GENERAL NOTES

metric units

ITEM 516 – JACKING AND TEMPORARY SUPPORT OF SUPERSTRUCTURE, AS PER PLAN:
THIS ITEM SHALL CONSIST OF FURNISHING ALL NECESSARY LABOR, MATERIALS, AND EQUIPMENT TO RAISE OR REPOSITION ANY EXISTING STRUCTURES TO THE DIMENSIONS AND REQUIREMENTS DEFINED IN THE PROJECT PLANS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, INSTALLATION AND OPERATION OF AN ADEQUATE JACKING SYSTEM INCLUDING ANY TEMPORARY OR PERMANENT SUPPORTS NECESSARY TO PERFORM THE WORK DESCRIBED IN THE PROJECT PLANS. THREE (3) SETS OF JACKING PLANS, WHICH INCLUDE THE INFORMATION DESCRIBED IN THIS NOTE, SHALL BE SUBMITTED TO THE DIRECTOR FOR APPROVAL AT LEAST THIRTY (30) DAYS BEFORE ACTUAL WORK IS TO BEGIN. THE PLANS SHALL BE PREPARED AND STAMPED BY A REGISTERED PROFESSIONAL ENGINEER.

JACKING SUBMITTALS SHALL INCLUDE AT LEAST THE FOLLOWING:

1. THE SIGNATURE AND NUMBER, OR PROFESSIONAL SEAL, OF THE REGISTERED PROFESSIONAL ENGINEER WHO PREPARED THE SUBMITTAL.
2. CALCULATIONS AND ANALYSIS OF THE STRUCTURE TO DETERMINE AND DEFINE THE ACTUAL LOADING APPLIED AT THE CONTRACTOR'S SELECTION JACKING POINTS.
3. A DRAWING SHOWING THE PHYSICAL AND DIMENSIONAL POSITION OF THE JACKS WITH RESPECT TO THE STRUCTURE INCLUDING CLEARANCES AND CENTER OF LIFT.
4. A SCHEMATIC LAYOUT OF JACKS, CHECK VALVES, PUMPS WITH 3 WAY RETRACTOR VALVE, PRESSURE GAUGES, FLOW CONTROL VALVES, ETC. IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. ALL JACKS FOR EACH PHASE'S LIFT AT ABUTMENT OR PIER SHALL BE CONNECTED TOGETHER. ALL JACKS AT EACH ABUTMENT OR PIER SHALL BE THE SAME SIZE.
5. ANALYSIS AND CALCULATIONS OF THE STRESSES INDUCED OR CREATED IN THE STRUCTURE AND ANY TEMPORARY OR PERMANENT SUPPORTS. DESIGN CALCULATIONS OF ANY TEMPORARY OR PERMANENT SUPPORTS.
6. PHYSICAL DIMENSIONS, MATERIALS, AND FABRICATION DETAILS OF ANY TEMPORARY OR PERMANENT SUPPORTS. HORIZONTAL AND VERTICAL MOVEMENT RESTRAINT SHALL BE PROVIDED.
7. A STEP BY STEP PROCEDURE DETAILING ALL STEPS IN THE JACKING OPERATION.
8. METHOD OF ATTACHMENT TO STRUCTURAL MEMBERS. WELDING TO TENSION AREAS WILL NOT BE PERMITTED.

THE WORK REQUIRED INCLUDES RAISING AND SUPPORTING THE GIRDERS WHILE THE BEARINGS ARE REMOVED AND REFURBISHED. THE ESTIMATED DEAD LOAD AT A BEARING WITH THE DECK REMOVED IS GIVEN IN THE TABLE BELOW. THE WORK IN EACH PHASE OF THE PROJECT SHALL BE PERFORMED AFTER THE REMOVAL OF THE EXISTING DECK, AND BEFORE THE PLACING OF THE NEW DECK EXCEPT FOR GIRDER LINE (J) ON THE NORTHBOUND BRIDGE.

STRUCTURE	REAR ABUTMENT	PIER 1	PIER 3	FORWARD ABUTMENT
SOUTHBOUND S.R. 44 OVER I–90 (LAK–90–23609)	25 kN	120 kN	90 kN	23 kN
NORTHBOUND S.R. 44 OVER I–90 (LAK–90–23641) (EXCEPT GIRDER LINE (J))	26 kN	130 kN	93 kN	25 kN
NORTHBOUND S.R. 44 OVER I–90 (LAK–90–23641) GIRDER LINE (J) WITH LIVE LOAD AND DECK DEAD LOAD INCLUDED		440 kN	330 kN	130 kN

THE ENTIRE SYSTEM INCLUDING JACKS SHALL HAVE AT LEAST 20% MORE CAPACITY THAN REQUIRED BASED ON CALCULATED LOADS. JACKS SHALL HAVE A SWIVEL LOAD CAP, A DOMED HEAD OR SOME OTHER DEVICE TO PROTECT AGAINST THE EFFECTS OF SIDE LOAD ON THE JACK. SINGLE RATING RAMS WITH NO OVER–TRAVEL PROTECTION SYSTEM SHALL NOT BE USED. SPARE EQUIPMENT SHALL BE AVAILABLE ON SITE FOR THE REQUIRED STRUCTURE RAISING TO PROCEED IN THE EVENT OF BREAKDOWN. A LIST OF SPARE EQUIPMENT SHALL BE PROVIDED TO THE ENGINEER. THE JACKING OPERATION SHALL BE DIRECTED BY A PROFESSIONAL ENGINEER EMPLOYED BY THE CONTRACTOR. FAILURE TO HAVE A PROFESSIONAL ENGINEER PRESENT SHALL BE CAUSE FOR CEASING JACKING OPERATIONS.

AT A MINIMUM, A JACKING OPERATION SHALL LIFT ALL GIRDERS TO BE WORKED ONE IN EACH PHASE AT ANY ONE ABUTMENT OR PIER SIMULTANEOUSLY.
THE ONLY EXCEPTION IS THE SITUATION WHERE WORK INVOLVES REPLACING OR REHABILITATING INDIVIDUAL BEARINGS; NO PERMANENT SHIMMING IS REQUIRED AND THE HEIGHT OF THE LIFT SHALL NOT EXCEED 6 mm.

JACKS ALONE SHALL NOT BE USED TO SUPPORT LOADS EXCEPT DURING THE ACTUAL JACKING OPERATION. TEMPORARY SUPPORTS, BLOCKING OR OTHER METHODS APPROVED BY THE DIRECTOR SHALL BE USED. THE CONTRACTOR SHALL DEMONSTRATE TO THE ENGINEER THAT THE BRIDGE BEARINGS ARE FULLY SEATED BETWEEN ALL CONTACT AREAS. IF FULL SEATING IS NOT ATTAINED, SUITABLE MEANS OF REPAIR, SUBJECT TO THE APPROVAL OF THE ENGINEER, WILL BE REQUIRED AT THE CONTRACTOR'S EXPENSE. ANY DAMAGE TO TO STRUCTURAL MEMBERS, CONNECTIONS, OR PARTS THAT ARE TO REMAIN AS PART OF THE PERMANENT CONSTRUCTION SHALL BE CORRECTED OR REPAIRED BY THE CONTRACTOR, AT HIS EXPENSE, TO THE SATISFACTION OF THE ENGINEER.

PAYMENT SHALL BE MADE AT THE LUMP SUM PRICE BID FOR ITEM 516, JACKING AND TEMPORARY SUPPORT OF SUPERSTRUCTURE, AS PER PLAN AND SHALL INCLUDE ALL NECESSARY TOOLS, LABOR, EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THIS ITEM OF WORK.

ITEM 517 – RAILING, CONCRETE PARAPET WITH CHAIN LINK FENCE, AS PER PLAN
HIGH PERFORMANCE CONCRETE MEETING THE 844 SPECIFICATIONS SHALL BE USED TO BUILD THE RAILINGS. CONCRETE PARAPETS SHALL NOT BE SLIP FORMED. THE MINIMUM CONCRETE SLUMP DURING PLACEMENT OF ALL CONCRETE PARAPETS SHALL BE 152 mm. THE MAXIMUM SLUMP ALLOWED DURING PLACEMENT IS 203 mm. FORMS SHALL NOT BE REMOVED UNTIL AT LEAST 2 HOURS AFTER THE FINAL SET. DETERMINATION OF THE FINAL SET SHALL BE AS PER ASTM C266 (GILLMORE NEEDLE). TESTING SHALL BE PERFORMED BY THE CONTRACTOR AT NO COST TO THE STATE. ANCHOR BOLTS FOR FENCE POSTS SHALL BE CAST IN PLACE.

ITEM 518 – POROUS BACKFILL WITH FILTER FABRIC, AS PER PLAN
EXISTING WEEPHOLES IN THE CONCRETE ABUTMENTS SHALL BE CLEANED AND FLUSHED WITH WATER TO REMOVE ALL DIRT AND DEBRIS. THE CLEANING SHALL BE INCLUDED WITH ITEM 518, POROUS BACKFILL WITH FILTER FABRIC, AS PER PLAN.

ITEM 519 – PATCHING CONCRETE STRUCTURES, AS PER PLAN
EXISTING DETERIORATED CONCRETE SHALL BE REPAIRED AT THE ABUTMENTS AND PIERS AT LOCATIONS SHOWN THE PLANS AND WHERE DIRECTED BY THE ENGINEER. THESE LOCATIONS OF DETERIORATION WERE MARKED ON EACH STRUCTURE IN AUGUST,1999. THE TABLE SHOWES THE MEASURED QUANTITIES SHOWN ON SHEET 1,5&6 / 18

WHERE THE BOND BETWEEN THE CONCRETE AND A REINFORCING BAR HAD BEEN DESTROYED OR WHERE MORE THAN ONE HALF THE PERIPHERY OF SUCH A BAR HAS BEEN EXPOSED, THE ADJACENT CONCRETE SHALL BE REMOVED TO A DEPTH THAT WILL PROVIDE A MINIMUM 38 mm CLEARANCE AROUND THE BAR EXCEPT WHERE OTHER REINFORCING BARS MAKE THIS IMPRACTICABLE. AFTER COMPLETION OF THE SECONDARY REMOVAL OPERATIONS, THE ENGINEER WILL RESOUND THE AREAS TO INSURE THAT ONLY SOLID CONCRETE REMAINS. CONCRETE MAYBE REMOVED BY CHIPPING OR HAND DRESSING. CHIPPING HAMMERS SHALL NOT BE HEAVIER THAN THE 16 KILOGRAM CLASS. WHERE EXISTING REINFORCING BARS WOULD BE LESS THAN 25 mm FROM THE PROPOSED FINISHED SURFACE OF CONCRETE, THEY SHALL, IF PRACTICAL, BE DRIVEN BACK INTO RECESSES CUT IN THE MASONRY TO OBTAIN THE COVERAGE UNLESS OTHERWISE APPROVED BY THE ENGINEER.

THE PERIMETER OF THE PATCH AREAS SHALL BE SAW CUT TO A MINIMUM 25 mm DEPTH, OR TO THE REINFORCING STEEL, IF LESS THAN 25 mm.

CLEANING SHALL PRECEDE APPLICATION OF THE PATCHING MATERIAL BY NOT MORE THAN 24 HOURS. THE SURFACE TO BE PATCHED AND EXPOSED REINFORCING STEEL SHALL BE THOROUGHLY CLEANED BY SANDBLASTING TO GRADE SA–1, FOLLOWED BY AN AIR BLAST. IT MAY BE NECESSARY TO USE HAND TOOLS TO REMOVE SCALE FROM THE REINFORCING STEEL. SURFACES SHALL BE MADE FREE OF SPALL, LAITANCE AND ALL TRACES OF FOREIGN MATERIAL. IF NECESSARY, DETERGENT CLEANING SHALL PRECEDE BLAST CLEANING TO INSURE THE REMOVAL OF CONTAMINANTS DETRIMENTAL TO ACHIEVING AN ADEQUATE BOND. ALL UNCHIPPED SURFACES THAT WILL RECEIVE NEW CONCRETE SHALL BE MECHANICALLY ROUGHENED.

FORMS SHALL BE ERECTED FLUSH WITH THE FACES OF THE REPAIR AREAS TO INSURE THAT CONCRETE DOES NOT ESCAPE FROM THE PATCH AREA.

WELDED STEEL WIRE FABRIC REINFORCEMENT SHALL BE REQUIRED FOR ALL PATCHES, INCLUDING TOP HORIZONTAL SURFACES. THE REINFORCMENT SHALL BE SECURED IN PLACE BY 10 mm DIAMETER ADHESIVE ANCHORS AT MAXIMUM 305 mm CENTERS IN BOTH DIRECTIONS, AS WELL AS TIED TO EXPOSED REINFORCING STEEL. ADHESIVE ANCHORS SHALL BE EMBEDDED AT LEAST 90 mm INTO THE EXISTING CONCRETE

	LAK–90–23.609 (SB)	LAK–90–23.641 (NB)	LAK–90–23.609 (SB) LAK–90–23.641 (NB)
MEASURED CONCRETE DETERIORATION	SQ. METER	SQ. METER	SQ. METER
REAR ABUTMENT	1.8	3	
PIER 1	0	0	
PIER 2	0.1	0	
PIER 3	0	0	
FORWARD ABUTMENT	1.6	0	
CONTINGENCY	5	5	
ESTIMATED STRUCTURE TOTAL	8.5	8	
ESTIMATED PLAN TOTAL			16.5

ITEM 815 – SURFACE PREPARATION AND FIELD PAINTING OF EXISTING STEEL, SYSTEM OZEU
THE PLANS INCLUDE CONTINGENCY QUANTITIES OF 5 SQUARE METERS PER STRUCTURE OF SURFACE PREPARATION AND PRIME, INTERMEDIATE AND FINISH COATING OF EXISTING STEEL, SYSTEM OZEU. A FIELD INSPECTION IN AUGUST,1999 REVEALED NO AREAS OF EXISTING PAINT DETERIORATION.

THE ENTIRE SUPERSTRUCTURE IS NOT SCHEDULED TO BE CLEANED AND PAINTED. THE QUANTITIES WILL BE USED AS DIRECTED BY THE ENGINEER TO REPAIR ANY EXISTING DAMAGE TO THE PAINT SYSTEM FOUND ON THE STEEL. ANY DAMAGE CAUSED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT NO COST TO THE STATE.

ITEM 844 HIGH PERFORMANCE CONCRETE, SUPERSTRUCTURE, (DECK) AS PER PLAN

ITEM 844 HIGH PERFORMANCE CONCRETE, SUPERSTRUCTURE, (PARAPET) AS PER PLAN

THE PROVISIONS OF 844 SHALL APPLY EXCEPT AS NOTED BELOW.

MIX OPTIONS

ALL OTHER CONCRETE SHALL BE THIS MIX OR MIX 2 CONCRETE.
THE FOLLOWING PROPORTIONS WILL BE USED AS A STARTING MIX DESIGN.

CONCRETE TABLE
QUANTITIES PER CUBIC YARD
AGGREGATES (SSD)

MIX 4, AS PER PLAN (GGBF SLAG + MICROSILICA)

AGGREGATE TYPE	FINE AGGRE. (LB.)	#8 COURSE AGGRE. (LB.)	#57 COARSE AGGRE. (LB.)	TOTAL (LB.)	CEMENT CONTENT (LB.)	GGBF SLAG (LB.)	MICRO–SILICA (LB.)	WATER TO CEMENTITIOUS RATION MX	AIR CONTENT +/–2%
GRAVEL	1245	360	1315	2920	400	170	30	0.42	7
LIMESTONE	1245	360	1335	2940	400	170	30	0.42	7
SLAG	1245	315	1155	2715	400	170	30	0.42	7

THE WEIGHTS SPECIFIED IN THE CONCRETE TABLE WERE CALCULATED FOR MATERIALS OF THE FOLLOWING BULK SPECIFIC GRAVITIES (SSD): NATURAL SAND AND GRAVEL 2.62, LIMESTONE SAND 2.68, LIMESTONE 2.65, SLAG 2.30, FLY ASH 2.65, GGBF SLAG 2.90, MICROSILICA SOLIDS 2.20, AND PORTLAND CEMENT 3.15. FOR AGGREGATES OF SPECIFIC GRAVITIES DIFFERING MORE THAN PLUS OR MINUS 0.02 FROM THESE, THE WEIGHTS IN THE TABLE WILL BE CORRECTED.

BASIS OF PAYMENT. PAYMENT FOR THE ABOVE COMPLETED AND ACCEPTED QUANTITIES WILL BE MADE AT THE CONTRACT BID PRICE FOR:

ITEM	UNITS	DESCRIPTION
844E48001	CUBIC YARDS	HIGH PERFORMANCE CONCRETE SUPERSTRUCTURE (DECK), AS PER PLAN
844E48041	CUBIC YARD	HIGH PERFORMANCE CONCRETE SUBSTRUCTURE, AS PER PLAN
844E49000	LUMP SUM	HIGH PERFORMANCE CONCRETE TRIAL MIX
844E49010	LUMP SUM	HIGH PERFORMANCE CONCRETE TESTING

RICHLAND ENGINEERING LIMITED
29 NORTH PARK STREET
MANSFIELD, OHIO 44902

DESIGNED KAK | DRAWN KAK | REVIEWED DAP | DATE 9/8/99
CHECKED DT | REVISED | STRUCTURE FILE NO. 4304381/4304411

GENERAL NOTES
BRIDGE NO. LAK–90–23609/23641
S.R. 44 OVER I–90

LAK–90–23.609/23.641

96161GN.DWG
JOB NO. 96161 DATE 8/30/99 DRAWN BY KAK,CAR