FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	220A-01-02M	2002	46	49

INDEX TO DRAWINGS

SHEET NO.	DESCRIPTION
46	INDEX TO DRAWINGS, GENERAL NOTES, ABBREVIATIONS AND SYMBOLS
47	BRIDGE RAIL UPGRADE AND THRIE BEAM TRANSITION DETAILS
48	SECTIONS AND DETAILS, TYPE "A" BRIDGE RAILINGS UPGRADE
49	METAL GUARDRAIL TYPE 3 THRIE BEAM AND APPURTENANCES DETAILS

TRAFFIC CONTROL:

A. The Contractor's attention is called to the traffic control costs for constructing the end post and bridge railing work. Such costs are incidental to the End Post Upgrade pay item. No separate payment for such traffic control is provided under Section 645 - Traffic Control Devices.

B. During working hours, traffic control may be covered by the one lane traffic control plan described in Section 645 - Traffic Control Devices. However, during non-working hours, additional provisions for safely maintaining traffic shall be required. For example, portable traffic signals to control traffic. Another means to control traffic would be to fully illuminate the site, illuminate approach warning signs, and provide flashing warning lights and flagmen on both approaches.

C. If there are any dropoffs next to the traveled way of more than two inches in height, portable concrete barriers or other approved crashworthy barriers shall be required to separate public traffic from the dropoff area.

D. For any non-working hour lane closure, the Contractor shall submit a Notice to Motorists for publication in the Hawaii Tribune Herald. The Notice shall be published at least three times prior to implementing the lane closure. Each separate lane closure phase shall require a Notice to Motorists, such as switching of detour routes.

E. The Contractor shall submit a specific site traffic control plan to the Engineer for acceptance. The Traffic control plan shall include a layout showing the locations of all traffic control devices and crashworthy barriers, the Notice to Motorists, and the proposed work schedule.

GENERAL NOTES

DESIGN SPECIFICATIONS:

A. AASHTO LRFD Bridge Design Specifications, 1998

MATERIALS:

A. Reinforced Concrete: Class A
B. Reinforced Steel: ASTM A 615, Grade 40 or 60
C. Admixture in concrete: See Special Provisions
D. All expansion and premolded joint filler shall be incidental to concrete and will not be paid for separately.
E. All structural steel shall be ASTM A 36 and hot-dip galvanized after fabrication.
F. All anchor bolts, washers and nuts shall confirm to AASHTO M 164 hot-dip galvanized unless noted otherwise.
G. All welding shall be in accordance with the current edition of the Bridge Welding Code ANSI / AASHTO / AWS D1.5 and the Reinforcing Steel Welding Code AWS D 1.4.

CONSTRUCTION METHODS:

A. Refer to Hawaii Standard Specifications for Road, Bridge and Public Works Construction, 1994 Edition and Special Provisions.
B. Except as noted otherwise, all vertical dimensions are measured plumb.
C. For steel reinforcing, stagger all splices where possible.
D. Steel reinforcing shall be supported, bent and placed as per the ACI Detailing Manual, 1994.
E. Unless otherwise noted, for cast-in-place concrete, minimum reinforcement cover:
   Concrete cast against earth: 3"
   Walls: 2"
F. At the time concrete is placed, reinforcing shall be free from mud, oil, laitance or other coatings adversely affecting bond capacity.
G. Reinforcement, dowels and other embedded items shall be positively secured before pouring.
H. Minimum clear spacing between parallel bars shall be one and one-half (1½) times the diameter of the bars (for non-bundled bars). But in no case shall the clear distance between the bars be less than one and one-half (1½) times the maximum size of the coarse aggregate.
I. All dimensions relating to reinforcing bars (e.g. spacing of bars, etc.) are to centers of bars unless noted otherwise.
J. All footings shall bear on firm undisturbed natural soils. In the event of over-excavation, the space between the footing or footing key and ground shall be filled with minimum of Class D concrete at no cost to the State.
K. All existing reinforcing and anchor bolts that can be incorporated in the new work shall be bent or cut as required and cleaned before being utilized in the new work.
L. All existing reinforcing and anchor bolts that cannot be incorporated in the new work shall be completely removed or removed to a minimum depth of one and one-half (1½) inches below finish grade and the area patched with mortar.
M. All existing concrete face receivng new concrete in the finish product shall be roughened, cleaned and have concrete epoxy adhesive applied prior to placement of the new pour, unless indicated otherwise or as ordered by the Engineer.
N. Epoxy fill for anchor bar and dowel holes shall be "Double Cartridge" type. Epoxies that require manual measuring or mixing shall not be allowed.

REFERENCE:

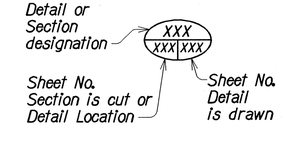
A. Refer to Standard Plans for additional details and notes not covered by details and typical drawings.

GENERAL:

A. All items noted incidental will not be paid for separately.
B. The location of the existing utilities shown on the plans are approximate.
C. The Contractor shall verify the locations of all existing utility lines and notify their respective owners before commencing with any work.
D. The Contractor shall verify all grades and dimensions in the field before commencing with any work.
E. The Contractor shall be solely responsible for the protection of adjacent property, utilities and existing and new structures from damage due to construction. Repairing any damage shall be at no cost to the State.
F. The Contractor shall conduct his work in such a manner and provide such temporary shoring or other measures as may be necessary to insure the safety of all concerned and to protect existing structures.
G. Unless noted otherwise, chamfer all exposed concrete edges three-quarters (¾) of an inch.

ABBREVIATIONS AND SYMBOLS

Abut.	Abutment	Max.	Maximum
AB	Anchor Bolt	Min.	Minimum
A.C.	Asphalt Concrete	MP	Mile Post
Alum.	Aluminum		
Approx.	Approximate	No., #	Number
		N.T.S.	Not To Scale
℄	Baseline		
Bal.	Balance	OB	Outbound
Beg.	Begin, Beginning	oc	On Center
Blk.	Block	OD	Outside Dimension
Bm.	Beam	o/s, O/S	Offset
Brg., Brgs.	Bearing, Bearings		
		PC	Point of Curvature
℄	Center Line	PL	Plate
Cl., Clr.	Clear		
Conc.	Concrete	R	Radius
Cont.	Continuous	Rdwy.	Roadway
		Ref.	Reference
Det.	Detail	Reinf.	Reinforcement
Dia., ø	Diameter	Req'd.	Required
Dim.	Dimension	R/W	Right of Way
Dwg., Dwgs.	Drawing, Drawings		
		Sect.	Section
EA, Ea., ea.	Each	Sht.	Sheet
EF	Each Face	Spcs.	Spaces
EP	Edge of Pavement	Spcg.	Spacing
ES	Edge of Shoulder	Sta.	Station
Exist.	Existing	Std.	Standard
Exp., (E)	Expansion	Str.	Straight
		Symm.	Symmetrical
FF	Front Face	T&B	Top and Bottom
Fin.	Finish	Thk.	Thick, Thickness
Ftg.	Footing	TS	Tubular Steel
		Typ.	Typical
Ga.	Gage, Gauge		
Galv.	Galvanized	Vert.	Vertical
Gr.	Grade	w/	With
Horiz.	Horizontal		
HS	High Strength		
Hwy.	Highway		
IB	Inbound		
Jt.	Joint		
LC	Length of Curve		
LF., Lin. Ft.	Linear Feet		
Lg.	Long		
Longit.	Longitudinal		
L.S.	Lump Sum		



ORIGINAL PLAN	SURVEY PLOTTED BY		DATE
	DRAWN BY	KWN	AUG 1999
	TRACED BY		
NOTE BOOK	DESIGNED BY	JF	AUG 1999
	QUANTITIES BY	JF	AUG 1999
No.	CHECKED BY	DCO	AUG 1999

cc1721

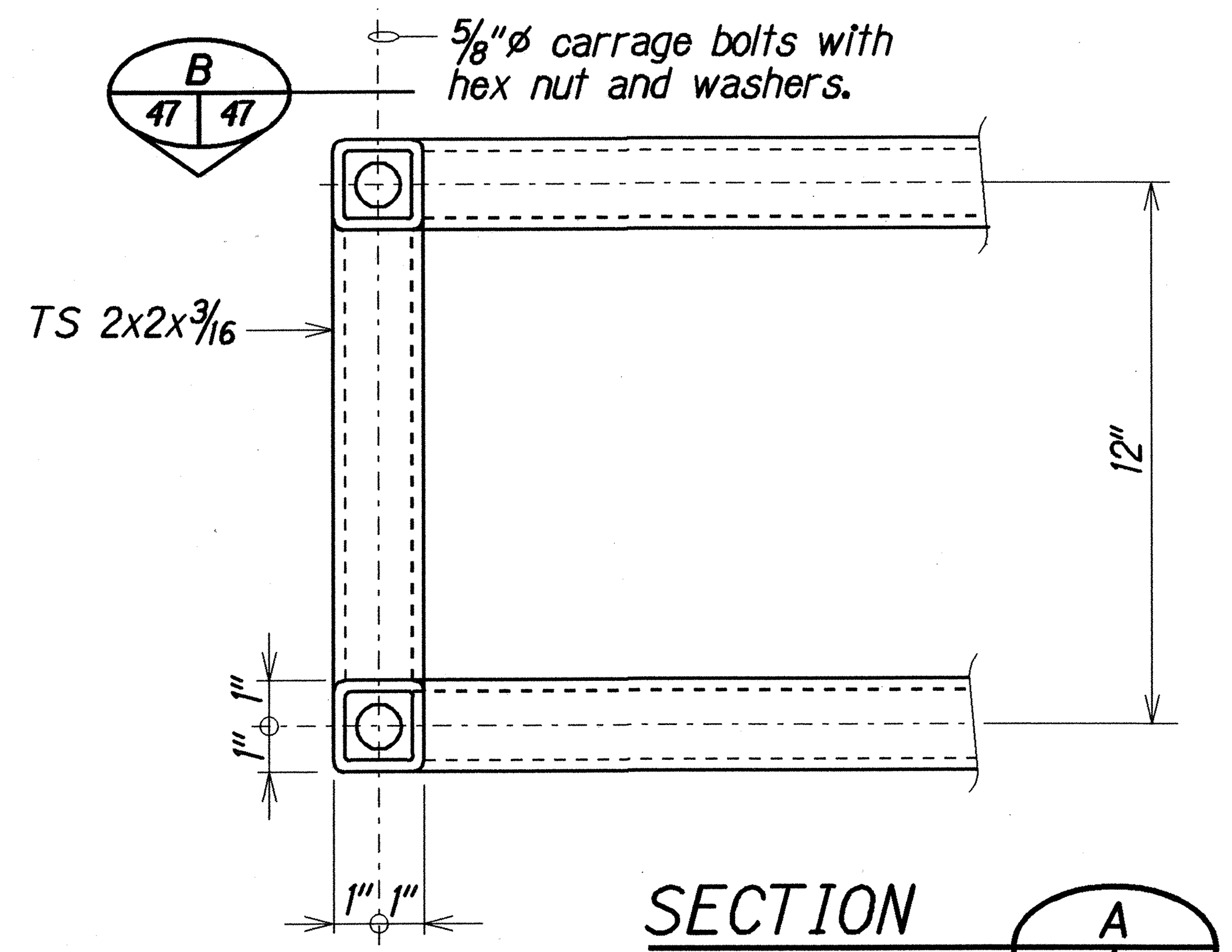
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

INDEX TO DRAWINGS, GENERAL NOTES, ABBREVIATIONS AND SYMBOLS

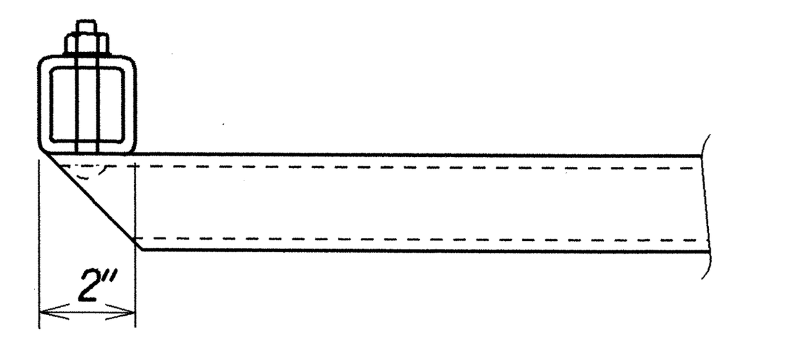
AKAKA FALLS ROAD RESURFACING
HONOMU TOWN TO AKAKA FALLS
PROJECT NO. 220A-01-02M

Scale: As Shown Date: April, 2002

SHEET No. 1 OF 4 SHEETS



SECTION A (47 | 47)
Scale : 3" = 1'-0"

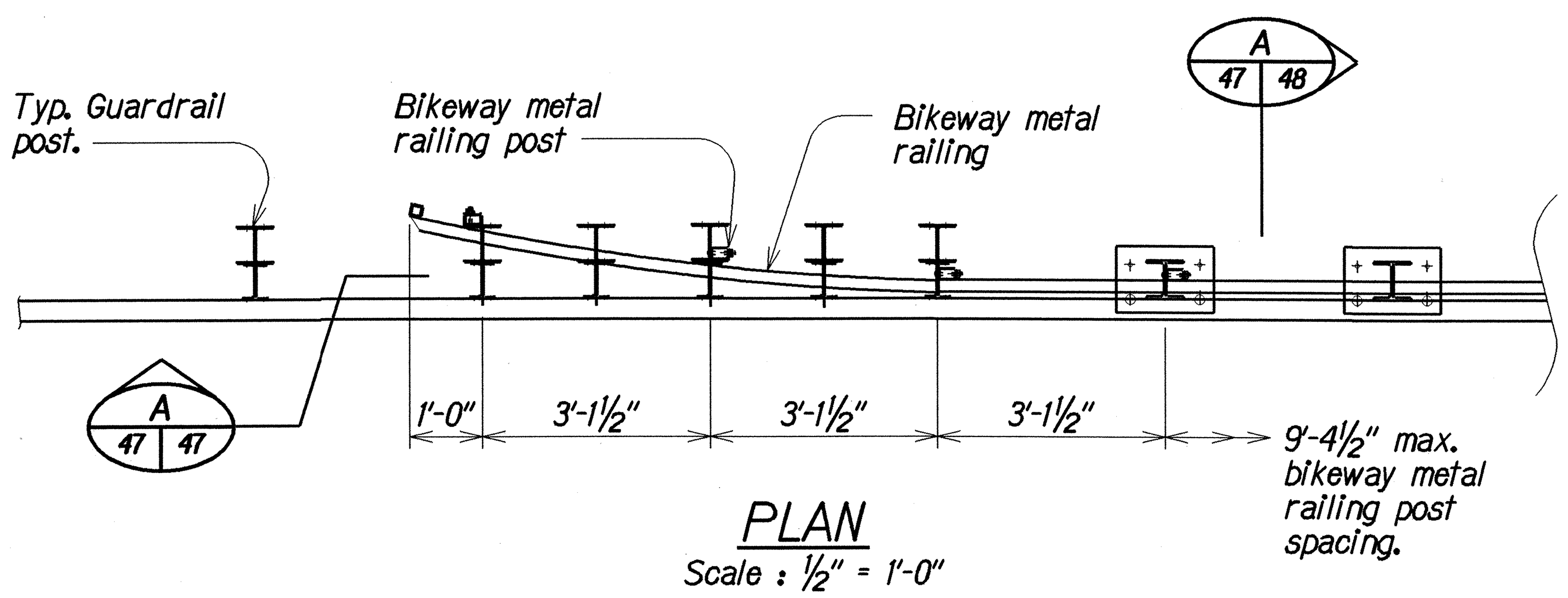


SECTION B (47 | 47)
Scale : 3" = 1'-0"

BRIDGE RAILING AND TRANSITION SCHEDULE

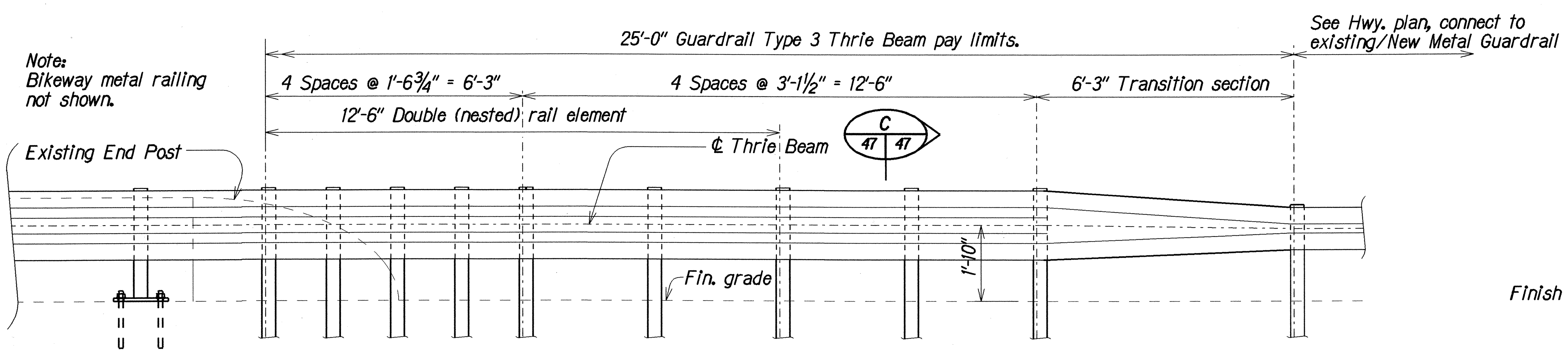
Station		Reference	Type 3 Thrie-beam transition (Linear Feet)	Type "A" Bridge Railing Upgrade (Linear Feet)	Remarks
Begin	End				
20+60	20+85	Left	25		
20+85	21+35	Left		50	Incl. 16 post base plates
21+35	21+60	Left	25		
20+60	20+85	Right	25		
20+85	21+35	Right		50	Incl. 16 post base plates
21+35	21+60	Right	25		

Note:
1. Removal of existing guardrails shall be considered incidental to installation of Type 3 Thrie-beam Metal Guardrail Transition.
2. Removal of existing bridge handrails and patching of holes left after removal shall be considered incidental to Type "A" Bridge Railing Upgrade.

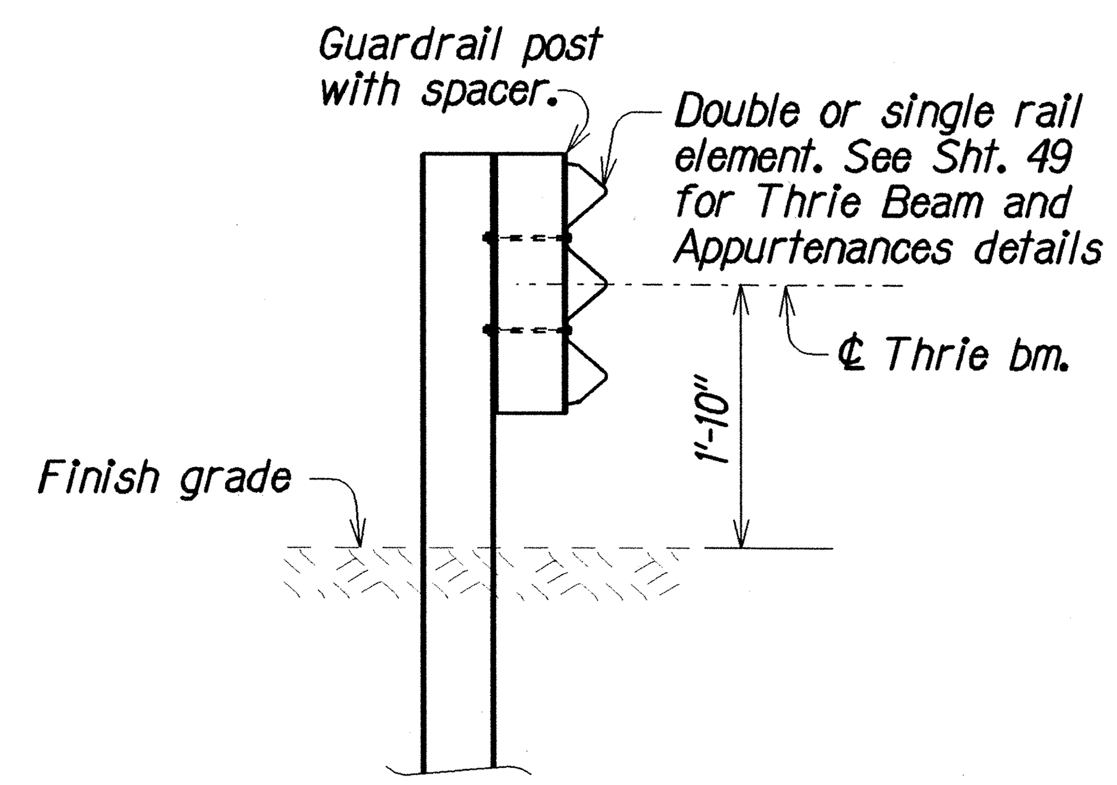


PLAN
Scale : ½" = 1'-0"

BRIDGE RAIL END FLAIR DETAIL



PARTIAL ELEVATION



SECTION C (47 | 47)
Scale : ¾" = 1'-0"

TYPE 3 THRIE BEAM METAL GUARDRAIL TRANSITION

Scale : ½" = 1'-0"

ORIGINAL PLAN		
NOTE BOOK: lofros2.dgn	SURVEY PLOTTED BY: KMN	DATE: AUG. 1999
No.: hel.jk	DRAWN BY:	
	TRACED BY:	
	DESIGNED BY: SA	AUG. 1999
	QUANTITIES BY: SA	AUG. 1999
	CHECKED BY: DCO	AUG. 1999

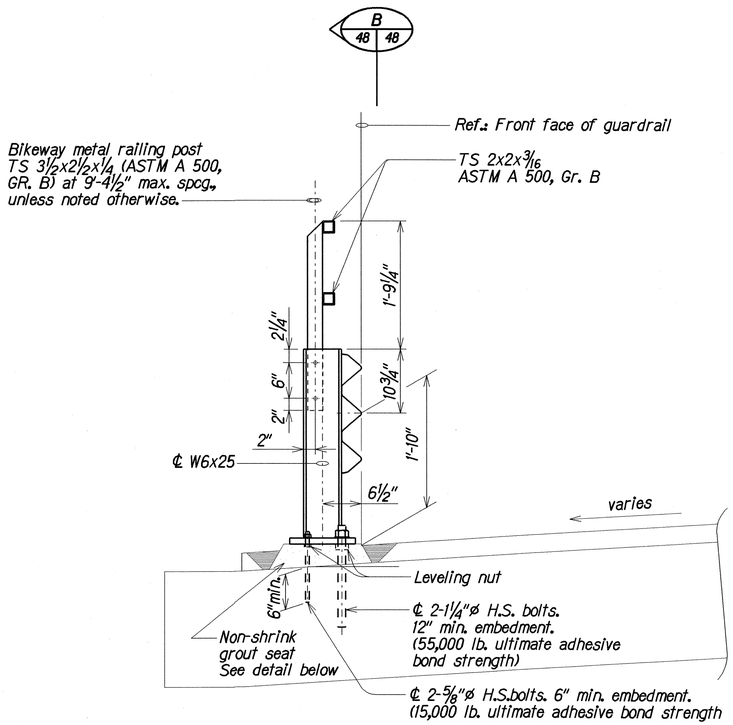
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE RAIL UPGRADE AND THRIE BEAM TRANSITION DETAILS

AKAKA FALLS ROAD RESURFACING
HONOMU TOWN TO AKAKA FALLS
PROJECT NO. 220A-01-02M

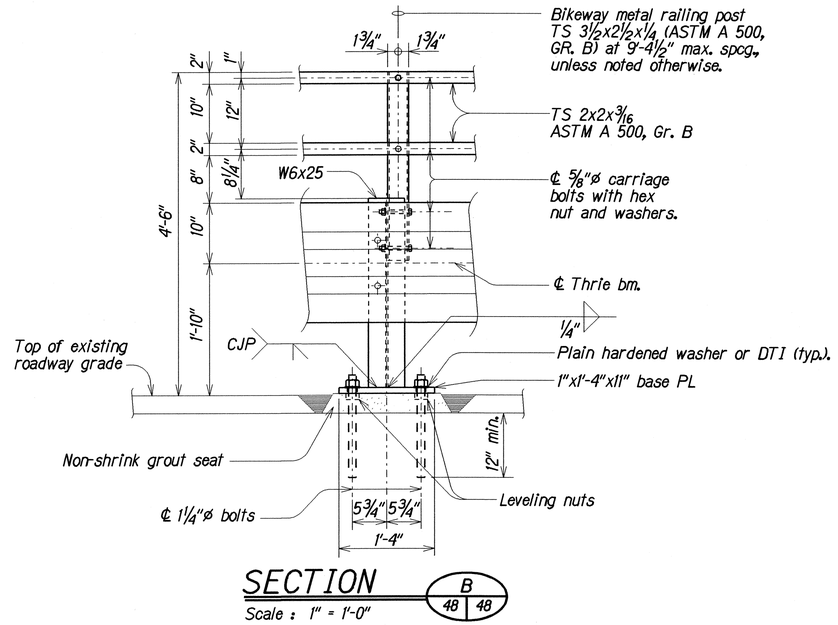
Scale: As Shown — Date: April, 2002

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	220A-01-02M	2002	48	49



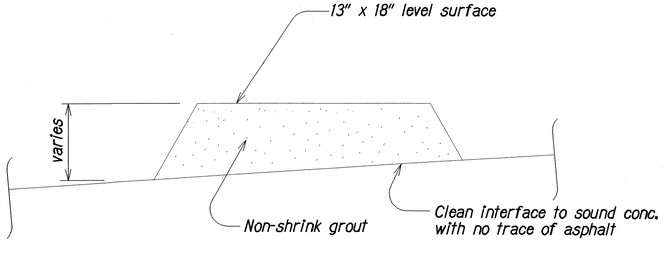
SECTION A 47 48

Scale : 1" = 1'-0"



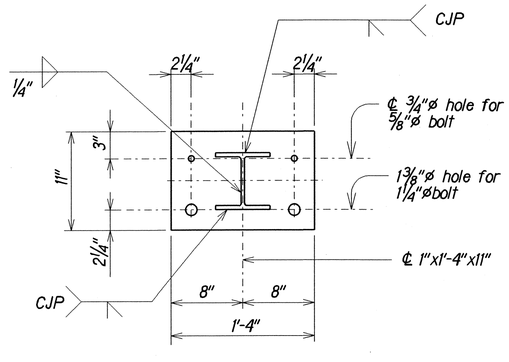
SECTION B 48 48

Scale : 1" = 1'-0"



SEAT FOR BEARING PLATE

Scale: 3" = 1' - 0"



PLAN

BASE PL DETAIL

Scale: 1½" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY KMH	AUG 1999
	TRACED BY	
NOTE BOOK	DESIGNED BY SA	AUG 1999
DATE	QUANTITIES BY SA	AUG 1999
No.	CHECKED BY DCO	AUG 1999

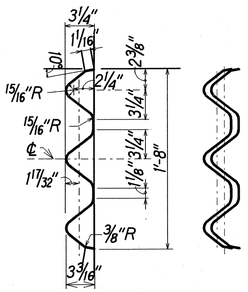
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SECTIONS AND DETAILS
TYPE "A" BRIDGE RAILING UPGRADE
AKAKA FALLS ROAD RESURFACING
HONOMU TOWN TO AKAKA FALLS
PROJECT NO. 220A-01-02M

Scale: As Shown Date: April, 2002

SHEET No. 3 OF 4 SHEETS

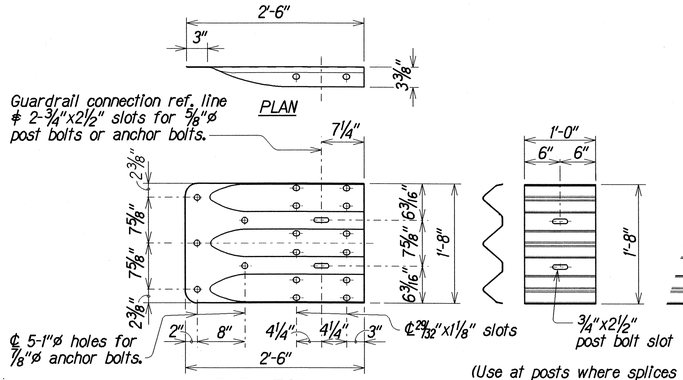
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	220A-01-02M	2002	49	49



SINGLE DOUBLE

SECTION THRU RAIL ELEMENT

Scale: 1½" = 1'-0"



TERMINAL CONNECTOR

Scale: 1" = 1'-0"

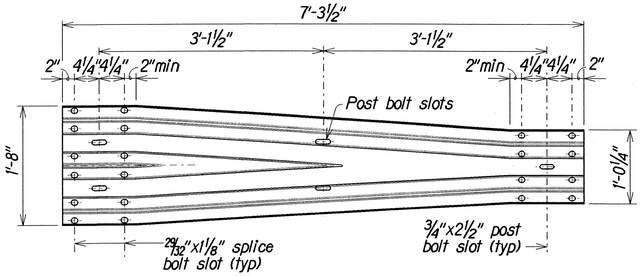
(Use at posts where splices do not occur.)

BACKUP PLATE

Scale: 1" = 1'-0"

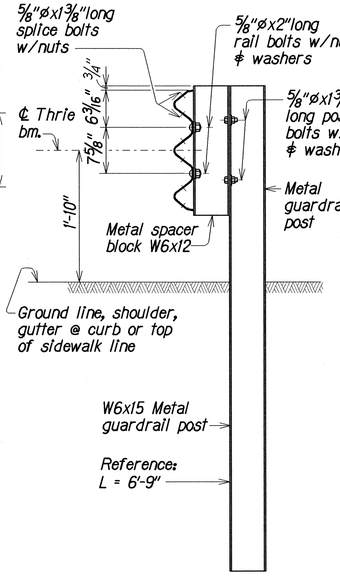
RAIL SPLICE

Scale: 1" = 1'-0"



TRANSITION SECTION

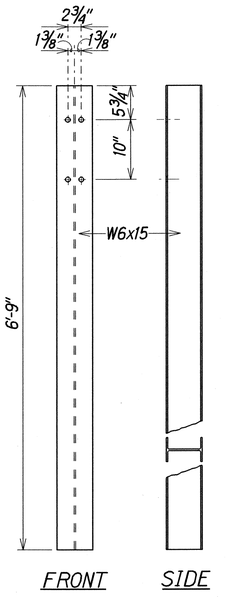
Scale: 1" = 1'-0"



TYPICAL SECTION

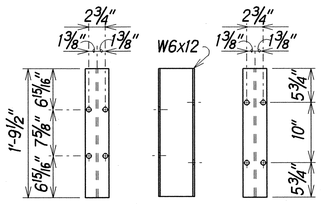
METAL GUARDRAIL ON METAL POST WITH METAL SPACER BLOCK

Scale: 1" = 1'-0"



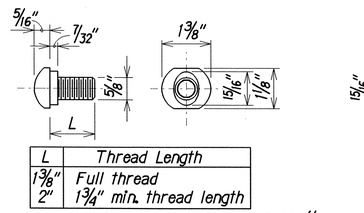
POST DETAILS

Scale: 1" = 1'-0"

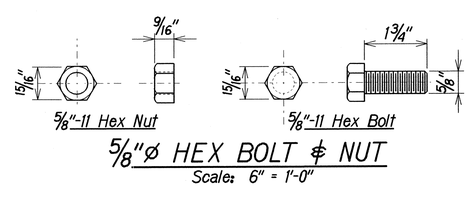


SPACER BLOCK DETAILS

Scale: 1" = 1'-0"

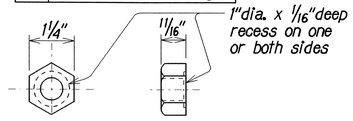


L	Thread Length
1⅜"	Full thread
2"	1¾" min. thread length



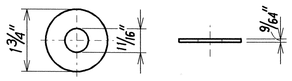
⅝"ø HEX BOLT & NUT

Scale: 6" = 1'-0"



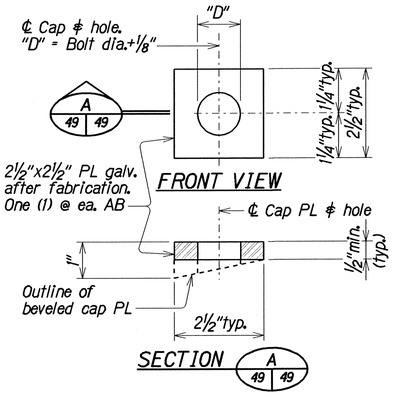
⅝"ø BUTTON HEAD BOLT & RECESS NUT

Scale: 6" = 1'-0"



STEEL WASHER FOR ⅝"ø BOLT

Scale: 6" = 1'-0"



CAP (BEARING) PLATE DETAIL

Scale: 6" = 1'-0"

METAL GUARDRAIL TYPE 3 THRIE BEAM AND APPURTENANCES DETAILS

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

METAL GUARDRAIL TYPE 3 THRIE BEAM AND APPURTENANCES DETAILS

AKAKA FALLS ROAD RESURFACING
HONOMU TOWN TO AKAKA FALLS
PROJECT NO. 220A-01-02M

Scale: As Shown Date: April, 2002

SHEET No. 4 OF 4 SHEETS