FHWA REGION	STATE	PROJECT	
5	OHIO		

5
13

LAKE COUNTY
LAK-2-13 54ES
LAK-44-(03 85)(05 61 R&L)(06 20SW)
LAK-535-0039

BR-1-89

SEQUENCE OF OPERATION LAK-2-1354 ES

1) SOUND AND PATCH BRIDGE DECK
2) MODIFY SCUPPERS
3) APPLY HMWM, AND MORTAR OVERLAY
4) APPLY EDGE AND CENTERLINES
5) SOUND, PATCH BRIDGE COMPONENTS, AND INJECT DECK BOTTOM.
6) SEAL BRIDGE COMPONENTS WITH EPOXY AND THEN URETHANE TOPCOAT
7) INSTALL BARRIER REFLECTORS

SEQUENCE OF OPERATION LAK-44-0385

1) SOUND AND PATCH BRIDGE DECK
2) MODIFY SCUPPERS
3) APPLY HMWM, AND MORTAR OVERLAY
4) APPLY EDGE, CENTER AND LANE LINES
5) SOUND, PATCH BRIDGE COMPONENTS, AND INJECT DECK BOTTOM.
6) SEAL BRIDGE COMPONENTS WITH EPOXY AND THEN THE URETHANE TOPCOAT
7) REPAIR BRIDGE TERMINAL ASSEMBLIES
8) INSTALL BARRIER REFLECTORS

SEQUENCE OF OPERATION LAK-44-0561 L&R

1) RESET BEARINGS
2) SOUND AND PATCH BRIDGE DECK
3) MODIFY SCUPPERS
4) APPLY HMWM
5) PREPARE DECK FOR MORTAR OVERLAY
6) APPLY MORTAR OVERLAY
7) APPLY EDGE, CENTER AND LANE LINES
8) SOUND AND INJECT DECK BOTTOM.
9) INSTALL BARRIER REFLECTORS.

SEQUENCE OF OPERATIONS LAK-44-0620 SW

1) RESET BEARINGS
2) SOUND AND PATCH BRIDGE DECK
3) MODIFY SCUPPERS
4) APPLY EPOXY WATERPROOFING OVERLAY
5) APPLY CENTER AND EDGE LINES
6) SOUND, PATCH BRIDGE COMPONENTS, AND INJECT DECK BOTTOM.
7) SEAL BRIDGE COMPONENTS WITH EPOXY AND THEN THE URETHANE TOPCOAT
8) INSTALL BARRIER REFLECTORS

SEQUENCE OF OPERATIONS LAK-535-0039

1) RESET BEARINGS
2) SOUND AND PATCH BRIDGE DECK
3) APPLY HMWM, AND MORTAR OVERLAY
4) APPLY EDGE, CENTER AND LANE LINES
5) REMOVE GUARDRAIL AND DRIPSTRIP
6) INSTALL BTA'S, GUARDRAIL AND ANCHOR ASSEMBLY
7) PLACE CLASS C CONCRETE
8) SOUND AND PATCH BRIDGE COMPONENTS
9) SEAL BRIDGE COMPONENTS WITH EPOXY AND THEN THE URETHANE TOPCOAT
10) INSTALL BARRIER REFLECTORS

ITEM SPECIAL - SOUNDING CONCRETE DECK BOTTOMS

THIS WORK SHALL CONSIST OF SUPPLYING THE MATERIALS, LABOR, AND EQUIPMENT NECESSARY FOR SOUNDING DECK BOTTOMS IN ORDER THAT THE ENGINEER MAY OUTLINE THE DELAMINATED AREAS. AFTER ALL OVERLAY REMOVAL OPERATIONS ON A GIVEN BRIDGE ARE COMPLETED, THE CONTRACTOR SHALL SOUND THE ENTIRE DECK BOTTOM WITH HAMMERS AND THE ENGINEER SHALL OUTLINE ALL UNSOUND AREAS FOR EPOXY INJECTION. THE FOOTAGE UNDER THIS ITEM SHALL BE THE NUMBER OF SQUARE FEET OF DECK BOTTOM THAT ARE SATISFACTORILY SOUNDED AND ACCEPTED. THE ACCEPTED QUANTITIES OF DECK BOTTOM SOUNDING WILL BE PAID FOR AT THE CONTRACT BID PRICE PER SQUARE FOOT, WHICH PRICE AND PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, LABOR, AND EQUIPMENT NECESSARY FOR SOUNDING THE CONCRETE DECK BOTTOMS. PAYMENT WILL BE MADE UNDER:

ITEM	UNIT	DESCRIPTION
SPECIAL	SQUARE FOOT	SOUNDING CONCRETE DECK BOTTOMS

ITEM SPECIAL - LOW-PRESSURE EPOXY INJECTING DELAMINATED CONCRETE

I. DESCRIPTION: THIS WORK SHALL CONSIST OF LOW-PRESSURE EPOXY INJECTION OF DELAMINATED BOTTOM COVER CONCRETE OF BRIDGE DECKS IN ACCORDANCE WITH THESE SPECIFICATIONS, IN REASONABLY CLOSE CONFORMITY WITH THE PLANS AND MANUFACTURER'S RECOMMENDATIONS AS DIRECTED BY THE ENGINEER.

II. MATERIALS: THE INJECTION RESIN SHALL BE THERMAL-CHEM INJECTION RESIN PRODUCT NO. 2, POLY-CARB MARK-10 INJECTION RESIN, OR SIKADUR 52 INJECTION RESIN. THE BONDER SHALL BE THERMAL-CHEM BONDER PRODUCT NO.4, POLY-CARB MARK 8 NON-SAG EPOXY BONDER, OR SIKADUR HI-MOD GEL (SIKASTIX 31). ALL MATERIALS SHALL BE STORED AND INCORPORATED IN THE WORK AS RECOMMENDED BY THE MANUFACTURER. A MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT AT THE JOB SITE UNTIL SUCH TIME AS HE AND THE ENGINEER ARE SURE THAT THE CONTRACTOR IS QUALIFIED IN ALL ASPECTS OF EPOXY PRESSURE GROUTING.

III. PREPARATION: PORTS SHALL BE INSTALLED IN CLEAN HOLES WHICH ARE VACUUM DRILLED (TO PREVENT FINES FROM BEING IMPACTED IN THE CRACK) 3 INCHES UP INTO THE DECK BOTTOM SO THAT EPOXY WILL PENETRATE THE HOLLOW PLANE. THE FIRST PORT SHALL BE LOCATED NEAR THE EDGE OF THE OUTLINED UNSOUND AREA. ADDITIONAL PORTS SHALL BE PLACED AT DISTANCES SLIGHTLY GREATER THAN THE DISTANCE FROM THE FIRST PORT TO THE VOID EDGE. PORT PLACEMENT MUST INSURE THAT THE GROUT FACE REACHES THE EDGE OF THE VOID BEFORE REACHING THE NEXT PORT. PORTS AND VISIBLE CRACKS SHALL BE SEALED WITH THE BONDER TO PREVENT EMISSION OF INJECTION RESIN. THE BONDER SHALL CURE 24 HOURS PRIOR TO INJECTION OF EPOXY RESIN.

IV. INJECTION: THE DECK SHALL BE INJECTED ONLY WHEN IT IS DRY AND ITS TEMPERATURE IS ABOVE 50° F. THE INJECTION RESIN SHALL BE AT 70° F PRIOR TO MIXING THE COMPONENTS.

THE EPOXY INJECTION EQUIPMENT SHALL BE CAPABLE OF INJECTING THE MATERIAL INTO THE PORTS AT LOW PRESSURES OF 14 TO 20 PSI. THE INJECTION EQUIPMENT SHALL BE CAPABLE OF METERING, MIXING, INJECTING, AND MEASURING THE FLOW OF THE EPOXY RESIN ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.

THE INJECTION SHALL COMMENCE AT THE EDGE OF THE DELAMINATION AND CONTINUE UNTIL THE EPOXY RESIN APPEARS AT THE NEXT PORT. MOST INCOMPLETELY FILLED VOIDS ARE CAUSED BY THE OPERATOR STOPPING THE INJECTION PROCESS PREMATURELY: THEREFORE, A STEADY LOW PRESSURE SHALL BE MAINTAINED ON THE EPOXY UNTIL A STEADY CLEAR FLOW APPEARS AT THE NEXT PORT. THEN THE INJECTION NOZZLE SHALL BE REMOVED AND THE PORT CLOSED. THE INJECTION SHALL BE CONTINUED FROM PORT TO PORT UNTIL THE VOID IS COMPLETELY FILLED. SINCE THE EPOXY FACE IS MOVING UNDER VISCOUS FLOW CONDITIONS, WHICH ARE GOVERNED BY FLUID SURFACE FRICTION, THE INJECTION PROCESS IS SLOW. REGARDLESS, INJECTION PRESSURE SHALL BE 20 PSI MAXIMUM SO THAT THE BOTTOM COVER CONCRETE IS NOT BLOWN OFF. PROGRESS OF THE EPOXY SHALL BE CHECKED WITH A TAPPING HAMMER.

V. TESTING THE INJECTED VOID: THE OUTLINED INJECTED VOIDS SHALL BE SOUNDED WITH A HAMMER BY THE ENGINGEER. THE REMAINING UNSOUND AREAS SHALL BE PORTED AND REINJECTED AT NO ADDITIONAL COST TO THE STATE. ALL EQUIPMENT, LABOR, AND MATERIAL REQUIRED BY THE ENGINEER TO ACCOMPLISH THIS WORK SHALL BE SUPPLIED BY THE CONTRACTOR.

VI. METHOD OF MEASUREMENT: THE FOOTAGE UNDER THIS ITEM SHALL BE THE NUMBER OF SQUARE FEET OF DELAMINATED DECK BOTTOM CONCRETE THAT ARE SATISFACTORILY LOW-PRESSURE EPOXY INJECTED AND ACCEPTED.

VII. BASIS OF PAYMENT: THE ACCEPTED QUANTITIES OF LOW-PRESSURE EPOXY INJECTED CONCRETE WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER SQUARE FOOT, WHICH PRICE AND PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING AND PLACING ALL MATERIALS, SOUNDING THE INJECTED AREAS, SUPPLYING THE MANUFACTURER'S REPRESENTATIVE, AND ALL OTHER MATERIAL, LABOR, AND EQUIPMENT NECESSARY TO COMPLETE THIS WORK ACCORDING TO SPECIFICATIONS.

PAYMENT WILL BE MADE UNDER:

ITEM	UNIT	DESCRIPTION
SPECIAL	SQ.FT.	LOW-PRESSURE EPOXY INJECTING DELAMINATED CONCRETE

ESTIMATED QUANTITIES

ITEM EXT.	ITEM	DESCRIPTION	TOTAL	UNIT	PART 1 LAK-2-1354ES	PART 2 LAK-44 0385	PART 3 LAK-44 0561L	PART 4 LAK-44 0561R	PART 5 LAK-44 0620SW	PART 6 LAK-535 0039	
	202	GUARDRAIL REMOVED	50	LIN. FT.						50	
	202	PORTIONS OF STRUCTURE REMOVED	LUMP	LUMP						LUMP	
	511	CLASS C, CONCRETE	1	CU.YD						1	
	606	BRIDGE TERMINAL ASSEMBLY, TYPE A, AS PER PLAN	2	EACH						2	
	606	GUARDRAIL, TYPE 5	200	LIN. FT.						200	
	606	ANCHOR ASSEMBLY, TYPE A	2	EACH						2	
	SPECIAL	STEEL DRIP STRIP	634	LIN. FT.						634	
	SPECIAL	BRIDGE TERMINAL ASSEMBLY REPAIR	4	EACH		4					
	SPECIAL	RESETTING BEARINGS	27	EACH			8	12	5	2	
	SPECIAL	PATCHING CONCRETE BRIDGE DECK, TYPE II, AS PER PLAN	306	SQ.YD	225	14	5	5	8	49	*
	SPECIAL	EPOXY WATERPROOFING OVERLAY (1/4" THICK)	1320	SQ.YD					1320		
	SPECIAL	TREATING CONCRETE BRIDGE DECK WITH HMWM RESIN	5511	SQ.YD	1074	1507	977	977		976	
	SPECIAL	SURFACE PREPARATION FOR MORTAR OVERLAY	5511	SQ.YD	1074	1507	977	977		976	
	SPECIAL	SOUNDING CONCRETE BRIDGE COMPONENTS	35 290	SQ.FT.	8841	9796			13085	3568	
	SPECIAL	PATCHING CONCRETE STRUCTURE WITH TROWELABLE MORTAR	550	SQ.FT.	100	100			300	50	*
	SPECIAL	SEALING OF CONCRETE SURFACE (EPOXY)	4844	SQ.YD	1122	1367			1625	730	
	SPECIAL	ACRYLIC LATEX MODIFIED MORTAR OVERLAY	5511	SQ.YD	1074	1507	977	977		976	
	SPECIAL	URETHANE TOPCOAT SEALER	4844	SQ.YD	1122	1367			1625	730	
	SPECIAL	SOUNDING CONCRETE DECK BOTTOM	46052	SQ. FT.	8347	12 348	7735	7735	9887	—	
	SPECIAL	LOW PRESSURE EPOXY INJECTING DELAMINATED CONCRETE	822	SQ.FT.	244	134	80	80	284	—	*
	630	REMOVAL OF BRIDGE MOUNTED CHEVRON SIGN	5	EACH					5		
	630	SIGN AND SIGN SUPPORT ASSEMBLY, BRIDGE MOUNTED,	9	EACH	4				5		
		41.40, MODIFIED, AS PER PLAN, STAINLESS STEEL (C-1,									
		C-2 SYSTEMS)									
	SPECIAL	SCUPPER MODIFICATION	72	EACH	18	12	10	10	22		
	802	BARRIER REFLECTOR, TYPE A AS PER PLAN	192	EACH	38	24	36	36	46	12	
	802	BARRIER REFLECTOR, TYPE B AS PER PLAN	46	EACH	16		6	6	18		
	802	BARRIER REFLECTOR, TYPE A2 AS PER PLAN	4	EACH		4					
	802	BARRIER REFLECTOR, TYPE B2 AS PER PLAN	16	EACH		8				8	
	624	MOBILIZATION	LUMP	LUMP	LUMP	LUMP	LUMP	LUMP	LUMP	LUMP	
	614	MAINTAINING TRAFFIC	LUMP	LUMP	LUMP	LUMP	LUMP	LUMP	LUMP	LUMP	
	614	TEMPORARY CENTERLINE, CLASS II	0.57	MILE	0.18				0.21	0.18	
	614	TEMPORARY LANE LINE, CLASS II	0.26	MILE		0.10	0.08	0.08			
	621	CENTERLINE	0.32	MILE	0.06	0.05	0.04	0.04	0.07	0.06	
	621	EDGE LINE	0.40	MILE	0.06	0.07	0.04	0.04	0.07	0.12	
	621	LANE LINE	0.13	MILE		0.05	0.04	0.04			

* - SINCE THE AMOUNT OF WORK TO BE PERFORMED UNDER THIS ITEM IS *INDETERMINATE*, ALL OR A PORTION OF THIS QUANTITY IS SUBJECT TO NON-PERFORMANCE WITHOUT PENALTY TO THE STATE OF OHIO.

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DISTRICT 12 BRIDGE DEPARTMENT

5/13

ESTIMATED QUANTITY SHEET
BR. NO. LAK-2/44/535-(1354ES)/(0385)
(0561 L&R)(0620SW)/0039

LAKE COUNTY OHIO

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
B.G.W.	J.P.H.	C.M.N.	EJA	DWL	1-7-89	