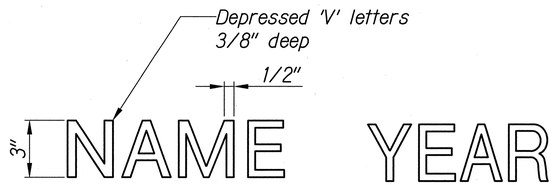
INDEX TO DRAWINGS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	50	99

ABBREVIATION LIST:

Ø	Diameter			NO., #	Number
#	Number Or Pound	E.F.	Each Face	N.F.	Near Face
AASHTO	American Association Of State Highway And Transportation Officials	E.J.	Expansion Joint	N.T.S.	Not To Scale
		Elev., El.	Elevation		
		E.W.	Each Way	O.C.	On Center
A.B.	Anchor Bolt	Exp.	Expansion	OD	Outside Diameter
A.C.	Asphalt Concrete				
ASTM	American Society For Testing And Materials	F.B.	Flat Bar	PCF	Pounds Per Cubic Feet
		F.F.	Far Face	PL., ℄	Plate
AWS	American Welding Society			PLF	Pounds Per Linear Foot
AZ.	Azimuth	G	Girder	PSF	Pounds Per Square Foot
		Galv.	Galvanized	PSI	Pounds Per Square Inch
Bot., Bott., B	Bottom	G.J.	Grooved Joint	PVC.	Polyvinyl Chloride
C.J.	Construction Joint	H	Height	R, Rad.	Radius
℄	Centerline	Horiz., H	Horizontal	Rebar.	Reinforcing Bar
C.G.	Center Of Gravity			Ref.	Reference
C.G.S.	Center Of Gravity Of Steel	In.	Inch	Reinf.	Reinforced, Reinforcing, Reinforcement
Clr., Cl.	Clear	Jt.	Joint	R.O.W.	Right Of Way
Conc.	Concrete				
Cont.	Continuous	K	Kips	Sht.	Sheet
C.Y.	Cubic Yard	KSI	Kips Per Square Inch	Sl.	Slope
				Sta.	Station
Dbl.	Double	Lb., Lbs	Pound, Pounds	Std.	Standard
Det.	Detail	L.F.	Linear Feet	Stirr.	Stirrup
D.I.	Ductile Iron	LRFD	Load And Resistance Factor Design	Sym., Symm.	Symmetrical
Dia.	Diameter			S.S.	Stainless Steel
Dn.	Down	L.S.	Lump Sum		
Dwg.	Drawing			Thk., Th.	Thick
		Max.	Maximum	Typ.	Typical
		Min.	Minimum		
				Vert., V	Vertical
				W/	With



Use Correct Name Of Bridge — Year Built

NOTES:

1. Name and date shall be placed at the trailing end post on each side of the rideway.
2. Exact details and spacing of letters and figures and location shall be as directed by the engineer. Gothic letters and figures approximating dimensions shown will be acceptable if approved by the engineer.
3. The name of bridge shall be "Maipalaoa Bridge"

TYPICAL DETAIL OF LETTERS AND FIGURES AT CONCRETE END POST

Not To Scale

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

LEE T. TAKUSHI
LICENSED PROFESSIONAL ENGINEER
NO. 4767-S
HAWAII USA

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4/30/16
SIGNATURE — EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL INDEX TO DRAWINGS AND ABBREVIATIONS

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-1 OF 26 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	51	99

STRUCTURAL NOTES:

1. General specifications: Hawaii Standard Specifications for Road And Bridge Construction, 2005, together with special provisions prepared for this contract.

2. Design specifications: AASHTO LRFD Bridge Design Specifications, 2012, including 2013 interim revisions.

3. LOADS:

   A. Dead loads:

   (1). An allowance of 25 psf (from curb-to-curb) has been Provided for in the design for future wearing surface.

   (2). An allowance of 150 plf (at each side of the bridge) has been provided for in the design for future utilities.

   B. Live Load: HL-93

   C. Seismic load: Acceleration coefficient = 0.18
   Seismic performance zone = 3
   Importance category = Essential Bridge
   Site Class: E

   D. Railing Test Level = TL-3

4. MATERIALS:

   A. Minimum concrete compressive strength (at 28 days):

   (1.) Concrete topping, end beams and abutments = 5,000 psi

   (2.) Drilled shaft = 4,500 psi

   (3.) Prestressed concrete box girder = 7,000 psi.

   (4.) All other concrete = 4,000 psi.
   Concrete shall have' 0.45 maximum water cement ratio.

   B. All reinforcing steel shall conform to ASTM A615, Grade 60, unless otherwise noted.

   C. All stainless steel plates, bars, rods, anchor bolts and shapes shall be type 316 or 316L. welding of stainless steel shall be in accordance with the latest edition of AWS D1.6 -Structural welding code - stainless steel. - 8.

   D. Tetraguard AS20 shrinkage reducing admixture, eclipse plus shrinkage reducing admixture, or an approved equal, shall be included in the concrete mix for the concrete topping, Bridge railing. The required dosage shall be 128 ounces per cubic yard concrete. Addition of shrinkage reducing admixture shall be as recommended by the manufacturer.

   F. For materials of prestressed girders, see applicable prestressed girder notes.

   G. A corrosion inhibiting admixture shall be included in the concrete mix for all concrete except the drilled shafts. the corrosion inhibiting admixture shall contain a minimum of 30% calcium nitrate by mass and shall be added at a dosage rate of 4.0 gallons per cubic yard of concrete. The admixture shall be Rheocrete CNI calcium nitrite-based corrosion inhibitor, DCI S corrosion inhibitor, or an approved equal. Addition of corrosion inhibiting admixture shall be as recommended by the manufacturer.

5. REINFORCEMENT:

   A. Unless otherwise noted, the covering measured from the surface of the concrete to the face of any reinforcing bars shall be as follows:

   (1). Deck bars = 3" clear

   (2). Railings and parapets = 3" - clear

   (3). Formed surfaces exposed to earth and weather = 3" clear

   (4). Bottom and sides of footings and where concrete is deposited on grade = 3" clear

   (5). Drilled shafts = 4" clear (to spirals)

   B. Minimum clear spacing between parallel bars shall be 1-1/2 times the diameter of the bar (for non bundled bars) or 1-1/2 times the diameter derived from the equivalent total area of the bars (for bundled bars), But in no case shall the clear distance between the parallel bars be less than 1-1/2 times the maximum size of the coarse aggregate or 1-1/2 inches.

   C. All dimensions relating to reinforcing bars (eg. spacing of bars, etc.) are to center of bars, unless otherwise noted.

   D. Reinforcing bars shall be detailed in accordance with AASHTO LRFD bridge design specifications, 2012, including 2013 interim revisions, unless otherwise noted.

   E. Reinforcing bars shall be securely tied at all intersections and lap splices except where the spacing of the intersections is less than 12 inches in each direction, in which case alternate intersections shall be tied.

   F. Deformed reinforcing bars to be welded shall conform to ASTM A706, Grade 60. Welding of deformed reinforcing bars shall be in accordance with the latest edition of AWS D1.4 -Structural Welding code - Reinforcing bars.

6. GENERAL CONSTRUCTION NOTES:

   A. See standard specifications and special provisions.

   B. All items noted incidental will not be paid for separately.

   C. Standard detail drawings refer to all structures in general, except for modifications as may be required for special conditions. For such modifications, refer to the corresponding detailed drawings.

   D. The Contractor shall comply with all construction permits for this project. In addition, The Contractor shall comply with all applicable laws of the federal, state and county Governments.

   E. All temporary construction items shall be in conformance with the AASHTO Guide Design Specifications for Bridge Temporary Works, 1995, with 2008 Interim Revisions and the Construction Handbook for Bridge Temporary Works, 1995, with 2008 Interim Revisions.

   F. Unless otherwise noted, all vertical dimensions are measured plumb.

   G. The Contractor shall verify all site conditions before commencing with work.

   H. The Contractor shall verify the location of all underground utility lines and notify the respective owners before commencing the work of excavation or drilled shafts.

   I. For concrete finish, see standard specifications.

   J. Unless otherwise noted, all exposed concrete edges shall be chamfered 3/4" x 3/4".

7. PRESTRESSED GIRDER BEARING SURFACE:

   A. Prestressed girder bearing surface shall be smooth and sloped to match the finish roadway slope.

   B. Prestressed girder shelf elevations shall be verified by the contractor. Shelf elevations shall take into consideration the concrete topping thickness, prestressed girder thickness, roadway slope, and the calculated, or if available, the actual camber of the prestressed girders.

8. FOUNDATION EXCAVATION AND DEWATERING:

   A. Temporary shoring and dewatering may be required for foundation excavations.

   B. Temporary shoring and dewatering, if required, shall be considered incidental to structure excavation.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
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LEE T. TAKUSHI
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STRUCTURAL NOTES

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-2 OF 26 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	52	99

STRUCTURAL NOTES (CONT.):

9. FOUNDATION:

These foundation notes were based on recommendations contained in a Geotechnical Engineering Exploration report by Geolabs, Inc. Dated September 12, 2014. Contractor may obtain a copy of the report at the State of Hawaii, Department Of Transportation - Highways Division upon request.

A. 4'-0- Diameter Drilled Shafts:

(1). The compressive load capacity for the drilled shafts are from friction between the concrete shaft and the surrounding soils and coral formation. the following

Compressive load capacity were used for design of the abutments:

- Strength limit state = 730 kips
- Extreme event limit state = 1620 kips

(2). The uplift load capacity for the drilled shafts are from a combination of friction between the concrete shaft and the surrounding soils and coral formation and from the self weight of the shaft. The following uplift load capacity were used for design of the abutments:

- Strength limit state = 427 kips (Abutment #1)
  418 kips (Abutment #2)
- Extreme event limit state = 1,220 kips (Abutment #1)
  = 1,195 kips (Abutment #2)

(3). The lateral load resistance for the drilled shafts is based on the stiffness of the surrounding soil, the stiffness of the shaft, allowable deflection at the top of shaft, and the induced moment in the shaft. The foundation loads, lateral deflection and maximum induced moments for the drilled shafts are as follows:

A) Longitudinal Lateral Load:

1) Strength limit state:

- Axial Loads = 5,100 kips (Both Abutments)
- Longitudinal Horizontal Loads = 630 kips (Both Abutments)
- Longitudinal lateral deflection = 0.42 inches (Abutment #1)
  0.88 inches (Abutment #2)
- Maximum induced moment = 1,085 ft-kips (Abutment #1)
  1,545 ft-kips (Abutment #2)

2) Extreme Event limit state:

- Axial Loads = 4,280 kips (Both Abutments)
- Longitudinal horizontal loads = 0 kips (Both Abutments)
- Longitudinal lateral deflection = 0.21 inches (Abutment #1)
  0.81 inches (Abutment #2)
- Maximum induced moment = 320 ft-kips (Abutment #1)
  580 ft-kips (Abutment #2)

B) Transverse Lateral Load (Based on a fixed against rotation boundary condition at the top of the drilled shaft):

1) Extreme event limit state:

- Transverse Horizontal Loads = 738 kips (Both Abutments)
- Transverse lateral deflection = 0.25 inches (Abutment #1)
  0.38 inches (Abutment #2)
- Maximum induced moment = 900 ft-kips (Abutment #1)
  820 ft-kips (Abutment #2)

(4). The drilled shaft estimated tip elevations shown on the plans are based on the boring data. The actual tip elevations could change due to varying subsurface conditions. The Geotechnical Engineer of record shall be present during the drilling operation to determine that the actual subsurface conditions are consistent with the conditions assumed for design. The Contractor shall make provisions for extension of the reinforcing steel cages for the drilled shafts to account for variations in the final tip elevations.

(5). The contractor shall exercise care in drilling the shaft holes and in placing concrete into the holes. Cobbles and boulders may be encountered in the fill deposit at the replacement bridge foundation locations. The drilled shaft contractor will need to have the appropriate equipment and tools to drill through these types of natural obstructions, where encountered. Appropriate measures will also be needed to avoid dislodging boulders into the drilled shaft hole during the drilling and shaft installation process.

(6). The abutment locations are underlain by sandy deposits. There is a strong potential for caving-in of the materials during the drilling operations. To reduce the potential for significant caving-in of the drilled holes, temporary casing will be required during drilled shaft installation. Care should be exercised during removal of the temporary casing to reduce the potential for "necking" of the drilled shaft concrete..

(7). Concrete placement by tremie methods is recommended during construction of the drilled shafts. The concrete shall be placed promptly after completion of drilling (within 24 hours) to reduce the potential of caving in of the sidewalls. The concrete shall be placed in a suitable manner by displacing the water in an upward fashion from the bottom of the drilled hole

(8). The Geotechnical Engineer of record shall be present during the trial shaft program to evaluate the contractor's method of drilled shaft installation and to evaluate the subsurface materials encountered; during the installation and performance of the instrumented load test on the drilled shaft; and at the site to observe the drilling and installation of production drilled shafts during construction.

(9). Drilling of shafts within a horizontal distance of 3.0 times the shaft diameter shall not commence until a minimum of 24 hours after the drilled shaft has been completed by placement of concrete to the top of shaft elevation.

10. ABUTMENT AND WING WALLS:

A. Static lateral earth pressures:
- Active earth pressure (Level Backfill) = 36 Pcf
- At-rest Earth Pressure (Level backfill) = 55 Pcf
- Active earth pressure (Max. 2H:1V Sloping Backfill)
  Horizontal = 47 Pcf
  Vertical = 23 Pcf
- At-rest Earth Pressure (Max. 2H:1V Sloping Backfill)
  Horizontal = 64 Pcf
  Vertical = 32 Pcf

B. Dynamic lateral earth forces:
- Level Backfill = 6.9 X H Psf (Rectangular Distribution)

11. STRUCTURAL BACKFILL:

1. Structural Backfill shall be in accordance with the requirements for Structure Backfill Material as indicated in Section 703.20 of the Hawaii Standard Specifications for Road and Bridge Construction, 2005 and the Special Provisions

2. Placement of the structural backfill shall be in accordance with the standard specifications and the special provisions.

3. Structural backfill on the backface of the abutment shall not be placed until the bridge concrete topping has been poured and has attained it's 28-day concrete compressive strength.

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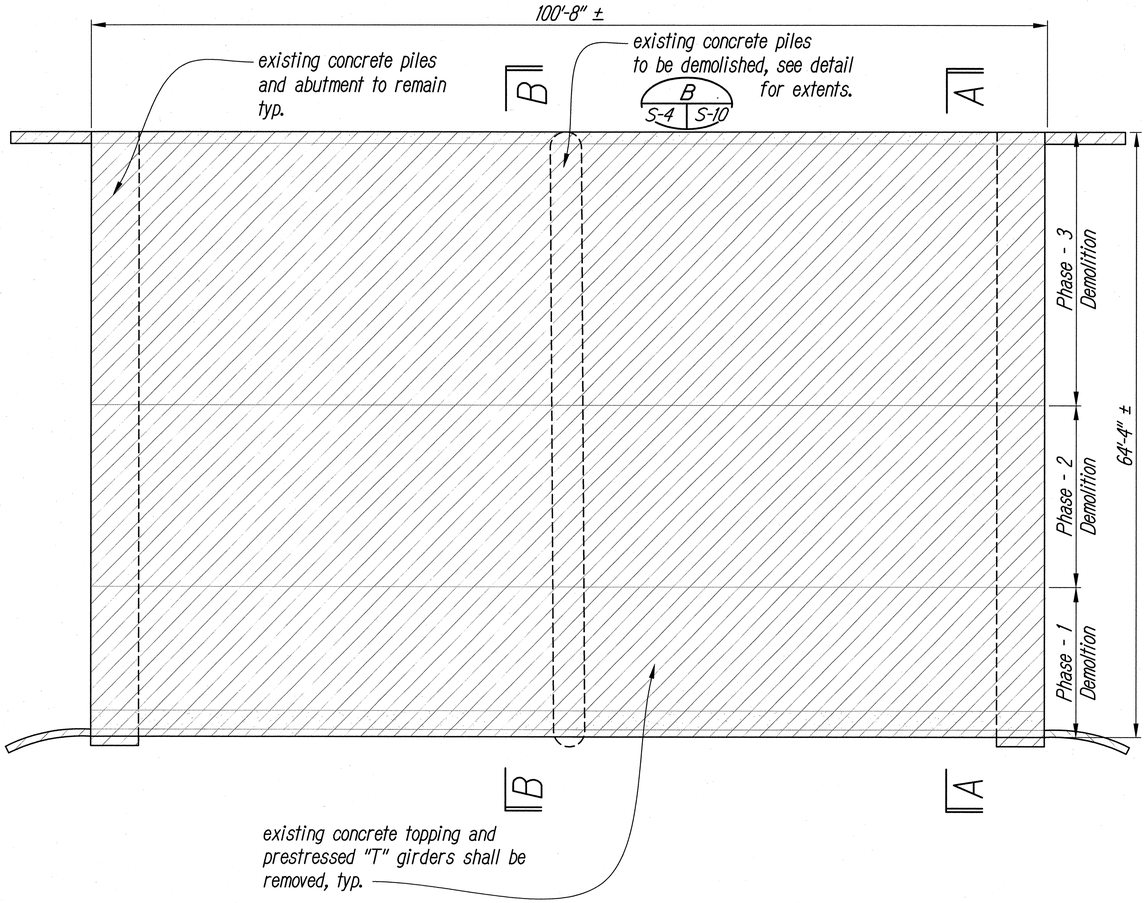
STRUCTURAL NOTES

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-3 OF 26 SHEETS

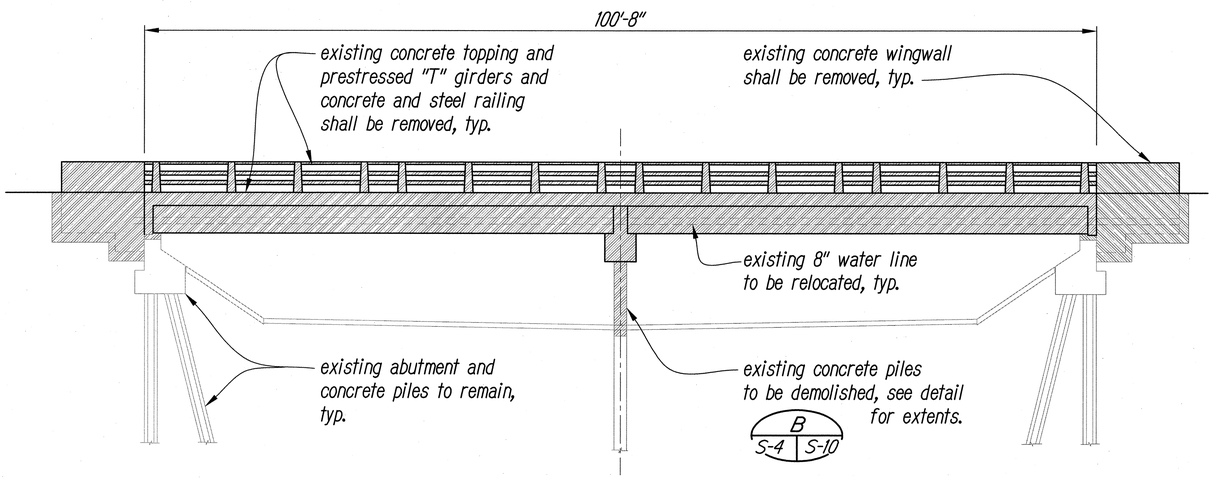
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	53	99



EXISTING BRIDGE DEMOLITION PLAN

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

TRUE NORTH
SCALE: 1/8" = 1'-0"



EXISTING BRIDGE ELEVATION

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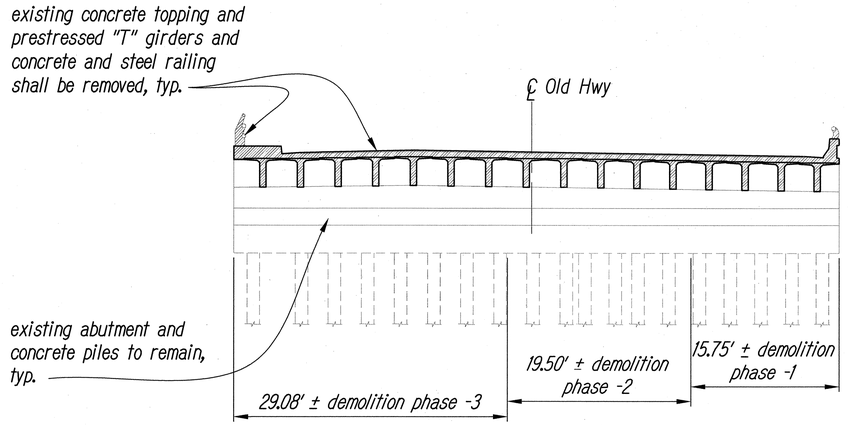
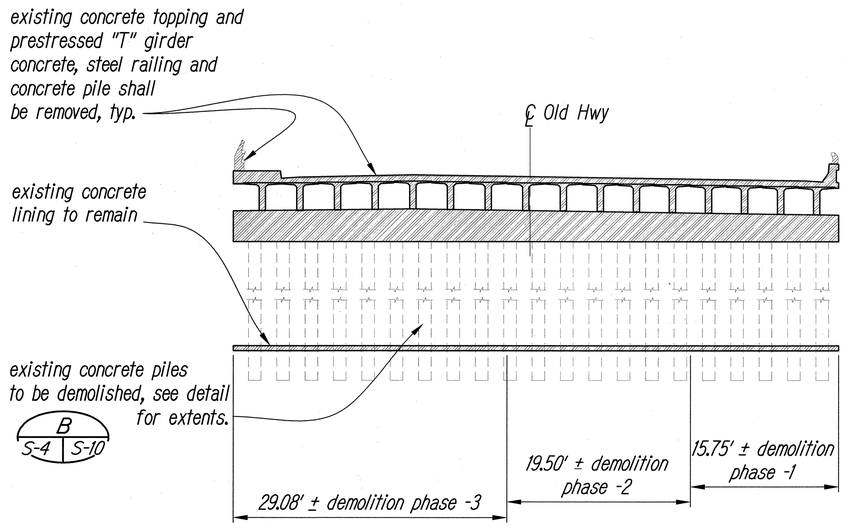


EXISTING SECTION A-A

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



EXISTING SECTION B-B

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

GRAPHIC SCALES
10' 8' 6' 4' 2' 0 10'
SCALE: 1/8" = 1'-0"

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BRIDGE DEMOLITION PLAN AND SECTIONS

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-4 OF 26 SHEETS

ORIGINAL PLAN
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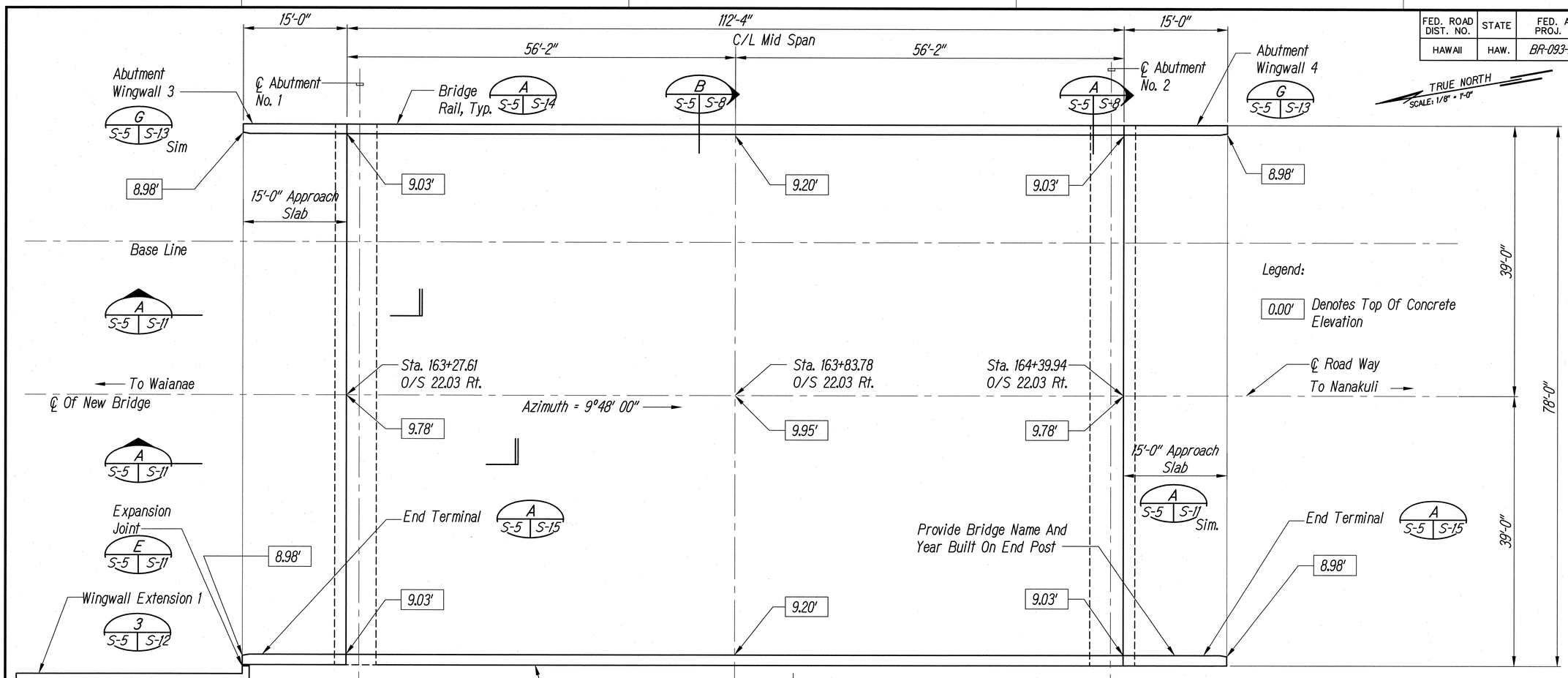
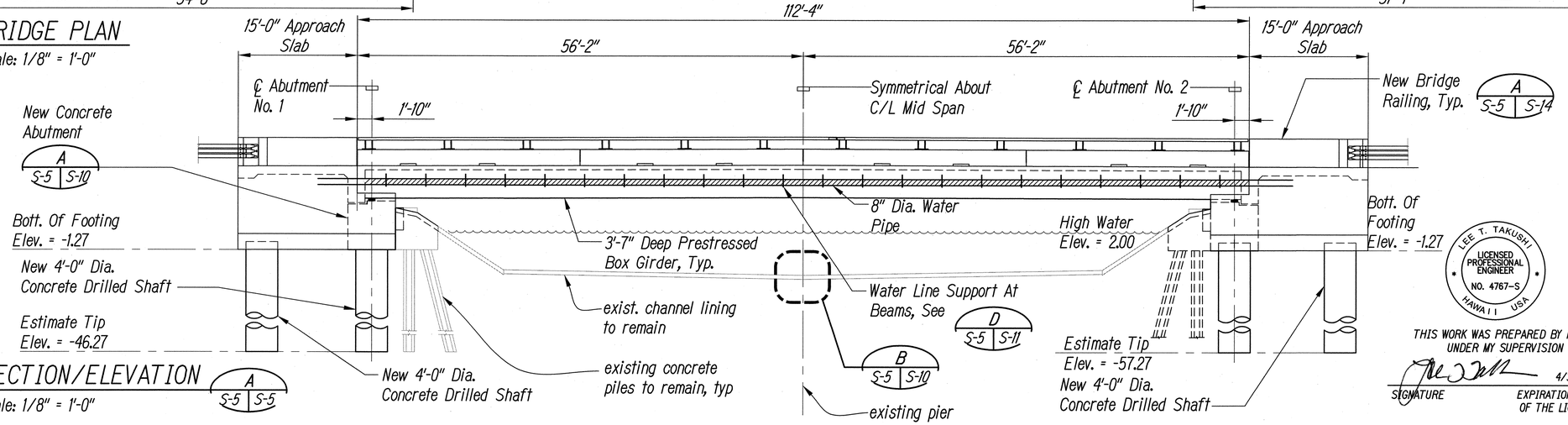
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	54	99



BRIDGE PLAN

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



SECTION/ELEVATION

A S-5 S-5

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

GRAPHIC SCALES

10' 8' 6' 4' 2' 0 10'

SCALE: 1/8" = 1'-0"

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

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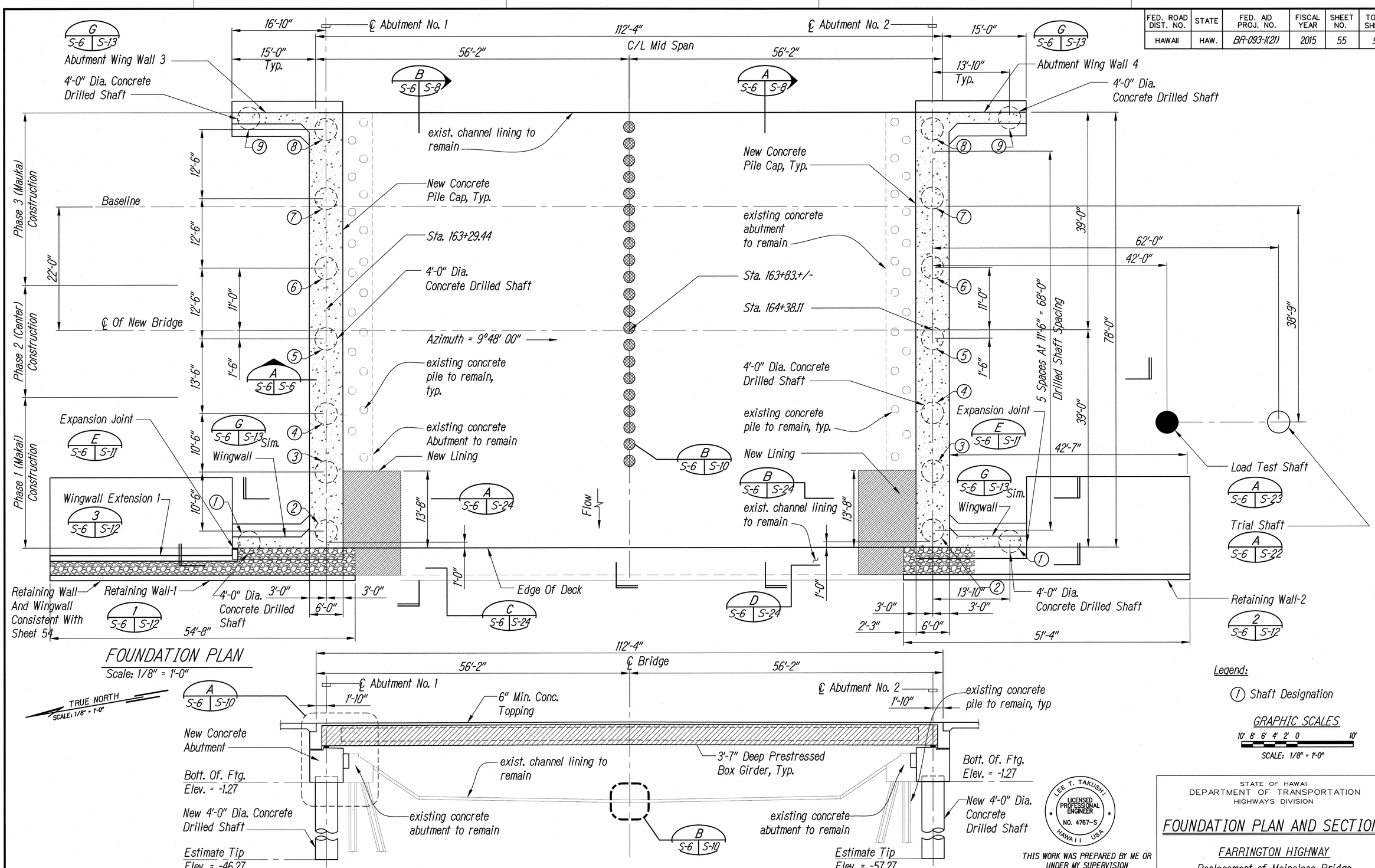
BRIDGE PLAN AND ELEVATIONS

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-5 OF 26 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	55	99



FOUNDATION PLAN

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

LONGITUDINAL SECTION

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

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

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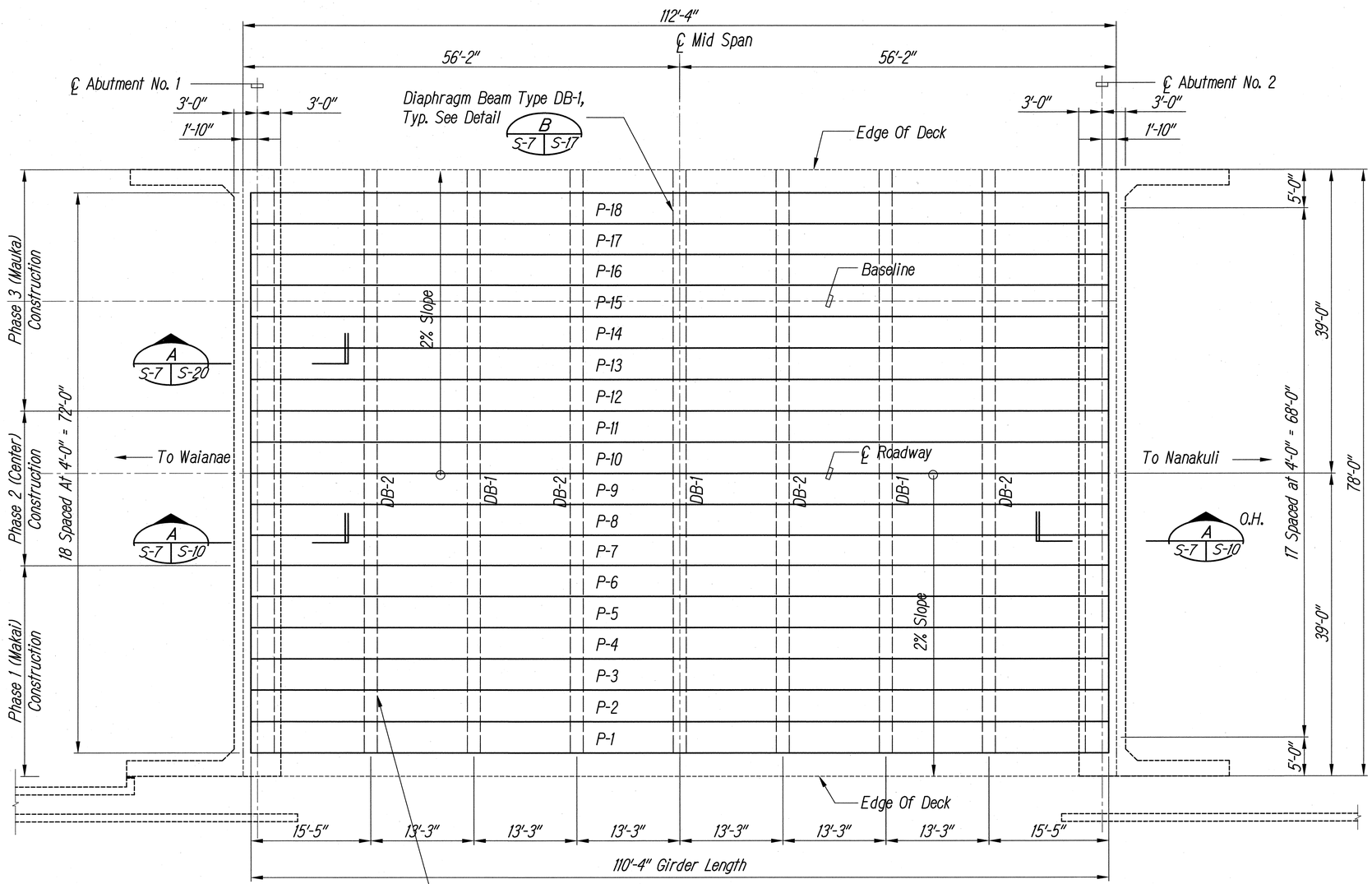
FOUNDATION PLAN AND SECTIONS

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-6 OF 26 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	56	99



GIRDER LAYOUT PLAN

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

TRUE NORTH
SCALE: 1/8" = 1'-0"

GRAPHIC SCALES
10' 8' 6' 4' 2' 0 10'
SCALE: 1/8" = 1'-0"

PRESTRESSED GIRDER NOTES:

1. Minimum concrete compressive strength (at 28 days) of prestressed girders shall be as follows:
   A) Final concrete strength = 7,000 Psi
   B) Concrete strength at transfer = 6,000 Psi
2. Prestress strands shall be seven wire 1/2" diameter low relaxation steel strands (area = 0.153 sq. In.), with an ultimate strength of 270 Ksi. For properties, see standard specifications.
3. Non-prestressed reinforcing steel shall be Grade 60, unless otherwise noted on plans. For properties, See Standard Specifications.
4. Effective prestressing force is after all losses. Losses shall take into consideration creep, shrinkage, elastic shortening and relaxation of prestressing steel.
5. Dead load deflection is due to weight of the topping.
6. Strand pattern shall be symmetrical about the longitudinal centerline of the prestressed girder.
7. Strand release sequence shall not include any lateral deflection of the prestressed girder.
8. The contractor shall submit his proposed strand pattern and releasing sequence to the engineer for approval.
9. During curing, care shall be taken to avoid any lateral deflection of the prestressed girder due to improper orientation.
10. Lifting devices shall be placed as close as possible to the centerline bearing of the prestressed girder. Details and locations of lifting devices shall be submitted to the engineer for approval. Such approval does not relieve the contractor of his responsibilities if the prestressed girder is damaged due to failure of the lifting devices.
11. Elastic shortening shall be included in determining the length of the prestressed girders.
12. The Contractor shall incorporate all inserts, dowels and other embedded items required in the prestressed girders during fabrication.
13. The calculated camber includes the effects of the initial prestress force and the weight of the prestressed girder at the time of placement. Negative values indicate a net upward deflection. The actual camber shall not exceed the calculated camber by more than 1-inch.
14. Contractor shall provide actual camber measurements prior to delivery and after delivery of prestressed girders to site. Prestressed girders exceeding the calculated camber by more than 1-inch will be rejected.

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GIRDER LAYOUT PLAN AND NOTES

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-7 OF 26 SHEETS

ORIGINAL PLAN
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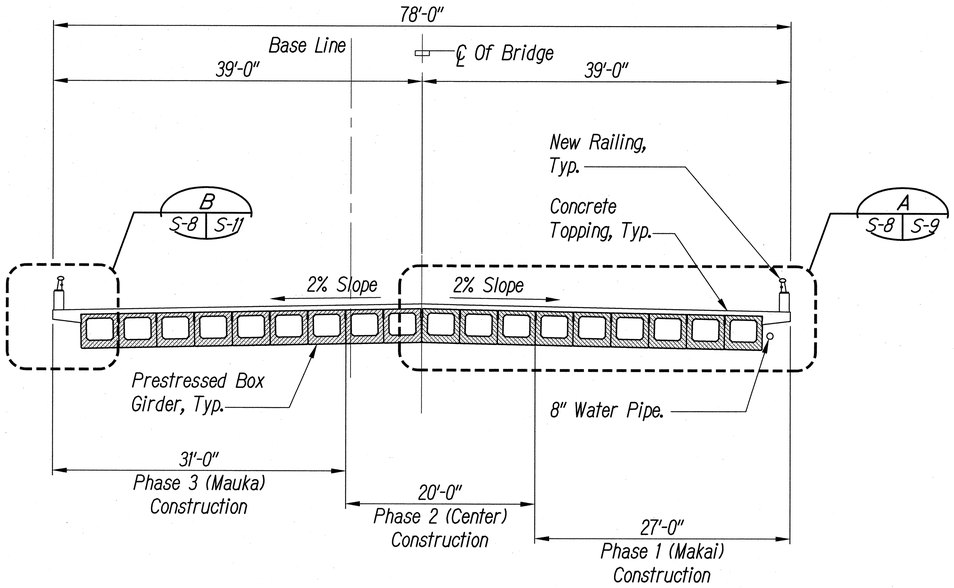
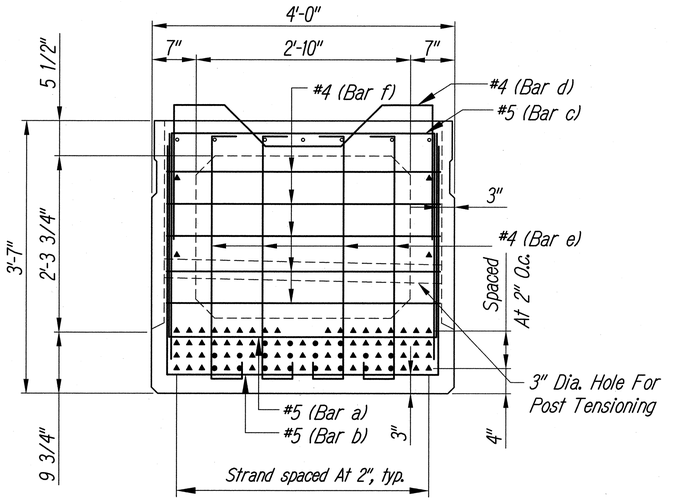
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	57	99



TYPICAL CROSS SECTION

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

B S-5, S-6 | S-8



SECTION

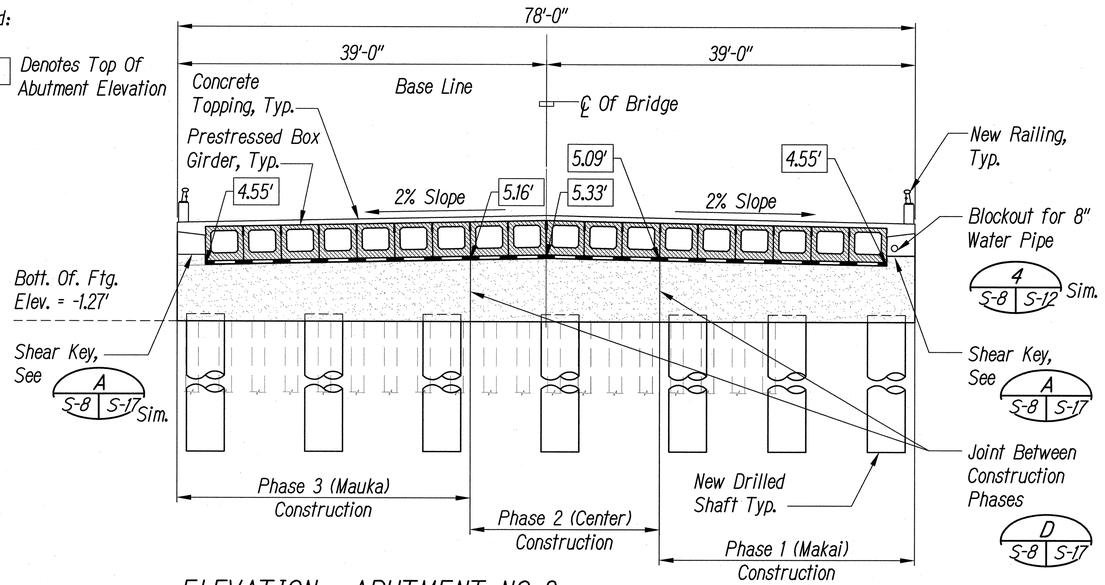
Scale: 1" = 1'-0"

C S-9 | S-8

NOTE:
For stirrup bar designations and spacing, see detail B S-9 | S-9

Legend:

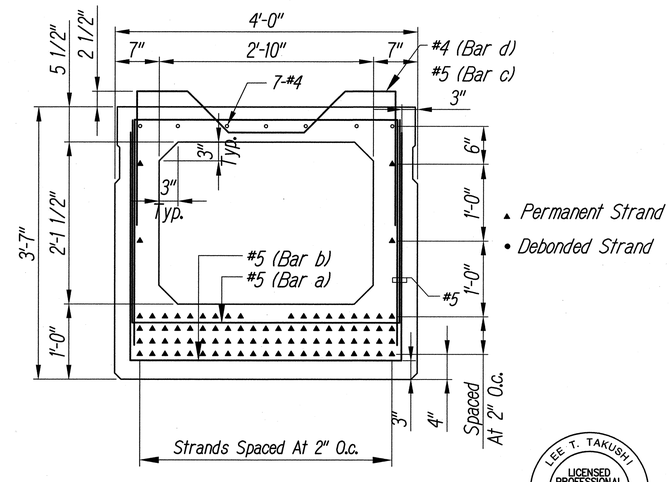
0.00' Denotes Top Of Abutment Elevation



ELEVATION - ABUTMENT NO 2
ELEVATION - ABUTMENT NO. 1 (OPPOSITE HAND)

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

A S-5, S-6 | S-8



SECTION

Scale: 1" = 1'-0"

D S-9 | S-8

NOTE:
For stirrup bar designations and spacing, see detail B S-9 | S-9

GRAPHIC SCALES

10' 8' 6' 4' 2' 0 10'
SCALE: 1/8" = 1'-0"

0 6" 1' 2' 3'
SCALE: 1" = 1'-0"

LEE T. TAKUSHI
LICENSED PROFESSIONAL ENGINEER
NO. 4767-S
HAWAII USA

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SIGNATURE 4/30/16 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE ELEVATION AND SECTIONS

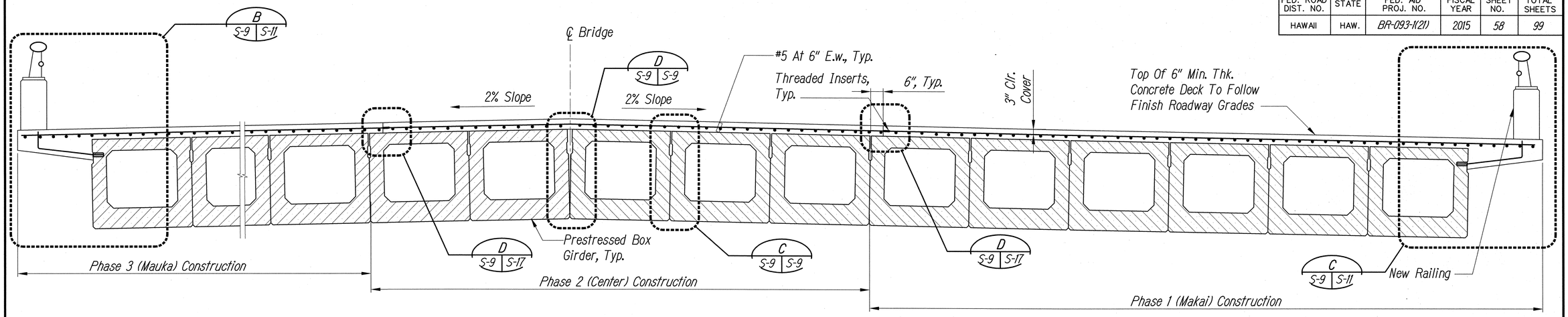
FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-8 OF 26 SHEETS

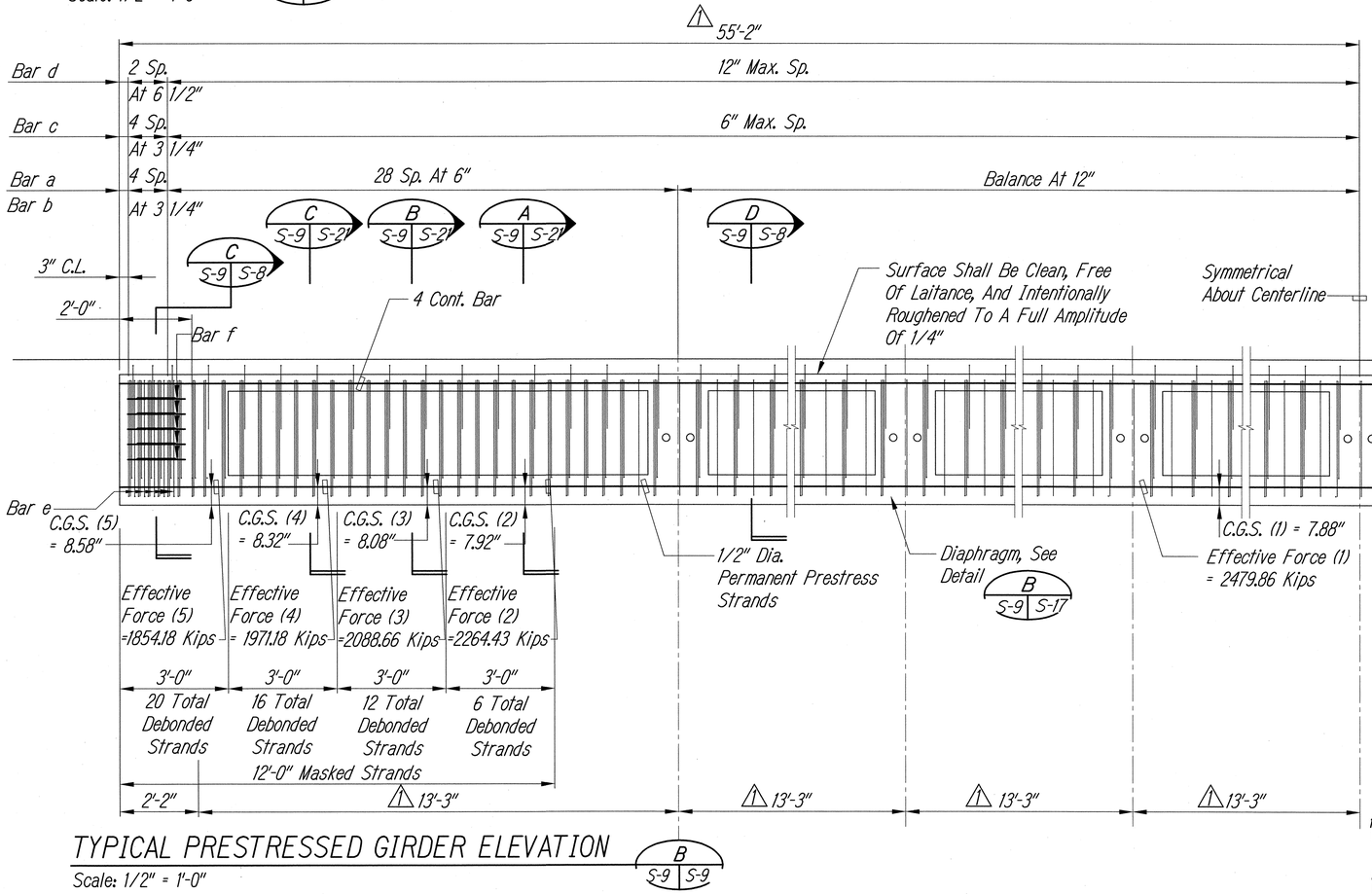
ORIGINAL PLAN | NOTE BOOK | No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	58	99



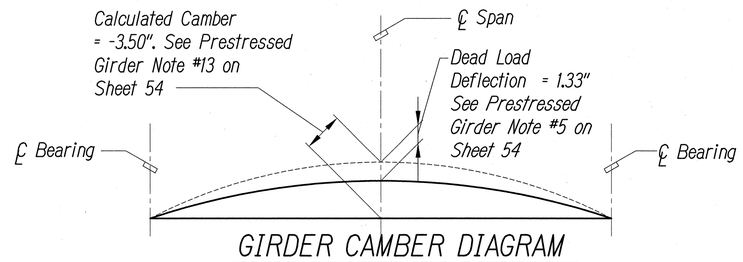
SECTION

Scale: 1/2" = 1'-0" A S-8 S-9



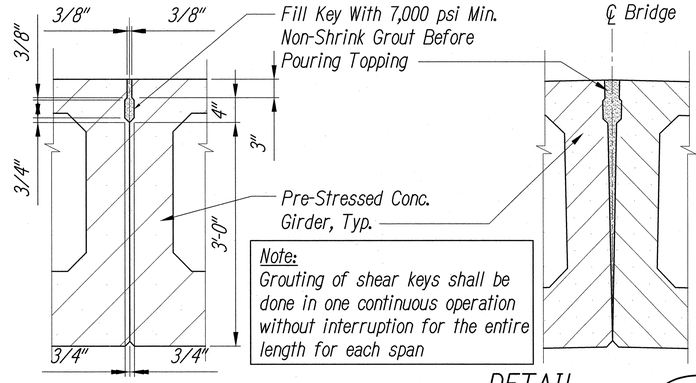
TYPICAL PRESTRESSED GIRDER ELEVATION

Scale: 1/2" = 1'-0" B S-9 S-9



GIRDER CAMBER DIAGRAM

Not To Scale



Note:
Grouting of shear keys shall be done in one continuous operation without interruption for the entire length for each span

DETAIL

Scale: 1" = 1'-0" C S-9 S-9

DETAIL

Scale: 1" = 1'-0" D S-9 S-9

GRAPHIC SCALES

1' 6" 0 1' 2' 3' 4' 5'
SCALE: 1/2" = 1'-0"
1' 6" 0 1' 2' 3'
SCALE: 3/4" = 1'-0"

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LICENSED PROFESSIONAL ENGINEER
NO. 4767-S
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DATE	REVISION
10/20/15	⚠ Revised Girder Dimensions On Typ. Girder Elev. B

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL PRESTRESSED GIRDER ELEVATION AND SECTIONS

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-9 OF 26 SHEETS

ADD. 58

ORIGINAL PLAN
NOTE BOOK No.
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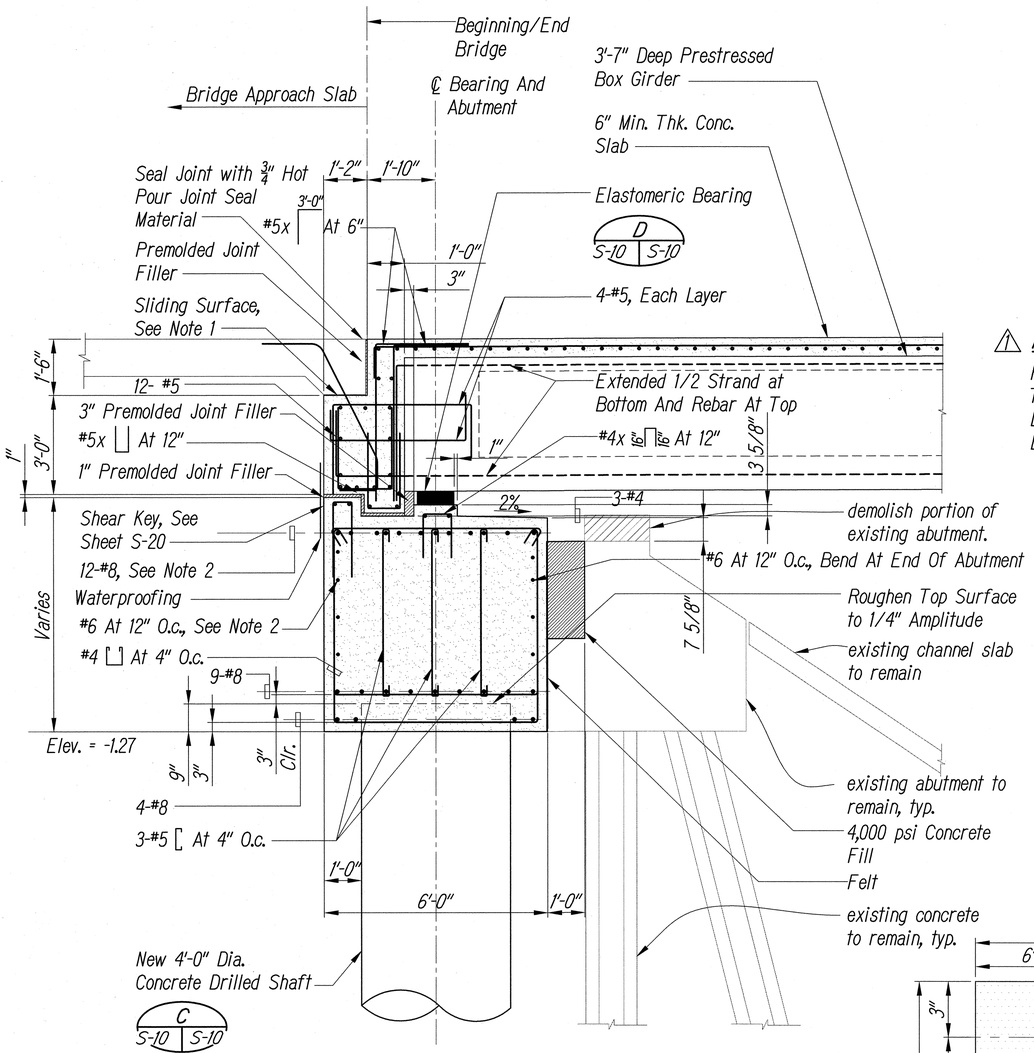
CHECKED BY
DATE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	59	99



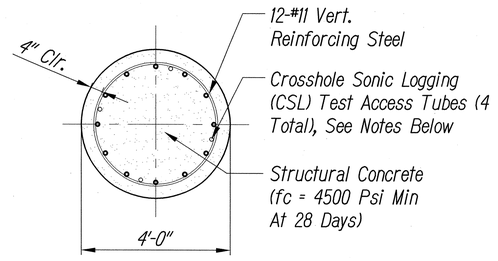
Notes:

1. Trowel Smooth And Place 2 Layers Of 4 Mil. Polyethylene Sheeting As Bond Breaker.
2. See Detail D, Sheet S-17 For All Horizontal Rebar Joints Between Construction Phases.

TYP. ABUTMENT SECTION

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

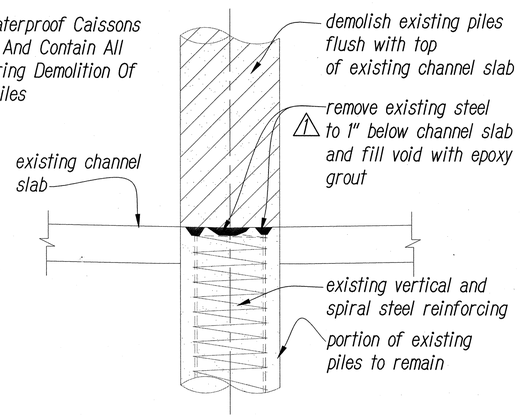
A | S-5, S-6, S-7 | S-10



SECTION "A" - "A"

⚠ **Note:**

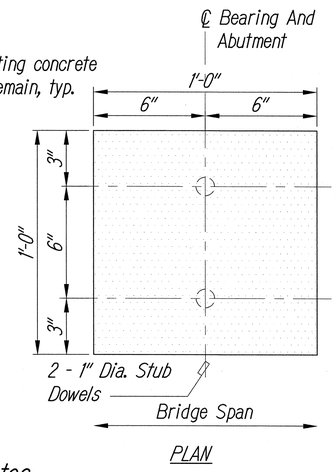
Provide Waterproof Caissons To Isolate And Contain All Debris During Demolition Of Existing Piles



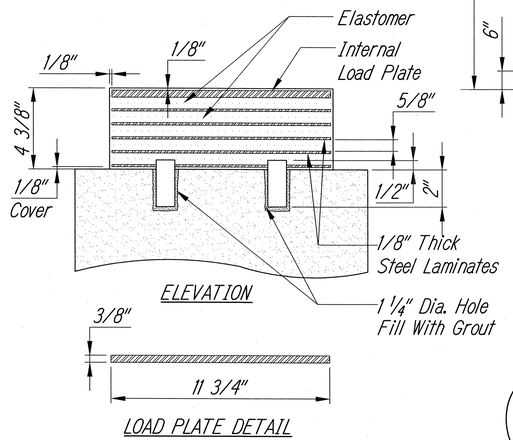
⚠ DETAIL AT EXISTING CENTER PIER

Scale: 1" = 1'-0"

B | S-4, S-5, S-6 | S-10

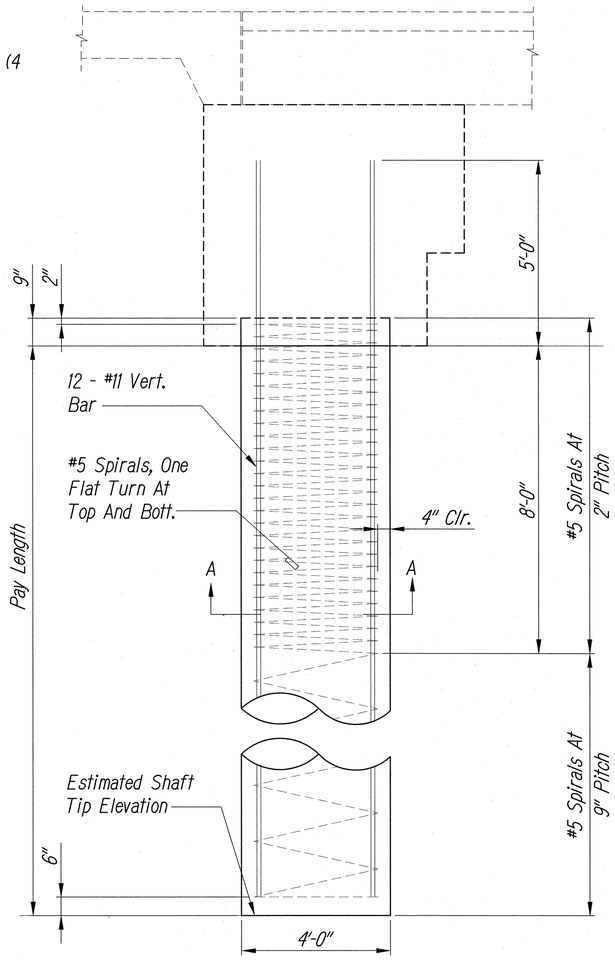


PLAN



ELEVATION

LOAD PLATE DETAIL



DRILLED SHAFT DETAIL

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

C | S-10 | S-10

GRAPHIC SCALES

1' 6" 0 1' 2' 3' 4' 5'

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

CSL Tube Notes:

1. Install CSL tubes centered between drilled shaft vertical bars.
2. CSL tubes shall be placed 90 degrees apart.
3. Securely tie CSL tubes to inside of the reinforcing cage.

Elastomeric Bearing Pad Notes:

1. Elastomer shall have a hardness of 60 durometer.
2. Steel laminates shall conform to ASTM A 1011 Grade 36 or better.
3. Load plate shall conform to AASHTO M 270 Grade 36.
4. Provide two bearing pads at each end of each girder.

TYP. ELASTOMERIC BEARING PAD DETAIL

Not To Scale

D | S-10 | S-10

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LICENSED PROFESSIONAL ENGINEER
NO. 4767-S
HAWAII USA

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4/30/16
EXPIRATION DATE OF THE LICENSE

DATE	REVISION
10/20/15	⚠ Rev. Det. B, Added Note

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL SECTIONS AND DETAILS

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

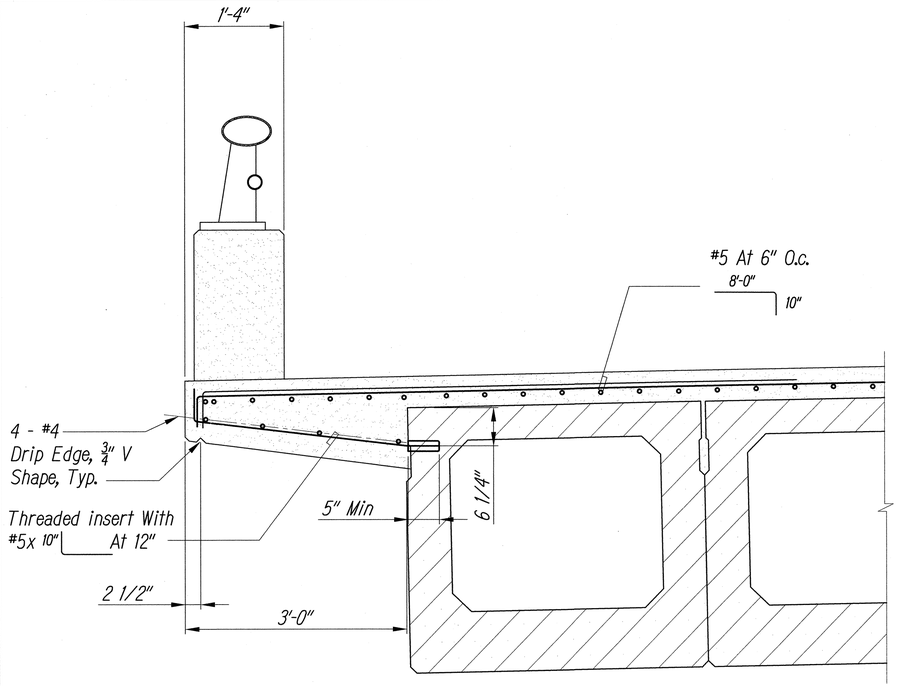
Scale: AS NOTED Date: JUNE 2015

SHEET No. S-10 OF 26 SHEETS

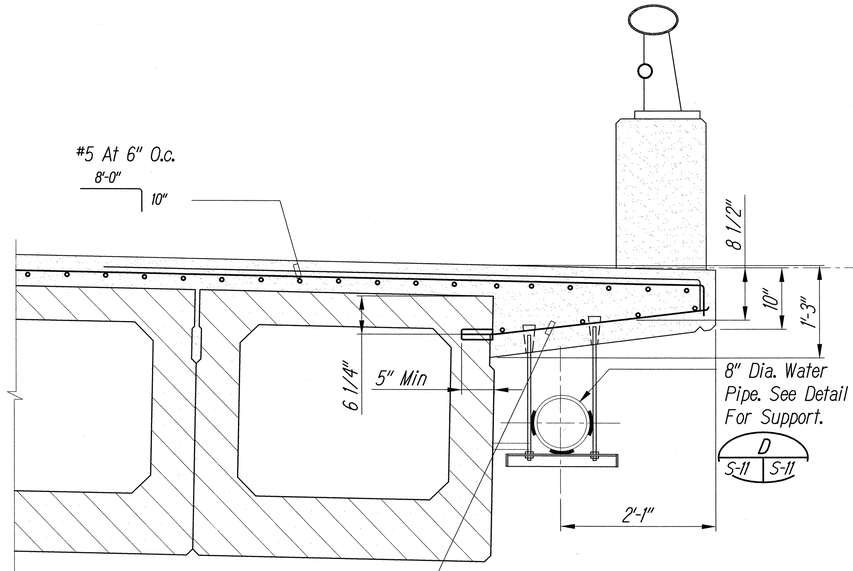
ADD. 59

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

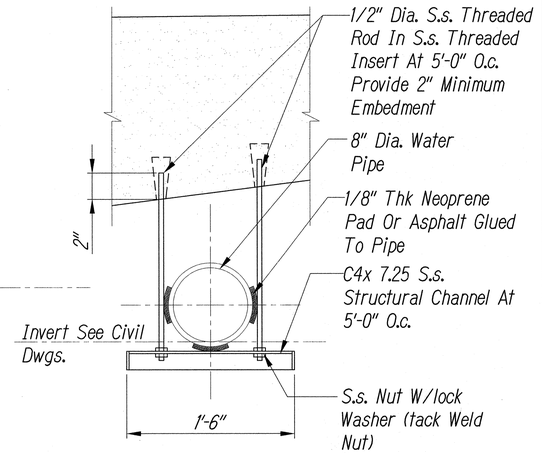
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	60	99



SECTION
Scale: 1" = 1'-0"
B
S-8, S-9 | S-11

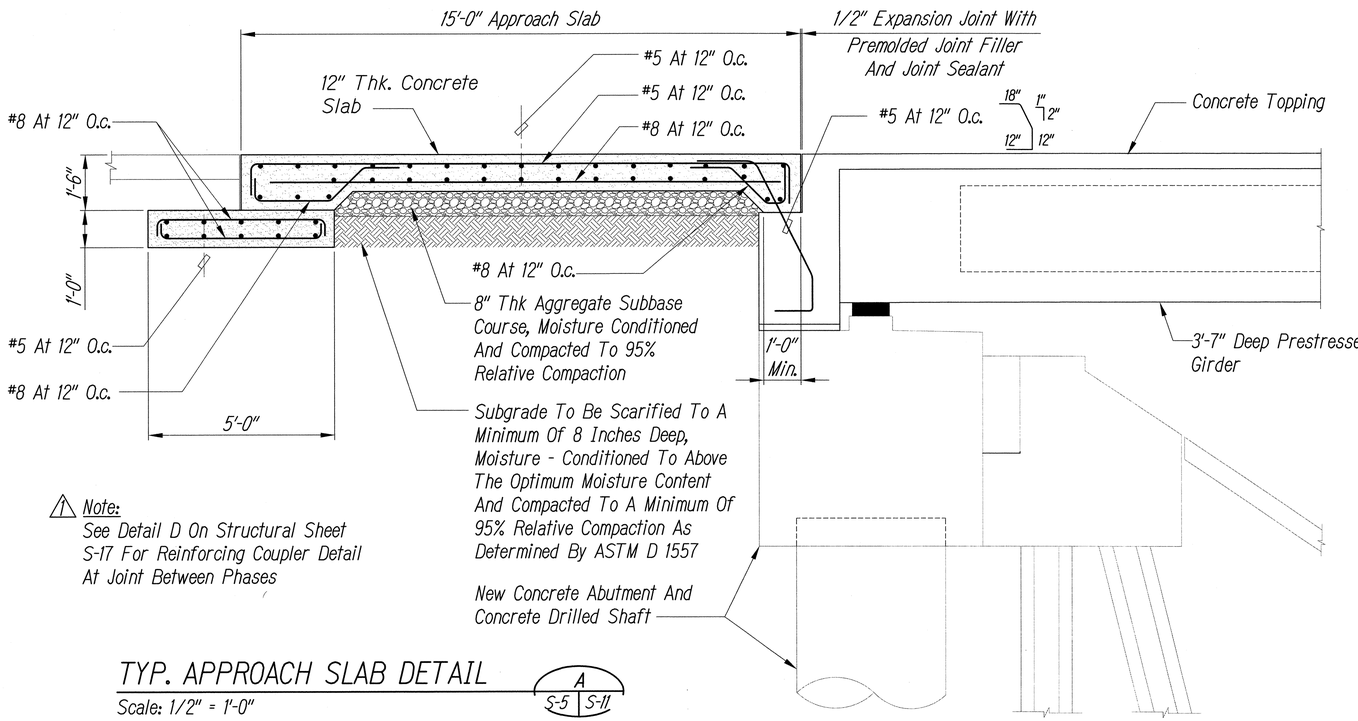


SECTION
Scale: 1" = 1'-0"
C
S-9 | S-11



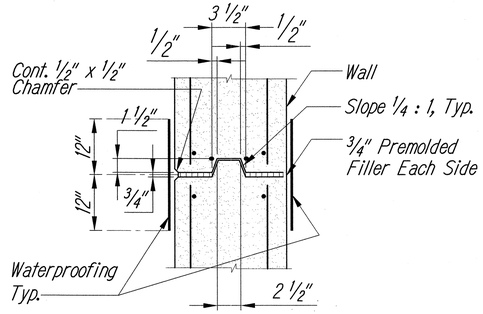
SECTION
Scale: 1 1/2" = 1'-0"
D
S-5, S-11 | S-11

APPROVED:
BY MANAGER AND CHIEF ENGINEER, BWS
(For work Affecting BWS Facilities In City/State R/W & BWS Easements only)
2-24-2015
DATE

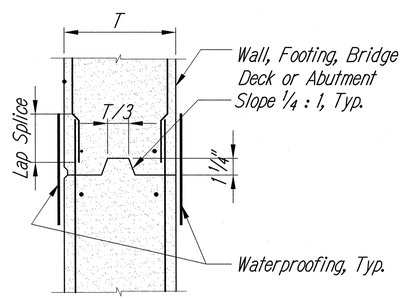


⚠ Note:
See Detail D On Structural Sheet S-17 For Reinforcing Coupler Detail At Joint Between Phases

TYP. APPROACH SLAB DETAIL
Scale: 1/2" = 1'-0"
A
S-5 | S-11



TYP. EXPANSION JOINT DETAIL
Scale: 1 1/2" = 1'-0"
E
S-5, S-6 | S-11



TYP. CONSTRUCTION JOINT DETAIL
Scale: 1 1/2" = 1'-0"
F
S-11 | S-11

GRAPHIC SCALES

1' 6" 0 1' 2' 3' 4' 5'
SCALE: 1/2" = 1'-0"

0 6" 1' 2' 3'
SCALE: 1" = 1'-0"

1' 9" 6" 3" 0 1'
SCALE: 1-1/2" = 1'-0"

LEE T. TAKUSHI
LICENSED PROFESSIONAL ENGINEER
NO. 4767-S
HAWAII USA

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DATE	REVISION
10/20/15	⚠ Added Note

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SECTIONS, DETAILS AND APPROACH SLAB

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

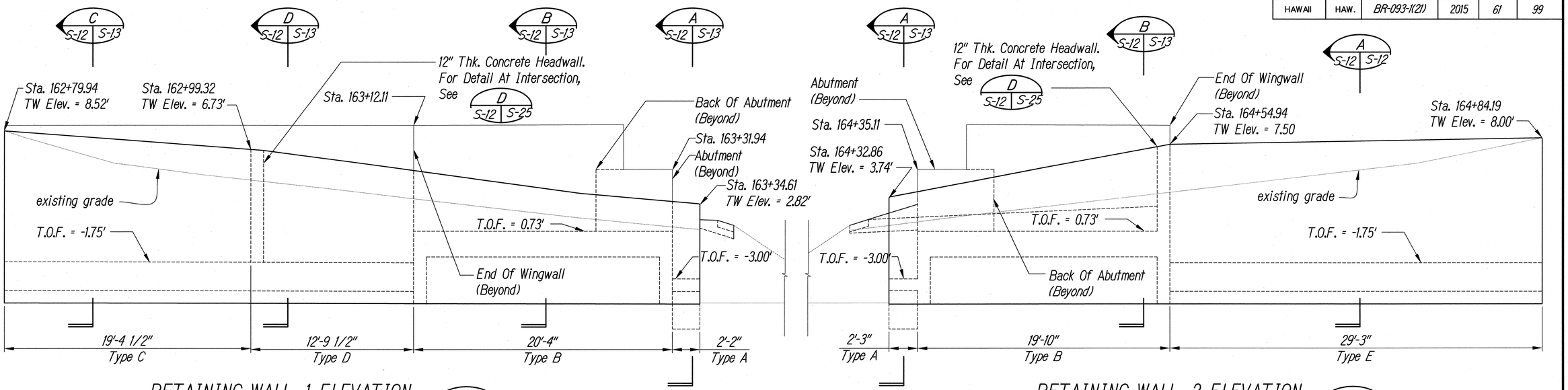
Scale: AS NOTED Date: JUNE 2015

SHEET No. S-11 OF 26 SHEETS

ADD. 60

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	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.	BR-093-1(21)	2015	61	99

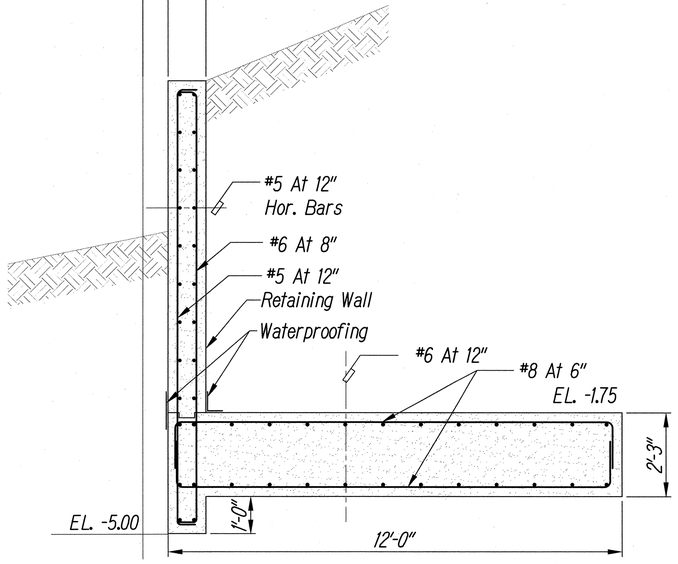


RETAINING WALL -1 ELEVATION (1 S-5, S-6 S-12)

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

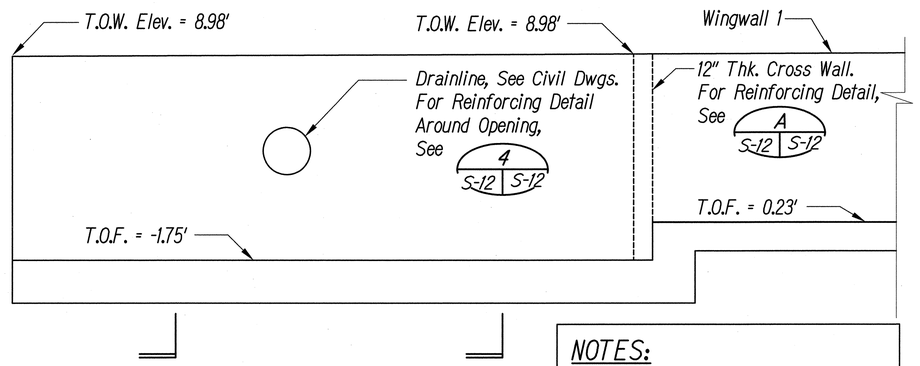
RETAINING WALL -2 ELEVATION (2 S-5, S-6 S-12)

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



SECTION (TYPE E) (A S-12 S-12)

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

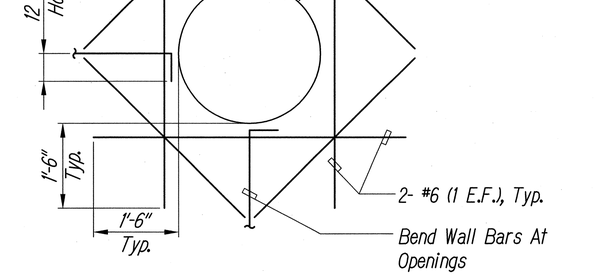


WINGWALL EXTENSION 1 (3 S-5, S-6 S-12)

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

NOTES:

1. For Reinforcing Detail at Wall Corner, See Detail E, Sheet S-25
2. For Reinforcing Detail at Wall End, See Detail F, Sheet S-25



REINFORCING AT PIPE PENETRATION (4 S-8, S-12 S-12)

Not To Scale

GRAPHIC SCALES

1" 6" 0 1' 2' 3' 4' 5'
SCALE: 1/2" = 1'-0"

5' 4' 3' 2' 1' 0 5'
SCALE: 1/4" = 1'-0"

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LICENSED PROFESSIONAL ENGINEER
NO. 4767-S
HAWAII USA

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RETAINING WALL ELEVATIONS

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-12 OF 26 SHEETS

ORIGINAL PLAN
NOTE BOOK No.
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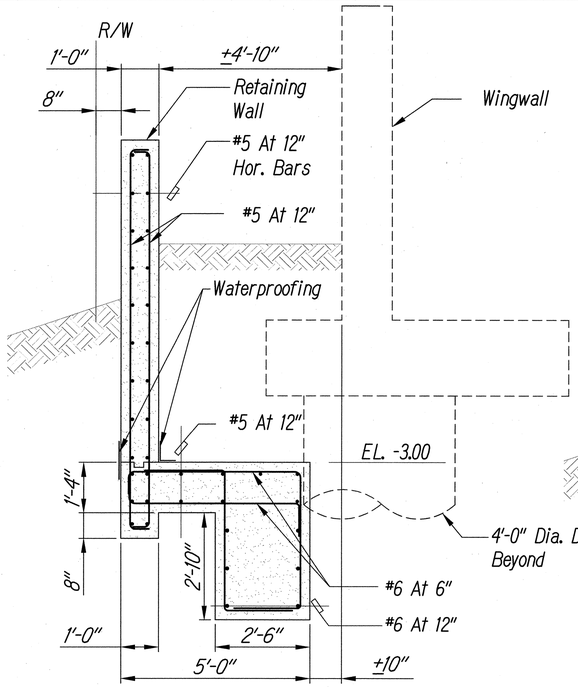
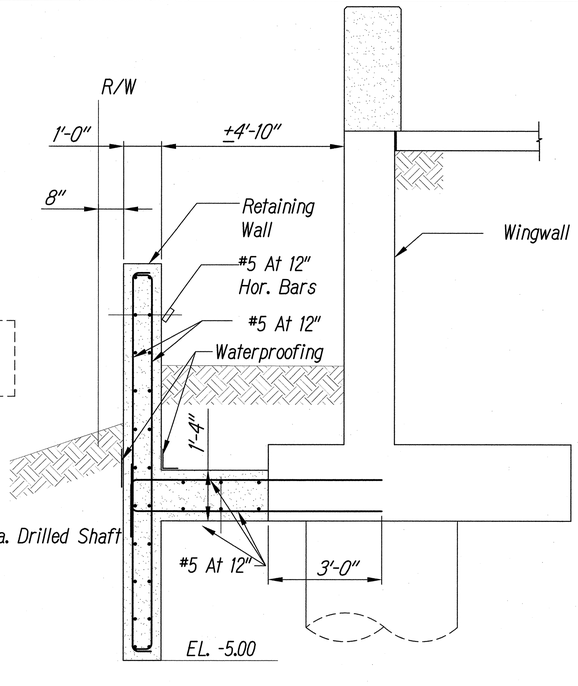
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	62	99



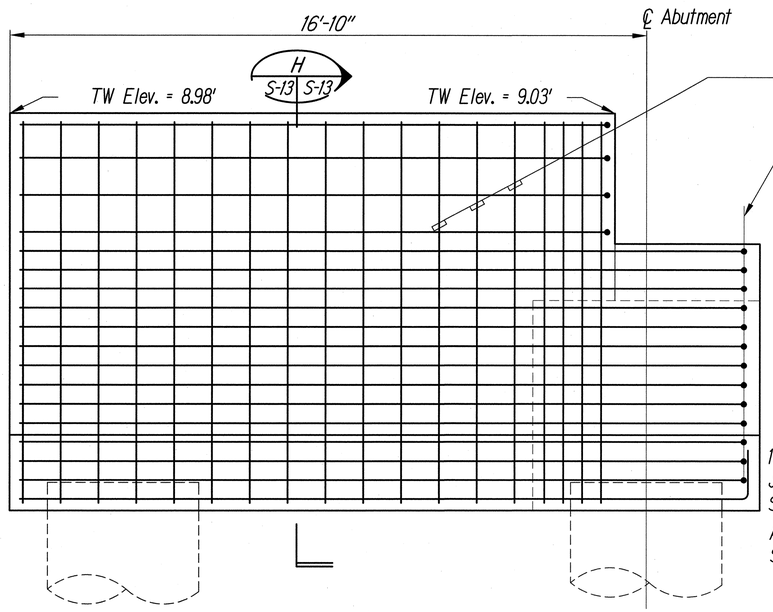
SECTION (TYPE A) — A — S-12 | S-13

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



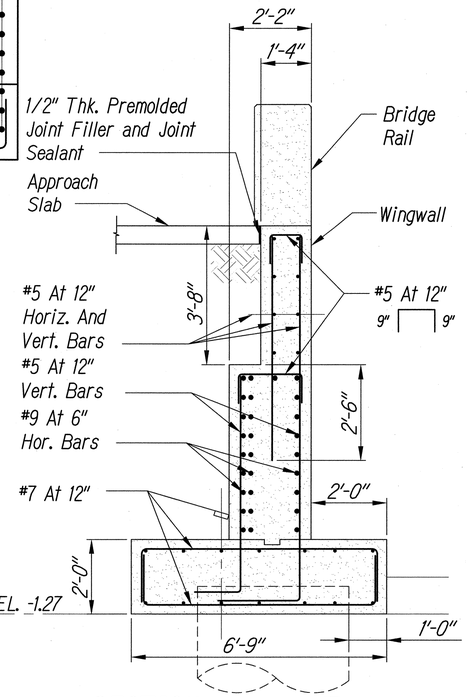
SECTION (TYPE B) — B — S-12 | S-13

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



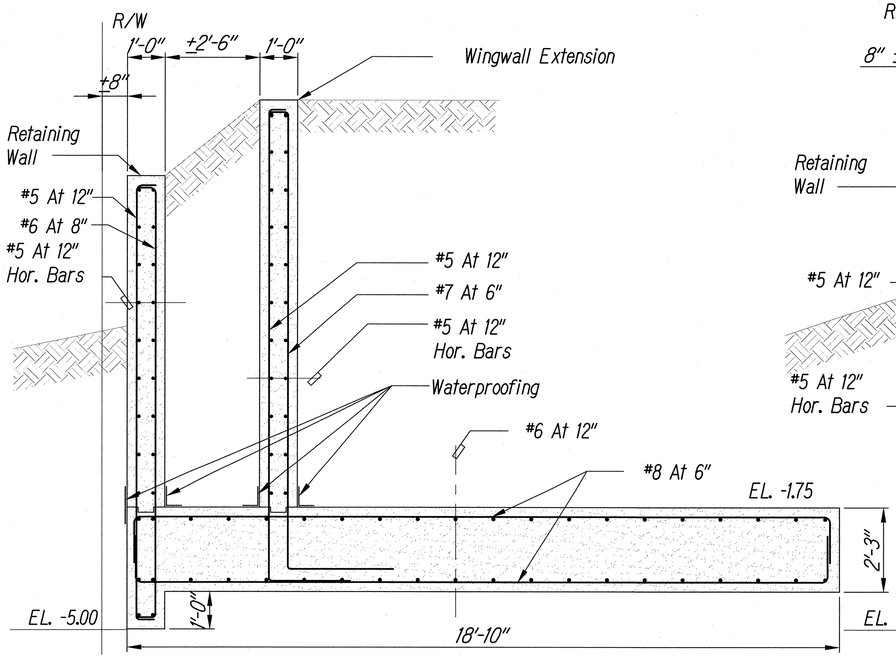
WINGWALL — G — S-5, S-6 | S-13

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



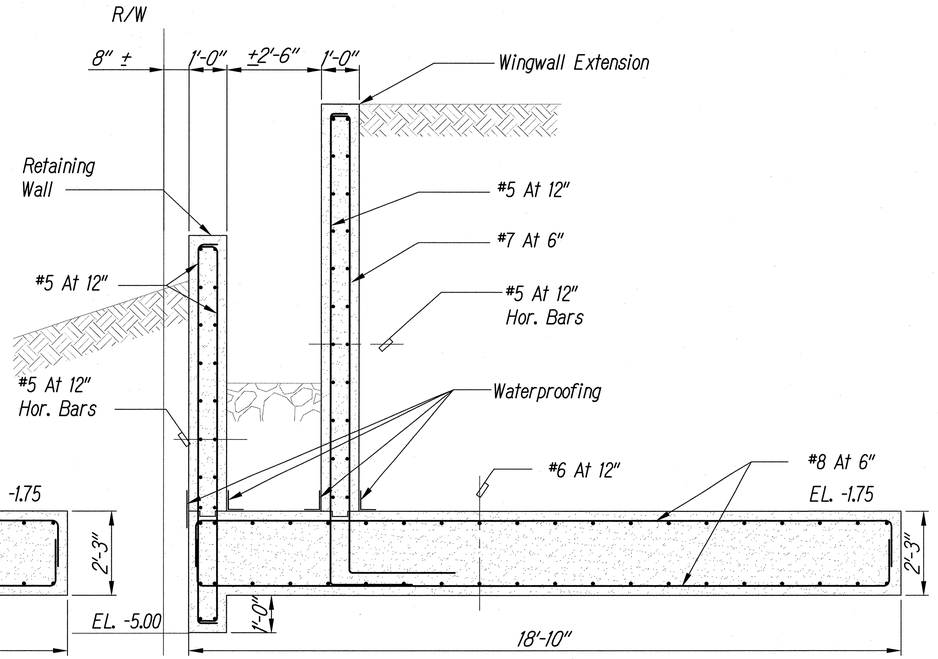
SECTION — H — S-13 | S-13

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



SECTION (TYPE C) — C — S-12 | S-13

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



SECTION (TYPE D) — D — S-12 | S-13

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

GRAPHIC SCALES

1' 6" 0 1' 2' 3' 4' 5'

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL WINGWALL AND RETAINING WALL SECTIONS

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-13 OF 26 SHEETS

ORIGINAL PLAN
NOTE BOOK No.
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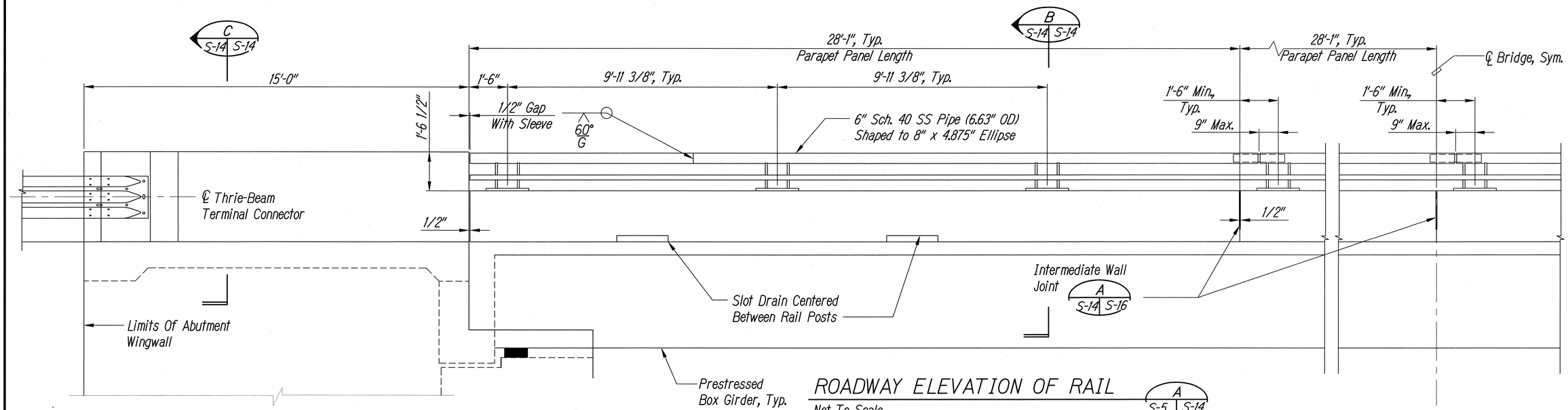
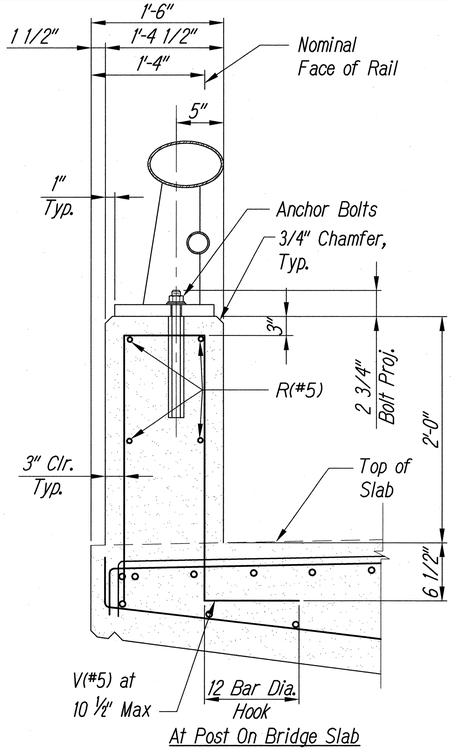
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	63	99



ROADWAY ELEVATION OF RAIL

Not To Scale

A S-5 S-14

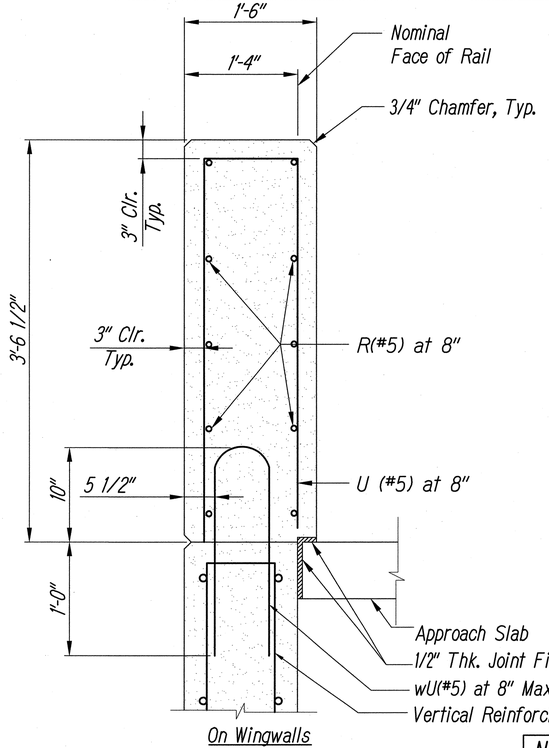


At Post On Bridge Slab

SECTION

Not To Scale

B S-14, S-19 S-14



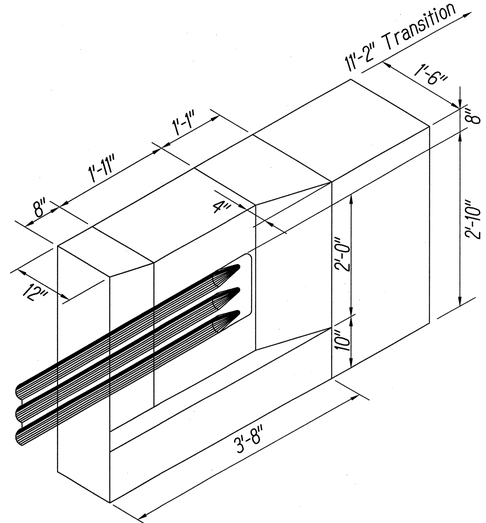
On Wingwalls

SECTION

Not To Scale

C S-14 S-14

NOTE:
Direction of Bend May Be Varied To Fit At ARV Slab Opening.



ISOMETRIC VIEW AT END OF BRIDGE

Not To Scale

D S-14 S-14

LEE T. TAKUSHI
LICENSED PROFESSIONAL ENGINEER
NO. 4767-S
HAWAII USA

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SIGNATURE 4/30/16 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE RAILINGS

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-14 OF 26 SHEETS

63

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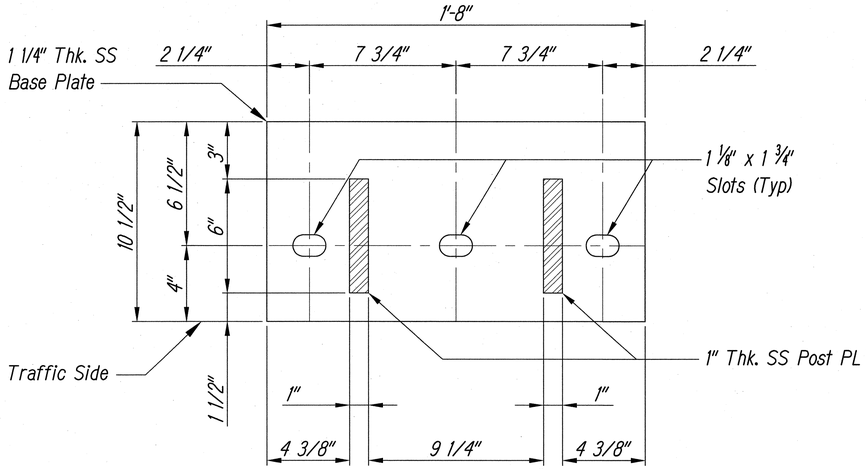
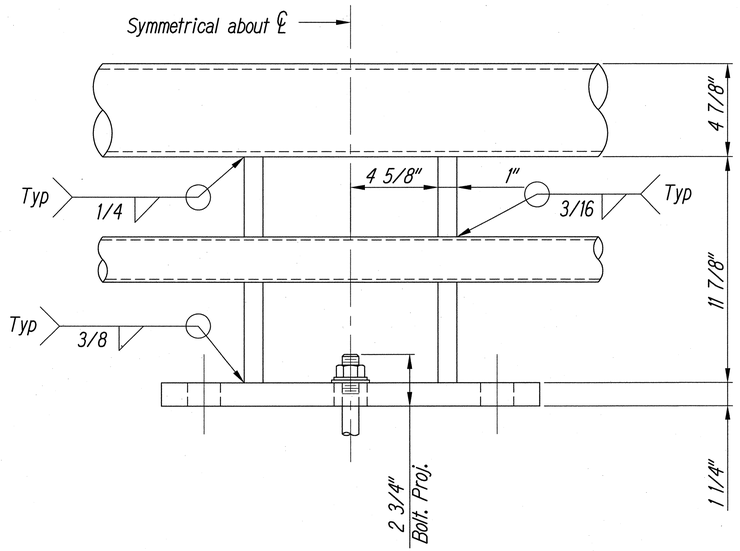
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

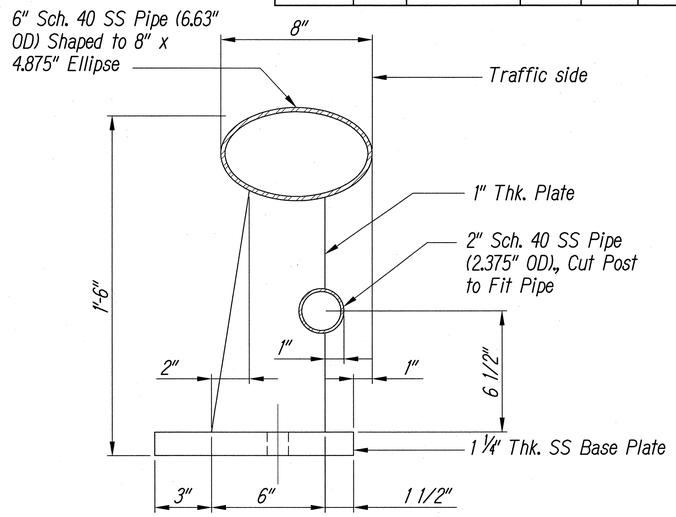
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	64	99



SECTION THRU POST



ELEVATION

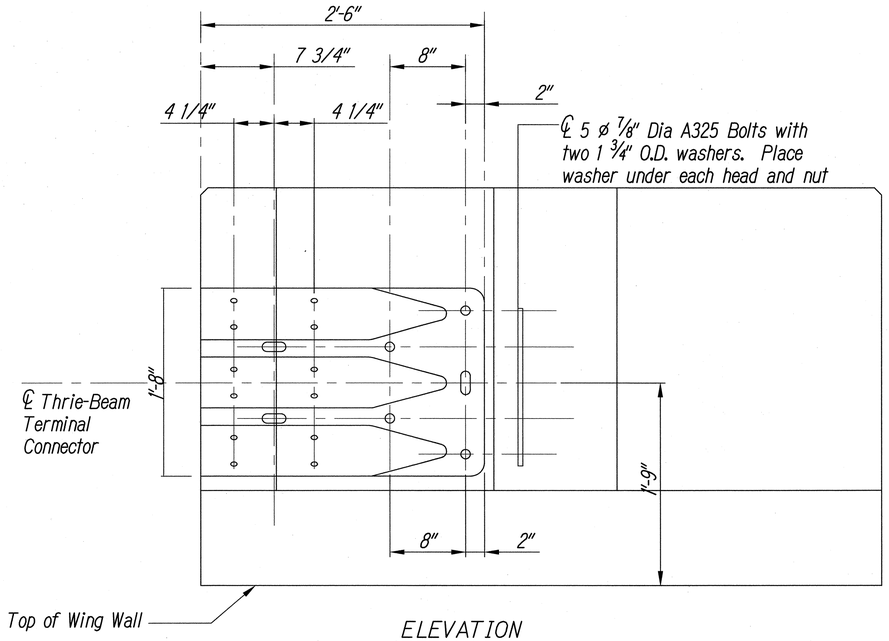


SECTION THRU RAIL

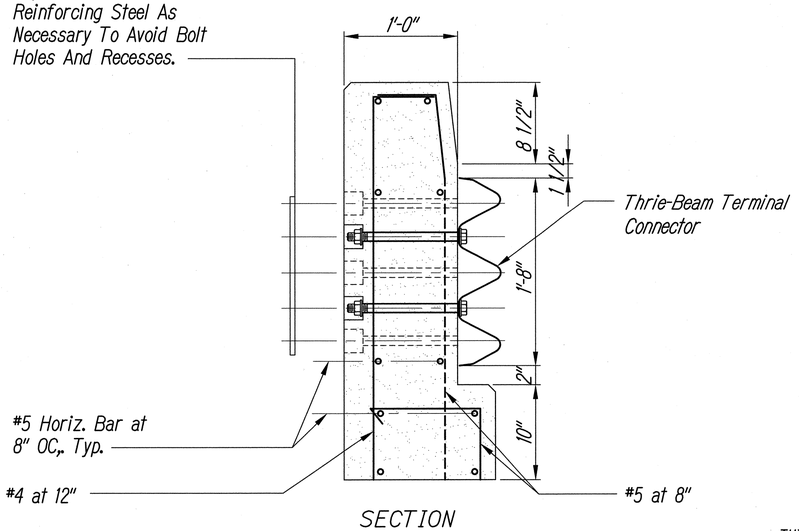
TUBE RAIL WITH POST AND ANCHORAGE DETAILS

Not To Scale

B S-15 | S-15



ELEVATION



SECTION

THRIE BEAM TERMINAL CONNECTION DETAILS

Not To Scale

A S-5 | S-15

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NO. 4767-S
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HIGHWAYS DIVISION

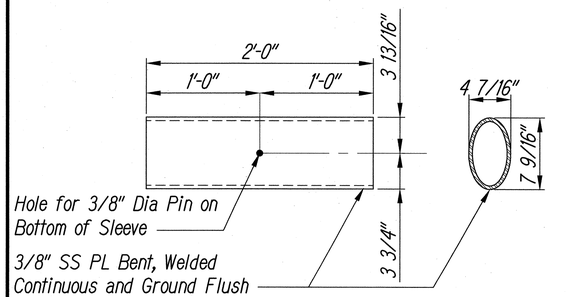
BRIDGE RAILINGS

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

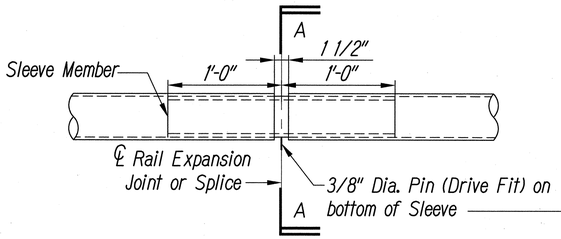
Scale: AS NOTED Date: JUNE 2015

SHEET No. S-15 OF 26 SHEETS

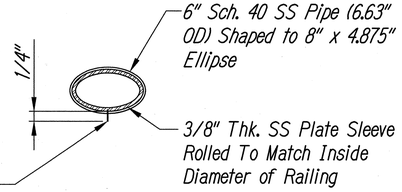
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	65	99



SLEEVE DETAIL
Not To Scale — B — S-16 | S-16

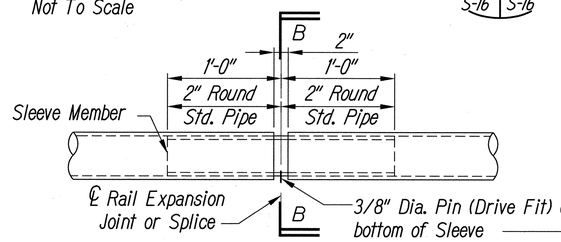


AT SPLICE OR EXP JTS

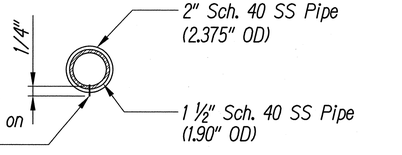


SECTION A-A

TUBE FABRICATION DETAIL
Not To Scale — C — S-16 | S-16

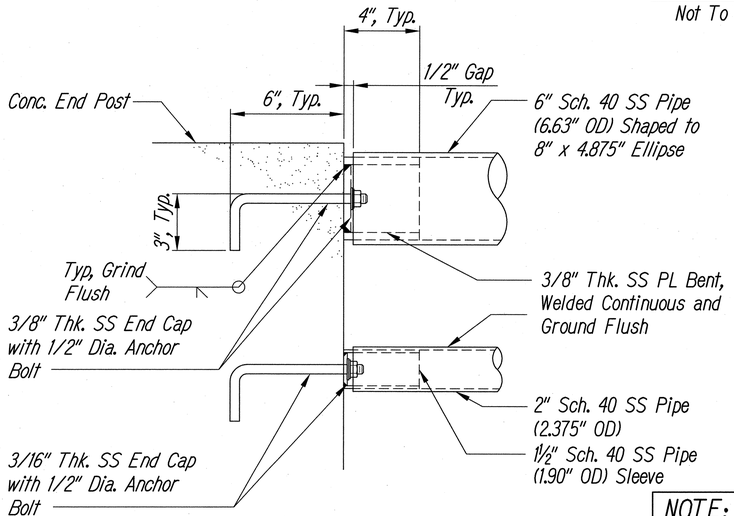


AT SPLICE OR EXP JTS

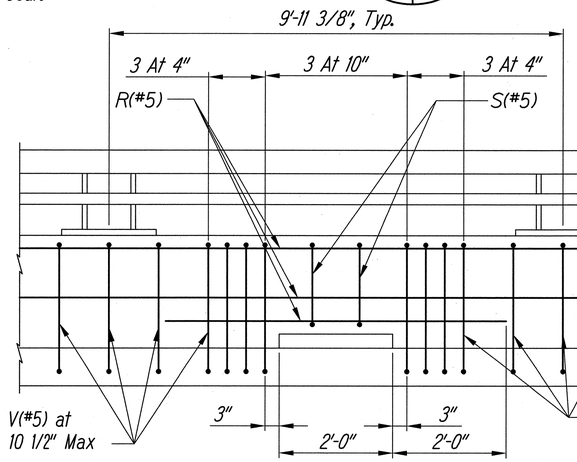


SECTION B-B

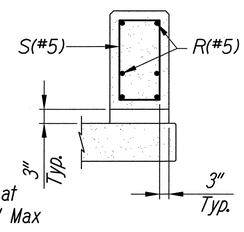
TUBE FABRICATION DETAIL
Not To Scale — D — S-16 | S-16

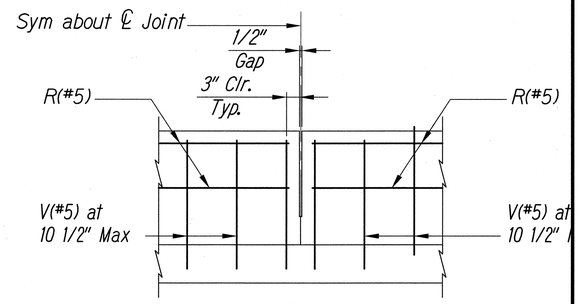


TUBE RAIL AT END POST
Not To Scale — E — S-16 | S-16



AT SLOT DRAIN

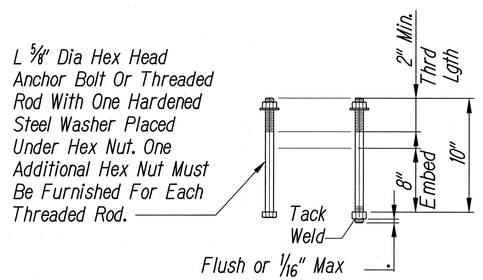


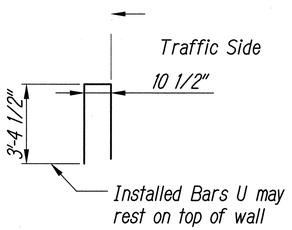


ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT
Not To Scale — A — S-14, S-16 | S-16

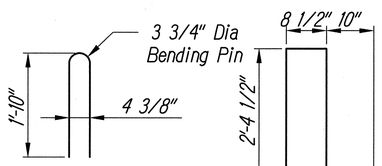
AT INTERMEDIATE WALL JOINT

NOTE:
Slot drains to be provided at both bridge rails.

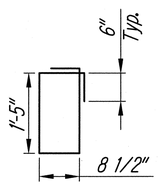




BARS U(#5)



BARS wU(#5) BARS V(#5)



BARS S(#5)

NOTES:

1. Face of rail, posts and parapet must be vertical transversely unless otherwise approved by the engineer. Pipe rail posts and opening end faces must be perpendicular to top of adjacent concrete parapet grade. Use epoxy mortar under pipe rail post base plates if gaps larger than 1/16" exist.
2. Pipe rail sections must not include less than two posts, and no more than four (except at abutments).
3. All steel components for bridge railing must be stainless steel unless otherwise shown on plans.
4. Chamfer all exposed corners.
5. Cast-in-place anchor bolts must be ASTM F593, Group 2, Condition A bolts (or threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer at each bolt.
6. Pipe for pipe rail shall conform to ASTM A312, Type 316.
7. Steel plates shall conform to ASTM A240, Type 316L
8. Erection drawings showing panel lengths, pipe rail post spacing, and anchor bolt setting must be submitted to the engineer for approval.
9. Shop drawings for approval required for steel rail sections.
10. 4 additional bars r(#5) 3'-8" in length must be placed inside bars u(#5) and centered 2'-0" from end of rail when terminal connections are required. Field bend as needed.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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	QUANTITIES BY	
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

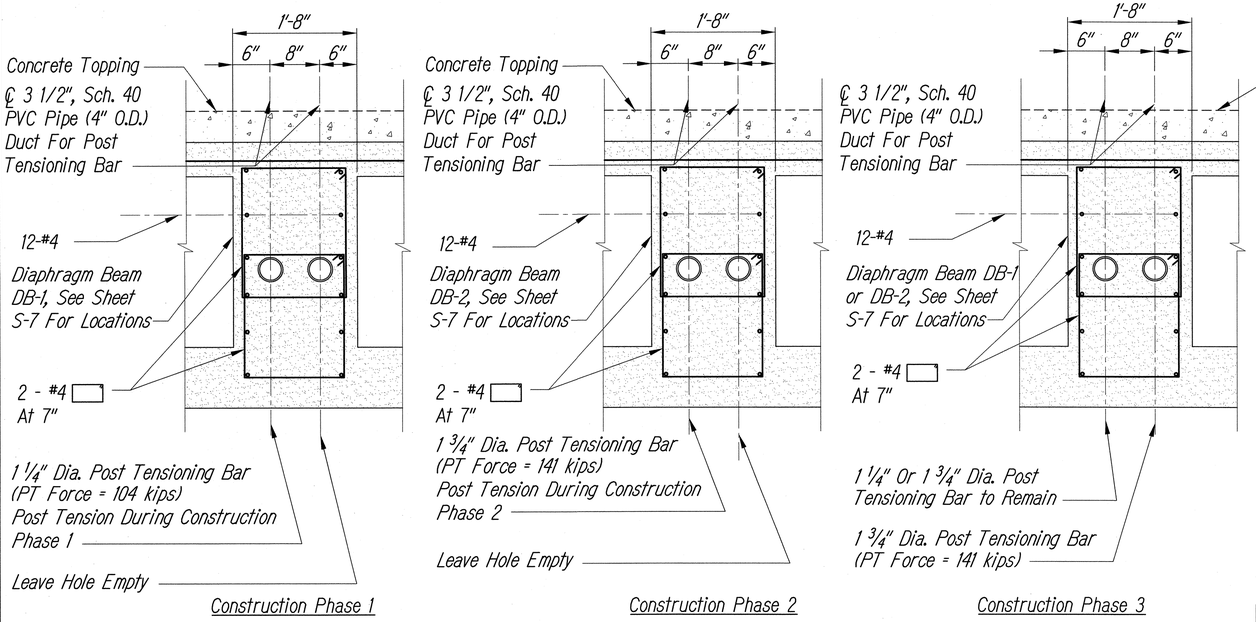
BRIDGE RAILINGS

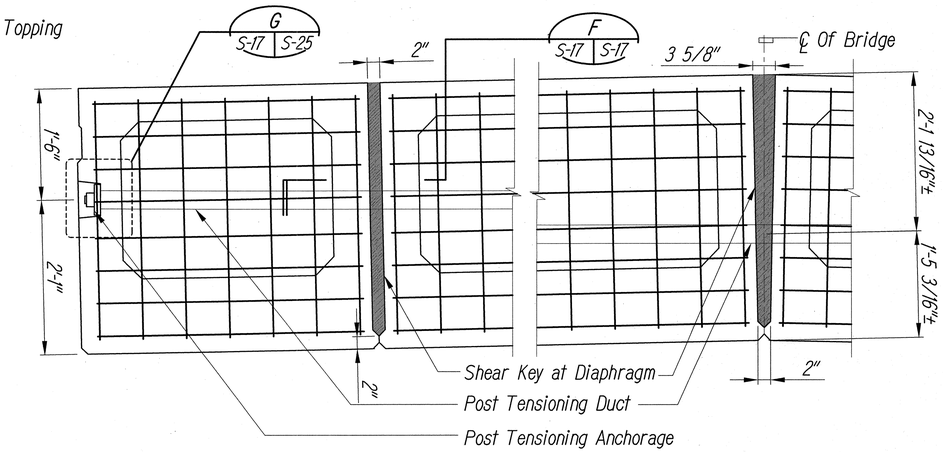
FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-16 OF 26 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	66	99





Prestressed Girder Transverse Post Tensioning Detail

Scale: 1" = 1'-0"

C S-17 S-17

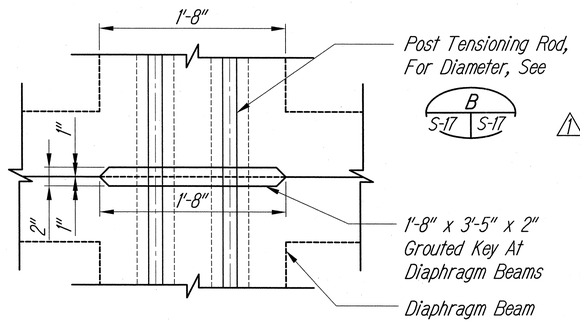
DETAIL

Scale: 1" = 1'-0" S-7, S-9, S-17, S-25

A S-7

Post Tensioning Notes:

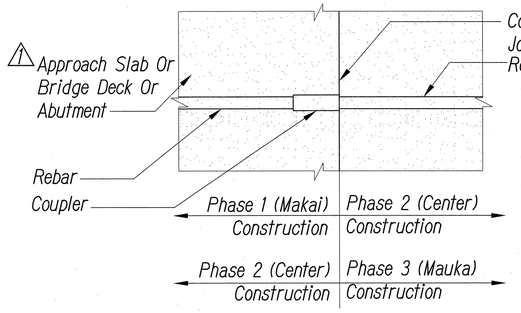
1. Post tensioning bars shall be ASTM A722, Type II (Fy = 150 ksi)
2. Grout shall have a 28 day compressive strength of 5,000 psi.
3. Grout all keys between box girder diaphragms prior to post tensioning.
4. Install post tensioning bars in Diaphragm Beam DB-1 during Construction Phase 1. Grout duct during Construction Phase 3.
5. Install post tensioning bars in Diaphragm Beam DB-2 during Construction Phase 2. Grout duct during Construction Phase 3.
6. Grout all ducts after to post tensioning.
7. Stressing of post tensioning bar shall be per Post Tensioning Institute.



DIAPHRAGM KEY PLAN

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

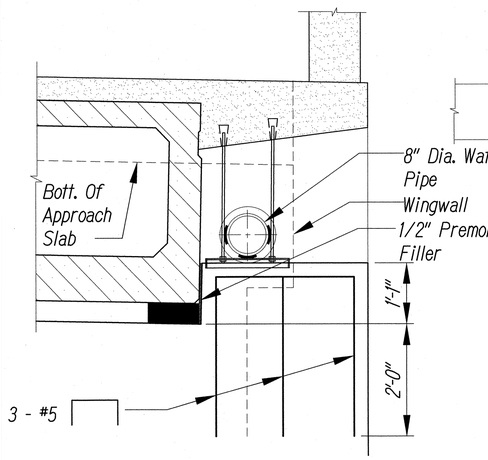
F S-17 S-17



DETAIL

Scale: 1 1/2" = 1'-0" S-8, S-9, S-10, S-11, S-21, S-23

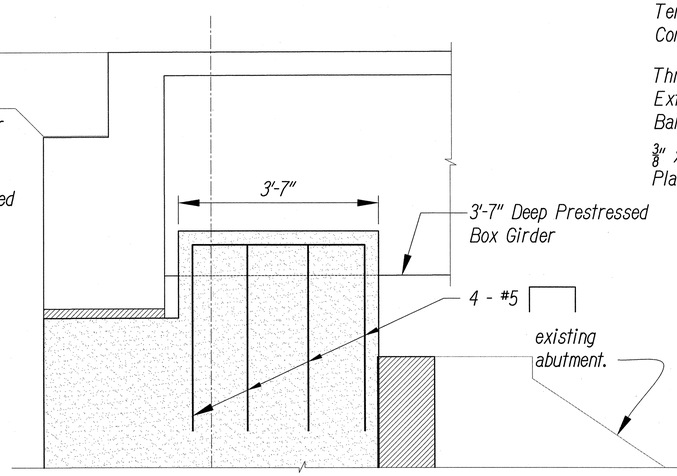
D S-17 S-17

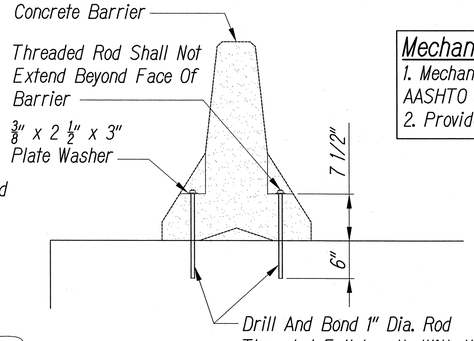


SHEAR KEY DETAIL

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

A S-8 S-17





DETAIL

Scale: 1" = 1'-0" S-18, S-19, S-20, S-21, S-22

E S-17 S-17

Mechanical Coupler Notes:

1. Mechanical couplers shall meet the requirements of AASHTO and standard specification section 602.03.
2. Provide construction joint per Detail F, Sheet S-11.

GRAPHIC SCALES

0 1' 2' 4'
SCALE: 3/4" = 1'-0"
0 6" 1' 2' 3'
SCALE: 1" = 1'-0"
1' 9" 6" 3" 0 1'
SCALE: 1-1/2" = 1'-0"

DATE	REVISION
10/20/15	⚠ Revised Note On Detail D

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STATE OF HAWAII
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HIGHWAYS DIVISION

SECTIONS AND DETAILS

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-17 OF 26 SHEETS

ADD. 66

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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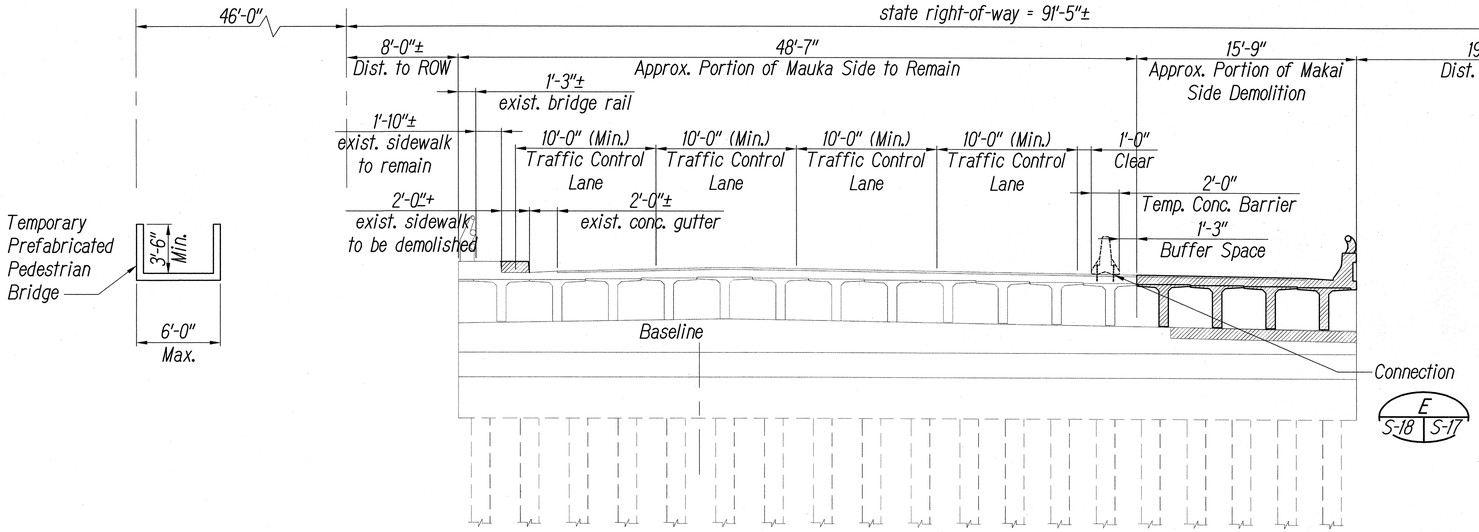
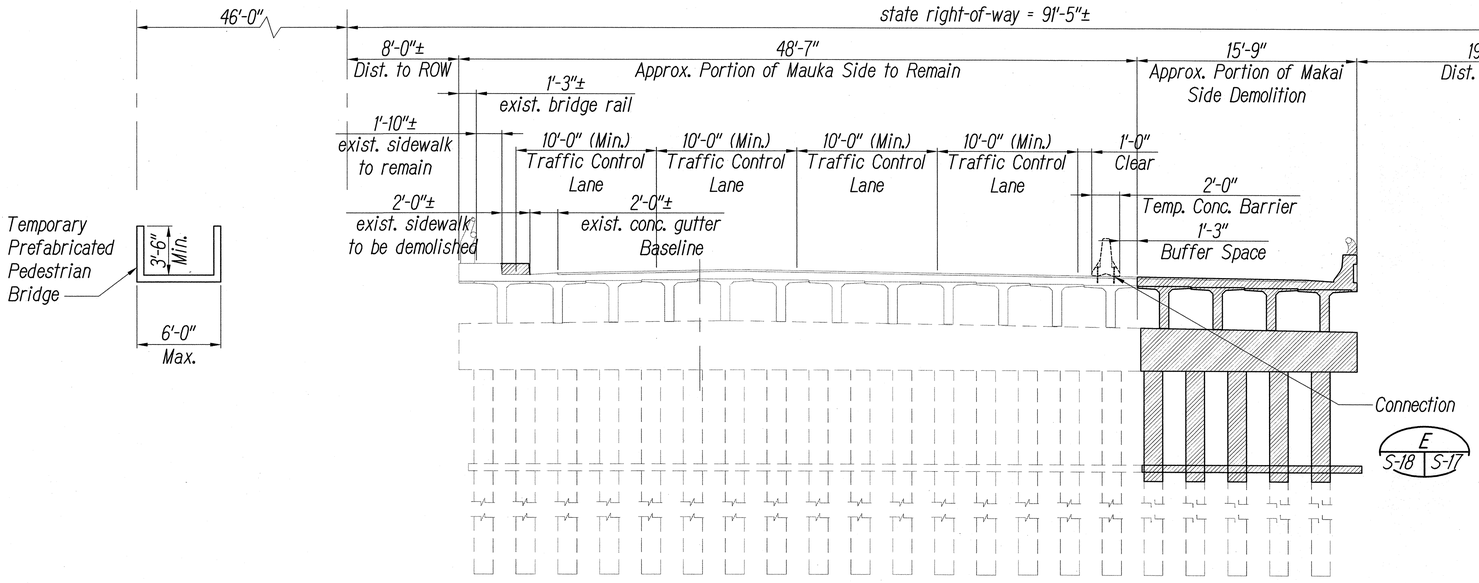
	CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	67	99



DEMOLITION BRIDGE SECTION AT ABUTMENT

Scale: 3/16" = 1'-0"



DEMOLITION SECTION AT CENTER PIER

Scale: 3/16" = 1'-0"

⚠ **Note:**

Provide Waterproof Caissons To Isolate And Contain All Debris During Demolition Of Existing Piles

GRAPHIC SCALES

5' 0 5' 10'

SCALE: 3/16" = 1'-0"

ORIGINAL PLAN
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DATE	REVISION
10/20/15	⚠ Added Note

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE DEMOLITION PHASE 1 SECTIONS

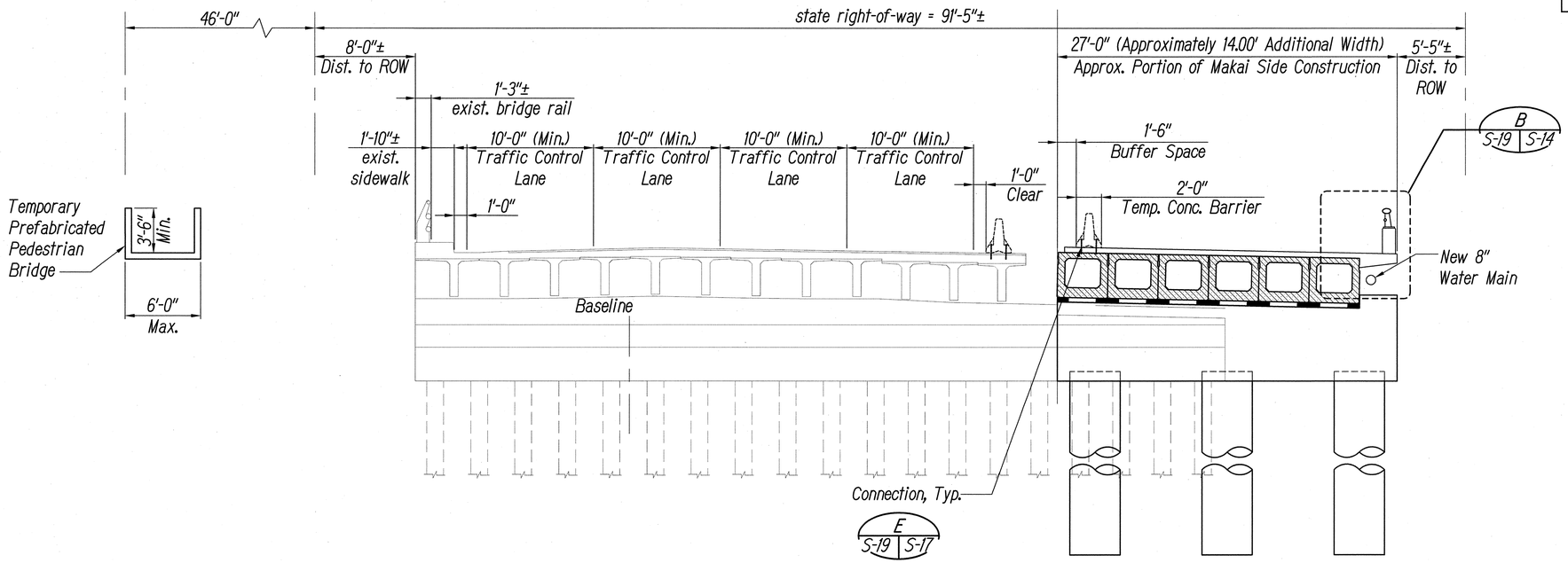
FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-18 OF 26 SHEETS

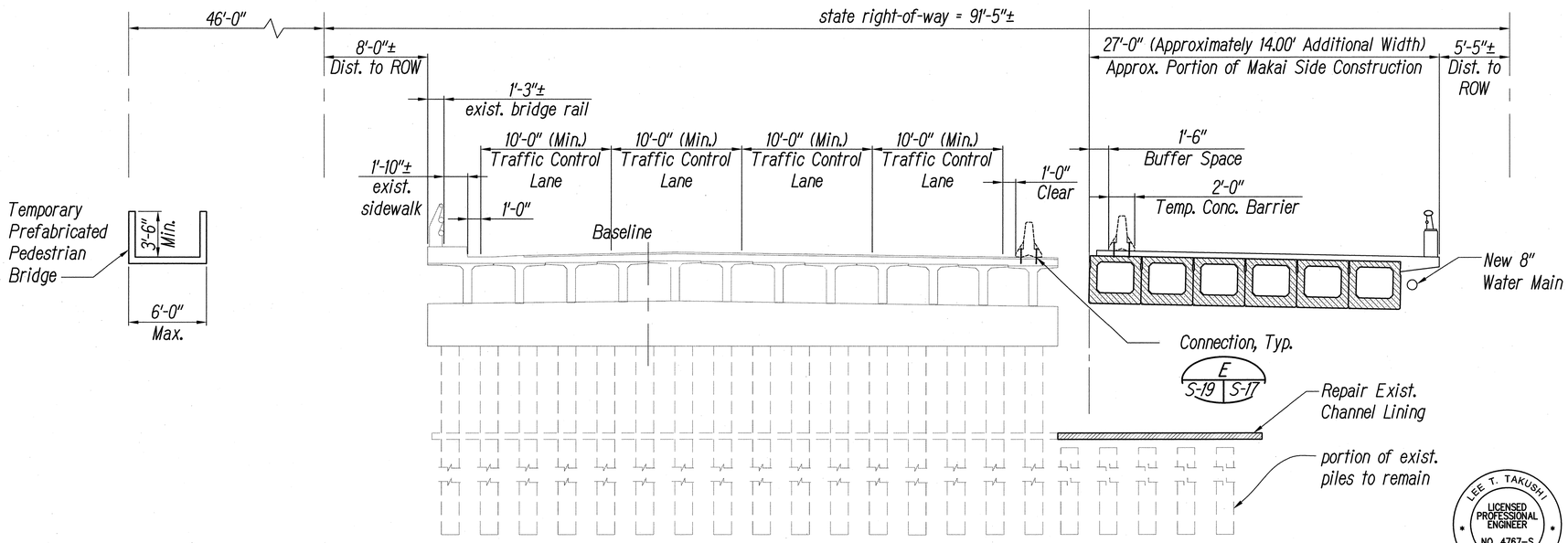
ADD. 67

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	68	99



NEW CONSTRUCTION BRIDGE SECTION AT ABUTMENT

Scale: 3/16" = 1'-0"



NEW CONSTRUCTION SECTION AT CENTER PIER

Scale: 3/16" = 1'-0"

ORIGINAL PLAN

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GRAPHIC SCALES

5' 0 5' 10'

SCALE: 3/16" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE NEW CONSTRUCTION

PHASE 1 SECTIONS

FARRINGTON HIGHWAY

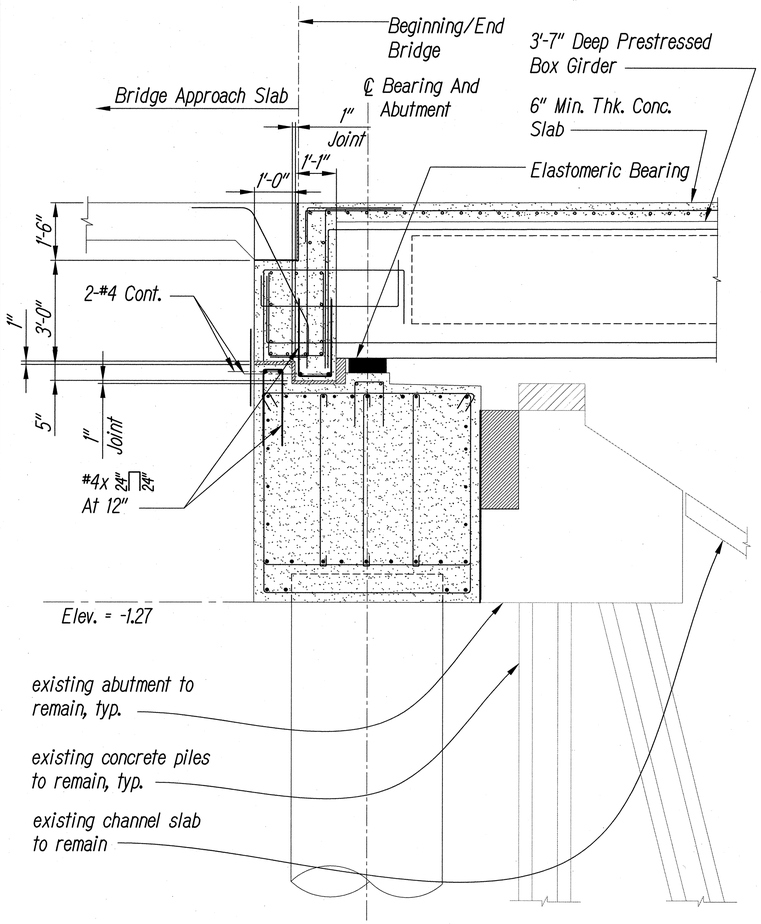
Replacement of Maipalaoa Bridge

Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-19 OF 26 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	69	99

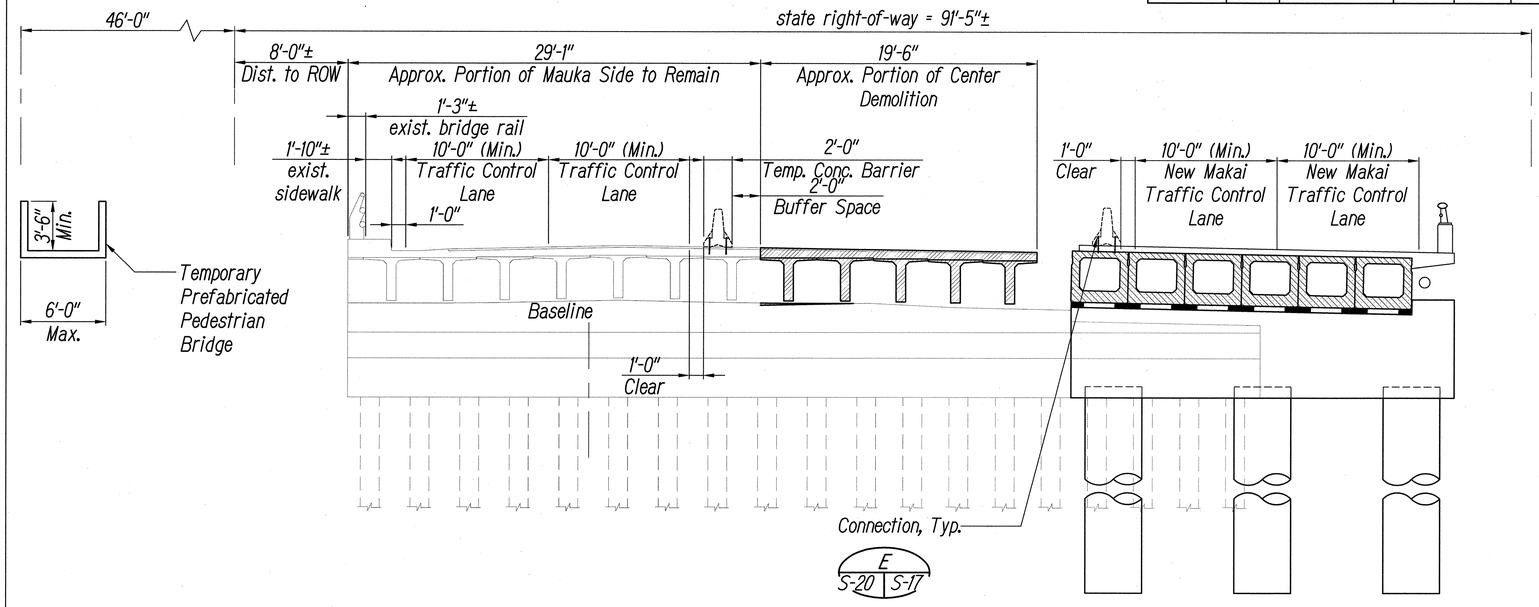


NOTE:
See Detail A, Sheet S-10 For Details Not Shown.

TYP. ABUTMENT SECTION

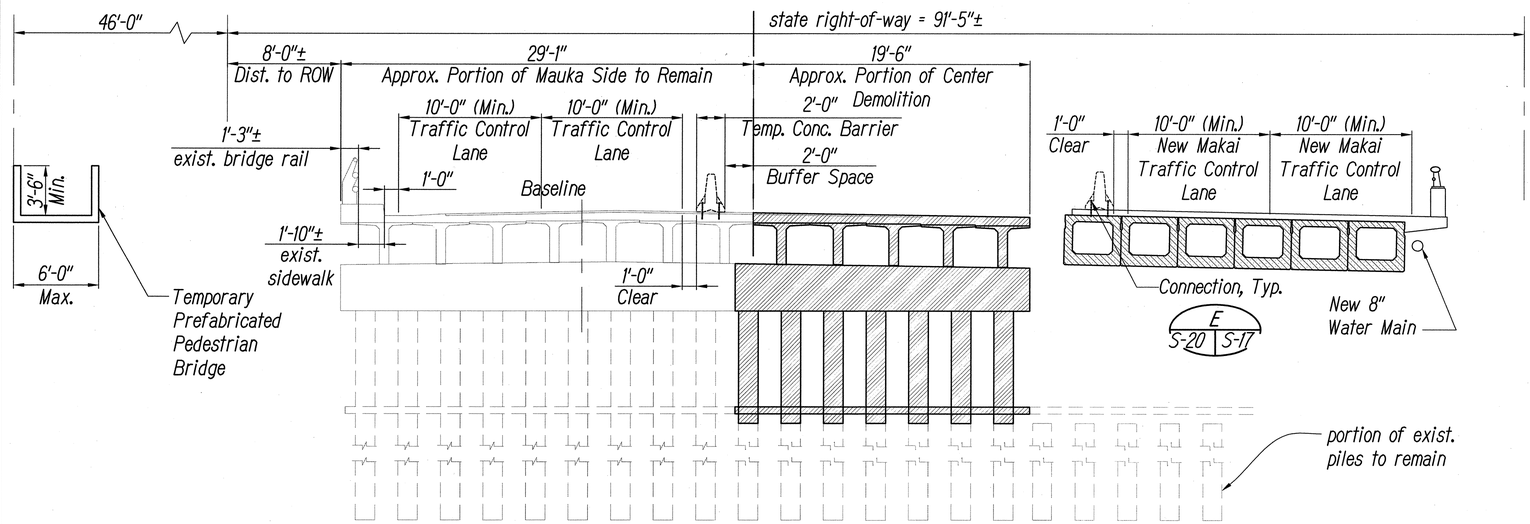
Scale: 1/2" = 1'-0"

A S-7 | S-20



DEMOLITION BRIDGE SECTION AT ABUTMENT

Scale: 3/16" = 1'-0"



DEMOLITION SECTION AT CENTER PIER

Scale: 3/16" = 1'-0"

GRAPHIC SCALES

5' 0 5' 10'
SCALE: 3/16" = 1'-0"

1' 6" 0 1' 2' 3' 4' 5'
SCALE: 1/2" = 1'-0"

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HIGHWAYS DIVISION

BRIDGE DEMOLITION PHASE 2
SECTIONS, ABUTMENT SECTION

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-20 OF 26 SHEETS

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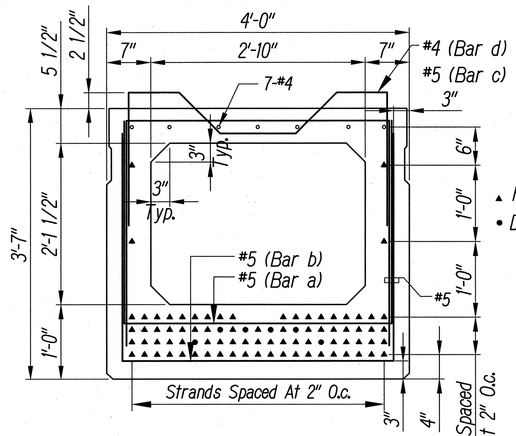
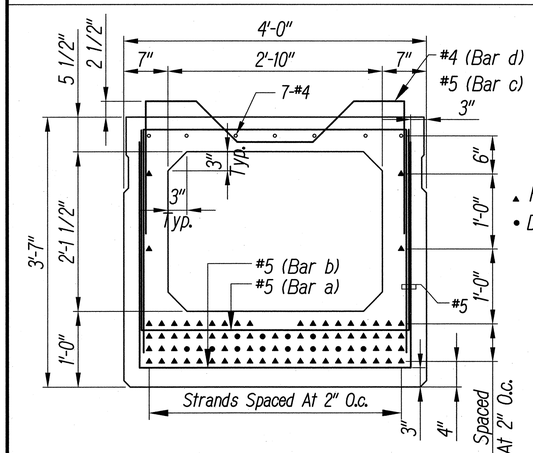
HAWAII	HAW.	BR-093-1(21)	2015	70	99



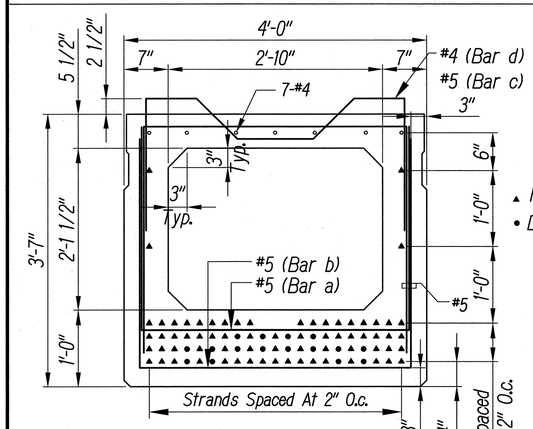
SECTION (A S-9 | S-21)

Scale: 1" = 1'-0"



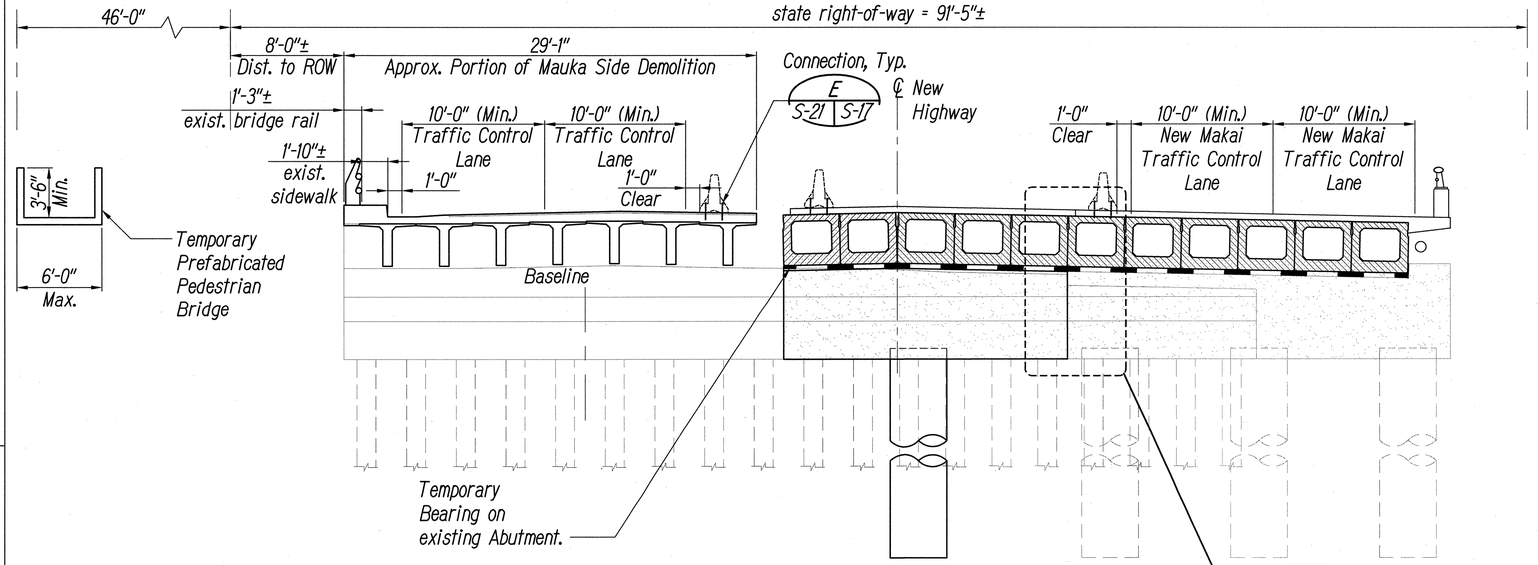
SECTION (B S-9 | S-21)

Scale: 1" = 1'-0"



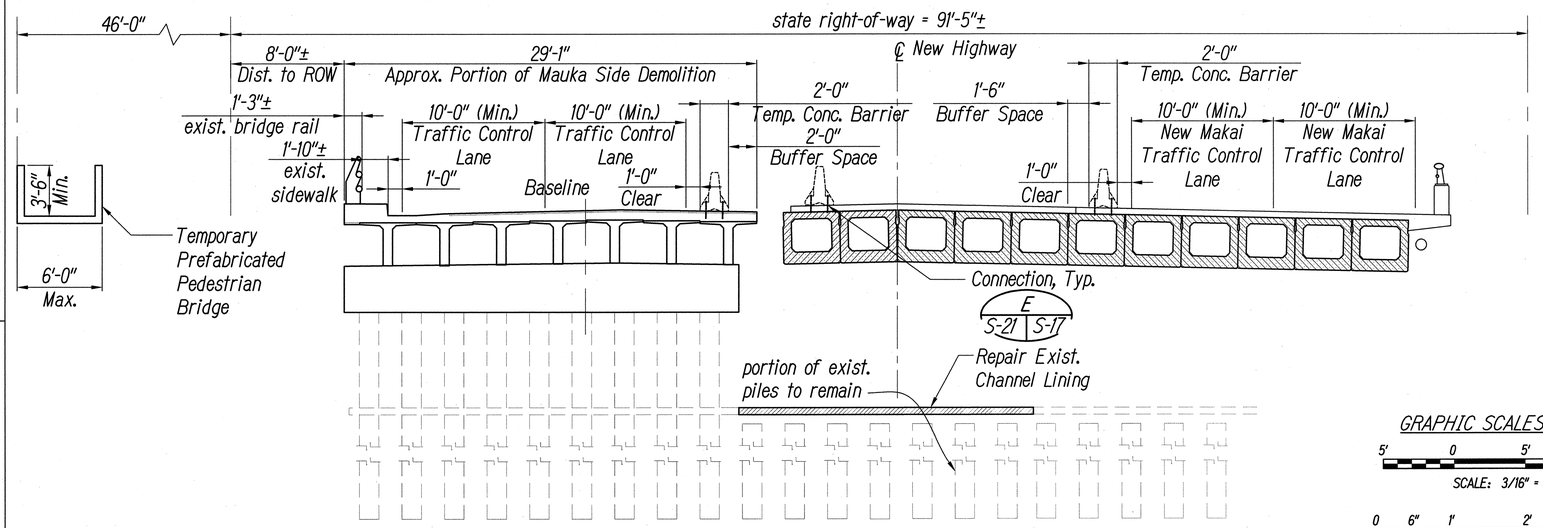
SECTION (C S-9 | S-21)

Scale: 1" = 1'-0"



NEW CONSTRUCTION BRIDGE SECTION AT ABUTMENT

Scale: 3/16" = 1'-0"



NEW CONSTRUCTION SECTION AT CENTER PIER

Scale: 3/16" = 1'-0"

GRAPHIC SCALES

5' 0 5' 10'

SCALE: 3/16" = 1'-0"

0 6" 1' 2' 3'

SCALE: 1" = 1'-0"

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

LEE T. TAKUSHI LICENSED PROFESSIONAL ENGINEER NO. 4767-S HAWAII USA

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SIGNATURE 4/30/16 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE NEW CONST. PH. 2

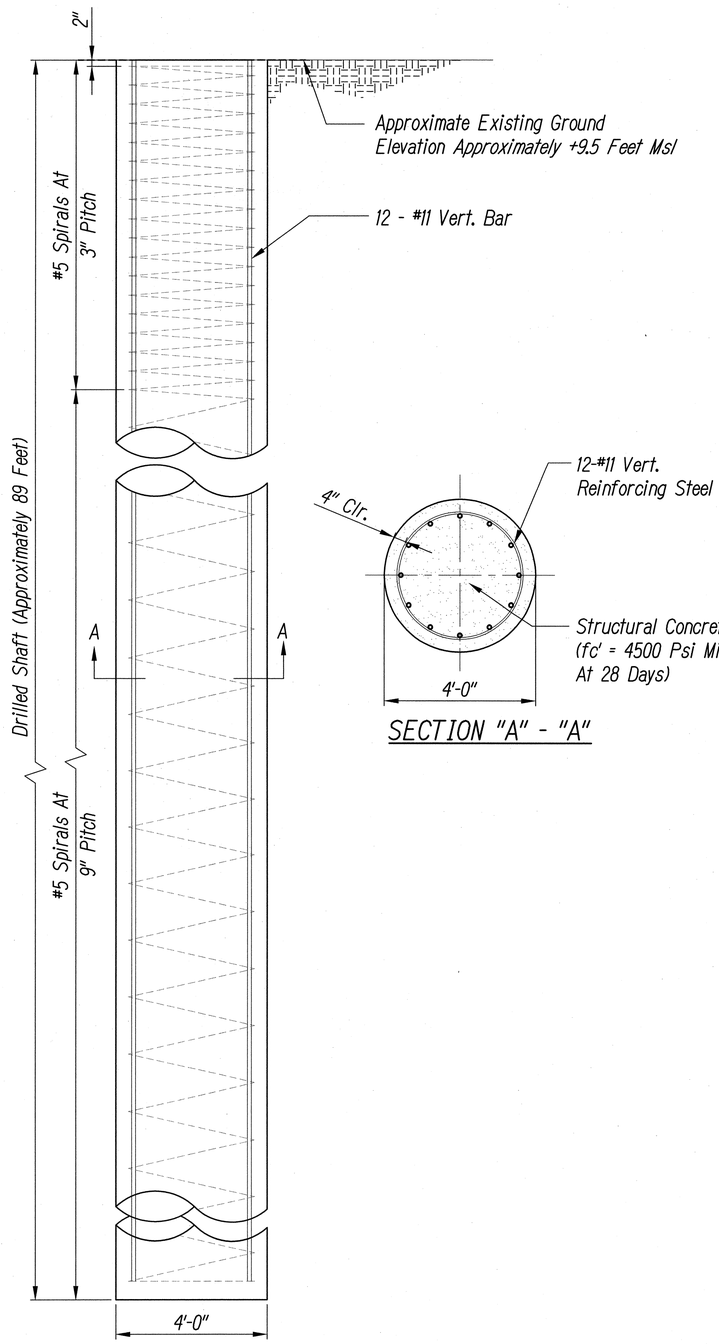
SECTIONS, BOX GIRDER SECTIONS

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

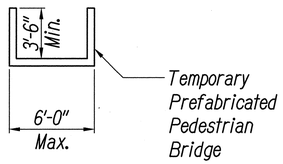
Scale: AS NOTED Date: JUNE 2015

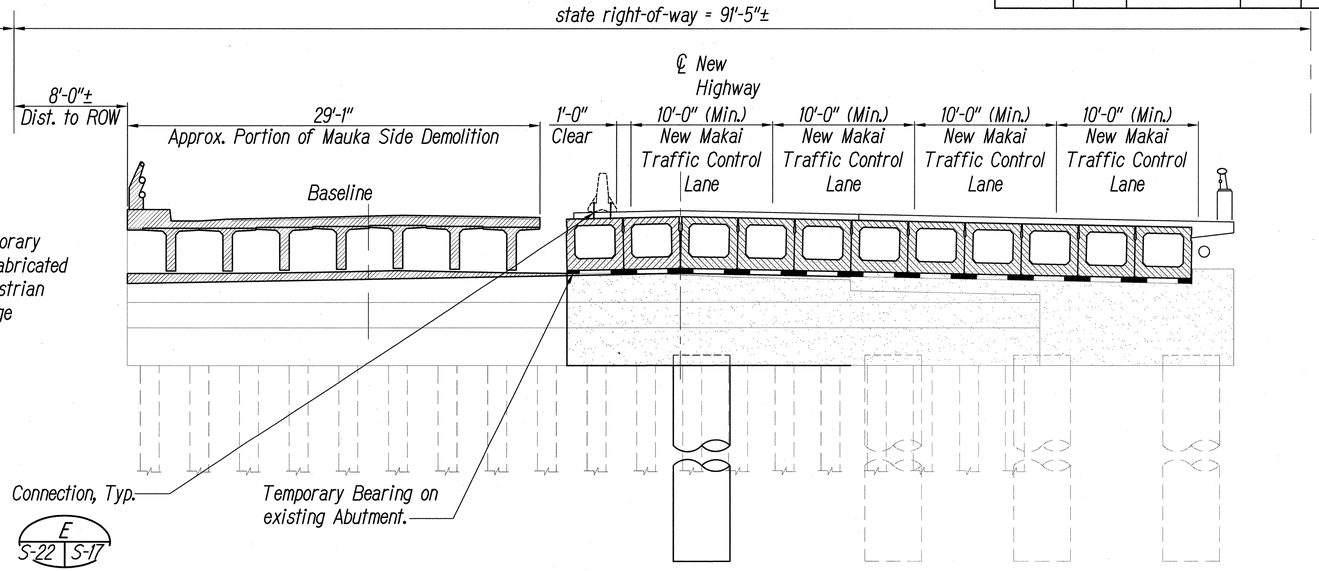
SHEET No. S-21 OF 26 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	71	99



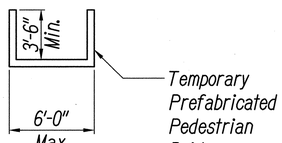
SECTION "A" - "A"

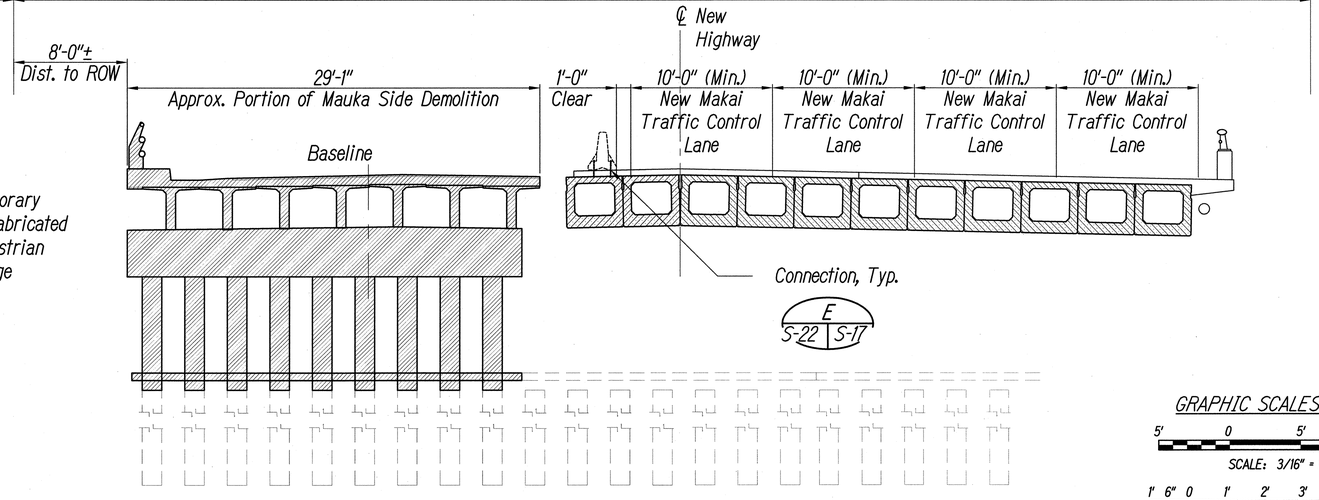




DEMOLITION BRIDGE SECTION AT ABUTMENT

Scale: 3/16" = 1'-0"





DEMOLITION SECTION AT CENTER PIER

Scale: 3/16" = 1'-0"

DRILLED SHAFT TRIAL SHAFT DETAIL

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

A
S-6 | S-22

GRAPHIC SCALES

5' 0 5' 10'
SCALE: 3/16" = 1'-0"

1' 6" 0 1' 2' 3' 4' 5'
SCALE: 1/2" = 1'-0"

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

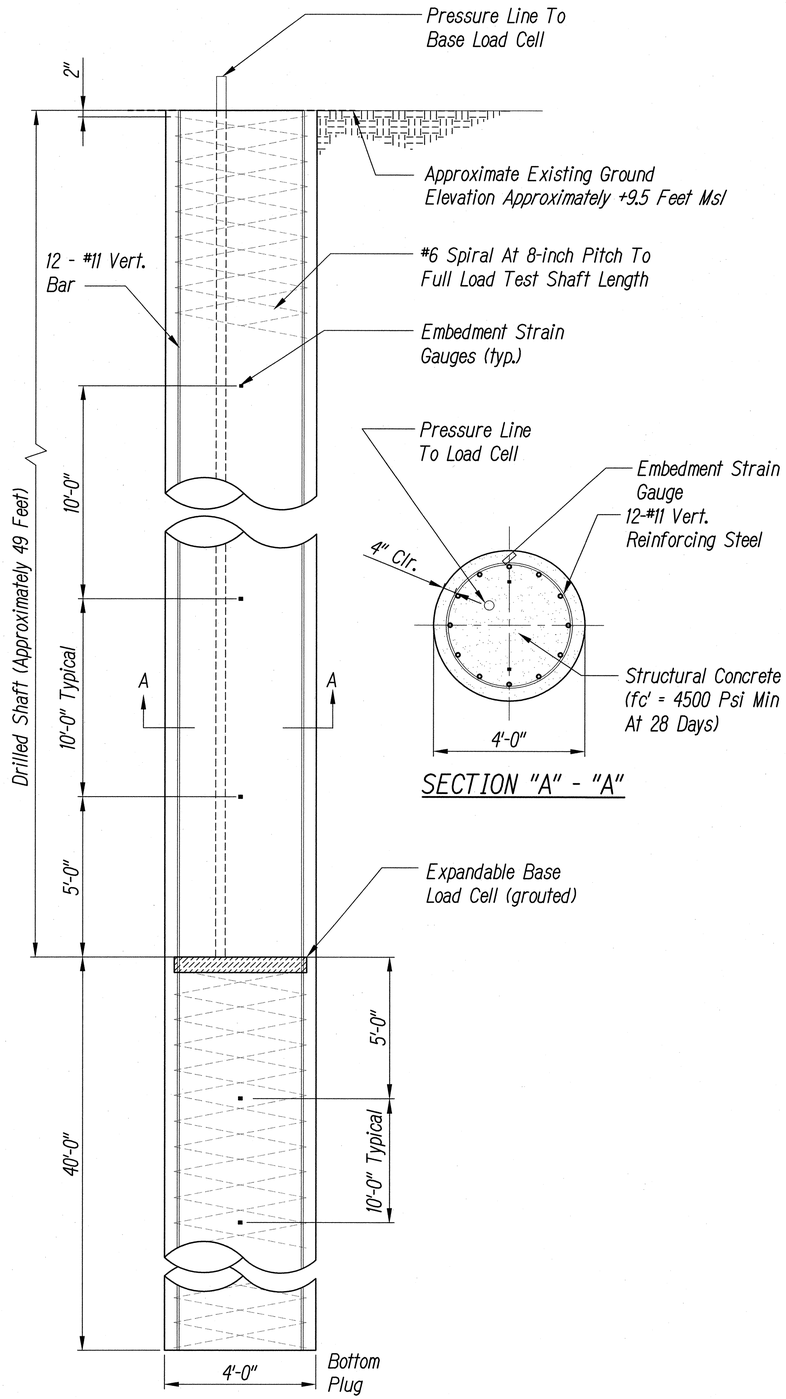
BRIDGE DEMOLITION PHASE 3
SECTIONS, TRIAL SHAFT DETAIL

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-22 OF 26 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	72	99

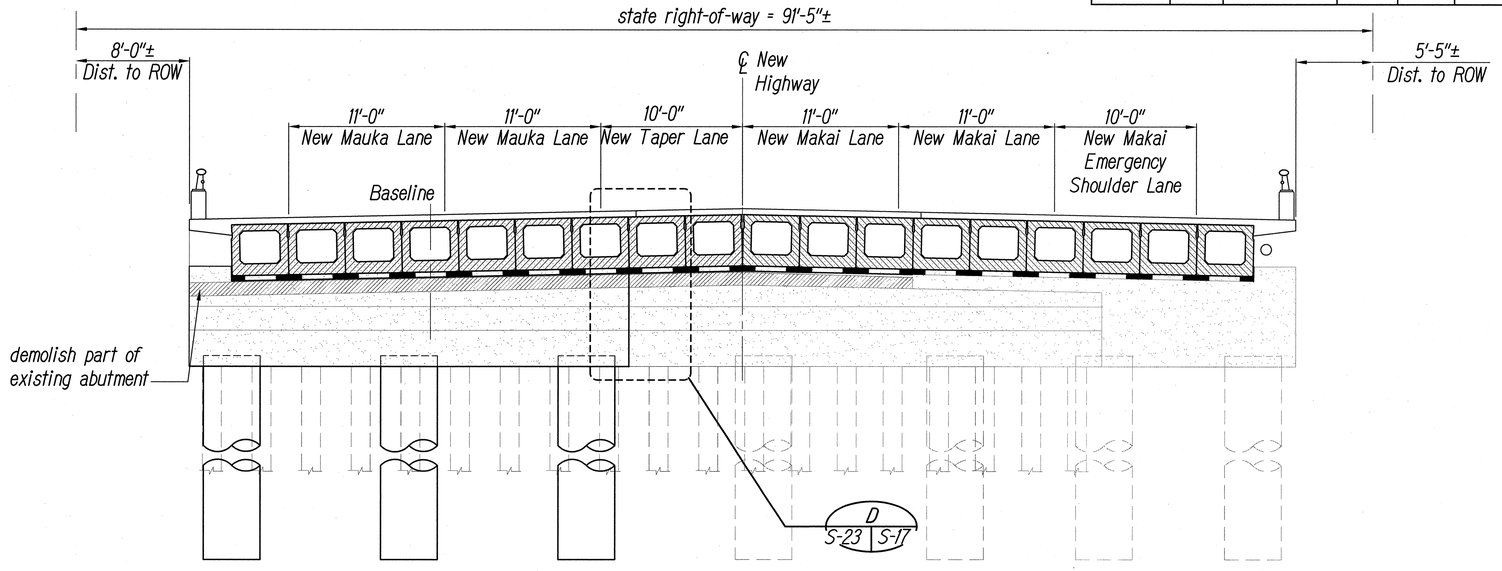


SECTION "A" - "A"

DRILLED SHAFT LOAD TEST SHAFT DETAIL

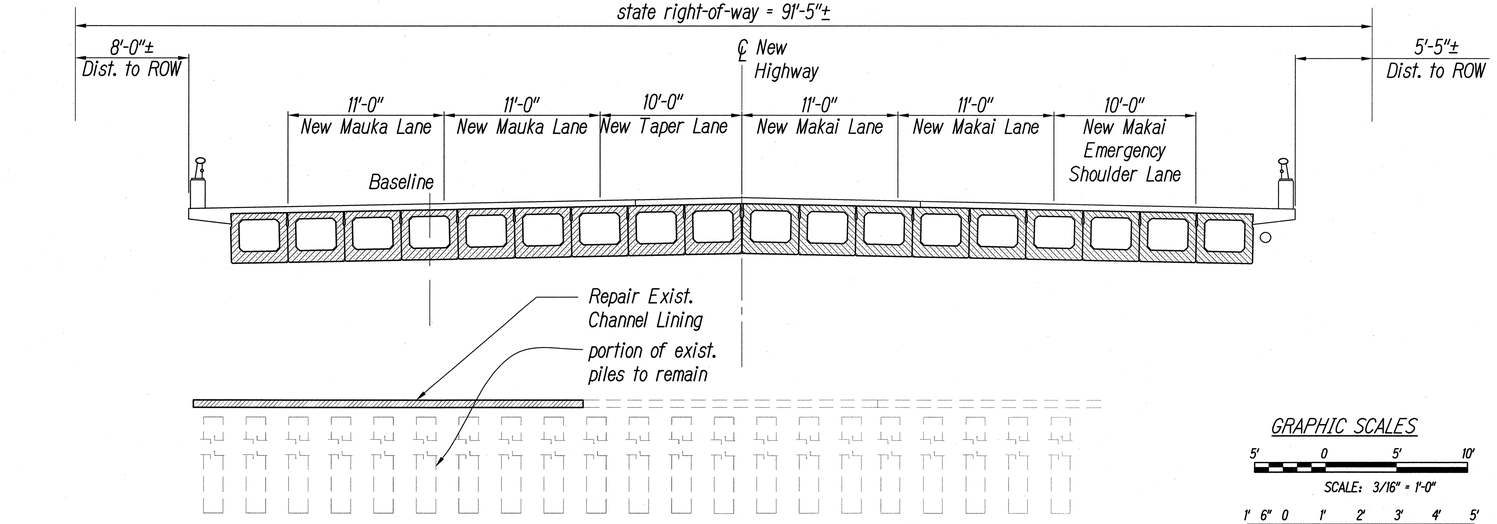
Scale: 1/2" = 1'-0"

A S-6 | S-23



NEW CONSTRUCTION BRIDGE SECTION AT ABUTMENT

Scale: 3/16" = 1'-0"



NEW CONSTRUCTION SECTION AT MIDSPAN

Scale: 3/16" = 1'-0"

GRAPHIC SCALES

5' 0 5' 10'

SCALE: 3/16" = 1'-0"

1' 6" 0 1' 2' 3' 4' 5'

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

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4/30/16

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE NEW CONST. PH. 3

SECTIONS, TEST SHAFT DETAIL

FARRINGTON HIGHWAY

Replacement of Maipalaoa Bridge

Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-23 OF 26 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY
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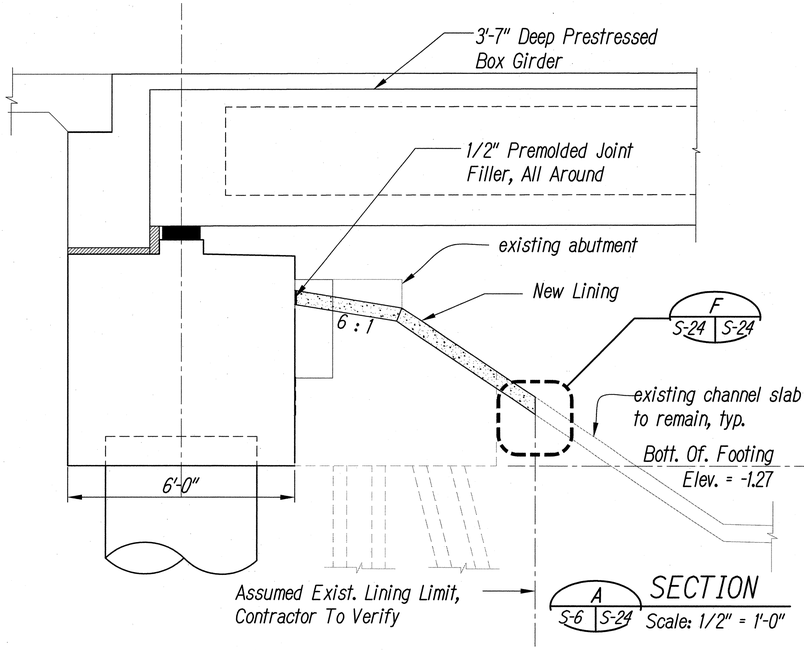
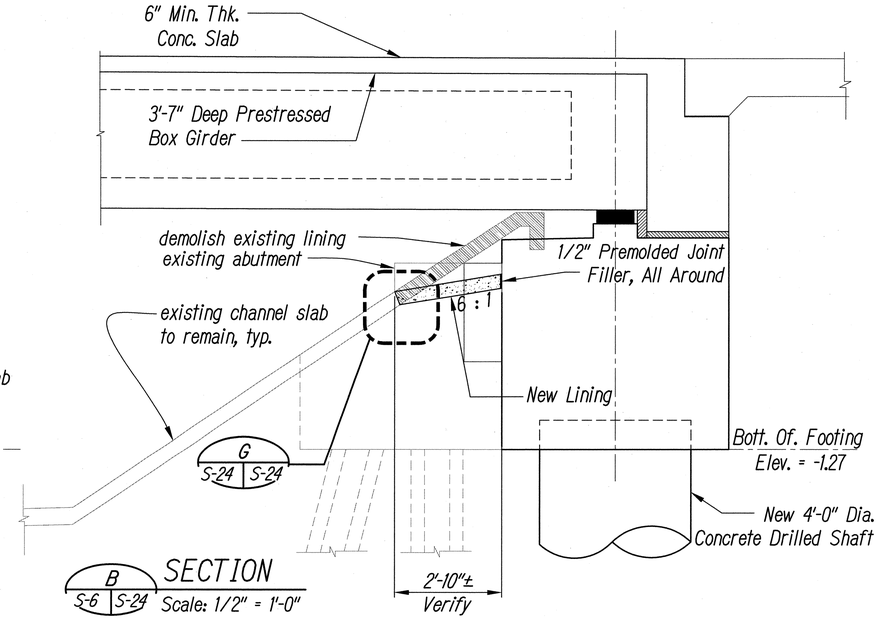
DATE

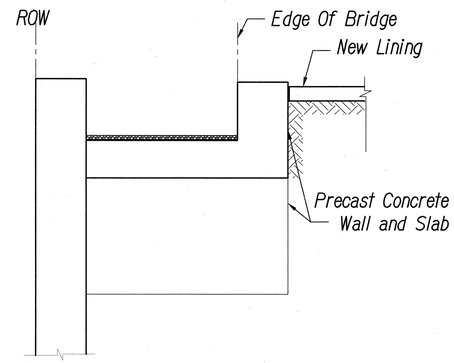
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	73	99



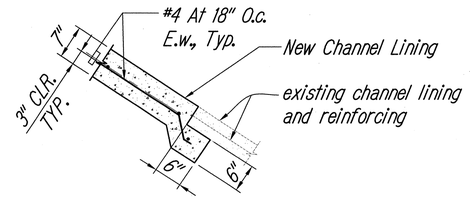
A S-6 S-24 SECTION
Scale: 1/2" = 1'-0"



B S-6 S-24 SECTION
Scale: 1/2" = 1'-0"



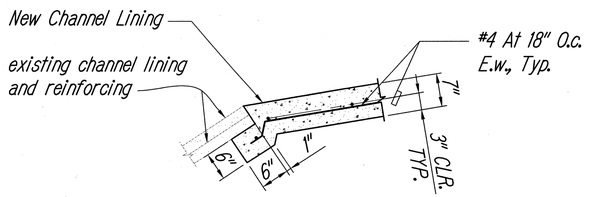
E S-24 S-24 SECTION
Scale: 1/2" = 1'-0"



CHANNEL LINING REPAIR DETAIL

F S-24 S-24

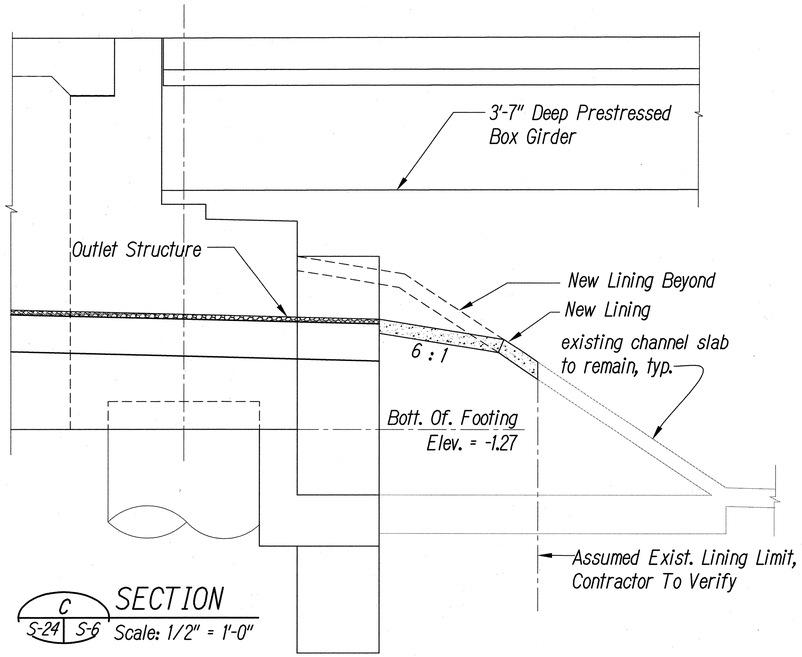
Scale: 3/4" = 1'-0"



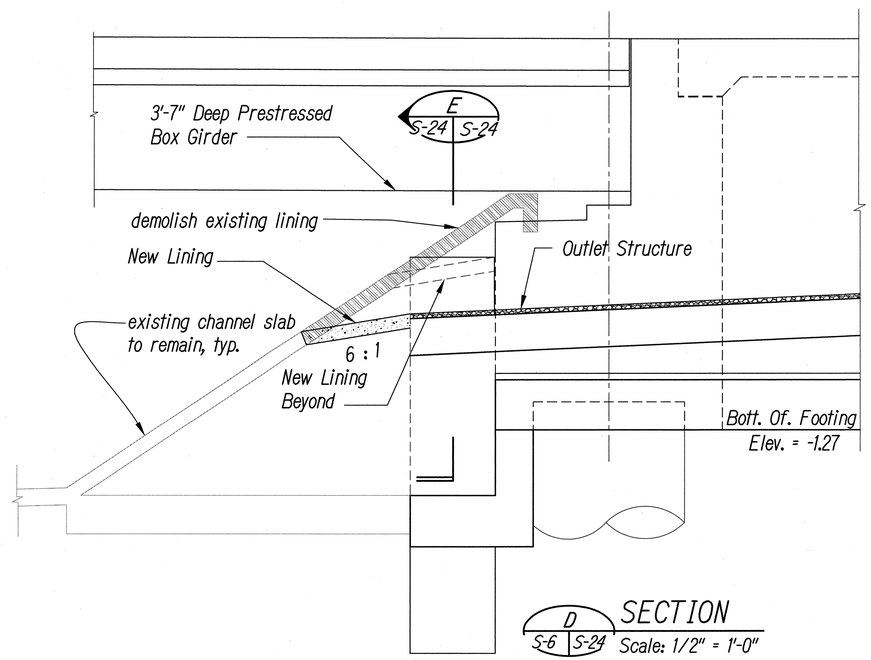
CHANNEL LINING REPAIR DETAIL

G S-24 S-24

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



C S-24 S-6 SECTION
Scale: 1/2" = 1'-0"



D S-6 S-24 SECTION
Scale: 1/2" = 1'-0"

GRAPHIC SCALES

1' 6" 0 1' 2' 3' 4' 5'
SCALE: 1/2" = 1'-0"
0 1' 2' 4'
SCALE: 3/4" = 1'-0"

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SECTIONS AND DETAILS

FARRINGTON HIGHWAY
Replacement of Maipalaoa Bridge
Federal Aid Project No. BR-093-1(21)

Scale: AS NOTED Date: JUNE 2015

SHEET No. S-24 OF 26 SHEETS

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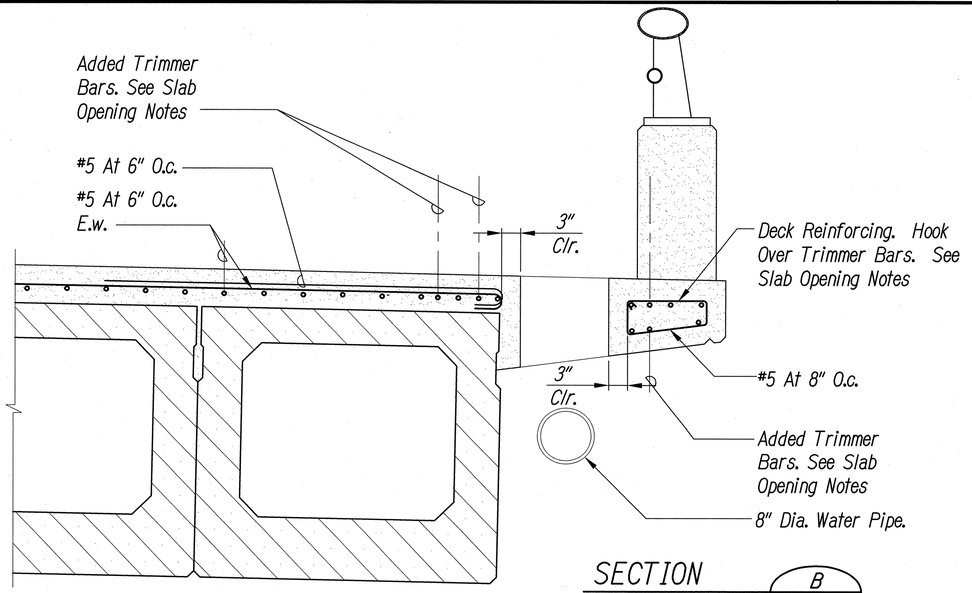
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(21)	2015	74	99



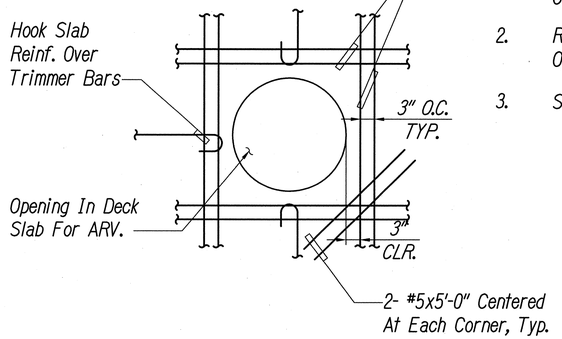
SECTION

Scale: 1" = 1'-0"

B S-25 | S-25

TRIMMER BARS:

Replace Slab Bars Interrupted By Opening, 1/2 Each Side, Extending From Support To Support, But Not Less Than 1- #5 Top And Bottom, Extended 2'-6" Min. Beyond Edge Of Opening.



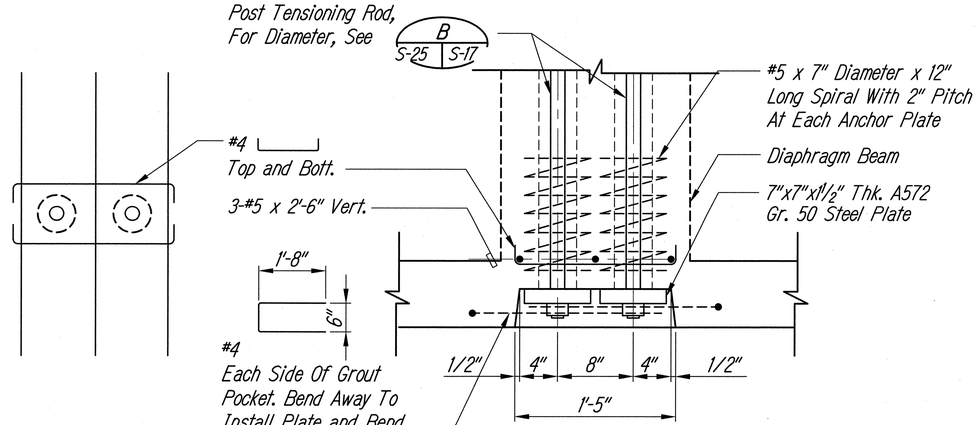
SLAB OPENING NOTES:

1. All Openings Having A Diameter Of 12" Or More Shall Have Additional Top And Bottom Reinforcing On All Sides. Diagonal Bars Shall Be 2- #5x5'-0" Long And Placed On Four Sides Of The Opening At An Angle Of 45 Degrees To The Slab Reinforcing Bars.
2. Reinforcing Bars Shall Be Placed 1 1/2" Clear From Edge of Opening And Shall Be Spaced Not Less Than 3" O.c.
3. See Civil Sheet 34 For Location And Size Of Opening In Slab.

REINFORCING AT ARV SLAB OPENING

Not To Scale

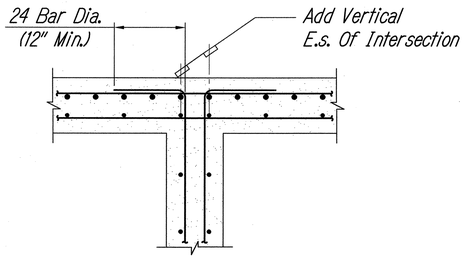
A S-25 | S-25



ANCHORAGE DETAIL

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

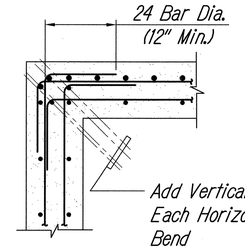
H S-25 | S-25



DETAIL AT WALL INTERSECTION

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

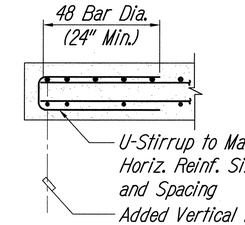
D S-12 | S-25



DETAIL AT WALL CORNER

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

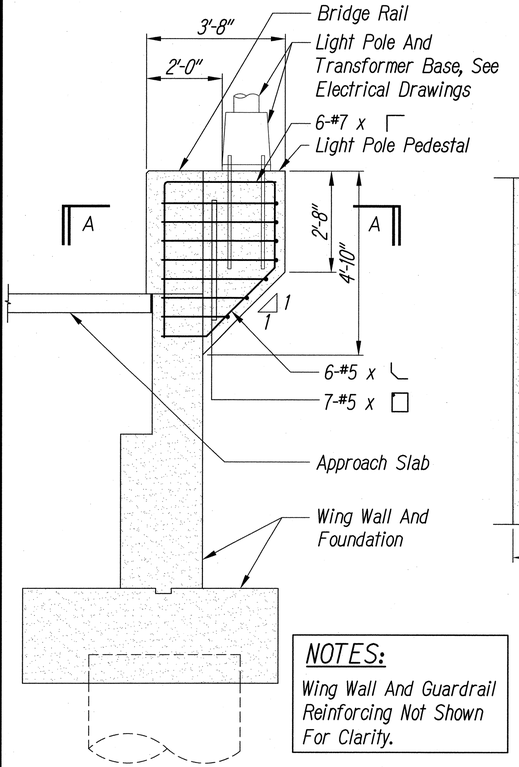
E S-12 | S-25



DETAIL AT WALL END

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

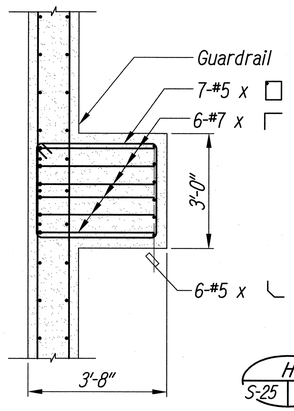
F S-12 | S-25



LIGHT POLE SUPPORT DETAIL

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

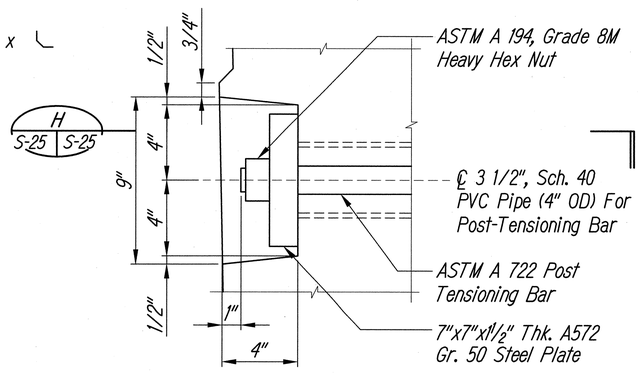
C S-25 | S-25



SECTION A-A

NOTES:

Wing Wall And Guardrail Reinforcing Not Shown For Clarity.



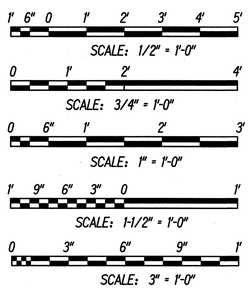
H S-25 | S-25

TYP. POST TENSION DETAIL

Scale: 3" = 1'-0"

G S-17 | S-25

GRAPHIC SCALES



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SECTIONS AND DETAILS

FARRINGTON HIGHWAY
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Scale: AS NOTED Date: JUNE 2015

SHEET No. S-25 OF 26 SHEETS

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