

COLE COUNTY, Missouri

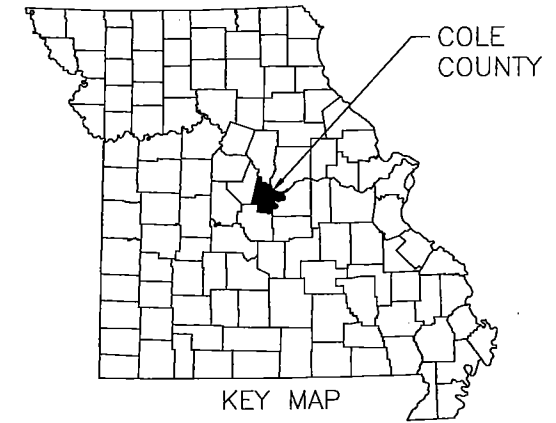
Department of Public Works



LIBERTY ROAD BRIDGE REPLACEMENT

PROJECT NO. 2016-801-0

SEPTEMBER 2016

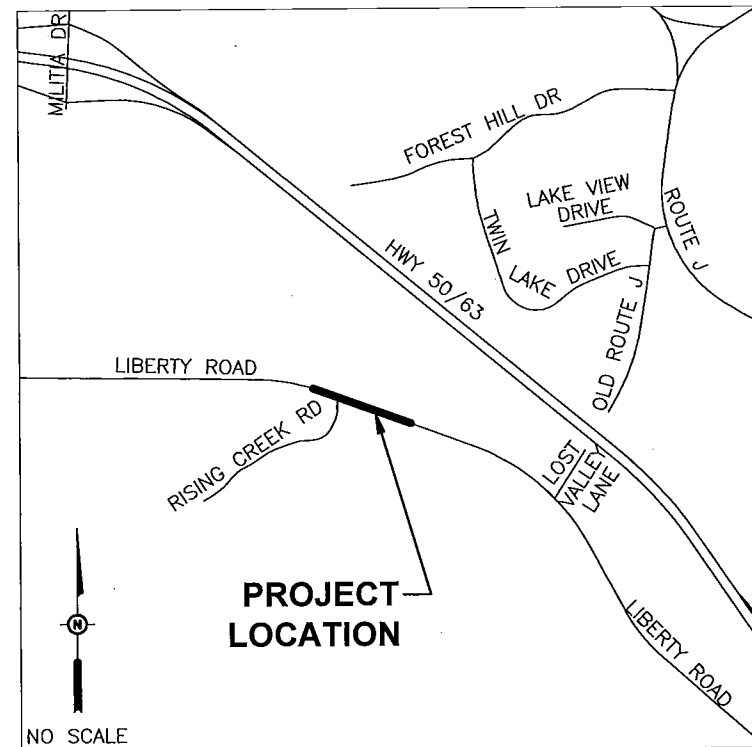


LEGEND

- | | | | |
|--------|----------------------------------|---|-------------------------|
| ⊕ | BILLBOARD | ⊙ | ROOF DRAIN |
| ⊕ | BORE HOLE or DRILL HOLE | ⊕ | CURB INLET |
| ⊕ | LANDSCAPE BOULDER | ○ | SANITARY MANHOLE |
| ⊕ | WELL | ○ | CLEANOUT |
| ⊕ | FLAG POLE | ⊕ | YARD HYDRANT |
| ⊕ | SATELLITE DISH | ⊕ | WATER SPRINKLER |
| ⊕ | POST | ○ | WATER MANHOLE |
| ⊕ | MAILBOX | ⊕ | WATER METER |
| ⊕ | TWO POLE SIGN | ⊕ | WATER VALVE |
| ⊕ | ONE POLE SIGN | ⊕ | FIRE HYDRANT |
| ⊕ | PARKING METER | ⊕ | LIGHT |
| ⊕ | STOP SIGN | ⊕ | FLOOD LIGHT |
| ⊕ | GAS REGULATOR | ⊕ | LUMINARY (STREET LIGHT) |
| ⊕ | GAS RISER | ○ | MANHOLE COVER |
| ⊕ | GAS TEST STATION | ⊕ | MISCELLANEOUS TOPO ITEM |
| ⊕ | GAS METER | ⊕ | FINISH FLOOR |
| ⊕ | GAS VALVE | ⊕ | MIN. OPENING ELEV. |
| ⊕ | UTILITY POLE | ⊕ | STUMP |
| ⊕ | GUY POLE | ⊕ | SHRUB |
| ⊕ | GUY ANCHOR | ⊕ | DECIDUOUS TREE |
| ⊕ | TELEPHONE PEDESTAL | ⊕ | EVERGREEN SHRUB |
| ⊕ | TELEPHONE MANHOLE | ⊕ | EVERGREEN TREE |
| ⊕ | CABLE TV PEDESTAL | | |
| ⊕ | ELECTRIC MANHOLE | | |
| ⊕ | ELECTRIC METER | | |
| ⊕ | TRANSFORMER/ELECTRIC PAD | | |
| ⊕ | AIR CONDITIONER | | |
| ⊕ | HAND HOLE | | |
| ⊕ | TRAFFIC SIGNAL | | |
| ⊕ | TRAFFIC SIGNAL BOX | | |
| ⊕ | SIGNAL MANHOLE | | |
| ⊕ | STORM MANHOLE | | |
| ⊕ | AREA INLET | | |
| —OHE— | OVERHEAD ELECTRIC | | |
| —UGE— | UNDERGROUND ELECTRIC | | |
| —UGT— | UNDERGROUND TELEPHONE | | |
| —UGCT— | UNDERGROUND CABLE AND TELEVISION | | |
| —G— | GAS LINE | | |
| —SAN— | SANITARY SEWER LINE | | |
| —W— | WATER LINE | | |

SURVEY MONUMENTATION

- | | |
|------------------|---------------------------------|
| ⊕ ^{BM} | BENCHMARK |
| ⊕ ^{TBM} | TEMPORARY BENCHMARK |
| ⊕ | R/W MARKER |
| ○ | FOUND SURVEY MONUMENT |
| • | SET SURVEY MONUMENT |
| ⊕ | SET SURVEY MONUMENT IN CONCRETE |
| ⊕ | CALCULATED SURVEY POINT |
| + | CHISELED CROSS FOUND |
| + | CHISELED CROSS SET |



LOCATION MAP

UTILITY CONTACTS:

- | | |
|---|--|
| Mr. Will Humphrey
Public Water Supply District No. 4
7712 Route M
Jefferson City, MO 65101
573-395-4578 | Mr. Brody Ash
Ameren UE-Electric
1310 Industrial Dr
Jefferson City, MO 65109
573-821-4531 |
| Phillips 66 Pipeline, LLC
Westchase, TX | Mr. Allen Groner
CenturyLink
3546 North Ten Mile Drive
Jefferson City, MO 65109
573-681-2503 |
| Sho-Me Technologies
PO Box D
Marshfield, MO 65706
417-859-2615 | |

SHEET INDEX:

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	TYPICAL SECTIONS
3	CONTROL POINT SHEET
4	PLAN SHEET
5	PROFILE SHEET
6	GUARDRAIL SHEET
7	EROSION CONTROL PLAN
8	TRAFFIC CONTROL PLAN
9-27	BRIDGE DETAIL SHEETS
28-30	CROSS SECTIONS (LIBERTY ROAD)
31	CROSS SECTIONS (GRAESSLE DRIVEWAY)

APPROVED BY
COLE COUNTY, MISSOURI

Eric Landwehr

COLE COUNTY PUBLIC WORKS:
ERIC LANDWEHR, P.E., COUNTY ENGINEER

9/8/16

DATE

CALL OR CLICK 3 DAYS BEFORE YOU DIG!

1-800-DIG-RITE or 811
www.mo1call.com

DESIGN DATA

CONSTRUCTION BEGINNING - ENDING STATION (LIBERTY ROAD) 28+50.00 - 30+50.00
 PROJECT LENGTH 200.00 FT
 DESIGN SPEED (LIBERTY ROAD) 55 MPH

BARTLETT & WEST
 1719 SOUTHWIDE DR., SUITE 100 • JEFFERSON CITY, MO 65109-4500
 MISSOURI CERTIFICATE OF AUTHORITY NO. 000167 - ENGINEERING
 WWW.BARTLETTWEST.COM

COVER SHEET
 LIBERTY ROAD BRIDGE REPLACEMENT
 PROJECT NO. 2016-801-0
 COLE COUNTY, MISSOURI

STATE OF MISSOURI
 TODD C. KEMPER
 NUMBER PE-2013000590
 PROFESSIONAL ENGINEER

SEALED DATE:	09/08/16
DESIGNED BY:	JDR
DRAWN BY:	TAA
APPROVED BY:	TCK
DESIGN PROJ:	15937-400
DATE:	SEPTEMBER 2016
DRAWING NO:	
SHEET NO:	1 of 31

Drawing Name: W:\Projects\15937\15937-400\Cover_Sheet.dwg Layout Name: COVER_SHEET.dwg Plot Date: 9/8/2016 11:20:16 AM
 Last edit on: 09/08/16

GENERAL NOTES

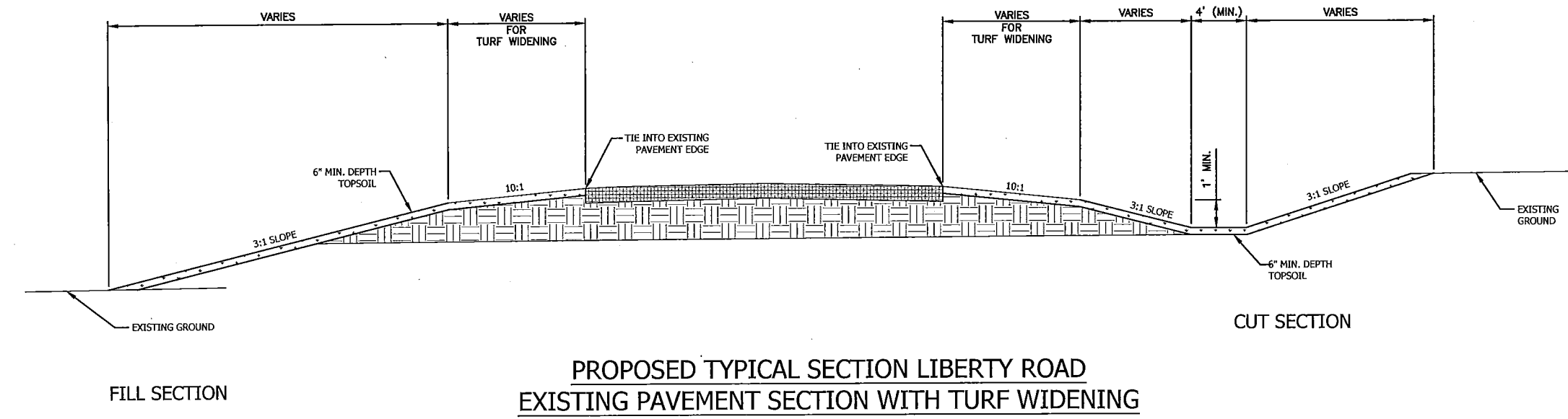
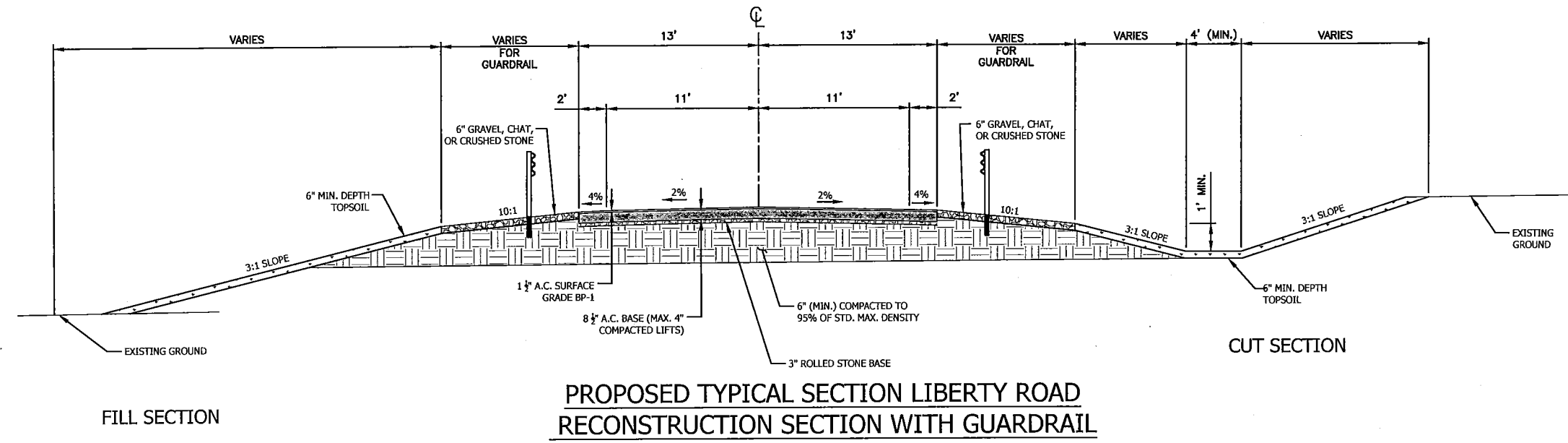
- A. VERIFYING THE LOCATIONS OF THE UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. ANY DAMAGE TO EXISTING OR PROPOSED FACILITIES, STRUCTURES OR UTILITIES SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE. NOTIFY MISSOURI ONE CALL FOR LOCATION OF THE UTILITIES AT LEAST 5 DAYS PRIOR TO CONSTRUCTION.
- B. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ALL DAMAGE TO PROPERTY OUTSIDE LIMITS OF CONSTRUCTION AT THE CONTRACTOR'S EXPENSE.
- C. REPORT ANY DISCREPANCIES FOUND WITH REGARD TO EXISTING CONDITIONS OR PROPOSED DESIGN IMMEDIATELY TO THE ENGINEER.
- D. DO NOT WILLFULLY PROCEED WITH CONSTRUCTION AS DESIGNED WHERE DISCREPANCIES EXIST. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REVISIONS TO THE WORK WHEN NO NOTICE WAS GIVEN TO THE ENGINEER.
- E. THE GENERAL CONTRACTOR SHALL COORDINATE OTHER SITE RELATED OPERATIONS PERFORMED BY OTHER CONTRACTORS OR UTILITY COMPANIES TO ACCOMPLISH THE WORK.
- F. CONTRACTOR SHALL PROTECT ALL EXISTING FACILITIES TO REMAIN INCLUDING ON-SITE PRIVATE AND PUBLIC PROPERTY.
- G. ALL WORK SHALL BE IN COMPLIANCE WITH ALL LOCAL, STATE AND FEDERAL CODES AND ORDINANCES.
- H. LEAVE AREAS OF DEMOLITION IN A NEAT AND SAFE CONDITION AT THE END OF EACH WORK DAY. CONTRACTOR SHALL BARRICADE AREAS OF DEMOLITION AS NECESSARY TO PROTECT THE GENERAL PUBLIC. MAINTAIN SAFE PUBLIC ACCESS TO RESIDENCES.
- I. LEGALLY DISPOSE OF ALL DEMOLITION ITEMS OFF SITE UNLESS NOTED TO RETURN ITEMS TO THE COUNTY.
- J. SEE SITE PLAN LAYOUTS FOR PLAN AND DETAILS FOR LOCATIONS AND DIMENSIONS FOR AREAS OF IMPROVEMENTS RELATED TO DEMOLITION ACTIVITIES.
- K. ALL REMOVALS ADJACENT TO EXISTING PAVEMENT TO REMAIN SHALL BE ISOLATED BY SAWCUTS. SAWCUTS SHALL BE A MINIMUM OF THE PAVEMENT THICKNESS.
- L. ALL UTILITIES NOT MARKED FOR REMOVAL SHALL REMAIN IN PLACE.
- M. ALL REINFORCING STEEL SHALL BE A.S.T.M. A615, GRADE 60 UNLESS NOTED OTHERWISE.
- N. UNLESS OTHERWISE SPECIFIED, ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION AND THE MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION.
- O. ALL EXISTING POLES AND SIGNS SHALL BE RE-INSTALLED BY THE CONTRACTOR, AS DIRECTED BY THE ENGINEER, UNLESS OTHERWISE NOTED.
- P. ALL STORMWATER END SECTIONS SHALL BE PRECAST WITH A CAST-IN-PLACE TOE WALL.
- Q. FIBER OPTIC LINE IS NOT SHOWN ON PLANS. IT IS LOCATED ON THE SOUTH SIDE OF LIBERTY ROAD. FIELD VERIFICATION IS REQUIRED BY THE CONTRACTOR.

EARTHWORK ESTIMATED QUANTITIES	
CUT	280 CY
FILL	466 CY
CLASS 1	100 CY

QUANTITIES LISTED ARE FOR INFORMATIONAL PURPOSES ONLY. EARTHWORK IS BID AS A LUMP SUM AND NO ADJUSTMENT IN CONTRACT PRICE WILL BE MADE FOR ACTUAL QUANTITY.

THE QUANTITIES LISTED ARE BASED ON AVERAGE END AREA METHOD. THE QUANTITIES DO NOT INCLUDE ANY OVER EXCAVATION BELOW SUBGRADE OR ANY REMOVAL OF EXISTING PAVEMENT. THE QUANTITIES LISTED ARE GIVEN AS IN PLACE AND DO NOT INCLUDE ANY ADJUSTMENT FACTORS.

CLASS 1 EXCAVATION IS FOR THE CONSTRUCTION OF THE BRIDGE END BENTS



BARTLETT & WEST

1719 SOUTH STATE ST. SUITE 100 - JEFFERSON CITY, MO 65105-4000
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 WWW.BARTLETTWEST.COM

GENERAL NOTES AND TYPICAL SECTIONS

LIBERTY ROAD BRIDGE REPLACEMENT
 PROJECT NO. 2016-801-0
 COLE COUNTY, MISSOURI

STATE OF MISSOURI
 TODD C. KEMPER
 NUMBER PE-203000500
 PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

SEALED DATE:	09/08/16
DESIGNED BY:	JDR
DRAWN BY:	TAA
APPROVED BY:	TCK
DESIGN PROJ:	15937.400
DATE:	SEPTEMBER 2016
DRAWING NO:	
SHEET NO:	2 of 31

Drawing Name: W:\Proj\15937.400\AutoCad\Plan Set\15937.400_C-TYPICAL SECTIONS.dwg Layout Name: TYPICAL SECTIONS Plotted By: AK01272 Plotted on: 9/7/2016 5:39:06 PM
 Last edit on: Sep 7, 2016 by: AK01272

LEGEND

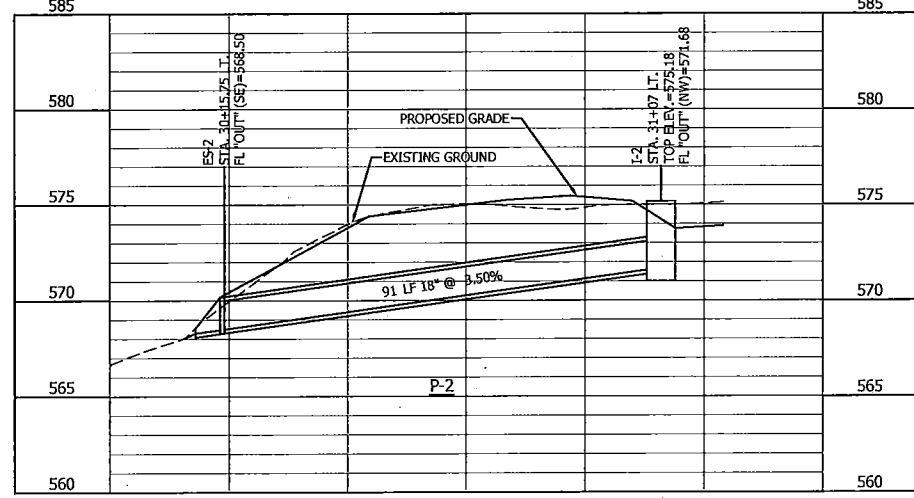
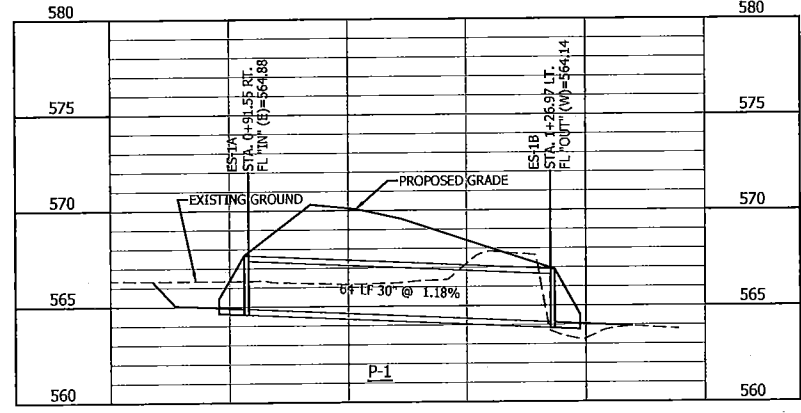
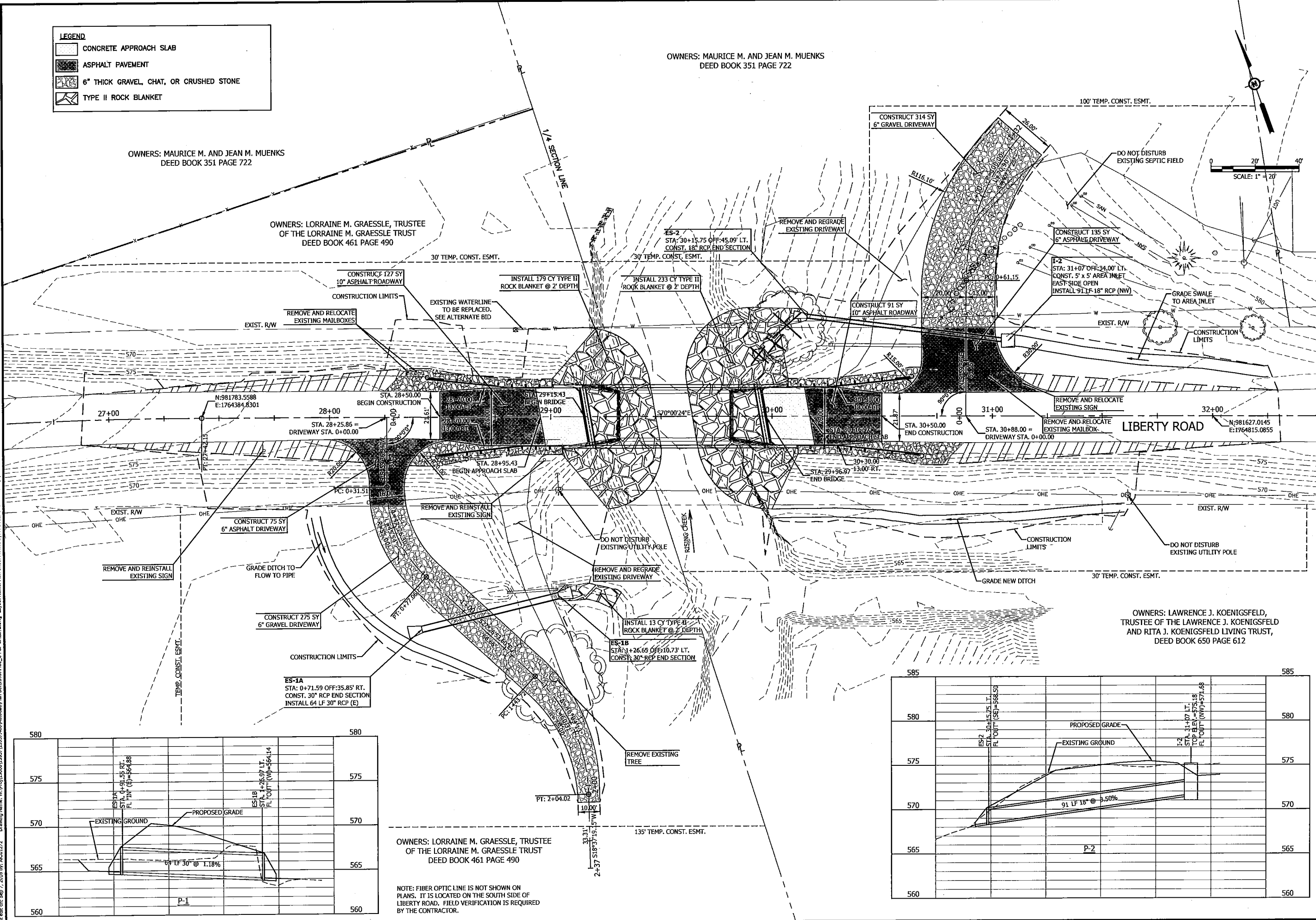
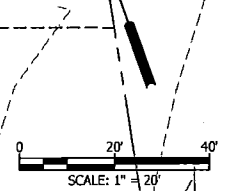
- CONCRETE APPROACH SLAB
- ASPHALT PAVEMENT
- 6" THICK GRAVEL, CHAT, OR CRUSHED STONE
- TYPE II ROCK BLANKET

OWNERS: MAURICE M. AND JEAN M. MUENKS
DEED BOOK 351 PAGE 722

OWNERS: MAURICE M. AND JEAN M. MUENKS
DEED BOOK 351 PAGE 722

OWNERS: LORRAINE M. GRAESSLE, TRUSTEE
OF THE LORRAINE M. GRAESSLE TRUST
DEED BOOK 461 PAGE 490

OWNERS: LAWRENCE J. KOENIGSFELD,
TRUSTEE OF THE LAWRENCE J. KOENIGSFELD
AND RITA J. KOENIGSFELD LIVING TRUST,
DEED BOOK 650 PAGE 612



OWNERS: LORRAINE M. GRAESSLE, TRUSTEE
OF THE LORRAINE M. GRAESSLE TRUST
DEED BOOK 461 PAGE 490

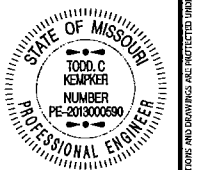
NOTE: FIBER OPTIC LINE IS NOT SHOWN ON
PLANS. IT IS LOCATED ON THE SOUTH SIDE OF
LIBERTY ROAD. FIELD VERIFICATION IS REQUIRED
BY THE CONTRACTOR.

BARTLETT & WEST

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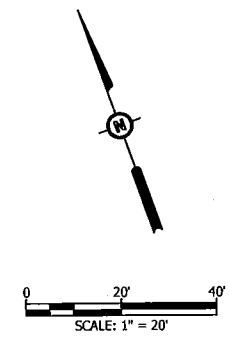
PLAN SHEET

LIBERTY ROAD BRIDGE REPLACEMENT
PROJECT NO. 2016-801-0
COLE COUNTY, MISSOURI

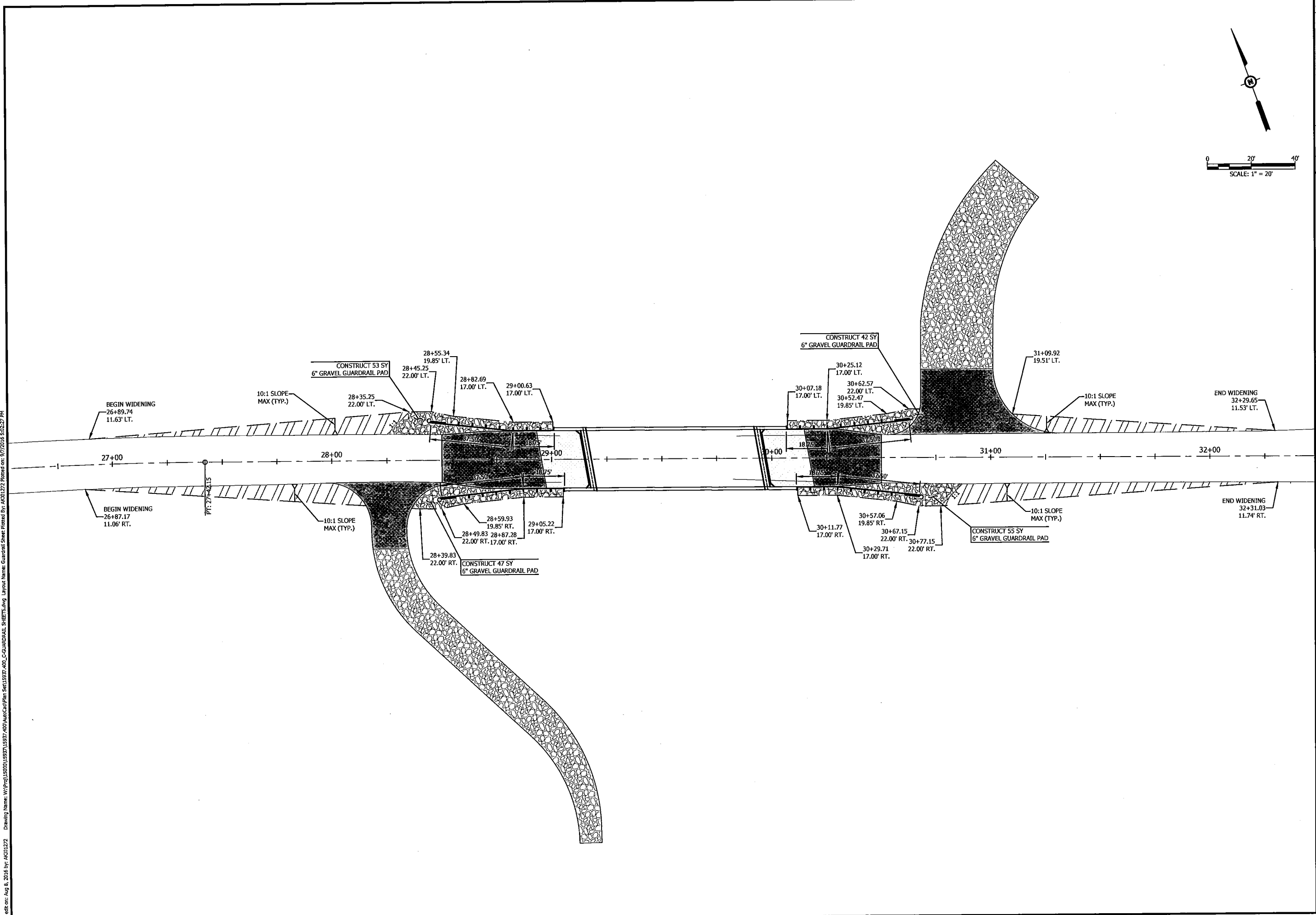


SEAL DATE: 09/08/16
DESIGNED BY: JDR
DRAWN BY: JDR
APPROVED BY: TCK
DESIGN PROJ: 15937.400
DATE: SEPTEMBER 2016
DRAWING NO:
SHEET NO: 4 of 31

Last edit on: Sep 7, 2016 by: AC021272 Drawing Name: W:\Proj\150001\15937\15937_400\AutoCAD\Plan_Sht\15937_400_C-88P_SHEETS.dwg Layout Name: Plan Sheet Plotted on: 9/8/2016 11:47:07 AM



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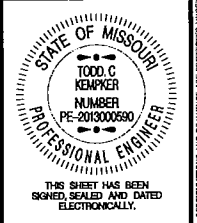


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1719 SOUTHRODGE DR., SUITE 100 - JEFFERSON CITY, MO 65109-4000
 PHONE 573.634.3181 - FAX 573.634.7920
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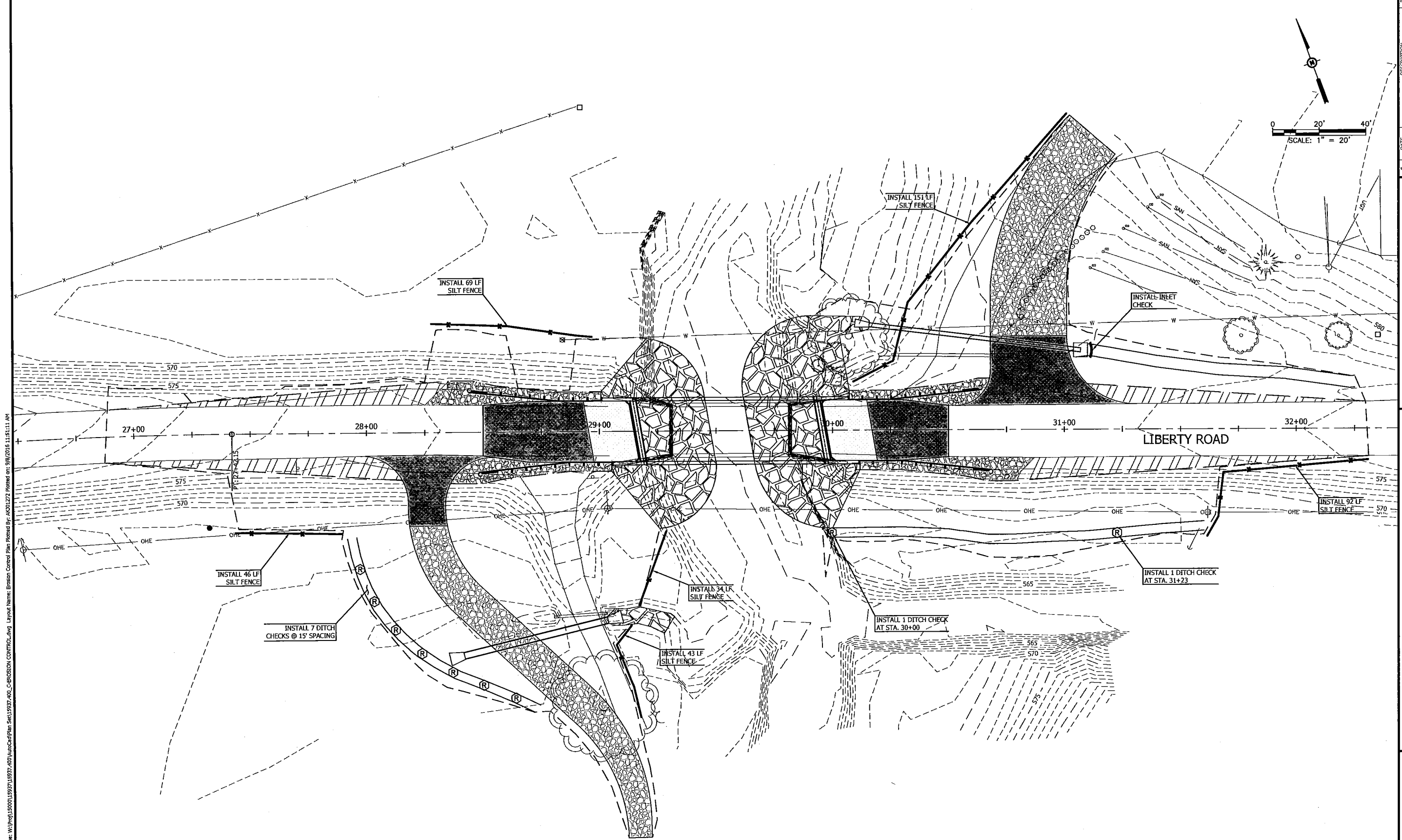
GUARDRAIL SHEET

LIBERTY ROAD BRIDGE REPLACEMENT
 PROJECT NO. 2016-801-0
 COLE COUNTY, MISSOURI



SEALED DATE:	09/08/16
DESIGNED BY:	JDR
DRAWN BY:	JDR
APPROVED BY:	TCK
DESIGN PROJ:	15937.400
DATE:	SEPTEMBER 2016
DRAWING NO:	
SHEET NO:	6 of 31

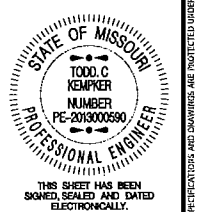
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Drawing Name: W:\Proj\15000\15937\15937.dwg; Layout Name: Erosion Control Plan Plotted By: AKD1272 Plotted on: 9/8/2016 11:51:11 AM
 Last edit on: Sep 8, 2016 By: AKD1272

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EROSION CONTROL PLAN
 LIBERTY ROAD BRIDGE REPLACEMENT
 PROJECT NO. 2016-801-0
 COLE COUNTY, MISSOURI



THIS SHEET HAS BEEN SKINNED, SEALED AND DATED ELECTRONICALLY.

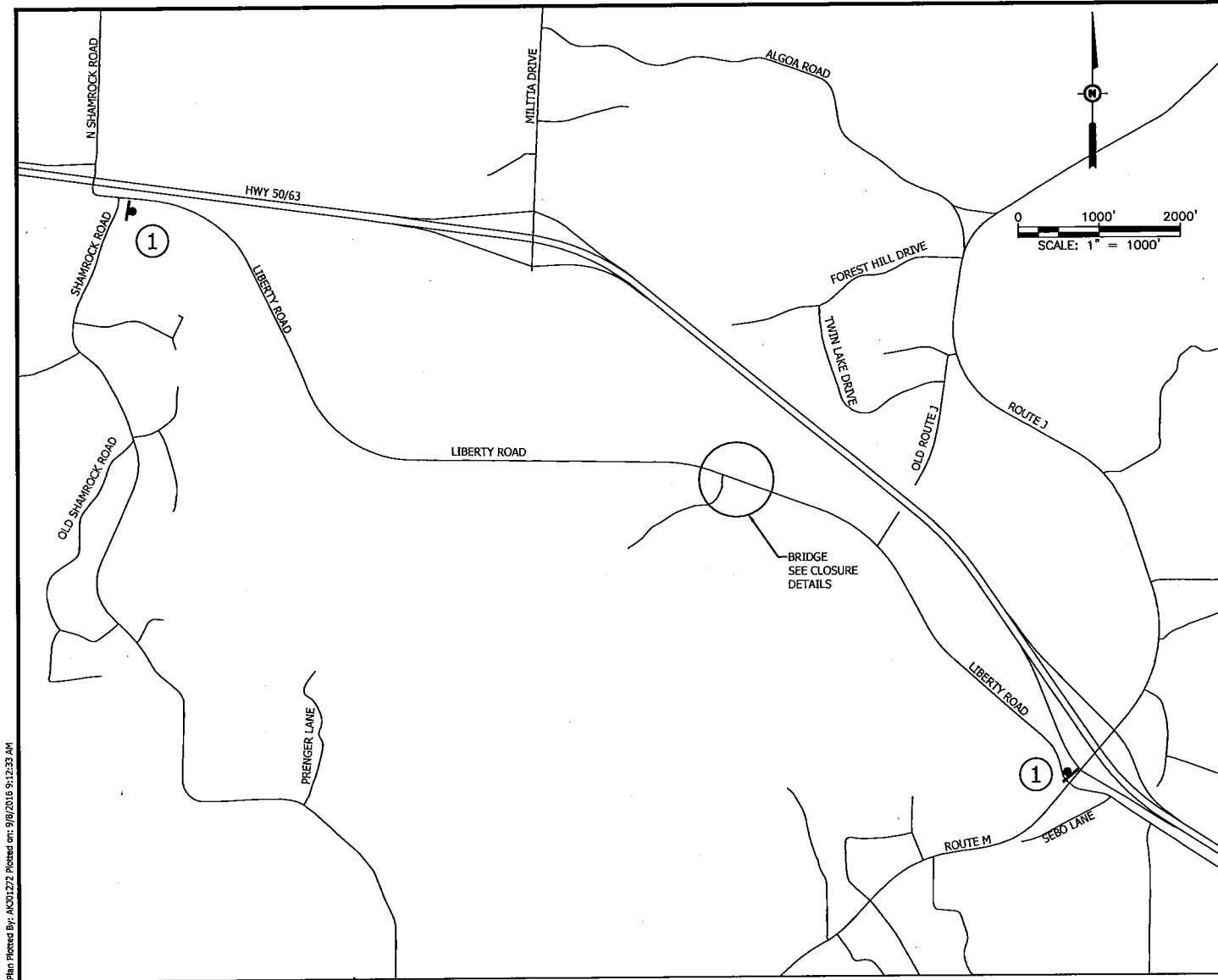
SEALED DATE:	09/08/16
DESIGNED BY:	JDR
DRAWN BY:	JDR
APPROVED BY:	TCK
DESIGN PROJ:	15937.400
DATE:	SEPTEMBER 2016
DRAWING NO:	
SHEET NO:	7 of 31

NOTES:

- ACTUAL PLACEMENT AND MEASURES USED FOR EROSION CONTROL WILL BE DICTATED BY FIELD CONDITIONS.
- SEEDING SHALL BE PERFORMED IMMEDIATELY UPON COMPLETION OF GRADING.
- TEMPORARY EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH SEC. 806.
- ALL DITCH CHECK SHALL HAVE AN EFFECTIVE HEIGHT OF 9".

LEGEND

- SILT FENCE
- INLET CHECK
- (R)— DITCH CHECK



TRAFFIC CONTROL LEGEND

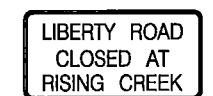
- ▲ SIGN (SINGLE SIDED)
- ▬ BARRICADE
- ⊙ TYPE C WARNING LIGHT



WO20-3
20



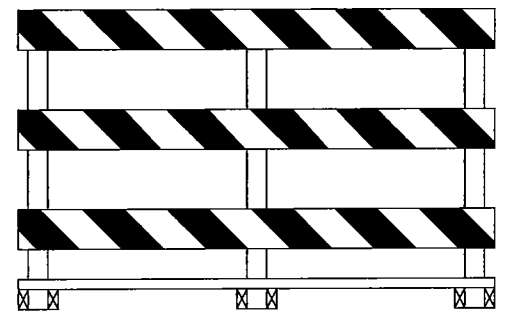
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21



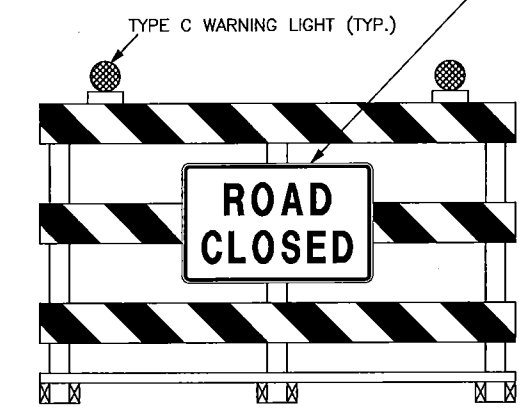
SPECIAL
60" X 30"
1



R11-2
48" X 30"
22

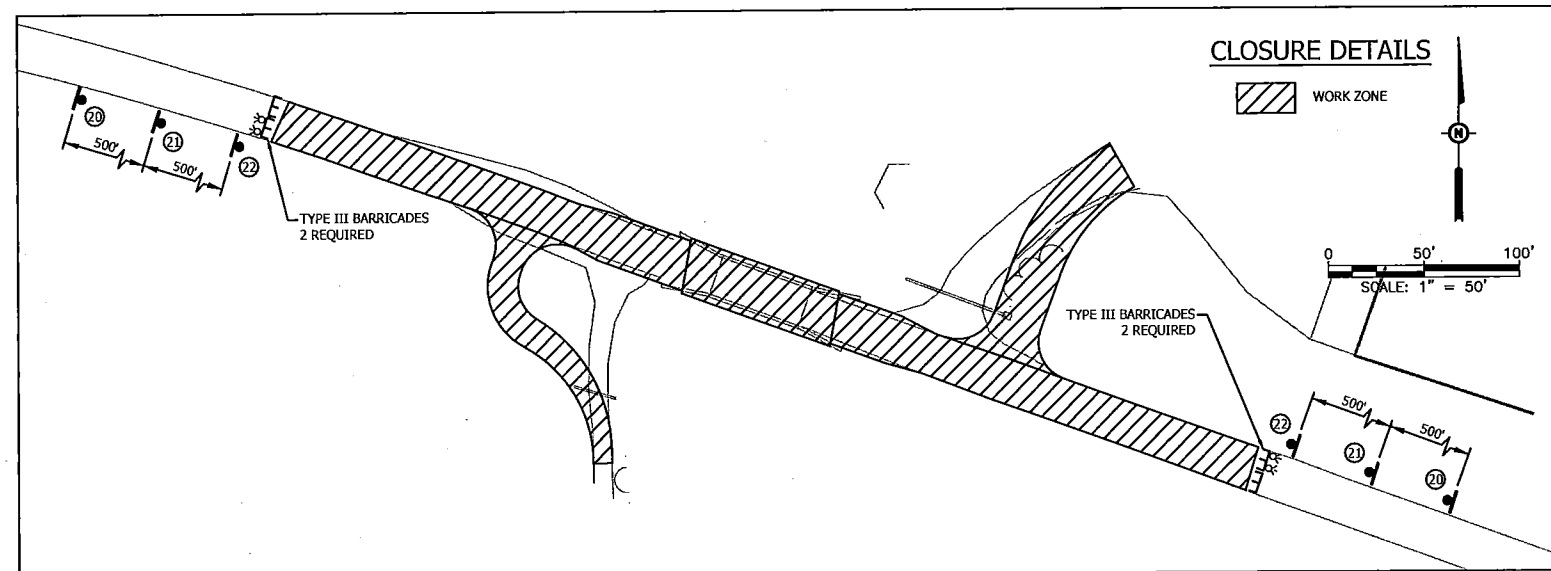


TYPE III MOVABLE BARRICADE



TYPE III MOVABLE BARRICADE

Last edit: Aug 3, 2016 by: AK01222 Drawing Name: W:\proj\15000\15937\15937-400\Misc\plan_Series\15937-400_C-TRAFFIC CONTROL.dwg Layout Name: Traffic Control Plan Plotted By: AK01222 Plotted on: 9/8/2016 9:12:33 AM



NOTES:

ACCESS TO DRIVEWAYS MUST BE MAINTAINED AT ALL TIMES.

CONTRACTOR SHALL COMPLY WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR THE TRAFFIC CONTROL OF THIS PROJECT.

COVER ALL CONFLICTING SIGNS.

USE A MINIMUM SIGN SPACING OF 500' OR AS DIRECTED BY THE ENGINEER.

SEE STANDARDS NO. 616.10 AND 903.03 OF THE MISSOURI STANDARD PLANS FOR DETAILS NOT SHOWN.

NO.	DATE	DESCRIPTION

BARTLETT & WEST

1719 SOUTH BROADWAY, SUITE 102, JEFFERSON CITY, MO 65109-4000
 PHONE: 636.334.3375 • FAX: 636.334.3376
 MISSOURI CERTIFICATE OF AUTHORITY NO. 000157 • ENGINEERING
 WWW.BARTLETTWEST.COM

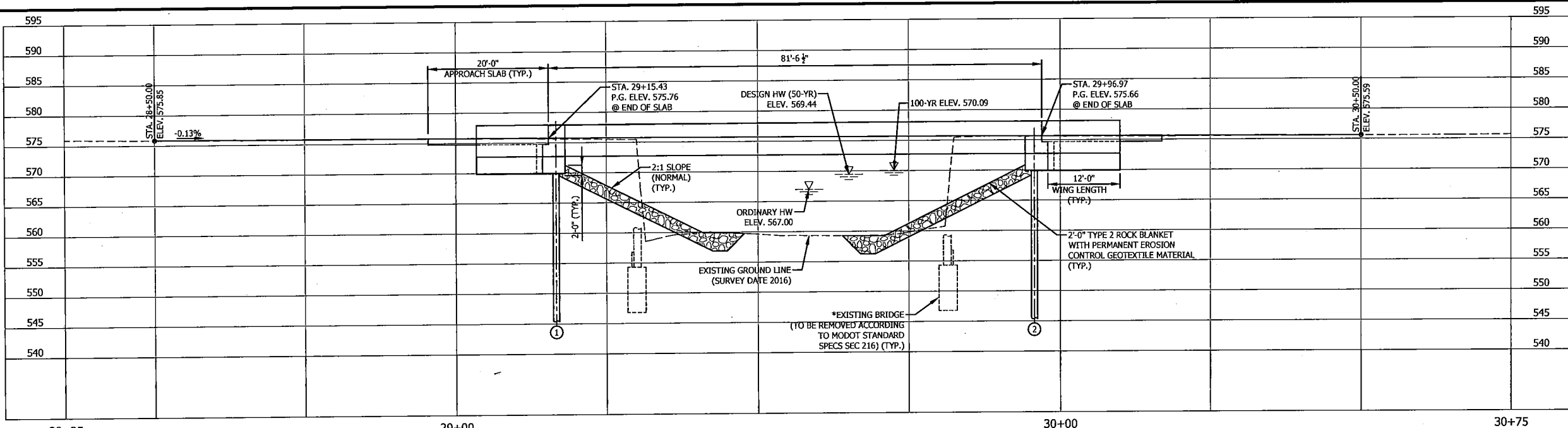
TRAFFIC CONTROL PLAN

LIBERTY ROAD BRIDGE REPLACEMENT
 PROJECT NO. 2016-801-0
 COLE COUNTY, MISSOURI

STATE OF MISSOURI
 TODD C. KEMPER
 NUMBER PE-203000580
 PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN
 SIGNED, SEALED AND DATED
 ELECTRONICALLY.

SEALED DATE:	09/08/16
DESIGNED BY:	JDR
DRAWN BY:	JDR
APPROVED BY:	TCK
DESIGN PROJ:	15937.400
DATE:	SEPTEMBER 2016
DRAWING NO:	
SHEET NO:	8 of 31



GENERAL ELEVATION
 79' PRESTRESSED CONCRETE BEAM SPAN
 PILE CAP END BENTS
 10° SKEW RIGHT ADVANCE
 26' ROADWAY
 SCALE: 1" = 10'

* REMOVE ANY EXISTING STRUCTURE THAT INTERFERES WITH NEW CONSTRUCTION IN ITS ENTIRETY. ANY EXISTING STRUCTURE NOT INTERFERING WITH NEW CONSTRUCTION MAY BE REMOVED ACCORDING TO SEC 216. IT IS ANTICIPATED THAT EXISTING WINGS WILL INTERFERE WITH EXTERIOR PILES OF NEW END BENTS.

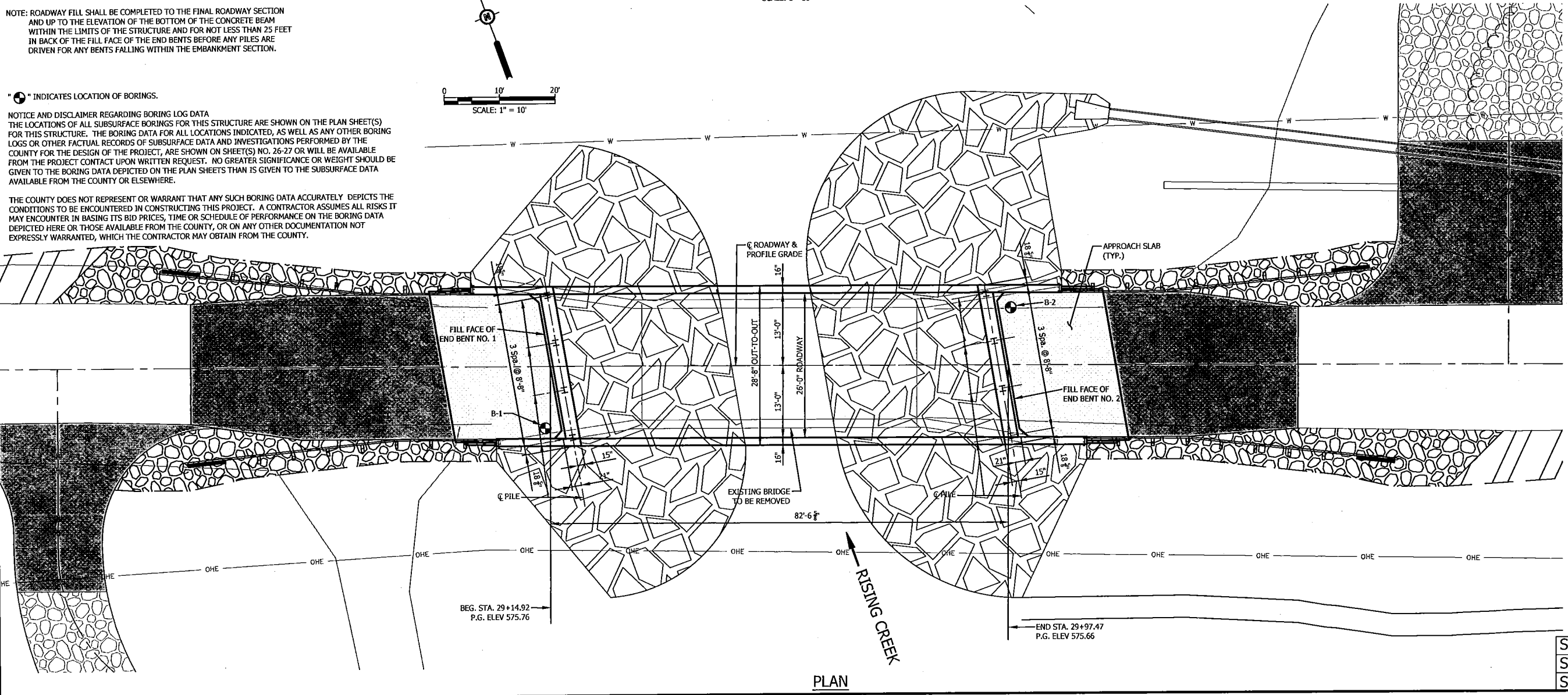
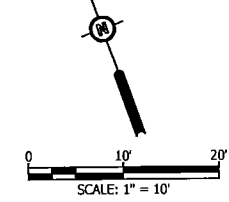
NOTE: FOR GENERAL NOTES, ESTIMATED QUANTITIES, FOUNDATION DATA, ESTIMATED QUANTITIES FOR SLAB ON CONCRETE I-GIRDER AND HYDROLOGIC DATA, SEE SHEET NO. 10.

NOTE: ROADWAY FILL SHALL BE COMPLETED TO THE FINAL ROADWAY SECTION AND UP TO THE ELEVATION OF THE BOTTOM OF THE CONCRETE BEAM WITHIN THE LIMITS OF THE STRUCTURE AND FOR NOT LESS THAN 25 FEET IN BACK OF THE FILL FACE OF THE END BENTS BEFORE ANY PILES ARE DRIVEN FOR ANY BENTS FALLING WITHIN THE EMBANKMENT SECTION.

* INDICATES LOCATION OF BORINGS.

NOTICE AND DISCLAIMER REGARDING BORING LOG DATA
 THE LOCATIONS OF ALL SUBSURFACE BORINGS FOR THIS STRUCTURE ARE SHOWN ON THE PLAN SHEET(S) FOR THIS STRUCTURE. THE BORING DATA FOR ALL LOCATIONS INDICATED, AS WELL AS ANY OTHER BORING LOGS OR OTHER FACTUAL RECORDS OF SUBSURFACE DATA AND INVESTIGATIONS PERFORMED BY THE COUNTY FOR THE DESIGN OF THE PROJECT, ARE SHOWN ON SHEET(S) NO. 26-27 OR WILL BE AVAILABLE FROM THE PROJECT CONTACT UPON WRITTEN REQUEST. NO GREATER SIGNIFICANCE OR WEIGHT SHOULD BE GIVEN TO THE BORING DATA DEPICTED ON THE PLAN SHEETS THAN IS GIVEN TO THE SUBSURFACE DATA AVAILABLE FROM THE COUNTY OR ELSEWHERE.

THE COUNTY DOES NOT REPRESENT OR WARRANT THAT ANY SUCH BORING DATA ACCURATELY DEPICTS THE CONDITIONS TO BE ENCOUNTERED IN CONSTRUCTING THIS PROJECT. A CONTRACTOR ASSUMES ALL RISKS IT MAY ENCOUNTER IN BASING ITS BID PRICES, TIME OR SCHEDULE OF PERFORMANCE ON THE BORING DATA DEPICTED HERE OR THOSE AVAILABLE FROM THE COUNTY, OR ON ANY OTHER DOCUMENTATION NOT EXPRESSLY WARRANTED, WHICH THE CONTRACTOR MAY OBTAIN FROM THE COUNTY.



PLAN

BARTLETT & WEST
 1719 BOUTHARD DR., SUITE 100 - JEFFERSON CITY, MO 65109-4000
 MISSOURI CERTIFICATE OF AUTHORITY NO. 000167 - ENGINEERING
 WWW.BARTLETTWEST.COM

GENERAL ELEVATION AND PLAN
 LIBERTY ROAD BRIDGE REPLACEMENT
 PROJECT NO. 2016-801-0
 COLE COUNTY, MISSOURI

STATE OF MISSOURI
 DAVID ANDREW STRATMANN
 NUMBER PE-2004000848
 PROFESSIONAL ENGINEER

SEAL DATE: 09/08/16
 DESIGNED BY: DAS
 DRAWN BY: TAA
 APPROVED BY: TCK

DESIGN PROJ: 15937.400
 DATE: APRIL 2016
 DRAWING NO:
 SHEET NO: 9 of 31

STD. 606.22
 STD. 609.00
 STD. 706.35

Last edit on: Aug 22, 2016 by: DAS01357 Drawing Name: W:\proj\15000\15937\15937_400\AutoCAD\Plan Set\15937_400_C-BRIDGE SHEET.dwg Layout Name: BRIDGE LAYOUT Plotted on: 9/8/2016 11:20:00 AM

Estimated Quantities

Item	Substr.	Superstr.	Total
Class I Excavation	cubic yard	100	100
Removal of Bridges	lump sum		1
Bridge Approach Slab (Minor Road)	square yard		119
Structural Steel Piles (14 in.)	linear foot	172	172
Pre-Bore for Piling	linear foot	160	160
Pile Point Reinforcement	each	8	8
Class B Concrete (Substructure)	cubic yard	27.4	27.4
Slab on Concrete I-Girder	square yard		260
Safety Barrier Curb	linear foot		213
Type 4 (45 in.) Prestressed Concrete I-Girder	linear foot		321
Steel Intermediate Diaphragm for P/S Concrete Girders	each		3
Slab Drain	each		14
Vertical Drain at End Bents	each		2
Plain Neoprene Bearing Pad	each		8

* Safety Barrier Curb shall be cast-in-place option or slip-form option.

*** For information only. Class 1 Excavation shall be considered completely covered by the contract unit price for Earthwork (lump sum).

All concrete above the construction joint in the end bents is included in the Estimated Quantities for Slab on Concrete I-Girder.

All reinforcement in the end bents is included in the Estimated Quantities for Slab on Concrete I-Girder.

GENERAL NOTES:

Design Specifications:
2012 AASHTO LRFD Bridge Design Specifications (6th Edition)
and 2013 Interim Revisions
Seismic Design Category A

Design Loading:
Vehicular=HL-93
35#/Sq. Ft. Future Wearing Surface
Earth=120#/Cu. Ft., Equivalent Fluid Pressure=45#/Cu. Ft.
Superstructure: Non-Composite for dead load
Composite for live load

Design Unit Stresses:
Class B Concrete (Substructure) $f'c = 3,000$ psi
Class B-2 Concrete (Superstructure, except
Prestressed Girders and Safety Barrier Curb) $f'c = 4,000$ psi
Class B-1 Concrete (Safety Barrier Curb) $f'c = 4,000$ psi
Reinforcing Steel (Grade 60) $fy = 60,000$ psi
Steel Pile (ASTM A709 Grade 50) $fy = 50,000$ psi
For Precast Prestressed Panel stresses, see Sheet No. 16.
For Prestressed Girder stresses, see Sheet No. 14.

Neoprene Pads:
Plain Neoprene Bearings shall be 60 durometer and shall be in accordance with Sec 716.

Joint Filler:
All joint filler shall be in accordance with Sec 1057 for preformed sponge rubber expansion and partition joint filler, except as noted.

Reinforcing Steel:
Minimum clearance to reinforcing steel shall be 1 1/2", unless otherwise shown.

Traffic Handling:
Structure to be closed during construction. See roadway plans for traffic control.

Miscellaneous:
Bridge construction shall be in accordance with the current Missouri Standard Specifications for Highway Construction and supplemental specifications.

"Sec" refers to the sections in the MoDOT standard and supplemental construction specifications unless specified otherwise.

"Std." refers to the Missouri Standard Plans for Highway Construction.

County Construction personnel will indicate the type of joint filler option used under the precast panels for this structure.

- Constant Joint Filler
- Variable Joint Filler

Estimated Quantities for Slab on Concrete I-Girder

Item	Total
Class B-2 Concrete	cubic yard 86.7
Reinforcing Steel	pound 7,640
Reinforcing Steel (Epoxy Coated)	pound 12,320

The table of Estimated Quantities for Slab on Concrete I-Girder represents the quantities used by the County in preparing the cost estimate for concrete slabs. The area of the concrete slab will be measured to the nearest square yard with the horizontal dimensions as shown on the plan of slab. Payment for prestressed panels, conventional forms, all concrete and coated and uncoated reinforcing steel will be considered completely covered by the contract unit price for the slab. Variations may be encountered in the estimated quantities but the variations cannot be used for an adjustment in the contract unit price.

Method of forming the slab shall be as shown on the plans and in accordance with Sec 703. All hardware for forming the slab to be left in place as a permanent part of the structure shall be coated in accordance with ASTM A123 or ASTM B633 with a thickness class SC 4 and a finish type I, II or III.

The Estimated Quantities for Slab on Concrete I-Girder are based on skewed precast prestressed end panels.

Class B-2 Concrete quantity is based on minimum top flange thickness and minimum joint material thickness.

The prestressed panel quantities are not included in the table of Estimated Quantities for Slab on Concrete I-Girder.

HYDROLOGIC DATA

Drainage Area	= 5.1 sq. miles
Design Flood Frequency	= 50 years
Design Flood Discharge	= 3,497 cfs
Design Flood (D.F.) Elevation	= 569.44 at centerline bridge

Base Flood Data (100 year)

Base Flood Elevation	= 570.09 at centerline bridge
Base Flood Discharge	= 4,136 cfs
Estimated Backwater	= 1.13 feet
Average Velocity Through Opening	= 8.14 ft/s

Freeboard (50 year)

Freeboard = 1.63 feet

Roadway Overtopping

Overtopping Flood Discharge	> 5,640 cfs
Overtopping Flood Frequency	> 500 years
500 year Flood Elevation	= 573.13 at centerline bridge

Foundation Data

Bent No.		1	2
Load Bearing Pile	Pile Type and Size	HP 14 x 73	HP 14 x 73
	Number	4	4
	Approximate Length	foot 22	21
	Pile Driving Verification Method	**	**
	Minimum Nominal Axial Compressive Resistance	kip 600	600
	Hammer Energy Required	foot-pound 8,000	8,000

Manufactured pile point reinforcement shall be used on all piles in this structure at End Bents No. 1 and 2.

** Modified Gates Formula

Load Bearing Pile: Minimum Nominal Axial Compressive Resistance = Maximum Factored Loads/Resistance Factor

Prebore piles at End Bent No. 1 and End Bent No. 2 to rock.

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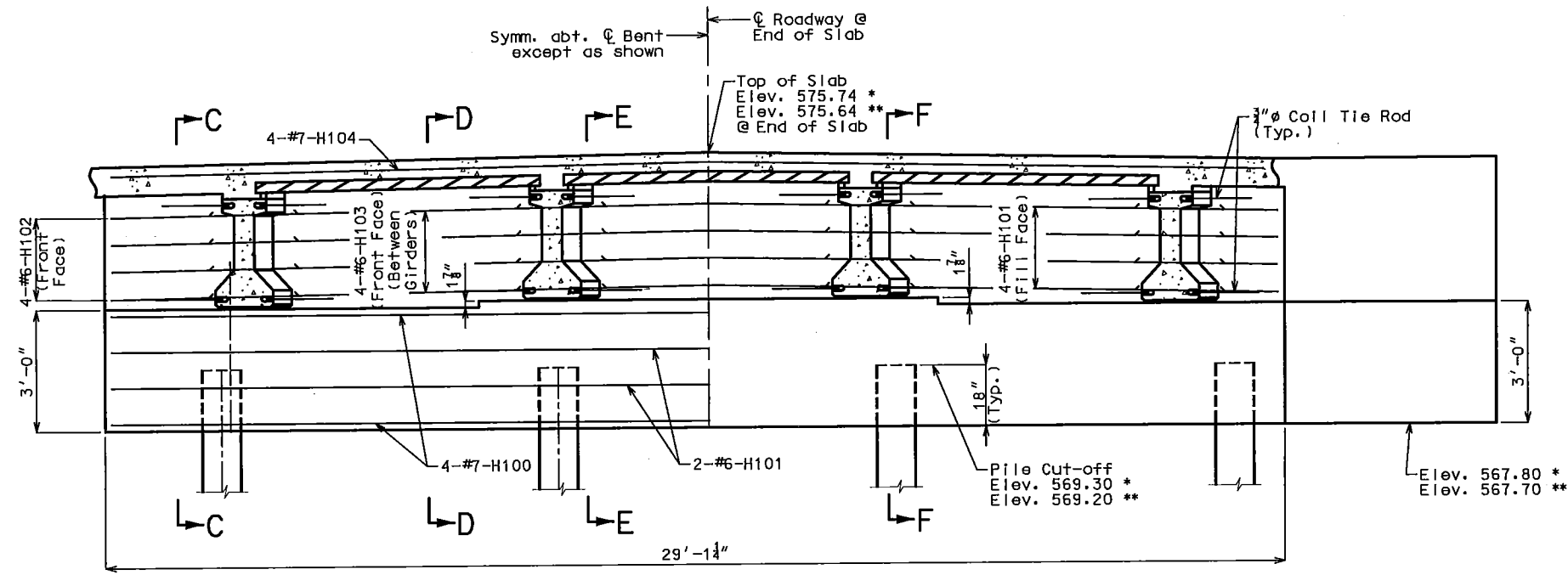
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GENERAL NOTES AND ESTIMATED QUANTITIES
LIBERTY ROAD BRIDGE REPLACEMENT
PROJECT NO. 2016-801-0
COLE COUNTY, MISSOURI



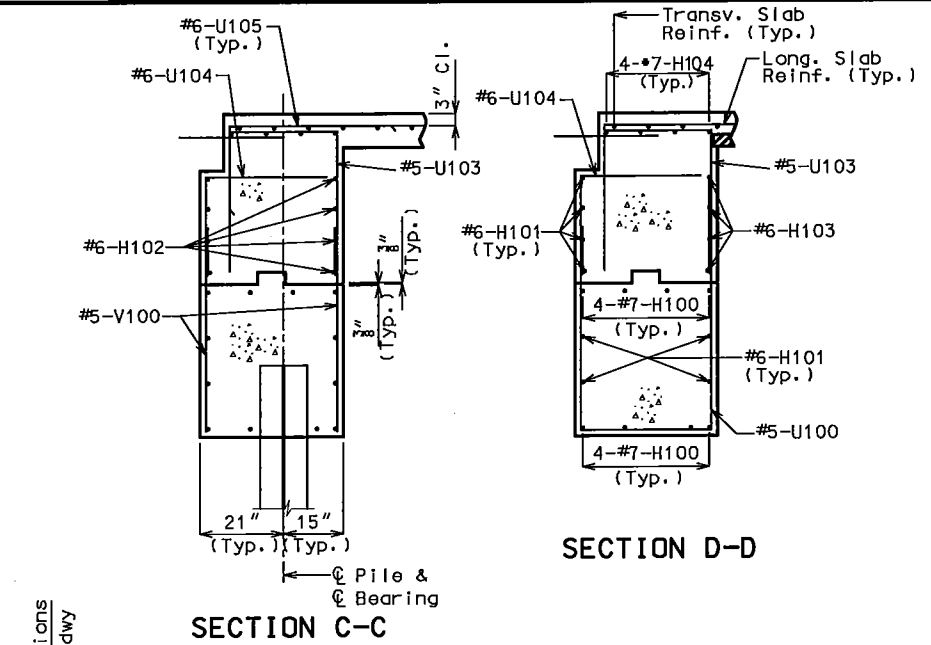
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ELECTRONICALLY.

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DESIGNED BY:	DAS
DRAWN BY:	TAA
APPROVED BY:	TCK
DESIGN PROJ.:	15937.400
DATE:	SEPTEMBER 2016
DRAWING NO.:	
SHEET NO.:	10 of 31



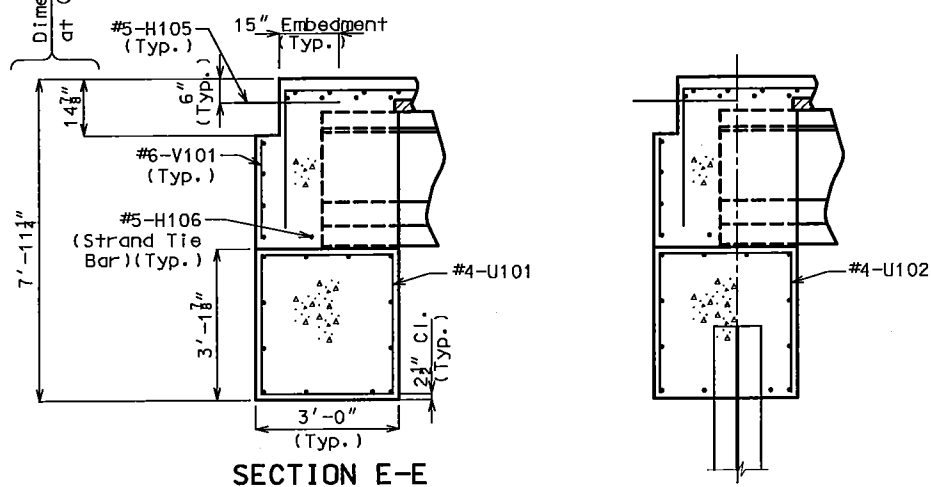
SECTION NEAR END BENT

Notes:
 For reinforcement of the Safety Barrier Curb not shown, see Sheet No. 21.
 For details of Vertical Drain at End Bents, see Sheet No. 13.
 For details of End Bents not shown, see Sheet No. 11.
 * - End Bent No. 1
 ** - End Bent No. 2



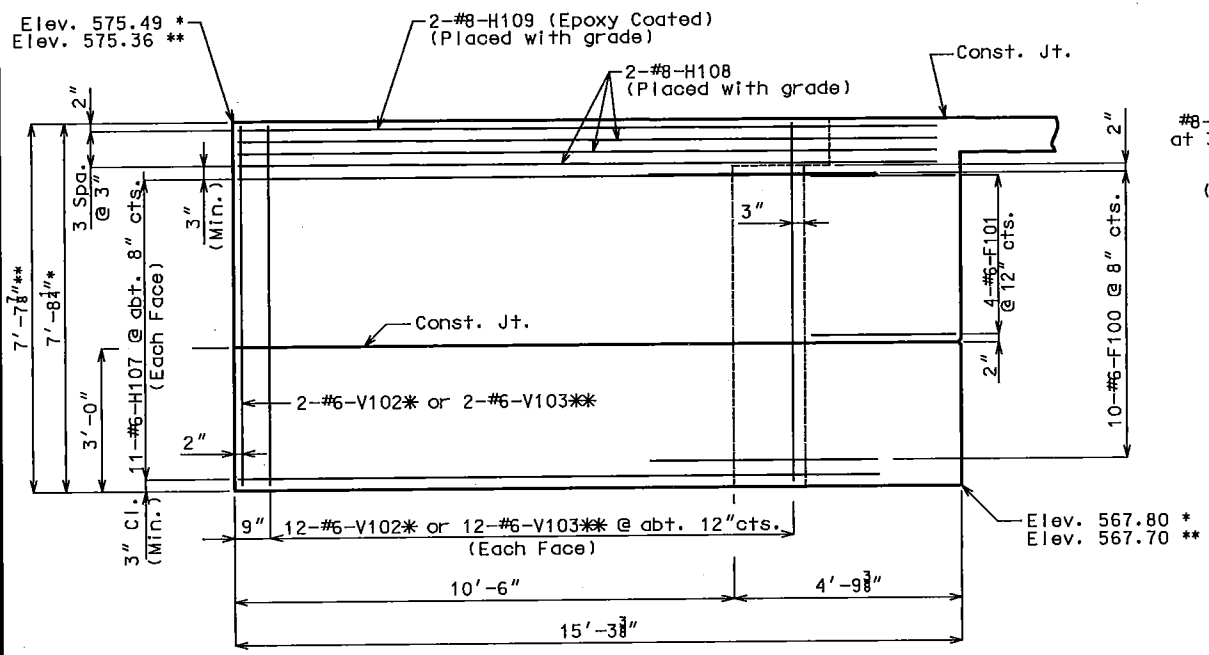
SECTION C-C

SECTION D-D

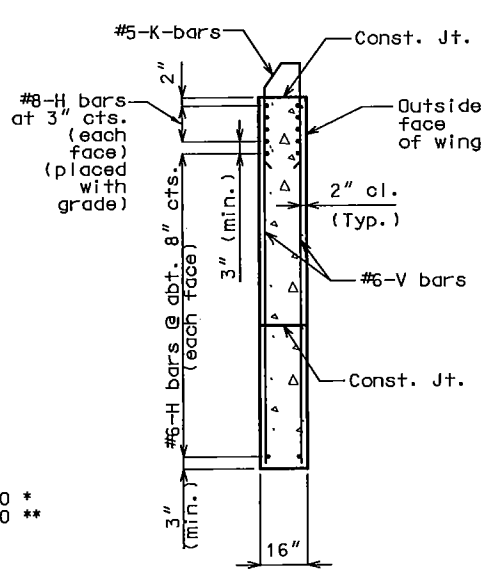


SECTION E-E

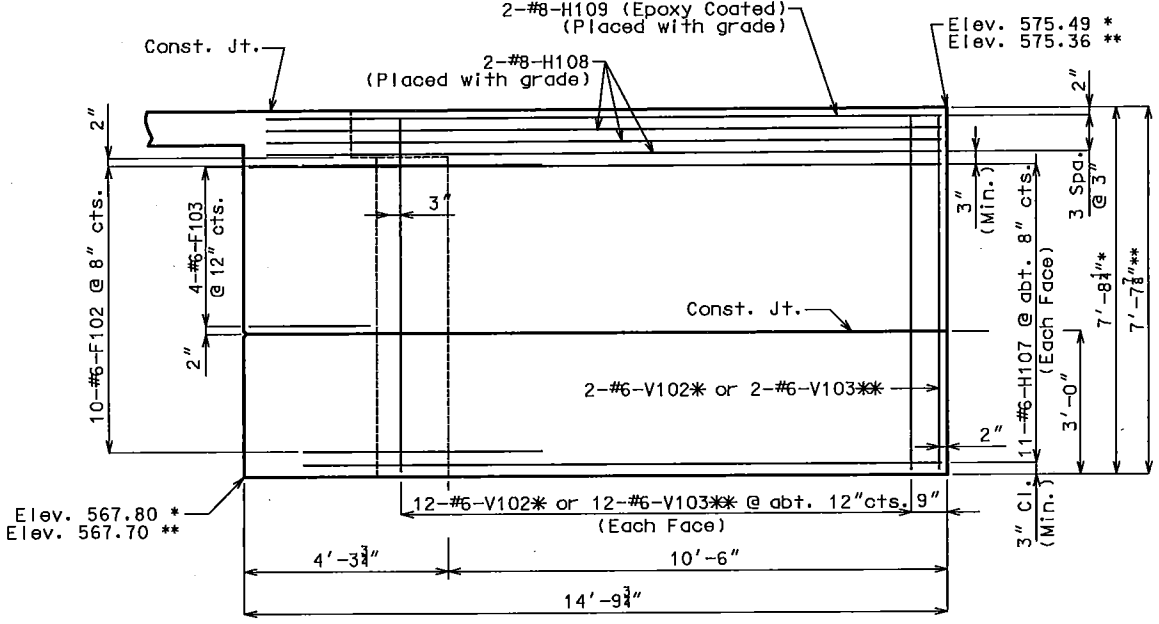
SECTION F-F



ELEVATION A-A



TYPICAL SECTION THROUGH WING



ELEVATION B-B

DETAILS OF END BENT NO. 1 & END BENT NO. 2

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

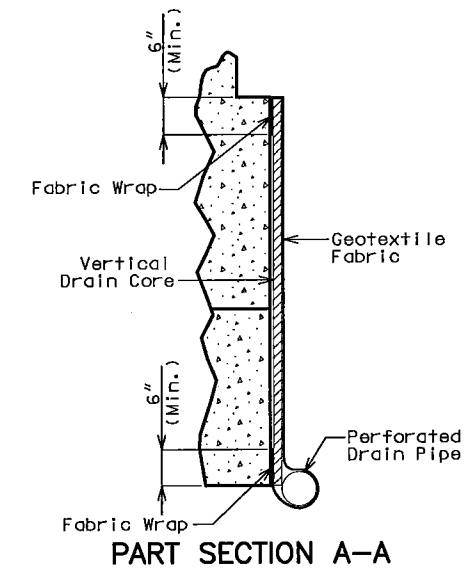
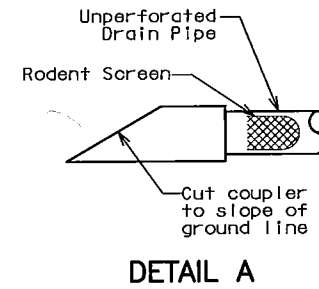
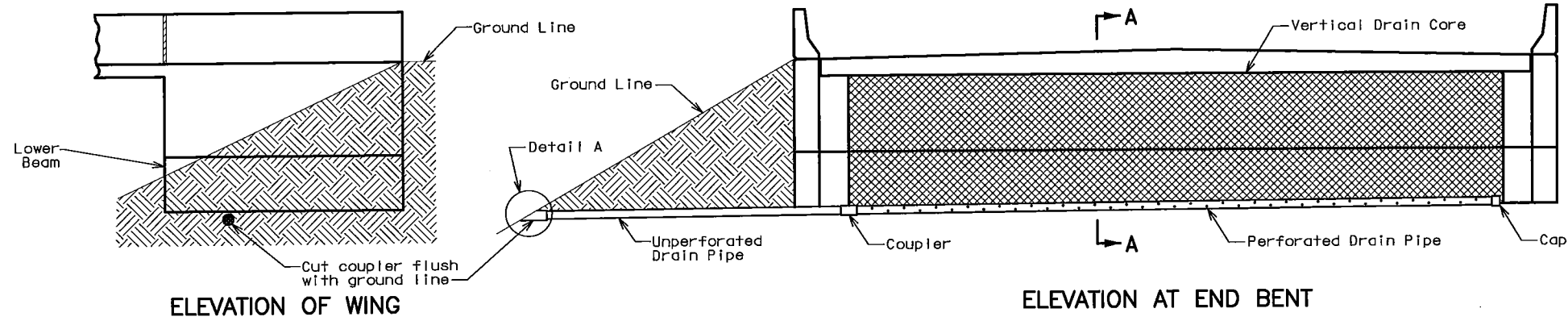
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DETAILS OF END BENT NO. 1 AND END BENT NO. 2
 LIBERTY ROAD BRIDGE REPLACEMENT
 PROJECT NO. 2016-801-0
 COLE COUNTY, MISSOURI

STATE OF MISSOURI
 DAVID ANDREW STRATMANN
 NUMBER PE-2004000848
 PROFESSIONAL ENGINEER

SEALED DATE:	09/08/16
DESIGNED BY:	DAS
DRAWN BY:	TAA
APPROVED BY:	TCK
DESIGN PROJ.:	15937.400
DATE:	SEPTEMBER 2016
DRAWING NO.:	
SHEET NO.:	12 of 31

Last edit on: Aug 15, 2016 by: DAS01287 Drawing Name: V:\Proj\15937.400\AutoCAD\Plan_Sect\15937.400_BR_End_Bis_Crossing.dwg Layout Name: End_Bis 2.2 Plotted on: 9/8/2016 11:21:38 AM



Note:

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.

Place drain pipe at fill face of end bent and slope to lowest grade of ground line, also missing the lower beam of end bent by 1 1/2 inches. (See Elevation at End Bent.)

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

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

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VERTICAL DRAIN AT END BENTS

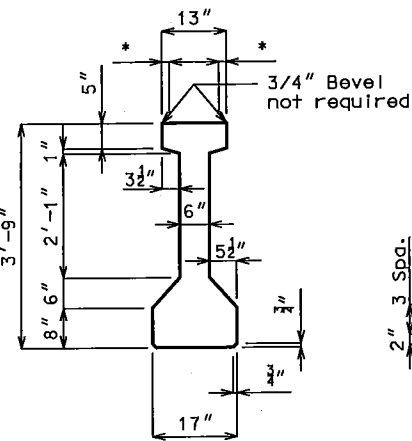
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PROJECT NO. 2016-801-0
COLE COUNTY, MISSOURI



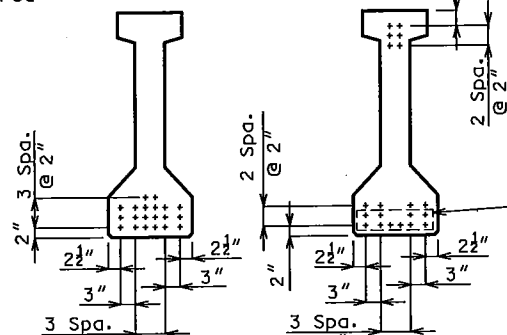
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DRAWN BY:	TAA
APPROVED BY:	TCK
DESIGN PROJ:	15937.400
DATE:	SEPTEMBER 2016
DRAWING NO:	
SHEET NO:	13 of 31

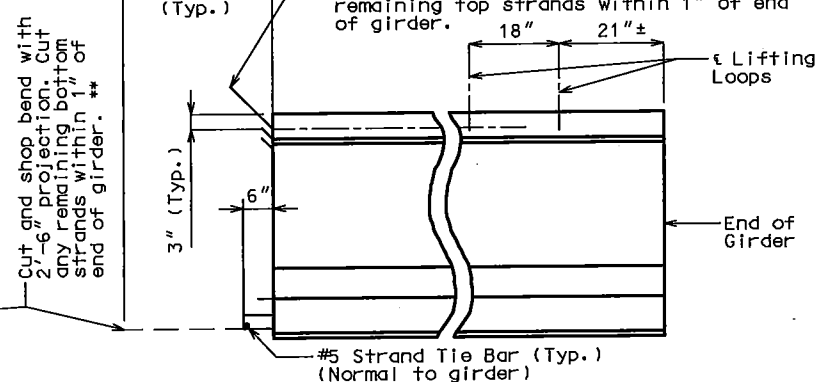
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GIRDER DIMENSIONS



GIRDER STRAND ARRANGEMENTS



END BENT STRAND DETAILS AT GIRDER ENDS LOCATION OF LIFTING LOOPS

Concrete for prestressed girders shall be Class A-1 with $f'c = 8,000$ psi and $f'ci = 6,500$ psi.

(+) indicates prestressing strand.

Use 20 strands with an initial prestress force of 879 kips.

Prestressing tendons shall be uncoated, seven-wire, low-relaxation strands, 0.6 inch diameter in accordance with AASHTO M 203, Grade 270. Pretensioned members shall be in accordance with Sec 1029.

* At contractor's option a 1 1/2" to 1 3/4" smooth finish strip is permitted to facilitate placement of preformed fiber expansion joint material or expanded or extruded polystyrene bedding material for the prestressed panels.

** At the contractor's option the location for bent-up strands may be varied from that shown for fully bonded strands only. The total number of bent-up strands shall not be changed. One strand tie bar is required for each layer of bent-up strands except at end bents which require one bar on the bottom layer of strands only. No additional payment will be made if additional strand tie bars are required.

Fabricator shall be responsible for location and design of lifting devices.

BILL OF REINFORCING STEEL - EACH GIRDER			
NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE
4	5 A1	41'-3"	20
158	5 B1	5'-2"	11
16	6 B2	4'-6"	11
87	4 C1	13"	10
174	4 D1	2'-6"	9

All dimensions are out to out.

Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures. Stirrup and Tie Dimensions.

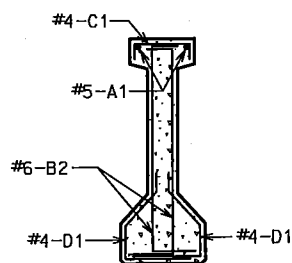
Actual lengths are measured along centerline of bar to the nearest inch.

Minimum clearance to reinforcing shall be 1".

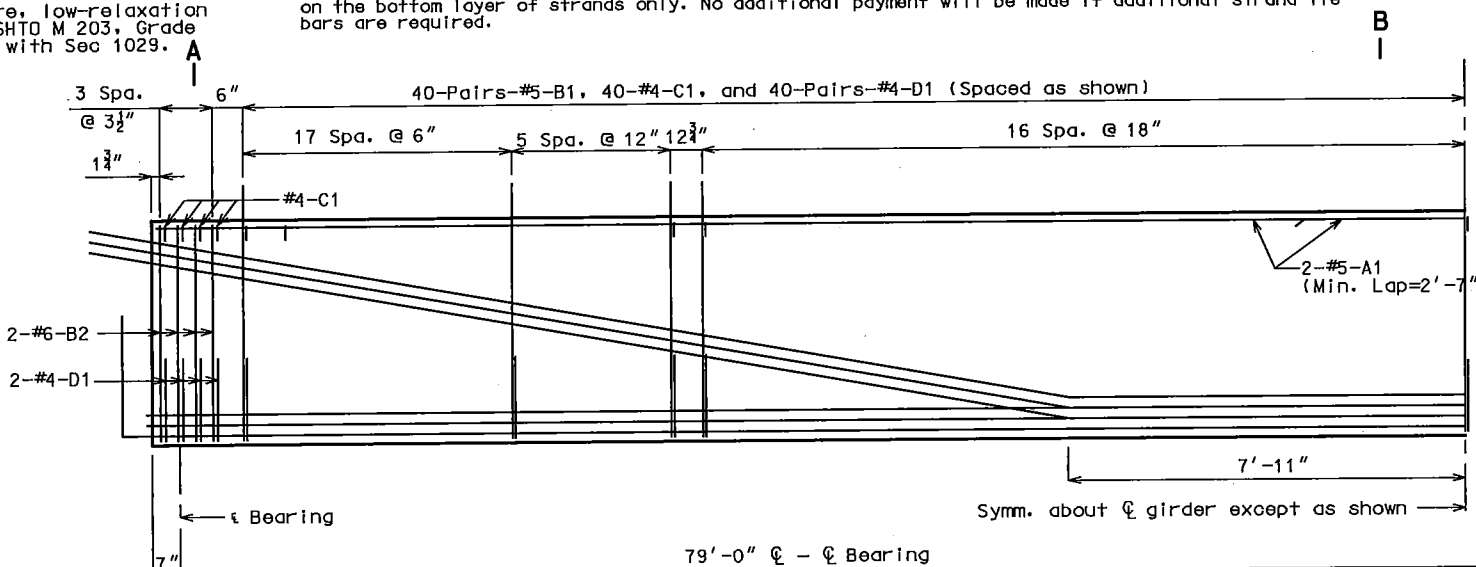
All reinforcement shall be Grade 60.

The two D1 bars may be furnished as one bar at the fabricator's option.

All B1 bars shall be epoxy coated.

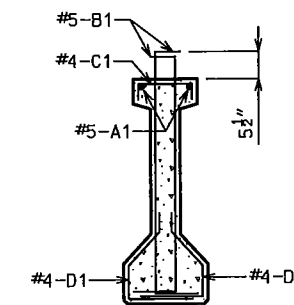


SECTION A-A Strands not shown for clarity.

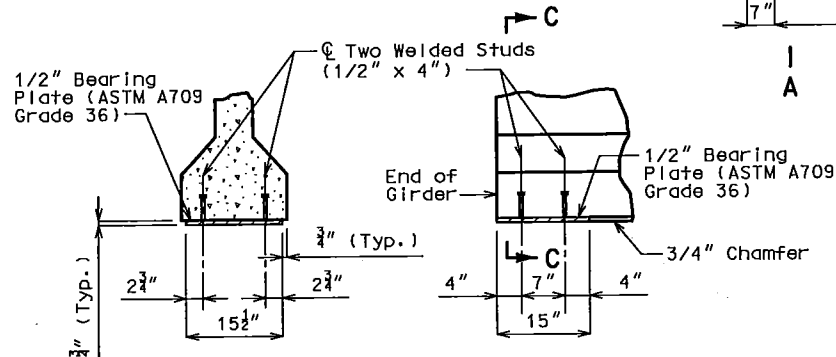


HALF ELEVATION OF GIRDER SPAN (1-2)

Exterior and interior girders are the same, except for coil ties, and coil inserts for slab drains and holes for steel intermediate diaphragms.



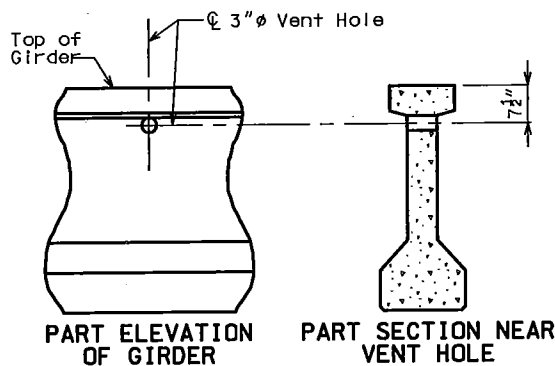
SECTION B-B Strands not shown for clarity.



SECTION C-C PART ELEVATION AT END OF GIRDER BEARING PLATE DETAILS

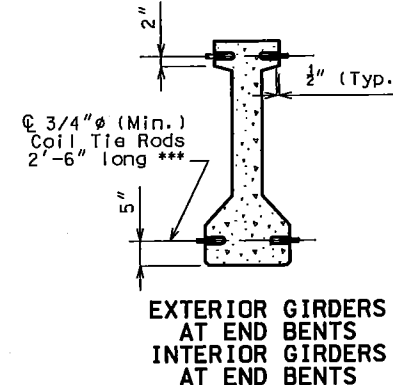
Galvanize the 1/2" bearing plate (ASTM A709 Grade 36) in accordance with ASTM A123.

Cost of furnishing, galvanizing, and installing the 1/2" bearing plate (ASTM A709 Grade 36) and welded studs in the prestressed girder will be considered completely covered by the contract unit price for Prestressed Concrete I-Girder.



DETAILS OF VENT HOLE

Place vent holes at or near upgrade 1/3 point of girders and clear reinforcing steel or strands by 1 1/2" minimum and steel intermediate diaphragm bolt connections by 6" minimum.



DETAILS OF COIL TIES

*** Length of coil tie rods at exterior girders at end bents = 2'-5"

Cost of 3/4" dia. coil tie rods placed in diaphragms will be considered completely covered by the contract unit price for Prestressed Concrete I-Girder.

Coil ties shall be held in place in the forms by slotted wire-setting-studs projecting through forms. Studs are to be left in place or replaced with temporary plugs until girders are erected, then replaced by coil tie rods.

For location of coil inserts at slab drains, see Sheet No. 17.

For location of coil ties, see Sheets No. 11 & 12.

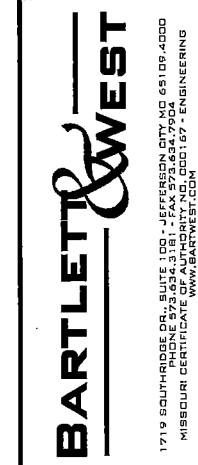
The 1 1/2" dia. holes shall be cast in the web for steel intermediate diaphragms. Drilling is not allowed.

For details of diaphragms, see Sheet No. 15.

For Girder Camber Diagram, see Sheet No. 18.

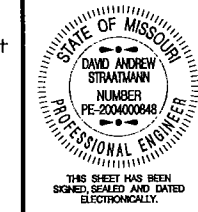
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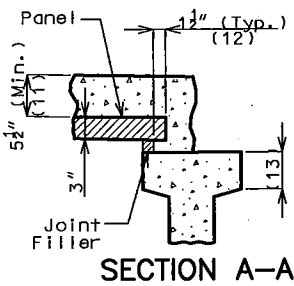
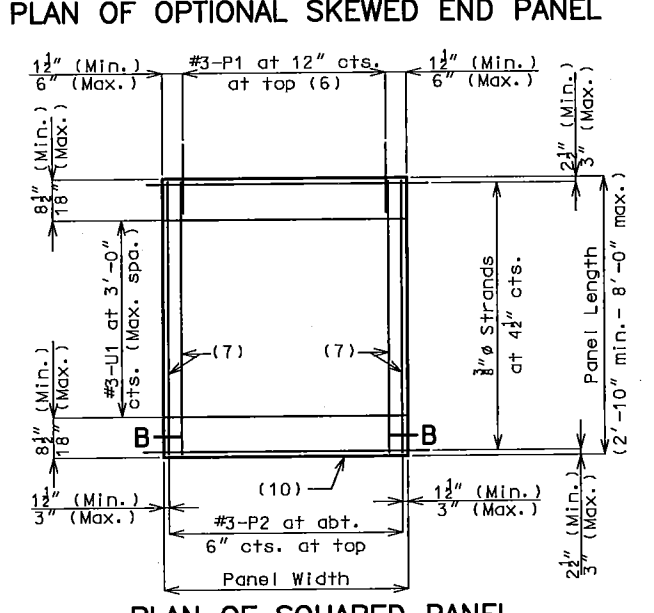
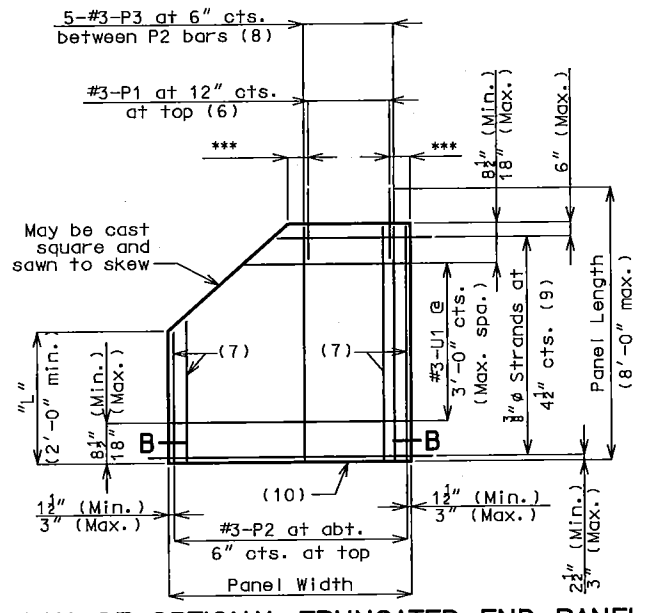
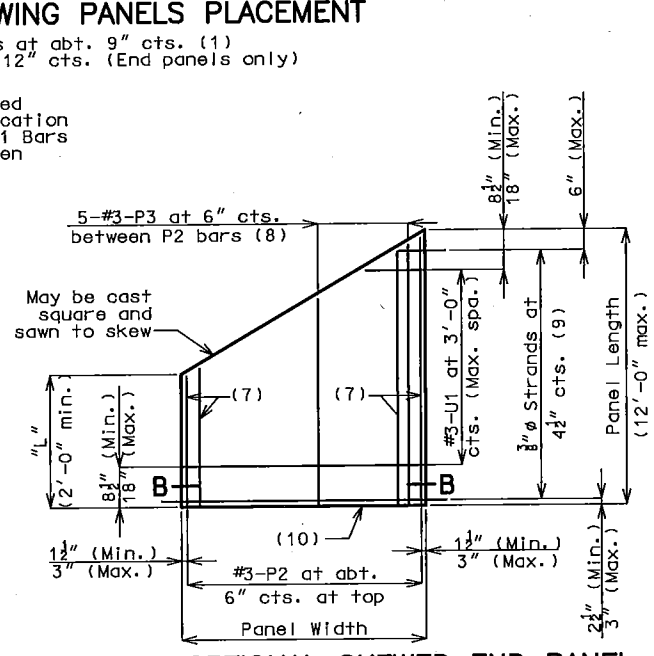
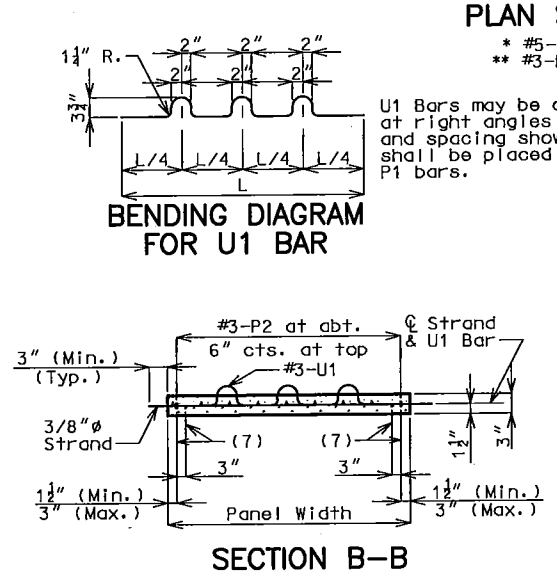
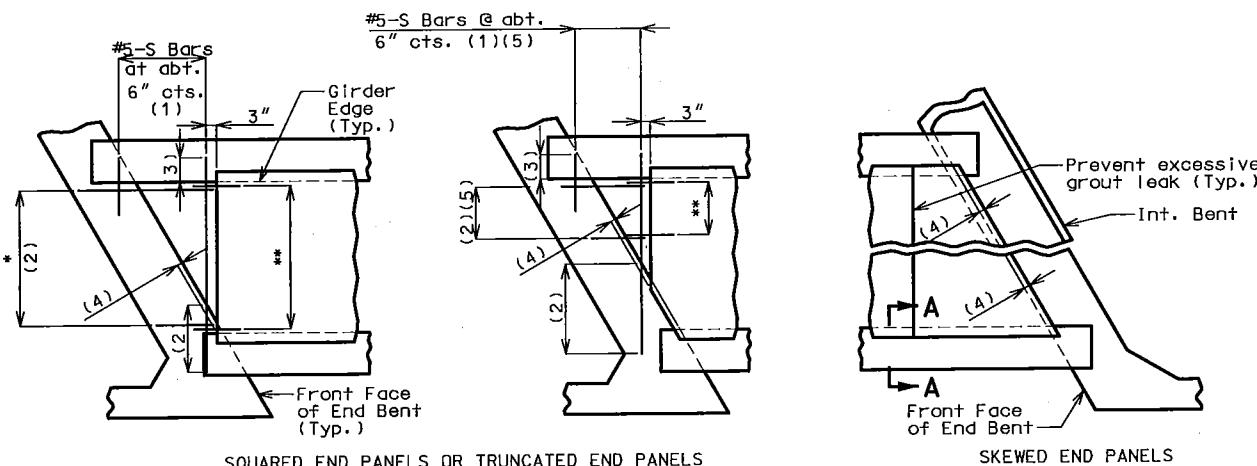


GIRDER DETAILS

LIBERTY ROAD BRIDGE REPLACEMENT
PROJECT NO. 2016-801-0
COLE COUNTY, MISSOURI



DESIGNED BY:	DAS
DRAWN BY:	TAA
APPROVED BY:	TCK
DATE:	SEPTEMBER 2016
DRAWING NO:	
SHEET NO:	14 of 31



Joint Filler Dimensions

Width	Height	
	Min.	Max.
1 1/2"	1"	2"

General Notes:

Prestressed Panels:
 Concrete for prestressed panels shall be Class A-1 with $f'_c = 6,000$ psi, $f'_{ci} = 4,000$ psi.

The top surface of all panels shall receive a scored finish with a depth of scoring of 1/8" perpendicular to the prestressing strands in the panels.

Prestressing tendons shall be high-tensile strength, uncoated, seven-wire, low-relaxation strands for prestressed concrete in accordance with AASHTO M 203 Grade 270, with nominal diameter of strand = 3/8" and nominal area = 0.085 sq.in. and minimum ultimate strength = 22.95 kips (270 ksi). Larger strands may be used with the same spacing and initial tension.

Initial prestressing force = 17.2 kips/strand.

The method and sequence of releasing the strands shall be shown on the shop drawings.

Suitable anchorage devices for lifting panels may be cast in panels, provided the devices are shown on the shop drawings and approved by the engineer. Panel lengths shall be determined by the contractor and shown on the shop drawings.

When squared end panels are used at skewed bents, the skewed portion shall be cast full depth. No separate payment will be made for additional concrete and reinforcing required.

Support from diaphragm forms is required under the optional skewed end until cast-in-place concrete has reached 3,000 psi compressive strength.

Prestressed panels shall be brought to saturated surface-dry (SSD) condition just prior to the deck pour. There shall be no free standing water on the panels or in the area to be cast.

The prestressed panel quantities are not included in the table of estimated quantities for the slab.

Reinforcing Steel:
 All dimensions are out to out.

Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.

Minimum clearance to reinforcing steel shall be 1 1/2", unless otherwise shown.

If U1 bars interfere with placement of slab steel, U1 loops may be bent over, as necessary, to clear slab steel.

Deformed welded wire reinforcement (WWR) providing a minimum area of reinforcing perpendicular to strands of 0.22 sq in./ft, with spacing parallel to strands sufficient to ensure proper handling, may be used in lieu of the #3-P2 bars shown. Wire diameter shall not be larger than 0.375 inch. The above alternative reinforcement criteria may be used in lieu of the #3-P3 bars, when required, and placed over a width not less than 2 feet.

The following reinforcing steel shall be tied securely to the strands with the following maximum spacing in each direction:
 #3-P2 bars at 16 inches.
 WWR at 24 inches.

The #3-U1 bars shall be tied securely to #3-P2 bars, to WWR or to strands (when placed between P1 bars) at about 3-foot centers.

Minimum reinforcement steel length shall be 2'-0".

All reinforcement other than prestressing strands shall be epoxy coated.

Precast panels may be in contact with stirrup reinforcing in diaphragms.

S-bars are not listed in the bill of reinforcing.

Cost of S-bars will be considered completely covered by the contract unit price for the slab.

Joint Filler:
 Joint filler shall be preformed fiber expansion joint material in accordance with Sec 1057 or expanded or extruded polystyrene bedding material in accordance with Sec 1073.

Use Slab Haunching Diagram on Sheet No. 18 for determining thickness of joint filler within the limits noted in the table of Joint Filler Dimensions.

Thicker material may be used on one or both sides of the girder to reduce cast-in-place concrete thickness to within tolerances.

The same thickness of preformed fiber expansion joint material shall be used under any one edge of any panel except at locations where top flange thickness may be stepped. The maximum change in thickness between adjacent panels shall be 1/4 inch. The polystyrene bedding material may be cut with a transition to match haunch height above top of flange.

Joint filler shall be glued to the girder. When thickness exceeds 1 1/2 inches, the joint filler shall be glued top and bottom. The glue used shall be the type recommended by the joint filler manufacturer.

Edges of panels shall be uniformly seated on the joint filler before slab reinforcement is placed.

Reference Notes:

Plan of Panels Placement:

(1) S-bars shown are bottom steel in slab between panels and used with squared and truncated end panels only.

(2) Extend S-bars 18 inches beyond the front face of end bents and int. bents for squared and truncated end panels only.

(3) Extend S-bars 9 inches beyond edge of girder (Typ.).

(4) End panels shall be dimensioned 1/2" min. to 1 1/2" max. from the inside face of diaphragm.

(5) For truncated end panels, use a min. of #5-S bars at 6" crossings in openings, or min. 4x4-W7xW7.

Plans of Panels:

(6) For end panels only, P1 bars shall be 2'-0" in length and embedded 12". P1 bars will not be required for panels at squared integral end bents.

(7) #3-P2 bars near edge of panel at bottom (under strands).

(8) Use #3-P3 bars if panel is skewed 45° or greater.

(9) Any strand 2'-0" or shorter shall have a #4 reinforcing bar on each side of it, centered between strands. Strands 2'-0" or shorter may then be debonded at the fabricator's option.

(10) Optional 1/2" x 45° Chamfer one or both sides at bottom.

Section A-A:

(11) Slab thickness over prestressed panels varies due to girder camber. In order to maintain minimum slab thickness, it may be necessary to raise the grade uniformly throughout the structure. No payment will be made for additional labor or materials required for necessary grade adjustment.

(12) Contractor shall ensure proper consolidation under and between panels.

(13) At the contractor's option, the variation in slab thickness over prestressed panels may be eliminated or reduced by increasing and varying the girder top flange thickness. Dimensions shall be shown on the shop drawings.

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

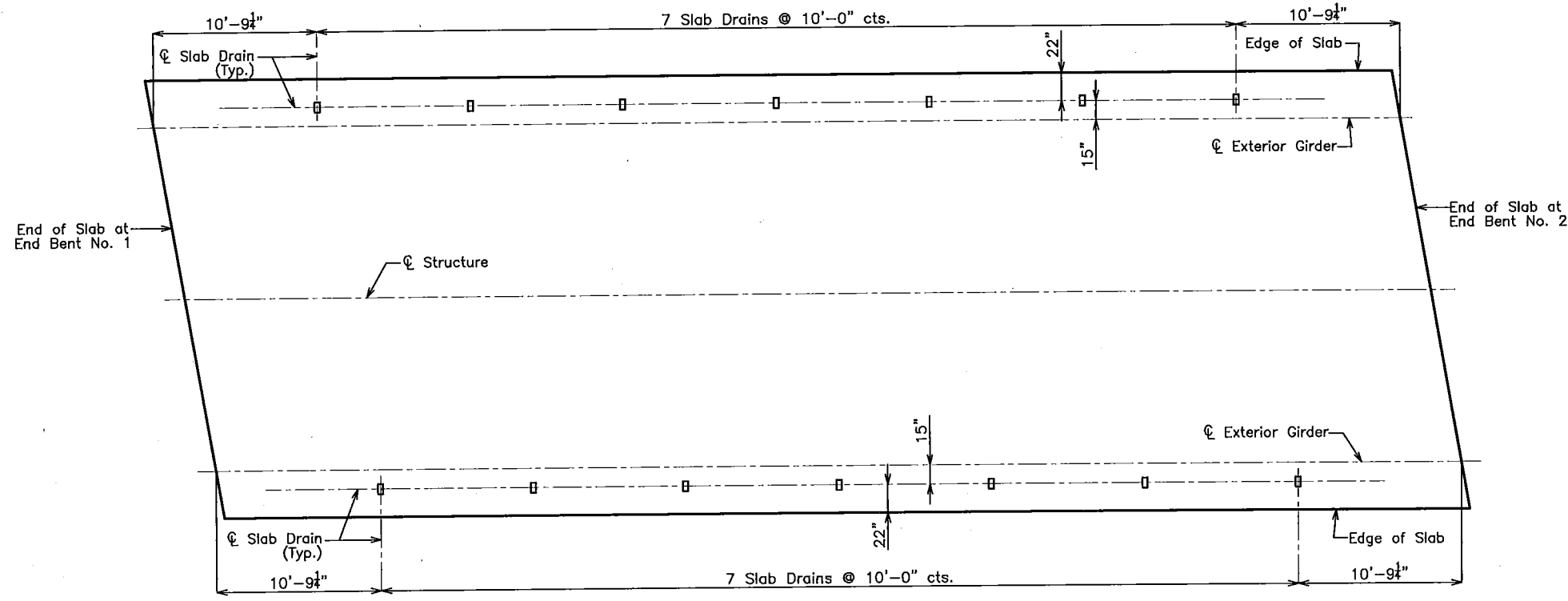
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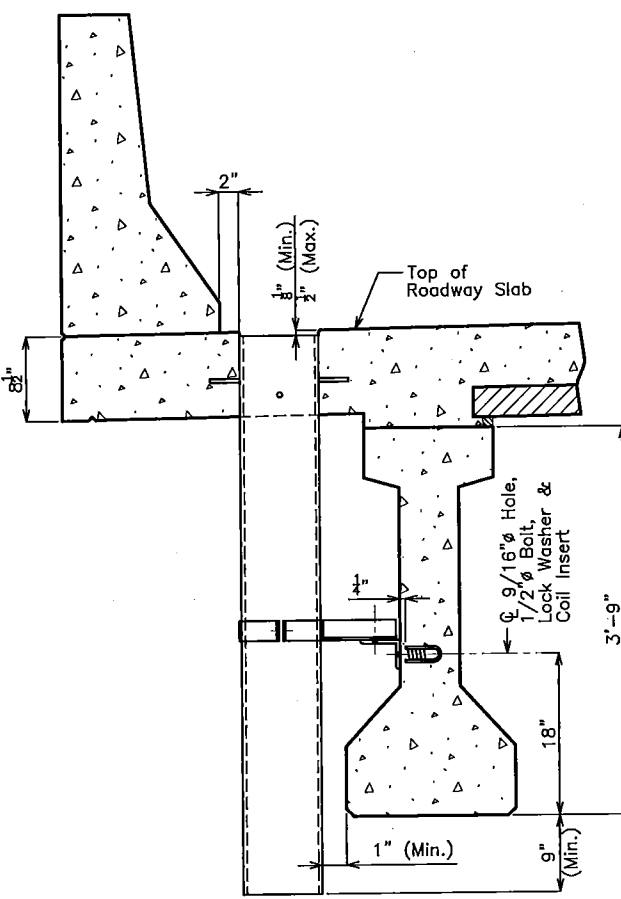
DETAILS OF PRESTRESSED PANELS
 LIBERTY ROAD BRIDGE REPLACEMENT
 PROJECT NO. 2016-801-0
 COLE COUNTY, MISSOURI

STATE OF MISSOURI
 DAVID ANDREW STRATMANN
 NUMBER PE-2004000848
 PROFESSIONAL ENGINEER

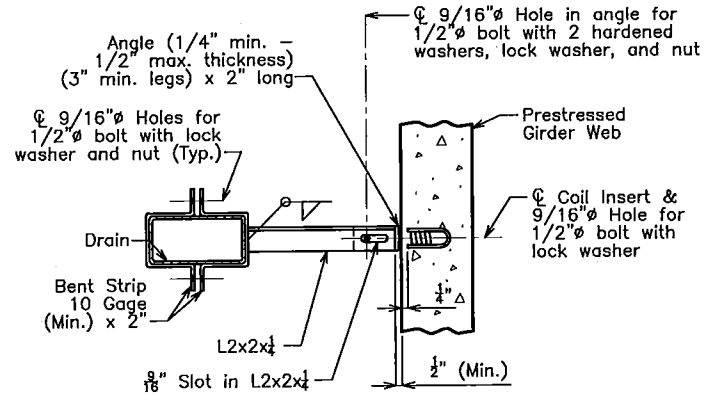
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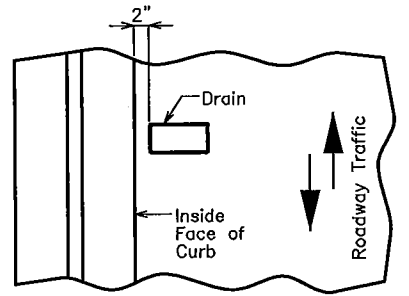
PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS



PART SECTION NEAR DRAIN



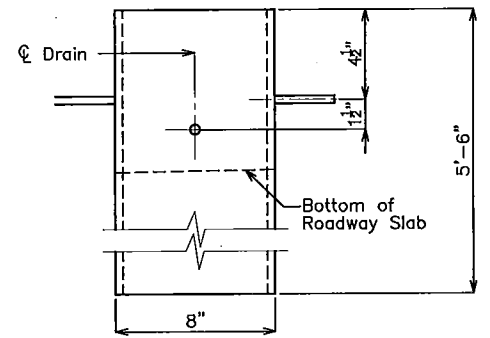
PART SECTION SHOWING BRACKET ASSEMBLY



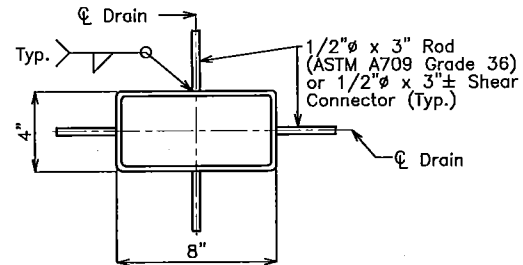
PART PLAN OF SLAB AT DRAIN

SLAB DRAIN DETAILS

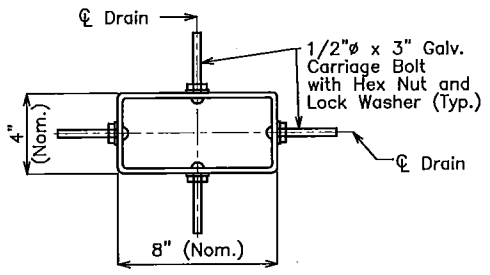
Note: This drawing is not to scale. Follow dimensions.



ELEVATION OF DRAIN



PLAN OF STEEL DRAIN



PLAN OF OPTIONAL FRP DRAIN

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 ASTM A153.

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

The coil insert required for the bracket assembly attachment shall be located on the prestressed girder 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 girder web shall be supplied by the prestressed girder 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.

No additional payment will be made for this substitution.

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SLAB DRAIN DETAILS

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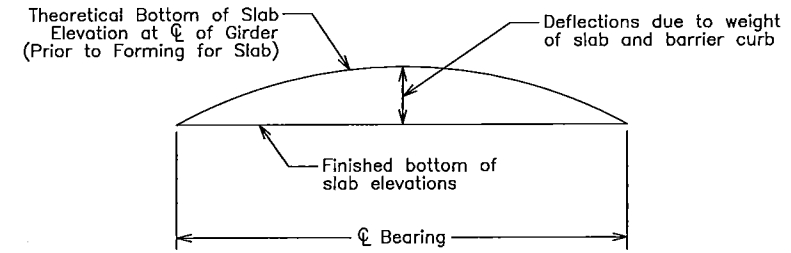


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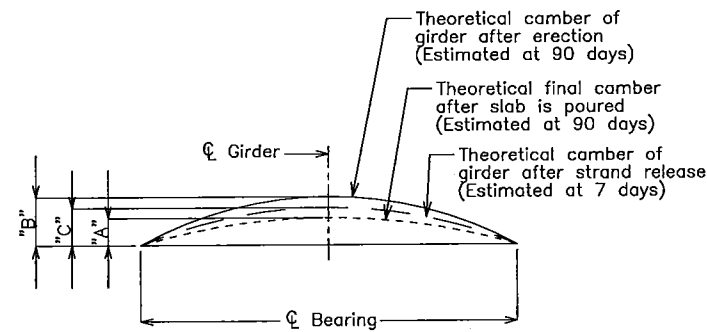
Last edit on: Aug 11, 2016 by: DAB01357 Drawing Name: V:\P\08\15937\15937.dwg User: DAB01357 Plot Date: 9/8/2016 11:26:21 AM

Theoretical Bottom of Slab Elevations at C of Girder (Prior to Forming for Slab) **											
	Span (1-2) (79'-0" C brg. - C brg.)										
	C Brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	C Brg.
Girder No. 1	574.83	574.86	574.88	574.90	574.90	574.90	574.88	574.85	574.82	574.78	574.73
Girder No. 2	574.98	575.01	575.04	575.05	575.06	575.06	575.04	575.01	574.97	574.93	574.88
Girder No. 3	574.98	575.01	575.03	575.05	575.06	575.05	575.04	575.01	574.97	574.93	574.88
Girder No. 4	574.83	574.85	574.87	574.89	574.90	574.89	574.88	574.85	574.81	574.77	574.72

** Elevations are based on a constant slab thickness of 8 1/2" and include allowance for theoretical dead load deflections due to weight of slab (including precast panel) and barrier curb.



TYPICAL SLAB ELEVATIONS DIAGRAM



	Span (1-2)		
	"A"	"B"	"C"
Ext. Girder	1 5/8"	3"	1 7/8"
Int. Girder	1 1/2"		

Conversion factors for girder camber (Estimated at 90 days)

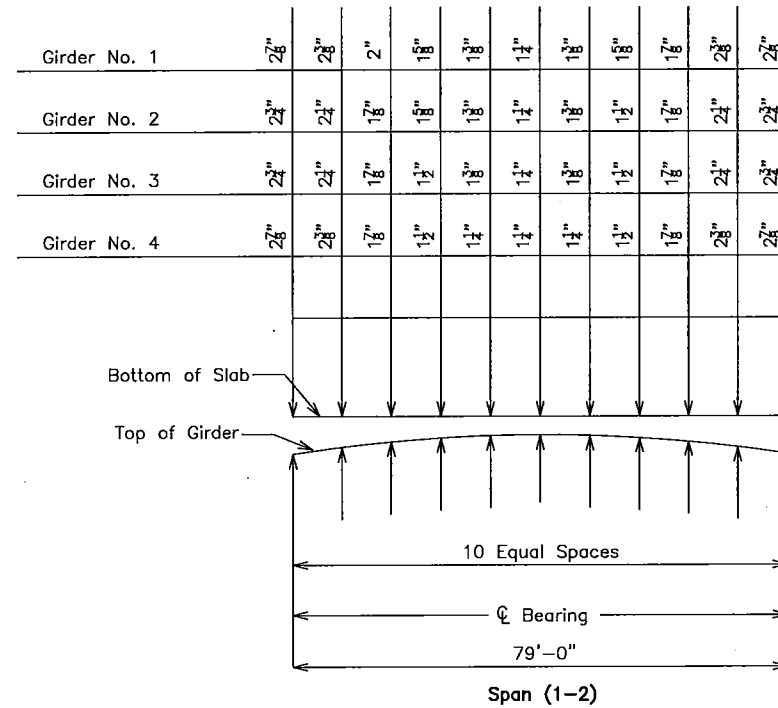
- 0.1 pt. = 0.314 x 0.5 pt.
- 0.2 pt. = 0.593 x 0.5 pt.
- 0.3 pt. = 0.813 x 0.5 pt.
- 0.4 pt. = 0.952 x 0.5 pt.

GIRDER CAMBER DIAGRAM

Notes:

If girder camber is different from that shown in the camber diagram, adjustment of the slab haunches, an increase in slab thickness or a raise in grade uniformly throughout the structure shall be necessary. No payment will be made for additional labor or materials required for variation in haunching, slab thickness or grade adjustment.

Concrete in the slab haunches is included in the Estimated Quantities for Slab on Concrete I-Girder.



THEORETICAL SLAB HAUNCHING DIAGRAM

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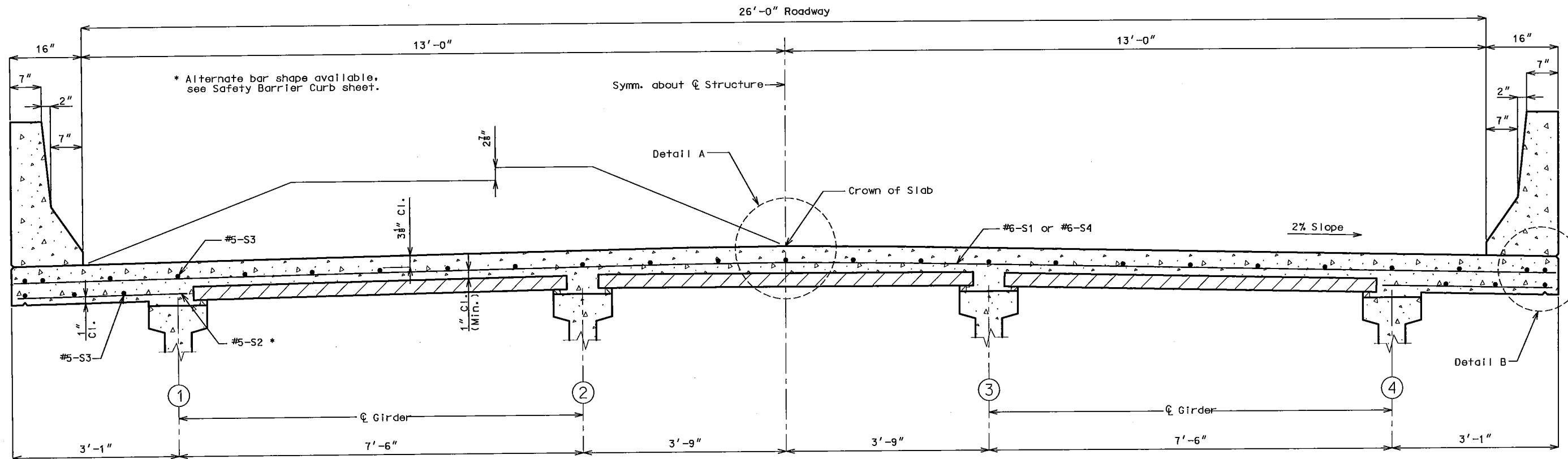
**DEAD LOAD DEFLECTION, CAMBER
SLAB HAUNCH & SLAB ELEVATION**

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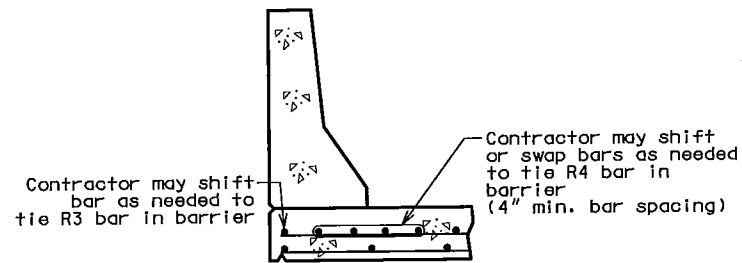


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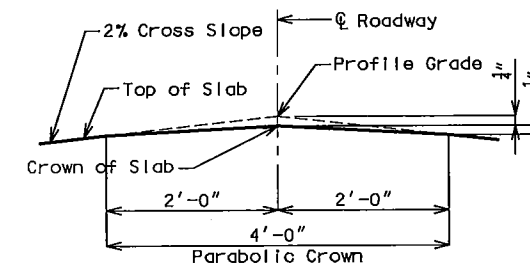
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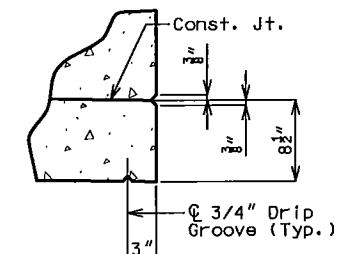
SECTION THRU SLAB



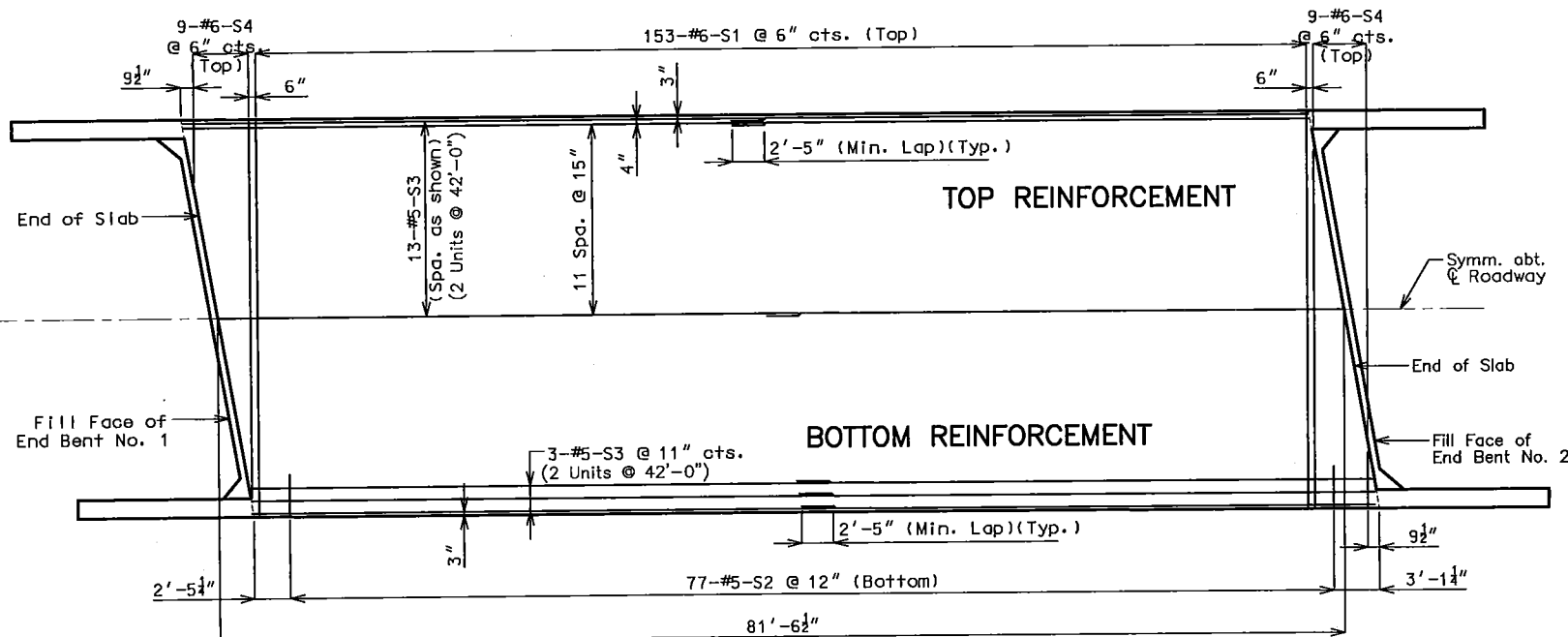
OPTIONAL SHIFTING TOP BARS AT BARRIER



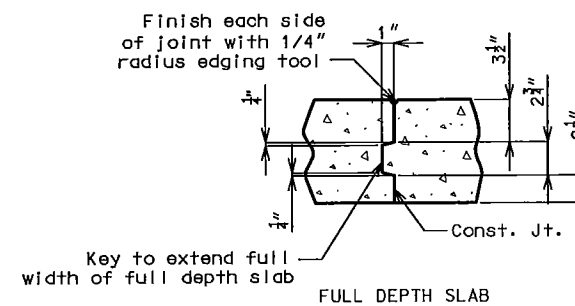
DETAIL A



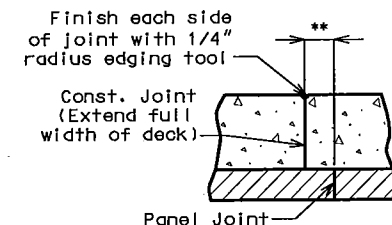
DETAIL B



PLAN OF SLAB SHOWING REINFORCEMENT



FULL DEPTH SLAB



SLAB ON PANELS

SLAB CONSTRUCTION JOINT (If needed)

** Adjust the construction joint to a clearance of 6 inches minimum from the panel joint.

Notes:

- For details of precast prestressed panels, see Sheet No. 16.
- For reinforcement of safety barrier curb not shown, see Sheet No. 20.
- For Theoretical Bottom of Slab Elevations, Girder Camber Diagram and Theoretical Slab Haunching Diagram, see Sheet No. 18.
- Longitudinal dimensions are horizontal.

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

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SLAB DETAILS

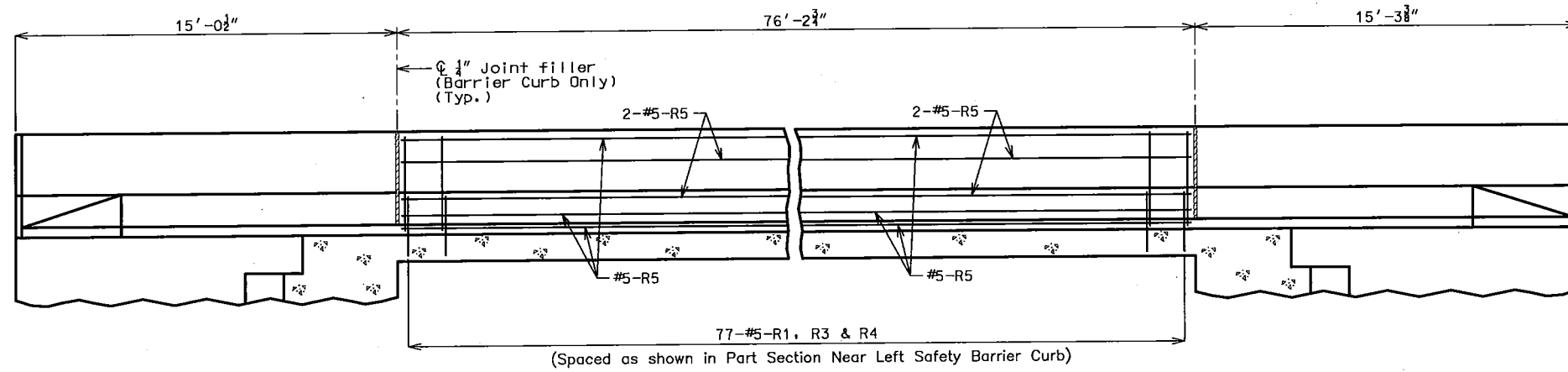
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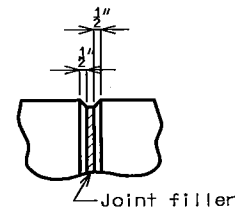
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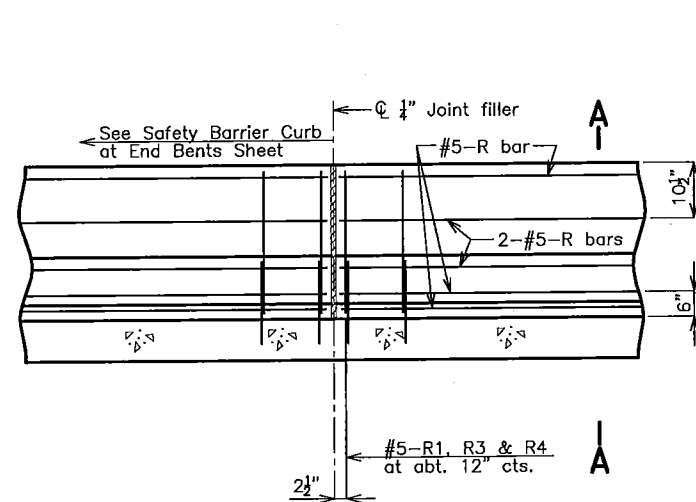
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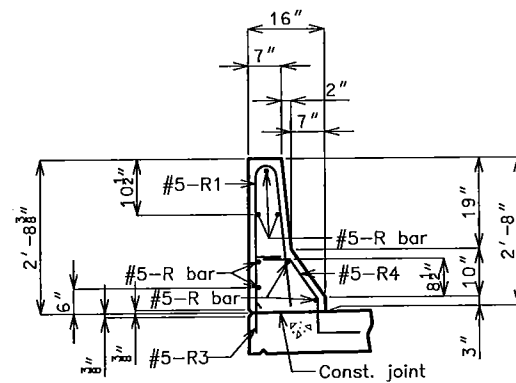
SPAN (1-2)
SECTION NEAR LEFT SAFETY BARRIER CURB
 (Right Safety Barrier Curb Similar by 180° rotation)
 Note: Longitudinal dimensions are horizontal.



FILLED JOINT DETAIL

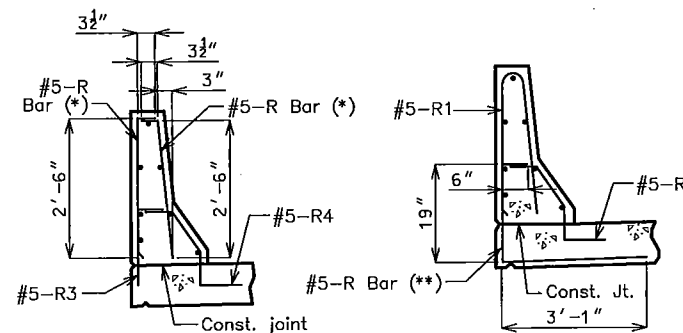


PART ELEVATION OF SAFETY BARRIER CURB
 (CAST-IN-PLACE CONVENTIONAL FORMING)



SECTION A-A

Notes:
 Use a minimum lap of 3'-1" for #5 horizontal safety barrier curb bars.
 The cross-sectional area above the slab = 2.27 sq. ft.



R-BAR PERMISSIBLE ALTERNATE SHAPE

(*) 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.)
 (**) The R3 bar and #5 bottom transverse slab bar in cantilever (P/S panels only) combination may be furnished as one bar as shown, at the contractor's option.

GENERAL NOTES:

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

All exposed edges of safety barrier curb 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 Safety Barrier Curb per linear foot.

Concrete in the safety barrier curb shall be Class B-1.

Measurement of safety barrier curb 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 safety barrier curb as shown on Missouri Standard Plans 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 Safety Barrier Curb.

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

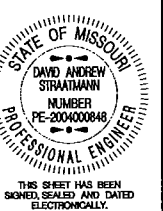
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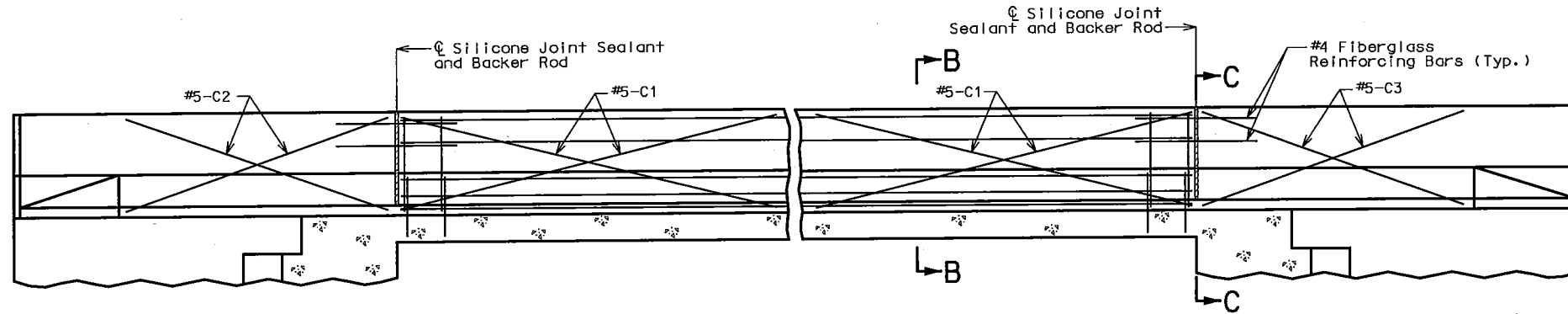
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DETAILS OF SAFETY BARRIER CURB

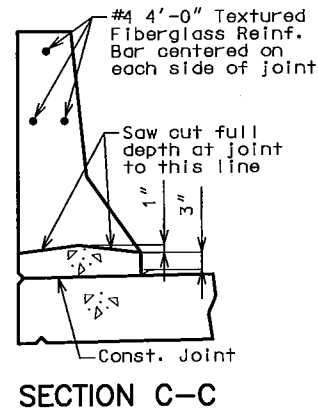
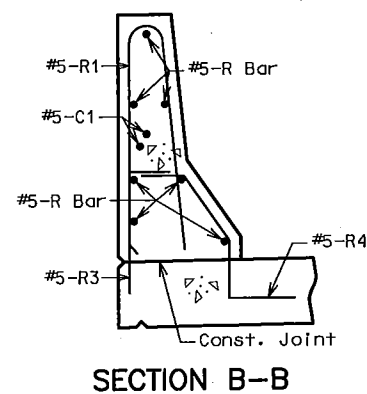
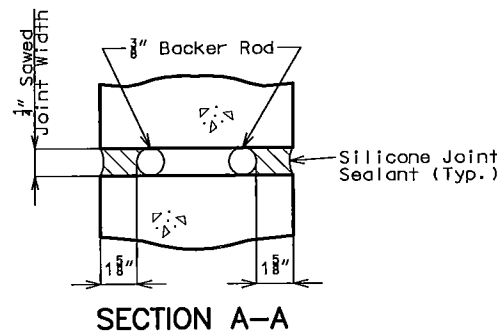
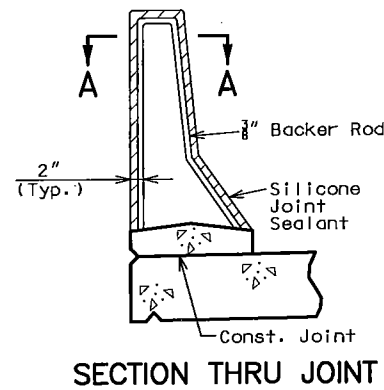
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TYPICAL ELEVATION OF LEFT SAFETY BARRIER CURB AT SUPPORT LOCATIONS
(Right Safety Barrier Curb similar by 180° rotation.)



GENERAL NOTES:

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

All exposed edges of safety barrier curb 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 Safety Barrier Curb per linear foot.

Concrete in the safety barrier curb shall be Class B-1.

Measurement of safety barrier curb 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 safety barrier curb as shown on Missouri Standard Plans 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 Safety Barrier Curb.

Joint sealant and backer rods shall be used on all slip-form barrier curbs instead of joint filler and shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

Plastic waterstop shall not be used with slip-form option.

For slip-form option, all sides of the safety barrier curb shall have a vertically broomed finish and the curb top shall have a transversely broomed finish.

C bars (slip-form option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge safety barrier curb.

Cost of silicone joint sealant and backer rod, complete in place, will be considered completely covered by the contract unit price for Safety Barrier Curb.

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

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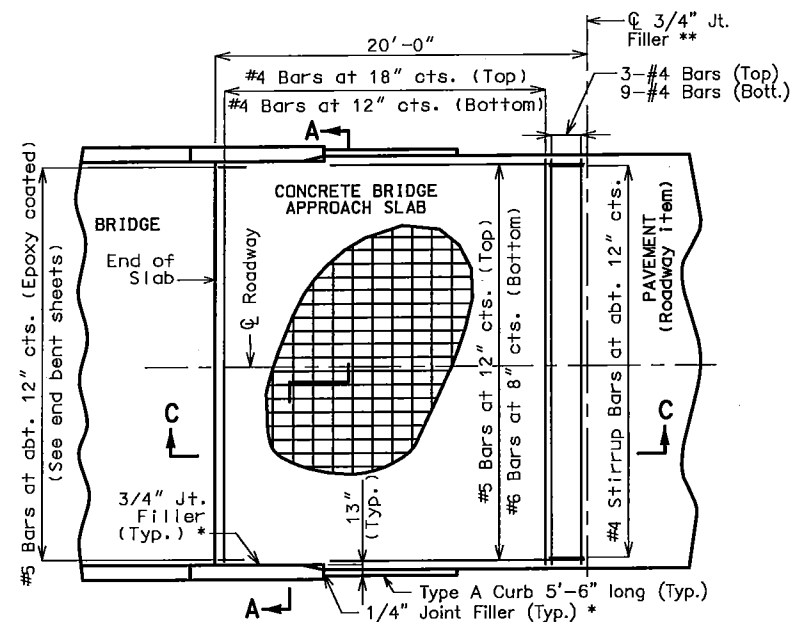
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OPTIONAL SLIP-FORM SAFETY BARRIER CURB
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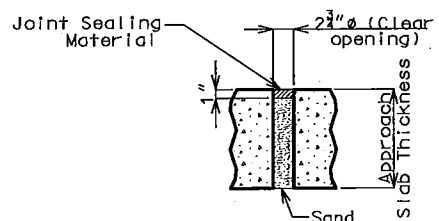


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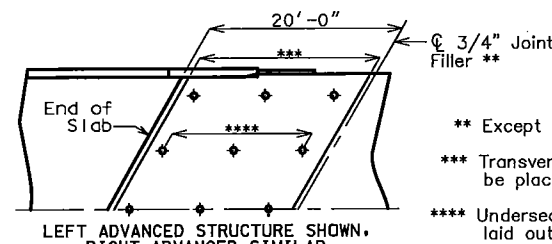
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PART PLAN OF SQUARED STRUCTURE

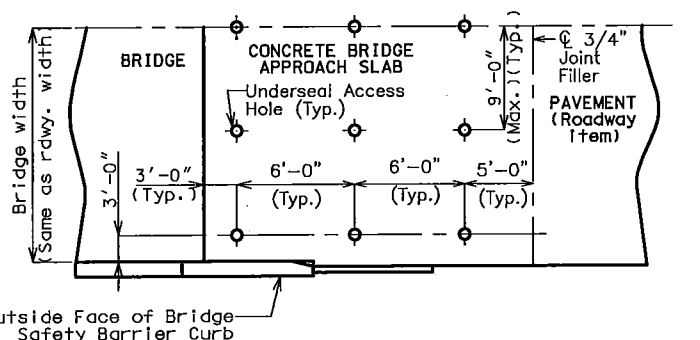


TYPICAL UNDERSEAL ACCESS HOLE DETAIL

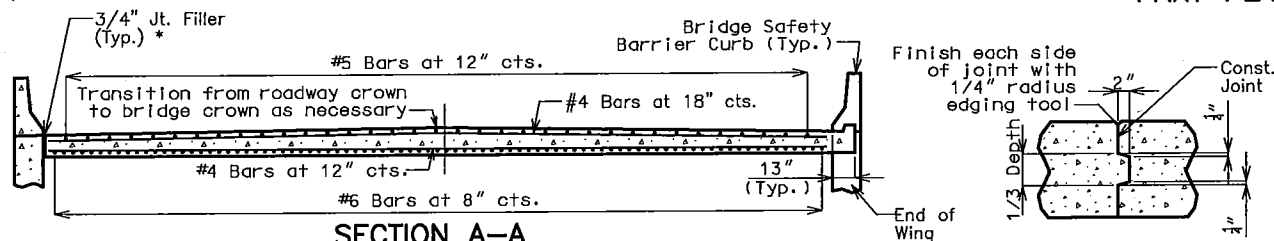


PART PLAN OF SKEWED STRUCTURE

- ** Except not allowed with asphalt pavement.
- *** Transverse reinforcing bars shall be placed parallel to end bents.
- **** Underseal access holes shall be laid out parallel to end bents.

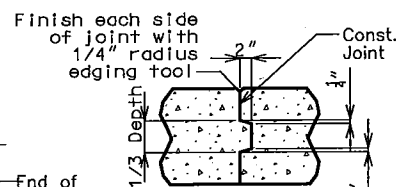


PART PLAN SHOWING UNDERSEAL ACCESS HOLES (Squared structure shown)

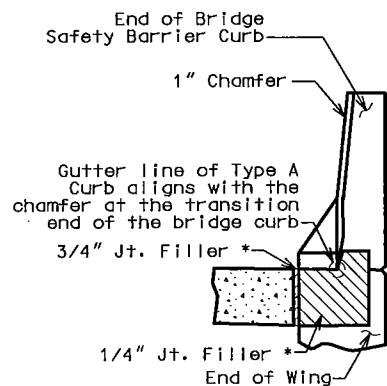


SECTION A-A

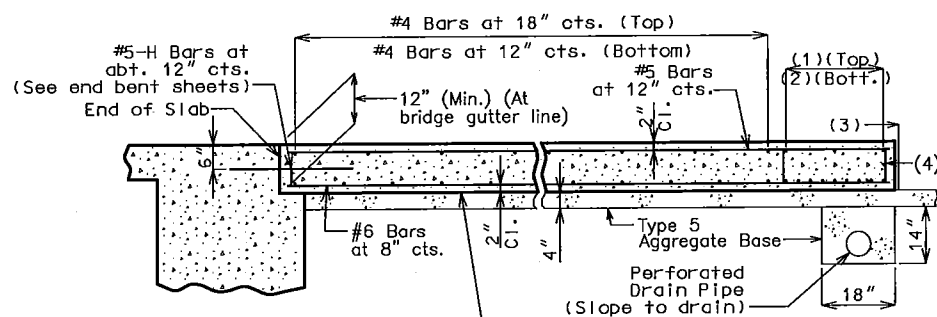
With the approval of the engineer, the contractor may crown the bottom of the approach slab to match the crown of the roadway surface.



CONCRETE CONST. JOINT DETAIL (If required)

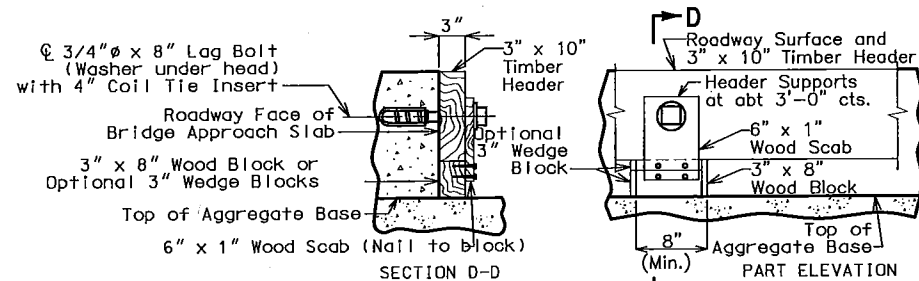


4" TYPE A CURB



SECTION C-C (Integral end bent)

- (1) 3-#4 Bars
- (2) 9-#4 Bars
- (3) 3/4" Jt. Filler **
- (4) #4 Stirrup Bars at abt. 12" cts.; 2'-0" x 8" (Min.) out to out; Actual length = 5'-10" (Min.); 90° stirrup hook at bottom; Stirrup height (8") and actual length vary due to crown.



DETAILS OF TIMBER HEADER

Remove timber header when concrete pavement is placed.

General Notes:

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

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

All concrete for the bridge approach slab shall be in accordance with Sec 503 (f'c = 4,000 psi).

The reinforcing steel in the bridge approach slab shall be epoxy coated Grade 60 with fy = 60,000 psi.

Longitudinal construction joints in bridge approach slab shall be aligned with longitudinal construction joints in bridge slab.

Minimum clearance to reinforcing steel shall be 1", unless otherwise shown.

The reinforcing steel in the bridge approach slab shall be continuous. The transverse reinforcing steel may be made continuous by lap splicing the #4 bars 23".

All joint filler shall be in accordance with Sec 1057 for preformed fiber expansion joint filler except as noted.

Payment for furnishing all materials, labor and excavation necessary to construct the concrete bridge approach slab, including the timber header, underdrain, Type 5 aggregate base, joint filler, and all other appurtenances and incidental work as shown on this sheet, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Minor Road) per square yard.

See Missouri Standard Plans Drawing 609.00 for details of Type A Curb.

* Seal joint between vertical face of bridge approach slab and wing with "Silicone Joint Sealant for Saw Cut and Formed Joints" in accordance with Sec 717.

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

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DETAILS OF BRIDGE APPROACH SLAB

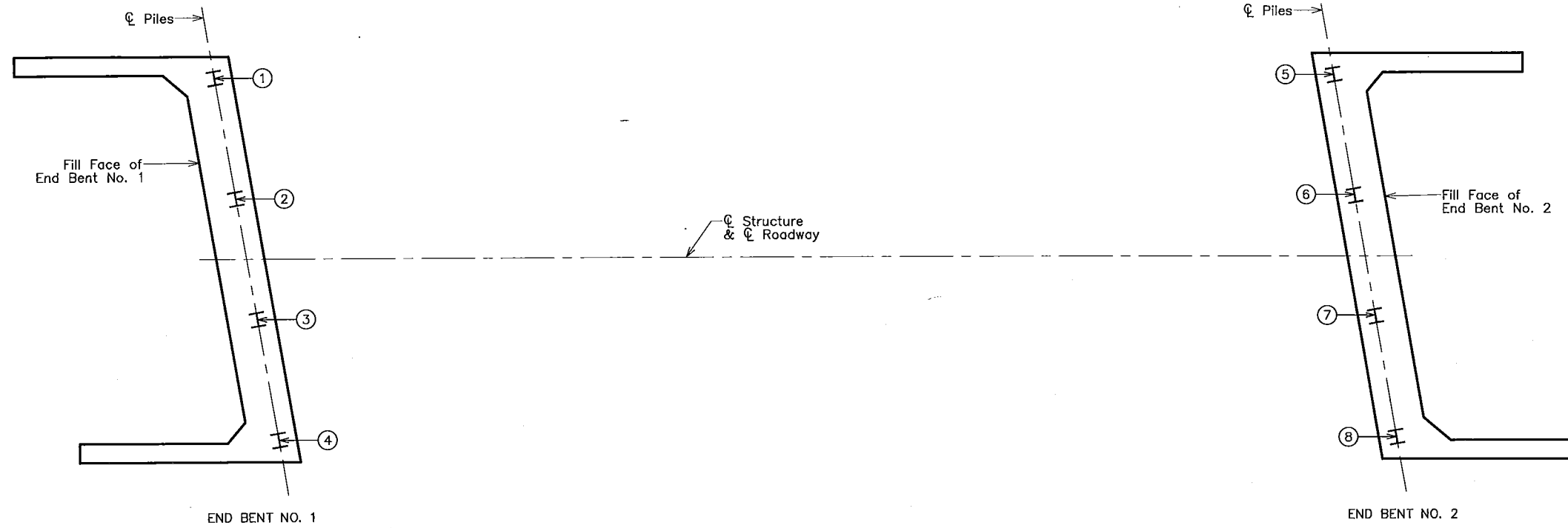
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STATE OF MISSOURI
 DAVID ANDREW STRATMANN
 NUMBER PE-200400848
 PROFESSIONAL ENGINEER

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

As-Built Pile Data			
Pile No.	Length in Place (ft)	Computed Nominal Axial Compressive Resistance (kips)	Remarks
			END BENT NO. 1
1			
2			
3			
4			

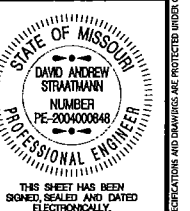
As-Built Pile Data			
Pile No.	Length in Place (ft)	Computed Nominal Axial Compressive Resistance (kips)	Remarks
			END BENT NO. 2
5			
6			
7			
8			

Note:
 Indicate remarks in the remarks column.
 A. Pile type and grade
 B. Batter (if other than shown on Bent Detail sheet.)
 C. Driven to practical refusal
 This sheet to be completed by County construction personnel.

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

BARTLETT & WEST
 1719 SOUTHRIDGE DRIVE, SUITE 100 - JEFFERSON CITY, MO 65109-4000
 MISSOURI CERTIFICATE OF AUTHORITY NO. 000167 - ENGINEERING
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AS-BUILT PILE DATA
 LIBERTY ROAD BRIDGE REPLACEMENT
 PROJECT NO. 2016-801-0
 COLE COUNTY, MISSOURI



THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.
 SEALED DATE: 09/08/16
 DESIGNED BY: DAS
 DRAWN BY: TAA
 APPROVED BY: TCK
 DESIGN PROJ.: 15937.400
 DATE: SEPTEMBER 2016
 DRAWING NO:
 SHEET NO: 25 of 31

Drawing Name: W:\Proj\15000\15937\400\AutoCad\Plan Set\15937_400_BR_as_built_drilled shaft.dwg Layout Name: Layout Plotted By: DAS01357 Plotted on: 9/8/2016 11:29:11 AM
 Last eSet on: Aug 4, 2016 by: DAS01357

BORING LOG NO. B-1

PROJECT: Liberty Road Bridge Replacement **CLIENT:** Bartlett and West
SITE: 7628 South Liberty Road
 Jefferson City, Missouri

DEPTH (FL)	ELEVATION (FL)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY TORVANE/HP (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS
0.3	109.5									
0.6	109									
4" of asphalt										
4" of gravel										
FILL - LEAN CLAY, gray and brown										
trace gravel										
12.0	98			16	2-3-3 N=6	1	2500 (HP)	23		
17.0	93			12	3-4-4 N=8	2	4500 (HP)	22		
17.0	93			8	5-5-5 N=10	3		13		
22.0	88			6	2-4-3 N=7	4	3000 (HP)	21		
25.0	85			6	9-17-21 N=38	5		17		

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic SPT Hammer

Advancement Method: Hollow-Stem Auger, NQ2 Rock Core
 Abandonment Method: Boring backfilled with soil cuttings upon completion.

See Exhibit A-4 for description of field procedures
 See Appendix B for description of laboratory procedures and additional data (if any).
 See Appendix C for explanation of symbols and abbreviations.
 Elevations measured in the field

Notes:

Water Level Observations: Groundwater not encountered

Boring Started: 6/7/2016 Boring Completed: 6/7/2016
 Drill Rig: CME-550 Driller: SB
 Project No.: 09165037 Exhibit: A-5

BORING LOG NO. B-1

PROJECT: Liberty Road Bridge Replacement **CLIENT:** Bartlett and West
SITE: 7628 South Liberty Road
 Jefferson City, Missouri

DEPTH (FL)	ELEVATION (FL)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY TORVANE/HP (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS
28.3	81.5			20	REC = 98% RQD = 27%	6				
30.0	80			58	REC = 97% RQD = 42%	7				
38.0	72			32	REC = 89% RQD = 72%	8				

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic SPT Hammer

Advancement Method: Hollow-Stem Auger, NQ2 Rock Core
 Abandonment Method: Boring backfilled with soil cuttings upon completion.

See Exhibit A-4 for description of field procedures
 See Appendix B for description of laboratory procedures and additional data (if any).
 See Appendix C for explanation of symbols and abbreviations.
 Elevations measured in the field

Notes:

Water Level Observations: Groundwater not encountered

Boring Started: 6/7/2016 Boring Completed: 6/7/2016
 Drill Rig: CME-550 Driller: SB
 Project No.: 09165037 Exhibit: A-5

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_09165037.GPJ TERRACON2015.GDT 24/8/16

Last edit: on Aug 11, 2016 by: DAS01357 Drawing Name: W:\Proj\150001\15937\15937_400\AutoCAD\Drawings\Boring Data Logs L2 Plotted By: DAS01357 Plotted on: 9/8/2016 11:29:48 AM

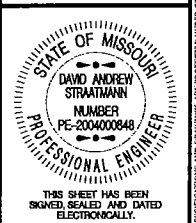
FOR BORING LOCATION, SEE SHEET NO. 9.

BORING LOGS

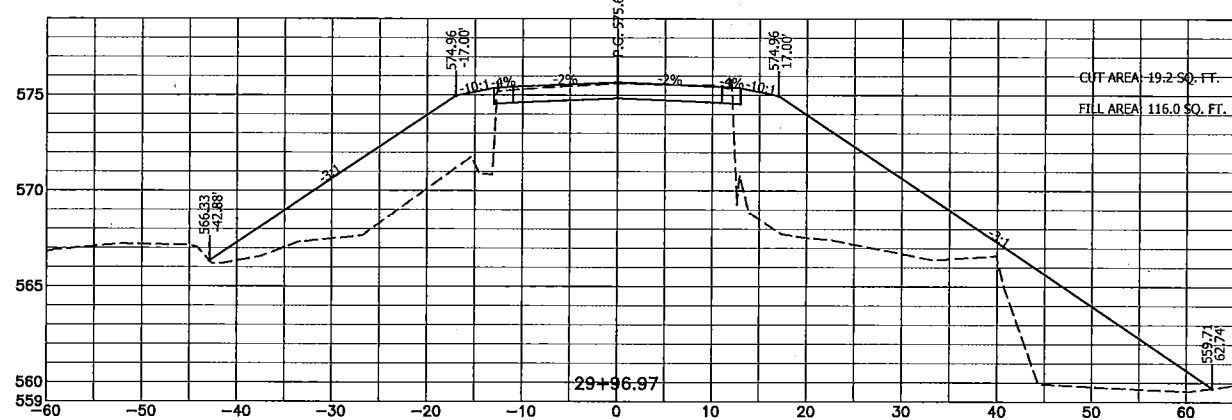
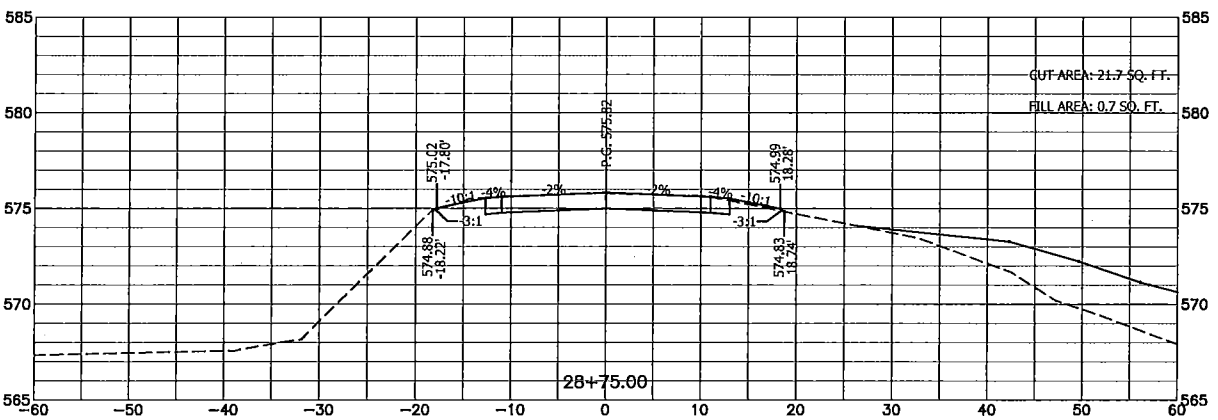
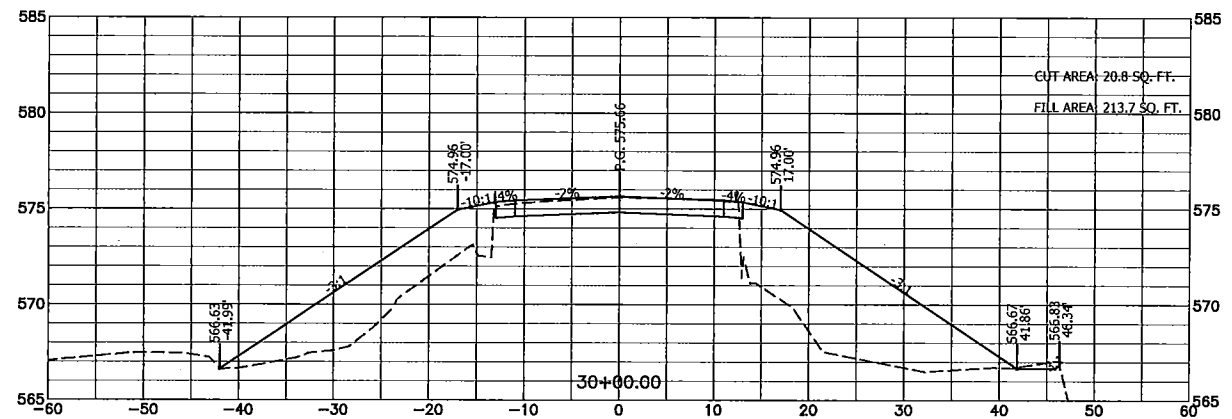
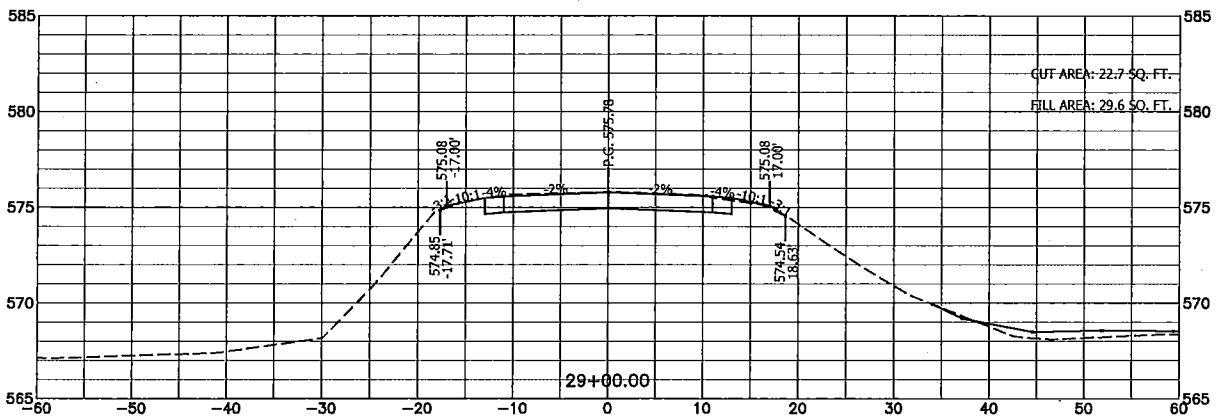
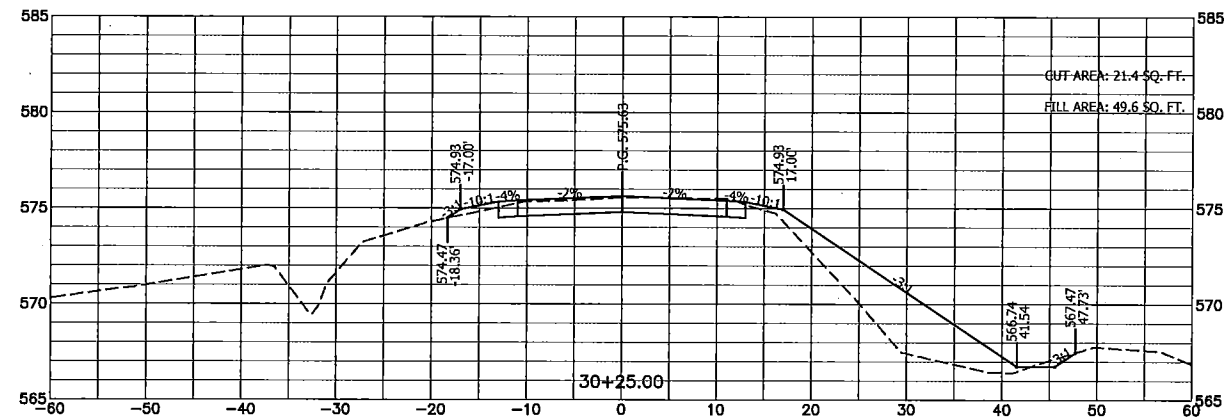
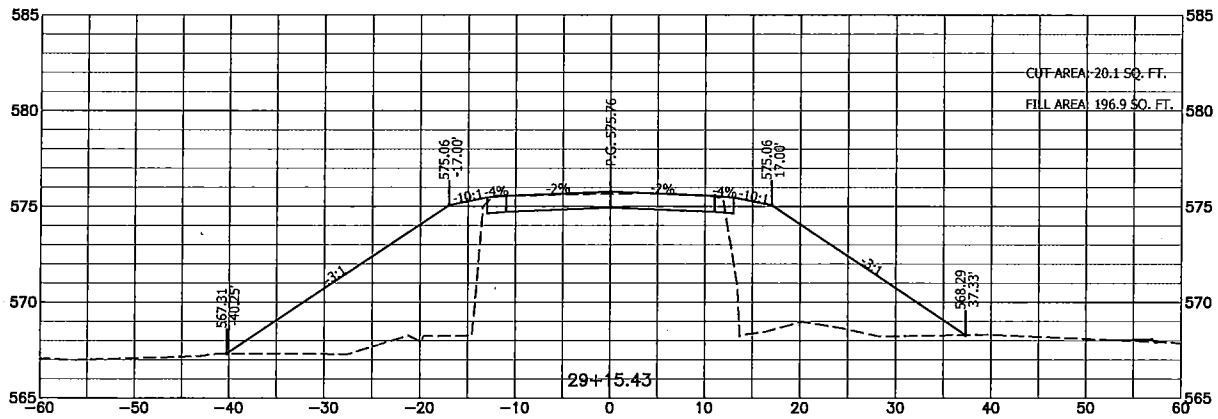
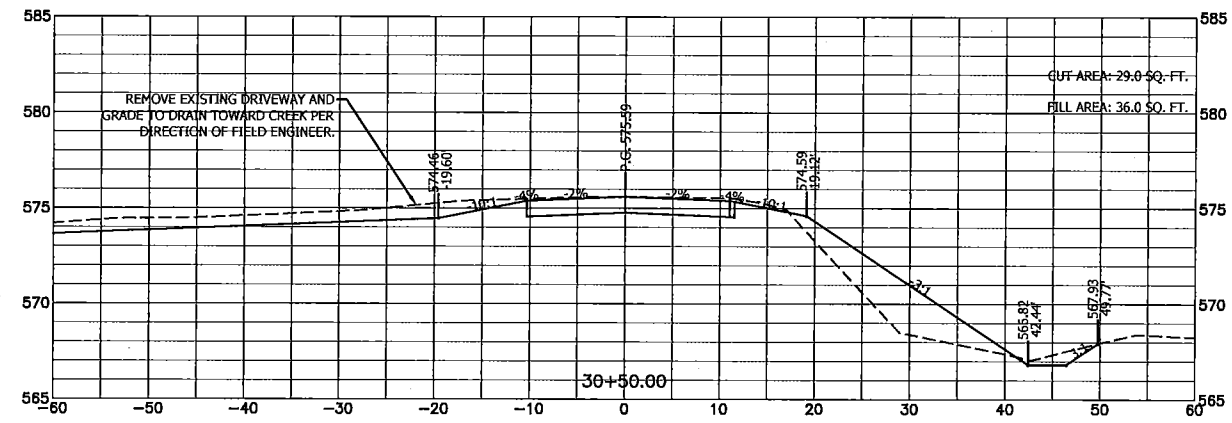
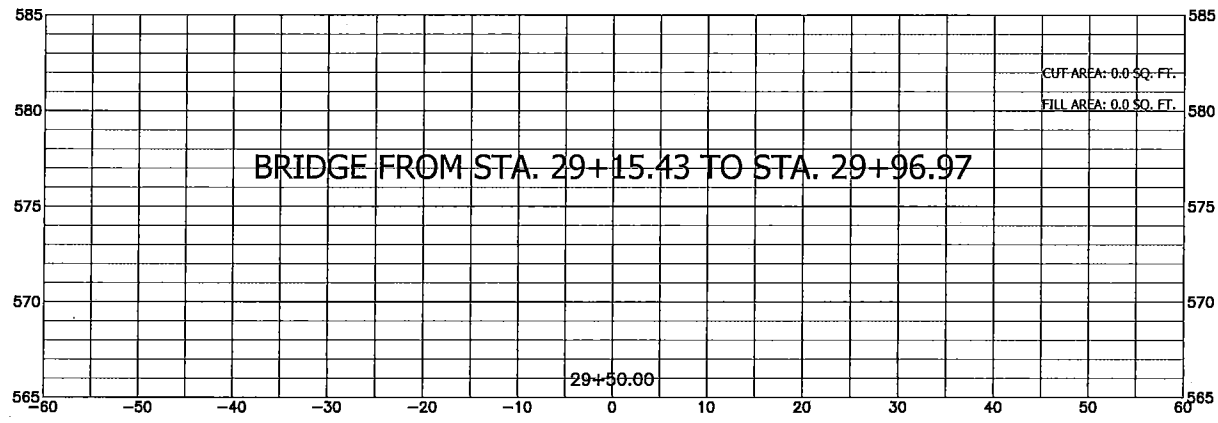
Note: This drawing is not to scale. Follow dimensions.



BORING DATA LOGS
 LIBERTY ROAD BRIDGE REPLACEMENT
 PROJECT NO. 2016-801-0
 COLE COUNTY, MISSOURI



DESIGNED DATE:	09/08/16
DESIGNED BY:	DAS
DRAWN BY:	TAA
APPROVED BY:	TCK
DESIGN PROJ:	15937.400
DATE:	SEPTEMBER 2016
DRAWING NO:	
SHEET NO:	26 of 31



Date: Aug 8, 2016 by: JCD1272 Drawing Name: W:\Proj\15937\15937_400_C-CROSS SECTION SHEETS.dwg Layout Name: S28+75 to 30+50 Plotted By: AKD1272 Plotted on: 9/7/2016 5:41:23 PM

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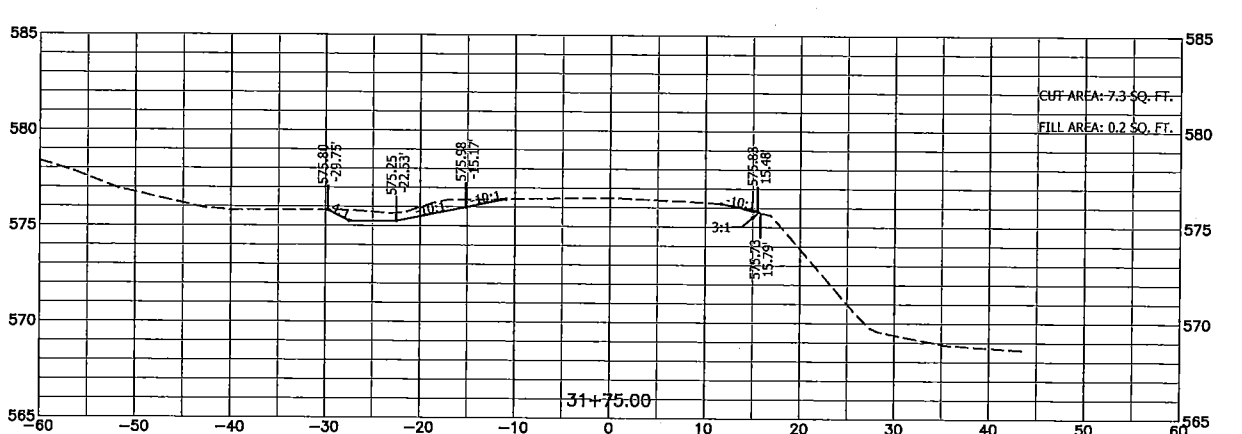
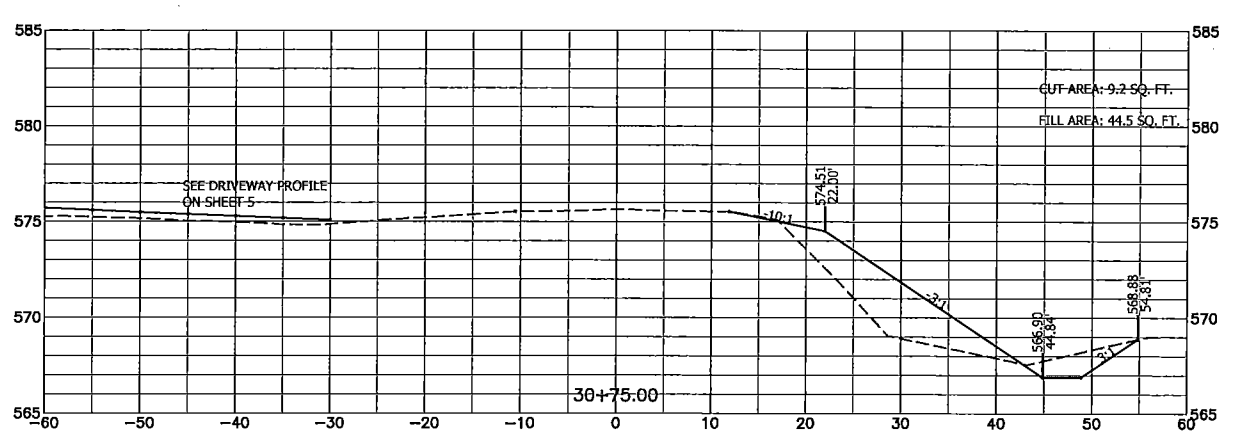
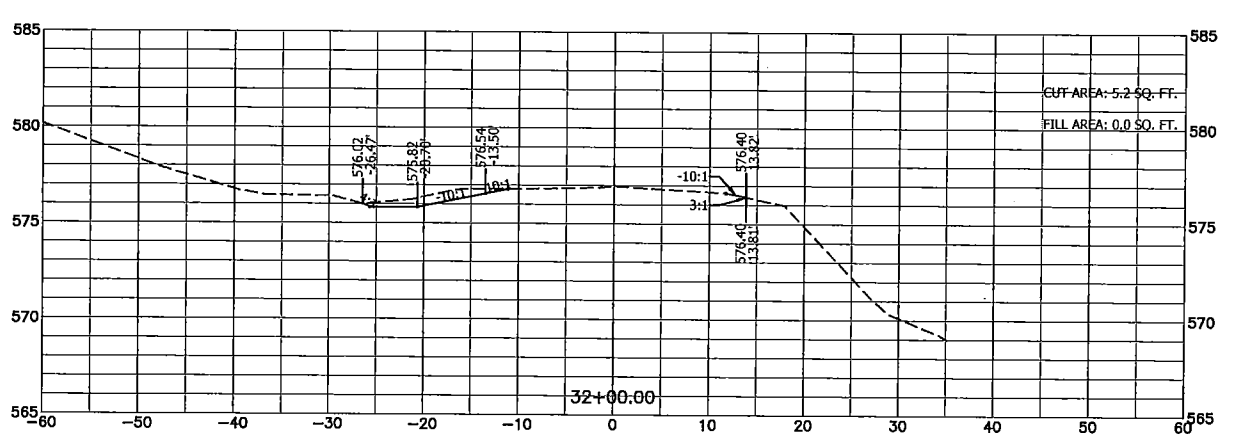
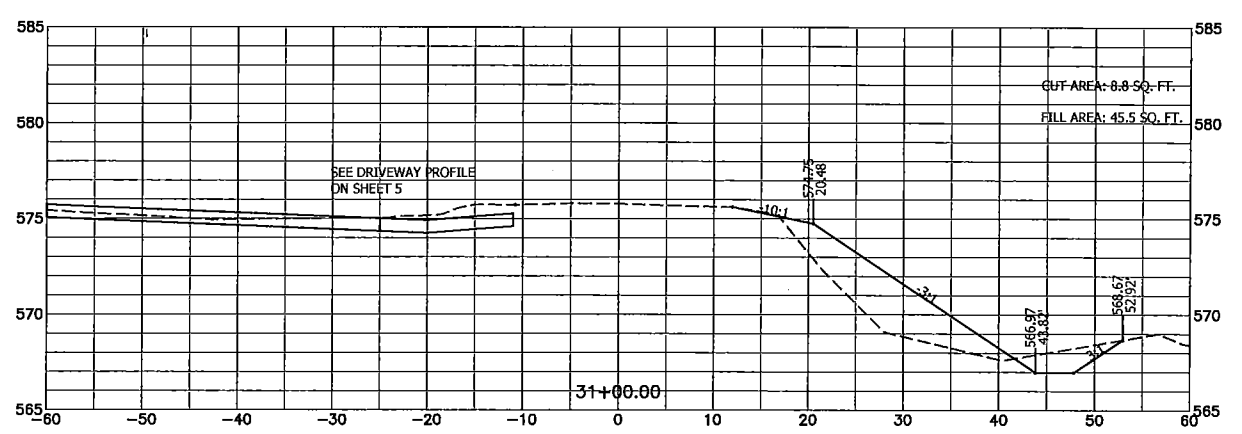
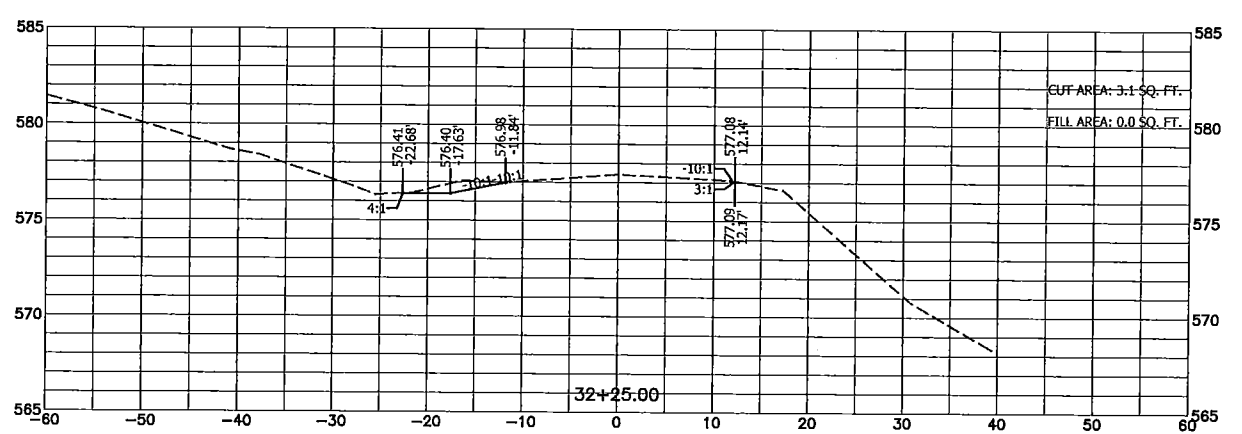
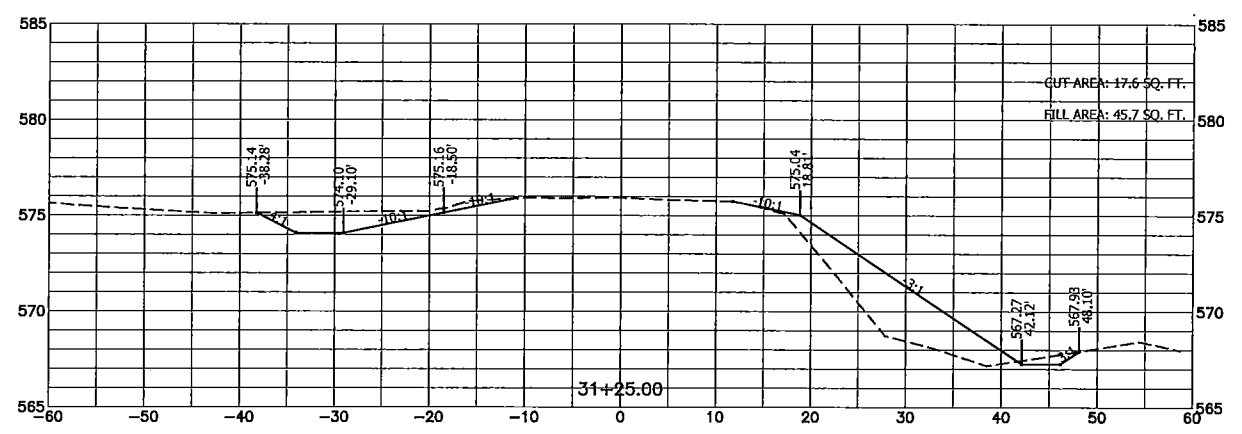
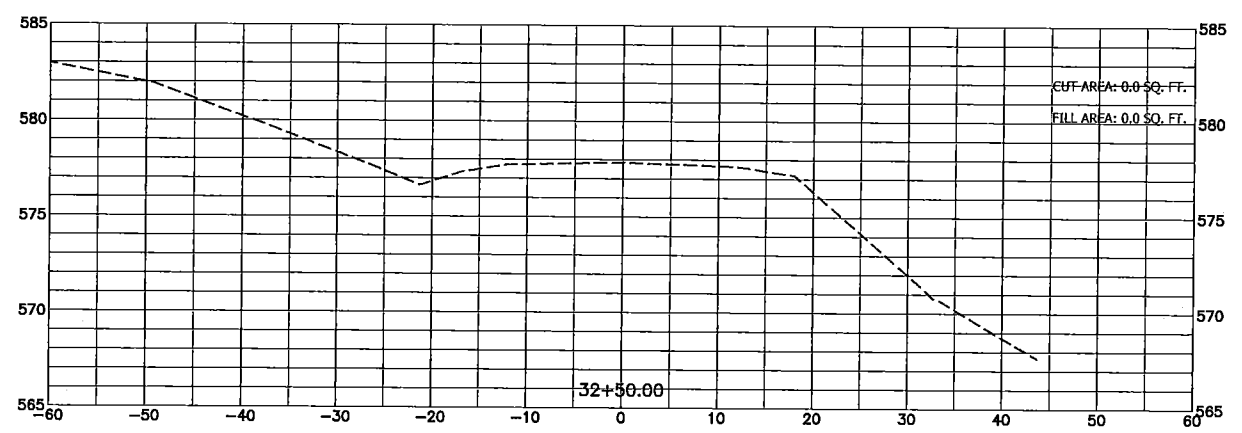
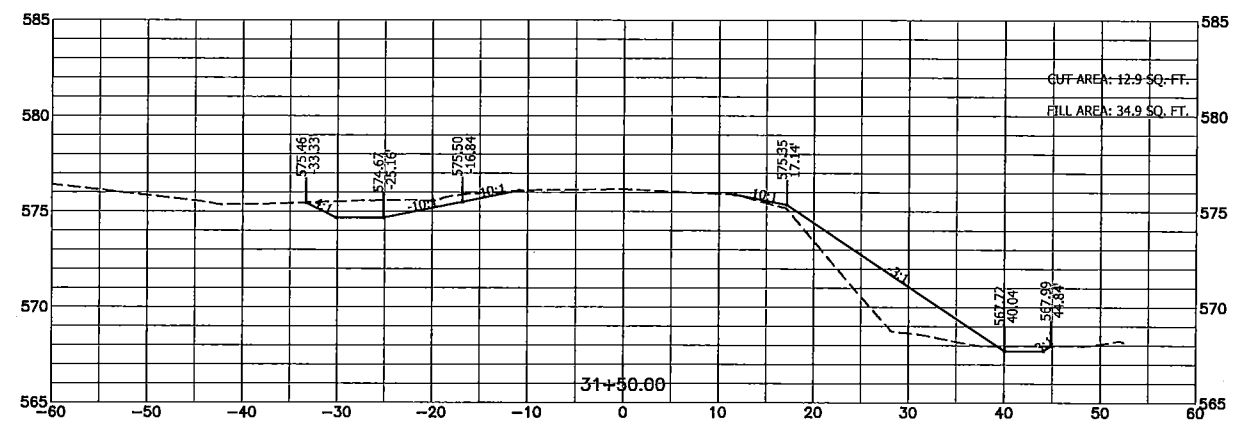
CROSS SECTIONS
LIBERTY ROAD
STA. 28+75 TO STA. 30+50
 LIBERTY ROAD BRIDGE REPLACEMENT
 PROJECT NO. 2016-801-0
 COLE COUNTY, MISSOURI



THIS SHEET HAS BEEN
 SIGNED, SEALED AND DATED
 ELECTRONICALLY.

DESIGNED BY:	JDR
DRAWN BY:	JDR
APPROVED BY:	TCK
DESIGN PROJ.:	15937.400
DATE:	SEPTEMBER 2016
DRAWING NO.:	
SHEET NO.:	29 of 31

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NO.	DATE	DESCRIPTION

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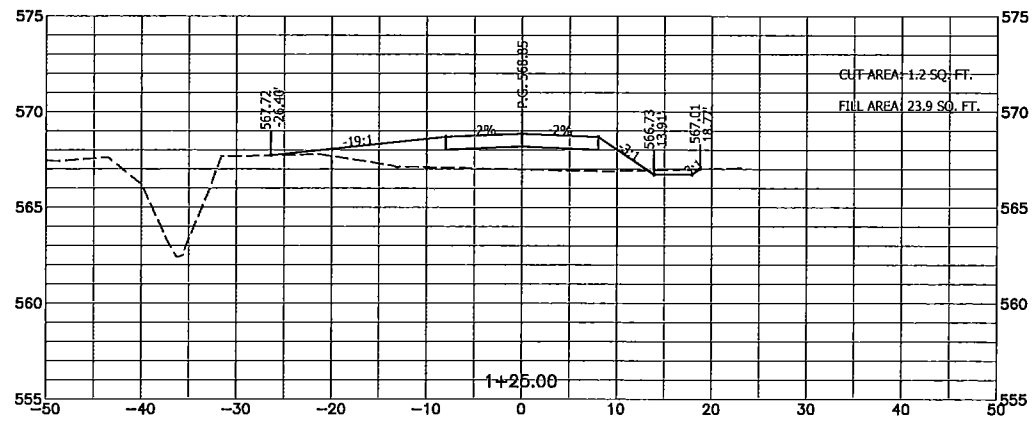
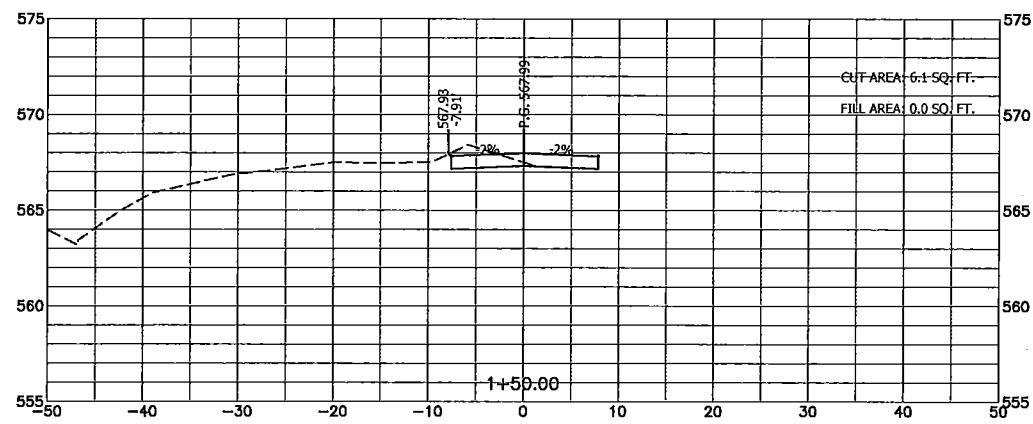
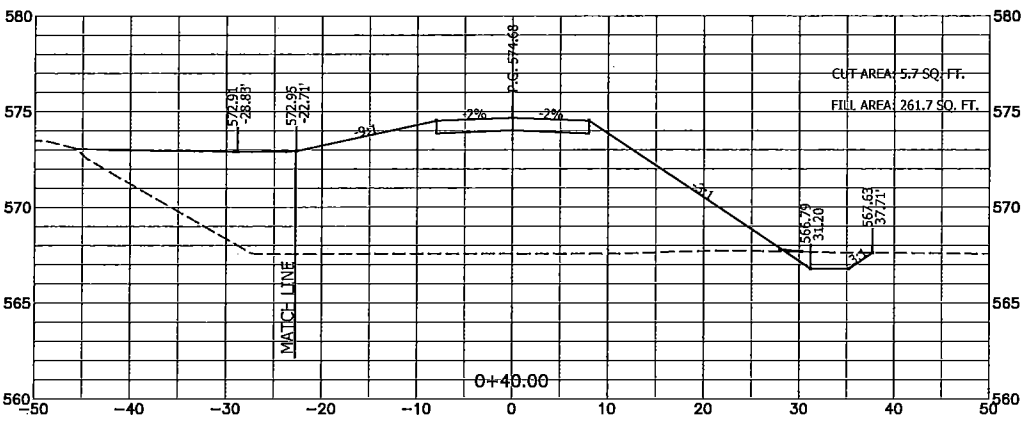
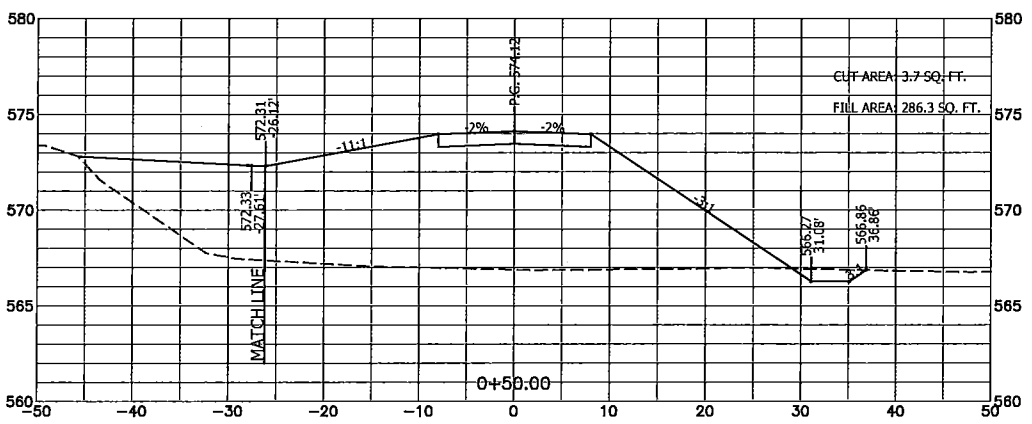
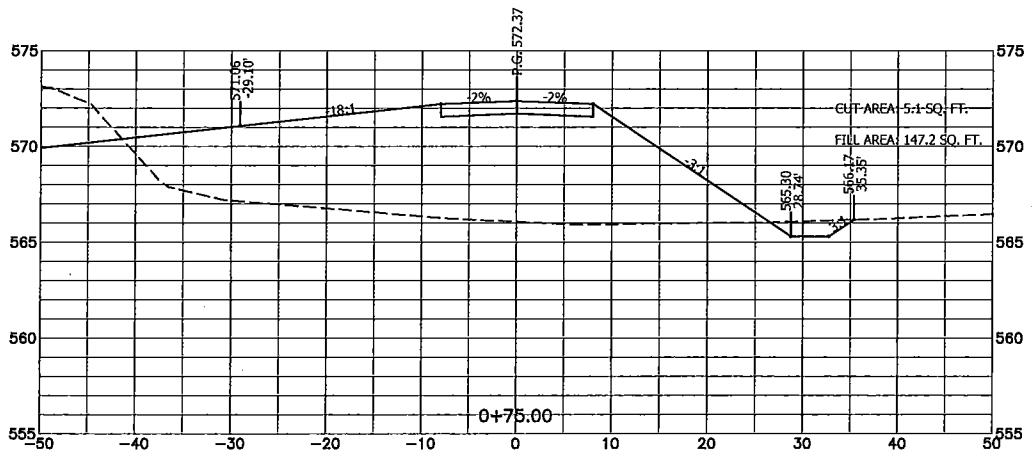
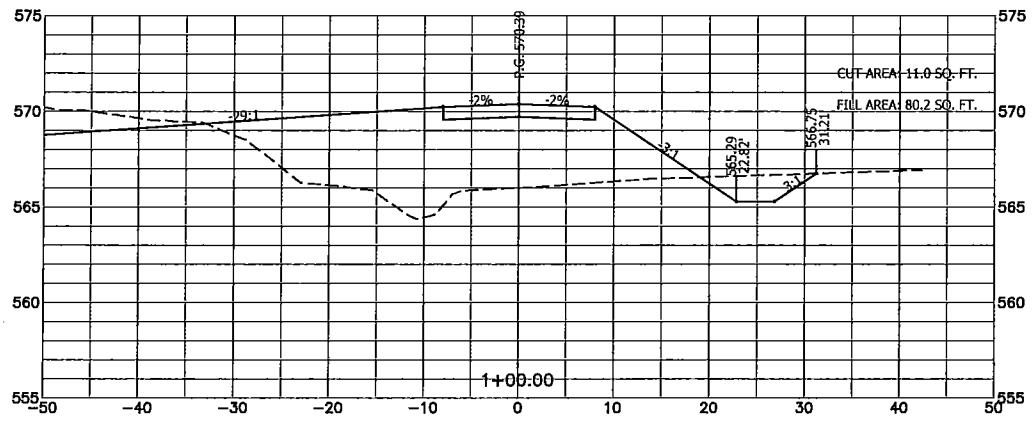
CROSS SECTIONS
LIBERTY ROAD
STA. 30+75 TO STA. 32+50
 LIBERTY ROAD BRIDGE REPLACEMENT
 PROJECT NO. 2016-801-0
 COLE COUNTY, MISSOURI

STATE OF MISSOURI
TODD C. KEMPER
 PROFESSIONAL ENGINEER
 NUMBER PE-2010000690

THIS SHEET HAS BEEN
 SIGNED, SEALED AND DATED
 ELECTRONICALLY.

SEALED DATE:	09/08/16
DESIGNED BY:	JDR
DRAWN BY:	JDR
APPROVED BY:	TCK
DESIGN PROJ. NO.:	15937.400
DATE:	SEPTEMBER 2016
DRAWING NO.:	
SHEET NO.:	30 of 31

Late edit: Aug 8, 2016 10:40 AM. Drawing Name: W:\Proj\15937.400_CROSS SECTION SHEETS.dwg Layout Name: 30+75 to 32+50 Plotted By: AK01272 Plotted on: 9/7/2016 5:41:27 PM



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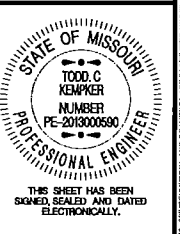
BY	DATE	DESCRIPTION

BARTLETT & WEST

1719 SOUTH RIVER BLVD. JEFFERSON CITY, MO 65109-4000
 PHONE: 636.461.3131 FAX: 636.461.3131
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LIBERTY ROAD BRIDGE REPLACEMENT
 PROJECT NO. 2016-801-0
 COLE COUNTY, MISSOURI



THIS SHEET HAS BEEN BOKED, SEALED AND DATED ELECTRONICALLY.

SEALED DATE:	09/08/16
DESIGNED BY:	JDR
DRAWN BY:	JDR
APPROVED BY:	TCK
DESIGN PROJ.:	15937-400
DATE:	SEPTEMBER 2016
DRAWING NO.:	
SHEET NO.:	31 of 31

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