FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	49	52

INDEX TO DRAWINGS

GENERAL STRUCTURAL NOTES:

1. General Specifications: Hawaii Department of Transportation, Standard Specifications for Road and Bridge Consrtuction, 1994, together with special provisions prepared for this contract.
2. Design Specifications: AASHTO 1998 LRFD Bridge Design Specifications with 1999 interim revisions.
3. Design Live Load: HL-93
4. Materials:
   - (A) All concrete shall be 4,000 PSI concrete unless otherwise noted.
   - (B) All reinforcing steel shall be A.S.T.M. A615, Grade 60 unless otherwise noted. Stirrups and ties shall be grade 40 unless otherwise noted.
   - (C) All structural steel shall be A.S.T.M. A-36 hot dip galvanized after fabrication, unless otherwise noted.
   - (D) Admixture in concrete: see special provisions.
   - (E) All anchor bolts, washers and nuts shall be ASTM A 325, hot-dip galvanized after fabrication, unless noted otherwise.
   - (F) 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.
   - (G) 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.
   - (H) 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.
5. Reinforcement:
   - (A) The minumum covering measured from the surface of the concrete to the face of any reinforcing bars shall be as noted on plans.
   - (B) Reinforcing bars shall be detailed in accordance with A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures unless otherwise noted.
   - (C) Minimum clear spacing between parallel bars shall be 1-½times the diameter of bars (for non bundled bars). But in no case shall the clear distance between the bars be less than 1-½times the maximum size of the coarse aggregate.
   - (D) All dimensions relating to reinforcing bars (e.g. spacing of bars etc.) are to centers of bars unless otherwise noted.
   - (E) Reinforcing bars shall be security tied at all intersections and lap splices except where the spacing of intersections is less than one foot in each direction, in which case alternate intersections shall be tied.
6. Construction Notes:
   - (A) In general, top of concrete slab shall be constructed to follow the roadway vertical and horizontal curves.
   - (B) All items designed for removal shall be removed in such a manner as to preclude any damage to the existing structures.
   - (C) Bars shall be arranged and located so that no interference will occur between vertical and horizontal reinforcements.
   - (D) Except as otherwise noted, all vertical dimensions are measured plumb.
   - (E) The Contractor shall verify all site conditions and not rely upon these plans for access road or stream location, etc. Conditions may differ from those shown due to work performed by other contracts.
   - (F) The Contractor shall coordinate his work with that performed concurrently on adjacent sites if applicable.
   - (G) The Contractor shall verify the location of all utility lines and notify the respective owners before commencing the work of excavation.
   - (H) For concrete finish see Standard Specificaitons.
   - (I) Steel reinforcing shall be supported, bent and placed as per the ACI Detailing Manual, 1994.
   - (J) 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"
   - (K) At time concrete is placed, reinforcing shall be free from mud, oil, laitance or other coatings adversely affecting bond capacity.
   - (L) Reinforcement, dowels and other embedded items shall be positively secured before pouring.
   - (M) All existing reinforcing and anchor bolts that can be incorporated in the new work shall be cleaned before being utilized in the new work.
   - (N) 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.
   - (O) 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.
   - (P) Large impacting or vibratory type equipment will not be permitted in the drilling of holes.
   - (Q) 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.
   - (R) All dimensions relating to reinforcing bars (e.g. spacing of bars, etc.) are to centers of bars unless noted otherwise.
   - (S) Existing Conditions: Contractor shall field verify existing conditions pertinent to his work prior to construction. Field conditions different from those noted on the drawings shall be promptly brought to the construction manager's attention.
7. Soil and Foundation:
   - (A) Allowable design values:

     Soil bearing capacity (Dead plus live) = 4 KSF
8. General:
   - (A) All items noted incidential will not be paid for separately.
   - (B) Footings are located in or near the existing lined ditch. Constructions at these locations may be complicated by the presence of the existing lined ditch.
   - (C) Unless otherwise noted, all exposed concrete edges shall be chamfered ¾" x ¾".

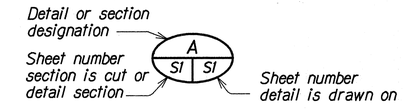
ESTIMATED QUANTITIES

ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL
202.0440	Demolition , removal and disposal of existing wingwall and concrete apron	L.S.	L.S
206.4100	Structure excavation for culvert & headwall	C.Y.	82
503.1030	Concrete in 11'-0" x 3'-0" box curlvert & headwall	C.Y.	89
602.0020	Reinforcing steel for 11'-0" x 3'-0" box culvert & headwall	LB	17,600
603.0010	Bed course material for 11'-0" x 3'-0" box culvert	C.Y.	9

ABBREVIATIONS

Abut.	Abutment	FF	Front Face	Sect.	Section
Approx.	Approximate	Fin.	Finish	Shld.	Shoulder
				Sht.	Sheet
℄	Baseline	Gr.	Grade	Spcs.	Spaces
Bal.	Balance			Spcg.	Spacing
Beg.	Begin, Beginning	Horiz.	Horizontal	Sta.	Station
				Struct.	Structural
℄	Center line	Jt.	Joint	Str.	Structure
Cl.	Clear				
		Lg.	Long		
Conc.	Concrete	Longit.	Longitudinal	T&B	Top and Bottom
Cont.	Continuous			Thk.	Thick
		Max.	Maximum		
		Min.	Minimum	Typ.	Typical
Det.	Detail				
Dia.	Diameter				
		No.	Number	Vert.	Vertical
Ea.	Each				
EF	Each Face				
Eq.	Equal	oc	On Center		
Exist.	Existing				
Exp.	Expansion	Reinf.	Reinforcing		
E.W.	Each Way				

SYMBOLS



ORIGINAL PLAN			
	SURVEY PLOTTED BY		DATE
	DRAWN BY	KMG	APR 2000
	TRACED BY		
NOTE BOOK	DESIGNED BY	LJK	APR 2000
	QUANTITIES BY	LJK	APR 2000
No. hhwbks1.dgn	CHECKED BY	DDO	APR 2000

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT

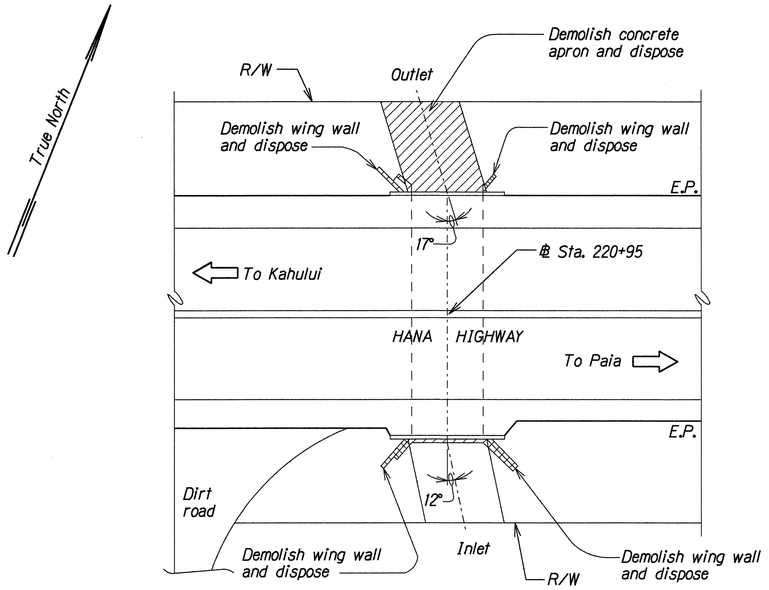
INDEX, ESTIMATED QUANTITIES, GENERAL STRUCTURAL NOTES, ABBREVIATIONS & SYMBOLS

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

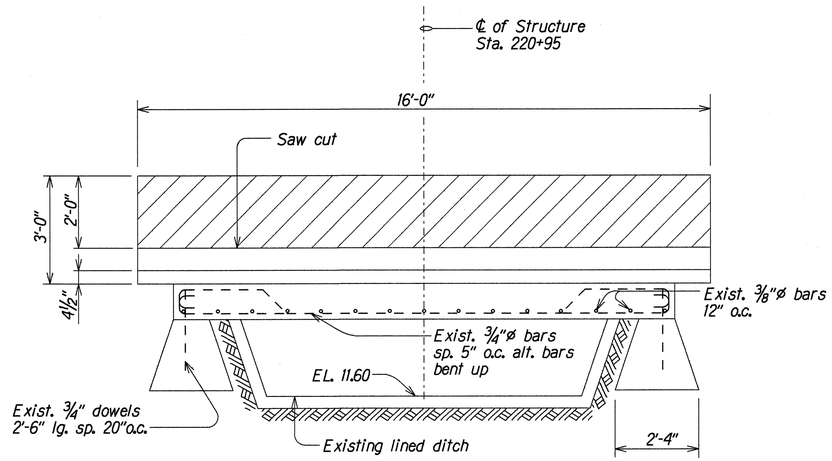
Scale: As Noted Date: Apr. 2000

SHEET No. S1 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	50	52



DEMOLITION PLAN
Scale: 1" = 10'-0"



LONGITUDINAL SECTION
Scale: ½" = 1'-0"

LEGEND:

Denotes existing structure to be removed and disposed.

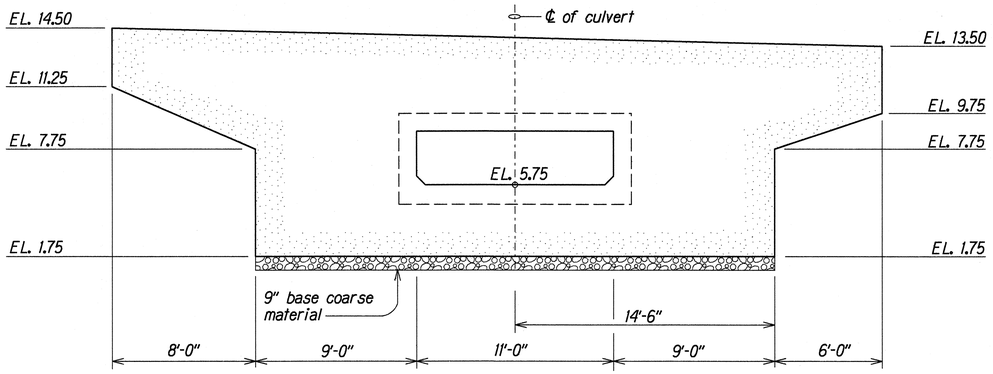
DEMOLITION OF EXISTING WING WALL AND CONCRETE APRON

ORIGINAL PLAN	SURVEY PLOTTED BY	KMH	DATE Apr 2000
	DRAWN BY		
	TRACED BY		
NOTE BOOK	DESIGNED BY	LJK	Apr 2000
	QUANTITIES BY	LJK	Apr 2000
N:\hana52.dgn	CHECKED BY	DDO	Apr 2000

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
CULVERT
DEMOLITION OF EXISTING WING WALL, AND CONCRETE APRON
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

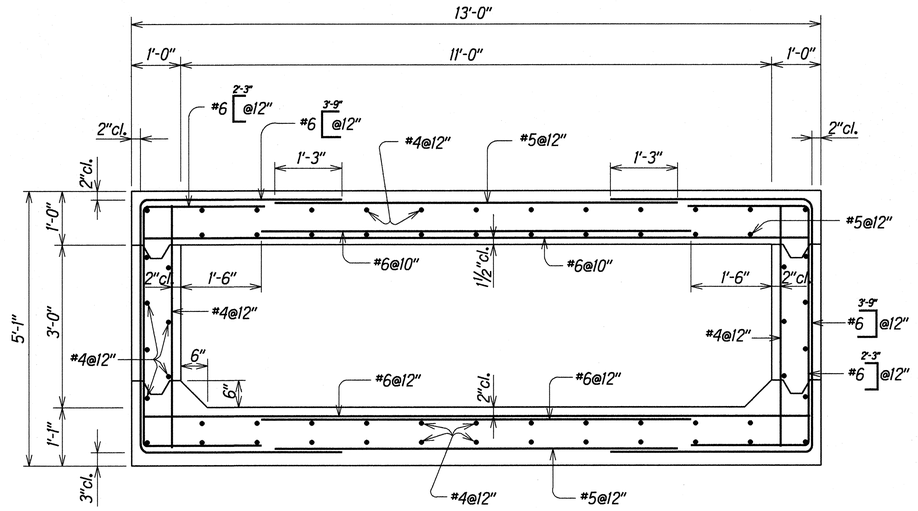
SHEET No. S2 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	51	52



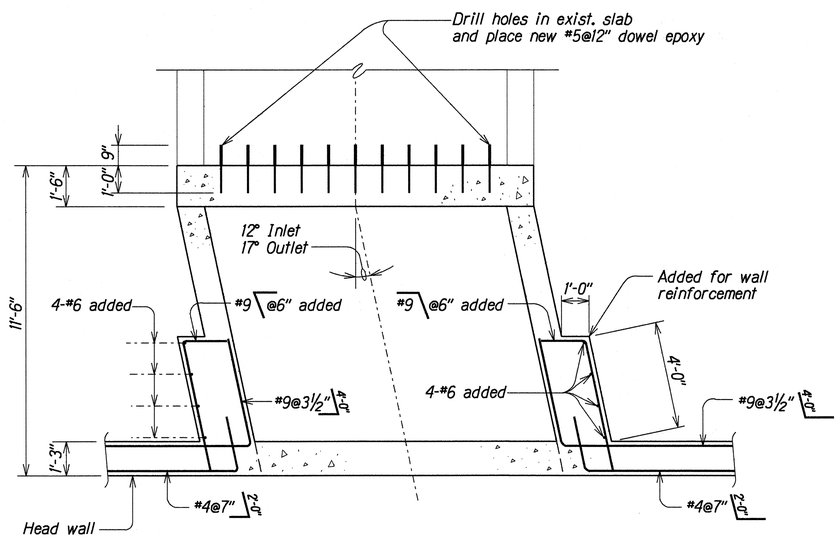
OUTLET ELEVATION - (Same Reinforcement as Inlet)

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



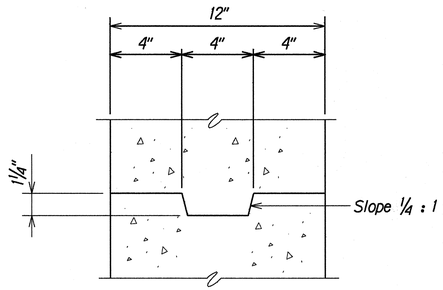
TYPICAL CULVERT SECTION

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



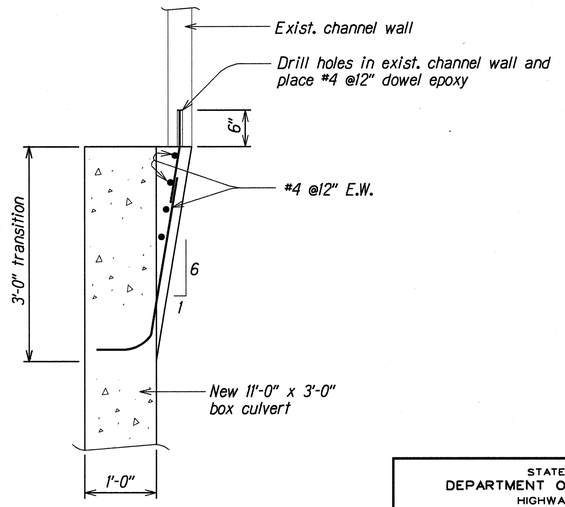
PLAN

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



DETAIL AT CONSTRUCTION JOINT

Scale: 3" = 1'-0"



DETAIL IN TRANSITION (INLET ONLY) Scale: 1" = 1'-0"

Note: Unsured channel wall thickness. If the exist. channel wall thickness is less than 4", apply epoxy bonded agent.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT

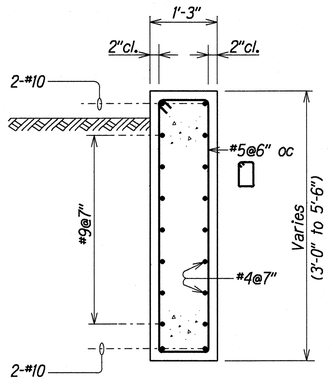
PLAN, ELEVATION, SECTION AND DETAIL

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)

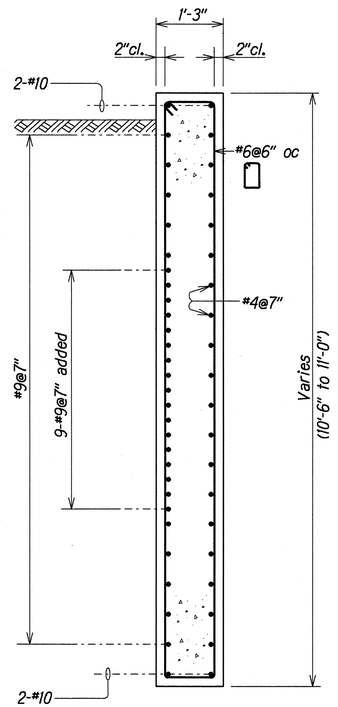
Scale: As Noted Date: Apr. 2000

SHEET No. S3 OF 4 SHEETS

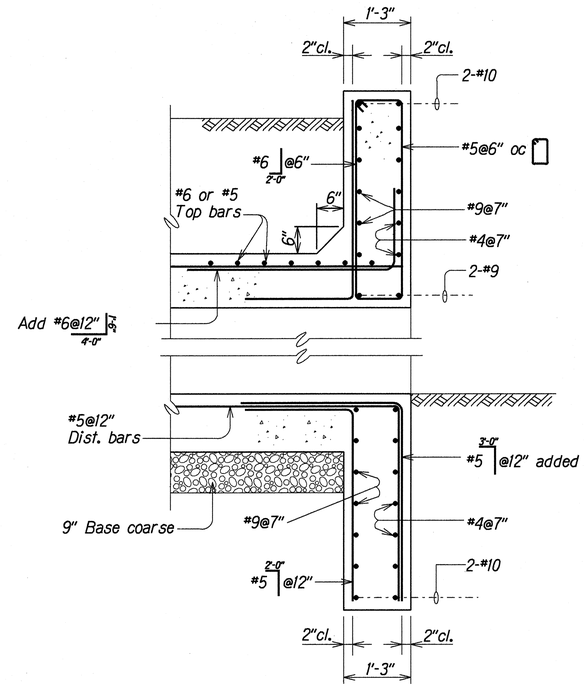
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0900(58)	2001	52	52



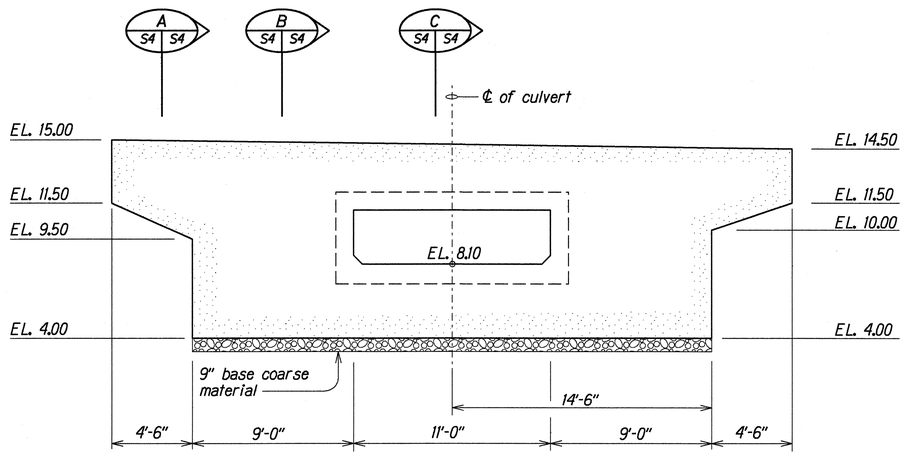
SECTION A (S4 | S4)
Scale: 3/4" = 1'-0"



SECTION B (S4 | S4)
Scale: 3/4" = 1'-0"



SECTION C (S4 | S4)
Scale: 3/4" = 1'-0"



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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT

ELEVATION AND SECTIONS

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. S4 OF 4 SHEETS