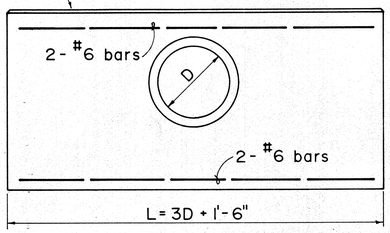
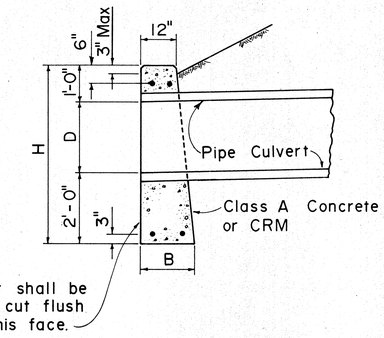
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	~~HES-0100(2)~~	1985	16	47

Chamfer all exposed edges one inch



ELEVATION



SECTION

DATA FOR CONC. HDWL.			
D	B	L	H
18"	1'-6"	6'-0"	4'-6"
24"	1'-6"	7'-6"	5'-0"
30"	2'-0"	9'-0"	5'-6"
36"	2'-0"	10'-6"	6'-0"
42"	2'-6"	12'-0"	6'-6"
48"	2'-6"	13'-6"	7'-0"

DATA FOR CRM HDWL.			
D	B	L	H
18"	1'-9"	6'-0"	4'-6"
24"	2'-0"	7'-6"	5'-0"
30"	2'-3"	9'-0"	5'-6"
36"	2'-6"	10'-6"	6'-0"

CONCRETE OR CRM HEADWALL

APPROVAL RECOMMENDED:

T. Takano — HYDRAULIC DESIGN ENGINEER — 6-19-79 DATE

APPROVED:

Herbert Takeishi — ASSISTANT CHIEF, ENGINEERING — 6-22-79 DATE

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 10 approved 12-17-69	H.T.	6/22/79
2.	Change Class of concrete	H.T.	12/4/80

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CONCRETE OR CEMENT RUBBLE MASONRY HEADWALLS

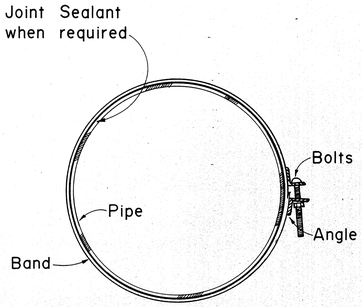
Not To Scale — Date: June 1979

SHEET No. 1 OF 23 SHEETS DH 10

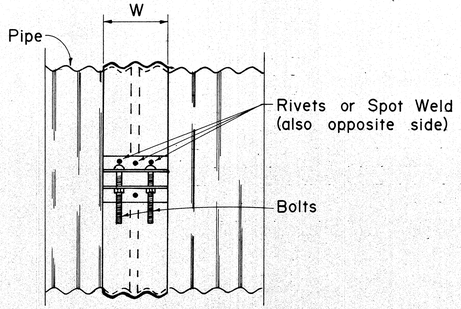
16

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES0100(27)	1985	17	47

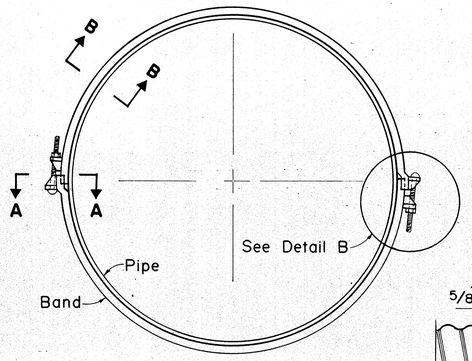


END VIEW

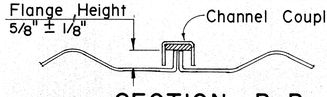


SIDE VIEW

ANNULAR COUPLING BAND

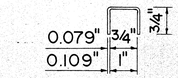


END VIEW

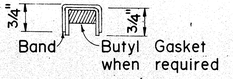


SECTION B-B

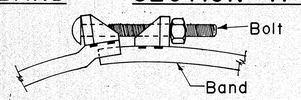
BOX END LUG CONNECTOR



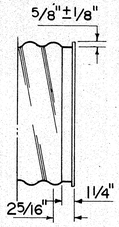
CHANNEL BAND



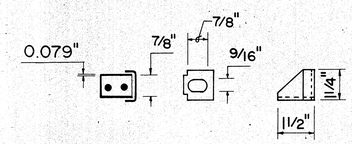
SECTION A-A



DETAIL B



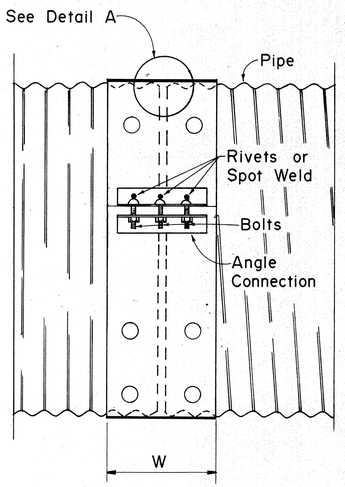
REFORMED END

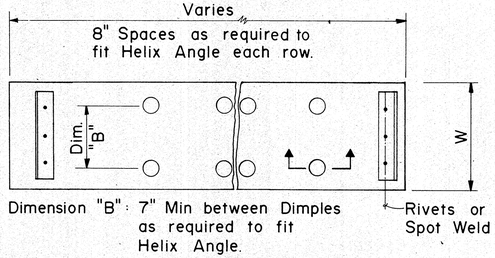


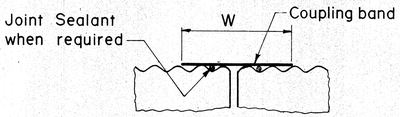
DETAIL LUG

GENERAL NOTES

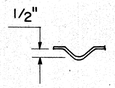
1. All coupling band connection hardware shall be galvanized or electro plated in accordance with Standard Specifications.
2. For pipe arches use same width band as for round pipe of same periphery.
3. Two pieces band required for pipe greater than 48" diameter.
4. Fillet welds of equivalent strengths may be substituted for spot welds or rivets.
5. Dimensions and thickness shown are in inches and are nominal.







DETAIL A

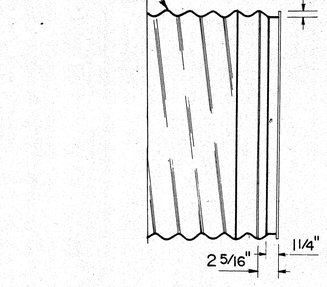


SECTION THRU DIMPLES

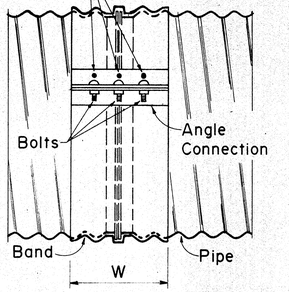
UNIVERSAL COUPLING BAND ANGLE CONNECTION

COUPLING TYPE	CORRUGATION	PIPE SIZE	W	PIPE WALL THICKNESS	ANGLE CONNECTIONS-QUANTITIES PER CONNECTION DIMENSIONS	BOLTS	RIVETS	SPOT WELD
UNIVERSAL	2 2/3 x 1/2	12 - 36	10 1/2	0.075-0.138	2 ea 2 x 2 x 3/16 x 7	2 ea 1/2 x 6	3 ea 3/8	3 ea 1/2
		42 - 60	16 1/2	0.164-0.168	2 ea 2 x 2 x 3/16 x 12	3 ea 1/2 x 6	4 ea 3/8	5 ea 1/2
		66-84	16 1/2	0.164-0.168	2 ea 2 x 2 x 3/16 x 12	3 ea 1/2 x 6	4 ea 3/8	
	3 x 1	36 - 72	10 1/2	0.075-0.138	2 ea 2 x 2 x 3/16 x 7	2 ea 1/2 x 6	3 ea 3/8	
		78-120	16 1/2	0.075-0.138	2 ea 2 x 2 x 3/16 x 12	3 ea 1/2 x 6	4 ea 3/8	
ANNULAR	2 2/3 x 1/2	12 - 36	7	0.075-0.138	2 ea 2 x 2 x 3/16 x 7	2 ea 1/2 x 6	3 ea 3/8	3 ea 1/2
		42 - 72	12	0.075-0.168	2 ea 2 x 2 x 3/16 x 12	3 ea 1/2 x 6	4 ea 3/8	5 ea 1/2
		78 - 84	12	0.164-0.168	2 ea 2 x 2 x 3/16 x 12	3 ea 1/2 x 6	4 ea 3/8	5 ea 1/2
	3 x 1	36 - 42	14	0.075-0.109	2 ea 2 x 2 x 3/16 x 12	3 ea 1/2 x 6	4 ea 3/8	
		48-84	14	0.075-0.109	2 ea 2 x 2 x 3/16 x 12	3 ea 1/2 x 6	4 ea 3/8	5 ea 1/2
		90-120	14	0.075-0.109	2 ea 2 x 2 x 3/16 x 12	3 ea 1/2 x 6	4 ea 3/8	

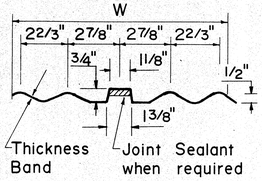
CHANNEL COUPLING BAND FOR USE ON REFORMED END C.M.P.



REFORMED END



SIDE VIEW



SECTION

WING CHANNEL COUPLING BAND FOR REFORMED END H.C.M.P.

COUPLING TYPE	CORRUGATION	PIPE SIZE	W	PIPE WALL THICKNESS	LUG TYPE CONNECTORS-QUANTITIES PER CONNECTION DIMENSIONS	BOLTS	SPOT WELD
CHANNEL	2 2/3 x 1/2	12 - 72		0.075-0.138	2 ea Lugs	1 ea 1/2 x 6	4 ea 1/2
	3 x 1	36 - 72		0.075-0.138	2 ea Lugs	1 ea 1/2 x 6	4 ea 1/2
WING	2 2/3 x 1/2	12 - 72	12	0.075-0.138	6 ea Lugs	3 ea 1/2 x 6	12 ea 1/2
		78-84	12	0.164-0.168	6 ea Lugs	3 ea 1/2 x 6	12 ea 1/2
	3 x 1	36-120	12	0.075-0.109	6 ea Lugs	3 ea 1/2 x 6	12 ea 1/2

APPROVAL RECOMMENDED:
H. Takano — HYDRAULIC DESIGN ENGINEER — 9-7-79 DATE

APPROVED:
Herbert Y. Kataoka — ASSISTANT CHIEF, ENGINEERING — 9-14-79 DATE

NO.	REVISION	APPROVED BY	DATE
1.	Revise pipe wall thickness from table and delete note #6.		9-7-83

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

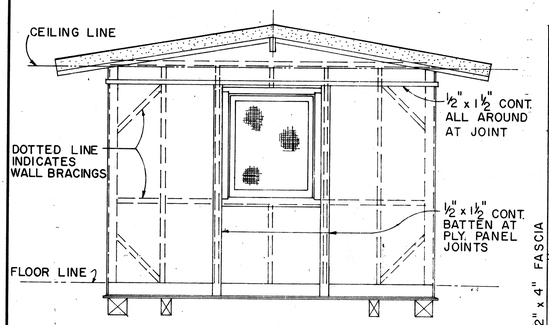
C.M.P. COUPLING DETAILS
STANDARD JOINT

Not To Scale — Date: Sept. 1979

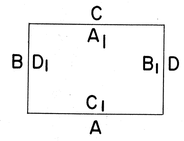
SHEET NO. 2 OF 23 SHEETS DH 18

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

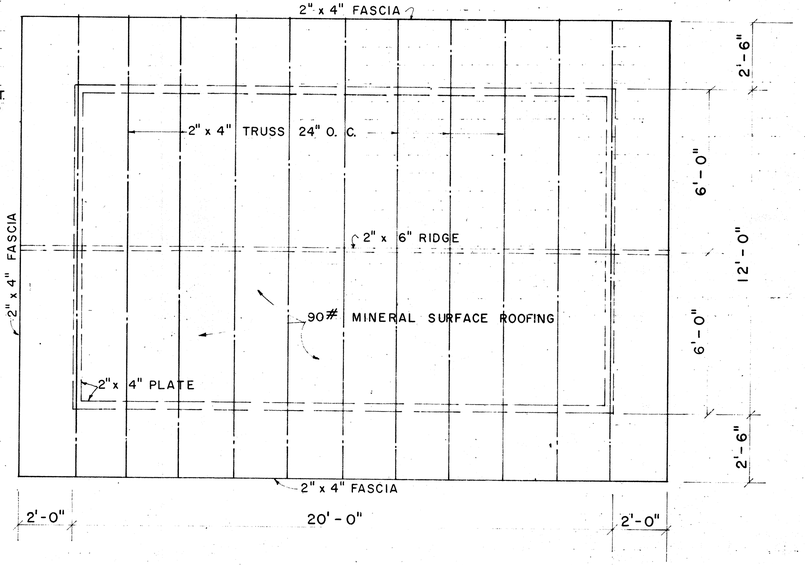
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	HES0100(27)	1985	18	47



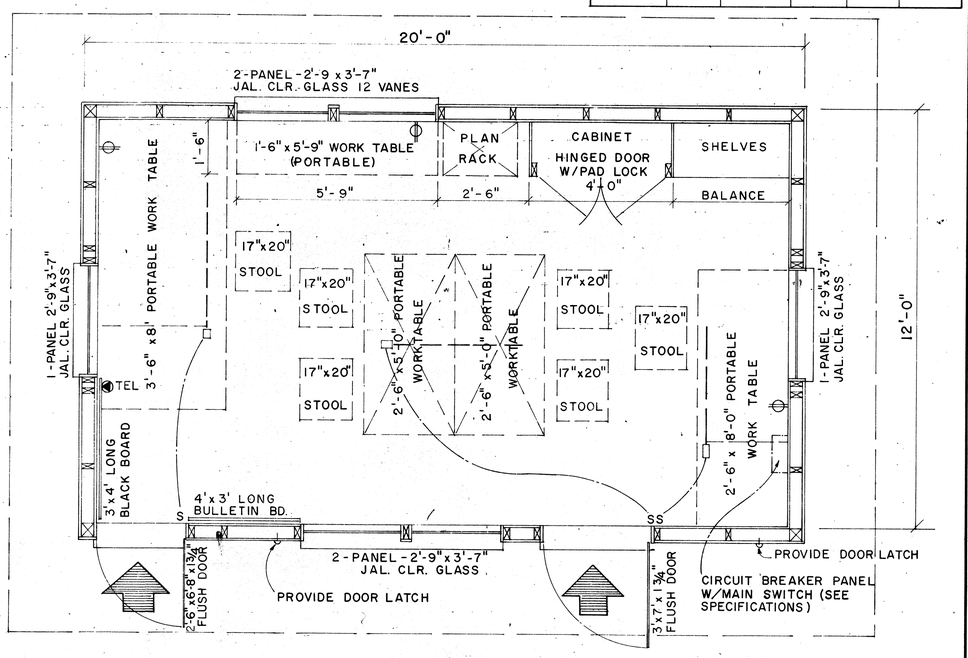
ELEVATION (B)
ELEVATION (D) SIMILAR
SCALE: 3/8" = 1'-0"



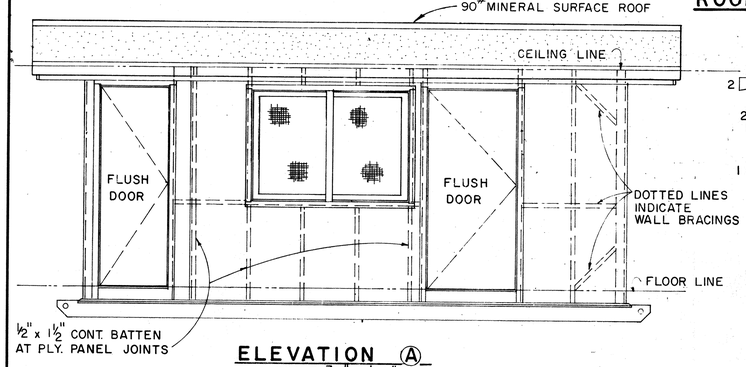
EXTERIOR & INTERIOR KEY



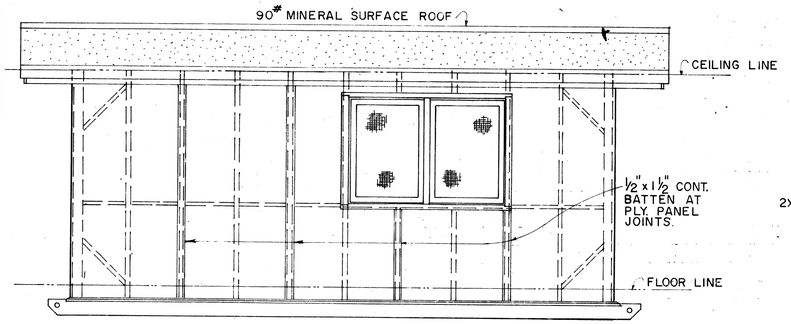
ROOF FRAMING PLAN
SCALE: 3/8" = 1'-0"



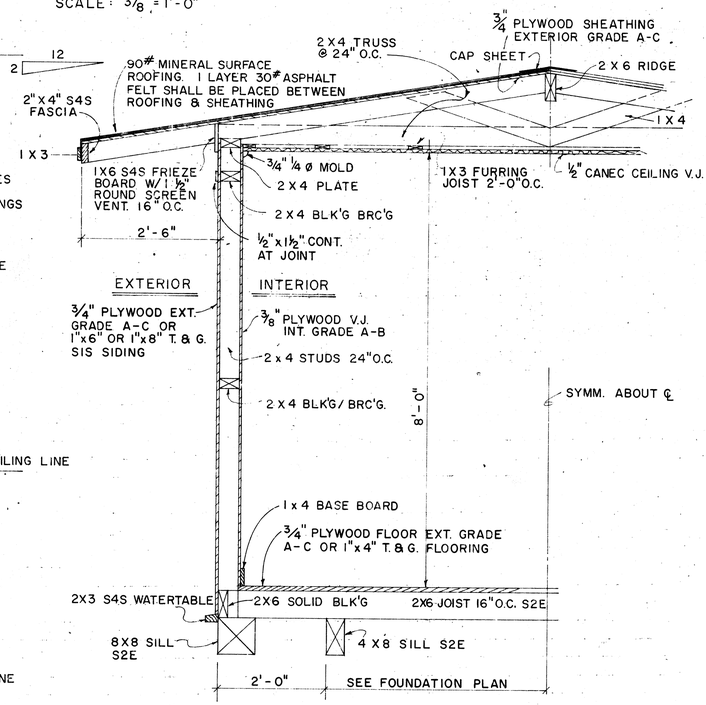
FLOOR PLAN
SCALE: ½" = 1'-0"



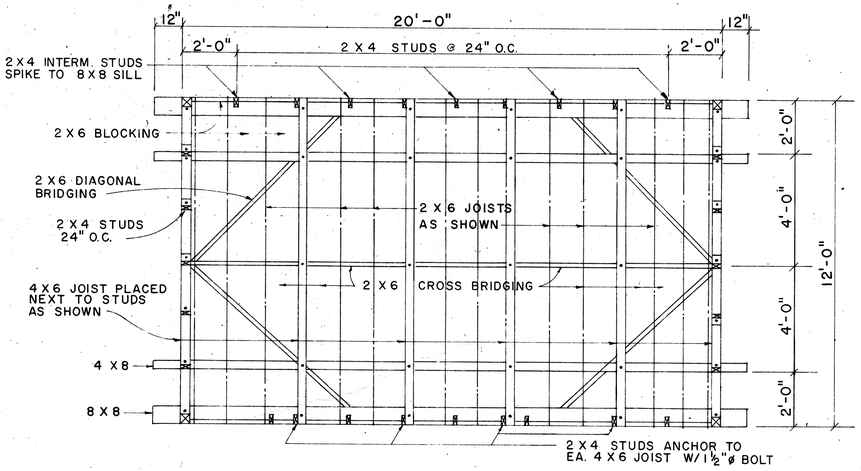
ELEVATION (A)
SCALE: 3/8" = 1'-0"



ELEVATION (C)
SCALE: 3/8" = 1'-0"



TYPICAL WALL SECTION
SCALE: ¾" = 1'-0"



FOUNDATION FRAMING PLAN
SCALE: 3/8" = 1'-0"

APPROVAL RECOMMENDED:
HIGHWAY DESIGN ENGINEER — DATE 12-4-69

APPROVED:
ASSISTANT CHIEF, ENGINEERING — DATE 12-10-69

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

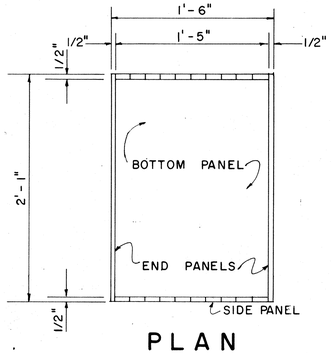
FIELD OFFICE

Scale : As Noted

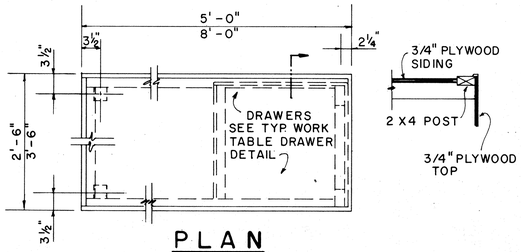
SHEET Nº 3 OF 23 SHEETS | DD 636.1

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

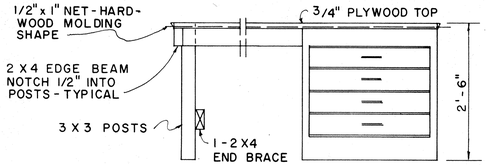
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	HES-0100(27)	1985	19	47



PLAN



PLAN

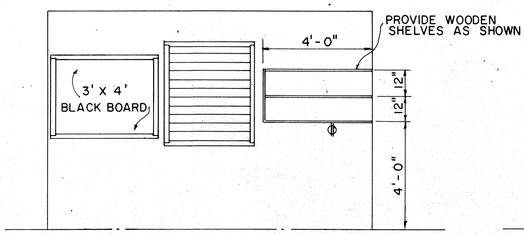


ELEVATION

2'-6" x 5'-0"	2 REQ'D.
3'-6" x 8'-0"	1 REQ'D
2'-6" x 8'-0"	1 REQ'D

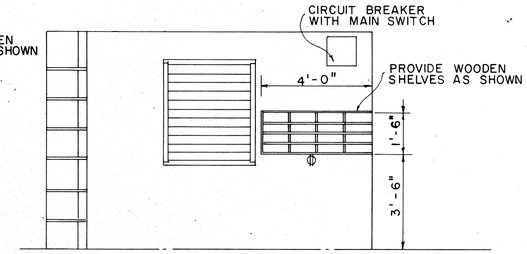
PORTABLE WORK TABLE DETAIL

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



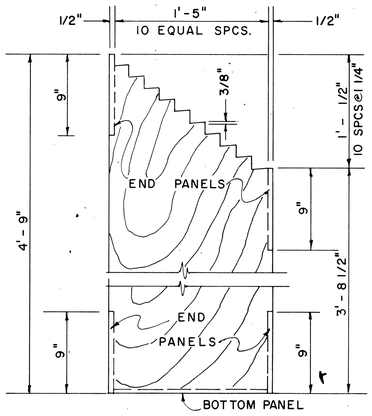
ELEVATION (D1)

SCALE: 3/8" = 1'-0"



ELEVATION (B1)

SCALE: 3/8" = 1'-0"

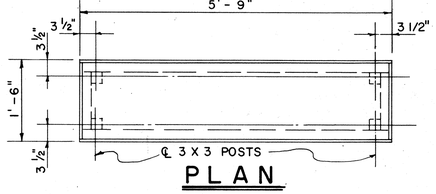


END ELEVATION

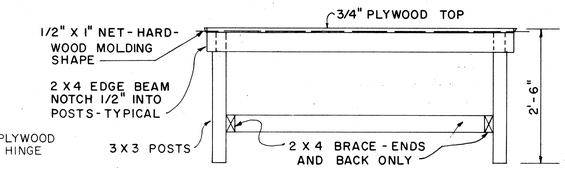
PLAN RACK DETAIL

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

(ONE REQUIRED)



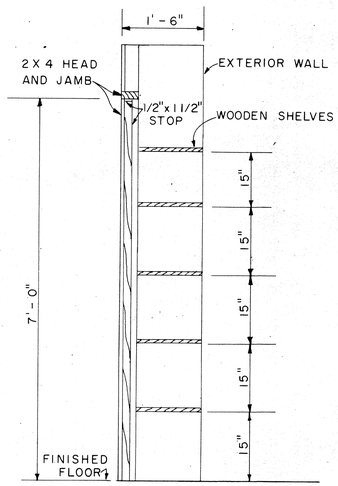
PLAN



ELEVATION

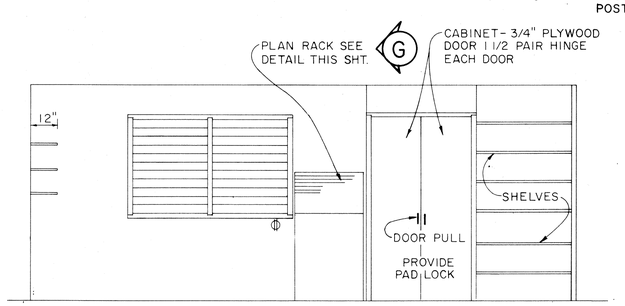
1'-6" x 5'-9" PORTABLE WORK TABLE DETAIL

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



SECTION (G)

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



ELEVATION (A1)

SCALE: 3/8" = 1'-0"

APPROVAL RECOMMENDED

HIGHWAY DESIGN ENGINEER — DATE 12-4-69

APPROVED

ASSISTANT CHIEF, ENGINEERING — DATE 12-10-69

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

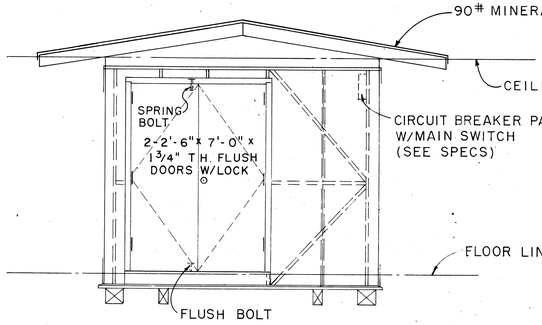
FIELD OFFICE

Scale: As Noted

SHEET No. 4 OF 23 SHEETS | DD 636.2

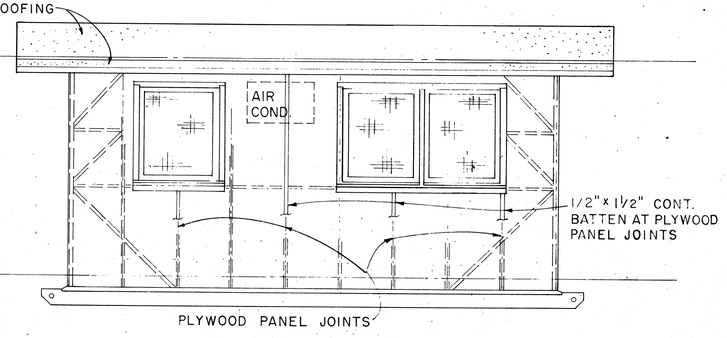
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
	TRACED BY	"
NOTE BOOK	DESIGNED BY	"
	QUANTITIES BY	"
No.	CHECKED BY	"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES0100(27)	1985	20	47



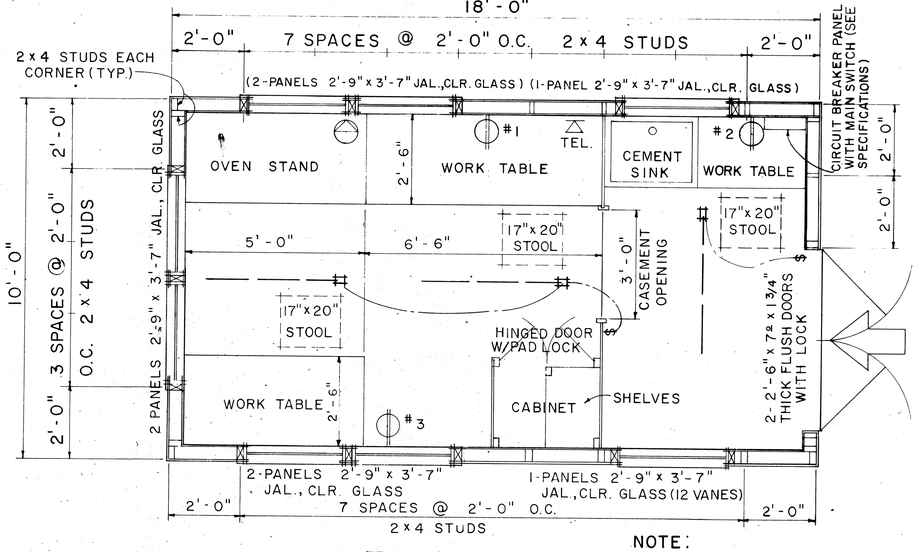
ELEVATION (B)

SCALE: 3/8" = 1'-0"



ELEVATION (A)

SCALE: 3/8" = 1'-0"



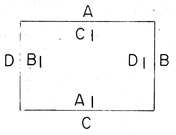
FLOOR PLAN

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

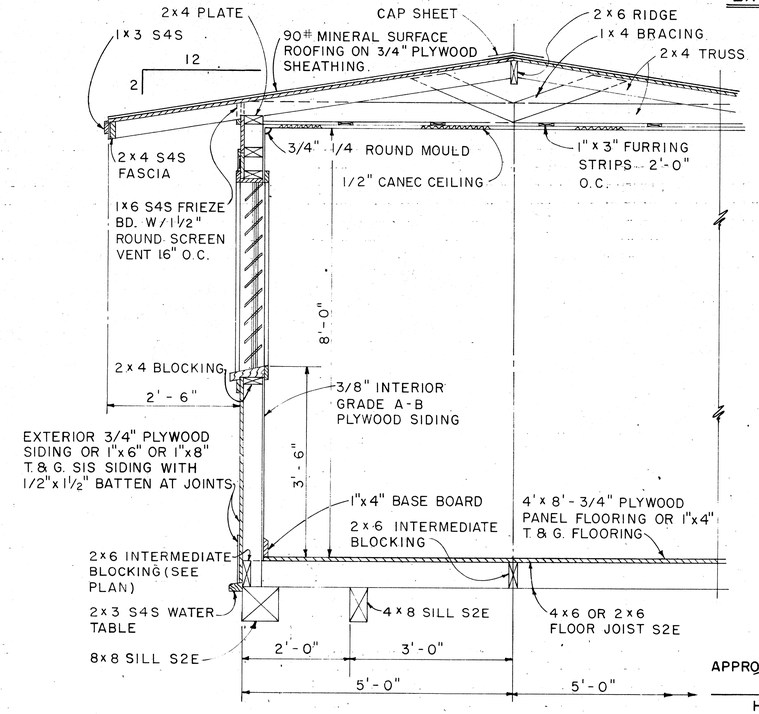
NOTE:

1. FLUORESCENT FIXTURE SHALL BE 48", 2 LAMP, 40 WATT, RAPID START.
2. TELEPHONE AND WALL OUTLET 4'-0" ABOVE FLOOR.

1-LAYER 30# ASPHALT FELT SHALL BE PLACED BETWEEN ROOFING AND SHEATHING.



EXTERIOR & INTERIOR KEY

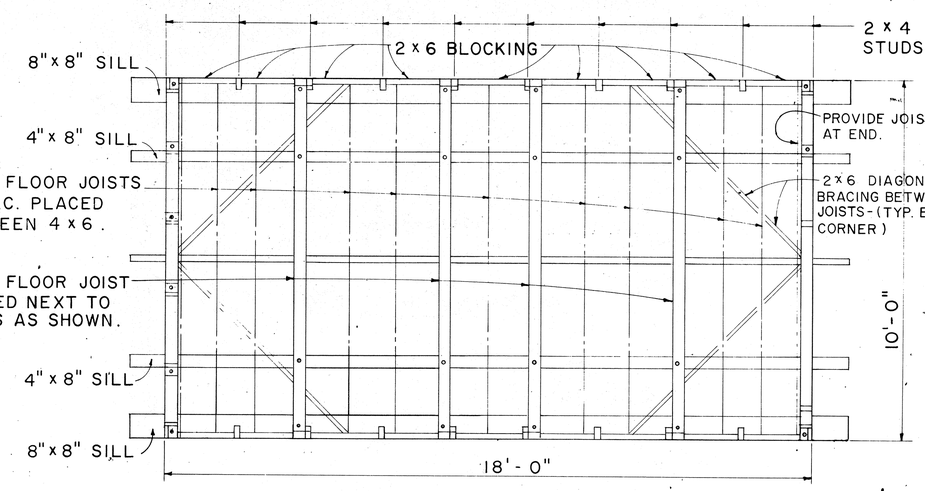


TYPICAL SECTION

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

NOTE:

ALL 3/4" PLYWOOD SHALL BE EXTERIOR GRADE A-C OR BETTER.



FLOOR FRAMING PLAN

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

APPROVAL RECOMMENDED:

HIGHWAY DESIGN ENGINEER — DATE: 12-4-69

APPROVED:

ASSISTANT CHIEF, ENGINEERING — DATE: 12-10-69

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

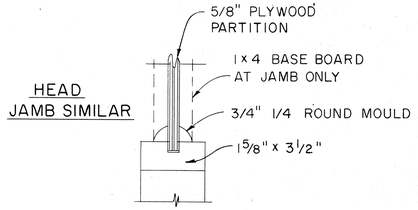
PROJECT SITE LABORATORY

Scale: As Noted

SHEET No. 5 OF 23 SHEETS | DD 636.3

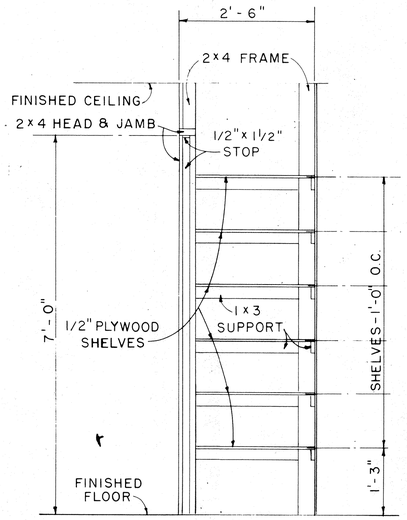
ORIGINAL PLAN | NOTE BOOK No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(27)	1985	21	47



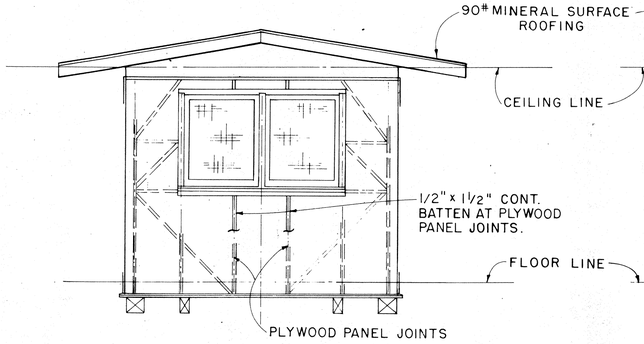
CASEMENT DETAIL

SCALE: 3" = 1'-0"



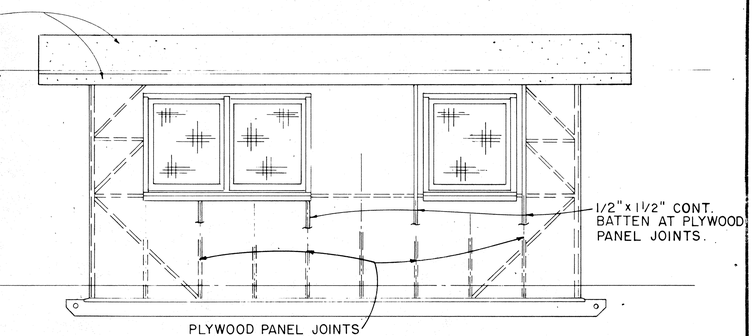
CABINET DETAIL

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



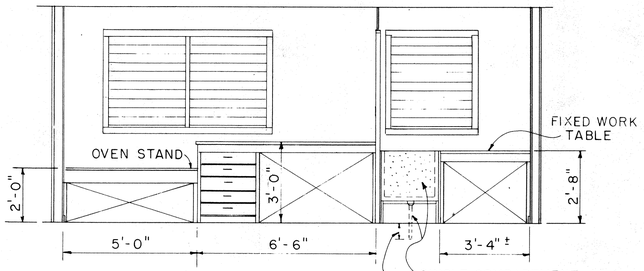
ELEVATION (D)

SCALE: 3/8" = 1'-0"



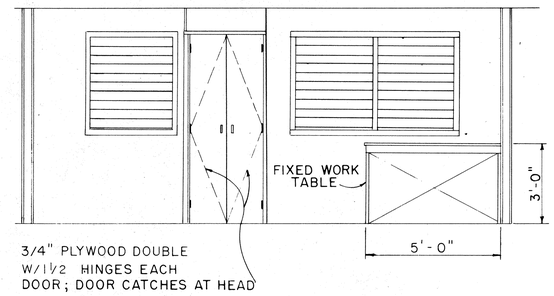
ELEVATION (C)

SCALE: 3/8" = 1'-0"



ELEVATION (C1)

SCALE: 3/8" = 1'-0"



ELEVATION (A1)

SCALE: 3/8" = 1'-0"

APPROVAL RECOMMENDED:

HIGHWAY DESIGN ENGINEER — DATE 12-4-69

APPROVED:

ASSISTANT CHIEF, ENGINEERING — DATE 12-10-69

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

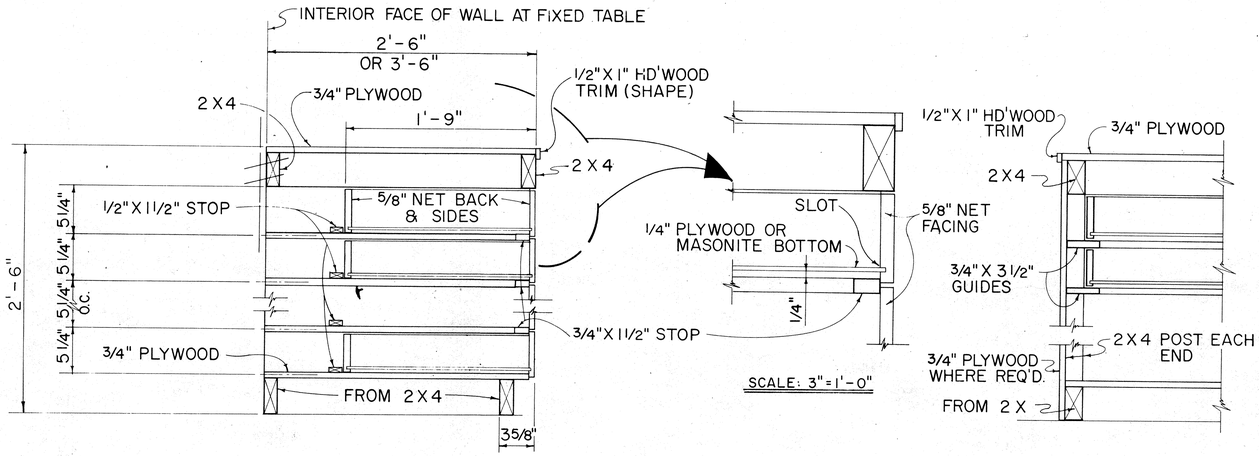
PROJECT SITE LABORATORY

Scale: As Noted

SHEET No. 6 OF 23 SHEETS | DD 636.4

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

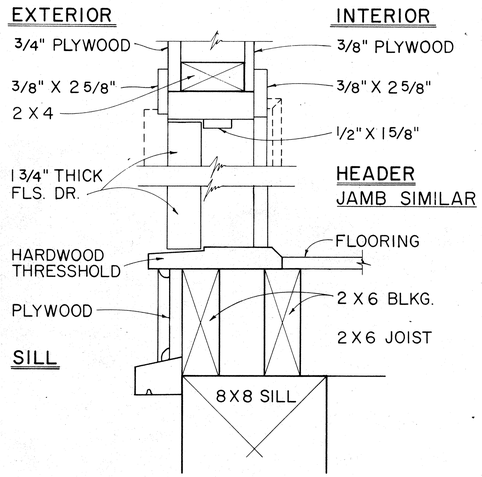
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	HES0100(27)	1985	22	47



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

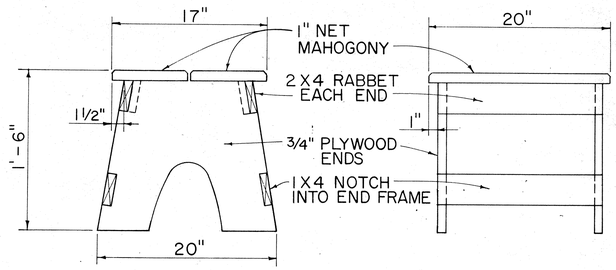
END SECTION
SCALE: 1 1/2"=1'-0"

TYPICAL WORK TABLE DRAWER DETAIL



TYP. SWING OUT DOOR

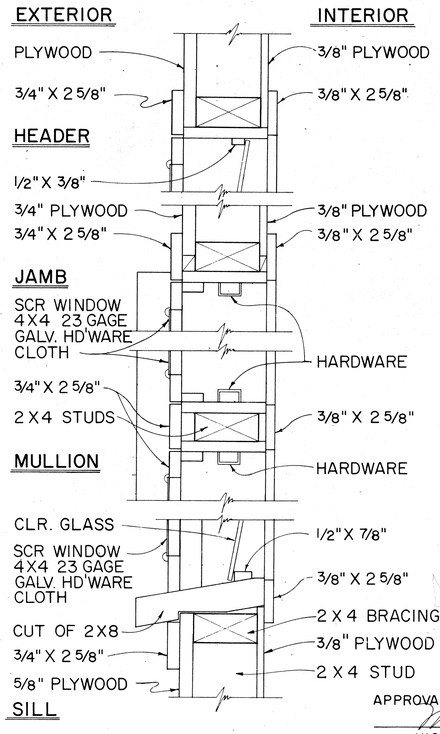
TYPICAL SINGLE OR DOUBLE EXTERIOR DOOR DETAIL



TYPICAL STOOL DETAIL

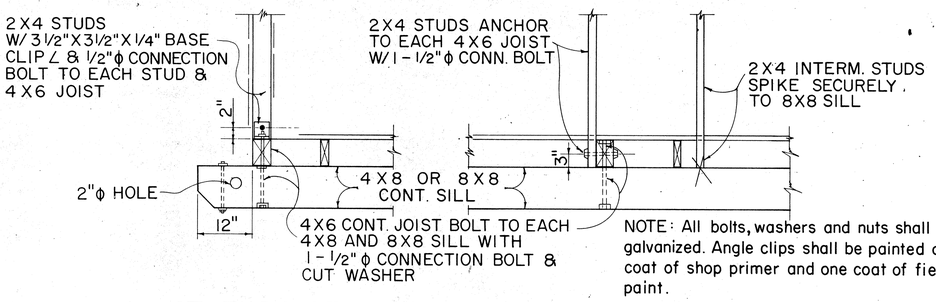
SCALE: 1 1/2"=1'-0"

NOTE: CONTRACTOR MAY WITH THE APPROVAL OF THE ENGINEER FURNISH THE FIELD OFFICE OR PROJECT SITE LABORATORY WITH STOOLS OTHER THAN THE TYPE SHOWN IN THE DETAIL.



TYPICAL DETAIL JALOUSIES WINDOWS

SCALE: 3"=1'-0"



NOTE: All bolts, washers and nuts shall be galvanized. Angle clips shall be painted one coat of shop primer and one coat of field paint.

AT ENDS OF BLDG. ALONG SIDES OF BLDG.

TYPICAL 2X4 STUD & 4X6 FLOOR JOIST BASE CONNECTION DETAILS

APPROVAL RECOMMENDED:
M. Hirogawa
HIGHWAY DESIGN ENGINEER — DATE 12-4-69

APPROVED:
Walter S. Sakai
ASSISTANT CHIEF, ENGINEERING — DATE 12-10-69

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

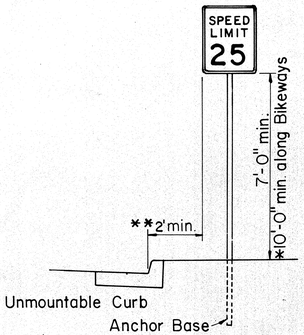
FIELD OFFICE
&
PROJECT SITE LABORATORY

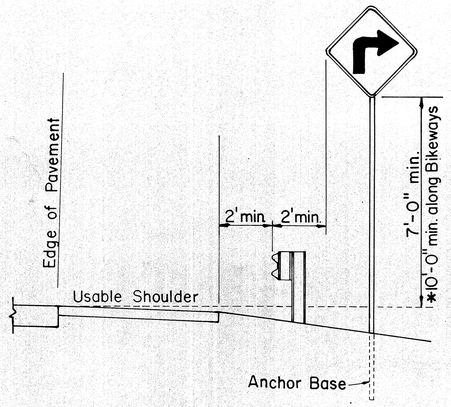
Scale As Noted

SHEET No. 7 OF 23 SHEETS | DD 636.5

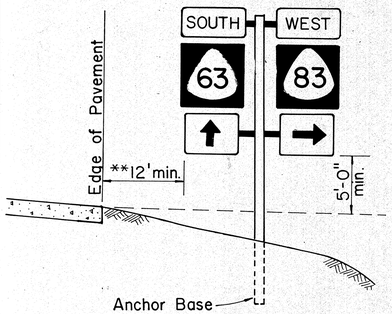
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
NOTE BOOK	TRACED BY	"
	DESIGNED BY	"
No.	QUANTITIES BY	"
	CHECKED BY	"

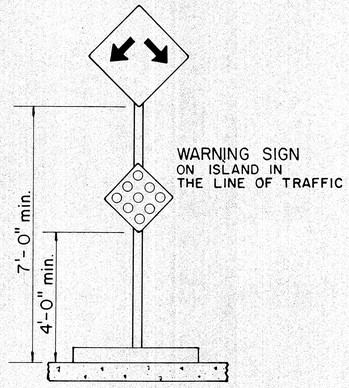
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES0100(27)	1985	23	47

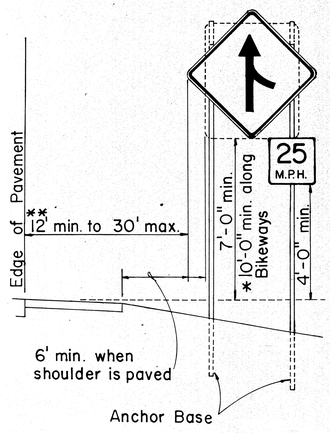


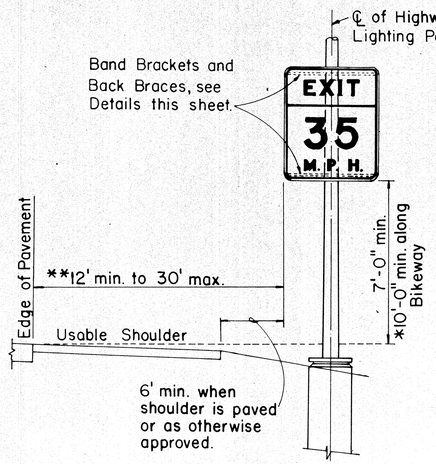


ROADSIDE ASSEMBLY
RURAL DISTRICT

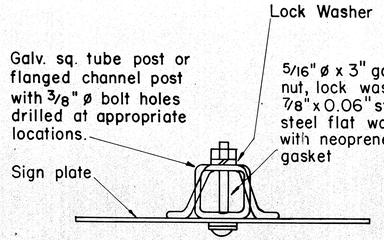








HEIGHT AND LATERAL LOCATION OF SIGNS TYPICAL INSTALLATION



GALVANIZED SQUARE TUBE OR FLANGED CHANNEL POST

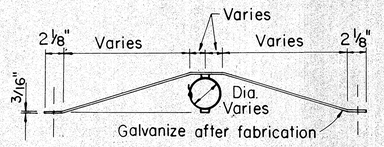
GENERAL NOTES

1. Signs shall be placed in conformance with positions shown and described in the "Manual on Uniform Traffic Control Devices for Streets and Highways", 1978, Part II, Section 2A-21, as amended, and as supplemented herein.
2. Sign 48" and wider or larger than 10 sq. ft. in area shall be mounted on two or more sign posts except as noted below.
3. Signs 48" and wider or larger than 10 sq. ft. in area may be mounted on objects other than sign posts (i.e. on highway lighting poles) as follows:
   a. Signs 48" and wider but less than 10 sq. ft. in area shall be mounted with a minimum of two sets of band brackets and back braces.
   b. Signs larger than 10 sq. ft. and less than 28 sq. ft. in area shall be mounted with a minimum of two sets of band brackets and back braces.
   c. Signs larger than 28 sq. ft. in area shall be mounted with a minimum of three sets of band bracket and back braces.
4. All parking restriction signs with arrows shall be mounted 45° to the line of traffic flow.
5. Sign posts shall extend 3 1/2" above each sign, where required, for attachment of City and County street name signs.
6. (R) or (L) indicates right or left and shown on the plans.

* 7. See plans for special details of signs along bikeways.

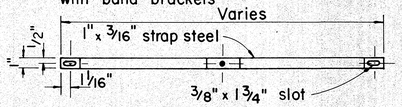
** 8. The minimum lateral distances shown are guidelines and shall be exceeded whenever possible. The Contractor shall place signs at the maximum practical lateral distance from the edge of the traveled way up to 30 feet and shall utilize protected locations whenever possible. Final locations of all signs shall be approved by the Engineer.

9. Signs in medians shall be placed at midpoint of median up to a maximum distance of 30 feet from the edge of traveled way. When appropriate, signs for opposing directions shall be placed back to back.
10. Anchor bases shall be installed for all signpost installations, unless otherwise shown or directed. See sheets DT 100A and DT 100B.



PLAN

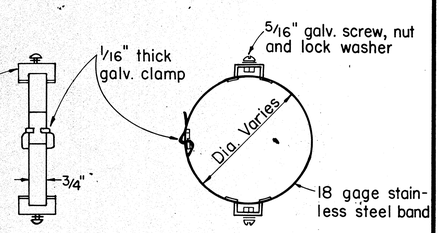
Back braces shall be used in conjunction with band brackets



ELEVATION

BACK BRACE

Additional. Required for bidirectional mounting or when used in conjunction with band brackets.



LEFT SIDE VIEW PLAN

BAND BRACKET

TYPICAL MOUNTING DETAILS

NO.	REVISION	APPROVED BY	DATE
1	Supercedes Sht. DT 100 approved 11/15/77		10-18-83

APPROVAL RECOMMENDED:
Eiichi Tanaka — TRAFFIC ENGINEER — 10/14/83 DATE

APPROVED:
[signature] — ASSISTANT CHIEF, ENGINEERING — 10-18-83 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

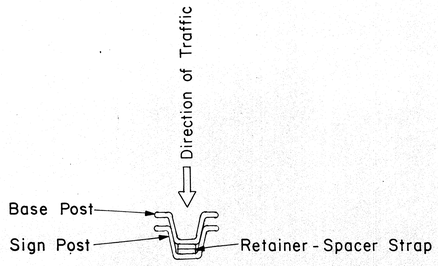
MISCELLANEOUS SIGN DETAILS

Not to Scale: Oct. 1983

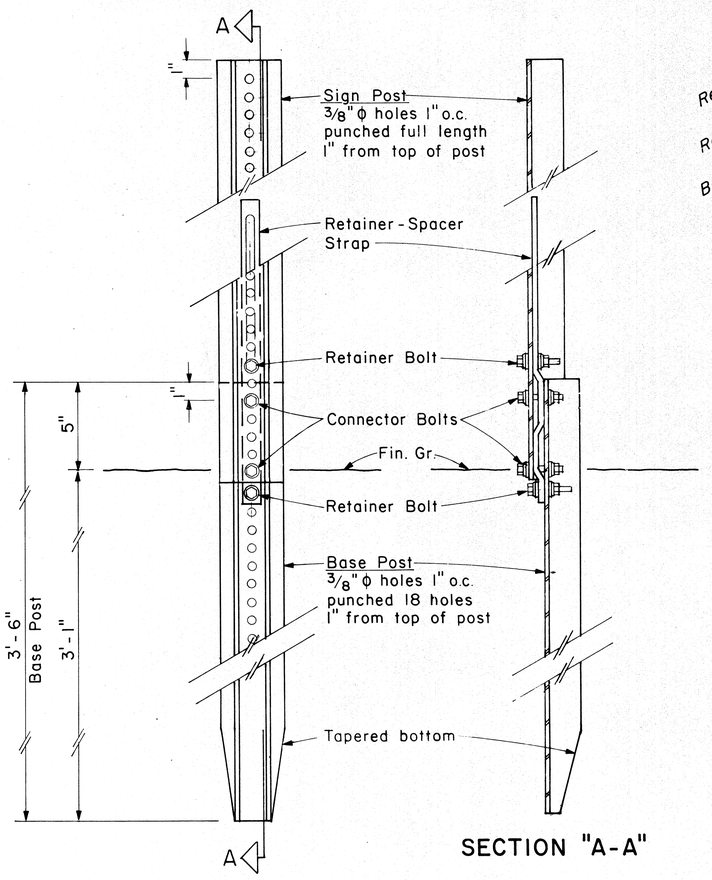
SHEET No. 8 OF 23 SHEETS DT 100

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(27)	1985	24	47



TOP VIEW

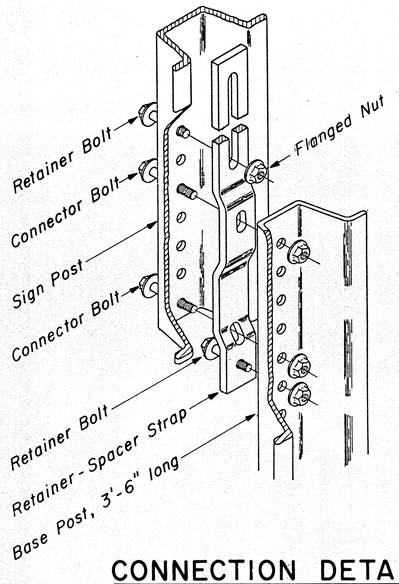


BACK VIEW

SECTION "A-A"

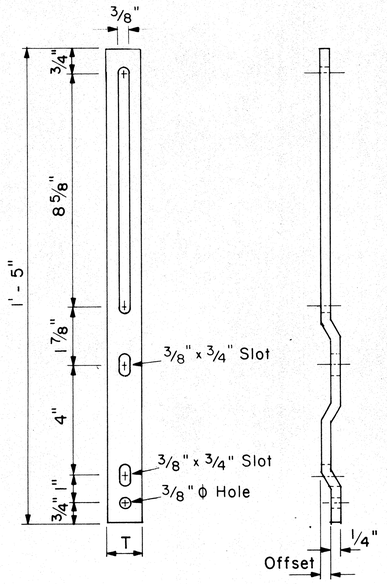
ANCHOR BASE DETAIL

Scale: 3" = 1'-0"



CONNECTION DETAIL

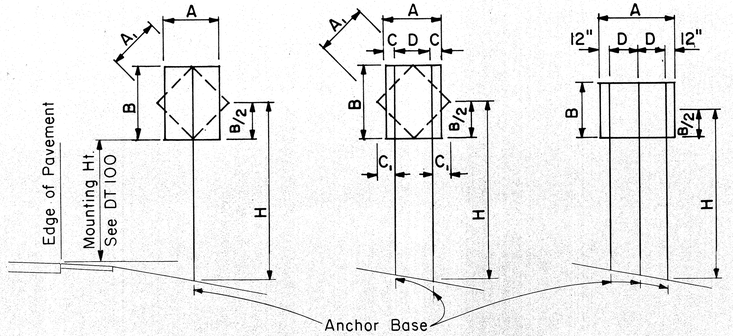
Not to Scale



RETAINER-SPACER STRAP

Not to Scale

RETAINER-SPACER STRAP		
Post Size	T	Offset
2.50 lbs./ft.	1.00"	0.145"
4.00 lbs./ft.	1.12"	0.280"



1-POST
Sign area 10 sq.ft. and less

2-POST
Sign area greater than 10 sq.ft. or A = 48" - 60"

3-POST
A = greater than 60"

TYPICAL INSTALLATION

Not to Scale

FLANGED CHANNEL: 1-POST INSTALLATION								
Post Size	A x B x H (Factor)	H = Ground Level to Midpoint (ft.)						A x B (Area, sq.ft.)
		7	8	9	10	11	12	
2.50 lbs./ft.	57	8.14	7.13	6.33	5.70	5.18	4.75	
4.00 lbs./ft.	112	–	–	–	–	–	9.33	

FLANGED CHANNEL: 2-POST INSTALLATION								
Post Size	A x B x H (Factor)	H = Ground Level to Midpoint (ft.)						A x B (Area, sq.ft.)
		7	8	9	10	11	12	
2.50 lbs./ft.	124	17.71	15.50	13.77	12.40	11.27	10.33	
4.00 lbs./ft.	241	34.43	30.13	26.78	24.10	21.91	20.08	

FLANGED CHANNEL: 3-POST INSTALLATION								
Post Size	A x B x H (Factor)	H = Ground Level to Midpoint (ft.)						A x B (Area, sq.ft.)
		7	8	9	10	11	12	
2.50 lbs./ft.	187	26.71	23.38	20.78	18.70	17.00	15.58	
4.00 lbs./ft.	362	51.71	45.25	40.22	36.20	32.91	30.17	

WINDLOAD CHARTS

A or A,	C	C,
36"	6"	–
48"	9"	19"
60"	12"	24"

NOTE: Frame stiffeners are required when D is greater than 24". See Gen. Note 4.

GENERAL NOTES

1. Sign posts and base posts shall be flanged channel type structural steel conforming to ASTM A 499 and galvanized in accordance with ASTM A 123.
   NOMINAL DIMENSIONS:
   2.50 lbs./ft. - 3.125" x 1.562"
   4.00 lbs./ft. - 3.500" x 1.750"
2. Retainer - Spacer Strap shall be AISI 1020 steel and galvanized in accordance with ASTM A 123.
3. Retainer and Connector Bolts shall be 5/16 - 18 UNC x 1.75" long. hex. head, integral flange conforming to ASTM A 354 Grade BC. Nuts shall be 5/16 - 18 UNC hex. head, integral flange conforming to ASTM A 563 Grade D. All bolts and nuts shall be cadmium plated per Federal spec. QQP 416 B, Class 2, Type 2.
4. All accessories, fittings and stiffener details (as required) shall be submitted to Engineer for approval 20 days prior to installation.
5. For additional details see sht. DT 100.
6. Basic formulas for use with the windload charts:
   Factor = A x B x H
   Therefore, if sign area (A x B) is known,
   Maximum H = $\frac{\text{Factor}}{\text{sign area (A x B)}}$
   and if H is known,
   Maximum sign area (A x B) = $\frac{\text{Factor}}{H}$

APPROVAL RECOMMENDED:

Eiichi Tanaka — 9/21/82
TRAFFIC ENGINEER — DATE

APPROVED:

[illegible] — 9/20/82
ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

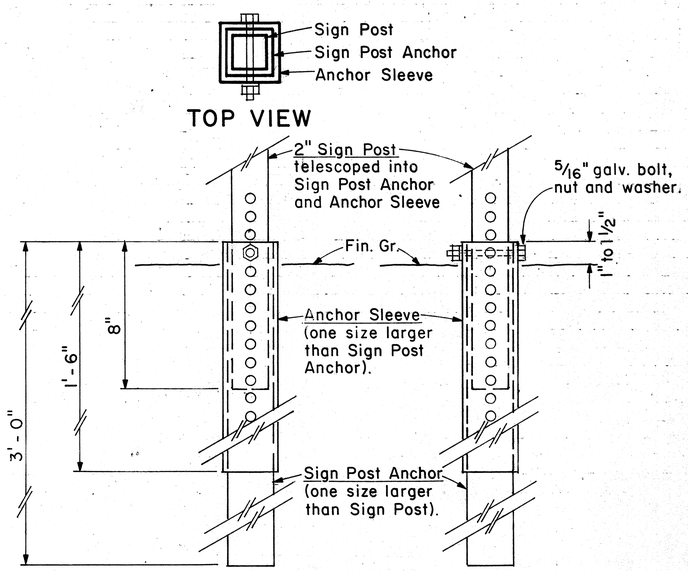
GALVANIZED FLANGED CHANNEL SIGN POST MOUNTING

Scale: As Shown — Date: Sept. 1982

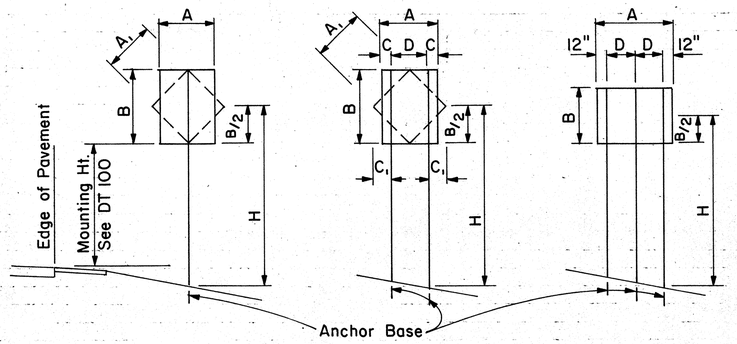
SHEET No. 9 OF 23 SHEETS DT 100A

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(27)	1985	25	47



2" SIGN POST INSTALLATION



1 - POST
Sign area 10 sq. ft. and less

2 - POST
Sign area greater than 10 sq. ft. or A = 48" - 60"

3 - POST
A = greater than 60"

TYPICAL INSTALLATION

Not to Scale

A or A1	C	C1
36"	6"	-
48"	9"	19"
60"	12"	24"

NOTE: Frame stiffeners are required when D is greater than 24". See Gen. Note 2.

SQUARE TUBE: 1 - POST INSTALLATION								
Post Size	A x B x H (Factor)	H = Ground Level to Midpoint (ft.)						A x B (Area, sq. ft.)
		7	8	9	10	11	12	
2"	62	8.8	7.7	6.8	6.1	5.6	4.8	
2 1/2"	107	-	-	-	-	9.6	8.8	

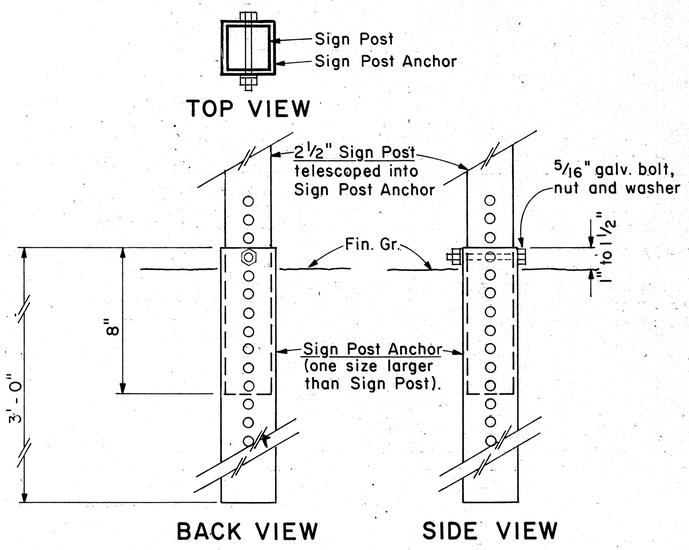
SQUARE TUBE: 2 - POST INSTALLATION								
Post Size	A x B x H (Factor)	H = Ground Level to Midpoint (ft.)						A x B (Area, sq. ft.)
		7	8	9	10	11	12	
2"	122	17.4	15.2	13.5	12.2	11.0	10.1	
2 1/2"	212	30.2	26.5	23.5	21.1	19.2	17.6	
2 1/2", 10 ga.	260	37.0	32.0	28.6	26.0	23.5	21.5	

SQUARE TUBE: 3 - POST INSTALLATION								
Post Size	A x B x H (Factor)	H = Ground Level to Midpoint (ft.)						A x B (Area, sq. ft.)
		7	8	9	10	11	12	
2"	183	26.0	22.8	20.3	18.2	16.6	15.2	
2 1/2"	318	45.4	39.5	35.2	31.5	28.8	26.5	
2 1/2", 10 ga.	388	55.0	48.5	43.0	38.5	35.0	32.0	

WINDLOAD CHARTS

GENERAL NOTES

1. Square tube sign posts shall conform to Subsection 713.11(C) Square Tube Posts of the Specifications.
2. All accessories, fittings and stiffener details (as required) shall be submitted to Engineer for approval 20 days prior to installation.
3. Square tube posts shall be perforated with 7/16" ϕ holes, 1" o.c., 4 sides, along entire length of post.
4. All posts shall be 12 gage unless otherwise specified or shown on the plans.
5. For additional details see sht. DT 100.
6. Basic formulas for use with the windload charts:
   Factor = A x B x H
   Therefore, if sign area (A x B) is known,
   Maximum $H = \frac{\text{Factor}}{\text{sign area}(A \times B)}$
   and if H is known,
   Maximum sign area $(A \times B) = \frac{\text{Factor}}{H}$



2 1/2" SIGN POST INSTALLATION

ANCHOR BASE DETAIL

Scale: 3" = 1'-0"

APPROVAL RECOMMENDED:

Eiichi Tanaka — 9/21/82
TRAFFIC ENGINEER — DATE

APPROVED:

Herbert Takeshita — 9/22/82
ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

GALVANIZED SQUARE TUBE SIGN POST MOUNTING

Scale: As Shown — Date: Sept. 1982

SHEET No. 10 OF 23 SHEETS DT100B

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

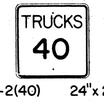
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES0100(27)	1985	26	47

R1-1 30"x30"
R1-1-A 36"x36"

R1-3 12"x6"
R1-3-A 18"x9"

R1-2 36"x36"x36"
R1-2-A 48"x48"x48"

R2-1(50) 24"x30"
R2-1(50)-A 48"x60"



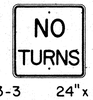
R2-2(40) 24"x24"
R2-2(40)-A 48"x48"

R2-4a(50/40) 24"x48"
R2-4a(50/40)-A 48"x96"

R2-5b(30) 24"x30"
R2-5b(30)-A 48"x60"

R3-1 24"x24"
24"x18"
R3-1-A 48"x48"
48"x36"

R3-2 24"x24"
24"x18"
R3-2-A 48"x48"
48"x36"



R3-3 24"x24"
R3-3-A 48"x48"

R3-4 24"x24"
24"x18"
R3-4-A 4"x4r"
48"x36"

R3-5(L) 30"x36"
R3-5(L)-A 48"x60"

R3-6(L) 30"x36"
R3-6(L)-A 48"x60"

R3-7(R) 30"x30"
R3-7(R)-A 48"x48"

R3-8(L) 30"x30"
R3-8(L)-A 36"x36"
R3-8(L)-B 48"x48"

R3-9 24"x30"

R4-1 24"x30"

R4-2 24"x30"

R4-3 24"x30"
R4-3-A 48"x60"

R4-5 24"x30"

R4-6(500) 24"x30"

R4-7 24"x30"
24"x18"

R4-8 24"x30"
24"x18"

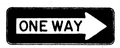
R5-1 30"x30"
R5-1-A 48"x48"

R5-2 24"x24"
24"x18"

R5-4 24"x30"

R5-6 24"x24"
24"x18"

R5-9 36"x24"



R6-1(R) 36"x12"

R6-2(R) 18"x24"

R7-1 12"x18"
R7-1-A 24"x30"

R7-4 12"x18"
R7-4-A 24"x30"

R7-107(R) 12"x18"

R7-108 12"x18"

R7-201 12"x6"
R7-201-A 24"x12"

R8-1 24"x30"

R8-2 24"x30"

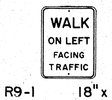
R8-3 24"x30"

R8-4 30"x24"
R8-4-A 48"x36"

R8-5 24"x30"

R8-6 24"x30"

R8-7 30"x24"
R8 7-A 48"x36"



R9-1 18"x24"

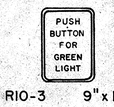
R9-2 12"x18"

R9-3 12"x18"

R9-4 18"x24"

R10-1 12"x18"

R10-2 12"x18"



R10-3 9"x12"

R10-4 9"x12"

R10-5 24"x30"

R10-6 24"x36"

R10-7 24"x30"

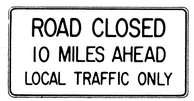
R10-8 24"x30"

R10-9 24"x30"

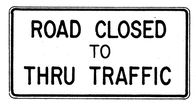
R10-10 24"x30"

R11-1 24"x30"

R11-2 48"x30"



R11-3(10) 60"x30"



R11-4 60"x30"

R12-1(10) 24"x30"

GENERAL NOTES

1. Sign details shall conform to the FHWA publications "Manual on Uniform Traffic Control Devices for Streets and Highways," 1971, and "Standard Highway Signs," 1972, and as amended.
2. All regulatory signs shall be reflectorized unless otherwise specified.
3. All regulatory signs shall have $\frac{3}{8}$" bolt holes drilled at appropriate locations.
4. Numerals in ( ) indicates numerals to be inserted for sign message. (R) or (L) indicates right or left.
5. All signs shall be erected without educational plaques unless called for in the plans.

APPROVAL RECOMMENDED:
Eiichi Tanaka 3/17/72
TRAFFIC ENGINEER DATE

APPROVED:
Talbert Jackson 3-20-72
ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE
1	Supersedes Sht. DT 101 Approved 12-30-69	H.I.	3/20/72
2	Revised General Note 1.	H.I.	10/10/74
3	Added General Note 5	H.I.	8/3/79

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

REGULATORY SIGNS

NOT TO SCALE

SHEET No. 11 OF 23 SHEETS DT 101

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

K&E IMPERIAL LA 3207

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(27)	1985	27	47

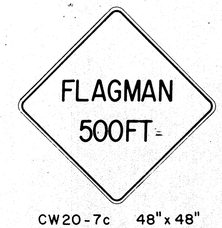
CW20-1a 48"x48"

CW20-2d 48"x48"

CW20-3b 48"x48"

CW20-4d 48"x48"

CW20-5d(L) 48"x48"



CW20-7c 48"x48"

CW21-1 30"x30"

CW21-2 30"x30"

CW21-3 36"x36"

CW21-4 36"x36"

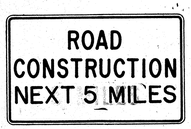
CW21-5 30"x30"

CW21-6 30"x30"

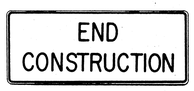
CW22-1b 48"x48"

CW22-2 42"x36"

CW22-3 42"x36"



CG20-1(5) 60"x36"



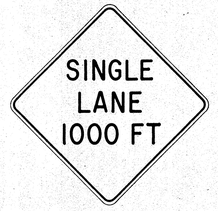
CG20-2 60"x24"

CM4-9(R) 30"x24"

CM4-10(R) 48"x18"

CG20-4 36"x18"

CW23-1 36"x36"



CW23-2b 48"x48"

CW23-3(R) 48"x48"

GENERAL NOTES

1. Sign details shall conform to the FHWA publications "Manual on Uniform Traffic Control Devices for Streets and Highways," 1971, and "Standard Highway Signs," 1972, and as amended.
2. All construction signs shall be reflectorized.
3. All construction signs shall have $^{3}/_{8}$" bolt holes drilled at appropriate locations.
4. Numerals in ( ) indicates numerals to be inserted for sign message. (R) or (L) indicates right or left.
5. For "CW" series signs, suffixes a,b,c and d are as follows: a-1500 FT, b-1000 FT, c-500 FT and d-AHEAD.

APPROVAL RECOMMENDED:
Eiichi Tanaka 3/21/12
TRAFFIC ENGINEER DATE

APPROVED:
Walter Zaleski 3/23/12
ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE
1	Supersedes Sht. DT 104 Approved 12-30-69	H.T.	3/23/72
2	Revised General Note 1	H.T.	10/10/74
3	Revised General Note 2	MF	9-16-75
4	Revised General Note 2 and sign CG20-1(5)	H.T.	9-14-76

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CONSTRUCTION SIGNS

NOT TO SCALE

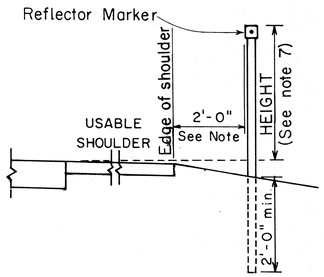
SHEET No. 12 OF 23 SHEETS DT 104

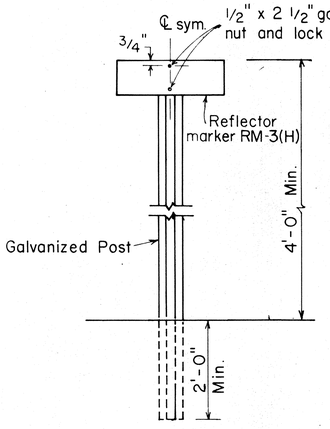
ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE
NOTE BOOK
No.

K&E IMPERIAL LA 3207

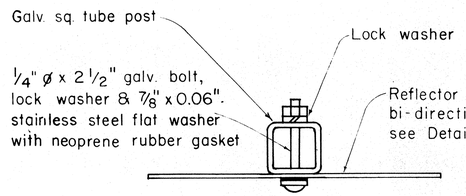
27

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(27)	1985	28	47

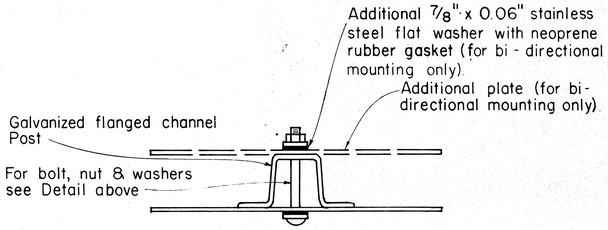




REFLECTOR MARKER MOUNTING DETAIL



GALVANIZED SQUARE TUBE POST

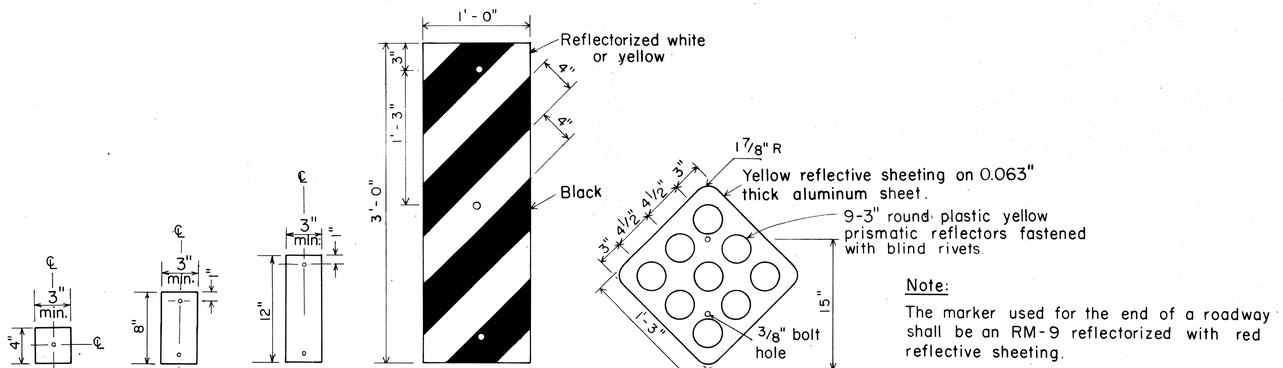


GALVANIZED FLANGED CHANNEL POST

TYPICAL MOUNTING DETAILS

GENERAL NOTES:

1. Clearance markers (RM-3, RM-4) shall be installed with the edge of the marker in line with the inner edge of the obstruction.
2. (R) or (L) indicates right or left and shall be as shown on the plans.
3. Reflector markers RM-1 and RM-2 shall be:
   a) Yellow if placed along the left edge of divided roadways, one-way roadways, and ramps in the direction of travel.
   b) White if placed along the right edge of divided roadways, one-way roadways, and ramps in the direction of travel.
4. For RM-4, the stripes shall slope downward at an angle of 45° toward the side of the obstruction that traffic is to pass.
5. For reflector marker RM-9, reflective sheeting material may be used as an alternate.
6. (H) indicates horizontal mounting of reflector marker.
7. Height = 4'-0" min. for RM-1, RM-2 and RM-3.
   Height = 5'-6" min. for RM-4 and RM-9.
8. Final locations of reflector markers shall be approved by the Engineer.



RM-1 (WHITE, YELLOW, OR RED)
RM-2 (WHITE, YELLOW, OR RED)
RM-3 (YELLOW)
RM-4(R)
RM-9

Note:
The marker used for the end of a roadway shall be an RM-9 reflectorized with red reflective sheeting.

REFLECTOR MARKERS

NO.	REVISION	APPROVED BY	DATE
1	Revised Mounting Details	H.I.	4/23/80
2	Revised General Notes, Mounting Details and Reflector Markers.	[illegible]	5-28-83

APPROVAL RECOMMENDED:
Eiichi Tanaka 11/7/77
TRAFFIC ENGINEER DATE

APPROVED:
Herbert S. Nakamura 11/15/77
ASSISTANT CHIEF, ENGINEERING DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

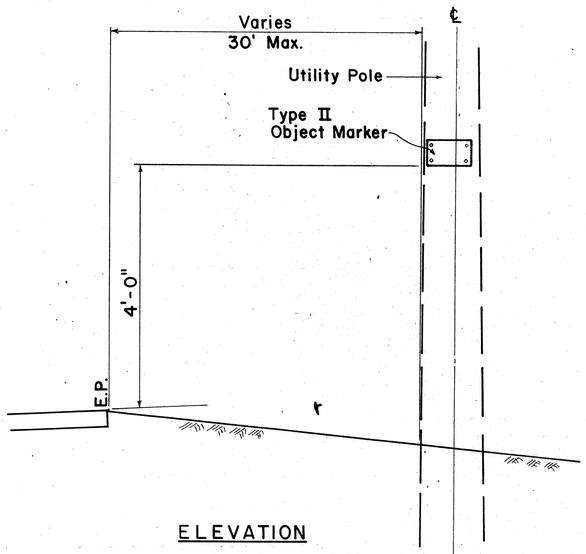
STANDARD DETAILS
MISCELLANEOUS REFLECTOR MARKERS

Not to scale June, 1977

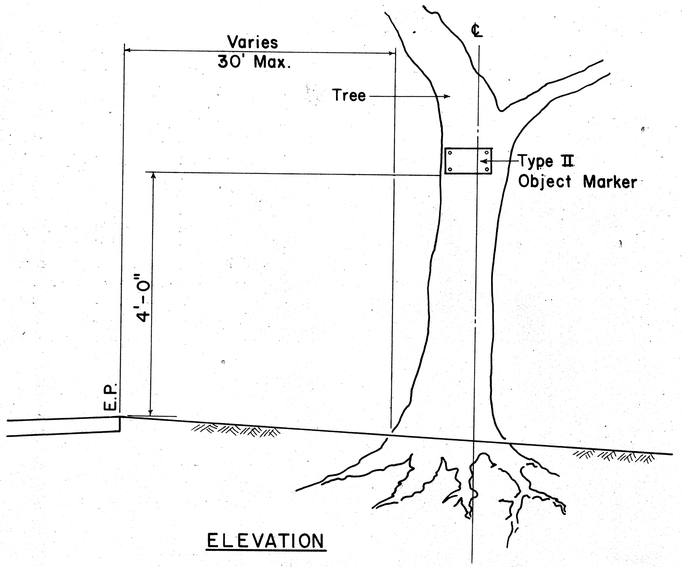
SHEET No. 13 OF 23 SHEETS DT 110

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

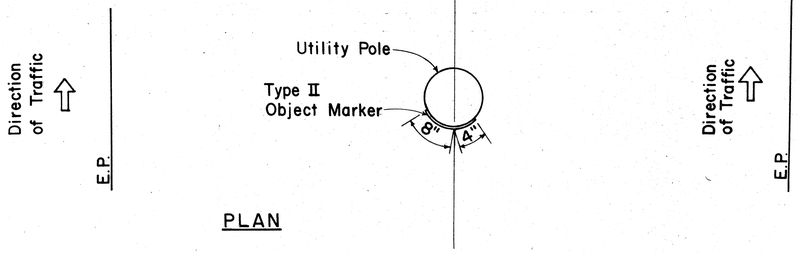
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(27)	1985	29	47



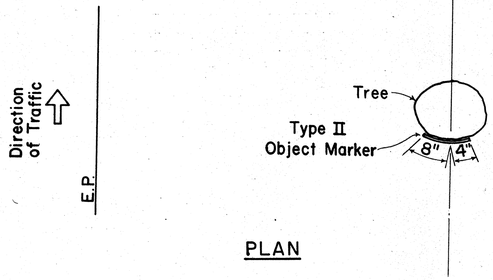
ELEVATION



ELEVATION



PLAN

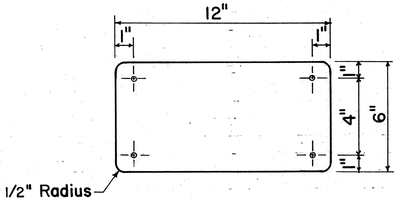


PLAN

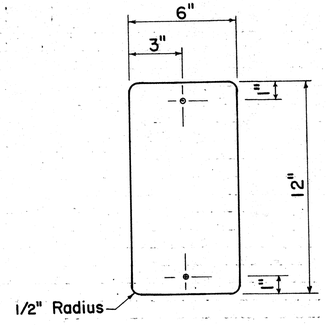
TYPICAL TYPE II OBJECT MARKER MOUNTING DETAIL

GENERAL NOTES

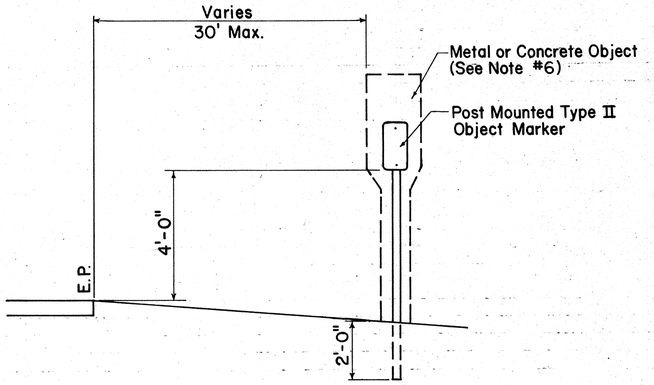
1. All objects (utility poles or trees) that are within the State highway right of way and within 30 feet of the roadway edge of pavement shall be marked as directed by the Engineer.
2. The Contractor shall prepare the mounting surface of each object as directed by the Engineer and place the Type II Object Marker as shown on this plan.
3. Type II Object Markers shall be mounted on utility poles and trees with 1¾" galv. roofing nails (4 ea.).
4. Branches of trees which obscure the object markers shall be trimmed. (Payment shall be incidental to Type II Object Markers as shown in the proposal).
5. Type II Object Markers for utility poles and trees, etc., shall be made of amber reflective sheeting material overlayed on 0.020" aluminum sheeting.
6. Objects such as concrete posts, concrete or rock walls and boxes, metal posts (greater than 2" in diameter), or metal boxes shall be marked with post mounted object markers. Post mounted Type II Object Markers shall conform to the following requirements:
   a. It shall consist of amber reflective sheeting material overlayed on 0.063" thick sheet aluminum backing of the dimensions shown on the plans.
   b. It shall be mounted on either metal posts or flexible delineator posts with ¼"x2" galv. bolts, nuts and washers. Metal posts shall be galvanized and shall be either 1½"x1½", 12 gage square tube posts or 1.12 lbs. per ft. flanged channel posts.



TYPE II OBJECT MARKER



TYPE II OBJECT MARKER
POST MOUNTED



POST MOUNTED TYPE II OBJECT MARKER DETAIL

APPROVAL RECOMMENDED:

Eiichi Tanaka — 3/30/83
TRAFFIC ENGINEER — DATE

APPROVED:

R I Fujiyama — 3-31-83
ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

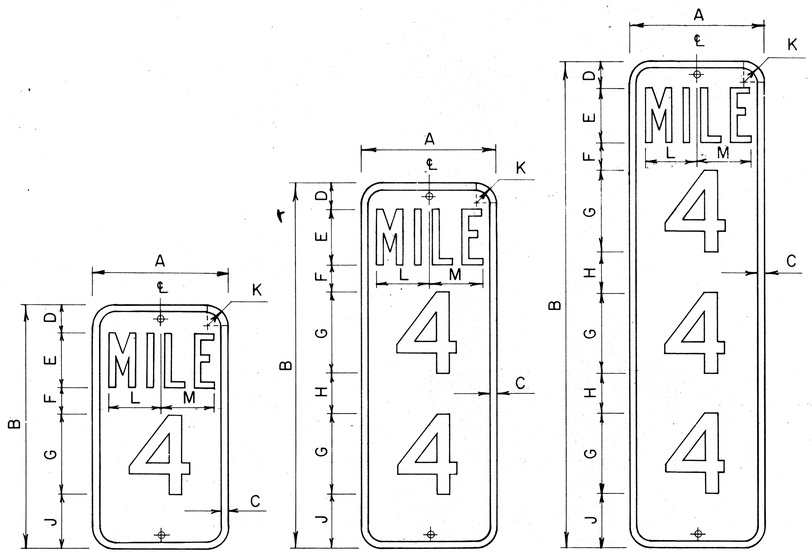
TYPE II OBJECT MARKERS

Scale: Not to scale — Date: March 1983

SHEET No. 14 OF 23 SHEETS DT III

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES0100(27)	1985	30	47



D10-1 10" x 18"
D10-4 12" x 24"

D10-2 10" x 27"
D10-5 12" x 36"

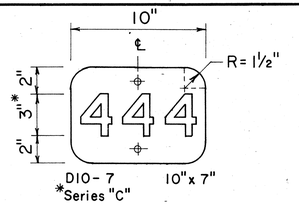
D10-3 10" x 36"
D10-6 12" x 48"

MILEPOST MARKER PLATE DETAILS

Scale: 3/16" = 1"

MILEPOST PLATE SCHEDULE (INCHES)

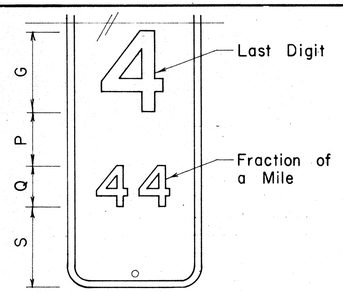
NAME	SIZE	A	B	C	D	E	F	G	H	J	K	L	M	LETTER SERIES	NUMERAL SERIES
D10-1	10 x 18	10	18	½	2	4	2	6		4	1½	3⅝	3⅞	B	C
D10-4	12 x 24	12	24	½	3	4	3	10		4	1½	4⅝	4⅞	C	C
D10-2	10 x 27	10	27	½	2	4	2	6	3	4	1½	3⅝	3⅞	B	C
D10-5	12 x 36	12	36	½	3	4	3	10	3	3	1½	4⅝	4⅞	C	C
D10-3	10 x 36	10	36	½	2	4	2	6	3	4	1½	3⅝	3⅞	B	C
D10-6	12 x 48	12	48	½	3	4	3	10	2½	3	1½	4⅝	4⅞	C	C



D10-7 10" x 7"
*Series "C"

HIGHWAY ROUTE NUMBER PLATE DETAIL

Scale: 3/16" = 1"



MILEPOST MARKER FRACTION DETAIL

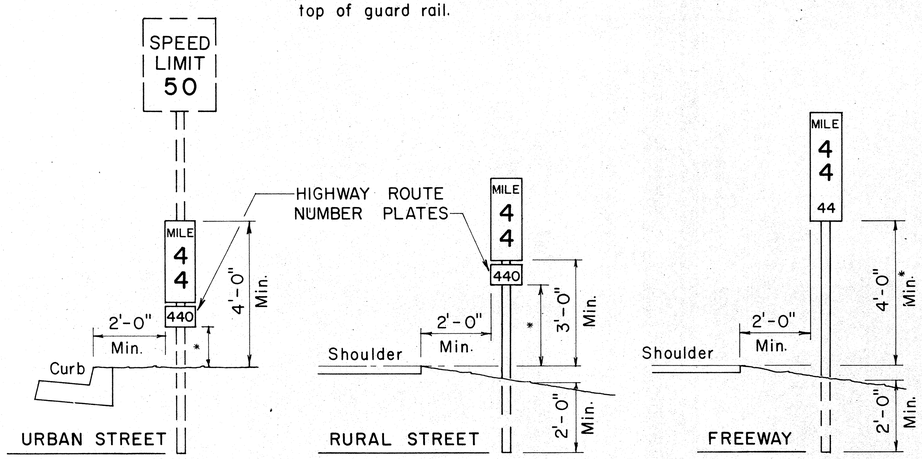
Scale: 3/16" = 1"

MILEPOST PLATE SCHEDULE WITH FRACTION OF A MILE

NAME	SIZE	G	P	Q	S	NUMERAL SERIES
D10-1a	10" x 27"	6"	4"	3"	6"	C
D10-4a	12" x 36"	10"	4"	5"	7"	C
D10-2a	10" x 36"	6"	4"	3"	6"	C
D10-5a	12" x 48"	10"	4"	5"	6"	C
D10-3a	10" x 45"	6"	4"	3"	6"	C
D10-6a	12" x 60"	10"	4"	5"	6"	C

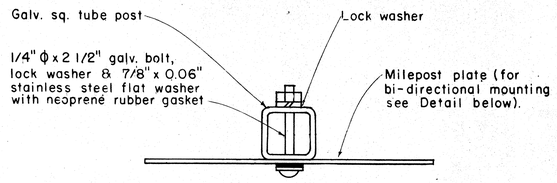
ORIGINAL PLAN	SURVEY PLOTTED BY	DRAWN BY	TRACED BY	DESIGNED BY	QUANTITIES BY	CHECKED BY	DATE
NOTE BOOK							
No.							

*One-foot minimum clearance above top of guard rail.

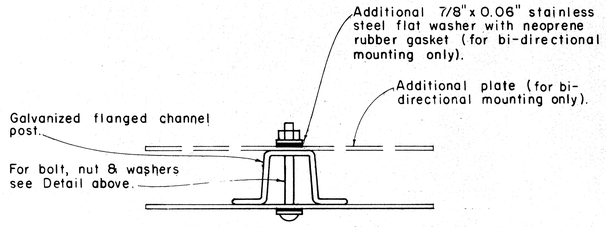


TYPICAL ROADSIDE INSTALLATION

Scale: ½" = 1'-0"



GALVANIZED SQUARE TUBE POST



GALVANIZED FLANGED CHANNEL POST

TYPICAL MOUNTING DETAILS

Scale: ½" = 1"

GENERAL NOTES:

1. Milepost marker and highway route number plates shall conform to the latest editions of the following FHWA publications:
   a. "Standard Alphabets for Highway Signs," and as amended.
   b. "Standard Highway Signs," and as amended.
   c. "Manual on Uniform Traffic Control Devices for Streets and Highways," and as amended.
2. Milepost markers and highway route numbers shall be completely reflectorized with reflective sheeting as follows:
   a. Milepost markers shall have white legends and border on a green background.
   b. Highway route numbers shall have black numerals on a white background.
3. The plate backings for milepost markers and highway route numbers shall conform to the requirements for standard highway signs. The plates shall have 3/8" bolt holes drilled at appropriate locations.
4. Highway route number plates shall be used in conjunction with milepost marker plates on all roadways, except Interstate freeways. Fabrication and installation costs of highway route number plates shall be considered incidental to the milepost marker assembly.
5. Milepost markers shall be installed on all roadways as follows:
   a. One milepost on each side of multi-lane roadways.
   b. Back-to-back mileposts on one side of 2-lane roadways. (Right side of roadway in direction of increasing mileage.)

APPROVAL RECOMMENDED:
Eiichi Tanaka — TRAFFIC ENGINEER — 1/17/78 DATE

APPROVED:
Hubert B. Gallagher — ASSISTANT CHIEF, ENGINEERING — 1/18/78 DATE

NO.	REVISION	APPROVED BY	DATE
1	Revised Mounting Details	H.K.	4/23/80

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

STANDARD DETAILS

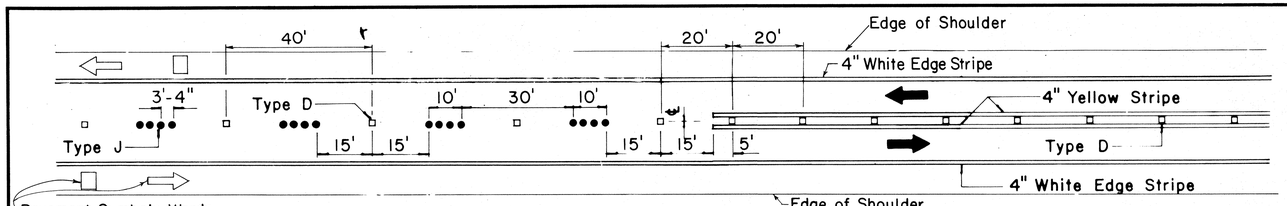
MILEPOSTS

SCALE: As Shown DATE: December, 1977

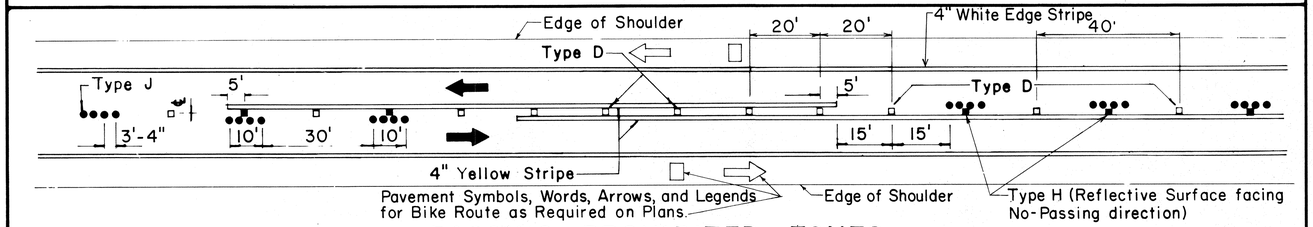
SHEET No. 15 OF 23 SHEETS DT 116

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES0100(27)	1985	31	47

TWO - LANE

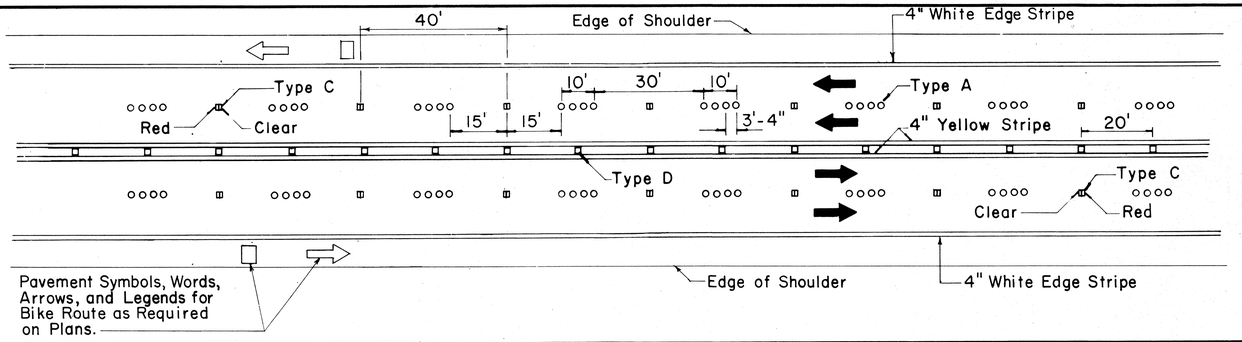


PASSING PERMITTED AND PASSING PROHIBITED

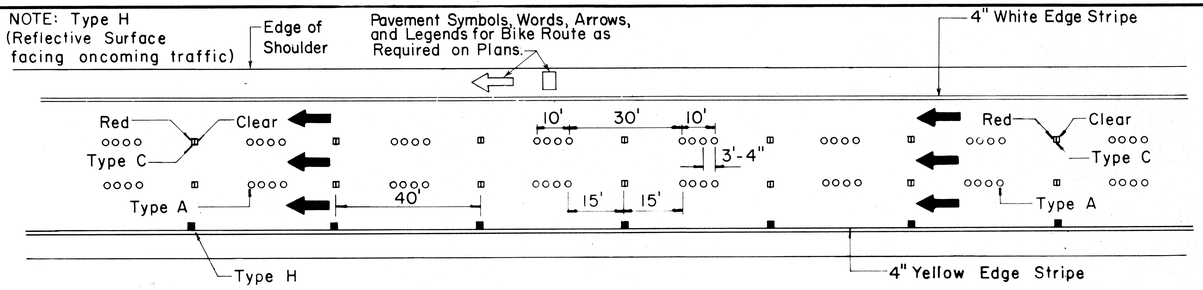


PASSING PROHIBITED ZONES

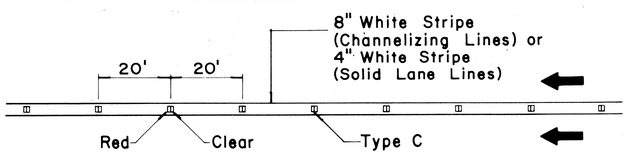
MULTI - LANE



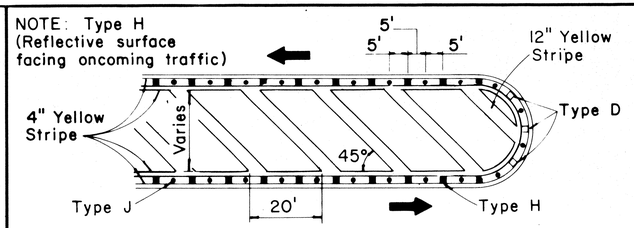
DIVIDED HIGHWAY AND FREEWAY



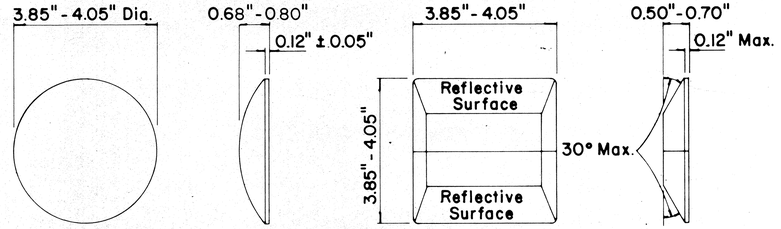
MISCELLANEOUS



CHANNELIZING LINES OR SOLID LANE LINES



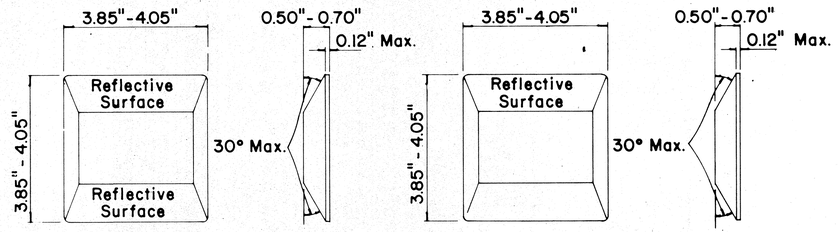
MEDIAN NOSE DELINEATION



TYPE A
NON - REFLECTIVE WHITE MARKER

TYPE C
RED - CLEAR REFLECTIVE MARKER

TYPE J
NON - REFLECTIVE YELLOW MARKER



TYPE D
TWO - WAY YELLOW REFLECTIVE MARKER

TYPE H
ONE - WAY YELLOW REFLECTIVE MARKER

GENERAL NOTES

1. Pavement marking and striping shall conform to the latest "Manual on Uniform Traffic Control Devices for Streets and Highways," and as amended.
2. Ldyout and installation of pavement marking and striping shall be done by the Contractor. The Contractor shall check the layouts with the Engineer prior to performing work.
3. Edge lines shall not be continued through intersections and shall not be broken for driveways unless otherwise shown or directed.

LEGEND

- ○ Type A
- ⊞ Type C
- □ Type D
- ■ Type H
- ● Type J

APPROVAL RECOMMENDED:
Eiichi Tanaka — TRAFFIC ENGINEER — 7/21/78 DATE

APPROVED:
Herbert T. Takiishi — ASSISTANT CHIEF, ENGINEERING — 7/24/78 DATE

No.	REVISION	APPROVED BY	DATE
1	Supercedes DT 300 approved 11/18/71.	H.T.	7/24/78
2	Delete Type A Markers from Bike Route Delineation.	H.T.	10/15/79
3	Added General Note 3. Revised left edge stripe.	[illegible]	9-28-83

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
RAISED PAVEMENT MARKERS AND STRIPING

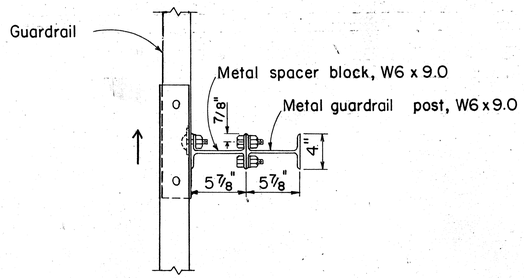
Not to Scale — July 1978

SHEET No. 16 OF 23 SHEETS DT 300

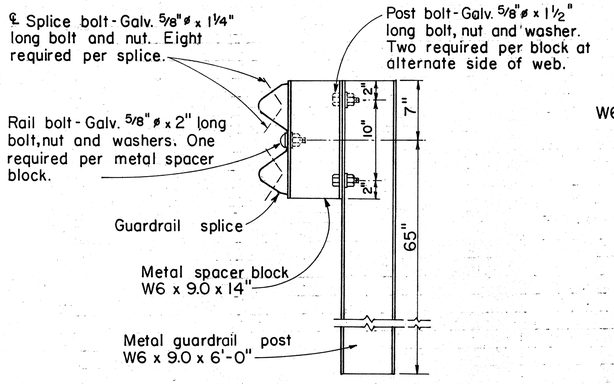
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | NOTE BOOK | QUANTITIES BY | CHECKED BY | DATE | No.

K+E IMPERIAL LA 320

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(27)	1985	32	47



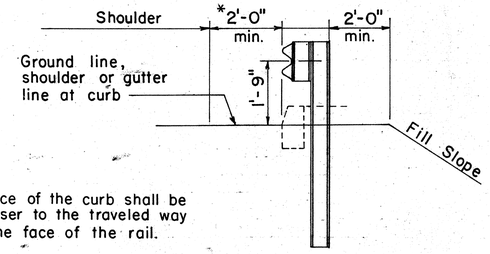
PLAN



ELEVATION

SINGLE METAL GUARDRAIL ON METAL POST WITH METAL SPACER BLOCK

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

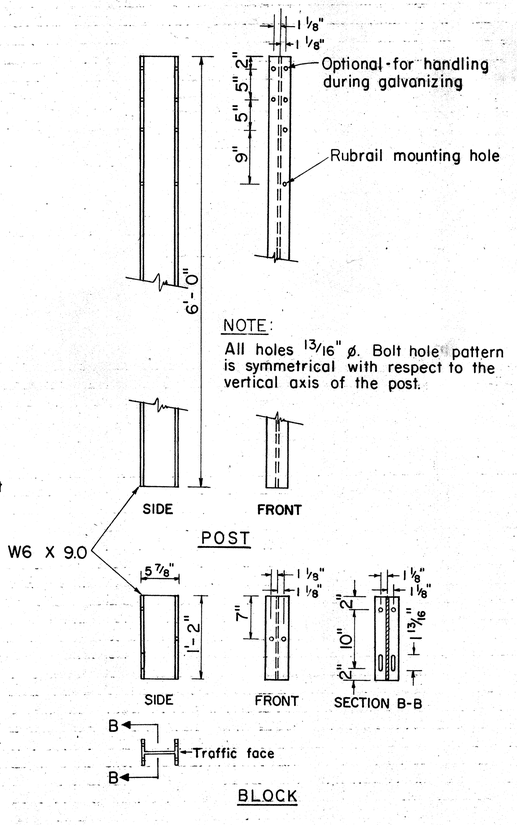


Note:
The face of the curb shall be no closer to the traveled way than the face of the rail.

AT SHOULDER SECTION

TYPICAL METAL GUARDRAIL DETAIL

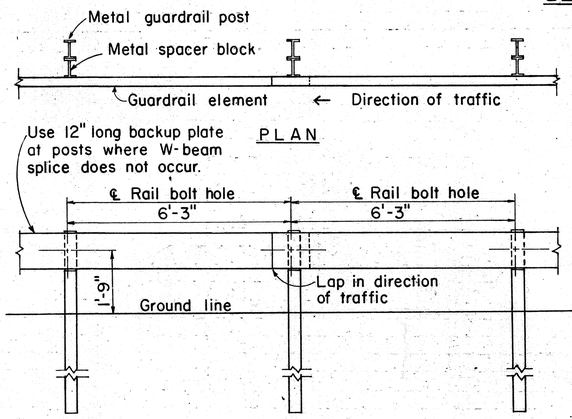
SCALE: 1/2" = 1'-0"



NOTE:
All holes 13/16" ø. Bolt hole pattern is symmetrical with respect to the vertical axis of the post.

STRUCTURAL SHAPE POST AND BLOCK

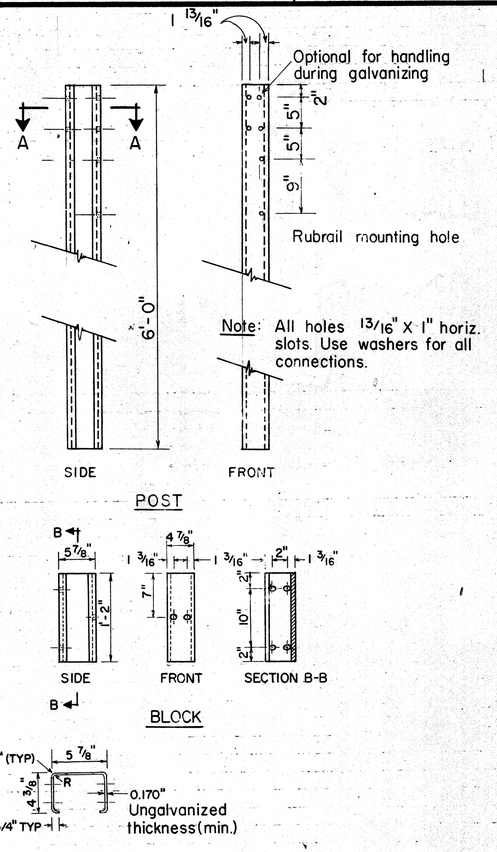
SCALE: 1" = 1'-0"



ELEVATION

METAL GUARDRAIL ON METAL POST WITH METAL SPACER BLOCK

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



Note: All holes 13/16" X 1" horiz. slots. Use washers for all connections.

SECTION A-A
N.T.S.

BENT PLATE POST AND BLOCK

SCALE: 1" = 1'-0"

GENERAL NOTES

1. 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.
2. All hardware, posts and blocks shall be galvanized. No punching, drilling or cutting will be permitted after galvanizing.
3. Connection details for bent plate post and block shall be similar to the details shown for structural shape post, and block.
4. Where conditions require, special post lengths in increments of 6 inches may be specified.
5. For details of rail elements, bolts, and nuts, see sheet DT 501.
6. 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.

APPROVAL RECOMMENDED:
Eiichi Tanaka — TRAFFIC ENGINEER — 9/7/82 DATE

APPROVED:
Herbert Sakiishi — ASSISTANT CHIEF, ENGINEERING — 9/22/82 DATE

NO.	REVISION	APPROVED BY	DATE
1	Supersedes sht. DT 500 approved 12/30/69.	HS	9/22/82
2	Added General Notes No. 6	[illegible]	9-28-83

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

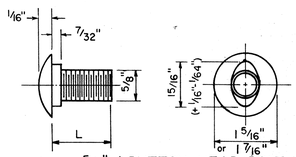
STANDARD DETAILS
METAL GUARDRAIL

Scale: As Shown — July, 1982

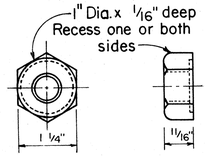
SHEET NO. 17 OF 23 SHEETS DT 500

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(27)	1985	33	47



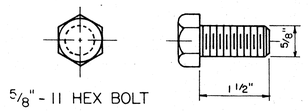
5/8" ø BUTTON HEAD BOLT



5/8" ø RECESS NUT

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

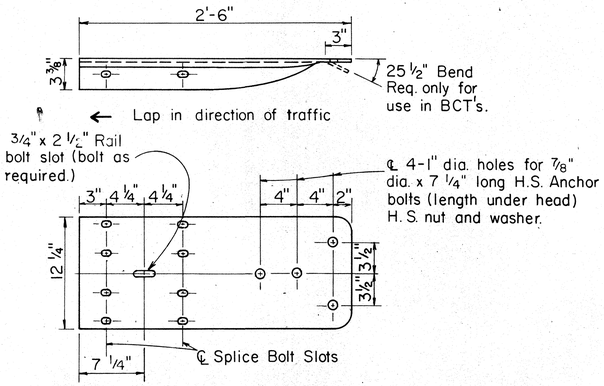
5/8" BUTTON HEAD BOLT AND RECESS NUT
Scale: NTS



5/8"-11 HEX BOLT

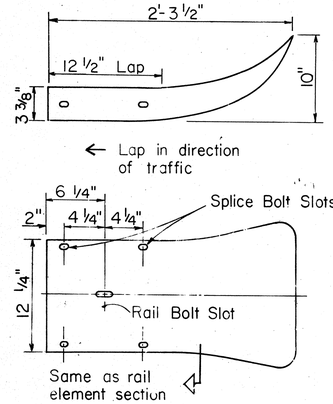
5/8"-11 HEX NUT

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

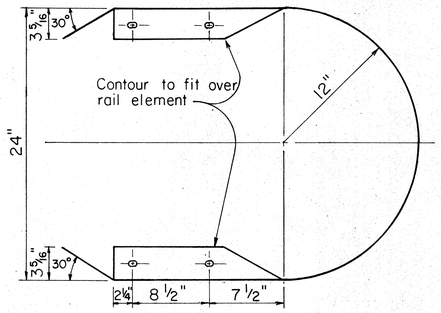


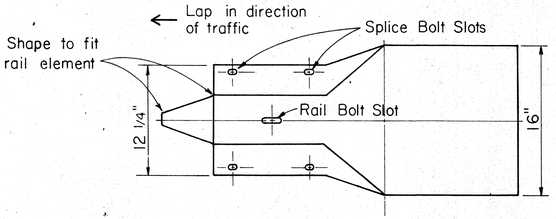
W BEAM TERMINAL CONNECTOR
Scale: 1 1/2" = 1'-0"

← Lap in direction of traffic

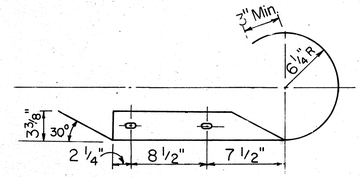


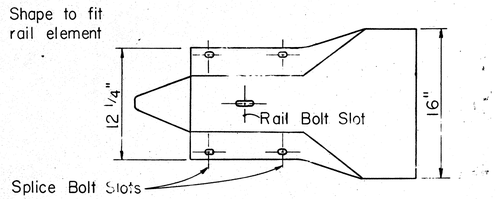
W BEAM END SECTION (FLARED)
Scale: 1 1/2" = 1'-0"



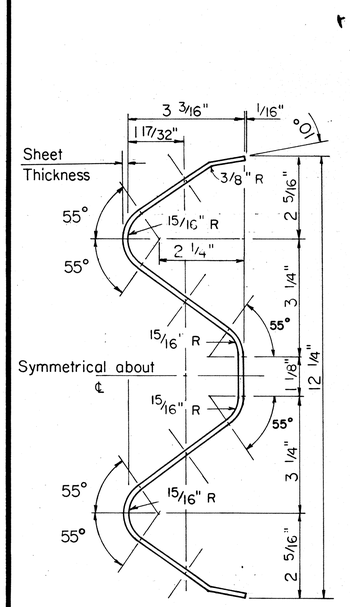


W BEAM END SECTION (BUFFER)
Scale: 1 1/2" = 1'-0"

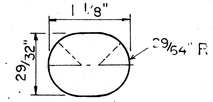




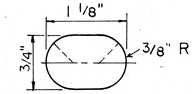
W BEAM END SECTION (ROUNDED)
Scale: 1 1/2" = 1'-0"



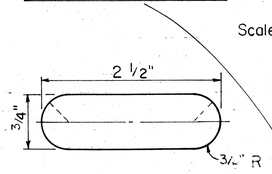
RAIL ELEMENT SECTION
Scale: 6" = 1'-0"



SPLICE BOLT SLOT

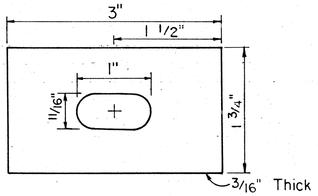


SPLICE BOLT SLOT FOR ALL ENDS

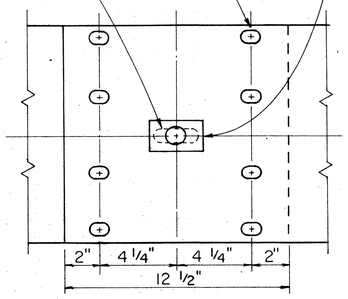


RAIL BOLT SLOT

Scale: Full Size



RAIL BOLT WASHER



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

APPROVAL RECOMMENDED:
Eiichi Tanaka — TRAFFIC ENGINEER — 9/20/82 DATE

APPROVED:
Herbert Sakahira — ASSISTANT CHIEF, ENGINEERING — 9/22/82 DATE

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
METAL GUARDRAIL

Scale: As Noted — July, 1982

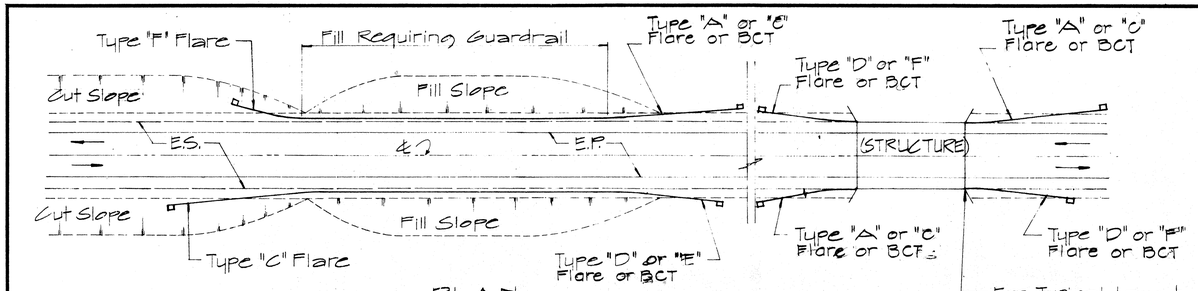
SHEET No. 18 OF 23 SHEETS DT 501

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(27)	1985	34	47

NOTE:

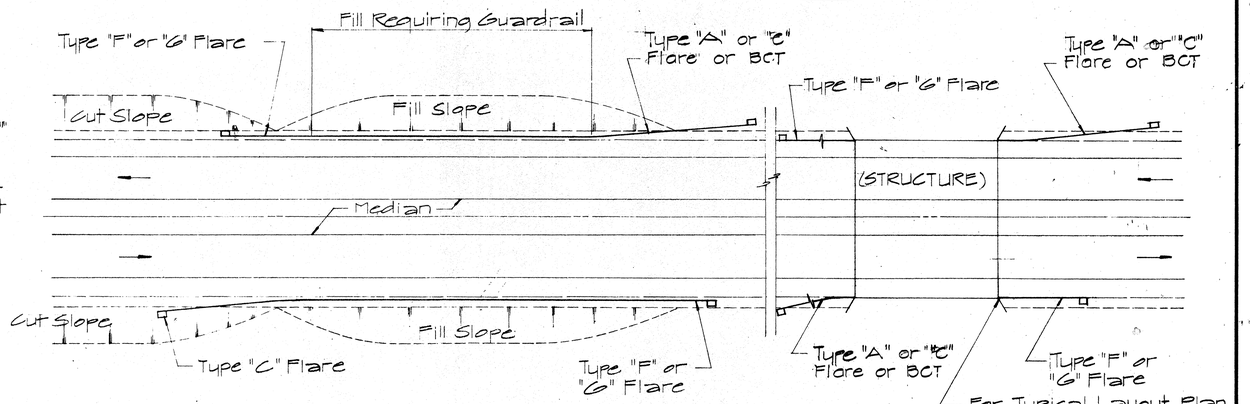
1. Metal guard rail connection to structures requires End Post Connection. See structure plans.
2. For detail of Breakaway Cable Terminal (BCT) See Sheet No. DT 519



PLAN

TWO WAY ROADWAY

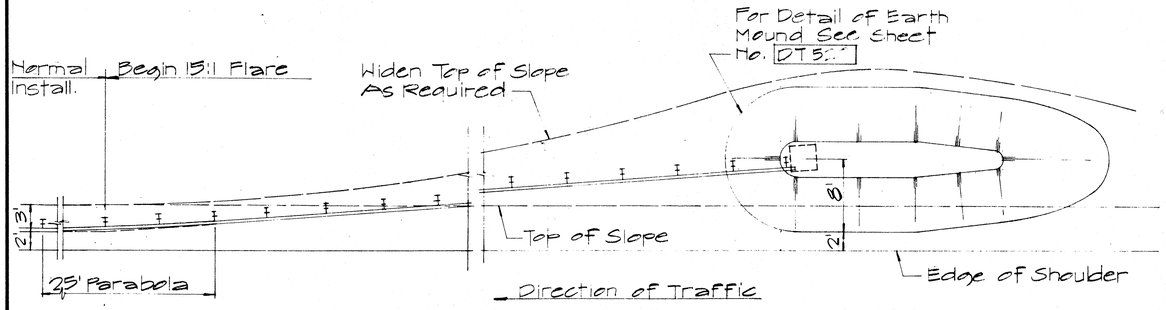
Sc. 1" = 40'



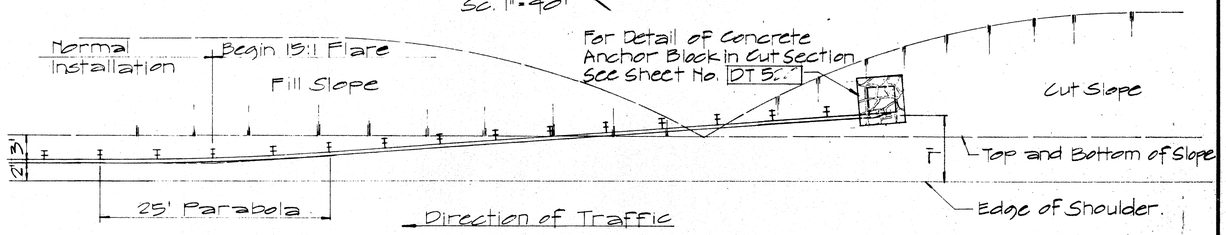
PLAN

ONE WAY ROADWAY (DIVIDED HIGHWAY)

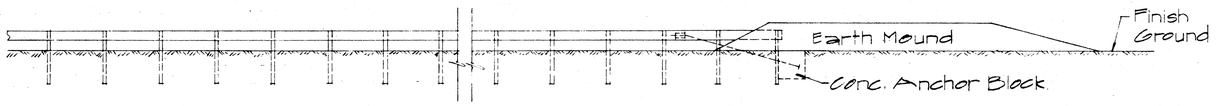
Sc. 1" = 40'



PLAN



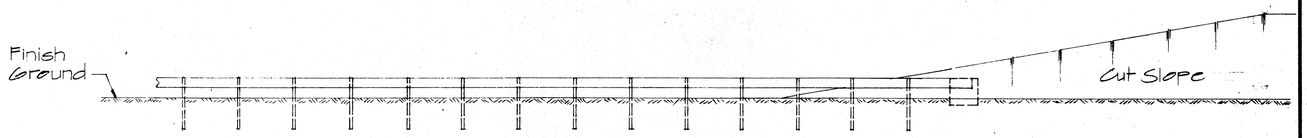
PLAN



ELEVATION

TYPE "A" FLARE

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



ELEVATION

TYPE "C" FLARE

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

APPROVAL RECOMMENDED:

Euichi Tanaka — TRAFFIC ENGINEER — 12/23/69 DATE

APPROVED

ASSISTANT CHIEF, ENGINEERING — 12-30-69 DATE

NO.	REVISION	APPROVED BY	DATE
1	Delete Type "B" Flare and Type "E" Flare	H.T.	6/15/78

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

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

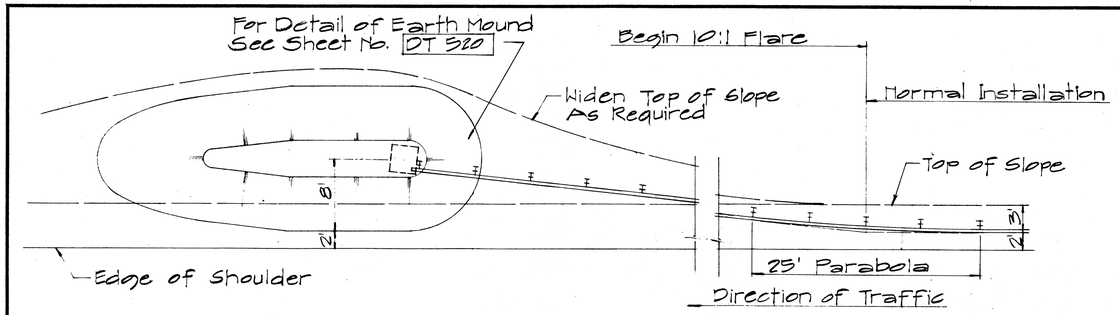
Sc. As Noted — April 1969

SHEET No. 19 OF 23 SHEETS | DT 516

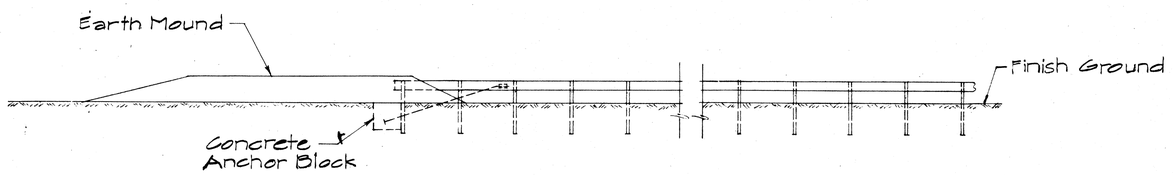
ORIGINAL PLAN		DATE
	SURVEY PLOTTED BY	
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	(ES-0100(27))	1985	35	47



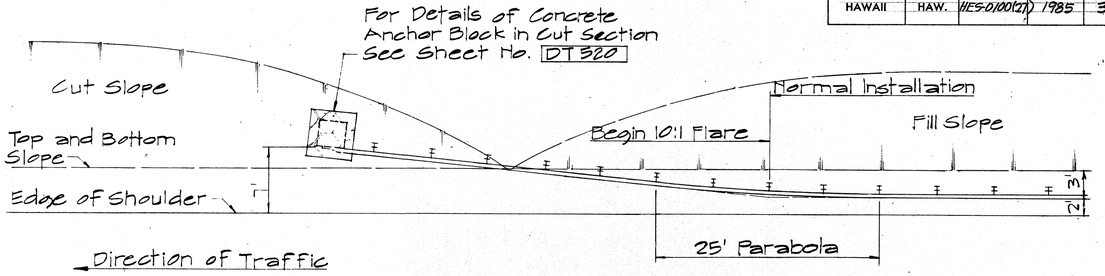
PLAN



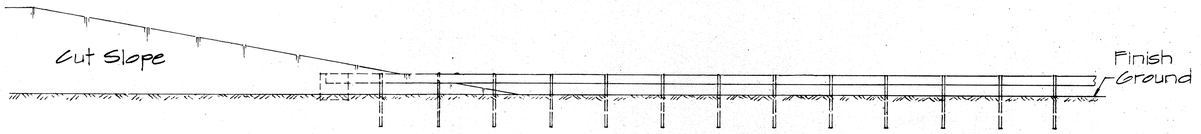
ELEVATION

TYPE "D" FLARE

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



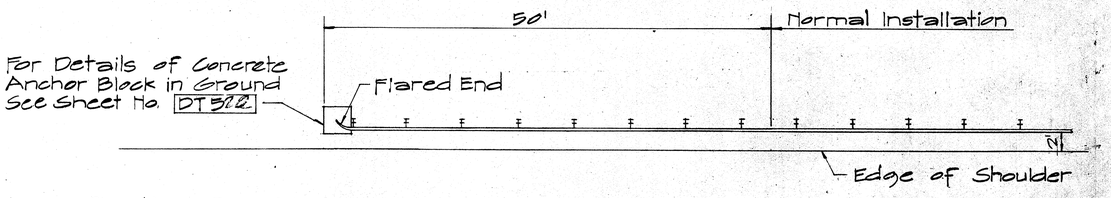
PLAN



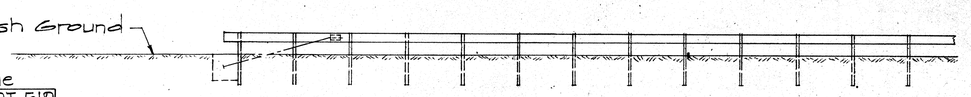
ELEVATION

TYPE "F" FLARE

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



PLAN

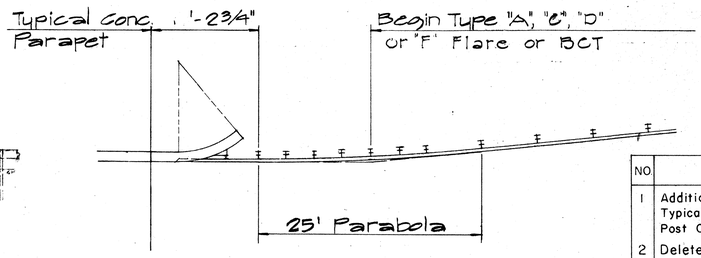


NOTE:
For detail of Breakaway Cable Terminal (BCT) See Sheet No. DT 519

ELEVATION

TYPE "G" FLARE

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



TYPICAL LAYOUT PLAN OF END POST CONNECTION

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

APPROVAL RECOMMENDED:
Eiichi Tanaka — TRAFFIC ENGINEER — 12/29/69 DATE

APPROVED:
[signature] — ASSISTANT CHIEF, ENGINEERING — 12-30-69 DATE

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.	6-15-78

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS TRAILING END FLARE - ONE & TWO WAY ROADWAY

Scale: As Noted — April 1967

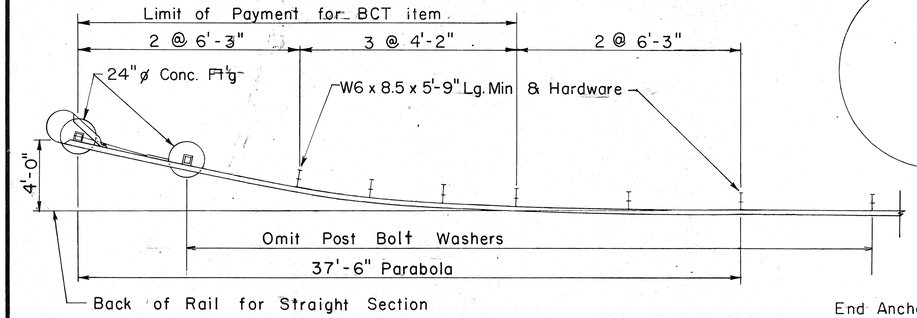
SHEET No. 20 OF 23 SHEETS | DT 517

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

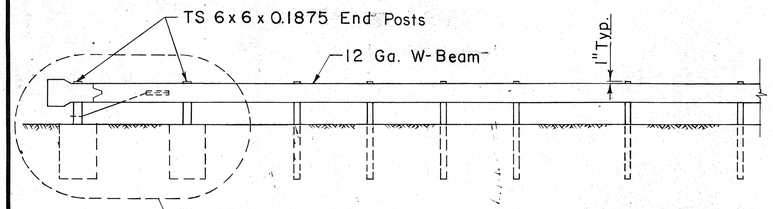
PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100 (27)	1985	ADD. 36	47

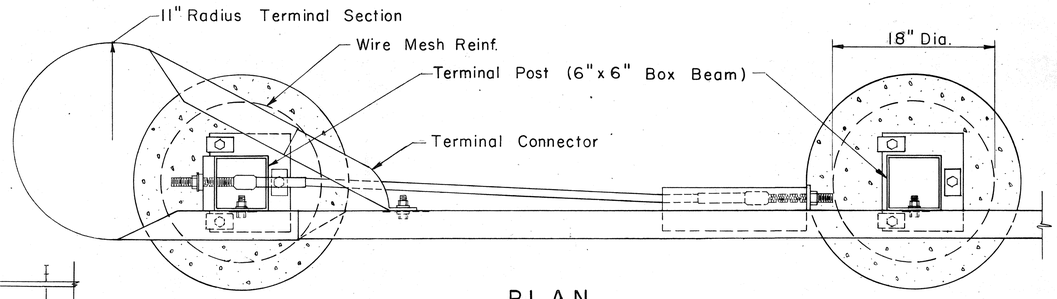
Use 12" long Backup Plate at Posts where W-Beam splice does not occur.



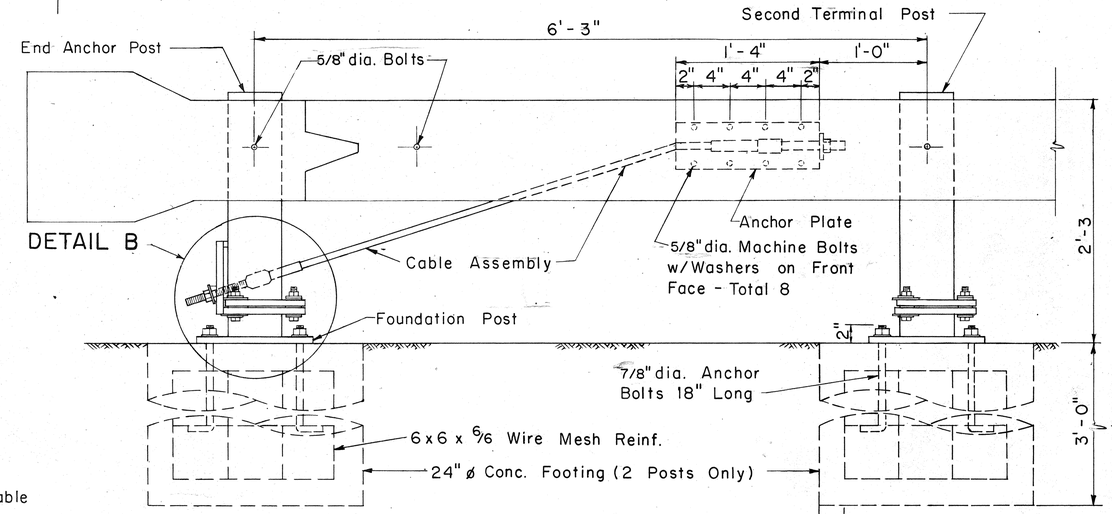
PLAN
Scale: 1/4" = 1'-0"



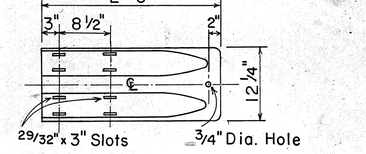
ELEVATION
Scale: 1/4" = 1'-0"



PLAN



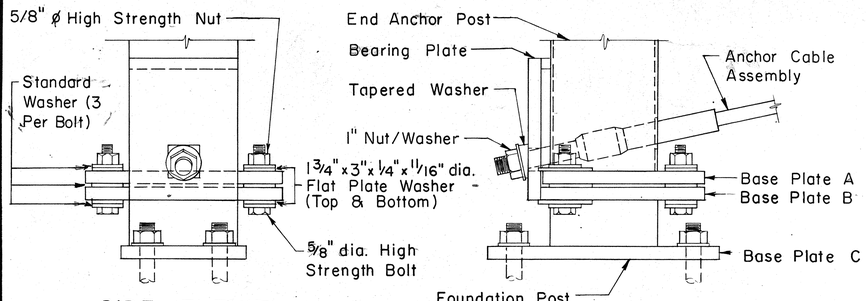
ELEVATION
DETAIL A
Scale: 1 1/2" = 1'-0"



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

NOTES:

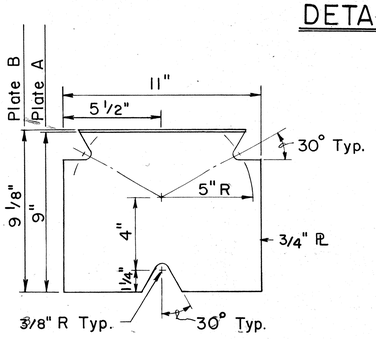
1. Anchor Plate and Anchor Cable Assembly (Standard Swaged Fitting and Stud). See Standard Detail Sheet No. DT 520.
2. Other Anchor Cable Assemblies may be used. Minimum breaking strength of assembly should be 40,000 lbs.
3. Second Terminal Post does not require holes to accomodate Anchor Cable.
4. Slip 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 superceded 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.



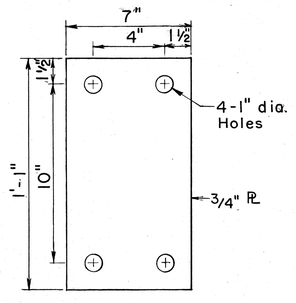
SIDE ELEVATION

FRONT ELEVATION

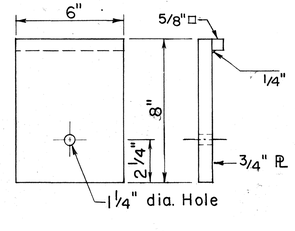
DETAIL B



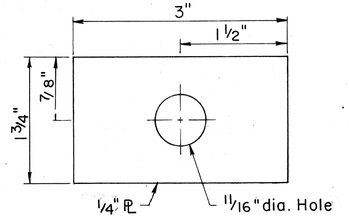
BASE PLATES A & B
Scale: 3" = 1'-0"



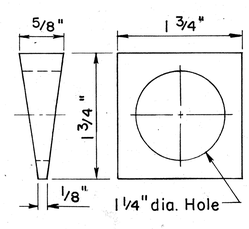
BASE PLATE C
Scale: 3" = 1'-0"



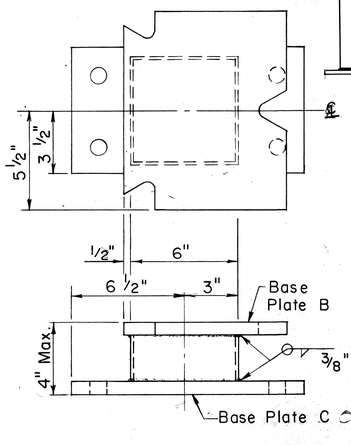
BEARING PLATE
Scale: 3" = 1'-0"



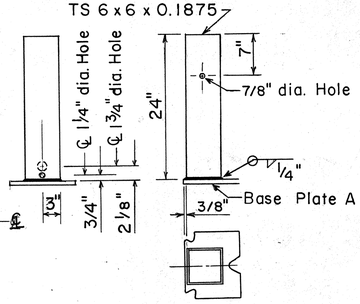
FLAT PLATE WASHER
Scale: Full Size



TAPERED WASHER
Scale: Full Size



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



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

APPROVAL RECOMMENDED:

Euichi Tanaka — TRAFFIC ENGINEER — 6/14/78 DATE

APPROVED:

Theodore Zaleski — ASSISTANT CHIEF, ENGINEERING — 6/15/78 DATE

NO.	REVISION	APPROVED BY	DATE
1	Supersedes Sht. DT 519 Approved 12/30/69	H.T.	6/15/78
2	Added Note 6	H.T.	12/17/80
3	Eliminated requirement of 25' rail	[illegible]	1-31-85

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAIL

BREAKAWAY CABLE TERMINAL (BCT)

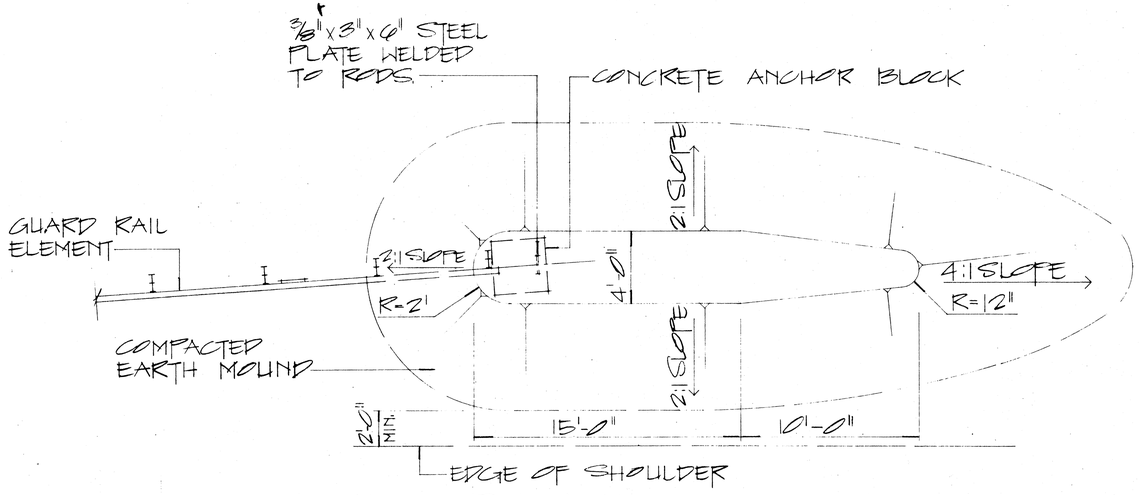
Scale: As Shown — Date: June 1978

SHEET No. 21 OF 23 SHEETS DT 519

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

ADD. 36

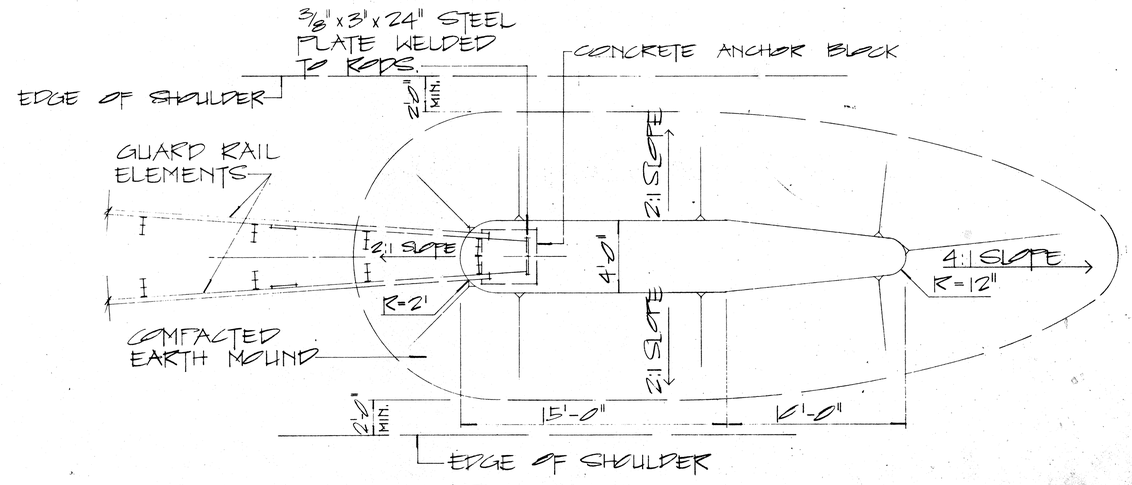
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	(HES0100(27))	1985	37	47



PLAN

EARTH MOUND DETAIL (SINGLE GUARD RAIL)

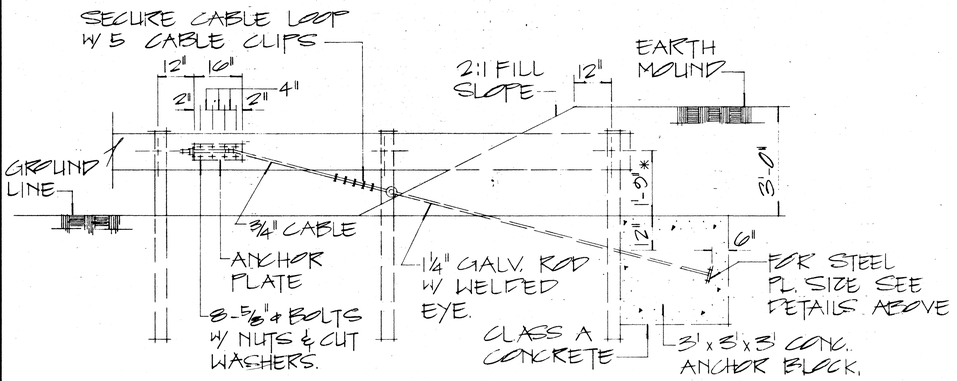
SCALE: 1/4" = 1'-0"



PLAN

EARTH MOUND DETAIL (DOUBLE GUARD RAIL)

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

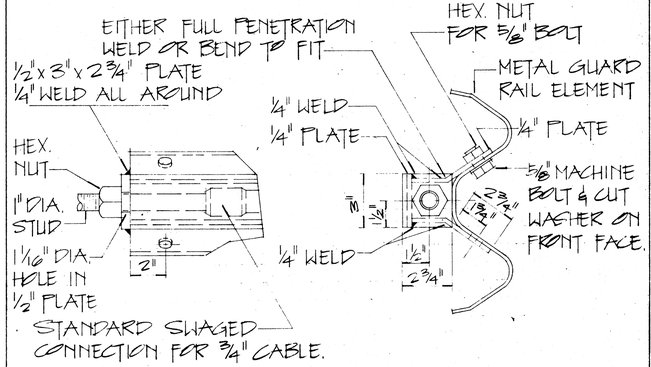


ANCHOR BLOCK DETAIL IN EARTH MOUND

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

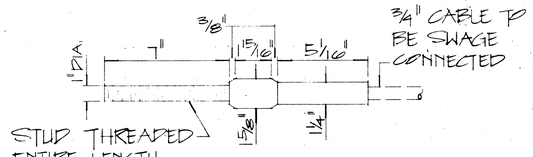
NOTE:

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, GR.P., EXCAVATION, EARTH MOUND, ANCHOR RODS AND MISCELLANEOUS APPURTENANCES NECESSARY TO ANCHOR THE GUARD RAIL ENDS SHALL BE INCIDENTAL TO THE METAL GUARD RAIL.



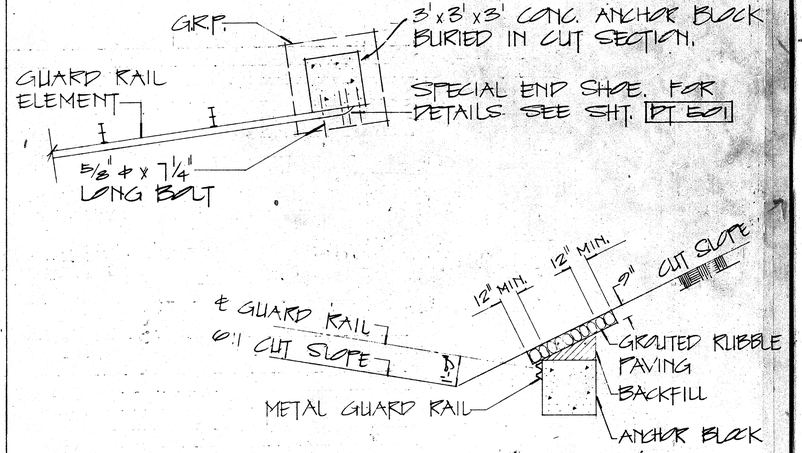
ANCHOR PLATE DETAILS

SCALE: 1" = 3"



STANDARD SWAGED FITTING AND STUD

SCALE: 1" = 3"



ANCHOR BLOCK IN CUT SECTION

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

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

APPROVED:
[signature] 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

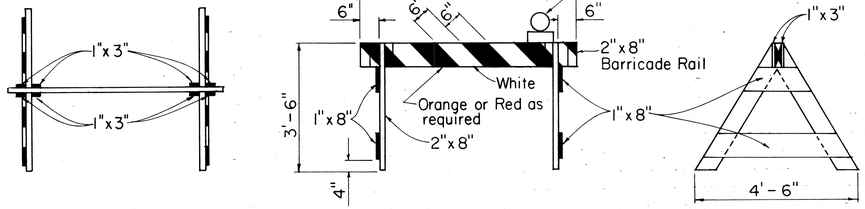
SCALE: AS SHOWN OCT 1969

SHEET No. 22 OF 23 SHEETS PT520

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

K&E CRYSTALENE® LA 2920 TRACING PAPER

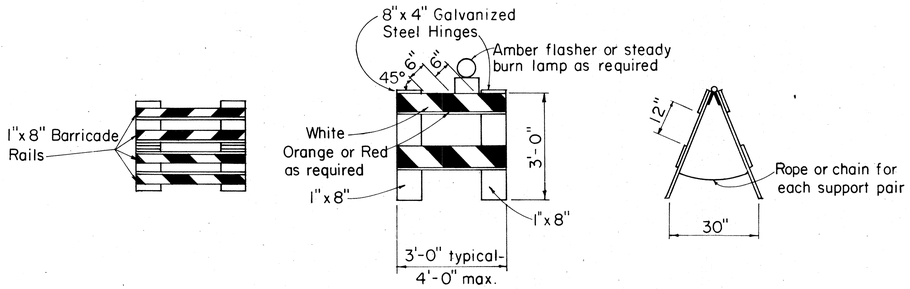
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(27)	1985	38	47



PLAN VIEW FRONT VIEW END VIEW

TYPE I BARRICADE

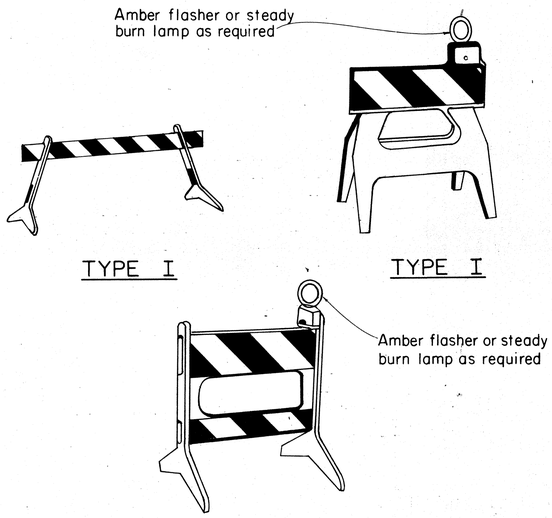
Scale: 1/2" = 1'-0"



PLAN VIEW FRONT VIEW END VIEW

TYPE II BARRICADE

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



TYPE I TYPE I

TYPE II

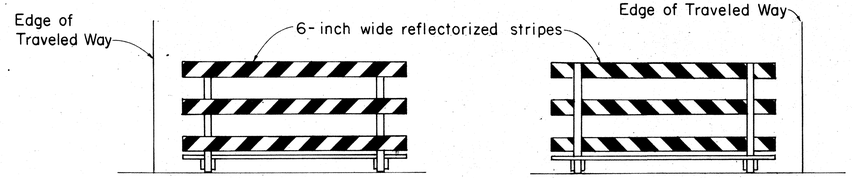
GENERAL NOTES

1. The front and back faces of each barricade rail shall be reflectorized with stripes sloping downward toward the same side (traveled way) of each barricade.
2. Contractor may submit alternate barricade designs for approval.
3. Sandbags or other approved weights shall not be placed on top of any striped rail.
4. The Contractor is directed to Section 626.

PLASTIC MOLDED BARRICADE OPTIONS*

Not to Scale

* Shop Drawings must be submitted for approval.

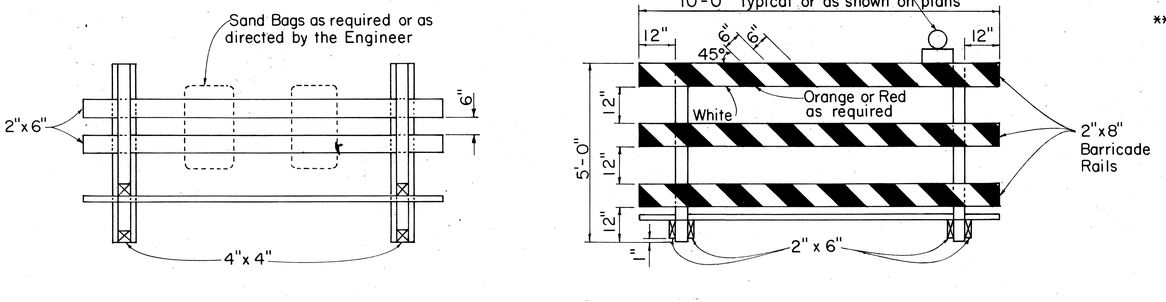


FRONT FACE BACK FACE

TYPICAL BARRICADE STRIPING DETAILS**

Not to Scale

** Similar for Types I & II



PLAN VIEW FRONT VIEW END VIEW

TYPE III BARRICADE

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

APPROVAL RECOMMENDED:

Eiichi Tanaka — 10/21/81
TRAFFIC ENGINEER — DATE

APPROVED:

Herbert S. Sakaishi — 10/23/81
ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE
1	Supercedes DT 800 Approved 12/30/69	HT.	10/23/81

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

BARRICADES

SCALE: As Shown

SHEET No. 23 OF 23 SHEETS DT 800

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