FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360B-01-03	2012	12	18

STRUCTURAL GENERAL NOTES

1. General:

A. Workmanship and materials shall conform to the AASHTO LRFD Bridge Design Specification, 5th Edition, and the Hawaii Standard Specifications for Bridge and Road Construction (2005 Edition), and all applicable special provisions by the State of Hawaii Department of Transportation.

B. The Contractor shall compare the Civil and Structural drawings with each other and report in writing to the Engineer, inconsistencies or omissions.

C. The Contractor shall take field measurements and verify field conditions and shall compare such field measurements and conditions with the drawings before commencing the work. Report in writing to the Engineer all inconsistencies or omissions.

D. The Contractor shall be responsible for means and methods of construction, workmanship and job safety. The Contractor shall provide temporary shoring and bracing as required for stability of structural members and systems.

E. Details noted as typical on structural drawings shall apply in all conditions unless specifically shown or noted otherwise.

F. The Contractor shall be responsible for coordinating the work of all trades.

G. The Contractor shall be responsible for protection of the adjacent properties, structures, streets, and utilities during the construction period. Any damage or deteriorated property shall be restored to the condition prior to the beginning of work or better at no cost to the State.

H. Construction loading shall not exceed design live load unless special shoring is provided. Permitted construction loads shall be properly reduced in areas where the structure has not attained full design strength.

2. Design Criteria:

A. Dead Load

Weight of all components of the structures, appurtenances attached thereto, and earth covers.

Future wearing surface (curb to curb) ——— 25 psf

Future utilities on each side of the bridge ——— 150 plf

B. Live Load

AASHTO HL-93 Loading

C. Seismic

Seismic design is in accordance with the AASHTO Guide Specifications for LRFD Seismic Bridge Design (May 2007), as modified by the State of Hawaii Department of Transportation.

0.2-second spectral response acceleration coefficient, Ss = 0.60

1.0-second spectral response acceleration coefficient, S_1 = 0.18

Horizontal peak ground acceleration coefficient, PGA = 0.28

Site class ——— = B

Seismic zone ——— = 2

D. Basic Wind Speed ——— = 105 MPH

E. Bridge Railing ——— in accordance with AASHTO TL-2 design factors

F. Soil Properties

1. Static Lateral Earth Pressure:
   a. At-Rest condition ——— = 55 pcf
2. Dynamic Lateral Earth Pressure:
   a. Wall movement less than 0.5 inches ——— = 19.0 H^2 pcf

   Where: H = Height of retained soil or backfill in feet
3. Bearing Pressure:
   a. Extreme event limit state ——— = 18,000 psf
   b. Strength limit state ——— = 8,000 psf
4. Coefficient of Friction:
   a. Extreme event limit state ——— = 0.75
   b. Strength limit state ——— = 0.60
5. Passive Earth Pressure (Level ground condition):
   a. Extreme event limit state ——— = 520 pcf
   b. Strength limit state ——— = 260 pcf

3. Foundation:

A. Foundation design is based upon the geotechnical report by Geolabs, Inc. and dated September 30, 2008.

B. Contractor shall provide for de-watering of excavation from either surface water, ground water or seepage. NPDES permit required for discharging into State waters.

C. Contractor shall provide for design and installation of all cofferdams, cribbing, sheeting, and shoring necessary for personnel safety and to preserve excavations and earth banks, and adjacent structures and property for damage.

D. Excavation boundaries and grade elevations for footing shall be approved by the Engineer prior to placing the concrete and reinforcing.

E. Backfill behind the abutment and retaining wall structure shall be Type A structural backfill, conforming to Section 703.20 of the Hawaii Standard Specifications for Roads, Bridges and Public Works Construction, 2005.

4. Concrete:

A. Concrete shall be regular weight concrete and shall have a minimum 28-day compressive strength of 4,000 psi and have a maximum w/c ratio of 0.45.

B. All inserts, anchor bolts, plates, etc. embedded in concrete shall be hot-dip galvanized unless otherwise noted.

C. Conduits, pipes, and sleeves passing through a wall not conforming to typical details shall be located and submitted to the Engineer for approval.

D. Construction joints may be relocated by the Contractor and submitted to the Engineer for approval. Construction joints shall be made and relocated as not to impair the strength of the structure and to minimize shrinkage stresses. All construction joints shall be cleaned, laitance removed and wetted. See typical details for specific requirements.

E. Non-shrink grouts shall be a premixed compound consisting of non-staining, non-metallic aggregate, cement, water reducing and plasticizing agents capable of developing minimum compressive strength of 4,000 psi in 3 days and 7,000 psi in 28 days.

F. Unless otherwise noted, chamfer all concrete edges 3/4".

G. Concrete delivery tickets shall record all free water in the mix: at batching by plant, for consistency by driver, and any additional request by Contractor if permitted by the mix design.

H. Reinforcing bars, anchor bolts, inserts and other items to be cast in the concrete shall be secured in position prior to placement of concrete.

I. Tetraguard AS20 shrinkage reducing admixture, Eclipse Plus shrinkage reducing admixture, or an approved equal, shall be included in the concrete mixes for the concrete deck and bridge railing. The required dosage shall be 96 ounces per cubic yard of concrete. Addition of shrinkage reducing admixture shall be as recommended by the manufacturer.

J. A corrosion inhibiting admixture shall be included in the concrete mix for all concrete. The corrosion inhibiting admixture shall contain a minimum of 30% calcium nitrate by mass and shall be added at a dosage rate of 4.0 gallons per cubic yard of concrete. The admixture shall be Rheocrete CNI Calcium Nitrite-Based corrosion inhibitor, DCI S corrosion inhibitor, or an approved equal. Addition of corrosion inhibiting admixture shall be as recommended by the manufacturer.

5. Reinforcing Steel:

A. Reinforcing steel shall be deformed bars conforming to ASTM A615, Grade 60, unless unless noted otherwise.

B. Stainless steel bars shall be Type 316.

C. Clear concrete coverage for reinforcing bars shall be as follows, unless otherwise noted:
   a. Footing, grade beams, etc. cast against earth ——— 3"
   b. Footing, grade beams, etc. formed and exposed to earth ——— 2"
   c. Wall faces exposed to earth of weather 2"
   d. Deck slab top bars ——— 2 1/2"

D. Splices:
   a. Reinforcing steel shall be spliced only where indicated on plans. Provide lap splice length per typical details and schedule sheet S0.2, unless otherwise noted.

E. Bar bends and hook shall be "standard hooks" in accordance with Typical Details on sheet S0.2.

6. Existing Concrete:

A. Contractor shall not damage, cut or drill through existing reinforcing, unless noted otherwise. If reinforcing is damaged, the Contractor shall inform the Engineer immediately and shall be responsible for repairing the damage at Contractor's sole expense and to the satisfaction of the Engineer.

7. Surface Preparation for Parapet Removal and Deck Repairs:

A. Concrete shall be removed down to the specified depth as noted in the deck repair details. Sawcut all edges 1", no feathering of patching material is allowed. Avoid cutting any reinforcing steel when sawcutting, unless noted otherwise. The exposed concrete shall be roughened to a 1/4" amplitude and shall be cleaned and free of laitance, dust and other bond inhibiting materials.

B. All unspecified reinforcing steel damaged due to the Contracator's operations shall be repaired by the Contractor at his/her expense and to the satisfaction of the Engineer.

C. Exposed reinforcing steel, whether fully exposed or only partially exposed, shall be exposed all around, creating a minimum 3/4" annular space around the rebars.

8. Bonding Agent:

A. After the concrete surfaces have been prepared and cleaned, and immediately before placing the concrete patching, a coat of bonding agent shall be applied. The surface shall receive a thorough and even coating and excess bonding agent shall not be permitted to collect in pockets. The rate of progress in applying the bonding agent shall be limited so that it does not become dry before it is covered with the concrete patching During delays in the concrete patching operations, should the surface of the bonding agent dry, the dried bonding agent shall be completely removed and fresh bonding agent applied. Removal shall be by sandblasting or by another procedure approved by the Engineer. The removal of bonding shall be at the expense of the Contractor.

B. The bonding agent provide corrosion protection to the reinforcing steel and act as a bonding agent for the fresh mortar. All exposed reinforcing steel shall receive two (2) coats of 20 mils each, total of 40 mils. The concrete surface shall receive one (1) coat at 20 mils. Follow manufacturer's specifications for recommended time between application of bonding agent and patching mortar. The minimum bond strength provided by the bonding agent shall be 2,400 psi after 14 days (ASTM C-882).

9. Polymer Modified Patching Mortar:

A. Patching mortar shall be a polymer modified mortar, have high abrasion resistance and shall be suitable for horizontal, vertical and overhead surfaces. The minimum bond strength provided by the patching mortar shall be 2,200 psi after 28 days (ASTM C-882). Refer to manufacturer's specifications for preparation and application guidance.

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

KEN KAZUO HAYASHIDA
LICENSED PROFESSIONAL ENGINEER
No. 6818-S
HAWAII, U.S.A.

EXPIRATION DATE OF THE LICENSE 4/30/2012
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL GENERAL NOTES

ROUTE 360 HANA HIGHWAY
IMPROVEMENTS
UAKEA ROAD TO KEAWA PLACE
Project No. 360B-01-03

Scale: As Noted Date: December 2011

SHEET No. S0.1 OF 7 SHEETS

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