FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	133	286

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SG0.2	BRIDGE GENERAL NOTES
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SG1.2	LAHAINALUNA ROAD GRADE SEPARATION STRUCTURE – FOUNDATION PLAN
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SG8.2	GUARDRAIL AND END POST – ELEVATION AND SECTIONS
SG8.3	GUARDRAIL AND END POST – PLAN, ELEVATION, SECTIONS AND DETAILS
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ORIGINAL PLAN
SURVEY PLOTTED BY _____ DATE
DRAWN BY _____ " "
TRACED BY _____ " "
DESIGNED BY _____ " "
QUANTITIES BY _____ " "
CHECKED BY _____ " "
NOTE BOOK _____
No. _____

DAVID K. FUJIWARA
LICENSED PROFESSIONAL ENGINEER
NO. 8104-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

David K. Fujiwara
KSF, INC.

APRIL 30, 2010
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

INDEX TO BRIDGE DRAWINGS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: None Date: April, 2009

SHEET No. SG0.1 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	134	379

BRIDGE GENERAL NOTES

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2. Design Specifications:
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   (B) HDOT "Design Criteria for Bridges and Structures" dated February 14, 2005.

3. Loads:

   (A) Dead Load: An allowance of 25 PSF for future wearing surface of asphalt concrete has been provided for in the design.

   (B) Live Load: AASHTO HL-93 Truck Loading

   (C) Seismic Loads:
   Acceleration coefficient 0.24
   Seismic Performance Zone 3
   Importance Category ..... Critical
   Soil Profile ..... Type I

   (D) Utility Load: An allowance of 150 PLF on each side of the bridge for Utility Loads has been provided for in the design.

4. Materials:

   (A) All concrete strengths for Lahainaluna Road Grade Separation Structure shall be as noted below:

Item No.	Structural Parts	Classes of Concrete	Specified Compressive Strength, f'c (28 Days)	Maximum W/C Ratio
(1)	Abutment walls (See Note 4.(B))	–	8,000 psi	.4
(2)	Beams (Girders), including closure joint and midspan diaphragm. (See Notes 4.(B) and 4.(H))	–	8,000 psi	.4
2/8/10 △ (3)	Deck, Sidewalk, End Beams, and Approach Slabs (See Note 4.(I))	–	7,000 psi	.38
(4)	Railings (See Notes 4.(B) and 4.(H))	–	4,000 psi	.45
(5)	End posts (See Note 4.(H))	–	4,000 psi	.45
(6)	Except as noted otherwise, all others	A	3,000 psi	0.55

   (B) A shrinkage reducing admixture (Tetraguard AS20 by BASF) shall be added to the concrete mix for Item No.'s (1), (2), (3), and (4) under Note 4.(A). The minimum dosage requirement shall be 128 ounces per cubic yard of concrete.

   (C) All reinforcing steel shall be ASTM A615 Grade 60 unless otherwise noted.

   (D) All structural steel shall be ASTM A36 hot-dip galvanized after fabrication, unless otherwise noted.

   (E) All anchor bolts, washers and nuts shall be ASTM A325 hot-dip galvanized after fabrication, unless otherwise specified.

4. Materials:(Cont.)

   (F) For materials of post-tensioned concrete see applicable post-tensioned concrete notes.

   (G) Steel tubes shall conform to ASTM A500, Grade B.

   (H) A migrating corrosion inhibitor amine carboxylate water-based admixture (CORTEC MCI-2005 NS) shall be added to the concrete mix for Item No.'s (2), (3), (4), and (5) under Note 4.(A). The minimum dosage shall be 1.5 pints per cubic yards of concrete.

2/8/10 △ (I) The concrete for Item No. (3) shall be Type SBD as described in Special Provisions Section 601.04.

   (J) The Contractor shall use curing compound SINAK LITHIUM for bridge structures and approach slabs. Six copies of the manufacturer's brochure and certificates of test result shall be submitted. All work shall conform with the manufacturer's recommendations. Coverage rate shall be 500 square feet per gallon. After the curing compound is applied the deck surface shall be covered by burlene for seven days.

   (K) Stainless steel bolts, rods, nuts and washers shall be ASTM A193, UNS S31600 Class I. Stainless steel and dissimilar metals, such as reinforcing steel, shall be separated with teflon tape at contact area.

   (L) Asphalt roll roofing shall be ASTM D6380 Class S, Type III.

5. Reinforcement:

   (A) The minimum covering measured from the surface of the concrete to the face of any reinforcing bars shall be as follows, except as otherwise shown:

   (1) Deck topping

   A. Top bars = 2 1/2"

   B Bottom bars = 1 1/2" except as otherwise noted

   (2) Abutment Walls = 2" to outermost reinforcing except as otherwise noted

   = 3" when concrete cast against and permanently exposed to earth

   (3) Approach slab top bars = 2 1/2"

   Approach slab bottom bars = 3"

   (4) Concrete cast against and permanently exposed to earth = 3"

   (5) All others unless otherwise noted = 2"

   (B) Reinforcing bars shall be detailed in accordance with the latest edition of the design specification in note 2 unless otherwise noted.

   (C) Minimum clear spacing between parallel bars shall be 1 1/2 times the diameter of bars (for non bundled bars). In no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate or 1 1/2" (except at approach slab dowel).

5. Reinforcement (Cont.):

   (D) All dimensions relating to reinforcing bars are to centers of bars unless otherwise noted.

   (E) Reinforcing bars shall be securely tied at all intersections and lap splices except where the spacing of intersections is less than one foot in each direction, in which case alternate intersections shall be tied.

   (F) Reinforcing steel bar supports for the prestressed beams shall be precast concrete having 8,000 psi compressive strength. Wire bar supports and all plastic supports shall not be allowed in precast concrete beams.

6. Glass Fiber Reinforced Polymer Rebar:

   △ (A) Glass Fiber Reinforced Polymer (GFRP) rebar shall have a tensile strength of 110 ksi for #3 bars, 100 ksi for #4 bars, 95 ksi for #5 bars, and 90 ksi for #6 bars. The allowable tensile stress is equal to 20% of the minimum ultimate tensile strength.

   (B) The modulus of elasticity of the GFRP bar shall be 5,900,000 psi.

   (C) Minimum concrete cover for the GFRP bars shall be 3/4" unless otherwise noted.

   (D) Minimum lap splice lengths for the GFRP bars shall be 42 bar diameters unless otherwise noted.

   (E) All GFRP bars shall be securely tied in place.

   (F) The GFRP bars may be cut in the field with a masonry or diamond blade.

   (G) All work including materials and bends shall follow manufacturer's recommendations.

△	2-8-10	Revised Notes 4(A)(3) and 4(I)
△	12-14-09	Revised GFRP Note
DATE	REVISION	

REDUCED PLAN (HALF SIZE)
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DAVID K. FUJIWARA LICENSED PROFESSIONAL ENGINEER NO. 8104-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE GENERAL NOTES

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd, Part B
Fed. Aid Proj. No. NH-030-1(35)R

Scale: None

SHEET No. SG0.2 OF 3 SHEETS

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

DRAWING NAME: Z:\2004\40019.0-HONOAPIILANI LAHAINA BYPASS-KAHOMA WOI\02-09-10 COMBINE LAHAINA GEN NOTES\HI-SG002 VC CHANGE 02-08-10.DWG PLOT TIME: 02-09-10, 11:35 AM)

100% DESIGN 134

BRIDGE GENERAL NOTES

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	134	379

1. General Specifications: Hawaii Department of Transportation, Standard Specifications for Road and Bridge Construction, 1994, together with Special Provisions prepared for this contract.

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   (B) HDOT "Design Criteria for Bridges and Structures" dated February 14, 2005.

3. Loads:

   (A) Dead Load: An allowance of 25 PSF for future wearing surface of asphalt concrete has been provided for in the design.

   (B) Live Load: AASHTO HL-93 Truck Loading

   (C) Seismic Loads:
   Acceleration coefficient 0.24
   Seismic Performance Zone 3
   Importance Category ..... Critical
   Soil Profile ..... Type I

   (D) Utility Load: An allowance of 150 PLF on each side of the bridge for Utility Loads has been provided for in the design.

4. Materials:

   (A) All concrete strengths for Lahainaluna Road Grade Separation Structure shall be as noted below:

Item No.	Structural Parts	Classes of Concrete	Specified Compressive Strength, f'c (28 Days)	Maximum W/C Ratio
(1)	Abutment walls (See Note 4.(B))	–	8,000 psi	.4
(2)	Beams (Girders), including closure joint and midspan diaphragm. (See Notes 4.(B) and 4.(H))	–	8,000 psi	.4
(3)	Deck, Sidewalk, End Beams, and Approach Slabs (See Note 4.(I))	–	8,000 psi	.35
(4)	Railings (See Notes 4.(B) and 4.(H))	–	4,000 psi	.45
(5)	End posts (See Note 4.(H))	–	4,000 psi	.45
(6)	Except as noted otherwise, all others	A	3,000 psi	0.55

   (B) A shrinkage reducing admixture (Tetraguard AS20 by BASF) shall be added to the concrete mix for Item No.'s (1), (2), (3), and (4) under Note 4.(A). The minimum dosage requirement shall be 128 ounces per cubic yard of concrete.

   (C) All reinforcing steel shall be ASTM A615 Grade 60 unless otherwise noted.

   (D) All structural steel shall be ASTM A36 hot-dip galvanized after fabrication, unless otherwise noted.

   (E) All anchor bolts, washers and nuts shall be ASTM A325 hot-dip galvanized after fabrication, unless otherwise specified.

4. Materials:(Cont.)

   (F) For materials of post-tensioned concrete see applicable post-tensioned concrete notes.

   (G) Steel tubes shall conform to ASTM A500, Grade B.

   (H) A migrating corrosion inhibitor amine carboxylate water-based admixture (CORTEC MCI-2005 NS) shall be added to the concrete mix for Item No.'s (2), (3), (4), and (5) under Note 4.(A). The minimum dosage shall be 1.5 pints per cubic yards of concrete.

   (I) The concrete mix for Item No. (3) shall have a maximum shrinkage strain of .00006 at 28 days and .000145 at 56 days according to ASTM C512.

   (J) The Contractor shall use curing compound SINAK LITHIUM for bridge structures and approach slabs. Six copies of the manufacturer's brochure and certificates of test result shall be submitted. All work shall conform with the manufacturer's recommendations. Coverage rate shall be 500 square feet per gallon. After the curing compound is applied the deck surface shall be covered by burlene for seven days.

   (K) Stainless steel bolts, rods, nuts and washers shall be ASTM A193, UNS S31600 Class I. Stainless steel and dissimilar metals, such as reinforcing steel, shall be separated with teflon tape at contact area.

   (L) Asphalt roll roofing shall be ASTM D6380 Class 5, Type III.

5. Reinforcement:

   (A) The minimum covering measured from the surface of the concrete to the face of any reinforcing bars shall be as follows, except as otherwise shown:

   (1) Deck topping

   A. Top bars = 2 1/2"

   B Bottom bars = 1 1/2" except as otherwise noted

   (2) Abutment Walls = 2" to outermost reinforcing except as otherwise noted

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   Approach slab bottom bars = 3"

   (4) Concrete cast against and permanently exposed to earth = 3"

   (5) All others unless otherwise noted = 2"

   (B) Reinforcing bars shall be detailed in accordance with the latest edition of the design specification in note 2 unless otherwise noted.

   (C) Minimum clear spacing between parallel bars shall be 1 1/2 times the diameter of bars (for non bundled bars). In no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate or 1 1/2" (except at approach slab dowel).

5. Reinforcement (Cont.):

   (D) All dimensions relating to reinforcing bars are to centers of bars unless otherwise noted.

   (E) Reinforcing bars shall be securely tied at all intersections and lap splices except where the spacing of intersections is less than one foot in each direction, in which case alternate intersections shall be tied.

   (F) Reinforcing steel bar supports for the prestressed beams shall be precast concrete having 8,000 psi compressive strength. Wire bar supports and all plastic supports shall not be allowed in precast concrete beams.

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   (A) Glass Fiber Reinforced Polymer (GFRP) rebar shall have a tensile strength of 110 ksi for #3 bars, 100 ksi for #4 bars, 95 ksi for #5 bars, and 90 ksi for #6 bars. The allowable tensile stress is equal to 20% of the minimum ultimate tensile strength.

   (B) The modulus of elasticity of the GFRP bar shall be 5,900,000 psi.

   (C) Minimum concrete cover for the GFRP bars shall be 3/4" unless otherwise noted.

   (D) Minimum lap splice lengths for the GFRP bars shall be 42 bar diameters unless otherwise noted.

   (E) All GFRP bars shall be securely tied in place.

   (F) The GFRP bars may be cut in the field with a masonry or diamond blade.

   (G) All work including materials and bends shall follow manufacturer's recommendations.

REDUCED PLAN (HALF SIZE)
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DAVID K. FUJIWARA LICENSED PROFESSIONAL ENGINEER NO. 8104-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

DATE	REVISION
△	12-14-09 Revised GFRP Note

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE GENERAL NOTES

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd, Part B
Fed. Aid Proj. No. NH-030-1(35)R

Scale: None

SHEET No. SG0.2 OF 3 SHEETS

100% DESIGN 134

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

DRAWING NAME: Z:\2004\40019.0-HONOAPIILANI LAHAINA BYPASS-KAHOMA WO\12-14-09 COMBINE KAHOMA FIELD CHANGE\HH-SG002 FIELD CHANGE 12-14-09.DWG PLOT TIME: 12-14-09, 4:54 PM)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	134	286

BRIDGE GENERAL NOTES

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   Seismic Performance Zone 3
   Importance Category ..... Critical
   Soil Profile ..... Type I

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4. Materials:(Cont.)

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   (H) A migrating corrosion inhibitor amine carboxylate water-based admixture (CORTEC MCI-2005 NS) shall be added to the concrete mix for Item No.'s (2), (3), (4), and (5) under Note 4.(A). The minimum dosage shall be 1.5 pints per cubic yards of concrete.

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   A. Top bars = 2 1/2"

   B Bottom bars = 1 1/2" except as otherwise noted

   (2) Abutment Walls = 2" to outermost reinforcing except as otherwise noted

   = 3" when concrete cast against and permanently exposed to earth

   (3) Approach slab top bars = 2 1/2"

   Approach slab bottom bars = 3"

   (4) Concrete cast against and permanently exposed to earth = 3"

   (5) All others unless otherwise noted = 2"

   (B) Reinforcing bars shall be detailed in accordance with the latest edition of the design specification in note 2 unless otherwise noted.

   (C) Minimum clear spacing between parallel bars shall be 1 1/2 times the diameter of bars (for non bundled bars). In no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate or 1 1/2" (except at approach slab dowel).

5. Reinforcement (Cont.):

   (D) All dimensions relating to reinforcing bars are to centers of bars unless otherwise noted.

   (E) Reinforcing bars shall be securely tied at all intersections and lap splices except where the spacing of intersections is less than one foot in each direction, in which case alternate intersections shall be tied.

   (F) Reinforcing steel bar supports for the prestressed beams shall be precast concrete having 8,000 psi compressive strength. Wire bar supports and all plastic supports shall not be allowed in precast concrete beams.

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   (A) Glass Fiber Reinforced Polymer (GFRP) rebar shall have a tensile strength of 100 ksi for #4 bars, 95 ksi for #5 bars and 90 ksi for #6 bars. The allowable tensile stress is equal to 20% of the minimum ultimate tensile strength.

   (B) The modulus of elasticity of the GFRP bar shall be 5,900,000 psi.

   (C) Minimum concrete cover for the GFRP bars shall be 3/4" unless otherwise noted.

   (D) Minimum lap splice lengths for the GFRP bars shall be 42 bar diameters unless otherwise noted.

   (E) All GFRP bars shall be securely tied in place.

   (F) The GFRP bars may be cut in the field with a masonry or diamond blade.

   (G) All work including materials and bends shall follow manufacturer's recommendations.

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

DAVID K. FUJIWARA
LICENSED PROFESSIONAL ENGINEER
NO. 8104-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE GENERAL NOTES

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: None Date: April, 2009

SHEET No. SG0.2 OF 3 SHEETS

Rev. 134

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	135	286

BRIDGE GENERAL NOTES

7. Foundation:

(A) Lahainaluna Road Grade Separation Structure

(1) Bearing Value (service) = 20,000 psf

(2) Bearing Value (strength) = 36,000 psf

(3) Bearing Value (extreme event) = 60,000 psf

(4) At-rest pressure (Top 8 feet of abutment) = 56 pcf

(5) At-rest pressure (Abutment wall retaining basalt) = 5 pcf

(6) Earthquake load (abutment walls) = 14.5^2 H (Restraint)
(H = height of retained soil or backfill in feet)

(7) Passive pressure (Extreme Event) = 1,000 psi.
Passive pressure (Strength) = 500 psi.
Horizontal spring (in contact with rock) = 5,000 psi.
Horizontal spring (in contact with soil) = 4 ksf/in.

(8) Friction Factor: Extreme Event : μ = 0.70
Strength : μ = 0.60

Other Notes:

8. (A) Reference Drawings:

(1) For Construction Sequence of Lahainaluna Road Grade Separation Structure, See sheet SG9.1.

(B) Except as otherwise noted, all vertical dimensions are measured plumb.

(C) Unless otherwise noted, all exposed concrete edges shall be chamfered 3/4"X3/4".

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

DAVID K. FUJIWARA LICENSED PROFESSIONAL ENGINEER NO. 8104-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

KSF, INC. APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

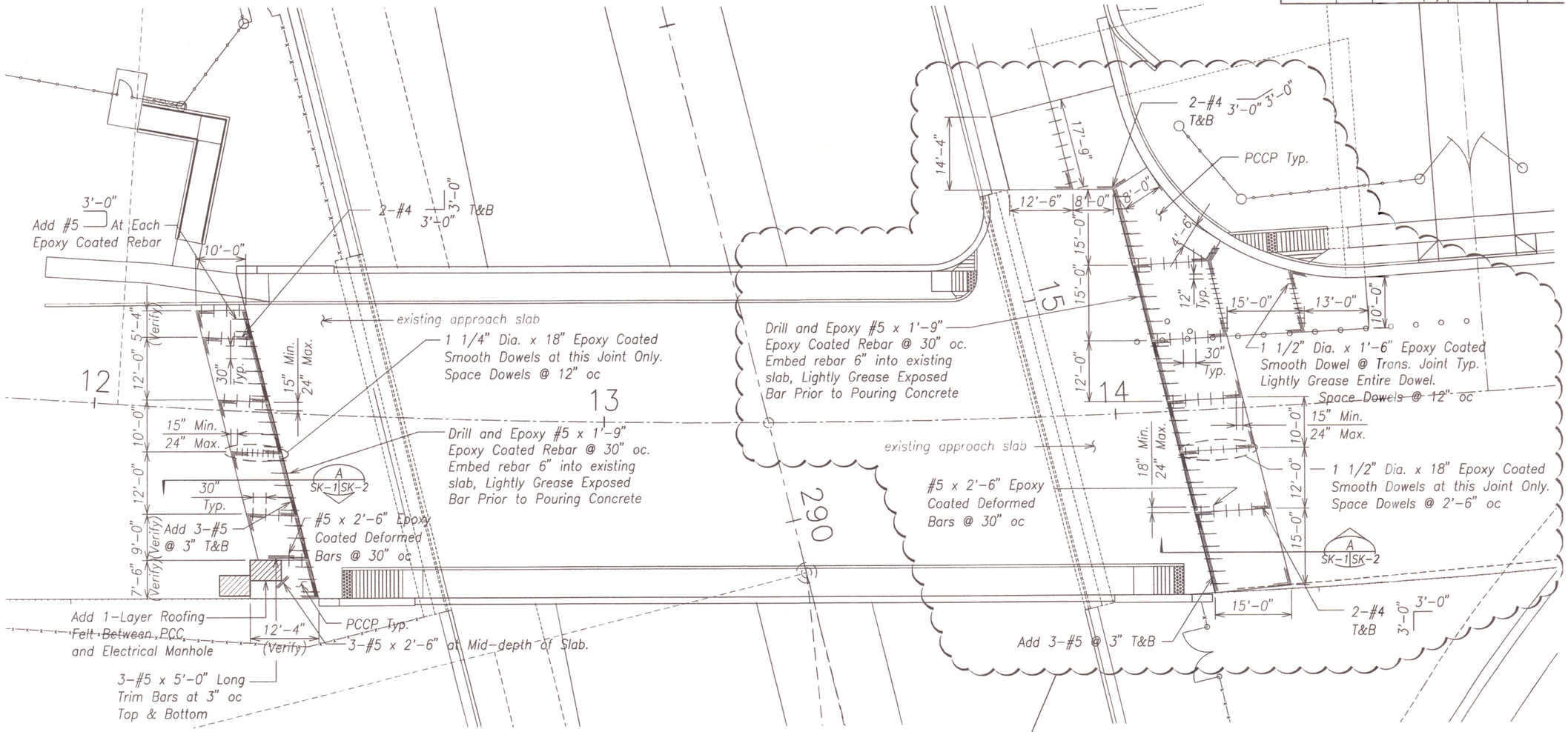
BRIDGE GENERAL NOTES

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: None Date: April, 2009

SHEET No. SG0.3 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	140	383



REINFORCING PLAN

Scale: 1" = 10'-0"

A SK-1 SK-1

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

KSF, INC. APRIL 30, 201 LIC. EXP. DA

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PCC PLAN

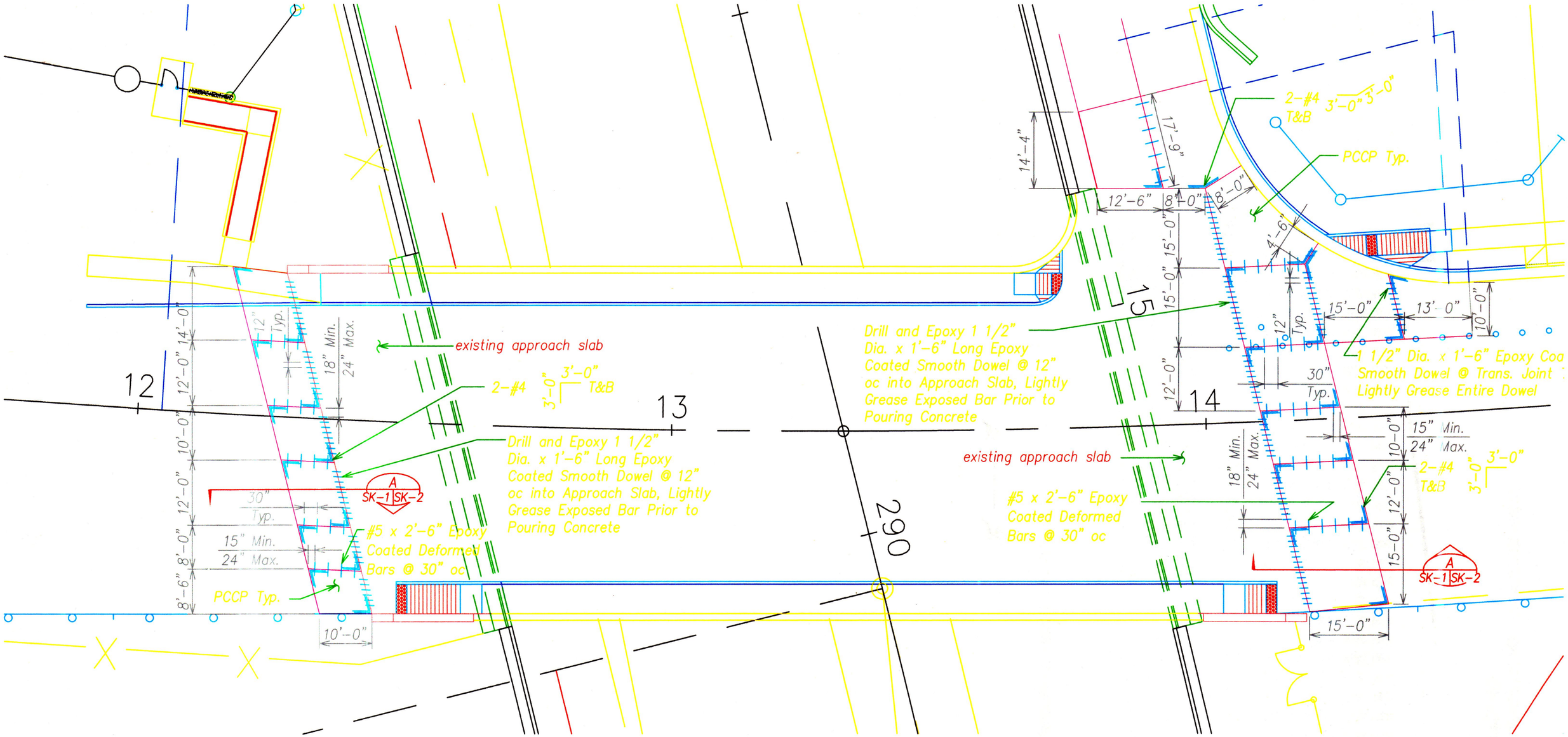
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd, Part E
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: June, 2010

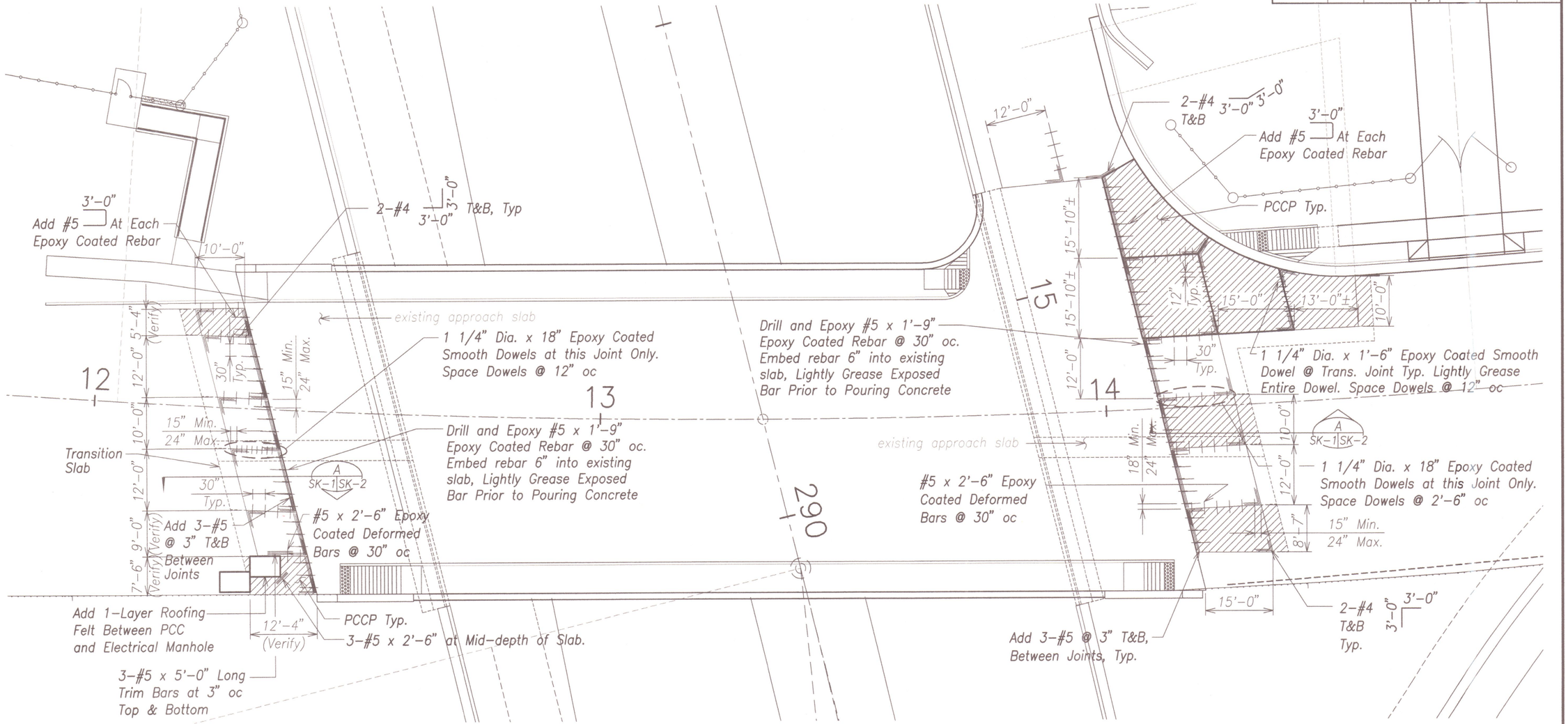
SHEET No. SK-1 OF SHEETS

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

DRAWING NAME: Z:\00 ONGOING\40019.0-HONOAPIILANI LAHAINA BYPASS-KAHOMA WO\09-07-10 PCC PAVMENT\HI-LRGS-SK01.DWG PLOT TIME: 09-07-10, 10:49 AM)


existing approach slab
2-#4
3'-0"
3'-0"
T&B
Drill and Epoxy 1 1/2" Dia. x 1'-6" Long Epoxy Coated Smooth Dowel @ 12" oc into Approach Slab, Lightly Grease Exposed Bar Prior to Pouring Concrete
A
SK-1 SK-2
30" Typ.
15" Min.
24" Max.
#5 x 2'-6" Epoxy Coated Deformed Bars @ 30" oc
PCCP Typ.
10'-0"
12'-0"
14'-0"
10'-0"
12'-0"
8'-6"
8'-0"
12" Typ.
18" Min.
24" Max.
12
13
290
15
14
14'-4"
17'-9"
12'-6"
8'-0"
8'-0"
15'-0"
15'-0"
12'-0"
4'-6"
2-#4
3'-0"
3'-0"
T&B
PCCP Typ.
Drill and Epoxy 1 1/2" Dia. x 1'-6" Long Epoxy Coated Smooth Dowel @ 12" oc into Approach Slab, Lightly Grease Exposed Bar Prior to Pouring Concrete
12" Typ.
30" Typ.
15'-0"
13'-0"
10'-0"
1 1/2" Dia. x 1'-6" Epoxy Coa
Smooth Dowel @ Trans. Joint
Lightly Grease Entire Dowel
existing approach slab
#5 x 2'-6" Epoxy Coated Deformed Bars @ 30" oc
18" Min.
24" Max.
15" Min.
24" Max.
10'-0"
12'-0"
15'-0"
2-#4
3'-0"
3'-0"
T&B
A
SK-1 SK-2
15'-0"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	140	383



REINFORCING PLAN (A SK-1|SK-1)

Scale: 1" = 10'-0"

Legend:

▨ Fiber Reinforced Concrete

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KSF, INC. — APRIL 30, 2012 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PCC PLAN

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd, Part B
Fed. Aid Proj. No. NH-030-1(35)R

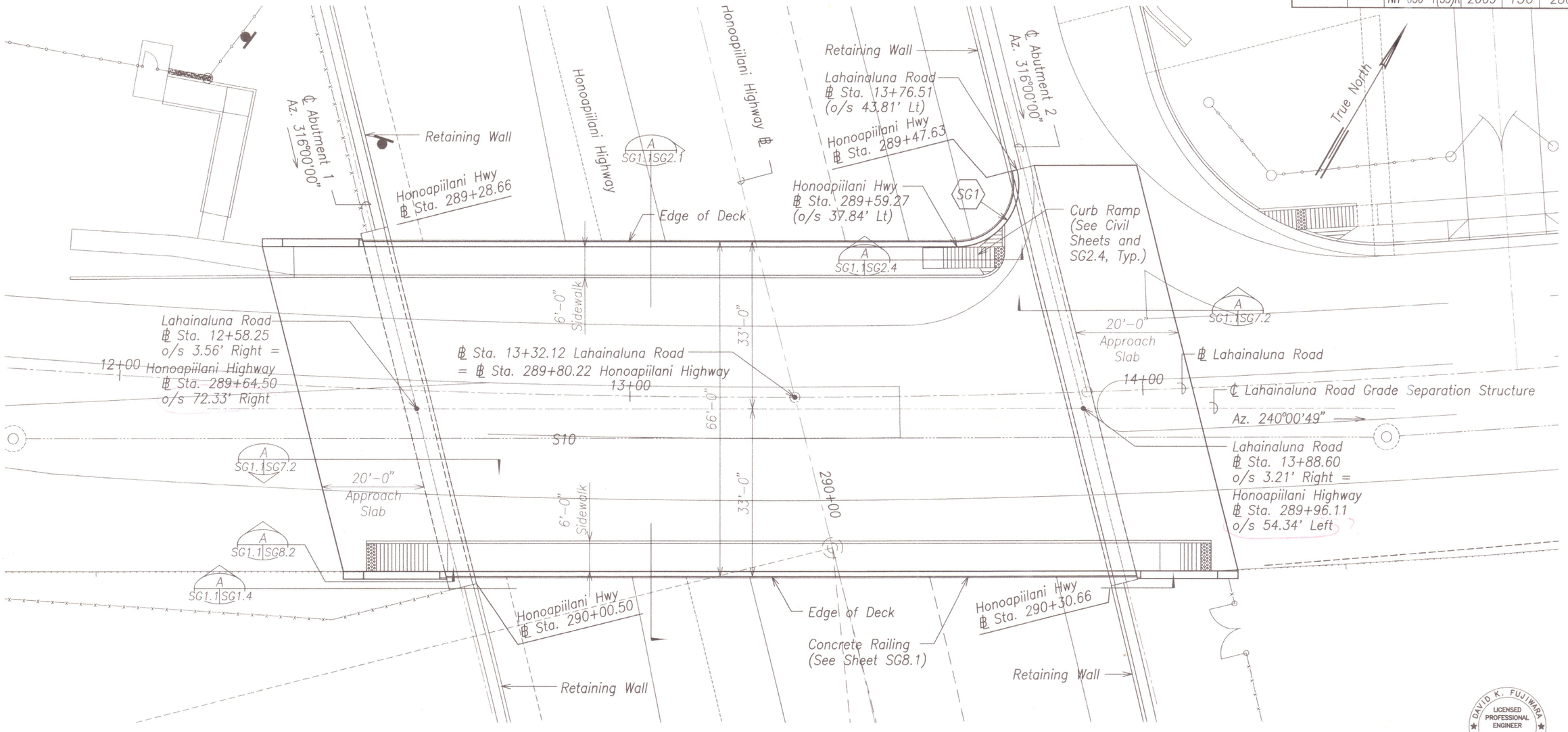
Scale: As Noted Date: June, 2010

SHEET No. SK-1 OF SHEETS

FINAL DESIGN

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	136	286



SG1 CURVE DATA

△	= 104° 00' 49"
△/2	= 52° 00' 25"
R	= 12
T	= 15.36
Ch	= 18.91
Lc	= 21.79

LAHAINALUNA ROAD GRADE SEPARATION STRUCTURE – LAYOUT PLAN

Scale: 1" = 10'-0"

Notes:

1. See Civil Plans for Retaining Wall details.
2. See Civil Plans for Sewer Line (S10) details.
3. See Civil Plans for further geometric details.
4. See Civil Plans and SG2.4 for Curb Ramp details.

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

DAVID K. FUJIWARA
LICENSED PROFESSIONAL ENGINEER
NO. 8104-S
HAWAII, U.S.A.

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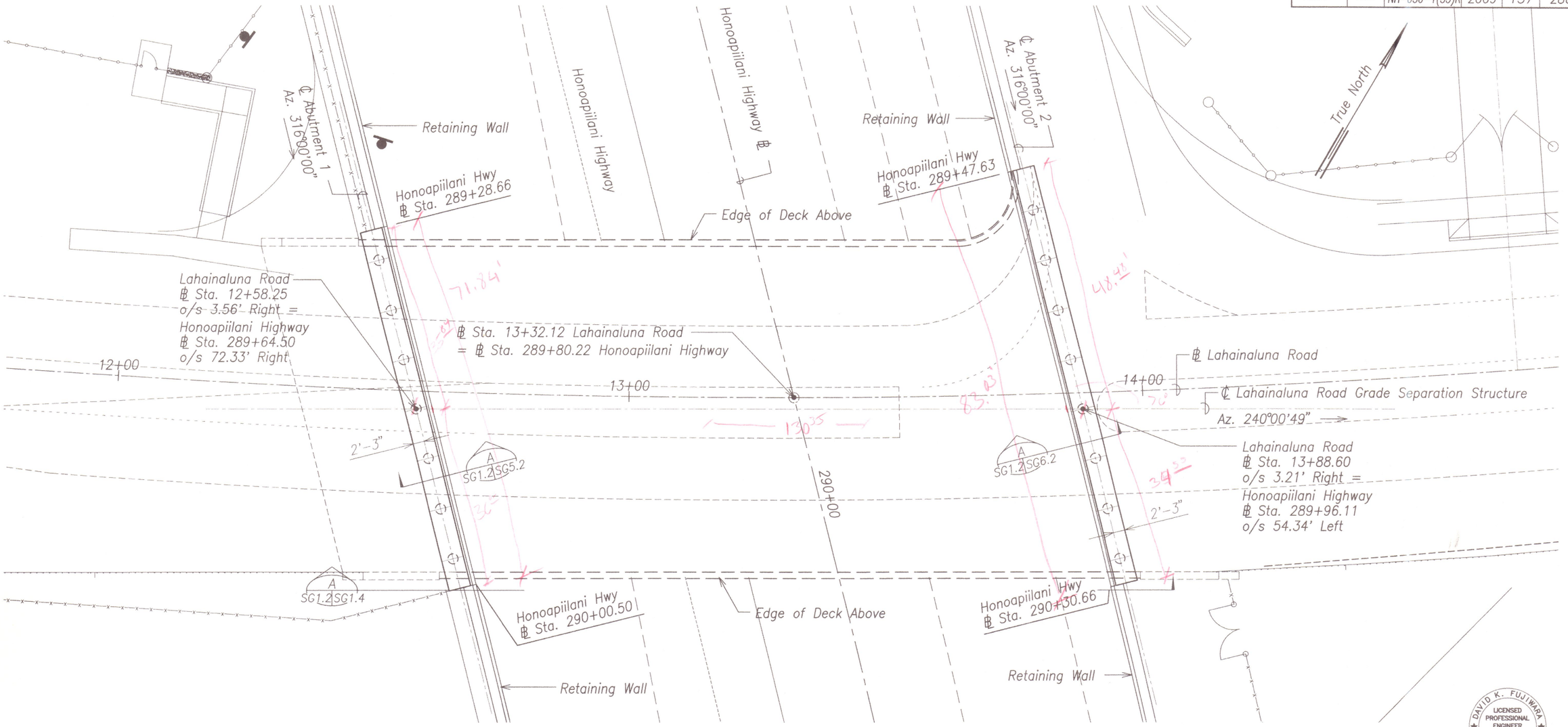
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LAHAINALUNA ROAD GRADE SEPARATION STRUCTURE– LAYOUT PLAN
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG1.1 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	137	286



Legend:

⊕ Probe hole locations @ 10'–0" oc along abutment wall footing ℄. Probe hole depth = 15'–0"± from bottom of footing. See Special Provisions Section 660.

Note:

See Civil Plans for retaining wall details.

LAHAINALUNA ROAD GRADE SEPARATION STRUCTURE – FOUNDATION PLAN

Scale: 1" = 10'–0"

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HIGHWAYS DIVISION

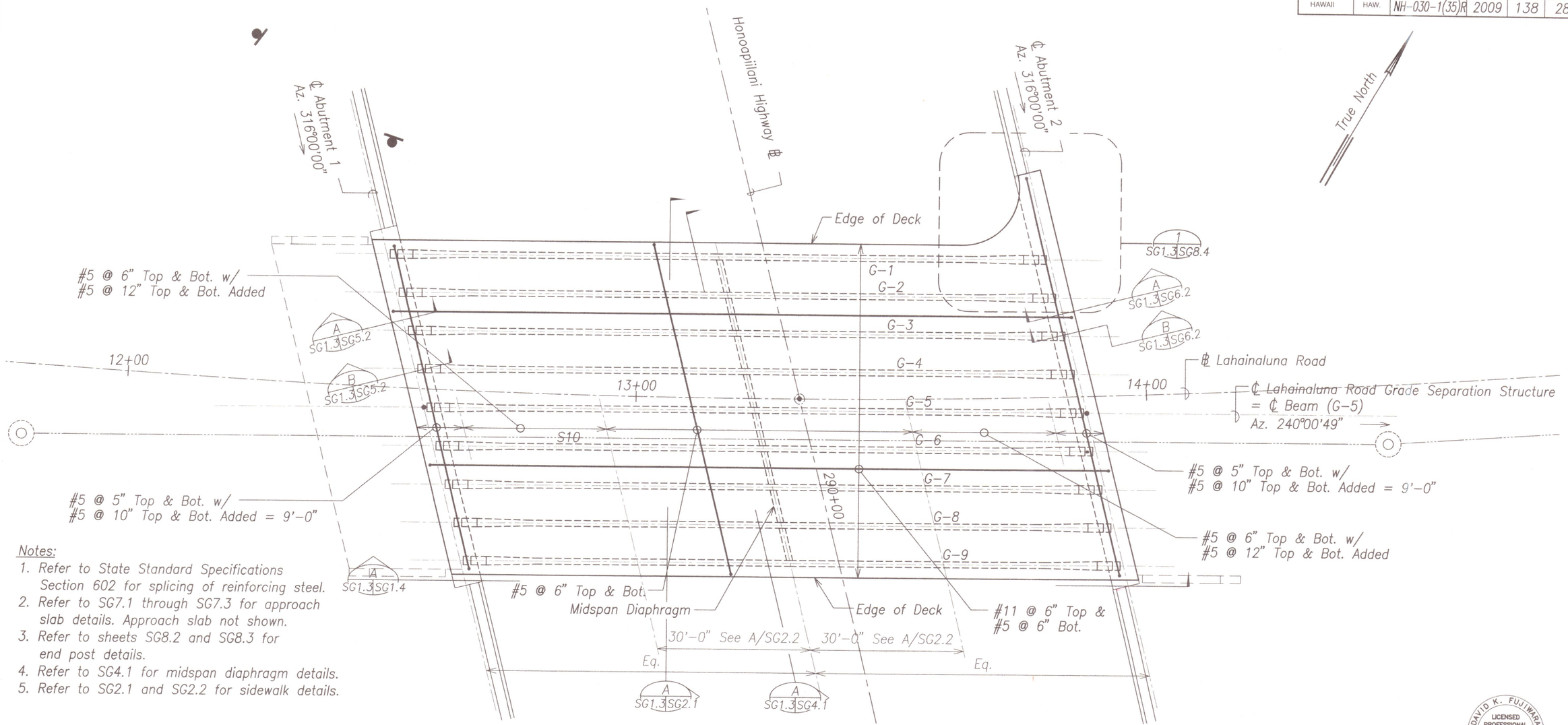
LAHAINALUNA ROAD GRADE SEPARATION STRUCTURE–FOUNDATION PLAN
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH–030–1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG1.2 OF 4 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	138	286



Notes:

1. Refer to State Standard Specifications Section 602 for splicing of reinforcing steel.
2. Refer to SG7.1 through SG7.3 for approach slab details. Approach slab not shown.
3. Refer to sheets SG8.2 and SG8.3 for end post details.
4. Refer to SG4.1 for midspan diaphragm details.
5. Refer to SG2.1 and SG2.2 for sidewalk details.

LAHAINALUNA ROAD GRADE SEPARATION STRUCTURE – DECK FRAMING AND REINFORCING PLAN

Scale: 1" = 10'-0"

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY DATE
DRAWN BY
TRACED BY
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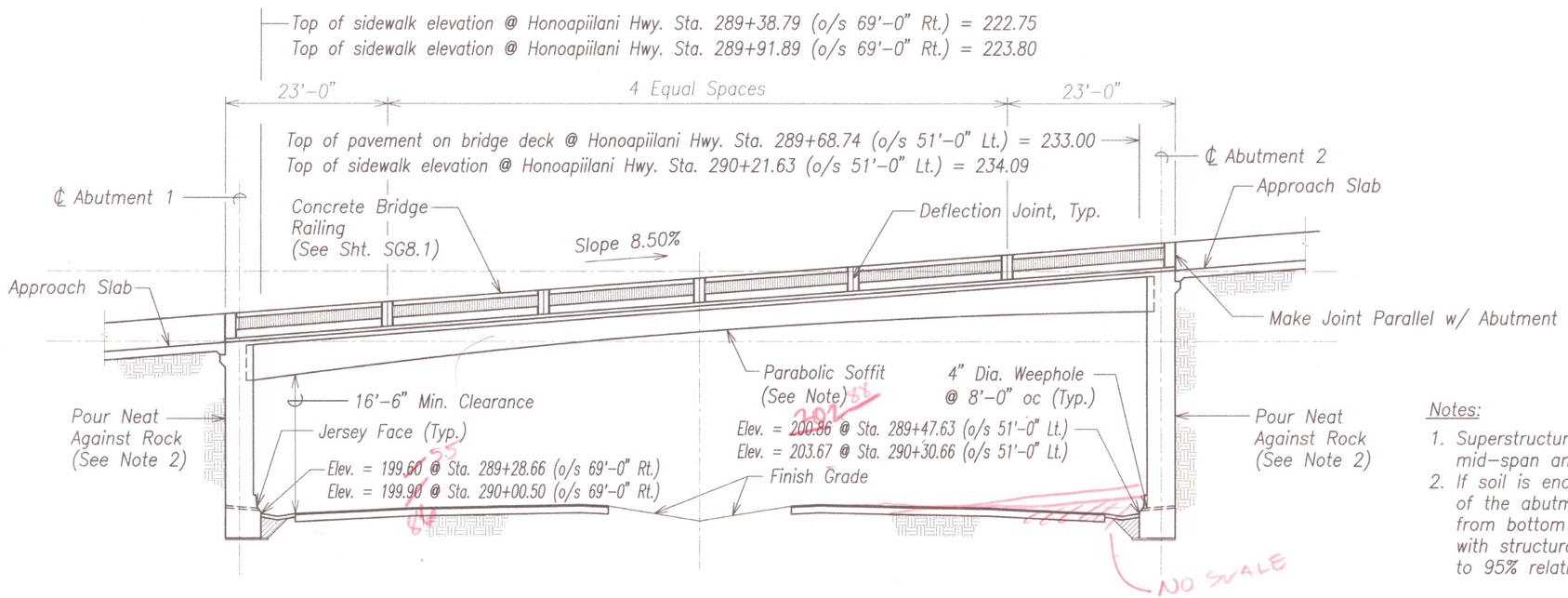
LAHAINALUNA ROAD GRADE SEPARATION STRUCTURE–
DECK FRAMING AND REINFORCING PLAN
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG1.3 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	139	286



Notes:

1. Superstructure is 3'-8" deep at mid-span and 5'-8" deep at abutments.
2. If soil is encountered behind the top of the abutment, excavate 1H : 1V from bottom of soil layer and backfill with structural backfill type "A" compacted to 95% relative compaction.

LAHAINALUNA ROAD GRADE SEPARATION STRUCTURE - ELEVATION

Scale: 1" = 10'-0"

A
SG1.1 | SG1.4
SG1.2, SG1.3

ORIGINAL PLAN

NOTE BOOK No.

SURVEY PLOTTED BY DATE
DRAWN BY "
TRACED BY "
DESIGNED BY "
QUANTITIES BY "
CHECKED BY "

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HIGHWAYS DIVISION

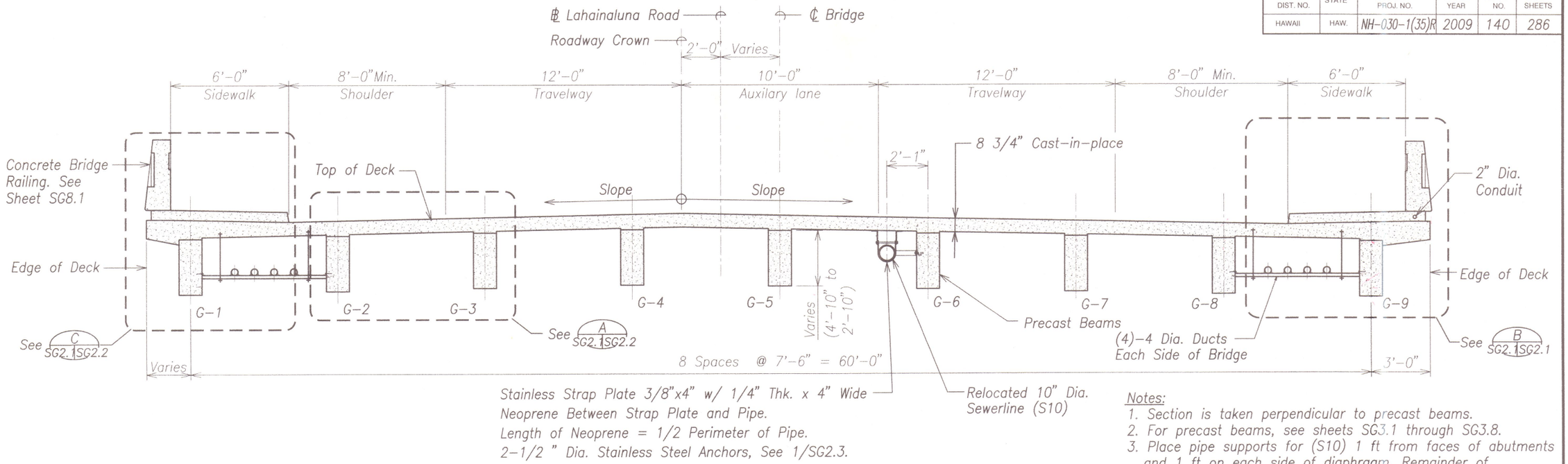
LAHAINALUNA ROAD GRADE SEPARATION STRUCTURE-ELEVATION

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG1.4 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	140	286



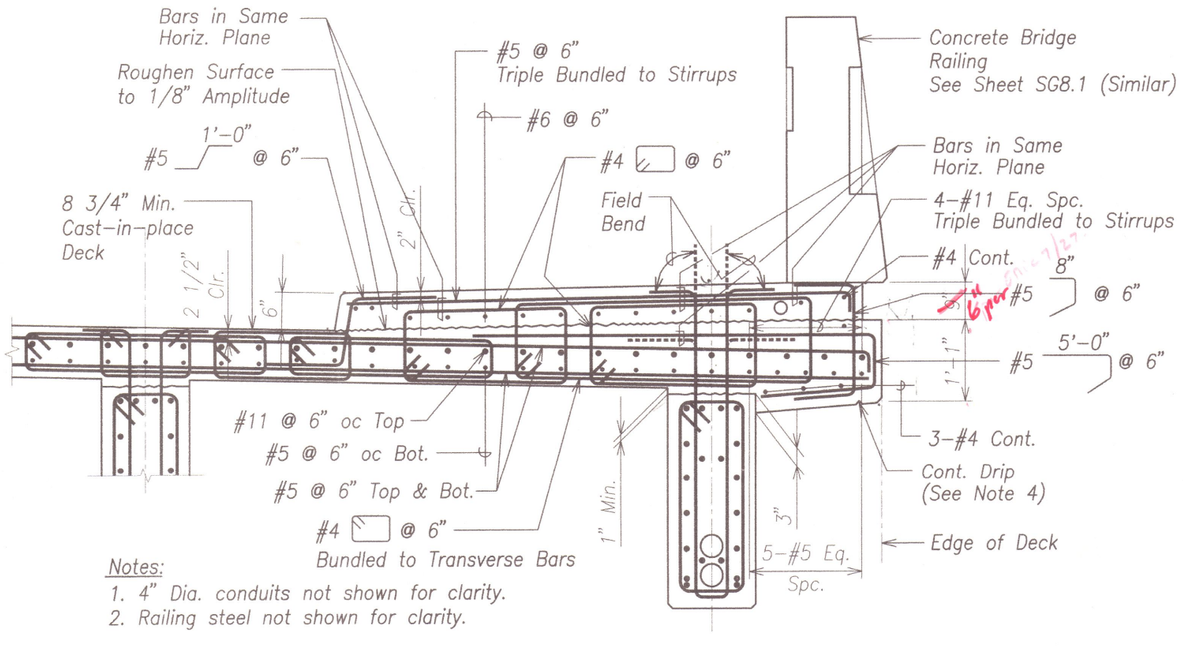
TYPICAL GRADE SEPARATION STRUCTURE NORMAL SECTION

Scale: 3/8" = 1'-0"

A | SG1.1 | SG2.1 | SG1.3

Notes:

1. Section is taken perpendicular to precast beams.
2. For precast beams, see sheets SG3.1 through SG3.8.
3. Place pipe supports for (S10) 1 ft from faces of abutments and 1 ft on each side of diaphragm. Remainder of pipe supports shall be spaced @ 8'-0" oc max. Verify locations with pipe manufacturer.
4. See Hawaii State Standard Plans Sheet B-01 for cont. drip details.
5. See Civil plans for location of sewerline and deck slopes.
6. See Electrical plans for location of 4" dia. ducts.
7. See SG2.5 for 4" dia. duct support details.



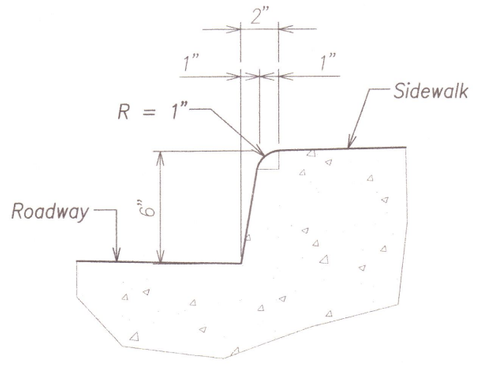
Notes:

1. 4" Dia. conduits not shown for clarity.
2. Railing steel not shown for clarity.

TYPICAL DECK SECTION AT SIDEWALK

Scale: 1" = 1'-0"

B | SG2.1 | SG2.1



DETAIL

Scale: 3" = 1'-0"

1 | SG2.1 | SG2.1

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STATE OF HAWAII
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HIGHWAYS DIVISION

TYPICAL NORMAL DECK SECTION & SIDEWALK

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

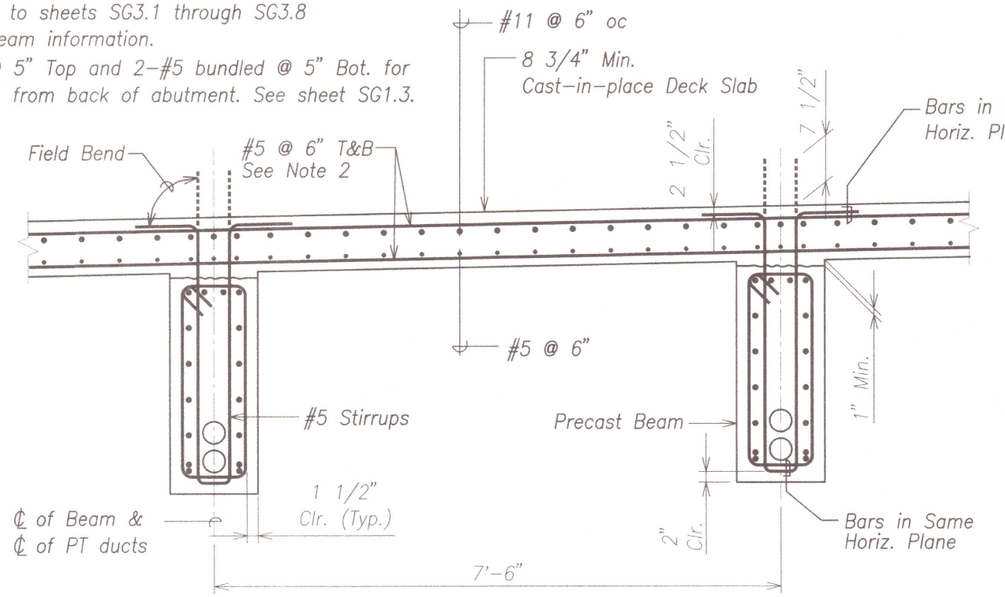
Scale: As Noted — Date: April, 2009

SHEET No. SG2.1 OF 5 SHEETS

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

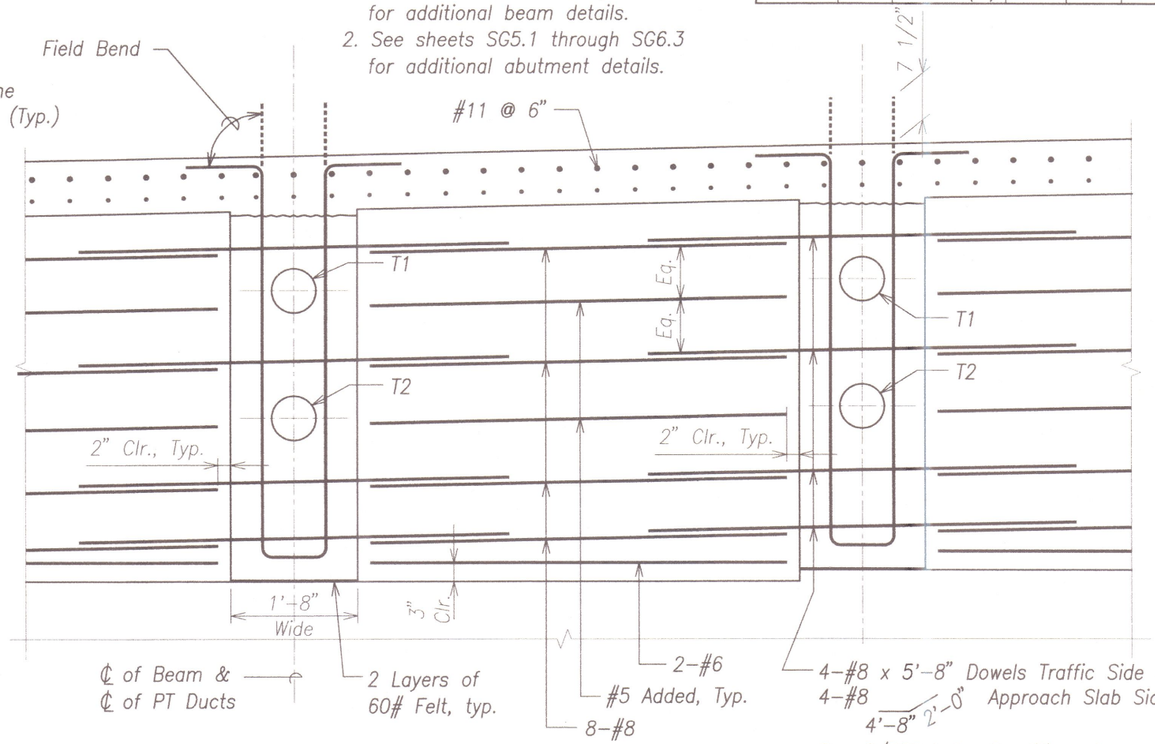
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	141	286

Notes:
1. Refer to sheets SG3.1 through SG3.8 for beam information.
2. #5 @ 5" Top and 2-#5 bundled @ 5" Bot. for 9'-0" from back of abutment. See sheet SG1.3.



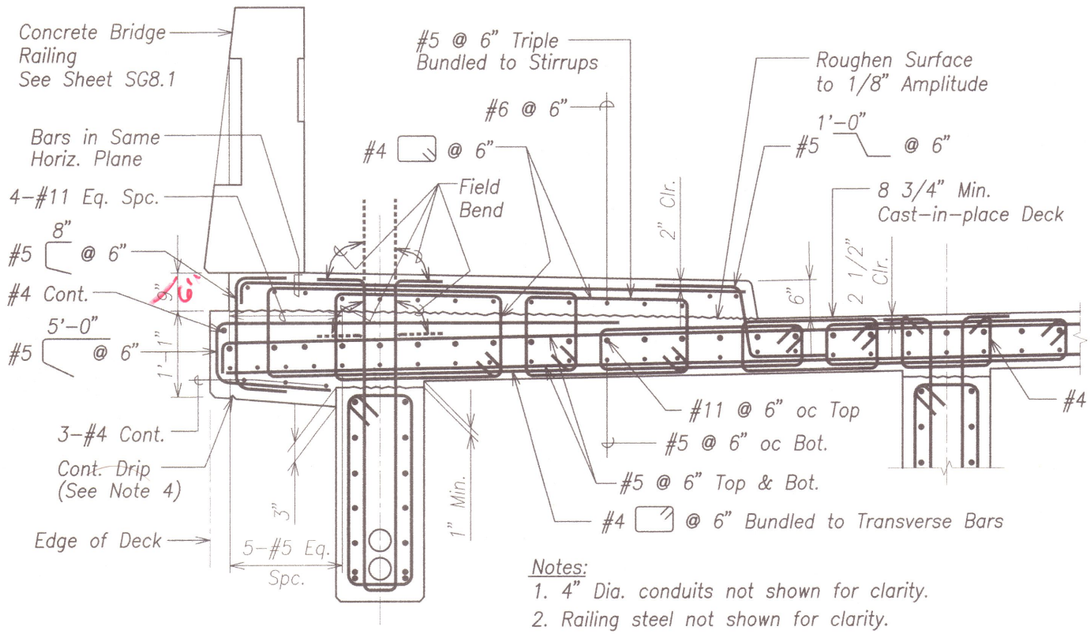
TYPICAL DECK SECTION (A) SG2.1 | SG2.2
Scale: 1" = 1'-0"

Notes:
1. See sheets SG3.1 through SG3.8 for additional beam details.
2. See sheets SG5.1 through SG6.3 for additional abutment details.



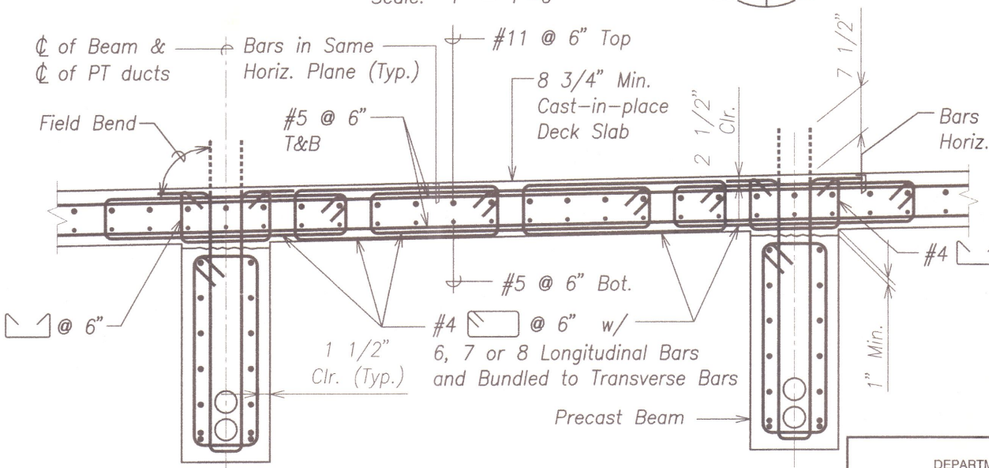
TYPICAL AT END BEAM (B) SG2.2 | SG5.1
Scale: 1" = 1'-0"

See 2/SG5.4 for Condition at Exterior Girders



Notes:
1. 4" Dia. conduits not shown for clarity.
2. Railing steel not shown for clarity.

TYPICAL DECK SECTION AT SIDEWALK (C) SG2.1 | SG2.2
Scale: 1" = 1'-0"



TYPICAL DECK SECTION AT MIDDLE 60 FT CENTERED AT MIDSPAN DIAPHRAGM (A) SG2.1 | SG2.2
Scale: 1" = 1'-0"

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HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DECK SECTIONS

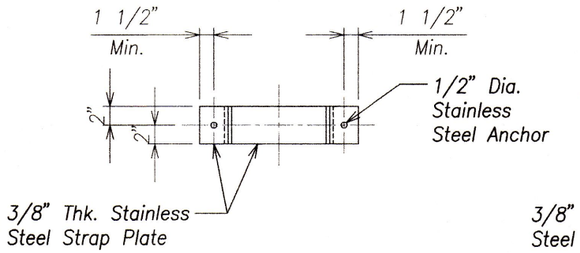
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

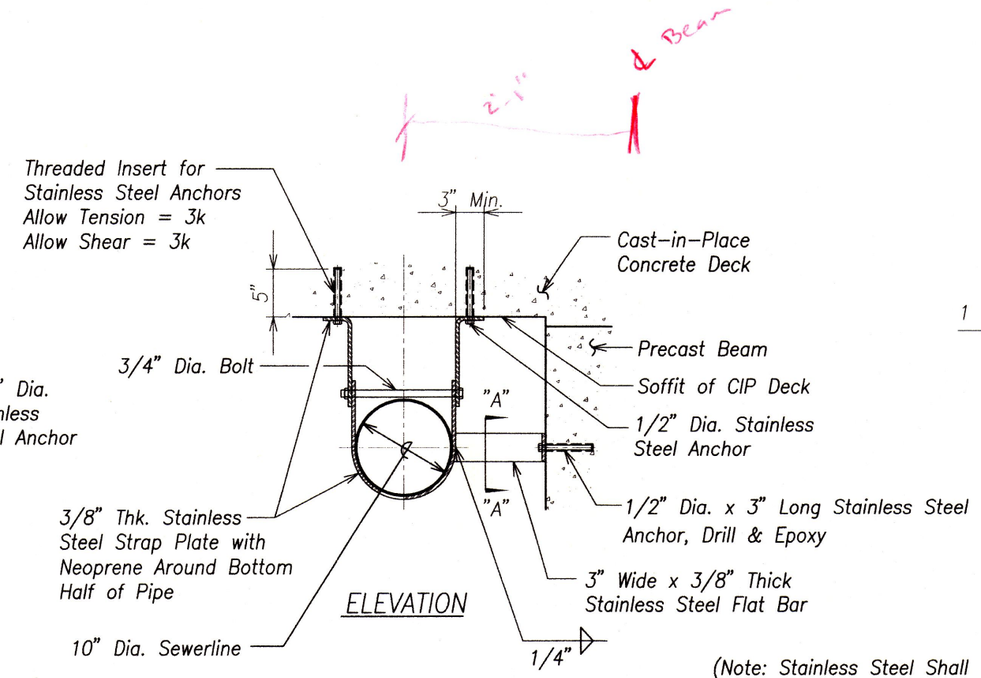
SHEET No. SG2.2 OF 5 SHEETS

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

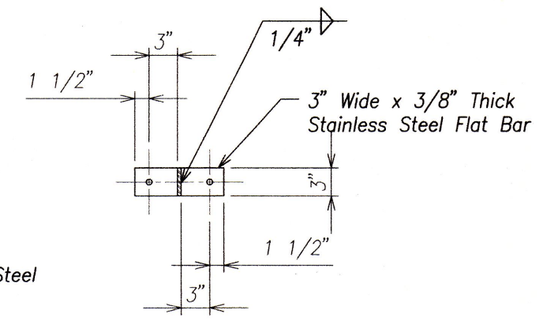
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	142	286



PLAN



ELEVATION



SECTION "A-A"

(Note: Stainless Steel Shall Not be in Contact w/ Dissimilar Metals)

SEWERLINE SUPPORT DETAIL

Scale: 1 1/2" = 1'-0"

1 / SG2.1 | SG2.3

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

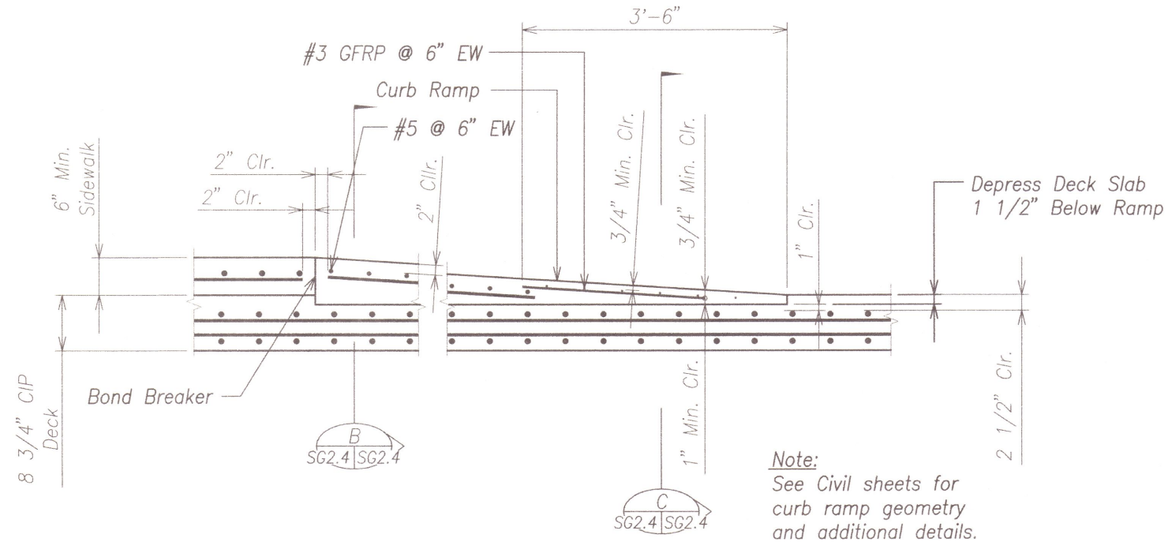
SEWERLINE SUPPORT DETAILS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG2.3 OF 5 SHEETS

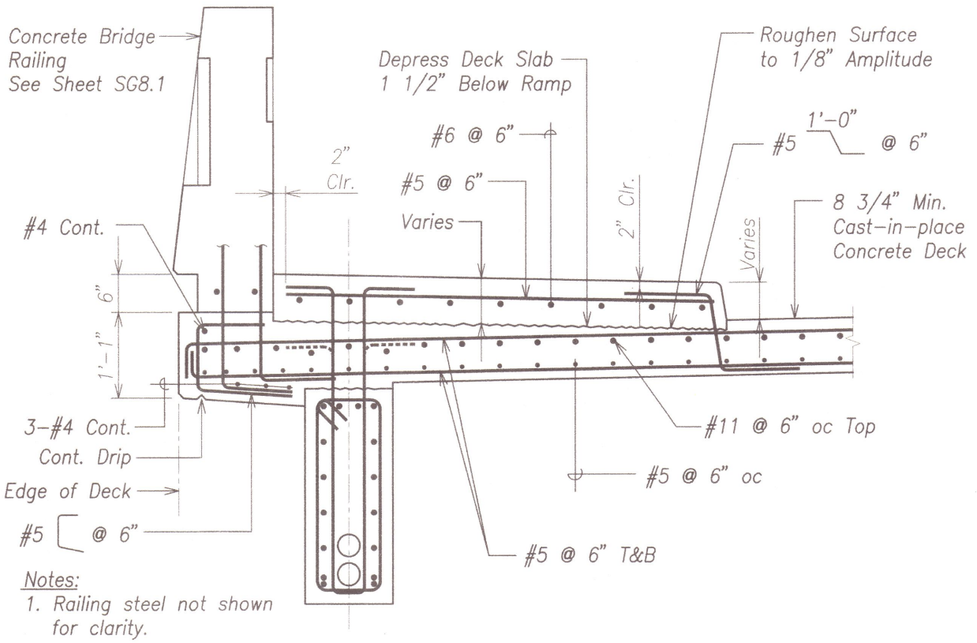
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	143	286



Note:
See Civil sheets for curb ramp geometry and additional details.

TYPICAL RAMP SECTION (A SG1.1 SG2.4)

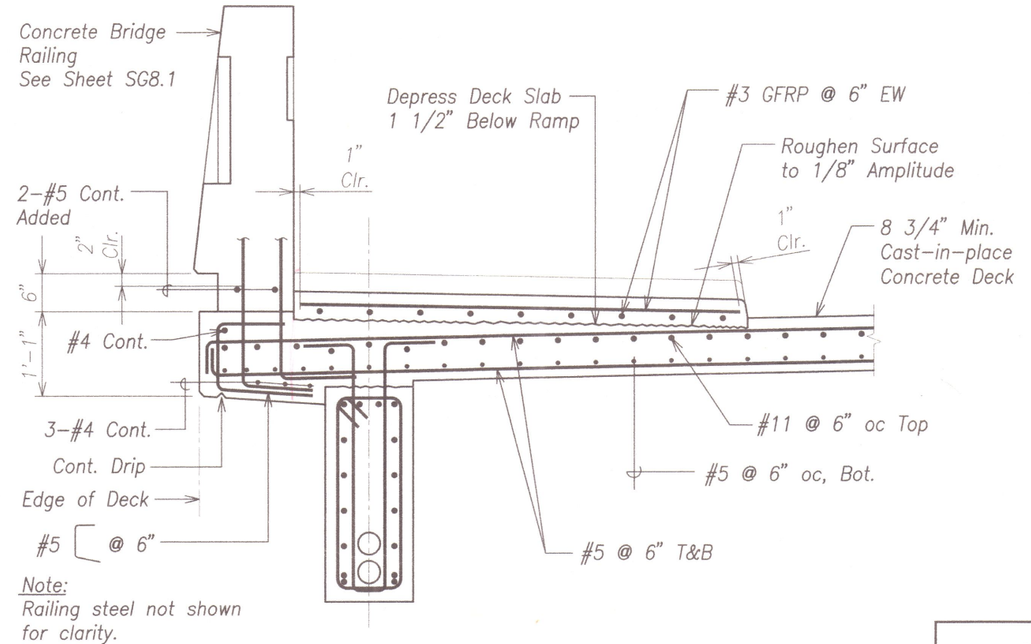
Scale: 1" = 1'-0"



Notes:
1. Railing steel not shown for clarity.
2. 4" Dia. ducts not shown for clarity.

SECTION AT CURB RAMP (B SG2.4 SG2.4)

Scale: 1" = 1'-0"



Note:
Railing steel not shown for clarity.

SECTION AT CURB RAMP (C SG2.4 SG2.4)

Scale: 1" = 1'-0"

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

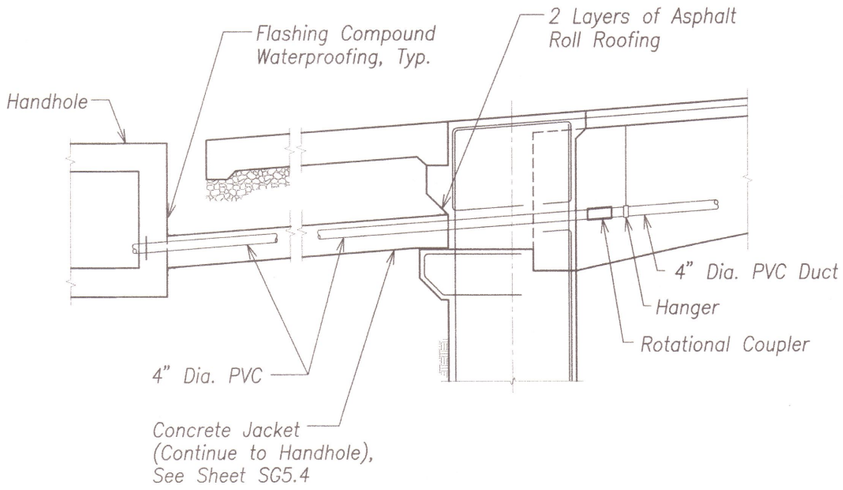
CURB RAMP SECTIONS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG2.4 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	144	286



Note:
See Electrical Plans for couplers.

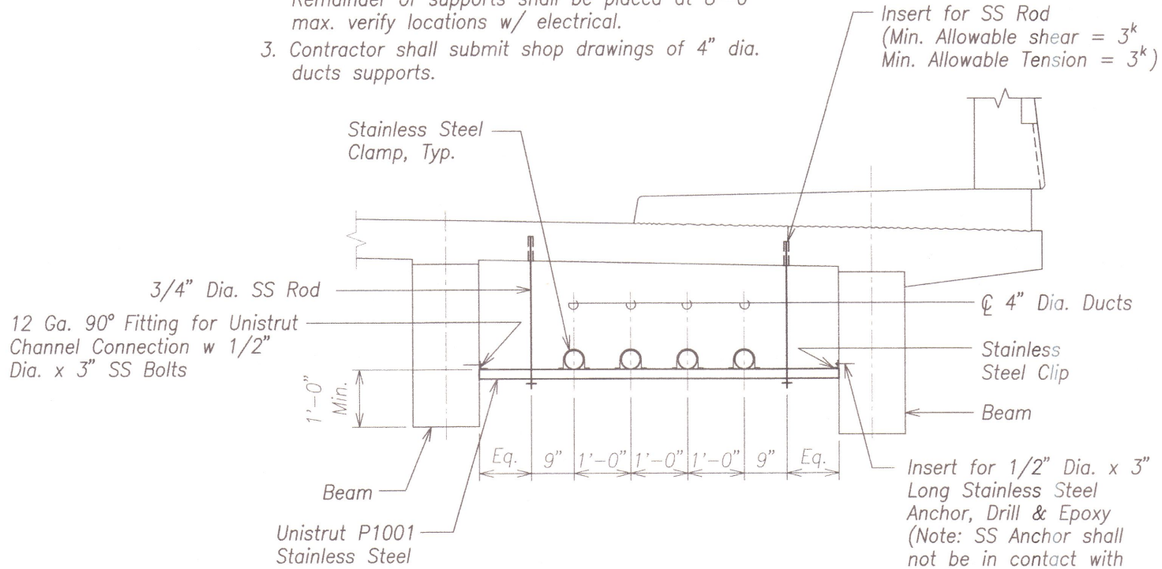
4" DIA. DUCTS THROUGH ABUTMENT (A)

Scale: 3/8" = 1'-0"

SG2.5 | SG2.5

Notes:

1. Stainless Steel shall not be in contact with dissimilar metals.
2. Place 4" dia. duct supports 1'-0" from faces of abutments and 1'-0" each side of diaphragm. Remainder of supports shall be placed at 8'-0" max. verify locations w/ electrical.
3. Contractor shall submit shop drawings of 4" dia. ducts supports.



SECTION (B)

Scale: 3/4" = 1'-0"

SG2.5 | SG2.5

ORIGINAL PLAN
NOTE BOOK
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DAVID K. FUJIWARA
LICENSED PROFESSIONAL ENGINEER
NO. 8104-S
HAWAII, U.S.A.

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KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

4 INCH DIA. DUCT SUPPORT DETAILS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

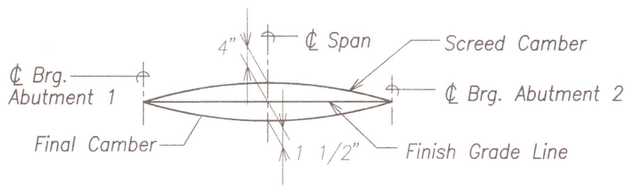
Scale: As Noted Date: April, 2009

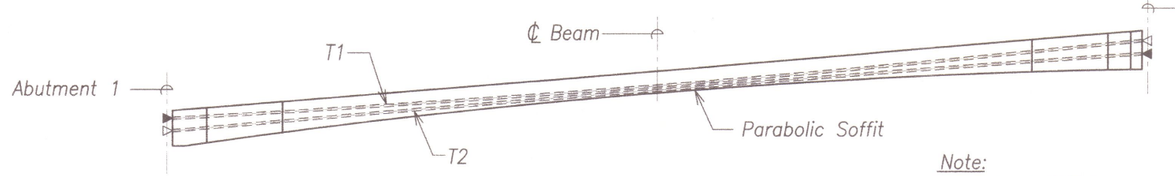
SHEET No. SG2.5 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	145	286

POST-TENSIONING SEQUENCE

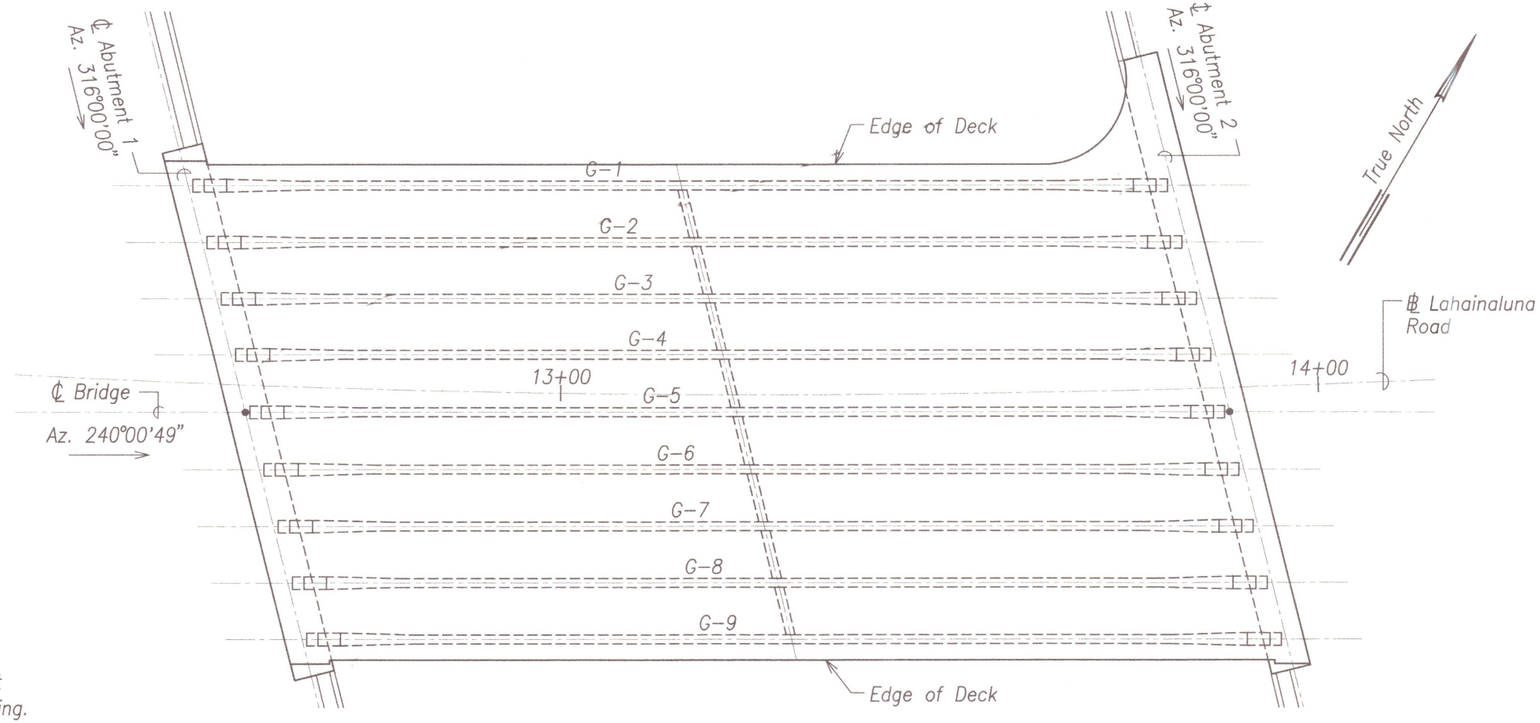
Girder No.	Tendon	Tendon Design Jacking Force (Kips)	
		Stage 1	Stage 2
G-5	T1	483	966
G-4	T1	483	966
G-6	T1	483	966
G-3	T1	483	966
G-7	T1	483	966
G-2	T1	483	966
G-8	T1	483	966
G-1	T1	483	966
G-9	T1	483	966
G-5	T2	483	966
G-4	T2	483	966
G-6	T2	483	966
G-3	T2	483	966
G-7	T2	483	966
G-2	T2	483	966
G-8	T2	483	966
G-1	T2	483	966
G-9	T2	483	966





ELEVATION (A) SG3.1 | SG3.1
Scale: 1" = 10'-0"

Note:
See sheet SG3.2 for tendon geometry.



PLAN (B) SG3.1 | SG3.1
Scale: 1" = 10'-0"

POST TENSIONING NOTES:

1. Post-tensioning ducts shall be 4 3/8" O.D. Spiro-Type Semi-Rigid galvanized.
2. After post-tensioning, all post-tensioning ducts tendons shall be pressure grouted w/ pre-packaged grout as specified in Specification Section 504.03 (H) (5) Grouting. Ducts shall have grouting vents at anchorages and at each high point along the tendon profile.
3. Duct shall be secured to prevent misalignment during concreting.
4. A minimum compressive strength of 8000 PSI shall be obtained in the beam and deck before the application of post tensioning.
5. Post tensioned strands shall be 7 wire 0.6 dia. low relaxation steel strands (Area = 0.217 $in.^2$) with an ultimate tensile strength of 270 ksi conforming to ASTM A416.
6. The post tensioning design assumptions are as follows:
   Curve Friction Coefficient 0.18
   Wobble Friction Coefficient 0.0002/ft.
   Anchor Set 3/8"
7. The design jacking force at end of each tendon = 966 k. The maximum stress in the strand before anchor set in is 75% of the guaranteed ultimate strength.
8. Post tensioning anchor shall be AVAR ACS 22 x 6 or equal.
9. Jacking symbols are as follows:
   ▷⤳ Jacking end
   ⤳◀ Dead end
10. Apply corrosion inhibitor amine carboxylate powder (Cortec MCI-309) in all post-tension ducts.
11. The minimum force in prestressing steel shall not be less than shown in table above. The force in the prestressing steel shall be considered as the smaller of the two values as determined by the measured elongation and the gage pressure. If the difference in stress as obtained by the measured elongation and the measured gage pressure exceeds 5 percent of the required prestressing force, the stressing process shall be terminated and shall not resume until the Contractor submits data indicating the cause of such difference and makes corrections, approved by the Engineer, to rectify such difference.
12. Prevent ducts, at all times, from getting plugged or damaged. Ducts shall be checked to show that ducts are clear and contain no obstructions prior to installing prestressing steel and stressing the member.
13. Extend 8 strands in each T2 tendon at each end 3'-0".

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

DAVID K. FUJIWARA
LICENSED PROFESSIONAL ENGINEER
NO. 8104-S
HAWAII, U.S.A.

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KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

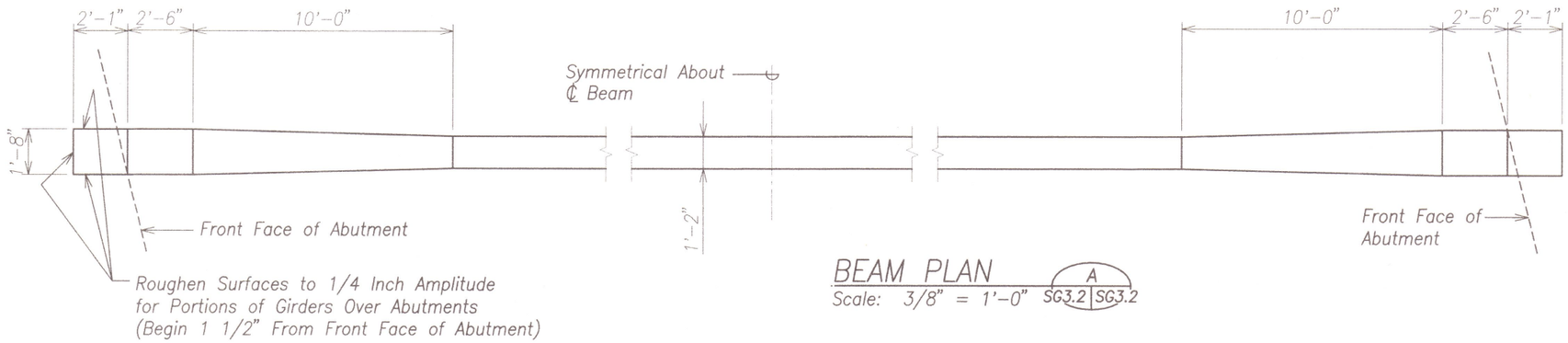
BEAM POST-TENSIONING

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

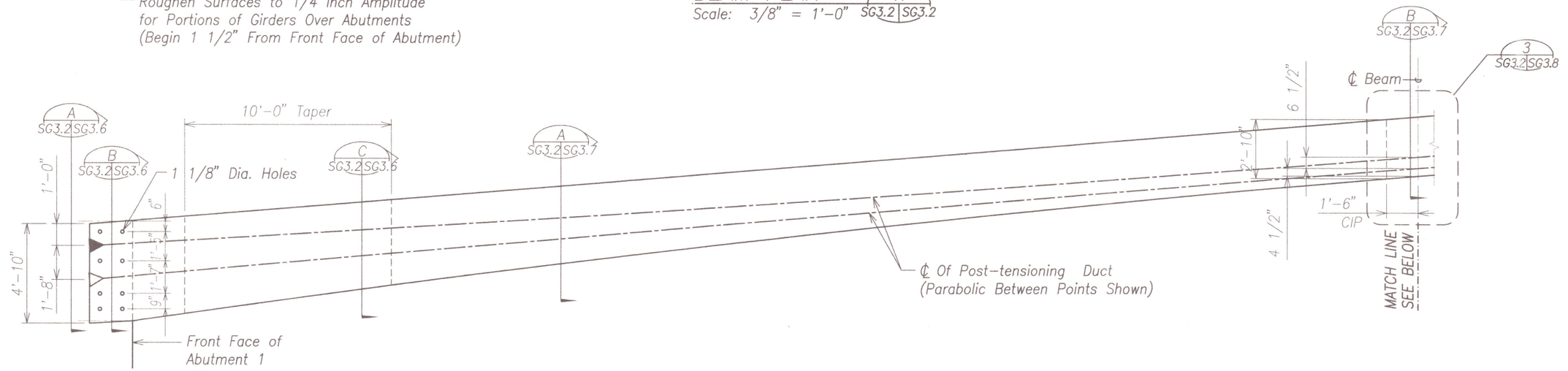
SHEET No. SG3.1 OF 8 SHEETS

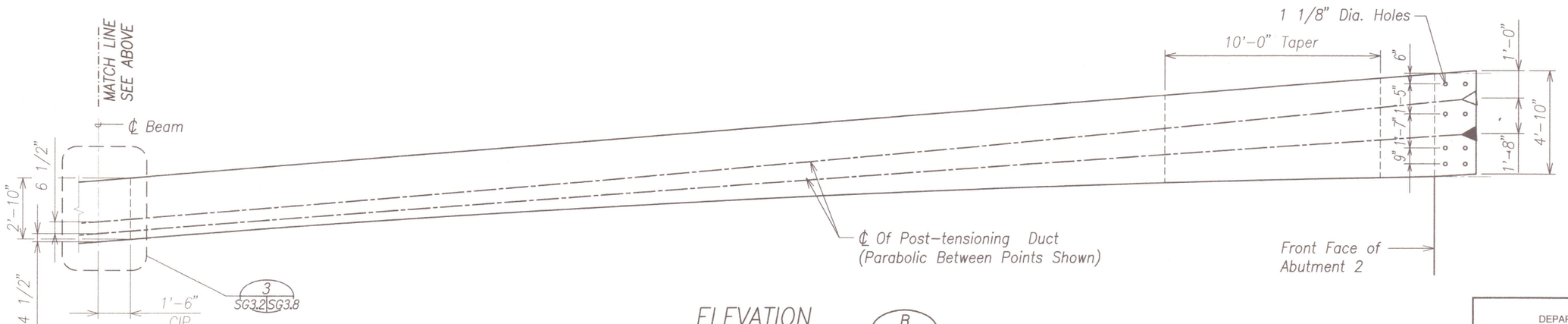
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	146	286



BEAM PLAN (A SG3.2 | SG3.2)
Scale: 3/8" = 1'-0"

Legend:
- Jacking end
- Dead end





ELEVATION (B SG3.2 | SG3.2)
Scale: 3/8" = 1'-0"

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

DAVID K. FUJIWARA
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KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

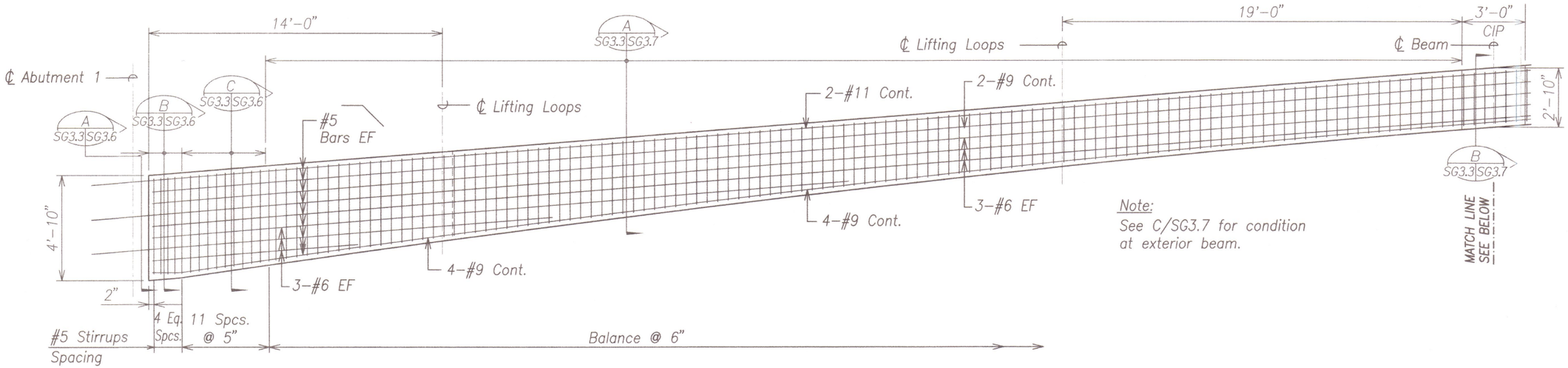
BEAM PLAN AND ELEVATION

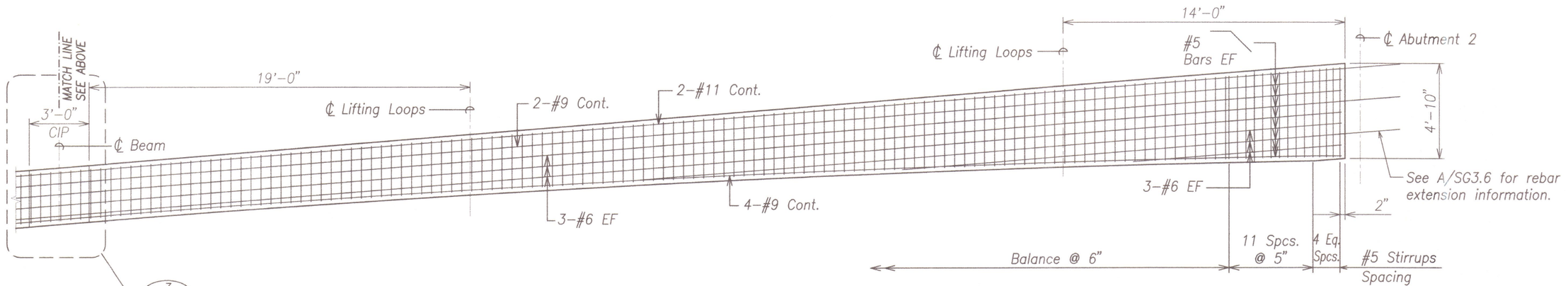
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG3.2 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	147	286





ELEVATION (A SG3.3 | SG3.3)
Scale: 3/8" = 1'-0"

DAVID K. FUJIWARA LICENSED PROFESSIONAL ENGINEER NO. 8104-S HAWAII, U.S.A.

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KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BEAM ELEVATION

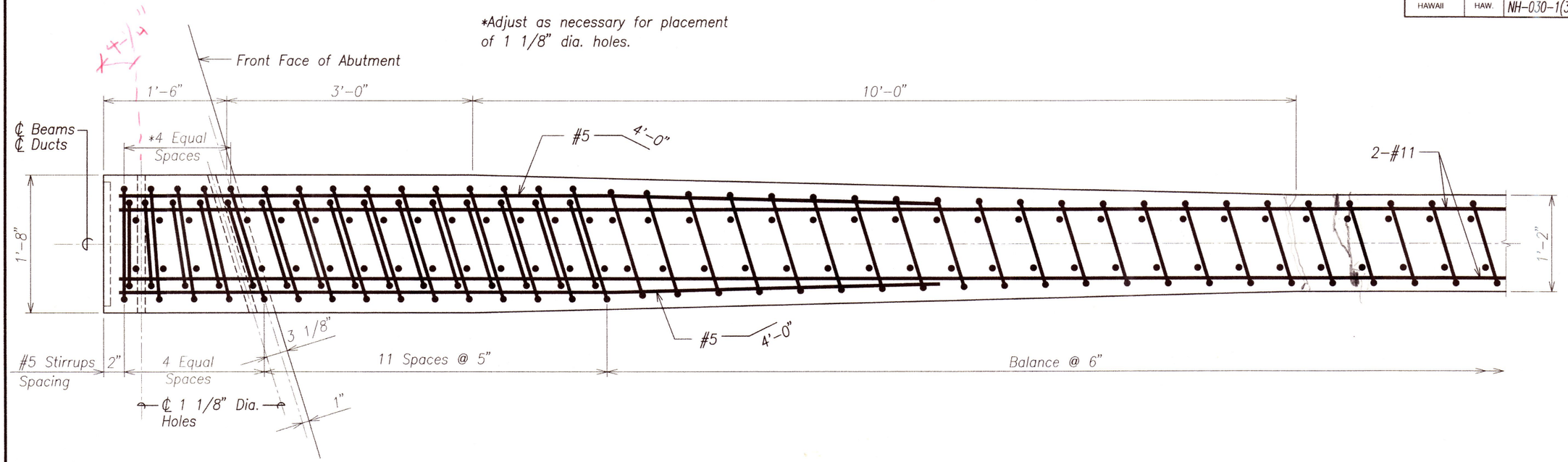
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

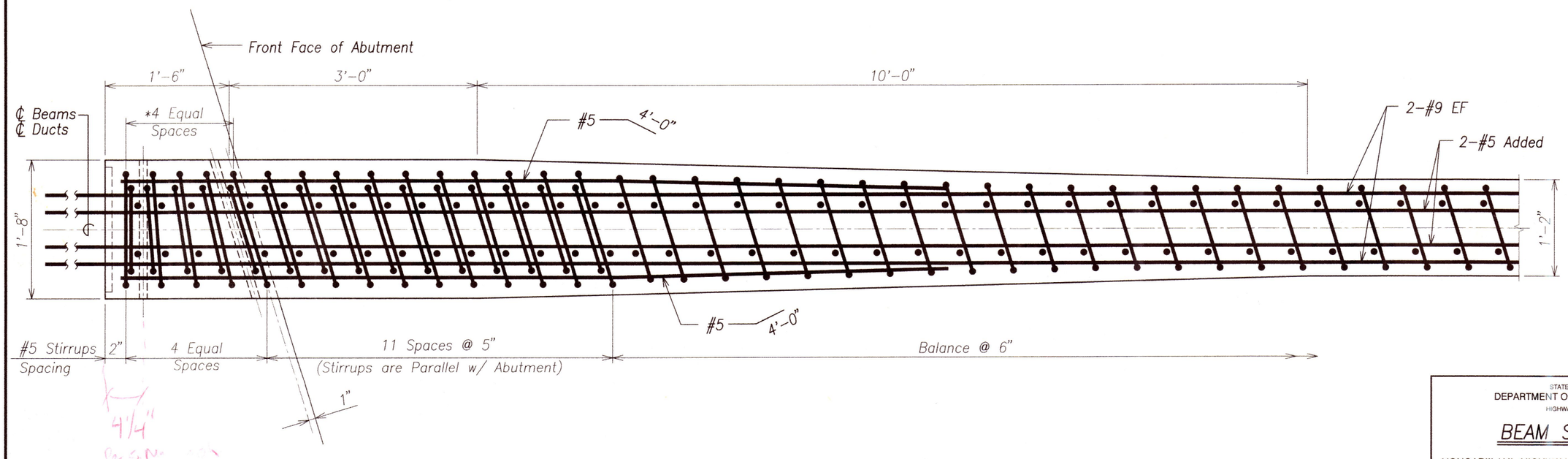
SHEET No. SG3.3 OF 8 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	148	286



SECTION AT TOP OF BEAM (A) SG3.4 | SG3.4
Scale: 1 1/2" = 1'-0"



SECTION AT BOTTOM OF BEAM (B) SG3.4 | SG3.4
Scale: 1 1/2" = 1'-0"

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

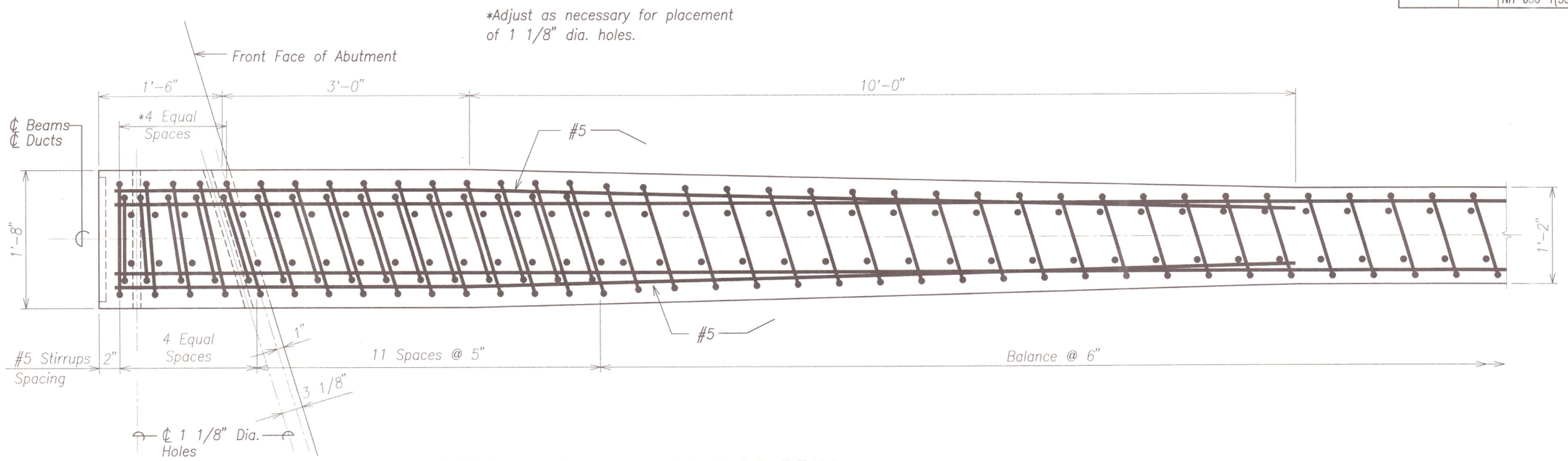
BEAM SECTIONS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG3.4 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	149	286



SECTION THROUGH MIDDLE OF BEAM

Scale: 1 1/2" = 1'-0"

A
SG3.5 | SG3.5

ORIGINAL PLAN

NOTE BOOK
No.

SURVEY PLOTTED BY DATE
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BEAM SECTION

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

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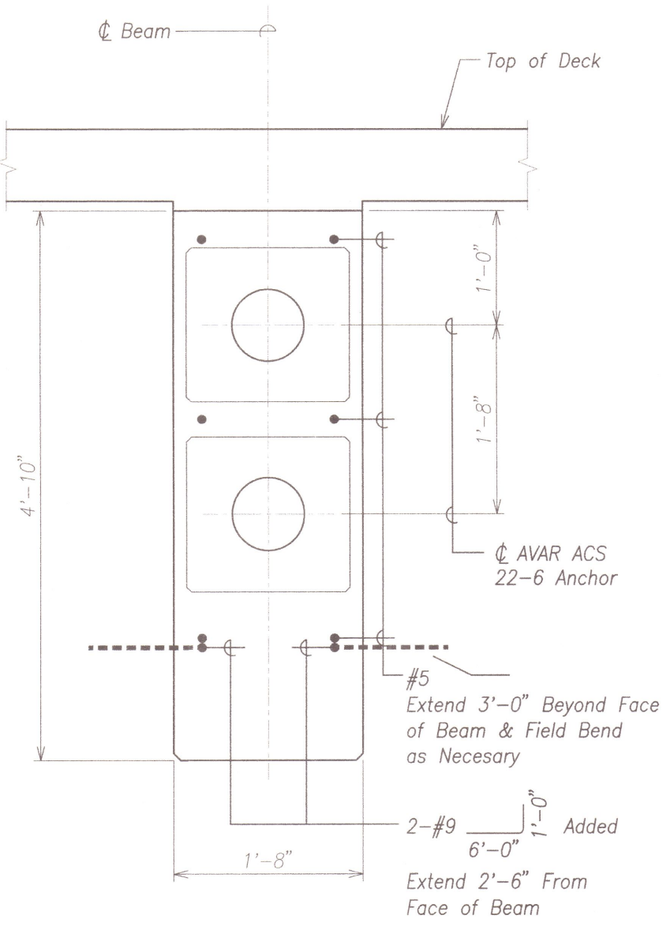
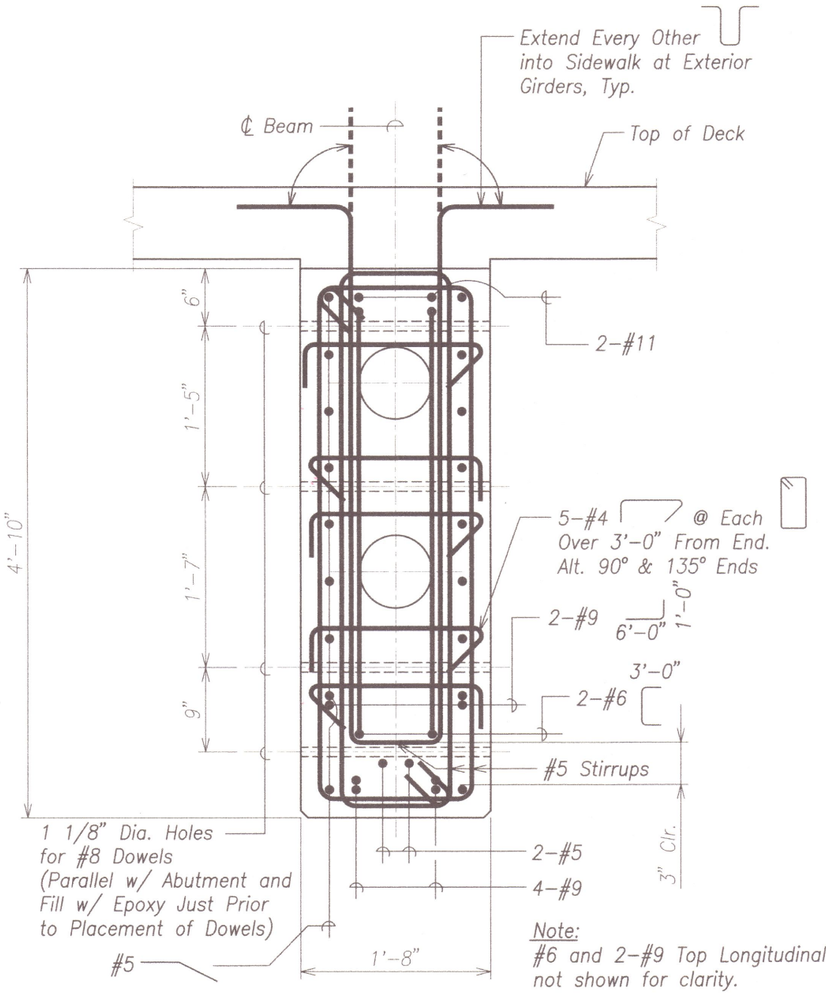
SHEET No. SG3.5 OF 8 SHEETS

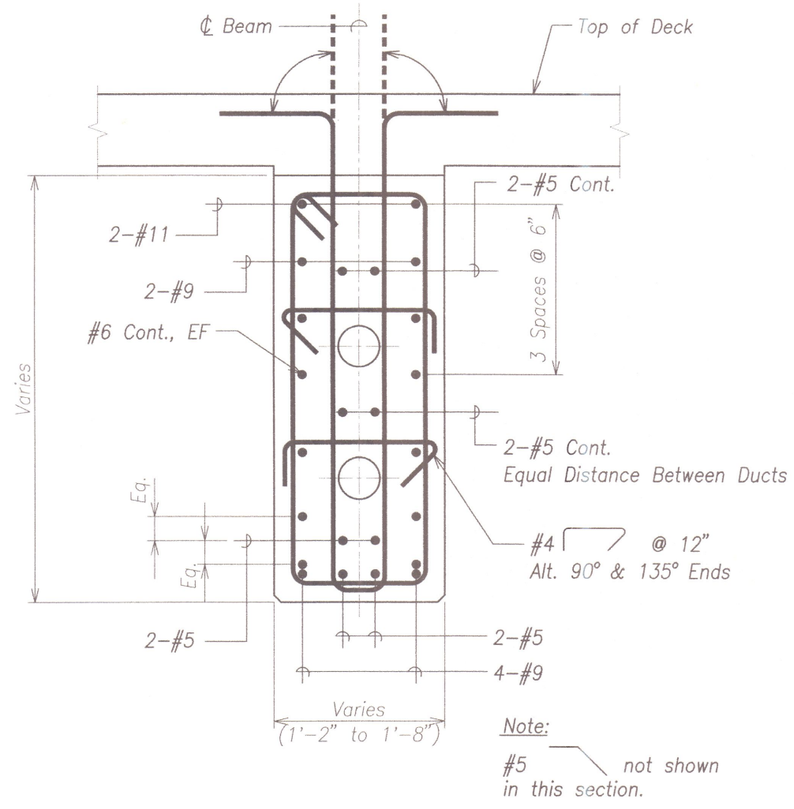
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	150	286



ELEVATION A
Scale: 1 1/2" = 1'-0" SG3.3 | SG3.6 SG3.2



SECTION B
Scale: 1 1/2" = 1'-0" SG3.3 | SG3.6 SG3.2



SECTION C
Scale: 1 1/2" = 1'-0" SG3.3 | SG3.6 SG3.2

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

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APRIL 30, 2010
LIC. EXP. DATE

STATE OF HAWAII
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HIGHWAYS DIVISION

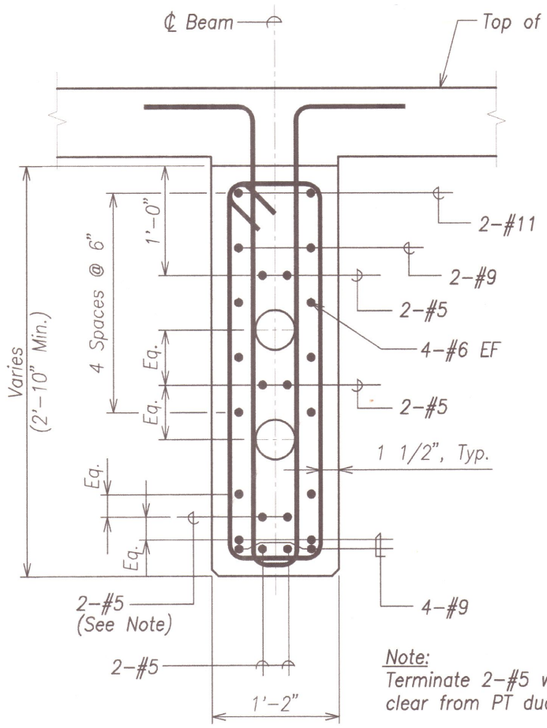
BEAM SECTIONS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

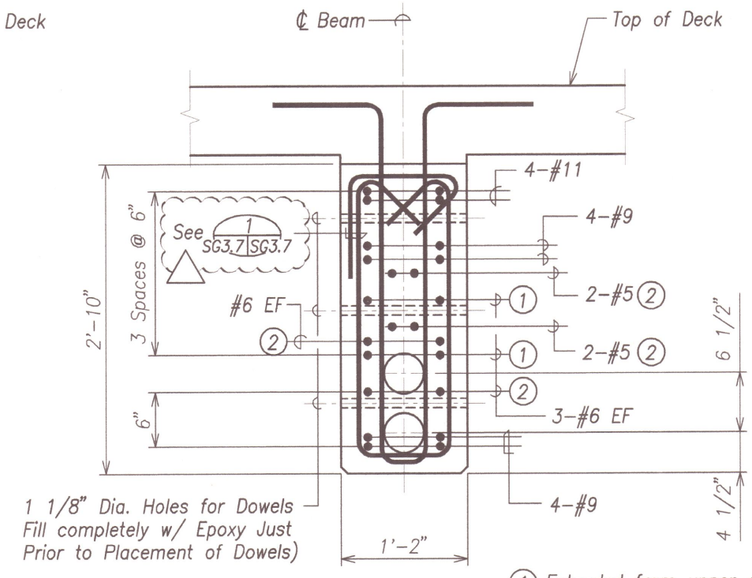
SHEET No. SG3.6 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	151	379



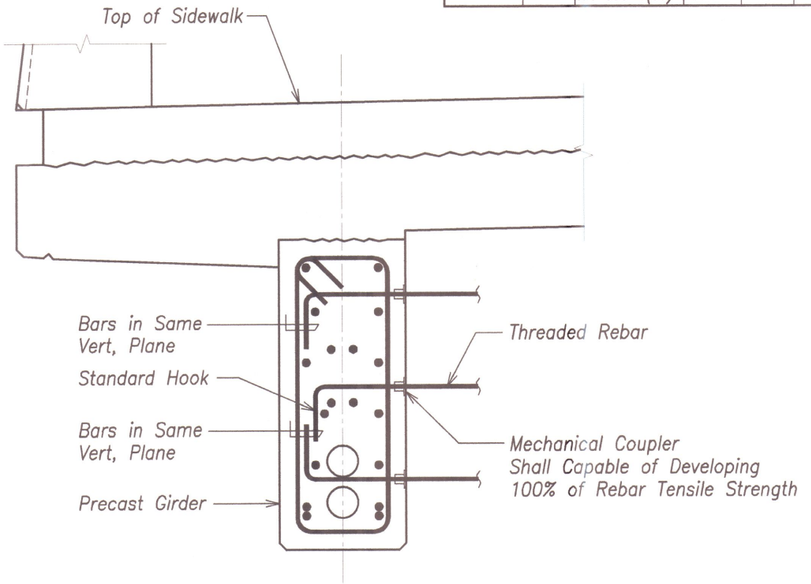
Note:
Terminate 2-#5 where clear from PT duct is < 2".

SECTION
Scale: 1 1/2" = 1'-0"
A — SG3.2 | SG3.7 — SG3.3



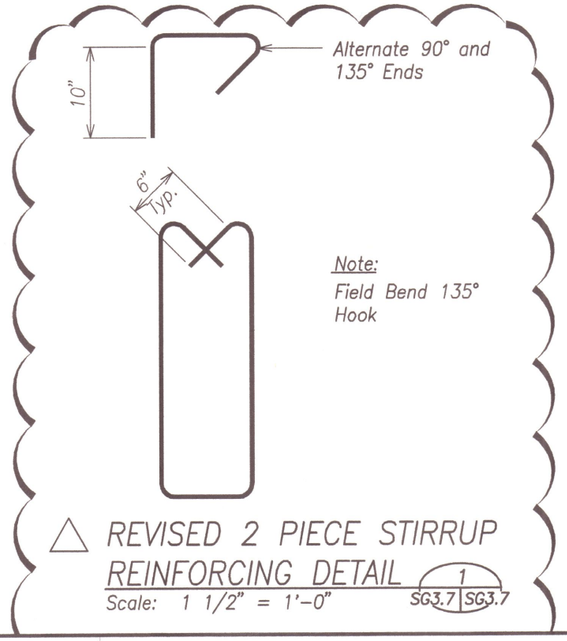
(1) Extended from upper girder
(2) Extended from lower girder

SECTION AT MID-SPAN
Scale: 1 1/2" = 1'-0"
B — SG3.2 | SG3.7 — SG3.3



Note:
#5 ⌐ Not shown for clarity.

SECTION AT EXTERIOR BEAM
Scale: 1 1/2" = 1'-0"
C — SG3.7 | SG3.7



Note:
Field Bend 135° Hook

△ REVISED 2 PIECE STIRRUP REINFORCING DETAIL
Scale: 1 1/2" = 1'-0"
1 — SG3.7 | SG3.7

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

DRAWING NAME: Z:\200A\40019.0-HONOAPIILANI LAHAINA BYPASS-KAHOMA WCA\11-XX-09 COMBINE KAHOMA HH-SG307 FIELD CHANGE12-04-09.DWG PLOT TIME: 12-04-09, 12:48 PM)

DATE	REVISION
△ 12-04-09	Revised Reinf. Detail

DAVID K. FUJIMARA — LICENSED PROFESSIONAL ENGINEER — NO. 8104-S — HAWAII, U.S.A.

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KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
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HIGHWAYS DIVISION

BEAM SECTIONS

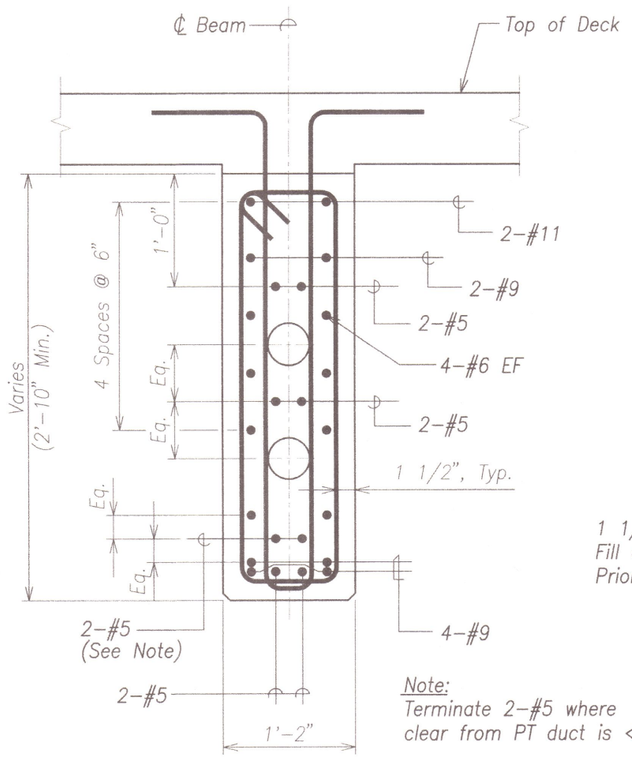
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd, Part B
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted

SHEET No. SG3.7 OF 8 SHEETS

100% DESIGN 151

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	151	286

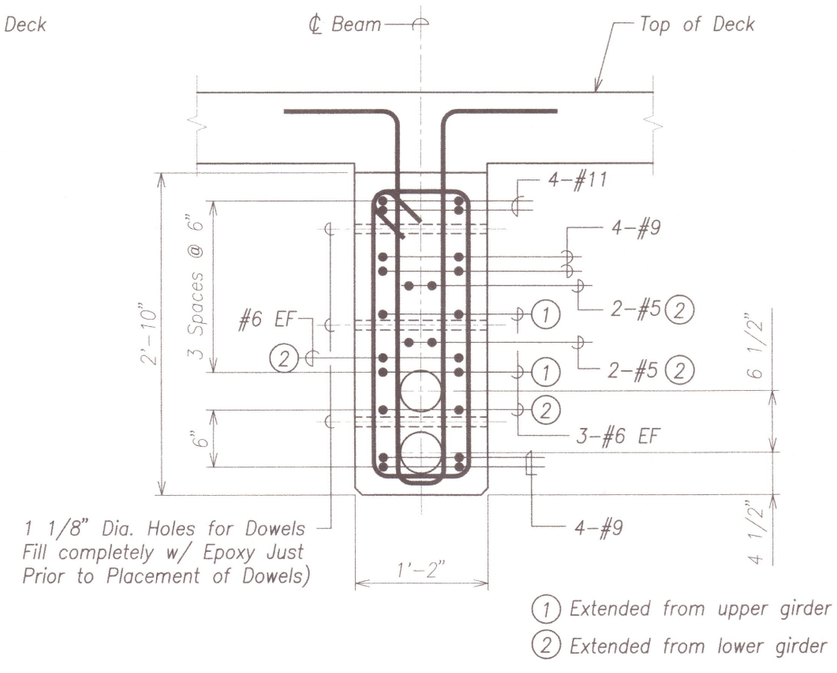


Note:
Terminate 2-#5 where clear from PT duct is < 2".

SECTION

Scale: 1 1/2" = 1'-0"

A — SG3.2 | SG3.7 — SG3.3



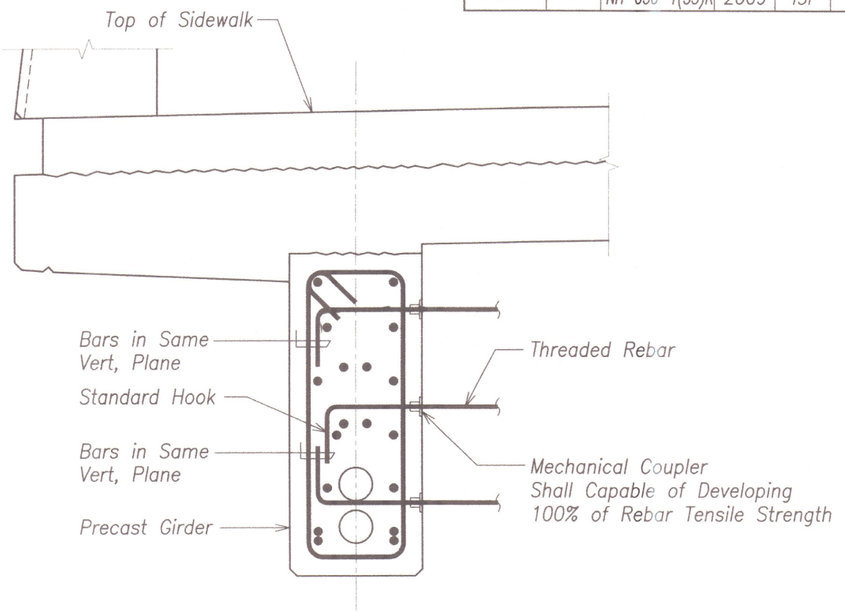
(1) Extended from upper girder

(2) Extended from lower girder

SECTION AT MID-SPAN

Scale: 1 1/2" = 1'-0"

B — SG3.2 | SG3.7 — SG3.3



Note:
#5 ⌐ Not shown for clarity.

SECTION AT EXTERIOR BEAM

Scale: 1 1/2" = 1'-0"

C — SG3.7 | SG3.7

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

DAVID K. FUJIWARA
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BEAM SECTIONS

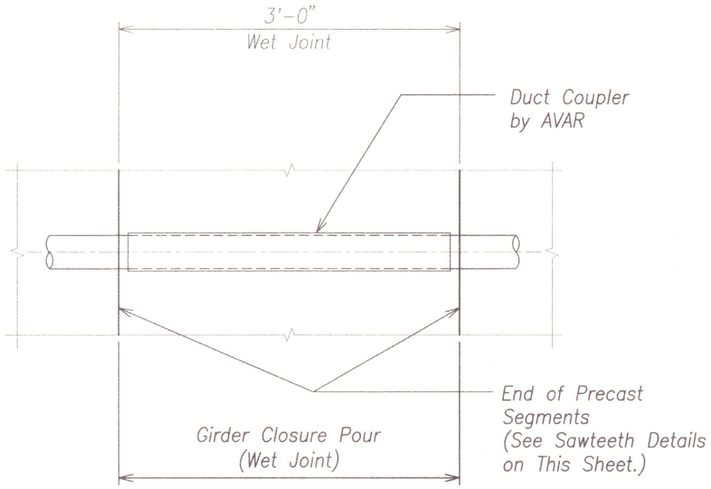
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG3.7 OF 8 SHEETS

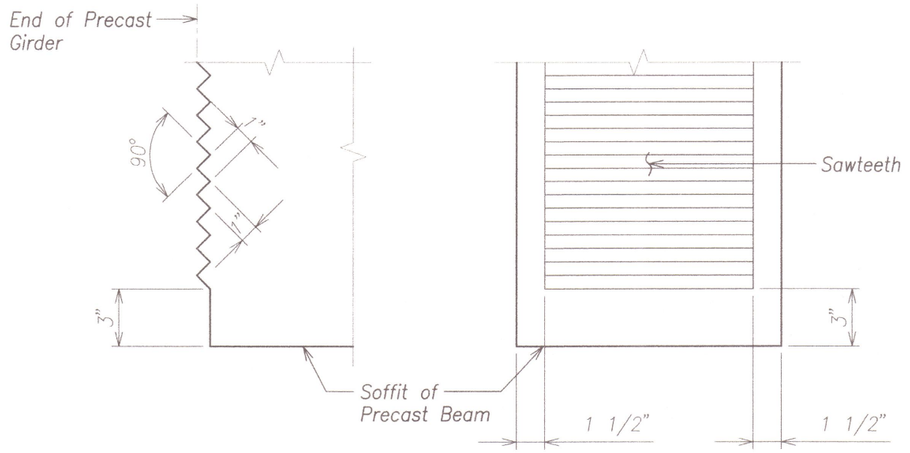
Rev. ~~151~~

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	152	286



DUCT SPLICE DETAIL (1 SG3.8|SG3.8)

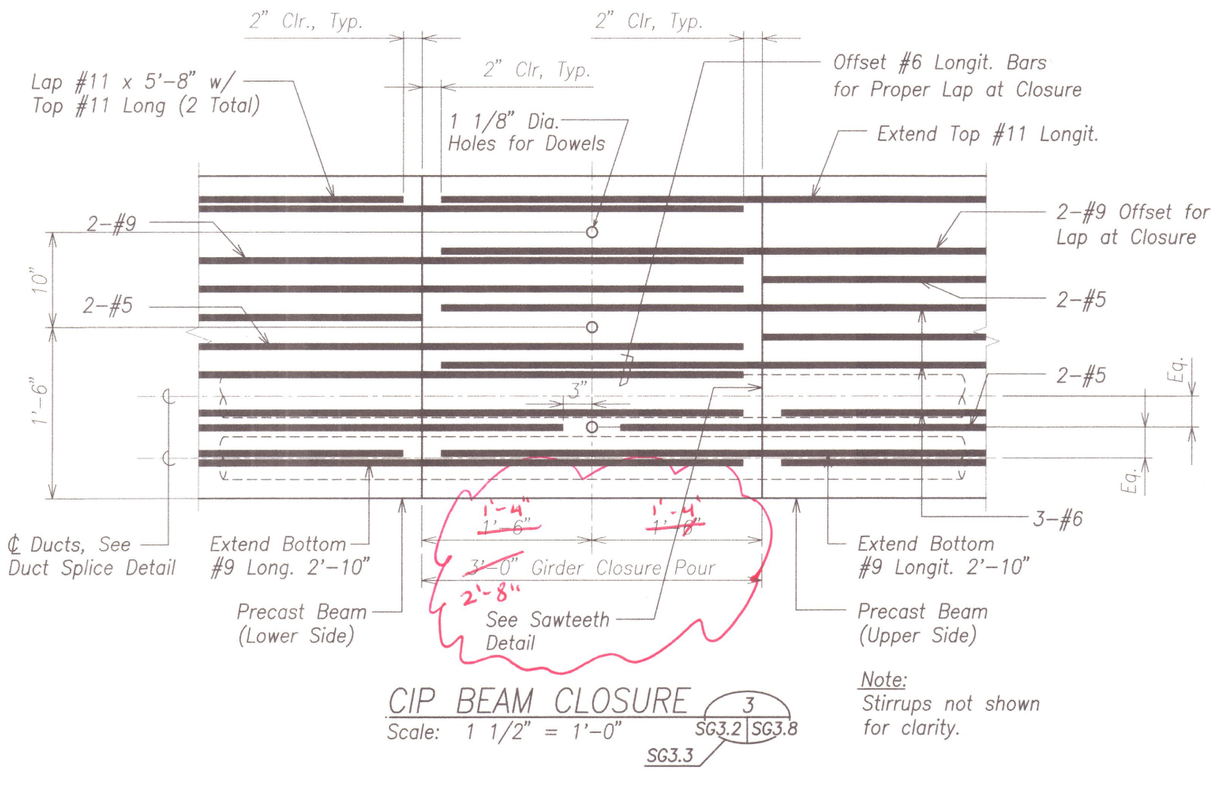
Scale: 1 1/2" = 1'-0"



SECTION ELEVATION

SAWTEETH DETAIL (2 SG3.8|SG3.8)

Use sawteeth key in areas outside of PT ducts.



CIP BEAM CLOSURE (3 SG3.2|SG3.8 SG3.3)

Scale: 1 1/2" = 1'-0"

Note:
Stirrups not shown for clarity.

ORIGINAL PLAN

NOTE BOOK No.

SURVEY PLOTTED BY DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

DAVID K. FUJIWARA
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HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

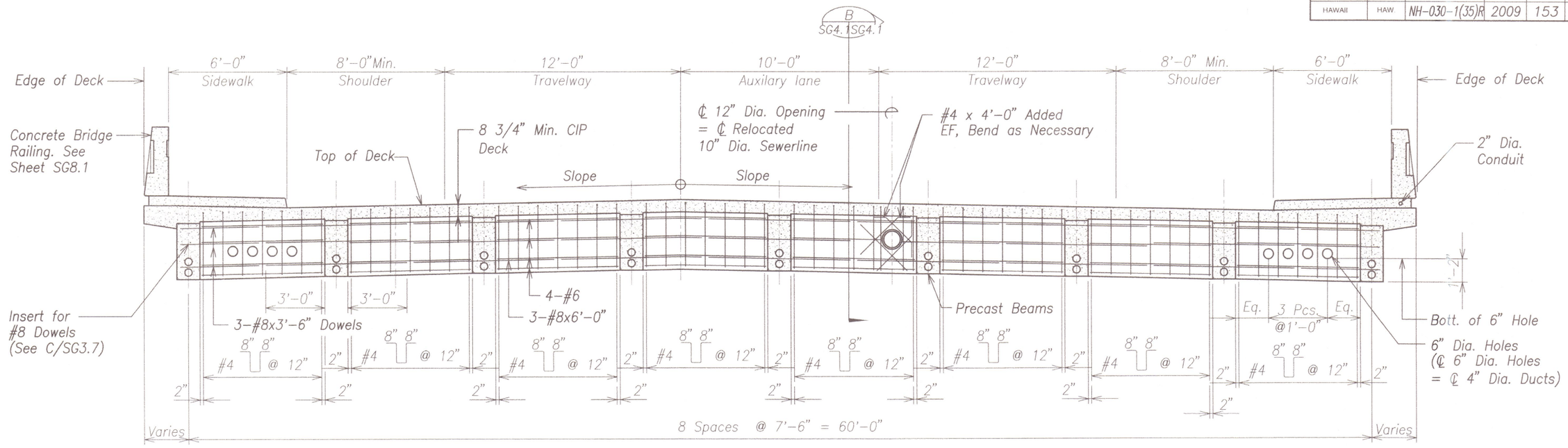
BEAM CLOSURE DETAILS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG3.8 OF 8 SHEETS

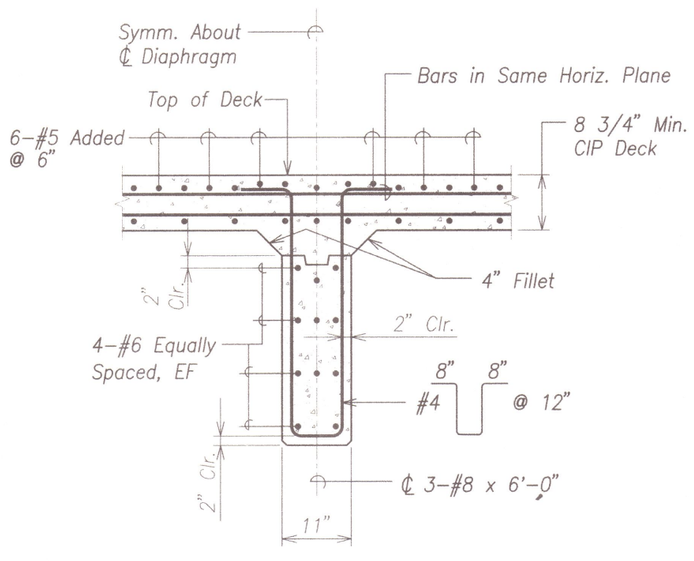
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	153	286



TYPICAL MIDSPAN DIAPHRAGM ELEVATION

Scale: 3/8" = 1'-0"

A
SG1.3 | SG4.1



SECTION

Scale: 1" = 1'-0"

B
SG4.1 | SG4.1

Notes:

1. Section is taken perpendicular to Precast beams.
2. For Precast beams, see sheets SG3.1 through SG3.8.
3. Pipe supports (S10) shall be spaced @ 8'-0" oc max. and as noted on SG2.1. Verify location with pipe manufacturer.
4. See Hawaii State Standard Plans Sheet B-01 for drip details.

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

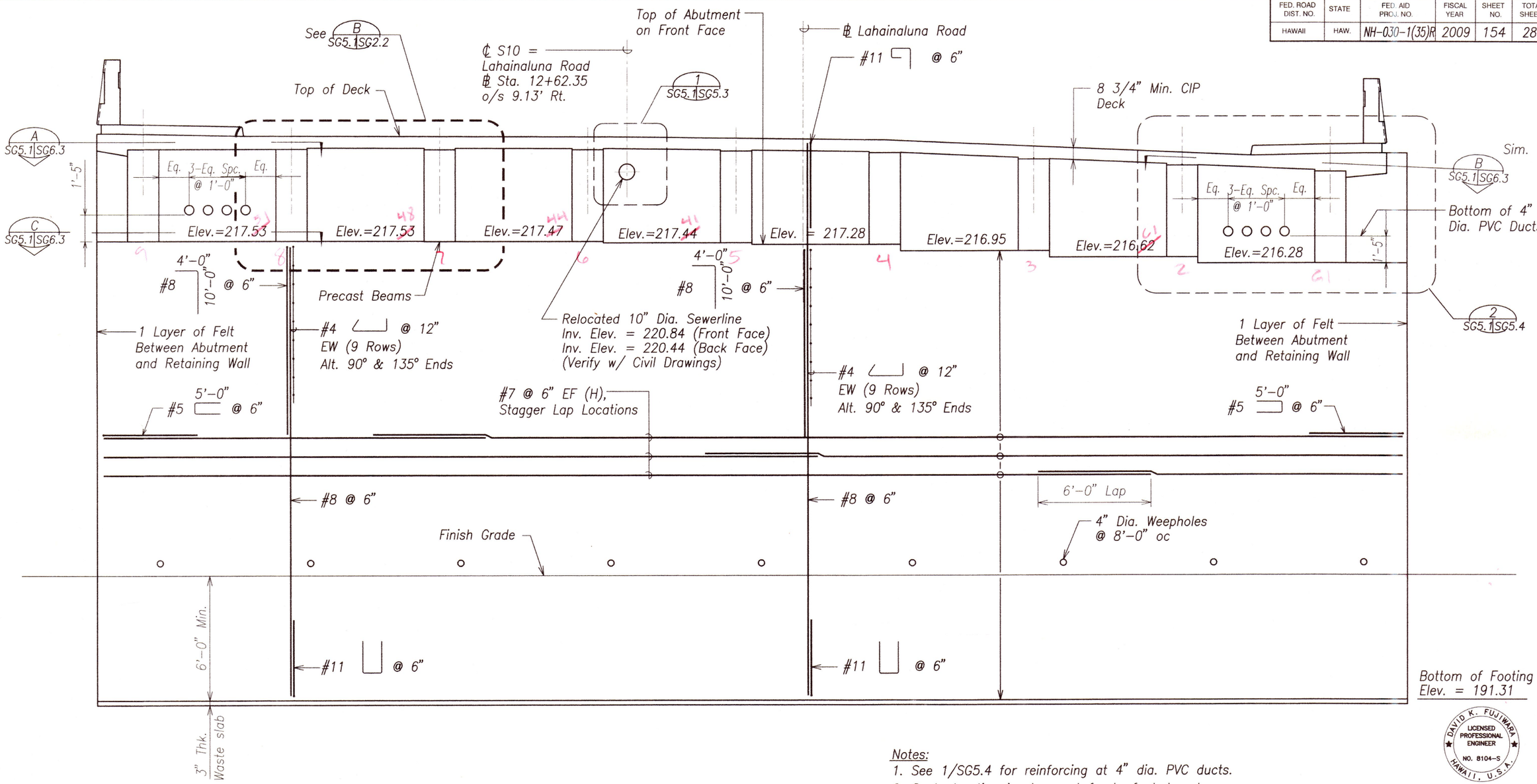
TYPICAL MIDSPAN DIAPHRAGM

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG4.1 OF 1 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	154	286



ABUTMENT 1 ELEVATION

Scale: 3/8" = 1'-0"

A SG1.2 | SG5.1

Notes:

1. See 1/SG5.4 for reinforcing at 4" dia. PVC ducts.
2. Seat elevation is shown at front of abutment.
3. Roughen waste slab parallel w/ Honoapiilani ℄ to 1/4" amplitude.
4. See B/S5.3 for weepholes additional reinforcing.

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HIGHWAYS DIVISION

ABUTMENT 1 ELEVATION

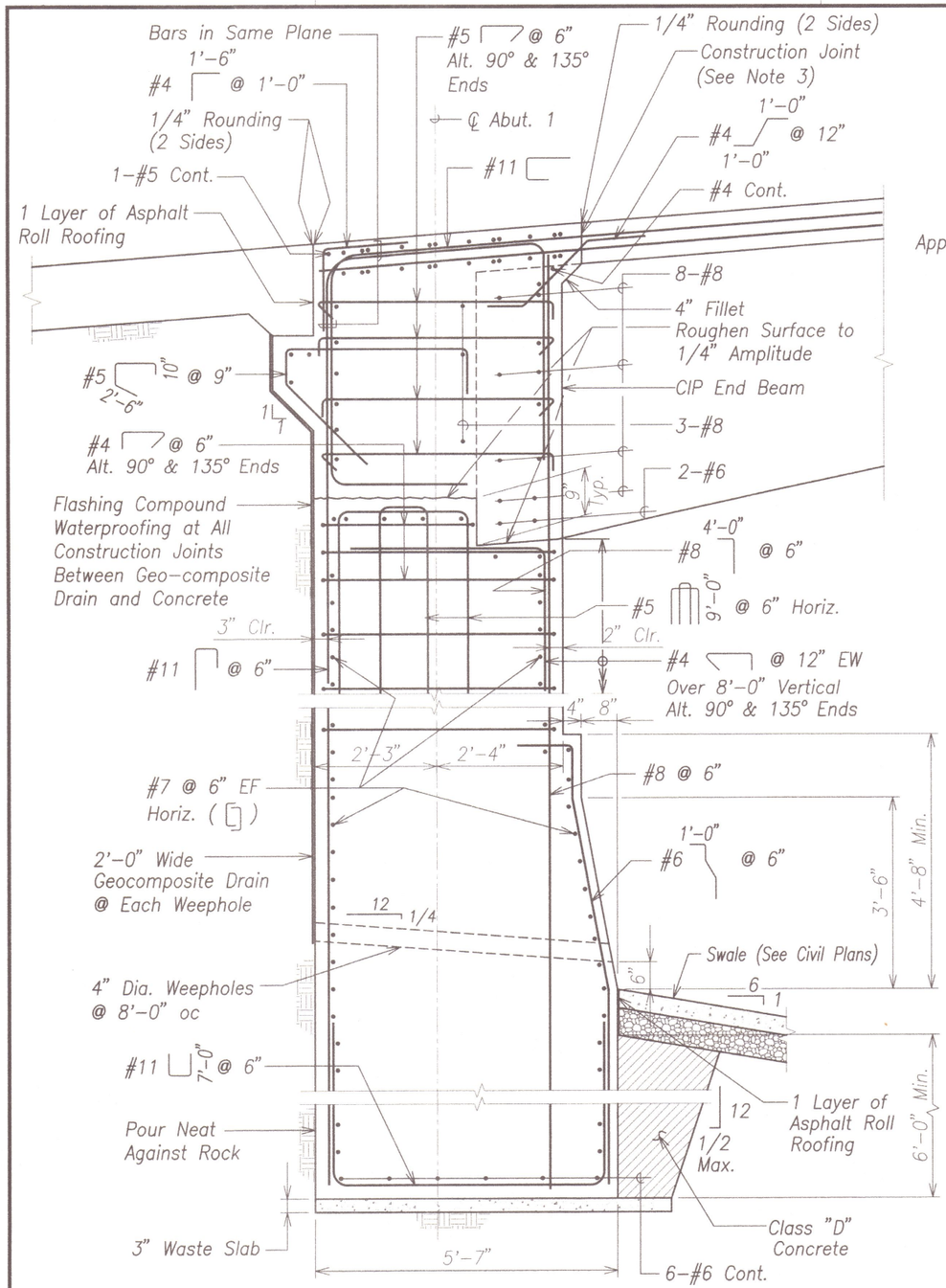
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

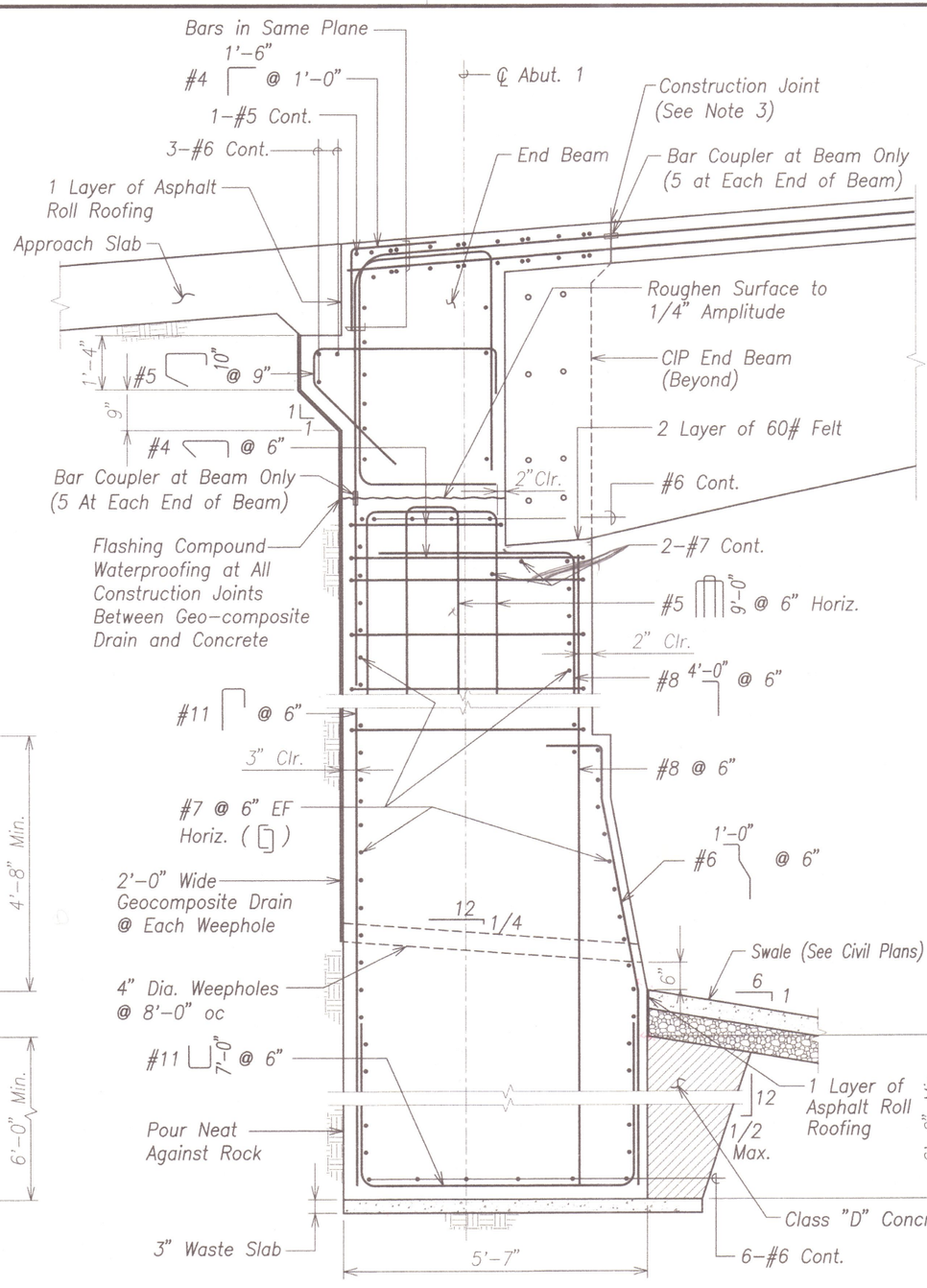
SHEET No. SG5.1 OF 4 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	155	286



ABUTMENT SECTION BETWEEN CIP BEAMS (A: SG1.2 | SG5.2; SG1.3)
Scale: 3/4" = 1'-0"



ABUTMENT SECTION – AT CIP BEAM (B: SG1.3 | SG5.2)
Scale: 3/4" = 1'-0"

Notes:

1. For additional corbel details, See sheet SG7.2.
2. For approach slab, See sheets SG7.1 and SG7.2.
3. Roughen deck surface construction joint by abrasive blast method. Moisten to saturated surface. Dry prior to applying DURAL PREP AC bonding agent and anticorrosion coating prior to concrete pour. Typical at all deck construction joints.
4. Beam seat is parallel with deck in longitudinal direction.
5. If soil or clinker material is encountered at the bottom of the footing, remove the soil and clinker material until rock is encountered and backfill with Class "D" concrete.

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

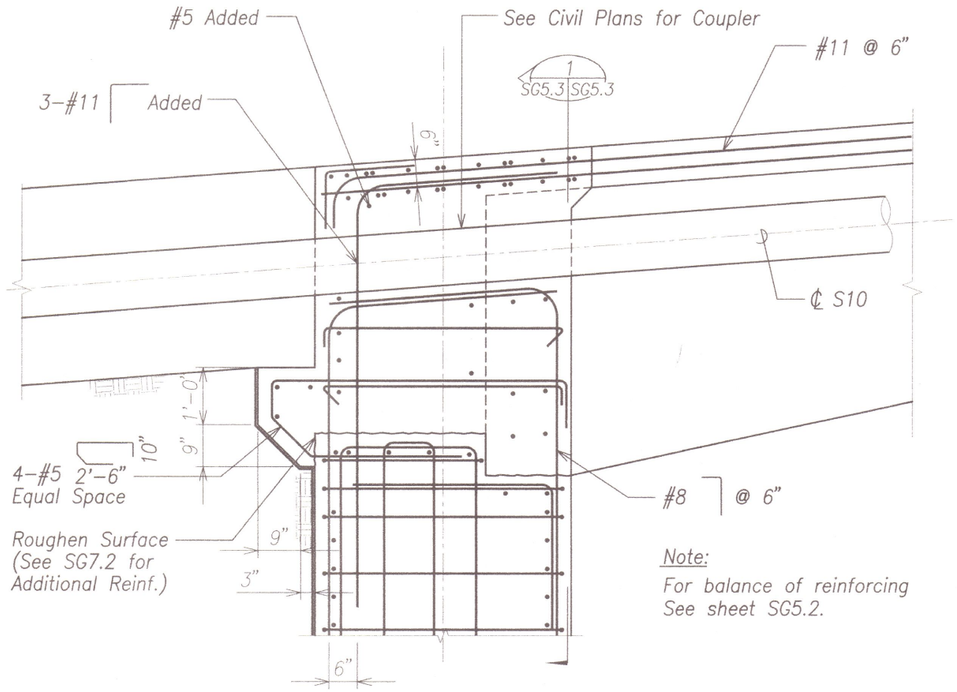
ABUTMENT 1 SECTIONS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

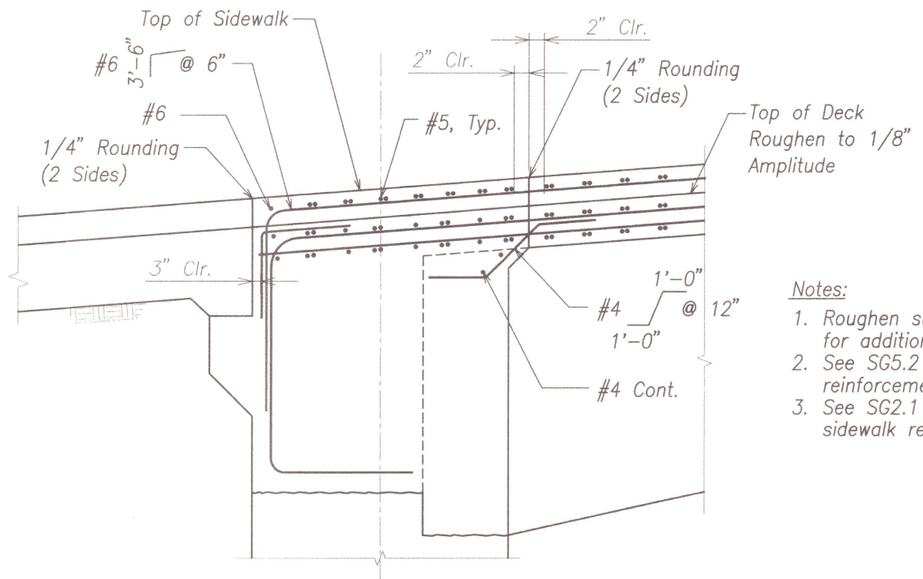
SHEET No. SG5.2 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	156	286



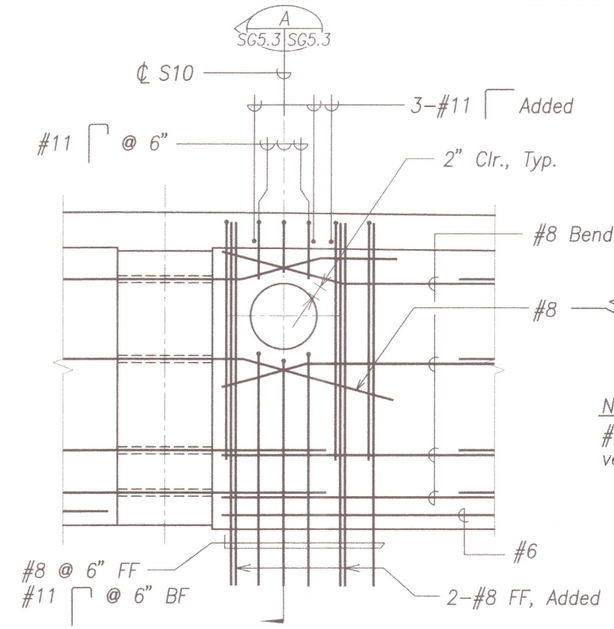
Note:
For balance of reinforcing See sheet SG5.2.

SECTION
Scale: 3/4" = 1'-0"
A
SG5.3 | SG5.3



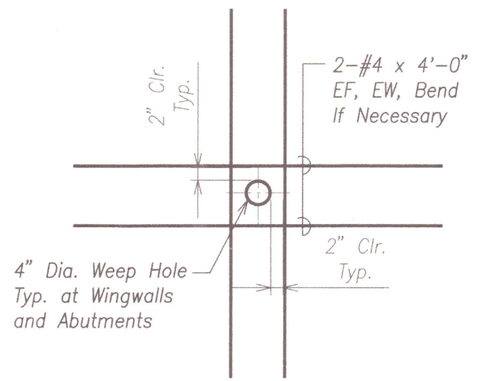
Notes:
1. Roughen surface (see SG7.2 for additional reinforcement).
2. See SG5.2 for balance of reinforcement.
3. See SG2.1 and SG2.2 for sidewalk reinforcement.

SECTION THROUGH ABUTMENT @ SIDEWALK
Scale: 3/4" = 1'-0"
B
SG5.3 | SG5.3



Note:
#5 ⌐ and balance of vertical bars not shown for clarity.

DETAIL
Scale: 3/4" = 1'-0"
1
SG5.1 | SG5.3
SG6.1



ADDED REINFORCING AT WEEPERS AND DRAINS
Scale: 1" = 1'-0"
2
SG5.3 | SG5.3

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT 1 SECTION AND DETAIL

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG5.3 OF 4 SHEETS

ORIGINAL PLAN
NOTE BOOK No.
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DESIGNED BY
QUANTITIES BY
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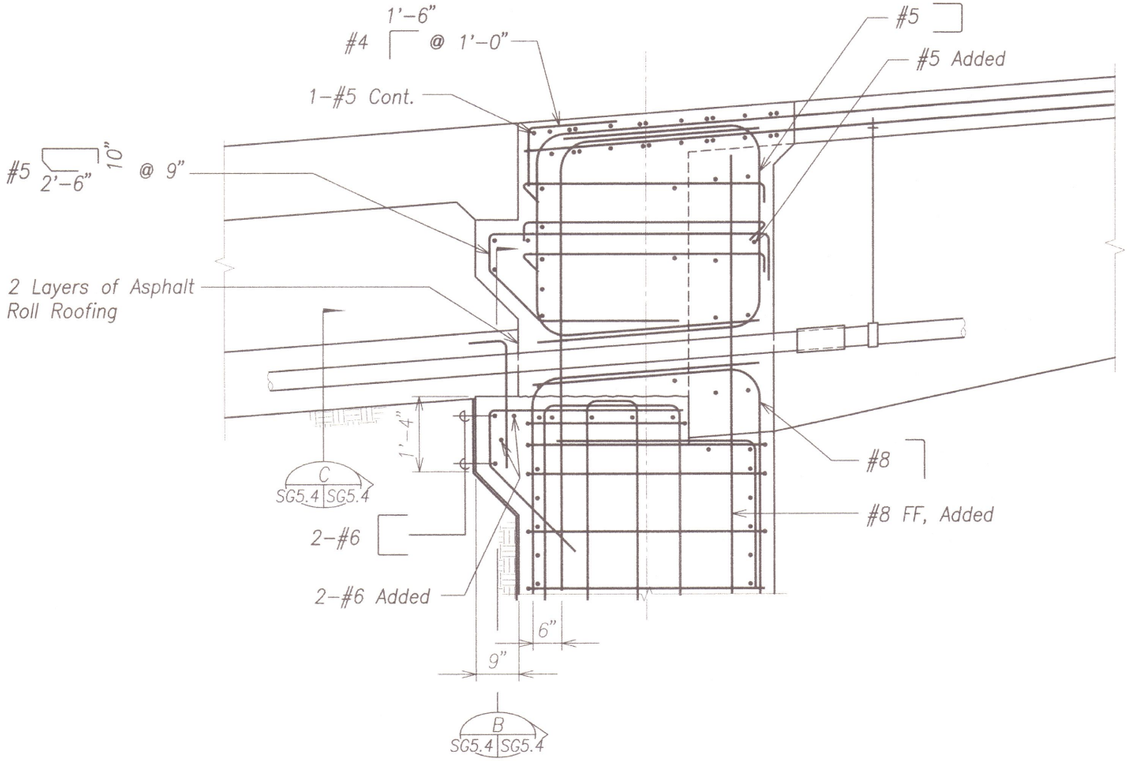
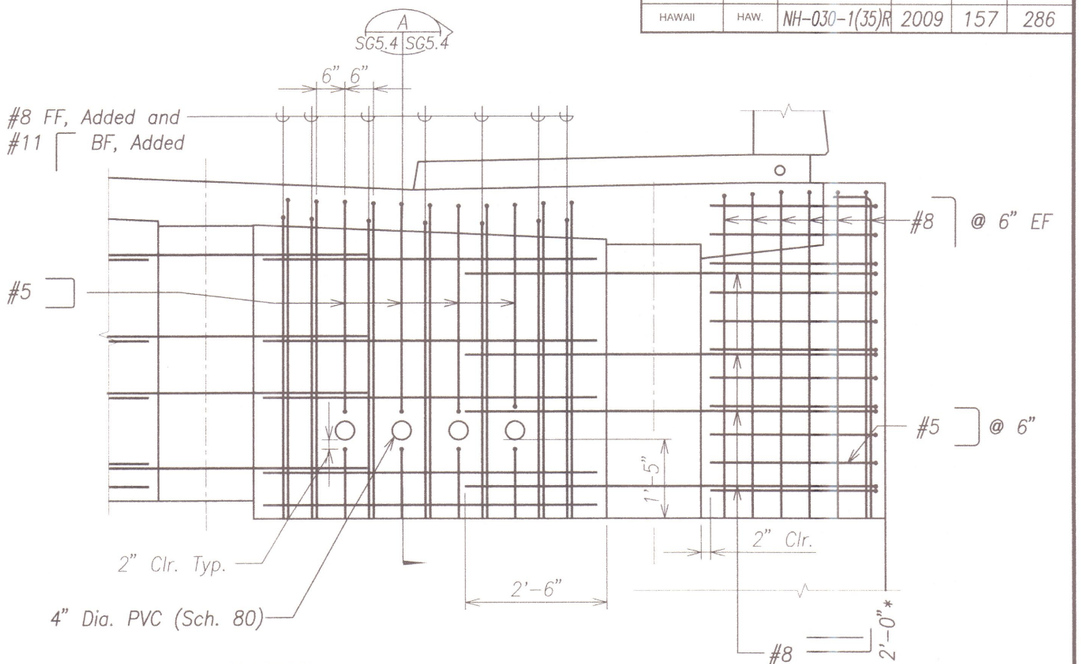
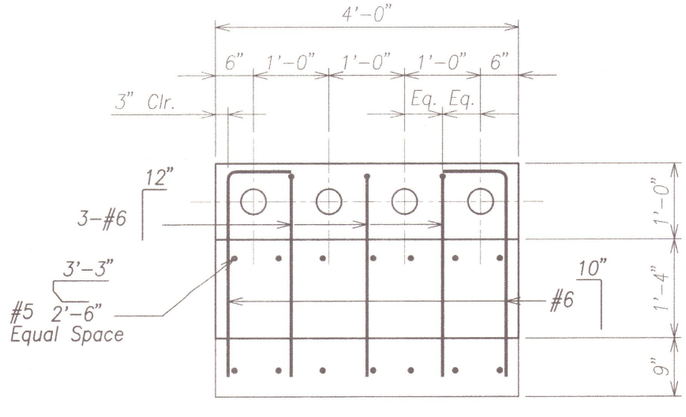
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	157	286



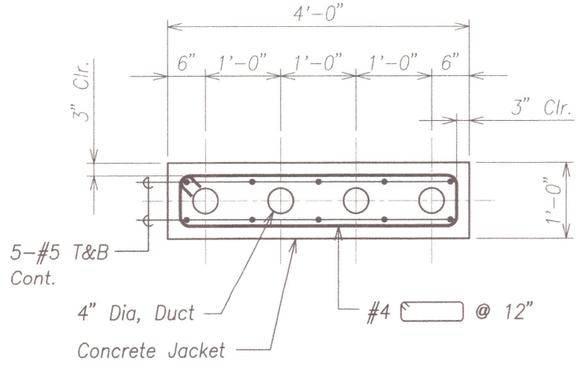
SECTION
Scale: 3/4" = 1'-0"
A SG5.4 SG5.4



DETAIL
Scale: 3/4" = 1'-0"
2 SG5.1 SG5.4



SECTION
Scale: 1" = 1'-0"
B SG5.4 SG5.4



SECTION
Scale: 1" = 1'-0"
C SG5.4 SG5.4

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STATE OF HAWAII
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HIGHWAYS DIVISION

ABUTMENT 1 SECTION AND DETAIL

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG5.4 OF SHEETS

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY DATE
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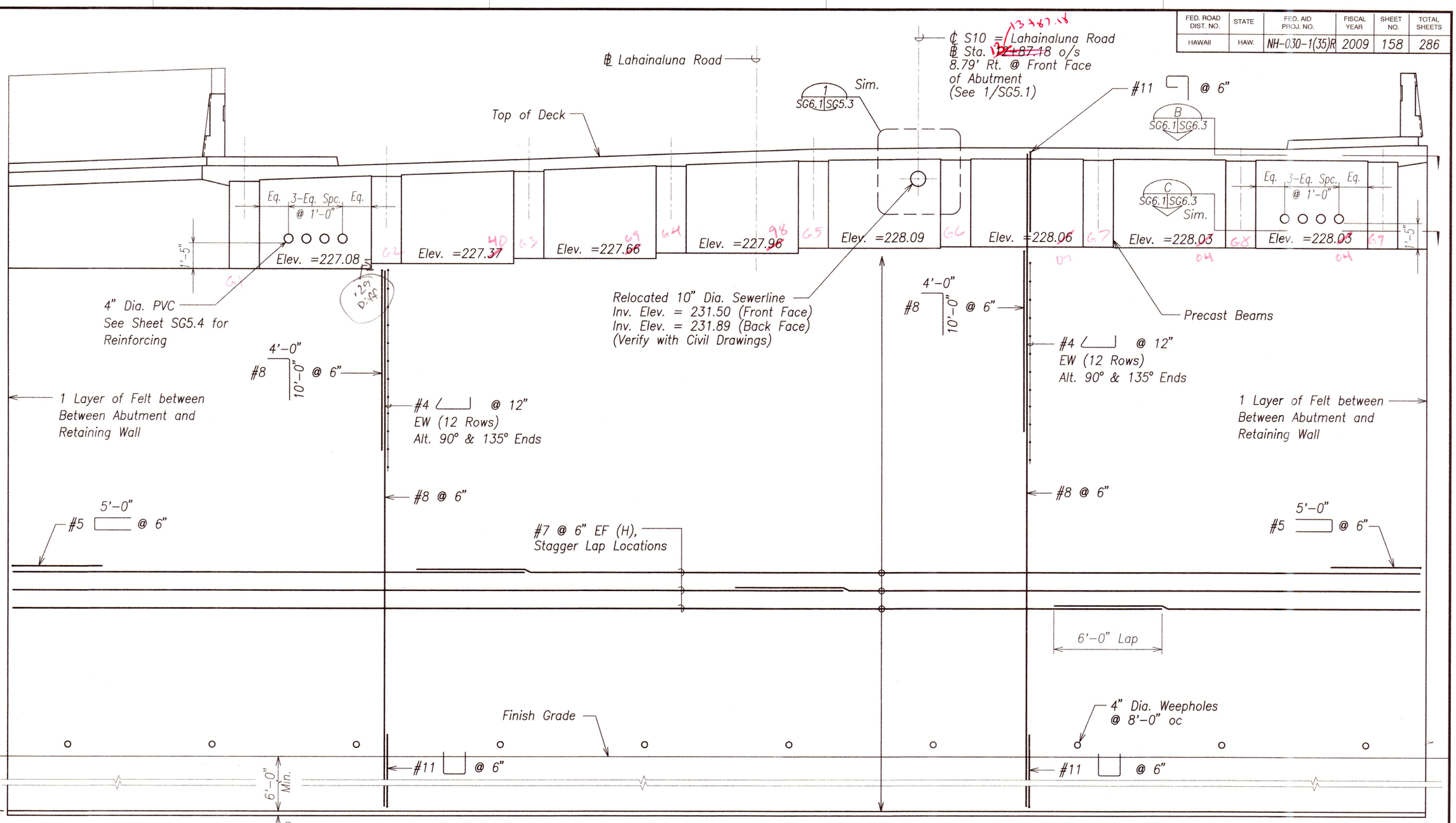
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	158	286



ABUTMENT 2 ELEVATION (A SG1.2|SG6.1)

Scale: 3/8" = 1'-0"

Notes:

1. Seat elevation is shown at front of abutment.
2. Roughen waste slab parallel w/ Honoapiilani ℄ to 1/4" amplitude.
3. See 2/S5.3 for weepholes additional reinforcing.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT 2 ELEVATION

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG6.1 OF 3 SHEETS

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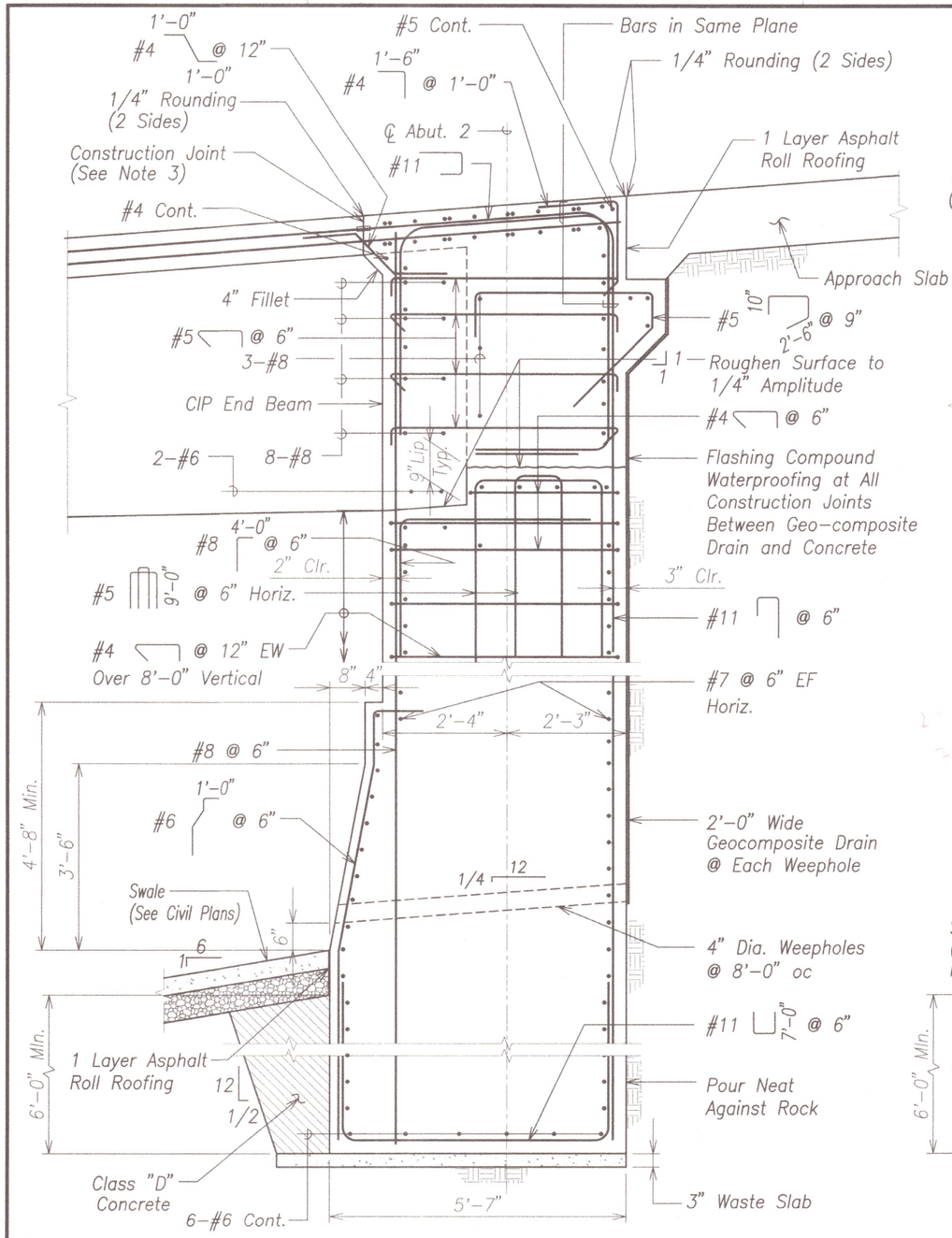
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | NOTE BOOK | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | No.

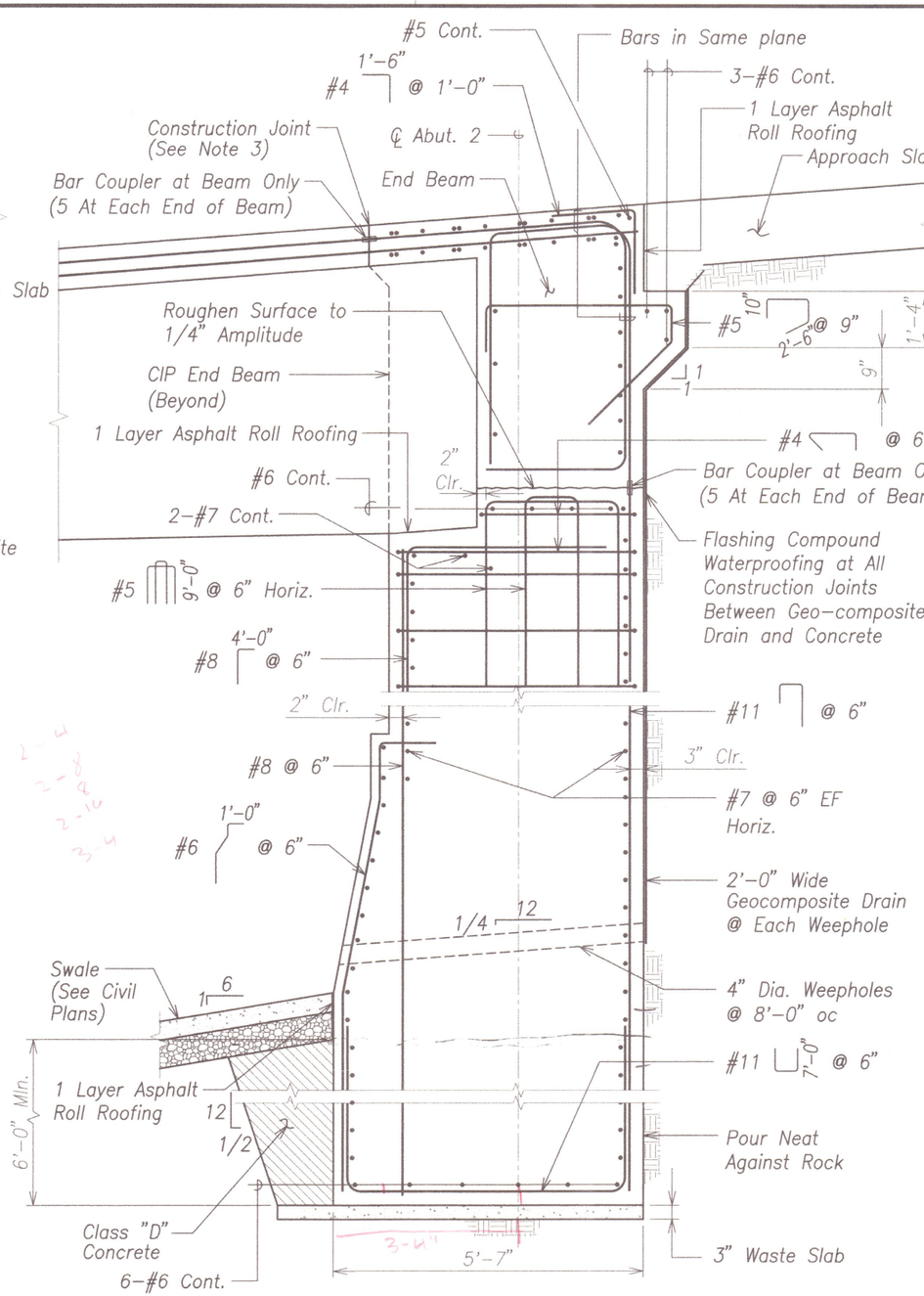
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	159	286



ABUTMENT SECTION BETWEEN CIP BEAMS

Scale: 3/4" = 1'-0"

A SG1.2 | SG6.2 SG1.3



ABUTMENT SECTION – AT CIP BEAM

Scale: 3/4" = 1'-0"

B SG1.3 | SG6.2

Notes:

1. For additional corbel details, See sheet SG7.1.
2. For approach slab, See sheet SG7.2
3. Roughen deck surface construction joint by abrasive blast method. Moisten to saturated surface. Dry prior to applying DURAL PREP AC bonding agent and anticorrosion coating prior to concrete pour. Typical at all deck construction joints.
4. Beam seat is parallel with deck in longitudinal direction.
5. If soil or clinker material is encountered at the bottom of the footing, remove the soil and clinker material until rock is encountered and backfill with Class "D" concrete.

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STATE OF HAWAII
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HIGHWAYS DIVISION

ABUTMENT 2 SECTIONS

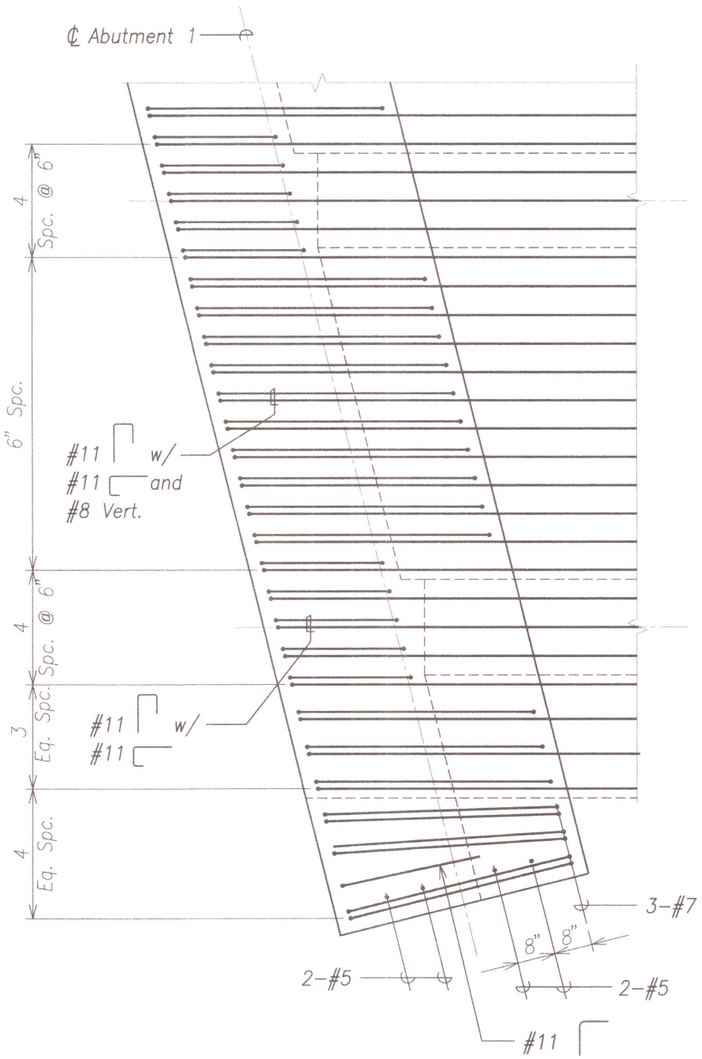
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

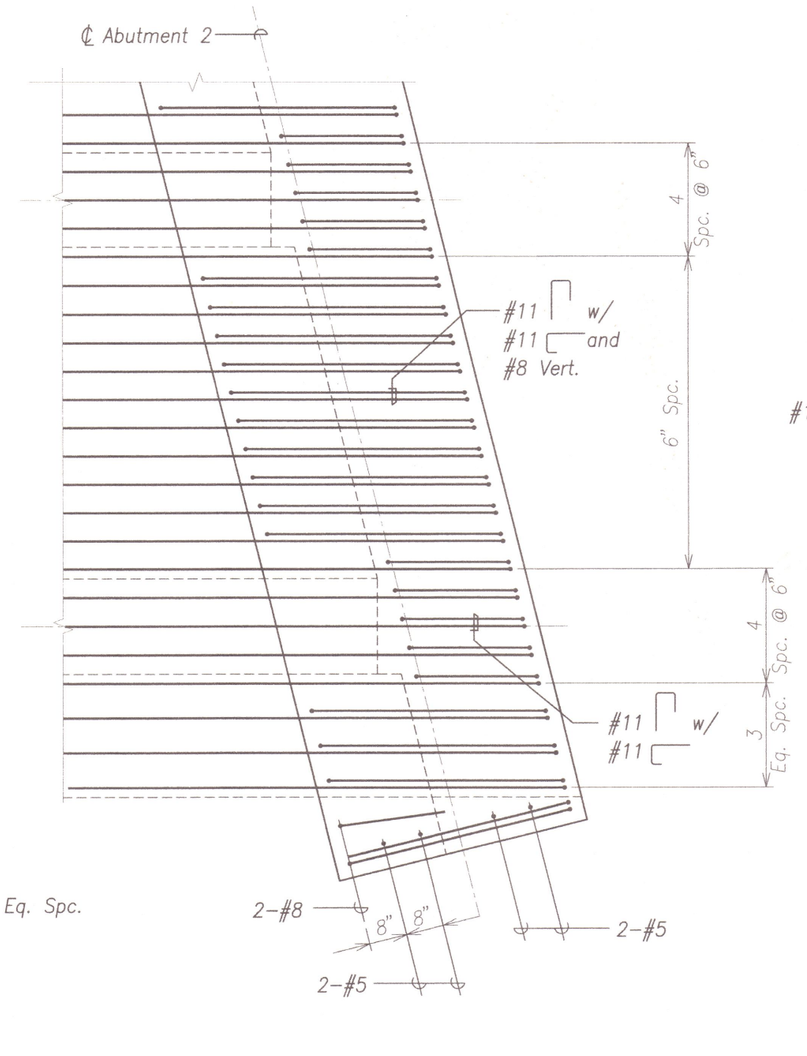
SHEET No. SG6.2 OF 3 SHEETS

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

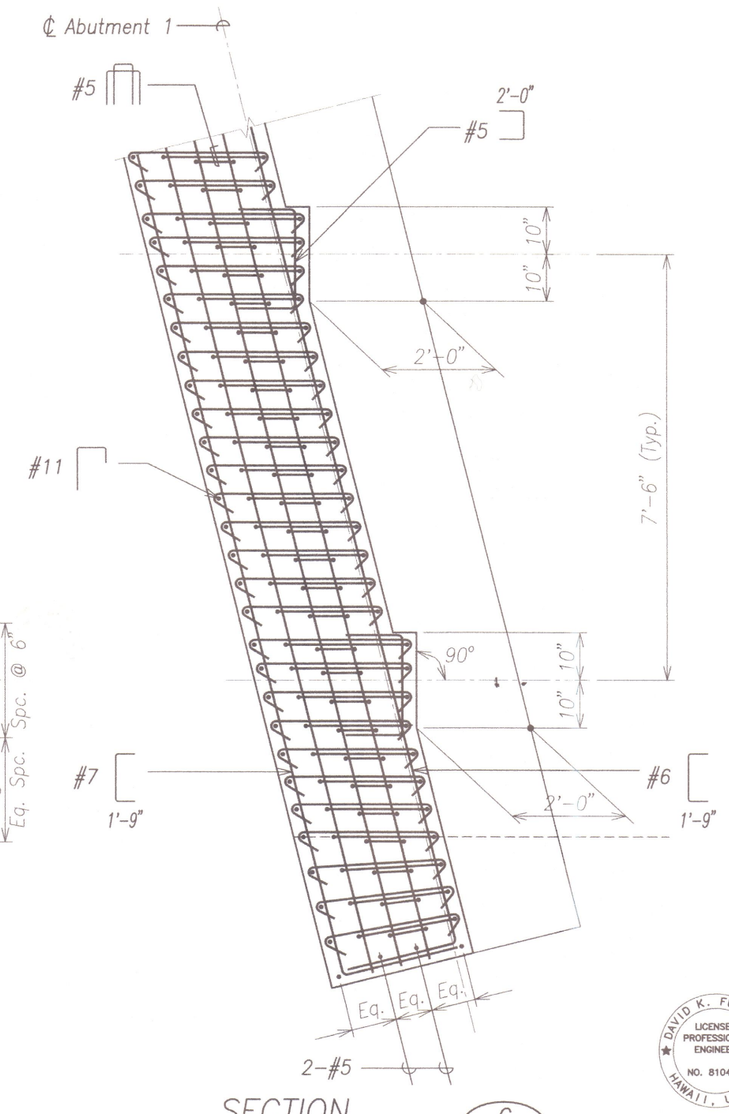
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	160	286



SECTION A
Scale: 3/4" = 1'-0" SG5.1 | SG6.3



SECTION B
Scale: 3/4" = 1'-0" SG6.1 | SG6.3



SECTION C
Scale: 3/4" = 1'-0" SG5.1 | SG6.3

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STATE OF HAWAII
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HIGHWAYS DIVISION

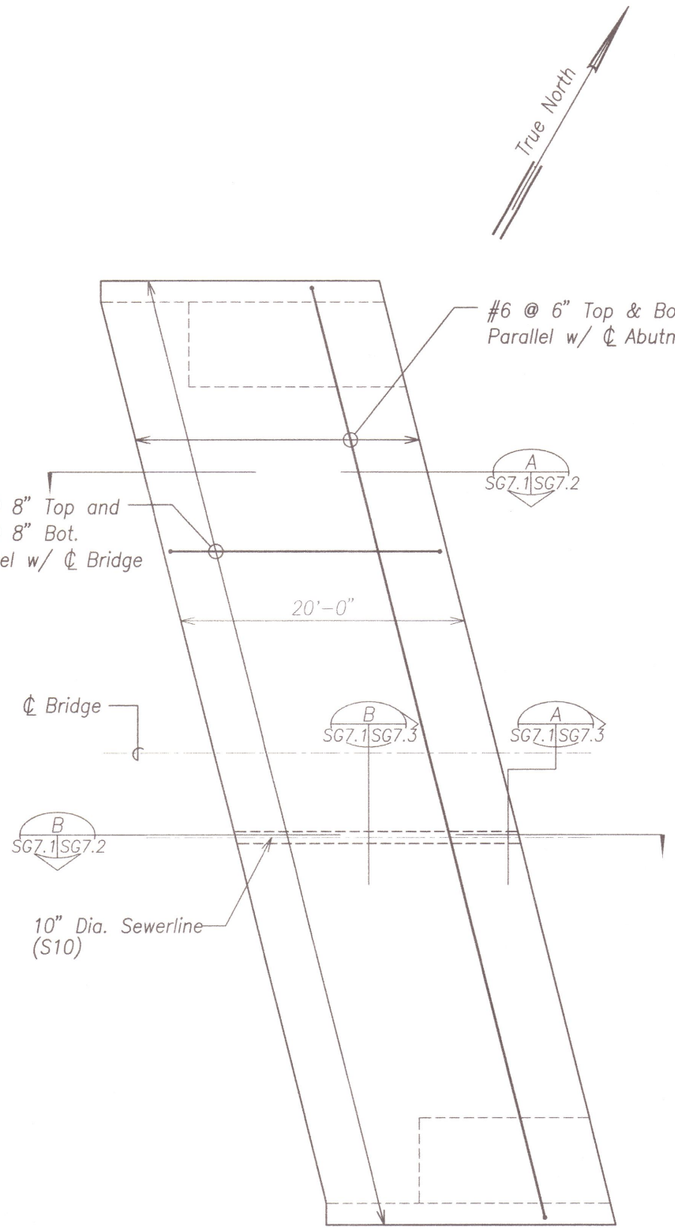
ABUTMENT SECTIONS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

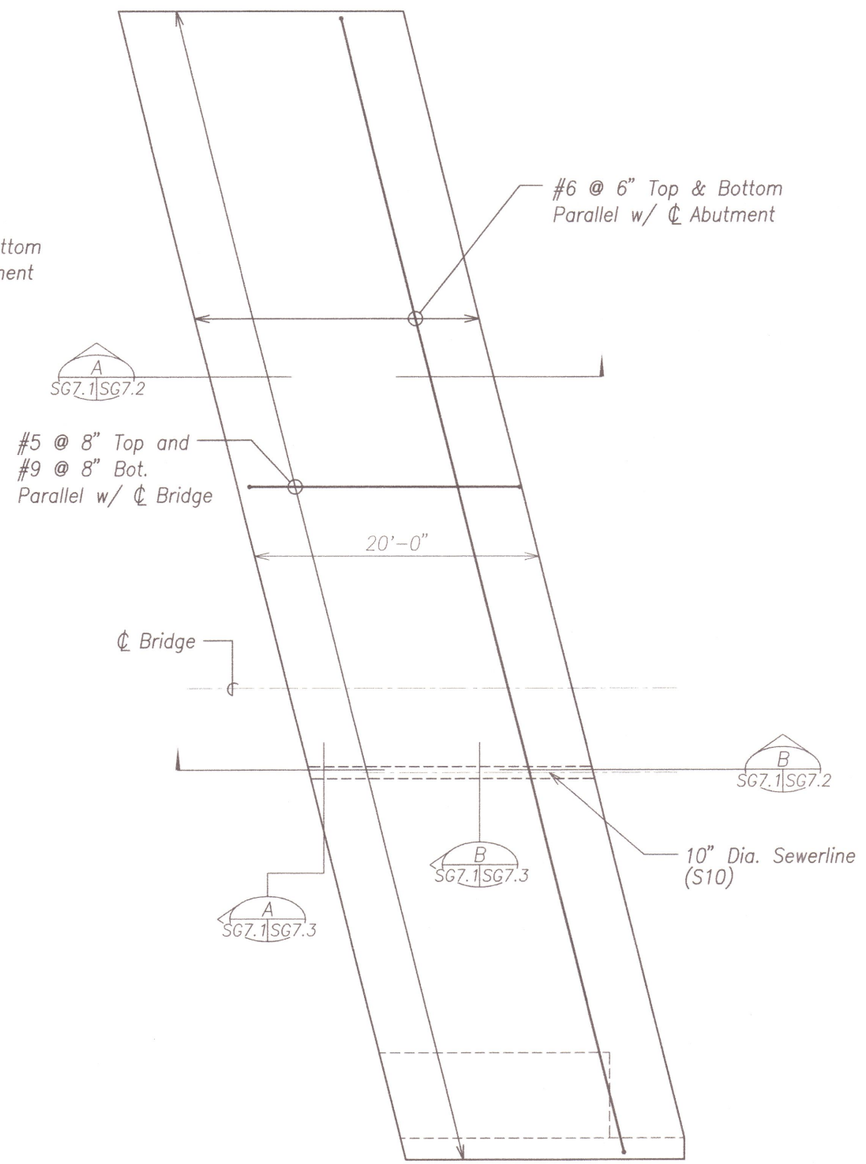
Scale: As Noted Date: April, 2009

SHEET No. SG6.3 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	161	286



LOWER APPROACH SLAB (A SG7.1 SG7.1)
Scale: 3/16" = 1'-0"



UPPER APPROACH SLAB (B SG7.1 SG7.1)
Scale: 3/16" = 1'-0"

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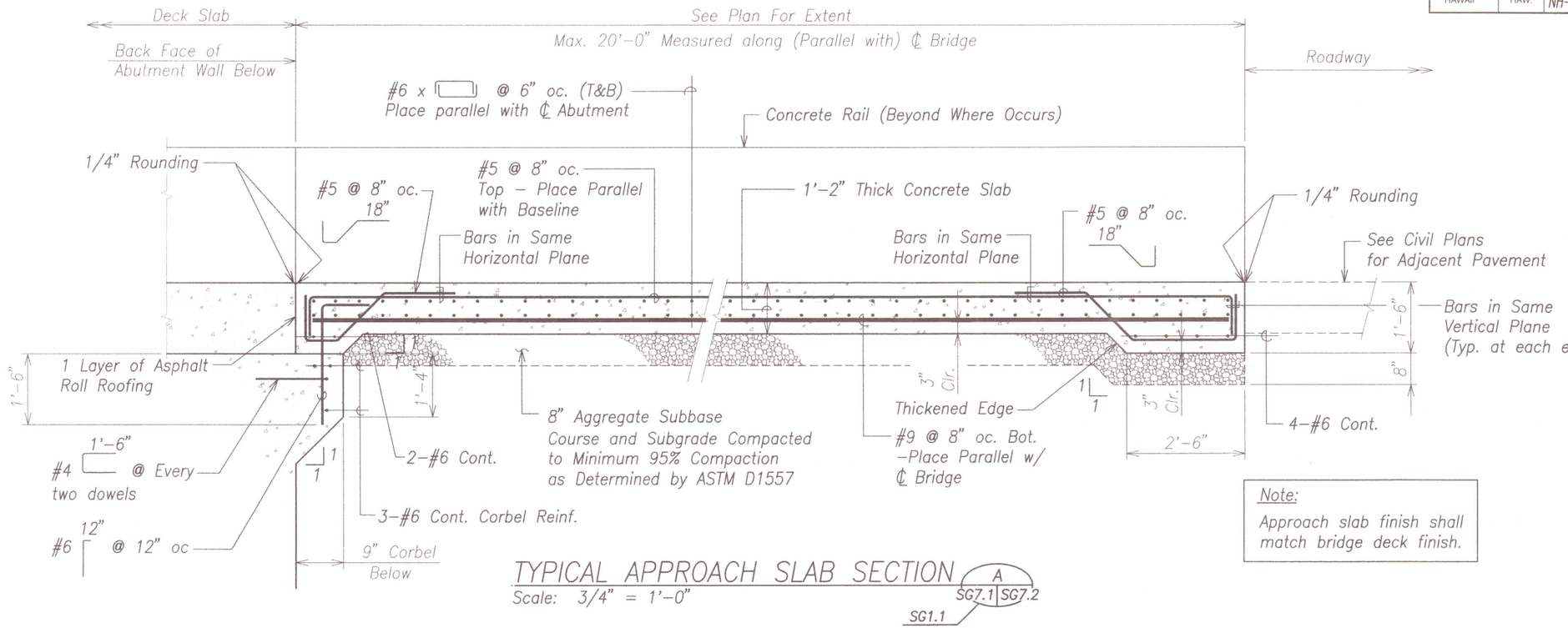
APPROACH SLAB PLANS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG7.1 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	162	286



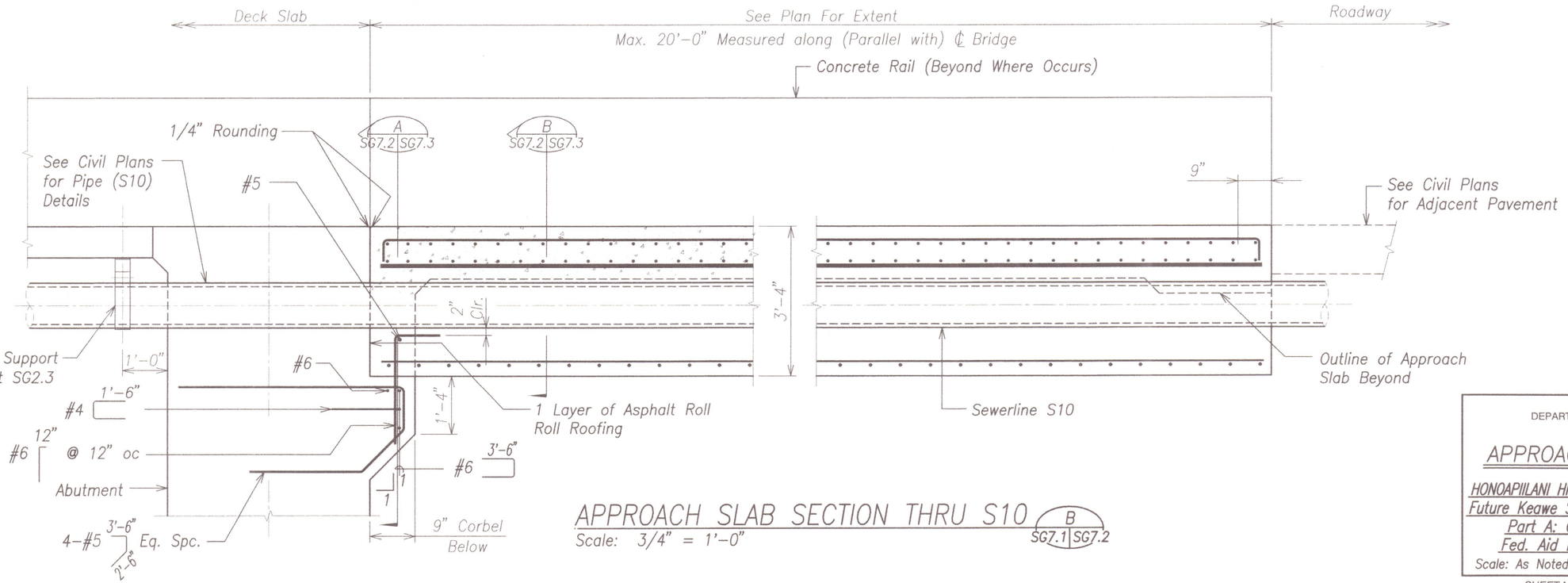
Note:
Approach slab finish shall match bridge deck finish.

TYPICAL APPROACH SLAB SECTION

Scale: 3/4" = 1'-0"

A SG7.1 | SG7.2

SG1.1



APPROACH SLAB SECTION THRU S10

Scale: 3/4" = 1'-0"

B SG7.1 | SG7.2

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

APPROACH SLAB SECTION

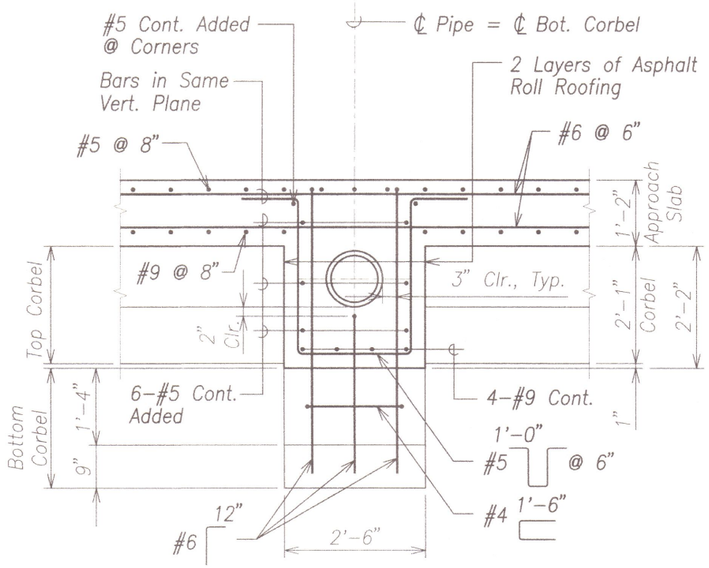
HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG7.2 OF 3 SHEETS

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

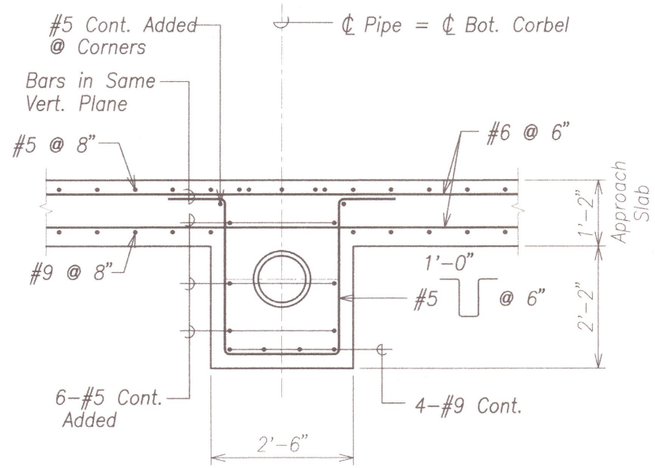
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	163	286



ELEVATION – CORBEL AT SEWER PIPE (A)

Scale: 3/4" = 1'-0"

SG7.1 | SG7.3 | SG7.2



SECTION – APPROACH SLAB AT SEWER PIPE (B)

Scale: 3/4" = 1'-0"

SG7.1 | SG7.3 | SG7.2

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

DAVID K. FUJIWARA
LICENSED PROFESSIONAL ENGINEER
NO. 8104-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

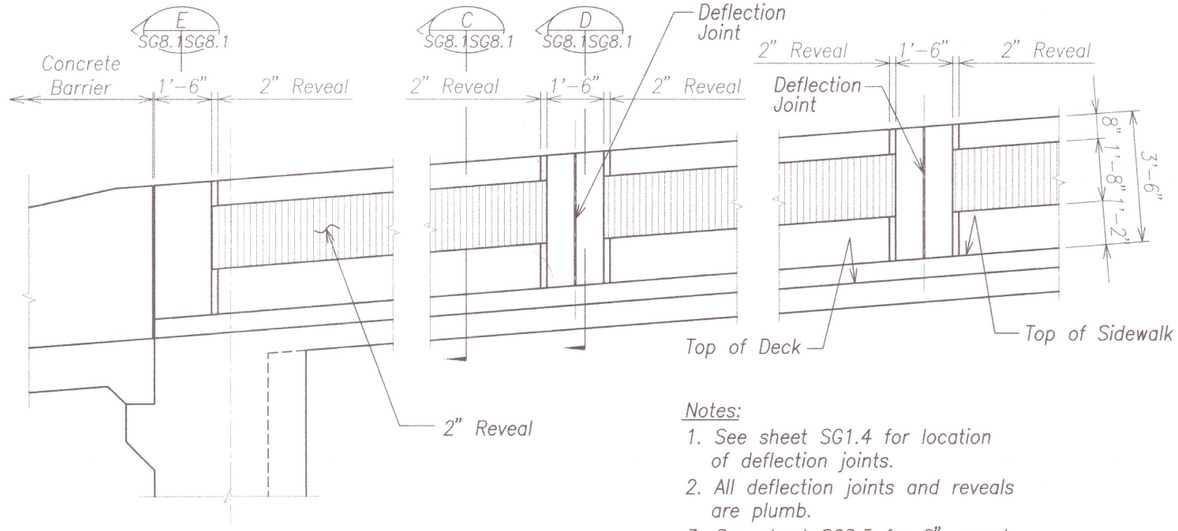
APPROACH SLAB SECTIONS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

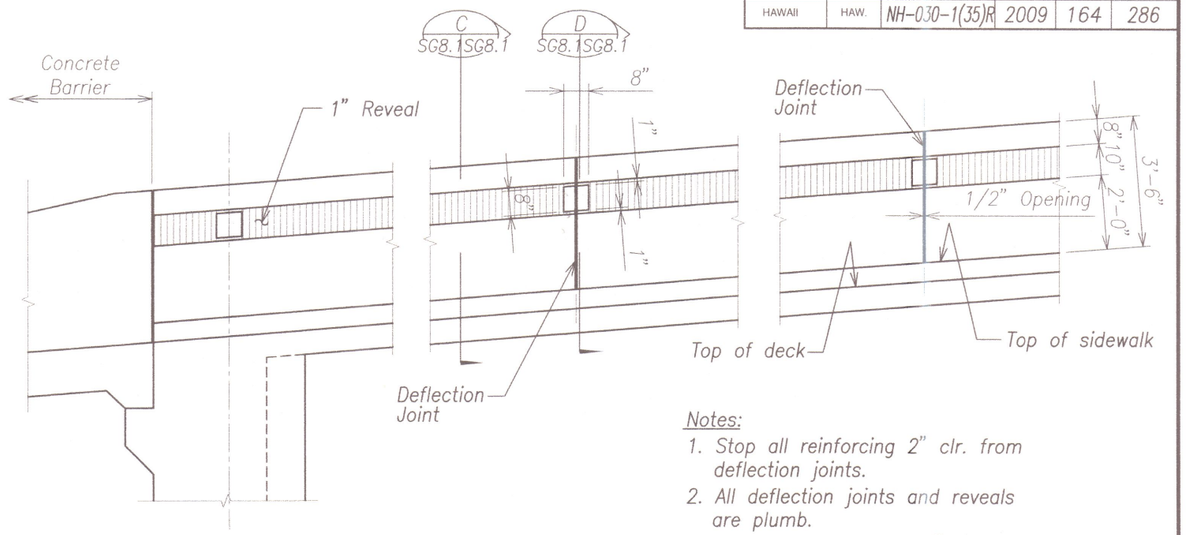
SHEET No. SG7.3 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	164	286



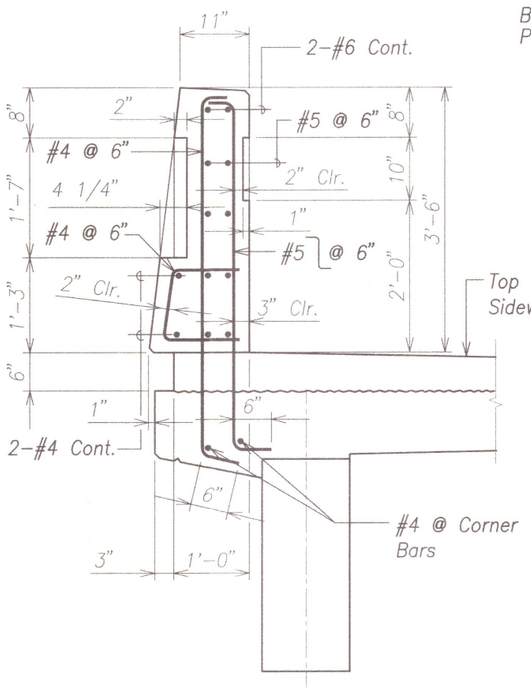
Notes:
1. See sheet SG1.4 for location of deflection joints.
2. All deflection joints and reveals are plumb.
3. See sheet SG8.5 for 2" reveal detail.

EXTERIOR RAILING ELEVATION (A SG8.1 | SG8.1)
Scale: 1/2" = 1'-0"

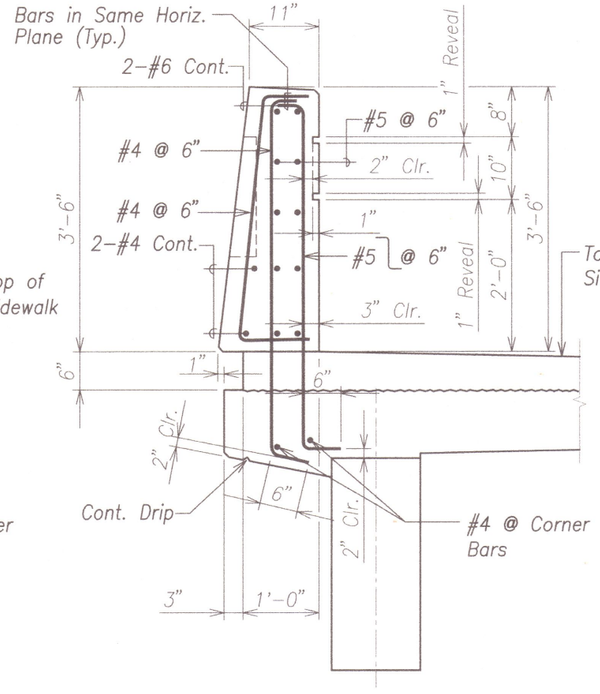


Notes:
1. Stop all reinforcing 2" clr. from deflection joints.
2. All deflection joints and reveals are plumb.
3. See sheet SG8.5 for 1" reveal detail.

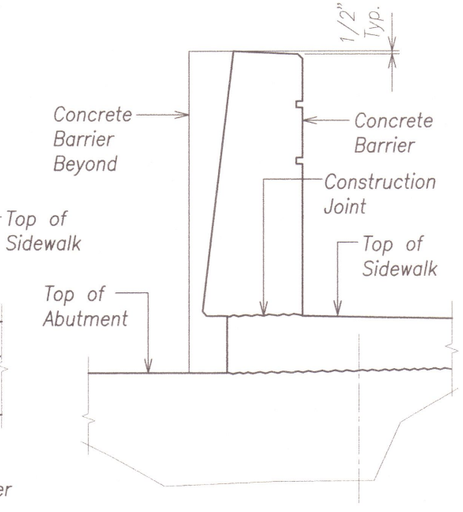
INTERIOR RAILING ELEVATION (B SG8.1 | SG8.1)
Scale: 1/2" = 1'-0"



SECTION (C SG8.1 | SG8.1)
Scale: 1" = 1'-0"

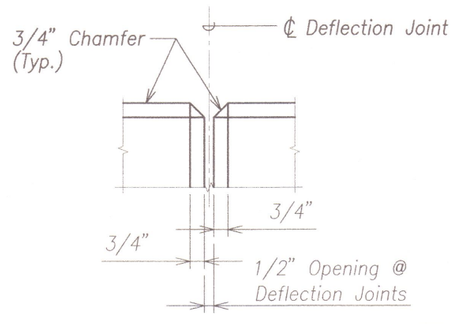


SECTION (D SG8.1 | SG8.1)
Scale: 1" = 1'-0"



Note:
Reinforcing is similar to Section D/SG8.1

SECTION (E SG8.1 | SG8.1)
Scale: 1" = 1'-0"



DEFLECTION JOINT DETAIL (1 SG8.1 | SG8.1)
Scale: 3" = 1'-0"

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KSF, INC.

APRIL 30, 2010
LIC. EXP. DATE

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

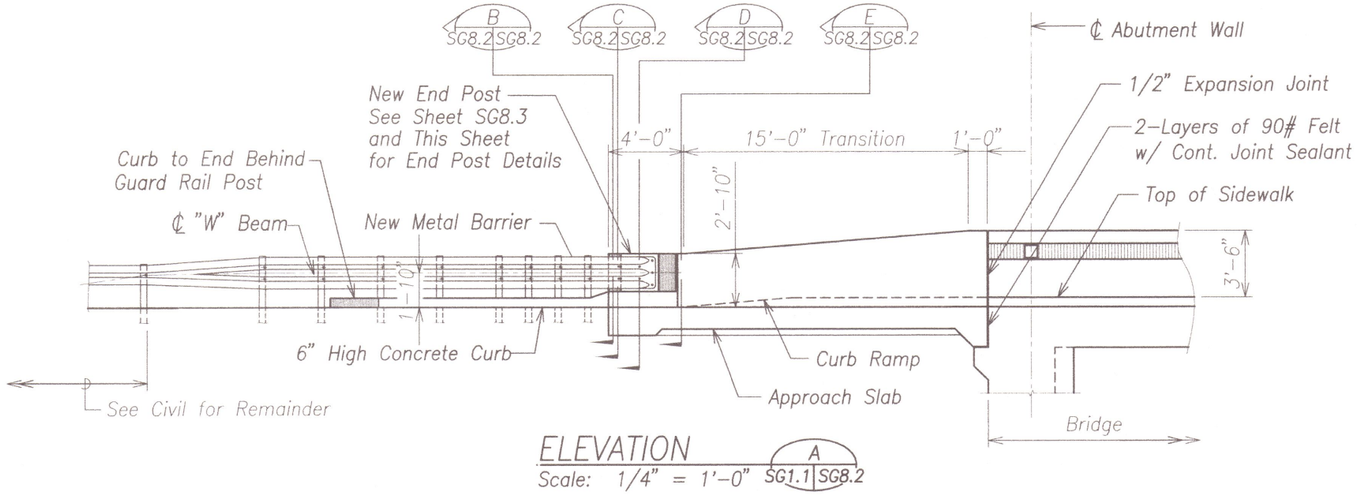
CONCRETE RAILING ELEVATIONS AND SECTIONS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

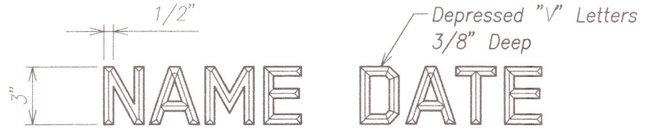
Scale: As Noted Date: April, 2009

SHEET No. SG8.1 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	165	286



ELEVATION (A SG1.1 | SG8.2)
Scale: 1/4" = 1'-0"

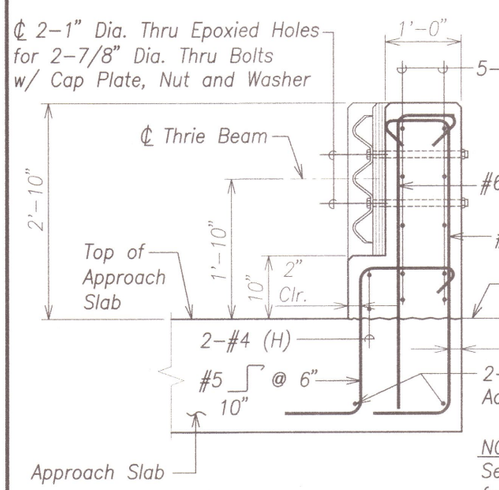


Name of Bridge — Date of Year Built

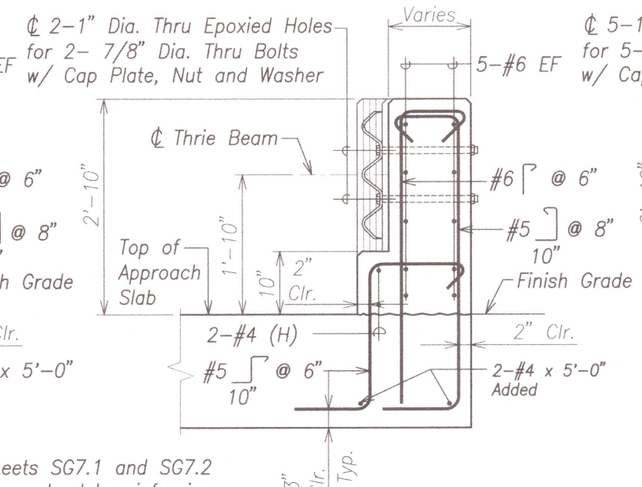
NOTES:
1. Exact details and spacing of letter and figures and location shall be as directed by the Engineer. Gothic letters and figures approximating the dimensions shown will be acceptable if approved by the Engineer.
2. Name & date shall be place on the trailing (exit) end post on each side of bridge.
3. Unless otherwise directed by the Engineer, The name of the bridge shall be "LAHAINALUNA ROAD GRADE SEPARATION". The date shall be 2009.

TYPICAL DETAIL OF LETTERS AND FIGURES

BRIDGE IDENTIFICATION DETAIL (1 SG8.2 | SG8.2)
Scale: 3" = 1'-0"

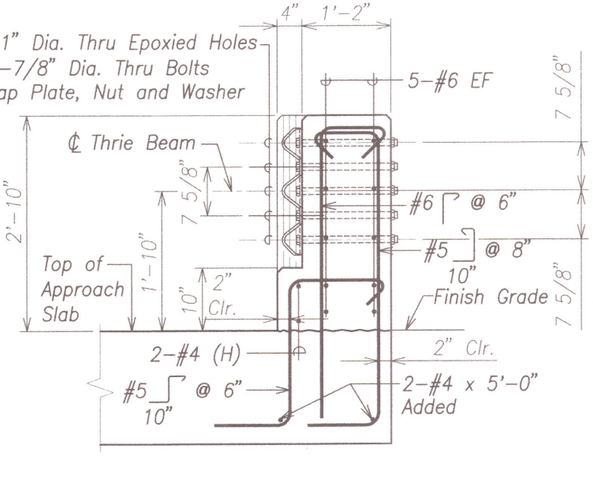


SECTION (B SG8.2 | SG8.2)
Scale: 1" = 1'-0"

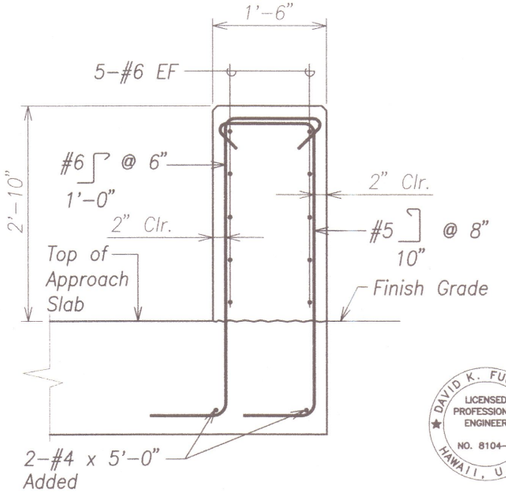


NOTE:
See sheets SG7.1 and SG7.2 for approach slab reinforcing.

SECTION (C SG8.2 | SG8.2)
Scale: 1" = 1'-0"



SECTION (D SG8.2 | SG8.2)
Scale: 1" = 1'-0"



SECTION (E SG8.2 | SG8.2)
Scale: 1" = 1'-0"

DAVID K. FUJIWARA LICENSED PROFESSIONAL ENGINEER NO. 8104-S HAWAII, U.S.A.

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KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

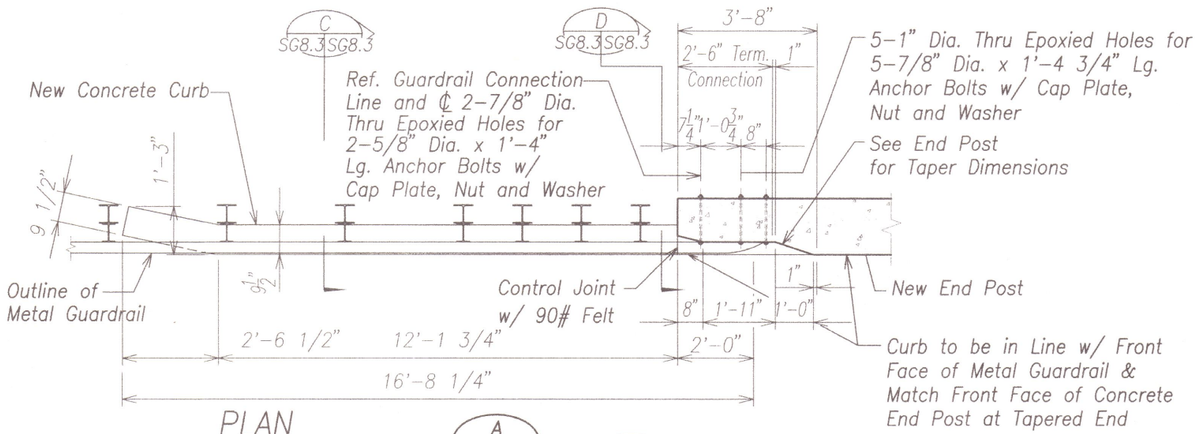
GUARD RAIL AND END POST - ELEVATION AND SECTIONS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

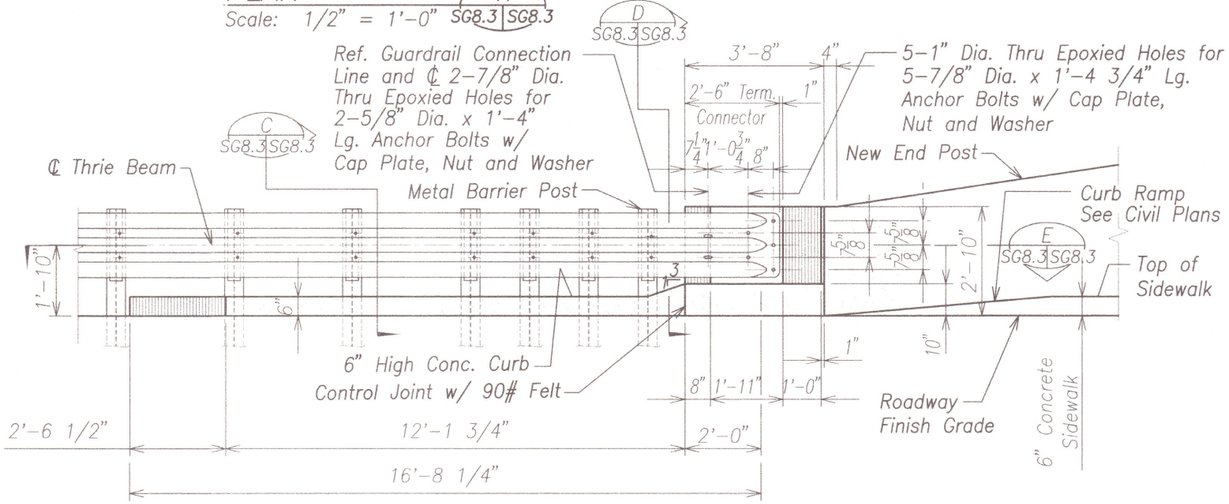
Scale: As Noted — Date: April, 2009

SHEET No. SG8.2 OF 5 SHEETS

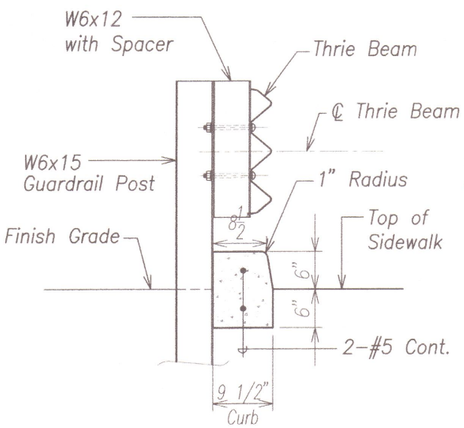
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	166	286



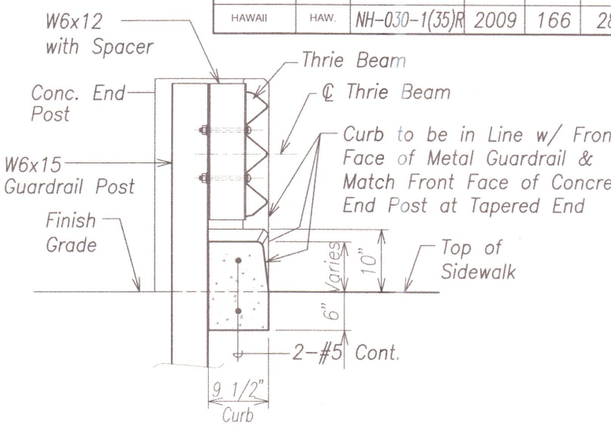
PLAN
Scale: 1/2" = 1'-0" A SG8.3 SG8.3



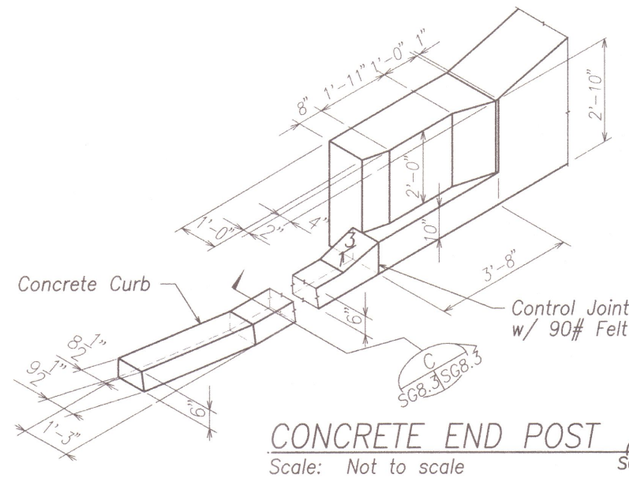
ELEVATION
Scale: 1/2" = 1'-0" B SG8.3 SG8.3



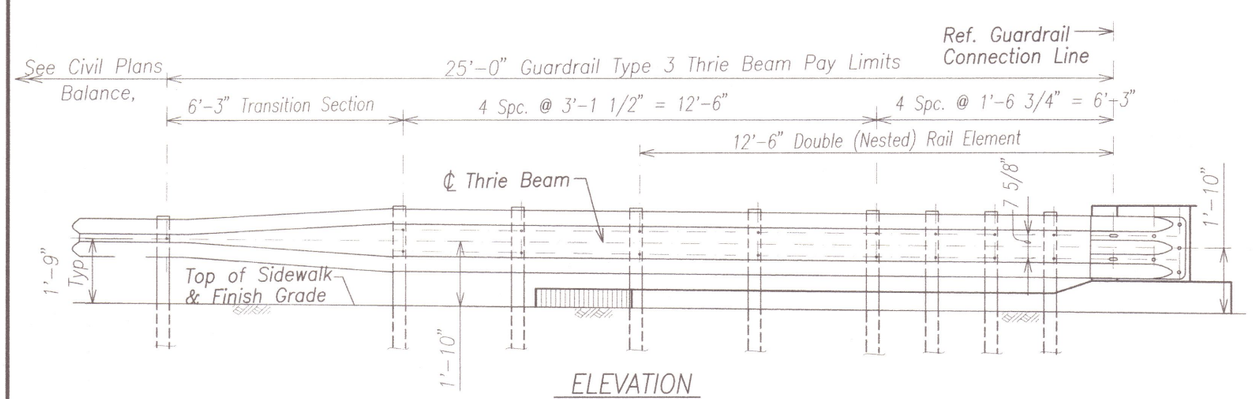
SECTION
Scale: 1" = 1'-0" C SG8.3 SG8.3



SECTION
Scale: 1" = 1'-0" D SG8.3 SG8.3

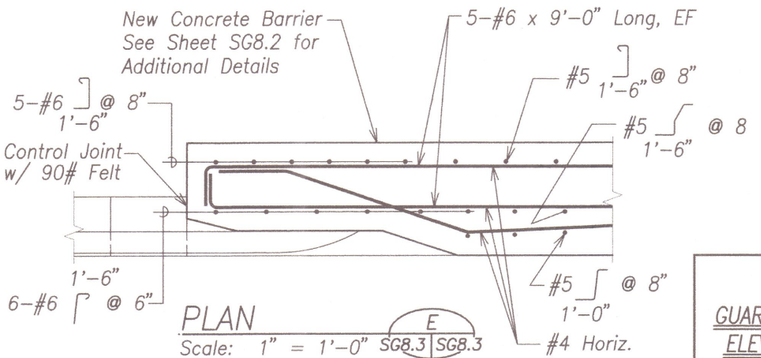


CONCRETE END POST
Scale: Not to scale 1 SG8.3 SG8.3



ELEVATION

TYPICAL TYPE 3 THRIE BEAM METAL GUARDRAIL FOR END POST
Scale: 1/2" = 1'-0" F SG8.3 SG8.3



PLAN
Scale: 1" = 1'-0" E SG8.3 SG8.3

DAVID K. FUJIWARA LICENSED PROFESSIONAL ENGINEER NO. 8104-S HAWAII, U.S.A.

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KSF, INC. APRIL 30, 2010 LIC. EXP. DATE

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARD RAIL AND END POST - PLAN ELEVATION, SECTIONS AND DETAILS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

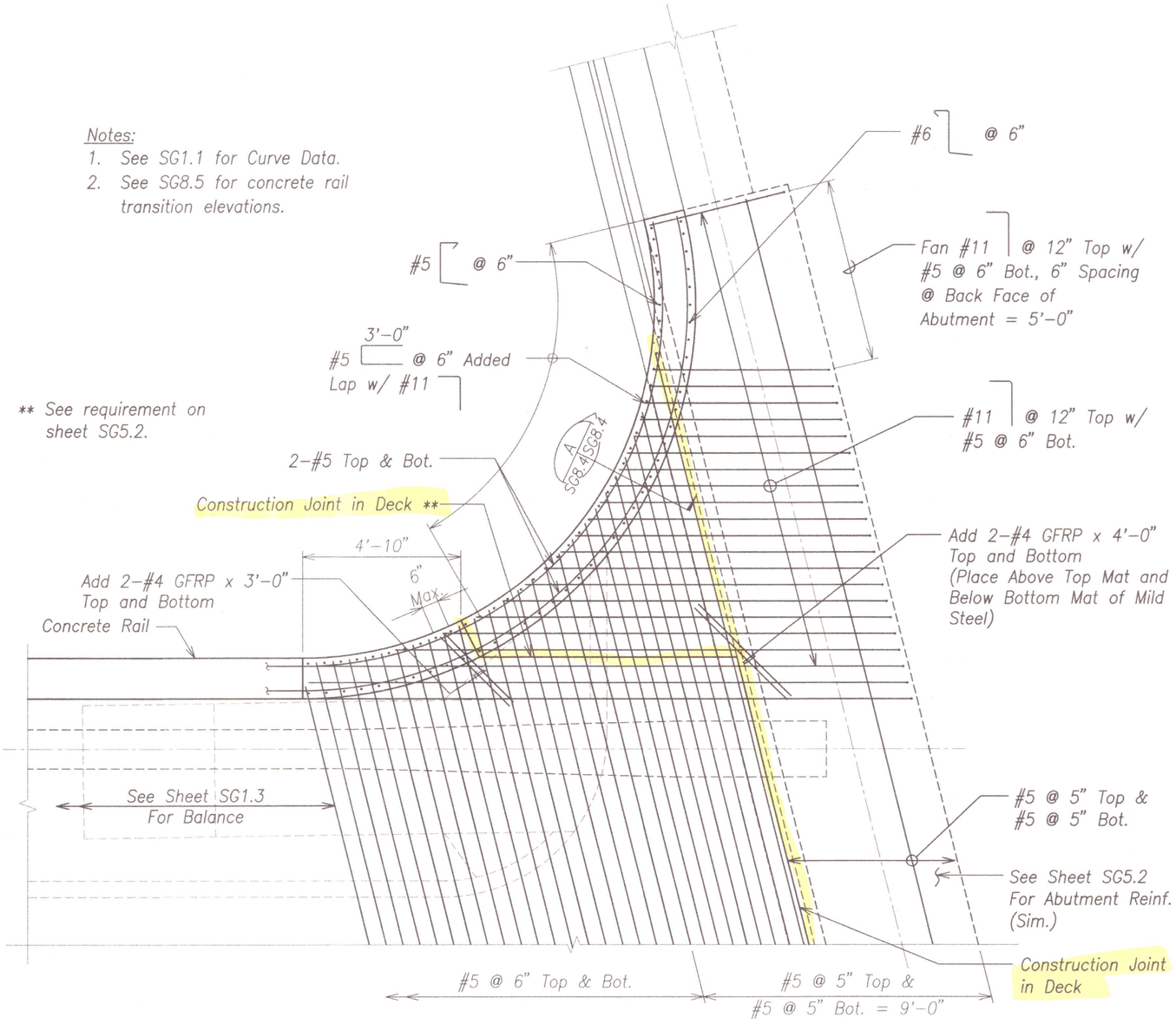
Scale: As Noted Date: April, 2009

SHEET No. SG8.3 OF 5 SHEETS

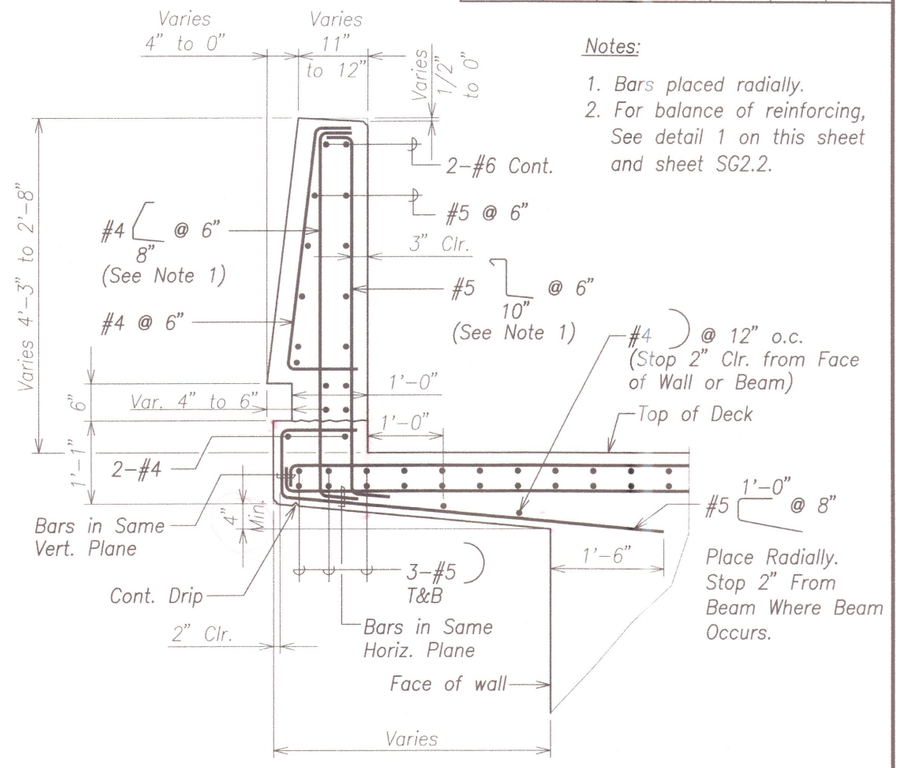
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	167	286

Notes:
1. See SG1.1 for Curve Data.
2. See SG8.5 for concrete rail transition elevations.

** See requirement on sheet SG5.2.



DETAIL 1 (SG1.3 | SG8.4)
Scale: 1/2" = 1'-0"



Notes:
1. Bars placed radially.
2. For balance of reinforcing, See detail 1 on this sheet and sheet SG2.2.

Place Radially. Stop 2" From Beam Where Beam Occurs.

SECTION A (SG8.4 | SG8.4, SG8.5)
Scale: 1" = 1'-0"

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

DAVID K. FUJIWARA LICENSED PROFESSIONAL ENGINEER NO. 8104-S HAWAII, U.S.A.

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KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

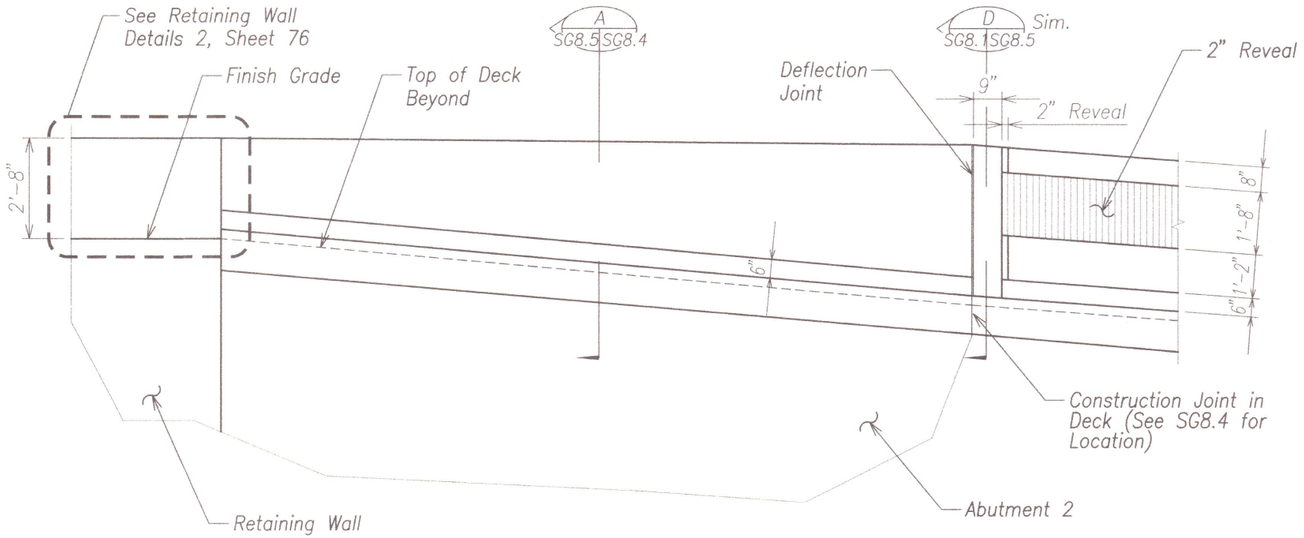
CONCRETE RAIL TRANSITION PLAN AND SECTION

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG8.4 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	168	286

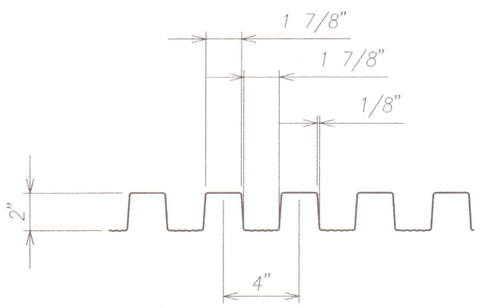


EXTERIOR RAILING ELEVATION

Scale: 1/2" = 1'-0"

A SG8.5 | SG8.5

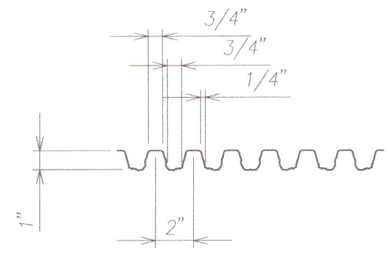
Note:
Curb ramp outline (beyond) not shown.



2" FLORIDA FIN REVEAL FORMLINER DETAIL

Scale: 3" = 1'-0"

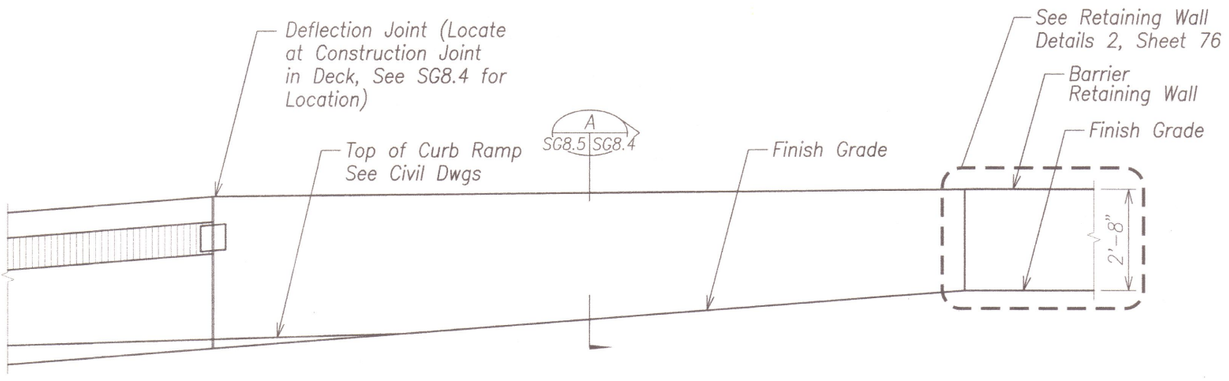
1 SG8.5 | SG8.5



1" SAN DIEGO FIN REVEAL FORMLINER DETAIL

Scale: 3" = 1'-0"

2 SG8.5 | SG8.5



INTERIOR RAILING ELEVATION

Scale: 1/2" = 1'-0"

B SG8.1 | SG8.5

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

DAVID K. FUJIWARA
LICENSED PROFESSIONAL ENGINEER
NO. 8104-S
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KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE RAIL TRANSITION ELEVATIONS

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH-030-1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG8.5 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	169	379

CONSTRUCTION SEQUENCE – LAHAINALUNA ROAD GRADE SEPARATION STRUCTURE

STAGE

1 Construct detour road. See Civil Plans.

2 Cast beams.

3 Probe and grout at abutments.
Pour waste slab.

4 Construct abutments after concrete in Stage 3 has attained a compressive strength of at least 3,000 psi.
Install diagonal (tilt–up) bracing prior to removing horizontal bracing for abutment formwork/falsework.

Note:
Stages 5 and 6 maybe done concurrently.

5 Backfill in front of abutment footing w/ Class "D" concrete. Backfill in back of abutment up to an elevation that is 1 ft. below horiz. joint after concrete in Stage 4 has attained a compressive strength of at least 8,000 psi.

6 Install falsework.
Place wedge between bottom 9" at end of beams and 9" vertical abutment lip.

7 Erect beams on falsework.

8 Pour closure joint and diaphragm.

9 Pour deck.

STAGE

1 10 Apply corrosion inhibitor amine carboxylate powder (Cortec MCI–309) in all post tension ducts.
Post tension longitudinal tendons in beams 28 days after concrete pour in Stages 8 and 9, and the concrete in Stages 8 and 9 have attained a compressive strength of 8,000 psi. Coat wedges with epoxy or ZRC. (Note: Post tension ducts will be grouted after end beam pour).

[Verify Bridge did not lift off of falsework.]

1 11 Pour sidewalks. Do not pour curb ramp at depression.

1 12 Remove wedge between beams end of and 9" abutment lip.
Remove falsework supporting vertical loads 21 days after concrete pour in Stage 11 and the concrete in Stage 11 has attained a compressive strength of 8,000 psi.
Do not remove diagonal (Tilt–up) bracing.

1 13 Fill gaps behind the girders at the abutments with the same prepackage post tensioning grout as used in the girders.
Inject epoxy into gaps under girders with Sikadur 55 SLV.

1 14 Remove diagonal (Tilt–up) bracing at least 72 hours after the grouting in Stage 13 and until the grout in Stage 13 has attained a compressive strength of 5,000 psi.

1 15 Re–shore falsework supporting Girder G–1 under overhang at on–ramp.

STAGE

1 16 Pour overhang at on–ramp.

1 17 Pour end beams, and corbels at least 7 days after the concrete pour in Stage 16. The concrete pour shall occur between mid–night and 3:00 AM (3 hours).

[Coordinate installation and removal of grout tubes with AVAR.]

1 18 Remove falsework under on–ramp at least 14 days after the concrete pour in Stage 17.

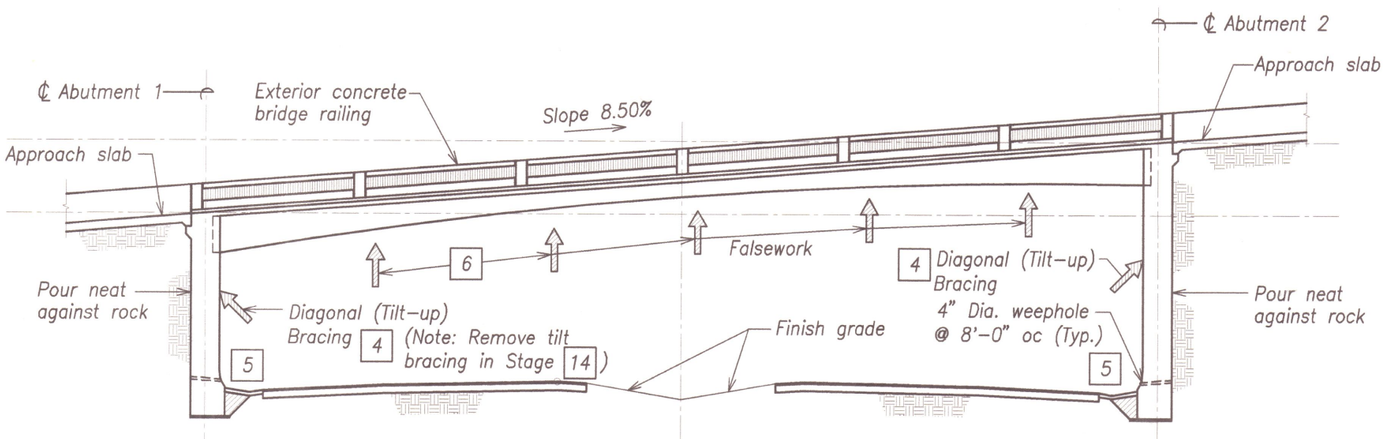
1 19 Grout post tension ducts. Grout shall be prepackaged.

1 20 Backfill remainder of abutment and construct approach slab and curb ramps once grout in Stage 19 has aged for 72 hours and has attained a compressive strength of 5,000 psi.

1 21 Construct railings and end post after approach slab has aged 7 days and has attained a compressive strength of 4,000 psi.

1 22 Grind and mechanical groove deck and approach slab 7 days after the concrete pour in Stage 21 but not before the concrete in Stage 21 has attained a compressive strength of 4,000 psi. Re–apply SINAK LITHIUM over entire bridge deck and approach slab.

1 23 Bridge may be opened for traffic.



CONSTRUCTION SEQUENCE (A SG9.1 | SG9.1)
Scale: 1" = 10'–0"

CONSTRUCTION SEQUENCE NOTES:

1. Order of construction sequence shall not be changed.
2. Each sequence stage shall be completely finished before proceeding to the next stage unless otherwise noted. The Engineer of record will be the sole judge of whether the sequence stage is complete, and may direct the Contractor to stop work on a sequence stage to complete work on the preceeding sequence stage.

DAVID K. FUJIWARA LICENSED PROFESSIONAL ENGINEER NO. 8104–S HAWAII, U.S.A.

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KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONSTRUCTION SEQUENCE

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd, Part B
Fed. Aid Proj. No. NH–030–1(35)R

Scale: As Noted

SHEET No. SG9.1 OF 1 SHEETS

DATE	REVISION
4/20/10	1 Revised Construction Sequence

100% DESIGN 169

220-3511 Don.

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

DRAWING NAME: Z:\2007\40019.0–HONOAPIILANI LAHAINA BYPASS–KAHOMA WO\04–20–10 COMBINE LAHAINA CONSTRUCTN SEQ\HH–SG901.DWG PLOT TIME: 04–20–10, 2:50 PM)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-030-1(35)R	2009	169	286

CONSTRUCTION SEQUENCE – LAHAINALUNA ROAD GRADE SEPARATION STRUCTURE

STAGE

[1] Construct detour road. See Civil Plans.

[2] Cast beams.

[3] Probe and grout at abutments.
Pour waste slab.

[4] Construct abutments after concrete in stage [3] has attained a compressive strength of at least 3,000 psi.
Install diagonal (tilt–up) bracing prior to removing horizontal bracing for abutment formwork/falsework.

Note:
Stages [5] and [6] maybe done concurrently.

[5] Backfill in front of abutment footing w/ Class "D" concrete.
Backfill in back of abutment up to an elevation that is 1 ft. below horiz. joint after concrete in stage [4] has attained a compressive strength of at least 8,000 psi.

[6] Install falsework.
Place wedge between bottom 9" at end of beams and 9" vertical abutment lip.

[7] Erect beams on falsework.

[8] Pour closure joint and diaphragm.

STAGE

[9] Pour deck.

[10] Apply corrosion inhibitor amine carboxylate powder (Cortec MCI–309) in all post tension ducts.
Post tension longitudinal tendons in beams 28 days after concrete pour in Stages [8] and [9], and the concrete in Stages [8] and [9] have attained a compressive strength of 8,000 psi.

[11] Grout post tension ducts.
Grout shall be prepackaged.

[12] Pour sidewalks once grout in Stage [11] has aged for 72 hours and has attained a compressive strength of 5,000 psi.

[13] Remove wedge between beams end of and 9" abutment lip.
Remove falsework supporting vertical loads 21 days after concrete pour in stage [12] and the concrete in stage [12] has attained a compressive strength of 8,000 psi.
Do not remove diagonal (Tilt–up) bracing.

[14] Fill gaps behind the girders at the abutments with the same prepackage post tensioning grout as used in the girders.
Inject epoxy into gaps under girders with Sikadur 55 SLV.

STAGE

[15] Pour end beams, remainder of deck, sidewalk, and corbel at least 72 hours after the grouting operation in Stage [14], whichever occurs later. The concrete pour shall occur between midnight and 3:00 AM (3 hours).

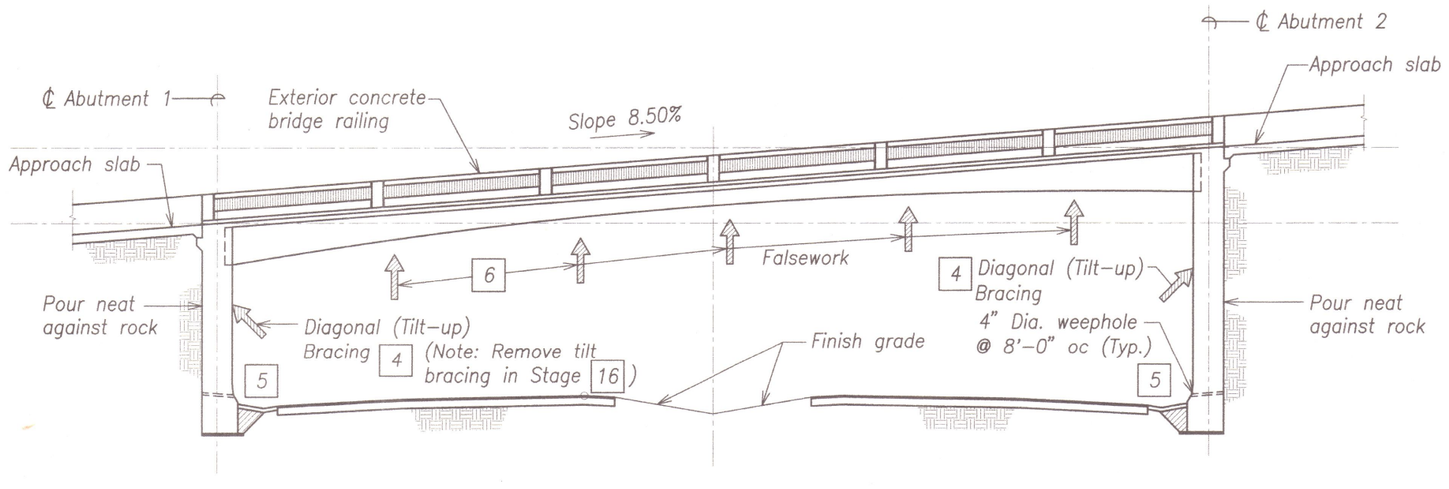
[16] Remove diagonal (Tilt–up) bracing at least 14 days after the concrete pour in Stage [15] and until the concrete in Stage [15] has attained a compressive strength of 7,000 psi.

[17] Backfill remainder of abutment and construct approach slab.

[18] Construct railings and end post after approach slab has aged 14 days and has attained a compressive strength of 4,000 psi.

[19] Grind and mechanical groove deck and approach slab 14 days after the concrete pour in Stage [17] but not before the concrete in Stage [17] has attained a compressive strength of 4,000 psi. Re–apply SINAK LITHIUM over entire bridge deck and approach slab.

[20] Bridge may be opened for traffic.



CONSTRUCTION SEQUENCE (A SG9.1 | SG9.1)
Scale: 1" = 10'–0"

CONSTRUCTION SEQUENCE NOTES:

1. Order of construction sequence shall not be changed.
2. Each sequence stage shall be completely finished before proceeding to the next stage unless otherwise noted. The Engineer of record will be the sole judge of whether the sequence stage is complete, and may direct the Contractor to stop work on a sequence stage to complete work on the preceeding sequence stage.

DAVID K. FUJIWARA LICENSED PROFESSIONAL ENGINEER NO. 8104–S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

KSF, INC. — APRIL 30, 2010 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONSTRUCTION SEQUENCE

HONOAPIILANI HIGHWAY REALIGNMENT, PHASE 1A
Future Keawe St Extension to Lahainaluna Rd
Part A: Off Ramp Mass Grading
Fed. Aid Proj. No. NH–030–1(35)R

Scale: As Noted Date: April, 2009

SHEET No. SG9.1 OF 1 SHEETS

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

Rev. 169