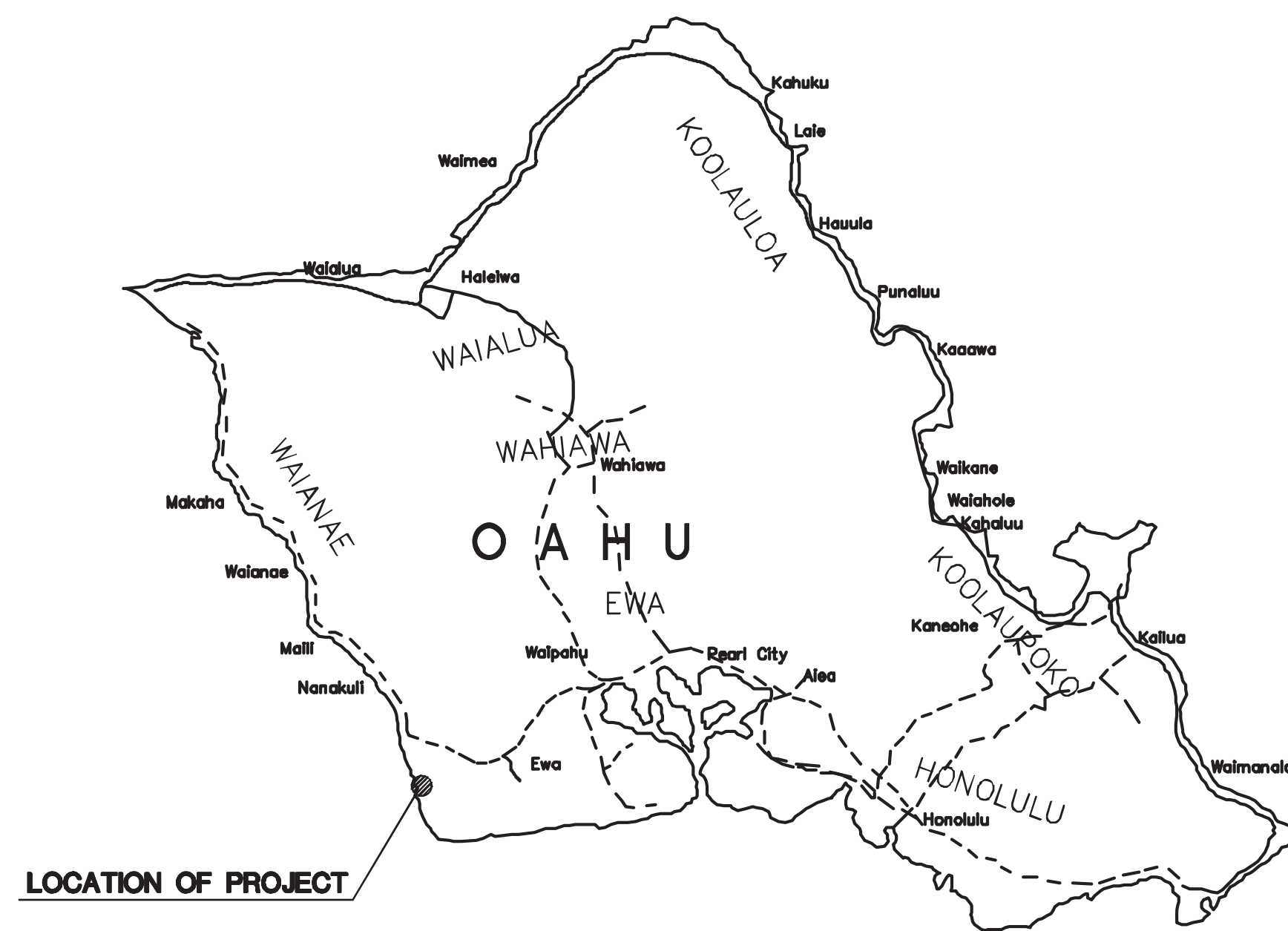


TRENCH DRAIN REPAIRS AT KALAELOA BARBERS POINT HARBOR, OAHU, HAWAII

FOR THE
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
S10873



ISLAND OF OAHU

LOCATION MAP
NOT TO SCALE




PROJECT SITE

VICINITY MAP
NOT TO SCALE



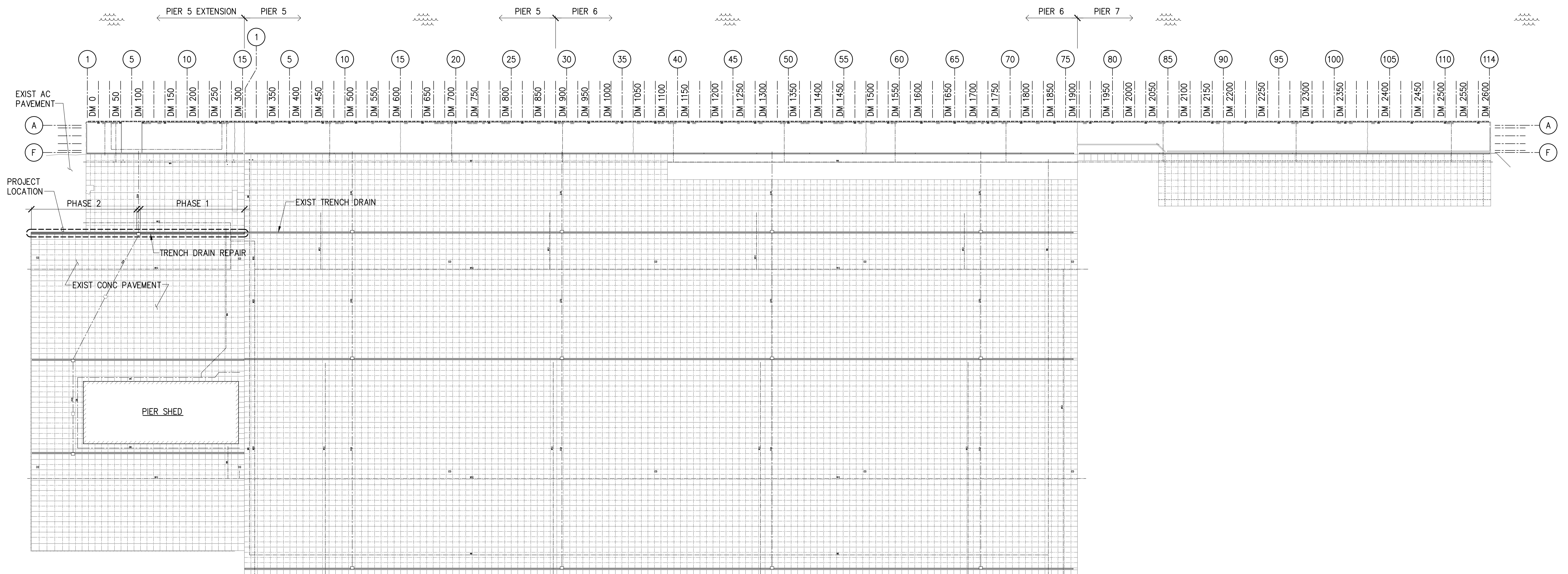
CONSULTANT:

MKE ASSOCIATES LLC
STRUCTURAL ENGINEER

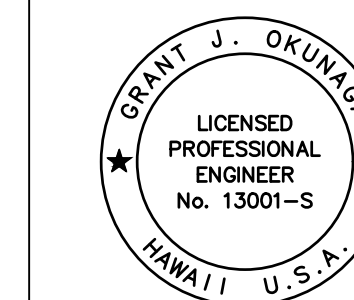
DEPARTMENT OF TRANSPORTATION STATE OF HAWAII		SHEET T-1
APPROVED BY: 	Mar 6, 2023	
for DIRECTOR OF TRANSPORTATION		DATE 1 OF 6 SHEETS

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	EXISTING TRENCH DRAIN PLAN
S-3	TRENCH DRAIN REPAIR DETAILS
S-4	MISCELLANEOUS REPAIR DETAILS



GENERAL PLAN
SCALE: 1" = 90'



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 TRENCH DRAIN REPAIRS AT KALAELOA BARBERS POINT HARBOR, OAHU, HAWAII				
SHEET TITLE INDEX TO DRAWINGS AND GENERAL PLAN				
DESIGNED BY: GO	JOB NUMBER		SHEET	
DRAWN BY: DL	S10873		T-2	
CHECKED BY: GM				
DATE: 03/2023	2 OF 6 SHEETS			
SCALE: AS SHOWN				

STRUCTURAL NOTES:

GENERAL:

- 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.
- 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.
- 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.
- 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 DIVISION 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 DIVISION 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/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.
- WORK SHALL BE PERFORMED IN PHASES AS SHOWN ON SHEET T-2. 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.
- 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 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.
- 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.
- 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.
- 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.

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 $\frac{3}{8}$ 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.
- BAR BENDS AND HOOKS SHALL BE STANDARD HOOKS IN ACCORDANCE WITH ACI 318.
- REINFORCING STEEL SHALL BE SPLICED WHERE INDICATED ON PLANS. PROVIDE LAP SPLICE LENGTH OF 48 BAR DIAMETERS, 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.
- 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.

STRUCTURAL STEEL:

- FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL OF STEEL CONSTRUCTION, FIFTEENTH EDITION.
- STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE NOTED.
- HEADED ANCHOR BOLTS SHALL CONFORM TO ASTM F 1554, GRADE 36.
- WELDS AND WELDING PROCEDURES SHALL CONFORM TO THE STRUCTURAL WELDING CODE AWS D1.1 OF THE AMERICAN WELDING SOCIETY.
- WELDING SHALL BE PERFORMED BY WELDERS PRE-QUALIFIED FOR WELDING PROCEDURES TO BE USED.
- WELDING ELECTRODES SHALL BE E70XX.
- TRENCH DRAIN FRAMES AND GRATING SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.

TRENCH DRAIN GRATING:

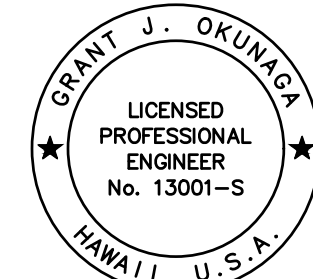
- TRENCH DRAIN GRATINGS SHALL BE FURNISHED AND DELIVERED TO A DESIGNATED DELIVERY AREA IN THE HARBOR DETERMINED BY THE HARBORS CONSTRUCTION ENGINEER. THE CONTRACTOR IS NOT REQUIRED TO INSTALL GRATINGS.
- AT THE COMPLETION OF THE THE PROJECT, THE CONTRACTOR SHALL CLEAN ALL DIRT AND DEBRIS FROM THE TRENCH DRAINS TO THE SATISFACTION OF THE HARBORS DIVISION CONSTRUCTION ENGINEER.

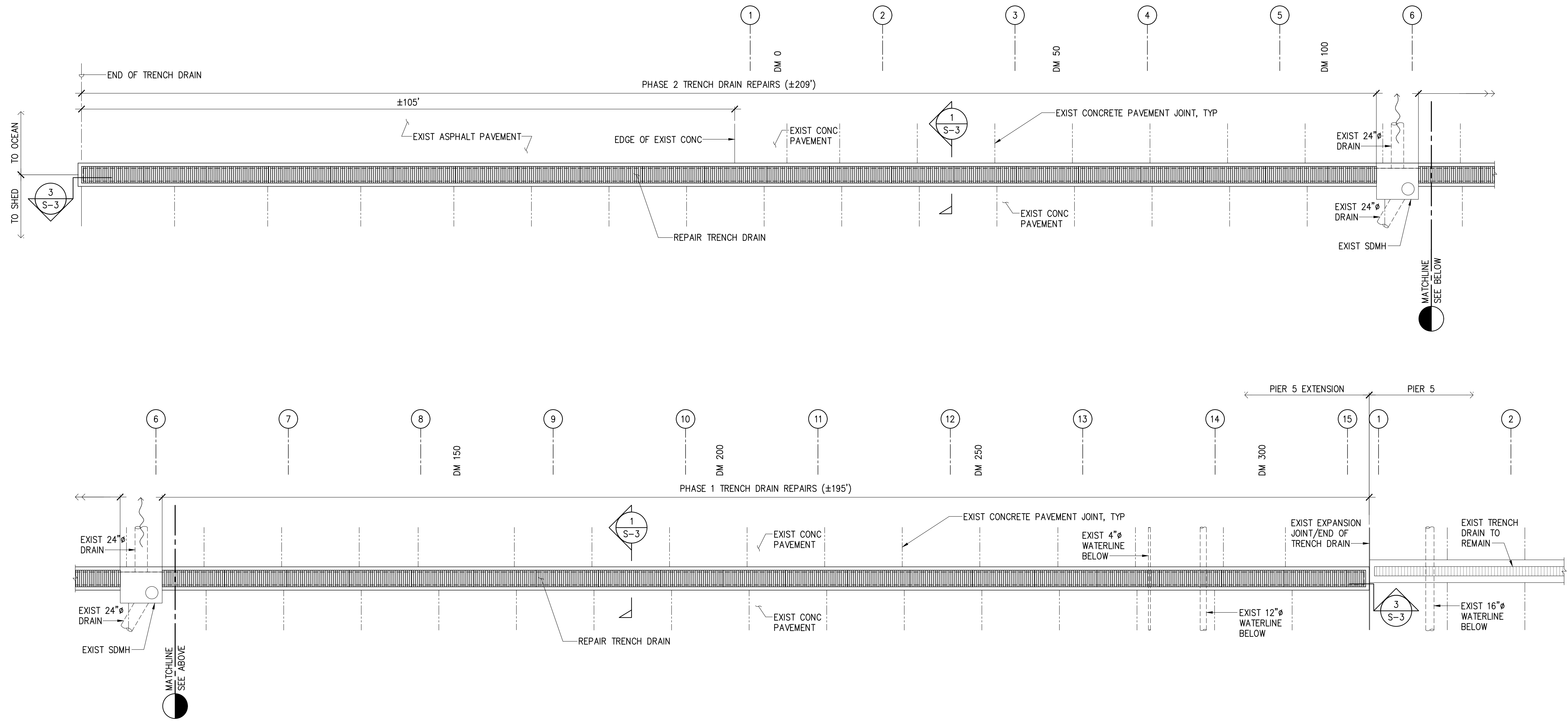
PREPARATION OF SUBSTRATE AND REINFORCING STEEL FOR SPALL REPAIRS:

- SURFACE PREPARATION FOR SPALL REPAIRS SHALL FOLLOW THE INTERNATIONAL CONCRETE REPAIR INSTITUTE (ICRI) GUIDELINE NO. 310.1R-2008.
- 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 DIVISION CONSTRUCTION ENGINEER.
- 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 REPAIRS GREATER THAN 5 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 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.
- SNAP TIES AND OTHER NON-REMOVABLE INSERTS SHALL BE PLASTIC OR STAINLESS STEEL.
- ALL FORMED CONCRETE REPAIRS SHALL BE BUILT UP TO THE ORIGINAL 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 SHALL NOT BE REMOVED FOR A MINIMUM OF 24 HOURS.
- CONCRETE REPAIRS SHALL BE CURED BY COVERING THE SURFACE WITH A CURING COMPOUND APPROVED BY THE HARBORS DIVISION CONSTRUCTION ENGINEER.

 <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION <i>Grant J. Okunaka</i> MKE ASSOCIATES LLC</p>	REVISION	DATE	DESCRIPTION	BY	APPROVED
	STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS DIVISION				
	JOB TITLE TRENCH DRAIN REPAIRS AT KALAELOA BARBERS POINT HARBOR, OAHU, HAWAII				
	SHEET TITLE STRUCTURAL NOTES				
DESIGNED BY: GO	JOB NUMBER			SHEET	
DRAWN BY: DL	S10873			S-1	
CHECKED BY: GM	DATE: 03/2023			SCALE: AS SHOWN	
			3 OF 6 SHTS.		



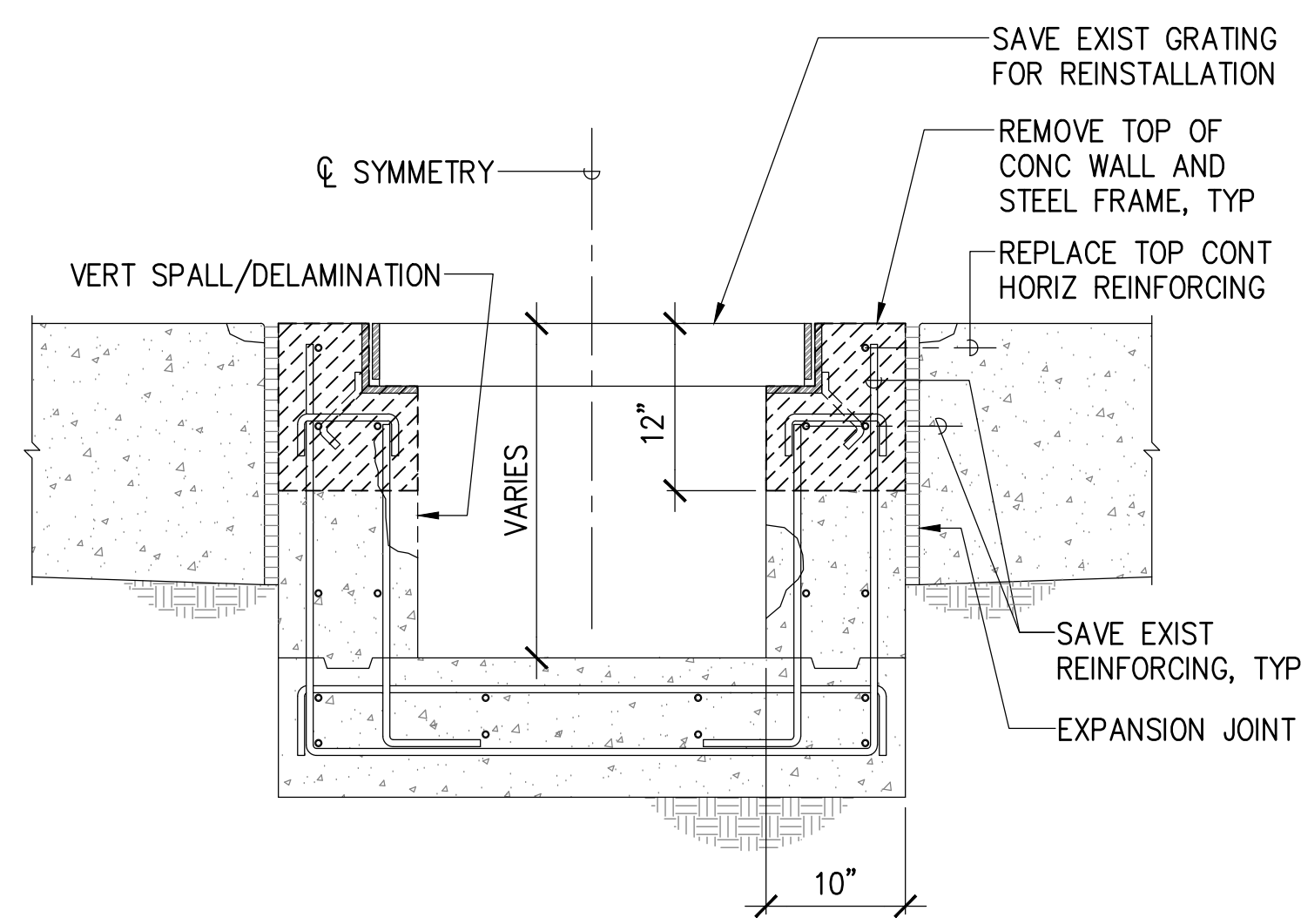
TRENCH DRAIN PLAN
SCALE: 1/8" = 1'-0"



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

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

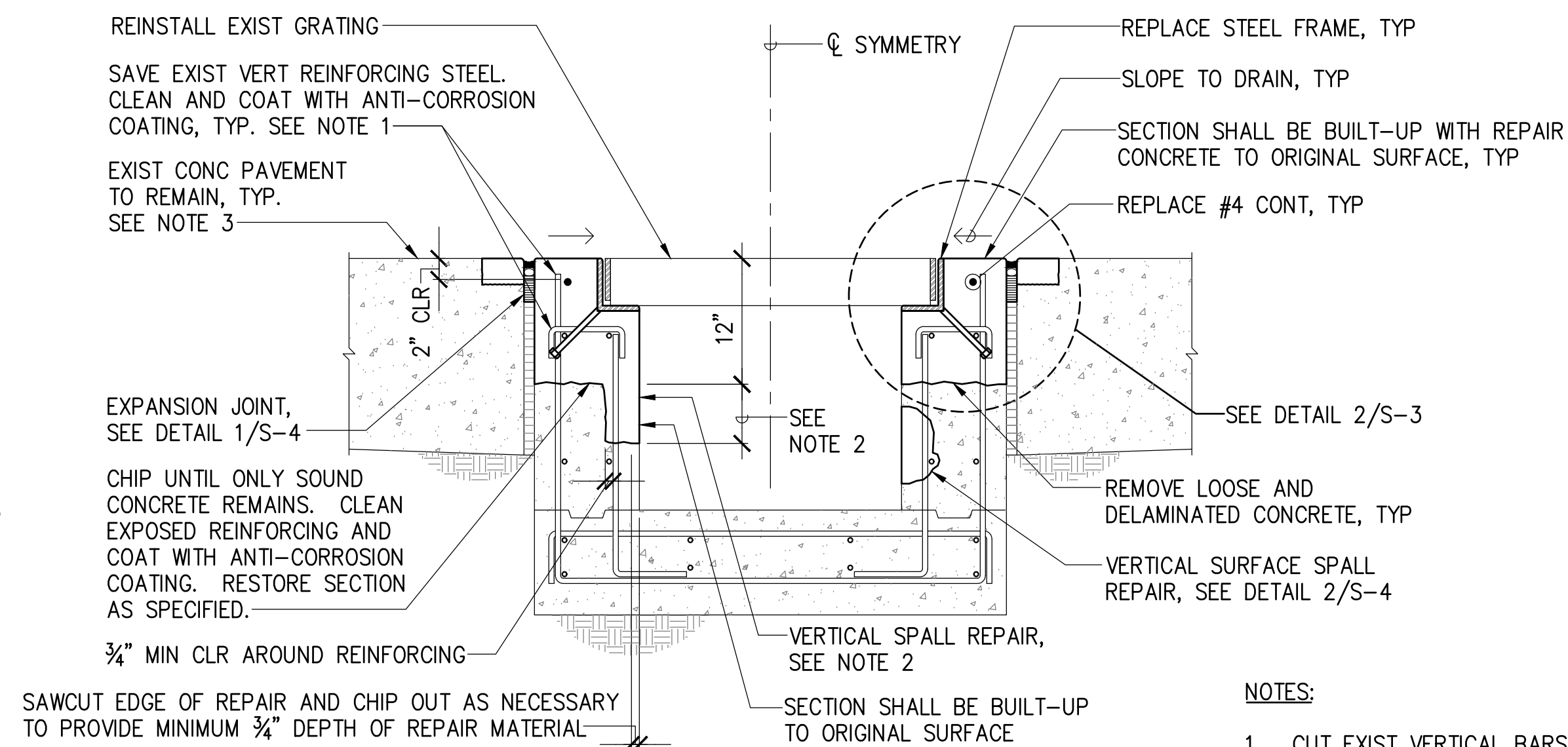
REVISION	DATE	DESCRIPTION	BY	APPROVED
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS DIVISION				
JOB TITLE TRENCH DRAIN REPAIRS AT KALAELOA BARBERS POINT HARBOR, OAHU, HAWAII				
SHEET TITLE EXISTING TRENCH DRAIN PLAN				
DESIGNED BY: GO	JOB NUMBER		SHEET	
DRAWN BY: DL	S10873		S-2	
CHECKED BY: GM				
DATE: 03/2023				
SCALE: AS SHOWN	4 OF 6 SHEETS			



EXISTING CONDITION

1 TRENCH DRAIN REPAIR DETAIL

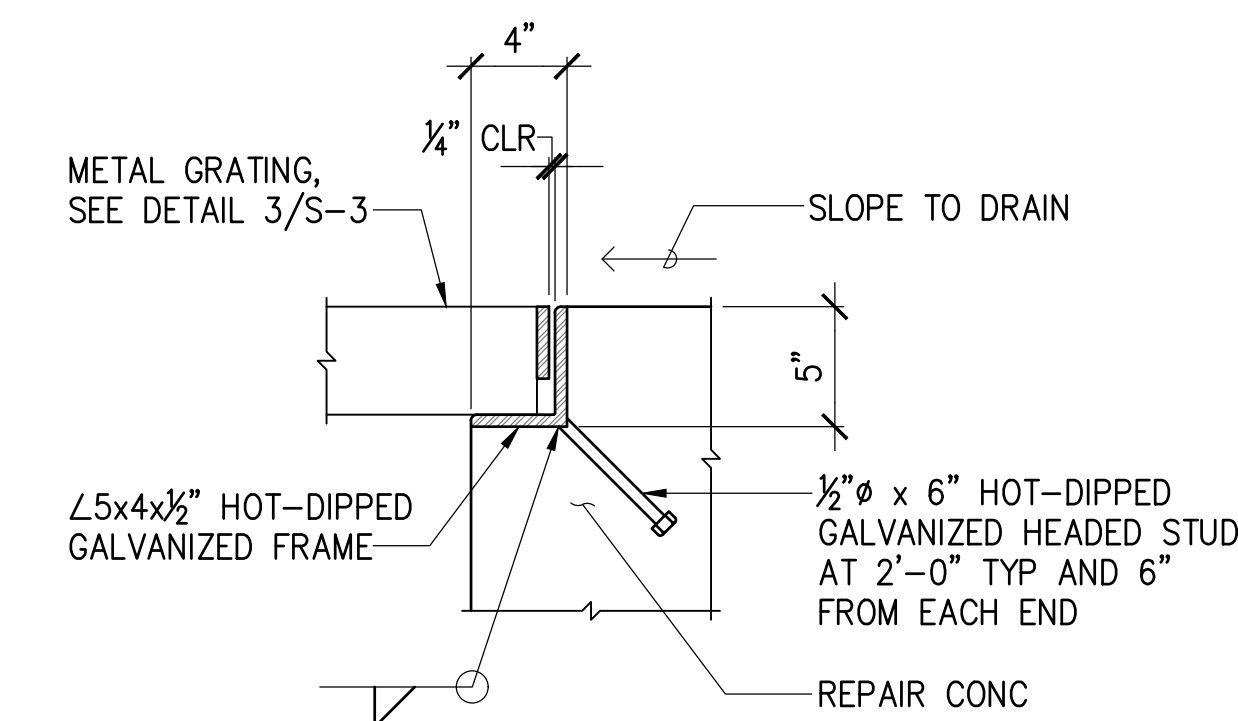
S-3 SCALE: 1" = 1'-0"



REPAIRED CONDITION

NOTES:

- CUT EXIST VERTICAL BARS AS REQUIRED TO PROVIDE COVER SHOWN ABOVE.
- VERTICAL SURFACE SPALL REPAIRS EXTENDING BELOW TRENCH DRAIN REPAIRS SHALL BE PAID FOR PER DETAIL 2/S-4.
- CONDITION AT ASPHALT PAVEMENT NOT SHOWN.

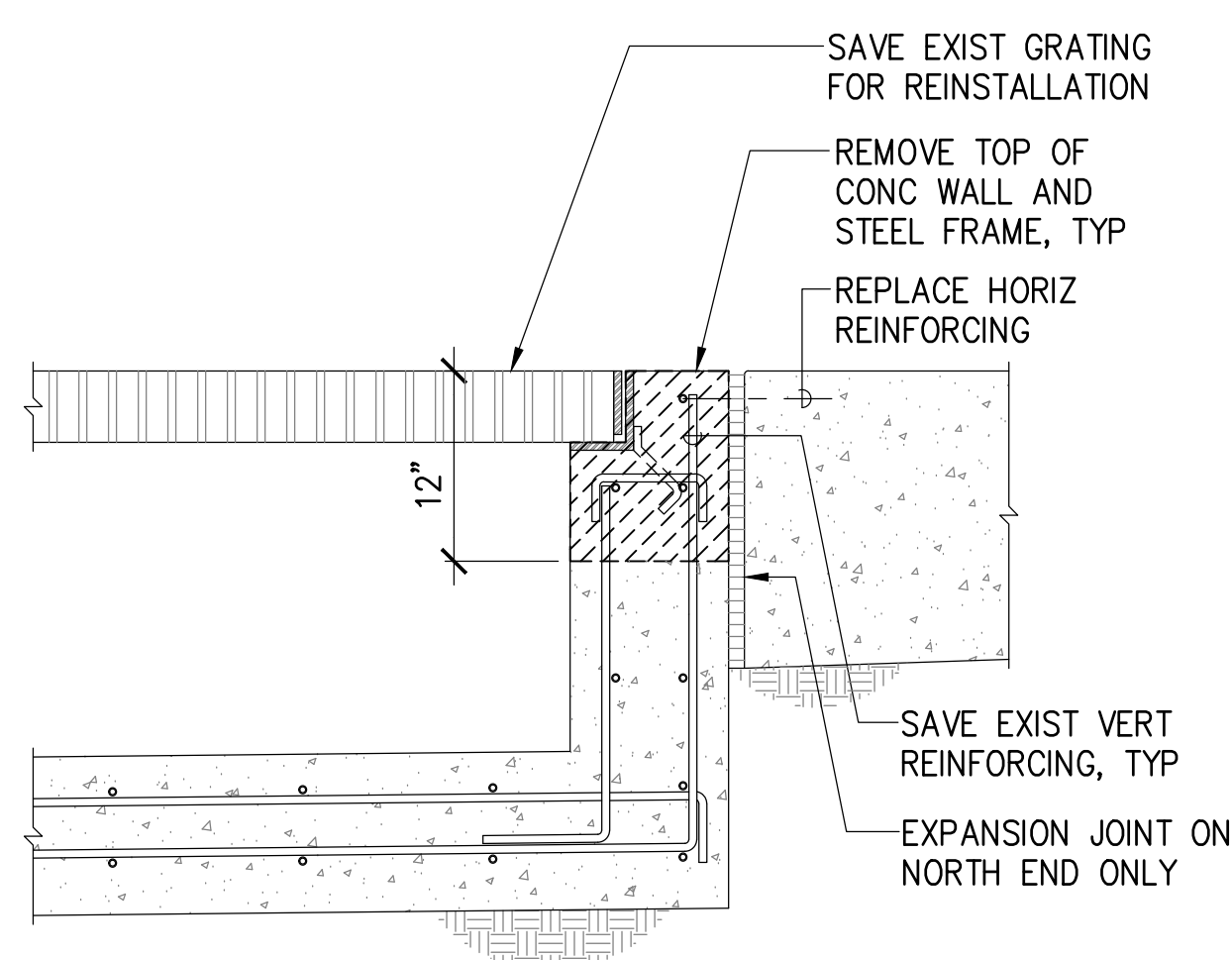


NOTE:

INSTALL IN MIN 20'-0" LONG PIECES.

2 FRAME DETAIL

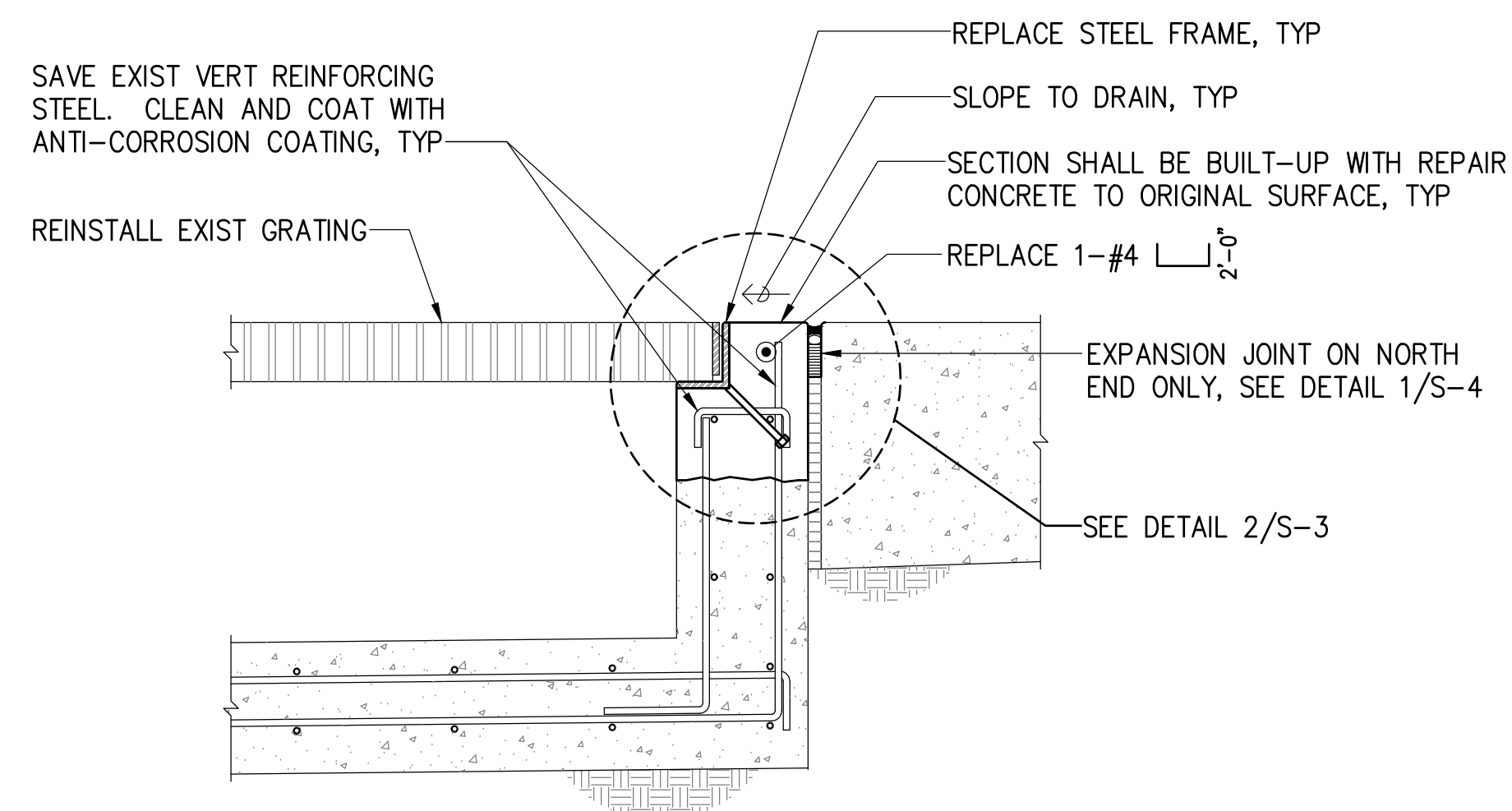
S-3 SCALE: 1-1/2" = 1'-0"



EXISTING CONDITION

3 TRENCH DRAIN REPAIR DETAIL

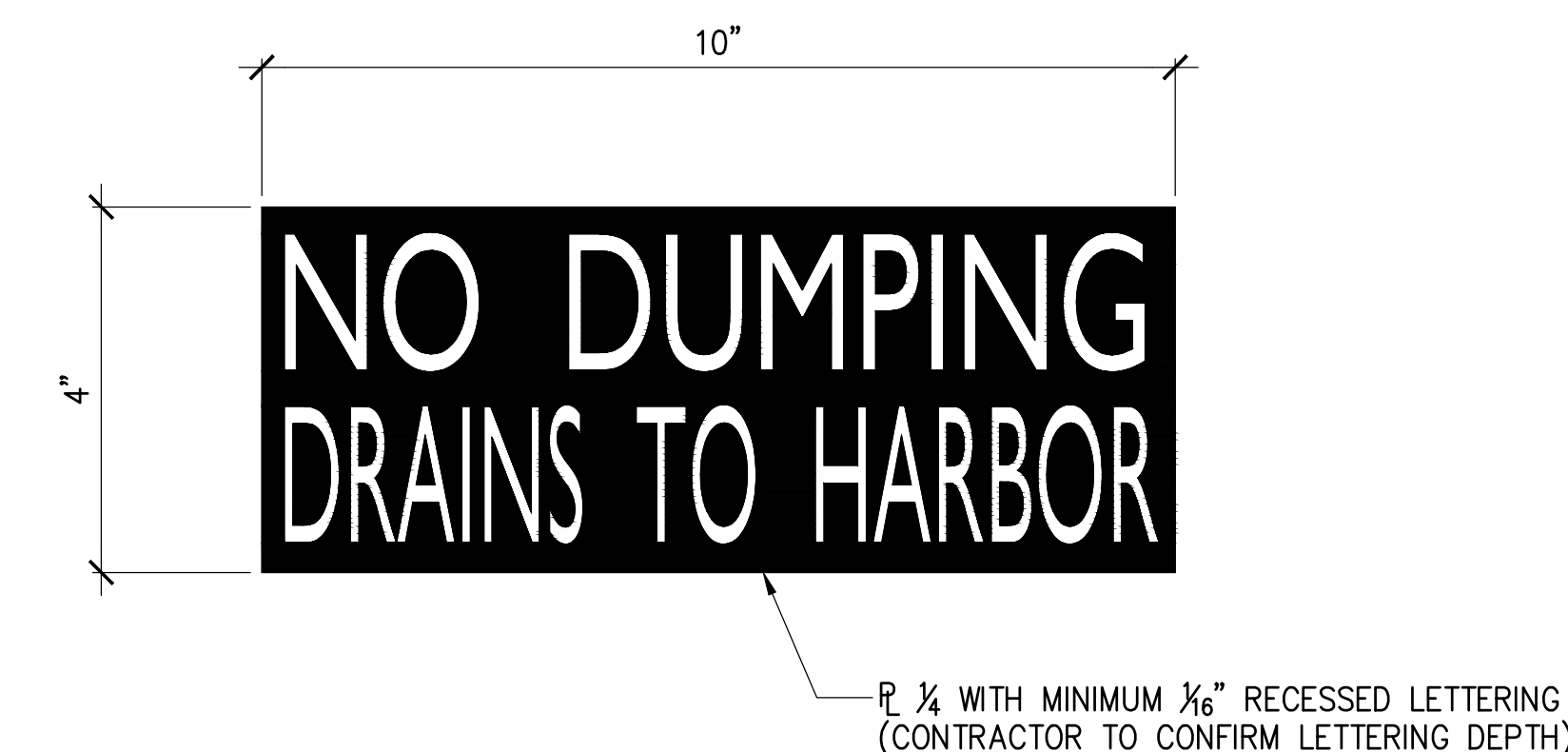
S-3 SCALE: 1" = 1'-0"



REPAIRED CONDITION

NOTE:

SEE DETAIL 1/S-3 FOR BALANCE OF INFORMATION.

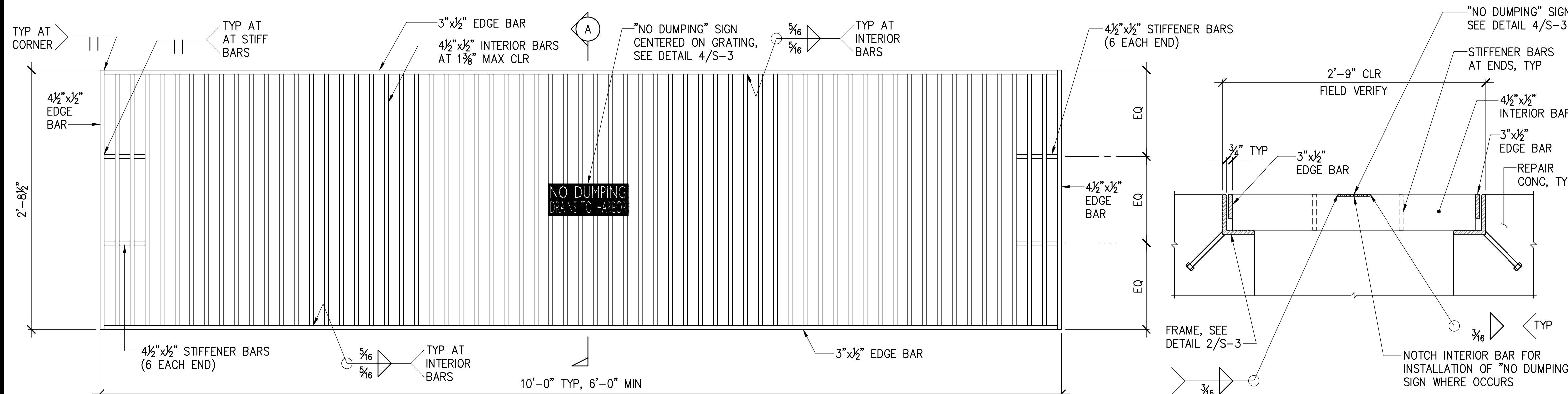


NOTE:

CONTRACTOR TO PAINT RECESSED LETTERS SAFETY YELLOW AFTER HOT-DIP GALVANIZING.

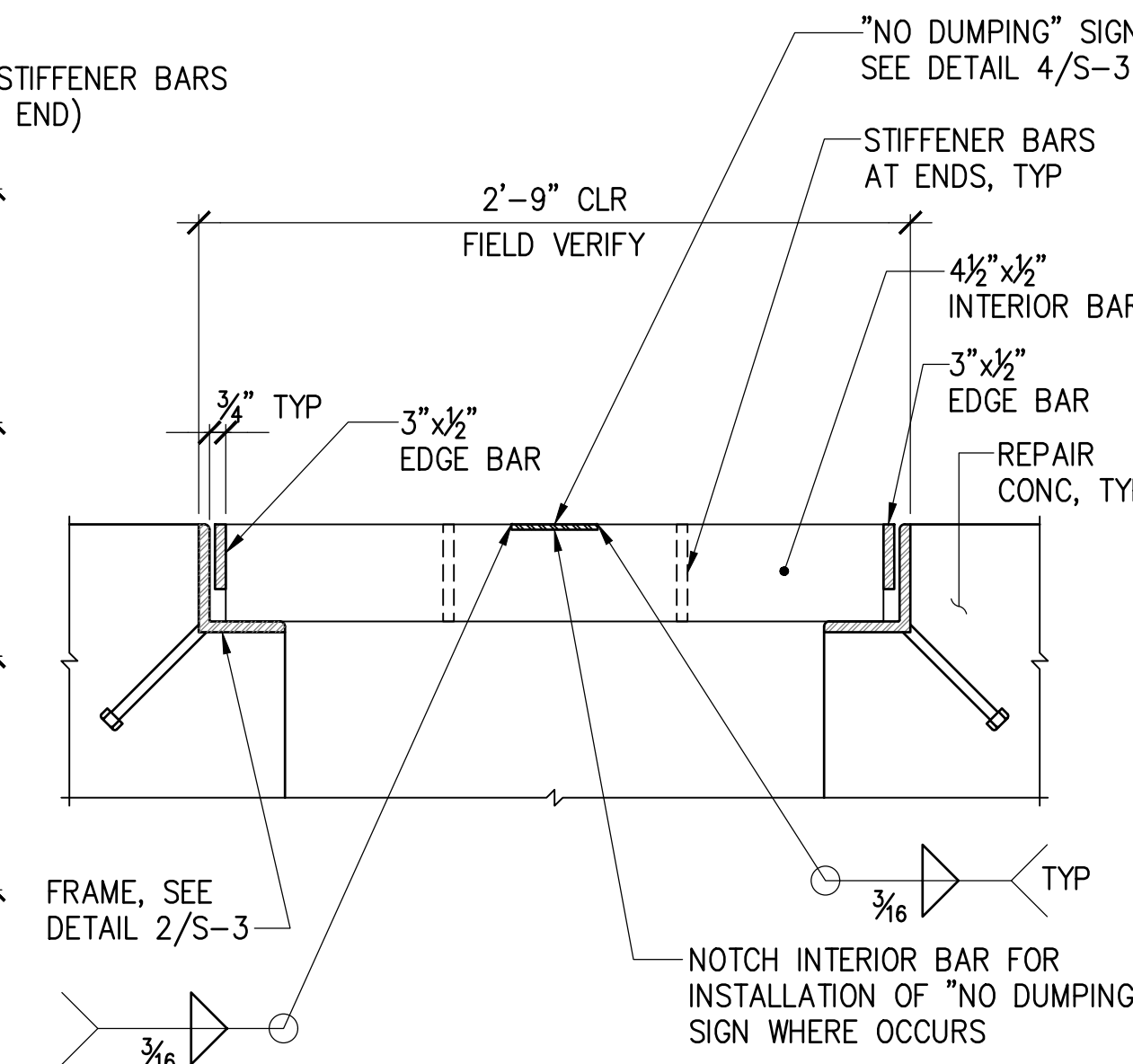
4 "NO DUMPING" SIGN

S-3 SCALE: 6" = 1'-0"



NOTE:

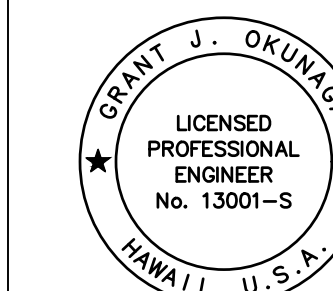
- VERIFY LENGTH OF GRATING WITH HARBORS DIVISION CONSTRUCTION ENGINEER PRIOR TO FABRICATION.



SECTION A

5 TRENCH DRAIN GRATING DETAIL

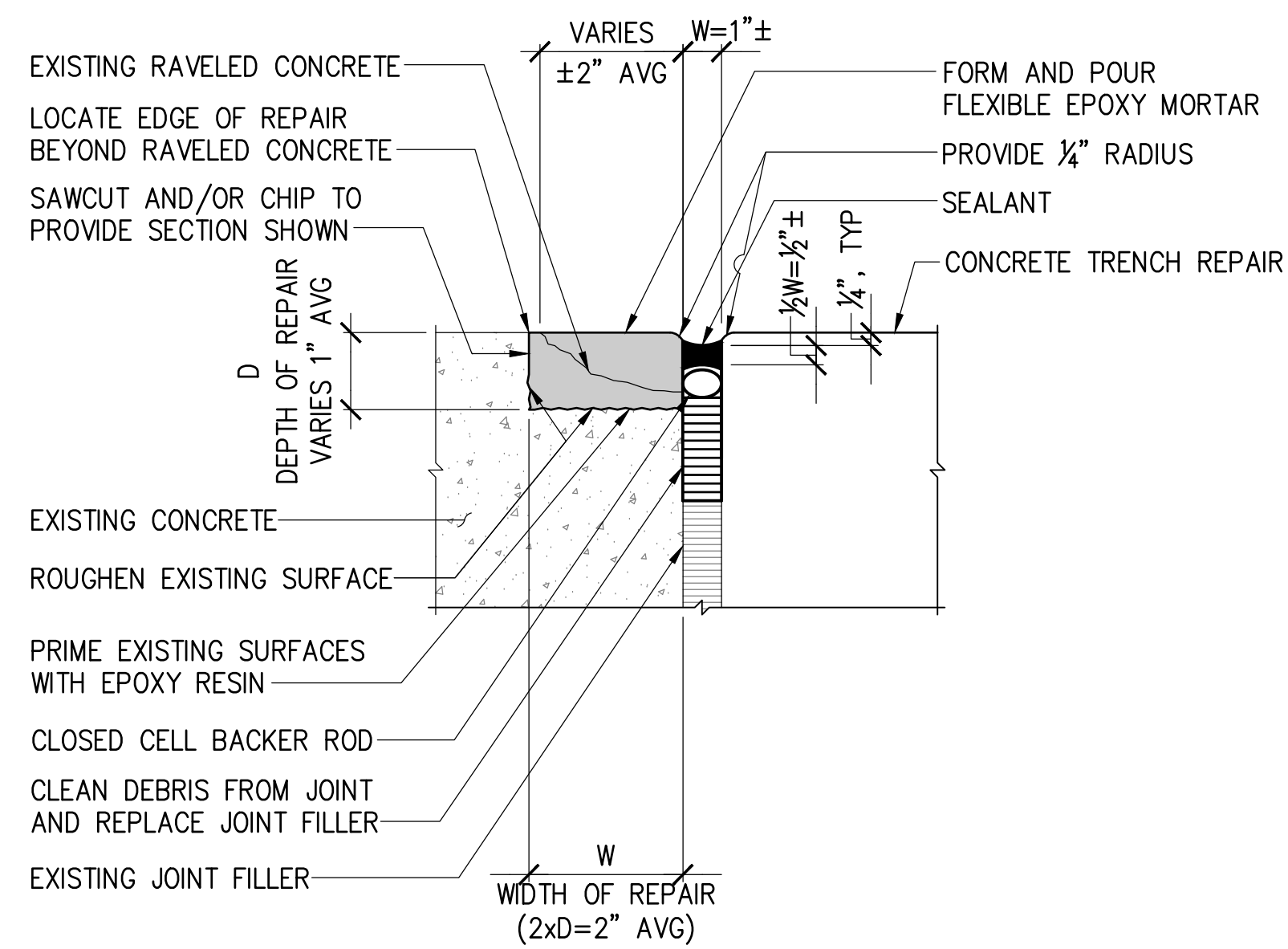
S-3 SCALE: 1-1/2" = 1'-0"



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

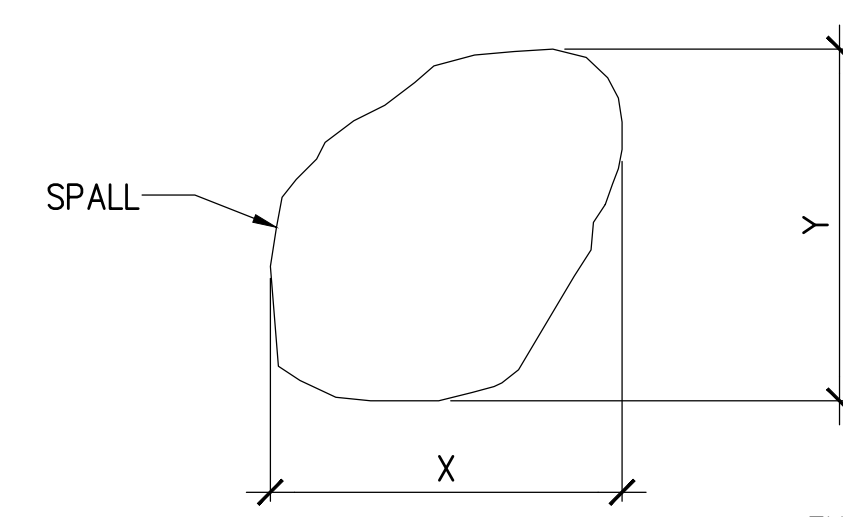
REVISION	DATE	DESCRIPTION	BY	APPROVED
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS DIVISION				
JOB TITLE TRENCH DRAIN REPAIRS AT KALAELOA BARBERS POINT HARBOR, OAHU, HAWAII				
SHEET TITLE TRENCH DRAIN REPAIR DETAILS				
DESIGNED BY: GO	DRAWN BY: DL			CHECKED BY: GM
DATE: 03/2023	JOB NUMBER: S10873			SCALE: AS SHOWN

SHEET
S-3
 5 of 6 SHTS.



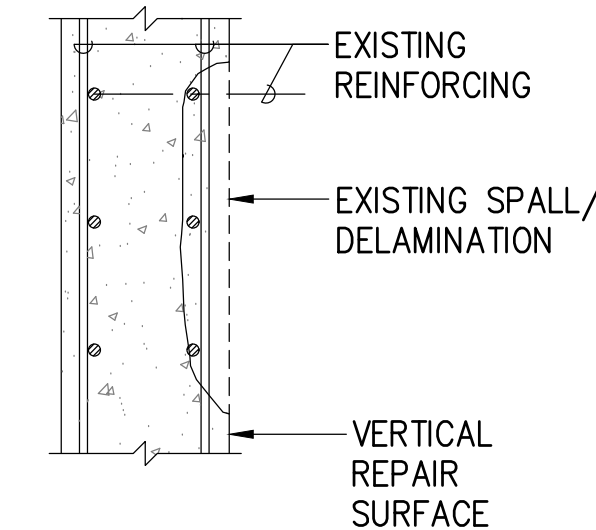
NOTES:

1. SAWCUT AND/OR CHIP EXISTING RAVELED JOINT TO ACHIEVE THE SECTION SHOWN. DO NOT DAMAGE EXISTING REINFORCING STEEL.
2. ROUGHEN EXISTING SURFACE TO 1/16" MIN SURFACE PROFILE.
3. BEFORE APPLYING FLEXIBLE EPOXY MORTAR, CONCRETE SURFACES SHALL BE CLEANED PER MANUFACTURER'S RECOMMENDATIONS. REMOVE LOOSE DEBRIS, DUST, LAITANCE, GREASE AND ANY OTHER BOND INHIBITING SUBSTANCES. ANY EXPOSED REINFORCING STEEL SHALL BE CLEANED OF CORROSION.
4. PRIME THE EXISTING SUBSTRATE WITH MIXED EPOXY RESIN. APPLY TO ENTIRE SURFACE CONTACT AREA AND EXPOSED REINFORCING STEEL. PLACE FLEXIBLE EPOXY MORTAR WITHIN 2 HOURS OF PRIMING.
5. FLEXIBLE EPOXY MORTAR SHALL BE 1 PART SIKADUR 21 LO-MOD BY SIKA CORP. MIXED WITH 3 PARTS 20/40 SILICA QUARTZ BLEND, OR APPROVED EQUAL.
6. CURE FOR MIN 4 HOURS BEFORE REMOVING FORMWORK. GRIND SURFACE TO BE IN CONTACT WITH SEALANT TO REMOVE LARGE DEFECTS AND LIGHTLY ABRASIVE SURFACE. WIPE CLEAN WITH MILD SOLVENT AND PLACE BACKER ROD AND SEALANT.
7. SEALANT SHALL BE SIKAFLEX 2C NS TG BY SIKA CORP., OR APPROVED EQUAL.
8. EXISTING RAVELED CONCRETE DOES NOT OCCUR EVERYWHERE. PAYMENT FOR EPOXY RESIN REPAIR AT RAVELED CONCRETE AT JOINT SHALL BE PER LINEAL FEET. JOINT FILLER, BACKER ROD, AND SEALANT SHALL BE INCLUDED IN THE TRENCH DRAIN REPAIR WORK AND INSTALLED ON BOTH SIDES OF THE TRENCH DRAIN.



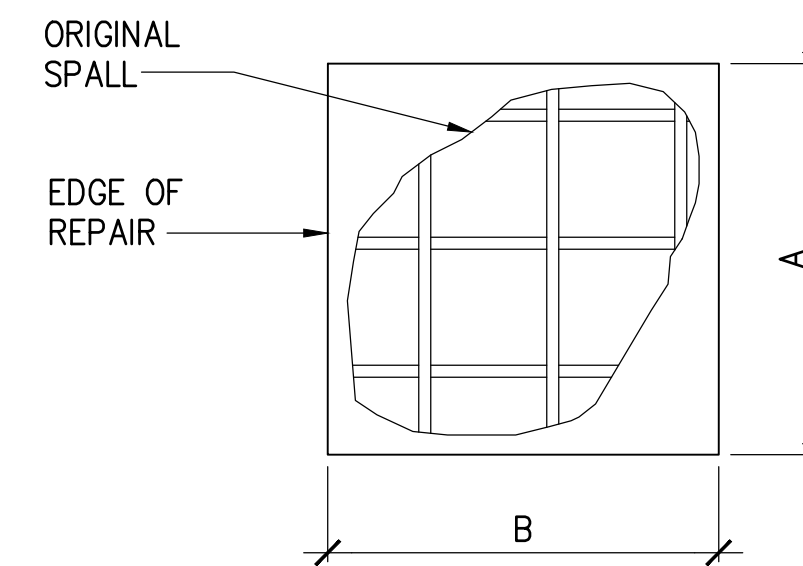
EXISTING SPALL AREA = X x Y

ELEVATION



SECTION

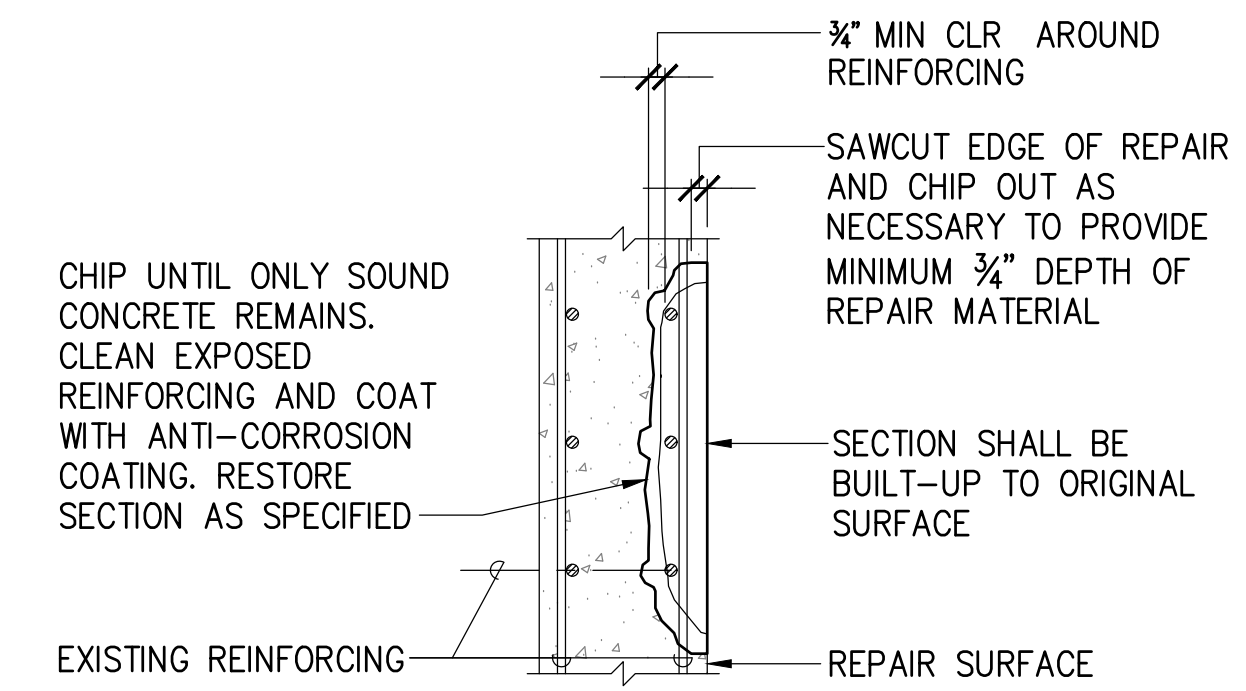
EXISTING CONDITION



PAY AREA = A x B

ELEVATION

REPAIRED CONDITION



SECTION

1 EXPANSION JOINT REPAIR DETAIL
S-4 NOT TO SCALE

2 VERTICAL SPALL REPAIR (TYPE V)
S-4 NOT TO SCALE

	REVISION	DATE	DESCRIPTION	BY	APPROVED
	STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HARBORS DIVISION				
	JOB TITLE TRENCH DRAIN REPAIRS AT KALAELOA BARBERS POINT HARBOR, OAHU, HAWAII				
	SHEET TITLE MISCELLANEOUS REPAIR DETAILS				
DESIGNED BY: GO		DRAWN BY: DL		SHEET S-4	
CHECKED BY: GM		DATE: 03/2023		JOB NUMBER S10873	
SCALE: AS SHOWN				6 of 6 SHTS.	

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