



**COMMONWEALTH OF KENTUCKY
TRANSPORTATION CABINET**

Frankfort, Kentucky 40622
www.transportation.ky.gov/

Matthew G. Bevin
Governor

Greg Thomas
Secretary

June 4, 2019

CALL NO. 404
CONTRACT ID NO. 192605
ADDENDUM # 1

Subject: OHIO COUNTY, 092GR19M050 - FE02
Letting June 21, 2019

(1)Added - Special Notes - Pages 1-64 of 64

Proposal revisions are available at <http://transportation.ky.gov/Construction-Procurement/>.

If you have any questions, please contact us at 502-564-3500.

Sincerely,

A handwritten signature in black ink that reads "Rachel Mills".

Rachel Mills, P.E.
Director
Division of Construction Procurement

RM:mr
Enclosures



An Equal Opportunity Employer M/F/D

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS
WESTERN KENTUCKY PARKWAY
OHIO COUNTY
BRIDGE REHABILITATION

MP 69.73 - WKP OVER LEWIS CREEK - 092B00134L/R

MP 72.42- WKP OVER KY 369 - 092B00133L/R

MP 76.74 - WKP OVER NATCHER PARKWAY - 092B00072L/R

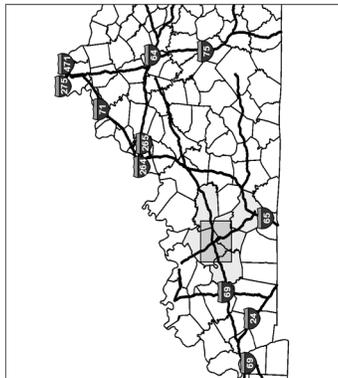
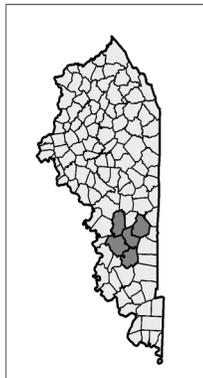
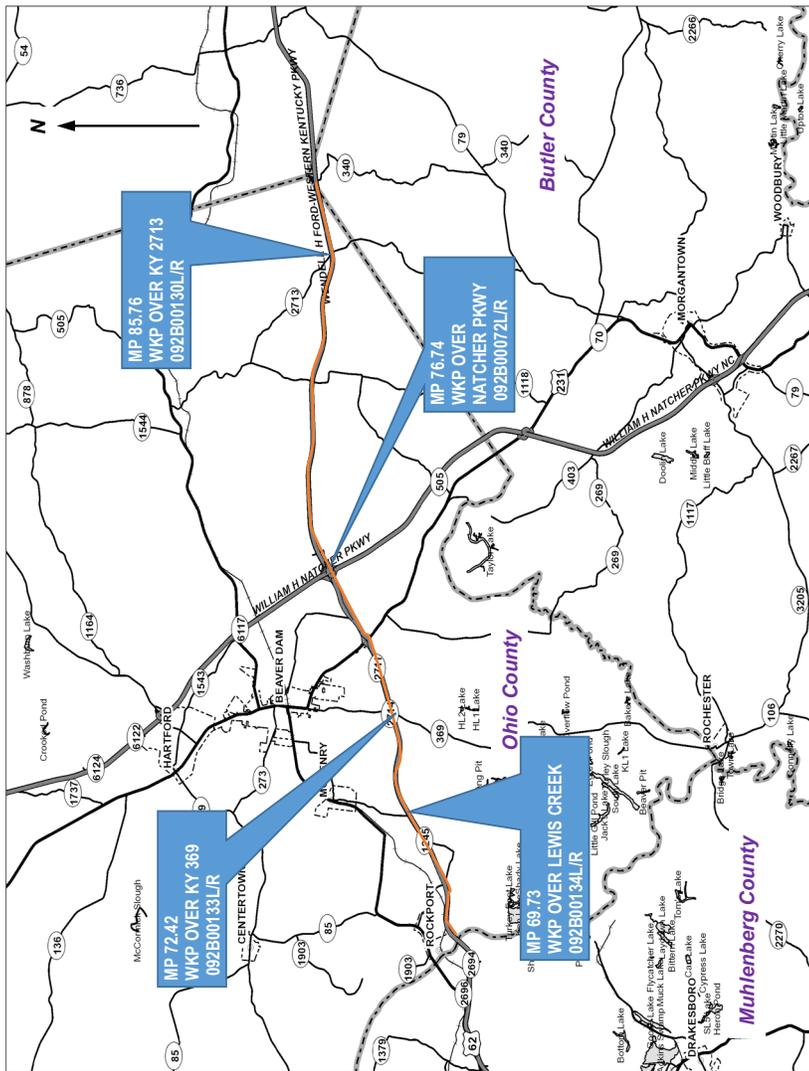
MP 85.76 - WKP OVER KY 2713 - 092B00130L/R

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Prepared By:
WSP USA INC.
1792 ALYSHEBA WAY
LEXINGTON, KY 40509
859-272-5400

April 26, 2019



**THIS PROJECT IS A FULLY
CONTROLLED ACCESS HIGHWAY**

NOT TO SCALE

COUNTY(S): OHIO

ITEM NO(S):

PROJECT NO(S):

LETTING DATE:

RECOMMENDED BY:

PLAN APPROVED BY:

FHWA APPROVED BY:

DATE:

DATE:

DATE:

KYTC Project Manager

State Highway Engineer

STANDARD DRAWINGS
WKP - OHIO COUNTY - BRIDGE REHABILITATION
PAGE 1 OF 1

APPLICABLE KENTUCKY DEPARTMENT OF HIGHWAYS STANDARD DRAWINGS - CURRENT EDITIONS:

TTC-120	LANE CLOSURE MULTI-LANE HIGHWAY CASE II
TTC-160	TEMPORARY PAVEMENT MARKER ARRANGEMENTS FOR LANE CLOSURES
RBM-020	DELINEATORS FOR CONCRETE BARRIERS
BJE-001	NEOPRENE EXPANSION DAMS AND ARMORED EDGE

APPLICABLE KENTUCKY DEPARTMENT OF HIGHWAYS STANDARD DRAWING SEPIAS (ATTACHED):

013	GUARDRAIL CONNECTOR TO BRIDGE END TYPE A AND A-1 COMPONENTS
015	GUARDRAIL CONNECTOR TO BRIDGE END TYPE A
016	GUARDRAIL CONNECTOR TO BRIDGE END TYPE A-1
027	STEEL BEAM GUARDRAIL "W" BEAM
028	STEEL GUARDRAIL POSTS

REFERENCES
WKP - OHIO COUNTY - BRIDGE REHABILITATION
PAGE 1 OF 1

1. KENTUCKY TRANSPORTATION CABINET, DEPARTMENT OF HIGHWAYS, STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.
2. FHWA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) - CURRENT EDITION WITH REVISIONS.
3. APPLICABLE KENTUCKY DEPARTMENT OF HIGHWAYS SUPPLEMENT SPECIFICATIONS (ATTACHED):
 - SPCL. NOTE 3/8" EPOXY-URETHANE WATERPROOFING OVERLAY FOR BRIDGE DECKS
 - SPCL. NOTE REPLACING EXPANSION DAMS AND/OR INSTALLING ARMORED EDGES FOR CONCRETE BRIDGES
 - SPCL. NOTE BRIDGE CLEANING AND PREVENTATIVE MAINTENANCE: BEARING CLEANING AND LUBRICATING
 - SPCL. NOTE BRIDGE BARRIER RETROFIT
 - SPCL. NOTE BRIDGE RESTORATION AND WATERPROOFING WITH CONCRETE OVERLAYS
 - SPCL. NOTE REPLACING COMPRESSION SEAL IN EXISTING EXPANSION JOINT
 - SPCL. NOTE BRIDGE DEMOLITION, RENOVATION AND ASBESTOS ABATEMENT

BRIDGE SUMMARY															
WESTERN KENTUCKY PARKWAY - OHIO COUNTY															
BID CODE	ITEM	NOTE	UNIT	QUANTITIES										TOTAL	
				MP 69.73 WKP OVER LEWIS CREEK 092B00134L/R		MP 72.42 WKP OVER KY 369 092B00133L/R		MP 76.74 WKP OVER NATCHER PKWY. 092B00072L/R		MP 85.76 WKP OVER KY 2713 092B00130L/R					
				EB	WB	EB	WB	EB	WB	EB	WB	EB	WB		
				R	L	R	L	R	L	R	L	R	L		
2363	GUARD. CONN. TO BRIDGE END TY A		EACH	-	-	-	-	2	2	-	-	-	-		4
2372	REMOVE GUARDRAIL CON TO BR END	5	EACH	-	-	-	-	3	3	-	-	-	-		6
2387	GUARD. CONN. TO BRIDGE END TY A-1		EACH	-	-	-	-	1	1	-	-	-	-		2
2998	MASONRY COATING		SQ. YD.	-	-	-	-	260	260	-	-	-	-		520
3293	EXPAN JOINT REPLACE 1 IN	1	LIN. FT.	92	92	34	34	-	-	86	86	-	-		424
3294	EXPAN JOINT REPLACE 1.5 IN	1	LIN. FT.	-	-	-	-	85	85	-	-	-	-		170
3298	EXPAN JOINT REPLACE 4.0 IN	1	LIN. FT.	-	-	34	34	-	-	-	-	-	-		68
3299	ARMORED EDGE FOR CONCRETE		LIN. FT.	92	92	67	67	85	85	86	86	-	-		660
6556	PAVE STRIPING-DUR TY 1-6 IN W		LIN. FT.	162.5	162.5	232.5	232.5	312.5	312.5	150.0	150.0	-	-		1715.0
6557	PAVE STRIPING-DUR TY 1-6 IN Y		LIN. FT.	130.0	130.0	186.0	186.0	250.0	250.0	120.0	120.0	-	-		1372.0
8504	EPOXY SAND SLURRY		SQ. YD.	60	60	249	249	100	100	58	58	-	-		934
8510	REM EPOXY BIT FOREIGN OVERLAY		SQ. YD.	507	507	619	619	1147	1147	490	490	-	-		5,526
8526	CONC CLASS M FULL DEPTH PATCH	3	CU. YD.	2.8	2.8	6.3	2.8	5.6	2.8	4.4	3.8	-	-		31.3
8534	CONCRETE OVERLAY-LATEX		CU. YD.	28.2	28.2	34.4	34.4	-	-	20.4	20.4	-	-		166.0
8549	BLAST CLEANING		SQ. YD.	567	567	868	868	1247	1247	548	548	-	-		6,460
8551	MACHINE PREP OF SLAB		SQ. YD.	507	507	619	619	1147	1147	490	490	-	-		5,526
23032EN	BRIDGE BARRIER RETROFIT		LIN. FT.	-	-	-	-	542	542	-	-	-	-		1,084
23331EC	EPOXY-URETHANE WATERPROOFING		SQ. FT.	-	-	-	-	10322	10322	-	-	-	-		20,644
23949EC	BRIDGE CLEANING AND PREV. MAINT.	4	LS	-	-	1	1	1	1	-	-	-	-		1
24094EC	PARTIAL DEPTH PATCHING	2	CU. YD.	0.8	0.8	1.0	1.0	1.9	1.9	0.8	0.8	-	-		9.0

- NOTES:
1. EXPANSION JOINT REPLACEMENT SIZE BASED ON EXISTING PLANS. CONTRACTOR SHALL FIELD VERIFY JOINT SEAL WIDTH BEFORE ORDERING MATERIAL.
 2. PARTIAL DEPTH QUANTITY IS BASED ON APPROXIMATE ESTIMATE OF 0.50% OF THE OVERALL OVERLAY AREA.
 3. FULL DEPTH CONCRETE PATCHING QUANTITY BASED ON VISUAL INSPECTION + 25%
 4. BRIDGE CLEANING & PREVENTATIVE MAINTENANCE CORRESPONDS TO THE CLEANING AND LUBRICATION OF ALL MOVEABLE BEARINGS. SEE THE SPECIAL NOTE FOR BEARING CLEANING AND LUBRICATION
 5. SHALL INCLUDE REMOVAL OF 25' OF GUARDRAIL.

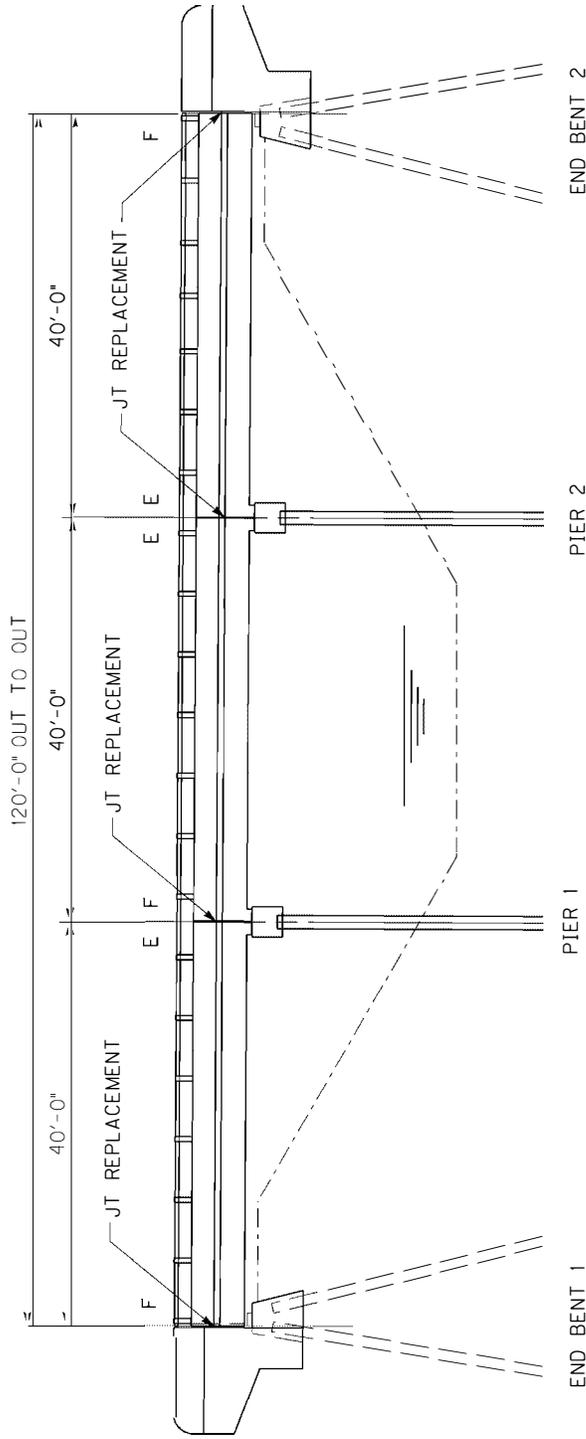
MP 69.73
WKP OVER LEWIS CREEK
092B00134L/R

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OHIO	ITEM NO. 2-20039.00
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KY 9001 over LEWIS CREEK (092B00134L/R)
(MP 69.73)



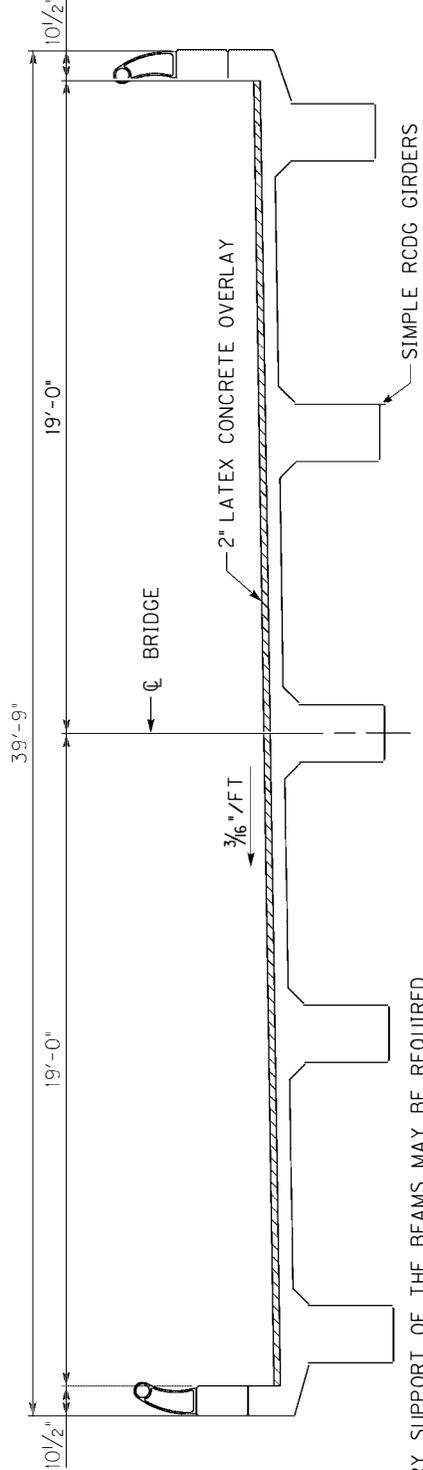
KY 9001 EB (WKP) OVER LEWIS CREEK BRIDGE MAINTENANCE #092B00134R



ELEVATION
33°00'00" SKEW LT
(NOT TO SCALE)

CONTRACTOR SHALL FIELD VERIFY THE EXISTING CONDITIONS SHOWN.

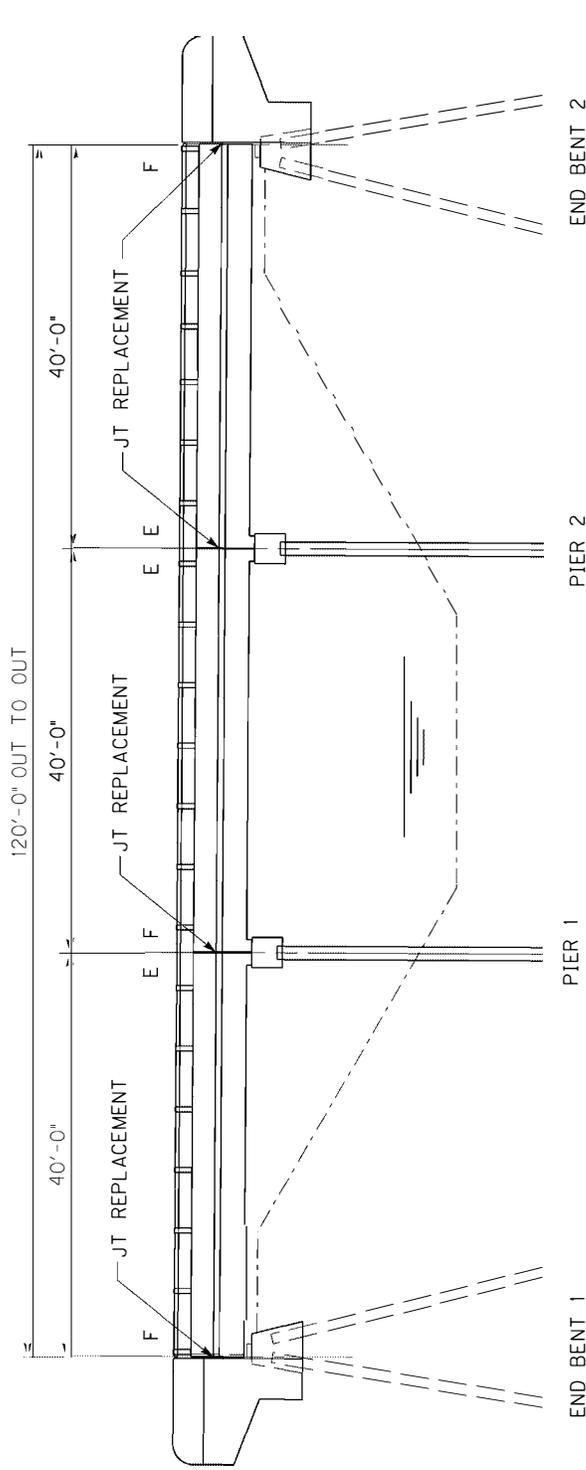
NOTES:
DETAILS SHOWN ARE BASED ON EXISTING PLANS (DWG NO 15279). FEATURES AND DIMENSIONS SHOWN ARE APPROXIMATE.



TYPICAL SECTION

* TEMPORARY SUPPORT OF THE BEAMS MAY BE REQUIRED DURING FULL DEPTH PATCHING. SUBMIT THE PROPOSED METHOD OF SUPPORT TO THE ENGINEER FOR APPROVAL BEFORE BEGINNING WORK.

KY 9001 WB (WKP) OVER LEWIS CREEK BRIDGE MAINTENANCE #092B00134L

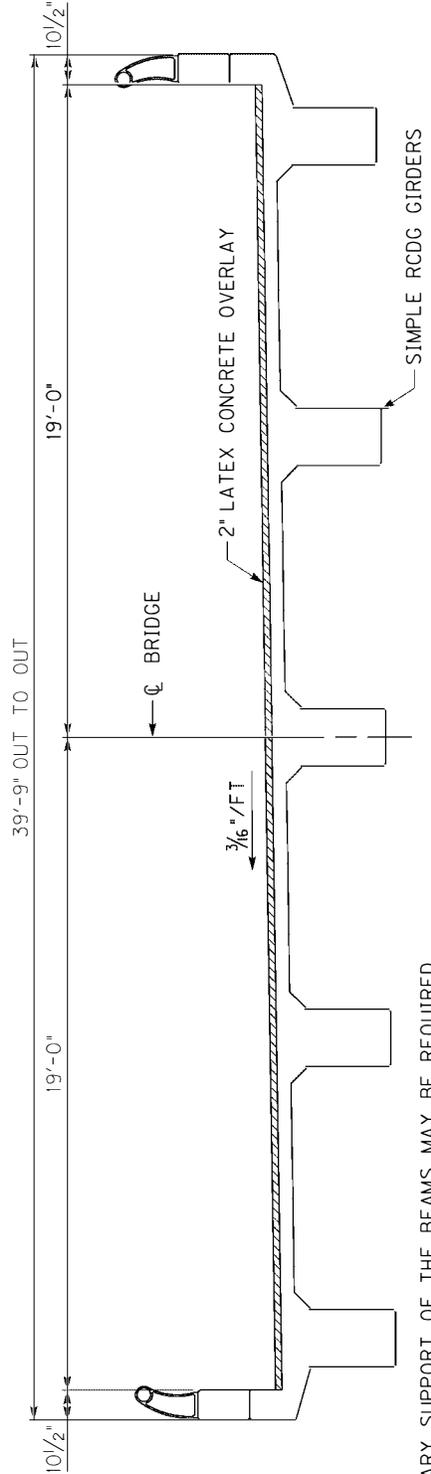


ELEVATION

33°00'00" SKEW LT
(NOT TO SCALE)

CONTRACTOR SHALL FIELD VERIFY THE EXISTING CONDITIONS SHOWN.

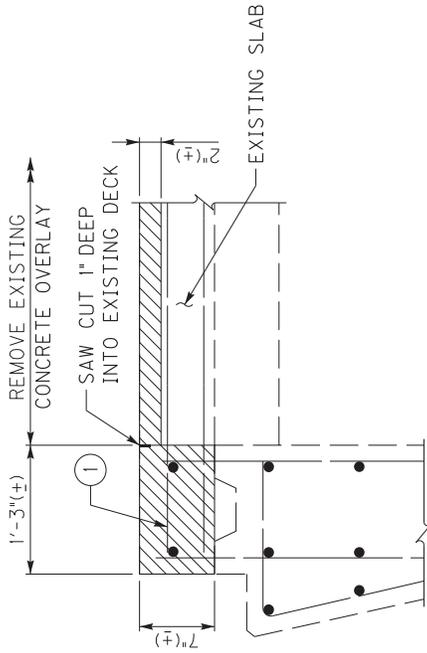
NOTES:
DETAILS SHOWN ARE BASED ON EXISTING PLANS (DWG NO. 15279). FEATURES AND DIMENSIONS SHOWN ARE APPROXIMATE.



* TEMPORARY SUPPORT OF THE BEAMS MAY BE REQUIRED DURING FULL DEPTH PATCHING. SUBMIT THE PROPOSED METHOD OF SUPPORT TO THE ENGINEER FOR APPROVAL BEFORE BEGINNING WORK.

TYPICAL SECTION

KY 9001 (WKP) OVER LEWIS CREEK JOINT REPLACEMENT DETAILS - BENTS 1 & 2



NOTES:
REMOVE HATCHED AREA OF CONCRETE.
CLEAN AND REUSE EXISTING REINFORCE-
MENT. THE CONTRACTOR HAS THE OPTION
TO REUSE OR REPLACE THE TRANSVERSE
REINFORCEMENT.

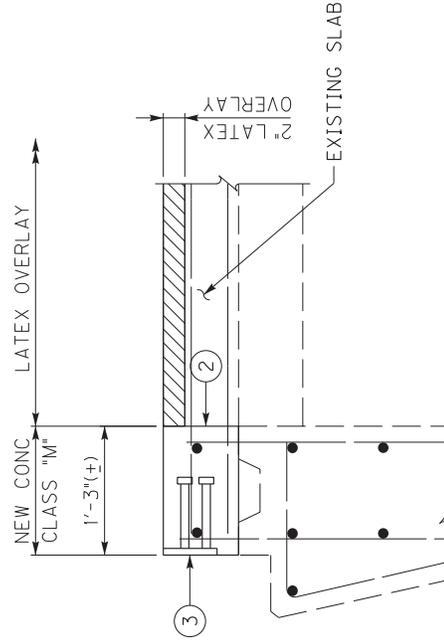
FOR BONDING NEW CONCRETE TO
EXISTING SURFACES, SEE SECTION 511
OF THE STANDARD SPECIFICATIONS.

ROUGHEN EXISTING CONCRETE WHEN
IN CONTACT WITH NEW CONCRETE.

THIS WORK, INCLUDING ALL LABOR,
TOOLS AND MATERIAL, IS TO BE
INCLUDED IN THE BID FOR: ITEM
3299 "ARMORED EDGE FOR CONCRETE".

EXISTING SECTION AT END BENT

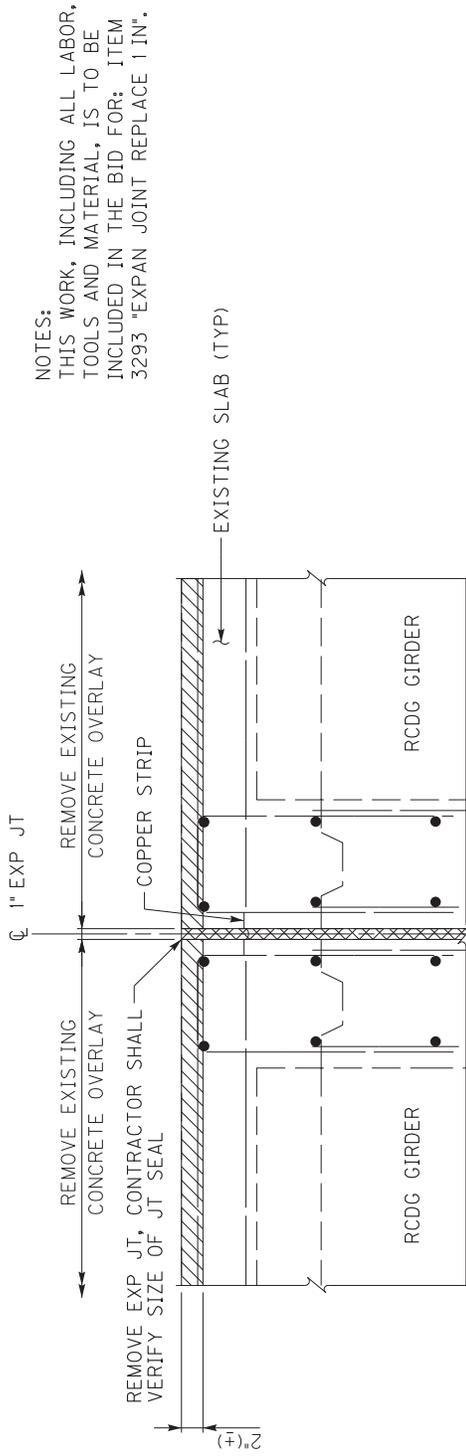
(SHOWING LIMITS OF REMOVAL)



- ① CLEAN AND PROTECT EXISTING REINFORCEMENT
- ② BONDED CONSTRUCTION JOINT
- ③ ARMORED EDGE, SEE STD DWG BJE-001-13.

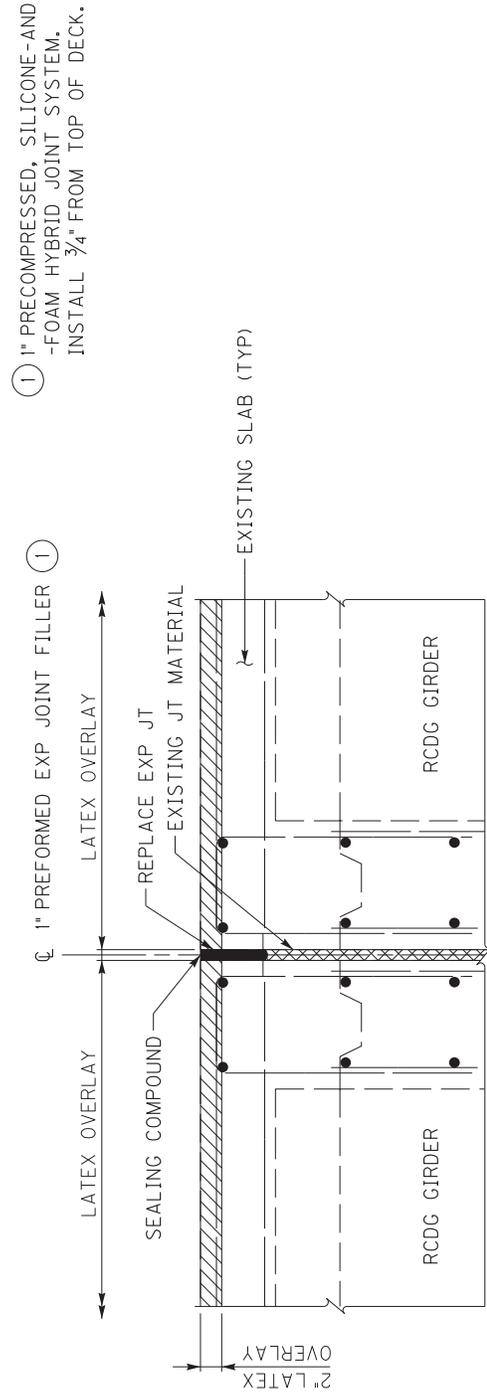
PROPOSED SECTION AT END BENT

KY 9001 (WKP) OVER LEWIS CREEK JOINT REPLACEMENT DETAILS - PIERS 1 & 2



EXISTING SECTION AT PIER

(SHOWING LIMITS OF REMOVAL)

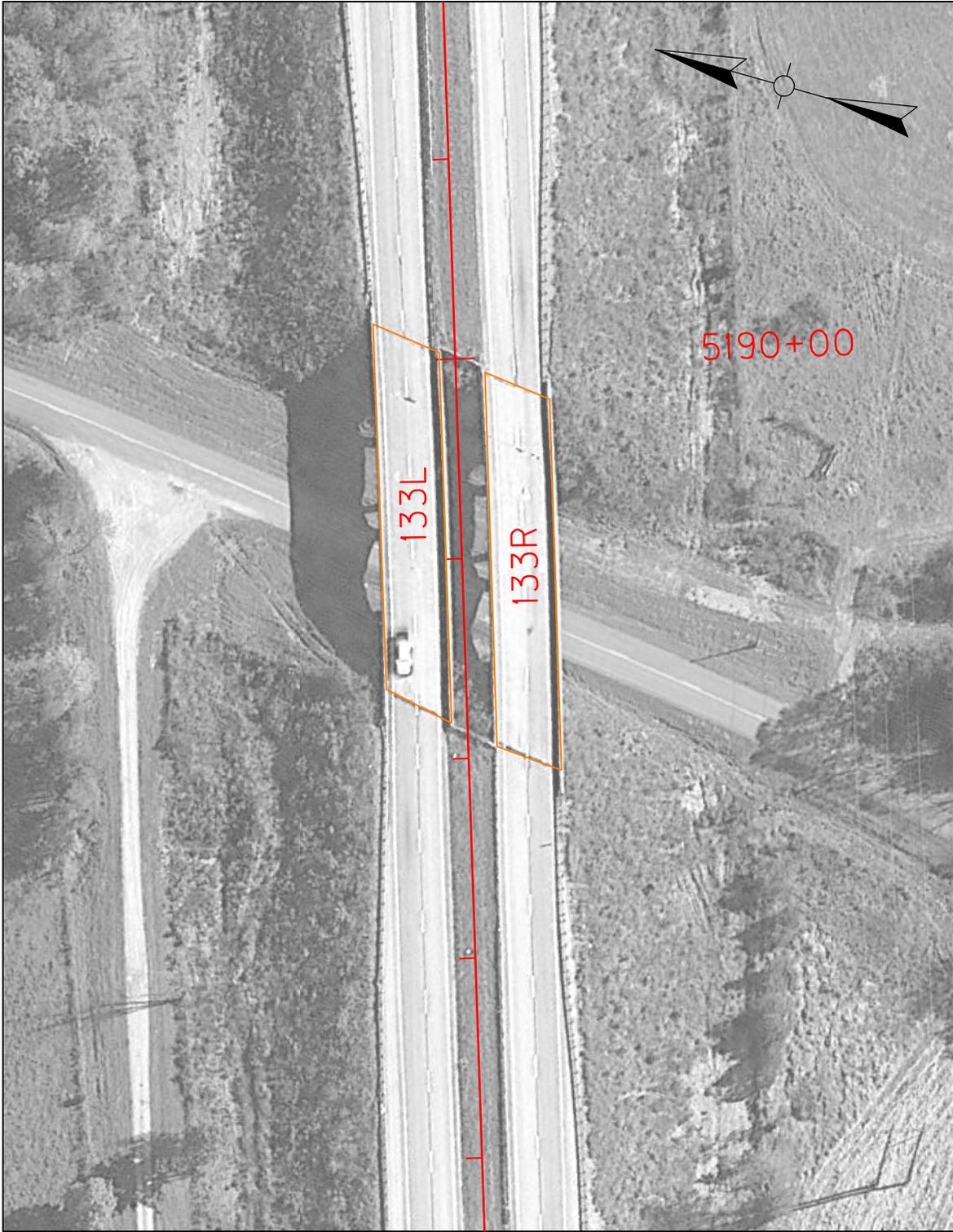


PROPOSED SECTION AT PIER

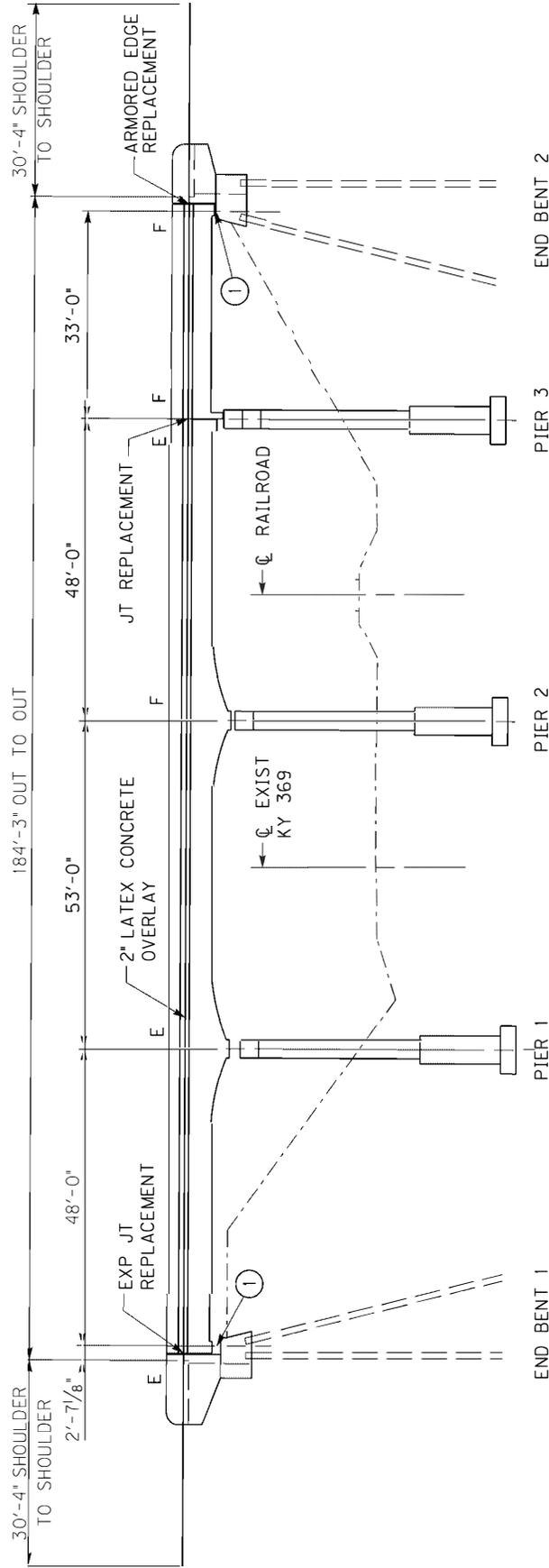
MP 72.42
WKP OVER KY 369
092B00133L/R

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KY 9001 over KY 369 (092B00133L/R)
(MP 72.42)



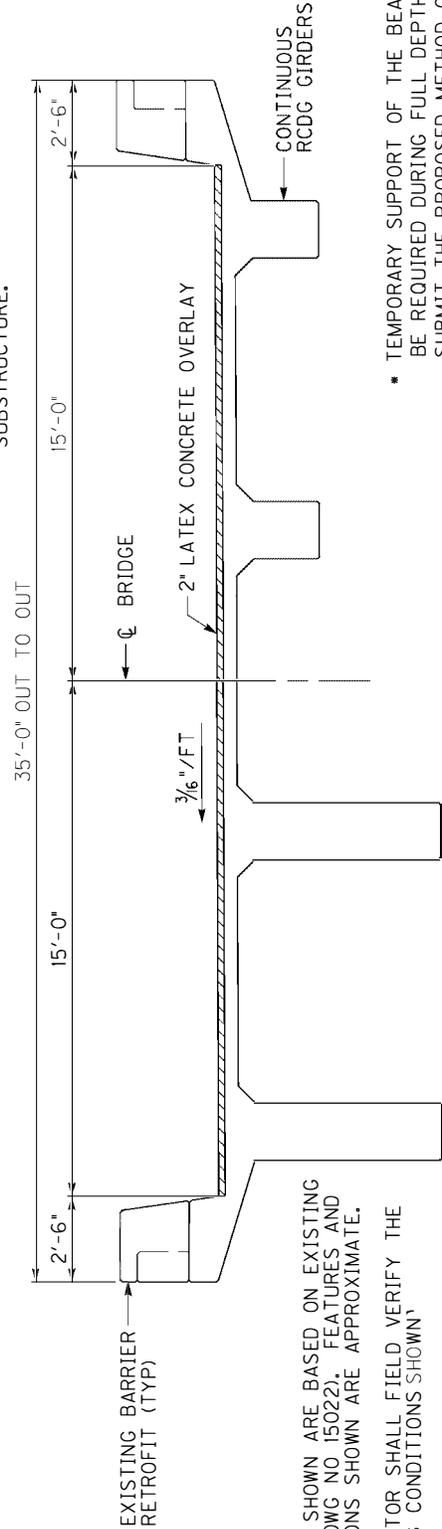
KY 9001 WB (WKP) OVER KY 369 BRIDGE MAINTENANCE #092B00133L



ELEVATION

24°48'00" SKEW RT
(NOT TO SCALE)

① BRIDGE CLEANING AND PREVENTATIVE MAINTENANCE
(SEE SPECIAL NOTE FOR BEARING CLEANING AND
LUBRICATION) & MOVEABLE BEARINGS PER NOTED
SUBSTRUCTURE.



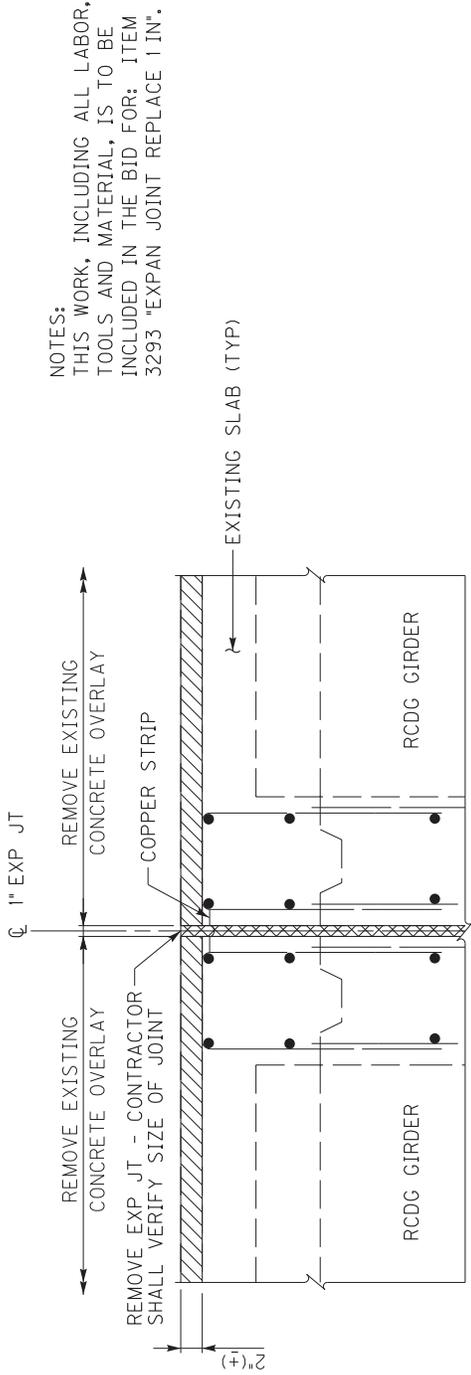
NOTES:
DETAILS SHOWN ARE BASED ON EXISTING
PLANS (DWG NO 15022). FEATURES AND
DIMENSIONS SHOWN ARE APPROXIMATE.

CONTRACTOR SHALL FIELD VERIFY THE
EXISTING CONDITIONS SHOWN.

* TEMPORARY SUPPORT OF THE BEAMS MAY
BE REQUIRED DURING FULL DEPTH PATCHING.
SUBMIT THE PROPOSED METHOD OF SUPPORT
TO THE ENGINEER FOR APPROVAL BEFORE
BEGINNING WORK.

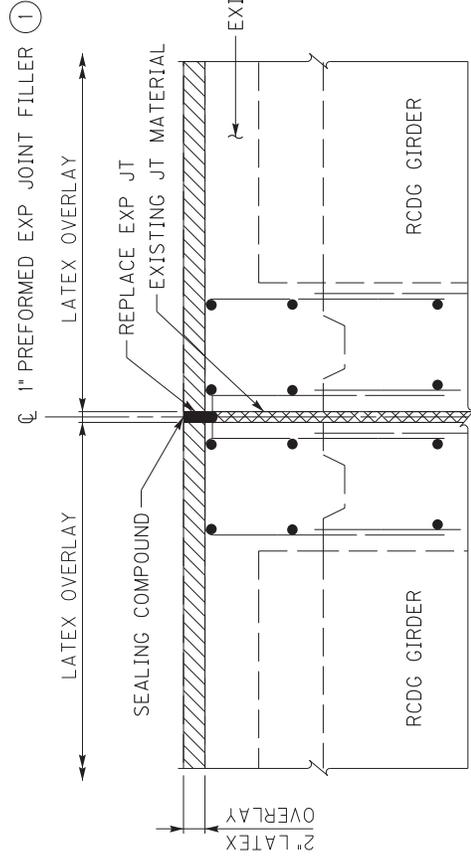
TYPICAL SECTION

KY 9001 (WKP) OVER KY 369 JOINT REPLACEMENT DETAILS - PIER 3



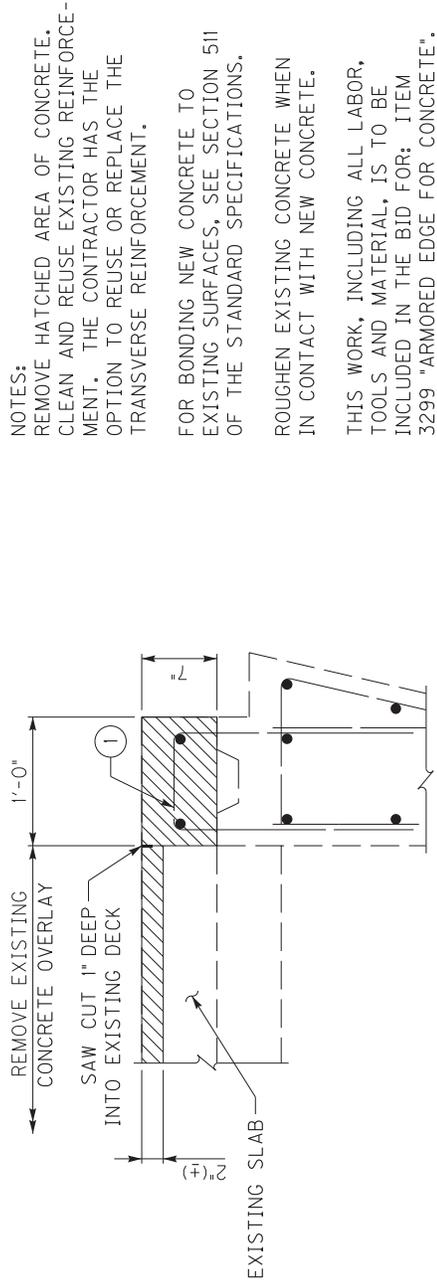
EXISTING SECTION AT PIER (SHOWING LIMITS OF REMOVAL)

① 1" PRECOMPRESSED, SILICONE-AND-FOAM HYBRID JOINT SYSTEM. INSTALL 3/4" FROM TOP OF DECK.



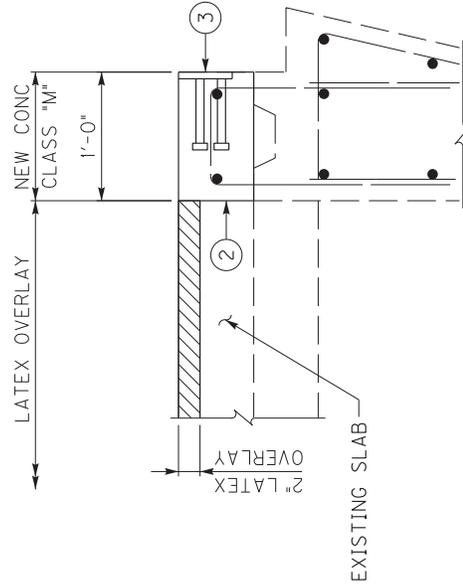
PROPOSED SECTION AT PIER

KY 9001 WB (WKP) OVER KY 369 JOINT REPLACEMENT DETAILS - BENT 2



EXISTING SECTION END BENT (SHOWING LIMITS OF REMOVAL)

- ① CLEAN AND PROTECT EXISTING REINFORCEMENT
- ② BONDED CONSTRUCTION JOINT
- ③ ARMORED EDGE, SEE STD DWG BJE-001-13.

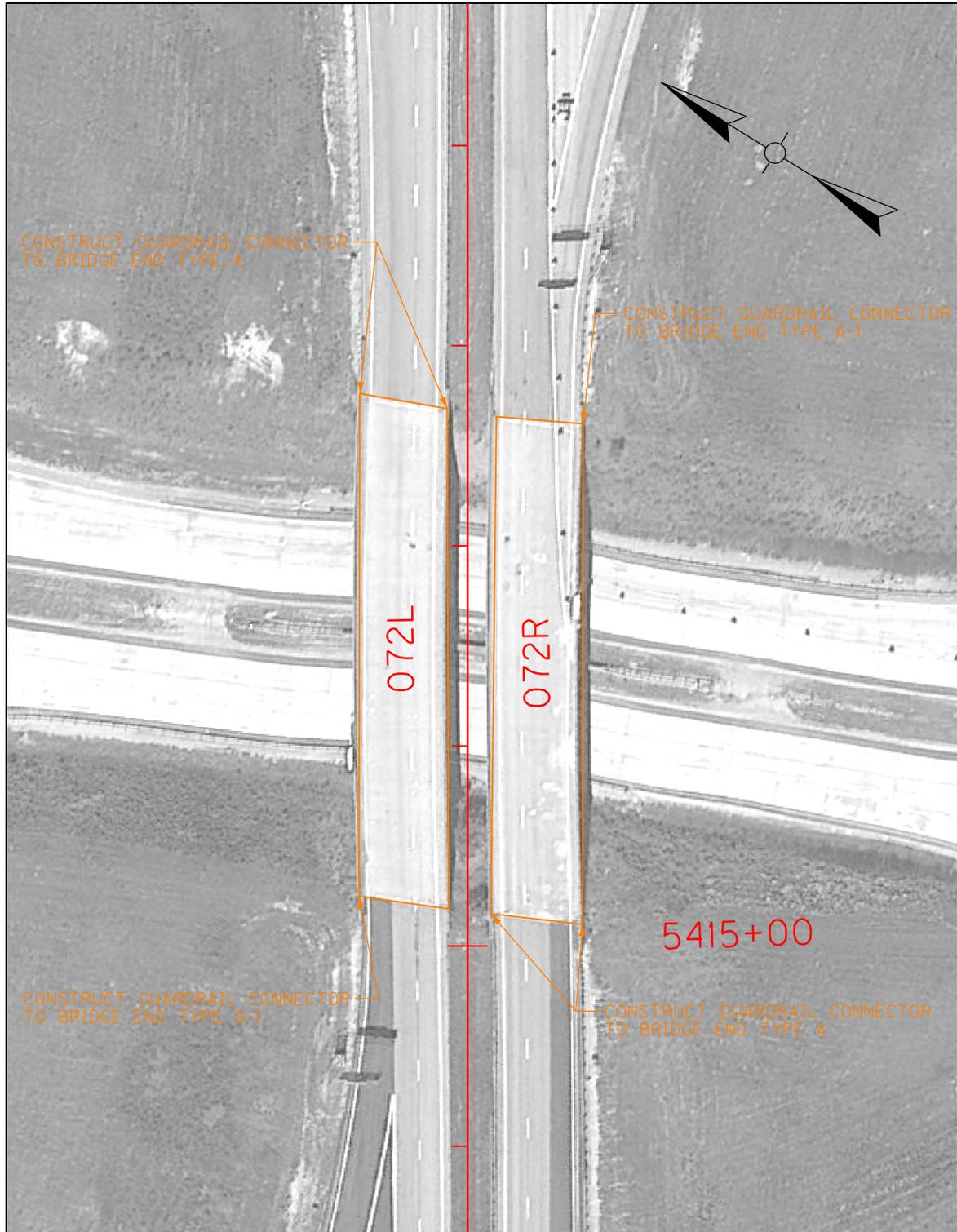


PROPOSED SECTION AT END BENT

MP 76.74
WKP OVER NATCHER
PARKWAY
092B00072L/R

KY 9001 over NATCHER PARKWAY (092B00072L/R)

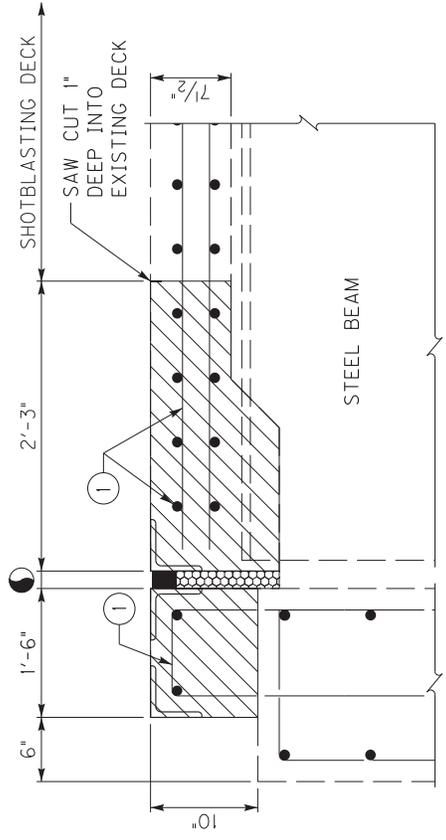
(MP 76.74)



KY 9001 (WKP) OVER NATCHER PARKWAY JOINT REPLACEMENT DETAILS - BENTS 1 & 2

- ① CLEAN AND PROTECT EXISTING REINFORCEMENT
- ② PL 5/8"x5" WITH 3/4"Øx6" STUDS
- ③ 1/2" PRECOMPRESSED, SILICONE-AND-FOAM HYBRID JOINT SYSTEM. INSTALL 3/4" FROM TOP OF DECK. MITER CUT THE JOINT TRANSITION INSTALLED AT BARRIERS TO MATCH THE SKEW AT THE GUTTERLINE.
- ④ BONDED CONSTRUCTION JOINT
- ⑤ ARMORED EDGE, SEE STD DWG BJE-001-13.

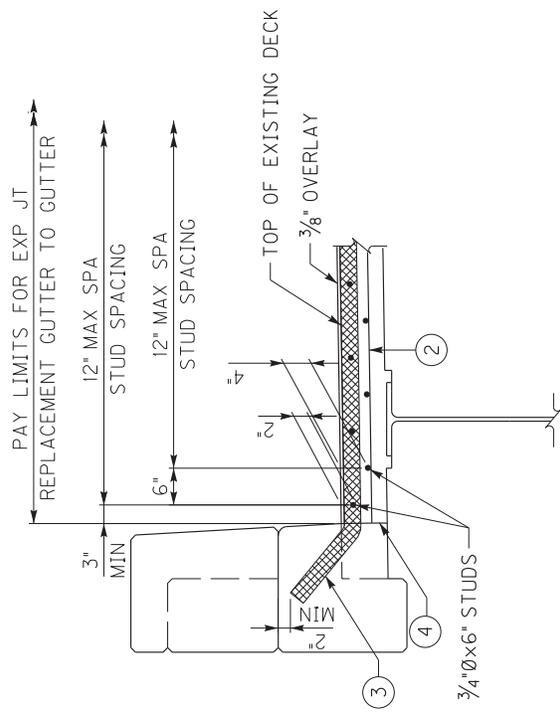
NOTES:
REMOVE HATCHED AREA OF CONCRETE, EXPANSION DEVICE AND ARMORED EDGE. CLEAN AND REUSE EXISTING REINFORCEMENT. THE CONTRACTOR HAS THE OPTION TO REUSE OR REPLACE THE TRANSVERSE REINFORCEMENT.
FOR BONDING NEW CONCRETE TO EXISTING SURFACES, SEE SECTION 511 OF THE STANDARD SPECIFICATIONS.
ROUGHEN EXISTING CONCRETE WHEN IN CONTACT WITH NEW CONCRETE.
THIS WORK, INCLUDING ALL LABOR, TOOLS AND MATERIAL, IS TO BE INCLUDED IN THE BID FOR: ITEM 3294 *EXPAN JOINT REPLACE 1/2 IN*.



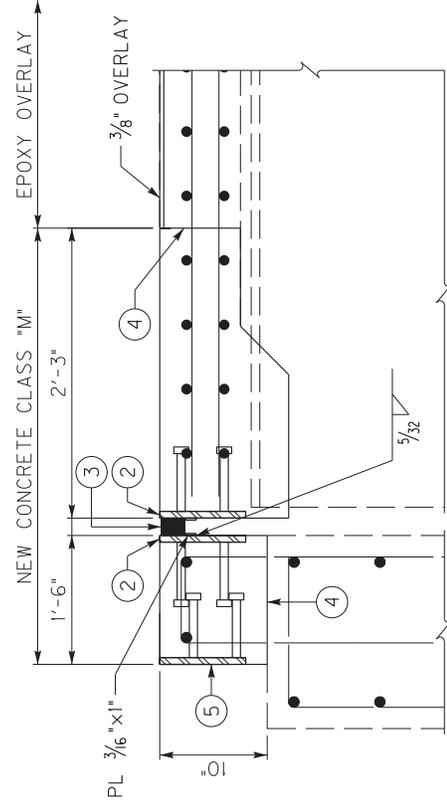
EXISTING SECTION AT END BENT

(SHOWING LIMITS OF REMOVAL)

- EXISTING JOINT, REPLACE WITH 1/2" JOINT. CONTRACTOR SHALL VERIFY SIZE OF JOINT.



PROPOSED SECTION THRU JOINT AT BARRIER



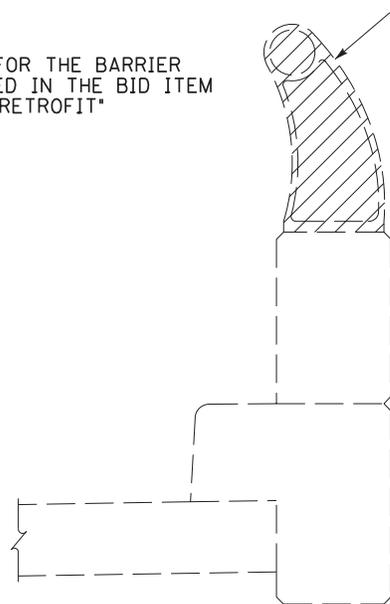
PROPOSED SECTION AT END BENT

KY 9001 (WKP) OVER NATCHER PARKWAY BARRIER RETROFIT DETAIL

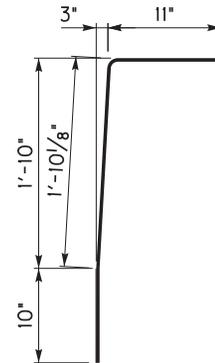
NOTE:

ALL ITEMS REQUIRED FOR THE BARRIER RETROFIT ARE INCLUDED IN THE BID ITEM FOR "BRIDGE BARRIER RETROFIT"

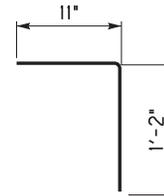
HANDRAIL TO BE REMOVED AND DELIVERED TO THE BAILY BRIDGE LOT IN FRANKFORT. INCLUDED IN THE UNIT BID FOR "BRIDGE BARRIER RETROFIT"



EXISTING BARRIER SECTION



S1(E) #5 BAR
492 REQUIRED

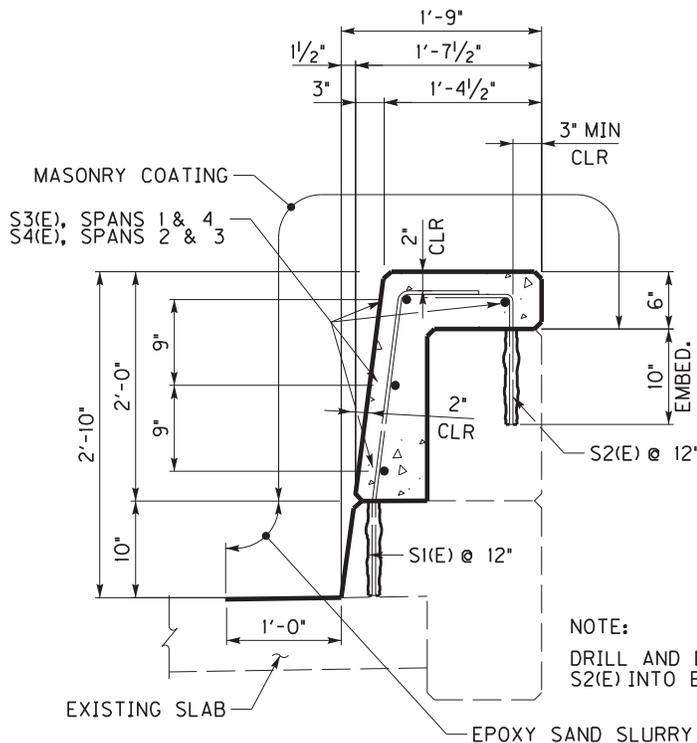


S2(E) #5 BAR
492 REQUIRED

52'-0" SPAN 1
70'-2" SPAN 2
70'-2" SPAN 3
52'-0" SPAN 4

S3(E) #5 BAR, SPANS 1 & 4
16 REQUIRED
S4(E) #5 BAR, SPANS 2 & 3
16 REQUIRED

**TOTAL WEIGHT 5,080 LBS
(PER BRIDGE L/R)**



NOTE:
DRILL AND EPOXY BARS S1(E) AND S2(E) INTO EXISTING BARRIER

BARRIER RETROFIT SECTION

KY 9001 (WKP) OVER NATCHER PARKWAY BARRIER RETROFIT DETAIL AT WING

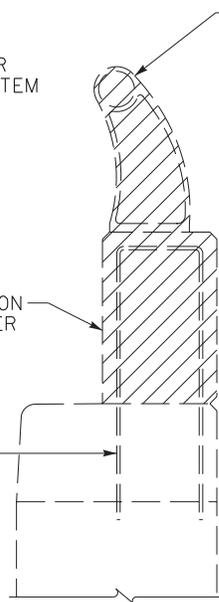
NOTE:

ALL ITEMS REQUIRED FOR THE BARRIER RETROFIT ARE INCLUDED IN THE BID ITEM FOR "BRIDGE BARRIER RETROFIT"

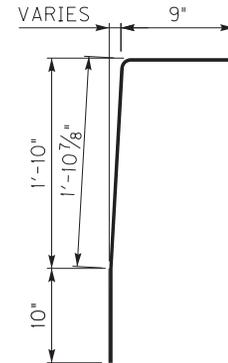
HANDRAIL TO BE REMOVED AND DELIVERED TO THE BAILY BRIDGE LOT IN FRANKFORT.

REMOVE THIS SECTION OF EXISTING BARRIER

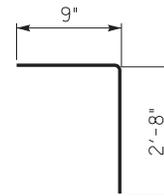
KEEP EXISTING STIRRUP BARS, CLEAN AND PREPARE FOR REUSE.



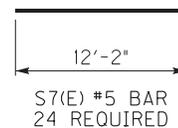
EXISTING BARRIER SECTION



S5(E) #5 BAR
52 REQUIRED

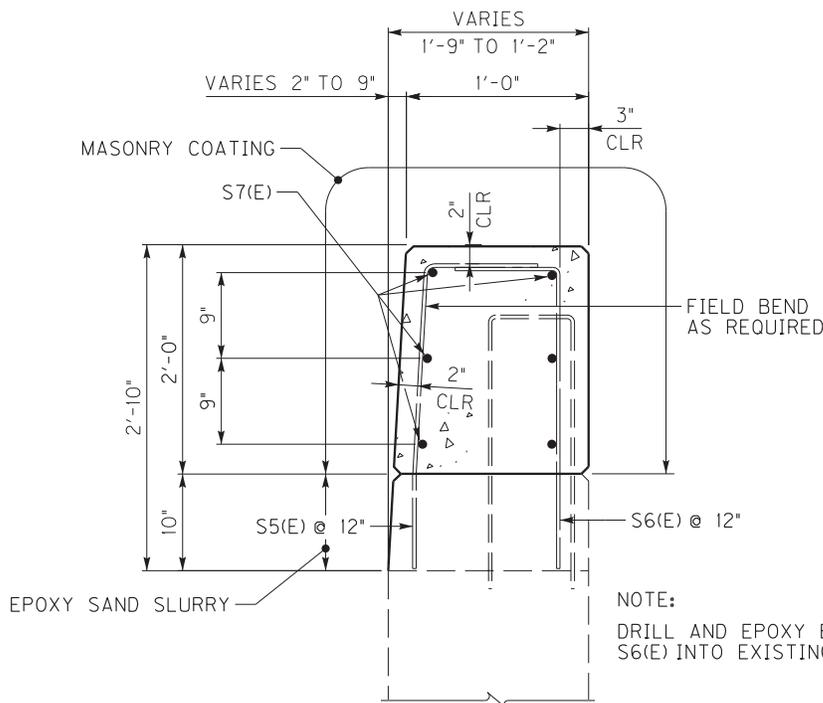


S6(E) #5 BAR
52 REQUIRED



S7(E) #5 BAR
24 REQUIRED

TOTAL WEIGHT 679 LBS
PER BRIDGE L/R



NOTE:
DRILL AND EPOXY BARS S5(E) AND S6(E) INTO EXISTING BARRIER

BARRIER RETROFIT SECTION

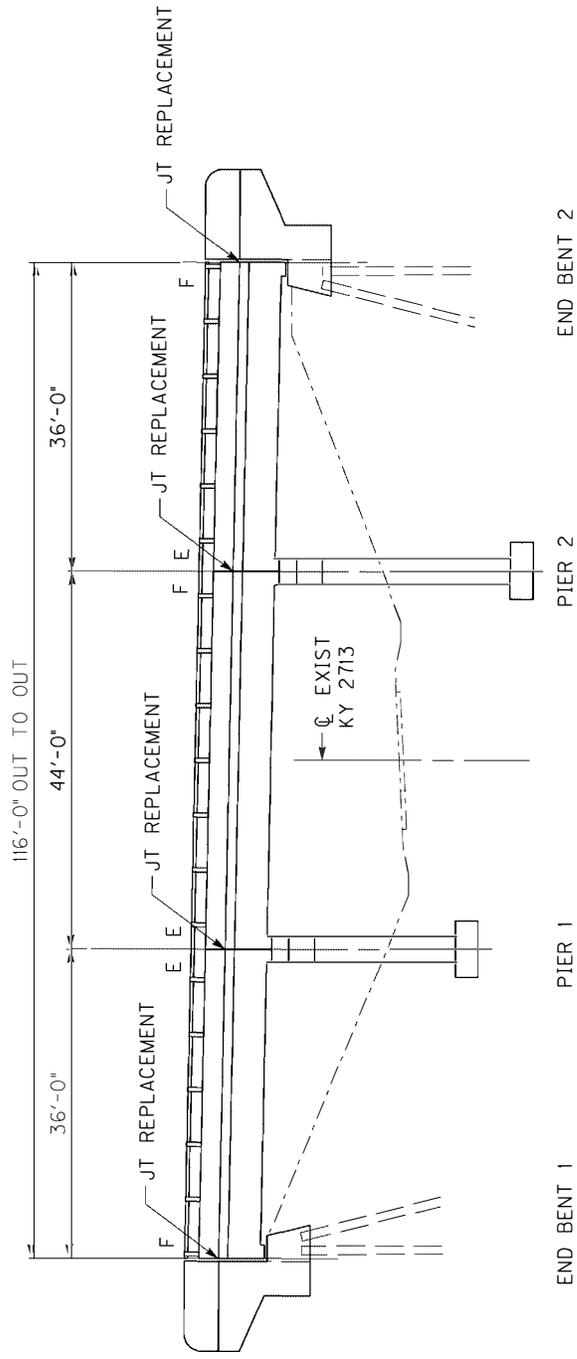
MP 85.76
WKP OVER KY 2713
092B00130L/R

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KY 9001 over KY 2713 (092B00130L/R)
(MP 85.76)



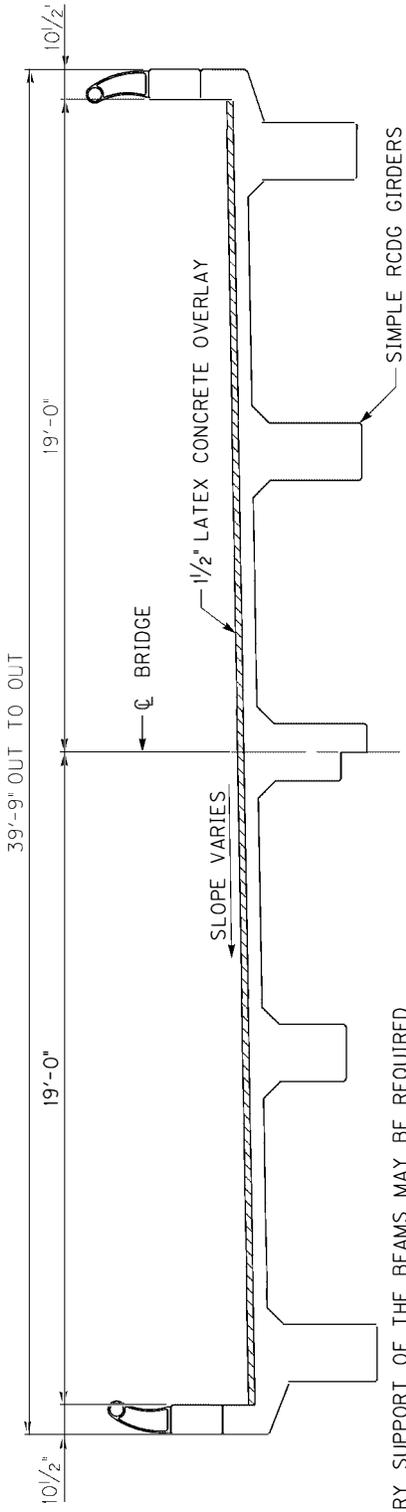
KY 9001 EB (WKP) OVER KY 2713 BRIDGE MAINTENANCE #092B00130R



CONTRACTOR SHALL FIELD VERIFY THE EXISTING CONDITIONS SHOWN.

ELEVATION
27° 59'26" SKEW LT
(NOT TO SCALE)

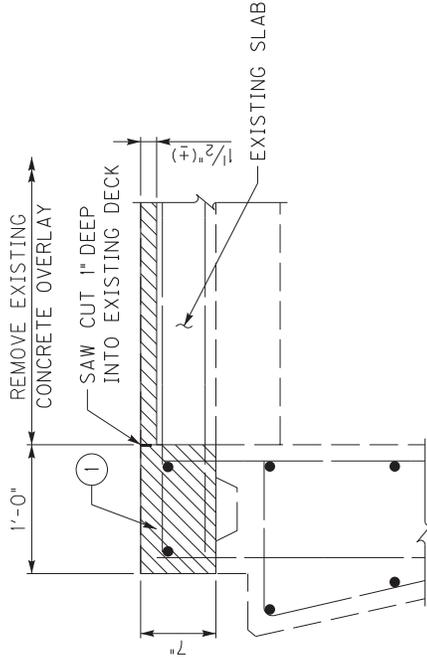
NOTES:
DETAILS SHOWN ARE BASED ON EXISTING PLANS (DWG NO 14759). FEATURES AND DIMENSIONS SHOWN ARE APPROXIMATE.



TYPICAL SECTION

TEMPORARY SUPPORT OF THE BEAMS MAY BE REQUIRED DURING FULL DEPTH PATCHING. SUBMIT THE PROPOSED METHOD OF SUPPORT TO THE ENGINEER FOR APPROVAL BEFORE BEGINNING WORK.

KY 9001 (WKP) OVER KY 2713 JOINT REPLACEMENT DETAILS - BENTS 1 & 2



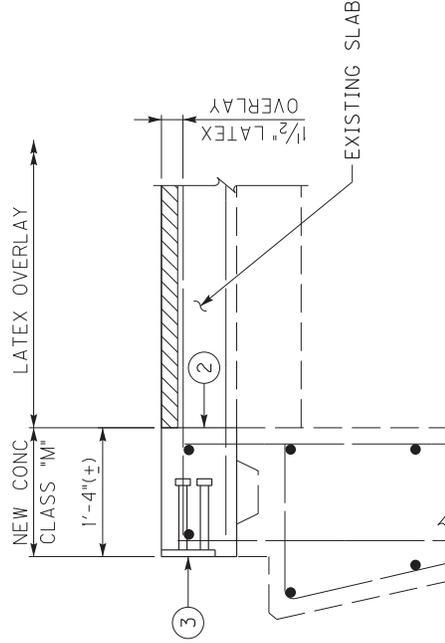
NOTES:
REMOVE HATCHED AREA OF CONCRETE. CLEAN AND REUSE EXISTING REINFORCEMENT. THE CONTRACTOR HAS THE OPTION TO REUSE OR REPLACE THE TRANSVERSE REINFORCEMENT.

FOR BONDING NEW CONCRETE TO EXISTING SURFACES, SEE SECTION 511 OF THE STANDARD SPECIFICATIONS.

ROUGHEN EXISTING CONCRETE WHEN IN CONTACT WITH NEW CONCRETE.

THIS WORK, INCLUDING ALL LABOR, TOOLS AND MATERIAL, IS TO BE INCLUDED IN THE BID FOR: ITEM 3299 "ARMORED EDGE FOR CONCRETE".

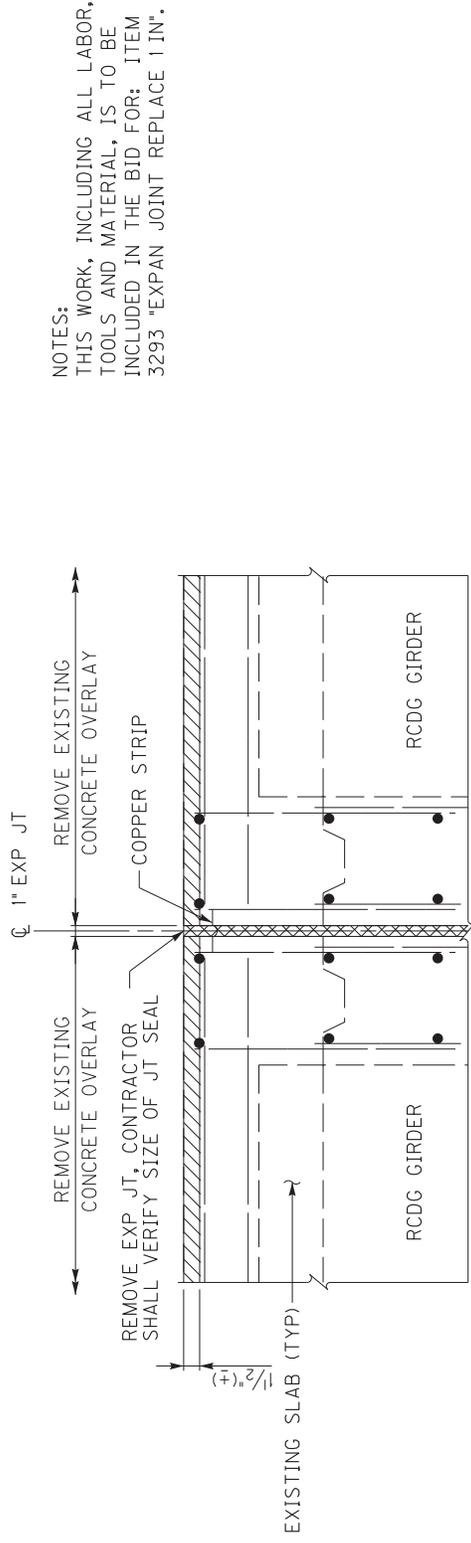
EXISTING SECTION END BENT (SHOWING LIMITS OF REMOVAL)



- ① CLEAN AND PROTECT EXISTING REINFORCEMENT
- ② BONDED CONSTRUCTION JOINT
- ③ ARMORED EDGE, SEE STD DWG BJE-001-13.

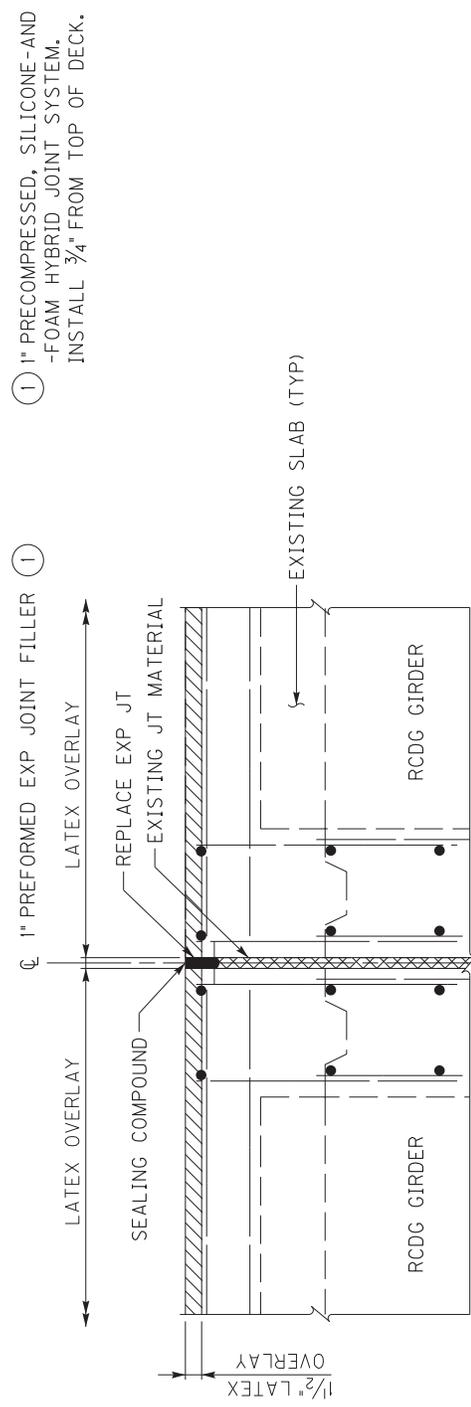
PROPOSED SECTION AT END BENT

KY 9001 (WKP) OVER KY 2713 JOINT REPLACEMENT DETAILS - PIERS 1 & 2



NOTES:
THIS WORK, INCLUDING ALL LABOR, TOOLS AND MATERIAL, IS TO BE INCLUDED IN THE BID FOR: ITEM 3293 "EXPAN JOINT REPLACE 1 IN".

EXISTING SECTION AT PIERS (SHOWING LIMITS OF REMOVAL)

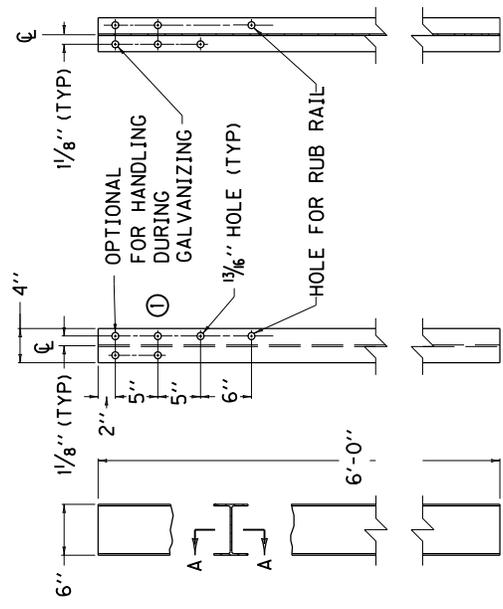


① 1" PRECOMPRESSED, SILICONE-AND-FOAM HYBRID JOINT SYSTEM. INSTALL 3/4" FROM TOP OF DECK.

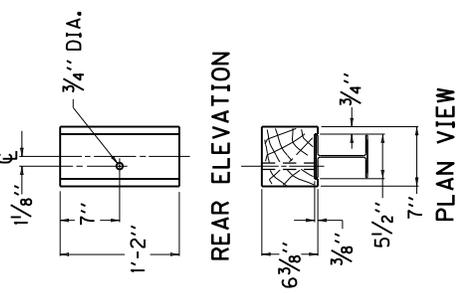
PROPOSED SECTION AT PIERS

SEPIAS

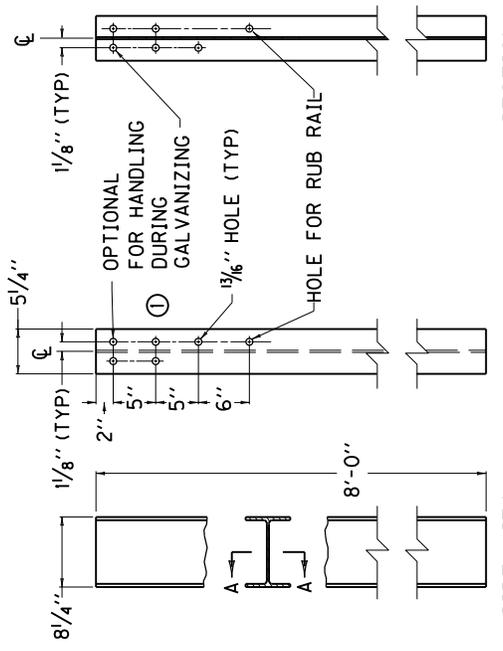
COUNTY OF	SHEET NO.



~ W6 X 9.0 STEEL GUARDRAIL POST ~
 (USED WITH C6 X 8.2 RUB RAIL)

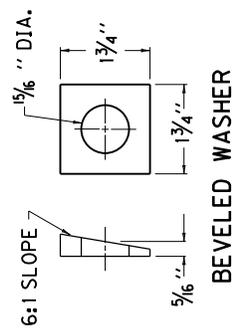
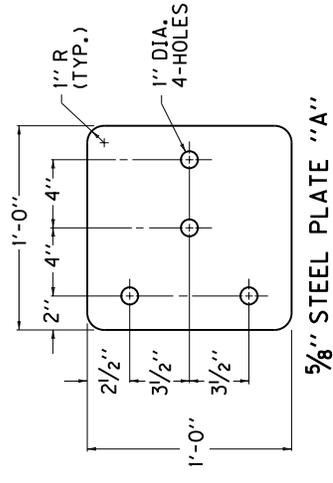


OFFSET BLOCK TYPE 6
 (TIMBER OR APPROVED COMPOSITE)



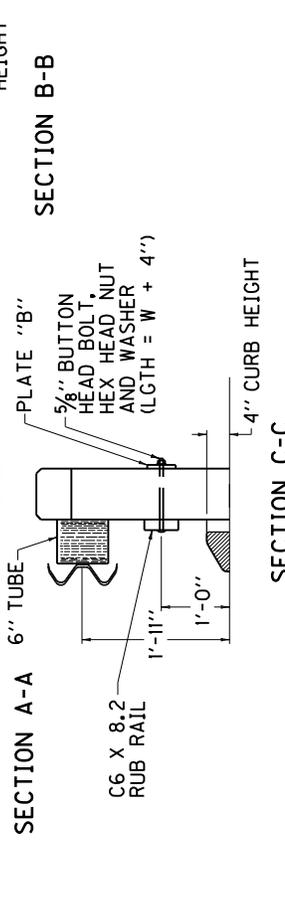
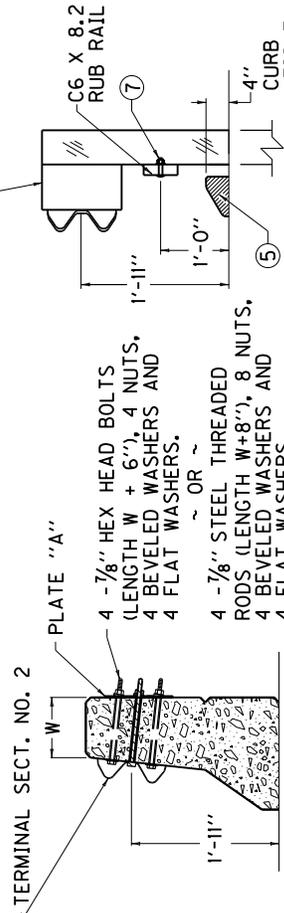
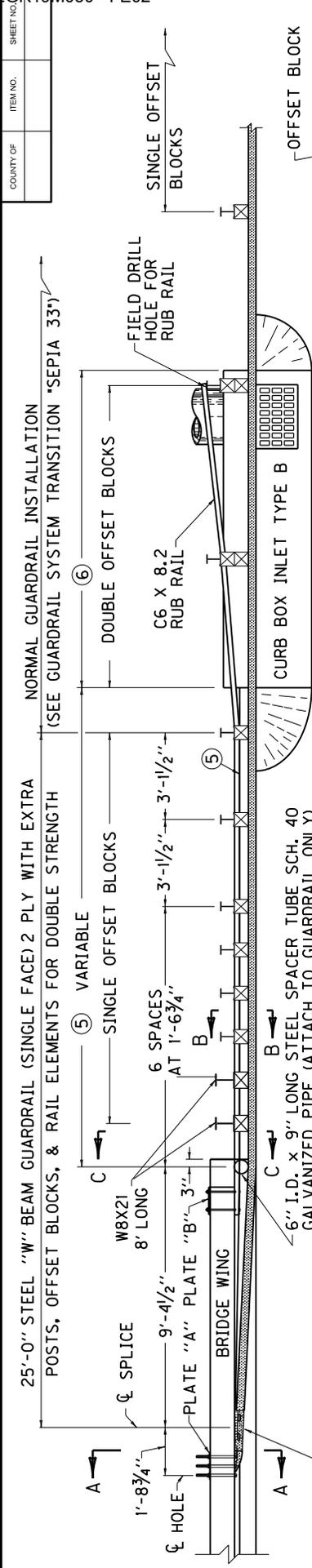
~ W8 X 21 STEEL GUARDRAIL POST ~

~ NOTES ~
 ① THESE HOLES ARE REQUIRED FOR ATTACHING RAIL.



USE WITH CUR. STD. DWGS.
 RBC-002, RBC-005, RBC-006
 KENTUCKY
 DEPARTMENT OF HIGHWAYS
 GUARDRAIL CONNECTOR
 TO BRIDGE END
 TYPE A AND A-1
 COMPONENTS

SUBMITTED: *[Signature]*
 DIRECTOR OF DIVISION OF DESIGN
 DATE: 12-20-18
 013



PLAN VIEW

NOTES

1. GENERAL
 - a. SEE CUR. STD. DWGS. IN THE RBB, RBI, RBR, AND RPM-SERIES FOR OTHER RELATED GUARDRAIL DETAILS AND BRIDGE PLANS FOR BRIDGE WING DETAIL.
 - b. SEE CUR. STD. DWG. RBB-SERIES FOR CURB BOX INLET TYPE B.
 - c. GUARDRAIL CONNECTOR TO BRIDGE END TYPE A IS FOR USE ON BOTH BRIDGE ENDS OF AN UNDIVIDED HIGHWAY AND ON THE APPROACH BRIDGE ENDS OF A DIVIDED HIGHWAY.
2. MATERIAL REQUIREMENTS
 - a. ALL HARDWARE SHALL BE GALVANIZED. (AASHTO M-232)
 - b. 5/8" STEEL PLATE "A" AND "B" (AASHTO M-270)
 - c. 7/8" HEX HEAD BOLTS OR STEEL THREADED RODS (LENGTH AS SHOWN)
 - d. 7/8" HEAVY HEX NUTS (7/8" THICK) (AASHTO M-291)
 - e. 7/8" FLAT WASHERS (3/16" THICK) (AASHTO M-293)
 - f. 7/8" BEVELED WASHERS (3/16" MEAN THICKNESS) (AASHTO M-293)

BOTH THE BOLT AND THREADED ROD SHALL HAVE A MINIMUM OF 50,000 LBS. TENSILE STRENGTH AT THE NARROWEST POINT.
3. CONSTRUCTION METHODS
 - a. ELIMINATE EXTRA OFFSET BLOCKS WHEN CURB BOX INLET TYPE B IS NOT REQUIRED.
 - b. HOLES TO BE FORMED THROUGH BRIDGE WING WITH 1" I.D. PLASTIC PIPE FOR 7/8" BOLTS AND 3/4" I.D. PLASTIC PIPE FOR 5/8" BOLTS, PIPE SHALL REMAIN IN PLACE.
 - c. METHOD OF MEASUREMENT AND BASIS OF PAYMENT
 - d. GUARDRAIL CONNECTOR TO BRIDGE END TYPE A SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND INCLUDES: TERMINAL SECTION NO. 2; ALL ITEMS WHICH ARE IN ADDITION TO THE NORMAL INSTALLATION OF STEEL BEAM GUARDRAIL (EXTRA POSTS, OFFSET BLOCKS, RAIL ELEMENTS, SPACER TUBE, HARDWARE, RUB RAIL, ETC.), AND OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION AS DETAILED. STEEL "W" BEAM GUARDRAIL (SINGLE FACE) AND ISLAND HEADER CURB ARE SEPARATE BID ITEMS WHICH ARE ALWAYS REQUIRED. CURB BOX INLET TYPE B IS A SEPARATE BID ITEM THAT WILL BE USED WHEN REQUIRED FOR BRIDGE END DRAINAGE.
 - e. BID ITEMS AND UNIT TO BID
 - GUARDRAIL CONNECTOR TO BRIDGE END TYPE A EACH
 - GUARDRAIL-STEEL "W" BEAM-S FACE LF
 - ISLAND HEADER CURB TYPE 1 OR 2 LF
 - CURB BOX INLET TYPE B (AS REQUIRED) EACH
 - f. THE PLASTIC PIPE AND COST OF FORMING SHALL BE INCLUDED IN THE UNIT PRICE BID FOR BRIDGE SUPERSTRUCTURE CONCRETE.

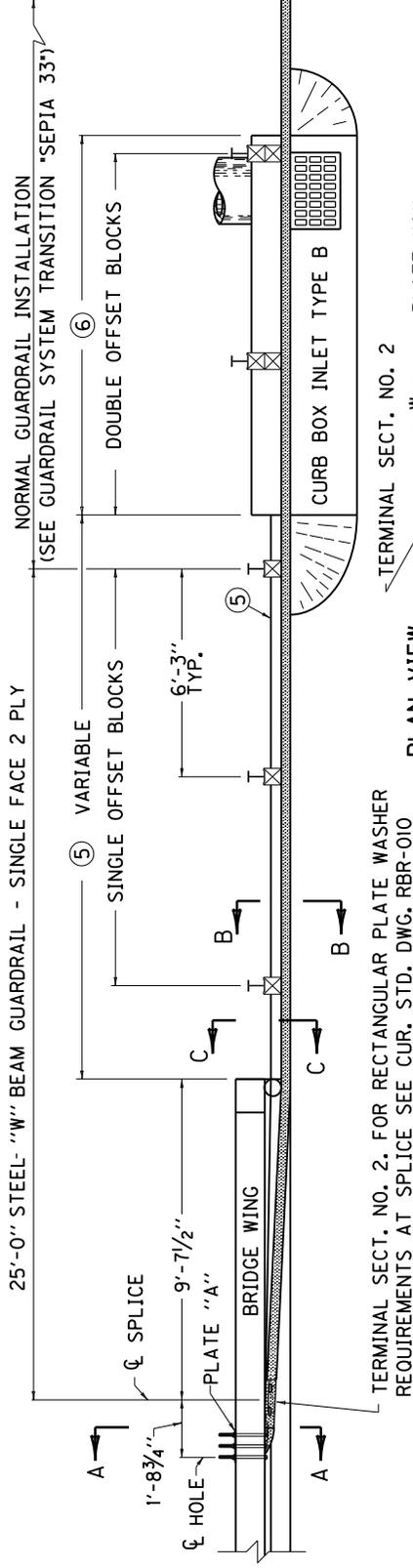
USE WITH CUR. STD. DWGS.
BHS-008, RBC-002, RBC-003
RBR-010

KENTUCKY
DEPARTMENT OF HIGHWAYS

**GUARDRAIL CONNECTOR
TO BRIDGE END
TYPE A**

SUBMITTED: *William J. Stubb*
DIRECTOR DIVISION OF DESIGN
DATE: 4-04-10

COUNTY OF	ITEM NO.	SHEET NO.

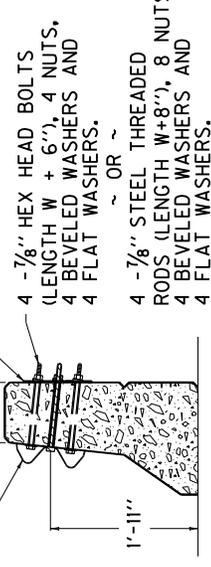


TERMINAL SECT. NO. 2. FOR RECTANGULAR PLATE WASHER REQUIREMENTS AT SPLICE SEE CUR. STD. DWG. RBR-010

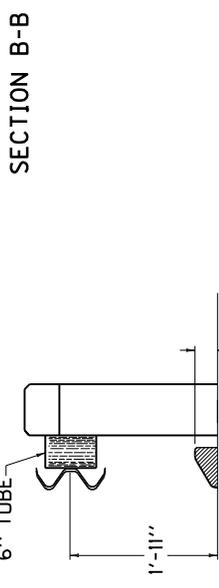
PLAN VIEW

NOTES

1. GENERAL
 - a. SEE CUR. STD. DWGS. IN THE RBB, RBI, RBR, AND RPM-SERIES FOR OTHER RELATED GUARDRAIL DETAILS AND BRIDGE PLANS FOR BRIDGE WING DETAIL.
 - b. SEE CUR. STD. DWG. RDB-SERIES FOR CURB BOX INLET TYPE B.
 - c. GUARDRAIL CONNECTOR TO BRIDGE END TYPE A-1 IS FOR USE ON THE EXIT END OF A DIVIDED HIGHWAY.
2. MATERIAL REQUIREMENTS
 - ALL HARDWARE SHALL BE GALVANIZED. (AASHTO M-232)
 - 5/8" STEEL PLATE "A" (AASHTO M-270)
 - 7/8" HEX HEAD BOLTS OR STEEL THREADED RODS (LENGTH AS SHOWN)
 - 7/8" HEAVY HEX NUTS (7/8" THICK) (AASHTO M-291)
 - 7/8" FLAT WASHERS (3/16" THICK) (AASHTO M-293)
 - 7/8" BEVELED WASHERS (5/16" MEAN THICKNESS) (AASHTO M-293)
3. CONSTRUCTION METHODS
 - a. ELIMINATE EXTRA OFFSET BLOCKS WHEN CURB BOX INLET TYPE B IS NOT REQUIRED.
 - b. HOLES TO BE FORMED THROUGH BRIDGE WING WITH 1" I.D. PLASTIC PIPE FOR 7/8" BOLTS. PLASTIC PIPE SHALL REMAIN IN PLACE.
4. METHOD OF MEASUREMENT AND BASIS OF PAYMENT
 - a. GUARDRAIL CONNECTOR TO BRIDGE END TYPE A-1 SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, WHICH INCLUDES TERMINAL SECT. NO. 2, RAIL ELEMENTS, SPACER TUBE, HARDWARE AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION. STEEL "W" BEAM GUARDRAIL (SINGLE FACE) AND ISLAND HEADER CURB ARE SEPARATE BID ITEMS WHICH ARE ALWAYS REQUIRED. CURB BOX INLET TYPE B IS A SEPARATE BID ITEM THAT WILL BE USED WHEN REQUIRED FOR BRIDGE END DRAINAGE.
 - b. BID ITEMS AND UNIT TO BID
 - GUARDRAIL CONNECTOR TO BRIDGE END TY A-1 EACH
 - GUARDRAIL-STEEL "W" BEAM-S FACE LF
 - ISLAND HEADER CURB TYPE 1 OR 2 LF
 - CURB BOX INLET TYPE B (AS REQUIRED) EACH
5. THE PLASTIC PIPE AND COST OF FORMING SHALL BE INCLUDED IN THE UNIT PRICE BID FOR BRIDGE SUPERSTRUCTURE CONCRETE.



SECTION A-A



SECTION B-B

SECTION C-C

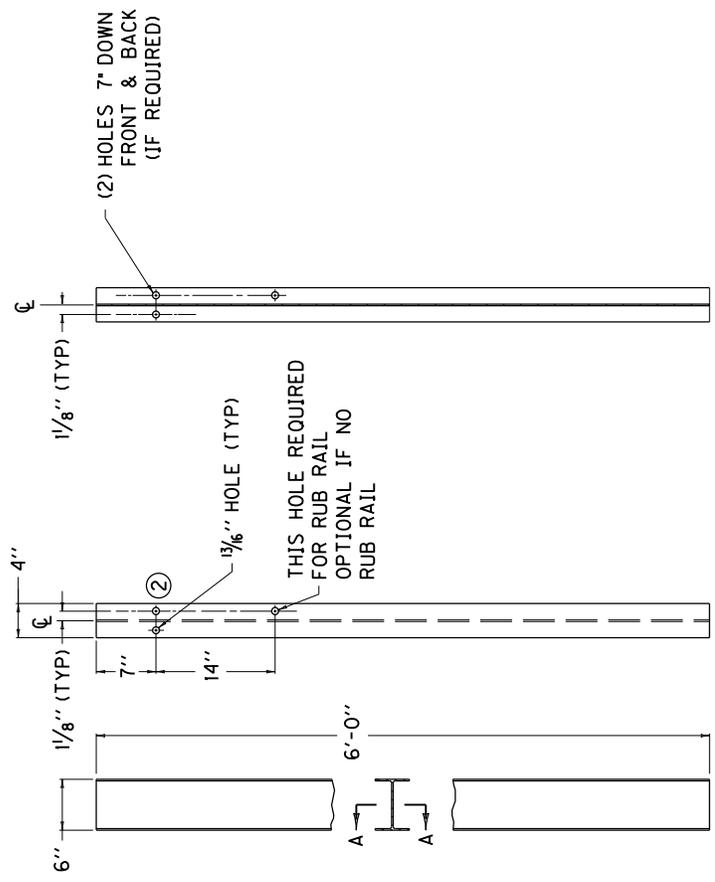
5. ISLAND HEADER CURB. TRANSITION FROM ISLAND CURB SHAPE TO SHAPE ON BRIDGE WING WITHIN 7'-3". LENGTH OF CURB VARIABLE (22'-3" WHEN L=5'-0") (17'-3" WHEN L=10'-0") (12'-3" WHEN L=15'-0") (7'-3" WHEN L=20'-0"). ON THE APPROACH END CONSTRUCT 25'-0" OF ISLAND HEADER CURB EVEN WHEN CURB BOX INLET TYPE B IS NOT REQUIRED.
6. 6'-4" WHEN L=5'-0" ☆
 11'-4" WHEN L=10'-0" ☆
 16'-4" WHEN L=15'-0" ☆
 21'-4" WHEN L=20'-0" ☆
7. CURB BOX NOT REQUIRED UNLESS NEEDED FOR DRAINAGE.
 ☆ 10'-0" LENGTH IS REQUIRED UNLESS OTHERWISE NOTED.
 L EQUALS THROAT LENGTH OF BOX.

USE WITH CUR. STD. DWGS.
 BHS-008, RBC-002, RBC-003,
 RBR-010

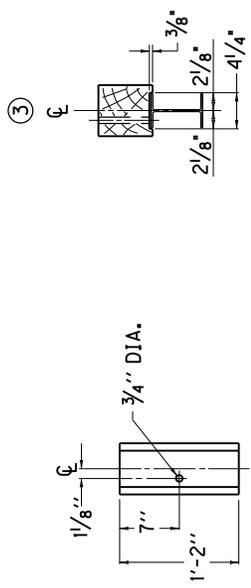
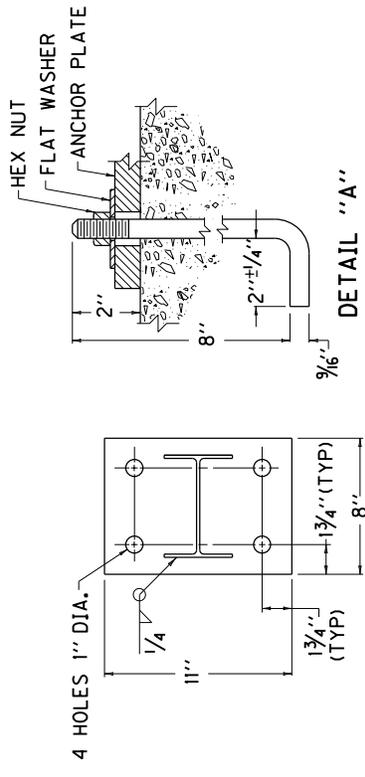
DEPARTMENT OF HIGHWAYS	
GUARDRAIL CONNECTOR TO BRIDGE END TYPE A-1	
KENTUCKY	
SUBMITTED	DATE
<i>Michael P. Seibel</i>	4-04-18
DIRECTOR DIVISION OF DESIGN	016

COUNTY OF	ITEM NO.	SHEET NO.

- ~ NOTES ~
- ① W6 X 8.5 IS AN ACCEPTABLE ALTERNATE.
 - ② THESE HOLES ARE REQUIRED FOR ATTACHING RAIL.
 - ③ TIMBER OR COMPOSITE BLOCKOUTS MAY BE USED WITH STEEL POST.



~ W6 X 9.0 STEEL POST ① ~



OFFSET BLOCK TYPE 4
 6" X 8" (Nominal Size)
 (TIMBER OR APPROVED COMPOSITE)
 (FOR USE WITH STEEL POST ONLY)

KENTUCKY DEPARTMENT OF HIGHWAYS
STEEL GUARDRAIL POSTS
SUBMITTED: <i>William P. Sells</i> DIRECTOR DIVISION OF DESIGN DATE: 3-06-18

SPECIAL NOTES

SPECIAL NOTE FOR 3/8" EPOXY-URETHANE WATERPROOFING OVERLAY FOR BRIDGE DECKS

I. DESCRIPTION

This specification describes the Pre-treatment and Overlay consisting of multiple layers of hybrid polymer systems and a special blend of extremely hard aggregate designed to provide a minimum of a 3/8" thick application for the purpose of complete waterproofing as well as providing a non-skid surface to withstand continuous heavy traffic and extreme changes in weather conditions.

Unless otherwise noted, Section references herein are to the Department's Standard Specifications for Road and Bridge Construction. All applicable portions of the Department's Standard Specifications apply unless specifically modified herein.

II. MATERIALS

A. Pre-Treatment

1. Hairline Cracks

- a) This two part hybrid polymer shall be free of any fillers, volatile solvents and shall be formulated to provide simple volumetric ratio of two components such as one to one or two to one by volume.
- b) This hybrid polymer system shall be formulated to provide a unique combination of extremely low viscosity and low surface tension coupled with a built-in affinity for concrete and steel.

2. Partial Depth Patching (if necessary)

- a) Class "M" Concrete. Use either "M1" or "M2". See Section 601.

3. Overlay

- a) The two-part epoxy-urethane co-polymer system shall be free of any fillers volatile solvents and shall be formulated to provide simple volumetric mixing ratio of two components such as one to one or two to one by volume.
- b) The epoxy-urethane co-polymer system shall be formulated to provide flexibility in the system without any sacrifice of the hardness, chemical resistance or strength of the epoxy-urethane co-polymer system. Use of external/conventional flexibilizers are not acceptable. Flexibility shall be introduced by interaction of elastomers to chemically link in the process of curing so that the flexibility of the molecule is least affected during the low temperature conditions that are confronted in actual use.

4. Material Requirements of Epoxy Overlay

- a) Physical Requirements of Cured Pretreatment for Cracks System. When Components A and B are mixed in the appropriate ratio, the cured resin shall conform to the requirements of Table 1. (Test methods are discussed in detail in Item III of this specification.)

TABLE 1	
PHYSICAL PROPERTIES OF THE CURED SYSTEM	
Property	Value
Compressive Strength, min. psi	5000
Tensile Strength, min. psi	2500
Tensile Elongation, percent	25 [±] 5
Water Absorption, percent by wt. max.	0.5%
Shore D hardness, 25°C (77°F)	70 [±] 5
Gel Time, minutes	48-52 (100gms)
Adhesion to Concrete	100% failure in concrete
Percent Solids	100

- b) Physical requirements of Epoxy-Urethane Copolymer Overlay System. When Components A and B are mixed in the appropriate ratio, the cured resin shall conform to the requirements of Table 2. (Test methods are discussed in detail in Item III of this specification.)

TABLE 2	
PHYSICAL PROPERTIES OF THE CURED SYSTEM	
Property	Value
Compressive Strength, min. psi	6000
Tensile Strength, min. psi	2000
Tensile Elongation, percent	30 [±] 10
Water Absorption, percent by wt. max.	0.5%
Shore D hardness, 25°C (77°F)	70 [±] 5
Gel Time, minutes	25-31 (100gms)
Abrasion Resistance, mg., max.	85
Adhesion to Concrete	100% failure in concrete
Flexural Yield Strength, min. psi	5000
Percent Solids	100

- c) Visco-Elastic Properties of Epoxy-Urethane Copolymer system. The modulus of the cured epoxy-urethane system determined by variable temperature Dynamic Mechanical Analysis (DMA) using DMA instruments and according to ASTM D4065-95, shall conform to the following minimum values as given in Table 3.

TABLE 3		
VISCO-ELASTIC PROPERTIES OF THE CURED SYSTEM		
Temperature	Storage Modulus Dynes/Sq.Cm.	Loss Modulus Dynes/Sq.Cm.
-10°C	1 x 10 ⁹	7 x 10 ⁷
20°C	6 x 10 ⁸	7 x 10 ⁷
50°C	4 x 10 ⁷	2 x 10 ⁷
60°C	1 x 10 ⁷	5 x 10 ⁶
70°C	6 x 10 ⁶	1 x

- d) The tests shall be conducted at a frequency of 1 Hz with a 0.3% strain in accordance with the guidelines described in the testing equipment manual.
- e) e. Load Bearing Capabilities. The cured epoxy-urethane system must exhibit the following load bearing capacity. At approximately 20% strain, the polymer shall retain at least 85% of its original load bearing strength (tensile stress) as per ASTM D-638.

5. Material Provider

The bridge deck restoration system shall be provided by the following Manufacturer or an approved equivalent.:

POLY-CARB, INC.,
 Pretreatment: MARK-135
 Overlay: MARK-163 FLEXOGRID
 33095 Bainbridge Road Solon, Ohio 44139
 (440) 248-1223

6. Aggregate

- a) Aggregate used for all layers shall be non-friable, non- polishing, clean and free from surface moisture. It shall be durable and sound and have a proven record of performance in applications of this type. The aggregate shall be 100 percent fractured, thoroughly washed and kiln dried to a maximum moisture content of 0.2 percent by weight, measured in accordance with ASTM C566. The fracture requirements shall be at least one mechanically fractured face and will apply to materials retained on U.S. No. 10 sieve. The recommended sources of aggregate are Washington Stone or Oklahoma Flint.
- b) Aggregate for all layers shall have a minimum Mohs scale hardness of 6.5.
- c) The grading of the aggregate shall conform to the requirements of Table 4.

TABLE 4	
AGGREGATE GRADATION	
Sieve Size	Percent Passing
No. 6	60 - 100
No. 10	0 - 40
No. 20	0 - 10

d) Thermoplastic. Conform to Section 837.

III. **METHOD OF TESTING**

A. **Tests shall be conducted in accordance with the following methods:**

1. **Compressive Strength:** ASTM C109, Compressive Strength of Hydraulic Cement Mortars. The two components of the resin are to be thoroughly mixed in their appropriate ratios. Two volumes of graded silica sand in accordance with ASTM C778 shall be added to one volume of mixed resin. The samples shall then be prepared according to the requirements of ASTM C109 and allowed to cure for 7 days at $23 \pm 2^\circ\text{C}$.
2. **Tensile Strength and Elongation:** ASTM D638, Tensile Properties of Plastics, Specimen Type I or Type II. Samples shall be cured at $23 \pm 2^\circ\text{C}$ ($73.4 \pm 3.6^\circ\text{F}$) and $50 \pm 5\%$ relative humidity. Speed of testing shall be at 0.5 in./min.
3. **Water Absorption:** ASTM D570, Water Absorption of Plastics. Sample specimens shall be prepared according to section 4.1 and allowed to cure at $23 \pm 2^\circ\text{C}$ ($73.4 \pm 3.6^\circ\text{F}$) and $50 \pm 5\%$ relative humidity. Tests are then to be carried out as per section 6.1.
4. **Shore D Hardness:** ASTM D2240, Rubber Property – Durometer Hardness. Specimen shall be prepared as per ASTM D570 section 4.1 and allowed to cure at $23 \pm 2^\circ\text{C}$ ($73.4 \pm 3.6^\circ\text{F}$).
5. **Gel Time:** The following procedure shall be used to determine gel time. Measure 4 oz. of Part A and 2 oz. of Part B each at 25°C (77°F), into an unwaxed paper cup and record the time and mix immediately. 100 gms of this mixture shall be poured into a 6 oz. unwaxed paper cup and placed on a wooden bench top. Starting twenty minutes from the time recorded above, the mixture shall be probed every two minutes with a small stick until a small ball forms in the center of the container. The total time, including mixing, required for the ball to form shall be regarded as the gel time. The test shall be performed in a room or enclosed area maintained at $25 \pm 2^\circ\text{C}$ ($77 \pm 3.6^\circ\text{F}$) and $50 \pm 5\%$ relative humidity.

6. **Abrasion Resistance:** ASTM C501, Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abrader. Tests shall be done using a CS-17 wheel and a 1,000-gram load for 1,000 cycles.
7. **Adhesion to Concrete:** ACI-503-R; Pull Out Test.
8. **Flexural Yield Strength:** ASTM D-790.
9. **DMA:** ASTM D-4065-95

IV. **CONSTRUCTION PRACTICE**

A. **Surface Preparation**

1. Perform partial depth patching in accordance with the requirements of Section 606.03.06. All patching materials shall be in accordance with the requirements of Section 601 and be free of Magnesium Phosphate.
2. Patching shall be scheduled so that the bridge can be open to traffic during all non-working hours.
3. Polymer patching system such as POLY-CARB, Inc.'s MARK-120 is recommended for shallow and partial depth repair. Completion of Partial Depth Patching including removal of concrete, cleaning, and placing the material will not be measured for payment and shall be considered incidental to "Epoxy-Urethane Waterproofing Overlay". The pay item includes additional quantity for partial depth patching.
4. The entire concrete deck shall be cleaned by shotblasting to remove any oil, dirt, rubber or any other potentially detrimental material such as curing compound and laitances which, in the Manufacturer and Engineer's opinion, would prevent proper bonding to and curing of the material.
5. In areas that the shotblasting equipment cannot reach (i.e., along curbs and median walls) or cannot remove (linemarking, asphalt, etc.), sandblasting and walk behind grinders are permitted to an extent satisfactory to the Manufacturer and Engineer. This should be performed prior to the shotblasting whenever applicable and practical.
6. Steel surfaces such as expansion joints, sidewalks, steel grids and steel plate to be treated with the restoration system, shall be shot or sand blasted clean to SSPC-SP-6 standards.
7. The overlay application equipment is allowed to drive on the deck surface during application provided precautions have been taken to ensure that the deck surface will not become contaminated. For any reason traffic is to be allowed on the deck after surface preparation, or between layers, a visual inspection by the Manufacturer and state Engineer will be required to determine if additional surface preparation is needed before applying material.

8. All surfaces to be treated shall be dry at the time of application. Immediately before the application of any liquids, all prepared surfaces shall be cleaned with compressed air (or vacuumed) to remove dust and debris.
9. The application of the system shall not be made when it has rained 24 hours before application or rain is forecast (greater than 50%) within eight hours after application or as determined by the Manufacturer (fog and high humidity will not impede the application of or affect the performance of the overlay). If waiting for 24 hours is impractical, then the moisture content in concrete substrate shall not exceed 4.5% when measured by an electronic moisture meter. Any exception shall be determined by the moisture content present in the deck which shall not exceed 75% of air entrainment in the mix design.
10. The minimum recommended temperature in which the system shall be applied is 50°F and rising. All applications at temperatures below 50°F shall require prior written approval from the Manufacturer.

B. Application of Overlay System

1. The Manufacturer of the epoxy-urethane overlay material shall have a representative on the jobsite at all times who, upon consultation with the Engineer, may suspend any item of work that is suspect and does not meet the requirements of this specification. Resumption of work will occur only after the Manufacturer's representative and the Engineer are satisfied that appropriate remedial action has been taken by the Contractor.
2. The overlay shall be applied on all deck areas using metering, mixing and distribution machinery owned and operated by the Manufacturer of the epoxy-urethane overlay system. The application machine shall feature positive displacement volumetric metering pumps controlled by a hydraulic power unit. Components A and B shall be stored in temperature controlled reservoirs capable of maintaining 100°F + 10°F to insure optimum mixing. Ratio check verification at the pump outlets as well as cycle counting capabilities to monitor output will be standard features. In line mixing shall be motionless so as to not overly shear the material or entrap air in the mix. The machine shall also make maximum use of the working time of the material to insure proper "wetting" of the system by mixing it immediately prior to dispensing onto the deck.

3. The number of layers (a minimum of three) and the application rates of the liquid in the various layers shall be as recommended by the Manufacturer in order to achieve an average overlay thickness of 3/8".
4. Hand mixing of material is not permitted.
5. **Application of Pre-treatment - Crack Filling (First Layer)** Application of the Liquid: After mechanically measuring and mixing of the components, the liquid shall be evenly distributed on the clean, dry deck surface at the rate/process recommended by the Manufacturer. The overlay application equipment may drive on this layer (prior to being cured) when applying the overlay system. If the overlay application is going to be applied after 6-8 hrs of the pretreatments application, a medium size coarse silica sand shall be broadcasted evenly into the pre- treatment system (prior to it curing) as directed by the Manufacturer.
6. **Overlay (Second and Third Layers)**
Application of Liquid: Prior to the application, if there exists any excess or loose aggregate from the previous coat, such excess aggregate shall be completely removed by vacuum or with compressed air. After mixing of the components via the mechanical application equipment, the liquid shall be evenly distributed on the clean, dry deck surface at the rate recommended by the Manufacturer.
7. After the application of the liquid in the second and third coats, the maximum time allowed before broadcasting of the aggregate is as follows:

Above 90°F	.....	10 minutes
80°F to 90°F	.....	15 minutes
70°F to 80°F	.....	20 minutes
60°F to 70°F	.....	25 minutes
50°F to 60°F	.....	35 minutes

8. No vehicle shall be allowed on the overlay during the curing period.
9. Broadcasting on decks shall be by truck-mounted equipment capable of dispensing the aggregate onto the deck in a uniform manner as directed or otherwise approved by the Manufacturer of the epoxy-urethane overlay.

10. The aggregate shall be broadcast as described below such that to cover the surface so that no wet spots appear and before the co-polymer begins to gel (see section 3.1.5). The aggregate must be dropped vertically in such a manner that the level of the liquid is not disturbed.
 - a) In the second and third layers of FLEXOGRID (or approved equivalent) liquid aggregate conforming to table 4 shall be broadcast to saturation.
11. Removal of Excess Aggregate: After the overlay has hardened, removal of all loose and excess aggregate with a power vacuum or other method shall be made prior to the application of subsequent coat.
12. Joints in the Overlay: (i.e., between two adjacent lanes) shall be staggered and overlapped between successive coats so that no ridges will appear.
13. Traffic may be allowed on the final layer (or in between layers) after the resin has cured (as determined by the Manufacturer) and after removal of all excess, loose aggregate.

V. **STORAGE AND HANDLING**

- A. **Liquid Material:** All material shall be transported and stored in their original containers inside a dry, temperature controlled facility and maintained at a minimum temperature of 60°F and not to exceed 120°F.
- B. **Job Site Storage:** The materials shall be stored on the jobsite in a dry, weather protected facility away from moisture and within the temperature range of 60°F to 90°F. When the materials are transported or stored on the job in the application machine tanks, the material must also be maintained at a temperature of 60°F to 90°F. Outdoor storage is permitted with Manufacturer's approval.
- C. **Handling of Liquid Materials on the Job:** Protective gloves, clothing, and goggles shall be provided to workers and inspectors directly exposed to the material if required. Product safety data sheets shall be provided to all workers and inspectors as obtained from the Manufacturer.
- D. **Packing Requirement:** All materials must be packaged in strong, substantial containers. The containers shall be identified as Part A and Part B and shall be plainly marked with the name and address of the Manufacturer, name of the product, mixing proportions and instructions, lot and batch numbers, date of manufacture, and quantity contained therein.
- E. **Aggregate:** All aggregate shall be stored in a dry, moisture-free atmosphere. The aggregate shall be fully protected from any contaminants on the jobsite and shall be stored so as not to be exposed to rain or other moisture sources.

VI. **SAMPLING AND ACCEPTANCES**

- A. Product Acceptance:** The Manufacturer of the system shall provide evidence of field performance, lab performance with infrared spectra in order to obtain state approval of the overlay system for use on the project:
1. **Independent Lab Performance.** A nationally recognized independent lab must verify that the material:
 - a) Has the capability of preventing the ingress of essentially all the chloride ions into the concrete at 1" depth when tested according to NCHRP-244 method.
 - b) Has the capability to de-activate the existing chloride ions present in the concrete specimen so that the corrosion of steel rebar embedded in the concrete stop corroding.
 - c) When tested as per Tables 1, 2 and 3, fully comply with the test results specified for cured system.
 2. **Infrared Spectrograph:** In addition to the initial certification process each Manufacturer shall furnish the state an infrared spectrum of each component of system for its permanent record and for individual installation verification.
 3. **Field Performance:** The selected material must have verifiable satisfactory performance of at least five (5) years in the state of Kentucky and a minimum of twelve (12) years in three neighboring states with comparable weather conditions.
- B. Certification for Compliance:** At the pre-construction conference, the Contractor shall notify the state project Engineer of the source of material.
1. **Independent Test Lab Report:** Test results certified and verified by a nationally recognized independent testing laboratory verifying properties of the cured system as per Table 1, 2 & 3 shall be submitted to the Engineer for approval prior to the bid opening. This certification shall be provided on each lot number to be used on the project.
 2. **Infrared Spectra:** Infrared spectra of each component from each lot number (to be used on the project) shall be submitted with the independent lab certification.
 3. **Test Sample for DOT Laboratory:** The Manufacturer shall furnish at least a one-quart sample of each component from each lot to the DOT laboratory to verify material supplied by the Manufacturer. Material shall be taken at job site.

C. Performance Acceptance

1. **Thickness Verification:** The state shall be notified of the number of gallons used on the project with two notarized statements - one from the Contractor and one from the Manufacturer. In addition, the Contractor shall verify to the State that the overlay is an average of at least 3/8" thick at three random locations agreed upon by the state Engineer and material Manufacturer representative. If 3/8" average is not achieved, a retest shall be performed in adjoining areas. Thin areas shall be re-coated as described above by the Contractor and re-verified at no additional cost to the State. This verification may consist of cores, holes, etc., but in all cases, any destructively tested areas shall be repaired by the Contractor before final acceptance by the Engineer.
2. **Performance Guarantee:** The epoxy-urethane co-polymer Manufacturer and the Contractor, by acceptance of the work described in this specification, jointly agree to guarantee the wearing surface against all defects incurred during normal traffic use for a period of five (5) years. The guarantee period shall commence on the date of acceptance of the work, usually the date the final layer of the overlay has been applied and cured. The guarantee covers all labor and materials required to satisfactorily repair or replace the wearing surface. Manufacturer will be responsible for integrity of warranty and will be removed from QPL if warranty repair not upheld within timely manner.

VII. MEASUREMENT

- A. Epoxy-Urethane Waterproofing Overlay.** The Department will measure the square feet of overlay application.
- B. Shotblasting:** The Department will measure "Blast Cleaning" in Square Yard. The Department will only measure this quantity once for any area to be shotblast. Additional blast cleaning to meet the requirements of this note shall be performed at the Contractor's expense.
- C. Partial Depth Patching.** The Department will measure the concrete necessary for partial depth patches in cubic yards.
- D. Thermoplastic Pavement Markings.** See Section 714.

VIII. PAYMENT

- A. Epoxy-Urethane Waterproofing Overlay.** The Department will pay for the measured quantities at the Contract unit bid price for "Epoxy-Urethane Waterproofing". -Urethane Waterproofing Overlay. The Department will measure the square feet of overlay application.

- B. Shotblasting.** The payment at the contract unit price for the pay item “Blast Cleaning” shall include all labor, equipment and material needed to complete the task as described in paragraphs 4.1.4 and 4.1.5.
- C. Partial Depth Patching.** The payment at the contract unit price, if necessary, shall include all labor, equipment and material needed to complete this task. The Department will not measure material removal, forming, blast cleaning, or retying steel reinforcement in the patches and will consider this work incidental to the pay item “Partial Depth Patching.”
- D. Thermoplastic Pavement Markings.** See Section 714.

**SPECIAL NOTE FOR REPLACING EXPANSION DAMS AND/OR
INSTALLING ARMORED EDGES FOR CONCRETE BRIDGES**

I. DESCRIPTION

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's Current Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications. This work consists of the following:

- Furnish all labor, materials, tools, and equipment
- Remove existing concrete and expansion devices and/or bridge ends
- Install armored edges and new concrete as specified and in accordance with the attached detail drawings
- Install new joint seals (where required)
- Maintain and control traffic
- Any other work specified as part of this Contract.

II. MATERIALS

- A. Class "M" Concrete.** Use either "M1" or "M2". See Section 601.
- B. Structural Steel.** Use new, commercial grade steel suitable for welding. The Engineer will base acceptance on visual inspection. See Standard Drawing BJE-001, current edition, for armored edges. See Manufacturer's specifications for "Armored Edges on Strip Seal Expansion Dams".
- C. Stud Anchors.** The armored edge stud anchors are $\frac{3}{4}$ " x 6" embedded stud shear connectors conforming to ASTM A108, Grade 1015 (Nelson Studs or equal).
- D. Steel Reinforcement - Epoxy Coated.** Use Grade 60. See Section 602.
- E. Epoxy Bond Coat.** See Section 511.
- F. Pre-Compressed Horizontal Expansion Joint System.** It shall have a cellular or micro-cell, polyurethane foam impregnated with hydrophobic acrylic emulsion, or a hydrophobic polymer. The polyurethane foam external facing shall be factory coated and cured with highway-grade, fuel resistant silicone or a highway-grade elastomeric coating at a width greater than the maximum joint expansion.

III. **EQUIPMENT**

- A. **Hammers.** See Section 606.02.10 B.
- B. **Sawing Equipment.** See Section 606.02.10 C.
- C. **Hydraulic Impact Equipment.** See Section 606.02.10 D.

IV. **CONSTRUCTION**

- A. **Remove Existing Materials.** Remove the existing expansion dam/bridge end and specified areas of concrete as shown on the attached sketches. Remove debris and/or expansion joint filler as directed by the Engineer.

When deteriorated concrete adjacent to the limits of removal is encountered, extend the removal area as directed by the Engineer. Dispose of all removed material entirely away from the job site. Clean and leave all existing steel reinforcement encountered in place. Damaged steel reinforcement will be repaired/replaced as directed by the Engineer at no additional cost to the Department. This work is incidental to the Contract unit price for "Expansion Joint Replacement" or "Armored Edge for Concrete".

- B. **Place New Concrete and Armored Edges.** After all specified existing materials have been removed; place new armored edges to match the grade of the proposed overlay or to match the original grade (See attached detail drawings). Place the new Class "M" Concrete to the scarified grade and finish to receive the new overlay or place the new Class "M" Concrete to the original grade and finish with broom strokes drawn transversely from curb to curb (See attached detail drawings).

All new structural steel shall be cleaned and painted in accordance with requirements of Section 607.03.23 except that surfaces to come in contact with concrete are not to be painted.

Blast clean all areas of existing concrete and structural steel to come in contact with new concrete until free of all laitance and deleterious substances immediately prior to the placement of the Class "M" Concrete. The surface areas of existing concrete to come in contact with the new Class "M" Concrete are to be coated with an epoxy bond coat immediately prior to placing new concrete in accordance with Section 511. The interfaces of the new and old concrete shall be as nearly vertical and horizontal as possible.

- C. Additional Steel Reinforcement.** Furnish for this work, as directed by the Engineer, steel reinforcement as shown in the attached detail drawings. Splice these bars to the existing reinforcement in the deck in the areas of removed concrete as shown in the attached detail drawings or as directed by the Engineer. Ensure that all exposed steel reinforcement is tied in accordance with Section 602.03.04 prior to pouring the new Class "M" Concrete. Field cutting and bending is permitted. Do not place any additional steel reinforcement above the height of the top row of Nelson studs on the armored edges.
Reinforcement, bar splices, and mechanical connectors are incidental to the Contract unit price for "Expansion Joint Replacement" or "Replace Armored Edge".
- D. Stage Construction.** Install concrete and armored edges in two (or more if specified) stages as necessary. Join the armored edges at or near the centerline of the roadway or lane line, field weld, and grind smooth.
- E. Pre-Compressed Horizontal Expansion Joint System.** System shall be supplied in pre-compressed sticks for easy installation. System shall be installed in accordance with Manufacturer's recommendations concerning approved adhesives, welds between sticks and appurtenances, and adhesion to concrete deck or armored edges. Joint seal is to be installed $\frac{3}{4}$ " recessed from the surface.
- F. Shop Plans.** Shop Plans will not be required. The Contractor is responsible for obtaining field measurements and supplying properly sized materials to complete the work.

V. **MEASUREMENT**

- A. Expansion Joint Replacement – 1", 1½", 2" and 2½".** The Department will measure the quantity in linear feet from gutterline to gutterline along the centerline of the joint.
- B. Longitudinal Joint Replacement –1".** The Department will measure the quantity in linear feet from abutment to abutment along the centerline of the joint.
- C. Armored Edge for Concrete.** The Department will measure the quantity in linear feet from gutterline to gutterline along the face of the bridge end.

VI. **PAYMENT**

- A. Expansion Joint Replacement – 1", 1½", 2" and 2½".** Payment at the Contract unit price per linear foot is full compensation for removing specified existing materials, furnishing and installing the new armored edges, concrete, reinforcement, precompressed joint seal, and all incidental items necessary to complete the work as specified by this Note and as shown on the attached detail drawings.

- B. Longitudinal Joint Replacement – 1”.** Payment at the Contract unit price per linear foot is full compensation for removing specified existing materials, furnishing and installing the new armored edges, concrete, reinforcement, precompressed joint seal, and all incidental items necessary to complete the work as specified by this Note and as shown on the attached detail drawings.
- C. Armored Edge for Concrete.** Payment at the Contract unit price per linear foot is full compensation for removing specified existing materials, furnishing and installing the new armored edges, concrete, reinforcement, and all incidental items necessary to complete work as specified by this Note and as shown on the attached detail drawings.

The Department will consider payment as full compensation for all work required by this Note and the attached detail drawings.

**SPECIAL NOTE FOR BRIDGE CLEANING AND PREVENTIVE MAINTENANCE:
BEARING CLEANING AND LUBRICATION**

I. DESCRIPTION

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's Current Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, and this Note. Section references are to the Standard Specifications.

This work consists of the following:

- Furnish all labor, materials, tools, and equipment
- Provide safe access to the bridge in accordance with Section 107.01.01
- Remove stratified and pack rust from bearings
- Pressure wash bearings
- Coat all surfaces of bearings with lubricant
- Maintain and control traffic
- Any other work specified as part of this Contract

II. MATERIALS

A. Bearing Lubricant. Conform to Manufacturer's Technical Guidance. One of the following lubricants shall be used:

"Never Seez – Mariner's Choice" produced by Bostick, Inc.

"Mobile Centaur Moly NLGI Grades 1 or 2" produced by Mobil Oil

"Premalub #1 WG" produced by Certified Labs

III. CONSTRUCTION

A. Removal of Stratified and Pack Rust. Stratified and pack rust shall be removed from all bearing devices. See attached detailed drawings for each bridge showing location and quantity of the bearing devices. Hand tools including wire brushes, scrapers or impact devices (hand hammers or power chisels) are to be used for removing stratified and pack rust. All surfaces to have stratified and pack rust removed shall be cleaned to an SSPC SP-2 level. All debris collected shall be disposed of in a suitable off-site disposal facility.

- B. Pressure Washing.** Specified bridge components shall be pressure washed. All equipment for pressure washing shall be operated at a minimum pressure of up to 4,000 psi with 0-degree spinner tips and/or fan tips as determined by the Engineer at the working location with a minimum flow rate of 3.5 gal/minute provided that these pressures do not damage any components of the structure. Pressure and flow rates shall be reduced to a level satisfactory to the Engineer should any damage occur due to power washing procedures. Pressure washing shall be operated at a distance of approximately six inches from and perpendicular to the surface. All pressure washing wands shall be equipped with a gauge to accurately determine the amount of pressure used. Pressure washing of any bridge element will proceed from top of wash area to bottom of wash area. Wash water will not be released to a bridge element previously washed.
- C. Residual Lead Paint.** Residual lead paint may still be on the bridge. The Contractor is advised to take all necessary protective measures including worker safety and environmental regulations when performing surface preparation. The Department will not consider any claims based on residual lead paint.
- D. Bearing Lubrication.** Bearing devices shall be lubricated after all stratified rust and pack rust is removed and power washing is complete, bearing devices shall have lubricant applied to all surfaces of the bearing including bearing plates and points of movement. Allow bearing devices to dry before lubricant is applied. Lubricant must be applied to a clean and dry surface.

IV. **MEASUREMENT**

- A. Bridge Cleaning and Preventive Maintenance.** The Department will measure the quantity as Lump Sum.

V. **PAYMENT**

- A. Bridge Cleaning and Preventive Maintenance.** Payment at the Contract lump sum price includes all labor, all materials and all incidental items necessary to complete bearing lubrication work in accordance with this Note, the Plans and the Standard Specifications.

The Department will consider payment as full compensation for all work required by this Note.

SPECIAL NOTE FOR BRIDGE BARRIER RETROFIT

I. **DESCRIPTION.**

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2019 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications.

This work consists of the following: (1) Furnish all labor, materials, tools, and equipment; (2) Remove existing aluminum handrail and deliver to the Baily Bridge Lot in Frankfort, KY; (3) Remove a portion of the existing concrete wing barrier as shown in the attached detail drawings and clean reinforcement to be reused in the proposed final wing barrier; (4) Remove any existing spalled/delaminated concrete from portion of the barrier to remain in place; (5) Repair and replace damaged and corroded reinforcing bars; (6) Drill and epoxy grout reinforcement into the existing barrier; (7) Prepare surface for concrete placement by blast cleaning; (8) Pour new concrete barrier using Class "M" Concrete according to the Standard Specifications; (9) Apply masonry coating to areas of new concrete as shown on the attached detail drawings; and (10) Any other work specified as part of this contract according to the attached detail drawings.

II. **MATERIALS.**

- A. Class "M" Concrete.** Use either "M1" or "M2". See Section 601.
- B. Steel Reinforcement.** Use Grade 60. See Section 602.
- C. Masonry Coating.** See Section 601.03.18 B.

III. **CONSTRUCTION.**

- A. Concrete Removal and Preparation.** The Contractor, as directed by the Engineer, shall locate and remove all loose, spalled, deteriorated and delaminated concrete. Sounding shall be used to locate delaminated areas. Care shall be exercised not to damage areas of sound concrete or reinforcing steel during concrete removal operations. Concrete removal shall be in accordance with a sequence approved by the Engineer.

Concrete removal shall be accomplished by chipping with hand picks, chisels or light duty pneumatic or electric chipping hammers (not to exceed 15 lbs.). If sound concrete is encountered before existing reinforcing steel is exposed, the surface shall be prepared and repaired without further removal of the concrete. When corroded reinforcing steel is exposed, concrete removal shall continue until there is a minimum $\frac{3}{4}$ inch clearance around the exposed, corroded reinforcing bar. Care shall be taken to not damage bond to adjacent non-exposed reinforcing steel during concrete removal processes.

The perimeter of all areas where concrete is removed shall be tapered at an approximately 45° angle, except that the outer edges of all chipped areas shall be saw cut to minimum depth of $\frac{3}{4}$ inch to prevent featheredging unless otherwise approved by the Engineer.

After all deteriorated concrete has been removed, the repair surface to receive concrete patching shall be prepared by abrasive blast cleaning. Abrasive blast cleaning shall remove all fractured surface concrete and all traces of any unsound material or contaminants such as oil, grease, dirt, slurry, or any materials which could interfere with the bond of freshly placed concrete.

The Contractor shall dispose of all removed material off State Right Of Way in an approved site. The Department will not measure concrete removal, Concrete Class "M", and steel reinforcement and will consider all work necessary as incidental to the bid item "BRIDGE BARRIER RETROFIT".

- B. Prepare existing surface.** Prepare the existing surface by blast cleaning in accordance with 606.03.04.
- C. Construct new barrier wall.** Drill and epoxy grout reinforcement into existing concrete according to Section 511. Form and pour new barrier wall in accordance with the detailed drawings.
- D. Apply finish.** Apply masonry coating to new concrete surfaces according to attached detail drawings and Sections 601.03.18 B.

- IV. **MEASUREMENT. See Section 606 and the following:**
- A. **Bridge Barrier Retrofit.** The Department will measure the quantity in linear feet from bridge end to bridge end. The wing lengths will be included in the measurement.
- V. **PAYMENT.**
- A. **Bridge Barrier Retrofit.** The Department will make payment at the contract unit price per linear foot under the bid item #23032EN "BRIDGE BARRIER RETROFIT" for full compensation for removal and delivery of aluminum railing, repair of spalled concrete, preparation of concrete surfaces, furnishing and installing the concrete and reinforcement, and all incidental items necessary to complete the work within the specified pay limits as specified by this note and as shown on the attached detail drawings.

The Department will consider payment as full compensation for all work required by these notes and the attached detail drawings.

SPECIAL NOTE FOR BRIDGE RESTORATION AND WATERPROOFING WITH CONCRETE OVERLAYS

I. DESCRIPTION.

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2019 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications.

This work consists of the following:

- Furnish all labor, materials, tools, and equipment;
- Remove the existing overlay;
- Complete full-depth and partial depth repairs as directed by the Engineer;
- Repair/replace damaged and corroded reinforcing bars;
- Place new concrete overlay and epoxy-sand slurry in accordance with Section 606 or the attached detail drawings;
- Place masonry coating in accordance with Section 601 or the attached detail drawings;
- Complete asphalt approach pavement;
- Maintain and control traffic; and
- Any other work specified as part of this contract.

All construction will be in accordance with Section 606 unless otherwise specified.

II. MATERIALS.

- A. Latex Concrete.** See Section 606.03.17.
- B. Class "M" Concrete.** Use either "M1" or "M2". See Section 601.
- C. Bituminous Asphalt.** Use CL2 ASPH SURF 0.38D PG64-22.
- D. Epoxy-Sand Slurry.** See Section 606.03.10.

III. **CONSTRUCTION.**

- A. **Machine preparation of existing slab.** Remove concrete from existing slab to a depth of at least ¼" below the existing surface, and remove all patches completely, in accordance with the requirements of Section 606.03.03.
- B. **Remove Existing Overlay.** In addition to Section 606.03.03, totally remove the existing concrete overlay by milling.
- C. **Partial Depth Slab Repair and Latex Overlay.** Remove areas determined to be unsound by the Engineer via hand held jackhammers weighing less than 45lbs in accordance with Section 606.02.10 D. Repair/Replace all damaged or severely corroded reinforcing bars prior to partial depth repair operation. The Department will not measure material removal and will consider this work incidental to the bid item "PARTIAL DEPTH PATCHING". Mix and place Latex Modified Concrete Overlay in accordance with Sections 606.03.08 and 606.03.17.
- D. **Full Depth Patching.** Construct full depth patching in accordance with Section 606.03.05. Temporary support of the beams may be required during full depth patching. Submit the proposed method of support to the Engineer for approval before beginning work.
- E. **Surface Texturing.** Texture the concrete surface of the overlay in accordance with Section 609.03.10.

IV. **MEASUREMENT.** See Section 606 and the following:

- A. **Latex Modified Concrete for Overlay.** The Department will measure the quantity in cubic yards using the theoretical volume as follows for each bridge:
 - 1. WKP (L&R) OVER KY 369 (184.25' x 30.25' x (2"/12"))/27 CF/CY = 34.4 CU YD
 - 2. WKP (L&R) OVER KY 2713 (116'x 38' x (1.5"/12")) /27 CF/CY = 20.4 CU YD
 - 3. WKP (L&R) OVER LEWIS CRK (120' x 38.0' x (2"/12"))/27 CF/CY = 28.2 CU YD
- B. **Latex Modified Concrete for Partial Depth Patching and variable thickness of Overlay.** The Department will measure the quantity in cubic yards by deducting the theoretical volume of bridge deck overlay (LMC) from the total volume (as indicated by the batch quantity tickets) of concrete required to obtain the finished grade shown on the Plans or established by the Engineer.
- C. **Concrete, Class M for Full-Depth Patching.** The Department will measure the quantity in cubic yards.

- D. **Machine Prep of Slab.** The Department will measure the machine preparation of the existing bridge deck in square yards, which shall include all labor, equipment, and material needed to complete this work.
 - E. **Remove Existing Overlay.** The Department will measure the removal of the existing overlay in square yards, which shall include all labor, equipment, and material needed to complete this work.
 - F. **Epoxy-Sand Slurry.** The Department will measure the quantity in square yards for the areas shown on the attached detail drawings.
 - G. **Steel Reinforcement.** Will not be measured for payment, but will be considered incidental to "CONCRETE OVERLAY-LATEX".
- V. **PAYMENT.** See Section 606 and the following:
- A. **Latex Modified Concrete for Overlay.** The Department will make payment for the Latex Modified Concrete under bid item #08534 "CONCRETE OVERLAY – LATEX" for the theoretical quantity per cubic yard.
 - B. **Latex Modified Concrete for Partial Depth Patching and variable thickness of Overlay.** The Department will make payment for the Partial Depth Patching under bid item #24094EC "PARTIAL DEPTH PATCHING". Payment will be for the quantity per cubic yard complete in place.
 - C. **Concrete, Class M for Full-Depth Patching.** The Department will make payment for Full-Depth Patching under bid item #08526 "CONC CLASS M FULL DEPTH PATCH". Payment will be for the quantity per cubic yard complete in place.
 - D. **Machine Prep of Slab.** The Department will make payment for the machine prep of existing slab under bid item #08551 "MACHINE PREP OF SLAB". Payment will be for the square yards completed.
 - E. **Remove Existing Overlay.** The Department will make payment for the removal of the existing overlay under the bid item #08510 "REM EPOXY BIT FOREIGN OVERLAY". Payment will be for the square yard completed.
 - F. **Epoxy-Sand Slurry.** The Department will make payment for the placement of Epoxy Sand Slurry under bid item #08504 "EPOXY SAND SLURRY". Payment will be for the square yards completed.

The Department will consider payment as full compensation for all work required by these notes and the attached detail drawings.

**SPECIAL NOTE FOR REPLACING COMPRESSION SEAL
IN EXISTING EXPANSION JOINT**

I. DESCRIPTION.

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2019 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications.

This work consists of the following:

- Furnish all labor, materials, tools, and equipment;
- Remove existing compression seal;
- Install new compression seal;
- Maintain and control traffic; and
- Any other work specified as part of this contract.

II. MATERIALS.

- A. Neoprene Joint Sealers (Compression Seals).** See Section 807.
- B. Silicone Rubber Sealant.** See Section 807.

III. CONSTRUCTION.

- A. Remove Existing Materials.** Remove the existing compression seal as shown on the attached sketches. Remove debris and/or expansion joint filler as directed by the Engineer. Dispose of all removed material entirely away from the job site. This work is incidental to the contract unit price for "Expansion Joint Seal Replacement".
- B. Blast Clean Armored Edges.** Blast clean all areas of existing armored edges until free of all laitance and deleterious substances immediately prior to the placement of the Compression Seal.
- C. Preformed Neoprene Joint Seal.** Place the preformed joint seal in one continuous, unbroken length. Place neoprene compression seals as recommended by the manufacturer and in accordance with Section 609.03.04 (D).
- D. Silicone Rubber Sealant.** Place the silicone sealant as recommended by the manufacturer and in accordance with Section 609.03.04 (C).
- E. Shop Plans.** Shop plans will not be required. The Contractor is responsible for obtaining field measurements and supplying properly sized materials to complete the work.

IV. **MEASUREMENT**

A. Expansion Joint Seal Replacement - The Department will measure the quantity in linear feet from gutterline to gutterline along the centerline of the joint.

V. **PAYMENT.**

A. Expansion Joint Seal Replacement - The Department will make payment at the contract unit price per linear feet under the bid item #23386EC "JOINT SEAL REPLACEMENT" for full compensation for removing specified existing materials, furnishing and installing the neoprene compression joint seal, and all incidental items necessary to complete the work within the specified pay limits as specified by this note and as shown on the attached detail drawings.

The Department will consider payment as full compensation for all work required by these notes and the attached detail drawings.

Special Note for Bridge Demolition, Renovation and Asbestos Abatement

If the project includes any bridge demolition or renovation, the successful bidder is required to notify Kentucky Division for Air Quality (KDAQ) via filing of form (DEP 7036) a minimum of 10 days prior to commencement of any bridge demolition or renovation work.

Any available information regarding possible asbestos containing materials (ACM) on or within bridges to be affected by the project has been included in the bid documents. These are to be included with the Contractor's notification filed with the KDAQ. If not included in the bid documents, the Department will provide that information to the successful bidder for inclusion in the KDAQ notice as soon as possible. If there are no documents stating otherwise, the bidders should assume there are no asbestos containing materials that will in any way affect the work.