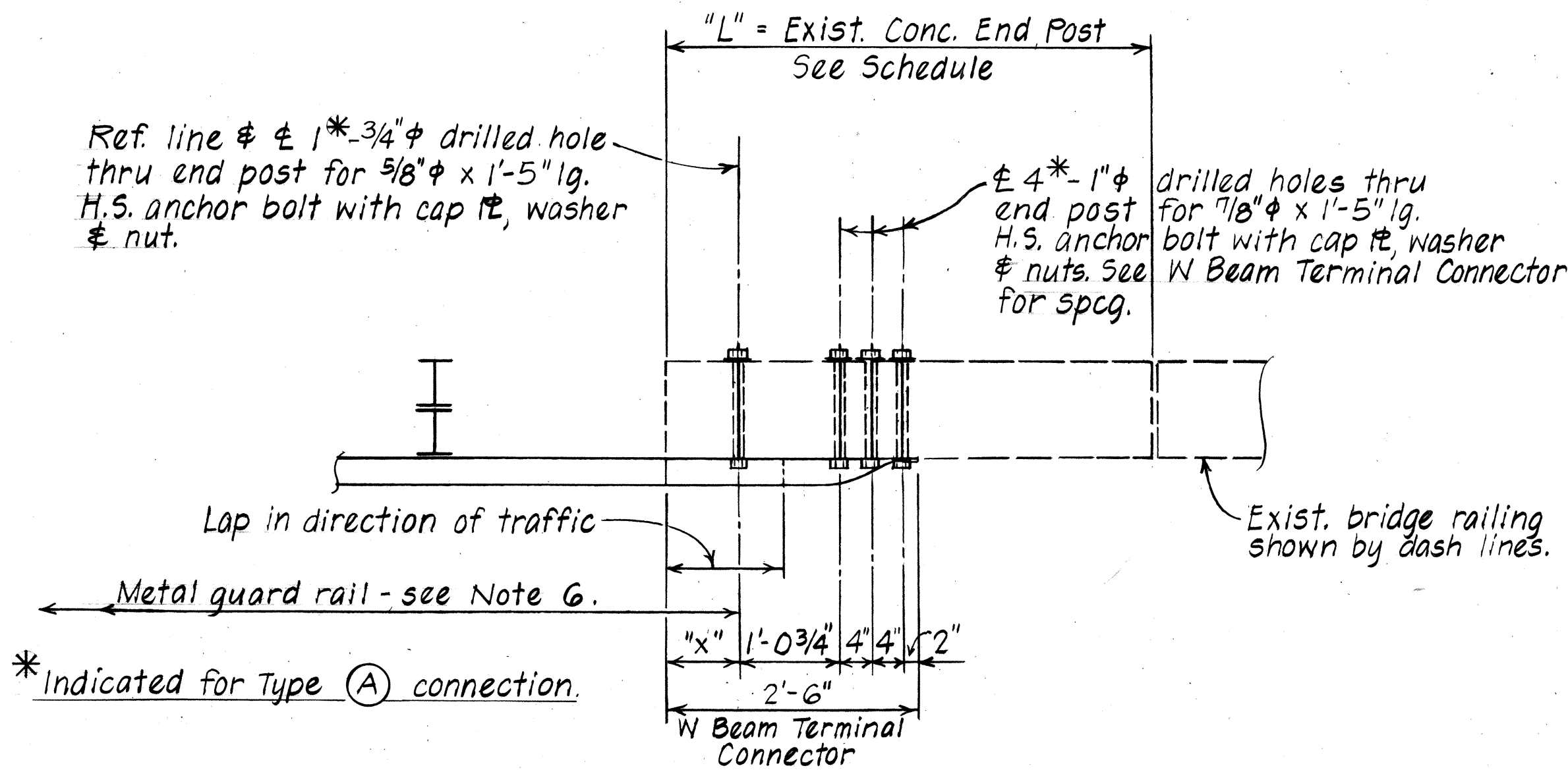


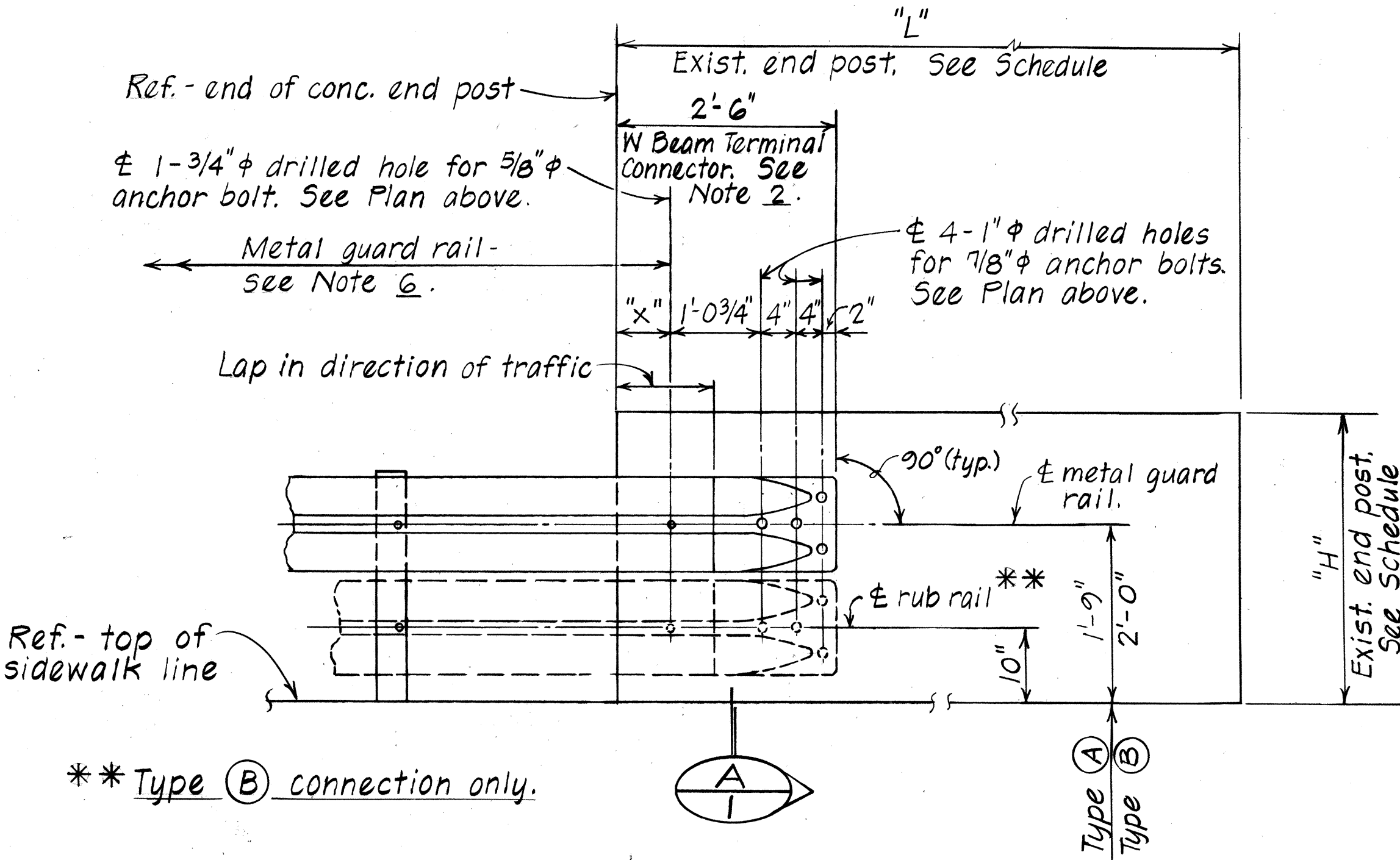
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	03A-01-85M	1985	13	30

GENERAL NOTES

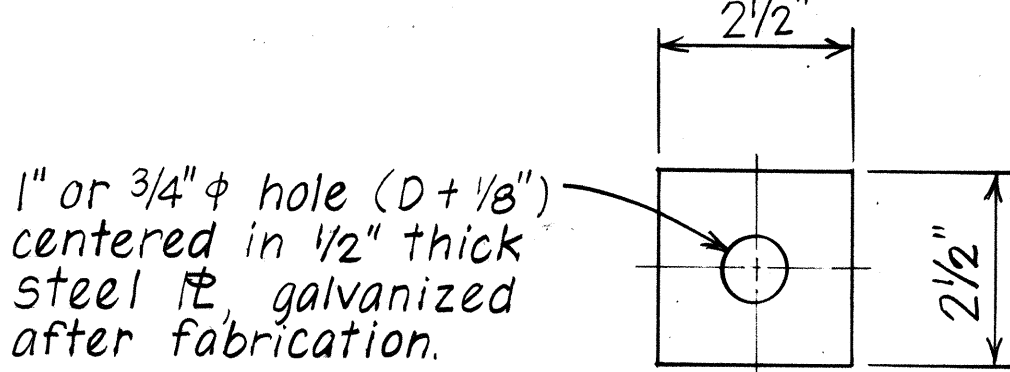
- See Standard Specifications for Road & Bridge Construction, (Hawaii, 1976 & Special Provisions.
- See Standard Detail Sht. DT-500 & DT-501 for details of spacer block & "terminal connector."
- All anchor bolts shall be high strength bolts conforming to the requirements of ASTM A325.
- "Terminal connector" shall be fabricated from 10 gage steel conforming to the requirements of AASHTO M180.
- All "terminal connector," & posts including all anchor bolts, cap & nuts and washers, shall be galvanized.
- First 25'-0" of guard rail adjoining "terminal connector" shall be of galvanized steel and supports spaced at 3'-1 1/2" o.c. See Standard Detail Sht. DT-500 for metal guard rail details.
- Large impacting or vibratory type of equipment will not be permitted for drilling.
- Any damage to the existing structures due to the Contractor's operation shall be repaired at his expense, to the satisfaction of the Engineer.
- The work necessary to connect guard rail to concrete end post shall include all labor, materials, tools, equipment and incidentals necessary to complete the work. This work will be measured and paid for in units of one.
- The Contractor shall verify all dimensions in field before commencing with work.
- The Contractor shall verify the location of all existing utility lines near structures and notify their respective owners before commencing with work.



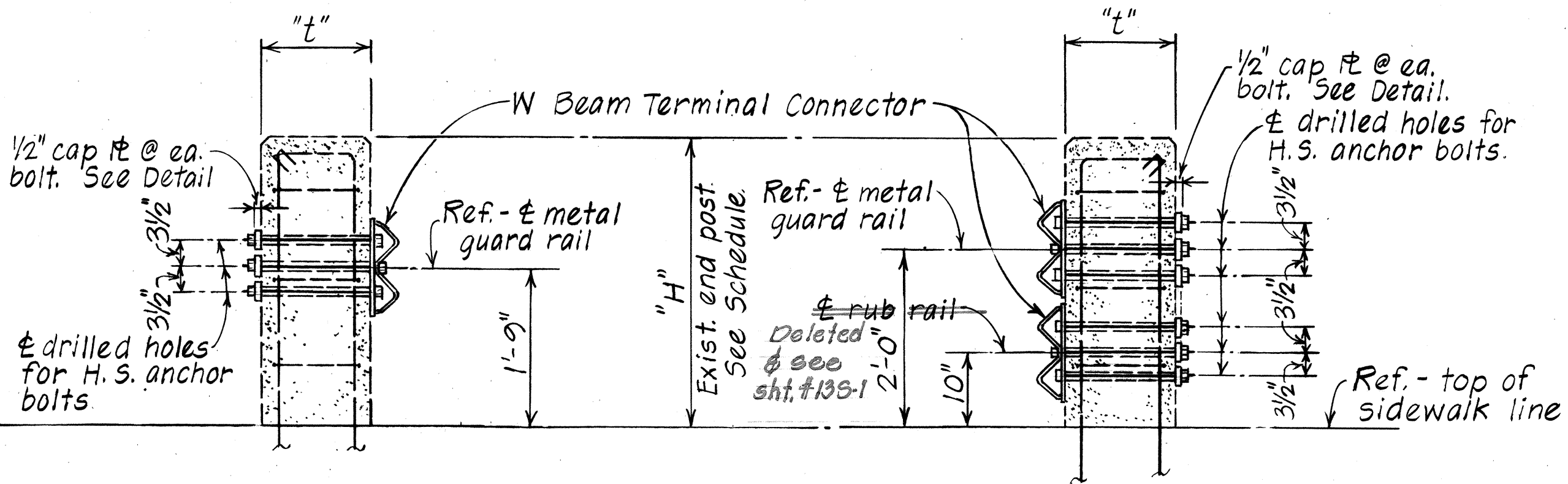
PLAN
Scale: 3/4\"/>



ELEVATION
Scale: 3/4\"/>



TYPICAL CAP & DETAIL
Not to Scale



TYPE (A)

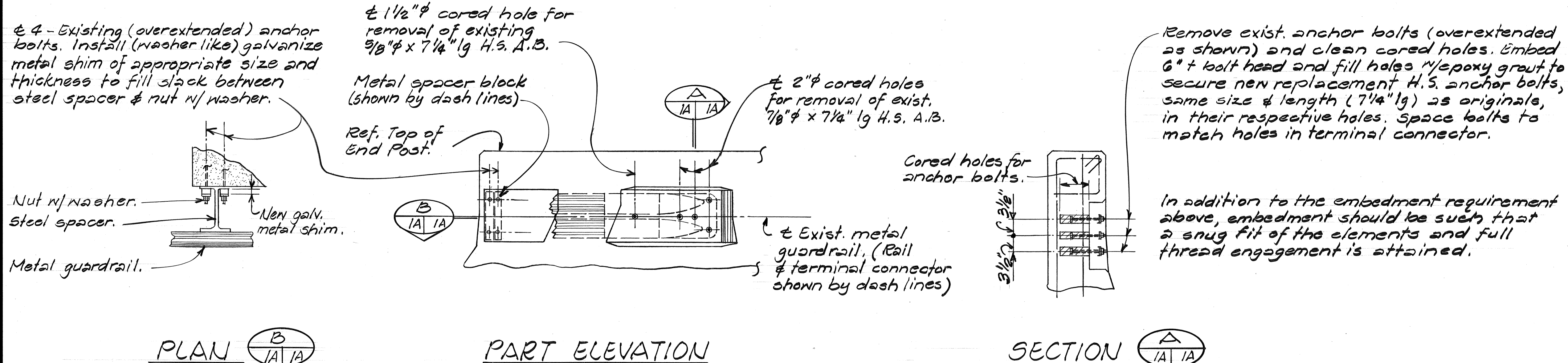
SECTION
Scale: 3/4\"/>

TYPE (B)
(AT APPROACH END)

END POST CONNECTION TYPE & DIMENSION SCHEDULE					
STRUCTURE	END POST CONNECTION TYPE	"x"	EXIST. END POST DIMENSION		
			"L"	"H"	"t"
Maipalaoa Bridge	(A)	7 1/4"	8'-9"	3'-3"	1'-3" ±
"	(B)	"	"	"	"
"					
"					

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
MAIPALAOA BRIDGE
GUARD RAIL CONNECTION
TO EXISTING END POST
FARRINGTON HIGHWAY RESURFACING
Proj. No. 03A-01-85M
Scale: As Noted Date: Oct. 1985
SHEET NO. 1 OF 2 SHEETS

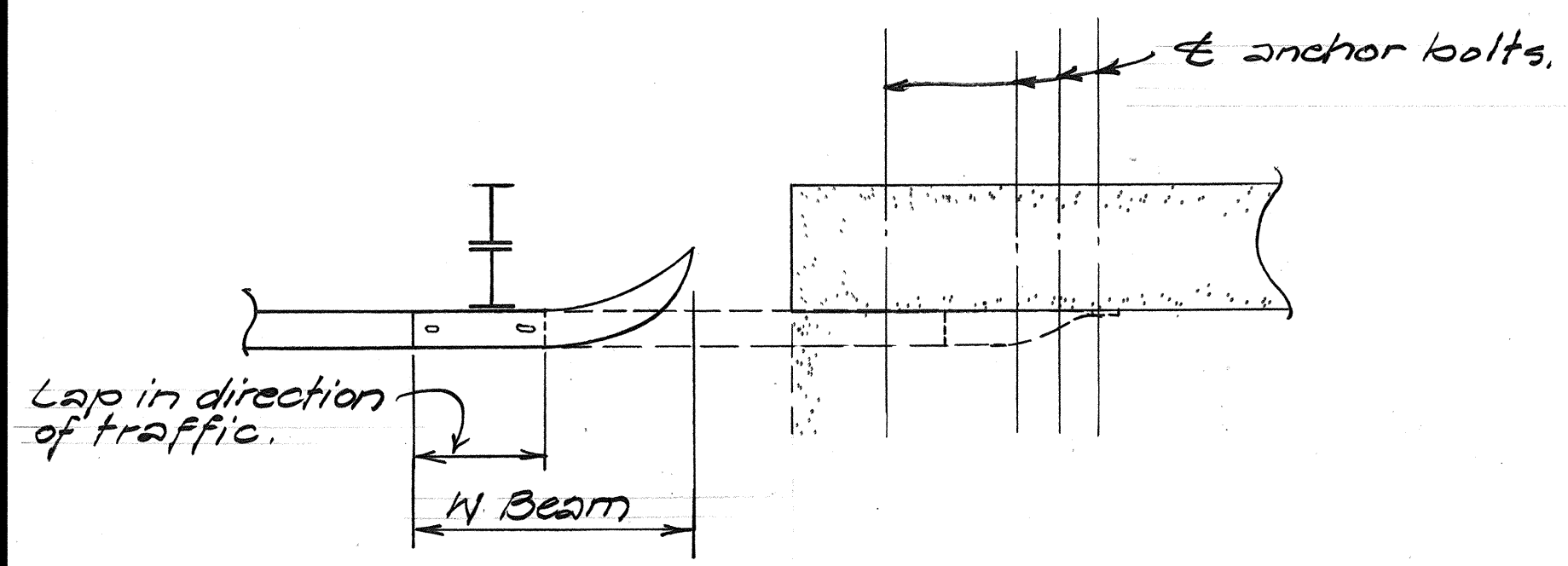
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	D3A-01-85M	1985	C0135-1	30



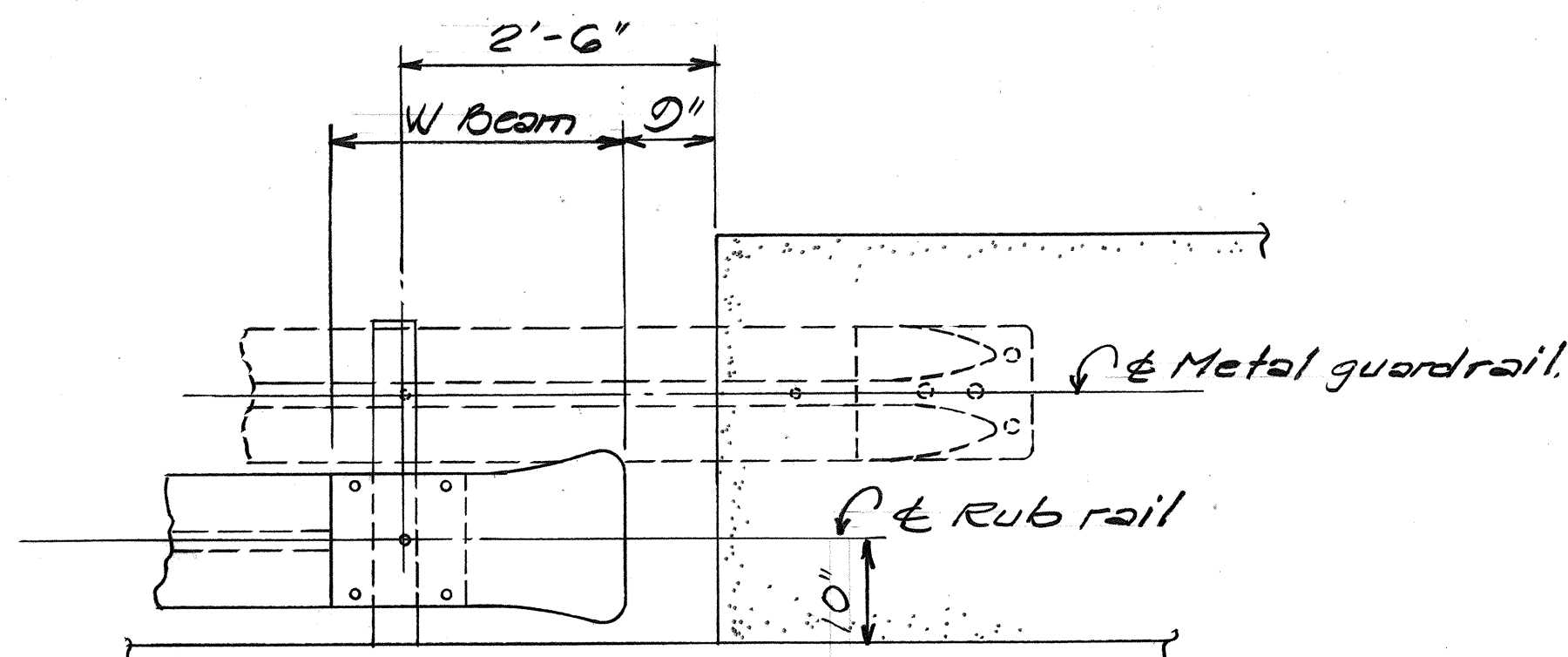
PLAN B
1A 1A PART ELEVATION SECTION A
1A 1A

TYPICAL END POST CONNECTIONS RENOVATION DETAILS

Not To Scale



PLAN scale: 3/4" = 1'-0"



ELEVATION scale: 3/4" = 1'-0"

W BEAM END BEAM (FLARED)

NOTE: THIS TRACING PREPARED DURING "AS-BUILT" POSTING.

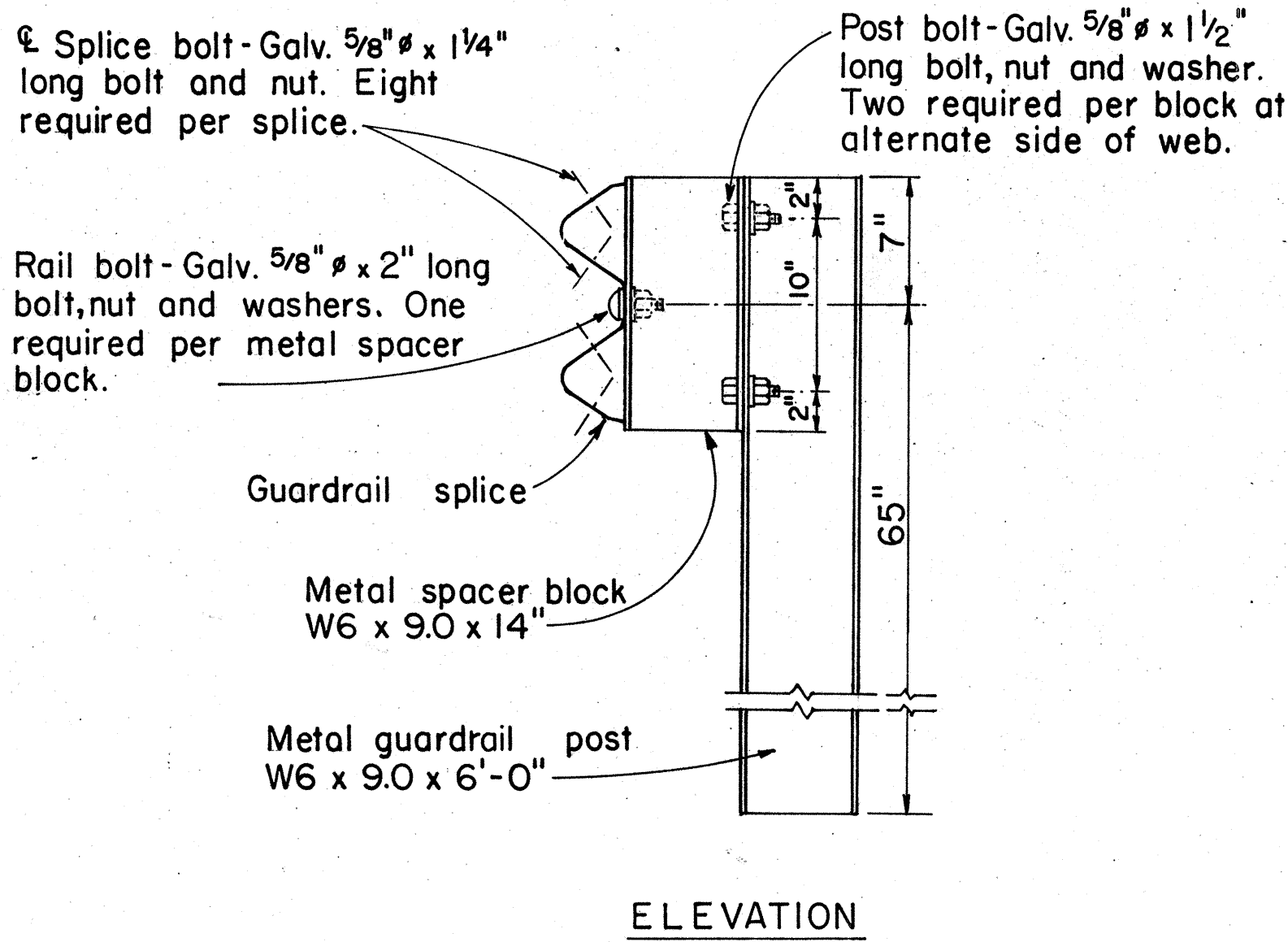
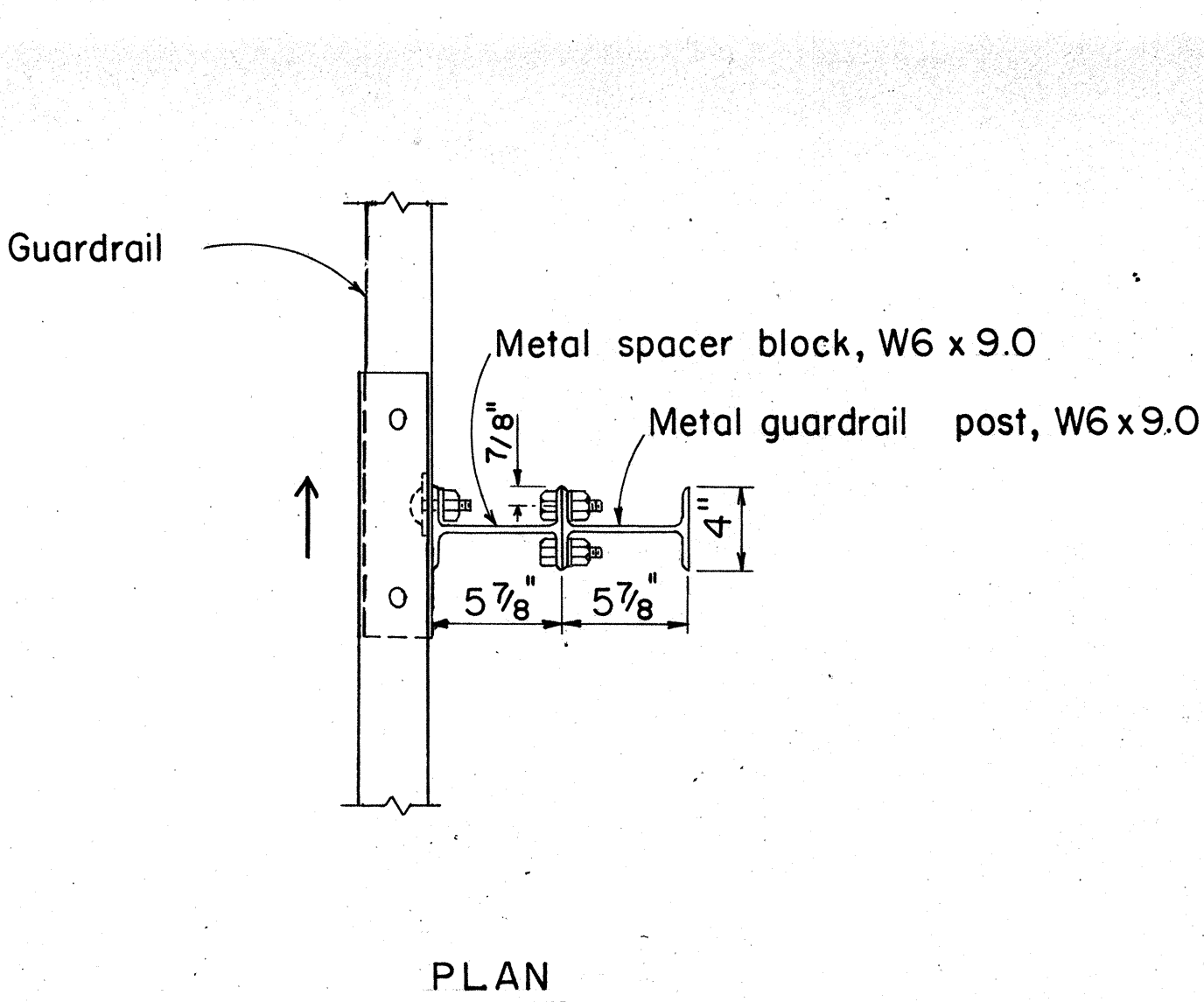
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
MAIPALAOA BRIDGE	
GUARD RAIL CONNECTION	
TO EXISTING END POST	
FARRINGTON HIGHWAY RESURFACING	
Proj. No. 93A-01-85M	
Scale: As Noted	Date: Oct. 1985
SHEET No. 1A OF 2 SHEETS	

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

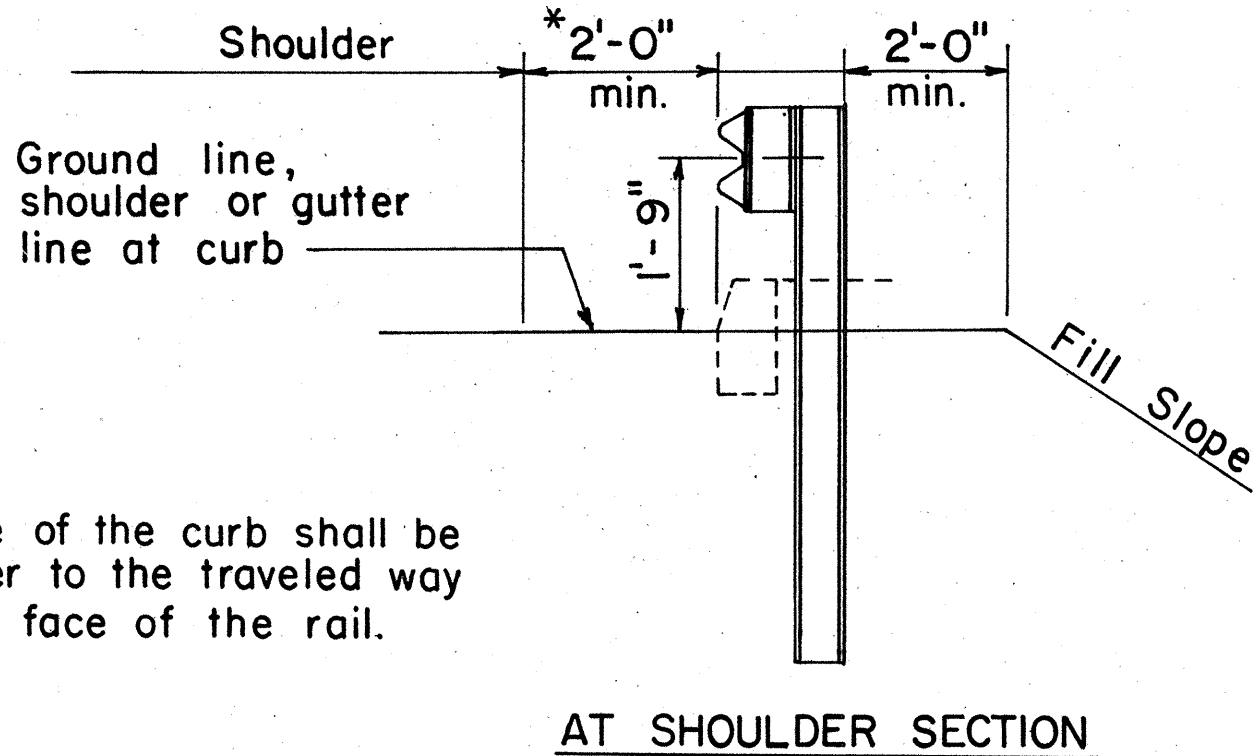
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-01-85M	1985	14	30

GENERAL NOTES

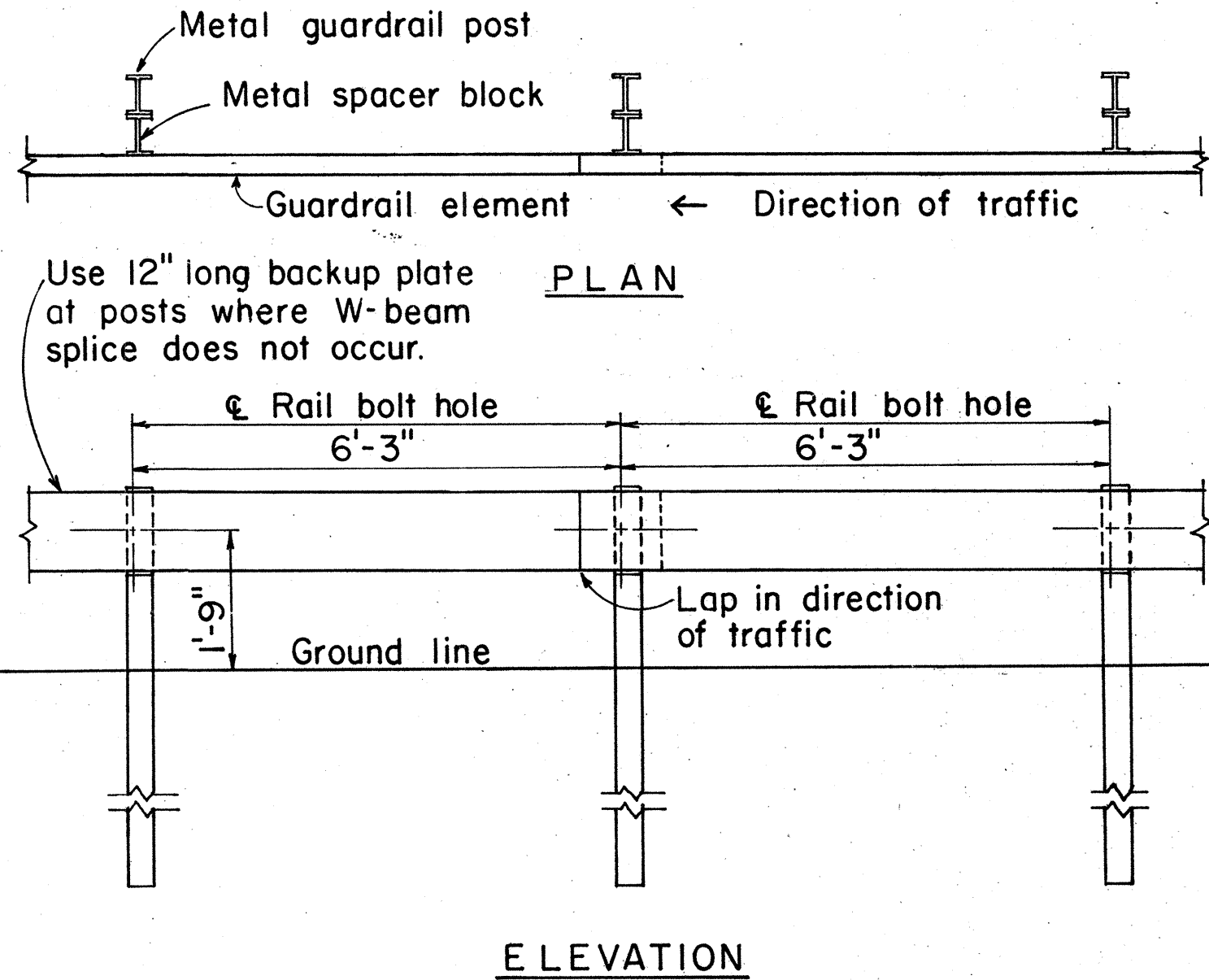
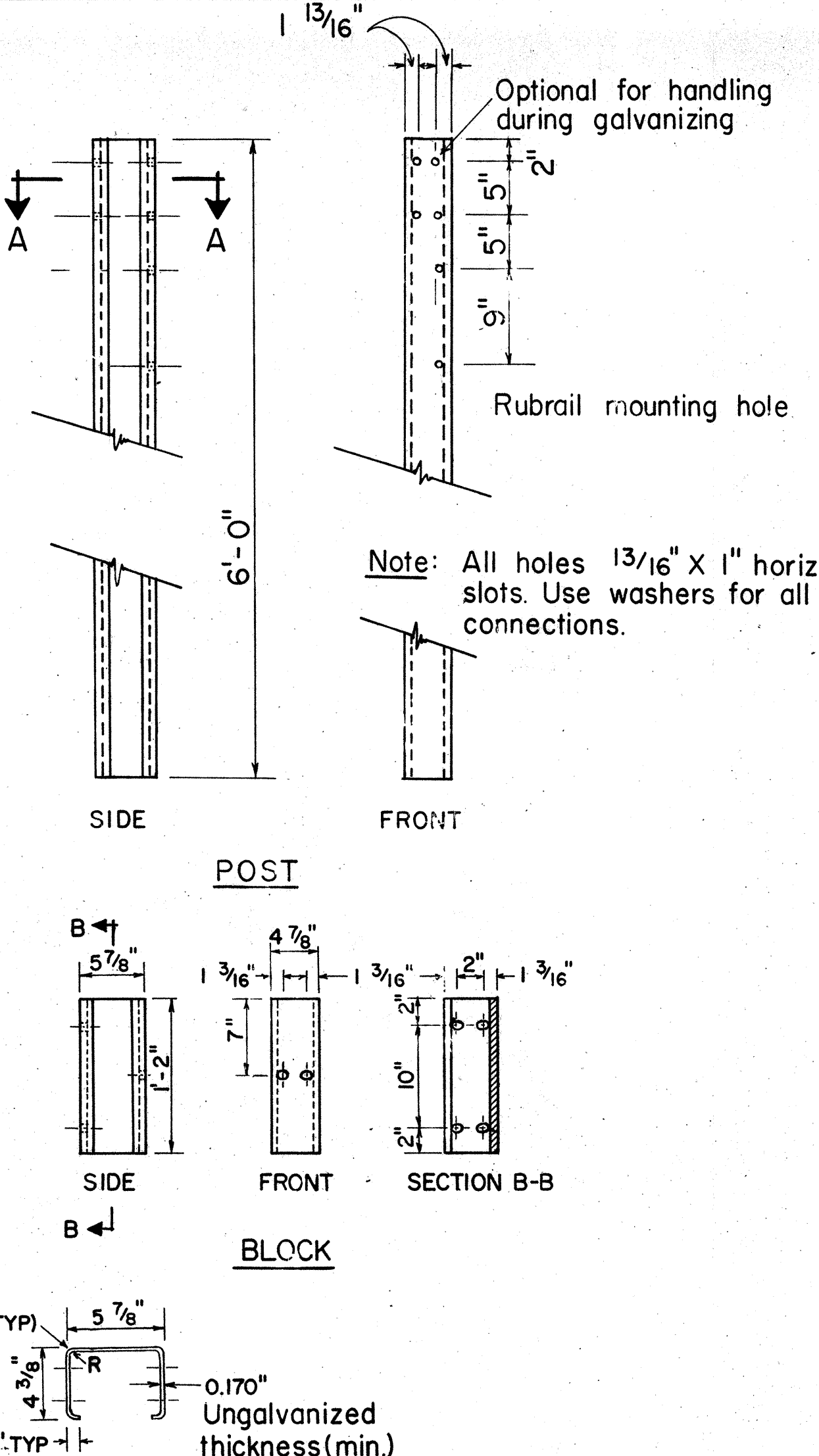
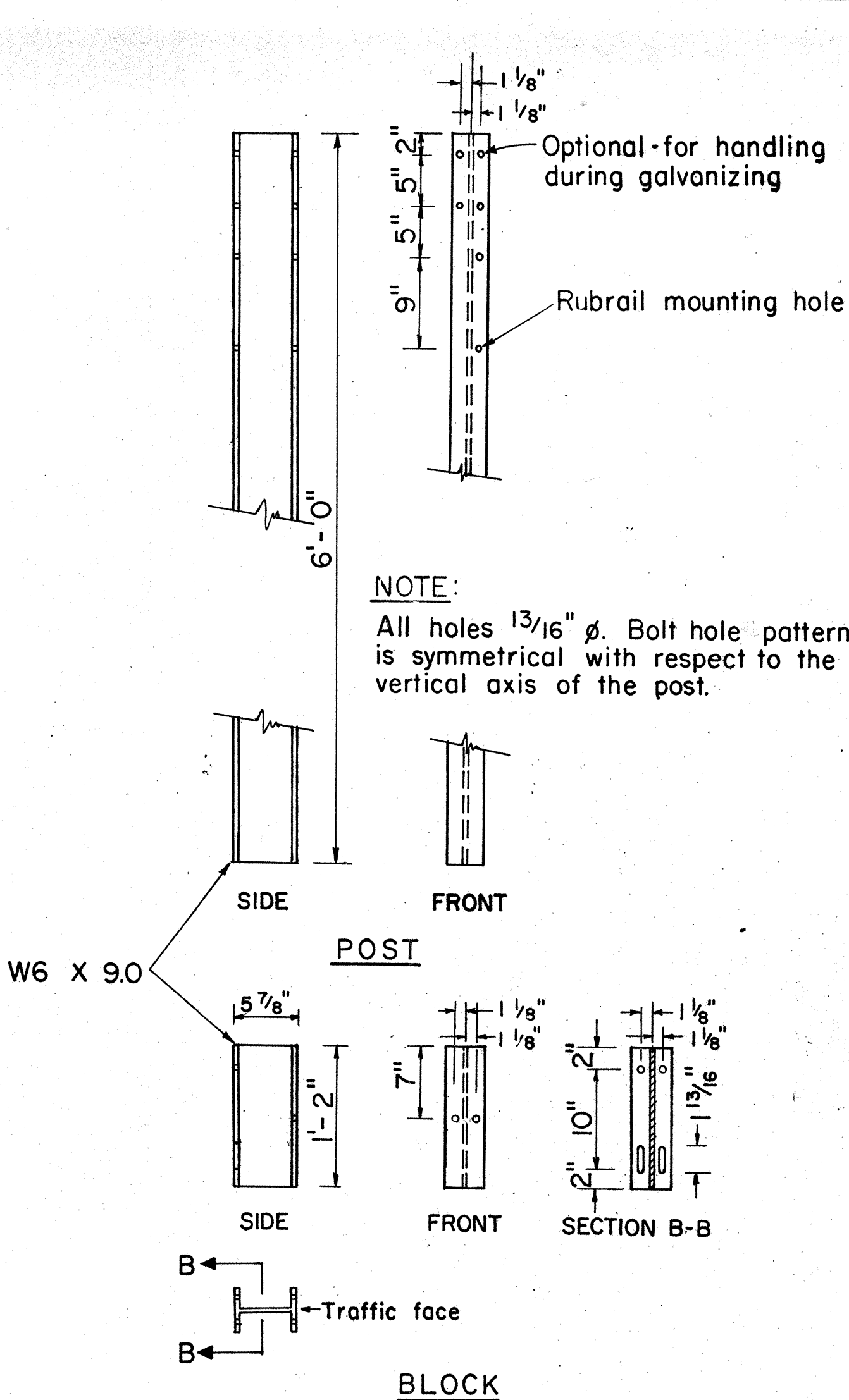
- Both of the alternate type posts may be used on any one project however, only one type of post shall be used in any single run of guardrail.
- All hardware, posts and blocks shall be galvanized. No punching, drilling or cutting will be permitted after galvanizing.
- Connection details for bent plate 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"



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



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

APPROVAL RECOMMENDED:
Erich Tanaka 9/1/82
TRAFFIC ENGINEER DATE

APPROVED:
Robert Salas 9/22/82
ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE
1	Supersedes sht. DT 500 approved 12/30/69.	H.P.	9/22/82
2	Added General Notes No. 6	J.D.O.	9-28-83

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

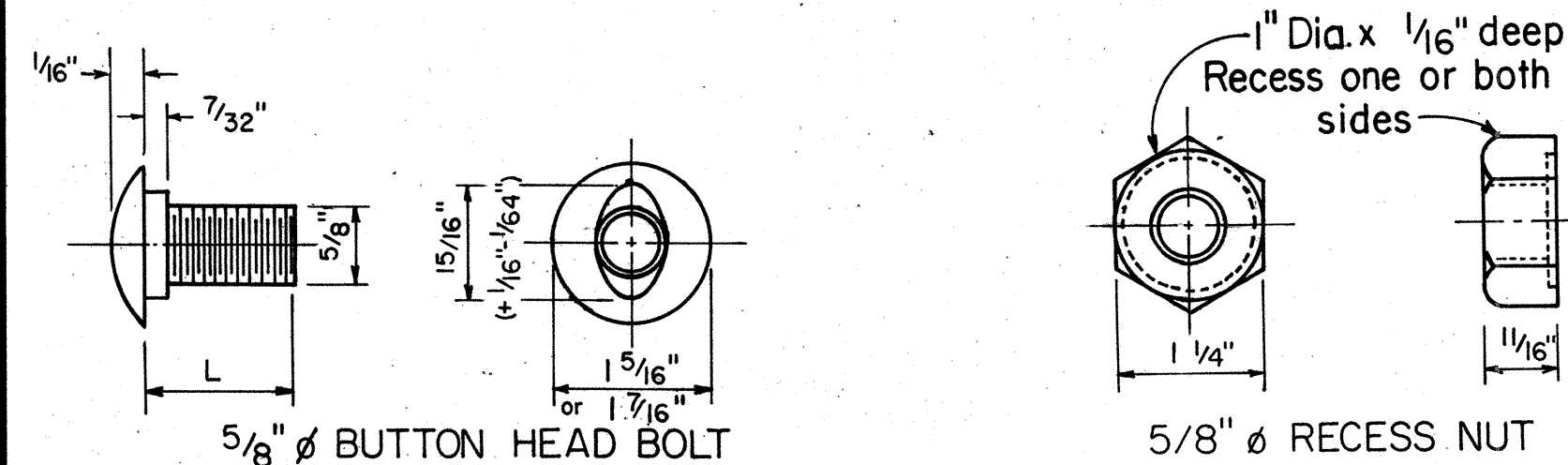
STANDARD DETAILS
METAL GUARDRAIL

Scale: As Shown
SHEET No. 2 OF 9 SHEETS DT 500

July, 1982

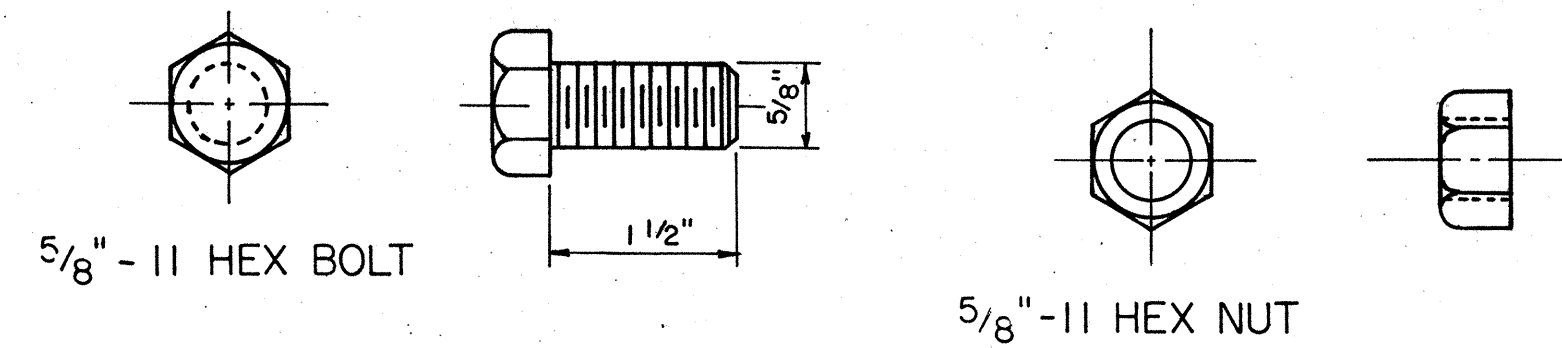
DATE	
SURVEY PLOTTED BY	
PLAN	
DRAWN BY	
TRACED BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL	
PLAN	
NOTE BOOK	
No.	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	73A-01-85M	1985	15	30

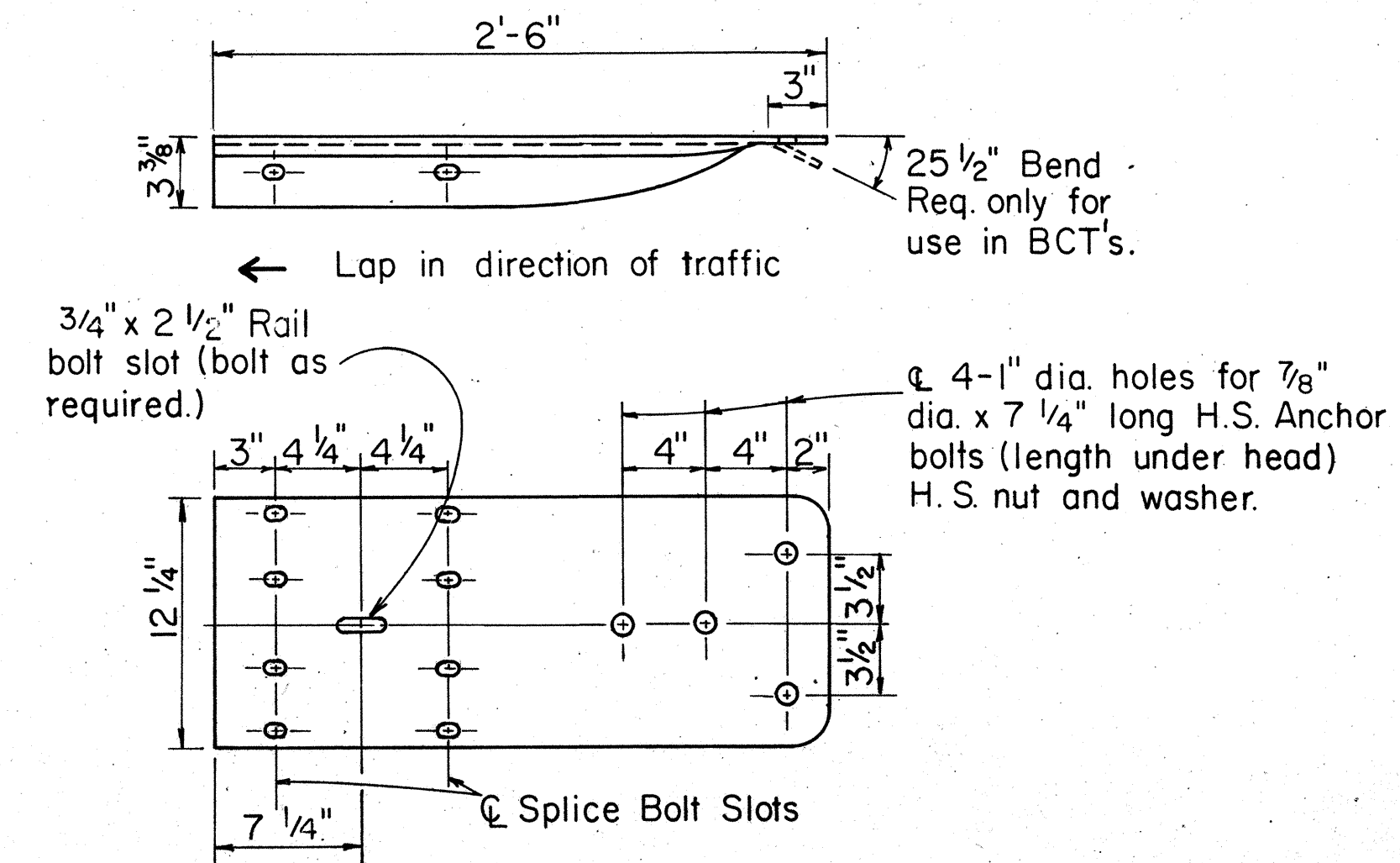


L	Thread Length	Intended Use
1 1/4"	Full length thread	Splice rail elements
2"	1 1/2" min. thread len.	Fasten rails to posts

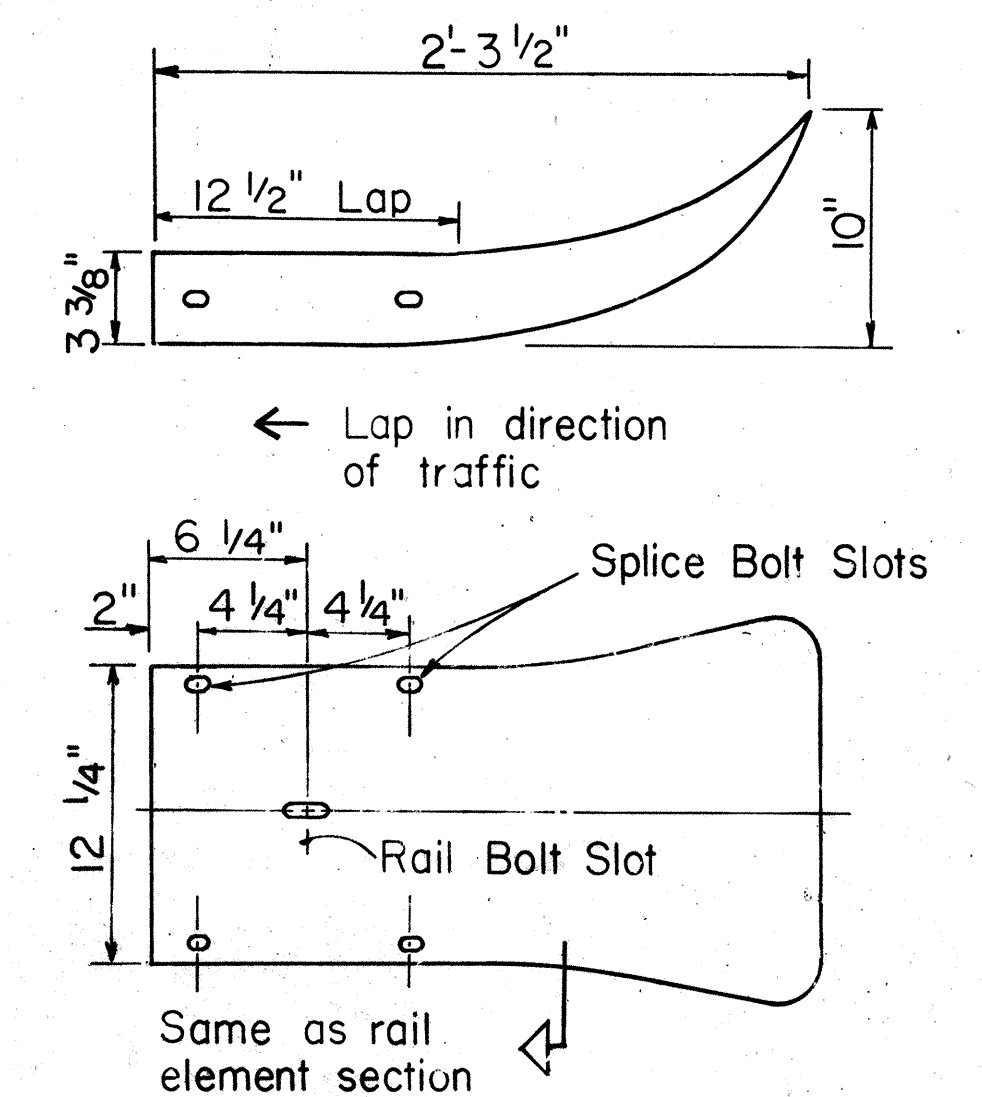
5/8" BUTTON HEAD BOLT
AND RECESS NUT
Scale: NTS



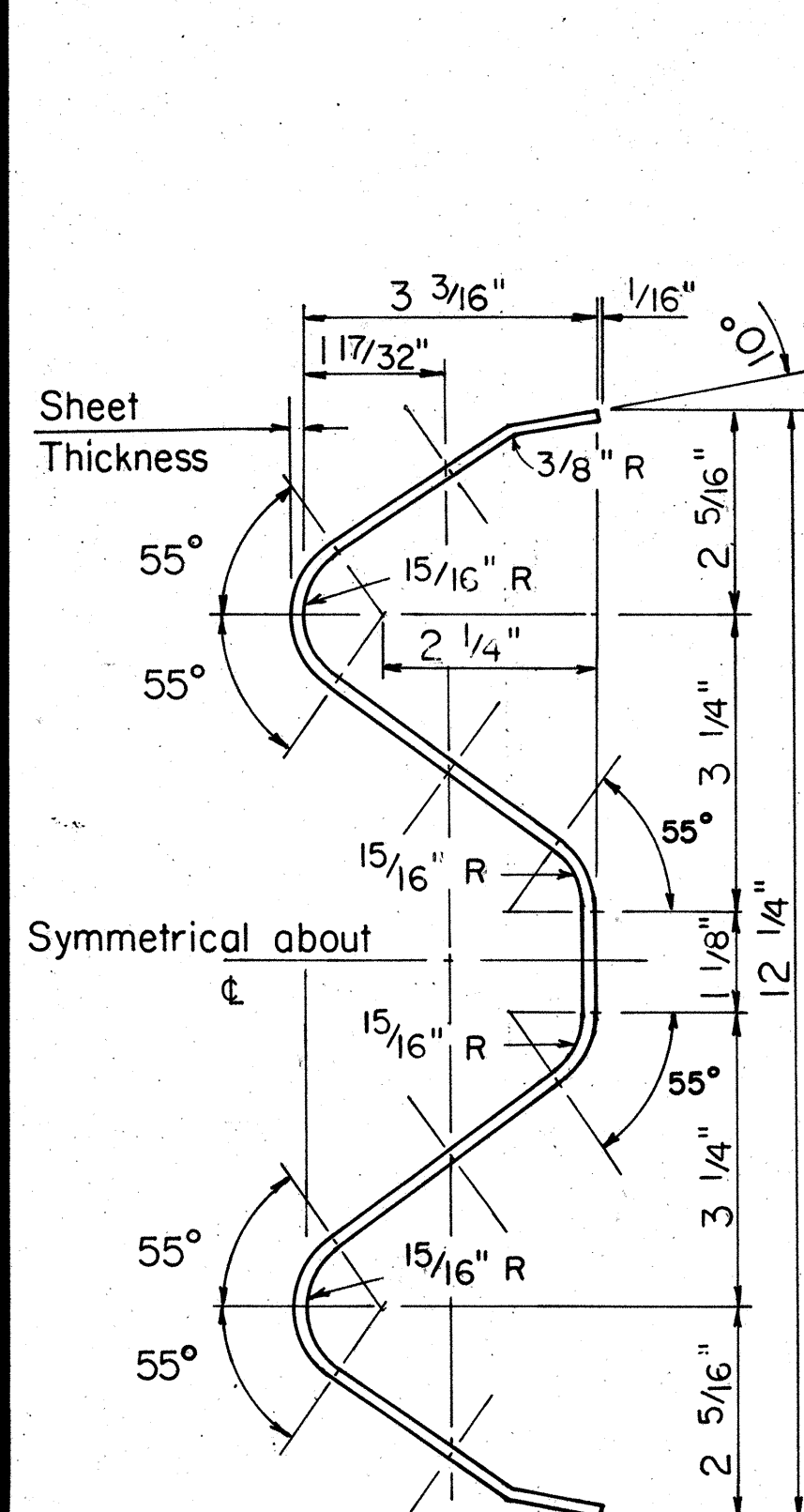
5/8" HEX POST BOLT AND NUT
Scale: N.T.S.



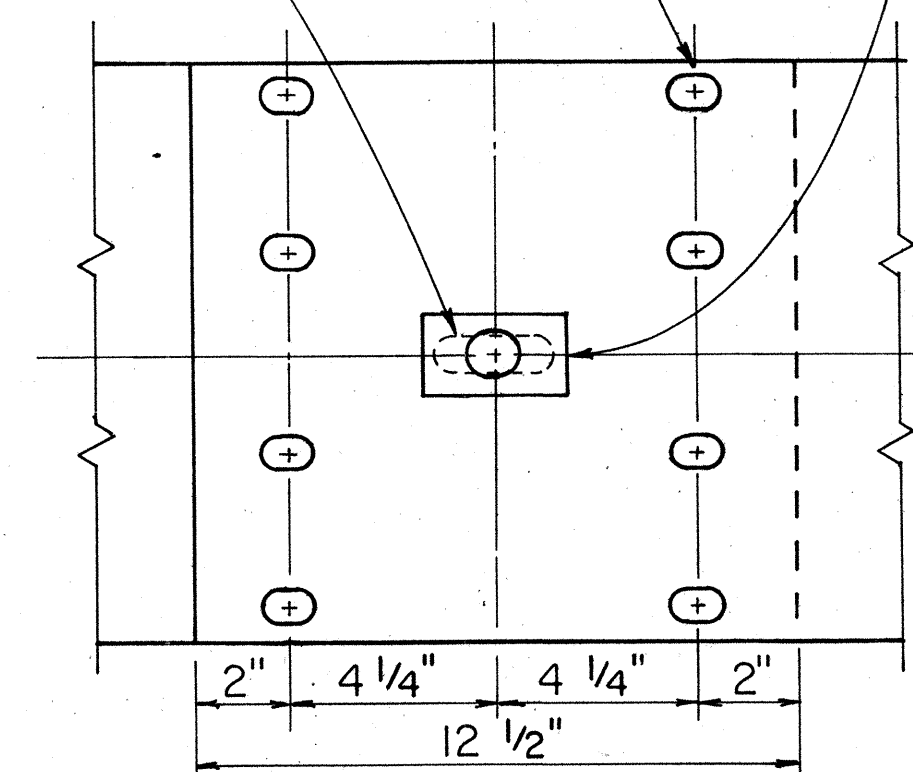
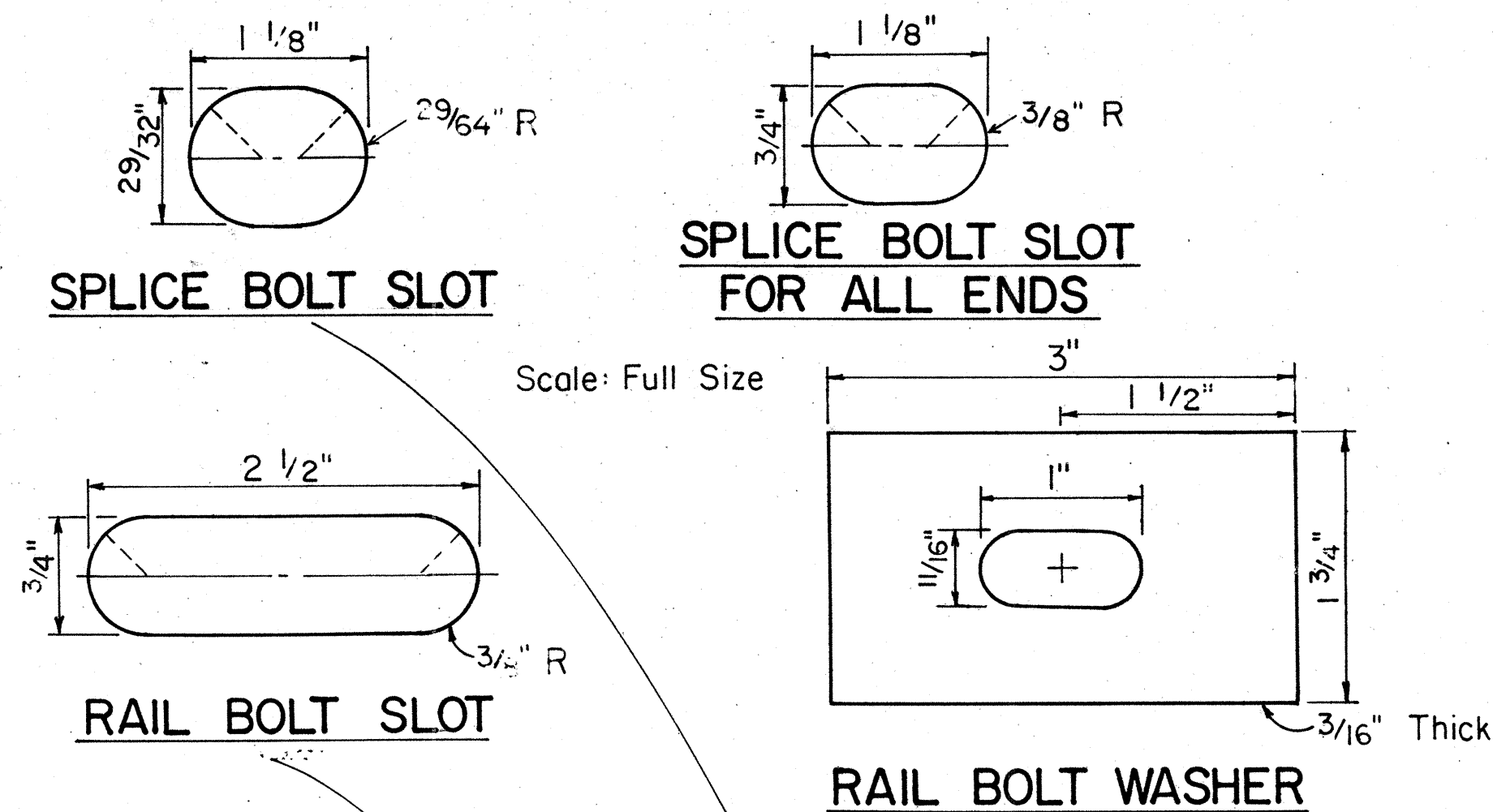
W BEAM TERMINAL CONNECTOR
Scale: 1 1/2" = 1'-0"



W BEAM END SECTION (FLARED)
Scale: $1\frac{1}{2}'' = 1' - 0''$

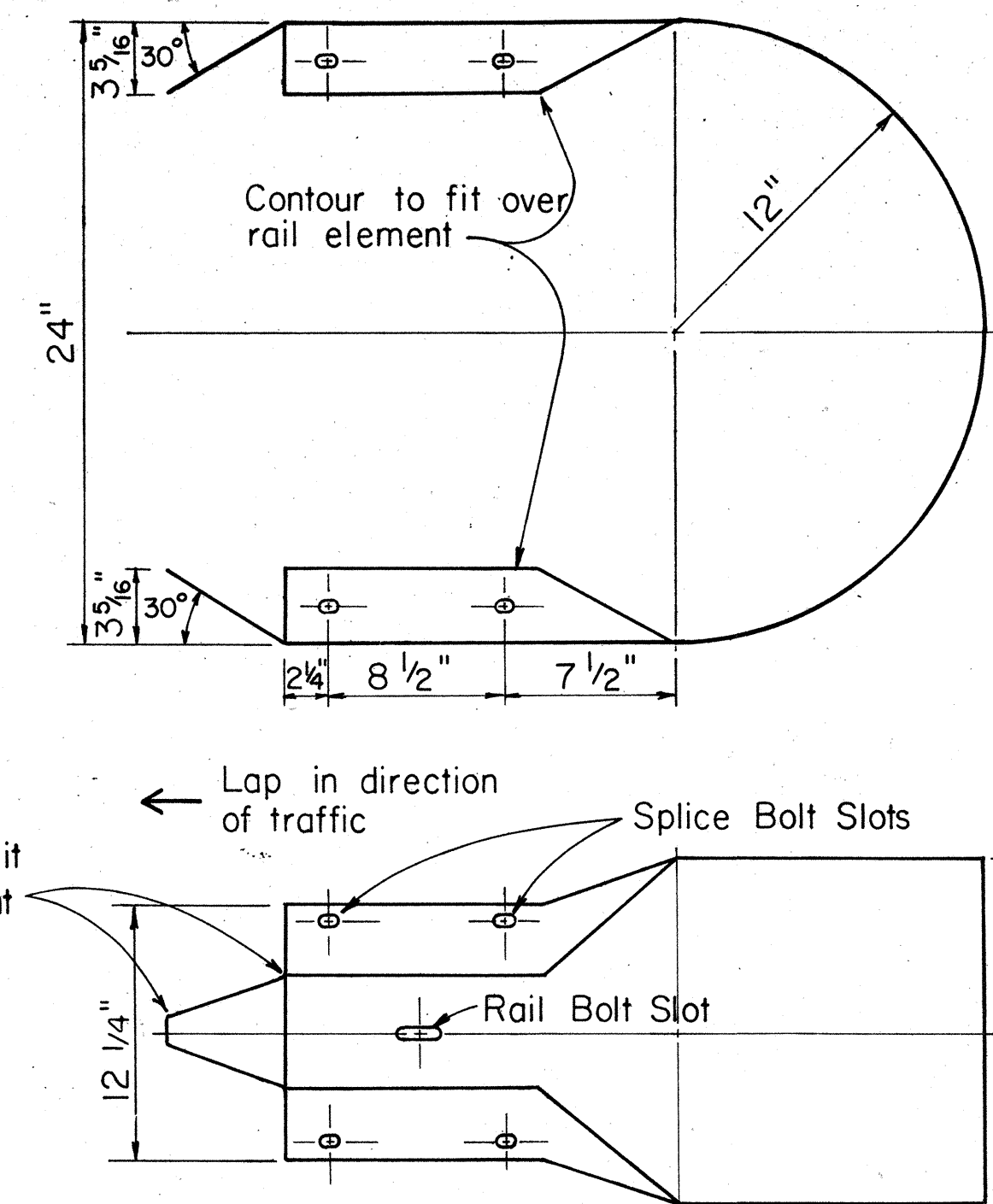


RAIL ELEMENT SECTION
Scale: 6" = 1'-0"

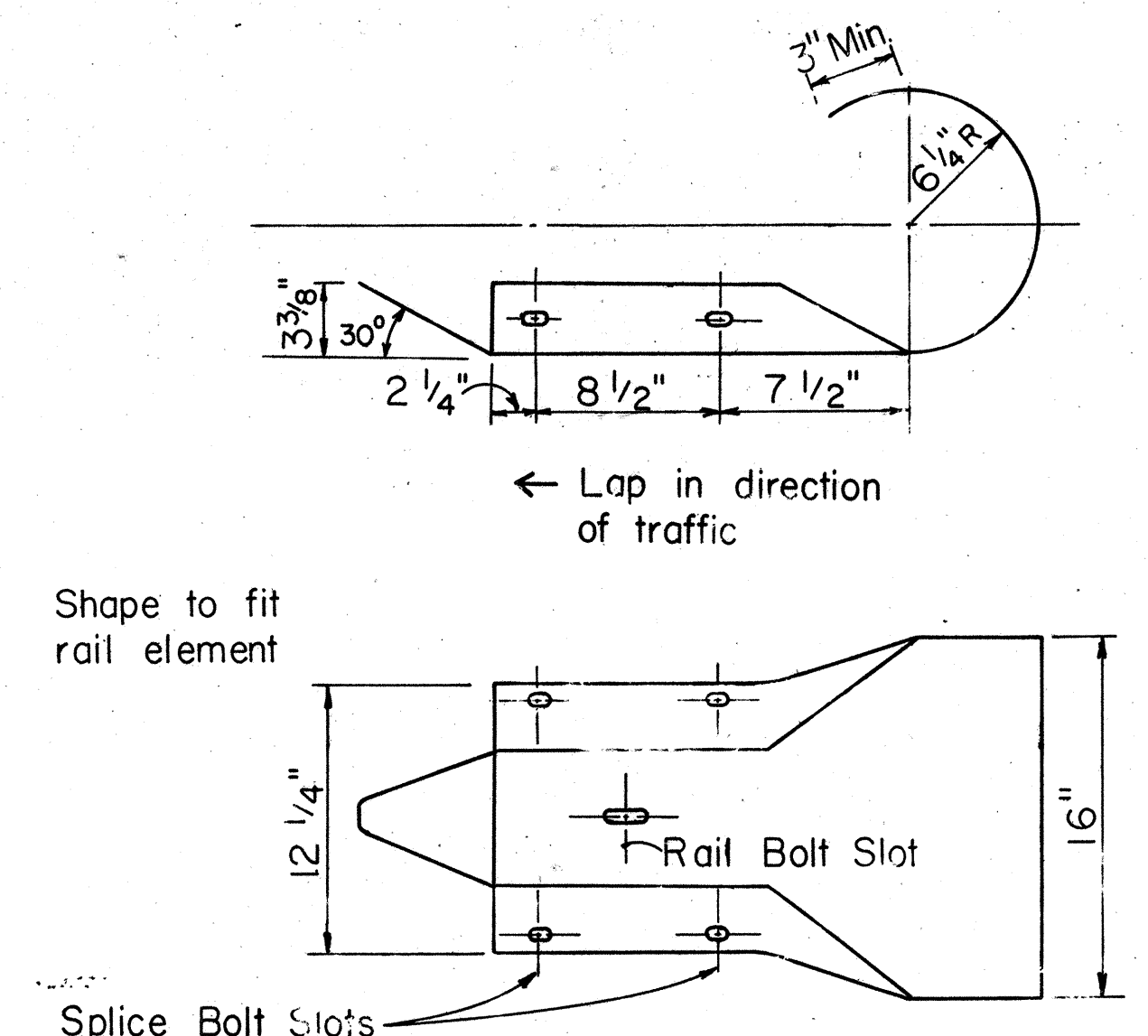


RAIL SPLICE

Scale: 3" = 1'-0"



W BEAM END SECTION (BUFFER)
Scale: 1 1/2" = 1'-0"



W BEAM END SECTION (ROUNDED)
Scale: $1 \frac{1}{2}'' = 1' - 0''$

APPROVAL RECOMMENDED:
Eishi Tanaka
TRAFFIC ENGINEER

9/20/82
DATE

APPROVED: 2 Herbert 2 Schick 9/22/82
ASSISTANT CHIEF, ENGINEERING DATE

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

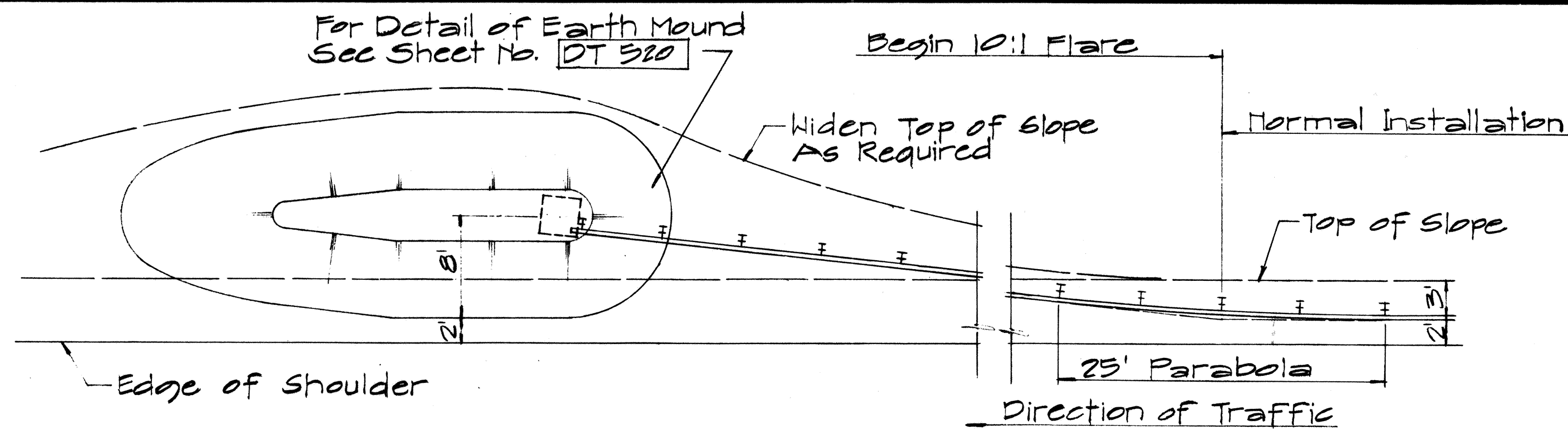
STANDARD DETAILS

METAL GUARDRAIL

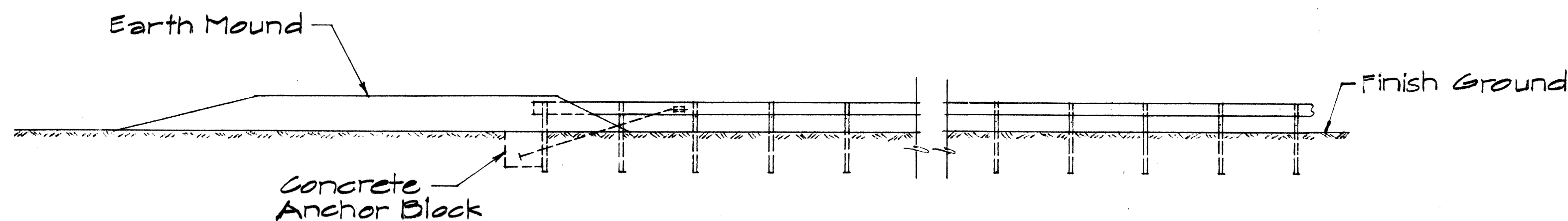
Scale: As Noted July, 1982

SHEET No. 3 OF 2 SHEETS DT 501

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-01-83M	1985	16	30

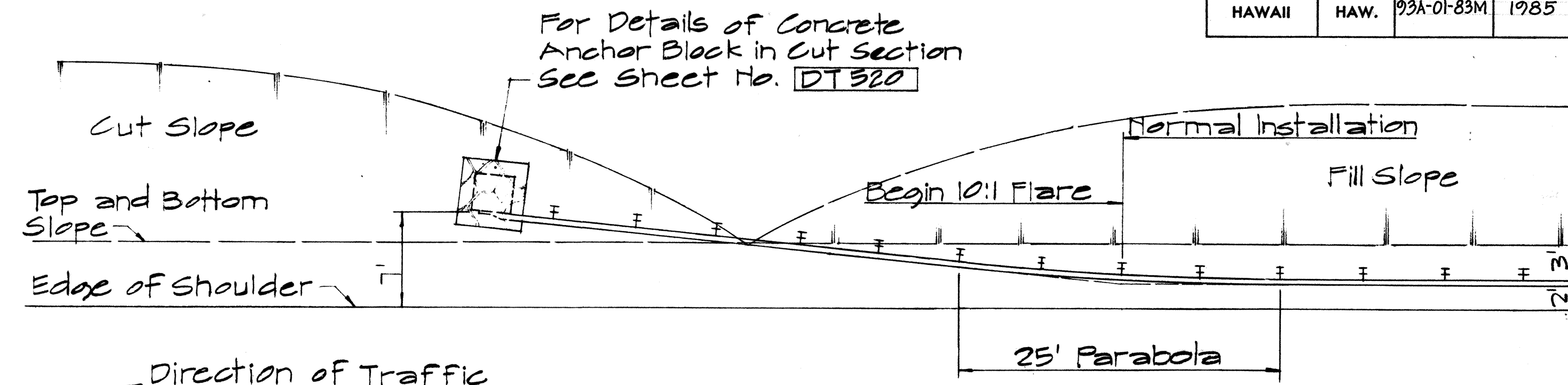


PLAN

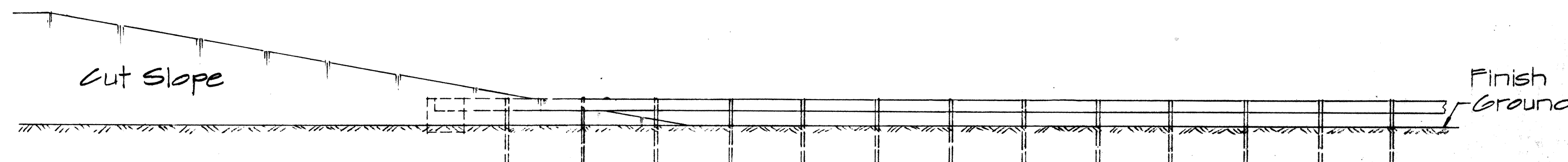


ELEVATION

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

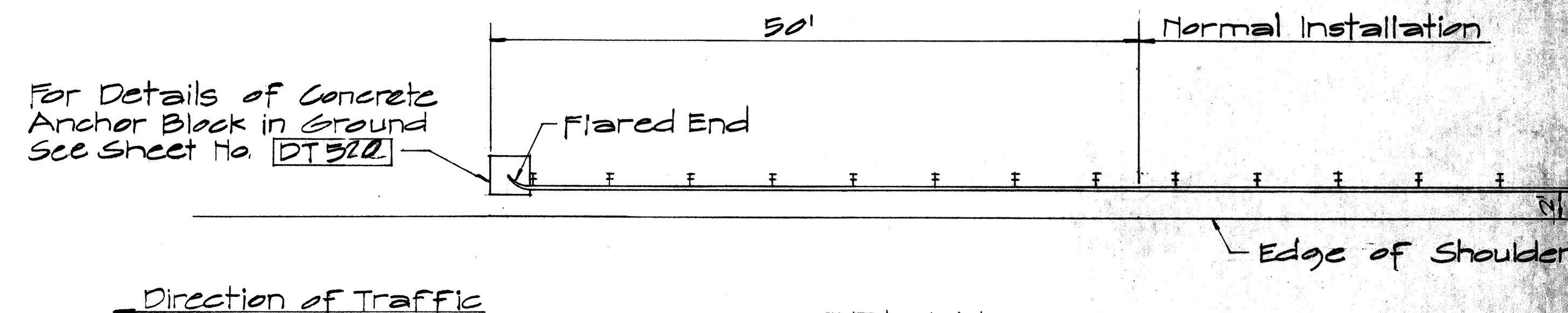


PLAN

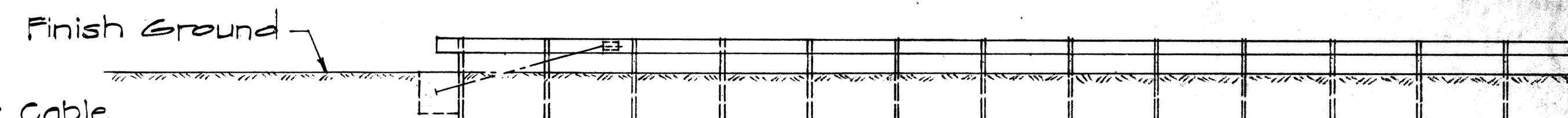


ELEVATION

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



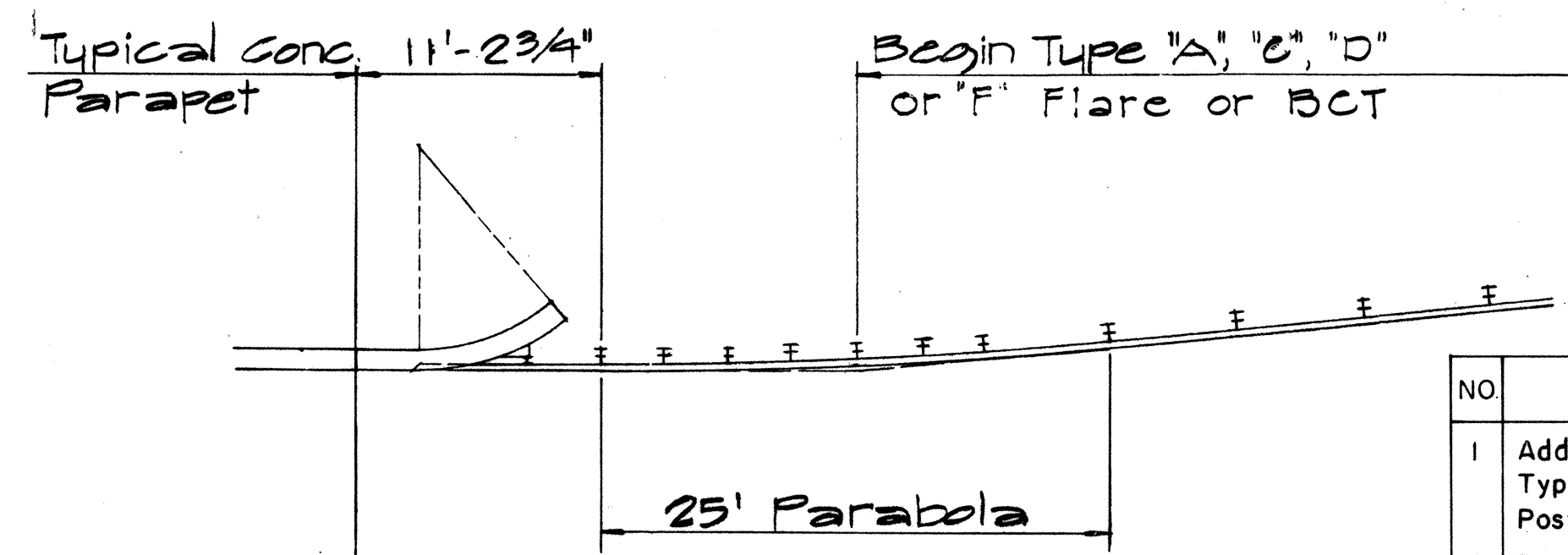
PLAN



ELEVATION

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

NOTE:
For detail of Breakaway Cable Terminal (BCT) See Sheet No. DT 519



TYPICAL LAYOUT PLAN OF
END POST CONNECTION
Sc. 1/8" = 1'-0"

APPROVAL RECOMMENDED:
Eishi Tanaka 12/29/69
TRAFFIC ENGINEER DATE
APPROVED:
John J. Sal 12-30-69
ASSISTANT CHIEF, ENGINEERING DATE

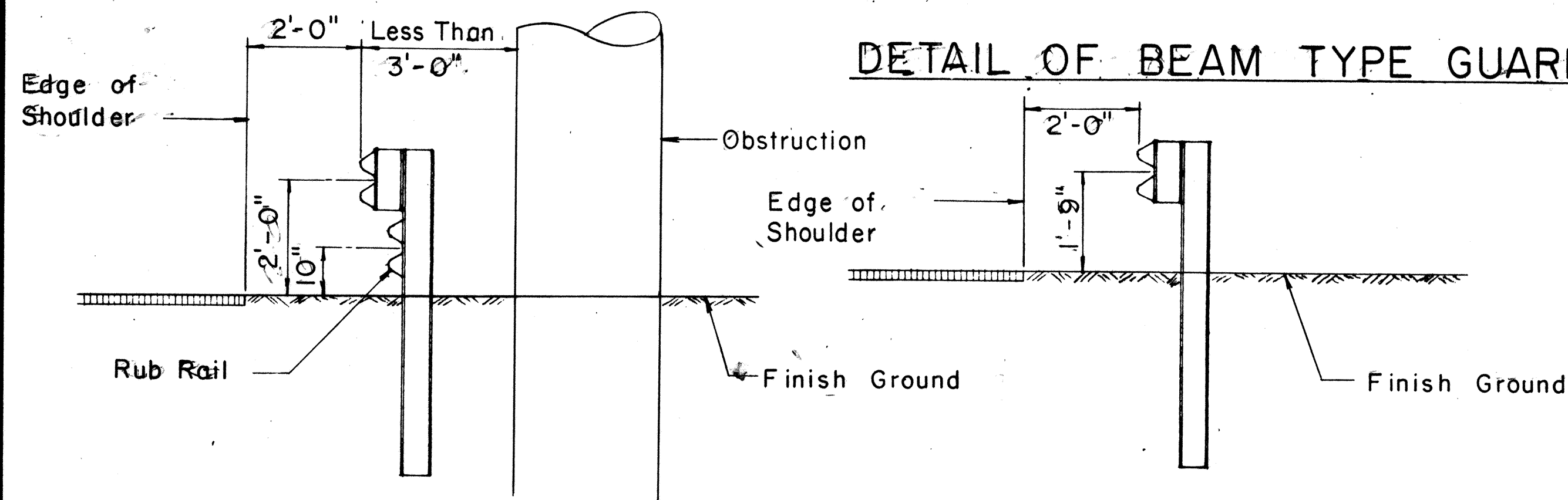
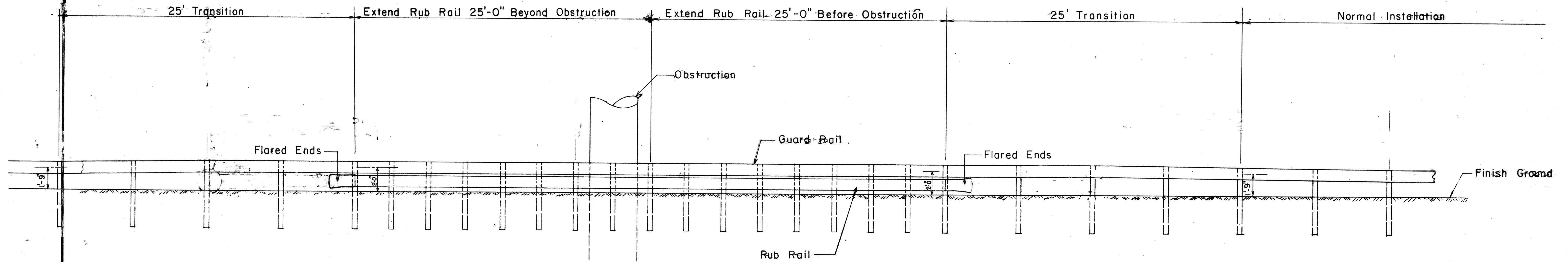
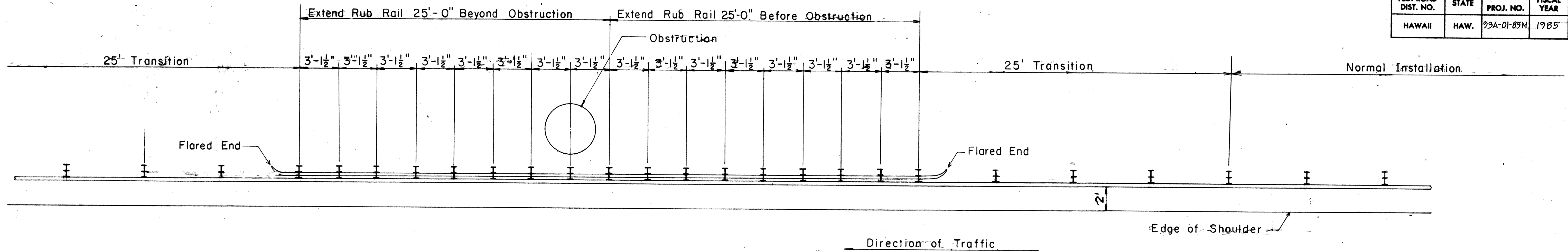
NO.	REVISION	APPROVED BY	DATE
1	Additional Posts Added to Typical Layout Plan Of End Post Connection	H.T.	4-12-72
2	Delete Type "B" Flare and Type "E" Flare	H.T.	6-15-78

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
TRAILING END
FLARE - ONE & TWO
WAY ROADWAY

Scale: As Noted April 1969

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-01-85M	1985	17	30



TYP. SEC. AT OBSTRUCTION

TYP. SEC. AT NORMAL INSTALLATION

TYP. GUARD RAIL SECTIONS

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

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

APPROVED:
Shirley S. Sakai
 ASSISTANT CHIEF, ENGINEERING
 12-30-69
 DATE

NO.	REVISION	APPROVED BY	DATE
1	Added Additional Guard Rail Posts and Installed Flared Ends at end of Rub Rail	H.T.	5/16/80

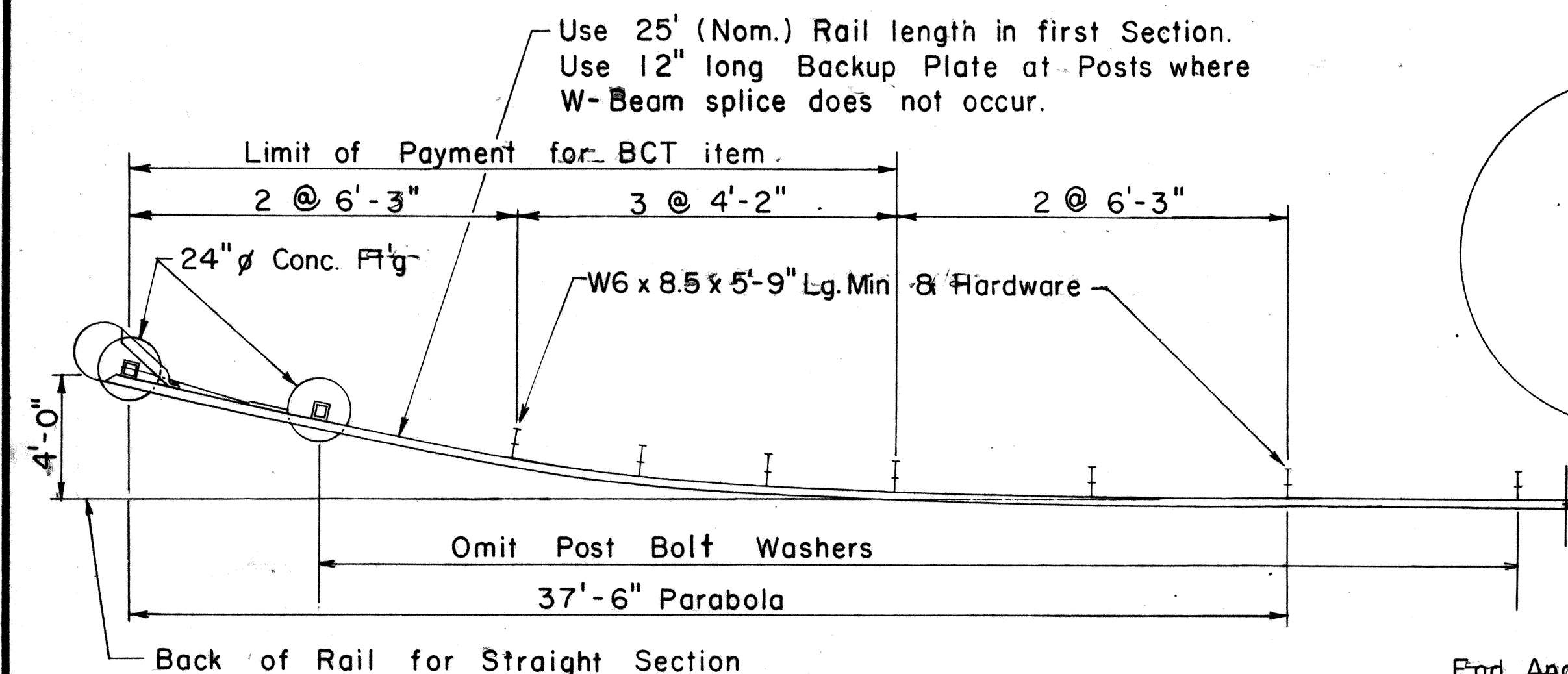
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 LAND TRANSPORTATION FACILITIES DIVISION
STANDARD DETAIL
 BEAM TYPE GUARD RAIL WITH
 RUB RAIL AT OBSTRUCTION
 SHOULDER INSTALLATION
 SCALE: AS SHOWN
 DATE: JUNE, 1969
 SHEET No. 5 OF 9 SHEETS DT 518

DESIGNED BY	DATE
TRACED 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.	93A-01-85M	1985	18	30

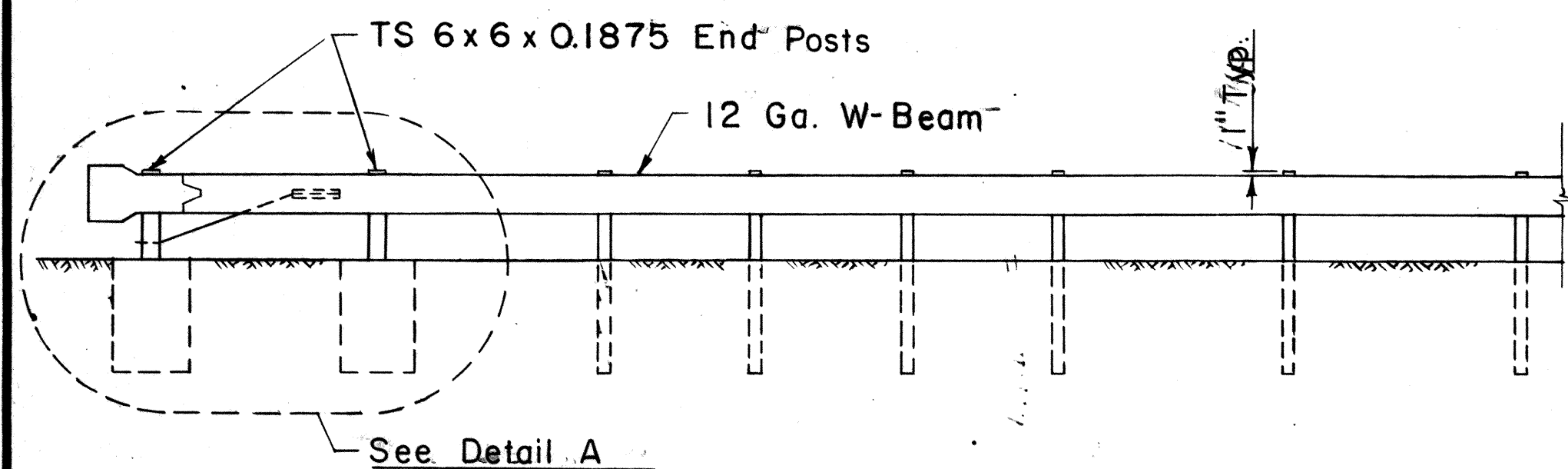
NOTES:

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.



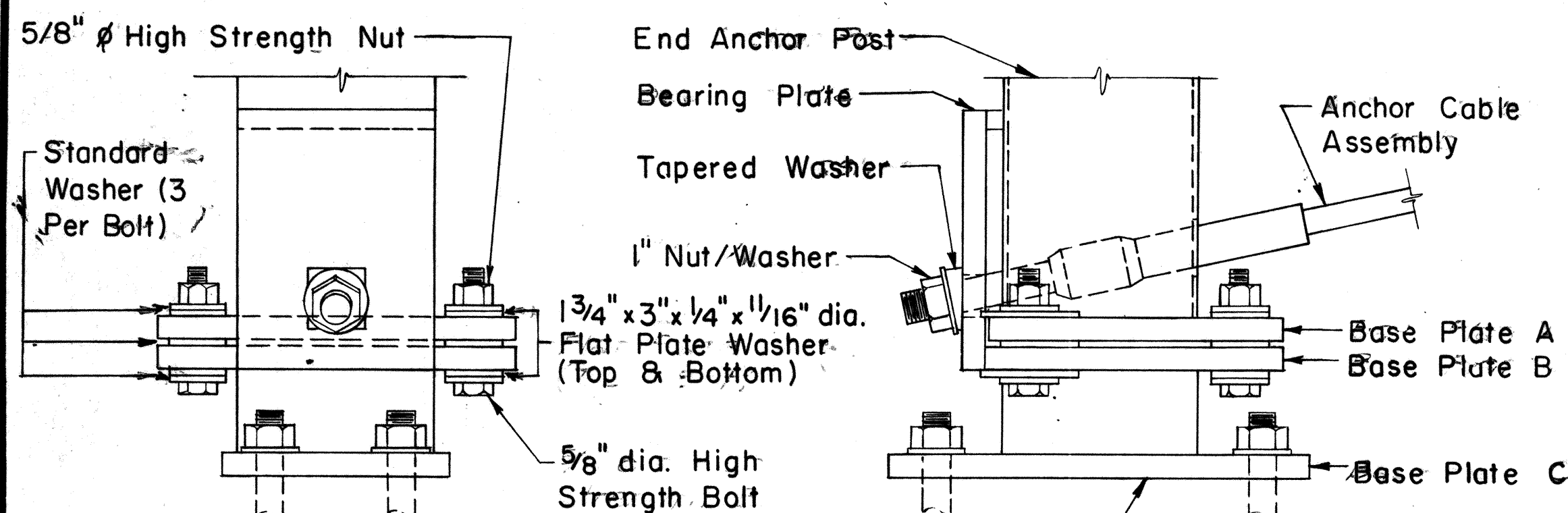
PLAN

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



ELEVATION

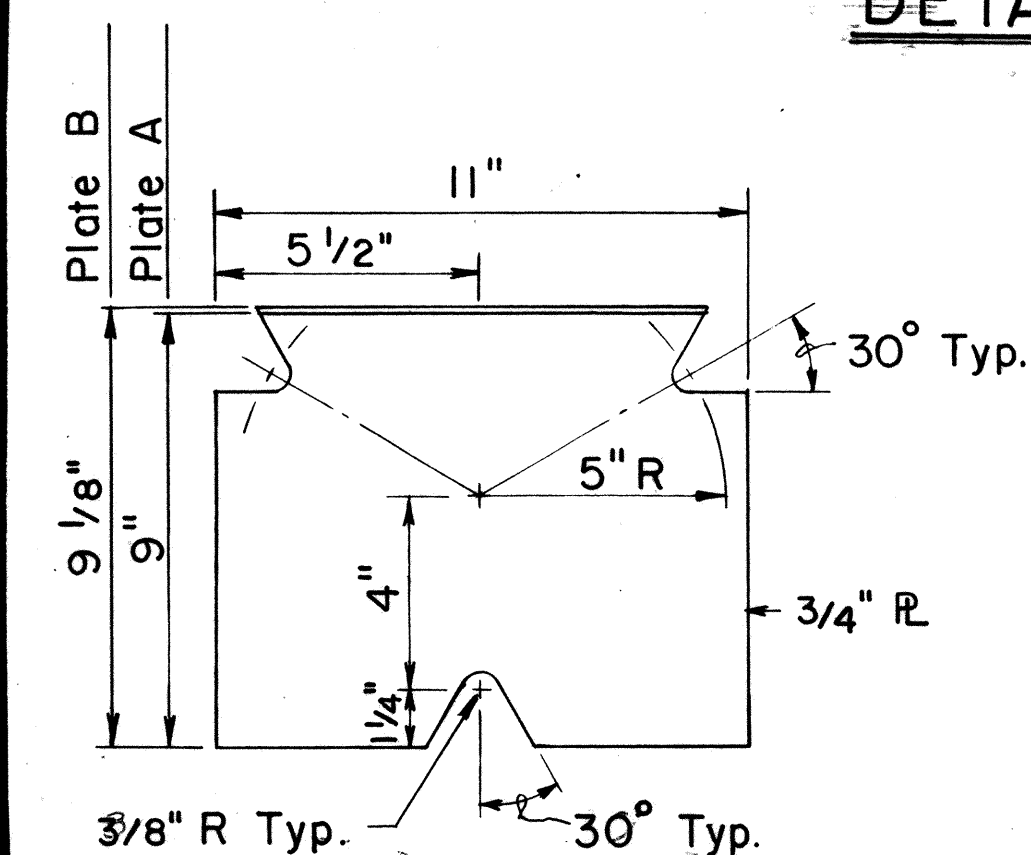
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SIDE ELEVATION

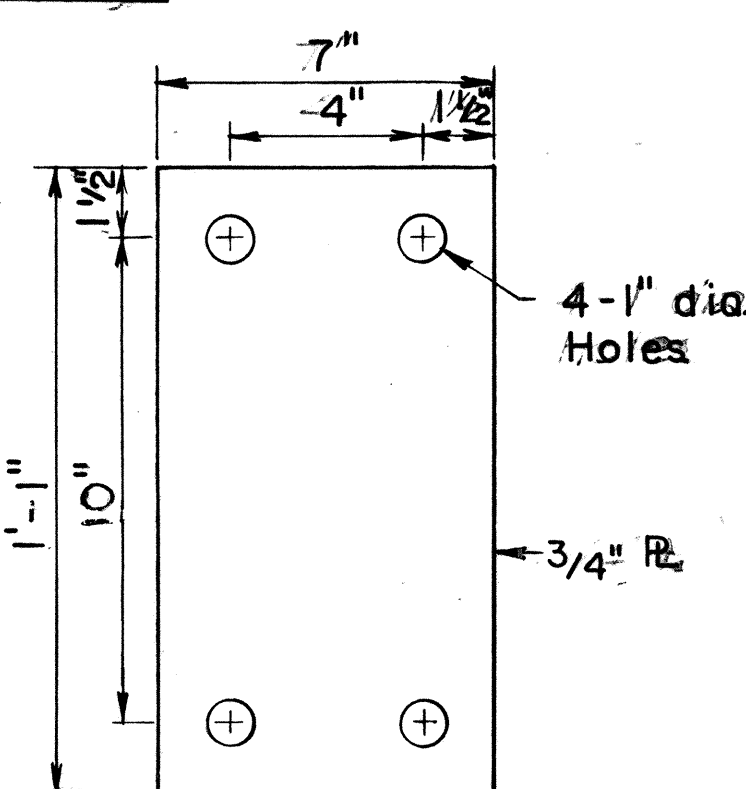
DETAIL B

FRONT ELEVATION



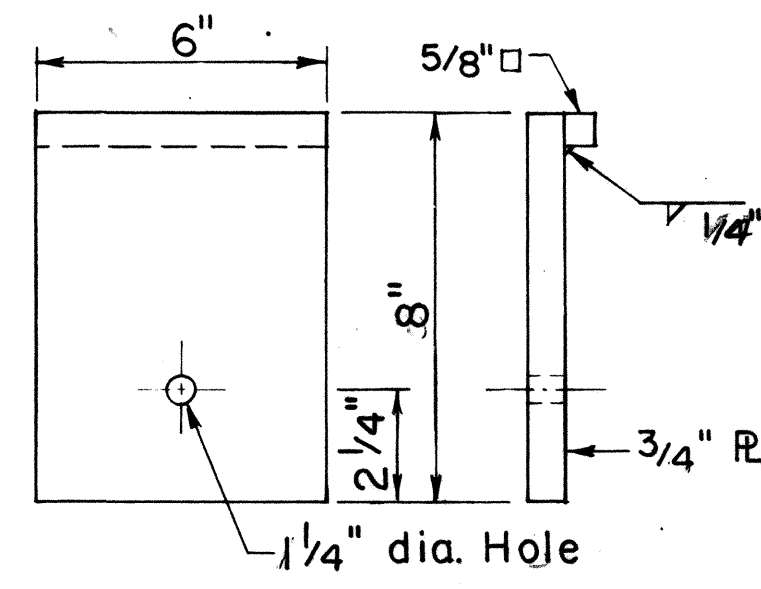
BASE PLATES A & B

Scale: 3" = 1'-0"



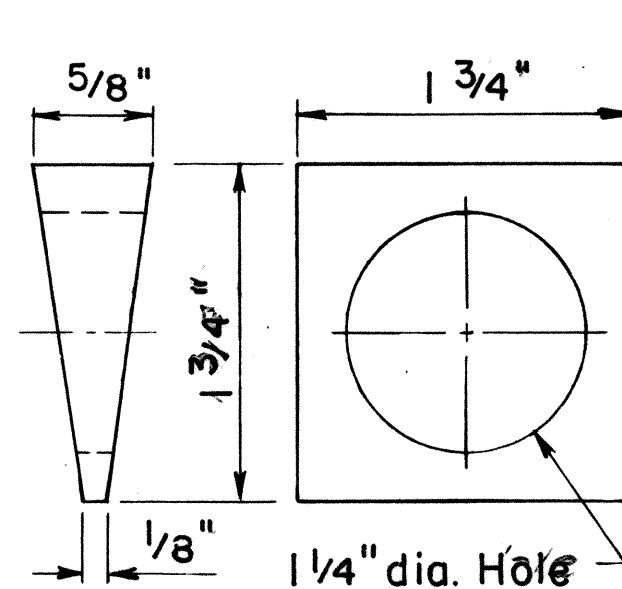
BASE PLATE C

Scale: 3" = 1'-0"



BEARING PLATE

Scale: 3" = 1'-0"

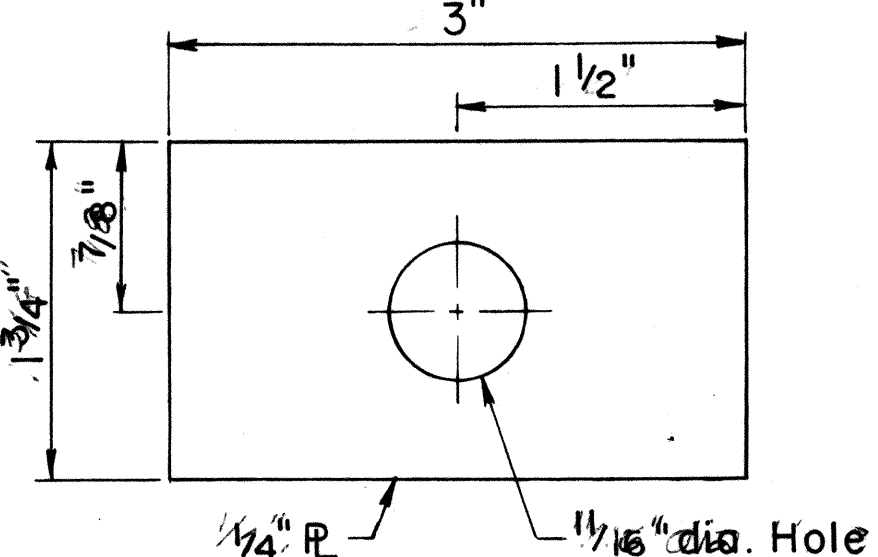


TAPERED WASHER

Scale: Full Size

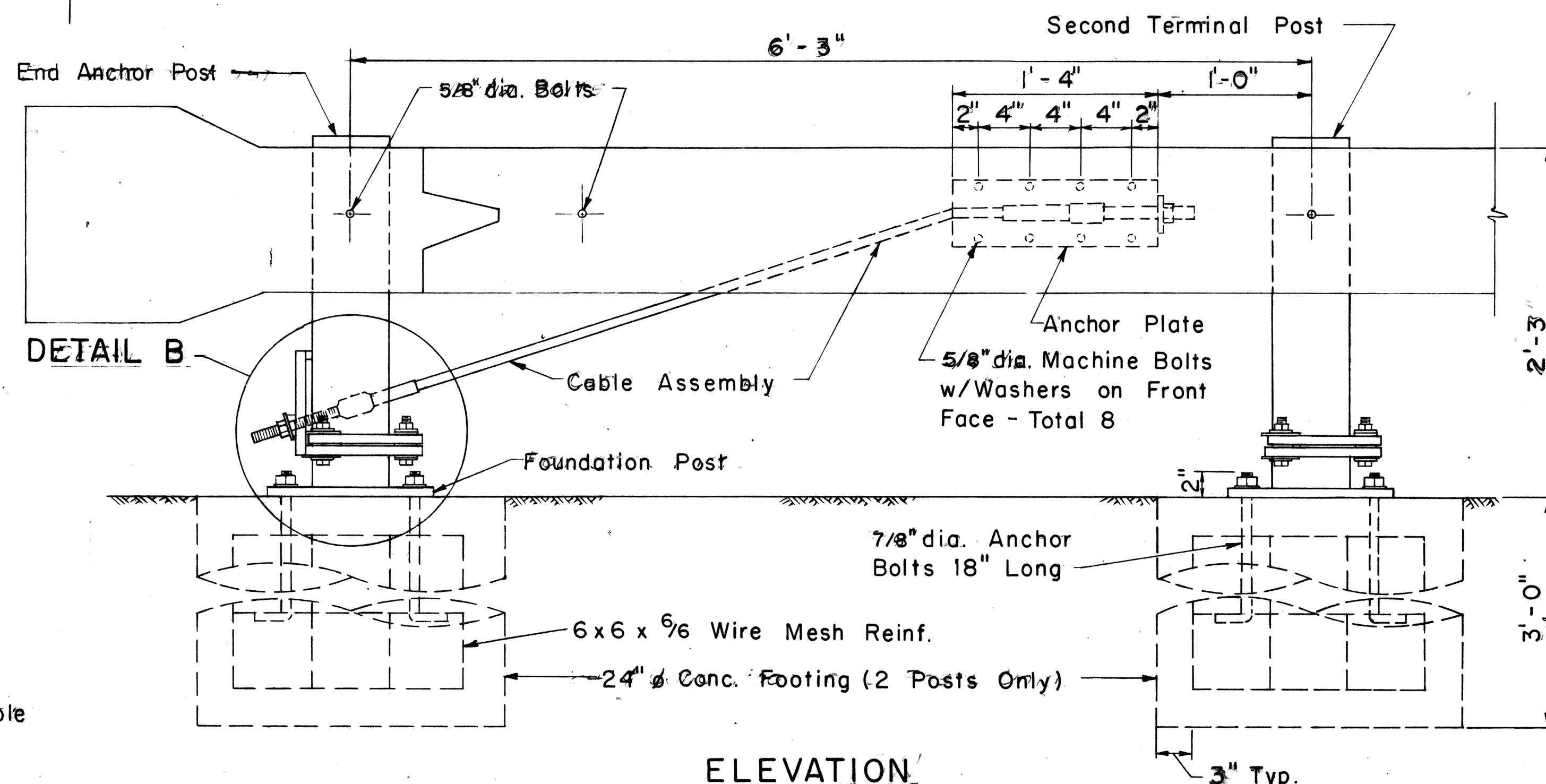
ELEVATION
DETAIL A

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



FLAT PLATE WASHER

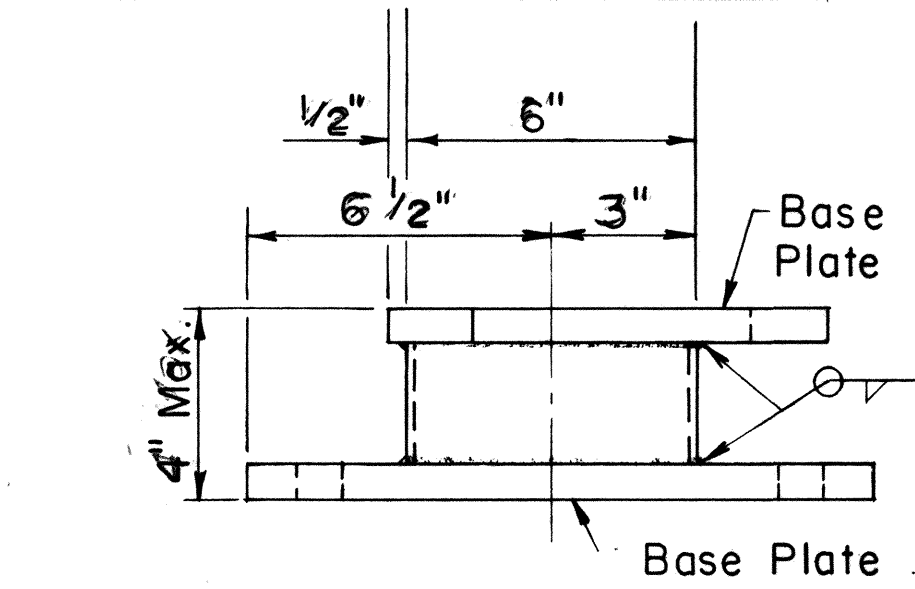
Scale: Full Size



PLAN

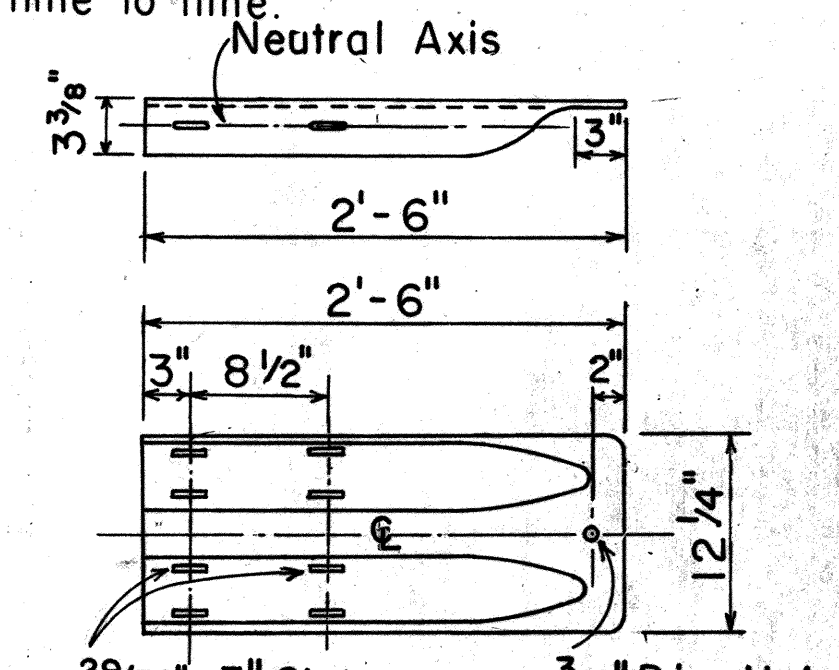
DETAIL B

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



FOUNDATION POST

Scale: 3" = 1'-0"



TERMINAL CONNECTOR

Scale: 1" = 1'-0"

APPROVAL RECOMMENDED:

Eishi Tanaka
TRAFFIC ENGINEER
6/14/85
DATE

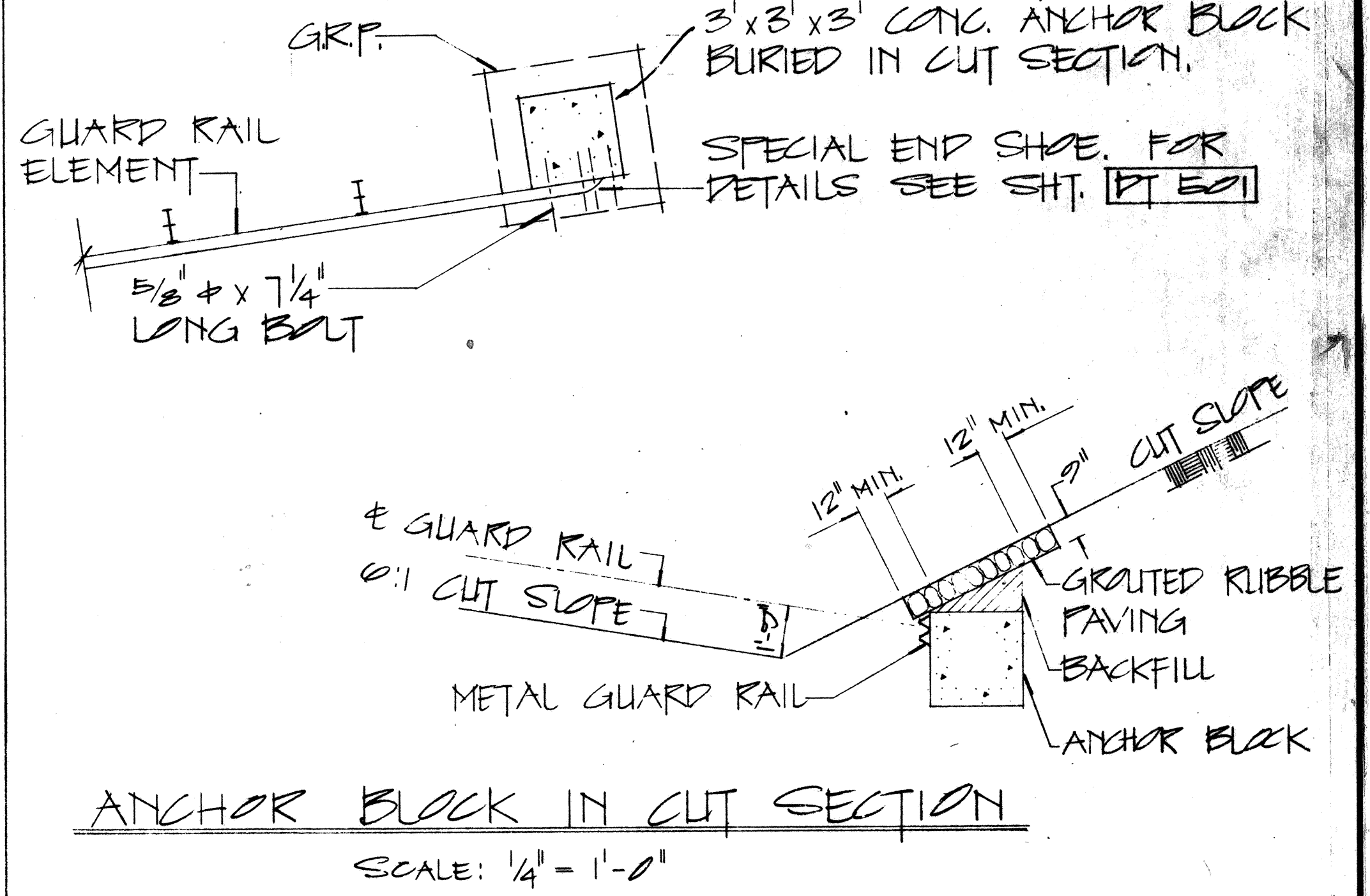
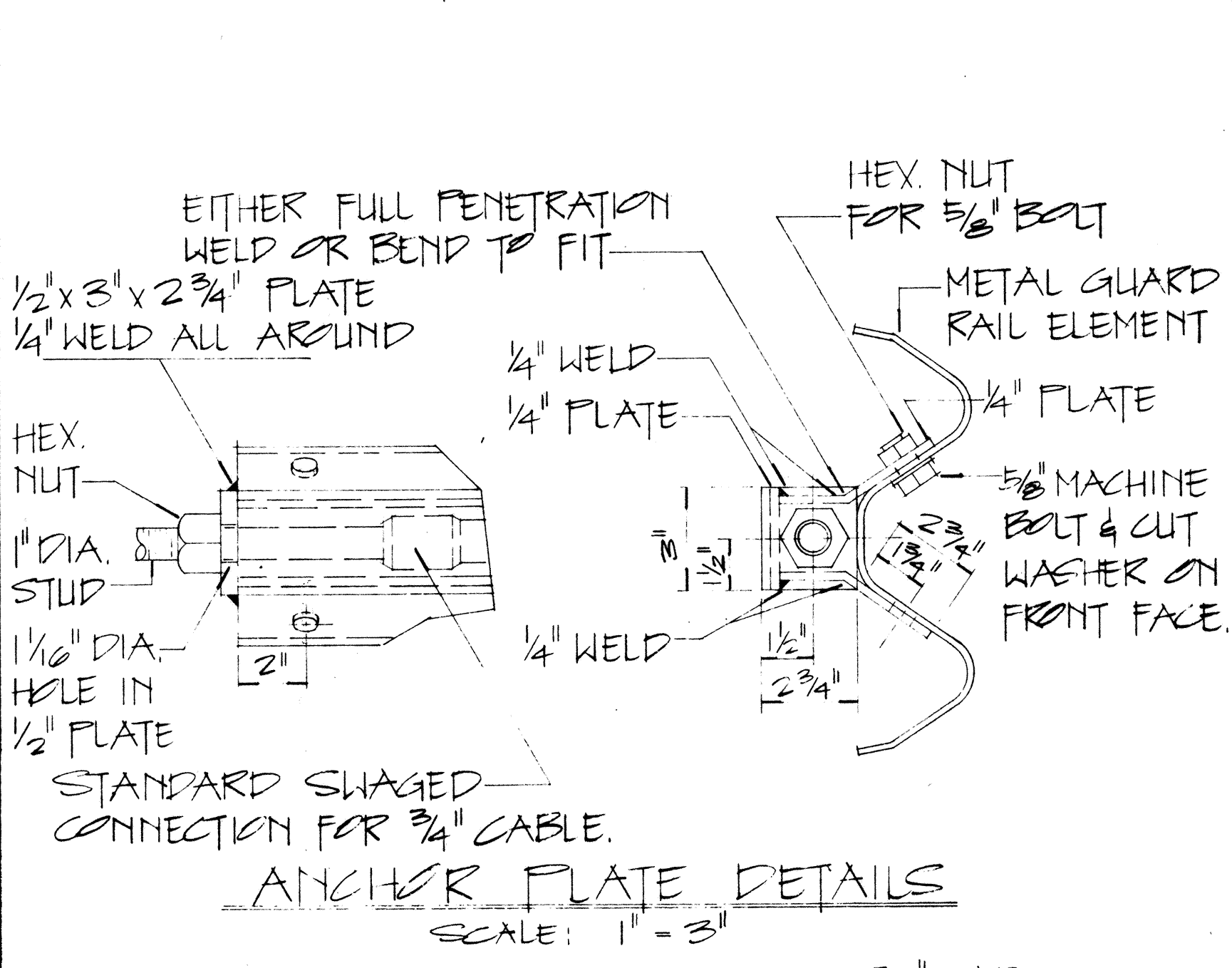
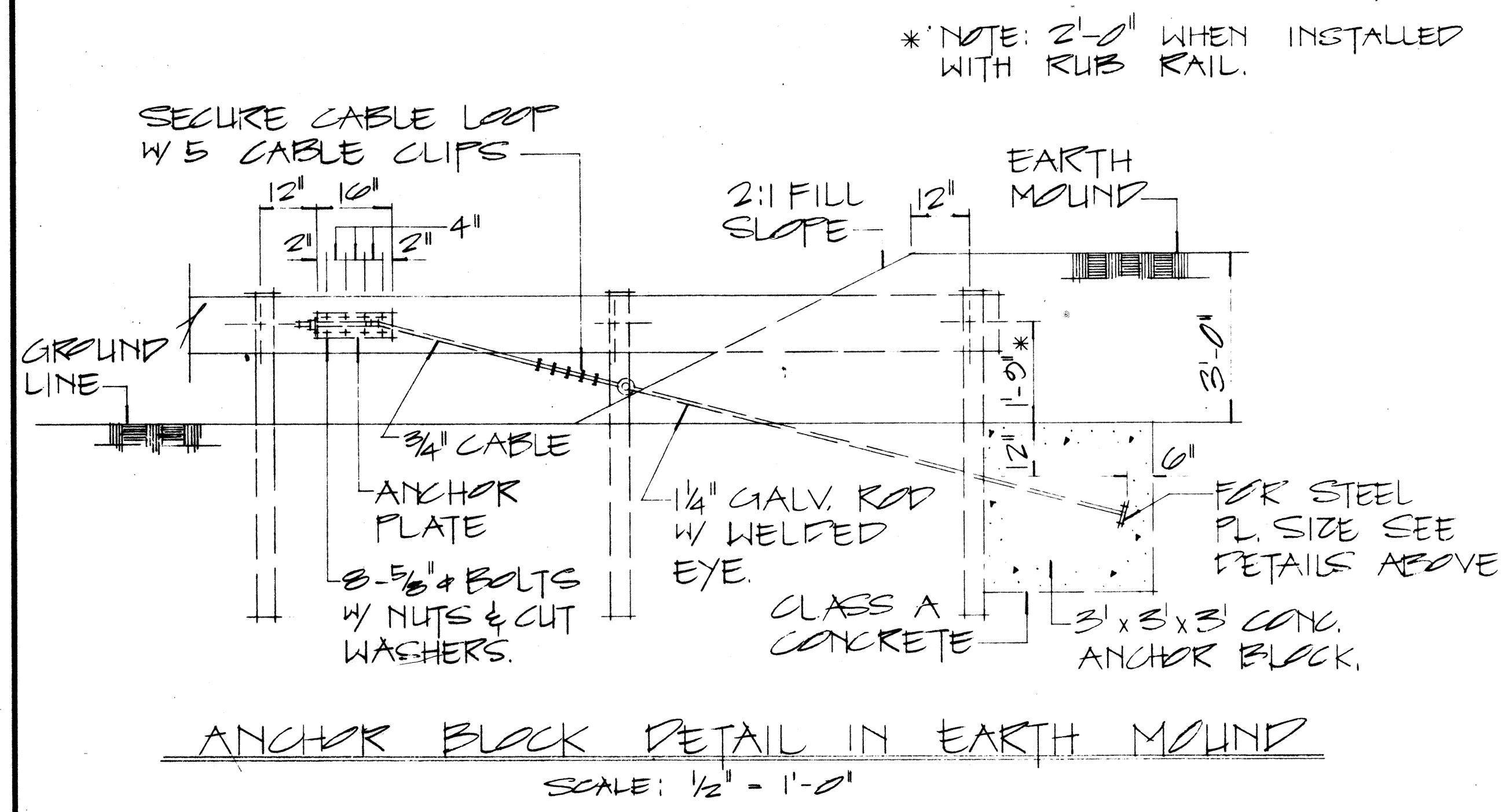
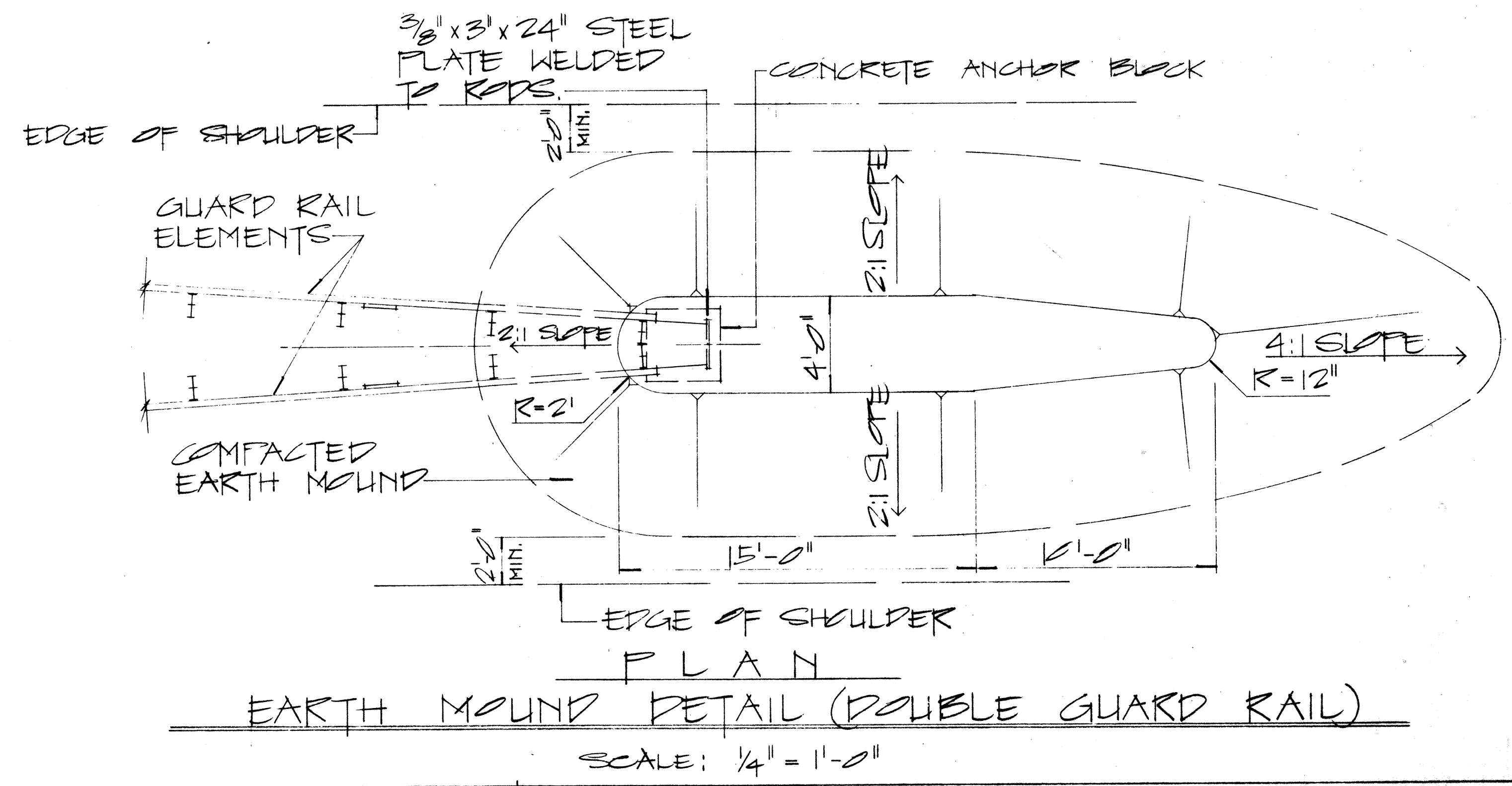
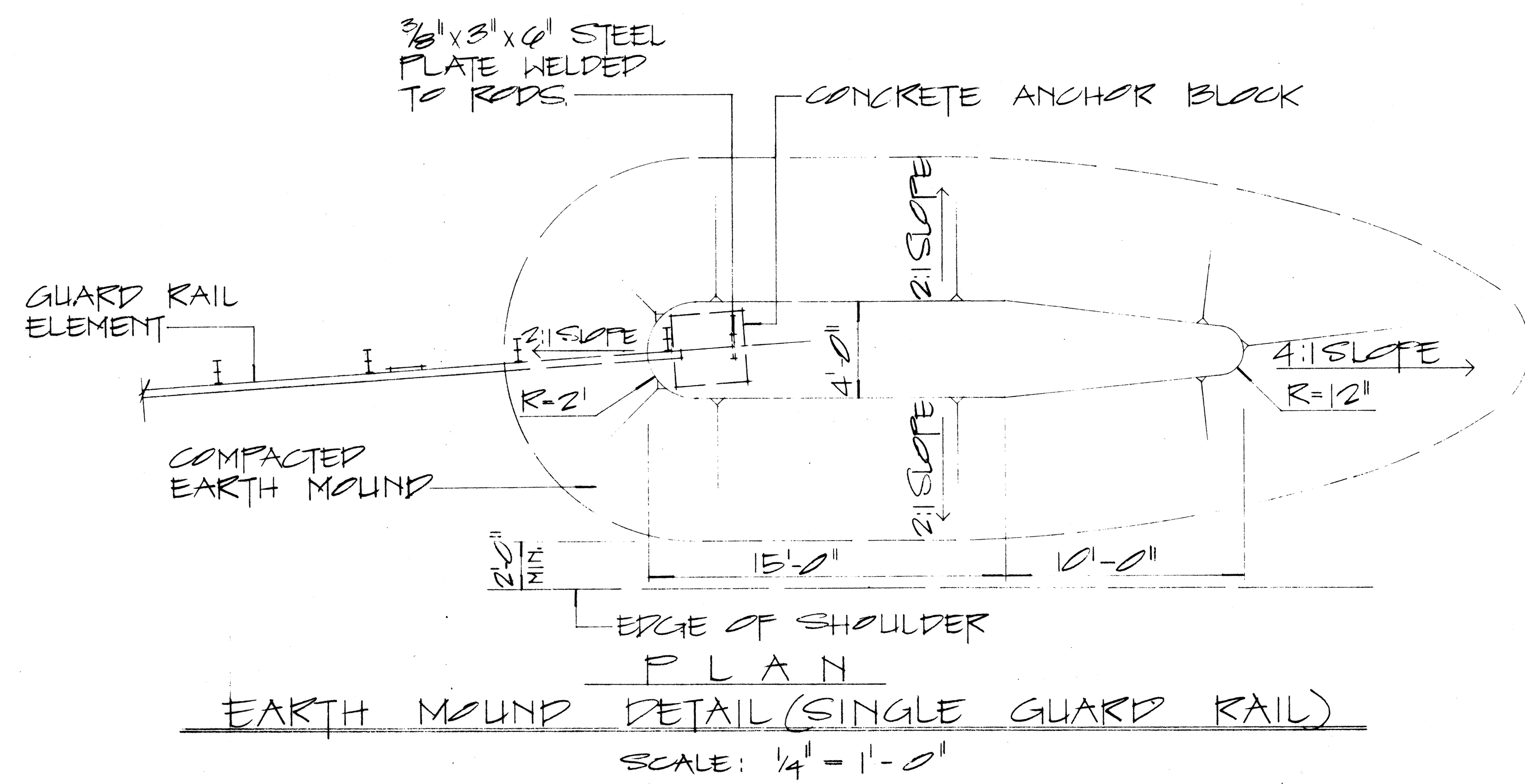
APPROVED:

Harbor Zakeishi
ASSISTANT CHIEF, ENGINEERING
6/15/85
DATE

NO.	REVISION	APPROVED BY	DATE
1	Supersedes Sht. DT 519 Approved 12/30/69	H.I.	6/15/85
2	Added Note 6	H.I.	12/11/85

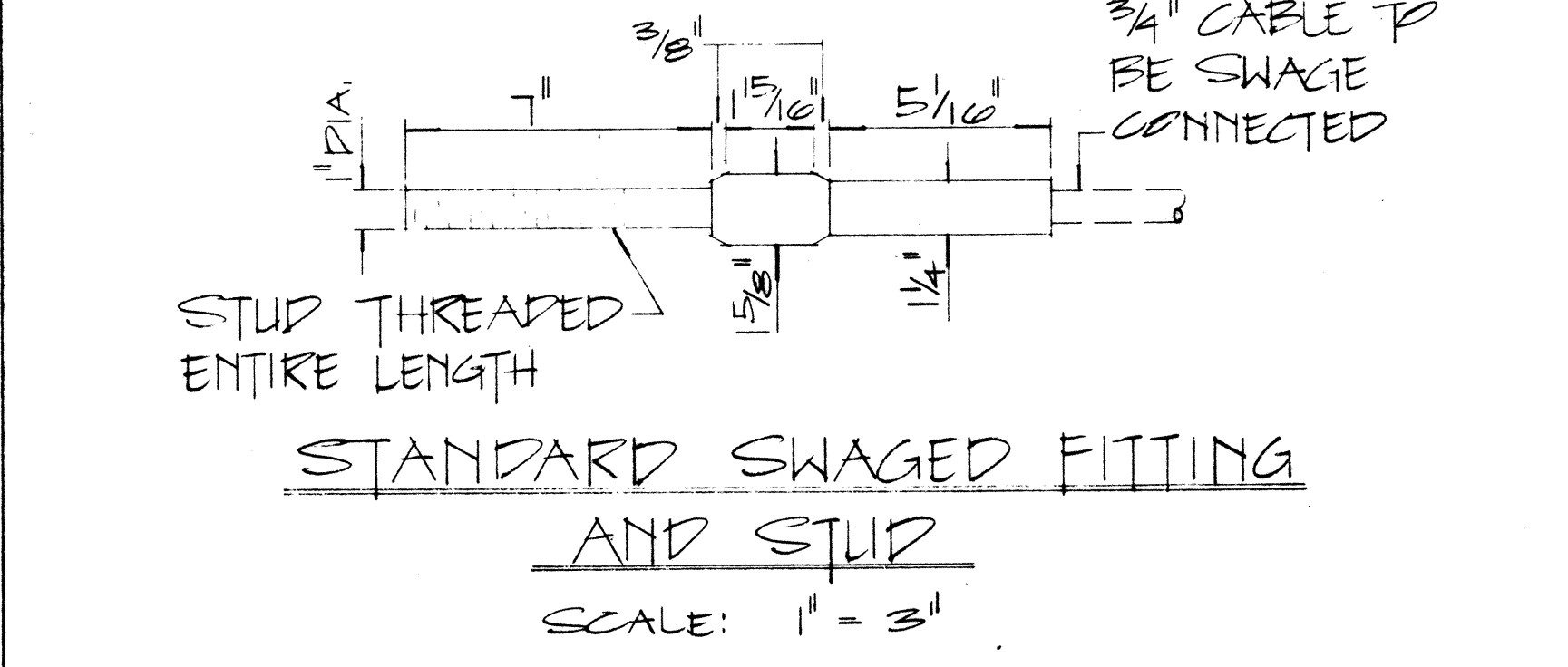
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
STANDARD DETAIL	
BREAKAWAY CABLE TERMINAL (BCT)	
Scale: As Shown	Date: June 1978
SHEET No. 6 OF 9 SHEETS DT 519	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	23A-01-85M	1985	19	30



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, G.R.P., 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:			
Eishi Tanaka		12/29/62	
TRAFFIC ENGINEER		DATE	
APPROVED:			
Assistant Chief, Engineering		12-30-69	
DATE			
NO.	REVISION	APPROVED BY	DATE

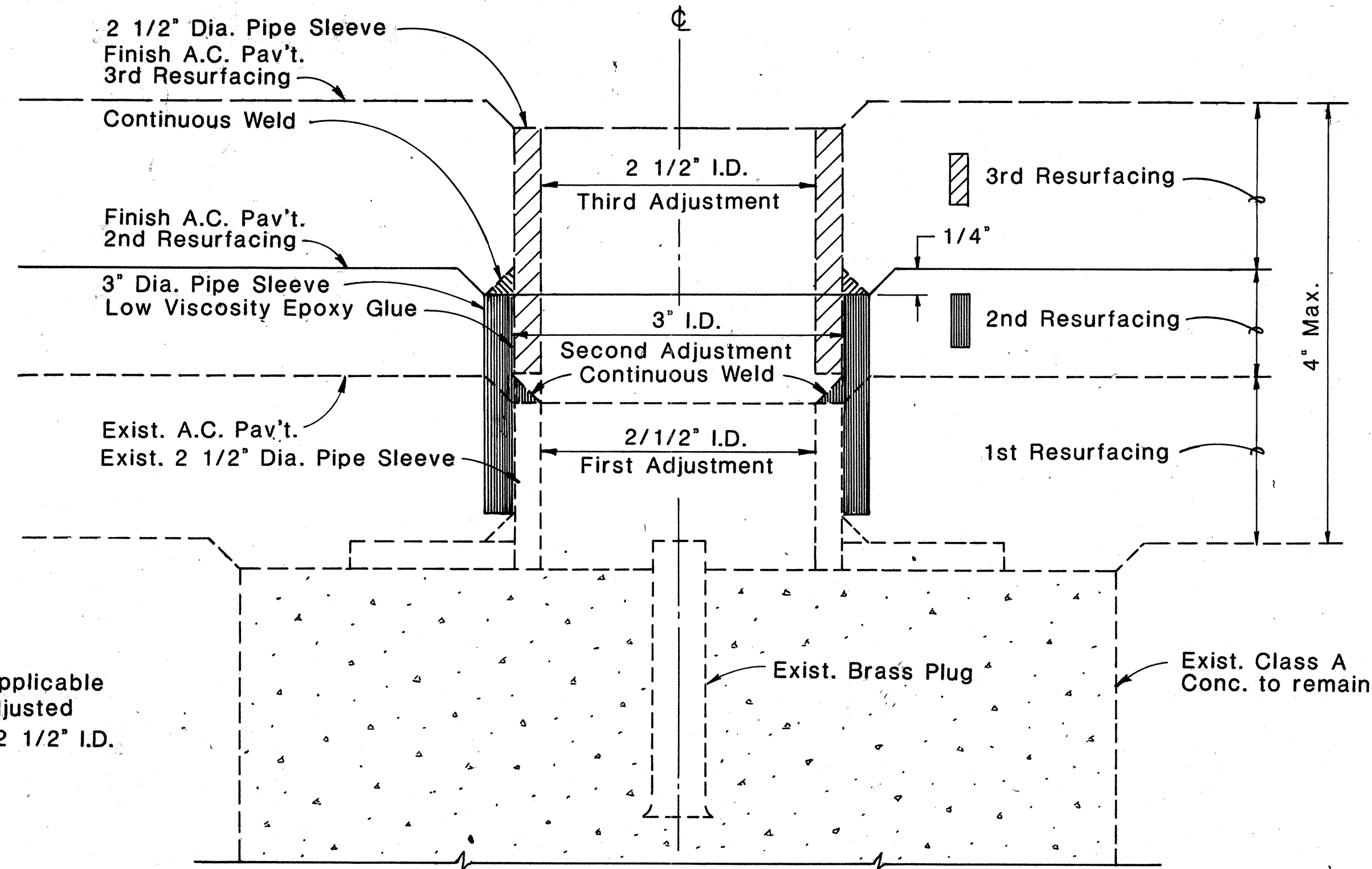
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
EARTH MOUND AND
ANCHOR BLOCK DETAILS

SCALE: AS SHOWN OCT 1969
SHEET No. 7 OF 9 SHEETS PT 520

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

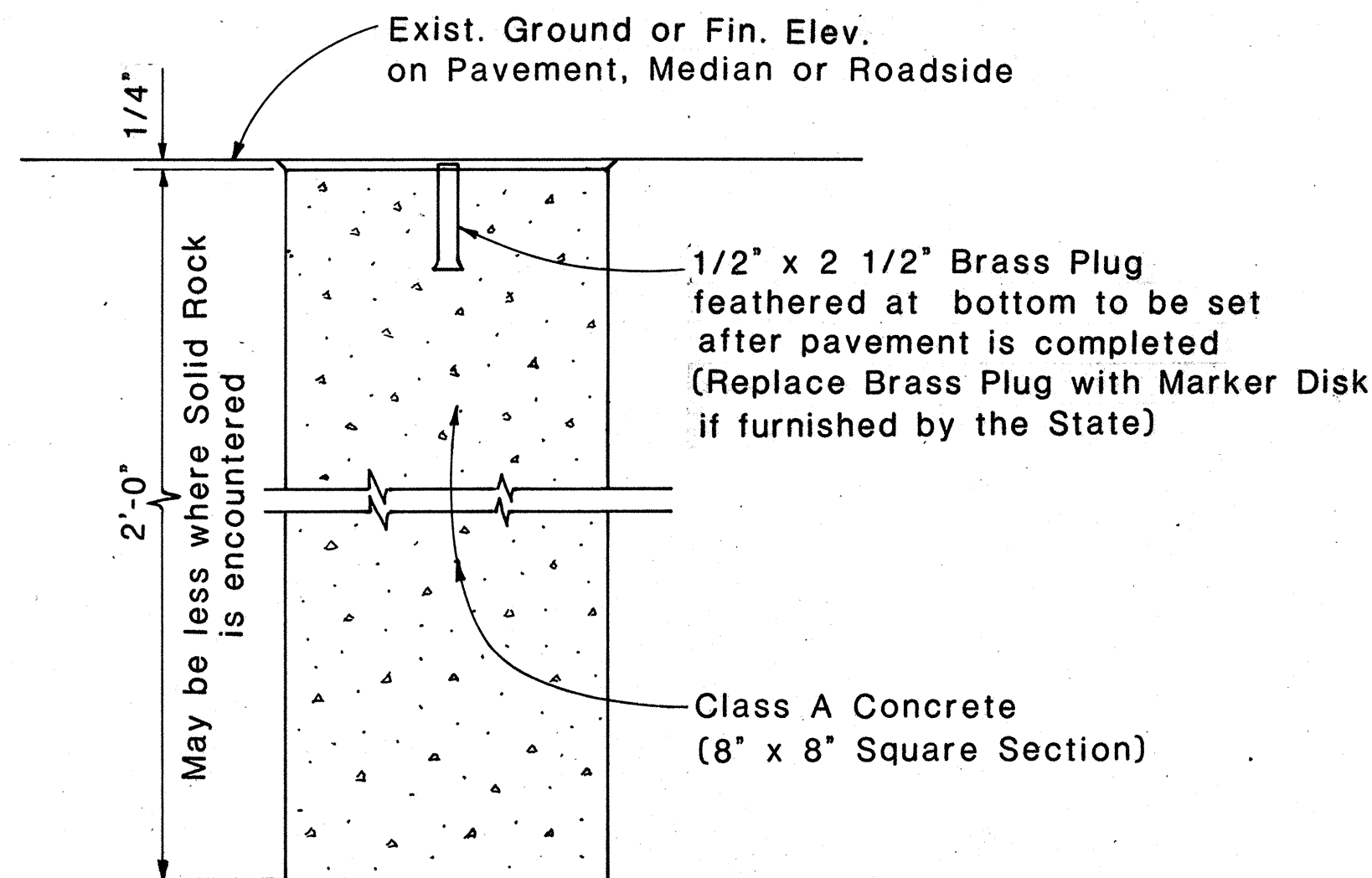
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-01-85M	1985	20	30



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

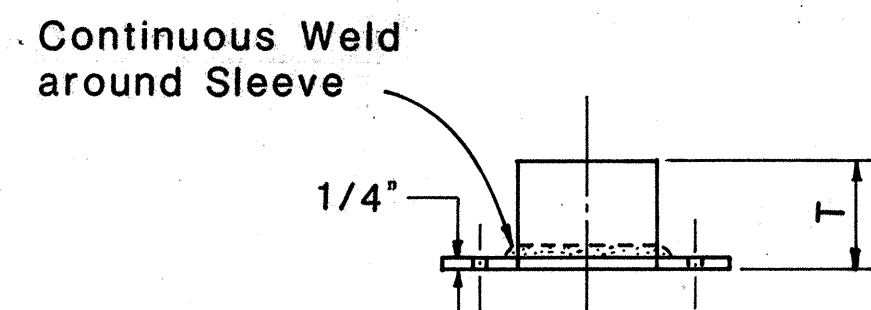
DETAIL FOR CENTERLINE MONUMENT (2ND & 3RD) ADJUSTMENTS

FULL SIZE



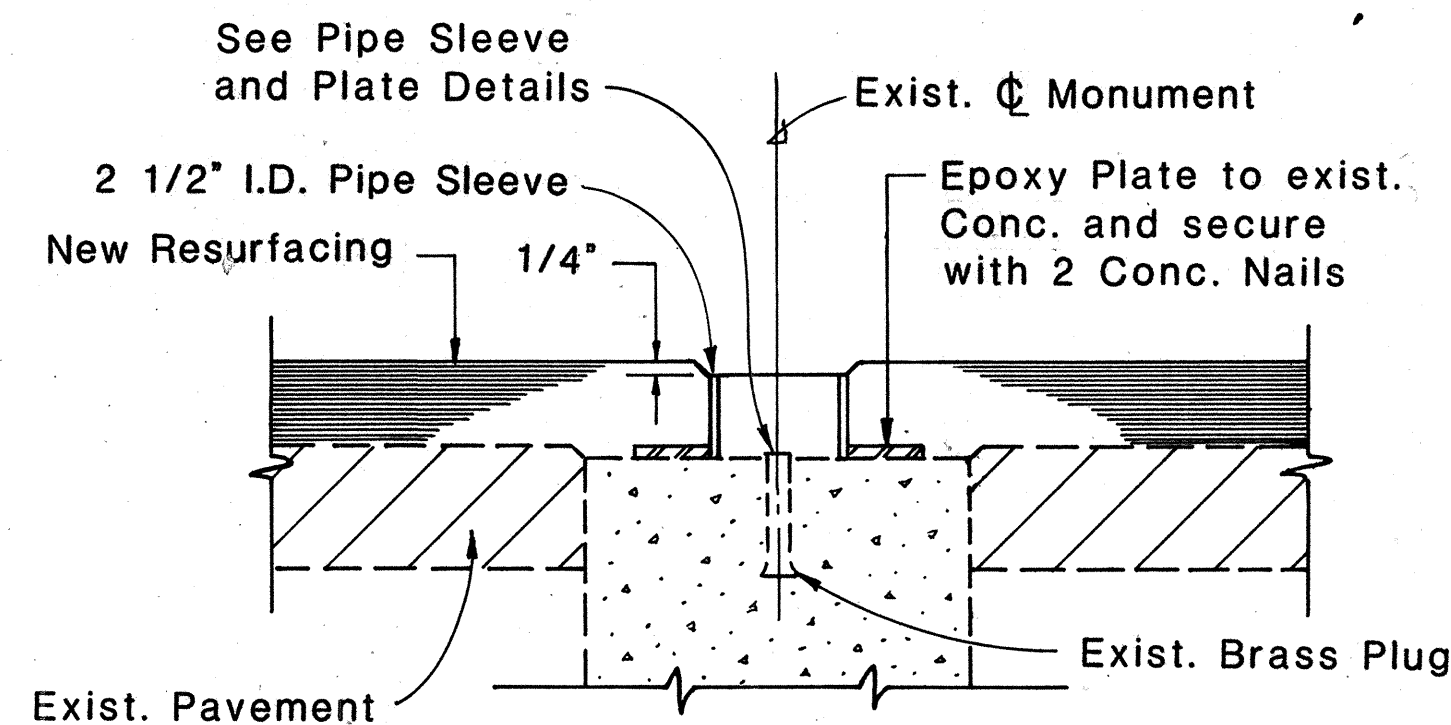
DETAIL FOR CENTERLINE & REFERENCE SURVEY MONUMENT

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

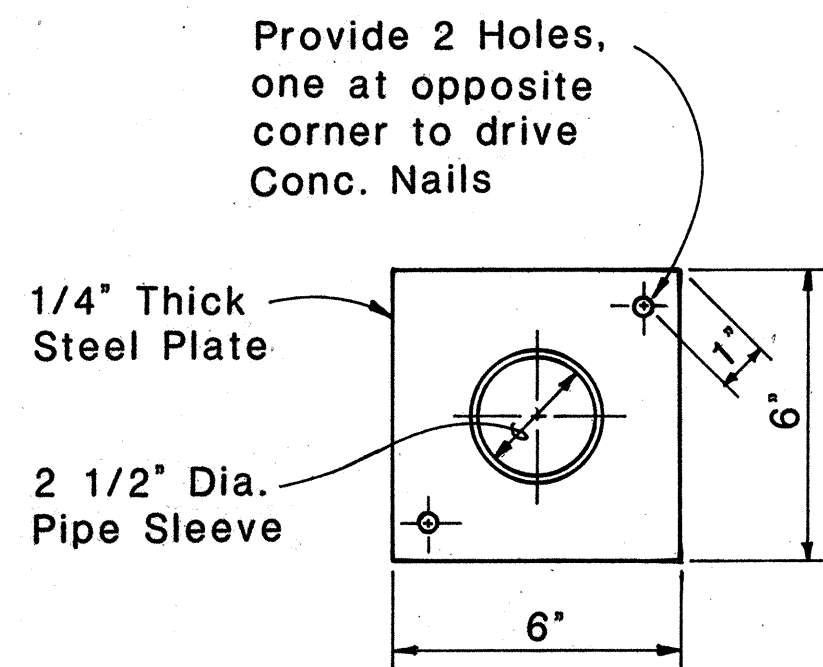


T = New Resurfacing Thickness

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:

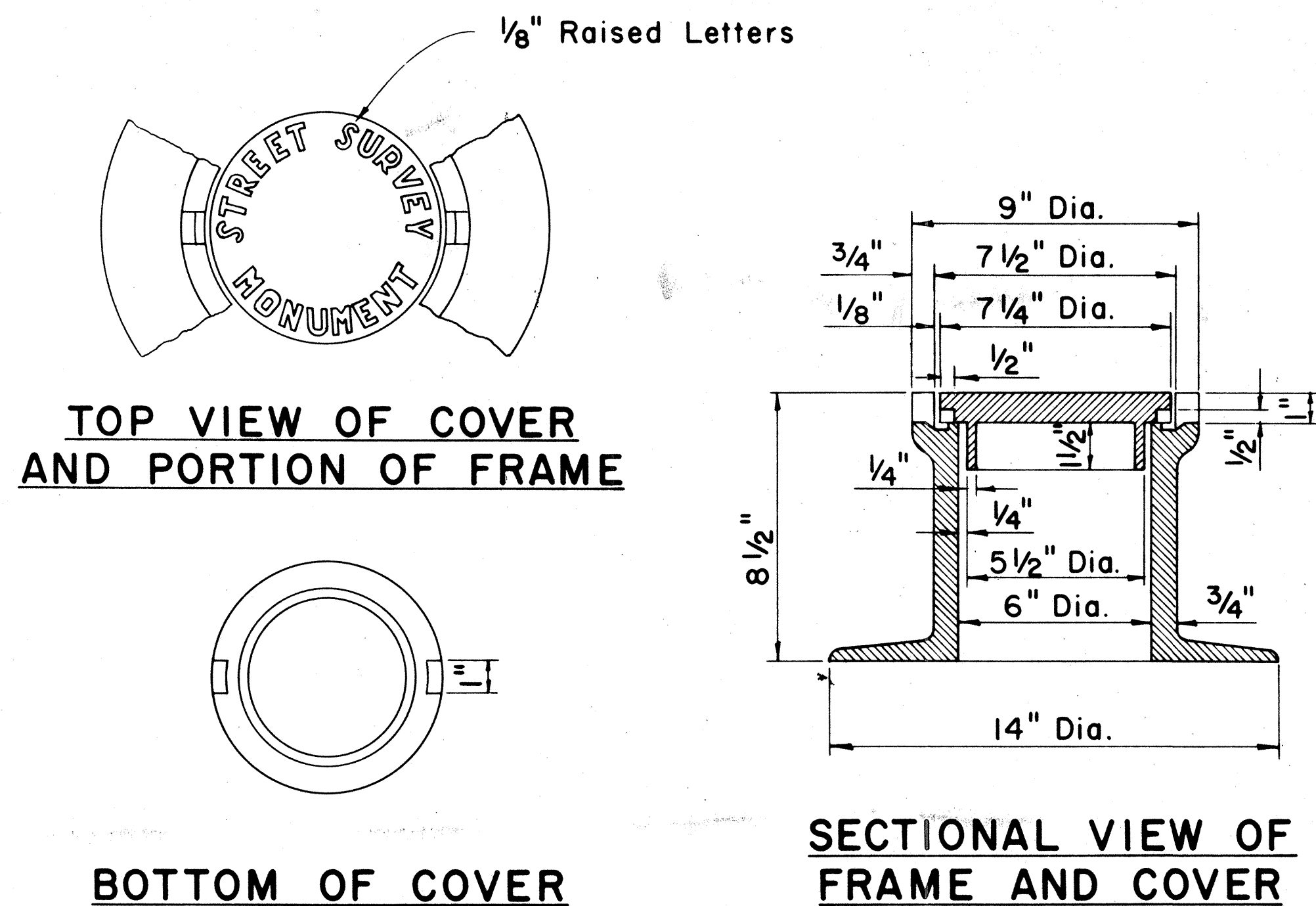
Mike Muna
HIGHWAY DESIGN ENGINEER 6-20-83
DATE

APPROVED:
P. Ojima
ASSISTANT CHIEF, ENGINEERING 6-22-83
DATE

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

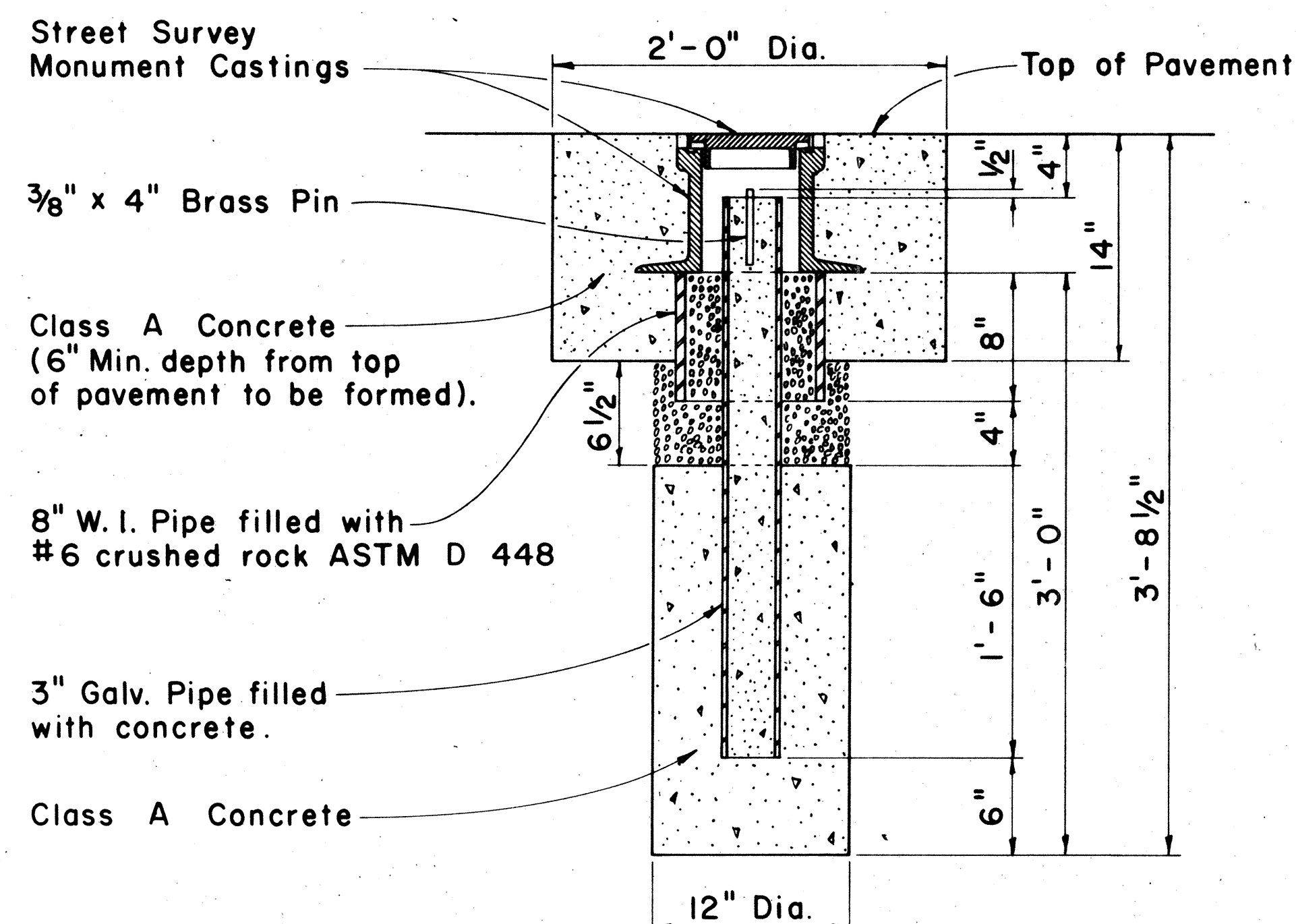
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
STANDARD DETAILS	
CENTERLINE AND REFERENCE SURVEY MONUMENT	
Scale: As Shown	Date: May, 1983
SHEET No. 8 OF 9 SHEETS	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-0185M	1985	21	30



STREET SURVEY MONUMENT CASTINGS

Scale: 3" = 1'-0"

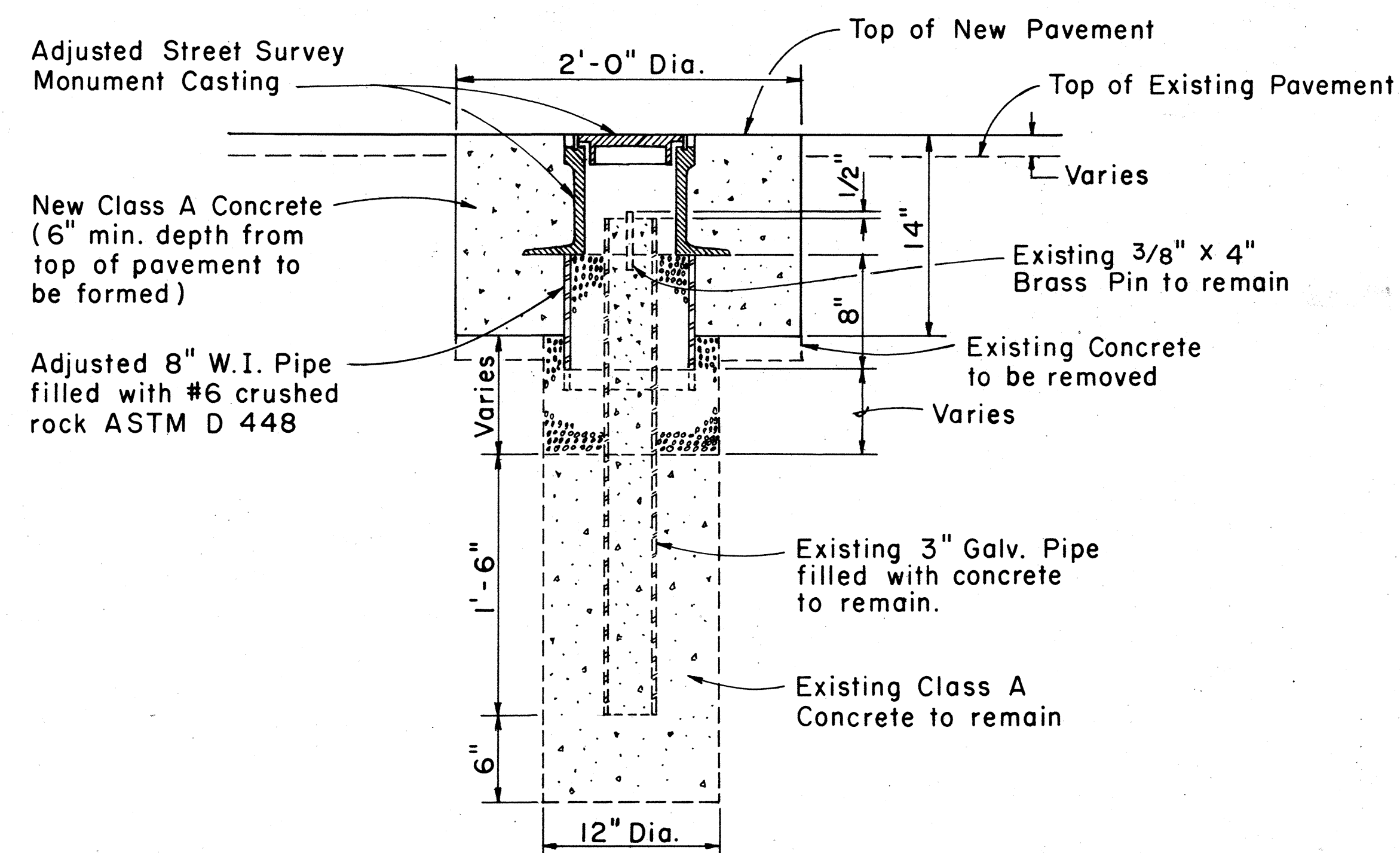


NOTE:

Where the excavation extends into solid rock the depth may be decreased if approved by the Engineer.

STREET SURVEY MONUMENT

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



DETAILS FOR ADJUSTED STREET SURVEY MONUMENT

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

APPROVAL RECOMMENDED:

M. H. H. H. 12-4-69
HIGHWAY DESIGN ENGINEER DATE

APPROVED:

M. H. H. H. 12-10-69
ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE
1	Deleted "Detail For Centerline & Reference Survey Monument," added "Detail For Adjusted Street Survey Monument" and deleted "C & C" Inscription on Cover.	<i>M. H. H. H.</i>	6-22-83

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

STREET SURVEY MONUMENT

SCALE: AS SHOWN

SHEET No. 21 OF 30 SHEETS DD 614.1