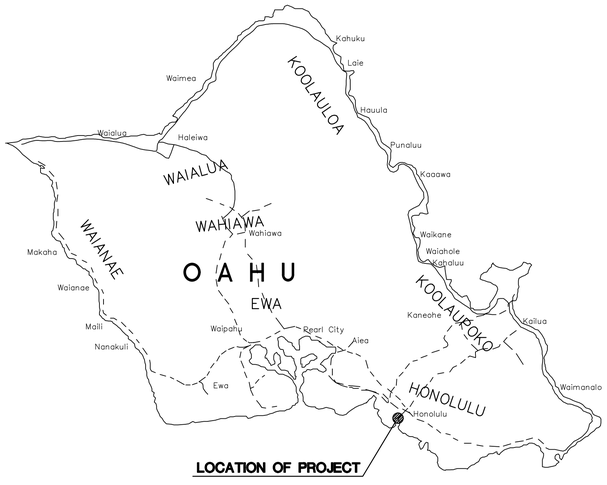
HONOLULU HARBOR, PIER 17, SUBSTRUCTURE REPAIRS, OAHU, HAWAII

FOR THE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS

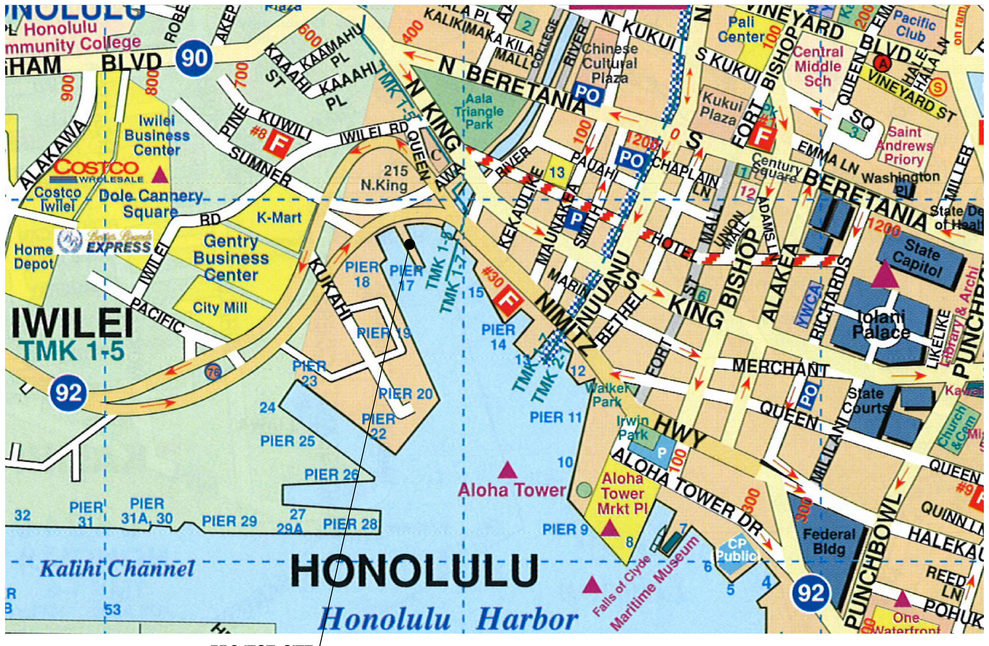
S10956



ISLAND OF OAHU

LOCATION MAP

NOT TO SCALE



VICINITY MAP

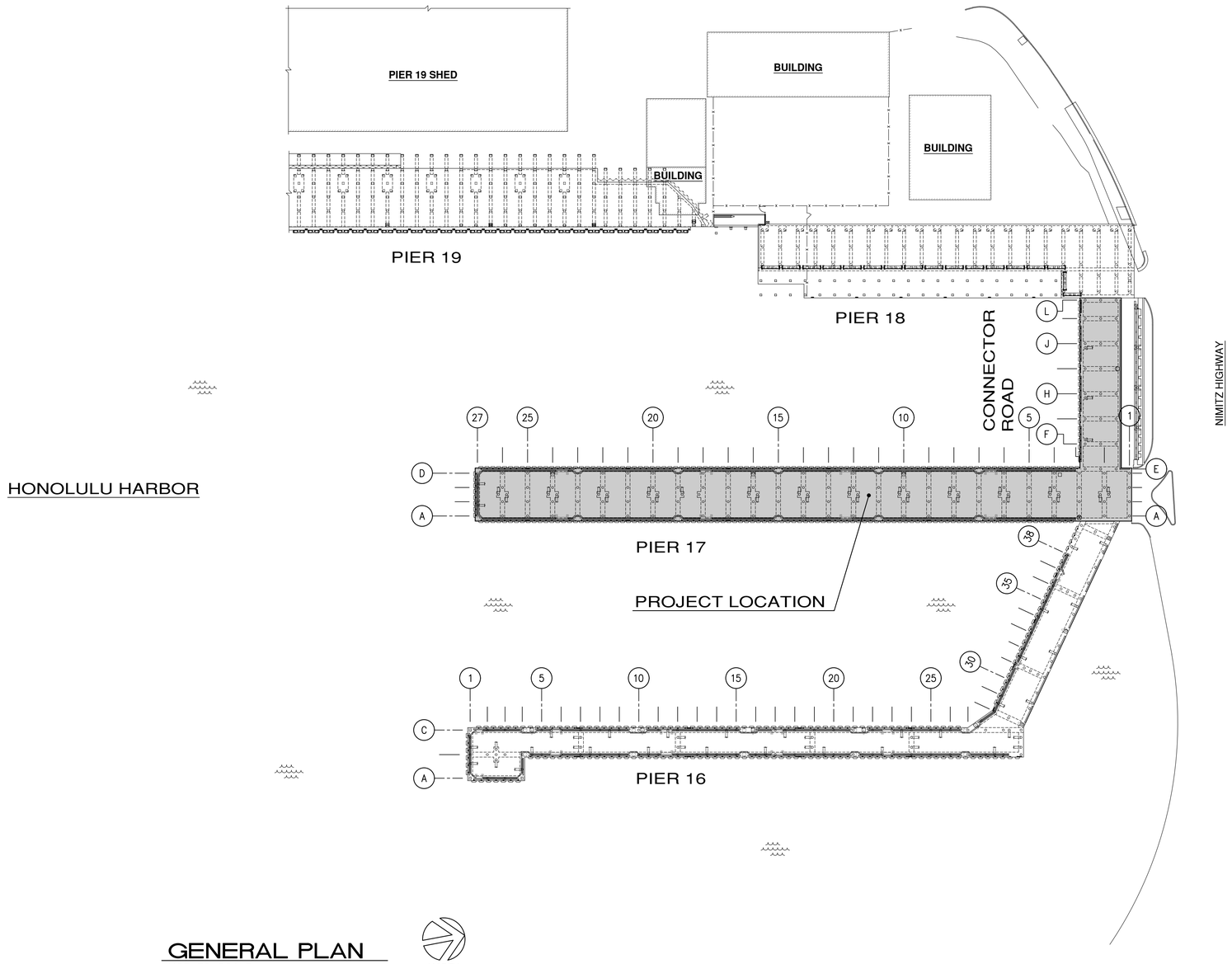
NOT TO SCALE

CONSULTANT:

MKE ASSOCIATES LLC
STRUCTURAL ENGINEER

DEPARTMENT OF TRANSPORTATION STATE OF HAWAII	SHEET T-1
APPROVED BY: 04/22/2026	1 OF 9 SHTS
FOR DIRECTOR OF TRANSPORTATION — DATE	

INDEX TO DRAWINGS



HONOLULU HARBOR

GENERAL PLAN
NOT TO SCALE

NORTH

REVISION	DATE	DESCRIPTION	BY	APPROVED

GRANT J. OKUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 13001-S
HAWAII U.S.A.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS

JOB TITLE
HONOLULU HARBOR, PIER 17, SUBSTRUCTURE REPAIRS, OAHU, HAWAII

SHEET TITLE
INDEX TO DRAWINGS AND GENERAL PLAN

DESIGNED BY: GO
DRAWN BY: DL
CHECKED BY: GO
DATE: 04/2026
SCALE: AS SHOWN

JOB NUMBER
S10956

SHEET
T-2
2 OF 9 SHTS.

Plotted: Apr 16, 2026 - 4:48pm

STRUCTURAL NOTES:

GENERAL:

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES.
7. 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.
8. 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.
9. 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.
10. 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.
11. ALL WORK SPECIFIED IN THE CONTRACT BUT NOT LISTED SEPARATELY SHALL BE CONSIDERED INCIDENTAL AND WILL NOT BE PAID FOR SEPARATELY.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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.

ORIGINAL PIER DESIGN LOADS:

1. H20-16 WHEEL LOADS OR 500 PSF

PHASING NOTES:

1. PHASING AND CAREFUL COORDINATION OF THE WORK WILL BE REQUIRED TO ALLOW CONTINUOUS USE OF THE PROJECT LOCATION AND ADJACENT AREAS.
2. CONTRACTOR SHALL PERFORM THE WORK IN PHASES TO KEEP THE PIER AND CONNECTOR ROAD OPERATIONAL.
3. SEE SPECIFICATIONS FOR ADDITIONAL PHASING INFORMATION.

CONCRETE:

1. CONCRETE CONSTRUCTION SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE ACI 318R AND ACI 546R.
2. FORMED CONCRETE SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH OF f'c=5,000 PSI WITH FLY ASH AND CORTEC MCI 2005 NS MIGRATING CORROSION INHIBITING ADMIXTURE, OR APPROVED EQUAL.
3. MAXIMUM AGGREGATE SIZE SHALL BE ⅜ INCHES AND SHALL BE COORDINATED WITH CONCRETE PREPARATION PROCEDURES FOR SPALL REPAIRS.
4. 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.
5. MAXIMUM WATER TO CEMENTITIOUS MATERIALS RATIO SHALL BE 0.40.
6. PATCHING COMPOUND FOR FORM AND POUR SPALL REPAIRS SHALL BE SIKACRETE 211 SCC PLUS BY SIKA, OR APPROVED EQUAL.
7. PATCHING COMPOUND FOR REPAIRING VERTICAL AND SOFFIT SPALLS IN LIFTS SHALL BE SIKAQUICK VOH WITH LATEX R BY SIKA, OR APPROVED EQUAL.
8. 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:

1. REINFORCING STEEL FOR WELD SPLICING SHALL BE ASTM A706 GRADE 60. WELDING ELECTRODES SHALL BE LOW HYDROGEN E70.
2. REINFORCING STEEL NOT TO BE WELD SPLICED SHALL BE ASTM A615, GRADE 60 OR ASTM A706 GRADE 60.
3. CLEAR CONCRETE COVER FOR REINFORCING BARS SHALL BE 3 INCHES MINIMUM, UNLESS OTHERWISE NOTED.
4. BAR BENDS AND HOOKS SHALL BE STANDARD HOOKS IN ACCORDANCE WITH ACI 318.
5. REINFORCING STEEL SHALL BE SPLICED AS INDICATED ON PLANS. PROVIDE WELD SPLICE PER TYPICAL DETAILS, UNLESS OTHERWISE NOTED.
6. ANTI-CORROSION COATING WITH A MINIMUM 7 DAY OPEN TIME FOR REINFORCING STEEL SHALL BE ARMATEC 110 EPOCEM BY SIKA OR APPROVED EQUAL.
7. EPOXY FOR GROUTING OF DOWELS SHALL BE SET-3G BY SIMPSON STRONG-TIE, OR APPROVED EQUAL.
8. 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.

MIGRATING CORROSION INHIBITOR:

1. MIGRATING CORROSION INHIBITOR SHALL BE MCI-2020 V/O BY CORTEC, OR APPROVED EQUAL.
2. APPLY MIGRATING CORROSION INHIBITOR TO ALL EXISTING PREPARED PRECAST CONCRETE REPAIR SURFACES PRIOR TO PLACING REPAIR CONCRETE.

EPOXY COATING SYSTEM:

1. EPOXY COATING SYSTEM SHALL BE TWO COATS OF AMERLOCK 400 BY PPG PROTECTIVE AND MARINE COATINGS, OR APPROVED EQUAL.
2. CONCRETE REPAIRS SHALL BE ALLOWED TO CURE A MINIMUM OF 14 DAYS OR PER MANUFACTURER'S RECOMMENDATIONS BEFORE APPLYING EPOXY COATING SYSTEM.
3. CLEAN ALL CONCRETE SURFACES TO BE COATED PER MANUFACTURER'S RECOMMENDATIONS.
4. APPLY EPOXY COATING SYSTEM TO ALL REPAIRED SURFACES OF PLANKS AND CONCRETE SURFACES OF BEAMS ON THE UNDERSIDE OF THE PIER IN THE PROJECT LOCATION AS SHOWN.

GALVANIC ANODES:

1. GALVANIC ANODES SHALL BE GALVASHIELD XP4 ANODES BY VECTOR CORROSION TECHNOLOGIES, OR APPROVED SUBSTITUTE.
2. INSTALL ANODES PER MANUFACTURER'S RECOMMENDATIONS.

PREPARATION OF SUBSTRATE AND REINFORCING STEEL FOR SPALL REPAIRS:

1. SURFACE PREPARATION FOR SPALL REPAIRS SHALL FOLLOW THE INTERNATIONAL CONCRETE REPAIR INSTITUTE (ICRI) GUIDELINE NO. 310.1R-2008.
2. BOTH SPALLS AND DELAMINATIONS ARE REFERRED TO ON THE DRAWINGS AS "SPALLS", AS THE REPAIR PROCEDURES ARE THE SAME FOR BOTH CONDITIONS.
3. THE CONTRACTOR SHALL SOUND ALL CONCRETE SURFACES TO IDENTIFY SPALLS AND DELAMINATIONS.
4. 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.
5. PREPARATION OF SUBSTRATE AND REINFORCING STEEL FOR SPALL REPAIRS SHALL BE PERFORMED IN THE ORDER LISTED BELOW.
6. 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.
7. 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 ¾ 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.
8. FOR ANY EXPOSED REINFORCEMENT WITHIN THE REPAIR AREA, ADDITIONAL CONCRETE SHALL BE REMOVED FOR A MINIMUM ¾ INCH CLEAR SPACE MEASURED RADIALLY AROUND THE BARS.
9. EXISTING CONCRETE SURFACES WITHIN THE REPAIR AREAS SHALL BE ROUGHENED TO ENSURE PROPER ADHESION WITH REPAIR CONCRETE.
10. 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.
11. 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.
12. ALL WELDING SHALL CONFORM TO AWS D1.4.
13. 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.
14. 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:

1. ALL EXPOSED STEEL IN THE REPAIR AREA SHALL BE LIBERALLY COATED WITH ANTI-CORROSION COATING PER MANUFACTURER'S RECOMMENDATIONS.
2. 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.
3. ALL VERTICAL AND OVERHEAD REPAIRS GREATER THAN 10 SQUARE FEET SHALL BE FORMED.
4. 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 ¾ INCH. COVER AFTER FORM REMOVAL.
5. 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.
6. SNAP TIES AND OTHER NON-REMOVABLE INSERTS SHALL BE PLASTIC OR STAINLESS STEEL.
7. 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.
8. 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.
9. CONCRETE REPAIRS SHALL MATCH AND MAINTAIN EXISTING CHAMFER EDGES AND EXPANSION JOINTS. CONTRACTOR SHALL INSTALL JOINT FILLER TO MAINTAIN JOINTS.
10. 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.
11. THERE SHALL BE NO COLD JOINTS IN THE FIELD OF THE REPAIR.
12. THE REPAIRED SURFACE FINISH SHALL MATCH THE ORIGINAL SURFACE FINISH.
13. VOID SPACES BEYOND THE EDGE OF THE FORM SHALL BE DRY PACKED IN LIFTS WITH PATCHING COMPOUND.
14. 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.
15. 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.

GRANT J. OKUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 13001-S
HAWAII U.S.A.

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 17, SUBSTRUCTURE REPAIRS, OAHU, HAWAII

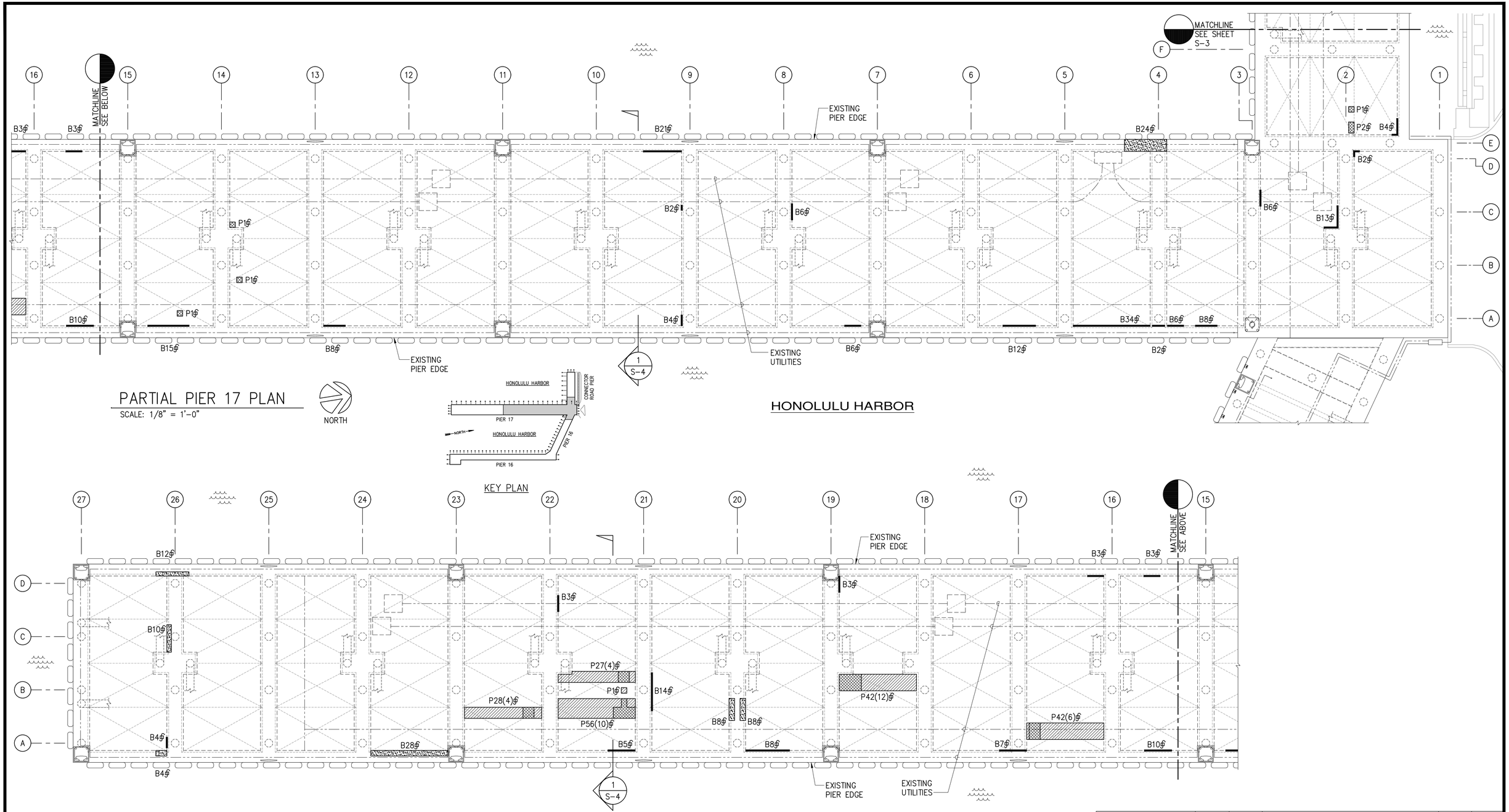
SHEET TITLE
STRUCTURAL NOTES

DESIGNED BY:	GO
DRAWN BY:	DL
CHECKED BY:	GO
DATE:	04/2026
SCALE:	AS SHOWN

JOB NUMBER
S10956

SHEET
S-1
3 OF 9 SHTS.

Plotted: Apr 08, 2026 - 9:48pm



PARTIAL PIER 17 PLAN

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

NORTH

KEY PLAN

HONOLULU HARBOR

PARTIAL PIER 17 PLAN

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

NORTH

KEY PLAN

SPALL REPAIR LEGEND:

- VERTICAL SURFACE SPALL ON BEAM (TYPE B OR BR), SEE DETAILS 1/S-5 AND 2/S-5
- BEAM SOFFIT SPALL REPAIR (TYPE B), SEE DETAIL 1/S-5
- BEAM SOFFIT SPALL WITH REINFORCING THAT HAS LOST MORE THAN 20% OF ITS CROSS-SECTIONAL AREA (TYPE BR), SEE DETAIL 2/S-5
- PRECAST PLANK SOFFIT SPALL REPAIR (TYPE P), SEE DETAIL 1/S-6
- ℔ SQUARE FEET

NOTES:

1. APPROX LINEAR FOOT AND SQUARE FOOT VALUES LISTED REFER TO COMPLETED REPAIR QUANTITIES.
2. FOR PRECAST PLANK SOFFIT REPAIRS (P), FIRST VALUE INDICATES FINAL REPAIR AREA AS SHOWN WITH HATCH. SECOND VALUE IN PARENTHESIS INDICATES APPROXIMATE SPALL AREA AS SHOWN WITH HATCH.
3. MORE UTILITIES NOT SHOWN ON PLAN.
4. CONCRETE CURB ON PIER TOPSIDE NOT SHOWN FOR CLARITY.
5. ADDITIONAL UTILITIES NOT SHOWN MAY BE PRESENT ON THE PIER UNDERSIDE.

GRANT J. OKUNAGA LICENSED PROFESSIONAL ENGINEER No. 13001-S HAWAII U.S.A.

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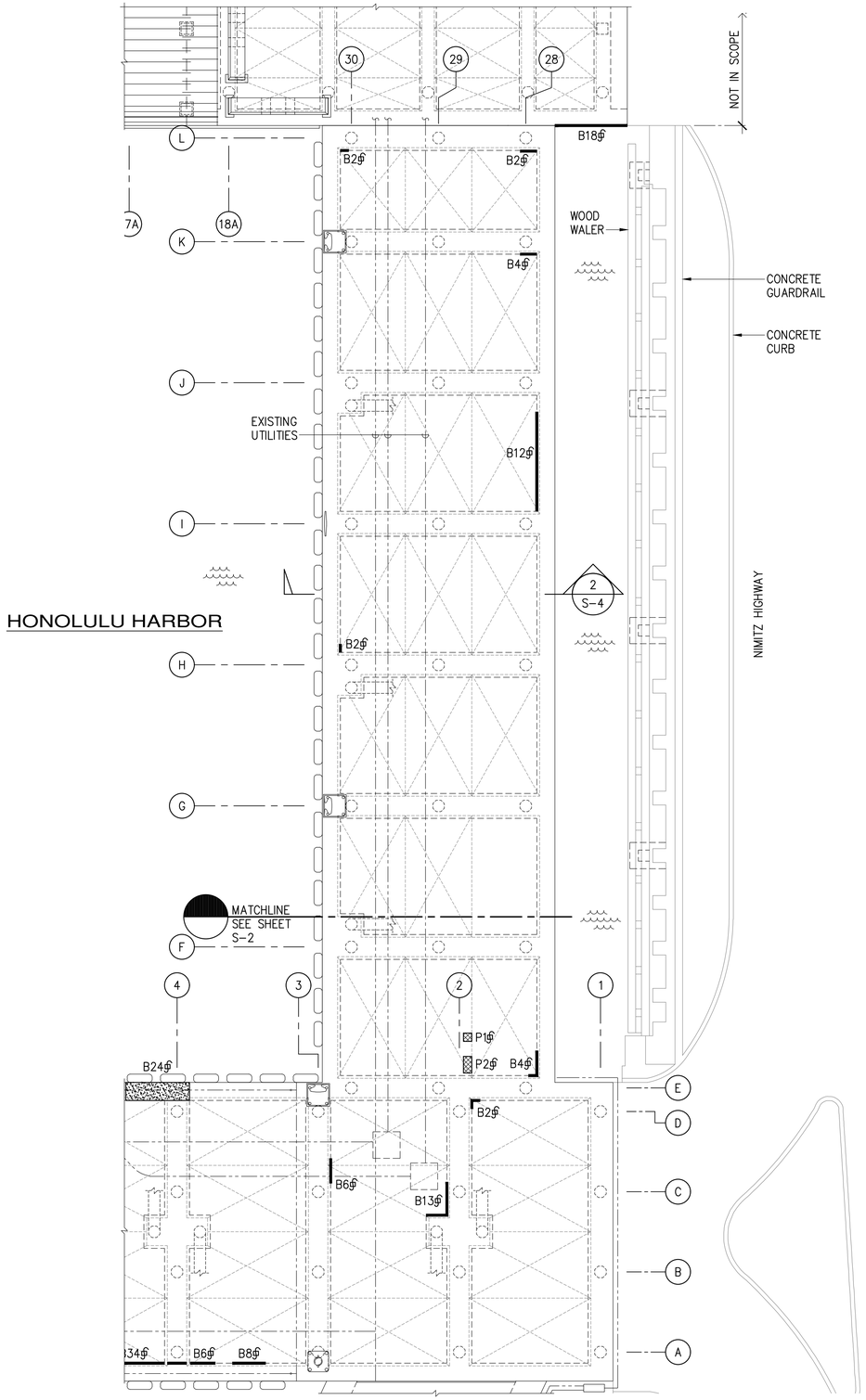
SHEET TITLE
PARTIAL PIER 17 PLAN

DESIGNED BY: GO
DRAWN BY: DL
CHECKED BY: GO
DATE: 04/2026
SCALE: AS SHOWN

JOB NUMBER S10956

SHEET S-2
4 OF 9 SHTS.

Plotted: Apr 10, 2026 - 4:57pm



CONNECTOR ROAD – PIER PLAN

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

NORTH

SPALL REPAIR LEGEND:

- VERTICAL SURFACE SPALL ON BEAM (TYPE B OR BR), SEE DETAILS 1/S-5 AND 2/S-5
- BEAM SOFFIT SPALL REPAIR (TYPE B), SEE DETAIL 1/S-5
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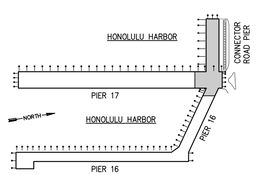
3. MORE UTILITIES NOT SHOWN ON PLAN.
4. CONCRETE CURB ON PIER TOPSIDE NOT SHOWN FOR CLARITY.
5. ADDITIONAL UTILITIES NOT SHOWN MAY BE PRESENT ON THE PIER UNDERSIDE.



KEY PLAN

REVISION	DATE	DESCRIPTION	BY	APPROVED

GRANT J. OKUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 13001-S
HAWAII U.S.A.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS

JOB TITLE
HONOLULU HARBOR, PIER 17, SUBSTRUCTURE REPAIRS, OAHU, HAWAII

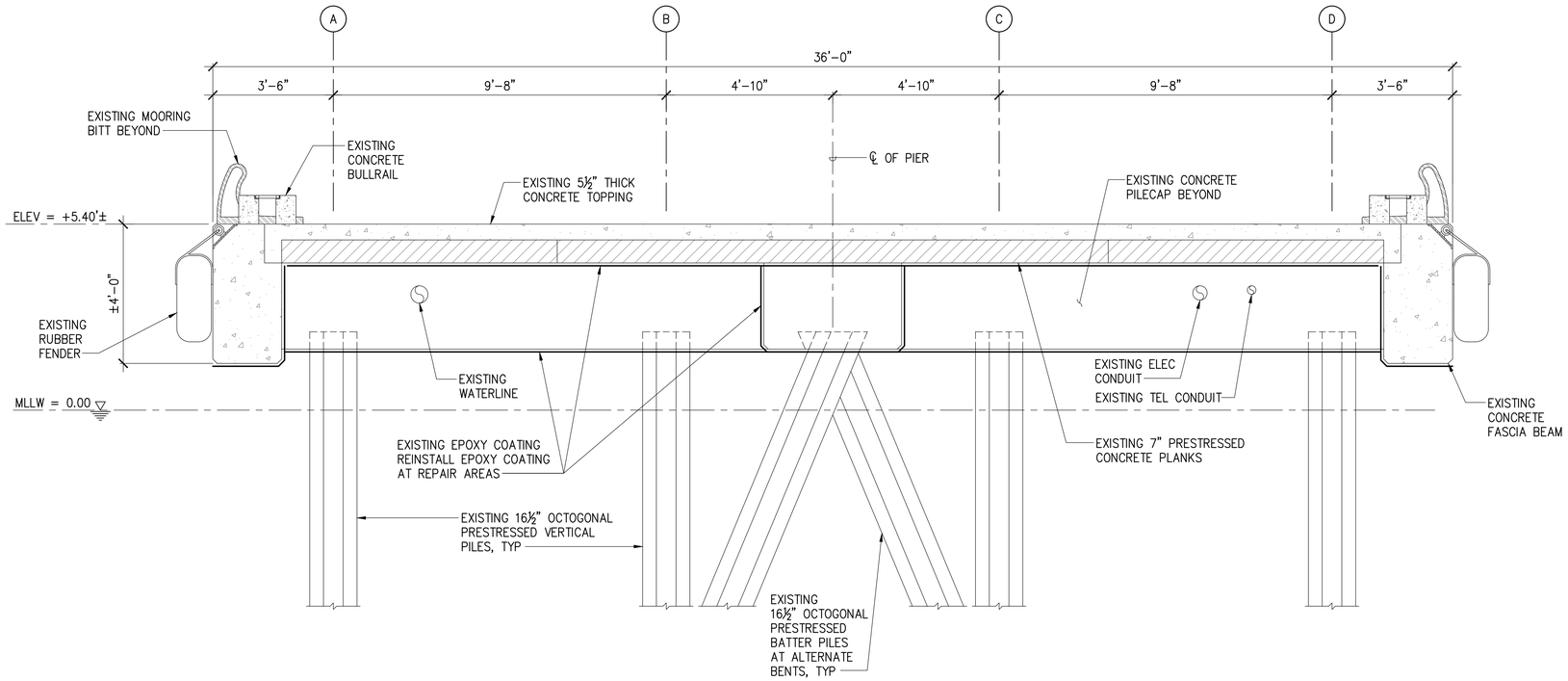
SHEET TITLE
CONNECTOR ROAD – PIER PLAN

DESIGNED BY:	GO
DRAWN BY:	DL
CHECKED BY:	GO
DATE:	04/2026
SCALE:	AS SHOWN

JOB NUMBER
S10956

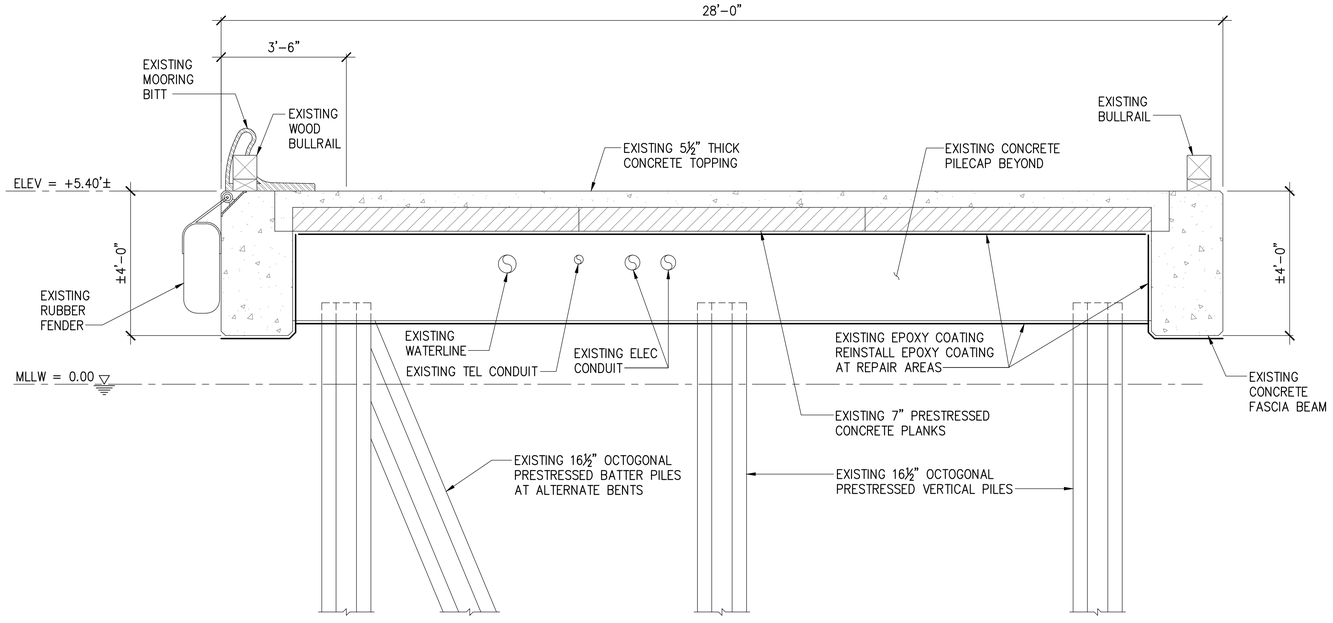
SHEET
S-3
5 OF 9 SHTS.

Plotted: Apr 08, 2026 - 5:51pm



1 / S-4 TYPICAL TRANSVERSE SECTION AT PIER 17

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



2 / S-4 TYPICAL TRANSVERSE SECTION AT CONNECTOR ROAD

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

Plotted: Apr 16, 2026 - 4:53pm

GRANT J. OKUNAGA
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No. 13001-S
HAWAII U.S.A.

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SHEET TITLE
TYPICAL PIER SECTIONS

DESIGNED BY: GO
DRAWN BY: DL
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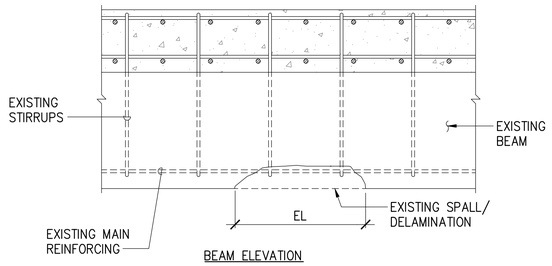
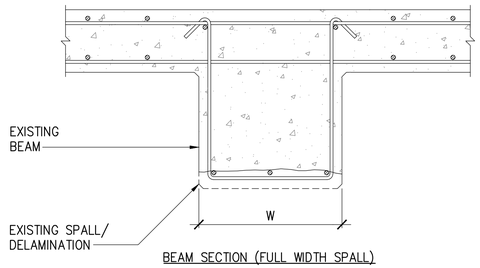
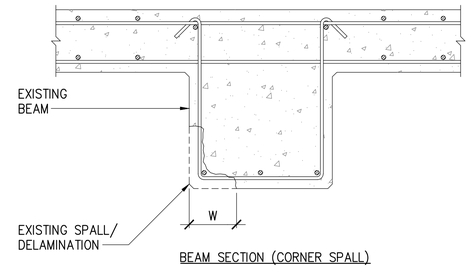
SHEET
S-4
6 OF 9 SHTS.



BEAM ELEVATION



BEAM SECTION (FULL WIDTH SPALL)



BEAM SECTION (CORNER SPALL)

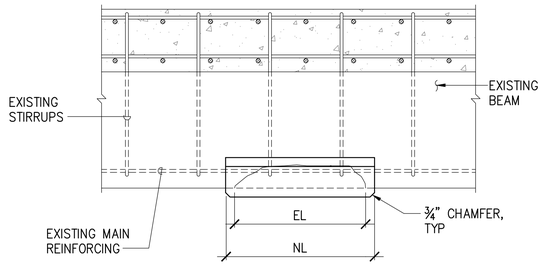
EXISTING CONDITION

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

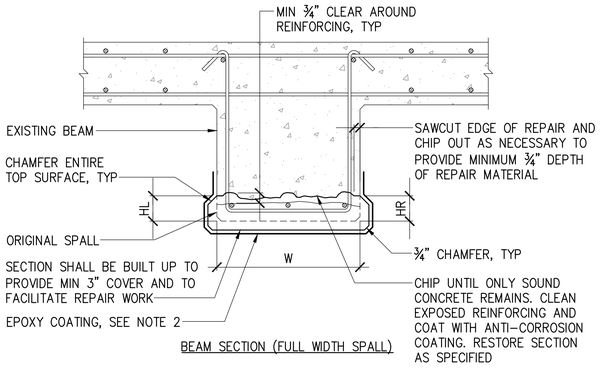
PAY AREA = (HL+HR+W)NL

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" MIN. OVER EXISTING EPOXY COATING.

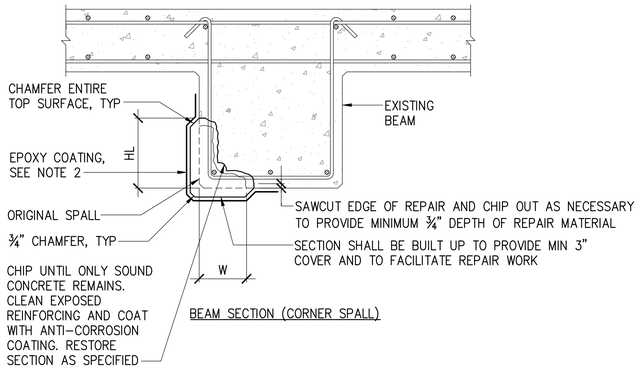


BEAM ELEVATION



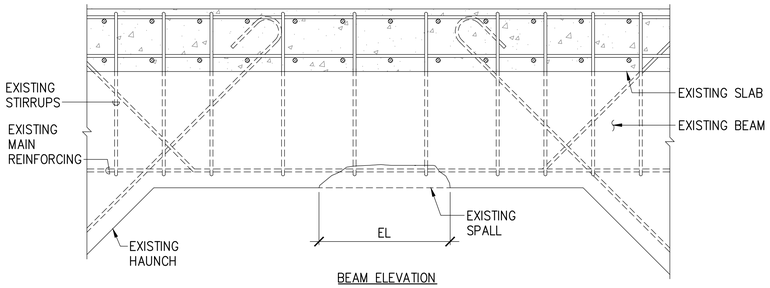
BEAM SECTION (FULL WIDTH SPALL)

REPAIRED CONDITION

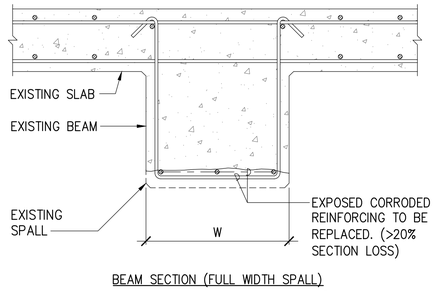


BEAM SECTION (CORNER SPALL)

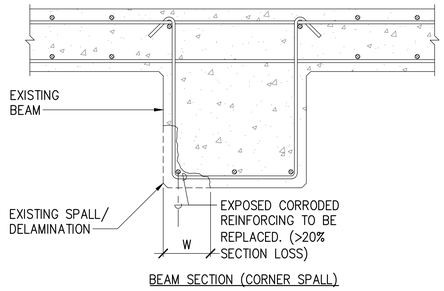
1 S-5 BEAM SPALL REPAIR (TYPE B)
NOT TO SCALE



BEAM ELEVATION



BEAM SECTION (FULL WIDTH SPALL)



BEAM SECTION (CORNER SPALL)

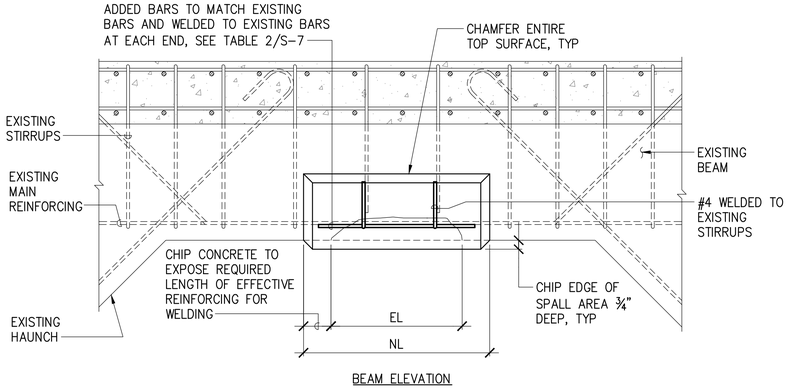
EXISTING CONDITION

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

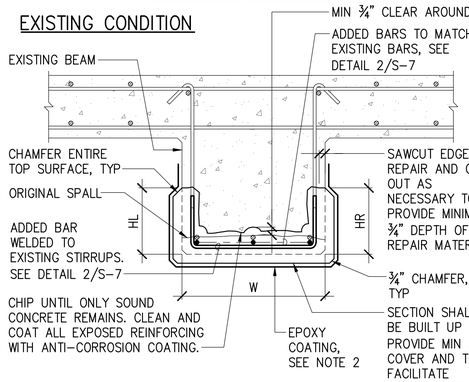
PAY AREA = (HL+HR+W)NL

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.

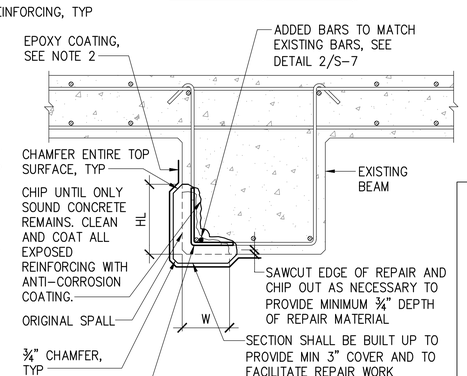


BEAM ELEVATION



BEAM SECTION (FULL WIDTH SPALL)

REPAIRED CONDITION



BEAM SECTION (CORNER SPALL)

2 S-5 BEAM SPALL REPAIR WITH REINFORCING STEEL REPLACEMENT (TYPE BR)
NOT TO SCALE

GRANT J. OKUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 13001-S
HAWAII U.S.A.

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 17, SUBSTRUCTURE REPAIRS, OAHU, HAWAII

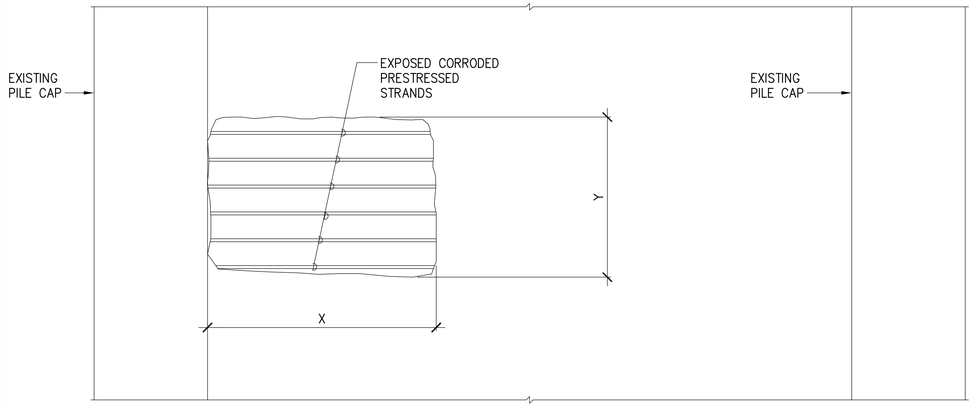
SHEET TITLE
BEAM SPALL REPAIR DETAILS

DESIGNED BY: GO
DRAWN BY: DL
CHECKED BY: GO
DATE: 04/2026
SCALE: AS SHOWN

JOB NUMBER
S10956

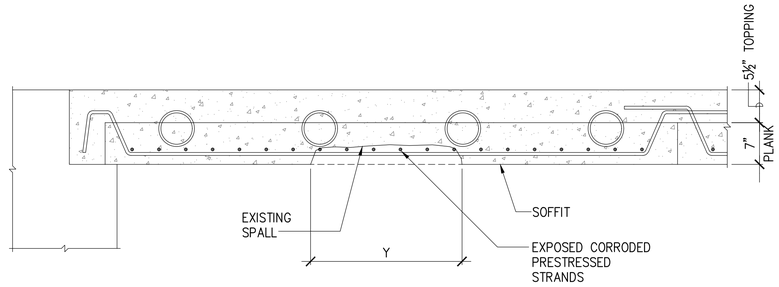
SHEET
S-5
7 OF 9 SHTS.

Plotted: Apr 10, 2026 - 5:50pm



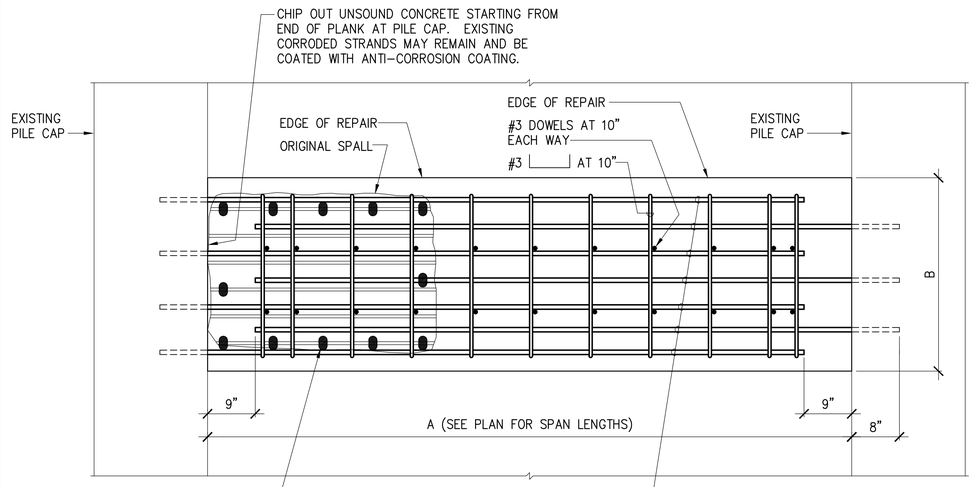
SOFFIT PLAN

EXISTING SPALL AREA = X x Y



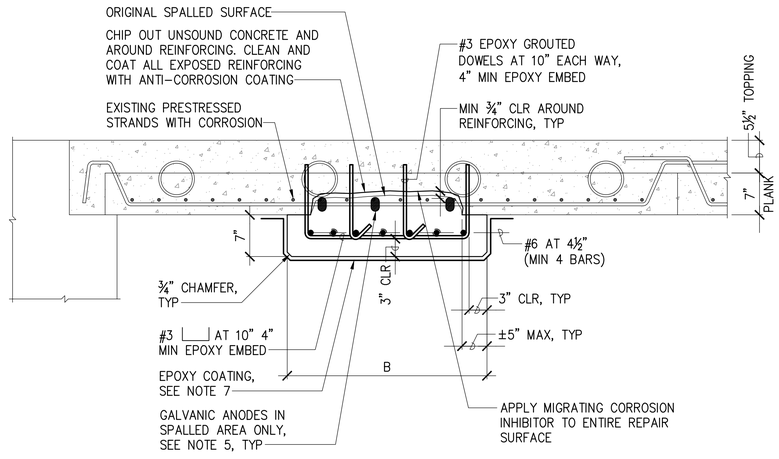
SECTION

EXISTING CONDITION



SOFFIT PLAN

PAY AREA = A x B



TYPICAL REPAIR SECTION

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 BEAMS.
3. AVOID DAMAGING EXISTING STRANDS WHEN DRILLING HOLES FOR DOWELS.
4. DOWELS ARE NOT REQUIRED AT LOCATIONS WHERE INSTALLATION IS NOT POSSIBLE DUE TO FULL DEPTH REPAIR OF THE EXISTING SLAB.
5. GALVANIC ANODES SHALL BE INSTALLED AT 17" MAX AROUND THE PERIMETER OF THE SPALLED AREA. FOR SPALLS LESS THAN 1 SQUARE FOOT IN SIZE, INSTALL ONE GALVANIC ANODE IN SPALLED AREA.
6. SHALLOW PRECAST PLANK SOFFIT SPALLS WITH NO EXPOSED PRESTRESSING STRANDS MAY BE REPAIRED PER DETAIL 1/S-7.
7. APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.

1 / S-6 PRECAST PLANK SOFFIT SPALL REPAIR DETAILS (TYPE P)

NOT TO SCALE

GRANT J. OKUNAGA
LICENSED PROFESSIONAL ENGINEER
No. 13001-S
HAWAII U.S.A.

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 17,
SUBSTRUCTURE REPAIRS, OAHU, HAWAII

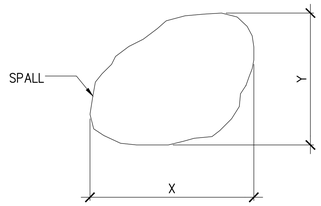
SHEET TITLE
PRECAST PLANK SOFFIT SPALL REPAIR DETAILS

DESIGNED BY: GO
DRAWN BY: DL
CHECKED BY: GO
DATE: 04/2026
SCALE: AS SHOWN

JOB NUMBER
S10956

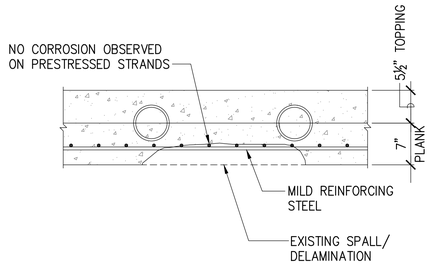
SHEET
S-6
8 OF 9 SHTS.

Plotted: Apr 10, 2026 - 5:03pm



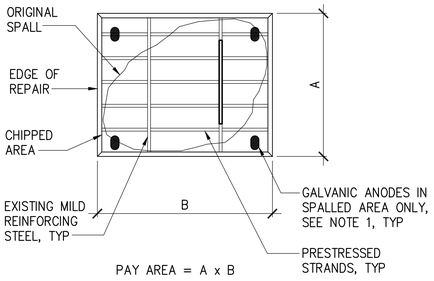
EXISTING SPALL AREA = X x Y

SOFFIT PLAN



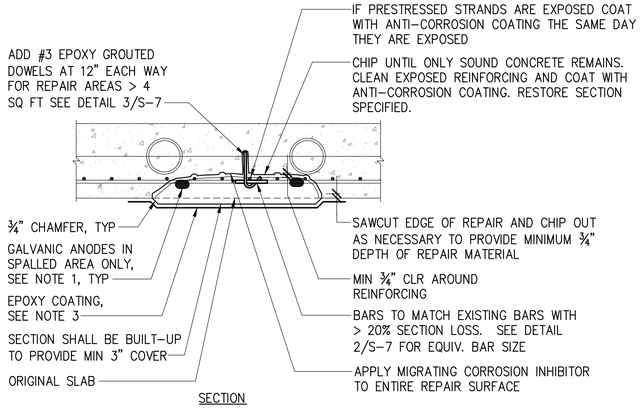
SECTION

EXISTING CONDITION



PAY AREA = A x B

SOFFIT PLAN



SECTION

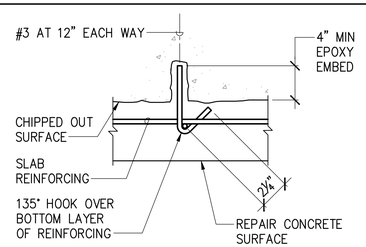
NOTES:

1. GALVANIC ANODES SHALL BE INSTALLED AT 17" AROUND THE PERIMETER OF THE REPAIRS. FOR SPALLS LESS THAN 1 SQUARE FOOT IN SIZE, INSTALL ONE GALVANIC ANODE IN SPALLED AREA.
2. ALTERNATE REPAIR SHALL BE ONLY FOR SHALLOW PRECAST PLANK SOFFIT SPALLS WITH NO CORROSION OF PRESTRESSING STRANDS.
3. APPLY EPOXY COATING OVER REPAIRS. OVERLAP 6" AT EXISTING EPOXY COATING.

REPAIRED CONDITION

1 S-7 ALTERNATE PRECAST PLANK SOFFIT SPALL REPAIR (TYPE P)

NOT TO SCALE

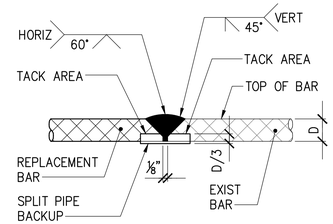


NOTE:

1. AS AN ALTERNATE TO THE #3 HOOKED REINFORCING BAR, A ⅜" DIA STAINLESS HEADED BOLT MAY BE USED.

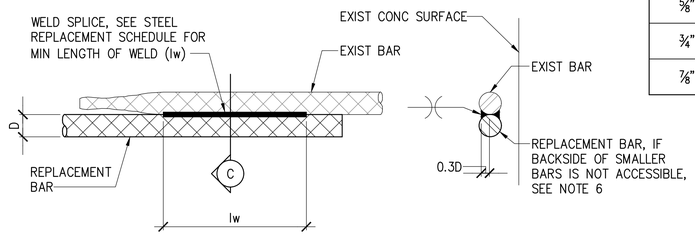
3 S-7 EPOXY GROUTED DOWEL DETAIL

NOT TO SCALE



A BUTT SPLICE

USE DETAIL A FOR #7 BARS AND LARGER



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

B LAP SPLICE

C SECTION

USE DETAIL B FOR #6 BARS AND SMALLER

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
SQUARE	ROUND			
⅜"	#3, #4	#4	2"	4"
½"	#5	#5	2½"	5"
⅝"	#6	#6	3½"	–
¾"	#7	#7	–	–
⅞"	#8	#8	–	–

2 S-7 REINFORCING STEEL SPLICE DETAIL

NOT TO SCALE

GRANT J. OKUNAGA LICENSED PROFESSIONAL ENGINEER No. 13001-S HAWAII U.S.A.

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
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SHEET TITLE
TYPICAL REPAIR DETAILS

DESIGNED BY:	GO
DRAWN BY:	DL
CHECKED BY:	GO
DATE:	04/2026
SCALE:	AS SHOWN

JOB NUMBER S10956

SHEET S-7

9 OF 9 SHTS.

Plotted: Apr 10, 2026 - 1:50pm