

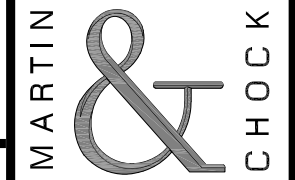
NOTE: THESE NOTES AND DETAILS ARE A GENERAL RECOMMENDATION ONLY. A LICENSED STRUCTURAL ENGINEER SHALL VERIFY ALL EXISTING CONDITIONS TO DETERMINE THEIR APPLICABILITY.

CONCRETE REPAIR NOTES:

- EXCAVATE ALL LOOSE FRACTURED CONCRETE AROUND SPALL. IN GENERAL, EXTEND LIMITS OF EXCAVATION UNTIL SOUND CONCRETE IS ENCOUNTERED OR AS SHOWN ON THE DRAWINGS. LIMIT CHIPPING GUN TO 15 LB.
- CLEAN ALL EXISTING REBAR OF ALL LOOSE RUST BY SANDBLAST OR NEEDLE GUN.
- ROUGHEN SURFACE TO 1/4" AMPLITUDE AT ALL INTERFACE CONTACT WITH EXISTING CONCRETE SUBSTRATE. PROVIDE UNDERCUT AT PERIMETER OF CONCRETE PATCH AS SHOWN ON DETAILS.
- CLEAN ALL EXCAVATED CONCRETE SURFACES OF DEBRIS, DUST, GREASE, OIL, ETC.
- IN GENERAL, THE FOLLOWING APPLIES TO REPLACEMENT/SUPPLEMENT OF CORRODED REBAR:
 - IF CROSS-SECTIONAL LOSS OF BAR IS LESS THAN 20% AFTER REMOVING ALL CORROSION PRODUCT, THE BAR DOES NOT REQUIRE REPLACEMENT/SUPPLEMENT.
 - IF CROSS-SECTIONAL LOSS OF BAR IS GREATER THAN 20% AFTER REMOVING ALL CORROSION PRODUCT, REPLACE OR SUPPLEMENT WITH SPLICED BARS PER DETAIL 1 THIS SHEET.
- ALL REPLACEMENT REINFORCING STEEL SHALL CONFORM TO ASTM A706 GRADE 60 UNLESS OTHERWISE NOTED.
- WHERE REINFORCING STEEL IS TO BE ADDED, IT SHALL BE LAP SPLICED FOR A LENGTH OF 48 BAR DIAMETERS. IN LIEU OF LAPPED REBAR, NEW REINFORCING MAY BE WELDED TO EXISTING REINFORCING PER DETAIL 1F THIS SHEET.
- PRIOR TO PLACEMENT OF PATCH MATERIAL, THE EXPOSED CONCRETE SHALL BE SATURATED SURFACE DRY WITH NO WATER ACCUMULATION.
- REPAIR MATERIALS SHALL BE APPLIED TO FILL VOIDS. FOR PATCH DEPTHS IN EXCESS OF ONE INCH, CONCRETE PATCH SHALL CONTAIN 3/8" PEA GRAVEL AGGREGATE.
- FOR DEEP OVERHEAD AND VERTICAL PATCHES, CEMENTITIOUS MATERIAL (PER ITEM "B" IN THE TABLE OF ACCEPTABLE CONCRETE REPAIR PRODUCTS) MAY BE USED IF APPLIED IN LIFTS. THICKNESS OF LIFTS AND TOTAL THICKNESS OF PATCH SHALL NOT EXCEED THE MAXIMUM THICKNESS RECOMMENDED BY THE MANUFACTURER. A CLEAN, ROUGHENED SURFACE SHALL BE MAINTAINED WITH AN APPROPRIATE SETTING TIME, PER MANUFACTURER'S INSTRUCTIONS, FOR PLACEMENT BETWEEN LIFTS. ALTERNATIVELY, THE PATCH SHALL BE FORMED AND CONCRETE PER ITEMS "C" AND "D" ON THE TABLE OF ACCEPTABLE CONCRETE REPAIR PRODUCTS SHALL BE USED. WHEN FORMED, THE CONCRETE SHALL BE EXTERNALLY AND/OR INTERNALLY VIBRATED AS IT IS PLACED IN THE FORMS TO ACHIEVE THE PROPER CONSOLIDATION TO FILL ALL CORNERS OF THE FORMS; ALLOWING SUFFICIENT SPACE AT THE TOP OF THE FORMED AREA TO PROPERLY PLACE AND CONSOLIDATE THE CONCRETE.
- FOLLOWING THE INITIAL SET OF THE CONCRETE AT FORMED AREAS, THE SPACE AT THE TOP OF THE PATCH AREA SHALL BE FILLED WITH PATCHING MORTAR.
- THE SURFACE FINISH SHALL MATCH ADJACENT CONDITIONS.
- FORMS SHALL BE REMOVED AFTER FIVE DAYS OF CURING. PATCHES SHALL BE INSPECTED FOR IMPROPER CONSOLIDATION OR CRACKING AROUND THE PERIMETER OR IN THE PATCH. IF THESE CONDITIONS EXIST, NOTIFY THE CONTRACTING OFFICER FOR POSSIBLE REMEDIAL ACTION.
- MINIMUM CONCRETE COVER TO REINFORCING STEEL FOR "PATCHES," REPAIRS, ETC., SHALL BE AT LEAST 2" FOR CONCRETE EXPOSED TO WEATHER AND 1 1/2" FOR CONCRETE NOT EXPOSED TO WEATHER.
- CONCRETE REPAIR AREAS SHALL BE ALLOWED TO CURE A MINIMUM OF 14 DAYS PRIOR TO SURFACE PRIMING AND PAINTING.

ACCEPTABLE CONCRETE REPAIR PRODUCTS

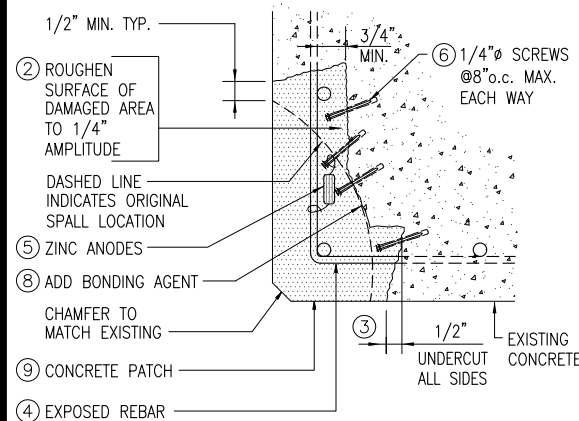
PRODUCT DESCRIPTION	ACCEPTABLE ALTERNATIVE PRODUCTS
A. MATERIAL FOR MINOR PATCH REPAIRS	• SEE PROJECT SPECIFICATIONS
B. MATERIAL FOR INTERMEDIATE PATCH REPAIRS	• SEE PROJECT SPECIFICATIONS
C. STEEL ANCHORS	<ul style="list-style-type: none"> • 1/4" ZINC PLATED HILTI KWIK-CON II HEX HEAD SCREWS IN 1/4" DEEP HOLE DRILLED WITH MATCHING DRILL BIT • 1/4" CLIMASEAL REDHEAD TAPCON IN 1/4" DEEP HOLE DRILLED WITH MATCHING DRILL BIT • 1/4" SIMPSON TITEN HD MINI IN 1/4" DEEP HOLE DRILLED WITH MATCHING DRILL BIT
D. BONDING AGENT (REFER TO PATCH MATERIAL PRODUCT SPECS FOR COMPATIBILITY)	<ul style="list-style-type: none"> • SIKA ARMATEC 110 • THORO ACRYL 60 • QUIKCRETE BONDING ADHESIVE
E. EPOXY TO SET ANY DOWELS	<ul style="list-style-type: none"> • HILTI HIT-RE 500-SD EPOXY ADHESIVE (INTERIOR APPLICATIONS ONLY) • HILTI HIT-HY 150 ACRYLIC ADHESIVE • RED HEAD EPON C6 EPOXY ADHESIVE (INTERIOR APPLICATIONS ONLY) • RED HEAD EPON A7 ACRYLIC ADHESIVE • SIMPSON SET-XP EPOXY-TIE ADHESIVE (INTERIOR APPLICATIONS ONLY) • SIMPSON AT ACRYLIC-TIE ADHESIVE



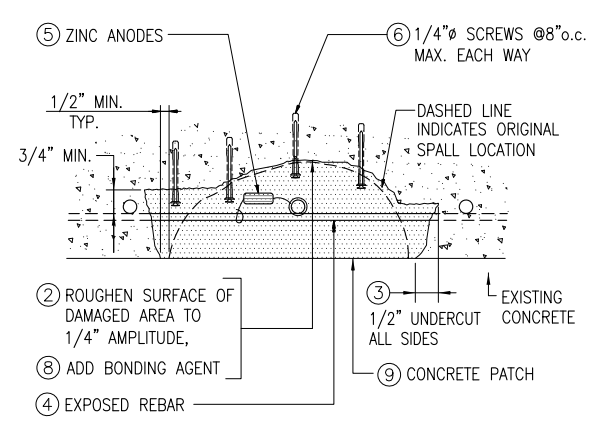
MARTIN & CHOCK, INC.
CONSULTING STRUCTURAL ENGINEERS
1132 Bishop Street Suite 1550 Honolulu, Hawaii 96813
phone: (808) 521-4513 fax: (808) 531-4508
www.martinchock.com

U.S. DEPARTMENT OF THE INTERIOR
 OFFICE OF INSULAR AFFAIRS
INSULAR ABCs PHASE III
UNITED STATE VIRGIN ISLANDS

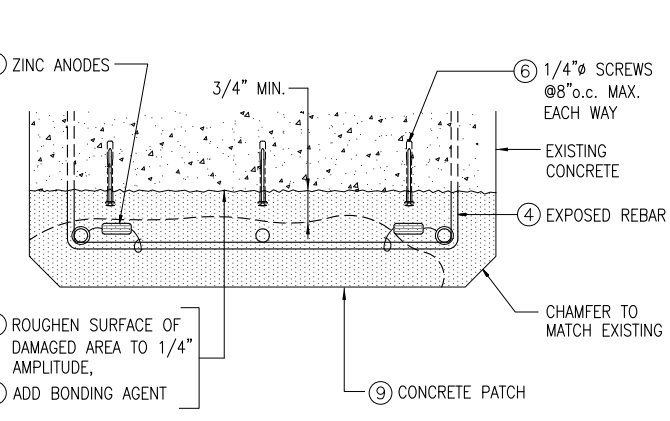
INVITATION FOR BID- Attachment #4



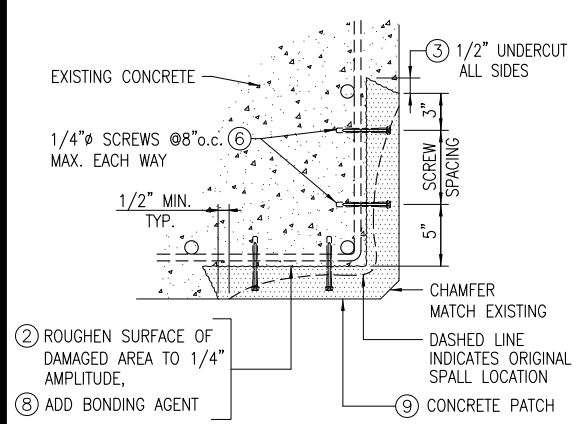
1A INTERMEDIATE PATCH REPAIR
CORNER SPALL
MIN. PATCH DEPTH = 1 1/2"
MAX. PATCH DEPTH = AS REQUIRED



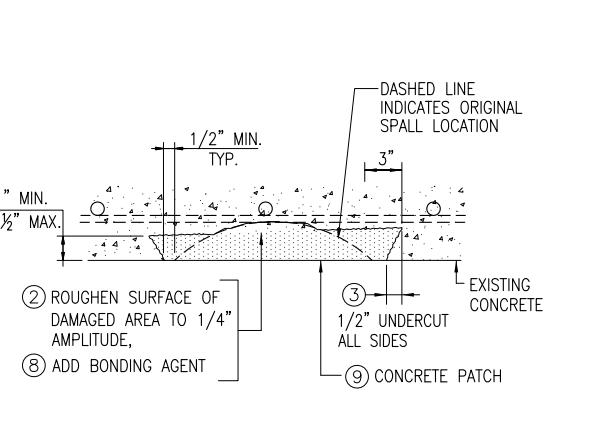
1B INTERMEDIATE PATCH REPAIR
VERTICAL OR HORIZONTAL SPALL
MIN. PATCH DEPTH = 1 1/2"
MAX. PATCH DEPTH = AS REQUIRED



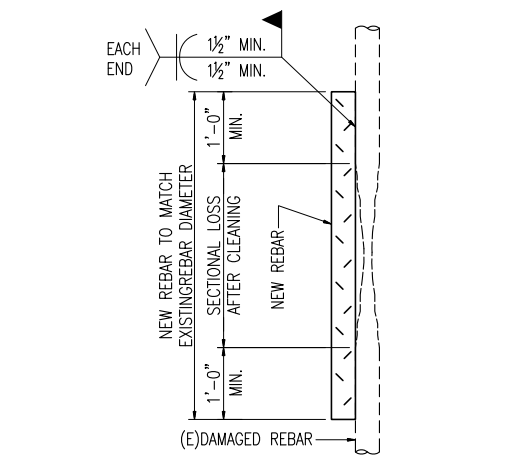
1C INTERMEDIATE PATCH REPAIR
SPALL FULL WIDTH OF MEMBER
MIN. PATCH DEPTH = 1 1/2"
MAX. PATCH DEPTH = AS REQUIRED



1D MINOR PATCH REPAIR
CORNER SPALL
MIN. PATCH DEPTH = 1"
MAX. PATCH DEPTH = 1 1/2"
MAX. EXPOSED REBAR LENGTH = 4"



1E MINOR PATCH REPAIR
VERTICAL OR HORIZONTAL SPALL
MIN. PATCH DEPTH = 1"
MAX. PATCH DEPTH = 1 1/2"
MAX. EXPOSED REBAR LENGTH = 4"



1F REINFORCING REPLACEMENT

REPAIR PROCEDURE

- CHIP OUT ALL LOOSE AND FRACTURED CONCRETE AROUND SPALL. EXTEND LIMITS OF EXCAVATION UNTIL SOUND CONCRETE IS ENCOUNTERED.
- ROUGHEN SURFACE TO 1/4" MINIMUM AMPLITUDE.
- CREATE 1/2" UNDERCUTS CUT AT PERIMETER.
- CLEAN ALL EXPOSED REBAR TO BRIGHT STEEL CONDITION. REPLACE CORRODED BARS WHICH HAVE LOST MORE THAN 20% OF CROSS-SECTION AND/OR AS DIRECTED BY THE ENGINEER (SEE DETAIL 1 THIS SHEET).
- INSTALL SACRIFICIAL ZINC ANODES WHERE REQUIRED (SEE DETAIL 2 THIS SHEET FOR INSTALLATION).
- INSTALL 1/4" SCREWS @8" o.c. MAX. EACH WAY. SEE ITEM "F" ON TABLE OF ACCEPTABLE CONCRETE REPAIR PRODUCTS ON THIS SHEET. PROVIDE 1 1/4" MIN. EMBEDMENT INTO SOUND CONCRETE. PROVIDE 3/4" MIN. CLEAR COVER TO HEAD OF SCREW AFTER PATCH INSTALLATION.
- PROVIDE SHADE ABOVE WORK AREA OF PATCHES IF CONCRETE MEMBER IS EXPOSED TO DIRECT SUNLIGHT DURING CURING.

- APPLY BONDING AGENT TO CONCRETE SURFACE. SEE ITEM "G" ON THE TABLE OF ACCEPTABLE CONCRETE REPAIR PRODUCTS ON THIS SHEET.
- INSTALL PATCH MATERIAL ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. SEE ITEMS "A" THROUGH "D" ON THE TABLE OF ACCEPTABLE CONCRETE REPAIR PRODUCTS ON THIS SHEET.
- FINISH AND CURE AS REQUIRED.

REINFORCING REPLACEMENT NOTES:

- SEE CONCRETE REPAIR NOTES 2, 5, 6, & 7 FOR GENERAL REPLACEMENT/SUPPLEMENT OF (E) REINFORCING.
- WELDING OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH "STRUCTURAL WELDING CODE-REINFORCING STEEL" (AWS D1.4).
- REBAR FOR SPLICE SHALL BE ASTM A706, GRADE 60.
- PREHEAT BARS ACCORDING TO AWS D1.4 STANDARDS.

1 TYPICAL CONCRETE REPAIR DETAIL AT SLABS, BEAMS AND COLUMNS
N.T.S.

DRAWING TITLE
TYPICAL CONCRETE AND MASONRY REPAIRS

NO.	DATE	REVISION

DATE FEB 3, 2017

SHEET

S-1