

INDEX OF BRIDGE DRAWINGS

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S1.1	NOT USED
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S2.1	NOT USED
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S3.1	NOT USED
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S4.1	NOT USED
S4.2	NOT USED
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S4.5	NOT USED
S5.1	NOT USED
S5.2	NOT USED
S5.3	NOT USED

SHEET NO.	DESCRIPTION
S6.1	NOT USED
S6.2	NOT USED
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S6.5	NOT USED
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S7.3	NOT USED
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S8.3	NOT USED
S8.4	NOT USED
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S9.A4	NOT USED
S9.A5	NOT USED
S9.A6	NOT USED
S9.B1	NOT USED
S9.B2	NOT USED
S9.B3	NOT USED
S9.B4	NOT USED
S9.B5	NOT USED
S9.B6	NOT USED
S9.B7	NOT USED

SHEET NO.	DESCRIPTION
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S9.D3	NOT USED
S9.D4	NOT USED
S10.1	NOT USED
S10.2	NOT USED
S11.1	NOT USED

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

DRAWING NAME: 2A00 ONGOING 00 CB PROJECTS 18-008.2-3W BRIDGES ASBY 01 CAD 03-XA-21 WAOLU AS-BUILTS 2WB-S0001 DELTA1 INDEX.DWG PLOT TIME: 03-15-21, 8:26 AM)

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

INDEX OF BRIDGE DRAWINGS

KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP  
At Various Locations April 2018, Rte. 560  
Fed. Aid Proj. No. ER-19(007)

Scale: As Noted      Date: Oct. 2018

SHEET No. S0.1 OF 5 SHEETS



STRUCTURAL GENERAL NOTES:

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	19	43

1. General Specifications:

- A. Hawaii Department of Transportation (HDOT), Standard Specifications for Road and Bridge, Construction, 2005, together with Special Provisions prepared for this project.



- B. As-built plans of the existing bridge are available for review from the Highways Design Branch located at the State Department of Transportation, Highways Division, Kekuhihewa Building, Room 604, 601 Kamokila Boulevard, Kapolei, HI 96707.

2. Design Specifications:

- A. AASHTO 2014 LRFD Bridge Design Specifications, Seventh Edition, including subsequent interim specifications with interim supplements and modifications by the HDOT Highways Division.
- B. HDOT document dated August 8, 2014 with subject title "Design Criteria for Bridges and Structures".

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: Horizontal Peak Ground Acceleration = 5.7%
- Horizontal Spectral Acceleration Coefficients  
 $S_s = 12.4\%$   
 $S_1 = 3.6\%$
- Seismic Zone: 1
- Soil Test Class = D
- Operational Classification = Essential Bridge
- D. Utility Load: An allowance of 150 PLF on each side of bridge for Utility Loads has been provided for in the design.
- E. Railing Test Level = TL-1
- F. Wind: Base Design Wind Velocity = 105 MPH
- G. Stream: Design Velocity = 7.5 Ft/s

4. Materials:

- A. All concrete strengths shall be as noted below:

Item No.	Structural Parts	Minimum Compressive Strength, f'c (28 Days)	Maximum Water/Cement (W/C)	Included Admixtures
(1)	VESLMC Overlay	6,000 psi	0.45	See Spec.
(2)	Railing	6,000 psi	0.40	B, C
(3)	Railing Cap	6,000 psi	0.40	B, C, D
(4)	Cutoff Wall	6,000 psi	0.40	B, C

- B. Amine carboxylate corrosion inhibiting water-based admixture such as Cortec MCI 2005 NS or approved equal shall be added at a dosage of 24 ounces per cubic yard.
- C. Shrinkage reducing admixture such as Eclipse 4500 or Masterlife SRA 20 or approved equal shall be added at a dosage of 128 ounces per cubic yard or as recommended by the manufacturer.
- D. Synthetic macro fiber such as Strux 90/40 by Grace or Forta-Ferro by Forta shall be added at a dosage of 7.5 pounds per cubic yard.
- E. The use of calcium chloride in any concrete is prohibited.
- F. All concrete exposed within 7 days of placement shall be cured using Sinak Lithium Cure or approved equal at a coverage rate of no less than 250 sq. ft. per gallon.
- G. Reinforcing steel shall conform to ASTM A615, Grade 60 deformed bars unless otherwise noted.
- H. Stainless steel deformed reinforcing bars (as noted) shall conform to ASTM A955 Type 2205, with a minimum yield and ultimate strength of 65 ksi and 95 ksi respectively.
- I. Glass Fiber Reinforced Polymer (GFRP) rebar shall have a minimum modulus of elasticity of 5,900,000 psi and shall have a guaranteed minimum tensile strength of 100 ksi for #4 rebar and 95 ksi for #5 rebar.
- J. Headed reinforcing bars shall meet the requirements of ASTM A970 Class B. Head width, height, and thickness shall allow for minimum clear cover and clear spacing between bars. HRC 555 headed bar or approved equal shall be used.

4. Materials (Cont.):

- K. Very early strength latex modified concrete (VESLMC) shall meet the classification of 6,000 psi compressive strength at 28-days, 3,000 psi at 3-hours, and shall have a maximum water to cement ratio of 0.45.

- L. The fiber reinforced polymer (FRP) composite system such as Tyfo SCH-41 Composite and Tyfo SCH-41-2X Composite by Fyfe or equal, shall consist of a uni-directional, high-strength carbon fiber fabric bonded to the existing concrete substrate using a structural epoxy via the wet-layup method.

Alternatively, FRP manufacturer may provide a system with equivalent E x A. Calculations by a licensed structural engineer shall be submitted for review and approval.

- (1) FRP laminate shall have an equivalent E x A = 6,672 kips per foot width based on material test values when substituting for Tyfo-SCH-41 Composite.
- (2) FRP laminate shall have an equivalent E x A = 13,344 kips per foot width based on material test values when substituting for Tyfo SCH-41-2X Composite.

- M. Epoxy for anchoring threaded rod or deformed bar shall be HILTI-RE 500-V3 or approved equal. All manufacturer's installation instructions, including hole cleaning, shall be followed.



- N. Polymer modified repair mortar shall be a factory blended cementitious patching material (containing no gypsum) combined with a polymer type admixture, water and a penetrating corrosion inhibitor. It shall conform to the following minimum material properties.

- (1) 7-Day compressive strength - 4,000 psi
- (2) 28-Day compressive strength - 5,000 psi
- (3) 28-Day splitting tensile strength - 750 psi
- (4) 28-Day flexural strength - 2,000 psi



- O. Bonding agent shall be a three-component, preproportioned, water based epoxy modified Portland cement bonding agent and anti-corrosion coating. 14-Day bond strength shall exceed 2,400 psi in accordance with ASTM C882.

DATE	____/____/____
DESIGNED BY	____
CHECKED BY	____
NO.	____



DRAWING NAME: Z:\DO ONGONG\00 CB PROJECTS\18-0082-3W BRIDGES\ASB\01 CAD\03-XR-21 WAOL AS-BUILT\3-WB-S0003 DETAIL GENNOTES.DWG PLOT TIME: 03-15-21, 8:28 AM

3/19/19	Revised and Added Notes
DATE	REVISION

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
<b>STRUCTURAL GENERAL NOTES</b>	
KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP At Various Locations April 2018, Rte. 560 Fed. Aid Proj. No. ER-19(007)	
Scale: None	Date: Oct. 2018
SHEET No. S0.3 OF 5 SHEETS	



STRUCTURAL GENERAL NOTES:


FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	20	43

5. Reinforcement:

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

(1) 2" to stirrups and ties

 (2) 2 1/2" to main reinforcing bars

 (3) 1" to GFRP bars

(4) 3" to reinforcing in concrete cast against and permanently exposed to earth

B. Minimum clear spacing between parallel bars shall be 1 1/2 times the maximum size of the coarse aggregate or 1 1/2 inches, whichever is greater.

C. Reinforcing bars shall be placed and installed in accordance with the CRSI Manual of Standard Practice and CRSI Placing Reinforcing Bars, unless otherwise noted.

D. 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.

E. Tie wire for stainless steel or GFRP reinforcing shall be either Alloy 302 or 304 stainless steel or non-metallic.

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

G. Unless otherwise noted, reinforcing splices shall be staggered. Minimum distance between staggered lap splice shall be equal to the length required for the lap splice. Number of bars spliced at sections normal to axis of member shall not exceed 50 percent of the total main reinforcing in the member.

H. Minimum lap splice length for steel reinforcing shall be 40 bar diameters or 2'-0", whichever is greater, unless otherwise noted. Increase lap length by multiplying the minimum lap splice length by 1.3 for bars having more than 12" of fresh concrete below bars.

I. Minimum lap splice length for GFRP reinforcing shall be 42 bar diameters or 2'-6", whichever is greater, unless otherwise noted.

5. Reinforcement (Cont.):



J. All dimensions relating to reinforcing bars are to centers of bars unless otherwise noted.

K. Stainless steel shall not come into contact with dissimilar metals. Separate contact points using teflon isolation material.

6. General Construction Notes:

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

B. The Contractor shall verify all site conditions before commencing the work of excavation.

C. Unless otherwise noted, corners of all exposed concrete surfaces shall be chamfered 3/4" x 3/4".

D. Existing reinforcing shall not be damaged during demolition work, unless otherwise permitted.

E. Location of drilled holes shown in plans are approximate. Prior to placing holes in concrete, the Contractor shall locate all reinforcing steel and adjust the location of the holes to clear all reinforcing bars. Final hole locations are subject to the approval of the Engineer.

F. Drilled holes in existing concrete for reinforcing steel dowels shall not be left unfilled for more than 8 hours. Epoxy in drilled holes shall be able to develop the full strength of the dowels prior to pouring concrete around reinforcing steel dowels.

G. All holes drilled into concrete that go unused shall be completely filled with a polymer-modified cementitious repair mortar.


H. All cracks wider than 0.010" shall be prepared and pressure injected with epoxy and all defective concrete shall be repaired. See sheet S15.5 for additional notes.



I. All surfaces to which FRP will be bonded to shall be considered "Bond Critical". See specifications for surface preparation requirements.

ORIGINAL PLAN	DATE
NOTE BOOK	
DESIGNED BY	
CHECKED BY	
QUANTITIES BY	
DATE	

DRAWING NAME: 2100 ONGOING 00 CB PROJECTS 18-002.2-SW BRIDGES (REV 01 CAD) 03-XX-21 WAOU AS-BUILT 2WB-S0003 DELTA1 GENNOTES.DWG PLOT TIME: 03-15-21, 8:28 AM

3/19/19	 Revised and Added Notes
DATE	REVISION
SHEET No. 50.4 OF 5 SHEETS	

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
<b>STRUCTURAL GENERAL NOTES</b>
<b>KAUAI EMERGENCY FLOOD REPAIRS &amp; CLEANUP</b> <b>At Various Locations April 2018, Rte. 560</b> <b>Fed. Aid Proj. No. ER-19(007)</b>
Scale: None Date: Oct. 2018
SHEET No. 50.4 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	21	43

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

DRAWING NAME: Z:\00 ONGOING\00 CB PROJECTS\18-008.2-3W BRIDGES ASB\01 CAD\03-XX-21 WAICILL AS-BILL TS\2WB-SC005 CYMBAR.DWG

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

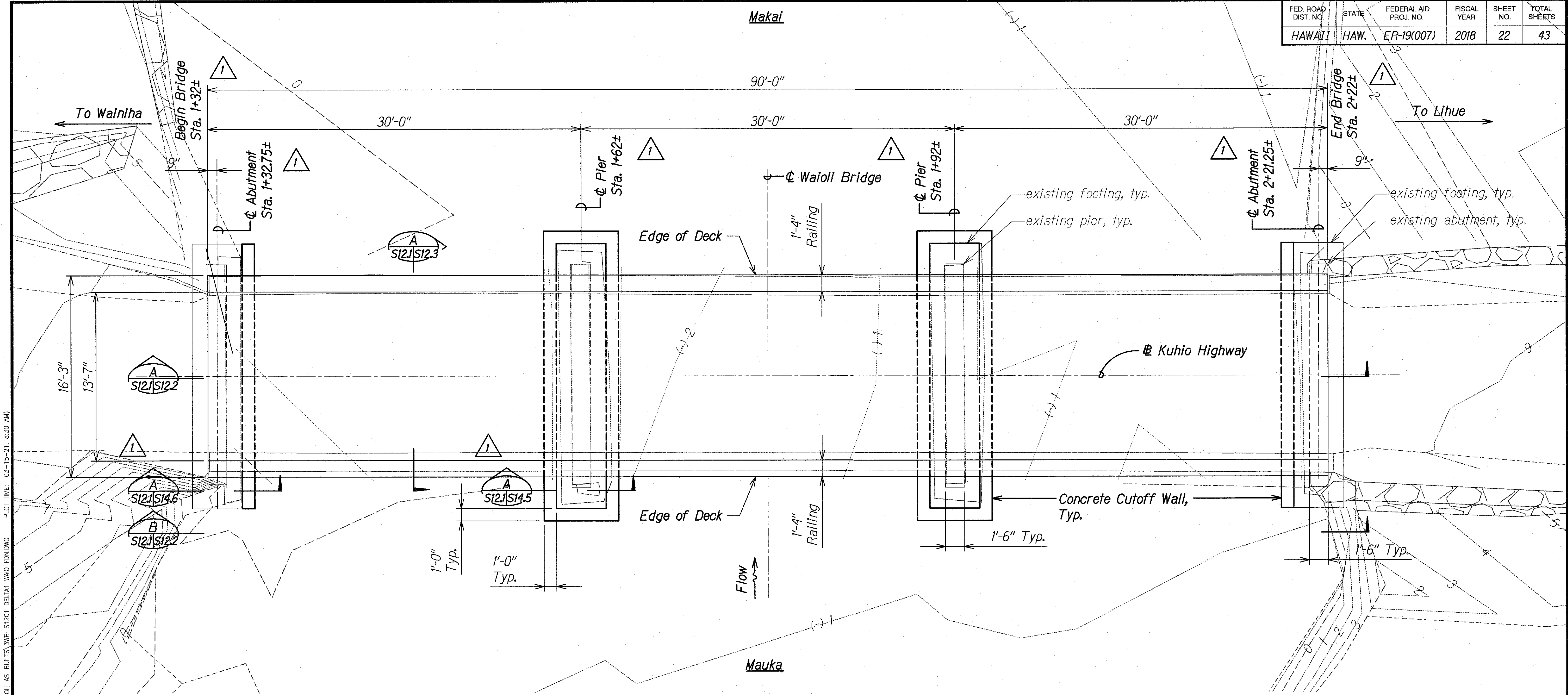
**SYMBOLS AND ABBREVIATIONS**

**KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP**  
**At Various Locations April 2018, Rte. 560**  
**Fed. Aid Proj. No. ER-19(007)**

Scale: None Date: Oct. 2018

SHEET No. **S0.5** OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	22	43



**LAYOUT PLAN** A  
 Scale: 1/4" = 1'-0" S121 S121

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

DRAWING NAME: 2A.00 ONGOING(00 CB PROJECTS)18-008.2-3W BRIDGES ASBY 01 CAD 03-XX-21 WAIOLI AS-BUILT'S 3WB-S1201 DELTA1 WAO FENDING PLOT TIME: 03-15-21 8:30 AM

3/19/19	<span style="border: 1px solid black; border-radius: 50%; padding: 2px;">1</span> Added Section Cuts and Stationing
DATE	REVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**WAIOLI STREAM BRIDGE**  
**LAYOUT PLAN**

**KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP**  
**At Various Locations April 2018, Rte. 560**  
**Fed. Aid Proj. No. ER-19(007)**

Scale: As Noted Date: Oct. 2018

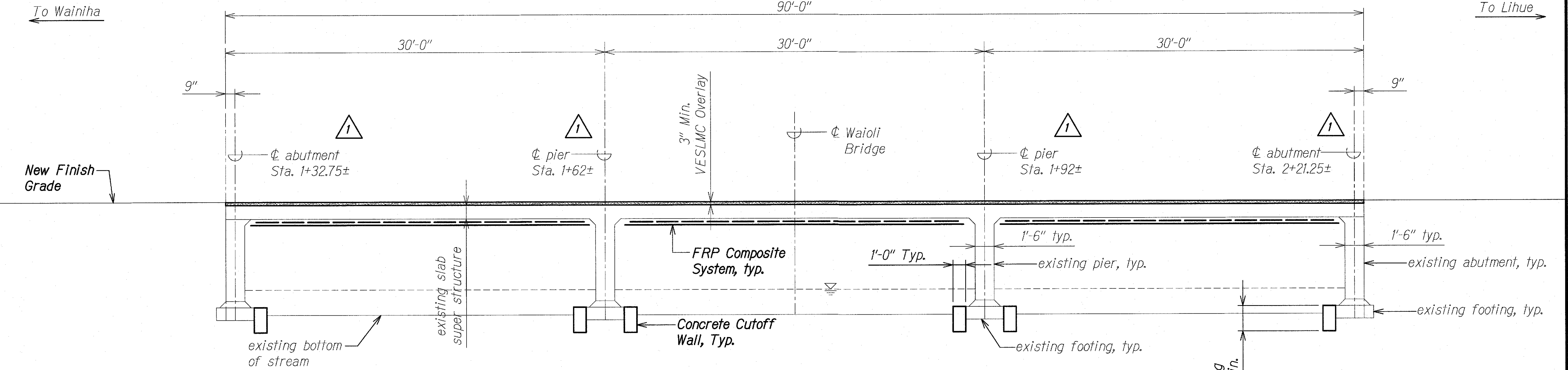
SHEET No. S121 OF 3 SHEETS



FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	23	43

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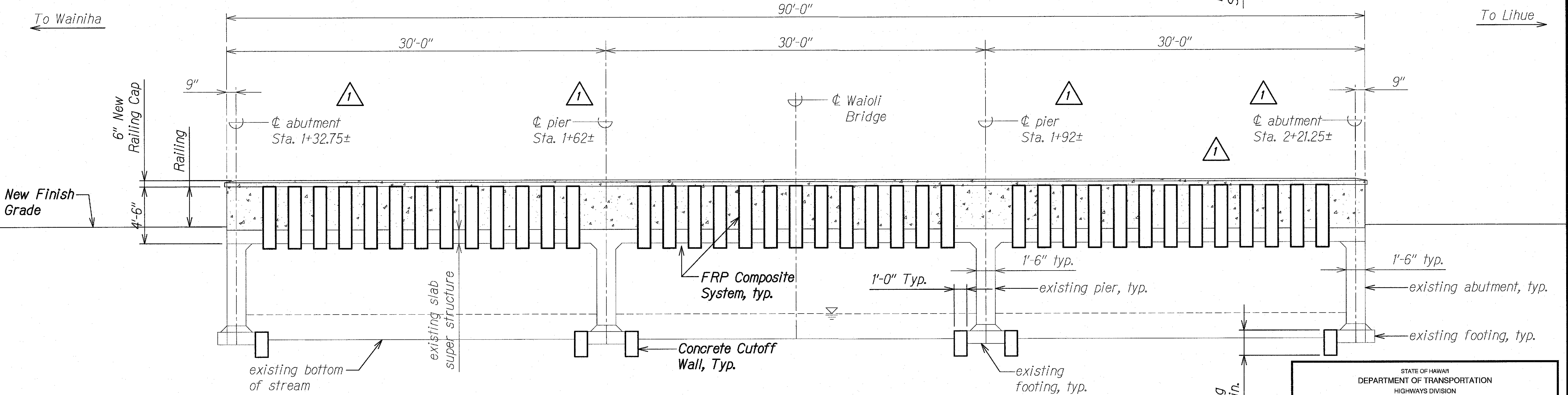
ORIGINAL PLAN	DATE
NOTE BOOK	DESIGNED BY
	QUANTITIES BY
	CHECKED BY
No.	



### LONGITUDINAL SECTION

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

A  
S121 S122



### ELEVATION

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

B  
S121 S122

3/19/19	Added FRP on Railing, Section Cuts & Stationing
DATE	REVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

WAIOLI STREAM BRIDGE  
LONGITUDINAL SECTION AND ELEV.

KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP  
At Various Locations April 2018, Rte. 560  
Fed. Aid Proj. No. ER-19(007)

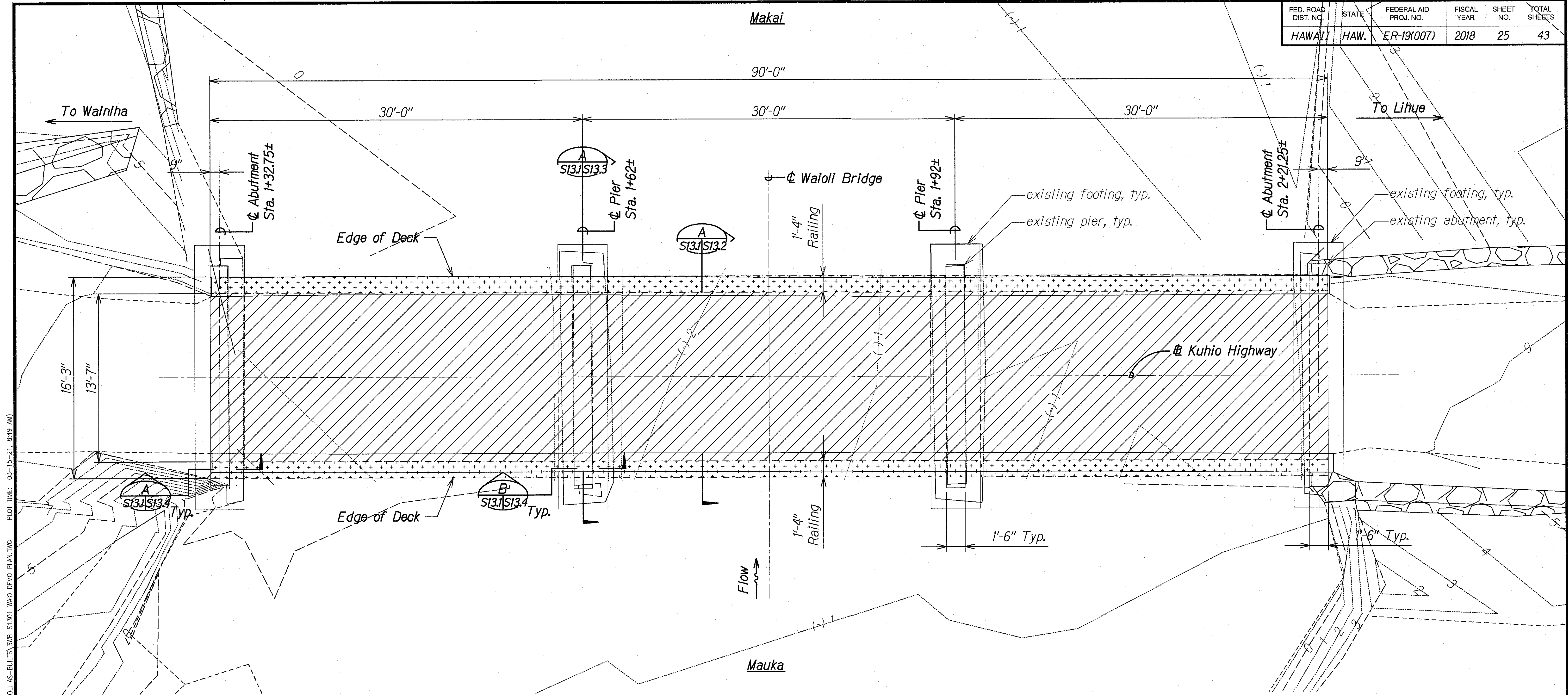
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Date: Oct. 2018

SHEET No. S122 OF 3 SHEETS





FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	25	43

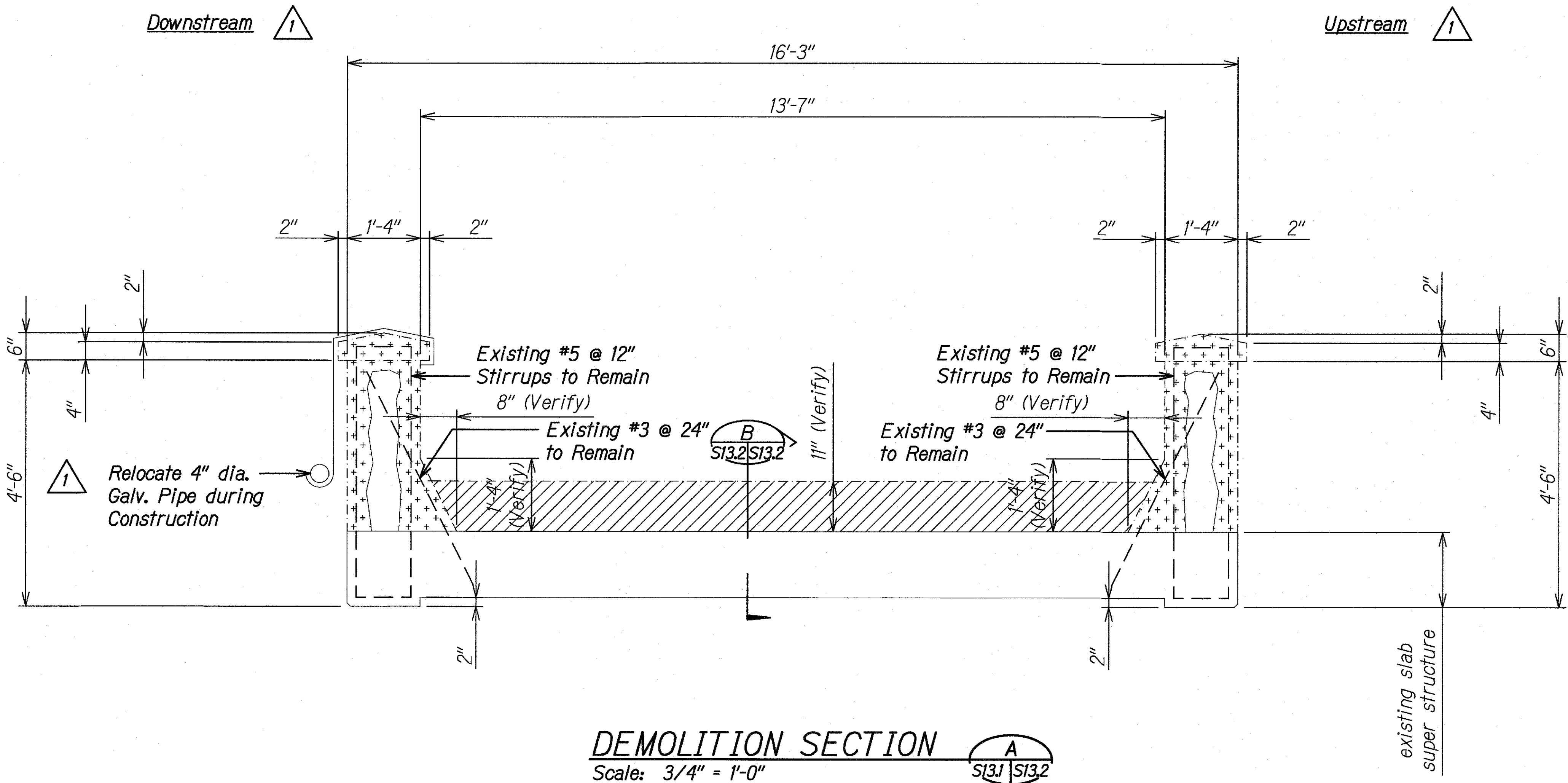


ORIGINAL PLAN	DATE
NOTE BOOK	
DESIGNED BY	
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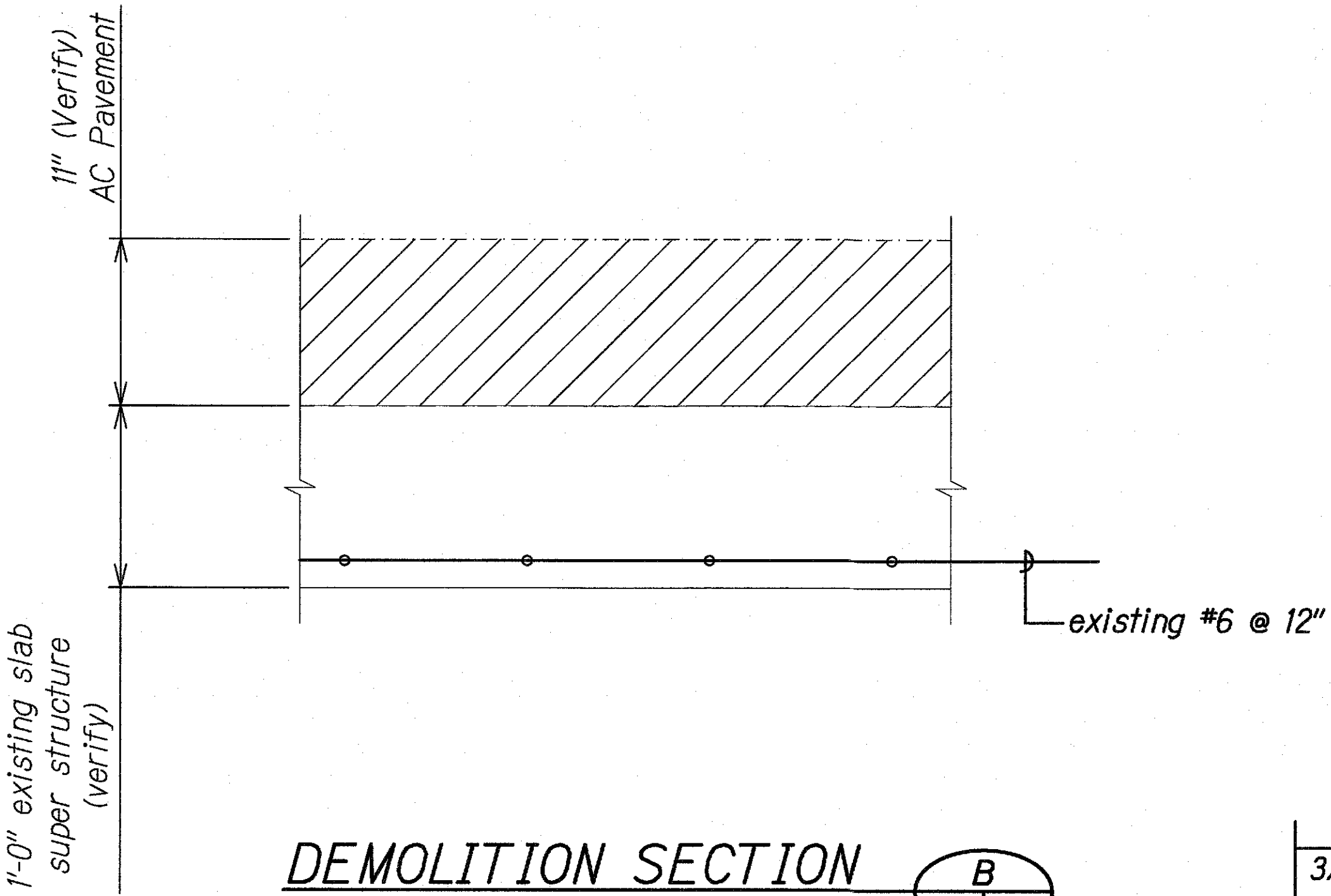
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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**WAIOLI STREAM BRIDGE**  
**DEMOLITION PLAN**  
KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP  
At Various Locations April 2018, Rte. 560  
Fed. Aid Proj. No. ER-19(007)  
Scale: As Noted Date: Oct. 2018  
SHEET No. S13J OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	26	43

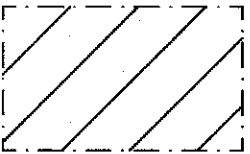


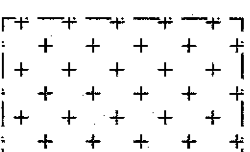
DEMOLITION SECTION A  
Scale: 3/4" = 1'-0"



DEMOLITION SECTION B  
Scale: 1 1/2" = 1'-0"

**LEGEND**

 Removal of AC Pavement

 Removal of Unsound Railing Concrete

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

DRAWING NAME: 21.00 ONGOING 00 CB PROJECTS\18-008.2-3W BRIDGES\ASER\01 CAD\03-XY-21 WAIOLI AS-BUILTS\2WB-S1302 DELT41 WAO DEMO TRANS SEC.DWG PLOT TIME: 03-15-21, 8:50 AM

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

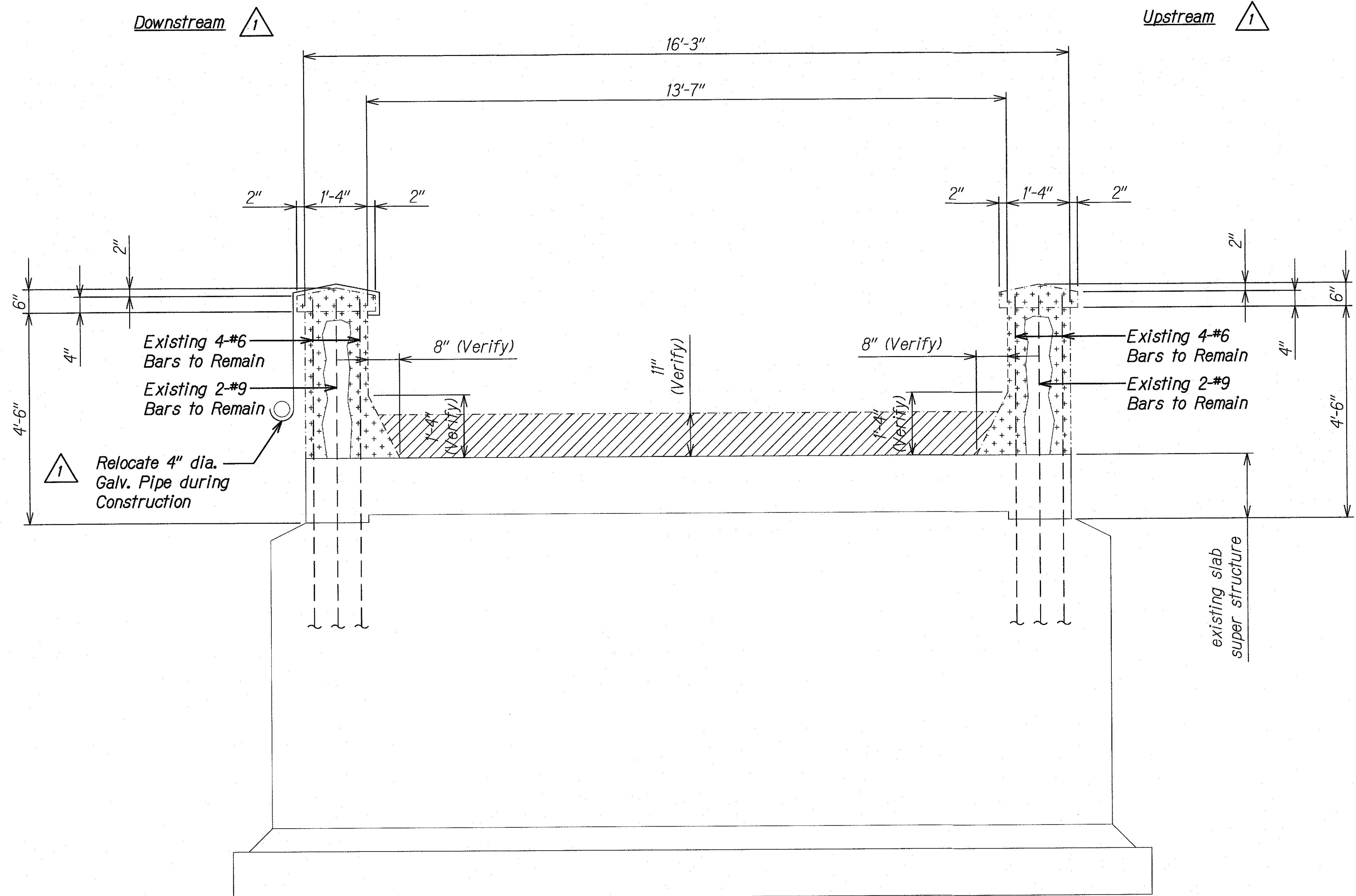
**WAIOLI STREAM BRIDGE**  
**DEMOLITION SECTIONS**  
**KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP**  
**At Various Locations April 2018, Rte. 560**  
**Fed. Aid Proj. No. ER-19(007)**

Scale: As Noted
Date: Oct. 2018

SHEET No. S13.2 OF 4 SHEETS

3/19/19	Added and Revised Notes
DATE	REVISION

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	27	43



**LEGEND**

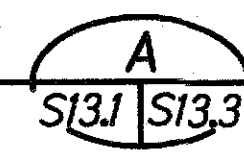
Removal of AC Pavement

Removal of Unsound Railing Concrete

**NOTE:**  
Condition at abutments is unknown. Any vertical reinforcing extending out of abutment walls shall remain.

## DEMOLITION SECTION AT PIER

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



SURVEY PLOTTED BY	DATE
DESIGNED BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	

DRAWING NAME: Z:\00 ONGOING\00 CB PROJECTS\18-0082-3W BRIDGES\ASR\01 CAD\03-KX-21 WAIOLI AS-BUILTS\DWG-S1303 DELTA1 WAO DEMO TRANS SEC.DWG PLOT TIME: 03-15-21, 8:51 AM

3/19/19	Added and Revised Notes
DATE	REVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**WAIOLI STREAM BRIDGE**  
**DEMOLITION SECTION**

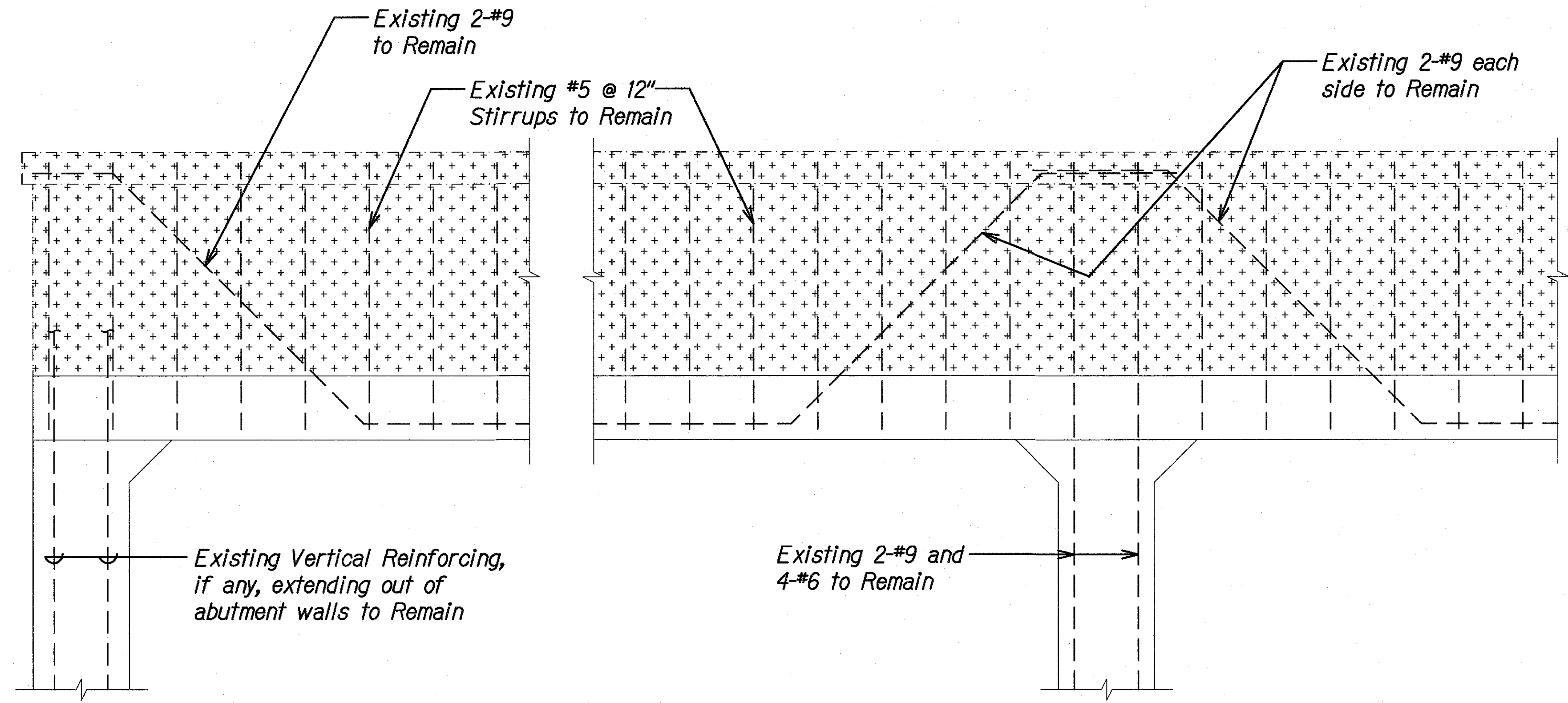
KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP  
At Various Locations April 2018, Rte. 560  
Fed. Aid Proj. No. ER-19(007)

Scale: As Noted Date: Oct. 2018

SHEET No. S13.3 OF 4 SHEETS



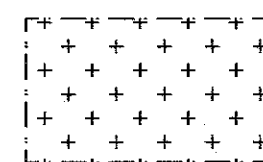
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	28	43



DEMOLITION  
SECTION AT ABUTMENT  
Scale: 3/4" = 1'-0" A  
S13.1 S13.4

DEMOLITION  
SECTION AT PIER  
Scale: 3/4" = 1'-0" B  
S13.1 S13.4

LEGEND



Removal of Unsound Railing Concrete

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

DRAWING NAME: 2A.00 ONGOING 00 03 PROJECTS 18-008.2-3W BRIDGES ASR-01 CAD 03-XX-21 WAIOLI AS-BUILTS JWP-S1304 WAO DEMO TRANS SECDWG PLOT TIME: 03-15-21, 11:03 AM

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

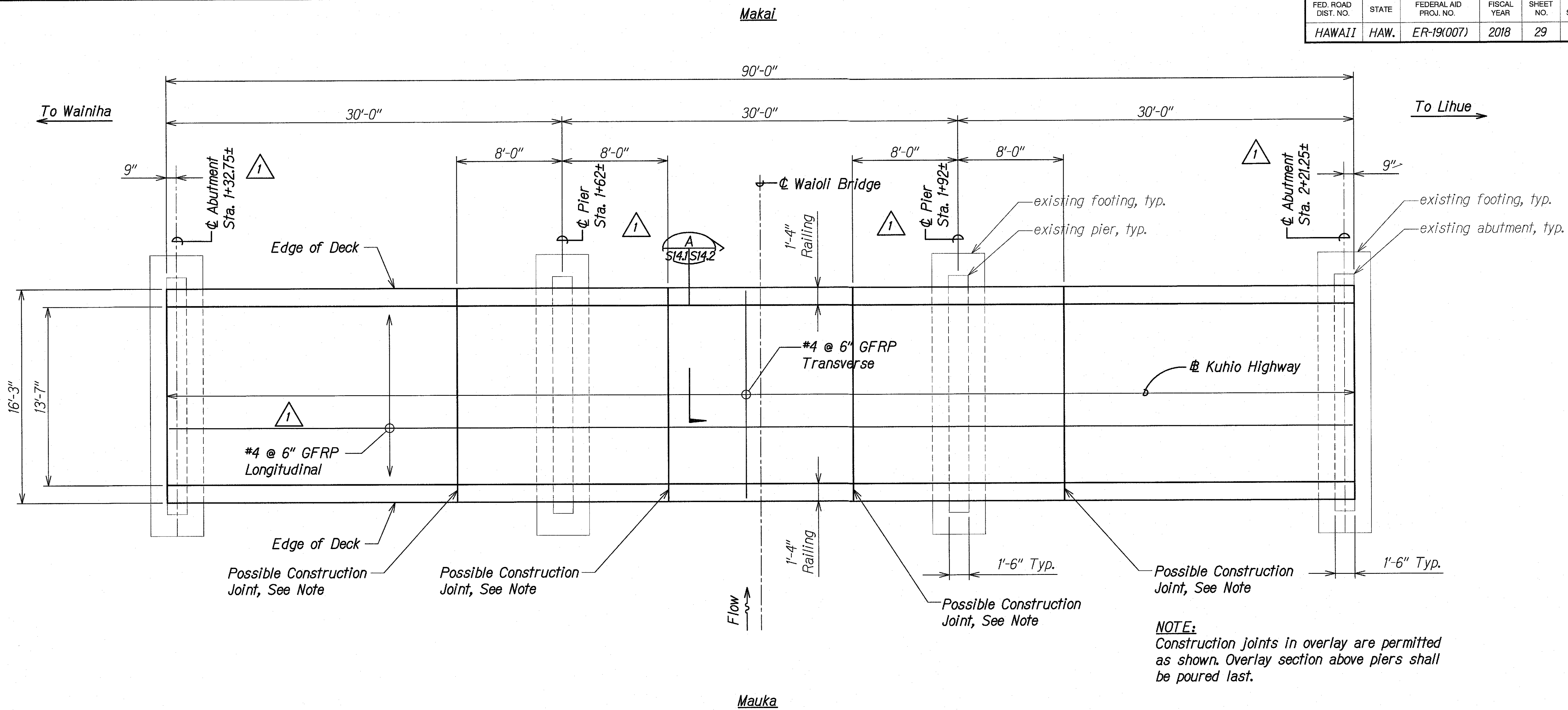
**WAIOLI STREAM BRIDGE**  
**DEMOLITION SECTIONS**

KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP  
At Various Locations April 2018, Rte. 560  
Fed. Aid Proj. No. ER-19(007)

Scale: As Noted Date: Oct. 2018

SHEET No. S13.4 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	29	43



**NOTE:**  
Construction joints in overlay are permitted as shown. Overlay section above piers shall be poured last.

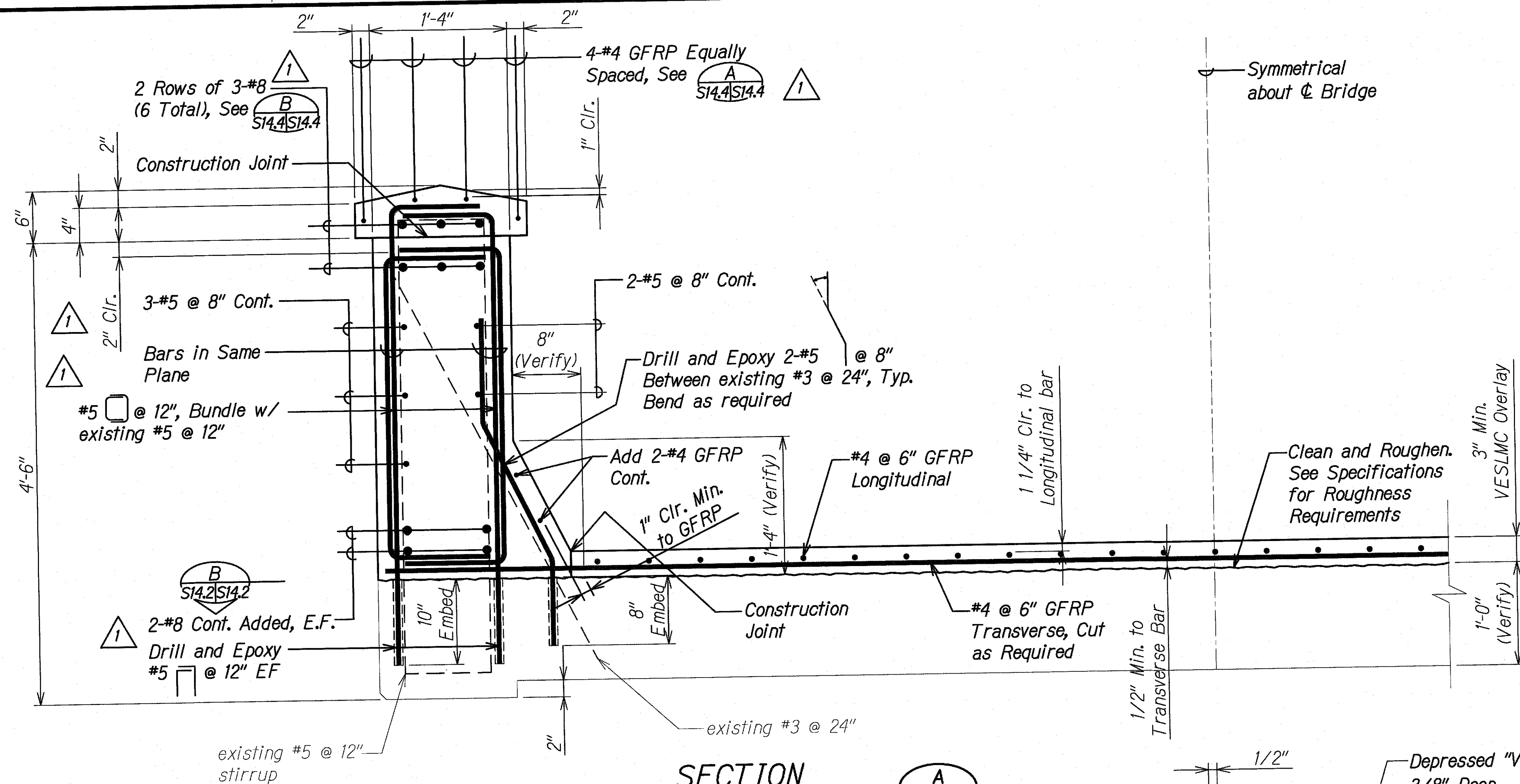
**OVERLAY REINFORCING PLAN**  
Scale: 1/4" = 1'-0" A  
S14.1 S14.2

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

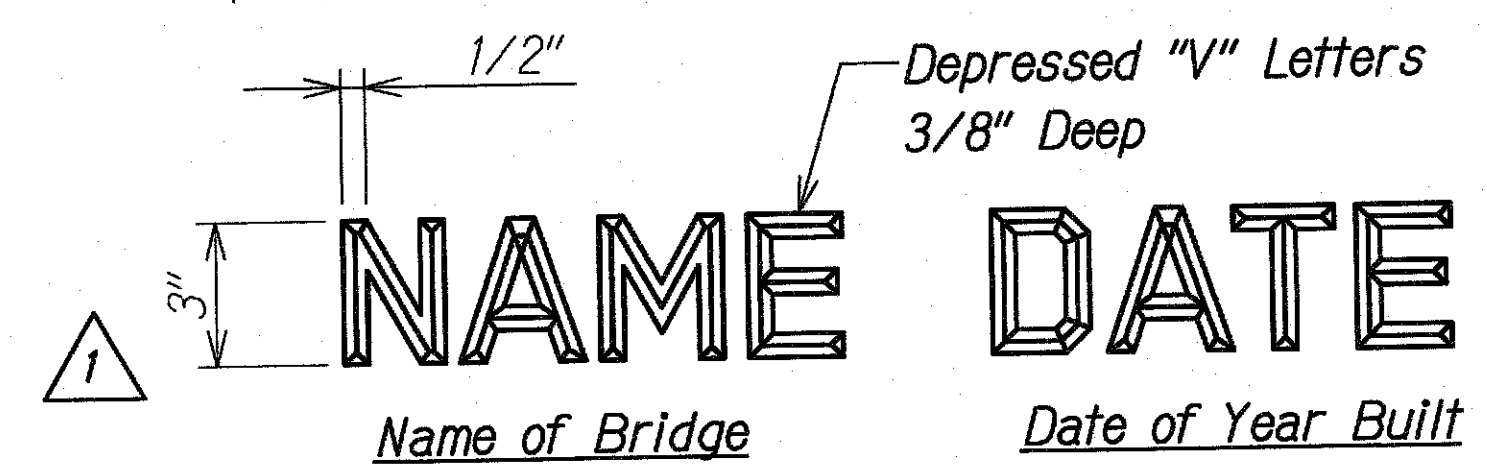
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3/19/19	<span style="border: 1px solid black; padding: 2px;">1</span> Revised GFRP Spacing, Added Stationing
DATE	REVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**WAIOLI STREAM BRIDGE  
OVERLAY REINFORCING PLAN**  
 KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP  
 At Various Locations April 2018, Rte. 560  
 Fed. Aid Proj. No. ER-19(007)  
 Scale: As Noted Date: Oct. 2018  
 SHEET No. **S14.1** OF 6 SHEETS



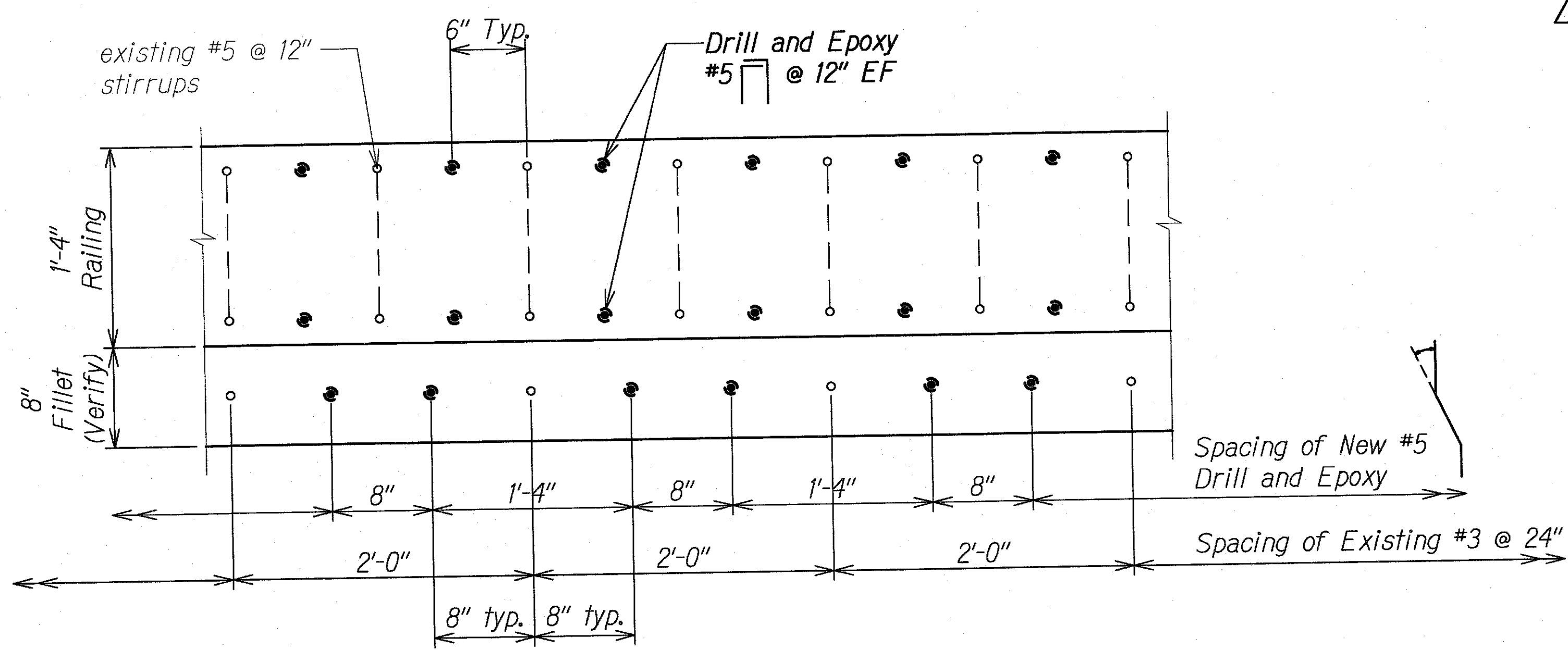
**SECTION**  
Scale: 1 1/2" = 1'-0"  
A  
S14.3 S14.2  
S14.1



- NOTES:**
- 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.
  - Name & date shall be place on the trailing end post on each side of each bridge.
  - Unless otherwise directed by the Engineer, the name shall be:

WAI'OLI BRIDGE 1912  
REHABILITATED 2018

**TYPICAL DETAILS OF LETTERS & FIGURES AT CONCRETE RAILING**  
Not to Scale  
1  
S14.2 S14.2



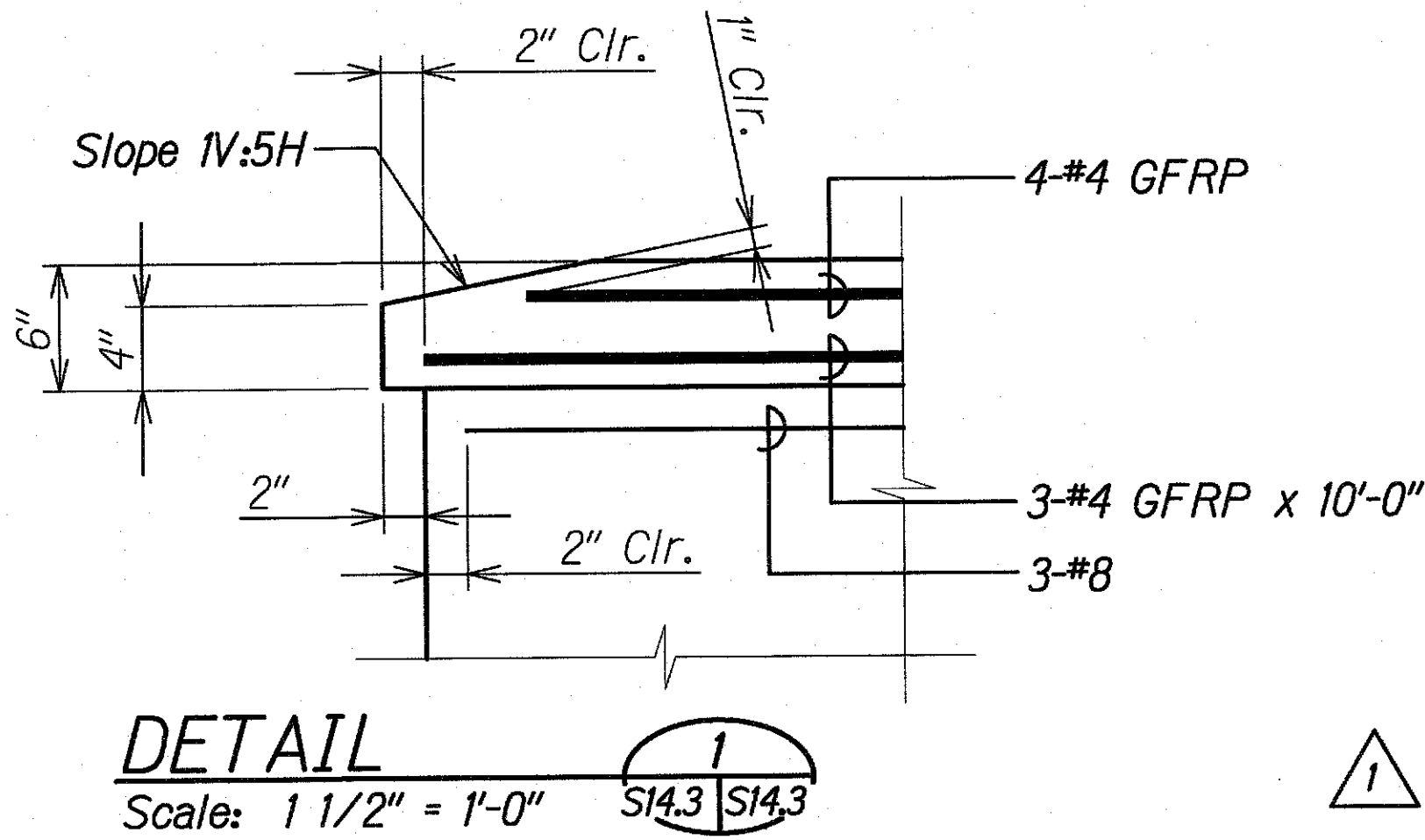
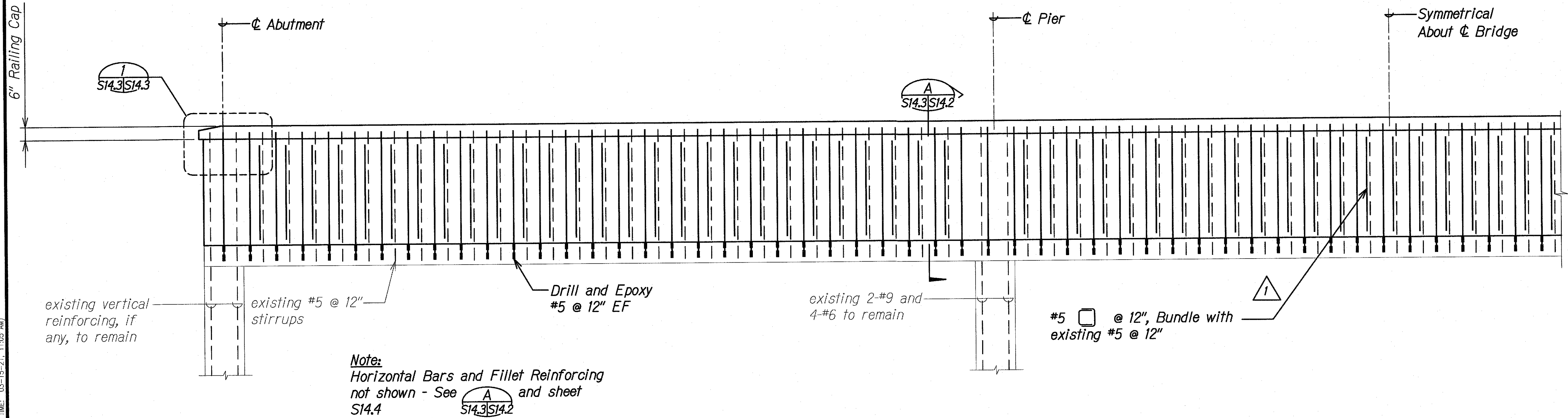
**SECTION**  
Scale: 1 1/2" = 1'-0"  
B  
S14.2 S14.2

**Note:**  
Clean and Roughen to 1/4" Amplitude all Construction Joints Prior to Pour, unless noted otherwise.

3/19/19	1	Revised Dimensions and Notes
DATE	REVISION	
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION <b>WAIOLI STREAM BRIDGE</b> <b>OVERLAY SECTION</b> KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP At Various Locations April 2018, Rte. 560 Fed. Aid Proj. No. ER-19(007) Scale: As Noted Date: Oct. 2018 SHEET No. S14.2 OF 6 SHEETS		



FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	31	43



**RAILING ELEVATION**  
Scale: 1/2" = 1'-0"

A  
S14.3/S14.3

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

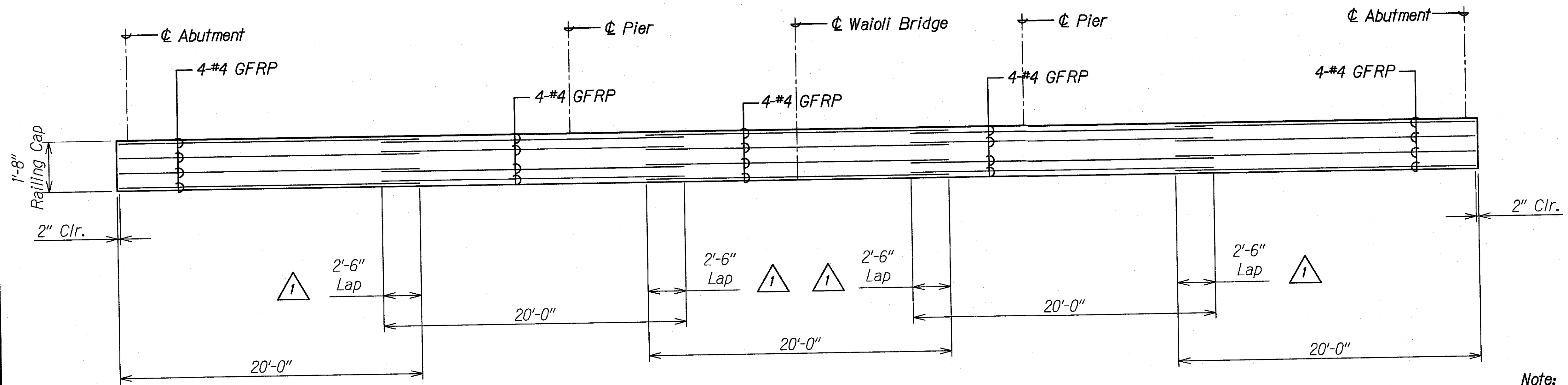
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3/19/19	Revised Railing Notes; Added Detail
DATE	REVISION

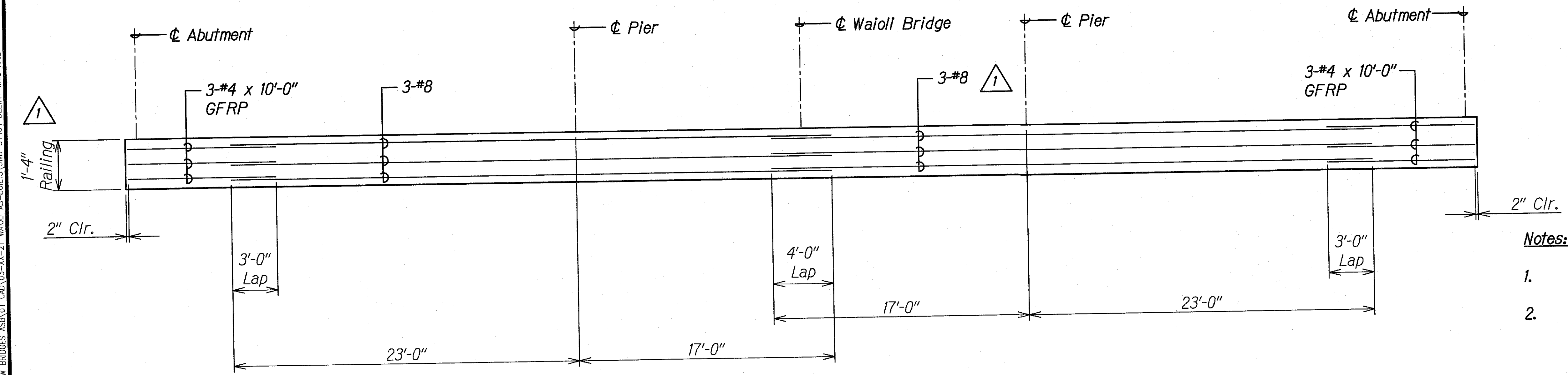
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**WAIOLI STREAM BRIDGE**  
**RAILING REINFORCING ELEVATION**  
KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP  
At Various Locations April 2018, Rte. 560  
Fed. Aid Proj. No. ER-19(007)  
Scale: As Noted Date: Oct. 2018  
SHEET No. S14.3 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	32	43



RAILING CAP  
TOP REINFORCING PLAN  
Not to Scale



RAILING  
TOP REINFORCING PLAN  
Not to Scale

- Notes:
- Layout is based on 40'-0" rebar lengths.
  - Second Row of 3-#8 in railing cap to be reinforced similarly.

SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
CHECKED BY	
NOTE BOOK	
No.	

DRAWING NAME: Z:\00 ONGOING\00 CB PROJECTS\18-008.2-SW BRIDGES\REV01 CAD\01-XI-21 WAIOLI AS-BUILT\3W-S1404 DELTA1 WAIOLI RAIL CAP.DWG PLOT TIME: 03-15-21 11:06 AM

3/19/19	1	Revised Lap Lengths and Notes
DATE	REVISION	

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

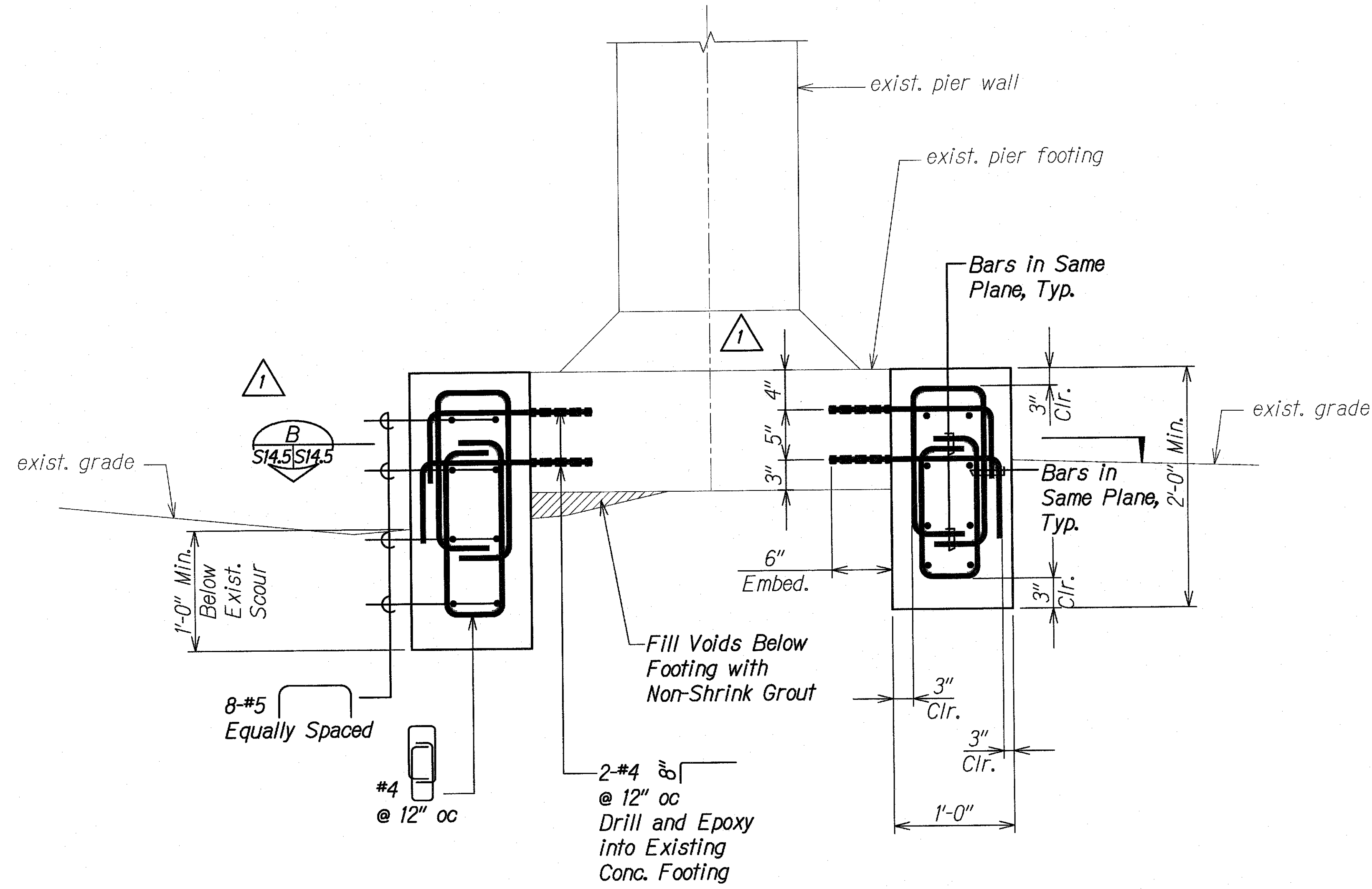
**WAIOLI STREAM BRIDGE**  
**RAILING CAP REINFORCING PLANS**

KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP  
At Various Locations April 2018, Rte. 560  
Fed. Aid Proj. No. ER-19(007)

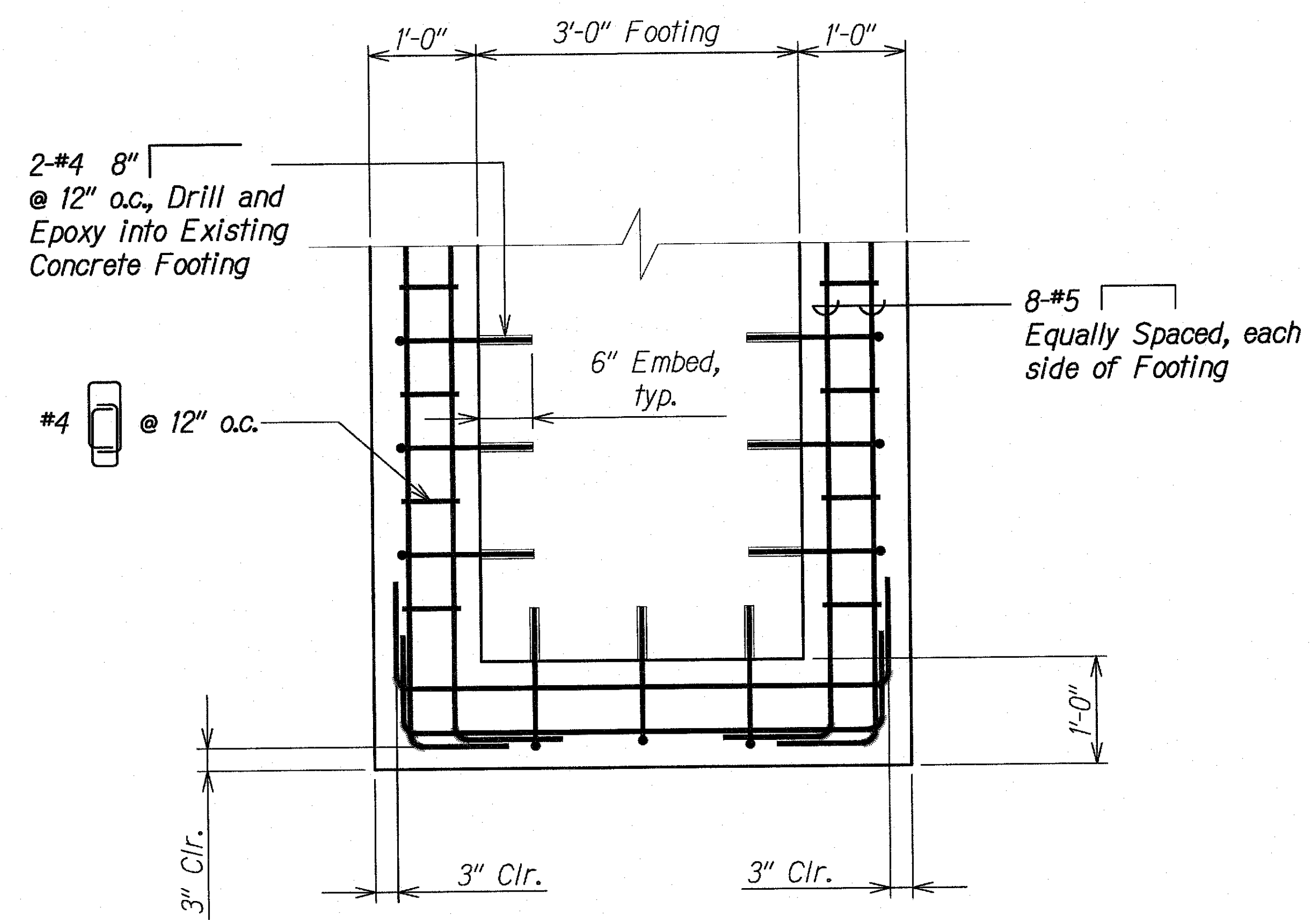
Scale: As Noted Date: Oct. 2018

SHEET No. S14.4 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	33	43



**CUTOFF WALL SECTION**  
 Scale: 1 1/2" = 1'-0"  
 A  
 S12.1 S14.5



**CUTOFF WALL SECTION**  
 Scale: 1" = 1'-0"  
 B  
 S14.5 S14.5 1

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

DRAWING NAME: Z:\00 ONGOING\00 CB PROJECTS\18-0082-3W BRIDGES\ASB\01 CAD\03-XX-21 WAIOLI AS-BUILTS\JWB-S1405 DELA1 WNO CUTOFF WALL.DWG PLOT TIME: 03-15-21, 11:06 AM)

3/19/19	1	Revised Dimensions; Added Section
DATE		REVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**WAIOLI STREAM BRIDGE**  
**CUTOFF WALL SECTION**

KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP  
At Various Locations April 2018, Rte. 560  
Fed. Aid Proj. No. ER-19(007)

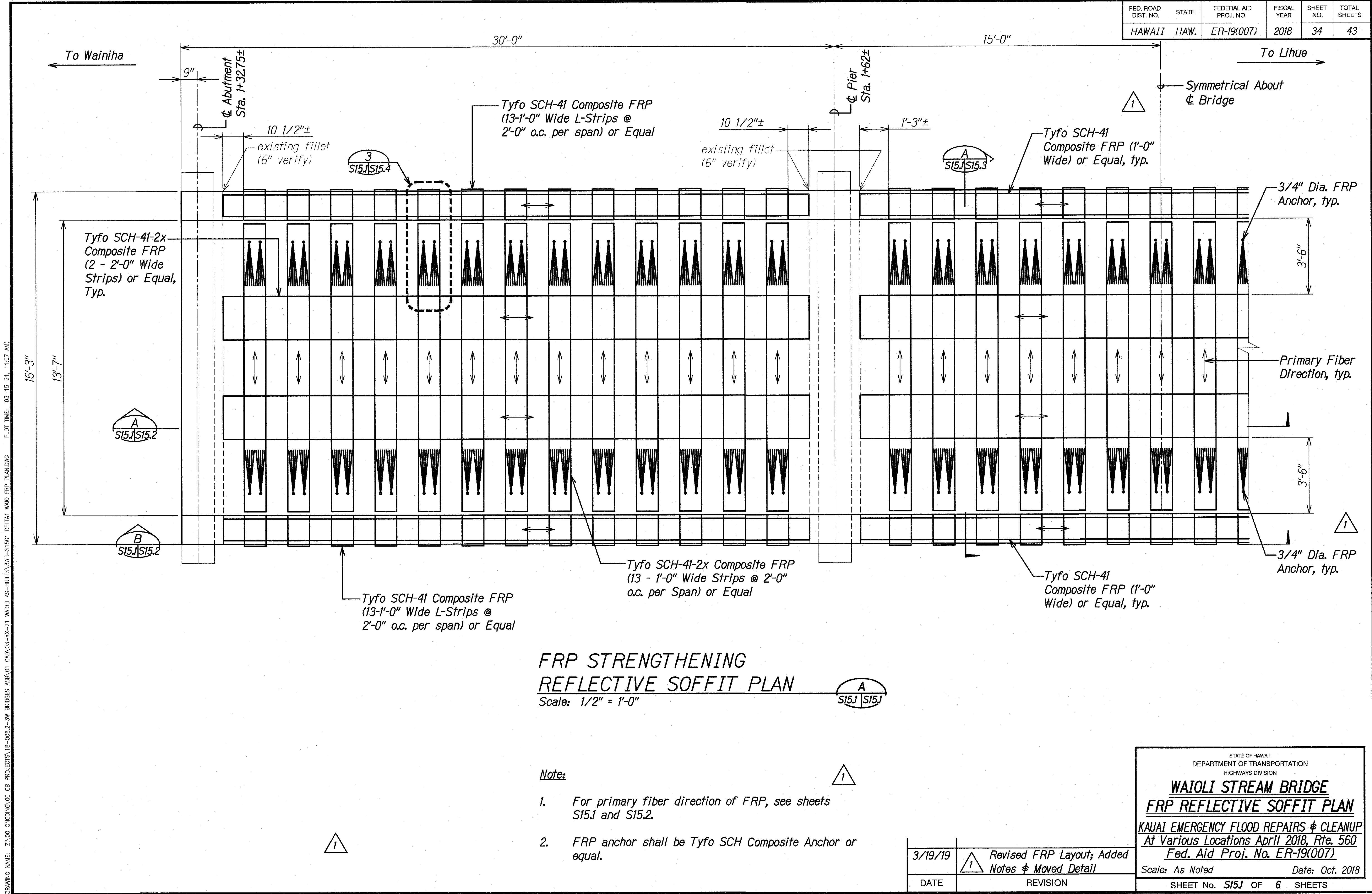
Scale: As Noted Date: Oct. 2018

SHEET No. S14.5 OF 6 SHEETS





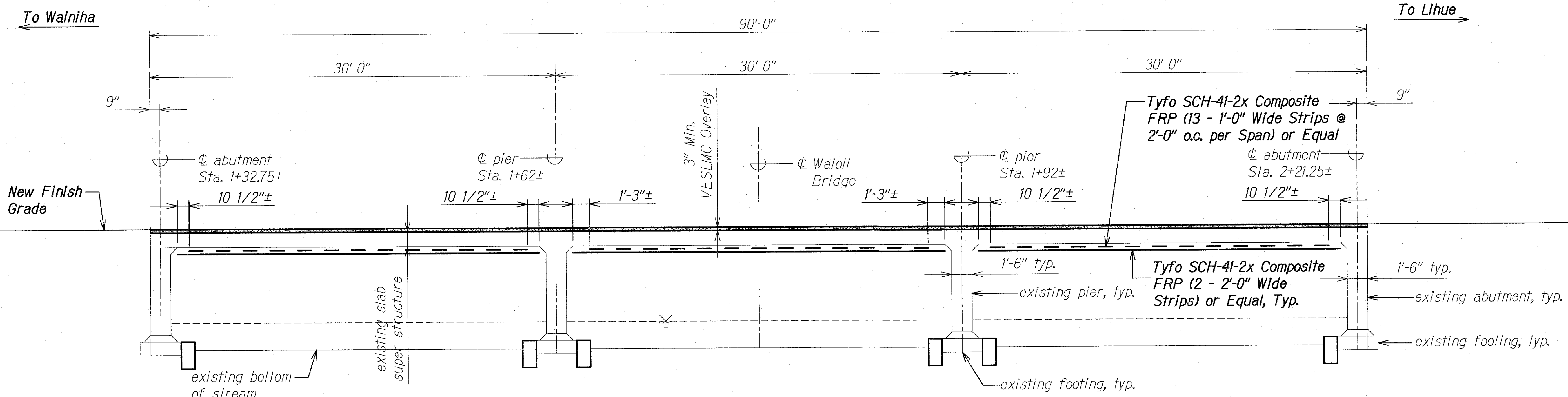
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	34	43



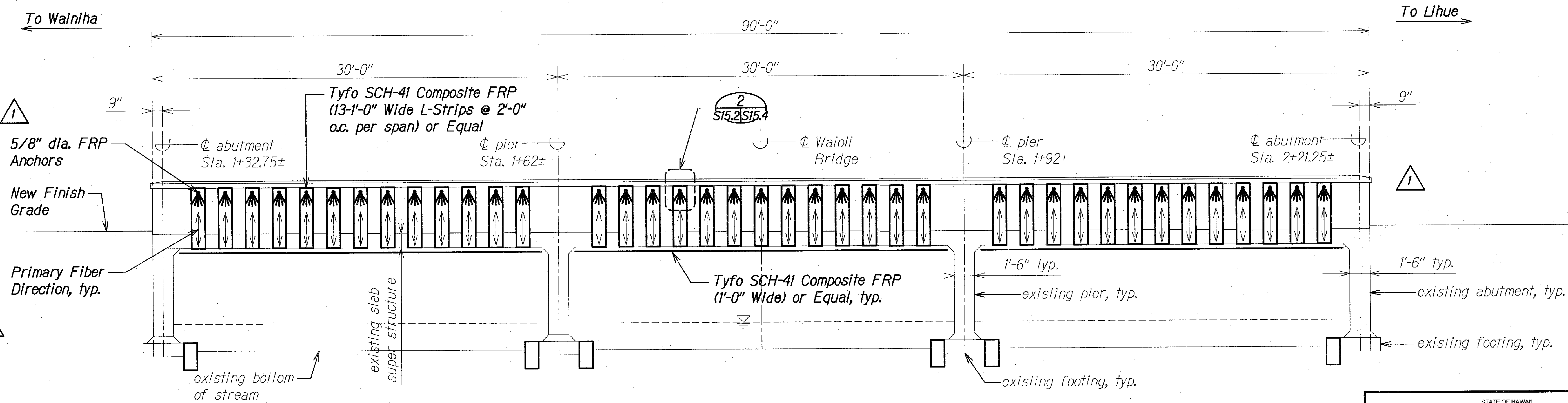
DESIGNED BY	DATE
TRACED BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
NO.	

DRAWING NAME: 2100 ONGOING 00 CB PROJECTS 18-008.2-3W BRIDGES ASSET 01 CAD 03-XX-21 WAIOLI AS-BUILT 218-WB-S1501 DETAIL WAO FRP PLANDING PLOT TIME: 03-15-21, 11:07 AM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	35	43



**SECTION A**  
Scale: 1/4" = 1'-0"



**SECTION B**  
Scale: 1/4" = 1'-0"

- Notes:**
- For primary fiber direction of FRP, see sheets S15.1 and S15.2.
  - FRP anchor shall be Tyfo SCH Composite Anchor or Equal.

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

DRAWING NAME: 2A-00 ONGOING/00-03 PROJECTS/18-008.2-3W BRIDGES/ASB/01 CAD/03-XX-21 WAIOLI AS-BUILT/3WB-S1502 DELTA WAO FRP LONG SECT.DWG PLOT TIME: 03-15-21, 11:08 AM

3/19/19	Added FRP to Railing; Revised Notes
DATE	REVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**WAIOLI STREAM BRIDGE**  
**FRP SECTION**

**KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP**  
At Various Locations April 2018, Rte. 560  
Fed. Aid Proj. No. ER-19(007)

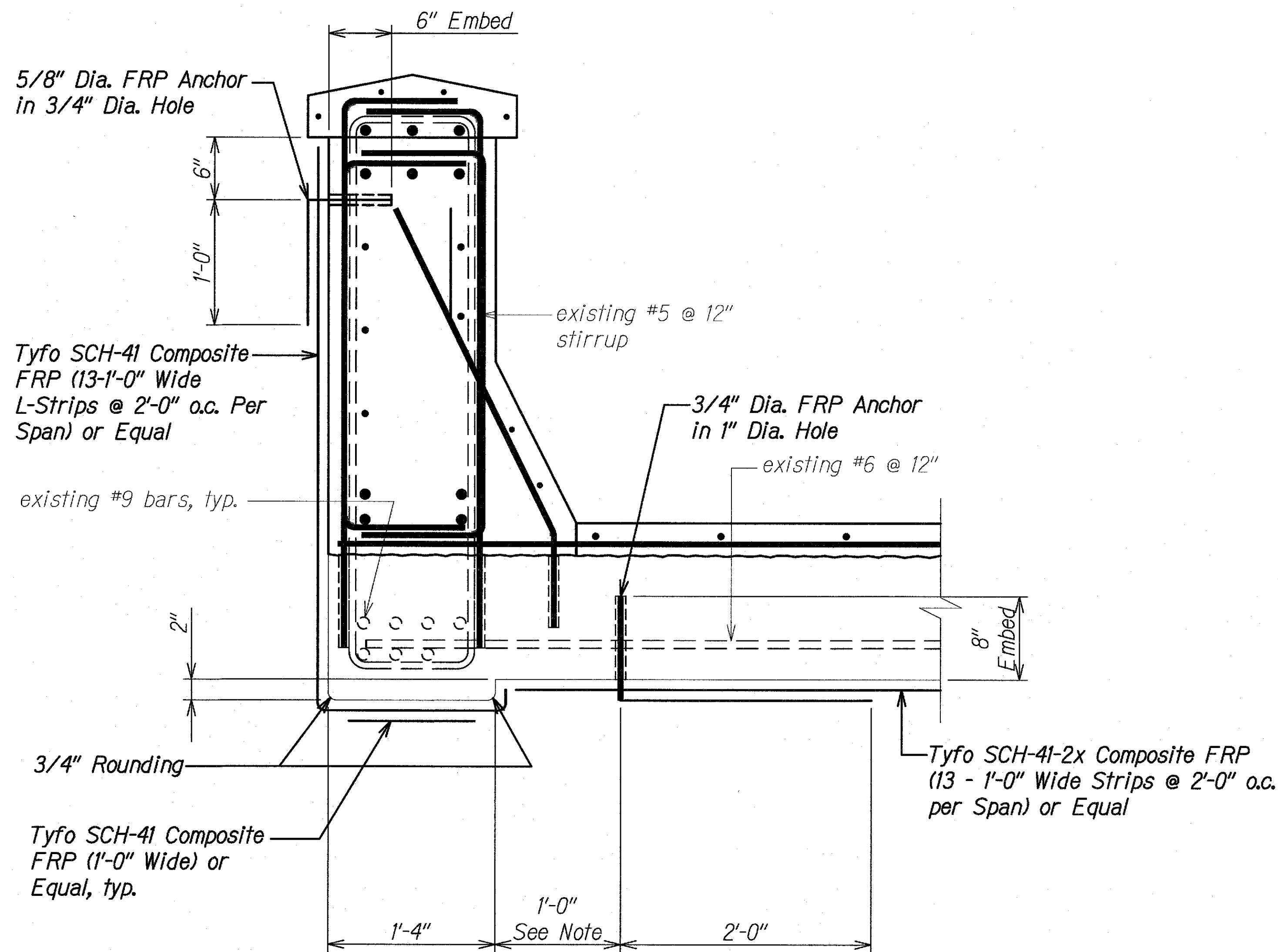
Scale: As Noted  
SHEET No. S15.2 OF 6 SHEETS

Date: Oct. 2018





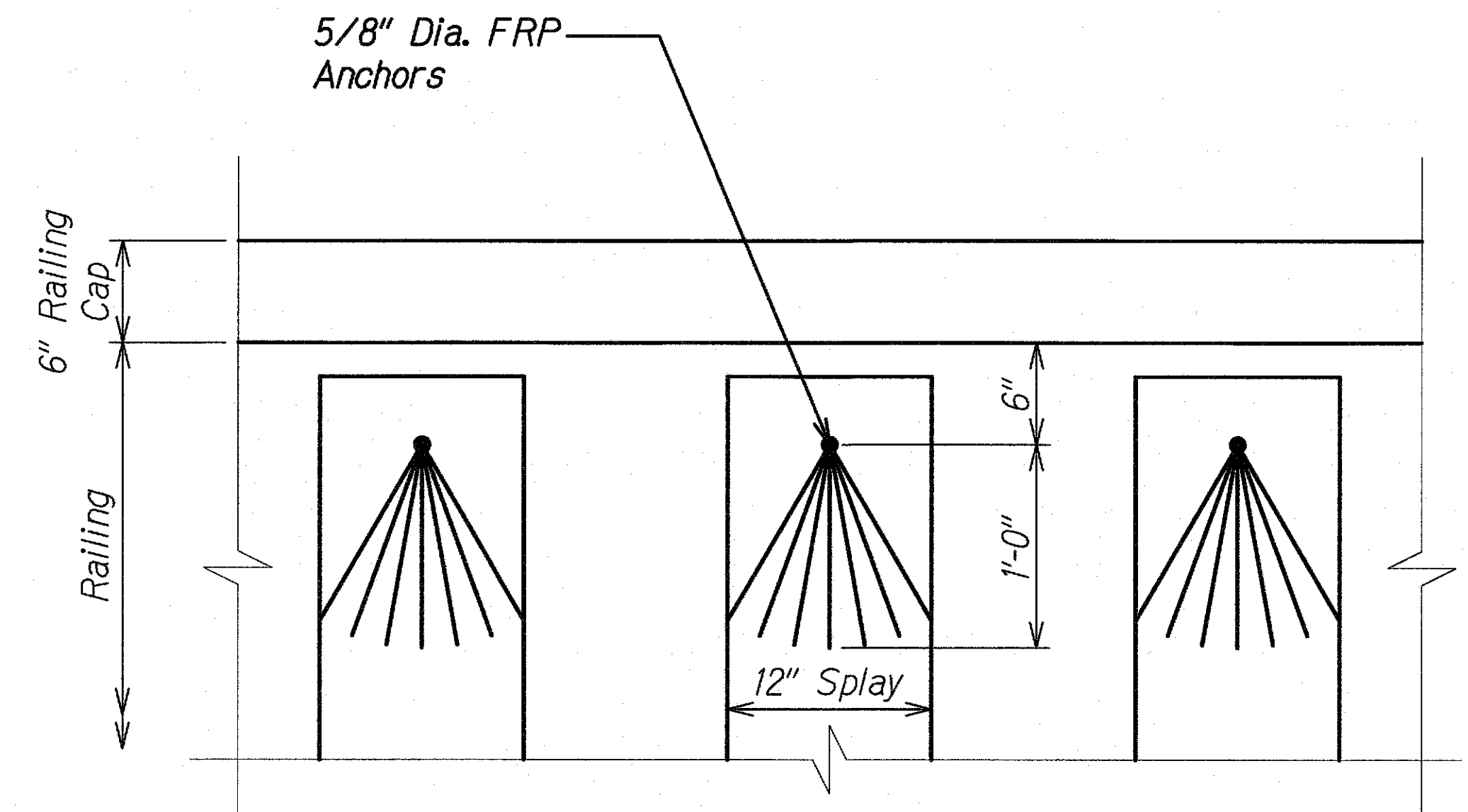
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	36S-1	43



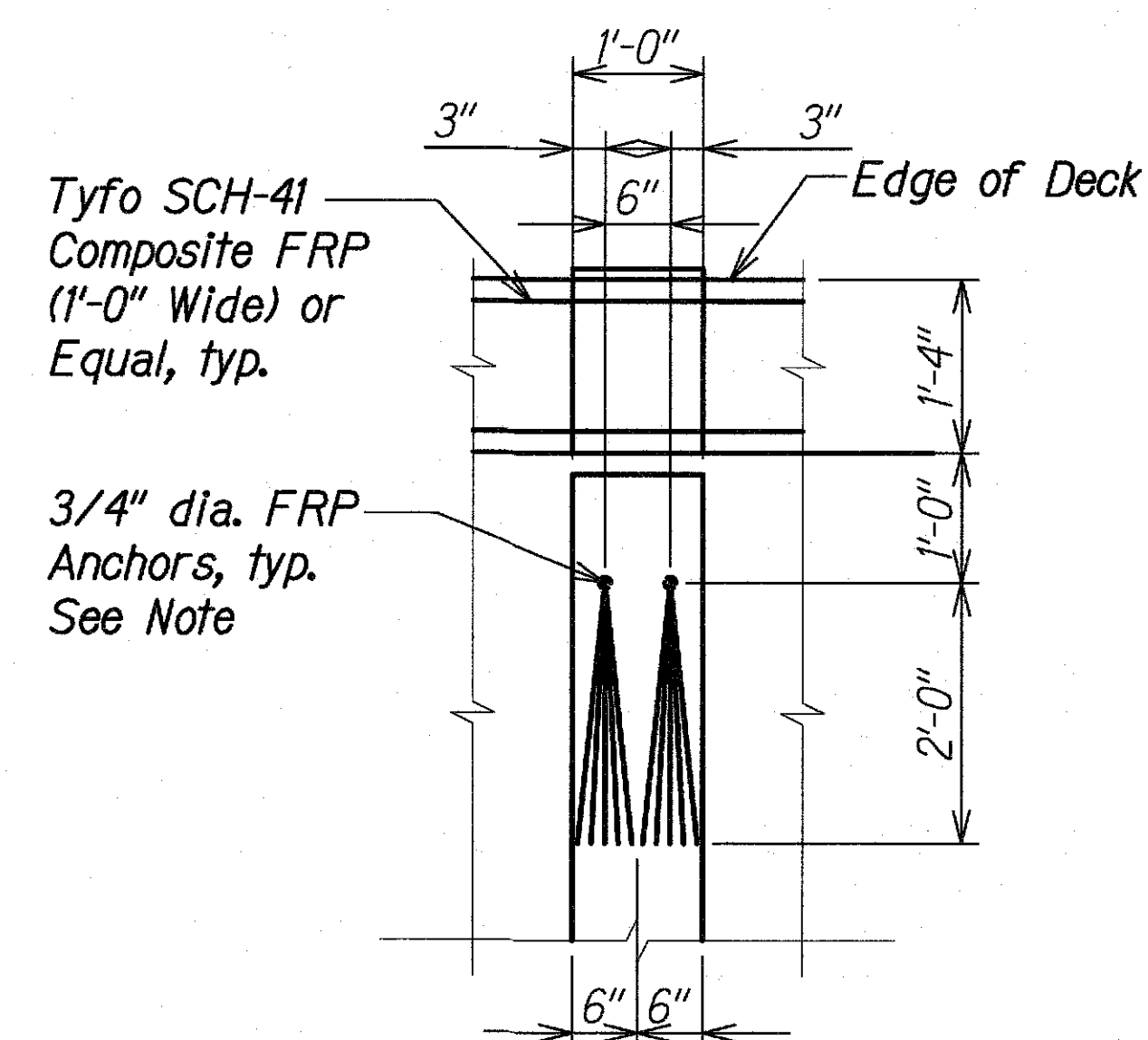
**Note:**

The Contractor shall verify the location of all existing reinforcing bars prior to drilling into bridge soffit. Existing reinforcing shall not be damaged.

**DETAIL**  
Scale: 1 1/2" = 1'-0" 1 S15.3 S15.4



**DETAIL**  
Scale: 1 1/2" = 1'-0" 2 S15.2 S15.4



**FRP DETAIL**  
Scale: 3/4" = 1'-0" 3 S15.1 S15.4

ORIGINAL PLAN	DATE
NO. 1	
DESIGNED BY	
CHECKED BY	
NOTED BY	
DATE	

DRAWING NAME: 2A-00 ON-GOING 00 CB PROJECTS 18-008.2-3W BRIDGES ASB-01 CAD/03-XX-21 WAIOLI AS-BUILDING SWP-S1504 DETAIL WAO TRANS SEC'DWG PLOT TIME: 03-15-21 11:09 AM

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**WAIOLI STREAM BRIDGE**  
**FRP DETAIL**  
KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP  
At Various Locations April 2018, Rte. 560  
Fed. Aid Proj. No. ER-19(007)  
Scale: As Noted Date: Oct. 2018  
SHEET No. S15.4 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	36S-2	43

PREPARATION OF SUBSTRATE AND REINFORCING STEEL

FOR SPALL REPAIRS:


- "Defective Concrete" as noted on the drawings refers to "spalls", "delaminations" and "honeycombing."
- The Contractor shall sound all concrete in the designated general areas before proceeding with repair work.
- The defective concrete shall be completely removed to sound substrate and beyond the extent of the existing reinforcing. The Contractor shall take necessary precautions to avoid damaging the underlying sound concrete.
- The defective concrete shall be squared by saw-cutting and chipping the concrete at the perimeter beyond the removal area a minimum of 1 inch to attain a 1/2 inch maximum depth and to prevent feather edge conditions. Exercise great care to avoid cutting or damaging any existing embedded steel reinforcing. Angles between adjacent saw-cuts around the perimeter shall not be less than 90 degrees and the shape of each patch shall not be irregular.
- For any embedded reinforcement within the repair area, additional concrete shall be removed to attain a minimum 1 inch clear space measured radially around the bars.
- Existing concrete surfaces within the repair areas shall be roughened to achieve a Concrete Surface Profile equal to CSP 6-8 in accordance with International Concrete Repair Institute (ICRI) Guideline 310.2 to ensure proper adhesion with repair material.
- All exposed concrete surfaces and reinforcing bars in the repair area shall be needle gunned to remove all scale, loose rust, debris and deteriorated concrete. Any areas not patched within 48 hours after needle gunning shall be recleaned.
- Immediately prior to placement of bonding agent and repair material, the repair area shall be cleaned of all dust and debris with high-pressure, oil-free compressed air at a minimum of 100 psi. Patch area shall then be washed with clean water so that exposed concrete surface is saturated, but with no water accumulation on the surface.

APPLICATION OF SPALL REPAIR MATERIALS:

- All exposed steel shall be liberally coated with two 20 mil coats of bonding agent. The coating shall be complete with no skips, pin holes or holidays around the entire surface of the exposed steel. The first coat shall be allowed to dry 3 hours prior to application of the second coat. The second coat shall also be allowed to dry a minimum of 30 minutes prior to the placement of the repair material. Care shall be taken to avoid applying the coating material to the concrete substrate. Repair material shall be placed within the open time of coating application.
- The Contractor shall not secure forms by powder actuated fastenings. All holes and spalls caused by temporary attachments shall be patched. All inserts shall be removed.
- Repair material shall be applied in thicknesses per manufacturer's recommendations. When thicknesses exceed maximum for neat material, it shall be extended with aggregate as recommended by manufacturer.
- Snap ties and inserts shall be plastic or stainless steel.
- All concrete repairs shall be made smooth and level with the existing concrete surface.
- The repair material shall be vibrated, rodded, or tamped during placement to consolidate the pour and fill all corners of the patch or form with no voids.
- There shall be no cold joints in the field of the repair.
- The repaired surface finish profile shall match the original surface finish profile.
- Void spaces beyond the edge of the form shall be dry packed in lifts with patching compound.
- Apply a curing compound as recommended by the manufacturer. Remove curing from any surface where bonding is needed after curing is complete.
- Repair areas shall be allowed to cure 4 hours minimum with no vehicular traffic applied directly above or within 6 feet horizontally of the repair area. The Contractor shall schedule the work accordingly to allow repairs to attain min. concrete compressive strength of 3,000 psi prior to reopening to traffic.

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

DRAWING NAME: 2100 ONGOING 00 CB PROJECTS 18-008.2-SW BRIDGES ASB(01) CAD(01) 03-XX-21 WAOI AS-BUILDING-WBS-S1505 DETAIL WAOI REPAIR NOTEDWG PLOT TIME: 03-15-21, 11:10 AM

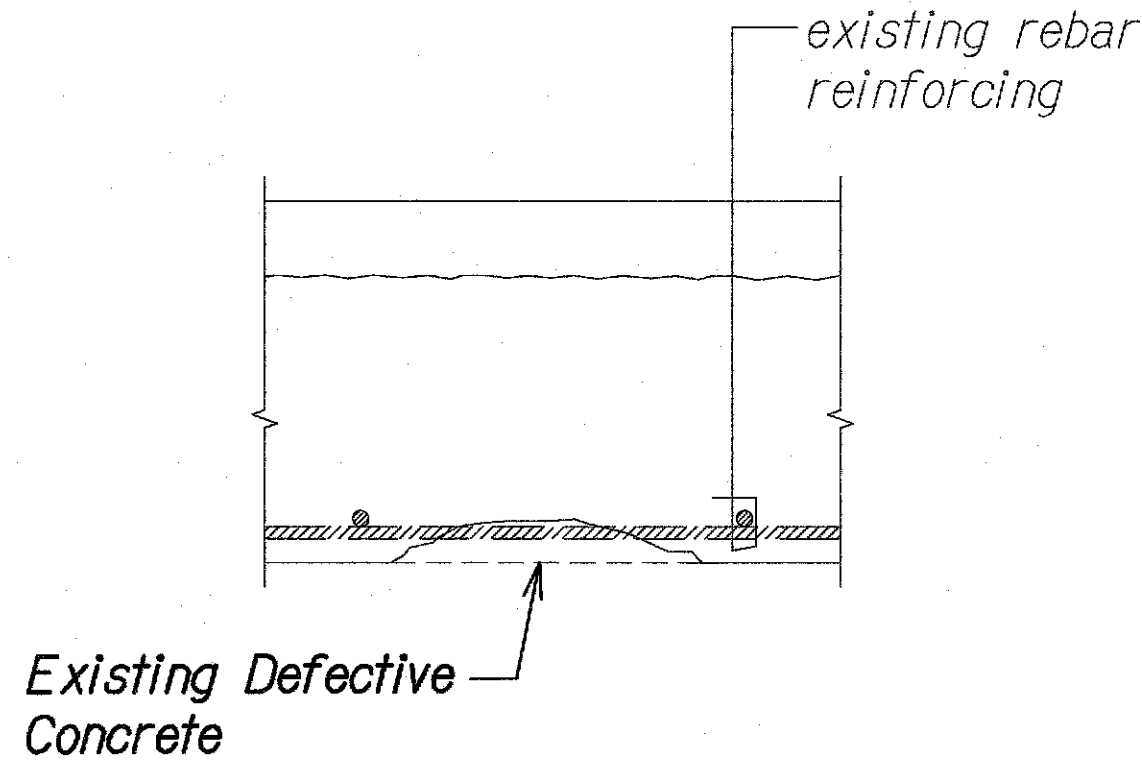
3/19/19	 Added Sheet
DATE	REVISION

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
<b>WAOI STREAM BRIDGE CONCRETE REPAIR NOTES</b>	
KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP At Various Locations April 2018, Rte. 560 Fed. Aid Proj. No. ER-19(007)	
Scale: As Noted	Date: Oct. 2018
SHEET No. S15.5 OF 6 SHEETS	

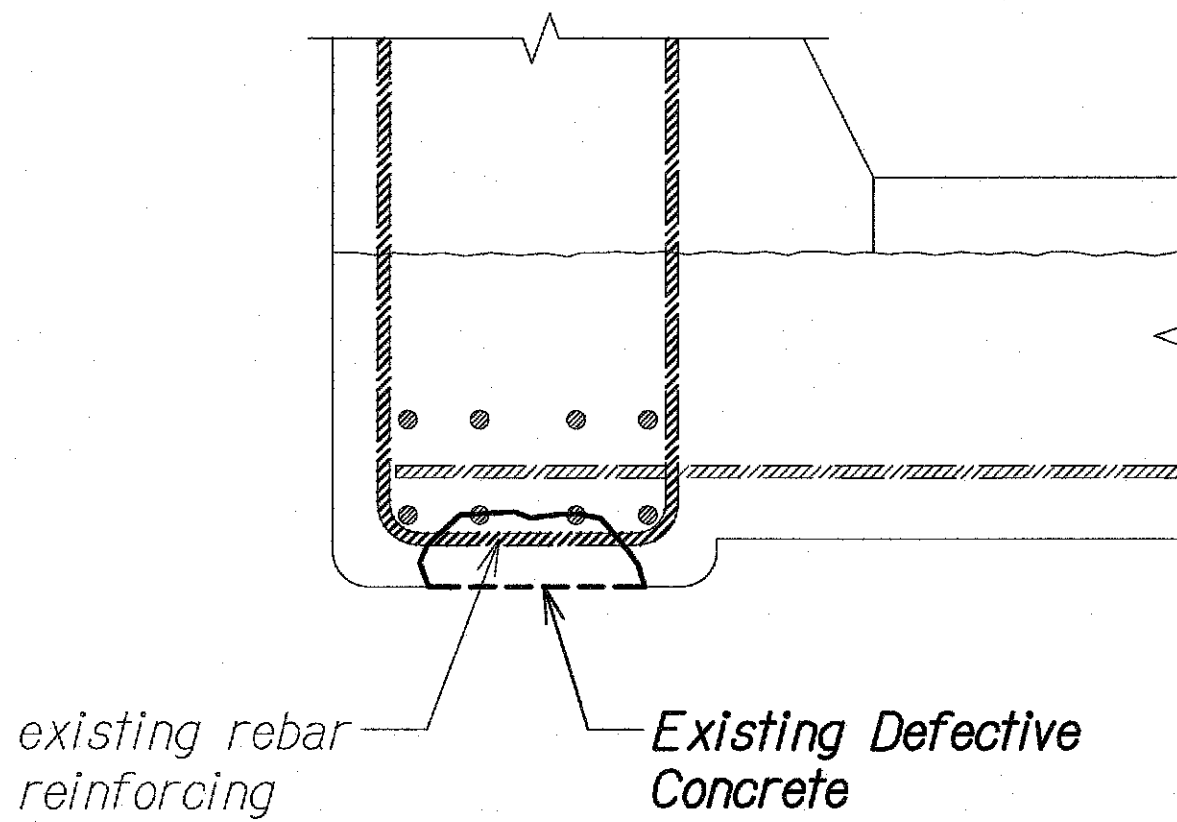


36S-2

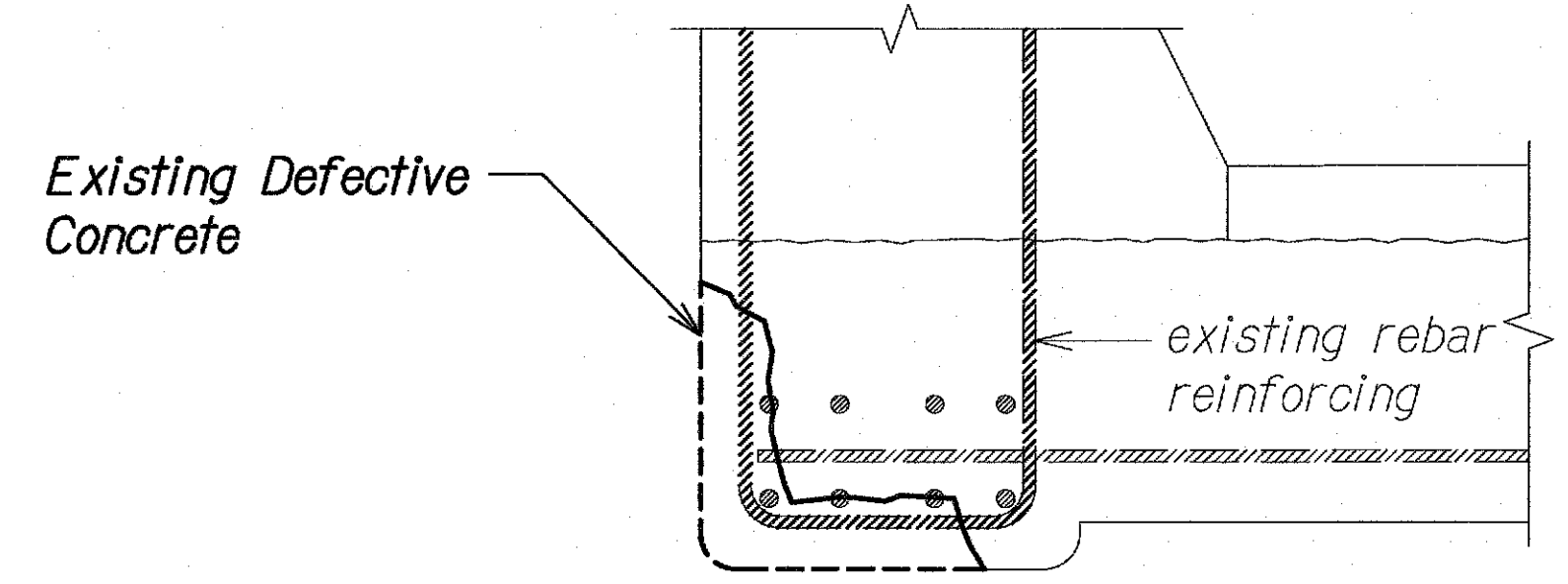
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	36S-3	43



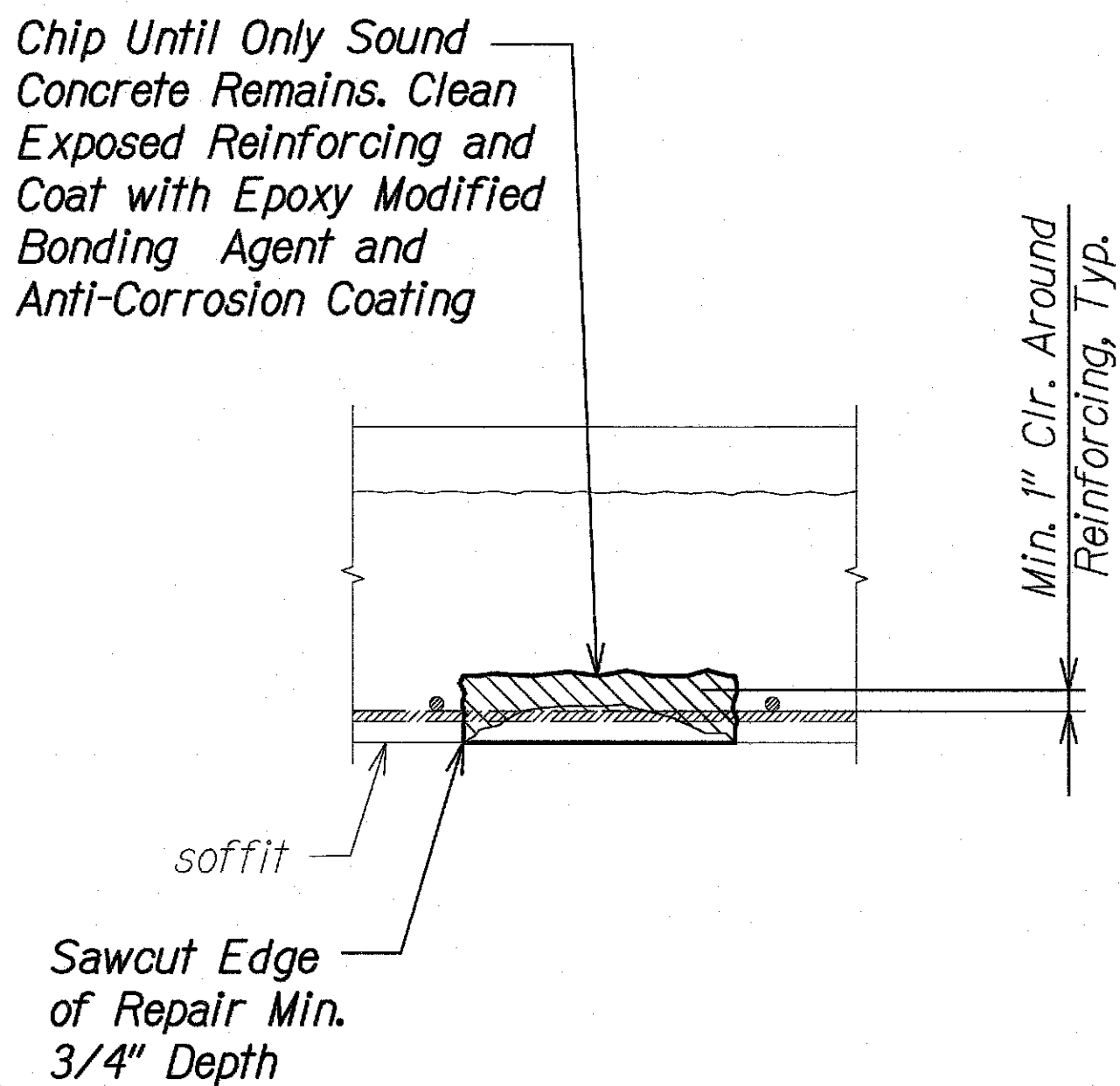
EXISTING DECK SECTION



RAILING SOFFIT

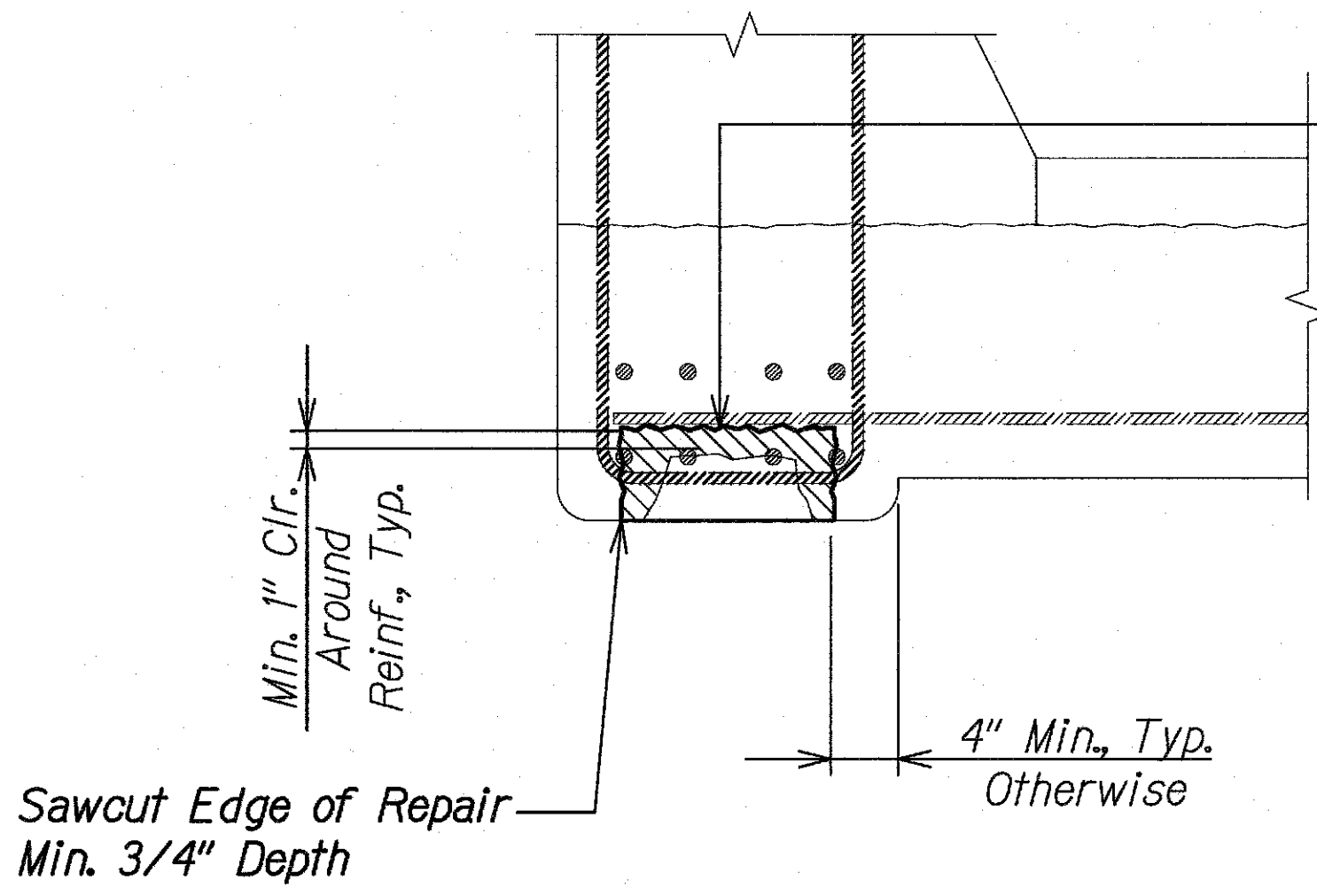


RAILING SOFFIT



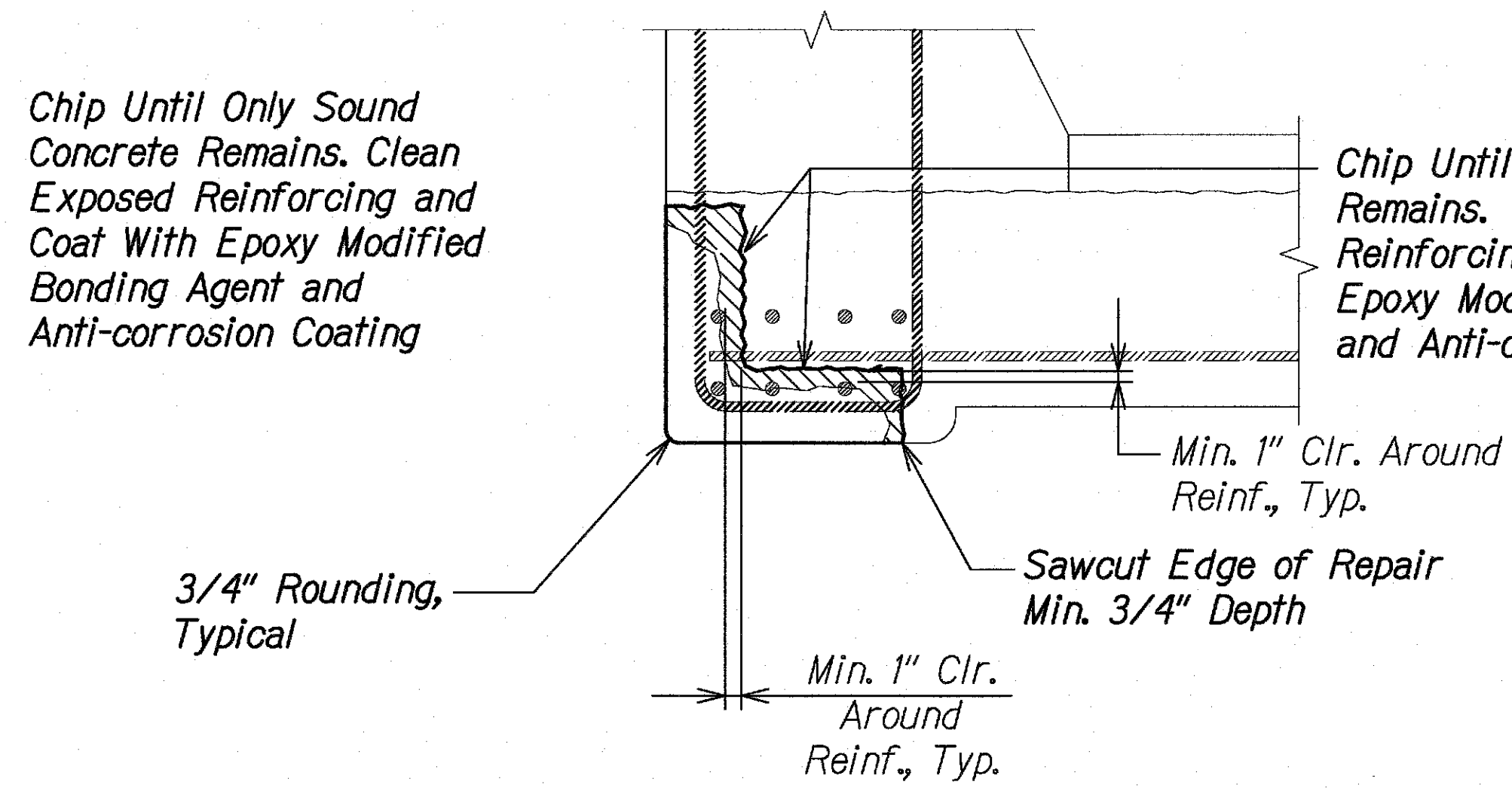
DECK REPAIR SECTION

DECK REPAIR DETAILS  
Scale: 1 1/2" = 1'-0"



RAILING SOFFIT REPAIR SECTION

RAILING SOFFIT REPAIR DETAILS - TYPE "A"  
Scale: 1 1/2" = 1'-0"



RAILING SOFFIT REPAIR SECTION

RAILING SOFFIT REPAIR DETAILS - TYPE "B"  
Scale: 1 1/2" = 1'-0"

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

DRAWING NAME: 2100 CONCRETE CO. CB PROJECTS 18-008.2-JW BRIDGES ASB-01 CAD:03-XX-21 WAIOLI AS-BUILT'S SWP-S1506 DEL-11 WAO REPAIR DET-11G PLOT TIME: 03-15-21 11:11 AM

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

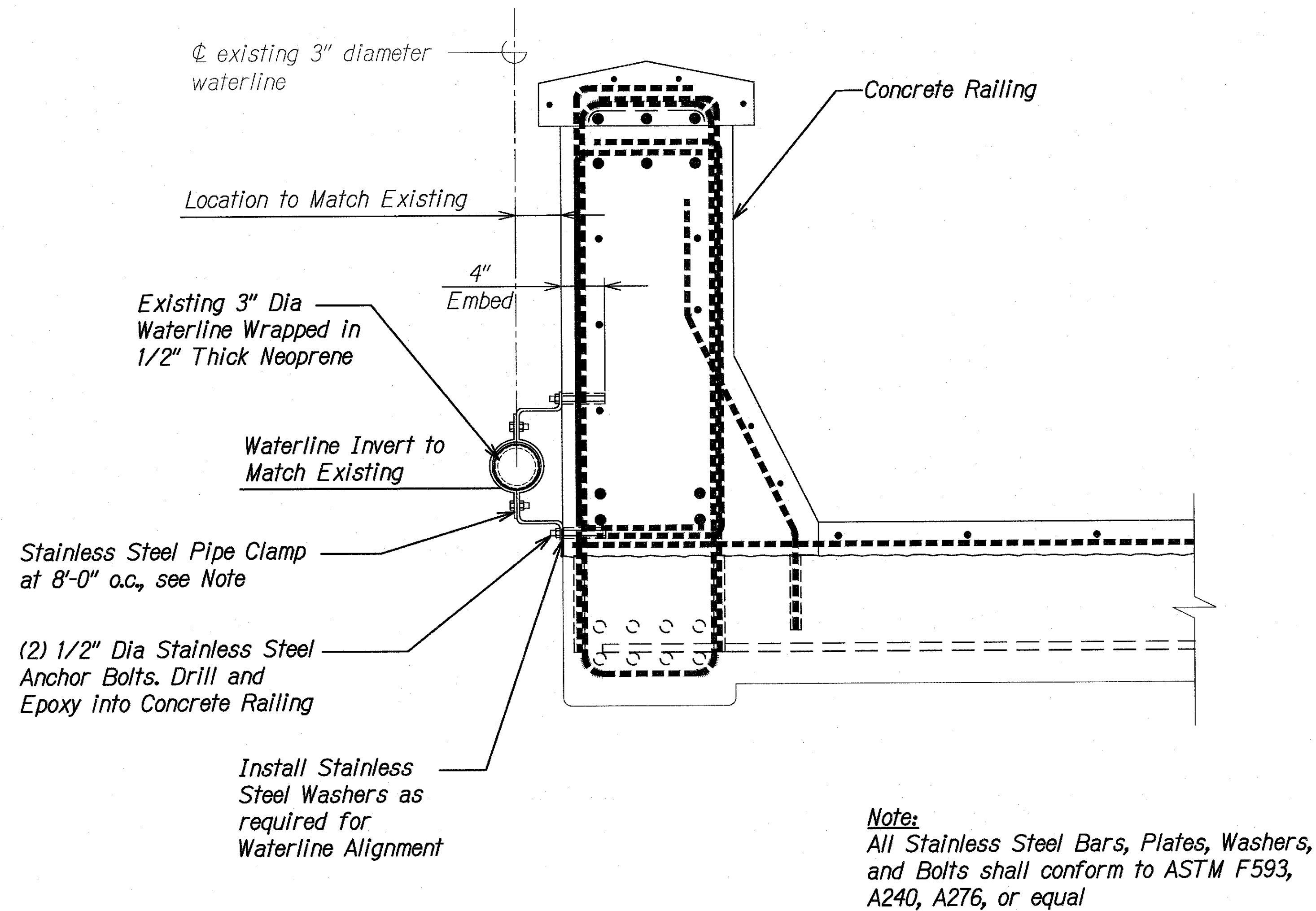
**WAIOLI STREAM BRIDGE**  
**CONCRETE REPAIR DETAILS**  
KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP  
At Various Locations April 2018, Rte. 560  
Fed. Aid Proj. No. ER-19(007)  
Scale: As Noted Date: Oct. 2018  
SHEET No. S15.6 OF 6 SHEETS

3/19/19	Added Sheet
DATE	REVISION





FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-19(007)	2018	37S-1	43



WATERLINE  
SUPPORT DETAIL 1  
Scale: 1 1/2" = 1'-0" SIT.J SIT.J

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

DRAWING NAME: Z:\00 ONGOING\00 CB PROJECTS\18-0082-3W BRIDGES\ASB\01 CAD\03-XX-21 WAIOLI AS-BUILT\DWG-S1701 DELTAI WAIOLI PIPE SUPPORT.DWG PLOT TIME: 03-15-21, 11:18 AM

3/19/19	Added Sheet
DATE	REVISION

SHEET No. 1 OF 1 SHEETS
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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**WAIOLI STREAM BRIDGE**  
**WATERLINE SUPPORT**

KAUAI EMERGENCY FLOOD REPAIRS & CLEANUP  
At Various Locations April 2018, Rte. 560  
Fed. Aid Proj. No. ER-19(007)

Scale: As Noted Date: Oct. 2018