

GENERAL NOTES

CALC. BY _____	LAKE COUNTY	OHIO	<div style="border: 1px solid black; border-radius: 50%; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin: 0 auto;"> 161 185 </div>
DATE _____	LAK-90/271-1.88/0.00	FHWA REGION 5	
CHKD. BY _____			
DATE _____			

ITEM SPECIAL – PATCHING CONCRETE BRIDGE DECK OVERLAYS

A. DESCRIPTION:

THIS ITEM SHALL CONSIST OF FURNISHING THE NECESSARY LABOR, MATERIALS AND EQUIPMENT TO REPAIR CONCRETE BRIDGE DECK OVERLAYS, INCLUDING THE REMOVAL OF LOOSE AND UNSOUND CONCRETE AND BITUMINOUS PATCHES, SURFACE PREPARATION, BONDING COAT AND THE MIXING, PLACING, FINISHING, CURING, SEALING AND COMPRESSIVE STRENGTH TESTING OF ALL THE PATCHES AS DIRECTED BY THE ENGINEER. THIS ITEM WILL BE USED TO REPAIR ONLY THOSE AREAS WHICH ARE TOO DAMAGED TO BE INJECTED SUCCESSFULLY.

B. REMOVAL OF UNSOUND CONCRETE:

THE ENGINEER SHALL SOUND THE ENTIRE DECK AND OUTLINE THE AREAS TO BE REPAIRED. THE PERIMETER OF ALL REMOVAL AREAS SHALL BE SAWED TO A DEPTH OF 2" TO PRODUCE A VERTICAL OR SLIGHTLY UNDERCUT FACE. ADDITIONAL SAW CUTS MAY BE REQUIRED TO FACILITATE REMOVAL. COOLING WATER FROM WET SAWING AND DUST FROM DRY SAWING SHALL NOT BE ALLOWED TO CONTAMINATE THE EXPOSED PATCH HOLES. THE UNSOUND CONCRETE MAY BE REMOVED BY CHIPPING OR HAND-DRESSING. CHIPPING HAMMERS SHALL NOT BE HEAVIER THAN THE NOMINAL 35-POUND CLASS AND SHALL BE OPERATED AT AN ANGLE OF LESS THAN 45 DEGREES MEASURED FROM THE SURFACE OF THE DECK. CONCRETE SHALL BE REMOVED IN A MANNER THAT PREVENTS CUTTING, ELONGATING OR DAMAGING REINFORCING STEEL. WHERE THE BOND BETWEEN THE CONCRETE AND A PRIMARY REINFORCING BAR HAS BEEN DESTROYED, OR WHERE MORE THAN ONE HALF OF THE PERIPHERY OF SUCH A BAR HAS BEEN EXPOSED, THE ADJACENT CONCRETE SHALL BE REMOVED TO A DEPTH THAT WILL PROVIDE A MINIMUM 3/4 INCH CLEARANCE AROUND THE BAR EXCEPT WHERE OTHER REINFORCING BARS MAKE THIS IMPRACTICABLE. REINFORCEMENT WHICH HAS BECOME LOOSE SHALL BE ADEQUATELY SUPPORTED AND TIED BACK INTO PLACE.

C. SURFACE PREPARATION:

CLEANING SHALL CLOSELY PRECEDE APPLICATION OF THE BONDING GROUT OR THE PATCHING MATERIAL. THE SURFACE TO BE PATCHED AND THE EXPOSED REINFORCING STEEL SHALL BE THOROUGHLY CLEANED WITHIN 24 HOURS PRIOR TO PATCHING BY ABRASIVE BLASTING FOLLOWED BY AN AIR BLAST. IT MAY BE NECESSARY TO USE HAND TOOLS TO REMOVE SCALE FROM THE REINFORCING STEEL.

CONTAMINATION OF THE AREA TO BE PATCHED BY CONSTRUCTION EQUIPMENT OR FROM ANY OTHER SOURCE SHALL BE PREVENTED BY PLACEMENT OF A CLEAN 4-MIL POLYETHYLENE SHEET (OR ANY OTHER COVERING AS APPROVED BY THE ENGINEER) ON THE SURFACE OF THE DECK FOLLOWING THE AIR BLAST CLEANING.

WHERE REINFORCING STEEL IS EXPOSED, THE CONTRACTOR SHALL PROVIDE ADEQUATE SUPPORTS FOR THE CONCRETE MIXER SO THAT REINFORCING STEEL AND ITS BOND WITH THE CONCRETE WILL NOT BE DAMAGED BY THE WEIGHT AND MOVEMENT OF THE CONCRETE MIXER, OR SHALL PROVIDE MEANS TO CONVEY CONCRETE FROM THE MIXER TO THE PATCH LOCATIONS.

D. MATERIALS, PLACING AND CURING:

OVERLAYS SHALL BE PATCHED WITH MICRO SILICA MODIFIED CONCRETE (MSMC)

MATERIAL SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

FINE AGGREGATE (NATURAL SAND)	-703.02
COARSE AGGREGATE (NO. 8)	-703.02
PORTLAND CEMENT, TYPE 1	-701.04
WATER	-499.02
CHEMICAL ADMIXTURE	-705.12, ASTM C 494, TYPE A OR D
AIR ENTRAINING ADMIXTURE	-705.10
SUPERPLASTICIZING ADMIXTURE	-705.12, ASTM C 494, TYPE F OR G (HIGH RANGE WATER REDUCER)
CURING MATERIAL	-705.05 OR 705.06 WHITE OPAQUE
MICRO-SILICIA ADMIXTURE	AS RECOMMENDED AND FURNISHED BY:

- EUCLID CHEMICAL COMPANY
CLEVELAND, OHIO
- OR
- CORMIX CONSTRUCTION CHEMICALS
DALLAS, TX.
- OR
- GRACE CONSTRUCTION PRODUCTS
CAMBRIDGE, MA.
- OR
- SIKA CORPORATION
LYNHURST, NJ.
- OR
- MASTER BUILDERS
CLEVELAND, OHIO

BONDING GROUT.

GROUT FOR MSMC PATCHES SHALL CONSIST OF PARTS BY VOLUME AS FOLLOWS:

- 1 PART MICROSILICA SLURRY MIX
- 6 PARTS CEMENT
- 10 PARTS SAND
- 2 1/2 PARTS WATER AS REQUIRED TO ACHIEVE A STIFF SLURRY

THE CONSISTENCY OF THIS SLURRY SHALL BE SUCH THAT IT CAN BE APPLIED WITH A STIFF BRUSH OR BROOM TO THE EXISTING SURFACE IN A THIN, UNIFORM COATING. THE COATING OF GROUT SHALL BE SCRUBBED ONTO THE DRY SURFACE IMMEDIATELY BEFORE PLACING THE CONCRETE. CARE SHALL BE EXERCISED TO ENSURE THAT NO EXCESS GROUT IS PERMITTED TO COLLECT IN LOW SPOTS. IN NO CASE SHALL THE GROUT BE PERMITTED TO DRY BEFORE PLACING THE NEW CONCRETE. GROUT SHALL BE PAINTED OVER ALL JOINTS BETWEEN THE NEW AND EXISTING CONCRETE IMMEDIATELY AFTER THE FINISHING HAS BEEN COMPLETED. THE GROUT SHALL BE MIXED AND PLACED WITHIN THE SAME TIME REQUIREMENTS AS FOR THE MSMC PATCHES.

PROPORTIONING AND ALL OTHER REQUIRED CHARACTERISTICS OF THE MIX, I.E. AIR ENTRAINMENT AND SLUMP, SHALL BE ADJUSTED OFF THE DECK BEFORE PLACEMENT OF THE PATCHES BEGINS. THE MSMC MIXTURE SHALL CONSIST OF A WORKABLE MIXTURE OF UNIFORM COMPOSITION AND CONSISTENCY WITH THE FOLLOWING PROPORTIONS:

	COARSE AGGREGATE	FINE AGGREGATE	CEMENT	MICRO SILICA	MAXIMUM WATER- CEMENT RATIO
TYPE OF AGGREGATE	(LBS.)	(LBS.)	(LBS.)	(LBS.)	
GRAVEL	1520	1170	700	105	0.36
LIMESTONE	1540	1170	700	105	0.36
SLAG	1335	1170	700	105	0.36

THE SPECIFIC GRAVITIES USED FOR DETERMINING THE ABOVE WEIGHTS ARE:
NATURAL SAND 2.62, GRAVEL 2.62, LIMESTONE 2.65, SLAG 2.30 AND MICRO-SILICA 2.20

NOTE: THE CONTRACTOR SHALL OBTAIN A WRITTEN STATEMENT FROM THE MANUFACTURER OF THE MICRO-SILICA ADMIXTURE THAT HE IS SATISFIED WITH THE COMPATIBILITY OF THE COMBINATION OF MATERIALS AND SEQUENCE IN WHICH THEY ARE COMBINED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SUPPLY A CONCRETE WHICH MEET THESE SPECIFICATIONS AND PROVIDES THE NECESSARY WORKABILITY, FINISHABILITY AND PUMPABILITY IF NEEDED. THE INCORPORATION OF INDIVIDUALLY APPROVED MATERIALS INTO THE CONCRETE WILL NOT NECESSARILY RESULT IN AN ACCEPTABLE MIX. THE USE OF DIFFERENT CHEMICAL ADMIXTURES OR AGGREGATES IS A DISTINCT POSSIBILITY. ALL COSTS OF WHICH SHALL BE INCLUDED UNDER THIS ITEM OF WORK.

DELETERIOUS MATERIAL SHALL NOT EXCEED ONE-HALF THE REQUIREMENT FOR SUPERSTRUCTURE AGGREGATE AND SODIUM SULFATE SOUNDNESS LOSS SHALL NOT EXCEED THAT SPECIFIED FOR SUPERSTRUCTURE CONCRETE IN 703.02.

THE BATCH WEIGHTS DESCRIBED SHALL BE CORRECTED TO COMPENSATE FOR THE MOISTURE CONTAINED IN THE AGGREGATE AT THE TIME OF USE. A CHEMICAL ADMIXTURE (705.12, TYPE A OR D) SHALL BE USED. THE TRANSIT MIXER SHALL BE LIMITED TO 3/4 OF ITS RATED CAPACITY OR 6 CUBIC YARDS, WHICHEVER IS THE SMALLER, UNLESS A LARGER SIZE IS APPROVED BY THE ENGINEER. ANY ADMIXTURE ADDED AFTER THE INITIAL MIXING SHALL BE MIXED A MINIMUM OF 5 MINUTES AT MIXING SPEED. AFTER ALL COMPONENTS HAVE BEEN ADDED, THE SLUMP RANGE SHALL BE 6 + 2 INCHES. THE AIR CONTENT SHALL BE 8 + 2 PERCENT AT THE POINT OF DISCHARGE. IF SLUMP LOSS OCCURS AFTER MIXING, THE MIX MAY BE "RETEMPERED" WITH THE ADMIXTURE. IF THE CONSISTENCY OF THE CHARGE AFTER "RETEMPERING" IS SUCH AS TO CAUSE SEGREGATION OF THE COMPONENTS. THIS WILL BE CAUSE FOR REJECTION OF THE LOAD. THE MSMC SHALL STILL BE PLACED WITHIN THE 90 MINUTE LIMITATION.

CONCRETE SHALL BE MIXED IN A CENTRAL MIXING PLANT OR READY-MIXED CONCRETE TRUCK CAPABLE OF DISCHARGING CONCRETE HAVING A MAXIMUM WATER-CEMENT RATIO OF 0.36.

CENTRAL MIXING PLANTS AND READY-MIXED CONCRETE TRUCKS SHALL MEET THE REQUIREMENTS OF 499.04 (B). ADMIXTURES SHALL BE INTRODUCED INTO THE CONCRETE IN SUCH A MANNER THAT WILL DISPERSE IT THROUGHOUT THE ENTIRE LOAD. BATCH PLANTS SHALL MEET THE REQUIREMENTS OF 499.04 (A) AND SHALL BE LOCATED SUCH THAT THE MAXIMUM TIME REQUIRED FROM START OF MIXING TO COMPLETION OF DISCHARGE OF THE CONCRETE AT THE SITE OF WORK SHALL NOT EXCEED 90 MINUTES.

THE OVERLAY PATCHES SHALL BE WATER CURED AS PER CMS 511.14 METHOD (A) USING CONTINUOUS SPRINKLING AND NO PLASTIC SHEETING, FOR A MINIMUM OF 24 HOURS FOLLOWED BY A MEMBRANE CURE PER CMS 511.14 METHOD (B).

AN EVAPORATION RETARDANT AND FINISHING AID MAY BE USED AT THE CONTRACTOR'S OPTION PRIOR TO THE TEXTURING OPERATION. ANY PRODUCT USED FOR SUCH PURPOSE SHALL BE SPECIFICALLY MARKETED FOR SAID USE. (PLAIN WATER IS NOT ACCEPTABLE) THE APPLICATION RATE SHALL NOT EXCEED THE HOURLY SURFACE EVAPORATION RATE AS DETERMINED BY FIGURE 1 ON THE NEXT SHEET.

IMMEDIATELY AFTER THE TEXTURING OPERATION THE CONTRACTOR SHALL SPRAY AN EVAPORATION RETARDANT OVER THE TEXTURED AREA. THE APPLICATION RATE SHALL BE AS PER THE MANUFACTURER'S RECOMMENDATIONS. THE WET BURLAP CURE SHALL FOLLOW THIS OPERATION AS CLOSELY AS POSSIBLE.

THE CONTRACTOR SHALL SUPPLY A PROPERLY CALIBRATED IMPACT REBOUND HAMMER TO VERIFY THAT THE PATCHES HAVE REACHED 3000 P.S.I. COMPRESSIVE STRENGTH PRIOR TO OPENING TO TRAFFIC.

THE MSMC PATCHING MATERIAL SHALL BE PLACED ONLY WHEN THE LOCAL AMBIENT TEMPERATURE IS ABOVE 45 DEGREES FAHRENHEIT AND IS FORECAST TO REMAIN 45 DEGREES FAHRENHEIT FOR THE CURING PERIOD. THE MSMC SHALL NOT BE PLACED WHEN RAIN IS FORECAST WITHIN THE INTENDED WORKING PERIOD. MSMC SHALL BE PLACED ONLY IF THE PATCH SURFACE EVAPORATION RATE, AS AFFECTED BY THE AMBIENT AIR TEMPERATURE, CONCRETE TEMPERATURE, DECK TEMPERATURE, RELATIVELY HUMIDITY AND WIND VELOCITY, IS 0.1 POUND PER SQUARE FOOT PER HOUR OR LESS. THE CONTRACTOR SHALL DETERMINE AND DOCUMENT THE ATMOSPHERIC CONDITIONS SUBJECT TO VERIFICATION BY THE ENGINEER. NO MSMC SHALL BE PLACED IF THE AMBIENT AIR TEMPERATURE IS 85 DEGREES FAHRENHEIT OR HIGHER OR PREDICTED TO GO ABOVE 85 DEGREES FAHRENHEIT DURING THE PATCHING OPERATING REGARDLESS OF THE SURFACE EVAPORATION RATE.

STILSON & ASSOCIATES, INC.
CONSULTING ENGINEERING AND ARCHITECTURE
COLUMBUS AND CLEVELAND

STRUCTURE
GENERAL NOTES
LAK-90/271-1.88/0.00

LAKE COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
W.M.	R.T.P.		V.S.	G.W.M.	2/21/92	