STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	45 C-5232-01	2024	1	39

STATE OF KANSAS
DEPARTMENT OF TRANSPORTATION

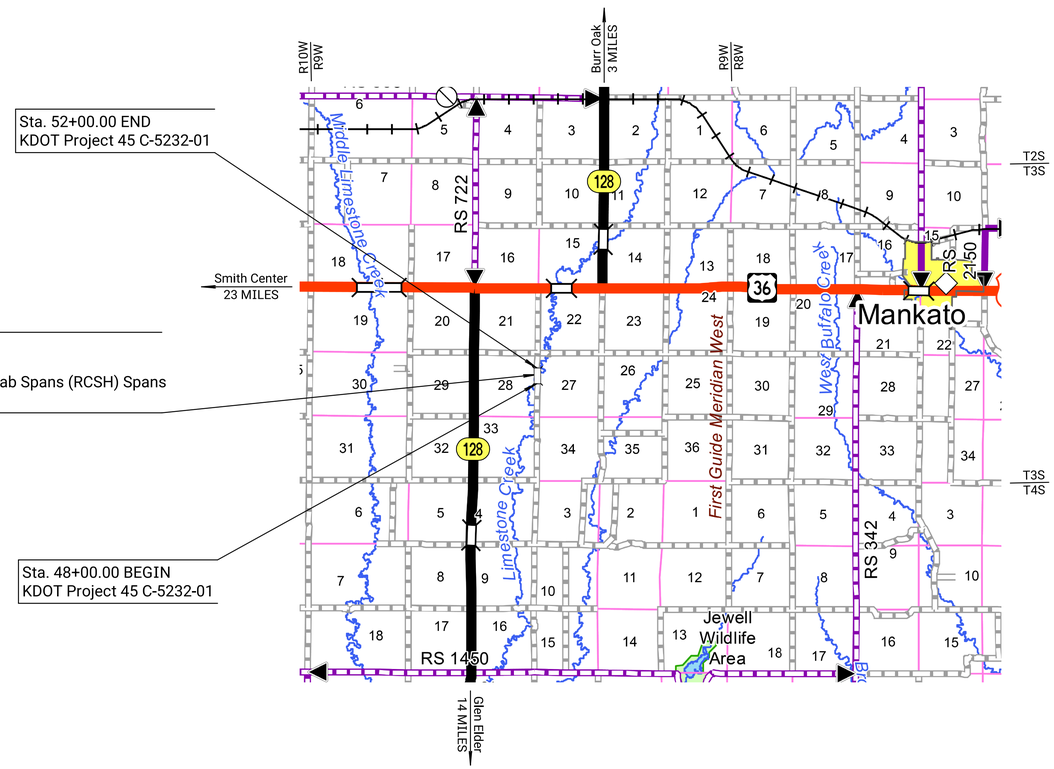
BRIDGE REPLACEMENT
FEDERAL AID PROJECT
JEWELL COUNTY
COUNTY ROAD 100

PROJECT NUMBER 45 C-5232-01
FED PROJ. NO. BRO-C523 (201)

GRADING & SURFACING
BRIDGE
SEEDING
SIGNING (BY OTHERS)

INDEX OF SHEETS

SCALE= 1"=7,000'



DESIGN DESIGNATION

AADT (2024) = 35
V = 55 mph

Note:
Project will be closed to traffic during construction.
Detour will be provided by others.

PLANS PREPARED BY:

PEC PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

CONVENTIONAL SIGNS

COUNTY LINE		CENTER LINE OF PROJECT	
CITY LIMITS		TERRACE	
STATE OR NATIONAL LINE		CULVERTS	
TOWNSHIP, SECTION or GRANT LINE		DROP INLET & STORM SEWER	
PROPERTY LINE		ACCESS CONTROL	
HIGHWAY FENCE		POWER POLE	
EXISTING FENCE		TELEPHONE POLE	
GUARDRAIL		MARSH	
CONSTRUCTION LIMITS		HEDGE	
RIGHT OF WAY LINE		TREES	
TRAVELED WAY		PROFILE ELEVATION	
RAILROADS		STREAM or CREEK	

GROSS LENGTH OF PROJECT	400.00 FT.	
EXCEPTIONS	NONE	
ADDITIONS	NONE	
NET LENGTH OF PROJECT	400.00 FT.	0.076 MILES
NET LENGTH OF BRIDGES	103.05 FT.	0.020 MILES
NET LENGTH OF ROAD	296.95 FT.	0.056 MILES

STEPHEN MATTHEW BOYD LICENSED 16469 08/15/2024 KANSAS PROFESSIONAL ENGINEER

RECOM. FOR APPROVAL DATE
8-19-2024
LOCAL PUBLIC OFFICIAL

Approved: Aug 19, 2024 (Date)
State Transportation Engineer
By:
Assistant Chief, Bureau of Local Projects
KANSAS DEPARTMENT OF TRANSPORTATION

DATE | BY | SURVEY | CADD TECHNICIAN | DESIGNERS | SQUAD

Plotted by : Brett.Morey 15-AUG-2024 14:57
File : 230580rti-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	45 C-5232-01	2024	5	39

SUMMARY OF QUANTITIES

Item / Location	Excavation Class I Cu. Yds.	Excavation Class II Cu. Yds.	Concrete (Grade 4.0) (AE) (SA) Cu. Yds.	Concrete (Grade 4.0) (AE) Cu. Yds.	Reinforcing Steel (Grade 60) (Epoxy Coated) Lbs.	Reinforcing Steel (Grade 60) Lbs.	Piles ✳ (Steel) (HP 10x42) Lin. Ft.	Piles ✳ (Steel) (HP 12x53) Lin. Ft.	Contractor Furnished PDA Each	Slope Protection (Riprap Stone) Cu. Yds.
Abutment No. 1	72.1		✳✳		✳✳		230			170
Pier No. 1	5.9	48.3		63.0		2,707		316	1	
Pier No. 2	36.0	48.0		63.0		2,707		306		
Abutment No. 2	80.0		✳✳		✳✳		240		1	182
Substr. Total	194.0	96.3		126.0		5,414	470	622	2	352
Superstr. Total			215.7		59,043					
Total	194	97	215.7	126.0	59,050	5,420	470 †	622 †	2	352

✳ NOTE: Only steel pile HP10X42 shall be used at abutments and HP12X53 at piers on this project.

✳✳ Quantities are included in the Superstr. Total Quantity.

TRAFFIC DATA	
AADT (2024)	35
AADT (2018)	35
DHV	1%
T	1%

† Summary of Piling
Abutment No. 1 5 @ 46'
Pier No. 1 5 @ 51', 1 @ 61' (PDA Pile)
Pier No. 2 6 @ 51'
Abutment No. 2 4 @ 46', 1 @ 56' (PDA Pile)

CONTRACTOR CONSTRUCTION STAKING: Contractor Construction Staking for clear span bridges requires two independent surveys. See KDOT Specifications.

INDEX TO BRIDGE DRAWINGS	
Sheet No.	Drawing
5	General Notes and Quantities
6	Contour Map
7	Construction Layout
8	Engineering Geology
9	Abutment Details
10	Pier Details
11 - 12	Superstructure Details
13	Slab Elevations
14	Corral Rail Details
15	Bill of Reinforcing Steel and Bending Diagrams
Standards	
16	Bridge Excavation
17	Standard Pile Details
18	Supports and Spacers for Reinforcing Steel
19	Marker Details for Guardrail, Barrier and Bridge Rails
20	Slope Protection Details

GENERAL NOTES

EXISTING STRUCTURE: Plans of the existing structure are on file and available for inspection by qualified bidders at the Jewell County Road and Bridge Department.

QUANTITIES: Items not listed separately in the Summary of Quantities are subsidiary to other items in the proposal.

DIMENSIONS: All dimensions shown on the design plans are horizontal dimensions unless otherwise noted. Make necessary allowances for roadway grade and cross slope.

TEMPERATURE: The design temperature for all dimensions is 60° F.

DEMOLITION PLANS: This is a Category A Demolition. Submit detailed Demolition Plans to the Field Engineer per KDOT Specifications. No Demolition work will begin without approved Demolition Plans. A Licensed Professional Engineer is not required.

UTILITIES: There are active overhead power lines within the construction limits of this project. The Contractor shall coordinate with Rolling Hills Elect. Co-Op prior to starting construction.

REMOVAL OF EXISTING STRUCTURE: Removal of existing structure is included in the bid item, "Removal of Existing Structures", Lump Sum.

Removal of existing structure includes the removal of the existing barrier, bridge deck, abutments, piers and any other items that are associated with the existing structure.

Lead content testing indicates that paint on the existing structure is positive for lead with a lead value of 98.5 mg/L TCLP. All painted materials shall be disposed of in accordance with KDOT Standard Specifications. All labor and materials associated with the disposal of any painted materials is subsidiary to the bid item, "Removal of Existing Structures", Lump Sum.

All materials removed from the existing structure shall become the property of the Contractor. Remove this material from the site.

PAINT SYSTEM ON EXISTING STRUCTURE: The structural steel has a paint history of:

1) Original paint system Unknown Date: 1940
2) Repaint system Unknown Date: Unknown
3) TCLP value 98.5 mg/L TCLP Report Date: 2/22/2024

BROKEN CONCRETE: Waste the broken concrete from the existing bridge on sites provided by the Contractor and approved by the Engineer.

EMBANKMENT: Complete the embankment at the abutment as shown on the Bridge Excavation sheet prior to driving the abutment piling or commencing with the abutment footing excavation.

BRIDGE EXCAVATION: Elevation 1635.06 shall designate the Excavation Boundary Plane of Class I and Class II Excavation; Class I above the plane, Class II below the plane. See the Bridge Excavation sheet for the limits of pay excavation.

PILING: Drive all piling to bear upon the Blue Hill Shale Member. Driving shall stop when in the opinion of the Engineer additional driving may damage the piling. Drive all piling to the Pile Driving Formula Load of:

Abutment No. 1	50 Tons
Pier No. 1	133 Tons
Pier No. 2	133 Tons
Abutment No. 2	50 Tons

As a minimum drive each pile to the load and penetration, but in no case shall the pile be driven to more than 110% of Pile Driving Formula Driving Load. At any location where problems are experienced, pile damage is suspected, or the Pile Driving Formula Load occurs significantly above the design pile tip elevation, the Engineer may request that the Pile Driving Analyzer (PDA) equipment be used.

CONTRACTOR FURNISHED PDA: Use the Pile Driving Analyzer equipment at locations on the Construction Layout. Use Pile Driving Analyzer equipment and methods compliant with KDOT Special Provision. The piling shall remain in place as permanent piling. Drive the piling to the resistance value of (Strength I divided by Phi).

At any location where problems are experienced, pile damage is suspected, or the Pile Driving Formula Load occurs significantly above the design tip elevation, the Owner's designated Engineer may request that the Pile Driving Analyzer (PDA) equipment be used.

PILING SPLICE LOCATION: Integral pile splice locations and weld testing criteria for Abutments No. 1 & 2 and Piers No. 1 & 2 will follow the "Standard Pile Details" Sheet (BR110).

FALSEWORK PLANS: A licensed Professional Engineer shall design the falsework details. Details shall bear the seal of a licensed Professional Engineer. Submit electronic plans conforming to Section 105 of the Standard Specification with details in compliance with KDOT Specifications to the Field Engineer for review.

FALSEWORK PLANS AND SHOP DRAWINGS: Use the U.S. Customary system of units on falsework plans and shop drawing details.

FALSEWORK INSPECTION: This project has falsework plan requirements which are considered "Category 2" by KDOT specifications. If falsework deficiencies or variations from the approved and sealed plans are found, the falsework design Engineer of Record will provide written approval of the changes. If for the convenience of the Contractor the falsework becomes "Category 1" by the use of non-typical supports; then the inspection and review requirement of "Category 1" will be fully enforced, but at no cost to the State. "Category 2" falsework inspection is not paid for directly, but is subsidiary to other bid items.

FALSEWORK: Leave the falsework in place for the entire unit until 15 days after the last concrete pour for the unit or longer as directed by the Engineer.

CAMBER: Provide camber as shown on the Camber Diagram unless the Contractor uses either long span steel beam falsework (concrete dead load deflection greater than 1/4") or timber falsework with greater than 12'-0" clear span. If either case exists, submit falsework plans which show the additional required camber.

CONCRETE: Superstructure concrete is bid as Concrete Grade 4.0)(AE)(SA). Substructure concrete is bid as Concrete (Grade 4.0)(AE). Bevel all exposed edges of all concrete with a 3/4" triangular molding, except as otherwise noted on the plans. Construction joints are optional with the Contractor, but if used, place only at locations shown, or at locations approved by the Engineer.

REINFORCING STEEL: All reinforcing steel dimensions are to the centerline of bars unless otherwise noted. All reinforcing steel, shall conform to the requirements of ASTM A615, Grade 60. Where non-coated bars come in contract with epoxy coated bars, they need not be coated.

CONCRETE PLACING SEQUENCE: The sequence of placing concrete in the slab and curbs shall be as shown, or the Contractor may submit an alternate placing sequence for review. Submit the alternate placing sequence to the Engineer at the Preconstruction Conference. Include the proposed rate of concrete placement in C.Y./h, the plant capacity, placement direction, construction joint location, a description of the equipment used in placing the concrete, proposed admixtures, and the quantity of concrete in each placing segment. Any additional cost for the Contractor's alternate plan of placing concrete, including admixtures, shall be at the Contractor's expense and shall be considered subsidiary to the bid item, "Concrete (Grade 4.0)(AE)(SA)". Approval of the Contractor's alternate sequence is required prior to placement of concrete in the deck.

CONSTRUCTION JOINTS: The construction joints shown are optional with the Contractor. If used, place the construction joints only at locations shown or at locations approved by the Engineer.

CONSTRUCTION LOADS: Limited traffic is permitted on the new sub-deck, one-course deck or any concrete overlay during the curing period, **keep any exposed deck wet during the curing period**. See KDOT Specifications Section 710 Tables 710-1 & 710-2 for additional information.

SLAB ELEVATIONS: The Contractor shall record elevation readings on the "Slab Elevations" sheet in the table at locations designated by a "(2)" and submit the sheet to the Engineer.

DECK FINISHING: Set the finishing machine parallel to the skew for striking off and screeding the concrete. Screeding normal to the centerline of the bridge will not be allowed.

Deck will be finished using a wet burlap drag. Labor and materials required for deck finishing shall be subsidiary to the bit item, "Concrete Grade 4.0 (AE) (SA)".

CORRAL RAIL: Build the corral rail after the falsework is struck.

SLOPE PROTECTION (Riprap Stone): Place Slope Protection (Riprap Stone) to the limits and thicknesses shown on the plans or as directed by the Engineer. Use Light 24"-200 lbs. Series as described in Division 1100 placed to the limits shown on the plans. Place a 10 foot wide mat of geotextile under the rock/rubble embankment on the berm and berm slopes and centered on the drip lines of the slab.

BACKFILL COMPACTION: Compact backfill at the abutments.

DESIGN DATA

DESIGN SPECIFICATIONS:
AASHTO Specifications, 2020 Edition and latest Interim Specifications. Load and Resistance Factor Design.

DESIGN LOADING:
HL-93

Design Dead Load includes an allowance of 15 psf for a future wearing surface.

UNIT STRESSES:

Concrete (Grade 4.0)(AE)	f'c =	4 ksi
Concrete (Grade 4.0)(AE)(SA)	f'c =	4 ksi
Reinforcing Steel (Grade 60)	fy =	60 ksi

LRFD DESIGN PILE LOAD:

Design Loading (Tons/Pile)	Strength	Service	Phi
Abutment	1 & 2	50	33	0.65
Piers	1 & 2	133	95	0.65

LFD & LRFR RATING FACTORS		
Truck / Rating Level	Inventory	Operating
HS-20 (36T)	1.70	2.84
Type HET (110T)	X	1.26
2002 LFD Rating. 17th Edition AASHTO		
HL-93 Loading	1.20	1.55
2020 Manual for Bridge Evaluation		

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 000450715003324 (188 N.7-10.0) STA. 50+10.56

GENERAL NOTES AND QUANTITIES

Jewell County Bridge Replacement
Proj. No. 45 C-5232-01 Jewell Co.

SHEET NO.	OF	SCALE	APP'D	
DESIGNED		DETAILED	QUANTITIES	CADD
DESIGN CK.		DETAIL CK.	QUAN. CK.	CADD CK.

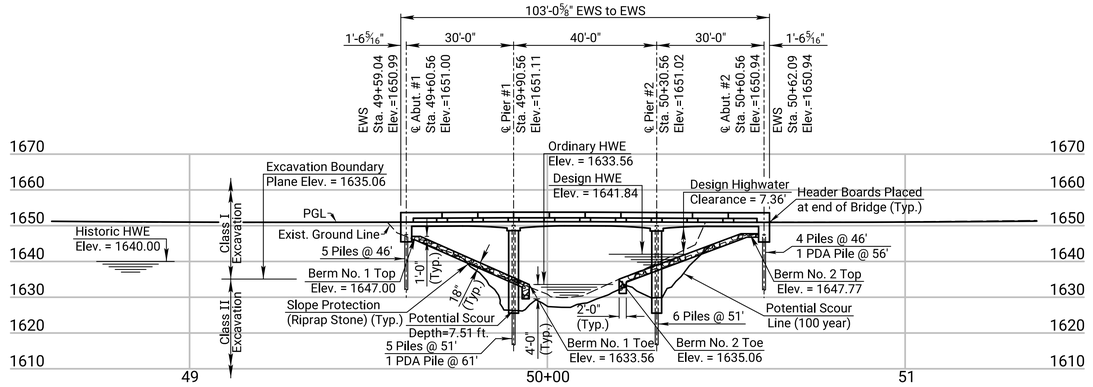
Plotted by : Brett.Morey 15-AUG-2024 14:44
File : c523201bbr-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	45 C-5232-01	2024	7	39

DRAINAGE DATA

Br. No. 000450715003324/188 N.7-10.0

Drainage Area	11.90 Sq. Mi.
Design Freq.	10 Yr.
Des. Discharge	1640 cfs
Design HWE	1641.84 ft.
Change in Design BW	+0.11 ft.
Design BWE	1642.02 ft.
Overtopping Elev. (49+30.68)	1650.94 ft.
Overtopping Disch.	5430 cfs
Overtopping Freq.	>200 Yr.
Discharge @ Q_{100}	4280 cfs
Change in Backwater @ Q_{100}	0.49 ft.
BW Elev @ Q_{100}	1647.00 ft.
Historic HWE	1640.00 ft.
Ordinary HWE	1633.56 ft.
Total Waterway Prov.	742.04 Sq. Ft.
Des Waterway Prov.	266.25 Sq. Ft.
Estimated OHW Discharge	76.8 cfs



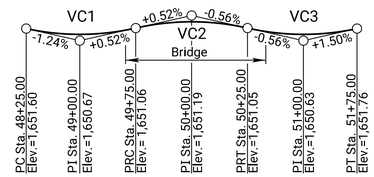
ELEVATION

Scale: 1" = 20'

30'-0" - 40'-0" - 30'-0" Reinforced Concrete Haunched Slab Spans (RCSH)
Pile Bent Abutments, Pile Bent Piers
28'-0" Roadway, Skew 35°00'00" Lt.

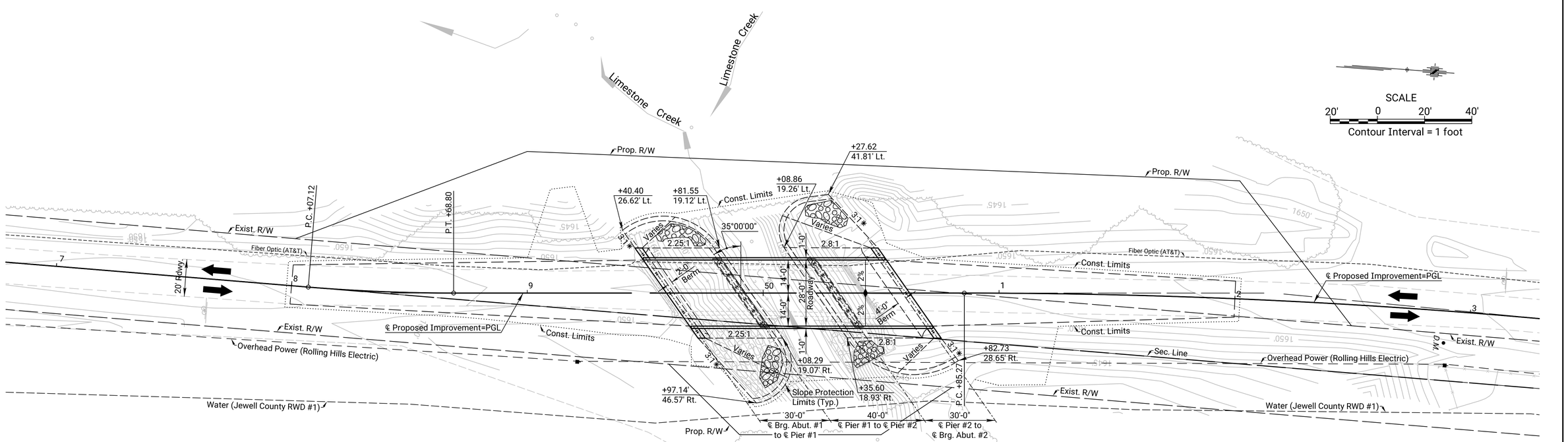
B.M. #201 Set "T" shaped fence post driven flush with ground 1.5' West of a wooden fence post.
18.67' Rt. of ℄ 100 Rd. Sta. 49+23.06 Elev.= 1,650.27

B.M. #202 Set "T" shaped fence post driven flush with ground 1.5' East of a wooden fence post.
50.47' Lt. of ℄ 100 Rd. Sta. 53+49.69 Elev.= 1,653.70



PROFILE GRADE

150' VC1
50' VC2
150' VC3



PLAN

Scale: 1" = 20'

SCALE
20' 0 20' 40'
Contour Interval = 1 foot

*See Cross-Sections for transition to Typical Section

Utility Owners

Water	Jewell County RWD #1
Power	Rolling Hills Elect Co-Op Inc.
Fiber Optic	AT&T Distribution

Contour Interval = 1 ft.

The elevations shown are referenced to the NAVD88 Vertical Datum

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 000450715003324 (188 N.7-10.0) STA. 50+10.56

CONSTRUCTION LAYOUT

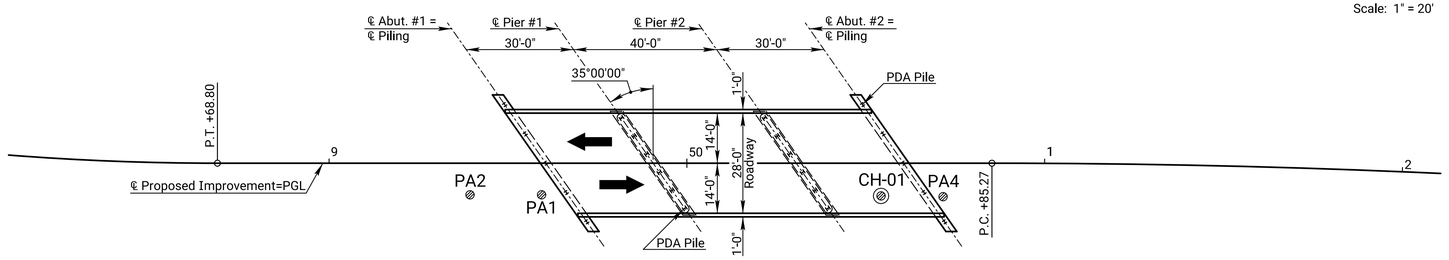
Jewell County Bridge Replacement

Proj. No. 45 C-5232-01 Jewell Co.

SHEET NO. OF	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

Plotted by : Brett.Morey 15-AUG-2024 14:45
File : c5232001bbr-05.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	45 C-5232-01	2024	8	39



Scale: 1" = 20'

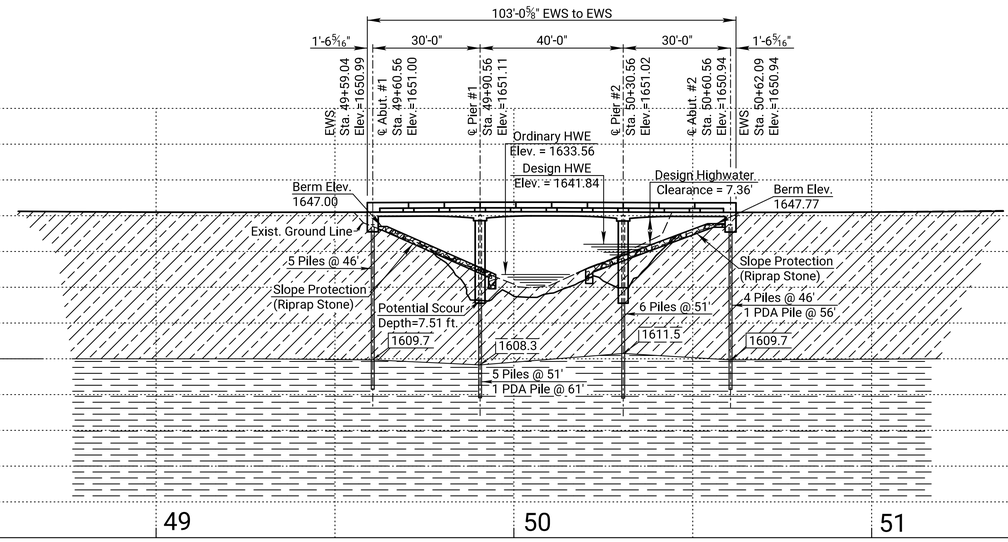
Piling: Once sufficient resistance is achieved, driving must cease to avoid damage to the pile. Final pile tip elevations should be determined in the field based on recommendations provided through the use of the Pile Driving Analyzer.

Test Pile (Special): Drive the test pile special at the locations directed by the Engineer/Geologist or as shown on the plans. Use Pile Driving Analyzer (PDA) equipment and methods compliant with KDOT Specifications. The test piling shall remain in place as permanent piling. Drive the test pile special piling to the resistance value of the Strength I load divided by Phi shown on the plans.

Use only Gr. 50 HP10x42 piling at Abutments and HP12x53 at Piers.

Pile driving is prohibited for 30 days following the completion of the embankments.

NOTE: ℄ Abutments and ℄ Piers are parallel.



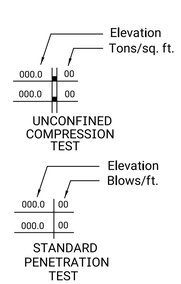
STANDARD GEOLOGIC SYMBOLS

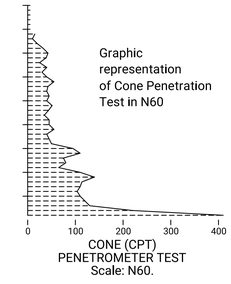
- Clay or Underclay
- Silty Clay
- Silt
- Sand
- Gravel
- Boulders
- Caliche
- Silty Clayey Shale
- Limy Shale
- Black or Fissile Shale
- Sandy Shale
- Gypsiferous Shale
- Weathered Shale
- Sandstone
- Shaly Sandstone
- Gypsum bed
- Dolomite
- Cross-bedded Sandstone
- Limestone
- Cherty Limestone
- Shaly Limestone
- Bentonite
- Weathered or Broken Limestone
- Loess
- Mortar bed
- Coal
- Siltstone
- Chalk
- Wavy limestone
- Chalky limestone

GEOLOGIC PROFILE

SOUNDINGS

- Core drill
- Power auger
- Hand tools
- Cone (CPT) penetrometer
- Shelby tube
- Water level
- 000.0 Elevation interpolated or from adjacent soundings
- 000.0 Actual sounding elevation





NOTE: Soundings shown on these plans are taken from notes obtained in the field and represent the best information available. Logs of these soundings are provided with the bid documents, or are available from the Kansas Department of Transportation in Topeka for inspection by interested and qualified bidders.

SCALE: 1"= 20' Horiz. 1"= 20' Vert.

The elevations shown are referenced to the NAVD88 Vertical Datum

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 000450715003324 (188 N.7-10.0) STA. 50+10.56

ENGINEERING GEOLOGY

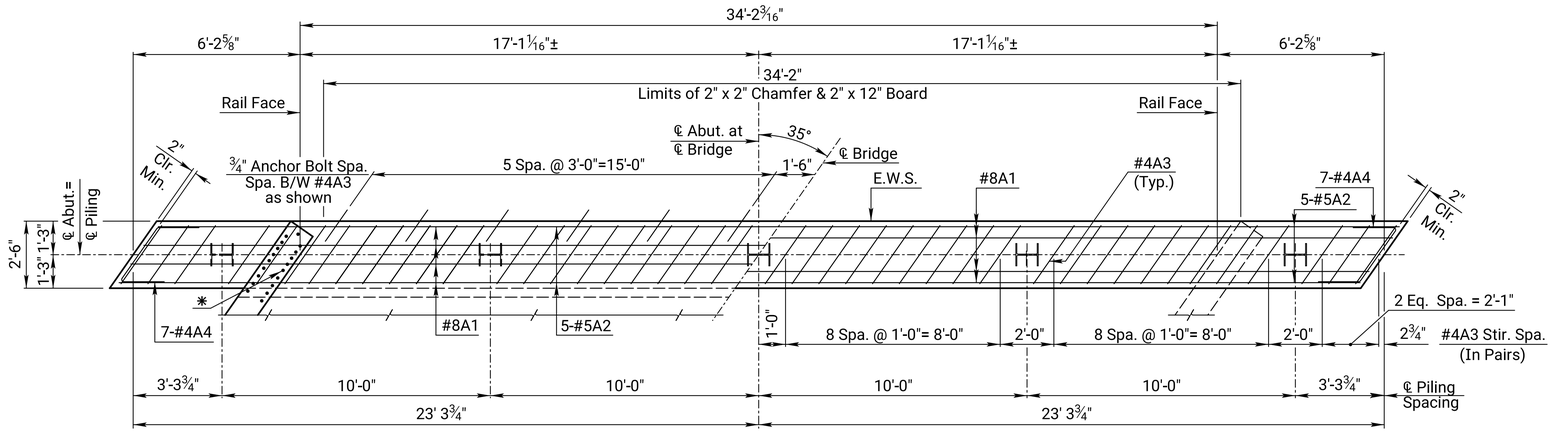
Jewell County Bridge Replacement

Proj. No. 45 C-5232-01 Jewell Co.

SHEET NO.	OF	SCALE	APP'D	
DESIGNED		DETAILED	QUANTITIES	CADD
DESIGN CK.		DETAIL CK.	QUAN. CK.	CADD CK.

Plotted by : Brett.Morey 15-AUG-2024 14:45
File : c523201bbr-07.dgn

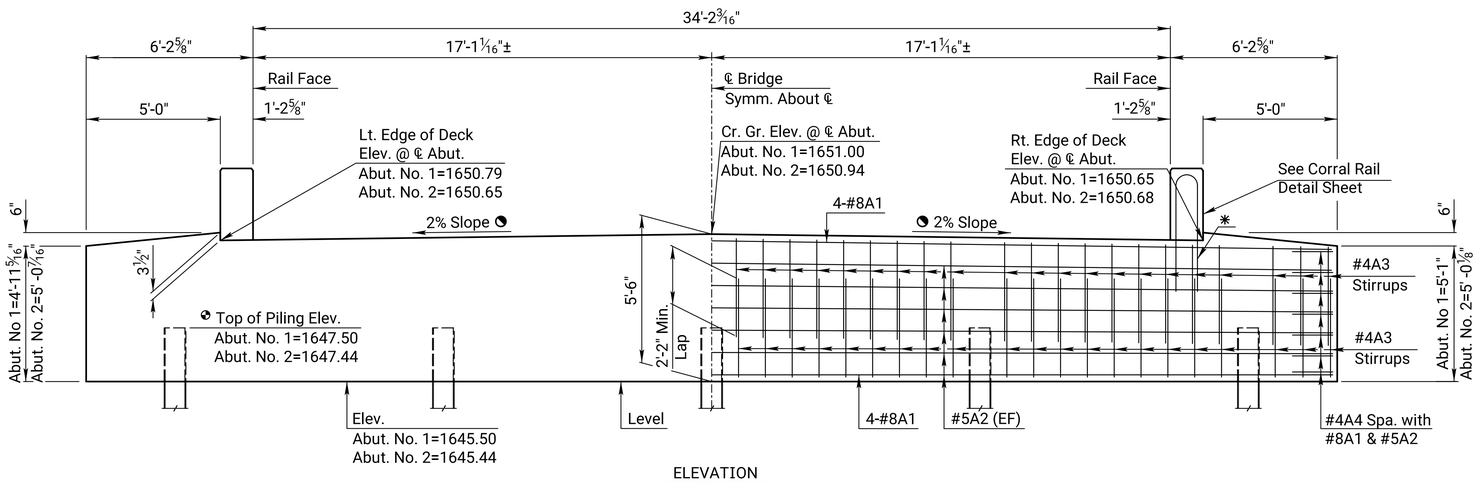
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	45 C-5232-01	2024	9	39



Reinforcing Steel in Top of Abutment

Reinforcing Steel in Bottom of Abutment

PLAN

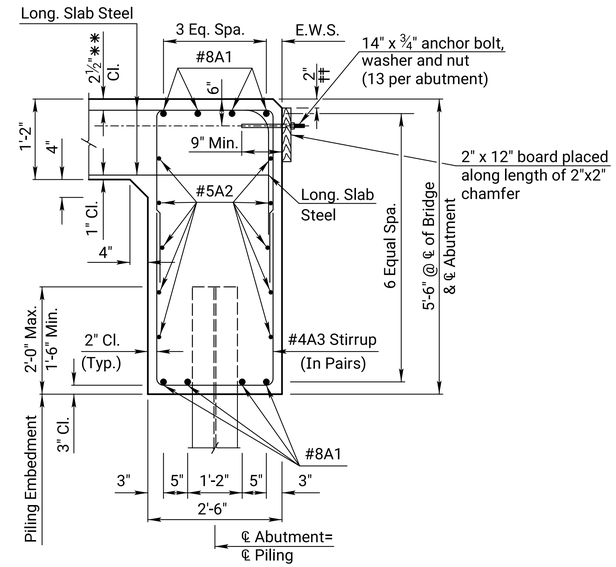


ELEVATION
(Along ℄ Abutment)
(Looking Upstation)

◔ Cross Slope Perpendicular to PG

◕ Note: Top of piling elevations are based on 2'-0" maximum embedment.

✱ Adjust stirrup to avoid conflict with rail bars.



TYPICAL SECTION

Note:
All labor and materials to install anchor bolts and 2" x 12" board are subsidiary to the bid item "Concrete Grade 4.0 (AE)(SA)".

✱✱To top of Stirrup

†† 2"x2" chamfer through roadway width only.

Legend
EF = Each Face

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 000450715003324 (188 N.7-10.0) STA. 50+10.56

ABUTMENT DETAILS

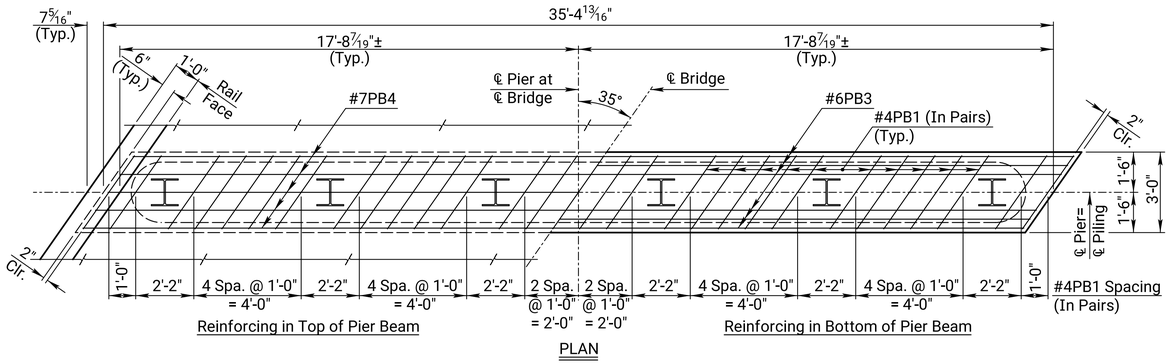
Jewell County Bridge Replacement

Proj. No. 45 C-5232-01 Jewell Co.

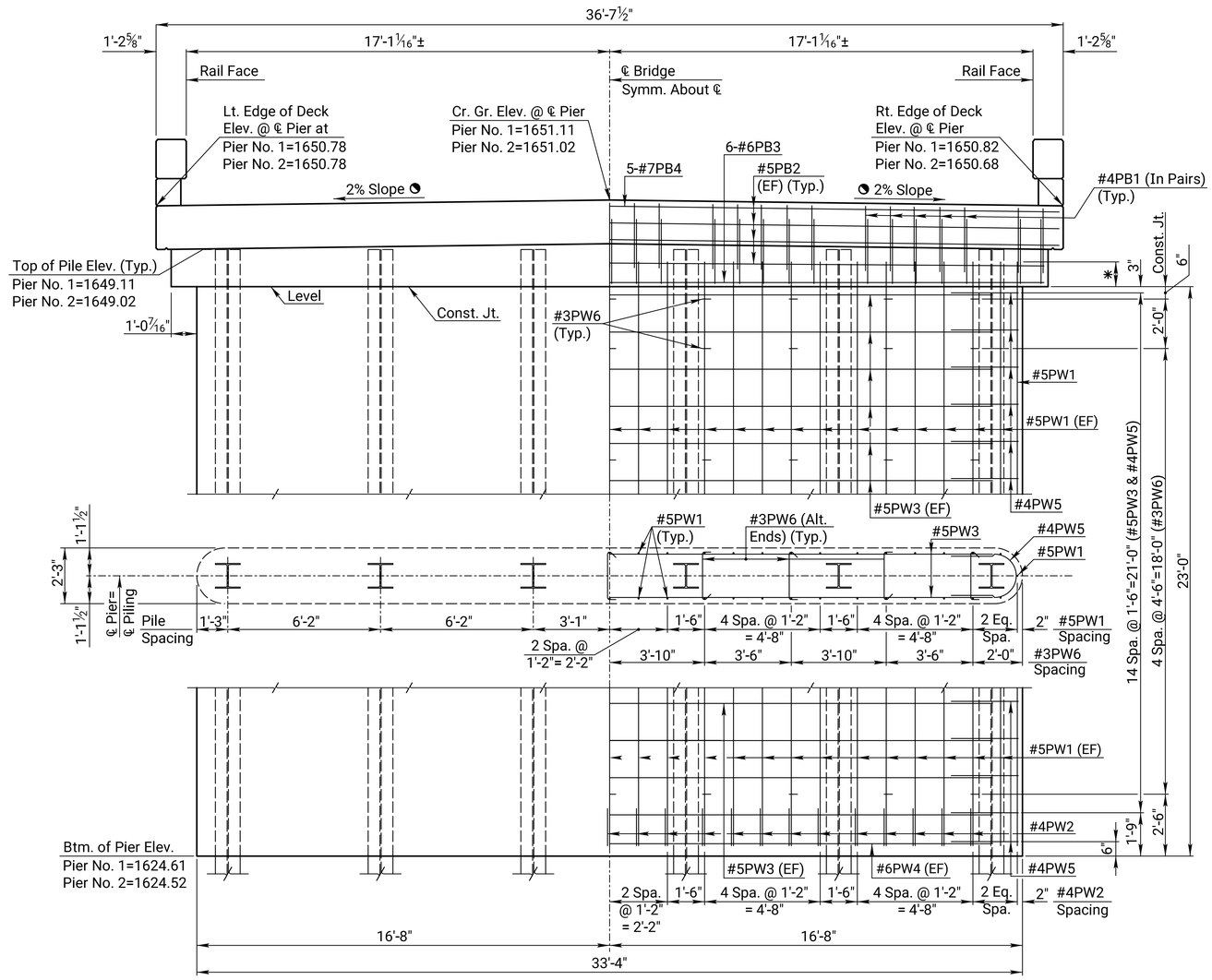
SHEET NO.	OF	SCALE	APP'D	
DESIGNED		DETAILED	QUANTITIES	CADD
DESIGN CK.		DETAIL CK.	QUAN. CK.	CADD CK.

Plotted by : Brett.Morey 15-AUG-2024 14:46
File : c5232201bbr-09.dgn

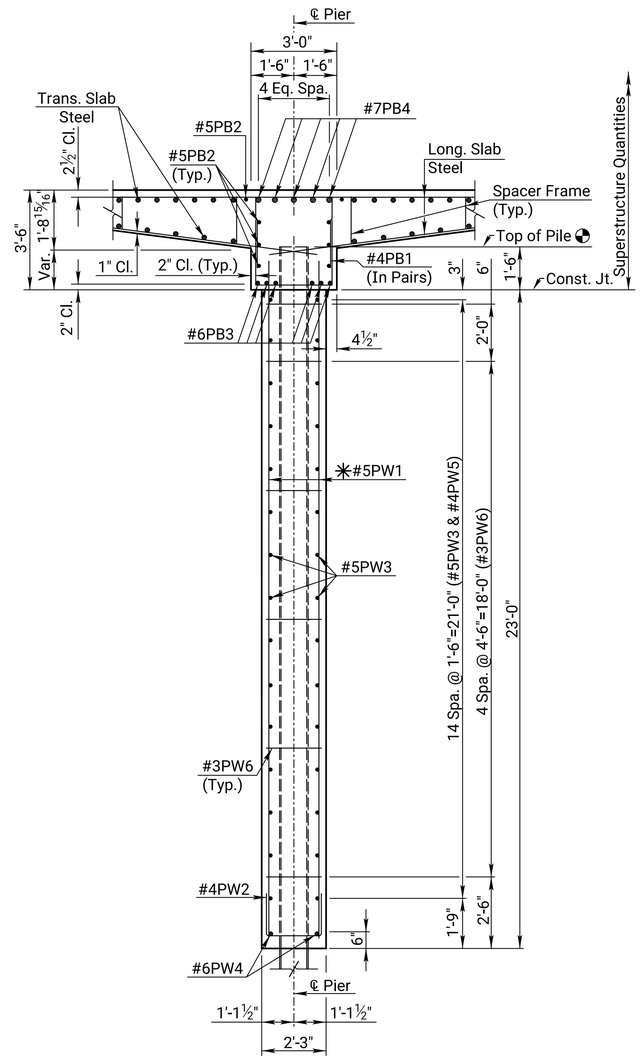
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	45 C-5232-01	2024	10	39



PLAN



ELEVATION
(Looking Upstation)



SECTION THRU PIER WALL

◔ Cross Slope Perpendicular to PG

✳ #5PW1 Extends 1'-0" into Pier Beam

◕ Note: Top of Pile Elevations are based on 1'-6" embedment into the Pier Beam

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 000450715003324 (188 N.7-10.0) STA. 50+10.56

PIER DETAILS

Jewell County Bridge Replacement

Proj. No. 45 C-5232-01 Jewell Co.

SHEET NO.	OF	SCALE	APP'D	
DESIGNED		DETAILED	QUANTITIES	CADD
DESIGN CK.		DETAIL CK.	QUAN. CK.	CADD CK.

Plotted by : Brett.Morey 15-AUG-2024 14:46
File : c523201bbr-13.dgn