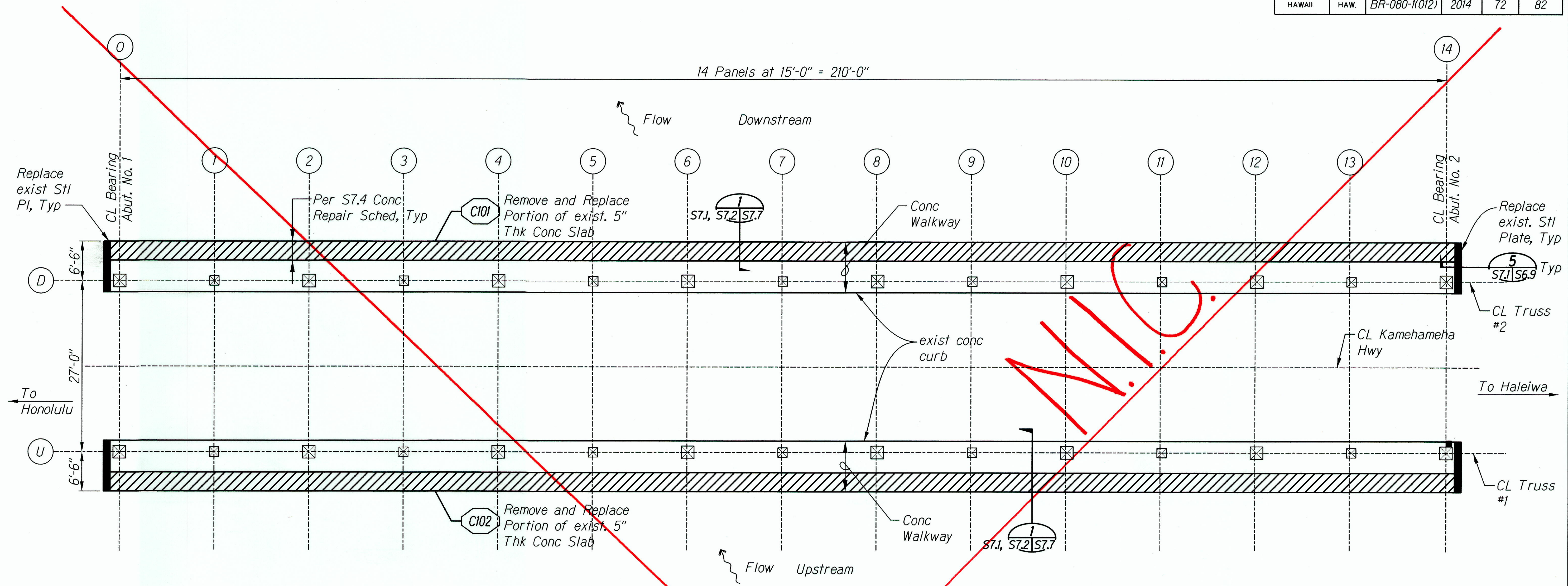
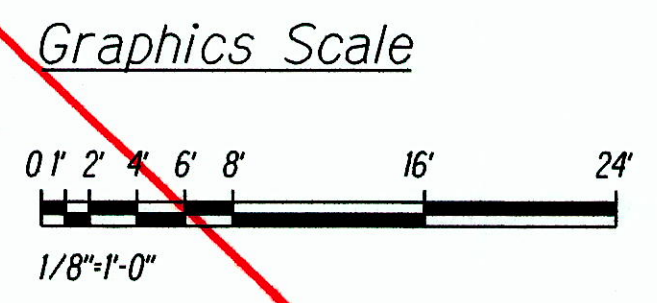


FED. ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-080-1(012)	2014	72	82



A BRIDGE DECK LEVEL PLAN
 SCALE: 1/8" = 1'-0"
 TRUE NORTH

- Notes:
- All dimensions shown are from exist drawings. Field verify as required.
 - Indicates Portion of Slab to be Removed and Replaced.
 - Indicates Steel Plates to be Replaced.
 - See Details on S7.5 and S7.6 for Concrete Repair.



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STATE OF HAWAII
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 HIGHWAYS DIVISION

BRIDGE DECK LEVEL PLAN
CONCRETE DECK SPALLS

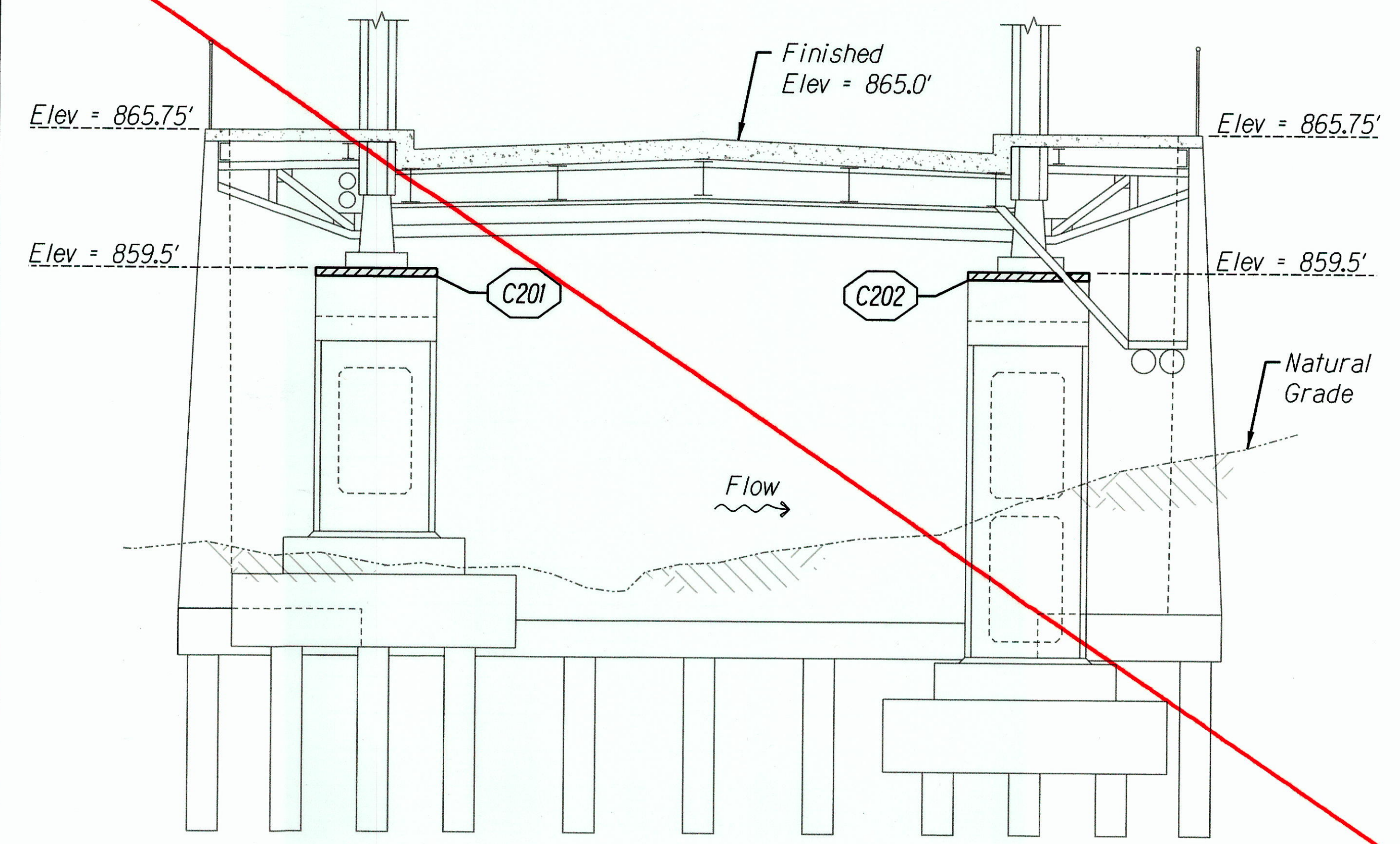
KAMEHAMEHA HIGHWAY
 Repair and Repaint Karsten Thot Bridge
 Federal Aid Project No. BR-080-1(012)

Scale: 1/8" = 1'-0" Date: Sept 2014

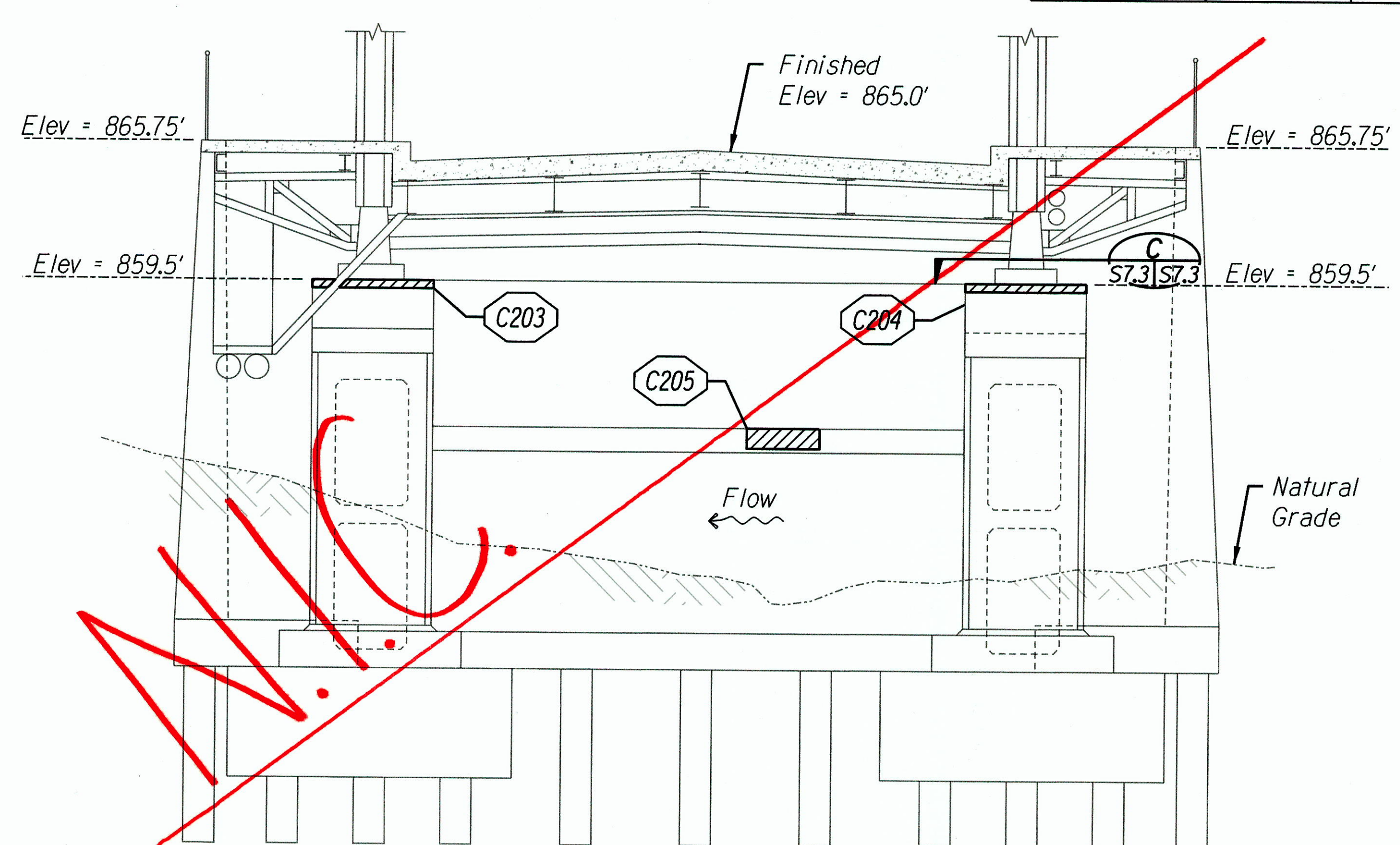
SHEET No. S7.1 OF 8 SHEETS

"AS-BUILT"

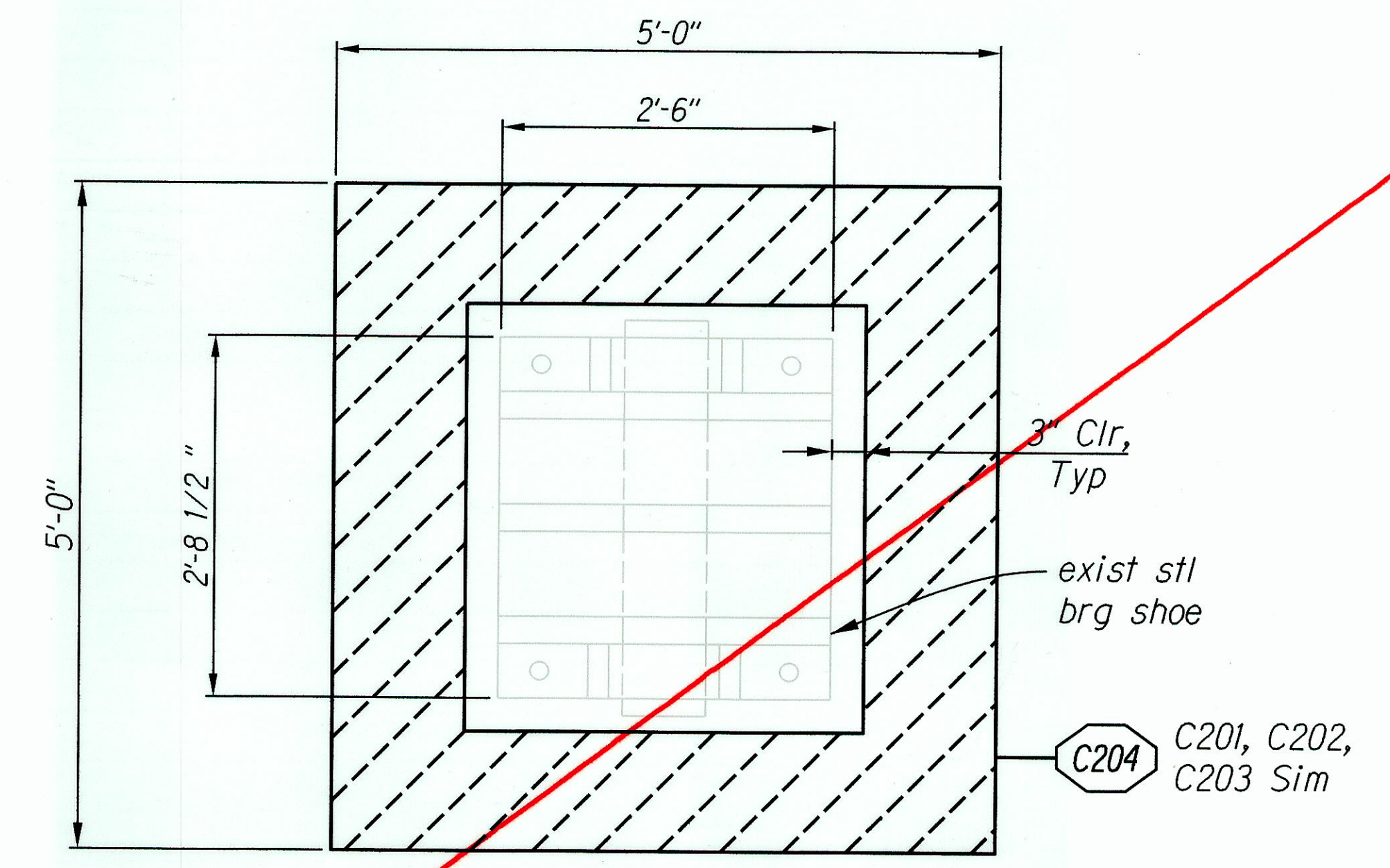
FED. ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-080-1(012)	2014	74	82



A ELEVATION ABUTMENT NO. 1 (HONOLULU SIDE)
 S7.3/S7.3 SCALE: 1/4" = 1'-0"

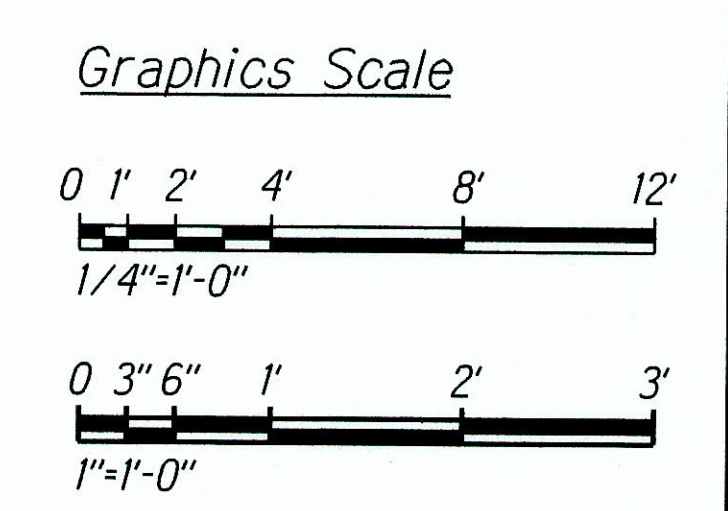


B ELEVATION ABUTMENT NO. 2 (HALEIWA SIDE)
 S7.3/S7.3 SCALE: 1/4" = 1'-0"



Note:
 1. 3" clear distance from edge of existing steel shoe shall be maintained during concrete repair work.

C CONCRETE SPALL REPAIR AT STEEL SHOE
 S7.3/S7.3 SCALE: 1" = 1'-0"



GEORGE O. GUTIERREZ JR.
 LICENSED PROFESSIONAL ENGINEER
 NO. 12107-S
 HAWAII, U.S.A.

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George O. Gutierrez Jr.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

ABUTMENT SPALLS

KAMEHAMEHA HIGHWAY
 Repair and Repaint Karsten Thot Bridge
 Federal Aid Project No. BR-080-1(012)

Scale: 1/4" = 1'-0" Date: Sept 2014

SHEET No. S7.3 OF 8 SHEETS

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"AS BUILT"

FED. ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-080-1(012)	2014	75	82




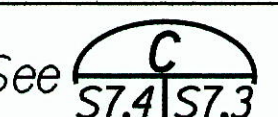
BRIDGE DECK SOFFIT CONCRETE SPALL REPAIR SCHEDULE

Label	Size	Detail	Comment
C101	210'-0"x3'-0"	1/S7.7	Full Depth of Slab
C102	210'-0"x3'-0"	1/S7.7	Full Depth of Slab
C103	14'-0"x2'-0"	S7.6, S7.8	
C104	2'-0"x2'-0"	S7.6, S7.8	
C105	2'-0"x2'-0"	S7.6, S7.8	
C106	1'-0"x1'-0"	S7.6, S7.8	
C107	2'-0"x1'-0"	S7.6, S7.8	
C108	2'-0"x1'-0"	S7.6, S7.8	
C109	1'-0"x1'-0"	S7.6, S7.8	
C110	2'-0"x1'-0"	S7.6, S7.8	
C111	2'-0"x1'-0"	S7.6, S7.8	
C112	2'-0"x1'-0"	S7.6, S7.8	
C113	2'-0"x1'-0"	S7.6, S7.8	
C114	8'-0"x1'-0"	S7.6, S7.8	
C115	2'-0"x2'-0"	S7.6, S7.8	
C116	4'-0"x1'-0"	S7.6, S7.8	
C117	4'-0"x3'-0"	S7.6, S7.8	
C118	4'-0"x1'-0"	S7.6, S7.8	
C119	4'-0"x1'-0"	S7.6, S7.8	
C120	3'-0"x1'-0"	S7.6, S7.8	
C121	1'-0"x1'-0"	S7.6, S7.8	
C122	1'-0"x1'-0"	S7.6, S7.8	
C123	2'-0"x2'-0"	S7.6, S7.8	
C124	2'-0"x1'-0"	S7.6, S7.8	
C125	2'-0"x1'-0"	S7.6, S7.8	
C126	2'-0"x2'-0"	S7.6, S7.8	
C127	1'-0"x1'-0"	S7.6, S7.8	
C128	1'-0"x1'-0"	S7.6, S7.8	
C129	2'-0"x1'-0"	S7.6, S7.8	
C130	2'-0"x2'-0"	S7.6, S7.8	
C131	1'-0"x1'-0"	S7.6, S7.8	
C132	1'-0"x1'-0"	S7.6, S7.8	
C133	2'-0"x1'-0"	S7.6, S7.8	
C134	1'-0"x1'-0"	S7.6, S7.8	
C135	2'-0"x1'-0"	S7.6, S7.8	
C136	3'-0"x3'-0"	S7.6, S7.8	
C137	2'-0"x1'-0"	S7.6, S7.8	
C138	1'-0"x1'-0"	S7.6, S7.8	
C139	1'-0"x1'-0"	S7.6, S7.8	
C140	2'-0"x1'-0"	S7.6, S7.8	
C141	1'-0"x1'-0"	S7.6, S7.8	
C142	2'-0"x2'-0"	S7.6, S7.8	
C143	2'-0"x1'-0"	S7.6, S7.8	
C144	1'-0"x1'-0"	S7.6, S7.8	
C145	4'-0"x2'-0"	S7.6, S7.8	
C146	13'-0"x2'-0"	S7.6, S7.8	
C147	3'-0"x1'-0"	S7.6, S7.8	
C148	1'-0"x1'-0"	S7.6, S7.8	

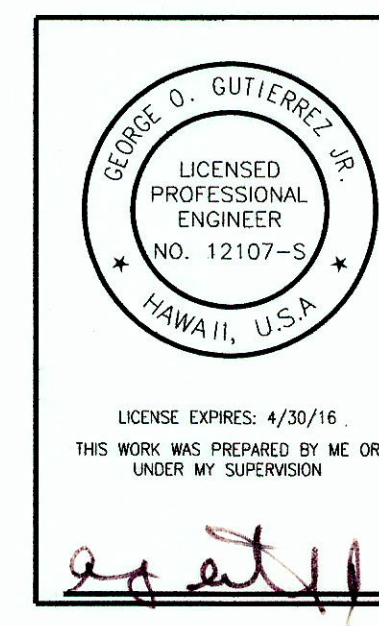
BRIDGE DECK SOFFIT CONCRETE SPALL REPAIR SCHEDULE

Label	Size	Detail	Comment
C149	2'-0"x1'-0"	S7.6, S7.8	
C150	4'-0"x1'-0"	S7.6, S7.8	
C151	1'-0"x1'-0"	S7.6, S7.8	
C152	1'-0"x1'-0"	S7.6, S7.8	
C153	2'-0"x2'-0"	S7.6, S7.8	
C154	2'-0"x1'-0"	S7.6, S7.8	
C155	3'-0"x3'-0"	S7.6, S7.8	

ABUTMENT REPAIR SCHEDULE

Label	Size	Detail	Comment
C201	16 S.F.	3/S7.5	See 
C202	16 S.F.	3/S7.5	See 
C203	16 S.F.	3/S7.5	See 
C204	16 S.F.	3/S7.5	See 
C205	3'-0" x 1'-0"	3/S7.5	

- Concrete Repair Schedule Notes:**
1. Size indicates size of spall (Length x Width) for slab repair, unless otherwise noted.
 2. Assume all spalls are 6" deep unless otherwise noted.
 3. See Details on S7.5 and S7.6 for Concrete Repair.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**REPAIR SCHEDULE -
CONCRETE SPALLS**

KAMEHAMEHA HIGHWAY
Repair and Repaint Karsten Thot Bridge
Federal Aid Project No. BR-080-1(012)

Scale: No Scale Date: Sept 2014

SURVEY PLOTTED BY _____ DATE _____
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DESIGNED BY _____
CHECKED BY _____
CREATED BY _____

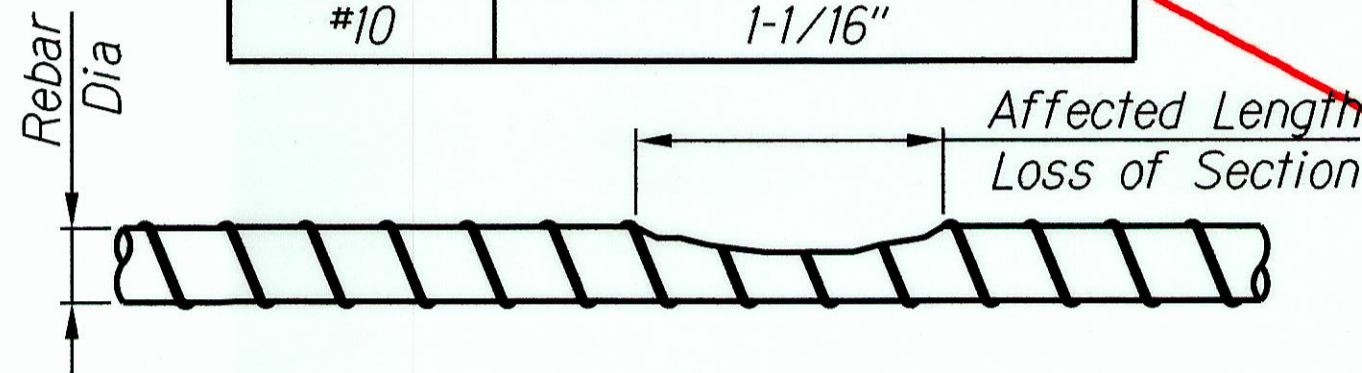
ORIGINAL PLAN _____
NOTEBOOK _____
No. _____

"AS-BUILT"

FED. ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-080-1(012)	2014	76	82

Table 1: Minimum Rebar Diameter at Section Loss

Rebar Size	Minimum Acceptable Diameter at Section Loss
#3	5/16"
#4	7/16"
#5	1/2"
#6	5/8"
#7	3/4"
#8	13/16"
#9	15/16"
#10	1-1/16"



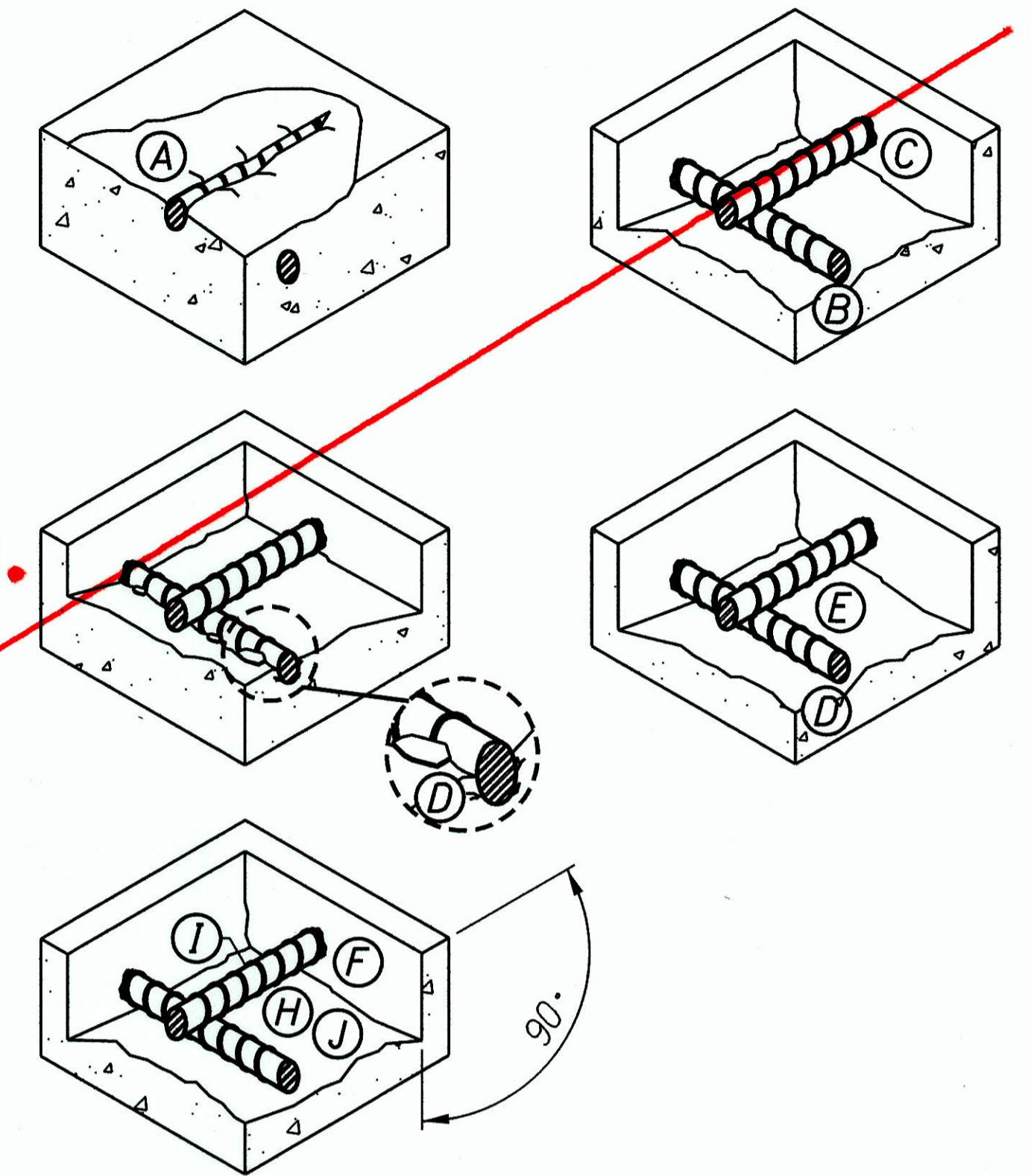
Note:

1. Remove Heavy Corrosion and Scale from Rebars using Hand Tools (eg: wire brush) or other Approved methods.
2. If Rebar Diameter after Cleaning is less than that Shown in the Table I above, Repair Rebar per $\frac{2}{S7.5|S7.5}$.

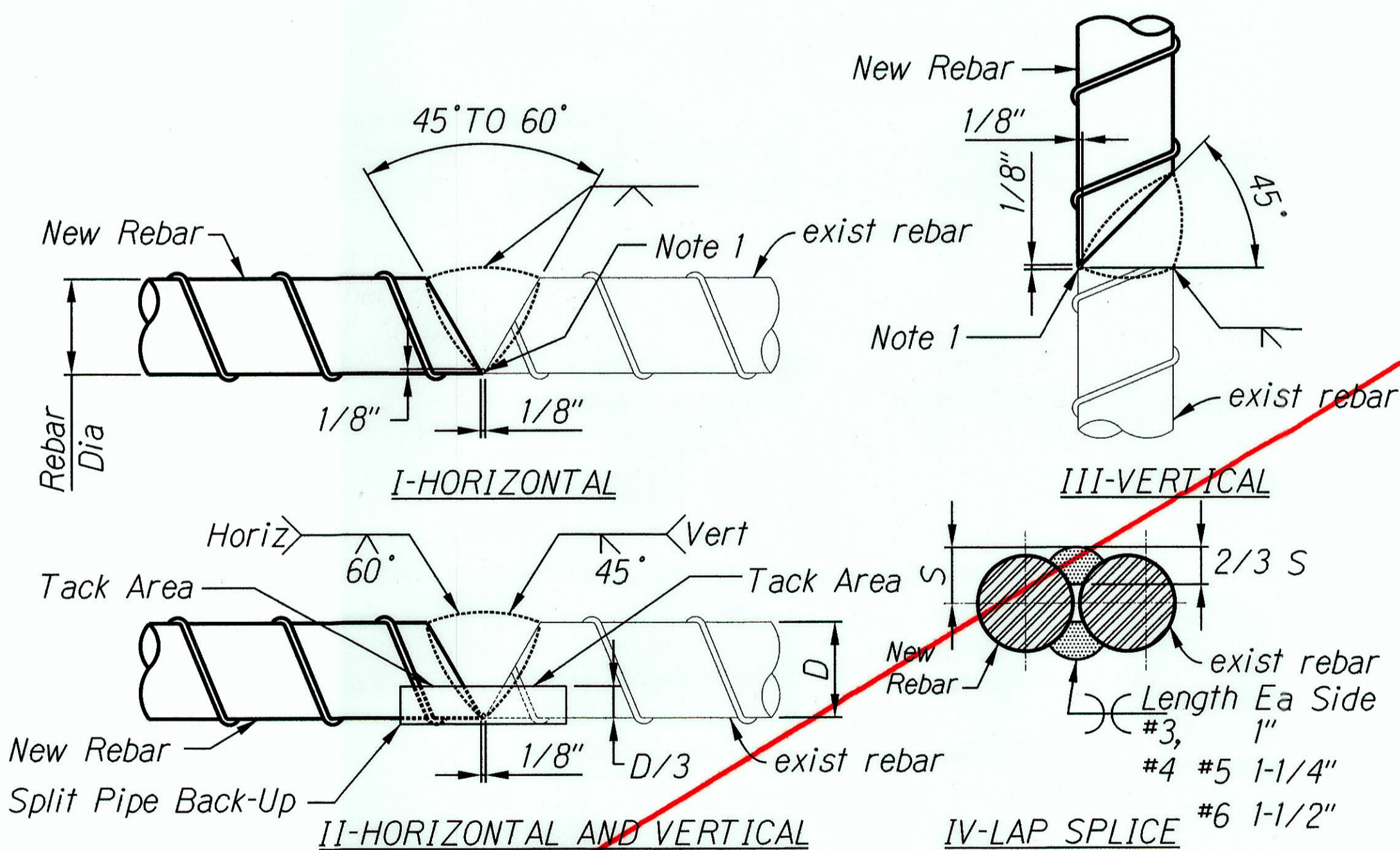
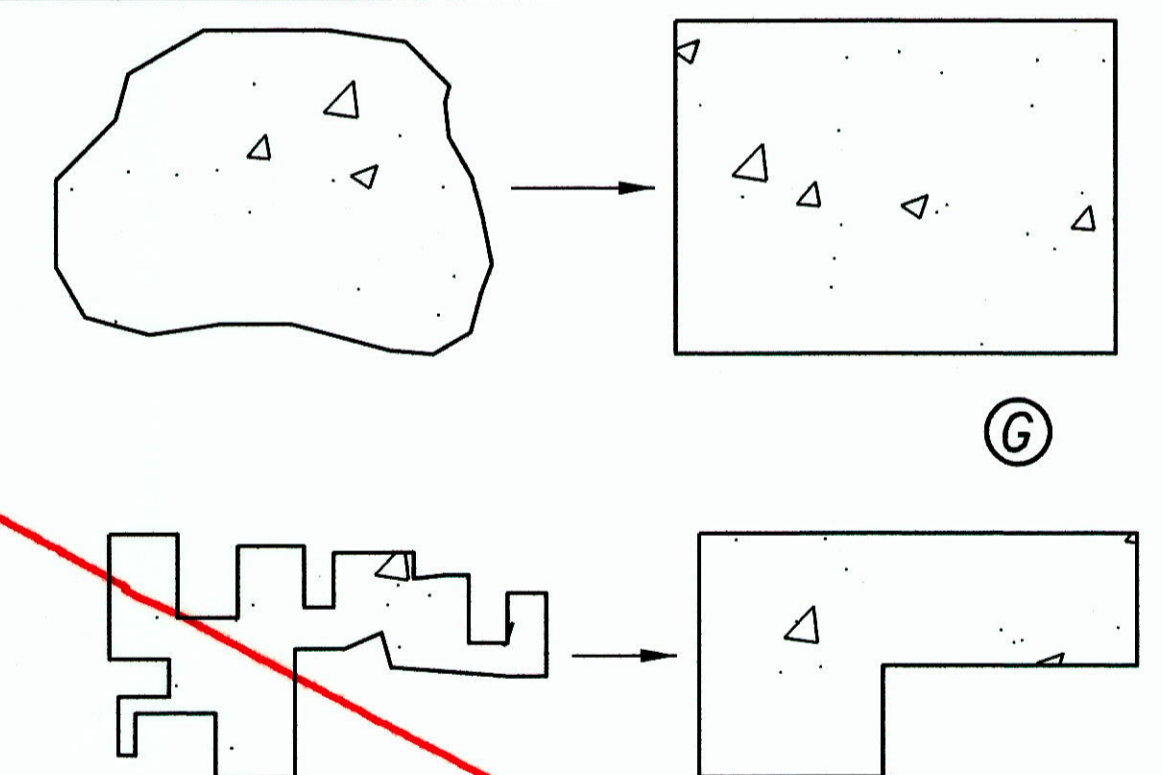
$\frac{1}{S7.5|S7.5}$ REBAR CLEANING AND LOSS OF SECTION
Not to Scale

CONCRETE REPAIR NOTES

1. Spalls and Delaminations are indicated as "Spalls" since the repairs are the Same.
2. Concrete Repair shall be in conformance with the "Concrete Repair Manual", 2nd edition, International Concrete Repair Institute unless otherwise indicated.
3. Cleaning and Repair of Reinforcing Steel See $\frac{1}{S7.5|S7.5}$ and $\frac{2}{S7.5|S7.5}$.
4. Exposing and Under Cutting of Reinforcing Steel:
 - (A) Remove loose or delaminated concrete surrounding corroded reinforcing steel. Using hand tools (eg: wire brush)
 - (B) Once initial removals are made, proceed with the undercutting of all exposed corroded bars. Undercutting shall provide clearance for under bar cleaning and full bar circumference bonding to surrounding concrete, and to secure the repair structurally. Provide minimum 3/4" clearance between exposed rebars and surrounding concrete or 1/4" larger than the largest aggregate in repair material, whichever is greater.
 - (C) Concrete removals shall extend along the bars to locations along the bar free of bond inhibiting corrosion, and where the bar is well bonded to surrounding concrete.
 - (D) If non-corroded reinforcing steel is exposed during the undercutting process, care shall be taken not to damage the bar's bond to surrounding concrete. If bond between bar and concrete is broken, undercutting of the bar shall be required.
 - (E) Any reinforcement which is loose shall be secured in place by tying to other secured bars or by other approved methods.
5. Edge and Surface Conditioning of Concrete:
 - (F) At edge locations, provide right angle cuts to the concrete surface with a sawcut 1/2" or less as required to avoid cutting reinforcing steel.
 - (G) Repair configurations should be kept as simple as possible, preferably with squared corners.
 - (H) After removals and edge conditioning are complete, remove bond inhibiting materials (dirt, concrete slurry, loosely bonded aggregates) using hand tools (eg: wire brush) or other contracting officer approved methods. Blasting using abrasive media or water is not allowed. Check the concrete surfaces after cleaning to insure that surface is free from additional loose aggregate, or that additional delamination are not present.
 - (I) Coat existing exposed bars with epoxy and allow to harden.
 - (J) Apply concrete bonding compound. See Special Provisions. Bonding compound Coat shall be thoroughly worked into concrete, corners and edges.
6. Repaired surfaces shall match existing conditions.
7. After repairs are completed and accepted by the Engineer, coat repaired areas with concrete anti-corrosive coating (migrating corrosion inhibitor). The coated area shall extend 12" beyond the repaired area. See Special Provisions Section 509 for additional requirements.



BOUNDARY OF SPALL OR DELAMINATED CONCRETE RECOMMENDED LAYOUT



Notes:

1. Chip, Grind or Gouge to Sound Metal before Welding other side.
2. Detail I and III for No. 9 and Larger. Detail II for No. 8 and smaller. Detail IV for No. 6 and smaller.
3. E70 Electrode for GR40, E90 Electrode for GR60.
4. See AWS D1.4 for Welding Process and other Details.
5. For Type IV Repairs Where Welds are not accessible on each side of bars, double weld length shown on one side of bar.

$\frac{2}{S7.5|S7.5}$ REBAR WELD SPLICE DETAIL
Not to Scale

$\frac{3}{S7.5|S7.5}$ SURFACE PREPARATION OF SPALLED CONCRETE AND CORRODED BARS
Not to Scale

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NOTEBOOK	_____
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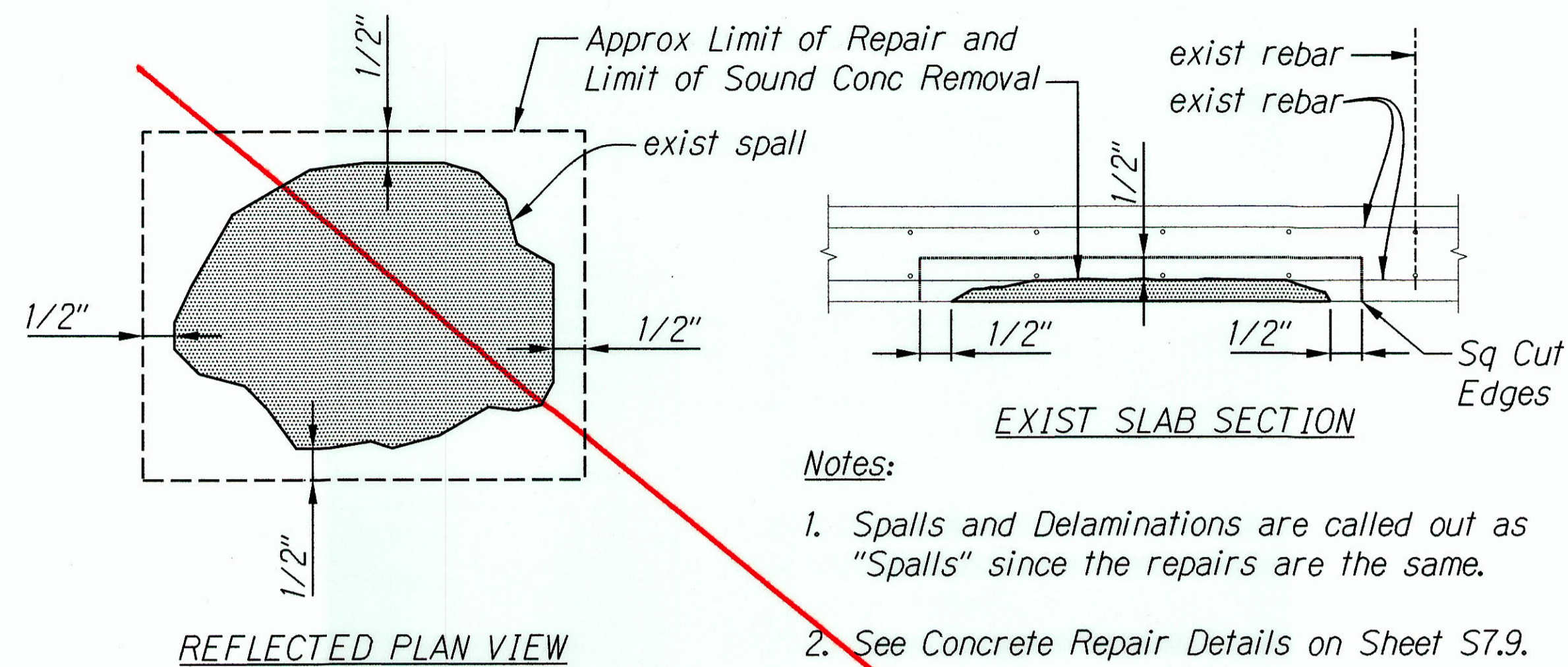
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE REPAIR DETAILS

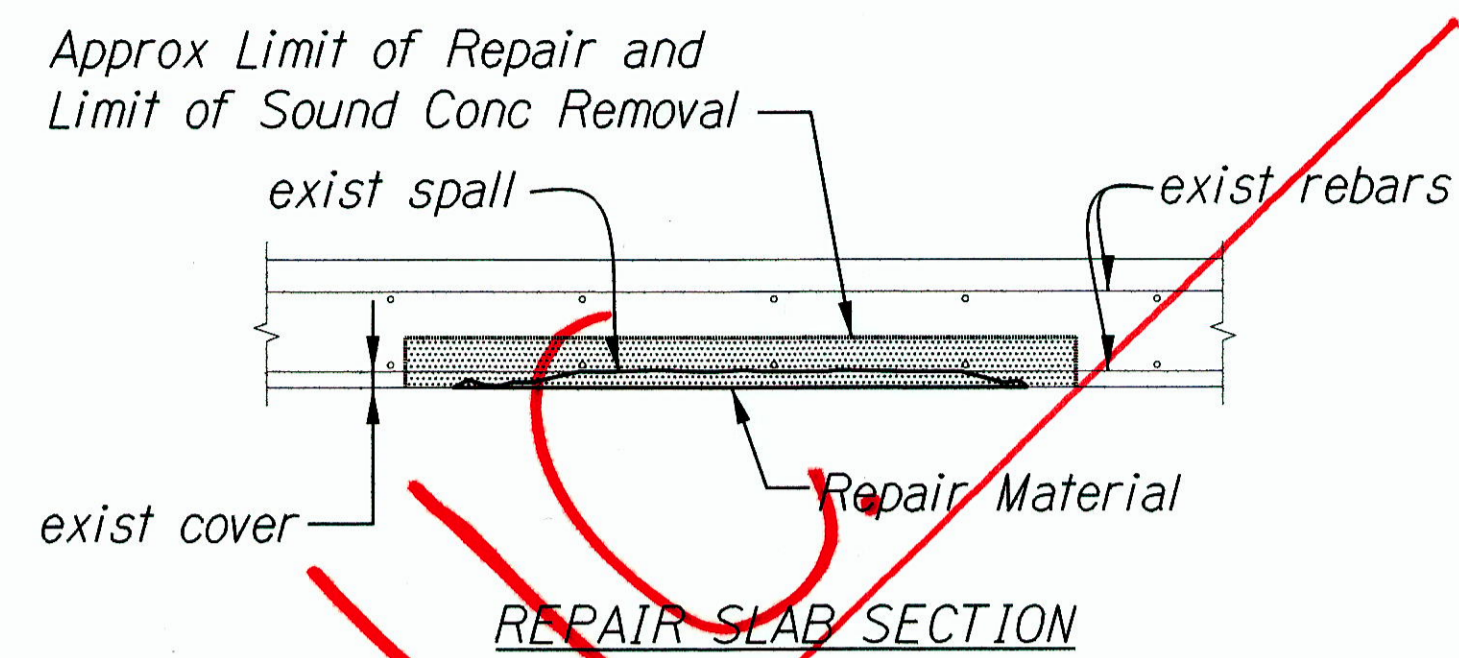
KAMEHAMEHA HIGHWAY
Repair and Repaint Karsten Thot Bridge
Federal Aid Project No. BR-080-1(012)

Scale: No Scale Date: Sept 2014

FED. ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-080-1(012)	2014	77	82



1 SLAB SOFFIT SPALL - EXISTING CONDITION
S7.6/S7.6 Not to Scale



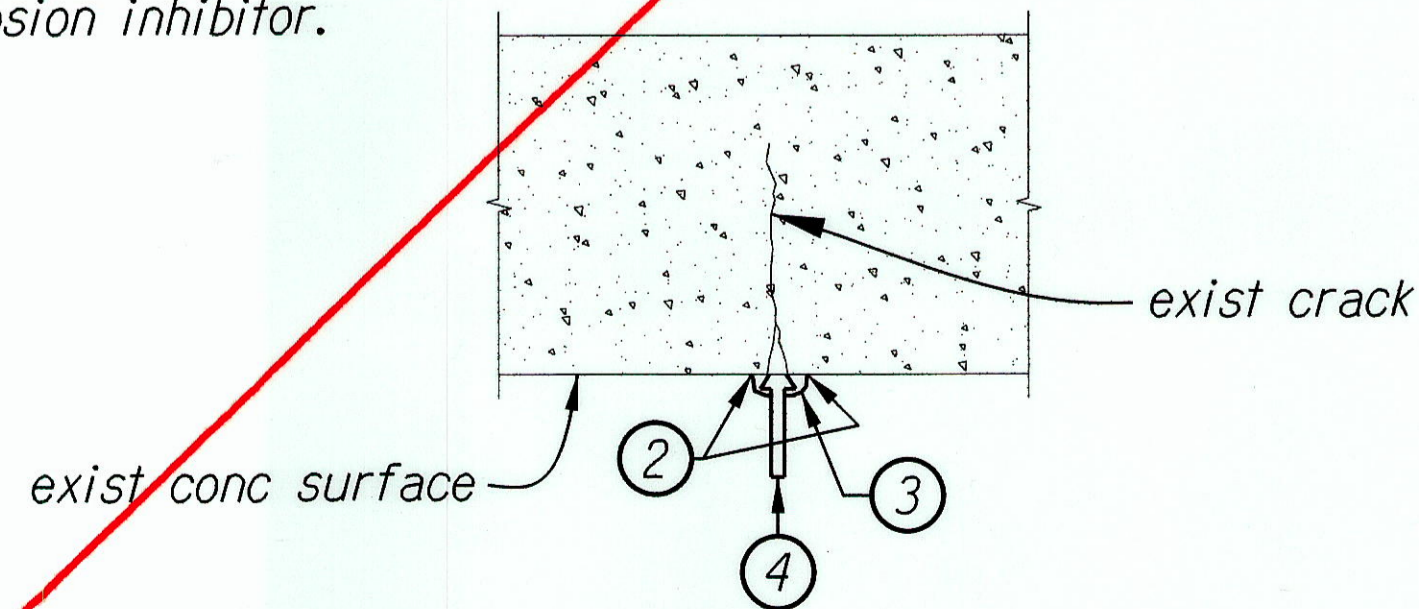
2 SLAB SOFFIT SPALL - REPAIR DETAIL
S7.6/S7.6 Not to Scale

Notes:

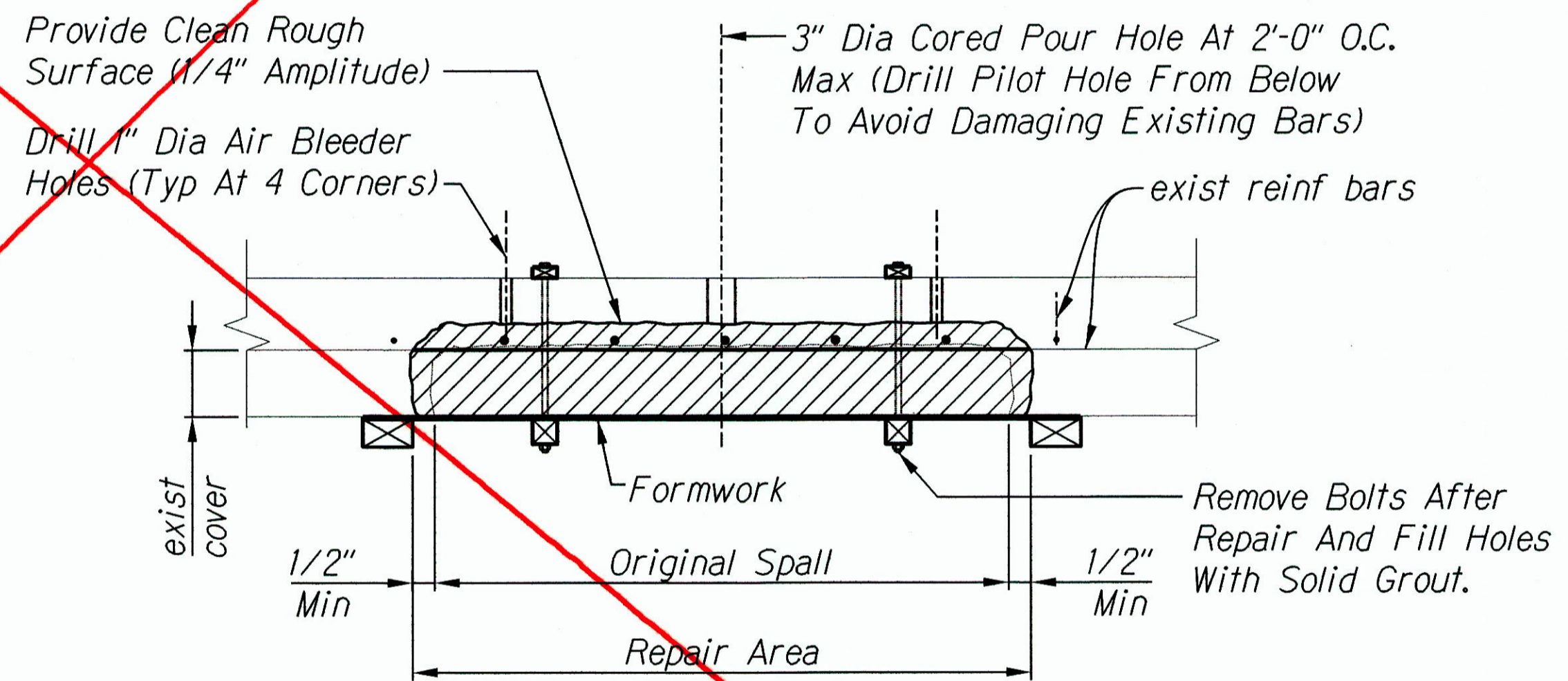
- Spalls and Delaminations are called out as "Spalls" since the repairs are the same.
- See Concrete Repair Details on Sheet S7.9.

CONCRETE CRACK REPAIR NOTES:

- Contractor shall field survey existing concrete surfaces subject to Engineer's approval. Survey shall be conducted with a report and submitted prior to scheduled start of work for Engineer's review. Cracks 0.040 inch and wider shall be repaired by epoxy injection. Cracks 0.010 inch to less than 0.040 inch shall be surface sealed. Crack repair allowance for pricing shall be 1,000 lineal feet total (See sheet S1.4, Note 3).
- Lightly tap the existing concrete adjacent to the crack. If the concrete sounds "hollow", chip off the surface and any delaminated concrete and repair as a spall; otherwise, proceed to step 3 below.
- Clean the existing concrete surface along the crack of all loose, bond inhibiting and other deleterious materials, including any exst crack sealant by use of hand tools. Seal the crack with the surface cap sealant and install the pressure injection ports over the crack at a maximum interval of 12" on centers. Insure cap sealant completely bridges crack.
- With steady pressure, pressure inject the epoxy beginning with the injection port at one end of the crack (bottom of the crack for vertical cracks). When epoxy emerges from the next adjacent port, move to the next adjacent port and continue with the epoxy injection.
- After the epoxy has cured, remove the injection ports and cap sealant.
- Finish concrete surface to match existing and apply concrete migrating corrosion inhibitor.



3 TYPICAL CONCRETE CRACK REPAIR DETAIL
S7.6/S7.6 Not to Scale



NOTES:

- Fill with concrete repair material by pumping until concrete is flush with top of slab.
- Remove formwork after concrete has cured.
- Patch cored and drilled holes to match existing.
- Patch and grind with repair mortar after form is removed to assure required reinforcement cover. Grind repair areas, as required, to remove concrete/mortar flashings and to provide a generally smooth surface repair.
- Where the spall removal of deteriorated concrete exceeds half the thickness of the slab, the repair shall be a full depth repair when directed by the Engineer. Provide same size and spacing of reinforcing as existing.
- Replace corroded rebars where required per Table 1 on Sht S7.9.
- This option shall be at no additional cost to the State.

4 SLAB SOFFIT SPALL - REPAIR AREA > 2 SQ FT
(CONTRACTOR'S OPTION) Not to Scale

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE REPAIR DETAILS

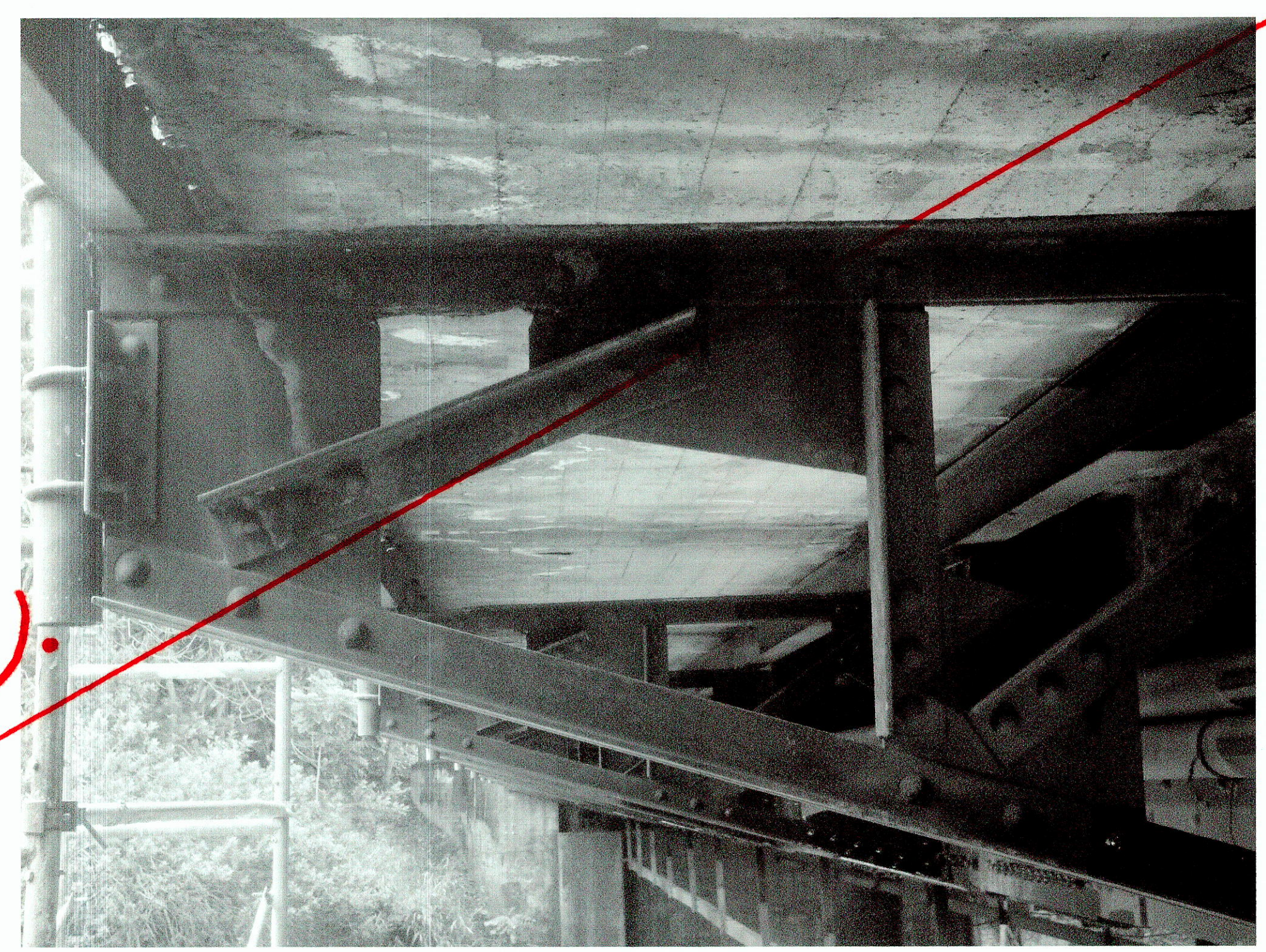
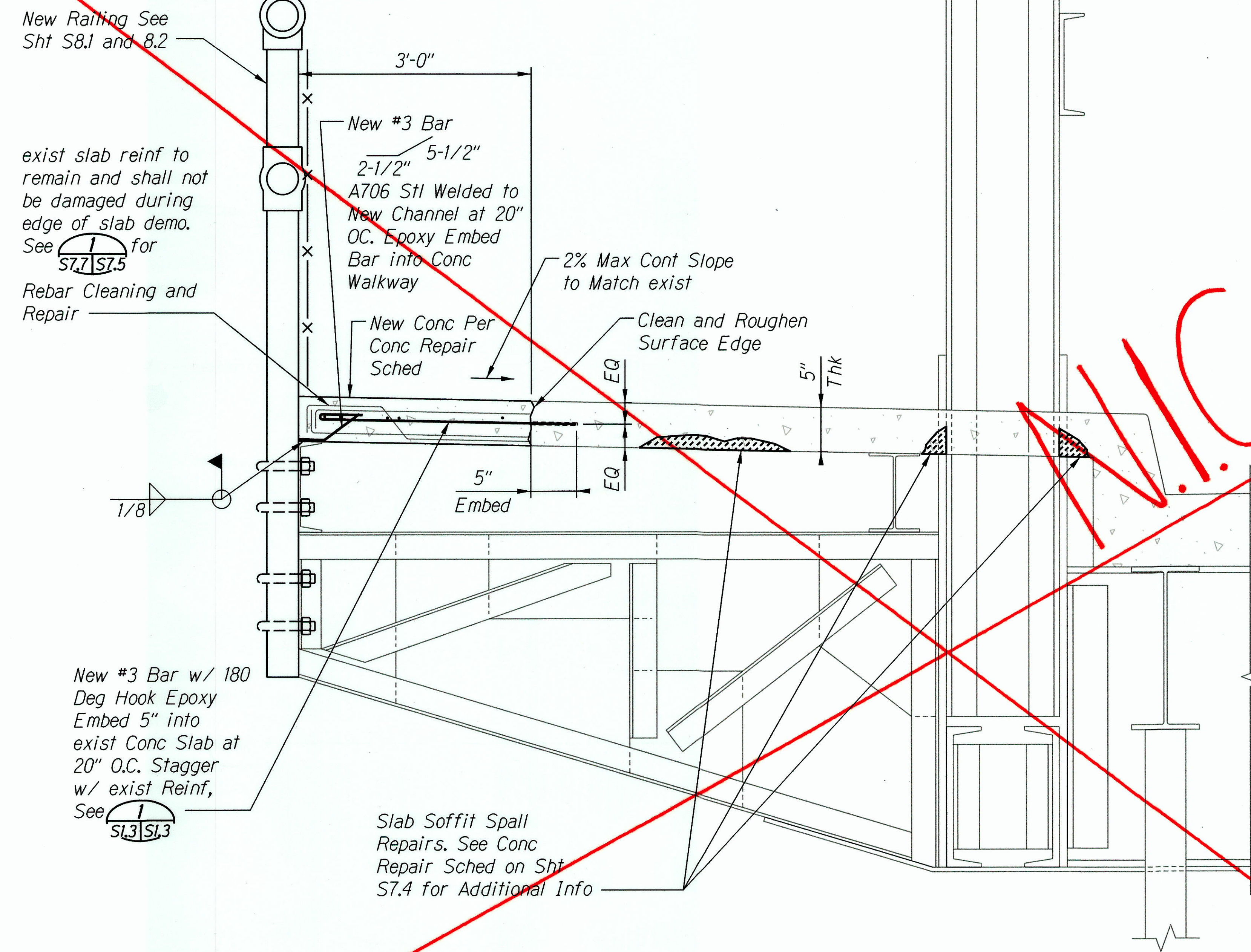
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Federal Aid Project No. BR-080-1(012)

Scale: No Scale Date: Sept 2014

SHEET No. S7.6 OF 8 SHEETS

"AS-BUILT"

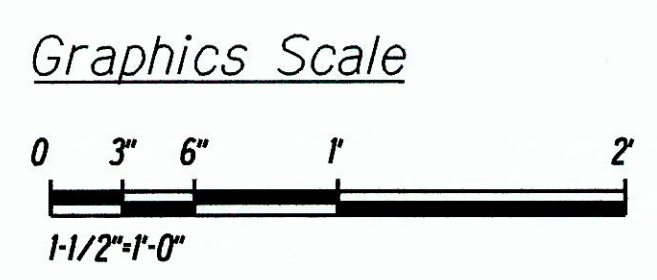
FED. ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-080-1(012)	2014	78	82



2 PHOTO - EDGE OF SLAB TYPICAL DETERIORATION
S7.7/S7.7

1 TYPICAL CONCRETE SPALL REPAIRS
S7.1, S7.2, S7.7 SCALE: 1-1/2" = 1'-0"

Note:
Contractor to field verify as-built dimensions as required.



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TRACED BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
NO.	

LICENSE EXPIRES: 4/30/16
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agata

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE REPAIR DETAILS

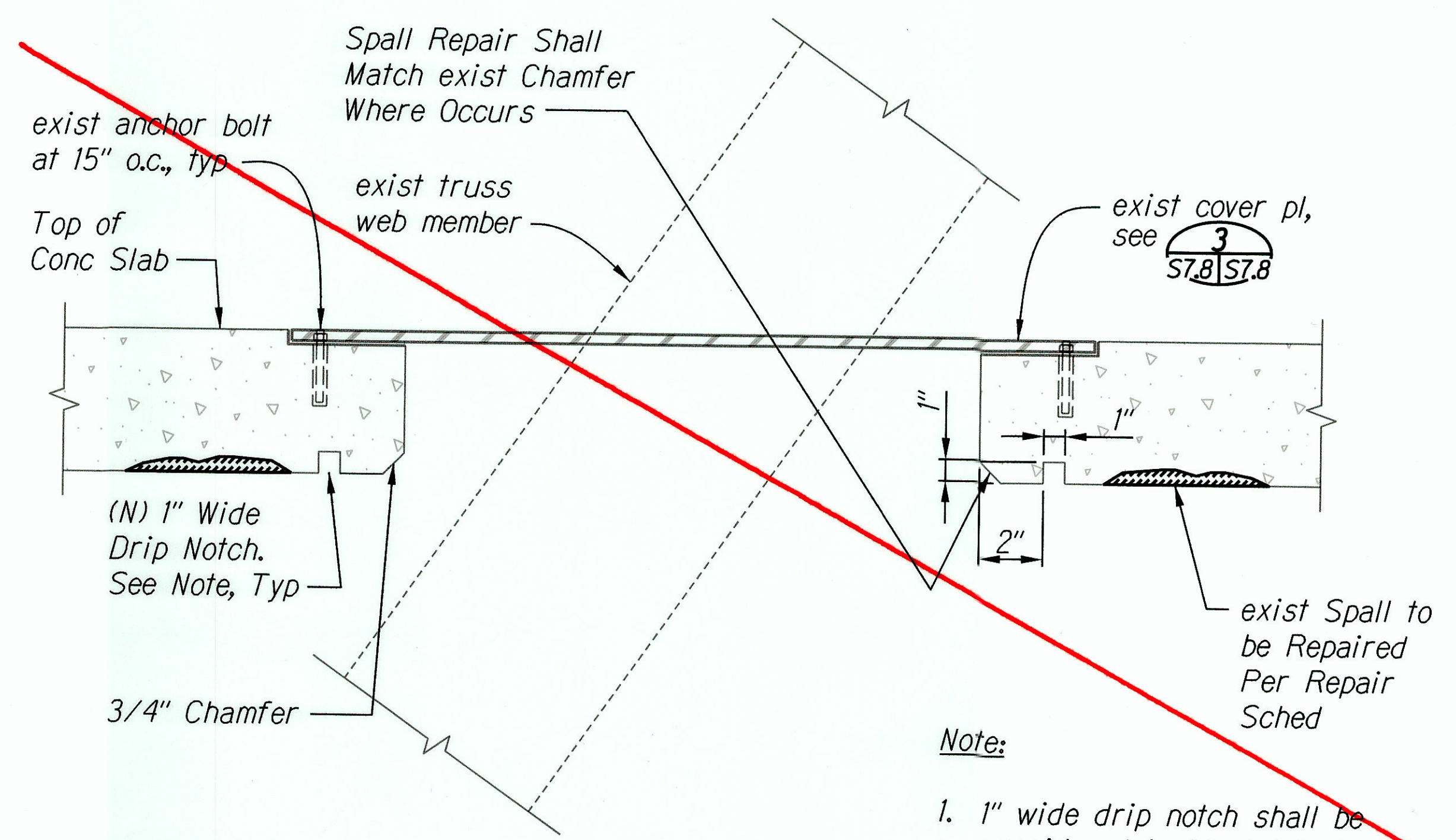
KAMEHAMEHA HIGHWAY
Repair and Repaint Karsten Thot Bridge
Federal Aid Project No. BR-080-1(012)

Scale: 3/4" = 1'-0" Date: Sept 2014

SHEET No. S7.7 OF 8 SHEETS

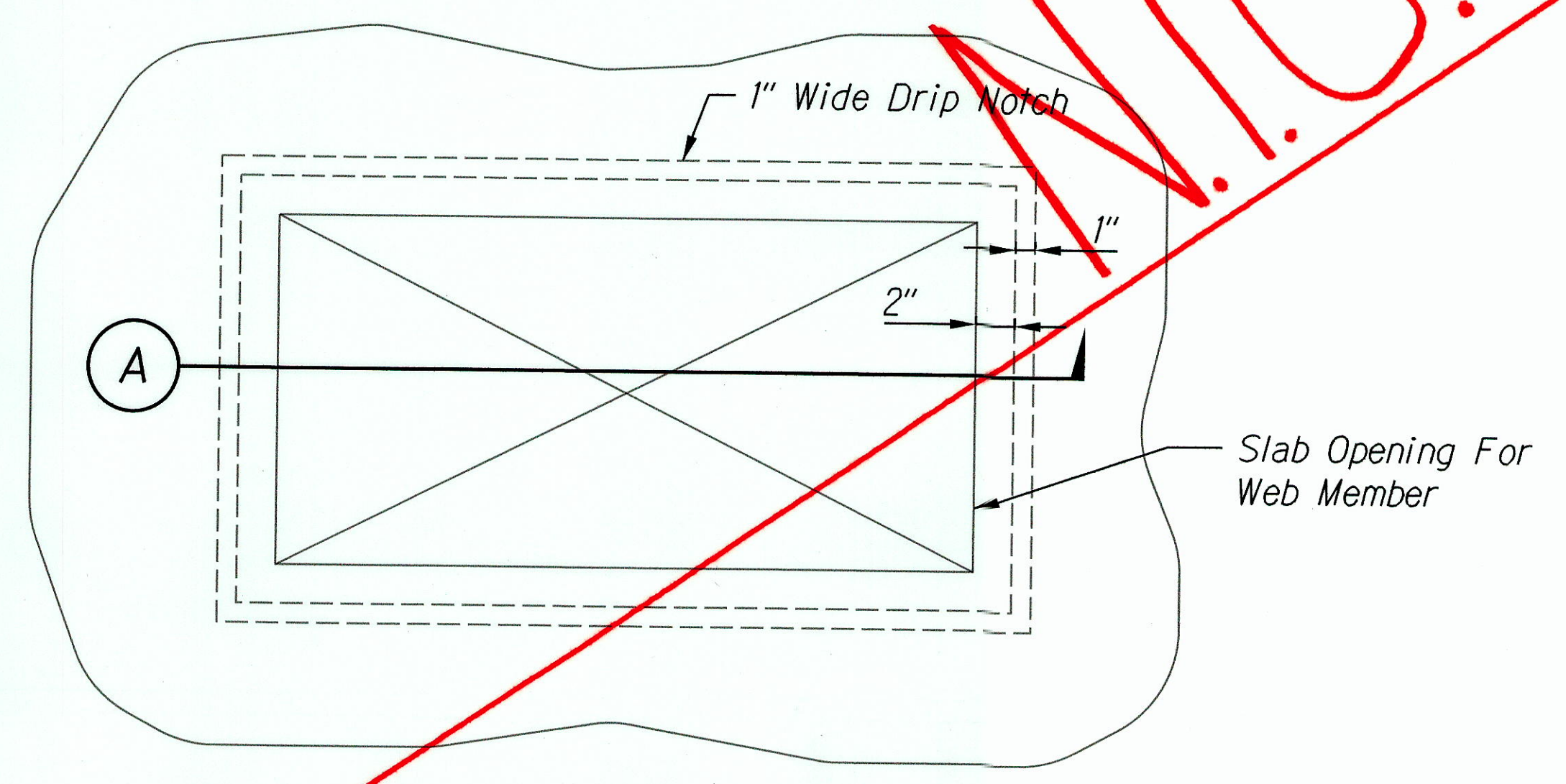
"AS-BUILT"

FED. ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-080-1(012)	2014	79	82



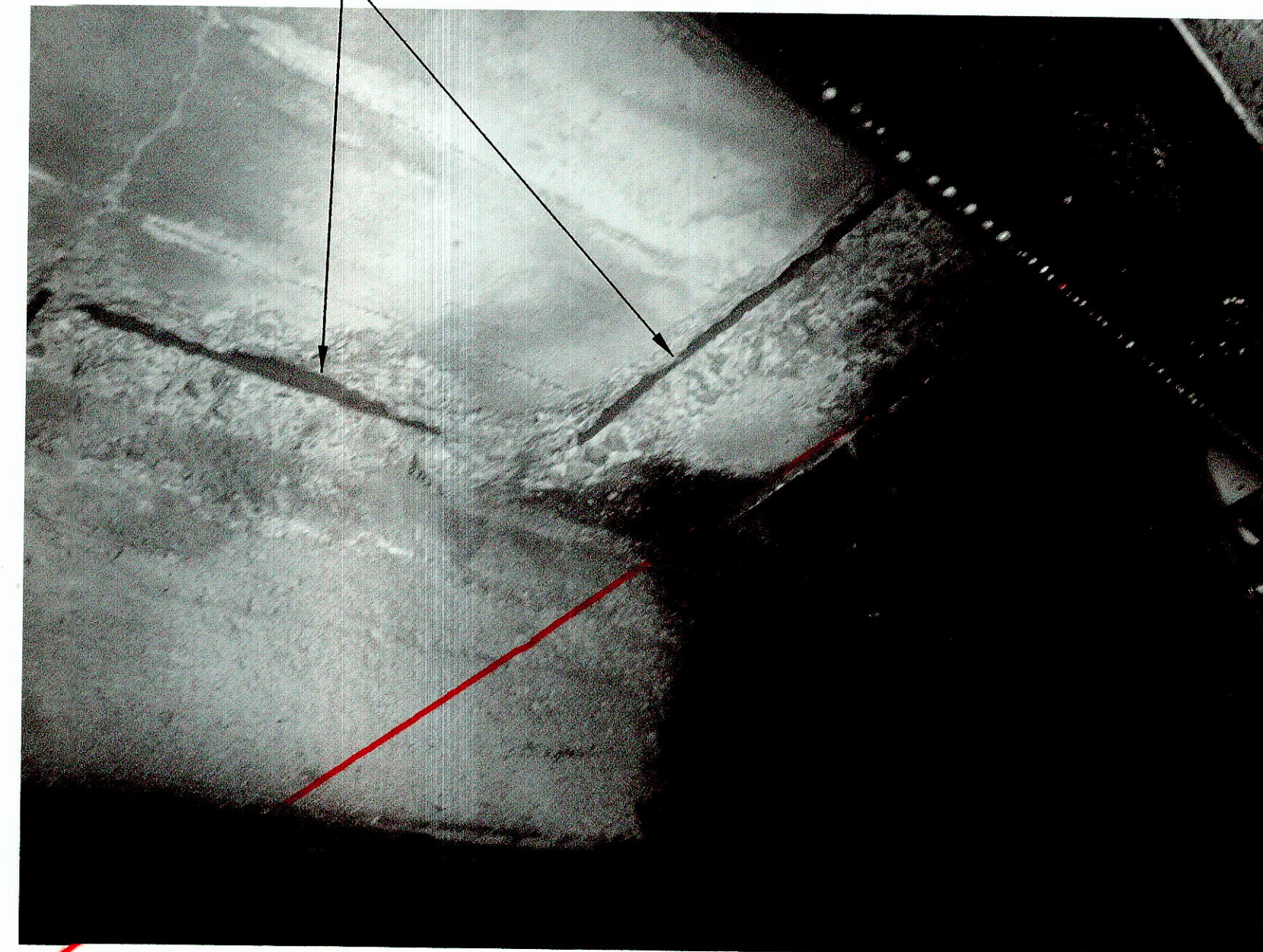
A SECTION

Note:
1. 1" wide drip notch shall be considered incidental to concrete deck soffit spall repairs.



1 REFLECTED PLAN - CONCRETE DRIP AT SLAB OPENING
S7.2, S7.4, S9.1, S7.8 SCALE: 3" = 1'-0"

Exposed Rebar Due to Concrete Spalls



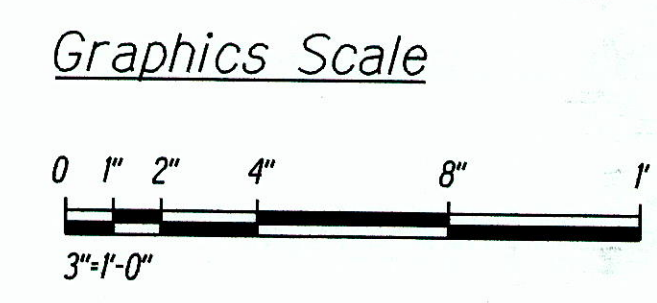
2 PHOTO - TYPICAL CONCRETE SPALLS AT SLAB OPENING
S7.8, S7.8



3 PHOTO - COVER PLATE AT DECK OPENING
S7.8, S9.1, S7.8

Note:
Contractor to field verify as-built dimensions as required.

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DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTEBOOK	
No.	



GEORGE O. GUTIERREZ, P.E.
LICENSED PROFESSIONAL ENGINEER
NO. 12107-S
HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE REPAIR DETAILS

KAMEHAMEHA HIGHWAY
Repair and Repaint Karsten Thot Bridge
Federal Aid Project No. BR-080-1(012)
Scale: 3" = 1'-0" Date: Sept 2014

SHEET No. S7.8 OF 8 SHEETS

"AS-BUILT"