

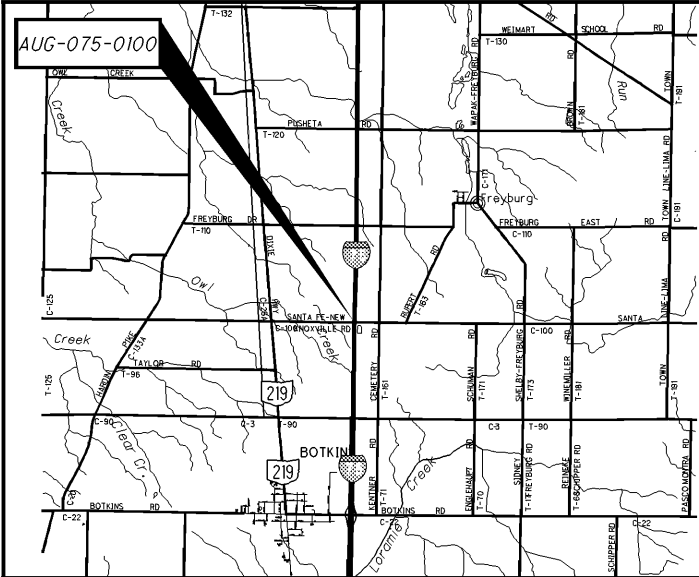
FOR LOCATION MAPS, LATITUDE AND LONGITUDE,  
SEE SHEETS 2-4

$$\frac{1}{79}$$

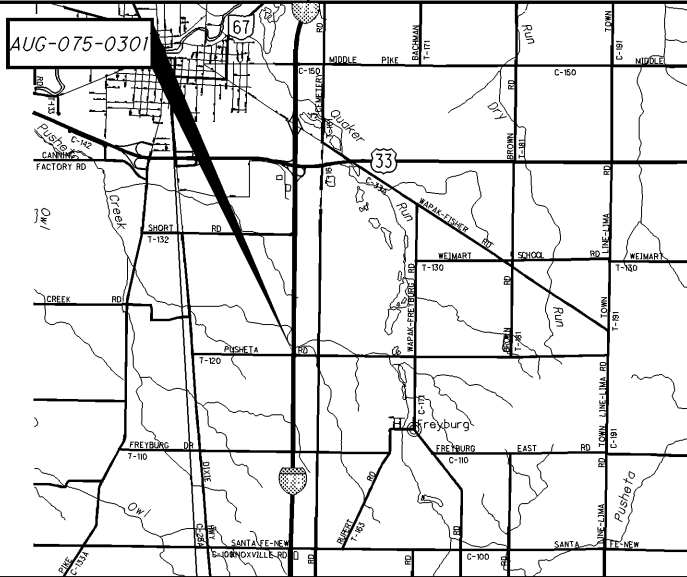
D07 - -BH-FY14  
140305 PID - 94483  
Dist 7 5/22/2014

Contract Proposal Available @ [www.contracts.dot.state.oh.us/home](http://www.contracts.dot.state.oh.us/home)

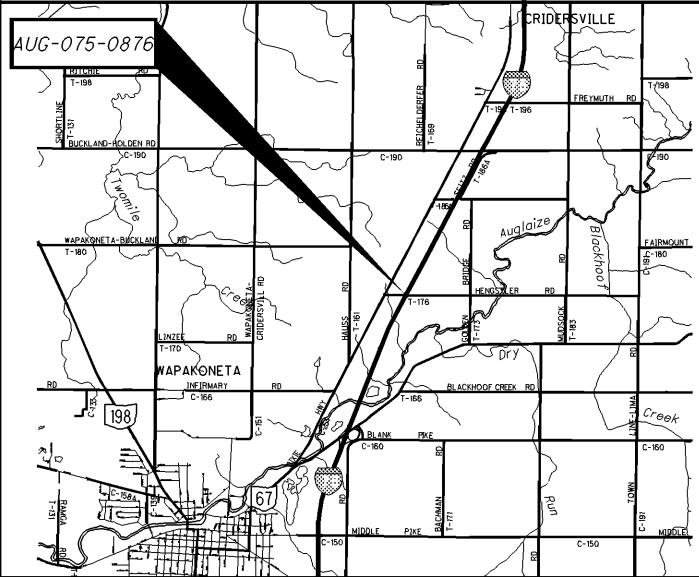
94483G02.dgn Sheet 1/29/2014 10:15AM CH\_OD0TV8i\_Half\_BW.pen \\antigone\Germantown\_baukerma



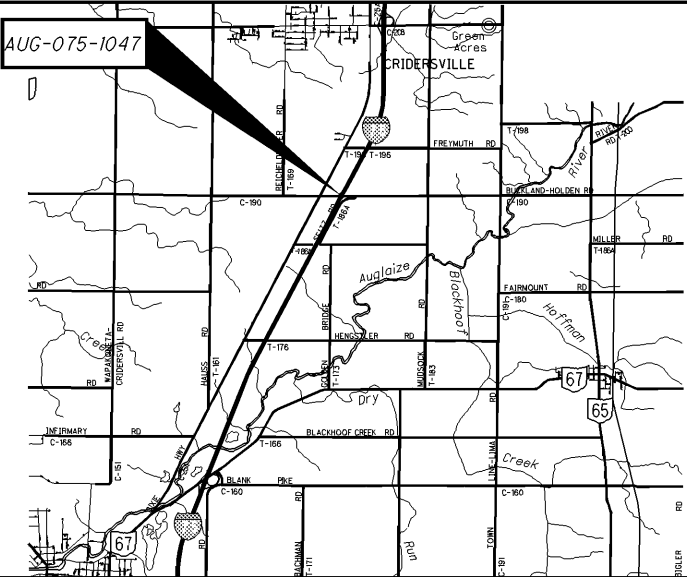
LOCATION MAP (STRUCTURE: AUG-075-0100)  
SFN: 0601896  
LATITUDE: 40° 29' 49" LONGITUDE: 84° 10' 10"



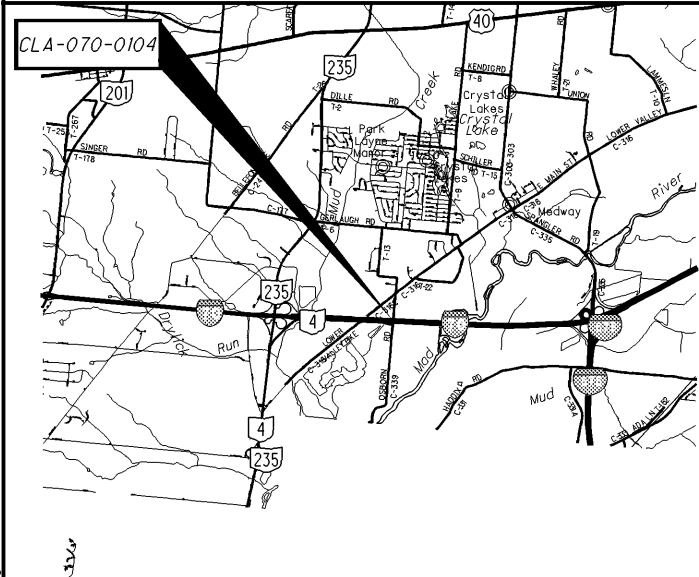
LOCATION MAP (STRUCTURE: AUG-075-0301)  
SFN: 0601950  
LATITUDE: 40° 31' 34" LONGITUDE: 84° 10' 10"



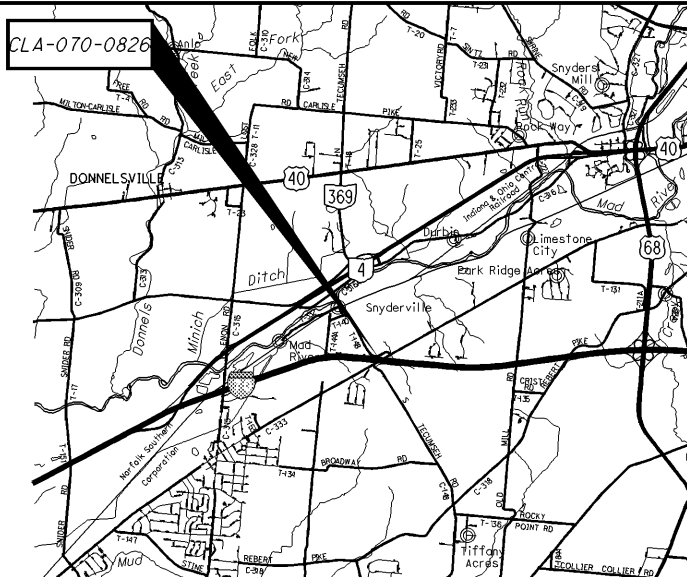
LOCATION MAP (STRUCTURE: AUG-075-0876)  
SFN: 0602310  
LATITUDE: 40° 36' 25" LONGITUDE: 84° 09' 12"



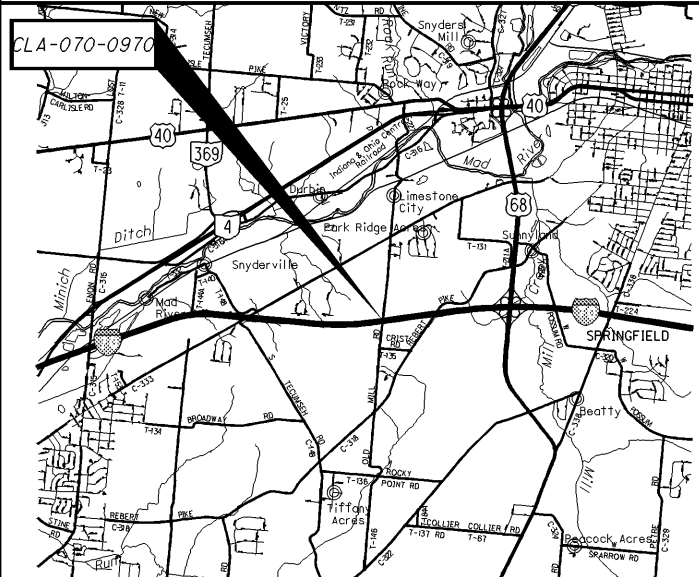
LOCATION MAP (STRUCTURE: AUG-075-1047)  
SFN: 0602345  
LATITUDE: 40° 37' 45" LONGITUDE: 84° 08' 20"



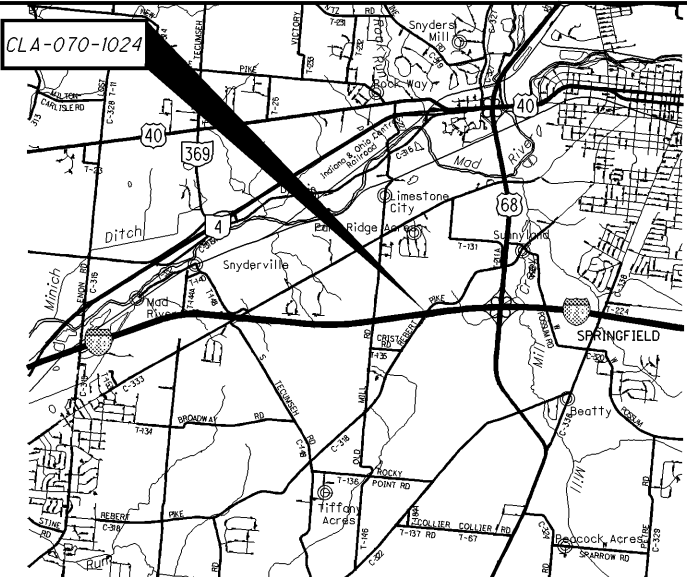
LOCATION MAP (STRUCTURE: CLA-070-0104)  
SFN: 1203541  
LATITUDE: 39° 51' 53" LONGITUDE: 84° 01' 58"



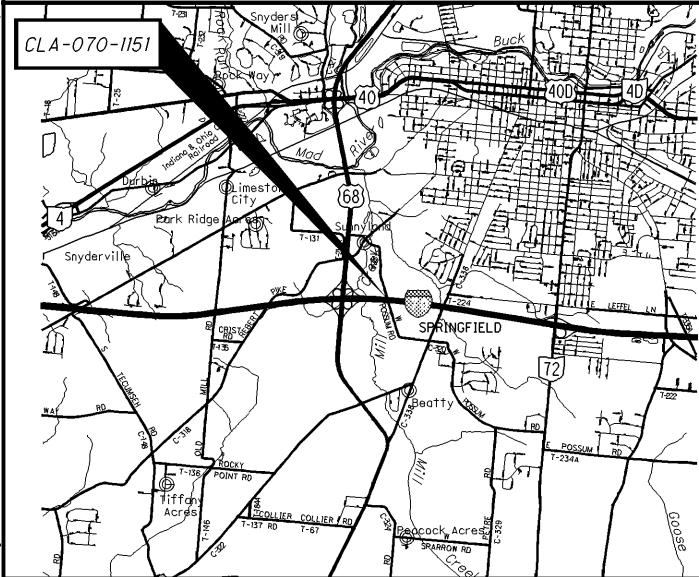
LOCATION MAP (STRUCTURE: CLA-070-0826)  
SFN: 1204084  
LATITUDE: 39° 53' 35" LONGITUDE: 83° 54' 20"



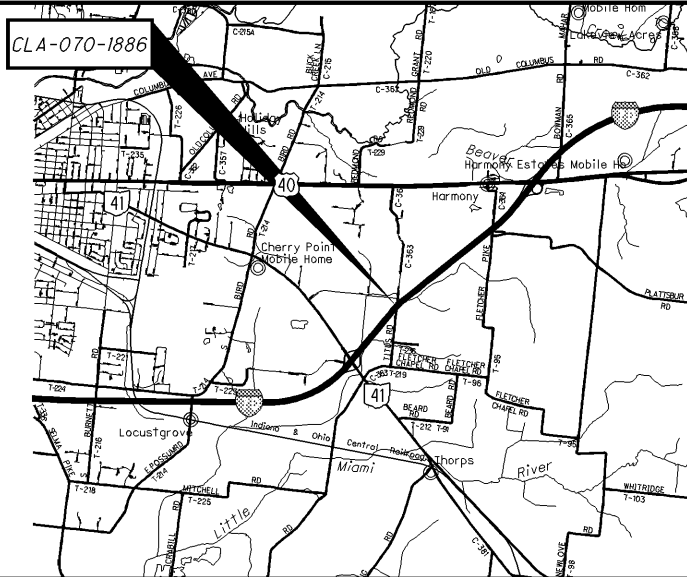
LOCATION MAP (STRUCTURE: CLA-070-0970)  
SFN: 1204114  
LATITUDE: 39° 53' 34" LONGITUDE: 83° 52' 42"



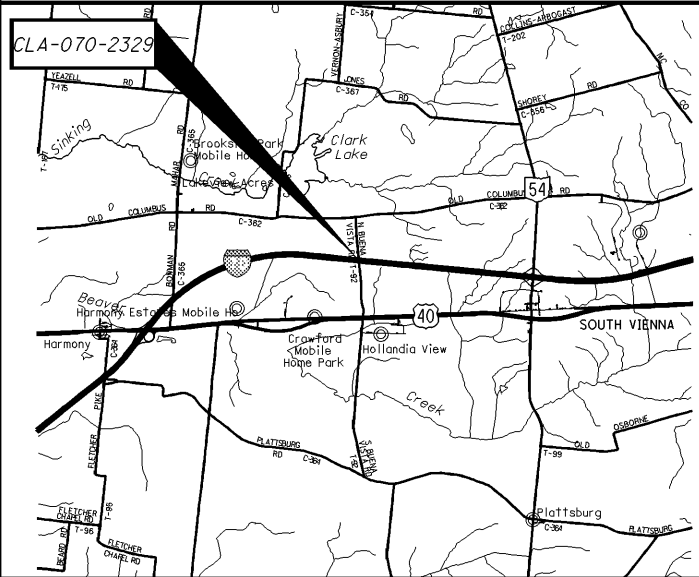
LOCATION MAP (STRUCTURE: CLA-070-1024)  
SFN: 1204149  
LATITUDE: 39° 53' 39" LONGITUDE: 83° 52' 06"



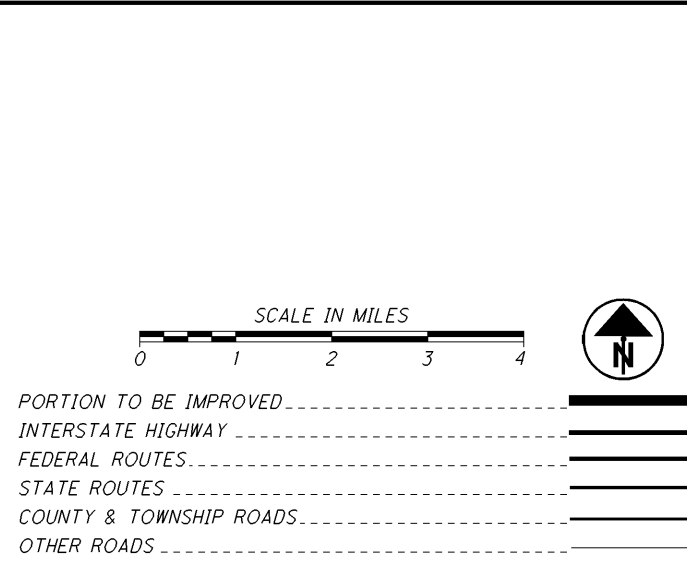
LOCATION MAP (STRUCTURE: CLA-070-1151)  
SFN: 1204297  
LATITUDE: 39° 53' 42" LONGITUDE: 83° 50' 40"



LOCATION MAP (STRUCTURE: CLA-070-1886)  
SFN: 1204831  
LATITUDE: 39° 54' 17" LONGITUDE: 83° 42' 52"



LOCATION MAP (STRUCTURE: CLA-070-2329)  
SFN: 1205161  
LATITUDE: 39° 56' 06" LONGITUDE: 83° 38' 47"



94483\_GN001.dgn Sheet 2/6/2014 2:59PM CH\_OD0TV81\_Half\_BW.pen \\antigone\HuffMan\_PCL\_jcenters

DESIGN STRESSES:

REINFORCING STEEL ASTM A615 OR A996  
GRADE 60 MINIMUM YIELD STRENGTH 60,000 P.S.I.

EXISTING STRUCTURE VERIFICATION:

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTRE AND FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK, BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05 AND 105.02 AND 513.04.

EXISTING BRIDGE PLANS:

EXISTING BRIDGE PLANS MAY BE INSPECTED AT THE OFFICE OF STRUCTURAL ENGINEERING IN COLUMBUS, OHIO OR IN THE DISTRICT 7 OFFICE IN SYDNEY, OHIO.

ITEM 509 - REINFORCING STEEL, REPLACEMENT OF EXISTING REINFORCING STEEL, AS PER PLAN:

AN ESTIMATED QUANTITY FOR NEW REINFORCING STEEL HAS BEEN PROVIDED FOR EACH STRUCTURE TO REPLACE ANY EXISTING REINFORCING STEEL WHICH HAS BEEN DEEMED UNUSABLE BY THE ENGINEER DUE TO CORROSION.

ANY EXISTING REINFORCING STEEL BARS WHICH ARE TO BE INCORPORATED INTO THE NEW WORK AND WHICH MADE UNUSABLE BY THE CONTRACTOR'S CONCRETE REMOVAL OPERATIONS SHALL BE REPLACED AS DIRECTED BY THE ENGINEER, WITH NEW REINFORCING STEEL OF THE SAME SIZE AT NO ADDITIONAL COST TO THE DEPARTMENT.

ITEM 512 - SEALING OF CONCRETE SURFACES (EPOXY-URETHANE), AS PER PLAN:

FOR THOSE STRUCTURES DESIGNATED TO RECIEVE SEALER TO ALL PIER COLUMNS, THE FINISH COAT COLOR SHALL BE FEDERAL COLOR NO. 17778, LIGHT NEUTRAL. ALL PIER COLUMNS FOR THE STRUCTURE SHALL BE SEALED REGARDLESS IF THE PIER COLUMN IS PATCHED OR NOT. SEALING OF CONCRETE SURFACE LIMITS SHALL BE THE ENTIRE PIER COLUMN FROM THE GROUND LINE UP TO THE BOTTOM OF THE PIER CAP UNLASS OTHERWISE NOTED IN THESE PLANS OR DIRECTED BY THE ENGINEER.

FOR THOSE STRUCTURES DESIGNATED TO RECEIVE SPOT SEALING ONLY, THE FINISH COAT COLOR SHALL MATCH THE EXISTING SEALER COLOR. SPOT SEALING SHALL COMPLETELY COVER AND EXTEND 3" BEYOND THE LIMITS OF THE PATCH AREAS SHOWN IN THE PLANS.

REMOVE STRUCTURE IDENTIFICATION SIGN(S) FOR EACH STRUCTURE AND INCLUDE WITH ITEM 512 FOR PAYMENT.

ITEM 519 - PATCHING CONCRETE STRUCTURE, AS PER PLAN:

THE CONTRACTOR SHALL PERFORM THIS ITEM OF WORK AS DESCRIBED IN CMS 519, EXCEPT THAT THE CONTRACTOR MAY USE THE SAME CONCRETE MIX DESCRIBED FOR ITEM SPECIAL, PATCHING CONCRETE STRUCTURE, MISC.: WITH PUMPED SELF-CONSOLIDATING CONCRETE IN LIEU OF CLASS S, CONCRETE.

PRIOR TO SURFACE CLEANING SPECIFIED IN 519.04 AND WITHIN 24 HOURS OF PLACING PATCHING MATERIAL, BLAST CLEAN ALL SURFACES TO BE PATCHED INCLUDING THE EXPOSED REINFORCING STEEL. ACCEPTABLE METHODS INCLUDE HIGH-PRESSURE WATER BLASTING WITH OR WITHOUT ABRASIVES IN THE WATER, ABRASIVE BLASTING WITH CONTAINMENT, OR VACCUM ABRASIVE BLASTING.

ITEM SPECIAL - PATCHING CONCRETE STRUCTURE, MISC.: WITH PUMPED SELF - CONSOLIDATING CONCRETE:

IN ADDITION TO THE WORK ITEMS REQUIRED IN CMS 519, THIS ITEM WILL ALSO INCLUDE THE DEVELOPMENT, DELIVERY AND PLACEMENT OF A SPECIAL CONCRETE MIX, FORM PUMPING TO PLACE AND CONSOLIDATED CONCRETE AS DESCRIBED IN THE FOLLOWING NOTE:

PROVIDE A CONCRETE WITH THE FOLLOWING PROPERTIES:

MINIMUM PORTLAND CEMENT CONTENT	800 LB/CU. YD.
NO MICROSILICA AND NO FLY ASH	
MAXIMUM COURSE AGGREGATE SIZE	#8
MAXIMUM WATER/CEMENT RATIO	0.38
COURSE TO FINE AGGREGATE RATIO TO PRODUCE SELF CONSOLIDATING CONCRETE	
MINIMUM 3 DAY STRENGTH	4000 PSI
MINIMUM 28 DAY STRENGTH	5500 PSI
AIR CONTENT	8% +/- 2%
MINIMUM SPREAD	24'

PROVIDE A CONCRETE MIX AT A SLUMP THAT ALLOWS THE CONCRETE MIX TO BE PUMPED THROUGH A 3½" DIAMETER ACCESS HOLE THROUGH THE BOTTOM OF THE FORM AND SELF CONSOLIDATE THE PIER. THE PUMPED CONCRETE SHALL UTILIZE A FORM MOUNTED GATE VALVE SYSTEM OR SIMILAR OPERATION THAT PROVIDES ENOUGH HEAD PRESSURE TO ENSURE AIR IS FORCED OUT OF THE FORMS.

THE FINAL CONCRETE MIX WILL BE A SELF CONSOLIDATING CONCRETE USING AN APPROVED SELF CONSOLIDATING ADMIXTURE.

SUBMIT THE MIX DESIGN AND TEST RESULTS TO THE ENGINEER FOR REVIEW AND ACCEPTANCE.

AREAS TO BE PATCHED WILL HAVE SQUARE EDGES AND BE ROUGHLY SQUARE OR RECTANGULAR IN SHAPE. WHERE THE BOND BETWEEN THE CONCRETE AND THE REINFORCING STEEL HAS BEEN DESTROYED, OR WHERE MORE THAN ONE HALF OF THE PERIPHERY OF THE STEEL HAS BEEN EXPOSED. THE ADJACENT CONCRETE WILL BE REMOVED TO A DEPTH THAT WILL PROVIDE A MINIMUM OF 1" CLEARANCE AROUND THE STEEL EXCEPT WHERE OTHER REINFORCING STEEL MAKES THIS IMPRACTICABLE.

ON PIER COLUMNS THAT HAVE MULTIPLE PATCH AREAS THE CONTRACTOR SHALL ONLY WORK ON ONE PATCH AREA AT A TIME, THE PATCH SHALL BE COMPLETED BEFORE STARTING ANY WORK ON ANOTHER PATCH AREA ON THE SAME PIER COLUMN.

AVOID DAMAGING OR DEBONDING THE REINFORCING STEEL, OR SHATTERING THE CONCRETE, BEYOND THE AREA TO BE PATCHED.

AFTER COMPLETING REMOVAL BUT BEFORE FORMING, PLACE GALVANIC ANODES AS DEFINED IN ITEM 511 CONCRETE, MISC.: EMBEDDED GALVANIC ANODE (EGA) NOTE.

REPAIR MORTARS, CONCRETE, AND BONDING AGENTS SHALL BE HYDRAULIC CEMENT-BASED MATERIALS WITH A 28-DAY MOIST CURED ELECTRICAL RESISTIVITY LESS THAN 15,000 OHM-CM. NON CONDUCTIVE REPAIR MATERIALS SUCH AS MAGNESIUM AMMONIUM PHOSPHATE CONCRETE OR MORTARS, AND EPOXY MORTARS OR BONDING AGENTS, SHALL NOT BE PERMITTED. CONCRETE MIXTURES CONTAINING HIGH LEVELS OF SUPPLEMENTARY CEMENTITIOUS MATERIALS SUCH AS SILICA FUME, GROUND-GRANULATED BLAST FURNACE SLAG. FLY ASH OR METAKAOLIN MAY NOT MEET THIS RESISTIVITY REQUIREMENT.

DURING THE CONCRETE OPERATIONS ASSURE THE REPRESENTATIVES OF THE READY MIX PRODUCER AND THE CHEMICAL ADMIXTURE MANUFACTURER ARE ON SITE TO

DETERMINE ANY ADJUSTMENTS REQUIRED TO COMPLETE THE CONCRETE PLACEMENT.

THE CONTRACTOR SHALL PERFORM HIS WORK AS TO NOT DAMAGE THE EMBEDDED ANODES OR CREATE AND AIR VOIDS AROUND THE EMBEDDED ANODES WHILE SETTING FORMWORK OR PLACING THE CONCRETE.

THE FORM PUMPING SYSTEM PROPOSED MUST BE SUBMITTED, AND ACCEPTED BY THE PROJECT ENGINEER PRIOR TO THE INSTALLATION OF ANY FORMWORK. A TEST AREA SHALL BE USED TO DETERMINE THE PERFORMANCE OF THE PROPOSED PUMPING SYSTEM. UPON ACCEPTANCE OF THE TEST SECTION BY THE PROJECT ENGINEER, THE CONTRACTOR MAY CONTINUE TO USE THE PROPOSED PUMPING SYSTEM.

THE DEPARTMENT WILL PAY FOR THE ACCEPTED QUANTITY OF CUBIC YARDS.

THE DEPARTMENT WILL CALCULATE THE AMOUNT OF CUBIC YARDS OF SELF CONSOLIDATING CONCRETE NEEDED PER PIER PATCH AS SHOWN BELOW:

PATCH SIZE (SQ. FT.) X 0.563 (MAX. DEPTH OF 6¾")  
X 1/27 = CU. YDS

ALL WORK DESCRIBED ABOVE SHALL BE PAID FOR AT THE UNIT BID PRICE PER CUBIC YARD FOR ITEM SPECIAL, PATCHING CONCRETE STRUCTURE, MISC.: WITH PUMPED SELF-CONSOLIDATING CONCRETE SHALL INCLUDE FORMWORK, DEVELOPMENT AND PLACEMENT OF THE SELF-CONSOLIDATING CONCRETE MIX, LABOR, ETC. NEEDED TO PERFORM THIS ITEM OF WORK.

ITEM 511 - CONCRETE MISC.: EMBEDDED GALVANIC ANODE (EGA):

PART 1 GENERAL

1.01 SUMMARY

A. THIS SECTION INCLUDES FURNISHING ALL LABOR, TOOLS, MATERIALS, EQUIPMENT AND SERVICES NECESSARY TO PROPERLY INSTALL EMBEDDED GALVANIC ANODES.

1.02 REFERENCES

- A. ACI/ICRI 2008 CONCRETE REPAIR MANUAL.
- B. ACI GUIDELINE NO. 222 CORROSION OF METALS IN CONCRETE.
- C. ICRI GUIDELINE 310.IR-2008 GUIDE FOR SURFACE PREPARATION FOR THE REPAIR OF DETERIORATED CONCRETE RESULTING FROM REINFORCING STEEL CORROSION.
- D. ASTM A615/A615M-09 STANDARD SPECIFICATION FOR DEFORMED AND PLAIN BILLET-STEEL BAR FOR CONCRETE REINFORCEMENT.
- E. ASTM B6-09 STANDARD SPECIFICATION FOR ZINC.
- F. ASTM B418-09 STANDARD SPECIFICATION FOR CAST AND WROUGHT GALVANIC ZINC ANODES.

1.03 MANUFACTURER TECHNICAL ASSISTANCE

- A. THE CONTRACTOR WILL ENLIST AND PAY FOR THE SERVICES OF A QUALIFIED CORROSION TECHNICIAN SUPPLIED BY THE EMBEDDED GALVANIC ANODE MANUFACTURER TO PROVIDE ON-SITE TECHNICAL ASSISTANCE FOR THE INITIAL INSTALLATION OF THE CORROSION PROTECTION SYSTEM.
- B. THE CONTRACTOR SHALL COORDINATE ITS WORK WITH THE DESIGNATED CORROSION TECHNICIAN TO ALLOW SITE SUPPORT DURING PROJECT STARTUP AND INITIAL ANODE INSTALLATION. THE TECHNICIAN SHALL PROVIDE CONTRACTOR TRAINING FOR VERIFICATION OF EMBEDDED REINFORCING STEEL CONTINUITY AND ANODE INSTALLATION.

PART 2 MATERIALS

2.01 MATERIALS

- A. EMBEDDED GALVANIC ANODES SHALL HAVE THE FOLLOWING NOMINATION DIMENSIONS: 2.5 IN. LONG BY 3.1 IN. WIDE BY 1.2 IN. DEEP, PRE-MANUFACTURED, AND CONSIST OF A MINIMUM OF 3.5 OZ (100 GRAMS) OF ZINC IN COMPLIANCE WITH ASTM B418 TYPE II AND ASTM B6 SPECIAL HIGH GRADE WITH IRON CONTENT OF 15 PPM OR LESS CAST AROUND A PAIR OF HEAT TREATED, UNCOATED STEEL TIE WIRES AND ENCASED IN A HIGHLY ALKALINE CEMENTITIOUS SHELL WITH A PH OF 14 OR GREATER. THE ANODE UNIT SHALL CONTAIN NO ADDED SULFATE NOR SHALL IT CONTAIN CHLORIDE, BROMIDE OR OTHER CONSTITUENTS THAT ARE CORROSIVE TO REINFORCING STEEL. ANODE UNITS SHALL BE SUPPLIED WITH INTEGRAL UNSPLICED WIRES WITH LOOP TIES FOR DIRECTLY TYING TO THE REINFORCING STEEL. EMBEDDED GALVANIC ANODES SHALL BE GALVASHIELD XP2 AVAILABLE FROM VECTOR CORROSION TECHNOLOGIES (WWW.VECTOR-CORROSION.COM) USA (813) 830-7566, CANADA (204) 489-6300, OR APPROVED EQUAL.

APPLICATIONS FOR EQUALS INCLUDE:

- 1. A HIGHLY ALKALINE CEMENTITIOUS SHELL WITH A PH OF 14 OR GREATER
- 2. PROVIDE A MINIMUM OF 10 YEARS SERVICE LIFE (IN SIMILAR ENVIRONMENT)
- 3. CONTAIN NO ADDED CONSTITUENTS CORROSIVE TO REINFORCING STEEL OR DETRIMENTAL TO CONCRETE, EG CHLORIDE, BROMIDE, SULFATES, ETC.
- 4. PROVEN TRACK RECORD WITH BRIDGE WORK SHOWING A MINIMUM OF 10 YEARS SATISFACTORY FIELD PERFORMANCE.
- 5. A MINIMUM OF 3 PROJECTS OF SIMILAR SIZE AND APPLICATION.
- 6. ANODE UNITS SHALL BE SUPPLIED WITH SOLID ZINC (ASTM B6 SPECIAL HIGH GRADE) CORE CAST AROUND ANNEALED UNCOATED STEEL TIE WIRES FOR TYING TO THE REINFORCING STEEL.
- 7. ANODE UNITS SHALL BE SUPPLIED WITH INTEGRAL UNSPLICED TIE WIRES SUCH THAT ZINC ANODE IS CONNECTED TO THE REINFORCEMENT WITH A CONTINUOUS, UNSPLICED WIRE.
- 8. THIRD PARTY PRODUCT EVALUATION, SUCH AS FROM CONCRETE INNOVATIONS APPRAISAL SERVICE, BBA ETC.
- B. REPAIR MORTARS, CONCRETE AND BONDING AGENTS SHALL BE AS DESCRIBED IN THE NOTE FOR ITEM SPECIAL, PATCHING CONCRETE STRUCTURE, MISC.: WITH HIGH EARLY STRENGTH PUMPED SELF-CONSOLIDATING CONCRETE ON SHEET 4.

- ANODES USED WITH HIGHER RESISTANCE REPAIR MATERIALS SHALL BE EMBEDDED IN GALVASHIELD EMBEDDING MORTAR TO CREATE A CONDUCTIVE BRIDGE TO THE SUBSTRATE PRIOR TO REPAIR MATERIAL INSTALLATION.
- C. DEFORMED BARS FOR REINFORCMENT SHALL BE HOT ROLLED STEEL IN ACCORDANCE WITH ASTM A615/A615M, GRADE 60 (GRADE 400).
- D. DELIVER, STORE, AND HANDLE ALL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

PART 3 EXECUTION

3.01 CONCRETE REMOVAL

- A. REMOVE LOOSE OR DELAMINATED CONCRETE AND UNDERCUT ALL EXPOSED REINFORCING BY REMOVING CONCRETE FROM THE FULL CIRCUMFERENCE OF THE STEEL AS PER ICRI R310.IR. THE MINIMUM CLEARANCE BETWEEN THE CONCRETE SUBSTRATE AND REINFORCING STEEL SHALL BE ¾".

94483\_GN002.dgn Sheet 1/29/2014 2:08PM CH\_ODOTV8i\_Half\_BW.pen \\antigone\HuffMan\_PCL\_jcenters

ITEM 511 - CONCRETE MISC.: EMBEDDED GALVANIC ANODE (EGA) CONT'D:

3.02 CLEANING AND REPAIR OF REINFORCING STEEL

- A. CLEAN EXPOSED REINFORCING STEEL OF RUST, MORTAR, ETC. TO PROVIDE SUFFICIENT ELECTRICAL CONNETION AND MECHANICAL BOND.
- B. IF SIGNIFICANT REDUCTION IN THE CROSS SECTION OF THE REINFORCING STEEL HAS OCCURRED, REPLACE OR INSTALL SUPPLEMENTAL REINFORCEMENT AS DIRECTED BY THE ENGINEER. ALL SUPPLEMENTAL REINFORCING SHALL BE CONSIDERED INCIDENTAL AND INCLUDED IN THE COST OF THE ITEM 509, REINFORCING STEEL, REPLACEMENT OF EXISTING REINFORCING STEEL.
- C. SECURE LOOSE REINFORCING STEEL BY TYING TIGHTLY TO THE OTHER BARS WITH STEEL TIE WIRE.

3.03 GALVANIC ANODE INSTALLATION

- A. INSTALL ANODE UNITS AND REPAIR MATERIAL IMMEDIATELY FOLLOWING PREPARATION AND CLEANING OF THE STEEL REINFORCEMENT. REPAIR MATERIAL SHALL BE PLACED NO LATER THAN ONE (1) WEEK AFTER CONCRETE REMOVAL UNLESS APPROVED BY ENGINEER.
- B. GALVANIC ANODES SHALL BE INSTALLED IN THE LOCATIONS AND SPACING AS SPECIFIED IN THE PLANS, IN NO CASE, SHALL THE SPACING EXCEED 18 INCHES.
- C. PLACE THE GALVANIC ANODES AS CLOSE AS POSSIBLE TO THE PATCH EDGE WHILE PROVIDING SUFFICIENT CLEARANCE BETWEEN ANODES AND SUBSTRATE TO ALLOW REPAIR MATERIAL TO ENCASE ANODE.
- D. THE TIE WIRES SHALL BE WRAPPED AROUND THE CLEANED REINFORCING STEEL MULTIPLE TIMES IN OPPOSITE DIRECTIONS AND THEN TWISTED TIGHT USING A REBAR TIE WIRE TWISTING TOOL OR PLIERS TO ALLOW LITTLE OR NO ANODE MOVEMENT DURING CONCRETE PLACEMENT.
  - a. WHENEVER POSSIBLE, PLACE ANODE SUCH THAT THE BARFIT GROOVE FITS ALONG THE BAR.
  - b. PLACE ANODE BESIDE OR BENEATH THE BAR AND SECURE TO CLEAN REINFORCING STEEL.
  - c. IF SUFFICIENT CONCRETE COVER EXISTS, THE ANODE MAY BE PLACED ALONG A SINGLE BAR OR AT THE INTERSECTION BETWEEN TWO BARS AND SECURED TO EACH CLEAN BAR.
- E. ELECTRICAL CONTINUITY
  - a. CONFIRM ELECTRICAL CONNECTION BETWEEN ANODE TIE WIRE AND REINFORCING STEEL BY MEASURING DC RESISTANCE (OHM) OR POTENTIAL (MV) WITH A MULTI-METER.
  - b. ELECTRICAL CONNECTION IS ACCEPTABLE IF THE DC RESISTANCE MEASURED WITH A MULTI-METER IS LESS THAN 1 OHM OR THE DC POTENTIAL IS LESS THAN 1 MV.
  - c. CONFIRM ELECTRICAL CONTINUITY OF THE EXPOSED REINFORCING STEEL WITHIN THE REPAIR AREA. IF NECESSARY, ELECTRICAL CONTINUITY SHALL BE ESTABLISHED WITH STEEL TIE WIRE.
  - d. ELECTRICAL CONTINUITY BETWEEN TEST AREAS IS ACCEPTABLE IF THE DC RESISTANCE MEASURED WITH MULTI-METER IS LESS THAN 1 OHM OR THE POTENTIAL IS LESS THAN 1 MV.

EACH EMBEDDED GALVANIC ANODE PROVIDED AND INSTALLED WITH ALL INCIDENTALS, INCLUDING REMOVAL OF ALL UNSOUND CONCRETE AND CLEANING AND REPAIR OF EXISTING REINFORCING STEEL, SHALL BE PAID FOR AT THE UNIT PRICE BID PER EACH ITEM 511, CONCRETE MISC.: EMBEDDED GALVANIC ANODE (EGA). PRIOR TO REPAIR MATERIAL INSTALLATION.

ITEM SPECIAL - STRUCTURE, MISC.: COMPOSITE FIBER WRAP SYSTEM, PIER COLUMNS:

DESCRIPTION

1.01 - THIS WORK SHALL CONSIST OF PROVIDING A FIBER WRAP CASING SYSTEM USING HIGH STRENGTH, HYBRID FIBER/EPOXY COMPOSITES FIELD APPLIED TO THE SURFACE OF THE SPECIFIED PIER COLUMNS FOR THE MOT-675-0063R STRUCTURE. THE COLUMNS ARE TO BE CLEANED AND PREPARED AS TO THE MANUFACTURER’S RECOMMENDATIONS. SEE SHEETS 71 AND 72 FOR LOCATIONS.

DESIGN

2.01 - THE SUPPLIER SHALL DETAIL THE NUMBER OF LAYERS OF FABRIC NEEDED AND SHALL SUBMIT DETAILED CALCULATIONS. NOTE, THERE MAY BE A DIFFERENT NUMBER OF WRAPS NEEDED AT DIFFERENT LOCATIONS ON THE SAME COLUMN.

MATERIALS

3.01 - ALL SUPPLIERS AND APPLICATORS MUST HAVE FIELD EXPERIENCE WITH A MINIMUM OF 10 INSTALLATIONS AND FURNISH CERTIFIED TEST REPORTS INCLUDING 1,000 HOUR DURABILITY TESTS AT 140° F FOR WATER, SALT WATER, ALKALINE SOIL, OZONE, EFFERVESCENCE AND OTHER FACTORS (REFER TO PARAGRAPH 3.04). FIBER COMPOSITE SUPPLIER SHALL ALSO HAVE CONDUCTED LABORATORY RESEARCH ON DELAMINATED COLUMNS DEMONSTRATING THAT THE REPAIRED COLUMN EXCEEDS THE ORIGINAL DESIGN IN AXIAL STRENGTH AND DUCTILITY.

3.02 THE FABRIC FOR THE COMPOSITE CASING SYSTEM SHALL BE CONTINUOUS FILAMENT WOVEN FABRIC. PRIMARY FIBERS FOR THE FABRIC SHALL BE ELECTRICAL (EJ GLASS FIBERS. THE FIBER SHALL HAVE A MINIMUM NOMINAL THICKNESS OF 0.05 INCHES. THE MINIMUM WEIGHT OF THE FABRIC SHALL BE 27.0 OUNCES PER SQUARE YARD.

3.03 THE EPOXY SHALL BE SUPPLIED BY THE MANUFACTURER TO MEET THE COMPOSITE STRENGTH GIVEN IN 3.04. POLYESTER RESIN SHALL NOT BE ALLOWED AS A SUBSTITUTE FOR EPOXY RESIN.

3.04 THE COMPOSITE OF THE FIBER WRAPPED COLUMN CASING SYSTEM SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

PROPERTY	REQUIREMENT	ASTM TEST METHOD
ULTIMATE TENSILE STRENGTH, PSI IN PRIMARY FIBER DIRECTIONS	60,000 PSI	D3039, AVERAGE OF 7, 1" BY 10" NORMALIZED FO 0.80" THICK 0.01" PER MINUTE TESTING SPEED
ULTIMATE TENSILE STRENGTH AT 90°F TO PRIMARY FIBERS, PSI, MIN.	3,000 PSI	D3039, AVERAGE OF 7, 1" BY 10" NORMALIZED FO 0.80" THICK 0.01" PER MINUTE TESTING SPEED
MINIMUM TENSILE STRENGTH AFTER TEST:		
1000 HRS EXPOSURE 100% HUMIDITY	60,000 PSI	C581
1000 HRS EXPOSURE TO OZONE	60,000 PSI	D1149 EXCEPT NOT UNDER STRESS DURING OZONE EXPOSURE
1000 HRS EXPOSURE TO ALKALI	60,000 PSI	E2098
1000 HRS EXPOSURE TO SALT WATER	60,000 PSI	C581 AND D1141 OMITTING ADDITION OF HEAVY MEATAL REAGENTS
1000 HRS EXPOSURE AT 140°	60,000 PSI	D3045
ULTRA VIOLET (UV) EXPOSURE	60,000 PSI	G154 USING FS40 UV-B BULB FOR A MIN. 40 CYCLES. THE CYCLES SHALL BE 4 HOURS OF CONSTANT AT 40° C.
ELONGATION PERCENT, MIN. PERCENT, MAX.	1.7% 5.0%	D3039
TENSILE MODULUS, PSI MIN. BASED ON CROSS SECTIONAL AREA OF PRIMARY FIBERS	3,000,000 PSI	D3039
VISUAL DEFECTS LEVEL III	ACCEPTANCE LEVEL III	D2563
COEFFICENT OF THERMAL EXPANSION IN PRIMARY DIRECTION	4.3 x 10° PPM/DEG. F (+15%)	D696

COLUMN PREPARATION

4.01.1 - THE SURFACE SHALL BE FREE FROM FINS, SHARP EDGES, AND PROTRUSIONS THAT WILL CAUSE VOIDS BEHIND THE CASING OR THAT, IN THE OPINION OF THE ENGINEER, WILL DAMAGE FIBER.

4.01.2 - THE SURFACES TO RECEIVE THE COMPOSITE WRAP SHALL BE SMOOTH AND FREE OF VOIDS OR UNDULATIONS THAT WOULD PREVENT FULL CONTACT BETWEEN THE CONCRETE AND THE WRAP.

4.01.3 - THE CONTACT SURFACES SHALL BE COMPLETELY DRY AT THE TIME OF APPLICATION OF THE COMPOSITE. NEWLY REPAIRED OR PATCHED SURFACES THAT HAVE SET, BUT NOT CURED A MINIMUM OF 7 DAYS, SHALL BE COATED WITH WATER-BASED EPOXY PAINT OR OTHER APPROVED SEALER.

COMPOSITE APPLICATION

4.02.1 - THE AMBIENT TEMPERATURE AND THE TEMPERATURE OF THE EPOXY RESIN COMPONENTS SHALL BE BETWEEN 55°F AND 95°F AT THE TIME OF MIXING. THE COMPOSITE SHALL BE APPLIED WHEN THE RELATIVE HUMIDITY IS LESS THAN 85% AND THE SURFACE TEMPERATURE IS MORE THAN 5°F ABOVE THE DEW POINT. APPLICATIONS SHALL BEGIN WITHIN ONE HOUR AFTER THE BATCH HAS BEEN MIXED.

4.02.2 - THE COMPONENTS OF THE EPOXY RESIN SHALL BE MIXED WITH A MECHANICAL MIXER FOR A MINIMUM OF 5 MINUTES AND APPLIED UNIFORMLY TO THE FIBER AT A RATE THAT SHALL INSURE COMPLETE SATURATION OF THE FABRIC.

4.02.3 - A PRIMER OF EPOXY SHALL BE APPLIED TO THE SURFACE OF THE CONCRETE.

4.02.4 - THE FABRIC/EPOXY COMPOSITE SHALL BE APPLIED TO THE PREPARED SURFACE BY WRAPPING USING METHODS THAT PRODUCE A UNIFORM FORCE THAT IS DISTRIBUTED ACROSS THE ENTIRE WIDTH OF THE FABRIC. THE PRIMARY FIBERS OF THE FABRIC SHALL NOT DEVIATE FROM A HORIZONTAL LINE MORE THAN 1/2" PER FOOT, AND THE TRANSVERSE FIBERS SHALL BE PERPENDICULAR TO THE PRIMARY. ENTRAPPED AIR SHALL BE RELEASED OR ROLLED OVER BEFORE THE EPOXY SETS.

4.02.5 - SUCCESSIVE LAYERS OF COMPOSITE MATERIALS SHALL BE PLACED BEFORE POLYMERIZATION OF THE PREVIOUS LAYER OF EPOXY IS TOO COMPLETE TO ACHIEVE COMPLETE BOND BETWEEN LAYERS. IF POLYMERIZATION DOES OCCUR BETWEEN LAYERS THE SURFACE MUST BE ROUGHENED USING A LIGHT ABRASIVE THAT WILL NOT DAMAGE THE FIBER.

4.02.6 - A FINAL LAYER OF EPOXY SHALL BE APPLIED TO THE FINAL LAYER, WITH CARE TAKEN TO INSURE COATING OF ALL EDGES AND SEAMS.

4.02. 7 - A FINAL INSPECTION SHALL BE PERFORMED ON ALL FIBER WRAPPED COLUMNS AFTER THE EPOXY SETS YET PRIOR TO THE APPLICATION OF THE URETHANE TOP COAT. ALL DEFECTS (INCLUDING BUBBLES, DELAMINATIONS, AND FABRIC TEARS MORE THAN 1 SQUARE INCH OF THE SURFACE AREA, OR AS SPECIFIED BY THE PROJECT ENGINEER, SHALL BE REPAIRED AS SUCH:

- A. SMALL DEFECTS (ON THE ORDER OF 6" DIAMETER) SHALL BE INJECTED OR BACK FILLED WITH EPOXY.
- B. BUBBLES LESS THAN 12" IN DIAMETER SHALL BE REPAIRED BY INJECTING WITH EPOXY. TWO HOLES SHALL BE DRILLED INTO THE BUBBLE TO ALLOW INJECTION OF THE EPOXY AND ESCAPE OF ENTRAPPED AIR.
- C. BUBBLES, DELAMINATIONS AND FABRIC TEARS GREATER THAN 12" IN DIAMETER SHALL BE REPAIRED BY REMOVING AND REAPPLYING THE REQUIRED NUMBER OF LAYERS OF THE COMPOSITE AND THE REQUIRED FINISH COATINGS. ALL REPAIRS SHALL BE APPROVED BY THE PROJECT ENGINEER.

COATING SYSTEM APPLICATION

4.03.1 - A FINAL COATING IS REQUIRED TO PROTECT THE FIBERS FROM THE ELEMENTS, SPECIFICALLY UV RADIATION AND TO GIVE THE FINAL AESTHETIC EFFECT.

4.03.2 - AFTER 96 HOURS FROM FINAL APPLICATION OF EPOXY, IF THE FINAL EPOXY COAT IS COMPLETELY POLYMERIZED, THE EXTERIOR SURFACE OF THE COMPOSITE WRAP SHALL BE CLEANED AND ROUGHENED BY A LIGHT ABRASIVE. CARE SHOULD BE TAKEN DURING THE ROUGHENING PROCESS SO THAT THE FIBERS ARE NOT DAMAGED. ALL CLEANED AND ROUGHENED SURFACES SHALL BE DRY BEFORE PAINTING.

4.03.3 - THE AREA TO BE PAINTED SHALL BE A TOTAL DRY FILM THICKNESS OF NOT LESS THAN 4 MILS.

MEASUREMENT AND PAYMENT

5.01 - THIS ITEM WILL BE PAID FOR BY SQUARE FOOTAGE COVERED AND SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.



94483mn01.dgn Sheet 2/11/2014 3:02PM CH\_ODOTVB81\_Half\_BW.pen \\antigone\HuffMon\_PCL\_jcenters

ITEM 614, MAINTAINING TRAFFIC

THE FOLLOWING WORK SHALL BE PERFORMED:

PERFORM ALL STRUCTURE REPAIRS INCLUDING PATCHING AND SEALING THE CONCRETE PIER COLUMNS. TRAFFIC SHALL BE MAINTAINED AS PER APPLICAPABLE STANDARD CONSTRUCTION DRAWINGS, AS SHOWN IN THESE PLANS, AND AS DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SAFE AND EFFECTIVE TRAFFIC CONTROL 24 HOURS A DAY FOR THE DURATION OF THIS PROJECT. THIS INCLUDES PROVIDING, PLACING, MAINTAINING, AND SUBSEQUENTLY REMOVING ALL NECESSARY TRAFFIC CONTROL MEASURES FOR ALL PROPOSED CONSTRUCTION OPERATIONS.

BEFORE WORK BEGINS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THE NAMES AND TELEPHONE NUMBERS OF PERSONS WHO CAN BE CONTACTED 24 HOURS A DAY BY THE OHIO DEPARTMENT OF TRANSPORTATION, THE HIGHWAY PATROL, AND ALL OTHER INTERESTED POLICE AGENCIES.

THESE PERSONS SHALL BE RESPONSIBLE FOR REPAIRING AND/OR REPLACING ALL TRAFFIC CONTROL DEVICES NEEDED TO MAINTAIN SAFETY FOR THE DURATION OF THIS PROJECT. THESE PERSONS SHALL HAVE AVAILABLE ALL MATERIALS, EQUIPMENT, AND INCIDENTALS NECESSARY TO PERFORM THE REQUIRED REPAIRS WITHIN A REASONABLE PERIOD OF TIME.

THE CONTRACTOR SHALL PROVIDE, ERECT, AND MAINTAIN SIGNS (IN PROPER POSITIONS, CLEAN AND LEGIBLE, AND IN GOOD WORKING CONDITION) AND REMOVE ALL LIGHTS, SIGNS, CONES, DRUMS, AND ANY OTHER TRAFFIC CONTROL DEVICES NECESSARY FOR THE MAINTENANCE OF TRAFFIC ACCORDING TO THESE PLAN NOTES AND DETAILS.

THE CONTRACTOR SHALL FURNISH AND INSTALL ADVANCE WARNING "ROAD WORK AHEAD" (W20-1) SIGNS AND "END ROAD WORK" (G20-2) SIGNS ON THE MAINLINE ROADS. THE SIGNS SHALL BE DUAL INSTALLATIONS AND SHALL BE PLACED ACCORDING TO STANDARD CONSTRUCTION DRAWING MT-95.30 WITH FINAL LOCATIONS AS DIRECTED BY THE ENGINEER.

VEHICLES AND OTHER EQUIPMENT SHALL NOT BE PERMITTED TO STOP OR TO BE PARKED ALONG THE ROADWAY EXCEPT WITHIN DESIGNATED WORK AREAS AND SHALL NOT ENTER OR LEAVE WORK AREAS IN A MANNER WHICH WILL BE HAZARDOUS TO, OR INTERFERE WITH THE NORMAL FLOW OF TRAFFIC. PERSONAL VEHICLES WILL NOT BE PERMITTED TO PARK WITHIN RIGHT-OF-WAY EXCEPT WITHIN SPECIFIC AREAS DESIGNATED BY THE ENGINEER.

TRAFFIC SHALL BE MAINTAINED IN A UNIFORM PATTERN THROUGHOUT THE ENTIRE LENGTH OF THE PROJECT AND SHALL NOT BE SUBJECTED TO CONSTANT LANE SHIFTS.

A MINIMUM LANE WIDTH OF 12 FEET SHALL BE PROVIDED FOR MAINTENANCE OF TRAFFIC PURPOSES AT ALL TIMES UNLESS OTHERWISE SHOWN IN THE PLANS OR OTHERWISE DIRECTED BY THE ENGINEER.

LENGTH AND DURATION OF LANE CLOSURES AND RESTRICTIONS SHALL BE AT THE APPROVAL OF THE ENGINEER. IT IS THE INTENT TO MINIMIZE THE IMPACT TO THE TRAVELING PUBLIC. LANE CLOSURES OR RESTRICTIONS OVER SEGMENTS OF THE PROJECT IN WHICH NO WORK IS ANTICIPATED WITHIN A REASONABLE TIME FRAME, AS DETERMINED BY THE ENGINEER, SHALL NOT BE PERMITTED. THE LEVEL OF UTILIZATION OF MAINTENANCE OF TRAFFIC DEVICES SHALL BE COMMENSURATE WITH THE WORK IN PROGRESS.

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH CMS 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

ITEM 614, REPLACEMENT SIGN

FLATSHEET SIGNS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLANS, SPECIFICATIONS AND PROPOSAL WHICH BECOME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. REPLACEMENT SIGNS SHALL BE NEW. OTHER MATERIALS MAY BE IN USED, BUT GOOD, CONDITION SUBJECT TO APPROVAL BY THE ENGINEER.

PAYMENT FOR THE NEW SIGNS SHALL BE MADE AT THE CONTRACT PRICE PER EACH FOR ITEM 614, REPLACEMENT SIGN, AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF DAMAGED SIGNS, HARDWARE AND SUPPORTS, AND PROVIDING THE NECESSARY REPLACEMENT HARDWARE, SUPPORTS, ETC.

AN ESTIMATED QUANTITY OF 10 EACH HAS BEEN PROVIDED IN THE GENERAL SUMMARY.

ITEM 614, REPLACEMENT DRUM

DRUMS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLANS, SPECIFICATIONS AND PROPOSAL WHICH BECOME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. REPLACEMENT DRUMS SHALL BE NEW.

PAYMENT FOR THE NEW DRUMS SHALL BE MADE AT THE CONTRACT PRICE PER EACH FOR ITEM 614, REPLACEMENT DRUM, AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF THE DAMAGED DRUM, AND PROVIDING AND MAINTAINING THE REPLACEMENT DRUM IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS FOR THE ORIGINAL DRUM.

AN ESTIMATED QUANTITY OF 50 EACH HAS BEEN PROVIDED IN THE GENERAL SUMMARY.

FLOODLIGHTING

FLOODLIGHTING OF THE WORK SITE FOR OPERATIONS CONDUCTED DURING NIGHTTIME PERIODS SHALL BE ACCOMPLISHED SO THAT THE LIGHTS DO NOT CAUSE GLARE TO THE DRIVERS ON THE ROADWAY. TO ENSURE THE ADEQUACY OF THE FLOODLIGHT PLACEMENT, THE CONTRACTOR AND THE ENGINEER SHALL DRIVE THROUGH THE WORK SITE EACH NIGHT WHEN THE LIGHTING IS IN PLACE AND OPERATIVE PRIOR TO COMMENCING ANY WORK. IF GLARE IS DETECTED, THE LIGHT PLACEMENT AND SHIELDING SHALL BE ADJUSTED TO THE SATISFACTION OF THE ENGINEER BEFORE WORK PROCEEDS.

PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC.

LANE CLOSURES

THE CONTRACTOR IS ADVISED THAT IT WILL BE NECESSARY TO SCHEDULE NIGHTTIME WORK FOR CONSTRUCTION ACTIVITIES AT SOME OF THE WORK LOCATIONS. IN ORDER TO COMFORM WITH THIS REQUIRMENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INCRECMENTAL COSTS ASSOCIATED WITH NIGHTTIME CONSTRUCTION ACTIVITIES.

LANE CLOSURES SHALL ONLY BE IMPLEMENTED AT THE TIMES LISTED ON THE OHIO DEPARTMENT OF TRANSPORTATION'S PERMITTED LANE CLOSURE WEBSITE WHICH IS LOCATED AT:

http://plcm.dot.state.oh.us

THE PERMITTED CLOSURE TIMES LISTED ON THE WEBSITE, 14 CALENDAR DAYS PRIOR TO THE BID LETTING DATE, SHALL BE IN EFFECT FOR THIS PROJECT.

NO WORK WITHIN ACTIVE TRAVEL LANES OR WHICH SHALL SLOW TRAFFIC IS PERMITTED AT ANY OTHER TIMES.

SHOULDER CLOSURES:  
FOR SHOULDER CLOSINGS, PLACE SIGNS AND BARRELS ACCORDING TO THE OMUTCD, FIGURE 6H-5. DRUMS WILL BE PLACED ON THE SHOULDER SIDE OF EDGE LINE AND AT LEAST 1 FOOT FROM THE EDGE LINE. WHEN WORK IS BEING PERFORMED ON THE TRAFFIC SIDE OF GUARDRAIL OR BARRIER, A TRUCK MOUNTED ATTENUATOR (TMA) IS REQUIRED. PCB HAS NOT BEEN INCLUDED IN THESE PLANS. IF THE CONTRACTOR CHOOSES TO UTILIZE PCB, IT WILL BE AT THE CONTRACTOR'S EXPENSE.

MOT-70-0662:  
FOR IR-70 WB DIRECTION, CLOSE OUTSIDE LANE THAT EXITS TO NB SR-49 PER STANDARD CONSTRUCTION DRAWING MT-95.30 AND KEEP SHARED LANE/EXIT RAMP LANE OPEN AT ALL TIMES.

MOT-675-0063R:  
LANE CLOSURES ON SR 741 SHALL NOT BE PERMITTED FROM 6:00 AM TO 9:00 AM OR 3:00 PM TO 7:00 PM MONDAY THROUGH FRIDAY OR FROM 4:00 PM TO 6:00 PM ON SATURDAY OR SUNDAY.

SHE-047-1403:  
IF WORK IS DONE FROM SR-47, LANE CLOSURES SHALL ONLY BE IMPLEMENTED AT THE TIMES LISTED ON THE OHIO DEPARTMENT OF TRANSPORTATION'S PERMITTED LANE CLOSURE WEBSITE.

ITEM 614, MAINTAINING TRAFFIC (LANES OPEN DURING HOLIDAYS OR SPECIAL EVENTS)

NO WORK SHALL BE PERFORMED AND ALL EXISTING LANES SHALL BE OPEN TO TRAFFIC DURING THE FOLLOWING DESIGNATED HOLIDAYS OR EVENTS:

CHRISTMAS	FOURTH OF JULY
NEW YEARS	LABOR DAY
MEMORIAL DAY	THANKSGIVING

THE PERIOD OF TIME THAT THE LANES ARE TO BE OPEN DEPENDS ON THE DAY OF THE WEEK ON WHICH THE HOLIDAY OR EVENT FALLS. THE FOLLOWING SCHEDULE SHALL BE USED TO DETERMINE THIS PERIOD:

DAY OF HOLIDAY OR EVENT	TIME ALL LANES MUST BE OPEN TO TRAFFIC
SUNDAY	12:00N FRIDAY THROUGH 6:00 AM MONDAY
MONDAY	12:00N FRIDAY THROUGH 6:00 AM TUESDAY
TUESDAY	12:00N MONDAY THROUGH 6:00 AM WEDNESDAY
WEDNESDAY	12:00N TUESDAY THROUGH 6:00 AM THURSDAY
THURSDAY	12:00N WEDNESDAY THROUGH 6:00 AM FRIDAY
THURSDAY (THANKSGIVING ONLY)	12:00N WEDNESDAY THROUGH 6:00 AM MONDAY
FRIDAY	12:00N THURSDAY THROUGH 6:00 AM MONDAY
SATURDAY	12:00N FRIDAY THROUGH 6:00 AM MONDAY

NO EXTENSIONS OF TIME SHALL BE GRANTED FOR DELAYS IN MATERIAL DELIVERIES, UNLESS SUCH DELAYS ARE INDUSTRY-WIDE, OR FOR LABOR STRIKES, UNLESS SUCH STRIKES ARE AREA-WIDE.

SHOULD THE CONTRACTOR FAIL TO MEET ANY OF THESE REQUIREMENTS, THE CONTRACTOR SHALL BE ASSESSED A DISINCENTIVE IN THE AMOUNT OF \$75 FOR EACH MINUTE THE ABOVE DESCRIBED LANE CLOSURE RESTRICTIONS ARE VIOLATED.

94483mn02.dgn Sheet 2/11/2014 3:01PM CH\_ODOTVB81\_Half\_BW.pen \\antigone\HuffMan\_PCL\_jcenters

ITEM 614, PORTABLE CHANGEABLE MESSAGE SIGNS, AS PER PLAN

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND REMOVE, WHEN NO LONGER NEEDED, A CHANGEABLE MESSAGE SIGN. THE SIGN SHALL BE OF A TYPE SHOWN ON A LIST OF APPROVED PCMS UNITS AVAILABLE ON THE OFFICE OF MATERIALS MANAGEMENT WEB PAGE. THE LIST CONTAINS CLASS A AND B UNITS WITH MINIMUM LEGIBILITY DISTANCES OF 650 FEET AND 475 FEET, RESPECTIVELY.

EACH SIGN SHALL BE TRAILER-MOUNTED AND EQUIPPED WITH A FUNCTIONAL DIMMING MECHANISM, TO DIM THE SIGN DURING DARKNESS, AND A TAMPER AND VANDAL PROOF ENCLOSURE. EACH SIGN SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS TO ENABLE ON-SITE PERSONNEL TO OPERATE AND TROUBLESHOOT THE UNIT. THE SIGN SHALL ALSO BE CAPABLE OF BEING POWERED BY AN ELECTRICAL SERVICE DROP FROM A LOCAL UTILITY COMPANY. The PCMS SHALL BE DELINEATED IN ACCORDANCE WITH CMS 614.03.

PLACEMENT, OPERATION, MAINTENANCE AND ALL ACTIVATION OF THE SIGNS BY THE CONTRACTOR SHALL BE AS DIRECTED BY THE ENGINEER. THE PCMS SHALL BE LOCATED IN A HIGHLY VISIBLE POSITION YET PROTECTED FROM TRAFFIC. THE CONTRACTOR SHALL, AT THE DIRECTION OF THE ENGINEER, RELOCATE THE PCMS TO IMPROVE VISIBILITY OR ACCOMMODATE CHANGED CONDITIONS. WHEN NOT IN USE, THE PCMS SHALL BE TURNED OFF. ADDITIONALLY, WHEN NOT IN USE FOR EXTENDED PERIODS OF TIME, THE PCMS SHALL BE TURNED AWAY FROM ALL TRAFFIC.

THE ENGINEER SHALL BE PROVIDED ACCESS TO EACH SIGN UNIT AND SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS TO ENABLE ODOT PERSONNEL TO OPERATE AND TROUBLESHOOT THE UNIT, AND TO REVISE SIGN MESSAGES, IF NECESSARY.

THE CONTRACTOR SHALL IMPLEMENT A SYSTEM WHEREBY CHANGEABLE MESSAGES WILL BE IMPLEMENTED WITHIN 4 HOURS FOLLOWING TELEPHONE NOTIFICATION FROM THE PROJECT ENGINEER TO A DESIGNATED PHONE.

ALL MESSAGES TO BE DISPLAYED ON THE SIGN WILL BE PROVIDED BY THE ENGINEER. A LIST OF ALL REQUIRED PRE-PROGRAMMED MESSAGES WILL BE GIVEN TO THE CONTRACTOR AT THE PROJECT PRECONSTRUCTION CONFERENCE. THE SIGN SHALL HAVE THE CAPABILITY TO STORE UP TO 99 MESSAGES. MESSAGE MEMORY OR PRE-PROGRAMMED DISPLAYS SHALL NOT BE LOST AS A RESULT OF POWER FAILURES TO THE ON-BOARD COMPUTER. THE SIGN LEGEND SHALL BE CAPABLE OF BEING CHANGED IN THE FIELD. THREE-LINE PRESENTATION FORMATS WITH UP TO SIX MESSAGE PHASES SHALL BE SUPPORTED. PCMS FORMAT SHALL PERMIT THE COMPLETE MESSAGE FOR EACH PHASE TO BE READ AT LEAST TWICE. THE PCMS SHALL CONTAIN AN ACCURATE CLOCK AND PROGRAMMING LOGIC WHICH WILL ALLOW THE SIGN TO BE ACTIVATED, DEACTIVATED OR MESSAGES CHANGED AUTOMATICALLY AT DIFFERENT TIMES OF THE DAY FOR DIFFERENT DAYS OF THE WEEK.

THE PCMS SHALL CONTAIN A CELLULAR TELEPHONE DATA LINK WHICH WILL (IN ACTIVE CELLULAR PHONE AREAS) ALLOW REMOTE SIGN ACTIVATION, MESSAGE CHANGES, MESSAGE ADDITIONS AND REVISIONS TO TIME OF DAY PROGRAMS. THE SYSTEM SHALL ALSO PERMIT VERIFICATION OF CURRENT AND PROGRAMMED MESSAGES. ONE REMOTE DATA INPUT DEVICE (LAPTOP COMPUTER PLUS MODEM OR EQUIVALENT) SHALL BE FURNISHED FOR USE BY THE DISTRICT TRAFFIC ENGINEER, OR EQUIVALENT, AND SHALL BE INSURED AGAINST THEFT.

THE PCMS UNIT SHALL BE MAINTAINED IN GOOD WORKING ORDER BY THE CONTRACTOR IN ACCORDANCE WITH THE PROVISIONS OF CMS 614.07. THE CONTRACTOR SHALL, PRIOR TO ACTIVATING THE UNIT, MAKE ARRANGEMENTS, WITH AN AUTHORIZED SERVICE AGENT FOR THE PCMS, TO ASSURE PROMPT SERVICE IN THE EVENT OF FAILURE. ANY FAILURE SHALL NOT RESULT IN THE SIGN BEING OUT OF SERVICE FOR MORE THAN 12 HOURS, INCLUDING WEEKENDS. FAILURE TO COMPLY MAY RESULT IN AN ORDER TO STOP WORK AND OPEN ALL TRAFFIC LANES AND/OR IN THE DEPARTMENT TAKING APPROPRIATE ACTION TO SAFELY CONTROL TRAFFIC. THE ENTIRE COST TO CONTROL TRAFFIC, ACCRUED BY THE DEPARTMENT DUE TO THE CONTRACTOR'S NONCOMPLIANCE, WILL BE DEDUCTED FROM MONEYS DUE, OR TO BECOME DUE THE CONTRACTOR ON HIS CONTRACT.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR 24-HOUR-PER-DAY OPERATION AND MAINTENANCE OF THESE SIGNS ON THE PROJECT FOR THE DURATION OF THE PHASES WHEN THE PLAN REQUIRES THEIR USE.

PAYMENT FOR THE ABOVE DESCRIBED ITEM SHALL BE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, FUELS, LUBRICATING OILS, SOFTWARE, HARDWARE AND INCIDENTALS TO PERFORM THE ABOVE DESCRIBED WORK.

ITEM 614, PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN 4 SIGN MONTH

ITEM 614 - LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE DURING CONSTRUCTION OPERATIONS

USE OF LAW ENFORCEMENT OFFICERS (LEOS) BY CONTRACTORS OTHER THAN THE USES SPECIFIED BELOW WILL NOT BE PERMITTED AT PROJECT COST. LEOS SHOULD NOT BE USED WHERE THE ODOT INTENDS THAT FLAGGERS BE USED.

IN ADDITION TO THE REQUIREMENTS OF CMS 614 AND THE ODOT, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHALL BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

DURING THE ENTIRE ADVANCE PREPARATION AND CLOSURE SEQUENCE WHERE COMPLETE BLOCKAGE OF TRAFFIC IS REQUIRED.

IN ADDITION TO THE REQUIREMENT OF CMS 614 AND THE ODOT, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHOULD BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

FOR LANE CLOSURES: DURING INITIAL SET-UP PERIODS, TEAR DOWN PERIODS, SUBSTANTIAL SHIFTS OF A CLOSURE POINT OR WHEN NEW LANE CLOSURE ARRANGEMENTS ARE INITIATED FOR LONG-TERM LANE CLOSURES/SHIFTS (FOR THE FIRST AND LAST DAY OF MAJOR CHANGES IN TRAFFIC CONTROL SETUP). IN GENERAL, LEOS SHOULD BE POSITIONED AT THE POINT OF LANE RESTRICTION OR ROAD CLOSURE AND TO MANUALLY CONTROL TRAFFIC MOVEMENTS THROUGH INTERSECTIONS IN WORK ZONES.

WHEN CONSTRUCTION VEHICLES ARE ENTERING/EXITING THE ZONE DIRECTLY FROM/INTO AN OPEN LANE OF TRAFFIC. IF A LANE HAS BEEN CLOSED TO PROVIDE AN ACCELERATION/ DECELERATION LANE FOR THE VEHICLE, THE LEO WILL NOT BE REQUIRED.

LEOS SHOULD NOT FORGO THEIR TRAFFIC CONTROL RESPONSIBILITIES TO APPREHEND MOTORISTS FOR ROUTINE TRAFFIC VIOLATIONS. HOWEVER, IF A MOTORIST'S ACTIONS ARE CONSIDERED TO BE RECKLESS, THEN PURSUIT OF THE MOTORIST IS APPROPRIATE.

THE LEOS WORK AT THE DIRECTION OF THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE SERVICES OF THE LEOS WITH THE APPROPRIATE AGENCIES AND COMMUNICATING THE INTENTIONS OF THE PLANS WITH RESPECT TO DUTIES OF THE LEOS. THE ENGINEER SHALL HAVE FINAL CONTROL OVER THE LEOS' DUTIES AND PLACEMENT, AND WILL RESOLVE ANY ISSUES THAT MAY ARISE BETWEEN THE TWO PARTIES.

THE LEO SHALL REPORT IN TO THE CONTRACTOR PRIOR TO THE START OF THE SHIFT, IN ORDER TO RECEIVE INSTRUCTIONS REGARDING SPECIFIC WORK ASSIGNMENTS DURING HIS/HER SHIFT. THE LEO IS EXPECTED TO STAY AT THE PROJECT SITE FOR THE ENTIRE DURATION OF HIS/HER SHIFT. THE LEO SHALL REPORT TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT. ONCE THE LEO HAS COMPLETED THE DUTIES DESCRIBED ABOVE AND STILL HAS TIME REMAINING ON HIS/HER SHIFT, THE LEO MAY BE ASKED TO PATROL THROUGH THE WORK ZONE (WITH FLASHING LIGHTS OFF) OR BE PLACED AT A LOCATION TO DETER MOTORISTS FROM SPEEDING. SHOULD IT BE NECESSARY TO LEAVE THE PROJECT SITE, THE LEO SHALL NOTIFY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE THE LEO WITH A TWO-WAY COMMUNICATION DEVICE WHICH SHALL BE RETURNED TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT.

LEOS (WITH PATROL CAR) REQUIRED BY THE TRAFFIC MAINTENANCE TASKS ABOVE SHALL BE PAID FOR ON A UNIT PRICE (HOURLY) BASIS UNDER ITEM 614, LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY.

ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE 50 HOURS

THE HOURS PAID SHALL INCLUDE ANY MINIMUM SHOW-UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED.

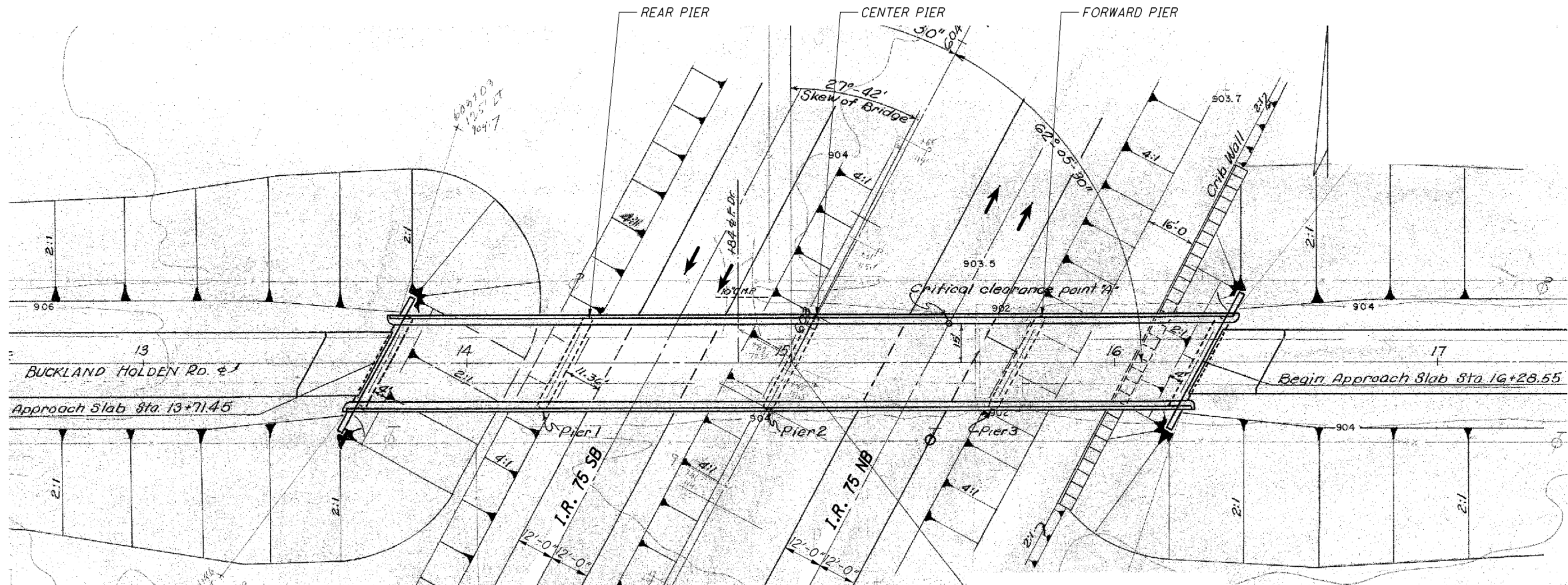
ANY ADDITIONAL COSTS (ADMINISTRATIVE OR OTHERWISE) INCURRED BY THE CONTRACTOR TO OBTAIN THE SERVICES OF AN LEO ARE INCLUDED WITH THE BID UNIT PRICE FOR ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE.



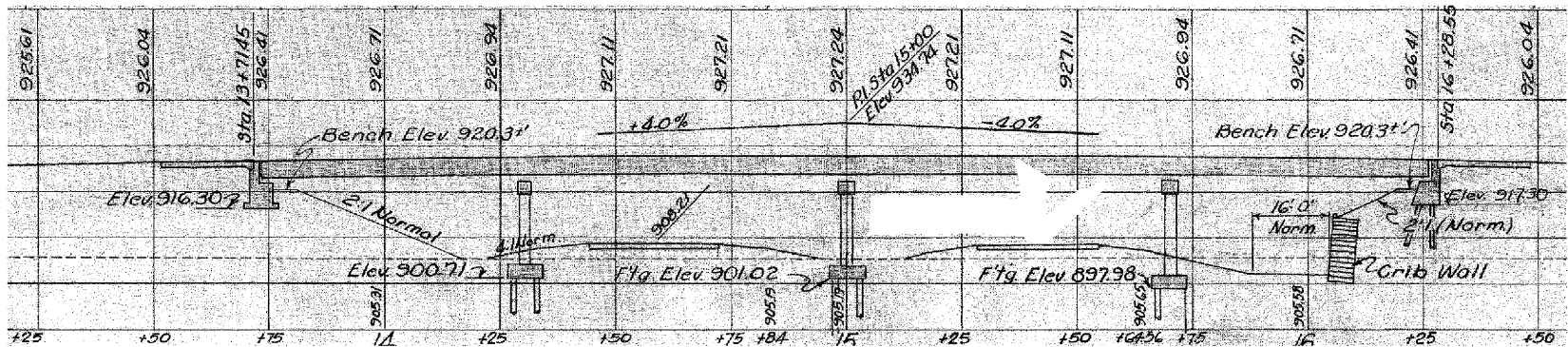
## SUBSUMMARY



075\_1047SP01.dgn Sheet 1/29/2014 10:25AM CH\_OD0TV8i\_Half\_BW.pen \\antigone\Germantown baukernm



PLAN



ELEVATION

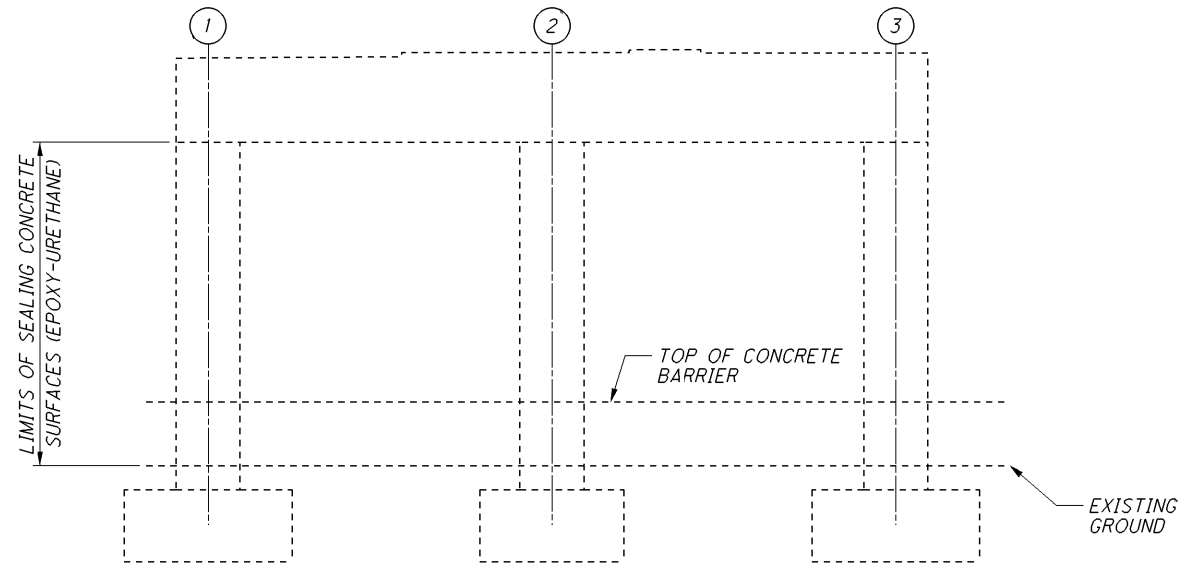
ESTIMATED QUANTITIES - AUG-075-1047					
ITEM	EXTENSION	TOTAL	UNIT	DESCRIPTION	PIERS SHEET #
509	20001	25	POUND	REINFORCING STEEL, REPLACEMENT OF EXISTING REINFORCING STEEL, AS PER PLAN	25 5 / 79
511	81300	21	EACH	CONCRETE, MISC.: EMBEDDED GALVANIC ANODE (EGA)	21 5 / 79
512	10101	114	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE), AS PER PLAN	114 5 / 79
SPECIAL	51911900	0.34	CU YD	PATCHING CONCRETE STRUCTURE, MISC.: WITH PUMPED SELF-CONSOLIDATING CONCRETE	0.34 5 / 79

QUANTITIES CARRIED TO SUBSUMMARY ON SHEET 9

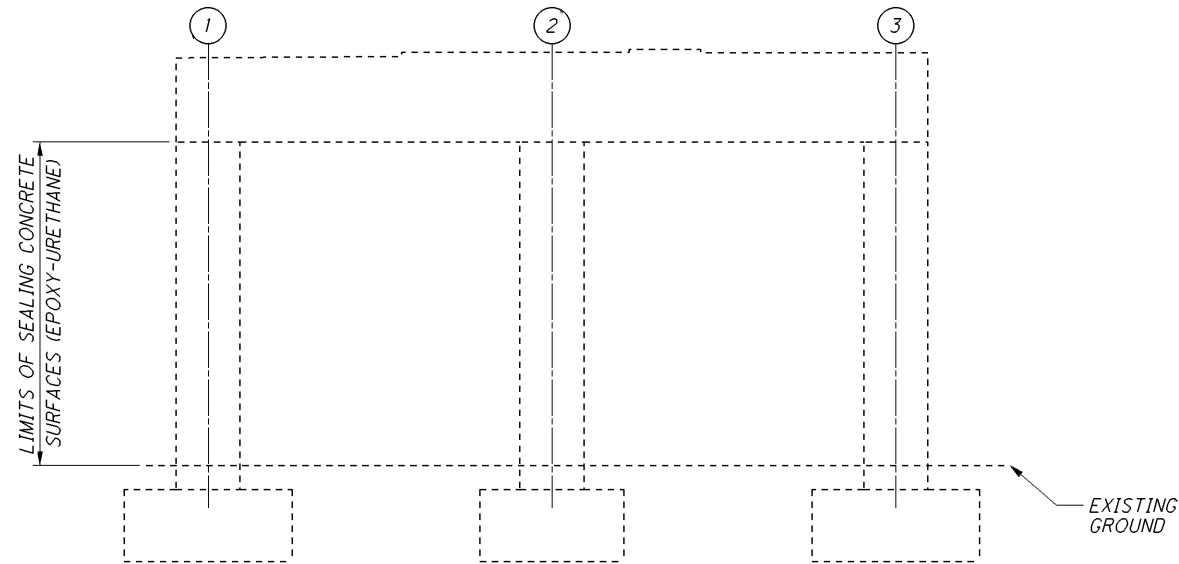
EXISTING STRUCTURE
TYPE: 4-SPAN CONTINUOUS STEEL BEAMS WITH REINFORCED CONCRETE DECK AND SUBSTRUCTURES.
SPANS: 56'-0", 70'-0", 70'-0", 56'-0" (±) C/C BEARINGS
ROADWAY: 28'-0" T/T PARAPETS
LOADING: HS20-44
WEARING SURFACE: 1 1/4" MONOLITHIC CONCRETE
SKEW: 27°42'00" LEFT FORWARD
APPROACH SLABS: AS-1-54 (20'-0" LONG)
ALIGNMENT: TANGENT
STRUCTURAL FILE NUMBER: 0602345
DATE BUILT: 1958 REHABILITATED: 1994
PROPOSED STRUCTURE
SAME AS EXISTING
PROPOSED WORK
1. PATCHING DAMAGED AREAS ON PIER COLUMNS AND INSTALLING EMBEDDED GALVANIC ANODES IN PATCHING LOCATIONS.
2. SEAL ALL PIER COLUMNS WITH EPOXY-URETHANE.



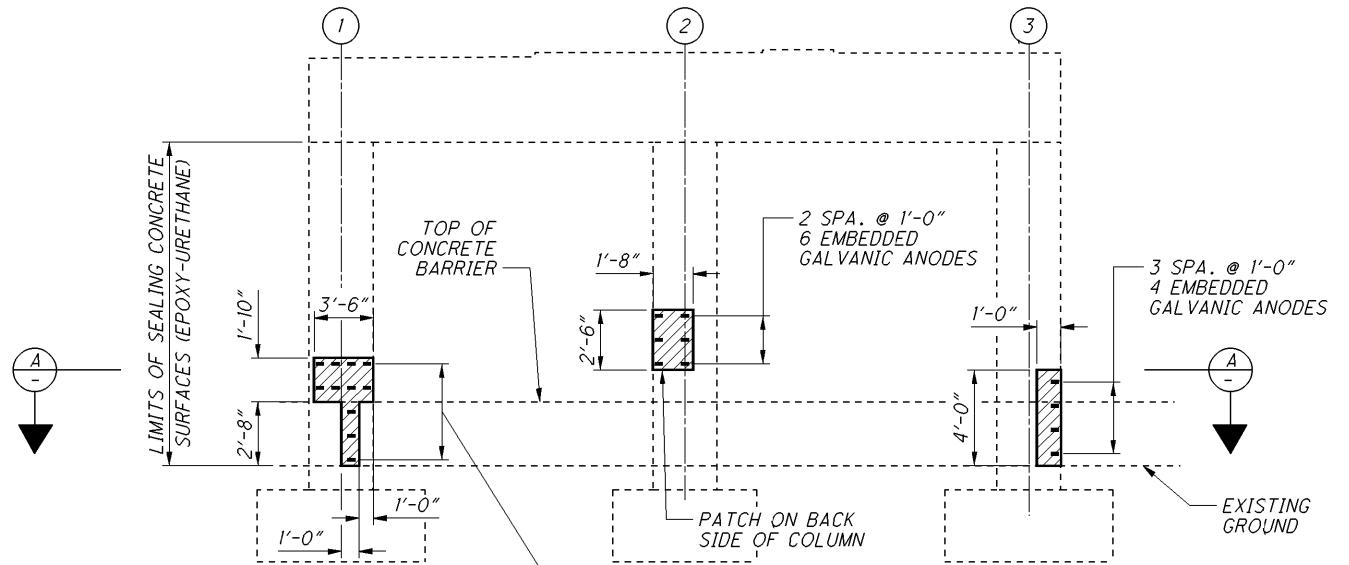
075\_1047PI01.dgn Sheet 1/29/2014 10:26AM CH\_ODOTV6i\_Half\_BW.pen \\antigone\Germantown baukerna



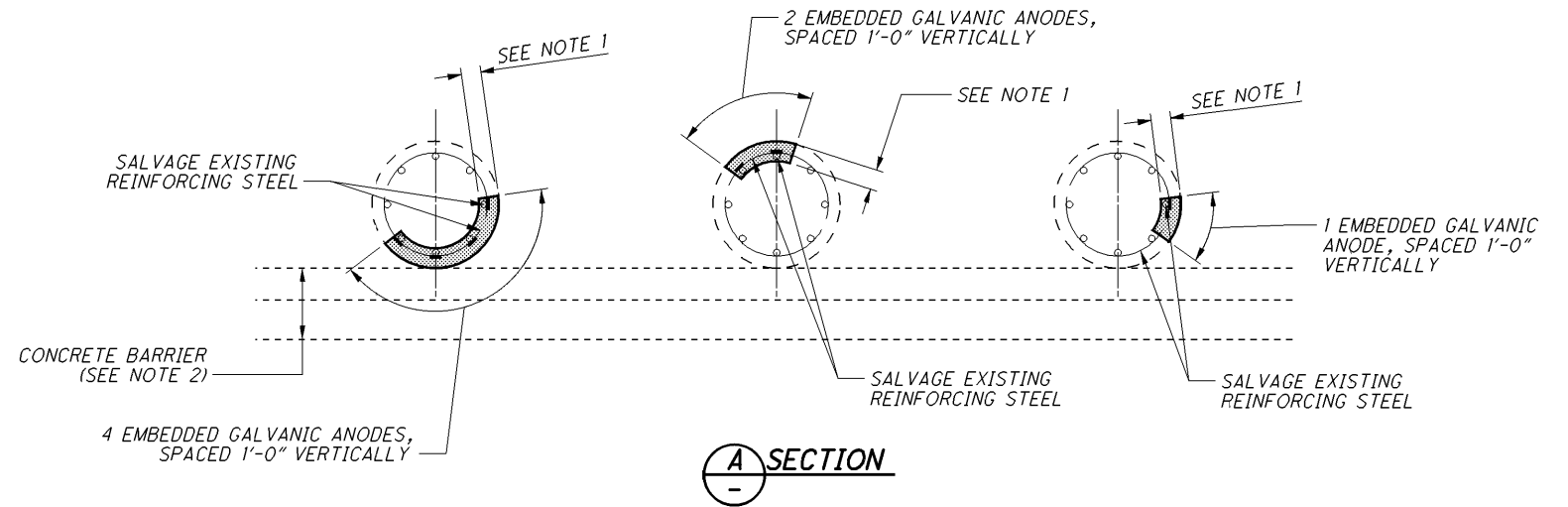
**REAR PIER**



**CENTER PIER**



**FORWARD PIER**



**LEGEND:**

- APPROXIMATE LIMITS OF UNSOUND CONCRETE TO BE REPAIRED
- PROPOSED CONCRETE
- PROPOSED EMBEDDED GALVANIC ANODE
- COLUMN NUMBER

**NOTES:**

- REMOVAL DEPTH SHALL BE A MINIMUM DEPTH OF  $4\frac{3}{4}$ " BUT SHALL NOT EXCEED A DEPTH OF  $6\frac{3}{4}$ ".
- EXTREME CARE SHALL BE TAKEN DURING CONCRETE REMOVAL AS NOT TO CAUSE ANY DAMAGE TO THE EXISTING CONCRETE BARRIER.
- ALL PIER ELEVATIONS ARE SHOWN LOOKING EAST.