

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-06-15M	2015	14	71

GENERAL NOTES

- A. Workmanship and materials shall conform to the Hawaii Standard Specifications For Road & Bridge Construction (2005 Edition) & Special Provisions. However, where reference is made to performance conforming to other standards the more stringent shall apply.
- 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 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. Construction loading shall not exceed design live load unless special shoring is provided. Allowable loads shall be reduced in areas where the structure has not attained full design strength.
- F. The Contractor shall be responsible for protection of the adjacent properties, structures, streets and utilities during the construction period.
- G. Details noted as typical on the structural drawings shall apply in all conditions unless specifically shown or noted.
- H. The General Contractor and his Subcontractors must submit in writing any requests for modifications to the plans and specifications.

FOUNDATION

- A. Foundation design is based on geotechnical investigation by Hirata & Associates, Inc. and report dated April 30, 2015.
- B. The Contractor shall provide for de-watering of excavation from surface water, ground water or seepage.
- C. The Contractor shall provide for design and installation of all cribbing, sheeting, and shoring necessary to preserve excavation and earth banks.
- D. Footings and slab-on-grade subgrades shall bear on undisturbed in-situ firm soils or properly compacted structural fill. Bottom of footings and slab-on-grade subgrades shall be compacted to provide a relatively firm and smooth bearing surface prior to placement of reinforcing steel and concrete and compacted to a minimum 95 percent relative compaction as determined by ASTM D 1557.

FOUNDATION (CON'T.)

- A. Foundation design is based on geotechnical investigation by Hirata & Associates, Inc. and report dated April 30, 2015.
- B. The Contractor shall provide for de-watering of excavation from surface water, ground water or seepage.
- C. The Contractor shall provide for design and installation of all cribbing, sheeting, and shoring necessary to preserve excavation and earth banks.
- D. Footings and slab-on-grade subgrades shall bear on undisturbed in-situ firm soils or properly compacted structural fill. Bottom of footings and slab-on-grade subgrades shall be compacted to provide a relatively firm and smooth bearing surface prior to placement of reinforcing steel and concrete and compacted to a minimum 95 percent relative compaction as determined by ASTM D 1557.
- A. The project sites shall be cleared of all vegetation, including large roots, debris, and other deleterious material.
- B. Prior to placement of fill, the exposed subgrade shall be scarified to a minimum depth of 6 inches, moisture conditioned to about 2 percent compaction as determined by ASTM D 1557. Soft or loose soils indicated by pumping conditions should be removed and replaced with either approved onsite material or imported granular structural fill.
- C. Prior to placement of the anchored wire mesh system, ACBM mats, concrete fabric lining system, and grouted riprap, slopes shall be cleared of vegetation and dressed to provide smooth surfaces free of sharp breaks in grade. In addition, soils interlaced with trees and brush roots overhanging all slopes should be removed to general math the existing slope.
- D. The onsite soils may be reused in compacted fills and backfills. However all rock fragments larger than 3 inches in maximum dimension should be removed from the onsite soils prior to reuse.
- E. Imported structural fill shall be well-graded, non-expansive granular material. Specifications for imported granular structural fill shall indicate a maximum particle size of 3 inches, and state that between 8 and 20 percent of the soil by weight shall pass the No. 200 sieve. In addition, the plasticity index (P.I.) of that portion of the soil passing the No. 40 sieve shall not be greater than 10. Imported structural fill shall have a CBR expansion value no greater than 1.0 percent and a maximum CBR value of 15 percent, when testing in accordance with ASTM D 1883.
- F. Cohesive soils, such as clays and silts, should be placed in horizontal lifts restricted to eight inches in loose thickness and compacted to a minimum 90 percent compaction as determined by ASTM D 1557. Granular fill, such as imported structural fill, shall be placed in horizontal lifts restricted to 8 inches in loose thickness and compacted to a minimum 90 percent compaction as determined by ASTM D 1557.
- G. Fill placed in areas where slopes are steeper than 5H:1V shall be continually benched as the fill is brought up in lifts.

FOUNDATION (CON'T.)

- H. All permanent cut and fill slopes shall be constructed at gradients no greater than 2H:1V. Fill placed on slopes shall be continually keyed and benched into the existing slope to provide stability for the new fill against sliding. Silver fills placed on slopes shall be avoided. Fill slopes shall be constructed by overfilling and cutting back to the design slope gradient to obtain a well-compacted slope face.
- I. The Geotechnical Engineer shall be retained during construction and shall be present for the following:
  - a. Observe the earth anchor installation
  - b. Structural fill placement and perform compaction testing
  - c. Review and/or perform laboratory testing on import borrow to determine its acceptability for use in compacted fills
  - d. Observe concrete fabric lining system installation
  - e. Provide geotechnical consultation as required
- A. Cohesive soils, such as clays and silts, should be placed in horizontal lifts restricted to eight inches in loose thickness and compacted to a minimum 90 percent compaction as determined by ASTM D 1557. Granular fill, such as imported structural fill, shall be placed in horizontal lifts restricted to 8 inches in loose thickness and compacted to a minimum 90 percent compaction as determined by ASTM D 1557.
- B. Fill placed in areas where slopes are steeper than 5H:1V shall be continually benched as the fill is brought up in lifts.
- C. All permanent cut and fill slopes shall be constructed at gradients no greater than 2H:1V. Fill placed on slopes shall be continually keyed and benched into the existing slope to provide stability for the new fill against sliding. Silver fills placed on slopes shall be avoided. Fill slopes shall be constructed by overfilling and cutting back to the design slope gradient to obtain a well-compacted slope face.
- D. The Geotechnical Engineer shall be retained during construction and shall be present for the following:
  - a. Observe the earth anchor installation
  - b. Structural fill placement and perform compaction testing
  - c. Review and/or perform laboratory testing on import borrow to determine its acceptability for use in compacted fills
  - d. Observe concrete fabric lining system installation
  - e. Provide geotechnical consultation as required

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	
NO.	

BIDDING 8/15/2014 8:55:32 AM

ROY E. IWAMOTO

LICENSED PROFESSIONAL ENGINEER

No. 8871-S

HAWAII, U.S.A.

4/30/16

EXP. DATE

*R. E. Iwamoto*

This work was prepared by me or under my supervision.

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

STRUCTURAL NOTES - 1

CENTRAL OAHU BEST MANAGEMENT PRACTICES

ERODED SLOPE REPAIRS, PHASE 2

Project No. HWY-O-06-15M

Scale: None

Date: May 2015

SHEET No. N-10 OF 11 SHEETS



SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
N.	

BORING: 8/15/2014 8:55:32 AM

CONCRETE

- A. Concrete construction shall be in accordance with Hawaii Standard Specifications for Road and Bridge Constructions & Special Provisions.
- B. Concrete shall be regular weight hard rock concrete and shall have the following minimum 28 day compressive strengths:
  - a. Footings 3,000 PSI
  - b. Slabs on grade 3,000 PSI
  - c. Walls 3,000 PSI
  - d. All other concrete 3,000 PSI
- C. 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.
- D. Reinforcing bars and other items to be cast in the concrete shall be secured in position prior to placement of concrete.
- E. The Contractor shall locate construction joints so as not to impair the strength of the structure and to minimize shrinkage stresses. Submit location of construction joints to the Engineer for approval, unless otherwise noted.
- F. Non-shrink grout shall be a premixed non-metallic formula, capable of developing a minimum compressive strength of 3,000 PSI in 1 day and 5,000 PSI in 28 days.
- G. The Engineer shall be notified at least 3 working days prior to any concrete pour. No concrete shall be poured prior to observation by the Engineer or his representative.

REINFORCING STEEL

- A. Reinforcing steel shall be deformed bars conforming to AASHTO M31, Grade 60.
- B. Welded wire fabric shall conform to ASTM A1064, galvanized.
- C. Clear concrete cover for reinforcing bars shall be as follows, unless otherwise noted:
  - a. cast against & permanently exposed to earth 3"
  - b. exterior (exposed to earth or weather) 2"
- D. Clear distance between the surface of a bar and any surface of a masonry unit shall be not less than 1/2 inch, unless otherwise noted.
- E. Reinforcing steel shall be spliced where indicated on plans. Provide lap splice length per typical details and schedule, unless otherwise noted.
- F. Bar laps shall be made away from points of maximum stress. Unless noted otherwise, splices, laps, dowel extensions and embedments shall be 48 bar diameters, but not less than 24 inches. Splices shall be staggered where possible.
- G. Unless otherwise noted, all horizontal reinforcing steel at wall and wall footing corners and intersections shall extend to the far face of the corner and hooked a length of 48 bar diameters, but not less than 24 inches, around the corner.
- H. Welded wire fabric shall be lapped 8 inches or one full mesh plus 2 inches, whichever is greater.
- I. Bar bends and hooks shall be "standard hooks" in accordance with ACI 318.

EPOXIED ANCHOR REQUIREMENTS

- A. Epoxy used for anchoring threaded rods and reinforcing steel into existing concrete shall be Hilti HIT-HY 200 system, Simpson SET-XP system, Powers P1000+ system, or approved equal, and shall be installed per manufacturer's recommendations.
- B. Epoxy used for anchoring threaded rods and reinforcing steel into existing concrete rubble masonry shall be Hilti HIT-HY 70 system, Simpson SET system, Powers P1000+ system, or approved equal, and shall be installed per manufacturer's recommendations.
- C. Anchors shall be installed with the minimum embedment requirements as indicated on the drawings.

STRUCTURAL STEEL

- A. Fabrication and erection of structural steel shall conform to the American Institute of Steel Construction Manual of Steel Construction, Thirteenth Edition.
- B. Structural steel shall conform to ASTM A36 unless otherwise noted.
- C. Threaded rods shall conform to ASTM F1554 Grade 36 unless otherwise noted.
- 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 steel shall be hot-dipped galvanized, unless otherwise noted.
- H. All field welding of galvanized metal shall be repaired per Hawaii Standard Specifications Section 501.03 (G) (2).

INSPECTION OF WORK AND MATERIALS

- A. Contractor shall be responsible for ensuring that inspection of portions of the work, as required by the Hawaii Standard Specifications for Road & Bridge Construction & Special Provisions, is made at the appropriate time. The Contractor shall give timely notice of when and where inspections are to be made and provide access for the Inspector. The Contractor shall correct defective work at no additional cost to the State and pay for re-inspection.
- B. The following structural work and materials requires inspection:
  - a. Concrete
  - b. Drilled and epoxied threaded rods & reinforcing steel in concrete or concrete rubble masonry.
  - c. Reinforcing steel
  - d. Structural welding

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-06-15M	2015	15	71

ROY E. IWAMOTO

LICENSED PROFESSIONAL ENGINEER

No. 8871-S

HAWAII, U.S.A.

4/30/16

EXP. DATE

*Roy E. Iwamoto*

This work was prepared by me or under my supervision.

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

STRUCTURAL NOTES - 2

CENTRAL OAHU BEST MANAGEMENT PRACTICES

ERODED SLOPE REPAIRS, PHASE 2

Project No. HWY-O-06-15M

Scale: None

Date: May 2015

SHEET No. N-11 OF 11 SHEETS