

STATE OF KANSAS DEPARTMENT OF TRANSPORTATION



PLAN AND PROFILE OF PROPOSED STATE HIGHWAY

FEDERAL AID PROJECT
BOURBON COUNTY
K-3

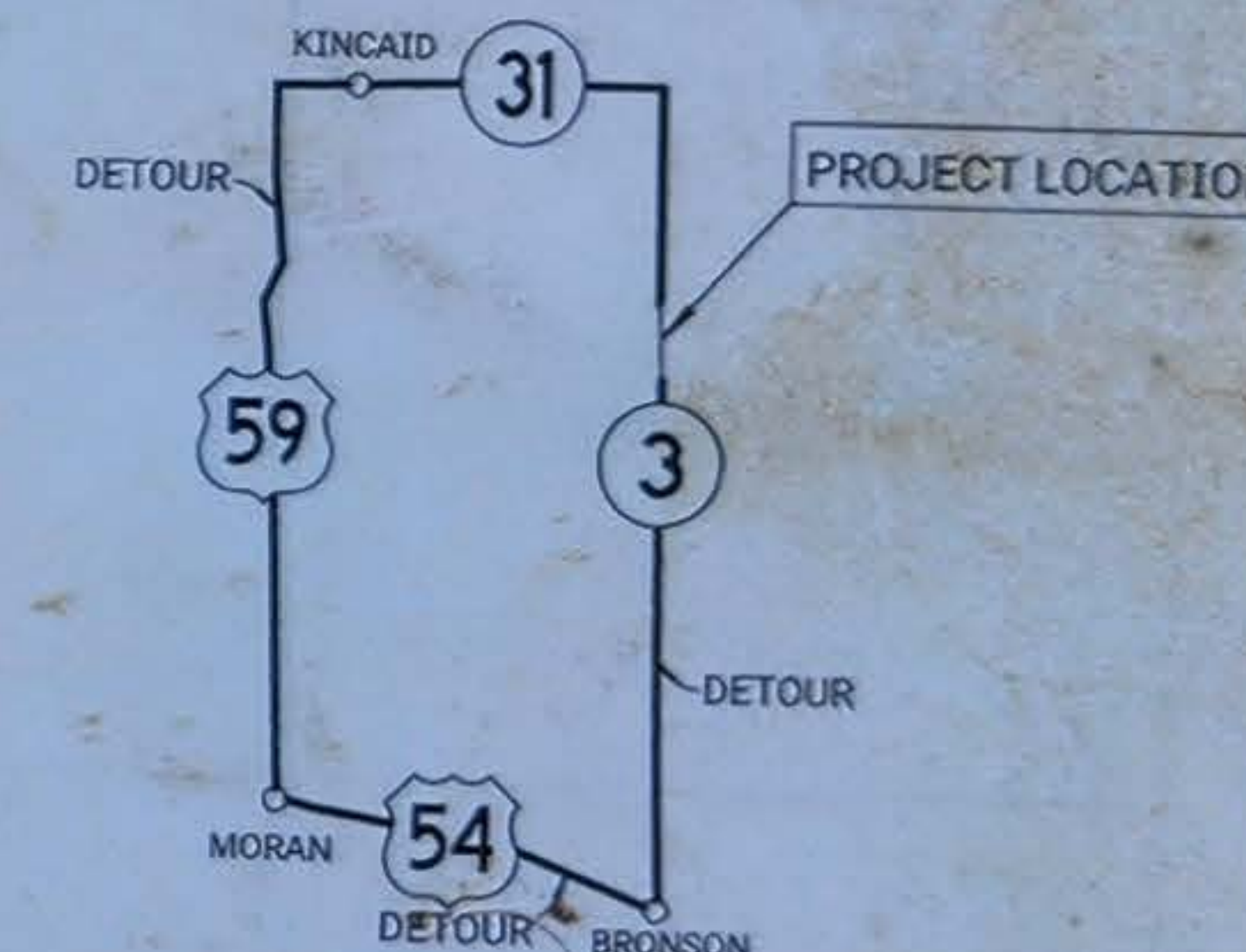
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	3-6 KA-5711-01	2024	1	110

PROJ. NO. 03-06 KA-5711-01
FED. AID. PROJ. NO. STP-A571(101)

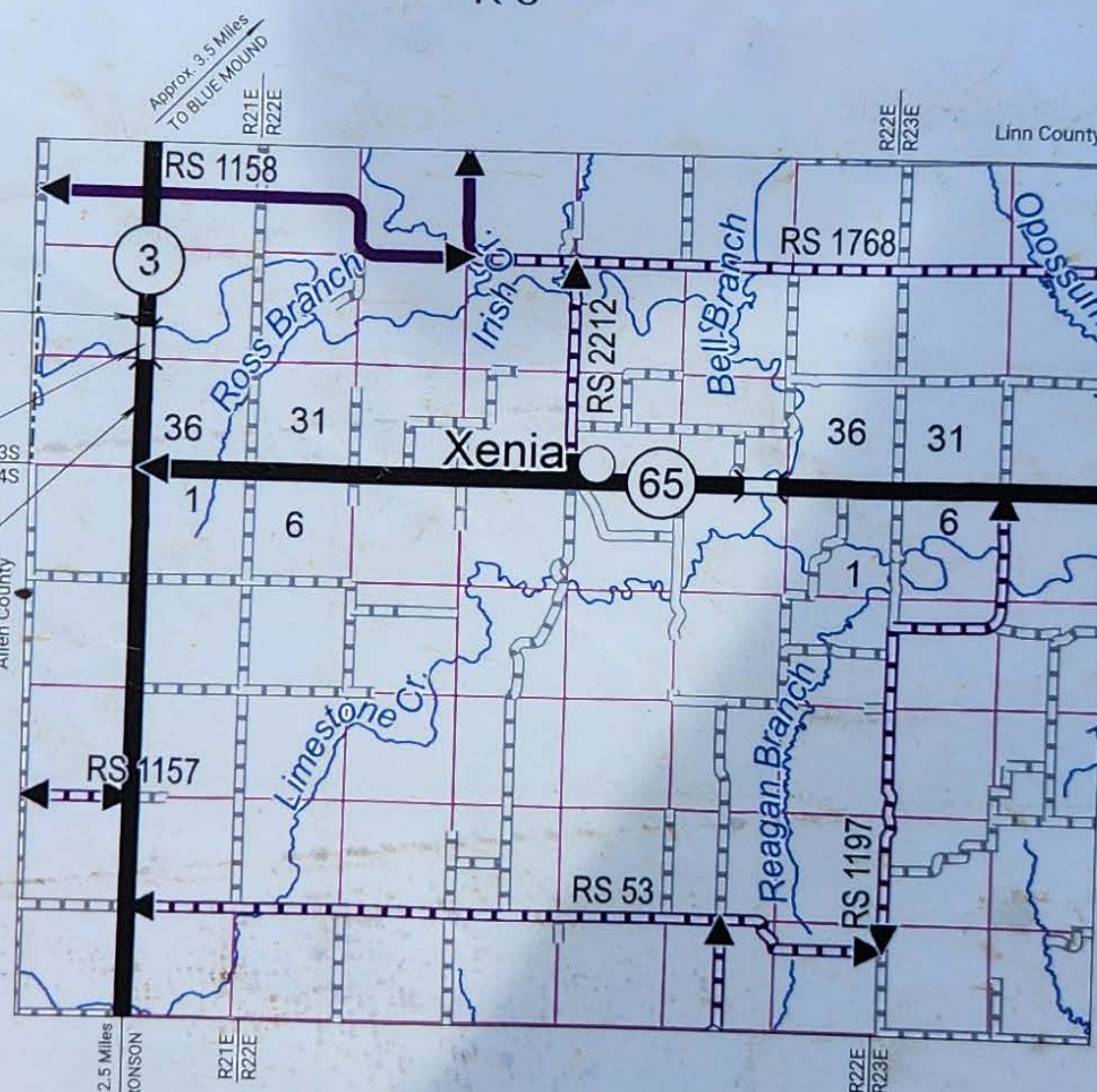
GRADING AND SURFACING (ASPHALT)
BRIDGE
SEEDING
SIGNING

SCALE: 1" = 1 MILE

DETOUR SKETCH
Not to Scale



Note: Traffic to be carried around construction on a state route detour as shown on the detour sketch. The detour shall be on US-54, US-59, K-31 and K-3.



STA. 23+00.00 BEGIN
Proj. 3-6 KA-5711-01=
Sta. 22+99.44 on
Proj. 3-6 FAS 148 A(1)

Sta. 26+24.50
Br. No. 03-06-38.34 (101)
95'-120'-95' Spans
Weathering Steel Welded Plate Girder,
Composite & Continuous (WWCC)
32' Roadway, Skew 30°

STA. 37+50.00 END
Proj. 3-6 KA-5711-01 =
Sta. 37+51.41 On
Proj. 3-6 FAS 148 A(1)

DESIGN DESIGNATION

AADT (2024) = 200
AADT (2044) = 300
DHV = 11%
D = 60%
T = 25.0%
V = 65 MPH
C of A = NONE
Clear Zone = 20 ft

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 1,450.00 FT. (Includes Equations)

EXCEPTIONS NONE

NET LENGTH OF PROJECT 1,450.00 FT. 0.275 MILES
NET LENGTH OF BRIDGES 313.46 FT. 0.059 MILES
NET LENGTH OF ROAD 1,136.54 FT. 0.215 MILES

Approved May 19, 2025
Date

B. M. M.
State Transportation Engineer

By: *Debra D. J.*
Chief, Bureau of Road Design

KANSAS DEPARTMENT OF TRANSPORTATION

Sh. No. 1

DATE	BY
2021	J. BOWEN
2021	J. MARTIN (ROAD)
2021	J. MARTIN (ROAD) / J. PEANNENSTIEL (BRIDGE)
2021	G. GONZALES (ROAD) / P. TOBAGEN (BRIDGE)
2021	SURVEY
2021	CADD TECHNICIAN
2021	DESIGNERS
2021	SQUAD

Plotted by: Juliana Martin@ks.gov
File: KA571101rt-01.dgn

11-SEP-2024 01:59

Item Location	SUMMARY OF QUANTITIES																		
	Excavation	Concrete		Reinforcing Steel		Structural Steel			Piles	Pre-Drilled	Bearing	Welded	Drilled Shaft	Core Hole	Sonic Test	Abutment	Bridge	Bridge	†† Slope
	Class I	(Gr. 4.0)	(Gr. 4.0)	Epoxy Coated	Grade	M270	A709	A709	(Steel)	Pile Holes	(Steel Reinf.)	Stud Shear	(48")	(Investigative)	(Drilled Shaft)	Aggregate	Backwall	Deck	Protection
	Cu. Yds.	(AE) (SW)	(AE)	Grade 60	60	(Gr. 50WT3)	(Gr. 50W)	(Gr. 50)	(HP10x42)	Lin. Ft.	Lin. Ft.	Each	Each	(Cased)	(Set Price)	Drain	Prot. System	Grooving	(Riprap Stone)
		Cu. Yds.	Cu. Yds.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lin. Ft.	Lin. Ft.	Each	Each	Lin. Ft.	Lin. Ft.	Each	Cu. Yds.	Sq. Yds.	Sq. Yds.	Cu. Yds.
Abutment No. 1	121	**	21.7	**					189	125						74	55		300
Pier No. 1			67.2		13,411						5		98.8	36.4					
Pier No. 2			61.5		12,524						5		96.3	36.4					
Abutment No. 2	132	**	23.5	**					342	214						74	55		960
Substr. Total	253		173.9		25,940				531	339			195.1	72.8	1	148	110		1,260
Superstr. Total		411.5		116,460		297,609	36,189	1,295			10	3,400						975	
Total	253	411.5	173.9	116,460	25,940	297,609	36,189	1,295	531 †	339	10	3,400	195	73	1	148	110	975	1,260

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

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

† Summary of Piling
Abutment No. 1 - 9 Pile @ 21'-0"
Abutment No. 2 - 9 Pile @ 38'-0"

†† Gradation shall meet the requirements of 200 Lbs. class.
Note: Only HP10x42 steel piles shall be used on this bridge.

GENERAL NOTES

BRIDGE EXCAVATION: Elevation 915.50 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.

CAUSEWAY: If the Contractor chooses to build a causeway for bridge construction purposes, the Contractor shall obtain any required U.S. Army Corps of Engineers Section 404 Permit, Kansas Department of Agriculture permit, Kansas Department of Health and Environment Section 401 Permit, Kansas Department of Wildlife Parks and Tourism Permit, or any other permit required by law for causeway construction. Obtain the permit in a timely manner so as not to delay the completion of the project.

PRE-DRILLING: All steel piles in Abutment No. 1 shall be pre-drilled to elevation 933.2. All steel piles in Abutment No. 2 shall be pre-drilled to elevation 913.8. Piles shall be set and driven to the computed bearing value shown. After driving the holes shall be backfilled with loose sand.

PILING: Drive all piling to penetrate or bear upon the Swope Formation (Abut. 1) or the Ladore Formation (Abut. 2). 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 65.0 Tons
Abutment No. 2 65.0 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.

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

SONIC TESTING: Equip all drilled shafts with piping to allow sonic testing to be done. Install pipes at locations shown on the plans. All wet pours will be tested. Also, the Engineer has the option to require sonic, non-destructive, integrity testing at any location of concern. Sonic testing shall be paid for at the unit price set for "Sonic Test" (Drilled Shaft) (Set Price). If the sonic testing indicates defective concrete in the shaft, the Engineer will measure the first sonic test for payment, and the Contractor is responsible for subsequent sonic testing of that shaft. Report test results directly to KDOT's Chief Geologist. No work will be done above the top of drilled shaft without the approval of the Chief Geologist.

PERMANENT CASING: See KDOT Specifications.

DRILLED SHAFTS: Construct the drilled shafts using the cased method. A permanent casing is required. All excavation, concrete, reinforcing steel, pipes for Sonic Testing, casings, labor, and incidentals necessary to complete the shaft as shown on the details and as directed by KDOT Specifications shall be included in the bid item "Drilled Shafts (48)". Use Grade 4.0 Concrete in the drilled shaft. In no case shall the bottom of the drilled shaft be placed higher than the elevation shown unless otherwise directed by the KDOT Geologist.

Drill an Investigative Core Hole at the locations shown on the plans. See KDOT Specifications.

If the location of the top of the shaft is such that the casing cannot be overtopped to remove concrete impurities, provide extra casing length to over-pour the concrete in the shaft and chip back to the plan elevation of the top of the shaft.

If the permanent casing is to be corrugated metal pipe (CMP) then it will be galvanized.

DRILLED SHAFT BACKFILL: Backfill the annular space between the temporary casing and the permanent casing with grout/flowable fill as defined in the KDOT Specifications.

COLUMN CONSTRUCTION: Cure the drilled shaft footing as required by the KDOT Specifications before beginning the column construction (placing resteel or formwork). Do not place cast in place shear bolts, coil inserts or other devices used as falsework support in the column without the approval of the Engineer. Do not remove the column formwork without the approval of the Engineer. Curing shall continue after the formwork is removed as required by the KDOT Specifications.

PIER BEAM CONSTRUCTION: Cure the columns as required by the KDOT Specifications before beginning the pier beam construction (placing resteel or formwork). Do not drill and grout bolts or other devices into the columns used for falsework support unless shown on the plans. Cure the columns as required by the KDOT Specifications before placing pier beam concrete. Do not remove falsework used to support the pier beam until the pier beam concrete has cured as required by the KDOT Specifications. Do not set girders or beams on the pier beam until after the falsework is removed or the pier beam concrete has 0.75f_c strength as tested.

ERECTION ELEVATION CHECKS: After the abutment and pier concrete has cured and before setting any structural steel, present verification to the Engineer that the elevations at the bearings match plan elevation ($\pm 1/4"$). Present verification to the Engineer that the elevations at all field splice locations match the elevations ($\pm 1/2"$) in the plans before any connection is fully tightened. (For steel girders that are blocked on the ground, fully tighten the bolted connections prior to erection.)

ABUTMENT AGGREGATE DRAIN: See the General Notes on the "Abutment Drainage Details" sheet.

BRIDGE BACKWALL PROTECTION SYSTEM: See the General Notes on the "Abutment Drainage Details" sheet.

BACKFILL COMPACTION: Compact backfill at the abutments.

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

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 200 Lb. Gradation as described in Division 1100.

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.

DESIGN DATA

DESIGN SPECIFICATIONS:
AASHTO Specifications, 9th Edition.
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) f'_c = 4 ksi
Concrete (Grade 4.0)(AE) f'_c = 4 ksi
Concrete (Grade 4.0)(AE)(SW) f'_c = 4 ksi
Reinforcing Steel (Grade 60) f_y = 60 ksi
Structural Steel (M270 Gr. 50WT3) f_y = 50 ksi
Structural Steel (A709 Gr. 50W) f_y = 50 ksi
Structural Steel (A709 Gr. 50) f_y = 50 ksi
Steel Pile (Grade 50) F_y = 50 ksi

LRFD DESIGN PILE LOAD:
Design Loading (Tons/Pile) Strength I Service I Phi
Abutment No. 1 & 2 65.0 44.3 0.55

LRFD DESIGN DRILLED SHAFT LOAD: *
Design Loading (Tons/Shaft) Strength I Service I Phi
All Piers 443.2 324.1 End Bearing 0.45
Side Friction 0.50

*Note: Drilled Shaft Load includes the self-weight of the shaft.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	3-6 KA-5711-01	2024	25	110

INDEX TO BRIDGE DRAWINGS

Sheet No.	Drawing
25-26	General Notes and Quantities
27	Contour Map
28	Construction Layout
29	Engineering Geology
30-32	Abutment Details
33	Abutment Drainage Details
34	Drilled Shaft Details
35-36	Pier Details
37-38	Bearing Device Details
39	Framing Plan
40	Steel Erection Details
41-42	Girder Details
43	Girder Field Splice Details
44	Abutment and Pier Crossframe Details
45	Intermediate Diaphragm Details
46	Superstructure Details
47-48	Slab Details
49	Auxiliary Superstructure Details
50-51	32" Kansas Corral Rail
52	Bill of Reinf. and Bending Diagrams
	Standards
53	Bridge Excavation
54	Standard Pile Details
55	Supports and Spacers for Reinf. Steel

LFD & LRFR RATING FACTORS

Rating Level		Inventory	Operating
Truck			
HS-20	(36T)	1.887	3.152
Type HET	(110T)		1.669
2002 LFD Rating, 17th Edition AASHTO			
HL-93 Loading		1.279	1.658
2017 Manual for Bridge Evaluation			

TRAFFIC DATA

AADT (2024)	200
AADT (2044)	300
DHV	11%
D	60/40
T	25%

3				
2				
1				
NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 3-6-38.34 (101) Sta. 26+24.50

GENERAL NOTES AND QUANTITIES

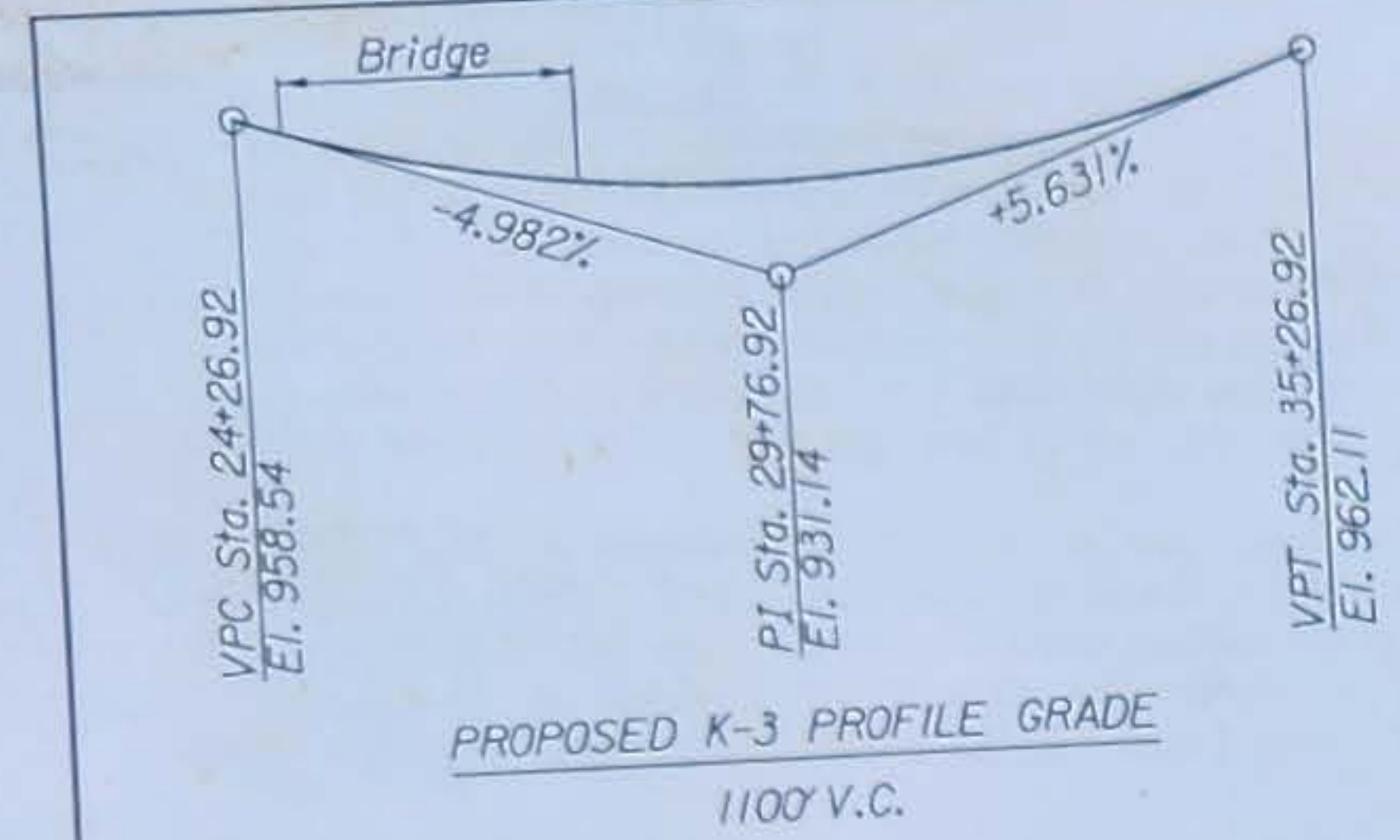
Proj. 3-6 KA-5711-01	Bourbon Co.
SHEET NO. OF SCALE	APP'D
DESIGNED CEM/DETAILED CEM/QUANTITIES CEM/CAAD KMS	
DESIGN CK. CFB/DETAIL CK. CFB/QUAN. CK. CFB/CAAD CK. CEM	

KDOT Graphics Certified 09-11-2024

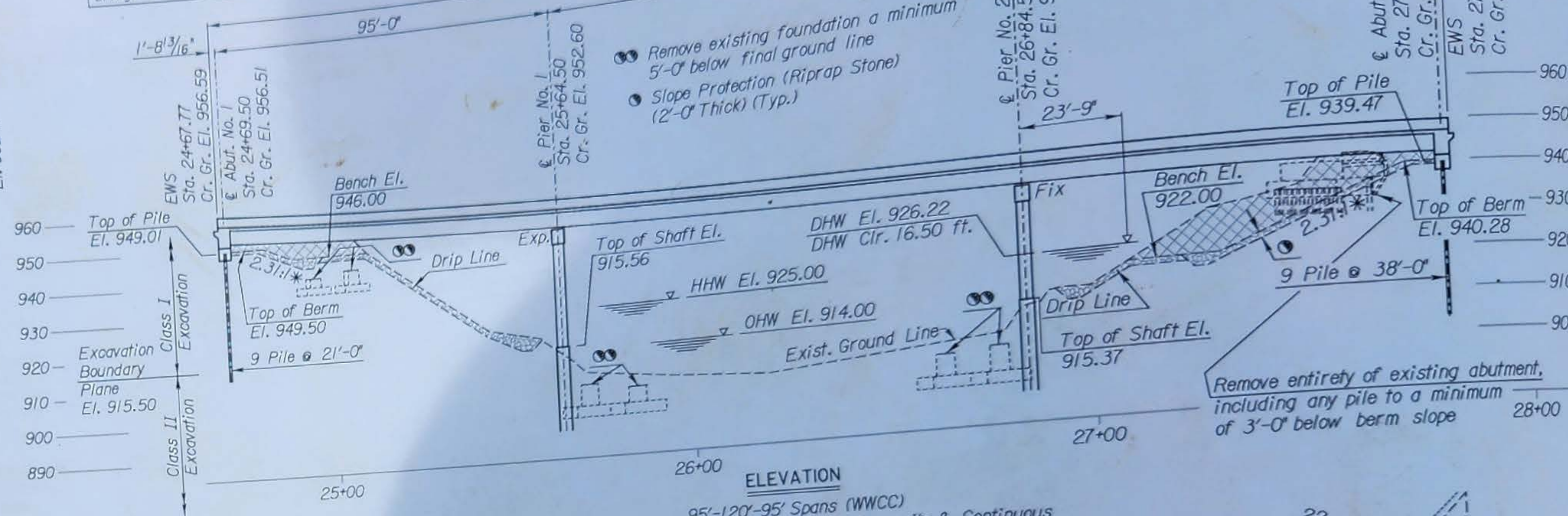
Sheet No. 25

B.M. #13 Chiseled cut on Hubguard, NE corner of river bridge over Little Osage River 16.24' Rt., Sta. 27+66.29 El. 941.20

B.M. #12 Chiseled cut on Hubguard, SW corner of river bridge over Little Osage River 16.33' Lt., Sta. 24+82.57 El. 955.48



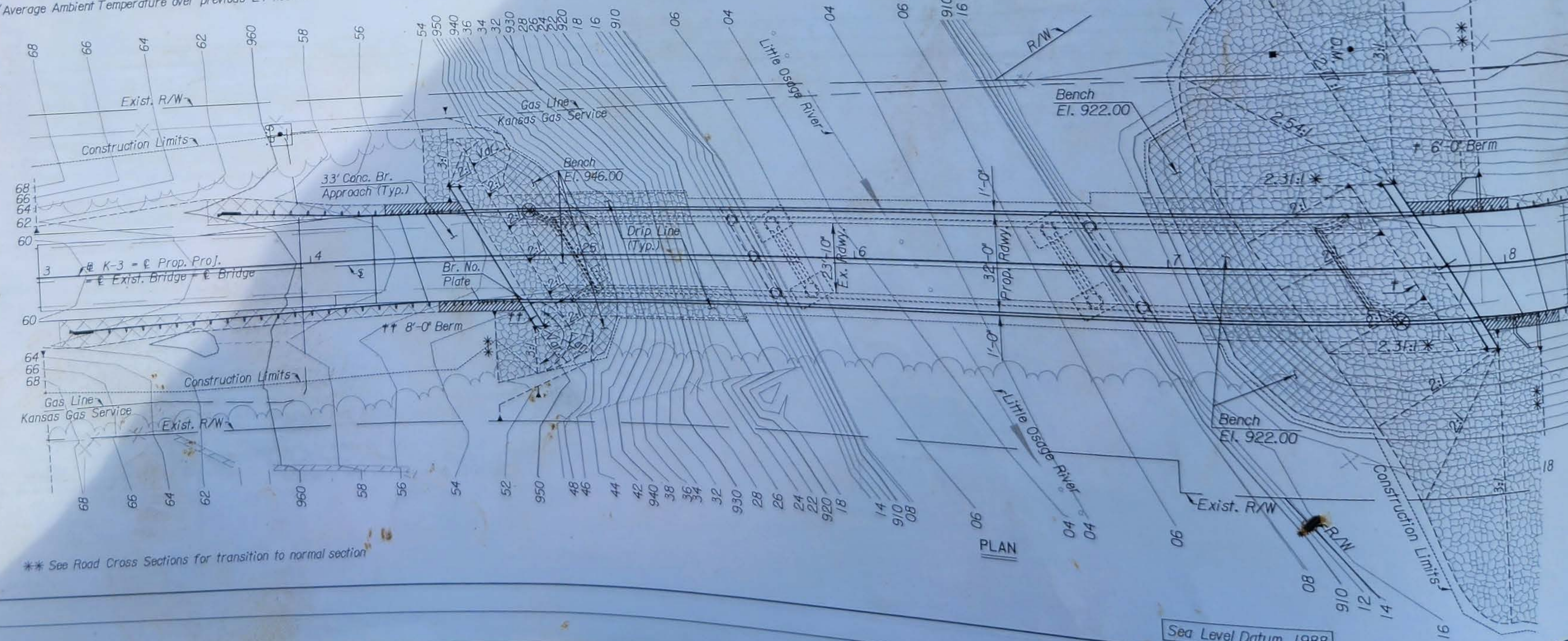
* Note: Berm slope parallel to roadway of 2.31:1 is equal to a 2:1 slope perpendicular to face of abutment



EXPANSION JOINT WIDTH DETAILS (W2)

Temperature (F°)	40°	50°	60°	70°	80°	90°
Formed Concrete Opening Size	3 5/16"	3 1/4"	3 3/8"	3"	2 7/8"	2 3/4"

† Average Ambient Temperature over previous 24 hours.



** See Road Cross Sections for transition to normal section

Sea Level Datum 1988

Plotted: Jaka Pfannenstiel, gdw Location: Bridge
File: k057101bwr01-004
Plot Date: 11-SEP-2024 18:23

23 8 7/16

AGE DATA

9-76-92

charge

20

Plot Date: 11-SEP-2024 18:23

PILING: Once the required resistance and penetration in firm limestone and/or shale of the Swope Formation of the Ladore Shale Formation is achieved, driving should cease to avoid damage to the pile. Final pile tip elevations should be determined in the field based on observed blow counts and bearing formula calculations.

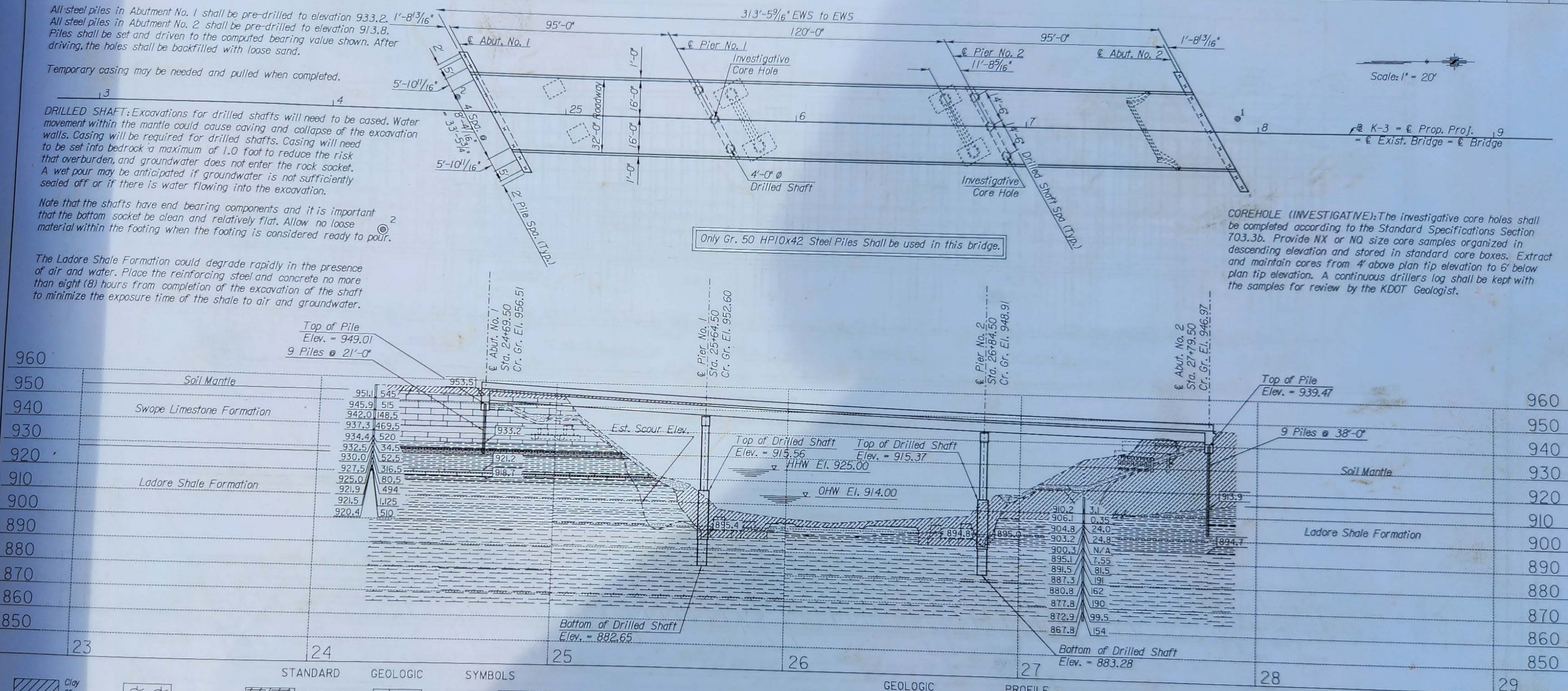
All steel piles in Abutment No. 1 shall be pre-drilled to elevation 933.2. 1'-8 3/16".
All steel piles in Abutment No. 2 shall be pre-drilled to elevation 913.8.
Piles shall be set and driven to the computed bearing value shown. After driving, the holes shall be backfilled with loose sand.

Temporary casing may be needed and pulled when completed.

DRILLED SHAFT: Excavations for drilled shafts will need to be cased. Water movement within the mantle could cause caving and collapse of the excavation walls. Casing will be required for drilled shafts. Casing will need to be set into bedrock a maximum of 1.0 foot to reduce the risk that overburden, and groundwater does not enter the rock socket. A wet pour may be anticipated if groundwater is not sufficiently sealed off or if there is water flowing into the excavation.

Note that the shafts have end bearing components and it is important that the bottom socket be clean and relatively flat. Allow no loose material within the footing when the footing is considered ready to pour.

The Ladore Shale Formation could degrade rapidly in the presence of air and water. Place the reinforcing steel and concrete no more than eight (8) hours from completion of the excavation of the shaft to minimize the exposure time of the shale to air and groundwater.

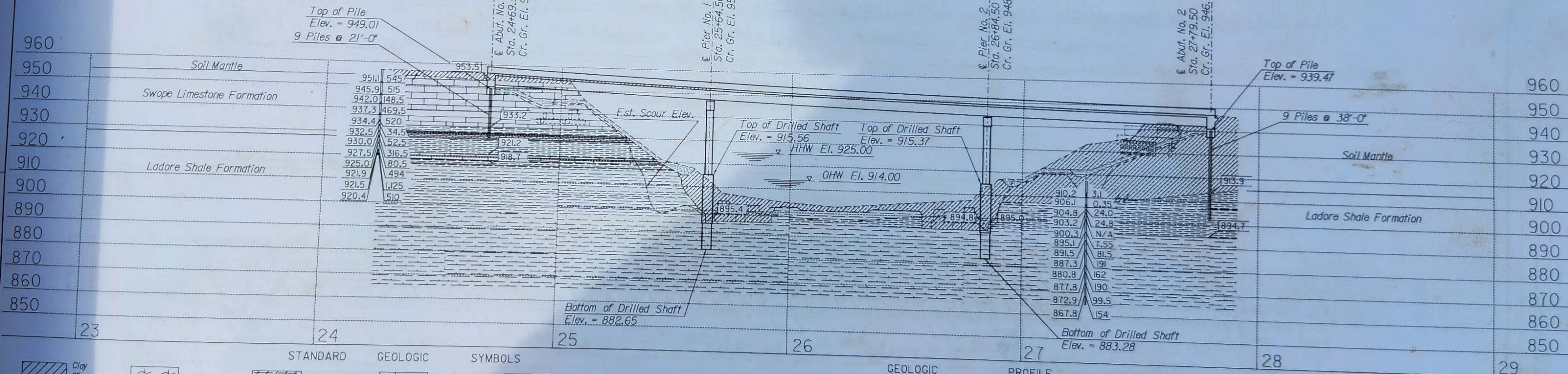


STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	3-6 KA-5711-01	2024	29	110

Scale: 1" = 20'

at K-3 = Prop. Proj. 9
= Exist. Bridge = Bridge

COREHOLE (INVESTIGATIVE): The investigative core holes shall be completed according to the Standard Specifications Section 703.3b. Provide NX or NQ size core samples organized in descending elevation and stored in standard core boxes. Extract and maintain cores from 4' above plan tip elevation to 6' below plan tip elevation. A continuous driller's log shall be kept with the samples for review by the KDOT Geologist.



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

SOUNDINGS
● Core drill
● Power auger
○ Hand tools
▽ Cone (CPT) penetrometer
⊙ Shelby tube
Water level
09/2022

GEOLOGIC

PROFILE

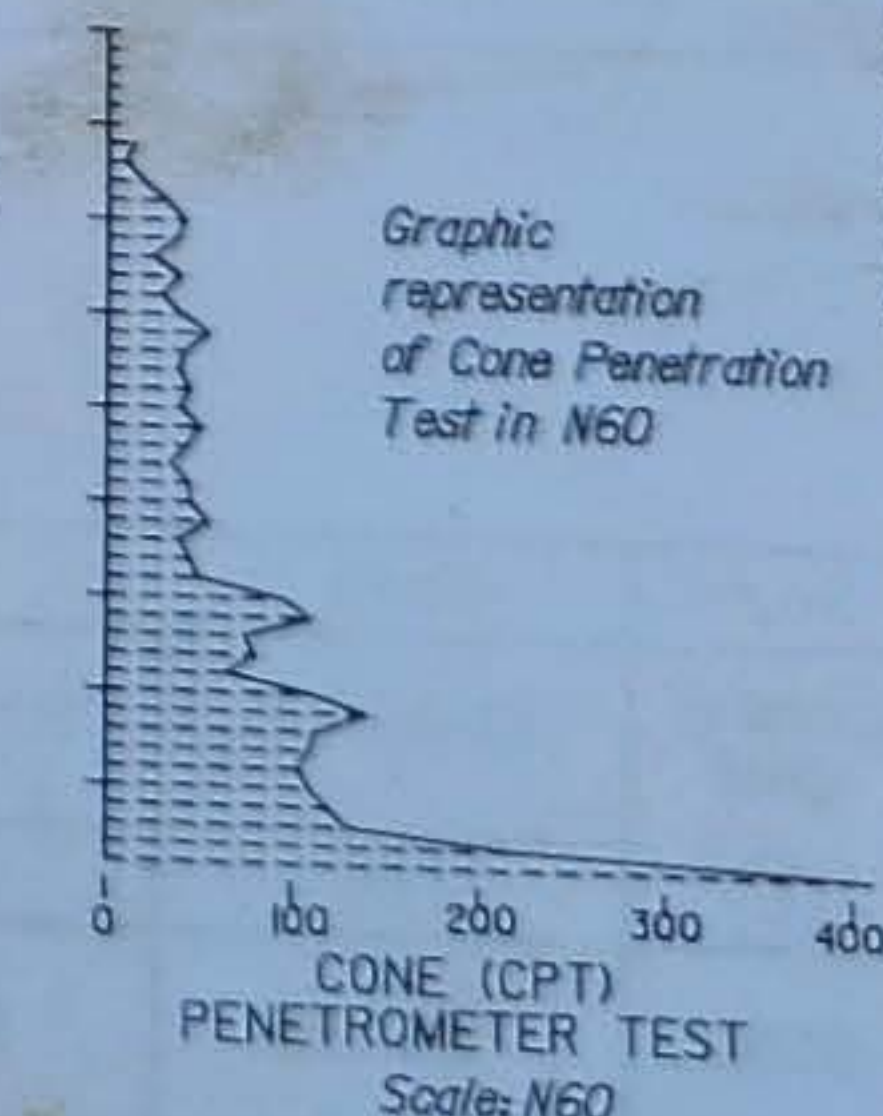
000.0 Elevation interpolated or from adjacent soundings
000.0 Actual sounding elevation

Elevation Tons/sq. ft.
000.0 00
000.0 00

UNCONFINED COMPRESSION TEST

Elevation Blows/ft.
000.0 00
000.0 00

STANDARD PENETRATION TEST



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.

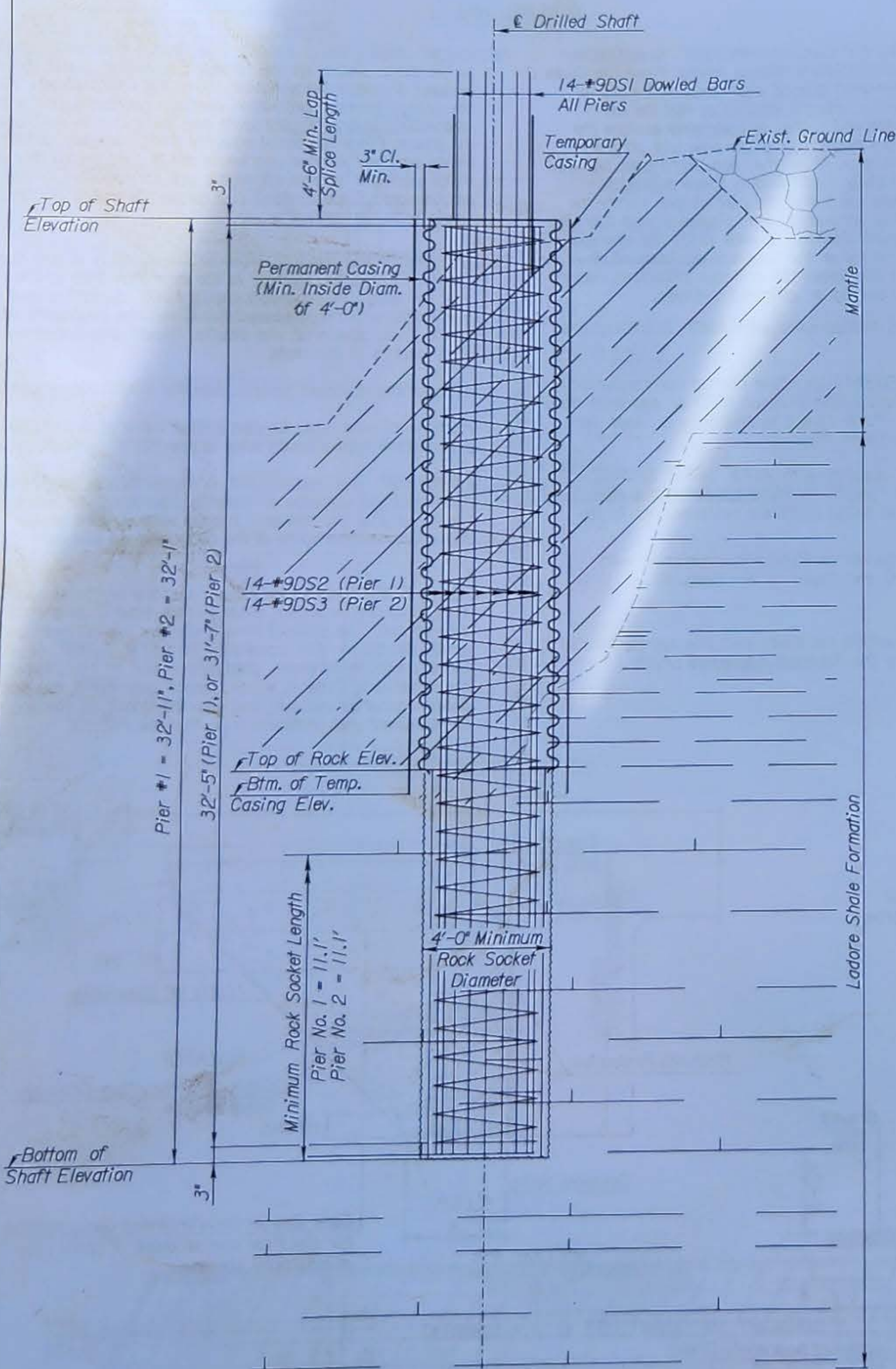
NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 3-6-38.34 (101) Sta. 26+24.50
ENGINEERING GEOLOGY
K-3 over Little Osage River
Proj. 3-6 KA-5711-01 Bourbon Co.
SHEET NO. OF SCALE APP'D
DESIGNED CEM DETAILED CEM QUANTITIES CEM CADD KMS
DESIGN CK. CFB DETAIL CK. CFB QUAN. CK. CFB CADD CK. CEM

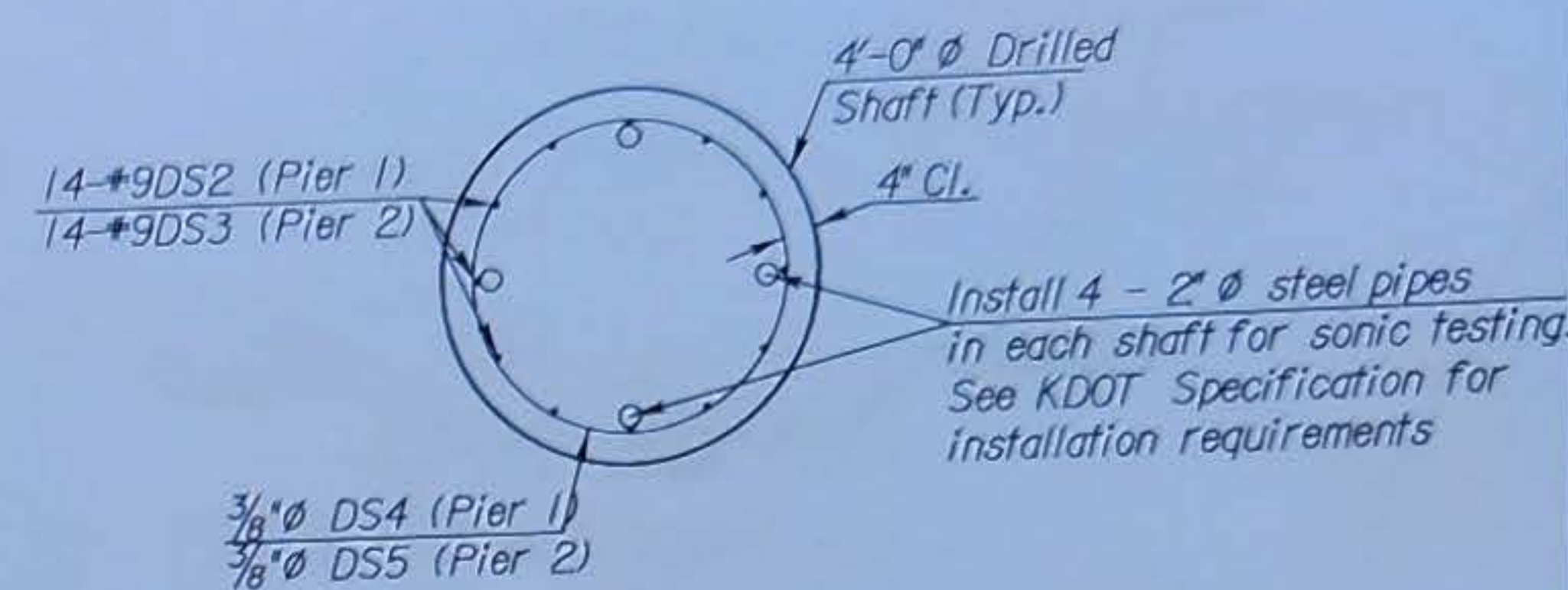
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Sheet No. 29

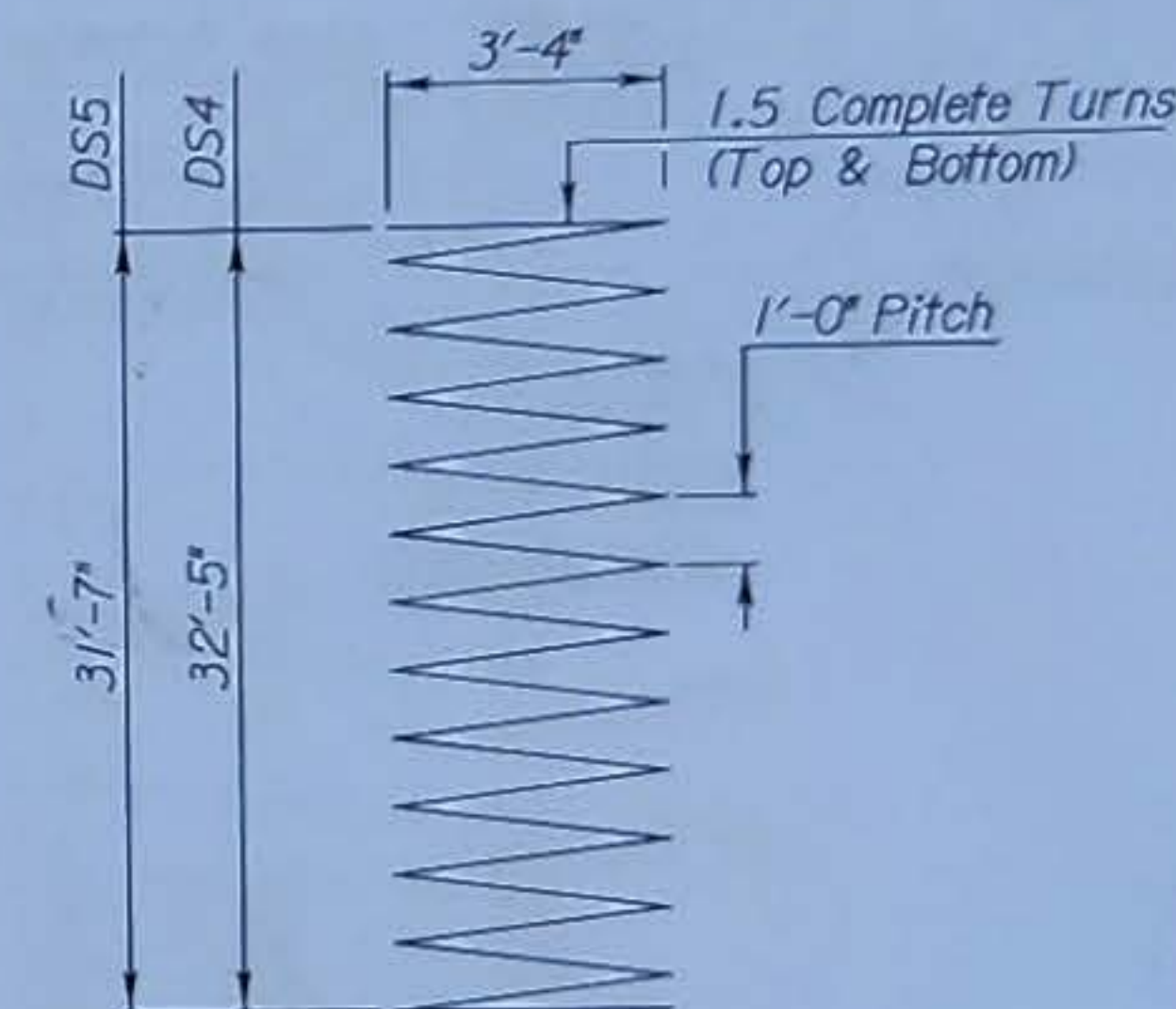
Plotted: Joke.Pfannenstiel@ks.gov Location: Bridge
 File: k571101bbr0101-025.dgn
 Plot Date: 11-SEP-2024 18:24



TYPICAL ELEVATION VIEW OF DRILLED SHAFT



TYPICAL SECTION OF DRILLED SHAFT



DS4 & DS5

(3/8" smooth or deformed bar)

Spiral reinforcing shall meet the requirements of ASTM A615 Grade (60 or 40) or ASTM A82.

Spiral Spacer Bars:

- 1) Minimum section modulus = 0.008 in.³
- 2) 4 required per spiral



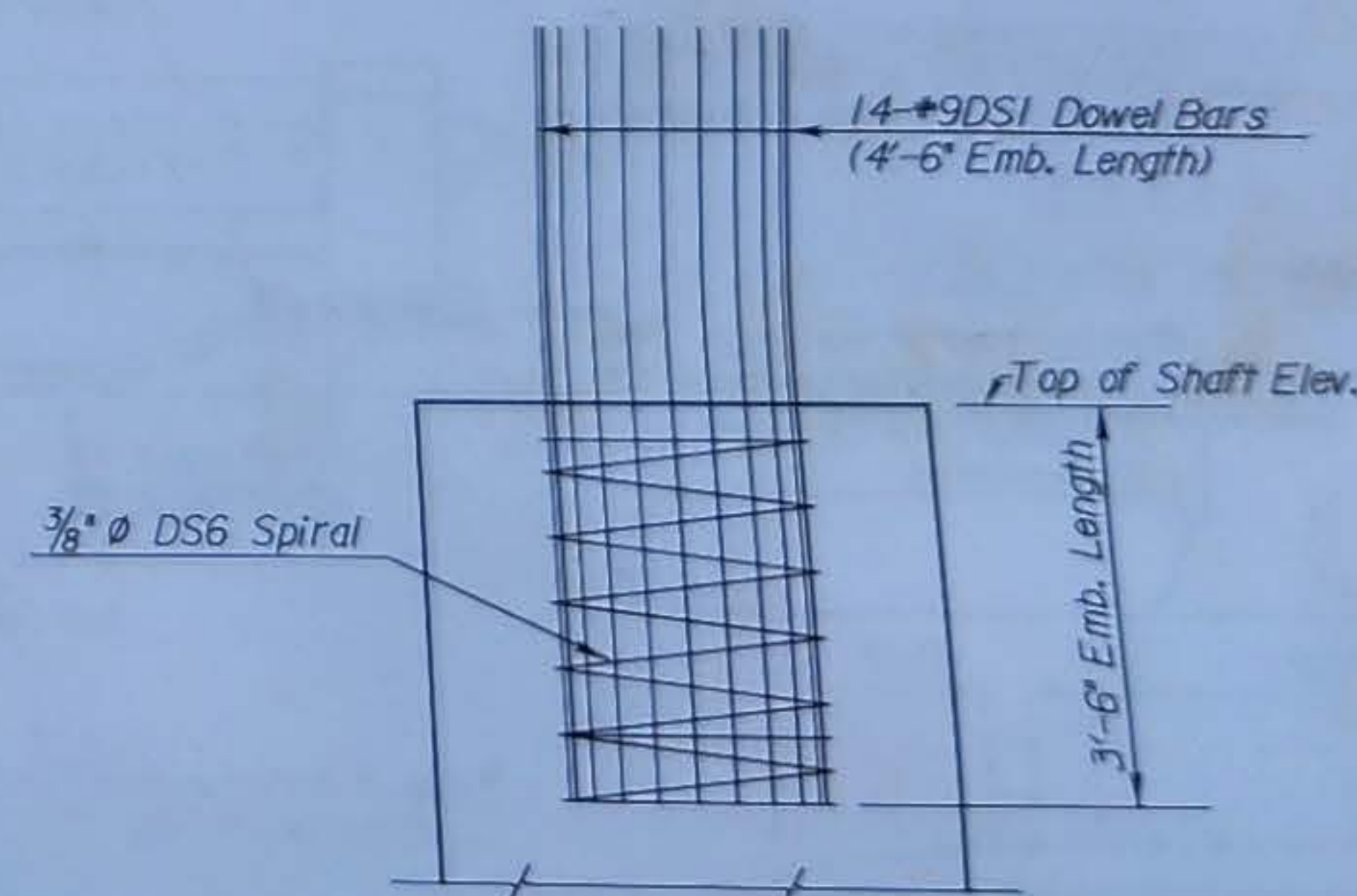
DS6

(3/8" smooth or deformed bar)

Spiral reinforcing shall meet the requirements of ASTM A615 Grade (60 or 40) or ASTM A82.

Spiral Spacer Bars:

- 1) Minimum section modulus = 0.008 in.³
- 2) 4 required per spiral



DETAIL OF DRILLED SHAFT DOWEL BARS

BILL OF REINFORCING STEEL
 Grade 60 Non-Epoxy
 Total for Pier #1 and Pier #2
 Subsidiary to Drilled Shafts
 Shown for Information Only

Mark	Size	Number	Length
DS2	9	42	32'-8"
DS3	9	42	31'-10"
DS1	9	84	8'-0"
DS4	3/8"	3	††
DS5	3/8"	3	††
DS6	3/8"	6	††

†† See Bending Diagram

DRILLED SHAFTS: Construct the drilled shafts using the excavator, concrete, reinforcing steel, testing, casings, labor, and incidentals to complete the shaft as shown on the plans directed by KDOT Specifications shall be bid item "Drilled Shafts (48") (Cased)". Concrete in the drilled shaft. In no case bottom of the drilled shaft be placed below elevation shown unless otherwise directed by Geologist.

Drill an Investigative Core Hole at the location shown on the plans. See KDOT Specifications.

If the location of the top of the shaft is such that casing cannot be overtopped to remove impurities, provide extra casing length to concrete in the shaft and chip back to the elevation of the top of the shaft.

If the permanent casing is to be corrugated (CMP) then it will be galvanized.

BOTTOM OF TEMPORARY CASING ELEVATION: casing Elevation shown is an approximate anticipated to penetrate at least one foot. Elevation to be determined in the field.

ROCK SOCKET LENGTH: Provide a minimum length below the bottom of casing as shown on the KDOT Bridge Design Section if not shown provide the minimum Rock Socket Length.

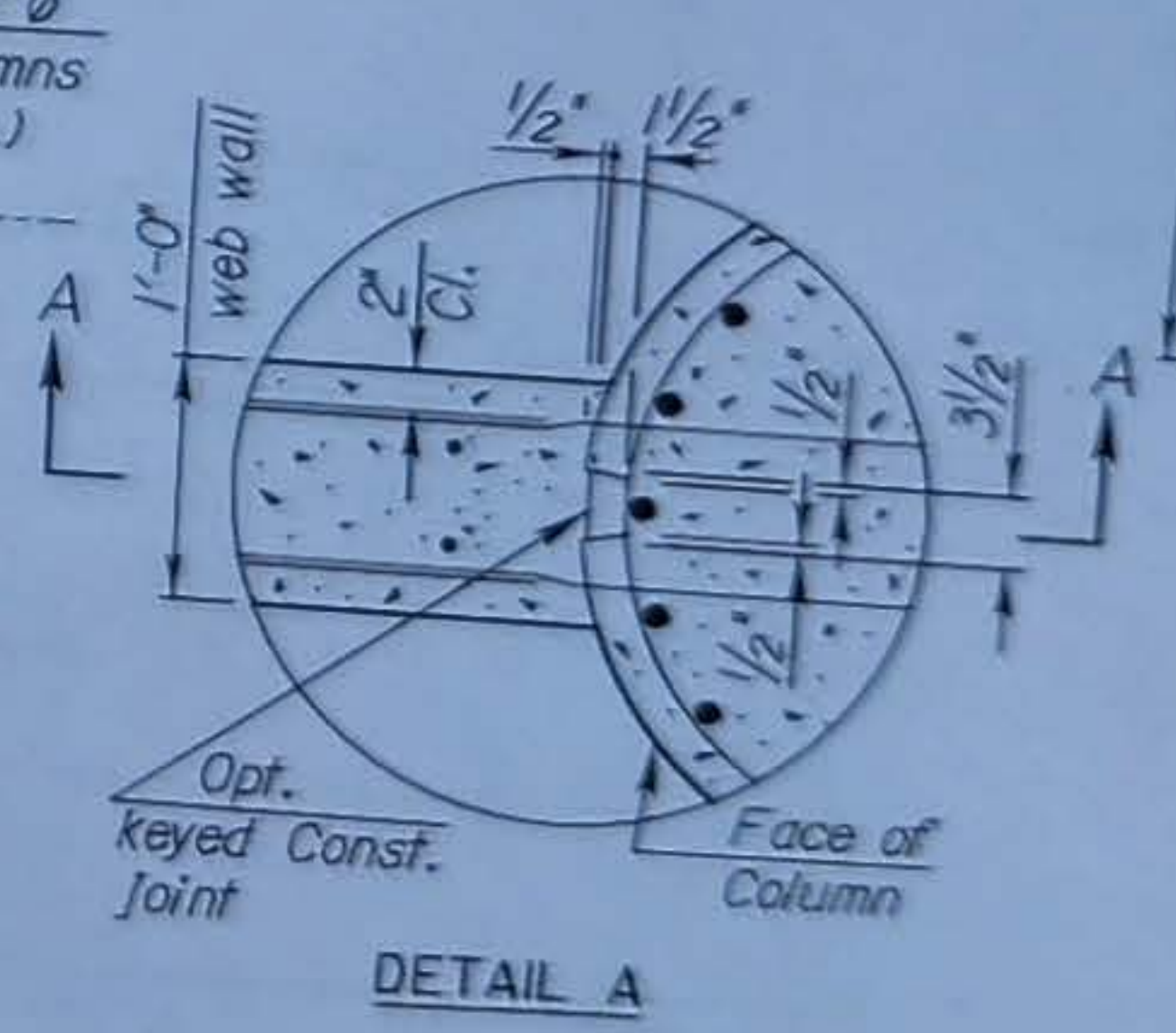
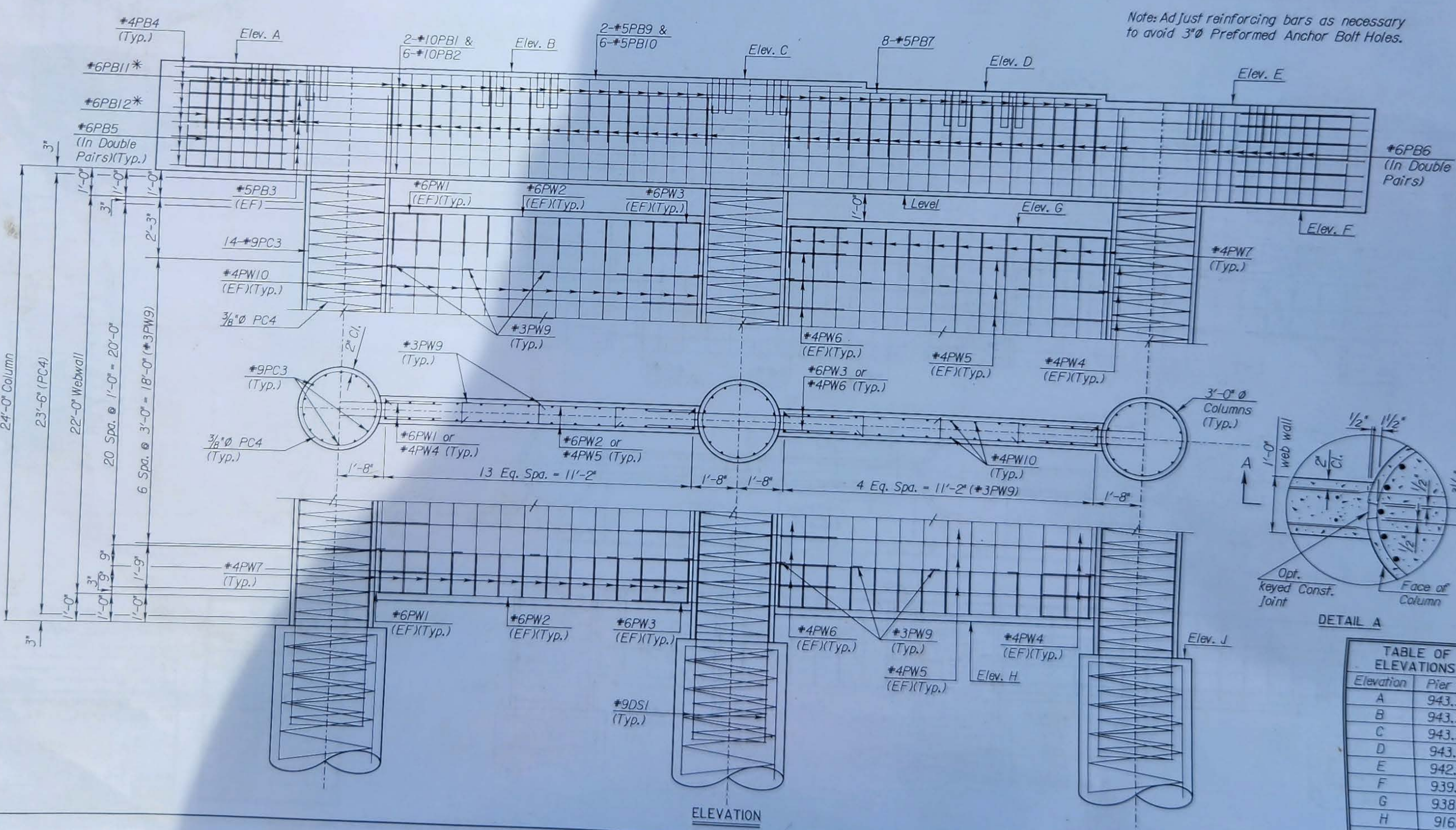
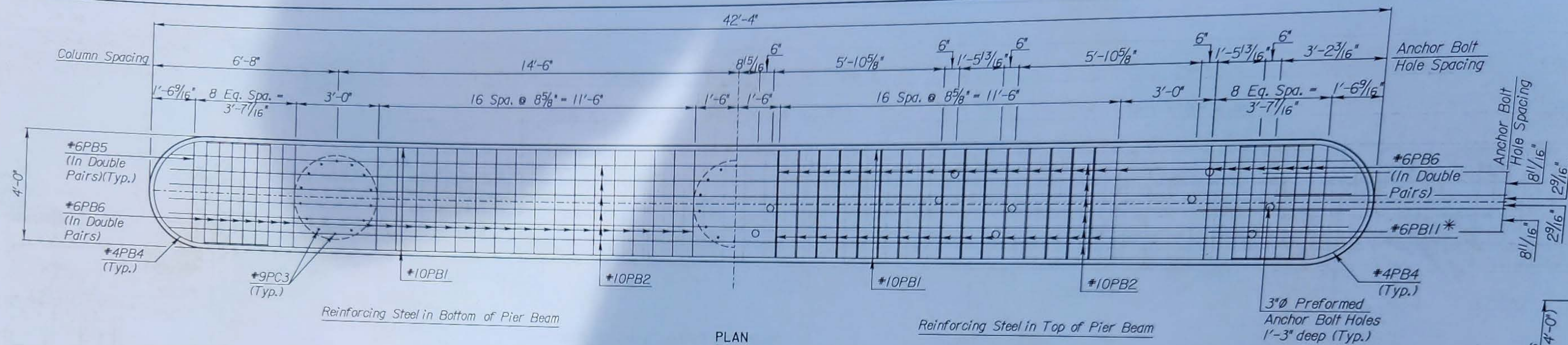
DRILLED SHAFT BACKFILL: Backfill the annular space between the temporary casing and the permanent casing with granular material as defined in the KDOT Specifications.

SONIC TESTING: Equip all drilled shafts with casing for sonic testing to be done. Install piezometers at locations shown on the plans. All wet ports tested. Also, the Engineer has the option to perform sonic, non-destructive, integrity testing at the location of concern. Sonic testing shall be at the unit price set for "Sonic Test" (Drilled Shaft). If the sonic testing indicates defects in the shaft, the Engineer will require a first sonic test for payment, and the Contractor responsible for subsequent sonic testing. Report test results directly to KDOT's Chief Geologist. No work will be done above the top of drilled shaft without the approval of the Chief Geologist.

Pier	Top of Shaft Elev.	Exist. Ground Line Elev.	Top of Rock Elev.	Bottom of Casing Elev.	Bottom of Shaft Elev.	Drilled Shaft Length (ft)	Top of Exist. Footing Elev.
Pier No. 1	915.56	913.00	894.20	893.80	882.65	32'-11"	898.44
Pier No. 2	915.37	913.65	893.70	894.40	883.28	32'-1"	897.80

NO.	DATE	REVISIONS
3		
2		
1		

KANSAS DEPARTMENT OF TRANSPORTATION
 Br. No. 3-6-38.34 (101)
 DRILLED SHAFT DETAIL
 Proj. 3-6 KA-5711-01
 SHEET NO. OF SCALE APP'D
 DESIGNED CEM/DETAILED CEM/QUANTITIES
 DESIGN CK. CFB/DETAIL CK. CFB/QUAN. CK.
 KDOT Graphics Certified 09-11-2024



Elevation	Pier #2
A	943.35
B	943.36
C	943.37
D	943.15
E	942.93
F	939.37
G	938.37
H	916.37
J	915.37

*9PC3 Extends 3'-0" into Pier B
*9DS1 Extends 4'-6" into Column

NO. DATE REVISIONS

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 3-6-38.34 (101)

PIER 2 DETAILS

Proj. 3-6 KA-5711-01

SHEET NO. OF SCALE APP'D
DESIGNED CEM DETAILED CEM QUANTITIES
DESIGN CK. CFB DETAIL CK. CFB QUANT. CK.

KDOT Graphics Certified 09-11-2024

Plotted: Joke.P\pamernst\files\g\p\ot Location: Bridge
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Plot Date: 11-SEP-2024 18:24