

# GENERAL NOTES

CALC. BY _____	<b>LAKE COUNTY</b>	OHIO	<b>159</b> <b>185</b>
DATE _____		FHWA REGION 5	
CHKD. BY _____	<b>LAK-90/271-1.88/0.00</b>		
DATE _____			

**ITEM 517 – RAILING FACED AS PER PLAN**

**A. DESCRIPTION:**

THIS ITEM SHALL CONSIST OF FACING EXISTING CURB STYLE PARAPETS TO ATTAIN A DEFLECTOR PARAPET SHAPE USING CAST IN PLACE CONCRETE. SEE DETAIL SHEET NO. 17/22 AND 18/22.

**B. REMOVAL:**

THE CONTRACTOR SHALL REMOVE THE EXISTING ALUMINUM RAILING, POSTS, PORTION OF CURB PLATES AND CONCRETE CURB TO PROVIDE CLEARANCE FOR PLACING CONCRETE AS DETAILED IN THE PLANS. ALL LOOSE OR UNSOUND PARAPET CONCRETE SHALL ALSO BE REMOVED. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT CUT, ELONGATE OR DAMAGE THE REINFORCING STEEL TO REMAIN IN ANY WAY. CONCRETE MAY BE REMOVED BY CHIPPING OR HAND DRESSING. CHIPPING HAMMERS SHALL NOT BE HEAVIER THAN THE NOMINAL 90-POUND CLASS. NO BACKHOE RAMS SHALL BE PERMITTED.

**C. DOWEL HOLES AND REINFORCING STEEL:**

DOWEL HOLES SHALL BE DRILLED AT 18 INCH MAXIMUM CENTER TO CENTER SPACING AS SHOWN ON THE PLANS. THE GROUT AND HOLES SHALL BE AS PER SS 852. GROUT MATERIAL SHALL BE LIMITED TO EPOXY RESIN ONLY. ANY REINFORCING STEEL WHICH IS TO REMAIN AND THAT IS BROKEN DURING RE-BENDING SHALL BE REPLACED WITH A NEW DOWELLED IN BAR AS DETAILED. ALL REINFORCING STEEL, DOWEL HOLES AND GROUTING ARE INCLUDED UNDER THIS ITEM OF WORK.

**D. SURFACE PREPARATION:**

THE PARAPET SURFACE SHALL BE THOROUGHLY CLEANED BY SANDBLASTING FOLLOWED BY AN AIR BLAST. IT MAY BE NECESSARY TO USE HAND TOOLS TO REMOVE SCALE FROM THE REINFORCING STEEL. THE SURFACE SHALL BE MADE FREE OF SPALLS, LAITANCE AND ALL TRACES OF FOREIGN MATERIAL. IF NECESSARY, DETERGENT CLEANING SHALL PRECEDE BLAST CLEANING TO ENSURE THE REMOVAL OF CONTAMINANTS THAT ARE DETRIMENTAL TO ACHIEVING AN ADEQUATE BOND.

**E. MATERIALS:**

REINFORCING STEEL	509,10 GRADE 60
CONCRETE	511, CLASS "S"

**F. SHRINKAGE CONTROL JOINTS:**

SHRINKAGE CONTROL JOINTS SHALL BE PLACED IN THE NEW CONCRETE PARAPETS AT THE SAME LOCATION AS THE EXISTING DEFLECTION JOINTS AND MIDWAY BETWEEN THE EXISTING JOINTS. MAXIMUM SAWN JOINT SPACING SHALL BE 10 FEET.

SHRINKAGE CONTROL JOINTS SHALL BE MADE NORMAL (AT RIGHT ANGLE) TO THE DECK BY SAWING. THE SAWING SHALL BE DONE AFTER THE CONCRETE HAS TAKEN ITS INITIAL SET AND BEFORE ANY SHRINKAGE CRACKS DEVELOP. THE USE OF AN EDGE GUIDE, FENCE OR JIG IS REQUIRED TO INSURE THAT THE CUT OF THE JOINT IS STRAIGHT, TRUE AND ALIGNED ON ALL FACES OF THE PARAPET. THE DEPTH OF THE SAW CUT SHALL BE ONE AND ONE-HALF INCHES. THE JOINT WIDTH SHALL BE THE WIDTH OF THE SAW BLADE, NOT TO EXCEED ONE QUARTER INCH. THE OUTSIDE ONE INCH OF THE PERIMETER OF THE SHRINKAGE CONTROL JOINT SHALL BE SEALED WITH A POLYURETHANE OR POLYMERIC JOINT SEALANT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION TT-S-00227E. THE BOTTOM ONE-HALF INCH OF BOTH THE INSIDE AND OUTSIDE FACES OF THE CONTROL JOINT SHALL BE LEFT UNSEALED TO ALLOW ANY WATER WHICH MAY ENTER THE JOINT TO ESCAPE.

**G. METHOD OF MEASUREMENT:**

THE QUANTITY SHALL BE THE ACTUAL LENGTH OF THE RAILING FACED, MEASURED FROM END OF WINGWALL TO END OF WINGWALL. THIS ITEM SHALL INCLUDE THE FURNISHING OF ALL LABOR EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THIS WORK. ALL COSTS OF REMOVAL, DOWEL HOLES, REINFORCING STEEL, CONCRETE, AND INSTALLING SHRINKAGE CONTROL JOINTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR:

ITEM	UNIT	DESCRIPTION
517	L.F.	RAILING FACED, AS PER PLAN, TYPE A OR TYPE B

**ITEM SPECIAL – LOW PRESSURE EPOXY INJECTING DELAMINATED CONCRETE**

THIS WORK SHALL CONSIST OF LOW-PRESSURE EPOXY INJECTION OF DELAMINATED CONCRETE OF BRIDGE DECKS IN ACCORDANCE WITH THESE SPECIFICATIONS, IN REASONABLY CLOSE CONFORMITY WITH THE PLANS AND MANUFACTURERS RECOMMENDATIONS AS DIRECTED BY THE ENGINEER.

INJECTION OF BRIDGE DECK BOTTOMS WILL NOT BE PERMITTED UNTIL ALL REMOVAL OPERATIONS ON THE DECK ARE COMPLETED. INJECTION OF DECK TOP SURFACES WILL NOT BE PERMITTED UNTIL ALL REMOVAL OPERATIONS FOR THAT CONSTRUCTION PHASE ARE COMPLETED. THE INJECTION RESIN SHALL BE THERMAL-CHEM INJECTION RESIN PRODUCT NO.2, POLY-CARB MARK-10 INJECTION RESIN, DURAL CRETE LV OR SIKADUR 52 INJECTION RESIN. BONDER SHALL BE THERMAL-CHEM BONDER PRODUCT NO.4, POLY-CARB MARK 8 NON SAG EPOXY BONDER, DURAL CRETE GEL 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 SATISFIED THAT THE CONTRACTOR IS QUALIFIED IN ALL ASPECTS OF EPOXY PRESSURE GROUTING.

PORTS SHALL BE INSTALLED IN CLEAN HOLES VACUUM-DRILLED TO PREVENT FINES FROM BEING IMPACTED INTO THE CRACK. THE HOLES SHALL BE 6 INCHES DEEP FOR TOP SURFACE INJECTION AND 3 INCHES FOR BOTTOM SURFACE INJECTION SO THAT THE 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 ENSURE THAT THE EPOXY RESIN FACE REACHES THE EDGE OF THE VOID BEFORE REACHING THE NEXT PORT. PORTS AND VISIBLE CRACKS SHALL BE SEALED WITH EPOXY BONDER BEFORE INJECTION OPERATION BEGINS TO PREVENT EMISSION OF INJECTION RESIN. THE BONDER SHALL CURE 24 HOURS PRIOR TO INJECTION OF EPOXY RESIN.

THE RESIN SHALL BE INJECTED ONLY WHEN THE DECK IS DRY AND ITS TEMPERATURE IS ABOVE 50 DEGREES F. THE INJECTION RESIN SHALL BE AT 70 DEGREES F. PRIOR TO MIXING COMPONENTS. THE EPOXY INJECTION EQUIPMENT SHALL BE CAPABLE OF INJECTING THE MATERIAL INTO THE PORTS AT LOW PRESSURE 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 STOOPIING THE INJECTION PROCESS PREMATURELY. THERFORE, A STEADY, LOW PRESSURE SHALL BE MAINTAINED ON THE EPOXY UNTIL A STEADY CLEAR FLOW APPEARS AT THE NEXT PORT. THEN THE NOZZLE IS REMOVED, THE PORT CAPPED AND THE INJECTION CONTINUED FROM PORT TO PORT UNTIL THE VOID IS COMPLETELY FILLED. SINCE THE EPOXY RESIN 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 COVER CONCRETE IS NOT BLOWN OFF. PROGRESS OF THE EPOXY SHALL BE CHECKED WITH A TAPPING HAMMER.

THE OUTLINED INJECTION VOIDS SHALL BE SOUNDED WITH A HAMMER BY THE ENGINEER. ANY REMAINING UNSOUND AREAS SHALL BE PORTED AND RE-INJECTED AT NO ADDITIONAL COST TO THE STATE. ALL PORTS SHALL BE CUT OFF FLUSH WITH THE SURFACE. ALL EQUIPMENT AND MATERIALS REQUIRED BY THE ENGINEER TO ACCOMPLISH THIS WORK SHALL BE SUPPLIED BY THE CONTRACTOR.

THIS SPECIFICATION LIMITS THE INJECTING PRESSURE TO 20 PSI MAX. TO PREVENT BLOWING THE DELAMINATION OFF THE DECK. IF THE CONTRACTOR PREFERENCES TO UTILIZE A HIGHER PRESSURE INJECTION PROCESS INSTEAD OF THE LOW PRESSURE HEREIN REQUIRED, HE SHALL SUBMIT HIS PROPOSED METHOD OF PREVENTING BLOW OFF OF THE SURFACE TO THE DIRECTOR FOR APPROVAL. NO HIGH PRESSURE INJECTION WILL BE PERMITTED WITHOUT WRITTEN APPROVAL FROM THE DIRECTOR.

NO VEHICULAR TRAFFIC WILL BE PERMITTED ON A BRIDGE DECK WHICH HAS RECEIVED TOP SURFACE INJECTION UNTIL THE EPOXY HAS CURED FOR A MINIMUM OF 24 HOURS.

METHOD OF MEASUREMENT: THE QUANTITY UNDER THIS ITEM SHALL BE THE NUMBER OF SQUARE FEET OF DELAMINATED DECK CONCRETE THAT ARE SATISFACTORILY INJECTED AND ACCEPTED.

BASIS OF PAYMENT: THE CONTRACT UNIT PRICE BID SHALL CONSTITUTE FULL COMPENSATION FOR FURNISHING AND PLACING ALL MATERIALS, SOUNDING THE INJECTED AREAS, SUPPLYING THE MANUFACTURERS REPRESENTATIVE AND ALL OTHER MATERIAL, LABOR AND EQUIPMENT NECESSARY TO COMPLETE THE WORK IN ACCORDANCE WITH THIS SPECIFICATION. PAYMENT WILL BE MADE AT CONTRACT PRICES FOR:

ITEM	UNIT	DESCRIPTION
SPECIAL	SQUARE FOOT	LOW PRESSURE EPOXY INJECTING DELAMINATED CONCRETE – BRIDGE DECK TOP SURFACE
SPECIAL	SQUARE FOOT	LOW PRESSURE EPOXY INJECTING DELAMINATED CONCRETE – BRIDGE DECK BOTTOM SURFACE

**ITEM 513 – STRUCTURAL STEEL MISC.: RETROFIT PIN AND HANGER ASSEMBLY**

THIS ITEM SHALL PROVIDE FOR REMOVAL OF THE EXISTING PIN AND HANGER ASSEMBLY AND INSTALLATION OF A NEW ASSEMBLY IN ACCORDANCE WITH THIS NOTE AND THE DETAILS IN THE PLANS. THE FOLLOWING PROCEDURE SHALL BE IMPLEMENTED TO ACCOMPLISH THE WORK:

- A. SUPPORT THE EXISTING JOINT AS DETAILED IN THE PLANS.
- B. REMOVE THE EXISTING PIN NUTS, LINKS, WASHERS, AND PINS.
- C. CLEAN AND PAINT THE STRINGERS FROM THE OPEN JOINT TO THE FIRST TRANSVERSE STIFFENER, UTILIZING SYSTEM OZEU. SEE PROPOSAL NOTE.
- D. INSTALL THE NEW PIN AND HANGER ASSEMBLY.
- E. REMOVE TEMPORARY SUPPORT ASSEMBLY AND FULLY LUBRICATE PINS WITH CHEVRON ULTRA DUTY II GREASE.

PAYMENT FOR ALL LABOR, MATERIAL AND EQUIPMENT INCLUDING PAINTING AND TEMPORARY SUPPORT SHALL BE PAID FOR UNDER:

ITEM	UNIT	DESCRIPTION
513	EACH	STRUCTURAL STEEL MISC.: RETROFIT PIN AND HANGER ASSEMBLY

**ITEM 513 – STRUCTURAL STEEL MISC.: REPLACE PIN AT FIXED HINGE**

THIS ITEM SHALL PROVIDE FOR REMOVAL OF THE EXISTING PIN AND INSTALLATION OF A NEW PIN IN ACCORDANCE WITH THIS NOTE AND THE DETAILS IN THE PLANS. THE FOLLOWING PROCEDURE SHALL BE IMPLEMENTED TO ACCOMPLISH THE WORK:

- A. SUPPORT THE EXISTING JOINT FROM BELOW THE DECK.
- B. REMOVE THE EXISTING PIN NUTS, WASHERS, AND PIN.
- C. INSTALL THE NEW PIN.
- D. REMOVE TEMPORARY SUPPORT ASSEMBLY AND FULLY LUBRICATE PINS WITH CHEVRON ULTRA DUTY II GREASE.

PAYMENT FOR ALL LABOR, MATERIAL AND EQUIPMENT INCLUDING TEMPORARY SUPPORT SHALL BE PAID FOR UNDER:

ITEM	UNIT	DESCRIPTION
513	EACH	STRUCTURAL STEEL MISC.: REPLACE PIN AT FIXED HINGE

<b>STILSON &amp; ASSOCIATES, INC.</b> CONSULTING ENGINEERING AND ARCHITECTURE COLUMBUS AND CLEVELAND						
<b>STRUCTURE</b> <b>GENERAL NOTES</b> <b>LAK-90/271-1.88/0.00</b>						
LAKE COUNTY						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
W.M.	R.T.P.		V.S.	G.W.M.	2/21/92	