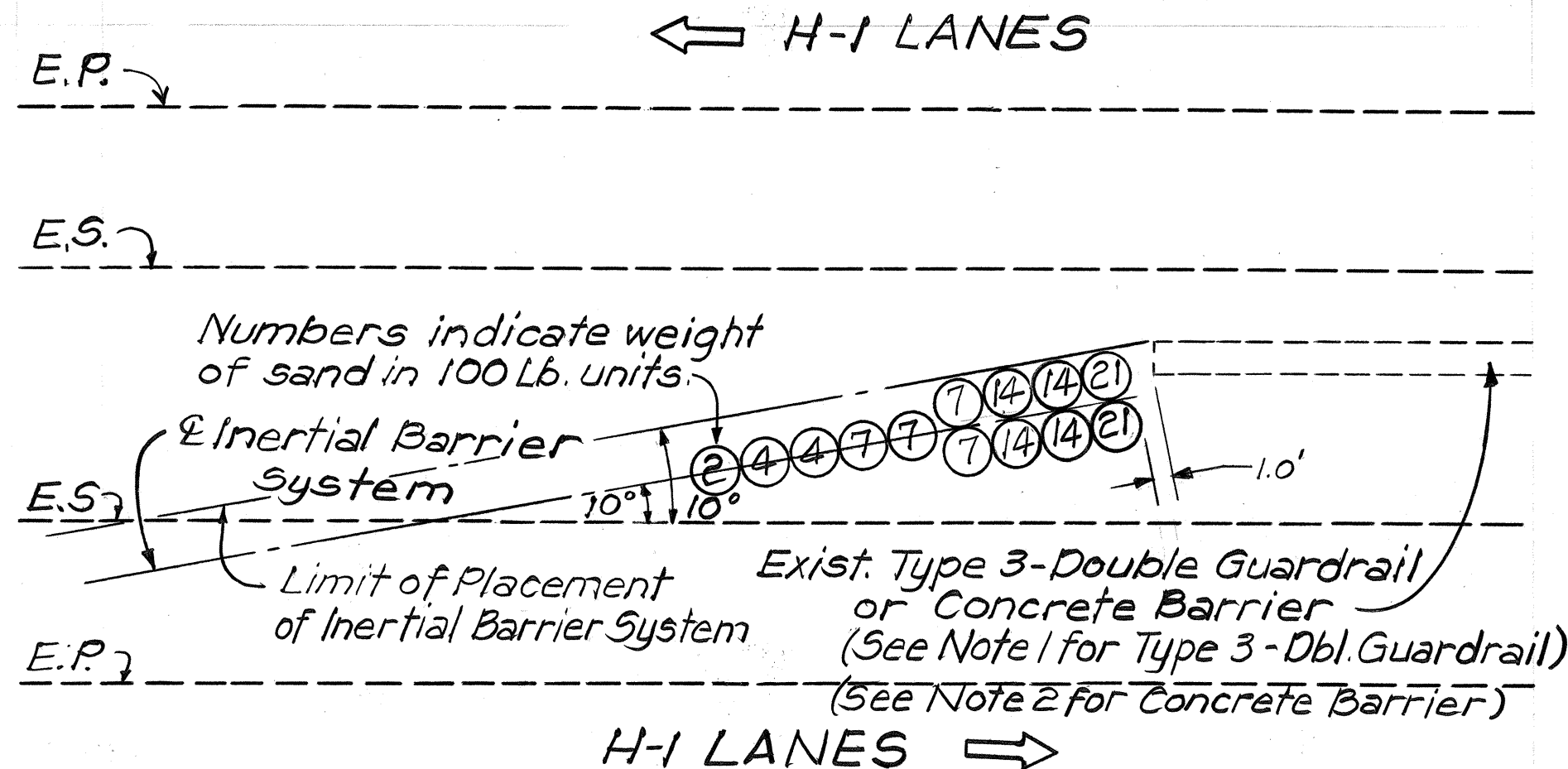
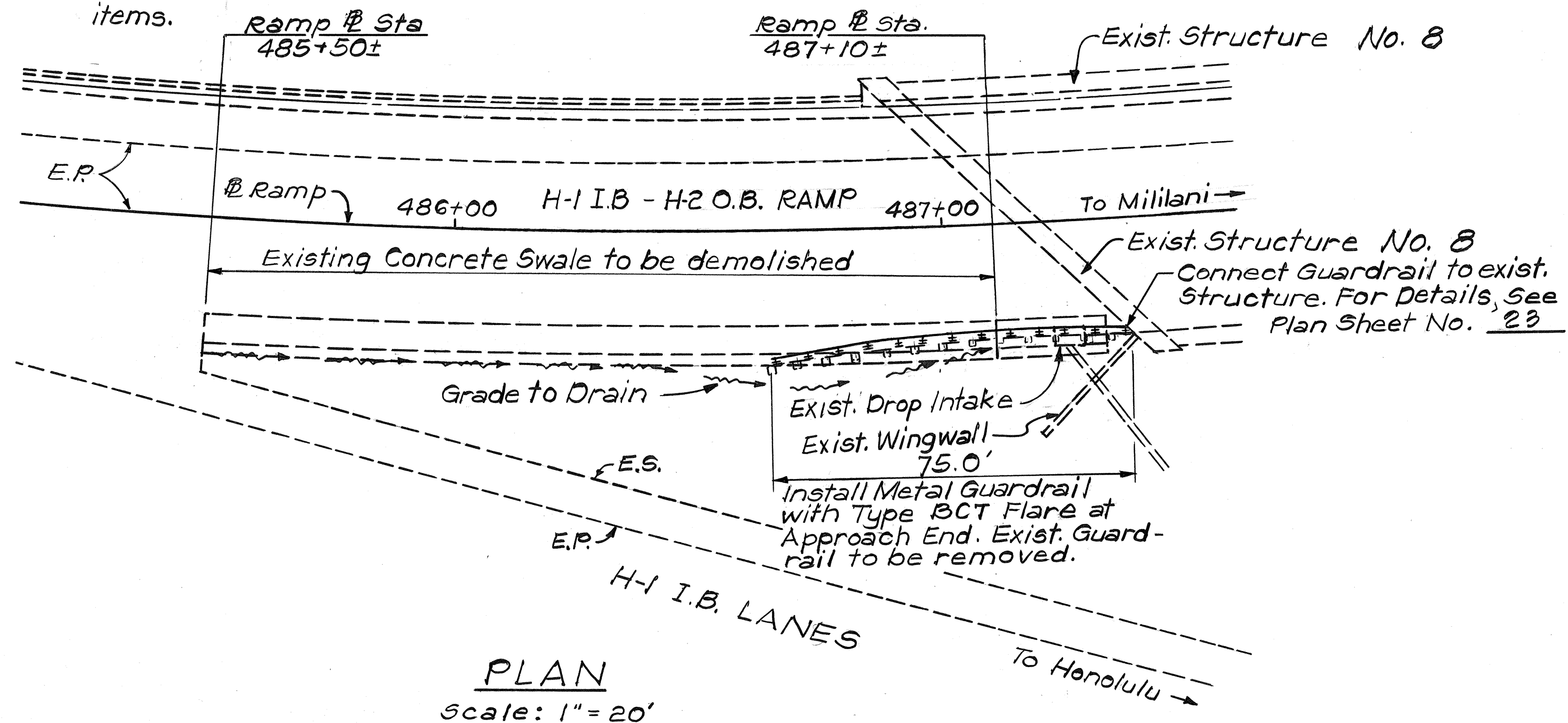
SURVEY PLOTTED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(181)	1986	14	67

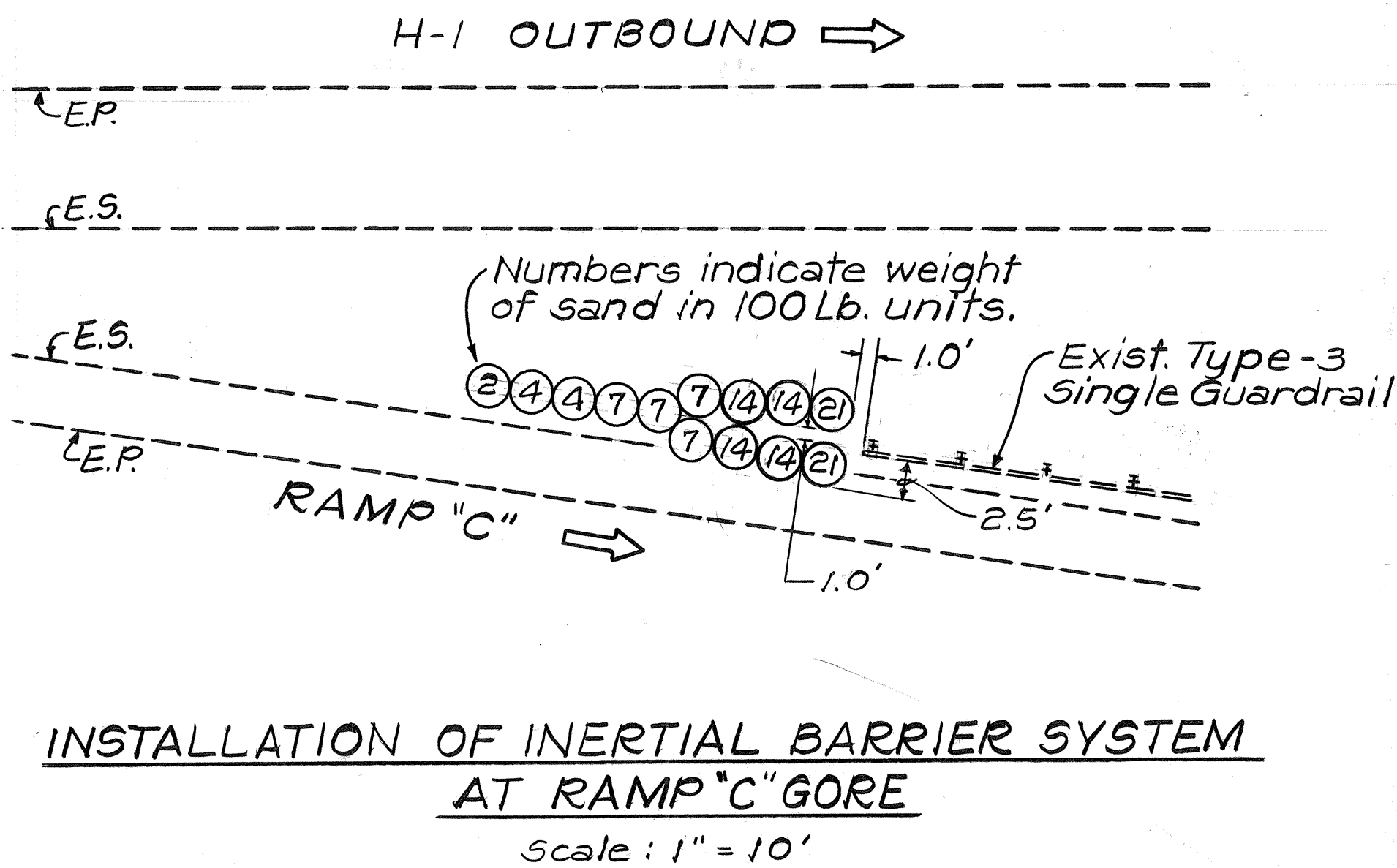
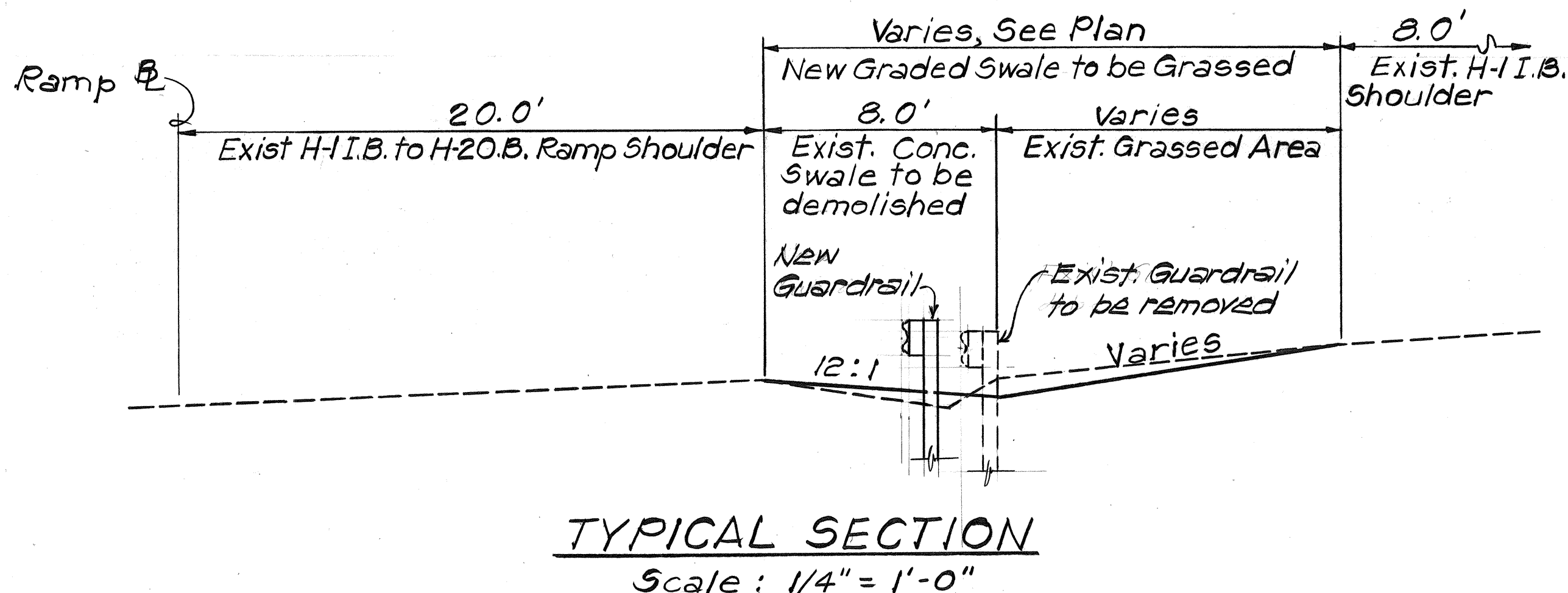
NOTES:

1. The exact limits of grading to construct the graded swale shall be determined in the field by the Engineer. Demolishing the existing concrete swale, grading the area, and backfilling will not be paid for and shall be considered incidental to various contract items.
2. The Contractor shall re-vegetate the new graded swale with comparable vegetation, as directed by the Engineer. This work will not be paid for and shall be considered incidental to various contract items.
3. The Contractor shall install guardrail posts spaced at 3'-1 1/2" O.C. for 25 feet from the existing structure except at the existing drop intake, where the Contractor shall install two rail elements between the posts spanning the existing intake as directed by the Engineer. All guardrail post holes in the existing concrete swale remaining, shall be filled with concrete. The above work will not be paid for and shall be considered incidental to new guardrail.
4. The guardrail connection to the structure will be paid for under Type "X" Connection.

Note 1: The Contractor shall remove 37.5± L.F. of Existing Guardrail, install a new Concrete Anchor Block, a Buffer End Section and grade the Median to 5% max. slope prior to the Inertial Barrier System installation as directed by the Engineer. Installation of the Concrete Anchor Block, Buffer End Section and grading of the Inertial Barrier System Site will not be paid for separately and shall be considered incidental to Inertial Barrier System. Removal of existing guardrail will be paid for under Item No. 606.3140-Removal of Existing Guardrail.



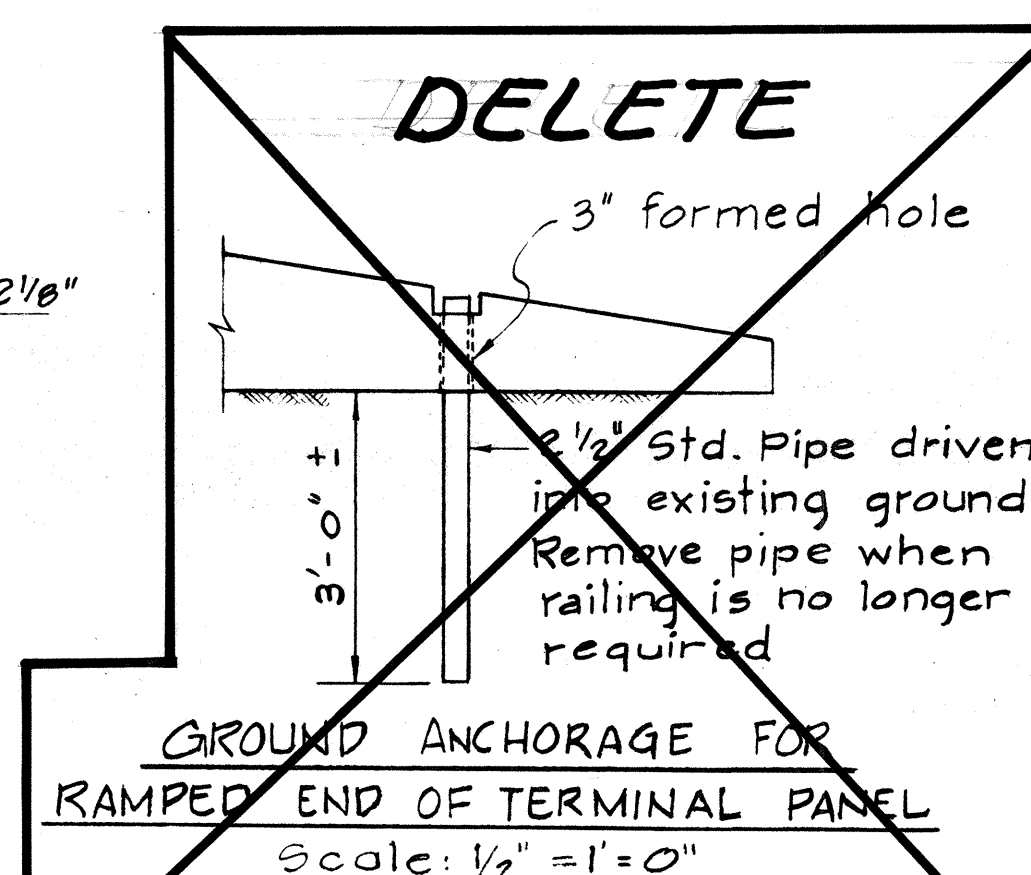
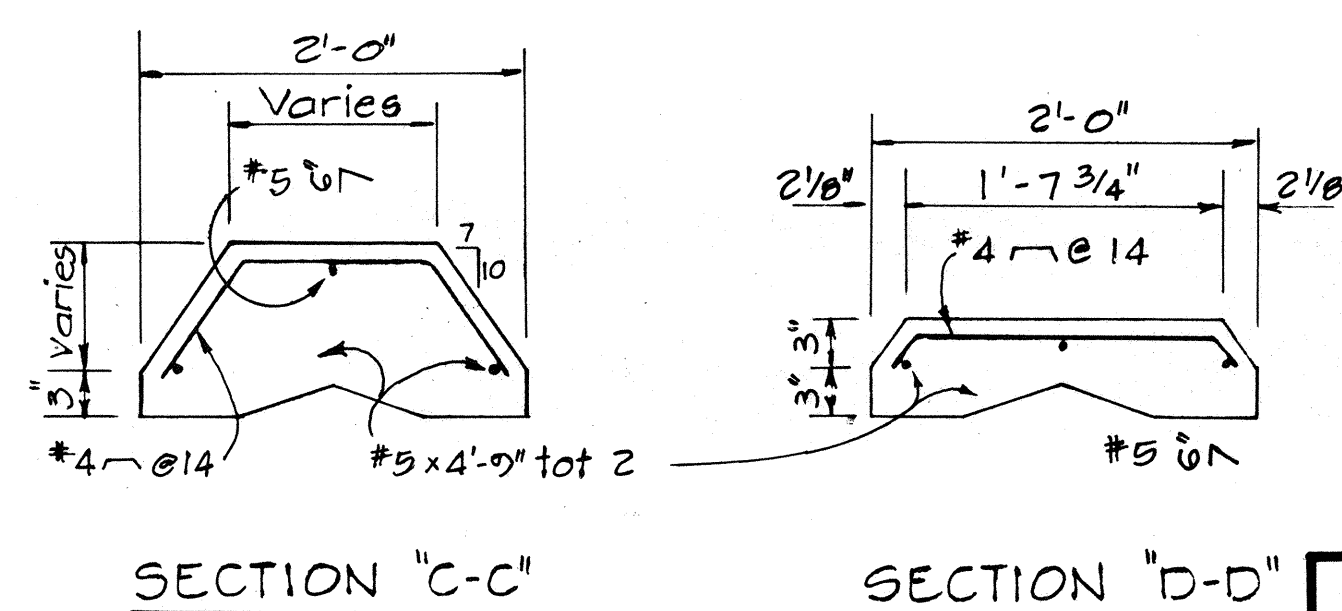
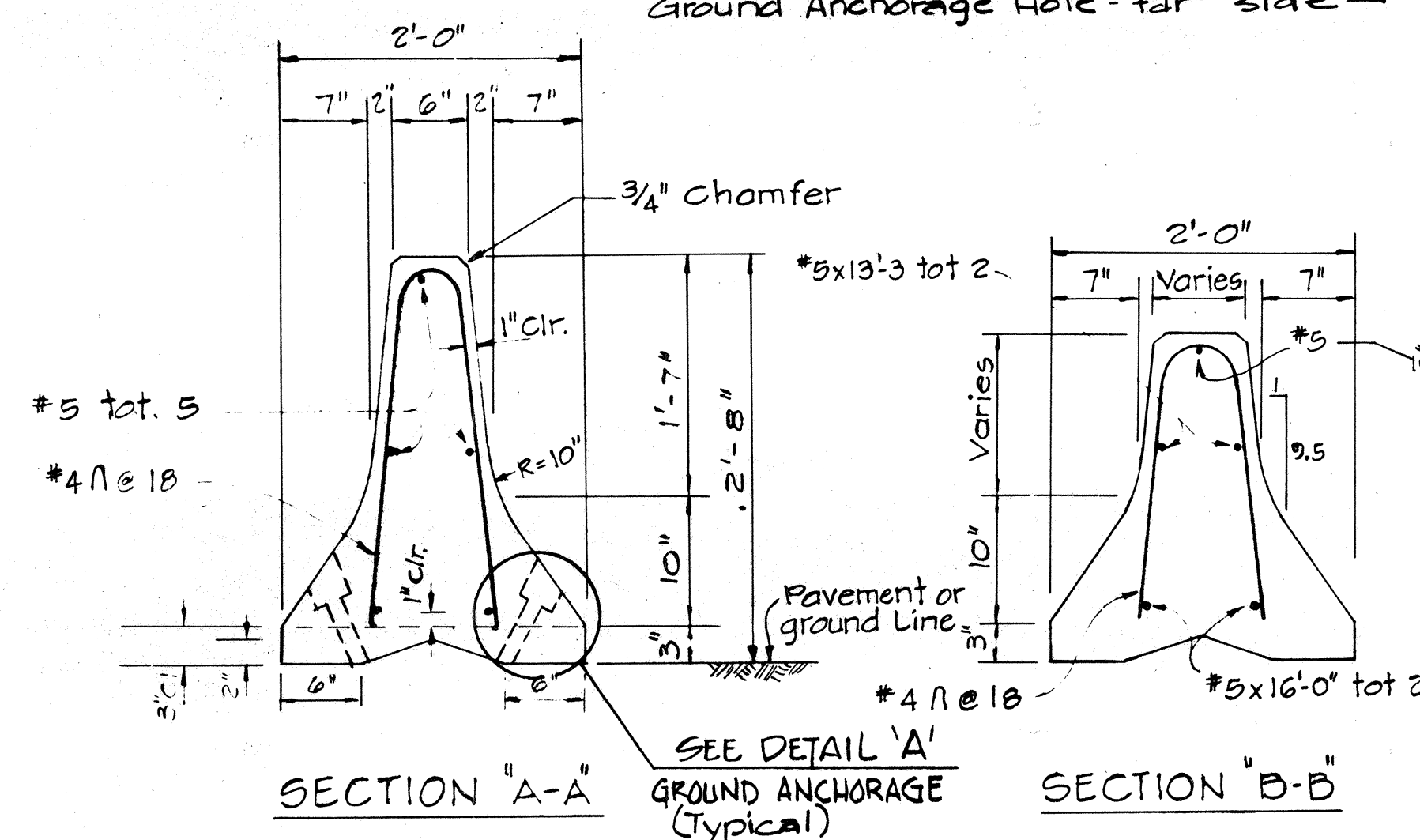
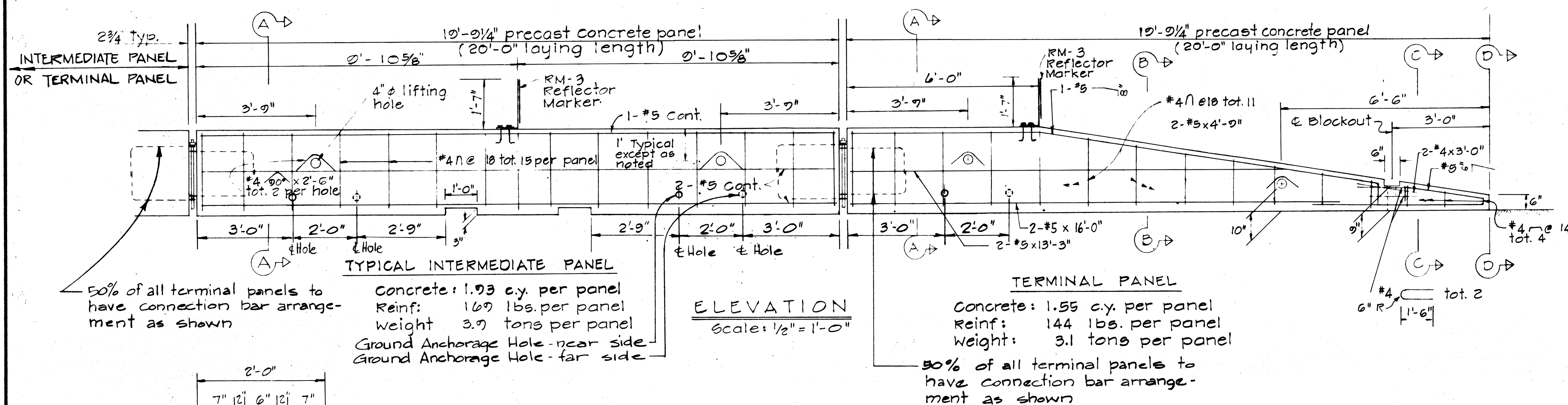
Note 2: Existing earth mound shall be removed and the Median graded to 5% max. slope as directed by the Engineer. Removal of the existing earth mound and grading will not be paid for separately and shall be considered incidental to Inertial Barrier System.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
GUARDRAIL & INERTIAL BARRIER SYSTEM DETAILS
INTERSTATE ROUTE H-1 RESURFACING
Kunia I.C. to Waiawa I.C.
F.A.I. Proj. No. IR-HI-1(181)
Scale: As Noted Date: Aug. 1985
SHEET NO. 2 OF 10 SHEETS

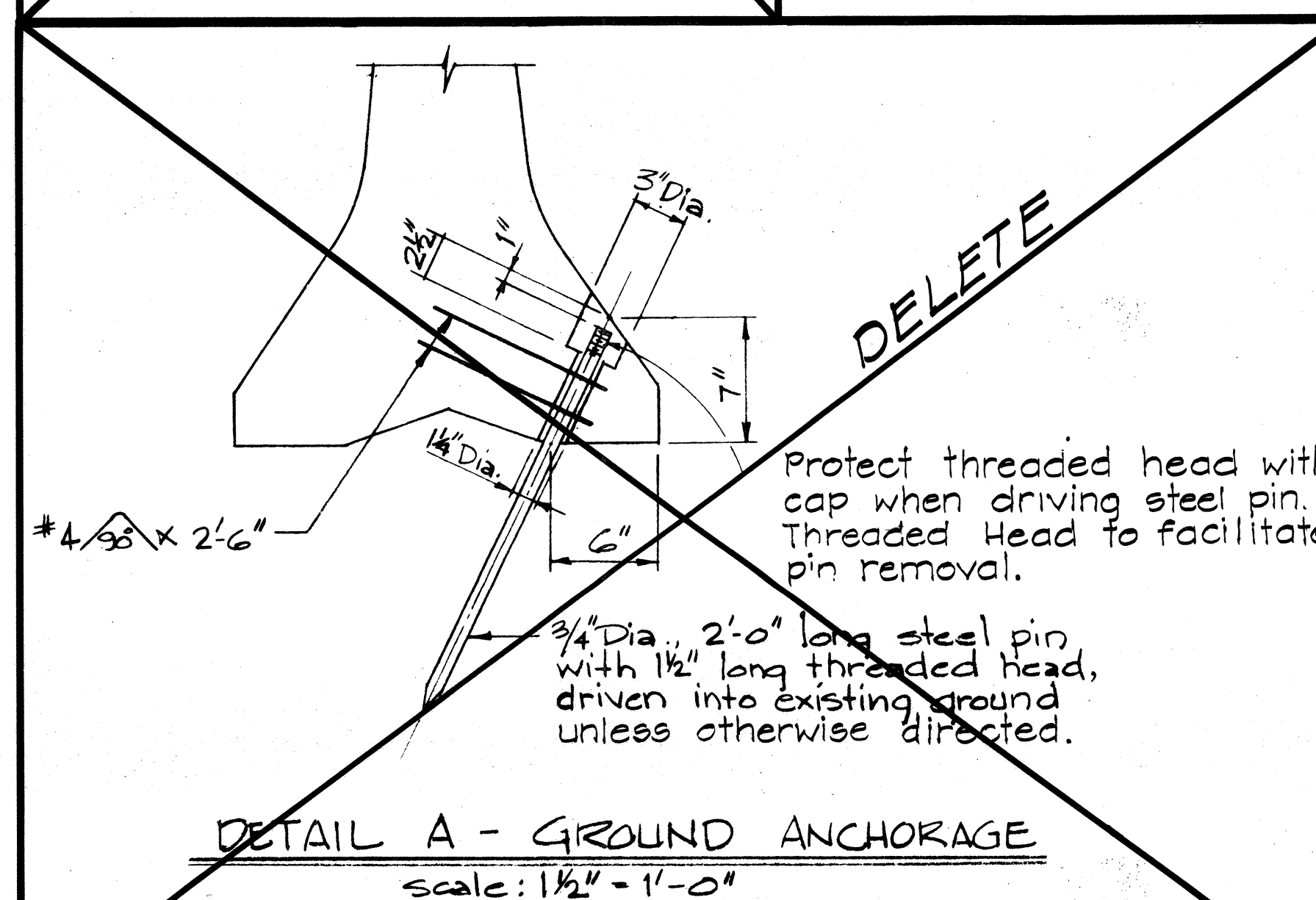
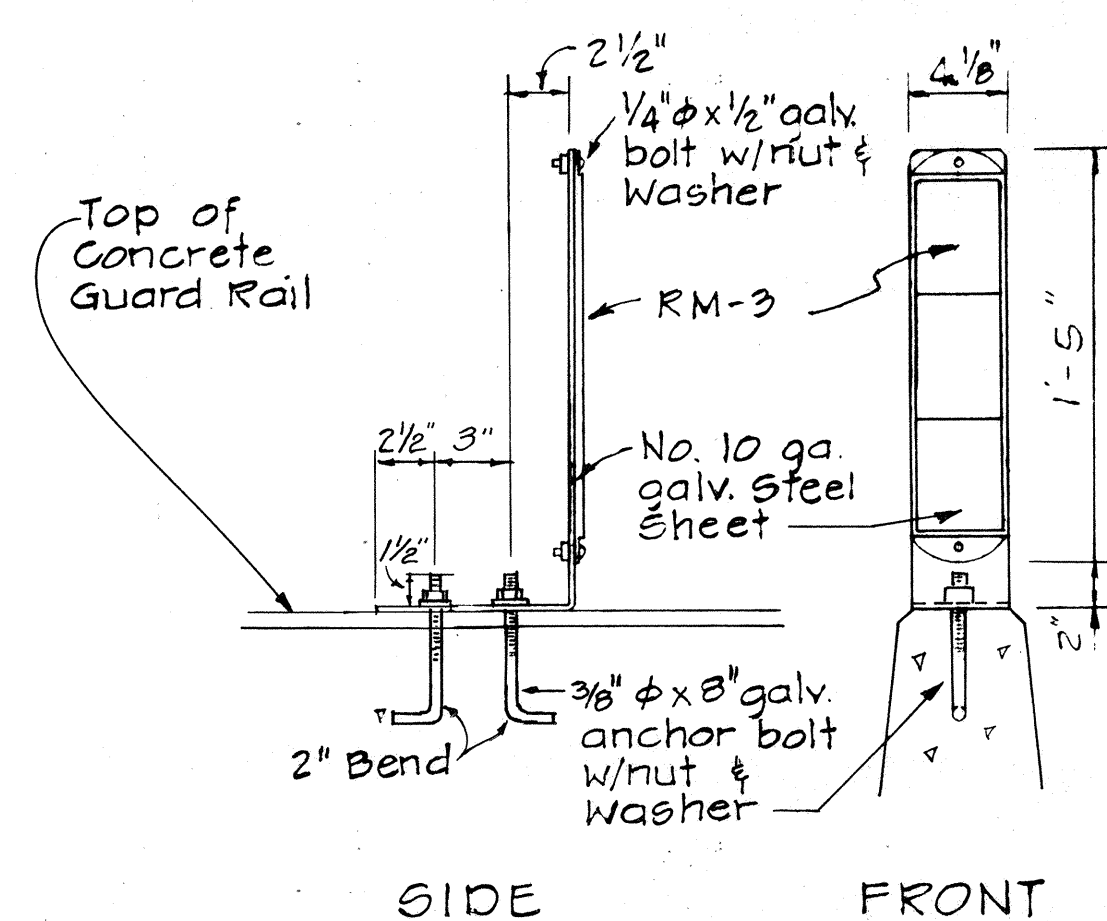
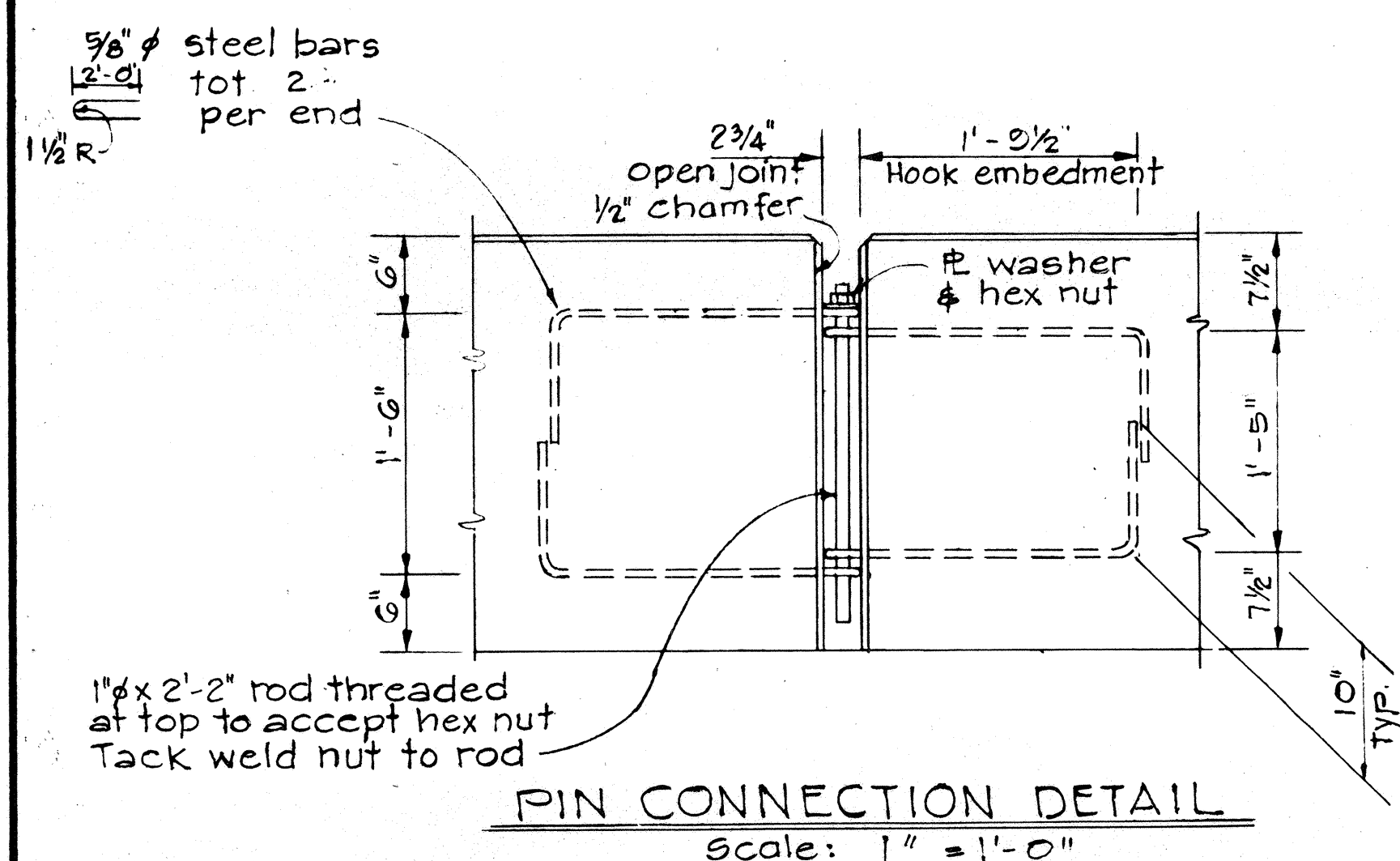
SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(181)	1986	15	67



NOTES

1. For details not shown in sections BB, C-C, & D-D, see Section A-A
2. Reflector Marker shall not be paid for separately but shall be considered incidental to "Portable Concrete Guard Rail."
3. Concrete shall be Class "A".
4. All bolts to have cut washers unless otherwise noted.



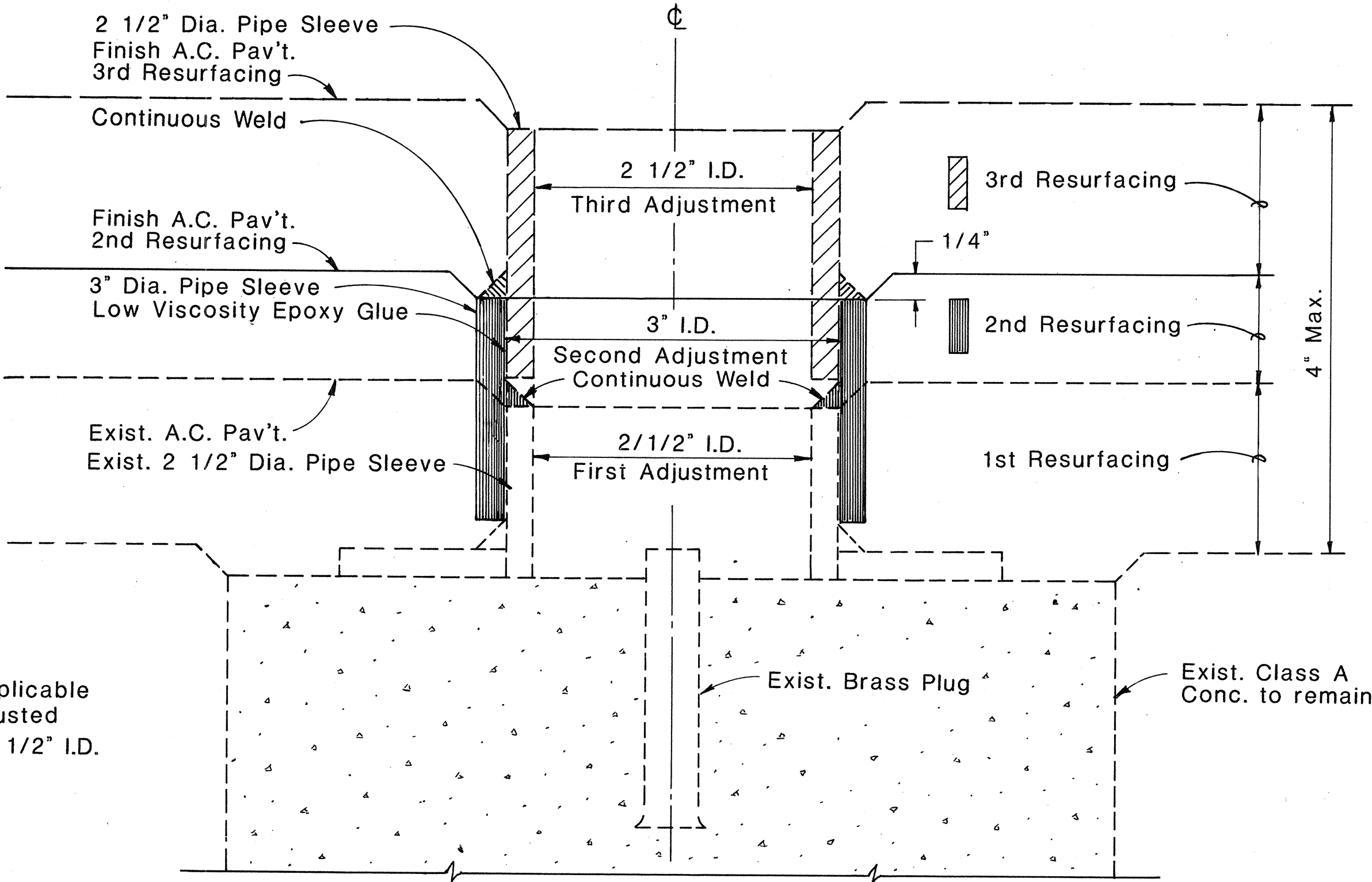
**STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION**

PORTABLE CONCRETE GUARD RAIL TYPICAL DETAILS

Scale: As Noted Date: _____

SHEET No. 3 OF 10 SHEETS

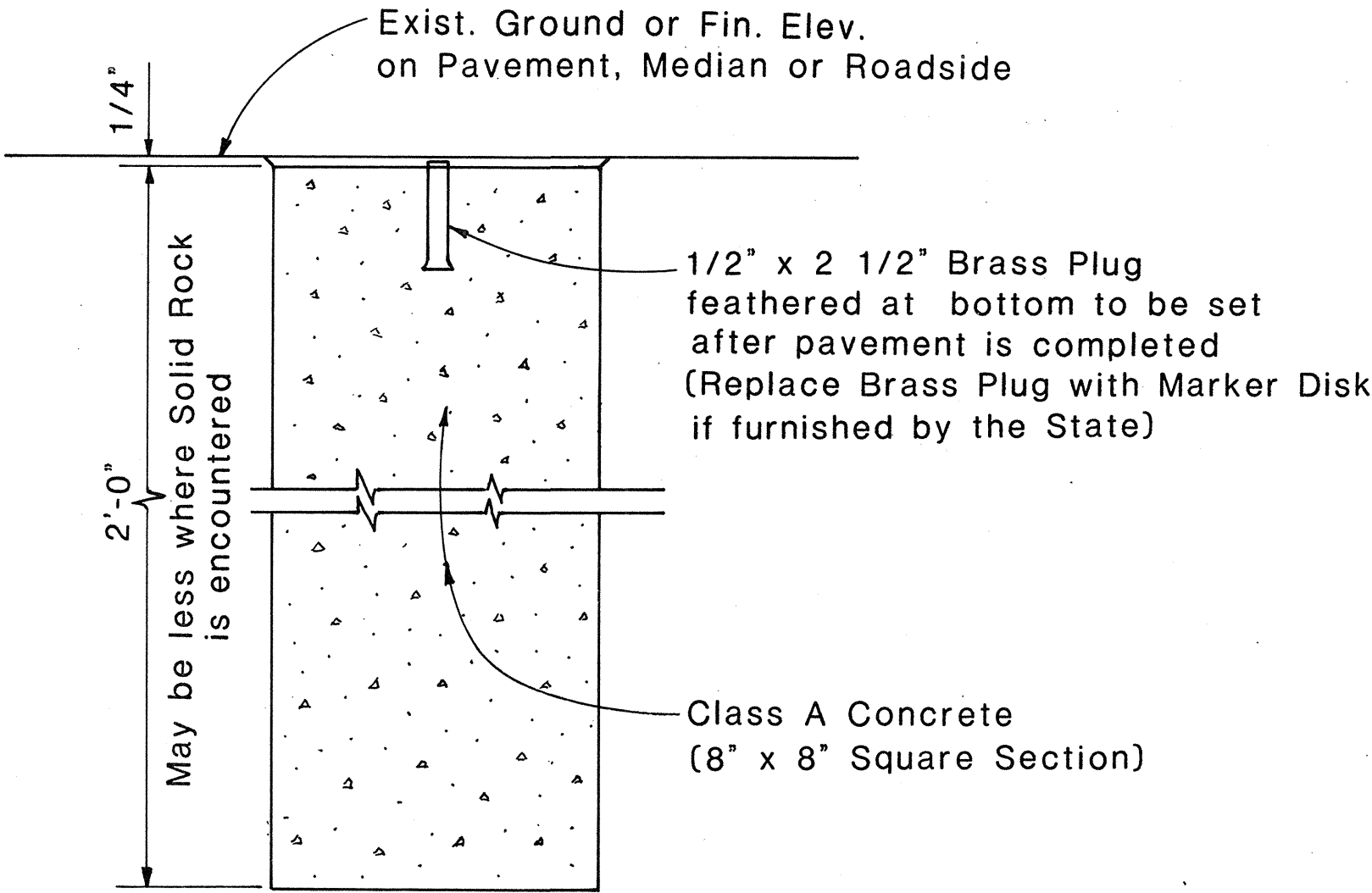
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-44-1(181)	1986	16	67



NOTE:
This detail is applicable only if initial adjusted pipe sleeve is 2 1/2" I.D.

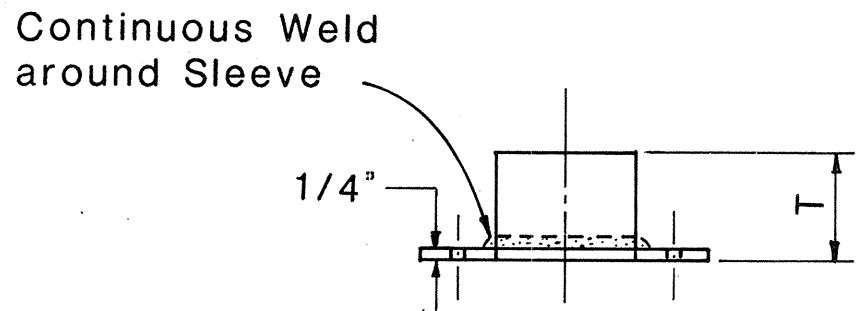
DETAIL FOR CENTERLINE MONUMENT (2ND & 3RD) ADJUSTMENTS

FULL SIZE

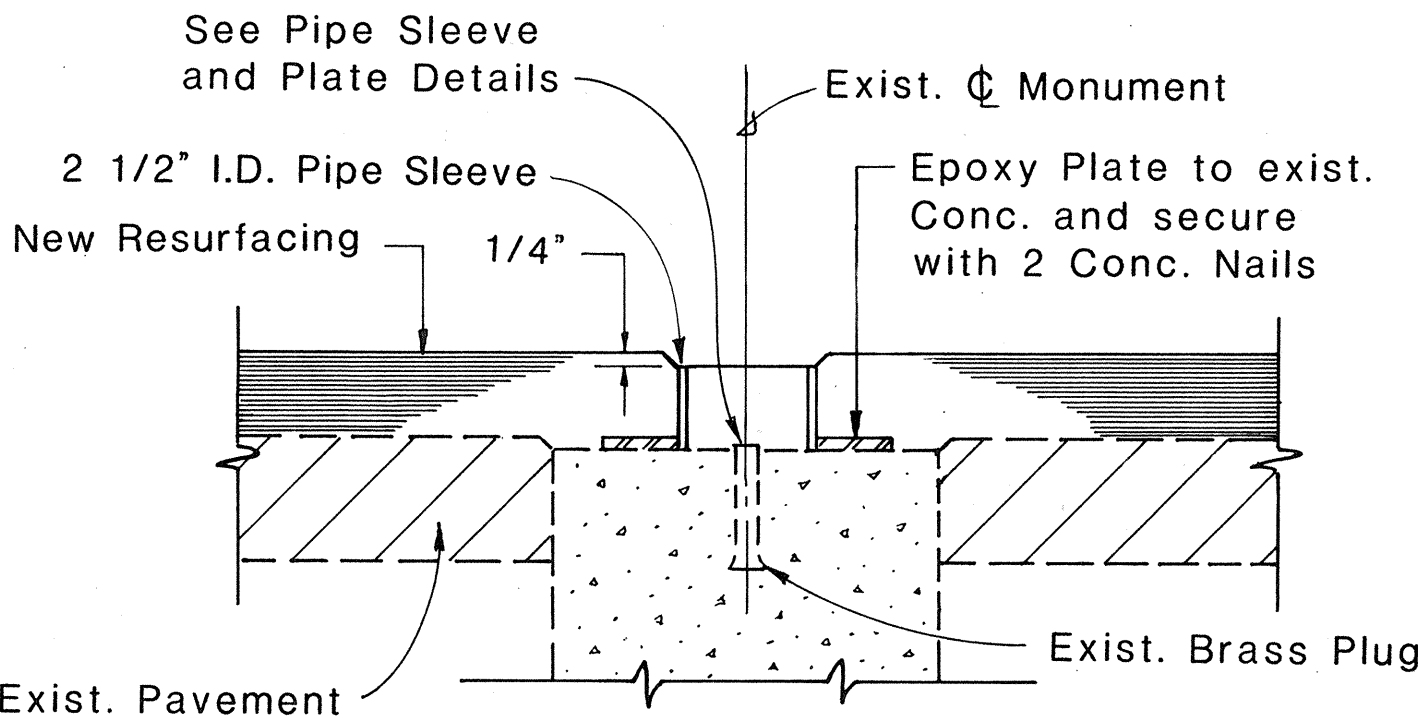


DETAIL FOR CENTERLINE & REFERENCE SURVEY MONUMENT

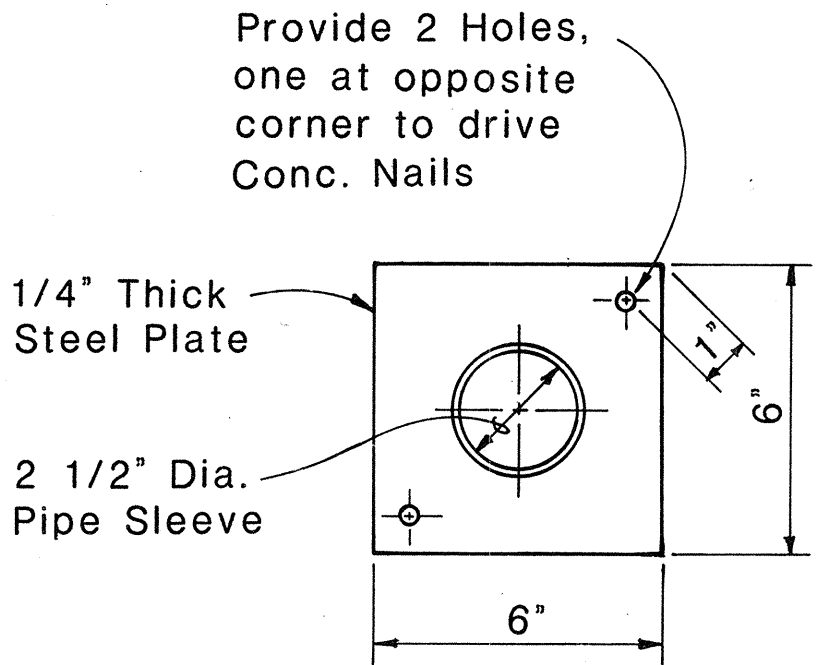
Scale: 1 1/2" = 1'-0"



PIPE SLEEVE & PLATE ELEVATION



SECTION THRU MONUMENT



PIPE SLEEVE & PLATE PLAN

NOTE
These Adjustment Details also apply to Centerline Monuments utilized as Stationline Reference Points.

DETAILS FOR ADJUSTED CENTERLINE MONUMENT

Scale: 3" = 1'-0"

APPROVAL RECOMMENDED:

Mike Miura 6-20-83
HIGHWAY DESIGN ENGINEER DATE

APPROVED:
Ed Fujiyama 6-22-83
ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED	
		BY	DATE
1	Delete Note No. 1	<i>ED</i>	11-19-84

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

**CENTERLINE AND REFERENCE
SURVEY MONUMENT**

Scale: As Shown Date: May, 1983

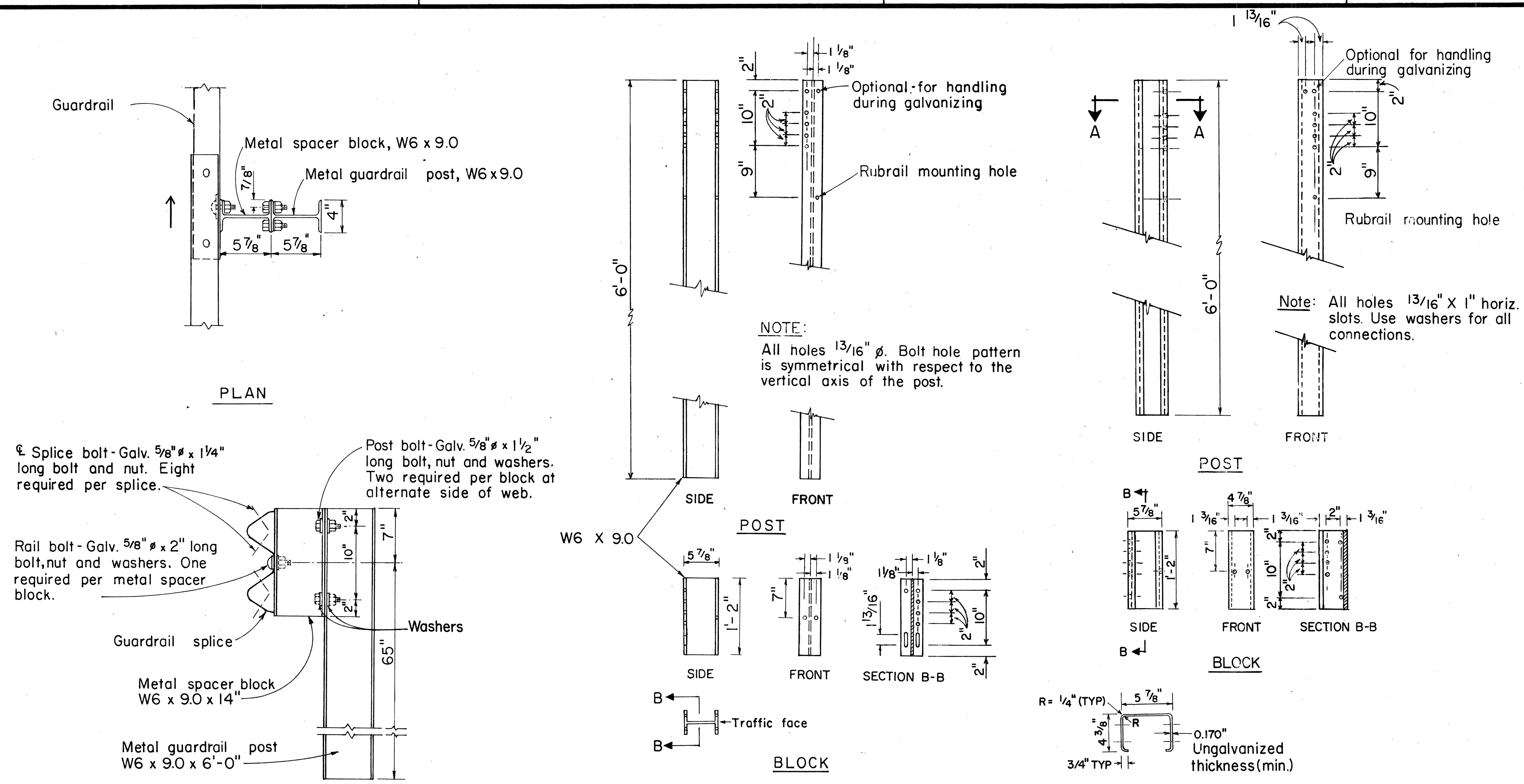
SHEET NO. 4 OF 10 SHEETS

SURVEY PLOTTED BY	DATE
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.	IR-HI-1(81)	1985	17	67

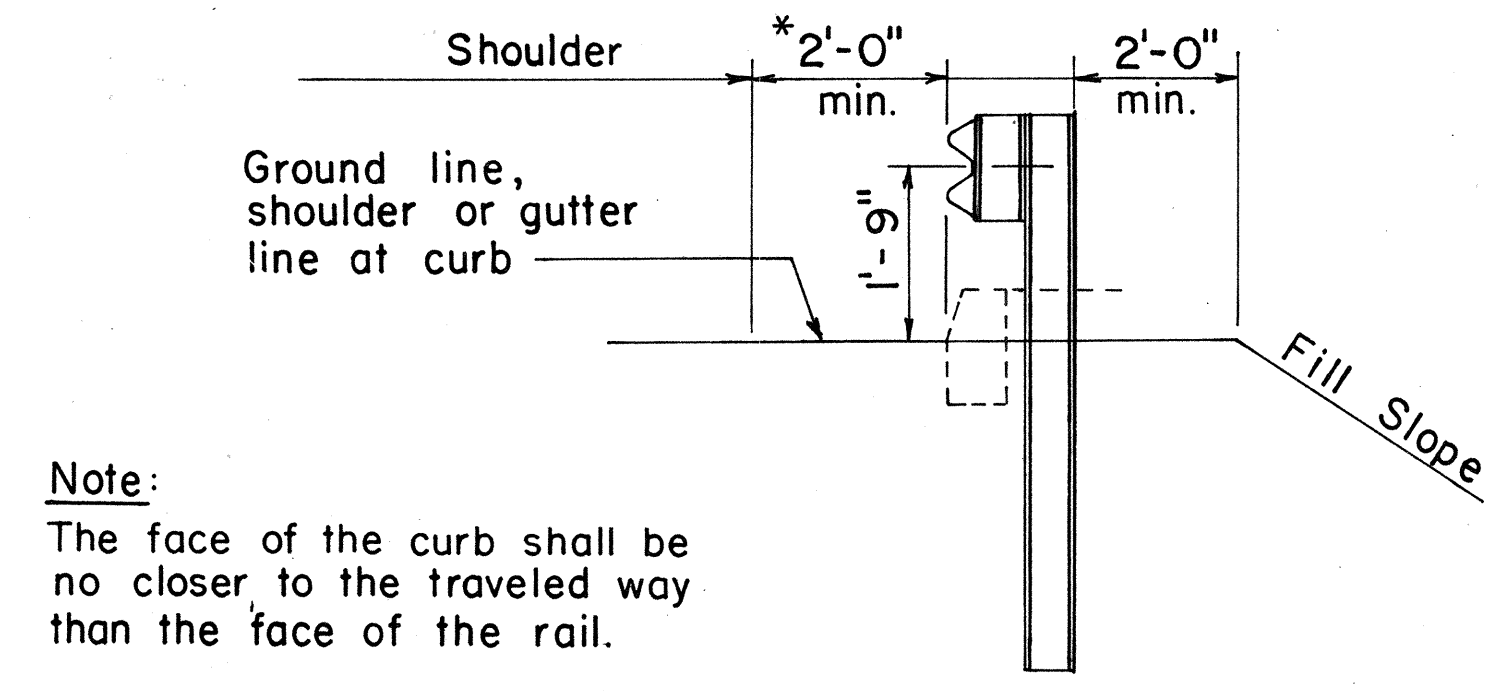
GENERAL NOTES

- Both of the alternate type posts may be used on any one project however, only one type of post shall be used in any single run of guardrail.
- All hardware, posts and blocks shall be galvanized. No punching, drilling or cutting will be permitted after galvanizing.
- Connection details for bent plate post and block shall be similar to the details shown for structural shape post, and block.
- Where conditions require, special post lengths in increments of 6 inches may be specified.
- For details of rail elements, bolts and nuts, see sheet DT 501.
- All fasteners, posts, blocks and rail elements shall conform to the latest edition and amendments of "A Guide to Standardized Highway Barrier Rail Hardware," a report prepared and approved by the AASHTO-AGC-ARTBA Joint Cooperative Committee.



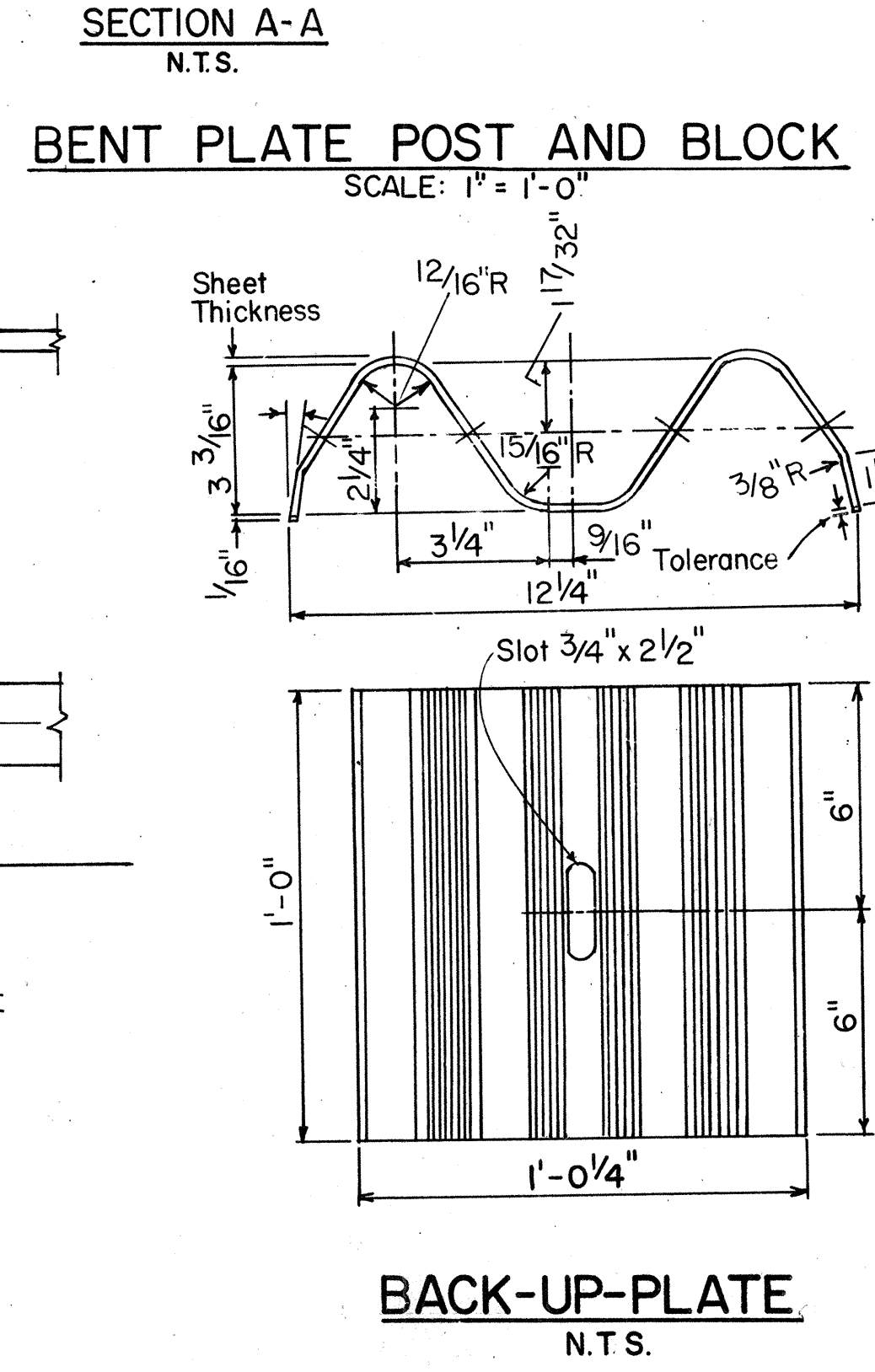
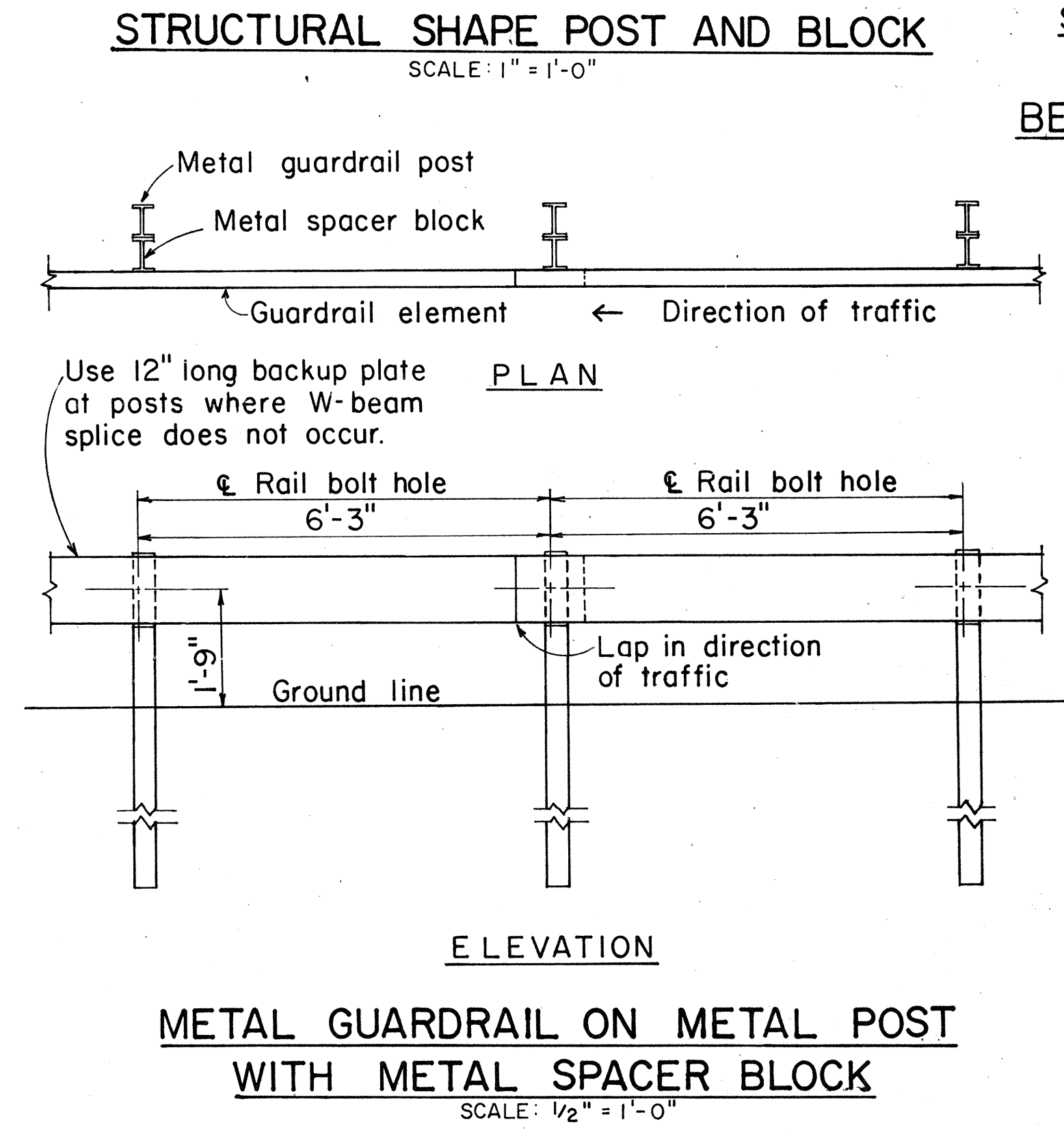
SINGLE METAL GUARDRAIL ON METAL POST WITH METAL SPACER BLOCK

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



Note:

The face of the curb shall be no closer to the traveled way than the face of the rail.



APPROVAL RECOMMENDED:

Eishi Tanaka

TRAFFIC ENGINEER

9/1/82

DATE

APPROVED:

Shunichi Salsiki

ASSISTANT CHIEF, ENGINEERING

9/22/82

DATE

NO.	REVISION	APPROVED BY	DATE
1	Supersedes sht. DT 500 approved 12/30/69.	H.F.	9/22/82
2	Added General Notes No. 6	J.D.	9-28-83
3	Added details for adjusting guardrail height and added Back-up Plate and washer	E.T.	9/18/85

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

METAL GUARDRAIL

Scale: As Shown

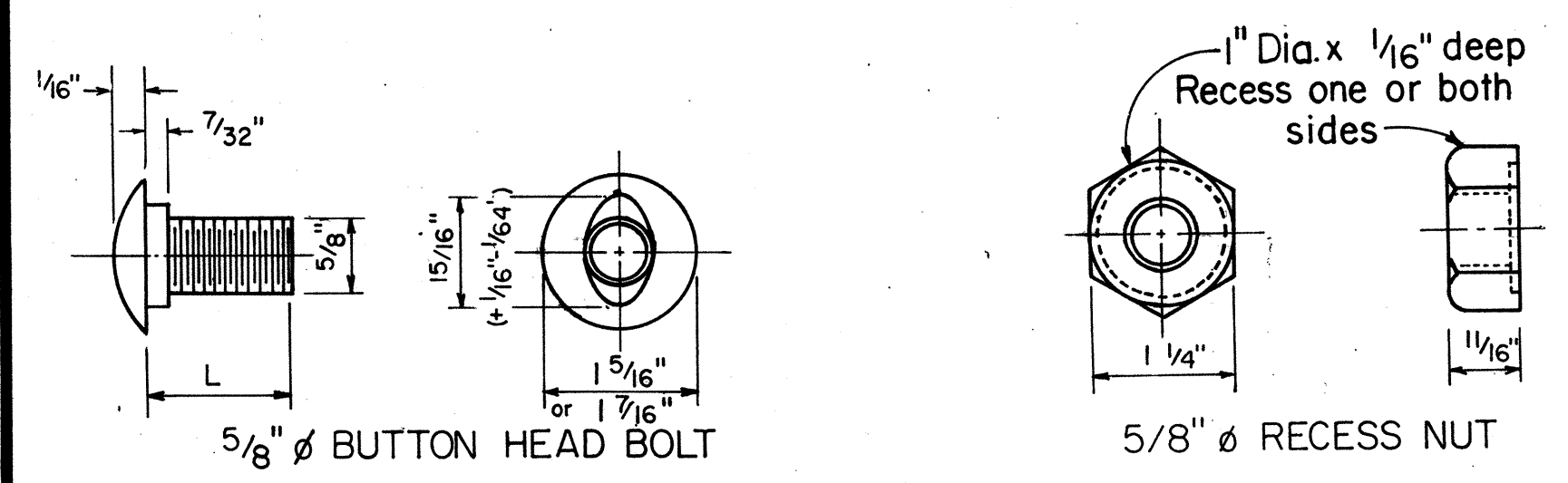
July, 1982

SHEET No. OF SHEETS

DT 500

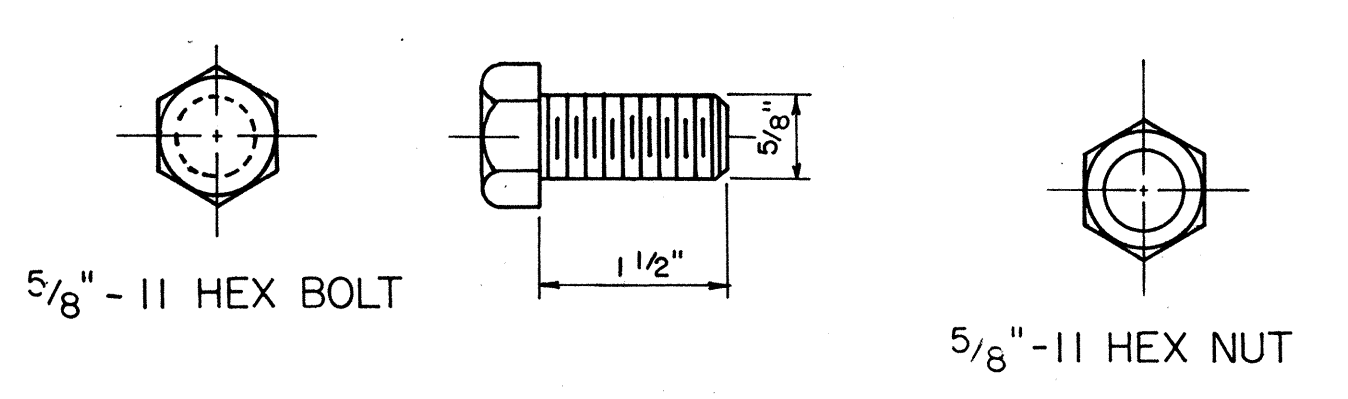
DATE	*****
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(181)	1986	18	67

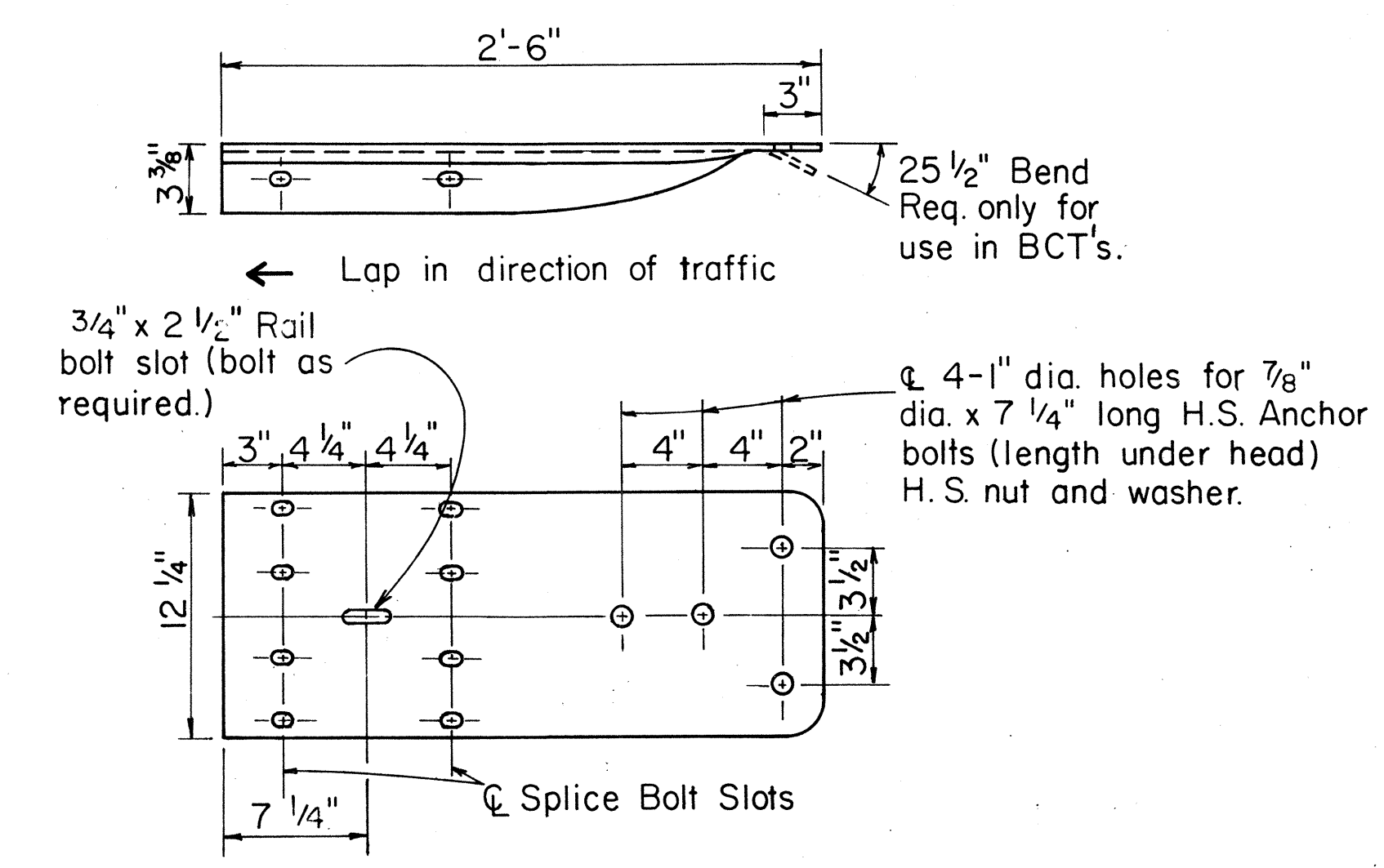


L	Thread Length	Intended Use
1 1/4"	Full length thread	Splice rail elements
2"	1 1/2" min. thread len.	Fasten rails to posts

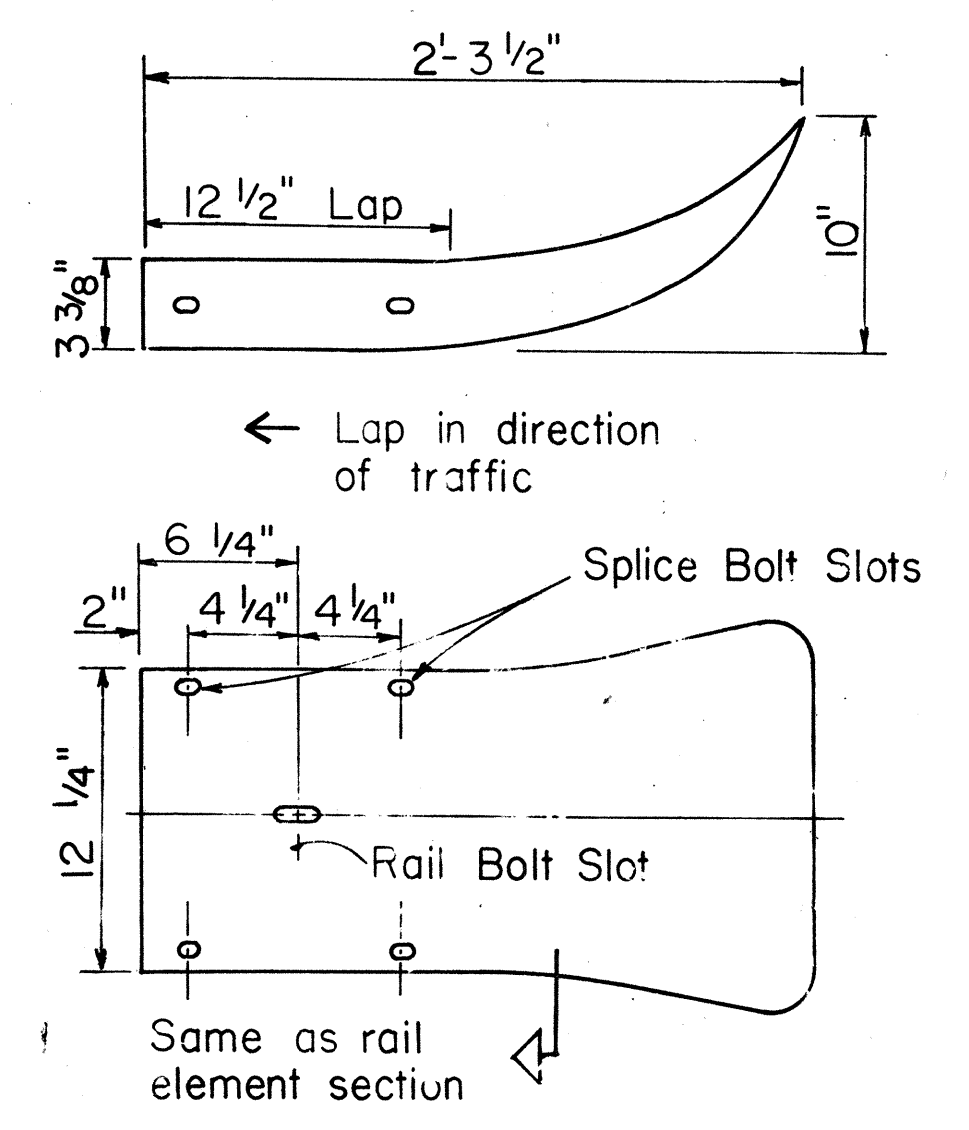
**5/8" BUTTON HEAD BOLT
AND RECESS NUT**
Scale: NTS



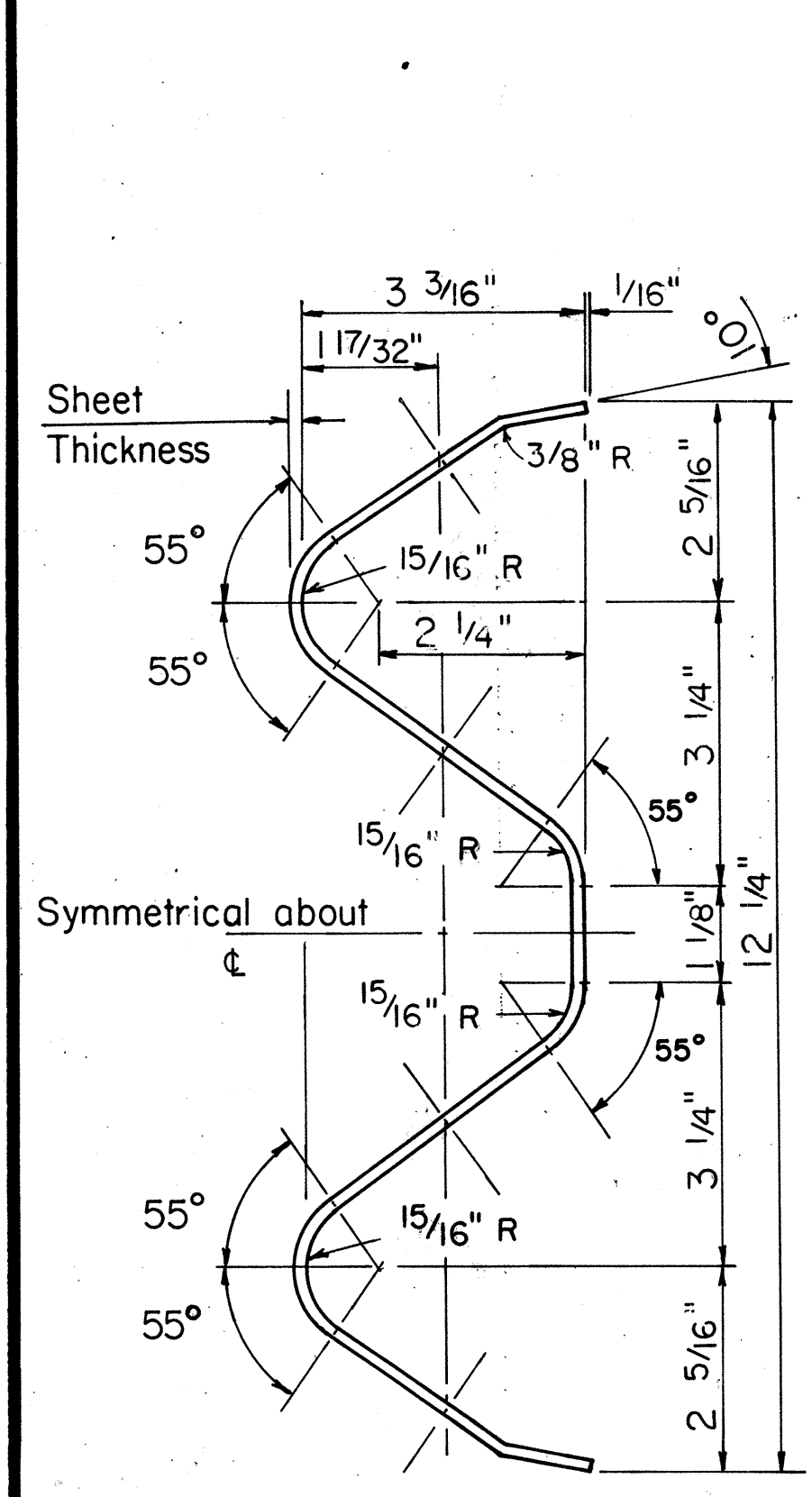
5/8" HEX POST BOLT AND NUT
Scale: N.T.S.



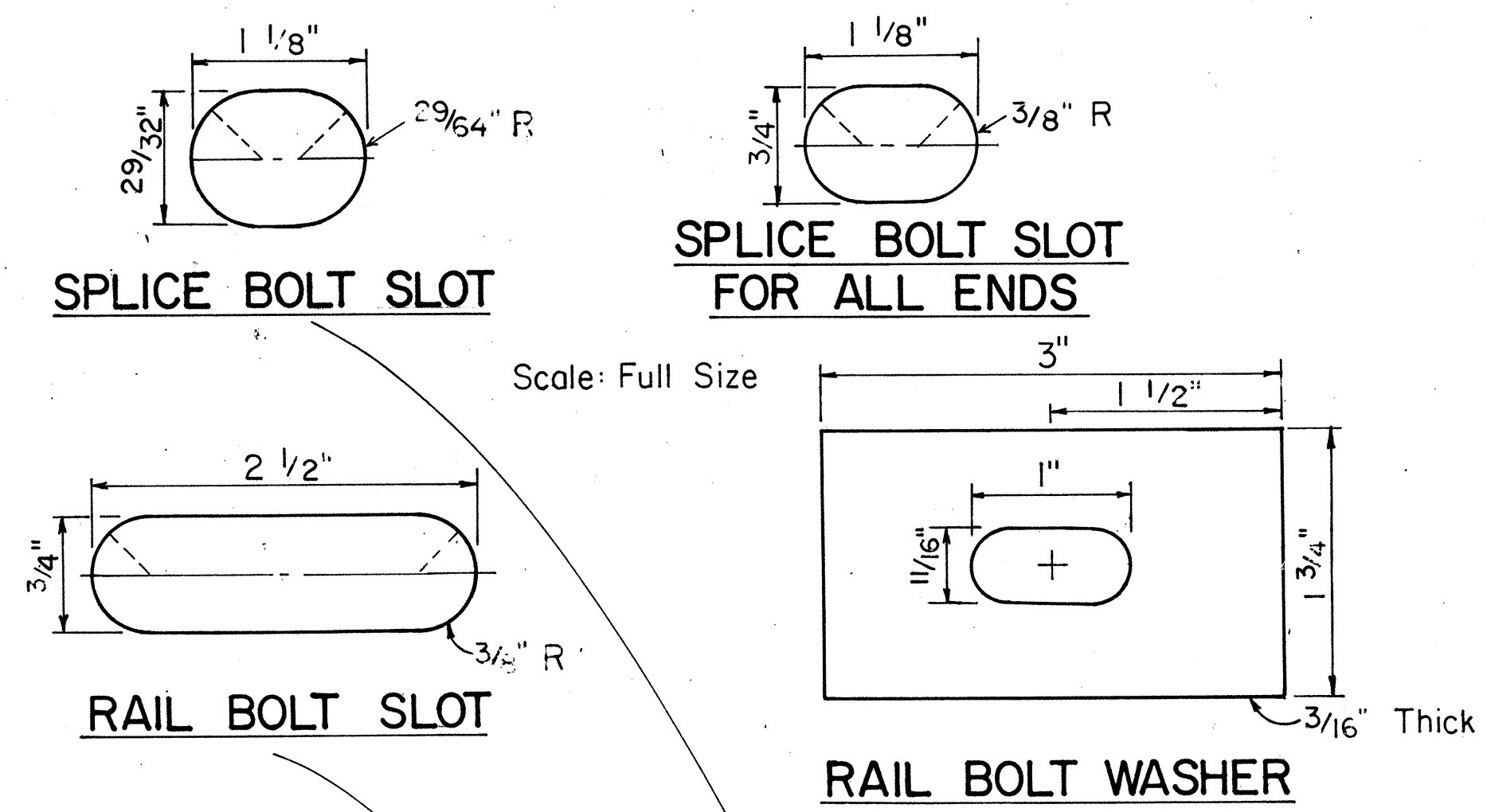
W BEAM TERMINAL CONNECTOR
Scale: 1 1/2" = 1'-0"
Lap in direction of traffic



W BEAM END SECTION (FLARED)
Scale: 1 1/2" = 1'-0"
Lap in direction of traffic



RAIL ELEMENT SECTION
Scale: 6" = 1'-0"

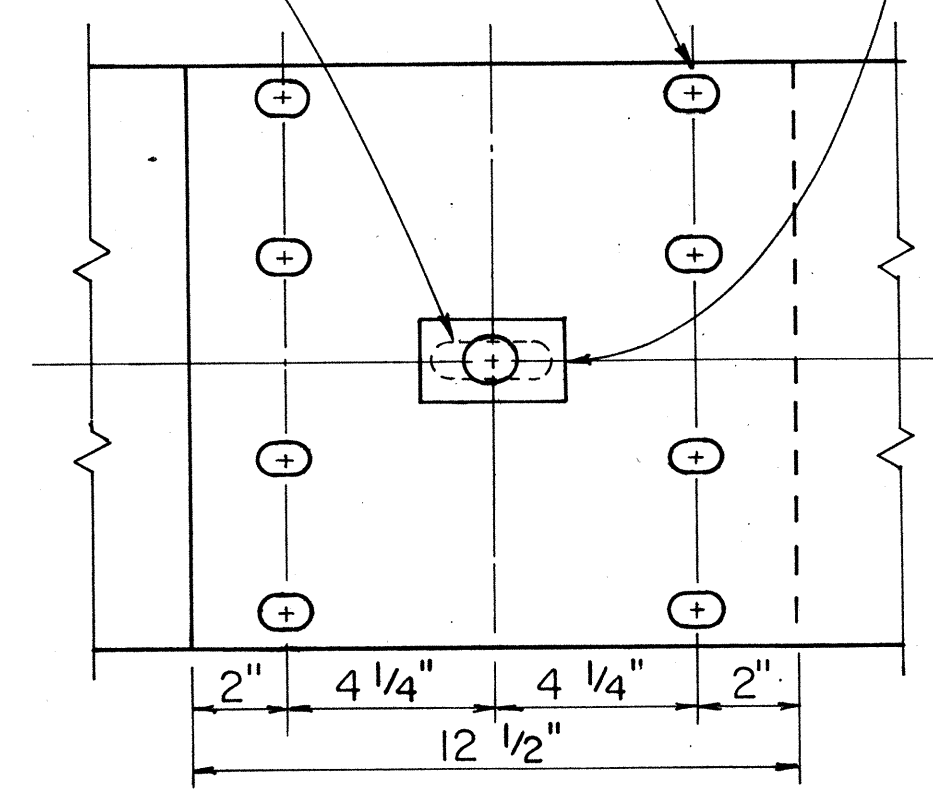


SPLICE BOLT SLOT

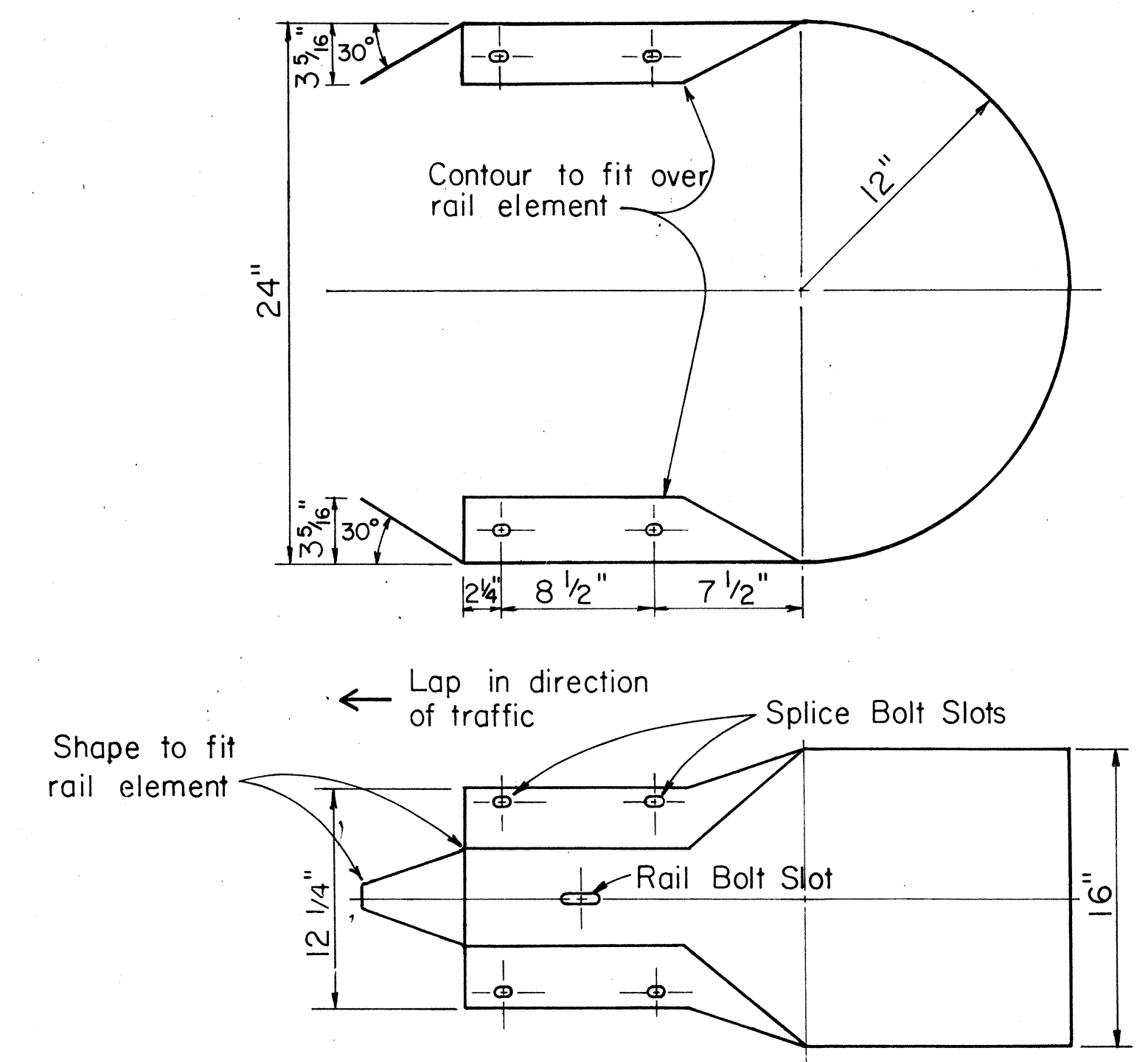
**SPLICE BOLT SLOT
FOR ALL ENDS**

RAIL BOLT SLOT

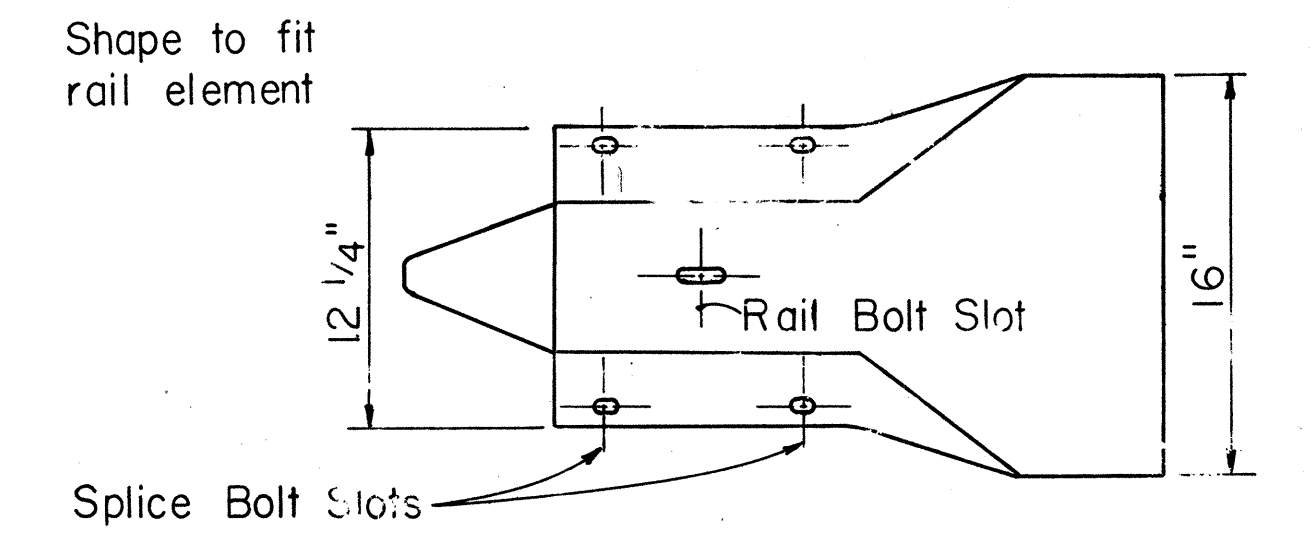
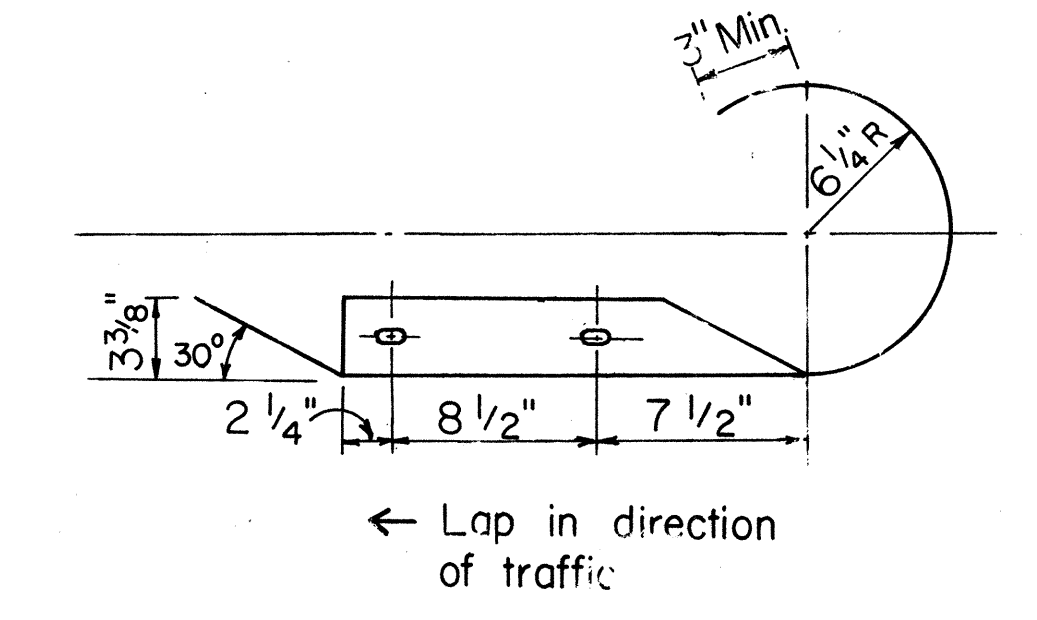
RAIL BOLT WASHER



RAIL SPLICE
Scale: 3" = 1'-0"



W BEAM END SECTION (BUFFER)
Scale: 1 1/2" = 1'-0"
Lap in direction of traffic



W BEAM END SECTION (ROUNDED)
Scale: 1 1/2" = 1'-0"
Lap in direction of traffic

APPROVAL RECOMMENDED:
Erich Tanaka 9/20/82
TRAFFIC ENGINEER DATE

APPROVED:
Shirley S. S. S. 9/22/82
ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE
1	Supersedes sht. DT 501 approved 12/30/69	H.T.	9/22/82

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
METAL GUARDRAIL

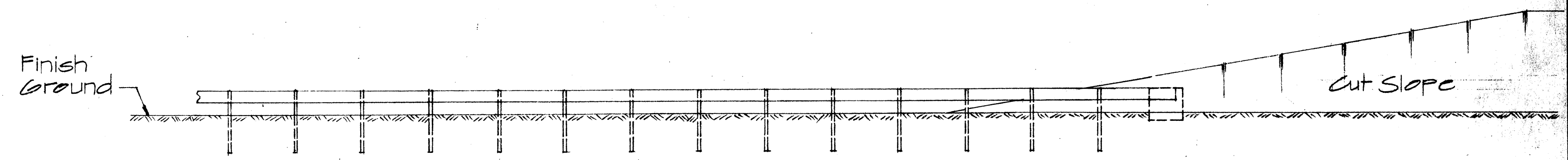
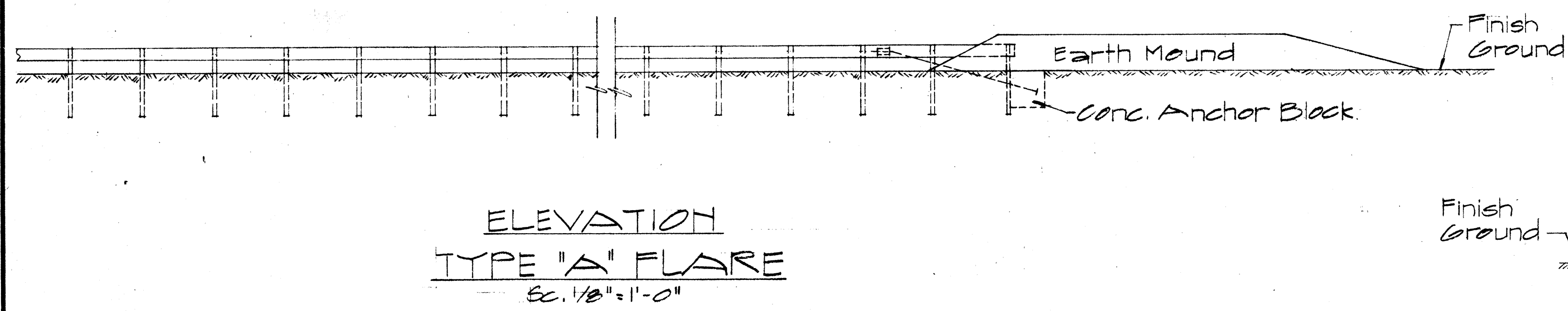
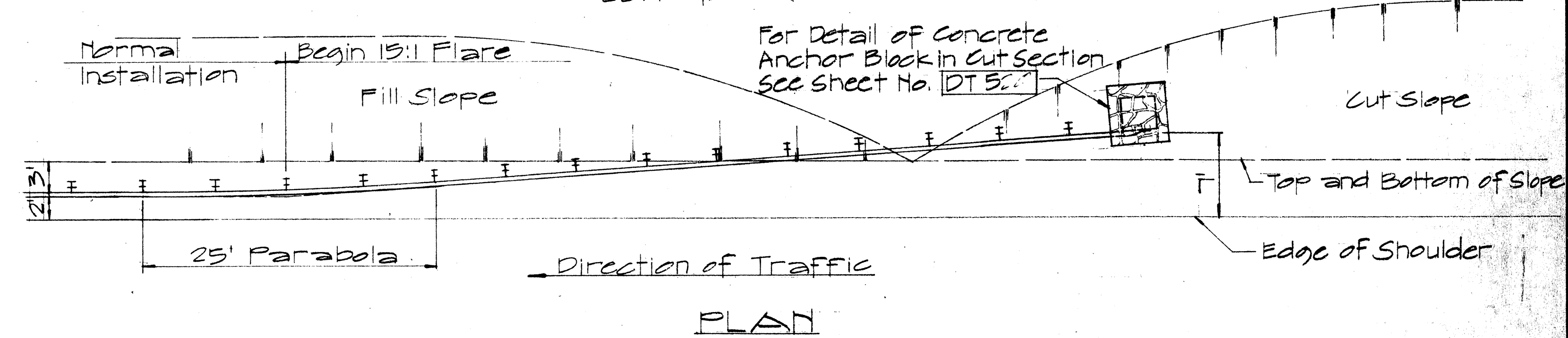
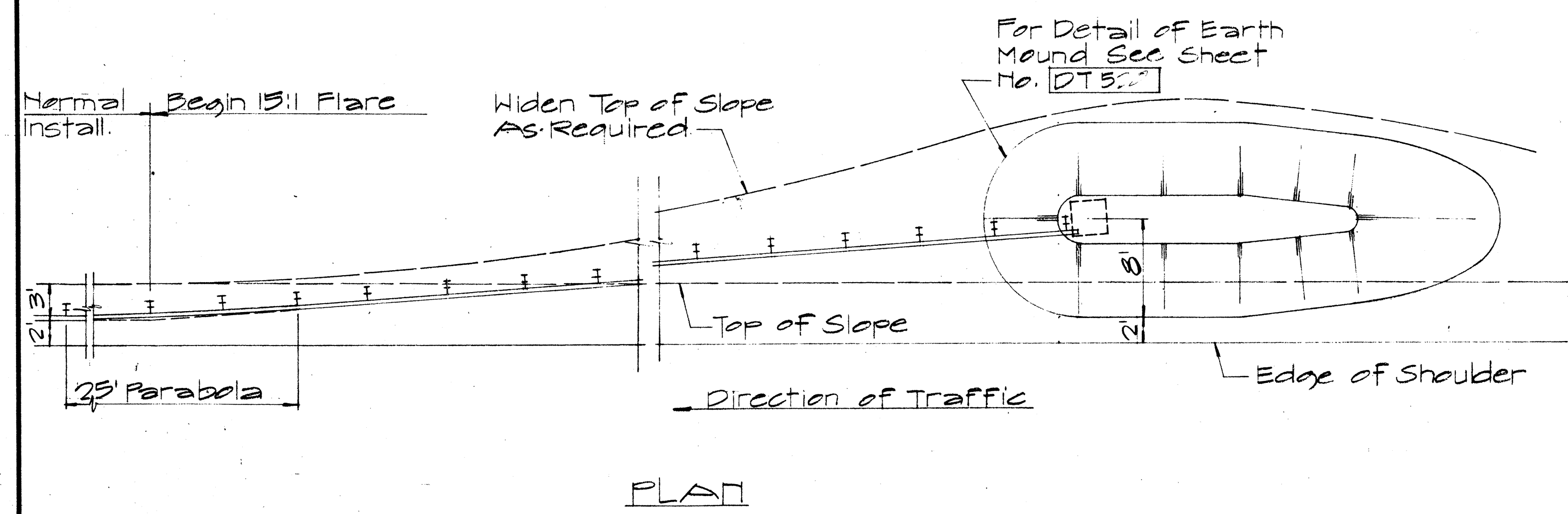
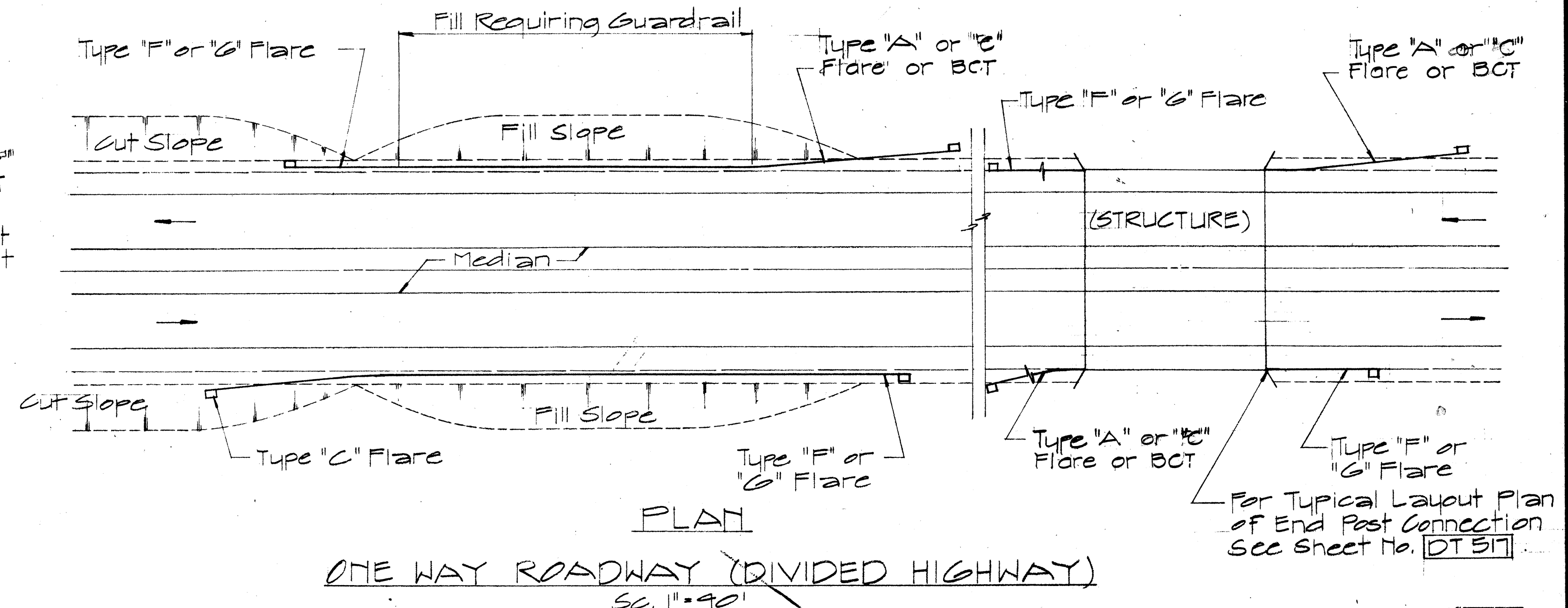
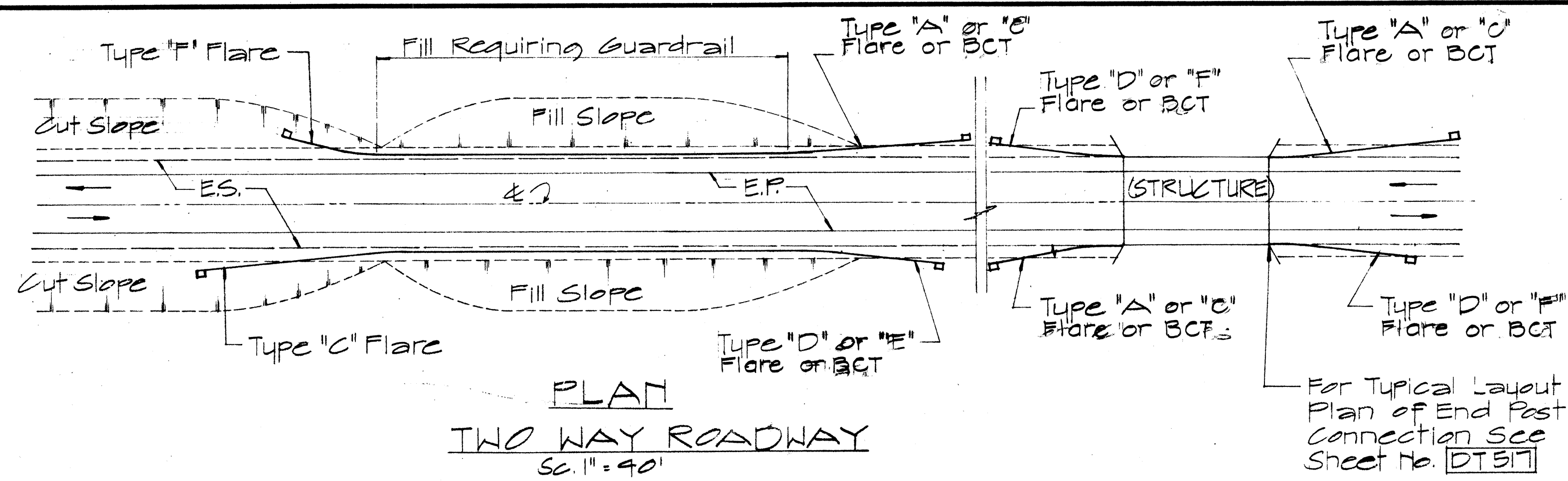
Scale: As Noted
SHEET No. 6 OF 10 SHEETS DT 501

DATE	DESIGNED BY	CHECKED BY
9/20/82	Erich Tanaka	Shirley S. S. S.
9/22/82	Shirley S. S. S.	Shirley S. S. S.
9/22/82	Shirley S. S. S.	Shirley S. S. S.
9/22/82	Shirley S. S. S.	Shirley S. S. S.
9/22/82	Shirley S. S. S.	Shirley S. S. S.
9/22/82	Shirley S. S. S.	Shirley S. S. S.
9/22/82	Shirley S. S. S.	Shirley S. S. S.
9/22/82	Shirley S. S. S.	Shirley S. S. S.
9/22/82	Shirley S. S. S.	Shirley S. S. S.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(181)	1986	19	67

NOTE:

1. Metal guard rail connection to structures requires End Post Connection. See structure plans.
2. For detail of Breakaway Cable Terminal (BCT) See Sheet No. DT 519



APPROVAL RECOMMENDED:
Traffic Engineer
DATE: 12/29/62

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

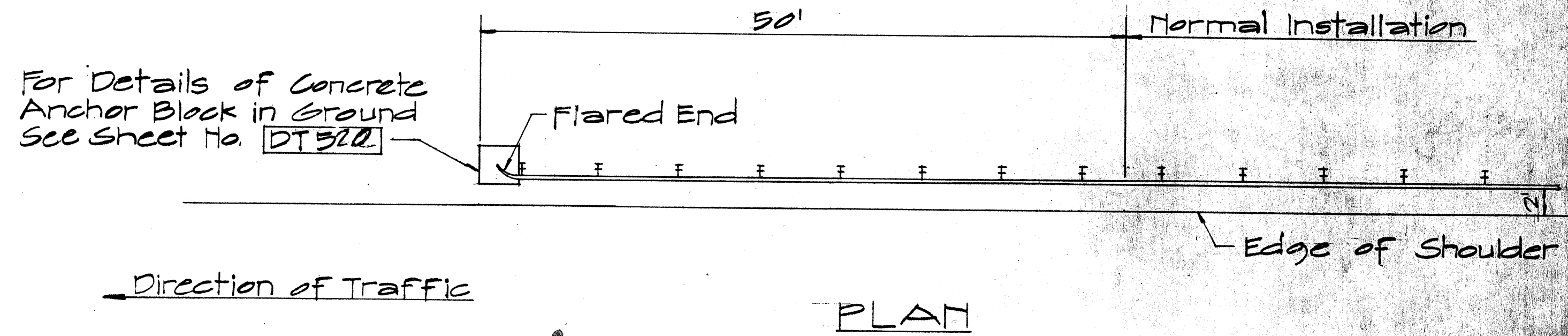
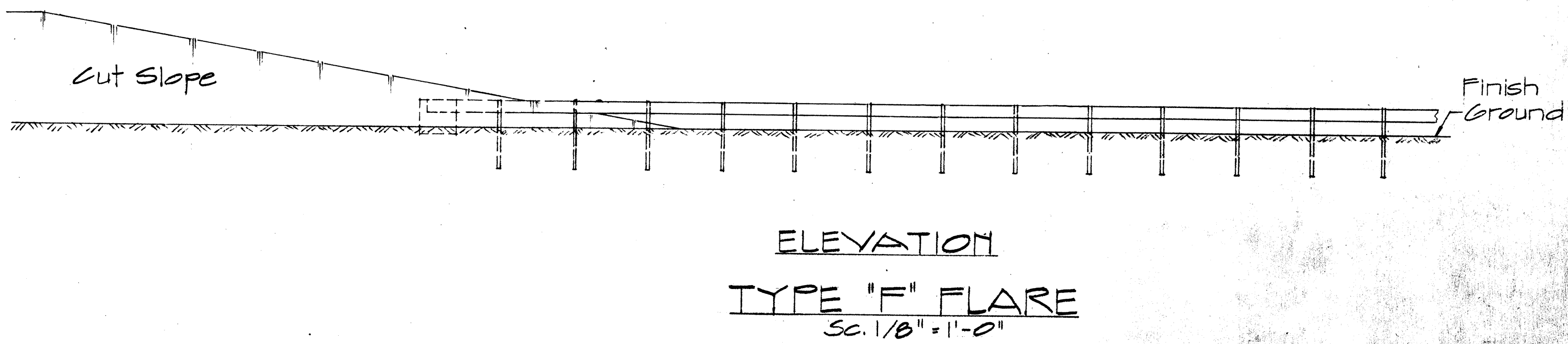
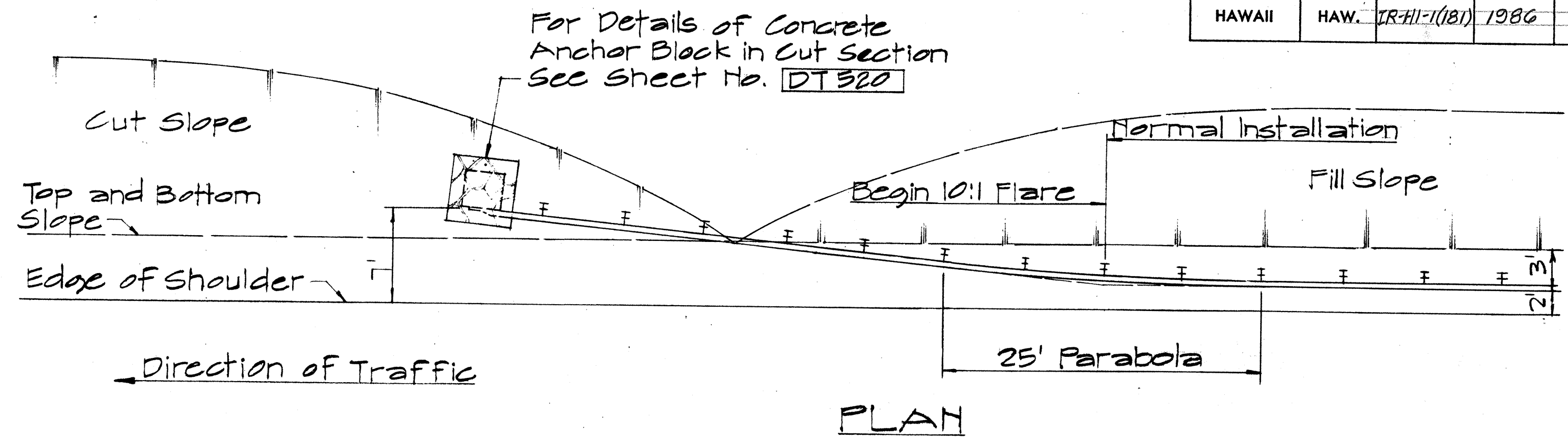
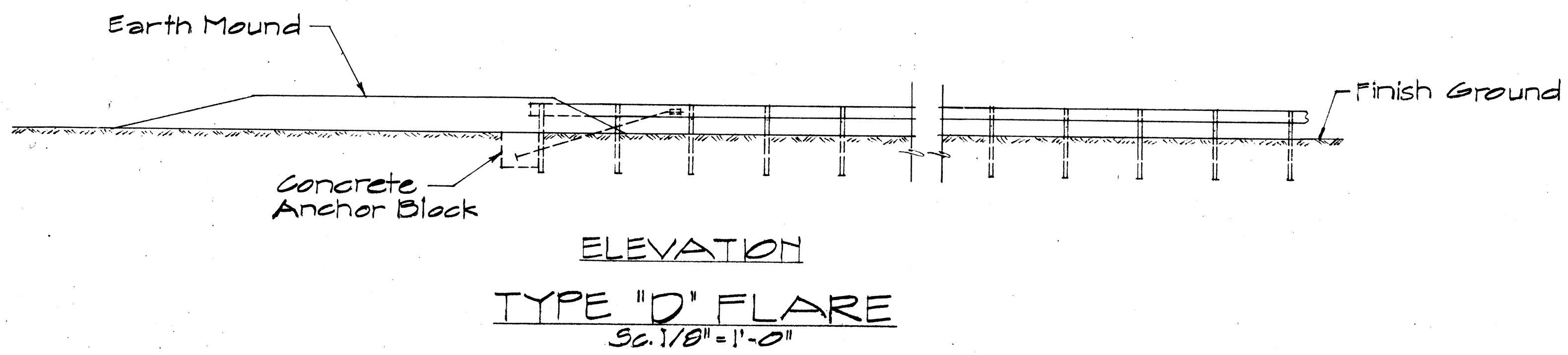
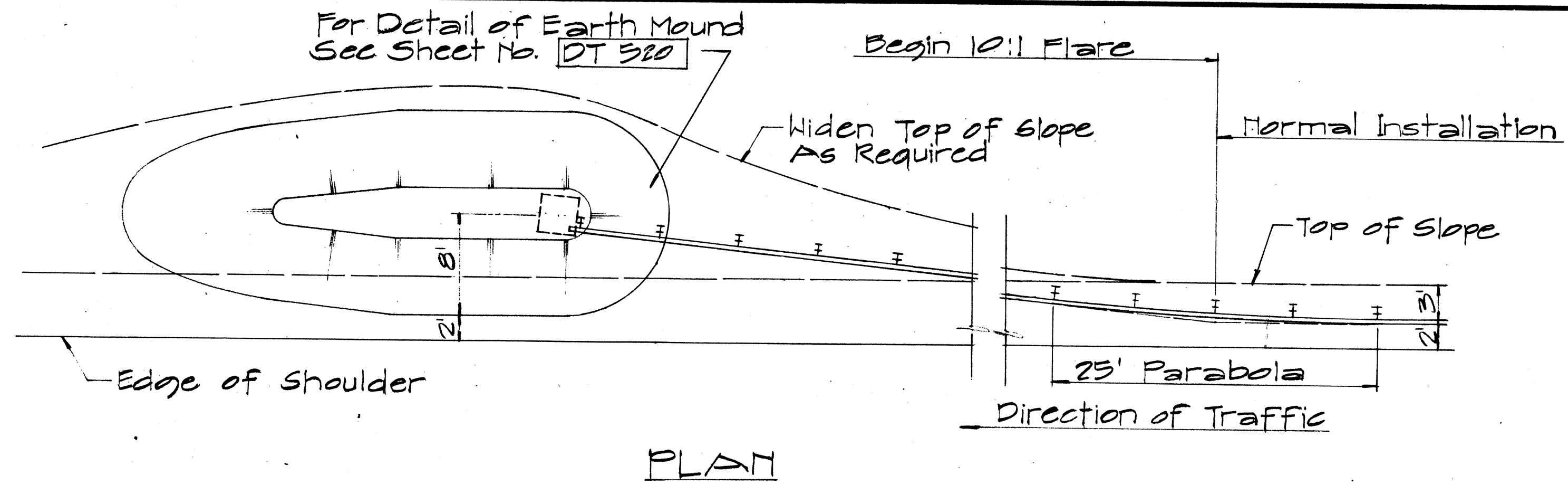
NO.	REVISION	APPROVED BY	DATE
1	Delete Type "B" Flare and Type "E" Flare	H.T.	6/15/82

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

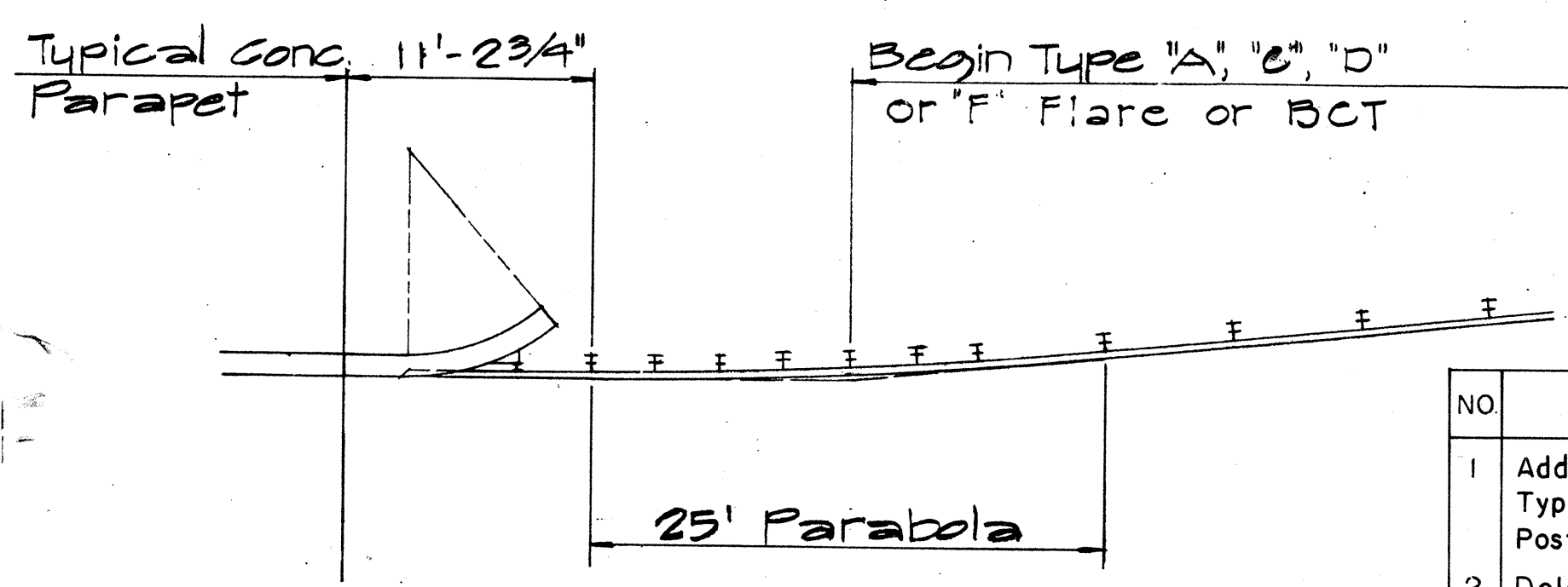
STANDARD DETAILS
OF APPROACH END
FLARE - ONE & TWO
WAY ROADWAY

Sc. As Noted April 1967

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IR-HI-1(181)	1986	20	67



NOTE:
For detail of Breakaway Cable Terminal (BCT) See Sheet No. DT 510



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.C.	4-12-72
2	Delete Type "B" Flare and Type "E" Flare	H.C.	6-15-73

APPROVAL RECOMMENDED:
Eishi Tanaka 12/29/69
TRAFFIC ENGINEER DATE
APPROVED:
Wm. S. Sal 12-29-69
ASSISTANT CHIEF, ENGINEERING DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
TRAILING END
FLARE - ONE & TWO
WAY ROADWAY

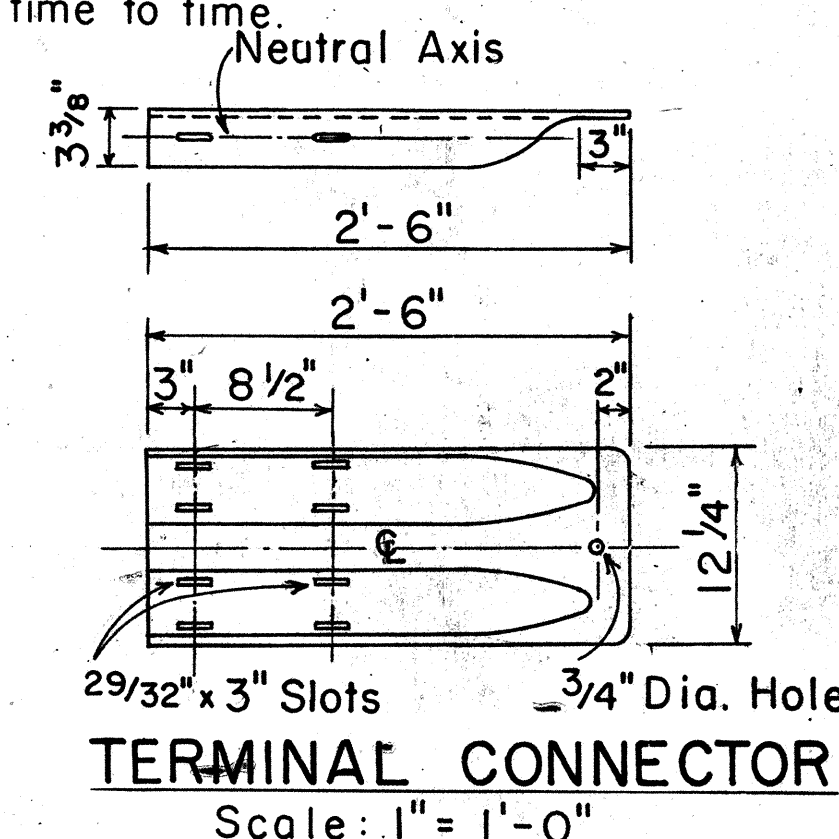
Scale: As Noted April 1969

DATE	_____
DESIGNED BY	_____
DRAWN BY	_____
CHECKED BY	_____
NOTED BY	_____
NO.	_____

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	2R-HI-1(81)	1986	21	67

NOTES:

1. Anchor Plate and Anchor Cable Assembly (Standard Swaged Fitting and Stud). See Standard Detail Sheet No. DT 520.
2. Other Anchor Cable Assemblies may be used. Minimum breaking strength of assembly should be 40,000 lbs.
3. Second Terminal Post does not require holes to accommodate Anchor Cable.
4. Slip Base Load shall be controlled with a Calibrated Torque Wrench - Torque 155 - 170 ft. lbs.
5. Concrete shall be Class A.
6. B.C.T. Hardware has been superseded by "A Guide Standardized Highway Barrier Rail Hardware," A report prepared and approved by the AASHTO-AGC-ARTBA joint cooperation committee. All hardware shall conform to above mentioned publication and as revised from time to time.



APPROVAL RECOMMENDED:

Erich Tanaka
TRAFFIC ENGINEER
6/14/78
DATE

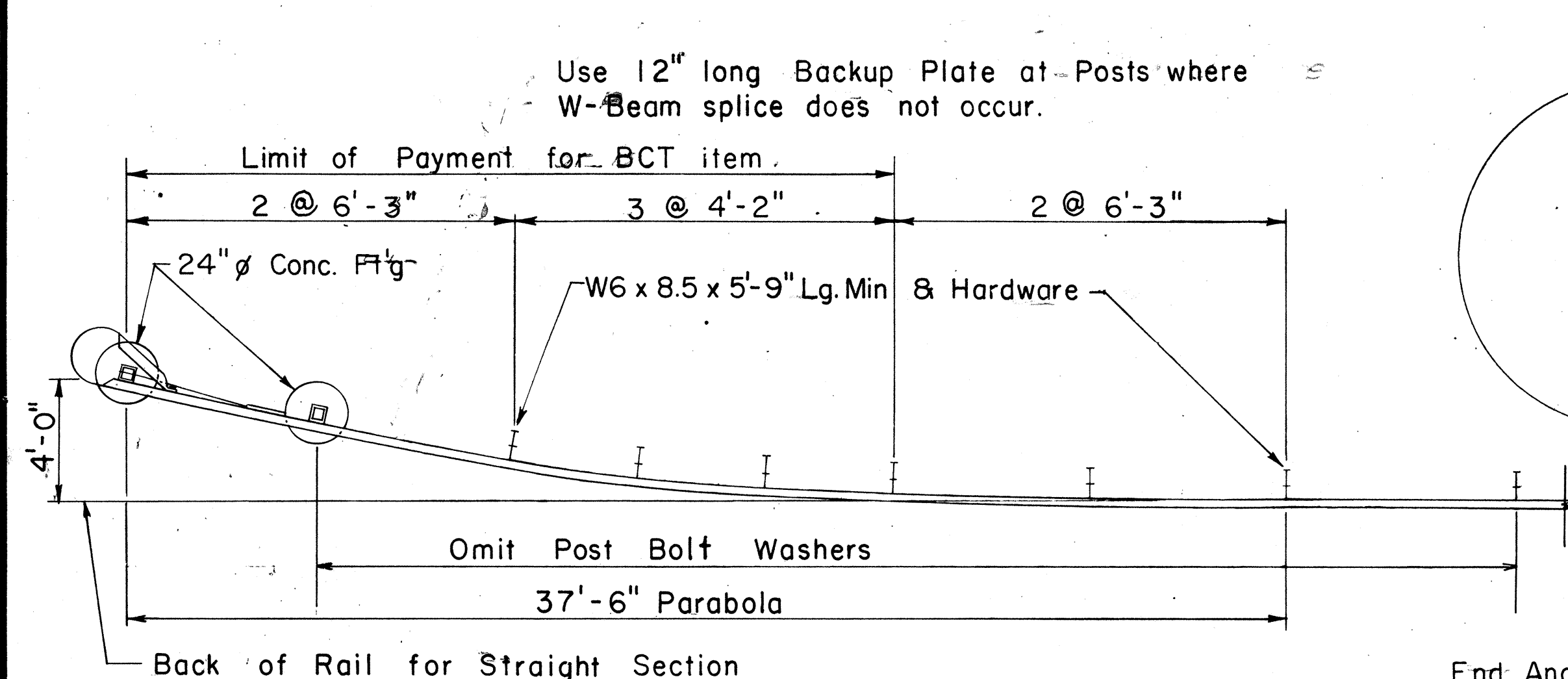
APPROVED:

Harbour Sakishi
ASSISTANT CHIEF, ENGINEERING
6/15/78
DATE

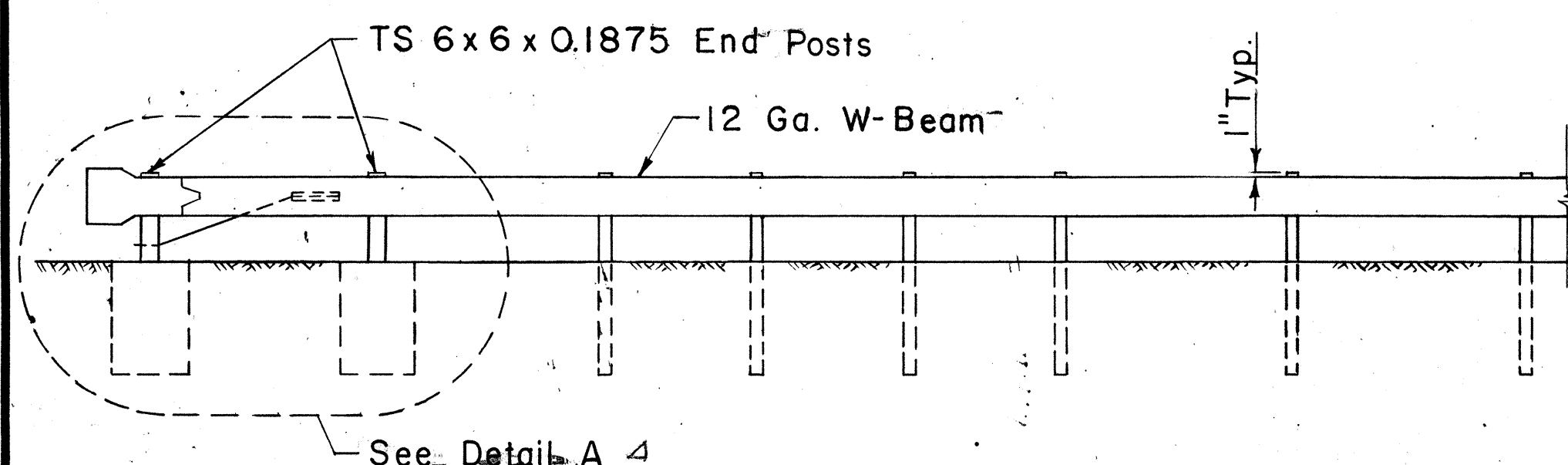
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAIL
BREAKAWAY CABLE TERMINAL (BCT)

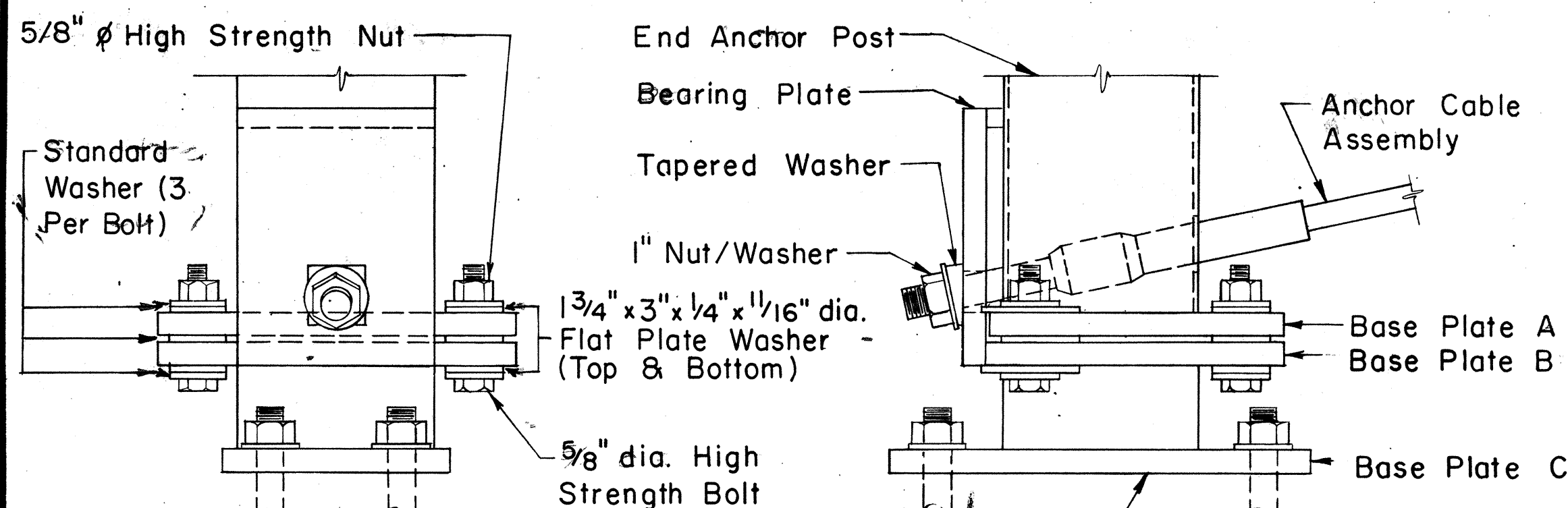
Scale: As Shown Date: June 1978
SHEET No. 9 OF 10 SHEETS DT 519



PLAN
Scale: 1/4" = 1'-0"



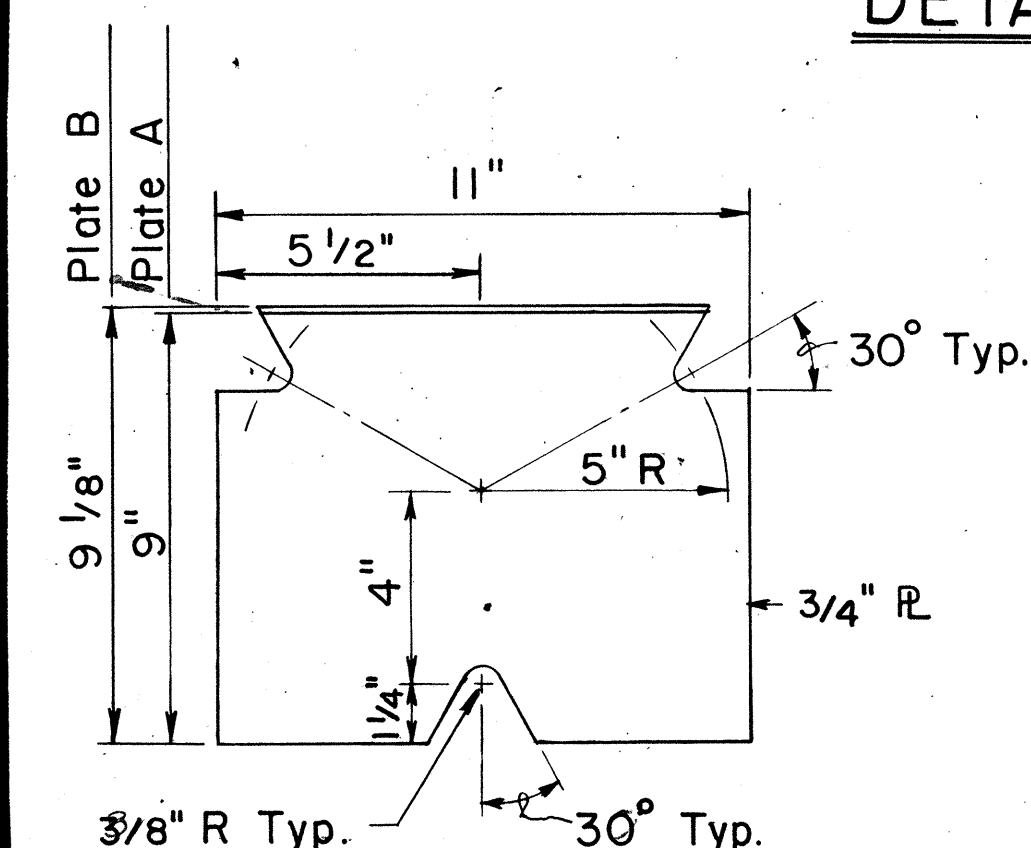
ELEVATION
Scale: 1/4" = 1'-0"



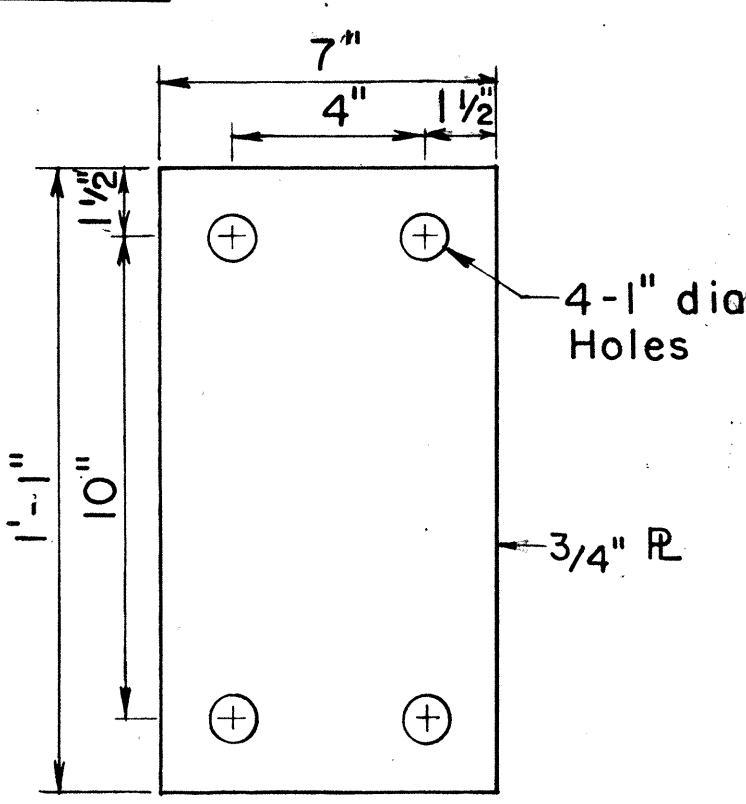
SIDE ELEVATION

FRONT ELEVATION

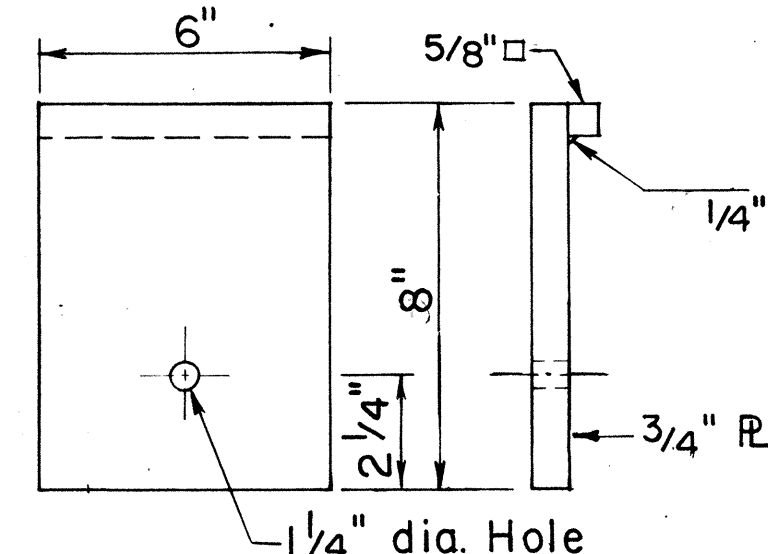
DETAIL B



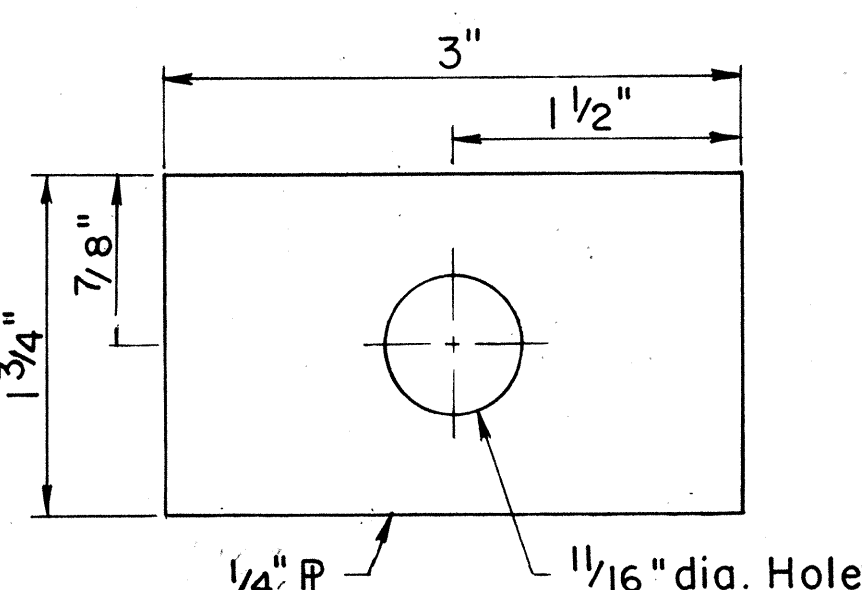
BASE PLATES A & B
Scale: 3" = 1'-0"



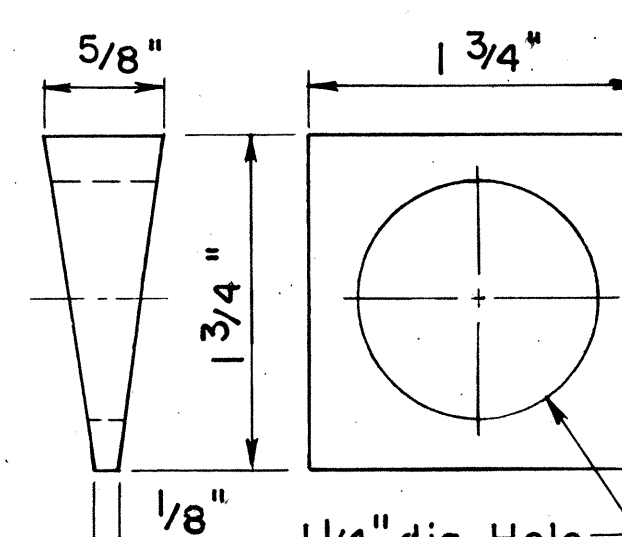
BASE PLATE C
Scale: 3" = 1'-0"



BEARING PLATE
Scale: 3" = 1'-0"

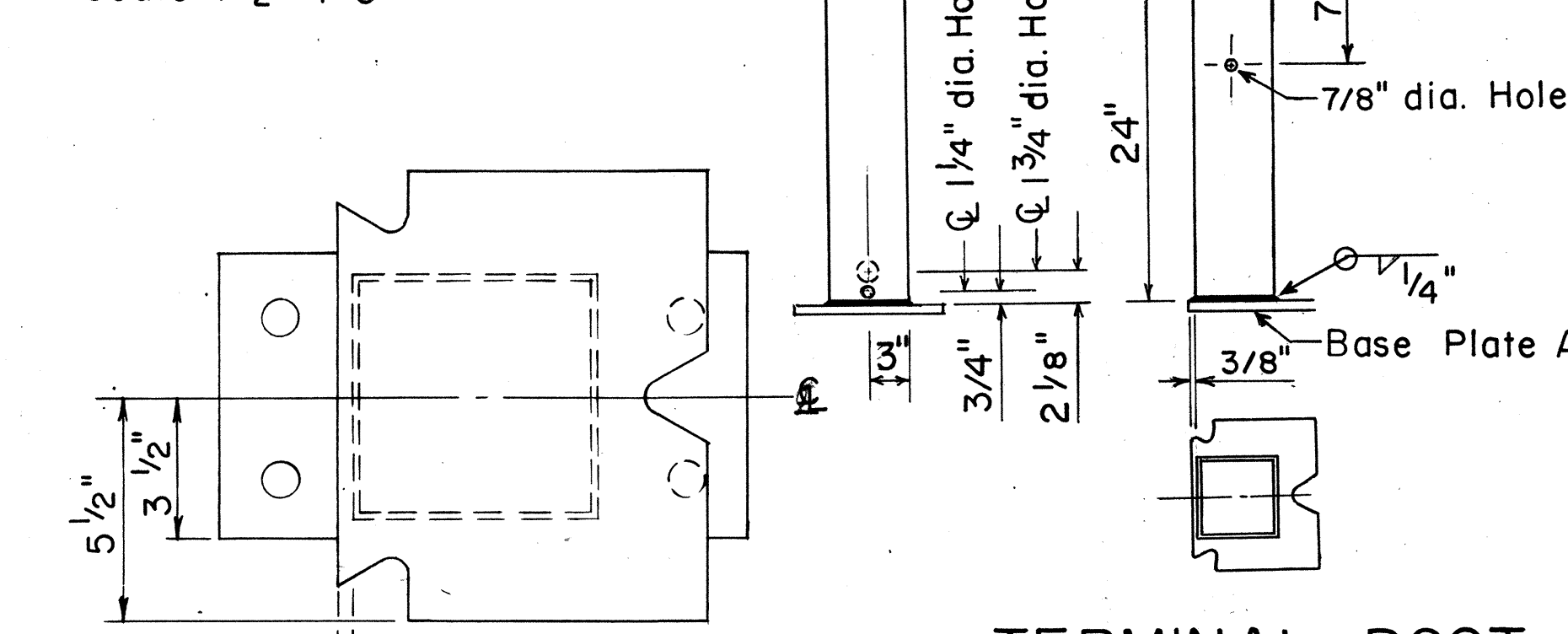


FLAT PLATE WASHER
Scale: Full Size

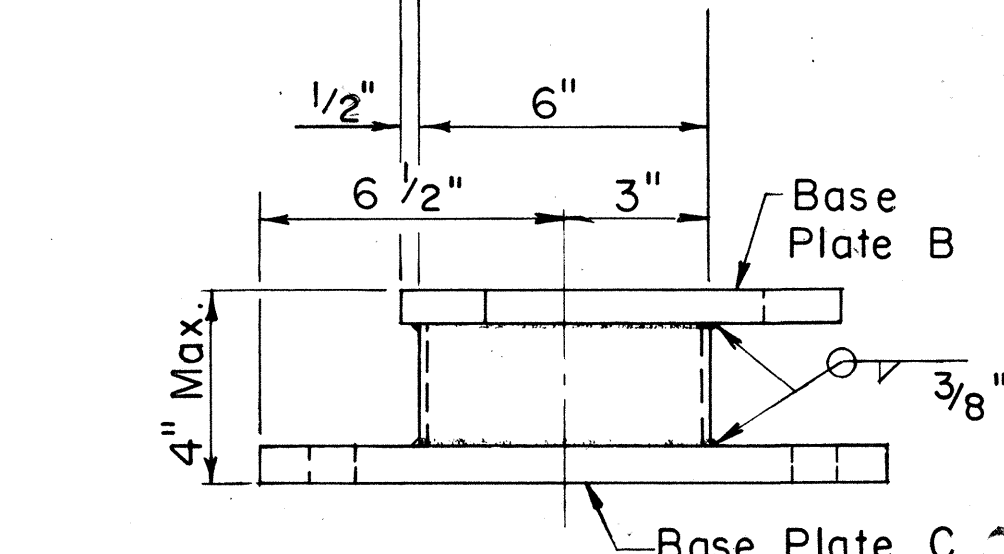


TAPERED WASHER
Scale: Full Size

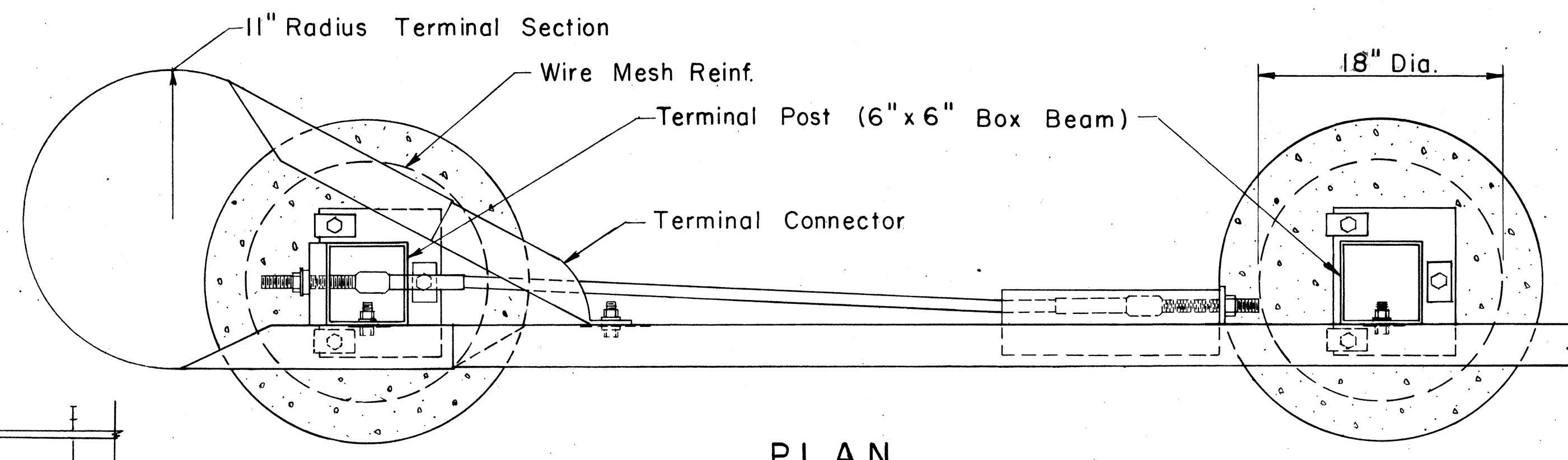
**ELEVATION
DETAIL A**
Scale: 1 1/2" = 1'-0"



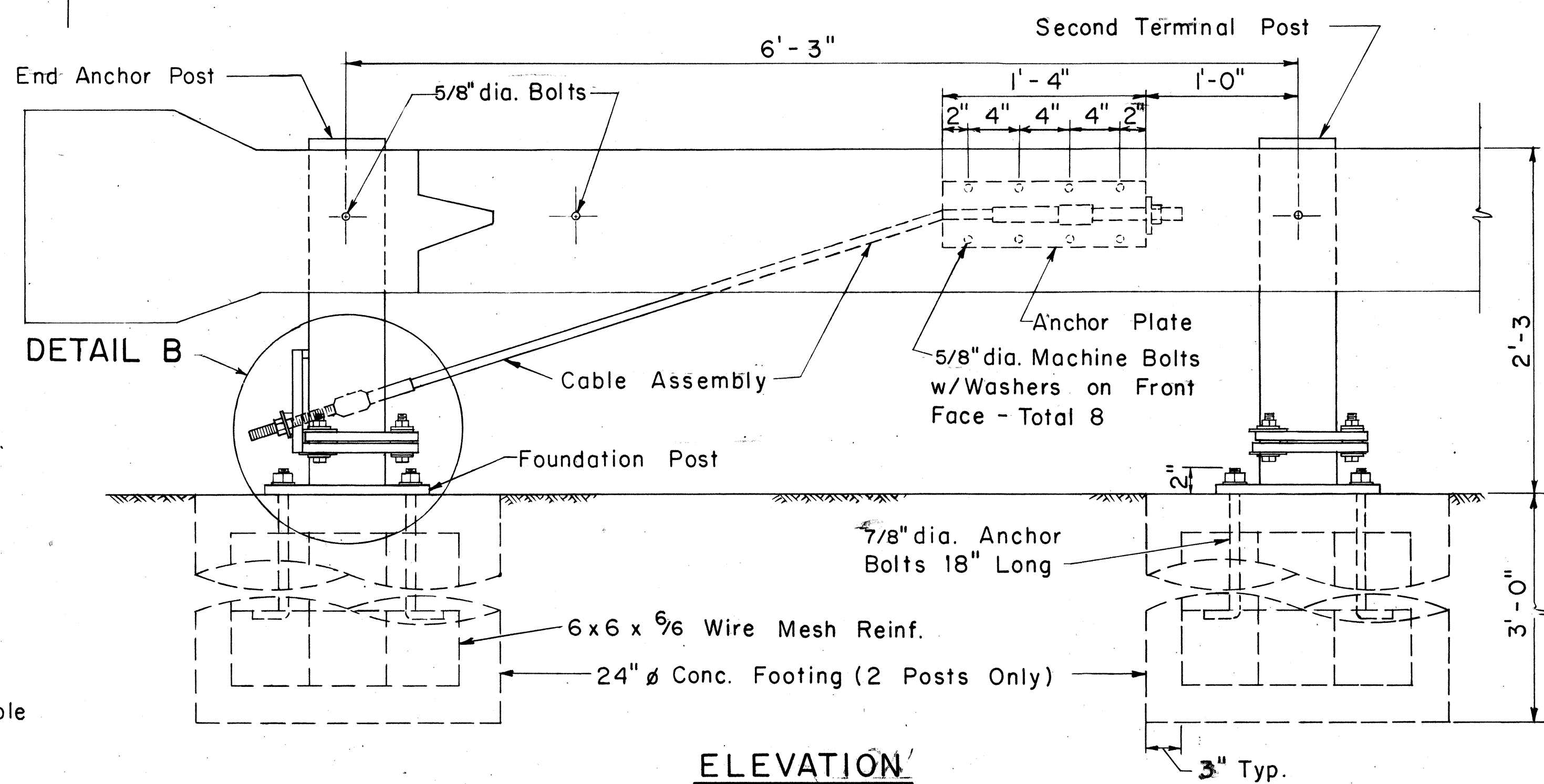
TERMINAL POST
Scale: 1" = 1'-0"



FOUNDATION POST
Scale: 3" = 1'-0"



PLAN

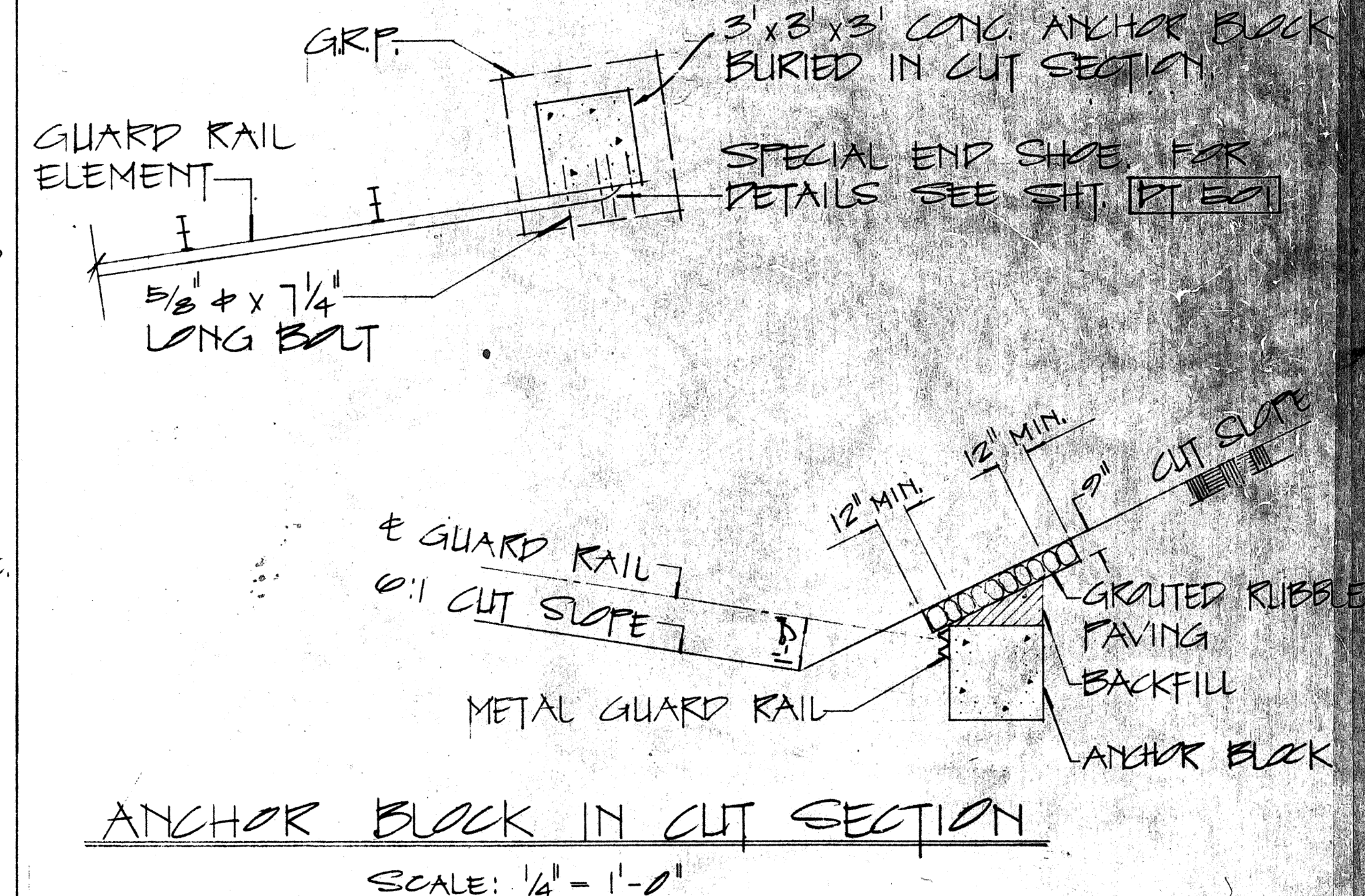
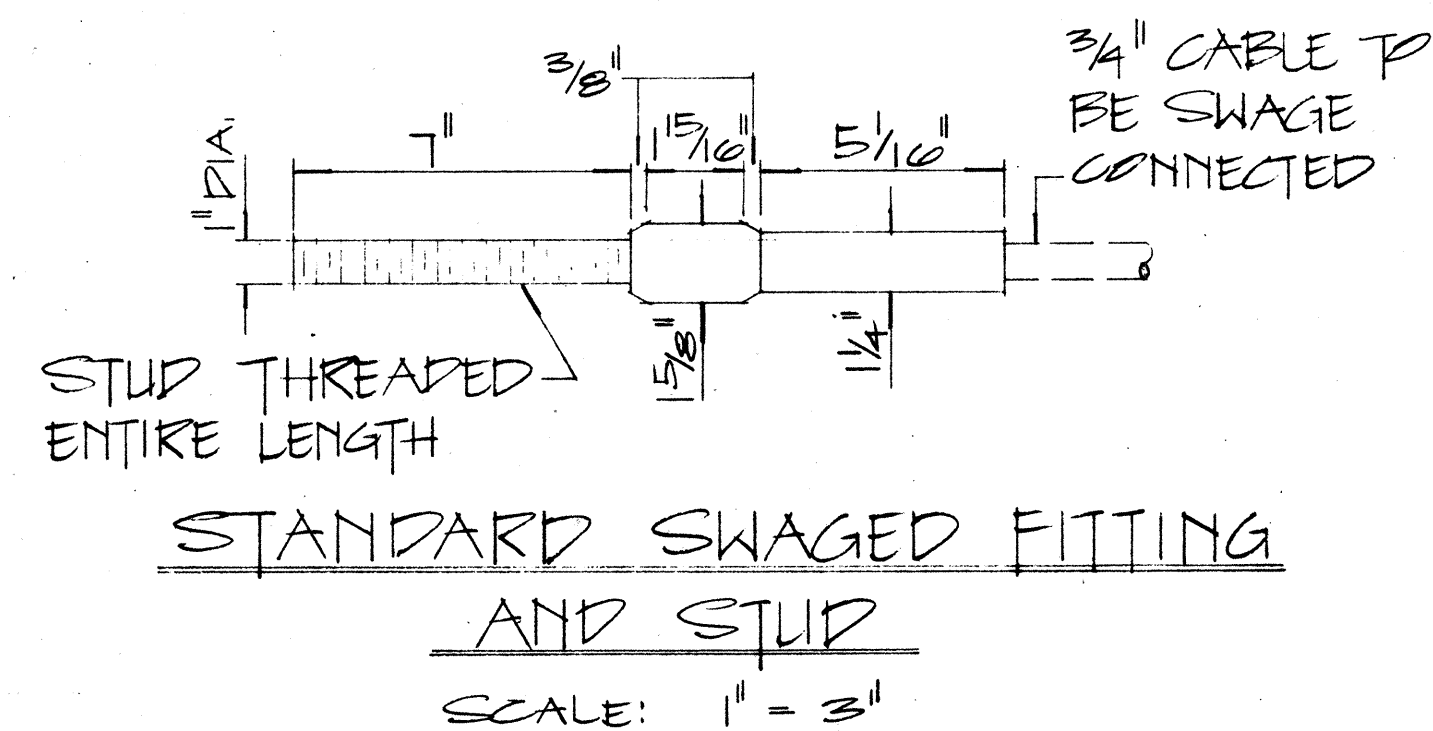
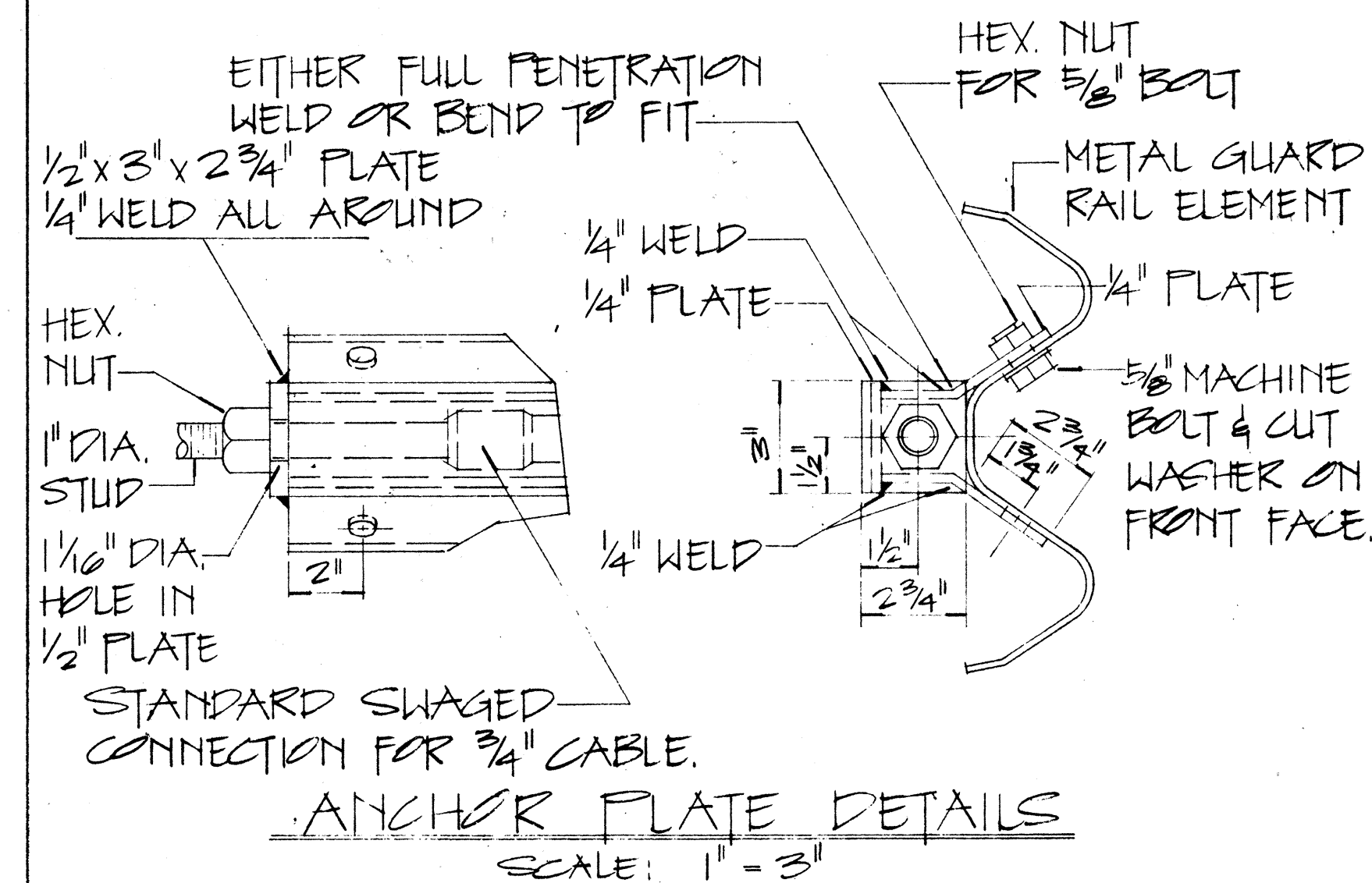
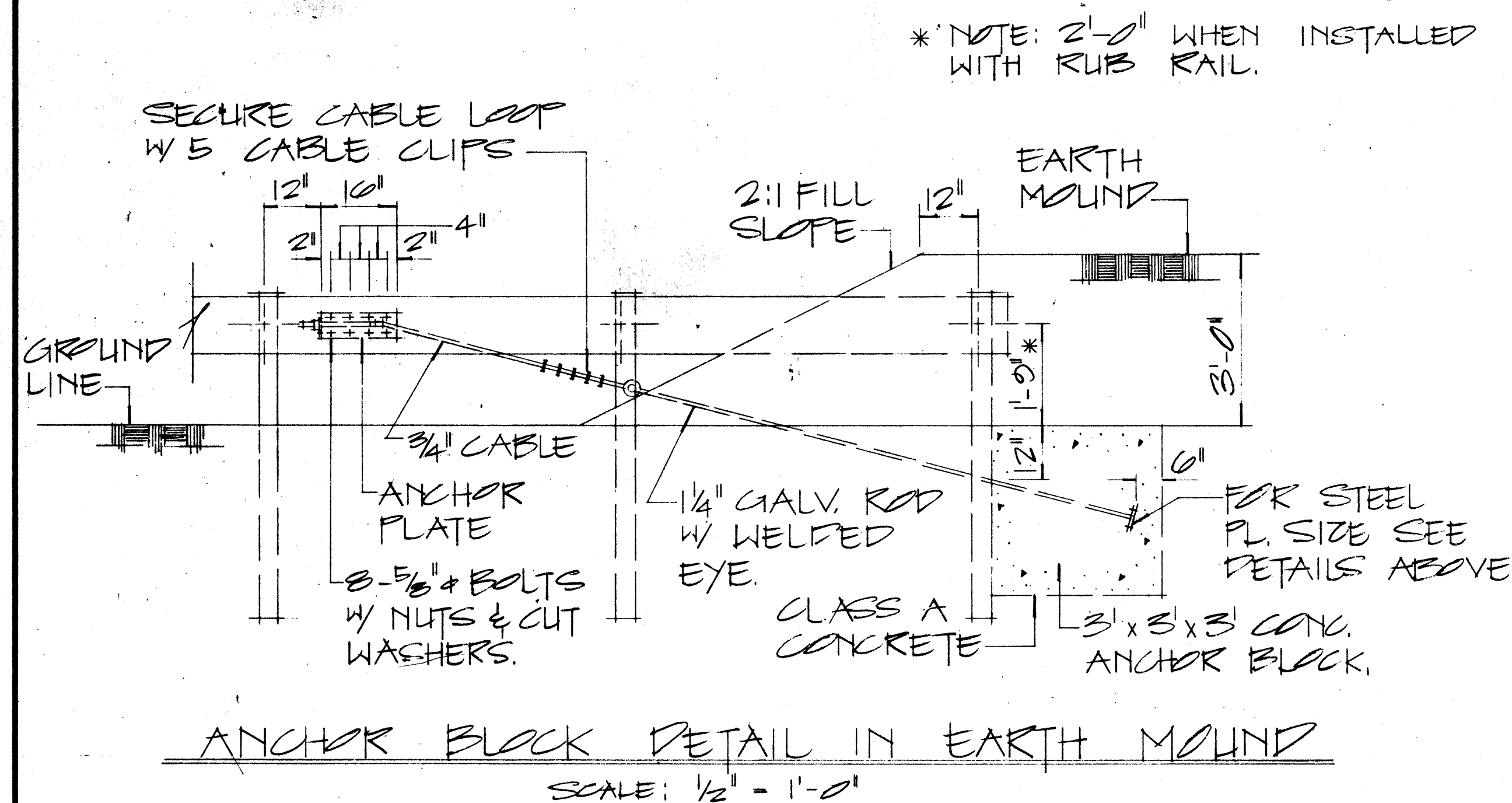
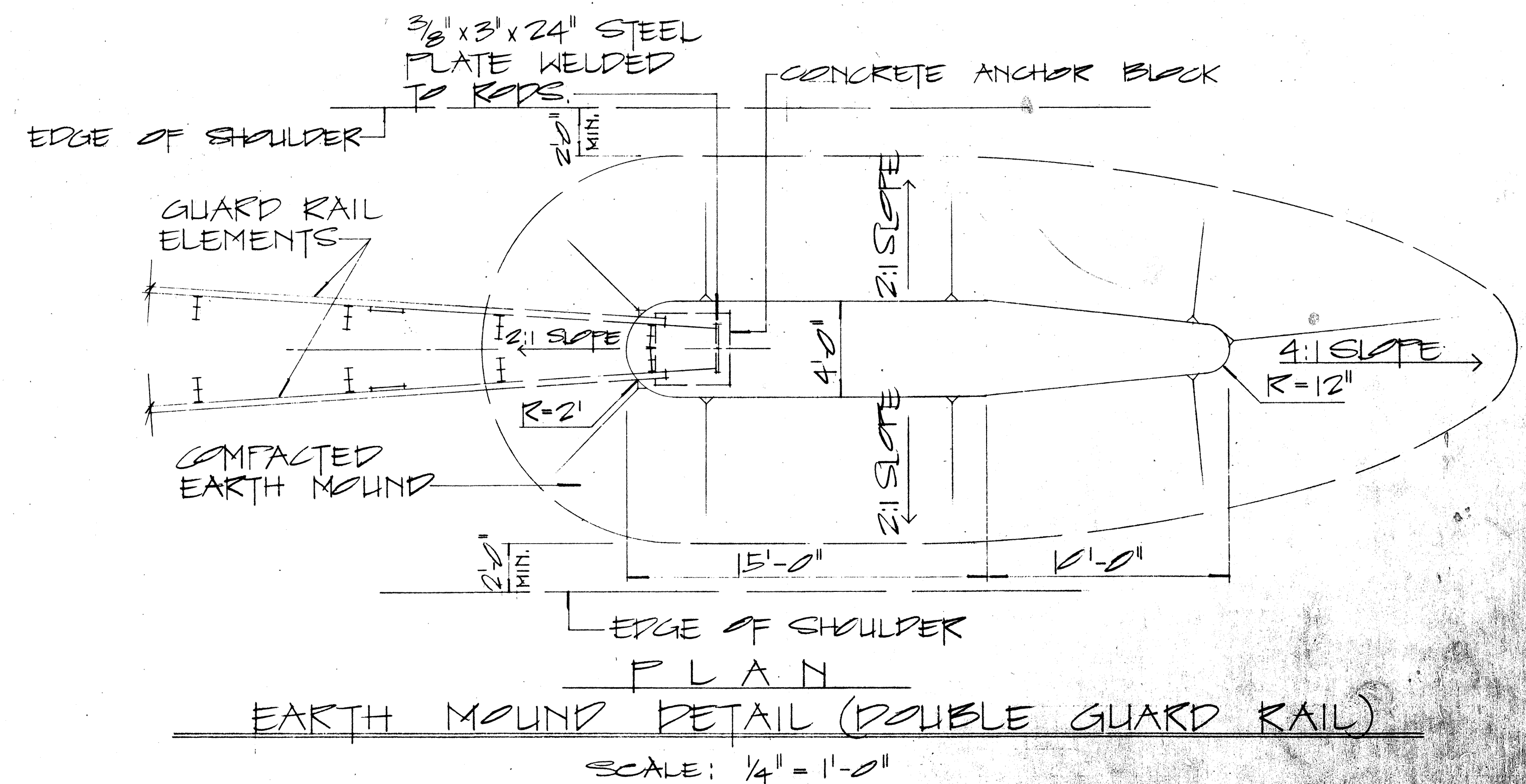
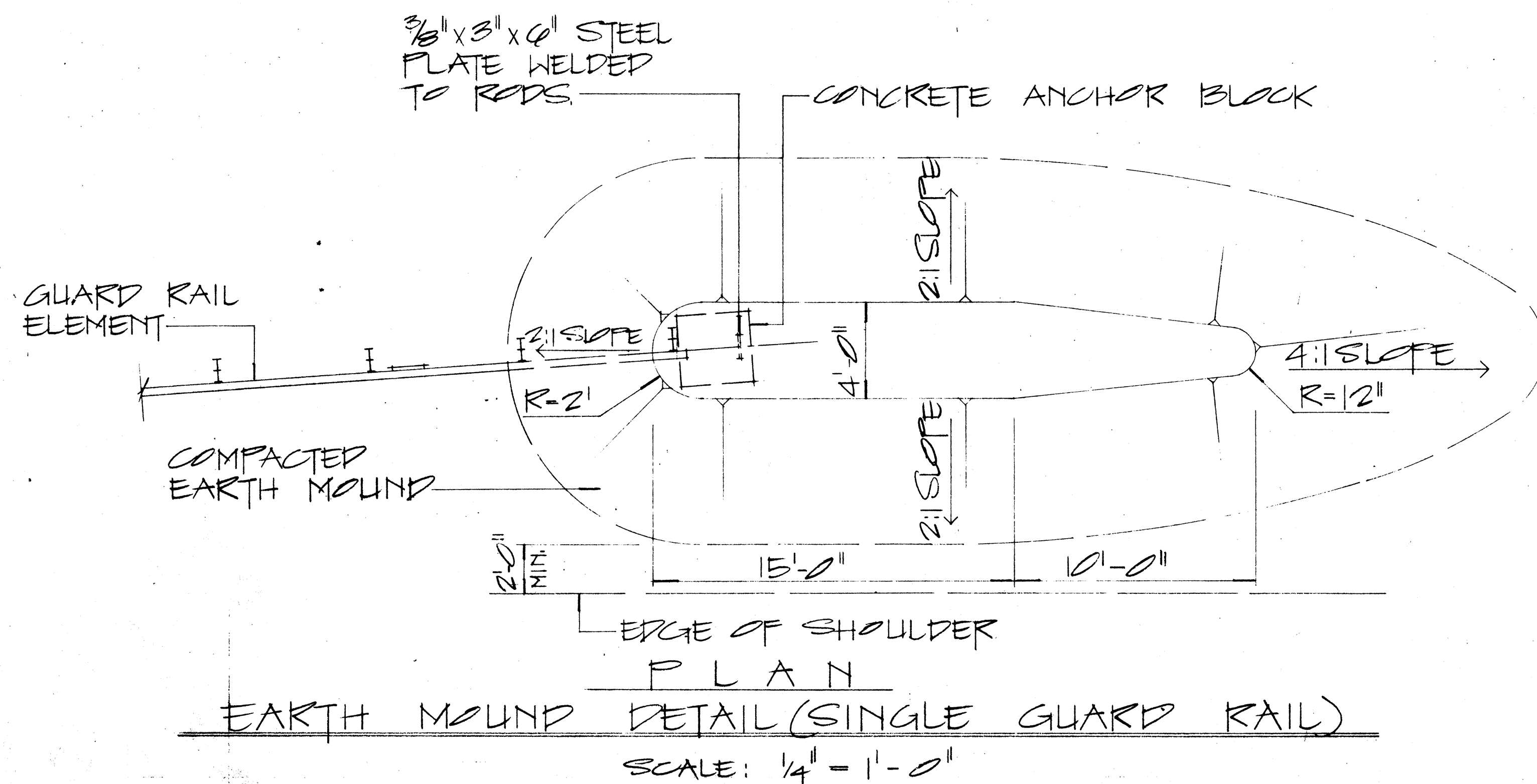


DETAIL B

**ELEVATION
DETAIL A**
Scale: 1 1/2" = 1'-0"

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES 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.	IR-HI-1(18)	1986	22	67



APPROVAL RECOMMENDED:			
Eishi Tanaka		12/29/62	
TRAFFIC ENGINEER		DATE	
APPROVED:			
Assistant Chief, Engineering		12-30-62	
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	
SHEET No. 10 OF 10 SHEETS	

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.

DATE	
DESIGNED BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
DESIGNED BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	