FED. ROAD DIST. NO.	STATE	FED. AID	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(125)	2011	32	55

STRUCTURAL NOTES

1. General Specifications: Standard Specifications for Road and and Bridge Construction, 2005, together with Special Provisions prepared for this contract.

2. Design Specifications:

   (A) AASHTO 2007 LRFD Bridge Design Specifications (Fourth Edition) and its subsequent interim specifications with interim supplements and modifications by the Highways Division, Department of Transportation, State of Hawaii.

   (B) HDOT "Design Criteria for Bridges and Structures" Dated October 20, 2010.

3. Loads:

   (A) Seismic Loads: Acceleration Coefficient _____ 0.18

4. Materials:

   (A) All concrete strengths shall be as noted below:

Item No.	Structural Parts	Maximum Water/Cement Ratio (W/C)	Specified Compressive Strength, f'c (28 Days)
(1)	Except as noted otherwise, all concrete (Refer to Notes 4.(B) and 4.(C))	.45	5000 PSI

   (B) Shrinkage Reducing Admixture (SRA) shall be added to the concrete mix. The minimum dosage requirement shall be 128 ounces per cubic yard of concrete.

   (C) A migrating corrosion inhibitor amine carboxylate water-based admixture shall be added to the concrete mix. The minimum dosage shall be 1.5 pints per cubic yard of concrete. The admixture shall not affect the set time of the concrete.

   (D) Concrete for the drop structure shall contain 2 lbs per cubic yard of 3mm alkali-resistant glass fiber.

   (E) All reinforcing steel shall be ASTM A615 Grade 60 unless otherwise noted.

   (F) Reinforcing steel shall be ASTM A706 where welded connections are required and shall be ASTM A775 for epoxy-coated reinforcing steel.

   (G) Glass Fiber Reinforced Polymer Bar:
   (1) Glass Fiber Reinforced Polymer (GFRP) rebar shall have a minimum tensile strength of 110 ksi for #4 bar and smaller. All others shall have a minimum tensile strength of 95 ksi. The allowable stress is equal to 1/4 of the tensile strength.
   (2) The modulus of elasticity of the GFRP bar shall be a minimum of 5,900,000 psi.
   (3) Minimum concrete cover for the GFRP bars shall be 3/4" unless otherwise noted.
   (4) Minimum lap splice lengths for the GFRP bars shall be 42 bar diameters unless otherwise noted.
   (5) All GFRP bars shall be securely tied in place.
   (6) The GFRP bars may be cut in the field with a masonry or diamond blade.
   (7) All work including materials and bends shall follow Manufacturer's recommendations.

5. Reinforcement:

   (A) The minimum covering measured from the surface of the concrete to the face of any reinforcing bars shall be as follows, except as otherwise shown:

   (1) Unless otherwise noted = 3"

   (B) Reinforcing bars shall be detailed in accordance with the latest edition of the design specification in note 2 unless otherwise noted.

   (C) Minimum clear spacing between parallel bars shall be 1 1/2 times the diameter of bars (for non bundled bars). In no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate or 1 1/2" (except at approach slab dowel).

   (D) All dimensions relating to reinforcing bars are to centers of bars unless otherwise noted.

   (E) Reinforcing bars shall be securely 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. Foundation Notes:

   (A) The foundation design is based upon discussions and recommendations contained in Geolabs, inc. report entitled "Geotechical Engineering Exploration, Castle Hills Access Road Drainage Improvements, Project No. HWY-0-04-98, Kaneohe, Oahu, Hawaii, Dated April 29, 2009. The report contains discussion and recommendations which may be implemented by the Contractor. The Contractor may obtain a copy of the report upon written request to the Engineer. The report notes the the presence of groundwater possible confined pressurized groundwater aquifer and unforeseen perched water in this project.

7. Construction Notes:

   (A) See Standard Specifications and Special Provisions.

   (B) Except as otherwise noted, all vertical dimensions are measured plumb.

   (C) The Contractor shall verify all site conditions and not rely upon these plans for stream location, etc. Conditions may differ from those shown.

   (D) The Contractor shall verify the location of all utility lines and notify the respective owners before commencing with excavation, and any temporary piling or sheeting.

   (E) The Contractor shall review all work in the adjacent project titled titled "Castle Hills Access Road Drainage Improvements, Phase I, Federal Aid Project No. STP-0300(122)".

   (F) For concrete finish see Standard Specifications and Special Provisions.

   (G) Construction joints may be relocated or additional ones added subject to the approval of the Engineer.

   (H) Unless otherwise noted, all exposed concrete edges shall be chamfered 3/4"x3/4".

7. Construction Notes (Cont):

   (J) The Contractor shall be solely responsible for the protection of adjacent properties, 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.

   (K) Bottom of footing or slab excavation shall be thoroughly cleaned of loose material prior to placement of reinforcing steel and concrete.

   (L) Removal of existing structures or portions thereof shall comply with Spec. Section 202 and the BMP. If removal of existing structures or portions thereof involves work or excavation below bottom of foundation for new construction, the area which was disturbed by the removal of other work below the new foundation shall be backfilled with Class "D" concrete. Such work shall be incidental to the removal work, and no separate payment shall be made.

   (M) The contractor's attention is directed to Subsection 205.03(A)(1) of the Special Provision regarding the protection of the sides of excavation from Cave-ins.

   (N) Cover and cure all concrete for drop structure for seven days after concrete placement. Leave forms for concrete for drop structure walls on for seven days after concrete placement.

DAVID K. FUJIWARA
LICENSED PROFESSIONAL ENGINEER
NO. 8104-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

KSF, INC. — APRIL 30, 2012 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL NOTES

CASTLE HILLS ACCESS ROAD
Drainage Improvements, Phase 2
Federal-Aid Project No. STP-0300(125)

Scale: None Date: Dec. 2011

SHEET No. S0.1 OF 17 SHEETS

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

DRAWING NAME: Z:\00 ONGOING\9041-CASTLE HILLS KAPUNAHALA STR DRAINAGE IMPROVEMENT\12-07-11 VELLUMS\CH-S001.DWG PLOT TIME: 12-06-11, 7:37 PM)