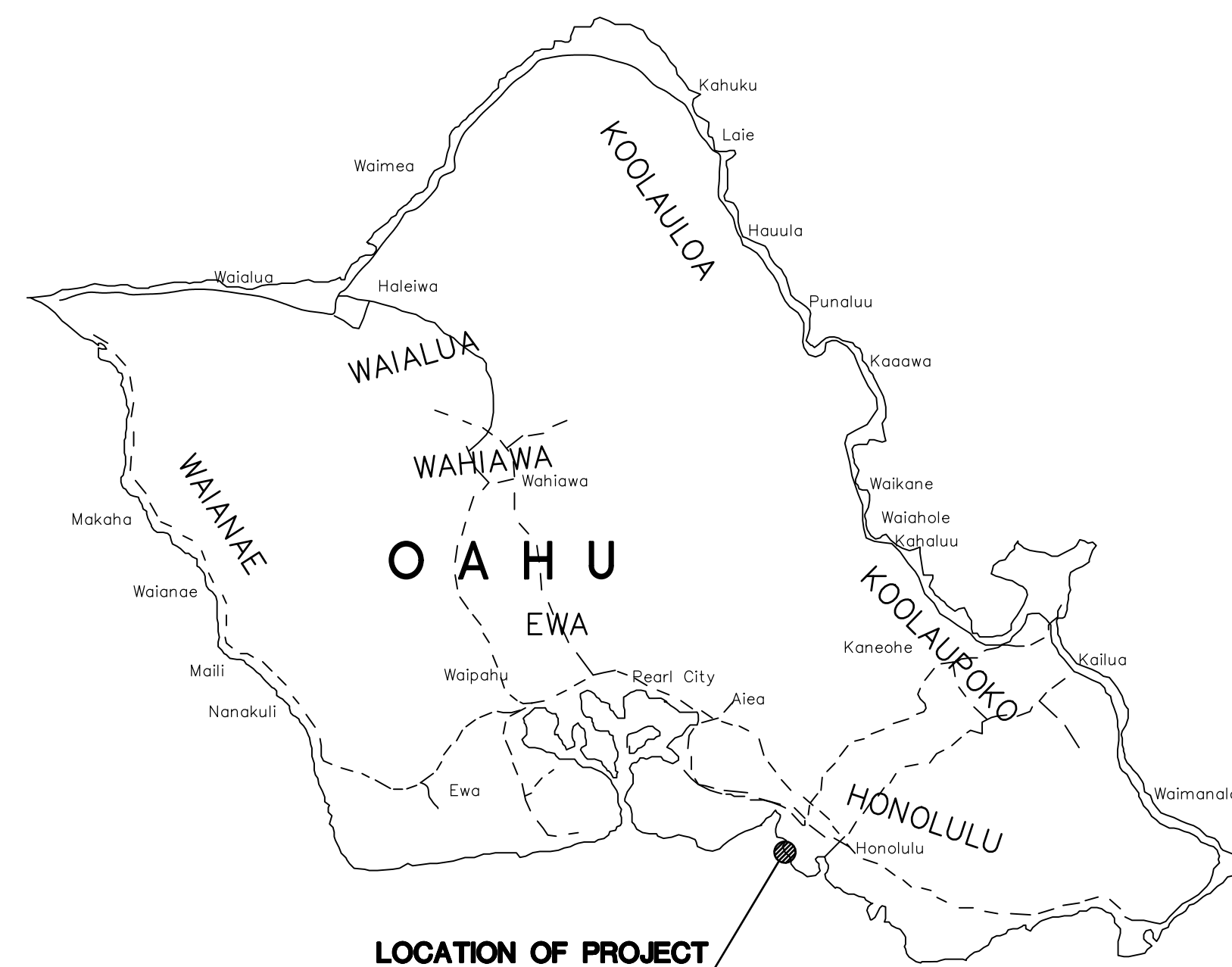


# BOLLARD AND FENDER REPAIRS AT PIER 60 HONOLULU HARBOR, OAHU, HAWAII

FOR THE  
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HARBORS DIVISION  
S10853

CONSULTANT:

**MKE ASSOCIATES LLC**  
STRUCTURAL ENGINEER



ISLAND OF OAHU

LOCATION MAP

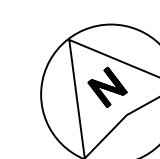
NOT TO SCALE



PROJECT SITE

VICINITY MAP

NOT TO SCALE

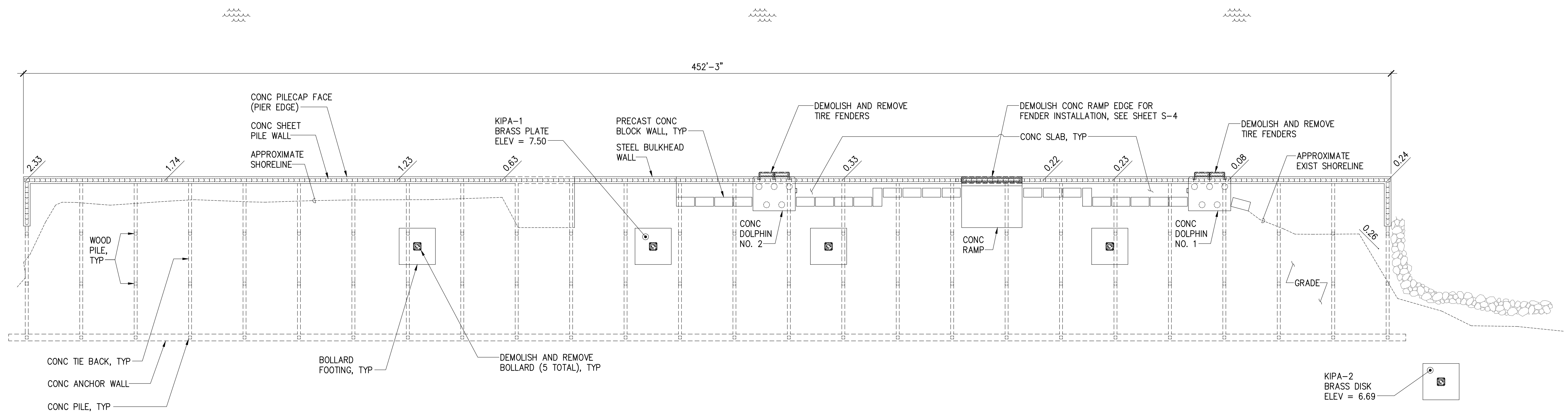


DEPARTMENT OF TRANSPORTATION STATE OF HAWAII		SHEET <b>T-1</b>
APPROVED BY:		DATE Apr 26, 2023
FOR DIRECTOR OF TRANSPORTATION		DATE 1 of 7 SHS

# INDEX TO DRAWINGS

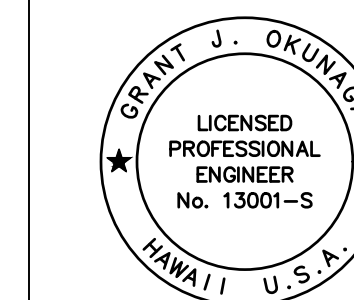
SHEET NO.	TITLE
T-1	TITLE SHEET, LOCATION AND VICINITY MAPS
T-2	INDEX TO DRAWINGS AND EXISTING SITE PLAN
S-1	STRUCTURAL NOTES
S-2	REPAIR PLAN
S-3	DOLPHIN FENDER REPAIRS
S-4	RAMP FENDER REPAIRS
S-5	BOLLARD REPLACEMENT DETAILS

## HONOLULU HARBOR



### EXISTING SITE PLAN

SCALE: 1/16" = 1'-0"



THIS WORK WAS PREPARED BY ME  
OR UNDER MY SUPERVISION  
EXP. 4-30-24  
*Grant J. Okunaga*  
MKE ASSOCIATES LLC

REVISION	DATE	DESCRIPTION	BY	APPROVED
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS DIVISION				
JOB TITLE BOLLARD AND FENDER REPAIRS AT PIER 60 HONOLULU HARBOR, OAHU, HAWAII				
SHEET TITLE INDEX TO DRAWINGS AND EXISTING SITE PLAN				
DESIGNED BY: GO				SHEET <b>T-2</b>
DRAWN BY: DL				JOB NUMBER <b>S10853</b>
CHECKED BY: GM				
DATE: 04/2023				
SCALE: AS SHOWN				2 OF 7 SHEETS

**STRUCTURAL NOTES:**

**GENERAL:**

1. WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE HAWAII STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, 2005, FOR THE STATE OF HAWAII, UNLESS OTHERWISE INDICATED. HOWEVER, 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 DIVISION 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 DIVISION 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 DIVISION 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/HER WORK WITH OTHER CONTRACTORS WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL ALSO COORDINATE WITH THE HARBORS DIVISION 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/HER WORK AS REQUIRED FOR PUBLIC HEALTH AND SAFETY AND TO THE SATISFACTION OF THE HARBORS DIVISION 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 DIVISION 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. 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.
13. THE CONTRACTOR SHALL COMPLY WITH THE CLEAN WATER ACT AND THE STATE HARBORS DIVISION STORMWATER MANAGEMENT PROGRAM. NO POLLUTANTS ARE ALLOWED TO BE DISCHARGED DIRECTLY OR INDIRECTLY THROUGH THE HARBORS SMALL MS4 OR OTHER POTENTIAL PATHWAY INTO HARBOR WATERS.
14. THE CONTRACTOR WILL BE RESPONSIBLE FOR REGULATORY FINES OR PENALTIES THAT MAY BE IMPOSED BY ENVIRONMENTAL REGULATORY AGENCIES (EPA AND/OR STATE DOH) IN THE EVENT OF VIOLATIONS.
15. THE CONTRACTOR SHALL SUBMIT A SITE-SPECIFIC BEST MANAGEMENT PRACTICES (BMP) PLAN TO HARBORS DIVISION ENGINEER BRANCH PRIOR TO THE START OF ANY CONSTRUCTION WORK. THE SITE SPECIFIC BMP PLAN SHALL COMPLY WITH ENVIRONMENTAL PROTECTION AND TEMPORARY WATER POLLUTION, DUST, AND EROSION CONTROL ARTICLES 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 DIVISION CONSTRUCTION ENGINEER IMMEDIATELY (I.E. WITHIN 24 HOURS). SUCH CONTACT INFORMATION MUST BE IN LOCATIONS THAT ARE READILY ACCESSIBLE AND AVAILABLE. CONTRACTOR SHALL NOTIFY THE HDOT HARBORS DIVISION ENGINEERING BRANCH ENVIRONMENTAL HOTLINE (808-587-1962) AND HDOT HARBORS DIVISION CONSTRUCTION ENGINEER OF ANY ILLICIT DISCHARGE AND/OR SPILL/RELEASE THAT OCCURS ONSITE.
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.

**CONCRETE:**

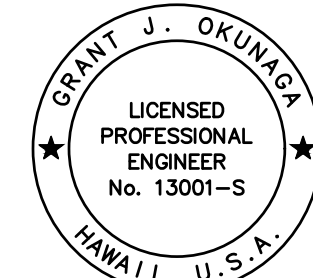
1. CONCRETE CONSTRUCTION SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE ACI 318R-14 AND ACI 546R-14.
2. FORMED CONCRETE SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH OF  $f'_c=5,000$  PSI WITH SILICA FUME AND CORTEC MCI 2005 NS MIGRATING CORROSION INHIBITING ADMIXTURE, OR APPROVED EQUAL.
3. MAXIMUM AGGREGATE SIZE SHALL BE  $\frac{3}{8}$  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:**

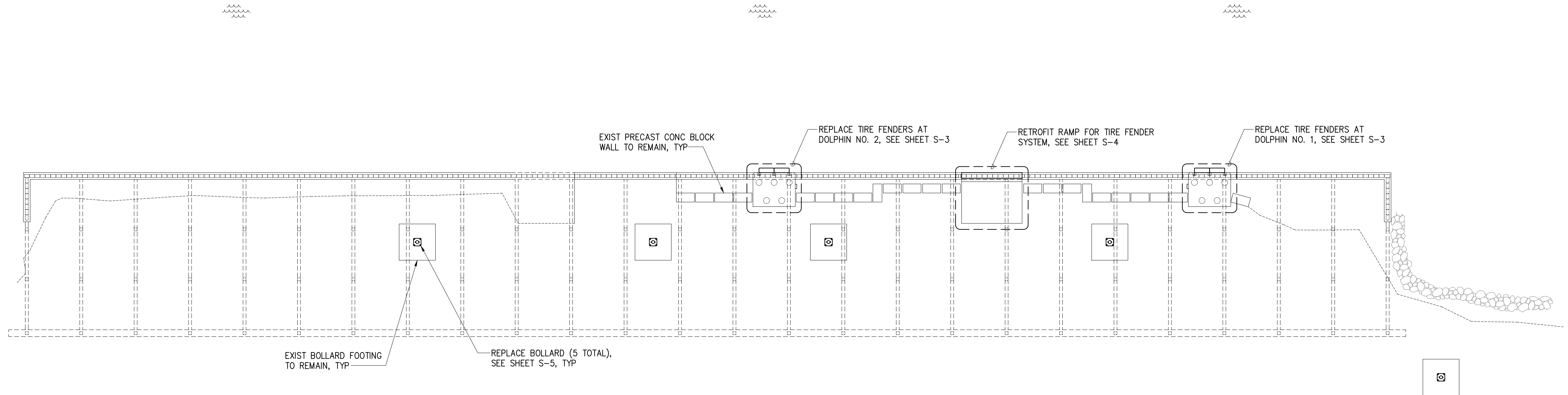
1. REINFORCING STEEL FOR WELD SPLICING SHALL BE ASTM A706 GRADE 60. WELDING ELECTRODES SHALL BE LOW HYDROGEN E70.
2. REINFORCING STEEL NOT TO BE WELD SPLICED SHALL BE ASTM A615, GRADE 60 OR ASTM A706 GRADE 60.
3. CLEAR CONCRETE COVER FOR REINFORCING BARS SHALL BE 3 INCHES MINIMUM, UNLESS OTHERWISE NOTED.
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.

**FENDER SYSTEM:**

1. FENDER HARDWARE INCLUDING SHACKLES, ANCHOR PINS, CHAINS, GROMMETS AND MISCELLANEOUS ITEMS EXCEPT COTTER PINS SHALL BE HOT-DIPPED GALVANIZED PER ASTM A-153.
2. COTTER PINS SHALL BE STAINLESS STEEL.
3. TIRES SHALL BE FURNISHED BY THE CONTRACTOR AND SHALL BE FREE OF RIPS, TEARS OR OTHER SIGNIFICANT DAMAGE TO THE SATISFACTION OF THE CONSTRUCTION ENGINEER.

 <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION          EXP. 4-30-24  <i>Grant J. Okunaka</i>          MKE ASSOCIATES LLC</p>	REVISION	DATE	DESCRIPTION	BY	APPROVED
	STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS DIVISION				
	JOB TITLE BOLLARD AND FENDER REPAIRS AT PIER 60 HONOLULU HARBOR, OAHU, HAWAII				
	SHEET TITLE STRUCTURAL NOTES				
	DESIGNED BY: GO				SHEET
	DRAWN BY: DL				<b>S-1</b>
	CHECKED BY: GM				
	DATE: 04/2023	JOB NUMBER			
	SCALE: AS SHOWN	S10853			
					3 OF 7 SHEETS

HONOLULU HARBOR

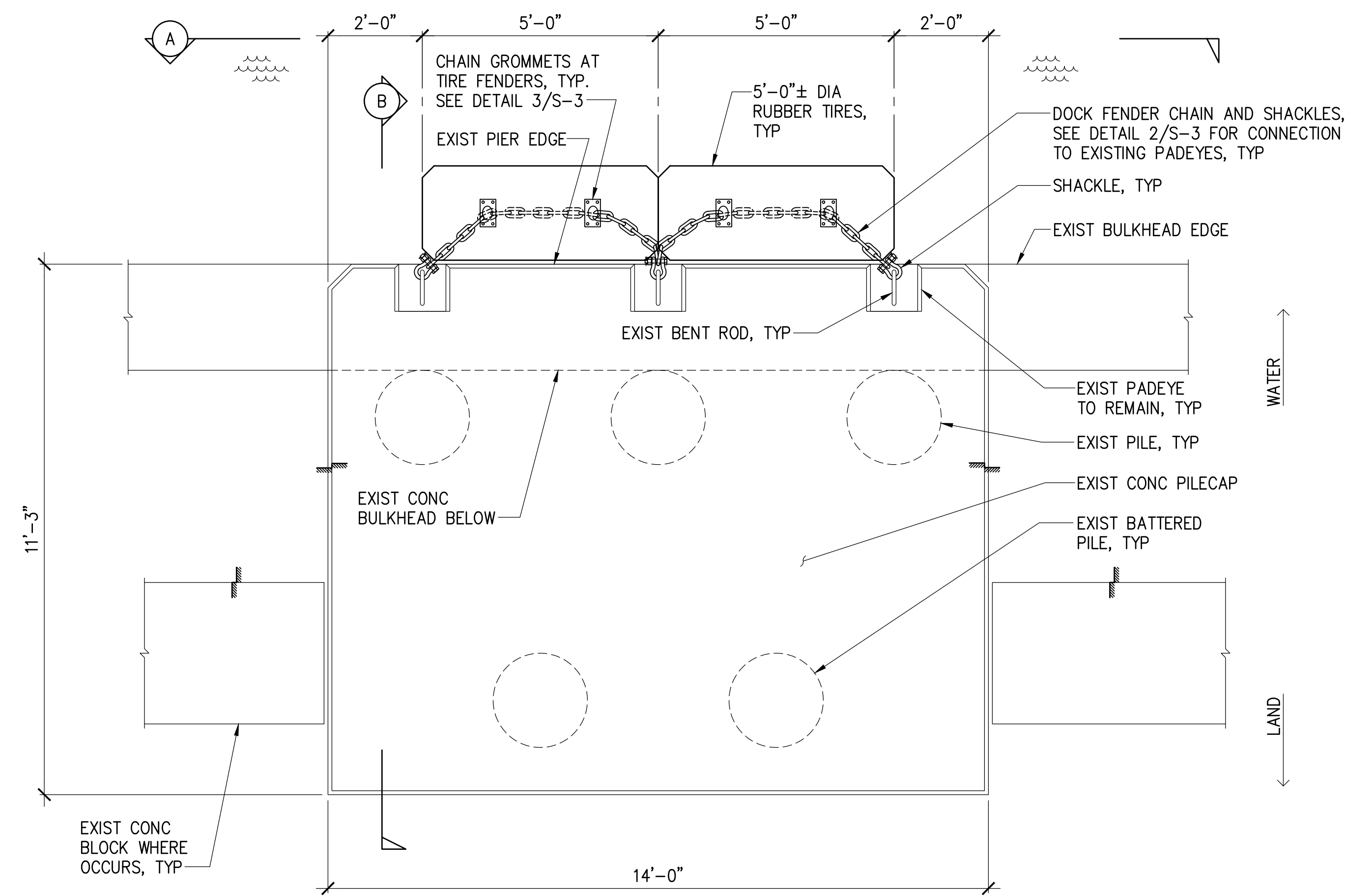


NOTE:  
FOR BALANCE OF INFORMATION, SEE SHEET T-2.

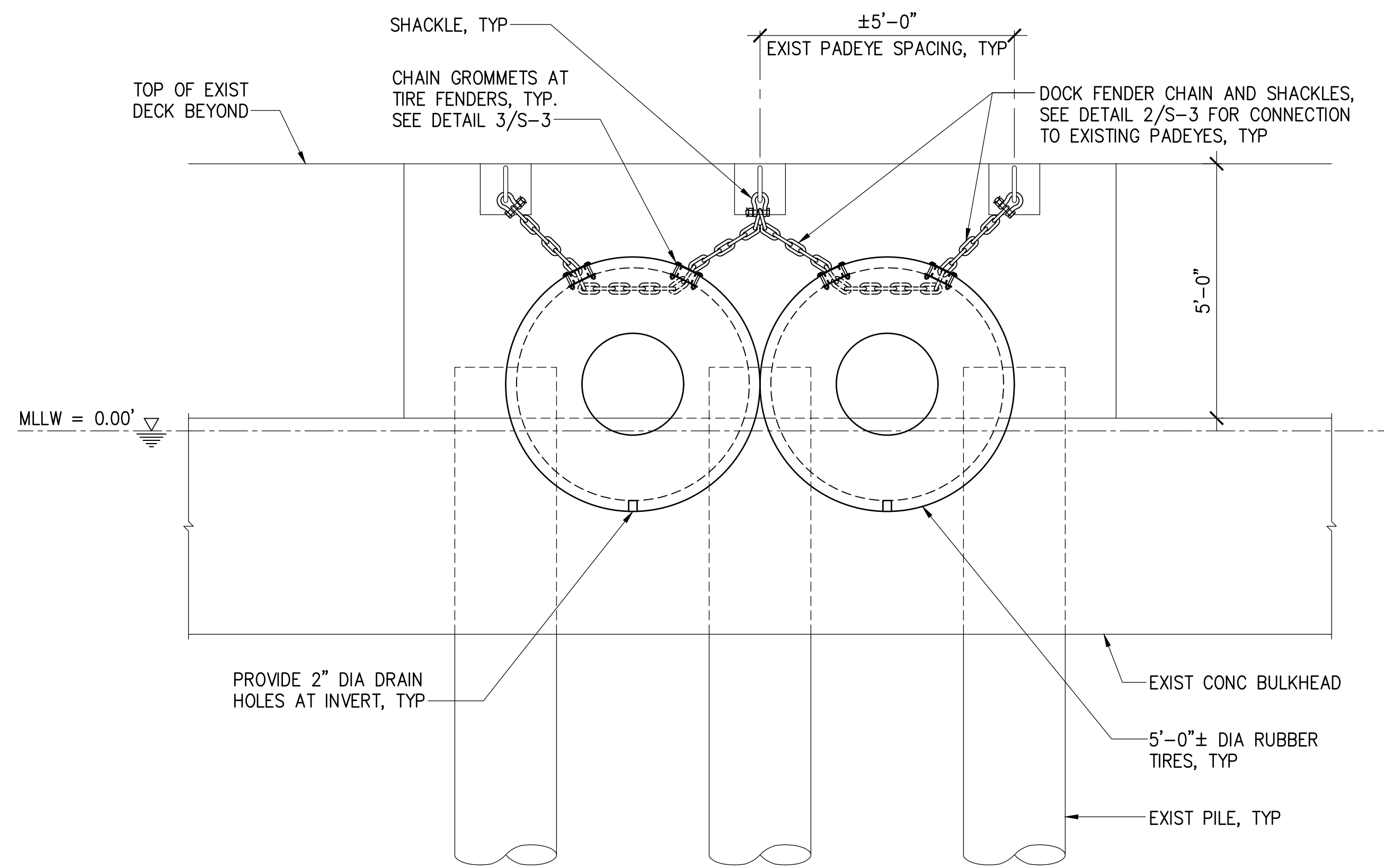
REPAIR PLAN  
SCALE: 1/16" = 1'-0"



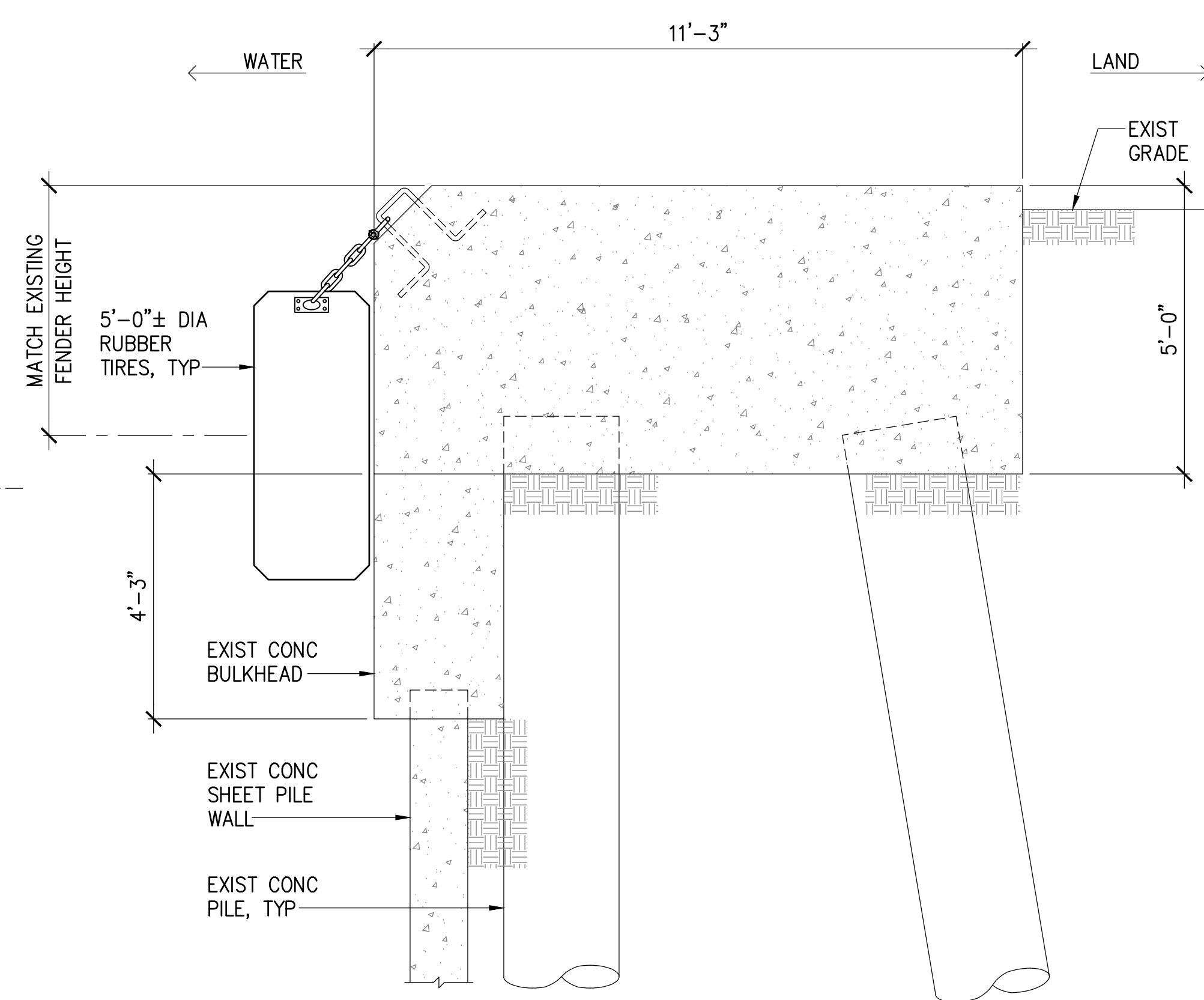
<p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION EXP. 4-30-24 <i>Grant Okunaka</i> MKE ASSOCIATES LLC</p>	REVISION	DATE	DESCRIPTION	BY	APPROVED
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	SHEET TITLE REPAIR PLAN				
DESIGNED BY: GO	JOB NUMBER			SHEET	
DRAWN BY: DL	S10853			S-2	
CHECKED BY: GM	DATE: 04/2023			SCALE: AS SHOWN	
			4 OF 7 SHTS.		



PLAN  
NORTH



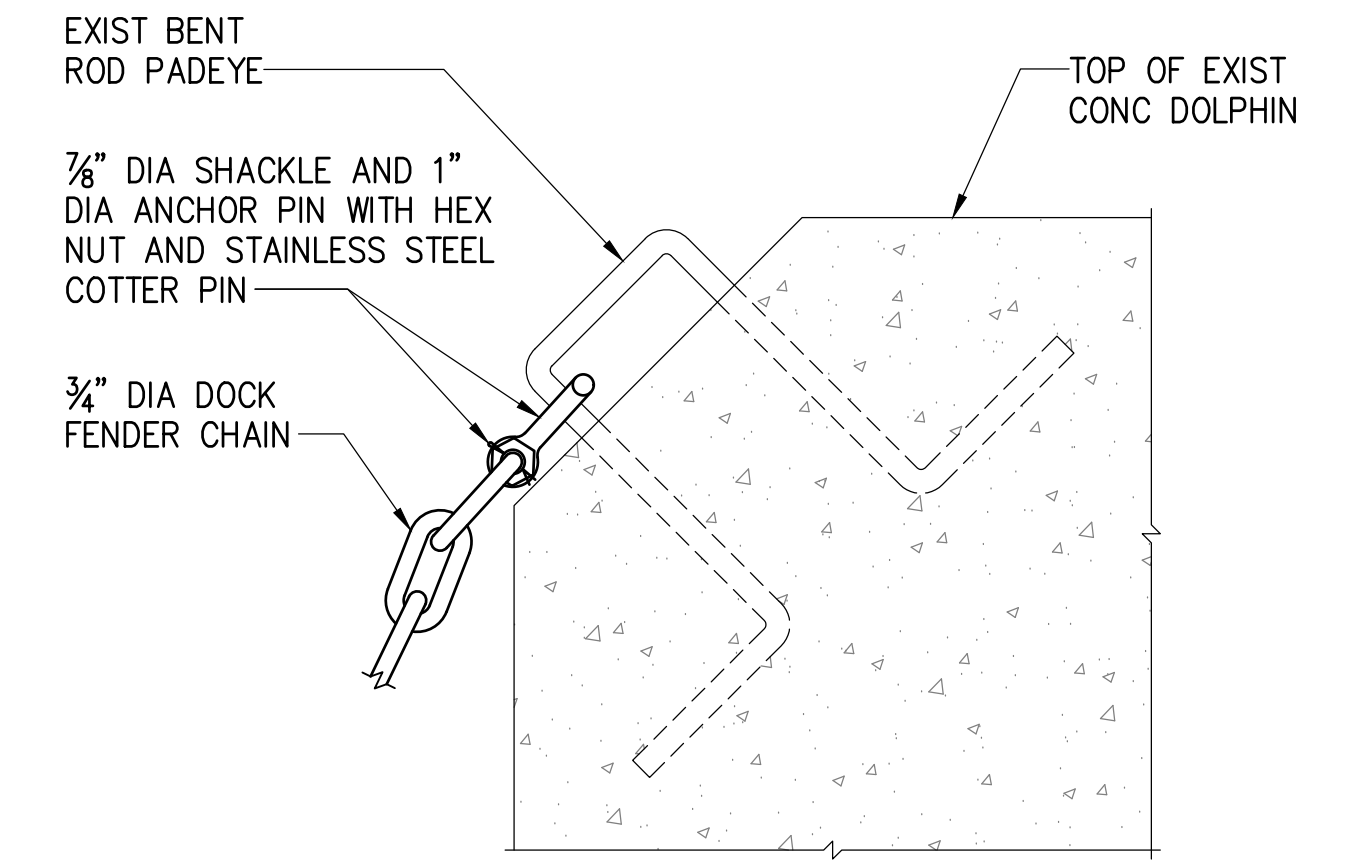
A ELEVATION



B SECTION

NOTES:

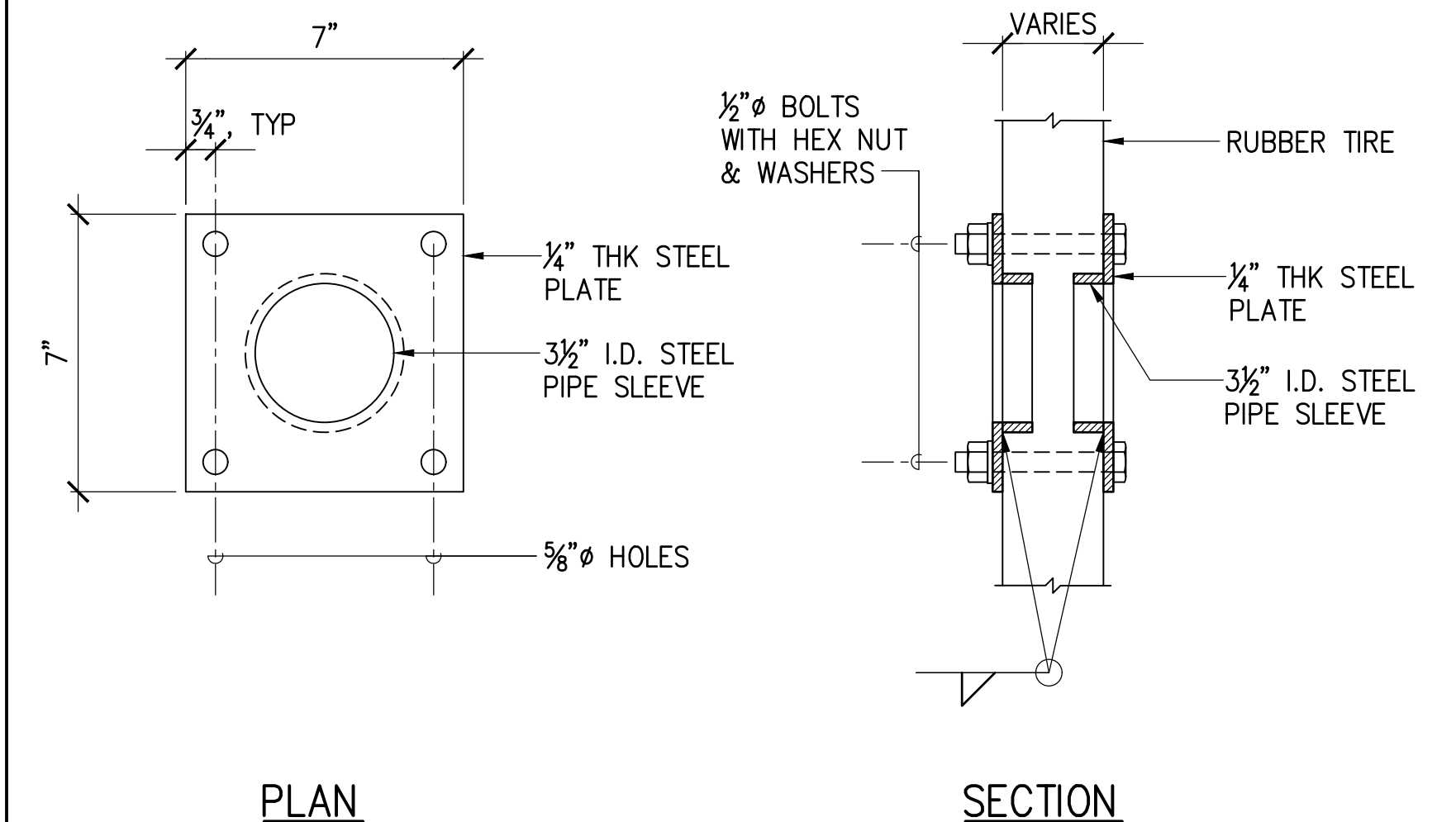
1. TIRE WIDTH SHALL MATCH THE EXISTING TIRE WIDTH.
2. FENDER REPAIRS AT DOLPHIN NO. 1 AND NO. 2 ARE SIMILAR.



NOTE:

SHACKLE, ANCHOR PIN, AND FENDER CHAIN SHALL BE HOT DIPPED GALVANIZED UNLESS NOTED OTHERWISE.

2 PADEYE CONNECTION DETAIL  
S-3 SCALE: 1-1/2" = 1'-0"



PLAN

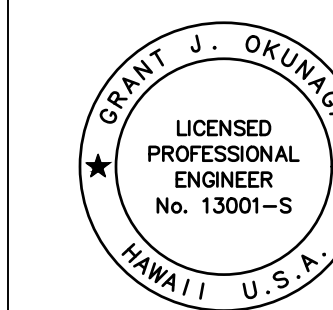
SECTION

NOTE:

TO THE GREATEST EXTENT POSSIBLE, HOT-DIP GALVANIZE AFTER FABRICATION.

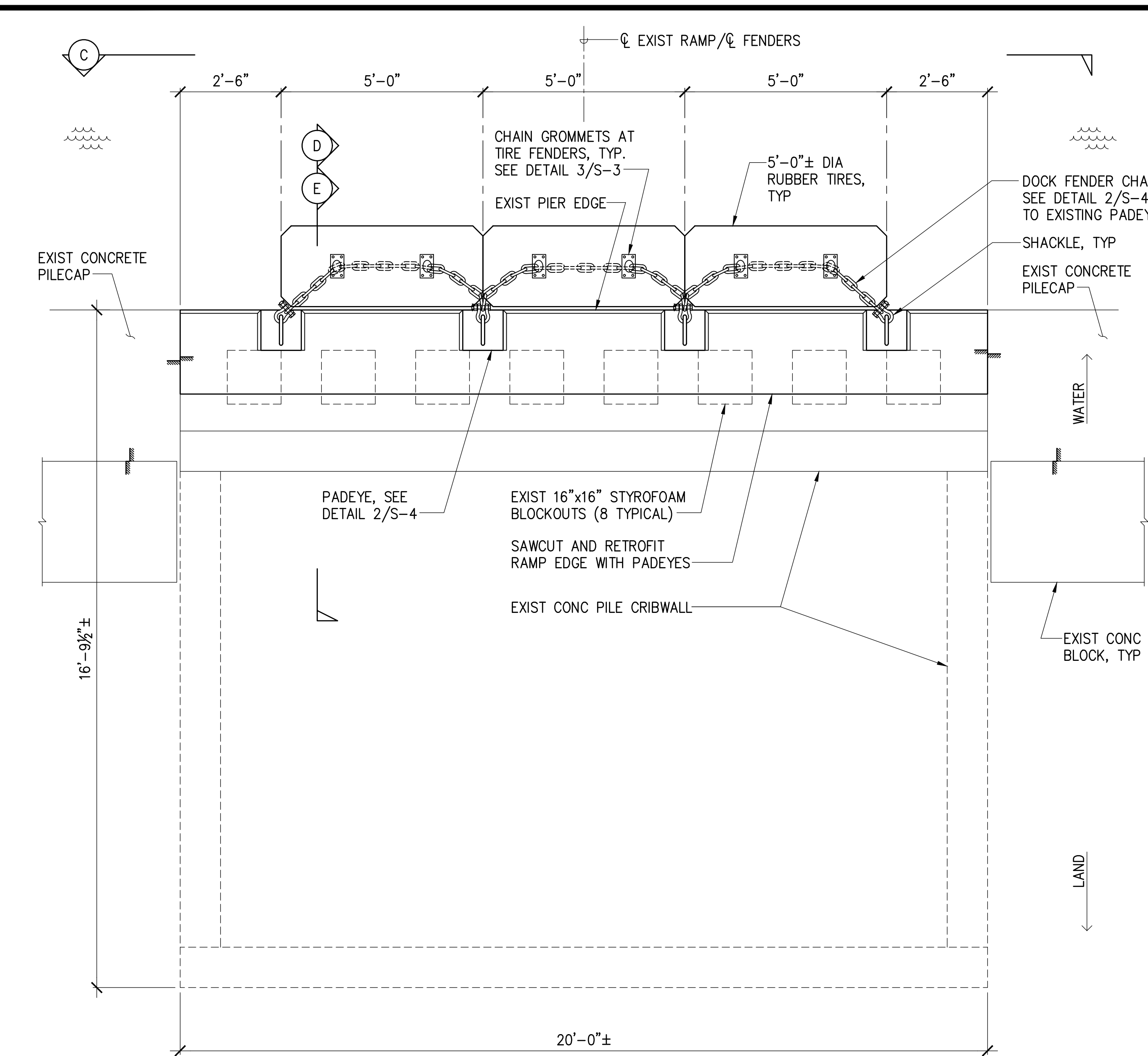
3 GROMMET DETAIL  
S-3 NOT TO SCALE

1 DOLPHIN FENDER REPAIRS  
S-3 SCALE: 1/2" = 1'-0"

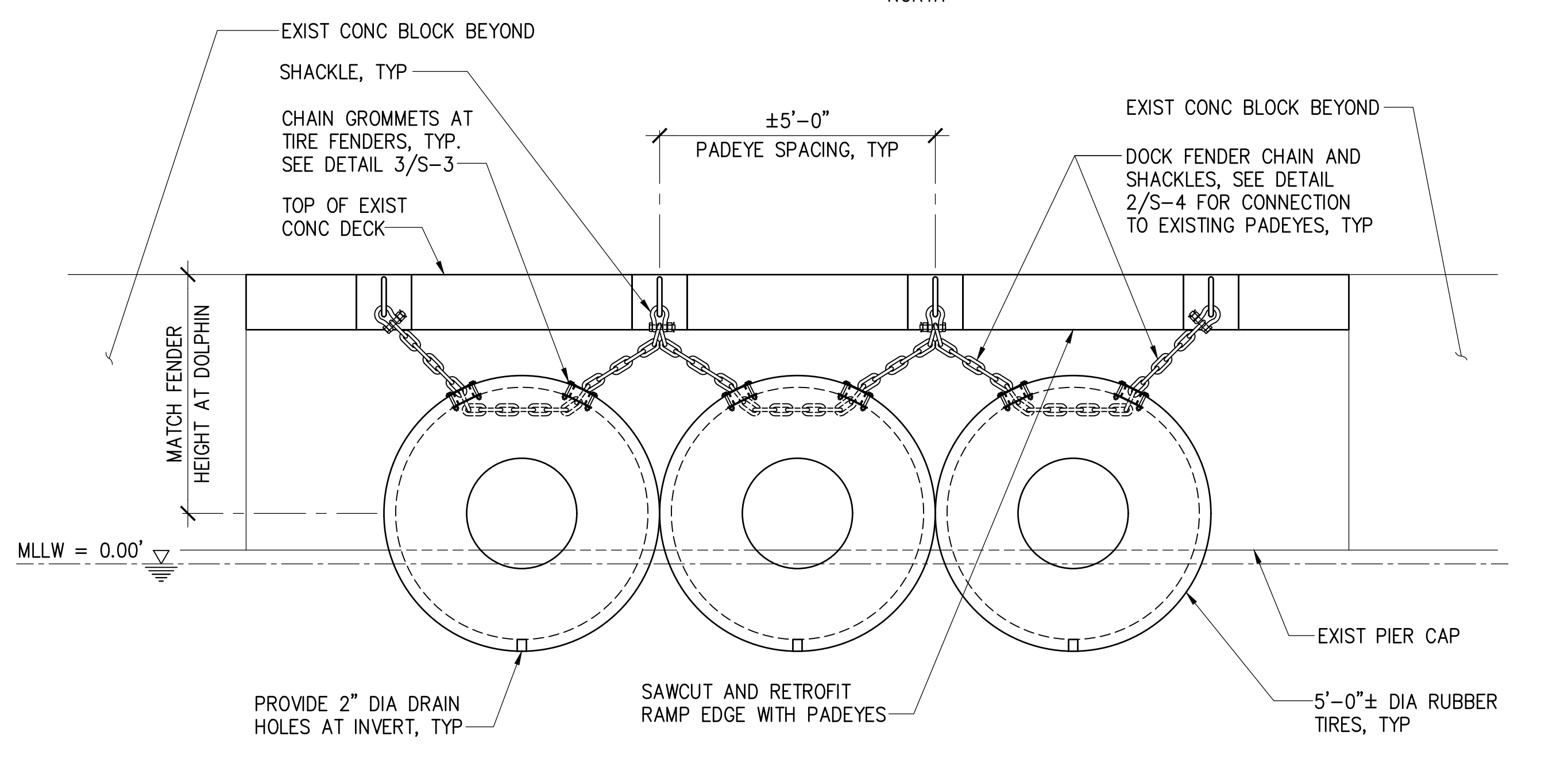


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SHEET TITLE DOLPHIN FENDER REPAIRS				
DESIGNED BY: GO	JOB NUMBER S10853		SHEET S-3	
DRAWN BY: DL			5 OF 7 SHTS.	
CHECKED BY: GM				
DATE: 04/2023				
SCALE: AS SHOWN				

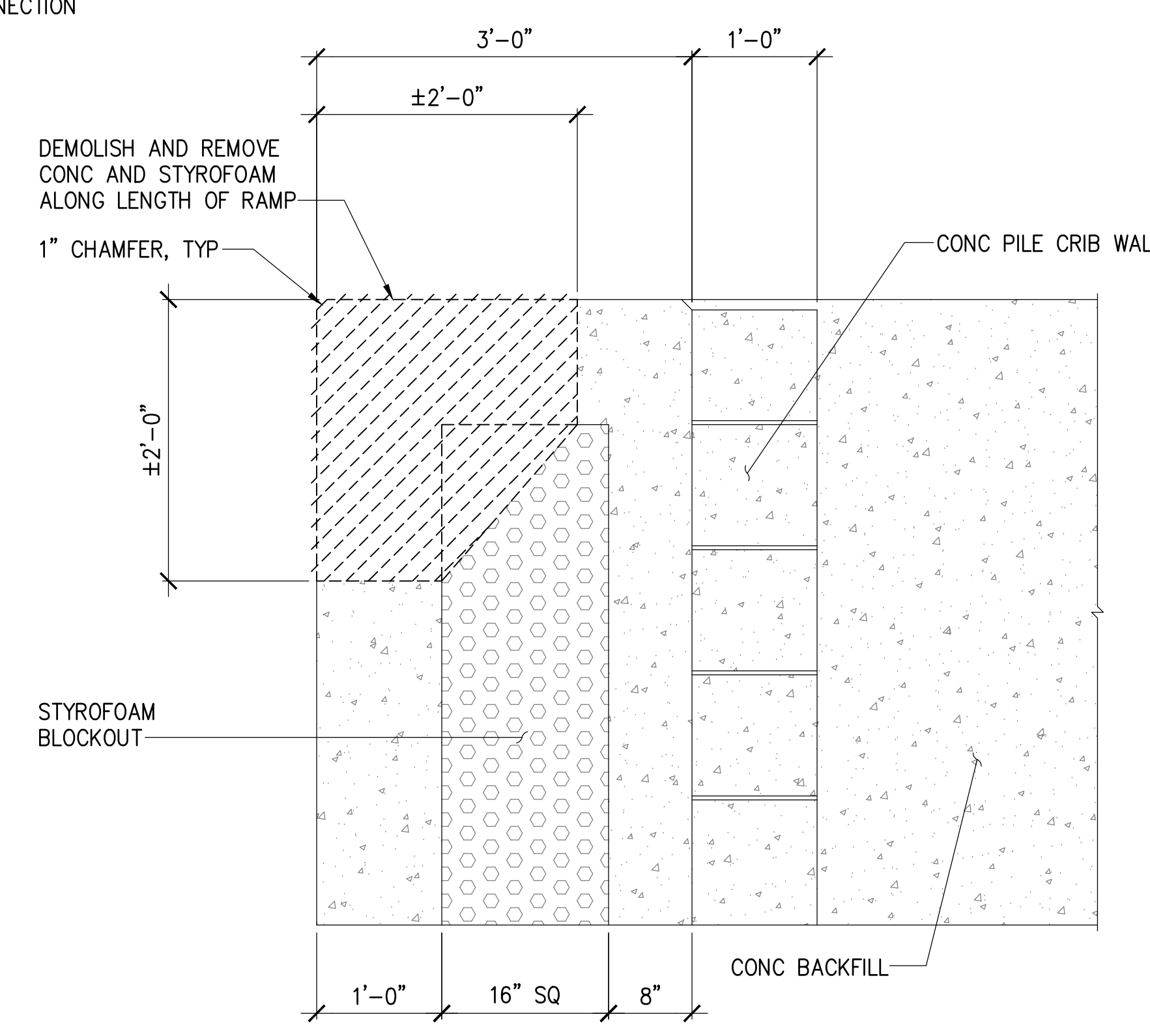


PLAN NORTH

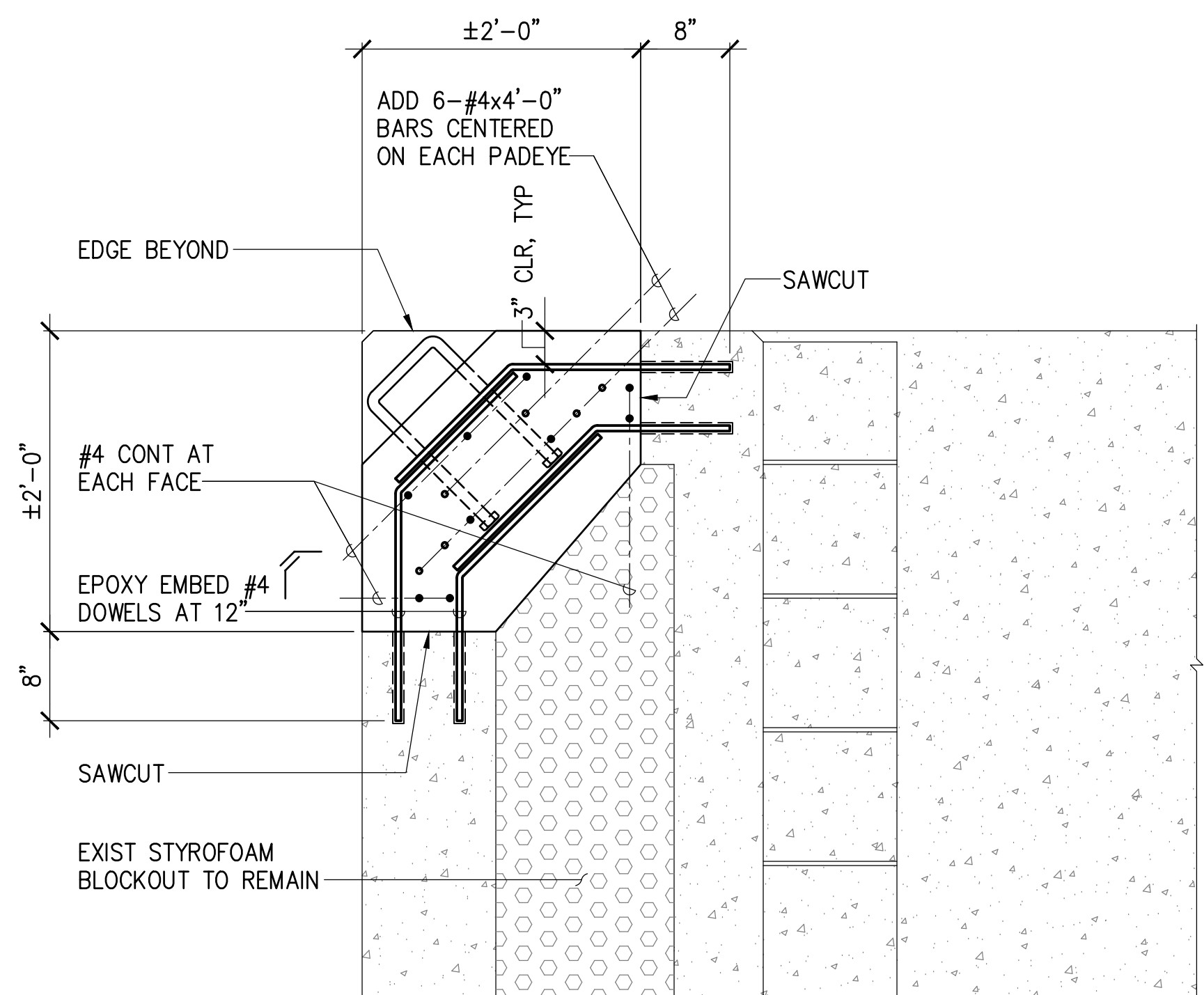


ELEVATION

1 RAMP FENDER RETROFIT SCALE: 1/2" = 1'-0"

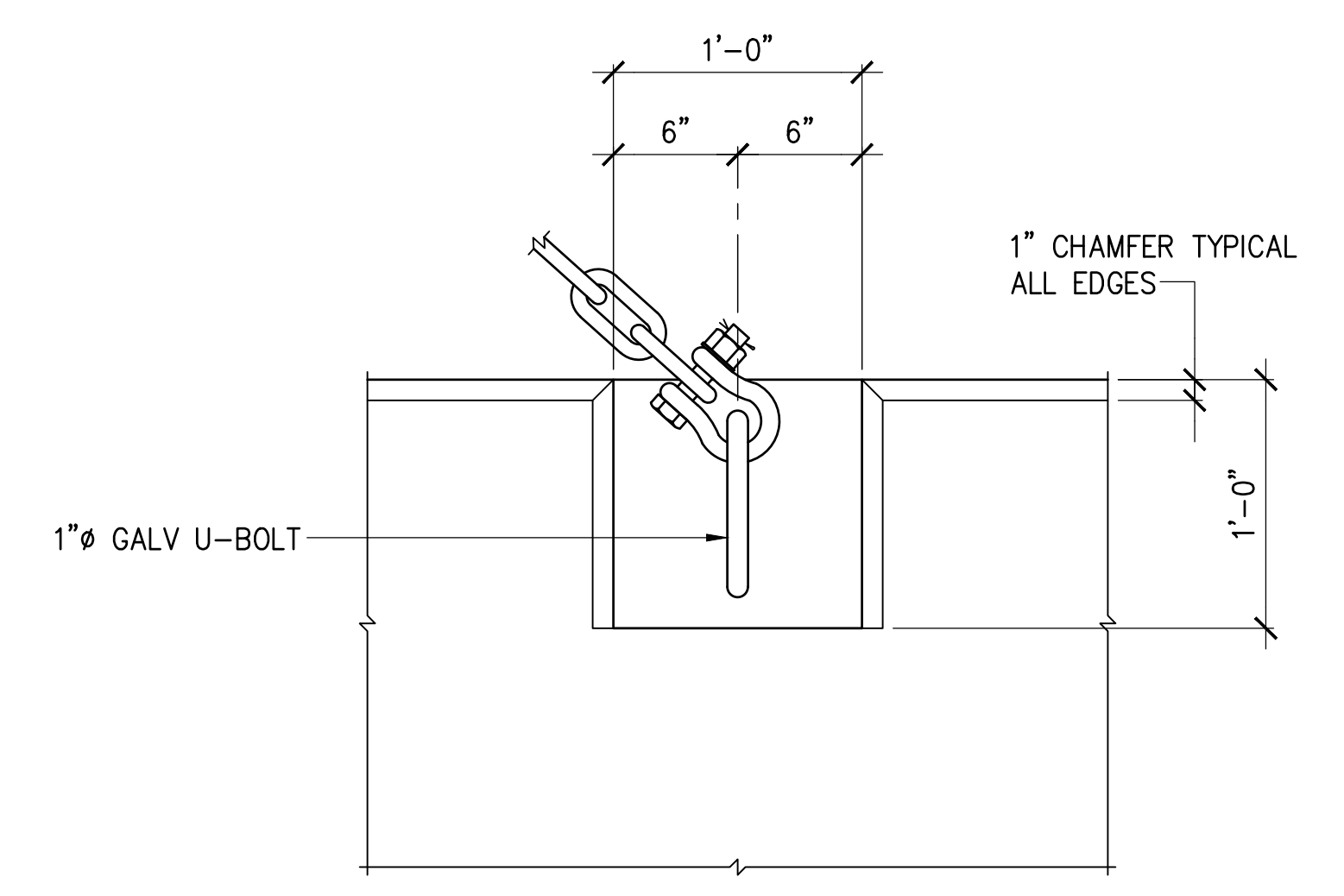


D EXISTING SECTION SCALE: 1" = 1'-0"

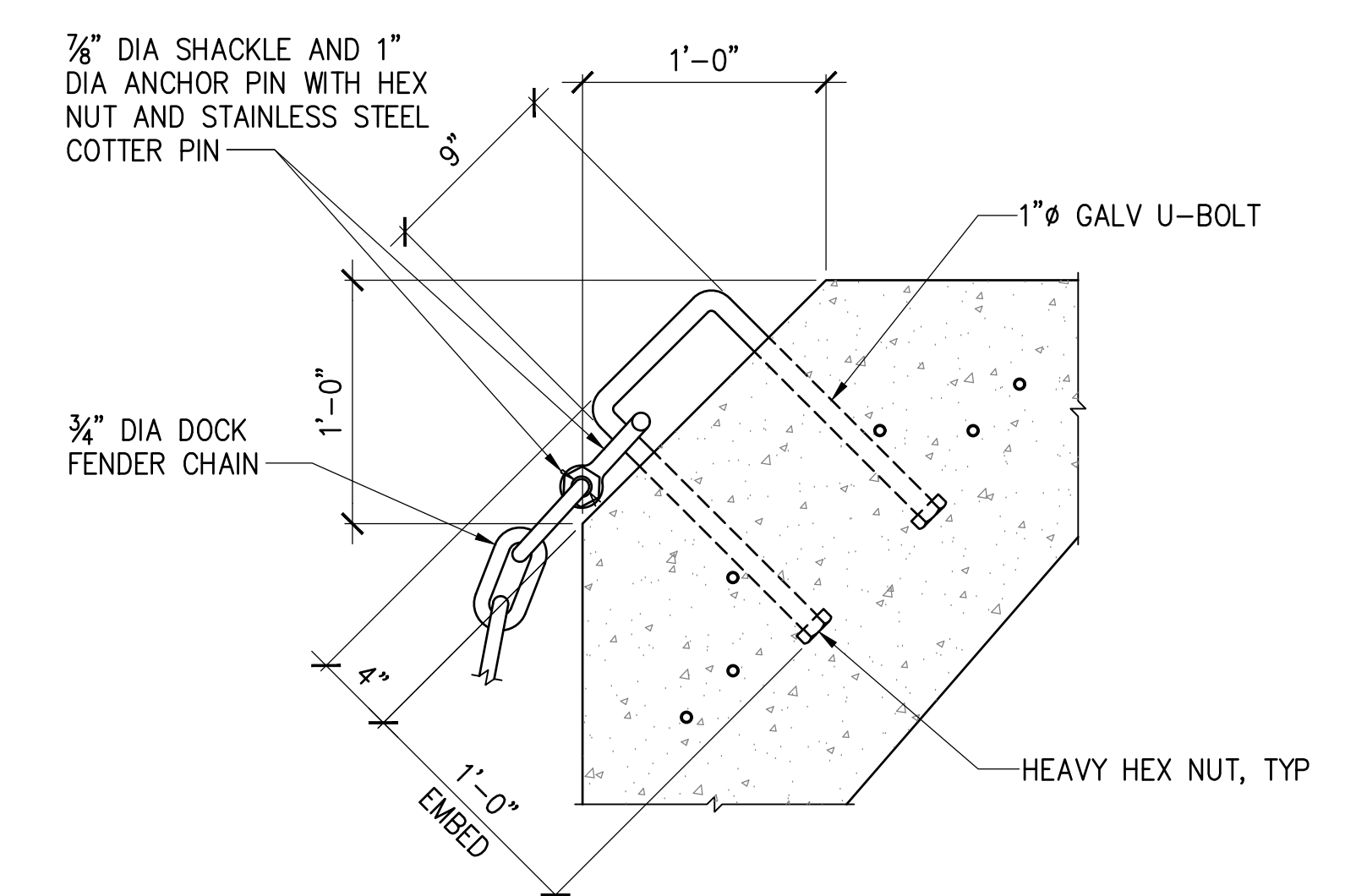


- NOTES:
- EXIST REINFORCING BARS ARE GFRP AND MAY BE SAWCUT AT EXTENTS OF DEMOLISHED AREAS.
  - TIRE FENDER NOT SHOWN FOR CLARITY.

E SECTION SCALE: 1" = 1'-0"

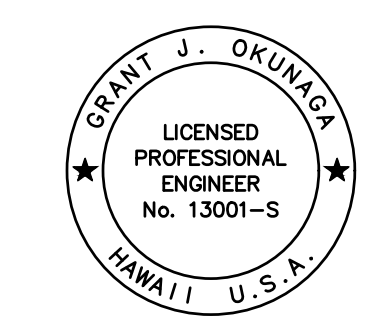


PLAN



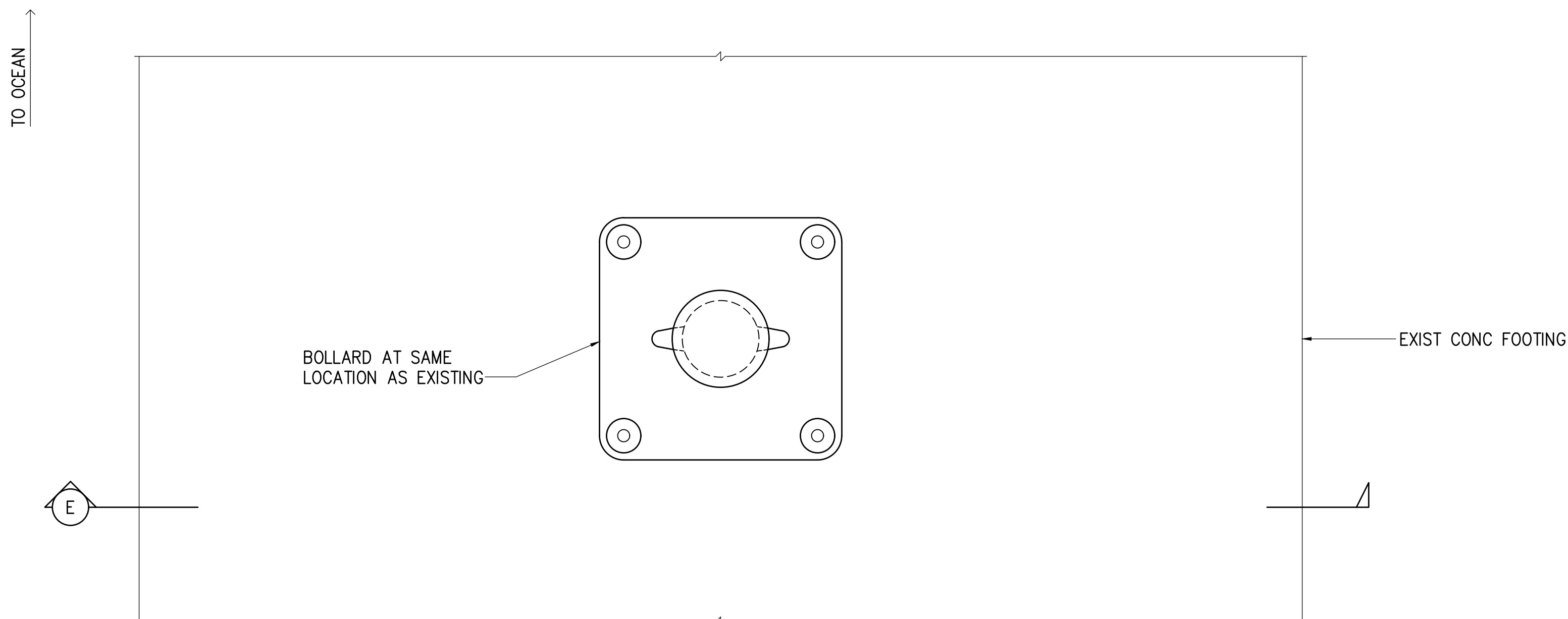
NOTE:  
SHACKLE, ANCHOR PIN, AND FENDER CHAIN SHALL BE HOT DIPPED GALVANIZED.

2 PADEYE CONNECTION DETAIL SCALE: 1-1/2" = 1'-0"

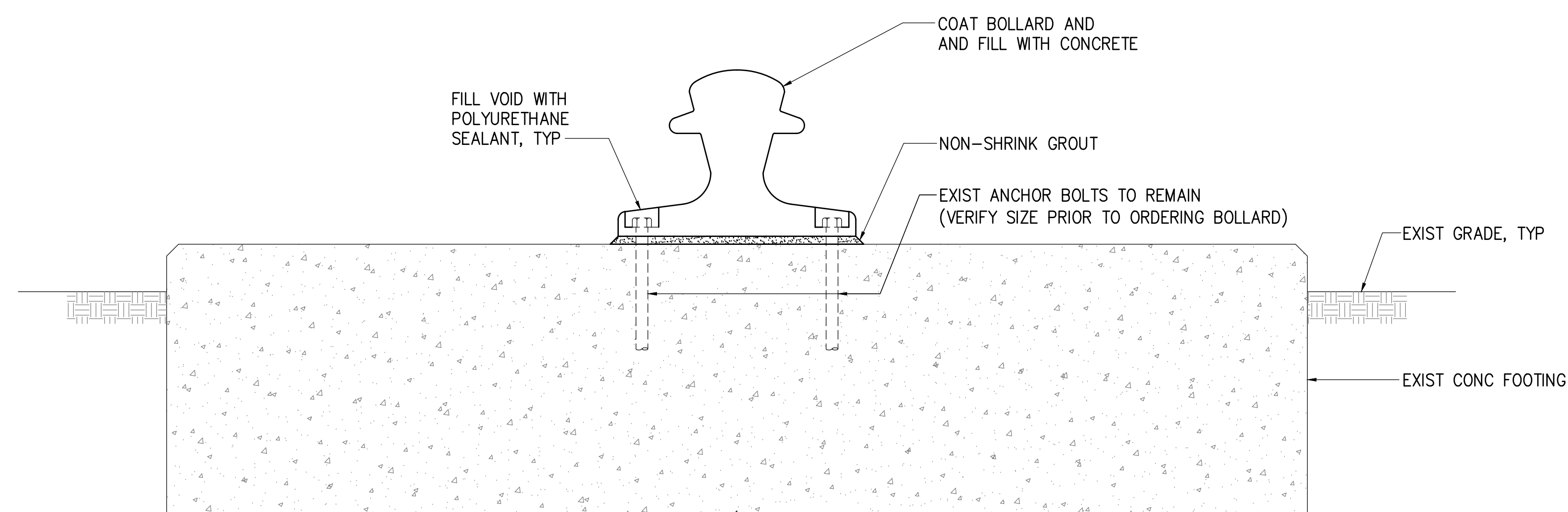


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JOB TITLE BOLLARD AND FENDER REPAIRS AT PIER 60 HONOLULU HARBOR, OAHU, HAWAII				
SHEET TITLE RAMP FENDER REPAIRS				
DESIGNED BY: GO	JOB NUMBER		SHEET	
DRAWN BY: DL	S10853		S-4	
CHECKED BY: GM	DATE: 04/2023		SCALE: AS SHOWN	
SCALE: AS SHOWN		6 OF 7 SHTS.		



PLAN



E SECTION

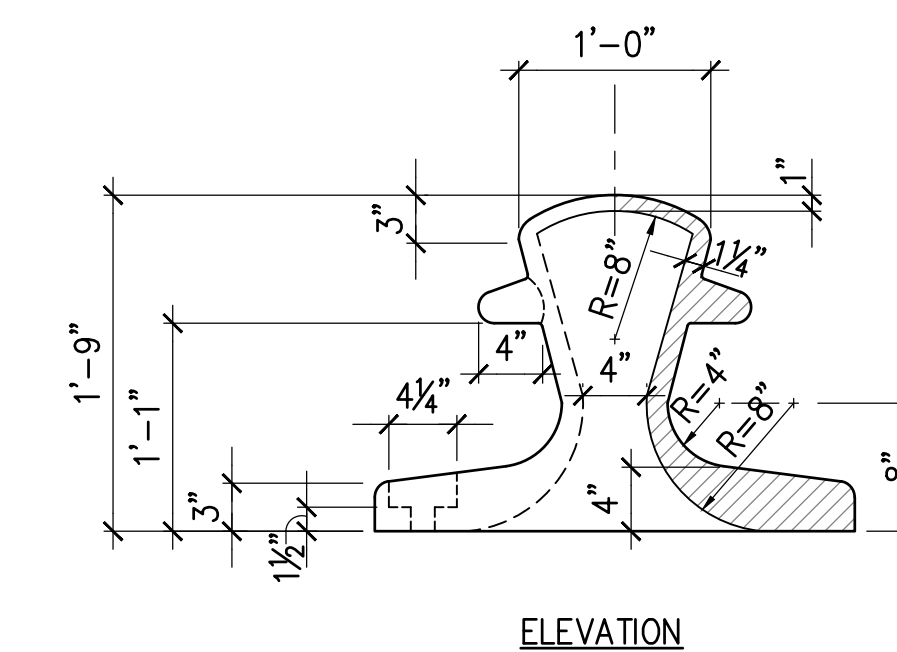
**BOLLARD REPLACEMENT NOTES:**

**GENERAL:**

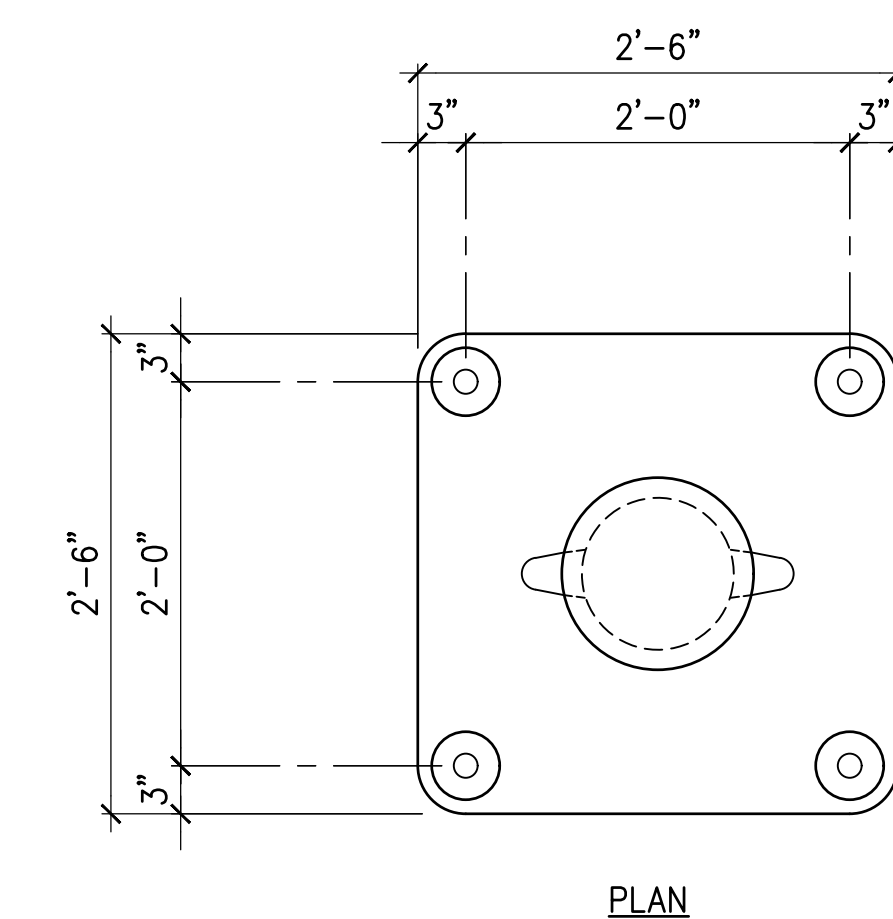
1. NON-SHRINK GROUT UNDER BOLLARD SHALL BE A PREMIXED NON-METALLIC FORMULA, CAPABLE OF DEVELOPING A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI IN 1 DAY AND 5,000 PSI IN 28 DAYS.
2. BOLLARD SHALL NOT BE SUBJECTED TO LIVE LOADS UNTIL CONCRETE IN THE BOLLARD HAS BEEN ALLOWED TO CURE FOR 7 DAYS.
3. COATING FOR BOLLARD SHALL BE AMERLOCK 400 AND PSX 700 BY PPG PROTECTIVE AND MARINE COATINGS, OR APPROVED EQUAL. COLOR SHALL BE OSHA YELLOW.

**BOLLARD REPLACEMENT PROCEDURE:**

1. REMOVE EXISTING BOLLARD. DO NOT DAMAGE EXISTING ANCHOR BOLTS TO REMAIN.
2. COAT BOLLARD PRIOR TO INSTALLATION.
3. CLEAN EXPOSED PORTIONS OF EXISTING ANCHOR BOLTS. PLUMB BOLLARD AND PROVIDE GROUT PAD.
4. FILL BOLLARD WITH CONCRETE.
5. FILL BOLLARD BOLT HOLES WITH POLYURETHANE SEALANT.



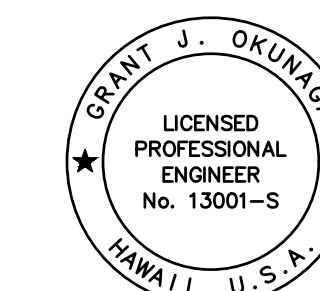
ELEVATION



PLAN

**NOTE:**

CONTRACTOR SHALL VERIFY EXISTING BOLLARD DIMENSIONS INCLUDING BOLT SPACING, SIZE AND PRIOR TO ORDERING.



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SHEET TITLE BOLLARD REPLACEMENT DETAILS				
DESIGNED BY: GO				SHEET S-5
DRAWN BY: DL				JOB NUMBER S10853
CHECKED BY: GM				
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SCALE: AS SHOWN				7 OF 7 SHTS.