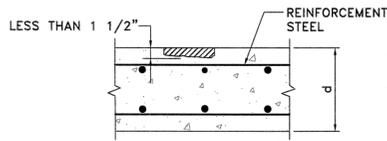


**TYPE A CONCRETE REPAIR (< 1 1/2" DEPTH)**

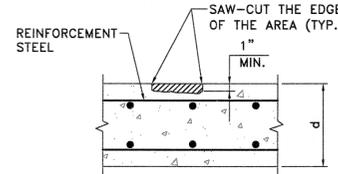
(PAY ITEM 1)

USE WHEN DEPTH OF REPAIR IS LESS THAN 1 1/2 INCHES AND NOT MORE THAN HALF THE CIRCUMFERENCE OF EXISTING REINFORCING STEEL IS EXPOSED. USE ON HORIZONTAL, VERTICAL AND SLOPED SURFACES.

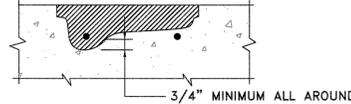


**REPAIR PROCEDURES:**

1. THE EDGES OF THE AREA TO BE REPAIRED SHALL BE SAW-CUT SHARP, PERPENDICULAR TO THE FACE OF THE CONCRETE TO AT LEAST 1" DEEP. REMOVE ALL UNSOUND AND DETERIORATED CONCRETE.



2. IN AREAS WHERE REMOVAL OF THE DETERIORATED CONCRETE DESTROYS THE BOND BETWEEN THE REINFORCEMENT STEEL AND THE CONCRETE, OR WHERE MORE THAN HALF THE CIRCUMFERENCE OF THE STEEL IS EXPOSED, REMOVE CONCRETE A MINIMUM OF 3/4 INCH ALL AROUND THE BARS.



3. IF CRACKS IN CONCRETE ARE STILL PRESENT AFTER REMOVAL OF DETERIORATED CONCRETE, THEY SHALL BE PRESSURE INJECTED WITH CRACK INJECTION GROUT.

4. CLEAN TO BRIGHT METAL AND COAT ALL EXPOSED REINFORCING STEEL WITH REINFORCEMENT COATING.

5. CLEAN CONCRETE SURFACES TO BE REPAIRED IN ACCORDANCE WITH THE CONCRETE BONDING AGENT MANUFACTURER'S INSTRUCTIONS.

6. APPLY CONCRETE BONDING AGENT TO CONCRETE SURFACE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

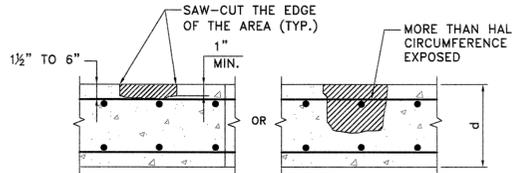
7. APPLY CONCRETE REPAIR MATERIAL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS EXCEPT AS FOLLOWS:

- (1) FINISH TO MATCH EXISTING CONCRETE SURFACES.
- (2) APPLY CONCRETE REPAIR MATERIAL ONLY WHEN SURFACE AND AMBIENT AIR TEMPERATURE ARE NOT EXPECTED TO EXCEED 80°F OR FALL BELOW 45°F DURING THE INITIAL TWO (2) DAY CURING PERIOD.

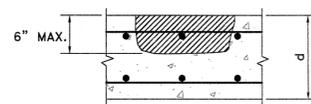
**TYPE B CONCRETE REPAIR (1 1/2" TO 6" MAX. DEPTH)**

(PAY ITEM 2)

USE WHEN MORE THAN HALF OF THE CIRCUMFERENCE OF EXISTING REINFORCING BARS IS EXPOSED OR WHEN DEPTH OF REPAIR EQUALS OR EXCEEDS 1 1/2 INCHES. USE ON HORIZONTAL, VERTICAL AND SLOPED SURFACES.



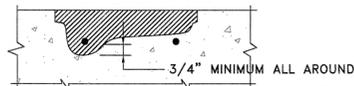
IF DEPTH OF REPAIR EXCEEDS 6" OR WHEN DEPTH OF REPAIR IS MORE THAN HALF OF THE THICKNESS. USE TYPE C REPAIR.



**REPAIR PROCEDURES:**

1. THE EDGES OF THE AREA TO BE REPAIRED SHALL BE SAW-CUT SHARP, PERPENDICULAR TO THE FACE OF THE CONCRETE TO AT LEAST 1" DEEP. REMOVE ALL UNSOUND AND DETERIORATED CONCRETE.

2. IN AREAS WHERE REMOVAL OF THE DETERIORATED CONCRETE DESTROYS THE BOND BETWEEN THE REINFORCEMENT STEEL AND THE CONCRETE, OR WHERE MORE THAN HALF THE CIRCUMFERENCE OF THE REBAR IS EXPOSED, REMOVE CONCRETE TO EXTEND A MINIMUM OF 3/4 INCH ALL AROUND THE BARS.



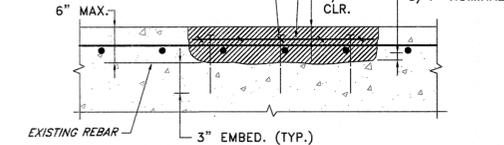
3. IF CRACKS IN CONCRETE ARE STILL PRESENT AFTER REMOVAL OF DETERIORATED CONCRETE, THEY SHALL BE PRESSURE INJECTED WITH CRACK INJECTION GROUT.

4. CLEAN TO BRIGHT METAL AND COAT ALL EXPOSED REINFORCING STEEL WITH REINFORCEMENT COATING. ALL REINFORCING STEEL WHICH HAS DETERIORATED OR BEEN CUT TO GREATER THAN 10% OF ITS ORIGINAL DIAMETER SHALL HAVE A SUPPLEMENTARY REBAR SPLICED TO IT. THIS REBAR SHALL BE OF THE SAME DIAMETER AS THE ORIGINAL REBAR (NO. 4 MINIMUM). SHALL BE SPLICED AT LEAST 60 BAR DIAMETERS TO THE EXISTING REBAR, EACH SIDE, AND SHALL BE HOT-DIPPED GALVANIZED OR EPOXY COATED. FOR OPTIONAL SPLICED METHODS SEE TYPICAL DETAIL ON THIS SHEET.



5. SECURELY FASTEN WELDED WIRE FABRIC TO THE EXISTING REINFORCING STEEL W/ WIRE.

3/8" DIA. STAINLESS STEEL THREADED ROD W/ NUT & WASHER SET IN ADHESIVE. ANCHOR SPACED @ 12" C. TO C. EA. WAY



6. CLEAN CONCRETE SURFACES TO BE REPAIRED IN ACCORDANCE WITH THE CONCRETE BONDING AGENT MANUFACTURER'S INSTRUCTIONS.

7. APPLY CONCRETE BONDING AGENT TO CONCRETE SURFACE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

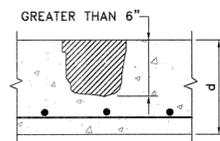
8. APPLY CONCRETE REPAIR MATERIAL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS EXCEPT AS FOLLOWS:

- (1) SURFACES EXCEEDING 1:1 VERTICAL TO HORIZONTAL SHALL BE FULLY FACED FORMED.
- (2) ALL SURFACES SHALL BE FINISHED TO MATCH EXISTING CONCRETE SURFACES.
- (3) APPLY CONCRETE REPAIR MATERIAL ONLY WHEN SURFACE AND AMBIENT AIR TEMPERATURE ARE NOT EXPECTED TO EXCEED 80°F OR FALL BELOW 45°F DURING THE INITIAL TWO (2) DAY CURING PERIOD.

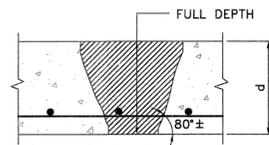
**TYPE C CONCRETE REPAIR (>6" DEPTH)**

(PAY ITEM 3)

USE WHEN DEPTH OF REPAIR EXCEEDS 6 INCHES. USE ON HORIZONTAL, VERTICAL AND SLOPED SURFACES.



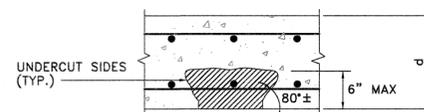
1. FOLLOW PROCEDURE FOR TYPE B CONCRETE REPAIR EXCEPT REMOVE CONCRETE ALL THE WAY THROUGH, AS SHOWN BELOW, WHEN DEPTH OF REPAIR IS MORE THAN HALF OF THE THICKNESS.



**TYPE D OVERHEAD CONCRETE REPAIR (0" TO 6" DEPTH)**

(PAY ITEM 4)

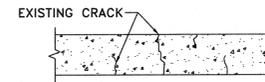
FOLLOW PROCEDURE FOR TYPE B REPAIR EXCEPT, UNDERCUT THE SIDES OF THE REPAIR AREA AS SHOWN BELOW IN ORDER TO "LOCK" PATCH IN PLACE TO UNDERSIDE OF SLAB. IF DEPTH OF REPAIR EXCEEDS 6", USE TYPE C (FULL DEPTH) REPAIR.



**CONCRETE CRACK REPAIR**

(PAY ITEM 5 & 6)

1. THOROUGHLY CLEAN CRACK AND THE SURFACE AREA ABOUT 1" WIDE ON EACH SIDE OF THE CRACK AND COMPLETELY REMOVE CAULKING, PREVIOUS REPAIR MATERIALS, MINERAL DEPOSITS, LOOSE PARTICLES, DUST, GREASE, LAITANCE, SALT AND ANY OTHER CONTAMINANTS OR FOREIGN MATTER.
2. WHERE CONCRETE SURFACE ADJACENT TO THE CRACK ARE DETERIORATED, "V"-GROOVE THE CRACK UNTIL SOUND CONCRETE IS REACHED. "V" GROOVES CAN ALSO BE USED WHEN HIGH INJECTION PRESSURE REQUIRE A STRONGER CAP SEAL.
3. APPLY EPOXY SURFACE CAP SEAL COMPOUND ALONG ENTIRE LENGTH OF CRACK.
4. INSTALL ENTRY PORTS IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. DISTANCE BETWEEN ENTRY PORTS SHALL NOT EXCEED THICKNESS OF CONCRETE SLAB. FOR FULL DEPTH CRACKS ACCESSIBLE ON BOTH SIDES OF THE WALL, PROVIDE PORTING DEVICES ON OPPOSITE SIDES AT STAGGERED LOCATIONS.
5. BEGIN PRESSURE INJECTION OF POLYURETHANE RESIN/FOAM/EPOXY AT THE ENTRY PORT AT ONE END OF CRACK. CONTINUE INJECTION AT FIRST PORT UNTIL INJECTION MATERIAL BEGINS TO FLOW OUT OF SECOND PORT. PLUG FIRST PORT, INJECT SECOND PORT AND CONTINUE UNTIL EPOXY RESIN FLOWS FROM THIRD PORT. INJECT ENTIRE CRACK LENGTH FOLLOWING THE SAME SEQUENCE. PERFORM THE ENTIRE TECHNIQUE IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
6. AFTER INJECTION COMPOUND HAS CURED, REMOVE SURFACE CAP SEAL COMPOUND AND FINISH FACE OF CRACK FLUSH WITH ADJACENT CONCRETE. INDENTATIONS OR PROTRUSIONS CAUSED BY PLACEMENT OF ENTRY PORTS WILL NOT BE ACCEPTABLE.

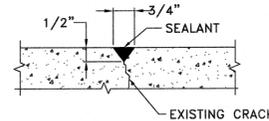


7. APPLICABLE TO CRACKS GREATER THAN 0.02" (20 MILS) WIDE ON TO TOP, BOTTOM AND VERTICAL SURFACES OF EXISTING CONCRETE ROOF SYSTEM (SLABS, BEAMS, GIRDERS ETC..)

**CAULKING AND SEALING OF CRACKS & JOINTS**

(PAY ITEM 7)

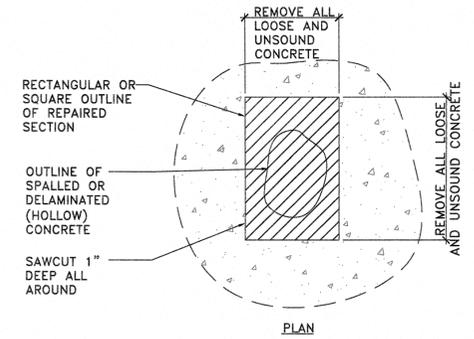
1. THOROUGHLY CLEAN CRACK AND THE SURFACE AREA ABOUT 1" WIDE ON EACH SIDE OF THE CRACK AND COMPLETELY REMOVE CAULKING, PREVIOUS REPAIR MATERIALS, MINERAL DEPOSITS, LOOSE PARTICLES, DUST, GREASE, LAITANCE, SALT AND ANY OTHER CONTAMINANTS OR FOREIGN MATTER.
2. PROVIDE "V"-GROOVE NOTCH ALONG THE CRACK.



3. APPLY SEALANT ALONG ENTIRE LENGTH OF CRACK. AVOID OVERLAPPING OF SEALANT TO ELIMINATE ENTRAPMENT OF AIR.
4. TOOL SEALANT TO ENSURE FULL CONTACT WITH JOINT WALLS AND REMOVE AIR ENTRAPMENT.
5. FOR JOINT BOND BREAKER TAPE OR BACKER ROD SHALL BE INSTALLED TO PREVENT BOND AT BASE OF JOINT. JOINT DIMENSION SHOULD ALLOW FOR 1/4" MINIMUM AND 1/2" MAXIMUM THICKNESS FOR SEALANT. PROPER DESIGN IS 2:1 WIDTH TO DEPTH RATIO.

**SPECIAL REPAIR NOTES:**

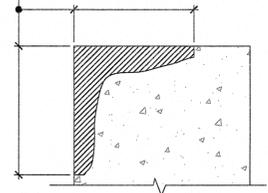
1. ALL REPAIR PRODUCTS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. AS DIRECTED BY THE ENGINEER, OPEN CRACKS SHALL BE FILLED WITH CRACK INJECTION GROUT.
3. CONCRETE REPAIR MATERIAL CRACK INJECTION GROUT, BONDING AGENT, REINFORCEMENT COATING, FORMING, REINFORCEMENT & ANCHOR RODS TO BE INCLUDED IN THE COST OF THE REPAIRS.
4. VERTICAL AND UNDERSIDE OF DECK OR BEAMS SURFACES WITH CONCRETE REPAIRS GREATER THAN OR EQUAL TO 1" IN DEPTH SHALL BE FULLY FACED FORMED.
5. APPLY CONCRETE REPAIR MATERIAL ONLY WHEN SURFACE AND AMBIENT AIR TEMPERATURE ARE NOT EXPECTED TO EXCEED 80°F OR FALL BELOW 45°F DURING THE INITIAL TWO (2) DAY CURING PERIOD.
6. A TECHNICAL REPRESENTATIVE OF THE MANUFACTURER SHALL BE PRESENT ON THE SITE TO PROVIDE GUIDANCE IN THE PREPARATION AND PLACEMENT OF REPAIR PRODUCTS FOR PREVAILING WEATHER AND JOB SITE CONDITIONS THE FIRST TIME THESE PRODUCTS ARE USED AT THE JOB SITE. THE REPRESENTATIVE SHALL BE PRESENT AT LEAST ONE COMPLETE CYCLE OF THE REPAIR PROCEDURES.



TYPICAL CONCRETE DECK/SPALL REPAIR

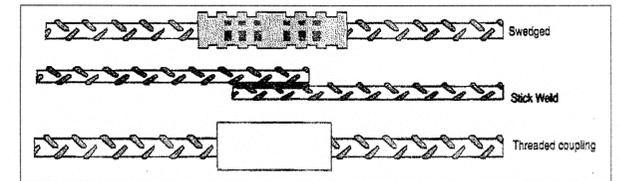
SCALE: N.T.S.

CONCRETE REPAIRS TO BE MEASURED ON SURFACE AREA THAT HAS THE LEAST DEPTH. NO DOUBLE MEASUREMENTS WILL BE MADE AT CORNERS.



**CONCRETE REPAIR PAYMENT LIMITS**

SCALE: N.T.S.



\* STICK WELD SPLICE SHALL BE EPOXY COATED.

**OPTIONAL TYPICAL SPLICE METHODS**

SCALE: N.T.S.

**PAY ITEM**

1 2 3 & 4

5

6

7

8

REPAIR PRODUCTS**	
1.0 CONCRETE BONDING AGENT	BELZONA 4911 TX CONDITIONER (PRIMER)
2.0 REINFORCEMENT COATING	BELZONA 4911 TX CONDITIONER (PRIMER)
3.0 CONCRETE REPAIR MATERIAL:	
3.1 HAND APPLIED TO TOP OF HORIZONTAL SURFACES	
3.1.1 TYPE "A"	BELZONA 4131 MAGMA SCREED BELZONA 4111 MAGMA QUARTZ
3.1.2 TYPE "B"	BELZONA 4131 MAGMA SCREED
3.2 HAND APPLIED TO TYPE "A" VERTICAL AND UNDERSIDE SURFACES	BELZONA 4131 MAGMA SCREED BELZONA 4141 MAGMA BUILD
3.3 FORM AND (POUR OR PUMP)	
3.4.1 TYPE "A"	BELZONA 4111 MAGMA QUARTZ
3.4.2 TYPE "B" AND "D"	BELZONA 4111 MAGMA QUARTZ
4.0 CRACK INJECTION	BELZONA 4151 MAGMA QUARTZ RESIN
4.1 EPOXY	
4.1.1 SEAL CRACKS & PORTS PRIOR AND AFTER INJECTION	BELZONA 4131 MAGMA SCREED BELZONA 2911 QD CONDITIONER WITH BELZONA 2211 MP HI-BUILD ELASTOMER
4.2 CHEMICAL GROUT	AVANTI 315 AVANTI 330
5.0 CAULKING AND SEALING OF CRACKS & JOINTS	BELZONA 2911 QD CONDITIONER WITH BELZONA 2211 MP HI-BUILD ELASTOMER BELZONA 2911 QD CONDITIONER WITH BELZONA 2221 MP FLUID ELASTOMER
6.0 ANCHOR ROD ADHESIVE	HILTI HY200
7.0 PARGE COAT	BELZONA 4131 MAGMA SCREED

\*\*REPAIR PRODUCTS 1.0 TO 5.0 SHALL BE BY THE SAME MANUFACTURER

APPROVED: *Richard A. Alaimo* 4/3/17

**Richard A. Alaimo**  
PROFESSIONAL ENGINEER  
NEW JERSEY LICENSE NO. 13195

REVISIONS	DATE	BY

**RICHARD A. ALAIMO**  
ENGINEERING COMPANY  
Consulting Engineers  
NJDCA 24GA27988800

200 HIGH STREET MOUNT HOLLY, N.J.  
2 MARKET STREET PATERSON, N.J.

GRIT CHAMBER UPGRADE
CONCRETE REPAIR PROCEDURES
SCALE: AS NOTED

CLIENT: <b>WOODBIDGE TOWNSHIP</b>	DATE: <b>APRIL 2017</b>	SHEET
PROJECT LOCATION: <b>WOODBIDGE TOWNSHIP MIDDLESEX COUNTY NEW JERSEY</b>	DESIGNED BY: <b>PG</b>	<b>S04</b>
PROJECT NO.: <b>B-0726-0023-000</b>	DRAWN BY: <b>PG</b>	
CONTRACT NO.: <b>1230</b>	CHECKED BY:	FILE NO.:
	DEPT. HEAD:	