FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	42	52

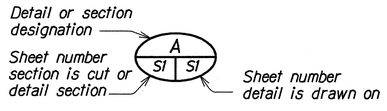
INDEX TO DRAWINGS

SHEET	DESCRIPTION
Q1	INDEX, GENERAL NOTES, ESTIMATED QUANTITIES, ABBREVIATIONS AND SYMBOLS
Q2	DEMOLITION OF EXISTING END POST
Q3	TYPE "A" END POST LAYOUT PLAN
Q4	TYPE "A" END POST UPGRADE PLAN AND ELEVATION
Q5	TYPICAL TYPE "A" SECTIONS AND PARTIAL ISOMETRIC VIEW
Q6	PARTIAL PLAN, ELEVATION, AND SECTION
Q7	GUARDRAIL TYPE 3 THRIE BEAM AND APPURTENANCES DETAILS

ABBREVIATIONS

AB	Anchor Bolt	FF	Front Face	PL	Plate
Abut.	Abutment	Fin.	Finish		
Alum.	Aluminum			R	Radius
Approx.	Approximate	Ga.	Gage, gauge	Rdwy.	Roadway
℄	Baseline	Galv.	Galvanized	Ref.	Reference
Bal.	Balance	Gr.	Grade	Req'd	Required
Beg.	Begin, Beginning			Reinf.	Reinforcing
Bm.	Beam	Horiz.	Horizontal		
Brg., Brgs.	Bearing, Bearings	HS	High Strength	Sect.	Section
		IB	Inbound	Shld.	Shoulder
℄	Center line	Jt.	Joint	Sht.	Sheet
Cl.	Clear			Spcs.	Spaces
Col.	Column	L	Length	Spcg.	Spacing
Conc.	Concrete	LC	Length of Curve	Sta.	Station
Cont.	Continuous	Lg.	Long	Std.	Standard
CR	Corrosion Resistant	Longit.	Longitudinal	Struct.	Structural
				Str.	Structure
Det.	Detail	Max.	Maximum		
Dia.	Diameter	Min.	Minimum	T℄B	Top and Bottom
Diag.	Diagonal			Thk.	Thick
		No.	Number	TS	Tubular Steel
Ea.	Each	NIC	Not In Contract	Typ.	Typical
EF	Each Face				
Eq.	Equal	oc	On Center	Vert.	Vertical
Exist.	Existing	OB	Outbound		
Exp.	Expansion	OD	Outside Dimension	w/	with
E.W.	Each Way				

SYMBOLS



SURVEY PLOTTED BY		DATE
DRAWN BY	KMG	Apr. 2000
TRACED BY		
DESIGNED BY	LJK	Apr. 2000
QUANTITIES BY	LJK	Apr. 2000
CHECKED BY	DCO	Apr. 2000
ORIGINAL PLAN		
NOTE BOOK		
No. Rhonda Loo		

GENERAL NOTES

DESIGN SPECIFICATIONS - AASHTO:

1. AASHTO LRFD Bridge Design Specifications, 1998, with 1999 interim reivisions.

MATERIALS:

1. Reinforced concrete: f'c = 4,000 psi
2. Reinforcing steel: ASTM A 615, Grade 60.
3. Admixture in concrete: See Special Provisions
4. All expansion and premolded joint filler shall be incidental to concrete and will not be paid for separately.
5. All structural steel shall be ASTM A 36 hot-dip galvanized after fabrication.
6. All anchor bolts, washers and nuts shall be ASTM A 325, hot-dip galvanized after fabrication, unless noted otherwise.
7. All welding shall be in accordance with the current edition of Structural Steel Welding Code AWS D 1.1. Welding electrodes for structural steel shall be E 70.
8. Epoxy shall be "Double Cartridge" type with static mixer. Epoxies that require manual measuring or mixing will not be allowed. Epoxy shall meet the requirements of ASTM C 881, Type IV, Grade 3, Class C.
9. Dowels. Stainless Steel AISI 316L grade dowels shall either conform to ASTM A 955 Grade 60 or be stainless steel AISI 316L grade, clad dowels which meet the requirements of ASTM A 955 Grade 60 and have an average cladding thickness of 0.04 inches. If clad dowels are used then the ends of the dowels shall be sealed with epoxy as per Section 11 of ASTM A755.

CONSTRUCTION METHODS:

1. Refer to Hawaii Standard Specifications for Road, Bridge and Public Works Construction, 1994 Edition and Special Provisions.
2. Except as noted otherwise, all dimensions are measured plumb.
3. For concrete finish, see Special Provisions.
4. Steel reinforcing shall be supported, bent and placed as per the ACI Detailing Manual, 1994.
5. The minimum cover measured from the surface of the concrete to the face of any reinforcing bars shall be as follows, except as noted otherwise:
   a. Concrete cast or finished to a smooth surface: 2"
   b. Concrete cast against and permanently exposed to earth: 3"
6. At time concrete is placed, reinforcing shall be free from mud, oil, laitance or other coatings adversely affecting bond capacity.
7. Reinforcement, dowels and other embedded items shall be positively secured before pouring.
8. All existing reinforcing and anchor bolts that can be incorporated in the new work shall be cleaned before being utilized in the new work.
9. All existing concrete faces receiving new concrete in the finish product shall be roughened to a min. ¼" amplitude and cleaned prior to placement of the new pour.
10. Existing structure that will be removed is shown by dashed lines. Limits of removal of existing structure shown by hatched lines. Removal shall be done in such a manner as to preclude any damage to the existing reinforcing and concrete to remain. Large vibratory type of equipmemt will not be permitted in the removal operation, nor for drilling of holes. Only small vibratory hand tools approved by the Engineer will be allowed. Any damage to the existing structure due to the Contractor's operation or negligence shall be repaired at his expense with no additional cost to the State, and to the satisfaction of the Engineer.
11. Large impacting or vibratory type equipment will not be permitted in the drilling of holes.
12. The holes for anchor bolts shall be drilled as shown into the existing concrete surfaces prior to fabrication of structural steel elements. If the drill contacts any existing rebar, the hole shall be filled with epoxy grout and a replacement hole shall be drilled. The Contractor shall not damage any existing rebars. Any damage by the Contractor shall be repaired at the Contractor's expense and at no cost to the State. The drilled holes shall be ⅛" larger. Blow the hole clean with compressed air, brush the hole, and blow it clean again. Holes should be clean and sound, or follow the manufacture recommendation.
13. All dimensions relating to reinforcing bars (e.g. spacing of bars, etc.) are to centers of bars unless noted otherwise.
14. All existing reinforcing that can be incorporated in the new work shall be cleaned before being utilized in the new work.
15. All footings shall bear on firm undisturbed natural soils or properly compacted structural fill.

REFERENCE:

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

GENERAL:

1. All items noted incidental will not be paid for separately.
2. The Contractor shall verify the locations of all existing utility lines and notify their respective owners before commencing with any work.
3. The Contractor shall verify all grades and dimensions in the field before commencing with any work.
4. Excavating, demolishing and/or disposing existing concrete end post and backfilling for new concrete end post shall not be paid for separately but shall be considered incidental to Item No. 507.7600 - Type A End Post Upgrade.
5. 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 the Contractor's own expense, to the satisfaction of the Engineer. He 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.
6. Unless noted otherwise, chamfer all exposed concrete edges three-quarters (¾) of an inch.

ESTIMATED QUANTITIES

ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL
507.7600	Type "A" End Post Upgrade	EA.	4
606.3112	Guardrail, Type 3 Thrie Beam	L.F.	100

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KALIALINUI BRIDGE

INDEX, GENERAL NOTES, ESTIMATED QUANTITIES, ABBREVIATIONS AND SYMBOLS

HANA HIGHWAY, Dairy Road to Vicinity of Paia Town &
PI'ILANI HIGHWAY, Mokulele Hwy. to Wailea Ike Drive

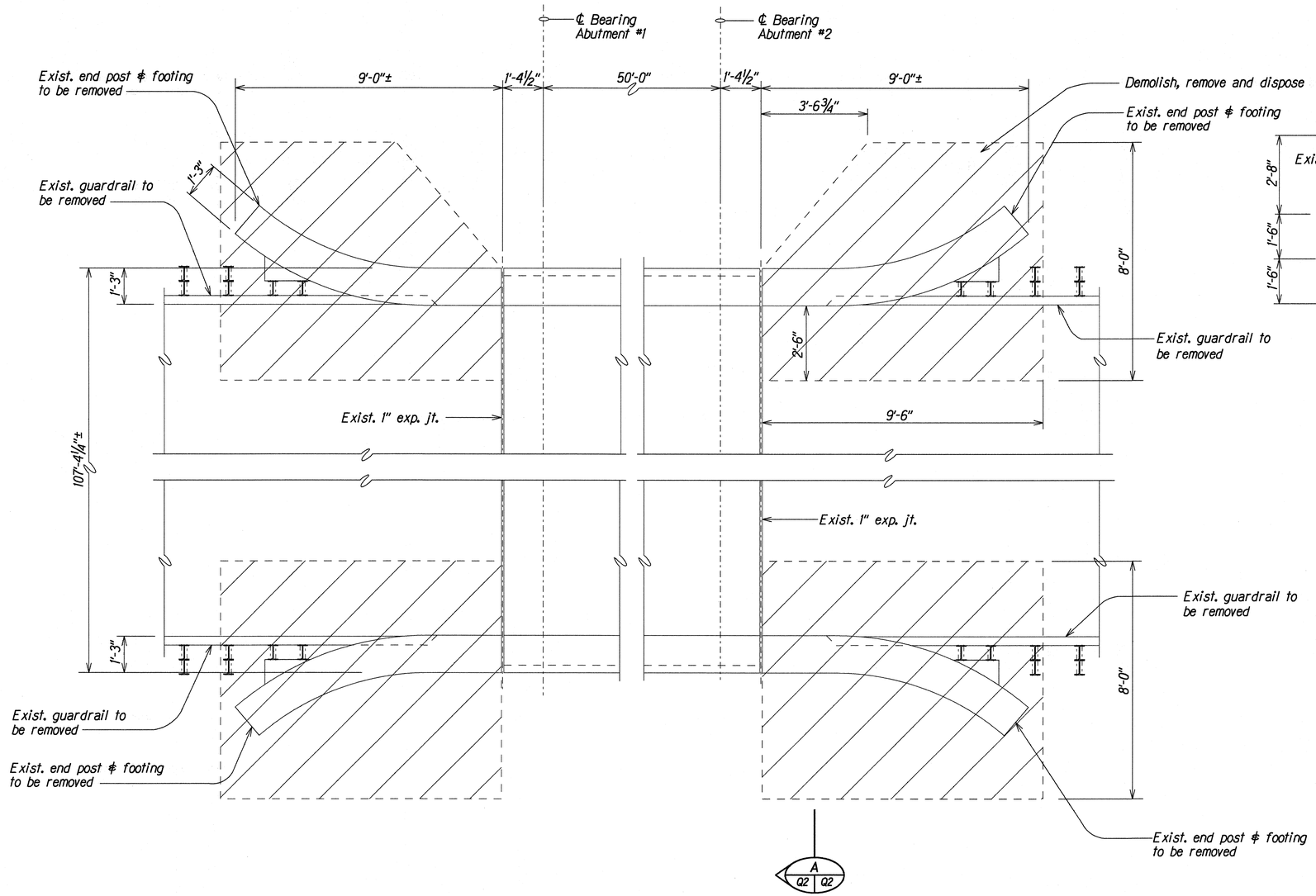
GUARDRAIL AND SHOULDER IMPROVEMENTS

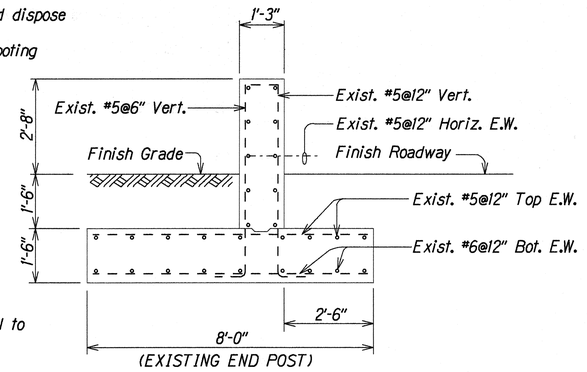
Federal-Aid Project No. STP-0900(58)

Scale: As Noted Date: Apr. 2000

SHEET No. Q1 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	43	52





SECTION A (Q2 | Q2)
Scale: ½" = 1'-0"

DEMOLITION PLAN OF EXISTING END POST AND GUARDRAILS

Scale: ½" = 1'-0"

LEGEND:

Denotes existing structure to be removed and disposed.

ORIGINAL PLAN	SURVEY PLOTTED BY	KMN
	DRAWN BY	•
	TRACED BY	•
NOTE BOOK	DESIGNED BY	LJK
	QUANTITIES BY	LJK
N:\hwy\2.dgn	CHECKED BY	DCO
	DATE	APR 2000

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KALIALINUI BRIDGE

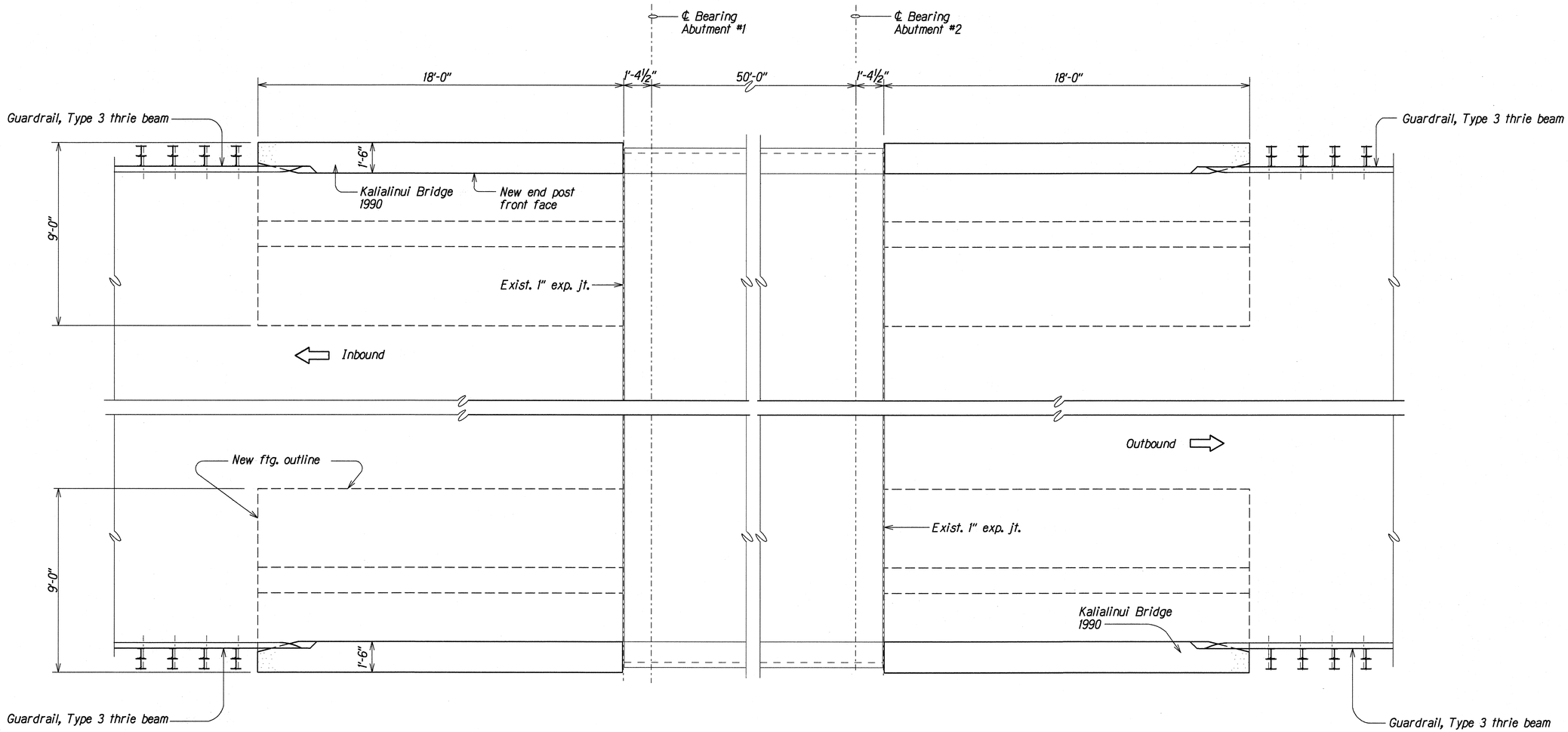
DEMOLITION OF EXISTING END POST

HANA HIGHWAY, Dairy Road to Vicinity of Paia Town ⊄
PIILANI HIGHWAY, Mokulele Hwy. to Wailea Ike Drive
GUARDRAIL AND SHOULDER IMPROVEMENTS
Federal-Aid Project No. STP-0900(58)

Scale: As Noted Date: APR. 2000

SHEET No. Q2 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	44	52



END POST LAYOUT PLAN

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

ORIGINAL PLAN	SURVEY PLOTTED BY	KMH	APR 2000
	DRAWN BY		
	TRACED BY		
NOTE BOOK	DESIGNED BY	LJK	APR 2000
	QUANTITIES BY	LJK	APR 2000
	CHECKED BY	DDD	APR 2000

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KALIALINUI BRIDGE

TYPE "A" END POST LAYOUT PLAN

HANA HIGHWAY, Dairy Road to Vicinity of Paia Town &
PIILANI HIGHWAY, Mokulele Hwy. to Wailea Ike Drive
GUARDRAIL AND SHOULDER IMPROVEMENTS
Federal-Aid Project No. STP-0900(58)

Scale: As Noted Date: APR. 2000

SHEET No. Q3 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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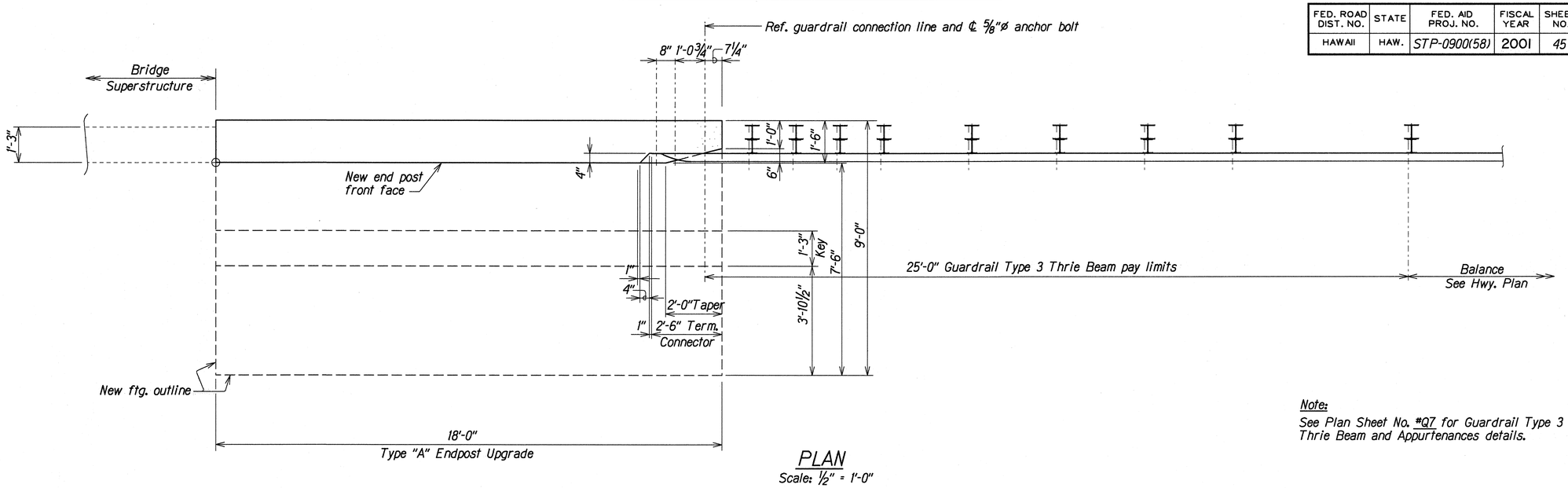
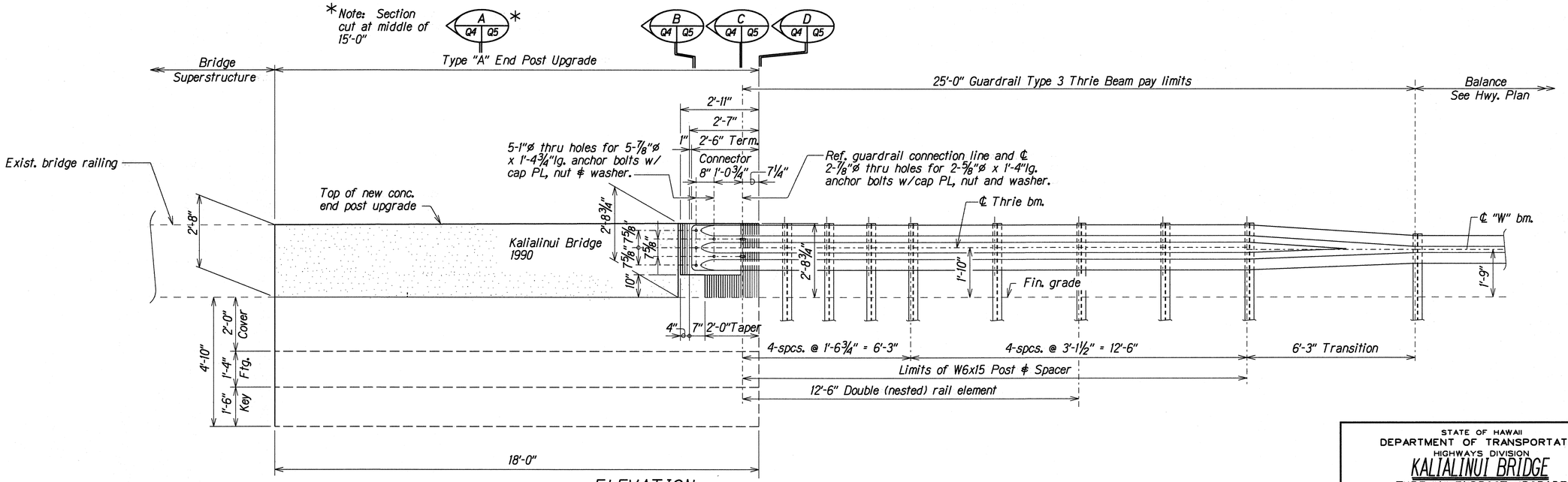


PLAN
Scale: 1/2" = 1'-0"

Note:
See Plan Sheet No. #Q7 for Guardrail Type 3 Thrie Beam and Appurtenances details.



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

TYPE "A" ENDPOST UPGRADE PLAN AND ELEVATION

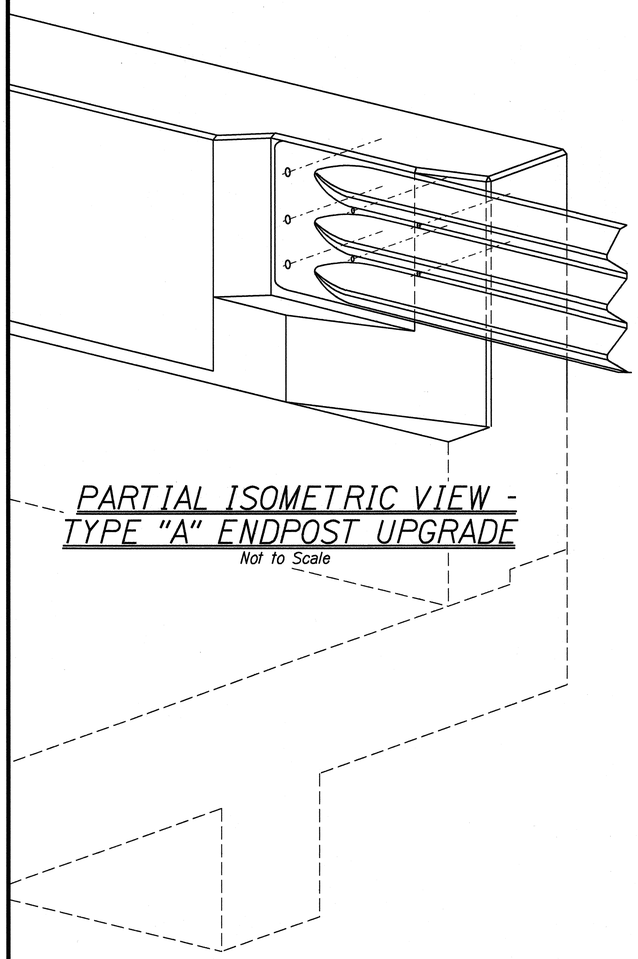
ORIGINAL PLAN	SURVEY PLOTTED BY	KMN	DATE APR 2000
	DRAWN BY		APR 2000
	TRACED BY	LJK	APR 2000
NOTE BOOK	DESIGNED BY	MK	APR 2000
	QUANTITIES BY	DCO	APR 2000
	CHECKED BY		

nathandot.dgn

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KALIALINUI BRIDGE
TYPE "A" ENDPOST UPGRADE
PLAN AND ELEVATION
HANA HIGHWAY, Dairy Road to Vicinity of Paia Town & PIILANI HIGHWAY, Mokulele Hwy. to Wailea Ike Drive
GUARDRAIL AND SHOULDER IMPROVEMENTS
Federal-Aid Project No. STP-0900(58)
Scale: As Noted Date: Apr. 2000

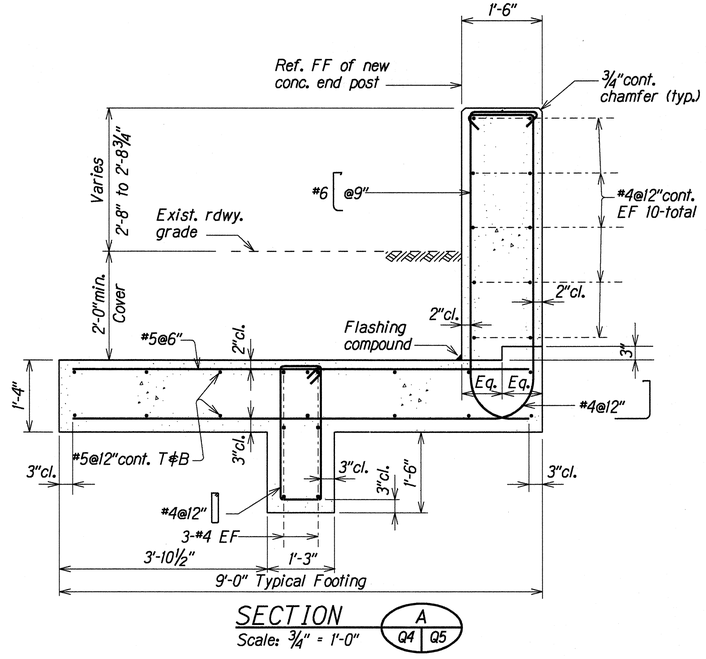
SHEET No. Q4 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	46	52



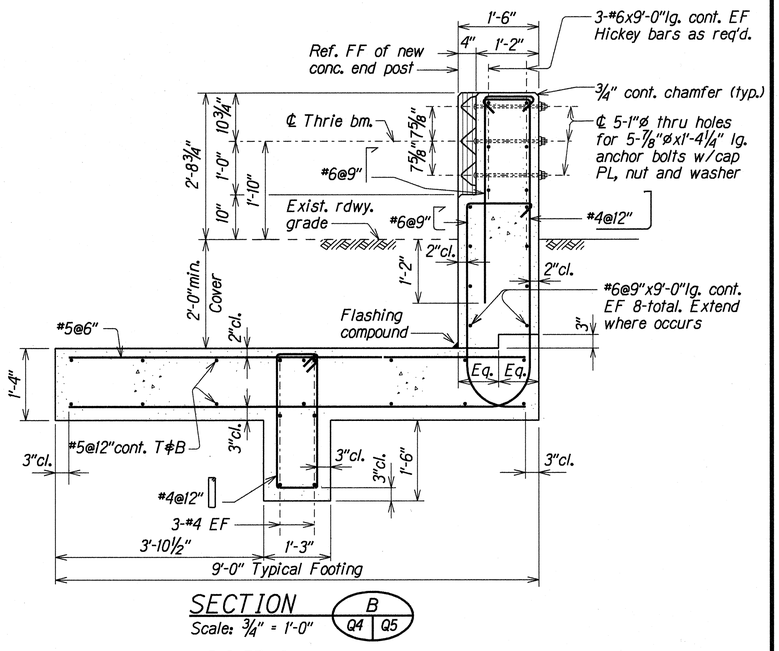
PARTIAL ISOMETRIC VIEW - TYPE "A" ENDPOST UPGRADE

Not to Scale



SECTION A (Q4 | Q5)

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



SECTION B (Q4 | Q5)

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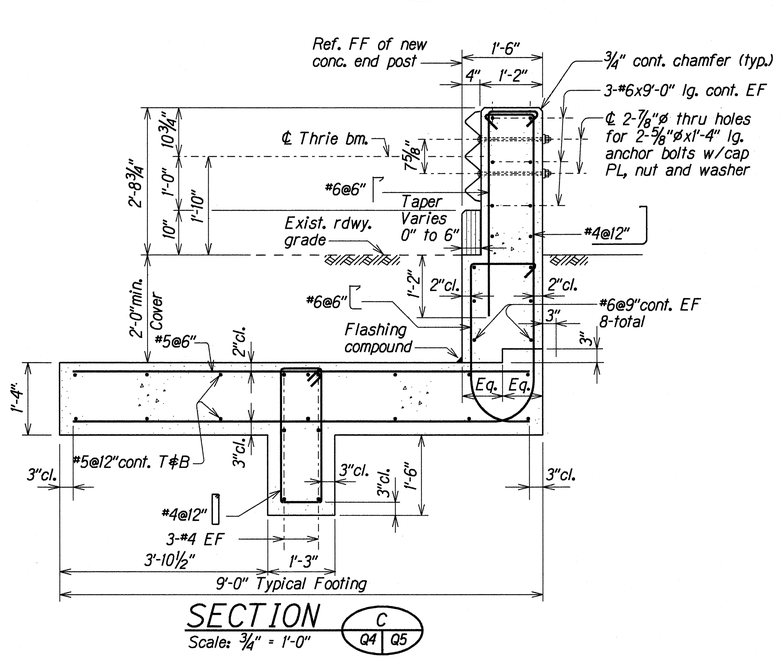
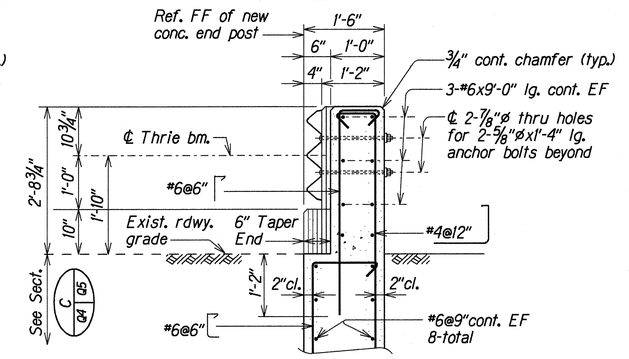


SECTION C (Q4 | Q5)

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



SECTION D (Q4 | Q5)

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

TYPICAL SECTIONS - ENDPOST UPGRADE DETAILS

ORIGINAL PLAN	SURVEY PLOTTED BY	KMK	DATE APR. 2000
	DRAWN BY		
	TRACED BY		
NOTE BOOK	DESIGNED BY	LJK	APR. 2000
	QUANTITIES BY	LJK	APR. 2000
No. Numbers Ages	CHECKED BY	DLO	APR. 2000

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KALIALINUI BRIDGE

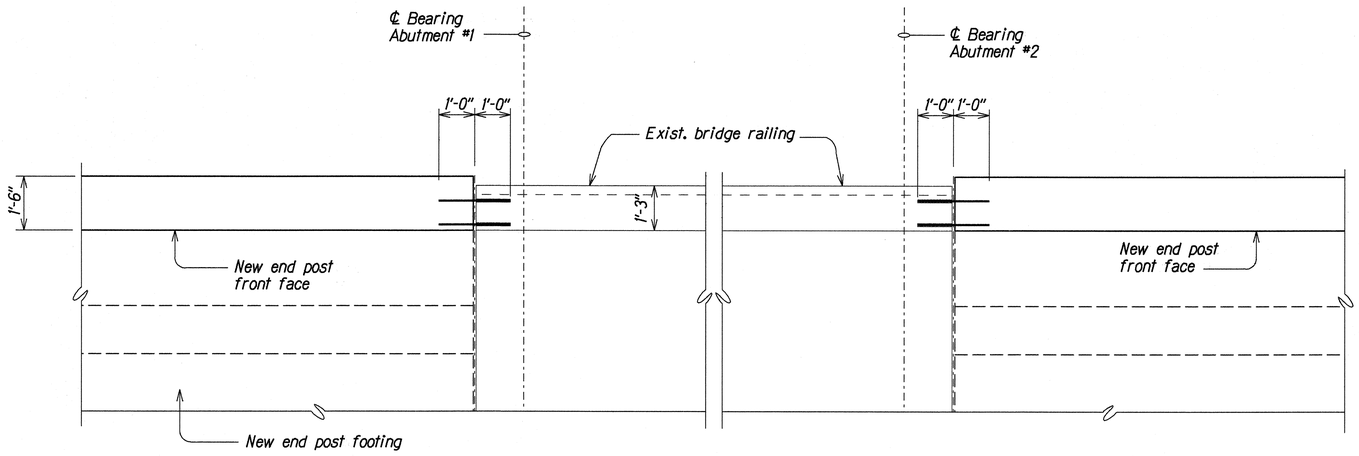
TYPICAL TYPE "A" SECTIONS AND PARTIAL ISOMETRIC VIEW

HANA HIGHWAY, Dairy Road to Vicinity of Paia Town & PIILANI HIGHWAY, Mokulele Hwy. to Wailea Ike Drive
GUARDRAIL AND SHOULDER IMPROVEMENTS
Federal-Aid Project No. STP-0900(58)

Scale: As Noted Date: Apr. 2000

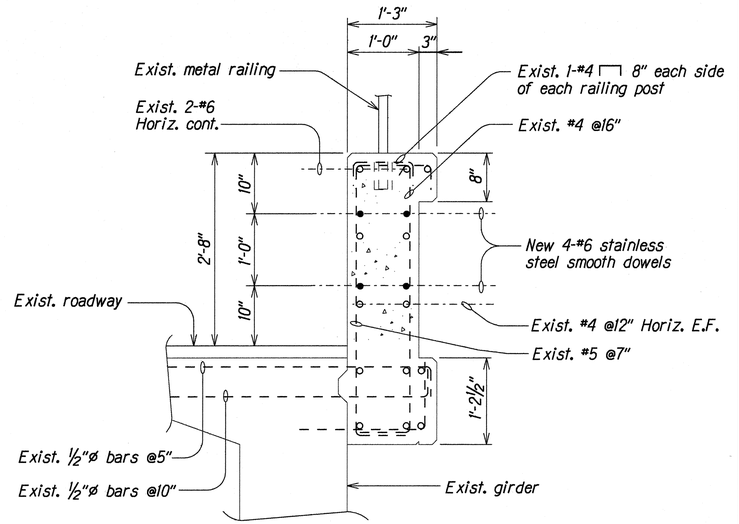
SHEET No. Q5 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	47	52



PARTIAL LAYOUT PLAN

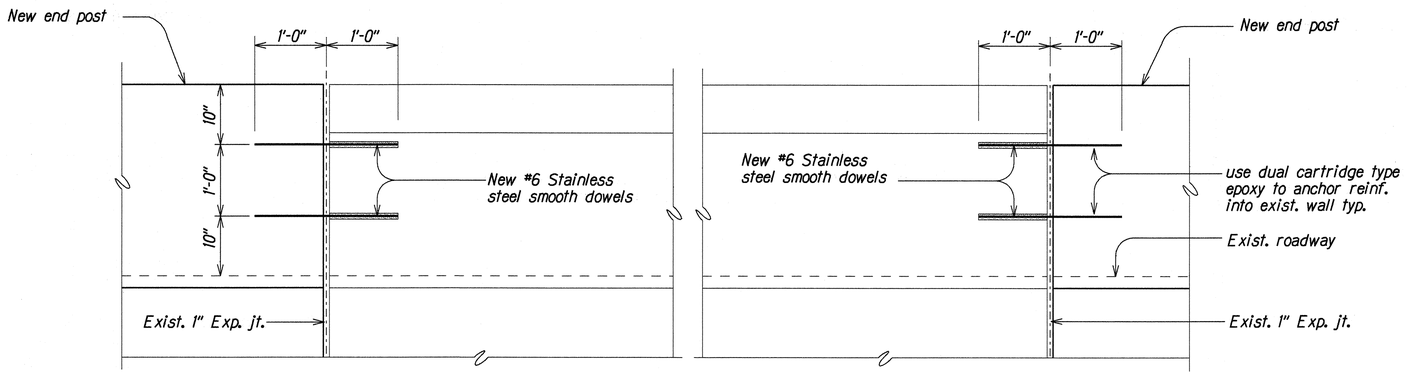
Scale: ½" = 1'-0"



SECTION

Scale: 1" = 1'-0"

A
Q6 | Q6



PARTIAL ELEVATION - EXTERIOR CONCRETE PARAPET

Scale: 1" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	KMN	DATE APR 2000
	DRAWN BY		APR 2000
NOTE BOOK	TRACED BY	LJK	APR 2000
	DESIGNED BY	LJK	APR 2000
	QUANTITIES BY	DCO	APR 2000
No. Revision by date	CHECKED BY		APR 2000

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KALIALINUI BRIDGE

PARTIAL PLAN, ELEVATION, AND SECTION

HANA HIGHWAY, Dairy Road to Vicinity of Paia Town &
PIILANI HIGHWAY, Mokulele hwy. to Wailea Ike Drive
GUARDRAIL AND SHOULDER IMPROVEMENTS
Federal-Aid Project No. STP-0900(58)

Scale: As Noted Date: Apr. 2000

SHEET No. Q6 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	48	52

NOTES:

A. The work necessary to connect guardrail to concrete end post shall include all labor, materials, tools, equipment and incidentals necessary to complete the work and will not be paid for separately.

B. Lap terminal connector and rail element in direction of traffic to prevent snagging.

C. All anchor bolts shall be high strength bolts conforming to the requirements of ASTM 325 and Standard Specification, Section 713.04.

D. Anchor bolt length shall be such that a snug fit of the elements and full thread engagement plus 1/4" (max) is attained.

E. "Terminal Connector", "Transition Section" and thrie beam shall be fabricated from 10gauge steel conforming to the requirements of AASHTO M 180, Type II, Class B.

F. "Terminal Connector" and standard spacer, including all anchor bolts, cap PL, nuts and washers, shall be hot-dip galvanized after fabrication.

G. Cap PL shall be fabricated from ASTM A 36.

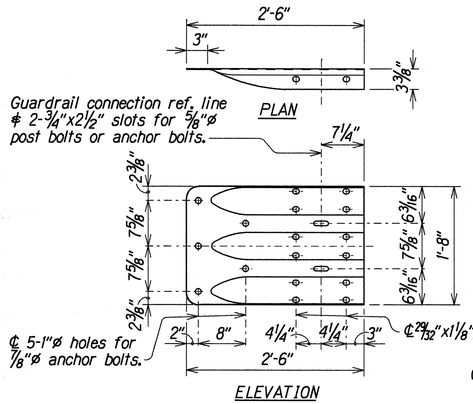
H. First 25'-0" of guardrail adjoining "Terminal Connector" shall be galvanized steel and supports spaced as shown on the detail drawings. This section of rail shall be placed on tangent to end post or parallel to roadway, unless conditions at site renders it impossible to do so. Flare point to be determined in field.

I. Double (nest 1st panel) thrie beam elements at all end post connections, except on highways with one-way traffic pattern, use single thrie beam elements at end post on trailing end only.

J. Where double (nested) beam occur, 12" "Back-up Plate" not required.

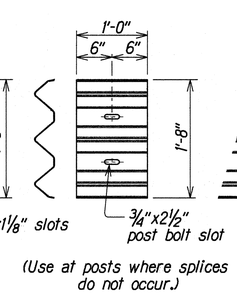
K. Heads of through anchor bolts shall be placed on the traffic side of the rail.

L. All steel shapes, rails and plates shall conform to ASTM A 36 specifications.



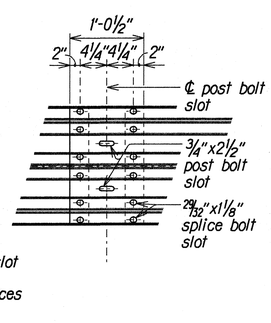
TERMINAL CONNECTOR

Scale: 1" = 1'-0"



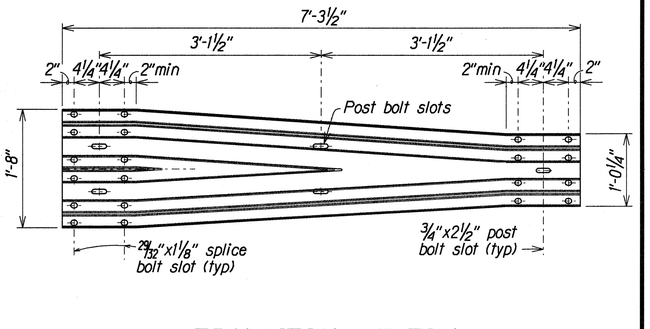
BACKUP PLATE

Scale: 1" = 1'-0"



RAIL SPLICE

Scale: 1" = 1'-0"



TRANSITION SECTION

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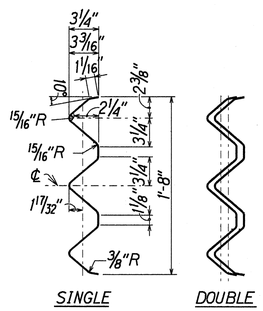
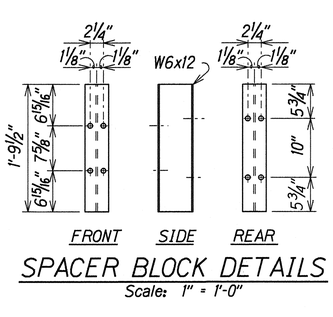


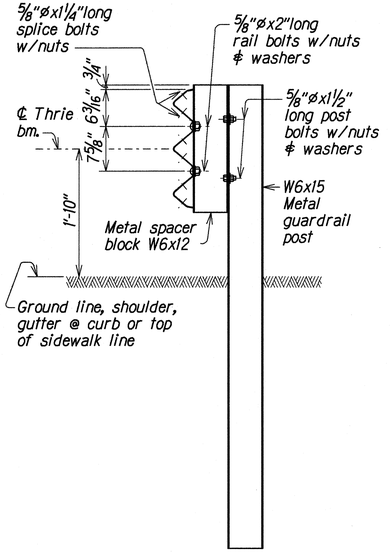
SECTION THRU RAIL ELEMENT

Scale: 1½" = 1'-0"



SPACER BLOCK DETAILS

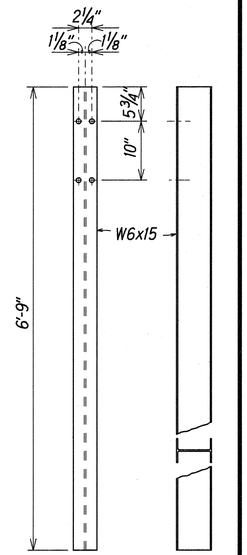
Scale: 1" = 1'-0"



TYPICAL SECTION

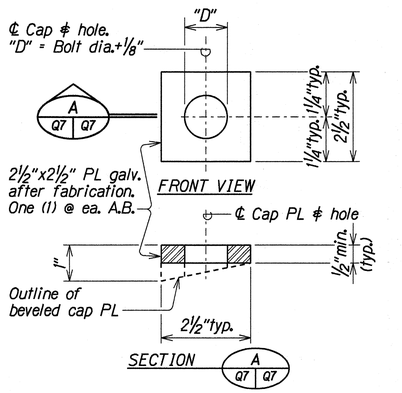
METAL GUARDRAIL ON METAL POST WITH METAL SPACER BLOCK

Scale: 1" = 1'-0"



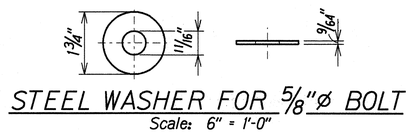
POST DETAILS

Scale: 1" = 1'-0"



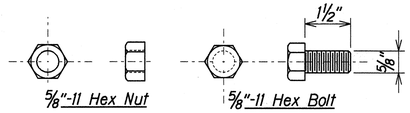
CAP (BEARING) PLATE DETAIL

Scale: 6" = 1'-0"



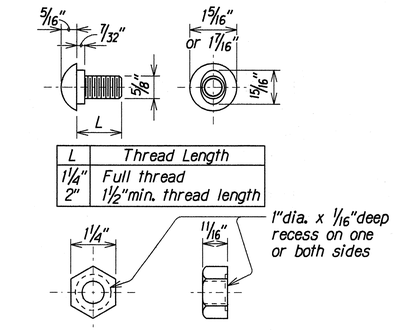
STEEL WASHER FOR ⅝"ø BOLT

Scale: 6" = 1'-0"



⅝"ø HEX BOLT ℄ NUT

Scale: 6" = 1'-0"



⅝"ø BUTTON HEAD BOLT ℄ RECESS NUT

Scale: 6" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	KMN	DATE	APR 2000
	DRAWN BY			
	TRACED BY			
NOTE BOOK	DESIGNED BY	LJK		APR 2000
	QUANTITIES BY	LJK		APR 2000
	CHECKED BY	DCO		APR 2000

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KALIALINUI BRIDGE
GUARDRAIL TYPE 3 THRIE BEAM AND APPURTENANCES DETAILS
HANA HIGHWAY, Dairy Road to Vicinity of Pala Town & PIILANI HIGHWAY, Mokulele Hwy. to Wailea Ike Drive
GUARDRAIL AND SHOULDER IMPROVEMENTS
Federal-Aid Project No. STP-0900(58)

Scale: As Noted Date: Apr. 2000

SHEET No. Q7 OF 7 SHEETS

METAL GUARDRAIL TYPE 3 THRIE BEAM AND APPURTENANCES DETAILS