FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-07-16	2020	19	22

General:

A. Workmanship and materials shall conform to the AASHTO LRFD bridge design specification, 8th edition (including most recent interims), AASHTO LRFD bridge construction specification, 4th edition (including most recent interims), and the Hawaii Standard Specifications for Road and Bridge Construction (2005 edition), and all applicable special provisions by the State of Hawaii Department of Transportation.
B. The contractor shall compare all the contract documents with each other and report in writing to the engineer all inconsistencies and 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 work. Report in writing to the engineer all inconsistencies and omissions.
D. The contractor shall be responsible for coordinating the work of all trades.
E. The contractor shall be responsible for means and methods of construction, workmanship and job safety.
F. The contractor shall provide temporary shoring and bracing as required for stability of structural members and systems.
G. 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.
H. The contractor shall be responsible for protection of the adjacent properties, structures, streets and utilities during the construction period. Any damaged or deteriorated property shall be restored to the condition prior to the beginning of work or better at no cost to the State.
I. Details noted as typical on the structural drawings shall apply in all conditions unless specifically shown or noted otherwise.
J. A licensed geotechnical engineer in the state of Hawaii, hired by the contractor, shall monitor all excavation and backfilling requirements.

Design Criteria:

A. Live Loads
   1. Vehicular: HL-93
B. Soils
   1. Bearing Pressure for Below Grade Structures: 1500 Psf
   2. Lateral Earth Pressures
      a. Above Groundwater: 60 pcf
      b. Below Groundwater: 95 pcf

Foundation:

A. Foundation design is based on assumed conservative values.
B. Contractor shall provide design and installation of all cribbing, sheeting, and shoring necessary to preserve excavations and earth banks. Shoring shall conform to OSHA regulations.
C. Footings shall bear on undisturbed in-situ firm soils bottom of footings shall be compacted to provide a relatively firm and smooth bearing surface prior to placement of reinforcing steel and concrete. If soft and/or loose materials are encountered at the bottom of footing excavations, they shall be over-excavated to expose the underlying firm materials. The over-excavated area shall be backfilled with select granular material compacted to a minimum of 90% relative compaction or the footing bottom may be extended down to the underlying competent material. Contractor may substitute flowable concrete or the granular material upon approval from the engineer.
D. Excavations for structures and footings shall be approved by the licensed geotechnical engineer in State of Hawaii (provided by contractor) prior to placement of concrete and reinforcing.
E. Engineered fill and backfill shall be in accordance with section 703.20 of the Hawaii Standard Specifications for Road and Bridge Construction, 2005 edition.
F. Fill should be moisture conditioned to within two percent of the optimum moisture content and placed in horizontal lifts not to exceed six inches. Fill shall be compacted to minimum 90%relative density as measured by HDOT TM-100 and HDOT TM-300.
G. Controlled low-strength material (CLSM) shall be in accordance with entire section 314 of the Hawaii Standard Specifications for Road and Bridge Construction, 2005 edition. The CLSM shall be placed as shown in the drawings or as approved by the engineer in writing.

Concrete:

A. Concrete construction shall conform to AASHTO bridge construction specifications.
B. Concrete shall be normal weight hard rock concrete and shall have 4000 psi minimum 28 day compressive strengths:
C. Concrete delivery tickets shall record all free water in the mix at batching plant, added for consistency by driver, and any additional request by contractor up to the maximum amount allowed by the mix design.
D. All inserts, anchor bolts, plates, and other items to be cast in the concrete shall be hot-dipped galvanized according to ASTM A153 unless otherwise noted.
E. Reinforcing bars, anchor bolts, inserts, and other items to be cast in the concrete shall be secured in position prior to placement of concrete.
F. Spacers shall be used to ensure minimum clearances and tolerances. If concrete spacer blocks are used they must be of the same strength of concrete used.

Reinforcing Steel:

A. Reinforcing steel shall be deformed bars conforming to ASTM A615, grade 60.
B. Reinforcing steel shall be spliced where indicated on plans. Provide lap splice length per AASHTO LRFD. Any longitudinal #4 bars in the slab that needs to be lapped for whatever reason should be lapped at least 18 inches or mechanically spliced.
C. Mechanical splice connectors shall develop in tension 125 percent of the specified minimum yield strength of reinforcing bars.
D. Minimum reinforcement bend diameters shall comply with AASHTO 5.10.2.3.

Structural Steel:

A. Fabrication and erection of structural steel shall conform to the AASHTO LRFD bridge design specification, 8th edition
B. Structural steel shall conform to ASTM A36 unless otherwise noted.
C. Plates and bars shall conform to ASTM A36.
D. Welds and welding procedures shall conform to the structural welding code AWS D1.1 of the American Welding Society.
E. Welding shall be performed by welders prequalified for welding procedures to be used.
F. Welding electrodes shall be E70XX.
G. All anchor bolts, plates, and other items to be cast in concrete shall be hot-dip galvanized according to ASTM A153 unless otherwise noted.
H. Bolts shall conform to ASTM F3125, grade A325 unless otherwise noted, and shall be hot-dip galvanized according to ASTM A153.
I. All steel shall be hot-dip galvanized after fabrication according to ASTM A123.
J. Any damaged galvanized surface shall be repaired as follows:
   1) Prepare surface per SSPC-SP1, solvent cleaning.
   2) Apply two coats of cold applied galvanizing compound containing 95% metallic zinc content by weight in dry film and 52% solids content by volume.
   3) Application rate shall be 1.5 mils dry film thickness per coat.

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

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

LICENSE EXPIRES 4/30/20

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL NOTES

DRAINAGE IMPROVEMENTS AT VARIOUS LOCATIONS
Interstate Route H-201, Vicinity of Fort Shafter Off-Ramp and Ala Napunani Street, Vicinity of Ala Aolani Street
Project No. HWY-0-07-16

Date: June 2019

SHEET No. S.1 OF 4 SHEETS