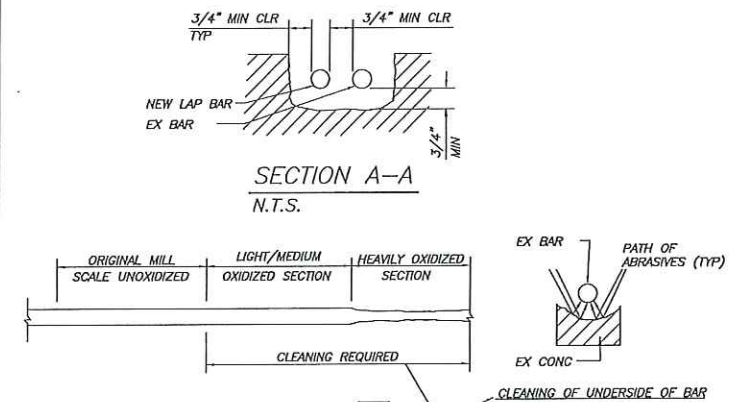


TYPICAL REINFORCEMENT REPAIR
N.T.S.

PREPARATION:
1. SEE TYPICAL CONCRETE REPAIR FOR REMOVAL/REPLACEMENT OF CONCRETE.

INSPECTION:
1. IF REINFORCEMENT HAS LOST MORE THAN 25% OF ITS CROSS SECTIONAL AREA, NOTIFY STRUCTURAL ENGINEER PRIOR TO PROCEEDING WITH PATCH.

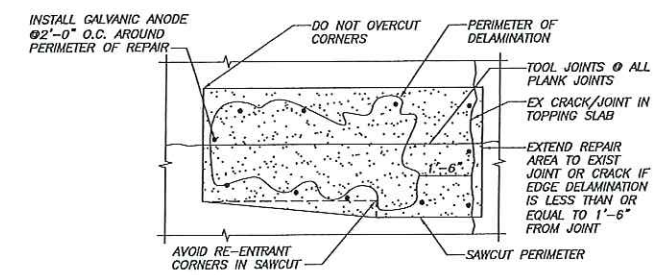
REPAIR:
1. LAP BARS AS NOTED ABOVE.
2. SEE TYPICAL CONCRETE REPAIR.



DETAIL
N.T.S.

REBAR LAP SPLICE TABLE

BAR SIZE	LAP LENGTH
#3	30"
#4	36"
#5	48"
#6	56"
#7	81"



PARTIAL SLAB PLAN
N.T.S.

- NOTES:**
- AREA OF CONCRETE REPAIR.
 - ALL EXISTING REINFORCEMENT SHALL BE SALVAGED.
 - PROVIDE TOOLED JOINTS AROUND PERIMETER OF REPAIR AND AS NOTED IN PLAN.

- REPAIR:**
- INSTALL GALVANIC ANODE
 - ENSURE ALL EXPOSED EXISTING REINFORCEMENT IS TIED W/STEEL TIE WIRES.
 - INSTALL ANODES USING A SUITABLE WIRE TWISTING TOOL TO ELIMINATE FREE MOVEMENT AND ENSURE GOOD ELECTRICAL CONNECTION. ANODE SHALL HAVE 3/4" MINIMUM COVER AND BE PLACED WITHIN 6" OF EDGE OF REPAIR.

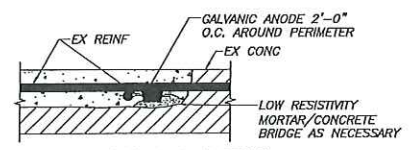
THIS DRAWING IS AN INSTRUMENT OF SERVICE AND SHALL REMAIN THE PROPERTY OF BECKER STRUCTURAL ENGINEERS INC. IT SHALL NOT BE REPRODUCED, COPIED, LENT OR DISPOSED OF DIRECTLY OR INDIRECTLY FOR ANY PURPOSES WITHOUT THE WRITTEN CONSENT OF BECKER STRUCTURAL ENGINEERS INC. ON COMPLETION OF WORK, IF REQUESTED.

CONCRETE REPAIR NOTES
GENERAL:
1. ALL PARTIAL DEPTH SLAB REPAIRS ARE ASSUMED TO BE 2" DEEP UNLESS OTHERWISE NOTED.
2. DUST AND MOISTURE PROTECTION SHALL BE PROVIDED AT AND BELOW THE LEVELS OF REPAIR.

- CONCRETE REMOVAL:**
1. REFERENCE CURRENT VERSIONS OF: ICRI 03750, 03732, ACI 546R-04.
2. AT EACH REPAIR AREA, REMOVE SMALL AREA OF CONCRETE TO CONFIRM DEPTH OF REINFORCEMENT PRIOR TO CUTTING.
3. SAW CUT PERIMETER OF REPAIR AREA TO A DEPTH OF 1/2" MIN. REFERENCE PARTIAL SLAB PLAN THIS SHEET FOR ADDITIONAL INFORMATION. NOTE THAT PERIMETER MAY NEED TO BE EXTENDED.
4. REMOVE ALL DETRIORATED, DELAMINATED AND UNSOUND CONCRETE. CONCRETE SHALL BE REMOVED BY A METHOD THAT LIMITS THE DAMAGE TO SURROUNDING SOUND CONCRETE.
5. MATERIAL REMOVAL SHALL CONTINUE UNTIL AGGREGATE PARTICLES ARE BEING BROKEN RATHER THAN BEING REMOVED FROM THE CEMENT MATRIX.
6. USE OF MECHANICAL IMPACT CHIPPING HAMMERS SHALL BE LIMITED TO 30% WITH A 15% RECOMMENDED. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO AVOID MICRO CRACKING (BRUISING) OF THE CONCRETE DECK.
7. ALL EXISTING REINFORCEMENT SHALL BE SALVAGED.

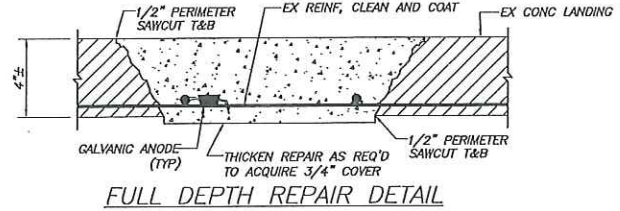
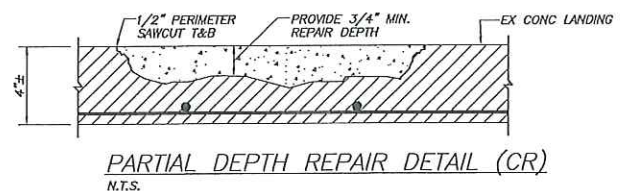
- PREPARATION:**
1. EXISTING REINF SHOULD BE THOROUGHLY PREPARED BY MECHANICAL CLEANING TO REMOVE ALL TRACES OF RUST. THE STEEL SHOULD BE HIGH-PRESSURE WASHED WITH CLEAN WATER AFTER MECHANICAL CLEANING. REMOVE ALL SCALE AND RUST.
2. REMAINING EXISTING REINF SHALL BE PRIMED OR EPOXY COATED WITH A PRODUCT COMPATIBLE WITH THE CONCRETE REPAIR MATERIAL.
3. PRIOR TO PROCEEDING WITH REPAIR, INSPECT ALL CONCRETE SURFACES. INSTALLATION OF REPAIR MATERIAL INDICATES ACCEPTANCE OF ALL SUBSTRATE CONDITIONS.
4. INSTALL GALVANIC ANODE AT LOCATIONS SHOWN ON DRAWINGS. REFERENCE THIS DRAWING.
5. APPLY POLYMER ADHESIVE/BONDING AGENT TO ALL CONCRETE SURFACES OR COAT ALL CONCRETE SURFACES WITH A CEMENT SLURRY PRIOR TO PLACING REPAIR MATERIAL.
6. INSTALL NEW REINFORCEMENT IF REQUIRED AND TIE TO EXISTING. PROVIDE CHAIRS AS REQUIRED TO MAINTAIN PROPER PLACEMENT AND MINIMUM COVER.
7. REPAIR MATERIAL FOR SMALL PLACEMENTS (PLACEMENT LESS THAN 1 YARD) SHALL BE A ONE-COMPONENT, EARLY STRENGTH GAINING, CEMENTITIOUS REPAIR MATERIAL WITH THE FOLLOWING PROPERTIES (REFERENCE SPECIFICATIONS FOR ADDITIONAL INFORMATION):
COMPRESSIVE STRENGTH: 5,000 PSI (MIN)
MINIMUM AGGREGATE SIZE: 3/8"
8. PLACEMENT: ALL CIP REPAIR MATERIAL MUST BE TESTED AS PER THE SPECIFICATIONS.
9. ALL JOINTS SHALL BE HAND TOOLED.

- CONCRETE CURING:**
1. WET CURE FOR MINIMUM OF 3 DAYS (72 HOURS). REFERENCE THE SPECIFICATIONS FOR FURTHER CURING INFORMATION.
2. PROTECT SLAB REPAIRS UNTIL MEMBRANE IS INSTALLED.
3. FOLLOW TRAFFIC MEMBRANE REQUIREMENTS FOR PREPARATION AND APPLICATION OF MEMBRANE OVER CONCRETE REPAIR AREAS.



GALVANIC ANODE DETAIL
N.T.S.

- GALVANIC ANODE NOTES**
- PRODUCT:**
EMBEDDED GALVANIC ANODES SHALL CONSIST OF A MINIMUM OF 100 GRAMS OF ZINC IN COMPLIANCE WITH ASTM B8 SPECIAL HIGH GRADE CAST AROUND A PAIR OF STEEL TIE WIRES IN COMPLIANCE WITH BRIGHT ANNEALED ASTM A82 AND ENCASED IN A HIGHLY ALKALINE CEMENTITIOUS SHELL WITH A PH OF 14 OR GREATER. THE CEMENTITIOUS SHELL SHALL CONTAIN NO ADDED SULFATE NOR SHALL IT CONTAIN CHLORIDE, BROMIDE OR OTHER CONSTITUENTS THAT ARE CORROSIVE TO REINFORCING STEEL. ANODE UNITS SHALL BE SUPPLIED WITH INTEGRAL UNSPLICED WIRES WITH LOOP TIES FOR DIRECTLY TYING TO THE REINFORCING STEEL.
 - GALVANIC ANODE INSTALLATION:**
 - INSTALL ANODES AND REPAIR MATERIAL IMMEDIATELY FOLLOWING PREPARATION AND CLEANING OF THE STEEL REINFORCEMENT.
 - GALVANIC ANODES SHALL BE INSTALLED ALONG THE PERIMETER OF THE REPAIR OR INTERFACE AT A SPACING AS SPECIFIED ON THE DRAWINGS. ANODE SPACING WILL VARY WITH CHANGES IN THE REINFORCING STEEL DENSITY, THE LEVEL OF CHLORIDE IN THE STRUCTURE AND THE CORROSIVITY OF THE LOCAL ENVIRONMENT, ETC.
 - PROVIDE SUFFICIENT CLEARANCE BETWEEN ANODES AND SUBSTRATE TO ALLOW REPAIR MATERIAL TO ENCASE ANODE.
 - SECURE THE GALVANIC ANODES AS CLOSE AS POSSIBLE TO THE PATCH EDGE USING THE ANODE TIE WIRES. THE TIE WIRES SHALL BE WRAPPED AROUND THE CLEANED REINFORCING STEEL AND TWISTED TIGHT TO ALLOW LITTLE OR NO FREE MOVEMENT.
 - ELECTRICAL CONTINUITY:**
 - CONFIRM ELECTRICAL CONNECTION BETWEEN ANODE TIE WIRE AND REINFORCING STEEL BY MEASURING DC RESISTANCE (OHM,Ω) OR POTENTIAL (MV) WITH A MULTI-METER.
 - ELECTRICAL CONNECTION IS ACCEPTABLE IF THE DC RESISTANCE MEASURED WITH MULTI-METER IS LESS THAN 1 Ω OR THE DC POTENTIAL IS LESS THAN 1 MV.
 - CONFIRM ELECTRICAL CONTINUITY OF THE EXPOSED REINFORCING STEEL WITHIN THE REPAIR AREA. IF NECESSARY, ELECTRICAL CONTINUITY SHALL BE ESTABLISHED WITH STEEL TIE WIRE.
 - ELECTRICAL CONTINUITY BETWEEN TEST AREAS IS ACCEPTABLE IF THE DC RESISTANCE MEASURED WITH MULTI-METER IS LESS THAN 1 Ω OR THE POTENTIAL IS LESS THAN 1 MV.
 - CONFORM TO ALL MANUFACTURERS RECOMMENDATIONS FOR PREPARATION INSTALLATION AND TESTING.

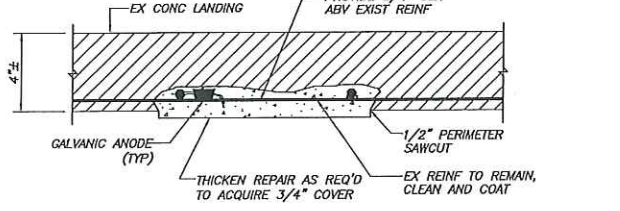


INSPECTION:
1. IF REPAIR AREA EXCEEDS 4 SF, NOTIFY ENGINEER FOR REVIEW. TEMPORARY SHORING MAY BE REQUIRED BASED ON SIZE AND LOCATION OF REPAIR.

- PREPARATION:**
1. SAWCUT PERIMETER OF DAMAGED AREA TO A DEPTH OF 1/2". DO NOT CUT REINFORCEMENT. REMOVE, BY HAND, A SECTION TO DETERMINE DEPTH OF REINFORCEMENT IF REQUIRED.
2. REMOVE DETRIORATED AND SOUND CONCRETE AS NECESSARY W/15LB(MAX) CHIPPING HAMMER. EXCAVATE 3/4" AROUND ALL REINFORCEMENT.
3. STEEL REINFORCEMENT SHOULD BE THOROUGHLY PREPARED BY MECHANICAL CLEANING TO REMOVE ALL TRACES OF RUST. THE STEEL SHOULD BE HIGH-PRESSURE WASHED WITH CLEAN WATER AFTER MECHANICAL CLEANING.
4. REMOVE LOOSE, DETRIORATED, AND BOND INHIBITING MATERIALS FROM SURFACE. PREPARATION WORK SHALL BE DONE BY HIGH PRESSURE WATER BLAST, SHOT BLAST, OR OTHER APPROPRIATE MECHANICAL MEANS TO OBTAIN AN EXPOSED AGGREGATE SURFACE WITH A MINIMUM SURFACE PROFILE OF +1-1/8".
5. SATURATE SURFACE WITH CLEAN WATER. SUBSTRATE SHOULD BE SATURATE SURFACE DRY (SSD) WITH NO STANDING WATER DURING APPLICATION.

- INSPECTION:**
1. INSPECT ALL CONCRETE SURFACES PRIOR TO APPLICATION OF PRIMERS/ADHESIVES TO INSURE PROPER PREPARATION AND SURFACE DRYING.
2. CONFORM TO ALL THE MANUFACTURERS PREPARATION INSTRUCTIONS.
3. ESTIMATE SECTION LOSS OF DETRIORATED REINFORCEMENT. IF SECTION LOSS EXCEEDS 25%, NOTIFY ENGINEER PRIOR TO PROCEEDING WITH REPAIR. SEE TYPICAL DETAIL THIS DWG.
4. ANY DAMAGED REINFORCEMENT SHALL BE REVIEWED BY ENGINEER PRIOR TO REPAIRS.

- REPAIR:**
1. CLEAN, PREPARE AND COAT EXISTING REINFORCEMENT PER CONCRETE REPAIR NOTES THIS DRAWING.
2. FORM WORK SHALL BE DESIGNED AND CONSTRUCTED TO SUPPORT THE REPAIR MATERIALS.
3. FORMS SHALL BE CONSTRUCTED TO FIT TIGHTLY AGAINST EXISTING CONCRETE SURFACES.
4. INSTALL GALVANIC ANODE AT LOCATIONS SHOWN ON DRAWINGS. ATTACH ANODE TO CLEAN REINFORCING STEEL. LOCATE THE ANODE ON THE SIDE OR BENEATH THE REINFORCING STEEL PROVIDING MINIMUM 3/4" COVER AND CLEARANCE TO CONCRETE SUBSTRATE.
5. MATERIAL SHALL BE PLACED AS PER SPECIFICATIONS AND PER MANUFACTURERS RECOMMENDATIONS.
6. FORM WORK, SHORING AND TEMPORARY PROTECTION SHALL REMAIN IN-PLACE UNTIL MATERIAL ACHIEVES A MINIMUM STRENGTH OF f'c=4,000 PSI MIN.

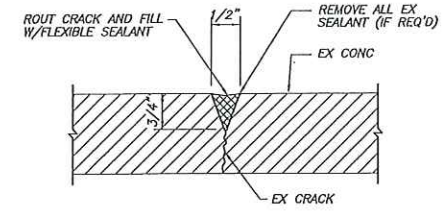


OVERHEAD CONCRETE REPAIR DETAIL (OH)
N.T.S.

- PREPARATION:**
1. SAWCUT PERIMETER OF DAMAGED AREA TO A DEPTH OF 1/2". DO NOT CUT REINFORCEMENT. REMOVE, BY HAND, A SECTION TO DETERMINE DEPTH OF REINFORCEMENT IF REQUIRED.
2. REMOVE DETRIORATED AND SOUND CONCRETE AS NECESSARY W/15LB(MAX) CHIPPING HAMMER. EXCAVATE 3/4" AROUND ALL REINFORCEMENT.
3. STEEL REINFORCEMENT SHOULD BE THOROUGHLY PREPARED BY MECHANICAL CLEANING TO REMOVE ALL TRACES OF RUST. THE STEEL SHOULD BE HIGH-PRESSURE WASHED WITH CLEAN WATER AFTER MECHANICAL CLEANING.
4. REMOVE LOOSE, DETRIORATED, AND BOND INHIBITING MATERIALS FROM SURFACE. PREPARATION WORK SHALL BE DONE BY HIGH PRESSURE WATER BLAST, SHOT BLAST, OR OTHER APPROPRIATE MECHANICAL MEANS TO OBTAIN AN EXPOSED AGGREGATE SURFACE WITH A MINIMUM SURFACE PROFILE OF +1-1/8".
5. SATURATE SURFACE WITH CLEAN WATER. SUBSTRATE SHOULD BE SATURATE SURFACE DRY (SSD) WITH NO STANDING WATER DURING APPLICATION.

- INSPECTION:**
1. INSPECT ALL CONCRETE SURFACES PRIOR TO APPLICATION OF PRIMERS/ADHESIVES TO INSURE PROPER PREPARATION AND SURFACE DRYING.
2. CONFORM TO ALL THE MANUFACTURERS PREPARATION INSTRUCTIONS.
3. ESTIMATE SECTION LOSS OF DETRIORATED REINFORCEMENT. IF SECTION LOSS EXCEEDS 25%, NOTIFY ENGINEER PRIOR TO PROCEEDING WITH REPAIR. SEE TYPICAL DETAIL THIS DWG.
4. ANY DAMAGED REINFORCEMENT SHALL BE REVIEWED BY ENGINEER PRIOR TO REPAIRS.

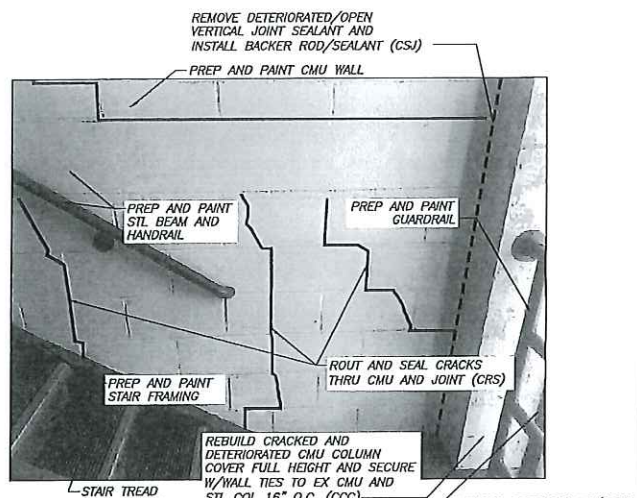
- REPAIR:**
1. ALL REINFORCEMENT SHALL BE PRIMED OR EPOXY COATED WITH A PRODUCT COMPATIBLE WITH THE CONCRETE REPAIR MATERIAL.
2. APPLY PRIMER TO CONCRETE SUBSTRATE COMPATIBLE WITH REPAIR MATERIAL.
3. FORMWORK MUST BE CONSTRUCTED/INSTALLED TO A STRENGTH SUFFICIENT TO HANDLE INDUCED PRESSURE BY HYDROMATIC PRESSURE AND THE ADDITIONAL PUMP PRESSURE REQUIRED TO CONSOLIDATE REPAIR MATERIAL.
4. FORM SHALL BE VENTED.
5. FORMS SHALL BE CONSTRUCTED TO FIT TIGHTLY AGAINST EXISTING CONCRETE SURFACES.
6. MATERIAL: PROVIDE PRE-PACKAGED REPAIR MATERIALS WHICH ARE DESIGNED FOR PUMPING AND INCORPORATE SHRINKAGE COMPENSATING ADMIXTURES.
7. ARRANGE PORTS BASED ON SIZE OF PUMP AND MATERIAL MANUFACTURERS RECOMMENDATIONS.
8. PLACEMENT: START PUMPING FROM THE LOWEST POINT, FILLING IN A MANNER THAT PREVENTS AND ENTRAPMENT.
9. PRESSURE GAGE SHALL BE ATTACHED TO THE PUMP LINE NEAR THE EXIT PORT TO MONITOR CAVITY PRESSURE. CAVITY PRESSURE SHALL NOT EXCEED FORM DESIGN PRESSURE.
10. FORMWORK SHALL REMAIN IN PLACE UNTIL MATERIAL ACHIEVES MINIMUM STRENGTH OF f'c=4,000 PSI.



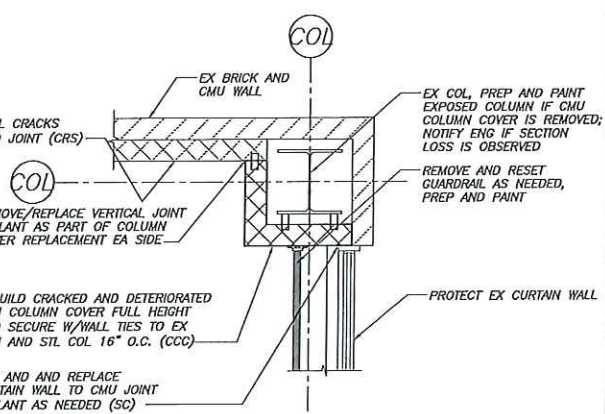
TYP CRACK CHASE REPAIR DETAIL (CCR)
N.T.S.

- PREPARATION:**
1. CENTER ROUTED GROOVE ON CRACK.
2. REMOVE ALL LOOSE AND DETRIORATED MATERIAL.
3. ALL JOINT-WALL SURFACES MUST BE CLEAN, SOUND, AND FROST FREE. JOINT WALLS MUST BE FREE OF OILS, GREASE, CURING COMPOUND RESIDUES, AND ANY OTHER FOREIGN MATTER THAT MIGHT PREVENT BOND. THIS SHOULD BE ACCOMPLISHED BY BLAST CLEANING OR EQUIVALENT MECHANICAL MEANS.
4. CONFORM TO ALL MANUFACTURER'S PREPARATION REQUIREMENTS.
5. JOINT PREPARATION SHALL BE CONFIRMED BY SEALANT INSTALLER. INSTALLATION OF SEALANT SHALL IMPLY PROPER JOINT PREPARATION.

- CRACK SEALANT INSTALLATION:**
1. INSTALLATION SHALL CONFORM TO MANUFACTURER'S REQUIREMENTS.
2. INSTALL SEALANT EVENLY AND RECESS 1/16" BELOW SURFACE. DO NOT OVERFILL JOINT.



TYP STAIR TOWER REPAIRS
N.T.S.



NOTE: AT SIM THERE IS CMU BOTH SIDES OF COLUMN AND THERE IS NO CURTAIN WALL.

DETAIL
NO SCALE

Approved	
Checked For	
Date	11/30/17
Rev No	1 FOR BID

SPRING STREET PARKING GARAGE
PORTLAND, MAINE
STAIR REPAIRS
CONCRETE REPAIR DETAILS AND NOTES

Designed	JMM	Scale	AS NOTED
Drawn	RJB	Date	11/30/17
Checked	JMM	Becker Job Number	4198