FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-030-1(34)	2004	42	46

GENERAL NOTES

DESIGN SPECIFICATIONS:

A. AASHTO LRFD Bridge Design Specifications, Second Edition, including all interim revisions

MATERIALS:

A. Concrete: Class A
B. Reinforcement Steel: ASTM A 615, Grade 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, hot-dip galvanized after fabrication.
F. All anchor bolts, washers and nuts shall be ASTM A 325, hot-dip galvanized after fabrication, unless noted otherwise.
G. All studs and threaded rods shall be ASTM A 449, hot-dip galvanized, unless noted otherwise.
H. All welding shall be in accordance with the current edition of Reinforcing Steel Welding Code AWS D 1.4. Welding electrodes for structural steel shall be E 70.
I. Steel tubes shall be ASTM A 500 Grade B, hot-dip galvanized after fabrication.

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 ACI Detailing Manual, 1994.
E. For cast-in-place concrete, minimum reinforcement cover:
Concrete cast against earth: 3"
Concrete cast against a smooth surface or finished to a smooth surface: 2"
F. At 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 ($1\frac{1}{2}$) times the diameter of the bars (for bundled bars). But in no case shall the clear distance between the bars be less than one and one-half ($1\frac{1}{2}$) times the maximum size of the course 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 or properly compacted structural fill.
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 reinforcement bars shown with bends shall conform to standard ACI hooks unless noted otherwise.
M. 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 ($1\frac{1}{2}$) inches below finish grade and the area patched with mortar.
N. Existing structure to be removed shown by hatched lines. Removal shall be done in such a manner as to preclude any damage to the existing structure(s). Large vibratory type of equipment will not be permitted in the removal operation, nor for drilling of holes. Only small vibratory hand tools accepted by the Engineer will be allowed. Any damage to the existing structure(s) due to the Contractor's operation or negligence shall be repaired at his expense with no cost to the State.
O. Where the plans call for reinforcement bars to be embedded or anchored into existing concrete, see Special Provisions Section 674--Concrete Retrofit for the Use of Adhesive Anchors.
P. Where the plans call for placing fresh plastic concrete against existing concrete, see Special Provisions Section 674--Concrete Retrofit for the Use of Bonding Agent.
Q. Recompact existing soil under all new slabs and footings.

REFERENCE:

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

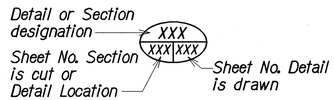
GENERAL:

A. All items noted incidental will not be paid for separately.
B. The Contractor shall verify the locations of all existing utility lines and notify their respective owners before commencing with any work.
C. The Contractor shall verify all grades and dimensions before commencing with any work.
D. 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.
E. The Conctractor 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.
F. In the event of over-excavation, the space between the footing and the ground shall be filled with a minimum of Class D concrete at the Contractor's expense at no cost to the State.
G. Unless noted otherwise, all exposed concrete edges shall be chamfered $\frac{3}{4}$".

GUARDRAIL 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 shall be incidental to the metal guardrail and will not be paid for separately.
B. Lap terminal connector and rail elements in direction of traffic to prevent snagging.
C. All anchor bolts shall be high strength bolts conforming to the requirements of ASTM A 325 and Standard Specification Section 713.04.
D. Anchor bolt length or embedment depth shall be such that a snug fit of the elements and full thread engagement plus $\frac{1}{4}$" (max.) is attained.
E. "Terminal Connector", "Transition Section" and Thrie Beam shall be fabricated from 10 gauge steel conforming to the requirements AASHTO M 180, Type II, Class B.
F. "Terminal Connector" and standard spacer, including all anchor bolts, cap PL's, 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 drawing. 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 occurs, 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.

SYMBOLS AND ABBREVIATIONS



(XX) - ℄ Bearing Abutment Seat Line
⊕ - Boring No. # Designation

Abut.	Abutment	Det.	Detail	I.B.	Inbound	R	Radius
AC	Asphaltic Concrete	Dia., ø	Diameter	I.F.	Inside Face	Rdwy	Roadway
Adj.	Adjacent	Dim.	Dimension	In.	Inch	Ref.	Reference
Alt.	Alternate	Dwg., Dwgs.	Drawing, Drawings	Int.	Interior	Reinf.	Reinforcement
Alum.	Aluminum			Inv.	Invert	Ret.	Retaining
Approx.	Approximate	EA, Ea., ea.	Each			Req'd	Required
Az.	Azimuth	E.F.	Each Face	Jt.	Joint	R.F.	Rear Face
		Elec.	Electrical			Rt.	Right
℄	Baseline	El., Elev.	Elevation	L	Length	R/W	Right Of Way
Bal.	Balance	Emb.	Embankment	LBS., lb., lbs.	Pound, Pounds		
Bet., Btwn.	Between	E.P.	Edge of Pavement	L.F., Lin. Ft.	Linear Feet	S	South
B.F.	Back Face	Eq.	Equal	Lg.	Long	S.B.	Southbound
B.F.E.	Bottom Footing Elevation	Est.	Estimated	Longit.	Longitudinal	Sect.	Section
Bk.	Back	E.W.	Each Way	L.S.	Lump Sum	SF	Square Feet
Blt.	Bolt	Exc.	Excavation	Lt.	Left	Shldr.	Shoulder
Bm.	Beam	Exist.	Existing	Ltg. Std.	Lighting Standard	Sht.	Sheet
B, Bot., Bott.	Bottom	Exp., (E)	Expansion			Spc.	Space
Br.	Bridge	Ext.	Exterior	Max.	Maximum	Spcd.	Spaced
Brg., Brgs.	Bearing, Bearings			Mech.	Mechanical	Spcg.	Spacing
B.V.C.	Beginning of Vertical Curve	(F)	Fixed	Min.	Minimum	Spec.	Specification
		F'_c	Specified Strength of Concrete	Misc.	Miscellaneous	Sprd.	Spread
℄	Center Line	F'_{ci}	Strength of Concrete at Time of Initial Prestress	N	North	Sta.	Station
Cant.	Cantilever	F.F.	Front Face	N.B.	Northbound	Std.	Standard
C.F.	Cubic Feet	Fig.	Figure	N.F.	Near Face	Stirr.	Stirrup
CIP	Cast in Place	Fin.	Finish	No., #	Number	Str.	Straight
C.I.P.	Cast Iron Pipe	Fin. Gr.	Finish Grade	N.T.S.	Not To Scale	Struct.	Structural
Cl., Clr.	Clear	Ftg.	Footing			Symm.	Symmetrical
Col.	Column			O.B.	Outbound	T	Top
Conc.	Concrete	Ga.	Gage, Gauge	o.c.	On Center	Temp.	Temporary
Conn.	Connection	Galv.	Galvanized	O.G.	Outside Girder	Thk.	Thick, Thickness
Const.	Construction	Gir., G	Girder	Opn'g	Opening	T.O.D.	Top Of Deck
Cont.	Continuous	G.R.P.	Grouted Rubble Paving	o/s, O/S	Offset	Tot.	Total
CRM	Cement Rubble Masonry	Gr.	Grade			Transv.	Transverse
C.Y., Cu. Yd.	Cubic Yards	Grd.	Ground	P.B.	Pull Box	Typ.	Typical
				P.C.	Point of Curvature	Var.	Varies
		(H)	Hinge	P.C.C.	Portland Cement Concrete	V.C.	Vertical Curve
		Horiz.	Horizontal	Perf.	Perforated	Vert.	Vertical
		HS	High Strength	PG-( )	Prestressed Girder-(Type)		
		Ht.	Height	PL	Plate	W	West
		Hwy.	Highway	P/S	Prestressed Strands	w/	With
				Pvmt.	Pavement	W.W.	Wingwall

ESTIMATED QUANTITIES

ITEM NO.	ITEM DESCRIPTION	QTY.	UNIT
202.0440	Removal of Aluminum Rail	L.S.	L.S.
202.0450	Removal of "W" Beam Guardrail	L.S.	L.S.
503.6000	Concrete for End Post Upgrade	L.S.	L.S.
503.6100	Concrete for Drainage Structure Upgr. (Honokahua Strm Br.)	L.S.	L.S.
507.2000	Metal Bike Rail	1,612	L.F.
507.5100	Concrete Railing Upgrade	1,522	L.F.
606.8000	Guardrail, Thrie Beam Transition	325	L.F.
606.8100	Guardrail, Thrie Beam Transition Along Drainage Structure (Honokahua Strm. Br.)	25	L.F.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE AUG. 2003
	DRAWN BY KSG	AUG. 2003
	TRACED BY	
NOTE BOOK	DESIGNED BY WW	AUG. 2003
	QUANTITIES BY WW	AUG. 2003
No. 16, pp. 01, 02	CHECKED BY PYS	AUG. 2003

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES, ESTIMATED QUANTITIES and SYMBOLS & ABBREVIATIONS

HONOAPIILANI HIGHWAY GUARDRAIL and SHOULDER IMPROVEMENTS, PHASE 1

Kahoma Stream Bridge to Honokahua Stream Bridge
Project No. STP-030-1(34)

Scale: As Noted Date: Aug. 2003

SHEET No. 01 OF 5 SHEETS