

STRUCTURAL GENERAL NOTES

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-M-05-19M	2020	7	17

1. General Specifications:

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

2. Design Specifications:

A. AASHTO 2017 LRFD Bridge Design Specifications, Eighth 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".

C. AASHTO 2012 Guide Specifications for Design of Bonded FRP Systems for Repair and Strengthening of Concrete Bridge Elements, 1st Edition, including all subsequent interim revisions and editions.

3. General:

A. The contract documents are complementary. Any requirement occurring in one document is as binding as though occurring in all. A stricter requirement prevails over any less strict requirement. The stricter requirement will be the requirement that provides the greater product life, durability, strength, and function.

B. Existing conditions are shown on the drawings to the best of the designer's knowledge and are intended to aid the contractor during construction. Dimensions and member sizes where shown on the drawings are based on field measurements. Existing dimensions shown may not be exact and are provided for information only. Contractor shall field verify all existing dimensions prior to construction. All discrepancies shall be promptly called to the attention of the Engineer and shall be resolved prior to proceeding with any construction work.

4. Materials:

A. Where welded connections are required, reinforcing steel shall be ASTM A706 deformed bars.

B. The fiber reinforced polymer (FRP) composite system 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. The FRP shall meet the following minimum test value material properties:

- (1) Composite Gross Laminate Properties of one layer
- (a) Tensile Strength - 143,000 psi - ASTM D3039
- (b) Tensile Modulus - 13.9 x 10⁶ psi - ASTM D3039
- (c) Elongation at Break - 1% - ASTM D3039
- (d) Nominal Laminate Thickness - 0.08 in. - ASTM D1777

4. Materials (Cont.):

C. Repair Mortar, for defective concrete repairs, shall be a factory blended, rapid setting, non-sag, shrinkage compensated cementitious patching material (containing no gypsum) combined with a polymer type admixture, water, and a penetrating corrosion inhibitor. It shall meet the following minimum material properties:

- (1) 7-day compressive strength - 5,000 psi
- (2) 28-day compressive strength - 6,000 psi
- (3) 28-day permeability - < 1,000 coulombs (ASTM C1202)
- (4) 28-day Bond strength - 1,500 psi (ASTM C882)

D. Spall repair bonding agent shall be a three-component, preproportioned, water-based epoxy-modified Portland cement bonding agent and anti-corrosion coating. Bond strength shall exceed 2,400 PSI in accordance with ASTM C882.

E. Curing compound shall be Sinak Lithium Core 1000 curing compound.

5. Construction Notes:

A. The contractor shall be solely responsible for the protection of adjacent properties, utilities and existing structures from damage due to construction.

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

C. All exposed concrete edges shall be chamfered 3/4" x 3/4", unless as otherwise noted.

D. Drilling procedures, equipment, material and certifications shall be submitted to the Engineer for approval.

E. Drilled holes in existing concrete for anchors and dowels shall not be left unfilled for more than 8 hours. Adhesive material in drilled holes shall fully cure prior to pouring concrete around reinforcing steel dowels.

F. Any drilled holes, inserts, or brackets needed for construction including, but not limited to, falsework for deck and beam overhang, and work platform scaffolding shall be approved by the Engineer. Expansion or wedge type anchors shall not be used. Location of drilled holes shall be coordinated with FRP work and shall not interfere with installation of FRP. Drilling of holes through FRP is prohibited.

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

H. The temporary work platform shall be positioned above the ordinary high water mark of the stream. The temporary work platform may be suspended by the bridge structure above or by temporary supports in the stream bed.

5. Construction Notes (Cont.):

I. Designated repair locations are not necessarily inclusive of all repair work required. The Contractor shall inspect the soffit and identify any and all cracks wider than 0.010" and all defective concrete. Problematic areas should be reported to the Engineer for review. If approved, the Engineer will pay for the repair of the areas as "additional work" under the respective specification section.

J. Prior to application of the FRP composite system, all cracks wider than 0.010" on the soffit shall be prepared and pressure injected with epoxy and all defective concrete shall be repaired so as to satisfy FRP manufacturer's requirements.

K. Demolition work shall be coordinated with construction of new work. Contractor shall submit proposed schedule and sequence of demolition work for Engineer's review prior to commencing with demolition work.

L. All connections between concrete substrate and FRP composite system shall be considered "bond critical" and shall be prepared to a concrete surface profile (CSP) 3 in accordance with the ICRI examples.



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Signature: David K. Fujiwara, 4-30-20
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL GENERAL NOTES

HONOKOHAU STREAM BRIDGE
MAINTENANCE REPAIRS
Proj. No. HWY-M-05-19M

Scale: None Date: Dec. 2019

SHEET No. 50J OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-M-05-19M	2020	8	17

STRUCTURAL GENERAL NOTES (CONTINUED)

5. Construction Notes (Cont.):

N. Load Rating:

A. New governing load rating results as follows:

		Rating Factor	Live Load Distribution Factor	Load Effect	Controlling Member
Design Loads	HL-93 (Inv.)	0.84	0.682	Shear	Interior Girder
	HL-93 (Opr.)	1.09	0.682	Shear	Interior Girder
Legal Loads	Type 3	2.15	0.540	Moment	Exterior Girder
	Type 3S2	2.18	0.550	Moment	Exterior Girder
	Type 3-3	2.64	0.545	Moment	Exterior Girder
	NRL	1.36	0.551	Moment	Exterior Girder
	SU4	1.77	0.547	Moment	Exterior Girder
	SU5	1.68	0.547	Moment	Exterior Girder
	SU6	1.51	0.551	Moment	Exterior Girder
	SU7	1.43	0.550	Moment	Exterior Girder

Load rating is based on a current, one-way ADTT of 39 and current superstructure condition rating of 5.

ORIGINAL PLAN

NOTE BOOK

No.

SURVEY PLOTTED BY

DRAWN BY

DESIGNED BY

QUANTITIES BY

CHECKED BY

DATE

DRAWING NAME: Z:\00 DIGGING\18-0014 04 HONOKOHAU STR BR LOAD Rtg-DOT\101.GAO\12-31-19 DEL INDEX\HSB-S002 STRUCT NOTES.DWG PLOT TIME: 12-31-19 11:19 AM



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Signature: David K. Fujiwara
Expiration Date: 4-30-20

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

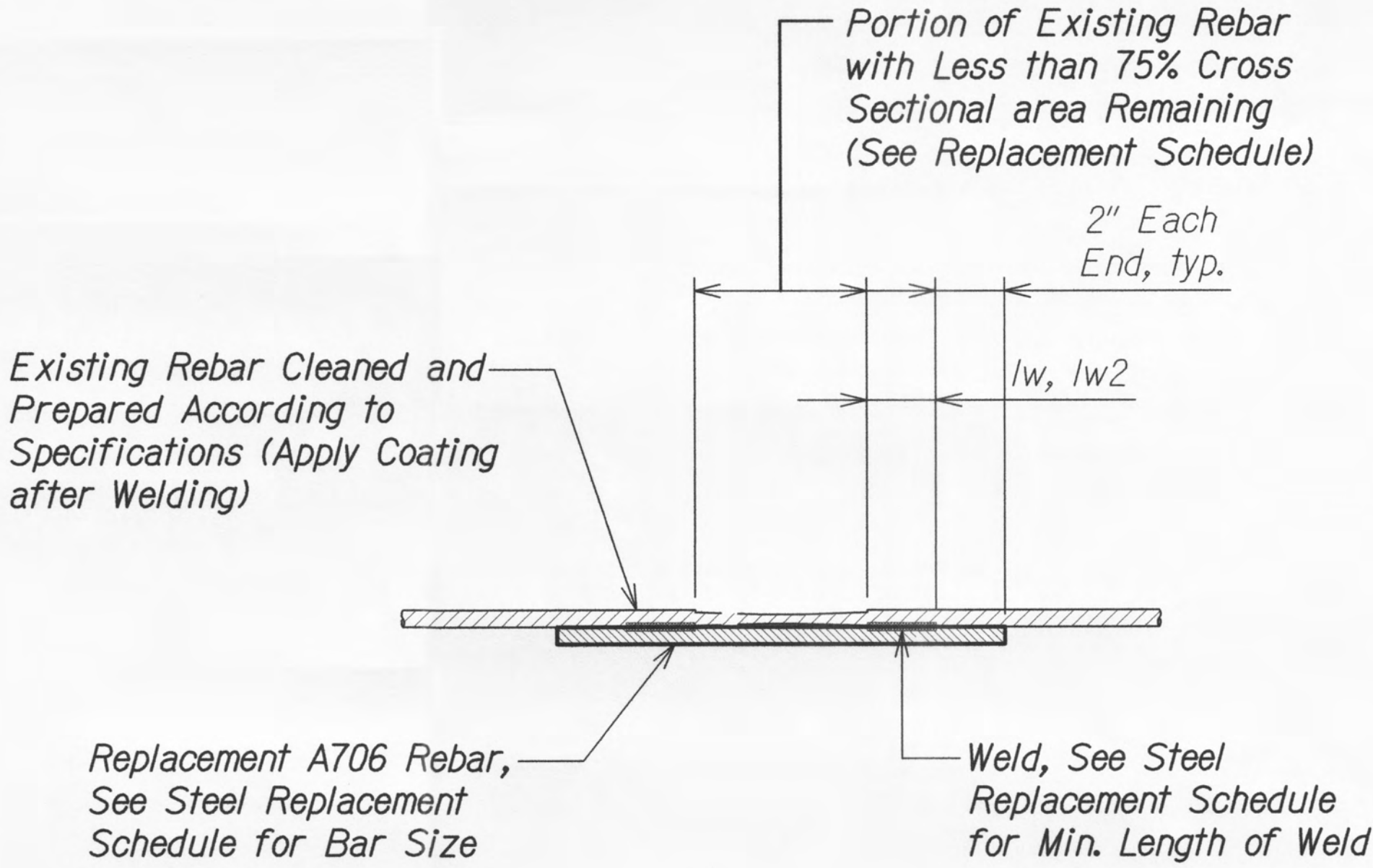
STRUCTURAL GENERAL NOTES

HONOKOHAU STREAM BRIDGE
MAINTENANCE REPAIRS
Proj. No. HWY-M-05-19M

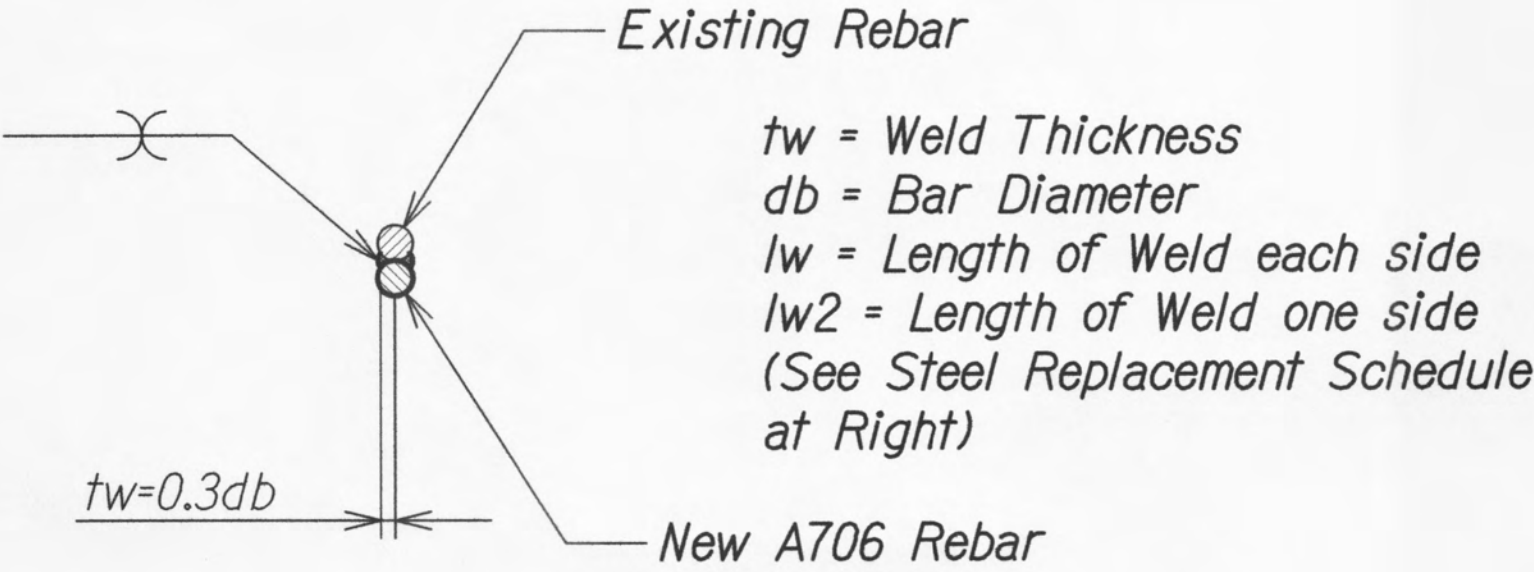
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SHEET No. S02 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-M-05-19M	2020	10	17



REBAR REPLACEMENT ELEVATION



SECTION

LAP SPLICE FOR #8 BARS AND SMALLER

Not to Scale

REPLACEMENT SCHEDULE

SIZE OF EXISTING REINFORCING		MINIMUM SIZE (INCH)	SIZE OF NEW REPLACEMENT REINFORCING	MINIMUM LENGTH OF WELD EACH SIDE (lw)	MINIMUM LENGTH OF WELD ONE SIDE (lw2)
SQUARE	ROUND				
3/8"	#3	5/16"	#3	2"	4"
	#4	7/16"	#4	2"	4"
1/2"	#5	1/2"	#5	2 1/2"	5"
5/8"	#6	5/8"	#6	3 1/2"	-
3/4"	#7	3/4"	#7	4"	-
7/8" OR 1"	#8	7/8"	#8	5"	-

NOTES:

- Replacement A706 reinforcing shall be spliced to existing reinforcing on the opposite face of the concrete repair so as not to reduce the existing clear cover.
- For welding of #3, #4 and #5 replacement A706 reinforcing, welding may be performed on one side only, if lw is increased to lw2 as shown above.
- Welding of reinforcing steel shall be done in accordance with AWS D1.4.
- For bidding purposes, contractor shall assume 1 LB of rebar replacement required per FT² of defective concrete repair.

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

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EXPIRATION DATE OF THE LICENSE: 4-30-20

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

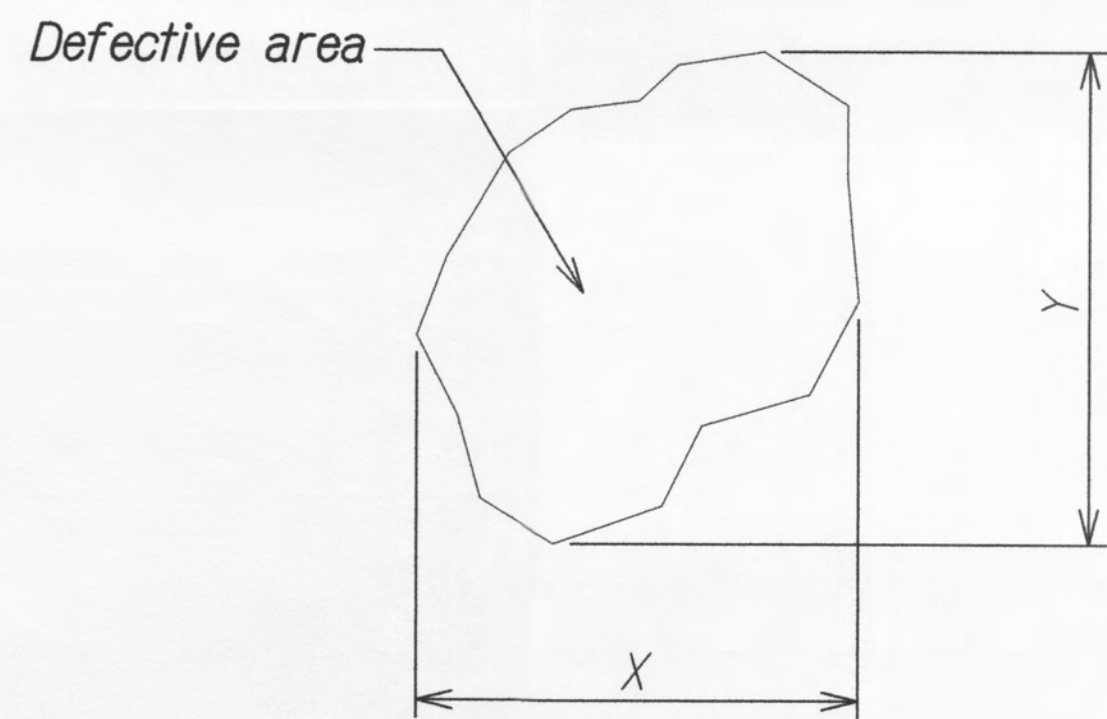
SPALL REPAIR DETAILS

**HONOKOHAU STREAM BRIDGE
MAINTENANCE REPAIRS
Proj. No. HWY-M-05-19M**

Scale: As Noted Date: Dec. 2019

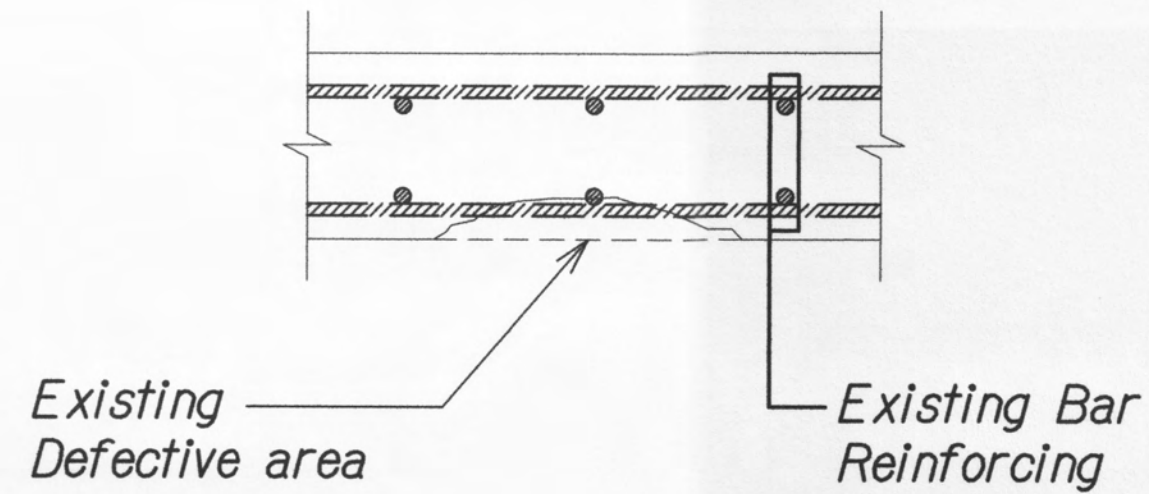
SHEET No. **SIJ** OF **4** SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-M-05-19M	2020	11	17

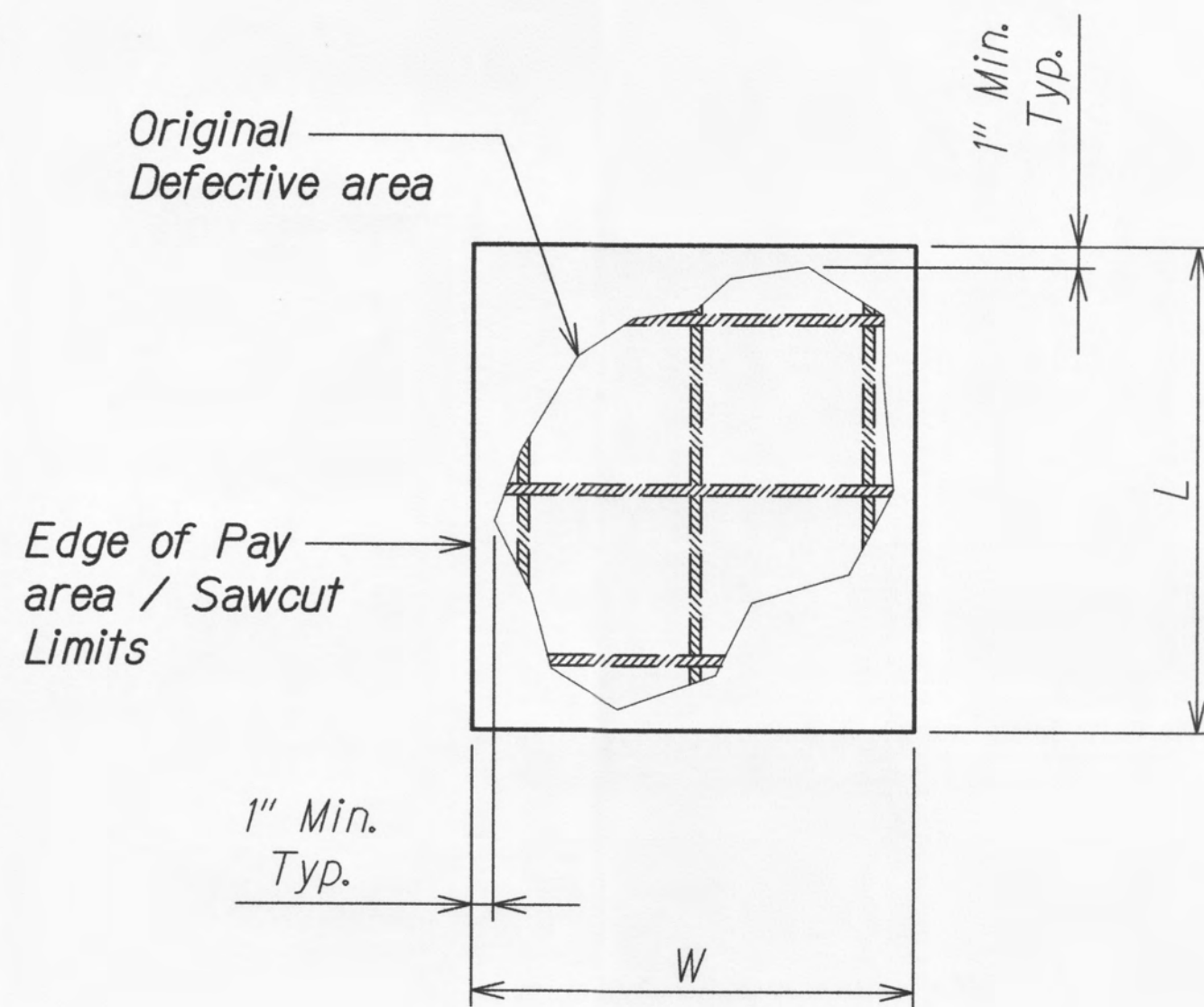


Existing defective area = $X \times Y$

DECK SOFFIT PLAN

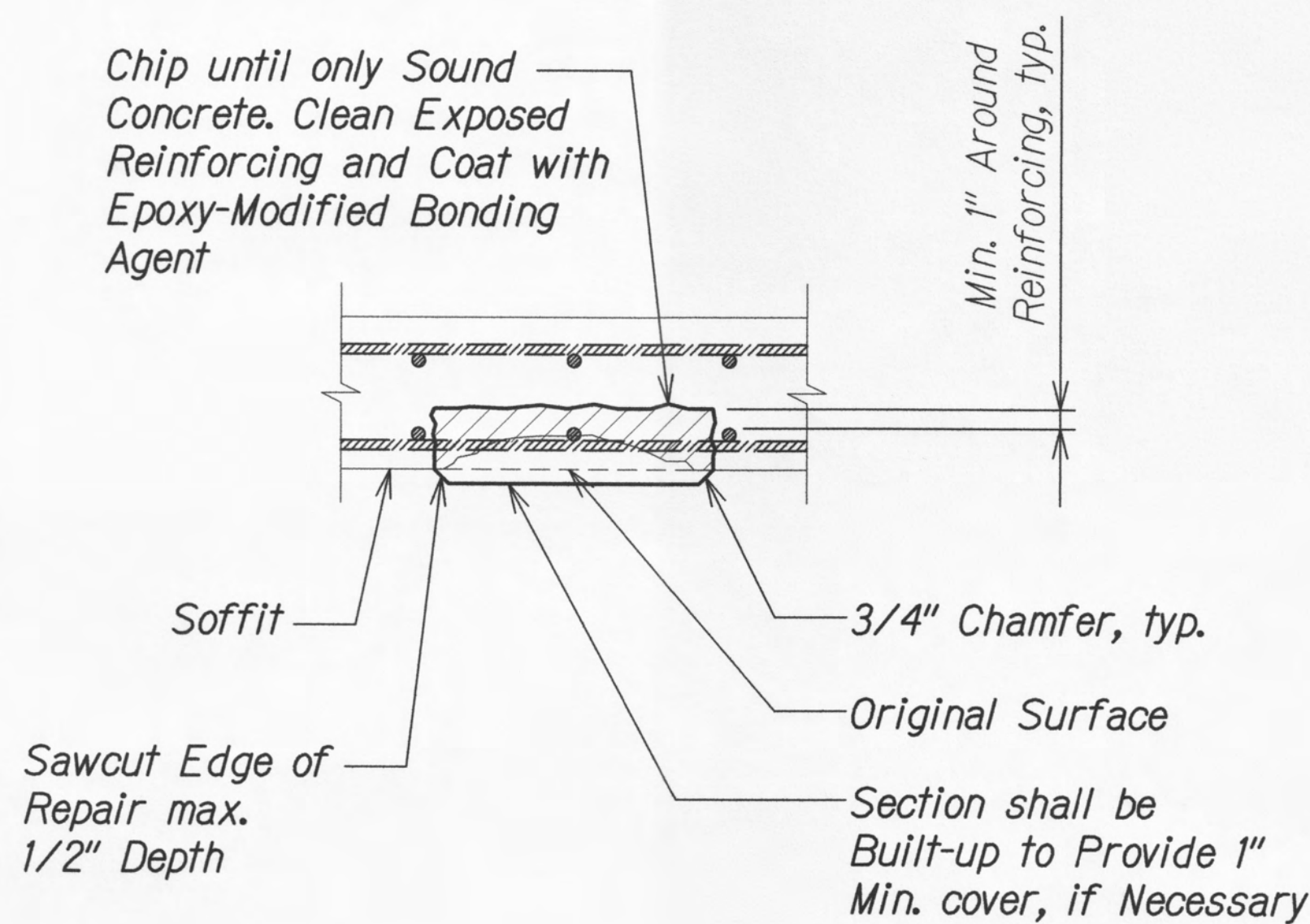


DECK SECTION



Pay area / Sawcut Limits = $W \times L$

DECK SOFFIT PLAN



DECK SECTION

CONCRETE SOFFIT REPAIR

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

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

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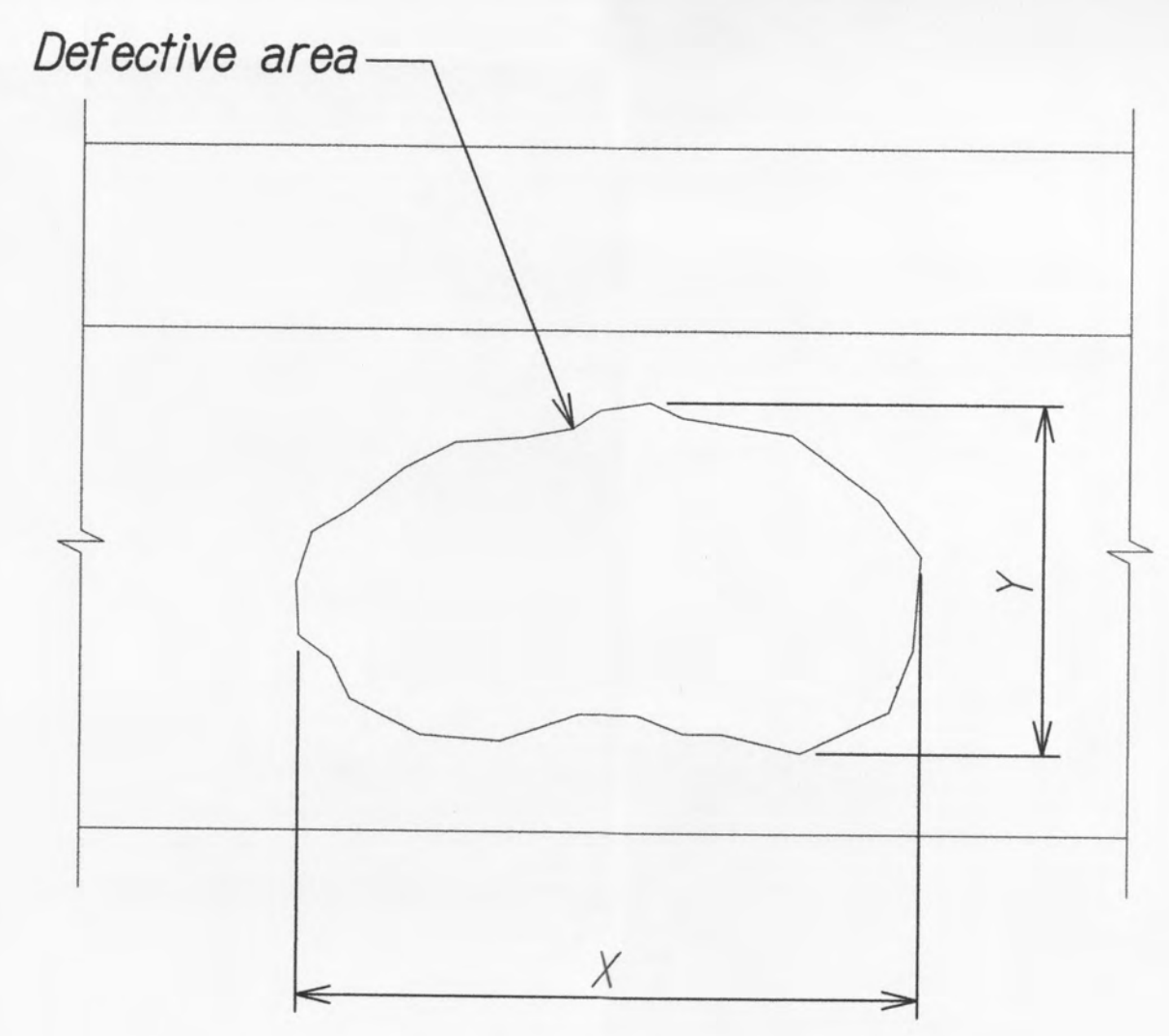
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Signature: *David K. Fujimura* 4-30-20
 SIGNATURE EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
TYPICAL CONCRETE REPAIR DETAILS
HONOKOHAU STREAM BRIDGE MAINTENANCE REPAIRS
Proj. No. HWY-M-05-19M
Scale: As Noted Date: Dec. 2019
SHEET No. **SI2** OF **4** SHEETS

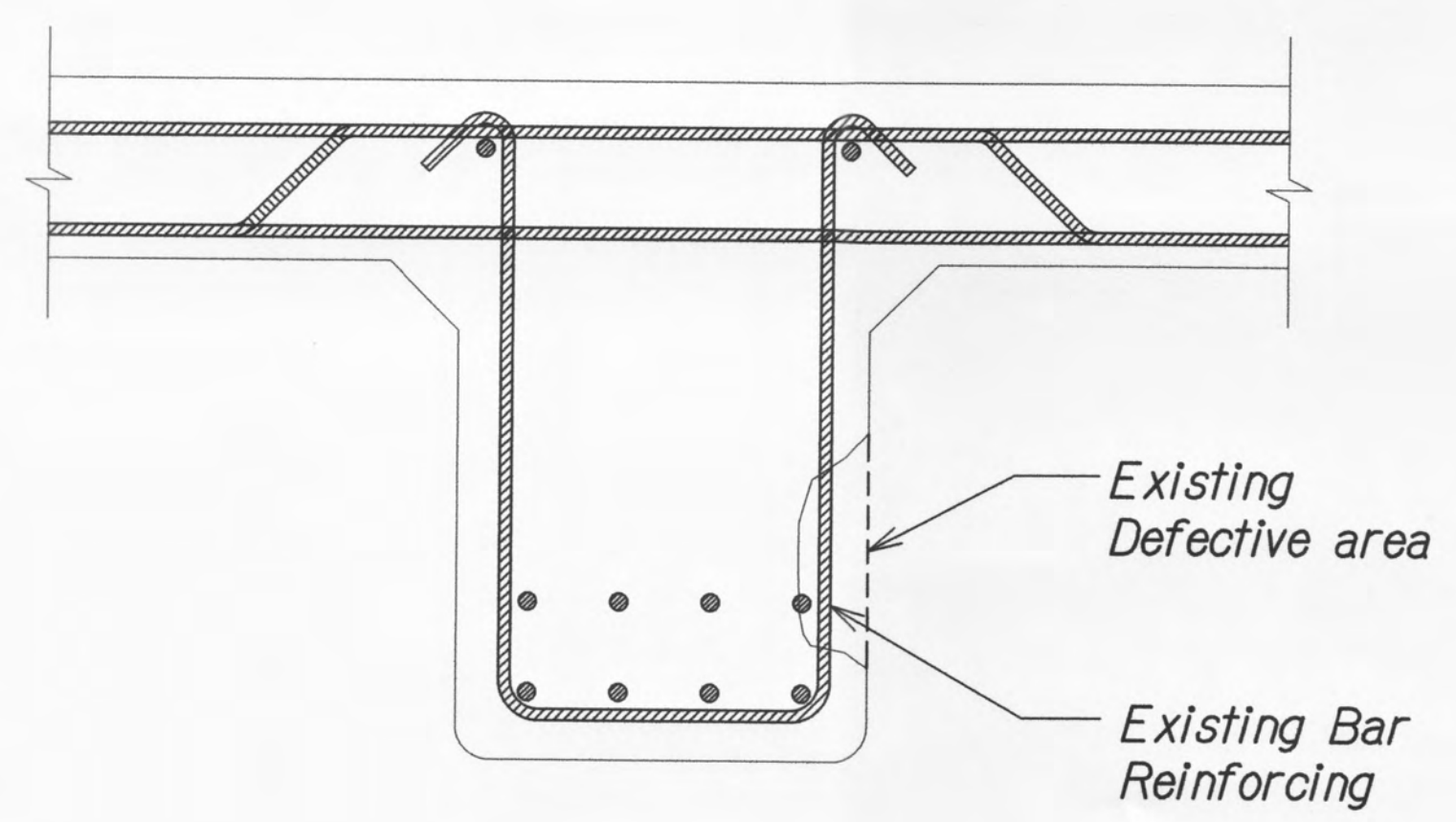
11

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-M-05-19M	2020	12	17

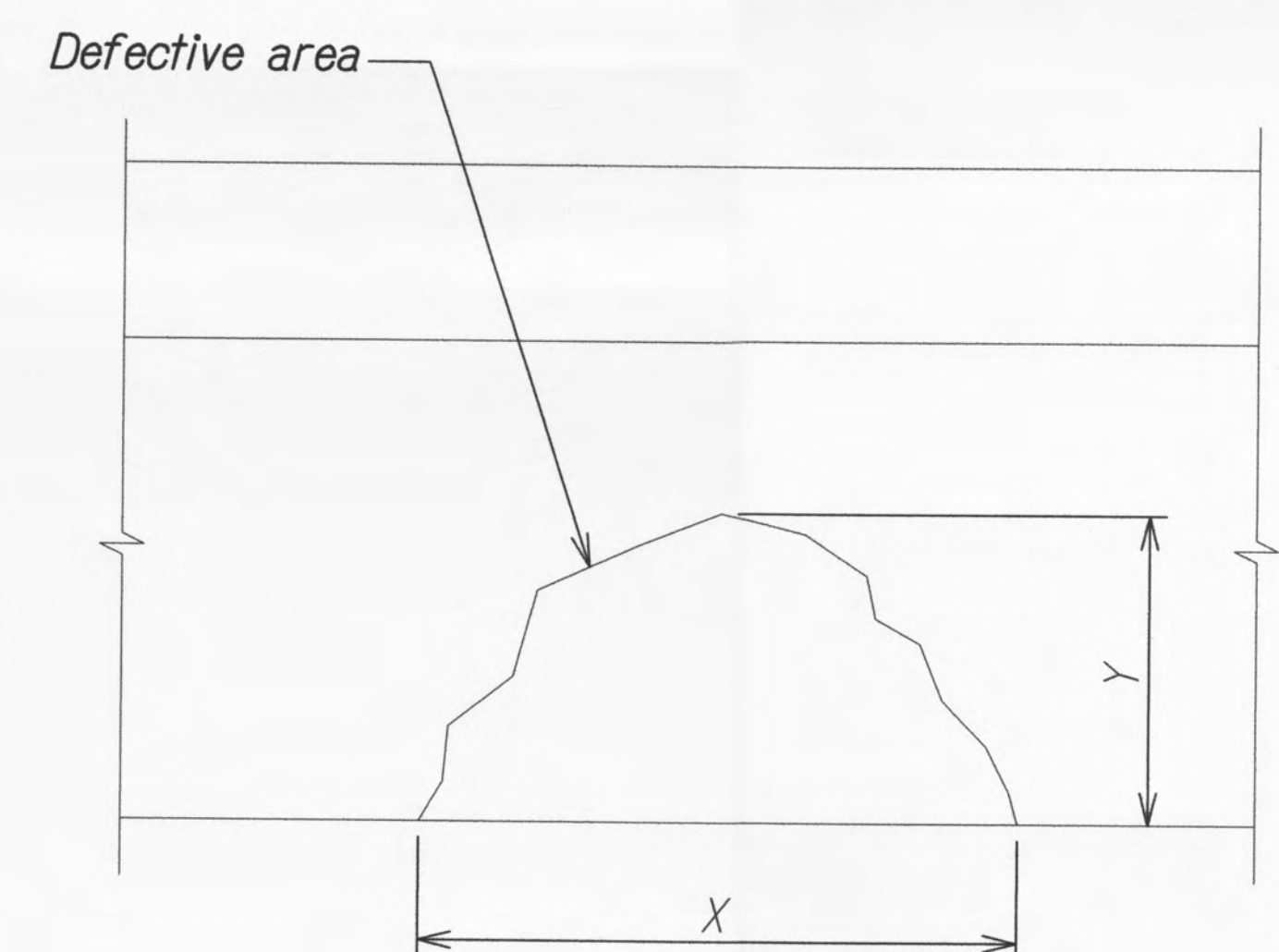


Existing defective area = $X \times Y$

GIRDER ELEVATION

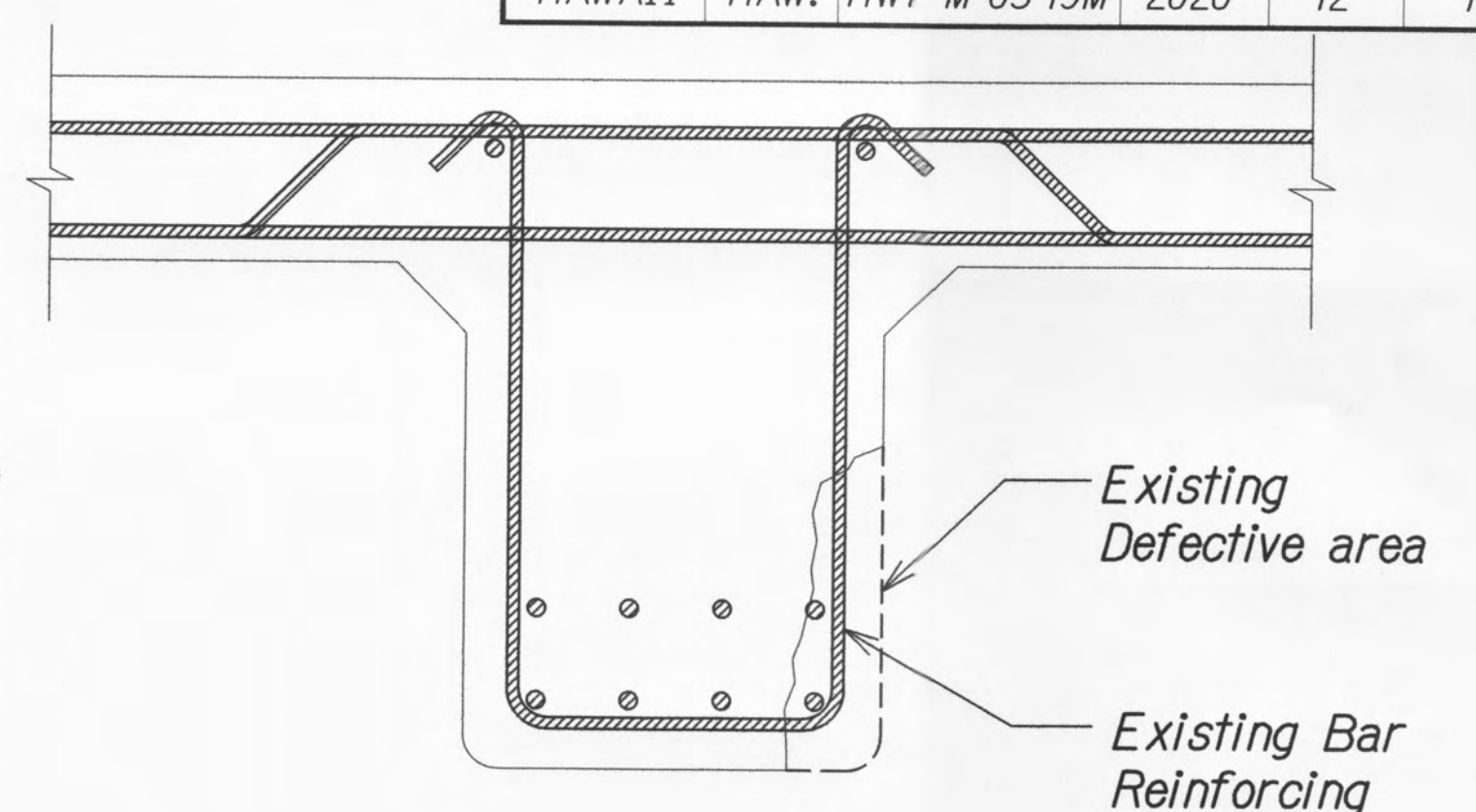


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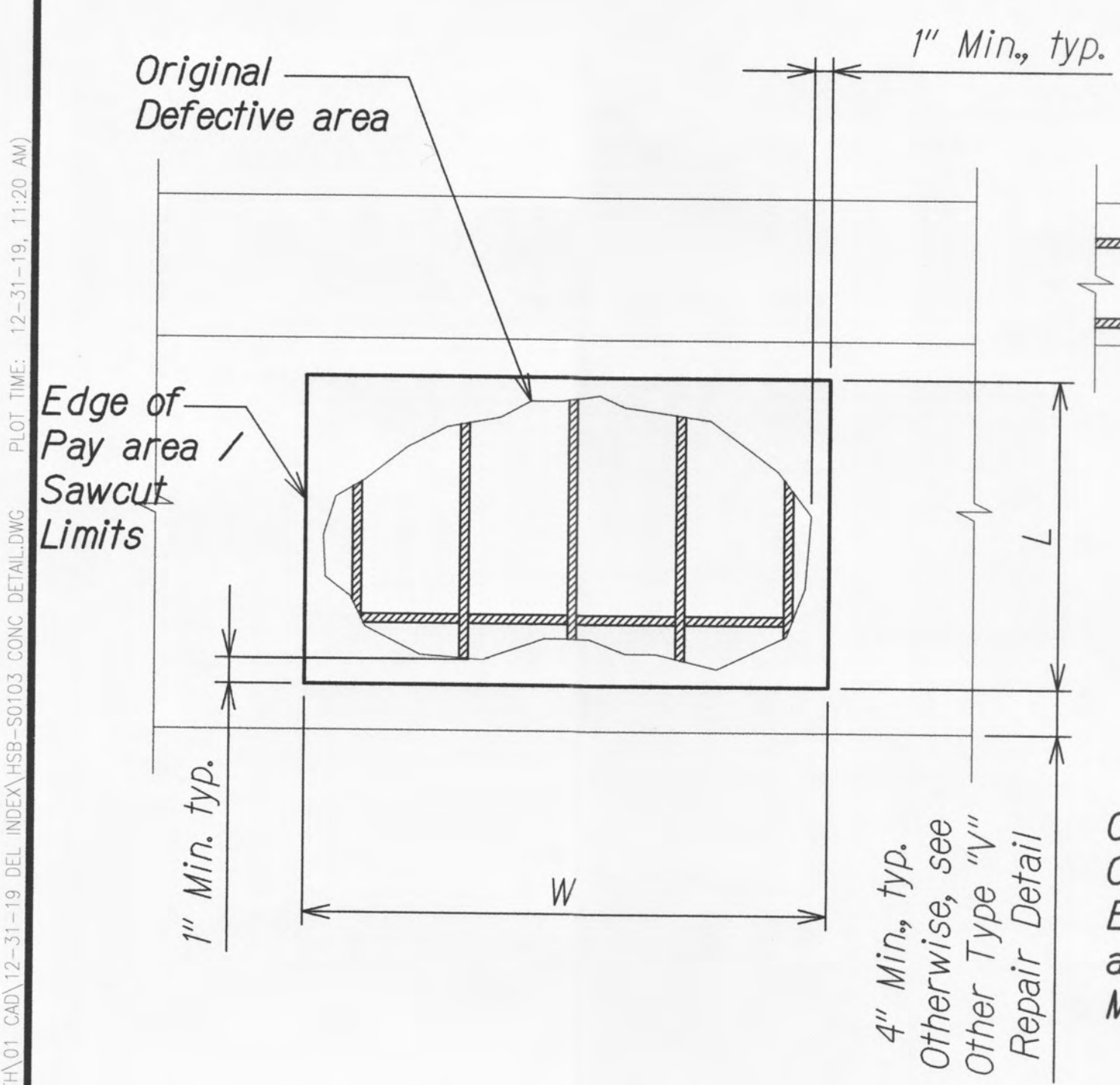


Existing defective area = $X \times Y$

GIRDER ELEVATION

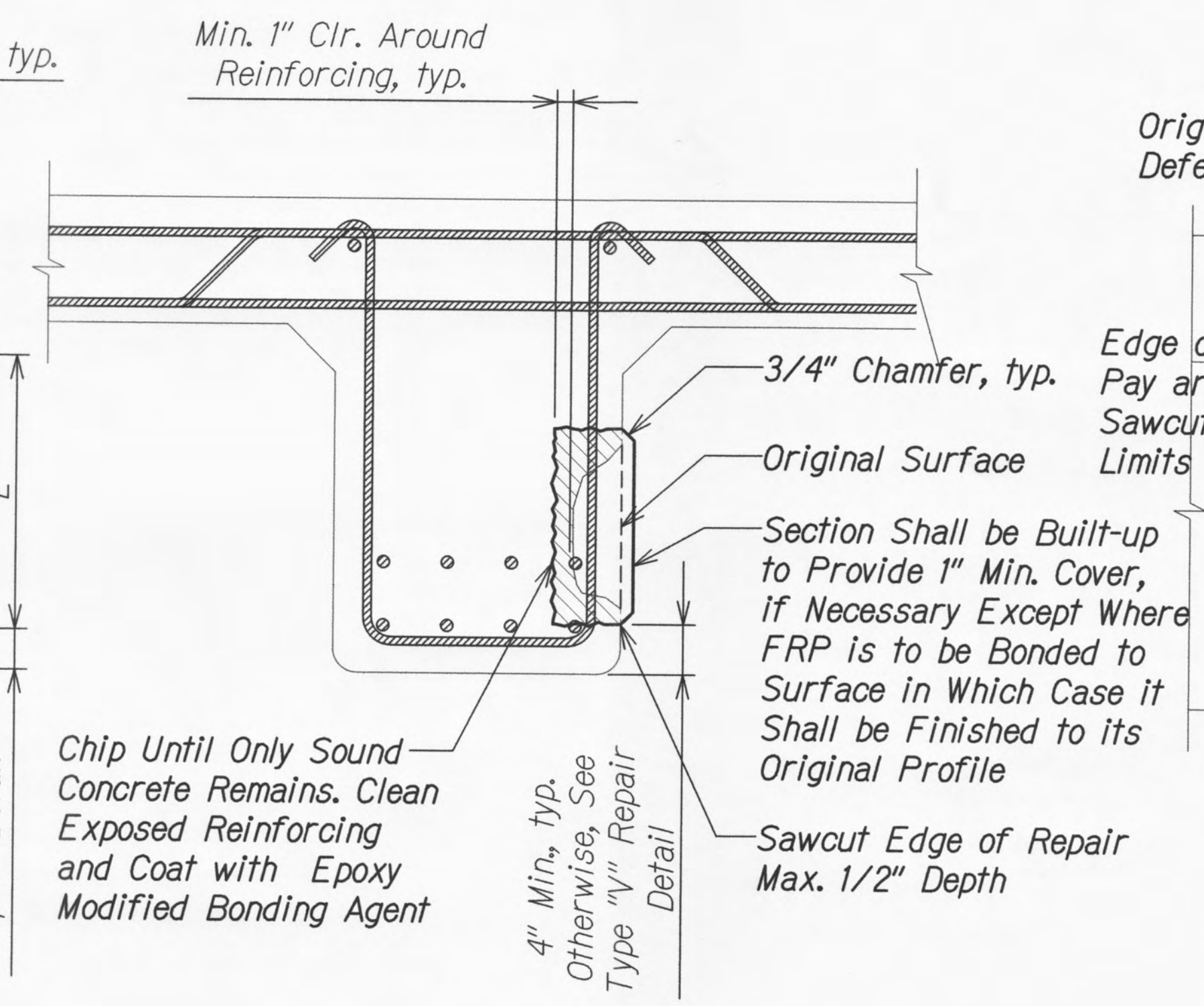


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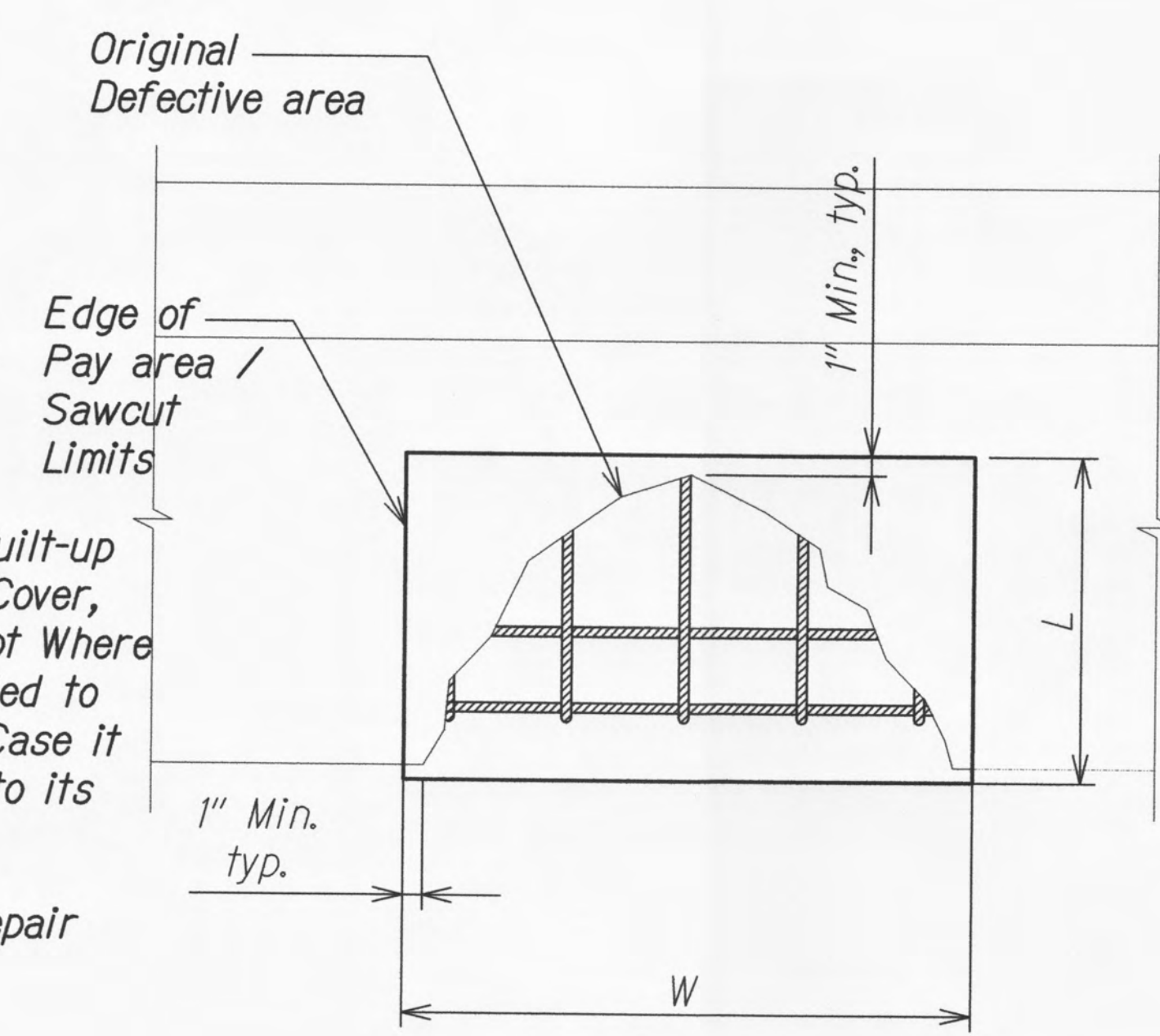


Pay area / Sawcut Limits = $W \times L$

GIRDER ELEVATION

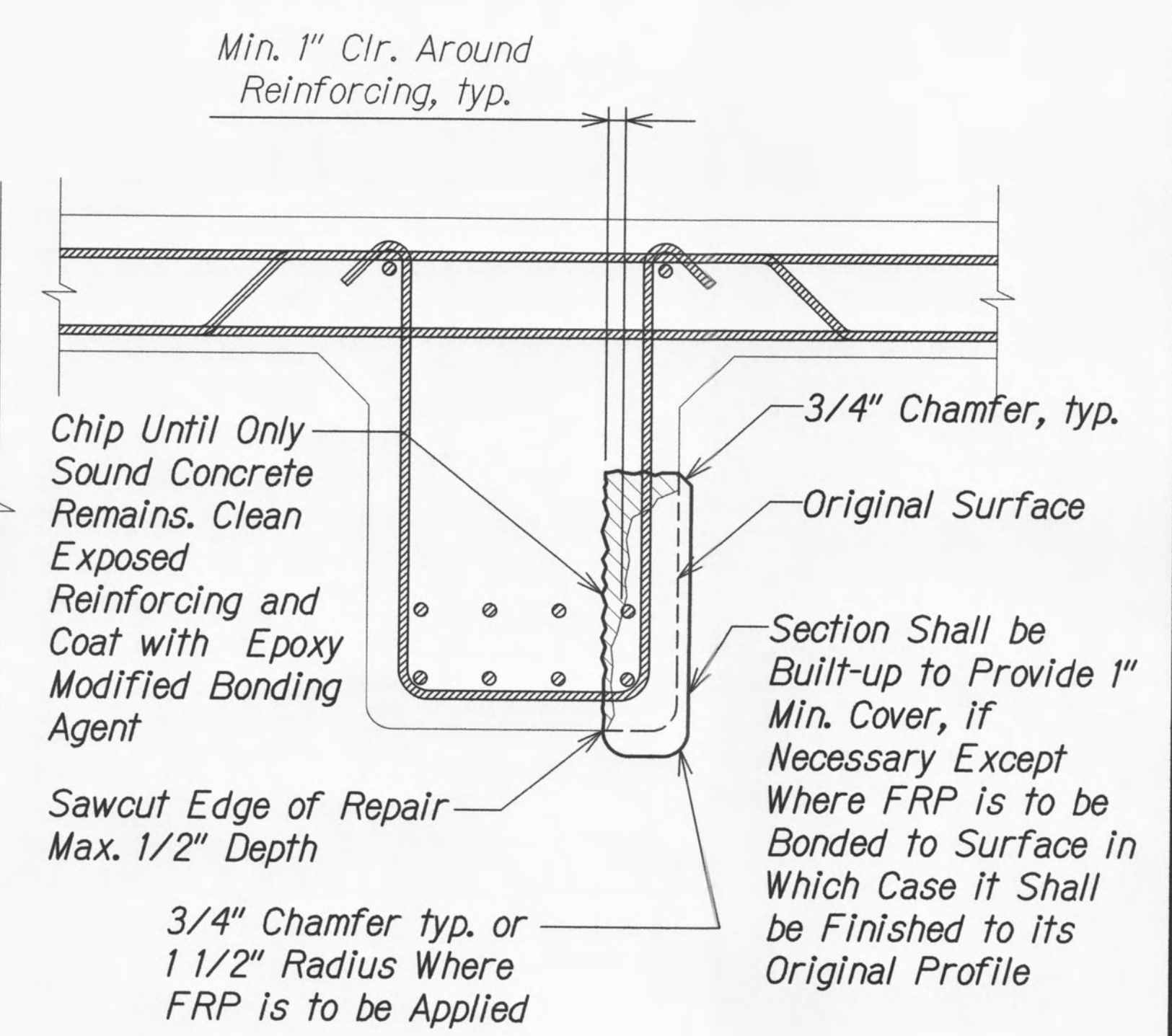


GIRDER SECTION



Pay area / Sawcut Limits = $W \times L$

GIRDER ELEVATION



GIRDER SECTION

CONCRETE GIRDER REPAIR - TYPE "V"
Scale: 1 1/2" = 1'-0"

CONCRETE GIRDER REPAIR - TYPE "V"
Scale: 1 1/2" = 1'-0"

ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
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DRAWING NAME: Z:\000\ENGINEERING\18-0014-04-HONOKOHAU STR BR LOAD RTG-DOT\A01 CAD\12-31-19-11:20 AM

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

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Signature: David K. Fujimura
4-30-20
SIGNATURE EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

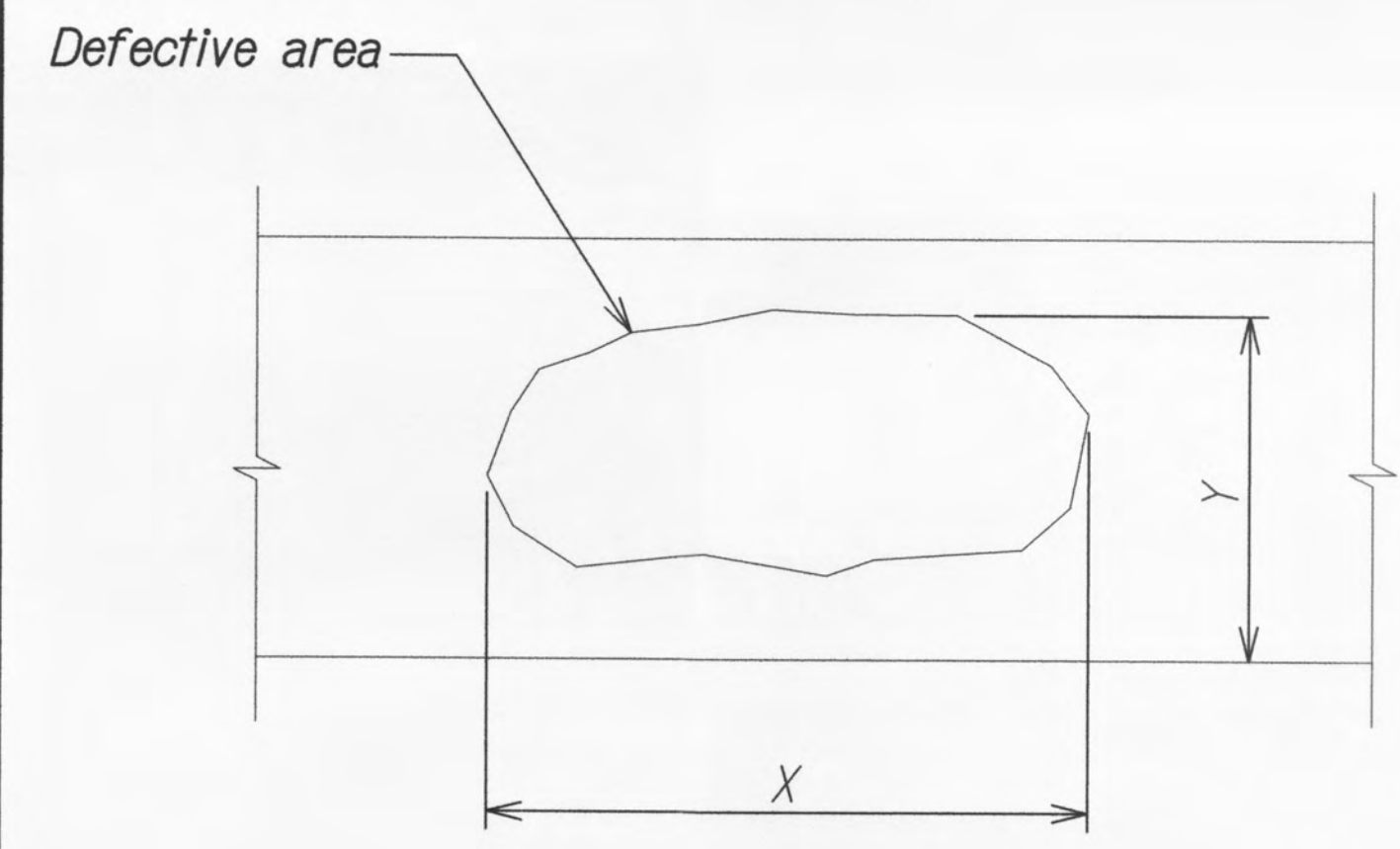
TYPICAL CONCRETE REPAIR DETAILS

HONOKOHAU STREAM BRIDGE MAINTENANCE REPAIRS
Proj. No. HWY-M-05-19M

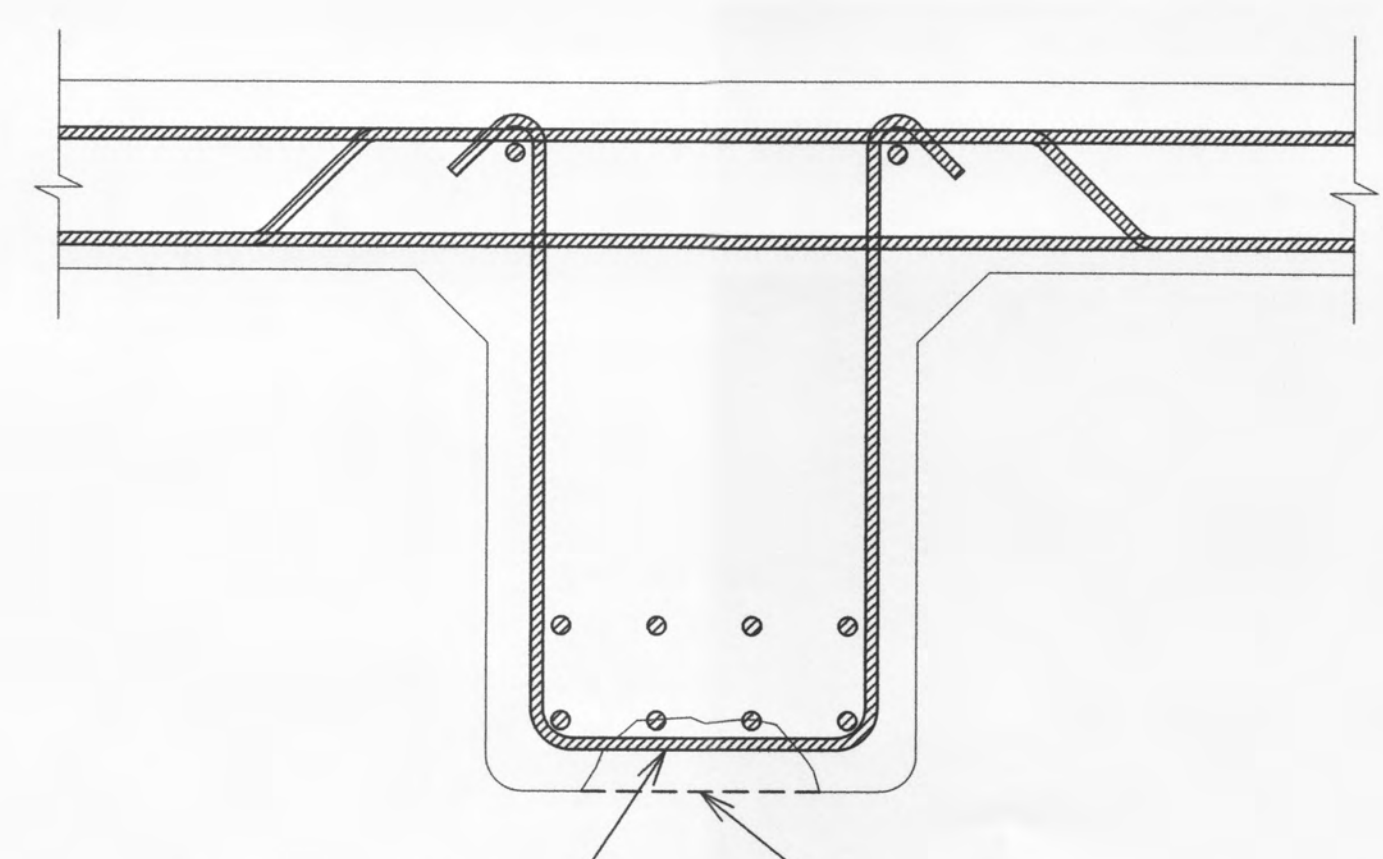
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SHEET No. **SL3** OF **4** SHEETS

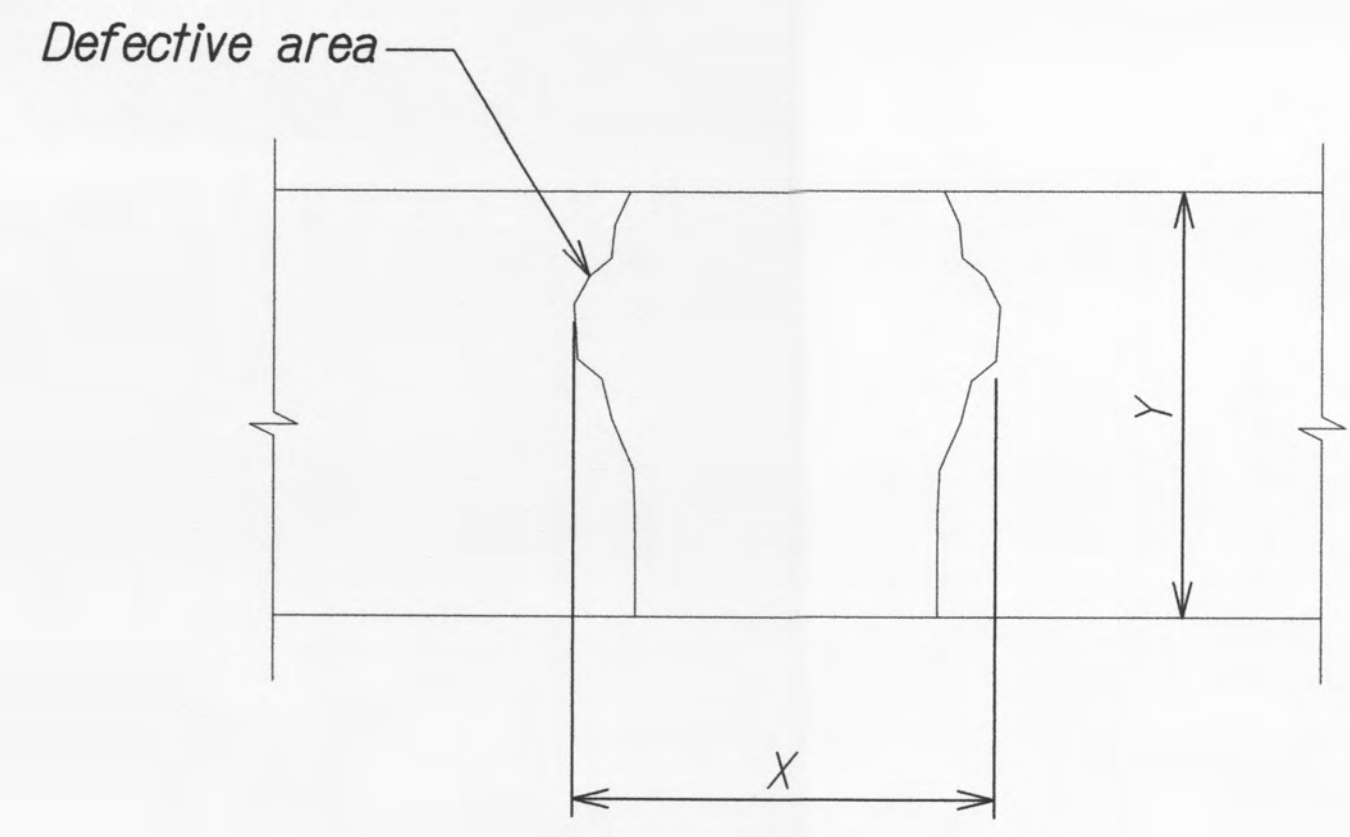
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-M-05-19M	2020	13	17



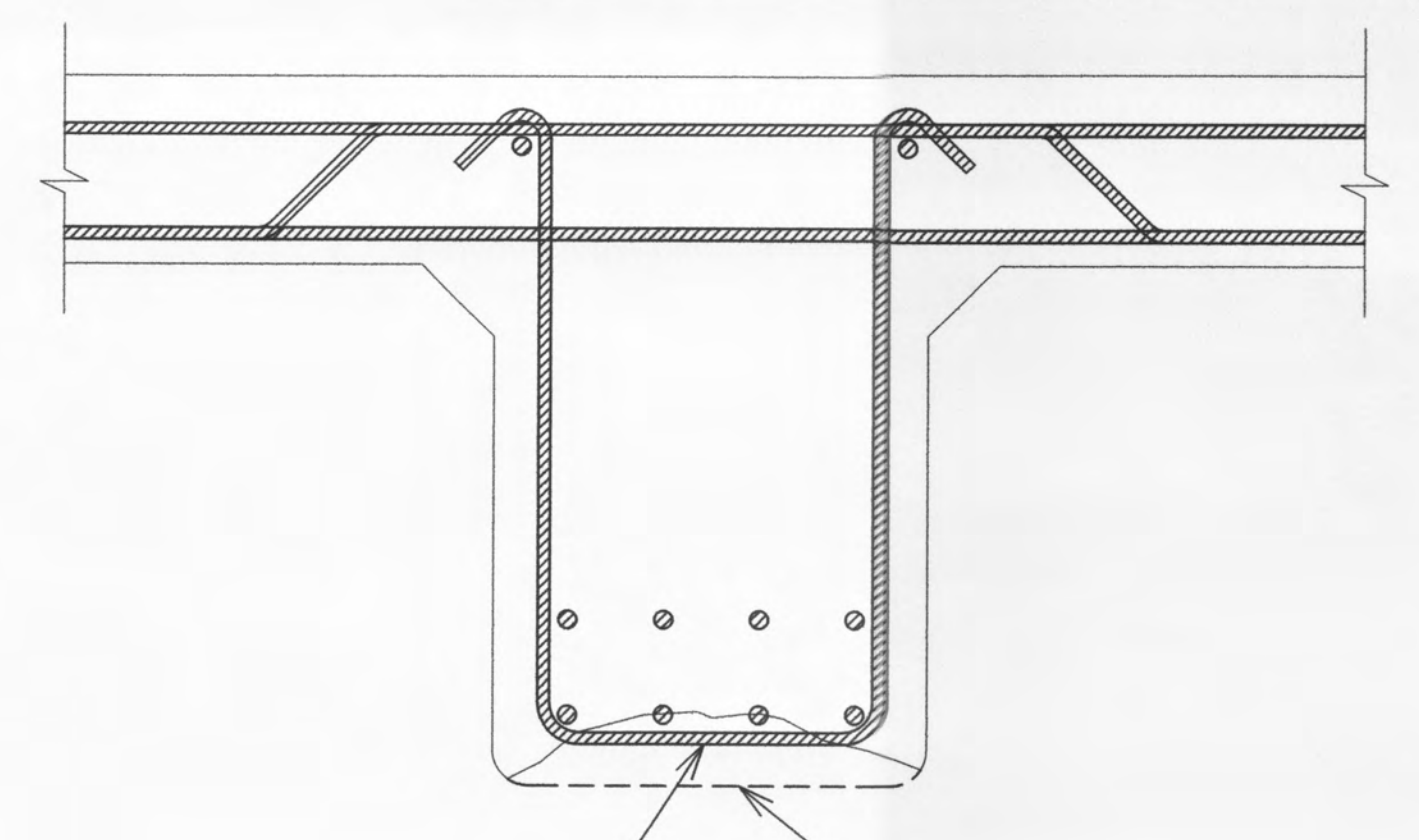
Existing defective area = $X \times Y$
GIRDER SOFFIT PLAN



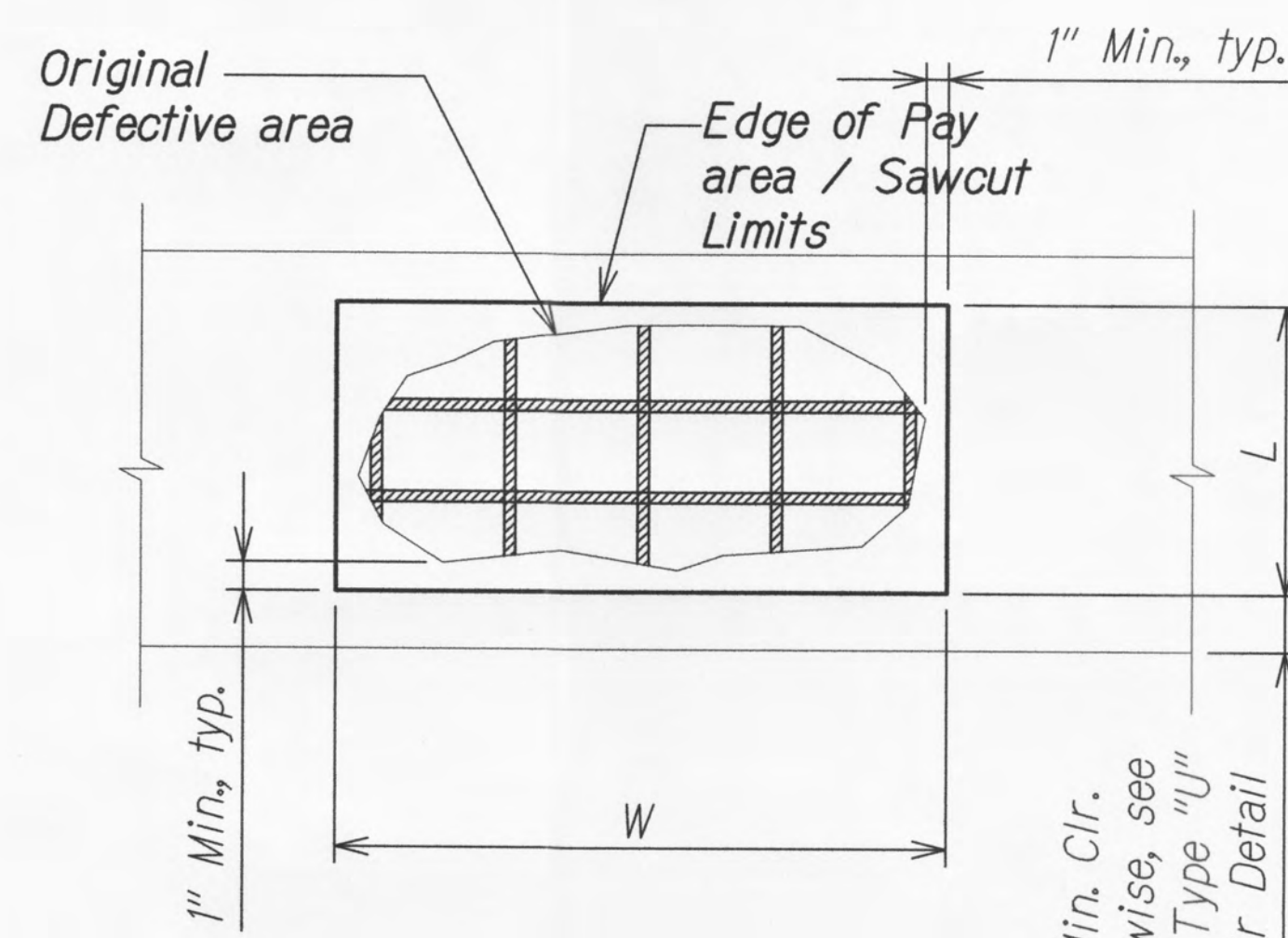
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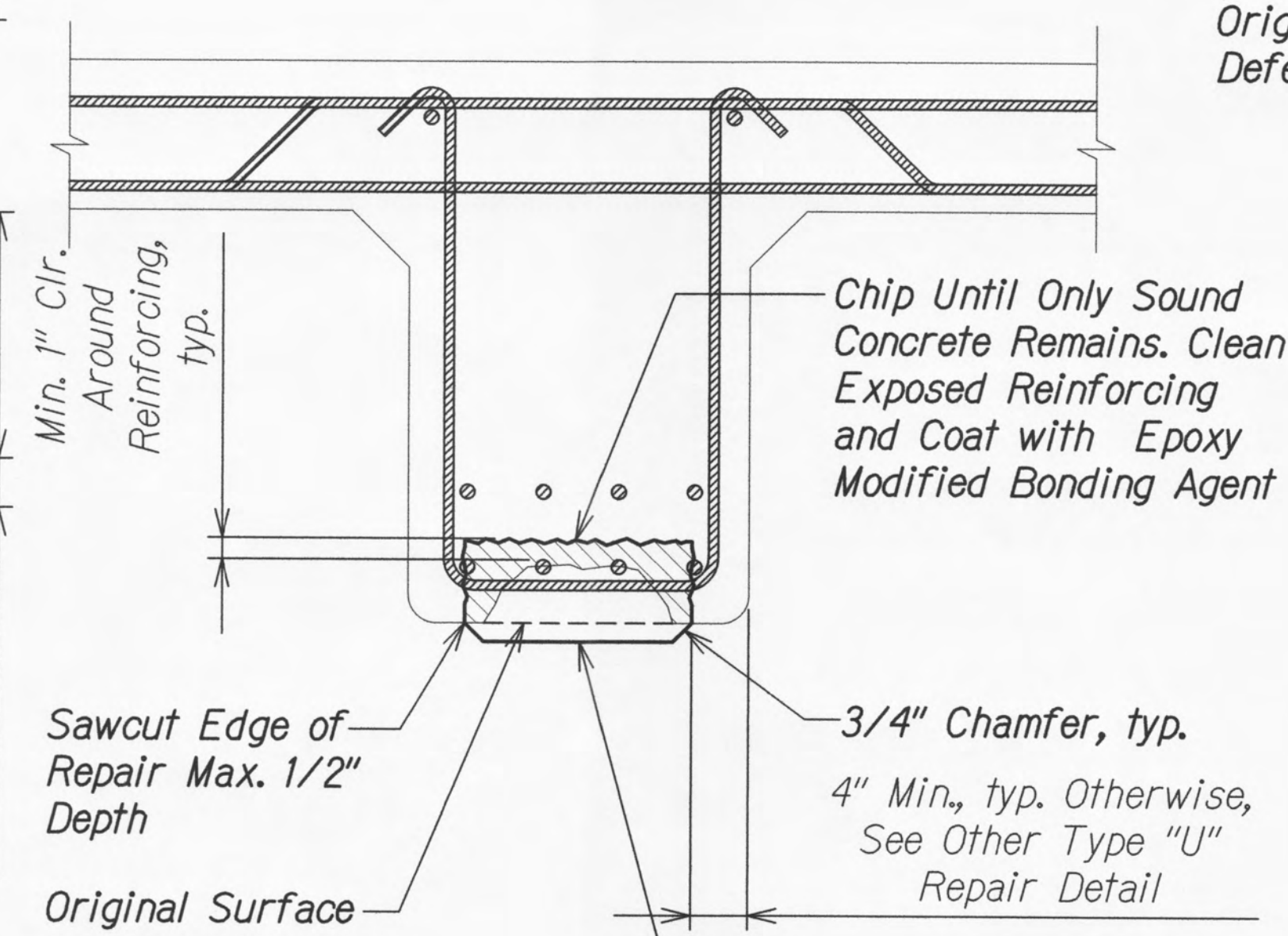
Existing defective area = $X \times Y$
GIRDER SOFFIT PLAN



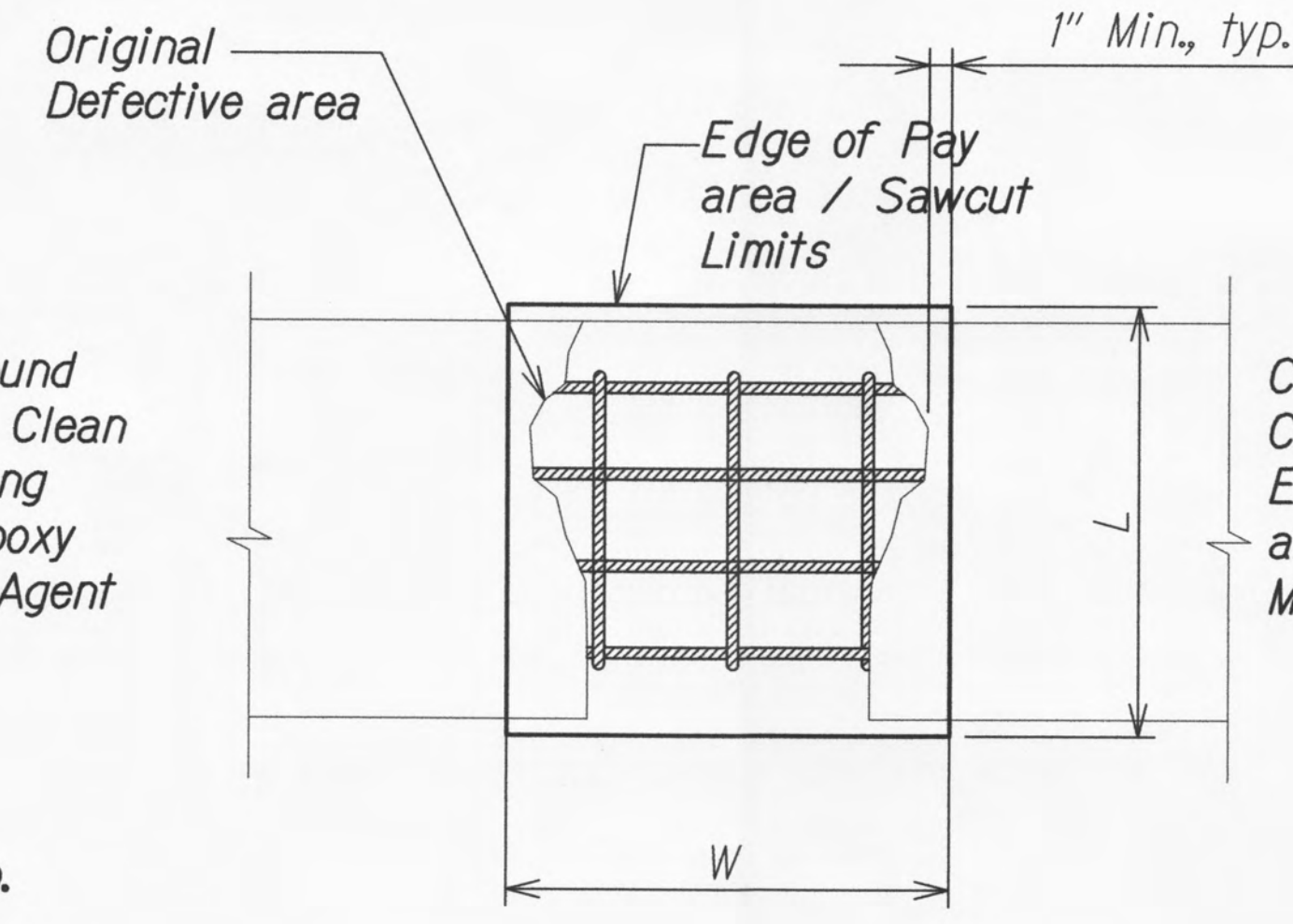
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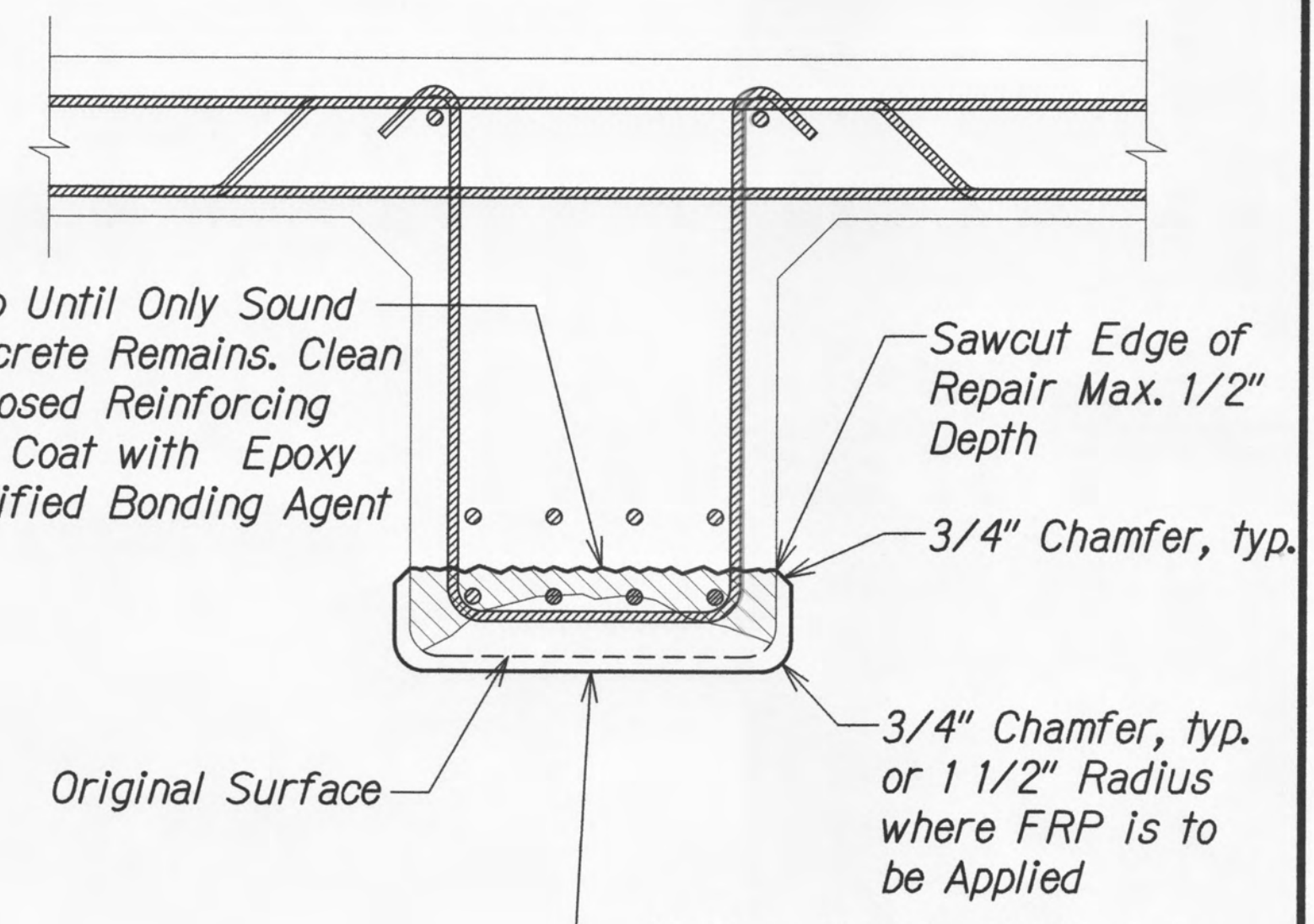
Pay Area / Sawcut Limits = $W \times L$
GIRDER SOFFIT PLAN



GIRDER SECTION



Pay Area / Sawcut Limits = $W \times L$
GIRDER SOFFIT PLAN



GIRDER SECTION

CONCRETE GIRDER REPAIR - TYPE "U"
 Scale: 1 1/2" = 1'-0"

CONCRETE GIRDER REPAIR - TYPE "U"
 Scale: 1 1/2" = 1'-0"

ORIGINAL PLAN	DATE
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CHECKED BY	

DRAWING NAME: Z:\000_ONGOING\18-0014.04-HONOKOHAU ST BR LOAD ETG-DDH\01 CAD\12-31-19 DEL INDEX\H5B-50104 CONG DETAIL.DWG PLOT TIME: 12-31-19 11:21 AM

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

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SIGNATURE: *David K. Fujimura* 4-30-20
 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

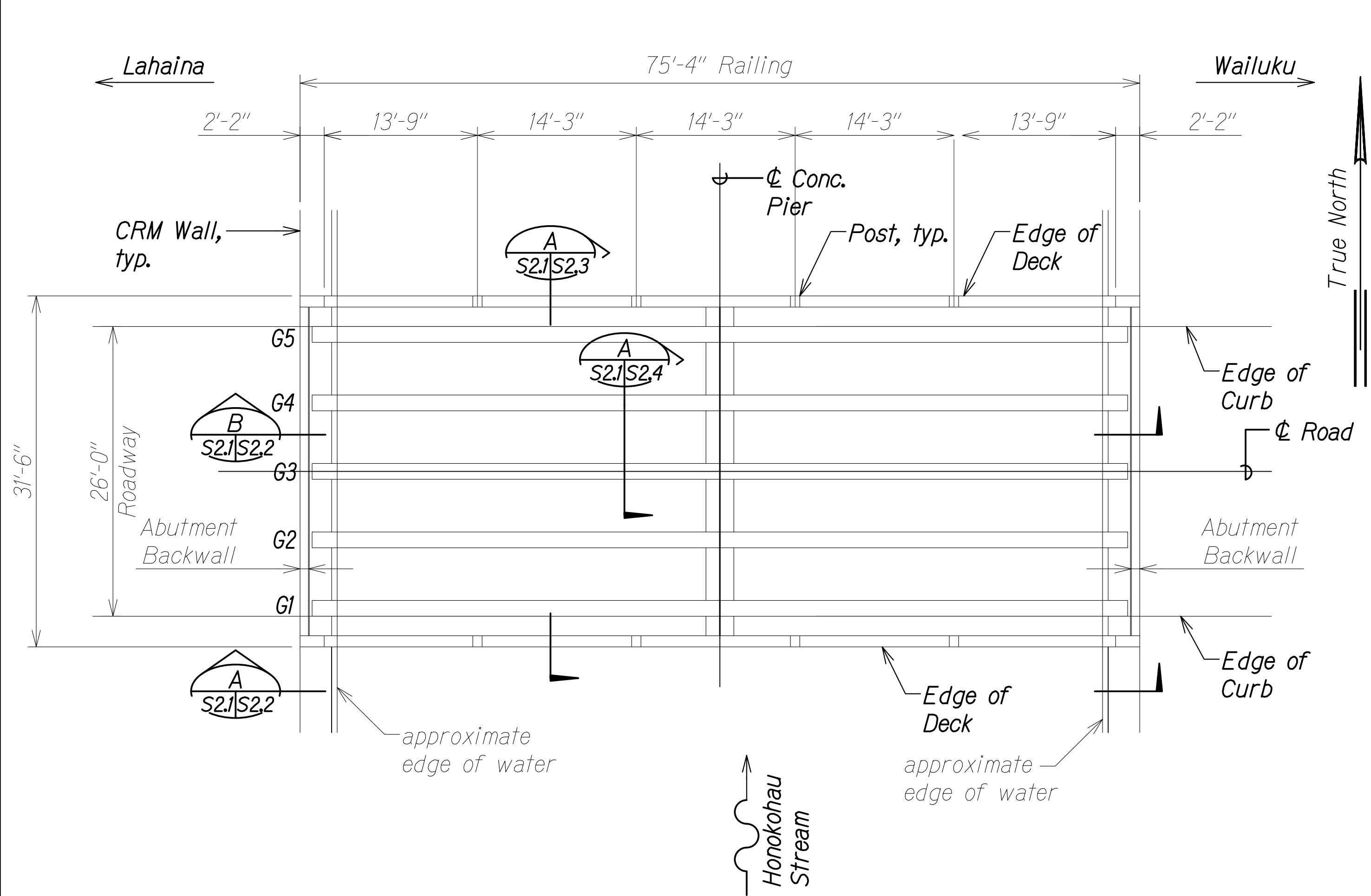
TYPICAL CONCRETE REPAIR DETAILS

HONOKOHAU STREAM BRIDGE MAINTENANCE REPAIRS
 Proj. No. HWY-M-05-19M

Scale: As Noted Date: Dec. 2019

SHEET No. **SI.4** OF **4** SHEETS

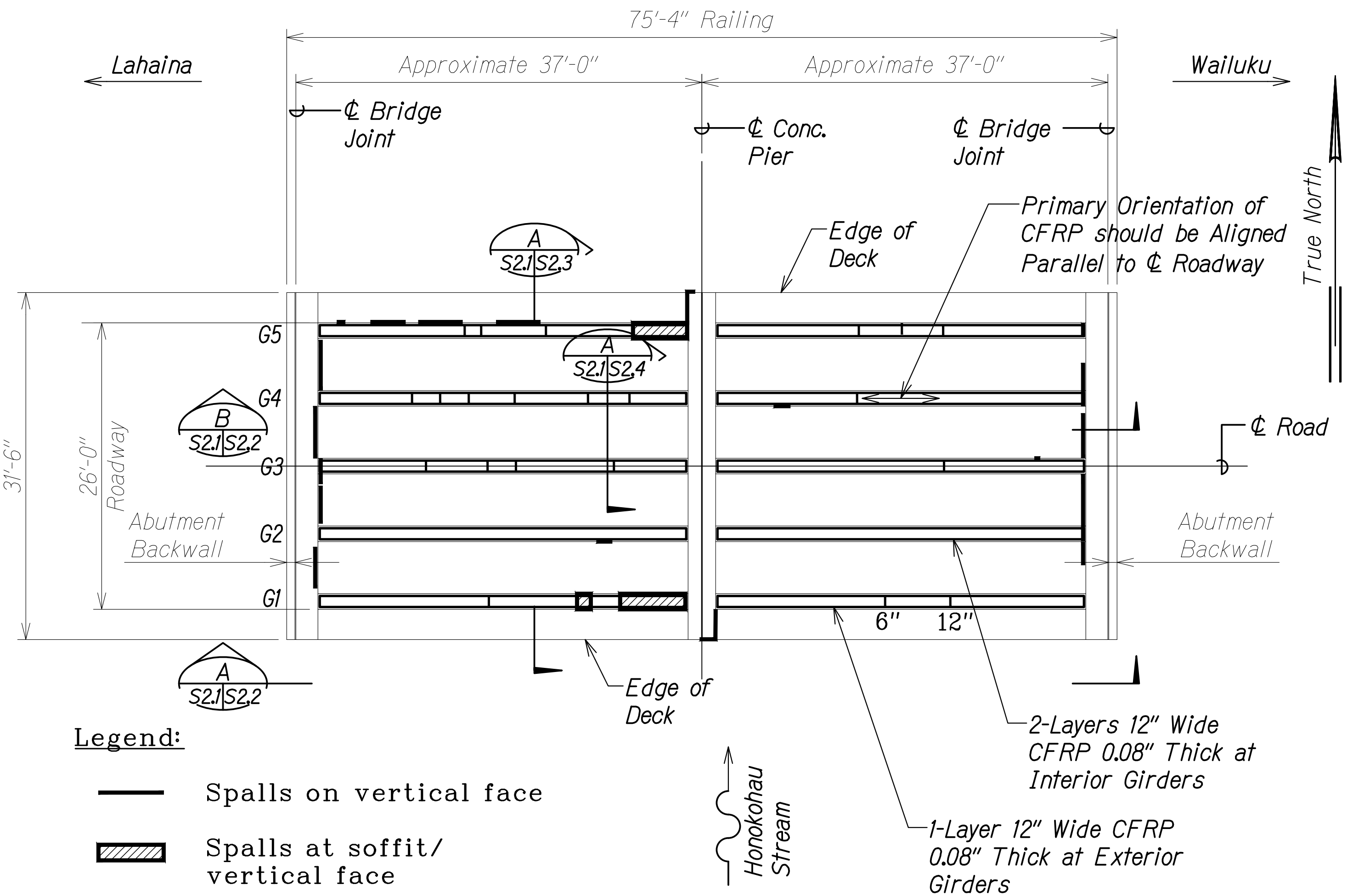
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-M-05-19M	2020	14	17



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

Note:

Each layer of CFRP shall have an equivalent
ExA = 13,344 kips per 12" width based on
material test values.



Legend:

- Spalls on vertical face
- Spalls at soffit/vertical face
- Cracks at 17" Unless Noted Otherwise

REFLECTIVE SOFFIT PLAN
Scale: 1/8" = 1'-0"

LEGEND FOR AS-BUILT POSTINGS

- Squiggly line for as-built deletion
- Double line for as-built deletion
- Roadway Text for as-built posting



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ME OR UNDER MY SUPERVISION.

David K. Fujimura
SIGNATURE

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE PLANS

**HONOKOHAU STREAM BRIDGE
MAINTENANCE REPAIRS
Proj. No. HWY-M-05-19M**

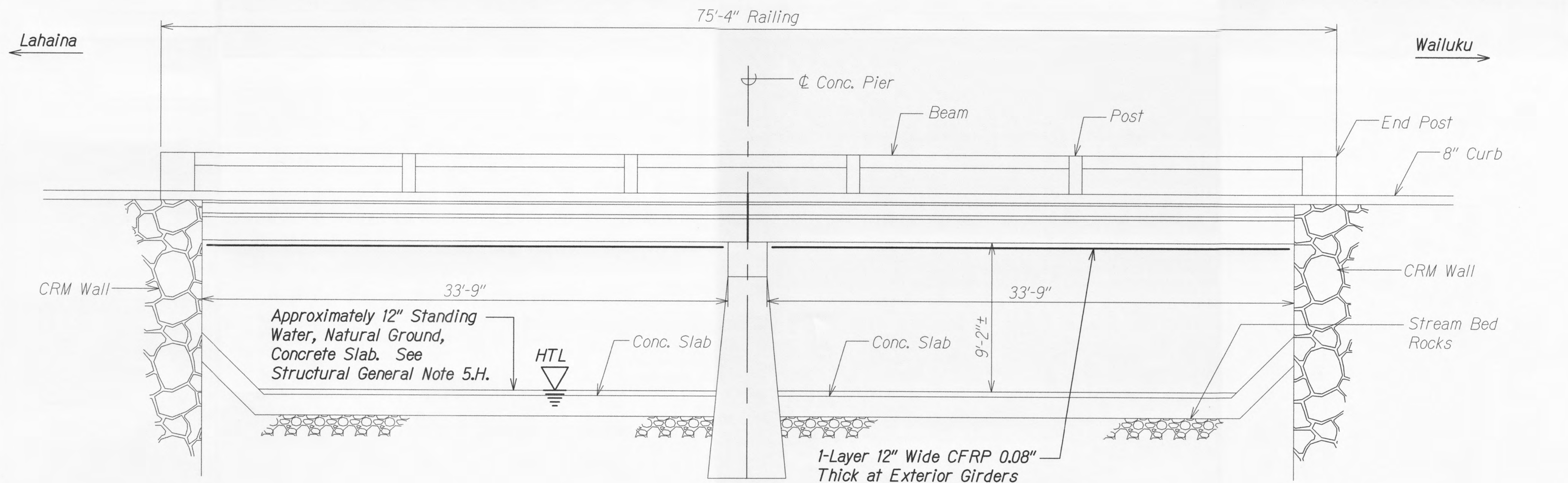
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SHEET No. S21 OF 4 SHEETS

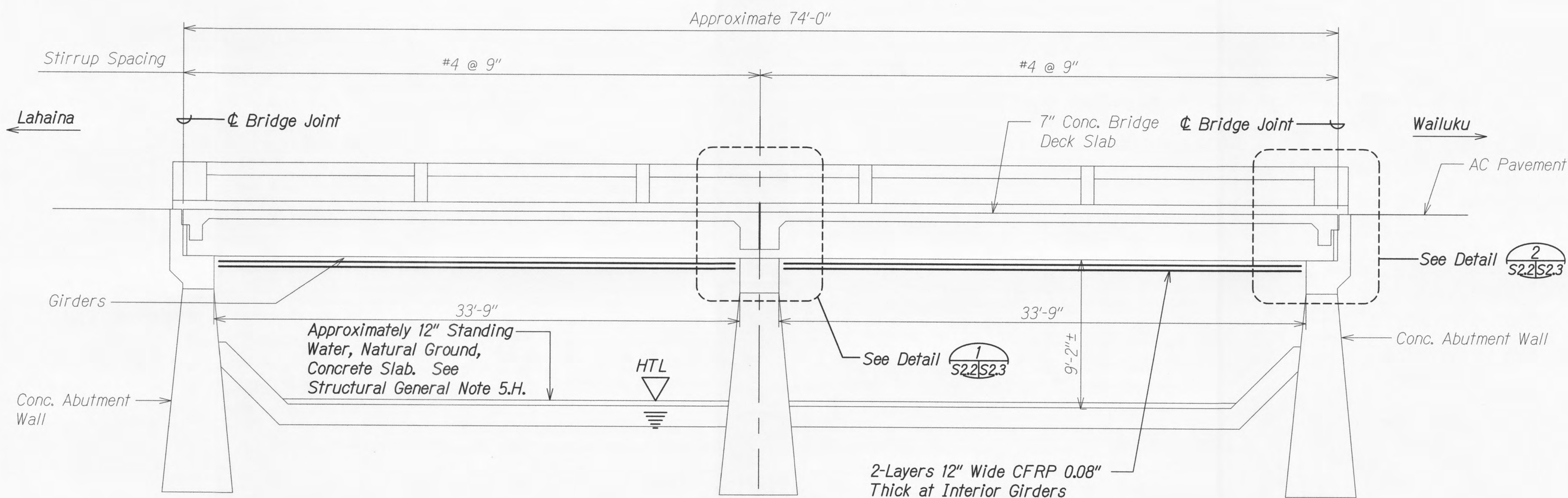
"AS-BUILT"

14

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-M-05-19M	2020	15	17



UPSTREAM ELEVATION A
 Scale: 1/4" = 1'-0" S2.1 | S2.2



LONGITUDINAL SECTION B
 Scale: 1/4" = 1'-0" S2.1 | S2.2

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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	QUANTITIES BY	
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DRAWING NAME: Z:\00_ONGOING\18-0014_04_HONOKOHAU STR BR LOAD FIG-DOHA\01 CAD\12-31-19 DEL INDEX\HSB-50202 ELEV.DWG. PLOT TIME: 12-31-19 11:22 AM



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David K. Fujimura 4-30-20
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 HIGHWAYS DIVISION

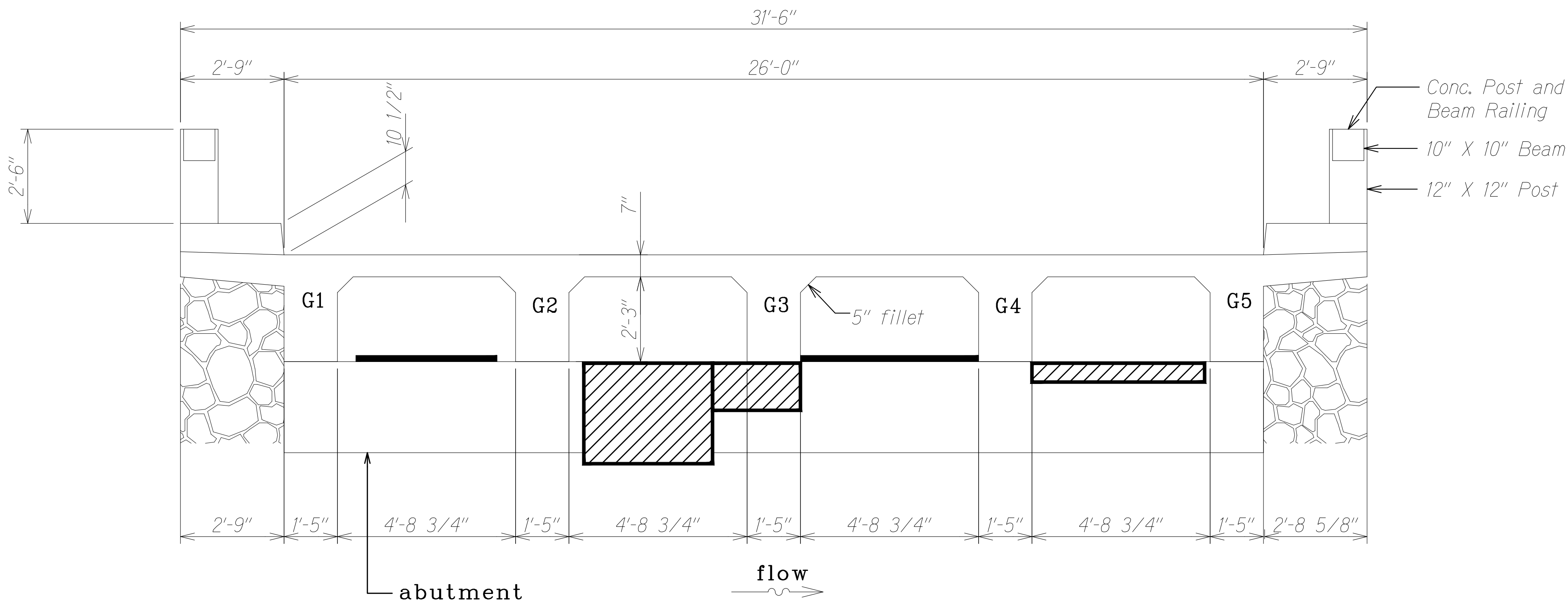
BRIDGE ELEVATION AND SECTION

**HONOKOHAU STREAM BRIDGE
 MAINTENANCE REPAIRS**
 Proj. No. HWY-M-05-19M

Scale: As Noted Date: Dec. 2019

SHEET No. S22 OF 4 SHEETS

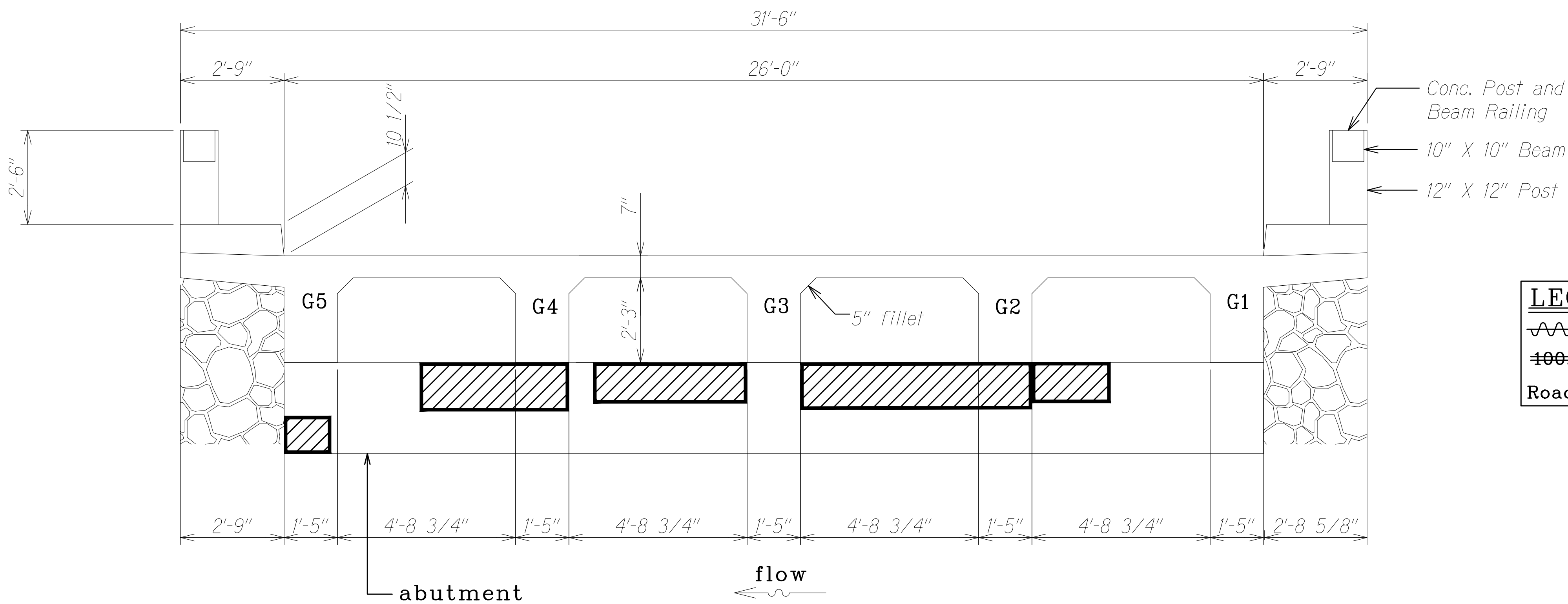
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-M-05-19M	2020	15 S-1	17



LAHAINA - ABUTMENT ELEVATION
Not to Scale

Legend:

- Spalls at abutment top face
- Spalls at soffit/vertical face



WAILUKU - ABUTMENT ELEVATION
Not to Scale

LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting



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David K. Fujimura
4-30-20
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABUTMENT ELEVATIONS
CONCRETE REPAIRS
HONOKOHAU STREAM BRIDGE
MAINTENANCE REPAIRS
Proj. No. HWY-M-05-19M

Scale: As Noted Date: Dec. 2019

SHEET No. S22A OF 4 SHEETS

11/19/20	1	As Built - New Sheet
DATE	REVISION	

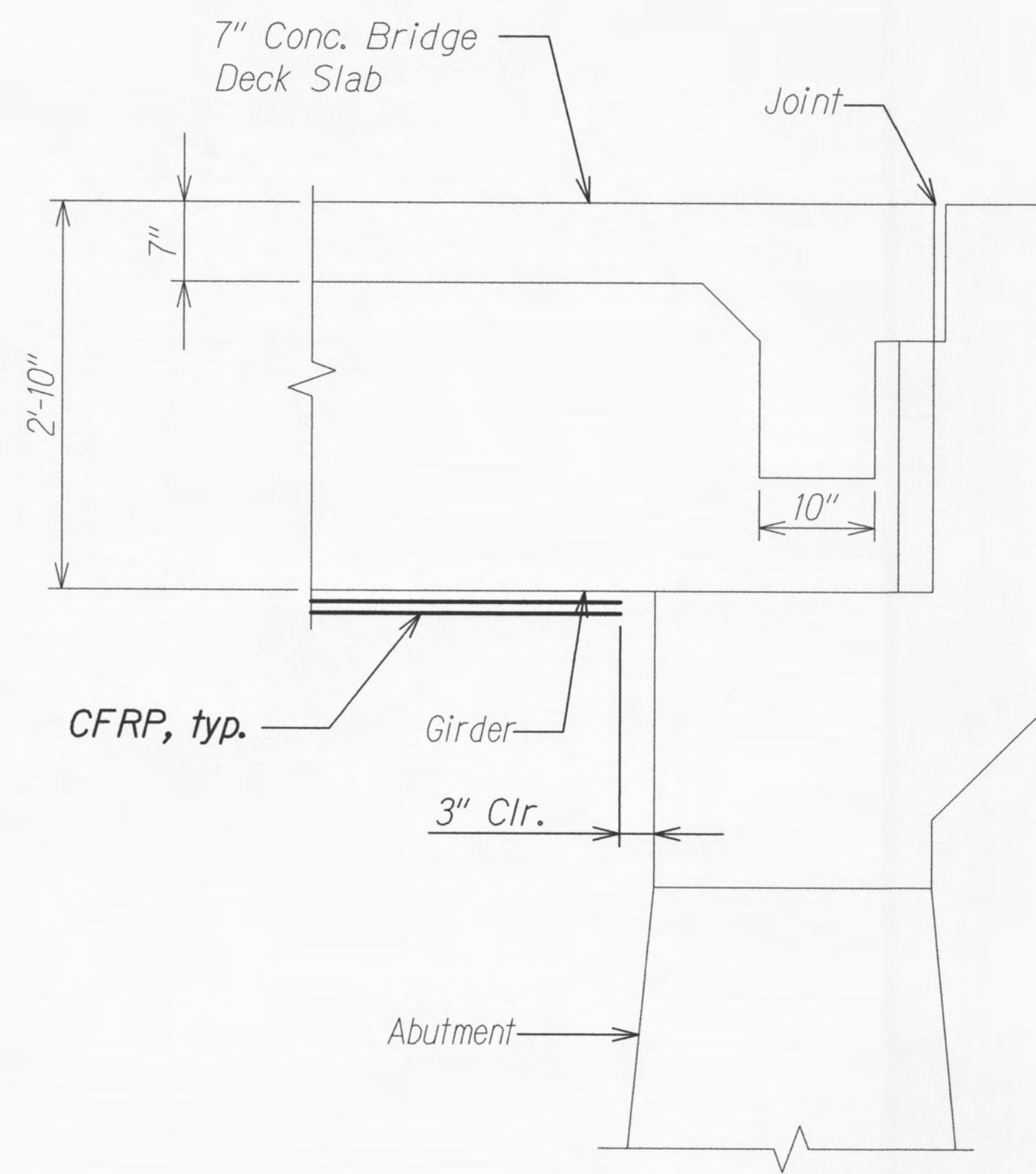
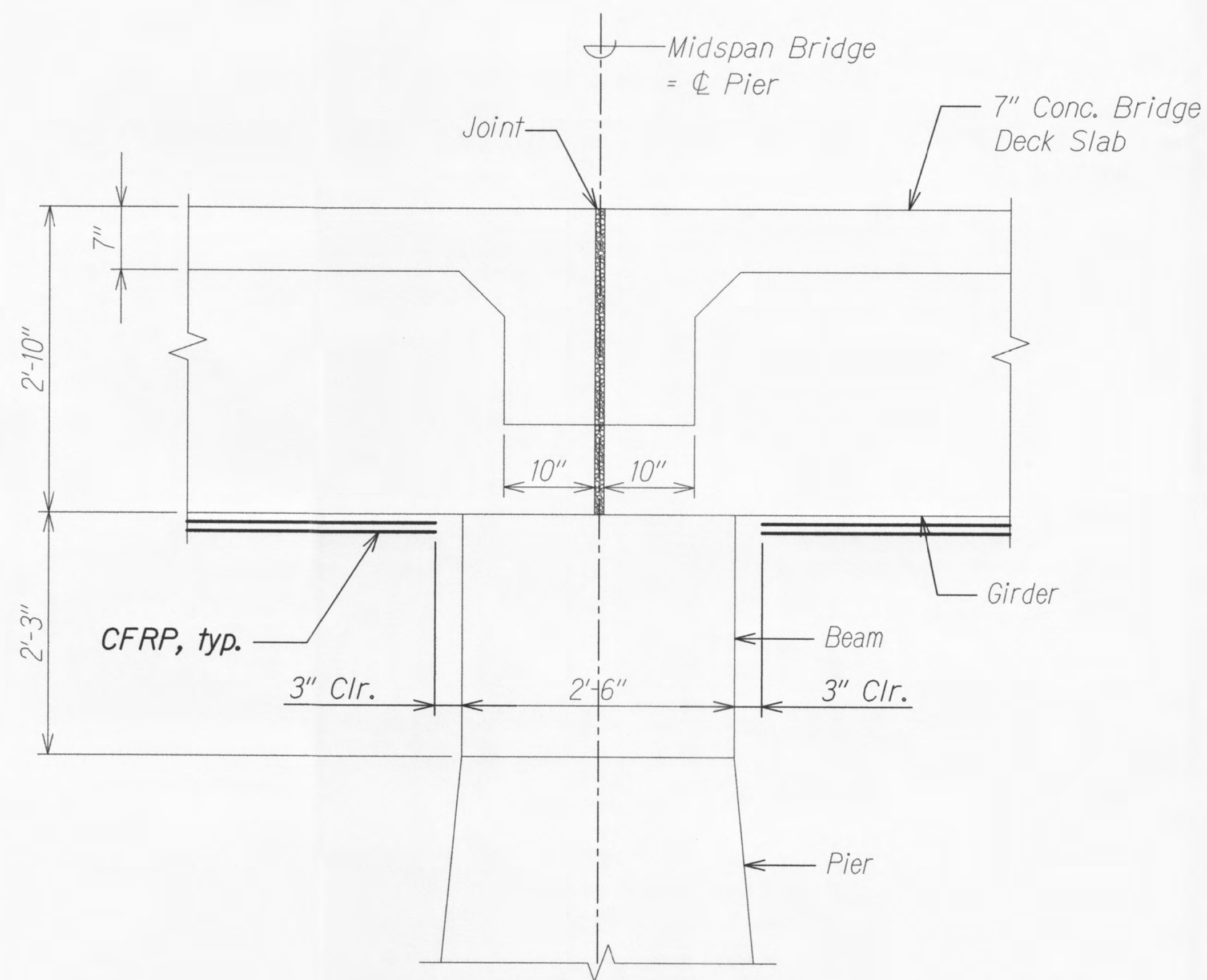
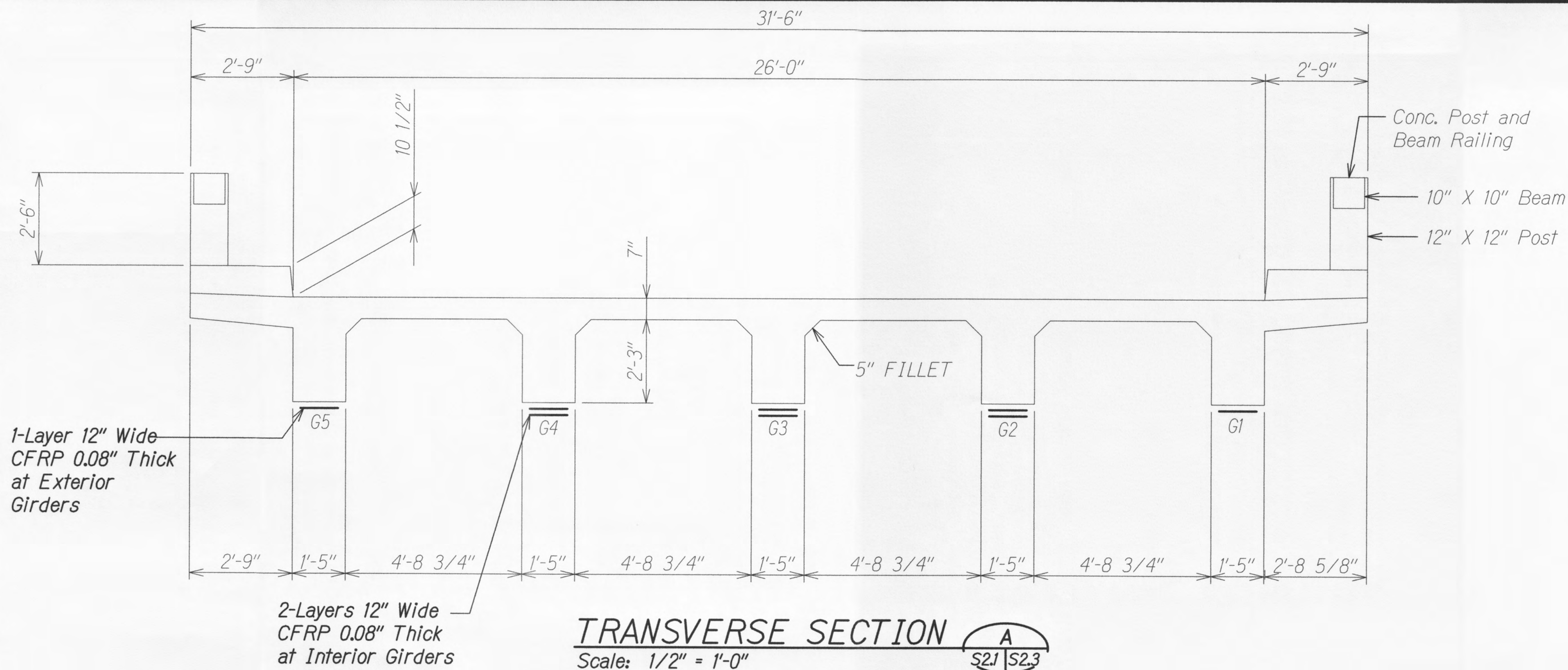
"AS-BUILT"

15 S-1 1

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

DRAWING NAME: Z:\00 ONGOING\19-009.5_HONOKOHAU, PAPANAHOA\01_CAD\11-23-20_AS-BUILT_HONOKOHAU_HSB-S0202A_ABUT_SECT.DWG PLOT TIME: 11-20-20, 10:47 AM

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-M-05-19M	2020	16	17



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature: David K. Fujiwara
Expiration Date of the License: 4-30-20

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

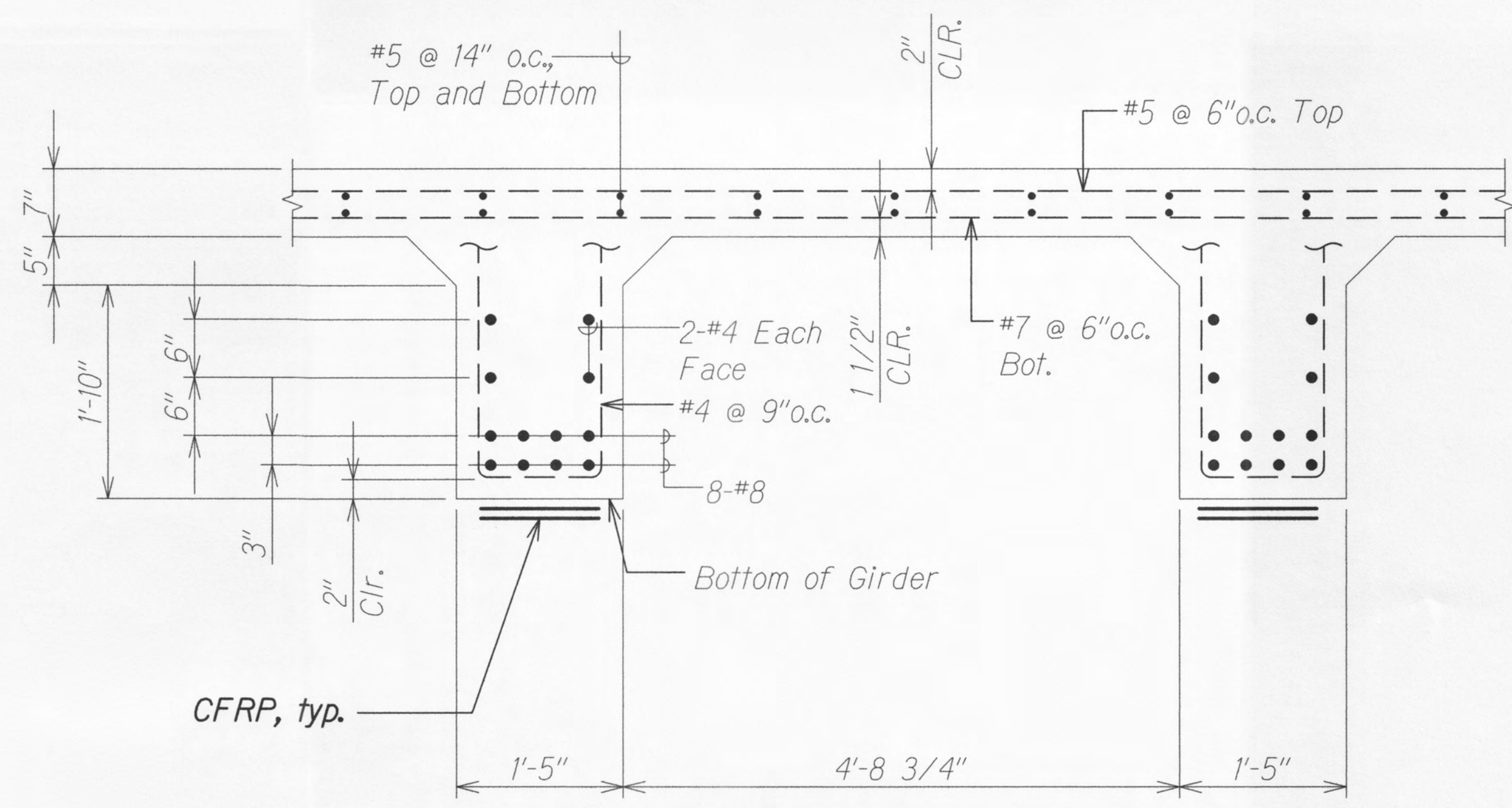
BRIDGE SECTIONS

**HONOKOHAU STREAM BRIDGE
MAINTENANCE REPAIRS
Proj. No. HWY-M-05-19M**

Scale: As Noted Date: Dec. 2019

SHEET No. S2.3 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-M-05-19M	2020	17	17



TRANSVERSE SECTION WITH TYPICAL REINFORCING
 Scale: 1" = 1'-0" A
S2.1 S2.4

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

DRAWING NAME: Z:\00 DRAWING\18-001.4 04 HONOKOHAU STR BR LOAD RTG-100\A01 CAD\17-31-19 DEL INDEX\H5B-S0204 BR SECT.DWG PLOT TIME: 17-31-19 11:23 AM



THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.

David K. Fujiwara
 SIGNATURE 4-30-20
 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE SECTIONS

HONOKOHAU STREAM BRIDGE

MAINTENANCE REPAIRS

Proj. No. HWY-M-05-19M

Scale: As Noted Date: Dec. 2019

SHEET No. S2.4 OF 3 SHEETS