

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(57)	1988		

A. SPECIFICATIONS:

- GENERAL SPECIFICATIONS: STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 1985 AND SPECIAL PROVISIONS WITH ADDENDUMS PREPARED FOR THIS CONTRACT.
- DESIGN SPECIFICATIONS: AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, THIRTEENTH EDITION, 1983 AND INTERIM SUPPLEMENTS OF 1984 THROUGH 1987 AND MODIFICATIONS BY THE STATE OF HAWAII DEPARTMENT OF TRANSPORTATION.

B. DESIGN LOADS:

- DEAD LOADS:
 - UNIT WEIGHT OF CONCRETE: 160 PCF (150 PCF FOR COMPUTATION OF MODULUS OF ELASTICITY)
 - 3" THICK OVERLAY: 40 PSF
 - BRIDGE RAILING 500 PLF EACH
 - ELECTRICAL LINE (OUTBOUND ONLY): 525 PLF
 - STEEL POLES FOR ELECTROMAGNETIC PROTECTION: 2 KIPS EACH
- LIVE LOADS:

ASSHTO HS 20-44 AND INTERSTATE HIGHWAY LOADING WITH IMPACT.
- WIND LOADS:

DESIGN WIND VELOCITY: 100 MPH.
- SEISMIC LOAD:

SEISMIC PERFORMANCE CATEGORY B IN ACCORDANCE WITH AASHTO GUIDE SPECIFICATION FOR SEISMIC DESIGN OF HIGHWAY BRIDGES, 1983. MINIMUM COMBINED RESPONSE COEFFICIENT SHALL BE EQUAL TO 0.06 OF THE DEAD LOAD.
- THERMAL FORCES:
 - COEFFICIENT OF THERMAL EXPANSION: 0.000006 PER DEGREE F
 - TEMPERATURE RISE: 10°F
TEMPERATURE FALL: 20°F
ASSUMED TEMPERATURE AT THE TIME OF ERECTION: 75°F
 - THERMAL GRADIENT IN THE LONGITUDINAL DIRECTION: ACCORDING TO NATIONAL COOPERATIVE RESEARCH PROGRAM REPORT 276: "THERMAL EFFECTS ON CONCRETE BRIDGE STRUCTURES."
 - THERMAL GRADIENT IN THE TRANSVERSE DIRECTION: TEMPERATURE DIFFERENTIAL OF ± 10°F BETWEEN OUTSIDE AND INSIDE SURFACES OF THE BOX GIRDER.
 - ONE-HALF MAXIMUM GRADIENT IS USED IN COMBINATION WITH LIVE LOADS.
- CREEP AND SHRINKAGE:

STRAINS CALCULATED IN ACCORDANCE WITH CEB-FIP MODEL CODE FOR STRUCTURES. RELATIVE HUMIDITY: 75%
- CONSTRUCTION LOADS:
 - LAUNCHING GANTRY REACTIONS (ONE TRUSS):

REAR SUPPORT DEAD LOAD: 77 K
CENTRAL SUPPORT DEAD LOAD: 300 K
GANTRY CRANE DEAD LOAD: 50 K
GANTRY CRANE LIFTING TROLLEY AND SEGMENT: 190 K
GANTRY LOAD ON CANTILEVER DURING LAUNCHING: 390 K
 - TOTAL WEIGHT OF SEGMENT AND SEGMENT CARRIER: 200 K
 - DISTRIBUTED CONSTRUCTION LIVE LOAD: 10 PSF
 - LOADS ASSUMED TO COMPUTE MAXIMUM UNBALANCED MOMENT (SERVICE LOAD DESIGN)
 - UNBALANCED SEGMENT
 - CONSTRUCTION LIVE LOAD: 10 PSF ON ONE CANTILEVER ARM, 5 PSF ON THE OTHER

- WIND UPLIFT: 5 PSF ON ONE CANTILEVER ARM
- UNBALANCED DEAD LOAD: 2% OF THE DEAD LOAD APPLIED TO ONE CANTILEVER
- MAXIMUM UNBALANCED MOMENT (LOAD FACTOR DESIGN)

THE ACCIDENTAL RELEASE OR APPLICATION OF A PRECAST SEGMENT LOAD WILL BE TAKEN INTO ACCOUNT BY APPLYING AN IMPACT FACTOR OF 2.

LOAD COMBINATIONS:

1.1 (DL + DIFF) + 1.3 CE + 2 A

DL + CE + 2 A

DIFF = DIFFERENTIAL DEAD LOAD
CE = CONSTRUCTION EQUIPMENT
A = UNBALANCED SEGMENT

C. MATERIALS

- CONCRETE:
 - CAST IN PLACE PIERS AND FOOTINGS, CAST IN PLACE PILES: F'c = 4500 PSI
 - ABUTMENTS, ABUTMENTS FOOTINGS, RAILINGS: CLASS A (F'c = 3000 PSI)
 - 3" CONCRETE OVERLAY: CLASS B0 (F'c = 3750 PSI)
 - PRECAST DECK SEGMENTS AND CAST-IN-PLACE DECK ELEMENTS: F'c = 5500 PSI
- REINFORCING STEEL:
 - ASTM 615 GRADE 60 UNLESS OTHERWISE NOTED.
 - THE MINIMUM CLEAR COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS UNLESS OTHERWISE SPECIFIED ON THE PLANS:
 - BOX GIRDER TOP SLAB: TOP BARS: 1 1/2"
BOTTOM BARS: 1 1/4"
 - BOX GIRDER BOTTOM SLAB: TOP BARS: 1 1/4"
BOTTOM BARS: 1 1/2"
 - BOX GIRDER WEBS: STIRRUPS AT OUTSIDE FACE: 1 1/4"
STIRRUP AT INSIDE FACE: 1"
 - ABUTMENTS, RETAINING WALLS: 2"
 - BRIDGE PIERS: 2 1/2" TO TIES
 - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"
 - REINFORCING STEEL DETAILED IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE" TWENTY-FOURTH EDITION BY CONCRETE REINFORCING STEEL INSTITUTE.
 - ALL DIMENSIONS RELATING TO REINFORCING BARS (I.E. SPACING OF BARS, ETC.) ARE TO CENTERS OF BARS UNLESS NOTED OTHERWISE..
 - END HOOPS FOR REINFORCING STEEL TO BE STANDARD HOOK UNLESS NOTED OTHERWISE.
- POST-TENSIONING STEEL:
 - STRAND: ASTM A416 GRADE 270 STRESS RELIEVED - LOW RELAXATION
 - HIGH STRENGTH BARS: ASTM A722 - GRADE 150
 - PRESTRESSING PARAMETERS:
 - FRICTION COEFFICIENT: 0.25 (STRANDS)
0.30 (BARS)
 - WOBBLE COEFFICIENT: 0.0002
 - MAXIMUM JACKING STRESS: 0.8 Fsu
 - MAXIMUM STRESS AFTER ANCHORING: 0.7 Fsu
 - ASSUMED ANCHOR SET: 3/8" (STRAND TENDONS)
1/16" (BARS)

D. ALLOWABLE STRESSES

- REINFORCED CONCRETE: AS PER AASHTO
- PRESTRESSED CONCRETE:
 - LONGITUDINAL CONCRETE STRESSES:
 - F'ci = CONCRETE COMPRESSIVE STRENGTH AT THE TIME OF INITIAL PRESTRESS - F'ci > 0.7 F'c
 - Fci = 0.55 F'ci MAXIMUM COMPRESSIVE STRESS AT THE TIME OF INITIAL PRESTRESS (OR OTHER CONSTRUCTION STAGES)
 - Fc = 0.40 F'c MAXIMUM COMPRESSIVE STRESS AT SERVICE LOADS AFTER PRESTRESS LOSSES.
 - MINIMUM COMPRESSIVE STRESS ACROSS THE JOINTS UNDER THE EFFECTS OF ALL LOADINGS: 200 PSI
 - MAXIMUM TENSION ACROSS THE JOINTS DURING CONSTRUCTION STAGES: 0
 - TRANSVERSE CONCRETE STRESSES
 - Fci = 0.55 F'ci MAXIMUM COMPRESSIVE STRESS AT THE TIME OF INITIAL PRESTRESS
 - Fci = 0.40 F'c MAXIMUM COMPRESSIVE STRESS AT SERVICE LOADS AFTER PRESTRESS LOSSES
 - MAXIMUM TENSION IN THE PRECOMPRESSED TENSILE ZONE: 0
 - BEARING STRESSES UNDER ANCHORAGES: ACCORDING TO AASHTO GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION OF SEGMENTAL CONCRETE BRIDGES SECTION 9.2.3.

E. SEGMENTS CASTING AND ERECTION

- REMOVAL OF FORMS:

MINIMUM CONCRETE STRENGTH: 2500 PSI
- TRANSVERSE POST-TENSIONING:

INITIAL POST-TENSIONING FORCE UP TO 60% OF THE FINAL VALUE
MINIMUM CONCRETE STRENGTH: 2750 PSI

FULL POST-TENSIONING FORCE:
MINIMUM CONCRETE STRENGTH: 0.7 F'ci

COMPRESSION BEHIND ANCHORAGES NOT TO EXCEED VALUES GIVEN IN AASHTO GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION OF SEGMENTAL CONCRETE BRIDGES SECTION 9.2.3.
- SEGMENT HANDLING:

MINIMUM CONCRETE STRENGTH: 3000 PSI
- SEGMENT ERECTION - LONGITUDINAL POST-TENSIONING:

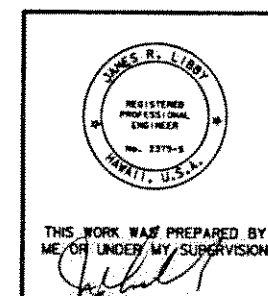
MINIMUM CURING TIME: 28 DAYS

MINIMUM CONCRETE STRENGTH: 5500 PSI
- CAST IN PLACE CLOSURE JOINTS:

MINIMUM COMPRESSIVE STRENGTH BEFORE POST-TENSIONING: 2750 PSI
- TEMPORARY STRESSES ON EPOXY JOINTS:

MINIMUM COMPRESSIVE STRESS: 40 PSI.

REVIEWED BY	DATE
DRAWN BY	DATE
DESIGNED BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE



08/23/91	REVISED LAUNCHING GANTRY REACTIONS.
01/04/91	REVISED NOTES D.2.C AND E.2.
DATE	REVISION
J. MULLER INTERNATIONAL	Libby Engineers

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
STRUCTURAL GENERAL NOTES
INTERSTATE ROUTE H-3 F.A.I. PROJECT No. I-H3-1(57) F.A.I. PROJECT No. I-H3-1(58)
SCALE: AS NOTED DATE: JUN. 1990

SHEET No. N2 OF SHEETS