

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(46)	2002	24	89

DRAINAGE STRUCTURES - GENERAL STRUCTURAL NOTES:

- All work shall conform to AASHTO code, and the State of Hawaii Department of Transportation, Highway Division, Standard Plans, 1986, unless otherwise noted on the plans.
- Structural drawings represent the finished structure, and do not specify the means and methods of construction. The Contractor shall provide all means necessary to handle and protect the structure, and any adjacent new or existing structures during construction. Such measures shall include, but not be limited to bracing and shoring for loads acting on the structure during construction, and lifting hardware inserts required to place finished precast units.

Observation by the structural engineer during construction will not include inspection of aforementioned bracing and shoring.
- Existing conditions are shown to the best of our knowledge. Discrepancies shall promptly be reported to the engineer and be resolved before proceeding with the work.
- Prior to commencement of construction, the contractor shall verify the locations of all utilities, which may be affected by his work. Interferences with the structure shall promptly be reported to the Engineer and be resolved before proceeding with the work.
- The contractor shall be solely responsible for coordinating the work of all trades and verifying all dimensions. The contractor shall notify the engineer of all structural discrepancies, and these discrepancies shall be resolved prior to proceeding with the work.
- Any discrepancy between the drawings and the state of hawaii standard plans shall be brought to the attention of the engineer before the affected work proceeds.
- Penetrations and openings that are not shown on the structural drawings are prohibited unless approved in writing by the structural engineer.
- Shop drawings required by the specifications shall be submitted to the engineer for review prior to fabrication of any structural components.

DESIGN CRITERIA

- Codes and standards
AASHTO, LRFD (1998), Load Resistance Factor Design
- Design live loads
Live Load Design Vehicle = HS20-44
- Earth pressure values indicated below are based on the document entitled geotechnical engineering exploration, Kamehameha Highway Drainage Improvements vicinity of Kahuku Hospital and replacement of Kii Bridge, prepared by Geolabs, Inc., dated August 1, 2003:
Soil Unit Weight = 110 PCF
Equivalent Fluid Weight = 58 PCF drained, restrained
= 58 PCF undrained, restrained
Surcharge = 36% of vertical in rect. dist.

FOUNDATION

- The foundation design values indicated below are based on the document entitled geotechnical engineering exploration, Kamehameha Highway Drainage Improvements Vicinity of Kahuku Hospital and replacement of Kii Bridge, prepared by Geolabs, Inc., dated august 1, 2003:

Allowable Soil Bearing Pressure = 1500 PSF

Any Significant geotechnical impact on the structure shall be reported to the Engineer, in writing, for resolution prior to commencement of the foundation work.
- The bottom of the excavations for the drainage structures shall be overexcavated 2' past the proposed bottom of the base slab and 1' outside of the extents of the base. Geotextile (Amoco Nonwoven Style 4553 or approved equal) shall be placed on the bottom and sides of the excavation where #67 material is to be placed. The overexcavated region shall be backfilled with ASTM C33, #67 material and tamped in place.

- Foundation excavations shall be prepared in accordance with the recommendations of the geotechnical engineer. Said excavations shall be observed by the geotechnical engineer prior to backfilling, and placement of precast units. Any backfilling shall be performed in accordance with the geotechnical engineer's recommendations. Contractor shall notify the geotechnical engineer when excavation is ready for inspection.
- Bottom of manhole and catch basin excavations shall be neat and level. Over-excavation of foundations shall be backfilled with compacted structural backfill or lean concrete base.
- Foundation backfill and utility trench backfill shall be mechanically compacted in layers, to the approval of the geotechnical engineer. Flooding is prohibited.
- Contractor shall provide for de-watering of excavations from either surface water, ground water, or seepage.

CONCRETE

- All concrete unless otherwise noted shall be regular weight (150#/CU.FT.)
- All phases of work pertaining to the concrete construction shall conform to the "Building Code Requirements for Reinforced Concrete" (ACI 318-95).
- Schedule of structural concrete 28-day strength and types:
Location of Structure Strength
All concrete 4000 PSI
- Portland Cement shall conform to ASTM C-150 Type II.
- Aggregate for concrete shall conform to all requirements and tests of ASTM C-33 and project specifications.
- Concrete mixes shall be designed by a qualified testing laboratory and shall be submitted to the structural engineer for his review.
- Large aggregate shall be ASTM C33, #67.
- Placement of concrete shall conform to ACI Standard 30I and project specifications.
- All projecting concrete corners and edges shall be formed with 3/4" chamfer, unless otherwise noted on drawings.
- Concrete admixtures containing chloride or chloride salts shall not be used. All admixtures shall be certified as being approved for use in concrete that is to be in contact with potable water.

REINFORCING STEEL

- All reinforcing bars shall conform to ASTM A-615 grade 60 requirements.
- All reinforcing steel shall be detailed and placed in conformance with the "Building Code Requirements for Reinforced Concrete" (ACI 318-95), the CRSI "Manual of Standard Practice," and the "ACI Detailing Manual - 1988" (SP- 66) as modified by the project drawings and specifications.
- All reinforcing bars shall be secured in position prior to placing concrete, to prevent displacement during the pour.
- Anchor bolts, dowels and other embedded items are to be securely tied in place before concrete is poured. Embedded metal components made up of alloys that are dis-similar to that of the reinforcing steel shall not be attached directly to reinforcing. Measures shall be taken to electrically isolate said components from any reinforcing to prevent galvanic effects.
- All reinforcing bar bends shall be made cold.
- Reinforcing splices shall be made only where indicated on the drawings.
- Dowels between foundations and walls shall be the same grade, size, spacing, and number as the vertical reinforcing respectively, U.O.N.
- Welding of reinforcing steel is not permitted unless otherwise noted.
- Contractor shall submit reinforcing bar layouts and details for engineer's review prior to fabrication.
Fabricate from reviewed drawings only.

- Unless otherwise noted, all hooks shown are standard hooks per ACI.

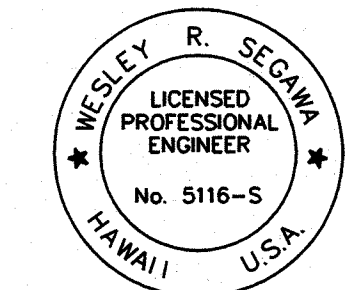
FITTINGS

- Manhole rungs shall be per standard specifications or a pre-approved equal.
- Frames and covers shall be per Standard Plan H-08, Type 'P'.

ABBREVIATIONS

CLR	CLEAR
EX	EXISTING
HORIZ	HORIZONTAL
LG	LONG
LONGIT	LONGITUDINAL
MAX	MAXIMUM
OC	ON CENTER
RCP	REINFORCED CONCRETE PIPE
THK	THICK
TRANS	TRANSVERSE
VERT	VERTICAL
W/	WITH

ORIGINAL PLAN	SURVEY DRAWN BY	DATE
NOTE BOOK	TRACED BY	
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Wesley R. Segawa
WESLEY R. SEGAWA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

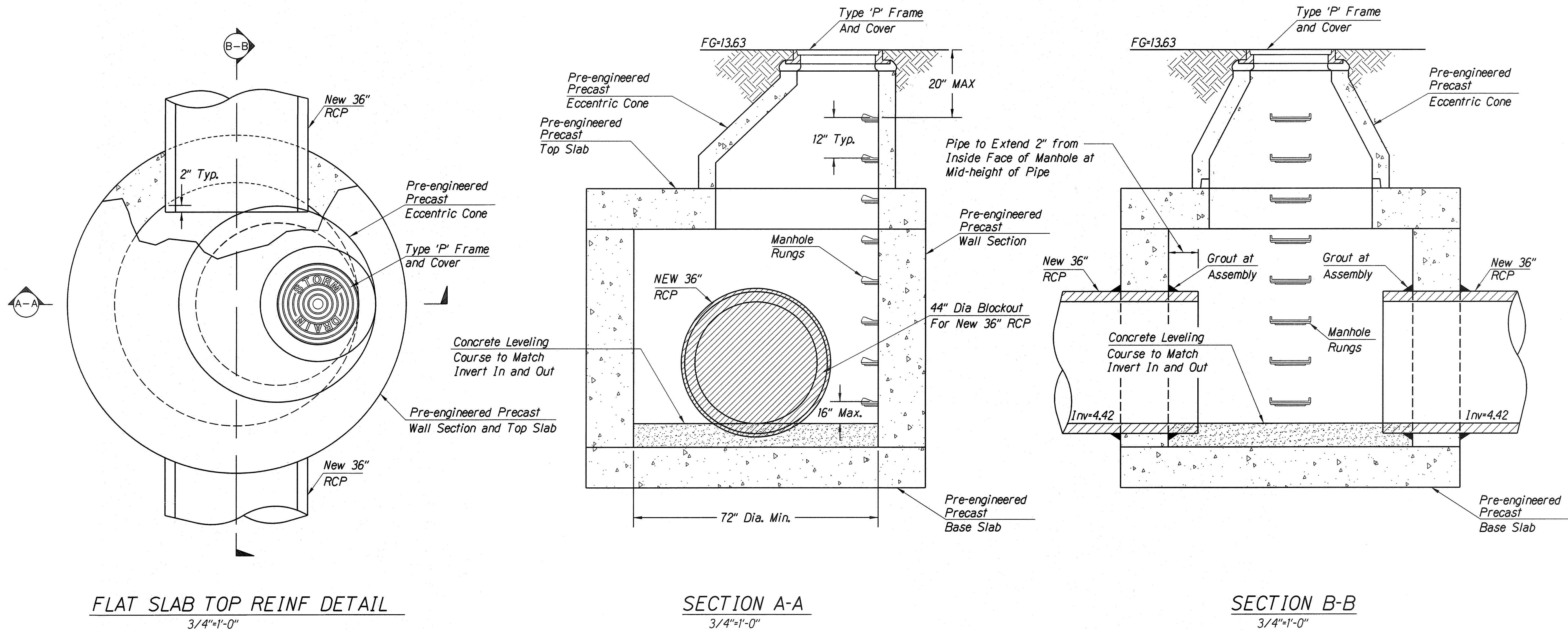
DRAIN MANHOLE PLANS

KAMEHAMEHA HIGHWAY DRAINAGE IMPROVEMENTS
Vicinity of Kahuku Hospital and Replacement of Kii Bridge
Federal Aid Project No. NH-083-1(46)

Scale: NTS Date: April 2004

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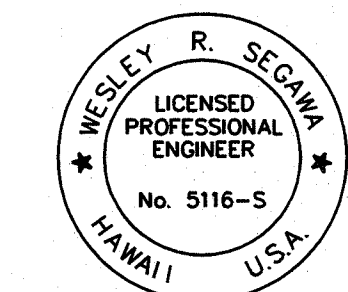
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PRE-ENGINEERED PRECAST COMPONENT NOTES:

- The "Drainage Structures - General Structural Notes" shall apply fully to pre-engineered pre-cast components, including but not limited to design criteria and overexcavation, bedding, and backfill requirements.
- All pre-engineered components shall be engineered and reinforced per ASTM C478-88A "Standard Specification for Precast Reinforced Concrete Manhole Sections". The following exceptions to ASTM C478 apply.
 - Acceptance will be on the basis of rational design. Along with detailed shop drawings, design calculations stamped by a professional engineer licensed to practice structural engineering in the State of Hawaii shall be submitted for approval.
 - Cement shall be type II.
 - Minimum cover over reinforcing for all components shall be 1 1/2".
 - Rungs shall be per Standard Plan H-07, or approved equal, and shall be 12" center to center.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
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Scale: As Noted Date: April 2004
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