

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	560A-02-12	2012	24	36

Structural Notes:

1. General Specifications: Hawaii Department of Transportation (HDOT), Standard Specifications for Road and Bridge Construction, 2005.
2. Design Specifications:
 - A. AASHTO 2010 LRFD Bridge Design Specifications, Fifth Edition and its subsequent interim specifications with interim supplements and modifications by the HDOT Highways Division, State of Hawaii.
 - B. HDOT "Design Criteria for Bridges and Structures" Dated Oct. 20, 2010.
3. Loads:
 - A. Retaining wall design parameters
 - (1) Active static earth pressure = 40 pcf (freestanding) and 55 pcf (restrained)
 - (2) Passive earth pressure = 65 pcf (sloping ground conditions)
 - (3) Coefficient of friction = 0.49
4. Materials:
 - A. Shotcrete for wall shall have a minimum concrete compressive strength at 28 days of 4,000 psi and have a maximum 0.45 water to cement ratio and contain 1.5 pints per cubic yard of amine carboxylate based Corrosion Inhibitor, Cortec MCI 2005NS or approved equal. A shrinkage reducing admixture, such as Eclipse or Tetraguard AS 20 or approved equal shall be added at a dosage of 1 gallon per cubic yard as recommended by the manufacturer.
 - B. Soil Nail Grout shall be $f'(c) = 4000$ psi.
 - (1) Use 94 lbs. of TYPE I/II cement, 4 gallons of water, 3-6 lbs. of Flowable Admixture or approved equal and 1 oz. of Cortec MCI 2005NS Corrosion Inhibitor or approved equal.
 - (2) Glenium 3030 or approved equal may be used as a high range water reducer for workability as needed.
 - (3) Grout shall be stable (bleed less than 2%) per ASTM C940.
 - C. Shotcrete shall be cured using Sinak Lithium Cure or approved equal at a coverage rate of no more than 200 sq. ft. per gallon for the shotcrete.
 - D. Reinforcing steel shall conform to ASTM A615, Grade 60 Deformed Bars unless otherwise noted.
 - E. 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.

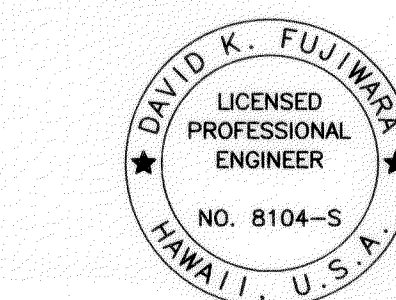
5. Reinforcement:

- A. Unless otherwise noted, the covering measured from the surface of the concrete to the face of any reinforcing bars shall be as follows:
 - (1) Concrete cast against and permanent exposed to each = 3"
 - (2) All others unless otherwise noted = 3"
 - B. Reinforcing bars shall be detailed in accordance with AASHTO 2010 LRFD Bridge Design Specifications, Fifth Edition, including subsequent interim revisions, unless otherwise noted.
 - C. Minimum clear spacing between parallel bars shall be $1\frac{1}{2}$ times the maximum size of the coarse aggregate or $1\frac{1}{2}$ inches, whichever is greater.
 - D. Reinforcing bars shall be securely tied at all intersections and lap splices except where the spacing of the intersections is less than 12 inches in each direction, in which case alternate intersections shall be tied.
6. General Construction Notes:
- A. See 2005 Standard Specifications and Special Provisions.
 - B. The Contractor shall comply with all applicable permits for this project. In addition, the Contractor shall comply with all applicable laws of the Federal, State, and County governments.
 - C. Unless otherwise noted, all vertical dimensions are measured plumb.
 - D. The Contractor shall verify all site conditions before commencing the work of excavation.
 - E. Unless otherwise noted, all exposed concrete surfaces shall be chamfered $3/4" \times 3/4"$.

7. Sculptured concrete shall be sculpted and stained as specified in Section 628 of the Special Provisions. The pattern shall match the existing sculpted Rock Finish at the adjacent work site, Mile Post 5.00 to 5.16.
8. The Contractor is notified of the existence of weight-posted one-lane bridges along Kuhio Highway (Route 560). Current weight limits are 15 tons at Hanalei Bridge and 8 tons for 3 bridges between Hanalei and the Project Site. Prior to crossing these bridges, the Contractor shall apply for an oversize/overweight/vehicle/load permit for each affected vehicle, equipment, and/or load at the State Highways Division Kauai Office (Ph. 241-3000). The State reserves the right to disallow crossing of these bridges by loads exceeding the posted weight limits.

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

DRAWING NAME: Z:\00 ONGOING\10-031-LUMAHAI EMER REPAIR SLOPE MITIGATION\10-17-11\FINAL\LSM-5001.DWG PLOT TIME: 10-17-11, 8:16 AM



THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION.

David K. Fujiwara
SIGNATURE

APRIL 30, 2012
LIC. EXP. DATE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
<u>STRUCTURAL NOTES</u>	
KUHIO HIGHWAY EMERGENCY SLOPE REPAIRS	
Vicinity of Lumahai	
Project No. 560A-02-12	
Scale: As Shown	Date: Oct. 17, 2011
SHEET No. 501 OF 2 SHEETS	