FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	19K-01-20M	2020	15	22

STRUCTURAL GENERAL NOTES

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.

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 2018 LRFD Bridge Design Guide Specifications for GFRP-Reinforced Concrete, 2nd Edition, including all 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 as-built drawings and 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. Glass Fiber Reinforced Polymer (GFRP) rebar shall comply with ASTM D7957 and shall have a minimum modulus of elasticity of 6,500,000 psi. See special provisions for additional requirements.

   B. Repair Material, for defective concrete repairs, shall be a factory blended, rapid setting, high spread, cementitious patching material (containing no gypsum) combined with a polymer type admixture, water, and a corrosion inhibitor. It shall meet the following minimum material properties:

      (1) 5-hour compressive strength - 3,000 psi

      (2) 28-day compressive strength - 6,000 psi

   C. Curing compound shall be a Lithium based curing compound.

   D. Adhesive material used for drill-and-epoxy post-installed reinforcing bars shall be HILTI HIT-HY 200 or approved equal.

5. Reinforcement:

   A. The clear covering measured from the surface of the concrete to the face of any reinforcing bar shall be as follows:

      (1) GFRP bars = 1"

      (2) Steel bars = 2 1/4"

   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, except when bundled.

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

   F. 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.

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

6. 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 steel 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. All post-installed drilled-and-epoxy bars shall be drilled, cleaned, and installed in accordance with the adhesive manufacturer's printed installation instructions (MPII).

6. Construction Notes (Cont.):

   G. Any drilled holes, inserts, or brackets needed for construction including, but not limited to, formwork for concrete repairs, 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 repair work.

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

   I. The temporary work platform shall be positioned above the mean higher high water (MHHW) mark of the water. The temporary work platform shall be supported from the existing bridge structure.

   J. Designated repair locations are not necessarily inclusive of all repair work required. The Contractor shall inspect the soffit and identify 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.

   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. Contractor shall note that a portion of the repair work will be performed above Wailuku Bay / Stream. Follow all regulations and requirements set forth by State of Hawaii Occupational Safety and Health (HIOSH).

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

DAVID K. FUJIWARA
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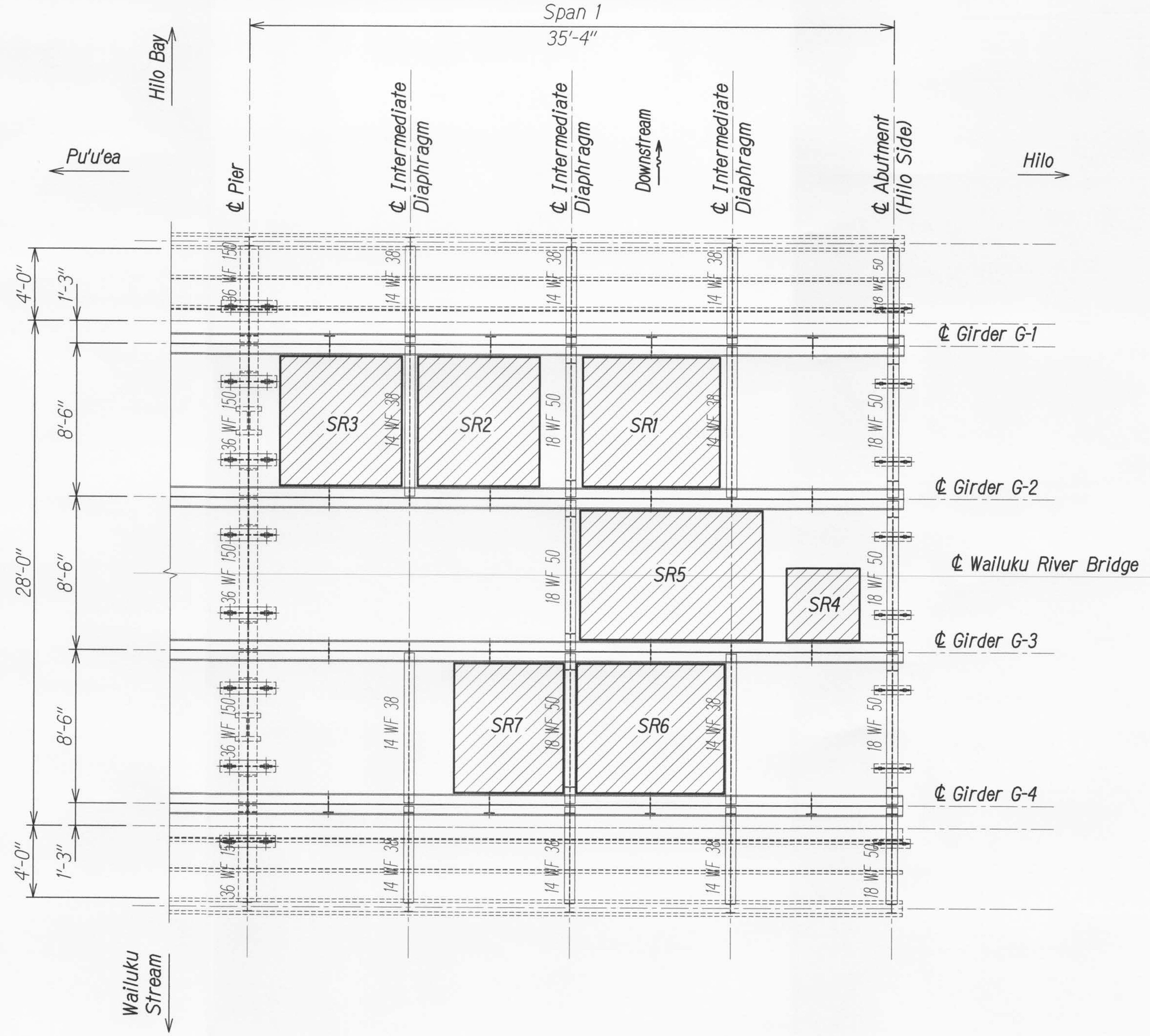
STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL GENERAL NOTES

HAWAII BELT ROAD
Wailuku Stream Bridge Spall Repairs, MP 2.74
Project No. 19K-01-20M

Scale: None — Date: Oct. 1, 2019

SHEET No. S-1 OF 8 SHEETS



REFLECTIVE DECK SOFFIT - REPAIR PLAN (A / S-2 | S-2)

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

DEFECTIVE CONCRETE REPAIR SCHEDULE	
ITEM	ESTIMATED REPAIR SIZE
SR1	7'-4" x 8'-0"
SR2	7'-4" x 6'-0"
SR3	7'-4" x 8'-6"
SR4	4'-0" x 4'-0"
SR5	7'-4" x 10'-0"
SR6	7'-4" x 8'-9"
SR7	7'-4" x 6'-0"
Defective concrete repair area based on inspection = 363 ft^2	
Total defective concrete repair area for bidding purposes = 800 ft^2	

Legend:

Estimated Defective Concrete Repair Area

Notes:

1. See special provision section 680 for defective concrete repair requirements, including but not limited to, concrete removal, substrate preparation, and material placement.
2. The defective concrete repair areas, as designated on the plans are locations with significant reinforcing section loss. The Contractor shall repair these areas in accordance with the details shown on sheets S-3, S-4, S-5, and S-6.
3. The remaining soffit of the deck shall be repaired in accordance with the details shown on sheets S-3, S-4, and S-7. The Contractor shall inform the Engineer if existing reinforcing steel has greater than 25% section loss.

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STATE OF HAWAII
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HIGHWAYS DIVISION

REFLECTIVE DECK SOFFIT
REPAIR PLAN

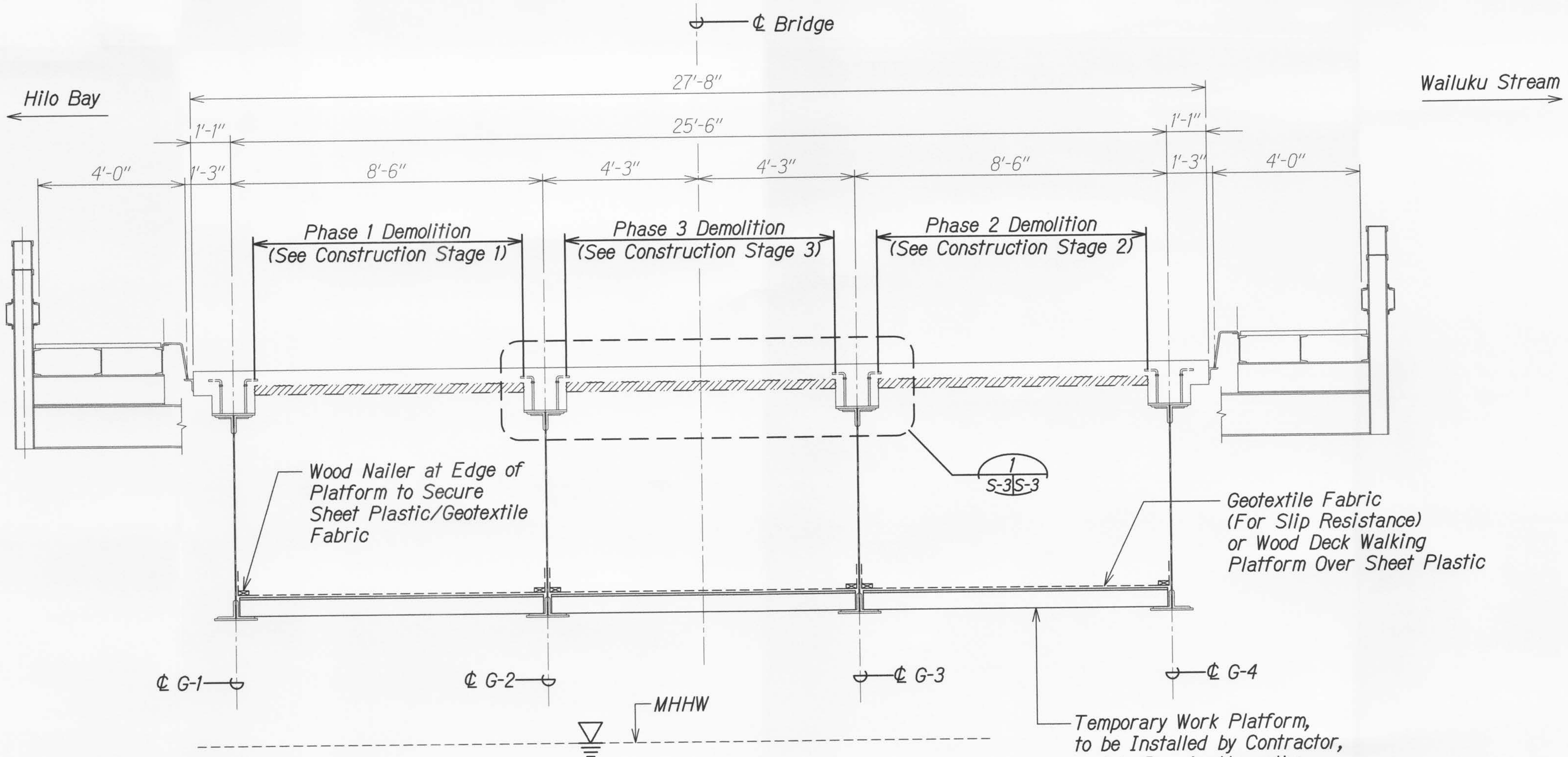
HAWAII BELT ROAD
Wailuku Stream Bridge Spall Repairs, MP 2.74
Project No. 19K-01-20M

Scale: As Noted — Date: Oct. 1, 2019

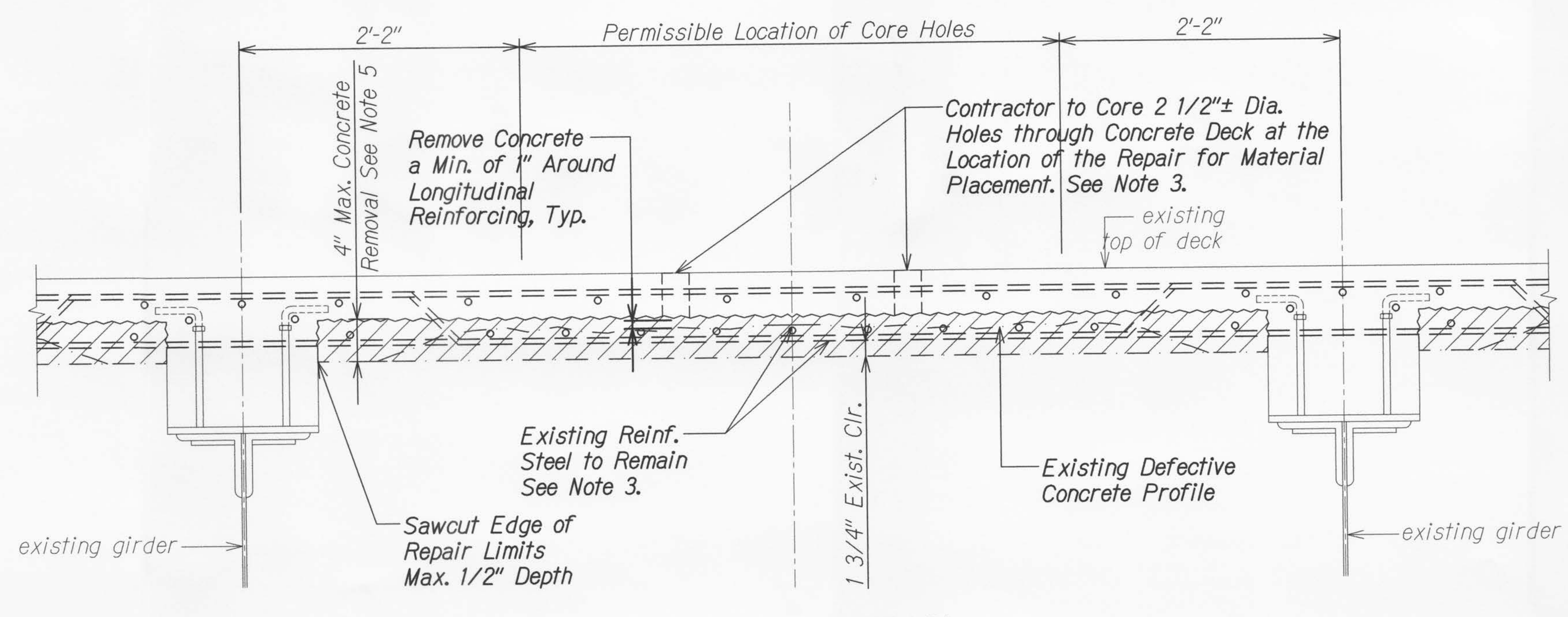
SHEET No. S-2 OF 8 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	19K-01-20M	2020	17	22



DEMOLITION SECTION AT SPAN 1 (A, S-3 | S-3)
Scale: 1/2" = 1'-0"



DEMOLITION DETAIL (1, S-3 | S-3)
Scale: 1 1/2" = 1'-0"

Legend:

Defective Concrete Repair Area

Notes:

1. All demolition/repair work shall be performed in phases and only during times of lane closure/traffic control. See Sheet S-8 for Construction Sequence.
2. Contractor shall install a debris containment device to prevent dust, wash water, and construction debris from entering the water. Containment device and temporary work platform shall be supported from existing bridge structure.
3. Reinforcing steel in the vicinity of the repair shall not be damaged, and shall be incorporated into new concrete pour. Scan deck for reinforcing steel placement, as necessary, to avoid damaging reinforcing steel during coring and drilling operation.
4. If defective concrete remains even after 4" max. concrete removal from soffit of deck, Contractor shall inform Engineer of the condition prior to installing formwork.
5. All debris shall be removed from temporary work platform at the end of each days work shift.

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

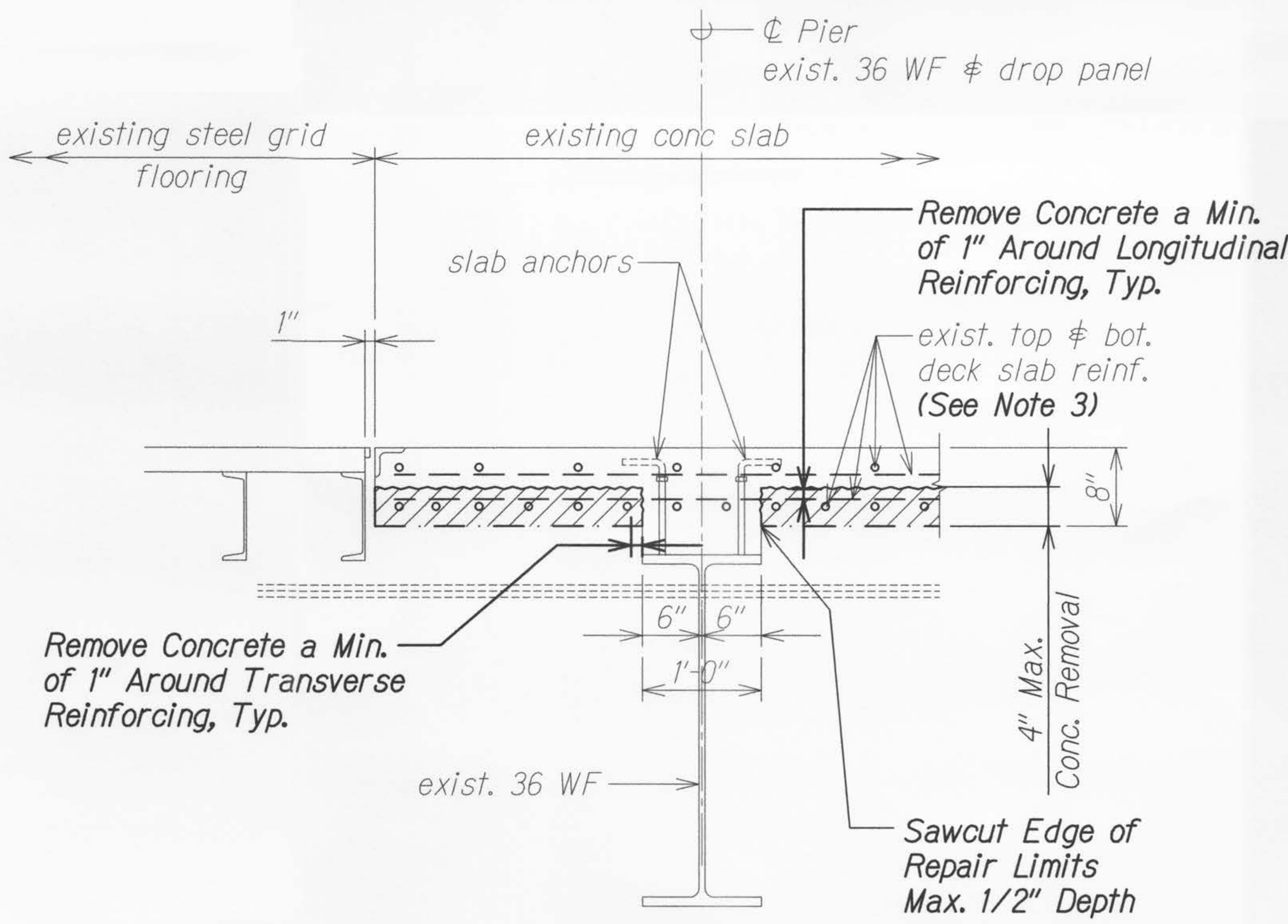
DEMOLITION SECTION AND DETAIL

HAWAII BELT ROAD
Wailuku Stream Bridge Spall Repairs, MP 2.74
Project No. 19K-01-20M

Scale: As Noted — Date: Oct. 1, 2019

SHEET No. S-3 OF 8 SHEETS

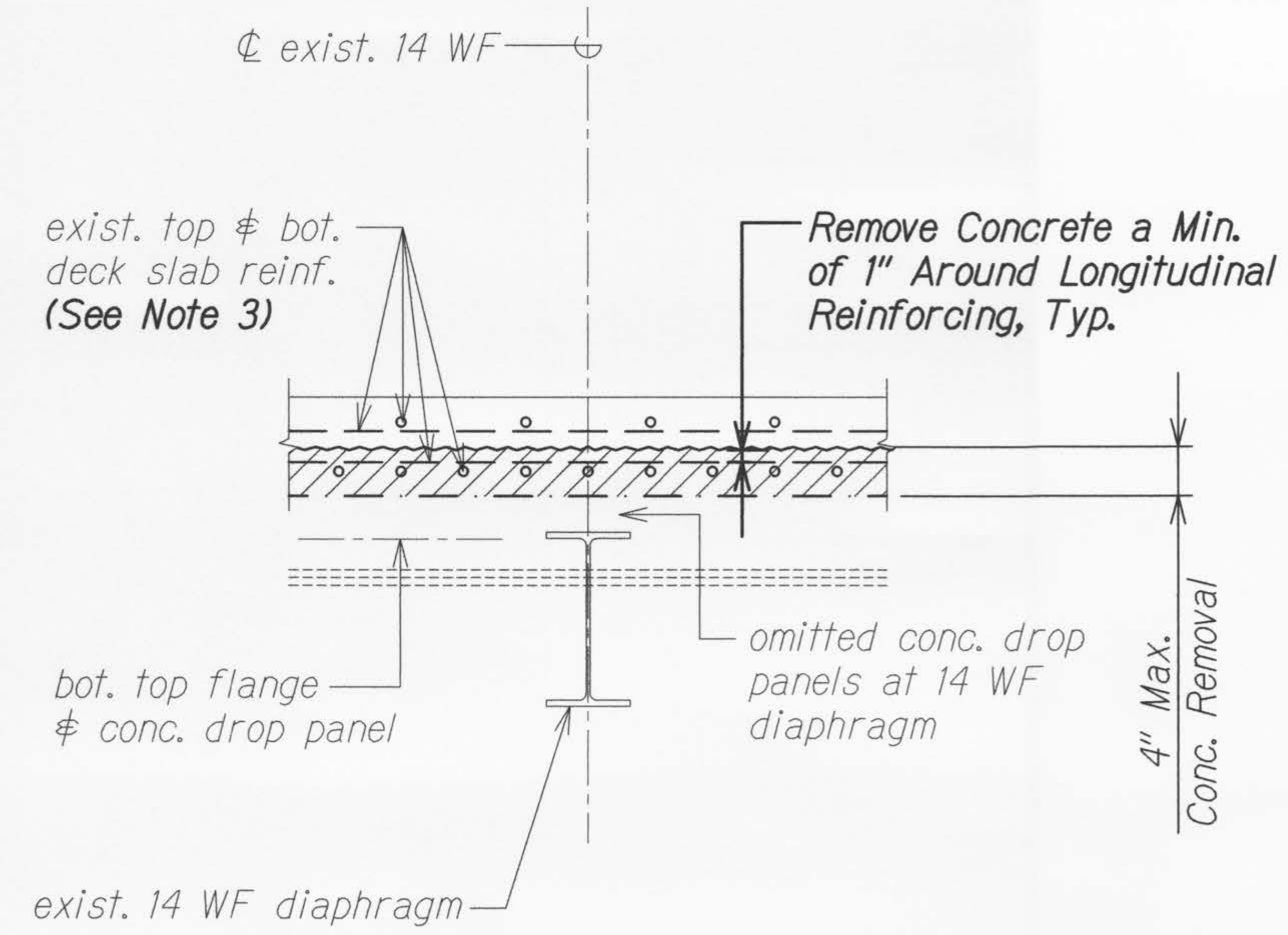
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	19K-01-20M	2020	18	22



DEMOLITION SECTION AT 36 WF DIAPHRAGM AT PIER

A S-4 | S-4

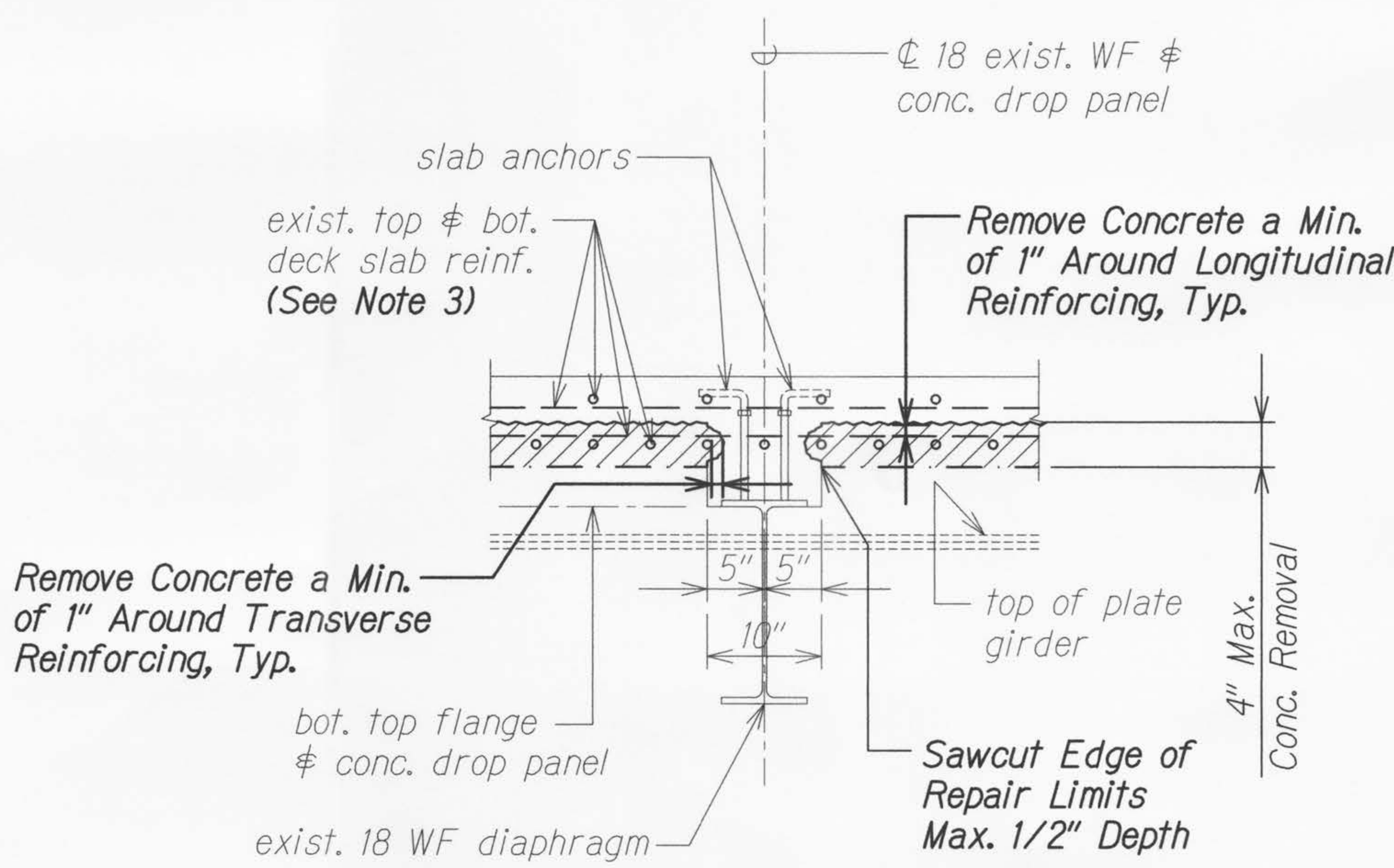
Scale: 1" = 1'-0"



DEMOLITION SECTION AT 14 WF INTERMEDIATE DIAPHRAGM

B S-4 | S-4

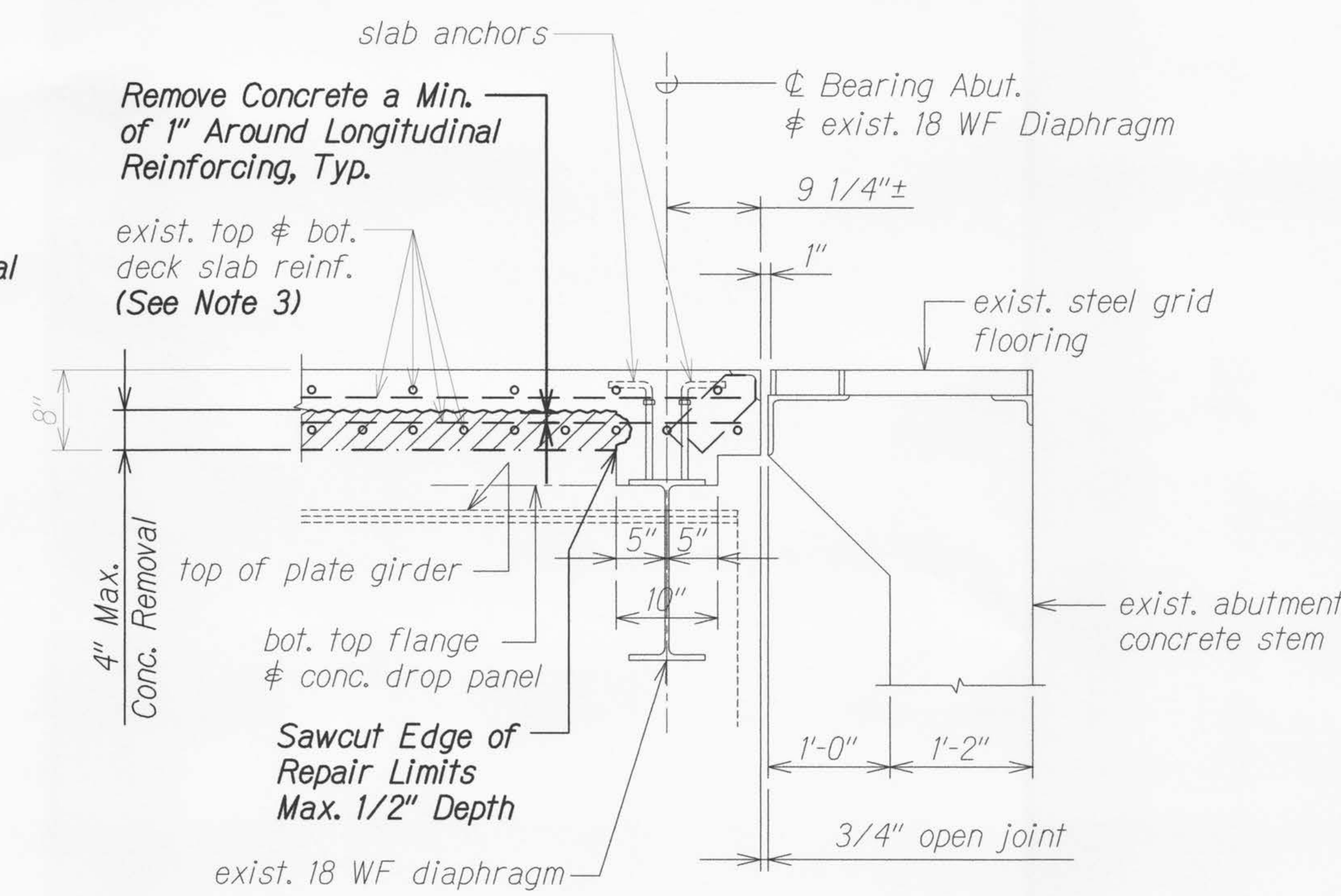
Scale: 1" = 1'-0"



DEMOLITION SECTION AT 18 WF INTERMEDIATE DIAPHRAGM

C S-4 | S-4

Scale: 1" = 1'-0"



DEMOLITION SECTION AT ABUTMENT

D S-4 | S-4

Scale: 1" = 1'-0"

Legend:

Defective Concrete Repair Area

Notes:

1. All demolition/repair work shall be performed in phases and only during times of lane closure/traffic control. See Sheet S-8 for Construction Sequence.
2. Contractor shall install a debris containment device to prevent dust, wash water, and construction debris from entering the water. Containment device and temporary work platform shall be supported from existing bridge structure.
3. Reinforcing steel in the vicinity of the repair shall not be damaged, and shall be incorporated into new concrete pour. Scan deck for reinforcing steel placement, as necessary, to avoid damaging reinforcing steel during coring and drilling operation.
4. If defective concrete remains even after 4" max. concrete removal from soffit of deck, Contractor shall inform Engineer of the condition prior to installing formwork.
5. All debris shall be removed from temporary work platform at the end of each days work shift.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DEMOLITION SECTIONS

HAWAII BELT ROAD
Wailuku Stream Bridge Spall Repairs, MP 2.74
Project No. 19K-01-20M

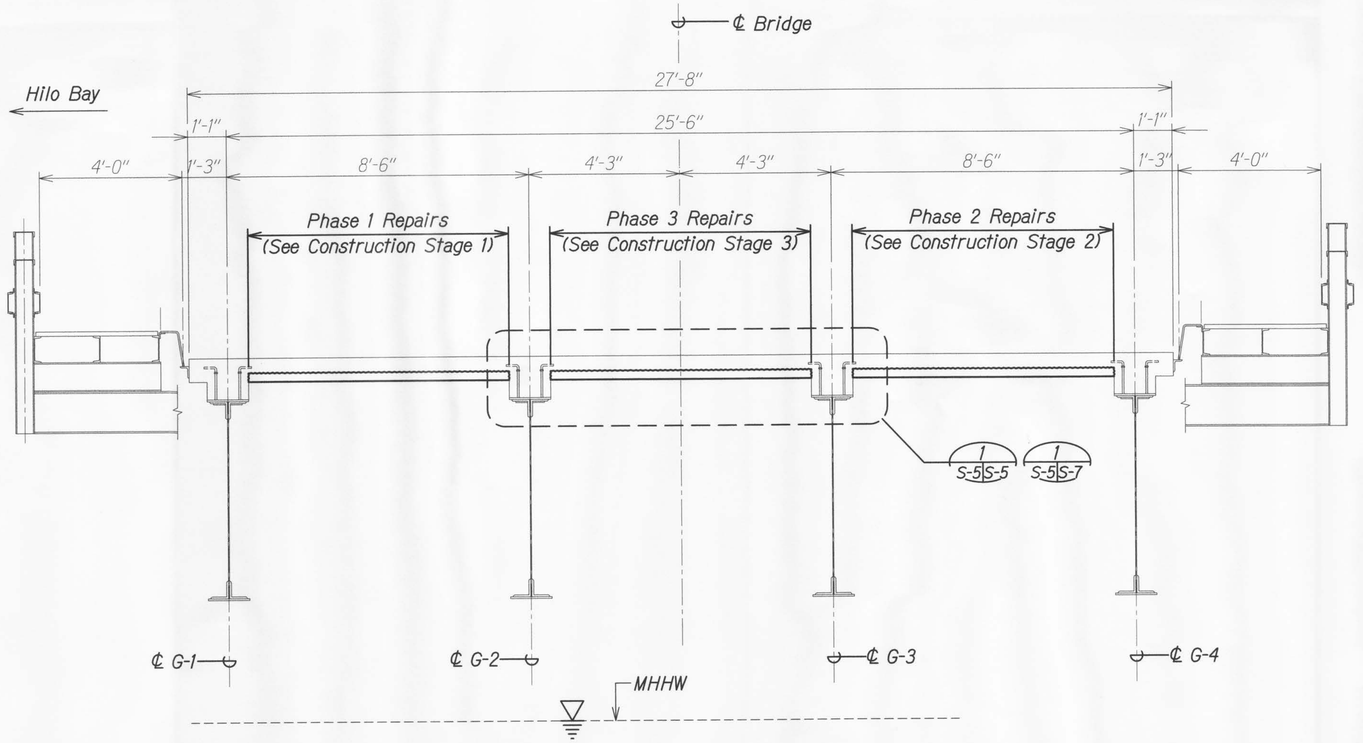
Scale: As Noted — Date: Oct. 1, 2019

SHEET No. S-4 OF 8 SHEETS

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

DRAWING NAME: Z:\00 ONGOING\19-009.2A WAILUKU BR INSP-DOT\V01 CAD\10-01-19 REVSD PROJ NAME\WB-S003 DEMO.DWG PLOT TIME: 10-02-19, 2:30 PM

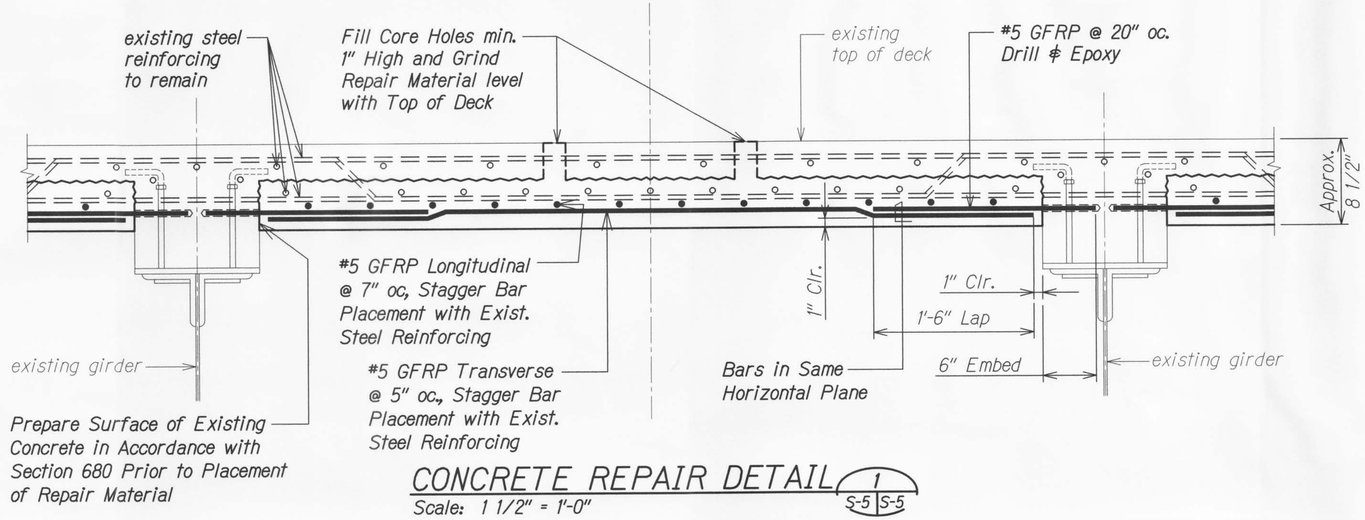
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	19K-01-20M	2020	19	22



CONCRETE REPAIR SECTION AT SPAN 1

A S-5 S-5

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



CONCRETE REPAIR DETAIL

1 S-5 S-5

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

Legend:

- ◦ ═══ Existing Steel Reinforcing
- • ——— New GFRP Reinforcing

Notes:

1. Work platform not shown for clarity. See demolition section for details.
2. Allow repair areas to cure for a minimum 3-days with formwork in place. After formwork removal, cure repair areas with Lithium based curing compound.

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

DRAWING NAME: Z:\OD ONGOING\19-009 2A WAILUKU BR INSP-DOT\A01 CAD\ 10-02-19 PROJ NAME: B02\WB-S005 REPAIR.DWG PLOT TIME: 10-02-19, 3:27 PM)

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

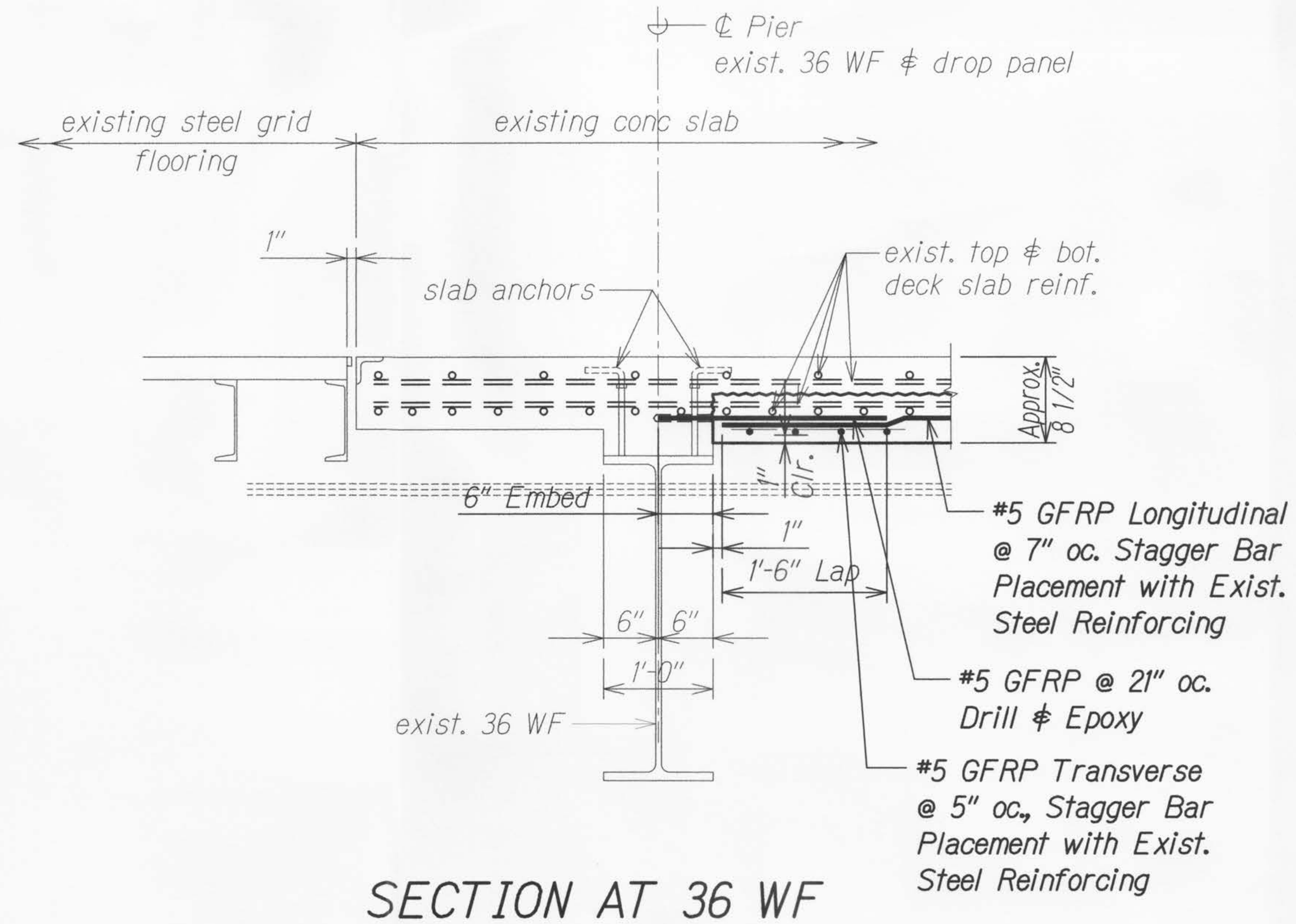
SECTION AND DETAIL

HAWAII BELT ROAD
Wailuku Stream Bridge Spall Repairs, MP 2.74
Project No. 19K-01-20M

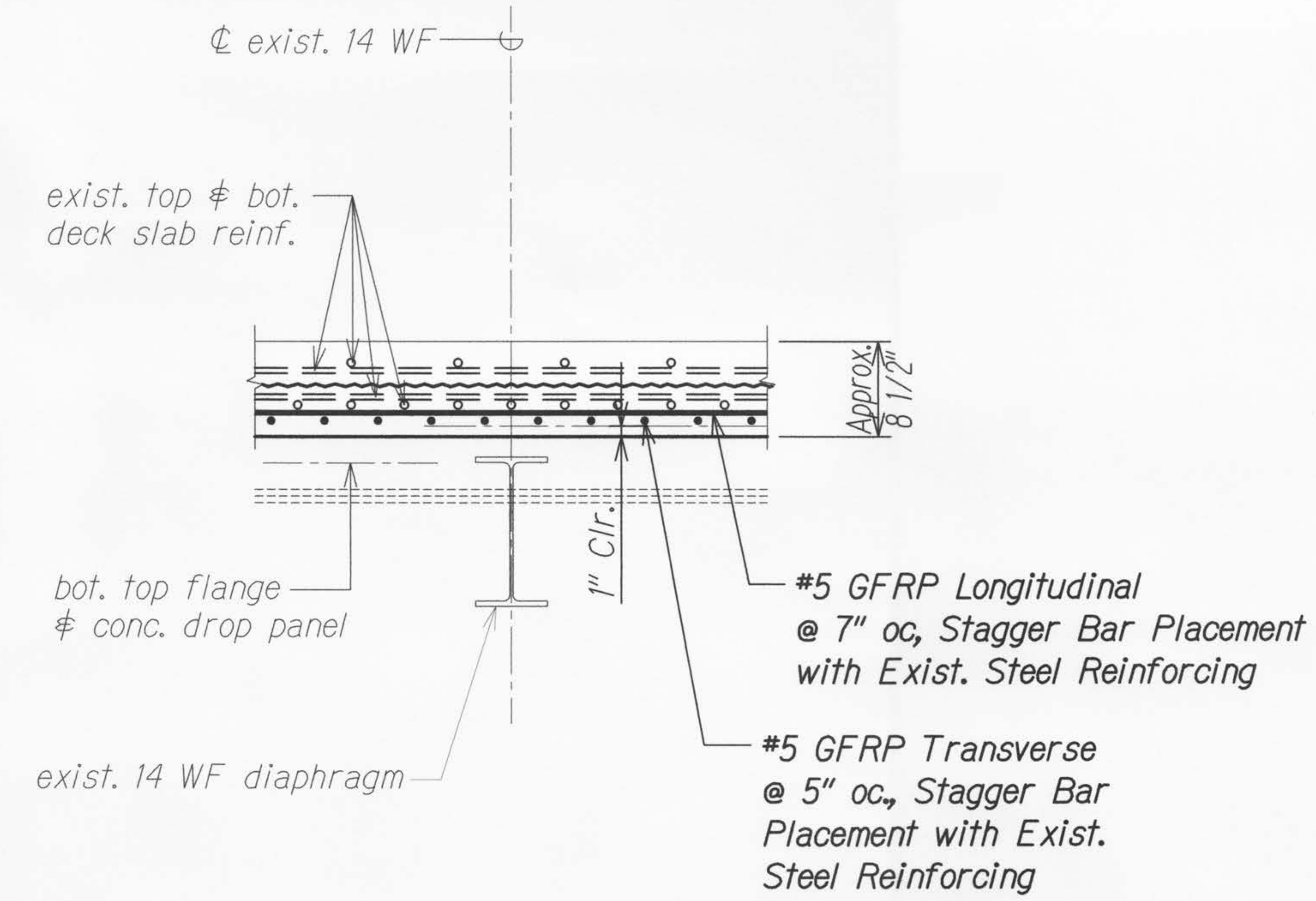
Scale: As Noted Date: Oct. 1, 2019

SHEET No. S-5 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	19K-01-20M	2020	20	22



SECTION AT 36 WF
DIAPHRAGM AT PIER (A, S-6 | S-6)
Scale: 1" = 1'-0"



SECTION AT 14 WF
INTERMEDIATE DIAPHRAGM (B, S-6 | S-6)
Scale: 1" = 1'-0"

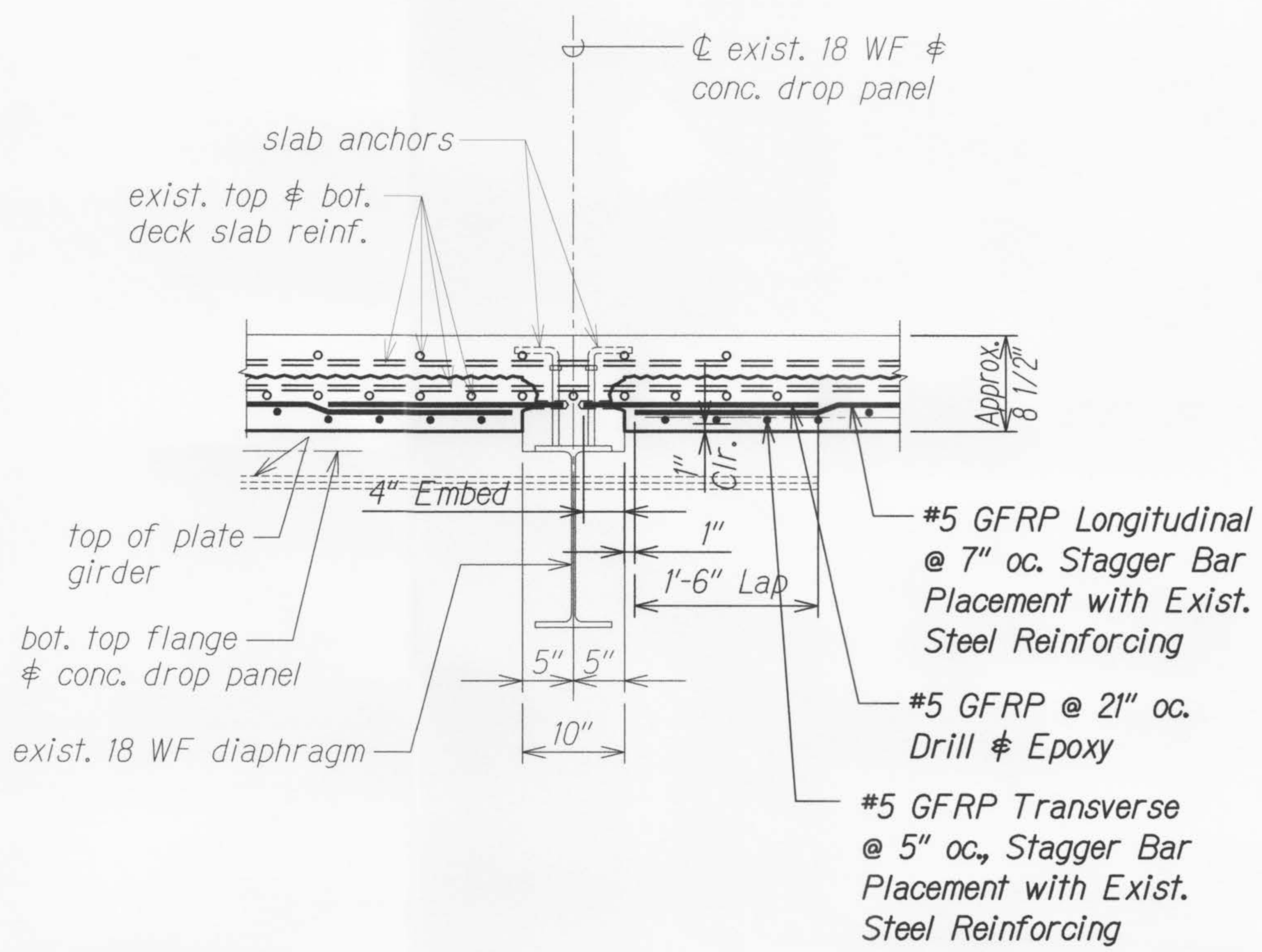
Legend:

∘ ══ Existing Steel Reinforcing

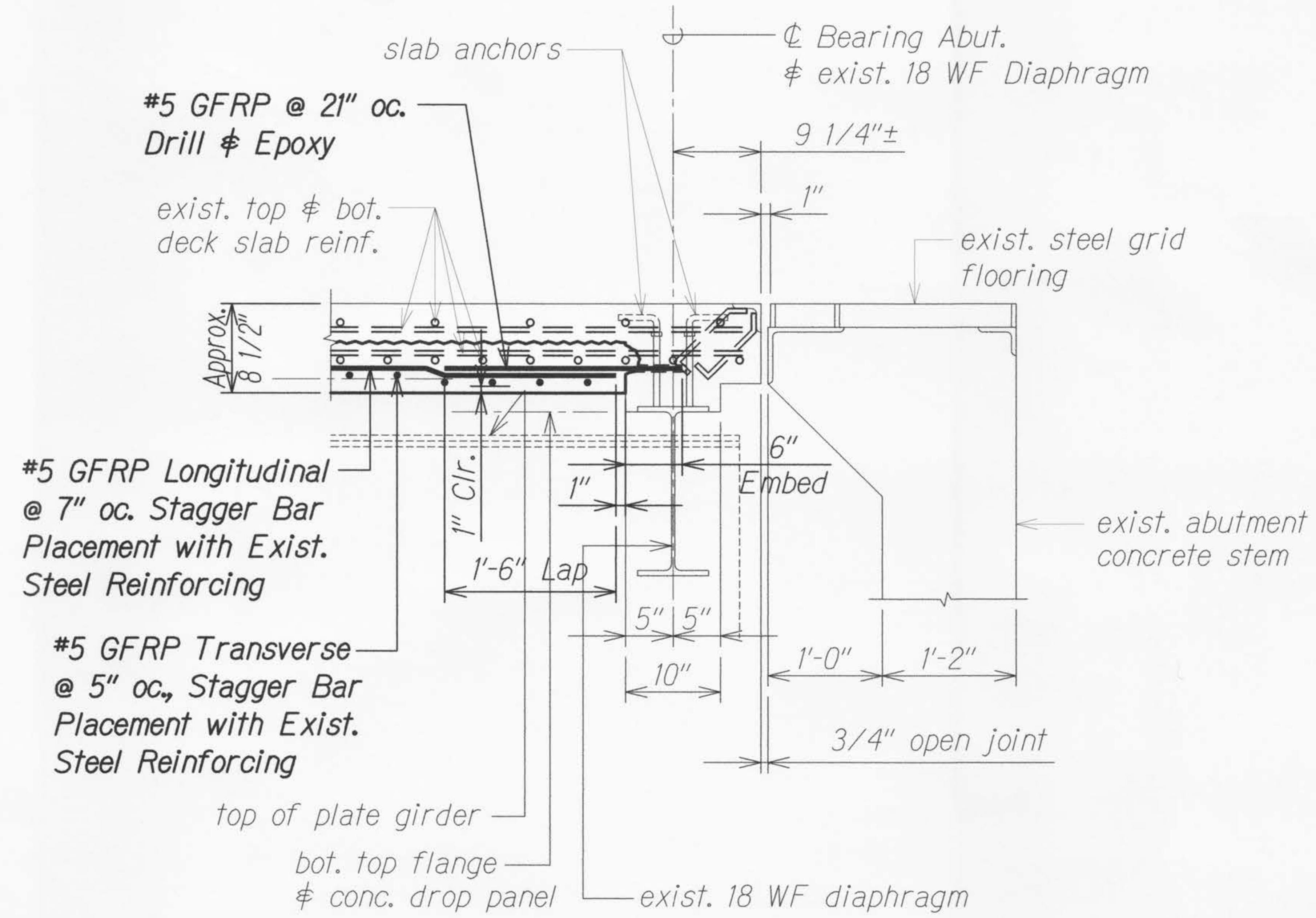
• ── New GFRP Reinforcing

Notes:

1. See Reflective Deck Soffit Plan for location of diaphragms.
2. Repair details are shown at designated defective concrete repair areas. See sheet S-2.



SECTION AT 18 WF
INTERMEDIATE DIAPHRAGM (C, S-6 | S-6)
Scale: 1" = 1'-0"



SECTION AT ABUTMENT (D, S-6 | S-6)
Scale: 1" = 1'-0"

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SECTIONS

HAWAII BELT ROAD
Wailuku Stream Bridge Spall Repairs, MP 2.74
Project No. 19K-01-20M

Scale: As Noted   Date: Oct. 1, 2019

SHEET No. S-6 OF 8 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	
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	DESIGNED BY	
	QUANTITIES BY	
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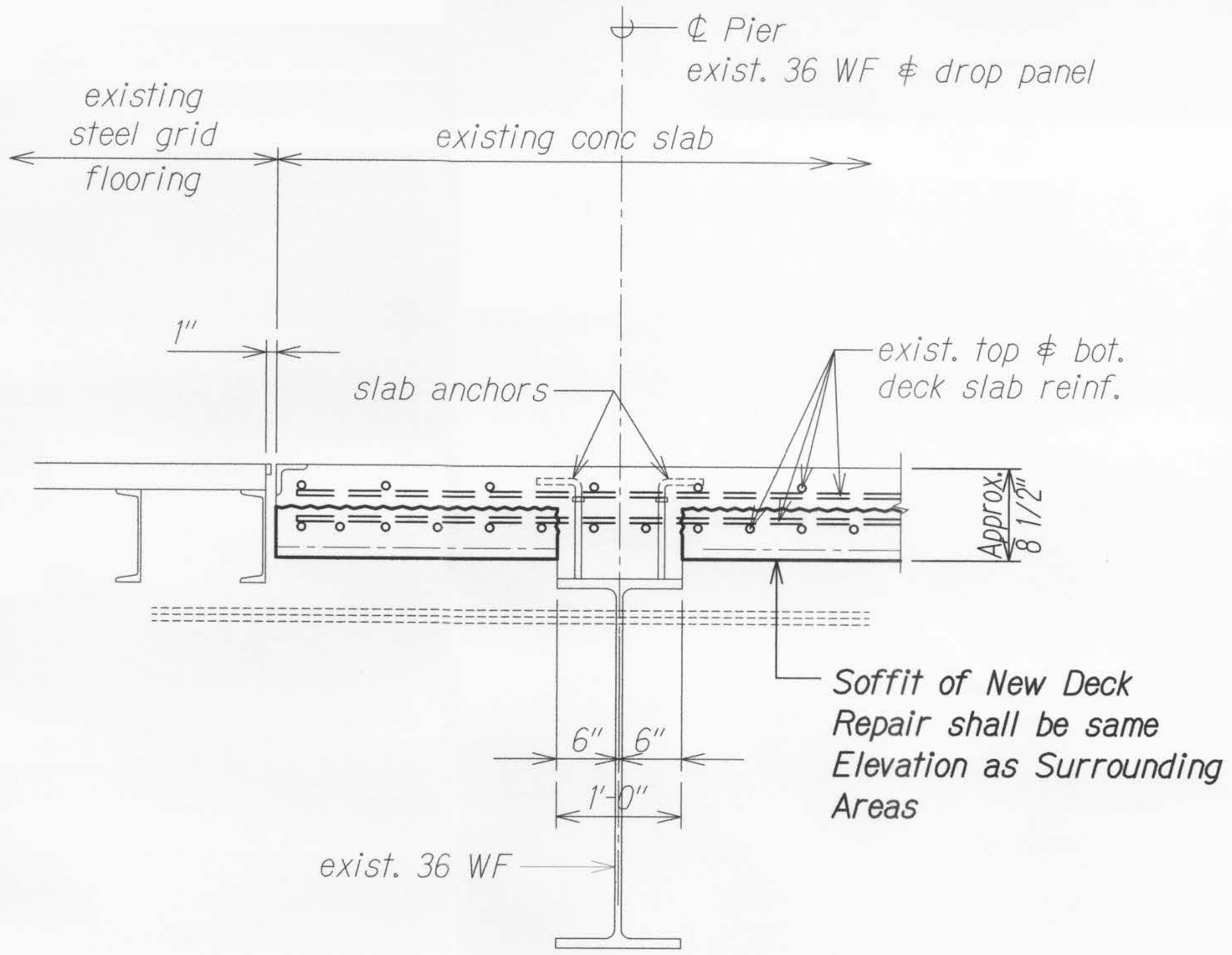
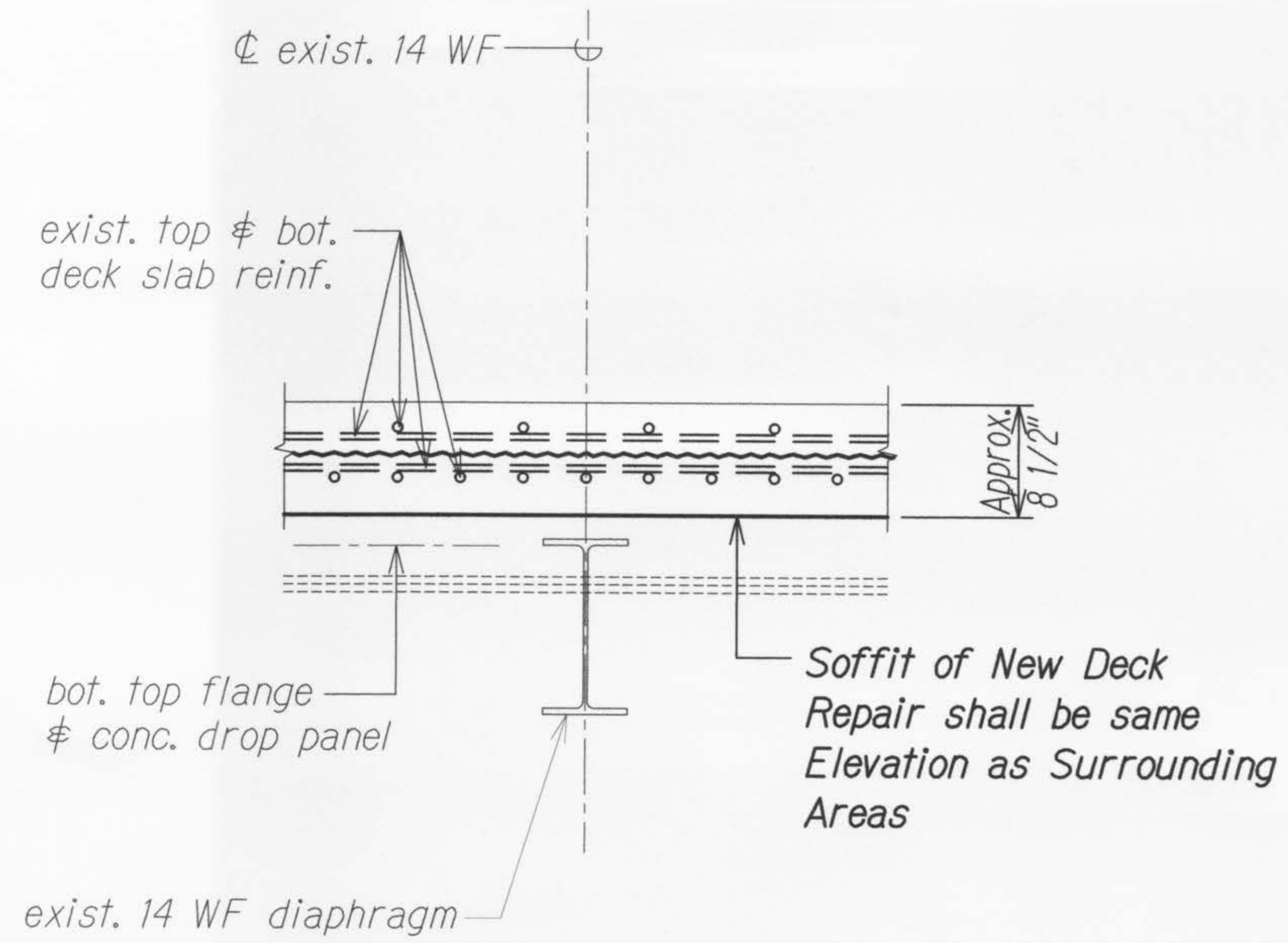
DRAWING NAME: Z:\00 ENGINEERING\19-009.2A WAILUKU BR INSP-DOT\01 CAD\10-01-19 REVISED PROJ NAME\WB-S005 REPAIR.DWG PLOT TIME: 10-02-19, 2:31 PM

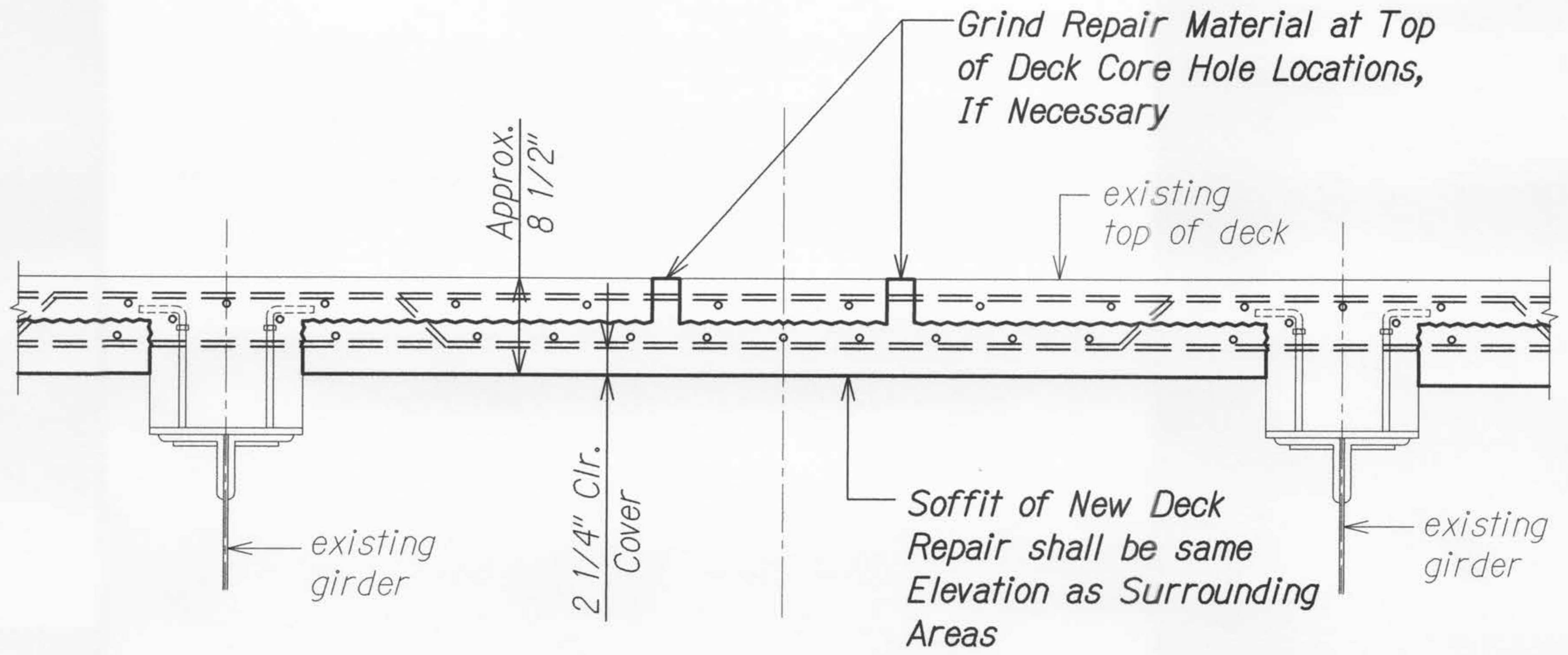
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	19K-01-20M	2020	21	22



SECTION AT 36 WF DIAPHRAGM AT PIER (A, S-7 | S-7)
Scale: 1" = 1'-0"



SECTION AT 14 WF INTERMEDIATE DIAPHRAGM (B, S-7 | S-7)
Scale: 1" = 1'-0"



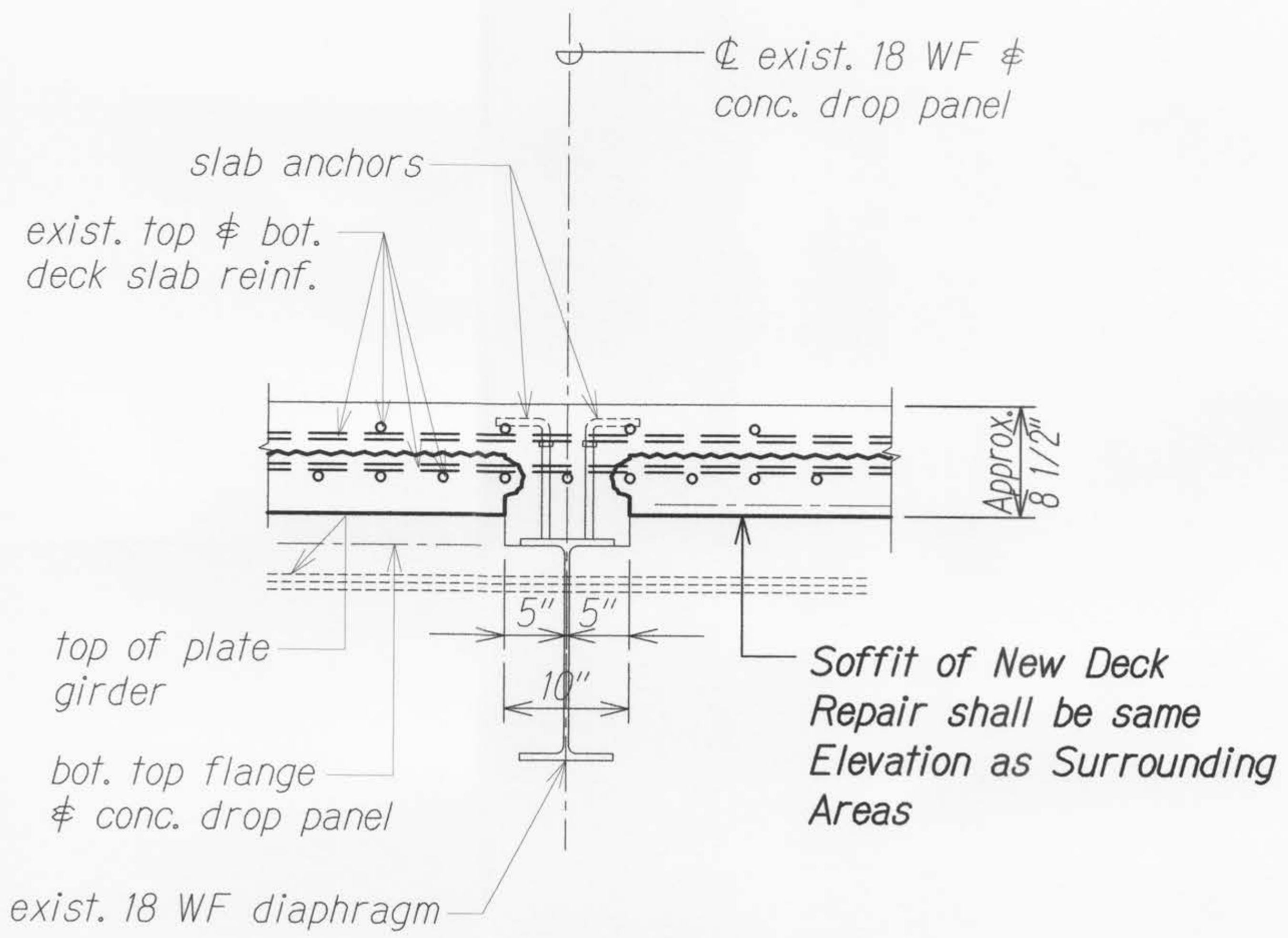
CONCRETE REPAIR DETAIL (1, S-5 | S-7)
Scale: 1" = 1'-0"

Legend:

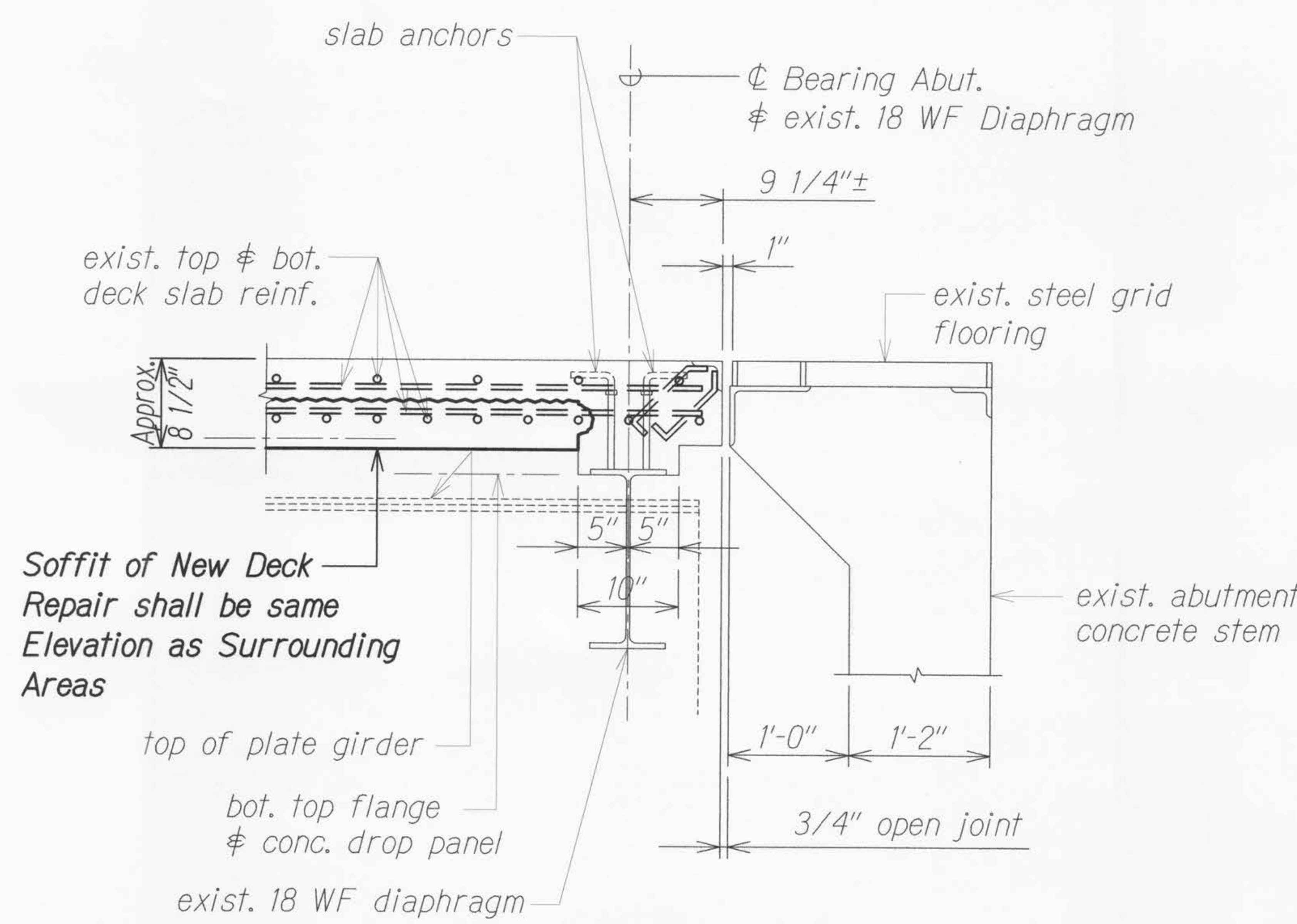
∘ ══ Existing Steel Reinforcing

Notes:

1. See Reflective Deck Soffit Plan for location of diaphragms.
2. Repair details are shown at areas outside of the designated concrete repair areas.



SECTION AT 18 WF INTERMEDIATE DIAPHRAGM (C, S-7 | S-7)
Scale: 1" = 1'-0"



SECTION AT ABUTMENT (D, S-7 | S-7)
Scale: 1" = 1'-0"

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SECTIONS

HAWAII BELT ROAD
Wailuku Stream Bridge Spall Repairs, MP 2.74
Project No. 19K-01-20M

Scale: As Noted — Date: Oct. 1, 2019

SHEET No. S-7 OF 8 SHEETS

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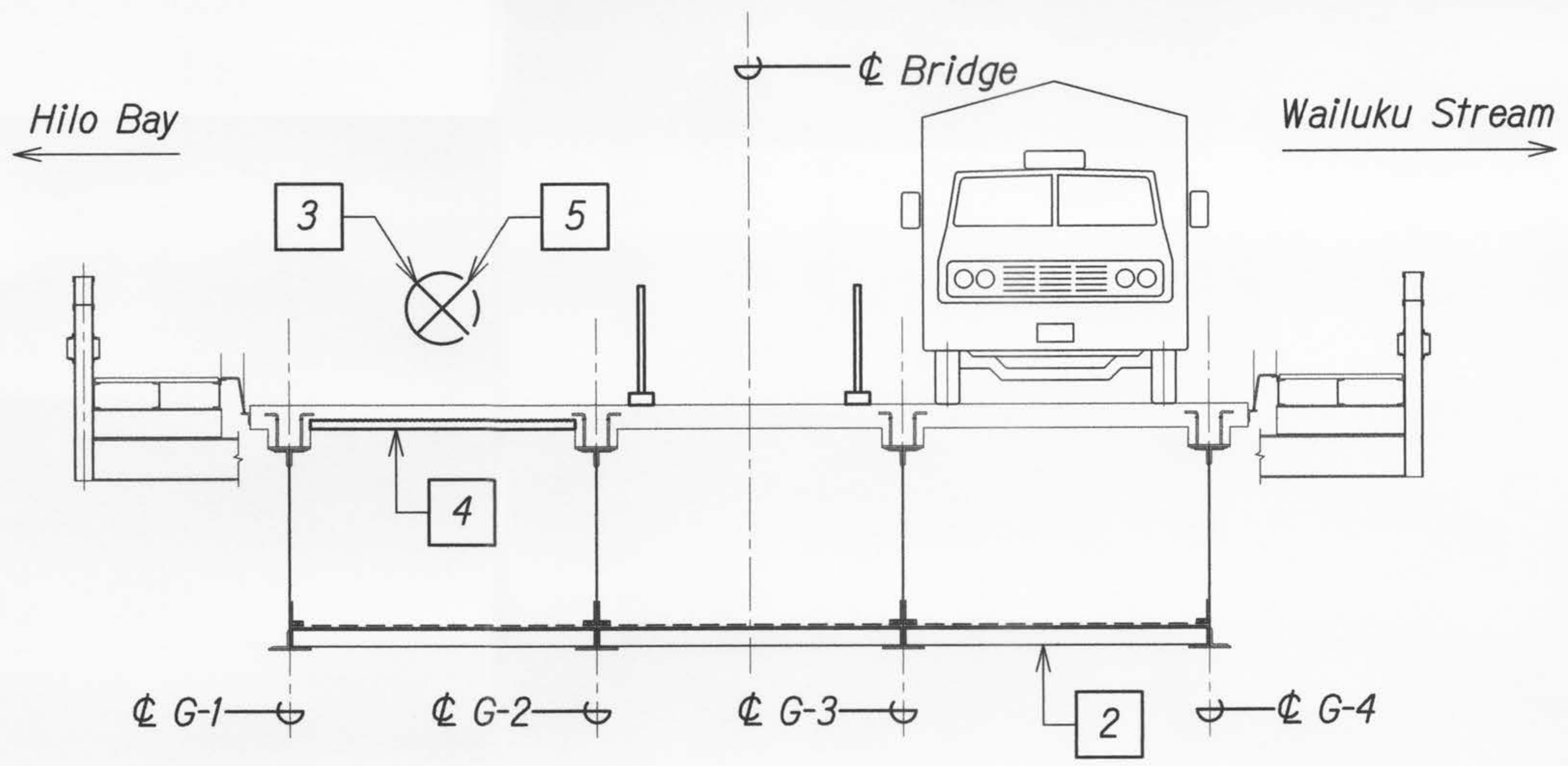
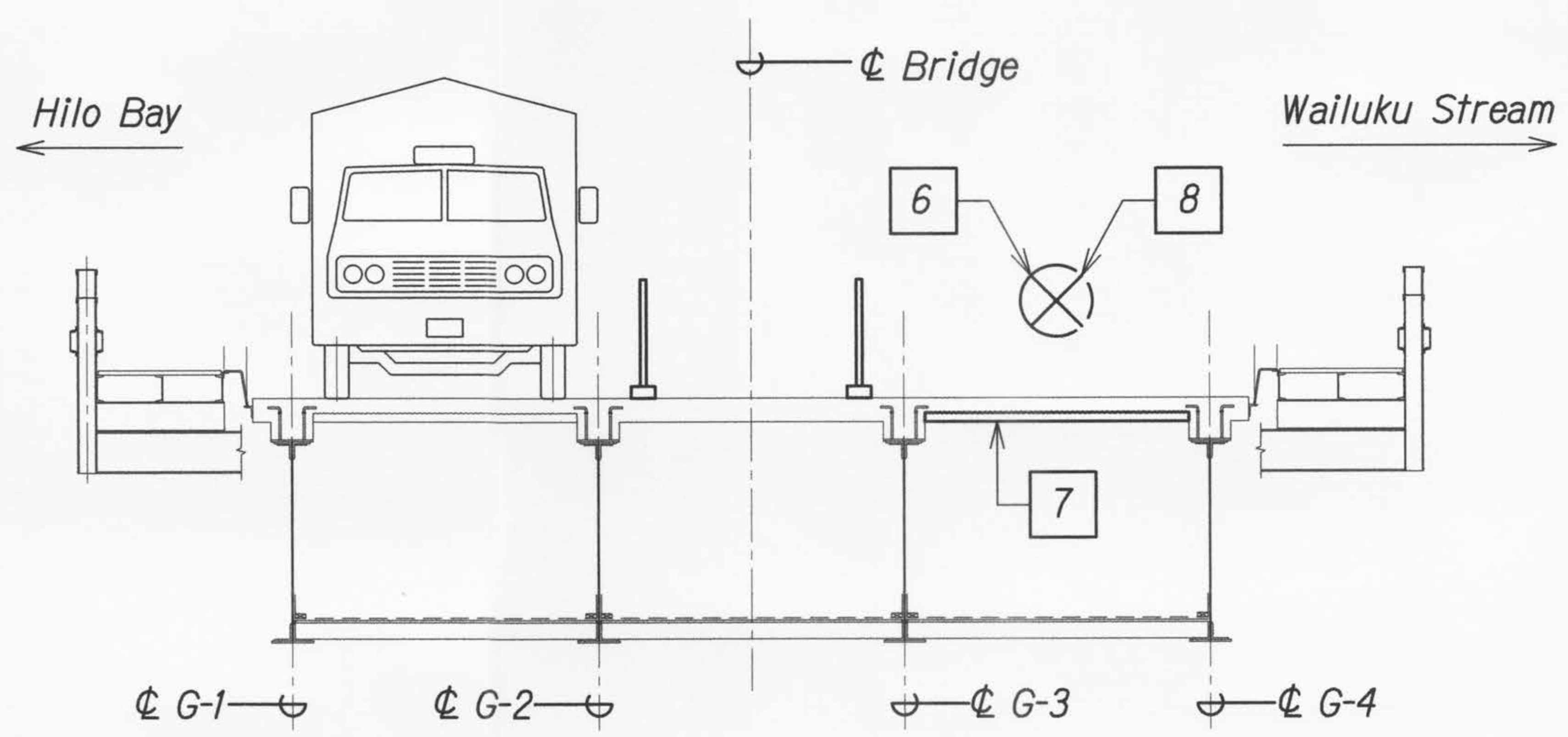
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	19K-01-20M	2020	22	22



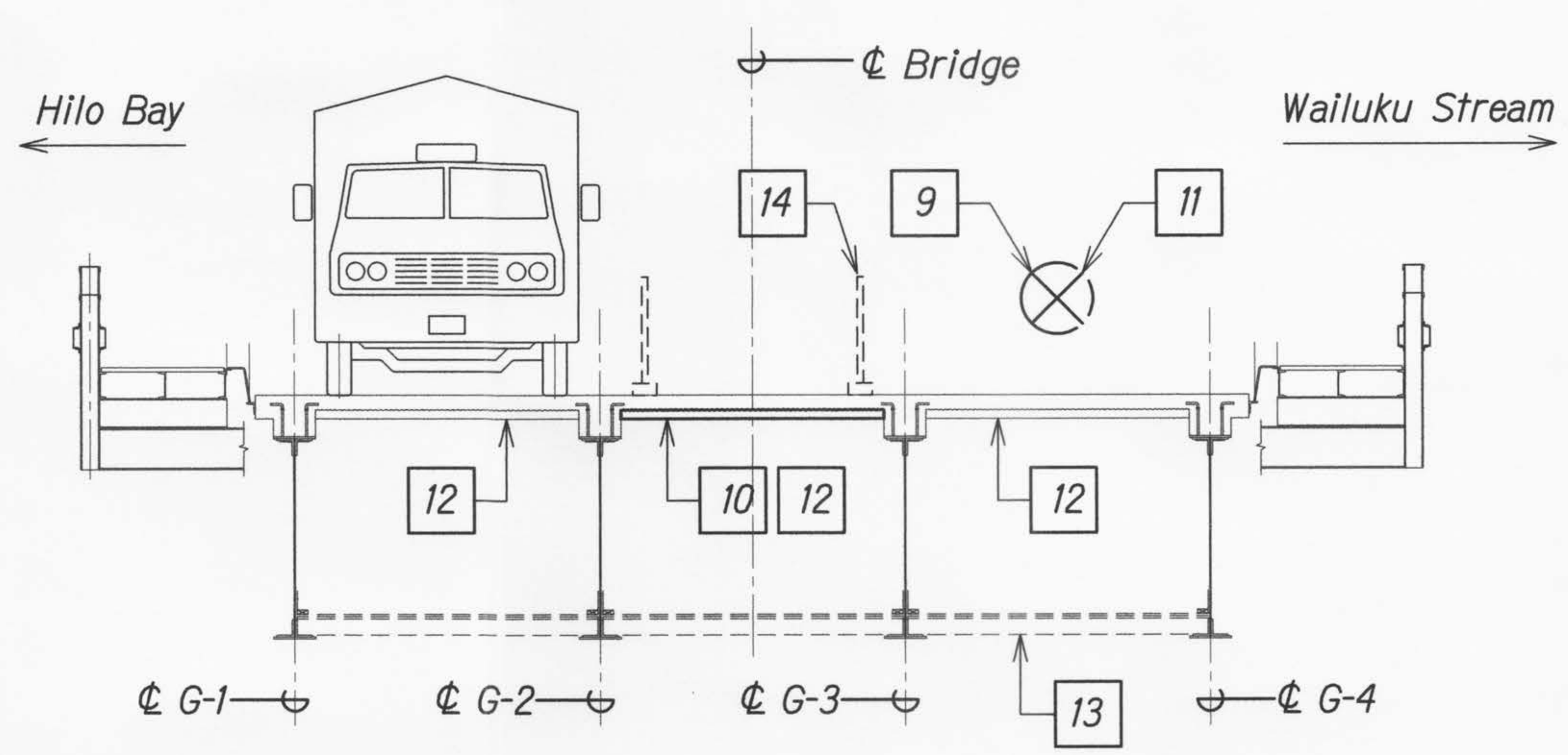
CONSTRUCTION STAGE 1

SEE TRAFFIC CONTROL PLANS - OPTION B



CONSTRUCTION STAGE 2

SEE TRAFFIC CONTROL PLANS - OPTION A



CONSTRUCTION STAGE 3

SEE TRAFFIC CONTROL PLANS - OPTION A

Construction Sequence:

1. Install BMP's. See BMP Plan
2. Erect Temporary Work Platform on Underside of the Bridge
3. Install Temporary Traffic Control - Option B (By Others)
4. Demolish Defective Concrete, Prep Surface Install New Reinforcing, and Pour New Repair Material.
5. Remove Temporary Traffic Control. (No Sooner than 5 Hours After Placement of Last Repair Material.)
6. Install Temporary Traffic Control - Option A (By Others)
7. Demolish Defective Concrete, Prep Surface Install New Reinforcing, and Pour New Repair Material.
8. Remove Temporary Traffic Control. (No Sooner than 5 Hours After Placement of Last Repair Material.)
9. Install Temporary Traffic Control - Option A (By Others)
10. Demolish Defective Concrete, Prep Surface Install New Reinforcing, and Pour New Repair Material.

    Note: Construction Sequence 10 may be performed Concurrently with 4 or 7.
11. Remove Temporary Traffic Control. (No Sooner than 5 Hours after Placement of Last Repair Material. By Others)
12. Strip Formwork from Soffit of Deck. (No Sooner than 3 Days after Placement of Final Section of Repair Material.) Apply Lithium based curing compound to all exposed concrete surfaces.
13. Remove Temporary Work Platform From Underside of the Bridge.
14. Remove Temporary Stripping, Delinetors, and Signage. (By others)
15. Remove BMP's.

NOTE:

All Construction Activities Requiring Continuous One-Lane Traffic Closures shall be Performed only from 6:00 am on Saturday to 6:00 am on Monday.

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

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SIGNATURE — EXPIRATION DATE OF THE LICENSE 4-30-20

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONSTRUCTION SEQUENCE

HAWAII BELT ROAD
Wailuku Stream Bridge Spall Repairs, MP 2.74
Project No. 19K-01-20M

Scale: As Noted — Date: Oct. 1, 2019

SHEET No. S-8 OF 8 SHEETS