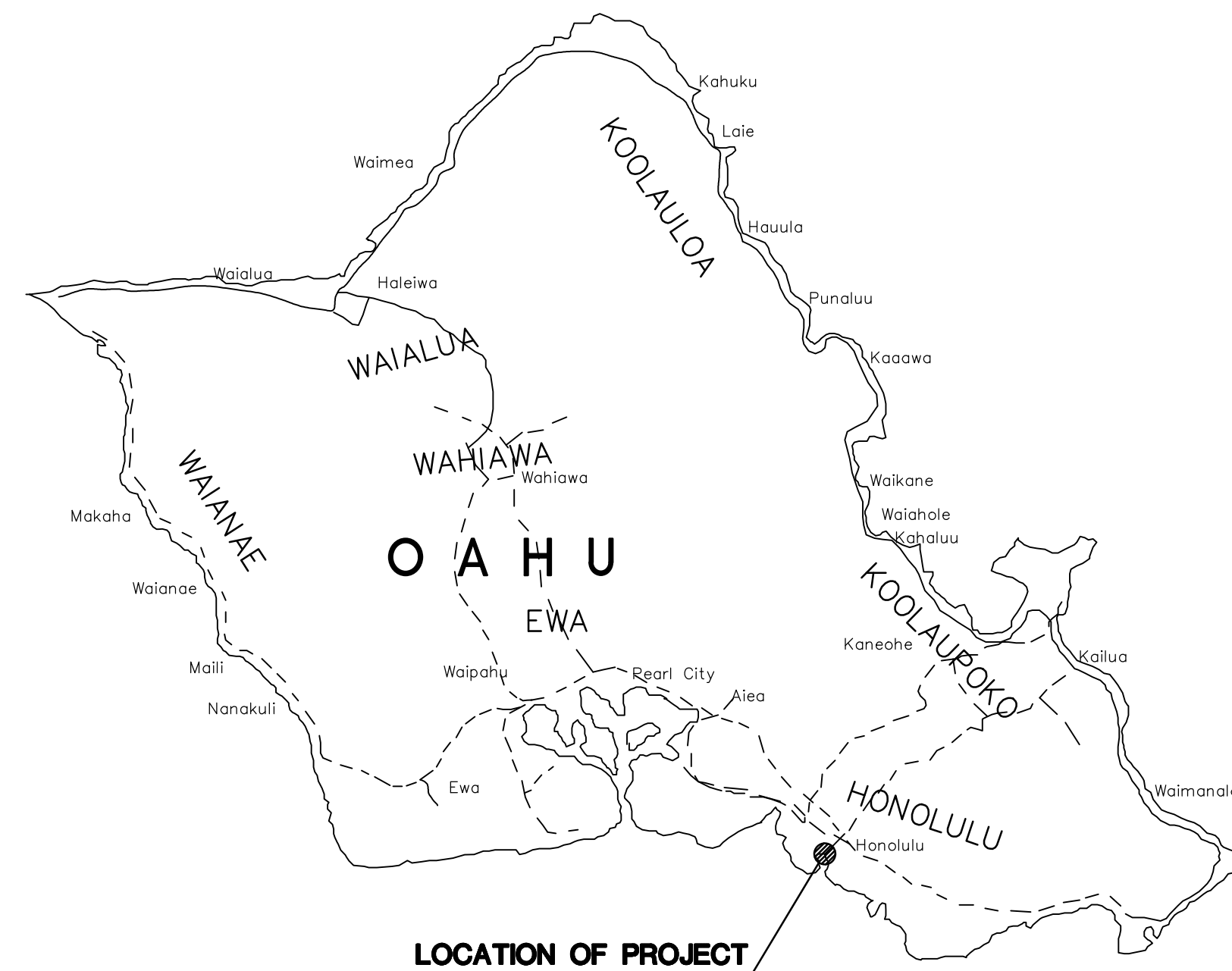


# HONOLULU HARBOR, PIER 10, SUBSTRUCTURE REPAIRS, OAHU, HAWAII

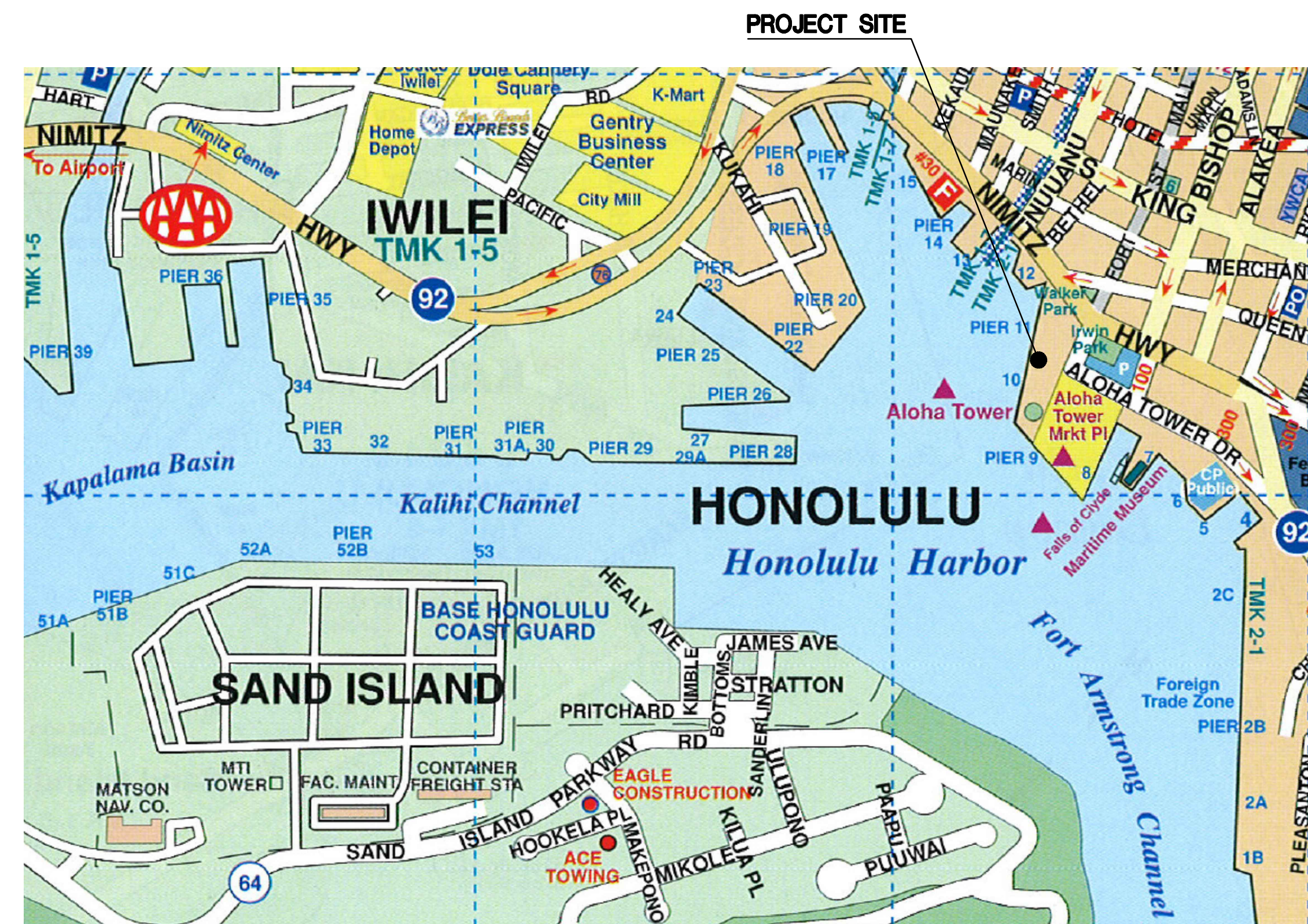
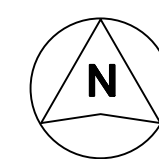
FOR THE  
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HARBORS  
S10955



ISLAND OF OAHU

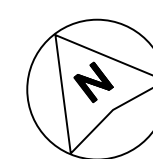
LOCATION MAP

NOT TO SCALE



VICINITY MAP

NOT TO SCALE



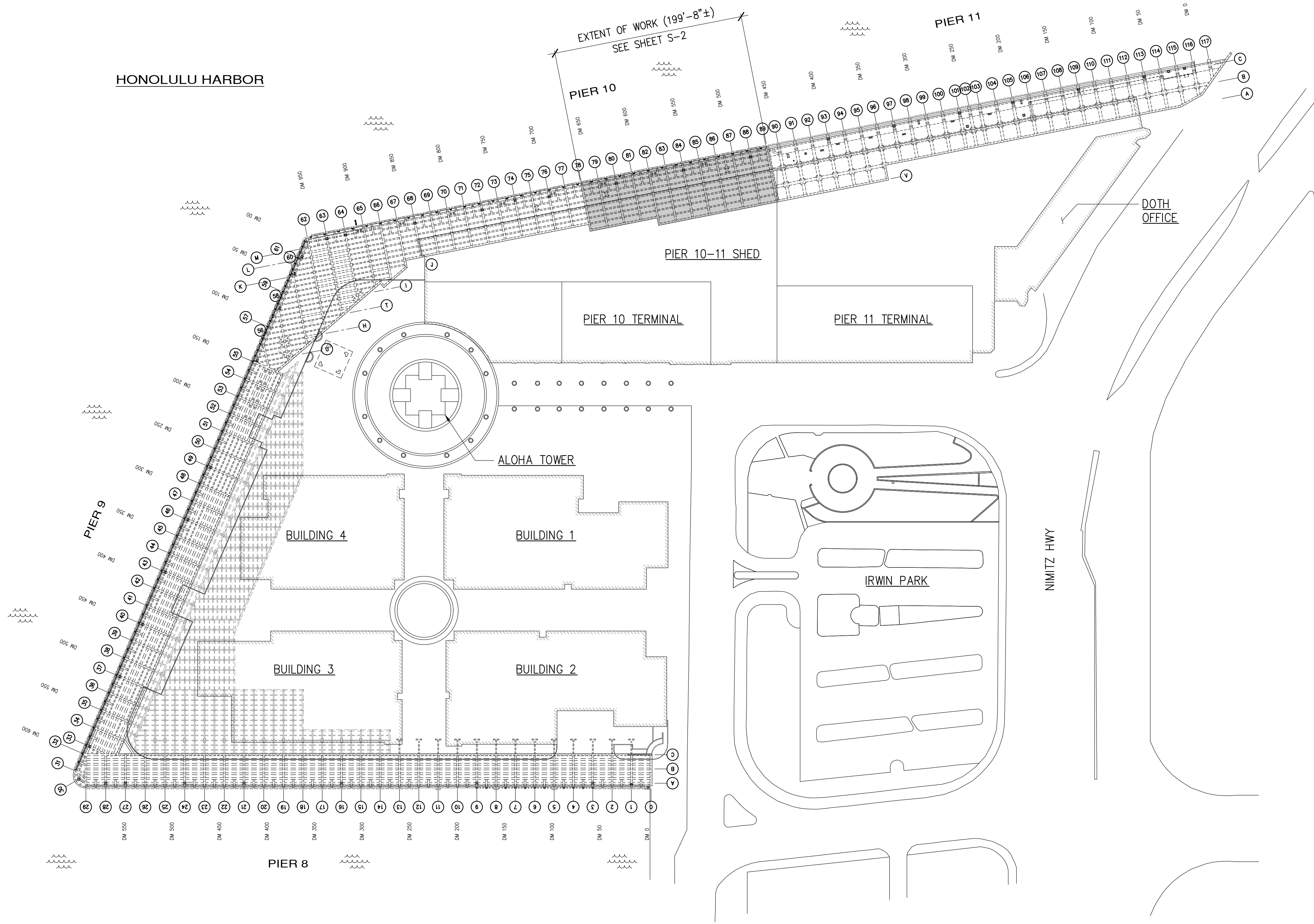
CONSULTANT:

**MKE ASSOCIATES LLC**  
STRUCTURAL ENGINEER

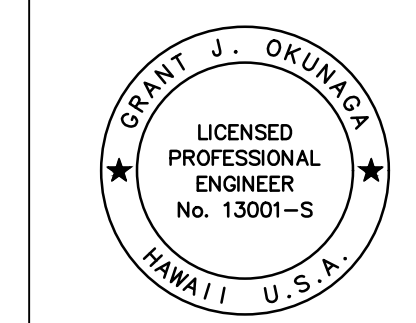
DEPARTMENT OF TRANSPORTATION STATE OF HAWAII		SHEET <b>T-1</b>
APPROVED BY:		04/23/2026
FOR DIRECTOR OF TRANSPORTATION		DATE 1 of 10 SHS

# INDEX TO DRAWINGS

SHEET NO.	TITLE
T-1	TITLE SHEET LOCATION AND VICINITY MAPS
T-2	INDEX TO DRAWINGS AND GENERAL PLAN
S-1	STRUCTURAL NOTES
S-2	PARTIAL PIER PLAN
S-3	EXISTING PIER SECTIONS
S-4	FULL SLAB REPLACEMENT DETAILS
S-5	FULL SLAB REPLACEMENT DETAILS
S-6	BEAM SPALL REPAIR DETAILS
S-7	SLAB AND VERTICAL SURFACE SPALL REPAIR DETAILS
S-8	SPLICE DETAIL



**GENERAL PLAN**  
NOT TO SCALE



THIS WORK WAS PREPARED BY ME  
OR UNDER MY SUPERVISION  
EXP. 4-30-28  
*Grant J. Okuniga*  
MKE ASSOCIATES LLC

REVISION	DATE	DESCRIPTION	BY	APPROVED
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS				
JOB TITLE HONOLULU HARBOR, PIER 10, SUBSTRUCTURE REPAIRS, OAHU, HAWAII				
SHEET TITLE INDEX TO DRAWINGS AND GENERAL PLAN				
DESIGNED BY: RA	JOB NUMBER		SHEET	
DRAWN BY: DL	S10955		T-2	
CHECKED BY: GO				
DATE: 04/2026				
SCALE: AS SHOWN	2 of 10 SHTS.			

**STRUCTURAL NOTES:**

**GENERAL:**

- WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE HAWAII STATE BUILDING CODE (2018 EDITION) AND THE HAWAII STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, 2005, FOR THE STATE OF HAWAII, UNLESS OTHERWISE INDICATED. HOWEVER, SHOULD THERE BE CONFLICTS, OR WHERE REFERENCE IS MADE TO PERFORMANCE CONFORMING TO OTHER STANDARDS THE MORE STRINGENT SHALL APPLY.
- THE CONTRACTOR SHALL COMPARE PLANS, SPECIFICATIONS AND ALL OTHER CONTRACT DOCUMENTS WITH EACH OTHER AND REPORT IN WRITING TO THE HARBORS CONSTRUCTION ENGINEER ALL INCONSISTENCIES AND OMISSIONS.
- THE CONTRACTOR SHALL TAKE FIELD MEASUREMENTS AND VERIFY FIELD CONDITIONS AND SHALL COMPARE SUCH FIELD MEASUREMENTS AND CONDITIONS WITH THE DRAWINGS BEFORE COMMENCING WORK. REPORT IN WRITING TO THE HARBORS CONSTRUCTION ENGINEER ALL INCONSISTENCIES AND OMISSIONS.
- CONTRACTOR SHALL RESOLVE ANY DISCREPANCIES AND QUESTIONS PRIOR TO THE START OF WORK. NO EXTRA PAYMENT SHALL BE ALLOWED ON ACCOUNT OF WORK MADE NECESSARY BY CONTRACTORS FAILURE TO VISIT THE SITE AND/OR FAILURE TO RESOLVE DISCREPANCIES AND QUESTIONS.
- THE CONTRACTOR SHALL PROTECT ALL UTILITIES AND STRUCTURES IN AND ADJACENT TO THE PROJECT SITE. ANY DAMAGE SHALL BE REPAIRED TO THE SATISFACTION OF THE HARBORS CONSTRUCTION ENGINEER AND PAID FOR BY THE CONTRACTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES.
- THE CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER CONTRACTORS WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL ALSO COORDINATE WITH THE HARBORS OAHU DISTRICT MANAGER AND CONSTRUCTION ENGINEER FOR AN APPROVED STAGING AND STORAGE AREA AND FOR RESTRICTIONS OF HARBORS OPERATIONS OVER REPAIR AREAS.
- THE CONTRACTOR SHALL REMOVE ALL DEBRIS RESULTING FROM HIS WORK AS REQUIRED FOR PUBLIC HEALTH AND SAFETY AND TO THE SATISFACTION OF THE HARBORS CONSTRUCTION ENGINEER. SHOULD THE STATE PERFORM ANY OF THE ABOVE WORK DUE TO NON-PERFORMANCE BY THE CONTRACTOR, THE CONTRACTOR AGREES TO REIMBURSE THE STATE FOR ALL COSTS INCURRED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR METHODS OF CONSTRUCTION, WORKMANSHIP AND JOB SAFETY. THE CONTRACTOR SHALL PROVIDE TEMPORARY SHORING AND BRACING AS REQUIRED FOR STABILITY OF STRUCTURAL MEMBERS AND SYSTEMS.
- ALL WORK SPECIFIED IN THE CONTRACT BUT NOT LISTED SEPARATELY SHALL BE CONSIDERED INCIDENTAL AND WILL NOT BE PAID FOR SEPARATELY.
- NOTES AND DETAILS ON THE PLANS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. SHOULD THERE BE CONFLICTS BETWEEN THE REQUIREMENTS OF THE PLANS OR SPECIFICATIONS, THE MORE STRINGENT SHALL APPLY.
- THE CONTRACTOR SHALL COMPLY WITH THE CLEAN WATER ACT AND THE STATE HARBORS STORMWATER MANAGEMENT PROGRAM. NO POLLUTANTS ARE ALLOWED TO BE DISCHARGED DIRECTLY OR INDIRECTLY INTO ADJACENT HARBOR WATER, THROUGH THE HARBORS SMALL MS4 OR OTHER POTENTIAL PATHWAYS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REGULATORY FINES OR PENALTIES THAT MAY BE IMPOSED BY ENVIRONMENTAL REGULATORY AGENCIES (USEPA AND/OR STATE DOH) IN THE EVENT OF VIOLATIONS.
- ALOHA TOWER MARKETPLACE, HAWAII PACIFIC UNIVERSITY, CRUISE SHIP AND HARBOR OPERATIONS TAKE PRECEDENCE OVER CONSTRUCTION ACTIVITY. THE CONTRACTOR MUST WORK AROUND THESE OPERATIONS SO THAT THE PIER WILL REMAIN OPERATIONAL. WEEKEND WORK MAY BE REQUIRED AND SHALL BE COORDINATED WITH THE HARBORS CONSTRUCTION ENGINEER AND TENANTS IN ADVANCE.
- THE CONTRACTOR SHALL PROVIDE DOCUMENTATION ON THE TYPES, SIZES, AND LOCATIONS OF ALL STRIPING AND STENCILS IN THE WORK AREA TO THE HARBORS CONSTRUCTION ENGINEER BEFORE STARTING THE WORK. REINSTALLATION OF STRIPING AND STENCILS AFTER THE WORK HAS BEEN COMPLETED SHALL BE PERFORMED BY DOT HARBORS.
- THE CONTRACTOR SHALL SUBMIT A SITE-SPECIFIC BEST MANAGEMENT PRACTICES (BMP) PLAN TO THE HARBORS ENGINEERING BRANCH FOR REVIEW AND ACCEPTANCE PRIOR TO THE START OF ANY CONSTRUCTION WORK. THIS BMP PLAN SHALL COMPLY WITH THE TEMPORARY WATER POLLUTION, DUST, AND EROSION CONTROL ARTICLE IN THE SPECIFICATIONS AND PROPOSAL.
- IN CASE OF SPILL, LEAK OR OTHER RELEASE CONTAINING A HAZARDOUS SUBSTANCE OR OIL, THE CONTRACTOR SHALL NOTIFY APPROPRIATE FACILITY PERSONNEL, EMERGENCY RESPONSE AGENCIES, AND REGULATORY AGENCIES FOLLOWING NOTIFICATION PROCEDURES, AND SHALL NOTIFY THE HARBORS CONSTRUCTION ENGINEER AND ENVIRONMENTAL HOTLINE (808-587-1962) IMMEDIATELY (I.E., WITHIN 24 HOURS). SUCH CONTACT INFORMATION MUST BE IN LOCATIONS THAT ARE READILY ACCESSIBLE AND AVAILABLE.
- TIDAL DATA MAY NOT REPRESENT CONDITIONS THAT OCCUR DURING CONSTRUCTION AND ACTUAL WATER LEVELS WILL VARY FROM LEVELS INDICATED. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN ESTIMATES OF WATER LEVELS WHICH MAY OCCUR DURING CONSTRUCTION. VARIATION FROM TIDAL LEVELS INDICATED OR CONTRACTOR'S ESTIMATION OF TIDAL LEVELS WILL NOT BE CONSIDERED AS A CLAIM FOR ADDITIONAL COMPENSATION OR DELAY OF WORK.

**CONCRETE MATERIALS:**

- CONCRETE FOR SPALL REPAIRS SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF  $f'_c=5000$  PSI WITH SILICA FUME AND CORTEC MCI 2005NS MIGRATING CORROSION INHIBITING ADMIXTURE, OR APPROVED EQUAL.
- PATCHING COMPOUND FOR REPAIRING VERTICAL AND SOFFIT SPALLS IN LIFTS SHALL BE SIKAFIX VEH WITH LATEX R, OR APPROVED EQUAL.
- ANTI-CORROSION COATING WITH A MINIMUM 7 DAY OPEN TIME FOR EMBEDDED BARE STEEL AND NON-FACTORY COATED REINFORCING STEEL SHALL BE SIKA ARMATEC 110 EPOCEM, OR APPROVED EQUAL. PATCHING COMPOUND AND ANTI-CORROSION COATING SHALL BE FROM THE SAME MANUFACTURER.
- REINFORCING STEEL FOR WELD SPLICING SHALL BE ASTM A706 GRADE 60. WELDING ELECTRODES SHALL BE LOW HYDROGEN E70.
- REINFORCING STEEL NOT TO BE WELD SPLICED SHALL BE ASTM A706 OR ASTM A615, GRADE 60.
- SNAP TIES, TIE WIRES AND INSERTS SHALL BE PLASTIC OR STAINLESS STEEL.
- EPOXY FOR HORIZONTAL AND VERTICAL GROUTING OF DOWELS IN CRACKED OR UNCRACKED CONCRETE SHALL BE SET 3G BY SIMPSON STRONG-TIE OR APPROVED EQUAL.

**CONCRETE PLACEMENT:**

- THE CONTRACTOR SHALL REMOVE ALL EXISTING SPALLED OR DELAMINATED GUNITE ON SLABS, BEAMS, HAUNCHES, GIRDERS, PILE CAPS, PILES AND THE BULKHEAD WALL WITHIN THE PROJECT AREA AS SHOWN. SOUND GUNITE MAY REMAIN.
- AFTER REMOVAL OF GUNITE, THE CONTRACTOR SHALL REPAIR CONCRETE TO SPALLS AND DELAMINATIONS.
- ALL SPALLS AT AREAS TO BE COVERED WITH REPAIR CONCRETE SHALL BE PREPARED SIMILAR TO DESIGNATED SPALLED AREAS.
- CONCRETE CONSTRUCTION SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE ACI 318R.
- CONCRETE DELIVERY TICKETS SHALL RECORD ALL FREE WATER IN THE MIX: AT BATCHING BY PLANT, FOR CONSISTENCY BY DRIVER, AND ANY ADDITIONAL REQUEST BY CONTRACTOR IF PERMITTED BY THE MIX DESIGN. PROVIDE CONCRETE DELIVERY TICKETS TO THE HARBORS CONSTRUCTION ENGINEER ON THE SAME DAY AS THE CONCRETE POUR.
- CLEAR CONCRETE COVER FOR REINFORCING BARS SHALL BE 3 IN. MINIMUM, UNLESS OTHERWISE NOTED.
- BAR BENDS AND HOOKS SHALL BE "STANDARD HOOKS" IN ACCORDANCE WITH ACI 318.
- REINFORCING STEEL SHALL BE SPLICED AS INDICATED ON PLANS. PROVIDE WELD LAP SPLICE LENGTH PER TYPICAL DETAILS AND SCHEDULE, UNLESS OTHERWISE NOTED.
- EXISTING CONCRETE SURFACES WITHIN THE REPAIR AREAS SHALL BE ROUGHENED TO ENSURE PROPER ADHESION WITH REPAIR CONCRETE.
- FOR EPOXY-GROUTED DOWELS DRILL HOLES INTO THE SUBSTRATE FOR ANCHORAGE OF DOWELS AS SHOWN IN THE DRAWINGS. BLOW HOLES COMPLETELY CLEAN OF ALL CONCRETE DEBRIS TO ALLOW FOR ADEQUATE BONDING OF THE EPOXY. THE HOLES SHALL BE FILLED WITH EPOXY BEFORE INSERTING AND TURNING THE SUPPLEMENTAL REINFORCEMENT TO DISPLACE THE GROUT.
- REINFORCING BARS, INSERTS, AND OTHER ITEMS TO BE CAST IN THE CONCRETE SHALL BE SECURED IN POSITION PRIOR TO PLACEMENT OF CONCRETE.
- THE CONTRACTOR SHALL NOT SECURE FORMS BY RAMSETTING. ALL HOLES AND SPALLS CAUSED BY TEMPORARY ATTACHMENTS SHALL BE PATCHED. ALL INSERTS SHALL BE REMOVED OR SHALL BE STAINLESS STEEL WITH MINIMUM 3/4 IN. COVER AFTER FORM REMOVAL.
- PRIOR TO PLACEMENT OF CONCRETE, ALL SUBSTRATE SURFACES SHALL BE WASHED WITH CLEAN WATER AND THE EXPOSED CONCRETE SURFACE SHALL BE SATURATED WITH NO WATER ACCUMULATION ON THE SURFACE.
- CONCRETE SHALL BE VIBRATED, RODDED OR TAMPED DURING PLACEMENT TO CONSOLIDATE THE POUR AND FILL ALL CORNERS OF THE PATCH OR FORM AND BENEATH THE REINFORCING.
- THERE SHALL BE NO COLD JOINTS IN THE FIELD OF THE REPAIR.
- THE REPAIRED SURFACE FINISH SHALL MATCH THE ORIGINAL SURFACE FINISH.
- VOID SPACES BEYOND THE EDGE OF THE FORM SHALL BE DRY PACKED IN LIFTS WITH PATCHING COMPOUND.
- REPAIR AREAS SHALL NOT BE SUBJECTED TO LIVE LOADS UNTIL THE CONCRETE HAS BEEN ALLOWED TO CURE FOR 7 DAYS.

**PREPARATION OF SUBSTRATE AND REINFORCING STEEL FOR SPALL REPAIRS:**

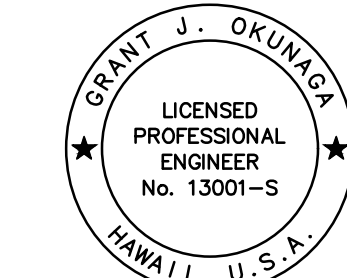

- ANY ELEMENT BEING REPAIRED SHALL NOT BE SUBJECTED TO LIVE LOADS DURING THE PERIOD STARTING FROM THE REMOVAL OF EXISTING CONCRETE UNTIL THE REPAIR CONCRETE HAS BEEN ALLOWED TO CURE FOR 7 DAYS.
- PREPARATION OF SUBSTRATE AND REINFORCING STEEL FOR SPALL REPAIRS SHALL BE PERFORMED IN THE ORDER LISTED BELOW.
- THE SPALLED AND DELAMINATED CONCRETE SHALL BE COMPLETELY REMOVED TO SOUND SUBSTRATE AND BEYOND THE EXTENT OF THE CORRODED REINFORCING. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO AVOID DAMAGING THE UNDERLYING SOUND CONCRETE.
- THE SPALLED AND DELAMINATED EDGES SHALL BE SQUARED BY SAW-CUTTING AND CHIPPING THE CONCRETE AT THE PERIMETER BEYOND THE REMOVAL AREA AS NECESSARY TO ATTAIN A MINIMUM DEPTH OF 3/4 IN. 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 EXPOSED REINFORCEMENT WITHIN THE REPAIR AREA, ADDITIONAL CONCRETE SHALL BE REMOVED FOR A MINIMUM 3/4 IN. CLEAR SPACE MEASURED RADIALLY AROUND THE BARS.
- ALL EXPOSED CONCRETE SURFACES AND REINFORCING BARS IN THE REPAIR AREA SHALL BE SANDBLASTED OR NEEDLE GUNNED TO REMOVE ALL SCALE, LOOSE RUST, DEBRIS AND DETERIORATED CONCRETE. ANY AREAS NOT PATCHED MORE THAN 48 HOURS AFTER SANDBLASTING SHALL BE RECLEANED.
- ANY REINFORCEMENT WHICH HAS LOST MORE THAN 20 PERCENT OF ITS CROSS-SECTIONAL AREA SHALL BE CALLED TO THE ATTENTION OF THE HARBORS CONSTRUCTION ENGINEER.
- ALL WELDING SHALL CONFORM TO AWS D1.4.
- ALL EXISTING BARS WITH CARBON EQUIVALENT (C.E.) ABOVE 0.55 PERCENT SHALL BE PREHEATED ACCORDING TO THE REQUIREMENTS SET FORTH IN AWS D1.4. IF THE C.E. IS UNKNOWN, MAXIMUM PREHEAT REQUIREMENTS, (500 DEGREES F) FOR AN ASSUMED C.E. GREATER THAN 0.75 PERCENT SHALL BE USED.
- THE PATCH AREA SHALL BE CLEANED OF ALL DUST AND DEBRIS JUST PRIOR TO PATCHING WITH HIGH PRESSURE, OIL-FREE COMPRESSED AIR AT A MINIMUM 100 PSI.

**APPLICATION OF SPALL REPAIR MATERIALS:**

- ALL EXPOSED STEEL SHALL BE LIBERALLY COATED WITH ANTI-CORROSION COATING PER MANUFACTURER'S RECOMMENDATIONS.
- ALL VERTICAL AND OVERHEAD REPAIRS GREATER THAN 5 SQUARE FEET SHALL BE FORMED.
- PATCHING COMPOUND MAY BE USED INSTEAD OF FORMED CONCRETE FOR VERTICAL AND OVERHEAD REPAIRS LESS THAN OR EQUAL TO 5 SQUARE FEET IN AREA. A SLURRY COAT OF THE COMPOUND SHALL BE USED TO PRIME THE SUBSTRATE AND THE MATERIAL SHALL BE APPLIED IN LIFTS PER MANUFACTURER'S RECOMMENDATIONS.
- WITH THE EXCEPTION OF TOP SURFACE OF DECK, ALL CONCRETE REPAIRS SHALL BE BUILT UP TO OR BEYOND THE ORIGINAL SURFACE AND SHALL MAINTAIN A 3 INCH MINIMUM COVER FOR REINFORCING.
- CONCRETE REPAIRS ON THE UNDERSIDE OF THE PIER SHALL BE CURED EITHER BY LEAVING FORMS IN PLACE A MINIMUM OF 7 DAYS OR IF FORMWORK IS REMOVED PRIOR TO 7 DAYS, COVERING THE SURFACE WITH A CURING COMPOUND IMMEDIATELY AFTER REMOVAL OF FORMWORK.
- CONCRETE REPAIRS ON THE TOPSIDE OF THE PIER SHALL BE CURED A MINIMUM 7 DAYS BY COVERING THE SURFACE WITH A POLYETHYLENE SHEET OVER WET BURLAP.
- APPLY ASPHALT CONCRETE TO MATCH EXISTING ASPHALT WEARING SURFACE ELEVATION AT TOP DECK SURFACE.

**EPOXY COATING SYSTEM:**

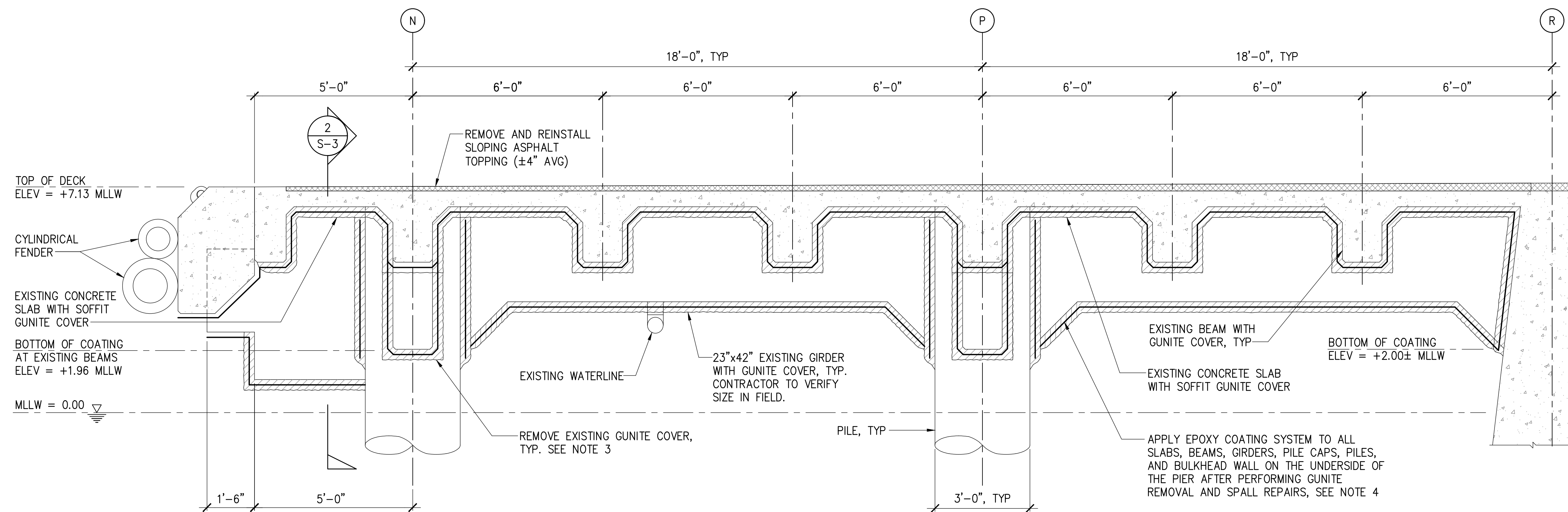
- EPOXY COATING SYSTEM SHALL BE TWO COATS OF AMERLOCK 400 BY PPG PROTECTIVE AND MARINE COATINGS, OR APPROVED EQUAL.
- CONCRETE SHALL BE ALLOWED TO CURE A MINIMUM OF 14 DAYS OR PER MANUFACTURER'S RECOMMENDATIONS BEFORE APPLYING EPOXY COATING SYSTEM.
- CLEAN ALL CONCRETE SURFACES TO BE COATED PER MANUFACTURER'S RECOMMENDATIONS.
- EPOXY COATING SYSTEM SHALL BE APPLIED TO ALL UNCOATED AREAS IN THE PROJECT AREA. SEE PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- APPLY EPOXY COATING SYSTEM TO ALL CONCRETE SURFACES OF SLABS, BEAMS, GIRDERS, PILE CAPS, AND PILES ON THE UNDERSIDE OF THE PIER DOWN TO AND INCLUDING THE SOFFIT OF BEAMS AND GIRDERS IN THE PROJECT AREA.

		REVISION    DATE    DESCRIPTION    BY    APPROVED	
STATE OF HAWAII <b>DEPARTMENT OF TRANSPORTATION</b> HARBORS			
JOB TITLE HONOLULU HARBOR, PIER 10, SUBSTRUCTURE REPAIRS, OAHU, HAWAII			
SHEET TITLE <b>STRUCTURAL NOTES</b>			
DESIGNED BY: RA DRAWN BY: DL CHECKED BY: GO DATE: 04/2026 SCALE: AS SHOWN	JOB NUMBER S10955		SHEET <b>S-1</b> 3 of 10 SHTS.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION EXP. 4-30-28  MKE ASSOCIATES LLC			

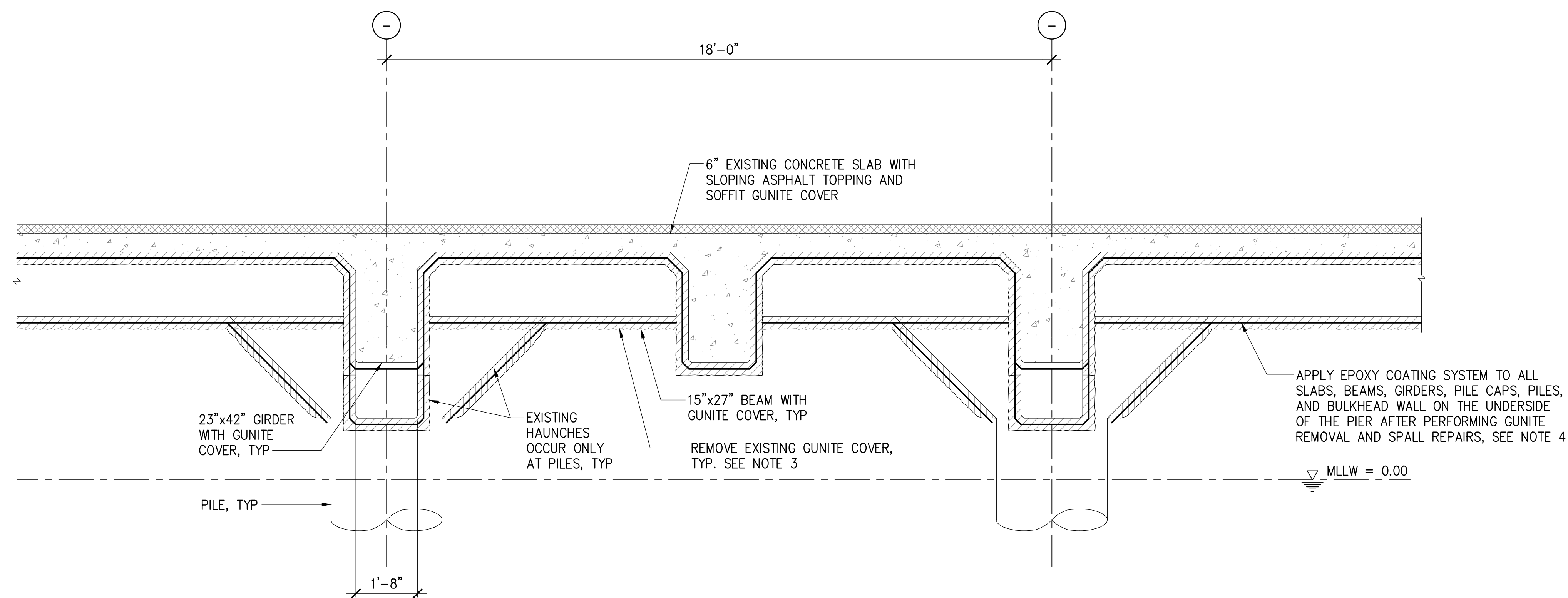


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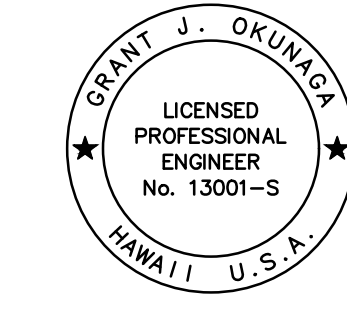
1. PORTIONS OF THE UNDERSIDE OF SLABS, BEAMS, GIRDERS, PILES AND THE BULKHEAD WALL HAVE BEEN COVERED WITH GUNITE. SEE PLANS FOR LOCATIONS. ALL DIMENSIONS REFLECT SLAB, BEAM AND GIRDER DIMENSIONS SHOWN ON ORIGINAL DRAWINGS BEFORE GUNITE APPLICATION.
2. CONTRACTOR SHALL REMOVE ALL EXISTING SPALLED AND DELAMINATED GUNITE ON SLABS, BEAMS, HAUNCHES, GIRDERS, PILES AND THE BULKHEAD WALL IN THE PROJECT VICINITY AND SOUND EXISTING CONCRETE FOR SPALLS. SOUND EXISTING GUNITE NOT EASILY REMOVED BY CHIPPING AND CONFIRMED BY THE HARBORS CONSTRUCTION ENGINEER MAY REMAIN. FOR BIDDING PURPOSES, CONTRACTOR MAY ASSUME THICKNESS OF GUNITE TO BE 4".
3. ALL ITEMS SHOWN ON THIS SHEET ARE EXISTING, UNLESS OTHERWISE NOTED.
4. APPLY EPOXY COATING OVER ENTIRE UNCOATED SUBSTRUCTURE IN THE PROJECT LOCATION AS SHOWN.




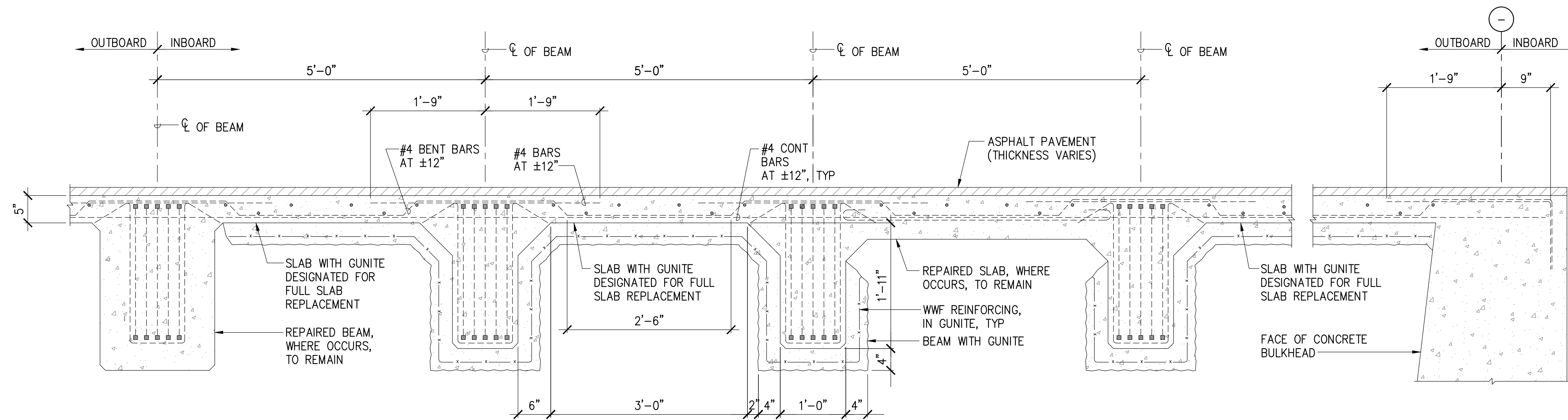
1 TYPICAL TRANSVERSE SECTION  
SCALE: 1/2" = 1'-0"



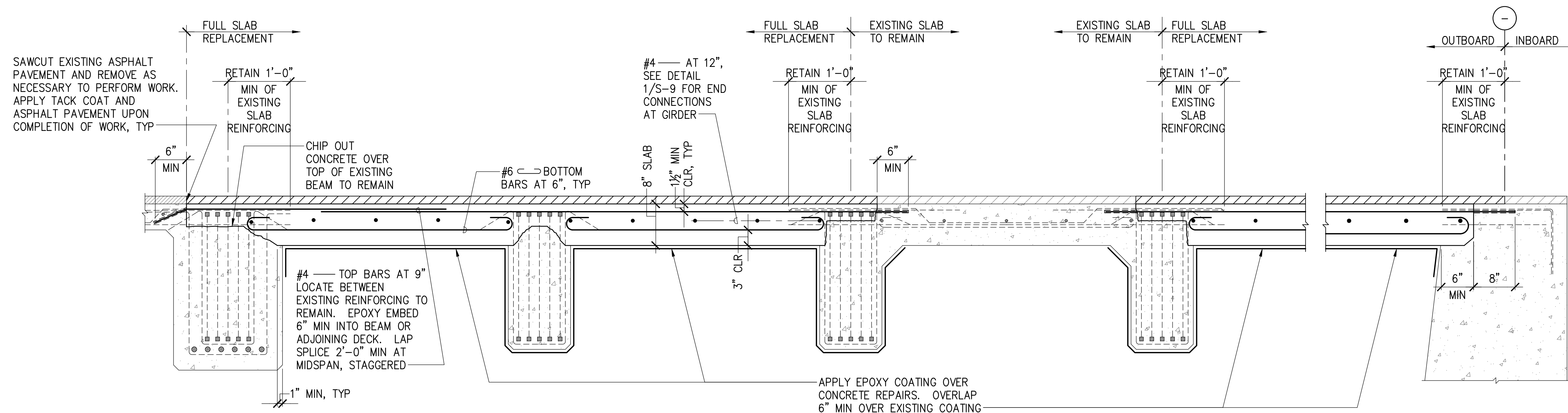
2 TYPICAL LONGITUDINAL SECTION  
SCALE: 1/2" = 1'-0"

		REVISION    DATE    DESCRIPTION    BY    APPROVED	
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS			
JOB TITLE HONOLULU HARBOR, PIER 10, SUBSTRUCTURE REPAIRS, OAHU, HAWAII			
SHEET TITLE EXISTING PIER SECTIONS			
DESIGNED BY: RA	JOB NUMBER S10955	SHEET	
DRAWN BY: DL		S-3	
CHECKED BY: GO		5 of 10 SHEETS	
DATE: 04/2026			
SCALE: AS SHOWN			

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 EXP. 4-30-28  
  
 MKE ASSOCIATES LLC



EXISTING CONDITION



SLAB REPLACEMENT END CONDITION AT EXISTING BEAM TO REMAIN

SLAB REPLACEMENT CONTINUOUS

SLAB REPLACEMENT END CONDITION

SLAB REPLACEMENT END CONDITION

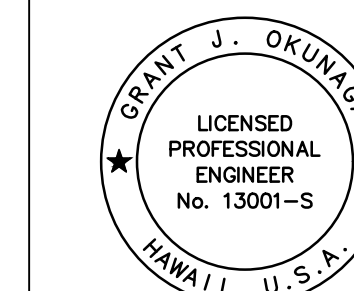
SLAB REPLACEMENT END AT BULKHEAD

REPAIRED CONDITION

NOTE:

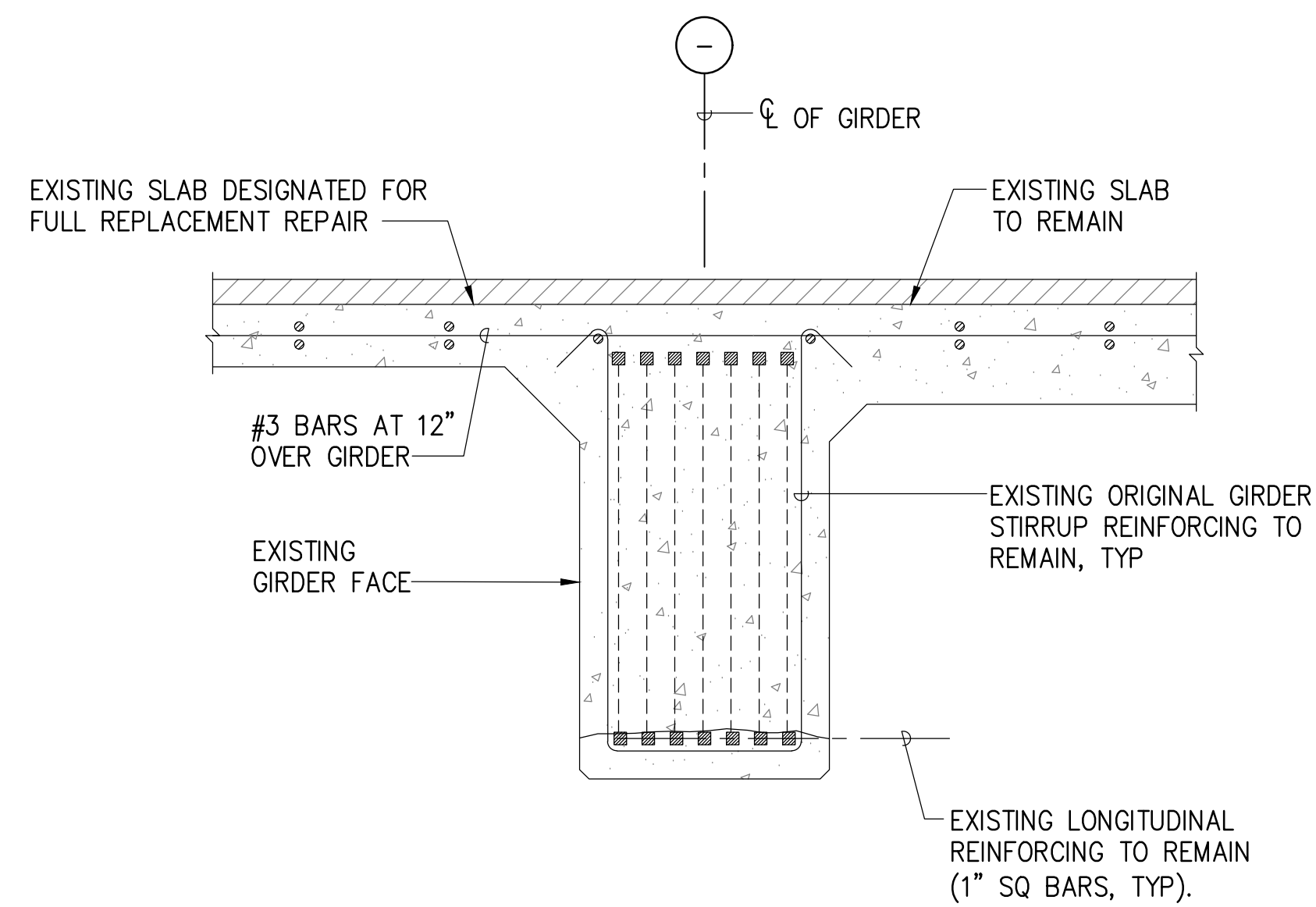
1. REMOVE EXISTING CONCRETE SLAB TO LINE AS SHOWN, LEAVING HAUNCH. SAVE ALL EXISTING REINFORCING TOP AND BOTTOM AS SHOWN. CLEAN ALL LOOSE CORROSION FROM EXISTING REINFORCING AND COAT ALL REINFORCING WITH ANTI-CORROSION COATING.

1 FULL SLAB REPLACEMENT DETAILS  
S-4 SCALE: 1" = 1'-0"



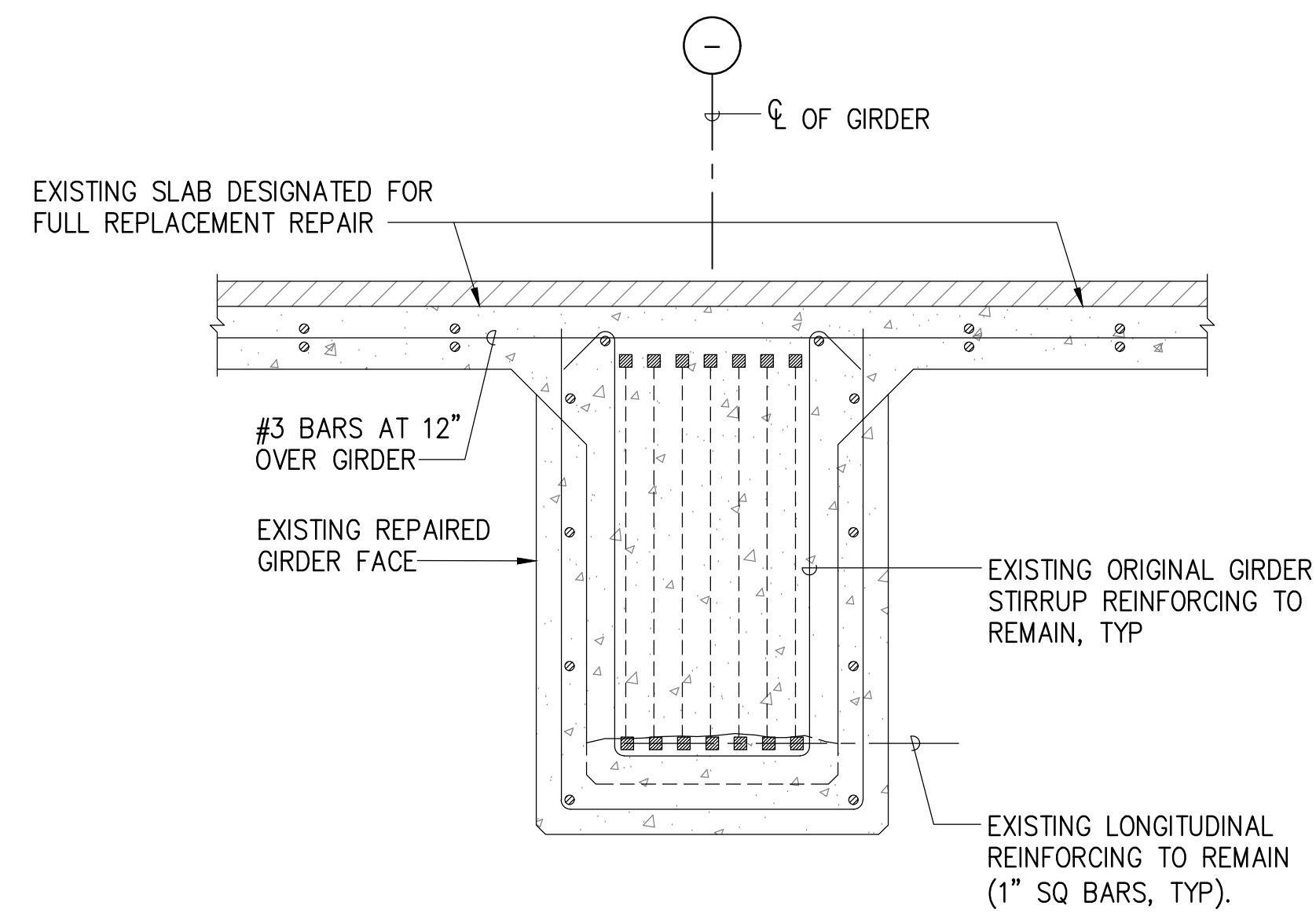
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EXP. 4-30-28  
*Grant J. Okuniga*  
MKE ASSOCIATES LLC

REVISION	DATE	DESCRIPTION	BY	APPROVED
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS				
JOB TITLE HONOLULU HARBOR, PIER 10, SUBSTRUCTURE REPAIRS, OAHU, HAWAII				
SHEET TITLE FULL SLAB REPLACEMENT DETAILS				
DESIGNED BY: RA	JOB NUMBER		SHEET	
DRAWN BY: DL	S10955		S-4	
CHECKED BY: GO	DATE: 04/2026		6 OF 10 SHTS.	
SCALE: AS SHOWN				



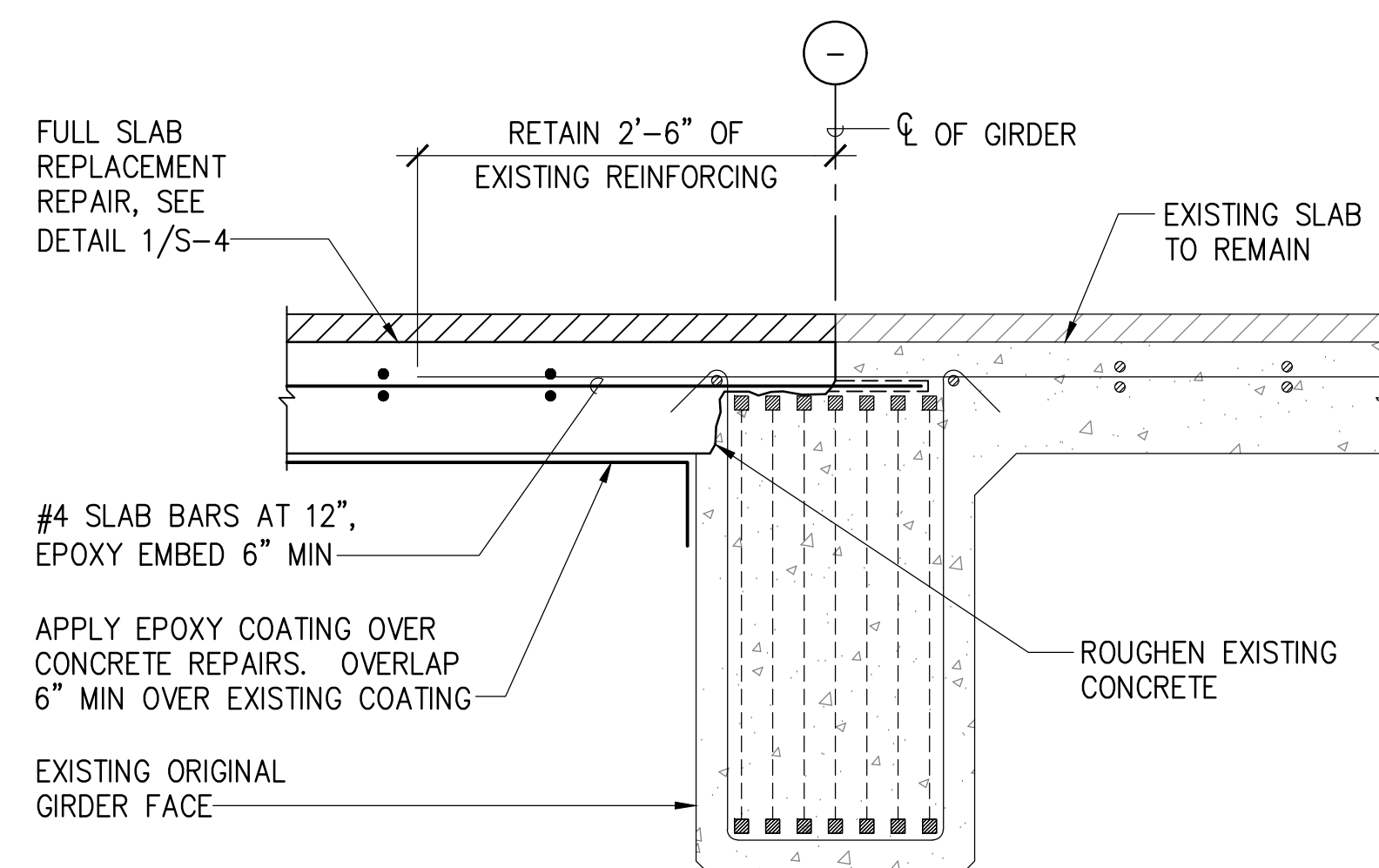
GIRDER SECTION  
SLAB REPLACEMENT ON ONE END

EXISTING CONDITION



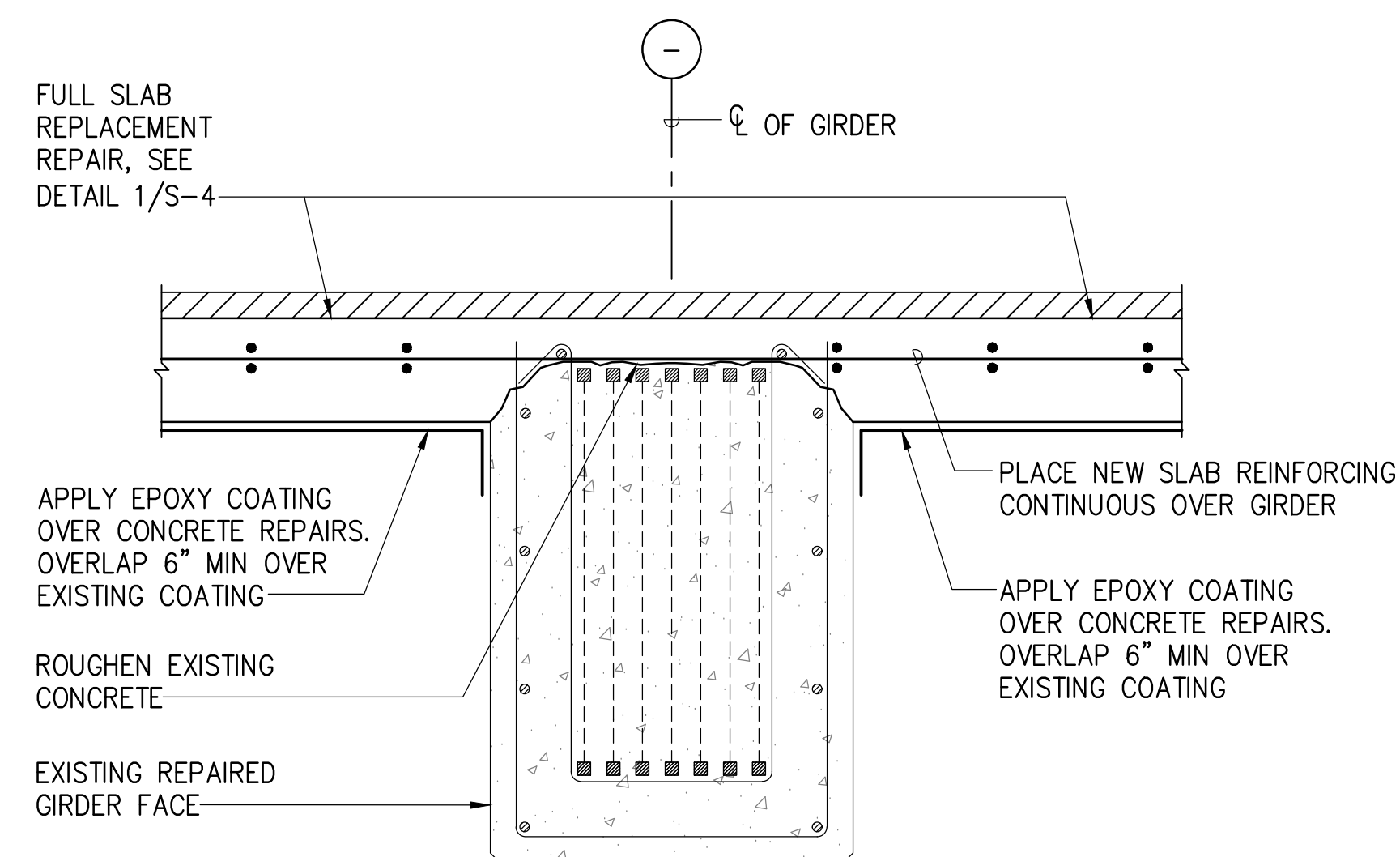
GIRDER SECTION  
SLAB REPLACEMENT ON BOTH ENDS

EXISTING CONDITION



SLAB REPLACEMENT ON ONE END AT GIRDER SECTION

REPAIRED CONDITION

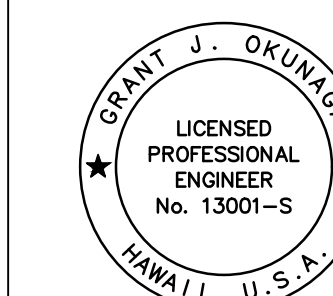


SLAB REPLACEMENT ON BOTH ENDS AT PREVIOUSLY REPAIRED

REPAIRED CONDITION

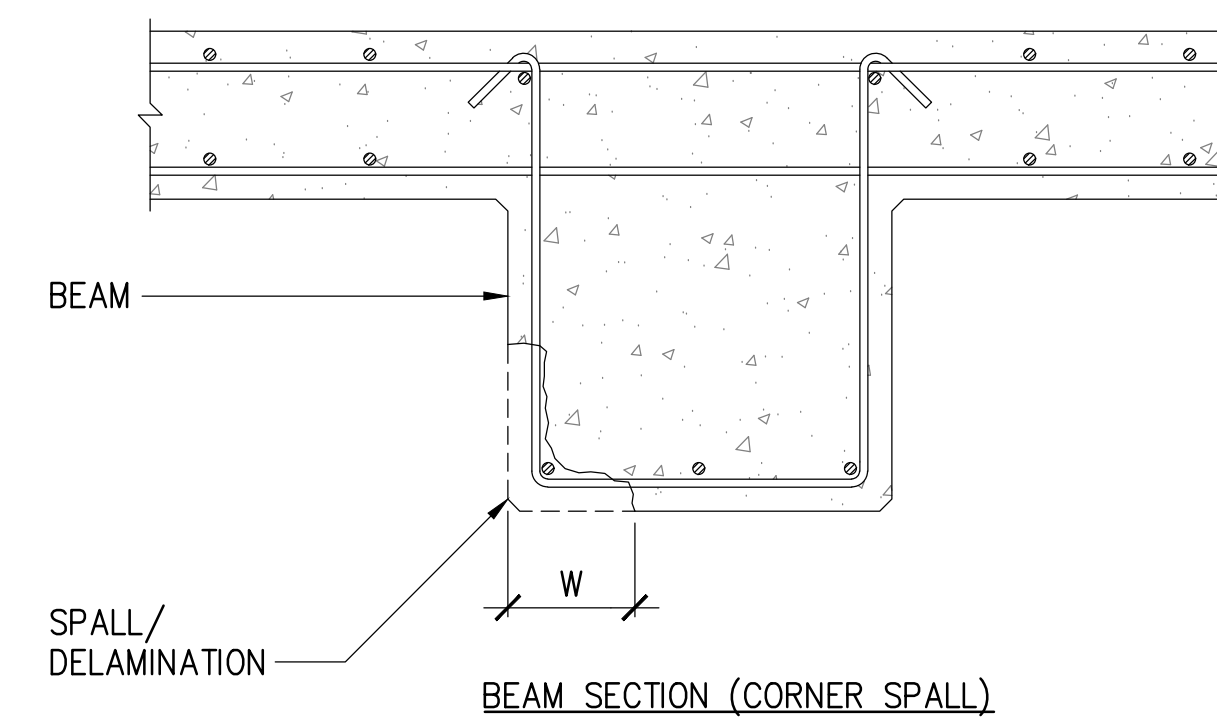
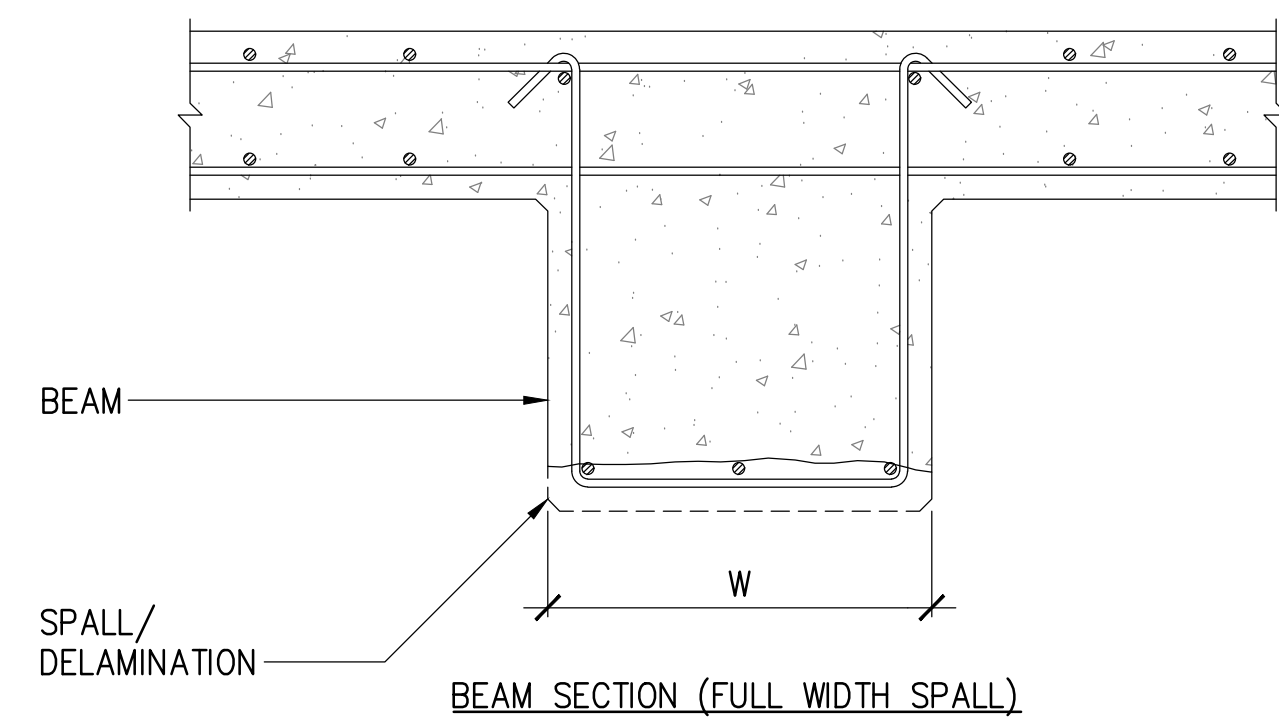
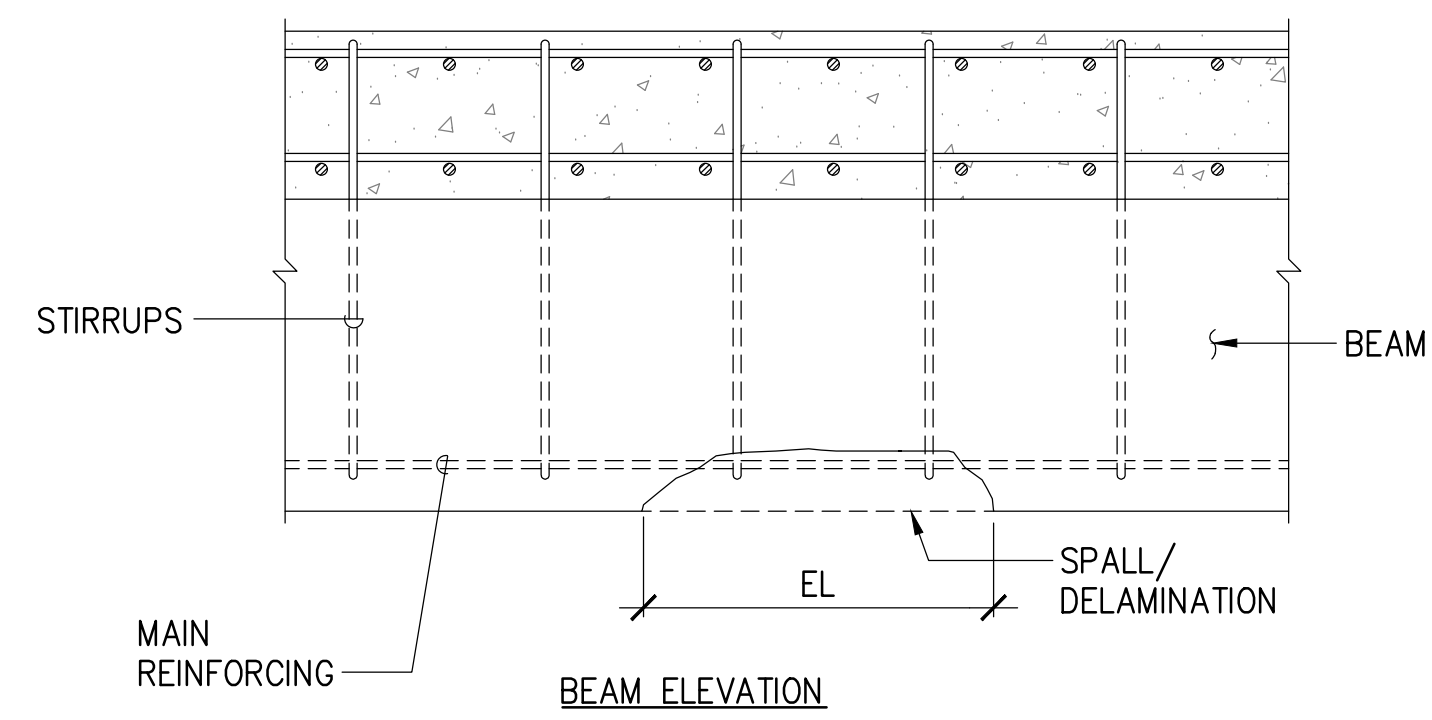
NOTE:

APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.



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EXP. 4-30-28  
*Grant J. Okunaga*  
MKE ASSOCIATES LLC

REVISION	DATE	DESCRIPTION	BY	APPROVED
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS				
JOB TITLE HONOLULU HARBOR, PIER 10, SUBSTRUCTURE REPAIRS, OAHU, HAWAII				
SHEET TITLE FULL SLAB REPLACEMENT DETAILS				
DESIGNED BY: RA	DRAWN BY: DL			CHECKED BY: GO
DATE: 04/2026	JOB NUMBER: S10955			SCALE: AS SHOWN
				SHEET <b>S-5</b> 7 OF 10 SHEETS



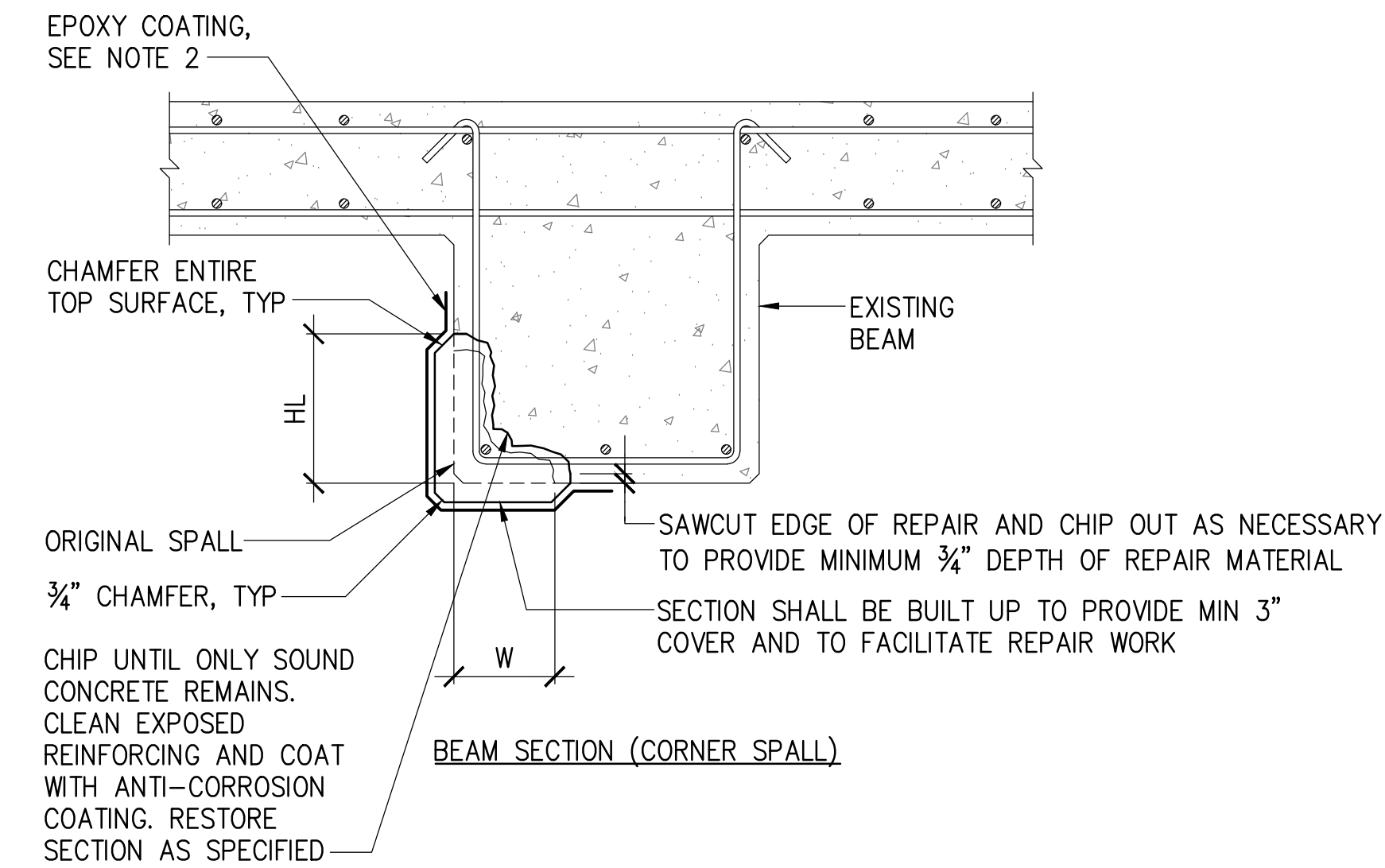
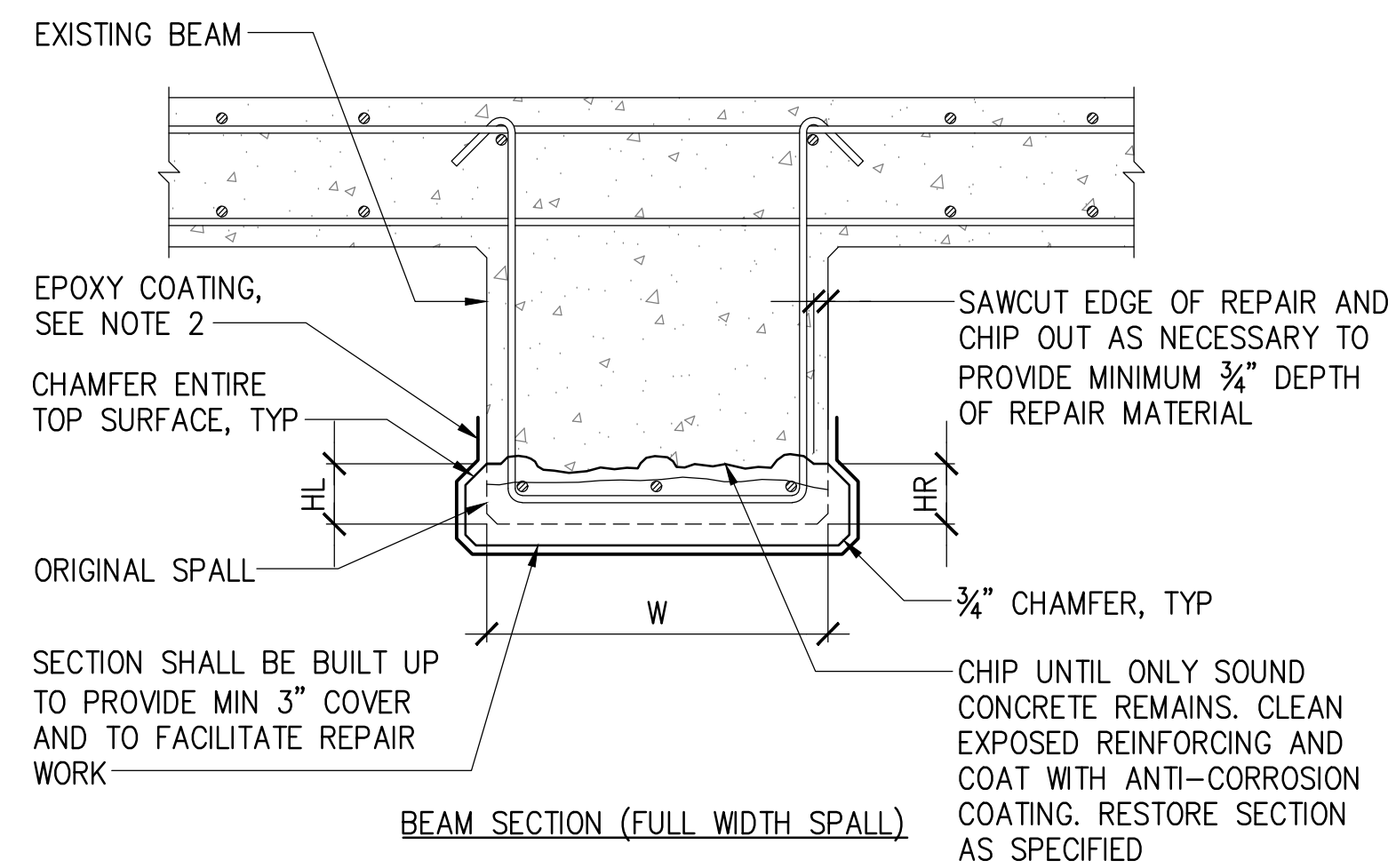
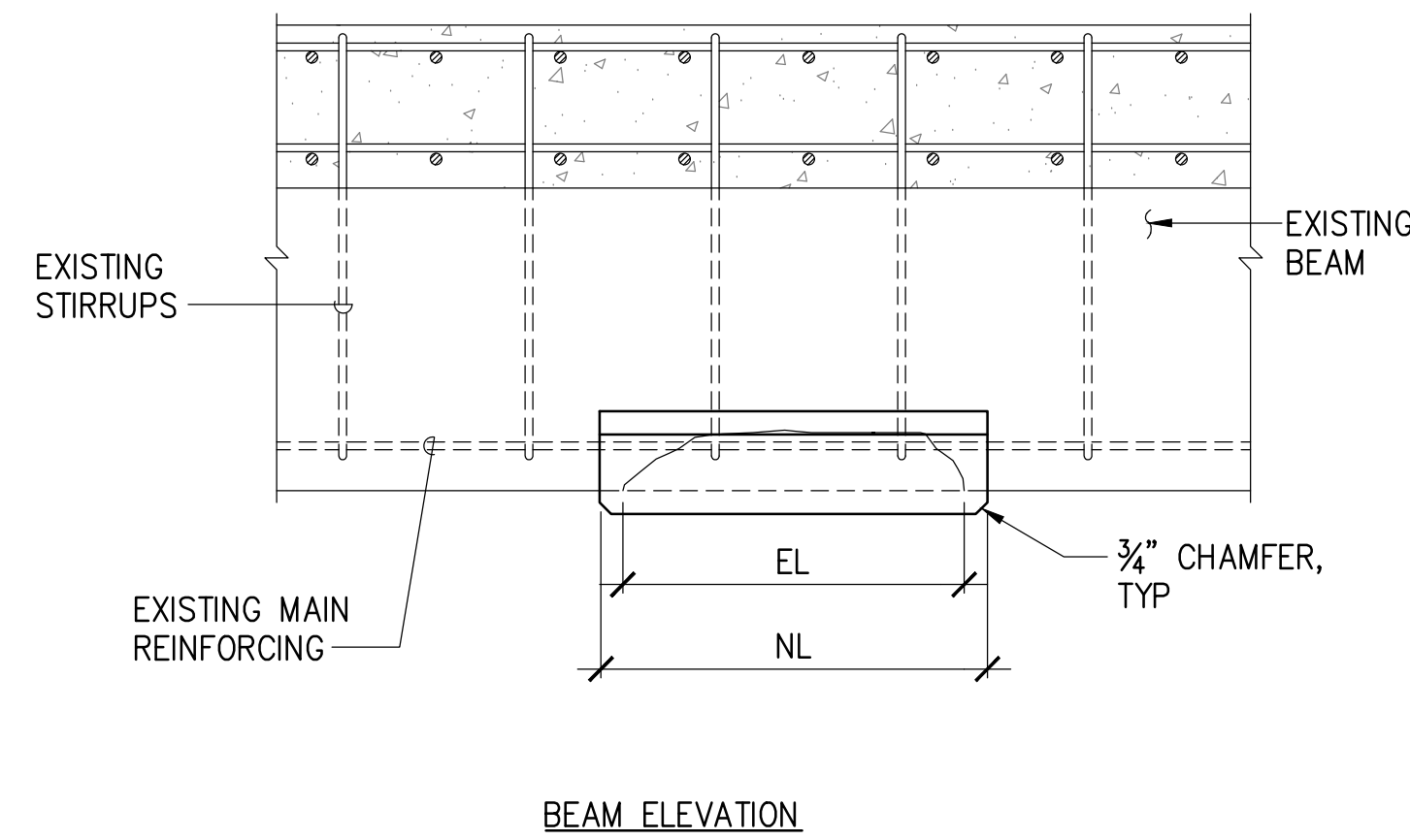
**PAY AREA:**  
 HL = HEIGHT OF REPAIR (LEFT SIDE)  
 HR = HEIGHT OF REPAIR (RIGHT SIDE)  
 W = ORIGINAL WIDTH OF BEAM/GIRDER  
 EL = EXISTING LENGTH OF SPALL  
 NL = LENGTH OF REPAIR

PAY AREA = (HL+HR+W)NL

**NOTES:**

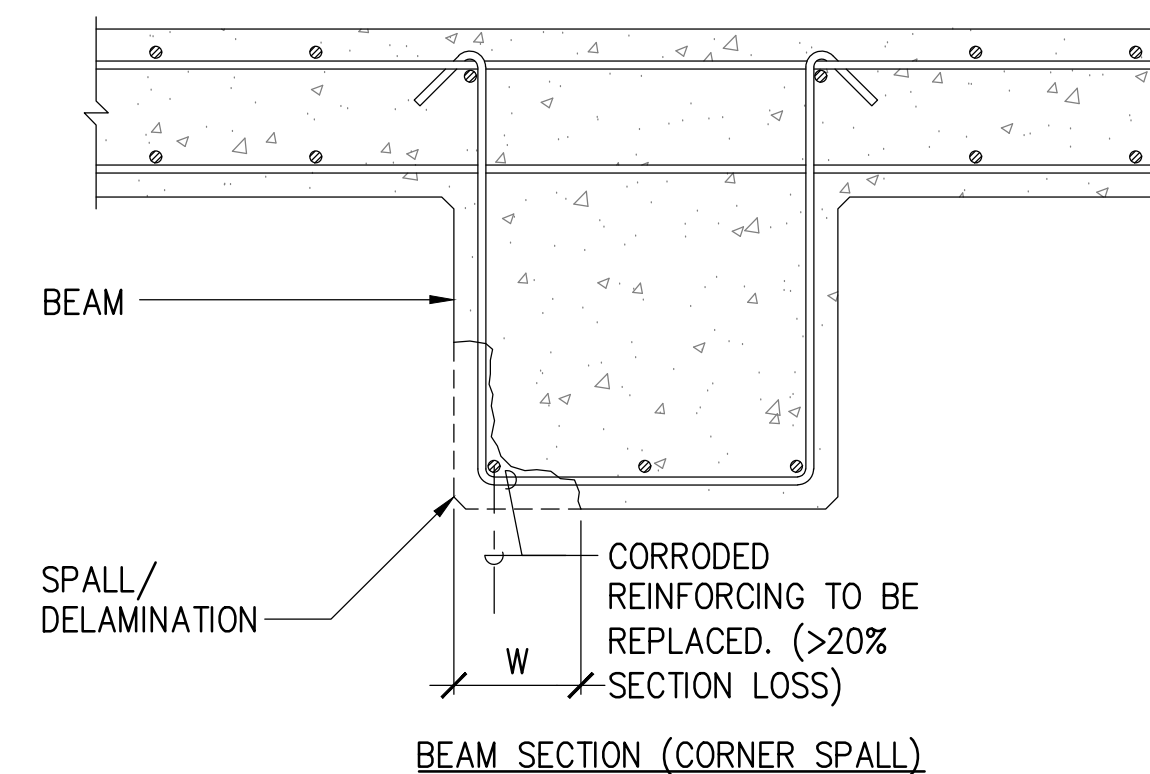
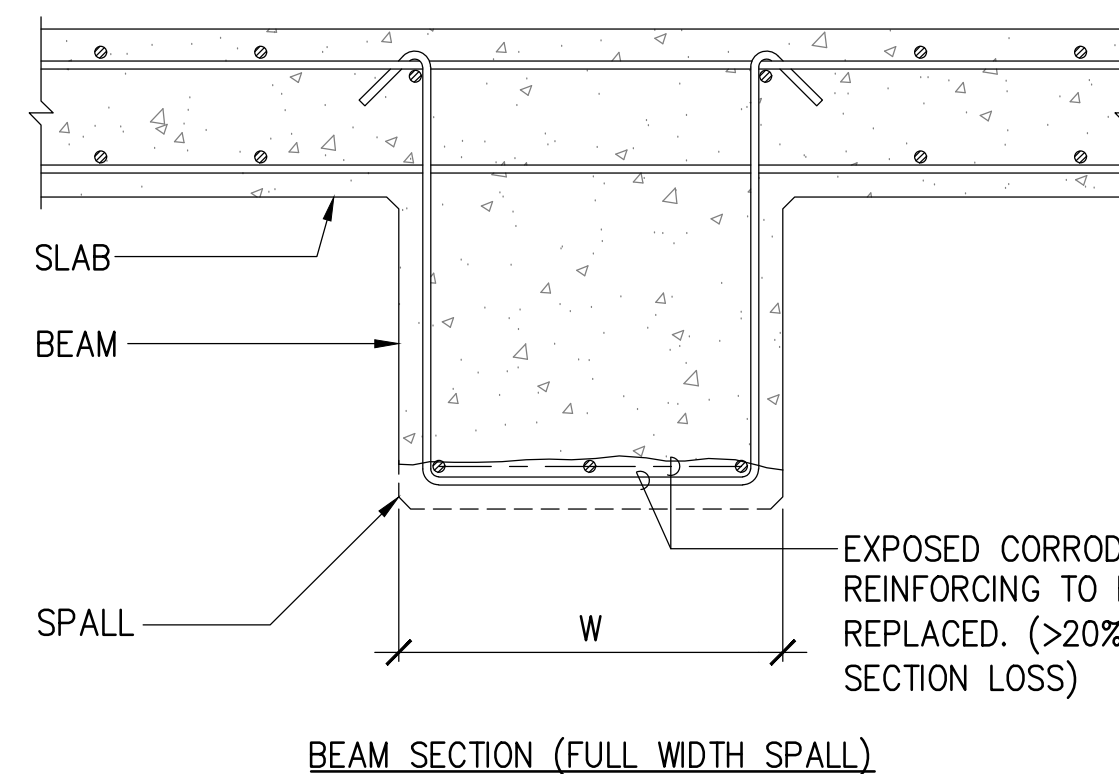
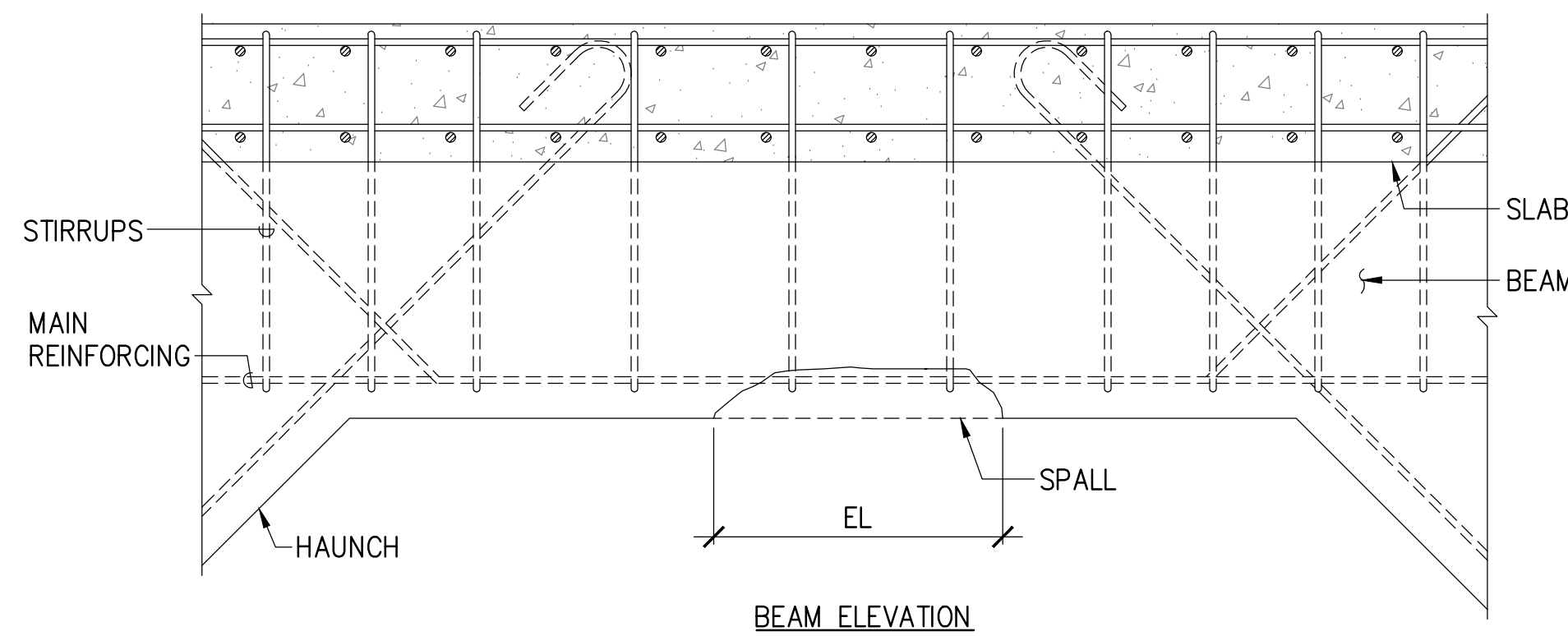
1. PAY AREA SHALL BE THE TOTAL REPAIRED AREA ON ALL BEAM FACES. IF HL, HR OR W VARY ALONG THE LENGTH OF REPAIR, PAY AREA SHALL BE CALCULATED INDIVIDUALLY FOR EACH BEAM FACE.
2. APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.

**EXISTING CONDITION**



**REPAIRED CONDITION**

**1 BEAM SPALL REPAIR (TYPE B)**  
 S-6 NOT TO SCALE



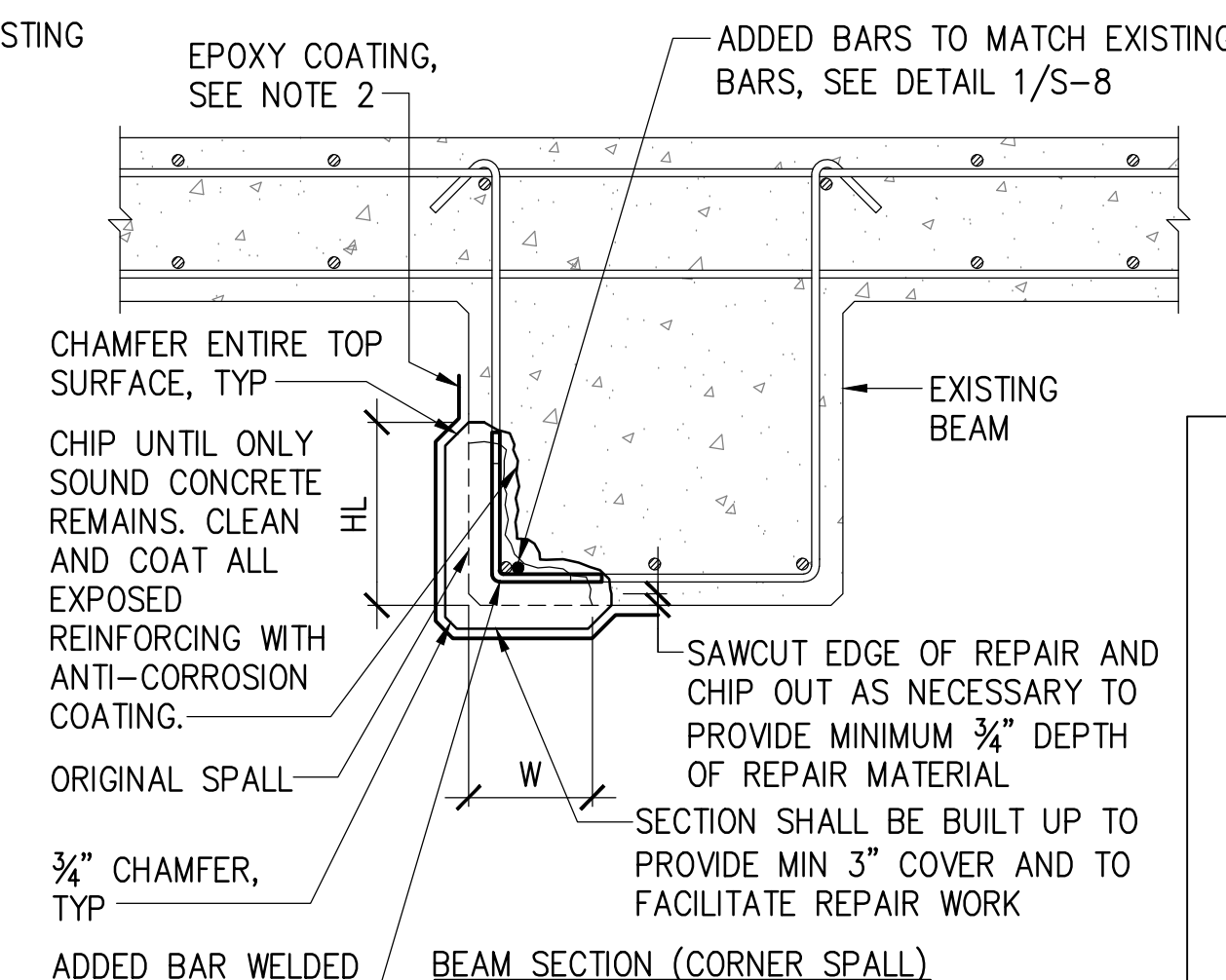
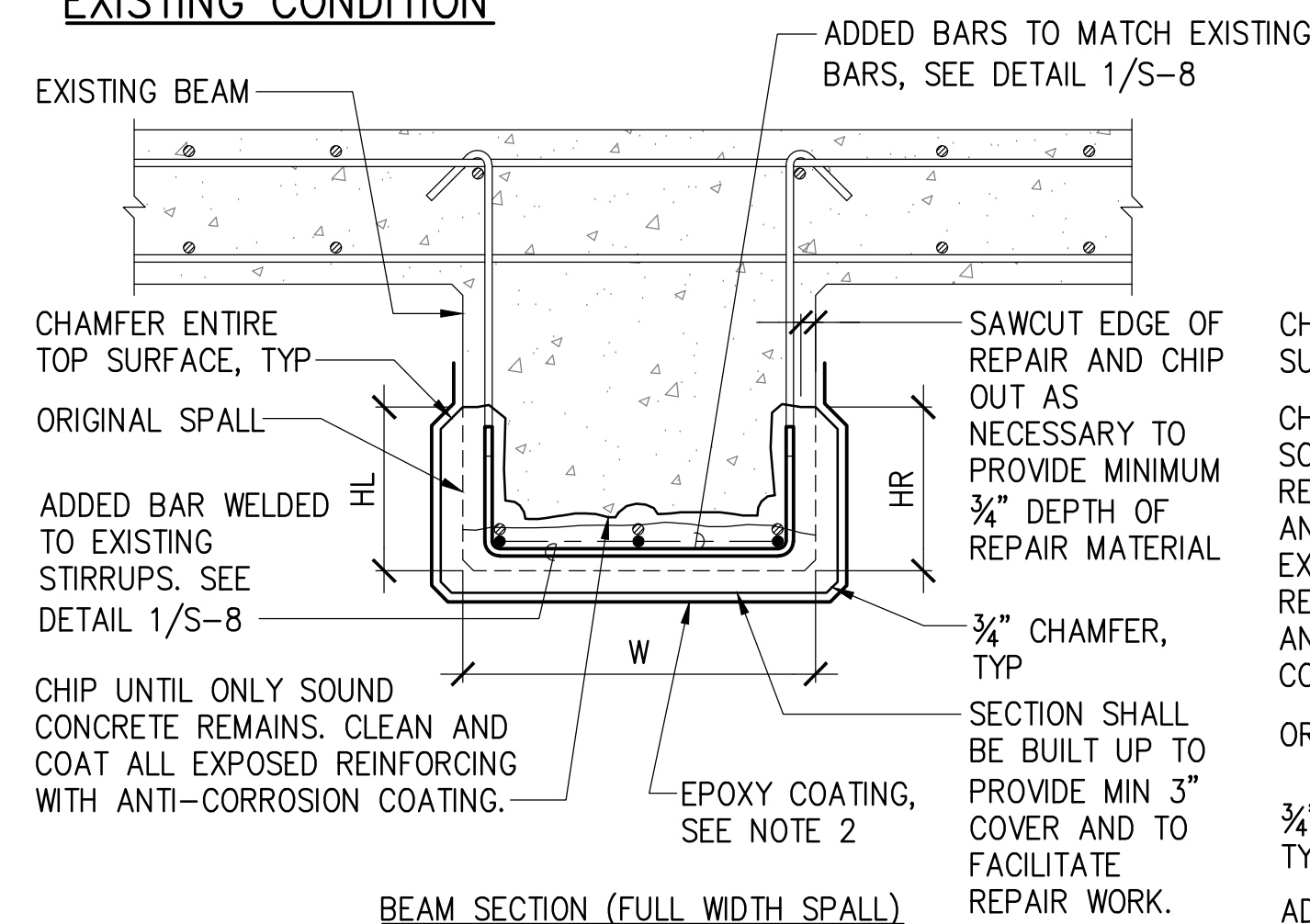
**PAY AREA:**  
 HL = HEIGHT OF REPAIR (LEFT SIDE)  
 HR = HEIGHT OF REPAIR (RIGHT SIDE)  
 W = ORIGINAL WIDTH OF BEAM/GIRDER SPALL  
 EL = EXISTING LENGTH OF SPALL  
 NL = LENGTH OF REPAIR

PAY AREA = (HL+HR+W)NL

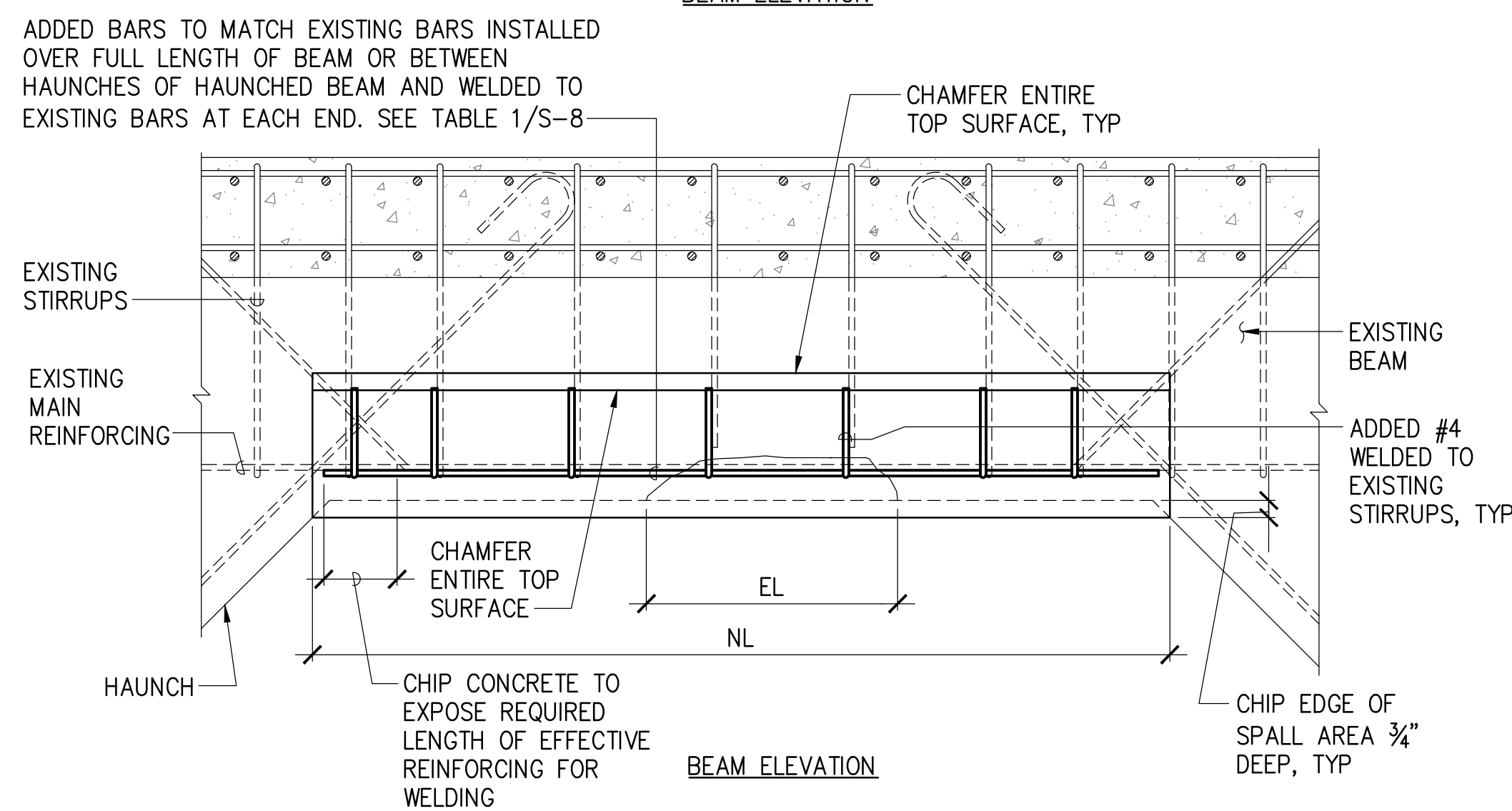
**NOTES:**

1. PAY AREA SHALL BE THE TOTAL REPAIRED AREA ON ALL BEAM FACES. IF HL, HR OR W VARY ALONG THE LENGTH OF REPAIR, PAY AREA SHALL BE CALCULATED INDIVIDUALLY FOR EACH BEAM FACE.
2. APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.

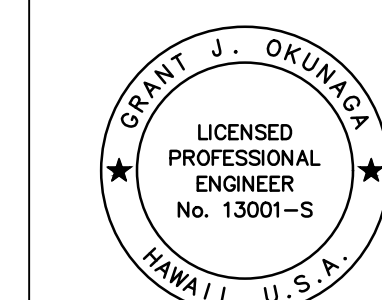
**EXISTING CONDITION**



**REPAIRED CONDITION**

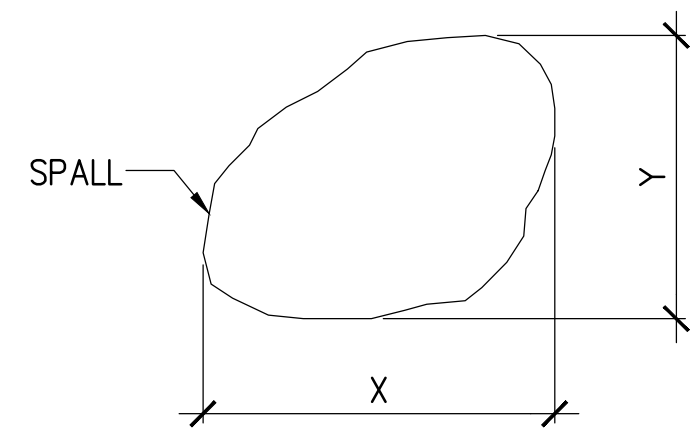


**2 BEAM SPALL REPAIR WITH REINFORCING STEEL REPLACEMENT (TYPE BR)**  
 S-6 NOT TO SCALE



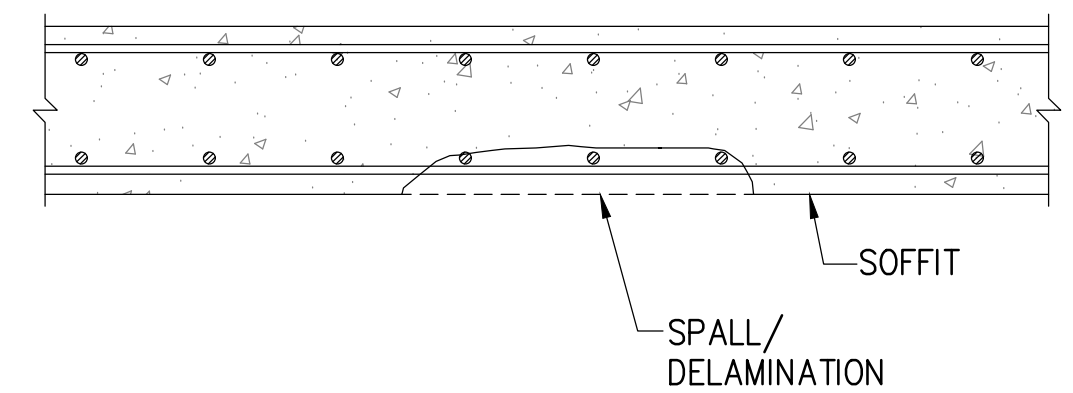
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION  
 EXP. 4-30-28  
 MKE ASSOCIATES LLC

REVISION	DATE	DESCRIPTION	BY	APPROVED
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS				
JOB TITLE HONOLULU HARBOR, PIER 10, SUBSTRUCTURE REPAIRS, OAHU, HAWAII				
SHEET TITLE BEAM SPALL REPAIR DETAILS				
DESIGNED BY: RA				SHEET <b>S-6</b>
DRAWN BY: DL				8 of 10 SHTS.
CHECKED BY: GO				
DATE: 04/2026	JOB NUMBER	S10955		
SCALE: AS SHOWN				



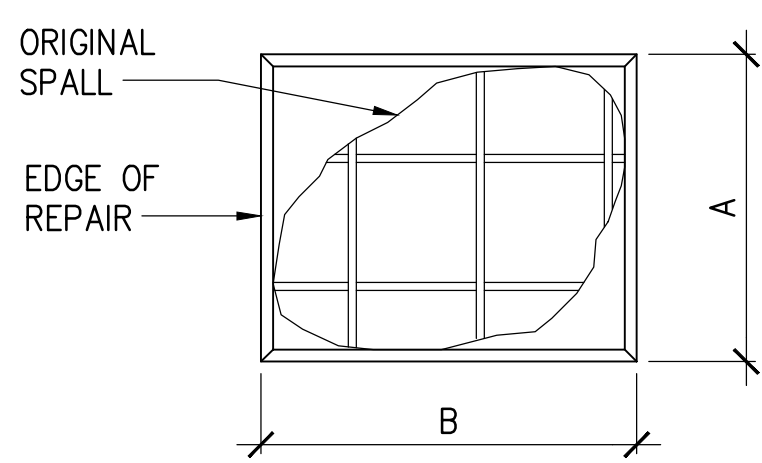
SOFFIT PLAN

EXISTING SPALL AREA = X x Y



SECTION

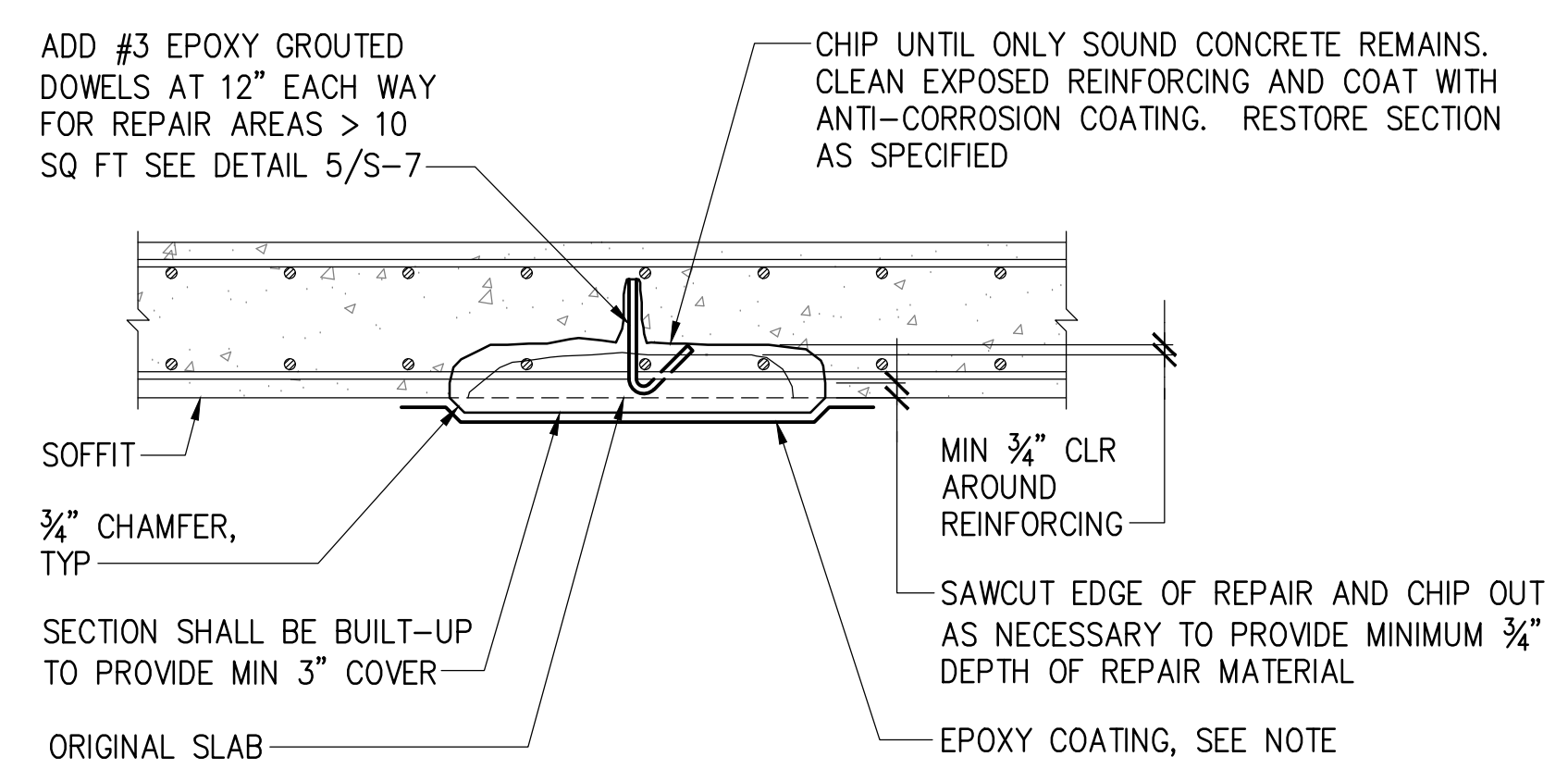
EXISTING CONDITION



PAY AREA = A x B

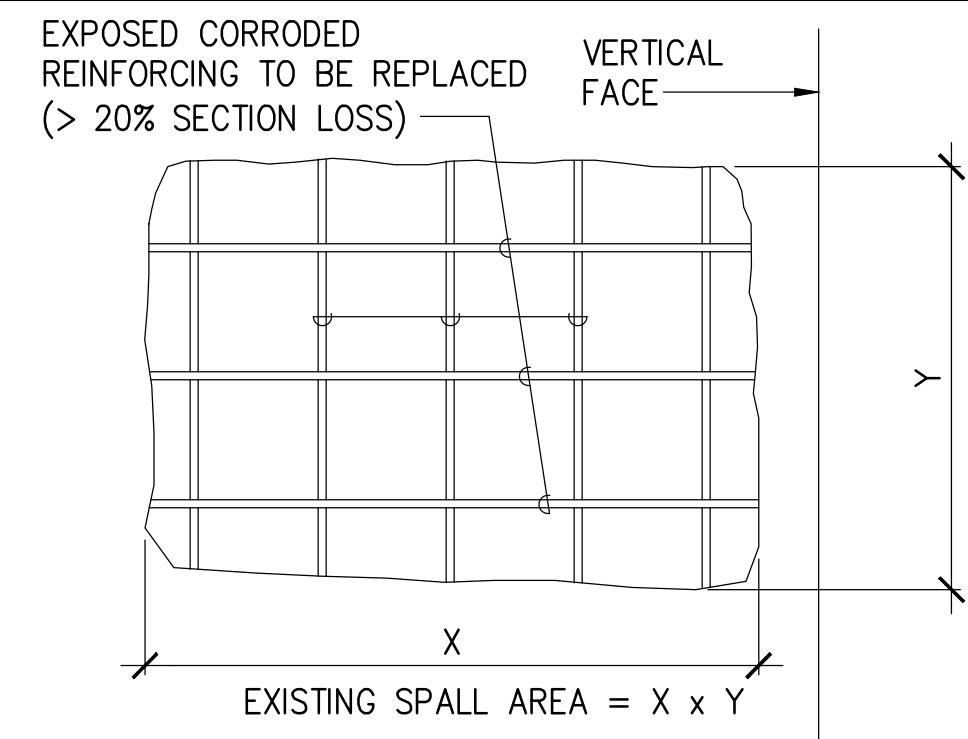
SOFFIT PLAN

REPAIRED CONDITION

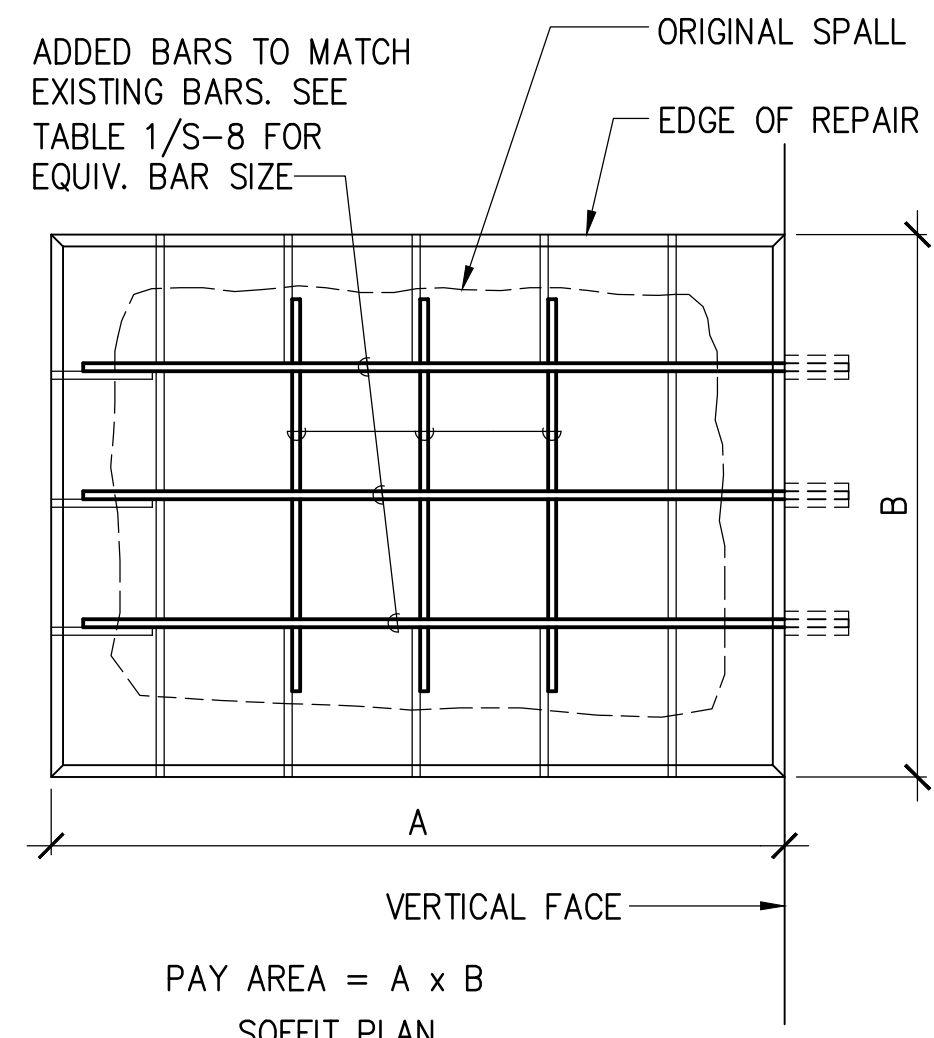


SECTION

NOTE:  
APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.



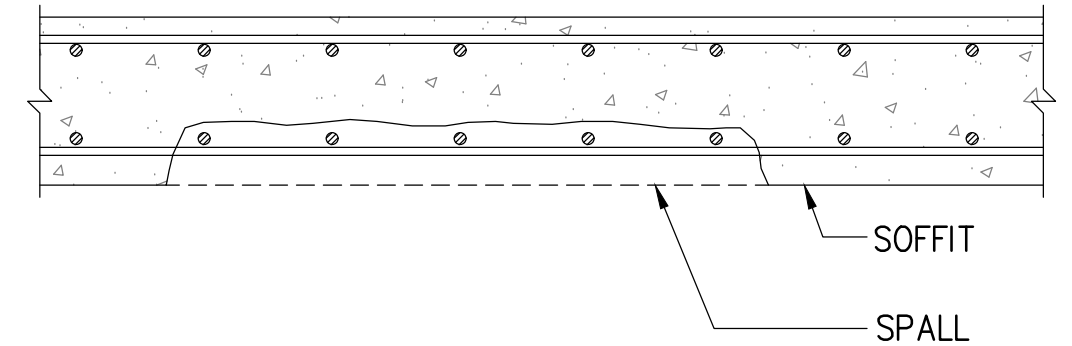
SOFFIT PLAN



SOFFIT PLAN

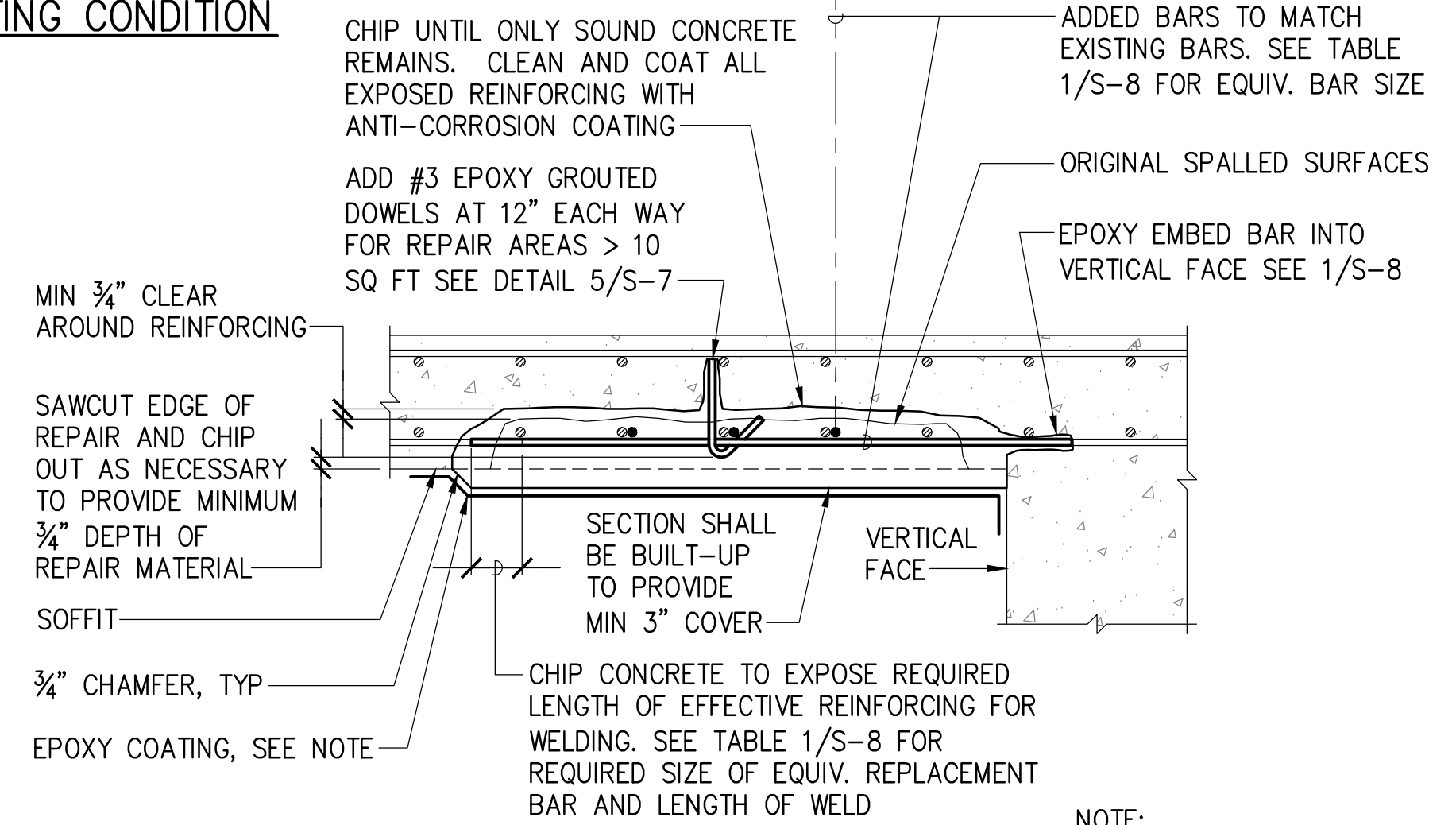
2 SLAB SOFFIT SPALL REPAIR WITH REINFORCING STEEL REPLACEMENT (TYPE SR)

NOT TO SCALE



SECTION

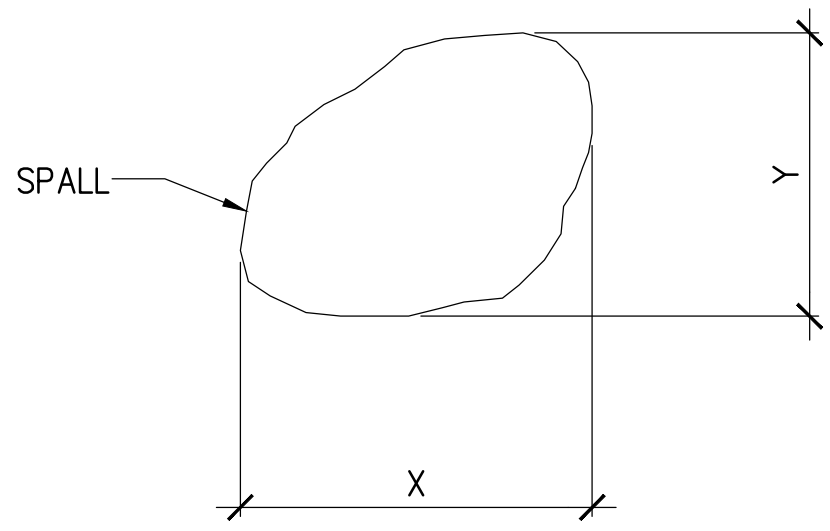
EXISTING CONDITION



SECTION

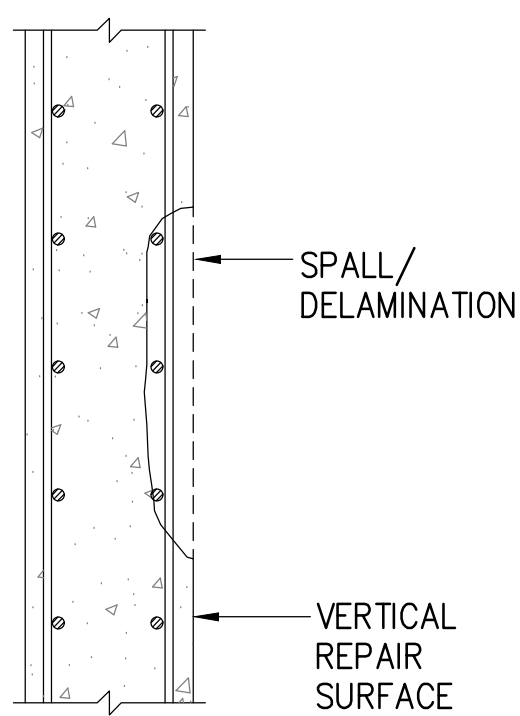
REPAIRED CONDITION

NOTE:  
APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.



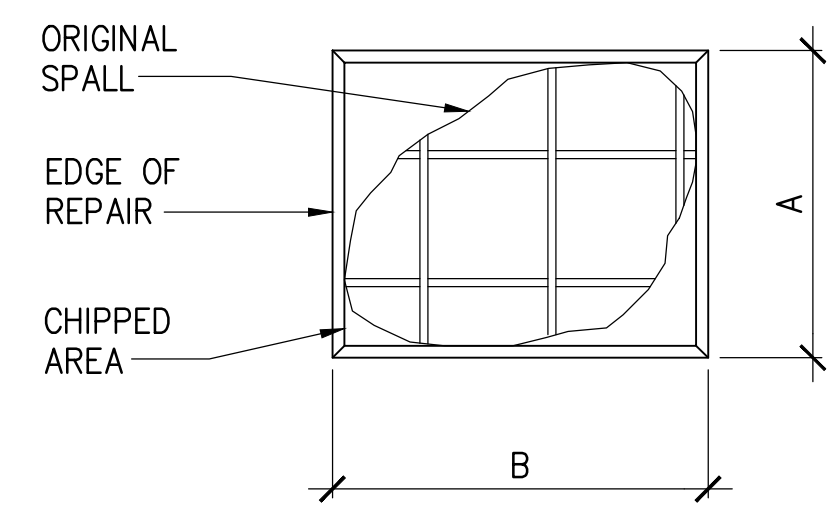
ELEVATION

EXISTING SPALL AREA = X x Y



SECTION

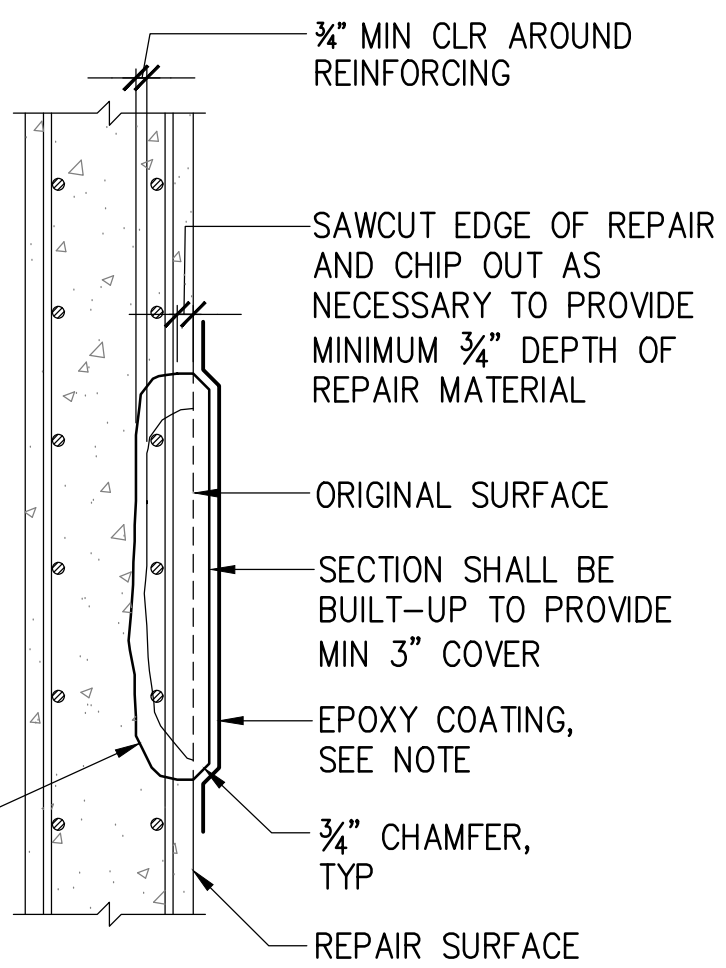
EXISTING CONDITION



ELEVATION

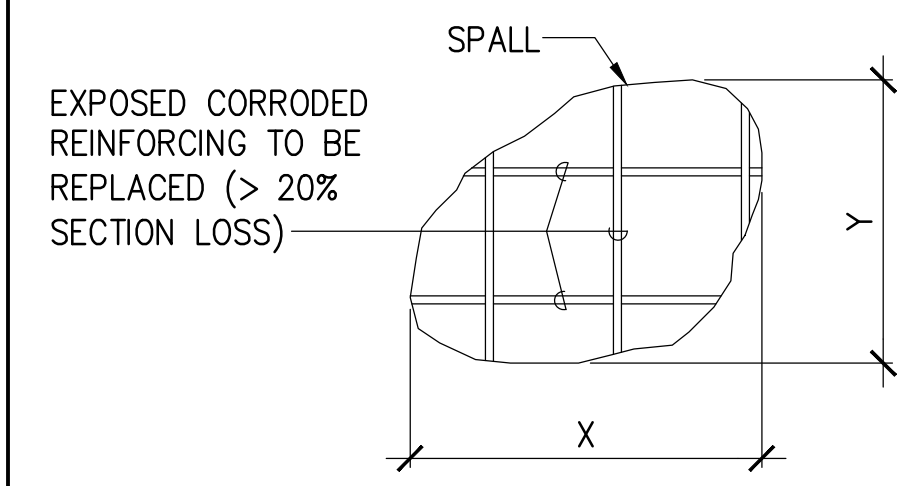
PAY AREA = A x B

REPAIRED CONDITION



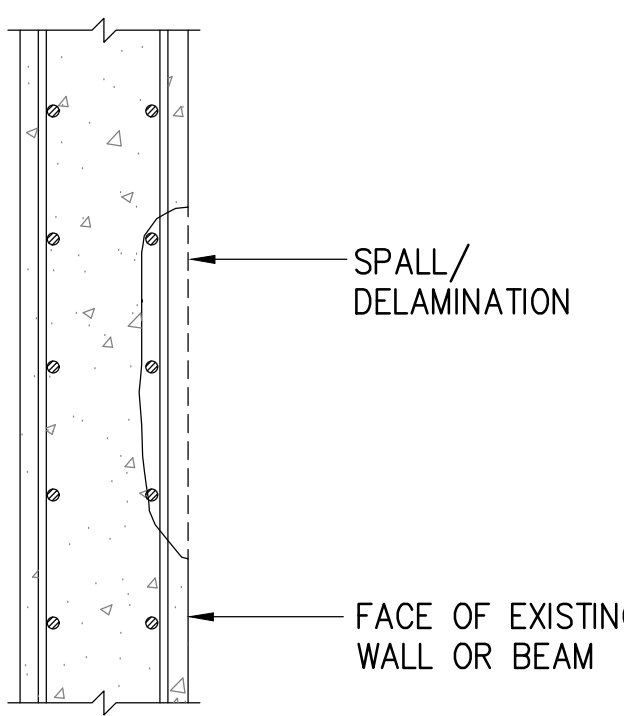
SECTION

NOTE:  
APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.



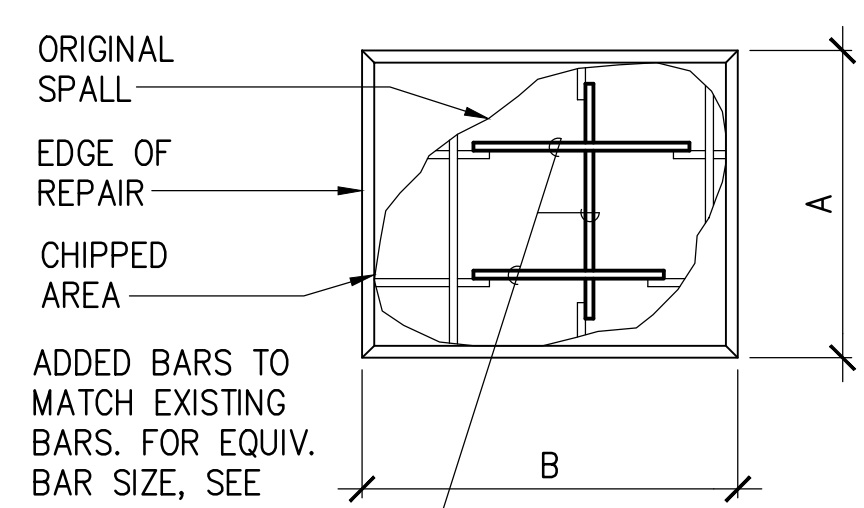
ELEVATION

EXISTING SPALL AREA = X x Y



SECTION

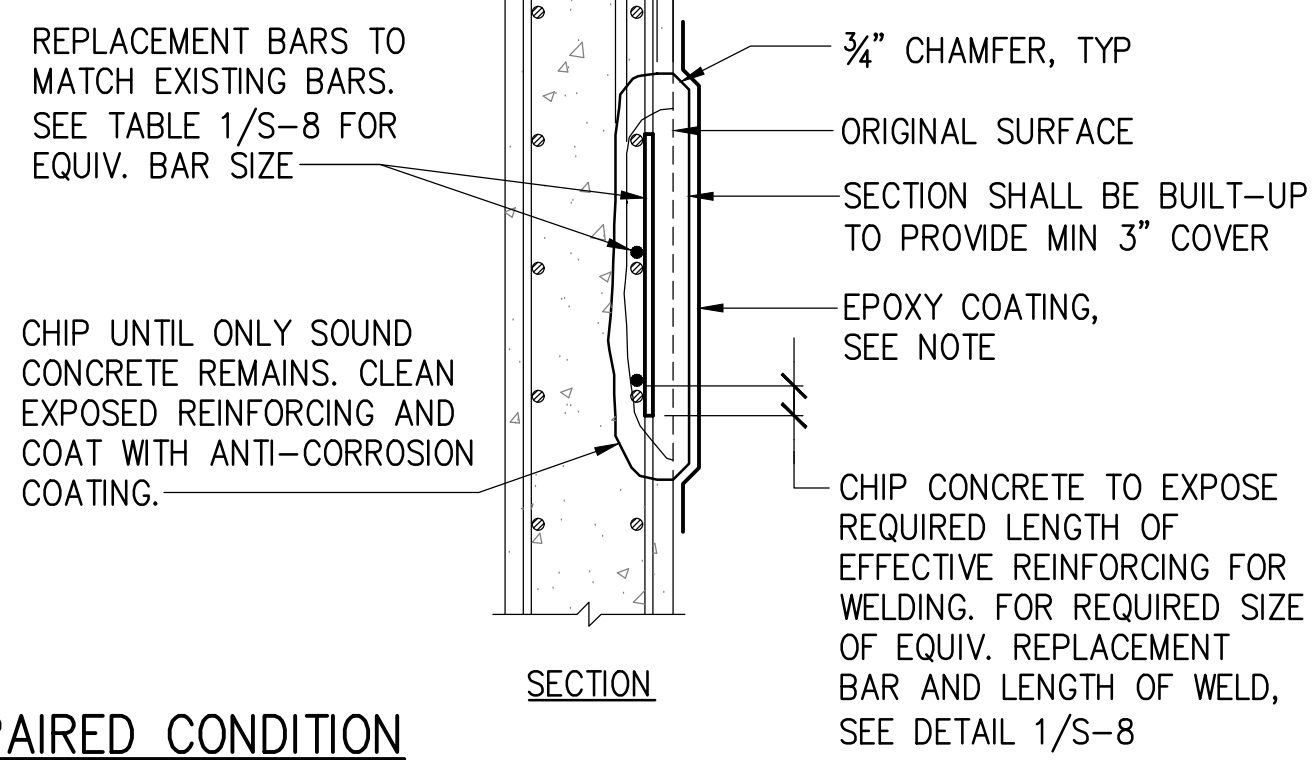
EXISTING CONDITION



ELEVATION

PAY AREA = A x B

REPAIRED CONDITION



SECTION

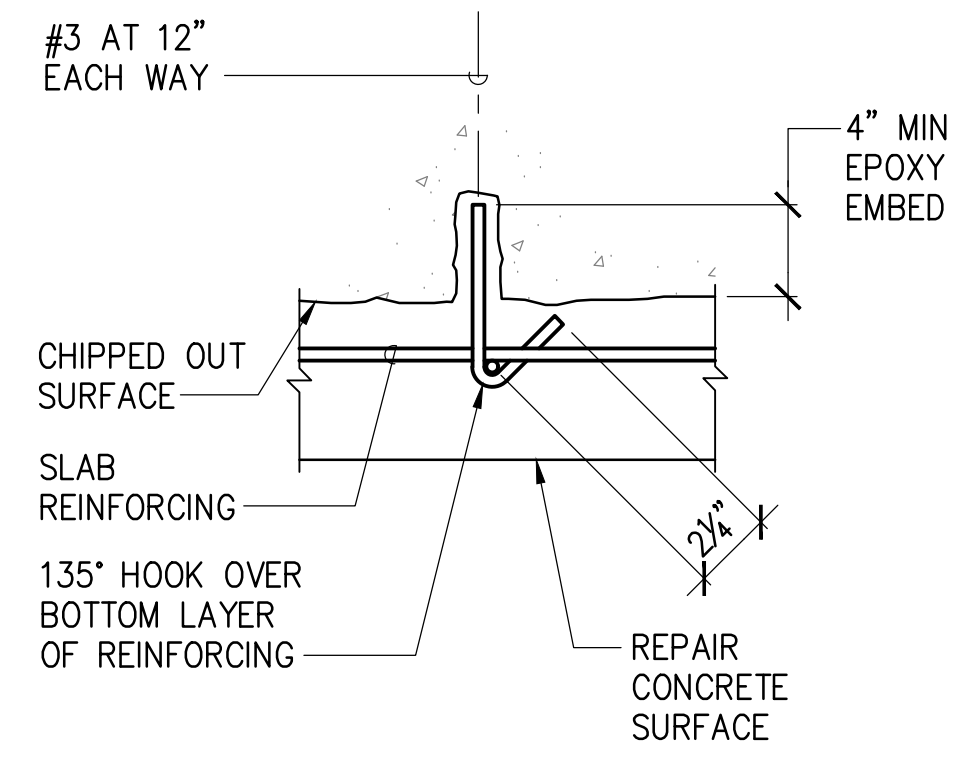
NOTE:  
APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.

3 VERTICAL SPALL REPAIR (TYPE V)

NOT TO SCALE

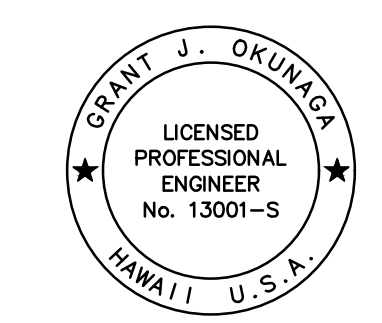
4 VERTICAL SPALL REPAIR WITH REINFORCING STEEL REPLACEMENT (TYPE VR)

NOT TO SCALE



5 EPOXY GROUDED DOWEL DETAIL

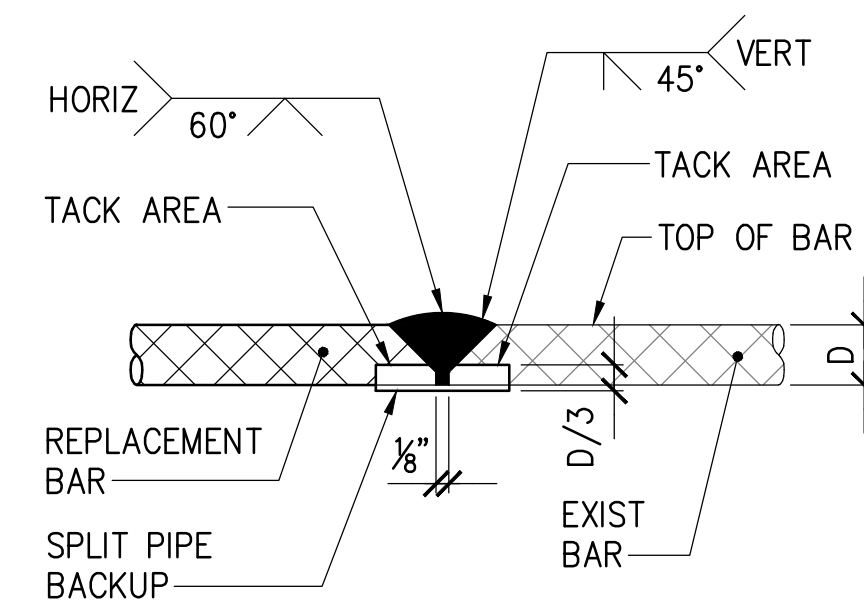
NOT TO SCALE



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION  
EXP. 4-30-28  
*Grant J. Okuniga*  
MKE ASSOCIATES LLC

REVISION	DATE	DESCRIPTION	BY	APPROVED
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS				
JOB TITLE HONOLULU HARBOR, PIER 10, SUBSTRUCTURE REPAIRS, OAHU, HAWAII				
SHEET TITLE SLAB AND VERTICAL SURFACE SPALL REPAIR DETAILS				
DESIGNED BY: RA				SHEET
DRAWN BY: DL				<b>S-7</b>
CHECKED BY: GO				
DATE: 04/2026	JOB NUMBER			
SCALE: AS SHOWN	S10955			

9 of 10 SHTS.



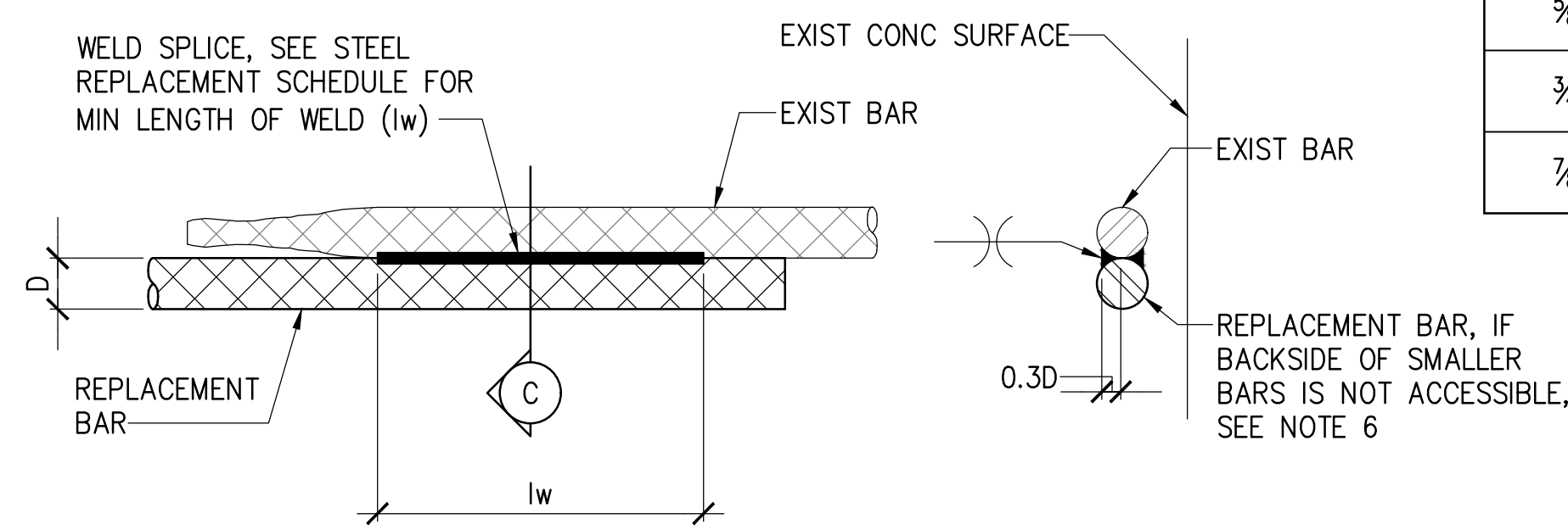
(A) BUTT SPLICE

USE DETAIL A FOR #7 BARS AND LARGER

REINFORCING STEEL WELDING NOTES:

1. CHIP, GRIND, OR GOUGE TO SOUND METAL BEFORE WELDING.
2. CLEAN EXIST REBAR AND PREPARE ACCORDING TO SPECIFICATIONS. APPLY COATING AFTER WELDING.
3. SEE STEEL REPLACEMENT SCHEDULE BELOW FOR REPLACEMENT BAR SIZE.
4. USE E70 ELECTRODES.
5. SEE AWS D1.4 FOR WELDING PROCESS AND OTHER DETAILS.
6. FOR WELDING OF #3, #4, AND #5 REPLACEMENT REINFORCING, WELDING MAY BE PERFORMED ON ONE SIDE ONLY, IF  $l_w$  IS INCREASED TO  $l_w1$  AS FOLLOWS

SIZE OF EXISTING REINFORCING		SIZE OF REPLACEMENT REINFORCING	MINIMUM LENGTH OF WELD EACH SIDE ( $l_w$ )	MINIMUM LENGTH OF WELD ONE SIDE $l_w1$
SQUARE	ROUND			
3/8"	#3, #4	#4	2"	4"
1/2"	#5	#5	2 1/2"	5"
5/8"	#6	#6	3 1/2"	-
3/4"	#7	#7	-	-
7/8"	#8	#8	-	-



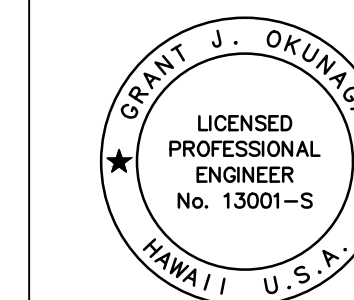
NOTE:  
 $l_w$  = LENGTH OF WELD EACH SIDE  
 (SEE STEEL REPLACEMENT SCHEDULE)

(B) LAP SPLICE

(C) SECTION

USE DETAIL B FOR #6 BARS AND SMALLER

1 REINFORCING STEEL SPLICE DETAIL  
 S-8 NOT TO SCALE



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 OR UNDER MY SUPERVISION  
 EXP. 4-30-28  
 MKE ASSOCIATES LLC

REVISION	DATE	DESCRIPTION	BY	APPROVED
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS				
JOB TITLE HONOLULU HARBOR, PIER 10, SUBSTRUCTURE REPAIRS, OAHU, HAWAII				
SHEET TITLE SPLICE DETAIL				
DESIGNED BY: RA				SHEET
DRAWN BY: DL				S-8
CHECKED BY: GO				
DATE: 04/2026	JOB NUMBER			
SCALE: AS SHOWN	S10955			10 of 10 SHTS.