

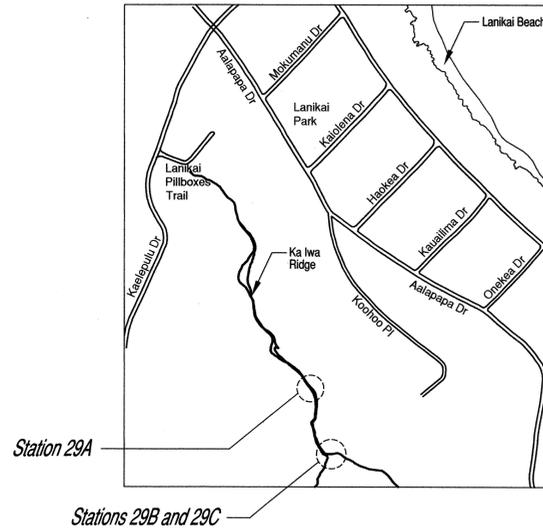
STATE OF HAWAII
 DEPARTMENT OF LAND AND NATURAL RESOURCES
 ENGINEERING DIVISION

FOR
 DIVISION OF FORESTRY AND WILDLIFE

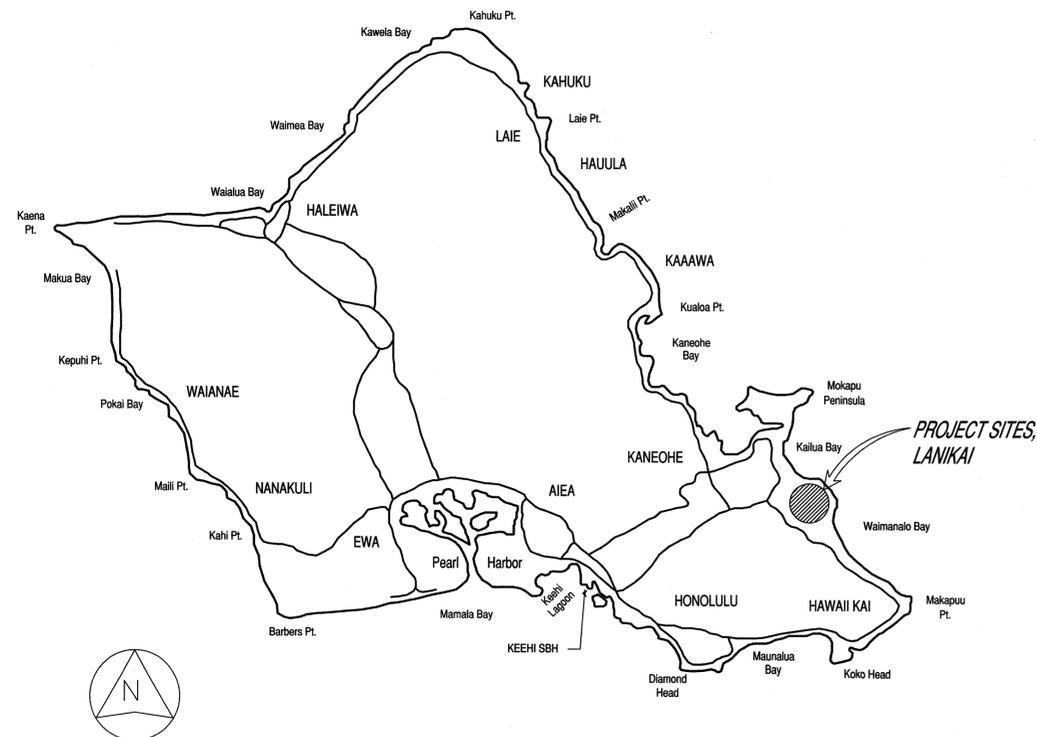
JOB NO. D01C099A

REPAIRS TO THE PILLBOXES
 ON LANIKAI TRAIL
 OAHU, HAWAII

T.M.K.: (1) 4-2-002-017



LOCATION MAP
 NOT TO SCALE



ISLAND OF OAHU
 NOT TO SCALE

APPROVED: _____ DATE: 16 May 16

[Signature]
 DAVID G. SMITH
 ADMINISTRATOR
 DIVISION OF FORESTRY AND WILDLIFE
 DEPARTMENT OF LAND AND NATURAL RESOURCES

APPROVED: _____ DATE: 5/16/16

[Signature]
 CARTY S. CHANG, P.E.
 CHIEF ENGINEER
 ENGINEERING DIVISION
 DEPARTMENT OF LAND AND NATURAL RESOURCES

DRAWING:
T-1

JOB NO. D01C099A REPAIRS TO THE PILLBOXES ON LANIKAI TRAIL

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CONSTRUCTION NOTES:

- THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, AND SHALL BE RESPONSIBLE FOR THE REPAIR, RELOCATION OR REPLACEMENT OF SAME IN THE EVENT OF DAMAGES DUE TO HIS CONSTRUCTION PRACTICES, OR INTERFERENCE WITH CONSTRUCTION WORK. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE RESPECTIVE UTILITY COMPANIES AND THE STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES DIVISION OF FORESTRY AND WILDLIFE.
- FIELD ADJUSTMENTS SHALL BE MADE AS APPROVED BY THE ENGINEER.
- NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW INTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY TAKE ALL REMEDIAL ACTIONS NECESSARY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS" AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL", AS WELL AS CHAPTER 14 OF THE REVISED ORDINANCES OF HONOLULU, AS AMENDED. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO PLAN AND CONSTRUCT BEST MANAGEMENT PRACTICES (BMP) AS REQUIRED BY HIS/HER OPERATIONS TO COMPLY WITH THE LAWS, STANDARDS, RULES, AND/OR POLICIES OF THE CITY, STATE OR FEDERAL REGULATORY AGENCIES. PRIOR TO ACCEPTANCE OF THE PROJECT BY THE STATE, THE CONTRACTOR SHALL BE REQUIRED TO REMOVE ALL BEST MANAGEMENT PRACTICES AND TO RESTORE THE PROJECT SITE TO ITS ORIGINAL CONDITION OR BETTER.
- THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH THE ADMINISTRATIVE RULES OF THE STATE OF HAWAII DEPARTMENT OF HEALTH REGARDING NOISE CONTROL.
- EXISTING TREES SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION. EXISTING TREES THAT OBSTRUCT CONSTRUCTION WORK MAY BE REMOVED IN ACCORDANCE WITH SECTION 02110 OF THE CONTRACT SPECIFICATIONS.
- PURSUANT TO CHAPTER 6E OF THE HAWAII REVISED STATUTES (HRS), IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE HONOLULU POLICE DEPARTMENT, THE STATE DEPARTMENT OF LAND AND NATURAL RESOURCES-HISTORIC PRESERVATION DIVISION (PHONE 808-692-8015).
- IN PERFORMING ALL WORK, THE CONTRACTOR SHALL EXERCISE DUE CARE AND CAUTION NECESSARY TO AVOID ANY DAMAGE INFLICTED TO AND IMPAIRMENT IN THE USE OF ANY EXISTING UTILITY LINE. ANY DAMAGE INFLICTED ON EXISTING UTILITY LINES RESULTING FROM CONTRACTOR'S OPERATIONS SHALL BE IMMEDIATELY REPAIRED OR RESTORED AS DIRECTED BY THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR AGREES THAT HE/SHE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY; AND THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE STATE AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPT FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE STATE OR ENGINEER.
- THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM RUBBISH, DUST, NOISE, EROSION, ETC. THE WORK SHALL BE DONE IN CONFORMANCE WITH THE AIR AND WATER POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.
- THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES AND OTHER PROTECTIVE MEASURES, AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC. THE CONTRACTOR SHALL ENSURE TEMPORARY SAFE PEDESTRIAN PASSAGEWAYS AROUND THE CONSTRUCTION SITE AS PER THE AMERICAN WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG) SECTION 4.1.1(4).
- THE CONTRACTOR SHALL PROVIDE ACCESS TO AND FROM PARKING AREAS AND PUBLIC STREETS AT ALL TIMES.
- THE CONTRACTOR SHALL RESTORE TO ORIGINAL OR BETTER CONDITION, ALL IMPROVEMENTS DAMAGED AS A RESULT OF THE CONSTRUCTION, INCLUDING PAVEMENTS, EMBANKMENTS, CURBS, SIGNS, LANDSCAPING, STRUCTURES, UTILITIES, WALLS, FENCES, ETC. UNLESS PROVIDED FOR SPECIFICALLY IN THE PROPOSAL. DEMOLITION AND RESTORATION OF EXISTING ITEMS SHALL BE INCIDENTAL AND INCLUDED WITHIN THE AMOUNT PAID FOR INSTALLATION OF NEW ITEMS.
- THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS FROM GOVERNMENT AGENCIES.
- ALL EXISTING UTILITIES TO REMAIN IN USE, WHETHER OR NOT SHOWN ON THE PLANS, SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR DURING CONSTRUCTION UNLESS SPECIFIED ON THE PLANS TO BE ABANDONED. ANY DAMAGES TO EXISTING UTILITIES SHALL BE REPAIRED AND PAID FOR BY THE CONTRACTOR.
- CONTRACTOR SHALL MAKE ARRANGEMENTS FOR TEMPORARY UTILITIES SUCH AS ELECTRICITY, WATER, ETC. REQUIRED FOR HIS OPERATIONS. ALL COSTS FOR TEMPORARY UTILITIES SHALL BORNE BY THE CONTRACTOR.
- DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALE. IF DIMENSIONAL ERRORS OR CONFLICT ARISE, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND SHALL WAIT FOR CLARIFICATION BEFORE RESUMING OR COMMENCING WORK ON THE DISCREPANCY ITEM.
- THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY, AND ENVIRONMENTAL QUALITY.
- DUE TO LIMITED SPACE AT THE JOB SITE THE STATE RECOGNIZES THE NEED FOR A CONSTRUCTION STAGING AREA FOR TEMPORARY STORAGE OF CONTRACTOR'S EQUIPMENT AND MATERIALS. CONTRACTOR SHALL COORDINATE WITH THE DLNR FOR USE OF STAGING AREA(S) AT LEAST 30 DAYS PRIOR TO ANTICIPATED OCCUPANCY. THE STATE IS NOT OBLIGATED TO PROVIDE THESE SPECIFIC STAGING AREAS. THE CONTRACTOR IS ENCOURAGED TO SUBMIT HIS/HER REQUEST FOR STAGING AREA(S) WELL IN ADVANCE. CONDITIONS OF USE OF THE STAGING AREA SHALL BE AS REQUIRED BY THE DLNR.

DEMOLITION NOTES

- USE ALL MEANS NECESSARY TO PROTECT ADJACENT STRUCTURES AND ITEMS TO REMAIN. IN THE EVENT OF ANY DAMAGE TO EXISTING ITEMS TO REMAIN IMMEDIATELY NOTIFY THE ENGINEER. REPAIRS OR REPLACEMENT SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
- PRESERVE AND PROTECT ALL EXISTING TREES AND SHRUBS UNLESS OTHERWISE INDICATED TO BE REMOVED.
- THE CONTRACTOR SHALL PROTECT AND MINIMIZE DAMAGE TO ALL EXISTING PLANTS AND SIGNIFICANT ROOTS OVER 1" DIAMETER THAT ARE TO REMAIN. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF

ALL PLANT MATERIAL AND ROOTS THAT AFFECT CONSTRUCTION.

STRUCTURAL NOTES:

GENERAL:

- WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE INTERNATIONAL BUILDING CODE 2006 EDITION AMENDED BY CITY & COUNTY OF HONOLULU.
- THE CONTRACTOR SHALL TAKE FIELD MEASUREMENTS AND VERIFY FIELD CONDITIONS AND SHALL COMPARE SUCH FIELD MEASUREMENTS AND CONDITIONS WITH THE DRAWINGS BEFORE COMMENCING THE WORK. REPORT IN WRITING TO THE ENGINEER ALL INCONSISTENCIES OR OMISSIONS.
- 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.
- THE DESIGN OF TEMPORARY SHORING IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR. ANY DAMAGE INCURRED AS A RESULT OF INSUFFICIENT SHORING SHALL BE REPAIRED TO NEW CONDITION, AND AT NO ADDITIONAL COST TO THE STATE.
- DETAILS NOTED AS TYPICAL ON STRUCTURAL DRAWINGS SHALL APPLY IN ALL CONDITIONS UNLESS SPECIFICALLY SHOWN OR NOTED OTHERWISE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF THE ADJACENT PROPERTIES, TRAILS, STRUCTURES, STREETS, AND UTILITIES DURING THE CONSTRUCTION PERIOD. ANY DAMAGE OR DETERIORATED PROPERTY SHALL BE RESTORED TO THE SAME OR BETTER CONDITION AT NO COST TO THE STATE.
- THE CONTRACTOR SHALL TAKE PHOTOGRAPHS OF THE TRAIL AND STOCK PILING AREAS BEFORE STARTING WORK. ANY DAMAGE TO SAID PROPERTIES BY THE CONTRACTOR DURING THE PERFORMANCE OF THE WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER, AND AT NO ADDITIONAL COST TO THE STATE. THIS MAY INCLUDE, BUT NOT LIMITED TO, PLANTS, VEGETATION, AND HIKING TRAIL SURFACES.

REINFORCING STEEL:

- REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60 AND SHALL BE EPOXY COATED IN ACCORDANCE WITH ASTM A775, UNLESS OTHERWISE NOTED.
- CLEAR CONCRETE COVER FOR REINFORCING BARS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
 - FOOTING, ETC. CAST AGAINST EARTH _____ 3"
 - ALL OTHER LOCATIONS _____ 2"
- SPLICES: REINFORCING STEEL SHALL BE SPLICED ONLY WHERE INDICATED ON PLANS. PROVIDE LAP SPlice LENGTH PER TYPICAL DETAILS AND SCHEDULE, UNLESS OTHERWISE NOTED. MECHANICAL SPlice CONNECTORS SHALL DEVELOP IN TENSION 90 PERCENT OF THE SPECIFIED ULTIMATE TENSILE STRENGTH OF REINFORCING BARS.
- BAR BENDS AND HOOK SHALL BE "STANDARD HOOKS" IN ACCORDANCE WITH ACI 318-05.

CONCRETE:

- CONCRETE CONSTRUCTION SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE ACI 318-05.
- ALL CONCRETE FOR CONCRETE REPAIR SHALL BE REGULAR WEIGHT CONCRETE AND SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI, UNLESS NOTED OTHERWISE ON THE PLANS.
- JOINT SEALANTS SHALL BE URETHANE AND SHALL CONFORM TO ASTM C920, TYPE S OR M.
- UNLESS OTHERWISE NOTED, CHAMFER ALL CONCRETE EDGES 3/4".
- REINFORCING BARS, ANCHOR BOLTS, INSERTS AND OTHER ITEMS TO BE CAST IN THE CONCRETE SHALL BE SECURED IN POSITION PRIOR TO PLACEMENT OF CONCRETE.
- NON-SHRINK GROUTS SHALL BE PREMIXED COMPOUND CONSISTING OF NON-METALLIC AGGREGATE AND NON-STAINING TYPES, CEMENT, WATER REDUCING AND PLASTICIZING AGENTS CAPABLE OF DEVELOPING MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI IN 3 DAYS AND 7,000 PSI IN 28 DAYS.

STRUCTURAL STEEL:

- FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION.
- STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE NOTED.
- STEEL WIDE FLANGE SECTIONS SHALL CONFORM TO ASTM A992.
- 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 PREQUALIFIED FOR WELDING PROCEDURES TO BE USED.
- WELDING ELECTRODES SHALL BE E70XX.
- ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION ACCORDING TO ASTM A123.
- ANY DAMAGED GALVANIZED SURFACE SHALL BE REPAIRED AS FOLLOWS:
 - PREPARE SURFACE PER SSPC-SP1, SOLVENT CLEANING.
 - APPLY TWO COATS OF COLD APPLIED GALVANIZING COMPOUND CONTAINING 95% METALLIC ZINC CONTENT BY WEIGHT IN DRY FILM AND 52% SOLIDS CONTENT BY VOLUME.
 - APPLICATION RATE SHALL BE 1.5 MILS DRY FILM THICKNESS PER COAT.

CONCRETE REPAIR:

- PUBLIC HEALTH AND CONVENIENCE:
 - THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF THE PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.
 - THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT SITE AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE STATE MAY REQUIRE SUPPLEMENTARY MEASURES AS NECESSARY.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE JOB IN A NEAT AND SAFE CONDITION. ALL WORK SHALL BE PERFORMED WITHIN THE LIMITS OF WORK AREAS AND SHALL BE COORDINATED WITH THE CONTRACTING OFFICER. DELIVERY OF MATERIALS SHALL BE COORDINATED TO MINIMIZE DISRUPTION OF EXISTING OPERATION. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL OF NOISE, DEBRIS AND AIRBORNE DUST, AND TO PREVENT DISRUPTION OF EXISTING OPERATIONS. CONTRACTOR TO PROVIDE BARRIERS TO PREVENT PUBLIC ENTRY, AND TO PROTECT THE WORK AND EXISTING FACILITIES FROM CONSTRUCTION OPERATIONS. REMOVE WHEN NO LONGER REQUIRED, OR AT THE COMPLETION OF WORK.

B. BONDING AGENT AND REINFORCING ANTI-CORROSION COATING:

- BONDING AGENT AND REINFORCING ANTI-CORROSION COATING SHALL BE EPOXY-MODIFIED, CEMENTITIOUS MATERIAL THAT SERVES BOTH AS A BONDING AGENT FOR THE REPAIR MORTAR AND AN ANTI-CORROSION COATING FOR REINFORCING.
- THE REINFORCING STEEL SHALL RECEIVE TWO (2) COATS AT 20 MILS EACH, TOTAL OF 40 MILS. THE CONCRETE SURFACE SHALL RECEIVE ONE (1) COAT AT 20 MILS.
- FOLLOW MANUFACTURER'S SPECIFICATIONS FOR RECOMMENDED TIME BETWEEN APPLICATION OF BONDING AGENT AND PATCHING MORTAR.
- THE MINIMUM BOND STRENGTH PROVIDED BY THE BONDING AGENT SHALL BE 2,400 PSI AFTER 14 DAYS (ASTM C882).

C. REPAIR MORTAR:

- REPAIR MORTAR SHALL BE POLYMER-MODIFIED CEMENT MORTAR, HAVE A HIGH ABRASION RESISTANCE AND SHALL BE SUITABLE FOR HORIZONTAL, VERTICAL AND OVERHEAD SURFACES.
 - THE MINIMUM BOND STRENGTH PROVIDED BY THE PATCHING MORTAR SHALL BE 2,200 PSI AFTER 28 DAYS (ASTM C882).
 - REFER TO MANUFACTURER'S SPECIFICATIONS FOR PREPARATION AND APPLICATION GUIDANCE.
 - REPAIR MORTAR AND BONDING AGENT/REINFORCEMENT PROTECTIONS SHALL BE SUPPLIED BY THE SAME MANUFACTURER AND SHALL BE FULLY COMPATIBLE WITH EACH OTHER.
- D. LOCATIONS AND QUANTITIES OF CONCRETE DEFICIENCIES ARE SHOWN TO PROVIDE A ROUGH ESTIMATE OF THE EXTENT AND TYPE OF REPAIR THAT EXISTS. THE CONTRACTOR SHALL DO A VISUAL INSPECTION AND SOUNDING OF ALL CONCRETE SURFACES AND NOTIFY THE CONTRACTING OFFICER OF ANY ADDITIONAL DEFICIENCIES, SUCH AS CRACKS AND SPALLS, NOT SHOWN. SUCH DEFICIENCIES SHALL BE REPAIRED AS APPROVED BY THE CONTRACTING OFFICER.
- E. THE CONTRACTOR SHALL RESTORE TO THEIR ORIGINAL CONDITION OR BETTER ALL IMPROVEMENTS DAMAGED AS A RESULT OF THE REPAIR WORK.

SEALANT:

- SEALANT SHALL BE A POLYURATHANE BASED SEALANT, AND SHALL CONFORM TO ASTM C-920, TYPE S, CLASS 25.
- PRIOR TO APPLICATION, THE SURFACE SHALL BE THOROUGHLY CLEANED, DRY AND SOUND, AND FREE OF DUST, GREASE, AND OTHER BOND INHIBITING PARTICLES.
- APPLICATION SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.

TABLE OF MINIMUM SPLICE AND EMBEDMENT LENGTHS

BAR SIZE	CONCRETE STRENGTH = 4,000 PSI				
	LAP SPlice		EMBEDMENT		
	BOT BAR OR WALL BAR	TOP BAR	BOT BAR OR WALL BAR	TOP BAR	WITH STANDARD 90° HOOK
#4	37"	42"	29"	33"	8"
#5	47"	53"	36"	41"	10"
#6	56"	63"	43"	49"	12"
#7	81"	92"	63"	71"	14"

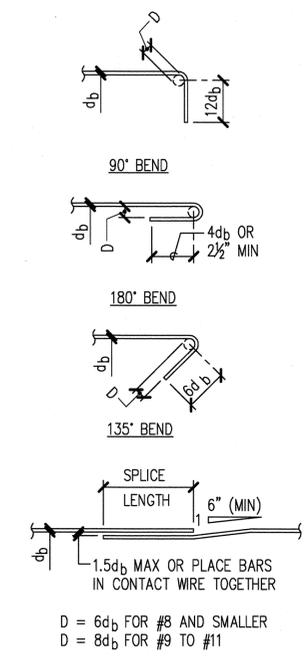
NOTES:

- LENGTHS ARE FOR CONCRETE WITH EPOXY COATED REBARS WITH CLEAR COVER LESS THAN 3 BAR DIAMETERS OR CLEAR SPACING LESS THAN 6 BAR DIAMETERS.
- "TOP BARS" ARE HORIZONTAL BARS WITH 12" OR MORE OF CONCRETE CAST BELOW.
- EMBEDMENT LENGTHS FOR BARS WITH 90° HOOK ARE BARS WITH SIDE COVER, NORMAL TO PLANE OF HOOK, OF NOT LESS THAN 2 1/2" AND COVER ON BAR EXTENSION BEYOND HOOK NOT LESS THAN 2". INCREASE EMBEDMENT LENGTH BY 43% FOR BARS NOT MEETING THESE REQUIREMENTS.

TYPICAL REBAR SPLICE AND DEVELOPMENT LENGTH SCHEDULE

1
S-0.1 NOT TO SCALE

ABBREVIATIONS			
BOT	BOTTOM	GALV	GALVANIZED
BTWN	BETWEEN	HORIZ	HORIZONTAL
CL	CENTERLINE	HSB	HIGH STRENGTH BOLT
CJ	CONSTRUCTION JOINT	I.D.	INSIDE DIAMETER
CLR	CLEAR	MAX	MAXIMUM
CONC	CONCRETE	MECH	MECHANICAL
CONT	CONTINUOUS	MIN	MINIMUM
DBL	DOUBLE	MISC	MISCELLANEOUS
DIA	DIAMETER	NO. OR #	NUMBER
DWG	DRAWING	N.T.S.	NOT TO SCALE
EA	EACH	O.C.	ON CENTER
E.F.	EACH FACE	O.D.	OUTSIDE DIAMETER
ELEV	ELEVATION	OPNG	OPENING
EQ	EQUAL	OPP	OPPOSITE
E.W.	EACH WAY	PL OR P	PLATE
EXIST OR (E)	EXISTING	PREFAB	PREFABRICATED
EXT	EXTERIOR	REF	REFERENCE
FIN	FINISH	REINF	REINFORCED OR REINFORCING
FT	FOOT OR FEET	SP	SPACES OR SPACING
FTG	FOOTING	SS	STAINLESS STEEL



REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
REPAIRS TO THE PILLBOXES ON LANIKAI TRAIL, OAHU, HAWAII					
CONSTRUCTION/STRUCTURAL NOTES					
DESIGNED: MH			SUBMITTED:		
DRAWN: CADD			DATE: MAY 2016		
CHECKED: MH			SCALE: AS NOTED		
APPROVED:			DRAWING NO. S-0.1		
EXPIRATION DATE OF THE LICENSE 4/30/2018 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION			MAY 18 2016 DATE		



MID PACIFIC COUNTRY CLUB

POTENTIAL STOCK PILING AREA (80'x12'). CONTRACTOR TO OBTAIN PERMISSION FROM OWNER PRIOR TO USE.

AALAPAPA DR

MOKUMANU DR

LANIKAI PARK

KAOLENA DR

LANIKAI BEACH

HAKOEA DR

KAWAIUMA DR

KALEPULU DR

START OF LANIKAI PILLBOXES TRAIL

KA IWA RIDGE

POTENTIAL STOCK PILING AREA (60'x10')

AALAPAPA DR

ONCKEA DR

KOHOO PL

STATION 29A (APPROX 460' ABOVE SEA LEVEL)

POTENTIAL STOCK PILING AREA (18'x12')

POTENTIAL STOCK PILING AREA (22'x12')

STATION 29B (APPROX 550' ABOVE SEA LEVEL)
STATION 29C

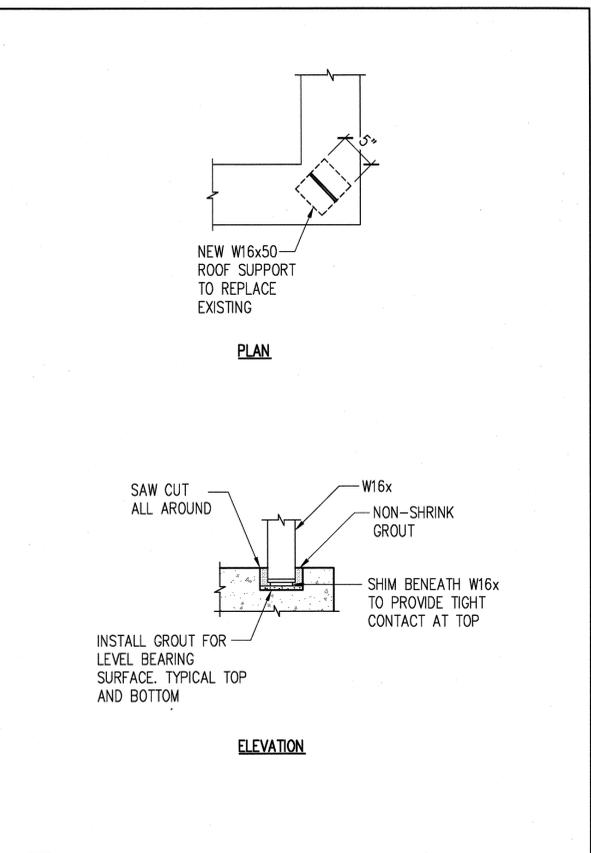
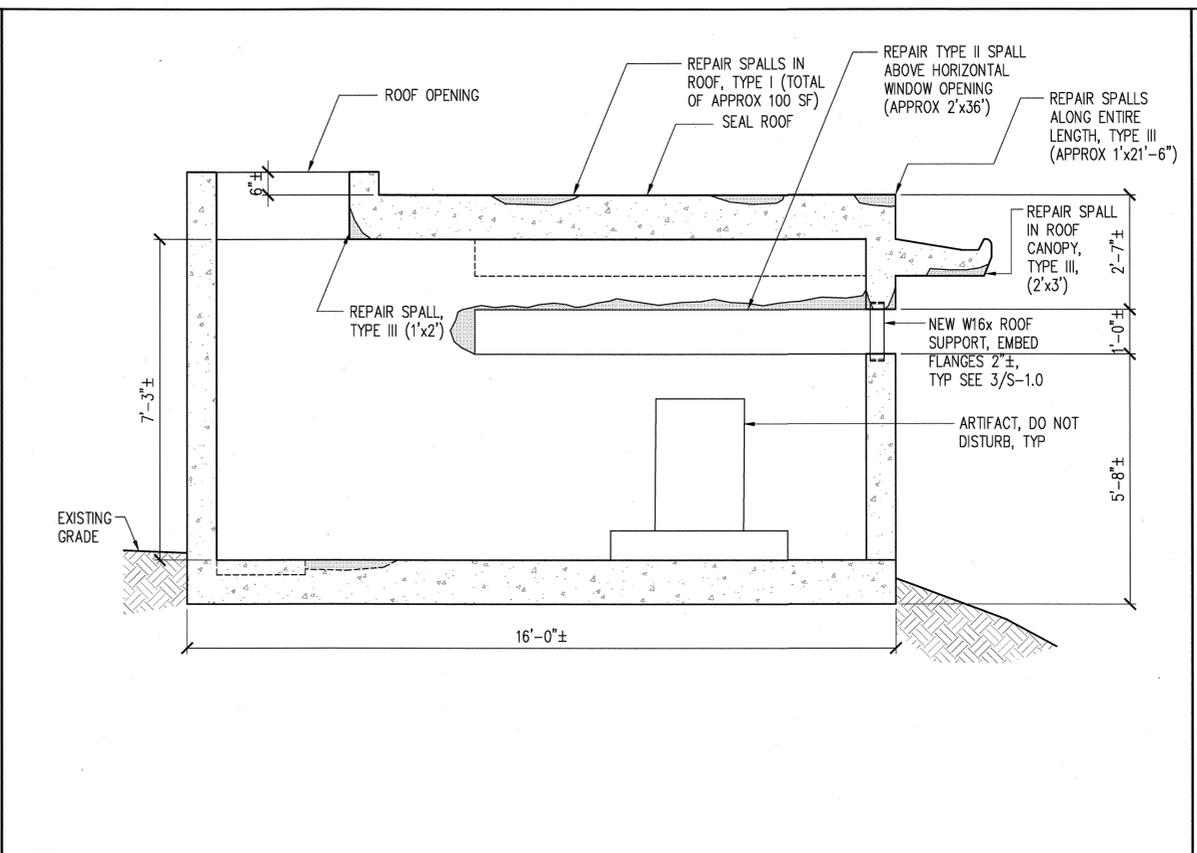
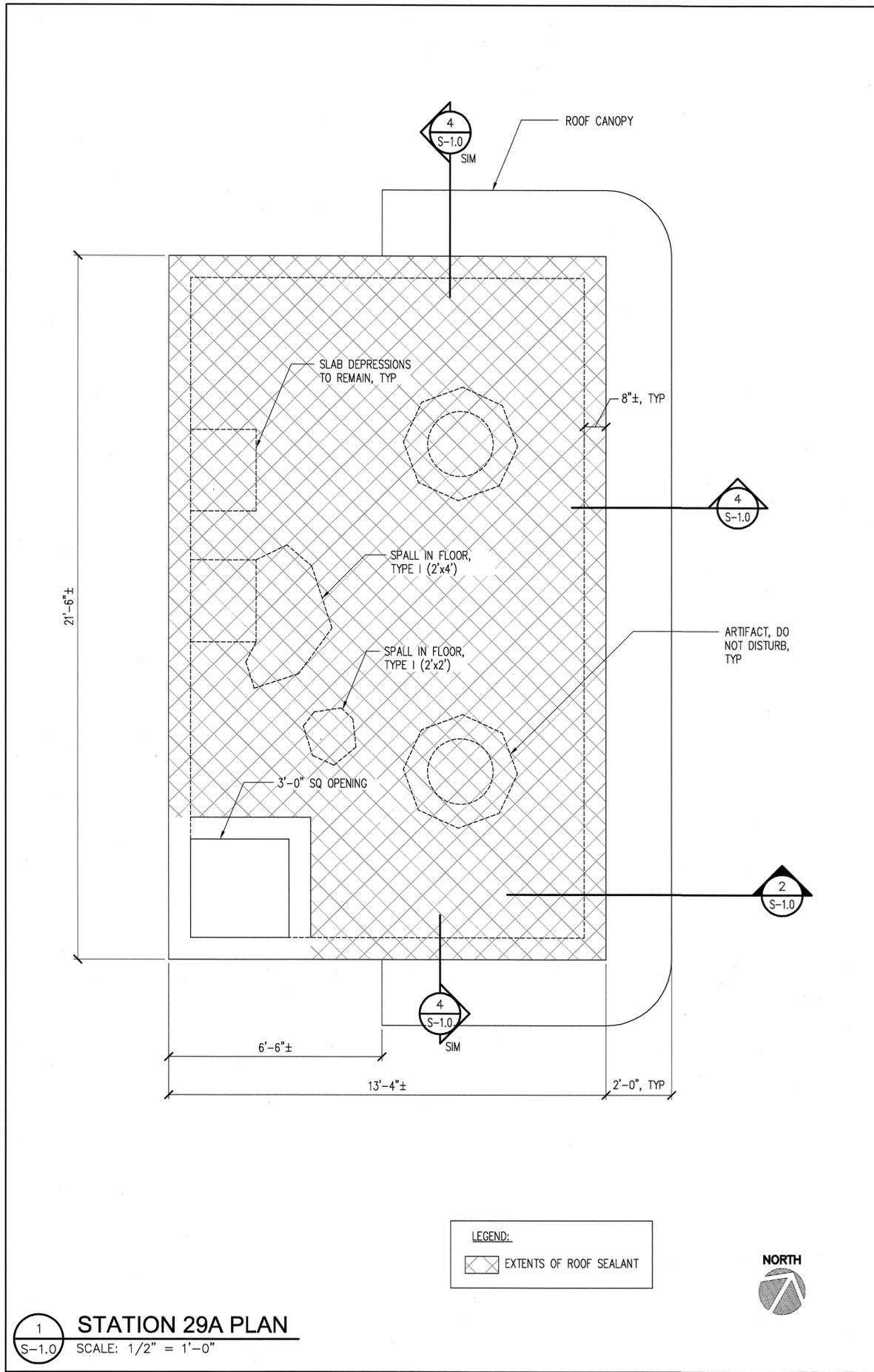
POTENTIAL STOCK PILING AREA (20'x10')

NOTE:

THE TRAIL MAY BE CLOSED FOR A MAXIMUM OF 60 CALENDAR DAYS.

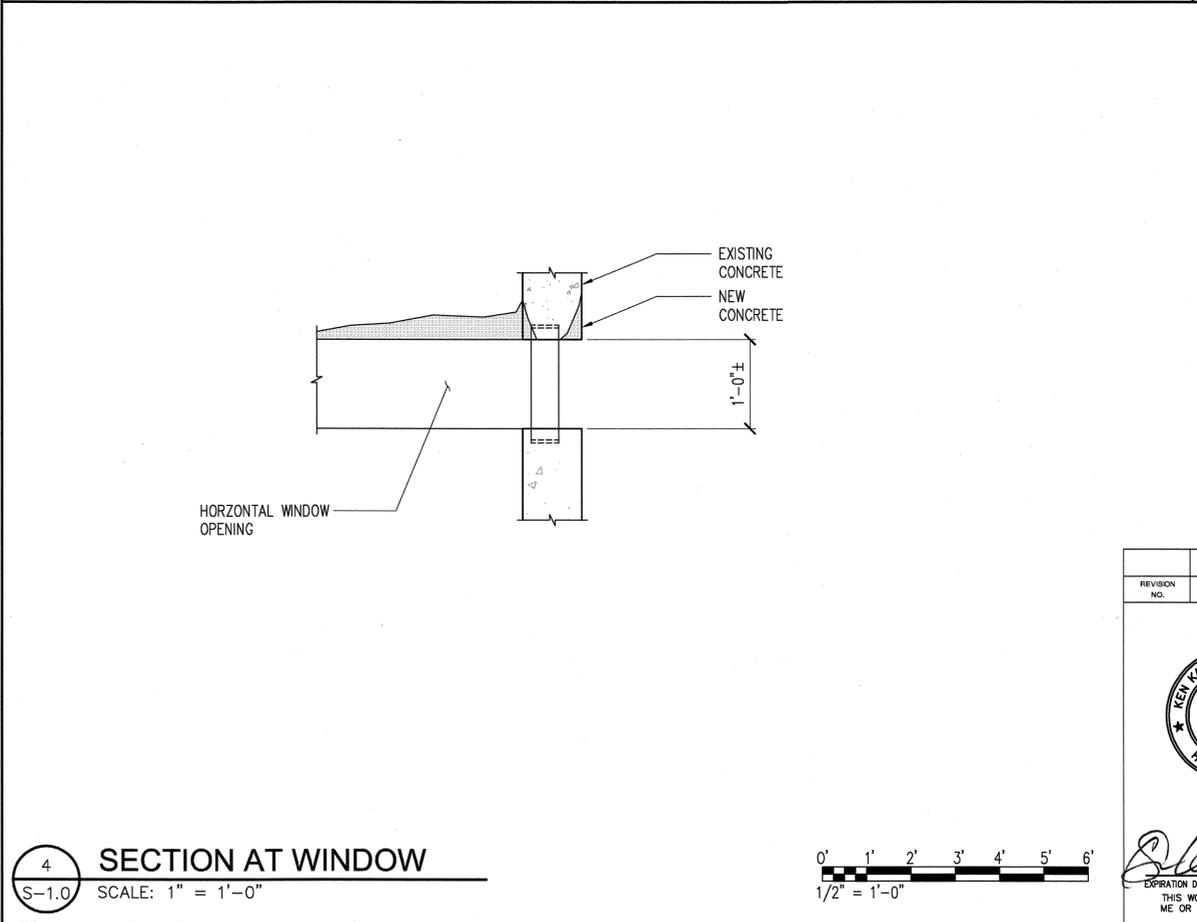
1 SITE PLAN
S-0.2 NOT TO SCALE

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REPAIRS TO THE PILLBOXES ON LANIKAI TRAIL, OAHU, HAWAII					
SITE PLAN					
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APPROVED:			DRAWING NO.		
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JOB NO. D01CO99A			SHEET NO. 3 OF 6 SHEETS		

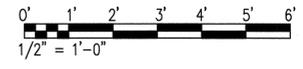


2 STATION 29A SECTION
S-1.0 SCALE: 1/2" = 1'-0"

3 ROOF SUPPORT DETAIL
S-1.0 SCALE: 1" = 1'-0"

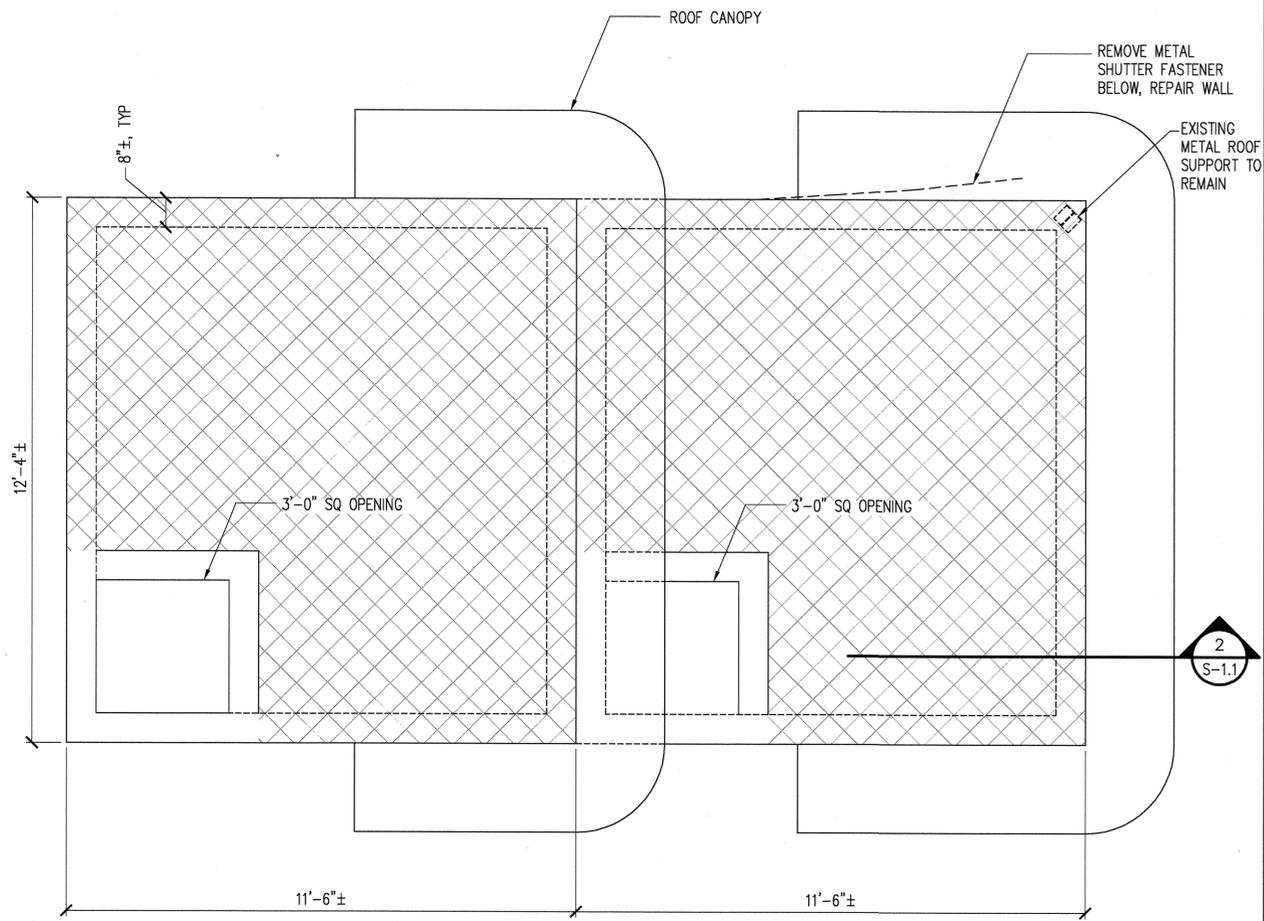


4 SECTION AT WINDOW
S-1.0 SCALE: 1" = 1'-0"



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REPAIRS TO THE PILLBOXES ON LANIKAI TRAIL, OAHU, HAWAII					
STATION 29A PLAN AND SECTION					
DESIGNED:	MH	SUBMITTED:			
DRAWN:	CADD	DATE:	MAY 2016		
CHECKED:	MH	SCALE:	AS NOTED		
APPROVED:	<i>[Signature]</i>	DATE:	MAY 18 2016		
EXPIRATION DATE OF THE LICENSE 4/30/2018		THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION		DRAWING NO. S-1.0	



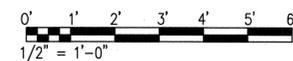
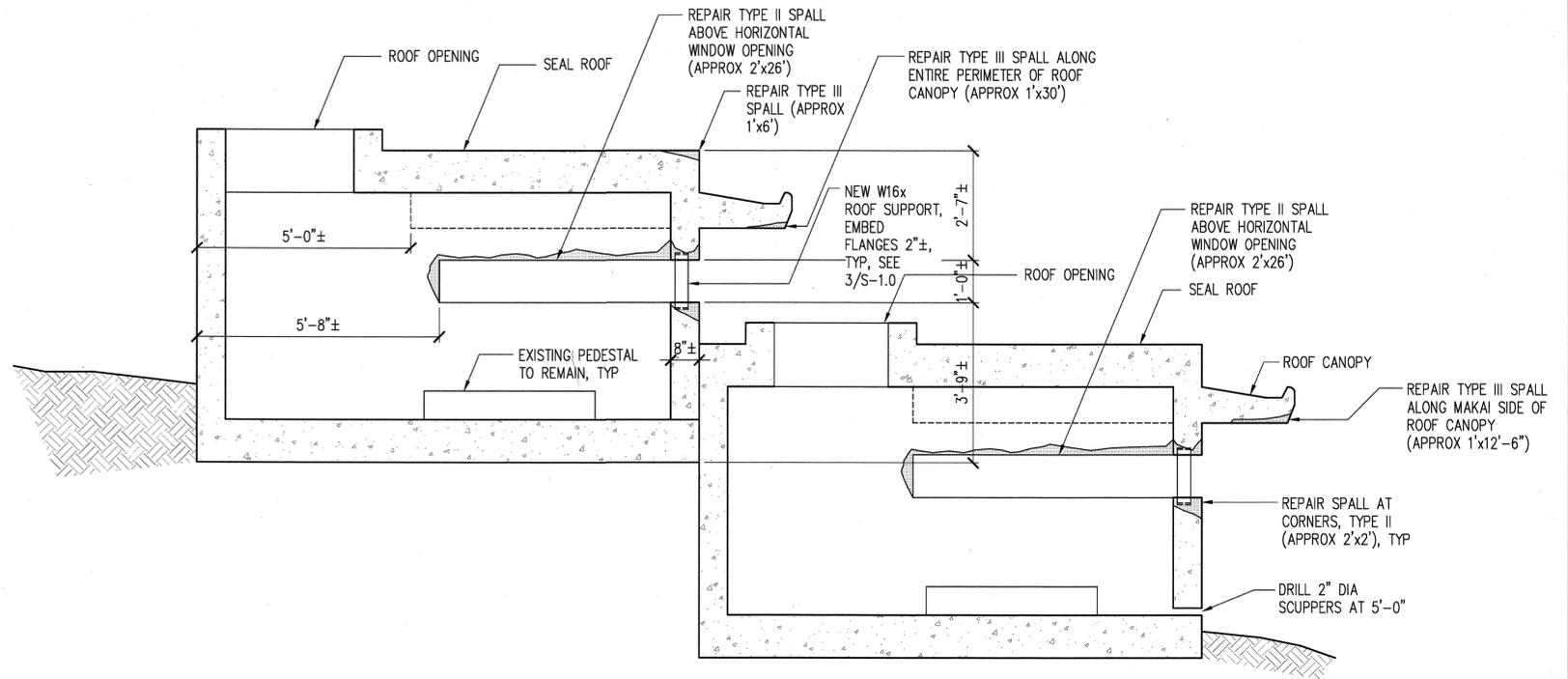


1 STATIONS 29B AND 29C PLAN
S-1.1 SCALE: 1/2" = 1'-0"

LEGEND:
 EXTENTS OF ROOF SEALANT



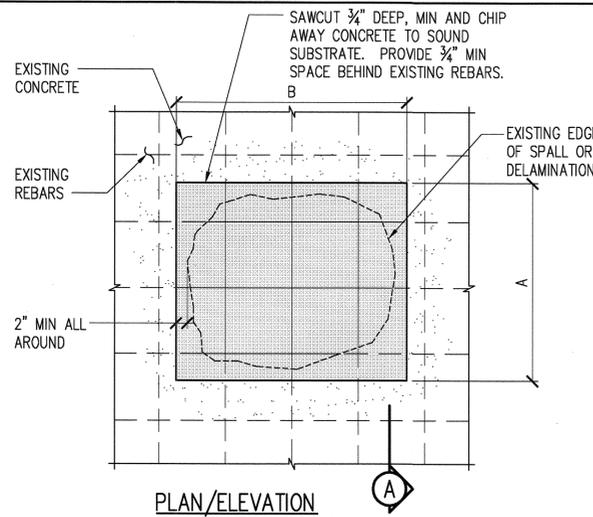
2 STATIONS 29B AND 29C SECTION
S-1.1 SCALE: 1/2" = 1'-0"



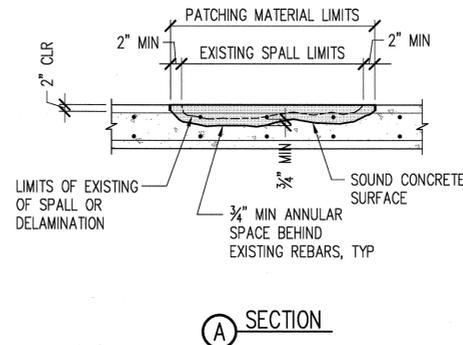
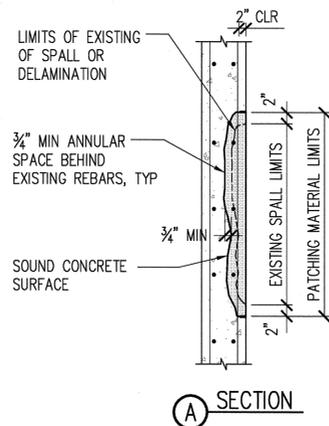
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STATIONS 29B AND 29C PLAN AND SECTION					
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<small>EXPIRATION DATE OF THE LICENSE 4/30/2018 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION</small>					

REPAIR NOTES:

1. SAWCUT 3/4" DEEP ALONG DETERIORATED CONCRETE. DO NOT CUT EXISTING REBAR.
2. REMOVE ALL UNSOUND AND LOOSE CONCRETE. REMOVE CONCRETE FROM AROUND REBAR. CREATE MINIMUM 3/4" ANNULAR SPACE AROUND REBAR.
3. INSPECT THE CONDITION OF THE NEWLY EXPOSED REBARS AFTER CONCRETE REMOVED. WHEN CORROSION HAS CAUSED SIGNIFICANT SECTION LOSS OF THE REBARS, THE CONTRACTOR SHALL SPlice A NEW SECTION OF REBAR INTO PLACE AS SHOWN IN DETAIL 3/S-2.0.
4. EXISTING REBAR TO REMAIN. REMOVE ALL CONCRETE, DUST AND OTHER BOND-INHIBITING MATERIALS FROM REBAR AND CONCRETE SURFACES.
5. COAT REBAR WITH CORROSION INHIBITOR.
6. APPLY BONDING AGENT
7. ADD POLYMER MODIFIED CONCRETE. EXPOSED AGGREGATE CONCRETE TO MATCH ARCHITECTURAL PATTERN OF EXISTING WALL SURFACE.



1 SPALL REPAIR DETAIL, TYPE I
S-2.0 NOT TO SCALE

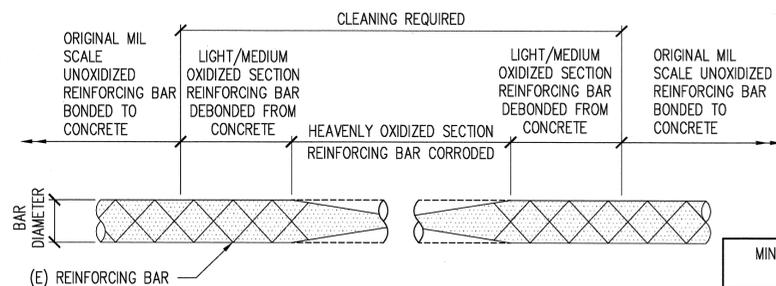


NOTES:

1. SEE SHEET S-1 FOR SURFACE PREPARATION FOR SPALL REPAIR.
2. HEAVILY CORRODED REBARS SHALL BE REPAIRED PER DETAIL 2/S-2.0.
3. AREA OF REPAIR MIGHT BE COMBINATION OF RECTANGULAR SHAPES.

QUANTITY CALCULATION:

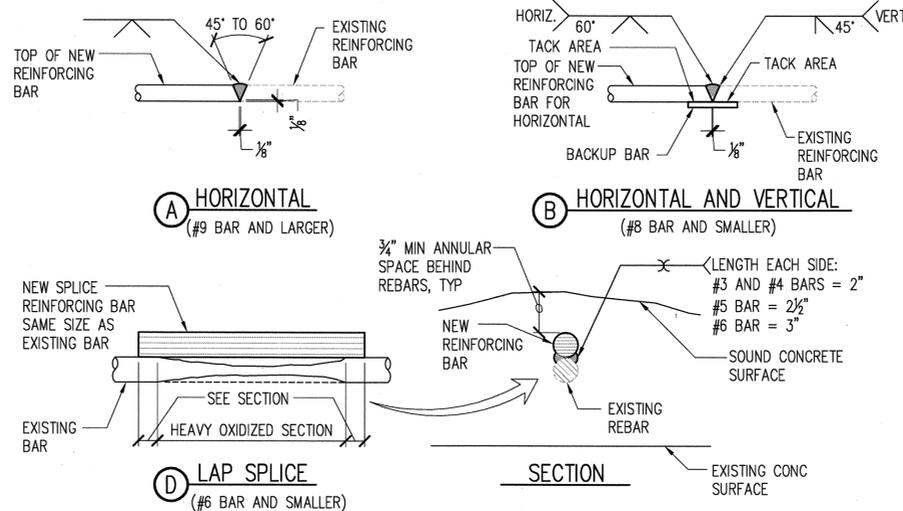
QTY = A x B (S.F.)



- NOTES:**
1. ALL HEAVY OXIDES, CORROSION, SCALE AND BOND INHIBITING AGENTS SHALL BE REMOVED FROM REINFORCING BAR BY MECHANICAL MEANS. ABRASIVE BLAST SHALL BE FREE OF OIL. TIGHTLY BONDED LIGHT OXIDE BUILD-UP ON THE SURFACE MAY RESULT AFTER BLAST CLEANING. THIS IS ACCEPTABLE UNLESS COATING MANUFACTURER REQUIRES CLEANER REINFORCING BAR SURFACE.
 2. CHECK REMAINING SECTION IN ACCORDANCE WITH CHART, WHEN DIAMETER IS LESS THAN MINIMUM, SPLICE AS REQUIRED, SEE

MINIMUM ALLOWABLE BAR DIAMETER CHART	
BAR SIZE	MIN DIAMETER
#4	3/8"
#5	1/2"
#6	5/8"
#7	1 1/16"
#8	1 3/16"
#9	7/8"

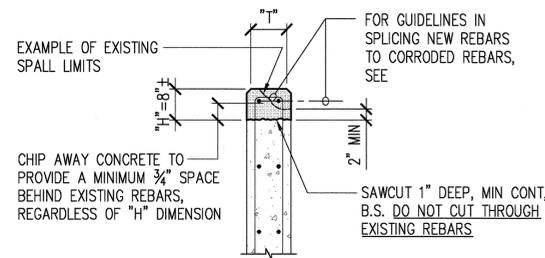
2 TYPICAL REINFORCING BAR REPAIR CRITERIA
S-2.0 NOT TO SCALE



NOTES:

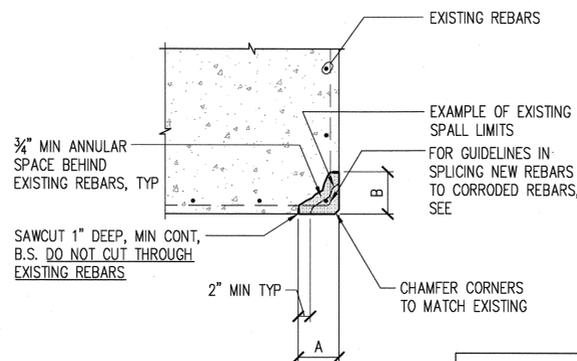
1. CHIP, GRIND, OR GOUGE TO SOUND METAL BEFORE WELDING.
2. IF MATERIAL TEST REPORTS OR CHEMICAL COMPOSITION DATA IS UNAVAILABLE FOR THE EXISTING REBAR, THE MINIMUM PREHEAT AND INTERPASS TEMPERATURE REQUIREMENTS SHALL BE AS FOLLOWS:
 - a. UP TO #6 BARS INCLUSIVE.....500F [260°C]
 - b. #7 BARS AND LARGER.....300F [150°C]
3. IF MATERIAL TEST REPORTS OR CHEMICAL COMPOSITION DATA IS AVAILABLE, REFER TO AWS D1.4 FOR MINIMUM PREHEAT AND INTERPASS TEMPERATURE REQUIREMENTS.
4. PREHEAT THE EXISTING REINFORCING BARS SUCH THAT THE CROSS-SECTION OF THE BAR IS AT OR ABOVE THE MINIMUM PREHEAT TEMPERATURE FOR AT LEAST SIX INCHES ON EACH SIDE OF THE JOINT TO BE WELDED.
5. USE E70 ELECTRODES FOR STIRRUPS, E90 ELECTRODES FOR ALL OTHERS.
6. NEW REINFORCING BARS SHALL CONFORM TO ASTM A706.

3 TYPICAL REINFORCING BAR WELDED SPLICE DETAIL
S-2.0 NOT TO SCALE



QUANTITY CALCULATION:
QTY = (2H+T) x LENGTH (S.F.)

4 TYPE II SPALL REPAIR
S-2.0 NOT TO SCALE



QUANTITY CALCULATION:
QTY = (A+B) x LENGTH (S.F.)

5 TYPE III SPALL REPAIR
S-2.0 NOT TO SCALE

REVISION NO.	SYMBOL	DESCRIPTION	SHEET OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION REPAIRS TO THE PILLBOXES ON LANIKAI TRAIL, OAHU, HAWAII SECTIONS AND DETAILS					
DESIGNED: MH		SUBMITTED:			
DRAWN: CADD		DATE: MAY 2016			
CHECKED: MH		SCALE: AS NOTED			
APPROVED: <i>[Signature]</i>		DATE: MAY 18 2016		DRAWING NO. S-2.0	
EXPIRATION DATE OF THE LICENSE: 4/30/2018		THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION		CHIEF ENGINEER	