

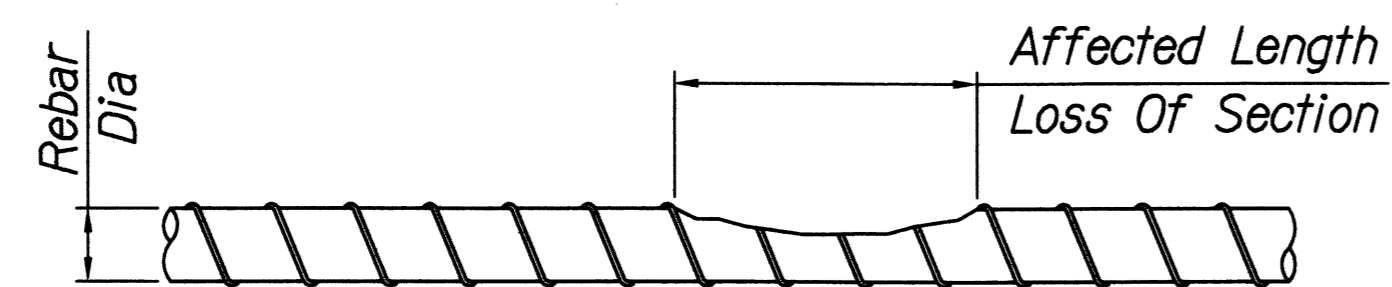
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	92A-01-10M	2010	17	44

TABLE 1: Minimum Rebar Diameter At Section Loss

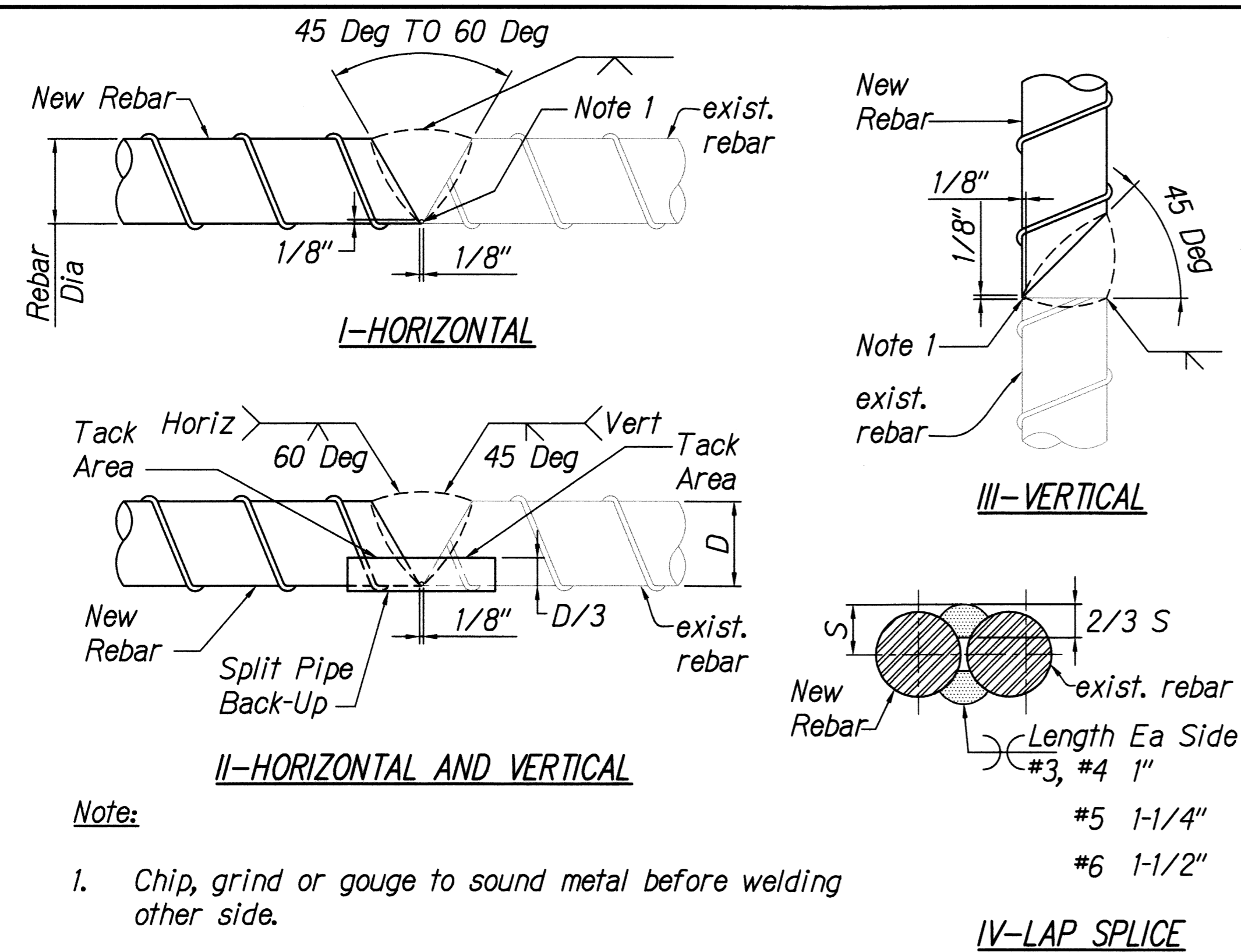
Rebar Size	Minimum Acceptable Diameter At Section Loss
#3	5/16"
#4	7/16"
#5	1/2"
#6	5/8"
#7	3/4"
#8	13/16"
#9	15/16"
#10	1-1/16"

Note:

- Remove heavy corrosion and scale from rebars using hand tools (eg: wire brush) or other approved methods.
- If rebar diameter after cleaning is less than that shown in the TABLE 1 above, repair rebar per $\frac{2}{S-15|S-15}$.



1 REBAR CLEANING AND LOSS OF SECTION
S-15|S-15 NOT TO SCALE



Note:

- Chip, grind or gouge to sound metal before welding other side.
- Detail I and III for No. 9 and larger. Detail II for No. 8 and smaller. Detail IV for No. 6 and smaller.
- E70 electrode for GR40, E90 electrode for GR60.
- See AWS D1.4 for welding process and other details.

2 REBAR WELD SPLICE DETAIL
S-15|S-15 NOT TO SCALE

CONCRETE REPAIR NOTES

- Spalls and delaminations are indicated as "spalls" since the repairs are the same.
- Concrete repair shall be in conformance with the "Concrete Repair Manual", 2nd Edition, International Concrete Repair Institute unless otherwise indicated.
- Cleaning and repair of reinforcing steel see $\frac{1}{S-15|S-15}$ and $\frac{2}{S-15|S-15}$.
- Exposing and undercutting of reinforcing steel:

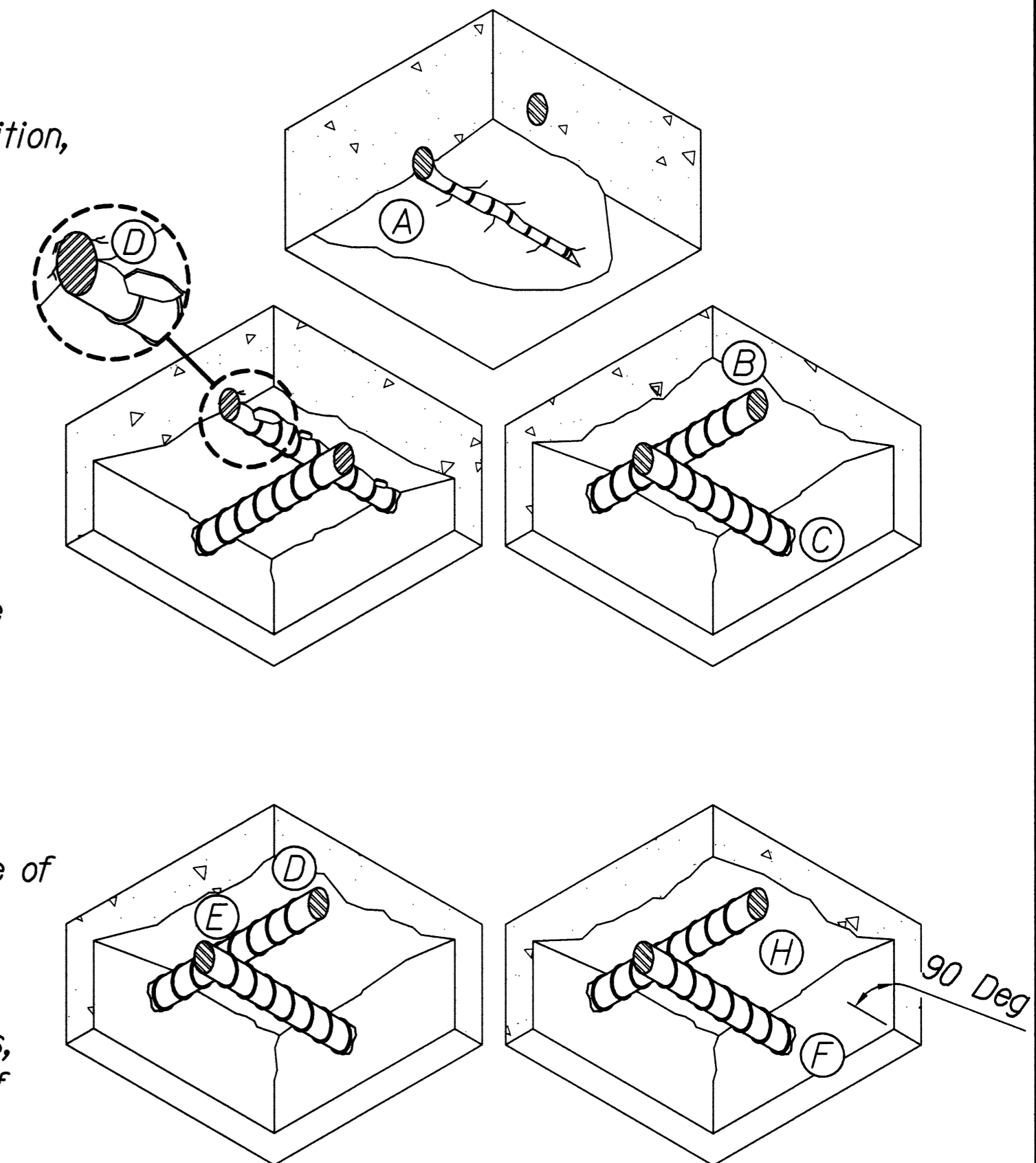
- (A) Remove loose or delaminated concrete above corroded reinforcing steel.
- (B) Once initial removals are made, proceed with the undercutting of all exposed corroded bars. Undercutting shall provide clearance for under bar cleaning and full bar circumference bonding to surrounding concrete, and to 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.

- Edge and surface conditioning of concrete:

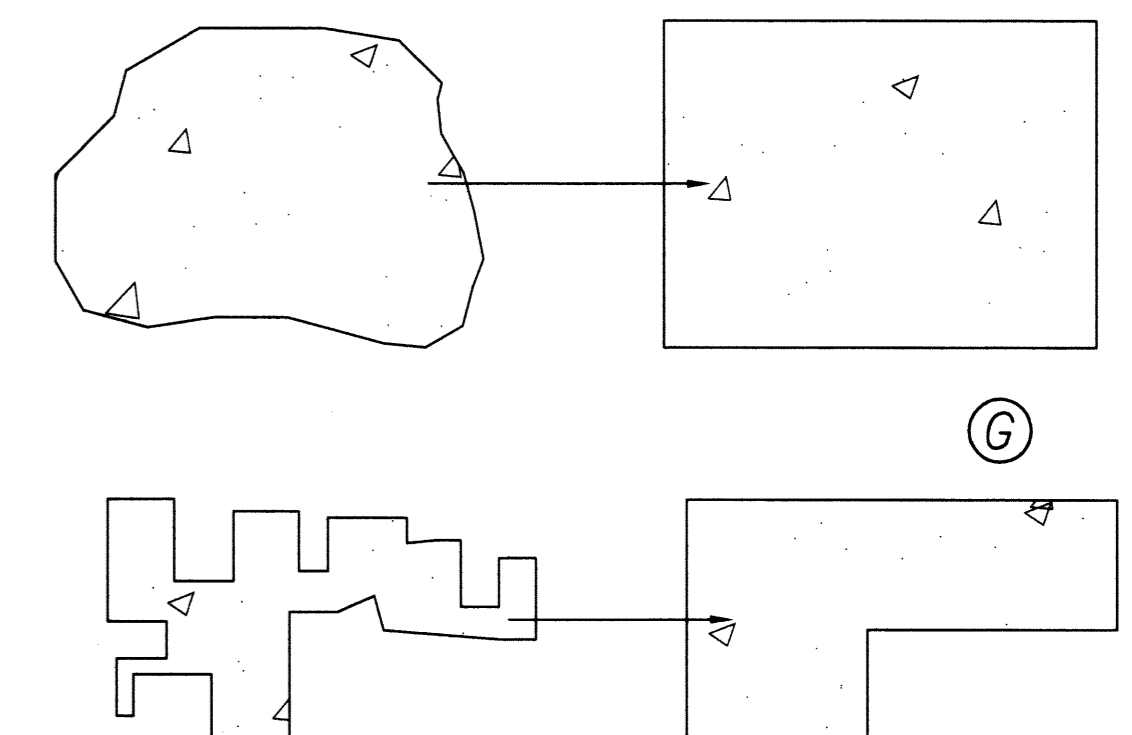
- (F) At edge locations, provide right angle cuts to the concrete surface with a sawcut 1/2" deep or less as required to avoid cutting reinforcing steel.
- (G) Repair configurations should be kept as simple as possible, preferably with squared corners.
- (H) After removals and edge conditioning are complete, remove bond inhibiting materials (dirt, concrete slurry, loosely bonded aggregates) using hand tools (eg wire brush) or other approved methods. Check the concrete surfaces after cleaning to insure that surface is free from additional loose aggregate, or that additional delamination are not present.

- See notes on Sht S-2.

3 SURFACE PREPARATION OF SPALLED CONCRETE AND CORRODED REBARS
S-15|S-15 NOT TO SCALE



BOUNDARY OF SPALL OR DELAMINATED CONCRETE **RECOMMENDED LAYOUT**



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

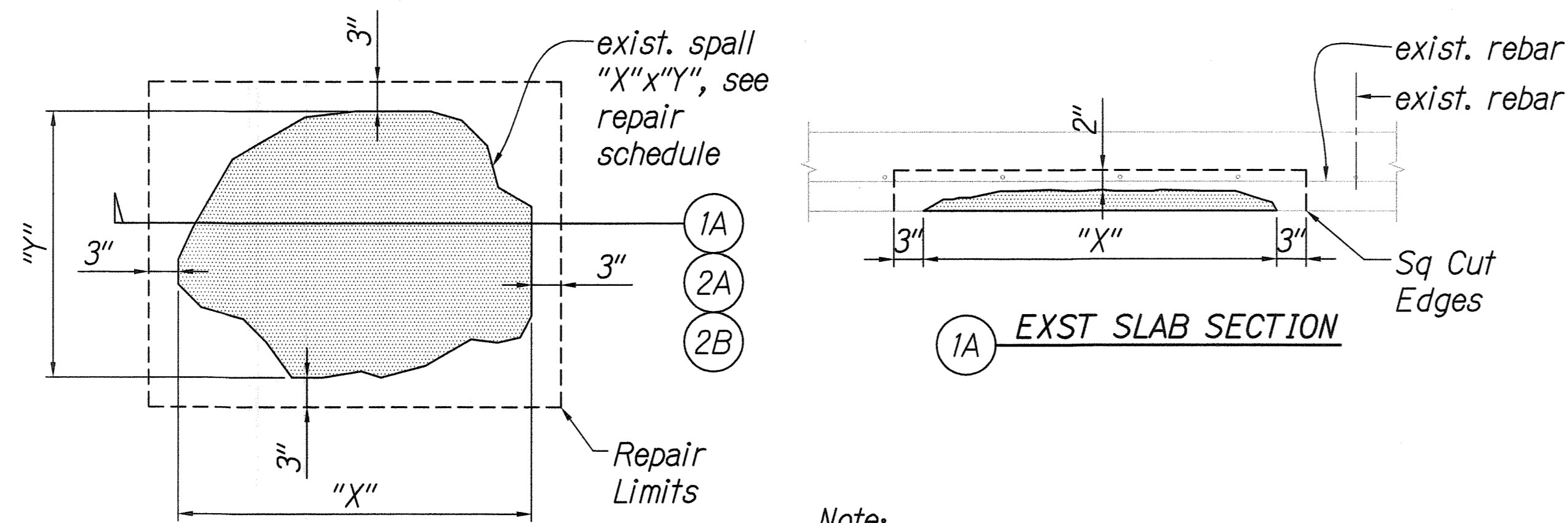
TYPICAL CONCRETE REPAIR DETAILS

NIMITZ HIGHWAY
Rehabilitation of Honolulu Slip Cover
and Slip Cover #3
Project No. 92A-01-10M

Scale: Not To Scale Date: April 2010

SURVEY PLOTTED BY	DATE
DESIGNED BY	
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QUANTITIES BY	
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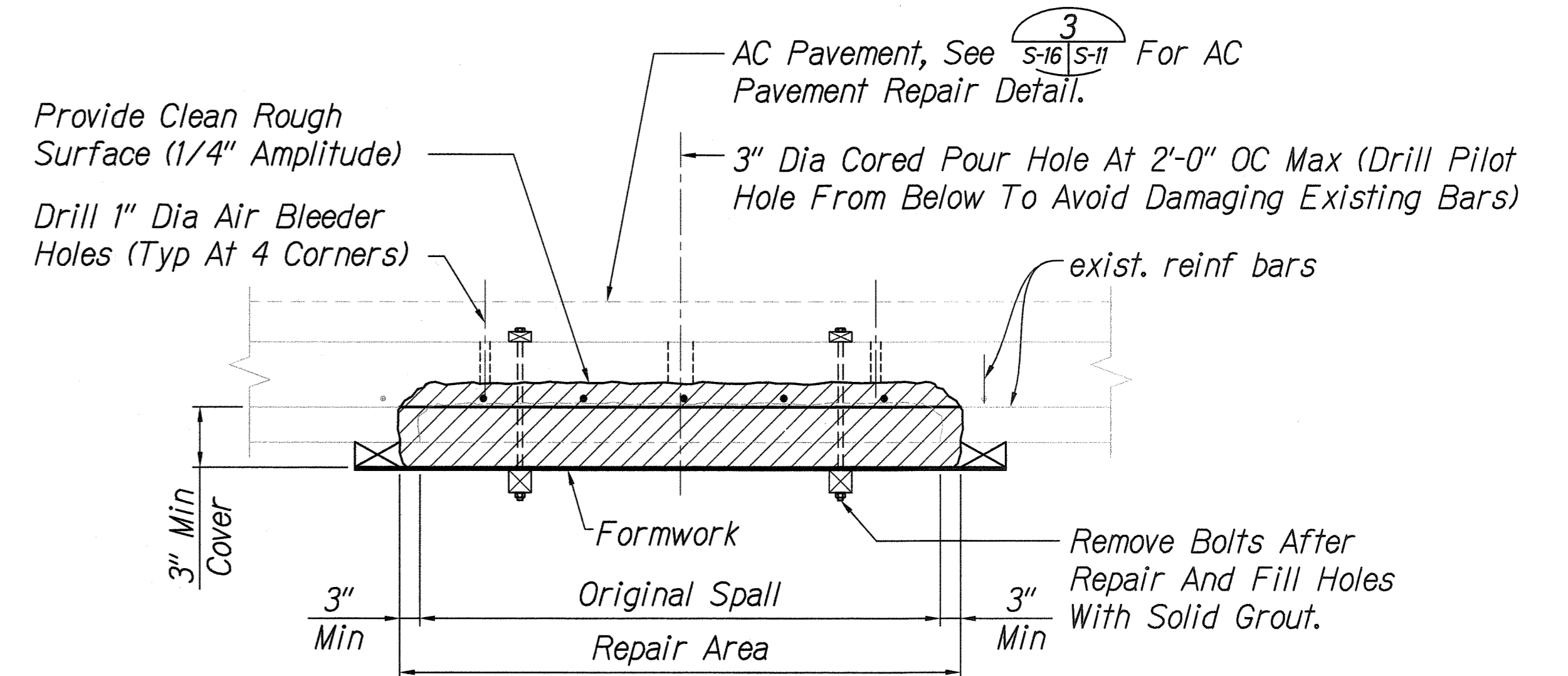
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	92A-01-10M	2010	ADD. 18	44



Note:

- Spalls and delaminations are called out as "spalls" since the repairs are the same.
- See concrete repair details on sheet S-15.

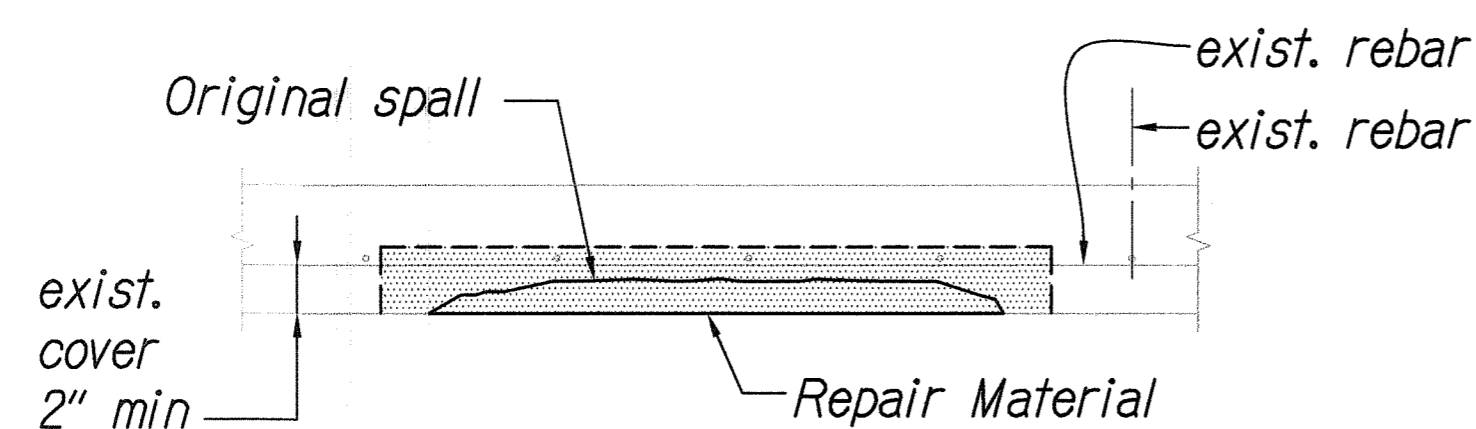
1 SLAB SOFFIT SPALL - EXISTING CONDITION
S-16/S-16 NOT TO SCALE



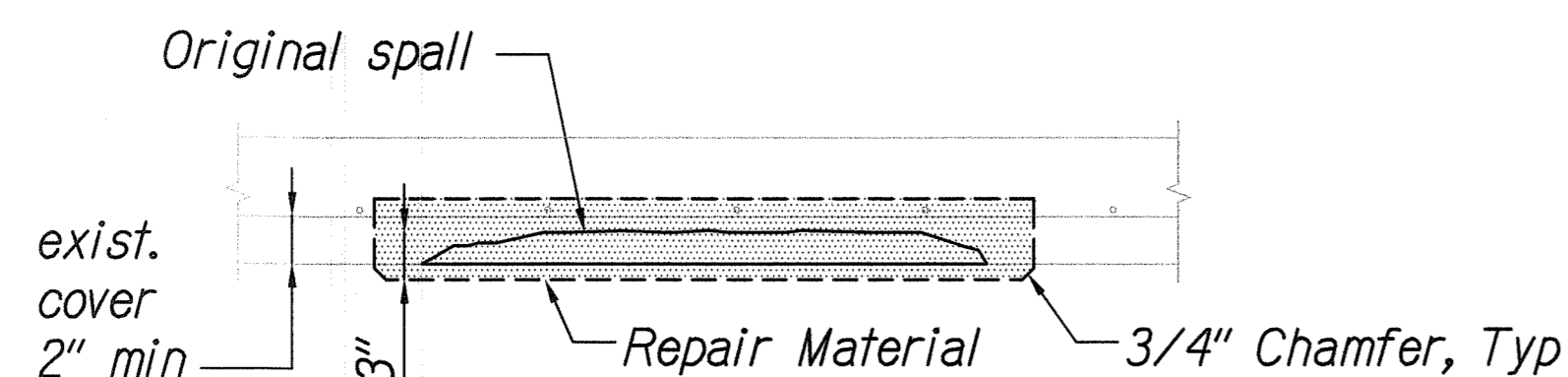
Note:

- 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. Provide same size and spacing of reinforcing as existing. Provide additional #3 at 12" o.c. on the bottom mat of the deck slab by tying in-place. Not required to dowel into existing concrete.
- Replace corroded rebars where required per Table 1 on Sht S-15.
- Replace A.C., see Standard Specs.

3 SLAB SOFFIT SPALL - REPAIR AREA > 2 SQ FT
S-16/S-16 NOT TO SCALE



2A SLAB SOFFIT SPALL REPAIR
WHERE EXST REBAR COVER \geq 2"



2B SLAB SOFFIT SPALL REPAIR
WHERE EXST REBAR COVER < 2"

Note:

- See concrete repair notes and details on Sht S-2 and Sht S-15.
- Replace corroded rebars where required per Table 1 on Sht S-15.
- See **1** S-16/S-16 for exst condition.
- Where the spall removal of deteriorated concrete exceeds half the thickness of the slab, the repair shall be a full depth repair similar to **3** S-16/S-16.

2 SLAB SOFFIT SPALL - REPAIR DETAIL
S-16/S-16 NOT TO SCALE

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NO.	

LICENSE EXPIRES: 4/30/10

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN HAWAII TITLE 16, CHAPTER 115, RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND SURVEYORS, STATE OF HAWAII.

Dwight M. Okawa

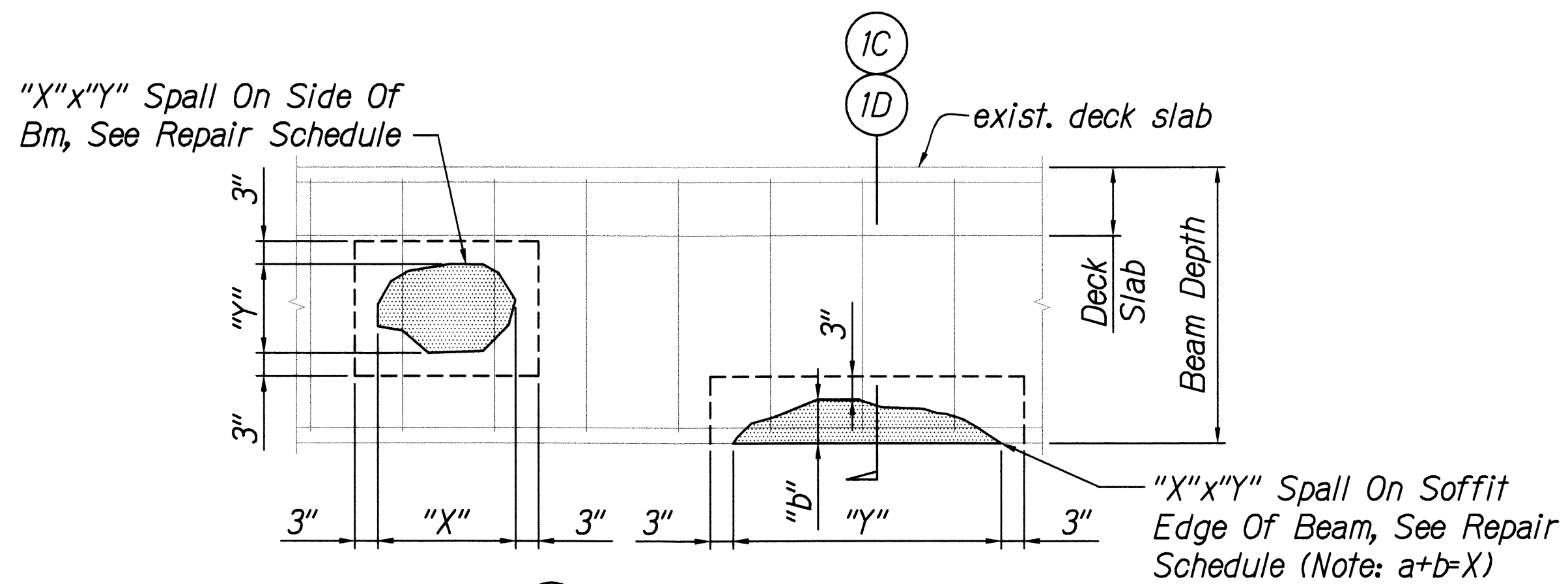
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**SLAB SOFFIT REPAIR
DETAILS**

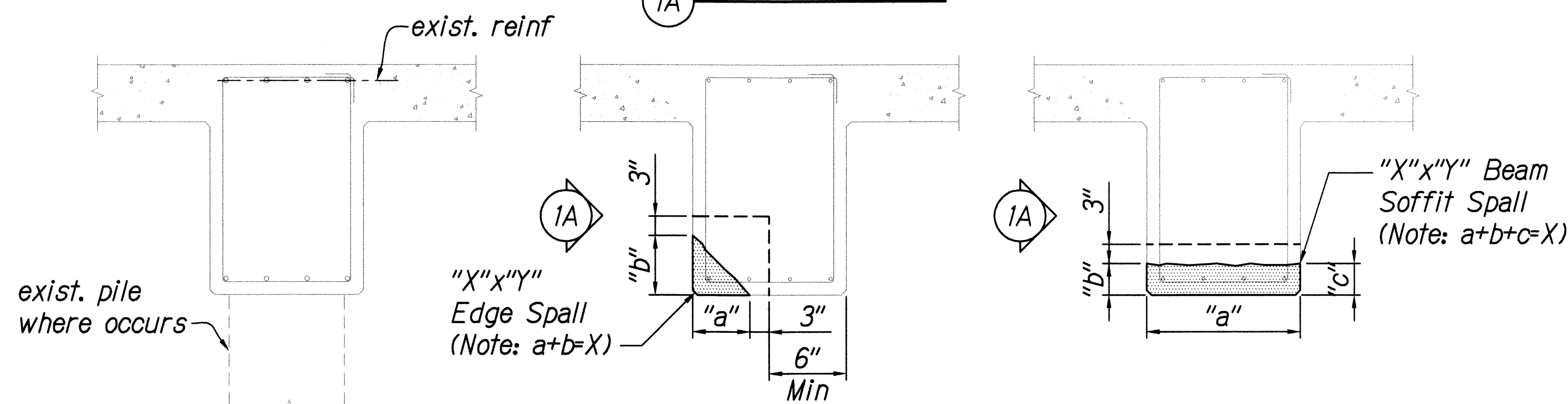
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1A BEAM ELEVATION



1B TYP EXST BEAM SECTION

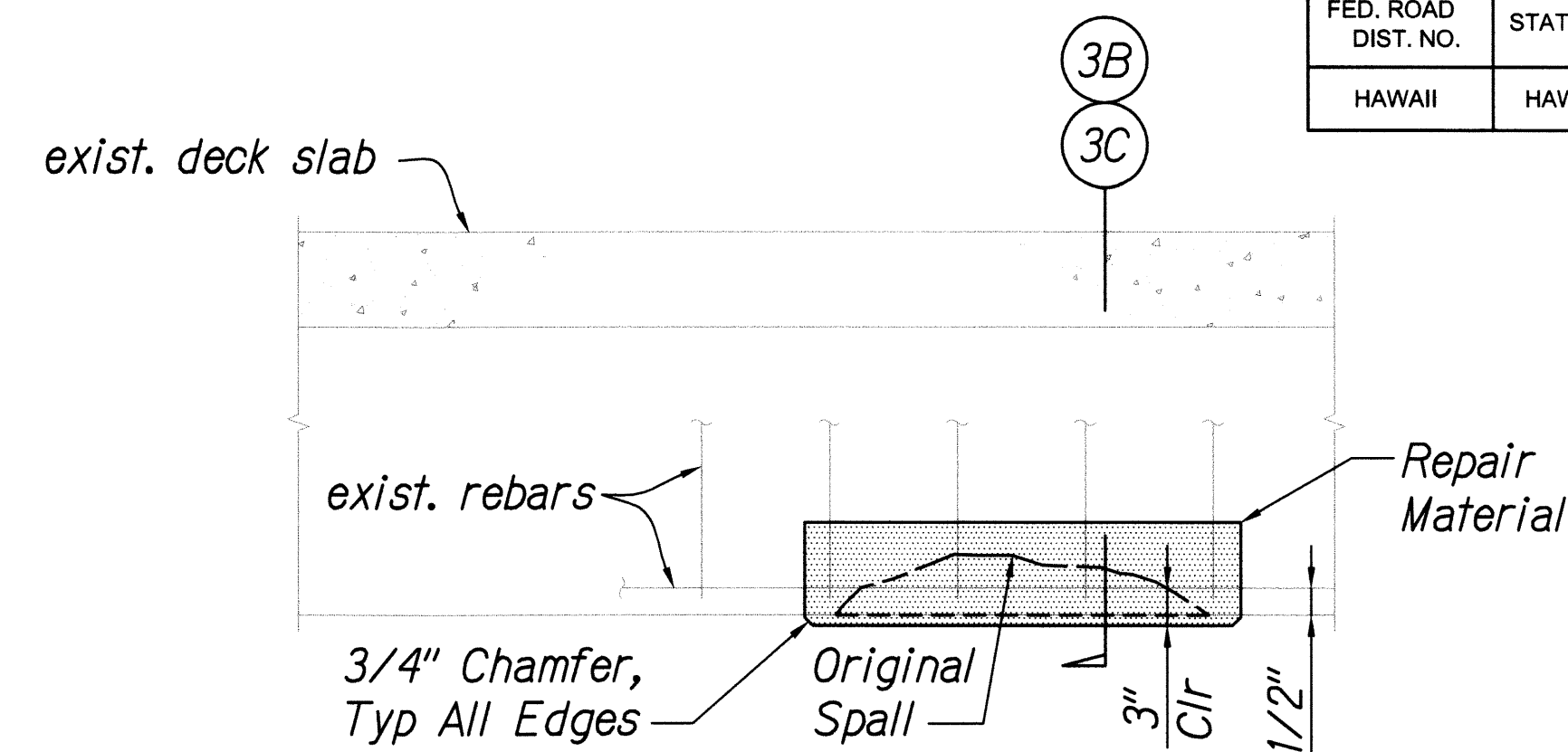
1C SECTION

1D SECTION

Note:

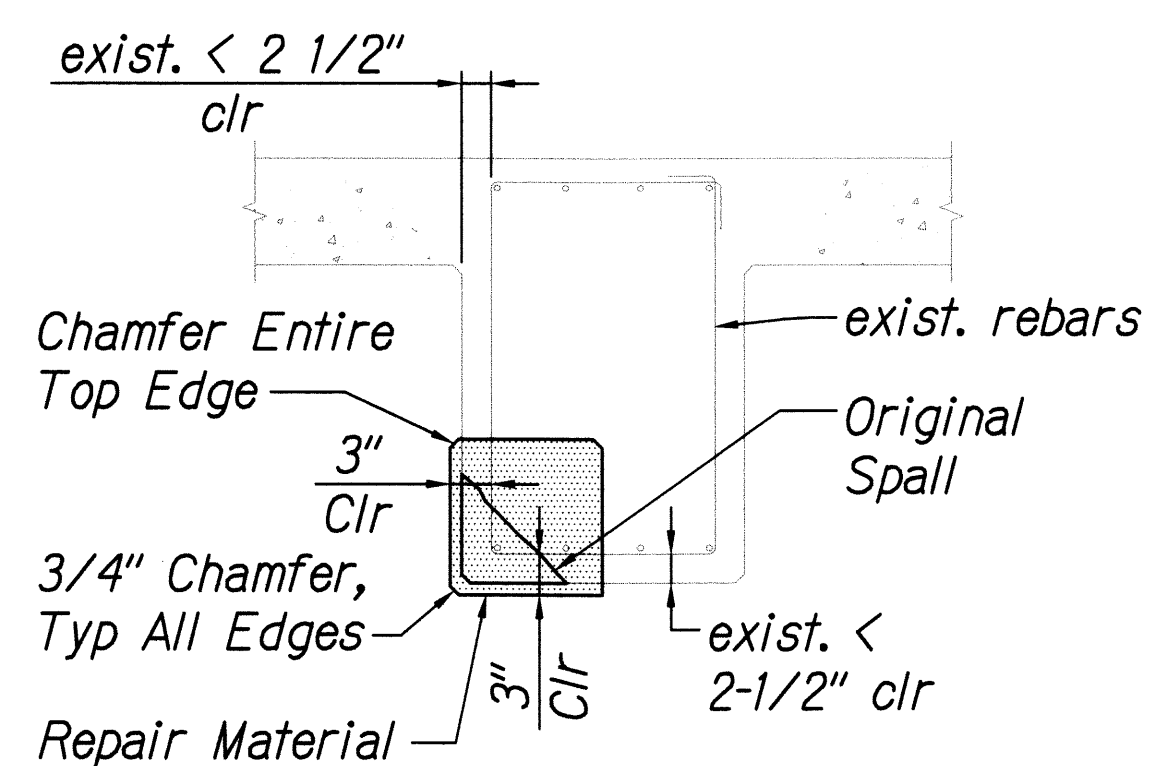
- Spalls and delaminations are called out as "spalls" since the repairs are the same.
- See concrete repair notes and details on Sheet S-2 and S-15.
- Replace corroded rebars where required per Table 1 on S-15.

1 BEAM SPALL - EXISTING CONDITIONS
S-18/S-18 NOT TO SCALE



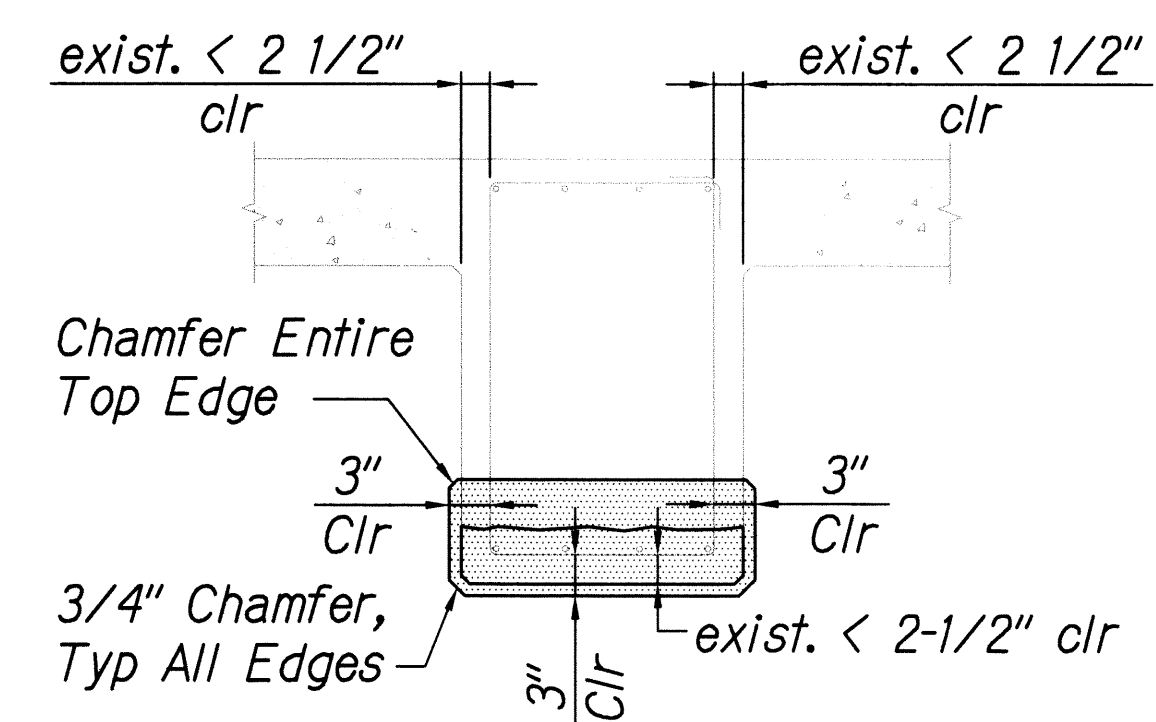
Note: See 1A on Sht S-18.

3A BEAM ELEVATION



Note: See 1C on Sht S-18.

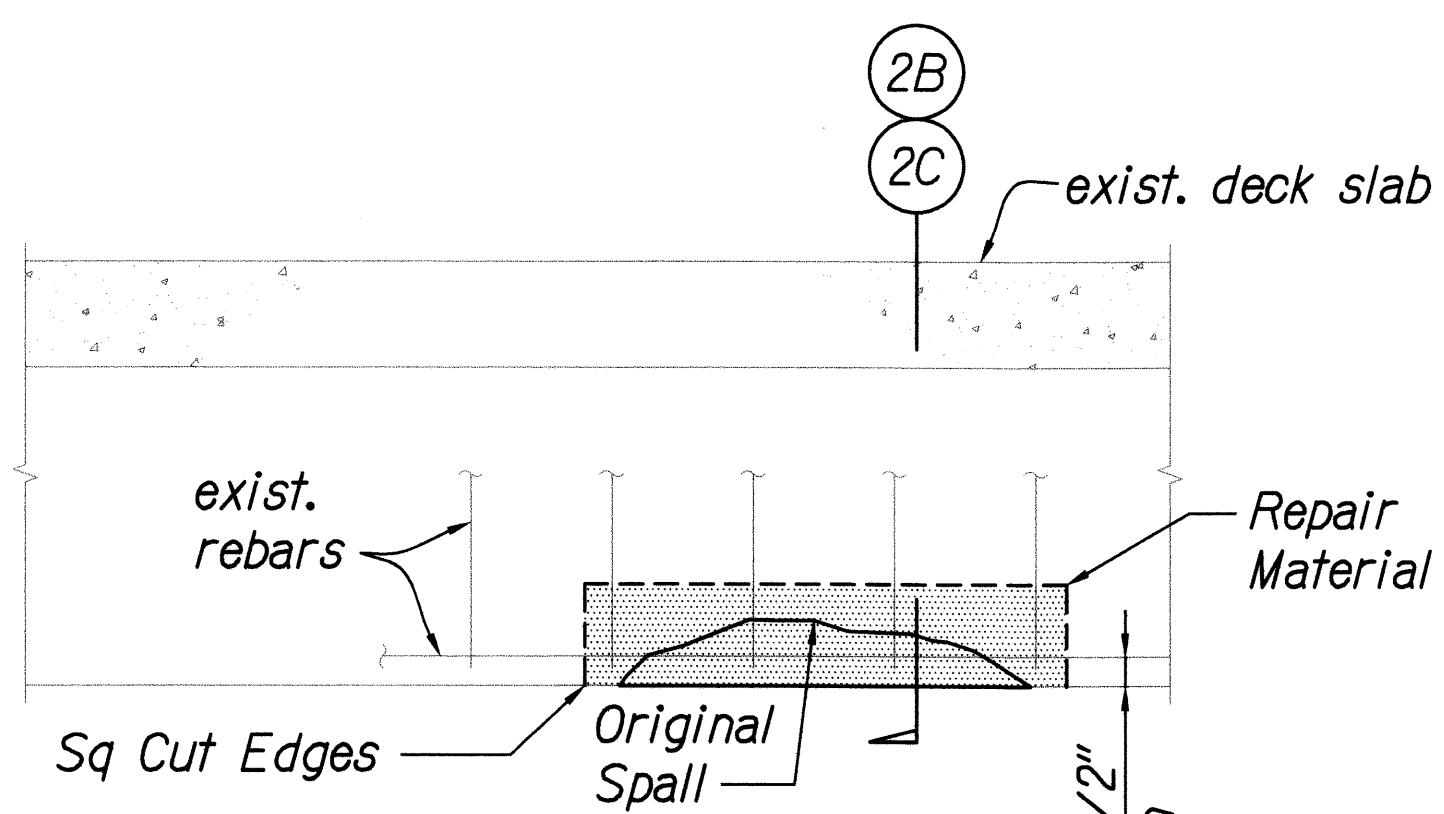
3B SECTION



Note: See 1D on Sht S-18.

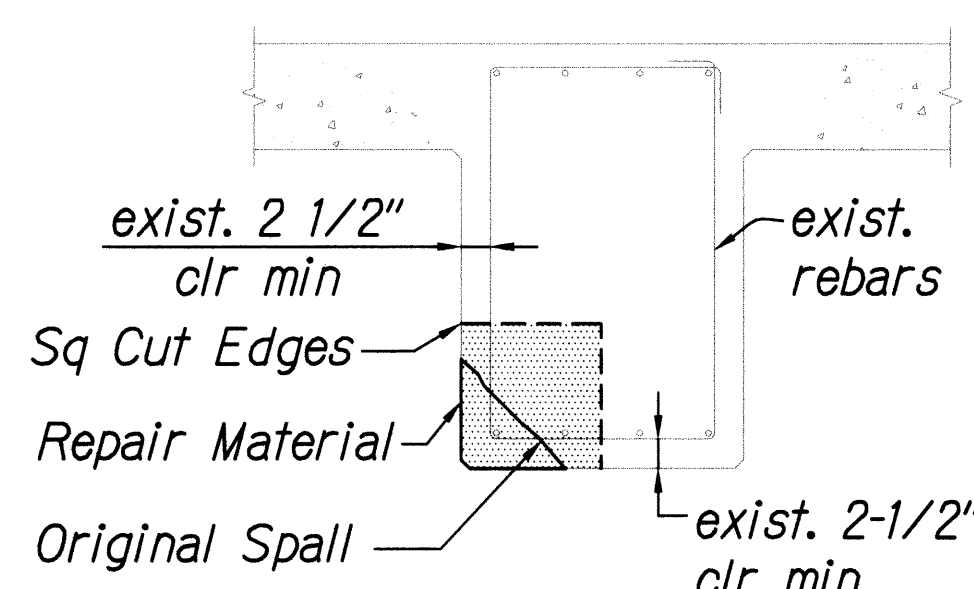
3C SECTION

3 BEAM SPALL - REPAIRS WHERE EXST REBAR COVER < 2-1/2"
S-18/S-18 NOT TO SCALE



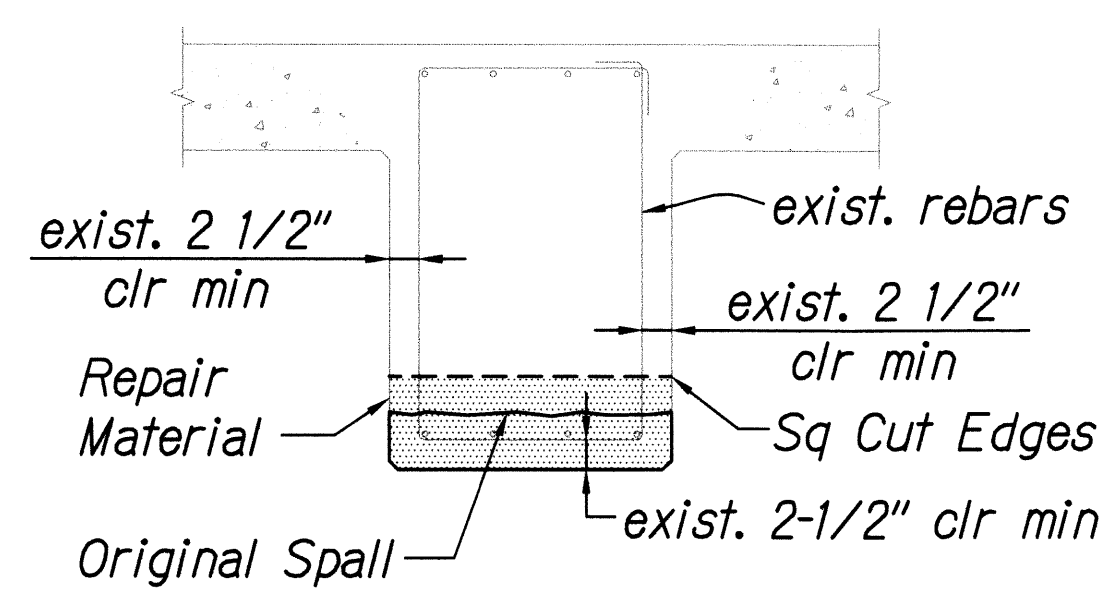
Note: See 1A on Sht S-18.

2A BEAM ELEVATION



Note: See 1C on Sht S-18.

2B SECTION



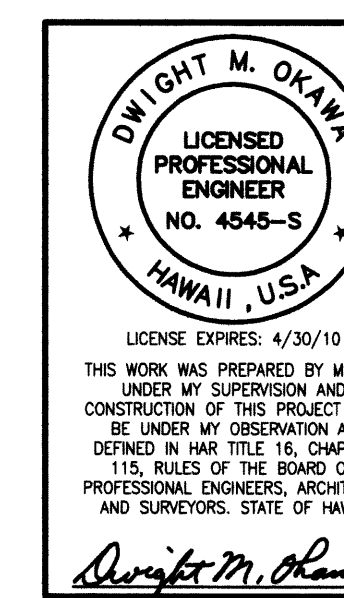
Note: See 1D on Sht S-18.

2C SECTION

2 BEAM SPALL - REPAIRS WHERE EXST REBAR COVER ≥ 2-1/2"
S-18/S-18 NOT TO SCALE

Legend:

- Deteriorated concrete. Dimension in schedule.
- Concrete removal limits.

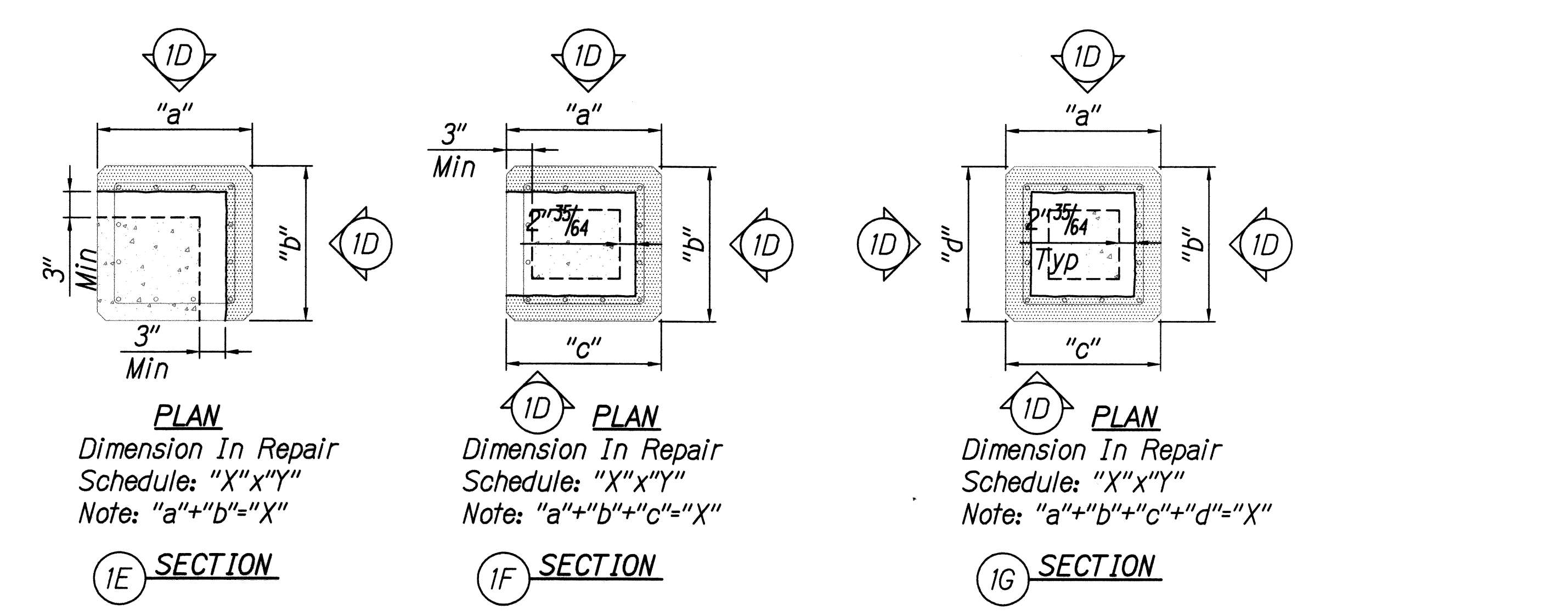
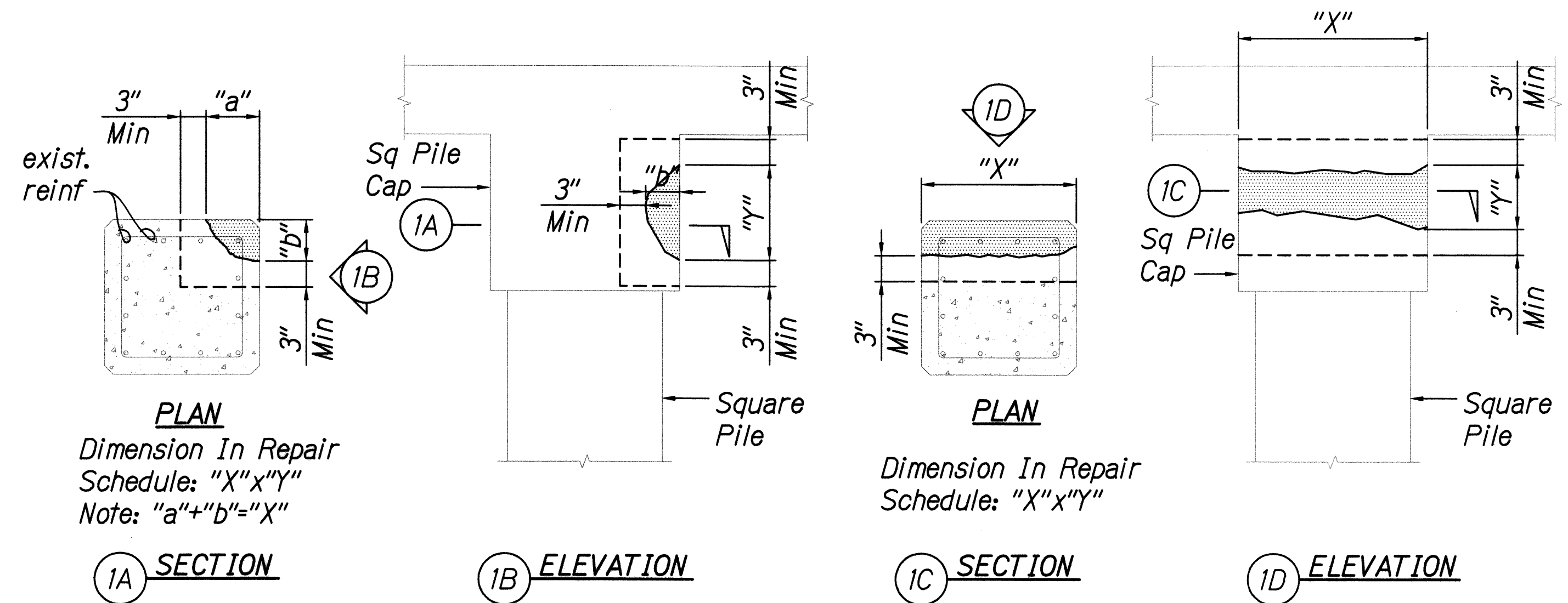


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
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**BEAM/BENTCAP REPAIR
DETAILS**
NIMITZ HIGHWAY
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Project No. 92A-01-10M
Scale: Not To Scale Date: April 2010

SHEET No. S-18 OF 19 SHEETS

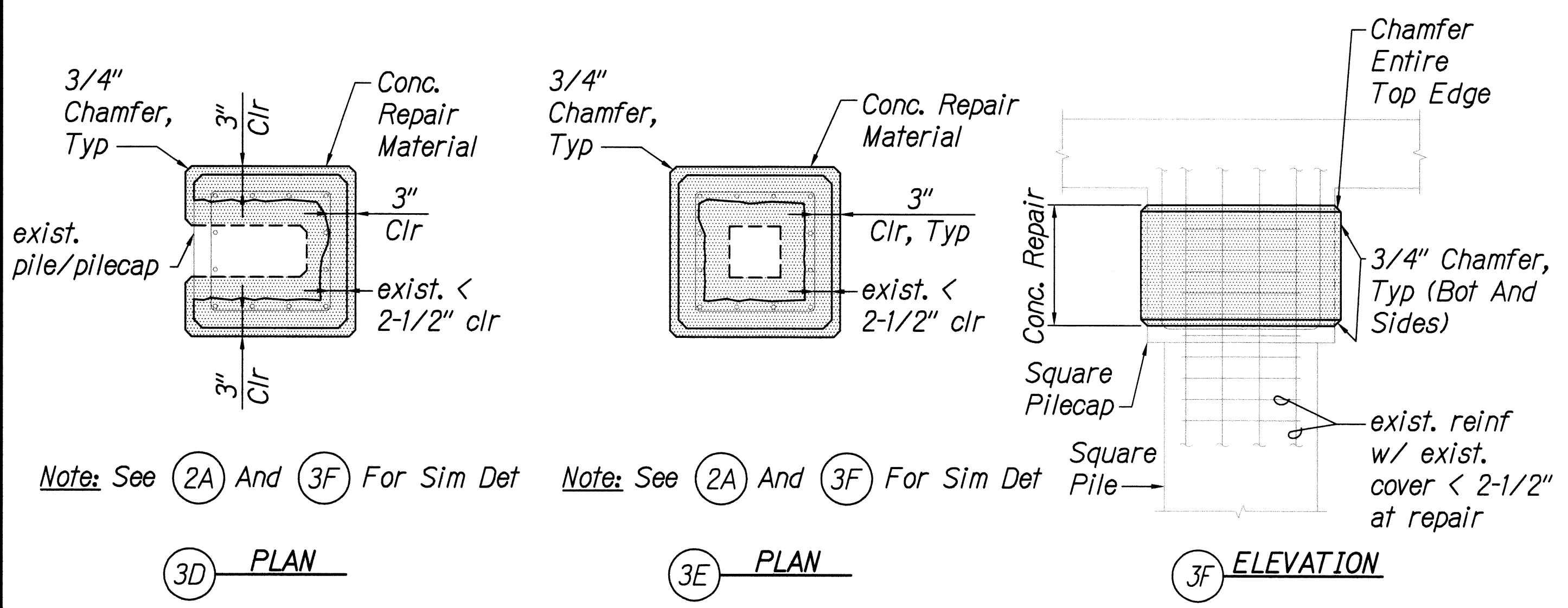
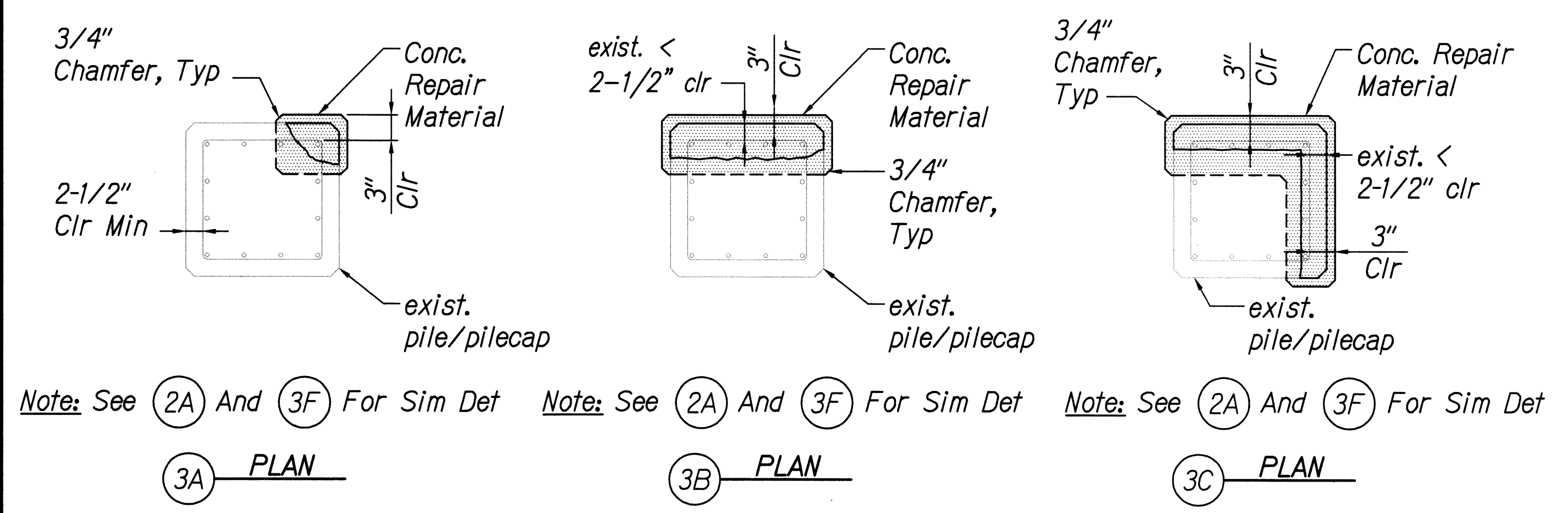
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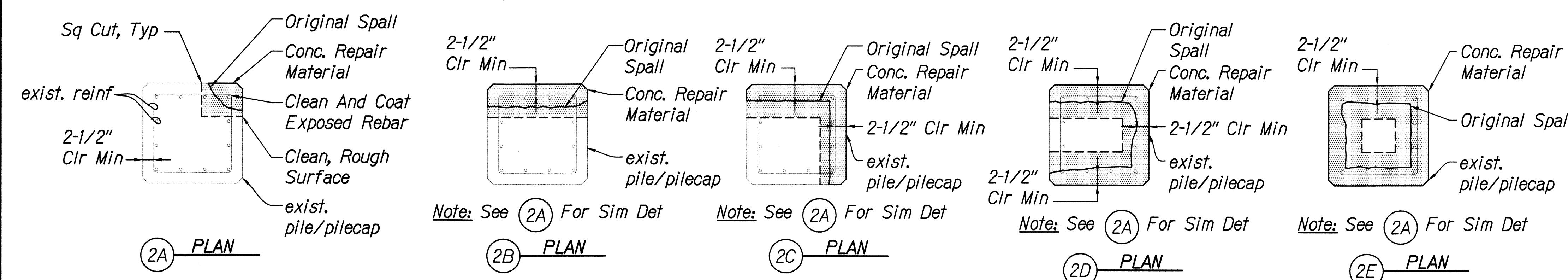


1 SQ PILE/PILECAP SPALL - EXISTING CONDITIONS
S-19/S-19 NOT TO SCALE

Note: Shore as required.

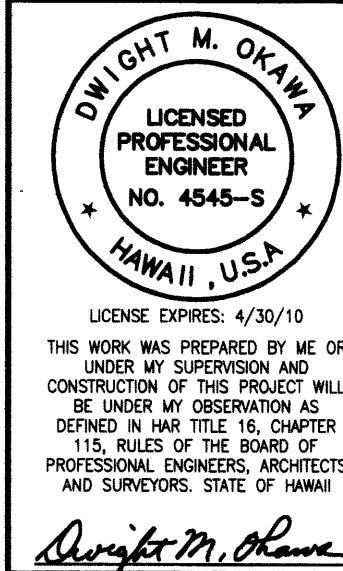


3 SQ PILE/PILECAP SPALL - REPAIRS WHERE EXIST COVER < 2-1/2"
S-19/S-19 NOT TO SCALE



2 SQ PILE/PILECAP SPALL - REPAIRS WHERE EXIST ≥ COVER 2-1/2"
S-19/S-19 NOT TO SCALE

Note:
1. For concrete repair detail and notes see Sht S-2 and S-15.
Legend:
Deteriorated concrete. Dimension in schedule.
Concrete removal limits.



STATE OF HAWAII
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HIGHWAYS DIVISION
PILE/PILECAP REPAIR DETAILS
NIMITZ HIGHWAY
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SHEET No. S-19 OF 19 SHEETS

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