

**NOTES - CONCRETE REPAIRS:**

**1. TYPICAL DETAILS**

- A. THE DETAILS SHOWN ON THIS SHEET ARE REFERENCED ON PLANS AND ELEVATIONS FOR SPECIFIC CONCRETE REPAIRS AND ARE BASED ON LIMITED FIELD INVESTIGATION. CONTRACTOR TO PROVIDE A UNIT PRICE FOR REPAIR WORK BASED ON UNITS AS IDENTIFIED IN KEYNOTE TABLE.
- B. REFER TO SPECIFICATION SECTION 03 0130 "MAINTENANCE OF CONCRETE" FOR ADDITIONAL REQUIREMENTS.

**2. PROCEDURE**

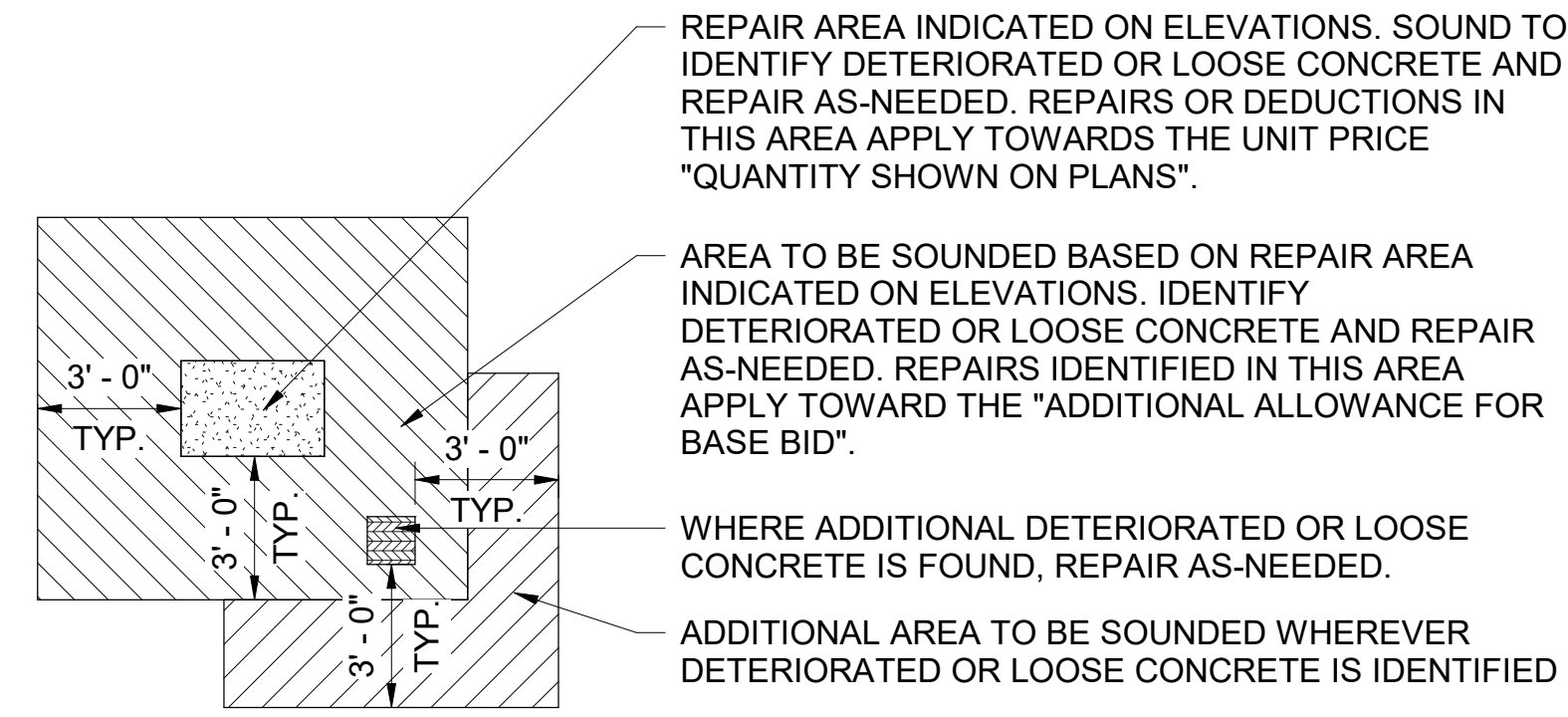
- A. THE FOLLOWING SEQUENCE DESCRIBES THE EXPECTED PROCEDURE AT CONCRETE AND CONCRETE-ENCASED MEMBERS:
  - a. SOUND MEMBER TO IDENTIFY ANY LOOSE OR DETERIORATED CONCRETE. SOUNDING SHALL EXTEND A MINIMUM OF 3 FEET BEYOND THE EXTENTS OF LENGTHS OR AREAS INDICATED ON ELEVATIONS. WHERE ADDITIONAL LOOSE OR DETERIORATED MATERIAL IS FOUND, SOUND AN ADDITIONAL 3 FEET IN ALL DIRECTIONS BEYOND THE LENGTH OR AREA OF ADDITIONAL DETERIORATION. SEE DETAIL TO RIGHT.
  - b. REMOVE ANY LOOSE OR DETERIORATED CONCRETE MATERIAL PER THE SPECIFICATIONS.
  - c. ALL OXIDIZED AND CORRODED BARS SHALL BE EXPOSED AND CLEANED WITH WIRE BRUSHING, SANDBLASTING, OR OTHER APPROVED METHODS PER THE SPECIFICATIONS. AFTER CLEANING CORRODED BARS SHALL BE REVIEWED FOR STRUCTURAL ADEQUACY BY THE CONTRACTOR, USING THE INFORMATION BELOW IN THE SECTION "CONCRETE REPAIR SEQUENCE & CONSTRUCTION NOTES." CONTRACTOR IS TO NOTIFY CONTRACTING OFFICER IF ASSESSMENT REQUIRES ADDITIONAL SUPPORT FROM CONTRACTING OFFICER.
  - d. PROVIDE ADDITIONAL REINFORCEMENT IF REQUIRED AS DIRECTED BY THE CONTRACTING OFFICER PER THE DETAILS AND SPECIFICATIONS (SEE NOTE 5.E BELOW).
  - e. PREPARE CONCRETE SURFACES TO BE RESTORED PER THE DETAILS, SPECIFICATIONS, AND MANUFACTURER'S PRINTED INSTRUCTIONS.
  - f. PLACE NEW REPAIR MORTAR AS NOTED IN THE DETAILS, AND SPECIFICATIONS. COORDINATE FINISH REQUIREMENTS WITH THE CONTRACTING OFFICER.

**3. INSPECTIONS & QUALITY CONTROL**

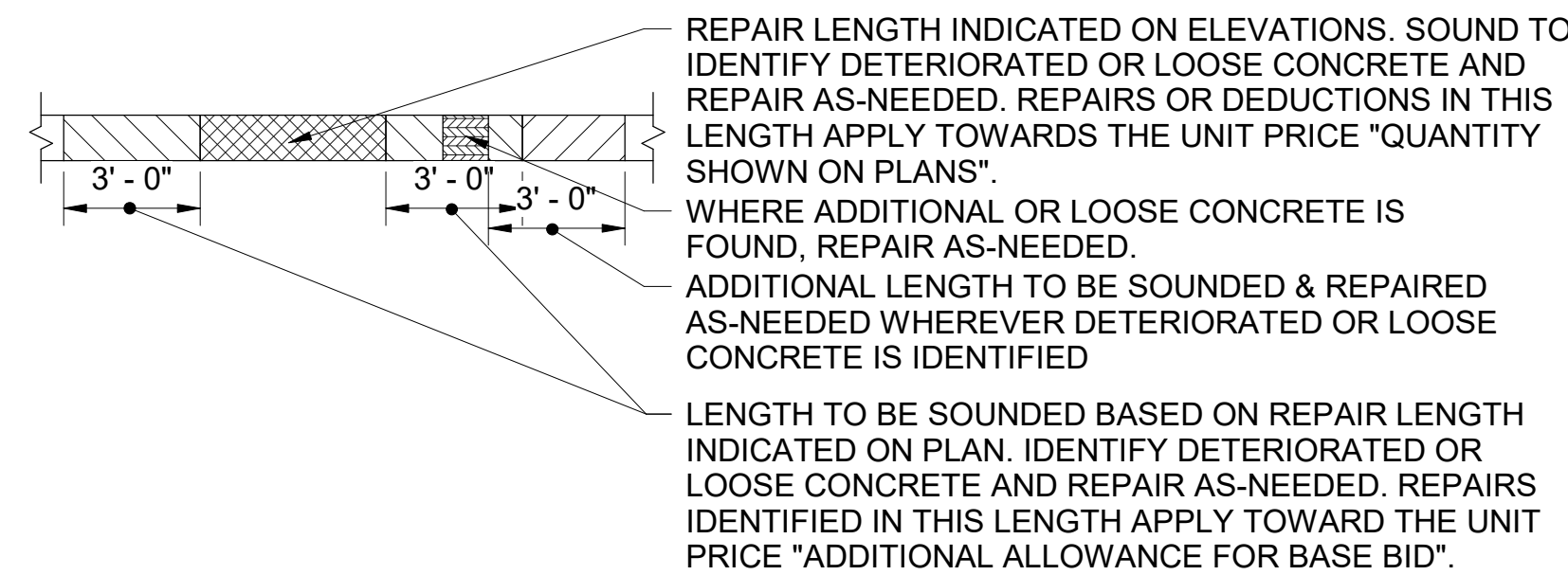
- A. REFER TO THE SPECIFICATIONS FOR INSPECTIONS AND QUALITY CONTROL REQUIREMENTS.

**4. CONCRETE REPAIR SEQUENCE & CONSTRUCTION NOTES**

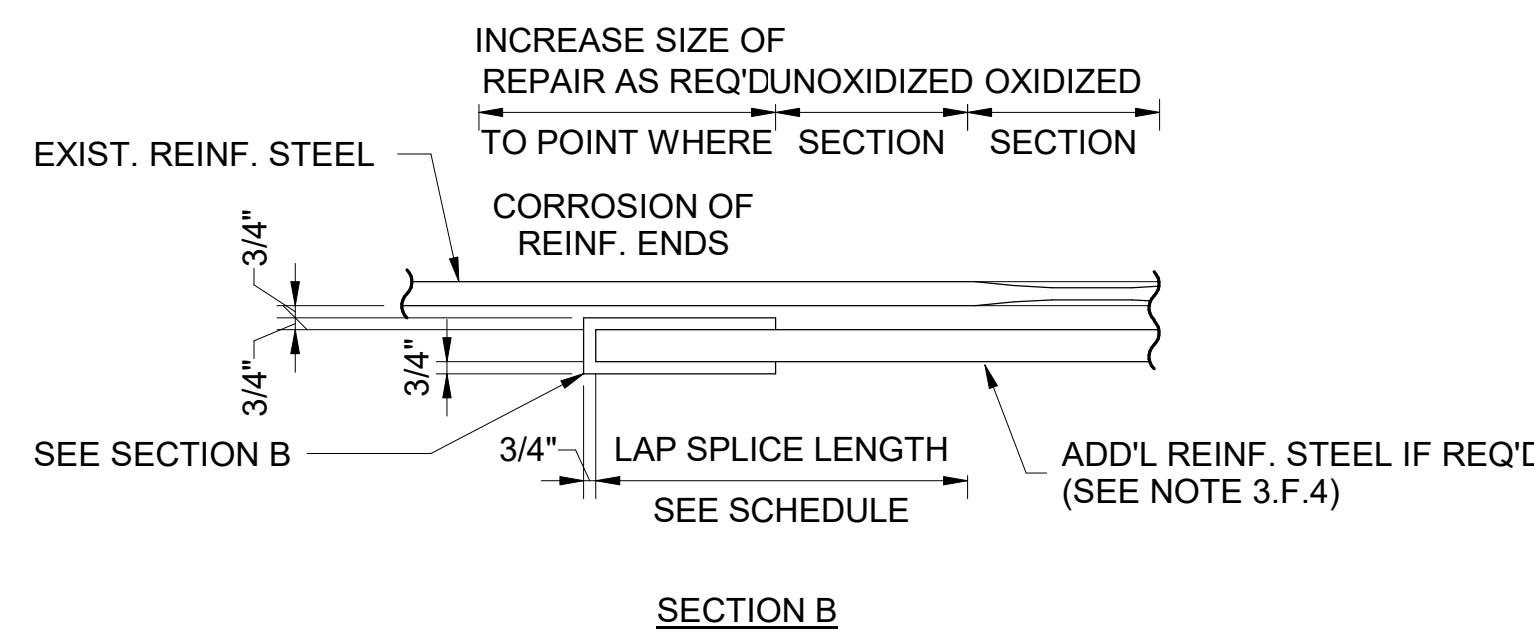
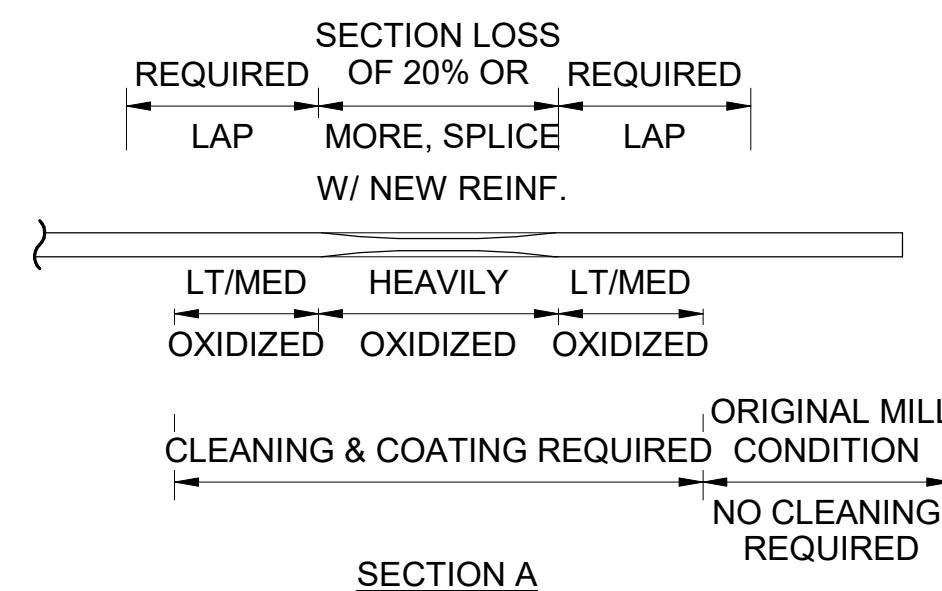
- A. PREPARE SURFACES TO BE RESTORED IN COMPLIANCE WITH PRODUCT MANUFACTURER'S PRINTED INSTRUCTIONS AND AS SPECIFIED. CLEAN AREAS TO BE RESTORED WITH WIRE BRUSH AND COMPRESSED AIR OR WATER TO REMOVE ALL LOOSE MATERIALS, INCLUDING OIL, DIRT, DUST, OR OTHER FOREIGN MATERIAL FROM SURFACES TO BE REPAIRED.
- B. REMOVE LOOSE AND DETERIORATED CONCRETE BY MECHANICAL MEANS DOWN TO SOUND CONCRETE SUBSTRATE. DO NOT CUT EXISTING REINFORCING. DETAIL THE EDGE OF THE PATCH TO A 1/2" MINIMUM DEPTH TO PREVENT FURTHER EDGING. CHIP CONCRETE SUBSTRATE TO OBTAIN A FRACTURED AGGREGATE SURFACE WITH A MINIMUM SURFACE PROFILE OF 1/8" DEPTH. SEE TYPICAL REPAIR DETAILS ON S5.2 & S5.3 FOR ADDITIONAL CONCRETE PREP PER CONDITION.
- C. ALL OXIDIZED AND CORRODED BARS SHALL BE UNDERCUT A MINIMUM OF 3/4" OR 1/4" LARGER THAN THE LARGEST SIZE AGGREGATE IN THE PATCHING CONCRETE, WHICHEVER IS GREATER. EXPOSED BARS WHICH ARE NOT OXIDIZED OR CORRODED DO NOT HAVE TO BE UNDERCUT IF LESS THAN 50% OF THE BAR'S CIRCUMFERENCE IS EXPOSED AND THE BOND BETWEEN THE BAR AND CONCRETE IS INTACT. IF THE BOND IS BROKEN OR MORE THAN 50% OF THE BAR'S CIRCUMFERENCE IS EXPOSED, THEN THE BAR SHALL BE UNDERCUT AS DESCRIBED IN SECTION C.
- D. CLEAN REINFORCING STEEL OF OXIDATION USING A WIRE BRUSH. THE REINFORCING BARS SHALL BE CLEANED TO BRIGHT METAL. APPLY ANTI-CORROSION PRIMER AND BONDING BRIDGE. COAT THE REINFORCEMENT OR OTHER STEEL TO REMAIN WITH CORROSION INHIBITOR.
- E. IF REDUCED SECTION OF REINFORCEMENT IS LESS THAN 80% OF ORIGINAL AREA, PROVIDE ADDITIONAL REINFORCING STEEL OF 1.5X AREA LOST OR GREATER OR REPLACE WITH NEW.
- F. REINFORCING SHALL BE ADDED ACCORDING TO NOTES BELOW AND SECTIONS A AND B.
  - 1. SPLICE LENGTH SHOWN SHALL EXTEND ON BOTH ENDS OF HEAVILY OXIDIZED SECTION FROM THE POINT WHERE THE EXISTING BAR IS BEING SPLICED.
  - 2. IF LAP SPLICE OF ADDITIONAL STEEL EXTENDS BEYOND THE REPAIR AREA PERIMETER, CUT A NOTCH IN THE EXISTING CONCRETE TO PROVIDE A 3/4" CLEAR SPACE BEHIND AND ON EACH SIDE OF THE ADDED STEEL.
  - 3. BOTTOM BAR SPLICE NEED NOT EXTEND BEYOND THE FACE OF SUPPORT OF THE BEAM OR GIRDER.
  - 4. IF ADDED STEEL ENCOUNTERS END OF MEMBER, PROVIDE HOOK OR MECHANICAL ANCHOR TO DEVELOP THE STEEL TENSION CAPACITY. DRILL & GROUT AS REQ'D.
  - 5. IF OBSTRUCTION PREVENTS FULL SPLICE LENGTH, USE MECHANICAL TENSION SPLICE COUPLER. CUT AND CONNECT TO EXIST REINF.
- G. SATURATE THE SURFACE OF THE PREPARED CONCRETE WITH WATER FOR A MAXIMUM OF TWO HOURS PRIOR TO THE PLACEMENT OF THE NEW CONCRETE. NO STANDING WATER AT THE TIME OF PATCH INSTALLATION.
- H. JUST PRIOR TO NEW CONCRETE PLACEMENT, APPLY A SCRUB COAT OF A THIN CEMENT SLURRY WITH A STIFF BRUSH. SLURRY MUST BE SCRUBBED INTO SUBSTRATE, FILLING ALL PORES AND VOIDS.
- I. APPLY REPAIR MORTAR PER MANUFACTURER'S REQUIREMENTS. AT AREAS WHERE THE DEPTH OF REPAIR TO SOUND CONCRETE EXCEEDS THE MAXIMUM THICKNESS OF A SINGLE LIFT AS INDICATED BY THE MORTAR MANUFACTURER, APPLY THE PATCHING MORTAR IN MULTIPLE LIFTS WITH THICKNESS NOT EXCEEDING THE MAXIMUM. ALLOW SUFFICIENT CURING TIME AND SCORE MORTAR SURFACE BETWEEN LIFTS.
- J. PLACE CONCRETE TO REPAIR PATCH/MORTAR MINIMUM 3/4" COVER OVER REINFORCING BARS FOR INTERIOR CONDITIONS AND 1-1/2" FOR EXTERIOR CONDITIONS.
- K. STRIKE OFF SURFACES AS NECESSARY AND ALLOW CONCRETE REPAIR PATCH/MORTAR TO SET. COORDINATE WITH CONTRACTING OFFICER FOR FINAL FINISH APPEARANCE, CURE BY COVERING EXPOSED SURFACES WITH WET BURLAP.



**REPAIRS (BASED ON AREA)**



**REPAIRS (BASED ON LENGTH)**



SLAB BAR REPAIR SPLICE SCHEDULE			
EXISTING BAR SIZE	BOT BARS	TOP BARS	REMARKS
#3	12"	16"	
#4	16"	22"	
#5	20"	27"	
#6	25"	35"	
#7	34"	48"	
#8	45"	63"	

**REINFORCEMENT REPAIR**

MASTER KEYNOTE LIST FOR REPAIRS	
KEY	REPAIR DESCRIPTION
C-1	SLAB ON GRADE REPLACEMENT. SEE DETAIL 1 ON S5.2.
C-2	INFILL SMALL OPENING IN CONCRETE SLAB, LESS THAN 6" DIAMETER, SEE DETAIL 2 ON S5.2.
C-3	INFILL OPENING IN CONCRETE SLAB, 6" TO 24" SQUARE, SEE DETAILS 3 & 4 ON S5.2.
C-4	SPALL, DELAMINATION, OR INADEQUATE COVER AT CONCRETE SLAB/WALL. REFER TO DETAILS 5, 6, & 7 ON S5.2 FOR EXPOSURE AND CONDITION OF STEEL REINFORCEMENT.
C-5	CRACK REPAIR, SEE DETAILS 1 & 2 ON S5.3 BASED ON CRACK SIZE.
C-6	SPALL, DELAMINATION, OR INADEQUATE COVER AT CONCRETE BEAM. REFER TO DETAIL 4 ON S5.3 FOR EXPOSURE AND CONDITION OF STEEL REINFORCEMENT.
C-7	FULL BAY CONCRETE SLAB REPLACEMENT, SEE DETAIL 3 & 5 ON S5.3.
S-1	REPLACEMENT OF POSITIVE STEEL ROOF RAFTER ATTACHMENT.

**NOTES:**

- 1. QUANTITY DENOTES NUMBER OF INSTANCES, SQUARE FOOTAGE (SF), OR LINEAR FOOTAGE (LF) OF REPAIR DEPENDENT UPON REPAIR TYPE.
- 2. CONTRACTOR SHALL VERIFY ALL CONDITIONS IN FIELD AND SHALL EXPOSE REPAIR AREAS DOWN TO SOUND CONCRETE PRIOR TO REPAIR INSTALLATION.
- 3. CONTRACTOR SHALL COORDINATE REPAIR WORK WITH MEANS AND METHODS AND SEQUENCE OF OTHER RENOVATION WORK/TRADES.
- 4. FLOOR FRAMING REPAIRS SHOWN ON PLAN ARE INTENDED TO BE UNDERSIDE REPAIRS PERFORMED FROM THE LEVEL BELOW, TYPICAL UNLESS NOTED OTHERWISE. WALL REPAIRS SHOWN ON PLAN ARE INTENDED TO BE PERFORMED FROM THE LEVEL THAT IT IS INDICATED.

REPAIR QUANTITY SUMMARY						
KEYNOTE	DETAIL / SHEET	REFRENC SPEC.	UNIT OF MEASURE	QTY. ON PLANS (APPROX.)	ADD. ALLOWANCE FOR HIDDEN CONDITIONS	TOTAL FOR BID
C-1	S5.2	03 3000	EACH	283	20%	340
C-2	S5.2	03 0130	SQUARE FEET	24	20%	29
C-3	S5.2	03 0130	SQUARE FEET	142	20%	170
C-4	S5.2	03 0130	SQUARE FEET	308	20%	370
C-5	S5.3	03 0130	LINEAR FEET	335	20%	402
C-6	S5.2 & S5.3	03 0130	LINEAR FEET	120	20%	144
C-7	S5.3	03 0130	SQUARE FEET	18	20%	22
S-1		05 1200	EACH	16		20

**PRICING NOTES**

- 1. THE CONTRACTOR SHALL PROVIDE SAFE ACCESS AND LIGHTING FOR THE OWNER'S REPRESENTATIVE, CONTRACTING OFFICER, AND INSPECTORS TO OBSERVE ALL REPAIRS UPON REQUEST AND AS REQUIRED PER THE NOTES, KEYNOTES, DETAILS, AND SPECIFICATIONS. WHERE ACCESS IS VIA LIFT, THE CONTRACTOR SHALL PROVIDE A CERTIFIED LIFT OPERATOR UPON REQUEST.
- 2. QUANTITY SHOWN ON PLANS. REFER TO THE KEYNOTES FOR ADDITIONAL QUANTITY ASSUMPTIONS, WHERE APPLICABLE.
- 3. ADDITIONAL ALLOWANCE - REFER TO THE KEYNOTES FOR ADDITIONAL QUANTITY ASSUMPTIONS, WHERE APPLICABLE.
- 4. QUANTITIES SHOWN ON PLANS AND ADDITIONAL ALLOWANCES ARE APPROXIMATE. ACTUAL REPAIR QUANTITIES SHALL BE TRACKED BY THE OWNER'S REPRESENTATIVE AND/OR THE GENERAL CONTRACTOR TO DETERMINE ADDITIONS OR DEDUCTIONS FROM THE BASE BID. REFER TO THE NOTES, KEYNOTES, DETAILS, AND SPECIFICATIONS FOR REQUIREMENTS TO IDENTIFY ACTUAL REPAIR QUANTITIES.
- 5. PROVIDE UNIT PRICING FOR EACH KEYNOTE REPAIR TYPE INDICATED IN THE TABLE ABOVE.
- 6. PROVIDE UNIT PRICING FOR ADDITIONAL MATERIALS AND LABOR TO ACCOUNT FOR CHANGES IN WEIGHT OR VOLUME OF MATERIALS FROM THE ASSUMPTIONS IN THE BASE BID. REFER TO THE "STEEL REPAIR NOTES" AND "CONCRETE REPAIR NOTES" AND REPAIR DETAILS FOR ADDITIONAL INFO. BOTH THE QUANTITY SHOWN ON PLANS AND ADDITIONAL ALLOWANCE WILL BE ADJUSTED FROM THE SCHEDULED MATERIALS (SHOWN ON "PRICING DETAILS") TO ACTUAL MATERIALS (SHOWN ON "CONSTRUCTION DETAILS") TO ACCOUNT FOR CHANGES IN THE WEIGHT OR VOLUME OF THE REPAIR MATERIAL ONLY.
  - A. FABRICATED STRUCTURAL STEEL TONNAGE, DELIVERED UNIT PRICE - PROVIDE A PER TON UNIT PRICE FOR CHANNELS, ANGLES, AND PLATES TO BE USED FOR REINFORCEMENT OF EXISTING STEEL, SHOP FABRICATED, DELIVERED TO THE SITE AND PLACED ON THE SCAFFOLD.
  - B. CONCRETE REINFORCING STEEL TONNAGE, DELIVERED UNIT PRICE - PROVIDE A PER TON UNIT PRICE FOR REINFORCING BARS USED FOR REPAIRS, CUT, BENT (AS NEEDED), DELIVERED TO THE SITE AND PLACED ON THE SCAFFOLD.
  - C. CONCRETE REPAIR VOLUME - PROVIDE A UNIT PRICE FOR EACH CUBIC FOOT OF CONCRETE REPAIR OR PATCHING PREPARED, FURNISHED AND INSTALLED. PRICE SHALL INCLUDE LABOR FOR CHIPPING CONCRETE, PLUS LABOR AND MATERIAL FOR INSTALLING REPAIR MORTAR OR SHOTCRETE.



A/E FIRMS ARCH: QUINN EVANS 219 1/2 N. MAIN STREET ANN ARBOR, MI T: 734.663.5888 ENG: SILMAN 211 N. 4TH AVE. ANN ARBOR, MI T: 734.900.2460	DESIGNED: KH CADD: CM TECH. REVIEW: NH DATE: 10.27.2023	SUB SHEET NO. <b>02</b> <b>S5.1</b>	TITLE OF SHEET LIBBEY BATHHOUSE <b>TYPICAL CONCRETE REPAIR DETAILS</b> REHABILITATE BATHHOUSES HOT SPRINGS NATIONAL PARK	DRAWING NO. <b>128</b> <b>182951</b> PMIS/PKG NO. 318915 221 OF 286
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