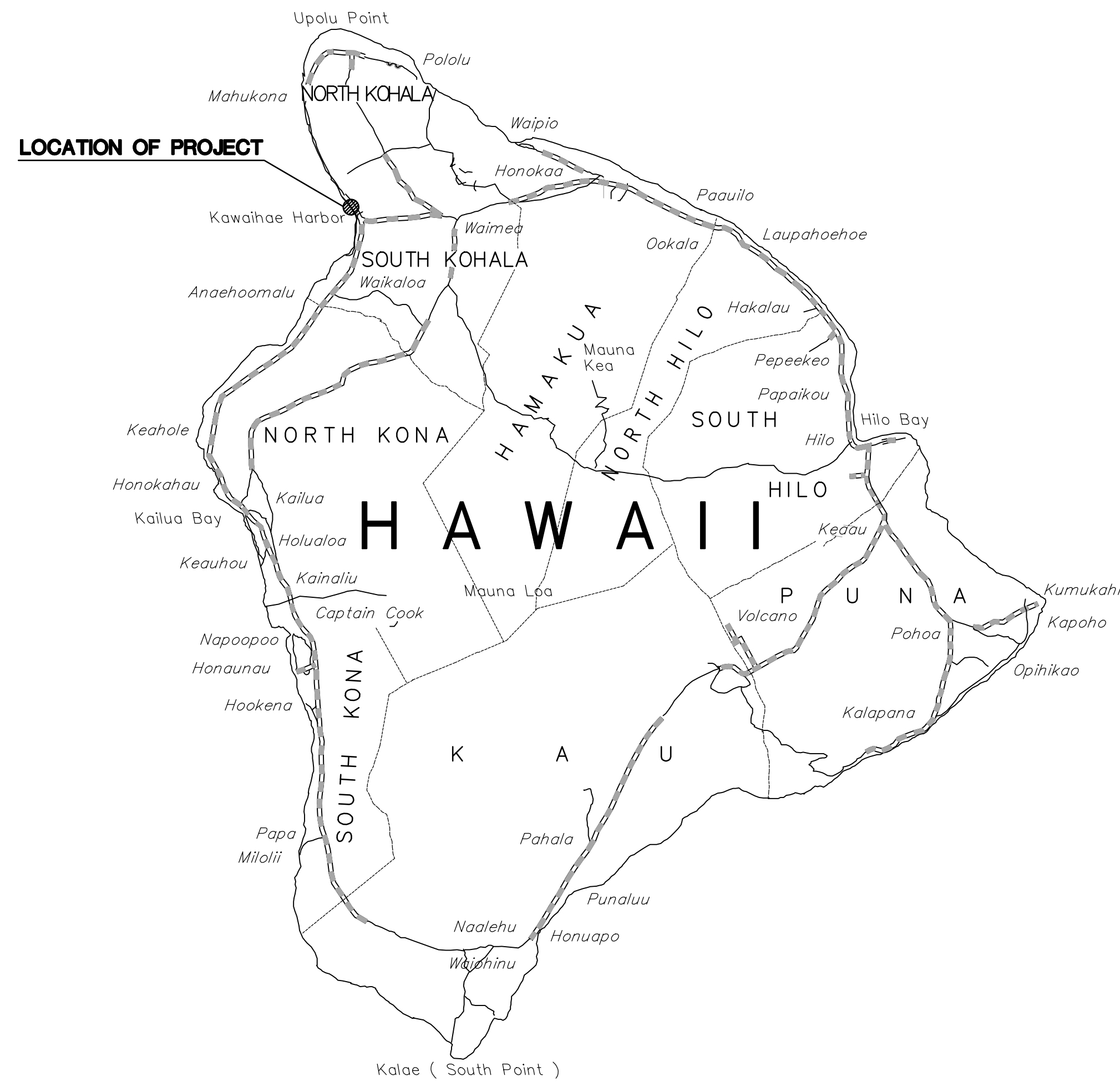


KAWAIHAE HARBOR, PIER 2B, SUBSTRUCTURE REPAIRS, ISLAND OF HAWAII, HAWAII

FOR THE
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS

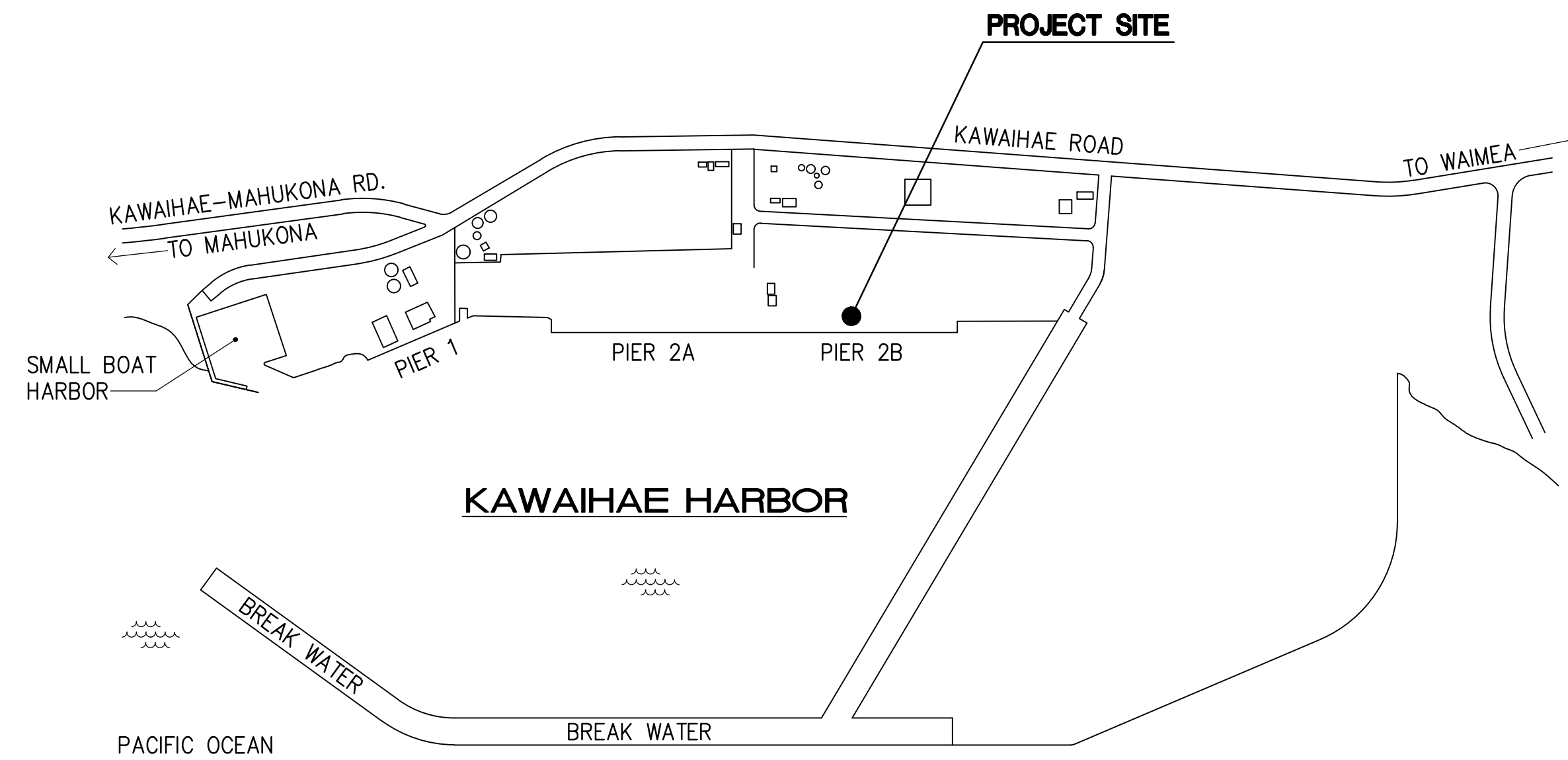
S50231



ISLAND OF HAWAII

LOCATION MAP

NOT TO SCALE



VICINITY MAP

NOT TO SCALE



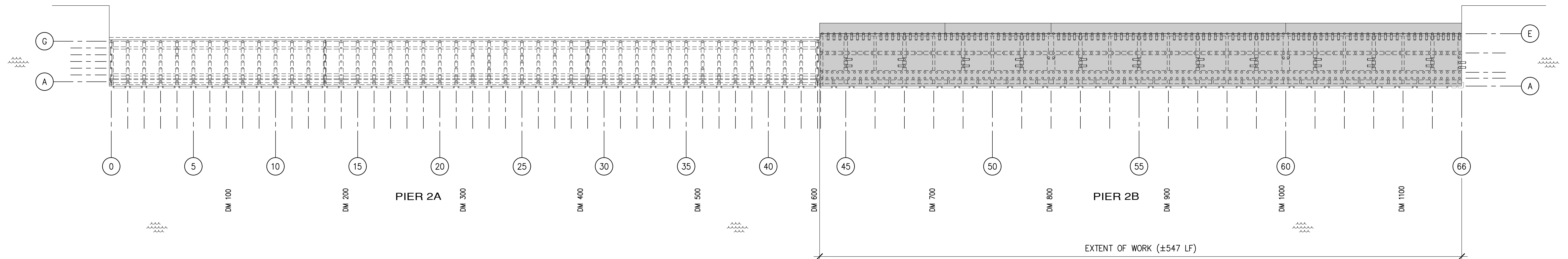
CONSULTANT:

MKE ASSOCIATES LLC
STRUCTURAL ENGINEER

| | | |
|---|--|----------------------|
| DEPARTMENT OF TRANSPORTATION STATE OF HAWAII | | SHEET T-1 |
| APPROVED BY: | | DATE 04/20/2026 |
| FOR DIRECTOR OF TRANSPORTATION | | DATE 1 of 10 SHRS |

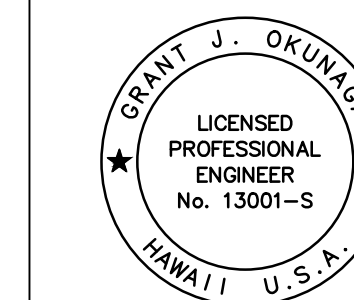
INDEX TO DRAWINGS

| SHEET NO. | TITLE |
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KAWAIHAE HARBOR

GENERAL PLAN
NOT TO SCALE



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

| REVISION | DATE | DESCRIPTION | BY | APPROVED |
|--|------|-------------|----|--------------------------------------|
| STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS | | | | |
| JOB TITLE KAWAIHAE HARBOR, PIER 2B, SUBSTRUCTURE REPAIRS, ISLAND OF HAWAII, HAWAII | | | | |
| SHEET TITLE INDEX TO DRAWINGS AND GENERAL PLAN | | | | |
| DESIGNED BY: RT | | | | JOB NUMBER S50231 |
| DRAWN BY: DL | | | | |
| CHECKED BY: GO | | | | |
| DATE: 04/2026 | | | | |
| SCALE: AS SHOWN | | | | SHEET T-2 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/HER WORK WITH OTHER CONTRACTORS WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL ALSO COORDINATE WITH THE HARBORS HAWAII 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/HER 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.
- HARBOR OPERATIONS TAKE PRECEDENCE OVER CONSTRUCTION ACTIVITY. THE CONTRACTOR MUST WORK AROUND HARBOR OPERATIONS SO THAT THE PIERS WILL REMAIN OPERATIONAL. WEEKEND WORK MAY BE REQUIRED AND SHALL BE COORDINATED WITH THE HARBORS CONSTRUCTION ENGINEER AND TENANTS IN ADVANCE.
- 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 SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF CHARTER 54, WATER QUALITY STANDARDS AND CHAPTER 55, WATER POLLUTION CONTROL OF TITLE 11, ADMINISTRATIVE RULES OF THE STATE DEPARTMENT OF HEALTH. NO POLLUTANTS ARE ALLOWED TO BE DISCHARGED DIRECTLY OR INDIRECTLY INTO ADJACENT HARBOR WATER THROUGH HARBORS STORM CONVEYANCE SYSTEM OR OTHER POTENTIAL PATHWAYS.
- THE CONTRACTOR WILL 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.
- THE CONTRACTOR SHALL SUBMIT A SITE-SPECIFIC BEST MANAGEMENT PRACTICES (BMP) PLAN AND HEALTH AND SAFETY PLAN TO THE HARBORS CONSTRUCTION ENGINEER PRIOR TO THE START OF ANY CONSTRUCTION WORK. THE SITE SPECIFIC BMP PLAN SHALL COMPLY WITH 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:

- CONCRETE CONSTRUCTION SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE ACI 318R-14 AND ACI 546R-14.
- FORMED CONCRETE SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH OF $f'_c=5,000$ PSI WITH SILICA FUME AND CORTEC MCI 2005 NS MIGRATING CORROSION INHIBITING ADMIXTURE, OR APPROVED EQUAL.
- MAXIMUM AGGREGATE SIZE SHALL BE $\frac{3}{4}$ INCHES AND SHALL BE COORDINATED WITH CONCRETE PREPARATION PROCEDURES FOR SPALL REPAIRS.
- 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.
- MAXIMUM WATER TO CEMENTITIOUS MATERIALS RATIO SHALL BE 0.40.
- PATCHING COMPOUND FOR FORM AND POUR SPALL REPAIRS SHALL BE SIKACRETE 211 SCC PLUS BY SIKA, OR APPROVED EQUAL.
- PATCHING COMPOUND FOR REPAIRING VERTICAL AND SOFFIT SPALLS IN LIFTS SHALL BE SIKAQUICK VOH WITH LATEX R BY SIKA, OR APPROVED EQUAL.
- REINFORCING BARS, ANCHOR BOLTS, INSERTS, AND OTHER ITEMS TO BE CAST IN THE CONCRETE SHALL BE SECURED IN POSITION PRIOR TO PLACEMENT OF CONCRETE.

REINFORCING STEEL:

- 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 A615, GRADE 60 OR ASTM A706 GRADE 60.
- CLEAR CONCRETE COVER FOR REINFORCING BARS SHALL BE 3 INCHES 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 SPLICE PER TYPICAL DETAILS, UNLESS OTHERWISE NOTED.
- ANTI-CORROSION COATING WITH A MINIMUM 7 DAY OPEN TIME FOR REINFORCING STEEL SHALL BE ARMATEC 110 EPOCEM BY SIKA OR APPROVED EQUAL.
- EPOXY FOR GROUTING OF DOWELS SHALL BE SET-3G BY SIMPSON STRONG-TIE, OR APPROVED EQUAL.
- TIE WIRE SHALL BE PLASTIC-COATED, STAINLESS STEEL, OR MADE OF DIELECTRIC OR OTHER ACCEPTABLE MATERIAL. ALL LOOSE REINFORCING STEEL SHALL BE SECURED WITH TIES AT ALL INTERSECTIONS WITH ADJACENT REINFORCING STEEL.

PREPARATION OF SUBSTRATE AND REINFORCING STEEL FOR SPALL REPAIRS:

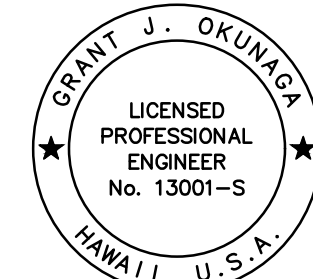
- BOTH SPALLS AND DELAMINATIONS ARE REFERRED TO ON THE DRAWINGS AS "SPALLS", AS THE REPAIR PROCEDURES ARE THE SAME FOR BOTH CONDITIONS.
- THE CONTRACTOR SHALL SOUND ALL CONCRETE SURFACES TO IDENTIFY SPALLS AND DELAMINATIONS.
- ANY ELEMENT BEING REPAIRED SHALL NOT BE SUBJECTED TO LIVE LOADS DURING THE PERIOD STARTING FROM THE REMOVAL OF EXISTING CONCRETE UNTIL THE REPAIR CONCRETE HAS OBTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.
- 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 $\frac{3}{4}$ INCH 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 $\frac{3}{4}$ INCH CLEAR SPACE MEASURED RADIALLY AROUND THE BARS.
- EXISTING CONCRETE SURFACES WITHIN THE REPAIR AREAS SHALL BE ROUGHENED TO ENSURE PROPER ADHESION WITH REPAIR CONCRETE.
- ALL EXPOSED CONCRETE SURFACES AND REINFORCING BARS IN THE REPAIR AREA SHALL BE NEEDLE GUNNED TO REMOVE ALL SCALE, LOOSE RUST, DEBRIS AND DETERIORATED CONCRETE.
- ANY REINFORCEMENT WHICH HAS LOST MORE THAN 20 PERCENT OF ITS CROSS-SECTIONAL AREA SHALL BE REPLACED AND 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 D.1. IF THE C.E. IS UNKNOWN, MAXIMUM PREHEAT REQUIREMENTS, 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 WITH APPROPRIATE PPE'S AND CONTAINMENT.

APPLICATION OF SPALL REPAIR MATERIALS:

- ALL EXPOSED STEEL IN THE REPAIR AREA SHALL BE LIBERALLY COATED WITH ANTI-CORROSION COATING PER MANUFACTURER'S RECOMMENDATIONS.
- PRIOR TO PLACEMENT OF REPAIR CONCRETE, ALL CONCRETE REPAIR SURFACES SHALL BE WASHED WITH CLEAN POTABLE WATER AND THE EXPOSED CONCRETE SURFACE SHALL BE SATURATED WITH NO WATER ACCUMULATION ON THE SURFACE.
- ALL VERTICAL AND OVERHEAD REPAIRS GREATER THAN 10 SQUARE FEET SHALL BE FORMED.
- 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 $\frac{3}{4}$ INCH. COVER AFTER FORM REMOVAL.
- PATCHING COMPOUND MAY BE USED INSTEAD OF FORMED CONCRETE FOR VERTICAL AND OVERHEAD REPAIRS LESS THAN OR EQUAL TO 10 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.
- SNAP TIES AND OTHER NON-REMOVABLE INSERTS SHALL BE PLASTIC OR STAINLESS STEEL.
- WITH THE EXCEPTION OF THE TOP SURFACE OF THE PIER AND FRONT FACE OF THE OUTBOARD FASCIA BEAM, ALL FORMED CONCRETE REPAIRS SHALL BE BUILT UP TO OR BEYOND THE ORIGINAL SURFACE AND SHALL MAINTAIN A 3 INCH MINIMUM CLEAR COVER FOR REINFORCING.
- CONCRETE REPAIRS AT THE TOP SURFACE OF THE PIER AND FRONT FACE OF THE OUTBOARD FASCIA BEAM SHALL BE BUILT UP TO THE ORIGINAL CONCRETE SURFACE.
- CONCRETE REPAIRS SHALL MATCH AND MAINTAIN EXISTING CHAMFER EDGES AND EXPANSION JOINTS. CONTRACTOR SHALL INSTALL JOINT FILLER TO MAINTAIN JOINTS.
- REPAIR 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.
- FORMWORK FOR CONCRETE REPAIRS ON THE PIER SUBSTRUCTURE SHALL NOT BE REMOVED FOR A MINIMUM OF 24 HOURS AND UNTIL CONCRETE HAS OBTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.
- CONCRETE REPAIRS ON THE UNDERSIDE OF THE PIER SHALL BE CURED EITHER BY LEAVING FORMS IN PLACE A MINIMUM OF 7 DAYS OR COVERING THE SURFACE WITH A CURING COMPOUND APPROVED BY THE HARBORS CONSTRUCTION ENGINEER.

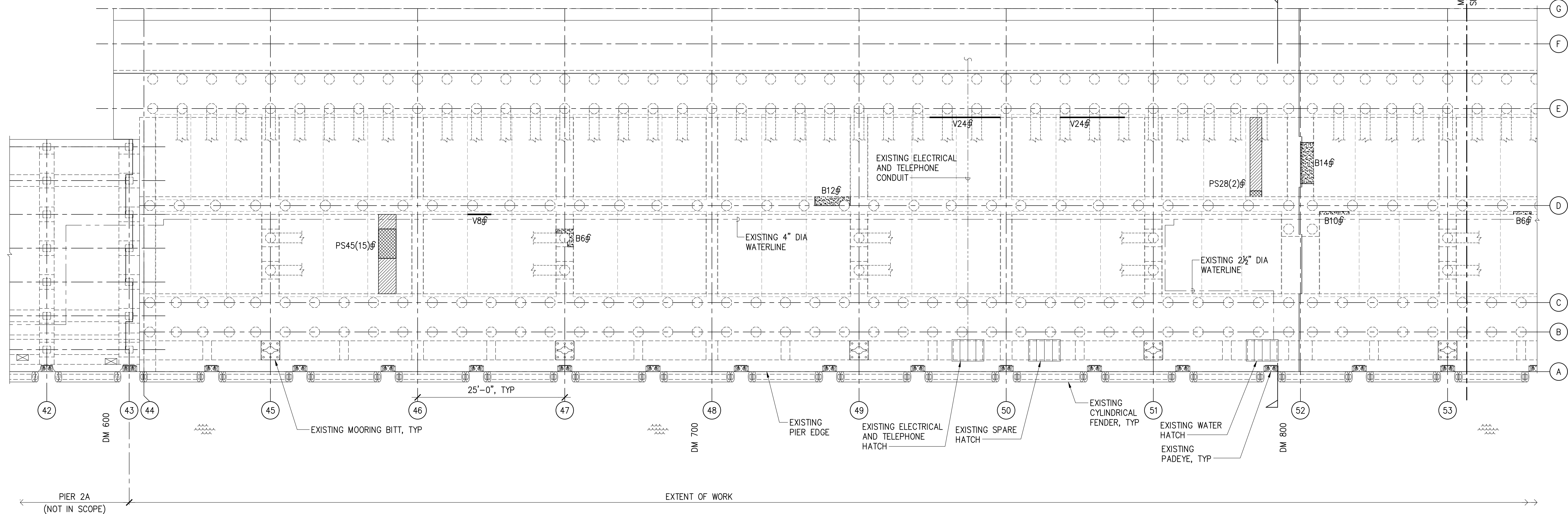
EPOXY COATING SYSTEM:

- EXISTING PIER SUBSTRUCTURE IS COATED WITH A COAL TAR EPOXY COATING. SEE PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- EPOXY COATING SYSTEM SHALL BE TWO COATS OF AMERLOCK 400 BY PPG PROTECTIVE AND MARINE COATINGS, OR APPROVED EQUAL. OVERLAP 6 INCHES MINIMUM OVER EXISTING COATING.
- CONCRETE REPAIRS SHALL BE ALLOWED TO CURE A MINIMUM OF 28 DAYS OR PER MANUFACTURER'S RECOMMENDATIONS BEFORE APPLYING EPOXY COATING SYSTEM.
- CLEAN ALL CONCRETE SURFACES TO BE COATED PER MANUFACTURER'S RECOMMENDATIONS.

| | | | | | |
|--|--|------|-------------|---------------|----------|
|  <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION EXP. 4-30-28 <i>Grant J. Okuniga</i> MKE ASSOCIATES LLC</p> | REVISION | DATE | DESCRIPTION | BY | APPROVED |
| | STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS | | | | |
| | JOB TITLE KAWAIHAE HARBOR, PIER 2B, SUBSTRUCTURE REPAIRS, ISLAND OF HAWAII, HAWAII | | | | |
| | SHEET TITLE STRUCTURAL NOTES | | | | |
| DESIGNED BY: RT | JOB NUMBER | | | SHEET | |
| DRAWN BY: DL | S50231 | | | S-1 | |
| CHECKED BY: GO | DATE: 04/2026 | | | 3 of 10 SHTS. | |
| SCALE: AS SHOWN | | | | | |

MATCHLINE
SEE SHEET S-3

1
S-5



KAWAIHAE HARBOR

PARTIAL PIER PLAN
SCALE: 1/8" = 1'-0"

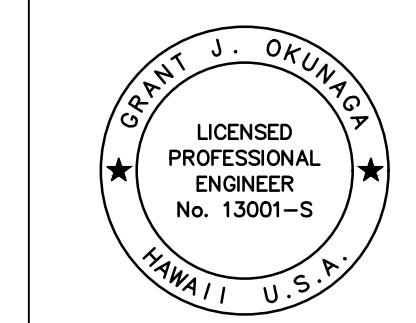


SPALL REPAIR LEGEND:

- PRECAST PLANK SOFFIT SPALL (PS), SEE DETAIL 1/S-6
- BEAM SOFFIT SPALL REPAIR (TYPE B), SEE DETAIL 1/S-7
- BEAM SPALL REPAIR WITH REINFORCING THAT HAS LOST MORE THAN 20% OF ITS CROSS-SECTIONAL AREA (BR), SEE DETAIL 2/S-7
- VERTICAL SURFACE SPALL ON BEAM (TYPE V OR VR), SEE DETAILS 1/S-8 AND 2/S-8
- ⊕ SQUARE FEET

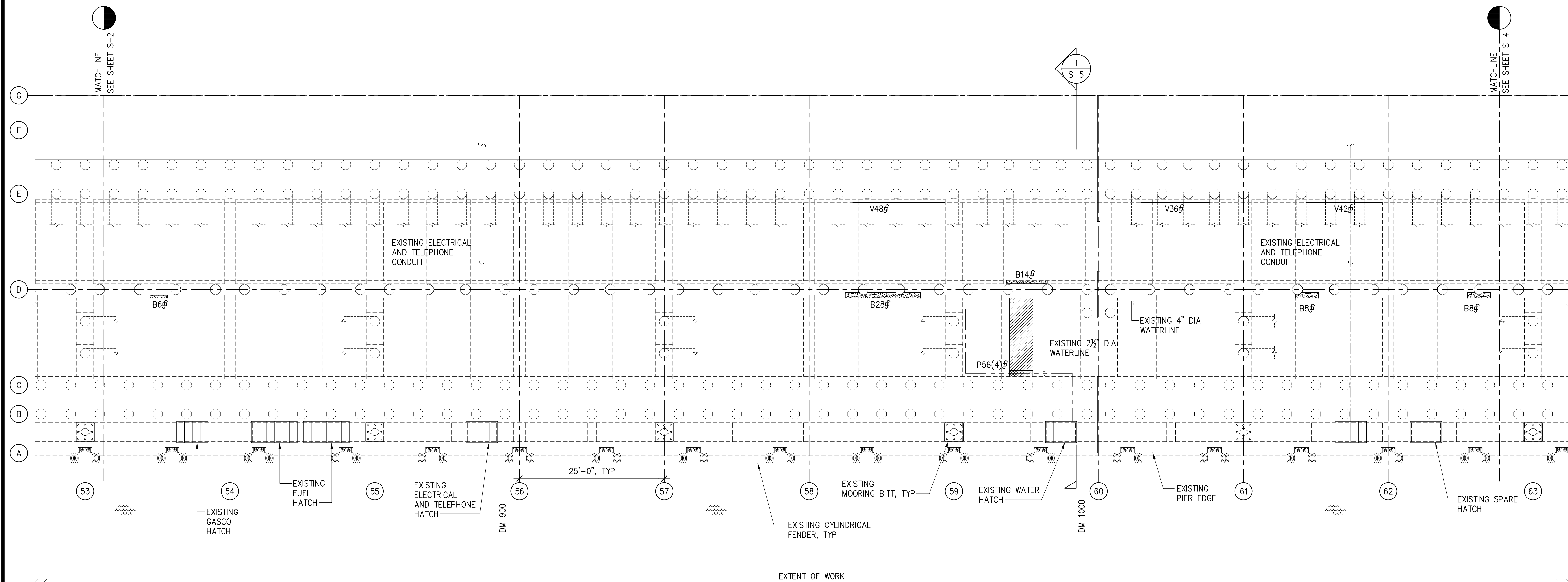
NOTES:

1. SQUARE FOOT VALUES LISTED AFTER ALL REPAIR INDICATES APPROXIMATE REPAIR AREA.
2. FOR PRECAST PLANK SOFFIT REPAIRS (PS), FIRST VALUE INDICATES FINAL REPAIR AREA AS SHOWN WITH HATCH. SECOND VALUE IN PARENTHESIS INDICATES APPROXIMATE SPALL AREA AS SHOWN WITH HATCH.



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

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| SHEET TITLE PARTIAL PIER PLAN | | | | |
| DESIGNED BY: RT | JOB NUMBER S50231 | | | SHEET S-2 |
| DRAWN BY: DL | | | | 4 of 10 SHEETS |
| CHECKED BY: GO | | | | |
| DATE: 04/2026 | | | | |
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KAWAIIHAE HARBOR

PARTIAL PIER PLAN
SCALE: 1/8" = 1'-0"



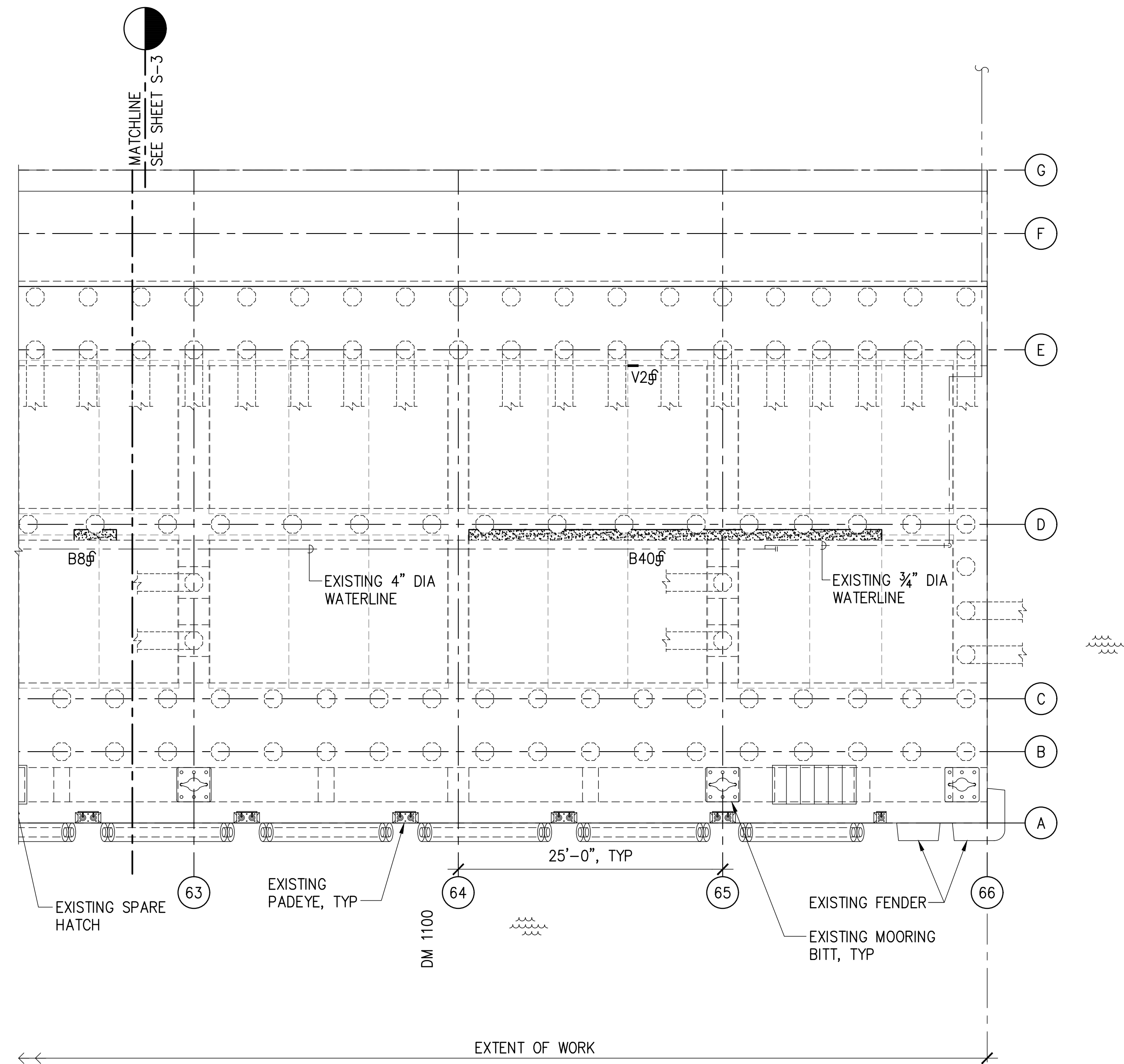
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| SHEET TITLE PARTIAL PIER PLAN | | | | |
| DESIGNED BY: RT | JOB NUMBER | | SHEET | |
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| CHECKED BY: GO | | | 5 of 10 SHTS. | |
| DATE: 04/2026 | | | | |
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KAWAIHAE HARBOR

PARTIAL PIER PLAN

SCALE: 1/8" = 1'-0"

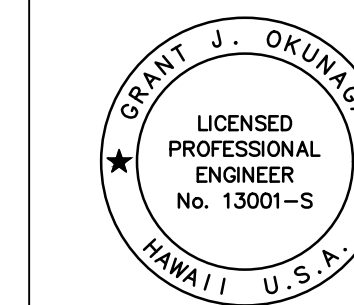


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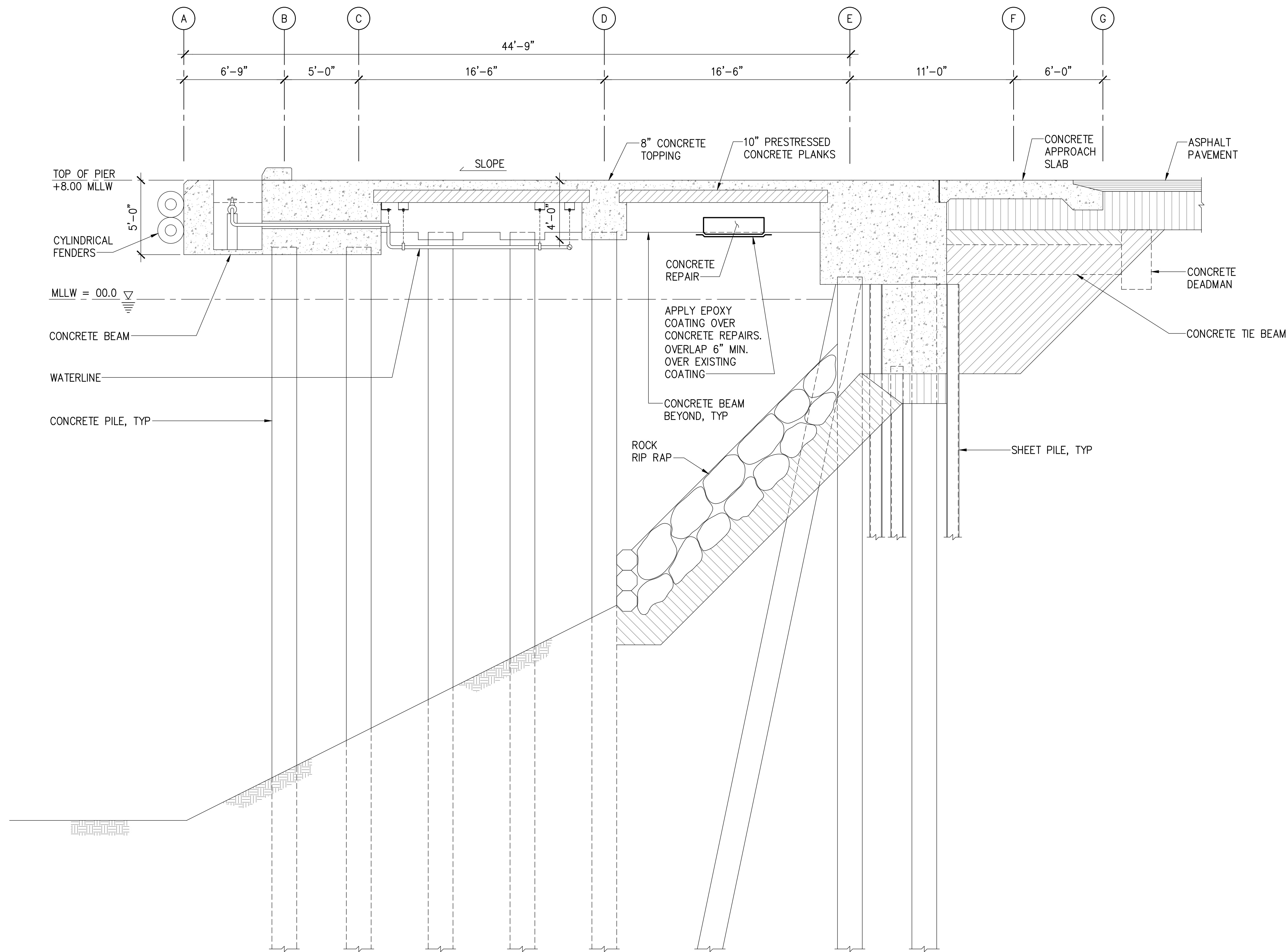
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| SHEET TITLE PARTIAL PIER PLAN | | | | |
| DESIGNED BY: RT | JOB NUMBER S50231 | | | SHEET S-4 |
| DRAWN BY: DL | | | | 6 OF 10 SHEETS |
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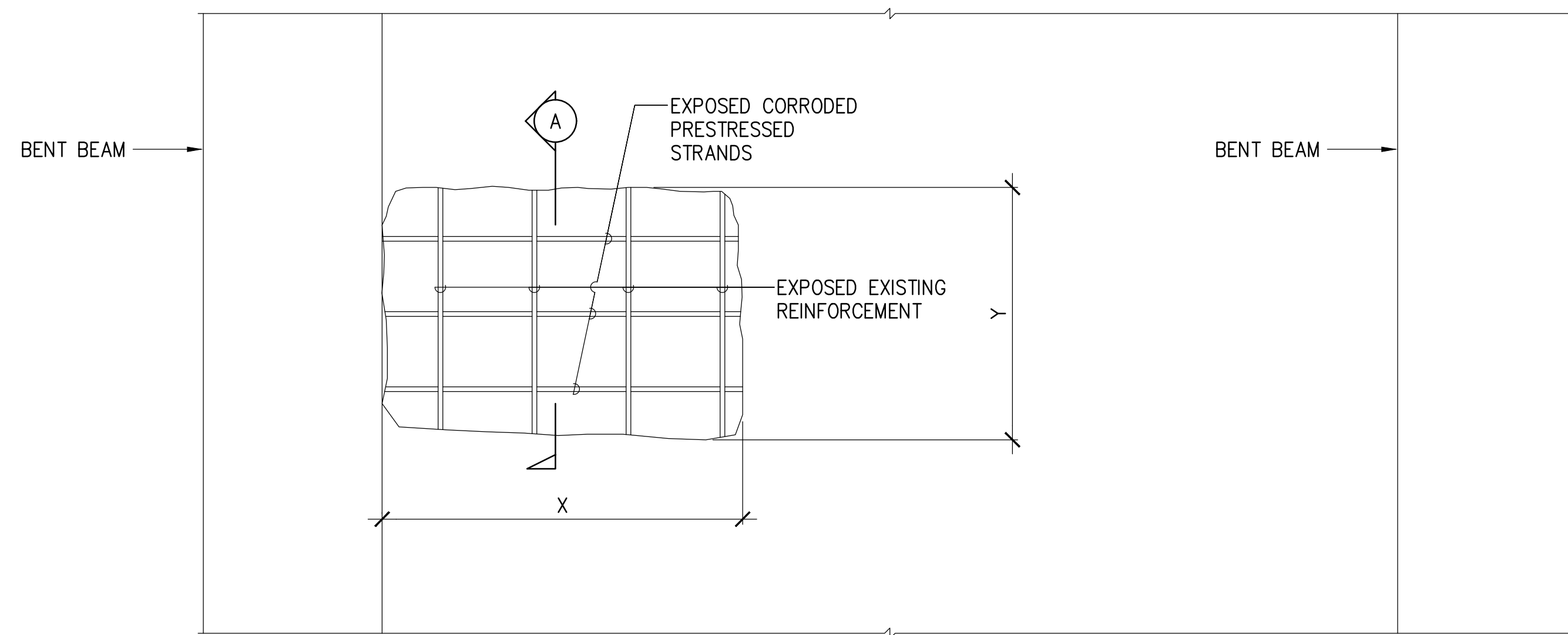


NOTES:

1. EXISTING PIER SUBSTRUCTURE IS COATED WITH A COAL TAR EPOXY.
2. UTILITIES SHOWN ON THIS SECTION AND ON THE PLANS ARE BASED ON LIMITED AVAILABLE INFORMATION OF THE EXISTING CONDITIONS. OTHER UTILITIES MAY EXIST WITHIN THE PROJECT AREA.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SHORING OF UTILITY LINES AND REINSTALLING EXISTING UTILITY HANGERS. LOCATIONS OF UTILITY HANGERS VARY AT BENT BEAMS AND/OR THE SLAB SOFFIT.

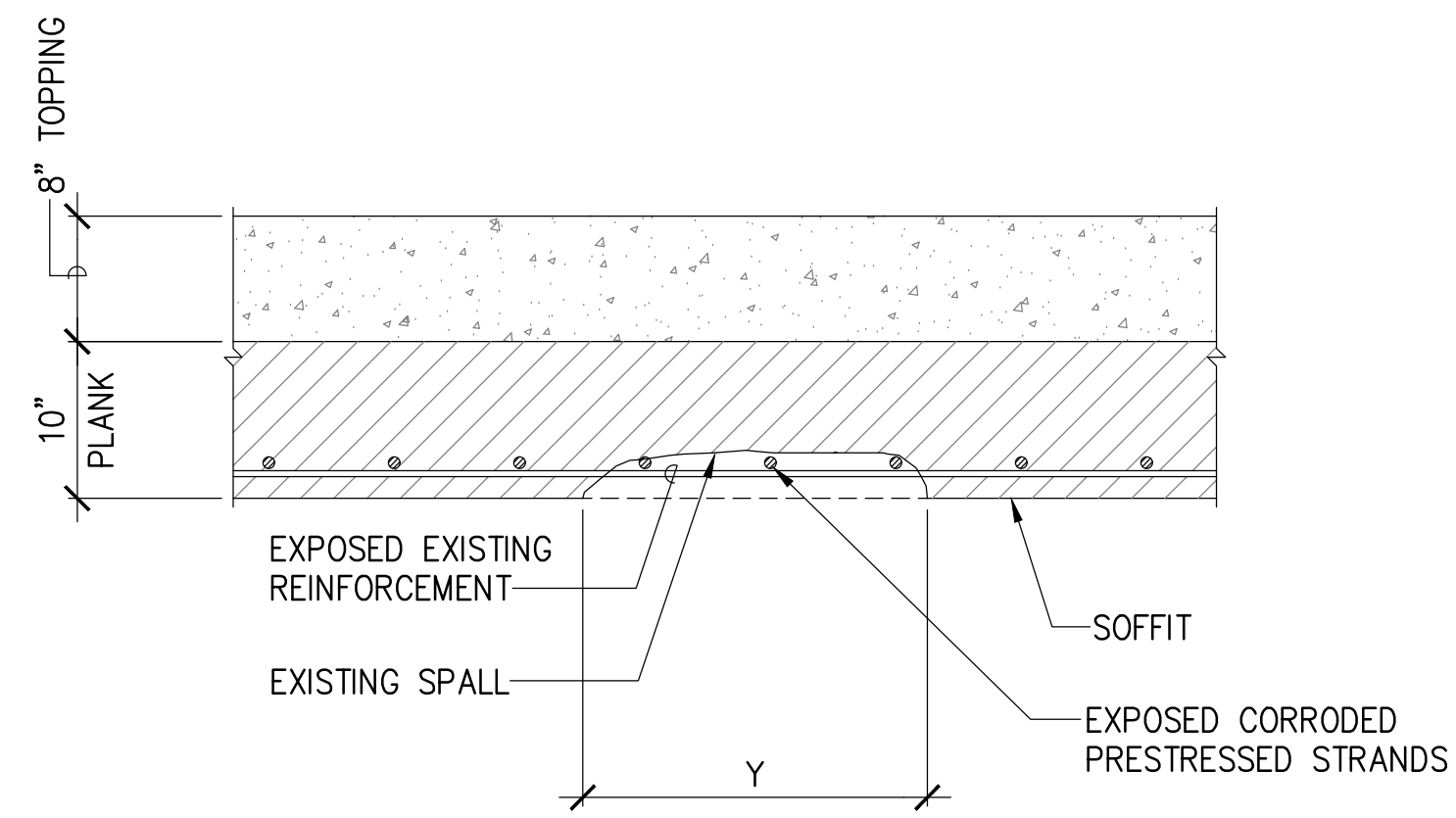
1
S-5 TYPICAL PIER 2B TRANSVERSE SECTION
SCALE: 1/4" = 1'-0"

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| | DESIGNED BY: RT | JOB NUMBER S50231 | SHEET S-5 |
| | DRAWN BY: DL | | |
| | CHECKED BY: GO | DATE: 04/2026 SCALE: AS SHOWN | 7 of 10 SHEETS |
| | DATE: 04/2026 SCALE: AS SHOWN | | |



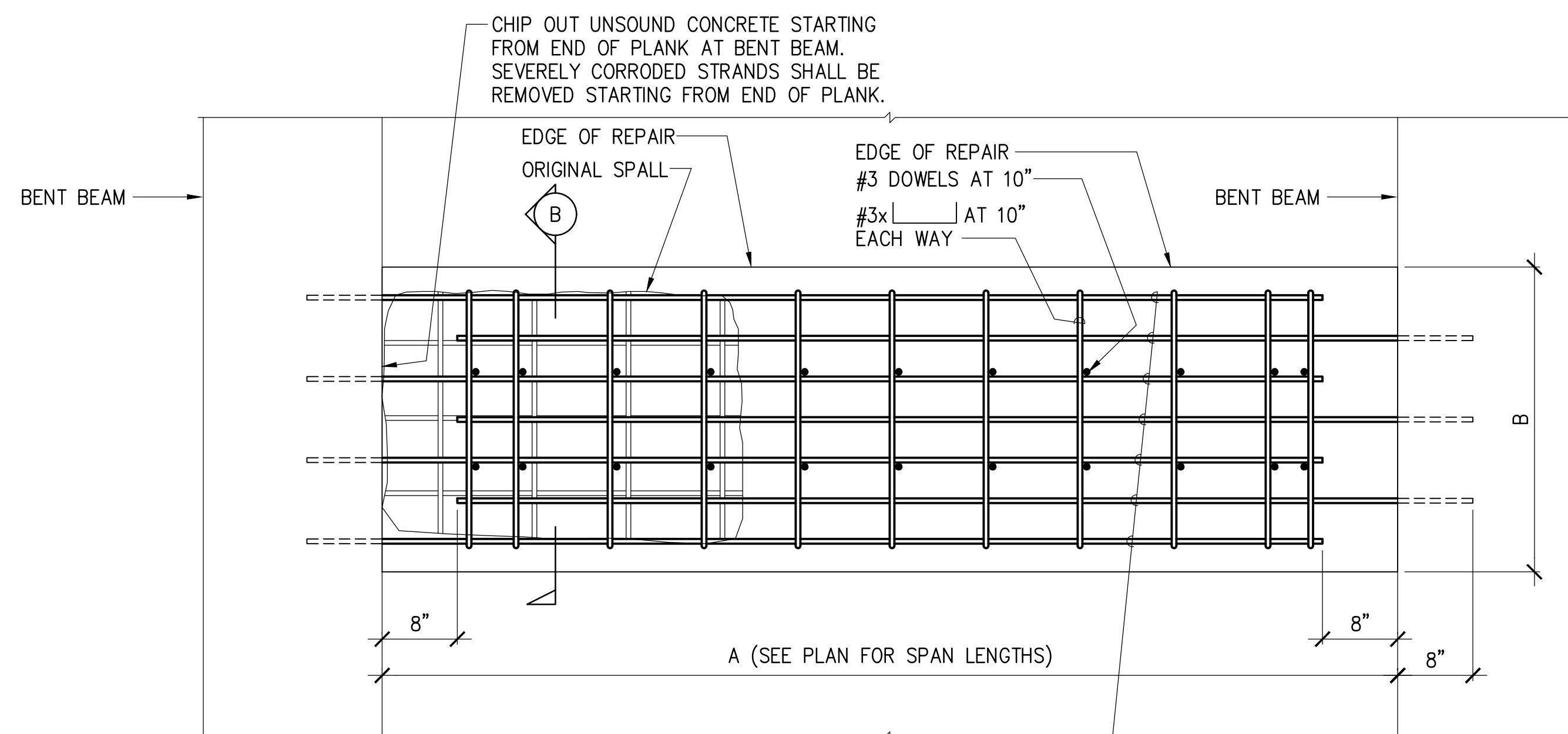
SOFFIT PLAN

EXISTING SPALL AREA = X x Y



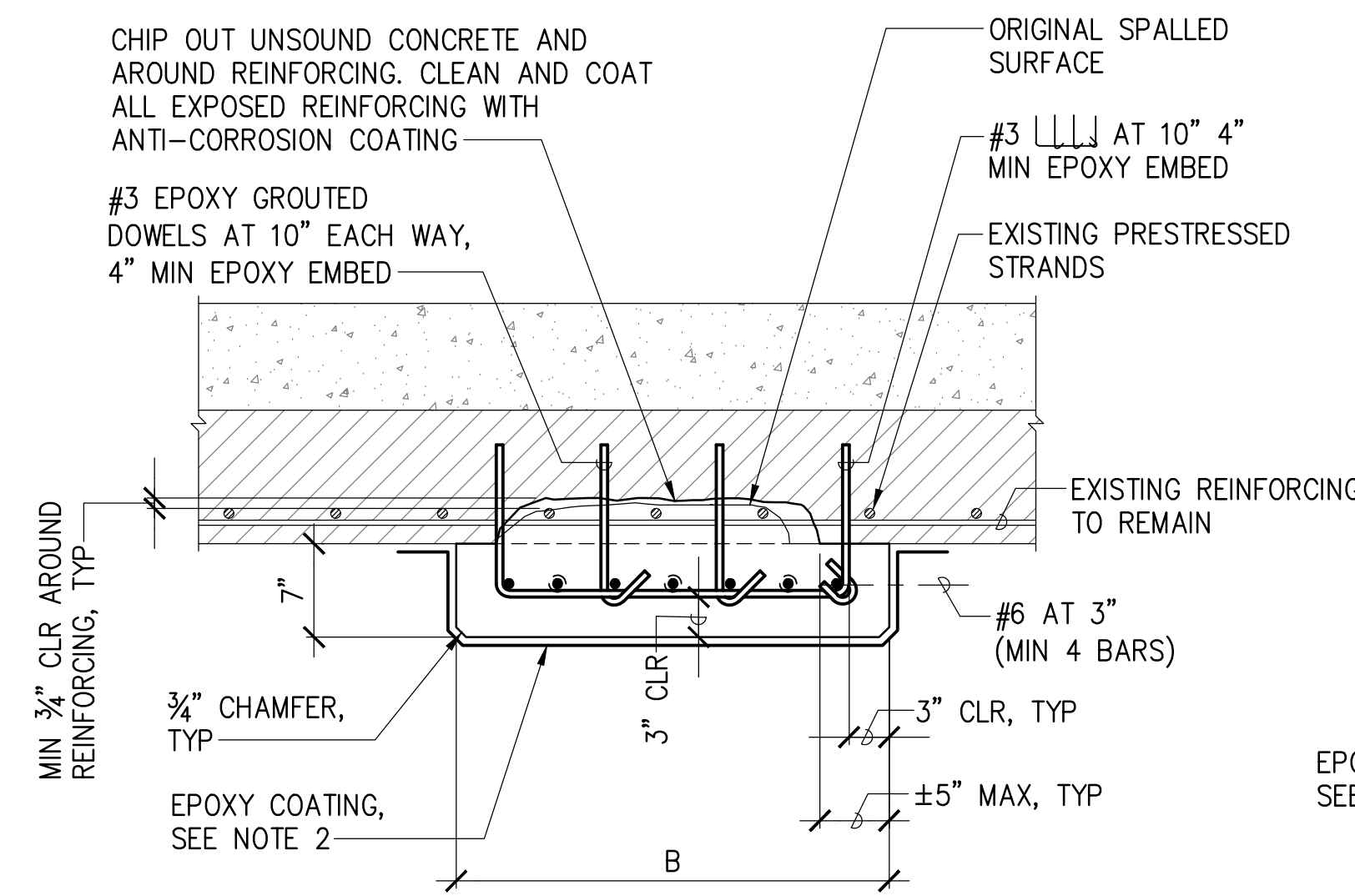
A SECTION

EXISTING CONDITION



SOFFIT PLAN

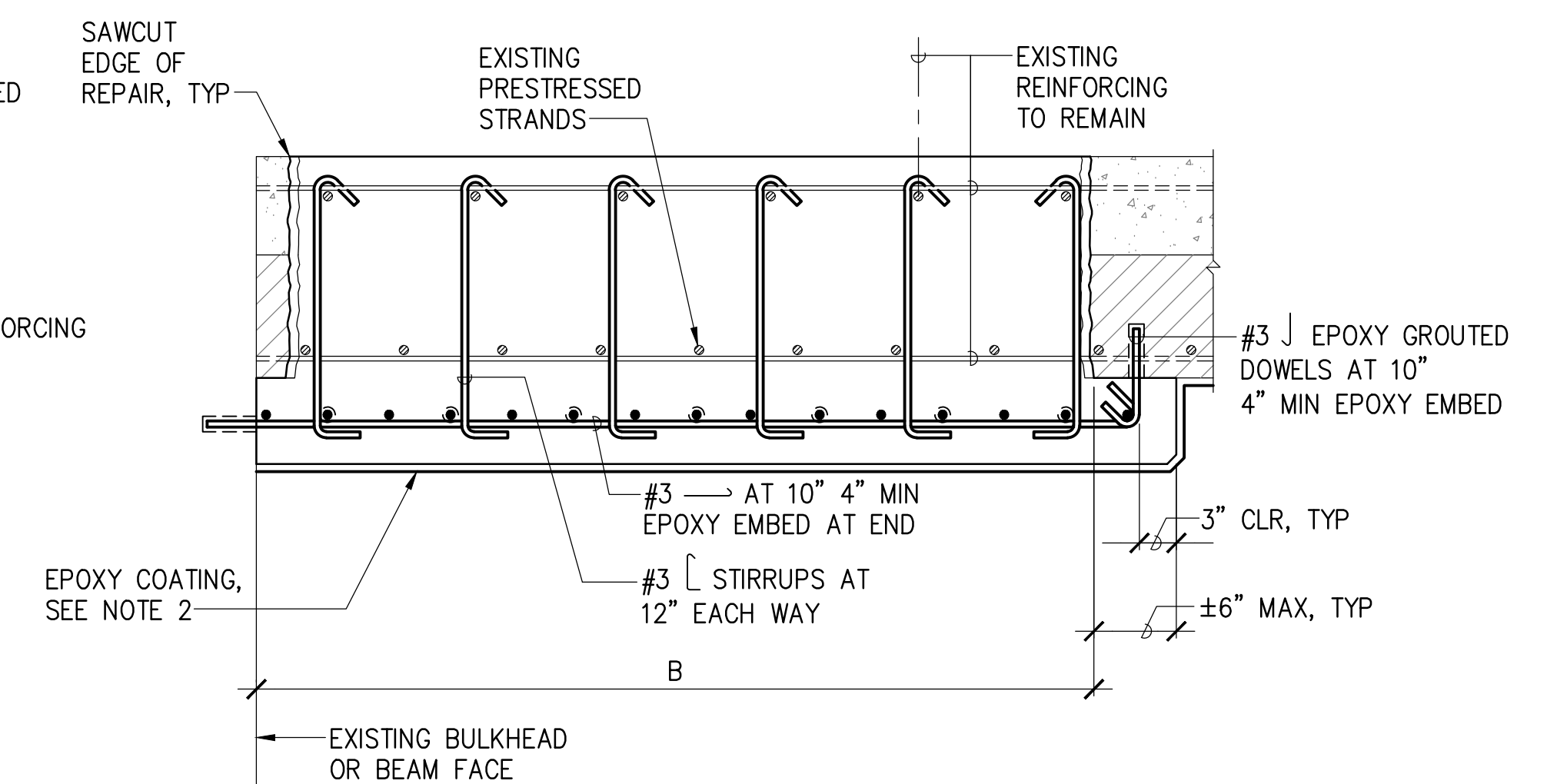
PAY AREA = A x B



B TYPICAL REPAIR SECTION

NOTE:

1. SEE ALTERNATE REPAIR DETAIL FOR REPAIRING FULL-DEPTH SPALLS.
2. APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.



C ALTERNATE REPAIR SECTION

NOTES:

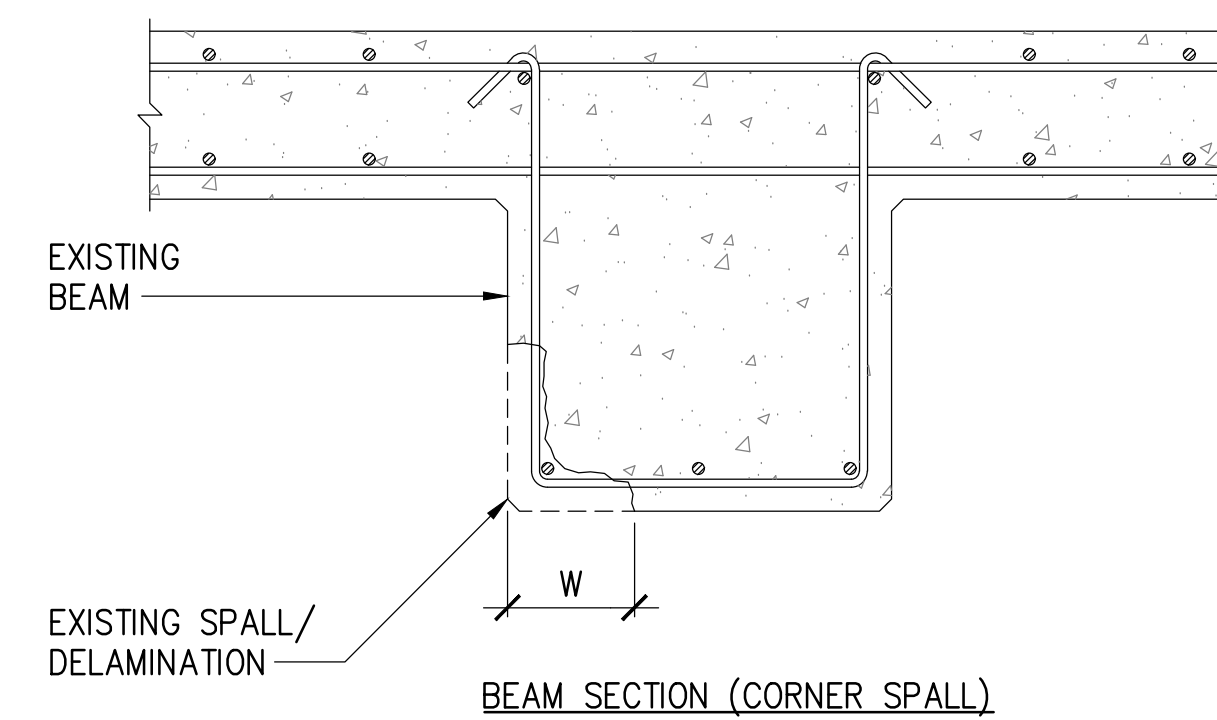
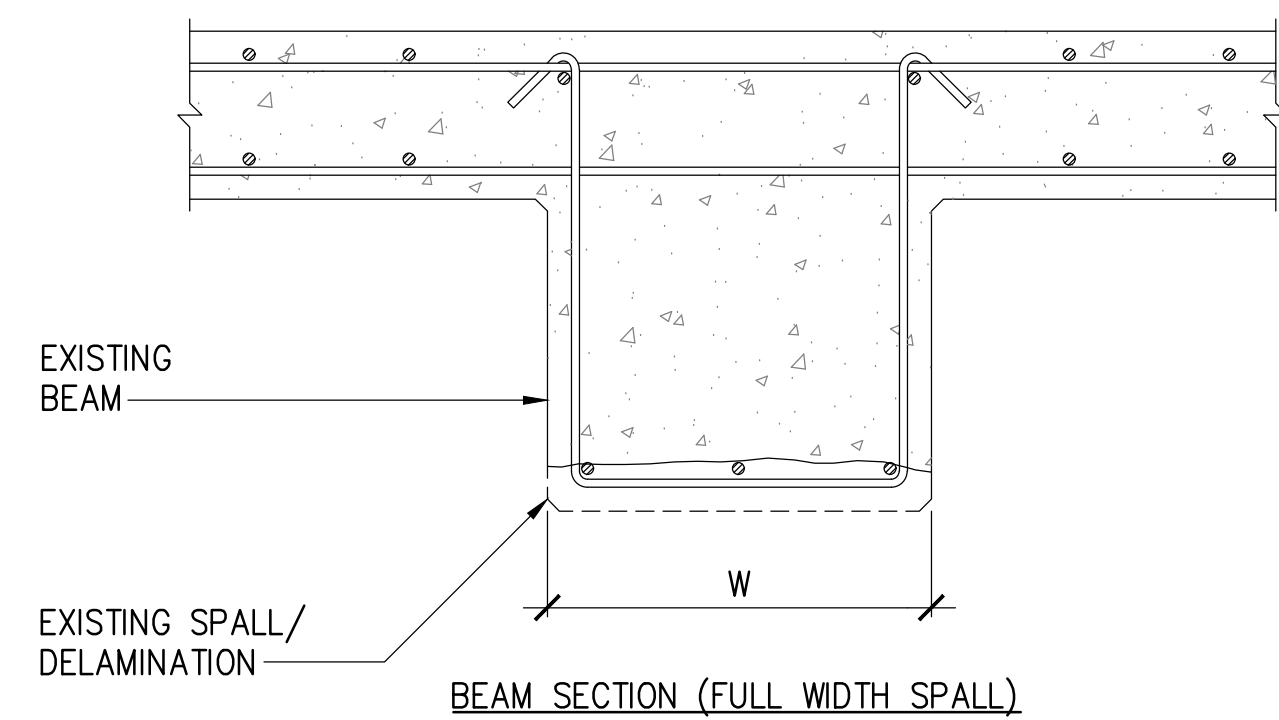
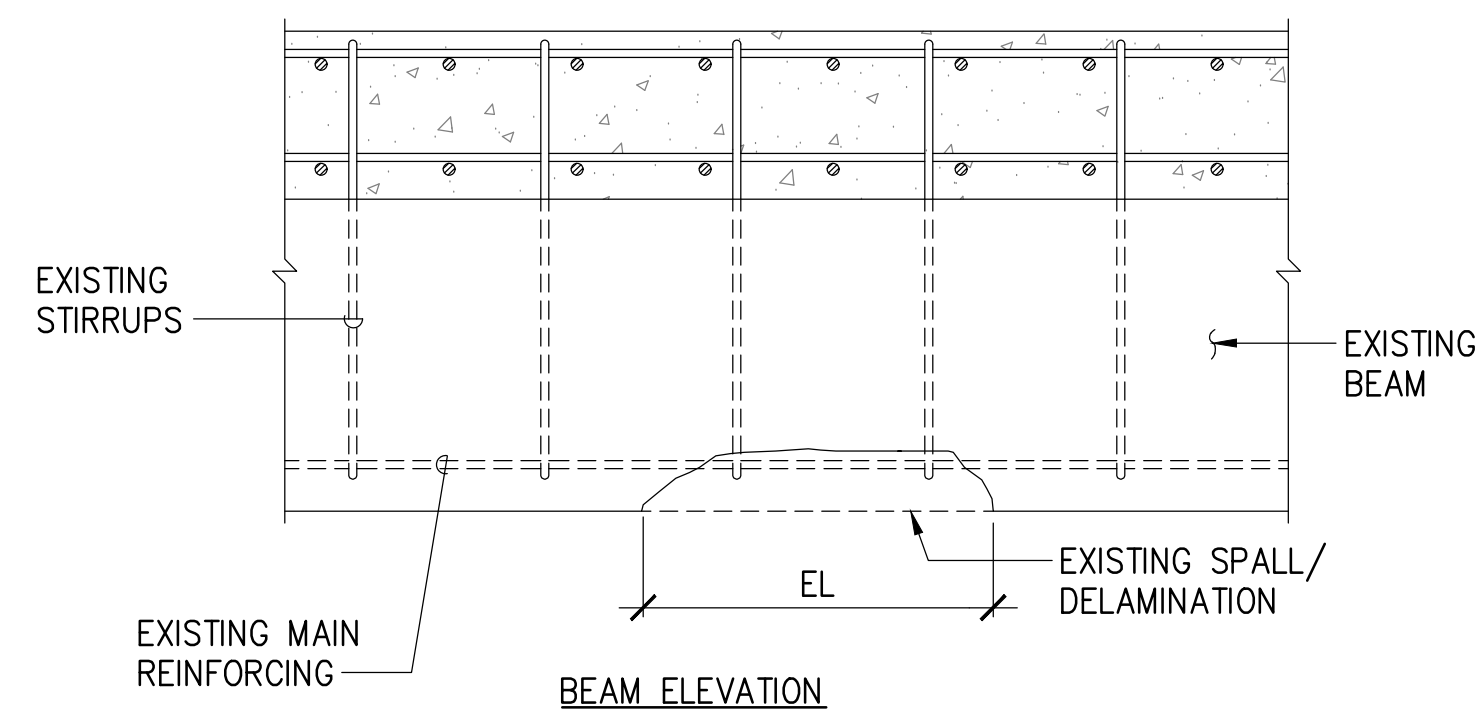
1. FOR BALANCE OF INFORMATION, SEE TYPICAL REPAIR SECTION.
2. APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.

REPAIRED CONDITION

NOTES:

1. REPAIR WIDTH (B) SHALL BE WIDER THAN ORIGINAL SPALL WIDTH (Y).
2. REPAIR LENGTH (A) SHALL EXTEND OVER ENTIRE CLEAR DISTANCE BETWEEN EXISTING BEAMS.
3. AVOID DAMAGING EXISTING STRANDS WHEN DRILLING HOLES.
4. DOWELS ARE NOT REQUIRED AT LOCATIONS WHERE INSTALLATION IS NOT POSSIBLE DUE TO FULL DEPTH CORROSION OF THE EXISTING SLAB.

| | | | | | |
|-----------------|--|---------------|-------------|----------------------|----------|
| | REVISION | DATE | DESCRIPTION | BY | APPROVED |
| | STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS | | | | |
| | JOB TITLE KAWAIHAE HARBOR, PIER 2B, SUBSTRUCTURE REPAIRS, ISLAND OF HAWAII, HAWAII | | | | |
| | SHEET TITLE PRECAST PLANK SOFFIT SPALL REPAIR DETAILS | | | | |
| DESIGNED BY: RT | | DRAWN BY: DL | | SHEET S-6 | |
| CHECKED BY: GO | | DATE: 04/2026 | | JOB NUMBER S50231 | |
| SCALE: AS SHOWN | | | | 8 of 10 SHTS. | |



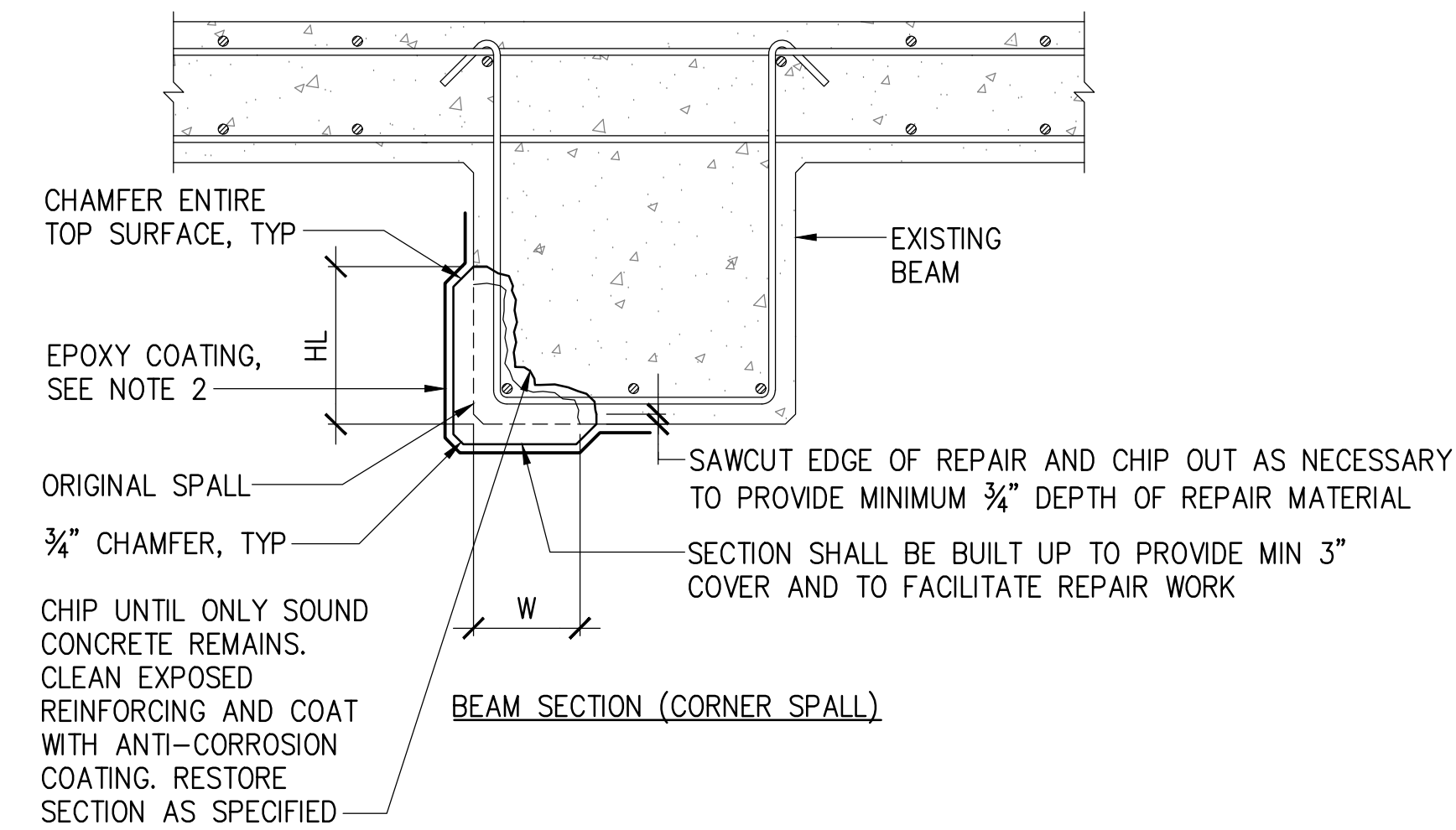
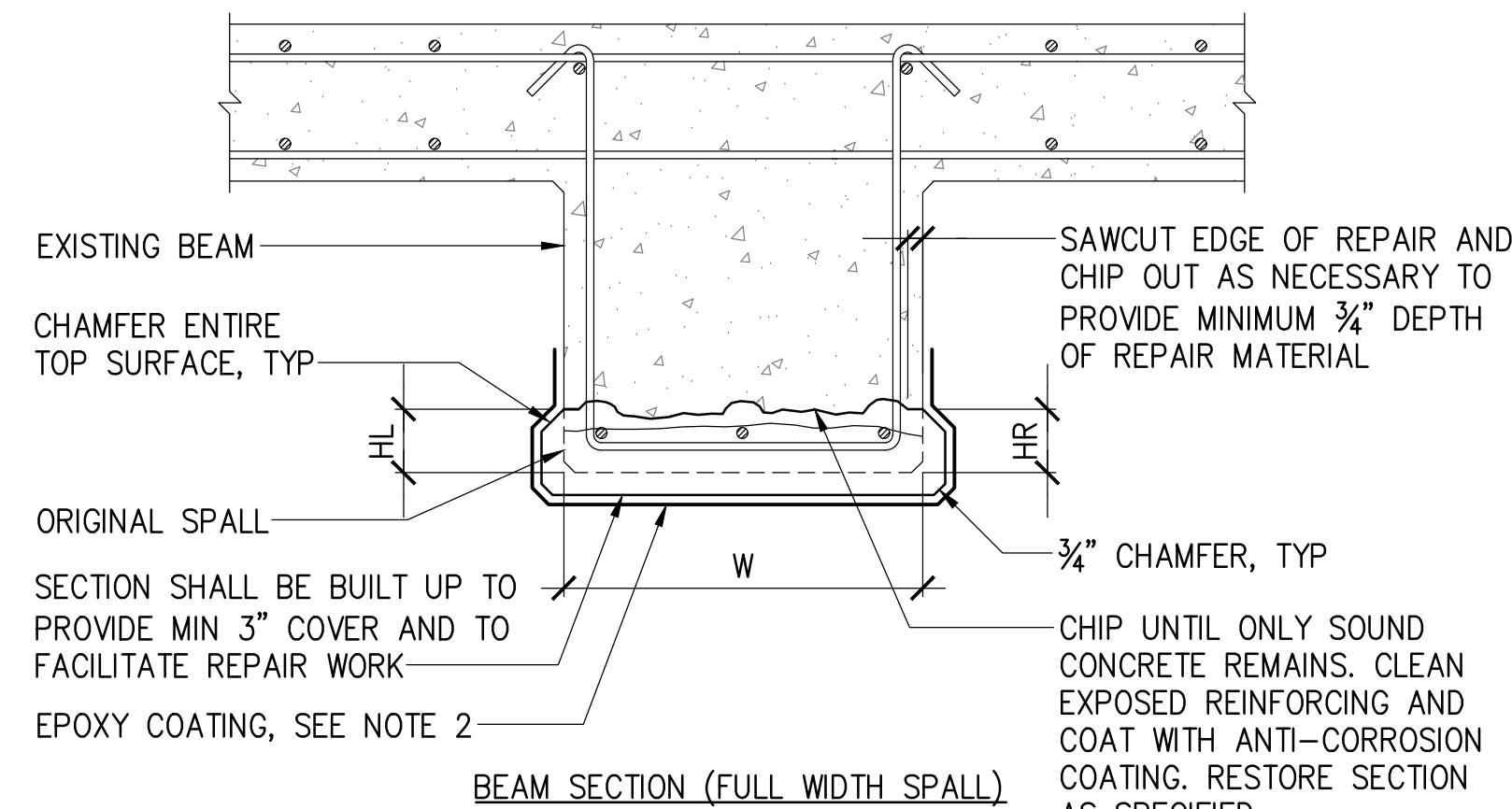
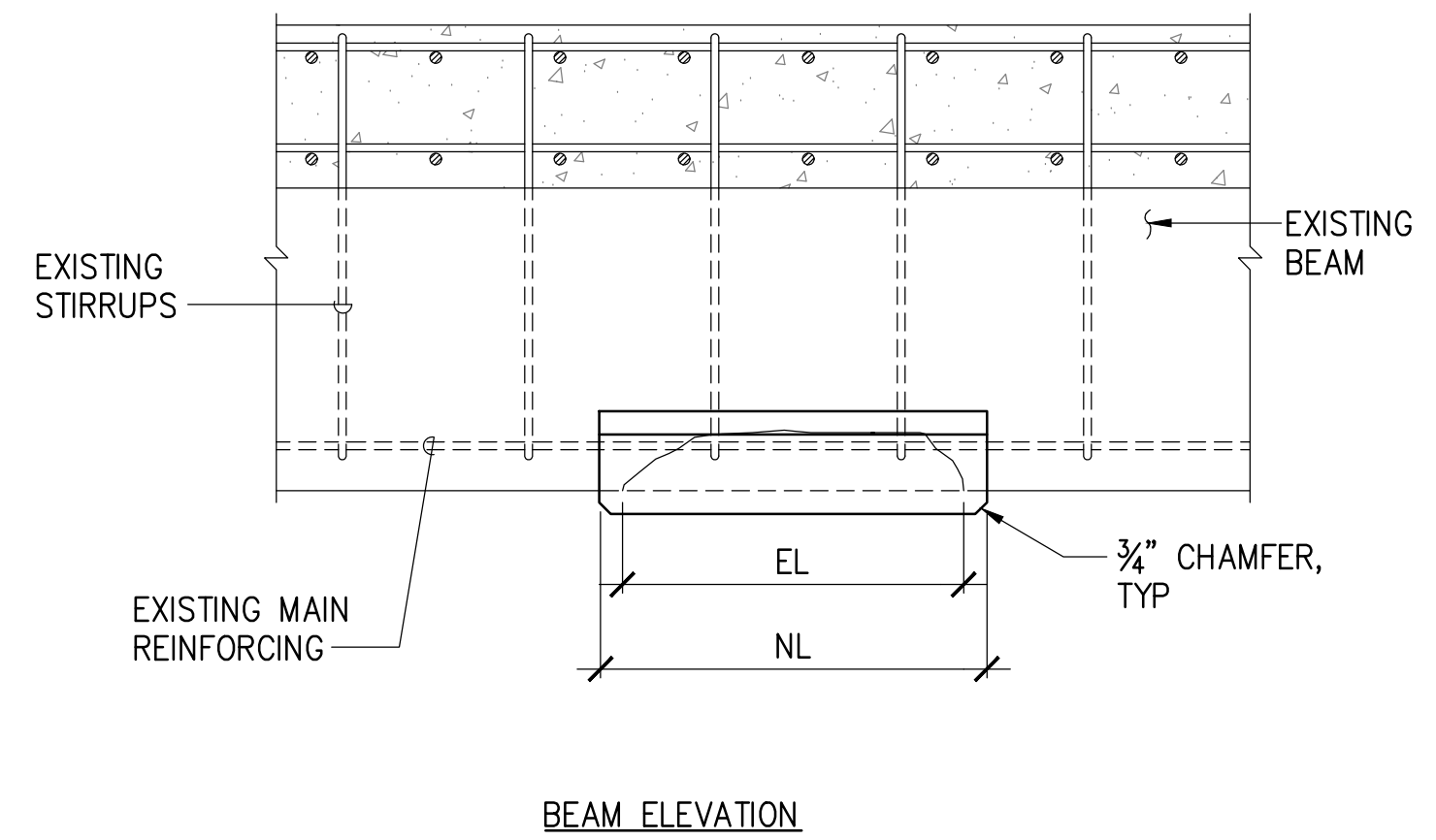
PAY AREA:
 HL = HEIGHT OF REPAIR (LEFT SIDE)
 HR = HEIGHT OF REPAIR (RIGHT SIDE)
 W = ORIGINAL WIDTH OF BEAM/GIRDER
 EL = EXISTING LENGTH OF SPALL
 NL = LENGTH OF REPAIR

PAY AREA = (HL+HR+W)NL

NOTES:

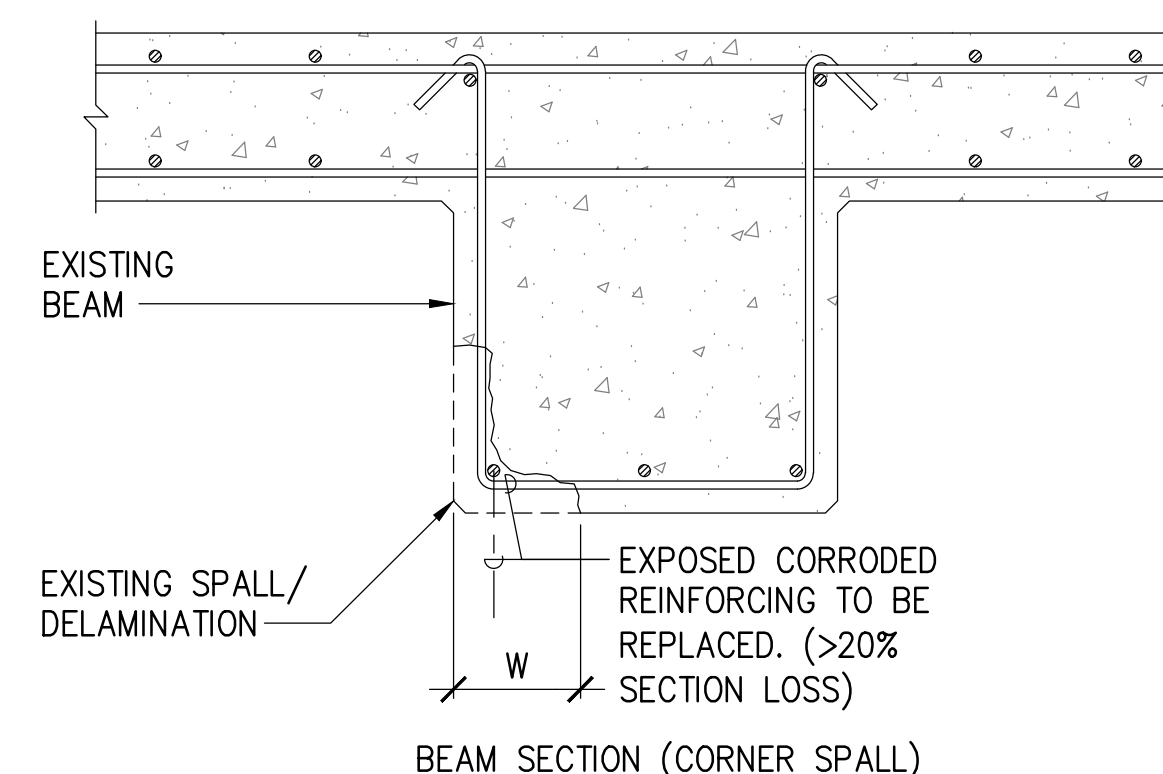
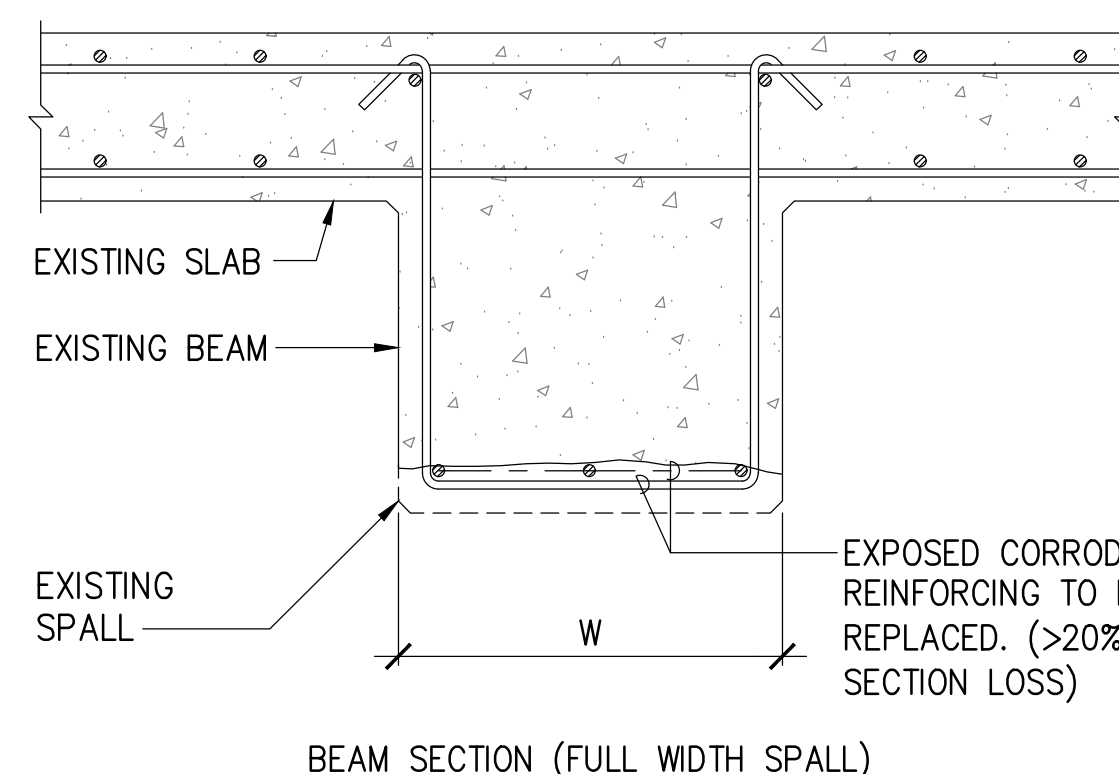
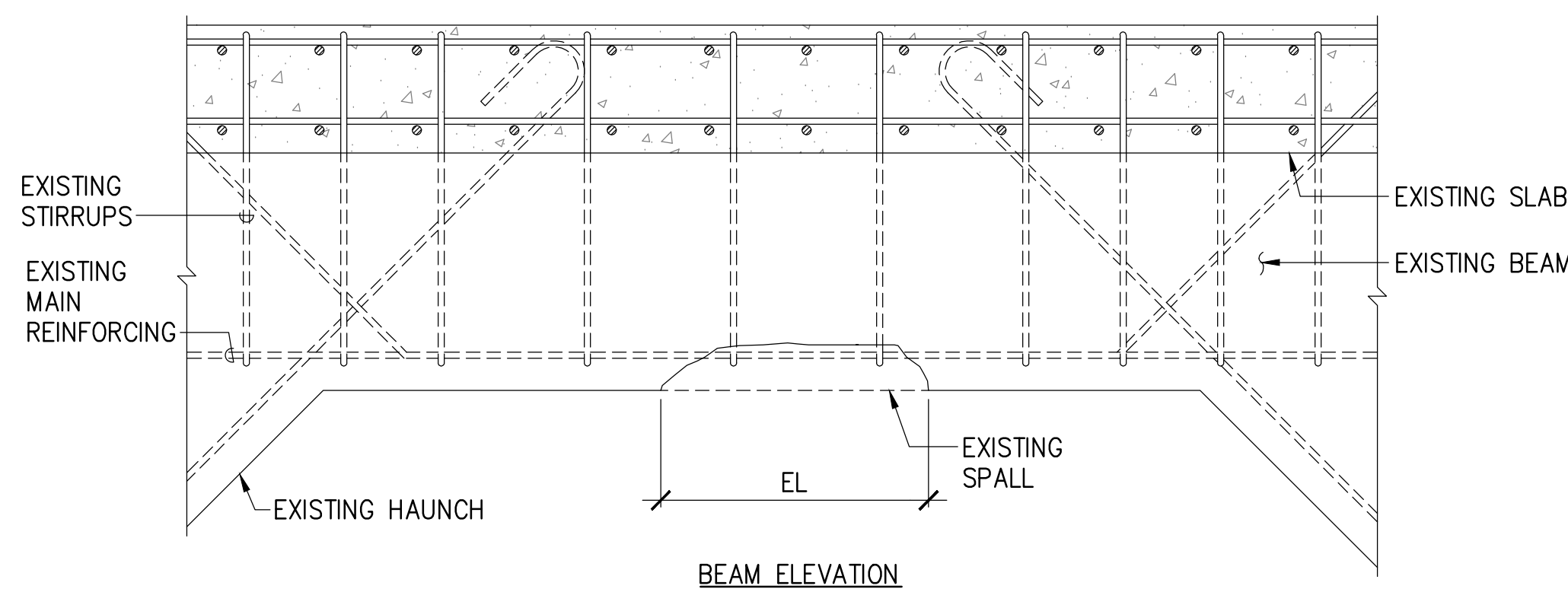
1. PAY AREA SHALL BE THE TOTAL REPAIRED AREA ON ALL BEAM FACES. IF HL, HR OR W VARY ALONG THE LENGTH OF REPAIR, PAY AREA SHALL BE CALCULATED INDIVIDUALLY FOR EACH BEAM FACE.
2. APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" MIN. OVER EXISTING EPOXY COATING.

EXISTING CONDITION



REPAIRED CONDITION

1 BEAM SPALL REPAIR (TYPE B)
 S-7 NOT TO SCALE



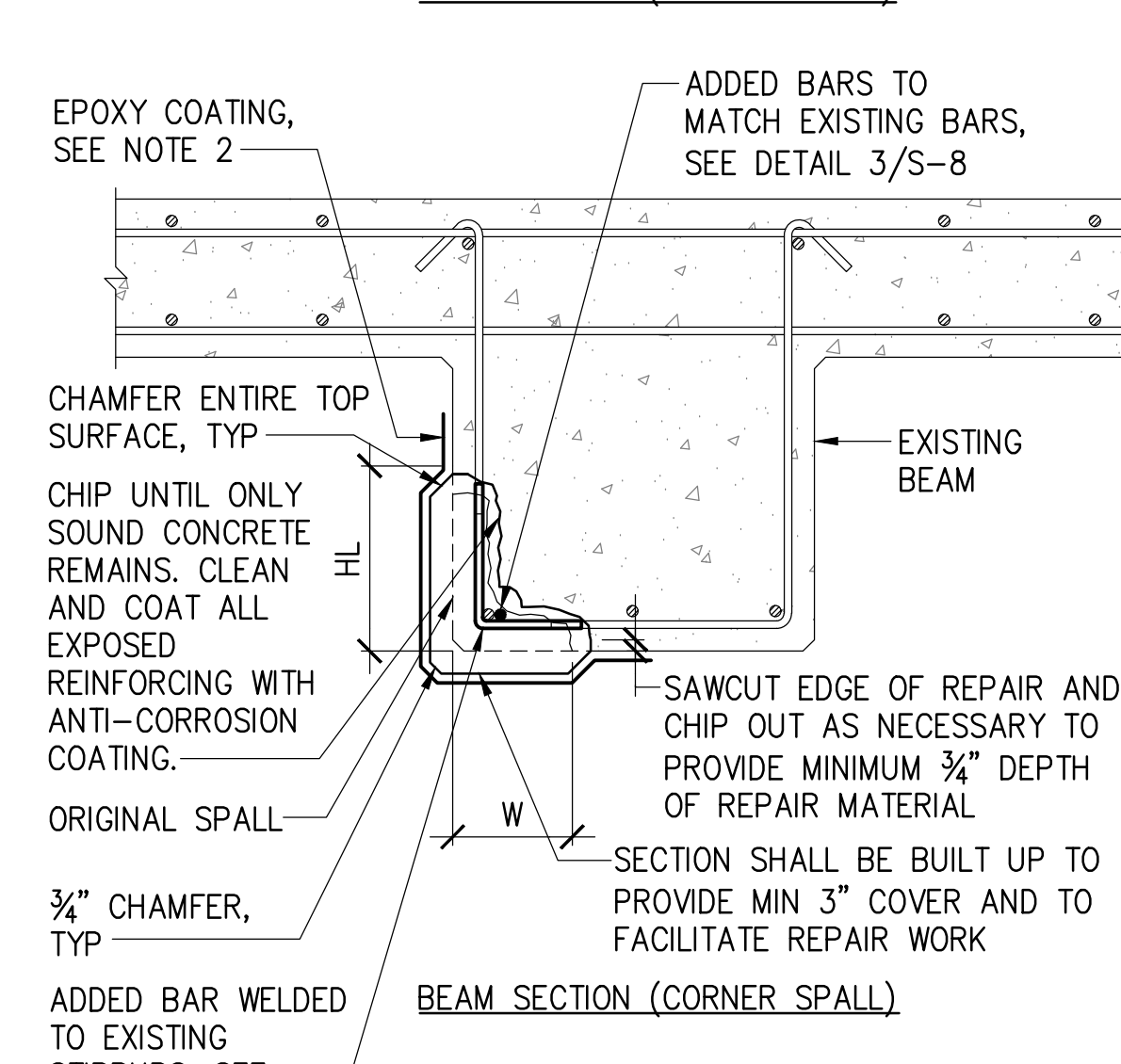
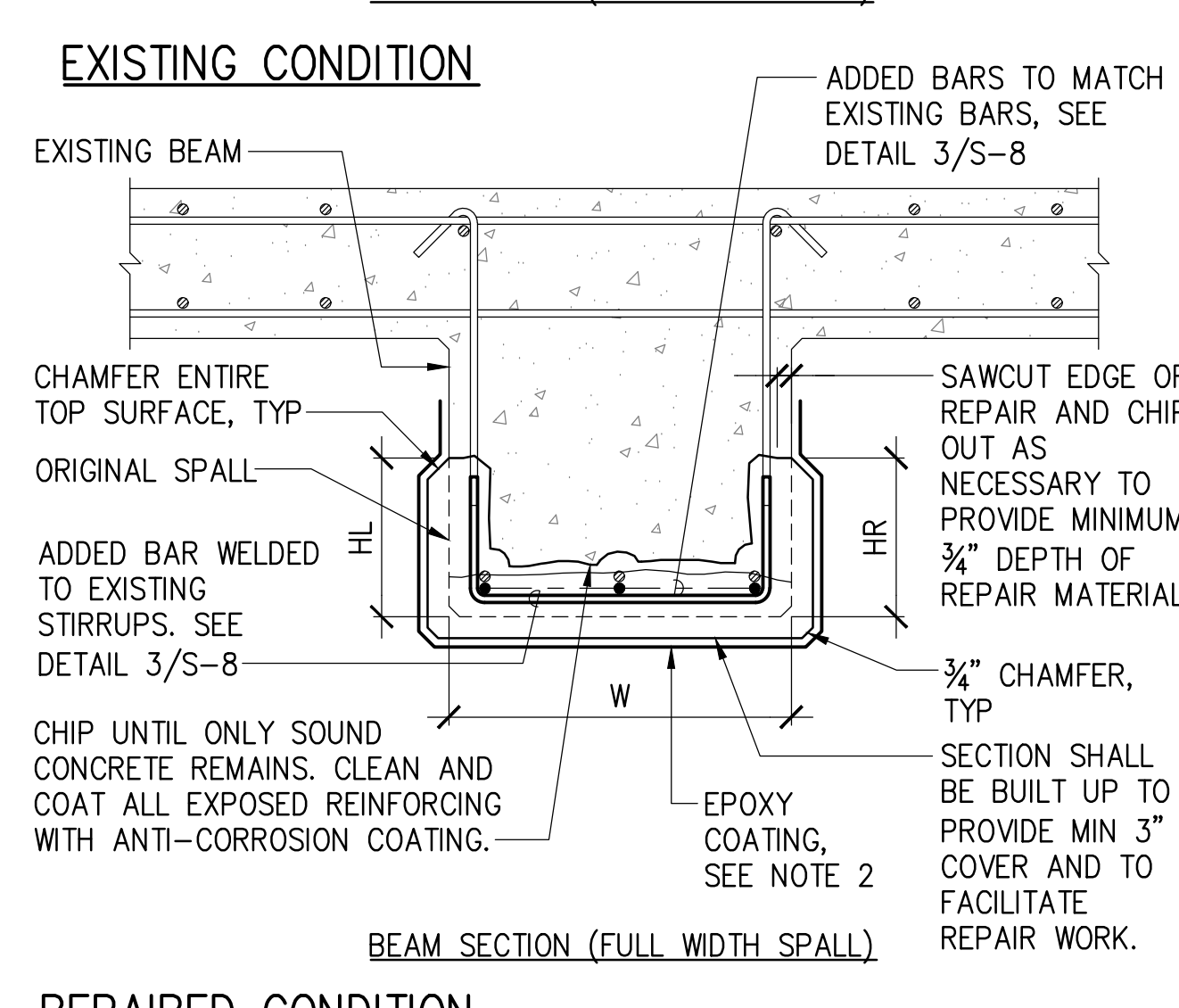
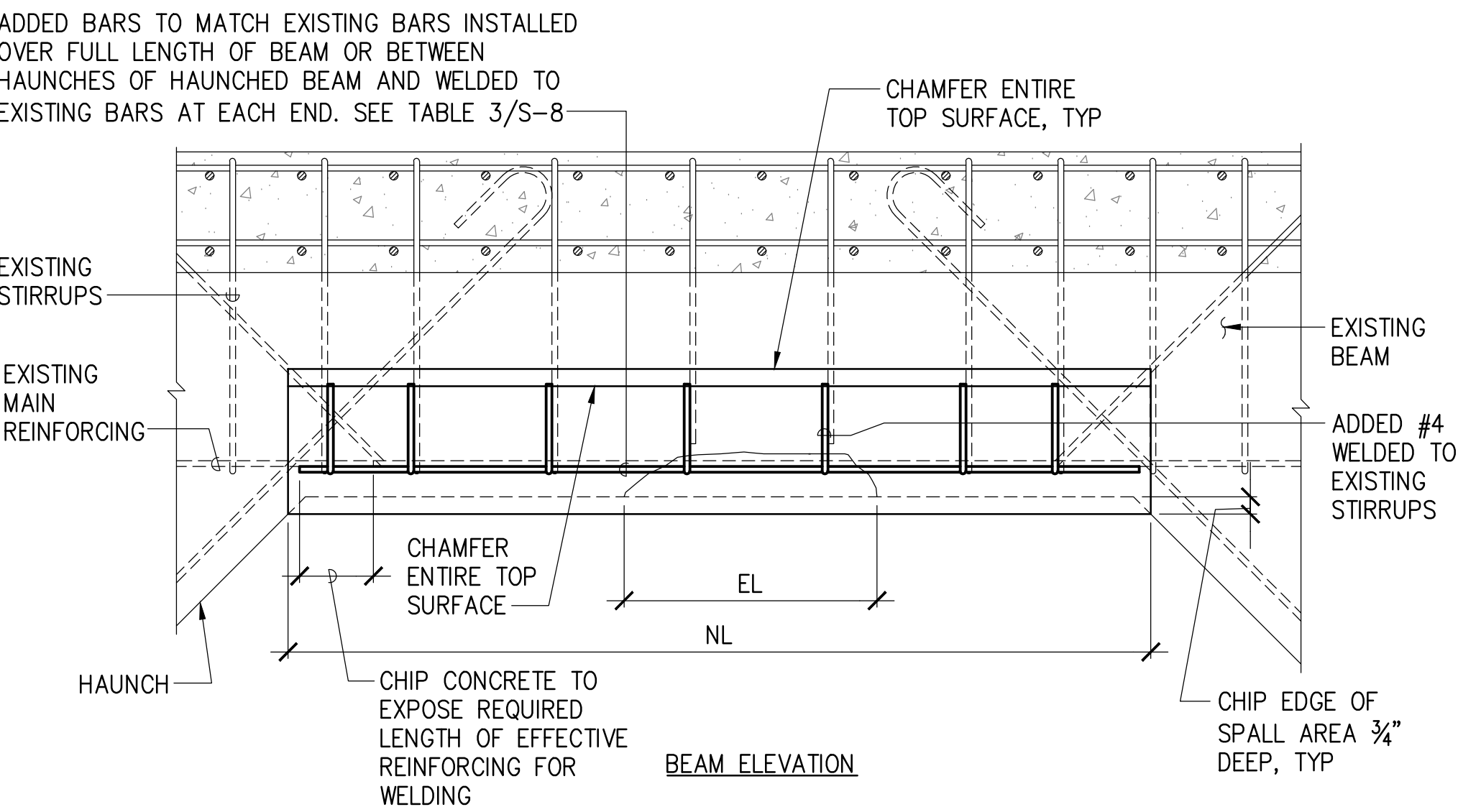
PAY AREA:
 HL = HEIGHT OF REPAIR (LEFT SIDE)
 HR = HEIGHT OF REPAIR (RIGHT SIDE)
 W = ORIGINAL WIDTH OF BEAM/GIRDER SPALL
 EL = EXISTING LENGTH OF SPALL
 NL = LENGTH OF REPAIR

PAY AREA = (HL+HR+W)NL

NOTES:

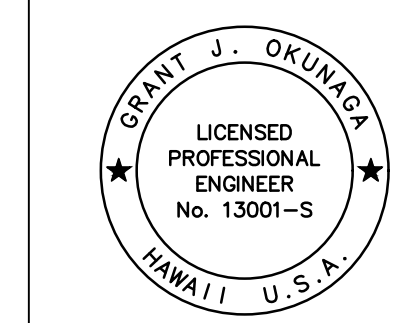
1. PAY AREA SHALL BE THE TOTAL REPAIRED AREA ON ALL BEAM FACES. IF HL, HR OR W VARY ALONG THE LENGTH OF REPAIR, PAY AREA SHALL BE CALCULATED INDIVIDUALLY FOR EACH BEAM FACE.
2. APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.

EXISTING CONDITION



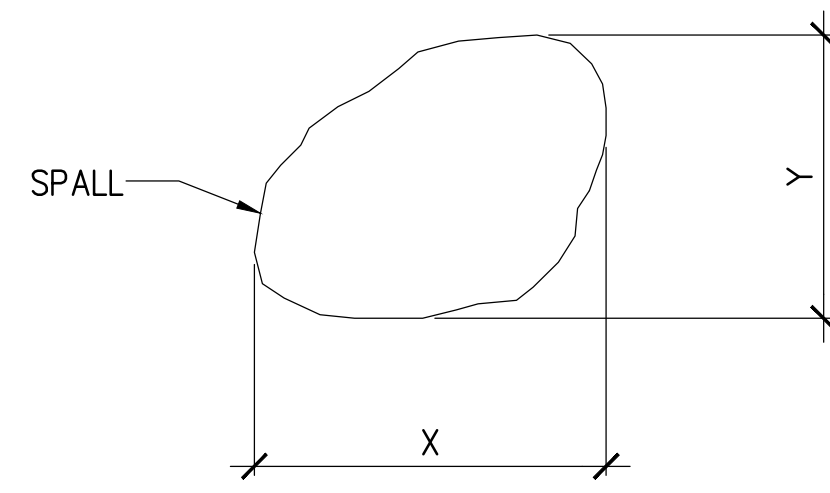
REPAIRED CONDITION

2 BEAM SPALL REPAIR WITH REINFORCING STEEL REPLACEMENT (TYPE BR)
 S-7 NOT TO SCALE



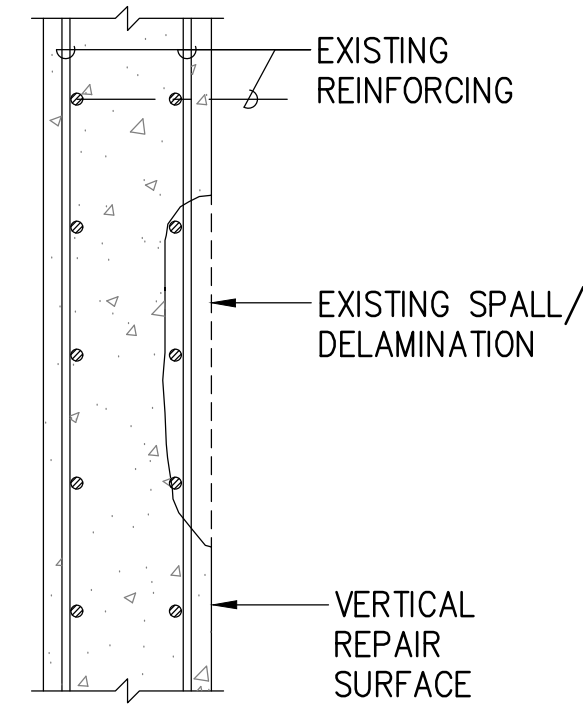
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
 EXP. 4-30-28
 MKE ASSOCIATES LLC

| REVISION | DATE | DESCRIPTION | BY | APPROVED |
|--|------|-------------|----|----------------------|
| STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS | | | | |
| JOB TITLE KAWAIHAE HARBOR, PIER 2B, SUBSTRUCTURE REPAIRS, ISLAND OF HAWAII, HAWAII | | | | |
| SHEET TITLE BEAM SPALL REPAIR DETAILS | | | | |
| DESIGNED BY: RT | | | | SHEET S-7 |
| DRAWN BY: DL | | | | JOB NUMBER S50231 |
| CHECKED BY: GO | | | | |
| DATE: 04/2026 | | | | |
| SCALE: AS SHOWN | | | | 9 of 10 SHTS. |



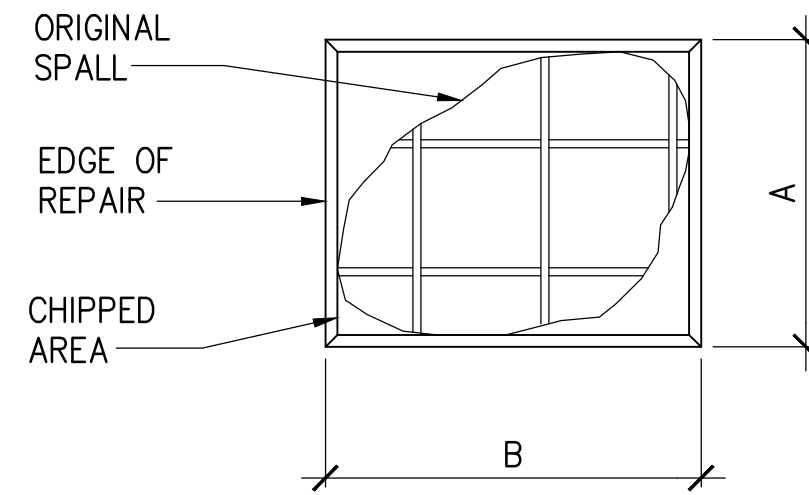
EXISTING SPALL AREA = X x Y

ELEVATION



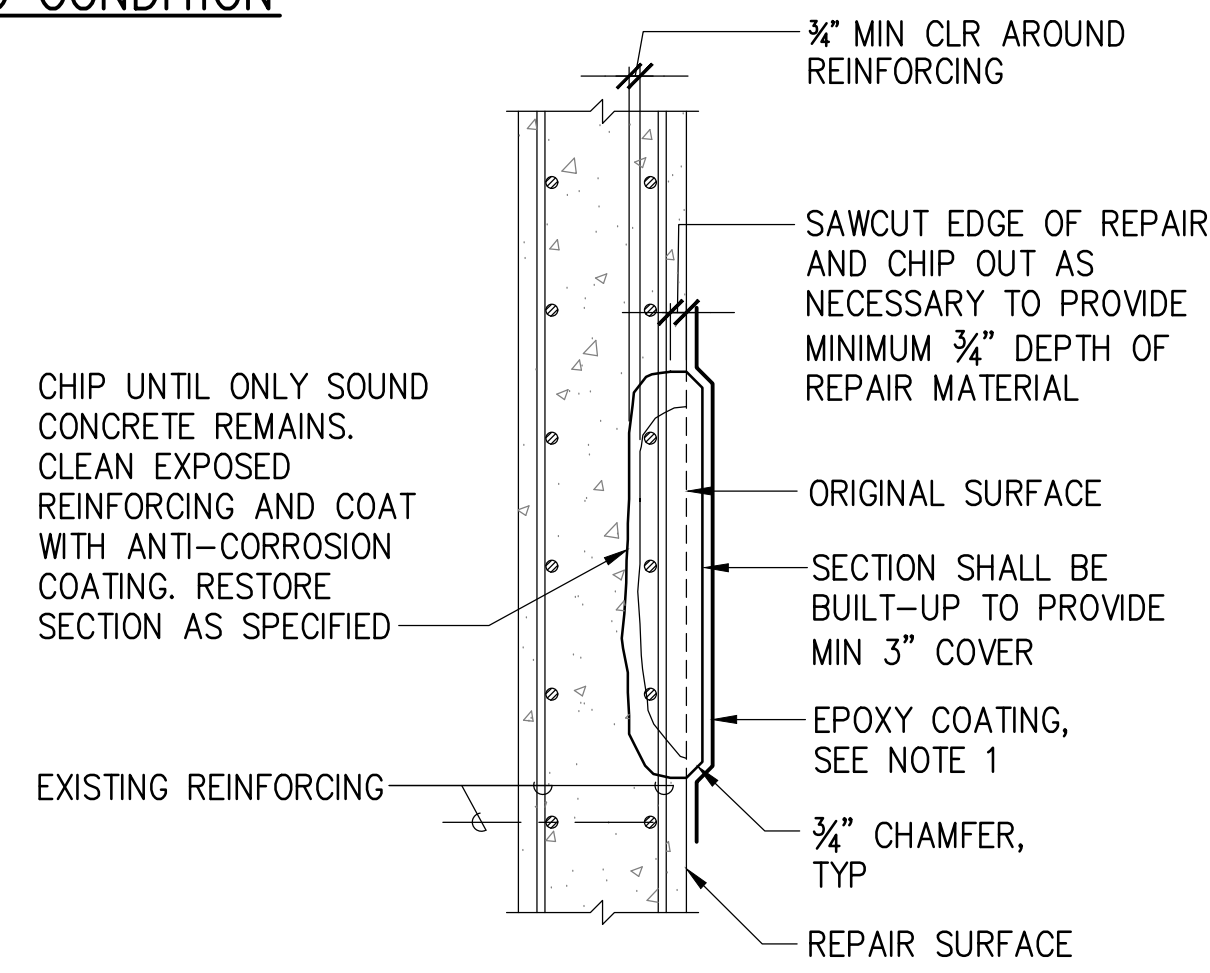
SECTION

EXISTING CONDITION



PAY AREA = A x B

ELEVATION



SECTION

REPAIRED CONDITION

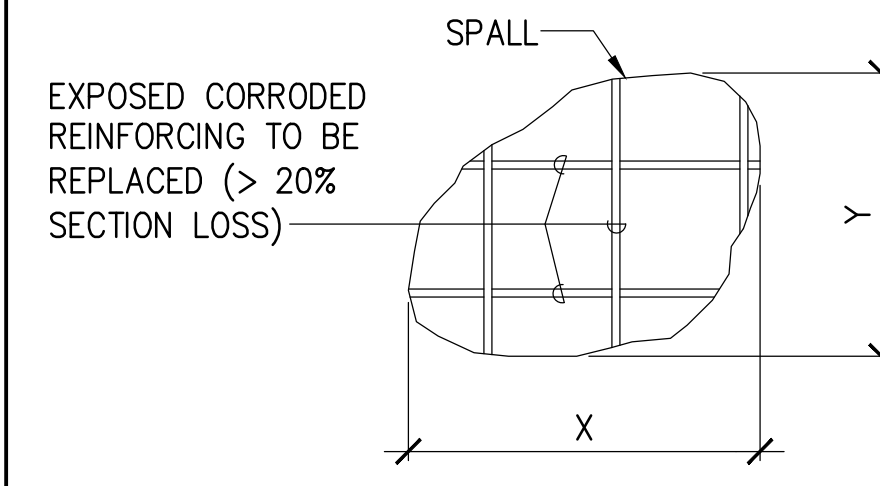
CHIP UNTIL ONLY SOUND CONCRETE REMAINS. CLEAN EXPOSED REINFORCING AND COAT WITH ANTI-CORROSION COATING. RESTORE SECTION AS SPECIFIED

3/4" MIN CLR AROUND REINFORCING
SAWCUT EDGE OF REPAIR AND CHIP OUT AS NECESSARY TO PROVIDE MINIMUM 3/4" DEPTH OF REPAIR MATERIAL
ORIGINAL SURFACE
SECTION SHALL BE BUILT-UP TO PROVIDE MIN 3" COVER
EPOXY COATING, SEE NOTE 1
3/4" CHAMFER, TYP
REPAIR SURFACE

NOTE:

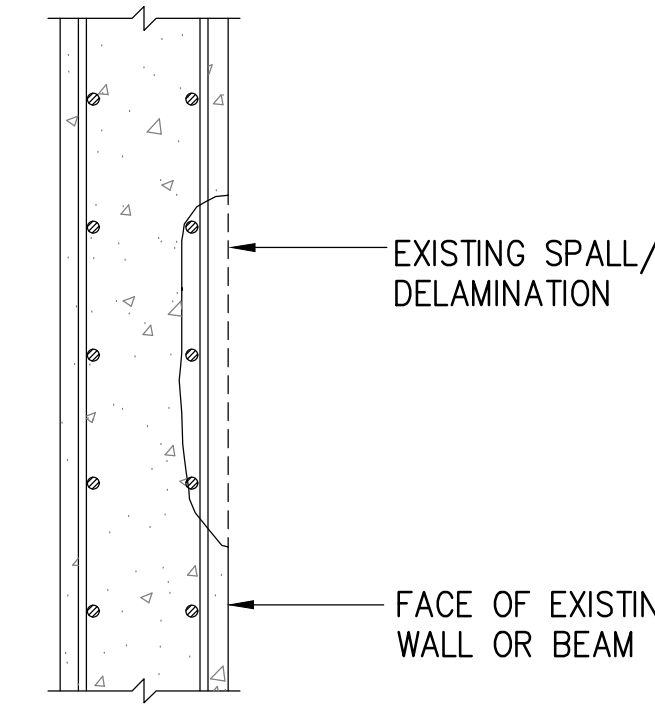
1. APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.

1 VERTICAL SPALL REPAIR (TYPE V)
S-8 NOT TO SCALE



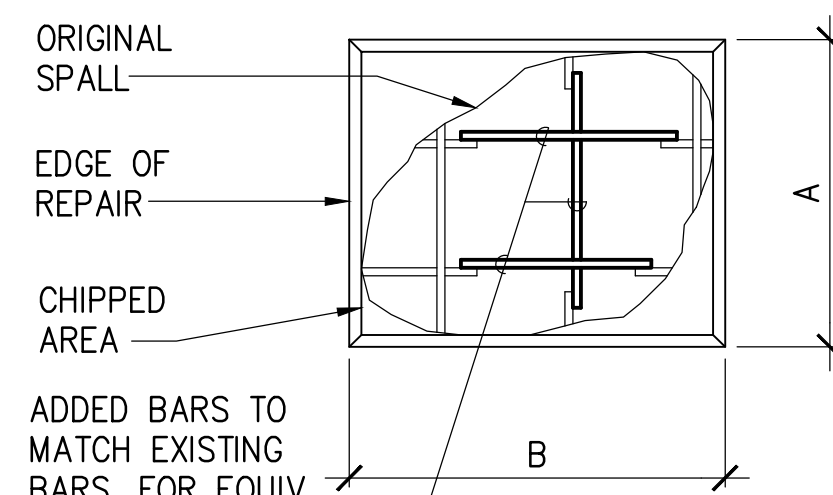
EXISTING SPALL AREA = X x Y

ELEVATION



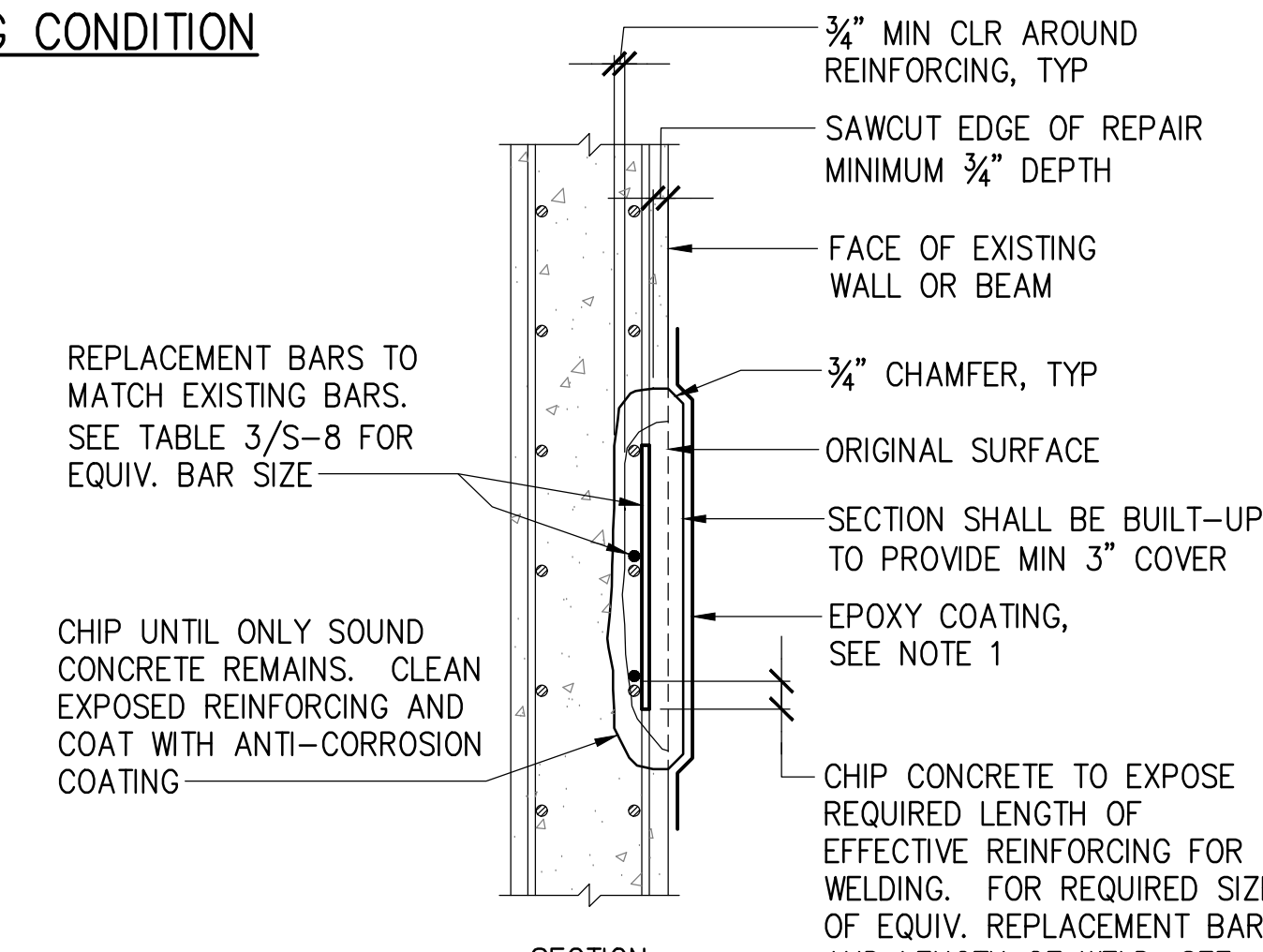
SECTION

EXISTING CONDITION



PAY AREA = A x B

ELEVATION



SECTION

REPAIRED CONDITION

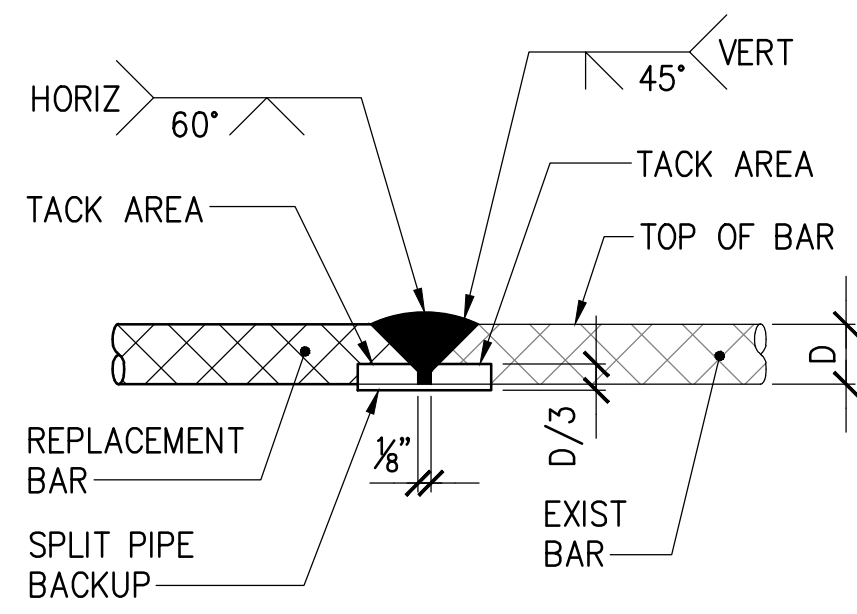
REPLACEMENT BARS TO MATCH EXISTING BARS. SEE TABLE 3/S-8 FOR EQUIV. BAR SIZE

3/4" MIN CLR AROUND REINFORCING, TYP
SAWCUT EDGE OF REPAIR MINIMUM 3/4" DEPTH
FACE OF EXISTING WALL OR BEAM
3/4" CHAMFER, TYP
ORIGINAL SURFACE
SECTION SHALL BE BUILT-UP TO PROVIDE MIN 3" COVER
EPOXY COATING, SEE NOTE 1
CHIP CONCRETE TO EXPOSE REQUIRED LENGTH OF EFFECTIVE REINFORCING FOR WELDING. FOR REQUIRED SIZE OF EQUIV. REPLACEMENT BAR AND LENGTH OF WELD, SEE DETAIL 3/S-8

NOTE:

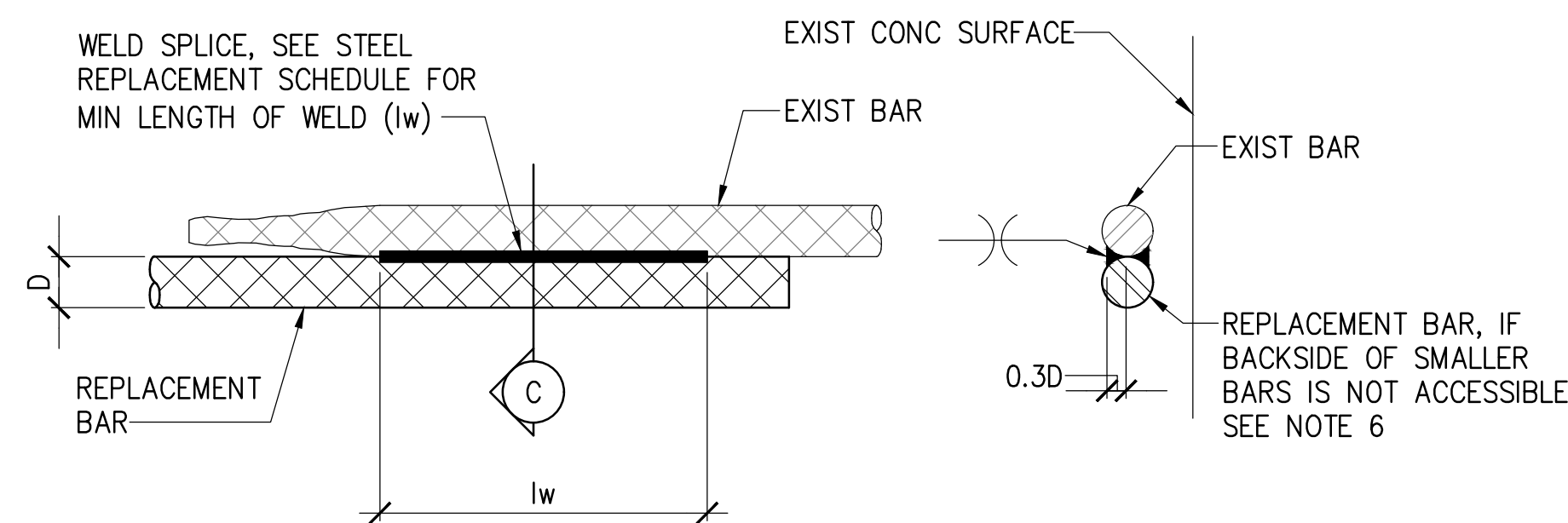
1. APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.

2 VERTICAL SPALL REPAIR WITH REINFORCING STEEL REPLACEMENT (TYPE VR)
S-8 NOT TO SCALE



A BUTT SPLICE

USE DETAIL A FOR #7 BARS AND LARGER



B LAP SPLICE

USE DETAIL B FOR #6 BARS AND SMALLER

C SECTION

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

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 lw IS INCREASED TO lw1 AS FOLLOWS

STEEL REPLACEMENT SCHEDULE

| SIZE OF EXISTING REINFORCING | | SIZE OF REPLACEMENT REINFORCING | MINIMUM LENGTH OF WELD EACH SIDE (lw) | MINIMUM LENGTH OF WELD ONE SIDE lw1 |
|------------------------------|--------|---------------------------------|---------------------------------------|-------------------------------------|
| 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 | - | - |

3 REINFORCING STEEL SPLICE DETAIL
S-8 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 KAWAIHAE HARBOR, PIER 2B, SUBSTRUCTURE REPAIRS, ISLAND OF HAWAII, HAWAII | | | | |
| SHEET TITLE VERTICAL SPALL REPAIR AND SPLICE DETAILS | | | | |
| DESIGNED BY: RT | JOB NUMBER | | SHEET | |
| DRAWN BY: DL | S50231 | | S-8 | |
| CHECKED BY: GO | | | | |
| DATE: 04/2026 | 10 OF 10 SHTS. | | | |
| SCALE: AS SHOWN | | | | |