

A.A.D.T. - 2023 = 400  
A.A.D.T. - 2043 = 466  
T = 11.41%  
PEAK HR = 10.00%  
DIRECTIONAL DISTRIBUTION (N/S) = 49.7%/50.3%  
V = 55 M.P.H.  
FUNCTIONAL CLASSIFICATION- MAJOR COLLECTOR

### CONVENTIONAL SYMBOLS (USED IN PLANS)

NOTE: DASHED OR OPEN SYMBOLS INDICATE  
EXISTING FEATURES

SAN  
HYD  
WV  
WM  
D  
SIGN  
PED  
V  
X  
BM

KEY MAP

LOCATION OF SHELBY COUNTY

RTE. K BRIDGE REPLACEMENT  
OVER BLACK CREEK  
0.054 MILES

BEGIN PROJECT  
STA. 503+66.17

END PROJECT  
STA. 506+53.63

R12W | R11W

R11W | R10W

R10W | R9W

T59N  
T58N

LEONARD

BETHEL

BURKSVILLE

KIRBY

KELLERVILLE

SHELBYVILLE

RANDOLPH COUNTY

MONROE COUNTY

Pin Oak CA

SCALE IN MILES

THE EXISTENCE AND APPROXIMATE LOCATION OF UTILITY FACILITIES KNOWN TO EXIST, AS SHOWN ON THE PLANS, ARE BASED ON THE BEST INFORMATION AVAILABLE TO THE COMMISSION AT THIS TIME. THIS INFORMATION IS PROVIDED BY THE COMMISSION "AS-IS" AND THE COMMISSION EXPRESSLY DISCLAIMS ANY REPRESENTATION OR WARRANTY AS TO THE COMPLETENESS, ACCURACY, OR SUITABILITY OF THE INFORMATION FOR ANY USE. RELIANCE UPON THIS INFORMATION IS DONE AT THE RISK AND PERIL OF THE USER, AND THE COMMISSION SHALL NOT BE LIABLE FOR ANY DAMAGES THAT MAY ARISE FROM ANY ERROR IN THE INFORMATION. IT IS, THEREFORE, THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE, LOCATION AND STATUS OF ANY FACILITY. SUCH VERIFICATION INCLUDES DIRECT CONTACT WITH THE LISTED UTILITIES.

| DESCRIPTION                         | NUMBER |
|-------------------------------------|--------|
| TITLESHEET -----                    | 1      |
| TYPICAL SECTIONS (TS) (1 SHEET)---- | 2      |
| QUANTITIES (QU) (2 SHEETS)-----     | 3      |
| PLAN/PROFILE SHEET (PP) (1 SHEET)-- | 4      |
| COORDINATE/REFERENCE POINTS (CP/RP) | 5      |
| SPECIAL SHEETS (SS) 1 SHEET)-----   | 6      |
| TRAFFIC CONTROL (TC) (2 SHEET)----- | 7-8    |
| EROSION CONTROL (EC)(1 SHEET)-----  | 9      |
| BRIDGE DRAWINGS (B)                 |        |
| A9344-----                          | 1-32   |
| CROSS SECTIONS (XS)-----            | 1-4    |

|                      |                |
|----------------------|----------------|
| BEGINNING OF PROJECT | STA. 503+66.74 |
| END OF PROJECT       | STA. 506+53.63 |

|                 |             |
|-----------------|-------------|
| APPARENT LENGTH | 286.89 FEET |
|-----------------|-------------|

EQUATIONS AND EXCEPTIONS:

NONE

|                       |        |       |
|-----------------------|--------|-------|
| TOTAL CORRECTIONS     | 0.00   | FEET  |
| NET LENGTH OF PROJECT | 286.89 | FEET  |
| STATE LENGTH          | 0.054  | MILES |

|                           |      |       |
|---------------------------|------|-------|
| FOR INFORMATION ONLY      |      |       |
| ESTIMATED DISTURBED ACRES | 0.24 | ACRES |



01/29/2024 8:38:09 AM  
KEITH ALLEN KILLEN - CIVIL  
MO-PE-2007020292

1 / 25 / 2024

|                |                |
|----------------|----------------|
| ROUTE<br>K     | STATE<br>MO    |
| DISTRICT<br>NE | SHEET NO.<br>1 |

COUNTY  
SHELBY

JNE0127

|              |
|--------------|
| CONTRACT ID. |
|--------------|

|             |
|-------------|
| PROJECT NO. |
|-------------|

BRIDGE NO.

| DESCRIPTION |
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MISSOURI HIGHWAYS AND TRANSPORTATION  
COMMISSION

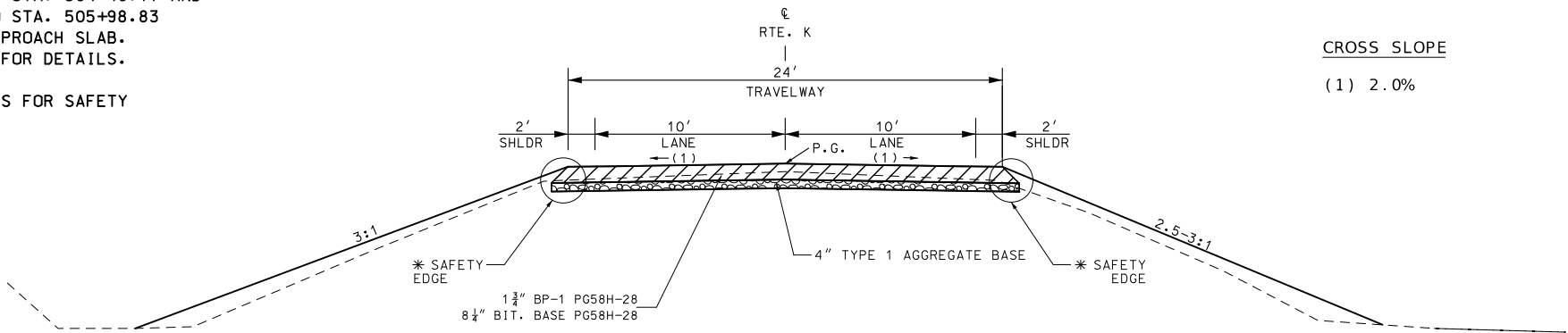


105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

TITLESHEET

STA. 504+20.17 TO STA. 504+40.17 AND  
STA. 505+78.83 TO STA. 505+98.83  
INSTALL BRIDGE APPROACH SLAB.  
SEE BRIDGE PLANS FOR DETAILS.

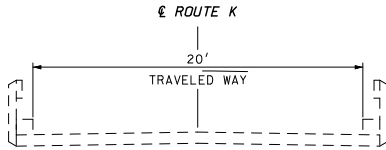
SEE STANDARD PLANS FOR SAFETY  
EDGE DETAILS.



**ROUTE K - TYPICAL SECTION**

\*\* STA. 503+66.74 TO STA. 504+20.17  
\*\* STA. 505+98.83 TO STA. 506+53.63

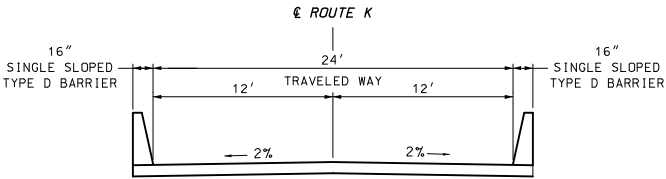
\*\* APPROXIMATE PAVEMENT WIDTH  
TRANSITIONS FROM 19'-24'



**EXISTING TYPICAL SECTION**

**BR# P0238**

STA. 504+48 TO STA. 505+69



**PROPOSED TYPICAL SECTION**

**BR. # A9344**

STA. 504+39.64 TO STA. 505+79.36

NOT TO SCALE



DATE PREPARED  
1/25/2024

ROUTE K STATE MO  
DISTRICT NE SHEET NO. 2

COUNTY SHELBY  
JOB NO. JNE0127  
CONTRACT ID.

PROJECT NO.

BRIDGE NO.

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

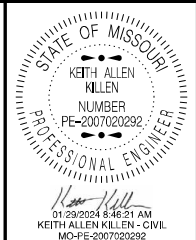
105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

MODOT

TYPICAL SECTION





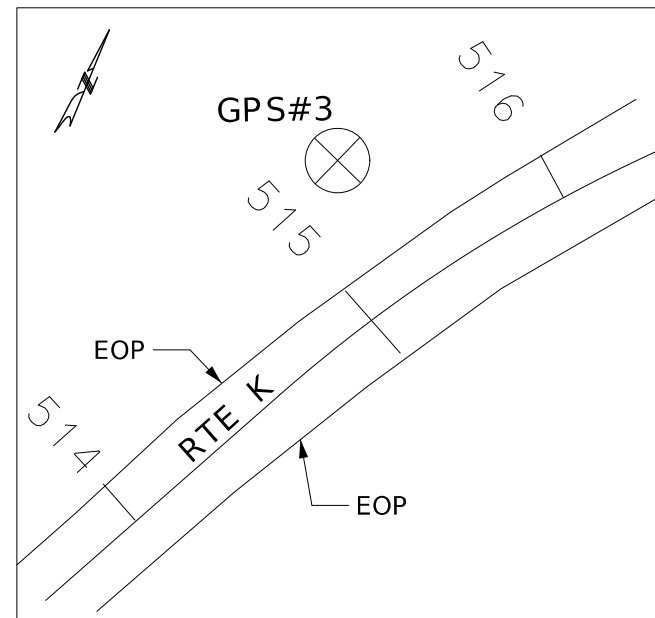


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PLAN AND PROFILE SHEET  
SHEET 1 OF 1

|                                             |
|---------------------------------------------|
| LINEAR UNIT CONVERSION                      |
| 1 METER = 3.280833333 US SURVEY FEET (USFT) |



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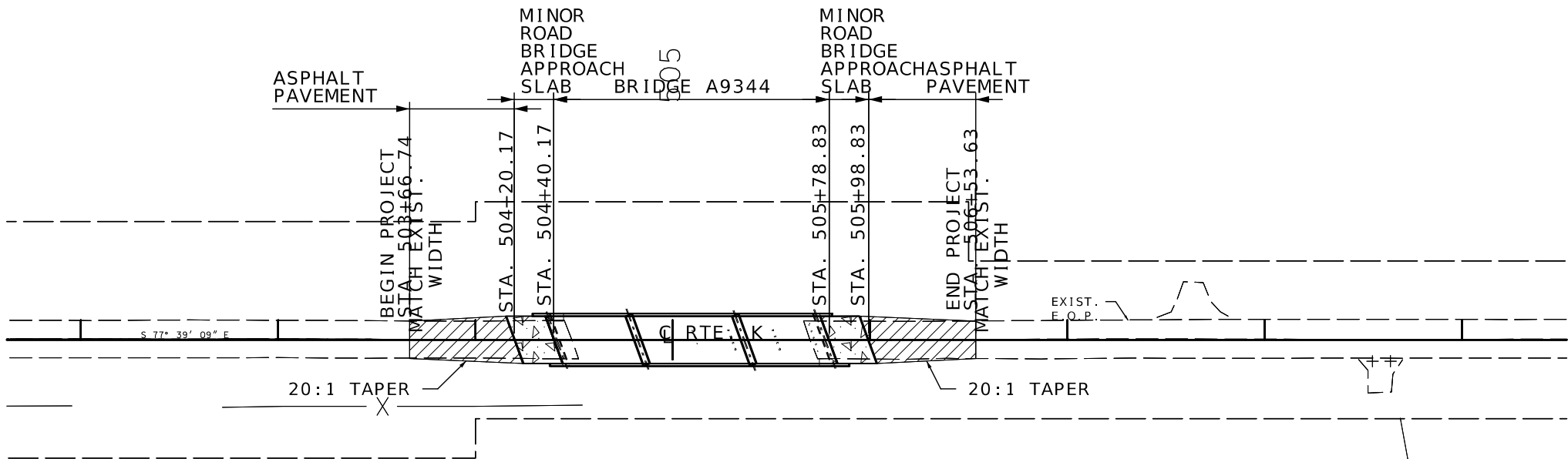
GPS 3
RTE. K
STA. 515+08.44 25.60' LT
      N-1447362.408
      E-1764592.684
      ELEV. 719.81

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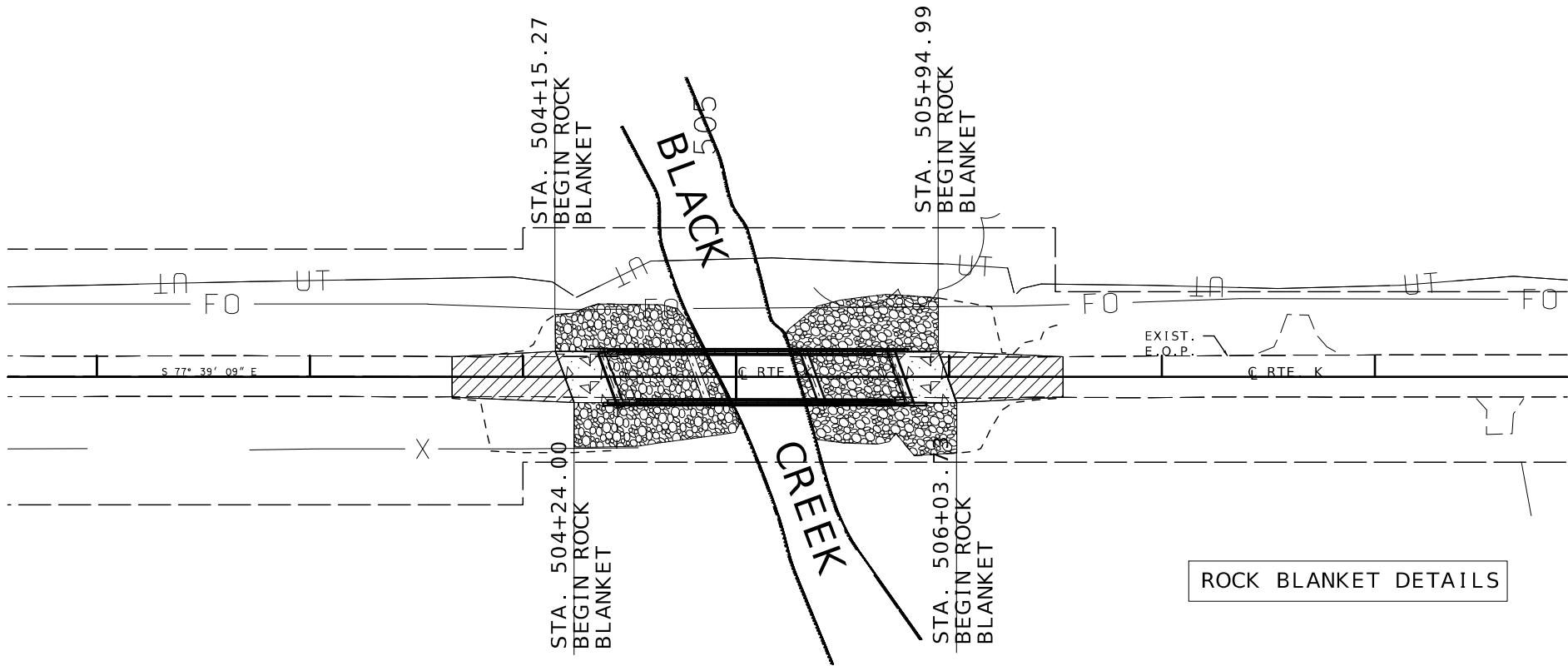




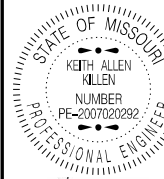
SCALE



PAVING DETAILS



ROCK BLANKET DETAILS



DATE PREPARED  
2/9/2024

ROUTE K STATE MO  
DISTRICT NE SHEET NO. 6

COUNTY SHELBY  
JOB NO. JNE0127  
CONTRACT ID.

PROJECT NO.

BRIDGE NO.

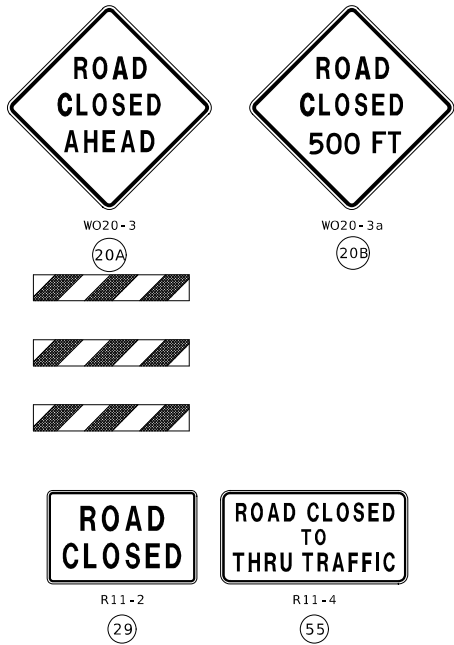
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MISSOURI HIGHWAYS AND TRANSPORTATION  
COMMISSION



105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

PAVING DETAILS AND  
ROCK BLANKET DETAILS  
SHEET 1 OF 1



NOTES:

INSTALL PRE-CLOSURE SIGNS WITH PLAQUES (48A) A MINIMUM OF 2 WEEKS PRIOR TO CLOSURE.

WHEN BRIDGE CLOSURE OCCURS - REMOVE SPECIAL SIGN PLAQUES AND RELOCATE NOTED SIGNS.

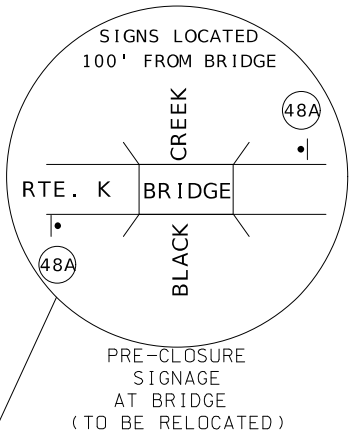
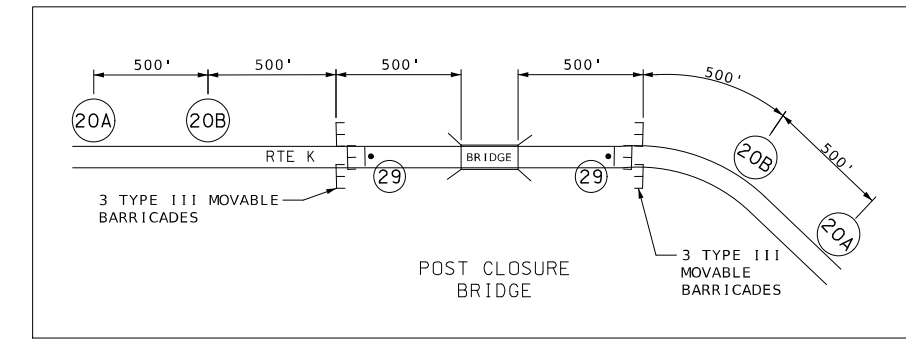
SEE TRAFFIC CONTROL SHEET 2 OF 2 FOR SPECIAL SIGN AND PLAQUE DETAILS FOR (48A) (48B) (48C).

\* LOCATE SIGNS 100' FROM INTERSECTION.

\*\* SIGNS RELOCATED FROM BRIDGE

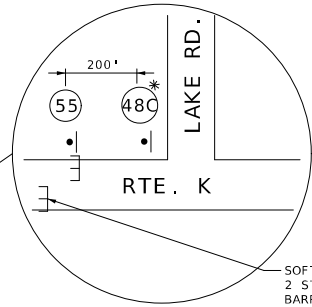
USE IN PLACE ALL SIGNS WHICH DO NOT CONFLICT WITH THIS PLAN. COVER OR REMOVE CONFLICTING SIGNS.

PLACE ALL SIGNS AS SHOWN OR AS DIRECTED BY THE ENGINEER.

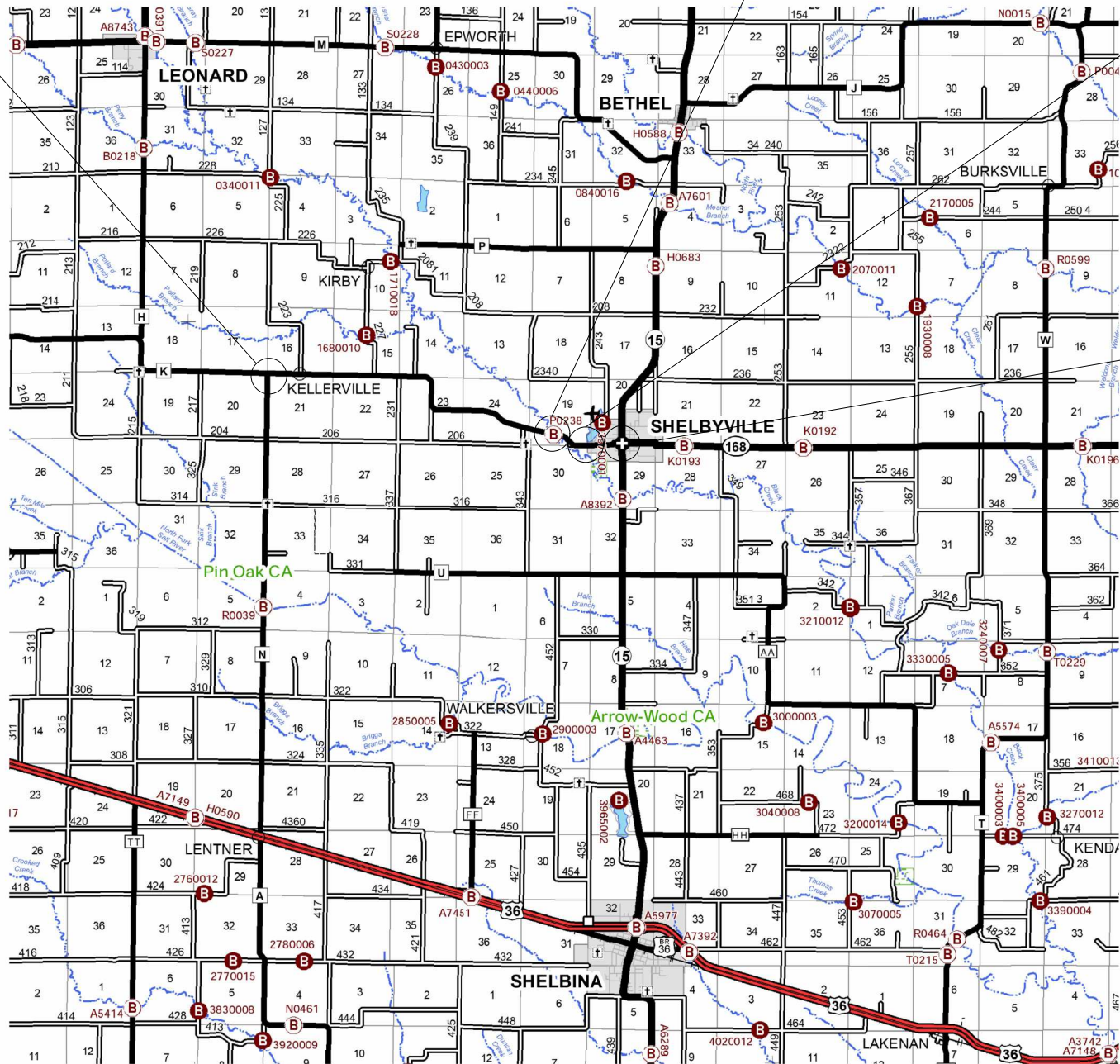
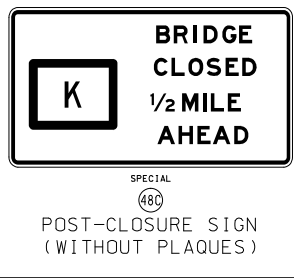
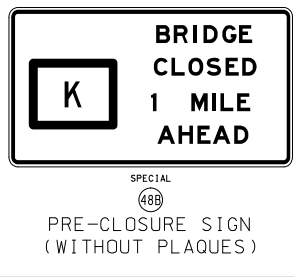
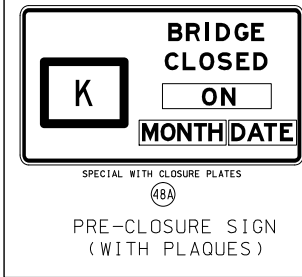
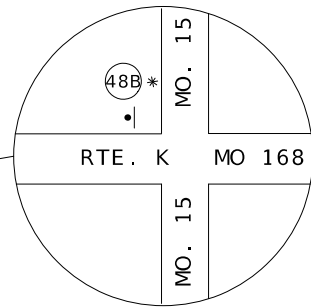


| TRAFFIC CONTROL LEGEND |                              |
|------------------------|------------------------------|
|                        | SIGN (SINGLE SIDED)          |
|                        | BARRICADE                    |
|                        | CHANGEABLE MESSAGE BOARD     |
|                        | ADVANCED WARNING RAIL SYSTEM |

SOFT CLOSURE SIGNAGE AT LAKE RD.



POST CLOSURE AT MO 15



STATE OF MISSOURI

KEITH ALLEN KILLEN

NUMBER

PE-2007020292

PROFESSIONAL ENGINEER

01/29/2024 9:01:45 AM

KEITH ALLEN KILLEN - CIVIL

MO-PE-2007020292

DATE PREPARED

1/25/2024

ROUTE

K

STATE

MO

DISTRICT

NE

SHEET NO.

7

COUNTY

SHELBY

JOB NO.

JNE0127

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

MODOT

105 WEST CAPITOL

JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-275-6636)

TRAFFIC CONTROL

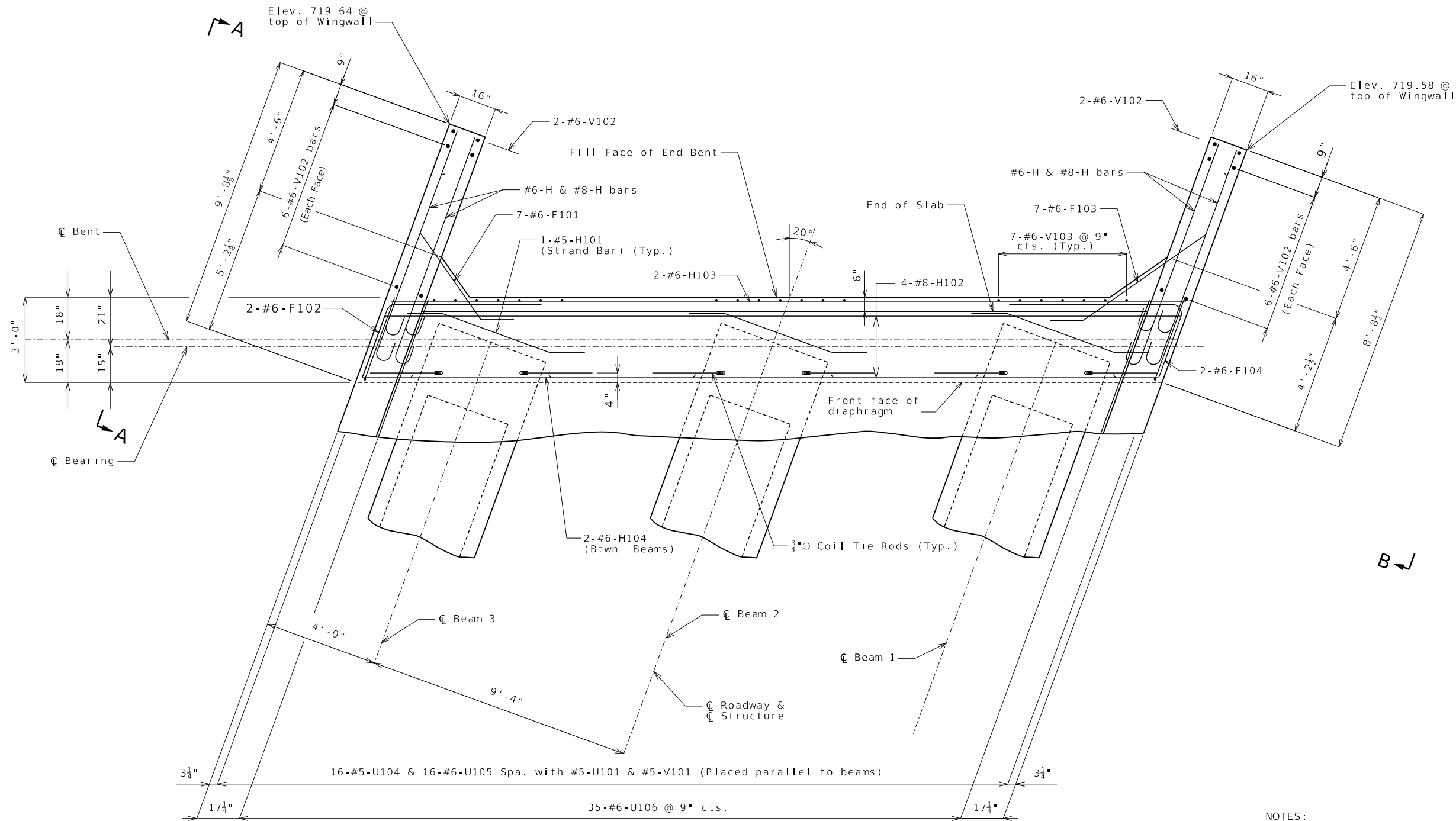
SHEET 1 OF 2











PART PLAN

Note: All U bars and V bar pairs in the End Bent shall be placed parallel to the girders.

| Substructure Quantity Table for End Bent No. 1 |             |          |
|------------------------------------------------|-------------|----------|
| Item                                           |             | Quantity |
| Class 1 Excavation                             | cu. yard    | 30       |
| Galvanized Structural Steel Piles (12 in.)     | linear foot | 232      |
| Pile Point Reinforcement                       | each        | 4        |
| Class B Concrete (Substructure)                | cu. yard    | 11.7     |

These quantities are included in the Estimated Quantities table on Sheet No. 2.

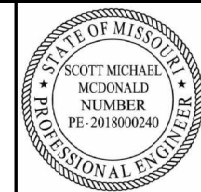
NOTES:  
All concrete in the end bent above top of beam and below top of slab shall be Class B-2.  
Strands at end of the beams shall be field bent or, if necessary, cut in field to maintain 1 1/2 inch minimum clearance to fill face of end bent.  
For location of coil tie rods and #5-H101 (strand tie bar), see Sheets No. 14 thru 15.  
For Elevation A-A and Elevation B-B see Sheet No. 6.  
For details of Vertical Drain at End Bent, see Sheet No. 7.  
For details of Bridge Approach Slab, see Sheet No. 22.  
For details of End Bent No. 1 not shown, see Sheets No. 4, 5, & 6.

DETAILS OF END BENT NO. 1

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 3 of 32

Detailed Jun. 2023  
Checked Aug. 2023



THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

DATE PREPARED  
12/04/2023

ROUTE K STATE MO  
DISTRICT BR SHEET NO. 3

COUNTY SHELBY  
JOB NO. JNE0127  
CONTRACT ID.

PROJECT NO.

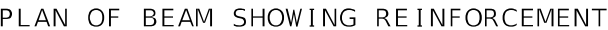
BRIDGE NO.  
A9344

| DESCRIPTION | DATE |
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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION  
105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-273-6636)

VEENSTRA & KIMM INC.  
9788 N Ash Ave. Kansas City, Missouri 64157  
816-781-6182 816-781-0643 (FAX)  
Certificate of Authority No. F00362673

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



Pile anchors not shown for clarity.

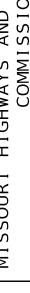
## DETAILS OF END BENT NO. 1

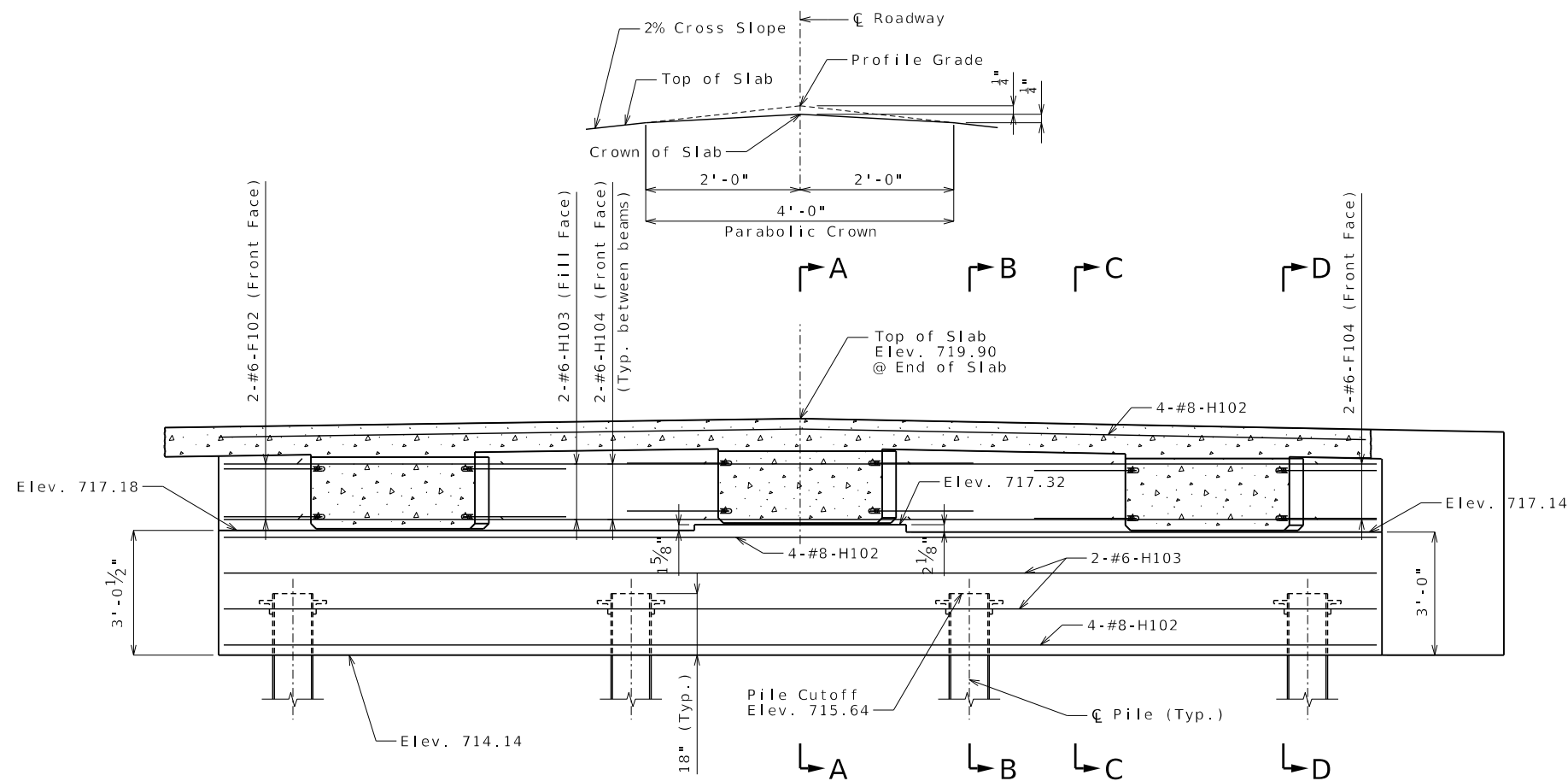


NOTES:

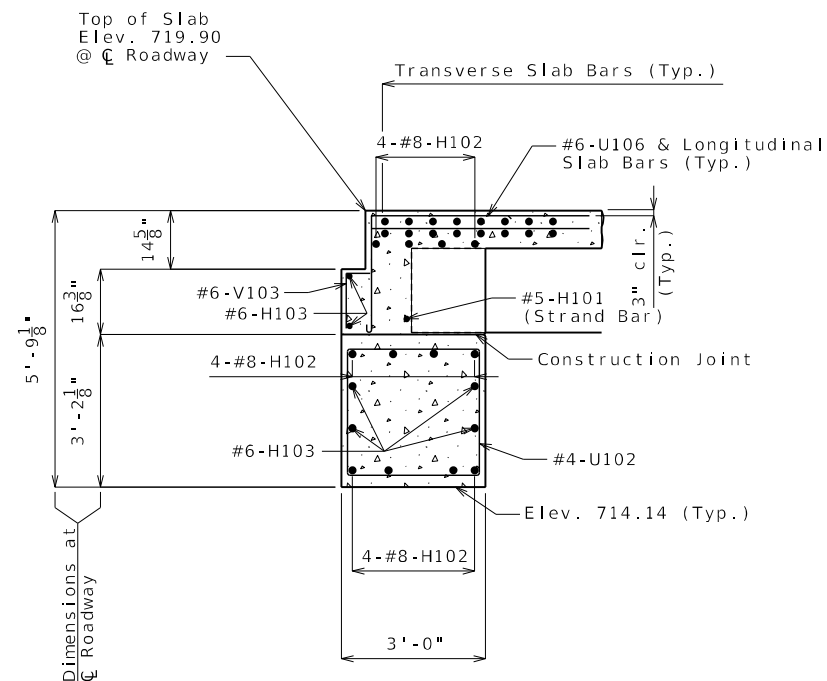
Reinforcing steel shall be shifted to clear piles. U bars shall clear piles by at least 1 1/2 inch.

For details of End Bent No. 1 not shown, see Sheets No. 3, 5 & 6.

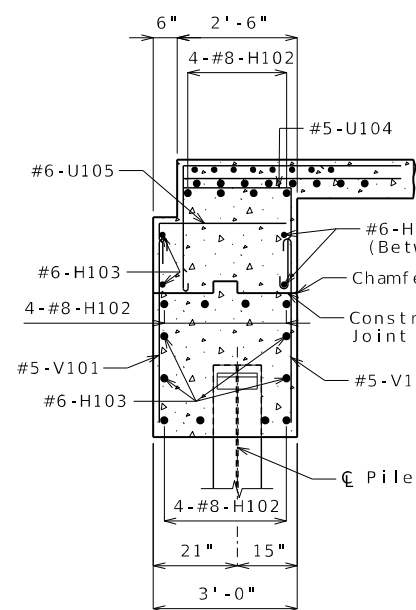
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| THIS SHEET HAS BEEN<br>SIGNED, SEALED AND DATED<br>ELECTRONICALLY.                                                                 |           |
| DATE PREPARED                                                                                                                      |           |
| 12/04/2023                                                                                                                         |           |
| ROUTE                                                                                                                              | STATE     |
| K                                                                                                                                  | MO        |
| DISTRICT                                                                                                                           | SHEET NO. |
| BR                                                                                                                                 | 4         |
| COUNTY                                                                                                                             |           |
| SHELBY                                                                                                                             |           |
| JOB NO.                                                                                                                            |           |
| JNE0127                                                                                                                            |           |
| CONTRACT ID.                                                                                                                       |           |
| PROJECT NO.                                                                                                                        |           |
| BRIDGE NO.                                                                                                                         |           |
| A9344                                                                                                                              |           |
| DESCRIPTION                                                                                                                        |           |
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| MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION                                                                                    |           |
|                                               |           |
| 105 WEST CAPITAL<br>JEFFERSON CITY, MO 65102<br>1-888-ASK-MODOT (1-888-275-6636)                                                   |           |
|                                               |           |
| 9788 N Ash Ave.      Kansas City, Missouri 64157<br>816-781-6182      816-781-0643 (FAX)<br>Certificate of Authority No. F00362673 |           |



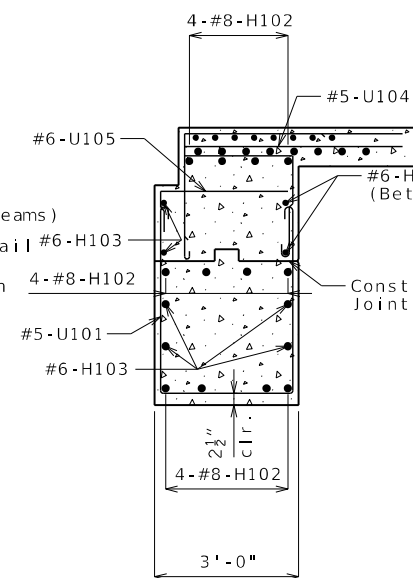
SECTION NEAR END BENT



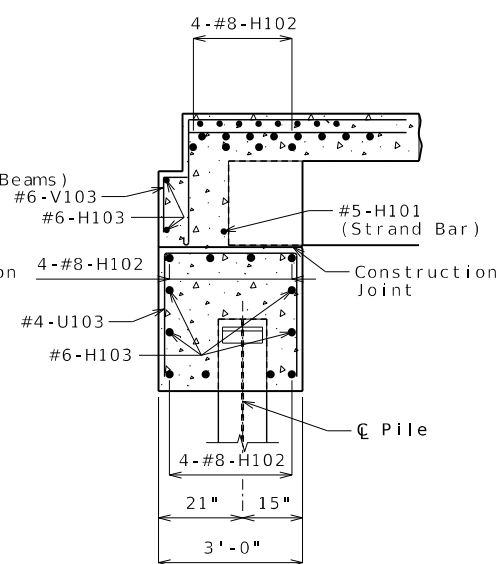
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

# DETAILS OF END BENT NO. 1

NOTES:

For details of End Bent No. 1 not shown, see Sheets No. 3, 4, & 6.



THIS SHEET HAS BEEN  
SIGNED, SEALED, AND DATED  
ELECTRONICALLY.

DATE PREPARED  
12/04/2023

ROUTE K STATE MO

DISTRICT BR SHEET NO. 5

COUNTY SHELBY

JOB NO. JNE0127

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9344

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-273-6636)

MODOT

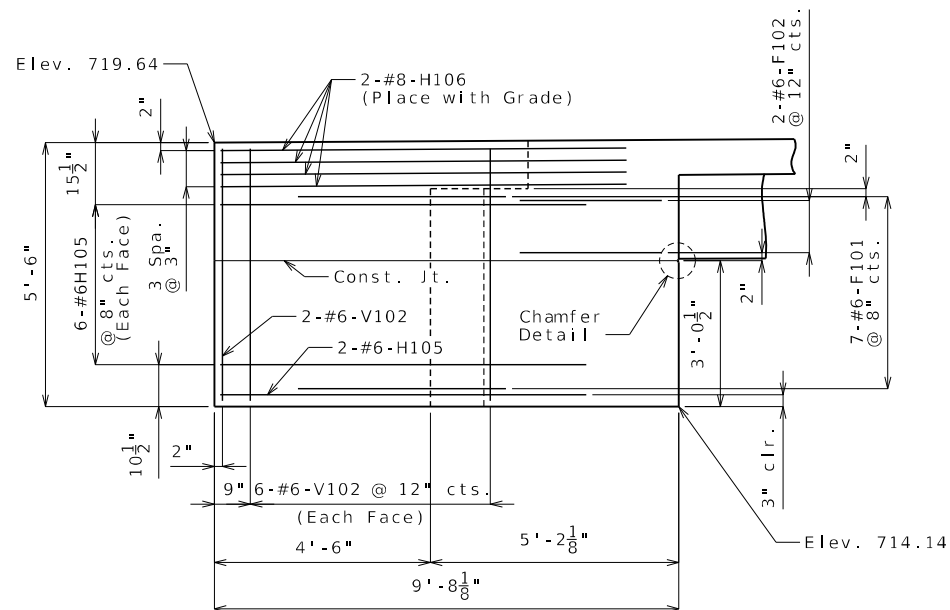
VEENSTRA & KIMM INC.

9788 N Ash Ave. Kansas City, Missouri 64157

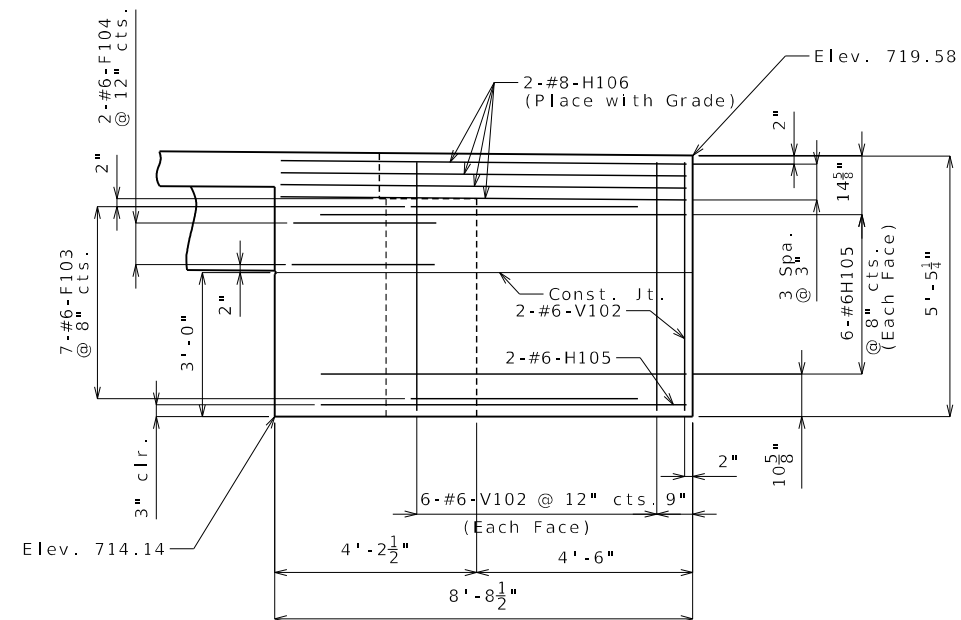
816-781-6182 816-781-0643 (FAX)

Certificate of Authority No. F00362673

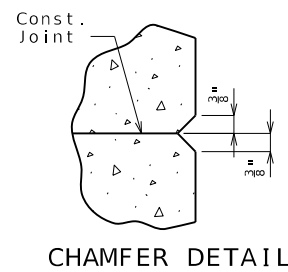
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



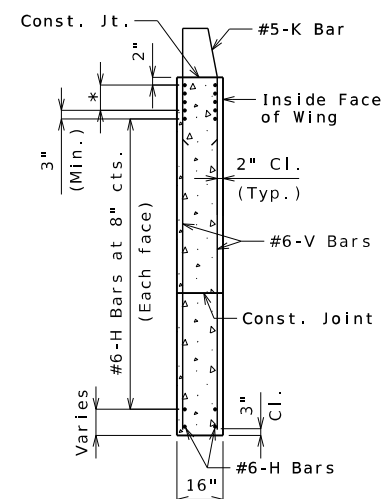
ELEVATION A-A



ELEVATION B-B



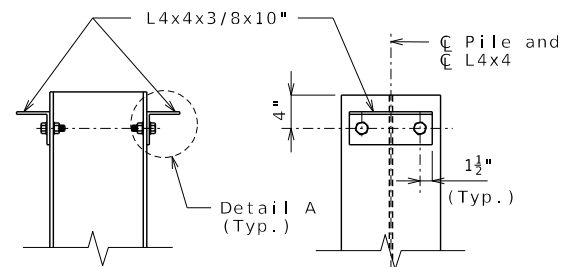
CHAMFER DETAIL



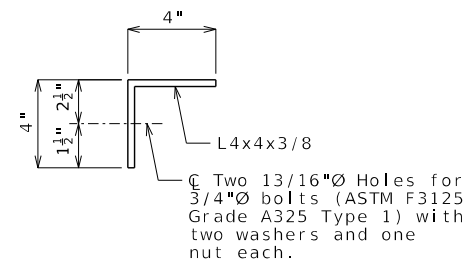
TYPICAL SECTION THRU WING

\* #8-H Bars at 3" cts. (Each face) (Place with grade)

For reinforcement of the barrier, see Sheet No. 21

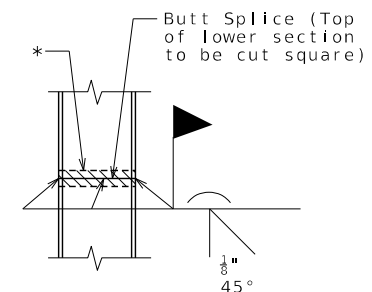


DETAILS OF HP PILE ANCHORS



DETAIL A

Angles shall be coated with a minimum of two coats of non-aluminum epoxy mastic primer to provide a dry film thickness of 4 mils minimum, 8 mils maximum, or galvanized in accordance with Sec 1081. Bolts, washers and nuts shall be galvanized in accordance with AASHTO M 232 (ASTM A153), Class C.



STEEL PILE SPLICE  
(If required)

\* Galvanizing material shall be omitted or removed one inch clear of weld locations in accordance with Sec 702.

Note:  
For location of Elevation A-A and Elevation B-B, see Sheet No. 3.

For Details of End Bent 1 not shown, see Sheets No. 3, 4 & 5.



THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

DATE PREPARED  
12/04/2023

ROUTE K STATE MO

DISTRICT BR SHEET NO. 6

COUNTY SHELBY

JOB NO. JNE0127

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9344

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-273-6636)

MoDOT

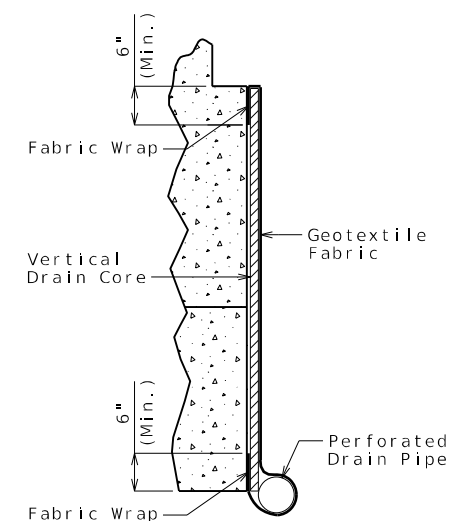
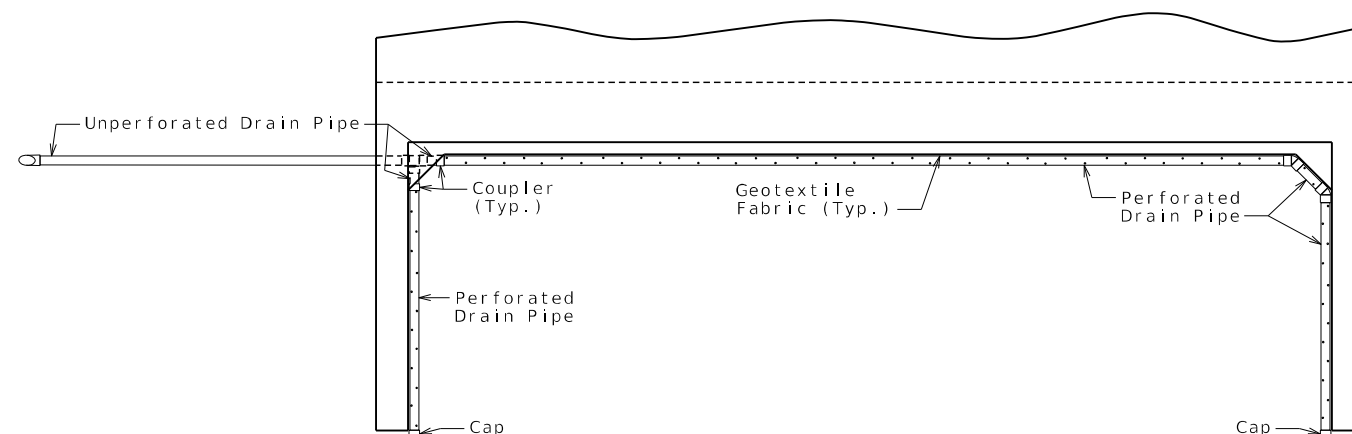
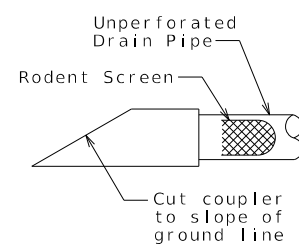
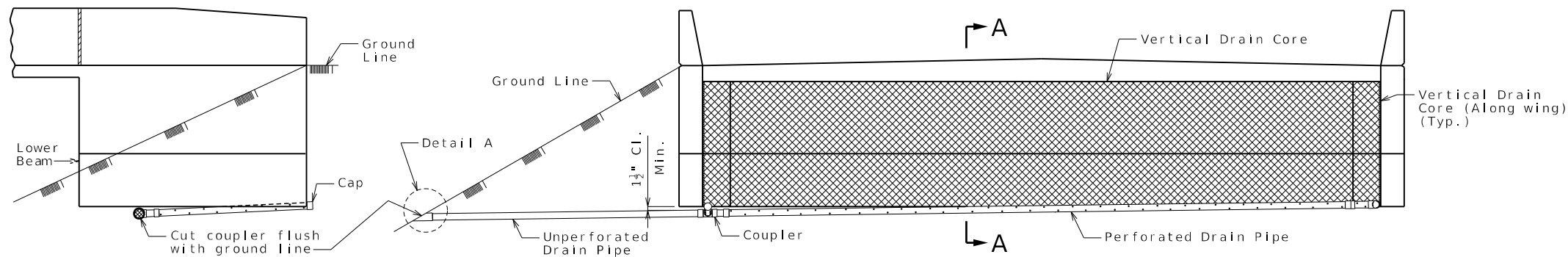
VEENSTRA & KIMM INC.

9788 N Ash Ave. Kansas City, Missouri 64157

816-781-6182 816-781-0643 (FAX)

Certificate of Authority No. F00362673

## DETAILS OF END BENT NO. 1



### VERTICAL DRAIN AT END BENTS

(Squared end bent shown, skewed end bent similar)

(Squared end bent shown, skewed end bent similar)

Detailed Aug. 2023  
Checked Sep. 2023

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 7 of 32

General Notes:

All drain pipe shall be sloped 1 to 2 percent.

Drain pipe may be either 6-inch diameter corrugated metallic-coated steel pipe underdrain, 4-inch diameter corrugated polyvinyl chloride (PVC) drain pipe, or 4-inch diameter corrugated polyethylene (PE) drain pipe.

Drain pipe shall be placed at fill face of end bent and inside face of wings. The pipe shall slope to lowest grade of ground line, also missing the lower beam of end bent by a minimum of 1 1/2 inches.

Perforated pipe shall be placed at fill face side and inside face of wings at the bottom of end bent and plain pipe shall be used where the vertical drain ends to the exit at ground line.



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COUNTY  
SHELBY

JOB NO.  
JNE0127

CONTRACT ID.

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MISSOURI HIGHWAYS AND TRANSPORTATION  
COMMISSION

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)



**VEENSTRA  
& KIMM INC.**

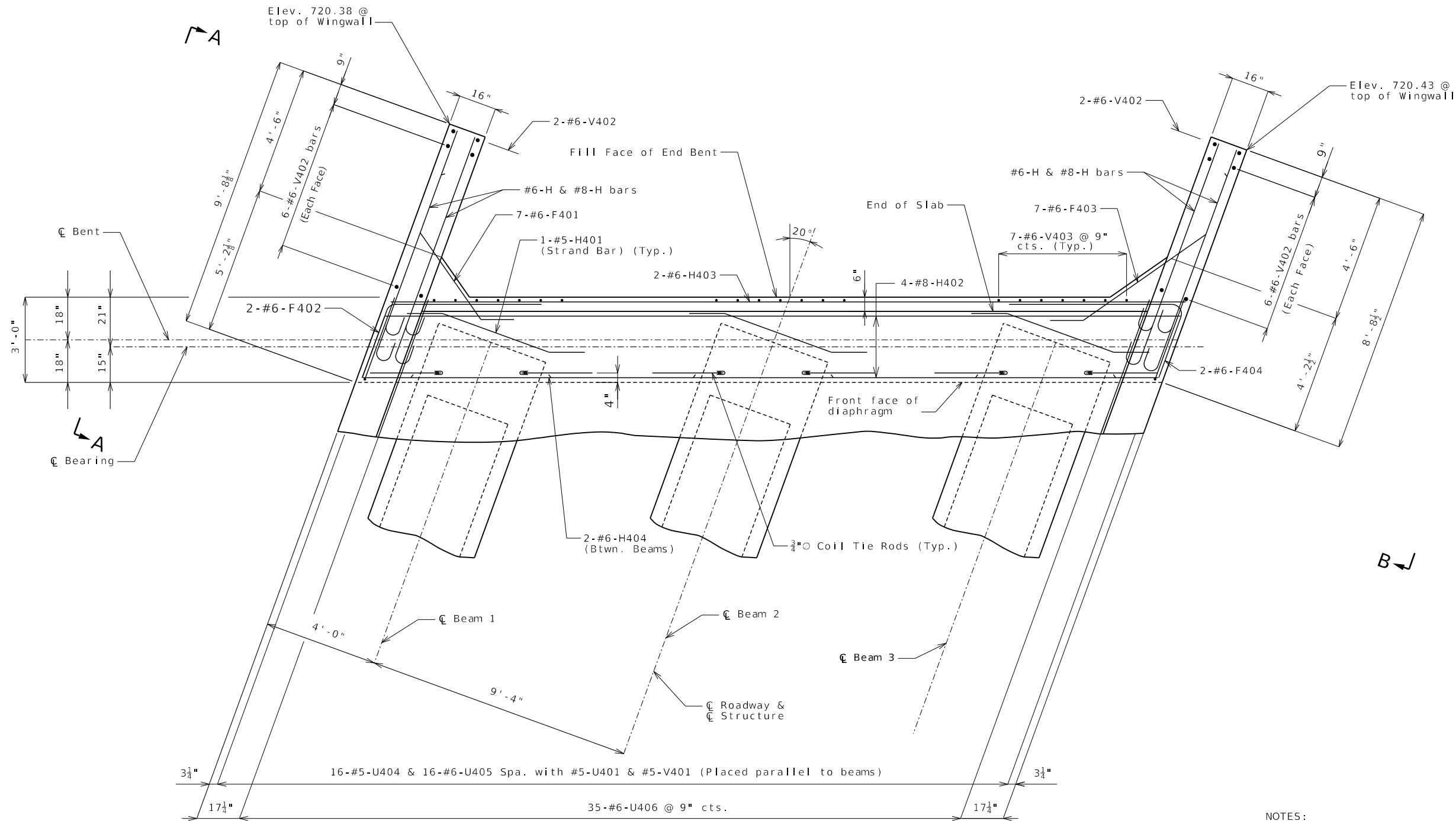
7788 N Ash Ave. Kansas City, Missouri 64157  
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REV.







PART PLAN

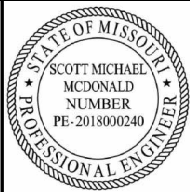
Note: All U bars and V bar pairs in the End Bent shall be placed parallel to the girders.

| Substructure Quantity Table for End Bent No. 4 |             |          |
|------------------------------------------------|-------------|----------|
| Item                                           |             | Quantity |
| Class 1 Excavation                             | cu. yard    | 30       |
| Galvanized Structural Steel Piles (12 in.)     | linear foot | 256      |
| Pile Point Reinforcement                       | each        | 4        |
| Class B Concrete (Substructure)                | cu. yard    | 11.7     |

These quantities are included in the Estimated Quantities table on Sheet No. 2.

NOTES:  
All concrete in the end bent above top of beam and below top of slab shall be Class B-2.  
Strands at end of the beams shall be field bent or, if necessary, cut in field to maintain 1 1/2 inch minimum clearance to fill face of end bent.  
For location of coil tie rods and #5-H401 (strand tie bar), see Sheets No. 14 thru 15.  
For Elevation A-A and Elevation B-B see Sheet No. 13.  
For details of Vertical Drain at End Bent, see Sheet No. 7.  
For details of Bridge Approach Slab, see Sheet No. 22.  
For details of End Bent No. 4 not shown, see Sheets No. 11, 12, & 13.

DETAILS OF END BENT NO. 4



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ROUTE  
K

DISTRICT  
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SHEET NO.  
10

COUNTY  
SHELBY

JOB NO.  
JNE0127

CONTRACT ID.

PROJECT NO.

BRIDGE NO.  
A9344

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-273-6636)

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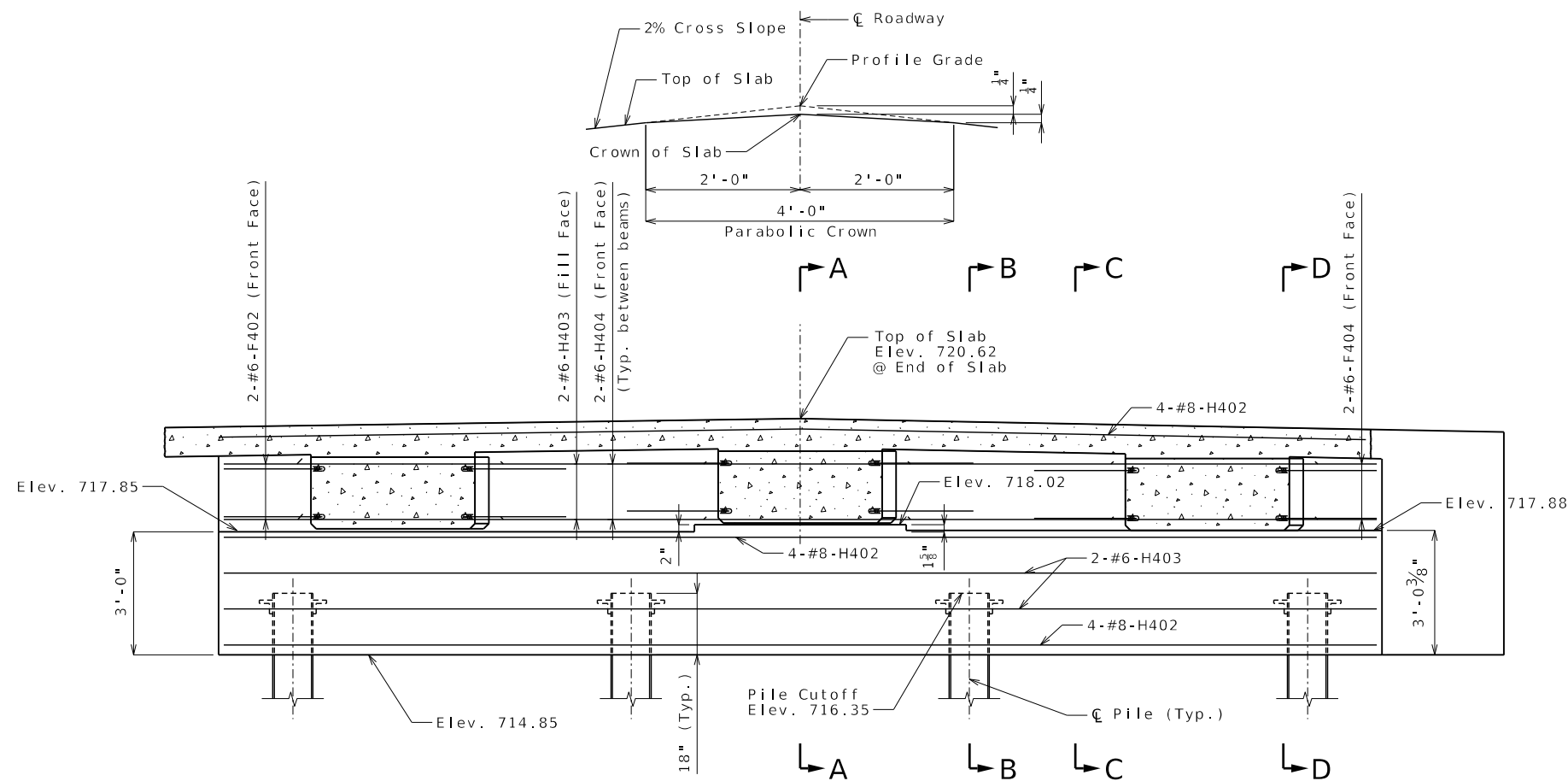
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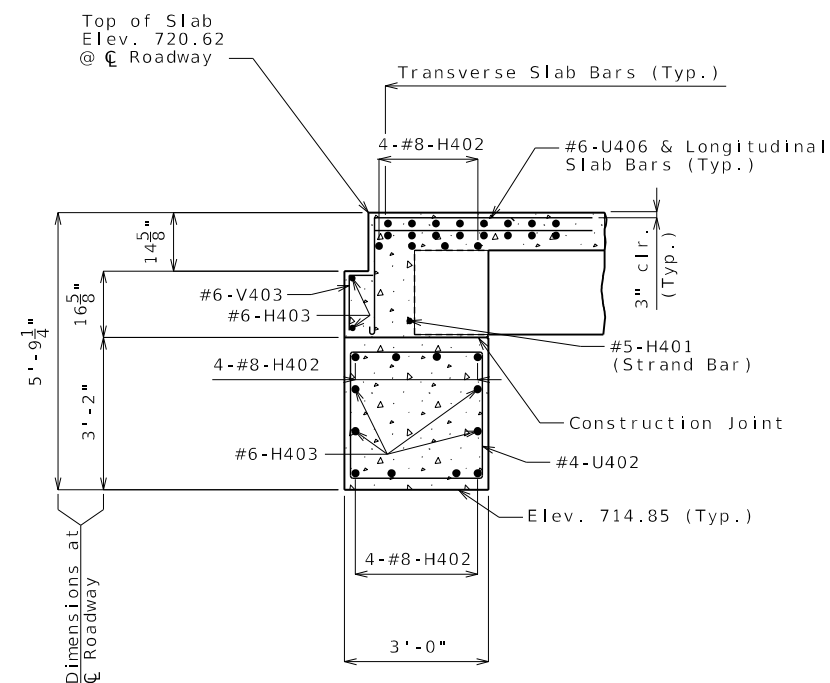
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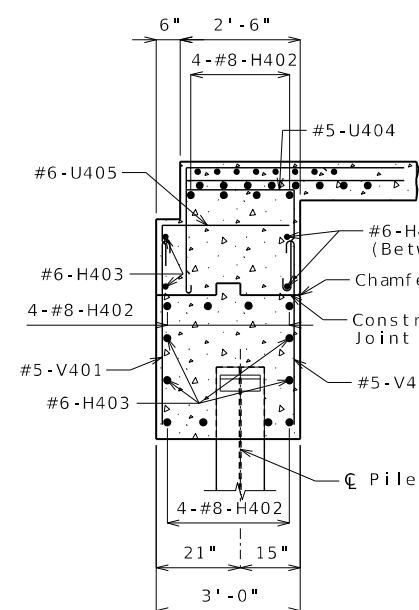




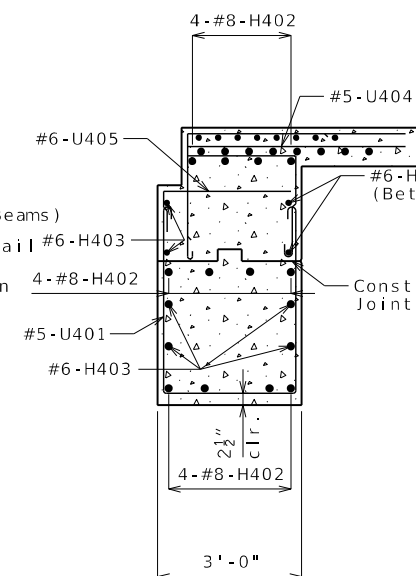
SECTION NEAR END BENT



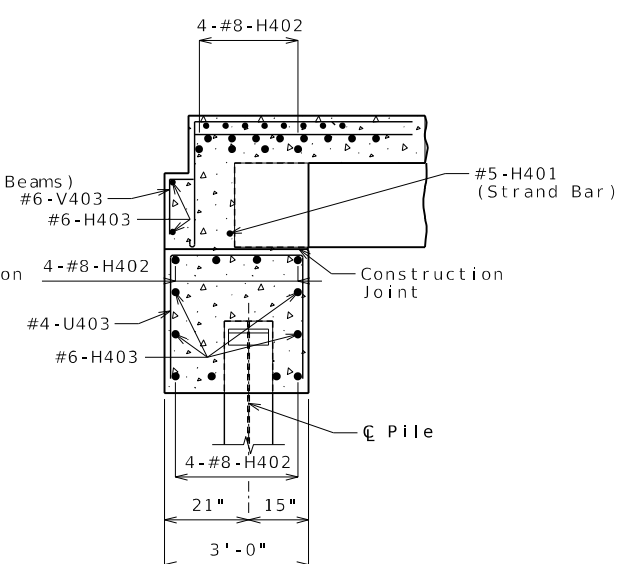
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

# DETAILS OF END BENT NO. 4

NOTES:

For details of End Bent No. 4 not shown, see Sheets No. 10, 11, & 13.



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12/04/2023

ROUTE K STATE MO

DISTRICT BR SHEET NO. 12

COUNTY SHELBY

JOB NO. JNE0127

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9344

DESCRIPTION

DATE

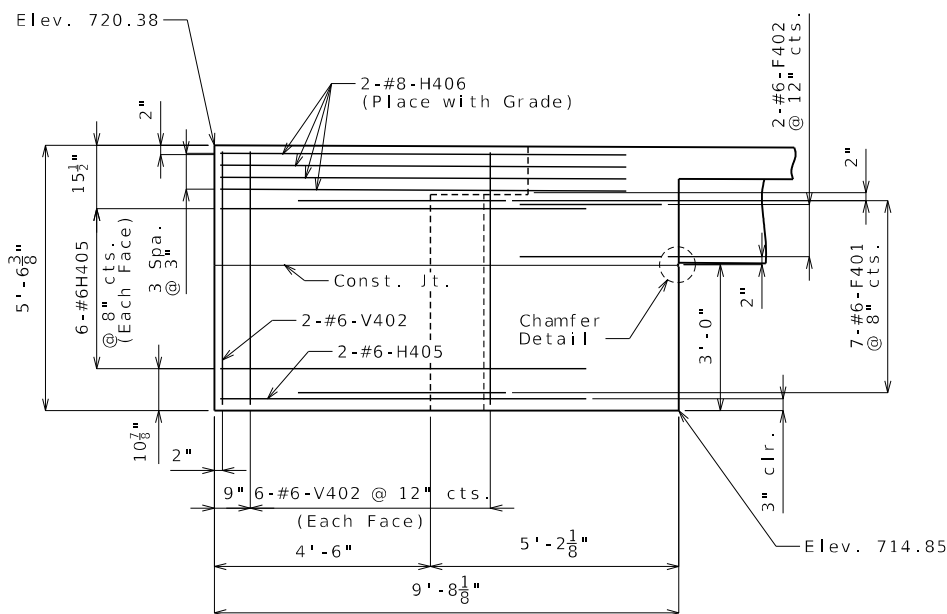
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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JEFFERSON CITY, MO 65102  
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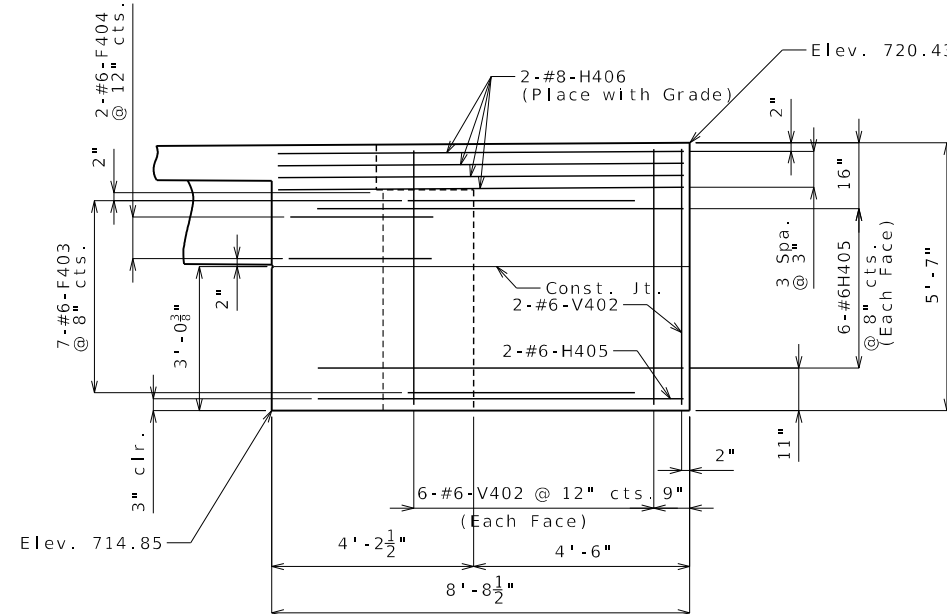
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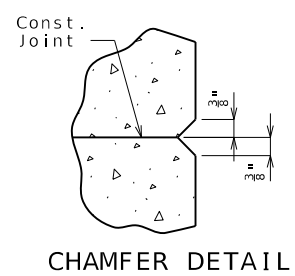
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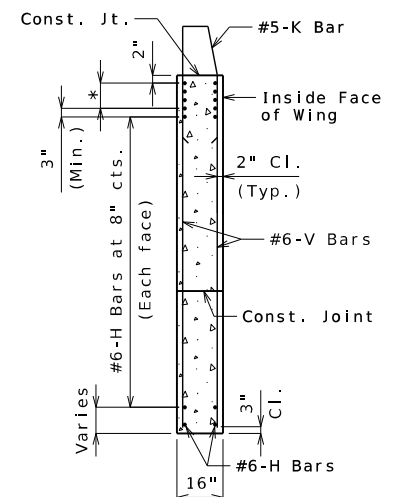
ELEVATION A-A



ELEVATION B-B

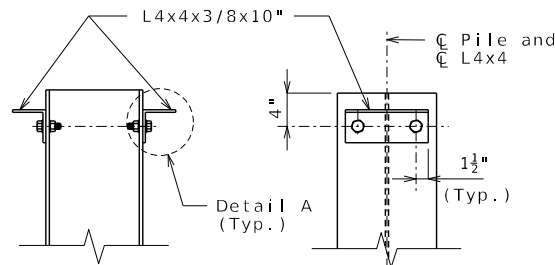


CHAMFER DETAIL

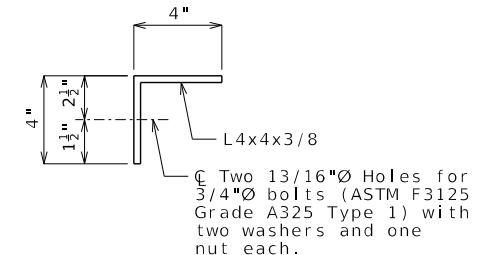


TYPICAL SECTION THRU WING

\* #8-H Bars at 3" cts. (Each face) (Place with grade)  
For reinforcement of the barrier, see Sheet No. 21

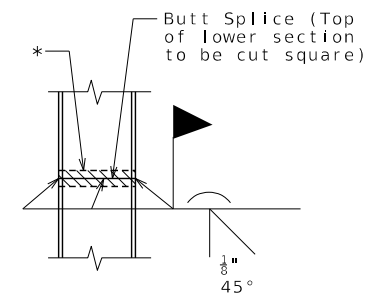


DETAILS OF HP PILE ANCHORS



DETAIL A

Angles shall be coated with a minimum of two coats of non-aluminum epoxy mastic primer to provide a dry film thickness of 4 mils minimum, 8 mils maximum, or galvanized in accordance with Sec 1081. Bolts, washers and nuts shall be galvanized in accordance with AASHTO M 232 (ASTM A153), Class C.



STEEL PILE SPLICE (If required)

\* Galvanizing material shall be omitted or removed one inch clear of weld locations in accordance with Sec 702.

Note:  
For location of Elevation A-A and Elevation B-B, see Sheet No. 10.  
For Details of End Bent 1 not shown, see Sheets No. 10, 11 & 12.

# DETAILS OF END BENT NO. 4

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DATE PREPARED: 12/04/2023

ROUTE: K STATE: MO

DISTRICT: BR SHEET NO.: 13

COUNTY: SHELBY

JOB NO.: JNE0127

CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: A9344

| DATE | DESCRIPTION |
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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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JEFFERSON CITY, MO 65102  
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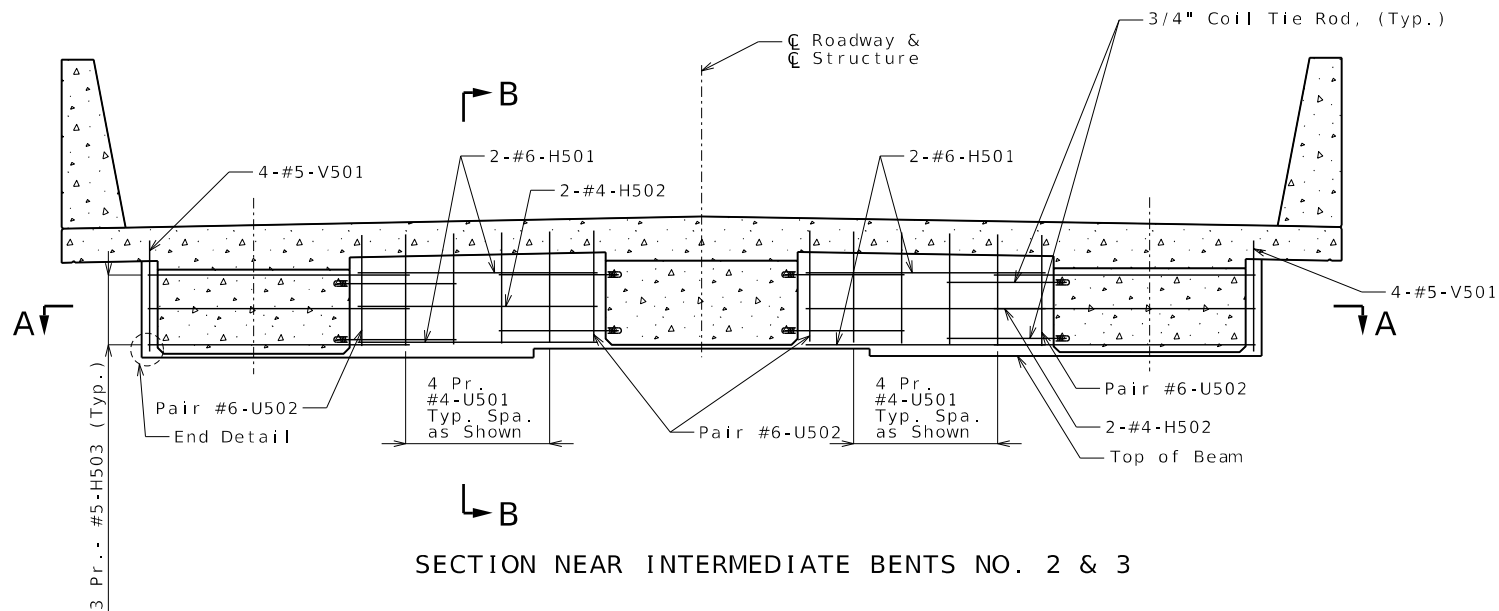
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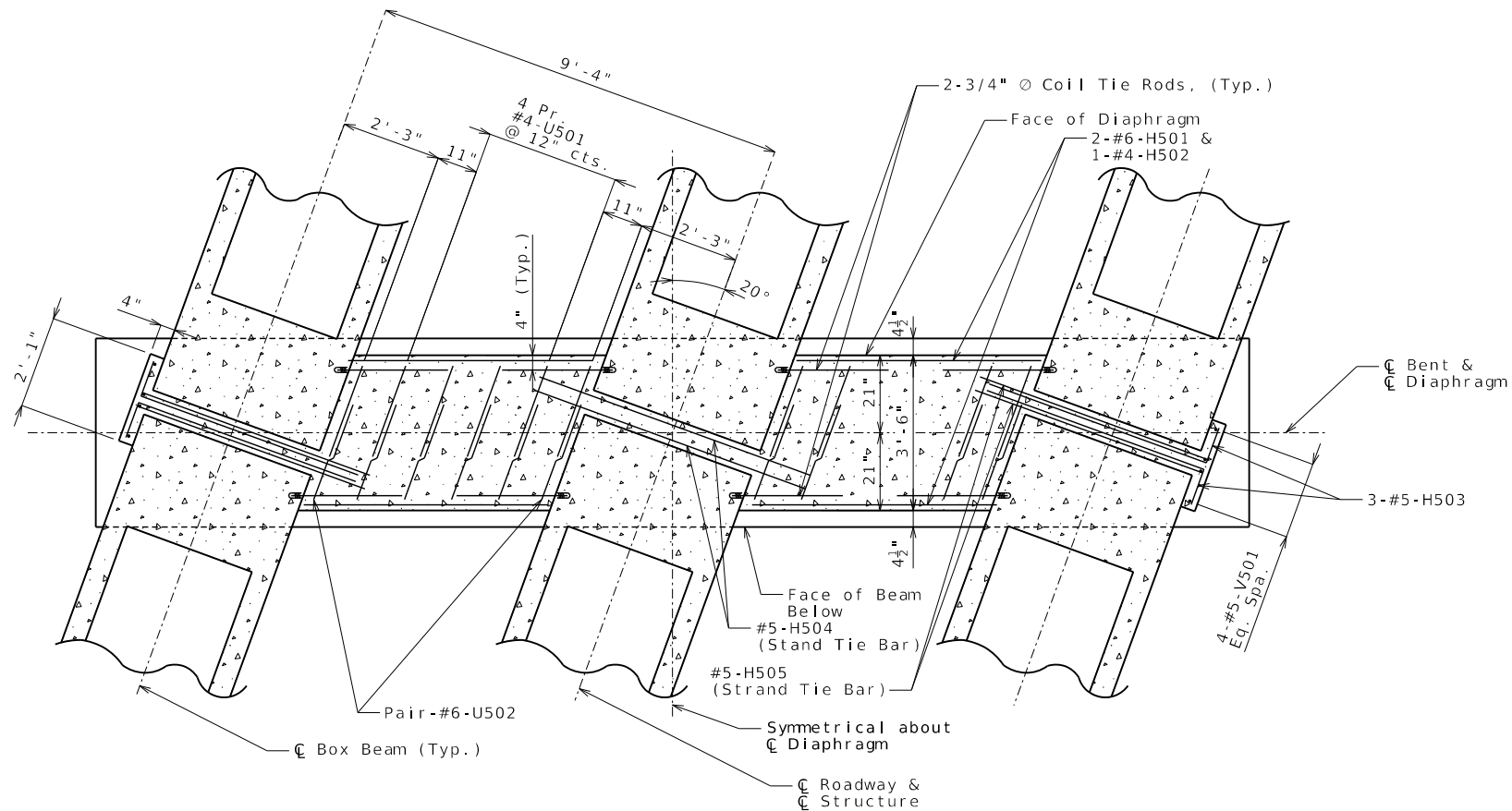
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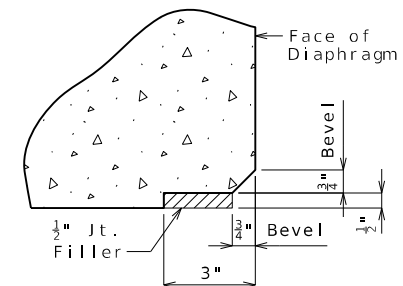


SECTION NEAR INTERMEDIATE BENTS NO. 2 & 3

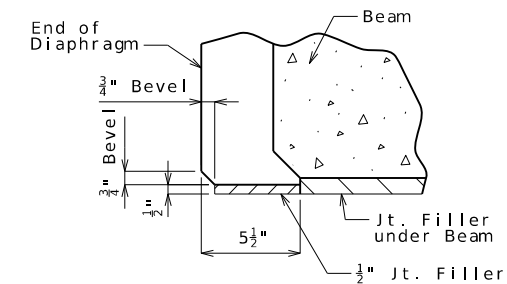


SECTION A-A

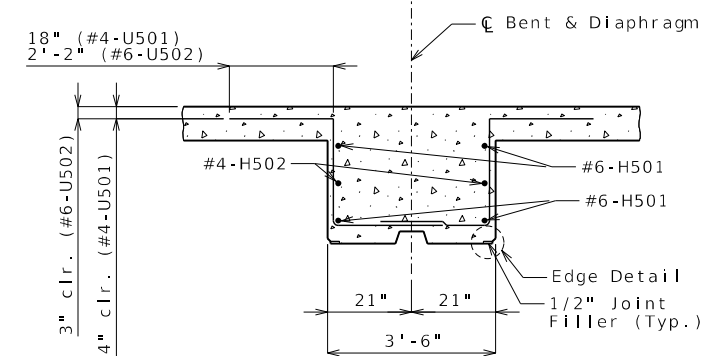
## DETAILS OF DIAPHRAGMS AT INTERMEDIATE BENTS NO. 2 & 3



EDGE DETAIL



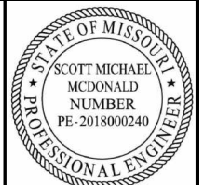
END DETAIL



SECTION B-B

### Notes:

Slab reinforcing bars not shown for clarity.  
For location of strand tie bars, see Sheets no. 14 & 15.  
For location and details of Coil Tie Rods, see Sheets no. 14 & 15.  
Diaphragms at intermediate bents shall be built vertical.  
All U bars in diaphragm are to be placed parallel to  $\text{CL}$  roadway.



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ROUTE K STATE MO

DISTRICT BR SHEET NO. 16

COUNTY SHELBY

JOB NO. JNE0127

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9344

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MISSOURI HIGHWAYS AND TRANSPORTATION  
COMMISSION

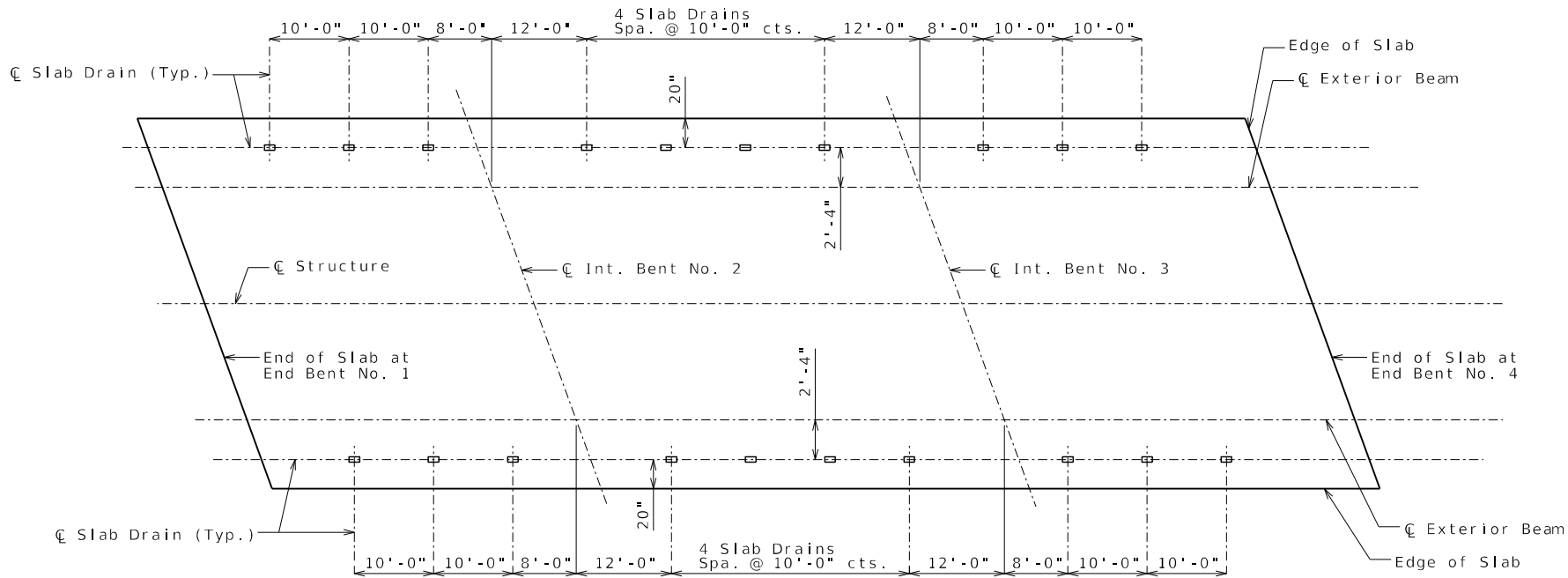
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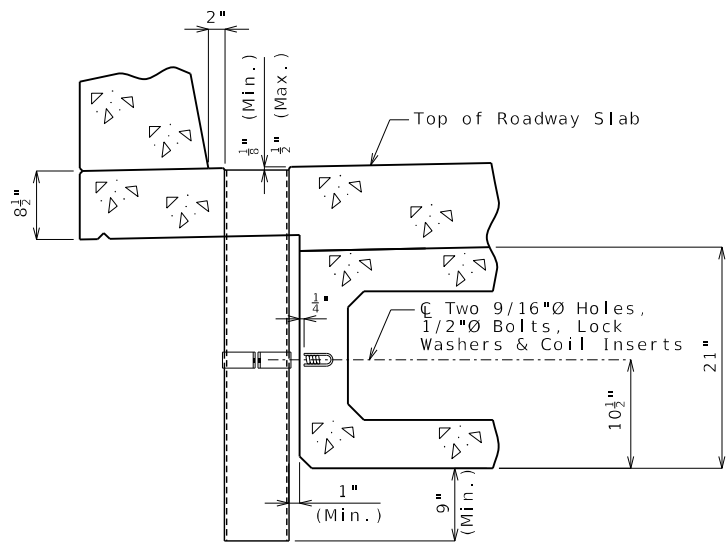
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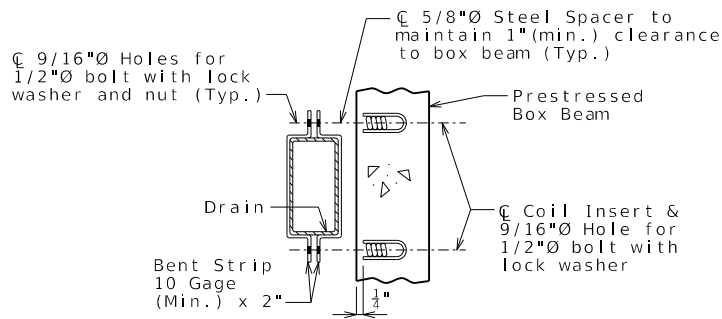
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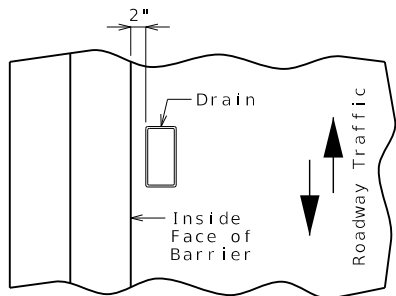
PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS



PART SECTION NEAR DRAIN

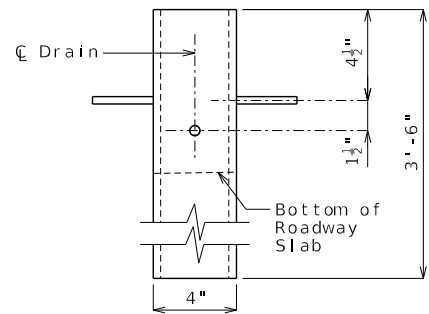


PART SECTION SHOWING BRACKET ASSEMBLY

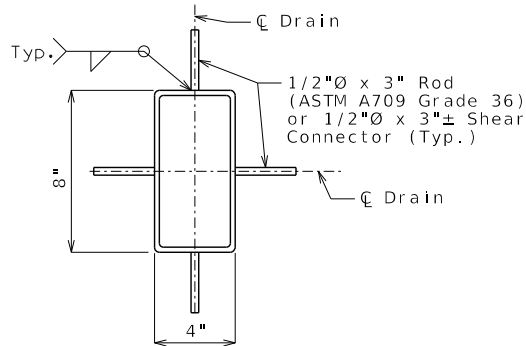


PART PLAN OF SLAB AT DRAIN

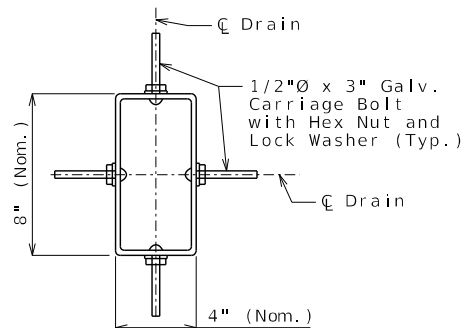
## SLAB DRAINS



ELEVATION OF DRAIN



PLAN OF STEEL DRAIN OPTION



PLAN OF FRP DRAIN OPTION

## General Notes:

Contractor shall have the option to construct either steel or FRP slab drains. All drains shall be of same type.

Slab drain bracket assembly shall be ASTM A709 Grade 36 steel.

Locate drains in slab by dimensions shown in Part Section Near Drain.

Reinforcing steel shall be shifted to clear drains.

The coil inserts and bracket assembly shall be galvanized in accordance with ASTM A123.

All bolts, hardened washers, lock washers and nuts shall be galvanized in accordance with AASHTO M 232 (ASTM A153), Class C.

All 1/2"Ø bolts shall be ASTM A307.

Shop drawings will not be required for the slab drains and the bracket assembly.

The coil inserts required for the bracket assembly attachment shall be located on the prestressed beam shop drawings.

Coil inserts shall have a concrete pull-out strength (ultimate load) of at least 2,500 pounds in 5,000 psi concrete.

The bolts required to attach the slab drain bracket assembly to the prestressed beam shall be supplied by the prestressed beam fabricator.

## Notes for Steel Drain:

Slab drains may be fabricated of either 1/4" welded sheets of ASTM A709 Grade 36 steel or from 1/4" structural steel tubing ASTM A500 or A501.

Outside dimensions of drains are 8" x 4".

The drains shall be galvanized in accordance with ASTM A123.

## Notes for FRP Drain:

Drains shall be machine filament-wound thermosetting resin tubing meeting the requirements of ASTM D2996 with the following exceptions:

Shape of drains shall be rectangular with outside nominal dimensions of 8" x 4".

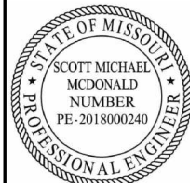
Minimum reinforced wall thickness shall be 1/4 inch.

The resin used shall be ultraviolet (UV) resistant and/or have UV inhibitors mixed throughout. Drains may have an exterior coating for additional UV resistance.

The color of the slab drain shall be gray (Federal Standard 26373). The color shall be uniform throughout the resin and any coating used.

The combination of materials used in the manufacture of the drains shall be tested for UV resistance in accordance with ASTM D4329 Cycle A. The representative material shall withstand at least 500 hours of testing with only minor discoloration and without any physical deterioration. The contractor shall furnish the results of the required ultraviolet testing prior to acceptance of the slab drains.

At the contractor's option, drains may be field cut. The method of cutting FRP slab drain shall be as recommended by the manufacturer to ensure a smooth, chip free cut.



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ROUTE K STATE MO

DISTRICT BR SHEET NO. 17

COUNTY  
SHELBY

JOB NO.  
JNE0127

CONTRACT ID.

PROJECT NO.

BRIDGE NO.  
A9344

DESCRIPTION

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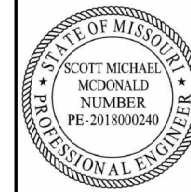
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ROUTE K STATE MO

DISTRICT BR SHEET NO. 19

COUNTY SHELBY

JOB NO. JNE0127

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9344

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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105 WEST CAPITOL  
JEFFERSON CITY, MO 65102

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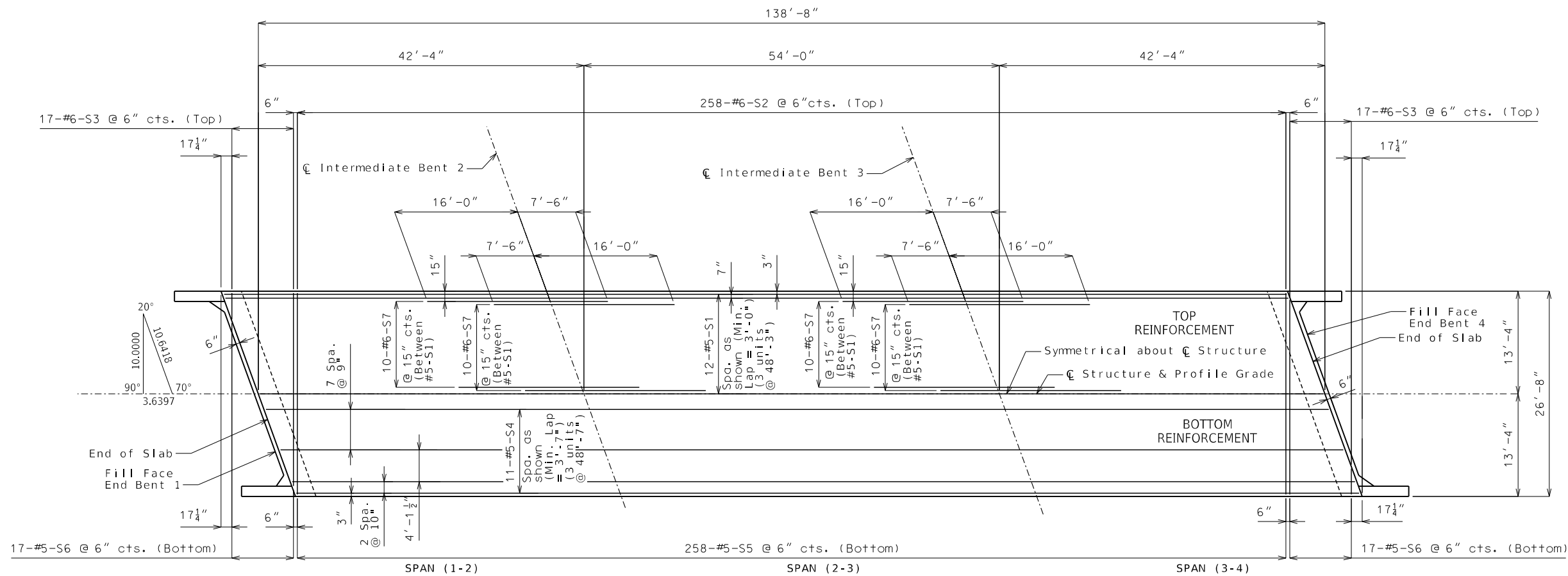
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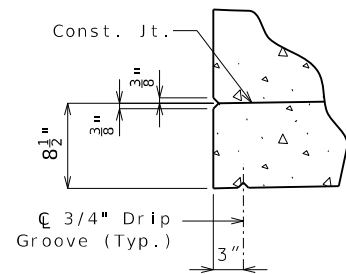
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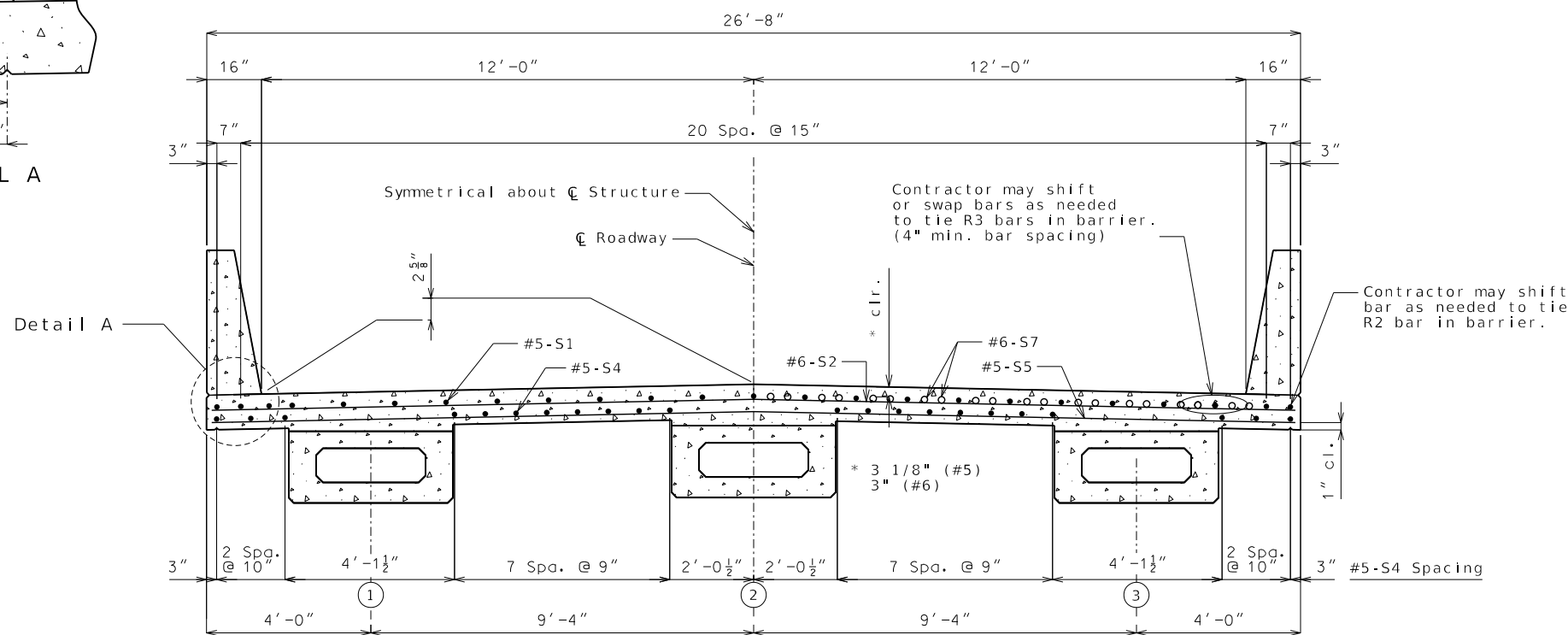
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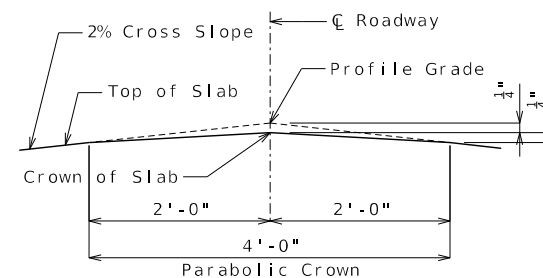
PLAN OF SLAB SHOWING REINFORCEMENT



DETAIL A

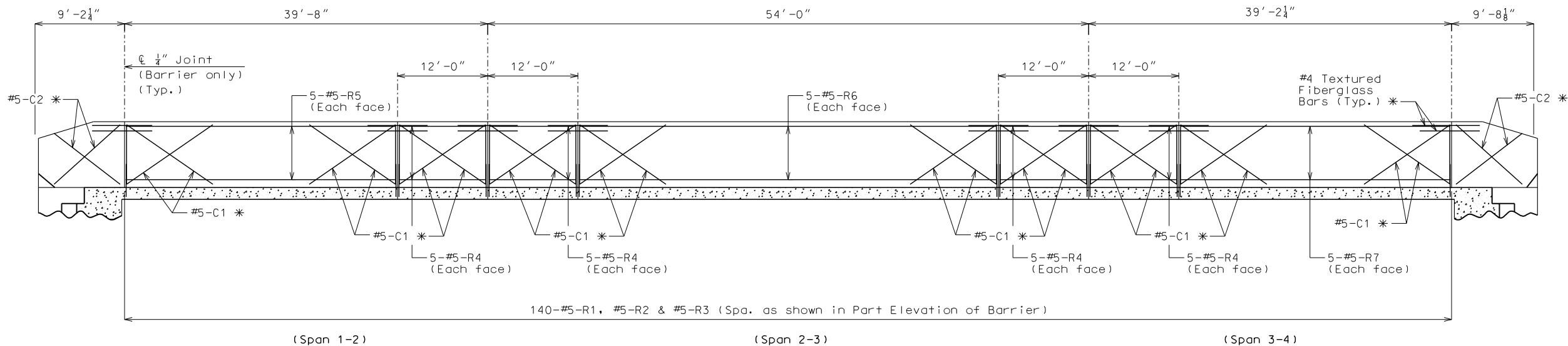


TYPICAL HALF SECTION NEAR MID SPAN TYPICAL HALF SECTION NEAR INTERMEDIATE BENT

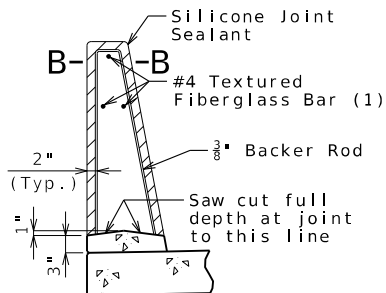


PARABOLIC CROWN

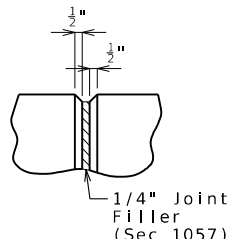
Notes:  
For details of barrier, see Sheets No. 20 & 21.  
For details and locations of slab drains, see Sheet No. 17.  
For theoretical haunch, see Sheet No. 18.  
For bottom of slab elevations along beam, see Sheet No. 18.  
For slab pouring sequence, see Sheet No. 18.  
Longitudinal slab dimensions are measured horizontally.



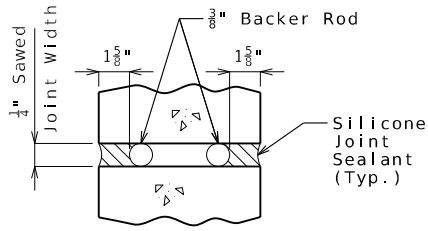
ELEVATION OF BARRIER  
(Left barrier shown, right barrier similar)  
Longitudinal dimensions are horizontal.



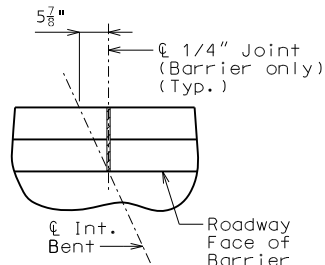
SECTION THRU SAW CUT JOINT



PART ELEVATION AT FORMED JOINT



SECTION B-B



PART PLAN SHOWING JOINT LOCATION

General Notes:

\* Slip-formed option only.

Conventional forming or slip forming may be used. Saw cut joints may be used with conventional forming.

Top of barrier shall be built parallel to grade and barrier joints (except at end bents) normal to grade.

All exposed edges of barrier shall have either a 1/2-inch radius or a 3/8-inch bevel, unless otherwise noted.

Payment for all concrete and reinforcement, complete in place, will be considered completely covered by the contract unit price for Type D Barrier per linear foot.

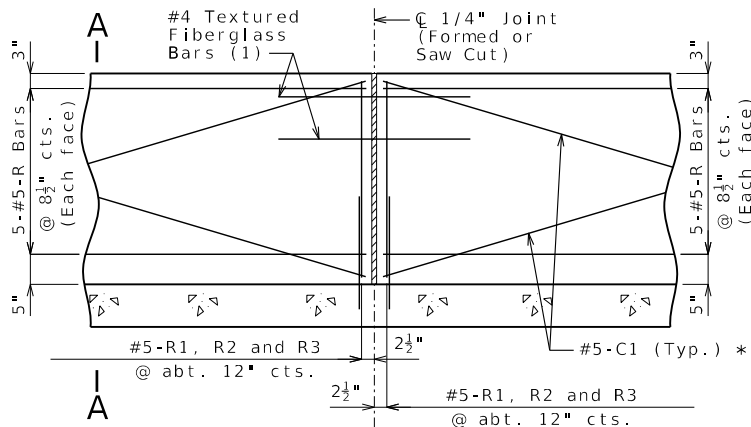
Concrete in barrier shall be Class B-1.

Measurement of barrier is to the nearest linear foot for each structure, measured along the outside top of slab from end of wing to end of wing.

Concrete traffic barrier delineators shall be placed on top of the barrier as shown on Missouri Standard Plan 617.10 and in accordance with Sec 617. Delineators on bridges with two-lane, two-way traffic shall have retroreflective sheeting on both sides. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for Type D Barrier.

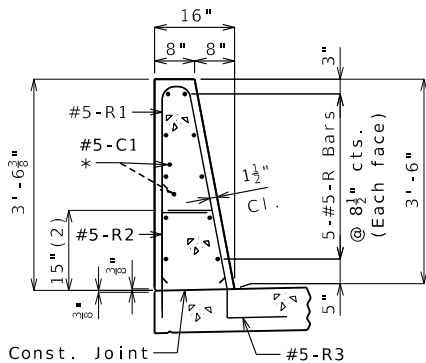
Joint sealant and backer rods shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

For slip-formed option, both sides of barrier shall have a vertically broomed finish and the top shall have a transversely broomed finish.



PART ELEVATION OF BARRIER

(1) Four feet long, centered on joint, slip-formed option only

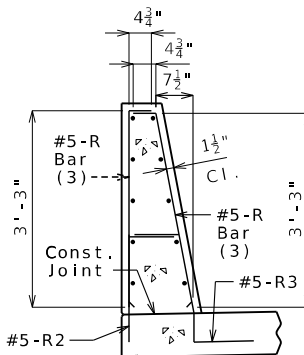


SECTION A-A

Use a minimum lap of 3'-1" for #5 horizontal barrier bars.

The cross-sectional area above the slab is 3.52 square feet.

(2) To top of bar



R-BAR PERMISSIBLE ALTERNATE SHAPE

(3) The R1 bar may be separated into two bars as shown, at the contractor's option, only when slip forming is not used. (All dimensions are out to out.)

TYPE D BARRIER

Sheet No. 20 of 32

Detailed Aug. 2023  
Checked Sep. 2023

Note: This drawing is not to scale. Follow dimensions.



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DATE PREPARED  
12/04/2023

ROUTE  
K MO

DISTRICT  
BR 20

COUNTY  
SHELBY

JOB NO.  
JNE0127

CONTRACT ID.

PROJECT NO.

BRIDGE NO.  
A9344

DESCRIPTION

DATE

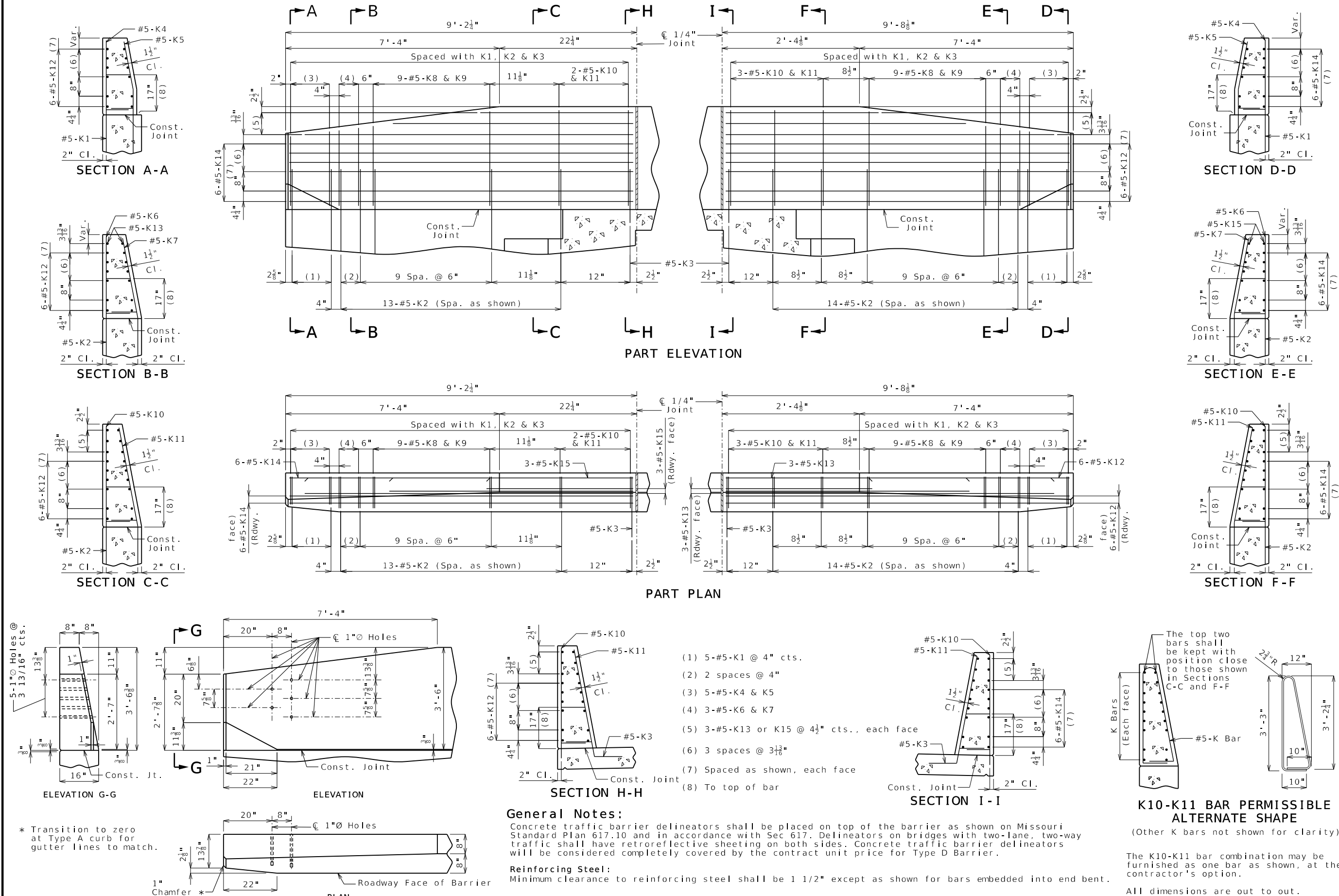
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

MO DOT

VEENSTRA & KIMM INC.

9788 N Ash Ave. Kansas City, Missouri 64157  
816-781-6182 816-781-0643 (FAX)  
Certificate of Authority No. F00362673



TYPE D BARRIER AT END BENTS  
(Left barrier shown, right barrier similar)

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 21 of 32



THIS SHEET HAS BEEN  
SIGNED, SEALED AND DATED  
ELECTRONICALLY.

DATE PREPARED  
12/04/2023

ROUTE K STATE MO

DISTRICT BR SHEET NO. 21

COUNTY SHELBY

JOB NO. JNE0127

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9344

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION  
COMMISSION

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-275-6636)

MODOT

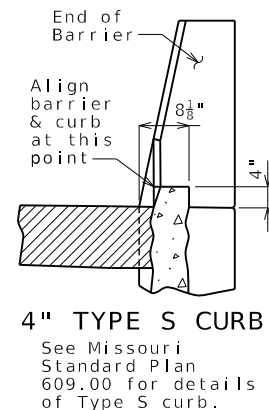
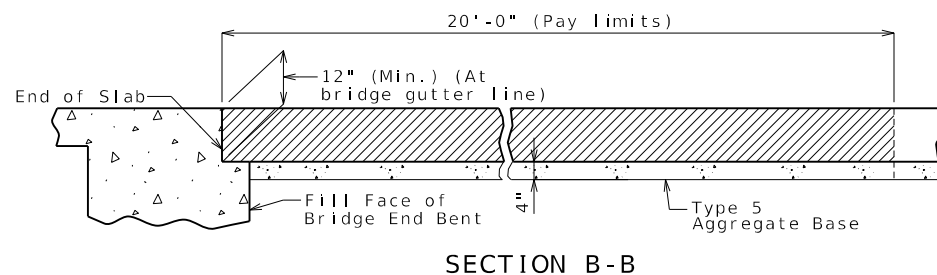
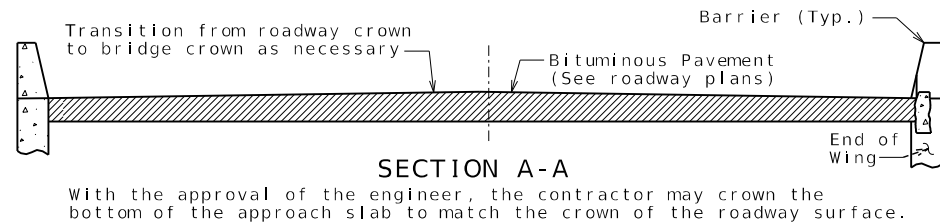
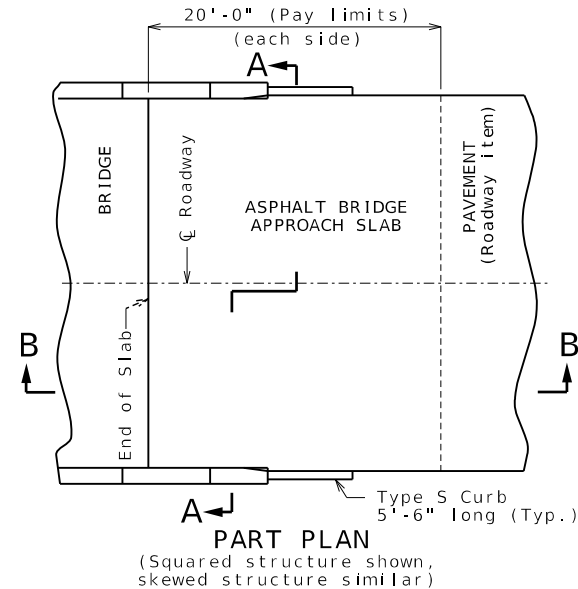
VEENSTRA & KIMM INC.

9788 N Ash Ave. Kansas City, Missouri 64157

816-781-0643 (FAX)

Certificate of Authority No. F00362673

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



General Notes:

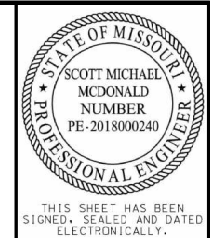
Contractor shall construct the asphalt slab. The concrete slab is not allowed.

The contractor shall pour and satisfactorily finish the bridge slab before placing the bridge approach slab.

Notes For Asphalt Slab Only:

Payment for furnishing all materials, labor and excavation necessary to construct the asphalt bridge approach slab, including tack, curb, and Type 5 aggregate base within the pay limits shown, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Minor) per square yard.

Application of tack is required between lifts per Sec 403.



|                             |                 |
|-----------------------------|-----------------|
| DATE PREPARED<br>12/04/2023 |                 |
| ROUTE<br>K                  | STATE<br>MO     |
| DISTRICT<br>BR              | SHEET NO.<br>22 |
| COUNTY<br>SHELBY            |                 |
| JOB NO.<br>JNE0127          |                 |
| CONTRACT ID.                |                 |
| PROJECT NO.                 |                 |
| BRIDGE NO.<br>A9344         |                 |

| DESCRIPTION | DATE |
|-------------|------|
|             |      |
|             |      |
|             |      |
|             |      |
|             |      |
|             |      |
|             |      |
|             |      |
|             |      |

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

MoDOT

**VEENSTRA & KIMM INC.**

9788 N Ash Ave. Kansas City, Missouri 64157  
816-781-6182 816-781-0643 (FAX)  
Certificate of Authority No. F00362673

Detailed Jun. 2023  
Checked Jul. 2023

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 22 of 32

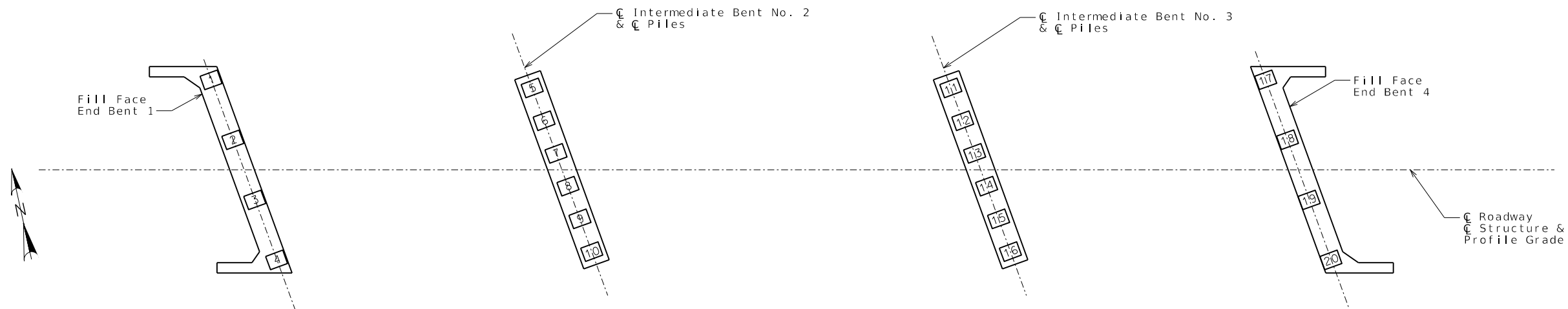
ASPHALT SLAB  
BRIDGE APPROACH SLAB (MINOR)  
Integral end bents shown, non-integral end bent similar.

\$FILE\$ \$TIME\$ \$DATE\$









PART PLAN SHOWING PILE NUMBERING FOR RECORDING AS-BUILT PILE DATA

[illegible][illegible][illegible]

Note:  
Indicate in remarks column:  
A. Pile type and grade  
B. Batter  
C. Driven to practical refusal

This sheet to be completed by MoDOT construction personnel.

Missouri Department of Transportation  
Construction and Materials

BORING NO. 102 (V-23-40)  
Page 1 of 3

Job No.: JNE0127  
Design: A9344  
Bent: 1  
Station:   
Offset:   
Elevation: 719.4  
Requested Station: 504+41.5  
Requested Offset: 10 Rt.  
Requested Elevation:   
Drill No.: G-9667  
County: Shelby  
Skew: 20 RA  
Location: Over Black Creek  
Logged By: Collin Walsh  
Operator: Gary Degraffenreid  
Northing: 1447732.4  
Easting: 1763695  
Requested Northing: 1447734.3  
Requested Easting: 1763696  
Equipment: Acker Renegade ,Split-Spoon Sampler, NQ  
Location Note:   
Route: K  
Date of Work: 05/31/23-06/01/23  
Depth to Water: 20.0  
Depth Hole Open:   
Time Change: At Time of Drilling  
Hammer Efficiency: 93%  
Drilling Method: Hollow Stem Auger

| Depth (ft) | Graphic | Description                                                                    | Elevation (ft) | Sample Type | REC % (RQD %) | Blow Counts (N <sub>60</sub> ) | Shear Data | Field Tests   | Index Tests                                                                   |
|------------|---------|--------------------------------------------------------------------------------|----------------|-------------|---------------|--------------------------------|------------|---------------|-------------------------------------------------------------------------------|
| 0          |         | 0.0-0.3' Tan, SAND with gravel, loose, dry                                     |                |             |               |                                |            |               |                                                                               |
|            |         | 0.3-5.3' Brown, LEAN CLAY scattered gravel, scattered sand, soft, dry to moist |                |             |               |                                |            |               |                                                                               |
| 5          |         |                                                                                | 715            |             |               |                                |            |               |                                                                               |
|            |         | 5.3-11.6' Gray, LEAN CLAY with silt, trace organics, soft, moist               |                | X           | 73            | 2-1-2 (5)                      |            | PP = 0.25 tsf | MC = 27.9%<br>γ <sub>sat</sub> = 122 pcf <sup>(1)</sup><br>LL = 37<br>PL = 21 |
| 10         |         |                                                                                | 710            |             |               |                                |            |               |                                                                               |
|            |         | 11.6-20.3' Gray, SANDY SILT, very soft, moist to wet                           |                | X           | 53            | 1-2-2 (6)                      |            | PP = 0.25 tsf | MC = 21.9%<br>γ <sub>sat</sub> = 128 pcf <sup>(1)</sup>                       |
| 15         |         |                                                                                | 705            |             |               |                                |            |               |                                                                               |
|            |         |                                                                                |                | X           | 93            | 0-0-0 (0)                      |            | PP = 0.00 tsf | MC = 23.2%<br>γ <sub>sat</sub> = 127 pcf <sup>(1)</sup><br>LL = NP            |
| 20         |         |                                                                                | 700            |             |               |                                |            |               |                                                                               |
|            |         | 20.3-25.4' Tan to gray, SILTY SAND, loose, wet                                 |                | X           | 87            | 1-1-2 (5)                      |            |               | MC = 22.9%<br>γ <sub>sat</sub> = 127 pcf <sup>(1)</sup>                       |
| 25         |         |                                                                                | 695            |             |               |                                |            |               |                                                                               |
|            |         | 25.4-42.5' Brownish gray, LEAN CLAY trace gravel, medium stiff, moist          |                | X           | 80            | 0-2-3 (8)                      |            | PP = 0.50 tsf | MC = 25.7%<br>γ <sub>sat</sub> = 124 pcf <sup>(1)</sup>                       |
| 30         |         |                                                                                | 690            |             |               |                                |            |               |                                                                               |
|            |         |                                                                                |                | X           | 100           | 2-2-3 (8)                      |            | PP = 1.00 tsf | MC = 26.2%<br>γ <sub>sat</sub> = 124 pcf <sup>(1)</sup><br>LL = 39<br>PL = 17 |
| 35         |         |                                                                                | 685            |             |               |                                |            |               |                                                                               |

N<sub>60</sub> = (Em/60)Nm N<sub>60</sub> - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value; (1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1983 Coordinate Zone: Missouri Central Coordinate Proj. Factor: 1.000079

Coordinate Datum: NAD 83 (CONUS) Coordinate Units: U.S. Survey Feet

\* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

Missouri Department of Transportation  
Construction and Materials

BORING NO. 102 (V-23-40)  
Page 2 of 3

Job No.: JNE0127  
Design: A9344  
Bent: 1  
Station:   
Offset:   
Elevation: 719.4  
Requested Station: 504+41.5  
Requested Offset: 10 Rt.  
Requested Elevation:   
Drill No.: G-9667  
County: Shelby  
Skew: 20 RA  
Location: Over Black Creek  
Logged By: Collin Walsh  
Operator: Gary Degraffenreid  
Northing: 1447732.4  
Easting: 1763695  
Requested Northing: 1447734.3  
Requested Easting: 1763696  
Equipment: Acker Renegade ,Split-Spoon Sampler, NQ  
Location Note:   
Route: K  
Date of Work: 05/31/23-06/01/23  
Depth to Water: 20.0  
Depth Hole Open:   
Time Change: At Time of Drilling  
Hammer Efficiency: 93%  
Drilling Method: Hollow Stem Auger

| Depth (ft) | Graphic | Description                                                                                                                    | Elevation (ft) | Sample Type | REC % (RQD %) | Blow Counts (N <sub>60</sub> ) | Shear Data | Field Tests   | Index Tests                                                                   |
|------------|---------|--------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|--------------------------------|------------|---------------|-------------------------------------------------------------------------------|
| 35         |         | 25.4-42.5' Brownish gray, LEAN CLAY trace gravel, medium stiff, moist (continued)                                              |                | X           | 100           | 2-3-3 (9)                      |            | PP = 0.75 tsf | MC = 28.9%<br>γ <sub>sat</sub> = 120 pcf <sup>(1)</sup>                       |
| 40         |         |                                                                                                                                | 680            |             |               |                                |            |               |                                                                               |
|            |         | 42.5-48.0' Brown mottled gray, LEAN CLAY trace fine gravel, very stiff, moist                                                  |                | X           | 100           | 1-2-3 (8)                      |            | PP = 0.50 tsf | MC = 27.3%<br>γ <sub>sat</sub> = 123 pcf <sup>(1)</sup>                       |
| 45         |         |                                                                                                                                | 675            |             |               |                                |            |               |                                                                               |
|            |         | 48.0-53.4' Brownish gray, FAT CLAY trace gravel, trace organics, medium stiff, moist                                           |                | X           | 93            | 3-5-7 (19)                     |            | PP = 2.75 tsf | MC = 18.6%<br>γ <sub>sat</sub> = 132 pcf <sup>(1)</sup><br>LL = 33<br>PL = 16 |
| 50         |         |                                                                                                                                | 670            |             |               |                                |            |               |                                                                               |
|            |         | 53.4-55.7' Dark gray, SAND scattered gravel, dense, wet                                                                        |                | X           | 80            | 2-3-3 (9)                      |            | PP = 0.50 tsf | MC = 29.1%<br>γ <sub>sat</sub> = 121 pcf <sup>(1)</sup>                       |
| 55         |         |                                                                                                                                | 665            |             |               |                                |            |               |                                                                               |
|            |         | 55.7-59.1' Greenish gray, CLAYEY GRAVEL scattered sand, very dense, moist                                                      |                | X           | 93            | 10-13-26 (60)                  |            |               | MC = 11.3%<br>γ <sub>sat</sub> = 143 pcf <sup>(1)</sup>                       |
| 60         |         |                                                                                                                                | 660            |             |               |                                |            |               |                                                                               |
|            |         | 59.1-67.5' Cherty Limestone, gray, very thin bedded, very weak rock to weak rock, highly weathered, fine grained, argillaceous |                | X           | 13            | 33-33/0.3'                     |            |               |                                                                               |
| 65         |         |                                                                                                                                | 655            |             |               |                                |            |               |                                                                               |
|            |         |                                                                                                                                |                |             |               | 46 (6)                         |            |               |                                                                               |
| 70         |         |                                                                                                                                | 650            |             |               |                                |            |               |                                                                               |
|            |         | 67.5-71.7' Argillaceous Conglomerate, gray, thinly laminated, very weak rock, highly weathered, with chert, poorly cemented    |                |             |               | 86 (0)                         |            |               |                                                                               |

N<sub>60</sub> = (Em/60)Nm N<sub>60</sub> - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value; (1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1983 Coordinate Zone: Missouri Central Coordinate Proj. Factor: 1.000079

Coordinate Datum: NAD 83 (CONUS) Coordinate Units: U.S. Survey Feet

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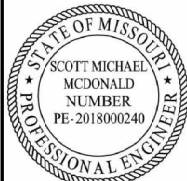
BORING DATA

Note: For locations of borings, see Sheet No. 1.

Detailed Aug. 2023  
Checked Sep. 2023

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 27 of 32



THIS SHEET HAS BEEN  
SIGNED, SEALED AND DATED  
ELECTRONICALLY.

DATE PREPARED  
12/04/2023

ROUTE  
K

STATE  
MO

DISTRICT  
BR

SHEET NO.  
27

COUNTY  
SHELBY

JOB NO.  
JNE0127

CONTRACT ID.

PROJECT NO.

BRIDGE NO.  
A9344

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION  
COMMISSION

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-273-6636)

MO DOT

VEENSTRA & KIMM INC.

9788 N Ash Ave. Kansas City, Missouri 64157

816-781-6182 816-781-0643 (FAX)

Certificate of Authority No. F00362673





Missouri Department of Transportation  
Construction and Materials

BORING NO. 302 (V-23-42)  
Page 1 of 3

Job No.: JNE0127  
Design: A9344  
Bent: 3  
Station:   
Offset:   
Elevation: 719.7  
Requested Station: 505+36.5  
Requested Offset: 10 Rt.  
Requested Elevation:   
Drill No.: G-9667  
County: Shelby  
Skew: 20 RA  
Location: Over Black Creek  
Logged By: Collin Walsh  
Operator: Gary Degraffenreid  
Northing: 1447716.7  
Date of Work: 06/07/23-06/07/23  
Easting: 1763791.9  
Depth to Water: 18.7  
Requested Northing: 1447714.0  
Depth Hole Open:   
Requested Easting: 1763788.8  
Time Change: At Time of Drilling  
Equipment: Acker Renegade ,Split-Spoon Sampler, NQ  
Location Note:   
Hammer Efficiency: 93%  
Drilling Method: Casing Advancer

| Depth (ft) | Graphic | Description                                                                                | Elevation (ft) | Sample Type | REC % (RQD %) | Blow Counts (N <sub>60</sub> ) | Shear Data    | Field Tests | Index Tests                                                                   |
|------------|---------|--------------------------------------------------------------------------------------------|----------------|-------------|---------------|--------------------------------|---------------|-------------|-------------------------------------------------------------------------------|
| 0          |         | 0.0-0.1' ASPHALT<br>0.1-0.8' CONCRETE<br>0.8-12.2' Air                                     |                |             |               |                                |               |             |                                                                               |
| 5          |         |                                                                                            | 715            |             |               |                                |               |             |                                                                               |
| 10         |         |                                                                                            | 710            |             |               |                                |               |             |                                                                               |
| 15         |         | 12.2-18.3' Tan, CLAYEY SAND, very loose, moist                                             | 705            |             |               |                                |               |             |                                                                               |
| 20         |         | 18.3-23.1' Gray, SAND, loose, wet                                                          | 700            | X           | 40            | 2-2-2 (6)                      |               |             | MC = 17.6%<br>γ <sub>sat</sub> = 133 pcf <sup>(1)</sup>                       |
| 25         |         | 23.1-41.0' Brownish gray, LEAN CLAY trace fine gravel, trace organics, medium stiff, moist | 695            | X           | 100           | 0-0-3 (5)                      | PP = 0.75 tsf |             | MC = 27.4%<br>γ <sub>sat</sub> = 123 pcf <sup>(1)</sup><br>LL = 42<br>PL = 18 |
| 30         |         |                                                                                            | 690            | X           | 100           | 0-1-3 (6)                      | PP = 0.75 tsf |             | MC = 26.7%<br>γ <sub>sat</sub> = 123 pcf <sup>(1)</sup>                       |
| 35         |         |                                                                                            | 685            | X           | 100           | 2-2-4                          | PP = 0.50 tsf |             | MC = 29.0%                                                                    |

N<sub>60</sub> = (Em/60)N<sub>m</sub> N<sub>60</sub> - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; N<sub>m</sub> - Observed N-value; (1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1983 Coordinate Zone: Missouri Central Coordinate Proj. Factor: 1.000079

Coordinate Datum: NAD 83 (CONUS) Coordinate Units: U.S. Survey Feet

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Missouri Department of Transportation  
Construction and Materials

BORING NO. 302 (V-23-42)  
Page 2 of 3

Job No.: JNE0127  
Design: A9344  
Bent: 3  
Station:   
Offset:   
Elevation: 719.7  
Requested Station: 505+36.5  
Requested Offset: 10 Rt.  
Requested Elevation:   
Drill No.: G-9667  
County: Shelby  
Skew: 20 RA  
Location: Over Black Creek  
Logged By: Collin Walsh  
Operator: Gary Degraffenreid  
Northing: 1447716.7  
Date of Work: 06/07/23-06/07/23  
Easting: 1763791.9  
Depth to Water: 18.7  
Requested Northing: 1447714.0  
Depth Hole Open:   
Requested Easting: 1763788.8  
Time Change: At Time of Drilling  
Equipment: Acker Renegade ,Split-Spoon Sampler, NQ  
Location Note:   
Hammer Efficiency: 93%  
Drilling Method: Casing Advancer

| Depth (ft) | Graphic | Description                                                                                                | Elevation (ft) | Sample Type | REC % (RQD %) | Blow Counts (N <sub>60</sub> ) | Shear Data | Field Tests   | Index Tests                                                                   |
|------------|---------|------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|--------------------------------|------------|---------------|-------------------------------------------------------------------------------|
| 35         |         | 23.1-41.0' Brownish gray, LEAN CLAY trace fine gravel, trace organics, medium stiff, moist (continued)     |                | X           |               | (9)                            |            |               | γ <sub>sat</sub> = 121 pcf <sup>(1)</sup>                                     |
| 40         |         |                                                                                                            | 680            | X           | 100           | 1-3-3 (9)                      |            | PP = 0.75 tsf | MC = 28.2%<br>γ <sub>sat</sub> = 122 pcf <sup>(1)</sup><br>LL = 43<br>PL = 18 |
| 45         |         | 41.0-47.2' Greenish gray, FAT CLAY trace fine gravel, very stiff, moist                                    | 675            | X           | 87            | 5-5-7 (19)                     |            |               | MC = 25.9%<br>γ <sub>sat</sub> = 124 pcf <sup>(1)</sup>                       |
| 50         |         | 47.2-52.7' Brownish gray, FAT CLAY trace fine gravel, medium stiff, moist                                  | 670            | X           | 100           | 0-1-3 (6)                      |            | PP = 0.50 tsf | MC = 31.6%<br>γ <sub>sat</sub> = 119 pcf <sup>(1)</sup>                       |
| 55         |         | 52.7-58.0' Brownish gray, LEAN CLAY with sand, very stiff, moist                                           | 665            | X           | 100           | 5-8-10 (28)                    |            | PP = 4.25 tsf | MC = 22.4%<br>γ <sub>sat</sub> = 128 pcf <sup>(1)</sup><br>LL = 32<br>PL = 17 |
| 60         |         | 58.0-61.2' Gray, SAND scattered gravel, trace organics, medium dense, wet                                  | 660            | X           | 53            | 7-7-4 (17)                     |            |               | MC = 31.5%<br>γ <sub>sat</sub> = 119 pcf <sup>(1)</sup>                       |
| 65         |         | 61.2-74.8' Cherty Conglomerate, gray, very weak rock, highly weathered, shaly, poorly cemented, coal seams | 655            |             |               | 33 33/0.3'                     |            |               |                                                                               |
| 70         |         |                                                                                                            | 650            |             |               | 34 (0)                         |            |               |                                                                               |

N<sub>60</sub> = (Em/60)N<sub>m</sub> N<sub>60</sub> - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; N<sub>m</sub> - Observed N-value; (1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1983 Coordinate Zone: Missouri Central Coordinate Proj. Factor: 1.000079

Coordinate Datum: NAD 83 (CONUS) Coordinate Units: U.S. Survey Feet

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BORING DATA

Note: For locations of borings, see Sheet No. 1.

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 30 of 32

Detailed Aug. 2023  
Checked Sep. 2023



THIS SHEET HAS BEEN  
SIGNED, SEALED, AND DATED  
ELECTRONICALLY.

DATE PREPARED  
12/04/2023

ROUTE  
K

STATE  
MO

DISTRICT  
BR

SHEET NO.  
30

COUNTY  
SHELBY

JOB NO.  
JNE0127

CONTRACT ID.

PROJECT NO.

BRIDGE NO.  
A9344

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION  
COMMISSION

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-273-6636)

MO DOT

VEENSTRA & KIMM INC.

9788 N Ash Ave.  
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Certificate of Authority No. F00362673

Missouri Department of Transportation  
Construction and Materials

BORING NO. 302 (V-23-42)  
Page 3 of 3

Job No.: JNE0127

Design: A9344

Bent: 3

Station:

Offset:

Elevation: 719.7

Requested Station: 505+36.5

Requested Offset: 10 Rt.

Requested Elevation:

Drill No.: G-9667

County: Shelby

Skew: 20 RA

Logged By: Collin Walsh

Northing: 1447716.7

Easting: 1763791.9

Requested Northing: 1447714.0

Requested Easting: 1763788.8

Equipment: Acker Renegade ,Split-Spoon Sampler, NQ

Location Note:

Route: K

Location: Over Black Creek

Operator: Gary Degraffenreid

Date of Work: 06/07/23-06/07/23

Depth to Water: 18.7

Depth Hole Open:

Time Change: At Time of Drilling

Hammer Efficiency: 93%

Drilling Method: Casing Advancer

| Depth (ft) | Graphic | Description                                                                                                                                                   | Elevation (ft) | Sample Type | REC % (RQD %) | Blow Counts (N <sub>60</sub> ) | Shear Data | Field Tests | Index Tests |
|------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------|--------------------------------|------------|-------------|-------------|
| 70         |         | 61.2-74.8' Cherty Conglomerate, gray, very weak rock, highly weathered, shaly, poorly cemented, coal seams (continued)                                        |                |             | 68 (6)        |                                |            |             |             |
| 75         |         | 74.8-84.8' Cherty Limestone, gray, thin bedded, strong rock to very strong rock, highly weathered to moderately weathered, medium to fine grained, coal seams | 645            |             | 44 (6)        |                                |            |             |             |
| 80         |         |                                                                                                                                                               | 640            |             | 100 (42)      |                                |            |             |             |
|            |         | Bottom of borehole at 84.8 feet.                                                                                                                              | 635            |             |               |                                |            |             |             |

N<sub>60</sub> = (Em/60)Nm    N<sub>60</sub> - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value; (1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1983    Coordinate Zone: Missouri Central    Coordinate Proj. Factor: 1.000079

Coordinate Datum: NAD 83 (CONUS)    Coordinate Units: U.S. Survey Feet

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Missouri Department of Transportation  
Construction and Materials

BORING NO. 401 (V-23-39)  
Page 1 of 3

Job No.: JNE0127

Design: A9344

Bent: 4

Station:

Offset:

Elevation: 719.5

Requested Station: 505+77.5

Requested Offset: 10 Lt.

Requested Elevation:

Drill No.: G-9667

County: Shelby

Skew: 20 RA

Logged By: Collin Walsh

Northing: 1447727.4

Easting: 1763830.2

Requested Northing: 1447725.1

Requested Easting: 1763826.2

Equipment: Acker Renegade ,Split-Spoon Sampler, NQ

Location Note:

Route: K

Location: Over Black Creek

Operator: Gary Degraffenreid

Date of Work: 05/30/23-05/31/23

Depth to Water: 20.0

Depth Hole Open:

Time Change: At Time of Drilling

Hammer Efficiency: 93%

Drilling Method: Hollow Stem Auger

| Depth (ft) | Graphic | Description                                                                                      | Elevation (ft) | Sample Type | REC % (RQD %) | Blow Counts (N <sub>60</sub> ) | Shear Data | Field Tests   | Index Tests                                                                                                                                          |
|------------|---------|--------------------------------------------------------------------------------------------------|----------------|-------------|---------------|--------------------------------|------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0          |         | 0.0-0.4' Tan, SAND with gravel, loose, dry                                                       |                |             |               |                                |            |               |                                                                                                                                                      |
|            |         | 0.4-3.5' Brown, SANDY LEAN CLAY, soft, dry to moist                                              |                |             |               |                                |            |               |                                                                                                                                                      |
| 5          |         | 3.5-10.7' Gray, LEAN CLAY with silt, soft, moist                                                 | 715            |             | 20            | 1-0-2 (3)                      |            | PP = 0.25 tsf | MC = 20.6%<br>γ <sub>sat</sub> = 130 pcf <sup>(1)</sup>                                                                                              |
| 10         |         | 10.7-20.1' Gray mottled black, LEAN CLAY with silt, trace organics, stiff to medium stiff, moist | 710            |             | 67            | 1-3-3 (9)                      |            | PP = 2.00 tsf | MC = 26.3%<br>γ <sub>sat</sub> = 124 pcf <sup>(1)</sup><br>LL = 34<br>PL = 20                                                                        |
| 15         |         |                                                                                                  | 705            |             | 87            | 1-2-2 (6)                      |            | PP = 1.00 tsf | MC = 30.9%<br>γ <sub>sat</sub> = 120 pcf <sup>(1)</sup><br>LL = 33<br>PL = 21                                                                        |
| 20         |         | 20.1-25.3' Gray, SAND with silt, very loose, wet                                                 | 700            |             | 93            | 1-1-0 (2)                      |            |               | MC = 24.9%<br>γ <sub>sat</sub> = 125 pcf <sup>(1)</sup><br>Sieve Analysis<br>#10 100.0<br>#16 99.9<br>#40 98.1<br>#50 88.2<br>#100 39.1<br>#200 25.8 |
| 25         |         | 25.3-38.7' Gray, LEAN CLAY trace fine gravel, medium stiff to stiff, moist                       | 695            |             | 87            | 1-1-2 (5)                      |            | PP = 1.00 tsf | MC = 24.7%<br>γ <sub>sat</sub> = 125 pcf <sup>(1)</sup><br>LL = 39<br>PL = 17                                                                        |
| 30         |         |                                                                                                  | 690            |             | 100           | 1-3-3 (9)                      |            | PP = 1.00 tsf | MC = 25.1%<br>γ <sub>sat</sub> = 125 pcf <sup>(1)</sup>                                                                                              |
| 35         |         |                                                                                                  | 685            |             |               |                                |            |               |                                                                                                                                                      |

N<sub>60</sub> = (Em/60)Nm    N<sub>60</sub> - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value; (1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1983    Coordinate Zone: Missouri Central    Coordinate Proj. Factor: 1.000079

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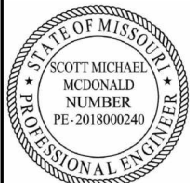
BORING DATA

Note: For locations of borings, see Sheet No. 1.

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 31 of 32

Detailed Aug. 2023  
Checked Sep. 2023



THIS SHEET HAS BEEN  
SIGNED, SEALED AND DATED  
ELECTRONICALLY.

DATE PREPARED  
12/04/2023

ROUTE  
K

STATE  
MO

DISTRICT  
BR

SHEET NO.  
31

COUNTY  
SHELBY

JOB NO.  
JNE0127

CONTRACT ID.

PROJECT NO.

BRIDGE NO.  
A9344

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION  
COMMISSION

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-275-6636)

MO DOT

VEENSTRA & KIMM INC.

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Kansas City, Missouri 64157

816-781-6182  
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