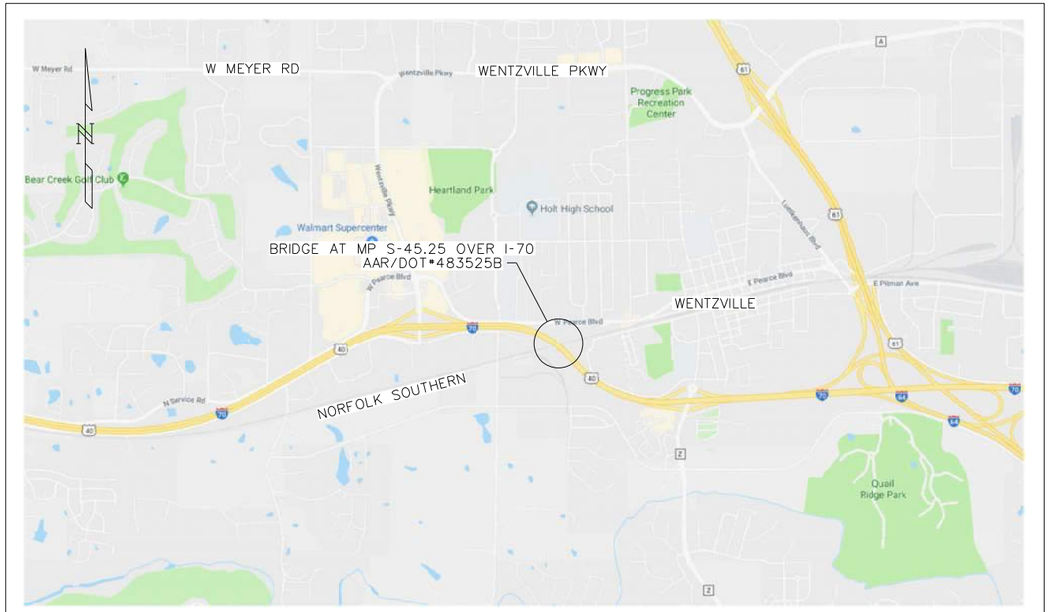
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
PLANS FOR PROPOSED
NSRR MAINLINE BRIDGE AT MP S-45.25
OVER I-70
WENTZVILLE, MO

NOT FOR CONSTRUCTION



LOCATION MAP

GENERAL INFORMATION

OWNER:
MR. JACOB WATSON
ENGINEER PUBLIC IMPROVEMENTS
BRIDGES AND STRUCTURES
NORFOLK SOUTHERN CORPORATION
1200 PEACHTREE STREET NE
ATLANTA, GA 30309
TELEPHONE: (404) 529-1225
EMAIL: JACOB.WATSON@NSCORP.COM

CONVENTIONAL SYMBOLS
(USED IN PLANS)

	SYMBOL
EXISTING TRACK CENTERLINE	———
NEW TRACK CENTERLINE	———
EXISTING TRACK RELOCATE TO	———
EXISTING TRACK RELOCATE FROM	------
EXISTING TRACK REMOVAL	------

Detailed JUNE 2023
Checked JUNE 2023

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.

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

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S1
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION	DATE

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

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I-70	MO
DISTRICT	SHEET NO.
BR	S2

COUNTY
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JOB NO.
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GENERAL NOTES:

CONSTRUCTION SPECIFICATIONS:
Provide materials and perform work in accordance with the following:

MoDOT CMS: Current Missouri Standard Specifications for Highway Construction

The supplemental specifications, and special provisions for this project as follows:
1. Norfolk Southern Railway standard specifications for materials and construction, current edition

NORFOLK SOUTHERN RAILROAD COORDINATION AND MAINTENANCE-OF-WAY:
The construction program will require close coordination and cooperation with Norfolk Southern personnel for all operations that involve track work and rail service. The time of specific track closings, openings, switching and other required rail, tie and ballast work in all cases shall be also subject to Norfolk Southern approval. Contractor is responsible for all coordination and phasing with MoDOT.

All work to be performed on, over, under, or adjacent to the railroad right-of-way shall comply with the Norfolk Southern Railway Company ("railroad", "NSRR" or "NS") public projects manual (Appendix E, Special Provisions for the Protection of Railway Interests, and Appendix H1, Overhead Grade Separation Design Criteria). When in conflict with other project specifications, the most stringent one shall apply.

The contractor shall not commence any work on railroad rights -of-way until he has complied with the conditions presented on NS public projects manual (see Appendix E, Norfolk Southern - Special Provisions for Protection of Railway Interests).

The contactor shall so arrange and conduct his work that there will be no interference with railroad's operations. Whenever work is liable to affect the operations or safety of trains, the methods of doing such work shall first be submitted to the railroad engineer for approval, but such approval shall not relieve the contractor from any liability.

All proposed submittals required either by the MoDOT CMS or the NSRR-PPM shall be submitted to NSRR for review and approval.

All ballast, rails, ties and incidental track metal work for the tracks will be furnished and placed by Norfolk Southern with the exception of the 8" pre-ballast over the waterproofing.

The contractor shall maintain a construction clearance of 10 feet horizontally (for elements below the top of rail) from the centerline of tracks and 22 feet vertically from a point level with the top of the higher rail, at all times. Clearance of 14 feet horizontally shall be provided to any temporary works installed above the top of rail, except as indicated by these plans or approved by NSRR.

The designated Norfolk Southern Railroad contact for this project is as follows:
Mr. Jacob Watson
Engineer Public Improvements
bridges and structures
Norfolk Southern Corporation
1200 Peachtree Street NE
Atlanta, GA 30309
phone: (404) 529-1225
email: jacob.watson@nscorp.com

For projects requiring more than 30 consecutive days of flagging, contractor shall provide the flagman a small work area with a desk/counter and chair within the field/site trailer, including the use of bathroom facilities, where the flagman can check in/out with the project, as well as to the flagman's home terminal.

The work area should provide access to two (2) electrical outlets for recharging radio(s), and a laptop computer; and have the ability to print off needed documentation and orders as neeeded at the field/site trailer. This should aid in maximizing the flagman's time and efficiency on the project.

NORFOLK SOUTHERN RAILROAD COORDINATION AND MAINTENANCE-OF-WAY (CONT.):
The railroad will be provided as-built drawings showing the actual clearances as constructed. depth, size, and location of all foundation components shall be shown on the drawings. (See NS Public Projects Manual, Appendix H1, Section 8a).

"One Call" services do not locate buried railroad signal and communications lines. The contractor shall contact the railroad's representative 2 days in advance of work at those places where excavation, pile driving, or heavy loads may damage the railroad's underground facilities. Upon request from the contractor or sponsor, railroad forces will locate and paint mark or flag the railroad's underground facilities. The contractor shall avoid excavation or other disturbance of these facilities. If disturbance or excavation is required near a buried railroad facility, the contractor shall coordinate with the railroad to have the facility potholed manually with careful hand excavation. The facility shall be protected by the contractor during the course of the disturbance under the supervision and direction of the railroad's representative. (see NS Public Projects Manual, Appendix E, Section 3.d).

All utility installations or relocations that are required in conjunction with this project can be installed or relocated as part of the project provided the construction is performed by the project contractor or project contractor's sub-contractor. However, the utility must submit an application for the installation or relocation to RailPros for appropriate handling for license agreement and applicable fees. For utility applications go to: www.nscorp.com/about nsrealestate/learnaboutourservices/wire/pipelineandfiber opticsprojects. Note: License agreement must be executed prior to utility being installed or relocated.

DIMENSIONS AND BOUNDARIES:
All dimensions shown are horizontal unless notes otherwise. Superstructure dimensions shown are given at a temperature of 65° F.

EXCAVATION:
The contractor is responsible for the stability of all excavated slopes. Direct surface runoff away from the excavation. Groundwater levels may fluctuate. Seasonally as a function of precipitation and other hydrological factors. Therefore, there may be considerable change in the water table or the presence of water where not previously encountered. Perform all excavations in accordance with osha shoring. Excavation and shoring shown in these plans assume an OSHA Type B soil (to be confirmed by the contractor).

Excavate according to construction sequences, drawings and notes. Do not over excavate.

DESIGN SPECIFICATIONS:
The design was completed in accordance with the following design standards:

NSRR-PPM: Norfolk Southern Railway Public Projects Manual, current edition, including appendices

AREMA: American Railway Engineering and Maintenance-of-Way Association, current edition (2021 used herein)

* AREMA, chapters 8, 9 & 15
* NSRR-PPM appendix H.2 "Underpass Grade Seperation Design Criteria"
* All reinforced concrete design as per AREMA, Chapter 8, Table 8-2-5, Load Factor Design.
* Structural steel design as per AREMA chapter 15, Allowable Stress Design.
* Design Live Load:
Cooper E-80 including Alternate Live Load on 4 axles. design speed of 60 mph - freight.
* Live Load Distribution:
To steel superstructure members per AREMA 15-1.3.4 to concrete deck per AREMA 8-2.2.3(c).
* Impact Load: Rolling equipment without hammer blow steel superstructure per AREMA chapter 15-1.3.5 concrete deck per AREMA 8-2.2.3(d).

DESIGN SPECIFICATIONS (CONT.):
* Dead Load:
9" minimum of ballast and includes 6" additional ballast for future track surfacing.
* Fatigue analysis is based on AREMA 15-1.3.13.
* The superstructure is analyzed as non-composite for strength requirements and composite for live load deflection requirements.

DESIGN DATA:
Superstructure concrete shall obtain a 28 day compressive strength of 4,000 psi (minimum) (deck and parapets). Substructure concrete shall obtain a 28 day compressive strength of 5,000 psi (minimum) (abutments, piers, footings and foundations).

Chamfer all exposed concrete edges and corners 3/4" except as noted.

Premolded (non-sag) expansion joint filler material shall be either rubber or cork conforming to ASTM D1752.

All construction joints shown on these plans shall be required unless shown as optional. Construction joints permitted except as shown on the plans, or where written approval from the engineer has been obtained.
* Structural Steel
Superstructure steel shall be ASTM A709, Grade 50W T2 (50,000 psi minimum yield strength)
Steel shear connectors shall be ASTM A108, Grade 1010 through 1020 (either semi- or fully killed)

* Structural Bolts
Unless otherwise noted, all structural bolts shall be ASTM F3125, Grade A325, high strength, Type 3, all washers shall be ASTM F436 and all nuts shall be heavy hex ASTM A563. All bolts, nuts and washers shall be painted after installation. Galvanized bolts shall not be used.

* Anchor Bolts shall be ASTM F1554 Grade 105 (55 ksi minimum yield strength) Galvanized

* DESIGN DENSITIES:

Steel:	490 pcf
Concrete:	150 pcf
Ballast:	120 pcf
Soil:	125 pcf
Track:	200 plf

* For cast-in-place concrete notes, see design data notes on this sheet and see Sheets No. S14 through S18 and S30 through S34.

* For structural steel notes, see design data notes on this sheet and see Sheets No. S21 through S29.

* For bridge deck waterproofing, see Sheets No. S33, S38, and S39 and NSRR-PPM Section H.4.3

* For painting shop fabricated bridge steel, see Special Provisions.

Vertical clearance for Route I-70 traffic during construction shall be 16'-6" minimum over a 68'-0" wide horizontal opening of the roadway in each direction.

ESTIMATED WEIGHT FOR MAINLINE BRIDGE

Span No.		Total
1	pound	327,650
2	pound	500,880
3	pound	500,880
4	pound	167,600

Lifting weights include a 20% contingency

ESTIMATED QUANTITIES FOR SLAB ON STEEL

Item		Total
Class B-2 Concrete	cu. yard	246.8
Reinforcing Steel (Epoxy Coated)	pound	44,680

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ROUTE I-70 | STATE MO
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COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

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Detailed JUNE 2023
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DRILLED SHAFT SPECIAL PROVISIONS:

DESCRIPTION:
The following work consists of constructing the rock sockets and drilled shafts per specifications acceptable to the railroad.

MATERIALS:
Concrete:
All concrete material, placement, and workmanship shall be in accordance with chapter 8 of the current edition of the AREMA manual for Railway Engineering and the American Concrete Institute manual of concrete practices.

Compressive strength - As specified per location.

Concrete shall be proportioned such that the water-cement ratio (by weight) does not exceed .45. Concrete must contain a minimum of 6 sacks of cement per cubic yard of concrete.

Aggregates shall be graded in accordance with ASTM C33.

Coarse aggregate shall be size no. 67.

Fine aggregate shall be natural sand.

Air content shall be between 5% and 7% (by volume).

Admixtures shall be submitted to the railroad for acceptance.

Prior to the addition of admixtures, concrete shall have a slump not greater than 4 inches. During placement, concrete shall have a slump of not less than 4 inches using the dry uncased or permanent casing method, 6 inches using the temporary casing method, or 7 inches using the slurry displacement method.

Curing shall be accomplished by wet curing or membrane curing compound. Membrane curing compound shall conform to ASTM C309, Type 2.

Do not use calcium chloride or any admixture containing intentionally added chloride ions. Testing for chloride ions is not required.

Reinforcing Steel:
All reinforcing steel materials and placement shall be in accordance with chapter 8 of the current edition of the AREMA manual for Railway Engineering.

Reinforcing steel shall be deformed, new billet bars per current ASTM A615 specifications and meet Grade 60 requirements. Bars to be welded shall conform to the requirements of ASTM A706.

Fabrication of reinforcing steel shall be per chapter 7 of the CRSI manual of standard practice. Dimensions of bending details are out to out of bar.

Reinforcing steel cage shall be prefabricated. Reinforcing steel is to be securely tied to prevent deformation or relative displacement of bars during handling and concrete placement. Tack welding of reinforcing is prohibited.

Splice bars in conformance with the drawings. Submit alternate splice details to the railroad for acceptance.

The minimum clear distance between vertical reinforcing steel, including lapped bars, shall be 1.5 times the bar diameter or four times the maximum aggregate size, whichever is larger.

Place reinforcing steel cage immediately prior to the start of concrete placement. Provide spacer rollers to maintain the reinforcing cage at the proper location. Secure the cage against displacement.

No reinforcing steel vertical movement during casing withdrawal will be permitted.

Steel Casing:
Permanent steel casing shall have sufficient strength to withstand handling stresses, drilling stresses, concrete pressures, and surrounding earth and water pressures, steel for permanent casing shall conform to the requirements of ASTM A283: Grade C, ASTM A36, or ASTM A929.

Submit size, wall thickness, type of steel, and length of permanent casing to the railroad for acceptance.

Temporary steel casing shall have sufficient strength for protection of personnel or to permit advancement of shaft through caving ground. Make diameter of excavation such that the annular void space outside any permanent or temporary casing is minimized.

Furnish full-penetration welds meeting the requirements of "structural welding code - steel" (ANSI/AWS DI. I) of the American Welding Society requirements for joints in non-corrugated permanent steel casings. Welders shall be AWS certified for the welds being installed.

Deliver casing to site in undamaged condition. Handle and protect casing to maintain diameter within 2 percent.

Sand-cement Grout Strength:
Place sand-cement grout suitable to fill annular void space outside permanent casing and temporary CMP in a manner acceptable to the railroad.

Sand-cement grout mix shall consist of a minimum of two socks of type II cement per cubic yard of grout and natural sand conforming to ASTM C33. The water - cement ratio shall be less than 1.0.

CONSTRUCTION REQUIREMENTS:
Drilled shaft construction shall be in accordance with the most current edition of the American Railway Engineering and Maintenance-of-Way Association (AREMA) manual of Railway Engineering, Chapter 8: Concrete Structures and Foundations, Part 24: Drilled Shaft Foundations.

Installation methods shall be compatible with those noted on the drawings and shall be submitted to the railroad for acceptance.

If actual subsurface conditions differ substantially from those provided, notify the railroad immediately by phone, e-mail, or fax and in writing within 48 hours of such a determination.

Develop a program for quality control and provide to the railroad for review and acceptance.

The contractor shall provide inspection of the drilled shaft construction, perform required testing on construction materials, for determining the acceptability of the shaft installation within the terms and conditions of these notes and the drawings. The contractors quality control plan shall state their process and personnel responsible for certifying inspection and test results.

Provide an on-site supervisor and drillers having a minimum of five years of acceptable experience with the installation method(s) to be used.

Perform all excavation and concrete placement work in the presence of the railroad unless otherwise permitted.

Schedule and provide time and means for inspection of each drilled shaft before concrete placement.

Provide the means and opportunity to take samples and make tests during concrete placement.

CONSTRUCTION REQUIREMENTS (CONT.):
Submit the following to the railroad at least 14 days before the start of the work, if applicable:
1. Experience record of supervisory and drilling personnel.
2. Quality control program.
3. Detailed description of shaft construction method including casing withdrawal.
4. List of equipment and operating procedures.
5. Concrete proportions including evidence that proposed concrete materials and mix proportions conform to the requirements of AREMA chapter 8, part 1. Submit results of trial batches if the railroad rejects the proposed mix proportions evidence.
6. Shop drawings showing placement of reinforcing steel, including splice details and locations.
7. Welding procedures for permanent casing and reinforcement.
8. AWS welder certification.
9. A test report from the slurry supplier giving the slurry type and admixtures and the physical and chemical properties of the mixed slurry.

Submit the following to the railroad during construction, if applicable:
1. Notification of drilling 24 hours in advance to permit in-place inspection of the finished excavation prior to placement of reinforcing steel and concrete.
2. Reports of material quantities including concrete, reinforcing steel, casing, and slurry.
3. Certified mill test reports for reinforcing steel, including bar markings.
4. Down-hole slurry test results in accordance with the requirements in these notes.
5. Concrete batch-plant tickets containing the information required by ASTM C94.

Acceptable drilled shaft construction methods shall be based on site and subsurface conditions and on design information provided on the drawings.

Use tolerances for construction in accordance with ACI 117, except as noted.

Remove loose material and free water from bottom of drilled shafts, excavate the bottom of the shaft to a level plane within tolerance of 1 vertical to 12 horizontal, or as acceptable to the railroad. Provide bottom area not less than that shown on the drawings, or as acceptable to the railroad.

The contractor will determine actual final bearing levels and suitability of bearing stratum during excavation. For end bearing shafts, explore bearing stratum with a foundation inspection hole to a minimum depth of 10 feet or twice the diameter of the rock socket, whichever is greater, below the bottom of the rock socket. The contractor shall use the foundation inspection hole to determine the amount of casing needed and casing ordered prior to foundation inspection holes is at the contractor's risk. The contractor may be directed to extend the rock socket to a lower elevation, resulting from the engineer's evaluation of the foundation inspection cores.

Inspection of each shaft by video camera shall be performed as directed by the engineer. The camera shall be operated such that optimum clarity of detail can be obtained and all surface areas of the shaft, including the rock socket and the rock socket's base, can be observed. All scanning of the rock surfaces shall be recorded. After completion of the inspection of the rock socket, the railroad inspector will direct whether or not drilling of the shaft shall be continued to a greater depth. Recordings shall be furnished to and shall become property of the railroad upon completion of the work.

GENERAL NOTES

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ESTIMATED QUANTITIES: NSR MAIN BRIDGE

	Item		Substr.	Superstr.	Total
	Class 1 Excavation	cu. yard	425		425
	Removal of Bridges (L0154)	lump sum			1
	Removal of Miscellaneous ACM (Non-Friable)	sq. foot			90
	Ballast	ton		395	395
	Bridge Approach Slab (Major)	sq. yard		36	36
	Handrail	linear foot		843	843
	Drilled Shafts (3 ft. 6 in. Dia.)	linear foot	113.3		113.3
	Drilled Shafts (4 ft. 0 in. Dia.)	linear foot	72.5		72.5
	Rock Sockets (3 ft. 0 in. Dia.)	linear foot	60.0		60.0
	Rock Sockets (3 ft. 6 in. Dia.)	linear foot	120.0		120.0
	Video Camera Inspection	each	10		10
	Foundation Inspection Holes	linear foot	280.0		280.0
	Sonic Logging Testing	each	10		10
	Class B-1 Concrete (Substructure)	cu. yard	213.5		213.5
	Slab on Steel	sq. yard		942	942
	Ballast Curb	linear foot		770	770
	Reinforcing Steel (Epoxy Coated)	pound	90,860		90,860
	Protective Coating - Concrete Bents and Piers (Epoxy)	lump sum	1		1
	Waterproofing	sq. yard		1069	1069
	Expansion Device (Flat Plate)	linear foot		137	137
	Fabricated Structural Low Alloy Steel (Plate Girder) A709, Grade 50W	pound		1,313,360	1,313,360
	Drainage System (On Structure)	lump sum		1	1
	Railroad Deck Drain	each		54	54
✳	Fabricated Structural Steel Bearings	each		48	48

✳ Bearing pads are incidental to Fabricated Structural Steel Bearings.

CONSTRUCTION REQUIREMENTS (CONT.):

Excavate rock sockets as required by the drawings. Drill a probe hole to a depth of two shaft diameters to verify sound material unless waived by the railroad. Rock cored samples shall be handled in accordance with ASTM D5079.

Keep all excavated materials away from each open shaft excavation.

Dewater drilled shaft excavation prior to placing concrete. Dewater in a manner that will not create subsidence or ground loss that might adversely affect the drilled shaft or existing adjacent structures.

If water inflow or sidewall instability encountered compromises the integrity of the hole, use alternative means to reduce inflow, such as extending casing, installing outside deep wells, grouting, or other acceptable means.

Place concrete as soon as possible after completion of excavation and after acceptance. Notification of concrete placement shall be made at least 24 hours in advance unless waived by the railroad.

Complete placement of concrete in uncased excavations before the work day is completed.

CONSTRUCTION REQUIREMENTS (CONT.):

Place concrete in shaft in one continuous operation unless otherwise permitted by the railroad. Level, roughen, and clean surface of construction joints to satisfaction of the railroad prior to recommencement of concrete placement. Provide reinforcing dowels or shear key when required by the railroad.

For placing concrete underwater, use tremie or concrete pumping with acceptable procedures in accordance with AREMA Chapter 8, Section 1.14.

Perform concrete testing for quality control.

Protect tops of shafts against damage and cure and protect to prevent moisture loss and temperature extremes in accordance with AREMA Chapter 8, Part 1.

Provide means and opportunity for the railroad to inspect the operation during the withdrawal of casing and placing of concrete.

Any temporary oversized casing utilized for shoring at the surface shall be withdrawn without damage to the drilled shaft for the abutment.

Fill void space between permanent casing and shaft excavation or between permanent (inner) casing and temporary casing with fluid sand-cement grout or other material using a procedure acceptable to the railroad.

Cross-Hole Sonic Log (CSL) Testing:

Drilled shafts shall be evaluated by cross-hole sonic log testing. Testing pipes shall be installed in each drilled shaft to facilitate the logging process, which will follow completion of each shaft.

Furnish and install four standard 2 inch nominal diameter steel pipes (ASTM A53, Grade B) for use in CSL testing of each drilled shaft. Pipes shall be equally spaced around the interior of the reinforcing steel cage.

Pipes shall be sufficiently regular and free from defects so as to permit the free and unobstructed passage of the probes. Pipes shall be installed such that all internal joints are flush. Pipes shall be watertight with clean internal and external faces, the latter to ensure good bond between the concrete and the pipes.

Pipes shall be fitted with a screw-on watertight shoe and cap and shall be securely fixed to the interior of the reinforcing steel cage. The pipes shall be filled with water and plugged or capped before concrete placement. The upper end of the pipe shall not be left open during or after concrete placement. The pipes shall extend at least 2'-6" above the top of the drilled shaft concrete. The lower end of the pipes shall extend to the bottom of the shaft.

Perform CSL testing no earlier than 48 hours and within 14 days after concrete placement.

No further work on shaft shall be done until CSL test reports have been reviewed and approved by NSRR.

METHOD OF MEASUREMENT:

Accepted drilled shafts and rock sockets will be measured for payment to the nearest 0.1 linear foot of length along the axis of each shaft complete-in-place. Measurement will be from the plan top of the shaft to the top of the rock socket. "Top of the rock socket" will be defined as the upper elevation at which rock occurs across the entire width of the shaft, as determined by the engineer.

Video camera inspection, as required, will be measured for payment per each.

Measurement and payment for foundation inspection holes will be to the nearest 0.1 linear foot of length along the axis of each hole by linear foot. Measurement will be from the top of the rock socket to the bottom of the foundation inspection hole. If the engineer directs foundation inspection borings more than 10 feet or twice the diameter of the rock socket, whichever is greater, below the anticipated bottom of the rock socket elevation as shown on the plans, measurement for payment for that portion of the boring in excess of 10 feet below or twice the diameter anticipated bottom of rock socket elevation as shown on the plans will be to the nearest 0.1 linear foot of excess.

Sonic logging testing of drilled shafts, as required, will be measured per each.

BASIS OF PAYMENT:

Payment will be considered full compensation for all steel casing required, costs of drilling, excavation, slurry, cleaning, an acceptable method of inspection as required, furnishing and placing of concrete, grouting and incidental work and material required by the contract documents. Payment for all drilled shafts and rock sockets will be at the contract unit price per linear foot for the diameter of the drilled shafts and rock sockets specified.

Payment for one complete video camera inspection of each shaft, including the rock socket, will be paid for at the contract unit price. Payment for video camera inspection will be considered full compensation for moving in equipment, flushing turbid water from the shaft, conducting the actual scanning as specified, furnishing video recording, removing equipment, and all tools, labor and any incidentals necessary to complete the work.

Payment for foundation inspection holes will be at the contract unit price and will be considered full compensation for drilling or coring the holes, extracting and packaging samples or cores, laboratory testing, delivering the samples or cores to the specified MoDOT or NSRR location and for all other expenses necessary to complete the work.

Payment for sonic logging testing of drilled shafts as required by the engineer will be made at the contract unit price per each for Sonic Logging Testing. No payment will be made for supplementary sonic logging testing to evaluate defects. Payment for sonic logging testing will be considered full compensation for providing all equipment, access pipes, conducting the actual probing measurements as specified, furnishing reports, removing equipment, and all tools, labor and any incidentals necessary to complete the work.

GENERAL NOTES AND QUANTITIES

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI
IGOR KRIVITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

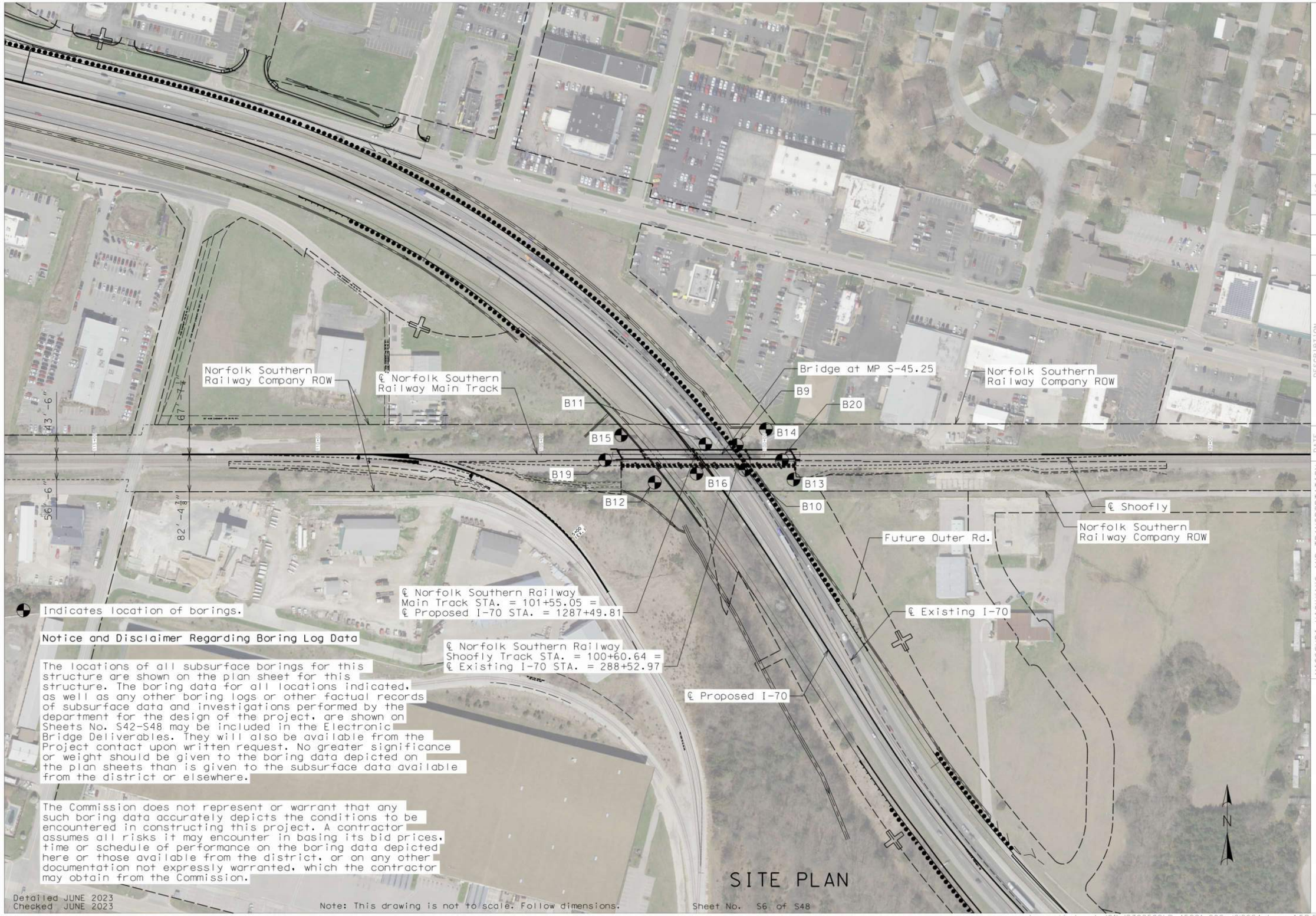
DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S5
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION | DATE

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856



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 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 department for the design of the project, are shown on Sheets No. S42-S48 may be included in the Electronic Bridge Deliverables. They will also 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 district or elsewhere.

The Commission 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 district, or on any other documentation not expressly warranted, which the contractor may obtain from the Commission.

SITE PLAN

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S6 of S48

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

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S6
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

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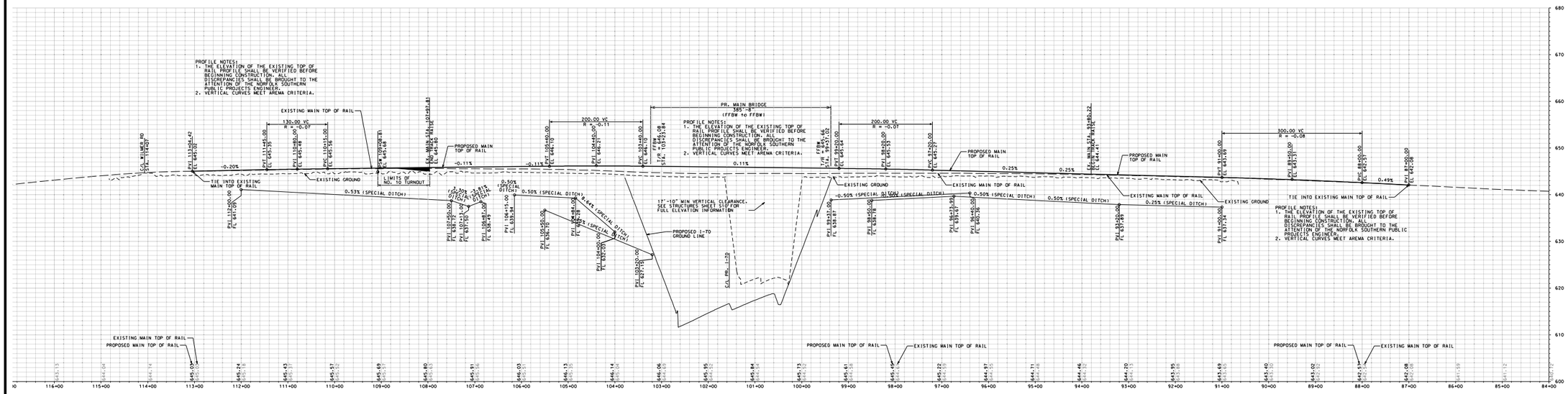

MAIN TRACK
SCALE: 1″ = 100′ HORIZONTALLY
1″ = 10′ VERTICALLY

Track Design Notes:
1. Design Speed = 60 MPH
2. Track Design Per Norfolk Southern Public Projects Manual, 2022 Edition.
3. Vertical Curves Meet AREMA Criteria.

Note:

The Elevation of the Existing Top-Of-Rail Profile Shall Be Verified Before Beginning Construction. All Discrepancies Shall Be Brought To The Attention Of The Norfolk Southern Public Projects Engineer.

TOP OF RAIL PROFILE

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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DATE PREPARED
8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S7

COUNTY
ST. CHARLES

JOB NO.
J6I0624

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A5801

DATE	DESCRIPTION

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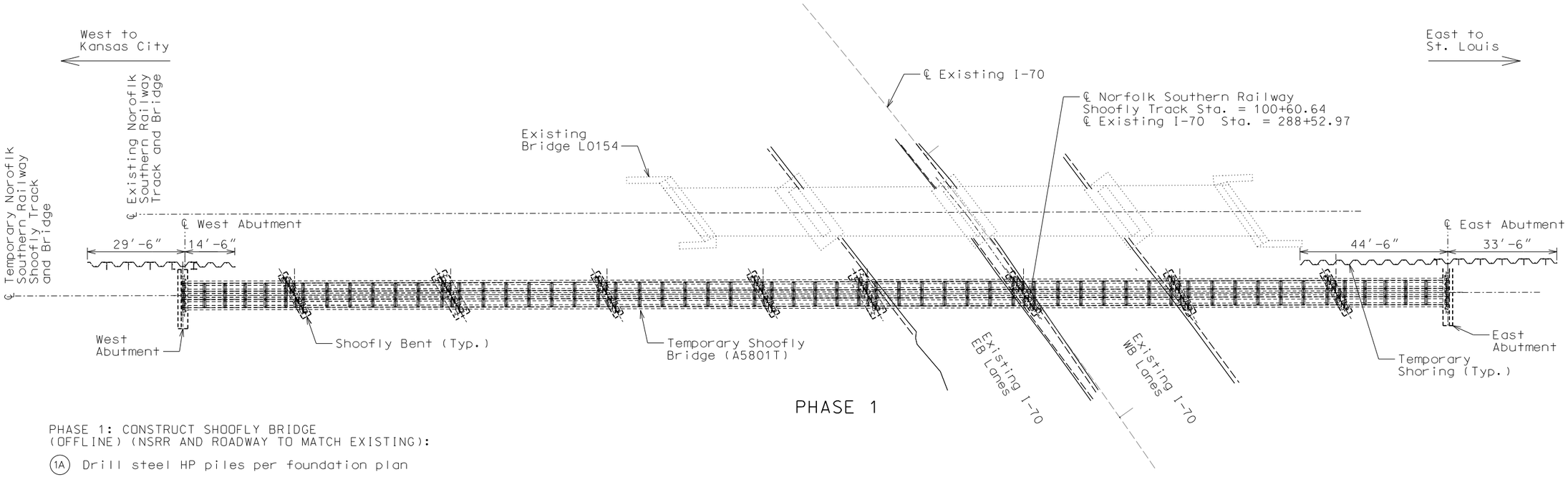


PHASE 1

PHASE 1: CONSTRUCT SHOOFLY BRIDGE (OFFLINE) (NSRR AND ROADWAY TO MATCH EXISTING):

(1A) Drill steel HP piles per foundation plan

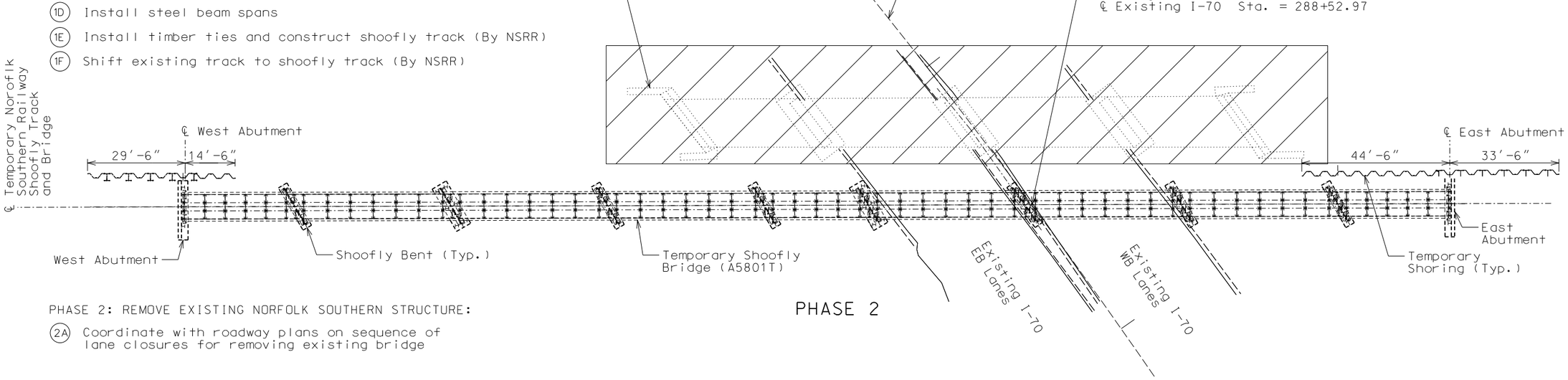
(1B) Install Temporary Shoring per plan

(1C) Install precast abutments and bents

(1D) Install steel beam spans

(1E) Install timber ties and construct shoofly track (By NSRR)

(1F) Shift existing track to shoofly track (By NSRR)



PHASE 2

PHASE 2: REMOVE EXISTING NORFOLK SOUTHERN STRUCTURE:

(2A) Coordinate with roadway plans on sequence of lane closures for removing existing bridge

Note:

For Temporary Shoring details, see plans for A5801T.

STAGED CONSTRUCTION PHASING (1 OF 2)

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S8 of S48

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S8

COUNTY ST. CHARLES

JOB NO. J6I0624

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A5801

DESCRIPTION	DATE

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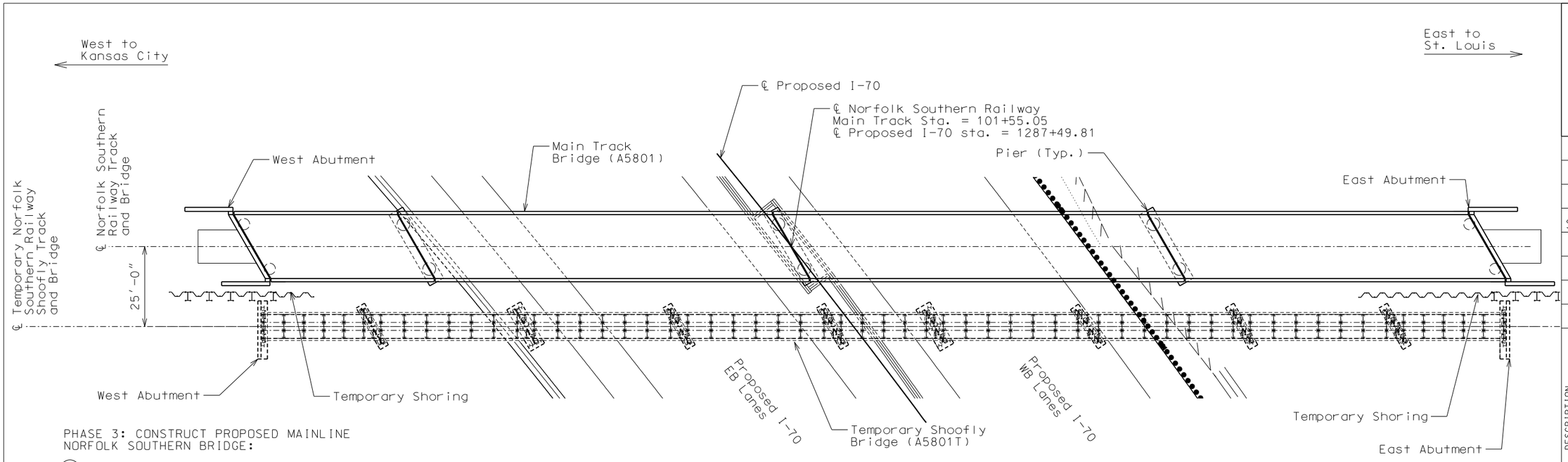


PHASE 3

PHASE 3: CONSTRUCT PROPOSED MAINLINE NORFOLK SOUTHERN BRIDGE:

(3A) Install drilled shafts per foundation plan

(3B) Construct concrete abutments, and bent caps

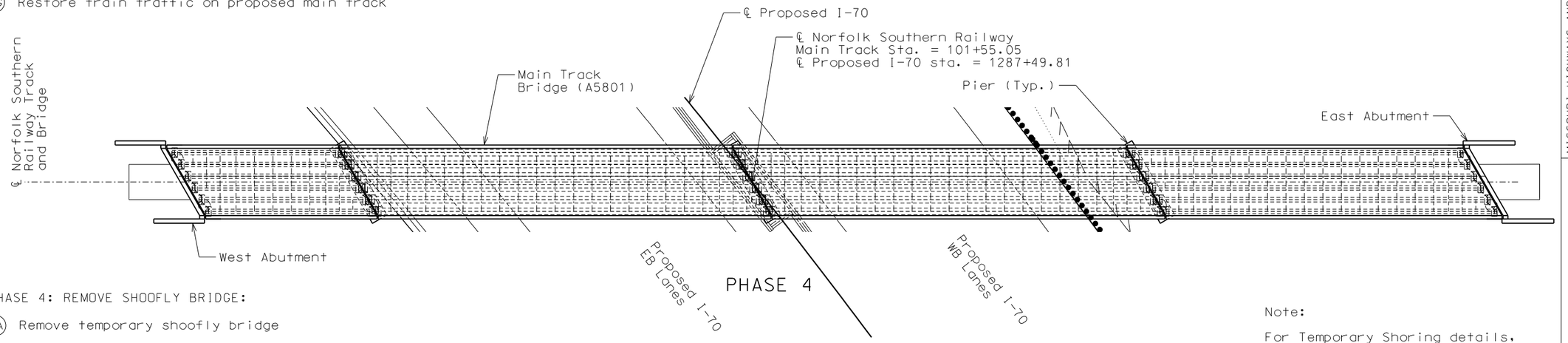
(3C) Install steel girders for superstructure

(3D) Construct CIP concrete deck per plans

(3E) Install waterproofing, two layers of protective asphaltic panels and pre-ballast the deck with 8" of ballast. Ballast to be installed within one week of placement of the waterproofing and asphaltic panels. See Special Provisions.

(3F) Construct proposed main track (By NSRR)

(3G) Restore train traffic on proposed main track



PHASE 4

PHASE 4: REMOVE SHOOFLY BRIDGE:

(4A) Remove temporary shoofly bridge

(4B) Coordinate with roadway plans on sequence of lane closures for removing existing bridge

Note:

For Temporary Shoring details, see plans for A5801T.

STAGED CONSTRUCTION PHASING (2 OF 2)

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S9 of S48

STATE OF MISSOURI
IGOR KRINTSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S9

COUNTY ST. CHARLES

JOB NO. J6I0624

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A5801

DESCRIPTION	DATE

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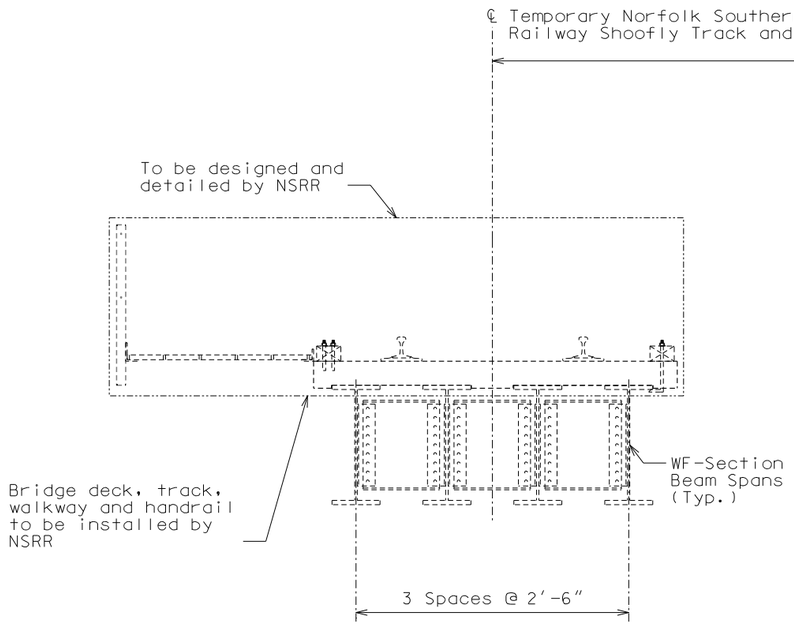
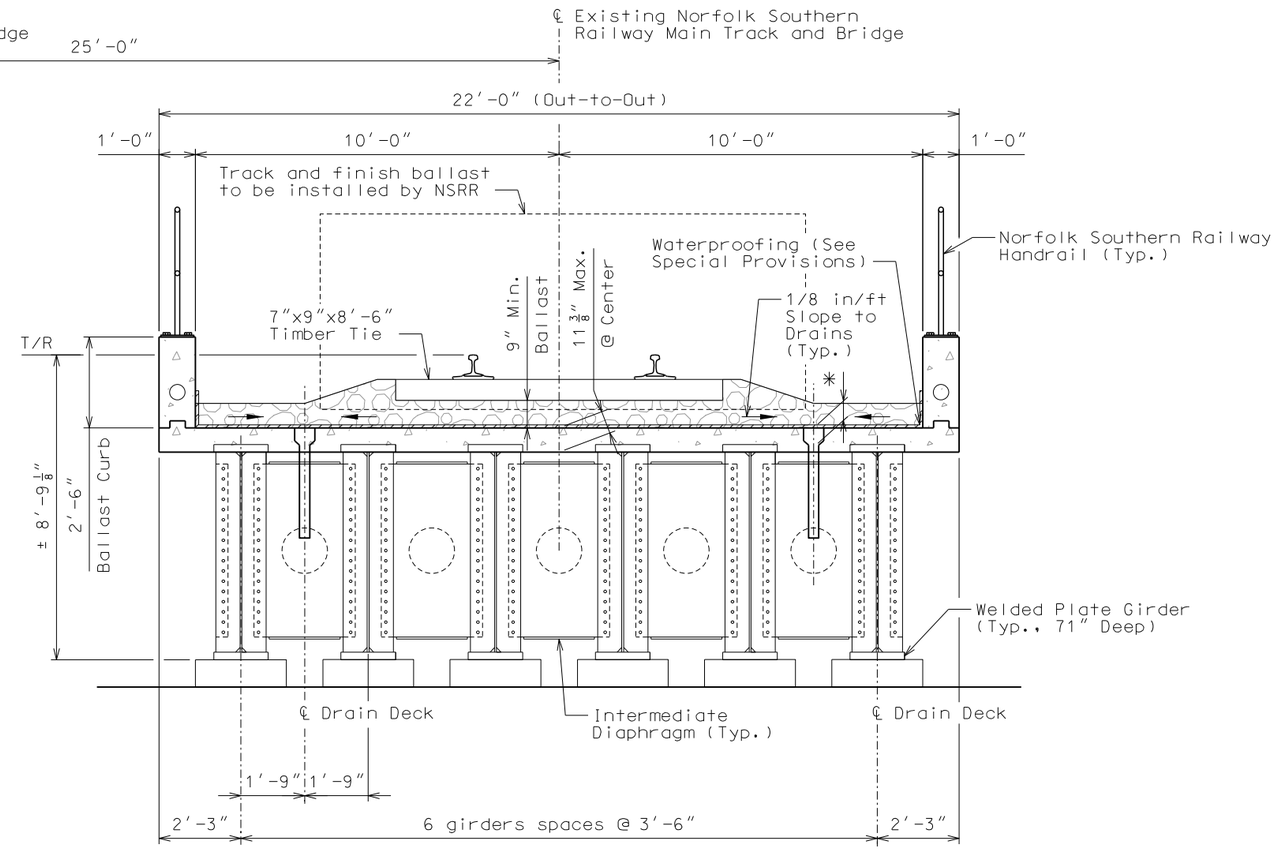


SHOOFLY BRIDGE (A5801T)



MAIN BRIDGE (A5801)

✳ 8″ Min. @ Drain to Top Flange

PROPOSED MAIN TRACK BRIDGE COMPONENTS @ CL BRIDGE	
NAME	HEIGHT (IN.)
136 RE Rail	7 3/8″
Tie Plate	7/8″
Tie	7″
Ballast	9″
Waterproofing	1″
Concrete Deck	8 7/8″
Beam	71″
TOTAL	8′-9 1/8″

Note:

For Deck Drain details, see Sheet No. S37.

TYPICAL SECTIONS THRU BRIDGES (SHOOFLY AND PROPOSED)

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S10 of S48

STATE OF MISSOURI
IGOR KRINTSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S10

COUNTY ST. CHARLES

JOB NO. J6I0624

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A5801

DESCRIPTION	DATE

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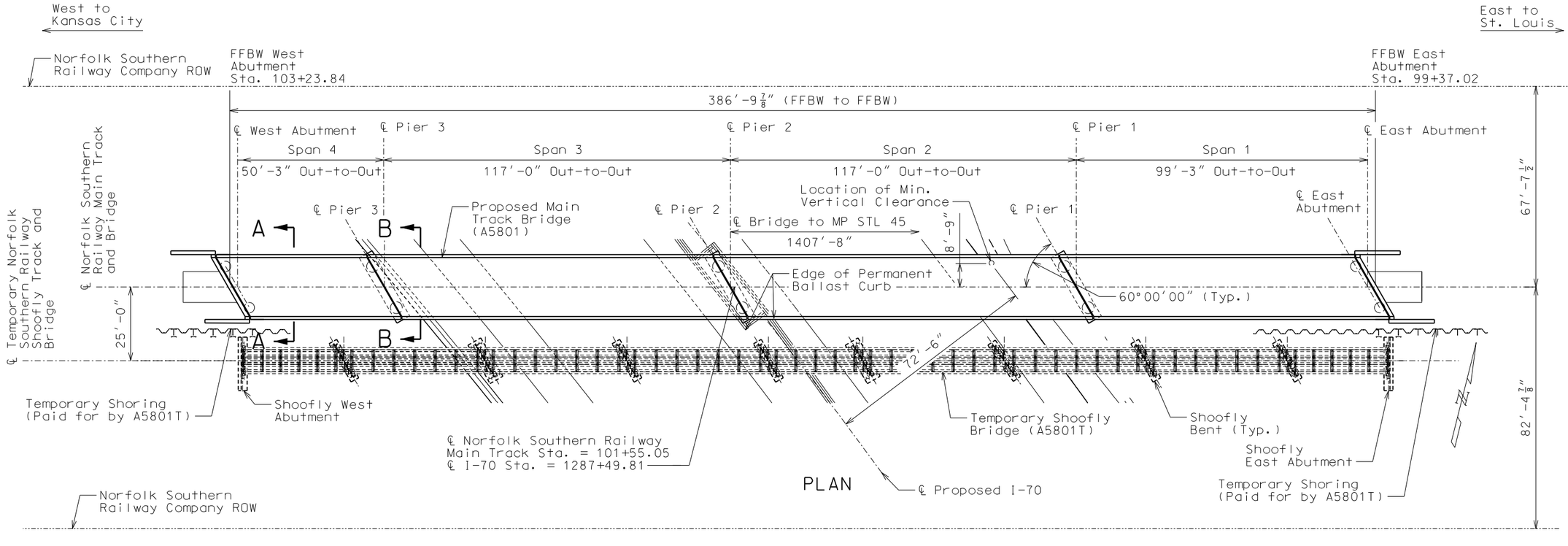

Notes:

For Typical Section thru Bridges, see Sheet No. S10.

For Sections A-A and B-B, see Sheet No. S12.

FFBW = Front Face of Backwall

GENERAL PLAN AND ELEVATION MAIN TRACK

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S11
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION | DATE

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105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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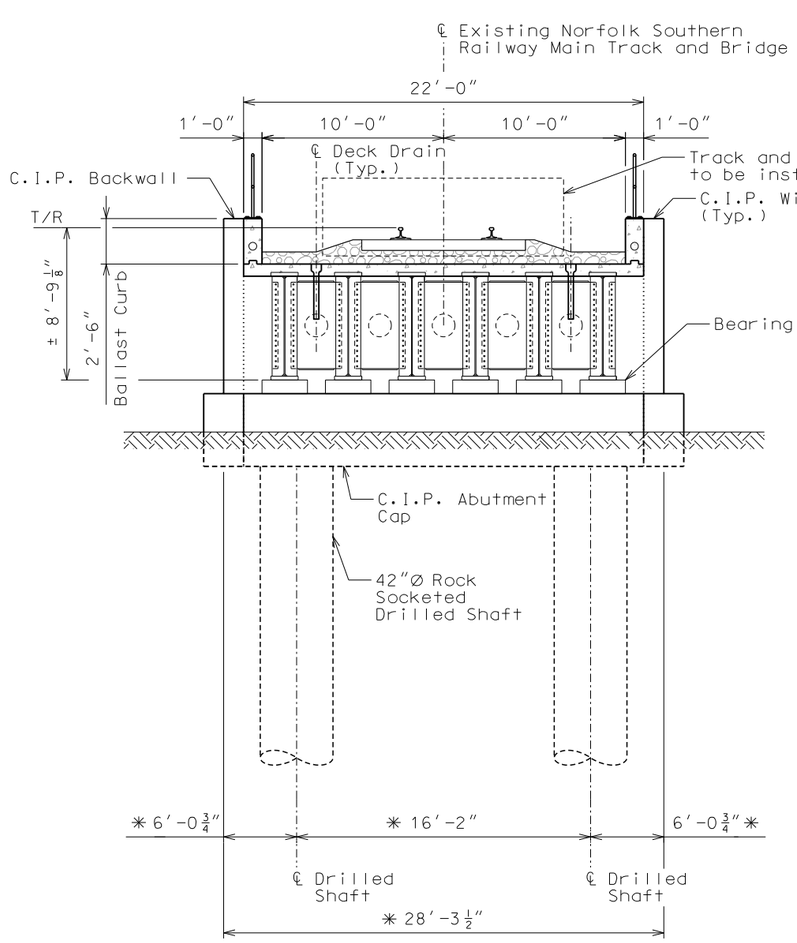
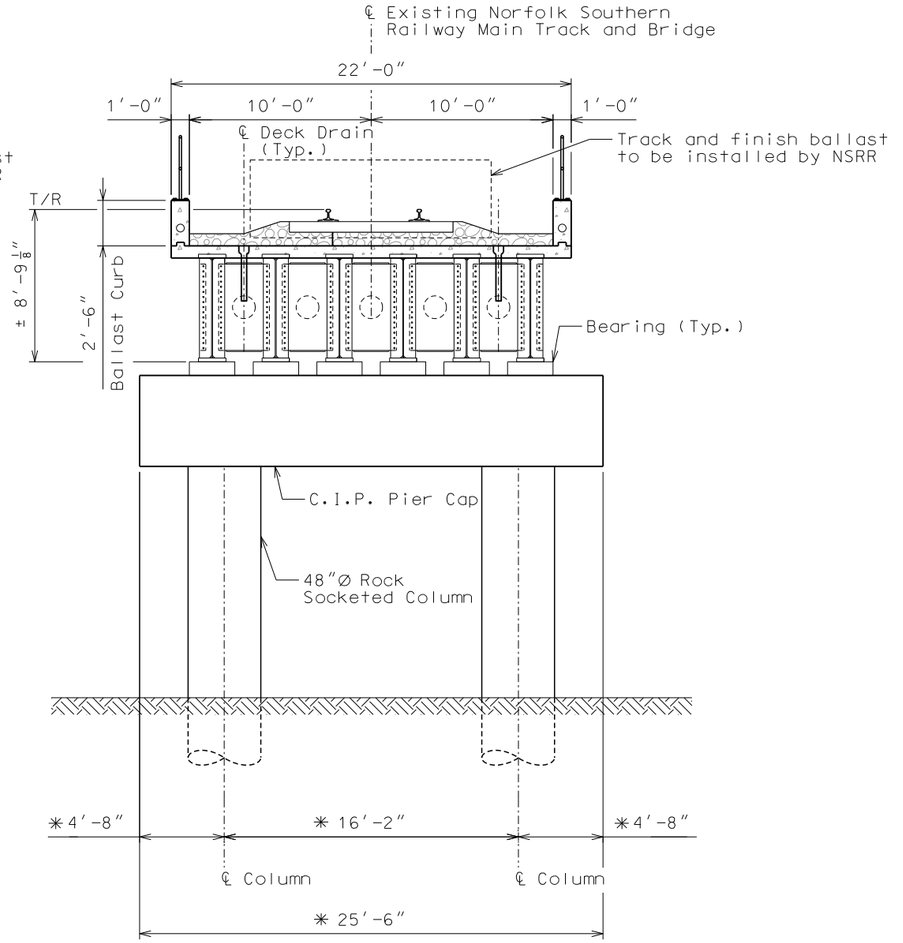


SECTION A-A



SECTION B-B

✳ Dimensions are shown along ℄ of cap at skew.

Note:
For location of Section A-A and B-B, see Sheet No. S11.

TYPICAL SECTIONS

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S12 of S48

STATE OF MISSOURI
IGOR KRINTSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S12
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION	DATE

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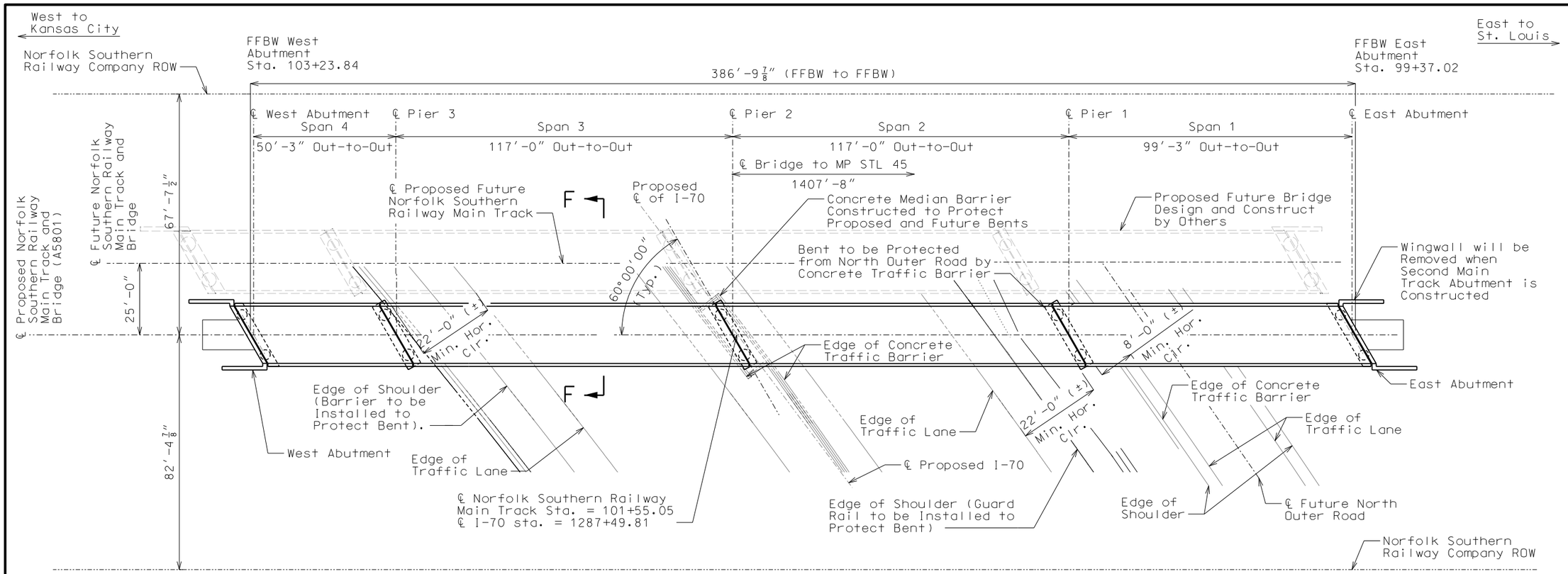
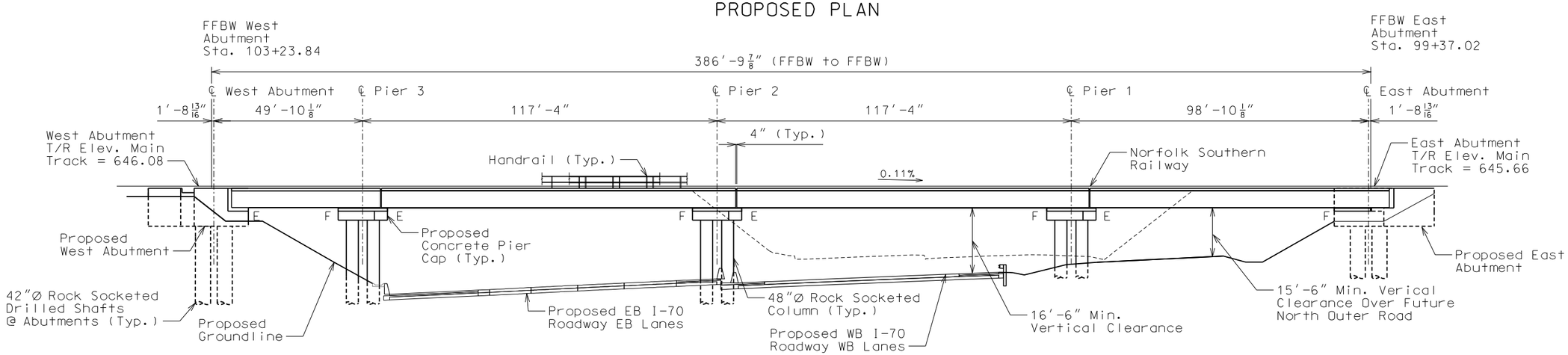


PROPOSED PLAN



PROPOSED ELEVATION

(Proposed main line bridge shown, future bridge similar)

GENERAL PLAN AND ELEVATION (FUTURE SECOND MAIN TRACK BRIDGE)

Notes:

The elevation of the existing Top-of-Rail Profile shall be verified before the beginning construction. All discrepancies shall be brought to the attention of the Norfolk Southern public projects engineer.

For Typical Section thru Bridges, see Sheet No. S14.

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S13 of S48

STATE OF MISSOURI — IGOR KRINTSKIY — NUMBER PE-2012018095 — PROFESSIONAL ENGINEER

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DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S13

COUNTY: ST. CHARLES

JOB NO.: J6I0624

CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: A5801

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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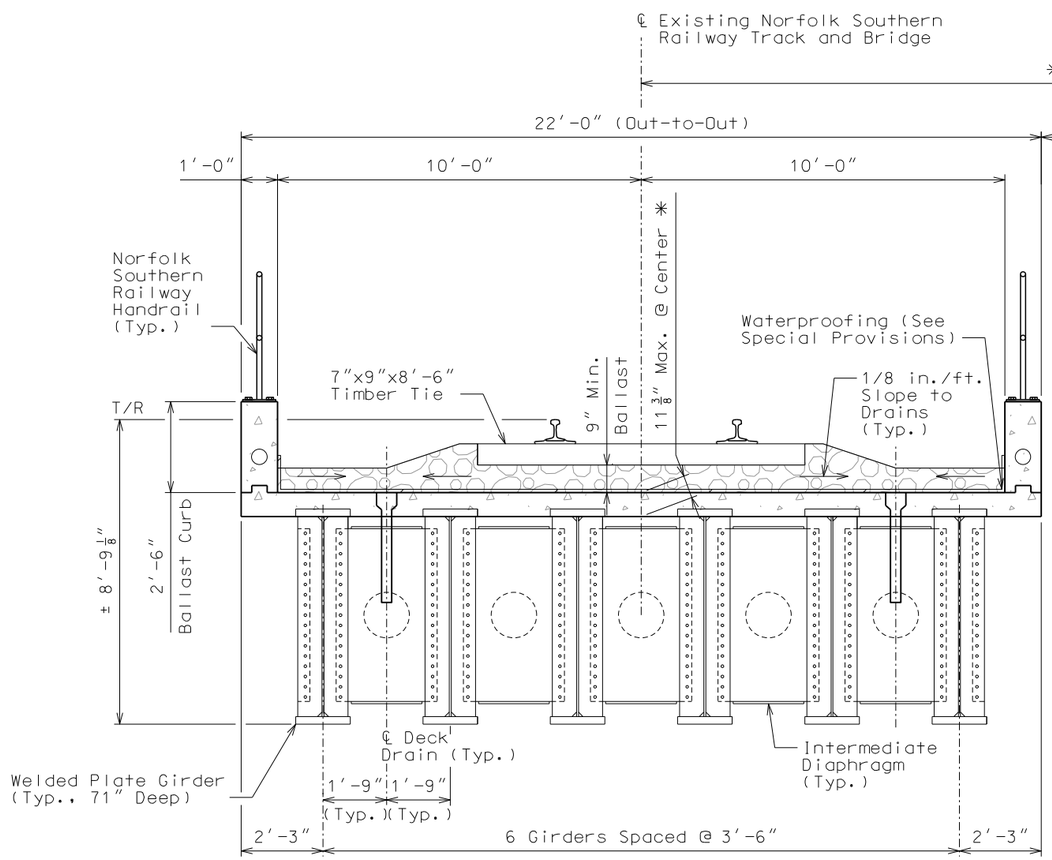
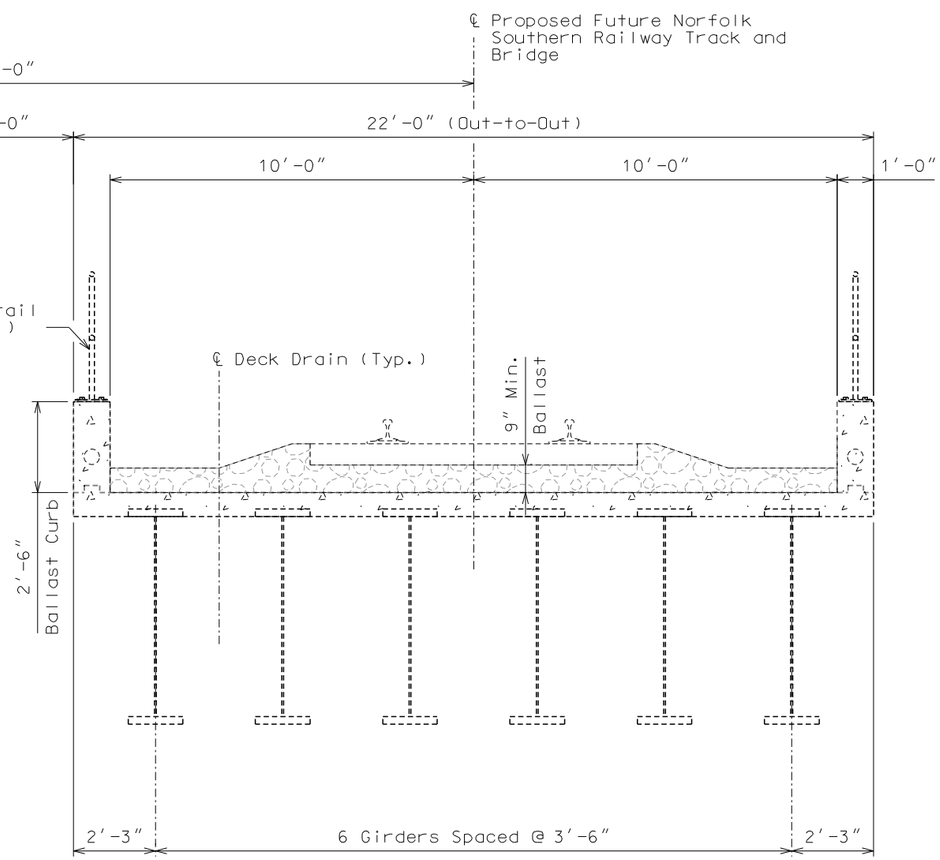


MAIN TRACK BRIDGE A5801



PROPOSED FUTURE BRIDGE

* 8″ Min. @ Drain to Top Flange

** Final dimension to be determined

TYPICAL SECTION THRU BRIDGES (MAIN TRACK AND FUTURE)

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER
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DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S14

COUNTY: ST. CHARLES
JOB NO.: J6I0624
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A5801

DESCRIPTION	DATE

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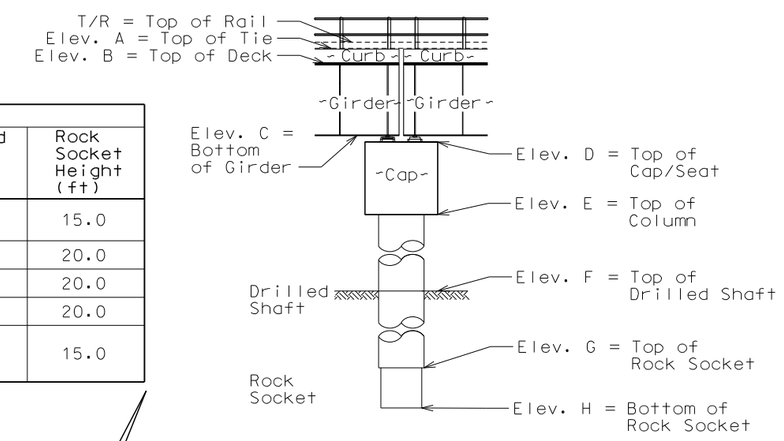
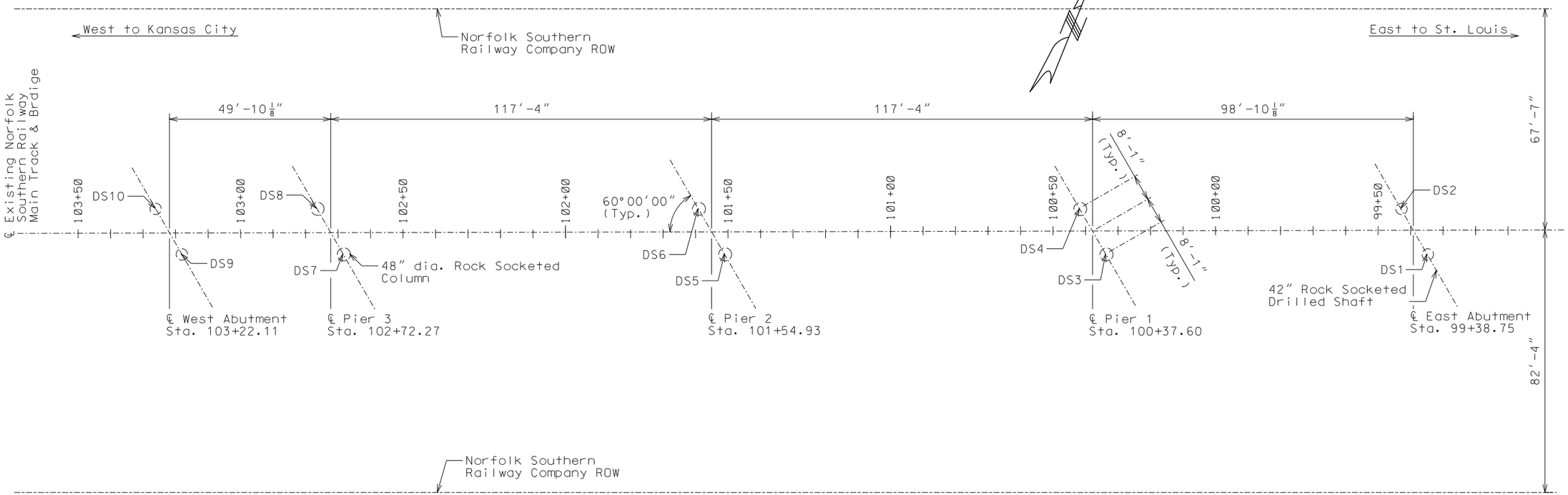
Elevations and Dimensions												
Pier/ Abutment	Station	T/R	Elevations								Drilled Shaft Height (ft)	Rock Socket Height (ft)
			A	B	C	D	E	F	G	H		
East Abutment	99+38.75	645.66	644.99	643.57	636.92	636.07	632.07	---	604.00	589.00	28.1	15.0
Pier 1	100+37.60	645.77	645.10	643.68	637.03	636.12	631.12	620.62	606.00	586.00	14.6	20.0
Pier 2	101+54.93	645.89	645.23	643.81	637.16	636.25	631.25	615.25	606.00	586.00	9.3	20.0
Pier 3	102+72.27	646.02	645.36	643.94	637.28	636.38	631.38	614.38	602.00	582.00	12.4	20.0
West Abutment	103+22.11	646.08	645.41	644.00	637.34	636.58	632.58	---	604.00	589.00	28.6	15.0





	DRILLED SHAFT LOCATIONS									
	DS1	DS2	DS3	DS4	DS5	DS6	DS7	DS8	DS9	DS10
Northing	1083734.41	1083746.04	1083710.44	1083722.06	1083681.97	1083693.59	1083653.51	1083665.13	1083641.42	1083653.04
Easting	716543.50	716532.27	716447.61	716436.37	716333.78	716322.54	716219.95	716208.71	716171.59	716160.36
Station	99+34.71	99+42.79	100+33.56	100+41.64	101+50.89	101+58.97	102+68.22	102+76.31	103+18.07	103+26.15
Offset	7.00 L	7.00 R	7.00 L	7.00 R	7.00 L	7.00 R	7.00 L	7.00 R	7.00 L	7.00 R

FOUNDATION LAYOUT

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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ROUTE I-70 | STATE MO
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COUNTY ST. CHARLES
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BRIDGE NO. A5801

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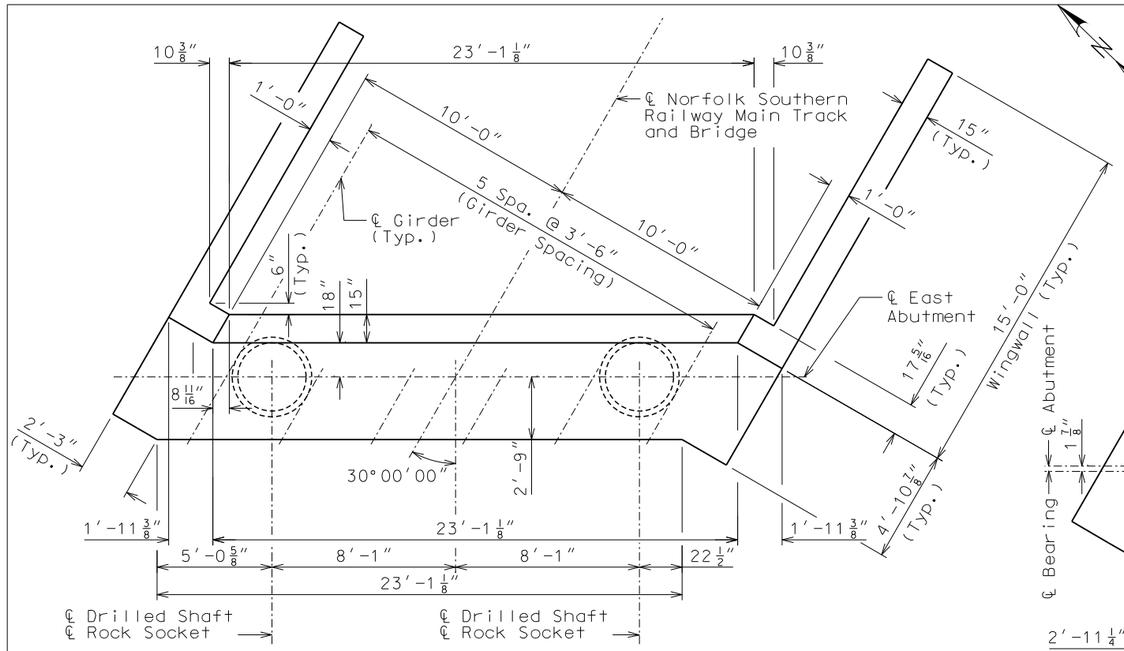
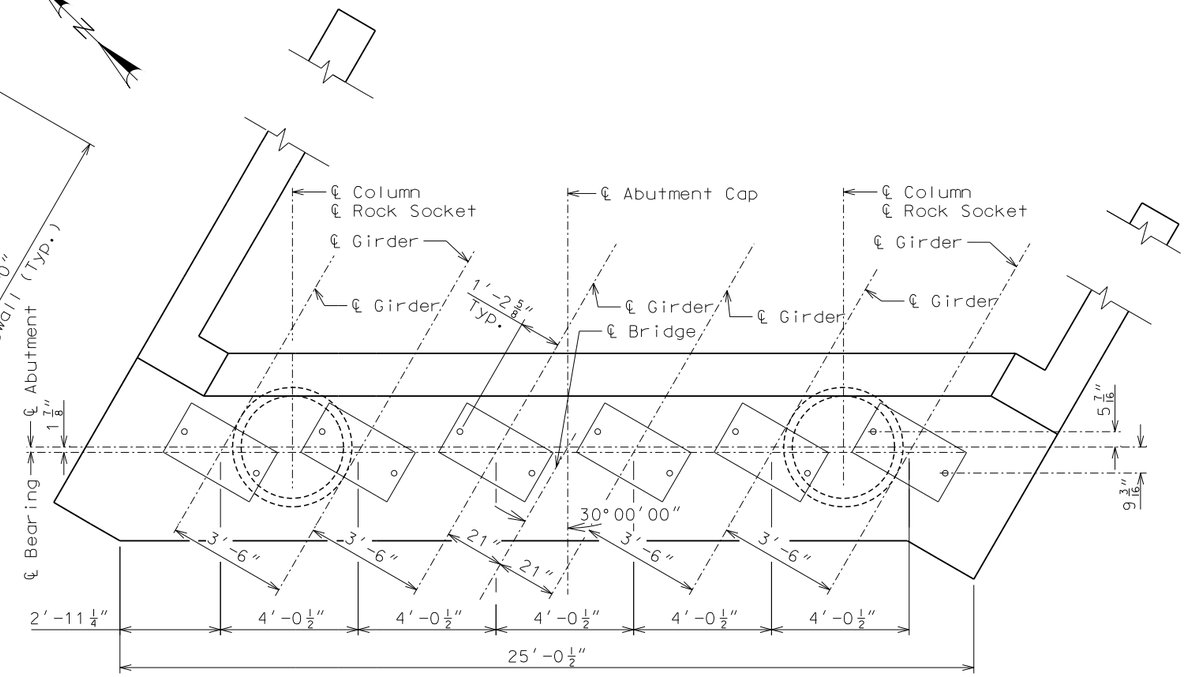
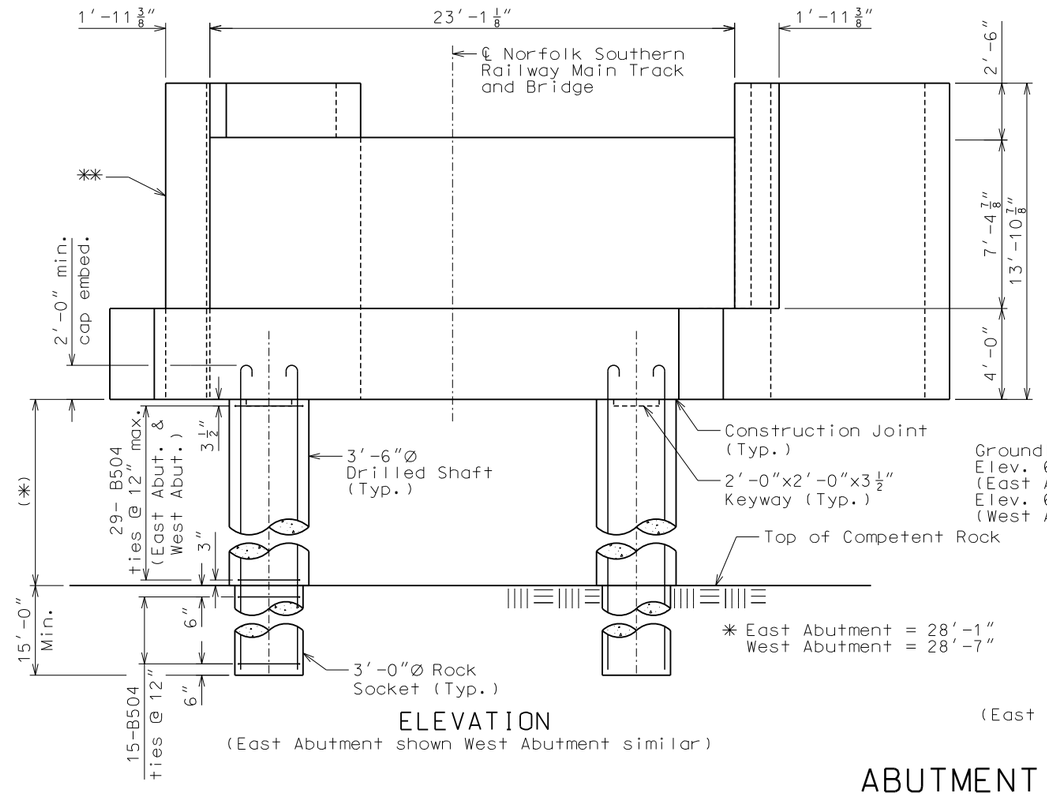


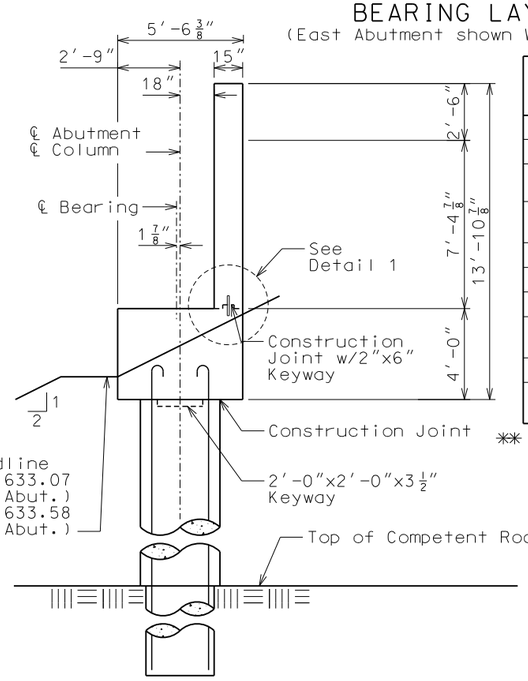
PLAN
(East Abutment shown West Abutment similar)



BEARING LAYOUT DETAIL
(East Abutment shown West Abutment similar)



ELEVATION
(East Abutment shown West Abutment similar)

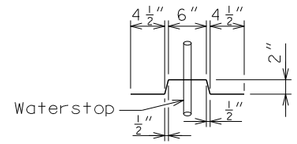


SECTION
(East Abutment shown West Abutment similar)

ESTIMATED QUANTITIES - BOTH ABUT.

ITEM		QUANTITY
Class 1 Excavation	cu. yard	425
Drilled Shaft (3 ft. 6 in. Dia.)	linear foot	113.3
Rock Socket (3 ft. 0 in. Dia.)	linear foot	60
Video Camera Inspection	each	4
Foundation Inspection Holes	linear foot	100
Sonic Logging Testing	each	4
Class B-1 Concrete (Substructure)	cu. yard	102.2
Reinforcing Steel (Epoxy Coated)	pound	49,800
Protective Coating - Concrete Bents and Piers (Epoxy)	lump sum	1

** All faces of abutment backwall and cap, except those exposed to earth, shall be coated with Protective Coating - Concrete Bents and Piers (Epoxy).



DETAIL 1

Notes:

For Abutment Details, see Sheet No. S17.

COVER: 2" Typ. Chamfer all edges 3/4"x3/4".

Work this sheet with Sheet No. S15.

Waterstops shall be 9"x5/8" PVC and shall be continuous across joint. Cost of furnishing and installing waterstops shall be considered incidental to Class B-1 Concrete (Substructure).

ABUTMENT PLAN AND ELEVATION

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S16 of S48

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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

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

DATE PREPARED 8/18/2023

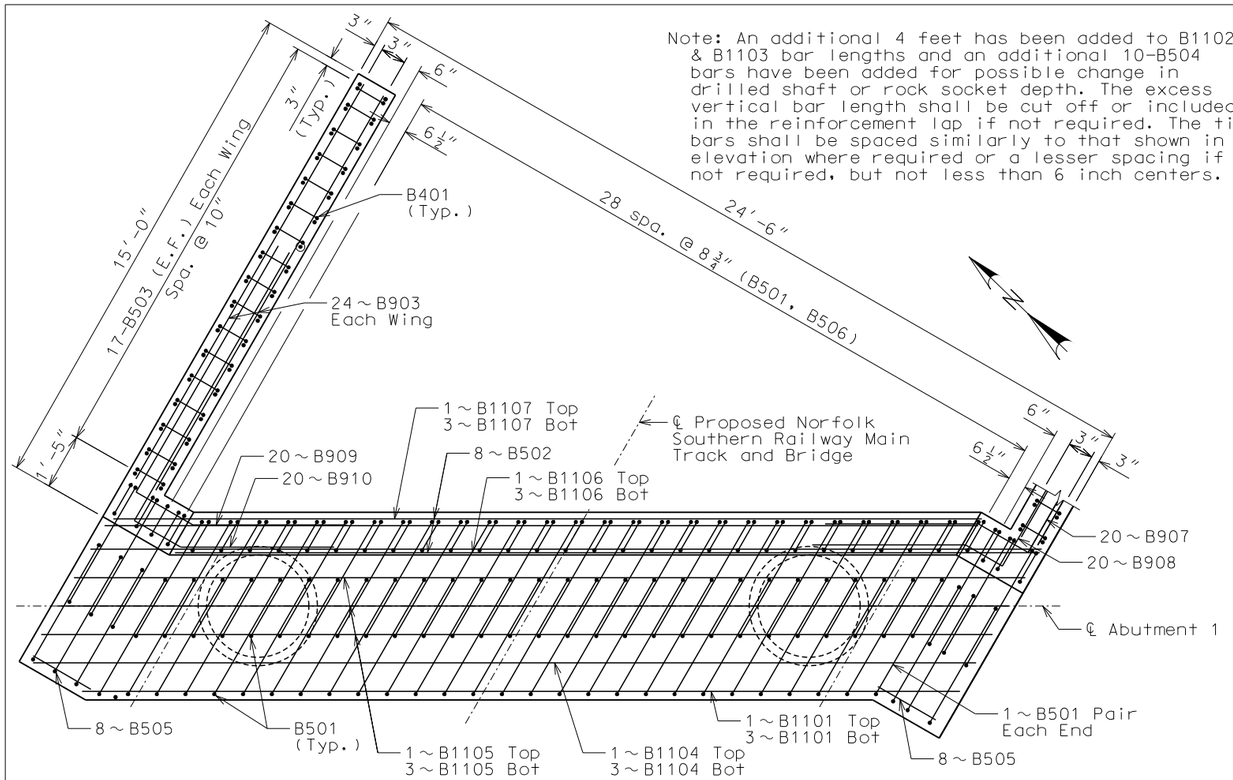
ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S16

COUNTY: ST. CHARLES
JOB NO.: J6I0624
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A5801

DATE	DESCRIPTION

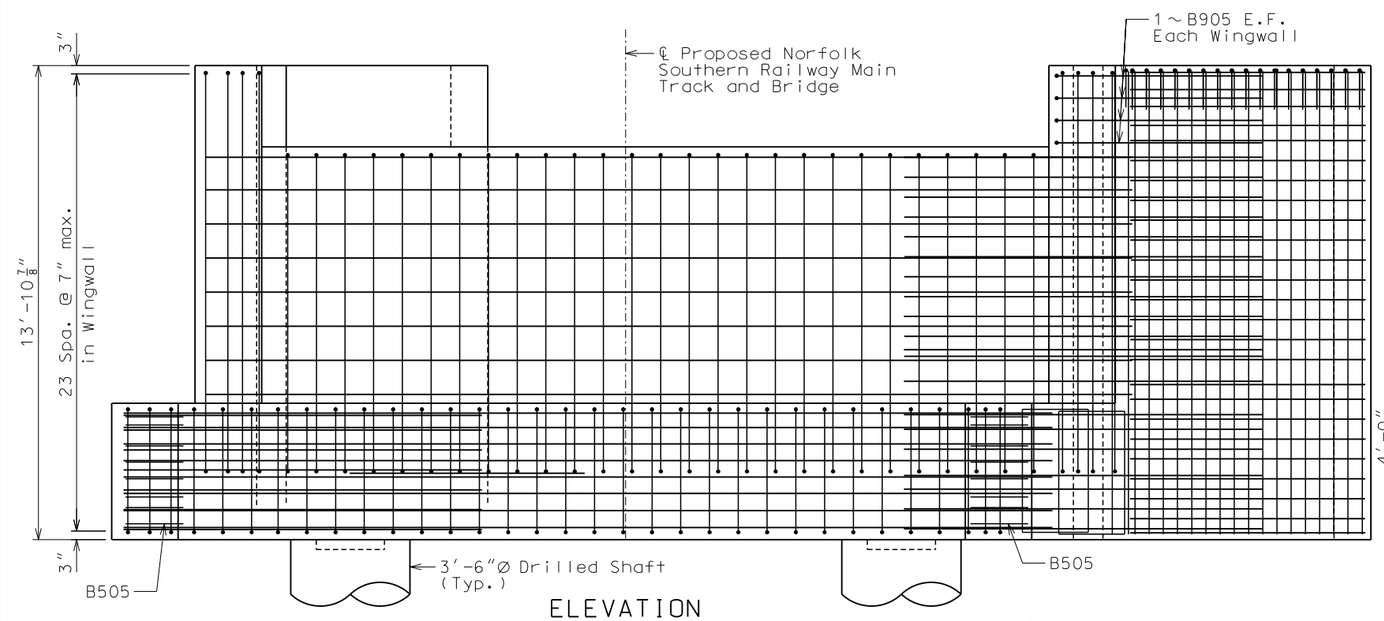
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

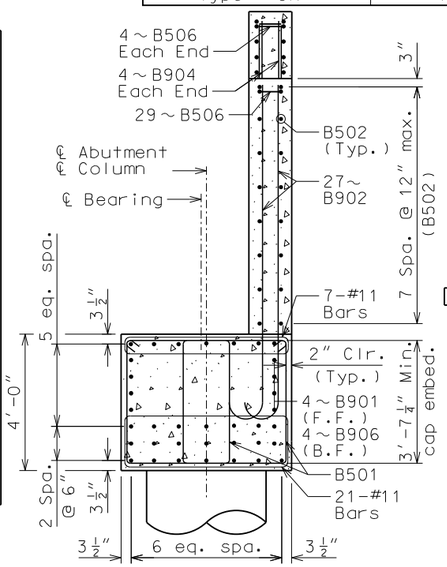


Note: An additional 4 feet has been added to B1102 & B1103 bar lengths and an additional 10-B504 bars have been added for possible change in drilled shaft or rock socket depth. The excess vertical bar length shall be cut off or included in the reinforcement lap if not required. The tie bars shall be spaced similarly to that shown in elevation where required or a lesser spacing if not required, but not less than 6 inch centers.

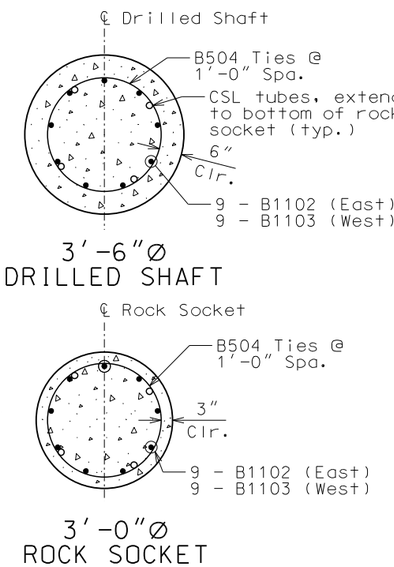
PLAN
(East Abutment shown West Abutment similar)



ELEVATION
(East Abutment shown West Abutment similar)
(Left Wing reinforcing not shown for clarity)



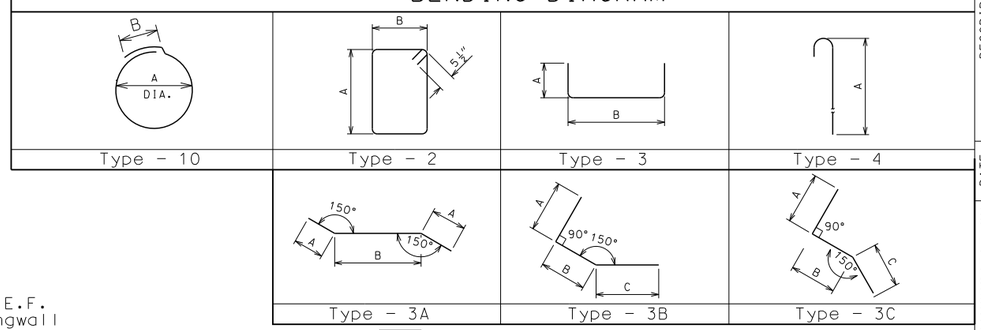
SECTION
(East Abutment shown West Abutment similar)



REINFORCING STEEL SCHEDULE - ABUT. EACH

MARK	BAR NO.	NO. REQ'D.	LENGTH (FT.)	TYPE	A	B	C	LOCATION	WEIGHT (LBS.)
B401	4	34	1'-9"	3	0'-5"	0'-11"		Top Wingwall	40
B501	5	70	15'-11"	2	3'-7"	3'-11"	-	Shear Stirrup - Cap	1162
B502	5	16	25'-8"	STR.	-	-	-	Long. Bar - Backwall	429
B503	5	68	13'-4"	STR.	-	-	-	Vert. Bar - Wingwall	946
B504	5	98	9'-11"	10	2'-6"	2'-0"	-	Tie - Shaft	1014
B505	5	16	2'-0"	STR.	-	-	-	Horiz. - End Cap	34
B506	5	35	2'-0"	3	0'-6"	1'-0"	-	Top Backwall	75
B901	9	4	25'-8"	STR.	-	-	-	Horiz. - Front Cap	350
B902	9	54	10'-6"	4	9'-3"	-	-	Vert. - Backwall	1928
B903	9	96	13'-4"	STR.	-	-	-	Horiz. - Wingwall	4352
B904	9	16	13'-0"	4	11'-9"	-	-	Vert. - Backwall	708
B905	9	16	9'-7"	4	8'-4"	-	-	Corner - Wingwall	522
B906	9	4	25'-10"	STR.	-	-	-	Horiz. - Back Cap	352
B907	9	20	15'-2"	3C	9'-1"	1'-11"	4'-2"	Corner - Wingwall	1031
B908	9	20	15'-2"	3C	9'-1"	1'-5"	4'-8"	Corner - Wingwall	1031
B909	9	20	15'-1"	3C	9'-1"	2'-2"	3'-10"	Corner - Wingwall	1026
B910	9	20	15'-2"	3C	9'-1"	1'-3"	4'-10"	Corner - Wingwall	1031
B1101	11	4	25'-8"	STR.	-	-	-	Long. Bar - Cap	546
B1102	11	18	50'-4"	4	-	-	-	Vert. - Shaft (E. Abut.)	4814
B1103	11	18	50'-10"	4	-	-	-	Vert. - Shaft (W. Abut.)	4861
B1104	11	4	27'-6"	STR.	-	-	-	Long. Bar - Cap	585
B1105	11	12	27'-10"	STR.	-	-	-	Long. Bar - Cap	1775
B1106	11	4	27'-6"	STR.	-	-	-	Long. Bar - Cap	585
B1107	11	4	25'-7"	STR.	-	-	-	Long. Bar - Cap	544

BENDING DIAGRAM



ABUTMENT DETAILS

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S17 of S48

STATE OF MISSOURI
IGOR KRINTSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S17
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION | DATE

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

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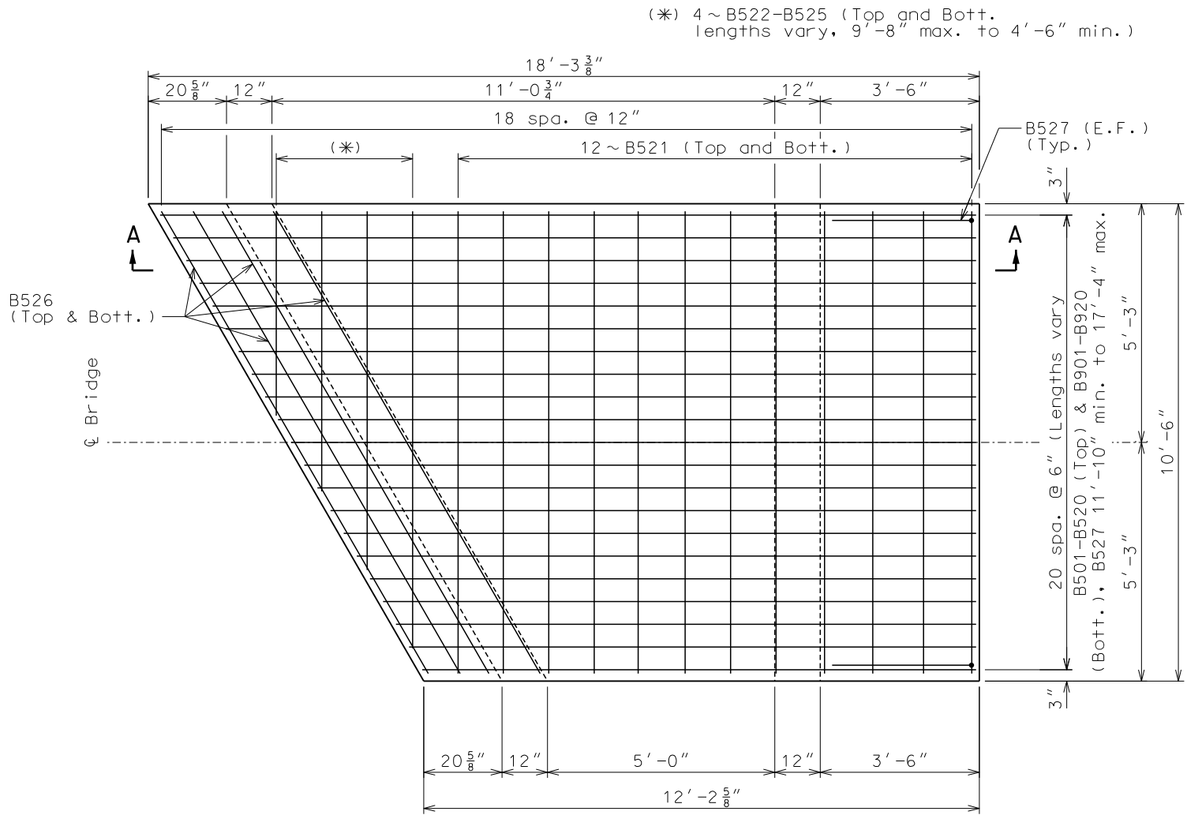
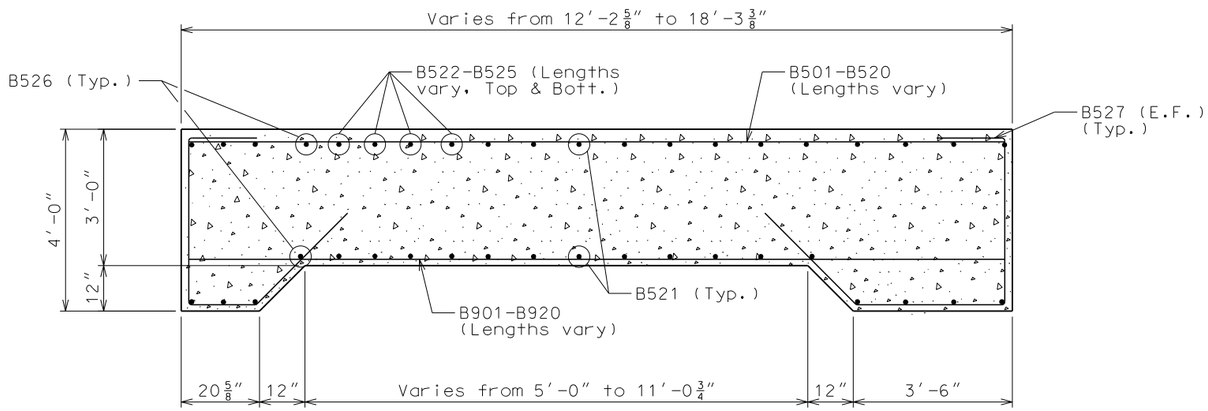


PLAN – CONCRETE APPROACH SLAB

(Both Abutment Approach Slabs Similar and Opposite Hand.)



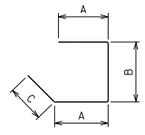
SECTION A-A

REINFORCING STEEL SCHEDULE – APPROACH SLAB (EA.)

MARK	BAR NO.	NO. REQ'D.	LENGTH (Ft.)	TYPE	A	B	C	WIEGHT (LBS.)
B501-B520	5	21	(1)	STR.	–	–	–	305
B521	5	24	10'-0"	STR.	–	–	–	250
B522-B525	5	8	(2)	STR.	–	–	–	30
B526	5	8	11'-7"	STR.	–	–	–	97
B527	5	42	9'-6"	20	2'-0"	3'-6"	2'-0"	416
B901-B920	9	21	(3)	STR.	–	–	–	993

(1) 17'-11" (Max.); 11'-10" (Min.)
(2) 9'-3" (Max.); 4'-6" (Min.)
(3) 17'-11" (Max.); 11'-10" (Min.)

BENDING DIAGRAM



Type – 20

ESTIMATED QUANTITIES – APPROACH SLAB (EA.)

	ITEM		QUANTITY
*	Class B-1 Concrete (5,000 psi concrete)	cu. yard	20.3
*	Reinforcing Steel (Epoxy Coated)	pound	2100

* Quantities shown for information only

Notes:

COVER: 3" Typ. Chamfer all edges $\frac{3}{4}$"x$\frac{3}{4}$"

All concrete for the bridge approach slab shall be in accordance with Sec 503 (f'c = 5,000 psi).

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

Payment for furnishing all materials, labor and excavation necessary to construct the approach slab, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Major) per square yard.

APPROACH SLAB DETAILS

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S18 of S48

STATE OF MISSOURI — IGOR KRINTSKIY — NUMBER PE-2012018095 — PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT STR | SHEET NO. S18
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

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

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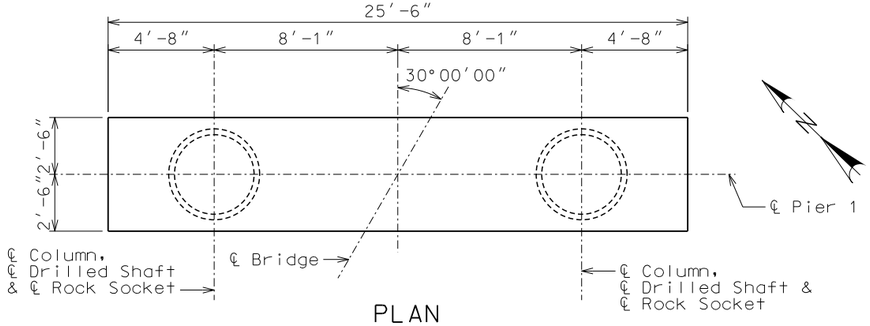
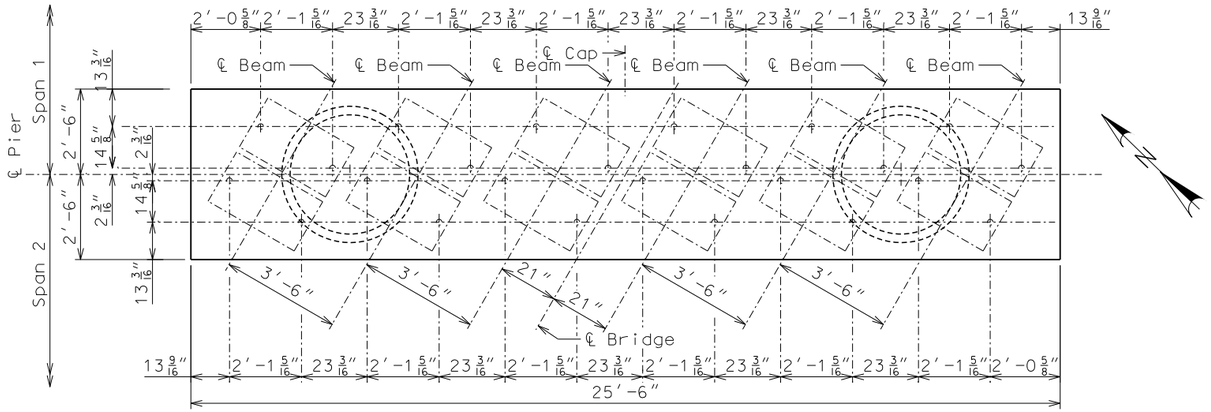
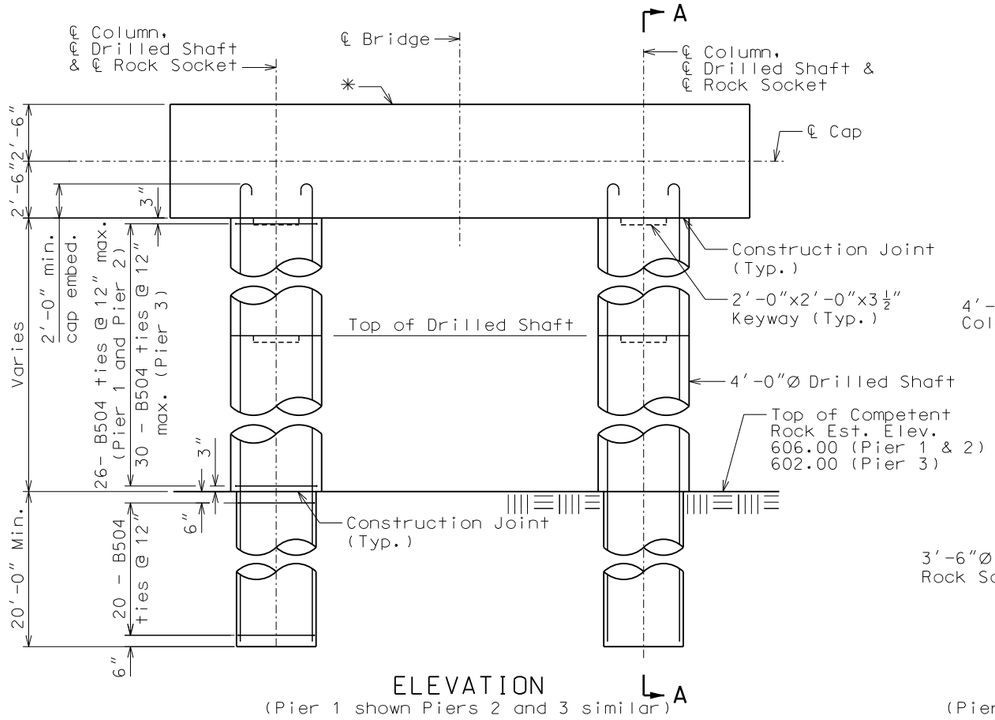


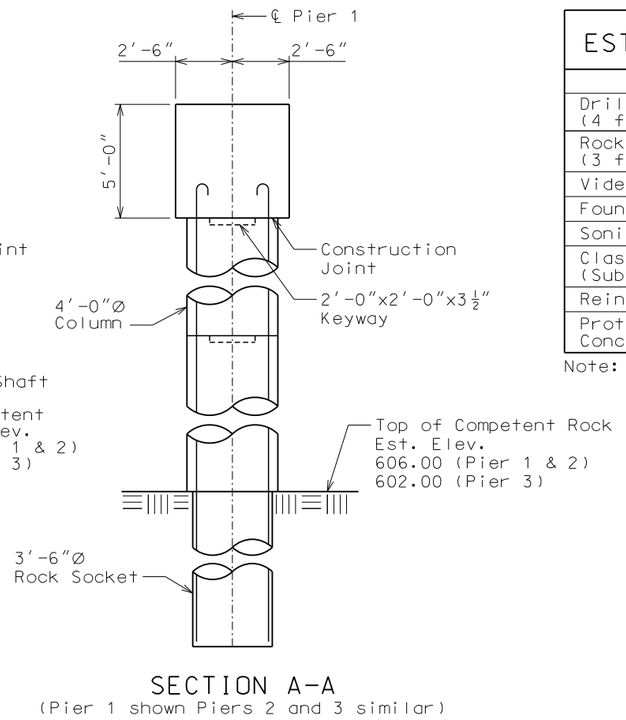
PLAN
(Pier 1 shown Piers 2 and 3 similar)



BEARING LAYOUT DETAIL
(Pier 1 shown Piers 2 and 3 similar)



ELEVATION
(Pier 1 shown Piers 2 and 3 similar)



SECTION A-A
(Pier 1 shown Piers 2 and 3 similar)

✳ All faces of pier cap and columns shall be coated with Protective Coating - Concrete Bents and Piers (Epoxy).

ESTIMATED QUANTITIES - PIERS 1, 2, & 3

ITEM		QUANTITY
Drilled Shaft (4 ft. 0 in. Dia.)	linear foot	72.5
Rock Socket (3 ft. 6 in. Dia.)	linear foot	120
Video Camera Inspection	each	6
Foundation Inspection Holes	linear foot	180
Sonic Logging Testing	each	6
Class B-1 Concrete (Substructure)	cu. yard	111.3
Reinforcing Steel (Epoxy Coated)	pound	41,060
Protective Coating - Concrete Bents and Piers (Epoxy)	lump sum	1

Note: Quantities shown above are total for Piers 1, 2, and 3.

Notes:

COVER: 2″ Typ. Chamfer all edges ¾″x¾″.

Work this sheet with Sheet No. S15.

PIER PLAN AND ELEVATION

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI
IGOR KRINTSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S19
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION | DATE

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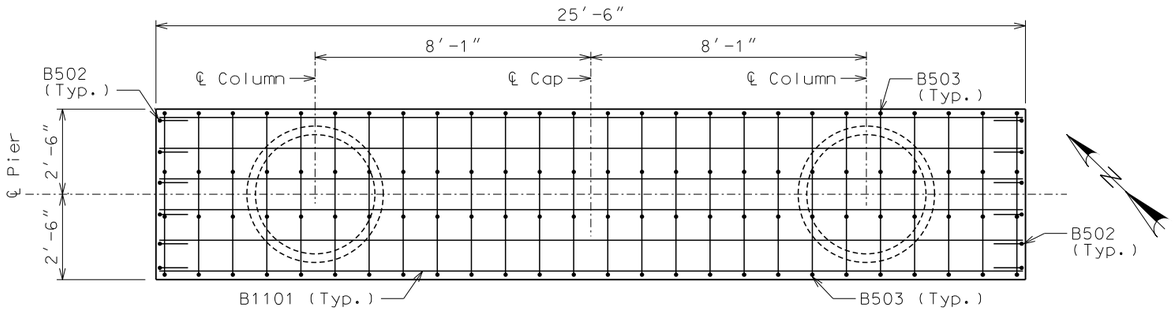
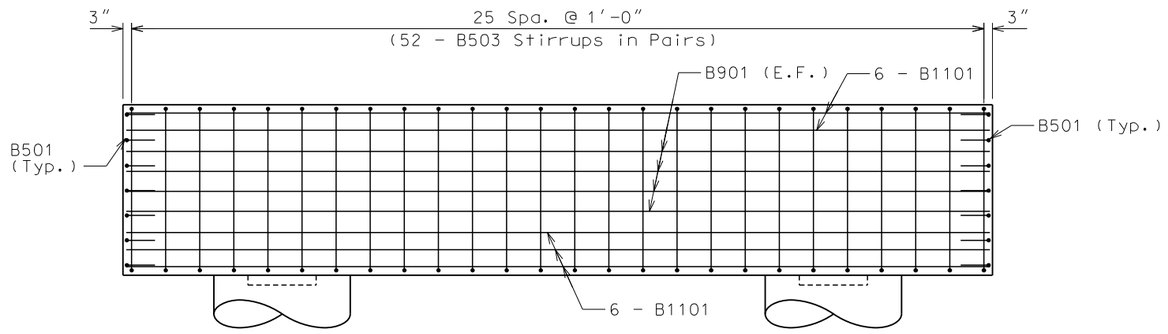
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

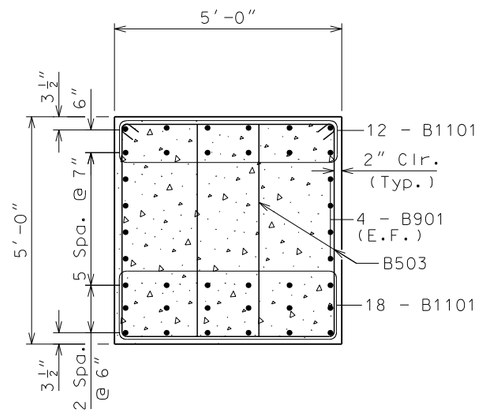
HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856



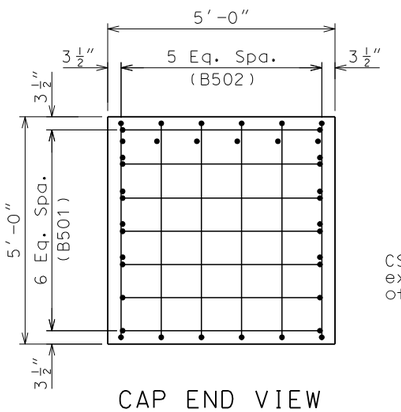
PIER CAP PLAN
(Pier 1 shown Piers 2 and 3 similar)



PIER CAP ELEVATION
(Pier 1 shown Piers 2 and 3 similar)



PIER CAP SECTION

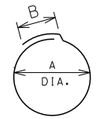


CAP END VIEW

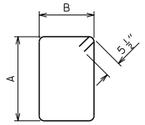
REINFORCING STEEL SCHEDULE - CAP AND SHAFTS

MARK	BAR NO.	NO. REQ'D.	LENGTH (FT.)	TYPE	A	B	LOCATION	WEIGHT (LBS.)
B501	5	14	6′-8″	3	1′-0″	4′-8″	End Bar - Cap (Each Pier)	97
B502	5	12	6′-8″	3	1′-0″	4′-8″	End Bar - Cap (Each Pier)	83
B503	5	52	15′-11″	2	4′-8″	2′-10″	Shear Bar - Cap (Each Pier)	863
B901	9	8	25′-2″	STR.	-	-	Longitudinal Bar - Cap (Each Pier)	685
B1101	11	30	25′-2″	STR.	-	-	Longitudinal Bar - Cap (Each Pier)	4011
B504	5	102	11′-6″	10	3′-0″	2′-2″	Tie Bar - Shaft (Piers 1 & 2)	1223
B1102	11	24	52′-5″	4	-	-	Vertical Bar - Shaft (Piers 1 & 2)	6684
B504	5	110	11′-6″	10	3′-0″	2′-2″	Tie Bar - Shaft (Piers 3)	1319
B1103	11	24	52′-7″	4	-	-	Vertical Bar - Shaft (Piers 3)	6705

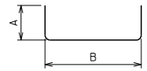
BENDING DIAGRAM



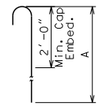
Type - 10



Type - 2

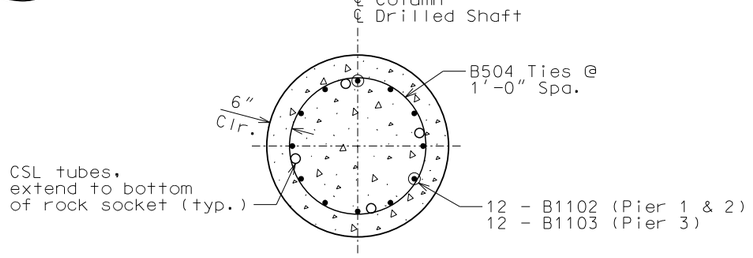


Type - 3

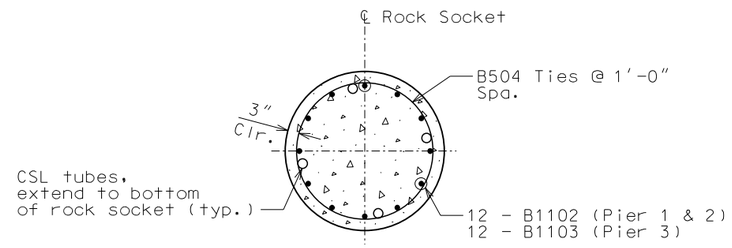


Type - 4

Note: An additional 4 feet has been added to B1102 & B1103 bar lengths and an additional 10-B504 bars have been added for possible change in drilled shaft or rock socket depth. The excess vertical bar length shall be cut off or included in the reinforcement lap if not required. The tie bars shall be spaced similarly to that shown in elevation where required or a lesser spacing if not required, but not less than 6 inch centers.



4′-0″Ø COLUMN & DRILLED SHAFT



3′-6″Ø ROCK SOCKET

Notes:

For Notes, see Sheet No. S19.

COVER: 2″ Typ. Chamfer all edges ¾″x¾″

PIER DETAILS

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI
IGOR KRINTSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S20
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

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

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
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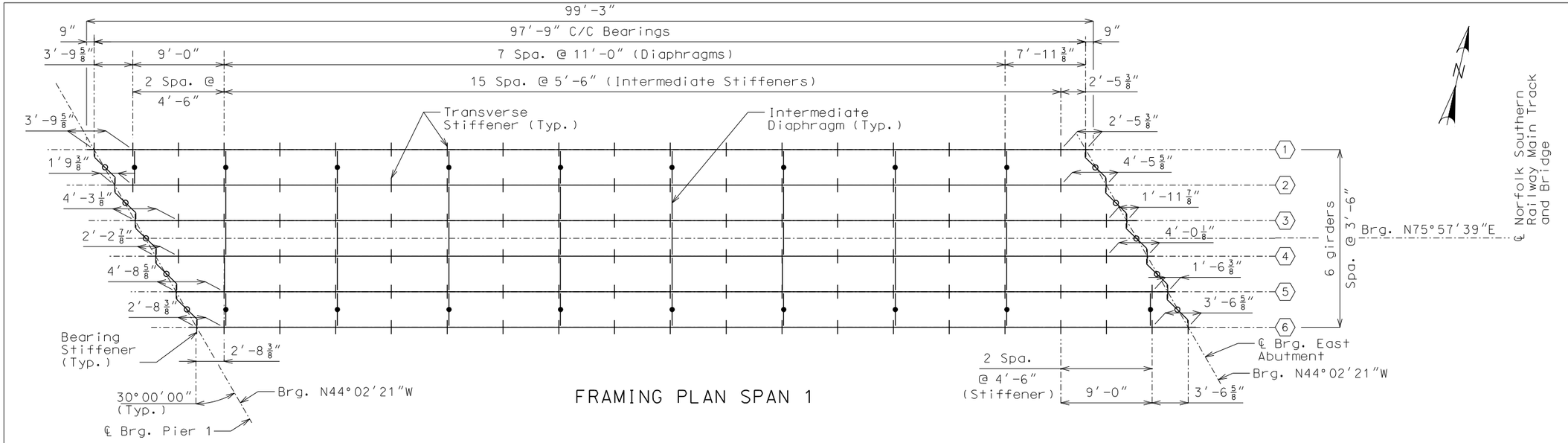
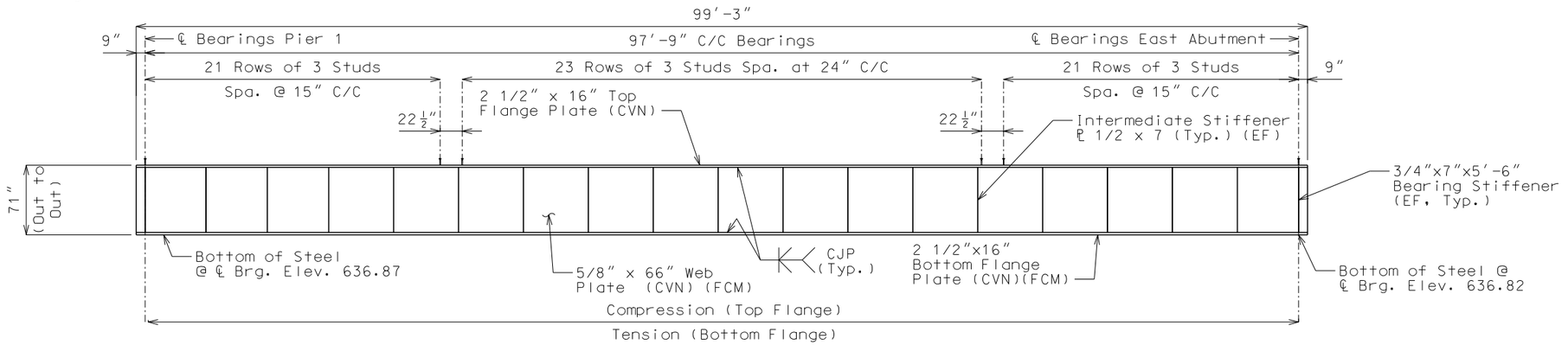
Certificate of Authority: 000856



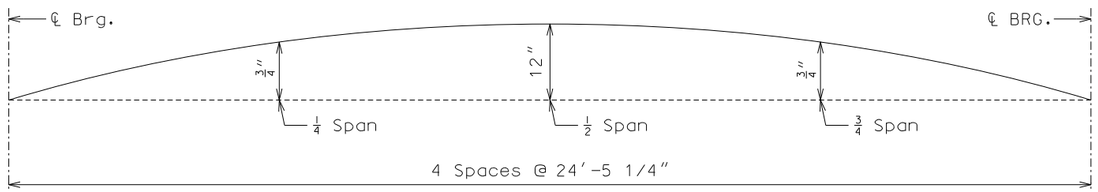
FRAMING PLAN SPAN 1



GIRDER ELEVATION

LEGEND:

- ● Location of diaphragm hole for drainage
- ○ Location of end diaphragm with bent web plates & jacking siffeners



FABRICATED GIRDER CAMBER DETAIL

Notes:

High strength bolts shall be 7/8-inch diameter ASTM F3125 Grade A325 Type 3, unless otherwise noted.

(CVN) Denotes a charpy v-notch test is required. Furnish material that meets the minimum notch toughness requirements as specified and AREMA Chapter 15 Tables 15-9-2 and 15-9-3.

(FCM) Denotes Fracture Critical Member. All FCM steel shall be provided per Norfolk Southern Specifications for structural steel and the General Notes on Sheets No. S3-S5.

Camber calculations include non-composite deflections due to the girder self-weight and concrete deck placement. All other dead load deflections, including secondary concrete pours, ballast and track, are calculated assuming composite section properties.

For Span 1 Superstructure Details, see Sheet No. S22.

For End Diaphragm Details, see Sheet No. S28.

For Bearing Details, see Sheet No. S29.

(X) - Beam Number

SPAN 1 FRAMING PLAN AND GIRDER ELEVATION

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI — IGOR KRINTSKIY — NUMBER PE-2010018095 — PROFESSIONAL ENGINEER

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

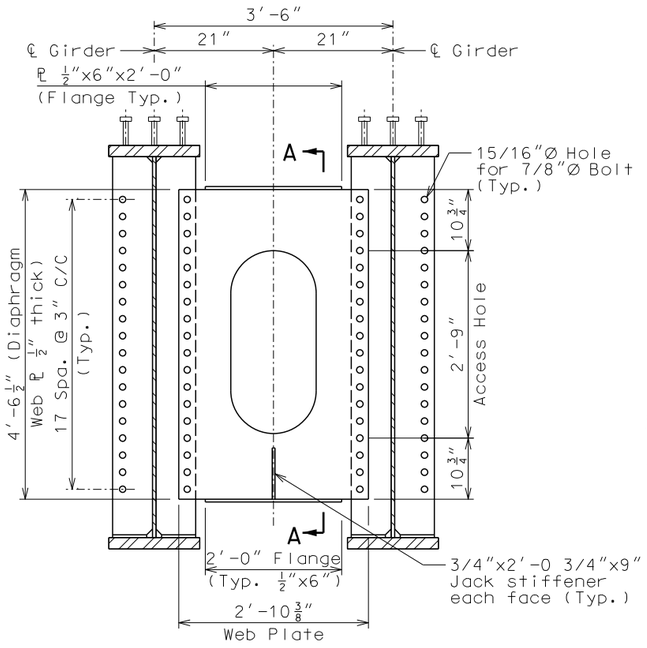
DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S21
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION | DATE

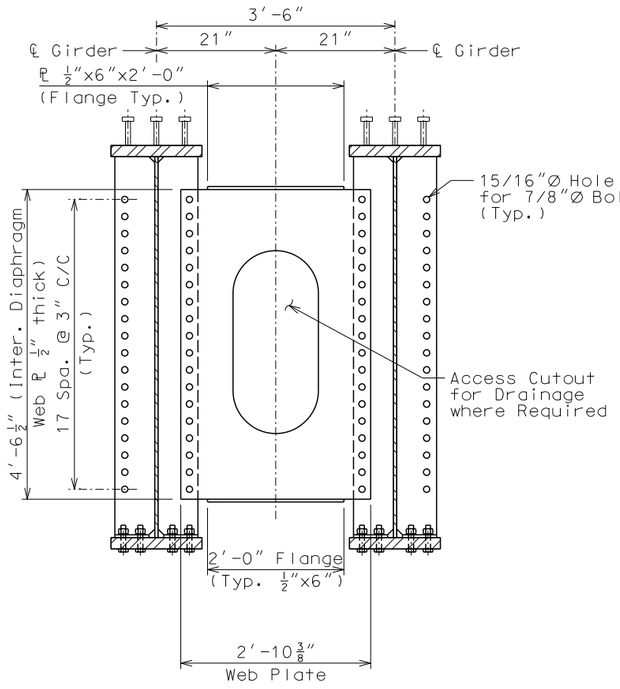
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

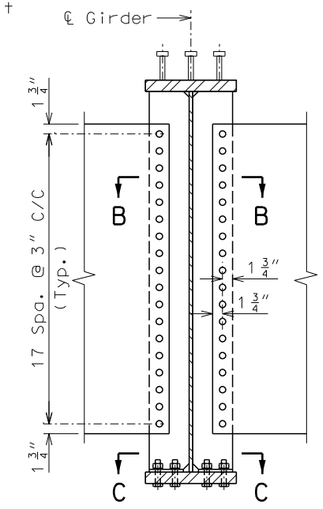
HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856



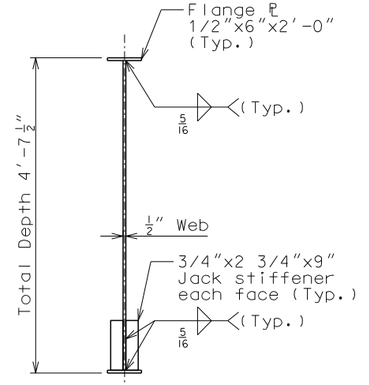
END DIAPHRAGM DETAIL



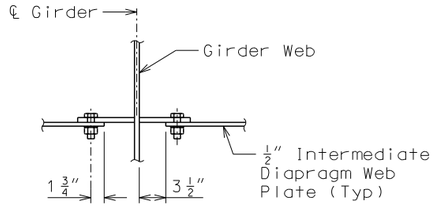
INTERMEDIATE DIAPHRAGM DETAIL



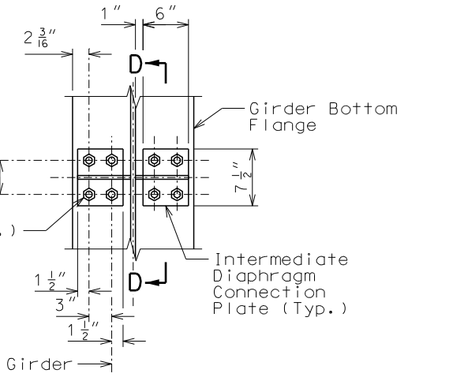
INTERMEDIATE DIAPHRAGM CONNECTION DETAIL



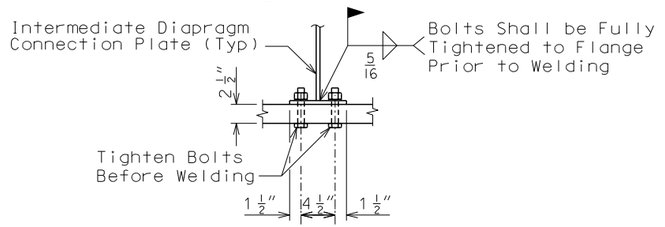
SECTION A-A



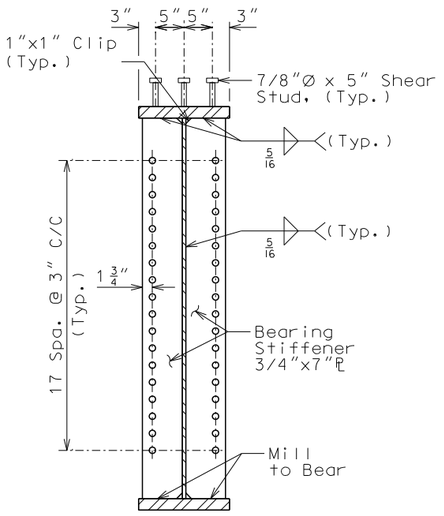
SECTION B-B



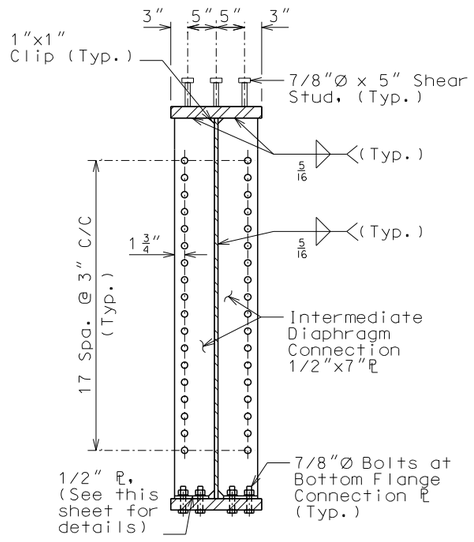
SECTION C-C



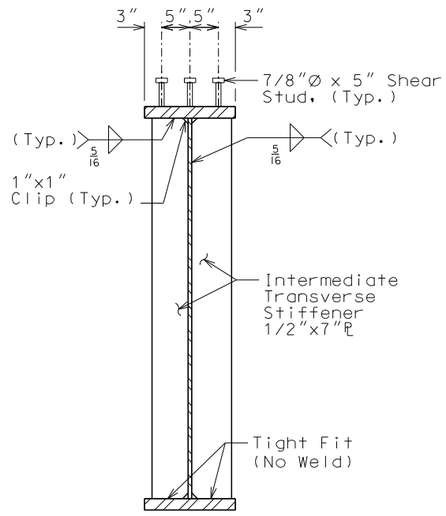
SECTION D-D



BEARING STIFFENER



INTERMEDIATE DIAPHRAGM CONNECTION PLATE



INTERMEDIATE TRANSVERSE STIFFENER

SPAN 1 SUPERSTRUCTURE DETAILS

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S22 of S48

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S22
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

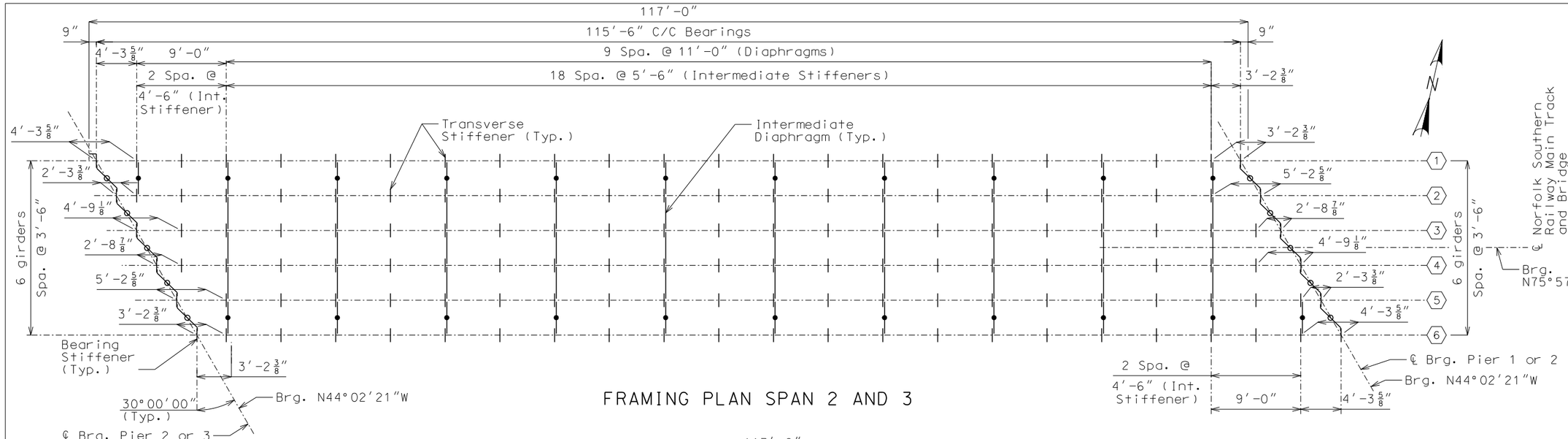
DESCRIPTION	DATE

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

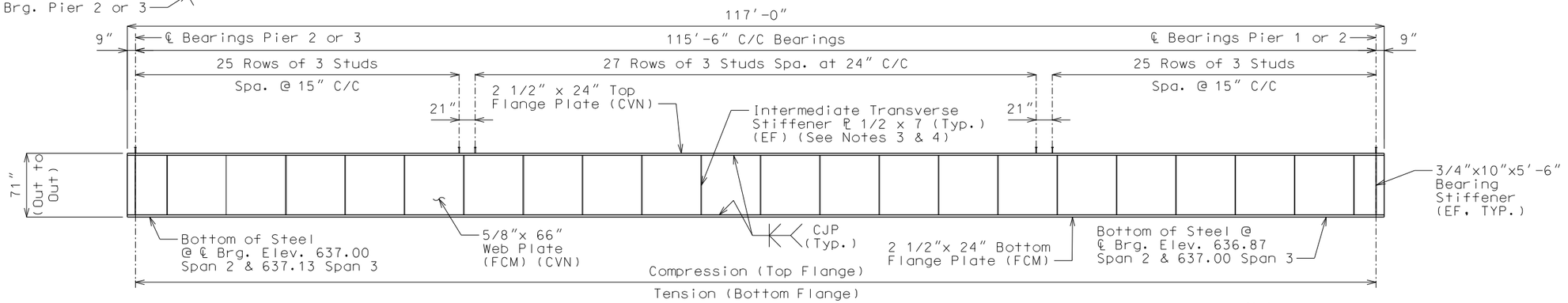
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

c:\pwworking\central01\d2302592\B_A5801_022_J6I0624.dgn 1:59:27 PM 8/18/2023



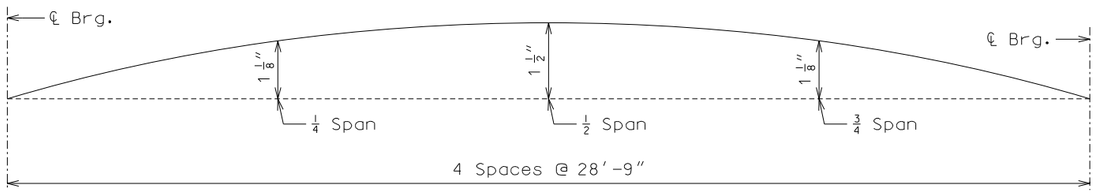
FRAMING PLAN SPAN 2 AND 3



GIRDER ELEVATION

LEGEND:

- ● Location of diaphragm hole for drainage
- ○ Location of end diaphragm with bent web plates & jacking siffeners



FABRICATED GIRDER CAMBER DETAIL

SPANS 2 AND 3 FRAMING PLAN AND GIRDER ELEVATION

Notes:

High strength Bolts shall be 7/8-inch diameter ASTM F3125 Grade A325 Type 3, unless otherwise noted.

(CVN) Denotes a charpy v-notch test is required. Furnish material that meets the minimum notch toughness requirements as specified in AREMA Chapter 15 Tables 15-9-2 and 15-9-3.

(FCM) Denotes Fracture Critical Member. All FCM steel shall be provided per Norfolk Southern Specifications for structural steel and the General Notes on Sheets No. S3-S5.

Camber calculations include non-composite deflections due to the girder self-weight and concrete deck placement. All other dead load deflections, including secondary concrete pours, ballast and track, are calculated assuming composite section properties.

For Span 2 and 3 Superstructure Details, see Sheet No. S24.

For Optional Splice Details, see Sheet No. S25.

For End Diaphragm Details, see Sheet No. S28.

For Bearing Details, see Sheet No. S29.

⟨X⟩ - Beam Number

Detailed JUNE 2023
Checked JUNE 2023

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

DATE PREPARED 8/18/2023

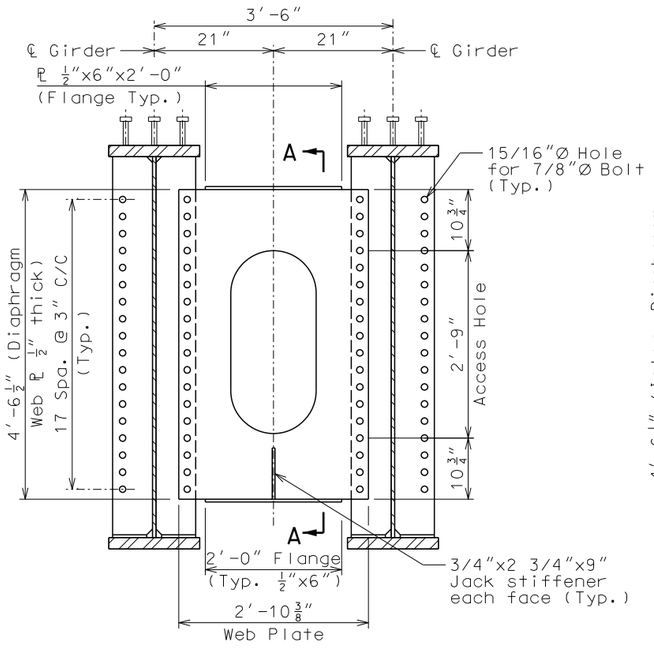
ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S23

COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

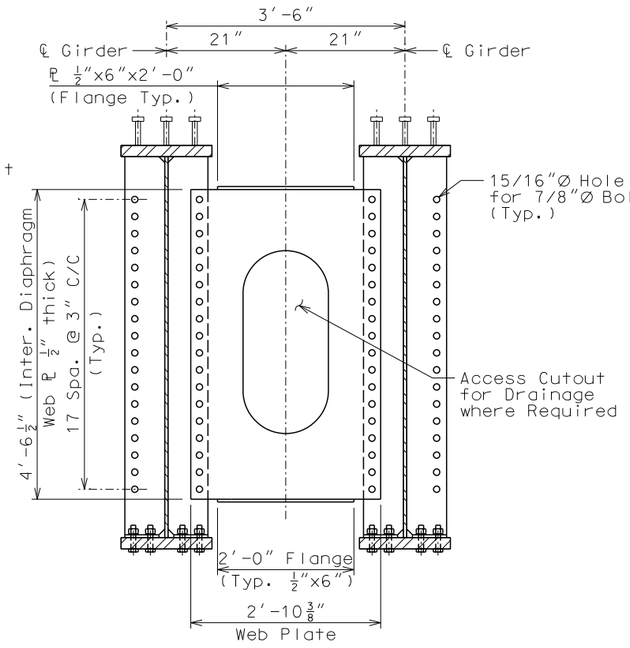
DESCRIPTION	DATE

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

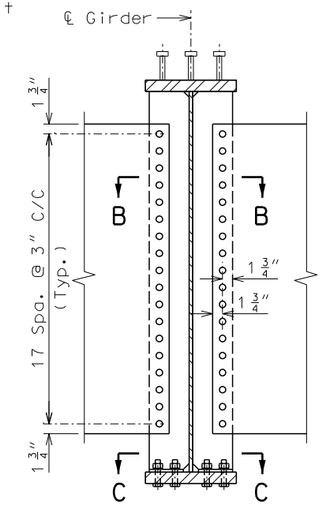
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
MoDOT
HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856



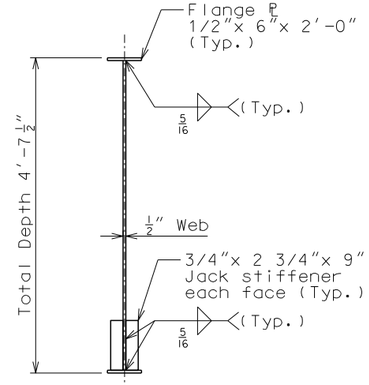
END DIAPHRAGM DETAIL



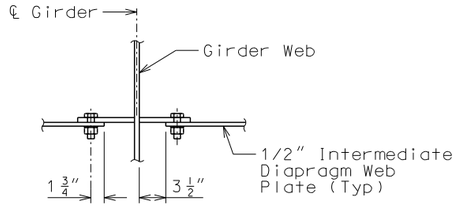
INTERMEDIATE DIAPHRAGM DETAIL



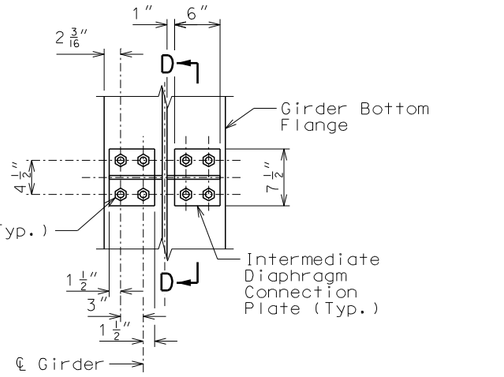
INTERMEDIATE DIAPHRAGM CONNECTION DETAIL



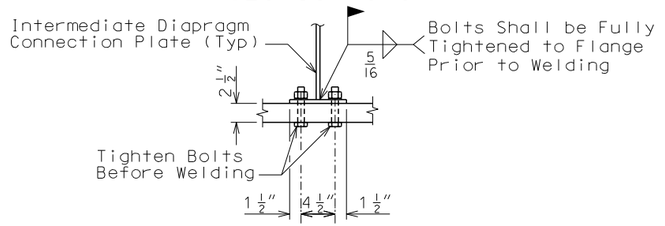
SECTION A-A



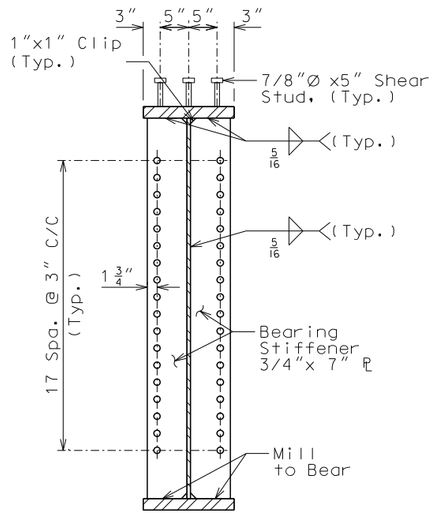
SECTION B-B



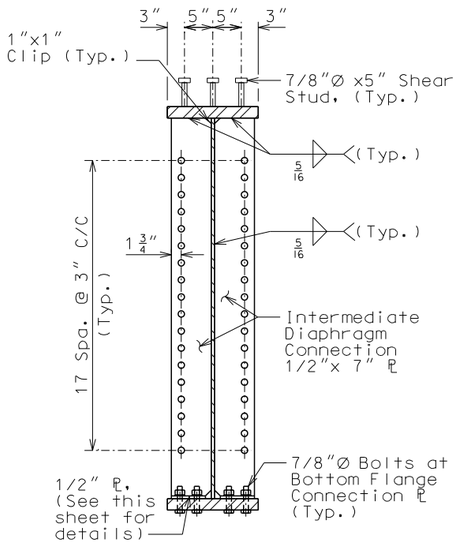
SECTION C-C



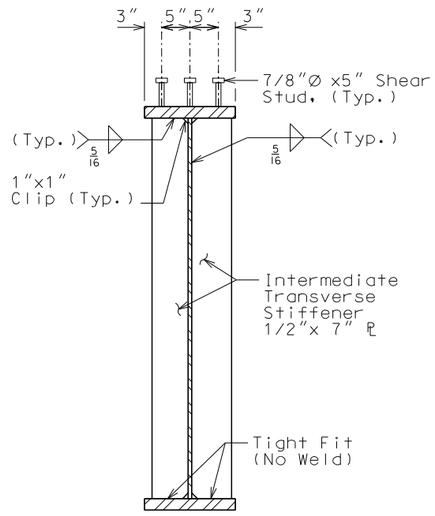
SECTION D-D



BEARING STIFFENER



INTERMEDIATE DIAPHRAGM CONNECTION PLATE



INTERMEDIATE TRANSVERSE STIFFENER

SPANS 2 AND 3 SUPERSTRUCTURE DETAILS

Detailed JUNE 2023
Checked JUNE 2023

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

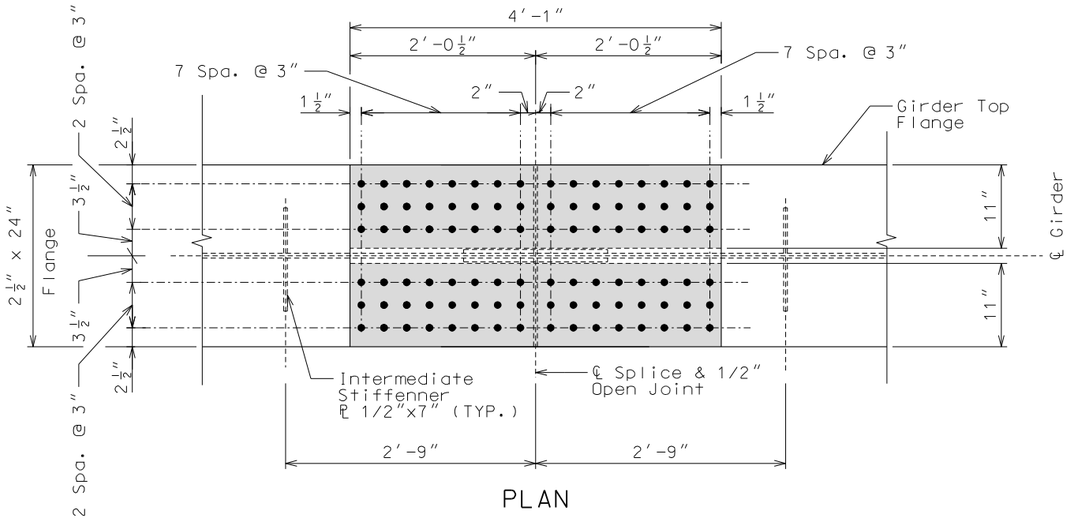
DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S24
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION | DATE

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

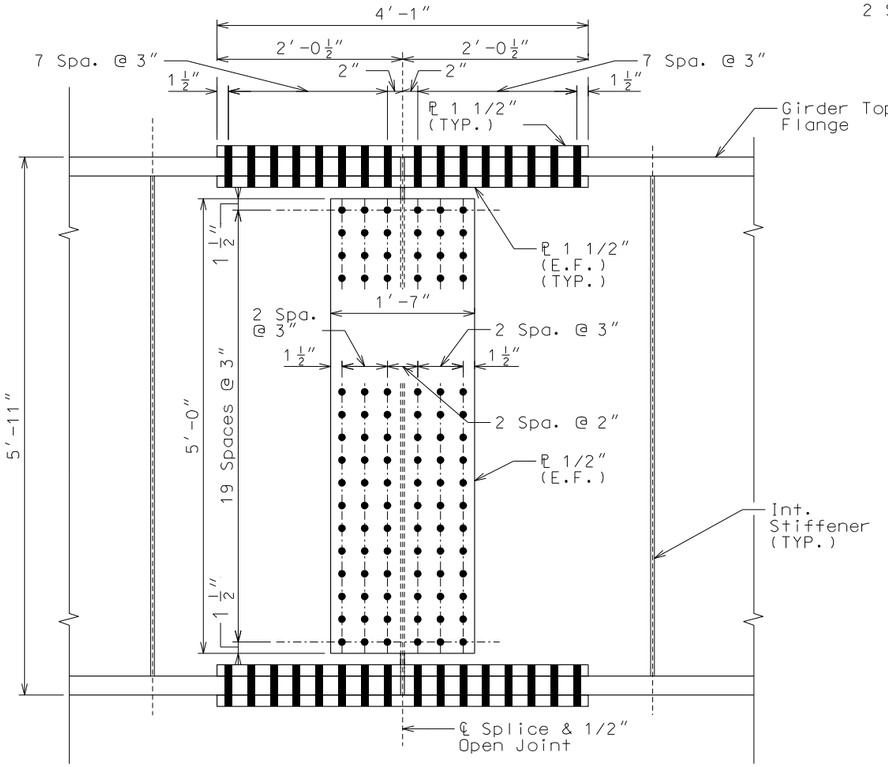
HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856



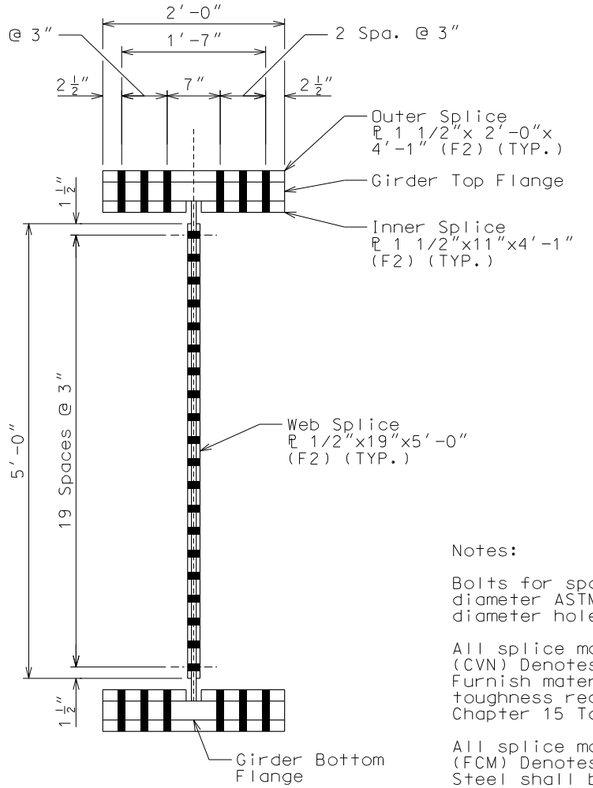
PLAN

Scale: 1″ = 1′-0″
Top Flange Shown, Bottom Flange Similar

Limits of Flange Inner Splice Plates



ELEVATION



SECTION

Notes:

Bolts for spans 2 and 3 splices shall be 1-inch diameter ASTM F3125 Grade A325 Type 3 in 1 1/16-inch diameter holes.

All splice material shall be designated as (CVN). (CVN) Denotes a charpy v-notch test is required. Furnish material that meets the minimum notch toughness requirements as specified in AREMA Chapter 15 Tables 15-9-2 and 15-9-3.

All splice material shall be designated as (FCM). (FCM) Denotes Fracture Critical Member, all FCM Steel shall be provided per Norfolk Southern Specifications for structural steel and the general notes on Sheets No. S3-S5.

OPTIONAL SPLICE DETAIL FOR SPANS 2 AND 3

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI — IGOR KRINTSKIY — NUMBER PE-2012018095 — PROFESSIONAL ENGINEER

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

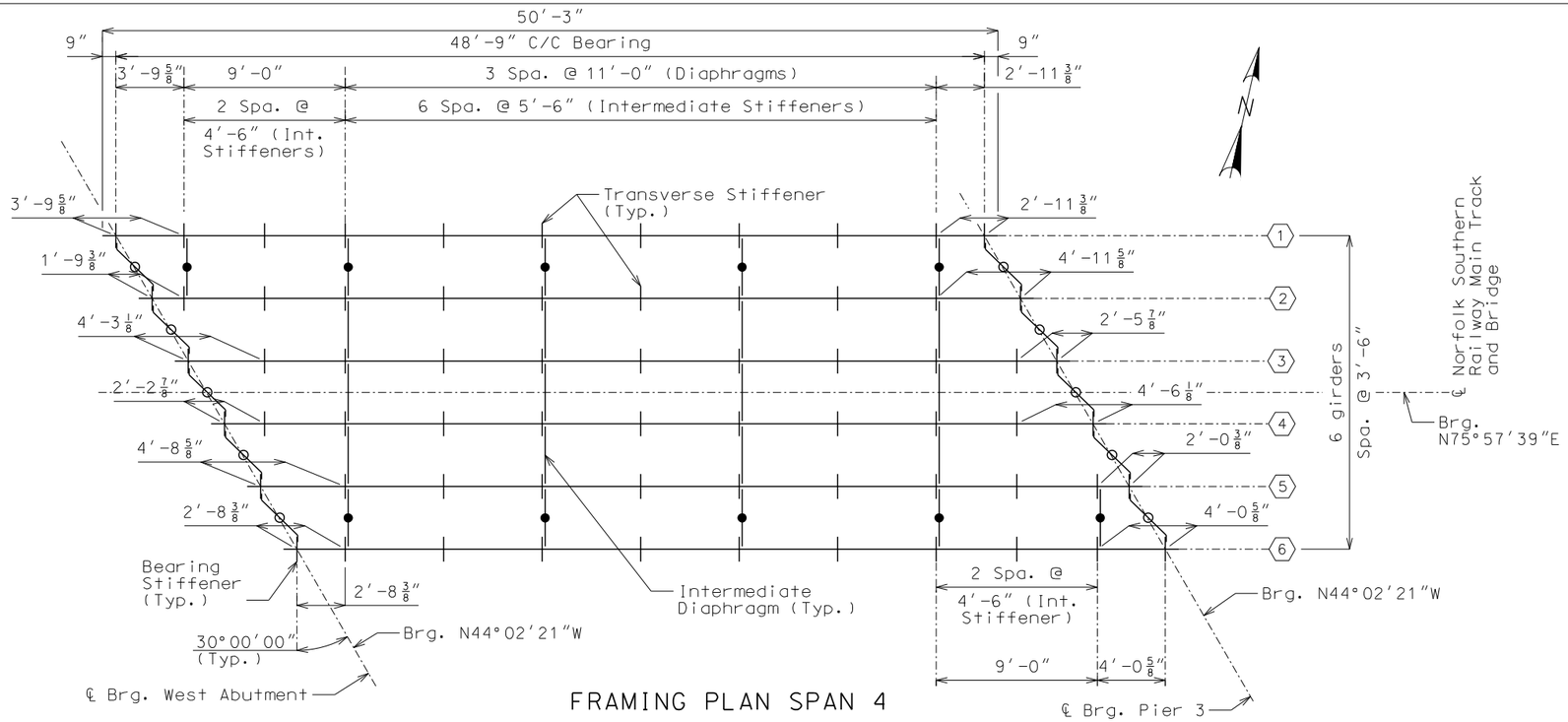
DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S25
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION | DATE

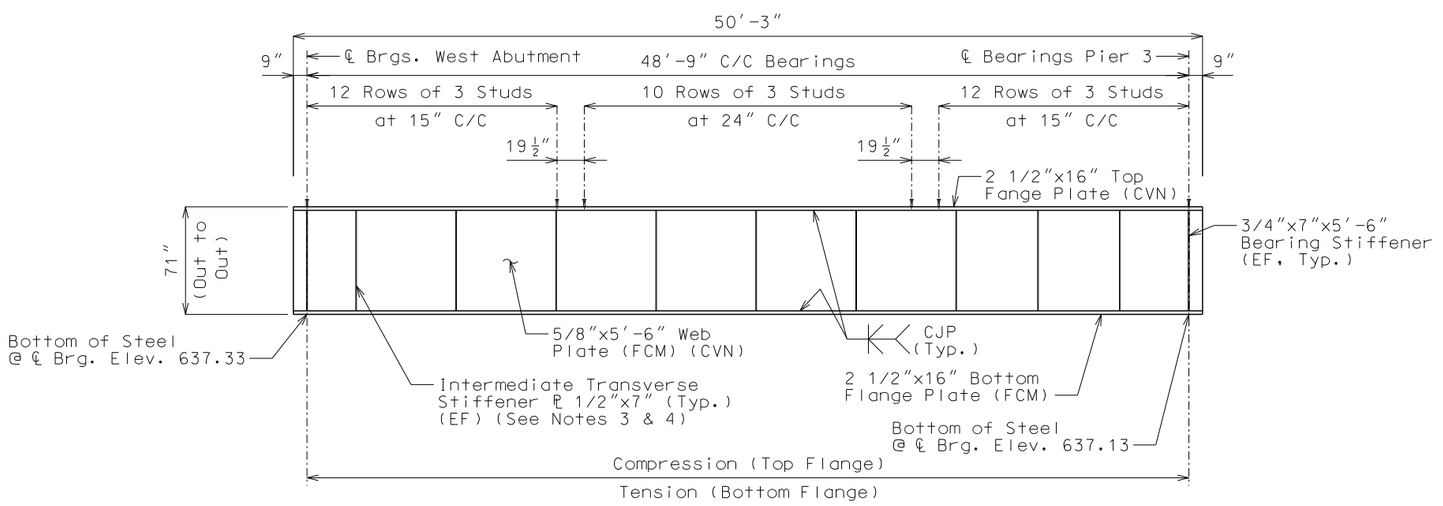
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856



FRAMING PLAN SPAN 4



GIRDER ELEVATION

LEGEND:

- ● Location of diaphragm hole for drainage
- ○ Location of end diaphragm with bent web plates & jacking siffeners

Notes:

High strength bolts shall be 7/8-inch diameter ASTM F3125 Grade A325 Type 3, unless otherwise noted.

(CVN) Denotes a charpy v-notch test is required. Furnish material that meets the minimum notch toughness requirements as specified in AREMA Chapter 15 Tables 15-9-2 and 15-9-3.

(FCM) Denotes Fracture Critical Member. all fcm steel shall be provided per Norfolk Southern Specifications for structural steel and the General Notes on Sheets No. S3-S5.

For Span 4 Superstructure Details, see Sheet No. S27.

For End Diaphragm Details, see Sheet No. S28.

For Bearing Details, see Sheet No. S29.

(X) - Beam Number

SPAN 4 FRAMING PLAN AND GIRDER ELEVATION

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI — IGOR KRINITSKIY — NUMBER PE-2012018095 — PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S26

COUNTY ST. CHARLES

JOB NO. J6I0624

CONTRACT ID.

PROJECT NO.

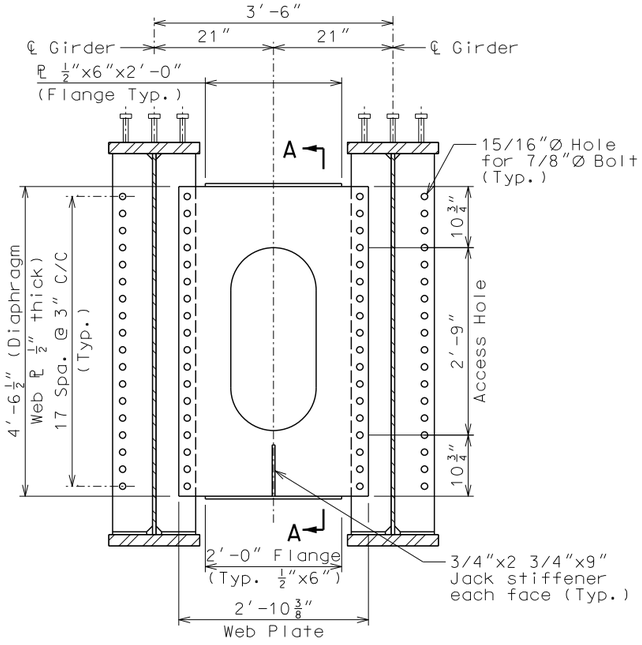
BRIDGE NO. A5801

DESCRIPTION	DATE

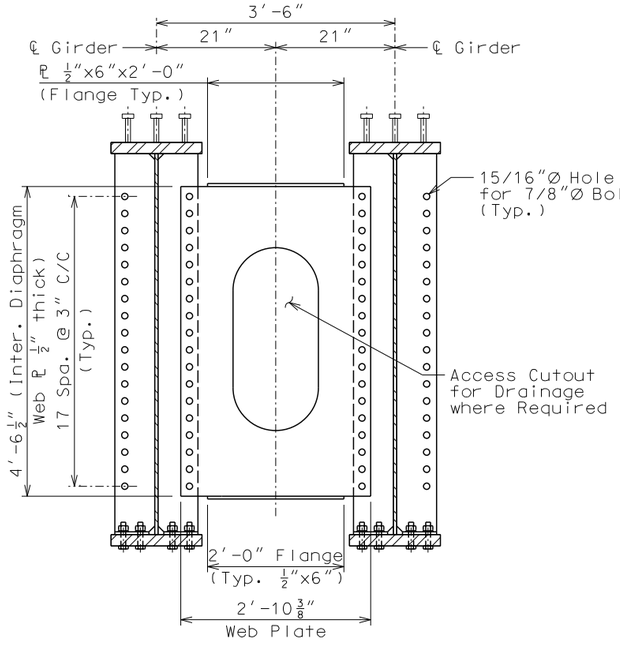
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

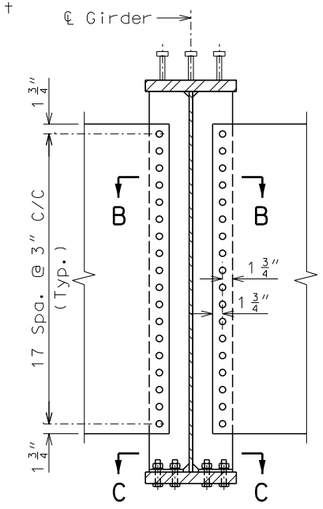
HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856



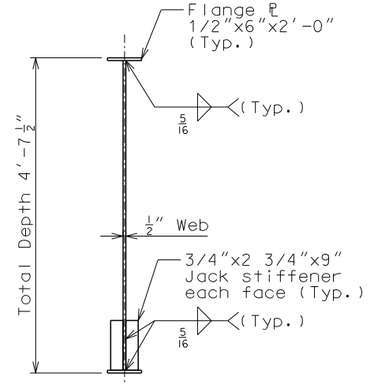
END DIAPHRAGM DETAIL



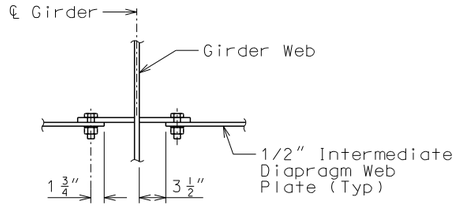
INTERMEDIATE DIAPHRAGM DETAIL



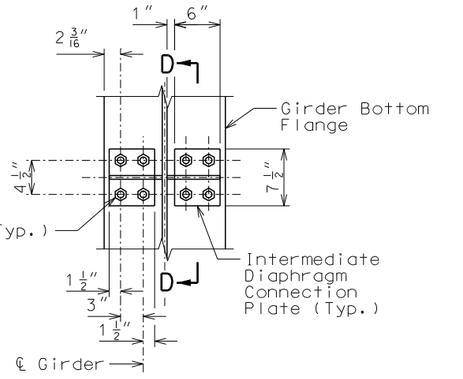
INTERMEDIATE DIAPHRAGM CONNECTION DETAIL



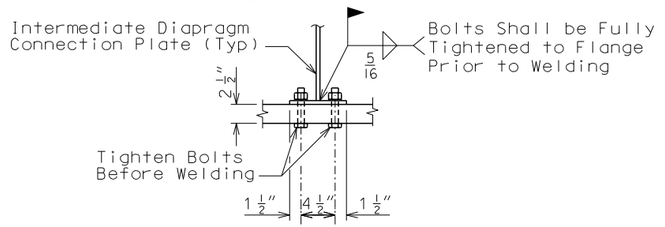
SECTION A-A



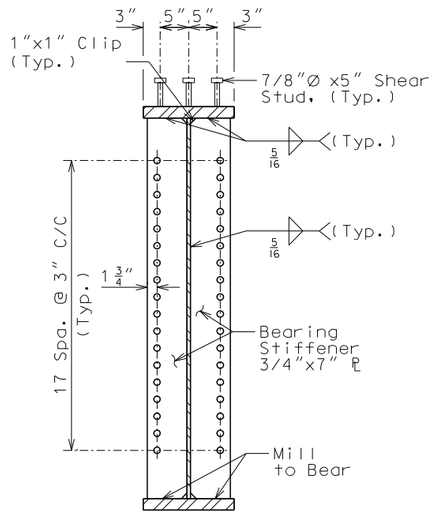
SECTION B-B



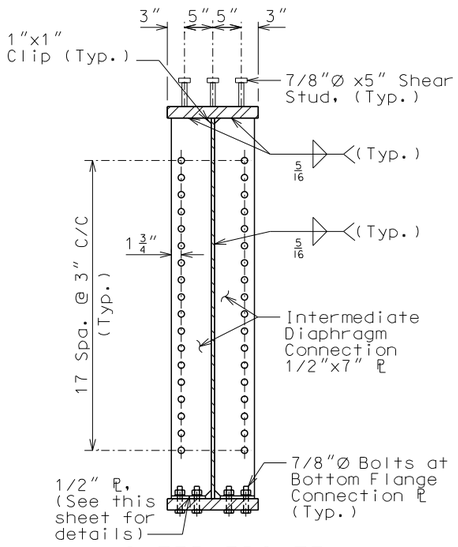
SECTION C-C



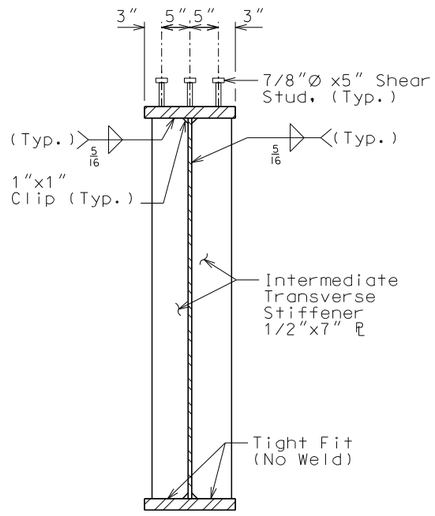
SECTION D-D



BEARING STIFFENER



INTERMEDIATE DIAPHRAGM CONNECTION PLATE



INTERMEDIATE TRANSVERSE STIFFENER

SPAN 4 SUPERSTRUCTURE DETAILS

Detailed JUNE 2023
Checked JUNE 2023

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

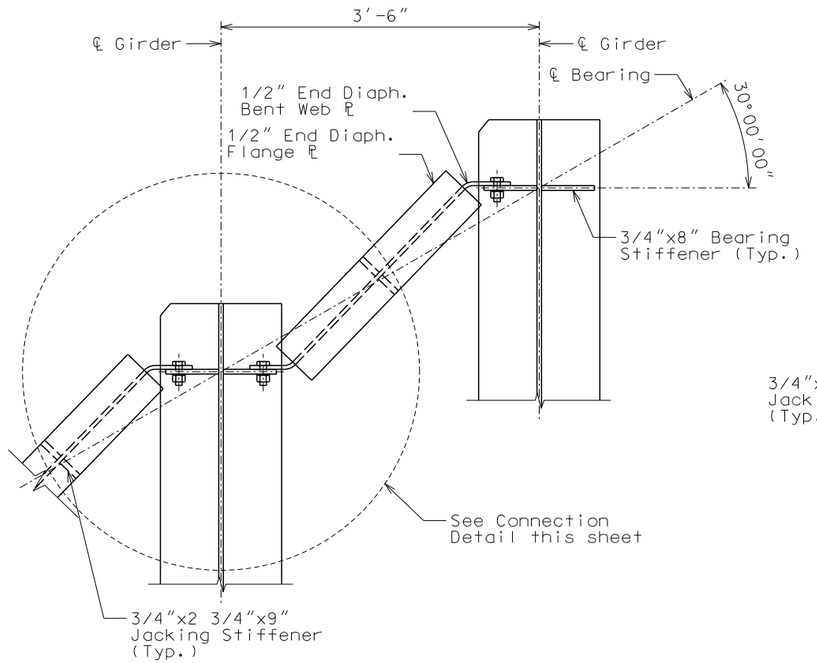
Sheet No. S27 of S48

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S27
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

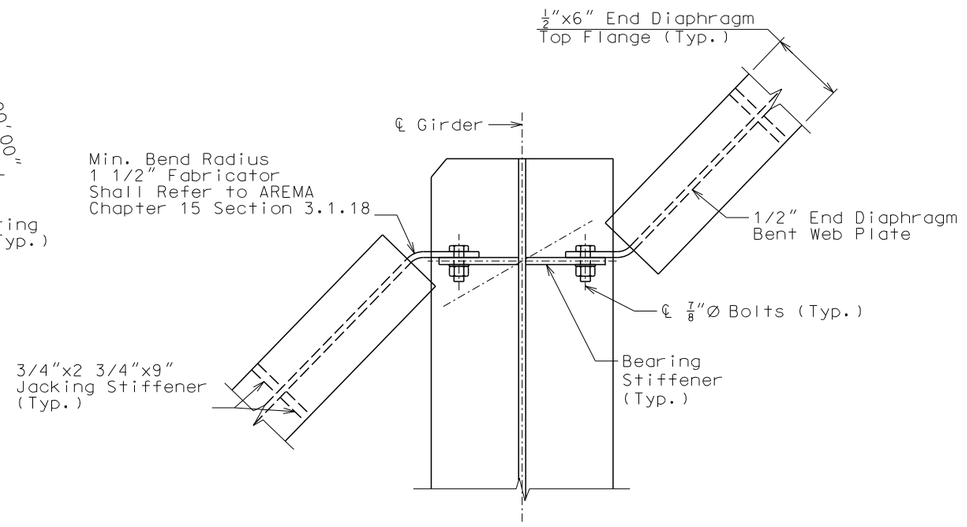
DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

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

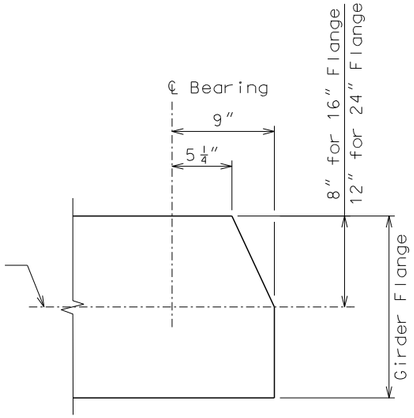


TYPICAL END DIAPHRAGM DETAIL

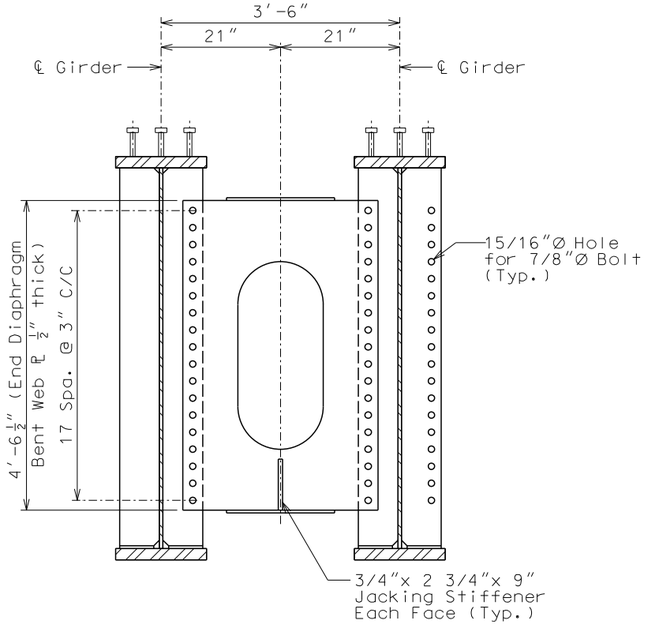


CONNECTION DETAIL

(Bearing stifener and end diaphragm bent web ℄)

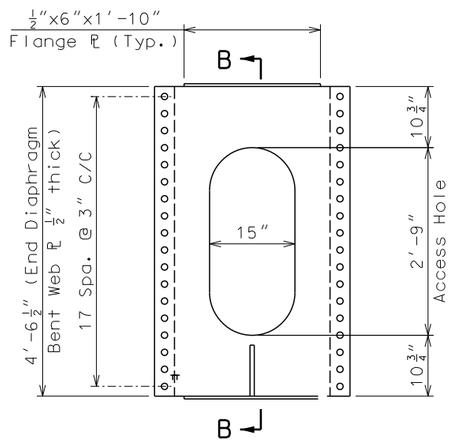


END OF GIRDER END BEVEL DETAIL



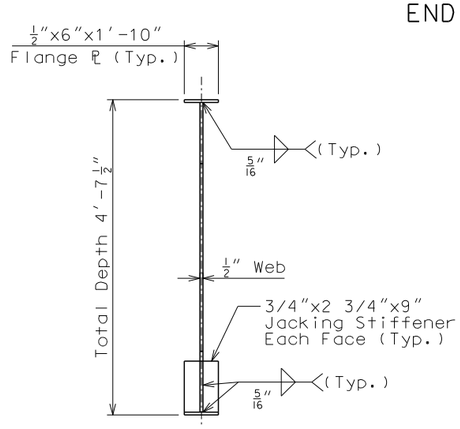
GIRDER FRAMING SECTION

(Normal to girder)



END DIAPHRAGM ELEVATION

(Parallel to Diaphragm)



SECTION B-B

END DIAPHRAGM DETAILS

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S28 of S48

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S28

COUNTY ST. CHARLES

JOB NO. J6I0624

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A5801

DESCRIPTION	DATE

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

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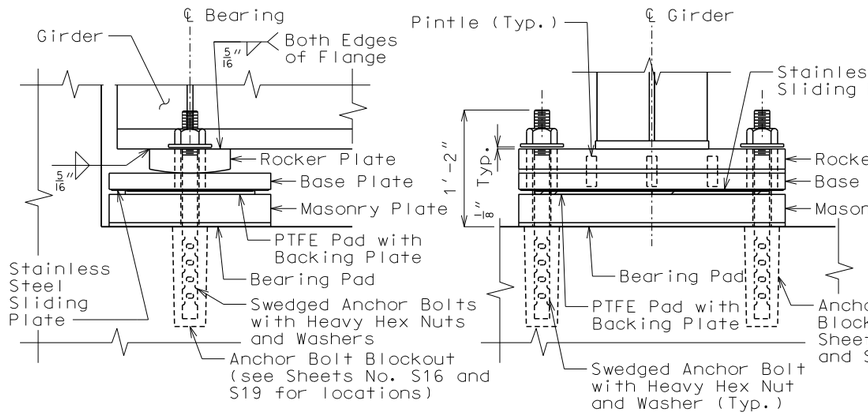
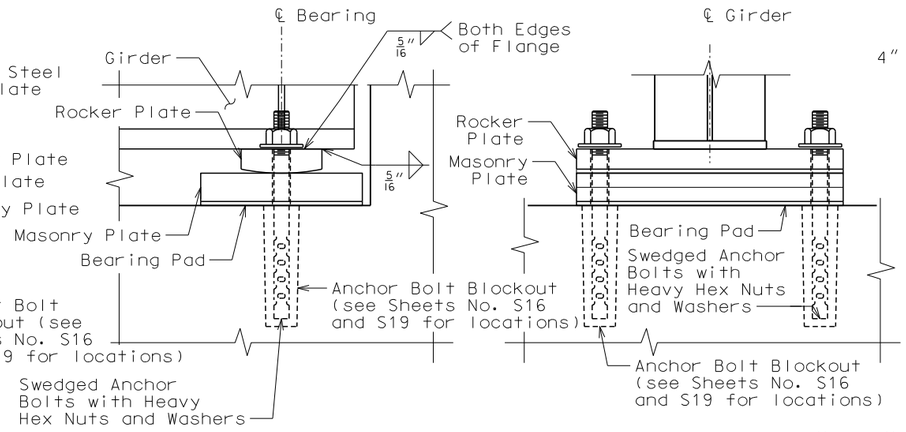
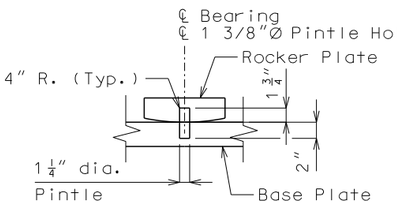


EXPANSION BEARING ASSEMBLY

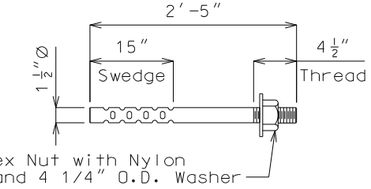


FIXED BEARING ASSEMBLY



PINTLE DETAIL

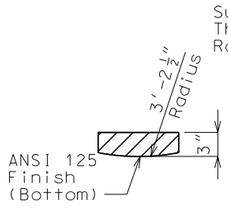
24 Required



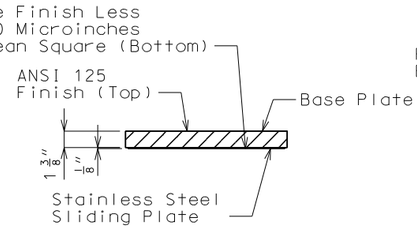
ANCHOR BOLT DETAIL

96 Required

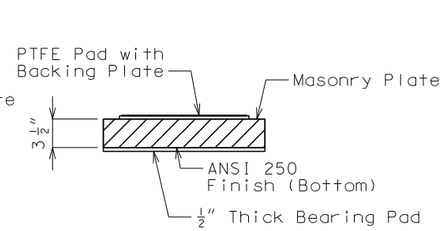
Anchor bolts shall have 1'-3" embedment.



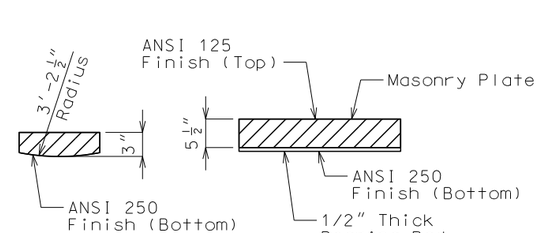
SECTION A-A



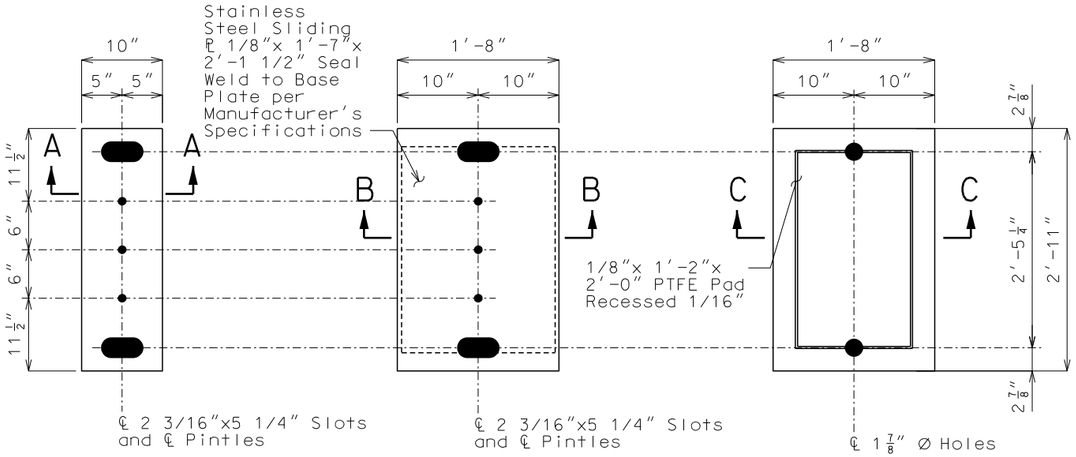
SECTION B-B



SECTION C-C



SECTION D-D SECTION E-E



ROCKER PLATE

BASE PLATE AND STAINLESS STEEL SLIDING PLATE

PTFE PAD WITH STEEL BACKING PLATE, MASONRY PLATE, AND BEARING PAD

ROCKER PLATE

MASONRY PLATE AND BEARING PAD

(*) 1/8"x 1'-2"x 2'-0" PTFE Pad Recessed 1/16" and Bonded to 7/16"x 14 1/2"x 2'-0 1/2"

EXPANSION BEARING

24 Each Required

FIXED BEARING

24 Each Required

Notes:

All steel bearing plates, anchor bolts, nuts, and washers shall be hot-dip galvanized in accordance with the Norfolk Southern Standard Specifications for metal fabrication, Section MF.

All steel bearing plates shall conform to ASTM A588 Grade 50, unless noted otherwise.

Stainless steel sliding plates shall conform to ASTM A167 or A240, Type 304 and shall not be galvanized.

Anchor bolts shall conform to ASTM F1554, Grade 105.

Anchor bolts shall be placed in formed holes prior to girder erection and shall be grouted in formed holes after girders are erected.

At all bearings, nuts for anchor bolts are to be tightened finger tight. Leave 1/8" gap below washer. The thread of the bolt shall be burned with a sharp point tool.

All bolt holes shall be sub-drilled and reamed or drilled from the solid. At no time are holes to be sub-punched and reamed or punched to full size.

Bearing pads shall be either shock pad style 15175, as manufactured by the Alert Manufacturing and Supply Company, Chicago, IL; or Fabreeka pads, as manufactured by the Fabreeka Products Company, Boston, MA; or Sorbtex Pads as manufactured by Voss Engineering, INC., Chicago, IL; or an approved equal.

All labor, material and equipment necessary to fabricate and install the main track bridge bearings, complete in place, shall be considered completely covered by the contract unit price for Fabricated Structural Steel Bearings. See Special Provisions.

BEARING DETAILS

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S29 of S48

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S29

COUNTY ST. CHARLES

JOB NO. J6I0624

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A5801

DESCRIPTION	DATE

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

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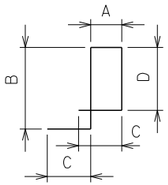
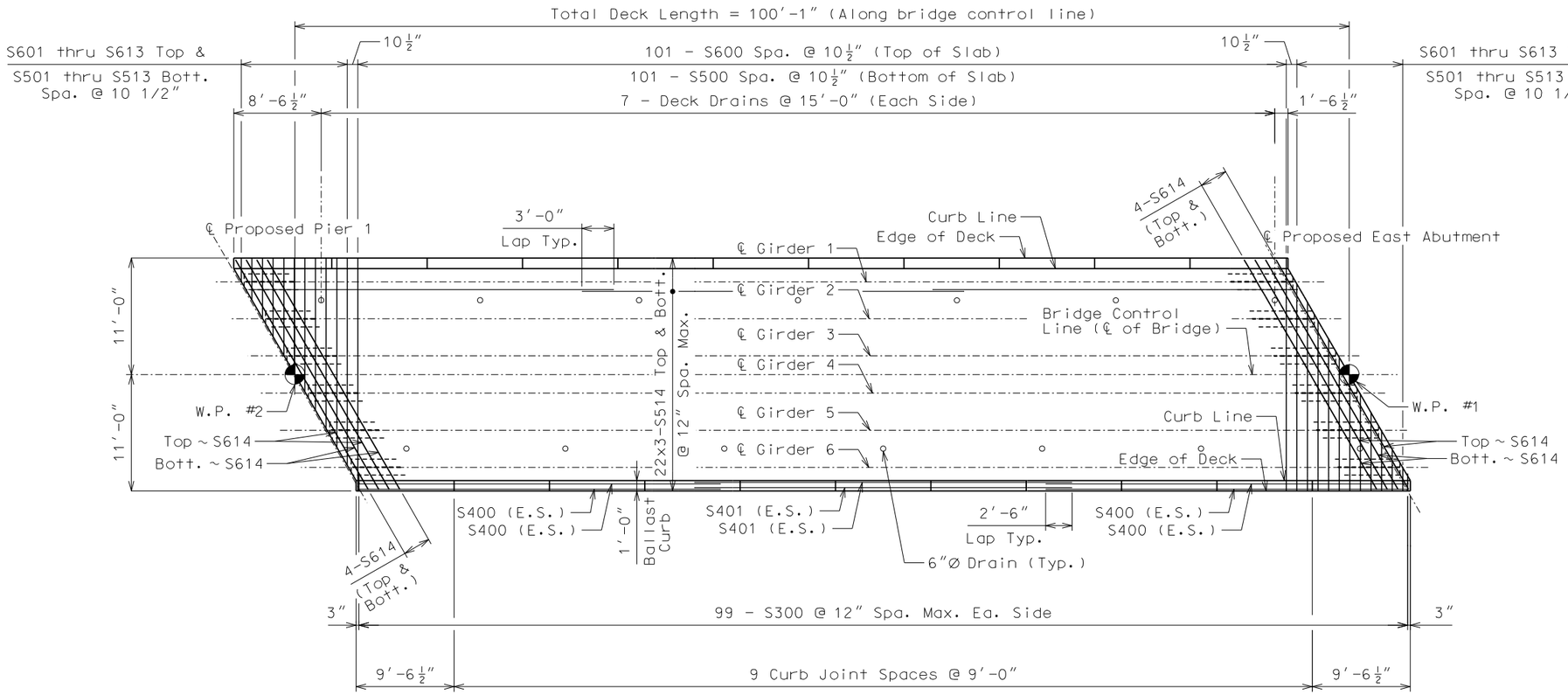
BENDING DIAGRAM



TYPE - 6



PLAN OF SPAN

SPAN 1 SLAB REINFORCING

Notes:

All superstructure reinforcing steel shall be epoxy coated.

Reinforcing steel may be shifted to avoid deck drains.

For Miscellaneous Slab Details, see Sheet No. S33.

For Ballast Curb Details, see Sheet No. S34.

For Deck Drain Details, see Sheets No. S36 and S37.

For Waterproofing Details, see Sheets No. S38 and S39.

Detailed JUNE 2023
Checked JUNE 2023

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STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S30

COUNTY: ST. CHARLES
JOB NO.: J6I0624
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A5801

DESCRIPTION	DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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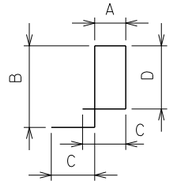
BENDING DIAGRAM



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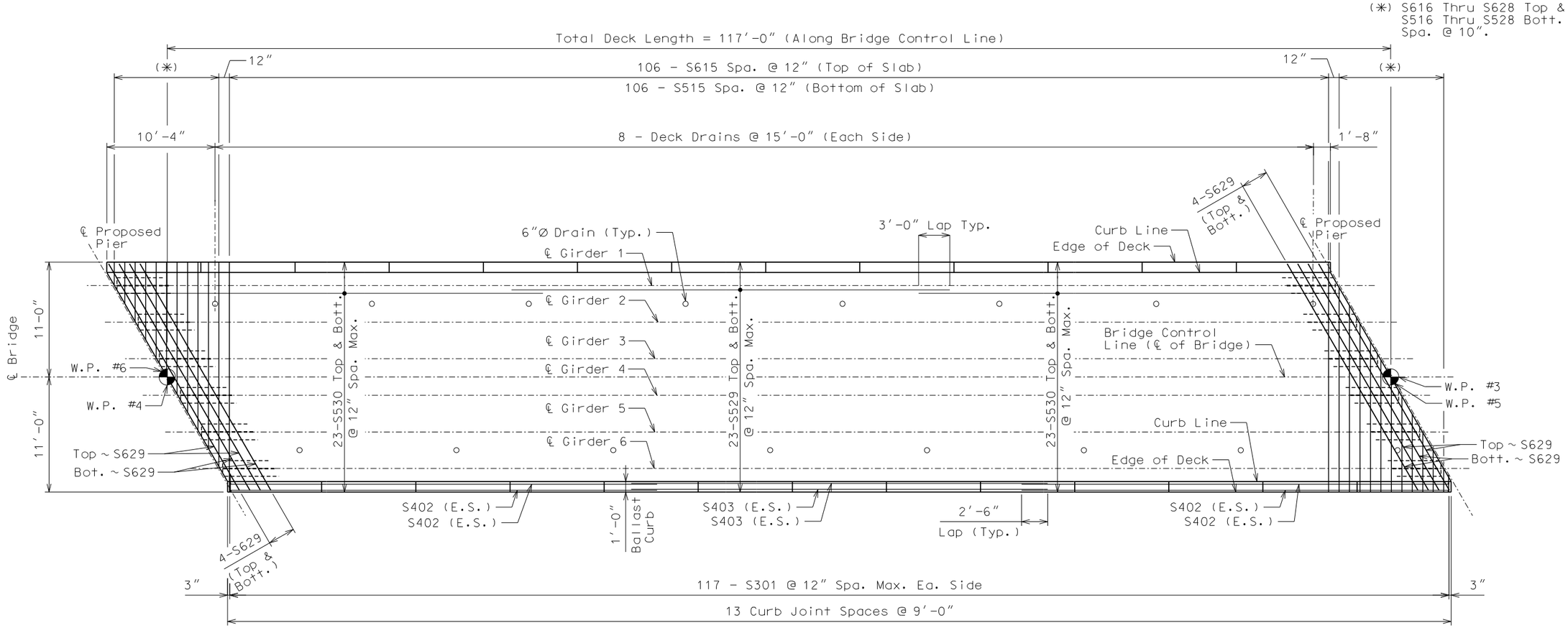

PLAN OF SPAN

Notes:

All superstructure reinforcing steel shall be epoxy coated.

Reinforcing steel may be shifted to avoid deck drains.

For Miscellaneous Slab Details, see Sheet No. S33.

For Ballast Curb Details, see Sheet No. S34.

For Deck Drain Details, see Sheets No. S36 and S37.

For Waterproofing Details, see Sheets No. S38 and S39.

SPANS 2 AND 3 SLAB REINFORCING

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI — IGOR KRINITSKIY — NUMBER PE-2012018095 — PROFESSIONAL ENGINEER

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DATE PREPARED: 8/18/2023

ROUTE	STATE
I-70	MO

DISTRICT	SHEET NO.
BR	S31

COUNTY: ST. CHARLES

JOB NO.: J6I0624

CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: A5801

DESCRIPTION	DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

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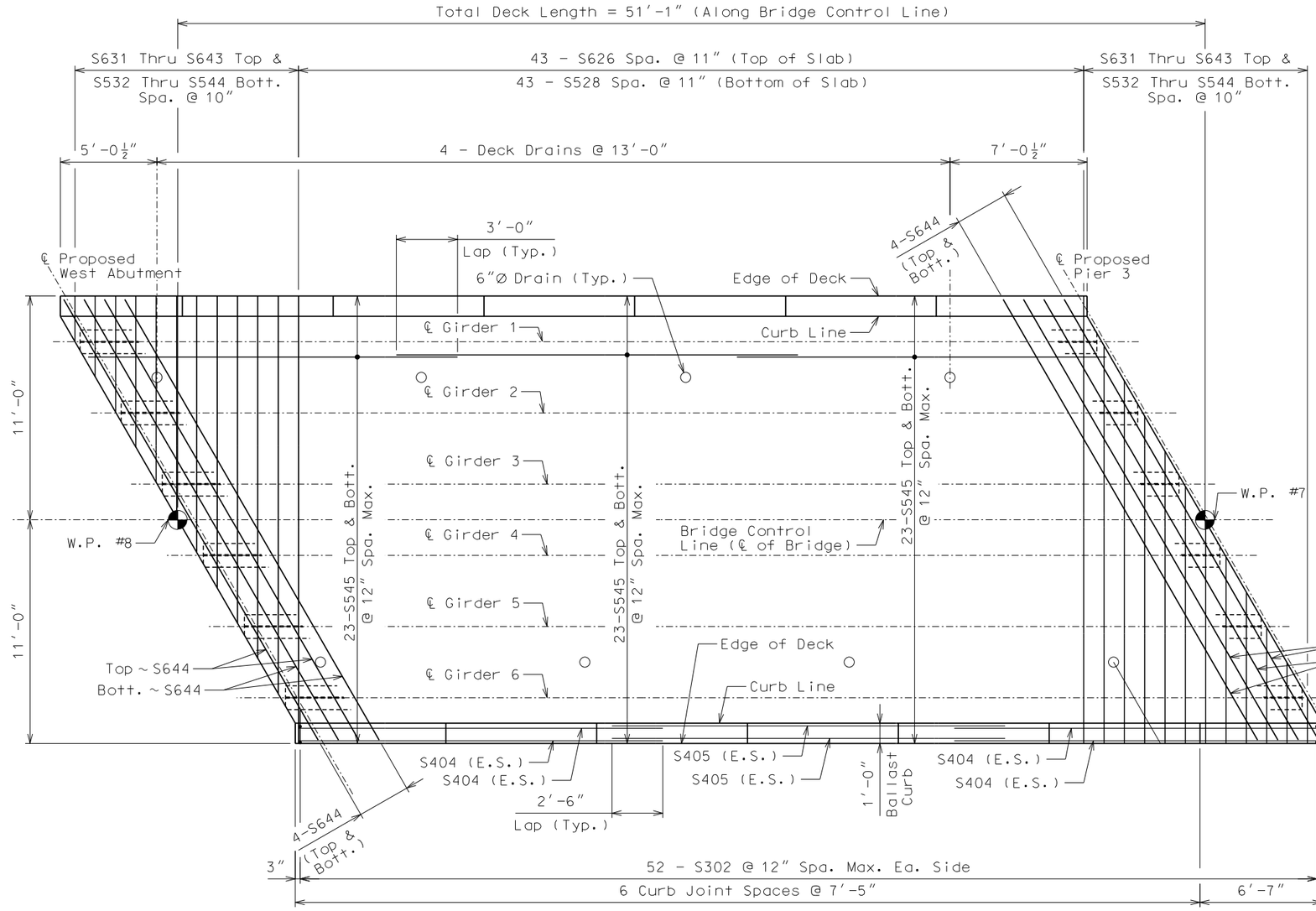


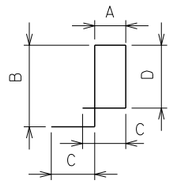
PLAN OF SPAN

SPAN 4 SLAB REINFORCING

Detailed JUNE 2023
Checked JUNE 2023

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

BENDING DIAGRAM



TYPE - 6

Notes:

All superstructure reinforcing steel shall be epoxy coated.

Reinforcing steel may be shifted to avoid deck drains.

For Miscellaneous Slab Details, see Sheet No. S33.

For Ballast Curb Details, see Sheet No. S34.

For Deck Drain Details, see Sheets No. S36 and S37.

For Waterproofing Details, see Sheets No. S38 and S39.

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S32

COUNTY ST. CHARLES

JOB NO. J6I0624

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A5801

DESCRIPTION	DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

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St. Louis, MO 63103-2296
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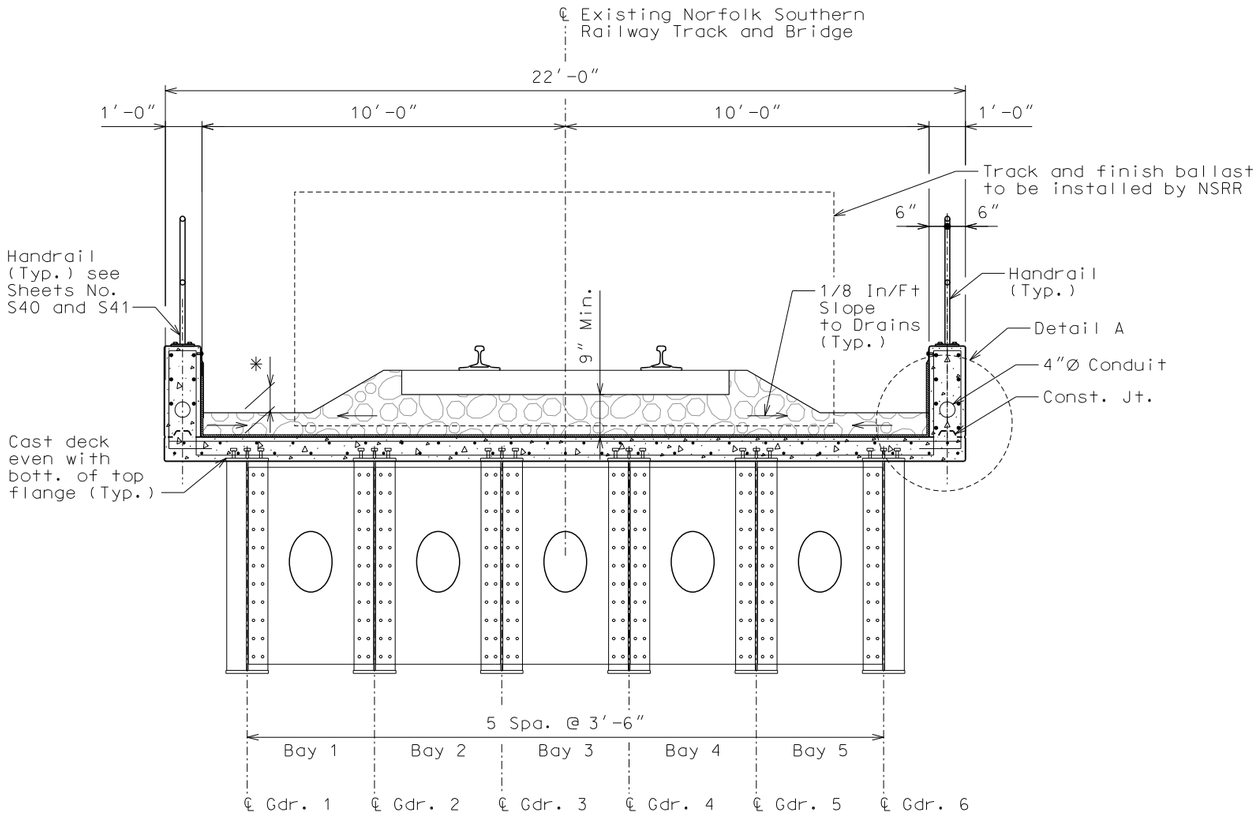
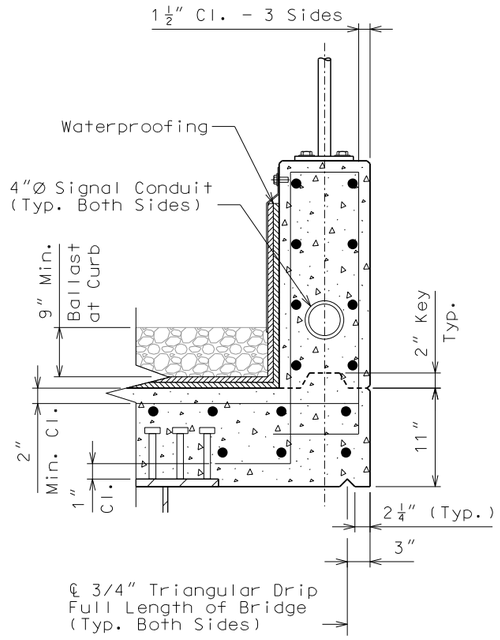


PROPOSED BRIDGE TYPICAL SECTION

✳ Contractor to install 8″ of pre-ballast following placement of waterproofing. Rails, ties and any incidental work required to construct the tracks shall be installed by Norfolk Southern.



DETAIL A

Notes:

Slab and curb reinforcing is based on the span. See slab reinforcing sheets for mark and spacing.

Install waterproofing, two layers of protective asphaltic panels and pre-ballast the deck with 8″ of ballast. Ballast to be installed within one week of placement of the waterproofing and asphaltic panels. See Special Provisions.

For Deck Drain Details, see Sheets No. S36 and S37.

For Waterproofing Details, see Sheets No. S38 and S39.

For Handrail Details, see Sheets No. S40 and S41.

MISCELLANEOUS SLAB DETAILS

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018005
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S33
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION | DATE

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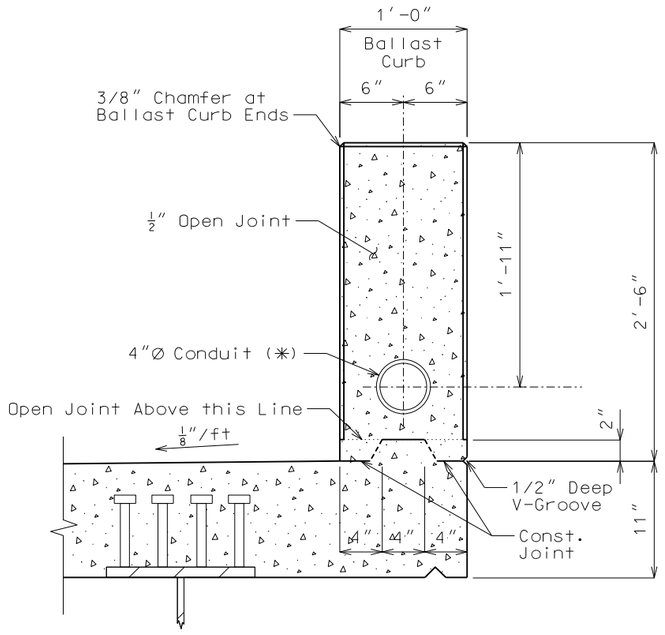
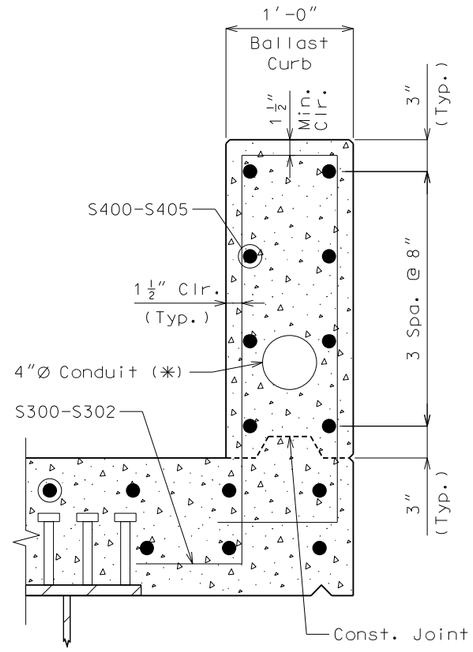
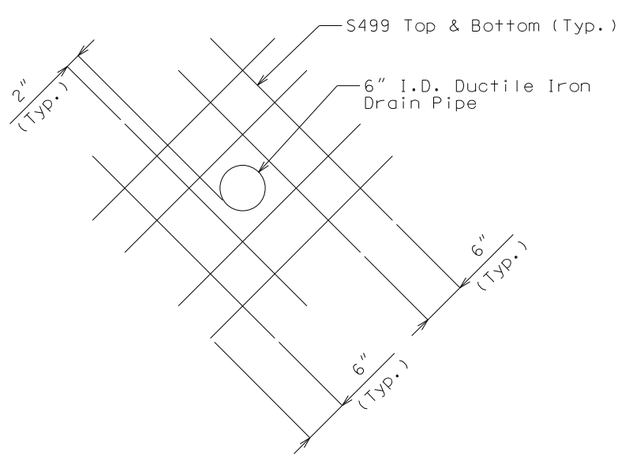


✳ Conduit to be capped at ends of barrier off the bridge.

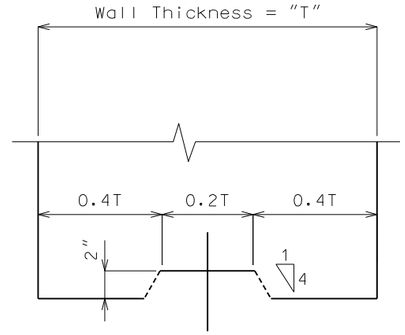
SECTION THRU OPEN JOINTS



BALLAST CURB REINFORCING DETAIL



REINFORCING AT DECK DRAIN PIPES



RAISED KEYWAY
(Construction Joint)

Notes:

The inside face of the ballast curb shall be waterproofed using membrane waterproofing and waterproofing protection, See Special Provisions.

Reinforcing is based on the Span. See slab reinforcing sheets for mark and spacing.

Payment for all concrete and reinforcement, complete in place, will be considered completely covered by the contract unit price for Ballast Curb. See Special Provisions.

BALLAST CURB DETAILS

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI
IGOR KRINTSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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

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DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S34
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
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314-425-8300
Certificate of Authority: 000856

REINFORCING STEEL SCHEDULE - SLAB SPAN 1

MARK	BAR NO.	NO. REQ'D	LENGTH (FT.)	TYPE	A	B	C	D	LOCATION	WEIGHT (LBS.)
S300	3	198	5'-4"	6	0'-9"	2'-0"	0'-6"		Curb	404
S400	4	32	34'-3"	STR					Curb	733
S401	4	16	35'-8"	STR					Curb	382
S499	4	224	3'-0"	STR					Slab Drains	449
S500	5	101	21'-8"	STR					Bott. Transverse	2283
S501	5	2	20'-0"	STR					Bott. Transverse @ Ends	42
S502	5	2	18'-6"	STR					Bott. Transverse @ Ends	39
S503	5	2	17'-0"	STR					Bott. Transverse @ Ends	36
S504	5	2	15'-6"	STR					Bott. Transverse @ Ends	33
S505	5	2	13'-11"	STR					Bott. Transverse @ Ends	29
S506	5	2	12'-5"	STR					Bott. Transverse @ Ends	26
S507	5	2	10'-11"	STR					Bott. Transverse @ Ends	23
S508	5	2	9'-5"	STR					Bott. Transverse @ Ends	20
S509	5	2	7'-11"	STR					Bott. Transverse @ Ends	17
S510	5	2	6'-4"	STR					Bott. Transverse @ Ends	14
S511	5	2	4'-10"	STR					Bott. Transverse @ Ends	11
S512	5	2	3'-4"	STR					Bott. Transverse @ Ends	7
S513	5	2	1'-10"	STR					Bott. Transverse @ Ends	4
S514	5	132	35'-3"	STR					Top and Bott. Longitudinal	4854
S600	6	101	21'-8"	STR					Top Transverse	3287
S601	6	2	20'-0"	STR					Top Transverse @ Ends	61
S602	6	2	18'-6"	STR					Top Transverse @ Ends	56
S603	6	2	17'-0"	STR					Top Transverse @ Ends	52
S604	6	2	15'-6"	STR					Top Transverse @ Ends	47
S605	6	2	13'-11"	STR					Top Transverse @ Ends	42
S606	6	2	12'-5"	STR					Top Transverse @ Ends	38
S607	6	2	10'-11"	STR					Top Transverse @ Ends	33
S608	6	2	9'-5"	STR					Top Transverse @ Ends	29
S609	6	2	7'-11"	STR					Top Transverse @ Ends	24
S610	6	2	6'-4"	STR					Top Transverse @ Ends	20
S611	6	2	4'-10"	STR					Top Transverse @ Ends	15
S612	6	2	3'-4"	STR					Top Transverse @ Ends	11
S613	6	2	1'-10"	STR					Top Transverse @ Ends	6
S614	6	8	24'-6"	STR					Diagonals @ Ends	295

REINFORCING STEEL SCHEDULE - SLAB SPAN 4

MARK	BAR NO.	NO. REQ'D.	LENGTH (FT.)	TYPE	A	B	C	D	LOCATION	WEIGHT (LBS.)
S302	3	104	5'-4"	6	0'-9"	2'-0"	0'-6"		Curb	209
S404	4	32	18'-2"	STR					Curb	389
S405	4	16	19'-4"	STR					Curb	207
S499	4	128	3'-0"	STR					Slab Drains	257
S528	5	43	21'-8"	STR					Bott. Transverse	972
S532	5	2	20'-0"	STR					Bott. Transverse @ Ends	42
S533	5	2	18'-6"	STR					Bott. Transverse @ Ends	39
S534	5	2	17'-0"	STR					Bott. Transverse @ Ends	36
S535	5	2	15'-6"	STR					Bott. Transverse @ Ends	33
S536	5	2	13'-11"	STR					Bott. Transverse @ Ends	30
S537	5	2	12'-5"	STR					Bott. Transverse @ Ends	26
S538	5	2	10'-11"	STR					Bott. Transverse @ Ends	23
S539	5	2	9'-5"	STR					Bott. Transverse @ Ends	20
S540	5	2	7'-11"	STR					Bott. Transverse @ Ends	17
S541	5	2	6'-4"	STR					Bott. Transverse @ Ends	14
S542	5	2	4'-10"	STR					Bott. Transverse @ Ends	11
S543	5	2	3'-4"	STR					Bott. Transverse @ Ends	7

REINFORCING STEEL SCHEDULE - SLAB SPAN 2 & 3 PER SPAN

MARK	BAR NO.	NO. REQ'D	LENGTH (FT.)	TYPE	A	B	C	D	LOCATION	WEIGHT (LBS.)
S301	3	234	5'-4"	6	0'-9"	2'-0"	0'-6"		Curb	470
S402	4	32	40'-11"	STR					Curb	875
S403	4	16	39'-10"	STR					Curb	426
S499	4	256	3'-0"	STR					Slab Drains	513
S515	5	106	21'-8"	STR					Bott. Transverse	2396
S516	5	2	20'-0"	STR					Bott. Transverse @ Ends	42
S517	5	2	18'-6"	STR					Bott. Transverse @ Ends	39
S518	5	2	17'-0"	STR					Bott. Transverse @ Ends	36
S519	5	2	15'-6"	STR					Bott. Transverse @ Ends	33
S520	5	2	13'-11"	STR					Bott. Transverse @ Ends	30
S521	5	2	12'-5"	STR					Bott. Transverse @ Ends	26
S522	5	2	10'-11"	STR					Bott. Transverse @ Ends	23
S523	5	2	9'-5"	STR					Bott. Transverse @ Ends	20
S524	5	2	7'-11"	STR					Bott. Transverse @ Ends	17
S525	5	2	6'-4"	STR					Bott. Transverse @ Ends	14
S526	5	2	4'-10"	STR					Bott. Transverse @ Ends	11
S527	5	2	3'-4"	STR					Bott. Transverse @ Ends	7
S528	5	2	1'-10"	STR					Bott. Transverse @ Ends	4
S529	5	46	41'-10"	STR					Top & Bott. Longitudinal	2008
S530	5	92	40'-6"	STR					Top & Bott. Longitudinal	3887
S615	6	106	21'-8"	STR					Top Transverse	3450
S616	6	2	20'-0"	STR					Top Transverse @ Ends	61
S617	6	2	18'-6"	STR					Top Transverse @ Ends	56
S618	6	2	17'-0"	STR					Top Transverse @ Ends	52
S619	6	2	15'-6"	STR					Top Transverse @ Ends	47
S620	6	2	13'-11"	STR					Top Transverse @ Ends	42
S621	6	2	12'-5"	STR					Top Transverse @ Ends	38
S622	6	2	10'-11"	STR					Top Transverse @ Ends	33
S623	6	2	9'-5"	STR					Top Transverse @ Ends	29
S624	6	2	7'-11"	STR					Top Transverse @ Ends	24
S625	6	2	6'-4"	STR					Top Transverse @ Ends	20
S626	6	2	4'-10"	STR					Top Transverse @ Ends	15
S627	6	2	3'-4"	STR					Top Transverse @ Ends	11
S628	6	2	1'-10"	STR					Top Transverse @ Ends	6
S629	6	8	24'-6"	STR					Diagonals @ Ends	295

REINFORCING STEEL SCHEDULE - SLAB SPAN 4

MARK	BAR NO.	NO. REQ'D.	LENGTH (FT.)	TYPE	A	B	C	D	LOCATION	WEIGHT (LBS.)
S544	5	2	1'-10"	STR					Bott. Transverse @ Ends	4
S545	5	92	18'-6"	STR					Top & Bott. Longitudinal	1776
S546	5	46	19'-6"	STR					Top & Bott. Longitudinal	936
S626	6	43	21'-8"	STR					Bott. Transverse	1400
S631	6	2	20'-0"	STR					Top Transverse @ Ends	61
S632	6	2	18'-6"	STR					Top Transverse @ Ends	56
S633	6	2	17'-0"	STR					Top Transverse @ Ends	52
S634	6	2	15'-6"	STR					Top Transverse @ Ends	47
S635	6	2	13'-11"	STR					Top Transverse @ Ends	42
S636	6	2	12'-5"	STR					Top Transverse @ Ends	38
S637	6	2	10'-11"	STR					Top Transverse @ Ends	33
S638	6	2	9'-5"	STR					Top Transverse @ Ends	29
S639	6	2	7'-11"	STR					Top Transverse @ Ends	24
S640	6	2	6'-4"	STR					Top Transverse @ Ends	20
S641	6	2	4'-10"	STR					Top Transverse @ Ends	15
S642	6	2	3'-4"	STR					Top Transverse @ Ends	11
S643	6	2	1'-10"	STR					Top Transverse @ Ends	6
S644	6	8	24'-6"	STR					Diagonals @ Ends	295

TOTAL REINFORCING STEEL SPAN 1 = 13,421 LBS.
TOTAL REINFORCING STEEL SPAN 2 AND 3 (EACH) = 15,057 LBS.
TOTAL REINFORCING STEEL SPAN 4 = 7,011 LBS.

SLAB REINFORCING MATERIALS

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2010010095
PROFESSIONAL ENGINEER

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

DATE PREPARED
8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S35

COUNTY
ST. CHARLES

JOB NO.
J6I0624

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A5801

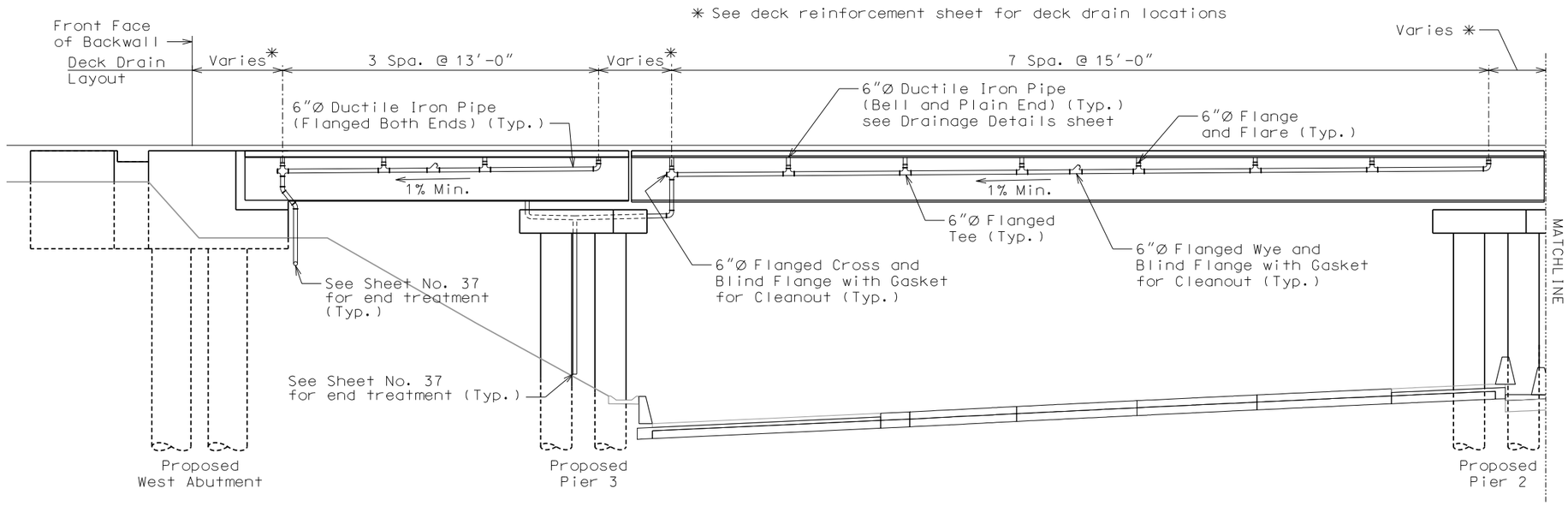
DESCRIPTION	DATE

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

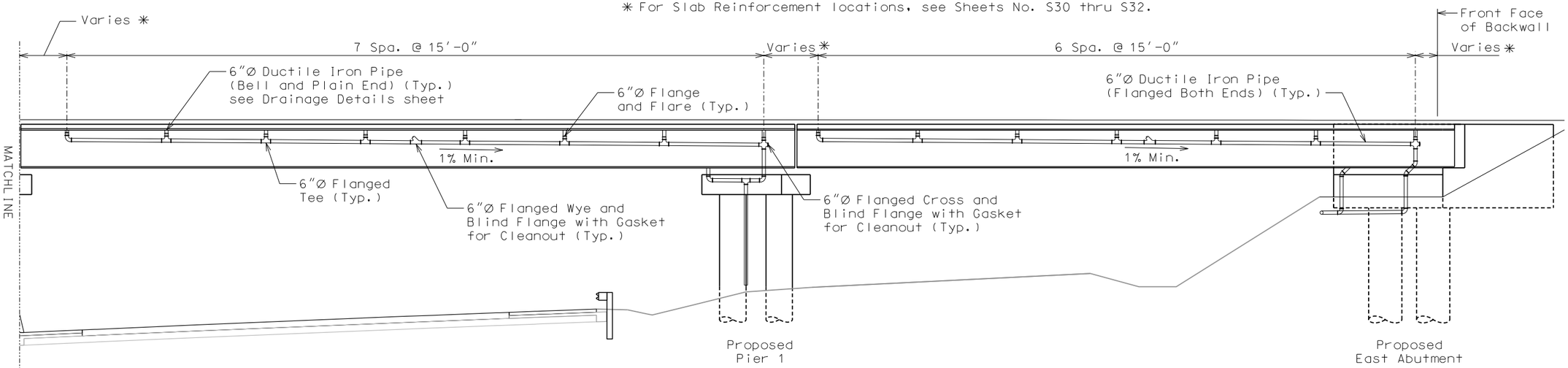
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856



DECK DRAIN SUPPORT ANGLE LAYOUT

✳ For Slab Reinforcement locations, see Sheets No. S30 thru S32.



DECK DRAIN SUPPORT ANGLE LAYOUT

Note:

Payment for all labor, materials and equipment necessary to furnish and install the drainage system, complete in place, will be considered completely covered by the contract lump sum price for Drainage System (On Structure). See Special Provisions.

DECK DRAIN LAYOUT

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI — IGOR KRINTSKIY — NUMBER PE-2012018095 — PROFESSIONAL ENGINEER

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

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

DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S36

COUNTY: ST. CHARLES

JOB NO.: J6I0624

CONTRACT ID.:

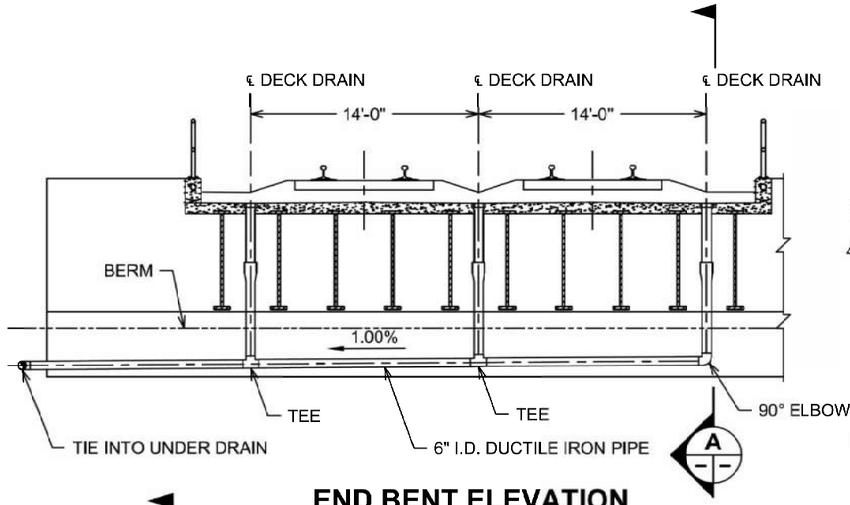
PROJECT NO.:

BRIDGE NO.: A5801

DESCRIPTION	DATE

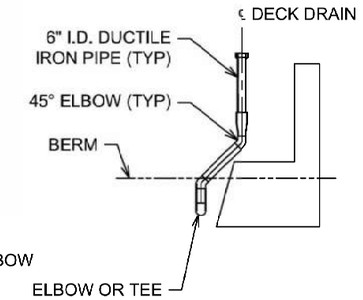
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

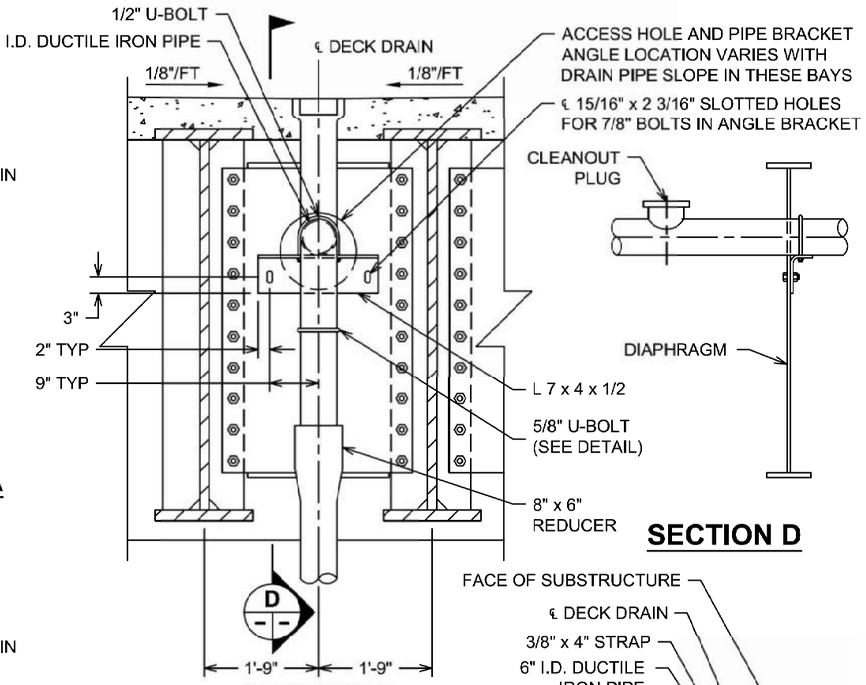


END BENT ELEVATION

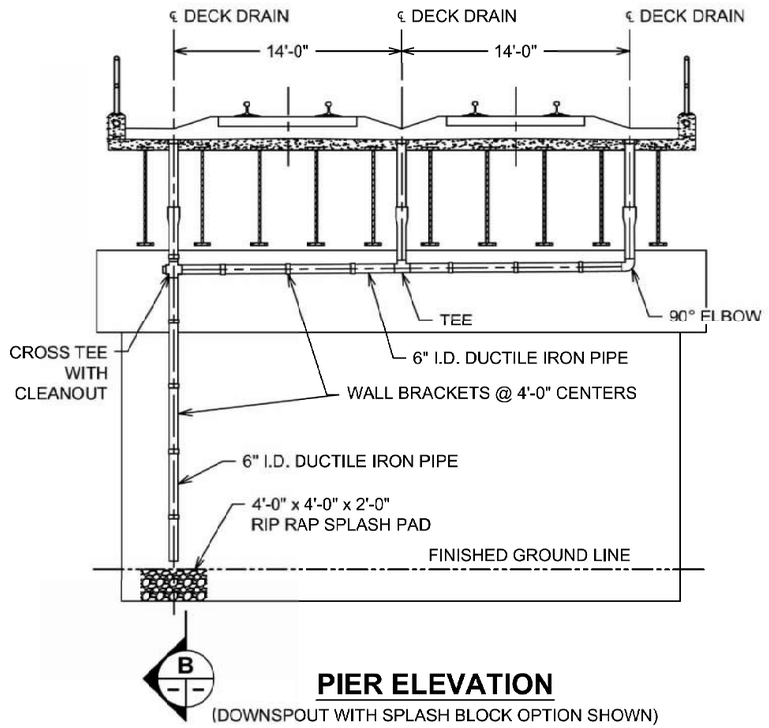
(UNDER DRAIN TIE IN OPTION SHOWN)



SECTION A

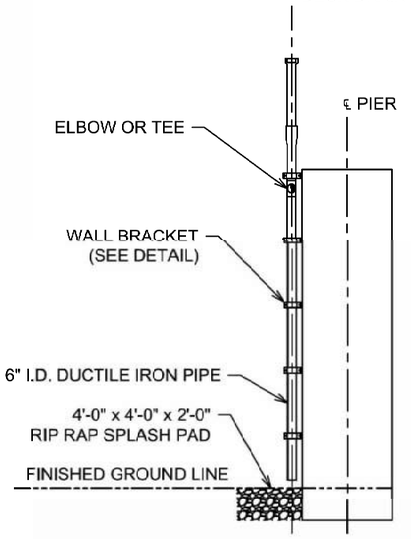


SECTION D

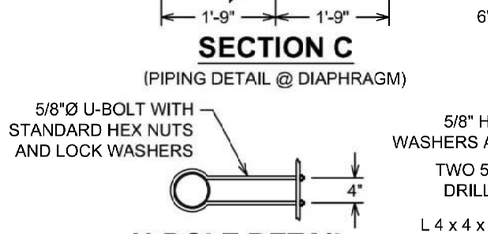


PIER ELEVATION

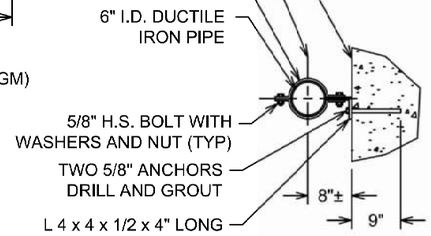
(DOWNSPOUT WITH SPLASH BLOCK OPTION SHOWN)



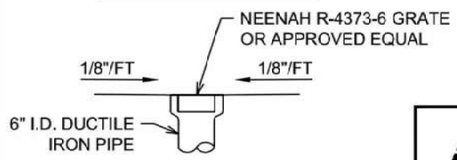
SECTION B



U-BOLT DETAIL



WALL BRACKET DETAIL



DECK DRAIN DETAIL

REVISIONS		
DATE	LTR.	DESCRIPTION

NORFOLK SOUTHERN

PUBLIC PROJECTS MANUAL
TYPICAL DRAWINGS

UNDERPASS BRIDGE DETAILS
DECK DRAIN II

REF. NO.: N/A

DATE: JANUARY 1, 2022 | DRAWING NO.: 17

DECK DRAIN DETAILS

Detailed JUNE 2023
Checked JUNE 2023

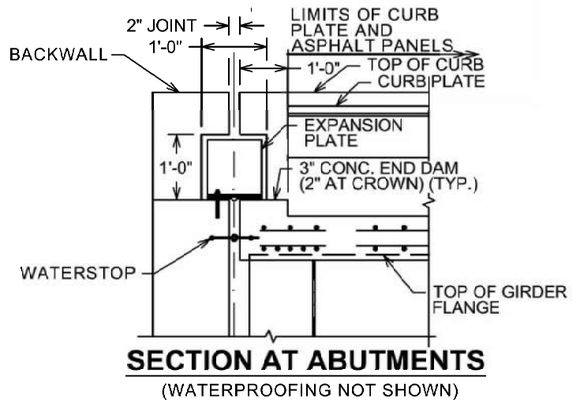
Note: This drawing is not to scale. Follow dimensions.

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S37
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION | DATE

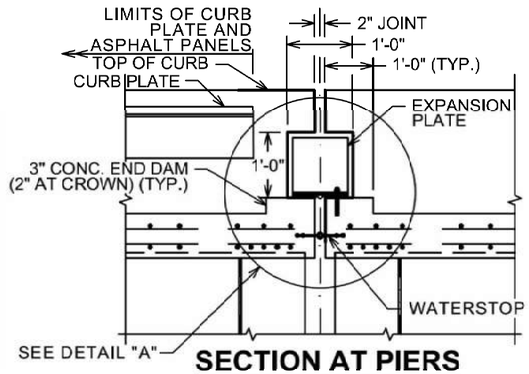
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856



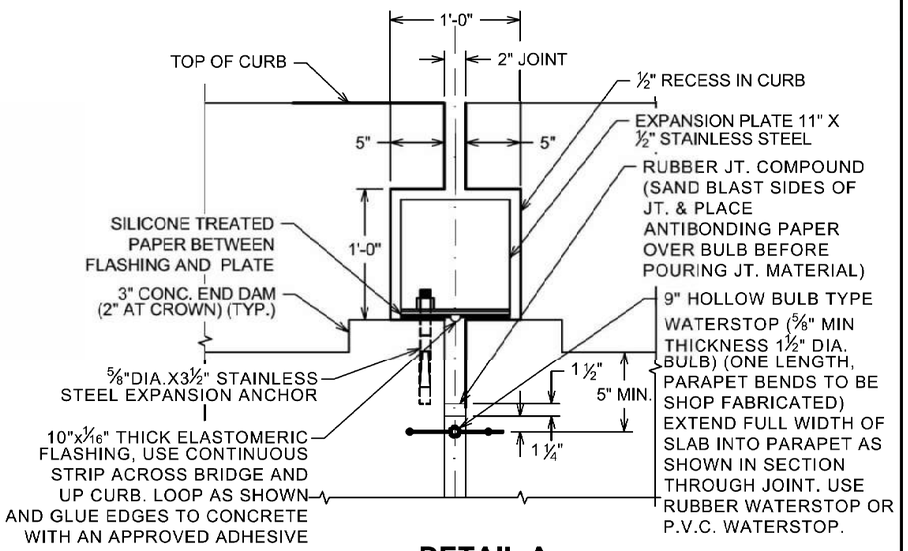
SECTION AT ABUTMENTS

(WATERPROOFING NOT SHOWN)



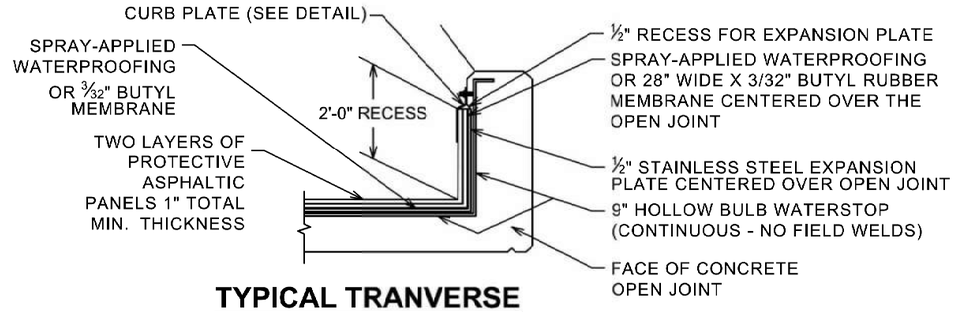
SECTION AT PIERS

(WATERPROOFING NOT SHOWN)

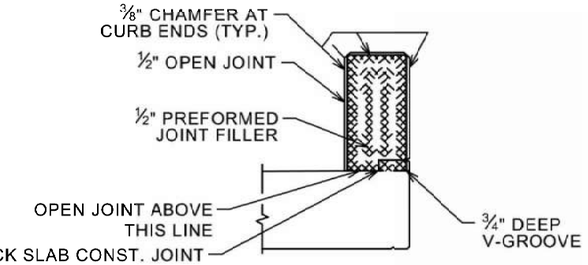


DETAIL A

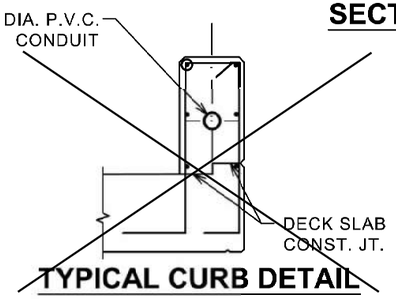
(ASPHALT PANELS AND CURB PLATE NOT SHOWN)



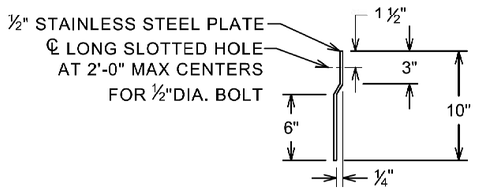
TYPICAL TRANVERSE SECTION AT OPEN JOINT



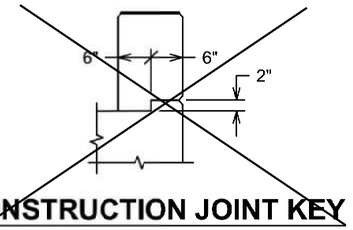
SECTION THROUGH OPEN JOINT IN CURB



TYPICAL CURB DETAIL



CURB PLATE DETAIL



CONSTRUCTION JOINT KEY

NOTES:

1. SPRAY APPLIED WATERPROOFING IS PREFERRED.
2. DETAILS SHOWN FOR A CONCRETE DECK. SIMILAR DETAILS SHALL BE IMPLEMENTED FOR STEEL DECK PLATES IF APPROVED BY NORFOLK SOUTHERN.
3. DISCONTINUE CURB PLATES OVER PIERS AND ABUTMENTS.
4. WORK DRAWING WITH NORFOLK SOUTHERN SPECIFICATION FOR BRIDGE DECK WATERPROOFING.
5. ALL DETAILS ARE NOT DRAWN TO SCALE.
6. JOINT SHALL BE TESTED FOR LEAKS AND MADE WATERTIGHT BEFORE FLASHING AND EXPANSION PLATE COVERS ARE INSTALLED.

REVISIONS		
DATE	LTR.	DESCRIPTION

NORFOLK SOUTHERN

PUBLIC PROJECTS MANUAL
TYPICAL DRAWINGS

UNDERPASS BRIDGE DETAILS
DECK JOINTS AND WATERPROOFING I

REF. NO.: N/A

DATE: JANUARY 1, 2022 | DRAWING NO.: 18

Note:

Payment for all labor, materials and equipment necessary to furnish and install the expansion joints and waterproofing, complete in place, will be considered completely covered by the contract unit price for Expansion Device (Flat Plate) and Waterproofing, respectively. See Special Provisions.

WATERPROOFING & EXPANSION DEVICE DETAILS (1 OF 2)

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S38 of S48

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

IGOR KRINTSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S38

COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

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

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

Filename: P:\LEGACY\USPHL1FP002\DATA\PROJECTS\62484400 - TECHNICAL\433 - PUBLIC PROJECTS MANUAL\STANDARD DRAWINGS\18_UNDERPASS BRIDGE DETAILS - WATERPROOFING DETAIL.DWG

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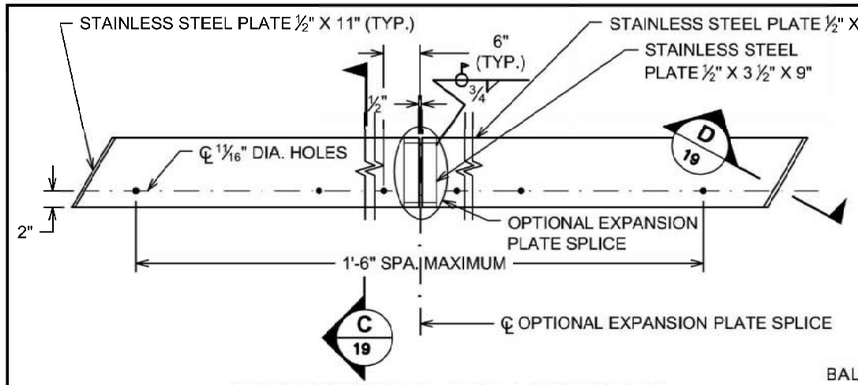
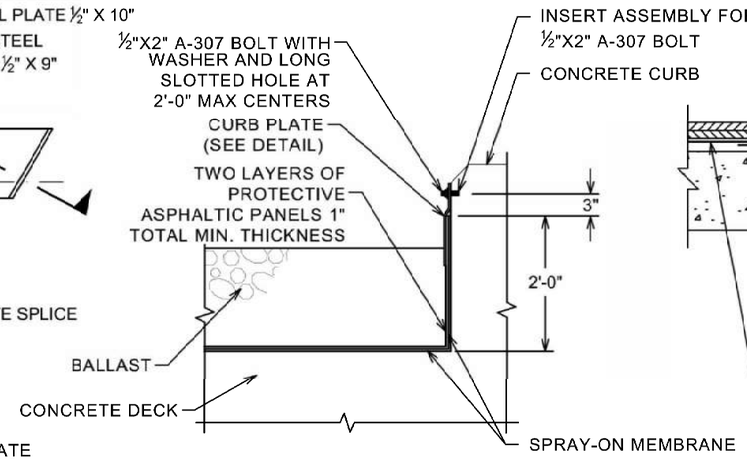
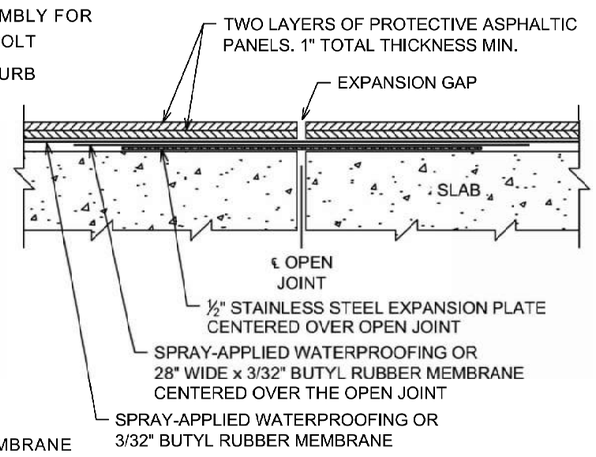


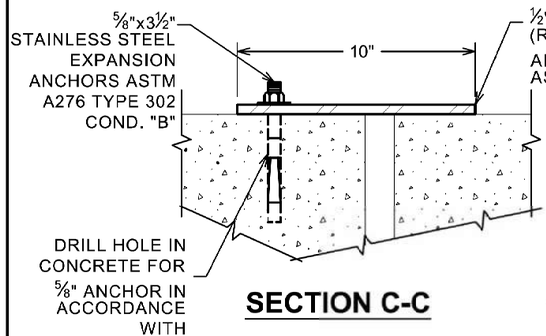
EXPANSION PLATE ASSEMBLY



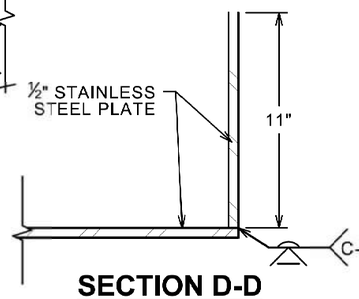
CONCRETE DECK



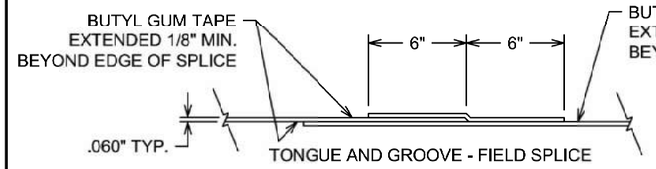
TYPICAL LONGITUDINAL SECTION AT BENTS AND BACKWALL



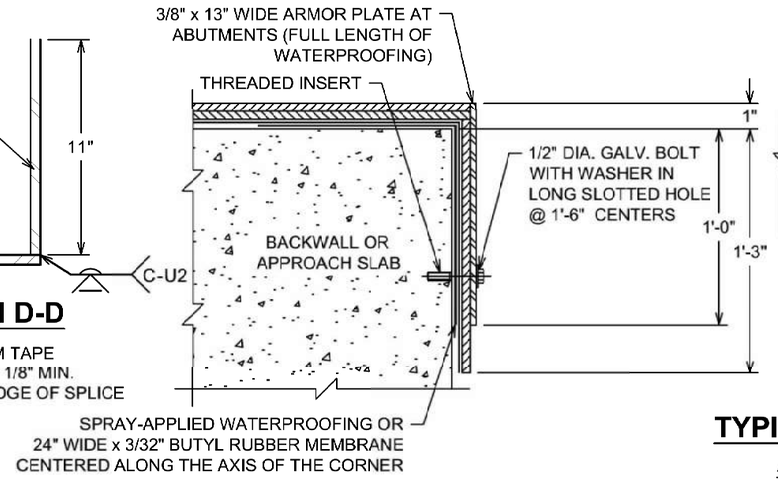
SECTION C-C



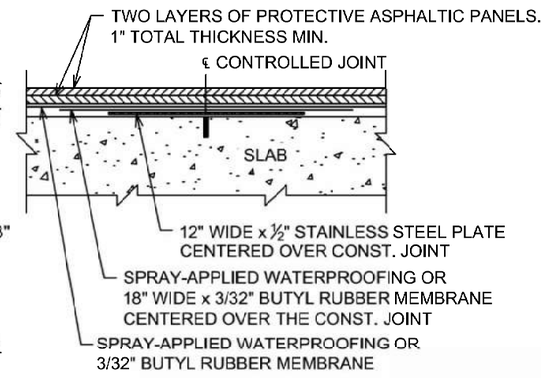
SECTION D-D



BUTYL RUBBER MEMBRANE SPLICE DETAIL



TYPICAL LONGITUDINAL SECTION AT END OF BACKWALL / APPROACH SLABS



TYPICAL LONGITUDINAL SECTION AT CONTROLLED JOINTS

NOTES:

1. FOR NOTES SEE DRAWING NO. 18.
2. ALL DETAILS ARE DRAWN NOT TO SCALE.

REVISIONS		
DATE	LTR.	DESCRIPTION

NORFOLK SOUTHERN

PUBLIC PROJECTS MANUAL
TYPICAL DRAWINGS

UNDERPASS BRIDGE DETAILS
DECK JOINTS AND WATERPROOFING II

REF. NO.: N/A

DATE: JANUARY 1, 2022 | DRAWING NO.: 19

WATERPROOFING & EXPANSION DEVICE DETAILS (2 OF 2)

Detailed JUNE 2023
Checked JUNE 2023

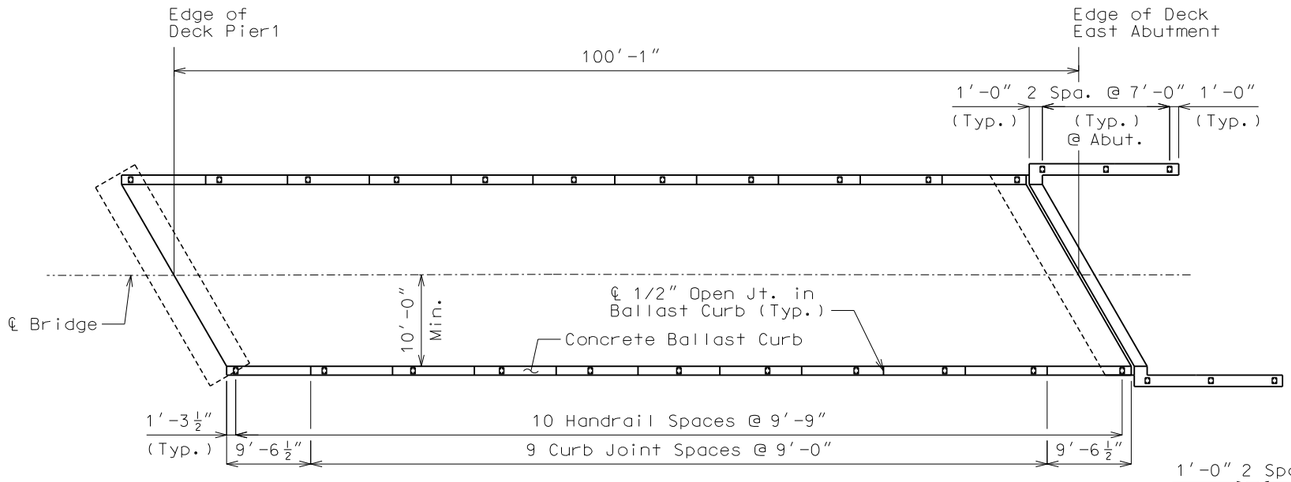
Note: This drawing is not to scale. Follow dimensions.

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S39
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

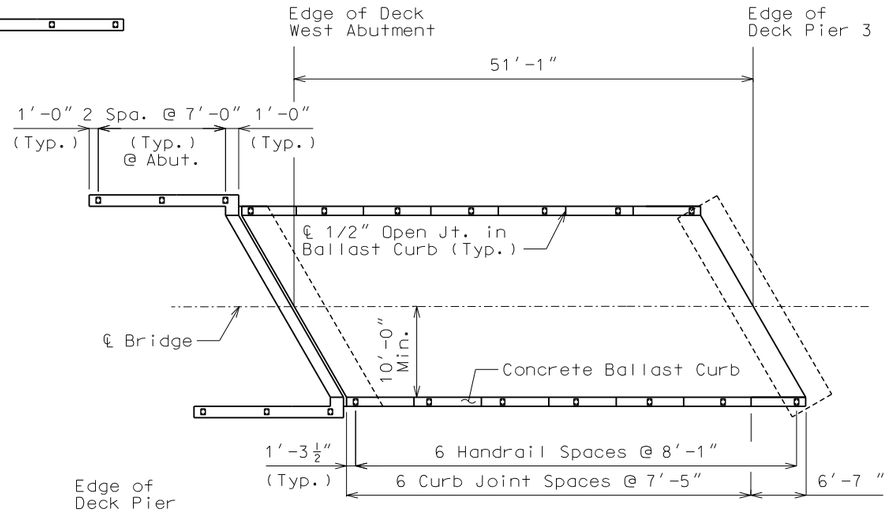
DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

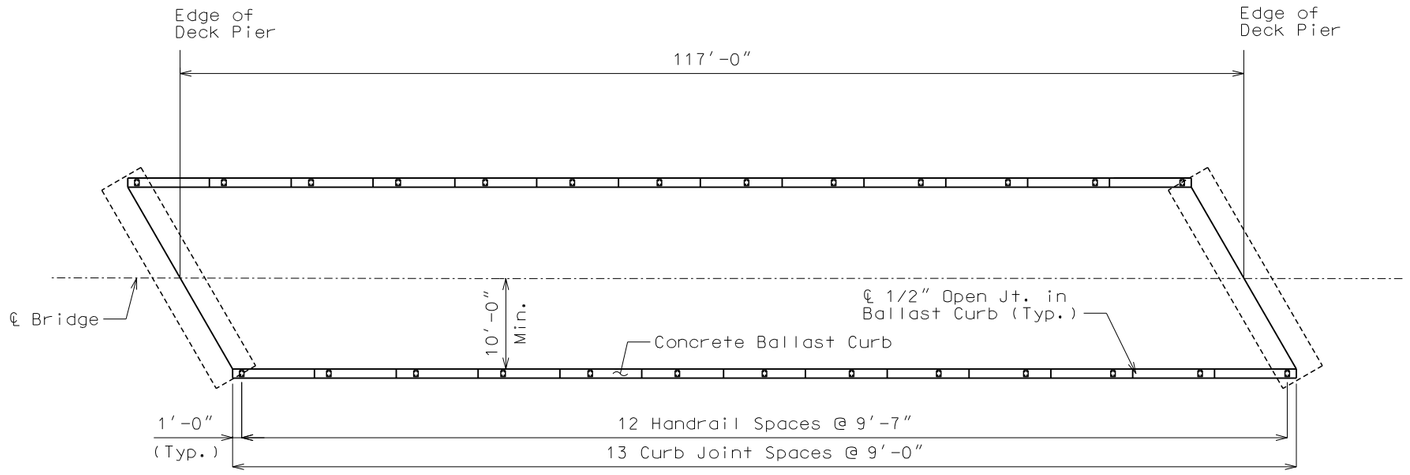
HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856



PLAN OF HANDRAIL POST & CURB JOINT SPACING SPAN 1



PLAN OF HANDRAIL POST & CURB JOINT SPACING SPAN 4



PLAN OF HANDRAIL POST & CURB JOINT SPACING SPAN 2 AND 3

HANDRAIL PLAN

Detailed JUNE 2023
Checked JUNE 2023

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

STATE OF MISSOURI
IGOR KRINTSKIY
NUMBER PE-2012010095
PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S40
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION | DATE

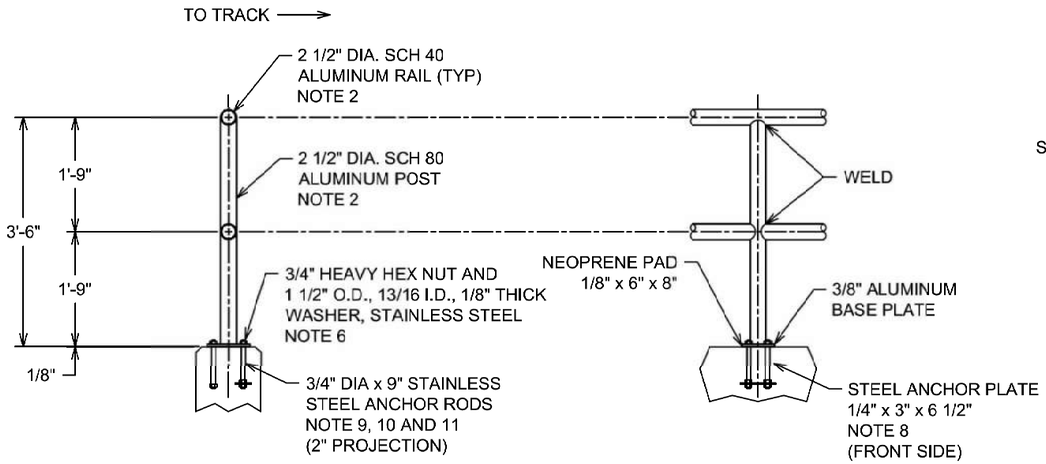
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

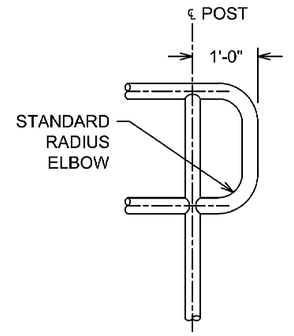
NOTES:

1. JOINTS IN RAILING (SPLICE GAP) SHALL BE LOCATED IN POST SPACING PLAN.
2. ALUMINUM PIPE TO BE ASTM B429, ALLOY 6061-T6 AND BASE PLATE TO BE ASTM B209, ALLOY 6061-T6.
3. STAINLESS STEEL BOLTS, CAP SCREWS AND NUTS TO BE ASTM A276, TYPE 304, STAINLESS STEEL WASHERS TO BE ASTM A276, TYPE 302.
4. POST TO BE SET PERPENDICULAR TO TOP OF CURB AND RAILS SHALL BE PLACED PARALLEL TO THE GRADE OF THE BRIDGE.
5. CERTIFIED MILL REPORTS ARE REQUIRED FOR RAIL AND POST. SHOP INSPECTIONS ARE NOT REQUIRED.
6. AFTER ANCHOR BOLT NUTS HAVE BEEN TIGHTENED, THREAD SHALL BE NICKED TO LOCK NUTS.
7. CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE, THE CONTRACTOR MAY AT HIS OPTION HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.
8. ANCHOR PLATES SHALL BE STEEL CONFORMING TO ASTM A36.
9. ANCHOR RODS SHALL CONFORM TO ASTM A276, TYPE 302 OR 304 STAINLESS STEEL AND THREADS SHALL BE ROLLED, NOT CUT.
10. UPPER ANCHOR ROD NUTS SHALL BE HEAVY HEX NUTS, PER ASTM A276 TYPE 302 OR 304 STAINLESS STEEL.
11. LOWER ANCHOR ROD NUTS SHALL BE HEAVY STEEL HEX NUTS, PER ASTM A563.
12. THE CENTERLINE OF ANY SPLICE AND/OR EXPANSION JOINT IS TO BE LOCATED AT LEAST 2'-0" AWAY FROM CENTERLINE OF POST. EXPANSION AND/OR SPLICE JOINTS FOR EACH RAIL OF TWO RAILINGS ARE TO BE PLACED IN THE SAME LOCATION AND IN THE SAME PANEL.
13. WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT AWS STRUCTURAL WELDING CODE FOR ALUMINUM.

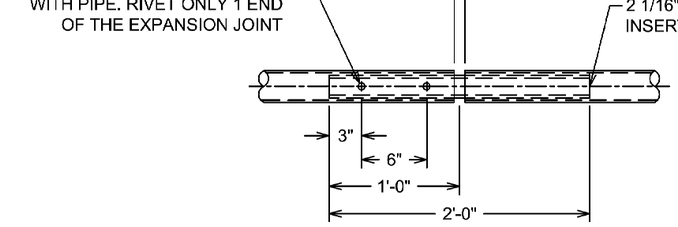


SECTION
NTS

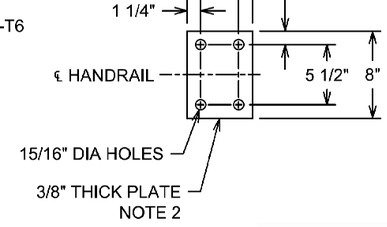
FRONT VIEW
NTS



END POST DETAIL
NTS



EXPANSION JOINT DETAIL
NTS



BASE PLATE DETAIL
NTS

REVISIONS		
DATE	LTR.	DESCRIPTION

NORFOLK SOUTHERN

PUBLIC PROJECTS MANUAL
TYPICAL DRAWINGS

UNDERPASS BRIDGE DETAILS
HANDRAIL

REF. NO.: SEC 2 - UP - 4 - SHT 7

DATE: JANUARY 1, 2022 | DRAWING NO.: 13

HANDRAIL DETAILS

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S41 of S48

c:\pwworking\central01\d2302592\B_A5801_041_J6I0624.dgn 2:00:25 PM 8/18/2023

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

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S41
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

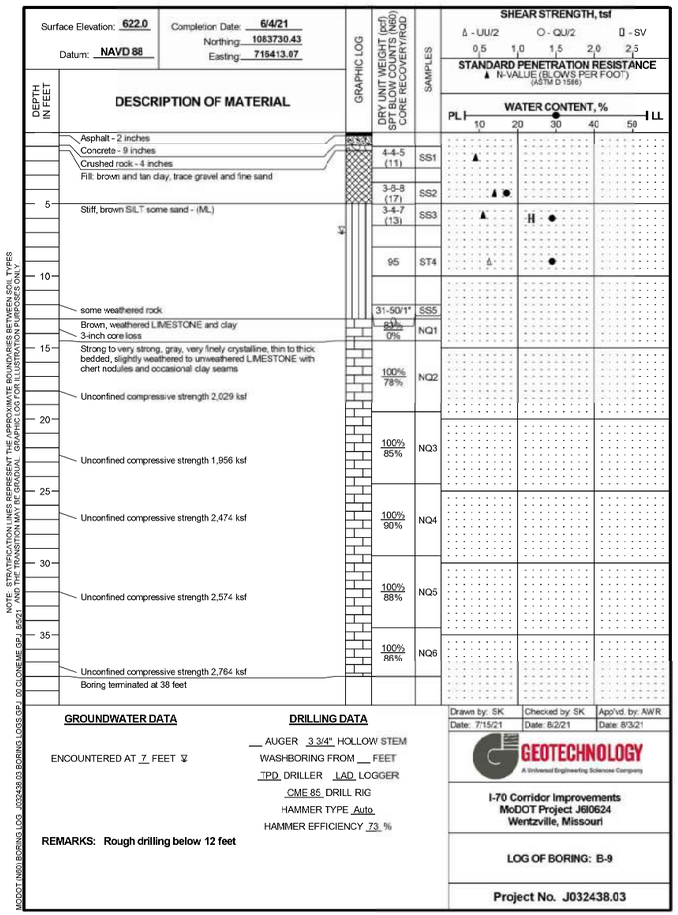
DESCRIPTION | DATE

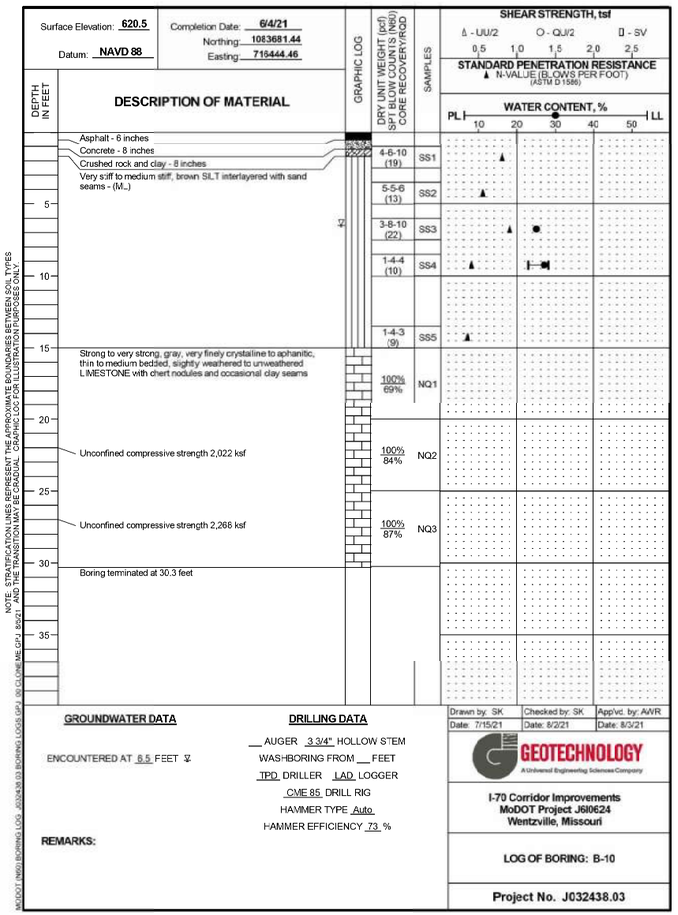
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

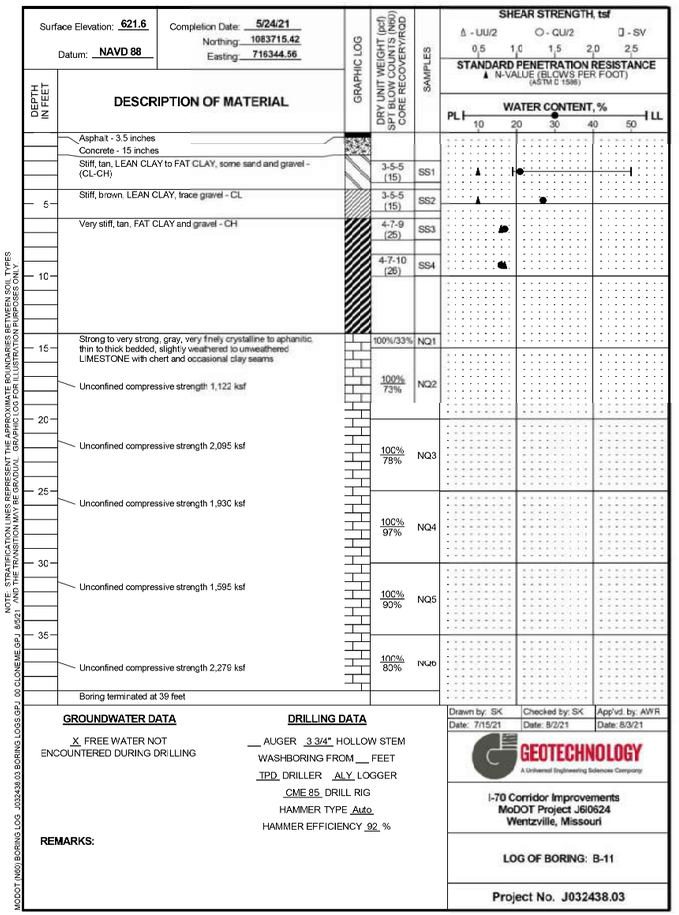
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

Filename: P:\LEGACY\USPHL1FP002\DATA\PROJECTS\62480400 - TECHNICAL\433 - PUBLIC PROJECTS MANUAL\STANDARD DRAWINGS\13_UNDERPASS BRIDGE DETAILS - HANDRAIL.DWG







For location of borings, see Sheet No. S6.

BORING LOGS (1 OF 7)

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S42 of S48

c:\pwworking\central01\d2302592\B_A5801_042_J6I0624.dgn 2:00:31 PM 8/18/2023

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023
ROUTE I-70
STATE MO
DISTRICT BR
SHEET NO. S42
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION | DATE

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

Surface Elevation: 627.9 | Completion Date: 5/25/21
Datum: NAVD 88 | Northing: 1083604.78 | Easting: 716255.13

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES	SHEAR STRENGTH, tsf (Δ - UU/2, ○ - QU/2, □ - SV; 0.5 1.0 1.5 2.0 2.5) / STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586) / WATER CONTENT, % (PL 10 20 30 40 50 LL)
	Top soil - 12 inches				
	Soft to very soft, brown, LEAN CLAY - (CL)		1-2-2 (5)	SS1	
			0-0-1 (1)	SS2	
5	Stiff, brown and gray, FAT CLAY - (CH)		3-4-6 (13)	SS3	62 >>
	Medium dense, brown, silty, clayey SAND, trace gravel - (SC-SM)		3-6-8 (18)	SS4	
10	Very stiff to stiff, brown, FAT CLAY, trace sand and gravel - CH		5-7-10 (21)	SS5	
15			3-6-8 (18)	SS6	
20	Strong to very strong, tan and gray to gray, very finely crystalline to aphanitic, thin to massive bedded, slightly weathered to unweathered LIMESTONE with chert nodules and occasional clay seams		100% 72%	NQ1	
	Unconfined compressive strength 1,328 ksf				
25			100% 82%	NQ2	
	Unconfined compressive strength 2,628 ksf				
30			100% 82%	NQ3	
	Unconfined compressive strength 1,640 ksf				
35			100% 93%	NQ4	
	Unconfined compressive strength 2,161 ksf				

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

MODOT (N60) BORING LOG J032438.03 BORING LOGS.GPJ 00 CLONE ME.GPJ 8/4/21

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
NJG DRILLER EER LOGGER
CME 550X DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 75 %

REMARKS:

Drawn by: SK | Checked by: SK | App'vd. by: AWR
Date: 7/15/21 | Date: 8/2/21 | Date: 8/3/21

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Corridor Improvements
MoDOT Project J6I0624
Wentzville, Missouri

LOG OF BORING: B-12

Project No. J032438.03

Surface Elevation: 627.9 | Completion Date: 5/25/21
Datum: NAVD 88 | Northing: 1083604.78 | Easting: 716255.13

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES	SHEAR STRENGTH, tsf (Δ - UU/2, ○ - QU/2, □ - SV; 0.5 1.0 1.5 2.0 2.5) / STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586) / WATER CONTENT, % (PL 10 20 30 40 50 LL)
	Strong to very strong, tan and gray to gray, very finely crystalline to aphanitic, thin to massive bedded, slightly weathered to unweathered LIMESTONE with chert nodules and occasional clay seams *(continued)*		100% 93%	NQ5	
	Unconfined compressive strength 1,735 ksf				
45			100%/83%	NQ6	
	Boring terminated at 46 feet				
50					
55					
60					
65					
70					
75					

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

MODOT (N60) BORING LOG J032438.03 BORING LOGS.GPJ 00 CLONE ME.GPJ 8/4/21

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
NJG DRILLER EER LOGGER
CME 550X DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 75 %

REMARKS:

Drawn by: SK | Checked by: SK | App'vd. by: AWR
Date: 7/15/21 | Date: 8/2/21 | Date: 8/3/21

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Corridor Improvements
MoDOT Project J6I0624
Wentzville, Missouri

CONTINUATION OF LOG OF BORING: B-12

Project No. J032438.03

For location of borings, see Sheet No. S6.

BORING LOGS (2 OF 7)

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S43 of S48

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S43
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

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

c:\pwworking\central01\d2302592\B_A5801_043_J6I0624.dgn 2:00:35 PM 8/18/2023

Surface Elevation: 637.2 | Completion Date: 7/21/21
Datum: NAVD 88 | Northing: 1083686.65 | Easting: 716555.23

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES	SHEAR STRENGTH, tsf (Δ - UU/2, ○ - QU/2, □ - SV) 0.5 1.0 1.5 2.0 2.5 / STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586) / WATER CONTENT, % PL 10 20 30 40 50 LL
	Fill: brown, lean clay		1-1-2 (4)	SS1	
			1-2-2 (5)	SS2	
5	Stiff to hard, brown and gray, FAT CLAY - (CH)		114	ST3	
			3-6-8 (18)	SS4	
10	some sand				
	some weathered rock		13-18-21 (49)	SS5	
15	Dense to loose, brown, SILTY SAND - SM				
			4-16-28 (55)	SS6	
20					
			4-4-5 (11)	SS7	
25					
	53 percent passing #200 sieve		4-4-50/1" ()	SS8	
30	Medium strong to strong, gray, finely crystalline, slightly weathered LIMESTONE with clay seams		100% 65%	NQ1	
35			100% 75%	NQ2	

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY

MODOT (N60) BORING LOG J032438.03 BORING LOGS.GPJ 00 CLONE ME.GPJ 8/8/21

GROUNDWATER DATA

ENCOUNTERED AT 28 FEET ▽

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
TPD DRILLER LAD LOGGER
CME 550X DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 75 %

REMARKS: Rough drilling at 13 feet.

Drawn by: SK | Checked by: SK | App'vd. by: AWR
Date: 7/22/21 | Date: 8/2/21 | Date: 8/3/21

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Corridor Improvements
MoDOT Project J6I0624
Wentzville, Missouri

LOG OF BORING: B-13

Project No. J032438.03

Surface Elevation: 637.2 | Completion Date: 7/21/21
Datum: NAVD 88 | Northing: 1083686.65 | Easting: 716555.23

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES	SHEAR STRENGTH, tsf (Δ - UU/2, ○ - QU/2, □ - SV) 0.5 1.0 1.5 2.0 2.5 / STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586) / WATER CONTENT, % PL 10 20 30 40 50 LL
	Medium strong to strong, gray, finely crystalline, slightly weathered LIMESTONE with clay seams *(continued)*		100% 87%	NQ3	
45			100% 83%	NQ4	
50			100% 85%	NQ5	
55			100% 100%	NQ6	
	Boring terminated at 56 feet				
60					
65					
70					
75					

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY

MODOT (N60) BORING LOG J032438.03 BORING LOGS.GPJ 00 CLONE ME.GPJ 8/8/21

GROUNDWATER DATA

ENCOUNTERED AT 28 FEET ▽

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
TPD DRILLER LAD LOGGER
CME 550X DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 75 %

REMARKS: Rough drilling at 13 feet.

Drawn by: SK | Checked by: SK | App'vd. by: AWR
Date: 7/22/21 | Date: 8/2/21 | Date: 8/3/21

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Corridor Improvements
MoDOT Project J6I0624
Wentzville, Missouri

CONTINUATION OF LOG OF BORING: B-13

Project No. J032438.03

For location of borings, see Sheet No. S6.

BORING LOGS (3 OF 7)

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S44 of S48

STATE OF MISSOURI — IGOR KRINITSKIY — NUMBER PE-2012018095 — PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S44
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION	DATE

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

c:\pwworking\central01\d2302592\B_A5801_044_J6I0624.dgn 2:00:39 PM 8/18/2023

Surface Elevation: 638.6
Datum: NAVD 88
Completion Date: 5/26/21
Northing: 1083780.69
Easting: 716467.79

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES	SHEAR STRENGTH, tsf (Δ - UU/2, ○ - QU/2, □ - SV; 0.5, 1.0, 1.5, 2.0, 2.5) / STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586) / WATER CONTENT, % (PL, 10, 20, 30, 40, 50, LL)
	Top soil - 12 inches				
	Soft to very stiff, brown and gray, FAT CLAY - (CH)		1-2-3 (6)	SS1	
			1-1-3 (5)	SS2	84 >>
5			3-7-9 (20)	SS3	
	Stiff, brown, LEAN CLAY - (CL)		2-5-7 (15)	SS4	
10					
	Limestone ledge - 4 inches				
	Brown, LEAN CLAY - (CL)				
15					
20					
25					
30					
	Strong to very strong, tan and gray to gray, very finely crystalline to aphanitic, thin to thick bedded, slightly weathered to unweathered LIMESTONE with occasional chert nodules and clay seams		100% 54%	NQ1	
35	Unconfined compressive strength 1,798 ksf		100% 77%	NQ2	

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
NJG DRILLER EER LOGGER
CME 550X DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 75 %

REMARKS: Commenced coring at auger refusal at 13 feet.

Drawn by: SK | Checked by: SK | App'vd. by: AWR
Date: 7/15/21 | Date: 8/2/21 | Date: 8/3/21

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Corridor Improvements
MoDOT Project J6I0624
Wentzville, Missouri

LOG OF BORING: B-14

Project No. J032438.03

MODOT (N60) BORING LOG J032438.03 BORING LOGS.GPJ 00 CLONE ME.GPJ 3/5/21

Surface Elevation: 638.6
Datum: NAVD 88
Completion Date: 5/26/21
Northing: 1083780.69
Easting: 716467.79

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES	SHEAR STRENGTH, tsf (Δ - UU/2, ○ - QU/2, □ - SV; 0.5, 1.0, 1.5, 2.0, 2.5) / STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586) / WATER CONTENT, % (PL, 10, 20, 30, 40, 50, LL)
	Strong to very strong, tan and gray to gray, very finely crystalline to aphanitic, thin to thick bedded, slightly weathered to unweathered LIMESTONE with occasional chert nodules and clay seams *(continued)*				
	Unconfined compressive strength 2,389 ksf		100% 75%	NQ3	
45	Unconfined compressive strength 2,302 ksf				
			100% 83%	NQ4	
50	Unconfined compressive strength 1,860 ksf				
			100% 92%	NQ5	
55	Unconfined compressive strength 2,131 ksf				
	Boring terminated at 56 feet				
60					
65					
70					
75					

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
NJG DRILLER EER LOGGER
CME 550X DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 75 %

REMARKS: Commenced coring at auger refusal at 13 feet.

Drawn by: SK | Checked by: SK | App'vd. by: AWR
Date: 7/15/21 | Date: 8/2/21 | Date: 8/3/21

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Corridor Improvements
MoDOT Project J6I0624
Wentzville, Missouri

CONTINUATION OF LOG OF BORING: B-14

Project No. J032438.03

MODOT (N60) BORING LOG J032438.03 BORING LOGS.GPJ 00 CLONE ME.GPJ 3/5/21

For location of borings, see Sheet No. S6.

BORING LOGS (4 OF 7)

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S45 of S48

STATE OF MISSOURI
IGOR KRINITSKIY
NUMBER PE-2012018095
PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S45
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION	DATE

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

c:\pwworking\central01\d2302592\B_A5801_045_J6I0624.dgn 2:00:43 PM 8/18/2023

Surface Elevation: 631.5 | Completion Date: 5/27/21
Datum: NAVD 88 | Northing: 1083689.44 | Easting: 716156.83

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES	SHEAR STRENGTH, tsf (Δ - UU/2, ○ - QU/2, □ - SV; 0.5 1.0 1.5 2.0 2.5) / STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586) / WATER CONTENT, % (PL 10 20 30 40 50 LL)
	Top soil - 30 inches		0-1-1 (3)	SS1	
	Very soft, brown, LEAN CLAY trace sand - (CL)		0-0-0 (0)	SS2	
5	Medium stiff to very stiff, brown, FAT CLAY, trace sand and gravel - CH		1-3-4 (9)	SS3	
			115	ST4	
10					
15			3-8-10 (23)	SS5	
20			3-5-6 (14)	SS6	
25			2-3-6 (11)	SS7	
	Medium strong to very strong, gray, very finely crystalline to aphanitic, thin to thick bedded, slightly weathered to unweathered LIMESTONE with chert nodules and clay seams Unconfined compressive strength 926 ksf		100% 90%	NQ1	
30			100% 92%	NQ2	
	Unconfined compressive strength 2,711 ksf				
35	1-inch core loss 1-inch core loss		98% 65%	NQ3	

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

MODOT (N60) BORING LOG J032438.03 BORING LOGS.GPJ 00 CLONE ME.GPJ 8/5/21

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
NJG DRILLER EER LOGGER
CME 550X DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 75 %

REMARKS:

Drawn by: SK | Checked by: SK | App'vd. by: AWR
Date: 7/15/21 | Date: 8/2/21 | Date: 8/3/21

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Corridor Improvements
MoDOT Project J6I0624
Wentzville, Missouri

LOG OF BORING: B-15

Project No. J032438.03

Surface Elevation: 631.5 | Completion Date: 5/27/21
Datum: NAVD 88 | Northing: 1083689.44 | Easting: 716156.83

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES	SHEAR STRENGTH, tsf (Δ - UU/2, ○ - QU/2, □ - SV; 0.5 1.0 1.5 2.0 2.5) / STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586) / WATER CONTENT, % (PL 10 20 30 40 50 LL)
	Medium strong to very strong, gray, very finely crystalline to aphanitic, thin to thick bedded, slightly weathered to unweathered LIMESTONE with chert nodules and clay seams *(continued)* Unconfined compressive strength 1,407 ksf		100% 78%	NQ4	
45	Unconfined compressive strength 1,660 ksf		100% 93%	NQ5	
50	Unconfined compressive strength 2,240 ksf		100% 100%	NQ6	
	Boring terminated at 52 feet				
55					
60					
65					
70					
75					

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

MODOT (N60) BORING LOG J032438.03 BORING LOGS.GPJ 00 CLONE ME.GPJ 8/5/21

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
NJG DRILLER EER LOGGER
CME 550X DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 75 %

REMARKS:

Drawn by: SK | Checked by: SK | App'vd. by: AWR
Date: 7/15/21 | Date: 8/2/21 | Date: 8/3/21

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Corridor Improvements
MoDOT Project J6I0624
Wentzville, Missouri

CONTINUATION OF LOG OF BORING: B-15

Project No. J032438.03

For location of borings, see Sheet No. S6.

BORING LOGS (5 OF 7)

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S46 of S48

STATE OF MISSOURI — IGOR KRINITSKIY — NUMBER PE-2012018095 — PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S46

COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

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

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Surface Elevation: 627.0 | Completion Date: 5/25/21
Datum: NAVD 88 | Northing: 1083646.88 | Easting: 716341.13

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES	SHEAR STRENGTH, tsf (Δ - UU/2, ○ - QU/2, □ - SV; 0.5 1.0 1.5 2.0 2.5) / STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586) / WATER CONTENT, % (PL 10 20 30 40 50 LL)
	Top soil - 12 inches				
	Stiff, brown, LEAN CLAY, trace sand and gravel - (CL)		3-9-9 (28)	SS1	
			10-5-8 (20)	SS2	
5	Stiff, brown, FAT CLAY - CH		4-5-9 (21)	SS3	
			6-5-4 (14)	SS4	
10					
			3-5-7 (18)	SS5	
15	Weathered LIMESTONE				
	Strong, tan and gray to gray, very finely crystalline, thin to medium bedded, slightly weathered to unweathered LIMESTONE with chert nodules and clay seams		100%/33%	NQ1	
20	Unconfined compressive strength 1,519 ksf		100% 70%	NQ2	
25	Unconfined compressive strength 1,952 ksf		100% 82%	NQ3	
30	Unconfined compressive strength 2,052 ksf		100% 82%	NQ4	
35	Unconfined compressive strength 2,099 ksf		100% 47%	NQ5	

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

MODOT (N60) BORING LOG J032438.03 BORING LOGS.GPJ 00 CLONE ME.GPJ 8/5/21

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
TPD DRILLER ALY LOGGER
CME 55LC DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 92 %

REMARKS: No recovery in Sample SS4. Rough drilling below 17 feet.

Drawn by: SK | Checked by: SK | App'vd. by: AWR
Date: 7/15/21 | Date: 8/2/21 | Date: 8/3/21

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Corridor Improvements
MoDOT Project J6I0624
Wentzville, Missouri

LOG OF BORING: B-16

Project No. J032438.03

Surface Elevation: 627.0 | Completion Date: 5/25/21
Datum: NAVD 88 | Northing: 1083646.88 | Easting: 716341.13

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES	SHEAR STRENGTH, tsf (Δ - UU/2, ○ - QU/2, □ - SV; 0.5 1.0 1.5 2.0 2.5) / STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586) / WATER CONTENT, % (PL 10 20 30 40 50 LL)
	Strong, tan and gray to gray, very finely crystalline, thin to medium bedded, slightly weathered to unweathered LIMESTONE with chert nodules and clay seams *(continued)*		100% 94%	NQ6	
45	Unconfined compressive strength 1,660 ksf				
	Boring terminated at 44 feet				
50					
55					
60					
65					
70					
75					

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

MODOT (N60) BORING LOG J032438.03 BORING LOGS.GPJ 00 CLONE ME.GPJ 8/5/21

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
TPD DRILLER ALY LOGGER
CME 55LC DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 92 %

REMARKS: No recovery in Sample SS4. Rough drilling below 17 feet.

Drawn by: SK | Checked by: SK | App'vd. by: AWR
Date: 7/15/21 | Date: 8/2/21 | Date: 8/3/21

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Corridor Improvements
MoDOT Project J6I0624
Wentzville, Missouri

CONTINUATION OF LOG OF BORING: B-16

Project No. J032438.03

For location of borings, see Sheet No. S6.

BORING LOGS (6 OF 7)

Detailed JUNE 2023
Checked JUNE 2023

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

Sheet No. S47 of S48

STATE OF MISSOURI — IGOR KRINTSKIY — NUMBER PE-2012018095 — PROFESSIONAL ENGINEER

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

DATE PREPARED 8/18/2023

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	S47

COUNTY: ST. CHARLES
JOB NO.: J6I0624
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A5801

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856

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

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Surface Elevation: 643.0 | Completion Date: 7/1/21
Datum: NAVD 88 | Northing: 1083626.41 | Easting: 716135.30

DEPTH IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES
	Fill: brown and gray, fat clay, some to trace asphalt	2-1-1 (3)	SS1
		0-0-1 (2)	SS2
5		1-1-2 (5)	SS3
		0-1-1 (3)	SS4
10			
	Brown, LEAN CLAY, trace sand - (CL)	99	ST5
15			ST6
	Stiff to very stiff, brown, FAT CLAY, trace gravel - CH	5-7-7 (21)	SS7
20			
		3-4-6 (15)	SS8
25			
		4-7-7 (21)	SS9
30			
		10-11-10 (32)	SS10
35			
	Weathered LIMESTONE	43-50/1" ()	SS11
	Auger and sampler refusal at 39 feet		

SHEAR STRENGTH, tsf: Δ - UU/2, ○ - QU/2, □ - SV (0.5, 1.0, 1.5, 2.0, 2.5)
STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586)
WATER CONTENT, % PL 10 20 30 40 50 LL

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
GS DRILLER DWJ LOGGER
CME 750Y DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 90 %

REMARKS: Perched water at 15 feet

Drawn by: SK | Checked by: SK | App'vd. by: AWR
Date: 7/15/21 | Date: 8/2/21 | Date: 8/3/21

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Corridor Improvements
MoDOT Project J6I0624
Wentzville, Missouri

LOG OF BORING: B-19

Project No. J032438.03

MODOT (N60) BORING LOG J032438.03 BORING LOGS.GPJ 00 CLONE ME.GPJ 8/5/21

Surface Elevation: 641.8 | Completion Date: 7/2/21
Datum: NAVD 88 | Northing: 1083722.34 | Easting: 716519.60

DEPTH IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES
	Fill: brown, lean to fat clay	2-1-1 ()	SS1
	Soft, brown, LEAN CLAY - CL	0-1-2 ()	SS2
5			
	Medium stiff to hard, brown and gray, FAT CLAY - (CH)	2-3-4 ()	SS3
			ST4
10		115	ST5
15	some gravel	2-4-6 ()	SS6
20		6-12-20 ()	SS7
	Medium dense, brown, silty SAND - SM		
25		6-12-18 ()	SS8
	Medium dense, brown, clayey SAND - SC		
30		4-5-6 ()	SS9
	Medium stiff, brown LEAN CLAY, some sand - CL		
35		2-3-4 ()	SS10
	Auger refusal at 36 feet		

SHEAR STRENGTH, tsf: Δ - UU/2, ○ - QU/2, □ - SV (0.5, 1.0, 1.5, 2.0, 2.5)
STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586)
WATER CONTENT, % PL 10 20 30 40 50 LL

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
GS DRILLER DWJ LOGGER
CME 750Y DRILL RIG
HAMMER TYPE Auto

REMARKS:

Drawn by: SK | Checked by: SK | App'vd. by: AWR
Date: 7/15/21 | Date: 8/2/21 | Date: 8/3/21

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Corridor Improvements
MoDOT Project J6I0624
Wentzville, Missouri

LOG OF BORING: B-20

Project No. J032438.03

MODOT (N60) BORING LOG J032438.03 BORING LOGS.GPJ 00 CLONE ME.GPJ 8/5/21

For location of borings, see Sheet No. S6.

BORING LOGS (7 OF 7)

Detailed JUNE 2023
Checked JUNE 2023

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

DATE PREPARED 8/18/2023
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. S48
COUNTY ST. CHARLES
JOB NO. J6I0624
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A5801

DESCRIPTION | DATE

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
401 South 18th Street
Suite 300
St. Louis, MO 63103-2296
314-425-8300
Certificate of Authority: 000856