STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	1	291

STATE OF KANSAS

DEPARTMENT OF TRANSPORTATION

KDOT PROJ. NO. 177–064 KA–6017–01
FED. AID PROJ. NO. ACSTP–A601(701)

PLAN AND PROFILE OF PROPOSED

STATE HIGHWAY

FEDERAL AID PROJECT
MORRIS COUNTY
K-177

GRADING AND SURFACING (ASPHALT)
BRIDGES
SEEDING
PAVEMENT MARKING
SIGNING

INDEX OF SHEETS

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2	Signature Seal Sheet
3-5	Typical Sections
6	Travelway Offsets
7	Foundation Treatment & Compaction of Earthwork
8	Salvaged Topsoil
9-22	Plan & Profile (K-177)
23	Plan & Profile (Sideroads)
24	Section Corner Monumentation Detail Sheet
25	R/W Survey Monument Installation Detail Sheet
26-29	Intersection Details
30-32	Bridge Approach Slab Details
33	Precast Manholes
34	Reinforced Concrete Manhole
35	Inlet Manhole Special
36	Storm Sewer Plan & Profile
37	Schedule of Inlets and Manholes
38	Ditch Lining
39-40	Underdrains
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53	Pipe Culvert Summary
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55	Miscellaneous Pipe Culvert Details
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68	RCB Auxiliary Details (LRFD)
69	RCB Auxiliary Details (Embedded Structure) with Rise > 48"
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100	Supports and Spacers for Reinforcing Steel
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103-104	Project Surfacing
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122	Seeding
123-132	Pavement Marking
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196	Inertial Barrier
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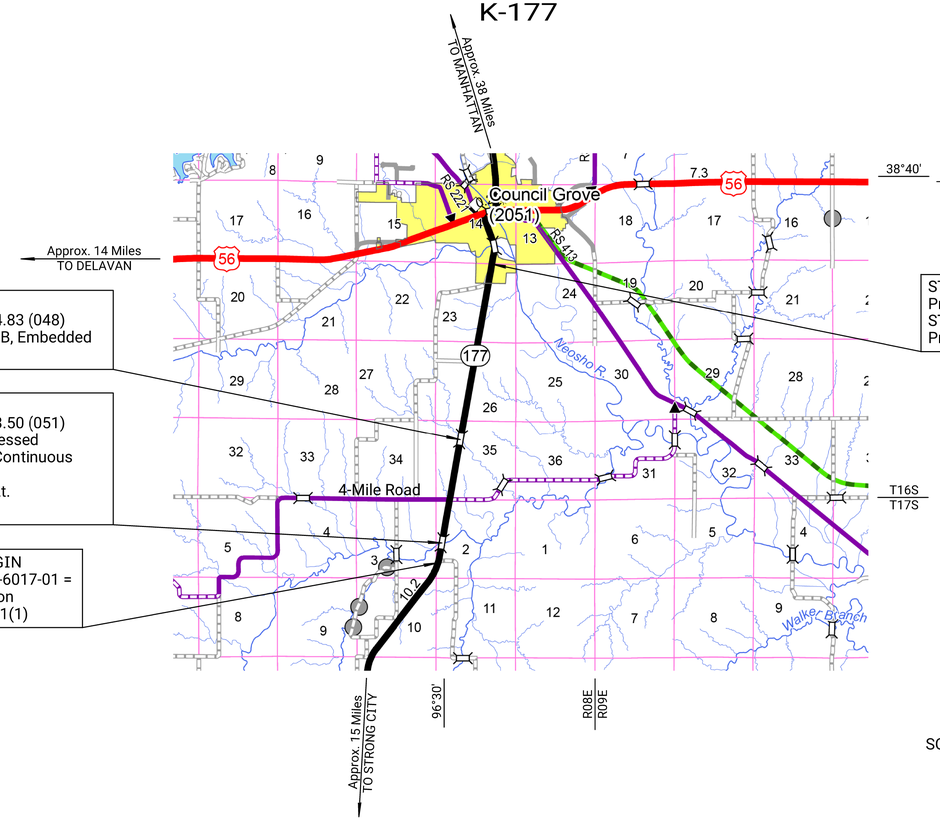
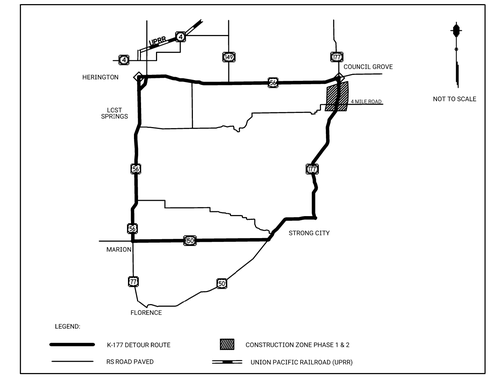
DESIGN DESIGNATION

AADT	950 (2024)
AADT	1,250 (2044)
DHV	10%
D	55/45
T	17%
V	60 mph (45 mph within City Limits)
C of A	none
Clear Zone	20' (14' within City Limits)





SCALE: 1" = 1 Mile

Note:
Traffic shall be carried through construction south of 4-Mile Road.
K-177 shall be closed north of 4-Mile Road with traffic carried through construction on detour route.
See construction sequencing sheets for specific detour route and corresponding sequences.

CONVENTIONAL SIGNS

COUNTY LINE		CENTER LINE OF PROJECT	50 1
CITY LIMITS		TERRACE	
STATE OR NATIONAL LINE		CULVERTS	
TOWNSHIP, SECTION or GRANT LINE		DROP INLET & STORM SEWER	
PROPERTY LINE	R	ACCESS CONTROL	
HIGHWAY FENCE		POWER POLE	
EXISTING FENCE		TELEPHONE POLE	
GUARDRAIL		MARSH	
CONSTRUCTION LIMITS		HEDGE	
RIGHT OF WAY LINE		TREES	
TRAVELED WAY		PROFILE ELEVATION	1172.18
RAILROADS		STREAM or CREEK	

GROSS LENGTH OF PROJECT	19,073.82 FT. (Includes Equations)	
EXCEPTIONS	None	
NET LENGTH OF PROJECT	19,073.82 FT.	3.612 MILES
NET LENGTH OF BRIDGES	239.10 FT.	0.045 MILES
NET LENGTH OF ROAD	18,834.72 FT.	3.567 MILES

Approved: Jan 17, 2025
Date

State Transportation Engineer

By:

Director, Division of Program & Project Management

KANSAS DEPARTMENT OF TRANSPORTATION

	BY	DATE
SURVEY	B. Fox, R.L.S. (Garber Surveying Service, P.A.)	12-2020
CADD TECHNICIAN	J. Unruh (Benesch)	10-2021
DESIGNERS	R. Nuessen (Benesch)	10-2021
SQUAD	S. Cross (KDOT); J. Deiter (PMC)	10-2021

Plotted :16-JAN-2025 07:32
Drawn By : mrockwell
File : ka601701rt-01.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	2	291

Name: Ron Nuessen
Co. Name: Benesch
Plan Section: 1-54, 102-291

01/16/2025

Name: Chris Tepen
Co. Name: Benesch
Plan Section: 55-101

KANSAS DEPARTMENT OF TRANSPORTATION

Signature Seal Sheet

RD048

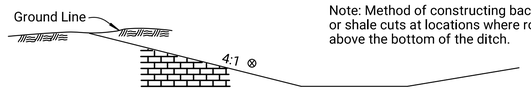
CADconform Certify This File

Sh. No. 2

CADconform Certify This File

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	3	291

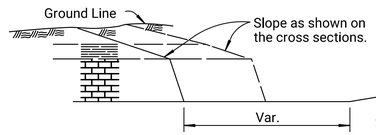
Guide to designer: Use this sheet when subgrading in rock or shale is not required. See Soils and Geology Reports for additional plan notes.

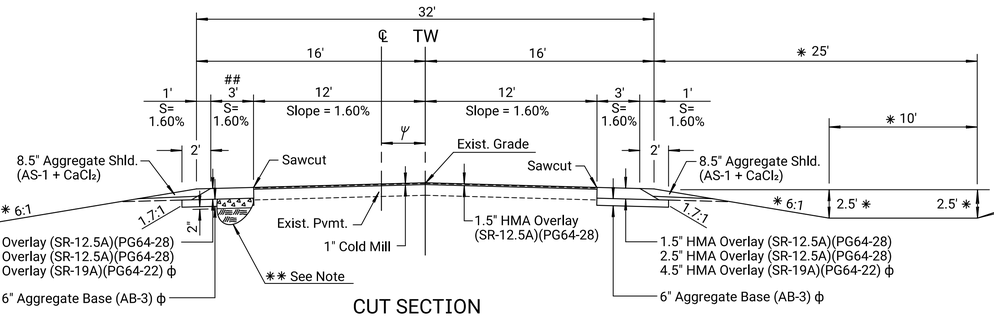


Note: Method of constructing backslope through shallow rock or shale cuts at locations where rock protrudes a short height above the bottom of the ditch.

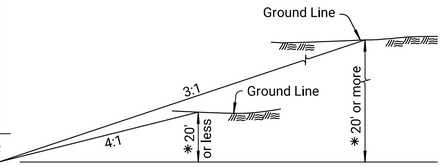
CUT SECTION

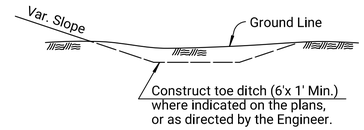
⊗ Slope to be 3:1 when depth of cut is 20' or more.



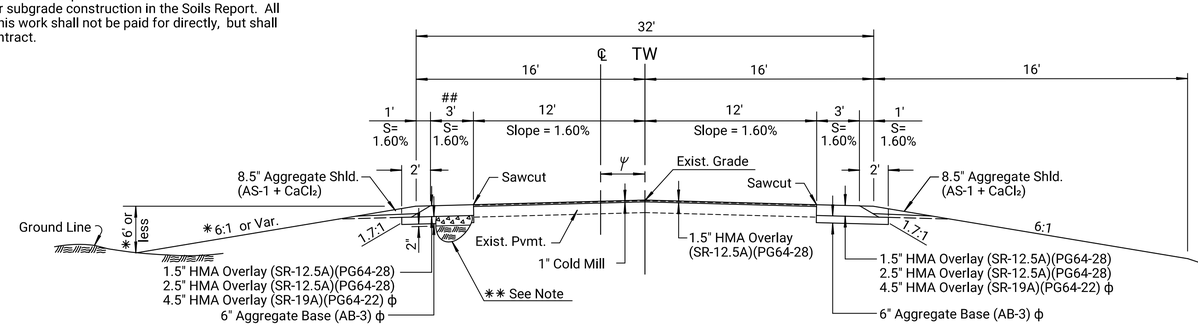


CUT SECTION





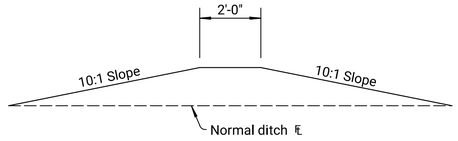
∗∗ Overbreakage in limestone or sandstone rock shall be brought to within 8" of the subgrade line with crushed stone, shot rock, and/or rock rubble, properly compacted, and then brought to the subgrade line with crushed stone meeting the requirements for "Crushed Stone for Backfill" in accordance with the Standard Specifications. Layers of earth or shale will not be permitted for backfill up to the bottom of the crushed stone. Overbreakage in shale or in rock where shale is exposed shall be backfilled with low permeability soils listed as useable for subgrade construction in the Soils Report. All materials, equipment, and labor for this work shall not be paid for directly, but shall be subsidiary to other items of the contract.



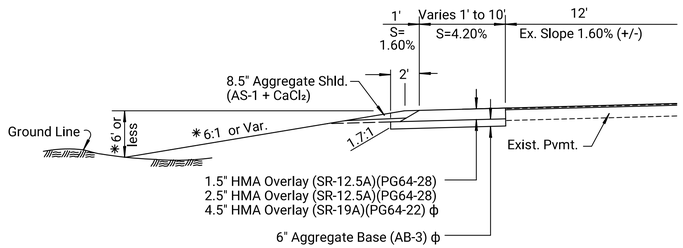
FILL SECTION

MILL & OVERLAY

STA. 303+90.00 TO STA. 370+60.00
STA. 371+40.00 TO STA. 438+84.00
STA. 439+64.00 TO STA. 450+33.00
STA. 451+13.00 TO STA. 461+13.00
STA. 461+93.00 TO STA. 482+26.00
STA. 483+06.00 TO STA. 488+10.00



SKETCH OF DITCH PLUG



SHOULDER WIDENING DETAIL

STA. 293+14.23 TO STA. 293+66.48
TRANSITION 12.97' LT TO 13.06' LT
STA. 293+66.48 TO STA. 296+34.80
TRANSITION 13.06' LT TO 22.0' LT
STA. 296+34.80 TO STA. 304+00
CONSTRUCT SHOULDER 22' LT
STA. 304+00 TO STA. 306+52.74
TRANSITION 22.0' LT TO 13.58' LT
STA. 306+52.74 TO STA. 307+15.88
TRANSITION 13.58' LT TO 13.60' LT
- As shown on See Sh. Nos. 10 & 12

NOTES:

ϕ Alternative 2: the 6" AB-3 may be eliminated with the thickness of the HMA Overlay (SR-19A)(PG64-22) layer increased from 4.5" to 6". Earthwork quantities have been developed based on the use of AB-3 subgrade, Alternative 1. The Contractor is responsible to adjust earthwork quantities accordingly if the extra thickness of HMA is used as the subgrade treatment. These changes shall be Subsidiary to other items in the contract.

2' Shoulder North of 900 Road.

∗ Dimensions and slopes for standard ditches and fills. See plan and cross-sections for variations.

Intersection of all slope lines shall be softened and rounded for pleasing appearance.

Ditch Plugs within the appropriate clear zone shall have side slopes of 10:1 or flatter.

ψ Varies - See Sh. No. 6 for Travelway Offsets.

NO.	DATE	REVISIONS	BY	APP'D
21	1-25-13	Removed Slope, Pvmt. Edge	S.W.K.	J.O.B.
20	5-20-09	8:1/6:1 over 10' fill mound ent./sd.rd.	S.W.K.	J.O.B.
19	11-10-04	Changed slope labels to percent	S.W.K.	J.O.B.
18	5-10-00	Rev. Ditch Plug Slope 10:1	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION SHOULDERS & WIDENING

~~RD600~~

FHWA APPROVAL	5-21-2013	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. W.L.H.

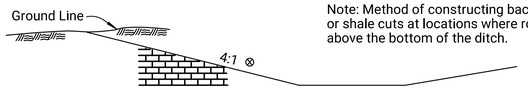
Drawn By : mrockwell Plotted :16-JAN-2025 07:34

CADconform Certify This File

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	4	291

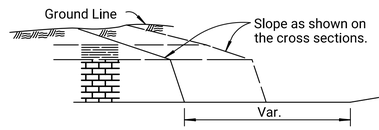
Guide to designer: Use this sheet when subgrading in rock or shale is not required.
See Soils and Geology Reports for additional plan notes.

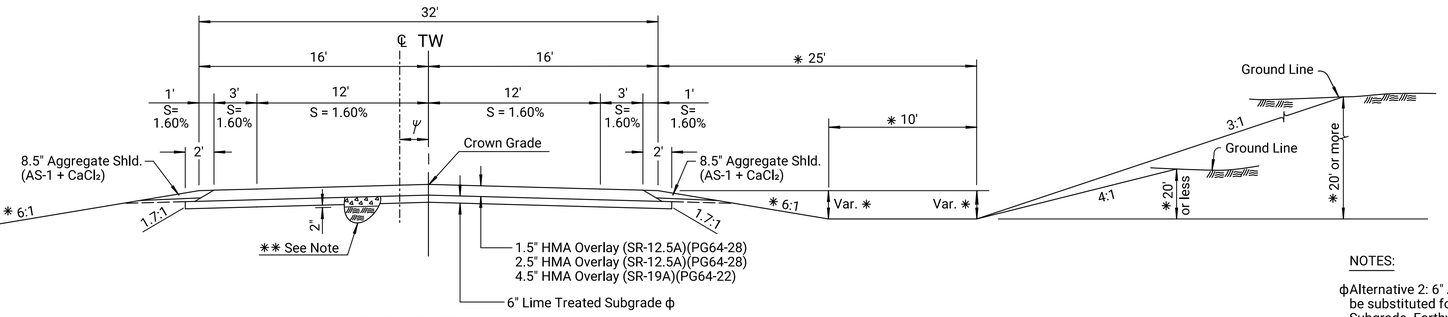


Note: Method of constructing backslope through shallow rock or shale cuts at locations where rock protrudes a short height above the bottom of the ditch.

CUT SECTION

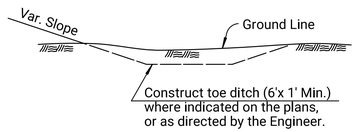
⊗ Slope to be 3:1 when depth of cut is 20' or more.

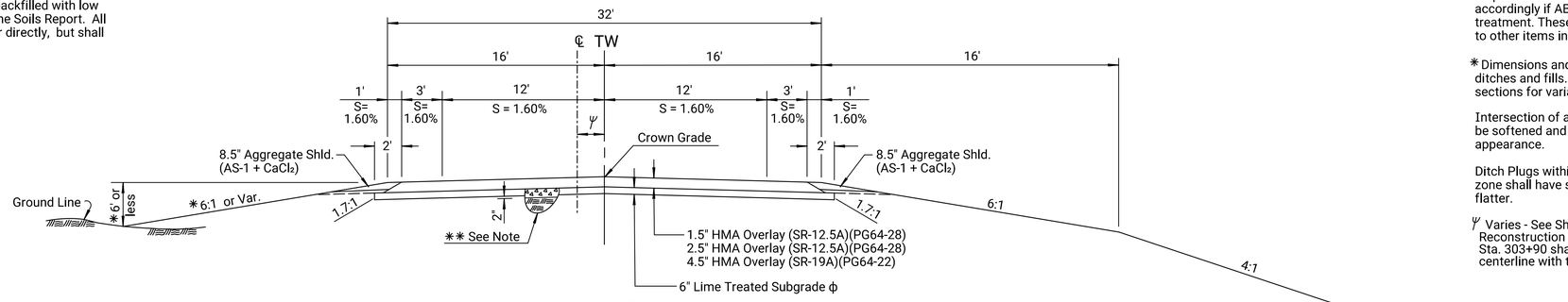




CUT SECTION

∗∗ Overbreakage in limestone or sandstone rock shall be brought to within 8" of the subgrade line with crushed stone, shot rock, and/or rock rubble, properly compacted, and then brought to the subgrade line with crushed stone meeting the requirements for "Crushed Stone for Backfill" in accordance with the Standard Specifications. Layers of earth or shale will not be permitted for backfill up to the bottom of the crushed stone. Overbreakage in shale or in rock where shale is exposed shall be backfilled with low permeability soils listed as useable for subgrade construction in the Soils Report. All materials, equipment, and labor for this work shall not be paid for directly, but shall be subsidiary to other items of the contract.





FILL SECTION

NOTES:

ϕ Alternative 2: 6" AB-3 may be substituted for the 6" Lime Treated Subgrade. Earthwork quantities have been developed based on the use of Lime Treated Subgrade, Alternative 1. The Contractor is responsible to adjust earthwork quantities accordingly if AB-3 is used as the subgrade treatment. These changes shall be Subsidiary to other items in the contract.

∗ Dimensions and slopes for standard ditches and fills. See plan and cross-sections for variations.

Intersection of all slope lines shall be softened and rounded for pleasing appearance.

Ditch Plugs within the appropriate clear zone shall have side slopes of 10:1 or flatter.

ψ Varies - See Sh. No. 6 for Travelway Offsets. Reconstruction Area from Sta. 298+00 to Sta. 303+90 shall be constructed on project centerline with transitions as noted on plan sheet.

RECONSTRUCTION AREAS

STA. 298+00.00 TO STA. 299+02.09
STA. 302+18.30 TO STA. 303+90.00
STA. 370+60.00 TO STA. 371+40.00
STA. 438+84.00 TO STA. 439+64.00
STA. 450+33.00 TO STA. 451+13.00
STA. 461+13.00 TO STA. 461+93.00
STA. 482+26.00 TO STA. 483+06.00
STA. 488+10.00 TO STA. 488+73.82

EXISTING PAVEMENT

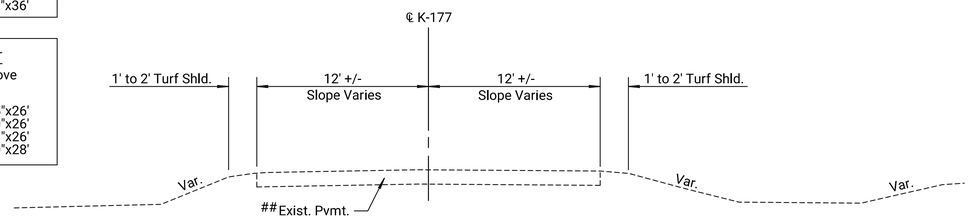
500' N. of S 850 Rd. to S. City Limits Council Grove:

2018	Chip Seal	0.5"x24'
2017	Chip Seal	0.5"x24'
2017	SR-12.5A	2.0"x24'
2003	Cold Recycle	4.0"x24'
1996	Cold Recycle	1.5"x24'
1964	BC-1R	4.5"x24'
1952	Bitcov	1.0"x36'

EXISTING PAVEMENT

S. City Limits Council Grove to Velie St.:

2003	SM-12.5A	1.5"x26'
2003	Cold Recycle	4.0"x26'
1964	Hot Mix	3.1"x26'
1937	Bitcov	1.0"x28'



FILL SECTION CUT SECTION

TYPICAL SECTION
EXISTING K-177
FOR INFORMATION ONLY

NO.	DATE	REVISIONS	BY	APP'D
21	1-25-13	Removed Slope, Pvmt. Edge	S.W.K.	J.O.B.
20	5-20-09	8:1/6:1 over 10' fill mound ent./sd.rd.	S.W.K.	J.O.B.
19	11-10-04	Changed slope labels to percent.	S.W.K.	J.O.B.
18	5-10-00	Rev. Ditch Plug Slope 10:1	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION EXISTING & RECONSTRUCTION

~~RD600~~

FHWA APPROVAL	5-21-2013	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. W.L.H.

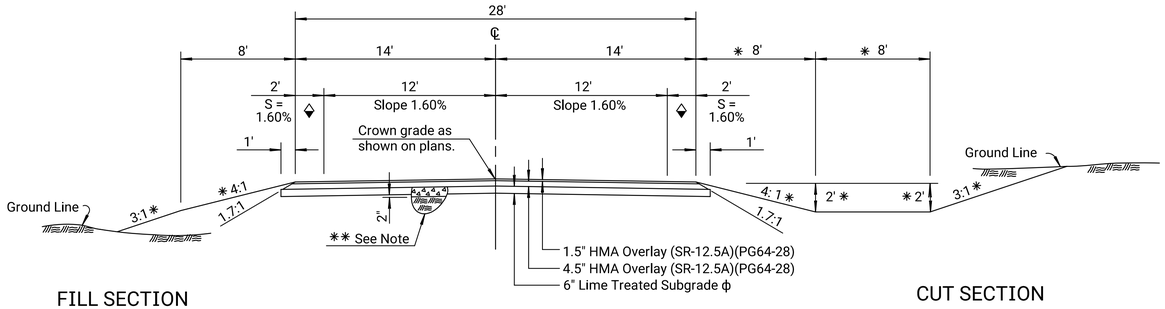
CADconform Certify This File

Sh. No. 4

Plotted :16-JAN-2025 07:34
Drawn By : mrockwell
File : ka601701rts-02.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	5	291

Guide to designer: Use this sheet when subgrading in rock or shale is not required.
See Soils and Geology Reports for additional plan notes.



FILL SECTION

CUT SECTION

TYPICAL SECTION
4-Mile Road
V Avenue
† MISCELLANEOUS SIDE ROADS

† If a side road is currently paved or within the full reconstruction portions of the project, the side road will be surfaced with 6" of HMA to the normal Right-of-Way line. Otherwise, the K-177 shoulder will be paved full depth within the returns. Beyond this, surfacing shall be 6.0" Surfacing Material (AB-3).
See Sh. No. 104 for entrace and side road surfacing

** Overbreakage in limestone or sandstone rock shall be brought to within 8" of the subgrade line with crushed stone, shot rock, and/or rock rubble, properly compacted, and then brought to the subgrade line with crushed stone meeting the requirements for "Crushed Stone for Backfill" in accordance with the Standard Specifications. Layers of earth or shale will not be permitted for backfill up to the bottom of the crushed stone. Overbreakage in shale or in rock where shale is exposed shall be backfilled with low permeability soils listed as useable for subgrade construction in the Soils Report. All materials, equipment, and labor for this work shall not be paid for directly, but shall be subsidiary to other items of the contract.

NOTES:

ϕ Alternative 2: 6" AB-3 may be substituted for the 6" Lime Treated Subgrade. Earthwork quantities have been developed based on the use of Lime Treated Subgrade, Alternative 1. The Contractor is responsible to adjust earthwork quantities accordingly if AB-3 is used as the subgrade treatment. These changes shall be Subsidiary to other items in the contract.

✳ Dimensions and slopes for standard ditches and fills. See plan and cross-sections for variations.

Intersection of all slope lines shall be softened and rounded for pleasing appearance.

Ditch Plugs within the appropriate clear zone shall have side slopes of 10:1 or flatter.

⧫ Asphalt portion of shoulder shall be constructed in conjunction with the roadway surfacing.

NO.	DATE	REVISIONS	BY	APP'D
21	1-25-13	Removed Slope, Pvmt. Edge	S.W.K.	J.O.B.
20	5-20-09	8:1/6:1 over 10' fill mound ent./sd.rd.	S.W.K.	J.O.B.
19	11-10-04	Changed slope labels to percent.	S.W.K.	J.O.B.
18	5-10-00	Rev. Ditch Plug Slope 10:1 _____	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION
SIDEROADS

~~RD600~~

FHWA APPROVAL ___ 5-21-2013		APP'D. James O. Brewer	
DESIGNED ___	DETAILED	QUANTITIES ___	TRACED B.N.B.
DESIGN CK. ___	DETAIL CK. ___	QUAN.CK. ___	TRACE CK. W.L.H.

CADconform Certify This File

Sh. No. 5

Drawn By : mrockwell
File : ka601701rts-03.dgn
Plotted :16-JAN-2025 07:34

CADconform Certify This File

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	6	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

Plotted : 16-JAN-2025 07:34

Drawn By : mrockwell
File : Travelway_Offsets.dgn

K-177 TRAVELWAY OFFSETS

STATION	OFFSET (FT.)	SIDE
286+00	1.05	RT
287+00	1.27	RT
288+00	0.96	RT
289+00	1.17	RT
290+00	0.90	RT
291+00	0.19	RT
292+00	0.56	RT
293+00	0.50	RT
294+00	0.45	RT
295+00	0.39	RT
296+00	0.33	RT
297+00	0.27	RT
298+00	0.22	RT
299+00	0.16	RT
300+00	0.37	RT
301+00	0.72	RT
302+00	1.07	RT
303+00	1.42	RT
304+00	1.50	RT
305+00	1.47	RT
306+00	1.43	RT
307+00	1.40	RT
308+00	1.53	RT
309+00	1.68	RT
310+00	1.82	RT
311+00	1.97	RT
312+00	1.94	RT
313+00	1.79	RT
314+00	1.65	RT
315+00	1.50	RT
316+00	1.36	RT
317+00	1.22	RT
318+00	1.07	RT
319+00	1.10	RT
320+00	1.14	RT
321+00	1.17	RT
322+00	1.20	RT
323+00	1.23	RT
324+00	1.26	RT
325+00	1.29	RT
326+00	1.32	RT
327+00	1.32	RT
328+00	1.23	RT
329+00	1.15	RT
330+00	1.06	RT
331+00	0.97	RT
332+00	0.88	RT
333+00	0.83	RT
334+00	0.80	RT
335+00	0.77	RT
336+00	0.75	RT
337+00	0.72	RT
338+00	0.69	RT
339+00	0.66	RT
340+00	0.63	RT
341+00	0.56	RT
342+00	0.48	RT
343+00	0.40	RT
344+00	0.32	RT
345+00	0.24	RT
346+00	0.16	RT
347+00	0.08	RT
348+00	0.00	LT
349+00	0.08	LT
350+00	0.15	LT
351+00	0.10	LT
352+00	0.06	LT
353+00	0.01	LT

K-177 TRAVELWAY OFFSETS

STATION	OFFSET (FT.)	SIDE
354+00	0.03	RT
355+00	0.08	RT
356+00	0.12	RT
357+00	0.17	RT
358+00	0.21	RT
359+00	0.26	RT
360+00	0.30	RT
361+00	0.33	RT
362+00	0.36	RT
363+00	0.38	RT
364+00	0.40	RT
365+00	0.43	RT
366+00	0.45	RT
367+00	0.48	RT
368+00	0.50	RT
369+00	0.52	RT
370+00	0.55	RT
371+00	0.57	RT
372+00	0.63	RT
373+00	0.70	RT
374+00	0.76	RT
375+00	0.83	RT
376+00	0.90	RT
377+00	0.96	RT
378+00	1.03	RT
379+00	1.10	RT
380+00	1.16	RT
381+00	1.15	RT
382+00	1.14	RT
383+00	1.12	RT
384+00	1.11	RT
385+00	1.09	RT
386+00	1.08	RT
387+00	1.06	RT
388+00	1.04	RT
389+00	1.03	RT
390+00	1.01	RT
391+00	0.98	RT
392+00	0.94	RT
393+00	0.90	RT
394+00	0.86	RT
395+00	0.82	RT
396+00	0.79	RT
397+00	0.75	RT
398+00	0.71	RT
399+00	0.67	RT
400+00	0.63	RT
401+00	0.60	RT
402+00	0.56	RT
403+00	0.52	RT
404+00	0.54	RT
405+00	0.66	RT
406+00	0.77	RT
407+00	0.88	RT
408+00	0.99	RT
409+00	1.11	RT
410+00	1.22	RT
411+00	1.33	RT
412+00	1.44	RT
413+00	1.53	RT
414+00	1.45	RT
415+00	1.37	RT
416+00	1.29	RT
417+00	1.22	RT
418+00	1.14	RT
419+00	1.06	RT
420+00	0.98	RT
421+00	0.92	RT

K-177 TRAVELWAY OFFSETS

STATION	OFFSET (FT.)	SIDE
422+00	0.86	RT
423+00	0.80	RT
424+00	0.74	RT
425+00	0.68	RT
426+00	0.62	RT
427+00	0.57	RT
428+00	0.51	RT
429+00	0.45	RT
430+00	0.39	RT
431+00	0.35	RT
432+00	0.30	RT
433+00	0.26	RT
434+00	0.21	RT
435+00	0.17	RT
436+00	0.10	RT
437+00	0.02	RT
438+00	0.07	LT
439+00	0.15	LT
440+00	0.24	LT
441+00	0.25	LT
442+00	0.22	LT
443+00	0.20	LT
444+00	0.17	LT
445+00	0.15	LT
446+00	0.16	LT
447+00	0.19	LT
448+00	0.22	LT
449+00	0.25	LT
450+00	0.27	LT
451+00	0.16	LT
452+00	0.03	LT
453+00	0.10	RT
454+00	0.24	RT
455+00	0.37	RT
456+00	0.50	RT
457+00	0.63	RT
458+00	0.76	RT
459+00	0.90	RT
460+00	1.03	RT
461+00	1.12	RT
462+00	1.19	RT
463+00	1.27	RT
464+00	1.35	RT
465+00	1.43	RT
466+00	1.50	RT
467+00	1.57	RT
468+00	1.65	RT
469+00	1.72	RT
470+00	1.79	RT
471+00	1.76	RT
472+00	1.72	RT
473+00	1.69	RT
474+00	1.66	RT
475+00	1.62	RT
476+00	1.51	RT
477+00	1.40	RT
478+00	1.29	RT
479+00	1.17	RT
480+00	1.06	RT
481+00	1.08	RT
482+00	1.11	RT
483+00	1.13	RT
484+00	1.16	RT
485+00	1.18	RT
486+00	0.99	RT
487+00	0.78	RT
488+00	0.58	RT
489+00	0.37	RT
490+00	0.00	LT

KANSAS DEPARTMENT OF TRANSPORTATION

TRAVELWAY OFFSETS

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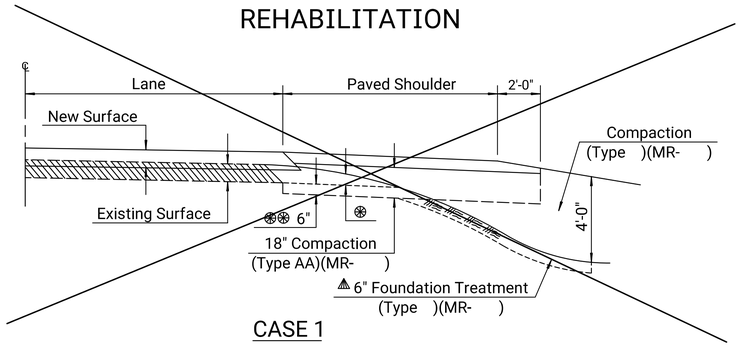
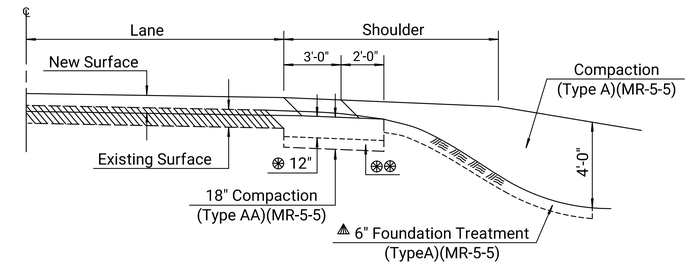
STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	7	291

REHABILITATION



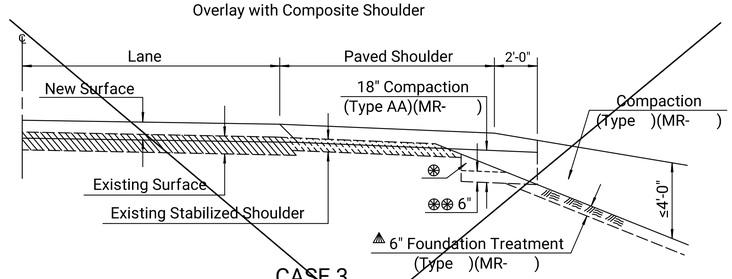
CASE 1

Overlay with Paved Shoulder



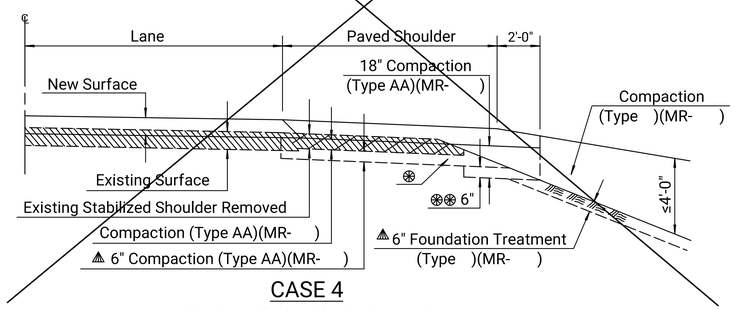
CASE 2

Overlay with Composite Shoulder



CASE 3

Overlay with Existing Paved Shoulder



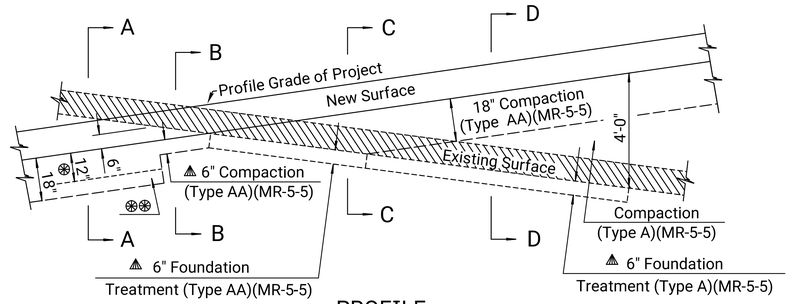
CASE 4

Overlay with Shoulder Replacement

❀ Excavation thru Cuts not Subgraded
❀❀ The lower 6" of Compaction is subsidiary.
⚠ Compaction of this material shall be subsidiary.

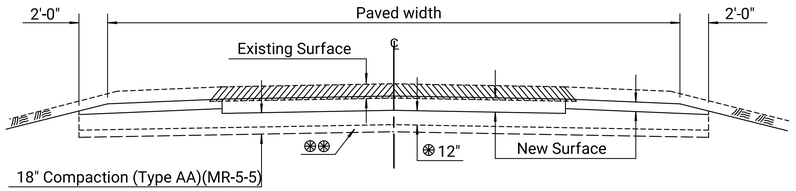
Note: These are 4 general cases. Specific compaction requirements are determined on a project-by-project basis.

RECONSTRUCTION



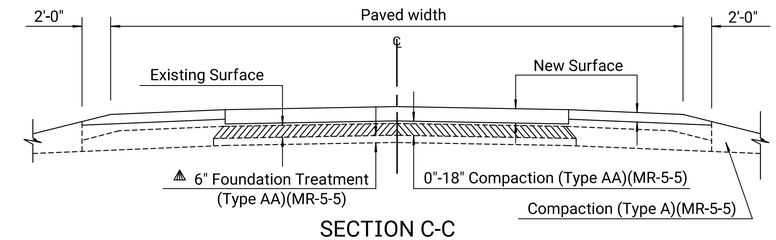
PROFILE

❀ Excavation thru Cuts not Subgraded
❀❀ The lower 6" of Compaction is subsidiary.
⚠ Compaction of this material shall be subsidiary.

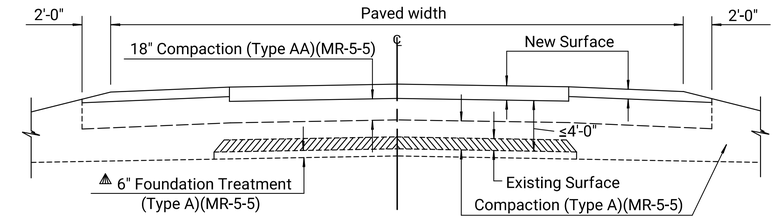


SECTION A-A

SECTION B-B

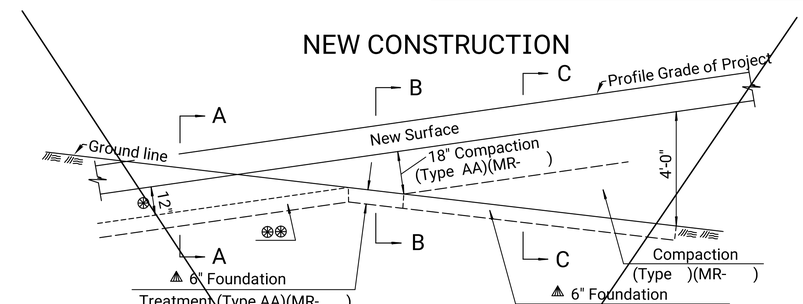


SECTION C-C



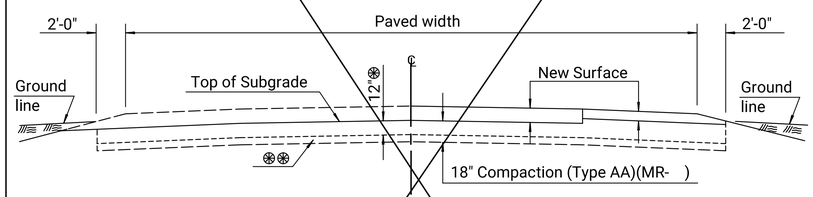
SECTION D-D

NEW CONSTRUCTION



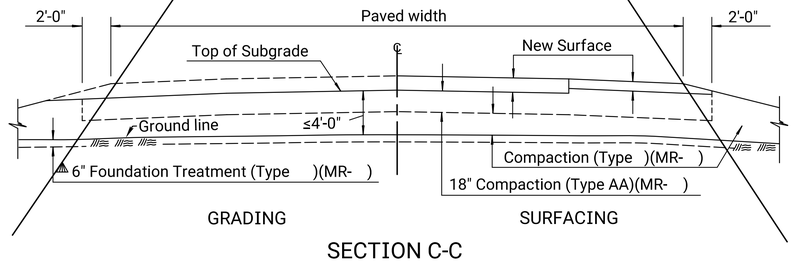
PROFILE

❀ Excavation thru Cuts not Subgraded
❀❀ The lower 6" of Compaction is subsidiary.
⚠ Compaction of this material shall be subsidiary.



SECTION A-A

SECTION B-B



SECTION C-C

General Note

For materials designated to be subgraded,compaction of soils, including shales, designated for backfill refer to Standard Drawing RD605A for details.

Unless otherwise noted on the Plans, compact all embankment, including side roads and entrances.

NO.	DATE	REVISIONS	BY	APP'D
5	10-17-1 1	Revised General Note	S.W.K.	J.O.B.
4	1-05-1 0	Added additional subsidiary comp.	S.W.K.	J.O.B.
3	2-16-05	Redrawn, Rev. Recon. Sec. C-C & D-D	S.W.K.	J.O.B.
2	5-29-98	Revised Reconstruction Section B-B	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

FOUNDATION TREATMENT & COMPACTION OF EARTHWORK

~~RD605~~

FHWA APPROVAL 12-5-1 1		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

CADconform Certify This File

Sh. No. 7

Plotted :16-JAN-2025 07:34
Drawn By : mrockwell
File : rd605.dgn

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	8	291

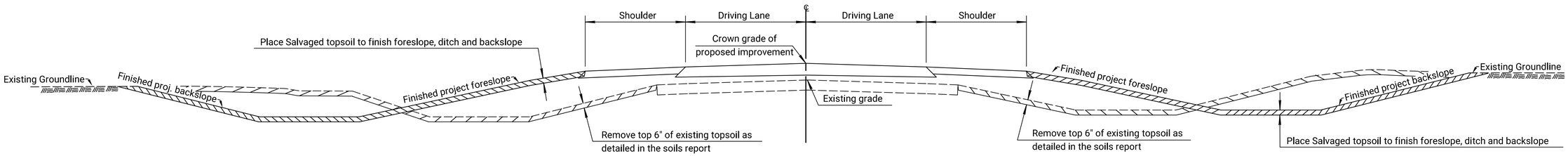
Note to Designer: Acceptable Topsoil locations on a project will be detailed in the Soils Report. The locations will be used in conjunction with the plans to measure a horizontal area in Sq. Yds of "Salvaged Topsoil" within the R/W limits.

GENERAL NOTE

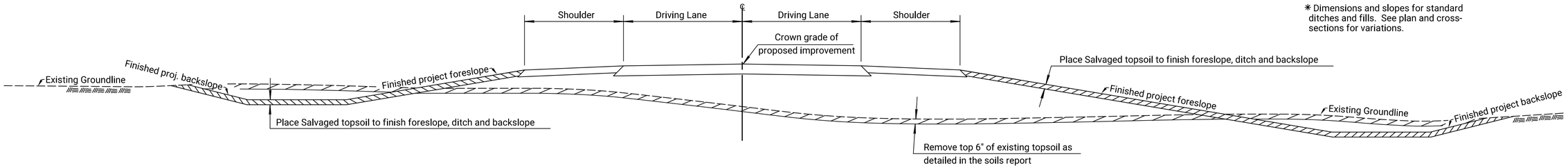
Adjust the cut and fill sections to accommodate the placement of the salvaged topsoil such that after placement the cross section will be at the final grade as shown on the plans.

Salvaging, Stockpiling and Placing Topsoil bid as "Salvaged Topsoil" in Square Yards. See KDOT Standard Specifications for details.

Soften and round the intersection of all slope lines for pleasing appearance.



RECONSTRUCTION/REHABILITATION OF EXISTING ROADWAY
(Removal and Placement of Salvaged Topsoil)



✳ Dimensions and slopes for standard ditches and fills. See plan and cross-sections for variations.

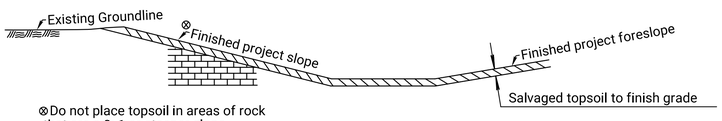
LEGEND

Topsoil to be Salvaged

Placement of Salvaged Topsoil

NEW ROADWAY ALIGNMENT
(Removal and Placement of Salvaged Topsoil)

Note: Method of showing backslope thru shallow rock or shale cuts at locations where rock protrudes a short height above the bottom of the ditch.



⊗Do not place topsoil in areas of rock that are a 3: 1 or steeper slope.

CUT SECTION

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1	12-16-09	Initial Release	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SALVAGED TOPSOIL

RD599A

FHWA APPROVAL 12-16-09		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. S.W.K.

KDOT Graphics Certified 06-10-2022 Sh. No. 8

KDOT Graphics Certified

Plotted :16-JAN-2025 07:34

Drawn By : mrockwell
File : rd599a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	9	291

DATE	BY	
10-2021	J. Unruh - Benesch	REFERENCES NOTED
10-2021	R. Nuessen - Benesch	REFERENCES CHECKED

GENERAL NOTE

THE GEOLOGICAL INFORMATION SHOWN ON THESE PLANS IS FROM STUDIES MADE IN THE FIELD AND REPRESENTS THE BEST INFORMATION AVAILABEL TO THE KANSAS DEPARTMENT OF TRANSPORTATION.

AT BORROW AREA LOCATIONS ADJACENT TO THE RIGHT-OF-WAY, UTILITY POLES MAY BE SET AT THE PERMANENT LOCATIONS PRIOR TO CONSTRUCTION AS APPROVED BY THE ENGINEER PROVIDED A MINIMUM VERTICAL CLEARANCE, IN ACCORDANCE WITH THE NATIONAL ELECTRICAL SAFETY CODE, IS OBTAINED. THE CONTRACTOR WILL BE REQUIRED TO WORK AROUND THESE POLES TO COMPLETE THE WORK.

ALL BORROW TO BE OBTAINED FROM AREAS PROVIDED BY THE CONTRACTOR SHALL BE APPROVED BY THE ENGINEER, BOTH AS THE SUITABILITY OF MATERIAL AND SITE LOCATION. LOCATIONS WHICH, IN THE OPINION OF THE ENGINEER, CONTAIN UNSUITABLE MATERIAL OR WILL LEAVE AN UNSIGHTLY APPEARANCE ON THE PROJECT WILL NOT BE APPOVED.

CHANNELS SHALL BE CUT AT THE BOX CULVERTS (UNLESS OTHERWISE NOTED) TO FLOW LINE ELEVATIONS AND TO WIDTH OF ONE FOOT OUTSIDE OF EACH OUTSIDE WALL AND WITH SLOPES OF 2 TO 1PRIOR TO CONSTRUCTION OF THE CULVERT.

ALL EXISTING DRAINAGE STRUCTURES AND PIPES TO REMAIN SHALL BE CLEANED OUT BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER. THIS WORK SHALL BE PAID FOR UNDER THE BID ITEM "CLEANING EXISTING STRUCTURES."

EXCAVATION SHOWN TO BE WASTED SHALL BE WASTED ON SITES PROVIDED BY THE CONTRACTOR. THESE SITES SHALL BE APPROVED BY THE ENGINEER AS TO SUITABILITY, APPEARANCE, AND SITE LOCATION. LOCATIONS THAT, IN THE OPINION OF THE ENGINEER, WILL LEAVE AN UNSIGHTLY APPEARANCE WILL NOT BE APPROVED. ALL BORROW/WASTE LOCATIONS SHALL BE SUBMITTED FOR CLEARANCE FROM THE KANSAS HISTORICAL SOCIETY AND THE KANSAS DEPARTMENT OF WILDLIFE AND PARKS PRIOR TO ANY EXCAVATION OR WASTING OF MATERIAL. THE CONTRACTOR IS RESPONSIBLE FOR ACQUIRING ANY PERMITS AND OTHER CLEARANCES THAT ARE REQUIRED.

ALL TREES, HEDGE ROWS, SHELTERBELTS, AND WOODY SHRUBS NOT SHOWN TO BE REMOVED AND LOCATED BETWEEN THE CONSTRUCTION LIMITS AND THE RIGHT-OF-WAY LINE OR EASEMENT LINE SHALL BE SPARED UNLESS DIRECTED BY THE ENGINEER TO BE REMOVED. ALL TREES WITHIN THE APPROPRIATE CLEAR ZONE SHALL BE REMOVED.

PROJECT SURVEY CONTROL

Proj. Coord. x 0.99995928 (CAF) = North American Datum of 1983 (NAD 83) 2011; Kansas North Zone

Vert. Datum: National Geodetic Vertical Datum (NGVD) 1929

Datum Bench Mark(s):

B.M. #18: Center Top of a Concrete R/W Marker Elev. 1,350.36
59.64' Lt. ℄ STA. 392+36.48 Elev. 1,350.36

UTILITY OWNERS

Telephone Lines & Fiber-Optic Cable on Project are owned by:

Tri-County Telephone
P.O. Box 299
1568 S 1000 Rd
Council Grove, KS 66846
Contact Person: Mitch Morgan
Tom Swensen
Ph: (620) 767-5153

Gas Lines on Project are owned by:

ATMOS Energy
300 W Main St.
Council Grove, KS 66846
Ph: (620) 757-5634

Power Lines on Project are owned by:

Flint Hills Rual Electric
Cooperative Association
P.O. Box B
Council Grove, KS 66846-0610
Ph: (620) 767-5144

Water Lines on Project are owned by:

Rural Water District No. 1
609 Main Street
Dwight, KS 66849-9597
Ph: (785) 482-3303

City of Council Grove Utility Department
Contact Person: Derrick Craige
(620) 767-5321

P.I. ℄ Sta. 282+12.24 (Bk.) = 281+74.81 (Ahd.)
N: 99,066.804 E: 1,740,770.959
1. Fnd. ½" Bar @ P.I. 0.3' Protruding
2. Ctr. Top of R/W Marker 40.9' WNW
3. Ctr. Top of R/W Marker 56.6' NW
4. N-S Fenceline 38.0' W

Control Point #96 ℄ Sta. 290+00.75, 26.89' Lt.
N: 99,887.660 E: 1,740,874.169
1. Set Magnail and Washer Flush in Asphalt Entrance to the W
2. ℄ Travelway K-177 26.0' E
3. ℄ Travelway of Entrance to the W 7.0' N
4. ℄ Top of Concrete R/W Marker 70.7' SW

P.T. Sta. 291+21.80
N: 100,001.715 E: 1,740,921.730
1. Not Set

P.O.T. ℄ Sta. 296+75.63
N: 100,548.481 E: 1,741,009.906
1. Fnd. ½" Bar @ P.O.T. 0.3' Deep
2. Spike and KDOT Washer in W face of Sign Post 31.8' NE
3. ℄ Travelway K-177 0.5' E
4. ℄ Top Yellow "No Passing" Sign Post 71.1' NW

Control Point #97 ℄ Sta. 297+01.01, 19.72' Lt.
N: 100,576.680 E: 1,740,994.478
1. Set ½" Rebar w/ Aluminum KDOT Cap Stamped "TP97"
2. Near Face of "No Passing" Sign Post 41.4' E
3. ℄ Top of "No Passing" Steel Marker Post 46.0' W
4. ℄ Travelway K-177 20.0' E

P.O.T. ℄ Sta. 304+75.63
N: 101,338.277 E: 1,741,137.275
1. Fnd. ½" Bar @ P.O.T. 0.3' Deep
2. ℄ Top Yellow "No Passing" Sign Post 52.3' ESE
3. Spike and KDOT Washer in N face of Sign Post 24.7' WSW
4. ℄ Travelway K-177 1.0' E

All saw cuts necessary to complete construction shall be full-depth or as approved by the engineer and shall not be paid for directly, but shall be subsidiary to other items of construction.

SOIL FOR EMBANKMENT CONSTRUCTION:

All soil used in the top 18" of the embankment shall conform to the following requirements: $10 \le PI \le 35$ and $20 \le LL \le 60$. Soils which contain substantial organic material, such as those classified as OL or OH according to the unified soil classification system (ASTM D2487) should not be used to construct the embankment or subgrade. The organic material may be used as select soil to cap the sideslopes of the embankment.

When less than five feet of limestone is to be excavated at the mantle-bedrock interface. Presplitting will not be required and the backslopes should be placed on the same slope as the mantle. Presplitting is required in areas when greater than five feet of limestone is to be excavated. This sufficient thickness is required for presplitting to be effective. The area of recommended presplitting will be mentioned in the cut and fill section in which it occurs.

The Havensville Shale Member, Speiser Shale Formation, and Blue Rapids Shale Formation found in the project area, will be classified as non-durable. The non-durable shales shall be manipulated with equipment and water as directed in Standard Specification 205.3.

Existing guard rail removed, millings, and culverts removed shall become the property of the contractor and removed from the site.

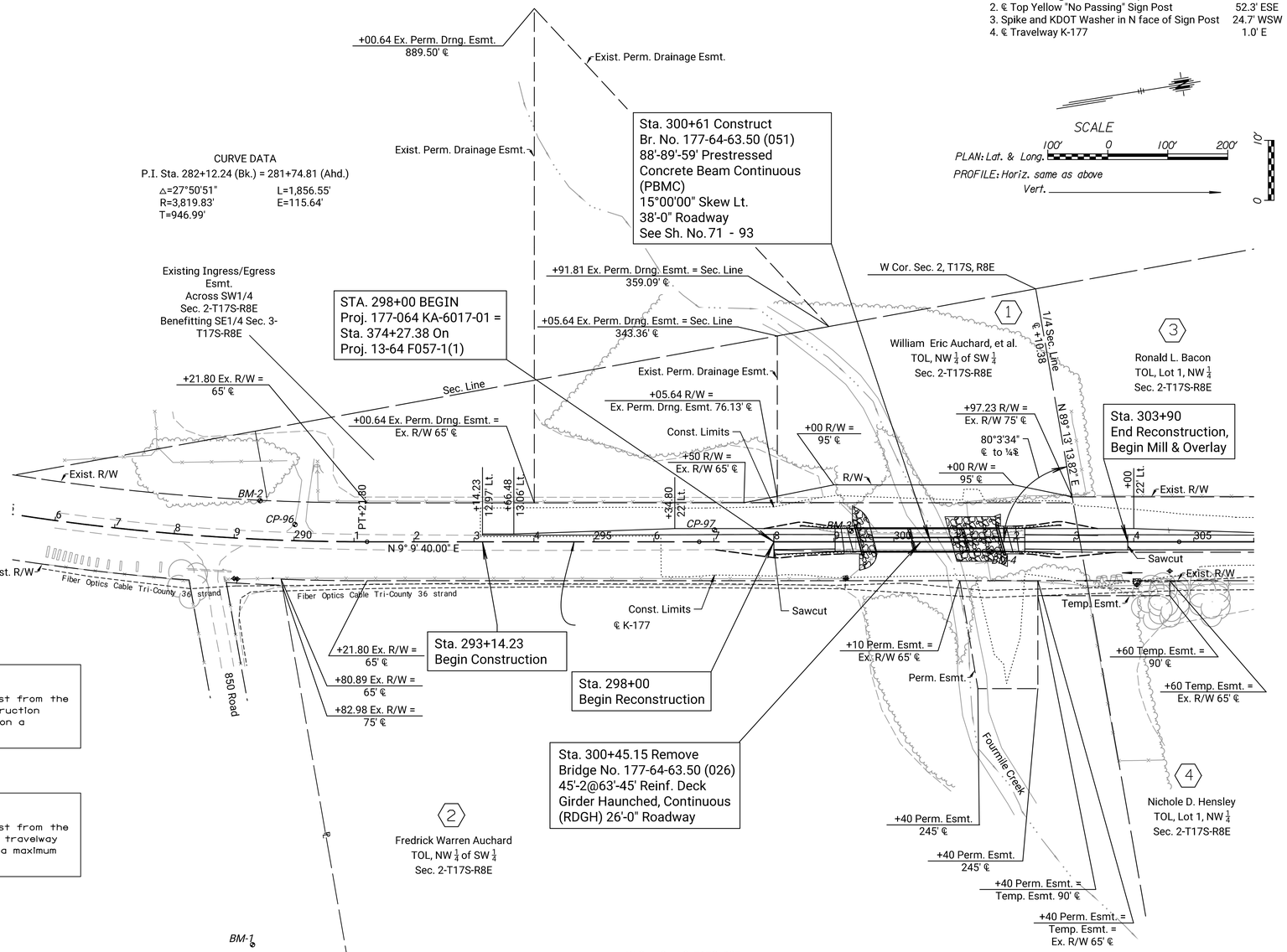
Any terrance or terrace plug disturbed by the construction shall be replaced as directed by the engineer. All terrace work shall be SUBSIDIARY to other earthwork items. Terraces which are level or drain away from the project shall be plugged inside the right-of-way line by the contractor as directed by the engineer. This construction shall be SUBSIDIARY to other bid items.

A gross vmf of 0.81 was used to compute earthwork quantities for this project.
This factor includes quantities for initial consolidation and settlement.

Information shown in the plans concerning type and location of underground utilities is not guaranteed to be accurate or all inclusive. It is the responsiblity of the contractor to determine the type and lcoation of underground utilities as may be necessary to avoid damages thereto. All KDOT owned utilities are to be located by the contractor.

NOTE: Sta. 298+00
Horizontal Alignment shall transition in 30' within the reconstructed portion to adjust from the existing travelway offset to the reconstruction centerline. The transition length is based on a maximum PI deflection angle of 0°30'.

NOTE: Sta. 303+90
Horizontal Alignment shall transition in 170' within the reconstructed portion to adjust from the reconstruction centerline to the existing travelway offset. The transition length is based on a maximum PI deflection angle of 0°30'.



SW Cor. Sec. 2, T17S, R8E
N: 98,524.872 E: 1,740,737.152
1. Fnd. 6"x12"x17" Reddish Stone protruding 0.8' w/ Square Rebar on NE Side
2. Ctr. Top of 4" Steel Fence Post 91.75' N

S Cor. Sec. 2, T17S, R8E
N: 98,557.320 E: 1,743,366.631
1. Fnd. 4"x11"x18"Limestone Protruding 0.8' w/ Rebar on S Face and "X" Cut on Ctr. Top
2. Spike and KDOT Washer in S Face of 3-Trunk Hedge 12.32' W
3. Spike and Washer in N Face of 18" Oak 9.95' ESE
4. "X" Cut in Stone Base for 2" Steel Fence Post 18.88' SSE

W Cor. Sec. 2, T17S, R8E
N: 101,169.304 E: 1,740,682.591
1. Fnd. ½" Rebar w/ Aluminum KDOT Cap 0.3' Deep
2. Spike and KDOT Washer in Top of Cor. Post 48.9' ENE
3. Spike and KDOT Washer in Top of Brace Post 54.4' NE
4. Line of Fence E 25.0' N

Ctr. Cor. Sec. 2, T17S, R8E
N: 101,205.279 E: 1,743,326.724
1. Fnd. ½" Rebar w/ Aluminum KDOT Cap
2. Spike and Washer in Top of Gate Cor. Post 26.1' NW
3. Spike and Washer in W Face of 4" Elm 22.8' S
4. Spike and Washer in NW Face of 18" Locust 36.8' SW

B.M. #2 "U" Shaped Steel Fence Post 1' E of Concrete R/W Marker
64.30' Lt. ℄ STA. 289+40.30 Elev. 1,255.08

B.M. #1 "U" Shaped Steel Fence Post 1' N of Brace Fence Post on S Side of 850 Road
676.20' Rt. ℄ STA. 289+59.50 Elev. 1,257.63

B.M. #3 Standard Brass Disc Stamped "5JK1971" in S End of W Hubguard BR.026
17.70' Lt. ℄ STA. 299+28.80 Elev. 1,258.70

B.M. #4 Rivet and KDOT Washer in N End of E Hubguard BR.026
16.80' Rt. ℄ STA. 301+62.00 Elev. 1,258.77

KANSAS DEPARTMENT OF TRANSPORTATION

PLAN SHEET

STA. 280+00 TO STA. 306+00

Plotted : 16-JAN-2025 07:34
Drawn By : mrockwell
File : ka601701rpl-01.dgn

CADconform Certify This File

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	10	291

DATE	BY	
10-2021	J. Unruh - Benesch	REFERENCES NOTED
10-2021	R. Nuessen - Benesch	REFERENCES CHECKED

Earthwork Balance 1 Sta. 293+14.23 to Sta. 329+00

+ 5,294 Cu. Yds. Common Excavation (VMF= 0.81)
5,626 Cu. Yds. Common Excavation (Contr. Furn.) (VMF=0.81)
400 Cu. Yds. Existing Pavement to be Wasted (VMF=1.00)

8,846 Cu. Yds. Embankment

Inlcudes:
+ 636 Cu. Yds. Common Excavation from Four Mile Creek

+65

1,370 1,360 1,350 1,340 1,330 1,320 1,310 1,300 1,290 1,280 1,270 1,260 1,250 1,240 1,230 1,220 1,210

No Ditch Lt.
No Ditch Rt.
Exist. Ditch Rt
+25

Crown Grade Proposed
Existing Ground Line
+ 0.06%
+ 0.00%
K = 166
70' V.C.
+ 0.42%
Historic High Water
Elev. 1258.79
Design High Water
Elev. 1250.89
Ordinary High Water
Elev. 1233.27
Streambed (West)
Streambed (East)

+35 P.V.C.
1,258.85
+70 P.V.I. El. 1,258.85
+105 P.V.T.
1,258.94
+90
Match Overlay
1259.35 ±

1,258.85
1,258.89
+00 Begin Project
Match Existing
+50 P.V.I.
1,258.82 ±
1,258.85
1,258.85
1,258.85
1,258.85

6 7 8 9 290 1 2 3 4 295 6 7 8 9 300 1

KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE SHEET

STA. 280+00 TO STA. 306+00

CADconform Certify This File

Sh. No. 10

Plotted : 16-JAN-2025 07:35

Drawn By : mrockwell
File : ka6017701rpr-01.dgn

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	11	291

Control Point #98 ℄ Sta. 307+91.63, 53.73' Rt.
N: 101,641.693 E: 1,741,240.628
1. Set ½" Rebar w/ Aluminum KDOT Cap Stamped "TP98"
2. Spike & KDOT Washer in Top Wire of Steel Fence Post 44.5' NNE
3. Spike & KDOT Washer in Top Wire of Steel Fence Post 31.4' SSE
4. ℄ Travelway K-177 52.0' W

Control Point #99 ℄ Sta. 314+81.14, 70.63' Lt.
N: 102,342.203 E: 1,741,227.635
1. Set ½" Rebar w/ Aluminum KDOT Cap Stamped "TP99"
2. N Face of N Gate Post 6.3' SSW
3. Panel Fenceline to the W 6.5' S
4. ℄ Travelway K-177 72.0' E

P.O.T. ℄ Sta. 316+75.63
N: 102,522.970 E: 1,741,328.329
1. Fnd. ½" Bar @ P.O.T. 0.3' Deep
2. Spike and KDOT Washer in Top of Brace Post 71.6' W
3. Ctr. Top of R/W Marker 66.6' ESE
4. ℄ Travelway K-177 1.0' E

Control Point #94 ℄ Sta. 322+24.25, 67.34' Lt.
N: 103,075.309 E: 1,741,349.192
1. Set ⅝" Rebar w/ Red GSS Cap 0.15' Deep
2. Spike in Top of Fence Post 28.00' SSW
3. Spike in Top of Fence Post 31.20' N
4. Spike in N Face of "Speed Limit" Sign 46.63' ESE

P.O.T. ℄ Sta. 330+03.32
N: 103,833.725 E: 1,741,539.712
1. Fnd. ½" Bar @ P.O.T.
2. Ctr. Top of R/W Marker 64.0' NW
3. Ctr. Top of R/W Marker 72.8' SW
4. Ctr. Top of R/W Marker 62.9' SE

Control Point #95 ℄ Sta. 337+88.71, 56.34' Lt.
N: 104,600.132 E: 1,741,720.373
1. Set ⅝" Rebar w/ Red GSS Cap 0.15' Deep
2. PK Nail & Washer in W Face of Power Pole 59.15' NNE
3. PK Nail & Washer in N Face of "Speed Limit" Sign 34.85' W
4. ℄ K-177 55.50' W

SW Cor. Sec. 35, T16S, R8E

Sec. Line

W 1/16 Cor. of the NW ¼ Sec. 2, T17S, R8E

1/16 Sec. Line ℄ +52.23

S 89° 17' 5.80" W

Sec. Line ℄ +03.32

S 89°-19' 31.63" W

4-Mile Road

POT+00.00

5
William Eric Auchard
TOL, Lot 2, NW ¼
Sec. 2-T17S-R8E

6
Nichole D. Hensley
SW 1/4, SW ¼
Sec. 35-T16S-R8E

3
Ronald L. Bacon
W ½ Lot 1, NW ¼
Sec. 2-T17S-R8E

+90 Temp. Esmt. 85' ℄
+80 Temp. Esmt. = Ex. R/W 75' ℄
+30 House Ent. (Mound)
+39.18 R/W = Ex. R/W 75' ℄
+70 Temp. Esmt. 85' ℄
+80 Temp. Esmt. = R/W 75.48' ℄
80°7'26" ℄ to 1/16℄
+46.87 R/W = Ex. R/W 150' ℄
80°9'52" ℄ to ℄
+07.76 R/W = Ex. R/W 150' ℄
+20 R/W 90' ℄
+60 R/W 80' ℄
+00 R/W = Exist. R/W 60' ℄
Sta. 330+03.32 K-177 = Sta. 50+00 4-Mile Road

Sta. 316+30 Construct House Mound Entrance Lt.

Sta. 323+45 Extend 9' x 4' x 46' RCB 11' Lt. & 15.5' Rt. See Sh. No.56 ,57 ,70 ,101

Sta. 328+37 Ditch Plug Lt. Elev = 1273.00

+52.74 13.58' Lt.
+15.88 13.60' Lt.
Const. Limits
Exist. R/W
℄ K-177
R/W
15" Pear
24" Willow
barbed wire
gravel
BM-6
CP-99
CP-94
BM-7
BM-8

CP-98
BM-5
Exist. R/W
Fiber Optics Cable Tri-County 36 strand
Const. Limits
Sta. 309+00 to Sta. 322+00 Do Not Disturb Exist. Fence
Sta. 316+63 Construct Mound Entrance Rt.
+63 Field Ent. (Mound)
+63.55 R/W = Ex. R/W 65' ℄
+00 R/W 65' ℄
+40 R/W 110' ℄
Sta. 323+45 Const. Slope Protection (Riprap Stone)(100 lbs.). See Sh. No. 102
Sta. 328+77 Extend 9' x 3' x 43' RCB 12.5' Lt. & 16.5' Rt. See Sh. No. 58 ,59 ,70 ,101
Sta. 328+77 Const. Slope Protection (Riprap Stone)(100 lbs.). See Sh. No. 102
Sta. 330+12, 51' Rt., Install 24" x 58' CRP Lt. with End Sections Remove 24" x 41' RCP See Sh. No.49,50,53,101,102
+91.95 R/W = Ex. R/W 110' ℄
+44.17 Ex. R/W 60' ℄
Sta. 330+44.17 Rt. Do Not Disturb Existing Utilities
Const. Limits
+00 Temp. Esmt. = Ex. R/W 60' ℄
+50 Temp. Esmt. 70' ℄
Temp. Esmt.
+50 Temp. Esmt. 70' ℄
+00 Temp. Esmt. = Ex. R/W 60' ℄

4
Nichole D. Hensley
TOL, Lot 1, NW ¼
Sec. 2-T17S-R8E

4
Nichole D. Hensley
TOL, Lot 2, NW ¼
Sec. 2-T17S-R8E

6
Nichole D. Hensley
SW 1/4, SW ¼
Sec. 35-T16S-R8E

SW Cor. Sec. 35, T16S, R8E
N: 103,822.991 E: 1,740,627.839
1. Fnd. ½" Rebar w/ Plastic KDOT Cap 0.3' Deep
2. Top Ctr. S End CMP 41.5' ESE
3. Top Ctr. N End CMP 40.5' ENE
4. Spike and KDOT Washer in Top of Cor. Post 41.8' SSE

S 1/16 Cor. of the SW ¼ Sec. 35, T16S, R8E
N: 103,838.637 E: 1,741,956.741
1. Fnd. 0.8'x0.5'xUnknown Depth Limestone w/ ½" Rebar w/ Aluminum KDOT Cap 0.4' Deep
2. Spike and KDOT Washer in W Face of Power Pole 39.3' SE
3. Spike and KDOT Washer in W Face of Power Pole 38.3' NE
4. Spike and KDOT Washer in E Face of Guy Pole 34.6' NNW

S Cor. Sec. 35, T16S, R8E
N: 103,852.520 E: 1,743,286.827
1. Fnd. ½" Rebar w/ Aluminum KDOT Cap 0.3' Deep
2. Spike and KDOT Washer in Top of Cor. Post 33.8' N
3. Spike and KDOT Washer in Top of Fence Post 43.7' NNE
4. Face of Steel Pipe Cor. Post 32.5' S

W 1/16 Cor. of the NW ¼ Sec. 2, T17S, R8E
N: 102,491.519 E: 1,740,655.310
1. Fnd. ½" Rebar w/ Aluminum KDOT Cap 0.65' Deep
2. Concrete Nail and KDOT Washer in N Face of Gate Post 13.4' E
3. Concrete Nail and KDOT Washer in N Face of Gate Post 11.3' W
4. Spike and KDOT Washer in W Face of Power Pole 33.4' NNE

E 1/16 Cor. of the NW ¼ Sec. 2, T17S, R8E
N: 102,524.612 E: 1,743,306.840
1. Fnd. ½" Rebar w/ Aluminum KDOT Cap 0.2' Deep
2. Spike and KDOT Washer in N Face of Fence Post 3.7' E
3. Line of Fence N-S 3.5' E
4. Spike and KDOT Washer in W Face of 6" Hackberry 8.2' SSE

UTILITY OWNERS (THIS SHEET)

Telephone - Tri-County Telephone

Powerline - Flint Hills RECA

Water - Rural Water District No. 1

B.M. #5 "U" Shaped Steel Fence Post 1' W of a N-S R/W Fenceline 68.20' Rt. ℄ STA. 308+60.40 Elev. 1,263.86

B.M. #6 "U" Shaped Steel Fence Post 1' E of a Private Entrance Gate Fence Post 70.70' Lt. ℄ STA. 316+65.00 Elev. 1,273.74

B.M. #7 Rivet and KDOT Washer in ℄ W Headwall RCB 20.80' Lt. ℄ STA. 328+77.30 Elev. 1,275.26

B.M. #8 "U" Shaped Steel Fence Post 1' E of a N-S R/W Fenceline 59.20' Lt. ℄ STA. 334+35.60 Elev. 1,292.61

KANSAS DEPARTMENT OF TRANSPORTATION

PLAN SHEET

STA. 306+00 TO STA. 338+00

DATE	BY	
10-202	J. Unruh - Benesch	REFERENCES NOTED
10-202	R. Nuessen - Benesch	REFERENCES CHECKED

Plotted : 16-JAN-2025 07:35
Drawn By : mrockwell
File : ka601701rpl-02.dgn

CADconform Certify This File

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	12	291

BY	DATE
J. Unruh - Benesch	10-2021
R. Nuessen - Benesch	10-2021
REFERENCES NOTED	
REFERENCES CHECKED	

For Earthwork Balance 1 See Sh. No. 10

Earthwork Balance 2 Sta. 329+00 to Sta. 423+00
19,171 Cu. Yds. Common Excavation (VMF= 0.82)
86 Cu. Yds. Existing Pavement to be Wasted (VMF=1.00)
\+ 3,354 Cu. Yds. Rock Excavation (VMF=1.14)
1,391 Cu. Yds. Rock Excavation (Non-Durable Shale) (VMF=1.10)
25,575 Cu. Yds. Embankment

\+ An Additional:
4,036 Cu. Yds. Rock Excavation (Weighted VMF= 1.13) to be Hauled in from Balance 3

No Ditch Lt.
10' x Sp. Dt. Rt.
+00
Exist. Ditch Rt.

No Ditch Lt.
10' x Sp. Dt. Rt.
+75
+25
+00
No Ditch Rt.

10' x Sp. Dt. Lt.
10' x Sp. Dt. Rt.

No Ditch Lt.
+49
+40
+40
No Ditch Rt.
+49

10' x Sp. Dt. Lt.
10' x Sp. Dt. Rt.

No Ditch Lt.
10' x Sp. Dt. Lt.
+40
+82
+70
+06
No Ditch Lt.
+73
+82
+79
+37
No Ditch Rt.
10' x Sp. Dt. Rt.
No Ditch Rt.

10' x Sp. Dt. Lt.
10' x Sp. Dt. Rt.
Std. Dt. Rt.
+75

Existing Ground Line

1259.70 +00 Rt.
+ 1.79% Sp. Dt. Rt.
1266.50 +80 Rt.
+ 1.17% Sp. Dt. Rt.
1270.00 +80 Rt.
+ 0.31% Sp. Dt. Rt.
1270.77 +25 Rt.
1271.80 +75 Lt.
- 0.33% Sp. Dt. Rt.
1270.25 +00 Rt.
- 0.98% Sp. Dt. Lt.
- 0.82% Sp. Dt. Rt.
1269.75 +50 Rt.
1267.10 +50 Lt.
1264.72 +40 Lt.
2.64% Lt.
1266.50 +00 Rt.
- 3.72% Sp. Dt. Rt.
1261.29 +40 Rt.
1264.72 +49 Lt.
+ 1.34% Sp. Dt. Lt.
1261.29 +49 Rt.
1266.75 +00 Lt.
+ 2.50% Sp. Dt. Lt.
+ 2.90% Sp. Dt. Rt.
1267.11 +50 Rt.
1270.50 +50 Lt.
1271.80 +40 Lt.
+ 1.26% Sp. Dt. Rt.
1269.00 +00 Rt.
+ 0.68% Sp. Dt. Lt.
+ 0.32% Sp. Dt. Rt.
1269.54 +73 Rt.
1270.29 +82 Lt.
+4.77% Rt.
+ 1.49% Lt.
1269.54 +82 Rt.
1271.60 +70 Lt.
1274.17 +79 Rt.
+4.88 % Rt.
+ 3.89% Sp. Dt. Rt.
+ 4.79% Sp. Dt. Lt.
1275.41 +37.00.
1272.30 +06 Lt.
1279.70 +25 Rt.
1286.50 +00 Rt.
+ 4.88% Sp. Dt. Rt.
+ 5.02% Sp. Dt. Lt.
1296.26 +00 Rt.
1293.00 +00 Lt.

Sta. 323+45
9'x4'x46' RCB
Cr. Gr. = 1,272.21
Ex. ℄ Lt. = 1,264.18
Ex. ℄ Rt. = 1,262.24
Prop. ℄ Lt. = 1,264.38
Prop. ℄ Rt. = 1,261.86

Sta. 328+77
9'x3'x43' RCB
Cr. Gr. = 1,278.00
Ex. ℄ Lt. = 1,270.13
Ex. ℄ Rt. = 1,269.74
Prop. ℄ Lt. = 1,270.20
Prop. ℄ Rt. = 1,269.64

1,370 1,360 1,350 1,340 1,330 1,320 1,310 1,300 1,290 1,280 1,270 1,260 1,250 1,240 1,230 1,220 1,210

6 7 8 9 310 1 2 3 4 315 6 7 8 9 320 1 2 3 4 325 6 7 8 9 330 1 2 3 4 335 6 7 8

KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE SHEET

STA. 306+00 TO STA. 338+00

Plotted : 16-JAN-2025 07:35
Drawn By : mrockwell
File : ka601701rpr-02.dgn

CADconform Certify This File
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	13	291

P.O.T. ℄ Sta. 346+00.00
N: 105,410.038 E: 1,741,793.921
1. Fnd. ½" Bar @ P.O.T.
2. Spike and KDOT Washer in Top of Brace Post 78.6' NW
3. ℄ Pasture Entrance to the W 69.0' N
4. @ ℄ Travelway K-177

Control Point #100 ℄ Sta. 346+80.47, 36.13' Rt.
N: 105,483.730 E: 1,741,842.402
1. Set ½" Rebar w/ Aluminum KDOT Cap 0.3' Deep
2. Concrete nail w/ KDOT Washer 24.0' E
3. ℄ Travelway Entrance 25.0' S
4. ℄ Travelway K-177 37.0' W

P.O.T. ℄ Sta. 355+00.00
N: 106,298.558 E: 1,741,937.211
1. Fnd. ½" Bar @ P.O.T.
2. Spike and KDOT Washer in Top of Steel Fence Post 64.5' NW
3. Near Face of "No Passing" Sign Post 78.8' NE
4. @ ℄ Travelway K-177

Control Point #101 ℄ Sta. 355+45.71, 50.88' Lt.
N: 106,351.781 E: 1,741,894.259
1. Set ½" Rebar w/ Aluminum KDOT Cap Flush
2. Spike and KDOT Washer on Fence Post 24.0' NNW
3. R/W Fence 8.8' W
4. ℄ Travelway K-177 51.0' E

6 Nichole D. Hensley
SW 1/4, SW ¼
Sec. 35-T16S-R8E

7 Erin Leann Brown
TOL, NW ¼
Sec. 35-T16S-R8E

8 William Eric Auchard
TOL, SW ¼
Sec. 35-T16S-R8E

9 CARJO, LLC
TOL, NW ¼
Sec. 35-T16S-R8E

1/4 Sec. Line ℄ +76.71

S 89° 55' 1.98" W

Sta. 346+72 Construct Mound Entrance Lt.

Sta. 346+55 Construct Mound Entrance Rt.

Sta. 349+85 Abandon
2'x2'x77' RCB w/ Wingwalls
Fill with Fly Ash Slurry Grout
(High Strength)
See Sh. No. 102

Sta. 351+00 Extend
4'x6'x34' RCB
16' Lt. & 16' Rt.
See Sh. No. 60 ,61 ,70 ,101

80°45'22" ℄ to ¼℄

℄ K-177

Const. Limits — Exist. R/W — barbed wire — 16" Osage

+50 R/W = Ex. R/W 60' ℄ | +00 R/W 80' ℄ | +72 Field Ent. (Mound) | +80 R/W 115' ℄ | +00 R/W 80' ℄ | +50 R/W 115' ℄ | +70 R/W 75' ℄ | +50 R/W 75' ℄ | +00 R/W 90' ℄ | +00 R/W 105' ℄

BM-10 | BM-11 | BM-12 | BM-13

CP-101 | CP-102 | CP-95 | CP-100

Fiber Optic Cable Tri-County Telephone 36-Strand

+55 Field Ent. (Mound) | +50 R/W = Ex. R/W 60' ℄ | +20 R/W 105' ℄ | +00 R/W 105' ℄ | +00 R/W = Ex. R/W 60' ℄ | +00 R/W = Ex. R/W 60' ℄ | +00 R/W 85' ℄ | +50 R/W 85' ℄ | +50 R/W 110' ℄ | +50 R/W 110' ℄ | +50 R/W 75' ℄ | +50 R/W 80' ℄

gravel

UTILITY OWNERS (THIS SHEET)

Telephone - Tri-County Telephone

Powerline - Flint Hills RECA

W Cor. Sec. 35, T16S, R8E
N: 106,470.997 E: 1,740,566.312
1. Fnd. ½" Rebar w/ Plastic KDOT Cap 0.3' Deep
2. No References Available
3. ℄ Sta. 356+76.71 @ NW ∠ 99°14'38" KDOT Proj. 177-064 KA-6017-01 1,399.04' W

Ctr. Cor. Sec. 35, T16S, R8E
N: 106,474.846 E: 1,743,230.238
1. Fnd. ½" Rebar w/ Aluminum KDOT Cap 1.25' Deep
2. ℄ of Channel 12.0' S
3. Spike and KDOT Washer in S Face of 14" Tree 34.6' WNW
4. Spike and KDOT Washer in E Face of 12" Tree 12.6' N

B.M. #9 RR Spike in W Face of Power Pole
64.80' Rt. ℄ STA. 338+51.00 Elev. 1,313.58

B.M. #10 "U" Shaped Steel Fence Post 1' E of a Brace Fence Post at Field Entrance W
58.46' Lt. ℄ STA. 346+90.21 Elev. 1,336.19

B.M. #11 Rivet and KDOT Washer in ℄ E Headwall RCB
16.86' Rt. ℄ STA. 351+00.23 Elev. 1,331.67

B.M. #12 "U" Shaped Steel Fence Post 1' E of a Fenceline
58.83' Lt. ℄ STA. 357+89.82 Elev. 1,320.66

B.M. #13 Rivet and KDOT Washer in a Bedrock Outcropping
40.70' Lt. ℄ STA. 365+38.97 Elev. 1,288.14

DATE	BY	
10-2021	J. Unruh - Benesch	REFERENCES NOTED
10-2021	R. Nuessen - Benesch	REFERENCES CHECKED

KANSAS DEPARTMENT OF TRANSPORTATION

PLAN SHEET

STA. 338+00 TO STA. 370+00

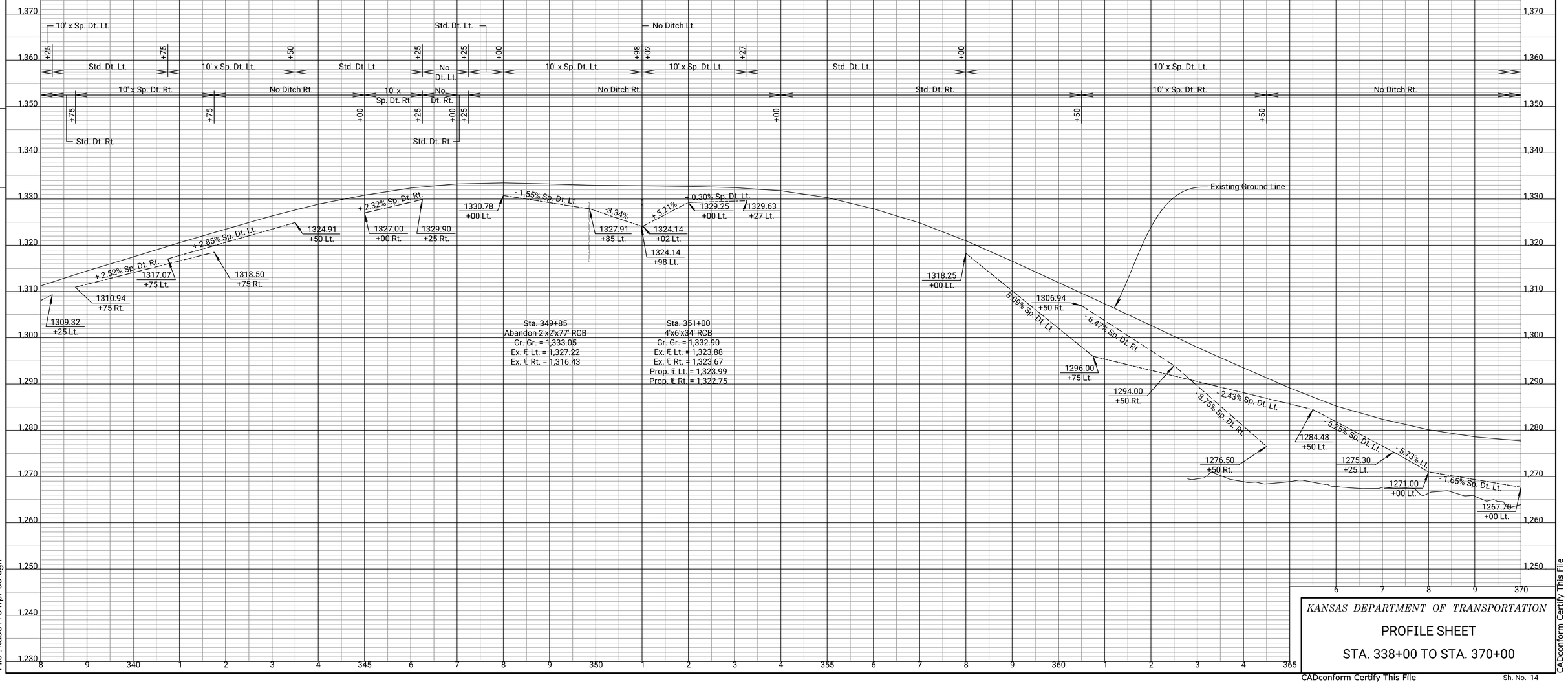
Plotted : 16-JAN-2025 07:35
Drawn By : mrockwell
File : ka601701rpl-03.dgn

CADconform Certify This File

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	14	291

BY	DATE
J. Unruh - Benesch	10-2021
R. Nuessen - Benesch	10-2021
REFERENCES NOTED	
REFERENCES CHECKED	

For Earthwork Balance 2 See Sh. No. 12



KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE SHEET

STA. 338+00 TO STA. 370+00

Plotted : 16-JAN-2025 07:35

Drawn By : mrockwell

File : ka601701rpr-03.dgn

CADconform Certify This File

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	15	291

Control Point #102 ℄ Sta. 370+59.10, 22.69' Lt.
N: 107,841.381 E: 1,742,163.037
1. Set ½" Rebar w/ Aluminum KDOT Cap 0.2' Deep
2. Concrete nail w/ KDOT Washer in Guardrail Post 27.5' S
3. SW Cor. of RCB Headwall 30.0' N
4. ℄ Travelway K-177 23.0' E

P.O.T. ℄ Sta. 375+00.00
N: 108,273.048 E: 1,742,255.633
1. Fnd. ½" Bar @ P.O.T.
2. Spike and KDOT Washer in Top of Steel Fence Post 65.5' ENE
3. Spike and KDOT Washer in Top of Steel Fence Post 71.0' ESE
4. ℄ Travelway K-177 1.0' E

Control Point #103 ℄ Sta. 383+88.52, 37.98' Lt.
N: 109,156.283 E: 1,742,359.599
1. Set ½" Rebar w/ Aluminum KDOT Cap 0.2' Deep
2. R/W Fence 22.1' W
3. Yellow Passing Zone Post 54.0' NNW
4. ℄ Travelway K-177 39.0' E

P.O.T. ℄ Sta. 386+00.00
N: 109,359.017 E: 1,742,430.766
1. Fnd. ½" Bar @ P.O.T.
2. Spike and KDOT Washer in Top of Brace Post 90.7' NW
3. Near Face of "No Passing" Sign Post 65.4' ENE
4. ℄ Travelway K-177 1.0' E

Control Point #104 ℄ Sta. 393+10.59, 32.62' Rt.
N: 110,055.351 E: 1,742,576.108
1. Set ½" Rebar w/ Aluminum KDOT Cap 0.3' Deep
2. Spike and KDOT Washer in Fence Post 35.4' NE
3. Travelway Entrance 32.0' N
4. ℄ Travelway K-177 33.0' W

P.O.T. ℄ Sta. 398+00.00
N: 110,543.710 E: 1,742,621.819
1. Fnd. ½" Bar @ P.O.T.
2. Near Face of "No Passing" Sign Post 69.3' SW
3. Spike and KDOT Washer in Top of Steel Fence Post 58.8' E
4. ℄ Travelway K-177 1.0' E

Sta. 371+00 Construct
Br. No. 177-64-64.83 (048)
2-12' x 12' x 69' RFB, Embedded
See Sh. No.69 ,94 - 97

Sta. 371+40
End Reconstruction,
Begin Mill & Overlay

Sta. 371+00 Remove
Br. No. 177-64-64.83 (025)
2-10'x10'x34.51' RCB

Sta. 370+60
End Mill & Overlay,
Begin Reconstruction

Sta. 370+11 Construct
Mound Entrance Rt.

Sta. 371+00 Construct
Slope Protection
(Riprap Stone)(200 lbs.)
See Sh. No. 107

Sta. 386+65 Construct
Mound Entrance Lt.

Sta. 387+00 Extend
30" x 45' CRP (RCP)
10' Lt. & 10' Rt.
with End Sections
See Sh. No.49,50,53,101

Sta. 393+52 Construct
Mound Entrance Rt.

Sta. 400+49 Const.
Slope Protection
(Riprap Stone)(100 lbs.).
See Sh. No.102

Sta. 400+49 Extend
30" x 73' CRP (RCP)
22' Lt. & 4' Rt.
with End Sections
See Sh. No.49,50,53,101

CARJO, LLC
TOL, NW ¼
Sec. 35-T16S-R8E

CARJO, LLC
SW ¼
Sec. 26-T16S-R8E

Sec. Line ℄ +44.82
N 89° 38' 16.07" W
1/4 Sec. Line
N 0° 55' 44.40" W
S 1° 14' 10.50" E

Four Mile Creek Drainage

+65 R/W 105' ℄
+75 R/W = Ex. R/W 150' ℄
+50 Ex. R/W 150' ℄
+50 Ex. R/W 60' ℄
+00 R/W = Ex. R/W 60' ℄
+00 R/W 80' ℄
+00 R/W 110' ℄
+00 R/W 200' ℄
+20 R/W 200' ℄
+11 Field Ent. (Mound)
+65 Field Ent. (Mound)
+52 Field Ent. (Mound)
81°12'4" ℄ to ℄
℄ K-177
R/W
Exist. R/W
Const. Limits
Sawcut
barbed wire
Fiber Optic Cable Tri-County Telephone 36 strand
D.M.

CP-102
CP-103
CP-104
BM-14
BM-15
BM-16
BM-17
BM-18

370 2 3 4 375 6 7 8 9 380 1 2 3 4 385 6 7 8 9 390 1 2 3 4 395 6 7 8 9 400 1 2

NW Cor. Sec. 35, T16S, R8E
N: 109,119.014 E: 1,740,504.811
1. Fnd. ⅝" Rebar 0.1' Deep
2. Spike and KDOT Washer in W Face of 24" Locust 67.7' SSW
3. Spike and KDOT Washer in E Face of 42" Hedge 68.7' SW
4. Spike and KDOT Washer in S Face of 15" Hedge 62.2' WNW

N Cor. Sec. 35, T16S, R8E
N: 109,102.143 E: 1,743,173.541
1. Fnd. ½" Rebar w/ Aluminum KDOT Cap 0.3' Deep
2. Fenceline to E 2.0' S
3. Fenceline in Ctr. of Abandoned Road to N 20.0' E
4. Spike and KDOT Washer in Top Wire of Barbwire Fence Near T-post 33.8' NE

UTILITY OWNERS (THIS SHEET)

Telephone - Tri-County Telephone

Powerline - Flint Hills RECA

B.M. #14 Brass Disc Set Flush in
S End of E Headwall 2 - 10x10x32 RCB
17.05' Rt. ℄ STA. 370+90.16 Elev. 1,276.72

B.M. #15 "U" Shaped Steel Fence Post 1' E of a Fence Post
59.56' Lt. ℄ STA. 378+31.12 Elev. 1,303.71

B.M. #16 "U" Shaped Steel Fence Post 1' E of a Fence Post
58.99' Lt. ℄ STA. 382+77.68 Elev. 1,324.78

B.M. #17 "U" Shaped Steel Fence Post 1' E of a Fence Post
58.59' Lt. ℄ STA. 388+55.15 Elev. 1,339.59

B.M. #18 Ctr. Top of a Concrete R/W Marker
59.64' Lt. ℄ STA. 392+36.48 Elev. 1,350.36

KANSAS DEPARTMENT OF TRANSPORTATION

PLAN SHEET

STA. 370+00 TO STA. 402+00

BY	DATE
J. Unruh - Benesch	10-2021
R. Nuessen - Benesch	10-2021
REFERENCES NOTED	
REFERENCES CHECKED	

Plotted : 16-JAN-2025 07:35
Drawn By : mrockwell
File : ka601701rpl-04.dgn

CADconform Certify This File

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	16	291

DATE	BY	
10-2021	J. Unruh - Benesch	REFERENCES NOTED
10-2021	R. Nuessen - Benesch	REFERENCES CHECKED

For Earthwork Balance 2 See Sh. No. 12

10' x Sp. Dt. Lt.
+00
No Ditch Rt.
+00
10' x Sp. Dt. Rt.
No Ditch Lt.
+00
10' x Sp. Dt. Lt.
+00
+75
Std. Dt. Lt.
+00
10' x Sp. Dt. Lt.
+00
No Ditch Rt.
Std. Dt. Lt.
+50
+00
No Ditch Lt.
10' x Sp. Dt. Rt.

1,370
1,360
1,350
1,340
1,330
1,320
1,310
1,300
1,290
1,280
1,270
1,260
1,250
1,240
1,230
1,220

Existing Ground Line

+ 4.33% Sp. Dt. Lt.
1334.33
+00 Lt.
1330.00
+00 Lt.

Sta. 387+00
30"x45' RCP
Cr. Gr. = 1,334.65
Ex. ℄ Lt. = 1,329.82
Ex. ℄ Rt. = 1,329.78
Prop. ℄ Lt. = 1,329.93
Prop. ℄ Rt. = 1,329.28

- 0.28% Sp. Dt. Rt.
1350.38
+00 Rt.
2.00% Rt.
+ 2.09% Sp. Dt. Rt.
1349.40
+50 Rt.
1347.38
+51 Rt.
1350.50
+00 Rt.

Sta. 400+49
30"x73' RCP
Cr. Gr. = 1,354.94
Ex. ℄ Lt. = 1,343.90
Ex. ℄ Rt. = 1,347.34
Prop. ℄ Lt. = 1,342.26
Prop. ℄ Rt. = 1,347.36

Design High Water
Elev. 1275.49
Historic High Water
Elev. 1271.21
Ordinary High Water
Elev. 1263.80

1287.20
+50
+ 6.42%
Sp. Dt. Lt.
1290.41
+00 Lt.
+ 7.40%
Sp. Dt. Lt.
+ 2.86% Sp. Dt. Rt.
1287.35
+75 Rt.
1283.50
+00 Lt.
1280.20
+25 Rt.
+ 0.18% + 0.55%
+ 4.81% Sp. Dt. Rt.
+ 3.92% Rt.
1272.65
+50 Rt.
- 3.30% Lt.
+ 7.81%
Sp. Dt. Rt.
1267.75
+25 Rt.
1264.40
+00 Lt.
1261.74
+00 Rt.
Streambed
(West)
Streambed (East)

Sta. 371+00
2-12'x12'x69' RFB (Embedded)
Cr. Gr. = 1,277.92
℄ Lt. = 1,263.44
℄ Floor Lt. = 1262.44
℄ Floor Rt. = 1261.02
℄ Rt. = 1,262.02

+60 P.V.I. End Mill & Overlay
1,277.85 Begin Reconstruction
+00 P.V.I.
El. = 1,277.92
+40 P.V.I. End Reconstruction
1,278.14 Begin Mill & Overlay

370 1 2 3 4 375 6 7 8 9 380 1 2 3 4 385 6 7 8 9 390 1 2 3 4 395 6 7 8 9 400 1 2

KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE SHEET

STA. 370+00 TO STA. 402+00

Sh. No. 16

Plotted : 16-JAN-2025 07:35
Drawn By : mrockwell
File : ka6017017rpr-04.dgn

CADconform Certify This File
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	17	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

Control Point #105 ℄ Sta. 405+69.27, 55.11' Rt.
N: 111,294.390 E: 1,742,798.699
1. Set ⅝" Rebar w/ Red GSS Cap 0.2' Deep
2. Magnail and Washer in S Face of Power Pole 11.65' ESE
3. Magnail and Washer in N Face of Sign 38.55' W
4. Hilti Nail and Washer in Top of Culvert Pipe 42.50' NW

P.O.T. ℄ Sta. 411+00.00
N: 111,827.128 E: 1,742,828.793
1. Fnd. ½" Bar @ P.O.T.
2. Spike and KDOT Washer in Top of Fence Post 66.7' SW
3. Spike and KDOT Washer in Top of Fence Post 73.4' NW
4. ℄ Travelway K-177 0.5' E

Control Point #106 ℄ Sta. 419+88.04, 50.62' Lt.
N: 112,711.906 E: 1,742,920.201
1. Set ⅝" Rebar w/ Red GSS Cap 0.2' Deep
2. Magnail and Washer in Top of Brace Post 9.90' W
3. Magnail and Washer in Top of Brace Post 36.30' N
4. ℄ Field Entrance 16.50' N

P.O.T. ℄ Sta. 423+00.00
N: 113,011.821 E: 1,743,019.847
1. Fnd. ½" Bar @ P.O.T.
2. ℄ Travelway V Road to the W 52.0' N
3. Ctr. Top of R/W Marker 63.1' NW
4. ℄ Travelway K-177 0.5' E

9 CARJO, LLC SW ¼ Sec. 26-T16S-R8E

9 CARJO, LLC S ½, NW ¼ Sec. 26-T16S-R8E

10 OH6, LLC NE ¼, NW ¼ Sec. 26-T16S-R8E

1/4 Sec. Line ℄ +14.10

N 89° 41' 10.92" W

V Avenue

℄ +34.75

N 89° 24' 5.50" W

℄ V Avenue

Sta. 405+94 Extend 30" x 45' CRP (RCP) 18' Lt. & 16' Rt. with End Sections See Sh. No. 49,50,53,101

Sta. 420+05 Construct Mound Entrance Lt.

Sta. 423+49, 40' Lt., Install 24" x 52' CRP Lt. with End Sections Remove 24" x 37' RCP See Sh. No. 49,50,53,101,102

Sta. 433+49 Extend 30" x 57' CRP (RCP) 22' Lt. & 10' Rt. with End Sections See Sh. No. 49,50,53,101

81°9'9" ℄ to ¼℄

81°26'15" ℄ to 1/16℄

81°26'15" ℄ to ℄

169°54'36" ℄ to ¼℄

+00 R/W 80' ℄

+00 R/W = Ex. R/W 60' ℄

+04.49 R/W = Ex. R/W 180' ℄

+44.89 R/W = Ex. R/W 180' ℄

+50 R/W = Ex. R/W 60' ℄

+20 R/W 65' ℄

+00 R/W 65' ℄

Const. Limits

R/W

Exist. R/W

Exist. R/W = 1/4 Sec. Line

barbed wire

gravel

15" Locust

℄ K-177

+05 Field Ent. (Mound)

CP-106

POT+50.00

BM-20

18" Elm

+15.30

Sta. 405+50 Ditch Plug Rt. Elev = 1353.64

CP-105

BM-19

+50 R/W = 80' ℄

+50 R/W = Ex. R/W 60' ℄

Sta. 409+00 to Sta. 416+00 Rt. Do Not Disturb Exist. Fence

Fiber Optic Cable Tri-County Telephone 36 strand

N 0° 55' 44.42" W

Sta. 423+54.98 K-177 = Sta. 50+00 V Avenue

+30 Temp. Esmt. = Ex. R/W 60' ℄

+40 Temp. Esmt. 70' ℄

Sta. 423+55, 42' Rt., Install 24" x 46' EP Rt. with End Sections Remove 24" x 43' RCP See Sh. No. 49-53 ,101,102

+55 Field Entrance

+78.16 Ex. R/W = 1/4 Sec. Line 60' ℄

+00 R/W = Ex. R/W 60' ℄

Exist. R/W = 1/4 Sec. Line

+56.14 Ex. R/W 60' ℄

+57.69 Temp. Esmt. = Ex. R/W 70' ℄

+59.42 Ex. R/W = 1/4 Sec. Line 81.13' ℄

+70 R/W 85' ℄

Const. Limits

Exist. R/W

R/W

Garage

T16S R8E

1/4 Sec. Line

S 0° 55' 44.40" E

W Cor. Sec. 26, T16S, R8E
N: 111,755.239 E: 1,740,456.290
1. Fnd. ½" Rebar w/ Plastic KDOT Cap 0.3' Deep
2. Concrete Nail and KDOT Washer in N Gate Post 25.3' E
3. Top Ctr. of Steel Cor. Post 36.2' SE
4. Fenceline to N 25.0' E

Ctr. Cor. Sec. 26, T16S, R8E
N: 111,740.599 E: 1,743,130.757
1. Fnd. ½" Rebar w/ Aluminum KDOT Cap 0.3' Deep
2. Spike and KDOT Washer in Top of Fence Post 26.4' NE
3. N-S Line of Fence in the Ctr. of an Abandoned Road 21.5' E
4. Ctr. of Traveled Way, K-177 Hwy 312.0' W

UTILITY OWNERS (THIS SHEET)

Telephone - Tri-County Telephone

Powerline - Flint Hills RECA

B.M. #19 "T" Post 1' W of Fence Post
58.90' Rt. ℄ STA. 406+09.26 Elev. 1,353.93

B.M. #20 Top R/W Marker N Side of V Avenue
59.70' Lt. ℄ STA. 423+66.32 Elev. 1,361.83

KANSAS DEPARTMENT OF TRANSPORTATION

PLAN SHEET

STA. 402+00 TO STA. 434+00

Plotted : 16-JAN-2025 07:36

Drawn By : mrockwell

File : ka601701rpl-05.dgn

CADconform Certify This File

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	18	291

BY	DATE
J. Unruh - Benesch	10-2021
R. Nuessen - Benesch	10-2021
REFERENCES NOTED	
REFERENCES CHECKED	

For Earthwork Balance 2 See Sh. No. 12

Earthwork Balance 3 Sta. 423+00 to Sta. 488+73.82

25,538 Cu. Yds. Common Excavation (VMF= 0.87)
360 Cu. Yds. Existing Pavement to be Wasted (VMF=1.00)
\+ 17,134 Cu. Yds. Rock Excavation (VMF=1.15)
11,160 Cu. Yds. Rock Excavation (Non-Durable Shale) (VMF=1.10)
48,028 Cu. Yds. Embankment

\+ Includes:
4,036 Cu. Yds. Rock Excavation (Weighted VMF= 1.13) to be Hauled to Balance 2
1,321 Cu. Yds. Rock Excavation (Weighted VMF= 1.13) to be Wasted

+00

No Ditch Lt. +25
10' x Sp. Dt. Rt.
No Ditch Rt. +50 +95
10' x Sp. Dt. Lt. +50
Std. Dt. Lt. +25 +50 +25
10' x Sp. Dt. Lt.
No Ditch Lt. +29 +81
10' x Sp. Dt. Lt.
10' x Sp. Dt. Rt.
No Ditch Rt. +25 +50
10' x Sp. Dt. Rt.

Existing Ground Line

+ 0.61% Sp. Dt. Rt.
+ 2.72% Sp. Dt. Rt.
+ 2.38% Lt.
+ 1.63% Sp. Dt. Lt.
+ 1.43% Sp. Dt. Rt.
+ 0.47% Sp. Dt. Lt.
+ 0.45% Sp. Dt. Rt.
+ 0.14% Sp. Dt. Rt.
- 1.56% Sp. Dt. Lt.
0.72% Sp. Dt. Rt.
- 2.92% Lt.
3.01% Rt.
0.26%
2.06% Lt.
2.16% Rt.
2.74% Lt.
2.89% Rt.
- 3.20% Lt.
- 3.45% Sp. Dt. Lt.
- 5.52% Sp. Dt. Lt.
- 3.04% Sp. Dt. Lt.
- 3.90% Sp. Dt. Lt.
- 2.00% Sp. Dt. Rt.
- 8.26% Lt.

Schroyer Limestone

1352.64 +50 Rt.
1349.59 +95 Rt.
1353.80 +50 Rt.
1354.33 +25 Lt.
1357.30 +50 Lt.
1360.57 +50 Lt.
1359.50 +50 Rt.
1361.50 +50 Lt.
1360.40 +50 Rt.
1361.30 +00 Rt.
1362.40 +25 Lt.
1359.87 +00 Rt.
1359.28 +25 Lt.
1356.24 +29 Lt.
1355.90 +32 Rt.
1355.78 +78 Rt.
1355.94 +81 Lt.
1354.00 +75 Lt.
1353.68 +75 Rt.
1350.58 +00 Lt.
1349.34 +25 Rt.
1347.38 +00 Lt.
1342.20 +50 Lt.
1335.30 +75 Lt.
1331.50 +00 Lt.
1327.60 +00 Lt.
1328.33 +50 Rt.
1322.30 +51 Rt.
1315.30 +49 Lt.

Sta. 405+94
30"x45' RCP
Cr. Gr. = 1,355.93
Ex. ℄ Lt. = 1,348.79
Ex. ℄ Rt. = 1,349.40
Prop. ℄ Lt. = 1,348.68
Prop. ℄ Rt. = 1,349.52

Sta. 433+49
30"x57' RCP
Cr. Gr. = 1,327.03
Ex. ℄ Lt. = 1,315.43
Ex. ℄ Rt. = 1,321.34
Prop. ℄ Lt. = 1,315.34
Prop. ℄ Rt. = 1,321.95

1,370 1,360 1,350 1,340 1,330 1,320 1,310 1,300 1,290 1,280

2 3 4 405 6 7 8 9 410 1 2 3 4 415 6 7 8 9 420 1 2 3 4 425 6 7 8 9 430 1 2 3 4

KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE SHEET

STA. 402+00 TO STA. 434+00

CADconform Certify This File

Plotted : 16-JAN-2025 07:36
Drawn By : mrockwell
File : ka6017101pr-05.dgn
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	19	291

DATE	BY	REFERENCES NOTED	CHECKED
10-2021	J. Unruh - Benesch	REFERENCES	
10-2021	R. Nuessen - Benesch		

Control Point #107 ℄ Sta. 435+02.33, 29.77' Lt.
N: 114,203.555 E: 1,743,181.877
1. Set ⅝" Rebar w/ Red GSS Cap 0.2' Deep
2. Hilti Nail and Washer in Top of RCP 153.75' SSW
3. Magnail and Washer in W Face of "No Passing" Sign 31.65' S
4. Spike and Washer in N Face of 8" Cedar 31.25' WNW

P.O.T. ℄ Sta. 435+98.71
N: 114,293.966 E: 1,743,226.616
1. Set ½" Rebar @ P.O.T. 0.3' Deep
2. ⅛" Bar 60.0' ENE
3. ⅛" Bar 60.0' SE
4. @ Travelway K-177

P.O.T. ℄ Sta. 452+00.00
N: 115,874.831 E: 1,743,481.559
1. Set ½" Rebar @ P.O.T. 0.3' Deep
2. Near Face of "No Passing" Sign Post 52.75' NW
3. Magnail & Washer in W Face of "No Passing" Sign Post 37.35' NW
4. @ ℄ Travelway K-177

Control Point #108 ℄ Sta. 453+65.60, 52.70' Lt.
N: 116,046.705 E: 1,743,455.899
1. Set ⅝" Rebar w/ Red GSS Cap 0.2' Deep
2. Magnail and Washer in E Face of 16' Tall Gate Post 18.60' SSW
3. Magnail and Washer in N Face of 16' Tall Gate Post 6.80' W
4. Hilti Nail and Washer in N End of CMP 26.25' WNW

P.O.T. ℄ Sta. 465+00.00
N: 117,158.249 E: 1,743,688.534
1. Set ½" Rebar @ P.O.T. 0.3' Deep
2. Magnail & Washer in Top of Guardfence Post 30.05' SSE
3. Magnail & Washer in Top of Guardfence Post 22.30' WNW
4. ℄ Travelway K-177 1.00' E

OH6, LLC
NE ¼, NW ¼
Sec. 26-T16S-R8E

N 89° 38' 42.77" W

N Cor. Sec. 26, T16S, R8E

+56.20 R/W = Ex. R/W = Sec. Line
149.63' ℄

Sta. 439+24 Const.
4'x4'x123' RCB
Remove 4' x 4' x 73' RCB
See Sh. No.62 ,63,101,102

Sta. 439+64
End Reconstruction,
Begin Mill & Overlay

Const. Limits

81°6'56" ℄ to ℄

R/W

Exist. R/W = Ex. R/W = Sec. Line

Exist. R/W = 1/4 Sec. Line

36"

BM-21

CP-107

Exist. R/W

barbed wire

rock ledge

Sawcut

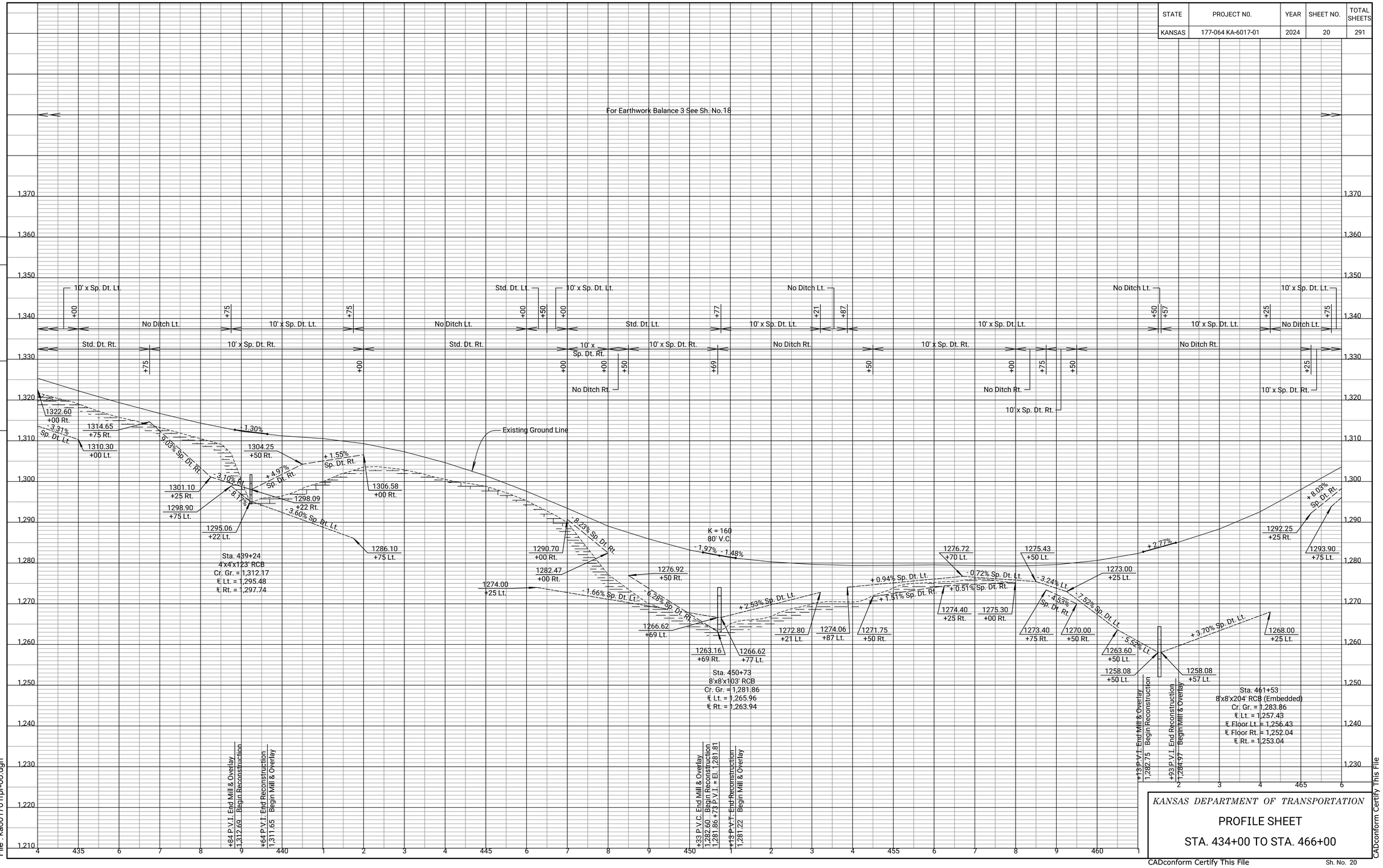
Sawcut

Sawcut

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	20	291

BY	DATE
J. Unruh - Benesch	10-2021
R. Nuessen - Benesch	10-2021
REFERENCES NOTED	
REFERENCES CHECKED	

For Earthwork Balance 3 See Sh. No.18



KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE SHEET

STA. 434+00 TO STA. 466+00

Plotted : 16-JAN-2025 07:36

Drawn By : mrockwell

File : ka6017701rpr-06.dgn

CADconform Certify This File

CADconform Certify This File

Control Point #109 ℄ Sta. 468+99.76, 44.03' Rt.
N: 117,545.894 E: 1,743,795.651
1. Set ⅝" Rebar w/ Red GSS Cap
2. Spike and 1 Washer in Top Barb Wire Fence Post, H.D. 58.30' S
3. Spike in Top Barb Wire Fence Post, H.D. 16.55' E
4. Spike and 2 Washers in Top Barb Wire Fence Post, H.D. 44.60' NE

P.O.T. ℄ Sta. 474+50.00
N: 118,096.131 E: 1,743,839.784
1. Set ½" Rebar @ P.O.T. 0.3' Deep
2. Magnail & Washer in E Face of Hwy Sign Post 89.80' SW
3. Magnail & Washer in E Face of Hwy Sign Post 67.85' NNW
4. ℄ Travelway K-177 1.50' E

Control Point #110 ℄ Sta. 482+71.14, 64.98' Lt.
N: 118,917.148 E: 1,743,906.366
1. Set ⅝" Rebar w/ Red GSS Cap
2. Magnail and Washer in Top of N Guard Fence Post 44.85' ESE
3. Magnail and Washer in W Face of "Historic Site" Sign 74.20' N
4. Hilti Nail and Washer in Ctr. of Top Headwall of 2x2 RCB 31.20' E

Control Point #111 ℄ Sta. 489+31.03, 49.78' Rt.
N: 119,550.342 E: 1,744,124.725
1. Set ⅝" Rebar w/ Red GSS Cap
2. In Line w/ W Face of the House to the N
3. Ctr. Top of Fire Hydrant 32.25' SSW
4. Magnail and Washer in N Face of "Snow Route" Sign 40.33' NW

P.O.T. ℄ Sta. 490+50.00
N: 119,675.722 E: 1,744,094.522
1. Set ½" Rebar @ P.O.T. 0.3' Deep
2. Hilti nail & Washer in Top of Curb 25.95' NW
3. ℄ Travelway K-177 0.70' E
4. ℄ Velie Street to the E 68.00' S

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	21	291

BY	DATE
J. Unruh - Benesch	10-2021
R. Nuessen - Benesch	10-2021
REFERENCES NOTED	
REFERENCES CHECKED	

1/4 Sec. Line
N 0° 54' 58.70" W

10 OH6, LLC
TOL, NE 1/4
Sec. 23-T16S-R8E

Jason D. Leeds
TOL, NE 1/4
Sec. 23-T16S-R8E

12 Jason D. Leeds
Lot 71
Samples Subdivision

13 Michelle J. Marquez, et al.
Lot 60, 61 & 62
Samples Subdivision

SW corner Velie Street
Do Not Disturb
Existing Rock Wall

STA. 488+10
End Mill & Overlay,
Begin Reconstruction

STA. 488+73.82 END
Proj. 177-064 KA-6017-01 =
Sta. 22+03.92 On
Proj. 13-6 F434(8)
End Reconstruction

POT+50.00
Velie Street
+57.58 Temp. Esmt. = Ex. R/W 65' ℄
+57.63 Ex. R/W 40' ℄
+40 Temp. Esmt. = Ex. R/W 40' ℄
+83.41 Ex. R/W 40' ℄
Const. Limits
81°2'13" ℄ to ℄
105°00'00" ℄ to ℄
89°47'40" ℄ to ℄
S 9° 9' 40.00" W
Exist. R/W
Sta.488+77.68 K-177 =
Sta. 50+00 Velie Street

+45.74 R/W = ℄ 245' ℄
+05 R/W 215' ℄
+05 R/W 194' ℄
+05 R/W 177' ℄
+60 R/W 158' ℄
+00 R/W 155' ℄
+25 R/W = Ex. R/W 77.63' ℄
℄ K-177
℄ 900 Road
Jason D. Leeds
Lot 71
Samples Subdivision
+71.68 R/W = ℄ 80' ℄
POT+50.00
PC+71.53
PT+97.53
Exist. R/W
R/W
Const. Limits
gravel
900 Road
BM-25
CP-110
Sawcut
barbed wire
wire fence
rock ledge
rock ledge
D.M.
Trailer
Crabapple
Tree
Elm
Redbud
Walnut
Oak
Maple
Fence Post
Sta. 482+26
End Mill & Overlay,
Begin Reconstruction

+20 R/W 75' ℄
+70 R/W 75' ℄
+94.47 R/W = Ex. R/W 65' ℄
+00 R/W 80' ℄
+00 R/W 80' ℄
+00 R/W 70' ℄
+50 R/W = Ex. R/W 65' ℄
+97.80 Ex. R/W 40' ℄
+97.80 Temp. Esmt. = Ex. R/W 55' ℄
+97.80 R/W = Ex. R/W 65' ℄
+97.80 R/W 70' ℄
+80 Temp. Esmt. = Ex. R/W 40' ℄
+40 Temp. Esmt. 55' ℄
+15 House Ent. (Mound)
+57.82 Temp. Esmt. = Ex. R/W 50' ℄
+57.80 Ex. R/W 40' ℄
+40 Temp. Esmt. = Ex. R/W 40' ℄
POT+00.00
℄ Velie Street
Sta.483+30.00 K-177 =
Sta. 50+00 900 Road
Sta. 483+06
End Reconstruction,
Begin Mill & Overlay
Sta. 486+15 Construct
Mound Entrance Rt.
S 89° 48' 7.14" E
Sec. Line ℄ 119.09

11 Debra K. Wylie
TOL, NE 1/4
Sec. 23-T16S-R8E

Sta. 482+66 Install
36"x74' CRP
with End Sections,
Plug & Fill Existing 2'x2'x70' RCB
with Fly Ash Slurry Grout
(High Strength)
and Abandon In Place
See Sh. No. 49,50,53,101,102

14 Duane Devries
Lots 68, 69 & 70
Samples Subdivision

15 JoDee Romo
TOL, Lot 63
Samples Subdivision

16 Lois Ann Bluhm
TOL, Lot 63
Samples Subdivision

Sta. 486+90 Rt.
Do Not Disturb House

N Cor. Sec. 23, T16S, R8E
N: 119,648.956 E: 1,743,003.696
1. Fnd. ½" Rebar w/ CLS20 Cap
2. 40D Nail and Washer in Power Pole in CL drive to W 58.25' NNE
3. Top of Anchor Bolt 48.0' NE
4. T-post 53.8' WNW

NE Cor. Sec. 23, T16S, R8E
N: 119,639.769 E: 1,745,661.981
1. Existent in Neosho River
2. ½" Rebar (SW Cor. SE ¼ Sec. 14) 2,658.3' W
3. ½" Rebar Witness w/ PS752 Cap (13' N of Fence) 87.00' E
4. ½" Rebar Witness w/ PS752 Cap 675.00' N

UTILITY OWNERS (THIS SHEET)

Telephone - Tri-County Telephone

Water - Rural Water District No. 1

Gas - ATMOS Energy

Powerline - Flint Hills RECA

B.M. #24 "T" Post 1' W of Fence Post
71.20' Rt. ℄ STA. 466+09.30 Elev. 1,304.71

B.M. #25 "T" Post at Top of K-177 Hwy Ditch Backslope
109.00' Lt. ℄ STA. 480+28.90 Elev. 1,297.13

B.M. #26 Square Cut on Top of Curb at W End, N Side Velie Street
53.40' Lt. ℄ STA. 488+89.90 Elev. 1,240.63

See Sh. No. 36 for Storm Sewer Design

KANSAS DEPARTMENT OF TRANSPORTATION

PLAN SHEET

STA. 466+00 TO STA. 493+00

Plotted : 16-JAN-2025 07:36
Drawn By : mrockwell
File : ka601701rpl-07.dgn

CADconform Certify This File

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	22	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

For Earthwork Balance 3 See Sh. No.18

+73.82

10' x Sp. Dt. Lt. +50
Std. Dt. Lt.
+75
10' x Sp. Dt. Lt.
+65
No Dt. Lt.
+75
4' x Sp. Dt. Lt.
+00
4' x 1.5' Dt. Lt.
+48 +73.82 No Dt. Lt.

Std. Dt. Rt.
10' x Sp. Dt. Rt.
4' x 1.5' Dt. Rt.
+48 +73.82 No Dt. Rt.

+00 10' x Sp. Dt. Rt.
+50
+75 +50 No Dt. Rt.

1315.57 +75 Lt.
1309.21 +50 Lt.
1306.30 +00 Rt.
1298.00 +25 Lt.
1293.00 +25 Lt.
1291.30 +00 Rt.
1285.20 +00 Lt.
1283.00 +00 Rt.
1281.00 +00 Lt.
1271.50 +65 Lt.
1270.40 +65 Rt.
1269.50 +00 Rt.
1268.75 +75 Lt.
1264.00 +00 Rt.
1260.70 +50 Rt.
1260.00 +00 Lt.
1255.75 +00 Rt.
1255.25 +75 Rt.
1256.64 +00 Lt.

-8.75% Sp. Dt. Lt.
-11.71% Sp. Dt. Lt.
-5.00% Lt.
-4.46% Sp. Dt. Lt.
-8.30% Rt.
-4.20% Lt.
-7.60% Sp. Dt. Rt.
-5.76% Sp. Dt. Lt.
-5.69%
-7.65% Rt.
-5.50% Rt.
-6.60% Rt.
-9.90% Rt.
-3.36% Lt.
-0.67% Rt.
-7.08%

Existing Ground Line

Sta. 482+66
36"x74' RCP
Cr. Gr. = 1,278.37
Ex. ℄ Lt. = 1,265.00
Ex. ℄ Rt. = 1,264.46
Prop. ℄ Lt. = 1,271.36
Prop. ℄ Rt. = 1,270.55

+26 P.V.I. End Mill & Overlay
1,280.64 Begin Reconstruction
+06 P.V.I. End Reconstruction
1,276.09 Begin Mill & Overlay
+10 P.V.I. End Mill & Overlay
1,244.97 Begin Reconstruction
+73.82 End Project
Match Existing

1,370 1,360 1,350 1,340 1,330 1,320 1,310 1,300 1,290 1,280 1,270 1,260 1,250 1,240 1,230 1,220 1,210

6 7 8 9 470 1 2 3 4 475 6 7 8 9 480 1 2 4 485 6 7 8 9

KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE SHEET

STA. 466+00 TO STA. 493+00

Plotted : 16-JAN-2025 07:36
Drawn By : mrockwell
File : ka6017101rpr-07.dgn

CADconform Certify This File

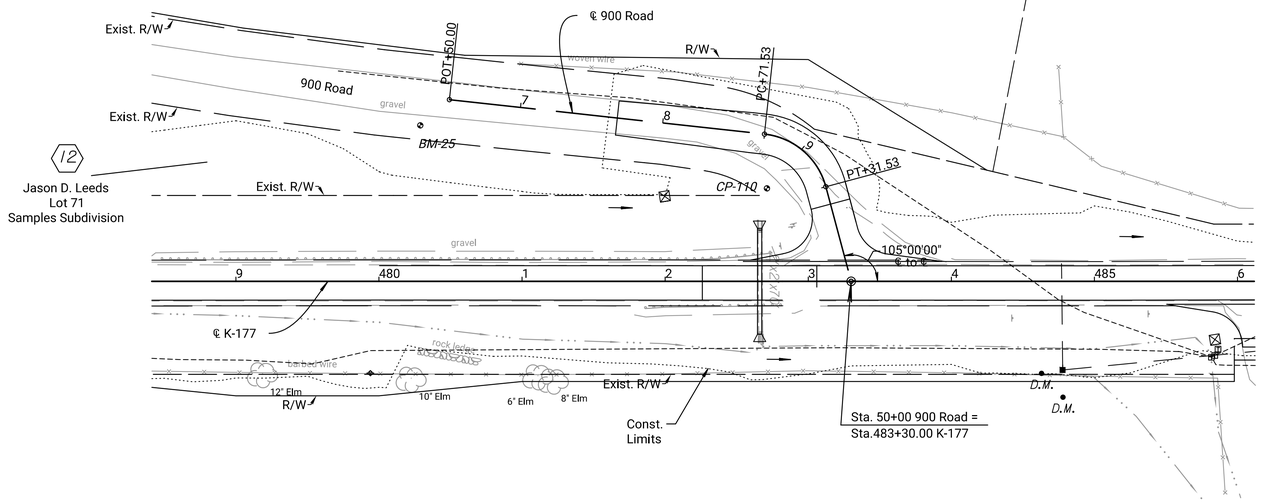
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	23	291

DATE	BY
10-2021	J. Unruh - Benesch
10-2021	R. Nuessen - Benesch
REFERENCES NOTED	
REFERENCES CHECKED	

12
Jason D. Leeds
Lot 71
Samples Subdivision

P.I. Sta. 49+05.74 (Bk.) = Sta. 48+97.32 (Ahd.)
△ = 68° 45' 33" (RT)
D = 114° 35' 30"
R = 50.00'
T = 34.21'
L = 60.00'
E = 10.58'



SCALE
50' 0 50' 100'
PLAN: Lat. & Long.
PROFILE: Horiz. same as above
Vert.
10'
0

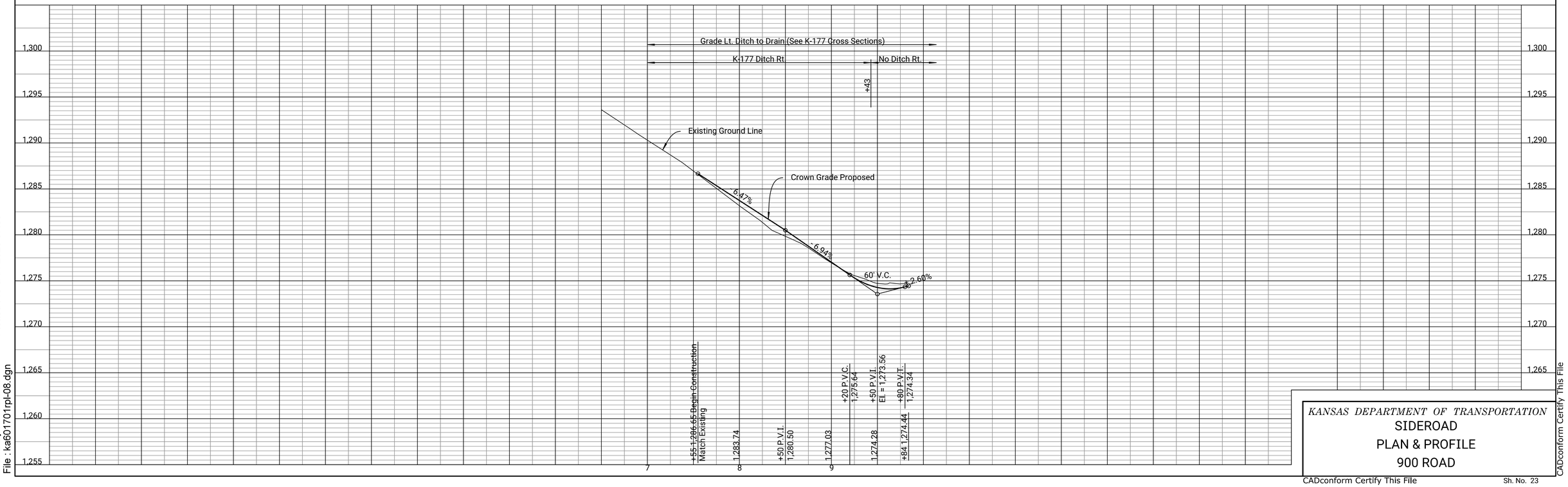
UTILITY OWNERS (THIS SHEET)

Telephone - Tri-County Telephone

Water - Rural Water District No. 1

Gas - ATMOS Energy

Powerline - Flint Hills RECA



KANSAS DEPARTMENT OF TRANSPORTATION
SIDEROAD
PLAN & PROFILE
900 ROAD

CADconform Certify This File

Sh. No. 23

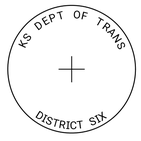
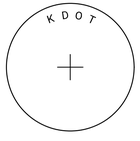
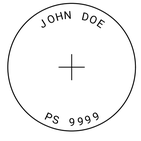
Plotted : 16-JAN-2025 07:36
Drawn By : mrockwell
File : ka601701rpl-08.dgn

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	24	291

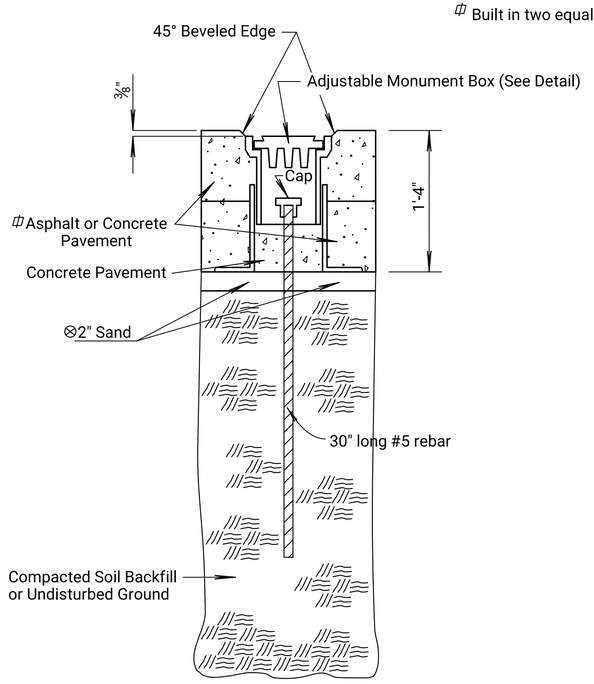
EXHIBIT

2" DIA. PRE-STAMPED ALUMINUM CAPS

KDOT - DISTRICT 1	KDOT - DISTRICT 2	KDOT - DISTRICT 3
		
KDOT - DISTRICT 4	KDOT - DISTRICT 5	KDOT - DISTRICT 6
		
KDOT STATE SURVEY CREW BUREAU OF RIGHT OF WAY	SURVEY COMPANY WITH A VALID CORPORATION LICENSE	INDEPENDENT SURVEYOR OR SOLE PROPRIETOR COMPANY

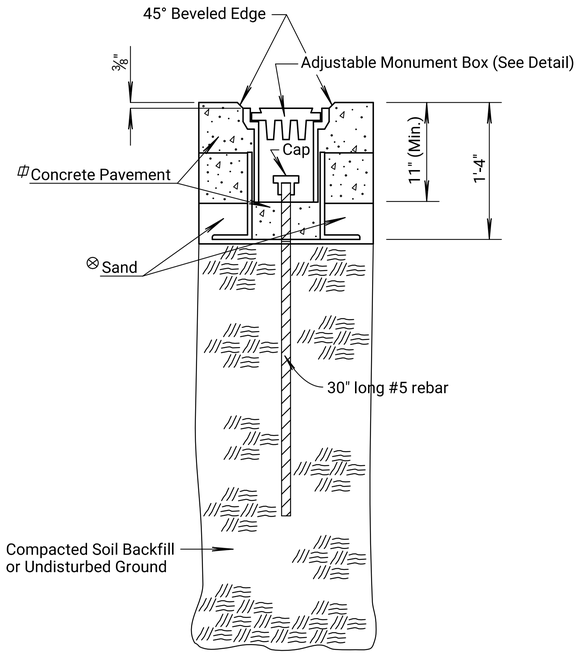
⊗ Hand tamp sand to achieve Type B compaction.

⧈ Built in two equal lifts



TYPE A-1

(Standard Land Corner Monument Box)



TYPE A-2

(Standard Land Corner Monument Box)

GENERAL NOTES

Use the proper identification cap for the party installing the monument, as shown on the exhibit.

Make all stampings, forgings, and impressions legible. The stampings, forgings, and impressions will properly identify the location of the monument within the Public Land Survey System (PLSS).

A "System of Marking" is available in the current "Manual of SURVEYING INSTRUCTION", which is published by the United States Department of the Interior, Bureau of Land Management.

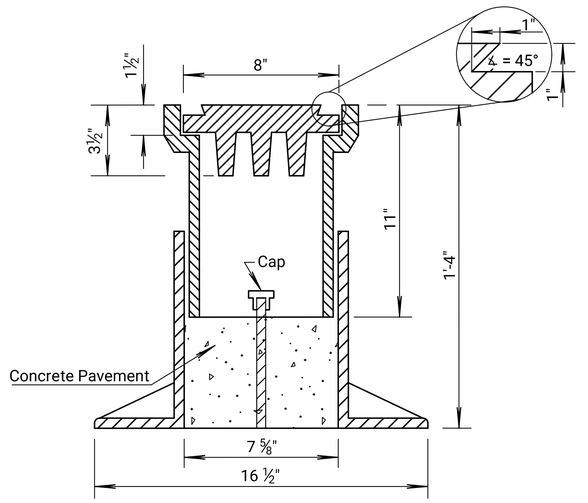
Reset all PLSS corners in accordance with KDOT's Standard Specifications.

In addition to monumentation of the PLSS corner, the Engineer may direct or select specific locations for offset monumentation, as shown.

Use Type A-1 or Type A-2 monuments as directed by the Surveyor or the Engineer.

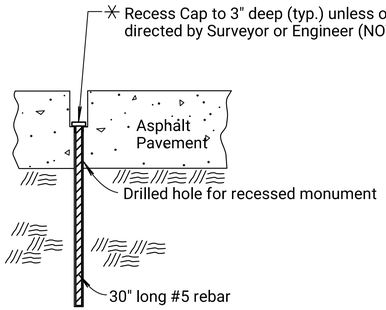
Type A monumentation may be used on a project as specified in the plans or as directed by the Engineer. Typically, Type A monuments are used on high traffic volume roadways, in urban areas, or as required by local governmental codes. Otherwise, use Types B-D monumentation. Avoid installing monument boxes in vehicle wheelpaths where practicable.

All work and materials required to install the Type A-1 and Type A-2 monument boxes will be paid under the bid item "Monument Box (Each)" and will be included in the plan quantities. All work and materials required to install Types B-D monumentation will be subsidiary to the bid item "Contractor Construction Staking (Lump Sum)". See KDOT's Standard Specifications for details.



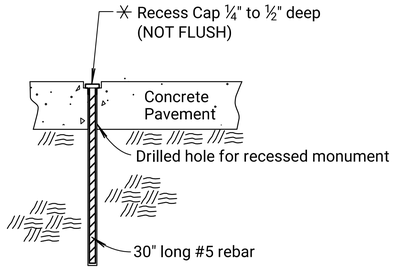
ADJUSTABLE MONUMENT BOX DETAIL

(Neenah R-1968 Type 36-B or approved equivalent)



Type B

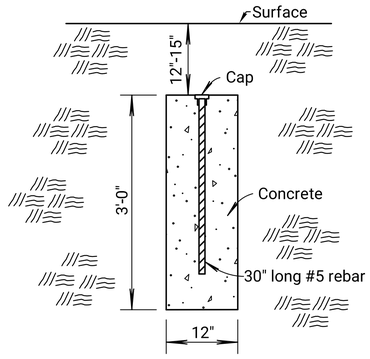
(Recessed Bar)



Type C

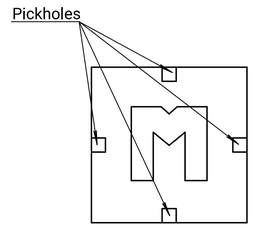
(Drilled Hole)

✳No Surface Monuments Allowed in Pavement



Type D

(Shoulder/Ditch Subsurface Monument)



MONUMENT BOX LID (PLAN VIEW)

Not to Scale

NO.	DATE	REVISIONS	BY	APP'D
4	8-24-18	Rev. Det. Mon. Box AND Rev. Gen. Note	A.L.R.	T.T.R.
3	1-15-16	Add. Det., Retrofit & Rev. Gen. Note	T.T.R.	S.W.K.
2	10-17-13	Revised Detail, Recessed Bar	S.W.K.	J.O.B.
1	11-10-03	Revised Monument Types	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SECTION CORNER MONUMENTATION DETAIL SHEET

RD990

FHWA APPROVAL 8-7-2019		APP'D. SCOTT W. KING	
DESIGNED	DETAILED KAHLE	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK. RHOADS	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-10-2022 Sh. No. 24

KDOT Graphics Certified

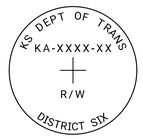
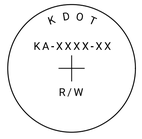
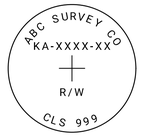
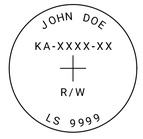
Plotted:16-JAN-2025 07:36

Drawn By : mrockwell
File : rd990.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	25	291

EXHIBIT

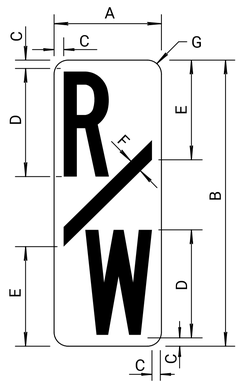
2" DIA. PRE-STAMPED ALUMINUM CAPS

KDOT - DISTRICT 1	KDOT - DISTRICT 2	KDOT - DISTRICT 3
		
KDOT - DISTRICT 4	KDOT - DISTRICT 5	KDOT - DISTRICT 6
		
KDOT STATE SURVEY CREW BUREAU OF RIGHT-OF-WAY	SURVEY COMPANY WITH A VALID CORPORATION LICENSE	INDEPENDENT SURVEYOR OR SOLE PROPRIETOR COMPANY

NOTES:

KA-XXXX-XX is the KDOT Project number
All stampings, forgings, and impressions shall be in accordance with the standard specifications and as shown on this drawing.

KI-107

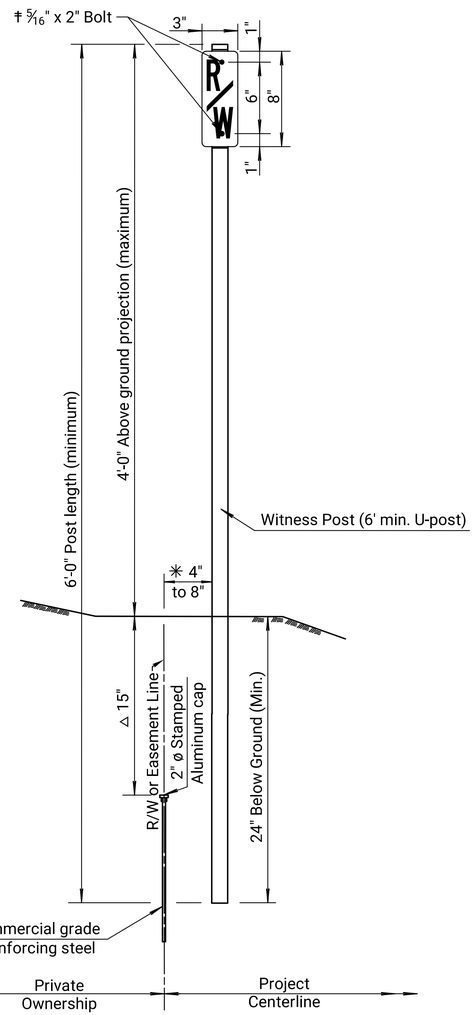


COLORS:

BACKGROUND - WHITE (REFLECTIVE)
LEGEND - BLACK (NON-REFLECTIVE)
LEGEND SERIES - 'B'

A	B	C	D	E	F	G
3"	8"	1/4"	3"	2 3/4"	3/8"	3/8"

R/W SIGN DETAIL



PLAN VIEW

NOTES

✳ 4" (Min.) to 8" (Max.) from rebar to witness post. (USE CAUTION, DO NOT DISTURB THE REBAR WHEN SETTING A POST). The witness post shall be set radial or perpendicular to the project centerline from the rebar. The "open face" of the U-post shall face the project centerline with the sign attached to the "open face". This exhibit is a side view, except for the sign, which is shown as turned for the purpose of illustrating content only. (See Sign Detail).

‡ Drill or punch holes. Attach 2 flat washers, 1 lock washer, and 1 nut per bolt.

△ Or as directed by the Engineer.

GENERAL NOTE

The post shall be U-shaped (6' minimum length) and factory painted the color of persian red (KDOT Orange) by an electronically powder-coated oven-baked process.

All installations shall have proper identification cap for the party installing it (See Exhibit). Monument(s) shall be set in accordance with the standard specifications and as shown on this drawing.

Removal and disposal of existing concrete R/W markers shall not be paid for directly but shall be Subsidiary to other items of the contract.

In an urban area, the witness post may be omitted as directed by the Engineer.

The R/W survey monuments shall be paid for under the bid item "Right-of-Way Survey Monuments (Each)" and be included in the plan quantities. ✡The table shown on this sheet is intended for additional monuments set in the field and will be filled out by the contracted survey company.

Mount R/W survey monument signs facing the road.

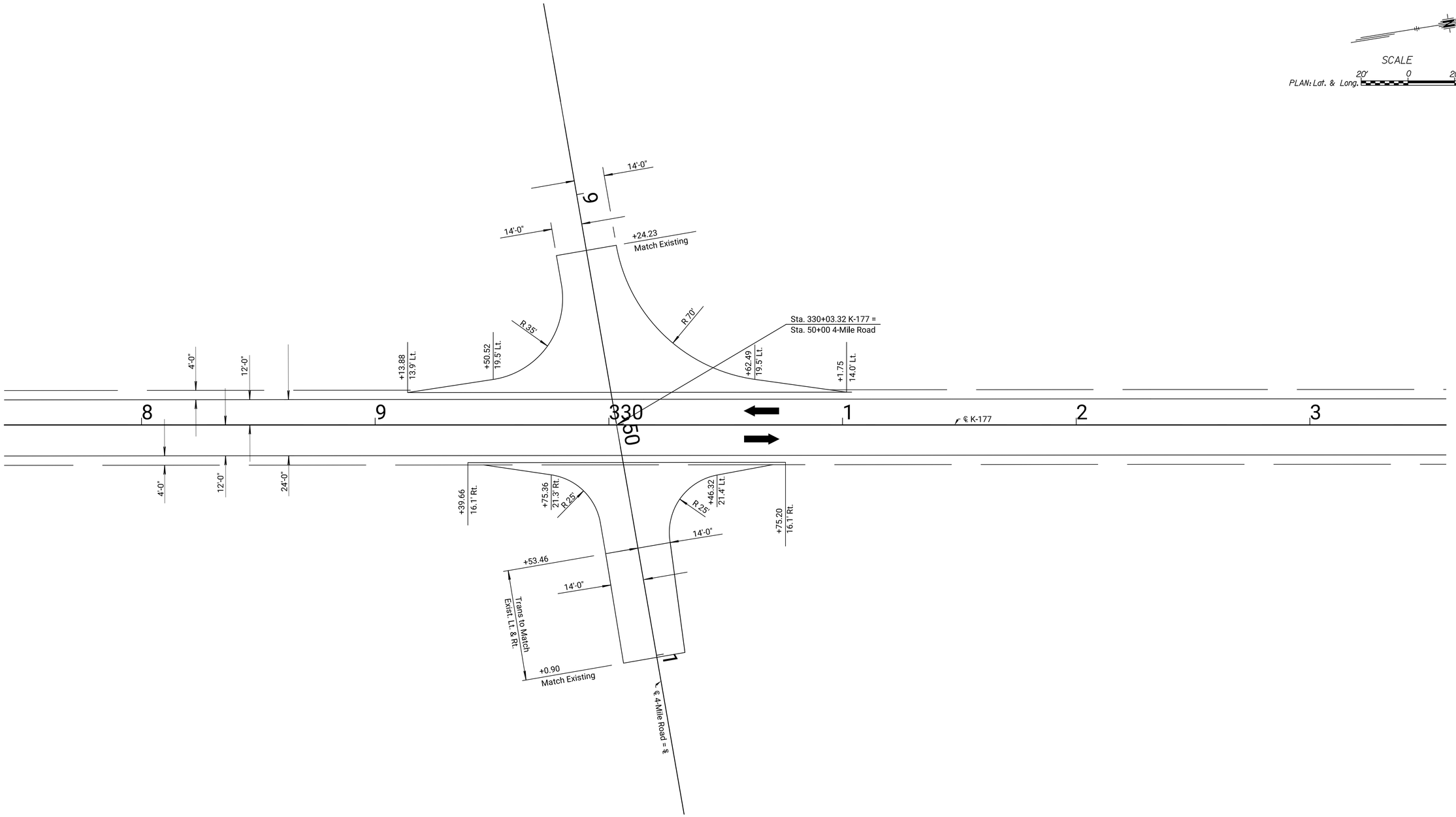
✡ Additional R/W Survey Monuments set by Contractor			
Station	Offset (Lt./Rt.)	Northing	Easting

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	26	291

SCALE
20' 0 20' 40'
PLAN: Lat. & Long.

BY	DATE
J. Unruh - Benesch	10-2021
R. Nuessen - Benesch	10-2021

REFERENCES NOTED
REFERENCES CHECKED



4 MILE ROAD

KANSAS DEPARTMENT OF TRANSPORTATION

INTERSECTION DETAIL

4 MILE ROAD

CADconform Certify This File

Sh. No. 26

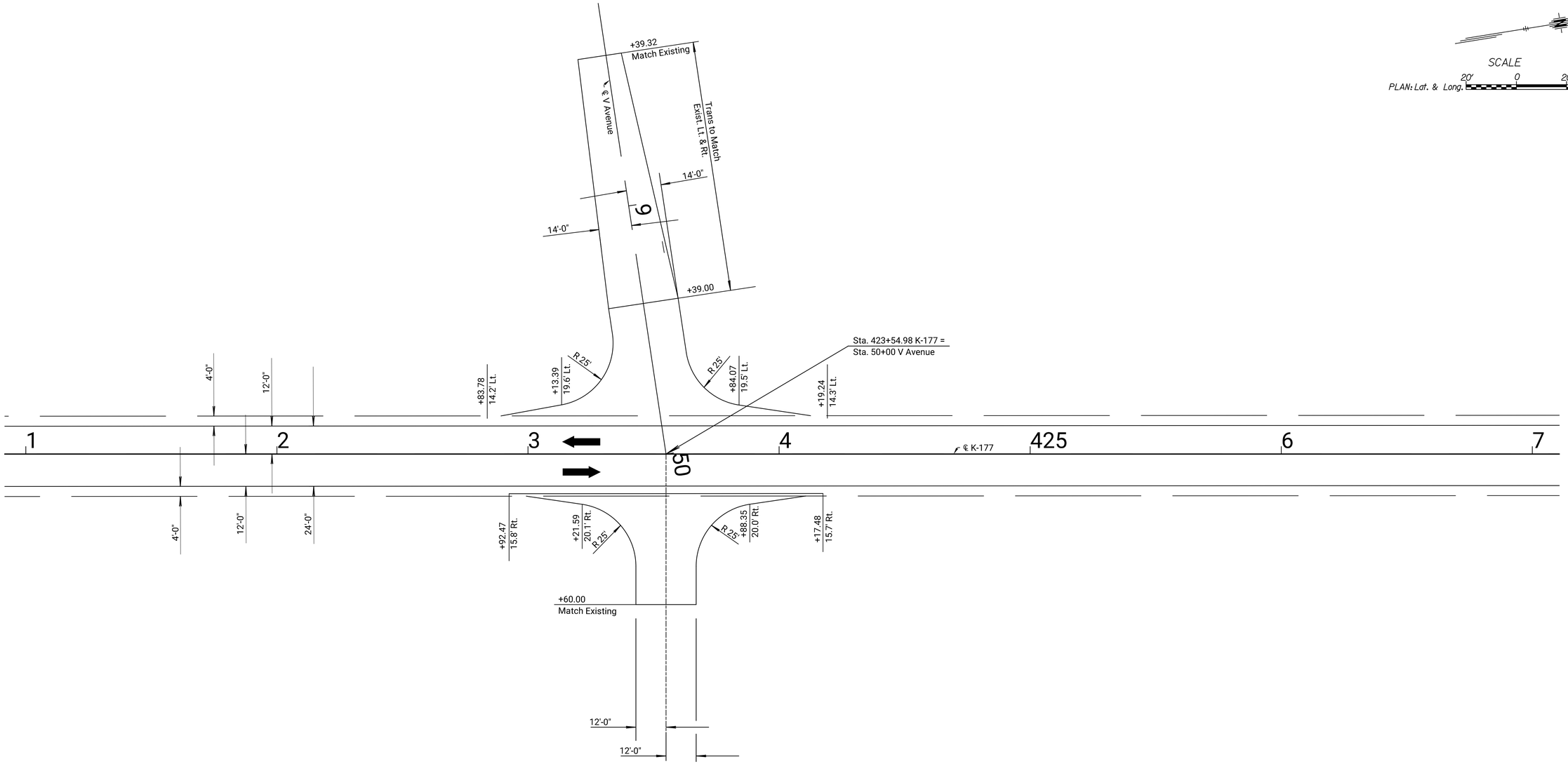
Drawn By : mrockwell
File : ka6017011nt-01.dgn
Plotted : 16-JAN-2025 07:37

CADconform Certify This File

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	27	291

SCALE
20' 0 20' 40'
PLAN: Lat. & Long.

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021



V AVENUE

KANSAS DEPARTMENT OF TRANSPORTATION

INTERSECTION DETAIL

V AVENUE

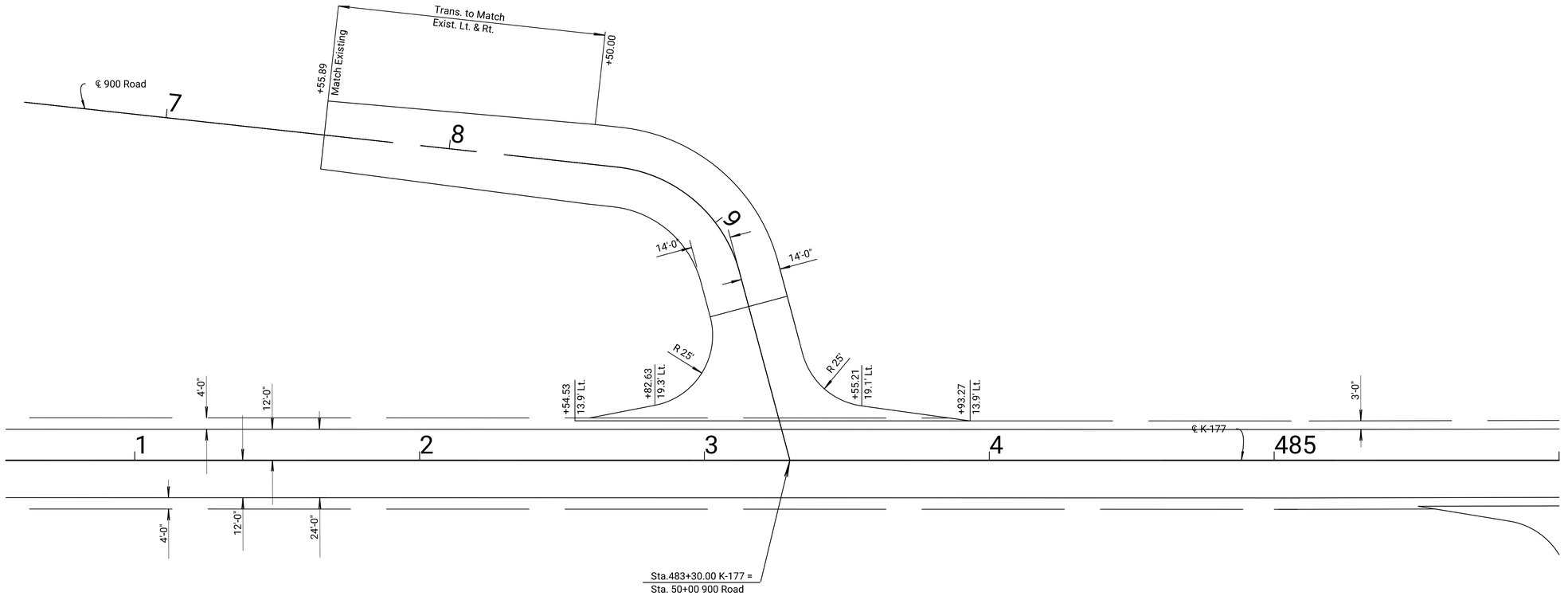
Plotted : 16-JAN-2025 07:37
Drawn By : mrockwell
File : ka601701int-02.dgn

CADconform Certify This File

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	28	291

SCALE
20' 0 20' 40'
PLAN: Lat. & Long.



900 ROAD

KANSAS DEPARTMENT OF TRANSPORTATION

INTERSECTION DETAIL

900 ROAD

CADconform Certify This File Sh. No. 28

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

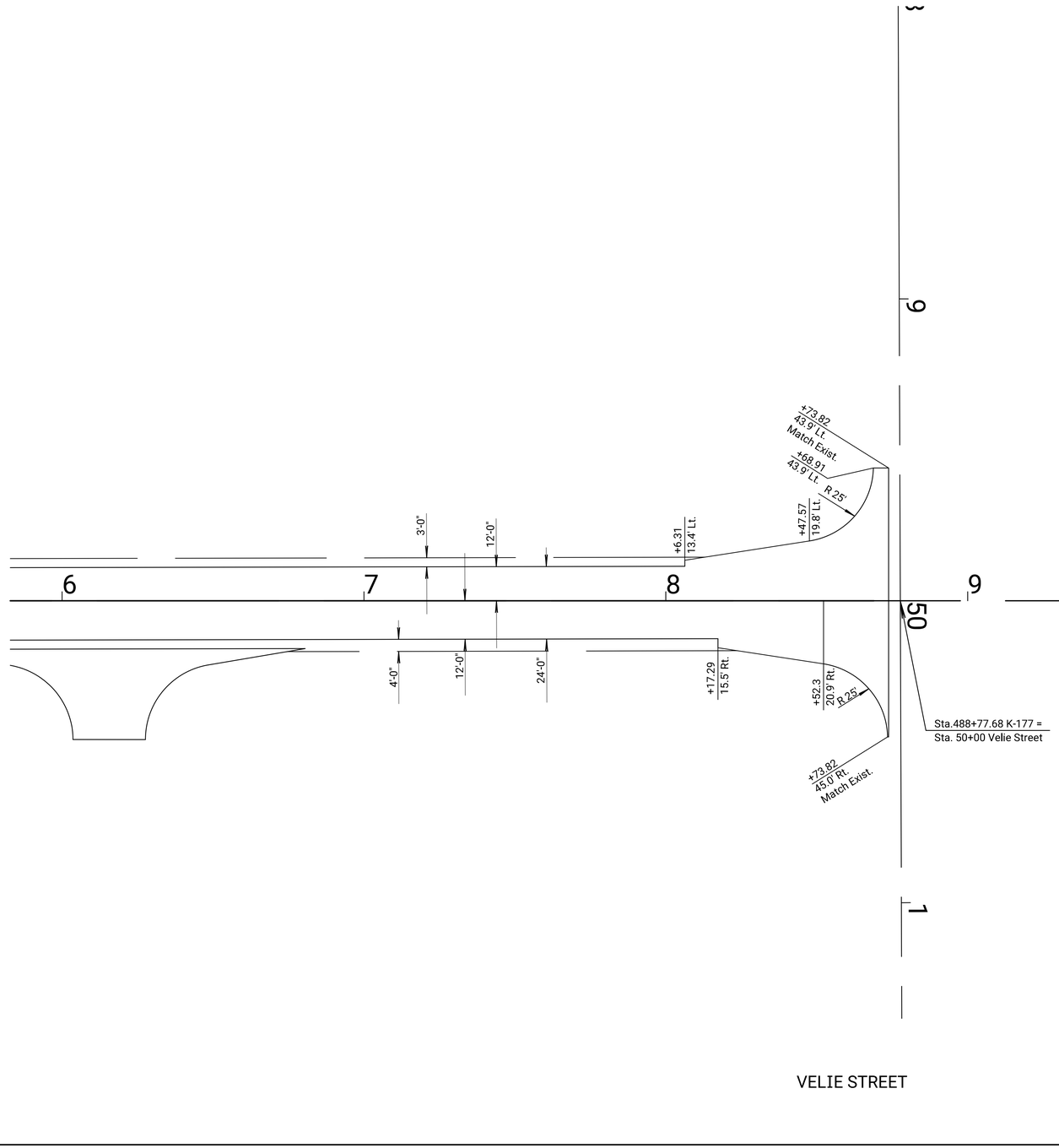
Plotted : 16-JAN-2025 07:37
Drawn By : mrockwell
File : ka6017701int-03.dgn

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	29	291

SCALE
20' 0 20' 40'
PLAN: Lat. & Long.

BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021



VELIE STREET

KANSAS DEPARTMENT OF TRANSPORTATION

INTERSECTION DETAIL

VELIE STREET

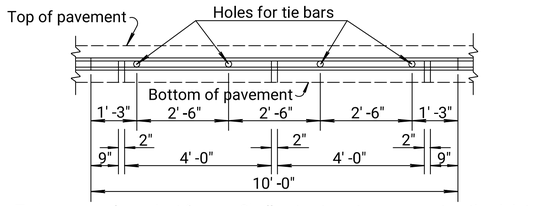
CADconform Certify This File

Sh. No. 29

Plotted : 16-JAN-2025 07:37
Drawn By : mrockwell
File : ka6017701int-04.dgn

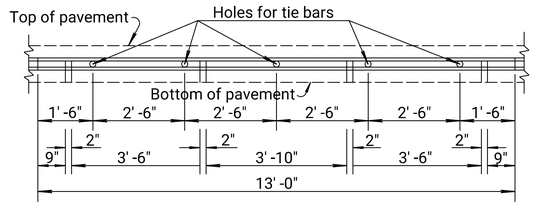
CADconform Certify This File

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	30	291



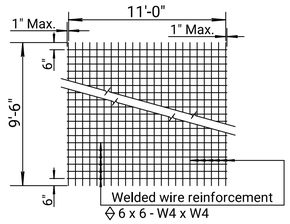
To be used only against forms. Shall not extend through contraction joints.

METAL STRIP FOR
LONGITUDINAL CONSTRUCTION JOINT (10'-0")



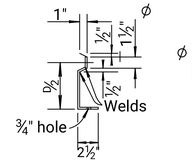
To be used only against forms. Shall not extend through contraction joints.

METAL STRIP FOR
LONGITUDINAL CONSTRUCTION JOINT (13'-0")



TYPICAL SHEET OF WELDED WIRE REINFORCEMENT
FOR SPECIAL BRIDGE APPROACH PAVEMENT

◊ Note: Epoxy coated #3 bars longitudinally @ 12" ctrs. & #3 bars transversely @ 18" ctrs. may be substituted for each layer of epoxy coated welded wire reinforcement.



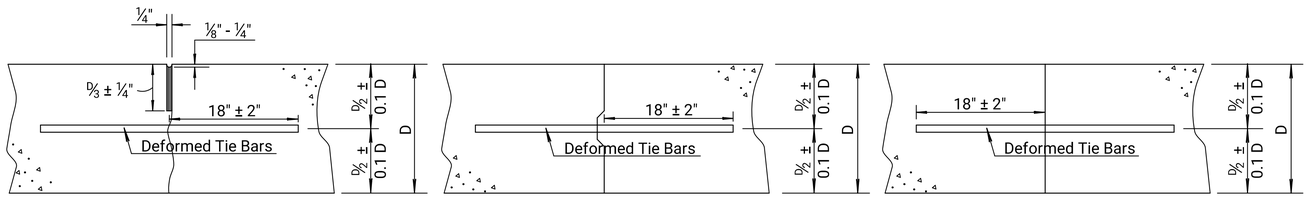
SECTION OF RECESSED
FORM LEG

ϕ Snap-in leg or other approved designs may be used in lieu of welded leg.

DETAIL OF LAP FOR WELDED WIRE REINFORCEMENT

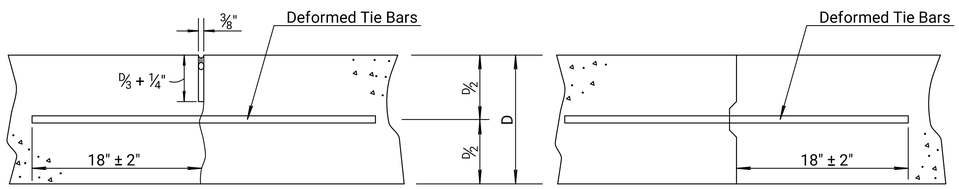
The lap shall extend beyond the first transverse or bag wire of each sheet.

The sheet shall be wired securely at the edges and at intervals not to exceed 2'-6" for the full width of the sheet. Approximate weight of welded wire reinforcement = 58 lbs. per 100 sq. ft. Other methods for fastening the sheets of welded wire reinforcement at the laps may be used with the approval of the Engineer.



LONGITUDINAL JOINTS

Note: For longitudinal construction joints the contractor has the option of using either the keyed or butt type. Place deformed tie bars mid-depth of the shoulder.



TRANSVERSE JOINTS

Note: A construction joint is required when the concrete placement has been interrupted for a substantial length of time or at the end of a day's placement.

GENERAL NOTES

All work shall be done in conformity with the Standard Specifications applicable to the project.

The cost of all bars and joint material shown on this sheet is to be included in the bid price for Concrete Pavement.

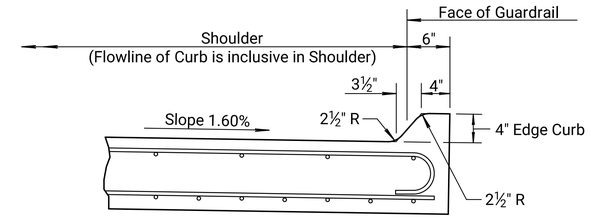
At each planned transverse joint location, a 4 to 6 inch wide strip of the pavement surface shall be protected from the texturing operation to provide a transverse textureless surface centered over the joint sawcut.

All sawed joints on this project shall be filled with sealant in accordance with Standard Specifications.

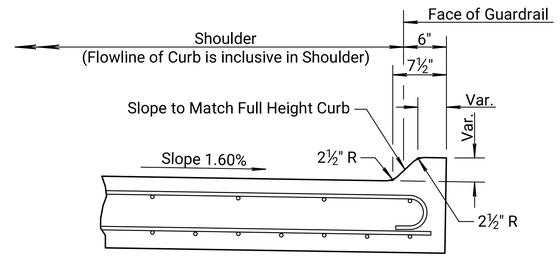
The 4 inch edge curb shall be constructed integral with the approach slab shoulder.

All materials and work required for this construction shall be Subsidiary to the concrete approach slab.

Tie bars shall be evenly spaced along the length of the slab and no tie bars shall be within 12" of contraction joint.

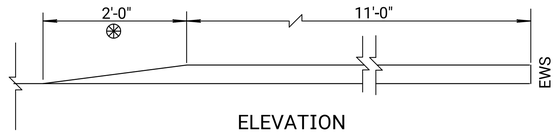


SECTION A-A

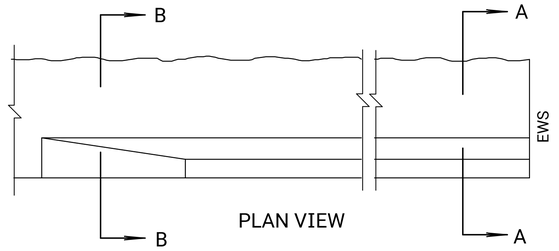


SECTION B-B

⊛ No 4" Curb transition when adjacent to Flume Inlet.



ELEVATION



PLAN VIEW

4" EDGE CURB DETAIL

NO.	DATE	REVISIONS	BY	APP'D
13	5-17-13	Revised Note, Longitudinal Joints	S.W.K.	J.O.B.
12	5-1 4-09	Pres. Relief Jt. to RD712/tie bar lab.	S.W.K.	J.O.B.
11	10-23-08	Revised Sec. A-A and Sec. B-B	S.W.K.	J.O.B.
10	10-3-07	Add. manufacturer jt. size recom'd.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS DETAILS
FOR CONCRETE
BRIDGE APPROACH PAVEMENT

RD711

FHWA APPROVAL	10-23-13	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

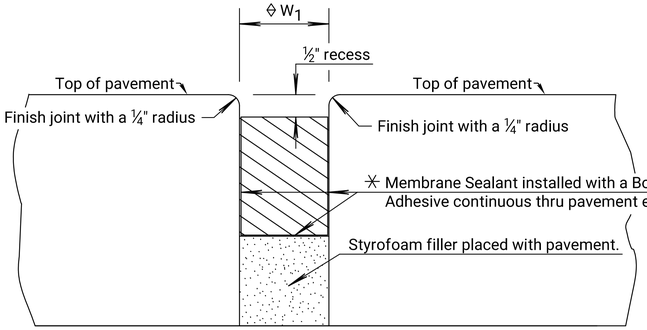
KDOT Graphics Certified 06-10-2022 Sh. No. 30

KDOT Graphics Certified

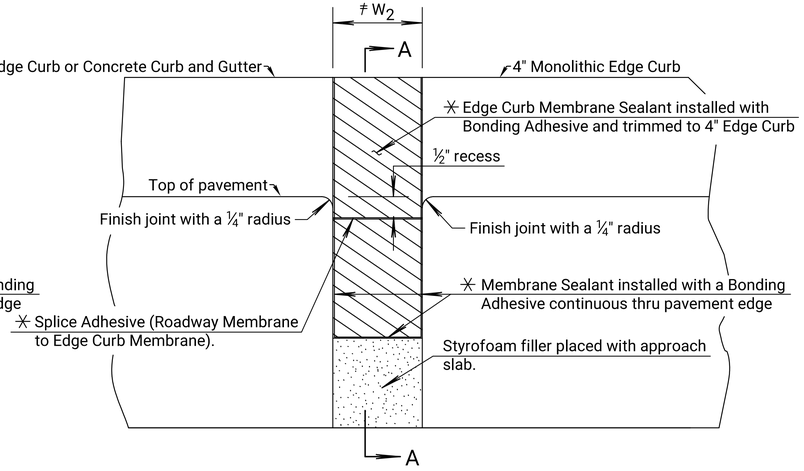
Plotted :16-JAN-2025 07:37
Drawn By : mrockwell
File : rd711.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	31	291

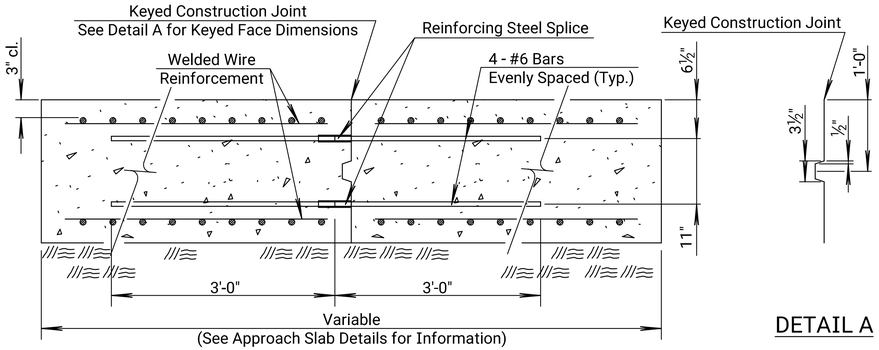
Note to Designer: For Membrane Sealant Expansion Joint on Non-skewed Bridges the maximum length of expansion is: 380' for Steel Bridges, 410' for Concrete Bridges.



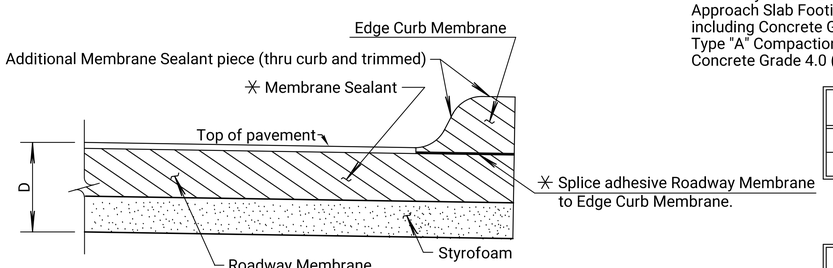
ELEVATION PRESSURE RELIEF JT.



ELEVATION EXPANSION JT.



DETAIL A



SECTION A-A

(See Std. Drawing RD711 for details of 4" Edge Curb.)

GENERAL NOTES

EXPANSION/PRESSURE RELIEF JOINTS

See Concrete Bridge Approach Pavement standard drawings for location of expansion and pressure relief joints.

Form the joint opening prior to placement of the pavement approach. Remove the material used to form the joint after the pavement approach has been in place for a minimum of 6 days.

Clean and construct the joint only after the concrete in the approach slab has cured for a minimum of 7 days.

Thoroughly clean the joint by sandblasting and by high pressure air blast to remove all laitance and contaminants from the joint. When any joint is shaped by saw cutting in lieu of forming, blast the joint with water prior to sandblasting and air cleaning.

Accomplish sandblasting in two passes to clean each face of the joint (one pass for each face). Hold the nozzle 1 to 2 inches from the joint face at an angle to the joint face.

Remove any contaminants such as oil, curing compound, etc. by sandblasting to the satisfaction of the Engineer. Solvents, wire brushing, or grinding are not permitted.

Air blast the joint just prior to installing the Membrane Sealant. Equip the air compressor used to clean the joint with trap devices capable of providing moisture-free and oil-free air at a recommended pressure of 90 psi. Spot check the joint to verify any residual dust or dirt has been removed. The Engineer is required to inspect the joint immediately prior to installing the joint material.

⚹ See KDOT Standard Specifications for Membrane Sealant, Bonding Adhesive and Splice Adhesive. The width of the membrane sealant is 4 inches (nominal).

Do not allow traffic on the joint for a minimum of 3 hours unless otherwise directed by the Engineer.

Use splice materials and methods recommended by the Manufacturer.

All work and materials for the preparation, construction, and installation of the joint will be subsidiary to the concrete approach pavement.

BRIDGE APPROACH SLAB FOOTING

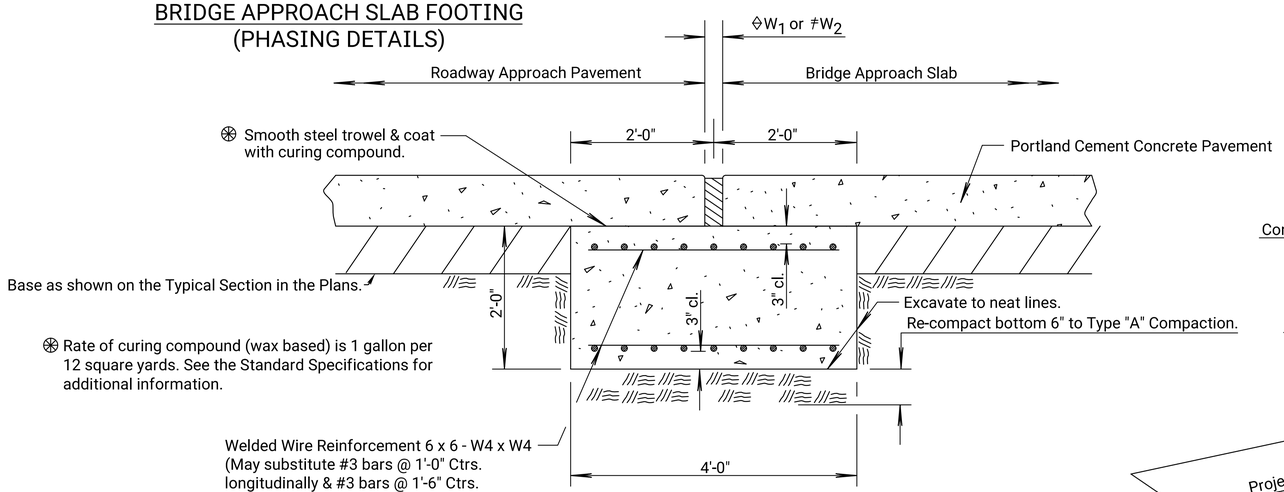
Pay for the Bridge Approach Slab Footing at the unit price bid per cubic yard for "Bridge Approach Slab Footing". This price will be full compensation for furnishing all materials and labor including Concrete Grade 4.0 (AE) Pavement, Reinforcing Steel (Gr. 60) (Epoxy Coated), excavation, Type "A" Compaction and materials used to prevent bonding of concrete. The Contractor may use Concrete Grade 4.0 (AE) or the mix used in the concrete pavement for the slab footing.

◊ PRESSURE RELIEF JOINT WIDTH DETAILS (W_1)							
℉ Temperature (F°)	40°	50°	60°	70°	80°	90°	100°
Formed Concrete Opening Size	4.0"	3¾"	3½"	3¼"	3.0"	2¾"	2½"

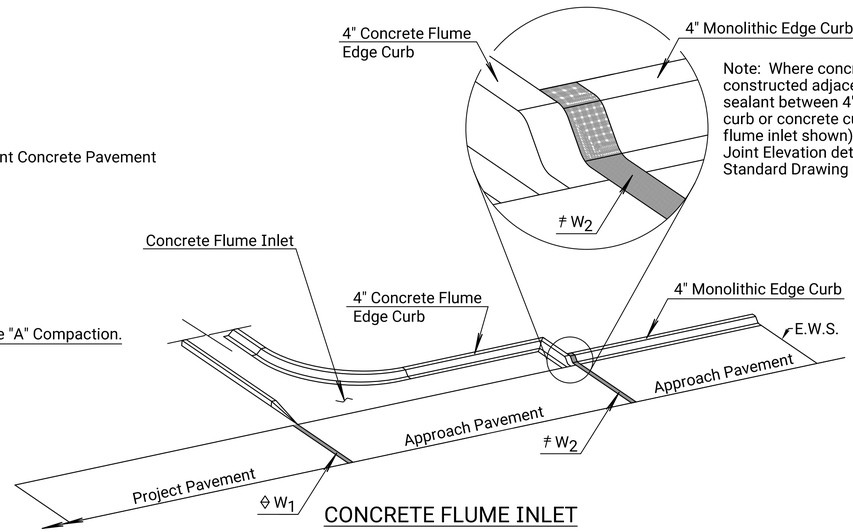
℉ Average Ambient Temperature over previous 24 hours.

≠ EXPANSION JOINT WIDTH DETAILS (W_2)
See bridge construction layout sheet for details.

BRIDGE APPROACH SLAB FOOTING (PHASING DETAILS)



BRIDGE APPROACH SLAB FOOTING



CONCRETE FLUME INLET

(Membrane Sealant Placed Through Edge Curb Detail)

Note: Where concrete flume inlets or concrete curb and gutter are constructed adjacent to bridge approach slab pavement place membrane sealant between 4" monolithic edge curb and 4" concrete flume inlet edge curb or concrete curb and gutter as shown on this sheet (concrete flume inlet shown). See approach slab Standard Drawings, Expansion Joint Elevation detail this sheet, Standard Drawing RD628, and Standard Drawing RD635 for additional details.

LEGEND

Membrane Sealant

NO.	DATE	REVISIONS	BY	APP'D
10	1-22-16	Add. Det., Keyed Joint & Flume Inlet	T.T.R.	S.W.K.
9	10-16-13	Revised General Note	S.W.K.	J.O.B.
8	4-4-13	Rev. Joint Width Det. Table	S.W.K.	J.O.B.
7	7-10-09	Adjusted Expansion joint table	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

BRIDGE APPROACH SLAB DETAILS EXPANSION/PRESSURE RELIEF JOINT/ BRIDGE APPROACH SLAB FOOTING

RD712

FHWA APPROVAL	2-1-16	APP'D.	Scott W. King	
DESIGNED	DETAILED	QUANTITIES	TRACED	
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.	

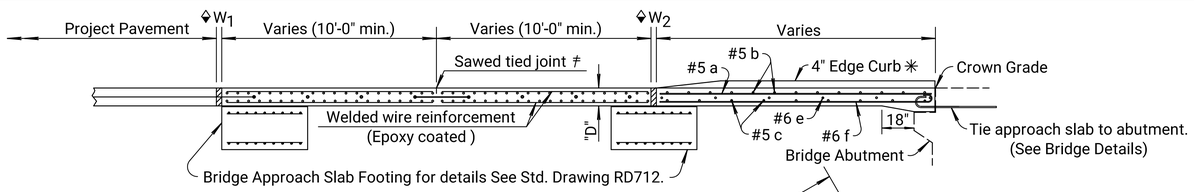
KDOT Graphics Certified 06-10-2022 Sh. No. 31

KDOT Graphics Certified

Plotted 16-JAN-2025 07:37

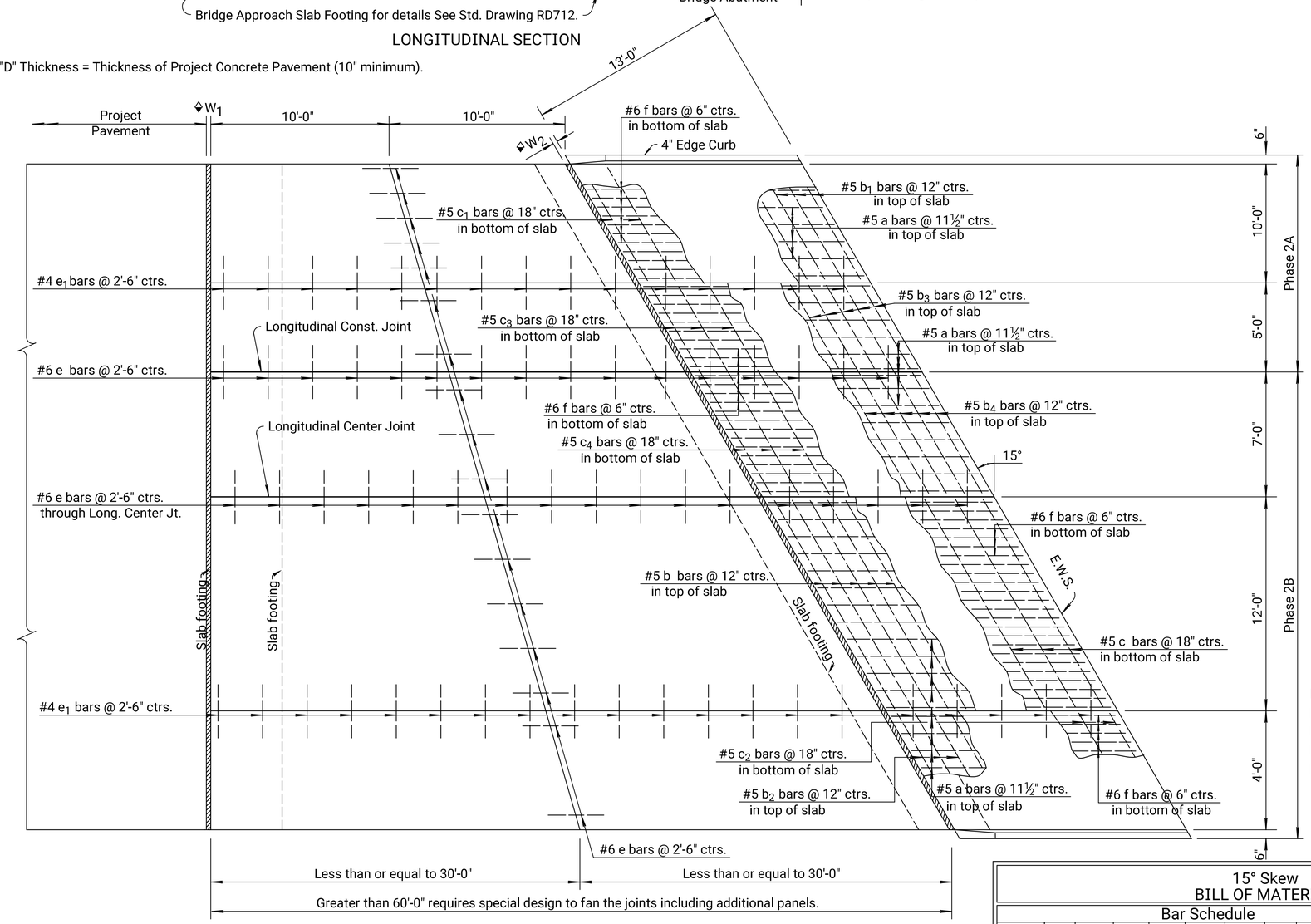
Drawn By : mrockwell
File : rd712.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	32	291



LONGITUDINAL SECTION

"D" Thickness = Thickness of Project Concrete Pavement (10" minimum).



PLAN VIEW

(No Scale)

Note: Spacing of longitudinal reinforcing bars is normal to center line.
Spacing of transverse reinforcing bars is parallel to center line.

⊗ Measured along the Expansion/Pressure Relief Joint.

✳ For details of 4" Edge Curb, See Std. Drawing RD711.

W1 and W2 for Expansion/Pressure Relief Joint width and details See Standard Drawing RD712.

≠ Contractor has the option of substituting a Tied Keyed Construction Joint.

GENERAL NOTE

Special Concrete Bridge Approach shall be paid for as Sq. Yds. of Concrete Pavement (10" Unif.)(AE)(Br. App.) and includes all work and materials required to construct the approach slab as shown on this sheet.

All work and materials required for installation of expansion joints and pressure relief joints shall be subsidiary to this bid item.

At the Contractor's option #4x3'-0" tie bars @ 15" centers may be substituted for the #6 e bars at 2'-6" centers.

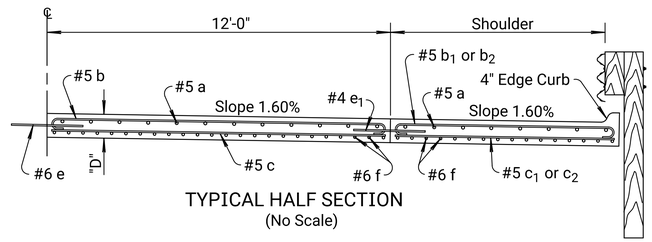
All reinforcing steel shall be epoxy coated.

See Standard Drawing RD711 for details of joints, welded wire reinforcement, and edge curb.

Clearance from the face of concrete for all reinforcing steel shall be 2 inches.

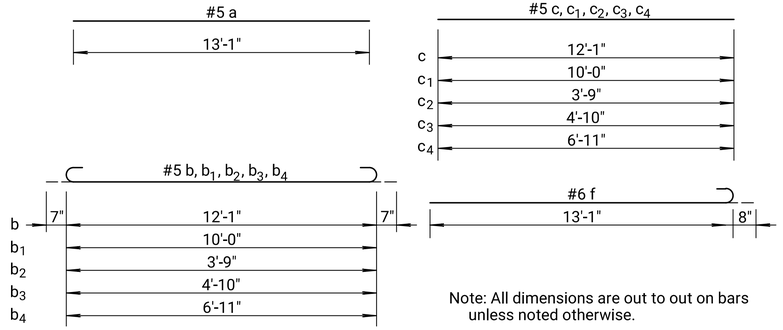
Standard reinforcing bar hooks in accordance with the latest ACI specifications shall be used throughout.

The pressure relief joint shall be omitted when the concrete bridge approach pavement abuts asphalt pavement.



TYPICAL HALF SECTION

(No Scale)



Note: All dimensions are out to out on bars unless noted otherwise.

BENDING DIAGRAMS

15° Skew
BILL OF MATERIALS

Bar Schedule														
Bar	a	b	b_1	b_2	b_3	b_4	c	c_1	c_2	c_3	c_4	e	e_1	f
No.	45	15	15	15	15	15	10	10	10	10	10	50	35	81
Size	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#6	#4	#6
Length	13'-1"	13'-3"	11'-2"	4'-11"	6'-0"	8'-1"	12'-1"	10'-0"	3'-9"	4'-10"	6'-11"	3'-0"	3'-0"	13'-9"

Reinforcing Steel (Grade 60) (Epoxy Coated)	3,654	lbs.
Concrete Pavement (10" Unif.)(AE)(Br. App.)	165	Sq. Yds.
Expansion Jt. Membrane Sealant ⊗	38.0	Lin. Ft.
Pressure Relief Jt. Membrane Sealant	39.4	Lin. Ft.

Note: Quantities listed for one approach slab only. Two required per bridge.
Reinforcing steel and joint lengths shown for information only.

NO.	DATE	REVISIONS	BY	APP'D
11	4-04-13	Rev. Exp./Pr. Relief Joint Dim.	S.W.K.	J.O.B.
10	9-09-09	Revised Reinforcing Steel listing	S.W.K.	J.O.B.
9	5-14-09	Revised pressure relief jt. material	S.W.K.	J.O.B.
8	10-30-08	Added guardrail post detail at curb	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

CONCRETE BRIDGE APPROACH PAVEMENT
SKEWED APPROACH

~~RD714~~ 15° Skew

FHWA APPROVAL	5-21-2013	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

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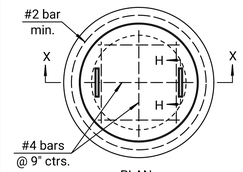
Sh. No. 32

Note to Designer: The designer shall be responsible for designating pavement thickness and computing reinforcing steel and concrete quantities and dimensions necessary to complete this sheet.

Plotted :16-JAN-2025 07:37

Drawn By : mrockwell
File : rd714.dgn

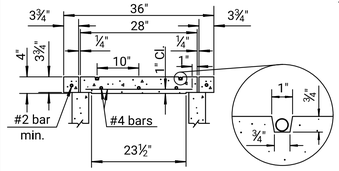
CADconform Certify This File



PLAN

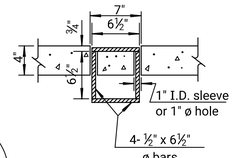
NOTE: Precast ring and cover may be substituted for light type cast iron ring and cover.

Handles shall be painted with two coats of zinc rich paint (commercial grade).



SECTION X-X

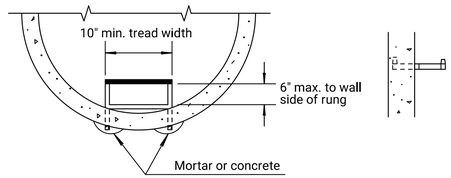
HANDLE RECESS



SECTION H-H

WELDED HANDLES
(2 required)

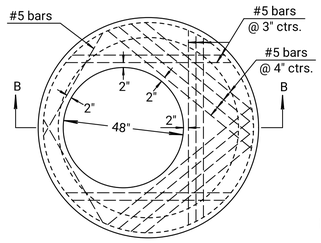
PRECAST RING AND COVER (LIGHT TYPE) (Optional)



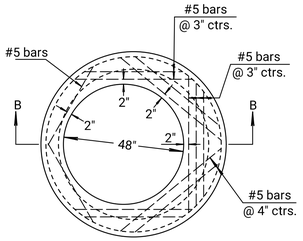
SECTION

SIDE VIEW

STEP IN MANHOLE WALL



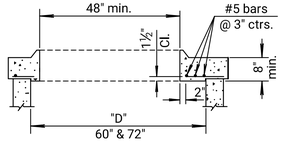
PLAN (D=72")



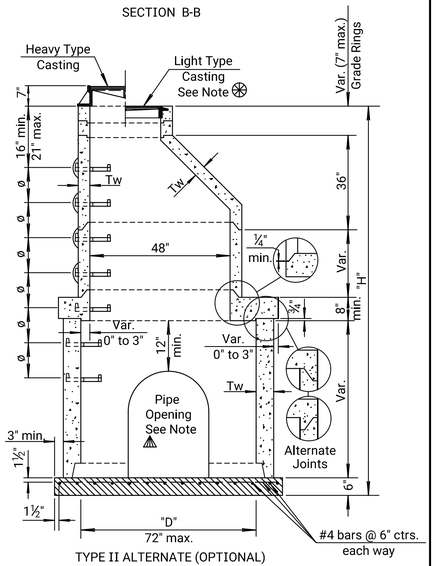
PLAN (D=60")

TYPICAL REINFORCING FOR REDUCING FLAT SLABS

NOTE: Eccentric pipe decreasers may be used for transition of manhole diameter when "H" is sufficiently large.



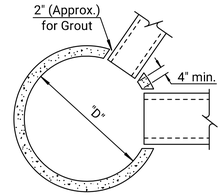
SECTION B-B



TYPE II ALTERNATE (OPTIONAL) (SECTION)

May be used when "H" is sufficiently large.

DIMENSIONS & REQUIREMENTS			
Type	"D"	Tw(min.)	⬙
I or II	48"	∓ 4"	24"
II	60"	5"	30"
II	72"	6"	48"



SKETCH SHOWING MIN. WALL BETWEEN PIPES

LEGEND (Concrete)

Precast

Cast in field

ø Steps shall be uniformly spaced. Spacing shall be 12 minimum and 16½" maximum.

∓ 5" Tw (min.) for portion of sanitary sewer manhole below 16 feet.

⬙ Maximum sewer pipe allowed for "D" shown. Increase "D" to provide 4 inch minimum wall between pipes. (see sketch)

(NOTE) Type II manhole required:
1. When distance from top of manhole to top of sewer pipe is less than 42 inches.
2. For sewer pipes greater than 24 inches.
3. To provide 4" min. wall between pipes. (see sketch)

GENERAL NOTES

Precast risers, cones, flat top slabs, reducing flat slabs, floors, grade rings, and rings and covers shall be manufactured according to the most recent ASTM C-478 Specifications and special provisions with specific details as shown on this sheet. Cone section shall be the eccentric type.

All manhole construction shall be water tight. All joints shall be filled with mortar or plastic joint compound as specified in the Standard Specifications. No payment will be made for this work.

When so ordered by the Engineer the top of the manhole shall be sloped slightly to approximately fit the ground line or other conditions.

Grade rings shall be formed with tongue and groove or lugs and notches. Grade rings shall be set in mortar.

When field conditions require "H" to be adjusted additional grade rings may be used as directed by the Engineer.

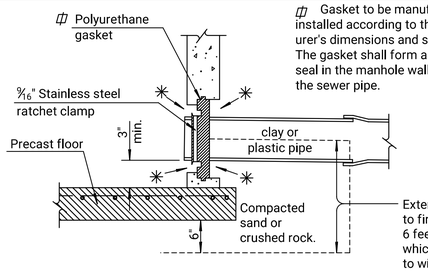
Contractor shall determine pipe locations in the field prior to ordering manholes, to insure proper positioning of pipe openings.

All dimensions relative to reinforcing steel are to center of bars unless otherwise noted.

Floor of manhole to be shaped as shown on Standard Drawing RD633. No additions in concrete quantities shall be made for shaping floor of manholes.

Steps shall be installed in all storm sewer manholes when specified in the plans or when "H" is equal to or greater than six feet. Steps shall comply with the requirements of the KDOT Standard Specification.

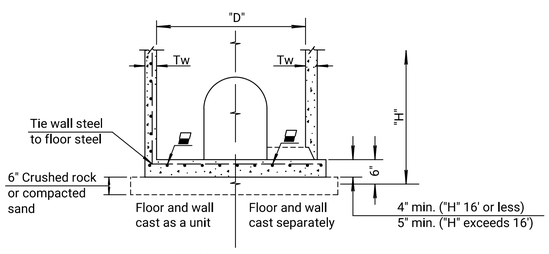
For notes and details on Cast Iron Manhole Covers and Rings see Standard Drawing RD633.



Gasket to be manufactured and installed according to the manufacturer's dimensions and specifications. The gasket shall form a watertight seal in the manhole wall and around the sewer pipe.

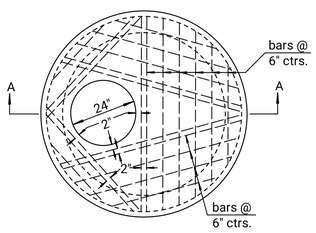
MANHOLE WITH POLYURETHANE GASKET (OPTIONAL)

✳ Fill opening in manhole wall, around Sewer Pipe, with grout or concrete. (to prevent pipe movement)



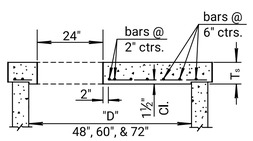
PRECAST FLOOR

Floor reinforcing shall be double the reinforcing required for wall or #4 bars @ 6" ctrs. each way.



PLAN

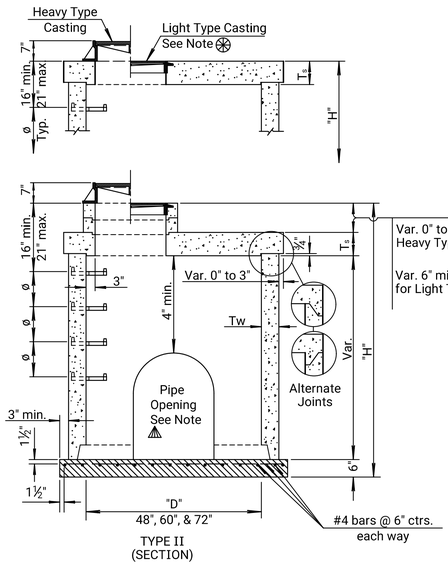
TYPICAL REINFORCING FOR FLAT TOP SLABS



SECTION A-A

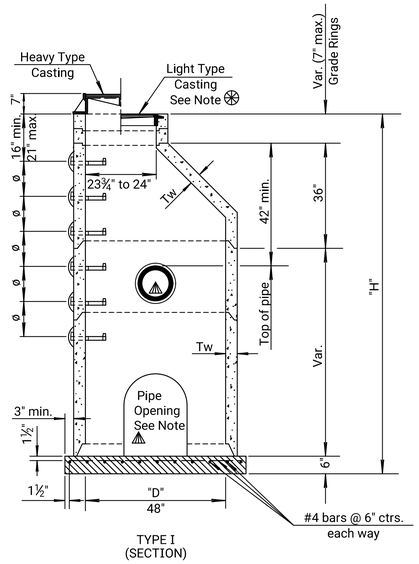
SLAB & BAR TABLE		
"D"	Ts(min.)	Bar size
48"	6"	#4
60"	6"	#4
72"	8"	#5

NOTE: Welded wire mesh of equivalent cross-sectional area may be substituted for bars @ 6" ctrs. (4 layers max.). Bars @ 2" ctrs. around opening to be as shown.



TYPE II (SECTION)

⚠ Openings for sewer pipes to be as follows:
Formed Openings: A one inch keyway shall be formed around the pipe opening.
Roughed In Openings: Reinforcing shall be left in place around the sewer pipe to reinforce the grout. Concrete shall be left rough to provide bond for grout.



TYPE I (SECTION)

⊛ NOTE: Light type cast iron ring shall be set in flat top slab or grade ring as shown. This grade ring may be precast or cast in the field. Reinforcing for grade ring cast in the field shall be a #2 circular bar (min.).

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	33	291

NO.	DATE	REVISIONS	BY	APP'D
07	07-17-17	Revised step dimension	A.L.R.	S.W.K.
06	12-11-97	Revised step spacing	R.J.S.	J.O.B.
05	10-23-92	Revised step & detailed on CADD	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

PRECAST MANHOLES

RD629

FHWA APPROVAL		08-09-17	APP'D.	Scott W. King
DESIGNED	DETAILED		QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.

CADconform Certify This File

Sh. No. 33

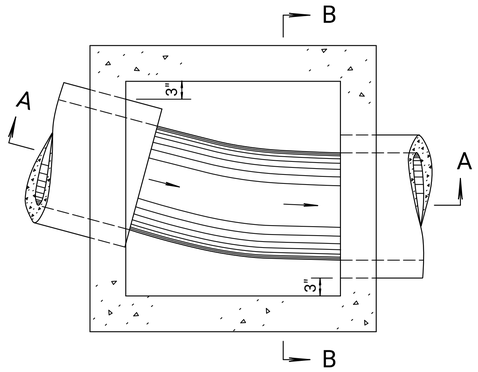
Plotted : 16-JAN-2025 07:37

Drawn By : mrockwell

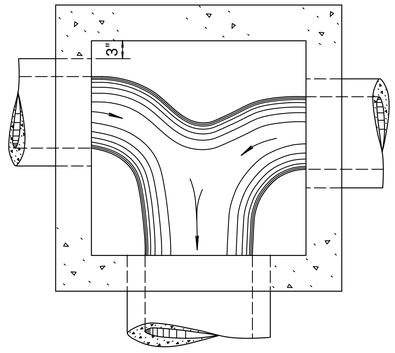
File : rd629.dgn

CADconform Certify This File

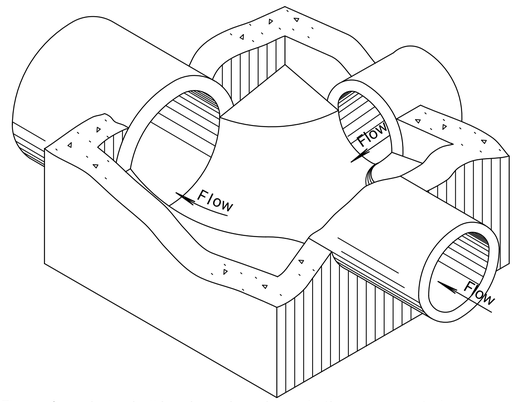
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	34	291



PLAN - FLOOR (Example I)



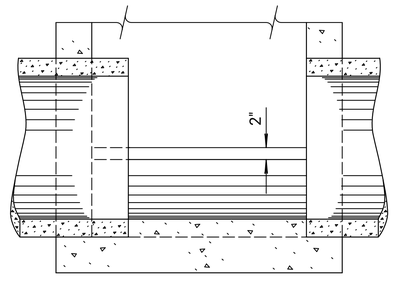
PLAN - FLOOR (Example III)



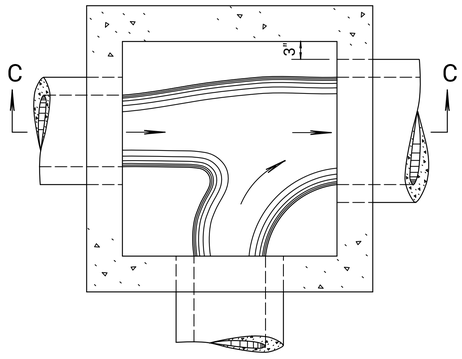
Floor of manhole shall be shaped as shown in the examples to increase hydraulic efficiency.

ISOMETRIC VIEW (Example IV)

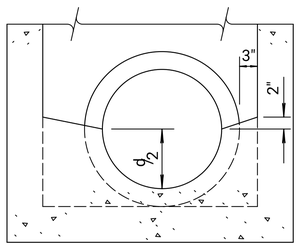
Note: Use Concrete Grade 3.0 throughout. All exposed edges shall be finished with an edging tool.
At the contractors option Concrete Grade 3.0 (AE) or mix used in concrete pavement may be used throughout.
In general, pipes will enter and leave manhole at various positions. Where possible bend bars around pipes.
Floor of manhole shall be shaped as shown in various "EXAMPLES" with unreinforced Concrete Grade 3.0.
Manhole opening and steps, where used, shall be placed to afford easy access to top of shaped invert. Top reinforcing bars shall be adjusted accordingly.
All castings shall be gray iron and shall comply with the KDOT Standard Specifications.
No deductions in concrete quantities shall be made for pipe openings or additions to concrete quantities shall be made for shaping floor of manholes.
The top of the manhole shall be sloped slightly to approximately fit the ground line or other condition as directed by the Engineer.
Dimensions and weights of cast iron as shown on this sheet are minimum. Larger dimensions and/or heavier weights of cast iron may be used.
The Contractor has the option of using precast manholes, as approved by the Engineer.
Steps shall be installed in all manholes when specified in the plans or when "H" is equal to or greater than six feet. Steps shall comply with the requirements of the KDOT Standard Specification.



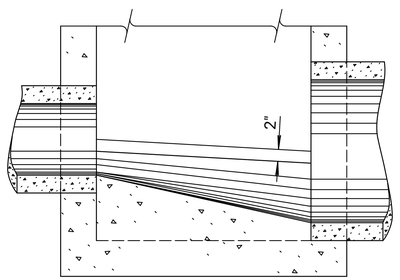
SECTION A-A (Example I)



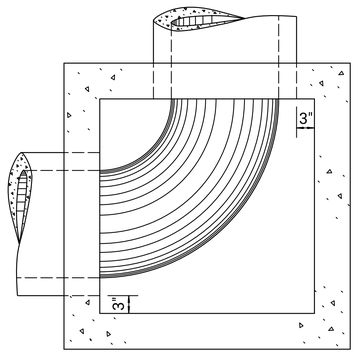
PLAN - FLOOR (Example IV)



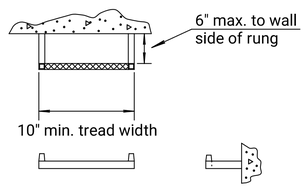
SECTION B-B (Example I)



SECTION C-C (Example IV)

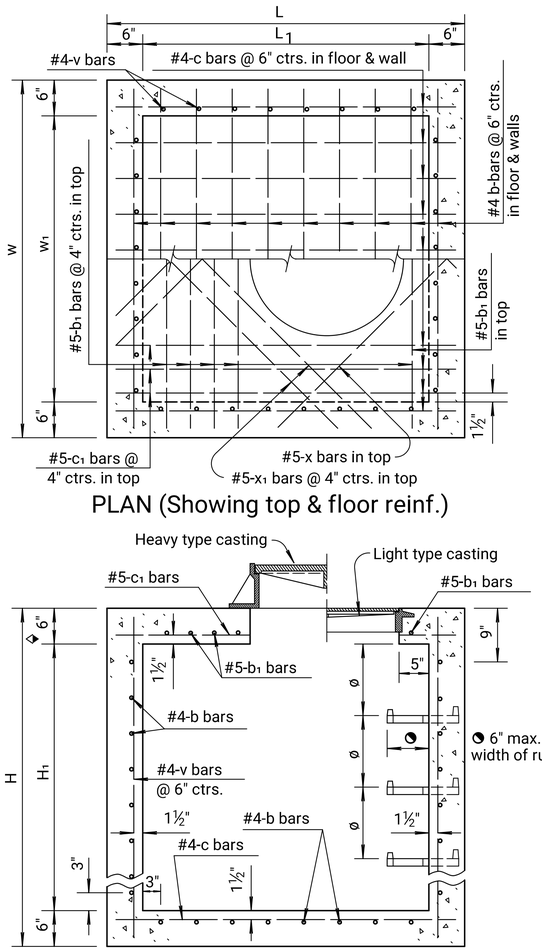


PLAN - FLOOR (Example II)



STEP DETAILS

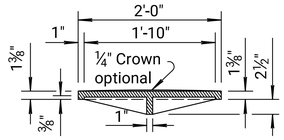
ø Steps shall be uniformly spaced. Spacing shall be 12" minimum and 16½" maximum.

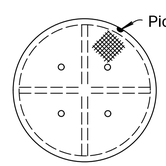


PLAN (Showing top & floor reinf.)

♦ Where dimension "L" or "W" is greater than 6'-0" use 8" slab thickness.

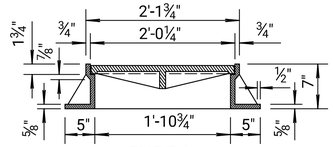
SECTION (Exclusive of floor shaping)



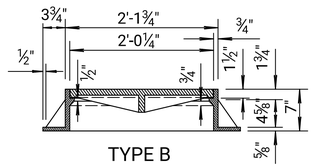


NOTE: All manhole castings are cast iron. Weight of castings includes no allowance for fillets and overruns.

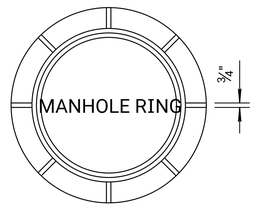
MANHOLE COVER TYPE A & B
(Weight=134 lbs.; without ¼" Crown= 125 lbs.)



TYPE A

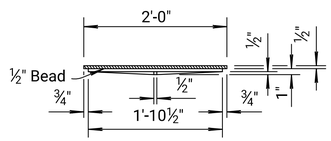


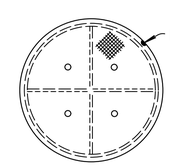
TYPE B



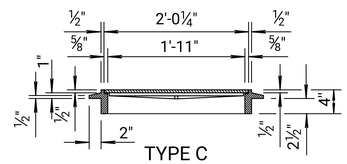
(Type A Ring= 192 lbs., Type B Ring= 198 lbs.)

HEAVY TYPE
MANHOLE COVER AND RING
Note: Either Type A or Type B may be used.

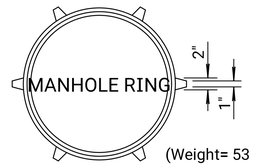




MANHOLE COVER TYPE C
(Weight= 64 lbs.)



TYPE C



(Weight= 53 lbs.)

✳ LIGHT TYPE
MANHOLE COVER & RING
✳Rings with four equally spaced lugs will be permitted.

NO.	DATE	REVISIONS	BY	APP'D
32	07-17-17	Changed step dimensions	A.L.R.	S.W.K.
31	01-28-05	Changed Class to Grade concrete	S.W.K.	J.O.B.
30	12-12-97	Revised step spacing	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

REINFORCED
CONCRETE MANHOLE

RD633

FHWA APPROVAL		08-09-17	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED	
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.	

CADconform Certify This File

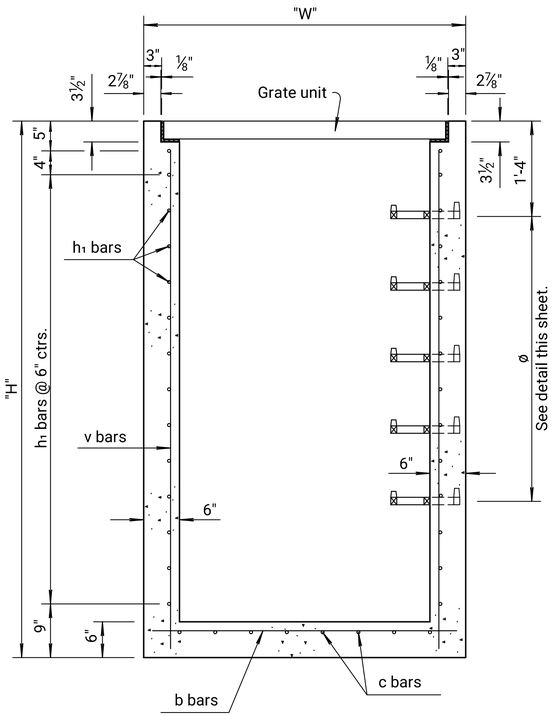
Sh. No. 34

Plotted : 16-JAN-2025 07:37
Drawn By : mrockwell
File : rd633.dgn

CADconform Certify This File

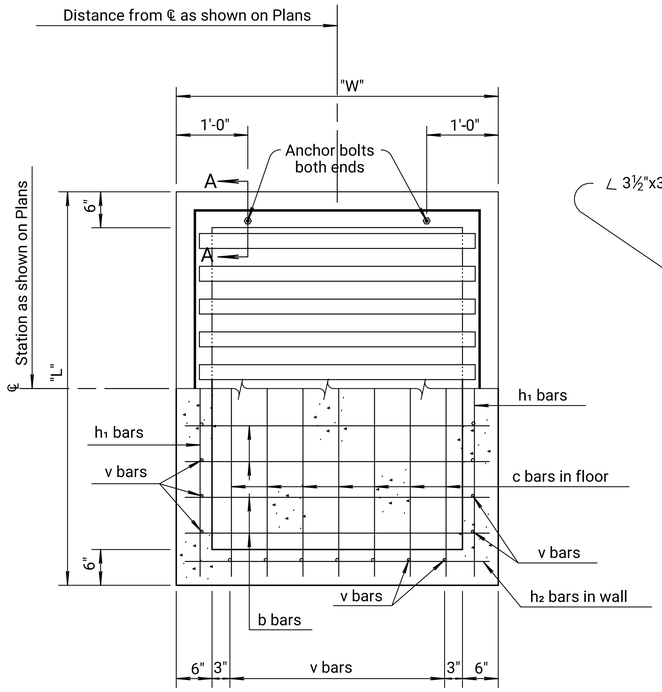
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	35	291

Note to Designer: For dimensions in any direction larger than those listed on this sheet, a structural design of both the inlet and grate should be performed.

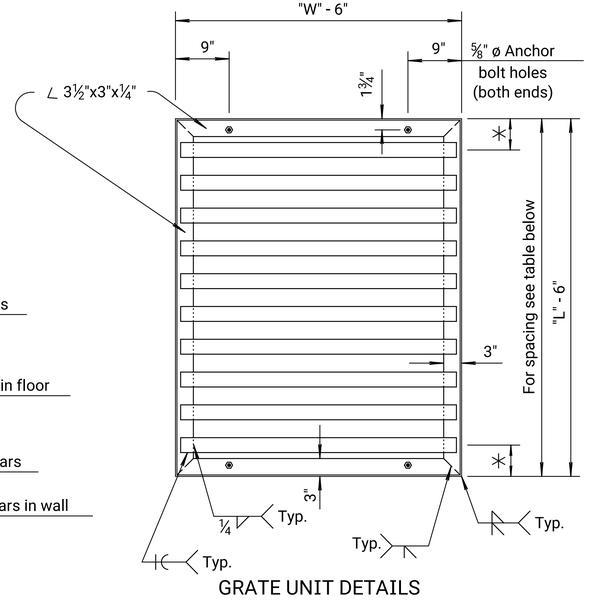


SECTION

ø Steps shall be uniformly spaced. Spacing shall be 12" minimum and 16½" maximum.



PLAN AND SECTION



GRATE UNIT DETAILS

GENERAL NOTE

Use Concrete Grade 3.0 throughout. All exposed edges shall be finished with an edging tool.

At the contractors option, Concrete Grade 3.0 (AE) or mix used in concrete pavement may be used throughout.

In general, pipes will enter and leave the manhole at various positions. Where possible bend bars around pipes.

Floor of inlet shall be shaped as shown in various "Examples" on Reinforced Concrete Manhole Standard Drawing RD633. Concrete used for shaping shall be unreinforced Concrete Grade 3.0 or concrete pavement mix. No addition in concrete quantities shall be made for shaping floor of inlets.

Manhole steps, where used, shall be placed to afford easy access to top of shaped invert.

No deductions in concrete quantities shall be made for pipe openings.

All bars are #4 @ 6" spacing and shall have a minimum clearance of 1½" unless otherwise noted on the plans.

The top of the manhole shall be sloped slightly to approximately fit the ground line or other conditions as directed by the Engineer.

Steps shall be installed on all storm sewer inlets when specified in the plans or when "H" is equal to or greater than six feet. Steps shall comply with the KDOT Standard Specification.

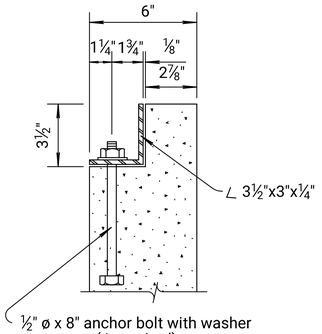
The grade shall be fabricated from standard or commercial grade structural steel and black steel pipe. The unit shall be hot dipped, galvanized after fabrication, in accordance with ASTM A123 except the weight of coating shall average not less than 2.0 ounces per square foot of actual surface and no individual test shall show less than 1.8 ounces of coating per square foot of actual surface area.

BILL OF MATERIALS FOR INLET-MANHOLE (SPECIAL)

"L" "W" "H" 4'-6" x 4'-6" x 3'-6"				"L" "W" "H" 7'-6" x 4'-6" x 7'-6"				"L" "W" "H" 4'-6" x 4'-6" x 5'-0"											
Bar	No.	Size	Length	Bar	No.	Size	Length	Bar	No.	Size	Length	Bar	No.	Size	Length	Bar	No.	Size	Length
v	28	#4	3'-0"	v	40	#4	7'-0"	v	28	#4	4'-6"	v		#4		v		#4	
c	7	#4	4'-3"	c	7	#4	7'-3"	c	7	#4	4'-3"	c		#4		c		#4	
b	7	#4	4'-3"	b	13	#4	4'-3"	b	7	#4	4'-3"	b		#4		b		#4	
h_1	12	#4	4'-3"	h_1	28	#4	7'-3"	h_1	18	#4	4'-3"	h_1		#4		h_1		#4	
h_2	12	#4	4'-3"	h_2	28	#4	4'-3"	h_2	18	#4	4'-3"	h_2		#4		h_2		#4	
Conc. Grade 3.0			1.23 Cu.Yd.	Conc. Grade 3.0			3.42 Cu.Yd.	Conc. Grade 3.0			1.80 Cu.Yd.	Conc. Grade 3.0			Cu.Yd.	Conc. Grade 3.0			Cu.Yd.
Reinf. steel			164 Lbs.	Reinf. steel			473 Lbs.	Reinf. steel			226 Lbs.	Reinf. steel			Lbs.	Reinf. steel			Lbs.
Struct. steel			260 Lbs.	Struct. steel			430 Lbs.	Struct. steel			236 Lbs.	Struct. steel			Lbs.	Struct. steel			Lbs.
Class III Excav.			5 Cu.Yd.	Class III Excav.			17 Cu.Yd.	Class III Excav.			8.0 Cu.Yd.	Class III Excav.			Cu.Yd.	Class III Excav.			Cu.Yd.

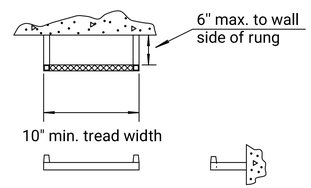
BILL OF MATERIALS FOR INLET-MANHOLE (SPECIAL)

"L" "W" "H" 4'-6" x 4'-6" x 6'-0"				"L" "W" "H" 5'-6" x 4'-6" x 7'-6"				"L" "W" "H" 4'-0" x 4'-0" x 4'-6"				"L" "W" "H" 4'-6" x 4'-6" x 4'-0"				"L" "W" "H" 4'-6" x 4'-6" x 4'-6"				"L" "W" "H" 5'-6" x 4'-6" x 5'-0"			
Bar	No.	Size	Length	Bar	No.	Size	Length	Bar	No.	Size	Length	Bar	No.	Size	Length	Bar	No.	Size	Length	Bar	No.	Size	Length
v	28	#4	5'-6"	v	32	#4	7'-0"	v	24	#4	4'-0"	v	28	#4	3'-6"	v	28	#4	4'-0"	v	32	#4	4'-6"
c	7	#4	4'-3"	c	7	#4	5'-3"	c	6	#4	3'-9"	c	7	#4	4'-3"	c	7	#4	4'-3"	c	7	#4	5'-3"
b	7	#4	4'-3"	b	9	#4	4'-3"	b	6	#4	3'-9"	b	7	#4	4'-3"	b	7	#4	4'-3"	b	9	#4	4'-3"
h_1	22	#4	4'-3"	h_1	28	#4	5'-3"	h_1	16	#4	3'-9"	h_1	14	#4	4'-3"	h_1	16	#4	4'-3"	h_1	18	#4	5'-3"
h_2	22	#4	4'-3"	h_2	28	#4	4'-3"	h_2	16	#4	3'-9"	h_2	14	#4	4'-3"	h_2	16	#4	4'-3"	h_2	18	#4	4'-3"
Conc. Grade 3.0			1.95 Cu.Yd.	Conc. Grade 3.0			2.75 Cu.Yd.	Conc. Grade 3.0			1.30 Cu.Yd.	Conc. Grade 3.0			1.37 Cu.Yd.	Conc. Grade 3.0			1.52 Cu.Yd.	Conc. Grade 3.0			1.91 Cu.Yd.
Reinf. steel			268 Lbs.	Reinf. steel			377 Lbs.	Reinf. steel			174 Lbs.	Reinf. steel			185 Lbs.	Reinf. steel			205 Lbs.	Reinf. steel			261 Lbs.
Struct. steel			260 Lbs.	Struct. steel			315 Lbs.	Struct. steel			206 Lbs.	Struct. steel			260 Lbs.	Struct. steel			260 Lbs.	Struct. steel			315 Lbs.
Class III Excav.			9 Cu.Yd.	Class III Excav.			14 Cu.Yd.	Class III Excav.			6 Cu.Yd.	Class III Excav.			6 Cu.Yd.	Class III Excav.			7 Cu.Yd.	Class III Excav.			9 Cu.Yd.



SECTION A-A

Note: Anchor bolts are subsidiary to the bid item "Inlet-Manhole, Special".



STEP DETAILS

PIPE DIMENSIONS AND SPACING			
L x W	No. of Bars	Dia. x Length x Spacing	⌖
7'-6"x4'-6"	13	2½"ø x 3'-10¼" pipes @ 6" ctrs.	6"
5'-6"x4'-6"	10	2½"ø x 3'-10¼" pipes @ 5½" ctrs.	5¼"
4'-6"x4'-6"	8	2½"ø x 3'-10¼" pipes @ 5½" ctrs.	4¾"
4'-0"x4'-0"	7	2½"ø x 3'- 4¼" pipes @ 5½" ctrs.	4½"

NO.	DATE	REVISIONS	BY	APP'D
11	07-17-17	Revised step dimensions	A.L.R.	S.W.K.
10	06-13-12	Revised Concrete Quantity	S.W.K.	J.O.B.
09	01-28-05	Chaned Class to Grade Concrete	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

INLET - MANHOLE, SPECIAL

RD648

FHWA APPROVAL		08-09-17	APP'D.	Scott W. King
DESIGNED	DETAILED		QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.

CADconform Certify This File

Sh. No. 35

Drawn By : mrockwell
File : rd648.dgn

Plotted : 16-JAN-2025 07:37

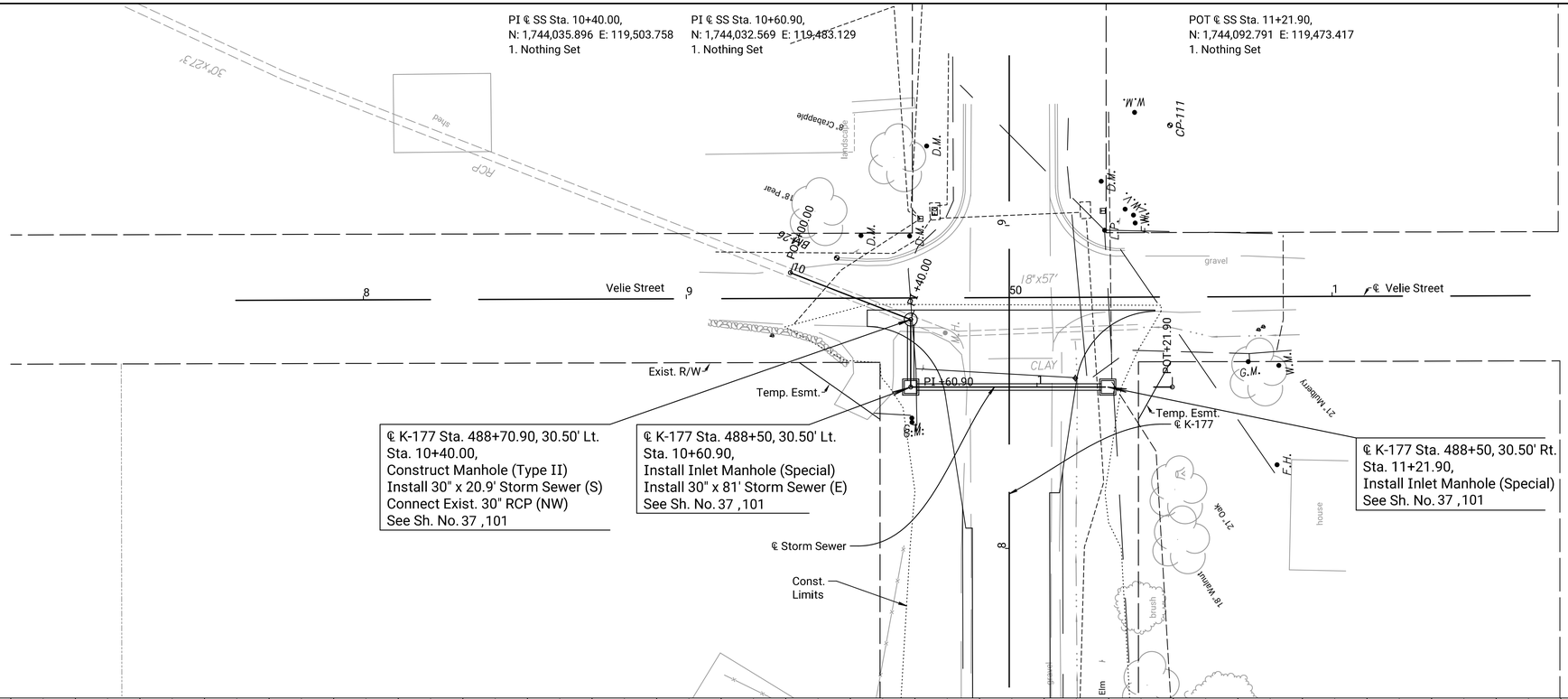
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	36	291

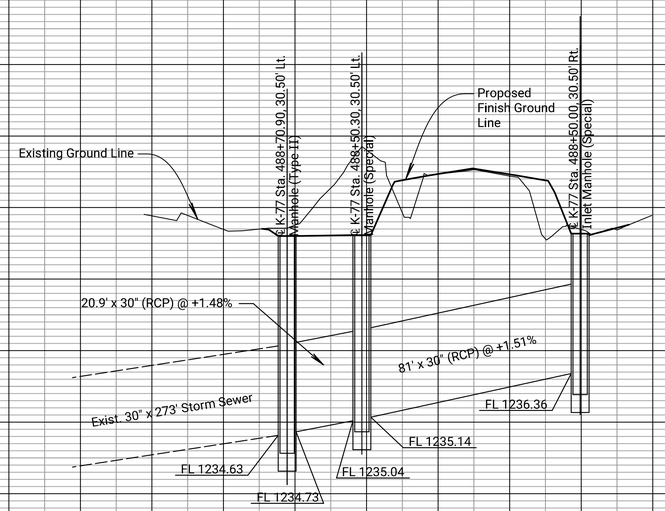
PI ℄ SS Sta. 10+40.00,
N: 1,744,035.896 E: 119,503.758
1. Nothing Set

PI ℄ SS Sta. 10+60.90,
N: 1,744,032.569 E: 119,483.129
1. Nothing Set

POT ℄ SS Sta. 11+21.90,
N: 1,744,092.791 E: 119,473.417
1. Nothing Set



SCALE
20' 0 20' 40'
PLAN: Lat. & Long.
PROFILE: Horiz. same as above
Vert.
2
0



	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

Plotted : 16-JAN-2025 07:37
Drawn By : mrockwell
File : ka6017017strm-01.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

STORM SEWER PLAN & PROFILE

CADconform Certify This File

Sh. No. 36

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	37	291

SCHEDULE OF INLETS AND MANHOLES

STATION	SIDE	TYPE		SEWER DATA							ELEVATIONS		DIMENSIONS			STORM SEWER LIN. FT.						END SECTIONS				SEWER EXC. (CU.YD.)		HT. FILL FT.	CONC. AASHTO CL. NO.	PIPE GAUGE	FOR INFORMATION ONLY						REMARKS
		MAN-HOLES	INLET MANHOLE (SPECIAL)	INFLOW PIPES				OUTFLOW PIPES			TOP ⊛	FLOOR	L (FT.)	W (FT.)	H (FT.)	15"	18"	21"	24"	30"	36"	15"	18"	21"	24"	COMM	ROCK			STEEL	CLASS III EXC.	CAST IRON (LBS.)	STRUC. STEEL (LBS.)	REINF. STEEL (LBS.)	CONC. GD. 3.0 (CU.YD.)	STEPS	
				SIZE	℄ ELEV.	SIZE	℄ ELEV.	SIZE	℄ ELEV.	SIZE	℄ ELEV.	GRADE																									
488+50.00	RT		1							30"	1236.36	1.51%	1240.20	1233.63	4.5	4.5	5.0				81.0																
488+50.00	LT		1					30"	1235.14	30"	1235.04	1.48%	1240.23	1234.23	4.5	4.5	6.0				20.9																
488+70.90	LT	1						30"	1234.73	30"	1234.63		1240.27	1235.27																								
TOTAL																					102															

⊛ Note: Top Elevation is located as follows:
1. Manhole - Top of Manhole Ring
2. Curb Inlet - Top of curb.
3. Gutter Inlet - Top back of gutter.
4. Inlet - Manhole, Special - Top of Grate.
5. Ditch Inlet - Top of Concrete at Cover Plate.

NO.	DATE	REVISIONS	BY	APP'D
03	01-28-05	Changed Class to Grade concrete	S.W.K.	J.O.B.
02	05-21-99	Added top elevation location note	R.J.S.	J.O.B.
01	10-08-90	Detailed on CADD	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SCHEDULE INLETS AND MANHOLES

RD653H

FHWA APPROVAL	06-10-05	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. R.J.S.

CADconform Certify This File

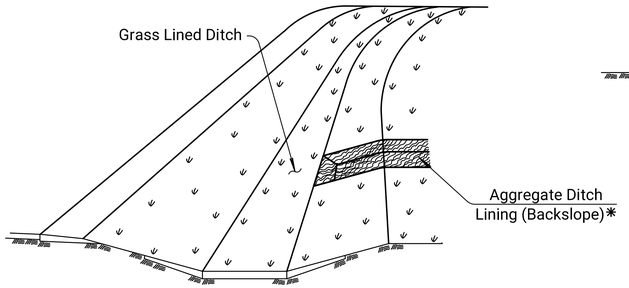
Sh. No. 37

Plotted : 16-JAN-2025 07:37

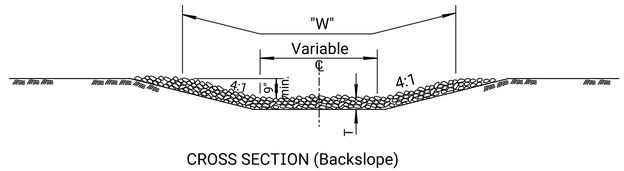
Drawn By : mrockwell
File : rd653h.dgn

CADconform Certify This File

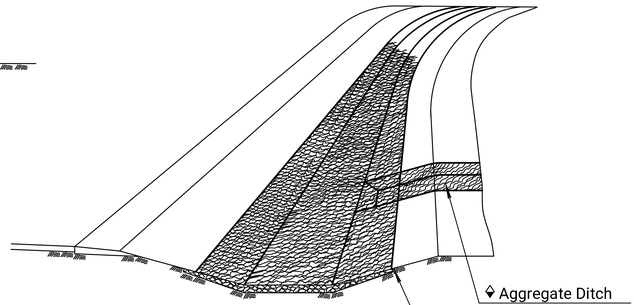
STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	38	291



PERSPECTIVE VIEW
(Backslope Dt. Lining without Highway Dt. Lining)



CROSS SECTION (Backslope)



Where select soil is specified adjust slopes to match edge of aggregate lining.

PERSPECTIVE VIEW

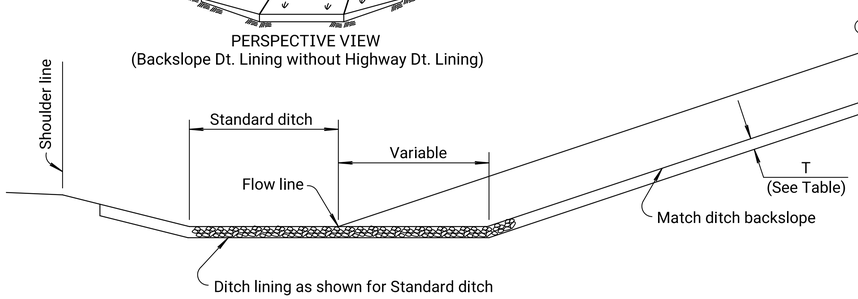
GENERAL NOTE

All work and materials required for this construction shall be paid for by the ton of "Aggregate Ditch Lining (D_{50})".

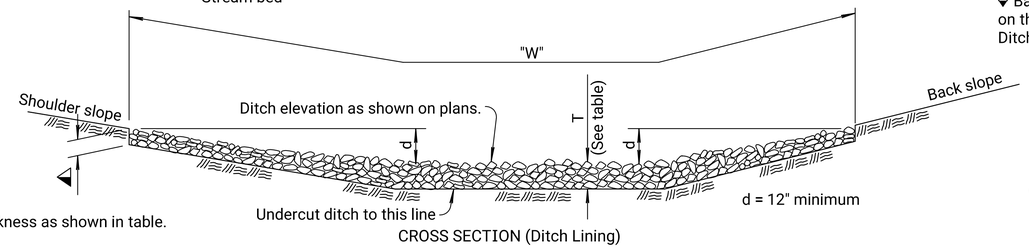
Dumped aggregate shall be spread in reasonable conformity with the ditch section as shown and as directed by the Engineer.

Aggregate Ditch Lining shall be measured and paid for by the ton in the vehicle at the location designated by the Engineer and shall be full compensation for excavation for undercutting, furnishing, hauling, placing and maintaining the material as specified to complete the work.

The weight of the aggregate is based on a standard density of 120 PCF. When the standard density of the material is more or less than 120 PCF, the thickness may vary correspondingly.



LONGITUDINAL SECTION (Backslope)



CROSS SECTION (Ditch Lining)

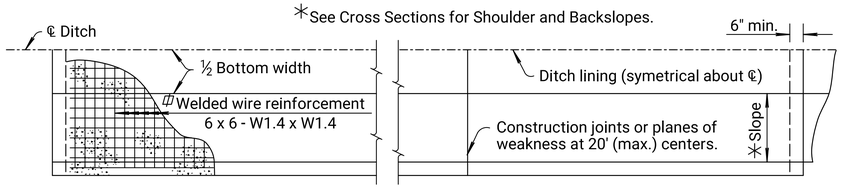
Feather edges to nominal thickness as shown in table.

◆ Backslope aggregate ditch lining, constructed as indicated on this sheet, shall be paid for by the ton of "Aggregate Ditch Lining (D_{50})."

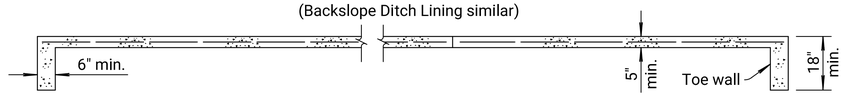
			QUANTITIES FOR TYPICAL 10' DITCH with 6:1 shoulder slope & 4:1 backslope			
D_{50}	T	◭	Approx. Excavation per Station (cu.yd.)			
			d = 1.0	d = 2.0	d = 3.0	d = 4.0
◔ 4"	12"	8"	68	99	130	161
6"	18"	12"	102	148	195	241

Note: Quantities provided for information only.
◔ Aggregate larger than 4 inches (D_{50}) should not be used within the clear zone.

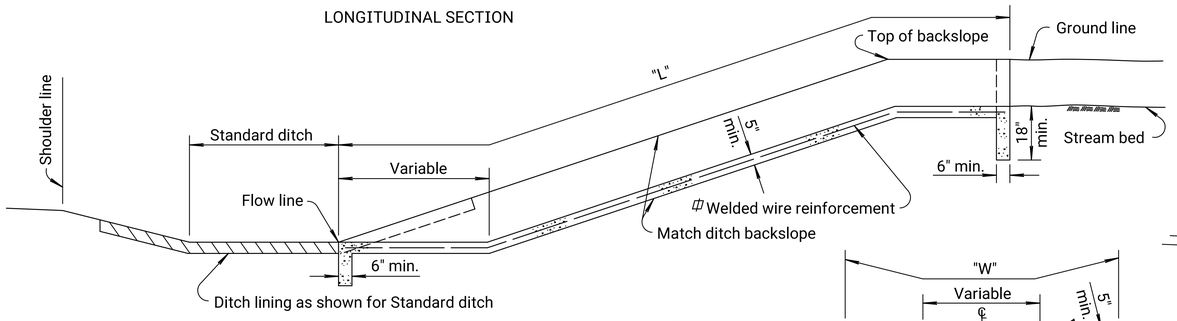
AGGREGATE DITCH LINING (D_{50})



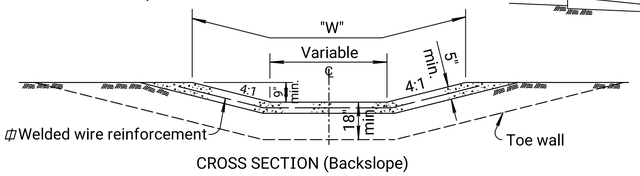
HALF PLAN
(Backslope Ditch Lining similar)



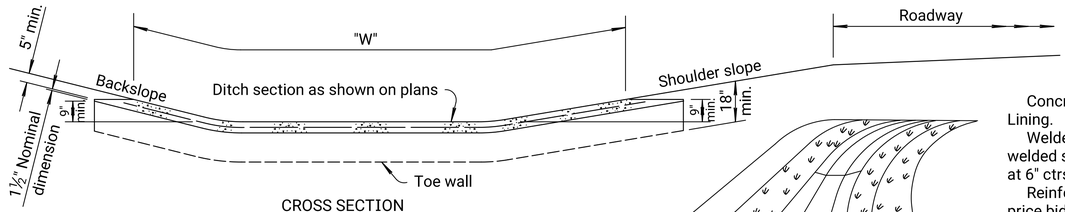
LONGITUDINAL SECTION



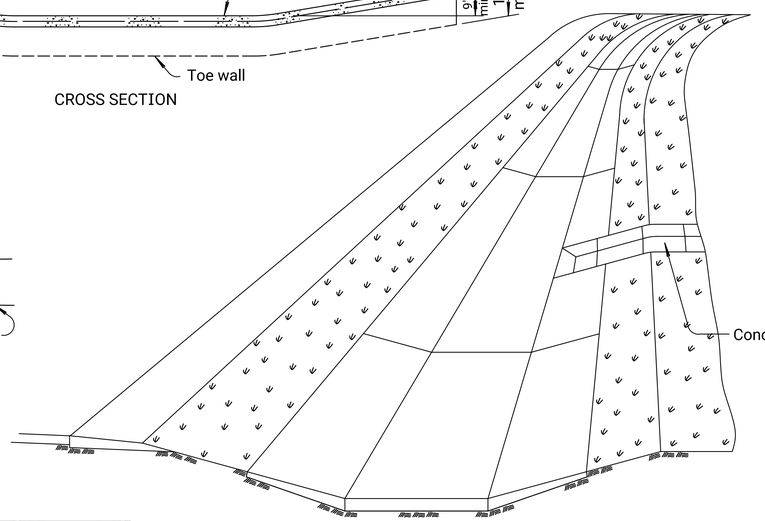
LONGITUDINAL SECTION (Backslope)



CROSS SECTION (Backslope)



CROSS SECTION



PERSPECTIVE VIEW

GENERAL NOTE

Concrete Grade 3.0 shall be used in Concrete Ditch Lining.

Welded wire reinforcement shall be of the electrically welded square mesh type with No. W1.4 wires spaced at 6" ctrs. each way.

Reinforcement as shown is included in the unit price bid for "Concrete Ditch Lining".

Measurements of Concrete Ditch Lining shall be in sq. yds. of outside surface area. Add 1'-6" times "W" for each toewall.

The exact location and dimensions may be adjusted, if required, by the Engineer at the time of construction.

Longitudinal construction joints may be constructed at the Contractor's option.

⎅ Welded wire can be substituted with macro fiber reinforcement. See Standard Specifications for macro fiber and application rate requirements

CONCRETE DITCH LINING

NO.	DATE	REVISIONS	BY	APP'D
10	3-27-18	Added Aggregate Size in Clear Zone Guidance	A.L.R.	T.T.R.
9	8-1-12	Revised General Note	S.W.K.	J.O.B.
8	3-20-08	Rev. agg. edge thickness and quant.	S.W.K.	J.O.B.
7	11-07-07	Revised aggregate to 120 PCF	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DITCH LINING

RD502

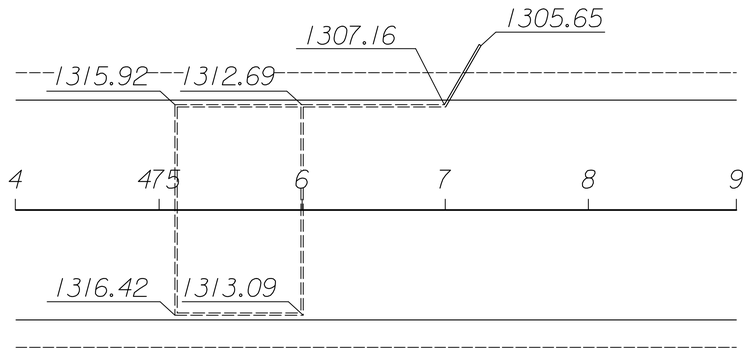
FHWA APPROVAL	6-19-18	APP'D. SCOTT W. KING	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

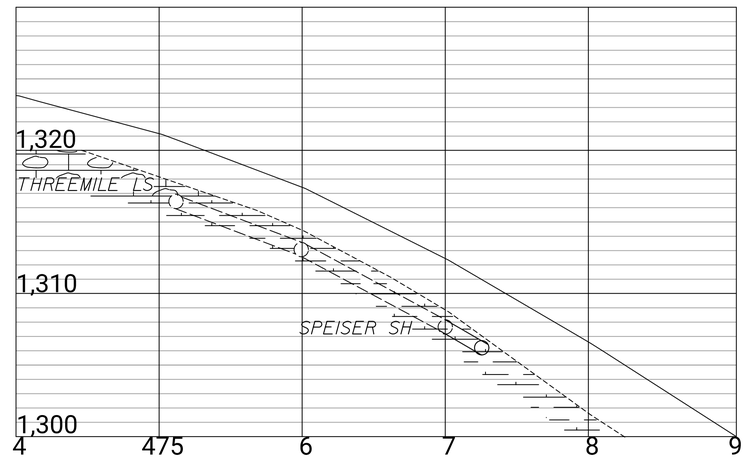
KDOT Graphics Certified 06-10-2022 Sh. No. 38

KDOT Graphics Certified

Plotted :16-JAN-2025 07:37
Drawn By : mrockwell
File : rd502.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	39	291





Underdrain Pipe Detalis		
Station	Offset	Elevation
475+12	11' Rt.	1316.42
475+12	11' Lt.	1315.92
476+00	11' Rt.	1313.09
476+00	11' Lt.	1312.69
477+00	11' Lt.	1307.16
475+25 (outlet)	40' Lt.	1305.65

Note:

Underdrains Station 475+12 to Station 477+25
Construct 6" Pipe Underdrain
Type F, H, J or T (Perforated): 320.0 Lin. Feet
Type G or K (Non-Perforated): 40.0 Lin. feet
Flume Outlet: 1
Underdrain Guidepost Marker: 1

Minimum drain slope is 1%.

Wrap underdrain trench with geotextile fabric.

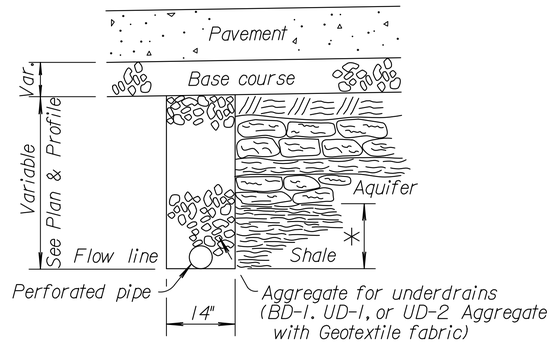
Underdrain should be installed a minimum of 1.5 feet beneath the pavement subgrade.

Set longitudinal pipe one (1) foot inside the edge of pavement.

Backfill underdrain trenches over perforated pipe with underdrain aggregate up to the base course under roadway.

Backfill outlet trenches with impervious materials using standard compaction. Do not use aggregate or sand to grade outlet pipe.

Place one (1) concrete flume and one (1) guidepost at each outlet.



NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

UNDERDRAINS
STA. 475+12 TO STA. 477+50

Proj. 177-64 KA-6017-01 MorrisCo.

SHEET NO. OF	SCALE	APP'D
DESIGNED	DETAILED	GEOLOGY DRAWN BY:
DESIGN CK.	DETAIL CK.	GEOLOGY LOCATION:

CADconform Certify This File

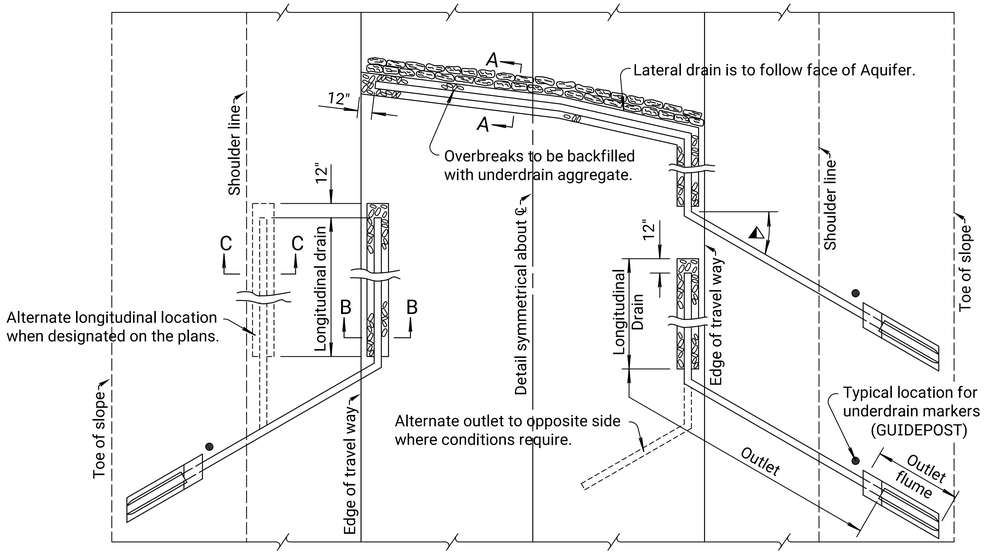
Sh. No. 39

Plotted By: mrockwell
File: Underdrains.dgn
Plot Date: 16-JAN-2025 07:38
Plot Location:

CADconform Certify This File

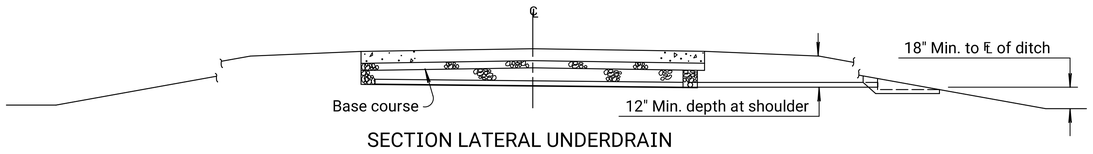
Note to Designer: For required pipe stiffness see KDOT Geology Report.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	40	291

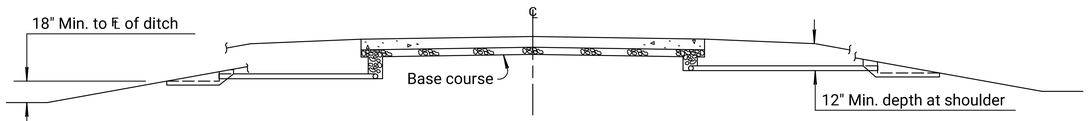


PLAN PIPE UNDERDRAINS

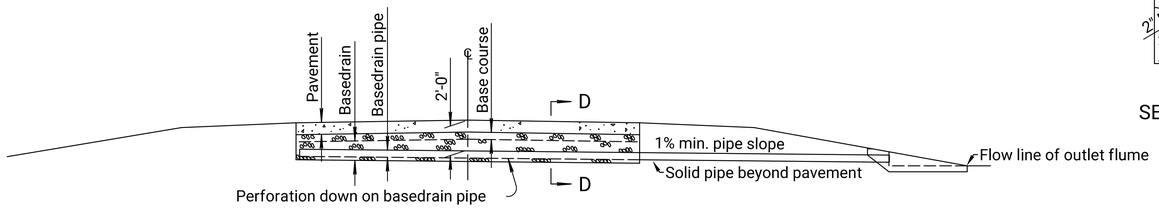
△ 30° unless otherwise specified.



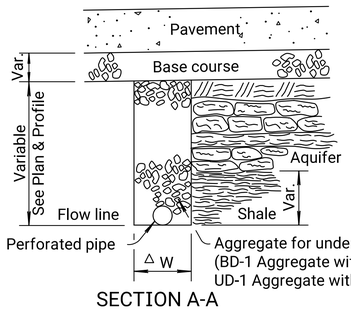
SECTION LATERAL UNDERDRAIN



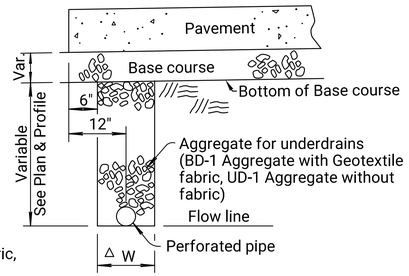
SECTION PIPE UNDERDRAINS



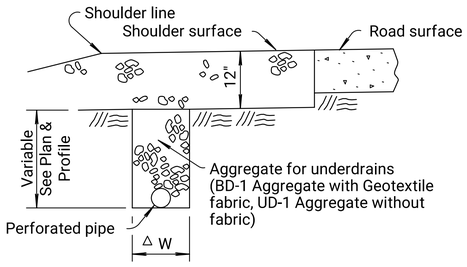
SECTION PIPE BASEDRAINS



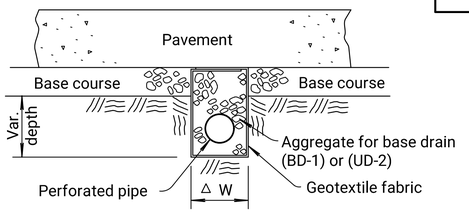
SECTION A-A



SECTION B-B



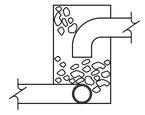
SECTION C-C



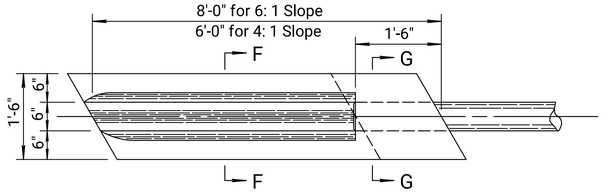
SECTION D-D (BASEDRAIN)

△ "W" should be 8" plus exterior diameter of the pipe used.

Note: Dirt unavoidably mixed with aggregate at subgrade elevation is not detrimental.



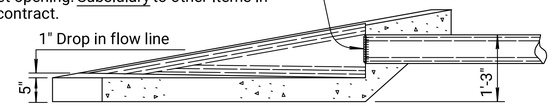
Note: Unless shown otherwise on the plans, 90° elbows shall be used on the longitudinal at all locations where there is a difference in elevation between the longitudinal drain at a lateral trench.



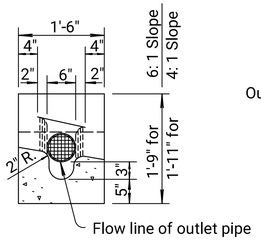
PLAN

Note: Drawing is dimensional for 6" outlet pipe. Adjust dimensions as required for other pipe sizes.

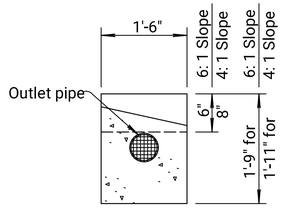
The lower end of each outlet shall be fitted with a screen to prevent the entrance of rodents. Use " mesh galvanized hardware cloth. Bend ends of wires to fit snugly into outlet opening. Subsidiary to other items in the contract.



LONGITUDINAL SECTION
CONCRETE OUTLET FLUME



SECTION F-F



SECTION G-G

GENERAL NOTE

Locations for all underdrains and basedrains as shown on the plans are approximate and the exact locations shall be determined at the time of construction by the Engineer and the Geologist.

All pipe fittings are included in the length shown for Pipe Underdrains and Basedrains.

Flumes shall be constructed at the end of all outlet pipes and shall be Concrete Grade 3.0. At the Contractor's option, Concrete Grade 3.0 (AE) may be used. This flume shall be considered subsidiary to the bid item "Pipe Underdrains".

Outlet pipe shall be either Type G or K with water tight joints. Perforated pipe shall be either Type F, H, J or T and shall be installed with perforations turned to the bottom of the trench. For pipe and outlet pipe pairings, see the KDOT Standard Specifications. Use of Geotextile fabric for underdrains and pipe size is from the Geologist recommendation.

Minimum depth of perforated pipe below pavement depends on pipe type. For details see the KDOT Standard Specifications.

Width, "W", is 8" plus the exterior diameter of the underdrain/base drain pipe unless shown otherwise.

All pipe shall be laid on a minimum grade of 1% unless shown otherwise.

Where the actual elevation of the stratigraphy is found to vary from plan elevation, The stratigraphy shall govern in the installation of underdrains.

Do not grade or backfill outlet pipe with aggregate or sand, use impervious material with standard compaction.

Underdrain/basedrain trench should be located 7.5' from contraction joint (center of slab).

Underdrain should be in place prior to placing base course. Basedrains are trenched and placed after base course is placed.

GENERAL NOTE GUIDEPOST

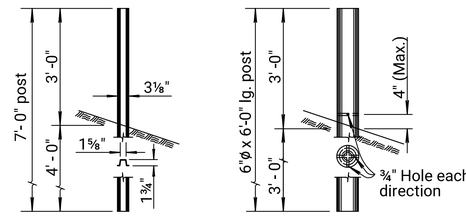
All wood posts shall be given a preservative treatment as provided for in the KDOT Standard Specifications. All cuts and injuries in treated posts shall be thoroughly saturated with preservative.

Reflectorized material shall be applied to the post by the state.

Where wood guidepost is used as underdrain markers, the top 18" of the post shall be given 2 coats of aluminum paint and the top 12" of the post shall be given one coat of International Orange enamel paint.

Only one type of preservative treatment may be used on a project.

Metal post shall have a galvanized or baked enamel coating, and the upper 12" of each post shall receive a coat of International Orange enamel paint.



Metal Guidepost Option
(7'-0" at 3.00 lbs./ft.)
Flanged channel

Wood Guidepost Option
(6" ø x 6'-0")

GUIDEPOST

NO.	DATE	REVISIONS	BY	APP'D
04	11-13-17	Added pipe types, revised notes	A.L.R.	S.W.K.
03	03-27-08	Added Basedrains, revised notes	S.W.K.	J.O.B.
02	01-28-05	Class to Grade conc., guidepost note	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

UNDERDRAINS, BASEDRAINS AND GUIDEPOSTS

RD650

FHWA APPROVAL	03-05-18	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 07-27-2022 Sh. No. 40

KDOT Graphics Certified

Drawn By : mrockwell
File : rd650.dgn

Plotted : 16-JAN-2025 07:38

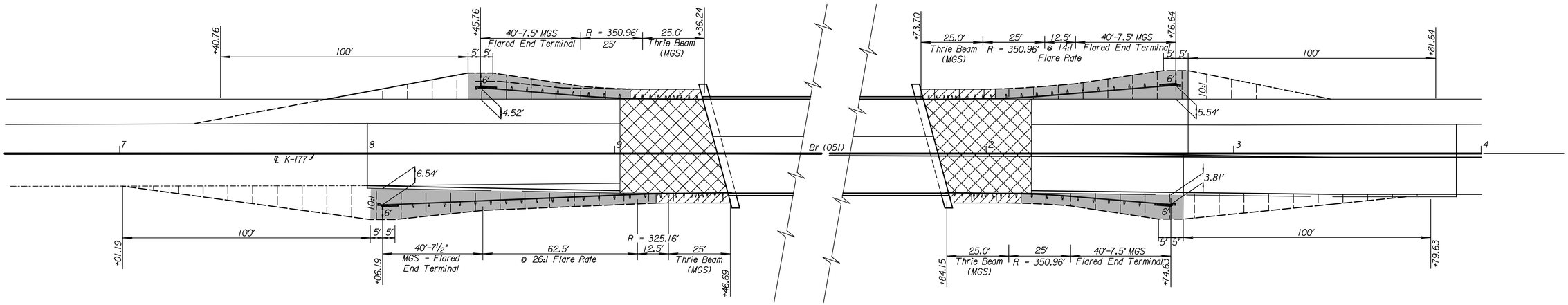
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	41	291

BY	DATE
J. Unruh - Benesch	10-2021
R. Nuessen - Benesch	10-2021
REFERENCES NOTED	
REFERENCES CHECKED	

SCALE

20' 0 20' 40'

PLAN: Lat. & Long.



K-177 OVER FOURMILE CREEK

LEGEND

- Approach Slab
- 6" HMA (Commercial Grade)(Class A)
- 4" Aggregate Shld.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAIL

STA. 297+00 TO STA 304+00

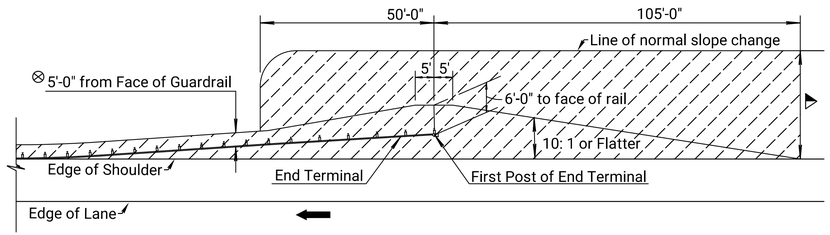
Plotted : 16-JAN-2025 07:38

Drawn By : mrockwell
File : ka6017701tgr-01

Note to Designer - Design guardrail installations using guidance shown on KDOT's 'Guardrail Typical Alignments' Standard Drawings. 'Flared' guardrail installations are preferred over 'Parallel' or 'Zero Flare' installations. Where 'Flared' or 'Parallel' installations are used, the flare rate of the guardrail end terminal typically matches the flare rate of the remaining guardrail installation. For 'Zero Flare' installations, 'Parallel' guardrail end terminals should be designed using typical flare rates of 50:1 or flatter for the length of the end terminal. However, while 50:1 or flatter flare rates are typical for 'Parallel' guardrail end terminals, these end terminals may be flared as steep as 26:1 or flatter in order to offset the end terminal head as far from the edge of the through traveled lane as practicable.

GUARDRAIL CLEAR AREA

Applies to all guardrail installations unless otherwise shown in the plans.



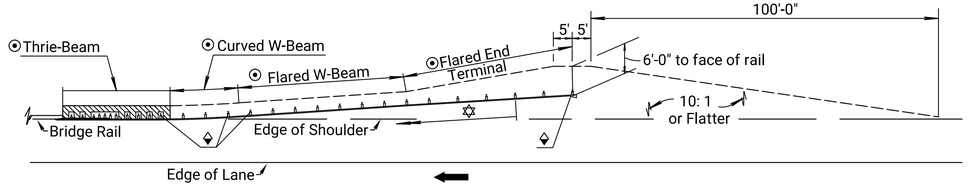
Keep Area Free of Stockpiled Material, Equipment, or Other Obstacles, Such as Temporary Signs, Regardless of Crash Worthiness. This Clear Area Extends 105 Feet in Advance of and 50 Feet behind the First Post of the Guardrail End Terminal and Then, in Order to Maintain Full Post Spacing, Continues 5 Feet behind the Face of the Guardrail through the W-Beam Portion of the Installation as Shown in the 'Guardrail Clear Area' Detail on this Sheet.

Normal Project Side Slope.

Deflection Distance for Normal Post Spacing

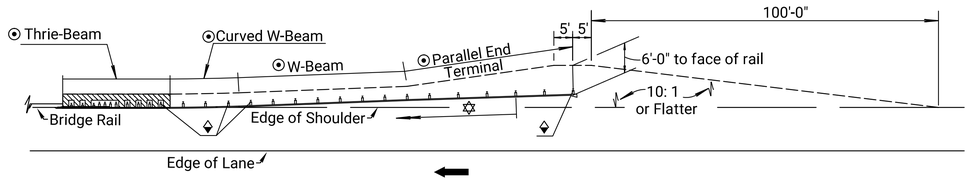
FLARED GUARDRAIL DETAIL

Applies to CGS AND MGS (MGS Shown)



PARALLEL GUARDRAIL DETAIL

Applies to CGS AND MGS (MGS Shown)



See Guardrail Layout Sheets for Details

On Guardrail Layout Sheets, Show Station AND Offset from the Roadway Alignment to the Face of Post at these Locations.

Length of Need (Begins at Post 3)

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	42	291

GENERAL NOTES

Install the guardrail end terminals according to the Manufacturer's Installation Manual. The Contractor will furnish a copy of the Manufacturer's Installation Manual to the Engineer prior to the start of the installation.

Use approved steel (preferred) or wood posts provided by the Manufacturer. The guardrail end terminal post type may be independent of the post type used in the remainder of the installation. However, no mixing of post types is permitted in the remaining w-beam and thrie-beam installation.

Use approved polymer (preferred) or wood blockouts provided by the Manufacturer. The guardrail end terminal blockout size and type may be independent of the blockout size and type used in the remainder of the installation. For blockout size and types for the remaining w-beam and thrie-beam portion of the installation see the details shown on KDOT's 'Guardrail Post Details' and 'Guardrail Thrie-Beam Transition Details' Standard Drawings.

Apply retroreflective sheeting to the end terminal impact head before installation.

Tighten all cable anchor assemblies as per the Manufacturer's Installation Manual.

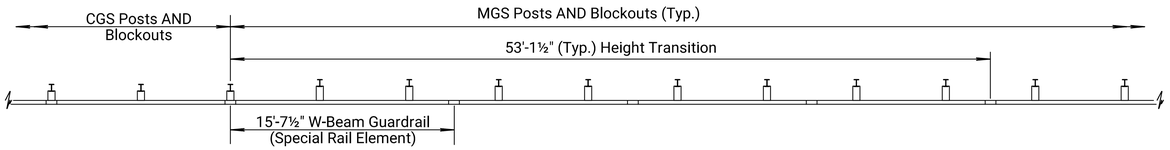
Lap w-beam and thrie-beam guardrail splices, in the direction of permanent traffic, even where temporary traffic may be carried in the opposite direction of the final traffic configuration. Lap end terminal splices per the Manufacturer's Installation Manual in the direction of permanent traffic, even where temporary traffic may be carried in the opposite direction of the final configuration.

The minimum length of w-beam guardrail required between the thrie-beam transition and the guardrail end terminal is 12'-6" for all installations; unless otherwise stated in the Manufacturer's Installation Manual.

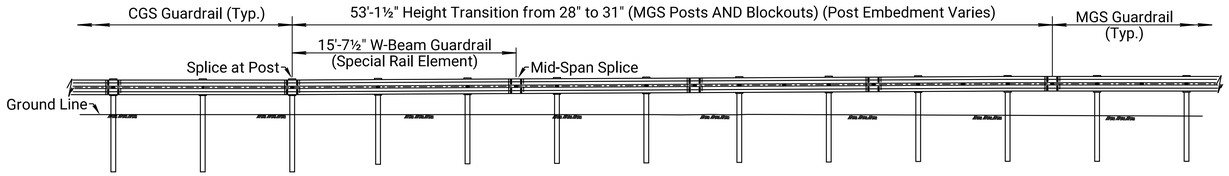
Where pavement with a thickness less than or equal to 8" is encountered during installation, use the details shown on KDOT's 'Guardrail Post Details' Standard Drawings to provide openings in the pavement for the guardrail posts. Where pavement with a thickness greater than 8" or geologic rock is encountered during installation, follow the Manufacturer's Installation Manual for guidance. Where the Manufacturer's Installation Manual does not address pavement with a thickness greater than 8" or geologic rock, contact the manufacturer for instructions or install the guardrail posts as directed by the Engineer.

All work and materials required for w-beam and thrie-bean guardrail installations are paid for under the appropriate bid items for either CGS or MGS guardrail depending on the type of installation.

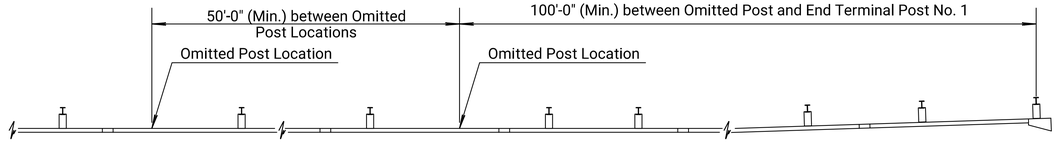
All work and materials required for guardrail end terminal installations are paid for under the bid item for the selected guardrail end terminal. See the table on this sheet for the appropriate end terminal bid item information.



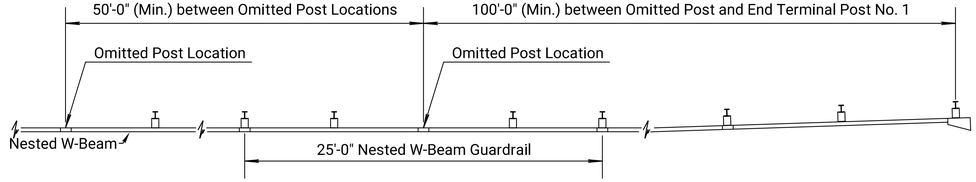
CGS TO MGS TRANSITION DETAILS (PLAN)



CGS TO MGS TRANSITION DETAILS (ELEVATION)



MGS OMITTED POST DETAIL



CGS OMITTED POST DETAIL

MIDWEST GUARDRAIL SYSTEM (MGS) END TERMINALS

END TERMINAL BID ITEM	FLARED OR PARALLEL	MOUNTING HEIGHT	CRASH TESTING CRITERIA	STEEL POST DESIGN AVAILABLE	WOOD POST DESIGN AVAILABLE	ENERGY ABSORBING	MANUFACTURER	DESIGN LENGTH	MANUFACTURER SYSTEM LENGTH
Guardrail End Terminal (MGS-FLEAT)	Flared	31"	NCHRP 350	Yes	Yes	Yes	Road Systems	40'-7½"	37'-6"
Guardrail End Terminal (MGS-SRT)	Flared	31"	NCHRP 350	Yes	Yes	No	Trinity Industries	40'-7½"	37'-6"
Guardrail End Terminal (MGS-MSKT)	Parallel	31"	MASH	Yes	No	Yes	Road Systems	46'-10½"	46'-10½"
Guardrail End Terminal (MGS-SOFTSTOP)	Parallel	31"	MASH	Yes	No	Yes	Trinity Industries	46'-10½"	50'-9½"

CONVENTIONAL GUARDRAIL SYSTEM (CGS) END TERMINALS

END TERMINAL BID ITEM	FLARED OR PARALLEL	MOUNTING HEIGHT	CRASH TESTING CRITERIA	STEEL POST DESIGN AVAILABLE	WOOD POST DESIGN AVAILABLE	ENERGY ABSORBING	MANUFACTURER	DESIGN LENGTH	MANUFACTURER SYSTEM LENGTH
Guardrail End Terminal (FLEAT)	Flared	28"	NCHRP 350	Yes	Yes	Yes	Road Systems	37'-6"	37'-6"
Guardrail End Terminal (SRT)	Flared	28"	NCHRP 350	Yes	Yes	No	Trinity Industries	37'-6"	37'-6"
Guardrail End Terminal (SKT)	Parallel	28"	NCHRP 350	Yes	Yes	Yes	Road Systems	50'-0"	50'-0"

NO.	DATE	REVISIONS	BY	APP'D
2	9-5-18	ADD. OMITTED POST AND TRANS. DETAILS	A.L.R.	T.T.R.
1	6-5-18	INITIAL RELEASE	A.L.R.	T.T.R.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL AUXILIARY DETAILS

RD606

FHWA APPROVAL	9-25-18	APP'D.	SCOTT W. KING
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-10-2022 Sh. No. 42

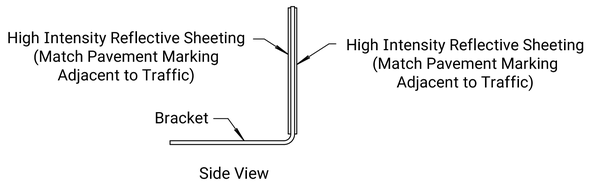
KDOT Graphics Certified

Plotted :16-JAN-2025 07:38

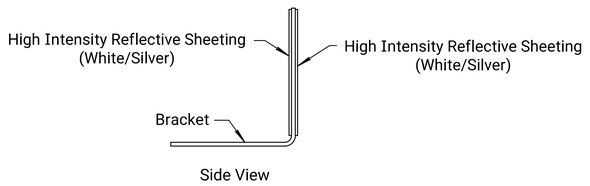
Drawn By : mrockwell
File : rd606.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	43	291

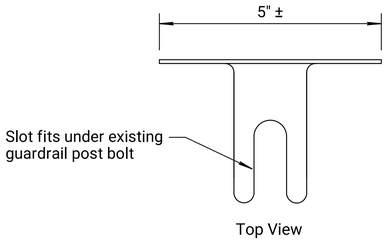
Flexible Marker
One-Way Traffic

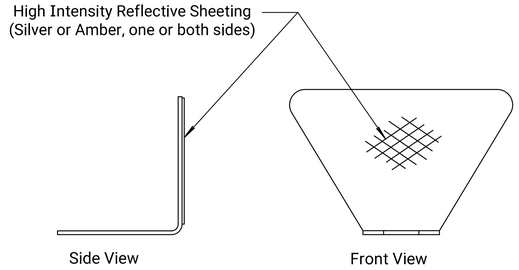


Flexible Marker
Median Locations



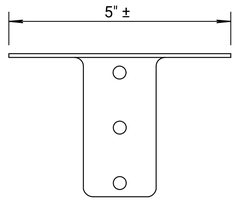
Flexible Marker
Two-Way Traffic



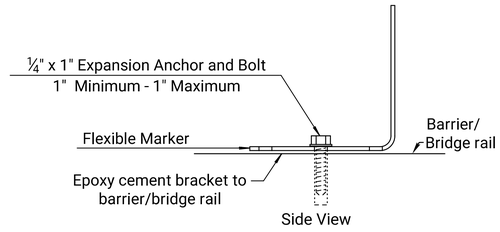


Flexible Guardrail Marker

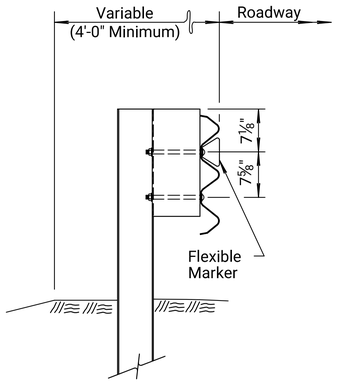
(High Impact Polycarbonate approx. .085" thick, 5¼" x 3")



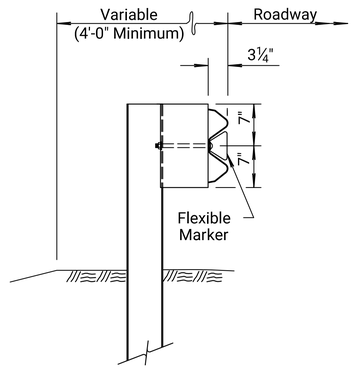
Barrier/Bridge Rail



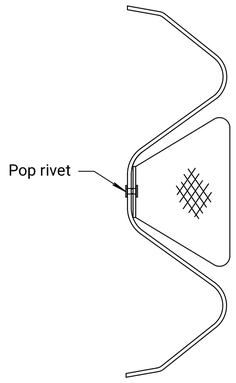
Method of Attaching Flexible
Marker to Barrier/Bridge Rail



THRIE-BEAM GUARDRAIL

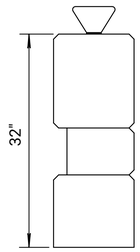


W-BEAM GUARDRAIL

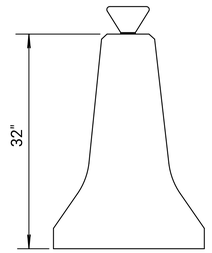


Typical Mounting on W-Beam

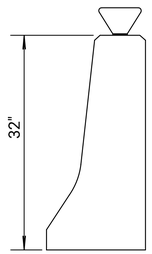
Pop rivet attachment to Guardrail when necessary.



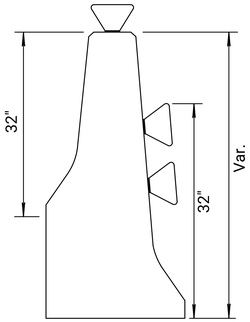
CORRAL RAIL



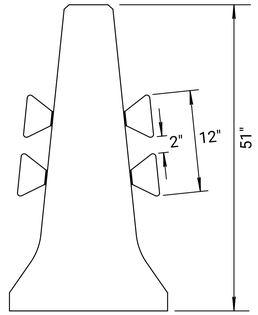
TYPE I CSB



TYPE II CSB or
F-SHAPED BRIDGE RAIL



TYPE III CSB



TYPE IV CSB

TYPICAL BARRIER/BRIDGE RAIL MOUNTING DETAILS

NO.	DATE	REVISIONS	BY	APP'D
9	9-11-17	Rev. Det. Markers, Rev. Gen. Note	A.L.R.	S.W.K.
8	11-15-10	Revised notes	S.W.K.	J.O.B.
7	12-21-08	AKT marker or approved equal	S.W.K.	J.O.B.
6	3-10-09	Add. Flexible rem. Button deline	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

MARKER DETAILS FOR GUARDRAIL,
BARRIER, AND BRIDGE RAILS

RD610

FHWA APPROVAL	3-15-18	APP'D. Scott W. King	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-10-2022 Sh. No. 43

GENERAL NOTES

Install flexible markers on a post behind the guardrail bolt head on the traffic side of guardrail installations at a spacing not to exceed 25'. No marker is installed between the head and post #5 when the guardrail is terminated with a crashworthy end terminal.

Install flexible markers on the top of bridge rails at a spacing not to exceed 50', except for long bridges (greater than 200' long), where spacing may be increased to 100'.

Install flexible markers on the top of concrete safety barrier at a spacing not to exceed 100', except for barrier along a horizontal curve or along ramps and ramp tapers, where spacing is not to exceed 50'.

Where the height of the bridge rail or concrete barrier is greater than 32", mount the flexible markers on the side of the barrier at a height of 32" as shown on this sheet.

For guardrail, bridge rail, or concrete safety barrier located on two-way roadways, use flexible markers with white/silver high intensity reflective sheeting on both sides.

For guardrail located on one-way or divided roadways, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only. For bridge rail or concrete safety barrier located on the outside edge of one-way or divided roadways, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only. For bridge rail or concrete safety barrier located in the median, use flexible markers with reflective sheeting installed on both sides of the bracket. Match the color of the marker (yellow/amber or white/silver) to the color of the pavement marking adjacent to the traffic lane.

Use High Impact Polycarbonate Flexible Guardrail Marker with High Intensity Reflective Sheeting or an approved equivalent, see Standard Specifications.

Use zinc or cadmium plated fasteners that comply with Standard Specifications.

Work and materials required for installation of markers on guardrail, bridge rail, or concrete safety barrier are subsidiary to other bid items in the contract.

Install flexible markers for the final (permanent) traffic configuration.

Plotted :16-JAN-2025 07:38
Drawn By : mrockwell
File : rd610.dgn

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	44	291

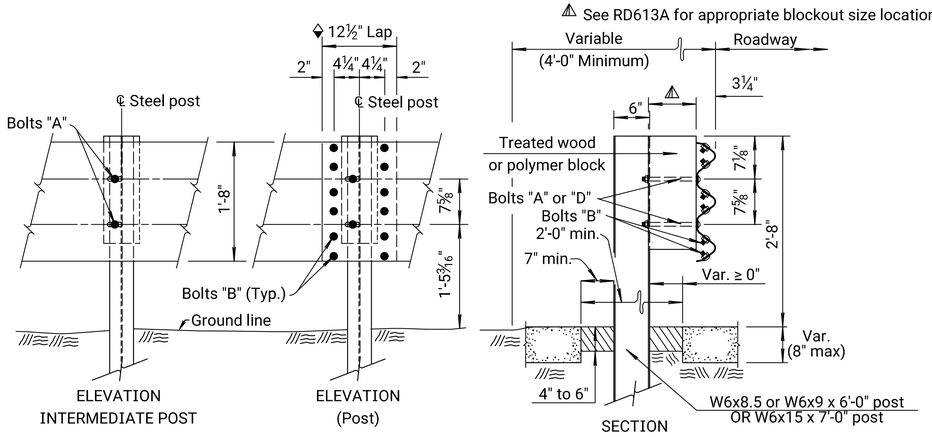
Notes to Designer: For posts installed in pavement thicker than 8" or posts installed in rock formations refer to AASHTO's Roadside Design Guide for details then revise this drawing and all supporting drawings appropriately.

Plotted :16-JAN-2025 07:38

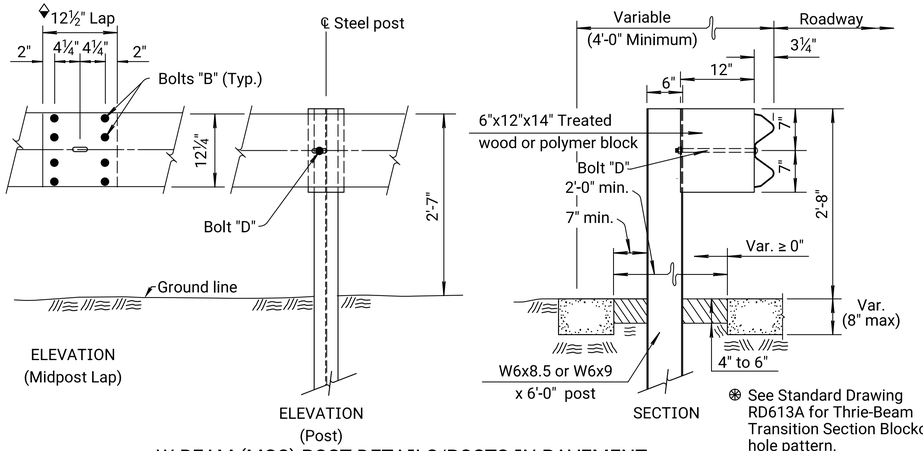
Drawn By : mrockwell
File : rd611a.dgn

♦ Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

⚠ See RD613A for appropriate blockout size location.



THRIE BEAM POST DETAILS/POSTS IN PAVEMENT

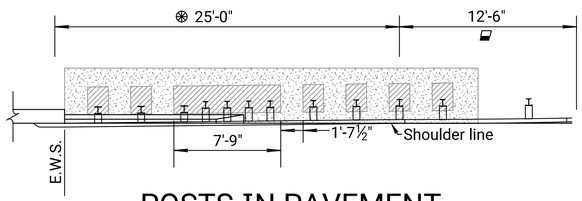


W-BEAM (MGS) POST DETAILS/POSTS IN PAVEMENT

✲ See Standard Drawing RD613A for Thrie-Beam Transition Section Blockout hole pattern.

✡ Non-Metallic (Polymer) or Treated Wood Block

▭ See Guardrail Layout Sheets for Details.



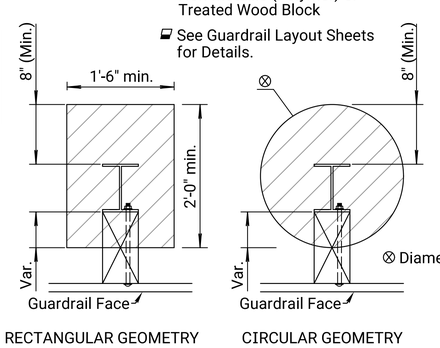
POSTS IN PAVEMENT

(Not to Scale)

▨ Slurry Grout (Low Strength)
See KDOT's Standard Specifications

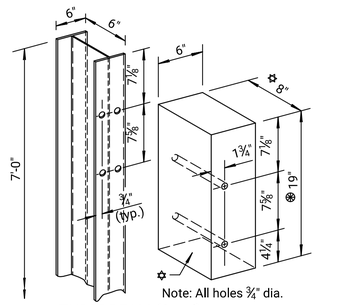
▨ Pavement (Concrete or Asphalt)

Note: Low Strength Grout must have a 28-day compressive strength of 120 psi or less. All work and materials related to posts in pavement are subsidiary to other guardrail bid items. Rectangular geometry shown in Posts in Pavement detail. Circular geometry, as shown on this sheet, may be used at the Contractor's option.

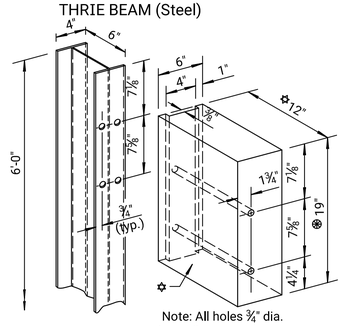


⊗ Diameter may vary from 1'-6" (min.) to 2'-0".

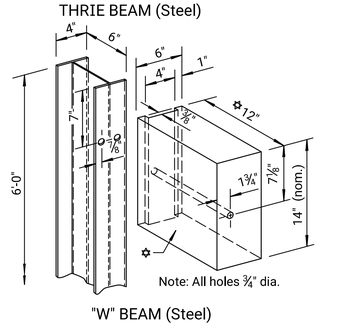
PLAN
(ALTERNATE GEOMETRIES)



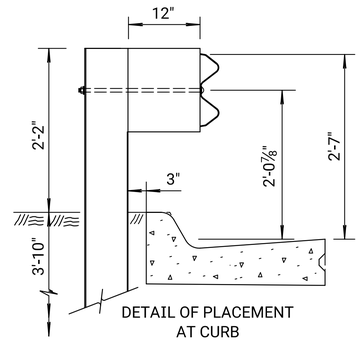
THRIE BEAM (Steel)



THRIE BEAM (Steel)



"W" BEAM (Steel)



DETAIL OF PLACEMENT
AT CURB

Note: Measure height of rail from the pavement surface at the curb/pavement joint as shown. A special design is needed when guardrail is not located as detailed. A Type II (laydown) curb & gutter is preferred when guardrail is adjacent to curb.

GENERAL NOTES (Steel Posts)

Use grade of steel for steel posts that meets the requirements of the standard specifications.

Hot dip galvanize the posts after fabrication, see standard specifications.

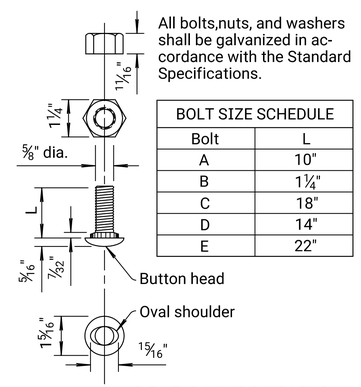
Wood blockouts may be used through the 25'-0" thrie-beam section with wood or polymer blockouts used throughout the remainder of the w-beam installation. The blockout size and material used in the guardrail end terminal may be independent from the remainder of the installation. For wood/polymer blockout requirements see standard specifications.

Use S4S rectangular blockouts for Thrie-Beam/W-Beam installation.

Set guardrail posts by digging or by driving. Use post caps to protect the post from crushing during driving operations.

Contractor must notify Engineer at the earliest time when a non-removable manmade object (footing, pipe, etc.) is encountered that prevents installation of a full length post.

All dimensions are nominal and are subject to manufacturing tolerances. Excavation including rock, shale, and other materials for erection of Guardrail is subsidiary to various bid items for which payment is made.



BOLT SIZE SCHEDULE	
Bolt	L
A	10"
B	1¼"
C	18"
D	14"
E	22"

BOLT & NUT DETAILS

NO.	DATE	REVISIONS	BY	J.O.B.
5	9-24-15	Separated Steel/Wood Post Details	T.T.R.	S.W.K.
4	11-8-12	Revised Detail, Posts in Pavement	S.W.K.	J.O.B.
3	8-1-12	Revised Note to Designer	S.W.K.	J.O.B.
2	5-24-12	Revised Detail, Posts in Pavement	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL POST (STEEL) (MGS) DETAILS

RD611A

FHWA APPROVAL	1-29-16	APP'D. Scott. W. King	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

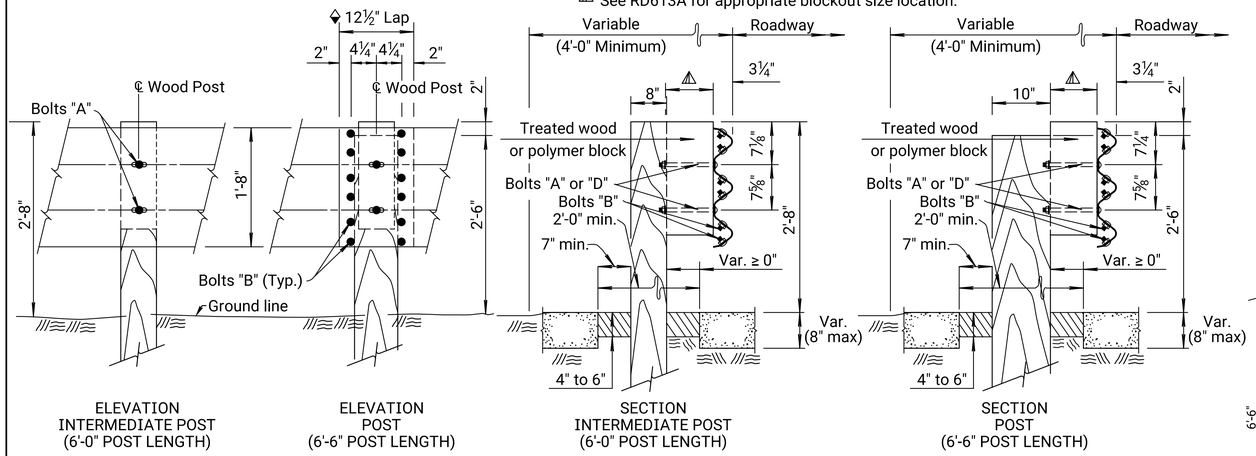
KDOT Graphics Certified 06-10-2022 Sh. No. 44

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	45	291

◈ Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

⚠ See RD613A for appropriate blockout size location.



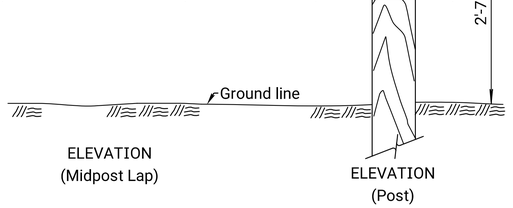
ELEVATION
INTERMEDIATE POST
(6'-0" POST LENGTH)

ELEVATION
POST
(6'-6" POST LENGTH)

SECTION
INTERMEDIATE POST
(6'-0" POST LENGTH)

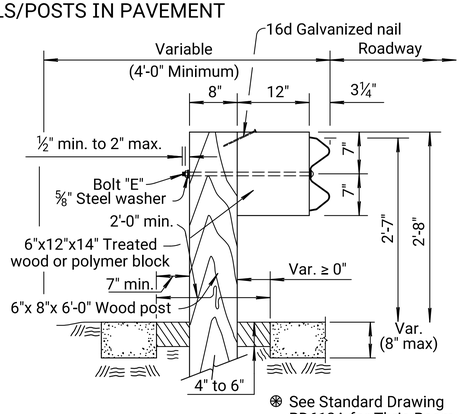
SECTION
POST
(6'-6" POST LENGTH)

THRIE BEAM POST DETAILS/POSTS IN PAVEMENT



ELEVATION
(Midpost Lap)

ELEVATION
(Post)



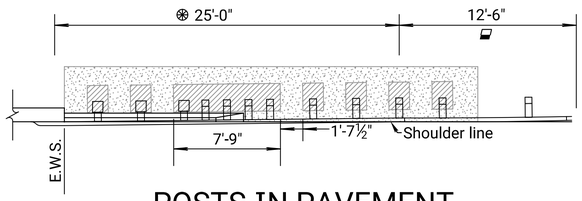
SECTION

⊛ See Standard Drawing RD613A for Thrie-Beam Transition Section Blockout hole pattern.

✡ Non-Metallic (Polymer) or Treated Wood Block

▤ See Guardrail Layout Sheets for Details.

W-BEAM (MGS) POST DETAILS/POSTS IN PAVEMENT



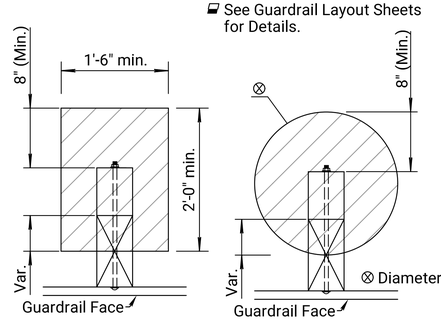
POSTS IN PAVEMENT

(Not to Scale)

▨ Slurry Grout (Low Strength)
See KDOT's Standard Specifications

▨ Pavement (Concrete or Asphalt)

Note: Low Strength Grout must have a 28-day compressive strength of 120 psi or less. All work and materials related to posts in pavement are subsidiary to other guardrail bid items. Rectangular geometry shown in Posts in Pavement detail. Circular geometry, as shown on this sheet, may be used at the Contractor's option.

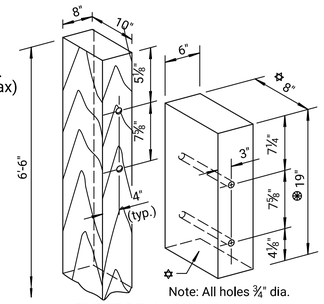


RECTANGULAR GEOMETRY

CIRCULAR GEOMETRY

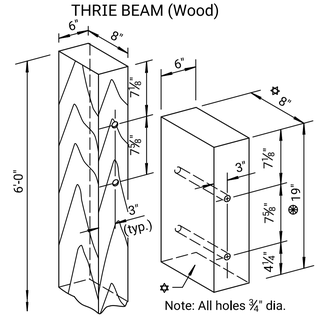
⊗ Diameter may vary from 1'-6" (min.) to 2'-0".

PLAN
(ALTERNATE GEOMETRIES)



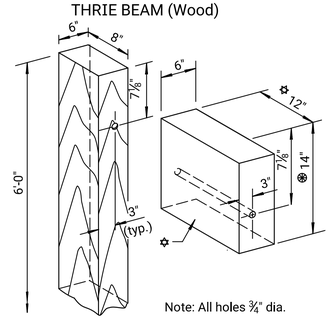
Note: All holes ¾" dia.

THRIE BEAM (Wood)



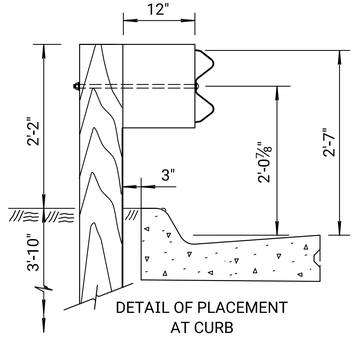
Note: All holes ¾" dia.

THRIE BEAM (Wood)



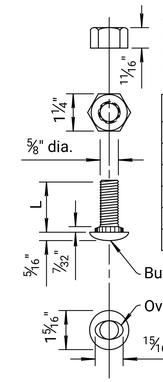
Note: All holes ¾" dia.

"W" BEAM (Wood)



DETAIL OF PLACEMENT
AT CURB

Note: Measure height of rail from the pavement surface at the curb/pavement joint as shown. A special design is needed when guardrail is not located as detailed. A Type II (laydown) curb & gutter is preferred when guardrail is adjacent to curb.



All bolts,nuts, and washers shall be galvanized in accordance with the Standard Specifications.

BOLT SIZE SCHEDULE	
Bolt	L
A	10"
B	1¼"
C	18"
D	14"
E	22"

BOLT & NUT DETAILS

GENERAL NOTES (Wood Posts)

Give all wood posts and wood blocks a preservative treatment, see standard specifications. Thoroughly saturate all cuts, injuries and bolt holes on wood posts and blocks with preservative. Use only one type of preservative treatment on a project.

Set guardrail posts by digging or by driving. Use post caps to protect the post from crushing during driving operations.

Wood blockouts may be used through the 25'-0" thrie-beam section with wood or polymer blockouts used throughout the remainder of the w-beam installation. The blockout size and material used in the guardrail end terminal may be independent from the remainder of the installation. For wood/polymer blockout requirements see standard specifications.

Use S4S rectangular posts/blockouts for Thrie Beam/W-Beam installation. See standard specifications for additional information.

Contractor must notify Engineer at the earliest time when a non-removable man-made object (footing, pipe, etc.) is encountered and prevents installation of a full length post.

All dimensions are nominal and are subject to manufacturing tolerances.

Excavation including rock, shale, and other materials for erection of Guardrail is subsidiary to various bid items for which payment is made.

NO.	DATE	REVISIONS	BY	APP'D
4	9-24-15	Initial Release	T.T.R.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL POST (WOOD) (MGS) DETAILS

RD611B

FHWA APPROVAL	1-29-16	APP'D. Scott W. King	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

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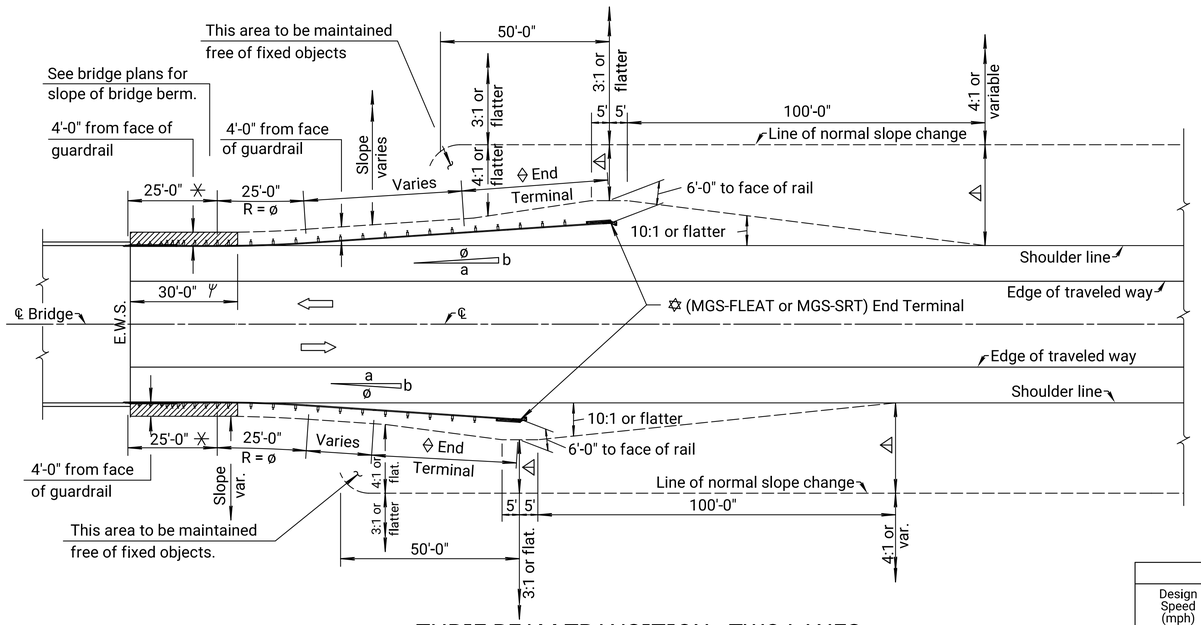
KDOT Graphics Certified

Notes to Designer: For posts installed in pavement thicker than 8" or posts installed in rock formations refer to AASHTO's Roadside Design Guide for details then revise this drawing and all supporting drawings appropriately.

Plotted :16-JAN-2025 07:38

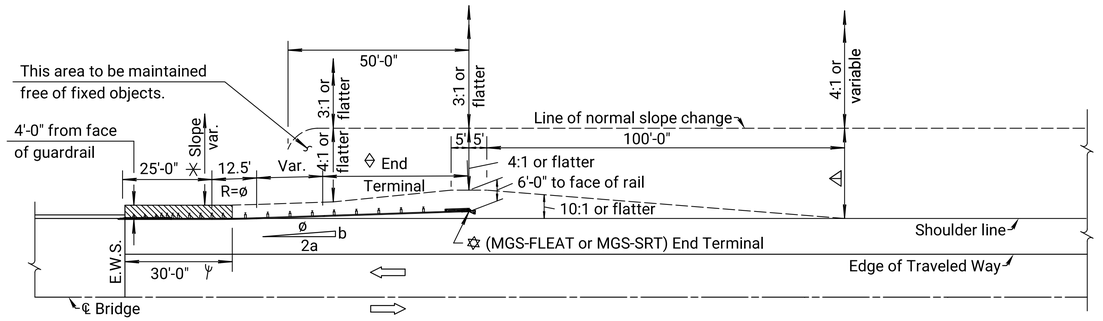
Drawn By : mrockwell
File : rd611b.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	46	291



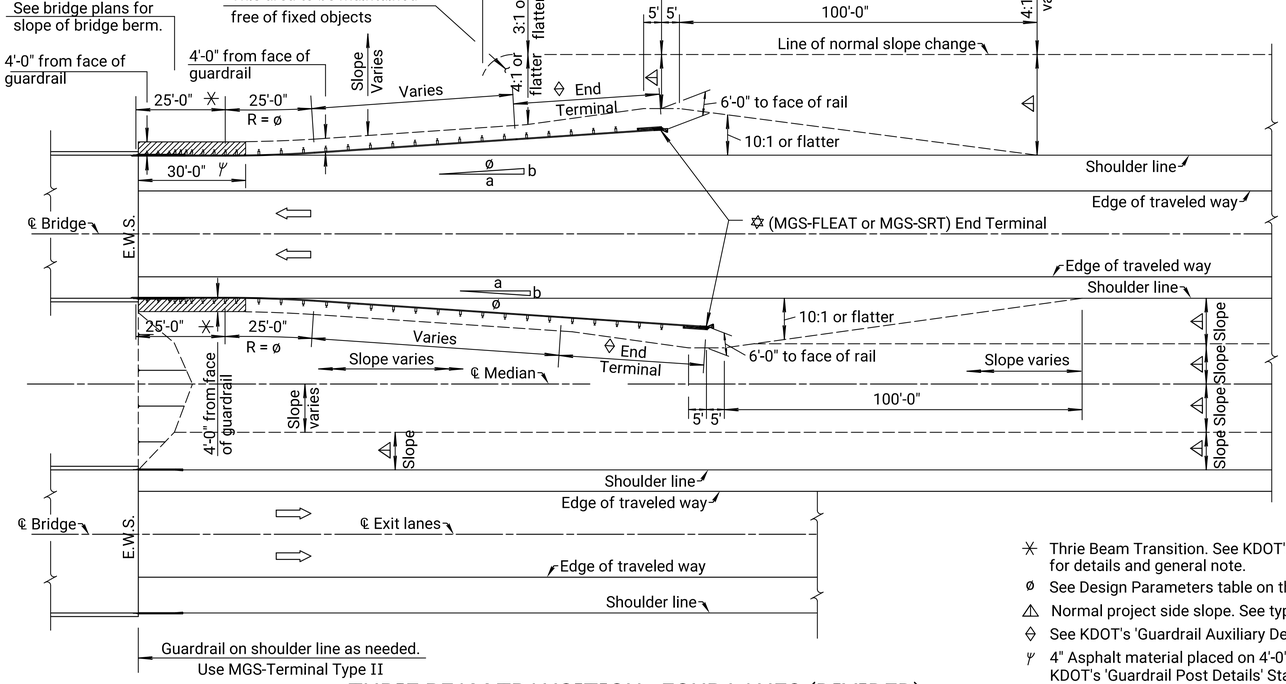
THRIE BEAM TRANSITION - TWO LANES

Note: Use flare rate of a:b and curve length of 25'-0" when guardrail is beyond shyline. Use flare rate of 2a:b and curve length of 12'-6" when guardrail is located inside the shy line.



ALTERNATE TREATMENT - TWO LANES (Flare Rate = 2a:b)

DESIGN PARAMETERS				
Design Speed (mph)	Flare Rate (a:b)	Radius (R)	Flare Rate (2a:b)	Radius (R)
70	15:1	375.55'	30:1	375.14'
60	14:1	350.59'	26:1	325.16'
55	12:1	300.69'	24:1	300.17'
50	11:1	275.76'	21:1	262.70'
45	10:1	250.83'	18:1	225.23'
40	8:1	201.04'	16:1	200.26'



THRIE BEAM TRANSITION - FOUR LANES (DIVIDED)

- ✳ Thrie Beam Transition. See KDOT's 'Thrie Beam Guardrail Transition Details' Standard Drawings for details and general note.
- ø See Design Parameters table on this sheet for radius, length of curve and flare rate information.
- ⚠ Normal project side slope. See typical sections.
- ⟠ See KDOT's 'Guardrail Auxiliary Details' Standard Drawing.
- ℽ 4" Asphalt material placed on 4'-0" embankment widening unless flume inlet and slope drain is constructed. See KDOT's 'Guardrail Post Details' Standard Drawings for "Post in Pavement" details.
- ✡ The minimum length of w-beam guardrail required between the guardrail end terminal and any transition section, including the thrie-beam transition, is 12'-6".

Notes to Designer: Determine guardrail length of need using either KDOT's Length of Need Equation or a graphic design approach with an L_1 distance measured from the edge of the area of concern to the P.I. of the curved guardrail section. Combine materials for asphalt widening in the plan quantities.

Optional: If approach side is within the shyline, use a flare rate of 2a:b for all quadrants.

Plotted :16-JAN-2025 07:38

Drawn By : mrockwell
File : rd612c.dgn

NO.	DATE	REVISIONS	BY	APP'D
4	6-5-18	Removed Flare-beyond-the-Flare	A.L.R.	T.T.R.
3	5-15-17	Removed X-LITE	A.L.R.	S.W.K.
2	6-7-12	Revised Note to Designer	S.W.K.	J.O.B.
1	1-25-12	Revised Layout, End Term.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

THRIE BEAM GUARDRAIL (MGS) BRIDGE APPROACH TRANSITION TYPICAL ALIGNMENTS (FLARED)

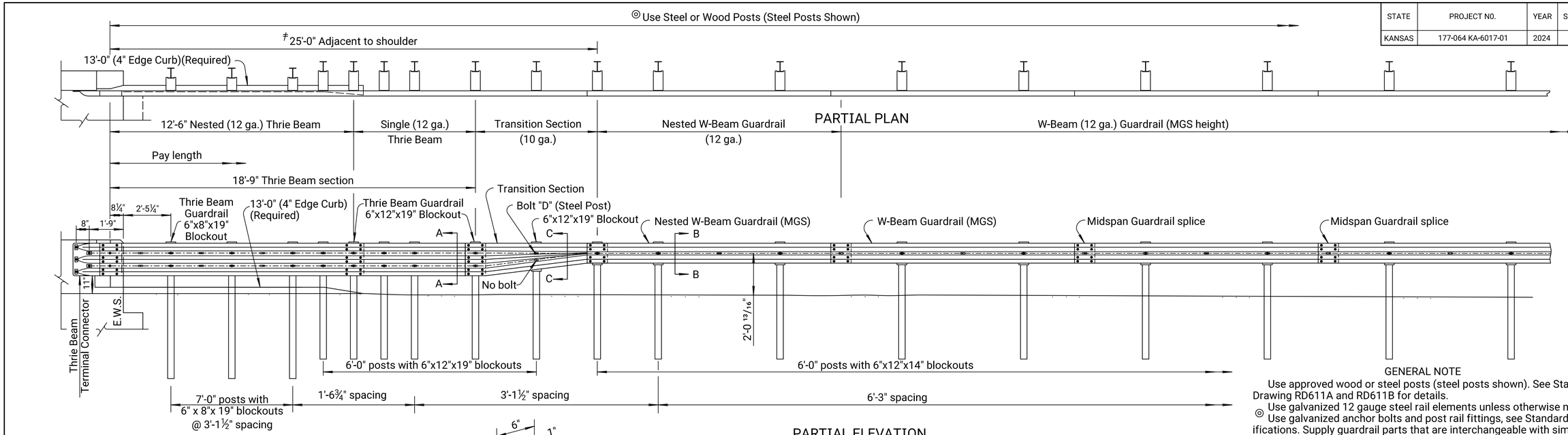
RD612C

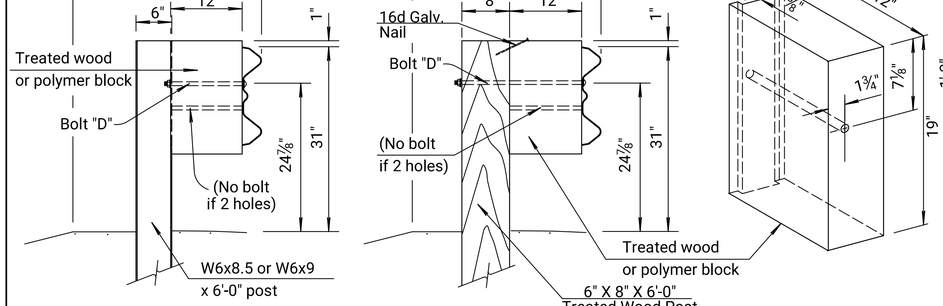
FHWA APPROVAL	6-19-18	APP'D. SCOTT W. KING	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-10-2022 Sh. No. 46

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	47	291

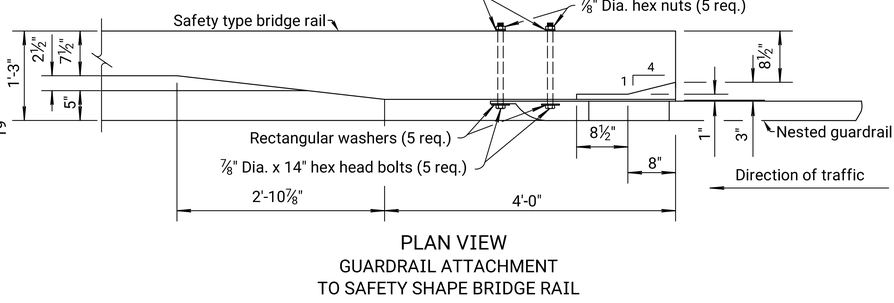




◎ SECTION C-C (STEEL POST)

◎ SECTION C-C (WOOD POST)

SECTION C-C (BLOCKOUTS)
Note: All holes ¾" dia.



PLAN VIEW
GUARDRAIL ATTACHMENT
TO SAFETY SHAPE BRIDGE RAIL

GENERAL NOTE

Use approved wood or steel posts (steel posts shown). See Standard Drawing RD611A and RD611B for details.

◎ Use galvanized 12 gauge steel rail elements unless otherwise noted.

Use galvanized anchor bolts and post rail fittings, see Standard Specifications. Supply guardrail parts that are interchangeable with similar parts regardless of source or manufacturer.

Wood blockouts may be used through the 25'-0" thrie-beam section with wood or composite blockouts used throughout the remainder of the w-beam installation. The blockout size and material used in the guardrail end terminal may be independent from the remainder of the installation.

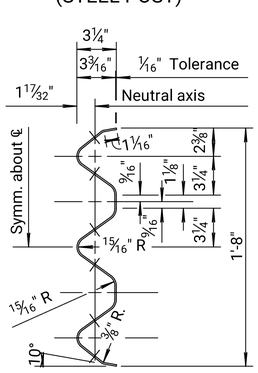
Fabricate Terminal Connector from 10 gauge steel, see Standard Specification. The connector has the same section as thrie beam guardrail. Terminal connector is Subsidiary to the bid item "Guardrail, Steel Plate (MGS)".

Shop bend curve rails when radius is less than 150'.

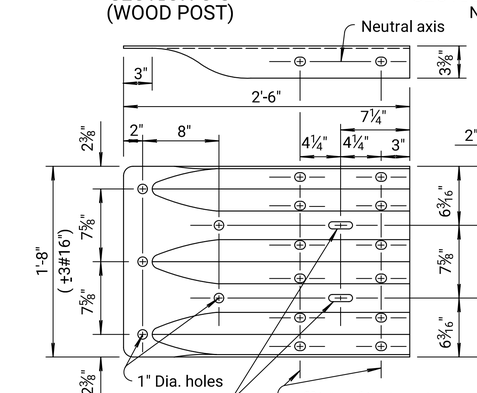
Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

Bridge to guardrail transition consists of 1- 18'-9" thrie-beam with 1- 12'-6" thrie-beam section nested in back of 18'-9" section (See Layout), 1- Thrie beam to W-beam Asymmetrical transition section, use associated hardware with post sizes and location shown. For the remainder of installation use (MGS) W-beam guardrail with only one post type used within (MGS) guardrail run.

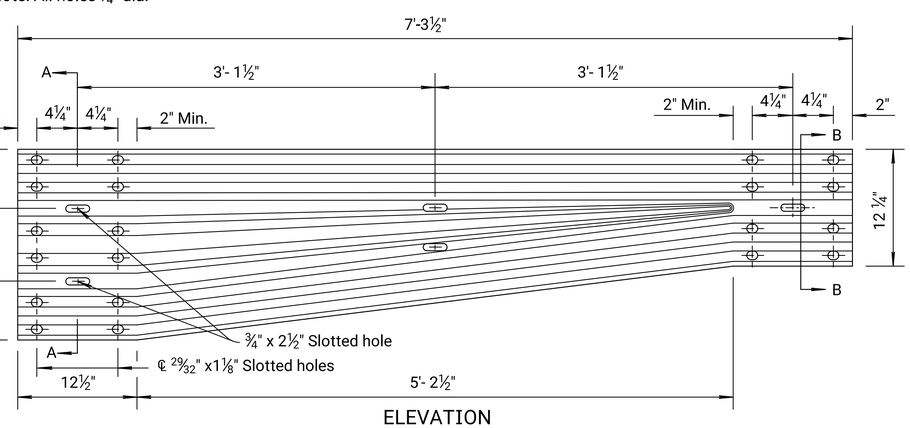
All material and work required for this construction is Subsidiary to the bid item "Guardrail, Steel Plate (MGS)".



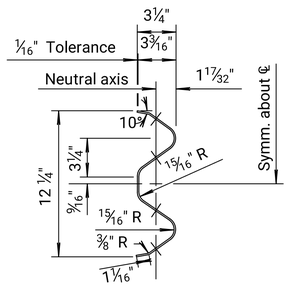
SECTION A-A
THRU RAIL ELEMENT
TYPICAL THRIE BEAM



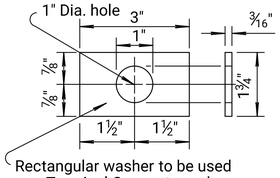
TERMINAL CONNECTOR
⊛ Optional 29/32" x 1¾" Slotted holes Rotated 50° (Typical) (12 req'd.)



ELEVATION
ASYMMETRICAL TRANSITION SECTION
(From Thrie Beam to W-Beam rail)



SECTION B-B
THRU RAIL ELEMENT
TYPICAL W-BEAM



RECTANGULAR WASHER
(Other approved washer may be used.)

NO.	DATE	REVISIONS	BY	APP'D
	2-10-16	Added Detail, Wood Post	T.T.R.	S.W.K.
	1-25-12	Revised Details, Thrie-Beam	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS OF THRIE BEAM to (MGS) GUARDRAIL TRANSITION

RD613A

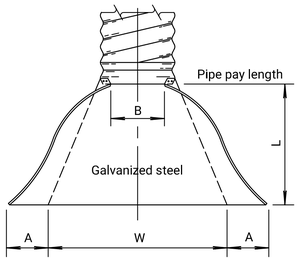
FHWA APPROVAL	4-21-16	APP'D.	SCOTT W. KING
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 01-15-2025 Sh. No. 47

KDOT Graphics Certified

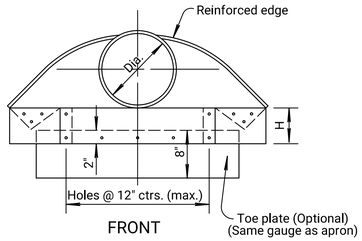
Plotted :16-JAN-2025 07:38
Drawn By : mrockwell
File : rd613a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	48	291

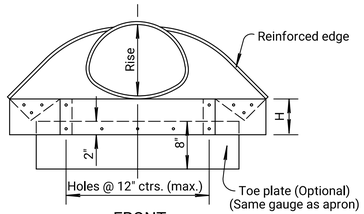


PLAN

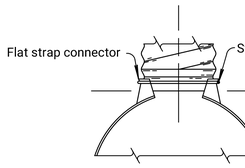
(Illustrated with Type #3 Connection)



FRONT

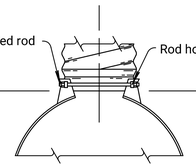


FRONT



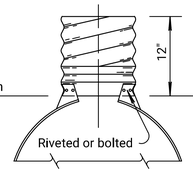
TYPE 1

Available in sizes 12" through 24" only.



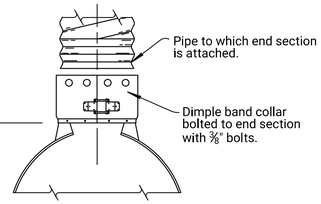
TYPE 2

Available in sizes 30" and 36" Round and 17"x13" through 57"x38" Pipe-Arches.



TYPE 3

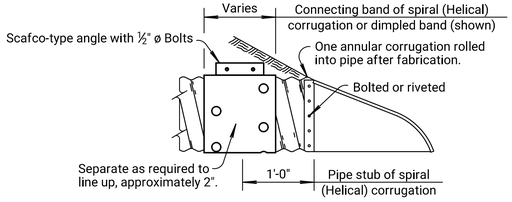
Available in sizes 42" through 96" Round and 60"x46" through 81"x59" Pipe-Arches.



TYPE 5

Available for all Round and equivalent Pipe-Arch sizes, (Type 1 and Type 2 connections are recommended for the smaller sizes with annular ends).

Note: Type 3 connection may be furnished instead of Type 1 or Type 2 for smaller round or arch pipe.



SPIRAL (HELICAL) CORRUGATION

For all sizes of round and arch culvert pipes having Spiral (Helical) corrugations, the end sections and connecting bands shall be as shown above.

Thickness CSP/ACSP	Thickness CAP	Gauge
0.064"	0.060"	16 ga.
0.079"	0.075"	14 ga.
0.109"	0.105"	12 ga.
0.138"	0.135"	10 ga.
0.168"	0.164"	8 ga.

Pipe Dia. (In.)	CS, ACS or CA Gauge	Dimensions in Inches A (min.)	B (max.)	H (min.)	L (±2")	W (min.)	Approx. Slope
12"	16	5	7	6	21	22	2½: 1
15"	16	6	8	6	26	28	2½: 1
18"	16	7	10	6	31	34	2½: 1
21"	16	8	12	6	36	40	2½: 1
24"	16	9	13	6	41	46	2½: 1
30"	14	11	16	8	51	55	2½: 1
36"	14	13	19	9	60	70	2½: 1
42"	12	15	25	10	69	82	2½: 1
48"	12	17	29	12	78	88	2¼: 1
54"	12	17	33	12	84	100	2¼: 1
60"	12/10	17	36	12	87	112	2: 1
66"	12/10	17	39	12	87	118	2: 1
72"	12/10	17	44	12	87	120	2: 1
78"	12/10	17	48	12	87	130	1½: 1
84"	12/10	17	52	12	87	136	1½: 1
90"	12/10	17	58	12	87	142	1½: 1
96"	12/10	17	58	12	87	144	1½: 1

Bid Designation Sq. Ft.	Nom. W.W. Area Sq. Ft.	Pipe Arch Span & Rise	Dimensions in Inches 2⅔" x ½" Corrugations CS, ACS or CA Gauge	A (min.)	B (max.)	H (min.)	L (±2")	W (min.)	Dimensions in Inches 3" x 1" or 5" x 1" Corr. CS, ACS or CA Gauge	A (min.)	B (max.)	H (min.)	L (±2")	W (min.)	Approx. Slope
1.0	1.1	17" x 13"	16	5	9	6	20	28							2½: 1
1.5	1.6	21" x 15"	16	6	11	6	24	34							2½: 1
2.0	2.2	24" x 18"	16	7	12	6	28	40							2½: 1
2.5	2.9	28" x 20"	16	7	16	6	32	46							2½: 1
3.0 or 4.0	4.5	35" x 24"	14	9	16	6	39	58							2½: 1
5.0 or 6.0	6.5	42" x 29"	14	11	18	7	46	73							2½: 1
7.0 or 8.5	8.9	49" x 33"	12	12	21	9	53	82							2½: 1
10.0 or 11.0	11.7	53" x 41"							12	17	26	12	63	88	2: 1
10.0 or 11.0	11.6	57" x 38"	12	16	26	12	62	88							2: 1
12.5 or 14.0	15.6	60" x 46"							12	17	36	12	70	100	2: 1
12.5 or 14.0	14.7	64" x 43"	12	17	30	12	69	100							2: 1
16.5	19.3	66" x 51"							12/10	17	36	12	70	112	1½: 1
16.5	18.1	71" x 47"	12/10	17	36	12	77	112							1½: 1
21.0	23.2	73" x 55"							12/10	17	36	12	77	124	1½: 1
21.0	21.9	77" x 52"	12/10	17	36	12	77	124							1½: 1
25.0	27.4	81" x 59"							12/10	17	44	12	77	136	1½: 1
25.0	26.0	83" x 57"	12/10	17	44	12	77	130							1½: 1
32.0	32.1	87" x 63"							12/10	17	44	12	77	136	1½: 1
36.0	37.0	95" x 67"							12/10	17	44	12	87	160	1½: 1
42.0	42.4	103" x 71"							12/10	17	44	12	87	172	1½: 1
47.0	48.0	112" x 75"							12/10	17	44	12	87	172	1½: 1

(Information listed in these tables are nominal and may vary by manufacturer.)

GENERAL NOTE for END SECTIONS

End section material shall follow KDOT Pipe Policy for geographic location. Location shall govern use of CS (Galvanized), ACS (Aluminized) or CA (Aluminum) (Type I) End Section. Pipe material and End Section material shall be the same with no mixing of types per location.

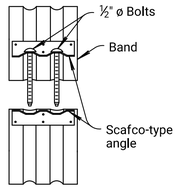
Toe plate extension, when specified, is an accessory and shall be the same gauge and metal as end section. Toe plate shall be punched to match holes in apron lip and attached with furnished 3#8" diameter nuts & bolts.

W + 10" for 12" to 30" diameter pipes inclusive.
W + 20" for 36" to 84" diameter pipes inclusive.
W + 10" for pipe-arches with a rise of 13" to 29" inclusive.
W + 20" for pipe-arches with a rise of 33" to 59" inclusive.

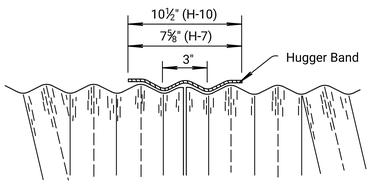
Multiple panel end sections may contain dual gauges of like metal and shall have lap seams which are tightly joined with rivets or bolts. For 60" and larger diameter round pipe end sections and 77"x52" arch pipe end sections, the reinforced edges are supplemented with stiffener angles. The angles are attached with nuts and bolts. Angle reinforcement may be required uder the center panel seams of 73"x55" and larger arch pipe end sections depending on manufacturer.

Other approved designs may be used in lieu of type shown.

Connection of end sections by welding will not be permitted.

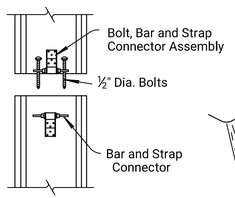


CONNECTION DETAIL
H-7 or H-10 BAND

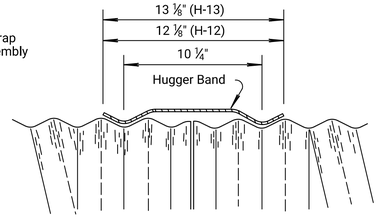


UNIVERSAL REFORMED END with
H-7 or H-10 HUGGER BAND

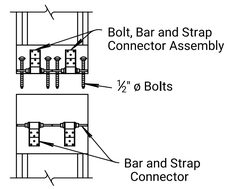
DETAILS FOR H-7 HUGGER BAND (12" thru 36")
or H-10 HUGGER BAND (12" thru 120")



CONNECTION DETAIL
SINGLE HARNESS



UNIVERSAL REFORMED END with
HUGGER BAND



CONNECTION DETAIL
DOUBLE HARNESS

DETAILS FOR H-12 or H-13 HUGGER BAND

Pipe Dia. Inches	Minimum Gauge of Round Pipe 2⅔" x ½" Corr. CSP or ACSP	3" x 1" Corr. CSP or ACSP	5" x 1" Corr. CSP or ACSP	2⅔"x ½" Corr. CAP	3" x 1" Corr. CAP
12"	14			16	
15"	14			16	
18"	14			16	
21"	14			16	
24"	14			16	
30"	14			14	
36"	14			14	16
42"	14			12	16
48"	12	14 16	14 16	12	16
54"	12	14 16	14 16	12	16
60"	10	14 16	14 16	10	16
66"	10	14 16	14 16	8	16
72"	10	14 16	14 16	8	16
78"	8	14 14	14 14		14
84"	8	14 14	14 14		12
90"		14 14	14 14		12
96"		12 12	12 12		12
102"		12 12	12 12		10
108"		12 12	12 12		10
114"		12 12	12 12		8
120"		10 10	10 10		8

Bid Designation Sq. Ft.	Pipe Dimension Span & Rise	Sq. Ft.	Equiv. Round Pipe Diameter	Minimum Gauge of Arch Pipe 2⅔"x ½" Corr. CSP or ACSP	3" x 1" Corr. CSP or ACSP	5" x 1" Corr. CSP or ACSP	2⅔"x ½" Corr. CAP	3" x 1" Corr. CAP
1.0	17" x 13"	1.1	15"	14			16	
1.5	21" x 15"	1.6	18"	14			16	
2.0	24" x 18"	2.2	21"	14			16	
2.5	28" x 20"	2.9	24"	14			14	
3.0 or 4.0	35" x 24"	4.5	30"	14			14	
5.0 or 6.0	42" x 29"	6.5	36"	14			12	
7.0 or 8.5	49" x 33"	8.9	42"	14			12	
10.0 or 11.0	53" x 41"	11.7	48"		14			
10.0 or 11.0	57" x 38"	11.6	48"	12			10	
12.5 or 14.0	60" x 46"	15.6	54"		14			14
12.5 or 14.0	64" x 43"	14.7	54"	12			10	
16.5	66" x 51"	19.3	60"		14			14
16.5	71" x 47"	18.1	60"	10			8	
21.0	73" x 55"	23.2	66"		14			14
21.0	77" x 52"	21.9	66"	8				
25.0	81" x 59"	27.4	72"		14	12		12
25.0	83" x 57"	26.0	72"	8				
32.0	87" x 63"	32.1	78"		12	12		12
36.0	95" x 67"	37.0	84"		12	12		12
42.0	103" x 71"	42.4	90"		12	12		10
47.0	112" x 75"	48.0	96"		12	12		8
54.0	117" x 79"	54.2	102"		10	10		
60.0	128" x 83"	60.5	108"		10	10		
67.0	137" x 87"	67.4	114"		10	10		
74.0	142" x 91"	74.5	120"		8	8		

GENERAL NOTE for METAL PIPE

Culvert "Type" listed may be CSP, ACSP, CAP, RCP, PVCP & PEP within guidelines of KDOT Pipe Policy for geographic location. More than one pipe "Type" may be acceptable for a design location with allowable types listed for each site.

There shall be no payment for gain in pipe length due to fit of pipe at connecting band.

When Hugger Bands are used, the H-7 Hugger Band may be used on circular pipes 36" diameter and smaller or pipe arches 42"x 29" and smaller. The H-10 Hugger Band may be used on 12" thru 120" pipe. The H-12 or H-13 Hugger Band are for pipe sizes larger than 36" diameter or 42"x29" arch pipe.

⊛ Pipe gauge listed in the tables on this sheet are minimum for E'=750 p.s.i. soil. Pipe gauge will be determined for each site based on the Design Manual Volume I- Part C Fill Height Tables and shall shall be listed in the Pipe Culvert Summary. Gauges shown on this Standard Drawing are KDOT minimum and may not be industry minimum gauge.

In geographic areas that allow CSP (24" or smaller arched or round pipe) for entrance and side road installation with less than 3,000 AADT, 16 gauge ACSP may be substituted for 14 gauge CSP.

Aluminum or aluminized pipes or end sections shall be coated with an asphaltic paint when in contact with fresh concrete in accordance with the Standard Specifications.

Note to Designer: KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, CAP & RCP. Provide end sections of the same type and coating as the pipe. Exceptions to this are noted in the Standard Specifications. Refer to the KDOT Design Manual, Volume I (Part C), Road Section "Elements of Drainage & Culvert Design" for structural pipe design information which includes: corrugations, sizes, gauges, maximum/minimum fill heights and classes of pipe.

Plotted :16-JAN-2025 07:38

Drawn By : mrockwell
File : rd660.dgn

NO.	DATE	REVISIONS	BY	APP'D
4	9-10-09	Rev. Round and Arch tables, add. Alum.	S.W.K.	J.O.B.
3	1-20-09	Rev. Round Pipe Gauges	S.W.K.	J.O.B.
2	4-1 8-08	Rev. layout, details, tables and notes	S.W.K.	J.O.B.
1	4-27-98	Added pipe corrugation option note	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

METAL END SECTION FOR ROUND & ARCH METAL CULVERTS (TYPE I) & PIPE GAUGE TABLES

RD660

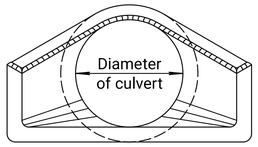
FHWA APPROVAL 12-16-09		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

KDOT Graphics Certified 06-10-2022 Sh. No. 48

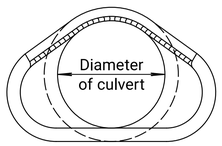
KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	49	291

Note to Designer: KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, CAP & RCP. Provide end sections of the same type and coating as the pipe. Exceptions to this are noted in the Standard Specifications. Refer to the KDOT Design Manual, Volume I (Part C), Road Section, "Elements of Drainage & Culvert Design" for structural pipe design information which includes: corrugations, sizes, gauges, maximum/minimum fill heights and classes of pipe.

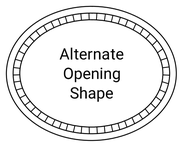


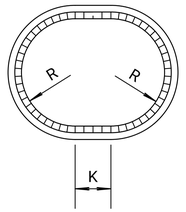
END ELEVATION (TYPE I)



SECTION A-A

Showing rounding of inside edge of end section.





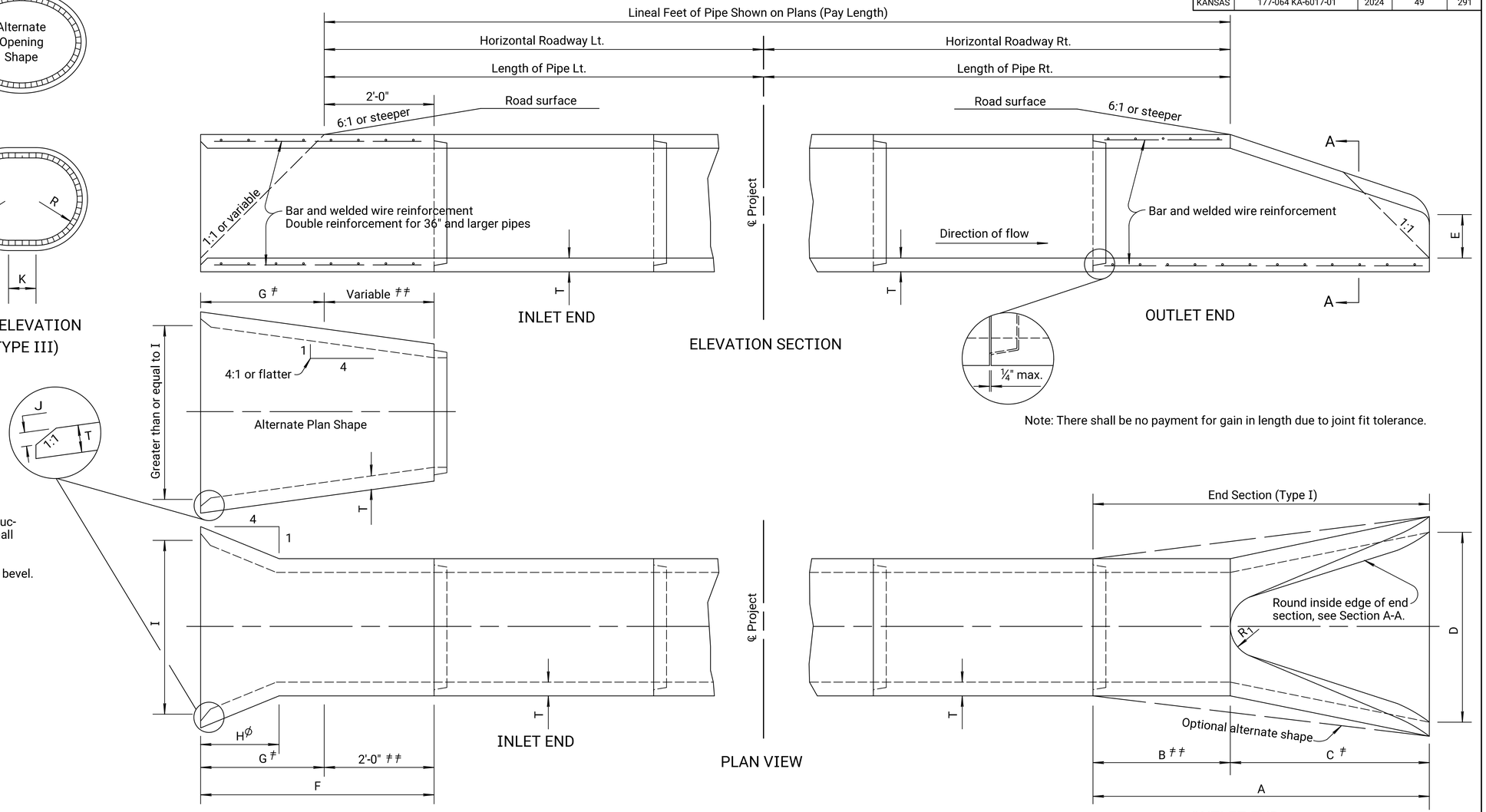
END ELEVATION
(TYPE III)

ϕ Transition to round pipe.

≠ Paid for as separate item of End Section, except when structures shall bid as alternates. In that case End Sections shall be subsidiary to bid item. "Drainage Structure No. ".

≠≠ Included in pay length of pipe.

⚹ Minimum waterway area is calculated at the inside of the bevel.



Note: There shall be no payment for gain in length due to joint fit tolerance.

END SECTION (TYPE I) NOMINAL DIMENSIONS

Diam.	A	B≠≠	C≠	D	E	R_I	Slope	T
12"	6'-0 ⅞"	4'-0 ⅞"	2'-0"	2'-0"	4"	9	3:1	2"
15"	6'-1"	3'-10"	2'-3"	2'-6"	6"	11	3:1	2 ¼"
18"	6'-1"	3'-10"	2'-3"	3'-0"	9"	12	3:1	2 ½"
24"	6'-1 ½"	2'-6"	3'-7 ½"	4'-0"	9 ½"	14	3:1	3"
30"	6'-1 ¾"	1'-7 ¾"	4'-6"	5'-0"	1'-0"	15	3:1	3 ½"
36"	8'-1 ¾"	2'-10¾"	5'-3"	6'-0"	1'-3"	20	3:1	4"
42"	8'-2"	2'-11"	5'-3"	6'-6"	1'-9"	22	3:1	4 ½"
48"	8'-2"	2'-2"	6'-0"	7'-0"	2'-0"	22	3:1	5"
54"	8'-2 ¼"	2'-9 ¼"	5'-5"	7'-6"	2'-3"	24	2.4:1	5 ½"
60"	8'-3"	3'-3"	5'-0"	8'-0"	2'-11"	24	21	6"
72"	8'-3"	1'-9"	6'-6"	9'-0"	3'-0"	24	1.86:1	7"
84"	9'-3 ½"	1'-9"	7'-6 ½"	10-0"	3'-0"	24	1.6:1	8"

SIDE TAPERED INLET SECTION (TYPE III)-NOMINAL DIMENSIONS

Diam.	Min. W.W.⚹ Area Sq. Ft.	F	G	H	I	J	K	R	T
24"	4.5	4'-3"	2'-3"	1'-5 ⅛"	2'-8"	1 ½"	8"	1'-0"	3"
30"	7.0	4'-9 ½"	2'-9 ½"	1'-9 ½"	3'-4"	2"	10"	1'-3"	3 ½"
36"	10.1	5'-4"	3'-4"	2'-1 ½"	4'-0"	2"	1'-0"	1'-6"	4"
42"	13.7	5'-10 ½"	3'-10 ½"	2'-5 ⅞"	4'-8"	2 ½"	1'-2"	1'-9"	4 ½"
48"	17.9	6'-5"	4'-5"	2'-10 ⅛"	5'-4"	3"	1'-4"	2'-0"	5"
54"	22.7	6'-11 ½"	4'-11 ½"	3'-2 ½"	6'-0"	3 ½"	1'-6"	2'-3"	5 ½"
60"	28.0	7'-6"	5'-6"	3'-6 ⅞"	6'-8"	4"	1'-8"	2'-6"	6"
72"	40.3	8'-7"	6'-7"	4'-3 ⅝"	8'-0"	5"	2'-0"	3'-0"	7"
84"	54.8	9'-8"	7'-8"	5'-0 ⅜"	9'-4"	6"	2'-4"	3'-6"	8"

Dimensions for alternate shapes shall be equal to or greater than those shown in the table, unless otherwise shown.

NO.	DATE	REVISIONS	BY	APP'D
2	4-18-08	Added ref. to KDOT Pipe Policy	S.W.K	J.O.B
1	4-05-05	Revised reinforcement callout	S.W.K	J.O.B

KANSAS DEPARTMENT OF TRANSPORTATION

CONCRETE END SECTIONS FOR CONCRETE PIPES TYPE I & SIDE TAPERED INLET SECTION (TYPE III)

RD662

FHWA APPROVAL 6-27-08		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

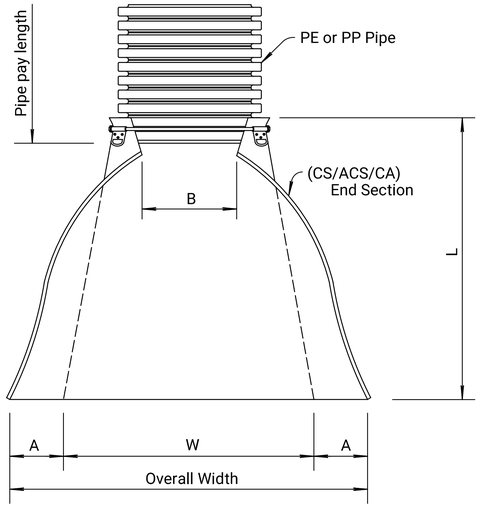
KDOT Graphics Certified 06-10-2022 Sh. No. 49

KDOT Graphics Certified

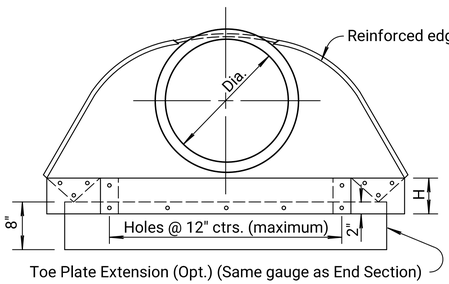
Plotted :16-JAN-2025 07:38

Drawn By : mrockwell
File : rd662.dgn

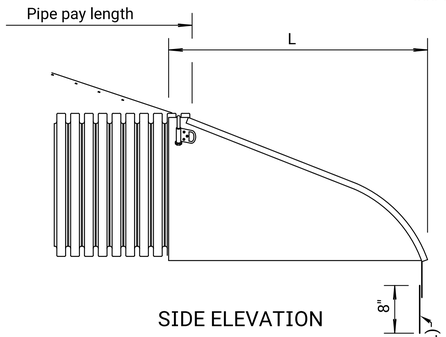
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	50	291



PLAN
(Illustrated with Type 2 Connector)

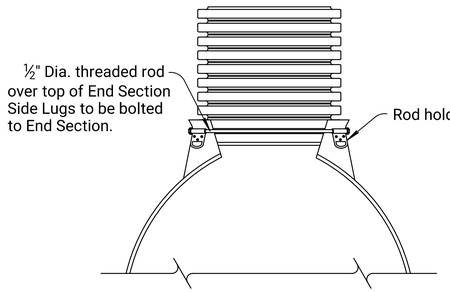


FRONT ELEVATION

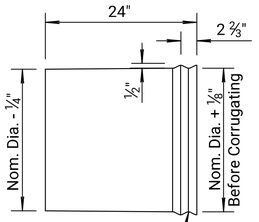


SIDE ELEVATION

✠ Toe plate extensions where specified, to be punched to match holes in apron lip and bolted with ⅜" dia. bolts. The length of toe plate to be as follows:
W + 10" for 12" to 30" diameter pipe inclusive.
W + 20" for 36" to 60" diameter pipe inclusive.

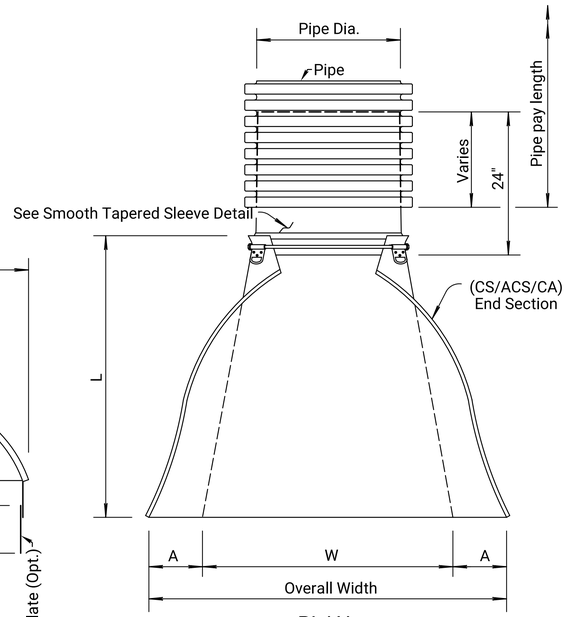


TYPE 2 CONNECTOR
(12" & Larger)

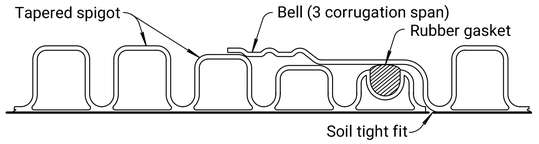


Form ½" x 2 ⅔" Corrugations in 12 ga. smooth CS (Galvanized) or ACS (Aluminized) metal, maintain inside diameter of sleeve.

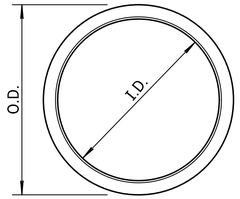
SMOOTH TAPERED SLEEVE DETAIL
(Required)



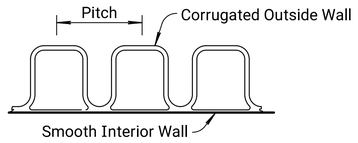
PLAN
TAPERED SLEEVE FOR ATTACHING
METAL END SECTION TO PE OR PP PIPE
(Illustrated with Type 2 Connector)



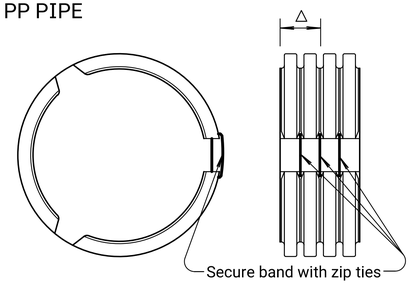
PE or PP PIPE BELL & SPIGOT CONNECTION
SOIL TIGHT JOINT



DETAILS OF CORRUGATED
PE or PP PIPE

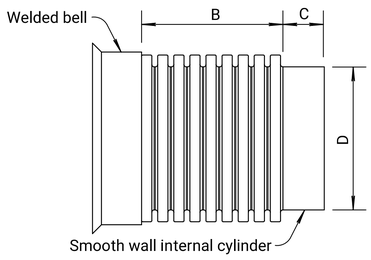


TYPICAL SECTION
CORRUGATED PE or PP PIPE



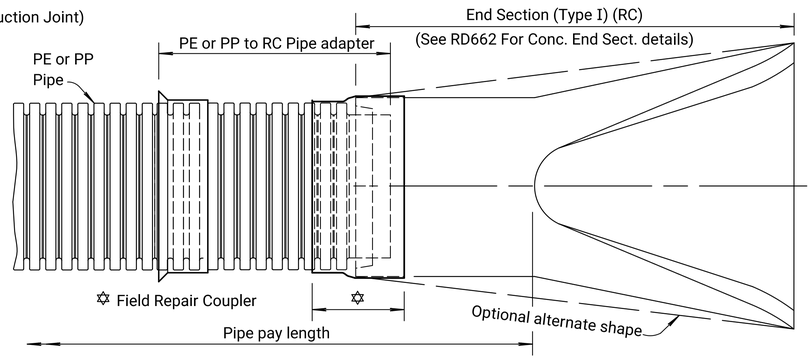
△ Two Full Corrugations (Minimum Overlap)

PE or PP PIPE SPLIT BAND COUPLER
SOIL TIGHT JOINT
This band is used for (Field Splice Construction Joint)



PE or PP to RC PIPE ADAPTER

PE or PP TO RC PIPE ADAPTER			
Pipe Dia. (In.)	B	C	D
18"	18¼"	6"	18"
24"	25"	6"	24"
30"	32 13/16"	6"	30"
36"	36¾"	6"	36"
42"	36"	6"	41¼"
48"	36¾"	6"	41¼"
60"	36"	6"	59"



PE or PP to RC PIPE ADAPTER to CONCRETE END SECTION
(This installation is for Acidic Soil Conditions)

GENERAL NOTES

The culvert type shall meet the KDOT Pipe Policy & Standard Specifications.

The size of pipe designated on the plan shall be the nominal inside diameter of a two wall corrugated PE pipe (Type S) or PP pipe (Type S).

PE or PP pipe couplings shall be designed to cover at least two full corrugations on each side of a joint.

No additional payment shall be made for any gain in length due to the fit of the pipe at connections.

All corrugated PE or PP pipe, end sections, couplings, and fittings shall conform with the Standard Specifications.

See Standard Specifications for PE or PP Pipe bedding and backfill.

Multiple panel end sections shall have lap seams which are to be tightly joined by bolts & nuts. Corner plate and toe plate to be same gauge and material as end section. When required optional toe plate extension shall be overall width less 6" x 8" high.

Attachment to PE or PP pipe 12" diameter and up shall be made with Type 2 Connector.

All work and materials required for construction and installation of end section shall be included in the bid item "End Section".

(CS/ACS/CA) END SECTION FOR PE or PP PIPE							
Pipe Dia. (In.)	Min. Gauge Ends	Dimensions in Inches					Slope
		A (min.)	B (max.)	H (min.)	L (+/-2")	W (min.)	
12"	16	6	7	6	21	24	2½:1
15"	16	7	8	6	26	30	2½:1
18"	16	8	10	6	31	36	2½:1
21"	16	9	12	6	36	42	2½:1
24"	16	10	13	6	41	48	2½:1
30"	14	12	16	8	51	60	2½:1
36"	14	14	19	9	60	72	2½:1
42"	12	16	25	11	69	84	2½:1
48"	12	18	29	12	78	90	2¼:1
54"	12	18	33	12	84	102	2¼:1
60"	12/10	18	36	12	87	114	2:1

NO.	DATE	REVISIONS	BY	APP'D
2	7-17-17	Changed tapered slv. requirement	A.L.R.	S.W.K.
1	2-8-08	Added ref. to KDOT pipe policy	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

METAL/CONCRETE END SECTION
(TYPE I)
for PE or PP PIPE

RD667

FHWA APPROVAL	8-9-17	APP'D. Scott W. King	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 01-15-2025 Sh. No. 50

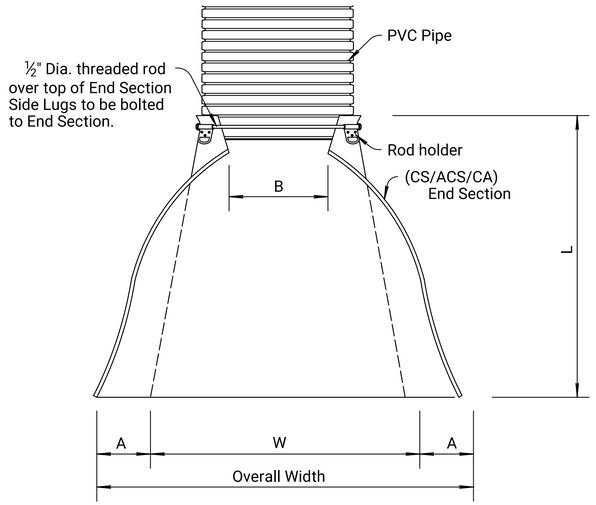
KDOT Graphics Certified

Note to Designer:
[illegible]

Plotted :16-JAN-2025 07:38

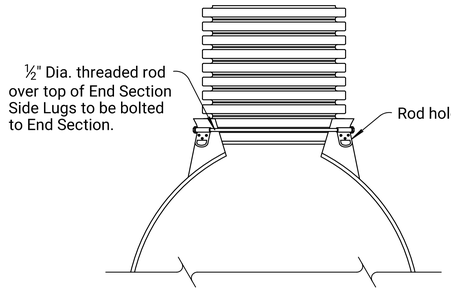
Drawn By : mrockwell
File : rd667.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	51	291



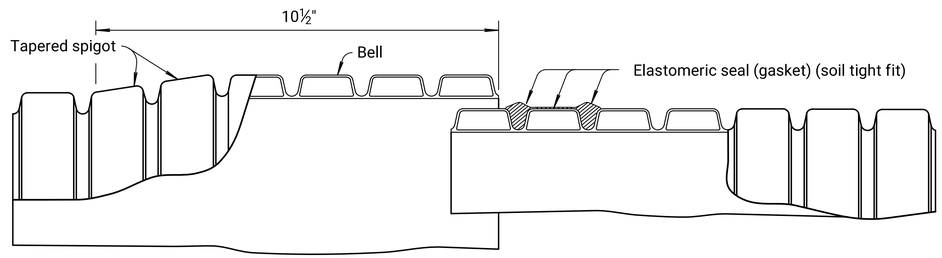
PLAN

(Illustrated with Type 2 Connector on 12" or larger)

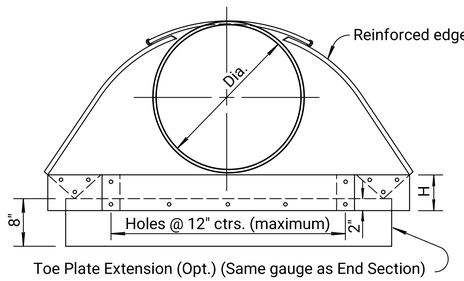


TYPE 2 CONNECTOR

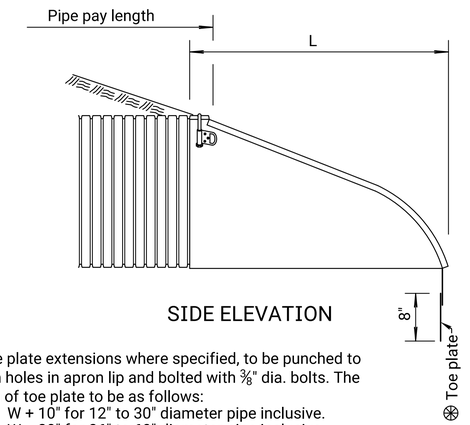
(12" & Larger)



PVC BELL & SPIGOT CONNECTION
SOIL TIGHT JOINT

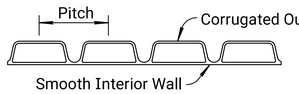


FRONT ELEVATION

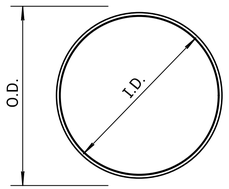


SIDE ELEVATION

⊛ Toe plate extensions where specified, to be punched to match holes in apron lip and bolted with ⅜" dia. bolts. The length of toe plate to be as follows:
W + 10" for 12" to 30" diameter pipe inclusive.
W + 20" for 36" to 60" diameter pipe inclusive.



TYPICAL SECTION
CORRUGATED PVC PIPE



DETAILS OF
CORRUGATED PVC PIPE

GENERAL NOTES

The culvert type shall meet the KDOT Pipe Policy & Standard Specifications.

The size of pipe designated on the plan shall be the nominal inside diameter of a two wall corrugated PVC pipe.

PVC pipe shall be joined with an integral bell gasket joint and Flexible Elastomeric Seals. PVC Pipe is available in lengths of 2.5' to 20'. PVC pipe can be field cut to length, cut through a corrugation valley using a hand or power saw. Gaskets are shipped loose and fitted on spigot/cut pipe end following Manufacturer's installation instructions.

No additional payment shall be made for any gain in length due to the fit of the pipe at connections.

All corrugated PVC pipe, end sections and fittings shall conform with the Standard Specifications.

See Standard Specifications for PVC Pipe bedding and backfill.

Multiple panel end sections shall have lap seams which are to be tightly joined by bolts & nuts. Corner plate and toe plate to be same gauge and material as end section. When required optional toe plate extension shall be overall width less 6" x 8" high.

The End Section attachment to PVC pipe shall be made with a Type 2 Connector for 12" or greater pipe size.

All work and materials required for construction and installation of end section shall be included in the bid item "End Section".

(CS/ACS/CA) END SECTION FOR PVC PIPE

Pipe Dia. (In.)	Min. Gauge Ends	Dimensions in Inches					Slope
		A 1" Tol.	B (max.)	H (min.)	L (+/- 2")	W (min.)	
12"	16	6	7	6	21	24	2½: 1
15"	16	7	8	6	26	30	2½: 1
18"	16	8	10	6	31	36	2½: 1
21"	16	9	12	6	36	42	2½: 1
24"	16	10	13	6	41	48	2½: 1
30"	14	12	16	8	51	60	2½: 1
36"	14	14	19	9	60	72	2½: 1

NO.	DATE	REVISIONS	BY	APP'D
	2-8-08	Added ref. to KDOT Pipe Policy	S.W.K	J.O.B

KANSAS DEPARTMENT OF TRANSPORTATION

METAL END SECTION
(TYPE I)
for PVC PIPE

RD667 B

FHWA APPROVAL	6-27-08	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

KDOT Graphics Certified 06-10-2022 Sh. No. 51

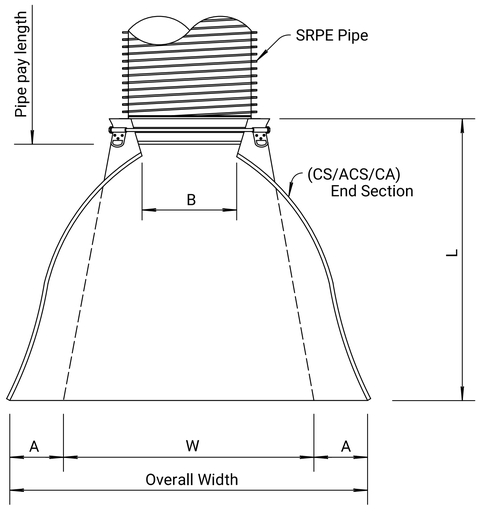
KDOT Graphics Certified

Note to Designer: KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, CAP & RCP. Provide end sections of the same type and coating as the pipe. Exceptions to this are noted in the Standard Specifications. Refer to the KDOT Design Manual, Volume I (Part C), Road Section, "Elements of Drainage & Culvert Design" for structural pipe design information which includes: corrugations, sizes, gauges, maximum/minimum fill heights and classes of pipe.

Plotted :16-JAN-2025 07:39

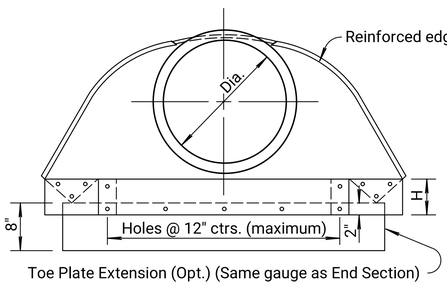
Drawn By : mrockwell
File : rd667b.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	51.001	291

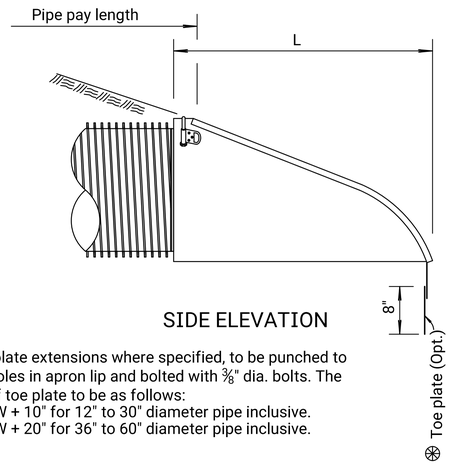


PLAN

(Illustrated with Type 2 Connector)



FRONT ELEVATION

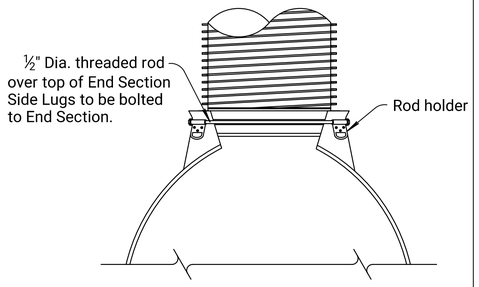


SIDE ELEVATION

⊛ Toe plate extensions where specified, to be punched to match holes in apron lip and bolted with ⅜" dia. bolts. The length of toe plate to be as follows:

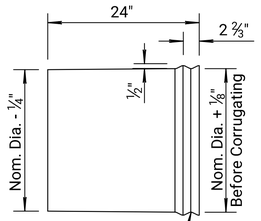
W + 10" for 12" to 30" diameter pipe inclusive.

W + 20" for 36" to 60" diameter pipe inclusive.



TYPE 2 CONNECTOR

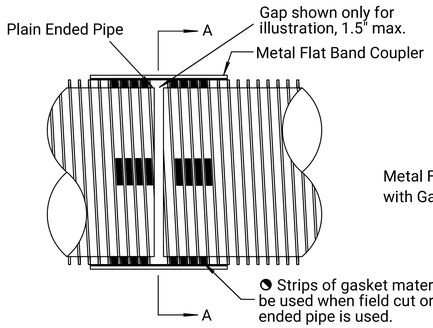
(30" & Larger)



Form ½" x 2 ⅔" Corrugations in 12 ga. smooth CS (Galvanized) or ACS (Aluminized) metal, maintain inside diameter of sleeve.

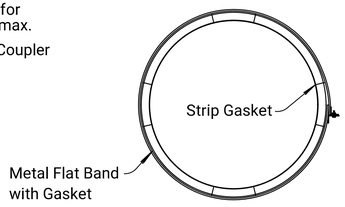
SMOOTH TAPERED SLEEVE DETAIL

(Required)

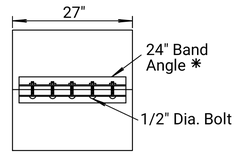


SIDE ELEVATION

◔ Different pipe diameters require a different number of gasket strips. See Manufacturers Guide for quantities.

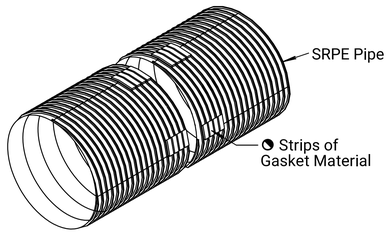


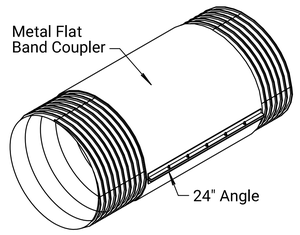
SECTION A-A



FLAT BAND COUPLER

✱ Alternate option: Double bar bolt & strap





SRPE FLAT BAND COUPLER - SOIL TIGHT JOINT (Used for Field Splice Construction Joints)

GENERAL NOTES

The culvert type shall meet the KDOT Pipe Policy & Standard Specifications.

The size of pipe designated on the plan shall be the nominal inside diameter of an SRPE pipe.

No additional payment shall be made for any gain in length due to the fit of the pipe at connections.

All SRPE pipe, end sections, couplings, and fittings shall conform with the Standard Specifications.

See Standard Specifications for SRPE Pipe bedding and backfill.

Multiple panel end sections shall have lap seams which are to be tightly joined by bolts & nuts. Corner plate and toe plate to be same gauge and material as end section. When required optional toe plate extension shall be overall width less 6" x 8" high.

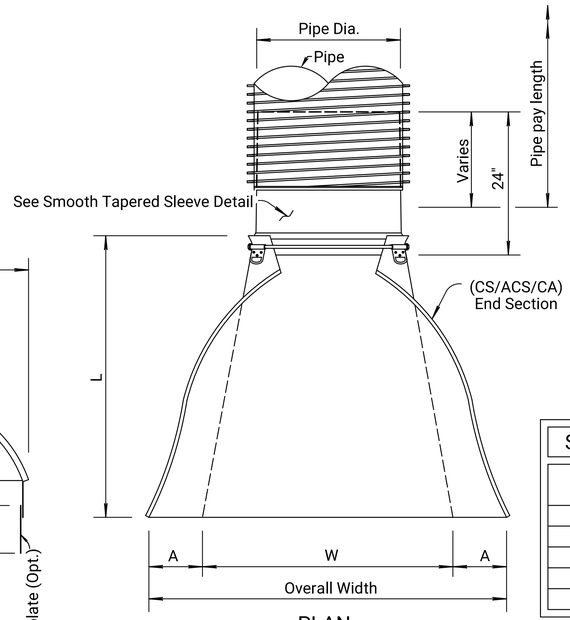
Attachment to SRPE pipe 30" diameter and up shall be made with Type 2 Connector.

All work and materials required for construction and installation of end section shall be included in the bid item "End Section".

(CS/ACS/CA) END SECTION FOR SRPE PIPE

Pipe Dia. (In.)	Min. Gauge Ends	Dimensions in Inches A (min.)	B (max.)	H (min.)	L (+/-2")	W (min.)	Slope
30"	14	12	16	8	51	60	2½:1
36"	14	14	19	9	60	72	2½:1
42"	12	16	25	11	69	84	2½:1
48"	12	18	29	12	78	90	2¼:1
54"	12	18	33	12	84	102	2¼:1
60"	12/10	18	36	12	87	114	2:1

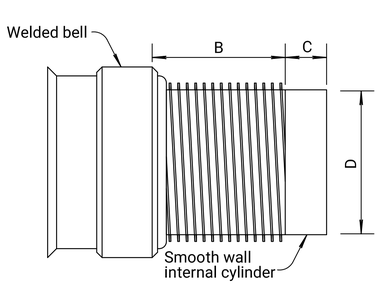
Pipe diameters up to 120" are acceptable for use. End sections are available only up to 96" pipe diameter.



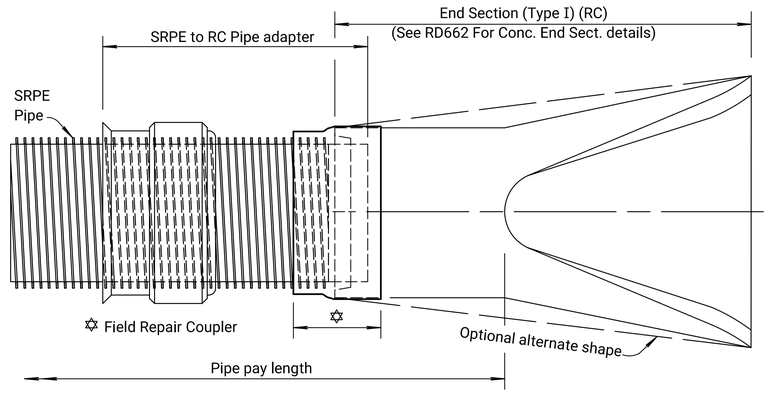
PLAN

TAPERED SLEEVE FOR ATTACHING METAL END SECTION TO SRPE PIPE

(Illustrated with Type 2 Connector)



SRPE to RC PIPE ADAPTER

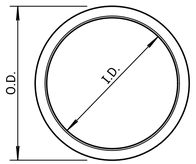


(This installation is for Acidic Soil Conditions)

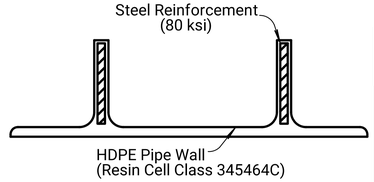
SRPE TO RC PIPE ADAPTER

Pipe Dia. (In.)	B	C	D
30"	32 13/16"	6"	29.5"
36"	36¾"	6"	35.4"
42"	36"	6"	41.3"
48"	36¾"	6"	47.2"
60"	36"	6"	59.1"

Pipe adapters are available up to 96" pipe diameter.



DETAILS OF SRPE PIPE



TYPICAL SECTION SRPE PIPE

NO.	DATE	REVISIONS	BY	APP'D
01	05-09-22	Initial Release	A.L.R.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

METAL/CONCRETE END SECTION (TYPE I) FOR SRPE PIPE

RD667D

FHWA APPROVAL	06-08-22	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

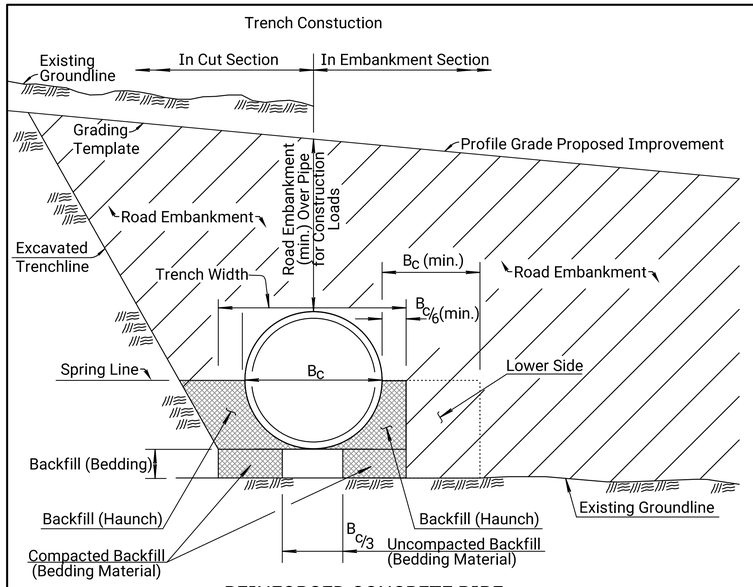
Sh. No. 51.001

Note to Designer:
KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, PPP, SRPEP, CAP & RCP. Provide end sections of the same type and coating as the pipe. Exceptions to this are noted in the Standard Specifications. Refer to the KDOT Design Manual, Volume I (Part C), Road Section, "Elements of Drainage & Culvert Design" for structural pipe design information which includes: corrugations, sizes, gauges, maximum/minimum fill heights and classes of pipe.

Plotted : 15-JAN-2025 15:53

Drawn By : mrockwell
File : RD667D.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	52	291



REINFORCED CONCRETE PIPE

Backfill (Bedding) Thickness: When over soil, use $B_C/_{24"}$ (min. of 4" & max of 24") of PB-2 or PB-3.
When over rock, excavate $B_C/_{12"}$ (min. of 6") below the bottom of the pipe and replace with PB-3.

Backfill Material: See KDOT's Standard Specifications, Aggregates for Backfill in Division 1100.

Compacted Backfill Material: Use Type B compaction in the haunch areas shown above. Use Type A compaction Backfill (Bedding), unless otherwise specified in the Contract Documents.

Road Embankment: For compaction See KDOT Road Standard Drawing, Foundation Treatment & Compaction of Earthwork.

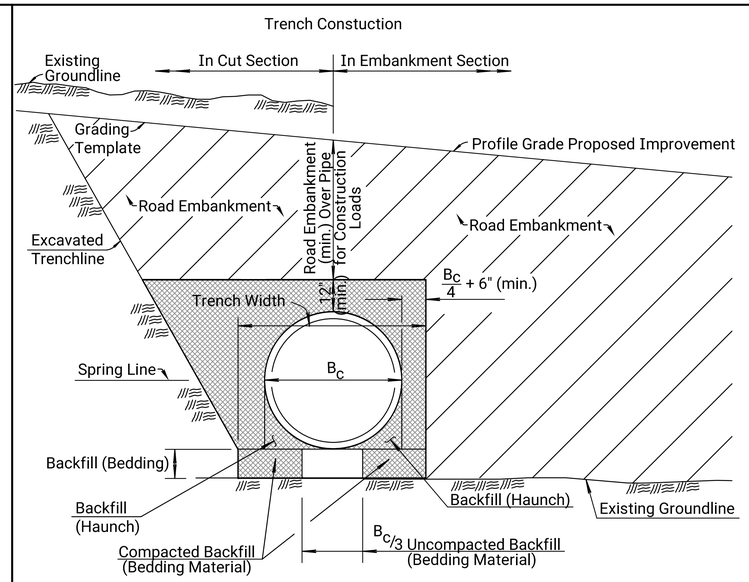
Trench Width: The minimum required trench width is the greater of:
$1.33 \times B_C$ or $B_C + 24"$

B_C: Outside Pipe Diameter

Minimum Road Embankment for Construction Loads				
Pipe Dia. (Inside Diameter)	Axle Load (Tons)			
	<25	25-37.5	37.5-55	55-75
≤ 15"	2'-0"	3'-0"	4'-6"	6'-0"
18"	2'-0"	3'-0"	4'-0"	6'-0"
21" - 24"	1'-6"	2'-6"	4'-0"	6'-0"
27"	1'-6"	2'-6"	4'-0"	5'-6"
30"	1'-0"	2'-6"	4'-0"	5'-6"
33"	1'-0"	2'-0"	4'-0"	5'-6"
36"	1'-0"	1'-6"	4'-0"	5'-6"
42"	1'-0"	1'-6"	3'-6"	5'-6"
48" - 54"	1'-0"	1'-6"	2'-6"	5'-6"
60" - 66"	1'-0"	2'-0"	2'-6"	5'-6"

Minimum Road Embankment for Construction Loads				
Pipe Dia. (Inside Diameter)	Axle Load (Tons)			
	<25	25-37.5	37.5-55	55-75
72"	1'-0"	2'-0"	3'-6"	4'-0"
66" - 84"	1'-0"	2'-0"	3'-0"	4'-0"
90"	1'-0"	2'-0"	3'-6"	4'-6"
96"	1'-0"	2'-6"	3'-6"	4'-6"
102"	0'-6"	2'-6"	3'-6"	5'-0"
108"	0'-6"	2'-0"	3'-6"	5'-0"
114"	0'-6"	2'-0"	4'-0"	5'-0"
120" - 132"	0'-6"	2'-0"	4'-0"	5'-6"
144"	1'-0"	2'-6"	4'-6"	5'-6"

Minimum Road Embankment height should be no less than the value in the provided table or the manufacturer's specification.



CORRUGATED METAL PIPE

Backfill (Bedding) Thickness: When over soil, use ½ in./ft. of fill over pipe (min. of 4" & max. of 24") of PB-2 or PB-3.
When over rock, excavate 6" below the bottom of the pipe and replace with PB-2 or PB-3.

Backfill Material: See KDOT's Standard Specifications, Aggregates for Backfill in Division 1100.

Compacted Backfill Material: See KDOT's Standard Specifications and Pipe Manufacturer's Installation Guidelines.

Compaction: Use Type B compaction in the haunch areas shown above. Use Type A compaction Backfill (Bedding), unless otherwise specified in the Contract Documents.

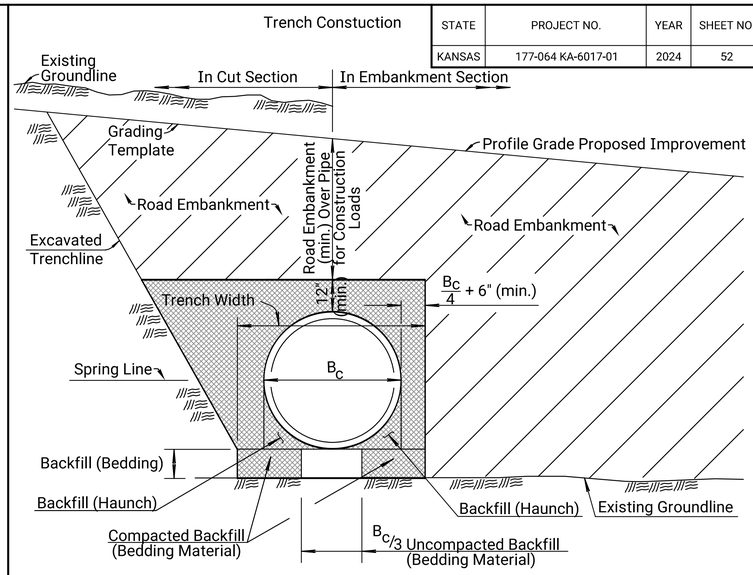
Road Embankment: For compaction See KDOT Road Standard Drawing, Foundation Treatment & Compaction of Earthwork

Trench Width: The minimum required trench width is the greater of:
$1.50 \times B_C + 12"$ or $B_C + 16"$

B_C: Outside Pipe Diameter

Corrugated Metal pipe: Minimum Road Embankment for Construction Loads				
Pipe Dia. (Inside Diameter)	Axle Load (Tons)			
	<25	25-37.5	37.5-55	55-75
< 42"	2'-0"	2'-6"	3'-0"	3'-0"
48" - 72"	3'-0"	3'-0"	3'-6"	4'-0"
78" - 120"	3'-0"	3'-6"	4'-0"	4'-0"
126" - 144"	3'-6"	4'-0"	4'-4"	4'-4"

Minimum Road Embankment height should be no less than the value in the provided table or the manufacturer's specification.



THERMOPLASTIC PIPE

Backfill (Bedding) Thickness: When over soil, use ½ in./ft. of fill over pipe (min. of 4" & max. of 24") of PB-2 or PB-3.
When over rock, excavate 6" below the bottom of the pipe and replace with PB-2 or PB-3.

Backfill Material: See KDOT's Standard Specifications, Aggregates for Backfill in Division 1100.

Compacted Backfill Material: Use Type B compaction.

Compaction: Hand-held or walk behind compaction equipment is permitted when compacting fill directly above the pipe only when the fill over the pipe is greater than or equal to 12". The use of ride-on compaction equipment is permitted for compacting fill directly above the pipe only when the fill over the pipe is greater than or equal to 36". A prime goal of pipe installation is to manipulate and compact embedment material under the pipe haunches, to achieve full contact of the material with the pipe bottom and fill voids under the pipe.

Road Embankment: For compaction See KDOT Road Standard Drawing, Foundation Treatment & Compaction of Earthwork.

Trench Width: The minimum required trench width is $1.50 \times B_C + 12"$
The maximum trench width is $1.575 \times B_C + 12½"$

B_C: Outside Pipe Diameter

Thermoplastic Pipe: Minimum Road Embankment for Construction Loads				
Pipe Dia. (Inside Diameter)	Axle Load (Tons)			
	<25	25-37.5	37.5-55	55-75
< 36"	2'-0"	2'-6"	3'-0"	3'-0"
42" - 48"	3'-0"	3'-0"	3'-6"	4'-0"
54" - 60"	3'-0"	3'-0"	3'-6"	4'-0"

Minimum Road Embankment height should be no less than the value in the provided table or the manufacturer's specification.

GENERAL NOTES

Do not drop, drag or otherwise handle pipe sections in a manner which may cause damage. Inspect the line and grade before and during placement of compacted backfill and uncompacted backfill materials.

For trench installations place pipe in the center of the excavated trench.

When installing pipe, place the uncompacted backfill and compacted backfill material in the bedding area to grade, install pipe to grade, place and compact the haunch area up to the spring line of the pipe and complete the backfill as specified in KDOT's Standard Specifications unless otherwise noted in the contract documents.

B_C for horizontal elliptical pipe, vertical elliptical pipe, arch pipe, and non bridge-sized concrete box structures will be measured along the horizontal axis; similar to the dimension shown for circular pipe on this sheet.

The spring line is a line along the side of the culvert where the tangent to the culvert wall is vertical. It occurs at the widest point in the culvert.

Material used for the roadway embankment may be used in lieu of compacted backfill material as approved by the Engineer.

The backfill load transmitted to the pipe is directly dependent on the trench width. Where maximum trench widths are not indicated in any of the contract documents, trench widths should be as a narrow as possible with side clearance adequate enough to ensure proper compaction of backfill material at the sides of the pipe. The trench width formulas provided can be used as a general guide.

NO.	DATE	REVISIONS	BY	APP'D
01	05-09-22	Initial Release	A.L.R.	T.T.R.

KANSAS DEPARTMENT OF TRANSPORTATION

PIPE INSTALLATION DETAILS

RD658

FHWA APPROVAL	06-08-22	APP'D.	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-10-2022 Sh. No. 52

KDOT Graphics Certified

Plotted : 16-JAN-2025 07:39
Drawn By : mrockwell
File : RD658.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	53	291

PIPE CULVERT SUMMARY

Station	Type	Size or Bid Designation Sq. Ft.	Crown Grade Elev.	Flow Line		Floor Elev. ⚹		Horizontal Roadway		Degree of Rotation	Length of Pipe		Lin. Ft. of Pipe	Height of Fill (max.) Ft.	Concrete Pipe AASHTO Class No.	Pipe Gauge ◔		Pipe Corrugations ◔		Remarks
				Lt.	Rt.	Lt.	Rt.	Lt.	Rt.		Lt.	Rt.				Steel	Alum.	Steel	Alum.	
330+12.00	CRP (RCP, CAP)	24"	1279.43	1274.17	1275.41			24.25	33.18	8° RT	33.51	24.49	58	2.32	II					
387+00.00	CRP (RCP, CAP) (Extend Ex. CRP)	30"	1334.65	1329.93	1329.28			31.83	33.17	0	10	10	20	1.97	II					
400+49.00	CRP (RCP, CAP) (Extend Ex. CRP)	30"	1354.94	1342.26	1347.36			58.66	40.66	0	22	4	26	5.12	II					
405+94.00	CRP (RCP, CAP) (Extend Ex. CRP)	30"	1355.93	1348.68	1349.52			41.50	37.72	0	18	16	34	2.77	II					
423+49.00	CRP (RCP, CAP)	24"	1359.67	1356.24	1355.94			25.55	25.67	10° RT	25.94	26.06	52	2.58	II					
423+55.00	EP (PVCP, PEP, PPP, SRPE, ACSP, CAP, RCP)	24"	1360.05	1355.90	1355.78			22.94	23.03	2° LT	22.95	23.05	46	3.21	II					
433+49.00	CRP (RCP, CAP) (Extend Ex. CRP)	30"	1327.03	1315.34	1321.95			56.48	32.94	0	22	10	32	5.45	II					
453+58.14	EP (PVCP, PEP, PPP, SRPE, ACSP, CAP, RCP)	24"	1280.29	1272.80	1274.06			36.53	29.22	5° RT	36.67	29.33	66	5.86	II					
482+66.00	CRP (RCP, CAP)	36"	1278.37	1265.00	1264.46			34.00	40.00	0	34	40	74	2.72	II					

◔ Unless otherwise noted, minimum pipe gauge & corrugations to be as shown in RD660. See Summary of Quantities for End Section information.

⚹ Only include floor elevations for embedded pipes. See RD668 for details. For structures not embedded, the floor elevations may be omitted.

Type		ALLOWABLE LOCATION ⚠			
	Mainline	Side Road	Entrance	Storm Sewer	
				Under ML	Not Under ML
✡PVCP		X	X		X
PEP		X	X		X
PPP		X	X		X
SRPE		X	X		X
CSP					
ACSP		X	X		X
CAP	X	X	X	X	X
RCP	X	X	X	X	X

✡ When inside diameter of pipe is 36" or less.

⚠ Unless otherwise specified in the plans. Some pipe types may not be allowed at a location if the fill height exceeds the maximum allowable or is less than the minimum allowable cover.

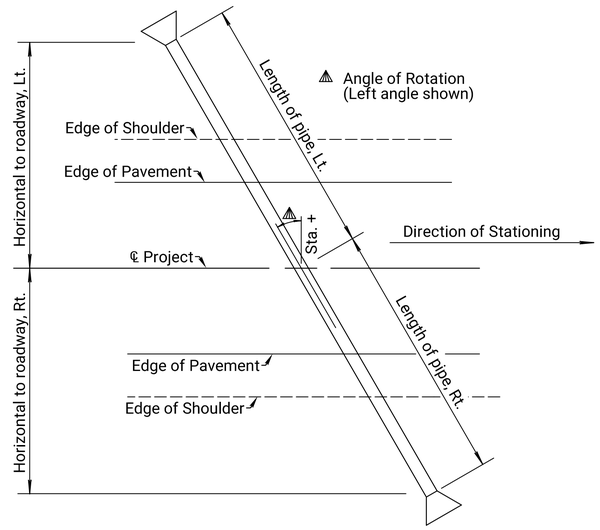
When inside diameter of pipe is 60" or less.

For inside diameter: ≥ 30"

Type	ALLOWABLE END SECTIONS			
	⧫ CS	⧫ ACS	CA	RC
PVCP	X	X	X	Ψ
PEP	X	X	X	
PPP	X	X	X	
SRPE	X	X	X	
RCP				X
ACSP CAP CSP	Provide End Sections of the same material and coating type as the pipe.			

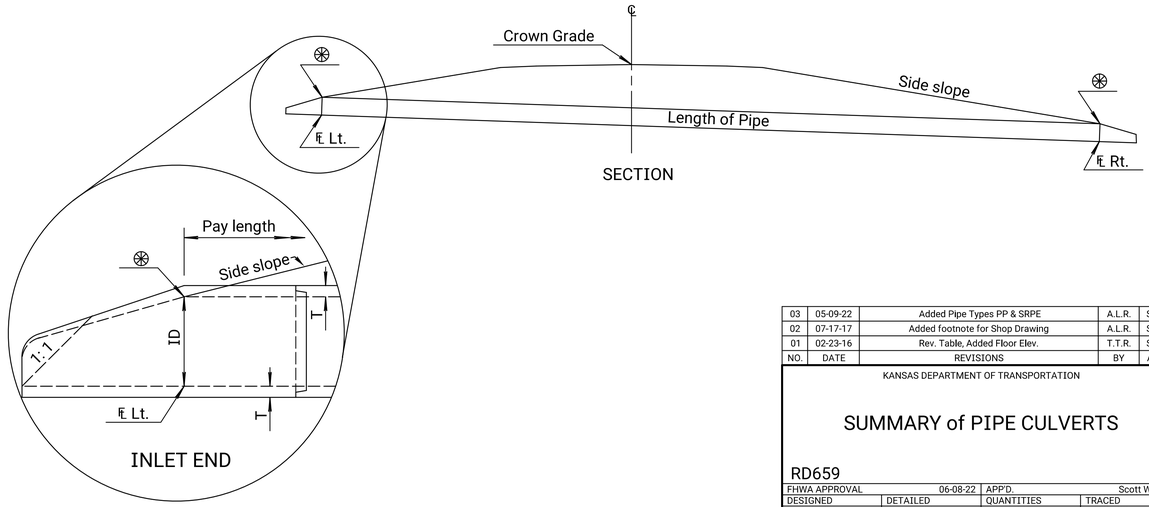
⧫ Type IV End Sections are only made of CS or ACS.

Ψ Submit Shop Drawing of connection for review



PLAN
(Showing Rotation about ℄)

✣ Design side slope to intersect inside diameter of pipe outside of Clear Zone.



NO.	DATE	REVISIONS	BY	APP'D
03	05-09-22	Added Pipe Types PP & SRPE	A.L.R.	S.W.K.
02	07-17-17	Added footnote for Shop Drawing	A.L.R.	S.W.K.
01	02-23-16	Rev. Table, Added Floor Elev.	T.T.R.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY of PIPE CULVERTS

RD659

FHWA APPROVAL	06-08-22	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

Plotted : 16-JAN-2025 07:39

Drawn By : mrockwell
File : rd659.dgn

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	54	291

SITE DATA							HYDROLOGY				HYDRAULICS	
DRAINAGE STRUCTURE NUMBER	LOCATION STATION	DRAINAGE AREA NUMBER	DRAINAGE AREA ACREAGE	RECURRENCE INTERVAL YEARS	A. H. W. ELEVATION FEET	REMARKS	METHOD	DATA	Qcfs	REMARKS	H. W. ELEVATION FEET	REMARKS
	323+45.00		114.4	25	1271.24	Top of Subgrade @ Sta. 323+45	RATIONAL	Tc=40min, C=0.58, I25=3.66"/hr	243		1269.29	
	328+77.00		97.8	25	1277.04	Top of Subgrade @ Sta. 328+77	RATIONAL	Tc=35min, C=0.62, I25=3.94"/hr	239		1275.71	
	330+12.00		1.5	10	1278.45	Top of Subgrade @ Sta. 330+12, 51' RT	RATIONAL	Tc=11min, C=0.51, I10=5.90"/hr	4		1276.39	
	351+00.00		5.0	25	1331.94	Top of Subgrade @ Sta. 351+00	RATIONAL	Tc=6min, C=0.62, I25=9.38"/hr	29		1325.98	
	387+00.00		2.9	25	1333.68	Top of Subgrade @ Sta. 387+00	RATIONAL	Tc=10min, C=0.61, I25=7.43"/hr	13		1332.78	
	400+49.00		5.6	25	1353.97	Top of Subgrade @ Sta. 400+50	RATIONAL	Tc=6min, C=0.62, I25=9.38"/hr	33		1350.79	
	405+94.00		4.0	25	1354.96	Top of Subgrade @ Sta. 405+94	RATIONAL	Tc=21min, C=0.61, I25=5.13"/hr	13		1351.29	
	423+49.00		2.2	10	1358.95	Top of Subgrade @ Sta. 423+49, 40' RT	RATIONAL	Tc=3min, C=0.50, I10=8.45"/hr	9		1357.60	
	423+55.00		.9	10	1359.33	Top of Subgrade @ Sta. 423+55 42' RT	RATIONAL	Tc=5min, C=0.51, I10=8.45"/hr	4		1357.21	
	433+49.00		6.5	25	1326.06	Top of Subgrade @ Sta. 433+49	RATIONAL	Tc=12min, C=0.62, I25=6.78"/hr	27		1324.76	
	439+24.00		41.2	25	1311.21	Top of Subgrade @ Sta. 439+24	RATIONAL	Tc=16min, C=0.63, I25=5.85"/hr	152		1305.95	
	450+73.00		278.5	25	1280.86	Top of Subgrade @ Sta. 450+73	RATIONAL	Tc=29min, C=0.60, I25=4.35"/hr	727		1277.30	
	453+58.14		2.8	10	1279.57	Top of Subgrade @ Sta. 453+58, 50' LT	RATIONAL	Tc=6min, C=0.34, I10=7.81"/hr	7		1275.55	
	461+53.00		115.9	25	1282.85	Top of Subgrade @ Sta. 461+53	RATIONAL	Tc=25min, C=0.56, I25=4.70"/hr	305		1262.38	
	482+66.00		4.6	25	1277.43	Top of Subgrade @ Sta. 482+66	RATIONAL	Tc=6min, C=0.55, I25=9.38"/hr	24		1273.69	

Drawn By : mrockwell
File : rd653.dgn

Plotted : 16-JAN-2025 07:39

NO.	DATE	REVISIONS	BY	APP'D
02	10-08-90	Detailed on CADD, no change	R.J.S.	J.O.B.
01	05-29-80	Assigned standard number	W.L.H.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DRAINAGE DATA SHEET

RD653

FHWA APPROVAL 01-17-91		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. R.J.S.

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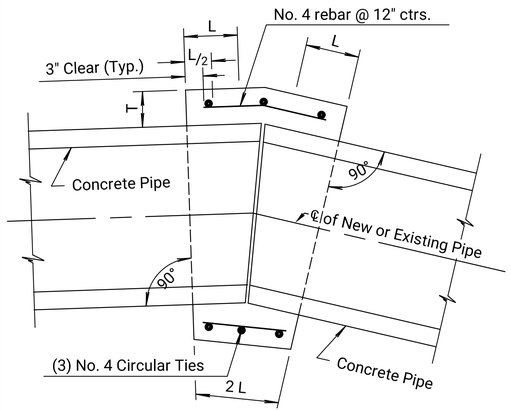
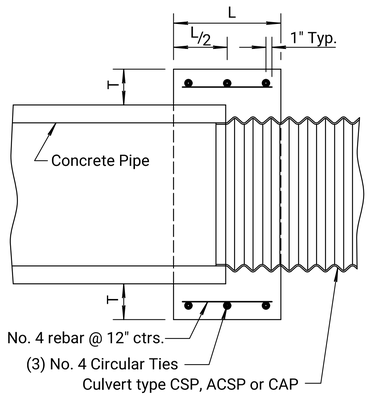
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	55	291



PIPE COLLAR AT CHANGE IN ALIGNMENT

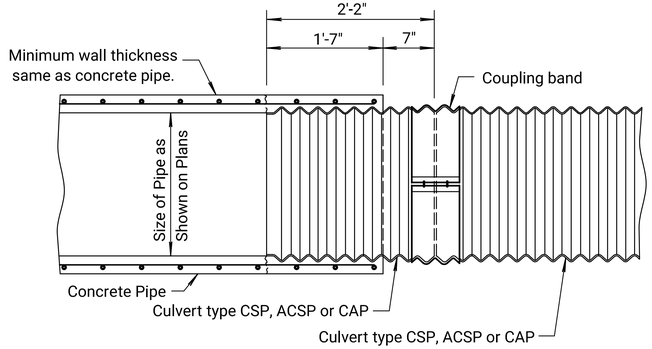
TYPE A COLLAR



PIPE COLLAR AT CHANGE IN PIPE MATERIAL

TYPE B COLLAR

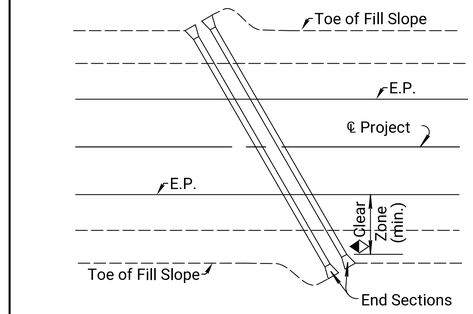
CONCRETE PIPE COLLAR		
Pipe Dia.	L	T
18"	1'-0"	6"
24"	1'-0"	6"
36"	1'-6"	8"
48"	1'-6"	10"
60"	1'-9"	11"



(CONCRETE PIPE CONNECTED TO CORRUGATED METAL PIPE)

TYPE C COLLAR ⚠

⚠ A section of concrete pipe (6'-0" min.) is cast 1'-7" short with the re-steel protruding. Tack weld the re-steel to the 2'-2" section of CMP and finish casting the remaining 1'-7" of RCP around the CMP. This is an approved connection provided it is fabricated as an integral part of a section of concrete pipe.



PLACEMENT OF ROTATED PIPES
RELATIVE TO FILL SLOPE
AND CLEAR ZONE

♦ Pipe culverts 2'-0" or less in height may terminate within the clear zone with Type I or Type III End Section. Any size pipe may terminate within the clear zone with a Type IV End Section.

General Notes:

Pipe collar shall be used to join pipes of different diameters or materials or where change in alignment or grade exceeds that allowed for ordinary joints.

All concrete shall be Concrete Grade 3.0. All reinforcing steel shall be Grade 60 and shall have a minimum of 2" of cover.

The diameter of the circular ties shall be the outside diameter of the larger pipe plus "T".

The maximum allowable distance between the ends of the pipes at any point is 2".

All labor, materials and incidentals required to construct the pipe collar Type A, B or C shall not be paid for directly but shall be subsidiary to the individual pipe bid items.

Aluminum or aluminized pipes or end sections shall be coated with an asphaltic paint when in contact with fresh concrete in accordance with the Standard Specifications.

Pipe ends shall be trimmed such that the maximum distance between pipes at any point is 2".

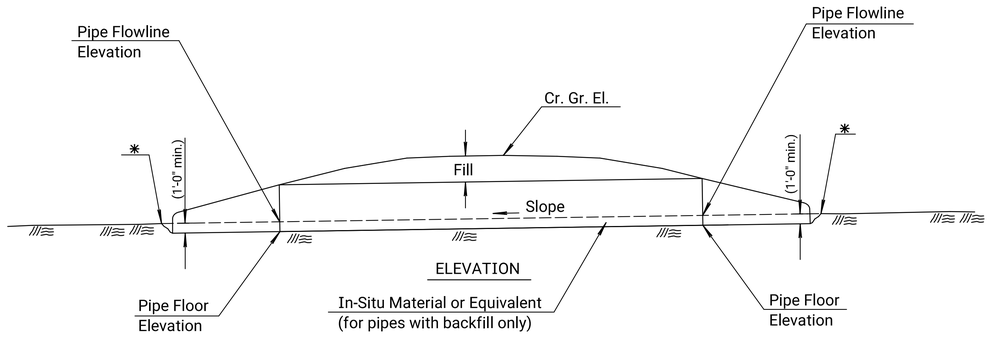
PIPE COLLARS

GENERAL NOTE

For pipes where the height or rise is greater than 4'-0" place uncompacted backfill through the pipe, including the end sections, 1'-0" (Min.). Backfill material will be reasonably free of organic material. In-situ material may be used for backfill as approved by the Engineer.

For pipes where the height or rise is less than or equal to 4'-0" install the pipe such that embedment will occur through natural sedimentation. See Pipe Embedment detail shown on this sheet.

Work and material for embedding pipes will not be paid for directly, but will be Subsidiary to the other pipe bid items in the contract.



PIPE EMBEDMENT

✳Natural channel or ditch flowline elevation. See profile sheets and cross sections for details.

a = Face width of end section ✡ + 1'.

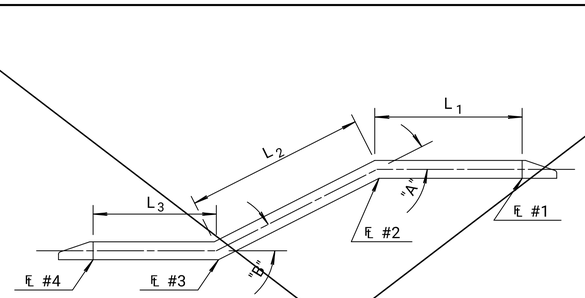
✡ Face width is equal to the following dimension shown on the end section std. drawing.

Type I Concrete = D
Type III Concrete = I
Type I CM = W+ 2A
Type III CM = G
Type IV = W+ 2A

b = Pipe diameter or span (3' min.)

Spacing shall be equal to the larger of dimensions a or b. Spacing for three or more pipes shall be determined using a similar method.

MULTIPLE PIPE SPACING



Sketch Along ℄ CRP (CMP)
Broken-Back

SUMMARY OF BROKEN BACK PIPES											
STATION	SIZE	FLOW LINES				LENGTH			ANGLES		REMARKS
		#1	#2	#3	#4	L_1	L_2	L_3	A	B	

NO.	DATE	REVISIONS	BY	APP'D
6	1-21-16	Added Details, Pipe Embedment	T.T.R.	S.W.K.
5	5-17-13	Rev. Dimension, Type B Collar	S.W.K.	J.O.B.
4	4-18-08	Added asphaltic paint note	S.W.K.	J.O.B.
3	1-28-05	Changed Class to Grade concrete	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS
PIPE CULVERT DETAILS

~~RD668~~

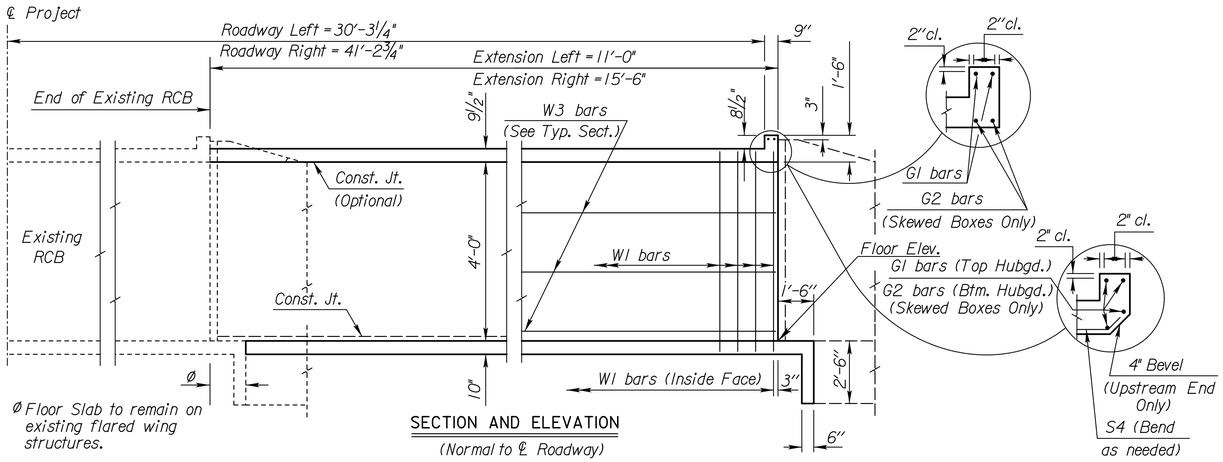
FHWA APPROVAL	3-16-16	APP'D. SCOTT W. KING	
DESIGNED	DETAILED KAHLE	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK. RHOADS	QUAN.CK.	TRACE CK.

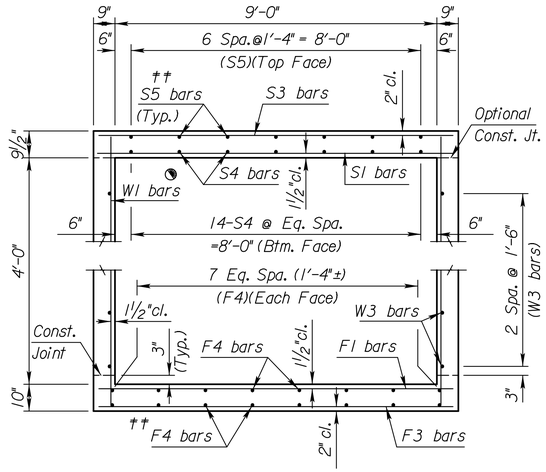
Sh. No. 55

Plotted :16-JAN-2025 07:39
Drawn By : mrockwell
File : rd668.dgn

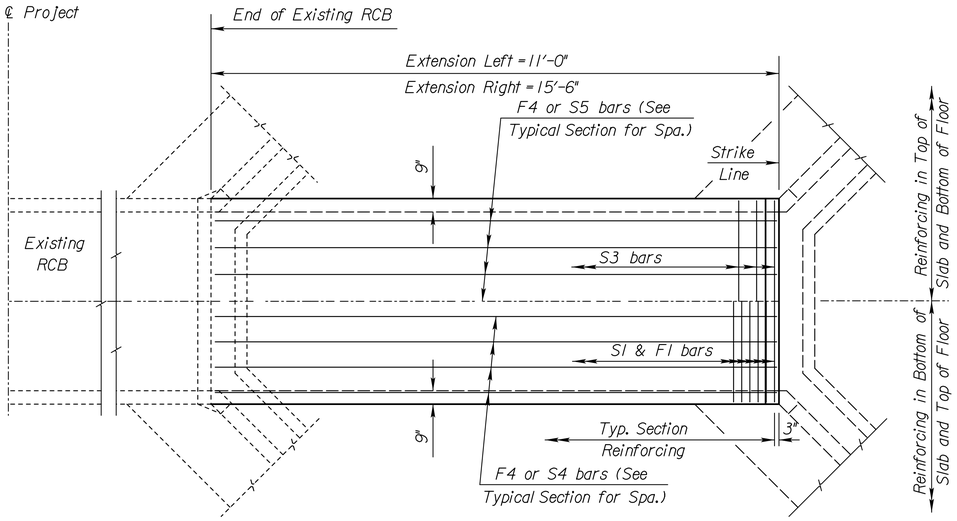
SYSTEM PART	VERSION/ID
CADD V8A	12/6/2000
DATABASE	5/4/2020
RCB PROGRAM	7.1.22
KBOX MODEL ID	1402
CELL LIBRARY	2/8/2022

06





TYPICAL SECTION



PLAN

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	56	291

◔ See RCB Auxiliary Details for Optional Splice.

Note:
S3 bars omitted unless grade box or slab thickness is greater than or equal to 12".

Note:
F3 bars omitted unless floor thickness is greater than or equal to 12.".

†† Omit S5 bars when S3 bars are omitted and omit the bottom layer of F4 bars when F3 bars are omitted.

See Standard No. RD 080 for additional details.

Note: Use only cast-in-place construction at this location.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete f'c = 4,000 p.s.i.
Reinforcing Steel fy = 60,000 p.s.i.
FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and includes the surfacing.
CONCRETE: Use concrete conforming to Grade 4.0 Concrete. Bevel all exposed edges with a ¾" triangular molding. Where Grade 4.0(AE) is specified, place this concrete in the top slab above the Construction Joint.
REINFORCING: Use reinforcing steel conforming to ASTM A615, Grade 60. All dimensions relative to reinforcing steel are to the centerline of the bar unless otherwise noted.
EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB bridges shall be paid for as Class III Excavation.
SEAL COURSE: The Engineer may require a seal course. The seal course shall be unreinforced Concrete(Commercial Grade) with a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.
FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.
QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when they are required by the plans. Payment for additional quantities that result from including a seal course and/or a floating apron, as a change in the original plans, shall be made at the unit price bid for the various items involved.
GRANULAR BACKFILL (WINGWALLS): See the "Auxiliary Details" sheet.
STRIKE LINE: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.
BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

CULVERT SUMMARY

⧖ For design purposes ONLY. Do NOT use for Construction — ◔ includes any welded wire fabric

	Floor Elev.	Crown Gr. Elev.	⧖Design Fill Ht.	Skew	Wings	Scour Apron	Soil Saver	Concrete Barrel (Cu.Yds.)	Concrete Wings (Cu.Yds.)	Concrete Total (Cu.Yds.)	Reinf. Steel (Gr. 60) Barrel (Lbs.)	Reinf. Steel (Gr. 60) ◔Wings (Lbs.)	Reinf. Steel (Gr. 60) Total (Lbs.)	LRFR RATING FACTORS HL-93 Loading Inventory	Operating
Ext.Lt.	1264.38	1272.21	2	0	Flared	No	No	9.31	4.88	14.20	1277	589	1866	1.27	1.66
Ext.Rt.	1261.86				Flared			13.18	4.88	18.06	1773	589	2361		

BAR SCHEDULE

	F1 Size	Spa.	No.	Length	F2 Size	Spa.	No.	Length	F3 Size	Spa.	No.	Length	F4 Size	No.	Length	S1 Size	Spa.	No.	Length	S3 Size	Spa.	No.	Length	S4 Size	No.	Length	S5 Size	No.	Length
Ext.Lt.	5	5"	28	10'-2"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10'-2"	4	8	9'-11"	7	5"	29	10'-2"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10'-2"	5	14	10'-8"	4	N/A	10'-8"
Ext.Rt.	5	5"	39	10'-2"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10'-2"	4	8	14'-5"	7	5"	40	10'-2"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10'-2"	5	14	15'-2"	4	N/A	15'-2"

	K1 Size	Spa.	No.	Length	K2 Size	Spa.	No.	Length	W1 Size	Spa.	No.	Length	W2 Size	Spa.	No.	Length	W3 Size	No.	Length	G1 Size	Spa.	No.	Length	G2 Size	No.	Length	Size	Spa.	No.	Length
Ext.Lt.	N/A	N/A	N/A		N/A	N/A	N/A		4	9"	30	5'-3"	N/A	N/A	N/A	N/A	4	6	10'-8"	N/A	N/A	N/A	N/A	5	2	10'-2"	W/A	N/A	N/A				
Ext.Rt.	N/A	N/A	N/A		N/A	N/A	N/A		4	9"	42	5'-3"	N/A	N/A	N/A	N/A	4	6	15'-2"	N/A	N/A	N/A	N/A	5	2	10'-2"	N/A	N/A	N/A				

SUMMARY OF QUANTITIES

Concrete (Grade 4.0)	32.3 C.Y.
Concrete (Grade 4.0)(AE)	0.0 C.Y.
Bridge Backwall Protection System	5.6 S.Y.
Reinforcing Steel (Gr. 60)	4230 Lbs.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	0 Lbs.
Class III Excavation	C.Y.
Foundation Stabilization	11 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	24 C.Y.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 323+45
SINGLE 9 ft x 4 ft RCB
15.5 ft EXT. RT.
11.0 ft EXT. LT.
BR 1.9.4 P
Morris Co.

FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck			
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP	CADD	MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA	CADD CK.	CEA

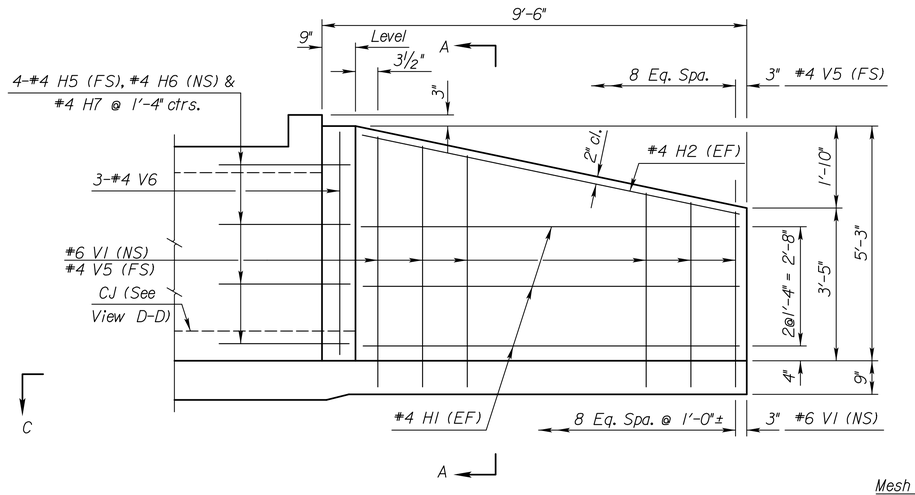
CADconform Certify This File

Sh. No. 56

Plotted By: mrockwell | Plot Location:
File: 323+45(Box).dgn
Plot Date: 16-JAN-2025 07:39

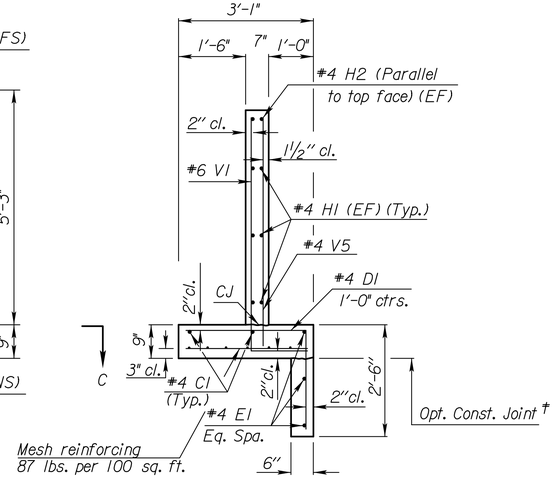
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	57	291



ELEVATION OF WINGWALL

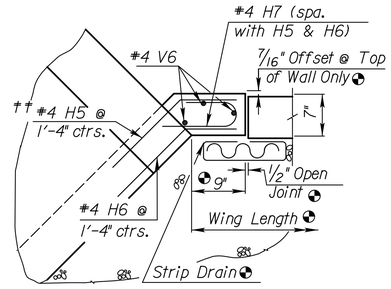
(Backface Shown)



SECTION A-A

See "RCB Aux. Details" sheet for additional requirements.

Typical both wings



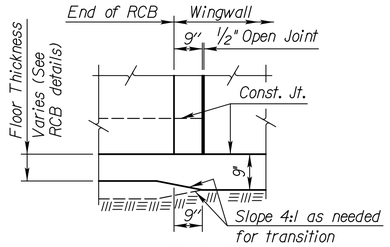
WINGWALL JOINT DETAIL

(Plan View)

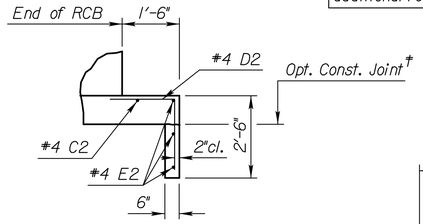
† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: ⌐ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2.
Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710.
Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

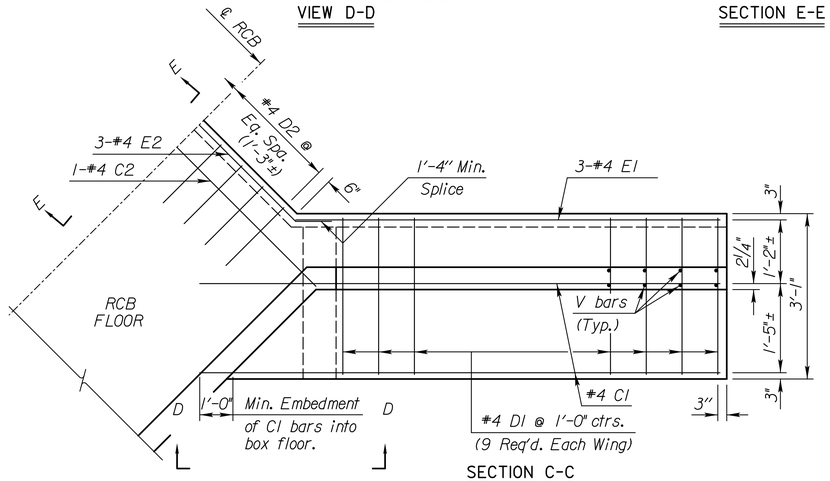


VIEW D-D

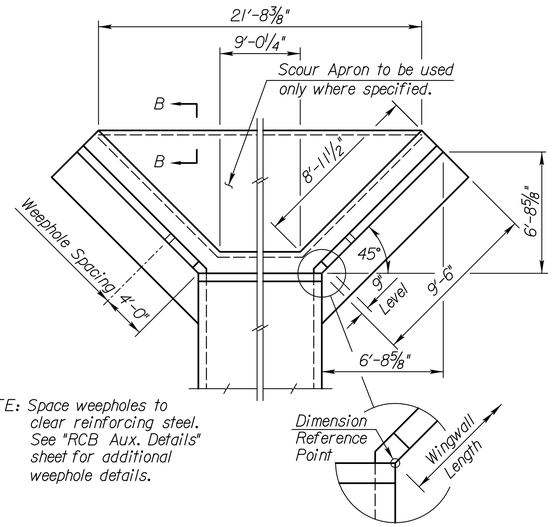


SECTION E-E

NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint



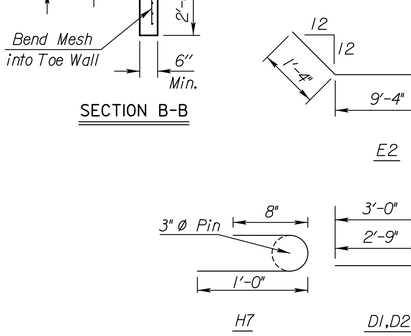
SECTION C-C



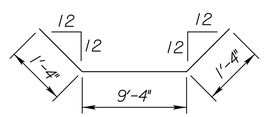
NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

WING DIMENSIONS FOR NORMAL BOX

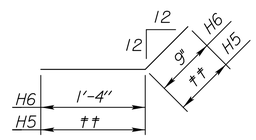
(3½:1 Embankment Slope)



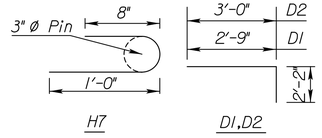
SECTION B-B



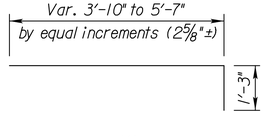
E2



H5, H6

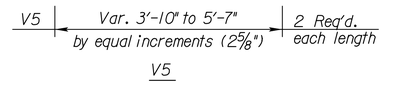


H7 D1,D2



V1

(2 Req'd., each length)



V5

BENDING DIAGRAM

(All dimensions are out to out of bars.)

†† Bend in Field

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	1.80	(C.Y.)	4.88	(C.Y.)
Apron	0.00	(C.Y.)	0.00	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			538	Lbs.
Welded Wire Fabric (Wings)			51	Lbs.
Welded Wire Fabric (Apron)			0	Lbs.
Granular Backfill (Wingwalls)			12.00	C.Y.
Filter Fabric (subsidiary)			18.00	S.Y.

NOTE: Reinforcing Bar List is for both wings at one end of box only.

✱ See Bending Diagram

0° Skew		#4C1	#4D1	#4E1	#4C2	#4D2	#4E2	#6V1	#4H1	#4H2	#4H5	#4H6	#4H7	#4V5	#4V6
	No.	4	18✱	6	1	7 ✱	3 ✱	18	12	4	8 ✱	8✱	8✱	18	6
	Length	11'-7"	4'-11"	8'-9"	10'-2"	5'-2"	12'-0"	✱	8'-4"	8'-6"	1'-10"	2'-1"	1'-9"	✱	5'-0"

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 323+45
FLARED WINGWALLS
4 ft Rise (0°SKEW)

BR 10.00.04 Morris Co.

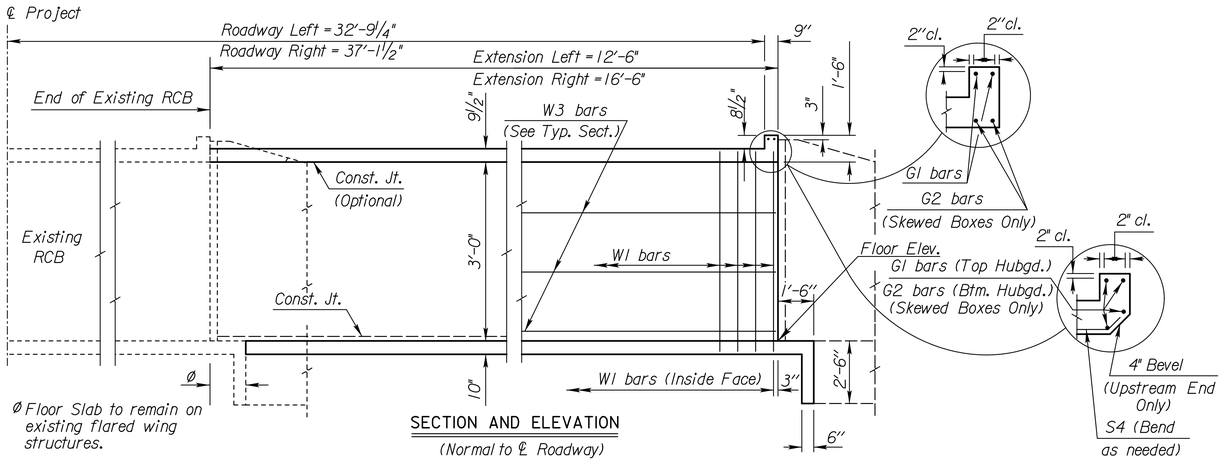
FHWA APPROVAL			10-20-10	APP'D	Terry L. Fleck		
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP	CADD	MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA	CADD CK.	CEA

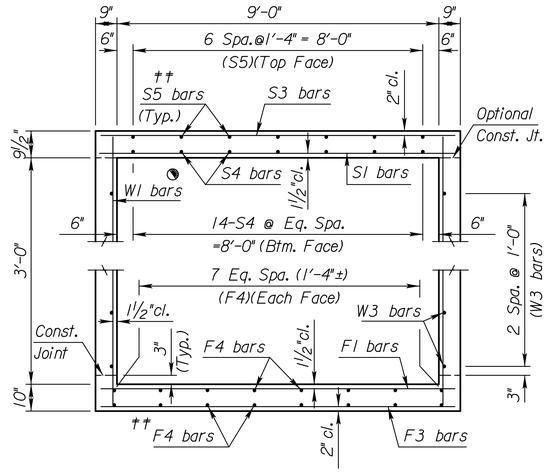
CADconform Certify This File

Sh. No. 57

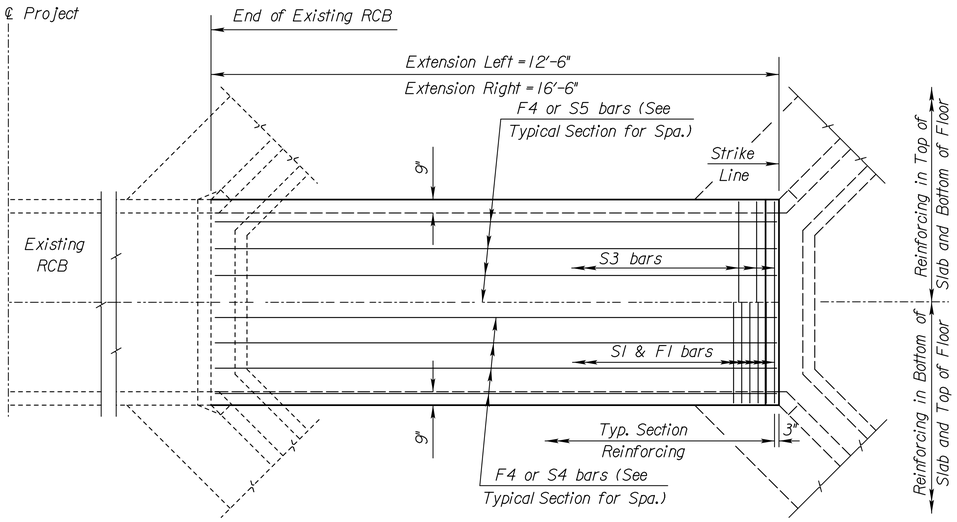
Plotted By: mrockwell | Plot Location:
File: 323+45Wing1.dgn
Plot Date: 16-JAN-2025 07:39

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	58	291





TYPICAL SECTION



PLAN

◔ See RCB Auxiliary Details for Optional Splice.

Note:
S3 bars omitted unless grade box or slab thickness is greater than or equal to 12".

Note:
F3 bars omitted unless floor thickness is greater than or equal to 12".

†† Omit S5 bars when S3 bars are omitted and omit the bottom layer of F4 bars when F3 bars are omitted.

See Standard No. RD 080 for additional details.

Note: Use only cast-in-place construction at this location.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete f'c = 4,000 p.s.i.
Reinforcing Steel fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and includes the surfacing.

CONCRETE: Use concrete conforming to Grade 4.0 Concrete. Bevel all exposed edges with a ¾" triangular molding. Where Grade 4.0(AE) is specified, place this concrete in the top slab above the Construction Joint.

REINFORCING: Use reinforcing steel conforming to ASTM A615, Grade 60. All dimensions relative to reinforcing steel are to the centerline of the bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB bridges shall be paid for as Class III Excavation.

SEAL COURSE: The Engineer may require a seal course. The seal course shall be unreinforced Concrete(Commercial Grade) with a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when they are required by the plans. Payment for additional quantities that result from including a seal course and/or a floating apron, as a change in the original plans, shall be made at the unit price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS):
See the "Auxiliary Details" sheet.

STRIKE LINE: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

⧖ For design purposes ONLY. Do NOT use for Construction — CULVERT SUMMARY — ◔ includes any welded wire fabric

	Floor Elev.	Crown Gr. Elev.	⧖Design Fill Ht.	Skew	Wings	Scour Apron	Soil Saver	Concrete Barrel (Cu.Yds.)	Concrete Wings (Cu.Yds.)	Concrete Total (Cu.Yds.)	Reinf. Steel (Gr. 60) Barrel (Lbs.)	Reinf. Steel (Gr. 60) ◔Wings (Lbs.)	Reinf. Steel (Gr. 60) Total (Lbs.)	LRFR RATING FACTORS HL-93 Loading Inventory	Operating
Ext.Lt.	1270.20	1278.00	2	0	Flared	No	No	10.12	4.53	14.65	1430	552	1982	1.27	1.66
Ext.Rt.	1269.64				Flared			13.38	4.53	17.91	1837	552	2389		

BAR SCHEDULE

	F1 Size	Spa.	No.	Length		F3 Size	Spa.	No.	Length	F4 Size	Spa.	No.	Length	S1 Size	Spa.	No.	Length		S3 Size	Spa.	No.	Length	S4 Size	No.	Length	S5 Size	No.	Length
Ext.Lt.	5	5"	32	10'-2"		N/A	N/A	N/A	N/A	N/A	N/A	N/A	10'-2"	4	8	11'-5"	7	5"	33	10'-2"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10'-2"	5	14	12'-2"	4	N/A	12'-2"
Ext.Rt.	5	5"	41	10'-2"		N/A	N/A	N/A	N/A	N/A	N/A	N/A	10'-2"	4	8	15'-5"	7	5"	42	10'-2"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10'-2"	5	14	16'-2"	4	N/A	16'-2"

	K1 Size	Spa.	No.	Length		K2 Size	Spa.	No.	Length	W1 Size	Spa.	No.	Length		W3 Size	No.	Length		G1 Size	Spa.	No.	Length	G2 Size	No.	Length				
Ext.Lt.	N/A	N/A	N/A			N/A	N/A	N/A		4	9"	34	4'-3"	N/A	N/A	N/A	N/A	4	6	12'-2"	N/A	N/A	N/A	N/A	5	2	10'-2"	N/A	N/A	N/A	N/A			
Ext.Rt.	N/A	N/A	N/A			N/A	N/A	N/A		4	9"	44	4'-3"	N/A	N/A	N/A	N/A	4	6	16'-2"	N/A	N/A	N/A	N/A	5	2	10'-2"	N/A	N/A	N/A	N/A			

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

SUMMARY OF QUANTITIES

Concrete (Grade 4.0)	32.6 C.Y.
Concrete (Grade 4.0)(AE)	0.0 C.Y.
Bridge Backwall Protection System	5.6 S.Y.
Reinforcing Steel (Gr. 60)	4370 Lbs.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	0 Lbs.
Class III Excavation	C.Y.
Foundation Stabilization	11 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	24 C.Y.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 328+77
SINGLE 9 ft x 3 ft RCB
16.5 ft EXT. RT.
12.5 ft EXT. LT.
BR 1.9.4 P
Morris Co.

FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck			
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP	CADD	MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA	CADD CK.	CEA

CADconform Certify This File

Sh. No. 58

SYSTEM PART	VERSION/ID
CADD V8A	12/6/2000
DATABASE	5/4/2020
RCB PROGRAM	7.L22
KBOX MODEL ID	H02
CELL LIBRARY	2/8/2022

06

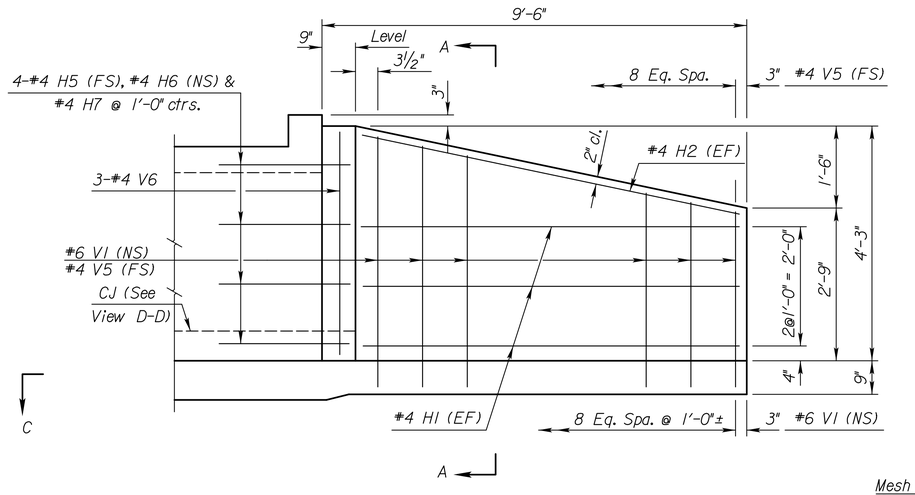
Plotted By: mrockwell
File: 328+77(Box).dgn
Plot Date: 16-JAN-2025 07:39
Plot Location:

CADconform Certify This File

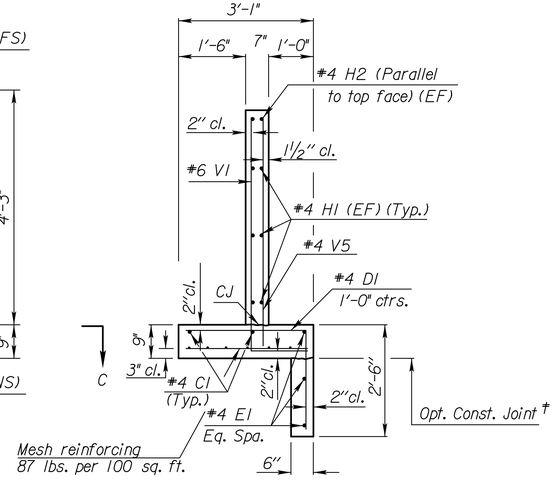
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	59	291

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2.
Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710.
Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.



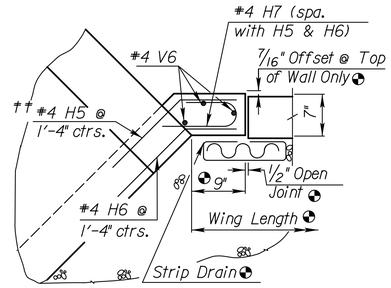
ELEVATION OF WINGWALL
(Backface Shown)



SECTION A-A

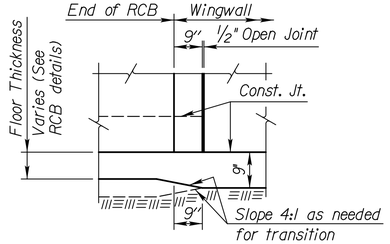
See "RCB Aux. Details" sheet for additional requirements.

Typical both wings

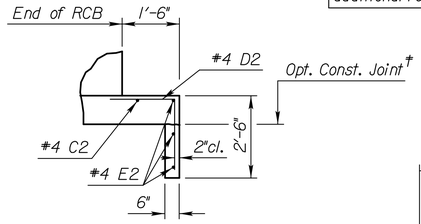


WINGWALL JOINT DETAIL
(Plan View)

† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: ⌐ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

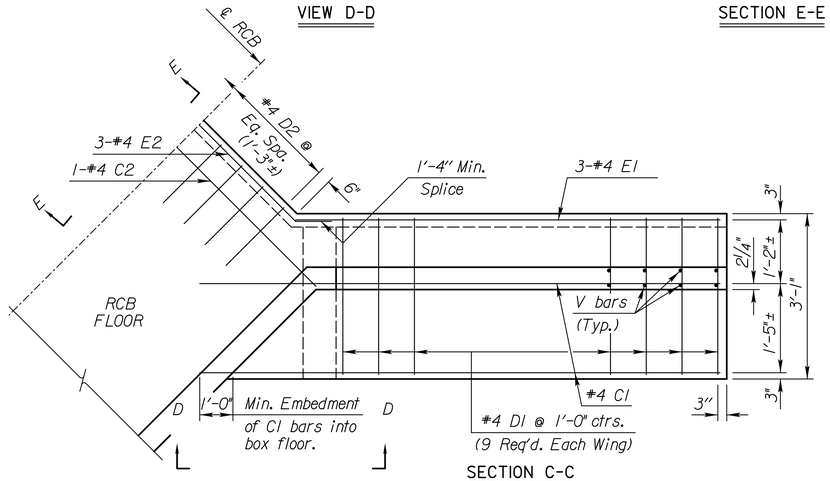


VIEW D-D

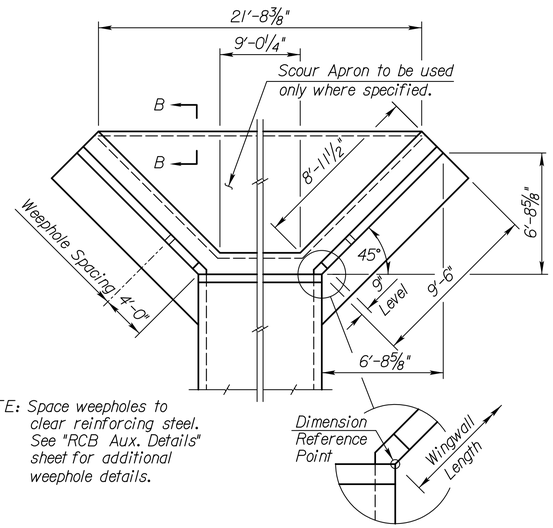


SECTION E-E

NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint

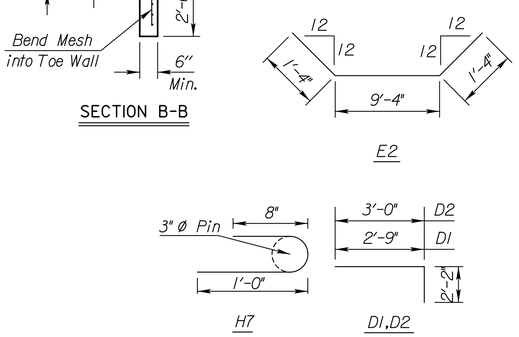


SECTION C-C



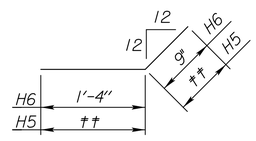
NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

WING DIMENSIONS FOR NORMAL BOX
(3½:1 Embankment Slope)



SECTION B-B

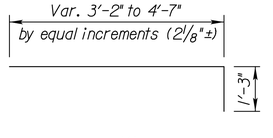
E2



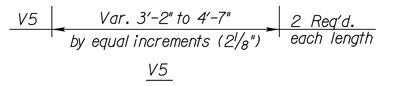
H5, H6

H7

D1, D2



V1
(2 Req'd., each length)



V5

BENDING DIAGRAM

(All dimensions are out to out of bars.)
†† Bend in Field

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	1.80	(C.Y.)	4.53	(C.Y.)
Apron	0.00	(C.Y.)	0.00	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			501	Lbs.
Welded Wire Fabric (Wings)			51	Lbs.
Welded Wire Fabric (Apron)			0	Lbs.
Granular Backfill (Wingwalls)			12.00	C.Y.
Filter Fabric (subsidiary)			18.00	S.Y.

NOTE: Reinforcing Bar List is for both wings at one end of box only.

✱ See Bending Diagram

0° Skew		#4C1	#4D1	#4E1	#4C2	#4D2	#4E2	#6V1	#4H1	#4H2	#4H5	#4H6	#4H7	#4V5	#4V6
	No.	4	18✱	6	1	7 ✱	3 ✱	18	12	4	8 ✱	8✱	8✱	18	6
	Length	11'-7"	4'-11"	8'-9"	10'-2"	5'-2"	12'-0"	✱	8'-4"	8'-6"	1'-10"	2'-1"	1'-9"	✱	4'-0"

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 328+77
FLARED WINGWALLS
3 ft Rise (0°SKEW)

BR 10.00.04 Morris Co.

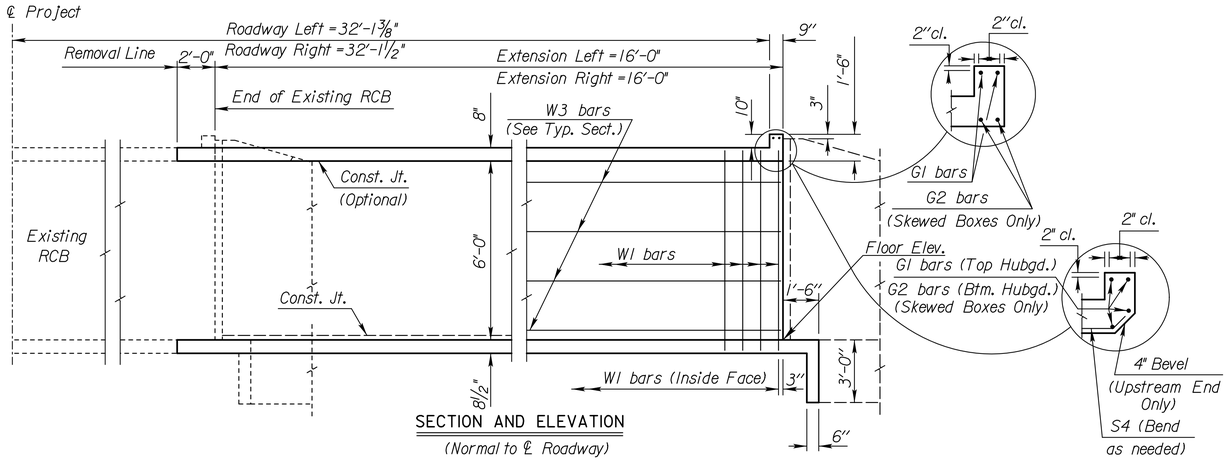
FHWA APPROVAL			10-20-10	APP'D	Terry L. Fleck		
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP	CADD	MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA	CADD CK.	CEA

CADconform Certify This File

Sh. No. 59

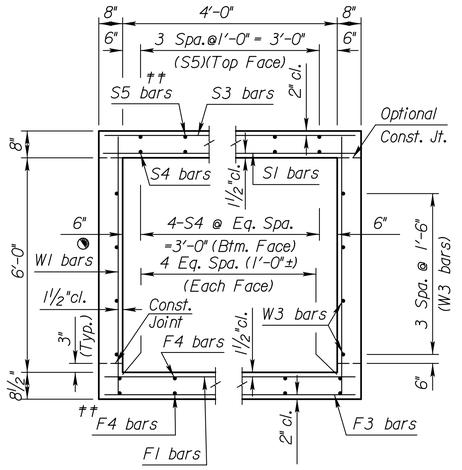
Plotted By: mrockwell | Plot Location:
File: 328+77(Wing1).dgn
Plot Date: 16-JAN-2025 07:39

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	60	291

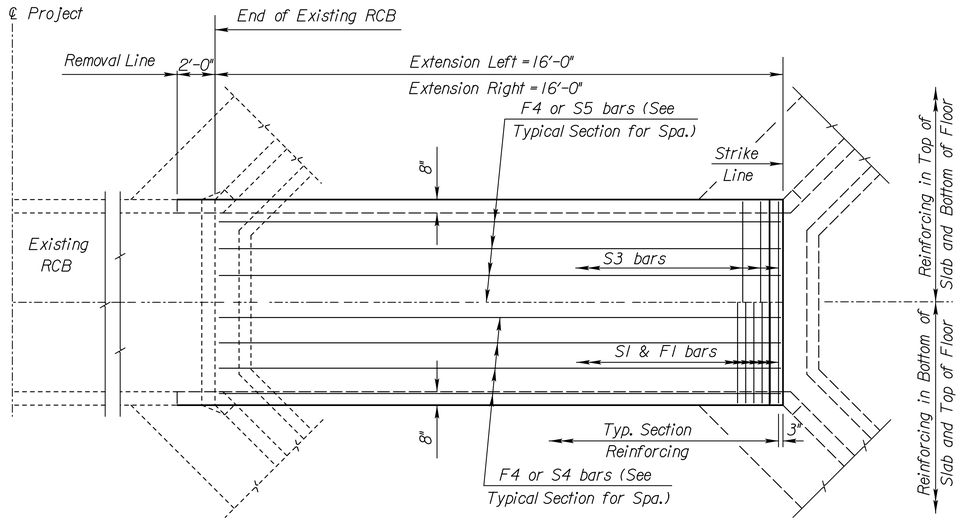


SECTION AND ELEVATION

(Normal to ℄ Roadway)



TYPICAL SECTION



PLAN

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete f'c = 4,000 p.s.i.
Reinforcing Steel fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and includes the surfacing.

CONCRETE: Use concrete conforming to Grade 4.0 Concrete. Bevel all exposed edges with a ¾" triangular molding. Where Grade 4.0(AE) is specified, place this concrete in the top slab above the Construction Joint.

REINFORCING: Use reinforcing steel conforming to ASTM A615, Grade 60. All dimensions relative to reinforcing steel are to the centerline of the bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB bridges shall be paid for as Class III Excavation.

SEAL COURSE: The Engineer may require a seal course. The seal course shall be unreinforced Concrete(Commercial Grade) with a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when they are required by the plans. Payment for additional quantities that result from including a seal course and/or a floating apron, as a change in the original plans, shall be made at the unit price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS):
See the "Auxiliary Details" sheet.

STRIKE LINE: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

◔ See RCB Auxiliary Details for Optional Splice.

Note:
S3 bars omitted unless grade box or slab thickness is greater than or equal to 12".

Note:
F3 bars omitted unless floor thickness is greater than or equal to 12".

†† Omit S5 bars when S3 bars are omitted and omit the bottom layer of F4 bars when F3 bars are omitted.

See Standard No. RD 080 for additional details.

Note: Use only cast-in-place construction at this location.

CULVERT SUMMARY — ⧗ For design purposes ONLY. Do NOT use for Construction — ◔ includes any welded wire fabric

	Floor Elev.	Crown Gr. Elev.	⧗ Design Fill Ht.	Skew	Wings	Scour Apron	Soil Saver	Concrete: Barrel (Cu.Yds.)	Concrete: Wings (Cu.Yds.)	Concrete: Total (Cu.Yds.)	Reinf. Steel (Gr. 60): Barrel (Lbs.)	Reinf. Steel (Gr. 60): ◔ Wings (Lbs.)	Reinf. Steel (Gr. 60): Total (Lbs.)	LRFR RATING FACTORS: HL-93 Loading: Inventory	Operating
Ext.Lt.	1323.99	1332.90	2	0	Flared	Yes	No	10.31	11.16	21.47	1088	1151	2239	1.16	1.51
Ext.Rt.	1322.75				Flared			10.35	11.16	21.51	1088	1151	2239		

BAR SCHEDULE

	F1 Size	F1 Spa.	F1 No.	F1 Length	F3 Size	F3 Spa.	F3 No.	F3 Length	F4 Size	F4 No.	F4 Length	S1 Size	S1 Spa.	S1 No.	S1 Length	S3 Size	S3 Spa.	S3 No.	S3 Length	S4 Size	S4 No.	S4 Length	S5 Size	S5 No.	S5 Length
Ext.Lt.	6	7"	33	5'-0"	N/A	N/A	N/A	N/A	N/A	4	5	6	7"	33	5'-0"	N/A	N/A	N/A	N/A	N/A	4	5	4	4	17'-8"
Ext.Rt.	6	7"	33	5'-0"	N/A	N/A	N/A	N/A	N/A	4	5	6	7"	33	5'-0"	N/A	N/A	N/A	N/A	N/A	4	5	4	4	17'-8"

	K1 Size	K1 Spa.	K1 No.	K1 Length	K2 Size	K2 Spa.	K2 No.	K2 Length	W1 Size	W1 Spa.	W1 No.	W1 Length	W3 Size	W3 No.	W3 Length	G1 Size	G1 No.	G1 Length	G2 Size	G2 No.	G2 Length
Ext.Lt.	N/A	N/A	N/A		N/A	N/A	N/A		5	9"	48	7'-0"	4	8	17'-8"	5	2	7'-0"	N/A	N/A	N/A
Ext.Rt.	N/A	N/A	N/A		N/A	N/A	N/A		5	9"	48	7'-0"	4	8	17'-8"	5	2	7'-0"	N/A	N/A	N/A

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

SUMMARY OF QUANTITIES

Concrete (Grade 4.0)	43.0 C.Y.
Concrete (Grade 4.0)(AE)	0.0 C.Y.
Bridge Backwall Protection System	3.3 S.Y.
Reinforcing Steel (Gr. 60)	4480 Lbs.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	0 Lbs.
Class III Excavation	C.Y.
Foundation Stabilization	16 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	54 C.Y.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 351+00
SINGLE 4 ft x 6 ft RCB
16.0 ft EXT. RT.
16.0 ft EXT. LT.
BR 1.6.6 P
Morris Co.

FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck			
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP	CADD	MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA	CADD CK.	CEA

CADconform Certify This File

Sh. No. 60

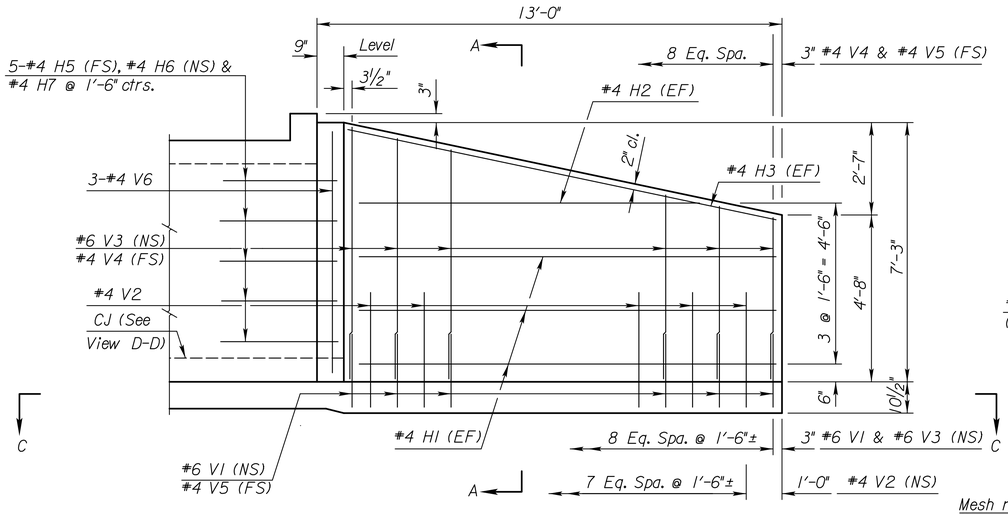
SYSTEM PART	VERSION/ID
CADD VBA	12/6/2000
DATABASE	5/4/2020
RCB PROGRAM	7.1.22
KBOX MODEL ID	1363
CELL LIBRARY	2/8/2022

06

Plotted By: mrockwell
File: 351+00(Box).dgn
Plot Date: 16-JAN-2025 07:39
Plot Location:

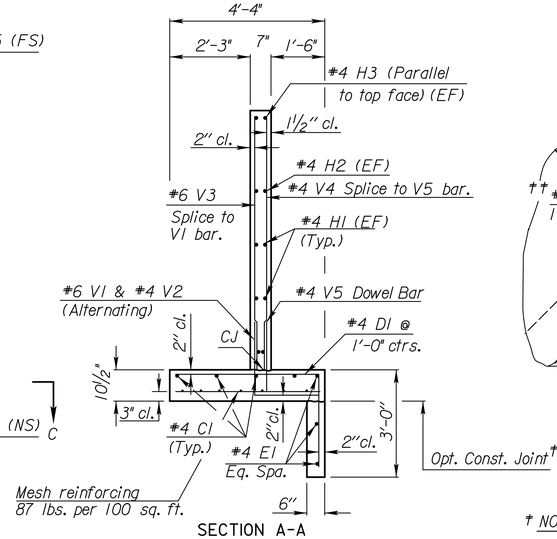
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	61	291



ELEVATION OF WINGWALL

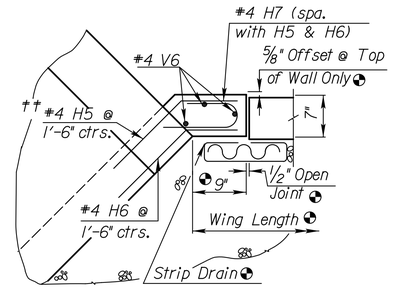
(Backface Shown)



SECTION A-A

See "RCB Aux. Details" sheet for additional requirements.

Typical both wings



WINGWALL JOINT DETAIL

(Plan View)

† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: ⌐ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.

DESIGN LOADING: HL93

UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i. Reinforcing Steel; fy = 60,000 p.s.i.

CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾" triangular moulding.

REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).

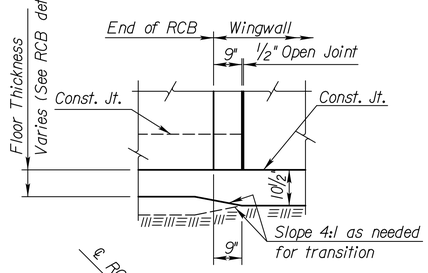
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.

APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.

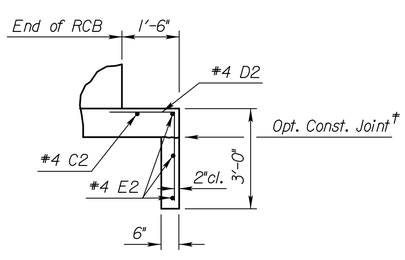
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2. Backfill all wings to limits shown on the "RCB Auxiliary Sheet".

FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710. Filter Fabric is subsidiary to "Granular Backfill".

FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

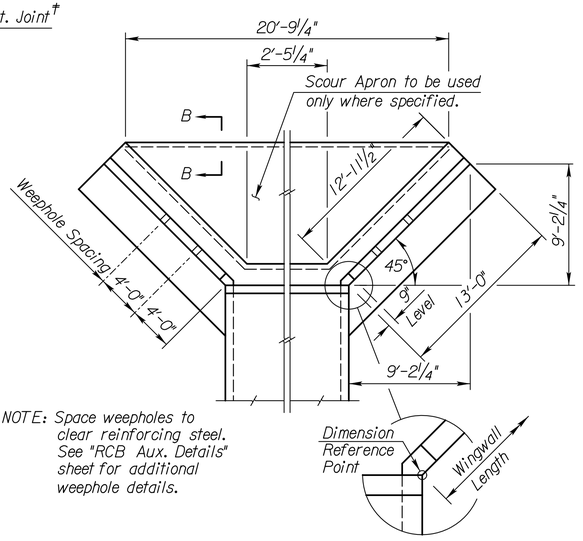


VIEW D-D



SECTION E-E

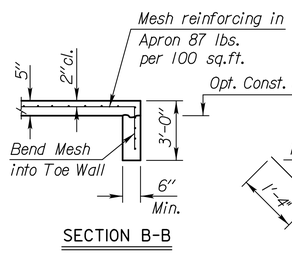
NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint



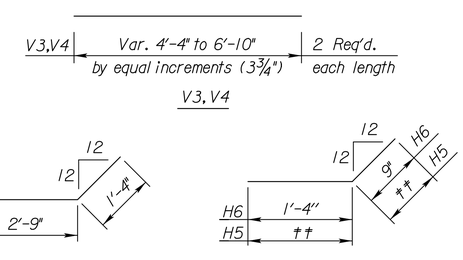
NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

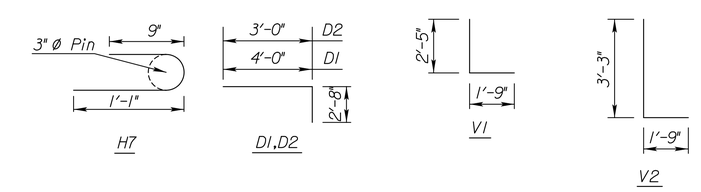
WING DIMENSIONS FOR NORMAL BOX

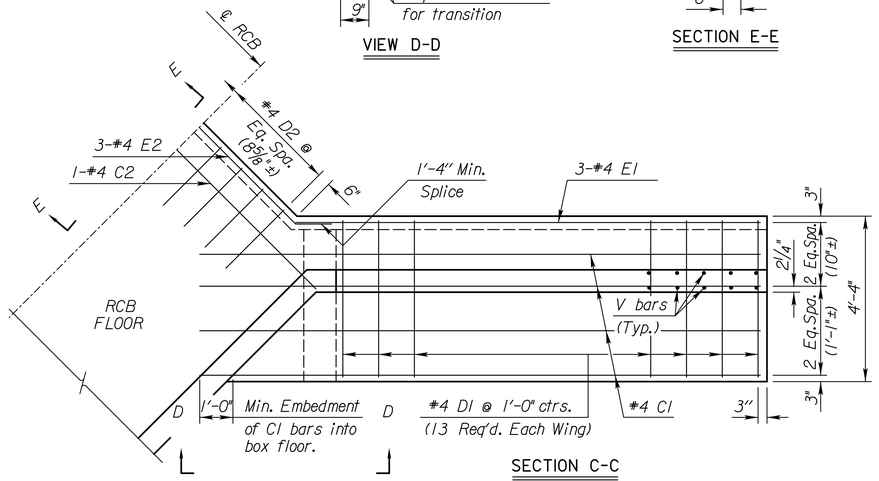
(3½:1 Embankment Slope)



SECTION B-B







SECTION C-C

(Plan of Footing)

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	3.11	(C.Y.)	8.53	(C.Y.)
Apron	1.78	(C.Y.)	2.63	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			906	Lbs.
Welded Wire Fabric (Wings)			98	Lbs.
Welded Wire Fabric (Apron)			147	Lbs.
Granular Backfill (Wingwalls)			27.00	C.Y.
Filter Fabric (subsidiary)			32.00	S.Y.

BENDING DIAGRAM

(All dimensions are out to out of bars.)

†† Bend in Field

NOTE: Reinforcing Bar List is for both wings at one end of box only.

✳ See Bending Diagram

	Mark	#4C1	#4D1	#4E1	#4C2	#4D2	#4E2	#6V1	#4V2	#6V3	#4H1	#4H2	#4H3	#4H5	#4H6	#4H7	#4V4	#4V5	#4V6
0° Skew	Number	8	26✳	6	1	3 ✳	3✳	18✳	16✳	18	12	4	4	10 ✳	10 ✳	10 ✳	18	18	6
	Length	15'-7"	6'-8"	12'-9"	5'-0"	5'-8"	5'-5"	4'-2"	5'-0"	✳	11'-10"	9'-7"	12'-1"	1'-10"	2'-1"	1'-11"	✳	2'-2"	7'-0"

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Sta. 351+00

FLARED WINGWALLS
6 ft Rise (0°SKEW)

BR 10.00.06 Morris Co.

FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck	
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA
CADD	MLP	CADD CK.	CEA		

Plotted By: mrockwell | Plot Location:
File: 351+00Wingl.dgn
Plot Date: 16-JAN-2025 07:39

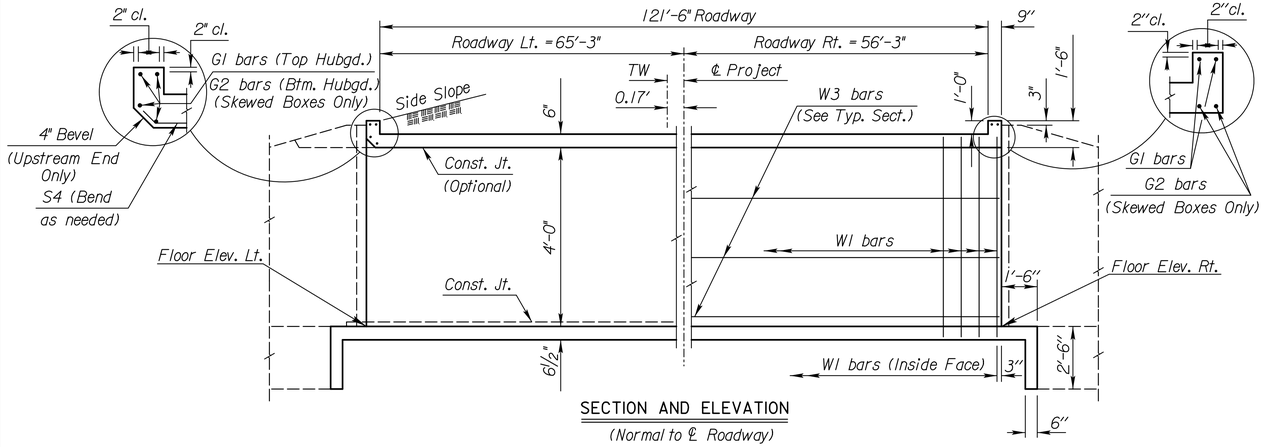
CADconform Certify This File

Sh. No. 61

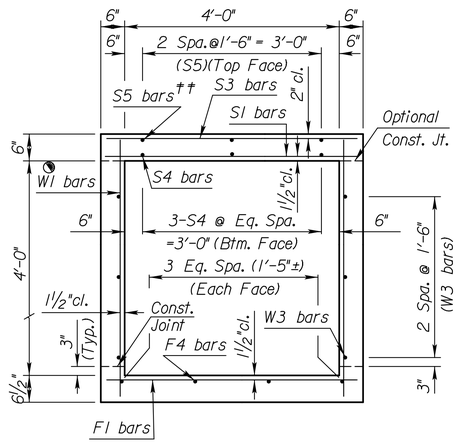
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	62	291

06	SYSTEM PART	VERSION/ID
	CADD VBA	12/6/2000
	DATABASE	5/4/2020
	RCB PROGRAM	7.1.22
	KBOX MODEL ID	56
	CELL LIBRARY	2/8/2022

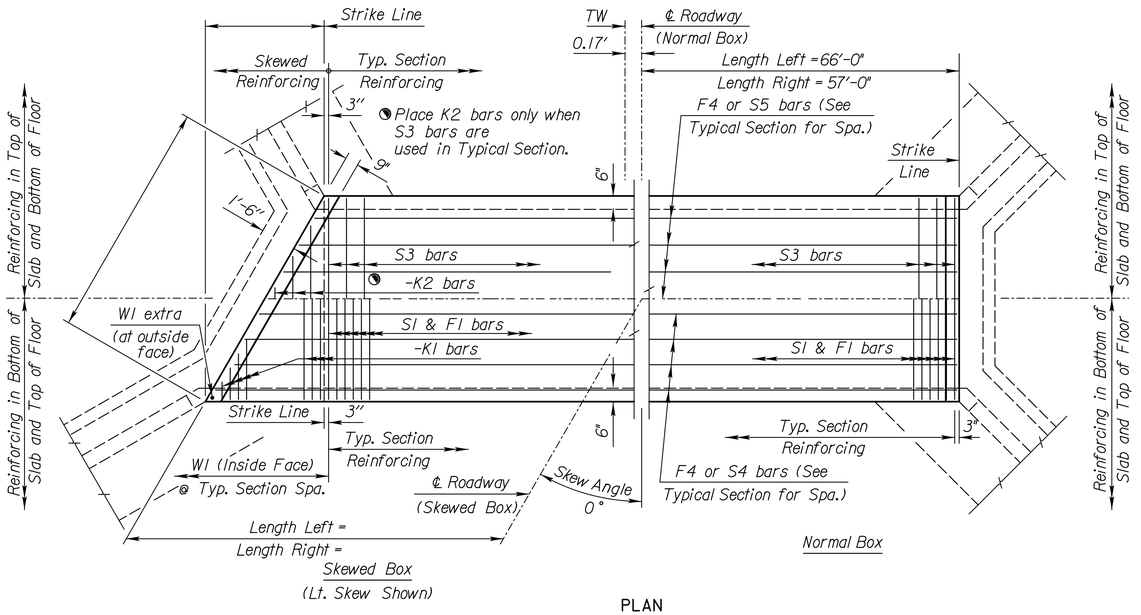
Plotted By: mrockwell Plot Location:
File: 439+24IBoxl.dgn
Plot Date: 16-JAN-2025 07:40



SECTION AND ELEVATION
(Normal to ℄ Roadway)



TYPICAL SECTION



PLAN

⧗For design purposes ONLY. Do NOT use for Construction					CULVERT SUMMARY ◔ includes any welded wire fabric									LRFR RATING FACTORS	
									Concrete			Reinf. Steel (Gr. 60)			HL-93 Loading	
Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	⧗Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Barrel (Cu.Yds.)	Wings (Cu.Yds.)	Total (Cu.Yds.)	Barrel (Lbs.)	◔Wings (Lbs.)	Total (Lbs.)	Inventory	Operating
1295.48	1297.74	1312.17	15	0	Flared	Flared	No	No	42.22	8.69	50.91	3679	1120	4799	N/A	N/A

BAR SCHEDULE

F1				F2				F3				F4			S1				S2				S3				S4			S5		
Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	No.	Length
4	6"	246	4'-8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4'-8"	4	16	31'-9"	4	6"	246	4'-8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4'-8"	4	12	31'-9"	4	N/A	31'-9"

K1				K2				W1				W2				W3				G1				G2							
Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	No.	No.	Length	Size	No.	No.	Length	Size	Spa.	No.	Length		
N/A	N/A	N/A		N/A	N/A	N/A		4	9"	328	4'-8"	N/A	N/A	N/A	N/A	4	24	31'-9"	N/A	N/A	N/A	N/A	5	4	4'-8"	N/A	N/A	N/A				

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete f'c = 4,000 p.s.i.
Reinforcing Steel fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and includes the surfacing.

CONCRETE: Use concrete conforming to Grade 4.0 Concrete. Bevel all exposed edges with a ¾" triangular molding. Where Grade 4.0(AE) is specified, place this concrete in the top slab above the Construction Joint.

REINFORCING: Use reinforcing steel conforming to ASTM A615, Grade 60. All dimensions relative to reinforcing steel are to the centerline of the bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB bridges shall be paid for as Class III Excavation.

SEAL COURSE: The Engineer may require a seal course. The seal course shall be unreinforced Concrete(Commercial Grade) with a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when they are required by the plans. Payment for additional quantities that result from including a seal course and/or a floating apron, as a change in the original plans, shall be made at the unit price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS):
See the "Auxiliary Details" sheet.

STRIKE LINE: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

◔ See RCB Auxiliary Details for Optional Splice.

Note:
S3 bars omitted unless grade box or slab thickness is greater than or equal to 12".

†† Omit S5 bars when S3 bars are omitted

Note: Use only cast-in-place construction at this location.

TW - Denotes Traveled Way, see Typical Section Sheets

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

SUMMARY OF QUANTITIES	
Concrete (Grade 4.0)	50.9 C.Y.
Concrete (Grade 4.0)(AE)	0.0 C.Y.
Bridge Backwall Protection System	S.Y.
Reinforcing Steel (Gr. 60)	4800 Lbs.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	0 Lbs.
Class III Excavation	C.Y.
Foundation Stabilization	24 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	24 C.Y.

NO.	DATE	REVISIONS	BY	APP'D
1				

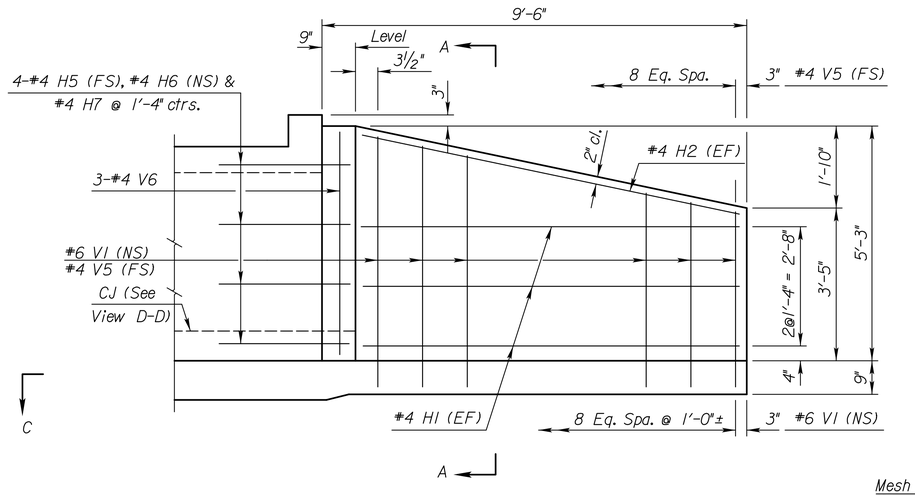
KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 439+24
SINGLE 4 ft x 4 ft RCB

BR 1.4.4 P Morris Co.

FHWA APPROVAL			10-20-10	APP'D		Terry L. Fleck	
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP	CADD	MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA	CADD CK.	CEA

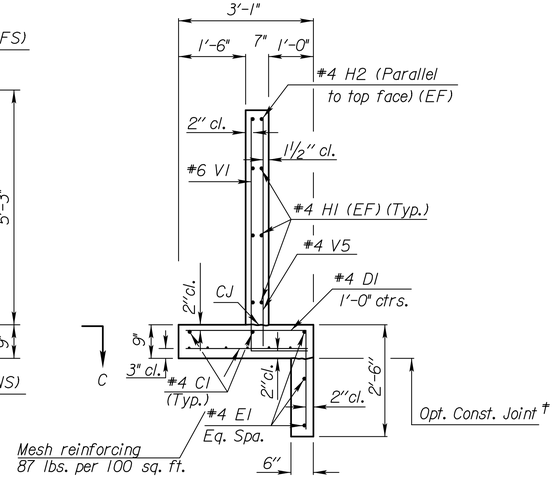
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	63	291



ELEVATION OF WINGWALL

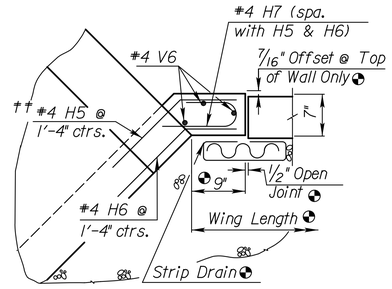
(Backface Shown)



SECTION A-A

See "RCB Aux. Details" sheet for additional requirements.

Typical both wings



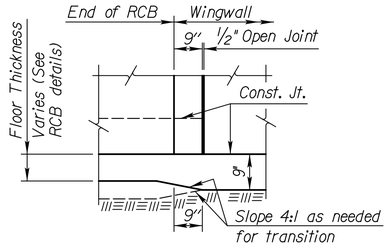
WINGWALL JOINT DETAIL

(Plan View)

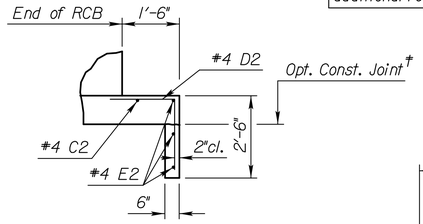
† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: ⌐ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a 3/4" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2.
Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710.
Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

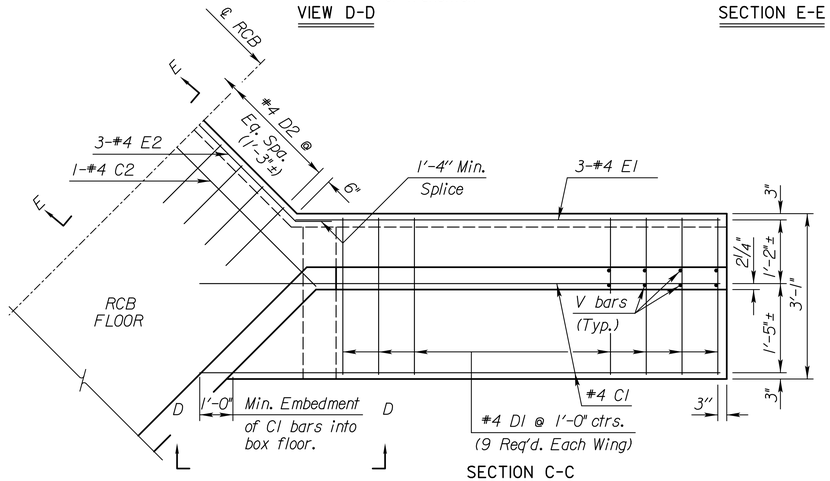


VIEW D-D

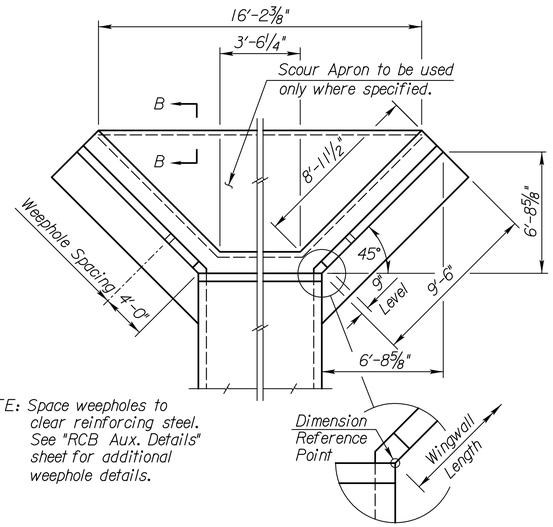


SECTION E-E

NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint



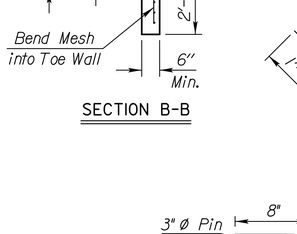
SECTION C-C



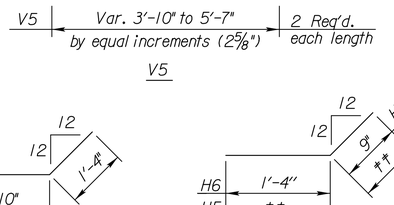
NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

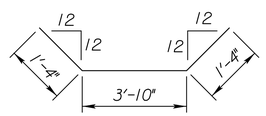
WING DIMENSIONS FOR NORMAL BOX

(3 1/2:1 Embankment Slope)

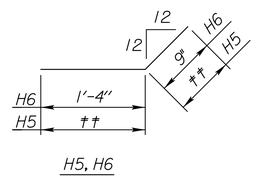


SECTION B-B

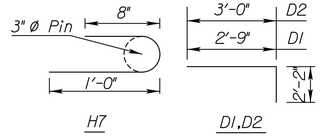




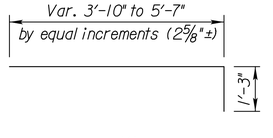
E2



H5, H6



H7 D1,D2



V1

(2 Req'd., each length)

BENDING DIAGRAM

(All dimensions are out to out of bars.)

†† Bend in Field

NOTE: Reinforcing Bar List is for both wings at one end of box only.

* See Bending Diagram

		#4C1	#4D1	#4E1	#4C2	#4D2	#4E2	#6V1	#4H1	#4H2	#4H5	#4H6	#4H7	#4V5	#4V6
0° Skew	No.	4	18*	6	1	3 *	3 *	18	12	4	8 *	8*	8*	18	6
	Length	11'-7"	4'-11"	8'-9"	4'-8"	5'-2"	6'-6"	*	8'-4"	8'-6"	1'-10"	2'-1"	1'-9"	*	5'-0"

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	1.80	(C.Y.)	4.34	(C.Y.)
Apron	0.00	(C.Y.)	0.00	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			509	Lbs.
Welded Wire Fabric (Wings)			51	Lbs.
Welded Wire Fabric (Apron)			0	Lbs.
Granular Backfill (Wingwalls)			12.00	C.Y.
Filter Fabric (subsidiary)			18.00	S.Y.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Sta. 439+24

FLARED WINGWALLS
4 ft Rise (0°SKEW)

BR 10.00.04 Morris Co.

FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck			
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP	CADD	MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA	CADD CK.	CEA

CADconform Certify This File

Sh. No. 63

Plotted By: mrockwell | Plot Location:
File: 439+24Wing1.dgn
Plot Date: 16-JAN-2025 07:40

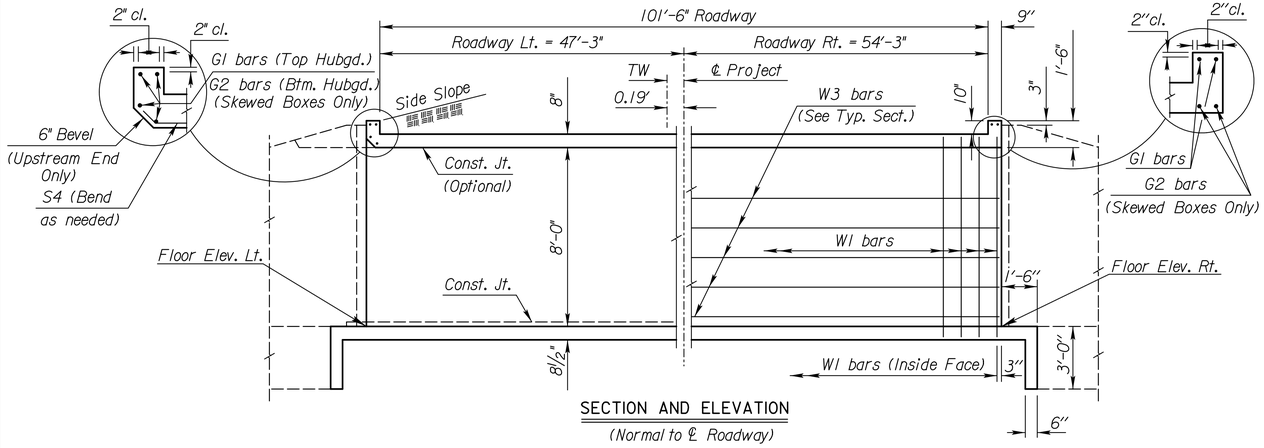
CADconform Certify This File

VERSION/ID	SYSTEM PART
12/6/2000	CADD VBA
5/4/2020	DATABASE
7.1.22	RCB PROGRAM
7.1.5	KBOX MODEL ID
2/8/2022	CELL LIBRARY

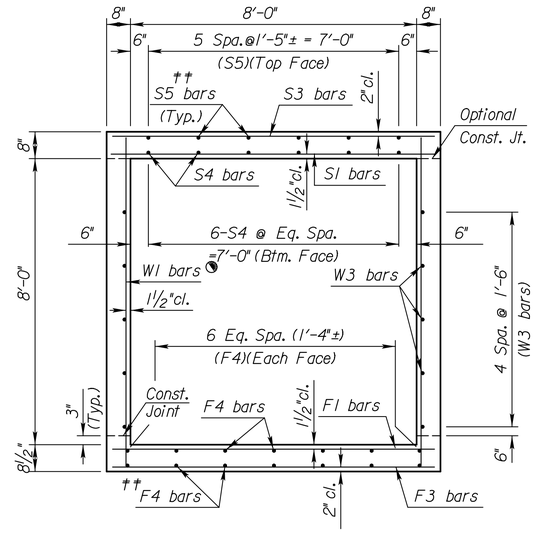
06

Plotted By: mrockwell
Plot Location:
File: 450+73Box1.dgn
Plot Date: 16-JAN-2025 07:40

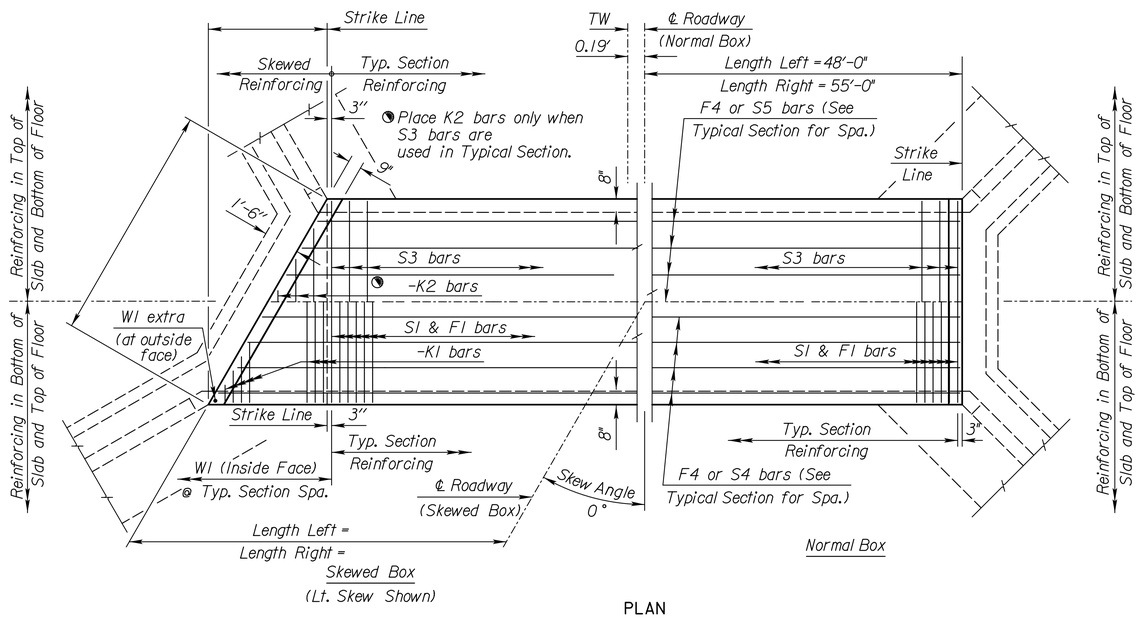
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	64	291



SECTION AND ELEVATION
(Normal to ℄ Roadway)



TYPICAL SECTION



PLAN

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete f'c = 4,000 p.s.i.
Reinforcing Steel fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and includes the surfacing.

CONCRETE: Use concrete conforming to Grade 4.0 Concrete. Bevel all exposed edges with a ¾" triangular molding. Where Grade 4.0(AE) is specified, place this concrete in the top slab above the Construction Joint.

REINFORCING: Use reinforcing steel conforming to ASTM A615, Grade 60. All dimensions relative to reinforcing steel are to the centerline of the bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB bridges shall be paid for as Class III Excavation.

SEAL COURSE: The Engineer may require a seal course. The seal course shall be unreinforced Concrete(Commercial Grade) with a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when they are required by the plans. Payment for additional quantities that result from including a seal course and/or a floating apron, as a change in the original plans, shall be made at the unit price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS):
See the "Auxiliary Details" sheet.

STRIKE LINE: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

◔ See RCB Auxiliary Details for Optional Splice.

Note:
S3 bars omitted unless grade box or slab thickness is greater than or equal to 12".

Note:
F3 bars omitted unless floor thickness is greater than or equal to 12.".

†† Omit S5 bars when S3 bars are omitted and omit the bottom layer of F4 bars when F3 bars are omitted.

Note: Use only cast-in-place construction at this location.

TW - Denotes Traveled Way, see Typical Section Sheets

⧗ For design purposes ONLY. Do NOT use for Construction — CULVERT SUMMARY — ◔ includes any welded wire fabric

Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	⧗ Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Concrete Barrel (Cu.Yds.)	Concrete Wings (Cu.Yds.)	Concrete Total (Cu.Yds.)	Reinf. Steel (Gr. 60) Barrel (Lbs.)	Reinf. Steel (Gr. 60) ◔Wings (Lbs.)	Reinf. Steel (Gr. 60) Total (Lbs.)	LRFR RATING FACTORS HL-93 Loading Inventory	HL-93 Loading Operating
1265.96	1263.94	1281.86	10	0	Flared	Flared	No	No	90.04	31.27	121.31	9185	3277	12462	N/A	N/A

BAR SCHEDULE

F1 Size	F1 Spa.	F1 No.	F1 Length	F2 Size	F2 Spa.	F2 No.	F2 Length	F3 Size	F3 Spa.	F3 No.	F3 Length	F4 Size	F4 No.	F4 Length	S1 Size	S1 Spa.	S1 No.	S1 Length	W2 Size	W2 Spa.	W2 No.	W2 Length	S3 Size	S3 Spa.	S3 No.	S3 Length	S4 Size	S4 No.	S4 Length	S5 Size	S5 No.	S5 Length
6	7"	177	9'-0"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9'-0"	4	21	35'-2"	6	7"	177	9'-0"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9'-0"	4	18	35'-2"	4	N/A	35'-2"

K1 Size	K1 Spa.	K1 No.	K1 Length	K2 Size	K2 Spa.	K2 No.	K2 Length	W1 Size	W1 Spa.	W1 No.	W1 Length	W2 Size	W2 Spa.	W2 No.	W2 Length	W3 Size	W3 No.	W3 Length	W4 Size	W4 Spa.	W4 No.	W4 Length	G1 Size	G1 No.	G1 Length	G2 Size	G2 No.	G2 Length	G3 Size	G3 Spa.	G3 No.	G3 Length
N/A	N/A	N/A		N/A	N/A	N/A		5	8½"	292	9'-0"	N/A	N/A	N/A	N/A	4	30	35'-2"	N/A	N/A	N/A	N/A	5	4	9'-0"	N/A	N/A	N/A			

SUMMARY OF QUANTITIES

Concrete (Grade 4.0)	121.3 C.Y.
Concrete (Grade 4.0)(AE)	0.0 C.Y.
Bridge Backwall Protection System	S.Y.
Reinforcing Steel (Gr. 60)	12460 Lbs.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	0 Lbs.
Class III Excavation	C.Y.
Foundation Stabilization	36 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	104 C.Y.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 450+73
SINGLE 8 ft x 8 ft RCB

BR 1.8.8 P — Morris Co.

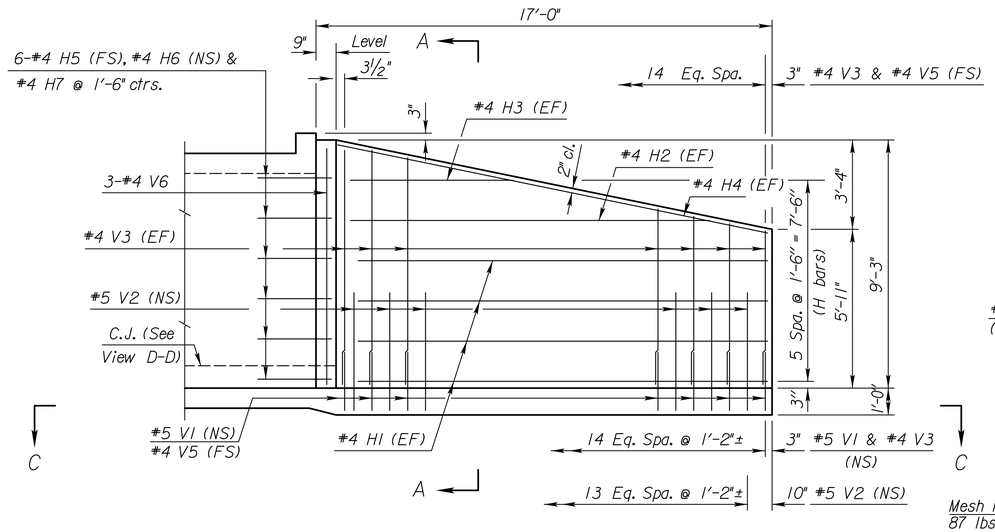
FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck			
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP	CADD	MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA	CADD CK.	CEA

CADconform Certify This File

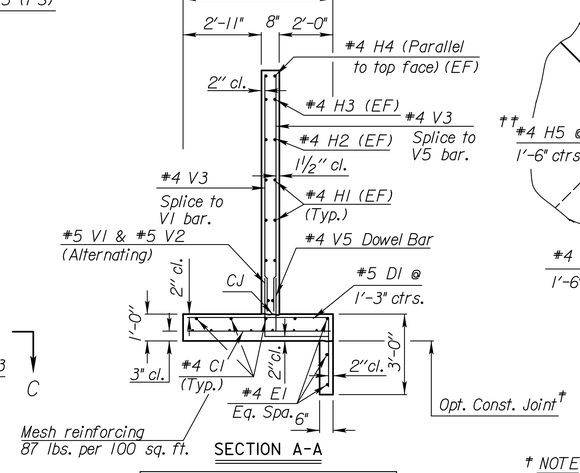
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	65	291

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2.
Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710.
Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

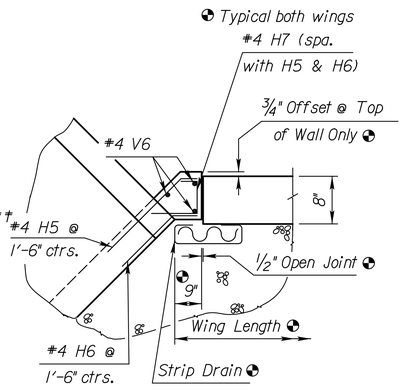


ELEVATION OF WINGWALL
(Backface Shown)



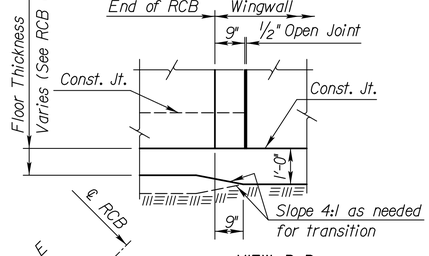
SECTION A-A

See "RCB Aux. Details" sheet for additional requirements.

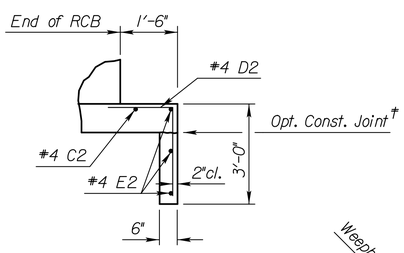


WINGWALL JOINT DETAIL
(Plan View)

† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: ⌐¬ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

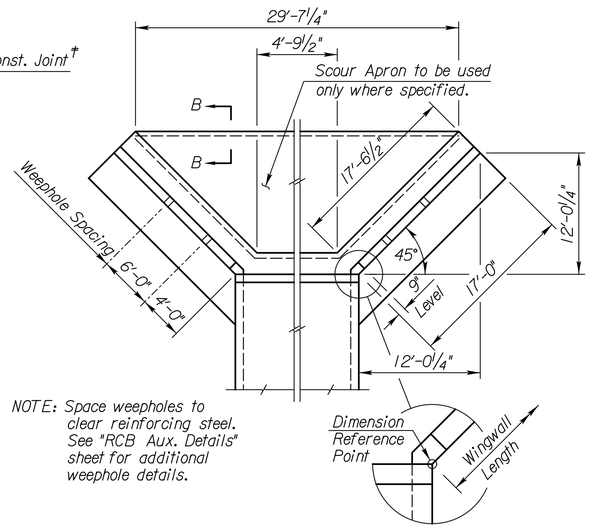


VIEW D-D



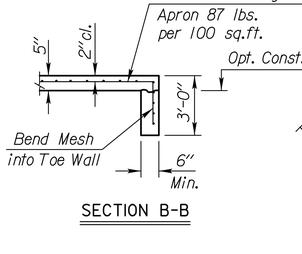
SECTION E-E

NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint

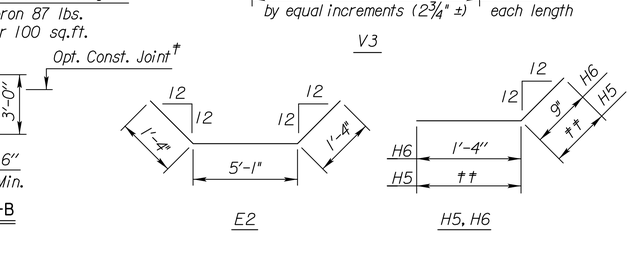


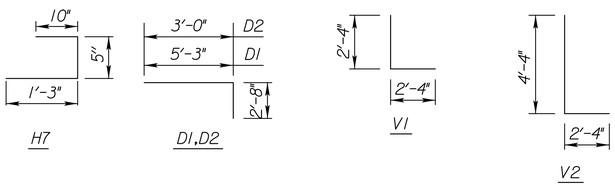
NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

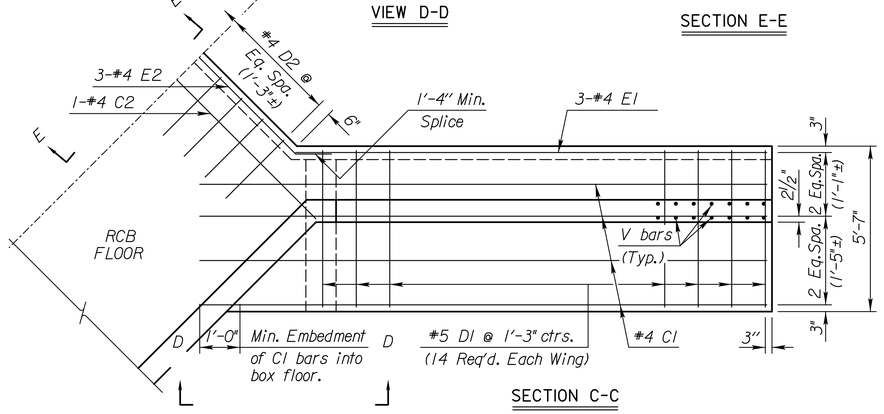
WING DIMENSIONS FOR NORMAL BOX
(3½:1 Embankment Slope)



SECTION B-B







SECTION C-C
(Plan of Footing)

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	4.91	(C.Y.)	15.63	(C.Y.)
Apron	0.00	(C.Y.)	0.00	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			1473	Lbs.
Welded Wire Fabric (Wings)			165	Lbs.
Welded Wire Fabric (Apron)			0	Lbs.
Granular Backfill (Wingwalls)			52.00	C.Y.
Filter Fabric (subsidiary)			48.00	S.Y.

NOTE: Reinforcing Bar List is for both wings at one end of box only.

✱ See Bending Diagram

0° Skew	Mark	#4C1	#5D1	#4E1	#4C2	#4D2	#4E2	#5V1	#5V2	#4V3	#4H1	#4H2	#4H3	#4H4	#4H5	#4H6	#4H7	#4V5	#4V6
	Number	8	28✱	6	1	4 ✱	3✱	30 ✱	28 ✱	60	16	4	4	4	12 ✱	12 ✱	12 ✱	30	6
	Length	20'-6"	7'-11"	17'-4"	9'-0"	5'-8"	7'-9"	4'-8"	6'-8"	✱	15'-10"	13'-8"	6'-4"	16'-2"	1'-10"	2'-1"	2'-6"	2'-2"	9'-0"

BENDING DIAGRAM
(All dimensions are out to out of bars.)
†† Bend in Field

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 450+73
FLARED WINGWALLS
8 ft Rise (0✱SKEW)

BR 10.00.08 Morris Co.

FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck	
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA
CADD	MLP	CADD CK.	CEA		

CADconform Certify This File

Sh. No. 65

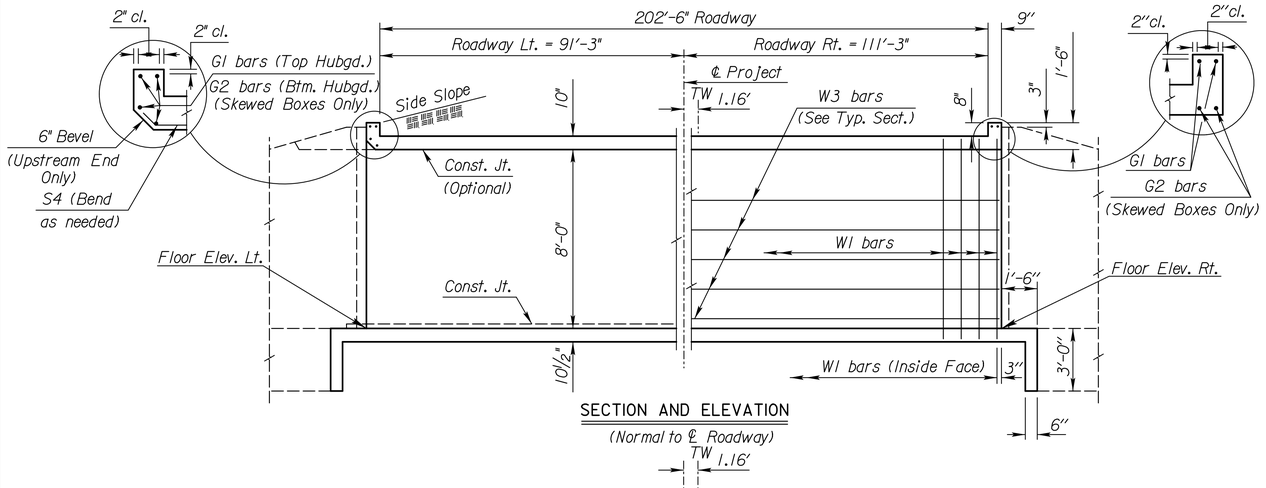
Plotted By: mrockwell | Plot Location:
File: 450+73Wing1.dgn
Plot Date: 16-JAN-2025 07:40

CADconform Certify This File

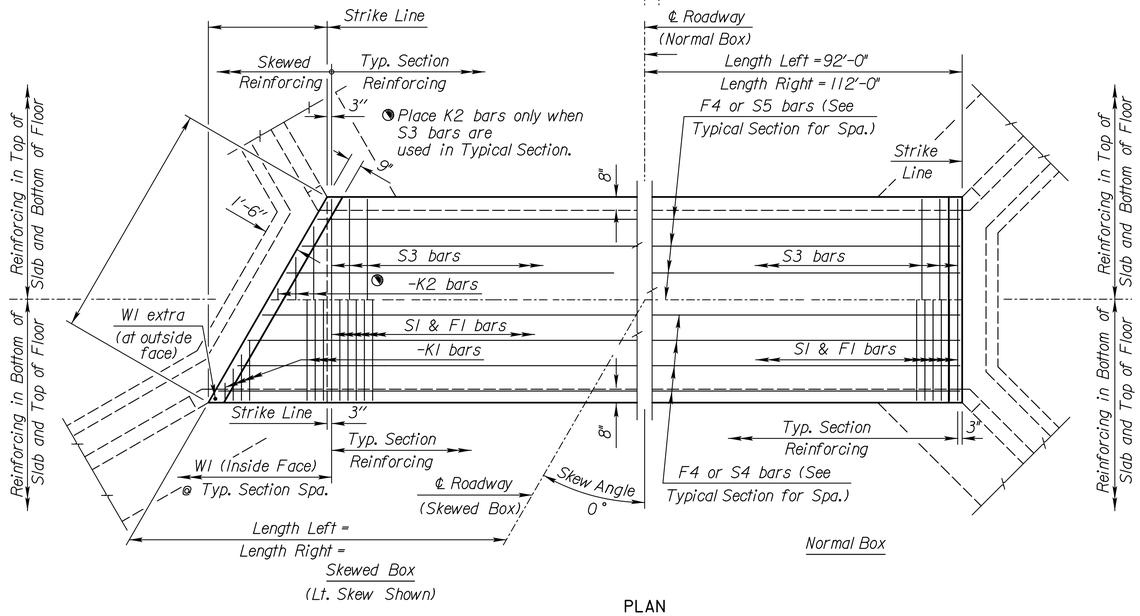
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	66	291

SYSTEM PART	VERSION/ID
CADD VBA	12/6/2010
DATABASE	5/4/2020
RCB PROGRAM	7.1.22
KBOX MODEL ID	777
CELL LIBRARY	2/8/2022

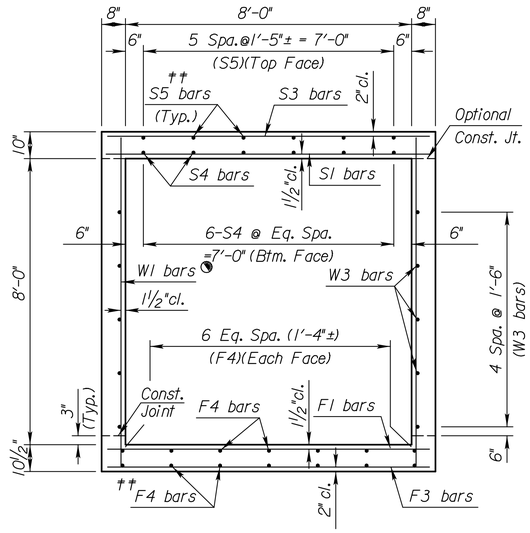
06



SECTION AND ELEVATION
(Normal to ℄ Roadway)



PLAN



TYPICAL SECTION

See RCB Auxiliary Details for Optional Splice.

Note:
S3 bars omitted unless grade box or slab thickness is greater than or equal to 12".

Note:
F3 bars omitted unless floor thickness is greater than or equal to 12.".

†† Omit S5 bars when S3 bars are omitted and omit the bottom layer of F4 bars when F3 bars are omitted.

Note: Use only cast-in-place construction at this location.

TW - Denotes Traveled Way, see Typical Section Sheets

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete f'c = 4,000 p.s.i.
Reinforcing Steel fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and includes the surfacing.

CONCRETE: Use concrete conforming to Grade 4.0 Concrete. Bevel all exposed edges with a ¾" triangular molding. Where Grade 4.0(AE) is specified, place this concrete in the top slab above the Construction Joint.

REINFORCING: Use reinforcing steel conforming to ASTM A615, Grade 60. All dimensions relative to reinforcing steel are to the centerline of the bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB bridges shall be paid for as Class III Excavation.

SEAL COURSE: The Engineer may require a seal course. The seal course shall be unreinforced Concrete(Commercial Grade) with a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when they are required by the plans. Payment for additional quantities that result from including a seal course and/or a floating apron, as a change in the original plans, shall be made at the unit price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS):
See the "Auxiliary Details" sheet.

STRIKE LINE: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

SUMMARY OF QUANTITIES	
Concrete (Grade 4.0)	232.8 C.Y.
Concrete (Grade 4.0)(AE)	0.0 C.Y.
Bridge Backwall Protection System	S.Y.
Reinforcing Steel (Gr. 60)	29930 Lbs.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	0 Lbs.
Class III Excavation	C.Y.
Foundation Stabilization	61 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	104 C.Y.

⧖ For design purposes ONLY. Do NOT use for Construction — CULVERT SUMMARY — ◔ includes any welded wire fabric

Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	⧖ Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Concrete Barrel (Cu.Yds.)	Concrete Wings (Cu.Yds.)	Concrete Total (Cu.Yds.)	Reinf. Steel (Gr. 60) Barrel (Lbs.)	Reinf. Steel (Gr. 60) ◔Wings (Lbs.)	Reinf. Steel (Gr. 60) Total (Lbs.)	LRFR RATING FACTORS HL-93 Loading Inventory	LRFR RATING FACTORS HL-93 Loading Operating
1256.43	1252.04	1283.86	20	0	Flared	Flared	No	No	201.37	31.47	232.84	26649	3277	29926	N/A	N/A

BAR SCHEDULE

F1 Size	F1 Spa.	F1 No.	F1 Length	F3 Size	F3 Spa.	F3 No.	F3 Length	F4 Size	F4 No.	F4 Length	S1 Size	S1 Spa.	S1 No.	S1 Length	S3 Size	S3 Spa.	S3 No.	S3 Length	S4 Size	S4 No.	S4 Length	S5 Size	S5 No.	S5 Length
6	5½"	445	9'-0"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9'-0"	4	42	35'-2"	7	5½"	445	9'-0"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

K1 Size	K1 Spa.	K1 No.	K1 Length	K2 Size	K2 Spa.	K2 No.	K2 Length	W1 Size	W1 Spa.	W1 No.	W1 Length	W3 Size	W3 Spa.	W3 No.	W3 Length	G1 Size	G1 No.	G1 Length	G2 Size	G2 No.	G2 Length	S3 Size	S3 Spa.	S3 No.	S3 Length
N/A	N/A	N/A		N/A	N/A	N/A		6	7½"	654	9'-4"	N/A	N/A	N/A	N/A	4	60	35'-2"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5	4	9'-0"	N/A	N/A	N/A				

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 461+53
SINGLE 8 ft x 8 ft RCB
(1' Embedded)

BR 1.8.8 P — Morris Co.

FHWA APPROVAL			10-20-10	APP'D	Terry L. Fleck		
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP	CADD	MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA	CADD CK.	CEA

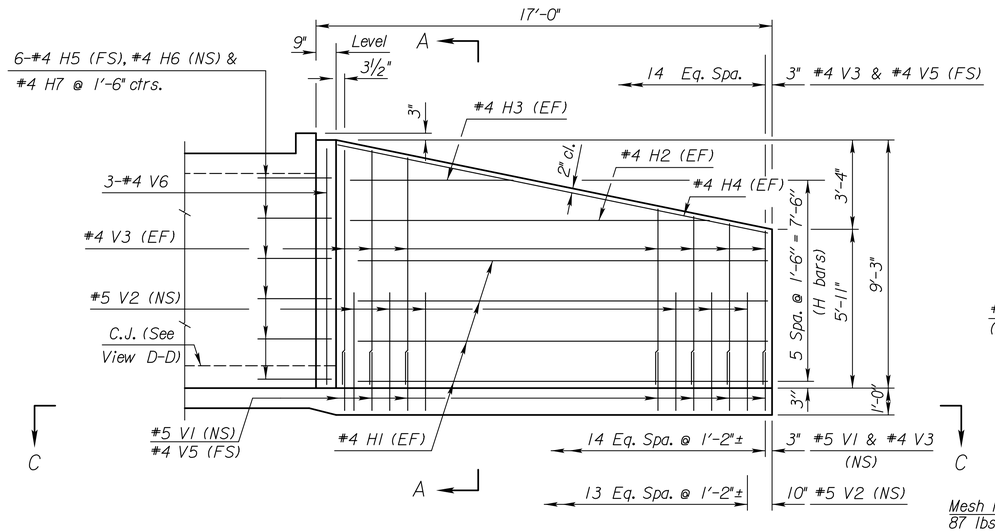
Plotted By: mrockwell
File: 461+53(Box).dgn
Plot Date: 16-JAN-2025 07:40
Plot Location:

CADconform Certify This File

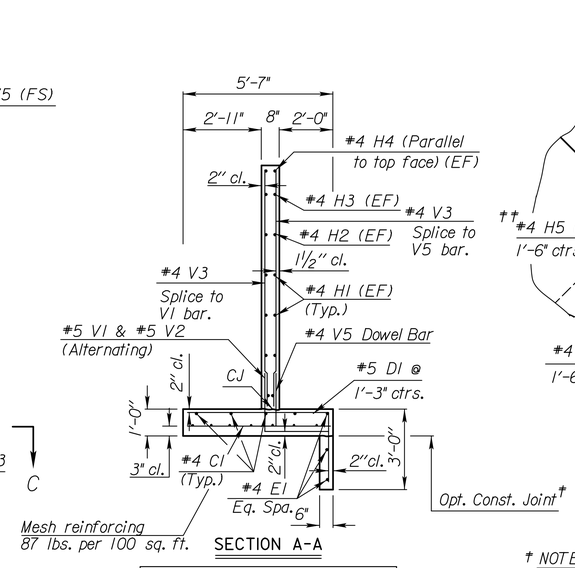
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	67	291

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2.
Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710.
Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

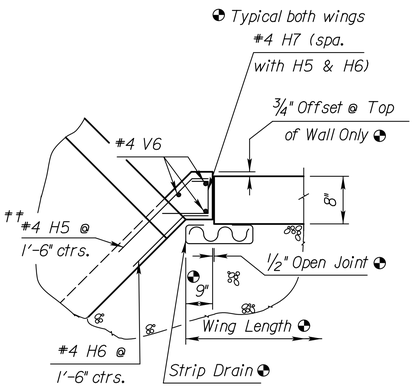


ELEVATION OF WINGWALL
(Backface Shown)



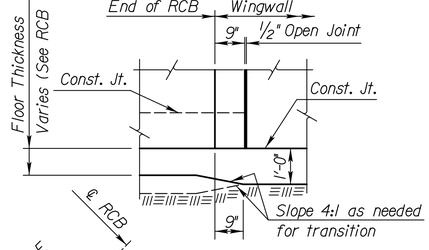
SECTION A-A

See "RCB Aux. Details" sheet for additional requirements.

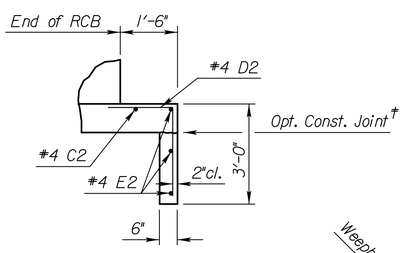


WINGWALL JOINT DETAIL
(Plan View)

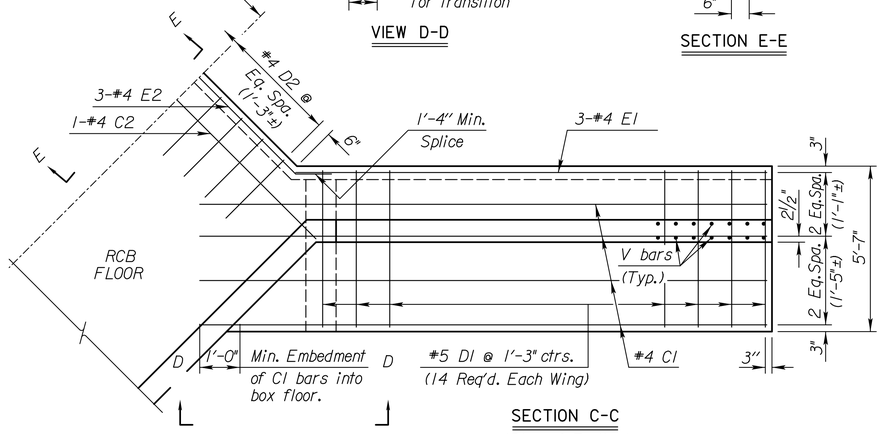
† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: ⌐¬ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.



VIEW D-D

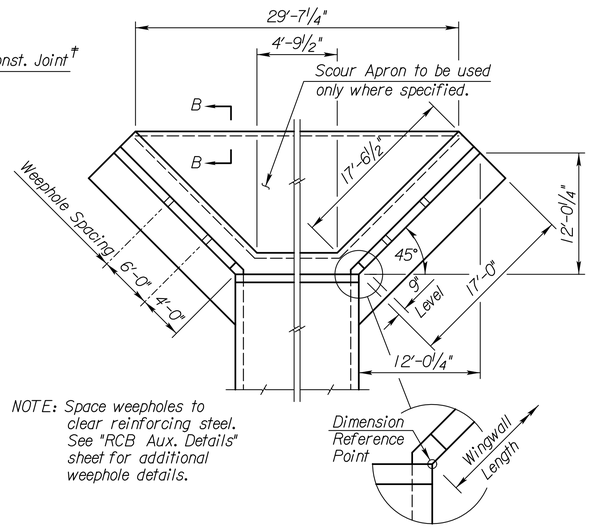


SECTION E-E



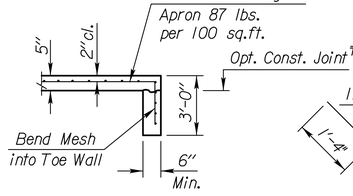
SECTION C-C
(Plan of Footing)

NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

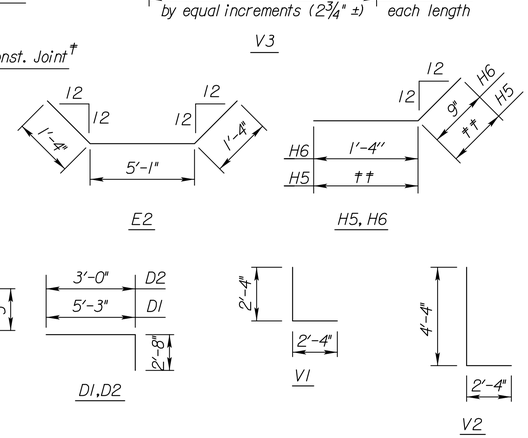


WING DIMENSIONS FOR NORMAL BOX
(3½:1 Embankment Slope)

NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint



SECTION B-B



BENDING DIAGRAM
(All dimensions are out to out of bars.)
†† Bend in Field

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	4.91	(C.Y.)	15.73	(C.Y.)
Apron	0.00	(C.Y.)	0.00	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			1473	Lbs.
Welded Wire Fabric (Wings)			165	Lbs.
Welded Wire Fabric (Apron)			0	Lbs.
Granular Backfill (Wingwalls)			52.00	C.Y.
Filter Fabric (subsidiary)			48.00	S.Y.

NOTE: Reinforcing Bar List is for both wings at one end of box only.

✱ See Bending Diagram

0° Skew	Mark	#4C1	#5D1	#4E1	#4C2	#4D2	#4E2	#5V1	#5V2	#4V3	#4H1	#4H2	#4H3	#4H4	#4H5	#4H6	#4H7	#4V5	#4V6
	Number	8	28✱	6	1	4 ✱	3✱	30 ✱	28 ✱	60	16	4	4	4	12 ✱	12 ✱	12 ✱	30	6
	Length	20'-6"	7'-11"	17'-4"	9'-0"	5'-8"	7'-9"	4'-8"	6'-8"	✱	15'-10"	13'-8"	6'-4"	16'-2"	1'-10"	2'-1"	2'-6"	2'-2"	9'-0"

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

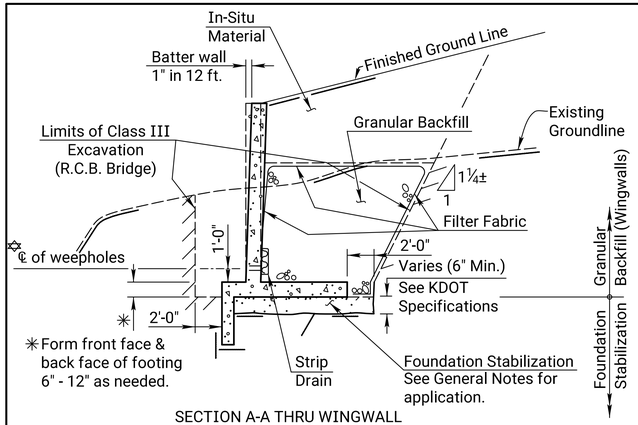
KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 461+53
FLARED WINGWALLS
8 ft Rise (0°SKEW)
(1' Embedded)
BR 10.00.08 Morris Co.

FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck	
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA

CADconform Certify This File
Sh. No. 67

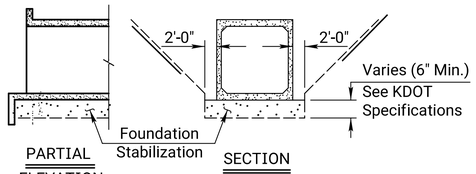
Plotted By: mrockwell | Plot Location:
File: 461+53Wing1.dgn
Plot Date: 16-JAN-2025 07:40

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	68	291



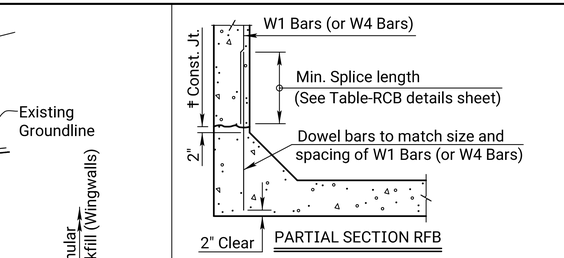
SECTION A-A THRU WINGWALL

Granular Backfill And Foundation Stabilization



PARTIAL ELEVATION

SECTION



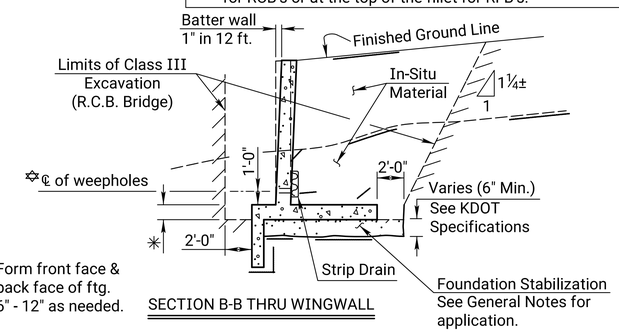
PARTIAL SECTION RFB

OPTIONAL BAR DETAIL

The Contractor shall have the option of using Dowel Bars to match vertical wall bars as shown, however no allowance will be made for additional steel required for bar laps.

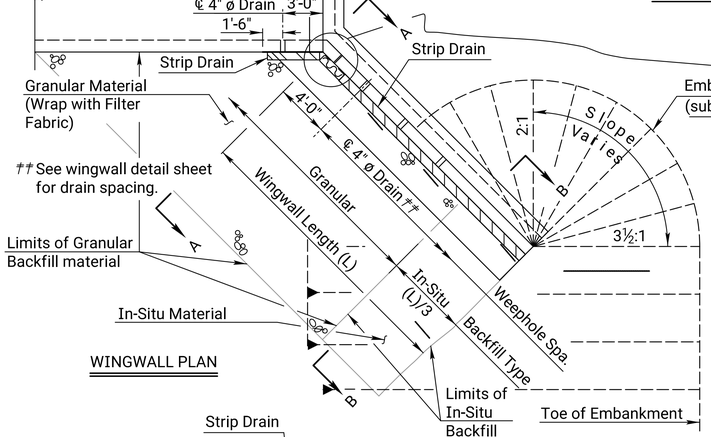
‡ OPTIONAL COLD JOINT

The Contractor has the option of placing the Lower Horizontal Construction Joint at the top of the slab for RCB's or at the top of the fillet for RFB's.

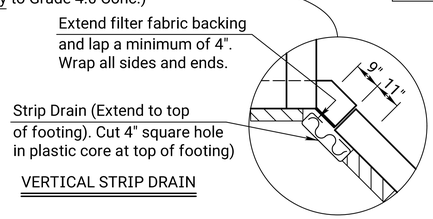


SECTION B-B THRU WINGWALL

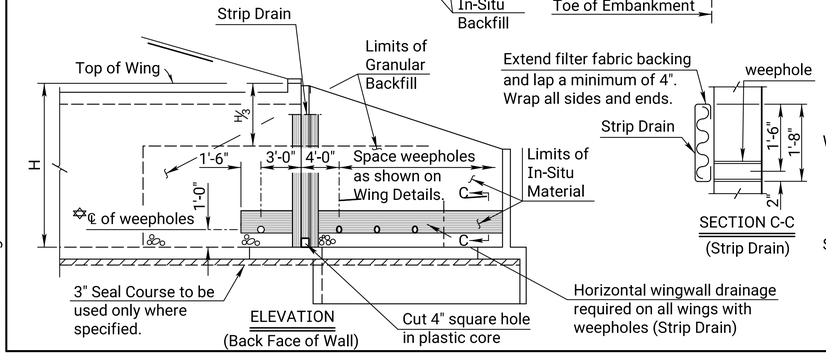
✳ Weep holes will be adjusted up by the amount of embeddment shown on BR025A if the structure is embedded.



WINGWALL PLAN



VERTICAL STRIP DRAIN



ELEVATION (Back Face of Wall)

SECTION C-C (Strip Drain)

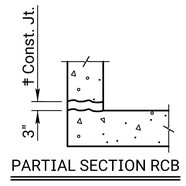
GENERAL NOTES

Wingwall Drainage:

1. All wingwalls with weepholes shall have horizontal and vertical wingwall drainage as shown. Strip drains will be used. See KDOT Specifications for "Abutment Strip Drains" for strip drain requirements.
2. Construction and materials for wingwall drainage, including weepholes, and strip drain shall be subsidiary to the bid item, "Grade 4.0 Concrete". Weepholes may be a formed opening or corrugated polyethylene tubing.

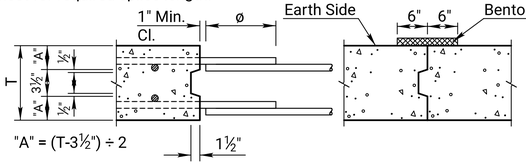
Wingwall Foundation Stabilization:
The Foundation Stabilization quantity has been calculated to the limits shown in the Section Thru Wingwall. The depth may be increased by the Engineer. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

Seal Course:
Seal Course consisting of 3" min. of Commercial Grade Concrete shall be constructed to the limits directed by the Engineer. No reinforcing in the floor of the slab or wall footing shall be placed until the Seal Course has gained sufficient strength to permit working upon it without injury.



PARTIAL SECTION RCB

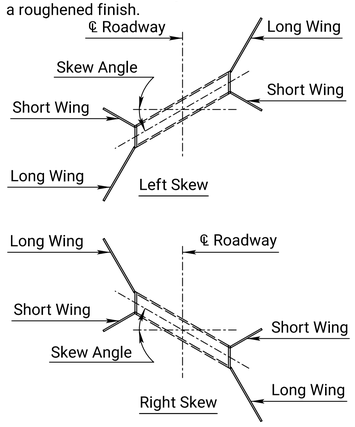
ø Longitudinal bars shall extend through the joint to provide a minimum lap equal to the required splice length. See RCB Details sheet for required splice length.



VERTICAL CONSTRUCTION JOINTS

NOTE: Vertical construction joints shall be perpendicular to the longitudinal axis of the RCB and shall be placed at any location as needed for construction and as approved by the Engineer.

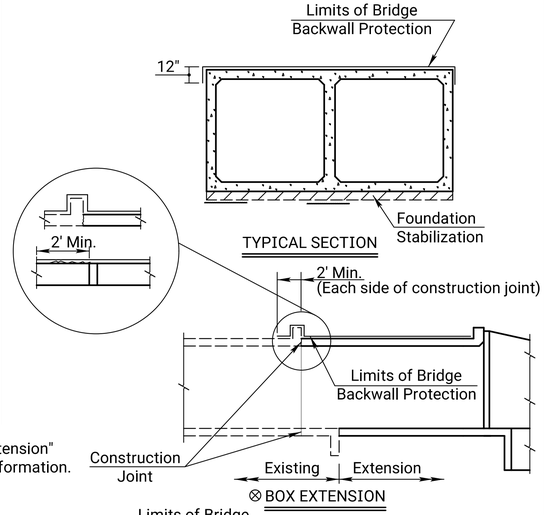
NOTE: Horizontal construction joints shall be a roughened finish.

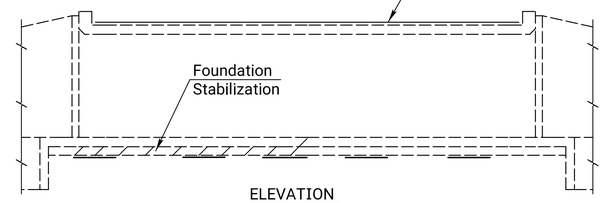


PLAN VIEW SKEWED R.C.B.

NOTE: Barrel Construction Joints located in a median with less than 5 ft. of fill or at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "Bridge Backwall Protection System". Material and installation of the bentonite system shall be subsidiary to the bid item "Grade 4.0 Concrete".

⊗ See "Typical Culvert Extension" RD080 for additional information.





ELEVATION (New Construction)

GENERAL NOTES

Foundation Stabilization:
The depth of Foundation Stabilization may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

Granular Backfill (Wingwalls):

1. Granular Backfill shall be used to backfill behind wingwalls to the limits shown in the WINGWALL PLAN and Elevation detail. Granular Backfill construction may be used separately or combined with Foundation Stabilization as directed by the Engineer.
2. Measurement for the bid item, "Granular Backfill (Wingwalls)", shall be measured in Cubic Yards to the theoretical limits as shown.
3. Material for Granular Backfill (Wingwalls) shall conform to the requirements of SB-1, SB-2, SCA-1 or SCA-2.
4. Consolidate Granular Backfill using hand equipment only. Avoid over consolidation.
5. Use filter fabric complying with Section 1710. Use only within the limits of Granular Backfill to separate from the In-Situ Material. Filter Fabric is subsidiary to "Granular Backfill".

In-Situ Backfill (Wingwalls):

1. Use any material found within the project limits except Highly Plastic Clay(s) or organic material. The material is subsidiary to "Granular Backfill".
2. Use Type "B" Compaction.
3. Use only hand or walk behind equipment for Compaction.

GENERAL NOTES

Bridge Backwall Protection System:

1. For all structures with less than or equal to 2'-0" of fill, apply a "Bridge Backwall Protection System" from Section 1700 to the limits shown. Do not place hot mix asphalt directly on this material.
2. Use a "non-coal tar" material from KDOT's approved list.
3. Protect this material from damage during backfilling. Repair at no additional cost.
4. When the Plans show hot mix asphalt placed directly on the slab, substitute "Pavement Water Proofing" material from Section 800, this material shall be subsidiary. Wait 28 days after top slab is completed before applying this material.

NO.	DATE	REVISIONS	BY	APP'D
07	02-06-18	Filter Fabric Clarification	M.L.L.	J.P.J.
06	06-07-17	Filter Fabric Modification	J.P.J.	J.P.J.
05	10-11-13	Granular Backfill Limits	J.P.J.	L.R.R.

KANSAS DEPARTMENT OF TRANSPORTATION

RCB AUXILIARY DETAILS (LRFD)

~~BR020B~~

FHWA APPROVAL			04-17-10	APP'D.		Terry L. Fleck	
DESIGNED	J.P.J.	DETAILED	R.A.A.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	J.S.R.	DETAIL CK.	J.P.J.	QUAN.CK.		TRACE CK.	J.P.J.

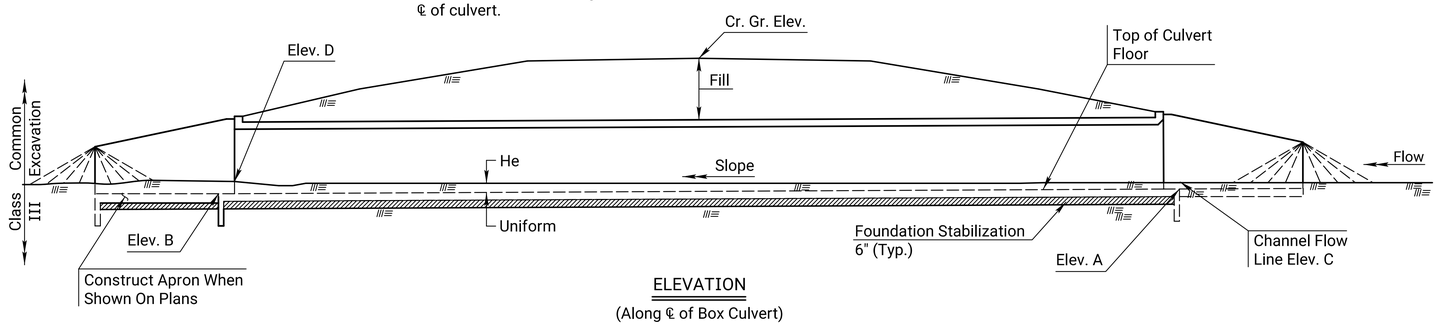
Sh. No. 68

Plotted : 16-JAN-2025 07:40
Drawn By : mrockwell
File : br020b.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	69	291

SUMMARY OF HYDRAULIC STRUCTURES											
Serial No.	Str. Type	Sta.	Size No. Cells - Span x Rise	Cr. Gr. Elev.	He	Floor Elev. A	Floor Elev. B	BackFill Elev. C	BackFill Elev. D	Up Stream Apron	Down Stream Apron
(048)	RFB	371+00	2 - 12 ft x 12 ft	1277.92	1.0	1263.44	1262.02	1264.44	1263.02	NO	NO
	RCB	461+53	1 - 8 ft x 8 ft	1283.86	1.0	1256.43	1252.04	1257.43	1253.04	NO	NO

NOTE:
All elevations taken along
℄ of culvert.



ELEVATION
(Along ℄ of Box Culvert)

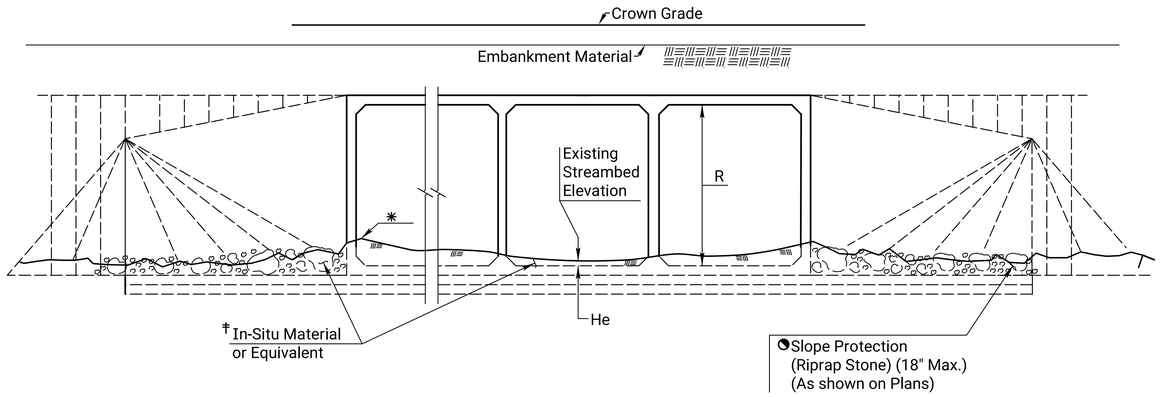
GENERAL NOTES

† BACKFILL:
The backfill within the barrel will occur by natural process for structures equal to or less than 4'-0" in height. For these structures the contractor will backfill to the limits shown outside of the barrel. Backfill structures larger than 4'-0" in height to a minimum depth of 1'-0". Work and material required for backfill is not paid for directly, but is subsidiary to Foundation Stabilization.

MATERIAL:
Backfill shall be with insitu or equivalent material. Material shall be reasonably free of organic material. Slope Protection (Riprap Stone) shall conform to KDOT Specifications. Place this material to the limits shown. The intent of the Slope Protection material is to protect the toe of the embankment which wraps around the wing walls.

EXCAVATION:
The grading contractor will excavate and clear the channel to the limits shown on standard BR100. The bridge contractor will consider the additional excavation below this elevation as Class III for bridge sized structures. Excavation below the floor shall be subsidiary to Foundation Stabilization.

LOADING:
For structures larger than 4'-0" in height, place in-situ material or equivalent in an uncompacted state to a minimum depth of 1'-0". Do not operate equipment on floor until the concrete has reached a strength of at least 3.0 ksi.

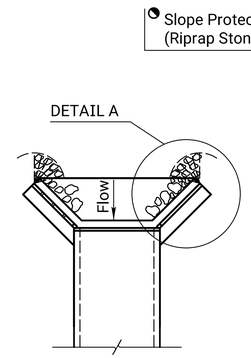


TYPICAL SECTION
(At the end of the box culvert)

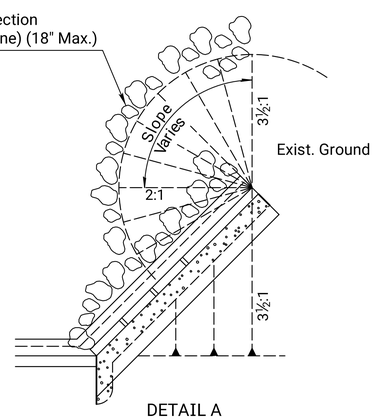
* Shape backfill in exterior cells so that top elevation of backfill material is 4" to 6" higher than the backfill material at ℄.

◔ See "RCB Box" Sheet for "Slope Protection" Quantities.

† Backfill material is limited to the material found within the footprint of the excavated structure.



PARTIAL PLAN NEAR ENDS



DETAIL A

NO.	DATE	REVISIONS	BY	APP'D
03	07-21-22	Change Shot Rock to Riprap Stone	M.L.L.	M.A.H.
02	05-06-16	Various Revisions	M.J.O.	J.P.J.
01	06-18-12	Modified per 2012 requirements	J.P.J.	T.L.F.

KANSAS DEPARTMENT OF TRANSPORTATION

RCB AUXILIARY DETAILS
(Embedded Structure)
With Rise > 48"

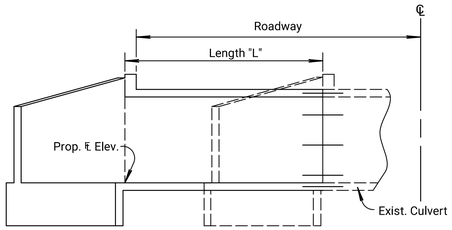
Proj. 177-064 KA-6017-01 MORRIS Co.

DESIGNED	M.J.O.	DETAILED	M.J.O.	QUANTITIES		CADD	R.A.A.
DESIGN CK.		DETAIL CK.		QUAN.CK.		CADD CK.	

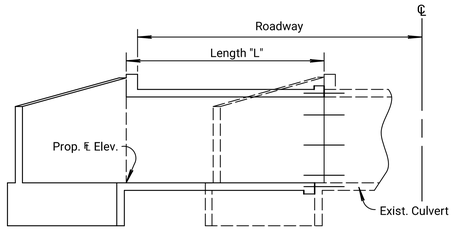
Sh. No. 69

Plotted : 16-JAN-2025 07:40
Drawn By : mrockwell
File : br025a.dgn

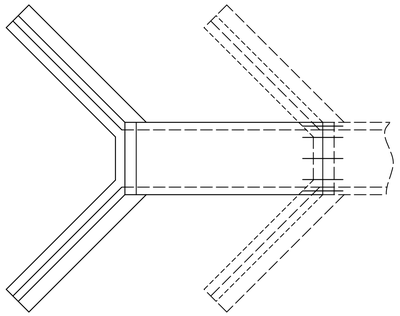
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	70	291



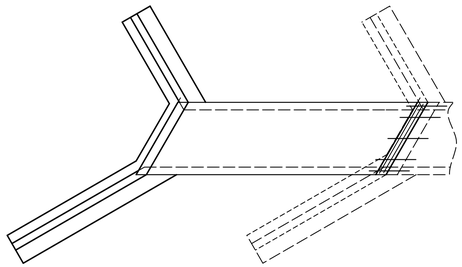
TYPICAL SECTION
(Flared Wings)



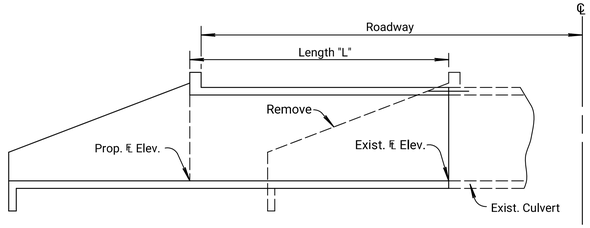
TYPICAL SECTION
(Skewed Structure)



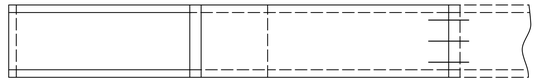
TYPICAL PLAN
(Flared Wings)



TYPICAL PLAN
(Skewed Structure)

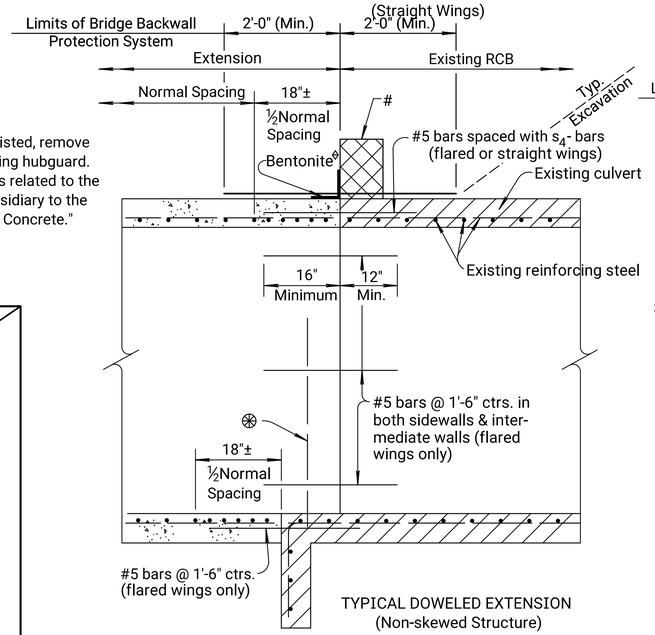


TYPICAL SECTION
(Straight Wings)

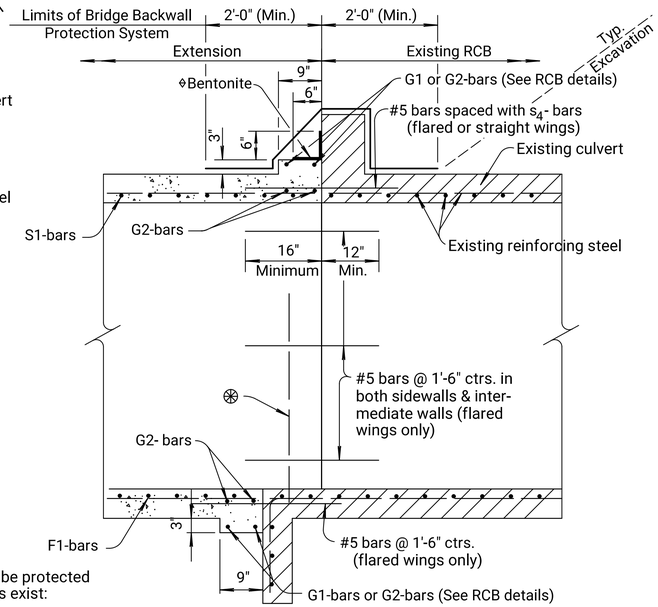


TYPICAL PLAN
(Straight Wings)

For the structures listed, remove the top of the existing hubguard. Work and quantities related to the removal will be subsidiary to the bid item "Grade 4.0 Concrete."
- Sta. 323+45.00
- Sta. 328+77.00
- Sta. 351+00.00



TYPICAL DOWELED EXTENSION
(Non-skewed Structure)

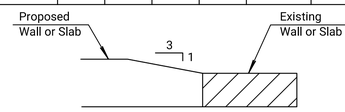


TYPICAL DOWELED EXTENSION
(Skewed Structure)

◊NOTE: The joint between the RCB extension and the existing structure shall be protected by a bentonite based system as shown when any of the following conditions exist:
1. Fill depth over the joint is 2 feet or less.
2. Lateral location of the joint is 20 feet or less from edge of pavement.
3. RCB span is equal to or greater than 8 feet.
4. When specified on the plans.

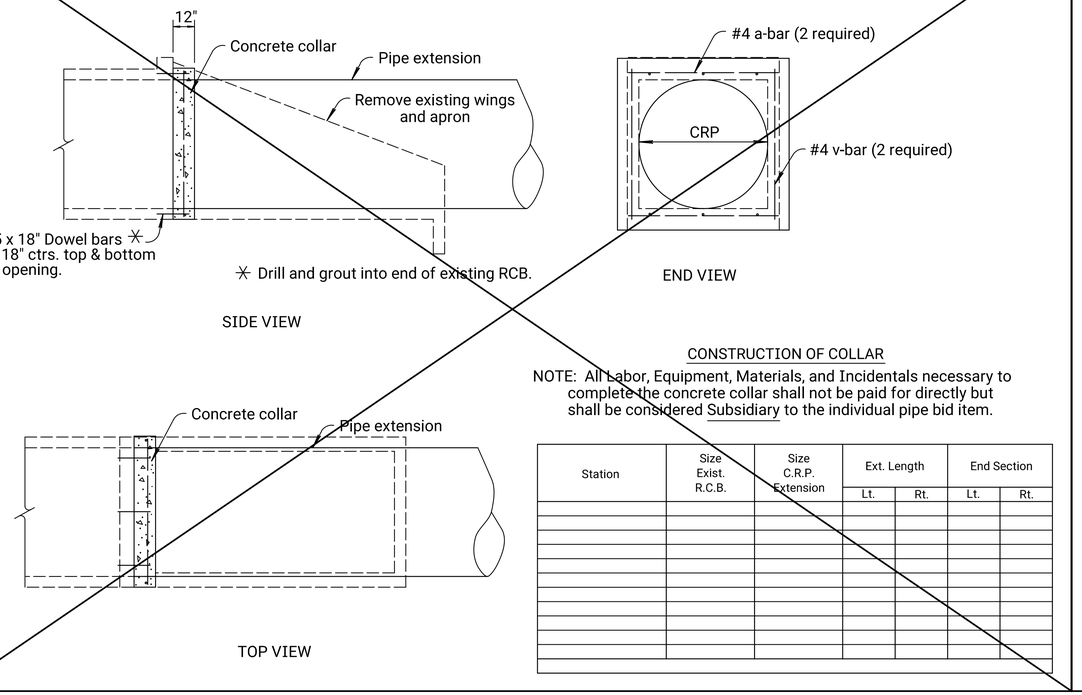
The bentonite shall be placed on the exterior walls and top slab and shall conform with the requirements of the Special Provision for "Bridge Backwall Protection System". All materials and labor required for this work shall be Subsidiary to the bid item "Grade 4.0 Concrete".

Station	Size Exist. R.C.B.	Roadway		Length "L"		Grade 4.0 Conc. Cu. Yds.	Reinf. Steel Lbs.	Remarks
		Lt.	Rt.	Lt.	Rt.			
		See Sh. No. 101 for RCB quantities.						



TRANSITION OF WALL OR SLAB THICKNESS

⊛ If the existing footings are left in place, dowel any vertical reinforcing steel located in the new walls into the existing footing. For rigid frame boxes, this may require additional #5 dowel bars to splice to the exterior vertical bars in the wall.



CONSTRUCTION OF COLLAR

NOTE: All Labor, Equipment, Materials, and Incidentals necessary to complete the concrete collar shall not be paid for directly but shall be considered Subsidiary to the individual pipe bid item.

Station	Size Exist. R.C.B.	Size C.R.P. Extension	Ext. Length		End Section	
			Lt.	Rt.	Lt.	Rt.

GENERAL NOTE

Dimensions of existing structures shall be checked in the field prior to starting the new construction. Interior walls of multiple box extensions need not be the same thickness as the existing walls.

All existing concrete surfaces adjacent to new concrete shall be thoroughly cleaned by brushing, and soaked with water immediately prior to placing the new concrete.

All work and material necessary for installing the dowel bars shall be subsidiary to the bid item "Reinforcing Steel".

Grouting of bars shall meet the Standard Specifications of the Kansas Department of Transportation. Locate dowel bars near the center of walls and slabs.

For non-skewed boxes "s_1" and "f_1" bars shall be placed at ½ normal spacing for the first 18".

Straight Wing Extensions

Remove existing wings and wing aprons. Remove top of hubguard if necessary to clear new construction. A minimum of 24" length of the existing wing and floor steel shall be left intact and shall be cleaned and straightened to bond into the new concrete. Dowels (#5 deformed bars) shall be inserted across the top of box as shown in sketch. Butt extensions against existing culvert. This work shall be subsidiary to the bid item "Grade 4.0 Concrete".

Flared Wing Extensions

Remove top of hubguard, if necessary, to clear new construction. Dowels (#5 deformed bars) shall be inserted in top, bottom, sides and intermediate walls, as shown in sketch. Butt extensions against existing culvert.

If the existing wingwall has an open vertical joint that interferes with the installation of the dowels, remove part of the wingwall to clear construction. This work shall be subsidiary to the bid item "Grade 4.0 Concrete".

NO.	DATE	REVISIONS	BY	APP'D
8	5-04-05	Class to Grade Conc., notes & details	S.W.K.	J.O.B.
7	4-18-01	Revised General Note	R.J.S.	J.O.B.
6	12-5-00	Rev. General Note flared wing ext.	R.J.S.	J.O.B.
5	12-30-97	Added bentonite system	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL CULVERT EXTENSIONS

~~RD080~~

FHWA APPROVAL 6-10-05		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Seitz

Plotted :16-JAN-2025 07:40
Drawn By : mrockwell
File : rd080.dgn

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	71	291

SUMMARY OF QUANTITIES

Item / Location	Excavation		Concrete		Reinforcing Steel		Prestressed Concrete Beam (NU35) Lin. Ft.	Drilled Shaft (54") (Cased) Lin. Ft.	Core Hole (Investigative) Lin. Ft.	Sonic Test (Drilled Shaft) (Set Price) Each	✳Piles (Steel) (HP12x53) Lin. Ft.	Temporary Shoring Lump Sum	Bridge Backwall Prot. System Sq. Yds.	Abutment Aggregate Drain Cu. Yds.	Bridge Deck Grooving Sq. Yds.	Slope Protection (Riprap Stone) Cu. Yds.
	Class I Cu. Yds.	Class II Cu. Yds.	(Grade 4.0) (AE) (SA) Cu. Yds.	(Grade 4.0) (AE) Cu. Yds.	(Grade 60) (Epoxy Coated) Lbs.	(Grade 60) Lbs.										
Abutment No. 1	113.8	-	20.2✳✳	20.9	5,190✳✳	-	-	-	-	-	170	-	344	51	-	379
Pier No. 1	-	159.2◔	15.5✳✳	102.4	860✳✳	21,290	-	49	116	-	-	-	-	-	-	-
Pier No. 2	-	492.2◔	15.5✳✳	102.4	860✳✳	21,290	-	49	138	-	-	-	-	-	-	-
Abutment No. 2	113.8	-	20.2✳✳	20.9	5,190✳✳	-	-	-	-	-	170	-	344	51	-	656
Substr. Total	227.6	651.4◔	71.4✳✳	246.6	12,100✳✳	42,580	-	98	254	1	340	-	688	102	-	1,035
Superstr. Total	-	-	331.6	-	122,560	-	1,175	-	-	-	-	-	-	-	904	-
Total	228	651◔	403.0	246.6	134,660	42,580	1,175	98	254	1	† 340	Lump Sum	-	102	904	1,035

◔ Additional excavation beyond minimum may be required.

✳✳Quantity includes diaphragm and coupled bars.

† Summary of Piling
Abutment No. 1 5 @ 34'.
Abutment No. 2 5 @ 34'.

✳NOTE: Only steel pile HP12X53 shall be used on this project.

TRAFFIC DATA - (051)	
AADT (2024)	950
AADT (2044)	1,250
DHV	10%
D	55/45
T	17%

LFD & LRFR RATING FACTORS		
Truck \ Rating Level	Inventory	Operating
HS-20 (36T)	1.87	2.67
Type HET (110T)		1.16
2002 LFD Rating. 17th Edition AASHTO		
HL-93 Loading	1.38	2.02
✳Manual for Bridge Evaluation, 3rd Edition		

✳2022 Interims

ERECTION ELEVATION CHECKS: After the abutment and pier concrete has cured and before setting any prestressed beams, present verification to the Engineer that the elevations at the bearings match plan elevation (± ¼").

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

GENERAL NOTES

EXISTING STRUCTURE: Plans of the existing structure are on file and available for inspection by qualified bidders at the State Bridge Office, KDOT, Eisenhower State Office Building, 700 SW Harrison, Topeka, KS.

EMBANKMENT: Complete the embankment at the abutments as shown on the Bridge Excavation sheet prior to driving the abutment piling.

BRIDGE EXCAVATION: Elevation 1234.77 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.

BACKFILL COMPACTION: Backfill compaction shall be required at abutments.

PILING SPLICE LOCATION: Integral pile splice locations and weld testing criteria for, Abutments, will follow the "Standard Pile Details" Sheet (BR110).

PILING: Drive all piling to bear upon the Eiss Limestone formation. 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	136 Tons
Abutment No. 2	136 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.

CONCRETE: Superstructure concrete is bid as Concrete (Grade 4.0)(AE)(SA). Substructure concrete is bid as Concrete (Grade 4.0)(AE). If desired, the Contractor may use Concrete (Grade 4.0) in the footings and in the abutments below the construction joint. Bevel all exposed edges of all concrete with a ¾" triangular molding, except where noted on the plans. Construction joints are optional, 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, except the spiral bars, shall conform to the requirements of ASTM A615, Grade 60. Spiral bars may meet the requirements of either ASTM A615 (Gr. 40 or 60) or AASHTO M32, and are included in the bid item "Reinforcing Steel (Gr. 60)".

Where non coated bars come in contact with coated bars, they need not be coated.

CAMBER: Construct the finished deck to plan grade by varying the depth of the fillet over the beam to provide for prestress camber, concrete dead load deflection and, if necessary, vertical curvature. After the prestressed beams are erected measure the camber in the field by taking a profile of each beam. Correct any variation between the actual camber and concrete dead load deflection shown in the plans by varying the depth of the concrete fillets over the beam so that the finished floor is constructed to the theoretical grade. The minimum depth of the slab over the beam shall be 10 inches. Prior to shipping, the camber shall be no greater than the design camber + ½". The design camber is equal to the 50 day camber shown in the plans.

The theoretical amount of concrete required for the fillets is 34.7 Cu. Yds. This amount of concrete is included in the Summary of Quantities. Any additional concrete required to construct the fillets will be subsidiary.

PRESTRESSED BEAM CONCRETE: Use air entrained concrete with select course aggregate as specified in the KDOT Specifications. The release strength and 28 day strength requirements shall be as noted on the plans. Submit mix designs to the Bureau of Materials and Research for approval.

ABUTMENT AGGREGATE DRAIN: See the General Notes on the "Abutment Aggregate Drain" sheet.

BRIDGE BACKWALL PROTECTION SYSTEM: See the General Notes on the "Abutment Aggregate Drain" sheet.

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

REMOVAL OF EXISTING STRUCTURE: Removal of existing structure is included in 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.

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 Series 200lb as described in Division 1100 placed to the limits shown on the plans.

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.

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

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.

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 Cu. Yds./hr., 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.

Place and hand vibrate all concrete for the pier diaphragms and the abutments above the construction joints to the bottom of the deck just prior to the normal paving train operations. Do this work in a manner to avoid a cold joint in either the abutments or in the diaphragms.

PLACING SEQUENCE: The Contractor will adhere to the placing direction/sequence shown on the plans. Changes will be accepted only if the Contractor's Engineer adjusts the deflection diagram so that the Contractor can adjust the fillet depth accordingly. This revised diagram will be approved by the design Engineer prior to deck forming. If profile grinding decreases the clearance to the top mat of reinforcement to less than 2½", a polymer overlay will be placed at no cost to the State.

BRIDGE DECK GROOVING: After the bridge deck has cured, transversely groove the deck in accordance with KDOT Specifications. For phased construction groove each completed phase before opening to traffic. Align the grooves from each adjacent phase across the bridge deck without jogs or discontinuities. For skewed bridges all grooving will be perpendicular to the centerline of the bridge.

DESIGN DATA

DESIGN SPECIFICATIONS: AASHTO Specifications, (9th) Edition and latest Interim Specifications. Load and Resistance Factor Design.

DESIGN LOADING:
HL-93
HET (Load Rating)
Design Dead Load includes an allowance of 15 psf for a future wearing surface.

UNIT STRESSES:

Concrete (Grade 4.0)	f'c =	4,000 psi
Concrete (Grade 4.0)(AE)	f'c =	4,000 psi
Concrete (Grade 4.0)(AE)(SA)	f'c =	4,000 psi
Prestressed Beam Concrete	f'c =	10,000 psi
Reinforcing Steel (Grade 60)	fy =	60 ksi
Steel Pile	fy =	50 ksi
Prestressed Strand		0.6" ø Grade 270 uncoated 7-wire, low relaxation strand.

LRFD DESIGN PILE LOAD:

Design Loading (Tons/Pile)	Strength I	Service I	Phi
Abutments 1 & 2	136	94	0.6

LRFD DESIGN DRILLED SHAFT LOAD:

Design Loading (Tons/Shaft)	Strength I	Service I		Phi
Pier No. 1	397	297	End Bearing	0.50
			Side Friction	0.50
Pier No. 2	326	226	End Bearing	0.50
			Side Friction	0.50

INDEX OF BRIDGE DRAWINGS	
Sheet No.	Drawing
71-72	General Notes and Quantities
73	Contour Map
74	Construction Layout
75	Engineering Geology
76	Construction Phasing
77-78	Abutments Details
79	Abutments Aggregate Drain
80-83	Pier Details
84-85	Standard Prestressed Beam Details
86	Framing Plan
87	Superstructure Details
88-89	Slab Details
90-92	Corral Rail Details
93	Bill of Reinforcing Steel and Bending Diagrams
	Standards
98	Bridge Excavation
99	Standard Pile Details
100	Supports and Spacers for Reinforcing Steel

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

GENERAL NOTES AND QUANTITIES
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

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Sh. No. 71

Drawn By : mrockwell Plotted : 16-JAN-2025 07:40
File : ka601701bbr051-001.dgn

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	72	291

GENERAL NOTES CONTINUED

DEMOLITION PLANS: This is a Category C Demolition. Submit detailed Demolition Plans to the State Bridge Office (or Bureau of Local Projects) at least 4 weeks before beginning the demolition process. Portions of the submitted details shall bear the seal of a Licensed Professional Engineer. Identify, on the plans, the Demolition Supervisor meeting the requirements of the KDOT Specifications. The Demolition Supervisor will attend the required pre-demolition meeting before these operations begin, as described in KDOT Specifications. No demolition work will begin without approved Demolition Plans.

ERECTION PLANS: This is a Category B Structure. Submit detailed Erection Plans to the State Bridge Office (or Bureau of Local Projects) at least 4 weeks before beginning the erection process. Portions of the submitted details shall bear the seal of a licensed Professional Engineer. Identify, on the Erection Plans, the Erection Supervisor required by KDOT Specifications. No structural erection work will begin without approved erection plans.

TEMPORARY SHORING: The bid item "Temporary Shoring" includes all labor and material necessary to furnish shoring at the location shown on the plans for the temporary bracing of the embankment during excavation. Maintain the temporary shoring until the Engineer authorizes its removal. The temporary shoring plans are to be designed and sealed by a registered Professional Engineer. Submit design calculations and shoring plans to the Field Engineer for review 3 weeks before work is scheduled to begin. Work shall not begin until the Engineer grants approval.

GEOTECHNICAL REPORT: The geotechnical report (Dated October 2022) includes soil parameters for retaining wall (sheet pile) design. The report recommends a traffic surcharge of 250 lb/ft2. The geotechnical information shown on the plans is the best information available. The report is available for inspection by qualified bidders at the State Bridge Office, KDOT, Eisenhower State Office Building, 700 SW Harrison, Topeka, KS.

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 (54")". 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 location(s) 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.

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 SHAFT BACKFILL: Backfilling the annular space between the temporary casing and the permanent casing, as defined in the KDOT Specifications, is not required at this location.

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.

DRIP LINE PROTECTION: 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.

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

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.

ASBESTOS INFORMATION: Samples of this structure were tested to determine the amount of Asbestos Containing Materials (ACM) present in the components. The results are listed below:

Concrete 0%

Date of Report 12/7/21

For any result above greater than 1%, abatement shall be performed according to KDOT Specifications. Results less than 1% require no abatement.

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.

NO.	DATE	REVISIONS	BY	APP'D
3				
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KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

GENERAL NOTES AND QUANTITIES CONT.

K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

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Sh. No. 72

Drawn By : mrockwell Plotted : 16-JAN-2025 07:40
File : ka6017016br051-002.dgn

CADconform Certify This File

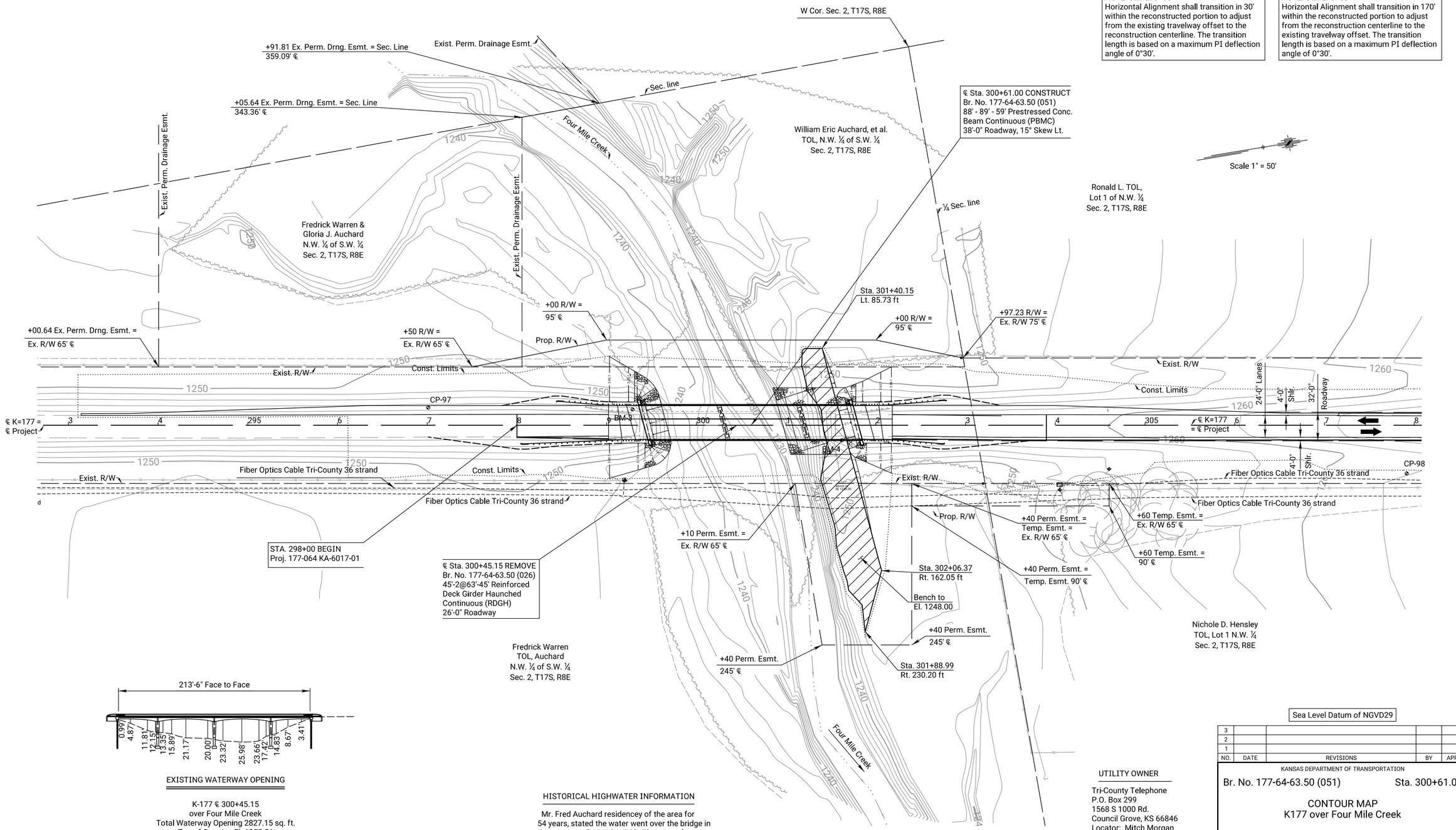
P.O.T. ℄ Sta. 296+75.63
N: 100,548.481 E: 1,741,009.906
1. Fnd. 5/8" Bar @ P.O.T. 0.3' Deep
2. Spike and KDOT Washer in W face of Sign Post 31.8' NE
3. ℄ Travelway K-177 0.5' E
4. ℄ Top Yellow "No Passing" Sign Post 71.1' NW

P.O.T. ℄ Sta. 304+75.63
N. 101,338.277 E. 1,741,137.275
1. Fnd. 5/8" Bar @ P.O.T. 0.3' Deep
2. ℄ Top of Yellow "No Passing" Sign Post 52.3' E.S.E.
3. Spike & KDOT Washer in N. Face of Sign Post 24.7' W.S.W.
4. ℄ of T/W K-177 Highway 1.0' E.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	73	291

NOTE: Sta. 298+00
Horizontal Alignment shall transition in 30' within the reconstructed portion to adjust from the existing travelway offset to the reconstruction centerline. The transition length is based on a maximum PI deflection angle of 0°30'.

NOTE: Sta. 298+00
Horizontal Alignment shall transition in 170' within the reconstructed portion to adjust from the reconstruction centerline to the existing travelway offset. The transition length is based on a maximum PI deflection angle of 0°30'.



EXISTING WATERWAY OPENING

K-177 ℄ 300+45.15
over Four Mile Creek
Total Waterway Opening 2827.15 sq. ft.
Top of Opening El. 1255.56
Looking Upstream of Bridge

HISTORICAL HIGHWATER INFORMATION

Mr. Fred Auchard residencey of the area for 54 years, stated the water went over the bridge in the summer of 1969 by 1'-0". Elevation of water was El. 1258.79.

UTILITY OWNER

Tri-County Telephone
P.O. Box 299
1568 S 1000 Rd.
Council Grove, KS 66846
Locator: Mitch Morgan
(785) 466-1773

Sea Level Datum of NGVD29

NO.	DATE	REVISIONS	BY	APP'D
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KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

CONTOUR MAP
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

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Sh. No. 73

Drawn By : mrockwell Plotted : 16-JAN-2025 07:41
File : ka6017 01bbr051-003.dgn

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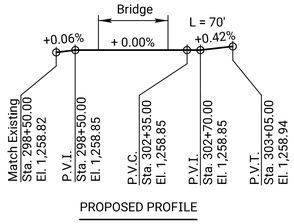
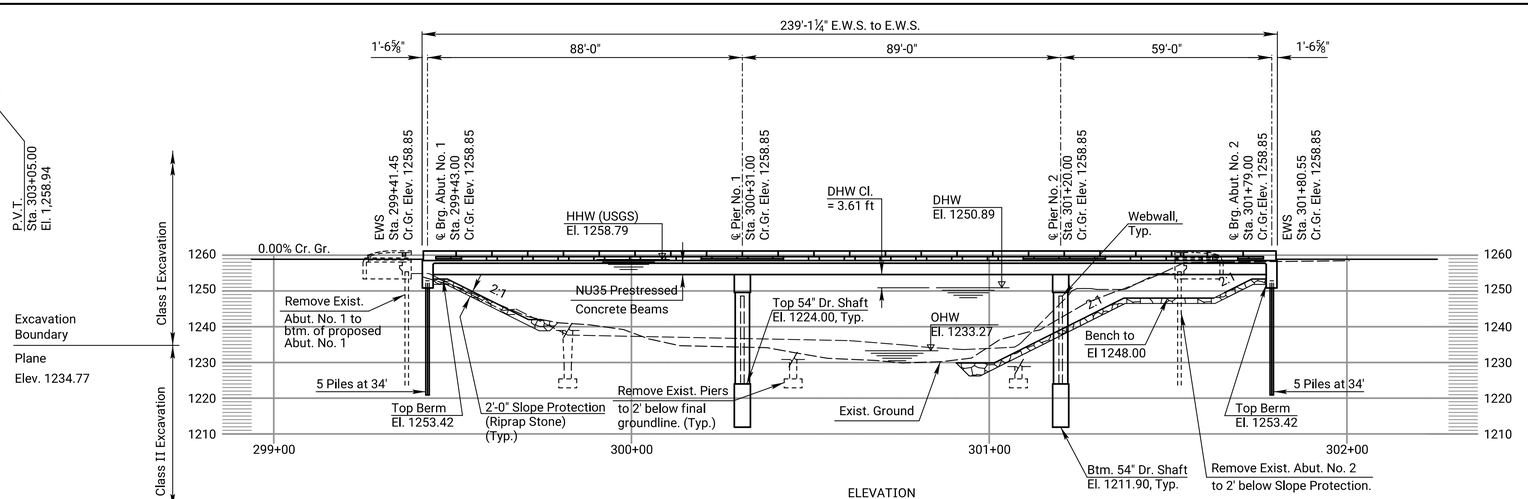
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	74	291



PROPOSED PROFILE



ELEVATION

88'-89'-59' Prestressed Concrete Beam (NU35) Spans
Continuous and Composite (PBMC)
Pile Bent Abutments and Column Bent Piers
38'-0" Roadway, 15° Skew Lt.

B.M. #3 Found Standard Brass Disk Stamped "5 JK 1971" in S. End of W. Hubguard Br. 026, 17.70' Lt. of ℄ Sta. 299+28.80 El. 1258.70

B.M. #4 Set Rivet & KDOT Washer in N. End of E. Hubguard Br. 026, 16.80' Rt. of ℄ Sta. 301+62.00 El. 1258.77

B.M. #5 Set "U" Shaped Steel Fence Post 1.0' W. of N.-S. R/W Fence, 68.28' Rt. of ℄ Sta. 308+60.44 El. 1263.86

DRAINAGE DATA

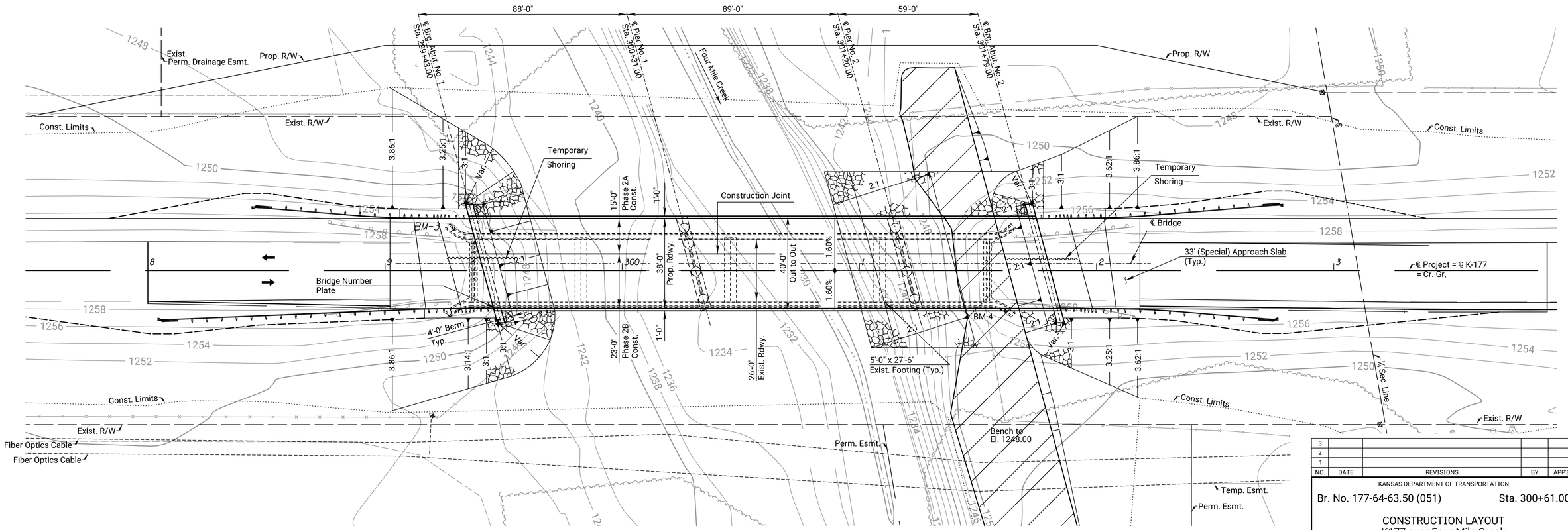
Drainage Area	55.5	sq. mi.
Design Frequency	50	yrs
Design Discharge (Q50)	13,100	cfs
Design High Water Elevation	1,250.89	
Change In Design Backwater	0.00	ft.
Design Backwater Elevation	1,250.89	ft.
Overtopping Elevation (Sta.)	1,258.72 (294+00)	
Overtopping Discharge	42,587	cfs
Overtopping Frequency	>100	yrs
Discharge at Q100	15,900	cfs
Change in Backwater at Q100	0.00	ft.
Backwater Elevation at Q100	1,251.56	
Historic High Water Elevation	1,258.79	
Ordinary High Water Elevation	1,233.27	
Total Waterway Provided	3,296	sq. ft.
Design Waterway Provided	2,753	sq. ft.
Estimated Ordinary High Water Discharge	143	cfs
Change in Waterway Opening	+329	sq. ft.

EXPANSION JOINT WIDTH DETAILS (W_2)

℉ Temperature (F°)	40°	50°	60°	70°	80°	90°
Formed Concrete Opening Size	3⅜"	3¼"	3⅛"	3"	2⅞"	2¾"

℉ Average Ambient Temperature over previous 24 hours.

Scale: 1" = 20'



PLAN

See cross-sections for transition to normal section.

Sea Level Datum of NGVD 1929

NO.	DATE	REVISIONS	BY	APP'D
3				
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1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

CONSTRUCTION LAYOUT
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

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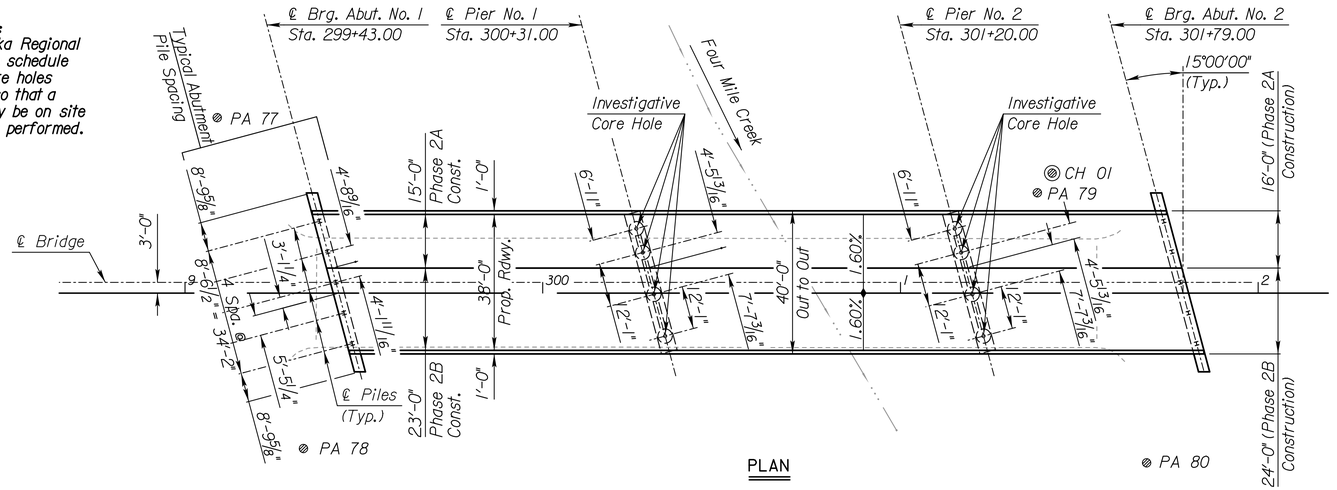
Sh. No. 74

Drawn By : mrockwell Plotted : 16-JAN-2025 07:41
File : ka601701bbr051-004.dgn

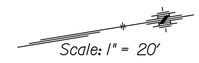
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	75	291

Investigative Core Holes:
Please contact the Topeka Regional Geology Office when the schedule for the investigative core holes have been established so that a member of the staff may be on site when the work is being performed.



The Cased Method is required for all pier foundations. Casing should be set a maximum of 1.0 ft. into the top of rock and extend a minimum of 1.0 ft. above the excavated footing to allow for the over pumping of the drilled shaft. If water is percolating through bedrock material at a high rate, wet pour techniques may be required. Allow no loose material within the shaft when the shaft is considered ready to pour. It is critical that the bottom socket be clean and relatively flat. The bottom of the rock socket should be placed no higher than the elevations provided below.



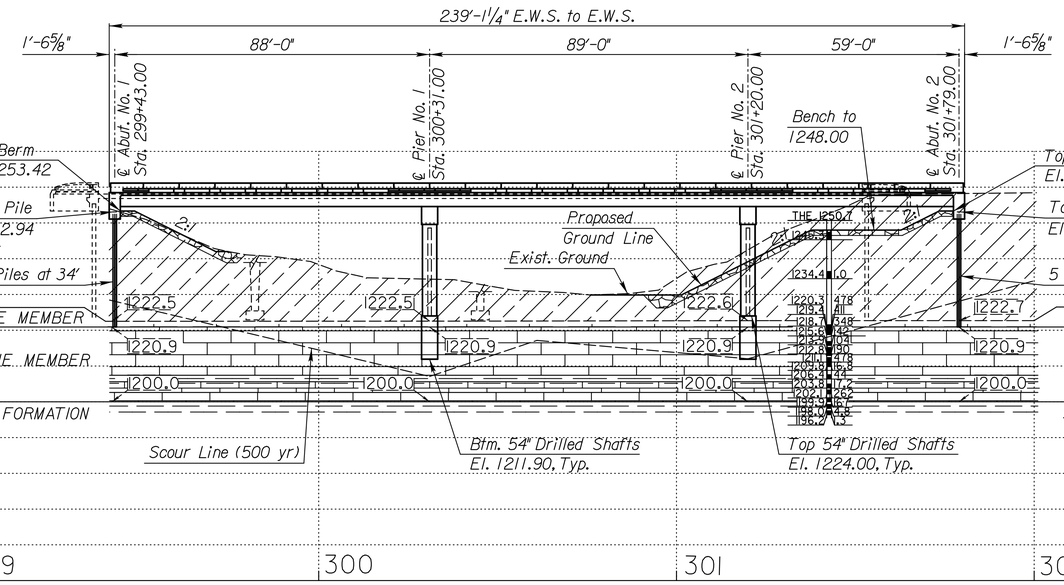
℄ Project = ℄ K-177
= Cr. Gr,

Piling: Once sufficient resistance is achieved, driving must cease to avoid damage to the pile. Final pile tip elevations shall be determined in the field based on recommendations provided through the use of the Pile Driving Analyzer. No pile should be driven below plan elevation without initiating restrike procedures, as outlined in the Standard Specifications.

No Test Piles and no Pile Points per BFGR.

NOTE: Use only Gr. 50 HP12x53 steel piles on this project.

Please contact KDOT Geology in Topeka at (785) 291-3861 when a schedule for pile driving has been established. A minimum of 5 working days is necessary to allow for proper scheduling.



STANDARD GEOLOGIC SYMBOLS

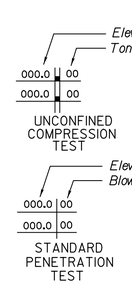
- Clay or Underclay
- Silty Clay
- Silt
- Sand
- Gravel
- Boulders
- Caliche
- Silty or Clayey Shale
- Limy Shale
- Black or Fissile Shale
- Sandy Shale
- Gypsiferous Shale
- Weathered Shale
- Sandstone
- Shaly Sandstone
- Gypsum bed
- Dolomite
- Cross-bedded Sandstone
- Limestone
- Cherty Limestone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

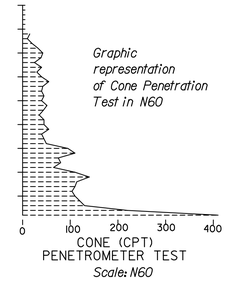
SOUNDINGS

- Core drill
- Power auger
- Hand tools
- Cone (CPT) penetrometer
- Shelby tube
- Water level

GEOLOGIC PROFILE

- 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.

NO.	DATE	REVISIONS	BY	APP'D
3				
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KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

ENGINEERING GEOLOGY
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

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Sh. No. 75

Drawn By : mrockwell Plotted : 16-JAN-2025 07:41
File : ka601701bbr051-005.dgn

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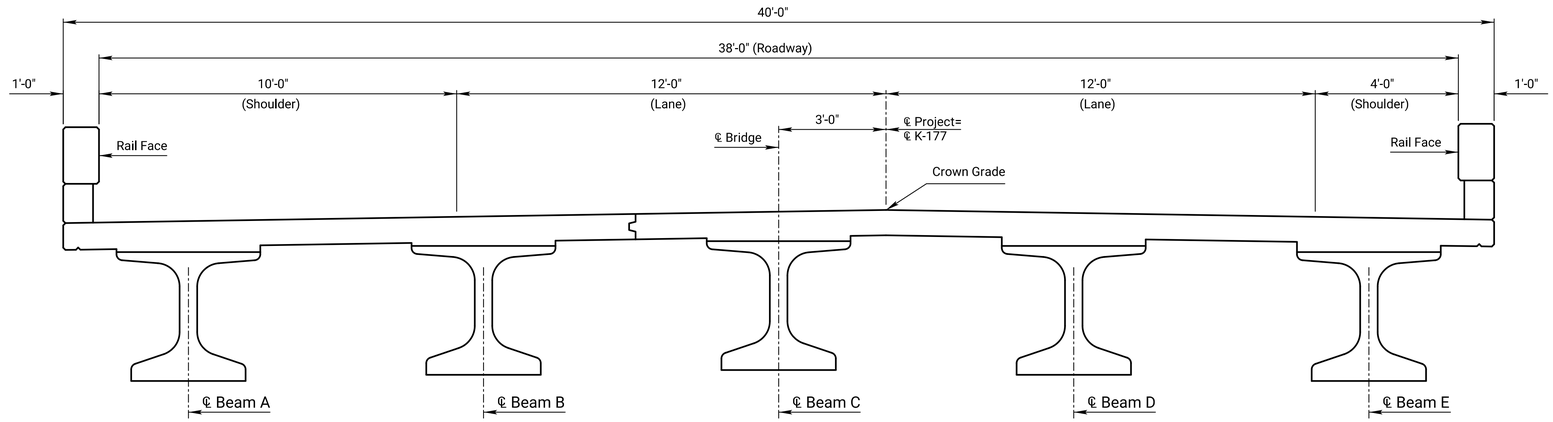
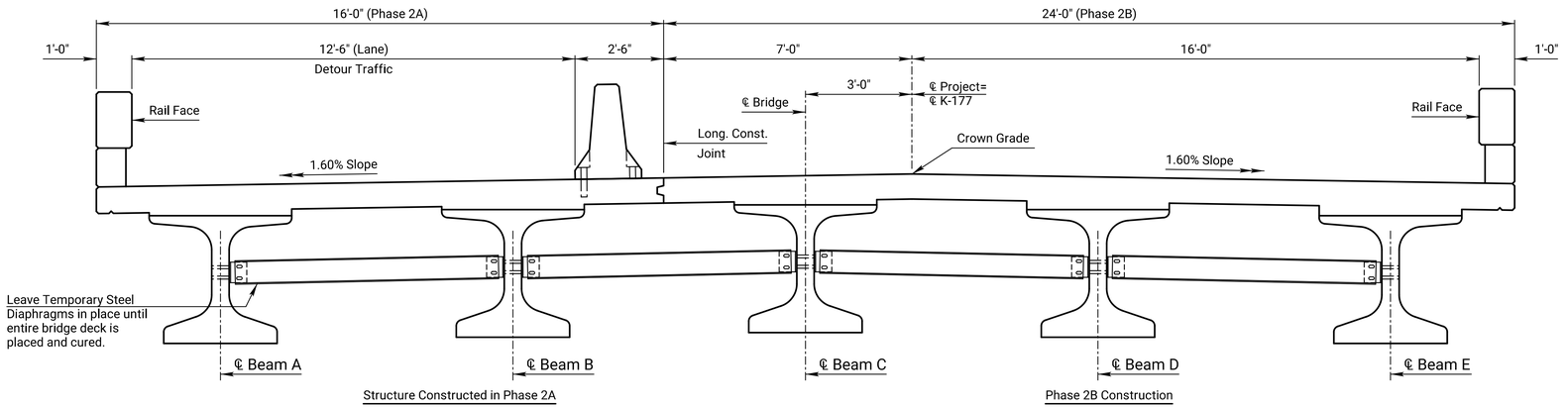
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	76	291



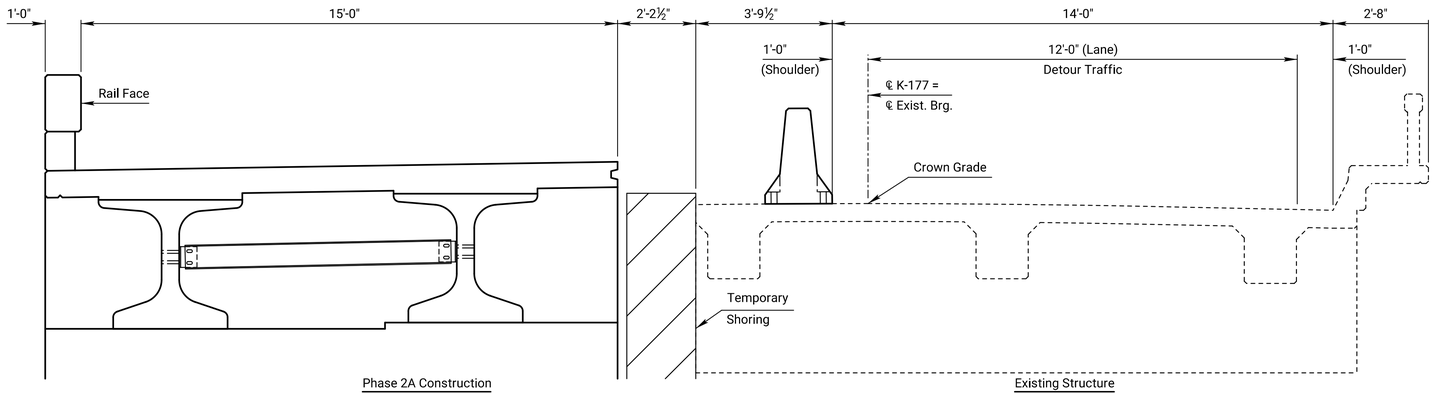
Completed Bridge
(View at Midspan)(Looking North)



Structure Constructed in Phase 2A

Phase 2B Construction

PHASE 2B
(View at Midspan)(Looking North)



Phase 2A Construction

Existing Structure

PHASE 2A
(View at Abutment)

CONSTRUCTION NOTES:
In Phase 2A only construct temporary steel diaphragm between Beams A & B at the piers. In Phase 2B construct remaining temporary steel diaphragms at the piers.

The contractor is responsible for considering long term camber and deflection of the prestressed beams and shall take the necessary precautions with the approval of the Engineer to minimize differential deflection between Phases 2A and 2B and to maintain final profile of the bridge.

Phase 2A Construction:
1. Place temporary F3 Barrier.
2. Install Temporary Shoring.
3. Per Controlled Demolition Plan (Category C), Remove Phase 2A portion of existing bridge. Sawcut required.
4. Construct Phase 2A portion of piers and abutments.
5. Erect beams A and B.
6. Construct remaining bridge components as necessary to open bridge to Phase 2B Traffic.
7. Place temporary F3 Barrier.

Phase 2B Construction:
1. Remove Phase 2B portion of existing bridge.
2. Construct Phase 2B portion of piers and abutments.
3. Erect beams C, D and E.
4. Construct remaining bridge components as necessary to open bridge to Traffic.
5. Remove temporary steel diaphragms.
6. Remove temporary F3 Barrier.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

CONSTRUCTION PHASING
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

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Sh. No. 76

Drawn By : mrockwell Plotted : 16-JAN-2025 07:41
File : ka601701bbr051-006.dgn

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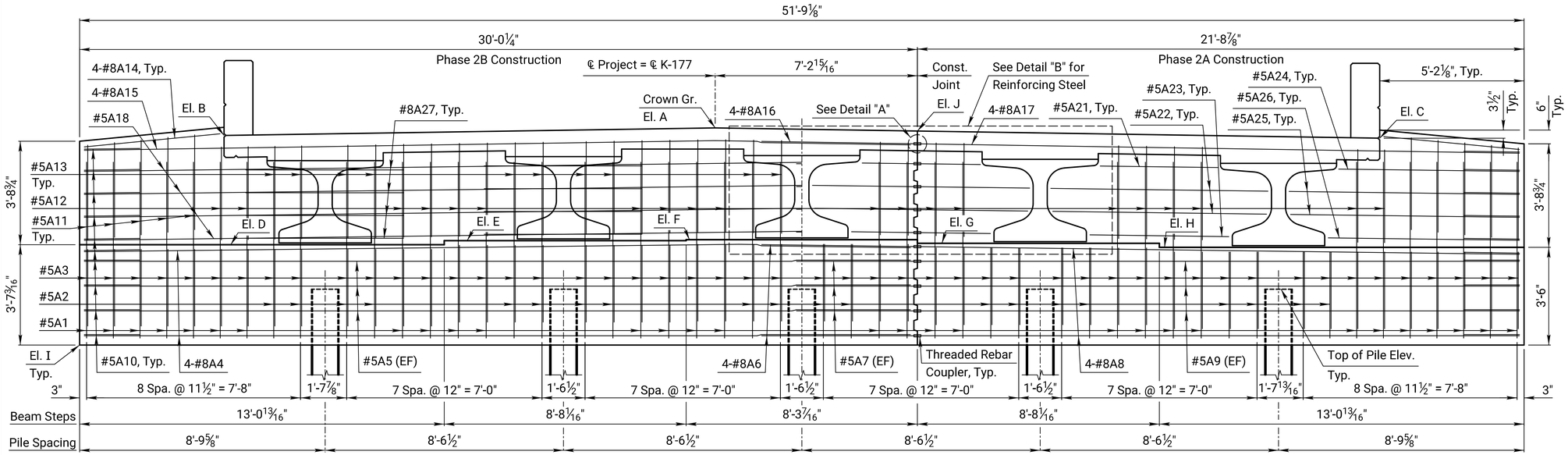
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	77	291

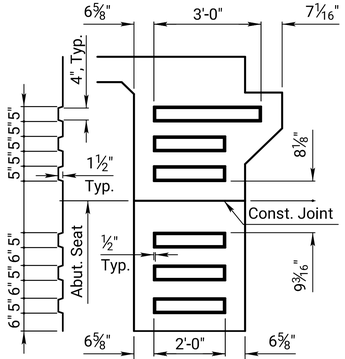


FAR FACE — ELEVATION — NEAR FACE

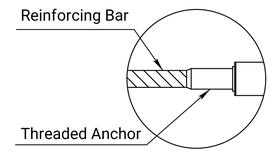
(Abut No. 1 Shown, Abut No. 2 Similar)(Looking South)

TABLE OF ELEVATIONS		
Elevation	Abut. No. 1	Abut. No. 2
A	1258.85	1258.85
B	1258.58	1258.58
C	1258.48	1258.48
D	1254.54	1254.54
E	1254.68	1254.68
F	1254.72	1254.72
G	1254.58	1254.58
H	1254.44	1254.44
I	1250.94	1250.94
J	1258.74	1258.74
*Top of Pile	1252.94	1252.94

*Based on 2'-0" Pile Embedment



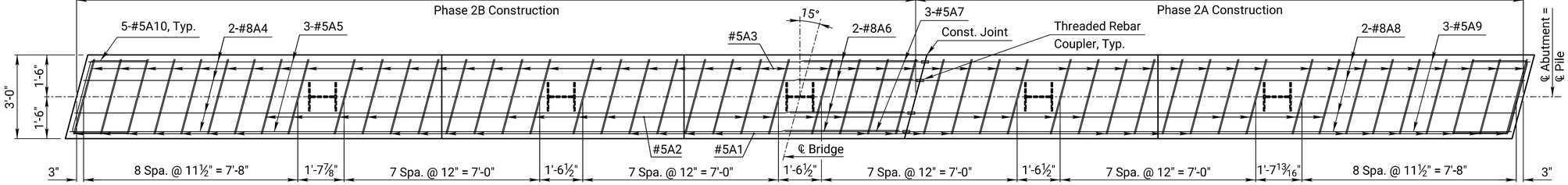
CONSTRUCTION JOINT DETAIL



DETAIL A

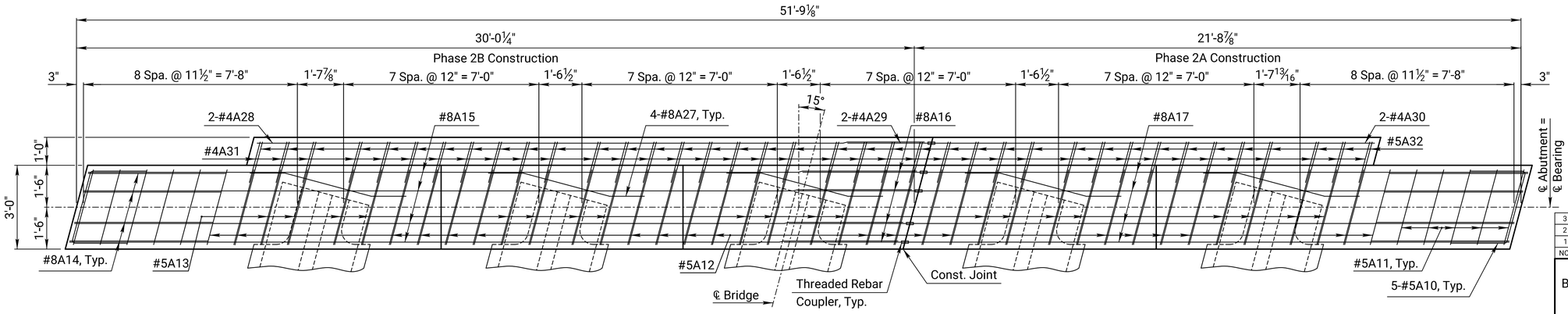
Suggested Blockout Details for Mechanical Splice

Min. Reinforcing Steel Splice Lengths:
Longitudinal Bars
#4 = 2'-9"
#5 = 3'-5"
#8 = 5'-4"
Stirrup Bars
#5 = 2'-5"



ABUTMENT BEAM PLAN

(Abut No. 1 Shown, Abut No. 2 Similar)



ABUTMENT DIAPHRAGM PLAN

(Abut No. 1 Shown, Abut No. 2 Similar)

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

ABUTMENT DETAILS
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

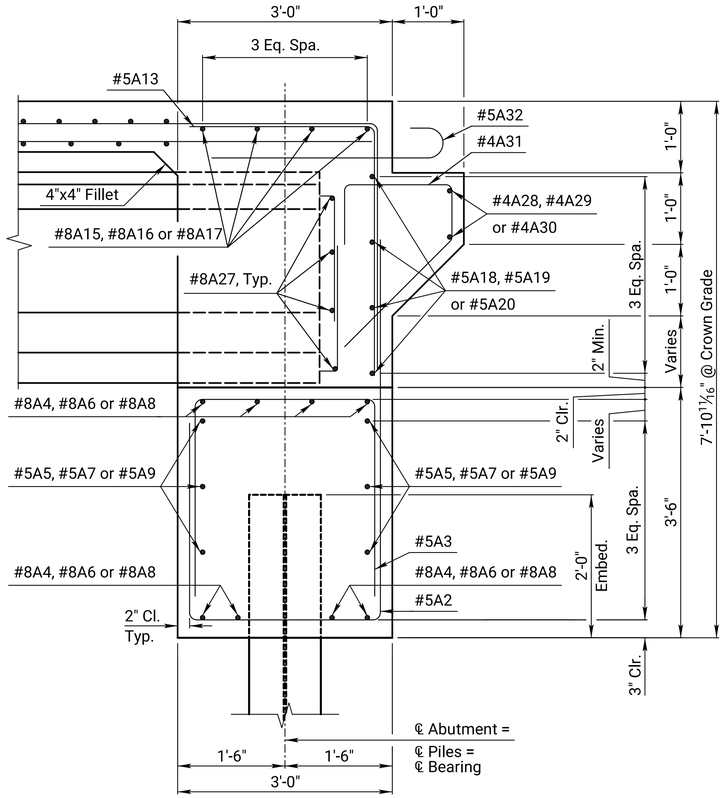
CADconform Certify This File

Sh. No. 77

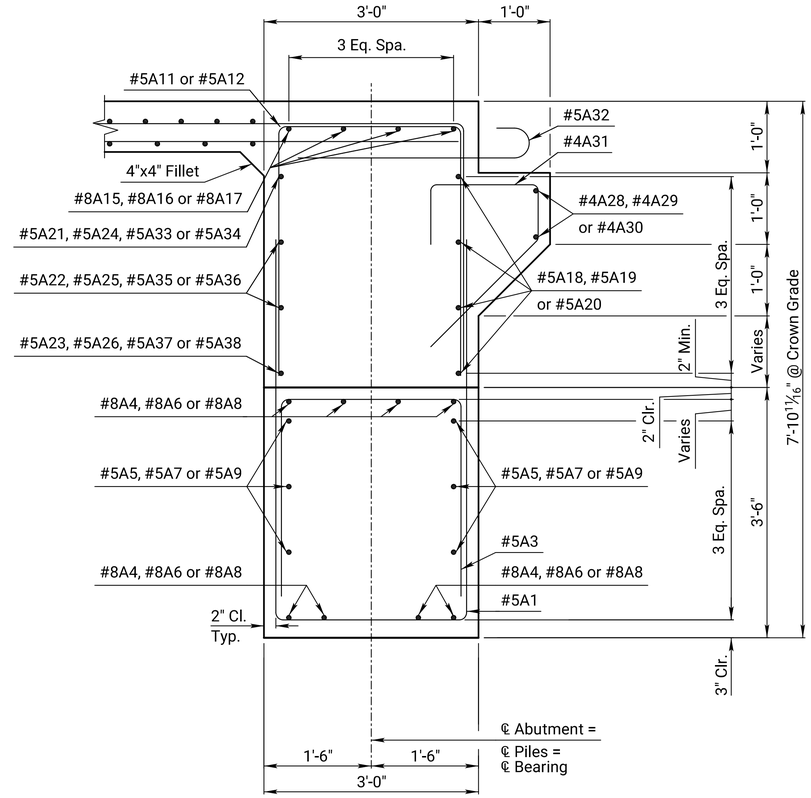
Drawn By : mrockwell
File : ka601701bbr051-007.dgn
Plotted : 16-JAN-2025 07:41

CADconform Certify This File

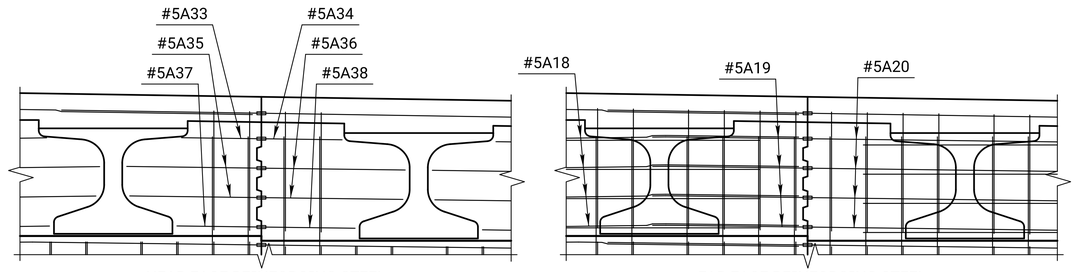
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	78	291



TYPICAL SECTION THRU ABUTMENT NEAR BEAMS
(Abut. No. 1 Shown, Abut. No. 2 Similar)



TYPICAL SECTION THRU ABUTMENT BETWEEN BEAMS
(Abut. No. 1 Shown, Abut. No. 2 Similar)



NEAR FACE REINFORCING STEEL

FAR FACE REINFORCING STEEL

DETAIL B

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

ABUTMENT DETAILS
CONT.
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

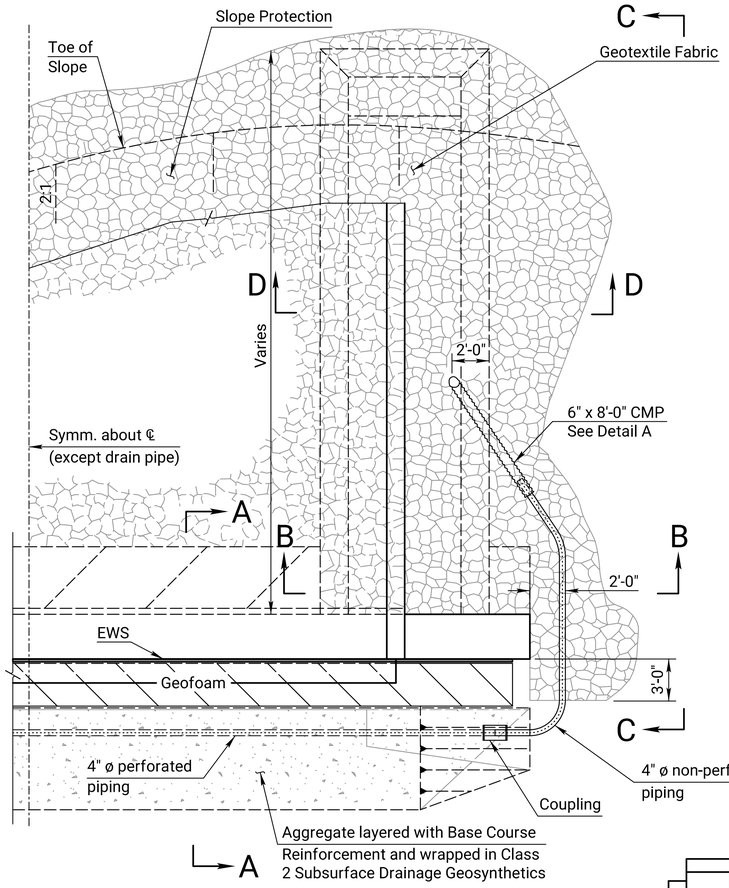
CADconform Certify This File

Sh. No. 78

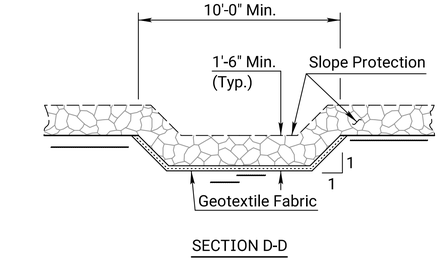
Drawn By : mrockwell Plotted : 16-JAN-2025 07:41
File : ka601701bbr051-008.dgn

CADconform Certify This File

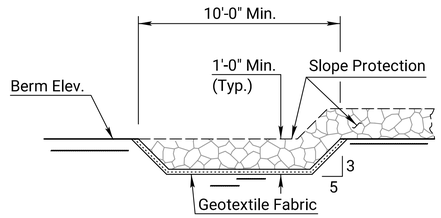
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	79	291



PLAN



SECTION D-D



SECTION B-B

GENERAL NOTES

GEOSYNTHETICS: Use material that complies with KDOT Specification Section 1710 Class 2 subsurface drainage fabric. Place the Class 2 subsurface drainage fabric on graded and compacted material shaped as shown. Allow for enough material so that the sides can be overlapped and that the ends fully separate the aggregate drain from the embankment soils. Place the perforated drain pipe and couple to non-perforated pipe as shown. Allow the non-perforated pipe to pass through a hole carefully cut in fabric. Place aggregate within fabric to just leave the top of the pipe visible. Verify the slope of the pipe, that it is not damaged or displaced and that the couplers are firmly coupled. Continue to backfill to the elevation and shape shown.

AGGREGATE: Use aggregates that complies with KDOT Specifications for SB-1 or SB-2.

BASE COURSE REINFORCEMENT: Use "Base Course Reinforcement" that complies with KDOT Specification Division 1700 or approved material. Place this material in uniform layers without gaps or sags per the manufacturer's recommendations.

GEOFOAM: Use "Geofoam" that complies with ASTM D6817 EPS 12. Acceptance according to Type "C" certification. Bond this material to the backwall protection using materials recommended by the manufacturer.

GEOTEXTILE FABRIC: Use "Geotextile Fabric" that conforms with KDOT Specification 1710 and found on the Prequalified Materials List.

PIPE: Place perforated pipe within the limits and use non-perforated pipe outside the limits of the Abutment Aggregate Drain.

ABUTMENT AGGREGATE DRAIN: The Bridge Contractor shall excavate to the limits shown on the Bridge Excavation Sheet. Backfill, compact & grade the cohesive soil to the limits shown. Place the bridge backwall protection, geofoam, geotextile, perforated pipe, alternating layers of aggregate and base course reinforcement as shown. Place the outlet pipe, the CMP, and the backfill. Separate as shown the entire Abutment Aggregate Drain with the geotextile.

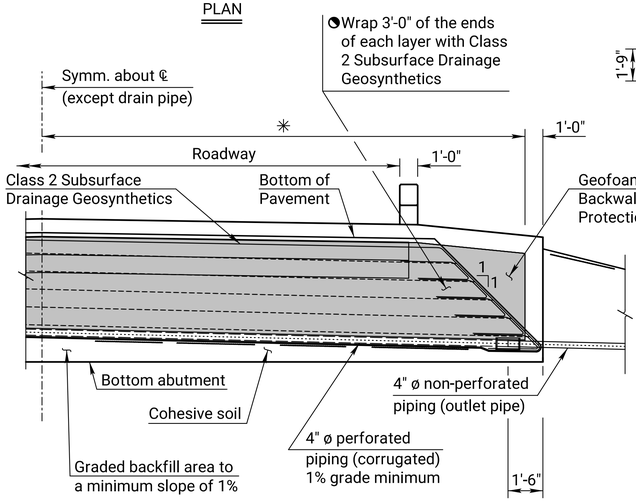
BRIDGE BACKWALL PROTECTION SYSTEM: Apply a non coal-tar Bridge Backwall Protection System to the approach side of the abutments and the wings in accordance with KDOT Specifications and the manufacturer's recommendations. Cover the abutments and wings to the limits shown on the details. Repair any damage done at no charge to the state.

Compact the abutment backfill. See the KDOT Specifications.

Perforated pipe and non-perforated outlet pipe shall be corrugated polyethylene tubing conforming to the KDOT Specifications.

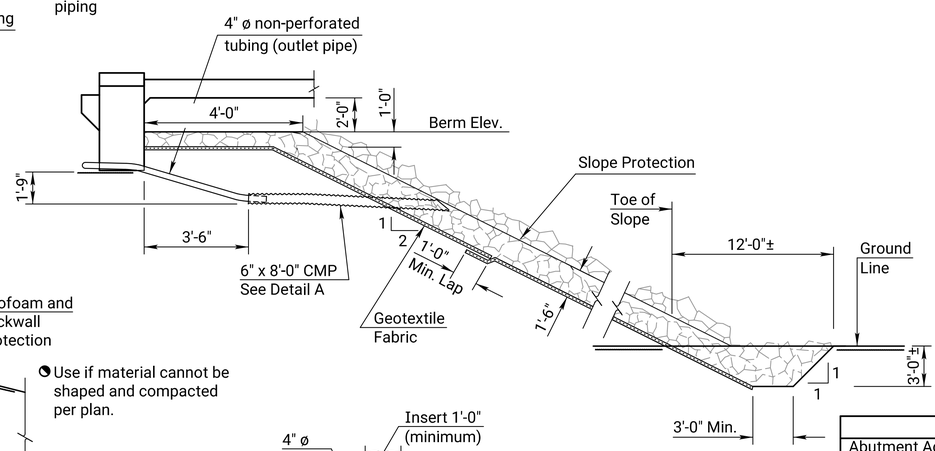
Fit the CMP end section with ¼" galvanized mesh screen to prevent the entrance of rodents. Seal the joint between the outlet pipe and the end section with a joint sealer.

COHESIVE SOILS: Grade the bottom surface of the excavated area to drain as shown. Backfill this area with a cohesive type of soil. The soil will have a Unified Soil Classification of CL, CH, ML or MH according to ASTM D2487 Classification System with a minimum plasticity index of 13. Compact the material to Type A, MR-90 specifications. If the plasticity index cannot be met, add and mix Bentonite to the soil prior to placement and compaction so that the PI ≥ 13.



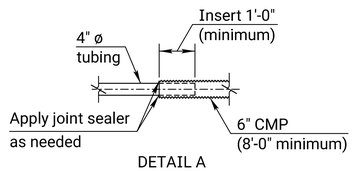
✳ Limits of Bridge Backwall Protection System & Geofoam

ELEVATION



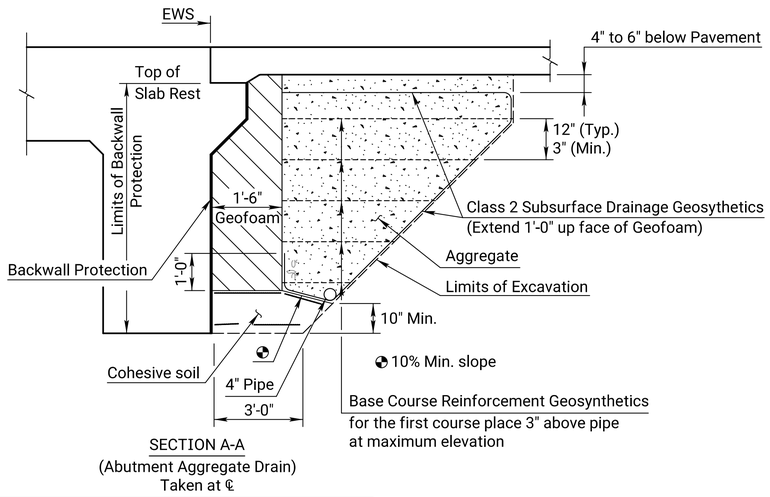
SECTION C-C

Note: The toe shall extend the entire width of the Slope Protection.



DETAIL A

Note: The 1'-0" lap and joint sealer may be replaced by a reducing coupler at the junction of the CMP and the 4" round tubing. For stream crossings place outlet on downstream side of bridge.



SECTION A-A
(Abutment Aggregate Drain)
Taken at ℄

SUMMARY OF QUANTITIES (2 Abutments)		
Abutment Aggregate Drain	102	Cu. Yds.
Bridge Backwall Protection System	688	Sq. Yds.
Items subsidiary to Abutment Aggregate Drain		
4" ø Perforated Pipe	102	Lin. Ft.
4" ø Outlet Pipe	38	Lin. Ft.
6" ø CMP	16	Lin. Ft.
Geosynthetics (Class 2 Subsurface Drainage)	184	Sq. Yds.
Geosynthetics (Base Course Reinforcement)	272	Sq. Yds.
Geofoam	26	Cu. Yds.
Items subsidiary to Slope Protection		
Geotextile Fabric	146	Sq. Yds.

NO.	DATE	REVISIONS	BY	APP'D
08	05-05-23	Removed soil cap; Geofoam bottom flat	M.L.L.	M.A.H.
07	12-11-18	Corrected std. base file name	M.L.L.	J.P.J.
06	02-04-15	Modified Per 2015 Specification	J.P.J.	C.E.R.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

ABUTMENT AGGREGATE DRAIN
(Stream, Drip-Line)
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	J.P.J.	DETAILED	J.P.J.	QUANTITIES		CADD	M.L.L.
DESIGN CK.		DETAIL CK.		QUAN.CK.		CADD CK.	

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Sh. No. 79

Drawn By : mrockwell Plotted : 16-JAN-2025 07:41
File : ka601701bbr051-010.dgn

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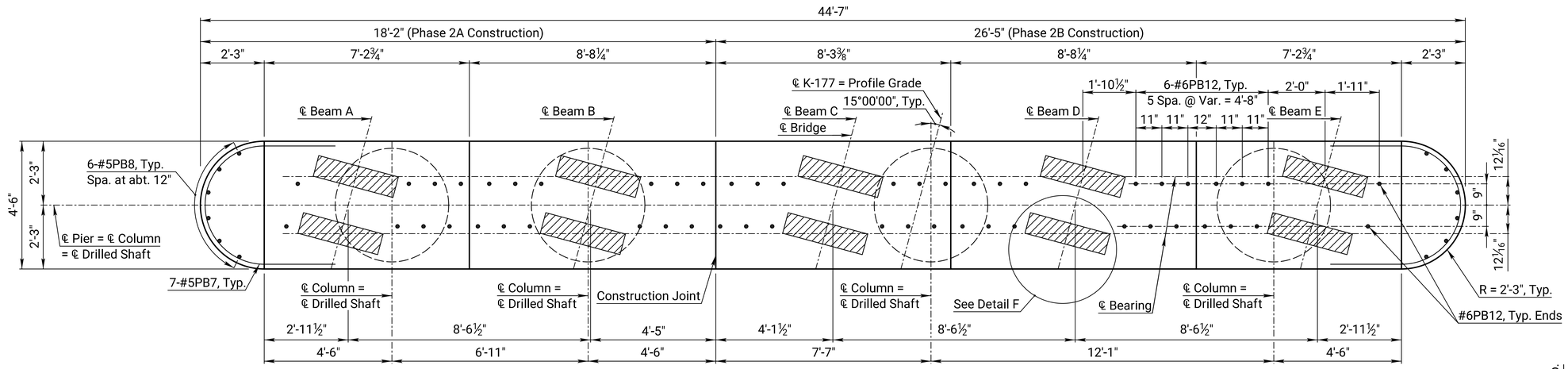
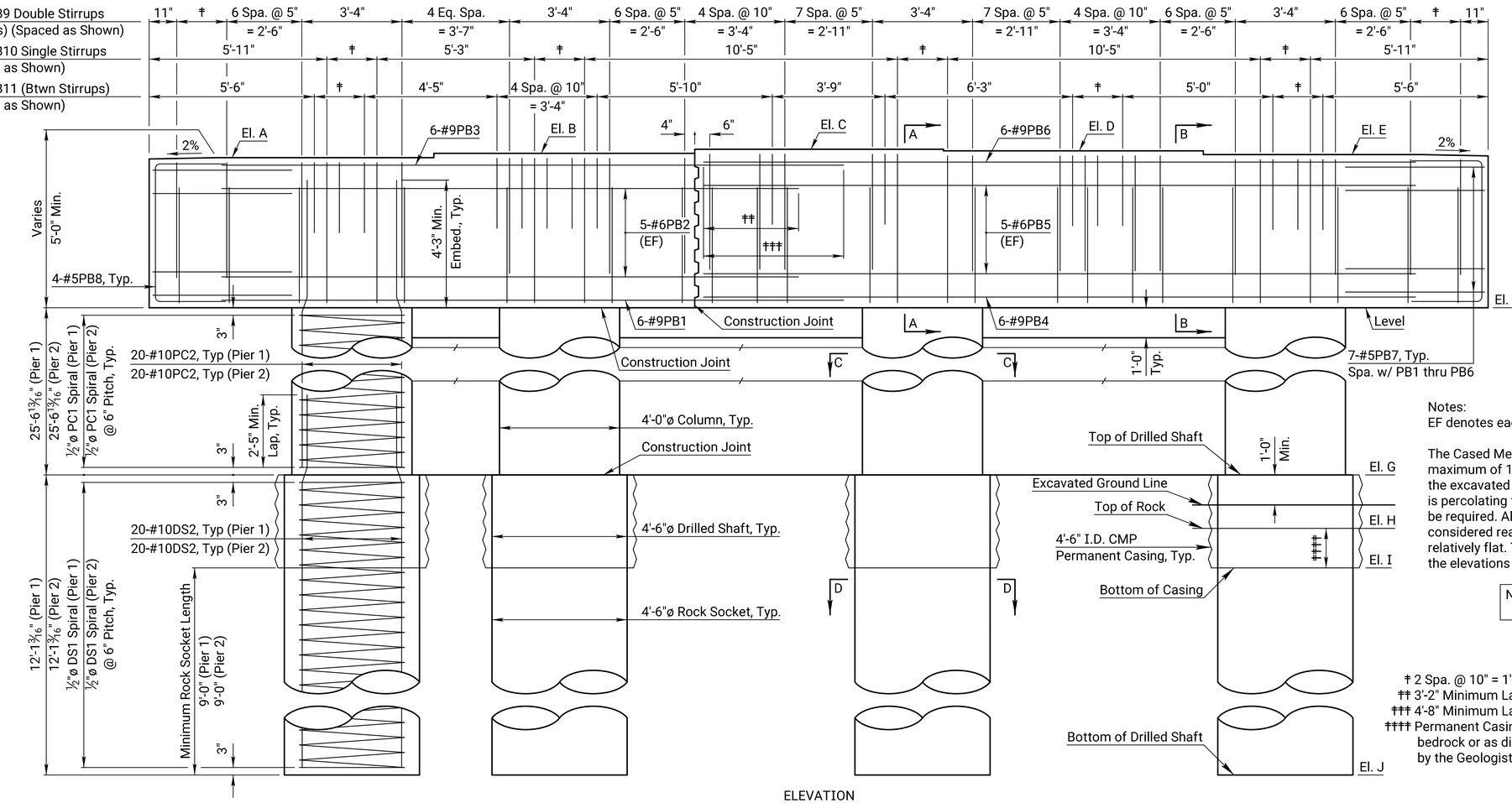
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	80	291

TABLE OF ELEVATIONS		
Elevation	Pier No. 1	Pier No. 2
A	1254.44	1254.44
B	1254.58	1254.58
C	1254.72	1254.72
D	1254.68	1254.68
E	1254.54	1254.54
F	1249.44	1249.44
G	1224.00	1224.00
H	1222.50	1222.60
I	1220.90	1220.90
J	1211.90	1211.90
Exist. Ground	1234.28	1242.49

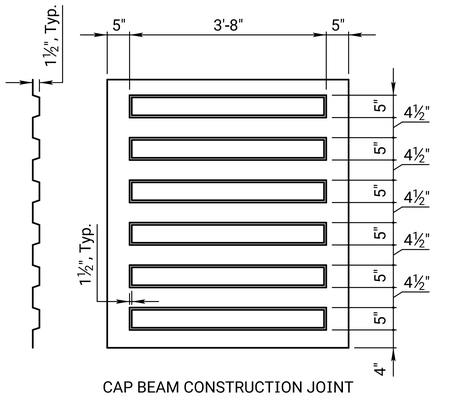


PLAN



ELEVATION

(Pier No. 1 shown, Pier No. 2 similar)(Dowels not shown for clarity)



CAP BEAM CONSTRUCTION JOINT

Notes:
EF denotes each face.

The Cased Method is required for all pier foundations. Casing should be set a maximum of 1.0 ft. into the top of rock and extend a minimum of 1.0 ft. above the excavated footing to allow for the over pumping of the drilled shaft. If water is percolating through bedrock material at a high rate, wet pour techniques may be required. Allow no loose material within the shaft when the shaft is considered ready to pour. It is critical that the bottom socket be clean and relatively flat. The bottom of the rock socket should be placed no higher than the elevations provided below.

Note: Contact the KDOT Topeka Regional Geology Office prior to construction of the drilled shafts.

ǂ 2 Spa. @ 10" = 1'-8"
ǂǂ 3'-2" Minimum Lap
ǂǂǂ 4'-8" Minimum Lap
ǂǂǂǂ Permanent Casing set into bedrock or as directed by the Geologist.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

PIER DETAILS
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

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Sh. No. 80

Drawn By : mrockwell Plotted : 16-JAN-2025 07:41
File : ka6017016br051-011.dgn

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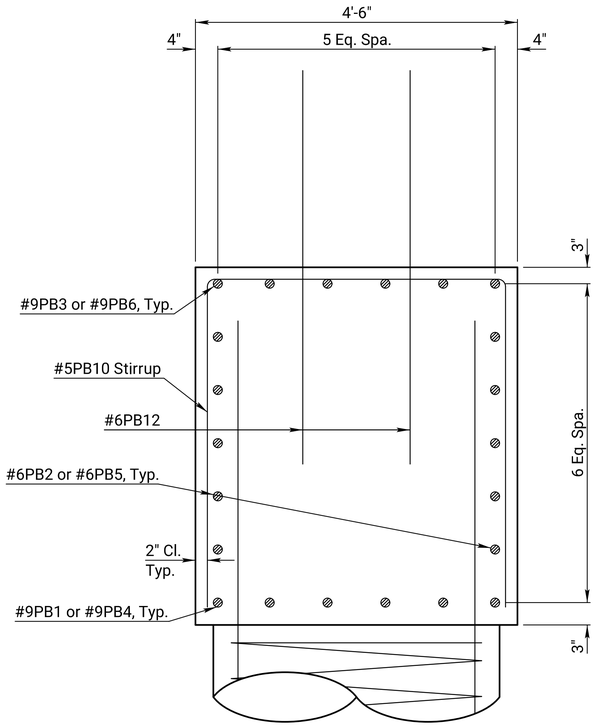
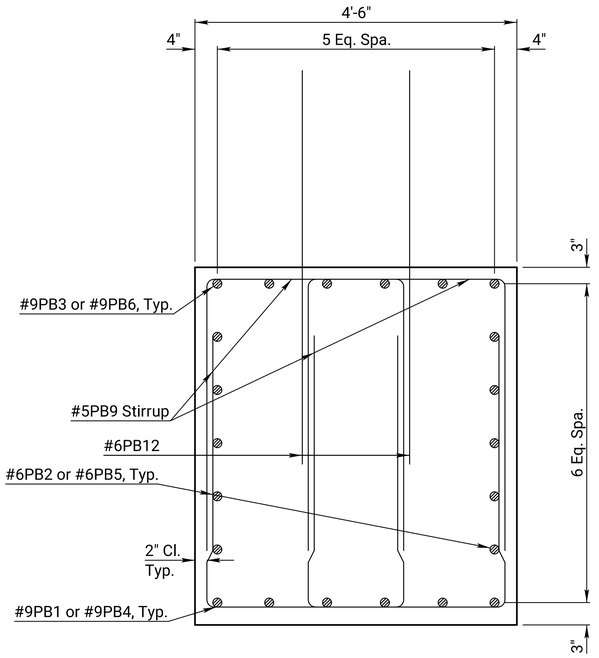
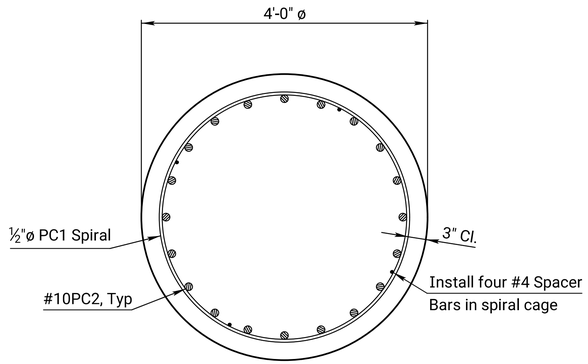
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	81	291



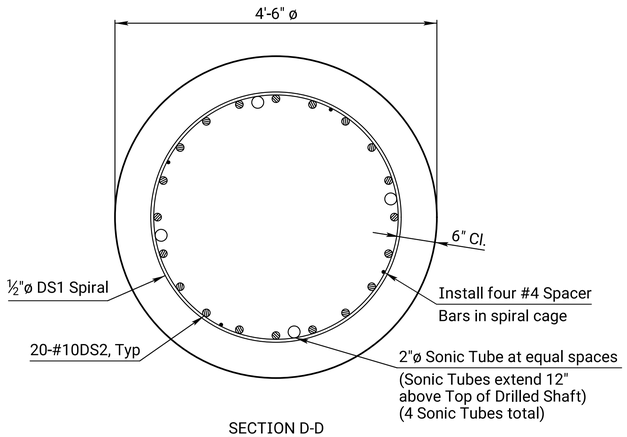
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

PIER DETAILS
CONT.
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

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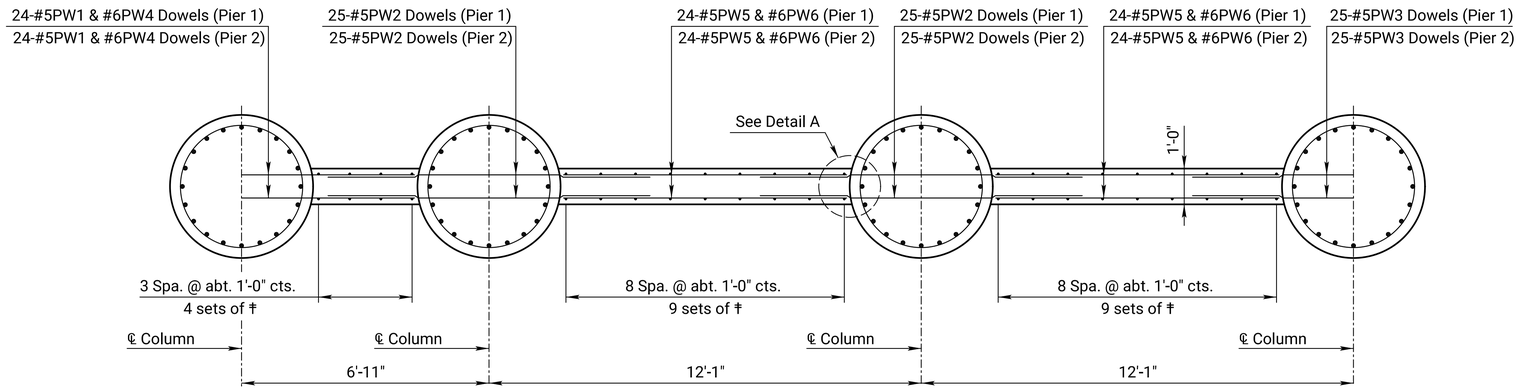
Sh. No. 81

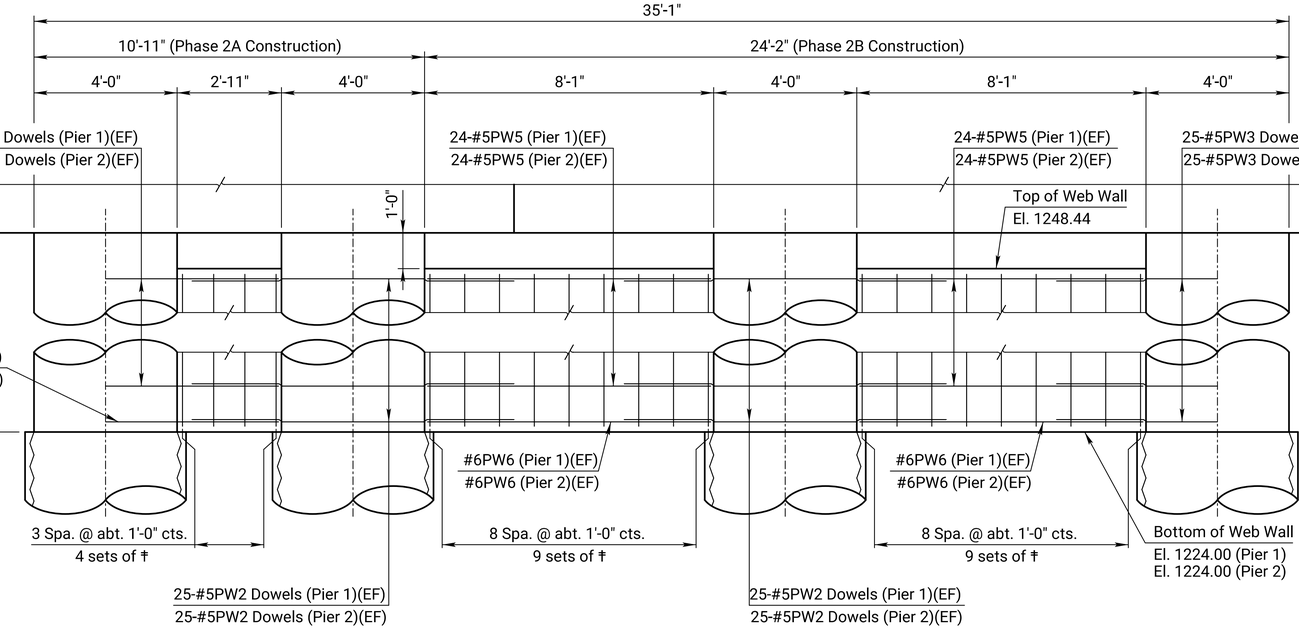
Drawn By : mrockwell Plotted : 16-JAN-2025 07:41
File : ka601701bbr051-012.dgn

CADconform Certify This File

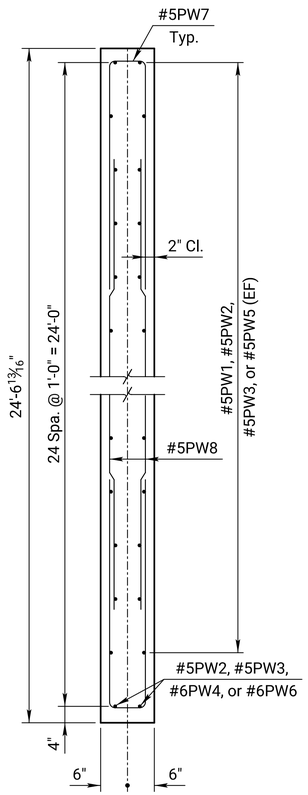
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	82	291



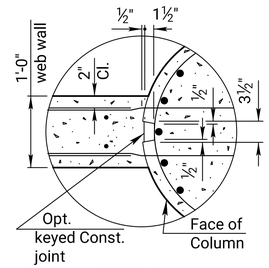
PLAN



ELEVATION



SECTION (PIER 1 & 2)



DETAIL A

Notes:
EF denotes each face.
Either cast the columns and pier web walls monolithically or cast the columns seperately using a keyed joint as shown in Detail A. If the columns are cast seperately, use threaded deformed bars in lieu of the dowel bars. Bar diameter and embedment length into the web wall shall be as designated. The inserts shall develop the full yield strength of the bars. No change in compensation is allowed with the use of inserts. Coil inserts are not allowed.

ŧ #5PW8(EF) lapped w/ 2-#5PW7

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

PIER DETAILS
CONT.
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

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Sh. No. 82

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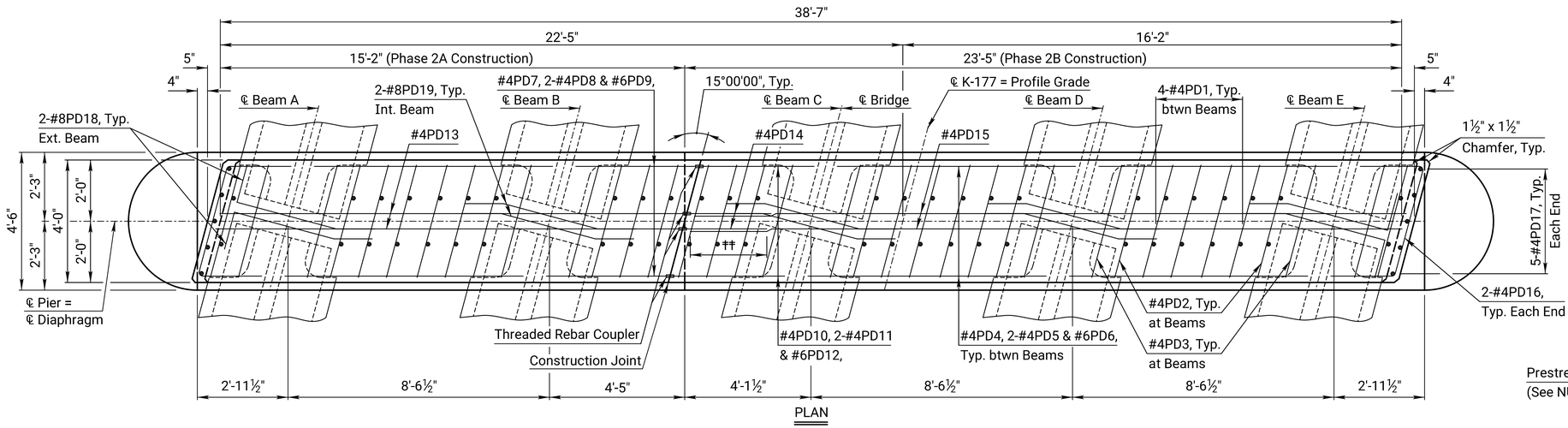
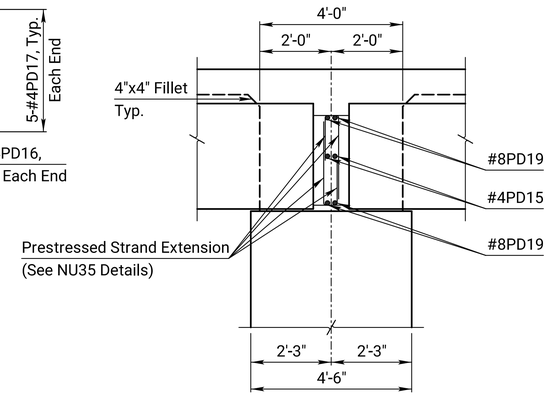
Drawn By : mrockwell
File : ka6017016brr051-012b.dgn
Plotted : 16-JAN-2025 07:41

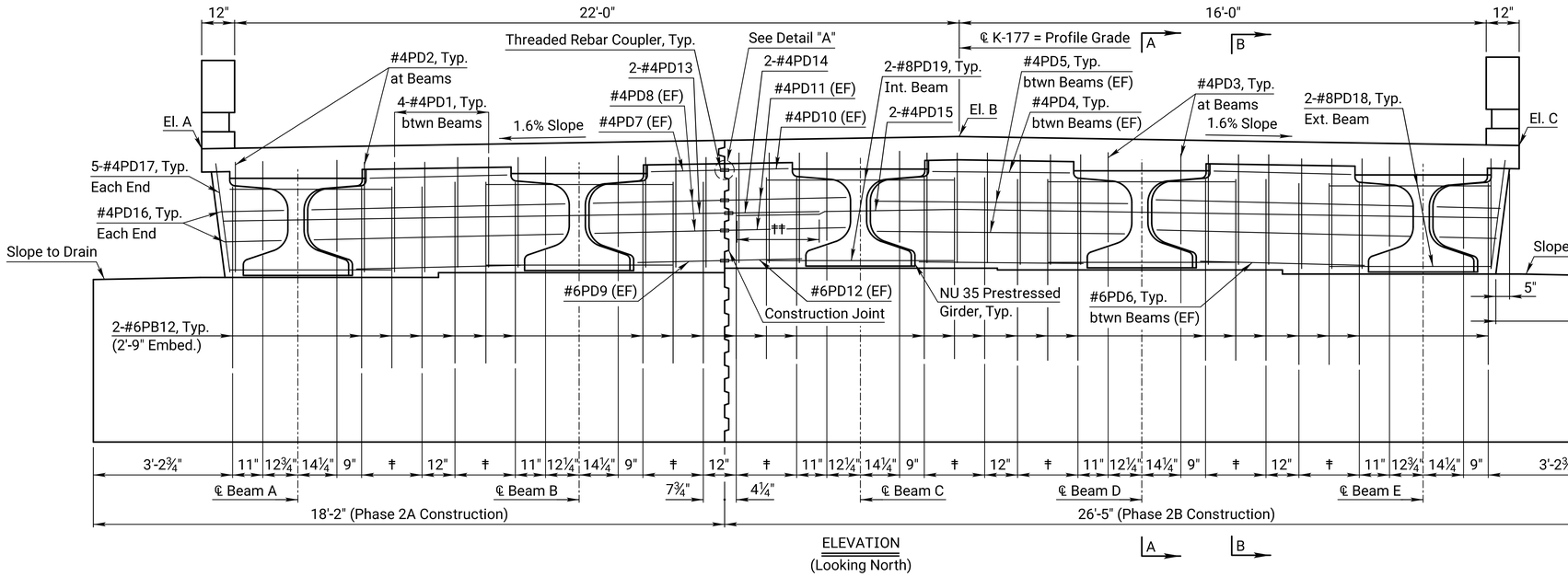
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	83	291



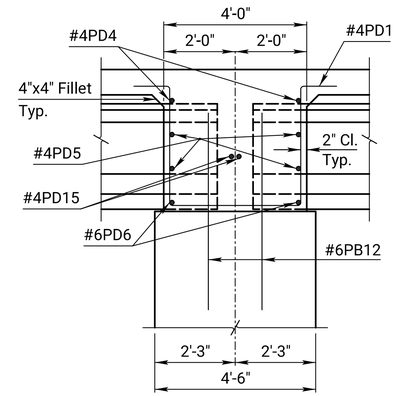
PLAN



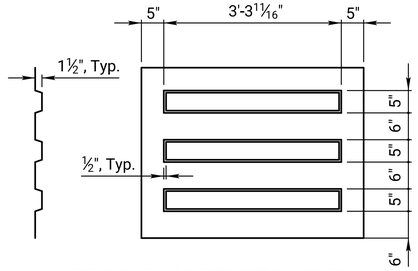
SECTION A-A
(At Beams)



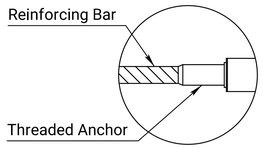
ELEVATION
(Looking North)



SECTION B-B
(Between Beams)



DIAPHRAGM CONSTRUCTION JOINT



DETAIL A
Suggested Blockout
Details for Mechanical Splice

‡ 2 Spa. @ 11" = 1'-10"
‡‡ 2'-6" Minimum Lap

TABLE OF ELEVATIONS		
Elevation	Pier No. 1	Pier No. 2
A	1258.48	1258.48
B	1258.85	1258.85
C	1258.58	1258.58

Notes:
EF denotes each face.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

PIER DIAPHRAGM DETAILS
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

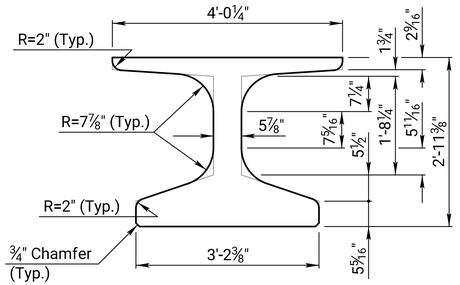
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

CADconform Certify This File Sh. No. 83

Drawn By : mrockwell Plotted : 16-JAN-2025 07:42
File : ka6017101bbr051-013.dgn

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	84	291



TYPE NU35

Area	648.3	in.²
IcG	110,307	in.⁴
Y Bot	16.12	in.
Vol./Surf. Area	3.10	in.
Wt./Ft.	675	lbs

TYPICAL BEAM SECTION

(Dimensions and properties are converted from metric fabrication forms.)

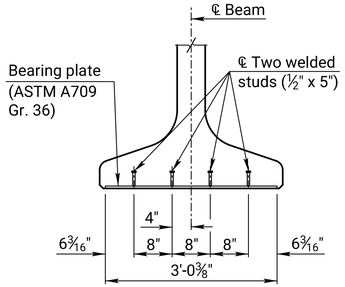
✳ Prior to shipping, the camber shall be no greater than the design camber +½". The design camber is equal to the 50 day camber shown in the plans.

◔◔ At expansion joint locations coat beam with approved epoxy substructure waterproofing membrane.

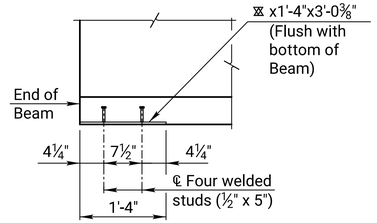
◔◔ Two Beam Depths

◔ At bridge deck drain locations coat beam with approved epoxy substructure waterproofing membrane.

◔ One Beam Depth at center of drain



End View



Side View

⧆ Use ¾" ℙ when field welding will occur, otherwise use ½" ℙ.

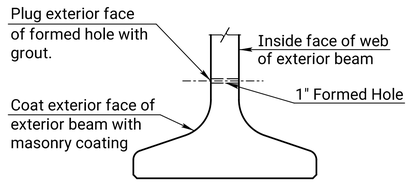
BEARING PLATE DETAILS

Note: Stud welding will be in accordance with the latest edition of AWS D1.1.

Use plate conforming to the requirements of ASTM A709 Grade 36. The stud anchors will be made of material as specified for Shear Connector Studs in the KDOT Specifications.

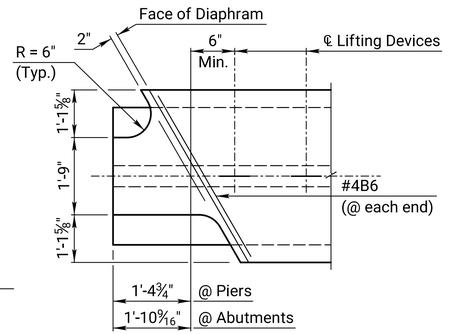
The exposed surface of the bearing plates shall be galvanized.

All work and material to install the bearing plates shall be subsidiary to the bid item "Prestressed Concrete Beam".

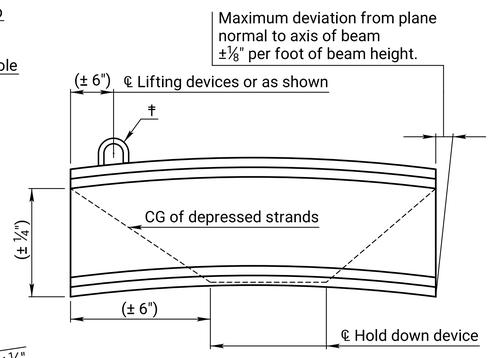


DETAIL OF FORMED HOLE(S)

(See Beam Detail sheet for locations)

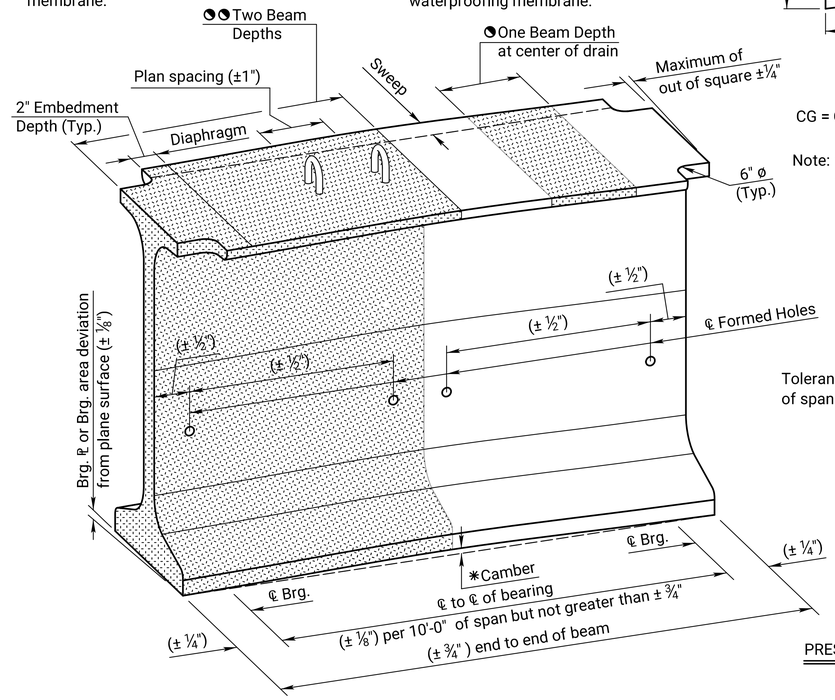


TOP FLANGE BLOCKOUT DETAIL



ELEVATION

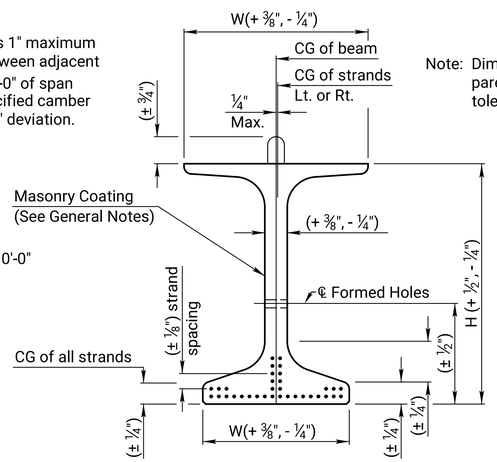
CG = Center of Gravity



PRESTRESSED BEAM FABRICATION TOLERANCES

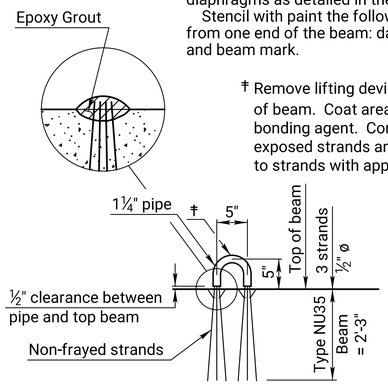
Note: Tolerance for camber is 1" maximum variation in camber between adjacent beams; and ±⅛" per 10'-0" of span deviation from the specified camber but not greater than ±1" deviation.

Tolerance for sweep is ⅛" per 10'-0" of span but not greater than 1".



TYPICAL SECTION

Note: Dimensions shown in parentheses are tolerances only.



LIFTING DEVICE

(Two required at each end)

(Fabricator to verify)

‡ Remove lifting device within ½" from top of beam. Coat area with approved epoxy bonding agent. Completely cover remaining exposed strands and fill depressions adjacent to strands with approved epoxy grout.

GENERAL NOTES

Fabricate the precast prestressed beams in accordance with the KDOT Specifications. Submit shop drawings in accordance with the KDOT Specifications.

Use air entrained concrete. The KDOT Materials Section shall approve the mix design. Unless otherwise shown on the plans, f'c = 10,000 psi and f'c at release = 7,500 psi.

Use reinforcing steel conforming to the requirements of ASTM A615, Grade 60. The reinforcing steel shown shall be uncoated unless otherwise indicated. Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.

Use 0.60" nominal diameter (unless otherwise indicated), uncoated, seven-wire, low relaxation prestressing tendons conforming to the requirements of ASTM A416, Grade 270.

Use bolts having an ultimate strength 50% in excess of the manufacturer's safe load. All items (except the tendons) cast-in or inserted in prestressed beams shall be epoxy coated or galvanized. Show Formed Holes on shop drawings. All bolts, nuts and washers shall be subsidiary to the bid item, "Prestressed Concrete Beams".

Show on the shop drawings any hardware, holes or other appurtenances that are required to be incorporated into the girder to construct the girder or for any temporary works needed to construct the bridge (e.g. safety railing pockets).

After beams are in the final position, remove lifting devices. See "Lifting Device" detail below. Removal of the lifting devices, coating and grouting shall be subsidiary to the bid item: "Prestressed Concrete Beams".

Use elastomeric bearing pads conforming to the KDOT Specifications. Bearing pads and Type B expansion joint material shall be subsidiary to the bid item, "Prestressed Concrete Beams".

The beam lengths shown on the design plans are net lengths measured horizontally along the beam centerline. The beam manufacturer shall make necessary allowances for grade, and for shortening due to elastic shortening, creep and shrinkage.

The beams shall reasonably conform to the lines and dimensions shown on the design plans and be within the tolerances specified in the latest edition of Prestressed Concrete Institute's, "Manual for Quality Control for Plants and Production of Structural Precast Concrete Products", except as modified by this sheet or the KDOT Specifications.

Apply an initial force of 1,000 to 3,000 pounds to each strand to take up any slack in the cables. Unless otherwise noted on the plans, apply a force of 43,900 pounds to each strand. Stress harped strands to a magnitude such that they are tensioned to 43,900 pounds after they are in position.

The center portion of the girder top flange shall be rough finished by scarlfying the surface transversely with a wire brush or stiff broom and no laitance shall remain on the surface. The outside 9" on each side of the top flange shall be steel troweled to a smooth finish and a bond breaker shall be applied to this region only. Bond breaker shall be 30# roofing felt. Secure roofing felt to the top flange with an adhesive approved by the Engineer.

Fill trapped air holes and surface voids on the exterior face of the exterior beams with an approved concrete masonry coating. This work shall conform to KDOT Specifications. This work shall be subsidiary to the bid item, "Prestressed Concrete Beams".

Detension strands in a sequence which minimizes lateral eccentricity. Show the method and sequence of strand release on the shop drawings. Use extreme care when lifting, handling, storing and transporting beams. Use the lifting system shown or an alternate system approved by the Engineer. Keep the beam in an upright position at all times. Support the beam on bearing points positioned directly below the designated lifting points or designated bearing points.

Do not place the bridge slab before the beams are 28 days old. Pour diaphragms as detailed in the bridge plans.

Stencil with paint the following information on the webs approximately 5'-0" from one end of the beam: date of concrete placement, date of strand release, and beam mark.

NO.	DATE	REVISIONS	BY	APP'D
01	09-11-18	Current Release	M.L.L.	J.P.J.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

STANDARD PRESTRESSED CONCRETE BEAM DETAILS

NU35

K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

FHWA APPROVAL		09-11-18	APP'D.	John P. Jones	
DESIGNED	DETAILED	M.L.L.	QUANTITIES	TRACED	M.L.L.
DESIGN CK.	DETAIL CK.	S.G.B.	QUAN.CK.	TRACE CK.	S.G.B.

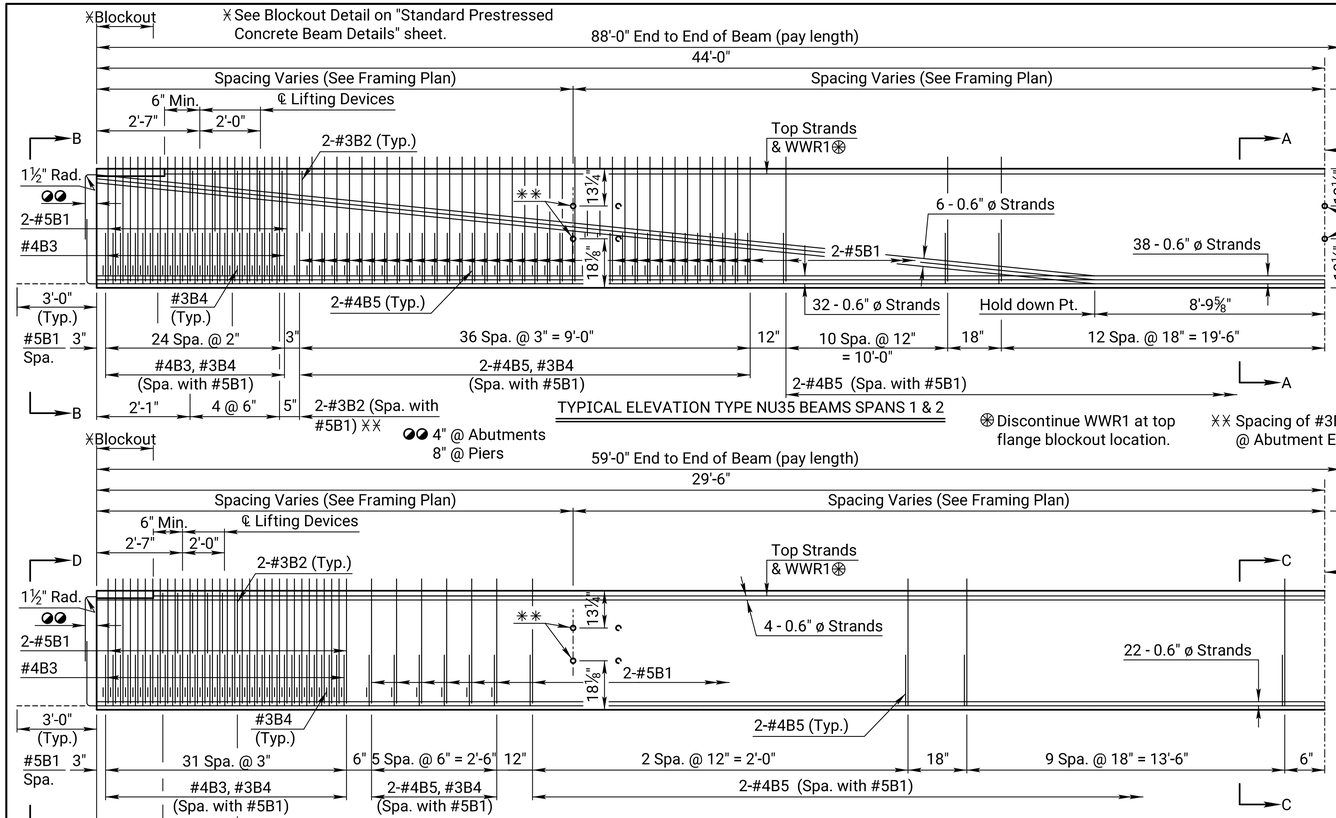
KDOT Graphics Certified 04-25-2022 Sh. No. 84

KDOT Graphics Certified

Drawn By : mrockwell Plotted : 16-JAN-2025 07:42

File : ka601701bbr051-014.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	85	291



TYPICAL ELEVATION TYPE NU35 BEAMS SPANS 1 & 2

◒◒ 4" @ Abutments
8" @ Piers

⊛ Discontinue WWR1 at top flange blockout location.

⚹⚹ Spacing of #3B2 bar @ Abutment End.

TYPICAL ELEVATION TYPE NU35 BEAMS SPAN 3

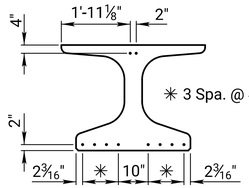
NOTE: Extend 10 strands 3'-0" beyond the end of the beam. Strands not shown shall be cut flush with the end of the beam. See "Strand Extension Details."

NOTE: During transportation and construction only, support beams on bearing points a maximum of 5 feet from the beam end. The Fabricator shall show the proposed support locations on the shop drawings.

NOTE: The hold down force at the harp points shall be 6 strands at 2.62 kips/strand = 15.7 kips total for Spans 1 & 2.

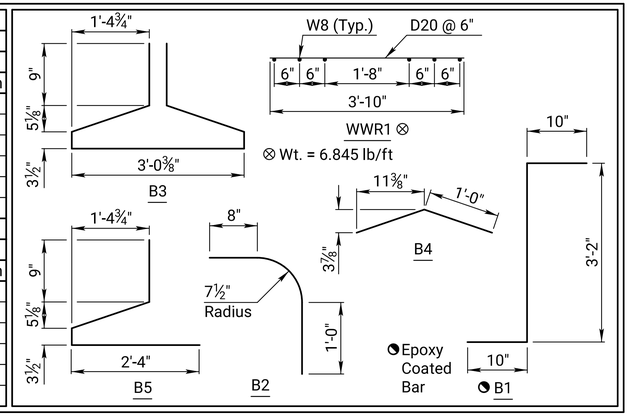
† WELDED WIRE REINFORCEMENT EQUIVALENT STEEL As						
Size	3"	6"	9"	12"	15"	18"
#3	0.440	0.220	0.147	0.110	0.088	0.073
#4	0.800	0.400	0.267	0.200	0.160	0.133
#5	1.234	0.617	0.411	0.308	0.247	0.206
#6	1.761	0.880	0.587	0.440	0.352	0.293

† If Welded Wire Reinforcement (WWR) is used in-lieu of reinforcing steel bars shown on this sheet, the spacing of wires for the WWR shall be equal to or less than the vertical bars shown in the typical beam section above. The equivalent As for the WWR shall be equal to or greater than typical beam section above.

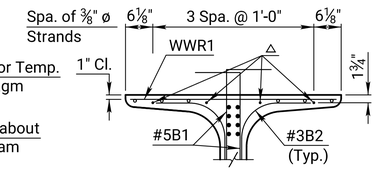


STRAND EXTENSION DETAIL
(88'-0" & 59'-0" span beams)

BILL OF REINFORCING STEEL							
88'-0" Beam (1 Listed-10 Reqd.) (Spans 1 & 2)							
Straight bars				Bent bars			
Mark	No.	Size	Length	Mark	No.	Size	Length
B6	2	#4	3'-10"	B2	28	#3	2'-8"
				B4	124	#3	2'-0"
				B3	50	#4	8'-1"
				B5	242	#4	4'-10"
				◔ B1	342	#5	4'-10"
59'-0" Beam (1 Listed-5 Reqd.) (Span 3)							
Straight bars				Bent bars			
Mark	No.	Size	Length	Mark	No.	Size	Length
B6	2	#4	3'-10"	B2	28	#3	2'-8"
				B4	76	#3	2'-0"
				B3	64	#4	8'-1"
				B5	76	#4	4'-10"
				◔ B1	204	#5	4'-10"



BILL OF MATERIAL		
Item	Unit	Quantity
Prestressed Concrete Beams (NU35) Spans 1 & 2 (88'-0")	Lin.Ft.	880
Prestressed Concrete Beams (NU35) Span 3 (59'-0")	Lin.Ft.	295
The following quantities are given for information only and shall not be paid for directly but shall be made subsidiary to the bid item "Prestressed Concrete Beams"		
Beam concrete (f'c= 10,000 PSI) (per Spans 1 & 2 beam)	Cu.Yds.	14.7
Beam concrete (f'c= 10,000 PSI) (per Span 3 beam)	Cu.Yds.	9.8
Approx. Wt. per 88'-0" beam	Tons	29.7
Approx. Wt. per 59'-0" beam	Tons	19.9
.6" ø Prestressing strand (270 KSI low relaxation fy= 243 KSI)	Lin.Ft.	4,999
Epoxy reinforcing steel (fy=60,000 PSI)	Lbs.	22,383
Reinforcing steel (fy=60,000 PSI)	Lbs.	15,185
Welded Wire Reinforcement (fy=70,000 PSI)	Lbs.	8,043
Elastomeric Brg. pads (¾"x8"x3'-0")	Each	30
1" Formed Holes	Each	40
Lifting devices	Each	60
Bearing plates (✡x 1'-4" x 3'-0⅜")	Each	30
Substructure Waterproofing Membrane	Sq. Yds.	N/A

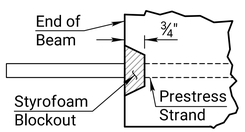


†† TOP FLANGE DETAIL

△ ⅜" Dia. reinforcement support strands (required). Tension to 2.0 kips/strand and place symmetrical about ℄ beam. May be moved laterally in pairs to maintain symmetry.

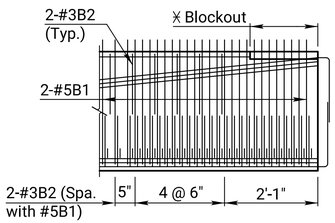
†† Check flange for Overhang Bracket loads where applicable.

✱✱✱ PROCEDURE FOR SEALING PRESTRESS BEAM ENDS

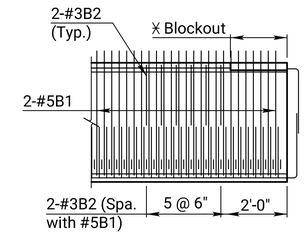


1. Cut strands 9" from the end of the beam.
2. Remove Styrofoam blockout.
3. Cut strands 1/2" deep in blockout with angle grinder.
4. Clean affected area.
5. Fill blockout area with approved epoxy grout.
6. After the grout has cured, according to the manufacturer's recommendation, grind entire face of beam to provide a smooth surface.
7. After waiting 28 days, clean the entire surface of beam end and apply an approved (epoxy-epoxy) Substructure Waterproofing Membrane.

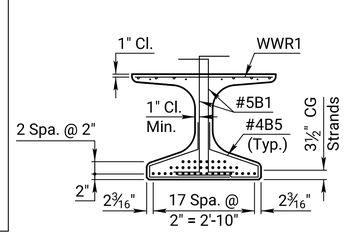
✱✱✱ Only for exposed Prestress Beam ends with all strands removed at expansion joints.



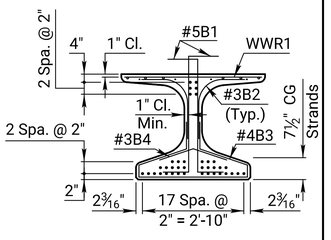
ELEVATION PIER END SPANS 1 & 2
(Spacing of #3B2 bar)



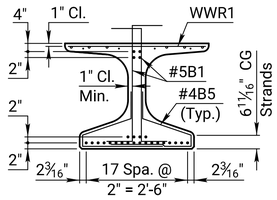
ELEVATION PIER END SPAN 3
(Spacing of #3B2 bar)



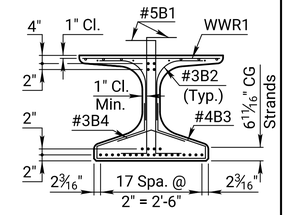
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

✡ Use ¾" ℄ when field welding will occur, otherwise use ½" ℄.

NO.	DATE	REVISIONS	BY	APP'D
04	01-27-22	Temporary Diaphragm table update	M.L.L.	M.A.H.
03	03-14-19	Corrected shear bar	M.L.L.	J.P.J.
02	11-15-18	Add WWR to Bill of Material & Wt/ft	M.L.L.	J.P.J.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

NU35 BEAM DETAILS
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

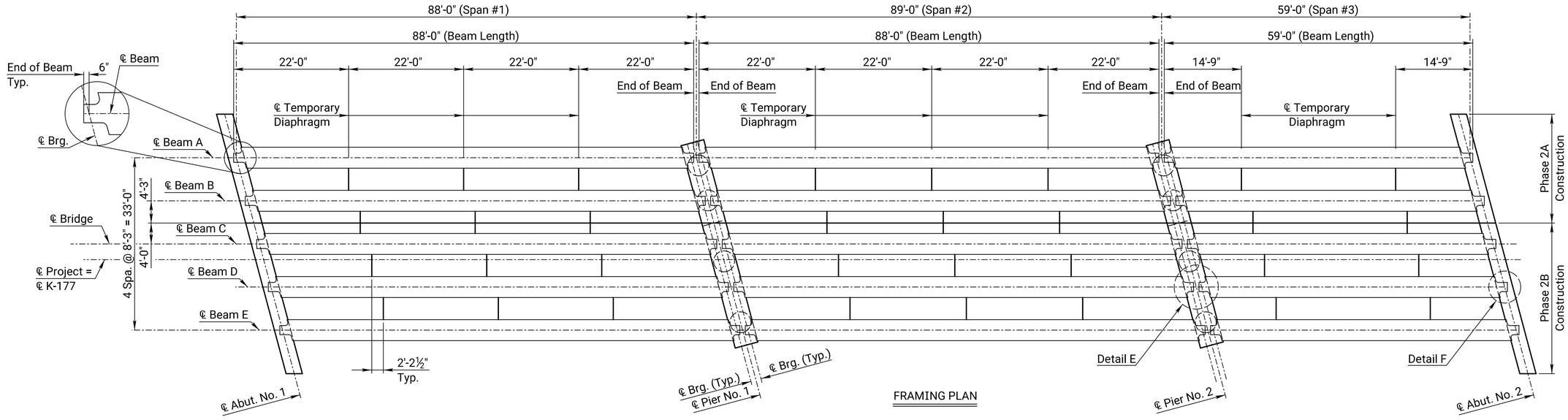
DESIGNED	DETAILED	M.L.L.	QUANTITIES	CADD	M.L.L.
DESIGN CK.	DETAIL CK.	S.G.B.	QUAN.CK.	CADD CK.	S.G.B.

KDOT Graphic Certified File Date: 10-10-2022 Sh. No. 85

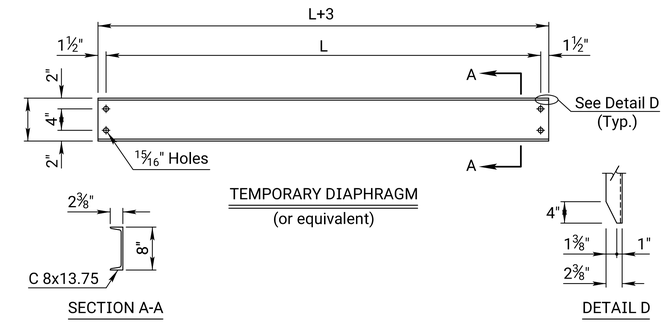
Drawn By : mrockwell Plotted : 16-JAN-2025 07:42
File : ka6017011bbr051-015.dgn

KDOT Graphic Certified File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	86	291



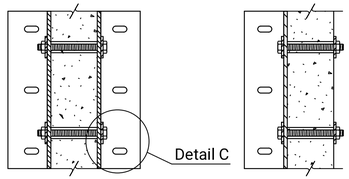
FRAMING PLAN



TEMPORARY DIAPHRAGM
(or equivalent)

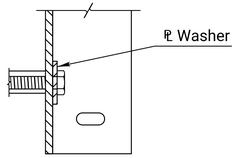
SECTION A-A

DETAIL D

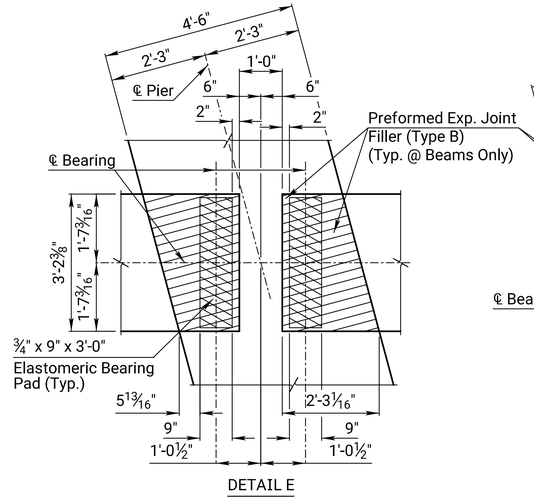


DETAIL A

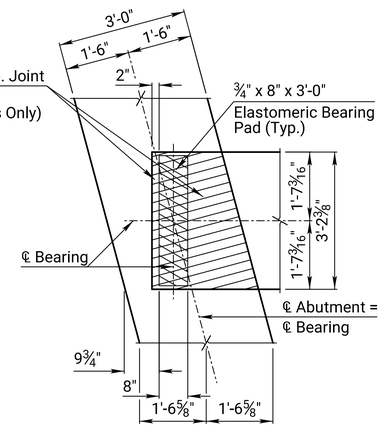
DETAIL B



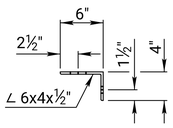
DETAIL C



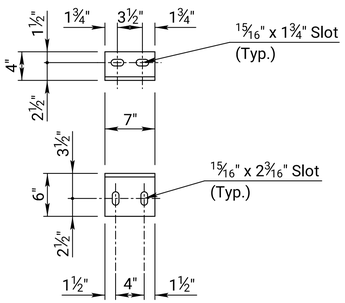
DETAIL E



DETAIL F



TYPICAL SECTION



7" CONNECTION ANGLE
(each Req'd.)
(Weight = 9.45 Lb. each)

CONNECTION ANGLE DETAILS

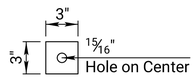
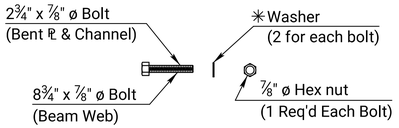
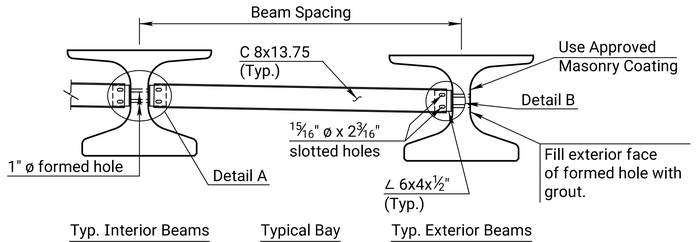


PLATE WASHER



✳Plate washers required for slotted holes.

FASTENER DETAILS



ELEVATION OF TEMPORARY DIAPHRAGMS

TEMPORARY DIAPHRAGMS: Use ASTM A709 Gr. 36 steel for all angles and bent plates for temporary diaphragms. All bolts, nuts, and washers for fasteners shall conform to the heavy hex structural requirements of ASTM F3125 Gr. A325, Type 1. Galvanize the angles, bolts, nuts, and washers in accordance with the KDOT Specifications. Use hardened steel washers over any oversized holes. Use 5⁄16" plate washers over any slotted holes along with hardened washers under the turned elements. Use the turn-of-the-nut tightening method. DTI's are not required. Install the temporary diaphragms, as shown in the details, prior to placing any superstructure concrete. Leave Temporary Steel Diaphragms in place until entire bridge deck is placed and cured. Remove the angles from the beams and fill the holes in the prestressed beams with an approved epoxy grout. The bent plate diaphragms, angles, nuts, bolts, and washers shall remain the property of the Contractor. Submit shop drawings of the temporary diaphragms to the KDOT Bridge Section for review and approval. The material, equipment, and labor necessary for the installation of the temporary diaphragms, including filling the bolt holes, shall not be paid for directly, but shall be subsidiary to the bid item "Prestressed Concrete Beams".

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

FRAMING PLAN
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

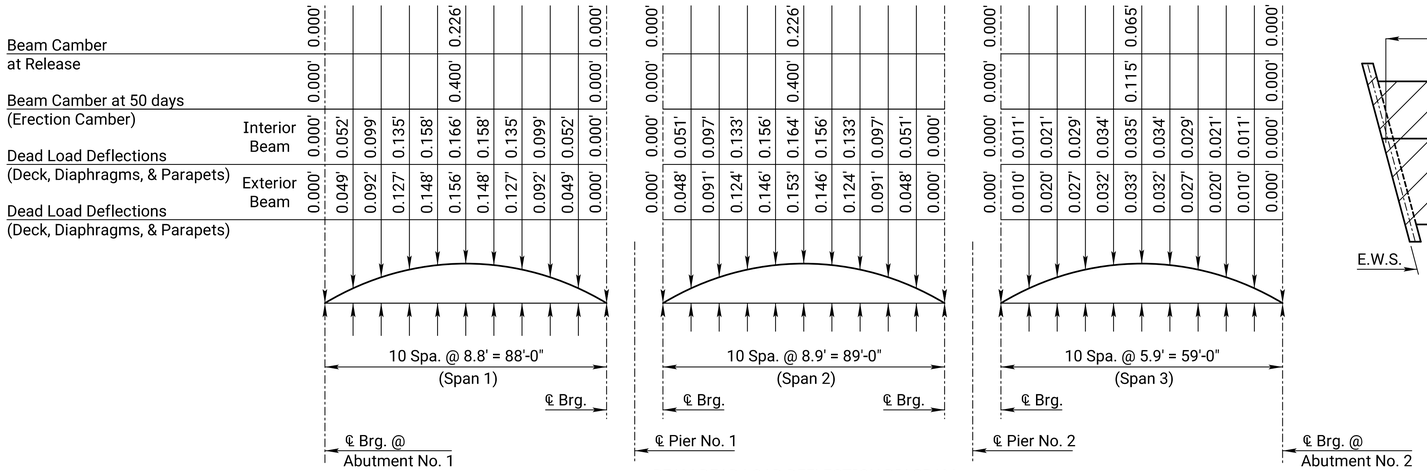
CADconform Certify This File

Sh. No. 86

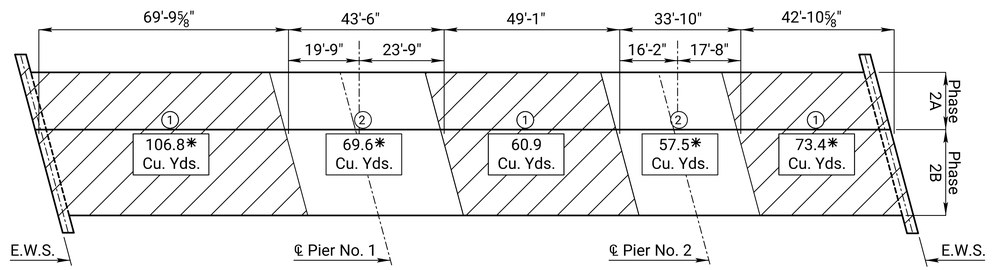
Drawn By : mrockwell Plotted : 16-JAN-2025 07:42
File : ka601701bbr051-016.dgn

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	87	291



BEAM DEAD LOAD DEFLECTION DIAGRAM

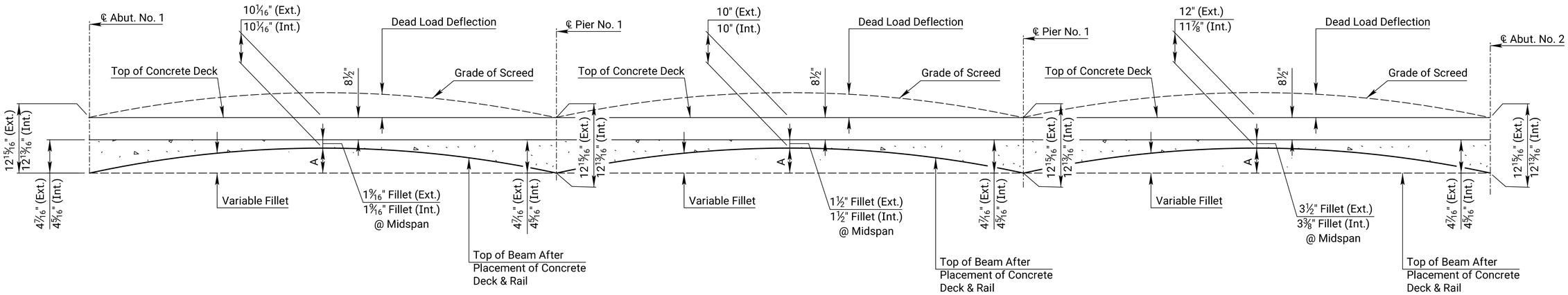


CONCRETE PLACING SEQUENCE DIAGRAM

*Includes diaphragm concrete

CONCRETE PLACING SEQUENCE:
Segmental, combined or continuous pours are allowed by an approved alternate placing sequence. Any discontinuous pour must stop at a construction join short of a pier.

The Contractor my place the corral rail continuously from one end of the bridge to the other.



PRESTRESSED FILLET DIAGRAM

Dimension "A" = (Camber at 50 days) - Dead Load Deflection (Deck + Rail + Fillet)
Total Thickness at ℄ Brg. = (Dimension "A") + (Total Deck Thickness) + (Fillet)

(Dimensions are along ℄ Beam.)

CAMBER NOTES:

Construct the finished slab to plan grade by varying the depth of the fillet over the beam to provide for prestress camber, concrete dead load deflection and, if necessary, vertical curvature. After the prestressed beams are erected, measure the camber in the field by taking a profile of each beam. Correct any variation between the actual camber and concrete dead load deflection shown in the plans by varying the depth of the concrete fillets over the beam so that the finished floor is constructed to the theoretical grade. The minimum depth of the slab and fillet over the beam shall vary per span at centerline of beam according to the "Prestressed Fillet Diagram".

Measure beam camber at midspan by the Contractor at the project site at time of delivery. Submit a copy of the field notes of measured beam camber to the Engineer not more than 5 working days after delivery of the beams to the site. Beam camber shall meet the tolerance specified on the "Standard Prestressed Concrete Beam Details" sheet.

Beam Concrete, Eci = 4,984 ksi (f'ci = 7.5 ksi)
Ec = 5,755 ksi (f'c = 10.0 ksi)

Notes:
Ordinates are in feet. Dead Load deflections are downward. Camber is upward.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

SUPERSTRUCTURE DETAILS
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

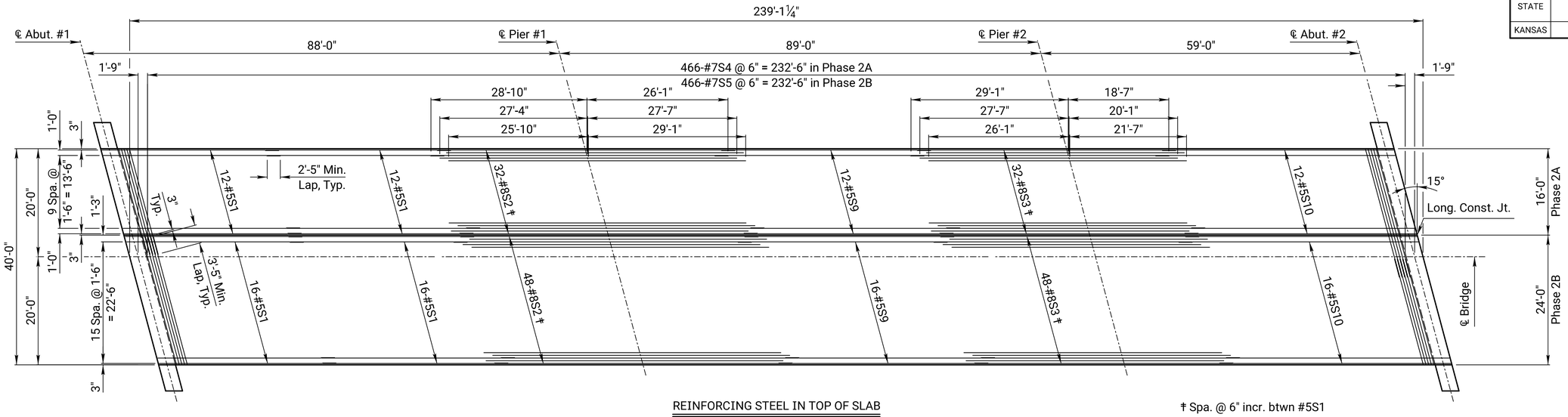
CADconform Certify This File

Sh. No. 87

Drawn By : mrockwell Plotted : 16-JAN-2025 07:42
File : ka601701bbr051-018.dgn

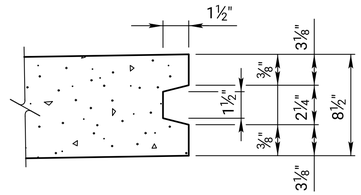
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	88	291

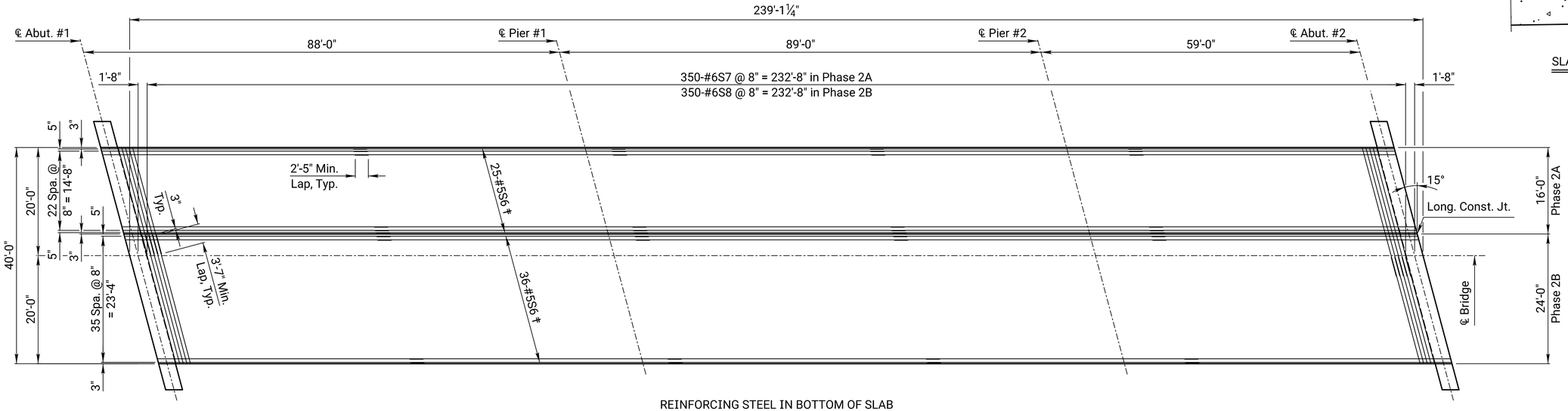


REINFORCING STEEL IN TOP OF SLAB

ǂ Spa. @ 6" incr. btwn #5S1



SLAB CONSTRUCTION JOINT



REINFORCING STEEL IN BOTTOM OF SLAB

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

SLAB DETAILS
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

CADconform Certify This File

Sh. No. 88

Drawn By : mrockwell
File : ka017017bbr051-020.dgn
Plotted : 16-JAN-2025 07:42

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
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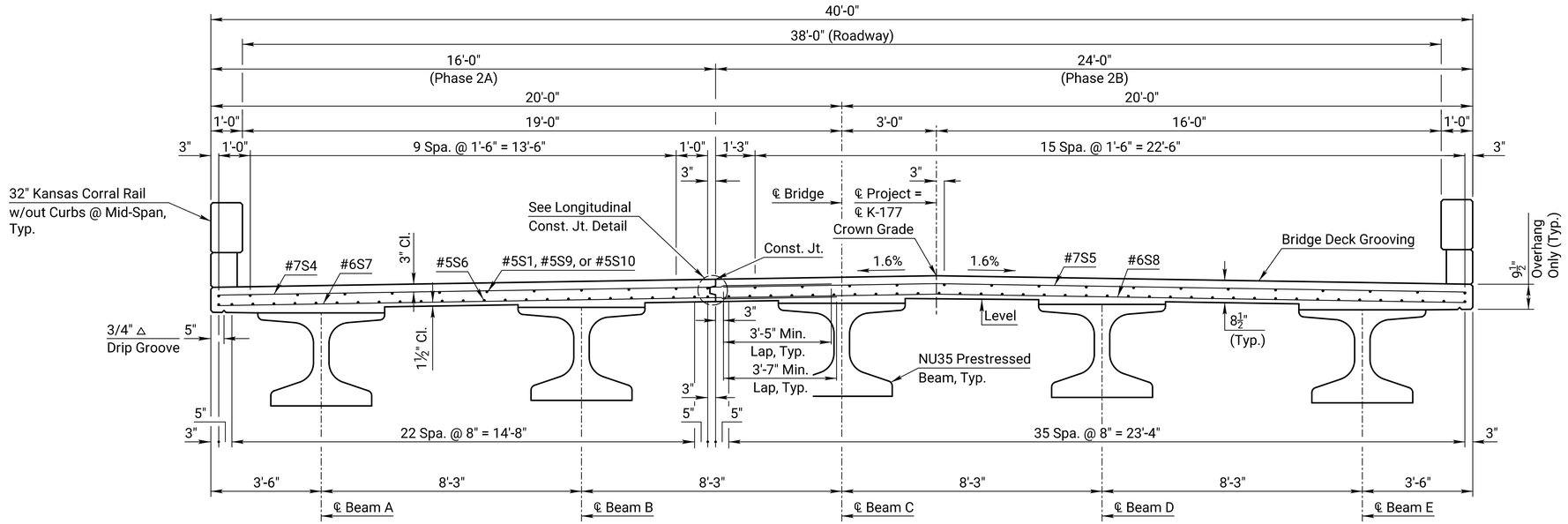
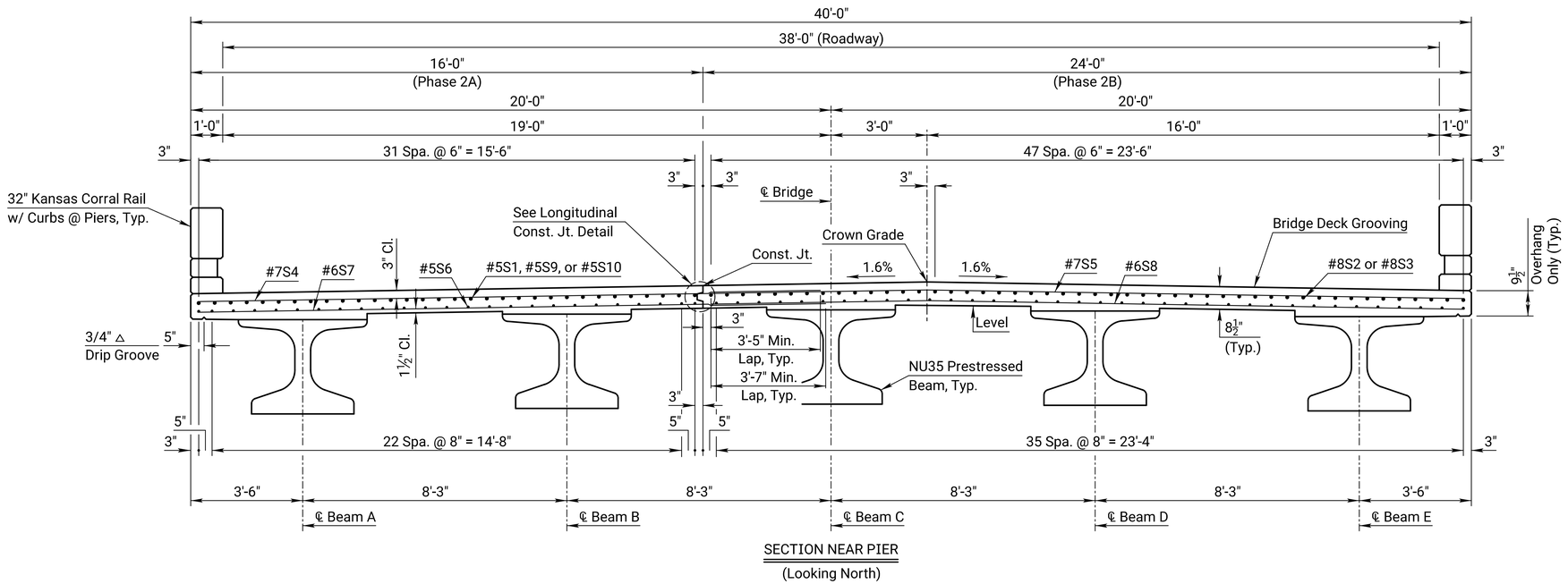


SECTION NEAR MID-SPAN
(Looking North)



SECTION NEAR PIER
(Looking North)

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

SLAB DETAILS
CONT.
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

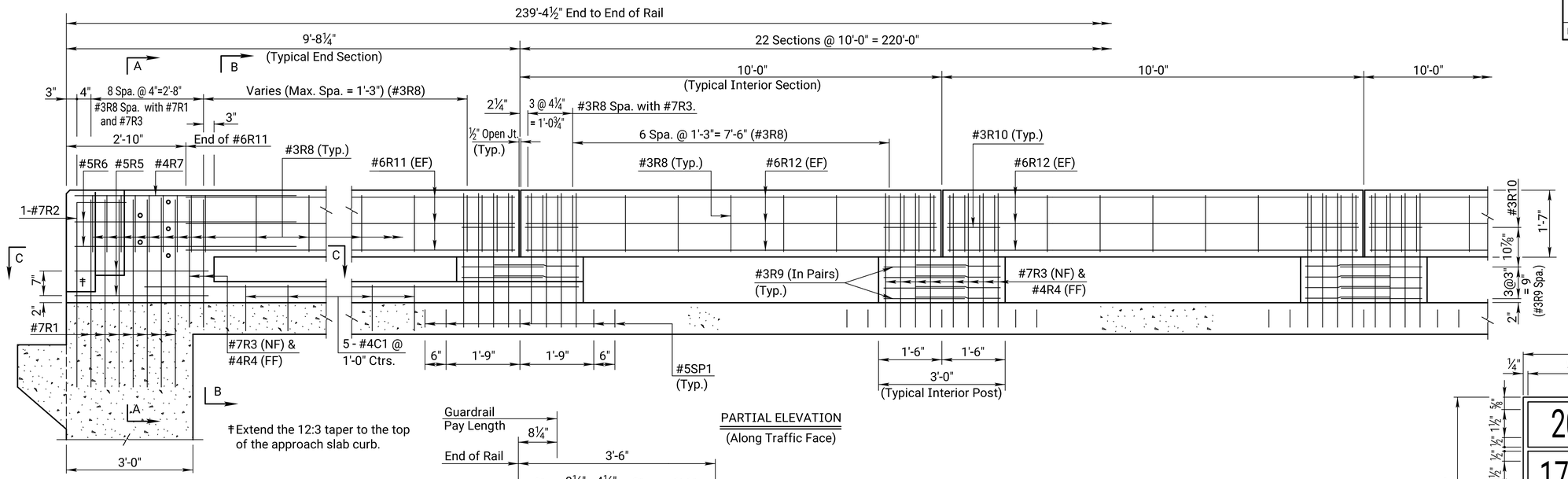
CADconform Certify This File

Sh. No. 89

Drawn By : mrockwell
File : ka6017016br051-021.dgn
Plotted : 16-JAN-2025 07:42

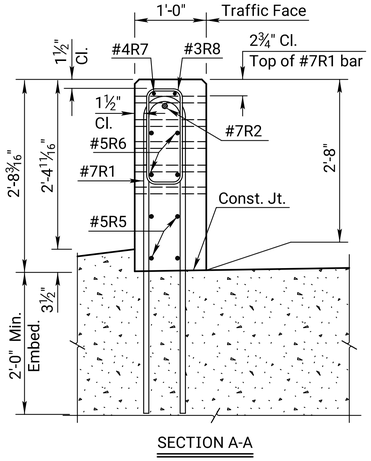
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	90	291

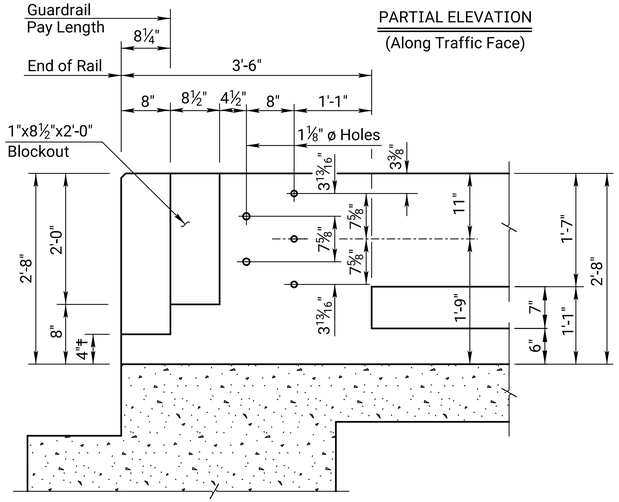


† Extend the 12:3 taper to the top of the approach slab curb.

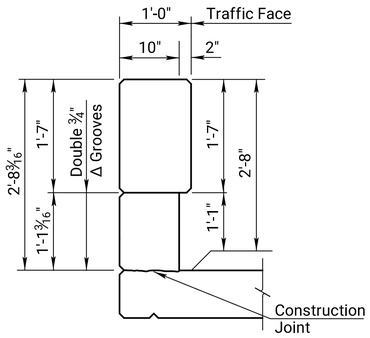
PARTIAL ELEVATION
(Along Traffic Face)



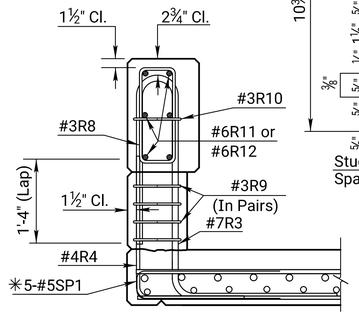
SECTION A-A



ELEVATION
(Dimensions at traffic face of rail.)

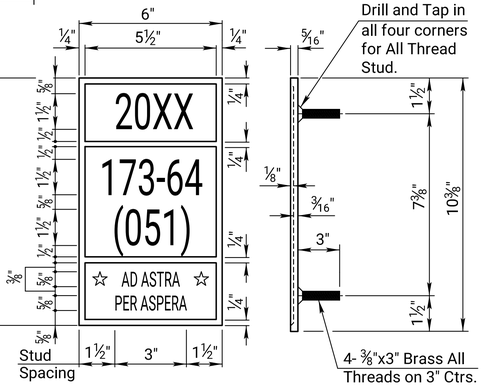


TYPICAL INTERIOR POST
(Without Curb)



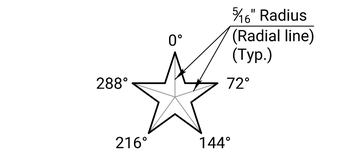
SECTION THRU POST
(Without Curb)

✳Note:
The hook may be canted to provide clearance and/or fit between reinforcing.

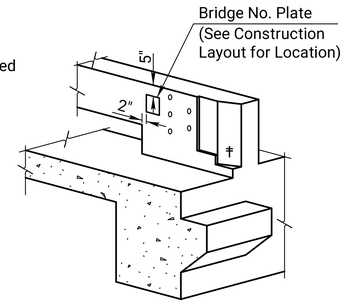


XX Year Bridge is Completed.

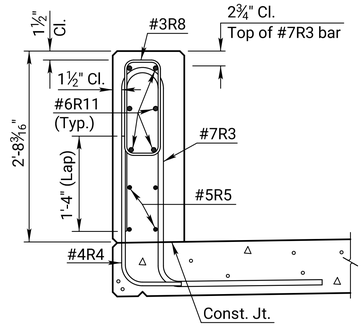
BRIDGE NUMBER PLATE
(1 Required)
(See Construction Layout for Location)



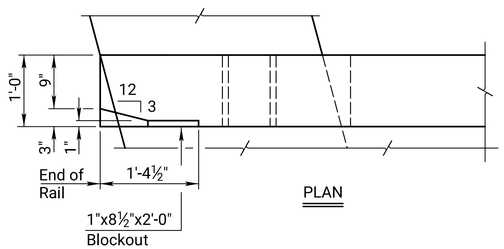
STAR GEOMETRY



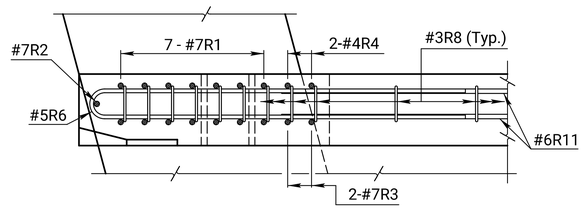
BRIDGE NUMBER PLATE PLACEMENT DETAIL



SECTION B-B



PLAN



SECTION C-C

NO.	DATE	REVISIONS	BY	APP'D
03				
02	12-03-21	Changed Bridge Number Plate detail	M.L.L.	M.A.H.
01	06-30-05	Current Release		

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

32" KANSAS CORRAL RAIL
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

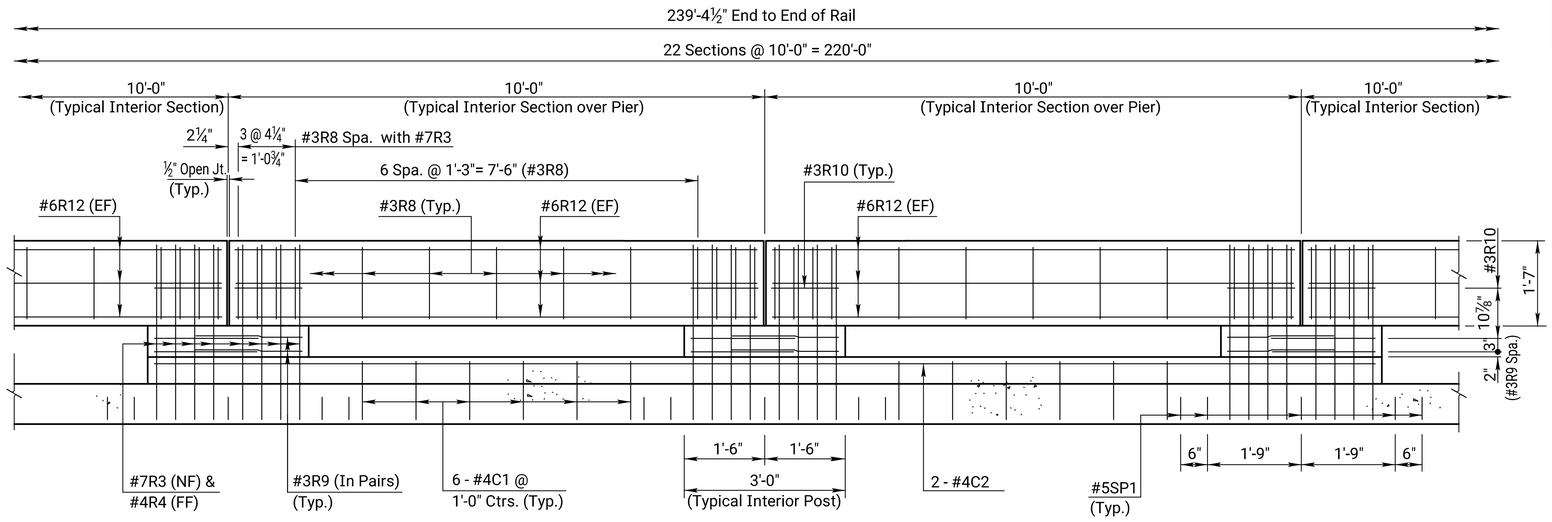
CADconform Certify This File

Sh. No. 90

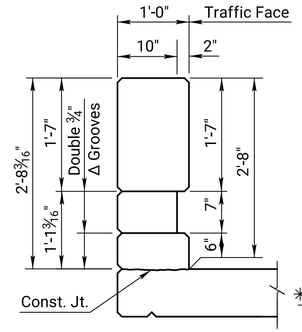
Drawn By : mrockwell Plotted : 16-JAN-2025 07:42
File : ka601701bbr051-022.dgn

CADconform Certify This File

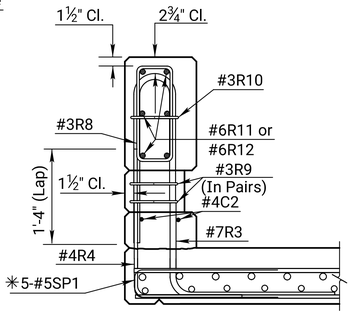
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	91	291



PARTIAL ELEVATION
(Along Traffic Face)
(Over Pier)

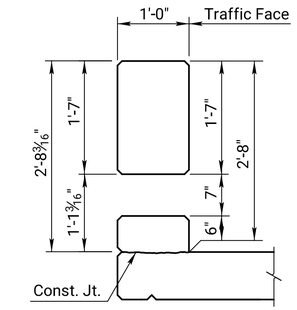


TYPICAL INTERIOR POST
(With Curb)

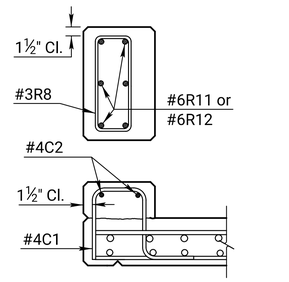


SECTION THRU POST
(With Curb)

✳Note:
The hook may be canted to provide clearance and/or fit between reinforcing.



TYPICAL SECTION BETWEEN POSTS
(With Curb)



TYPICAL SECTION BETWEEN POSTS
(With Curb)

NO.	DATE	REVISIONS	BY	APP'D
03	12-03-21	Changed Bridge Number Plate detail	M.L.L.	M.A.H.
02	01-30-12	Clarify C2 Termination	J.P.J.	T.L.F.
01	06-30-05	Current Release		

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

32" KANSAS CORRAL RAIL
CONT.
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

CADconform Certify This File

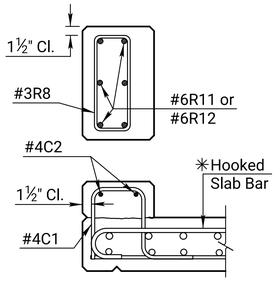
Sh. No. 91

CADconform Certify This File

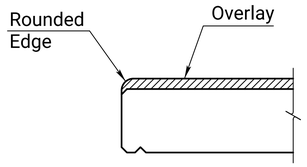
Drawn By : mrockwell Plotted : 16-JAN-2025 07:42
File : ka601701bbr051-023.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	92	291

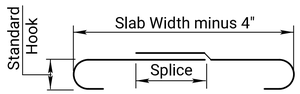
UNIT STRESSES :
Concrete (Grade 4.0)(AE) f'c = 4,000 psi
Reinforcing Steel (Grade 60)(Epoxy Coated) fy = 60,000 psi



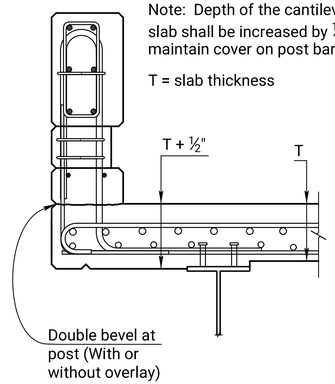
TYPICAL SECTION BETWEEN POSTS WITH CURB



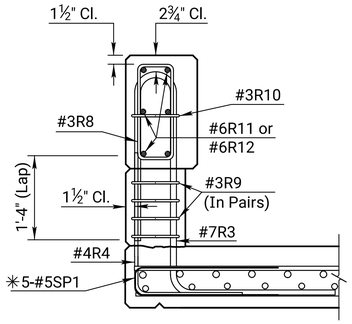
OVERLAY DETAIL BETWEEN POSTS WITHOUT CURB



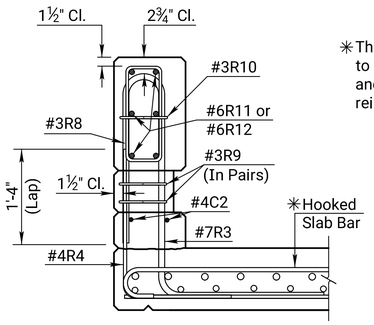
✳HOOKED SLAB BAR



OVERHANG DETAILS

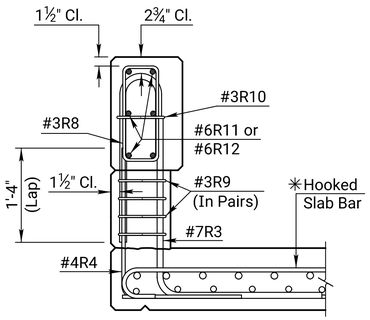


TRANSVERSE REINFORCED SLAB
(Alternate No. 1)



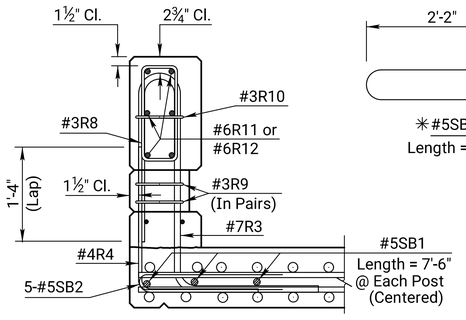
SECTION WITH CURB

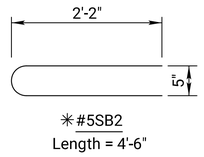
✳The hook may be canted to provide clearance and/or fit between reinforcing.



SECTION WITHOUT CURB

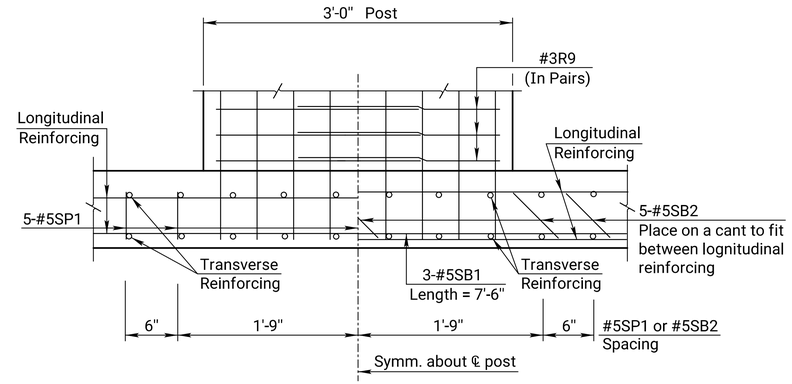
TRANSVERSE REINFORCED SLAB
(Alternate No. 2)





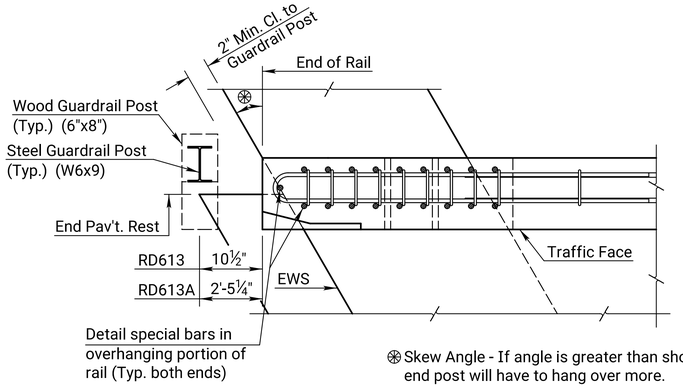
LONGITUDINAL REINFORCED SLAB & R.C.B.'S
(Less Than 1'-0" Thick)

NOTE: This detail is to be used mainly for Corral Rails placed on RCB's with slabs less than 1'-0" thick.

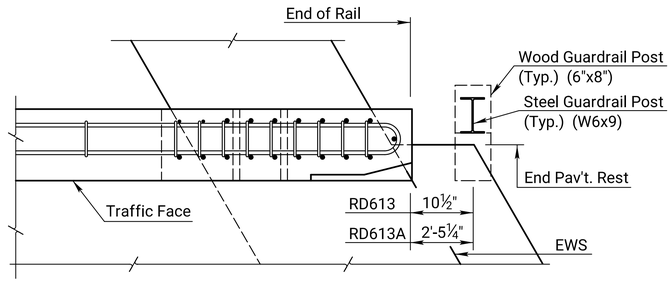


TRANSVERSE REINFORCED SLAB
(Alternate No. 1)

LONGITUDINAL REINFORCED SLAB & R.C.B.'S
(Less Than 1'-0" Thick)

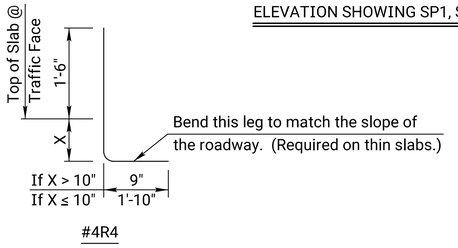


❀Skew Angle - If angle is greater than shown, end post will have to hang over more.



SKETCH FOR SKEWED STRUCTURE

ELEVATION SHOWING SP1, SB1 & SB2 BAR PLACEMENT



NO.	DATE	REVISIONS	BY	APP'D
03	01-27-22	Update guardrail post spacing	M.L.L.	M.A.H.
02	11-15-11	Guardrail Post Update	J.P.J.	T.L.F.
01		Current Release		

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 177-64-63.50 (051) Sta. 300+61.00
32" KANSAS CORRAL RAIL
AUXILIARY DETAILS
K177 over Four Mile Creek
Proj. 177-064 KA-6017-01 Morris Co.

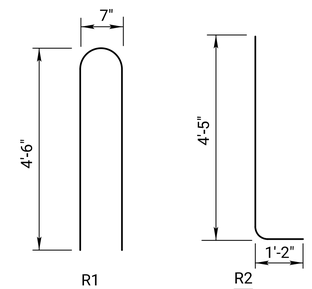
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

CADconform Certify This File Sh. No. 92

CADconform Certify This File

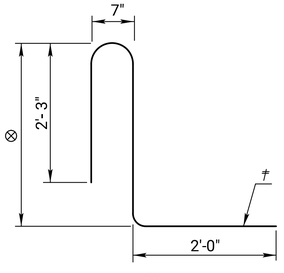
Drawn By : mrockwell Plotted : 16-JAN-2025 07:42
File : ka6017101bbr051-024.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	93	291

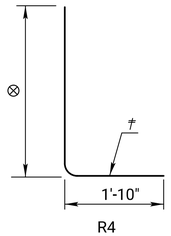


R1

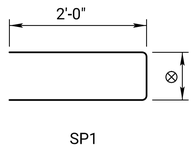
R2



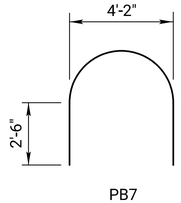
R3



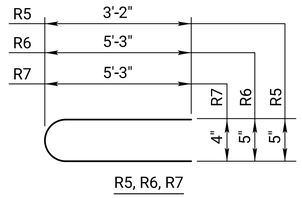
R4
(Lap 1'-4" with R3)



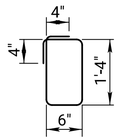
SP1



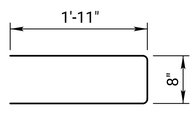
PB7



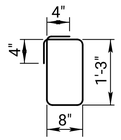
R5, R6, R7



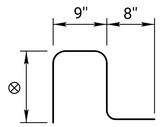
R8



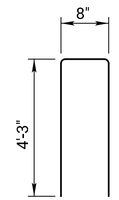
R9



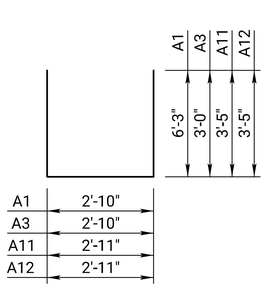
R10



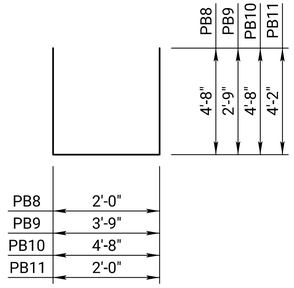
C1



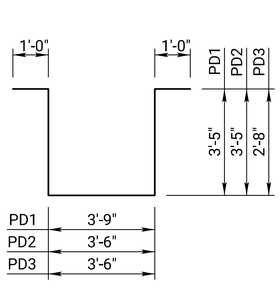
PW7



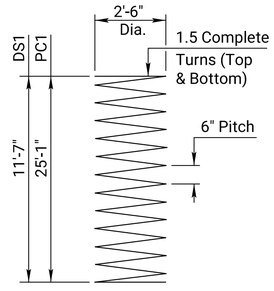
A1, A3, A11, A12



PB8, PB9, PB10, PB11



PD1, PD2, PD3

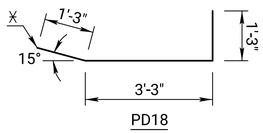


DS1, PC1

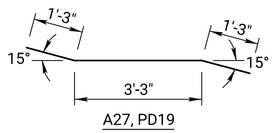
(½" ø smooth or deformed bar)

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

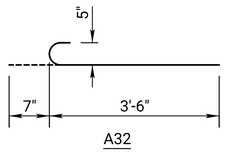
Spiral Spacer Bars:
1) Are included in the mass of reinforcing steel.
2) Min. section modulus = 0.030 in.³
3) 4 required per spiral.



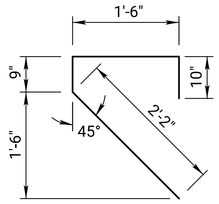
PD18



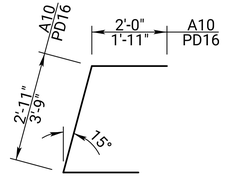
A27, PD19



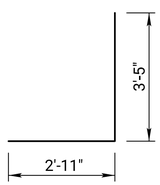
A32



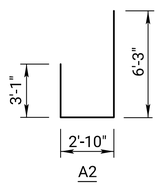
A31



A10, PD16



A13



A2

BENDING DIAGRAMS

All dimensions are out to out of bars.

BILL OF REINFORCING STEEL
Grade 60 (Epoxy Coated)

	Straight Bars				Bent Bars			
	Mark	Size	Number	Length	Mark	Size	Number	Length
Abutments	A4	8	16	29'-7"	A27	8	40	5'-9"
	A14	8	16	4'-10"				
	A15	8	8	29'-7"	A1	5	60	15'-4"
					A2	5	40	12'-2"
	A5	5	12	29'-7"	A3	5	100	8'-10"
	A18	5	8	29'-7"	A10	5	40	6'-11"
	A21	5	6	4'-0"	A11	5	20	9'-9"
	A22	5	12	7'-8"	A12	5	40	9'-9"
	A23	5	6	4'-10"	A13	5	40	6'-4"
	A24	5	4	6'-8"	A32	5	76	4'-1"
	A25	5	8	8'-6"				
	A26	5	4	7'-1"	A31	4	76	5'-3"
	A28	4	4	23'-11"				

BILL OF REINFORCING STEEL
Grade 60 (Epoxy Coated)

	Straight Bars				Bent Bars			
	Mark	Size	Number	Length	Mark	Size	Number	Length
	PD6	6	12	4'-10"	PD18	8	16	5'-9"
					PD19	8	24	5'-9"
	PD4	4	12	4'-0"				
	PD5	4	24	7'-8"	PD1	4	32	12'-7"
	PD15	4	4	23'-2"	PD2	4	16	12'-4"
	PD17	4	20	3'-4"	PD3	4	16	10'-10"
					PD16	4	8	7'-7"
	Non-Epoxy							
	DS2	10	160	14'-7"	PB7	5	28	11'-6"
	PC2	10	160	29'-7"	PB8	5	16	8'-8"
					PB9	5	472	10'-3"
	PB1	9	12	20'-9"	PB10	5	24	14'-0"
	PB3	9	12	20'-9"	PB11	5	32	8'-2"
	PB4	9	12	23'-8"	PW7	5	88	9'-2"
Piers	PB6	9	12	23'-8"				
					DS1	✳	8	✳
	PB2	6	20	19'-3"	PC1	✳	8	✳
	PB5	6	20	23'-8"				
	PB12	6	104	5'-6"				
	PW4	6	4	4'-10"				
	PW6	6	8	7'-11"				
	PW1	5	96	4'-10"				
	PW2	5	200	9'-0"				
	PW3	5	100	4'-6"				
	PW5	5	192	7'-11"				
	PW8	5	88	21'-0"				

✳ See Bending Diagram

BILL OF REINFORCING STEEL
Grade 60 (Epoxy Coated)

	Straight Bars				Bent Bars			
	Mark	Size	Number	Length	Mark	Size	Number	Length
Railing	R11	6	24	6'-8"	R1	7	28	9'-3"
	R12	6	264	9'-8"	R2	7	4	5'-7"
					R3	7	380	7'-6"
	C2	4	8	22'-8"				
					R5	5	8	6'-6"
					R6	5	8	10'-8"
					SP1	5	230	4'-5"
					C1	4	68	3'-7"
					R4	4	380	4'-0"
					R7	4	4	10'-7"
					R8	3	640	4'-4"
					R9	3	272	4'-6"
					R10	3	92	4'-6"

BILL OF REINFORCING STEEL
Grade 60 (Epoxy Coated)

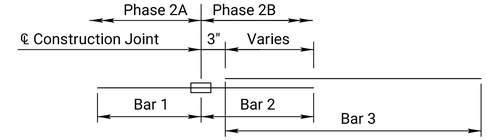
Coupled End Rebar (Place in Phase I Const.)

Coupled Rebar (Place in Phase II Const.)

Straight Coupled Bars

	Bar 1				Bar 2				Bar 3
	Mark	Size	Number	Length	Mark	Size	Number	Length	Mark
Coupled Bars	A6	8	16	5'-7"	A8	8	16	21'-7"	A4
	A16	8	8	5'-7"	A17	8	8	21'-7"	A15
	PD9	6	4	2'-7"	PD12	6	4	2'-3"	N/A
	A7	5	12	4'-4"	A9	5	12	21'-7"	A5
	A19	5	8	4'-4"	A20	5	16	21'-7"	A18
	A33	5	2	1'-10"	A34	5	2	2'-1"	N/A
	A35	5	4	3'-8"	A36	5	4	3'-11"	N/A
	A37	5	2	2'-3"	A38	5	2	2'-6"	N/A
	A29	4	4	2'-9"	A30	4	4	15'-8"	A28
	PD7	4	4	2'-2"	PD10	4	4	1'-10"	N/A
	PD8	4	8	4'-0"	PD11	4	8	3'-8"	N/A
	PD13	4	4	15'-2"	PD14	4	4	23'-2"	PD15

NOTE: The reinforcing bar lengths are calculated to the center of the coupling device. The mechanical splice system shall meet the requirements of the KDOT Specifications for "Fatigue Resistant" mechanical couplers. The additional material and labor shall be subsidiary to the bid item "Reinforcing Steel (Gr. 60)(Epoxy Coated)".



SPLICE/COUPLER REINFORCING DETAIL

BILL OF REINFORCING STEEL
Grade 60 (Epoxy Coated)

Straight Bars

	Mark	Size	Number	Length	Mark	Size	Number	Length
Slab	S2	8	80	54'-11"	S1	5	56	34'-3"
	S3	8	80	47'-8"	S6	5	305	49'-9"
					S9	5	28	39'-0"
	S4	7	466	20'-1"	S10	5	28	44'-6"
	S5	7	466	24'-4"				
	S7	6	350	20'-3"				
	S8	6	350	24'-4"				

Bend this leg to match the slope of the roadway.

⊗ These dimensions vary due to slope of deck or thickness of slab.

⁑ Bend this leg to be parallel with ℄ Pier.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64-63.50 (051) Sta. 300+61.00

BILL OF REINFORCING & BENDING DIAGRAM
K177 over Four Mile Creek

Proj. 177-064 KA-6017-01 Morris Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

CADconform Certify This File

Sh. No. 93

Drawn By : mrockwell Plotted : 16-JAN-2025 07:42
File : ka6017101bbr051-025.dgn

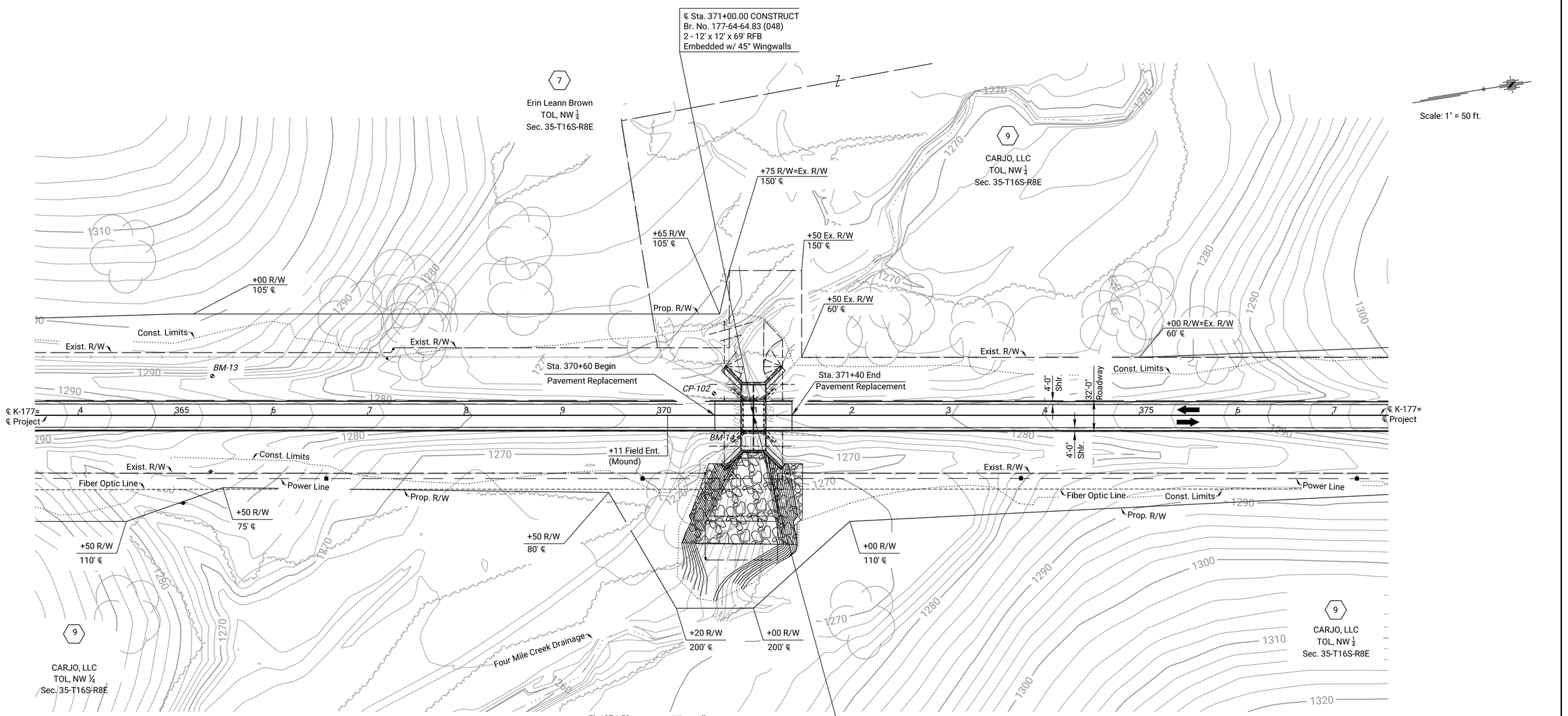
CADconform Certify This File

Control Point #102 ℄ Sta. 370+59.10, 22.69' Lt.
N: 107,841.381 E: 1,742,163.037
1. Set 5/8" Rebar w/ Aluminum KDOT Cap 0.2' Deep
2. Concrete nail w/ KDOT Washer in Guardrail Post 27.5' S
3. SW Cor. of RCB Headwall 30.0' N
4. ℄ Travelway K-177 23.0' E

P.O.T. ℄ Sta. 355+00.00
N: 106,298.558 E: 1,741,937.211
1. Fnd ½" Bar @ P.O.T.
2. Spike and KDOT Washer in Top of Steel Fence Post 64.5' NW
3. Near Face of "No Passing" Sign Post 78.8' NE
4. @ ℄ Travelway K-177

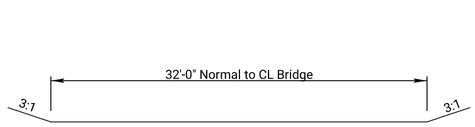
P.O.T. ℄ Sta. 375+00.00
N: 108,273.048 E: 1,742,255.633
1. Fnd. 5/8" Bar @ P.O.T.
2. Spike and KDOT Washer in Top of Steel Fence Post 65.5' ENE
3. Spike and KDOT Washer in Top of Steel Fence Post 71.0' ESE
4. ℄ Travelway K-177 1.0' E

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	YEAR	94	291

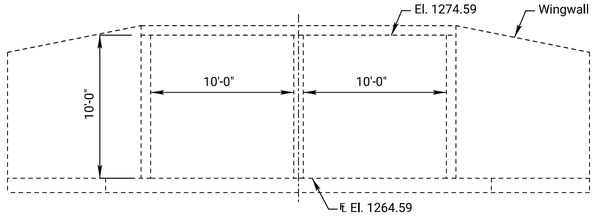


PLAN

℄ Sta. 371+00.00 REMOVE
Br. No. 177-64-64.83 (025)
2 - 10' x 10' x 34.5' RCB



TYPICAL CHANNEL SECTION



EXISTING WATERWAY OPENING

K177 Over Four Mile Creek
(Looking Downstream, East)
Existing Waterway Opening = 200.0 Sq. Ft.

UTILITY OWNERS

Telephone - Tri-County Telephone
Powerline - Flint Hills RECA

HISTORIC HIGHWATER INFORMATION

Randy Kunc a 13 year KDOT Council Grove Maint. Supervisor stated he has only seen the box ¾'s full at Sta. 370+78.30. The water has never reached the shoulder of roadway.

Elevations Shown Are to the NGVD 1929 Vertical Datum

B.M. #13 Rivet and KDOT Washer in a Bedrock Outcropping
40.70' Lt. ℄ STA. 365+38.97 Elev. 1,288.14

B.M. #14 Brass Disc Set Flush in S End of E Headwall
2 - 10x10x32 RCB 17.05' Rt. ℄ STA. 370+90.16 Elev. 1,276.72

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 177-64-64.83 (048) Sta. 371+00.00

CONTOUR MAP
2-12'x12' RFB (1' Embedded)
Proj. 177-064 KA-6017-01 Morris Co.

FHWA APPROVAL		APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

Sh. No. 94

Std. Base File:
Plotted By: mrockwell
File: ks6017001bbr0048-001.dgn
Plot Date: 16-JAN-2025 07:43
Plot Location:

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	YEAR	95	291

DRAINAGE DATA

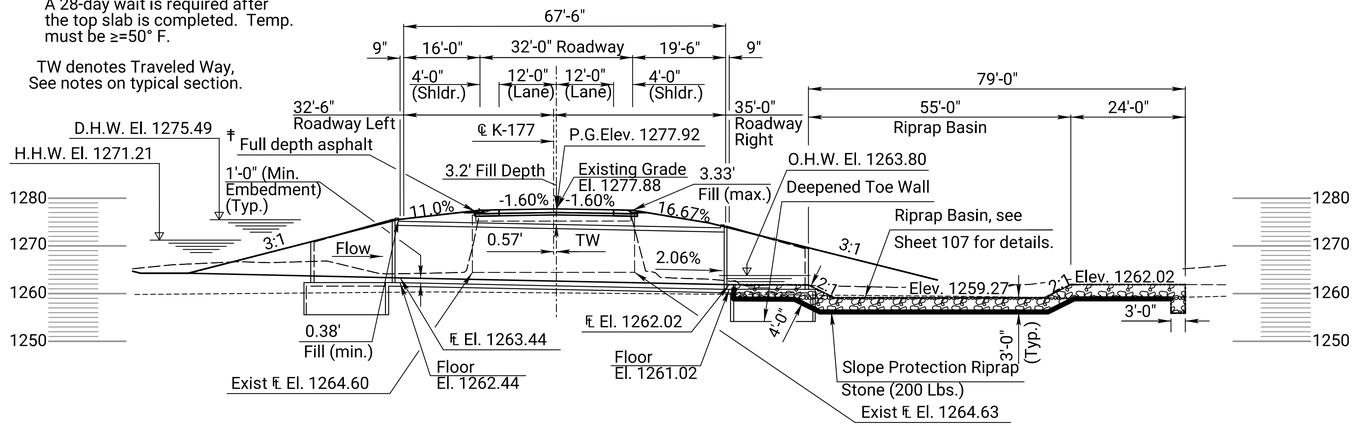
Drainage Area	1.8	sq. mi.
Design Frequency	50	yrs
Design Discharge (Q50)	2898	cfs
Design High Water Elevation	1275.49	ft.
Change In Design Backwater	-2.90	ft.
Design Backwater Elevation	1275.49	ft.
Overtopping Elevation (Sta. 370+00)	1277.88	ft.
Overtopping Discharge	3570	cfs
Overtopping Frequency	99	yrs
Discharge at Q100	3609	cfs
Change in Backwater at Q100	-0.95	ft.
Backwater Elevation at Q100	1278.00	ft.
Historic High Water Elevation	1271.21	ft.
Ordinary High Water Elevation	1263.80	ft.
Total Waterway Provided	264	sq. ft.
Design Waterway Provided	264	sq. ft.
Estimated Ordinary High Water Discharge	14	cfs
Average Velocity at QDesign	17.3	fps
Average Velocity at Q100	18.6	fps

Average Velocity (at exit end of culvert):

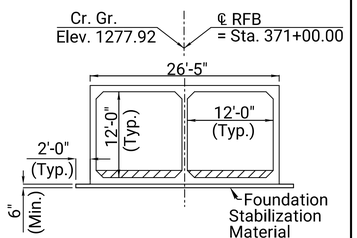
Frequency	2 yr.	50 yr.	100 yr.
Existing Velocity (fps)	10.2	16.9	17.1
Proposed Velocity (fps)	9.0	17.3	18.6

‡ Use "Pavement Water Proofing" see "RCB" Auxiliary Details" sheet. A 28-day wait is required after the top slab is completed. Temp. must be ≥=50° F.

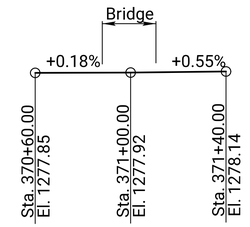
TW denotes Traveled Way, See notes on typical section.



ELEVATION
(Looking Upstation)
2-12x12x69" RFB
(1' EMBEDDED)



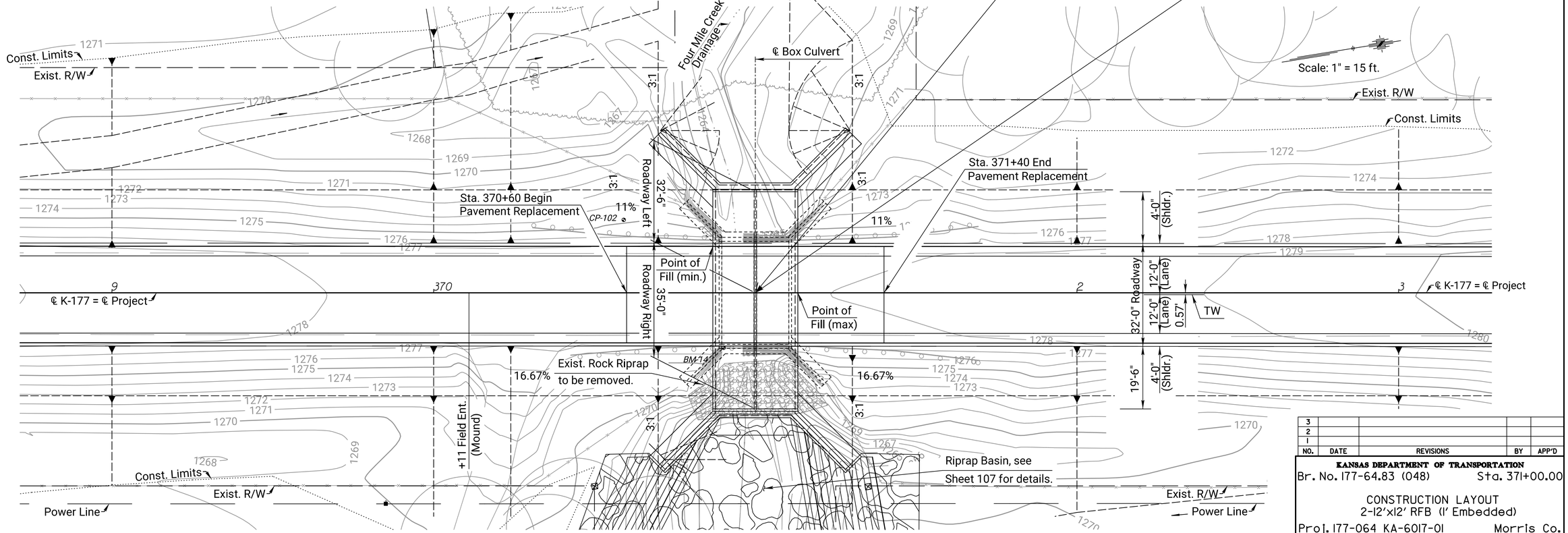
TYPICAL SECTION



PROPOSED PROFILE GRADE
Match Existing Elevations

℄ Sta. 371+00.00 CONSTRUCT
Br. No. 177-64-64.83 (048)
2 - 12' x 12' x 69' RFB
Embedded W/45°Wingwalls

℄ Sta. 371+00.00 REMOVE
Br. No. 177-64-64.83 (025)
2 - 10' x 10' x 34.5' RCB



PLAN

See roadway cross-sections for transition to normal section.

BM #14 - Brass Disc Set Flush in S. End of E. Headwall. of 2-10x10x32 RCB, 17.05' Rt. of Sta. 370+90.16 El. 1276.72

Sea Level Datum of NGVD 1929

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 177-64.83 (048) Sta. 371+00.00

CONSTRUCTION LAYOUT
2-12'x12' RFB (1' Embedded)

Proj. 177-064 KA-6017-01 Morris Co.

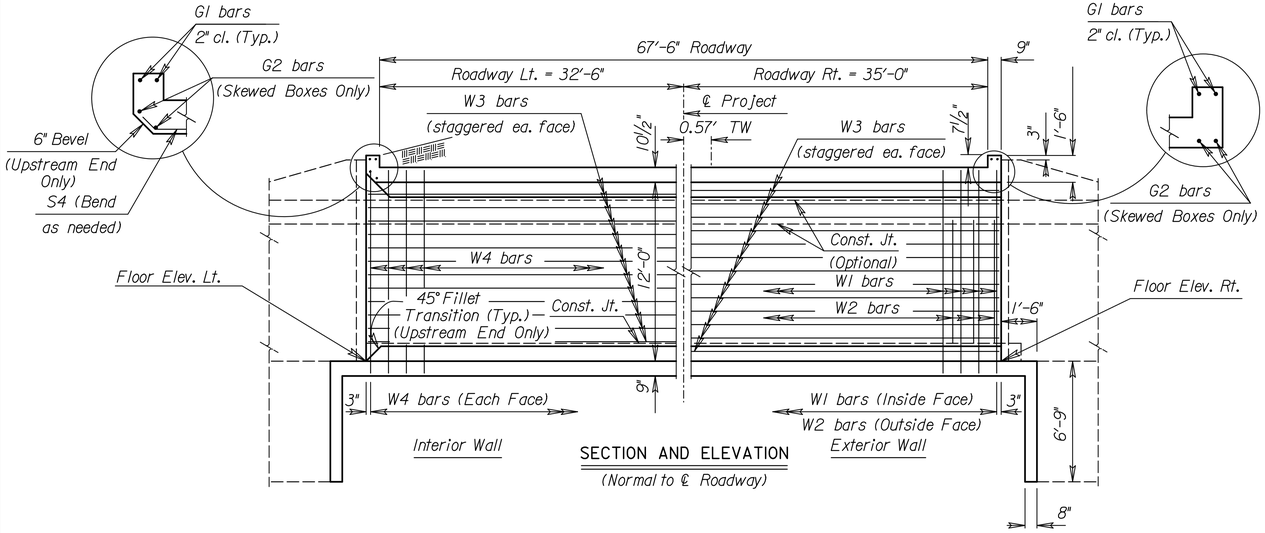
FHWA APPROVAL		APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

Sh. No. 95

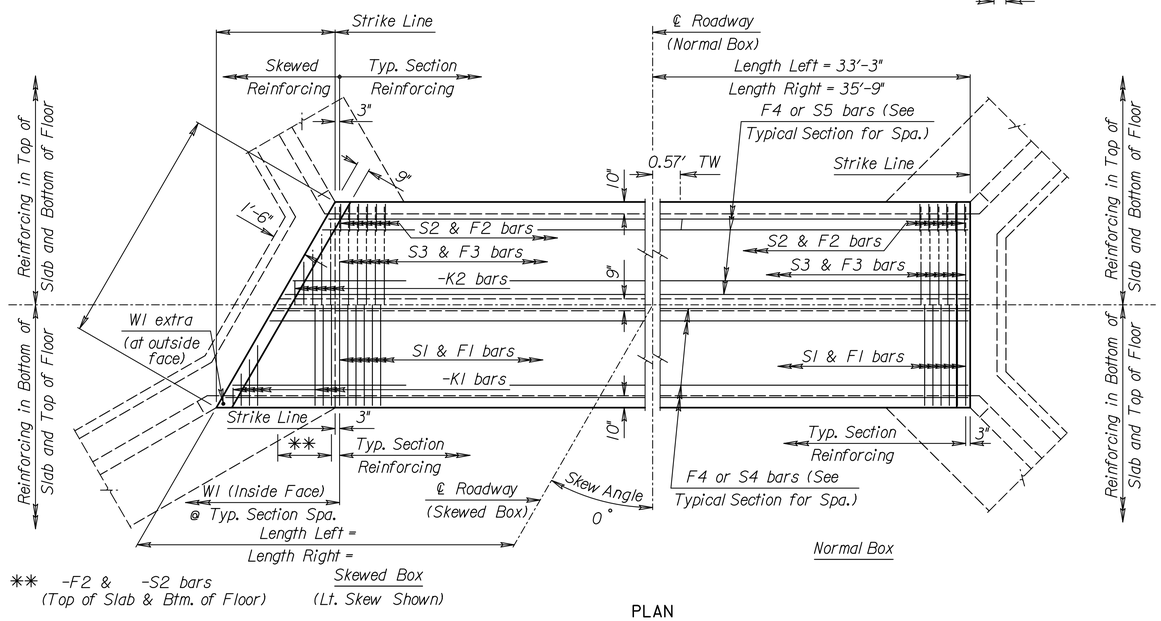
Std. Base File:
Plotted By: mrockwell
Plot Location:
File: ks6017101bbr0048-002.dgn
Plot Date: 16-JAN-2025 07:43

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	96	291

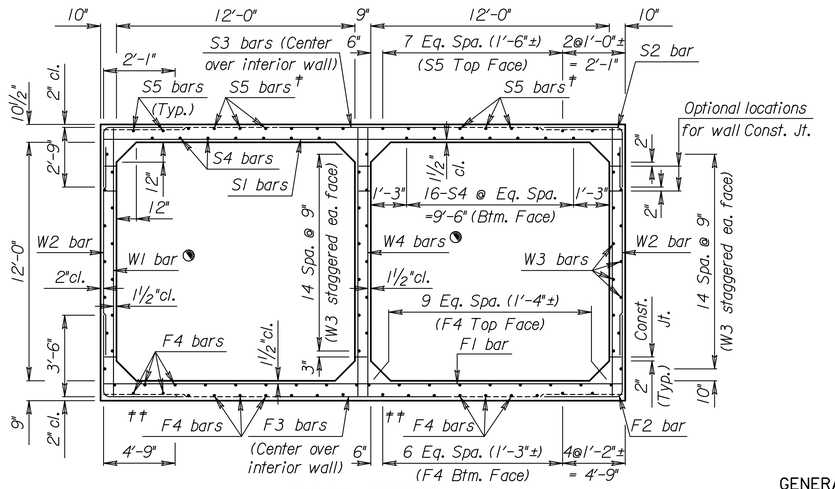
06	SYSTEM PART	VERSION/ID
	CADD VBA	12/6/2000
	DATABASE	5/4/2020
	RCB PROGRAM	7.1.22
	KBOX MODEL ID	79
	CELL LIBRARY	2/8/2022



SECTION AND ELEVATION
(Normal to ℄ Roadway)



PLAN



TYPICAL SECTION

◔ See RCB Auxiliary Details for Optional Splice.

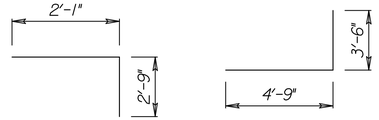
† Place when S3 bar extends to exterior walls.

†† Place when F3 bar extends to exterior walls.

Note: Use only cast-in-place construction at this location.

TW - Denotes Traveled Way, see Typical Section Sheets

Sea Level Datum of NGVD 1929



BENDING DIAGRAM

All Dimensions are out to out of bars.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete f'c = 4,000 p.s.i.
Reinforcing Steel fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and includes the surfacing.

CONCRETE: Use concrete conforming to Grade 4.0 Concrete. Bevel all exposed edges with a ¾" triangular molding. Where Grade 4.0(AE) is specified, place this concrete in the top slab above the Construction Joint.

REINFORCING: Use reinforcing steel conforming to ASTM A615, Grade 60. All dimensions relative to reinforcing steel are to the centerline of the bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB bridges shall be paid for as Class III Excavation.

SEAL COURSE: The Engineer may require a seal course. The seal course shall be unreinforced Concrete(Commercial Grade) with a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when they are required by the plans. Payment for additional quantities that result from including a seal course and/or a floating apron, as a change in the original plans, shall be made at the unit price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS): See the "Auxiliary Details" sheet.

STRIKE LINE: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

⧖ For design purposes ONLY. Do NOT use for Construction — CULVERT SUMMARY — ⊕ includes any welded wire fabric

Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	⧖ Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Concrete Barrel (Cu.Yds.)	Concrete Wings (Cu.Yds.)	Concrete Total (Cu.Yds.)	Reinf. Steel (Gr. 60) Barrel (Lbs.)	Reinf. Steel (Gr. 60) ⊕Wings (Lbs.)	Reinf. Steel (Gr. 60) Total (Lbs.)	LRFR RATING FACTORS HL-93 Loading Inventory	LRFR RATING FACTORS HL-93 Loading Operating
1262.44	1261.02	1277.92	0	0	Flared	Flared	No	No	194.76	93.64	288.40	45703	10290	55993	2.38	3.07

✻ See Bending Diagram

BAR SCHEDULE

F1 Size	F1 Spa.	F1 No.	F1 Length	F2 ✻ Size	F2 ✻ Spa.	F2 ✻ No.	F2 ✻ Length	F3 Size	F3 Spa.	F3 No.	F3 Length	F4 Size	F4 No.	F4 Length	S1 Size	S1 Spa.	S1 No.	S1 Length	S2 ✻ Size	S2 ✻ Spa.	S2 ✻ No.	S2 ✻ Length	S3 Size	S3 Spa.	S3 No.	S3 Length	S4 Size	S4 No.	S4 Length	S5 Size	S5 No.	S5 Length
6	6½"	127	26'-1"	7	7"	236	8'-3"	7	7"	118	10'-6"	4	72	35'-1"	8	6½"	127	26'-1"	5	7"	236	4'-10"	8	7"	118	26'-1"	5	64	35'-3"	4	36	35'-1"

K1 Size	K1 Spa.	K1 No.	K1 Length	K2 Size	K2 Spa.	K2 No.	K2 Length	W1 Size	W1 Spa.	W1 No.	W1 Length	W2 Size	W2 Spa.	W2 No.	W2 Length	W3 Size	W3 No.	W3 Length	W4 Size	W4 Spa.	W4 No.	W4 Length	G1 Size	G1 No.	G1 Length	G2 Size	G2 No.	G2 Length	Size	Spa.	No.	Length
N/A	N/A	N/A		N/A	N/A	N/A		6	1'-1"	128	13'-3"	5	7"	236	11'-5"	4	90	35'-1"	7	1'-1"	128	13'-3"	6	4	26'-1"	N/A	N/A	N/A				

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

SUMMARY OF QUANTITIES	
Concrete (Grade 4.0)(RCB BR)	288.5 C.Y.
Concrete (Grade 4.0)(AE)	0.0 C.Y.
Bridge Backwall Protection System	S.Y.
Reinforcing Steel (Gr. 60)	56000 Lbs.
Reinforcing Steel (Gr.60)(Epoxy Coated)	0 Lbs.
Class III Excavation (RCB)	156.0 C.Y.
Foundation Stabilization	56 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	264 C.Y.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. K-177-64-22.59(048) Sta. 371+00
DOUBLE 12 ft x 12 ft RFB
(EMBEDDED)

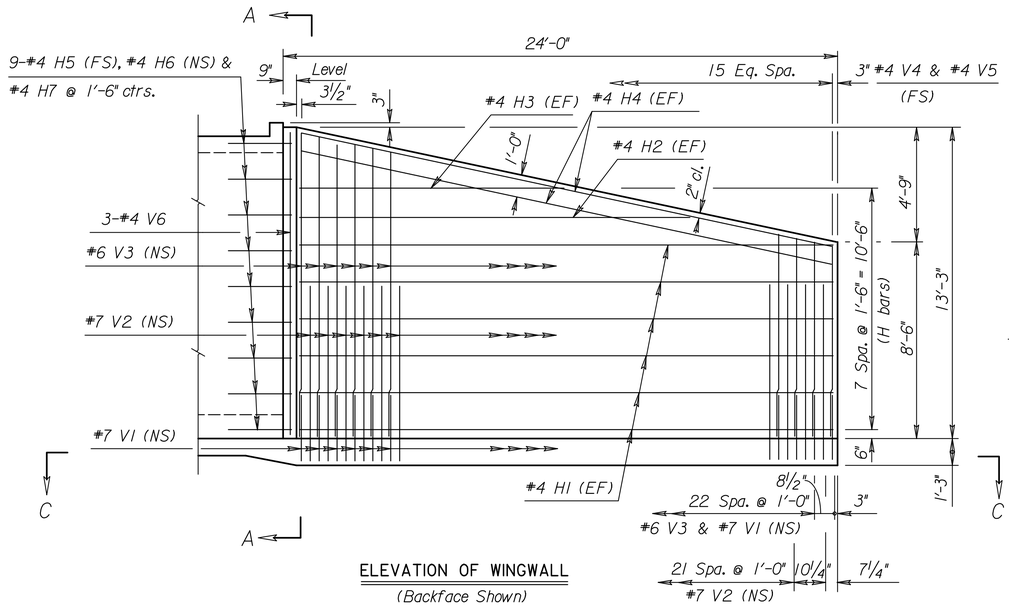
BR 2.12.12 F Morris Co.

FHWA APPROVAL			10-20-10	APP'D	TERRY L. FLECK	
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP	CADD MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA	CADD CK.

Plotted By: mrockwell
File: 371+00(Box).dgn
Plot Date: 16-JAN-2025 07:43
Plot Location:

CADconform Certify This File

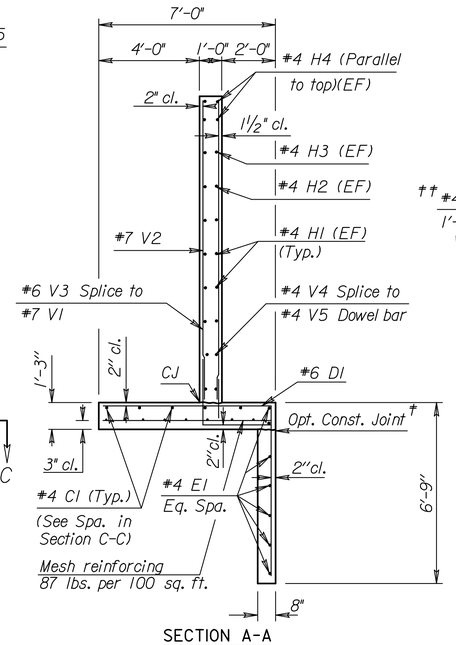
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2023	97	291



ELEVATION OF WINGWALL

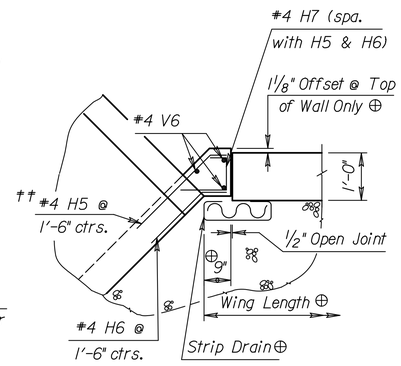
(Backface Shown)

See "RCB Aux. Details" sheet for additional requirements.



SECTION A-A

⊕ Typical both wings



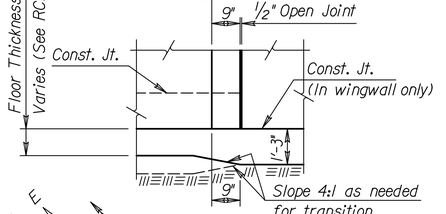
WINGWALL JOINT DETAIL

(Plan View)

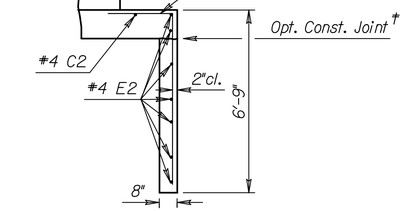
† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2. Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710. Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

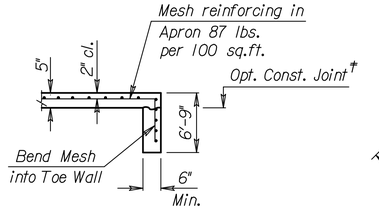


VIEW D-D

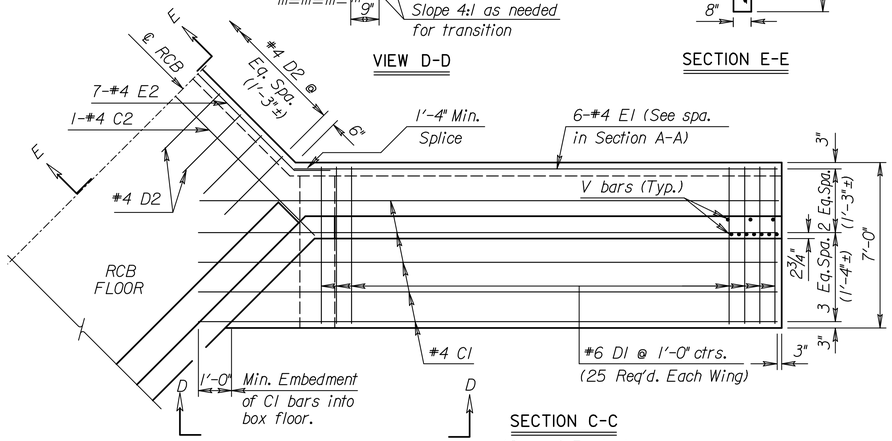


SECTION E-E

NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint

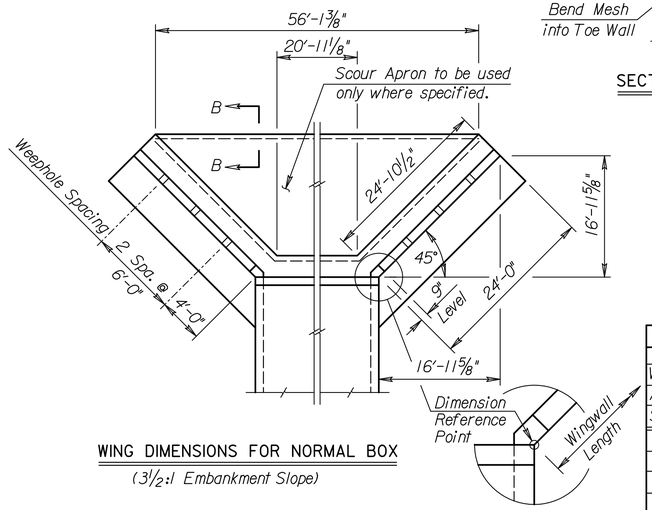


SECTION B-B



SECTION C-C

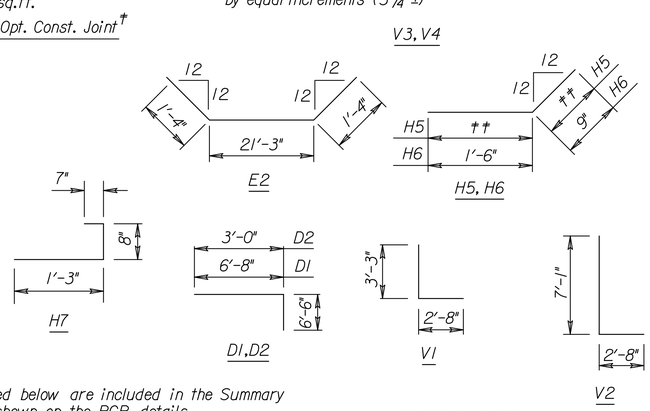
(Plan of Footing)



WING DIMENSIONS FOR NORMAL BOX

(3½:1 Embankment Slope)

V3	Var. 8'-2" to 12'-10"	2 Req'd., each length by equal increments (2⅜"±)
V4	Var. 8'-2" to 12'-10"	2 Req'd., each length by equal increments (3¾"±)



BENDING DIAGRAM

(All dimensions are out to out of bars.)
†† Bend in Field

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	8.09	(C.Y.)	46.82	(C.Y.)
Apron	0.00	(C.Y.)	0.00	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			485.3	Lbs.
Welded Wire Fabric (Wings)			292	Lbs.
Welded Wire Fabric (Apron)			0	Lbs.
Granular Backfill (Wingwalls)			132.00	C.Y.
Filter Fabric (subsidiary)			90.00	S.Y.

NOTE: Reinforcing Bar List is for both wings at one end of box only.

* See Bending Diagram

	Mark	#4C1	#6D1	#4E1	#4C2	#4D2	#4E2	#7V1	#7V2	#6V3	#4V4	#4V5	#4V6	#4H1	#4H2	#4H3	#4H4	#4H5	#4H6	#4H7
0° Skew	Number	10	50 *	12	1	17 *	7 *	48 *	46 *	48	32	32	6	24	4	4	8	18 *	18 *	18 *
	Length	28'-9"	13'-2"	24'-8"	26'-1"	9'-6"	23'-11"	5'-11"	9'-9"	*	*	2'-6"	13'-0"	22'-11"	17'-4"	10'-0"	23'-5"	2'-6"	2'-3"	2'-6"

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. K-177-64-22.59(048) Sta. 371+00
RCB WINGWALLS
12 ft Rise (0°SKEW)

BR 10.00.12 Morris Co.

FHWA APPROVAL		10-20-10	APP'D	TERRY L. FLECK	
DESIGNED	CEA	DETAILED	CEA	QUANTITIES	MLP
DESIGN CK.		DETAIL CK.		QUAN. CK.	CEA
CADD	MLP	CADD CK.	CEA		

Plotted By: mrockwell | Plot Location:
File: 371+00WingI.dgn
Plot Date: 16-JAN-2025 07:43

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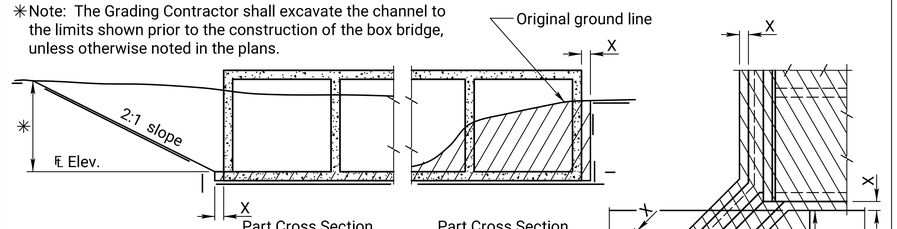
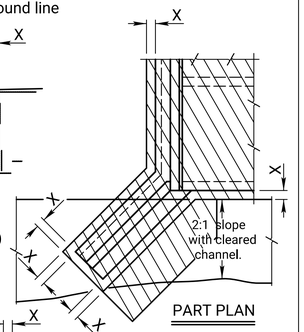
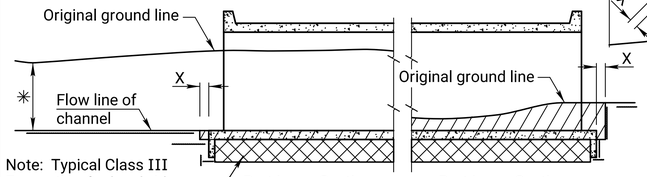
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	98	291

✳Note: The Grading Contractor shall excavate the channel to the limits shown prior to the construction of the box bridge, unless otherwise noted in the plans.

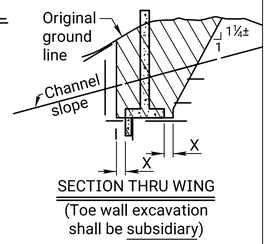






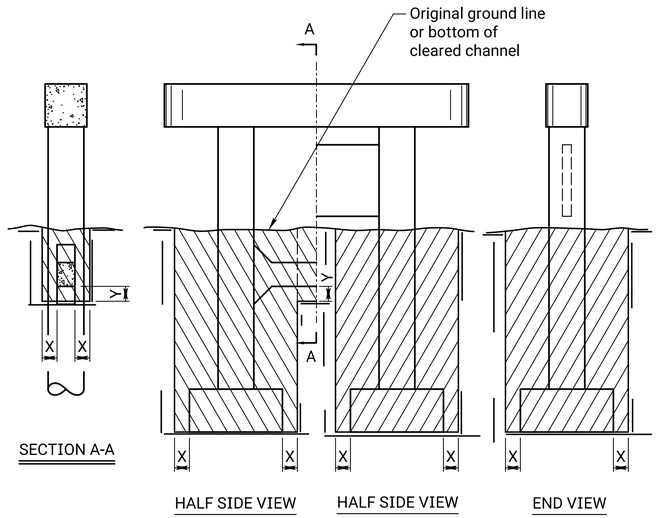
Note: Typical Class III Excavation for box bridges shall be below the "cleared" channel unless otherwise noted on the plans.

Excavation below the elevation of the bottom of the box floor and/or wingwalls is subsidiary to "Foundation Stabilization".



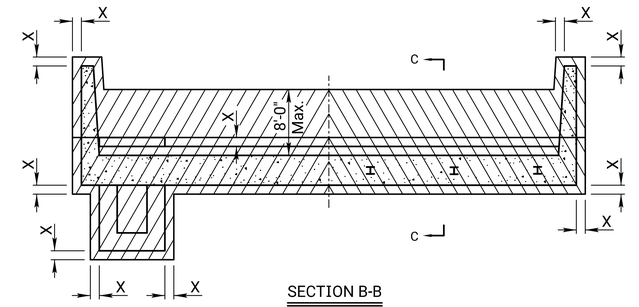
EXCAVATION DETAILS FOR REINFORCED CONCRETE BOX CULVERT

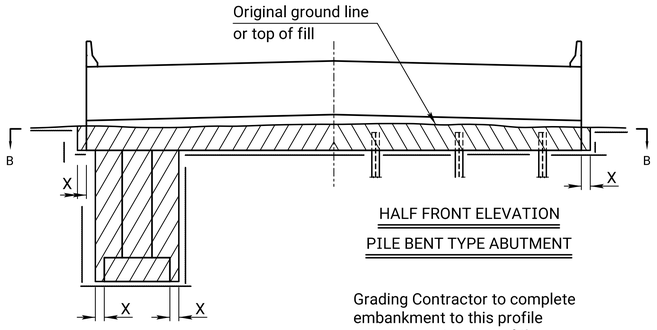
Note: Excavation for culverts less than bridge length and the additional excavation for "Embedded Structures" shall not be paid for as Class III Excavation, but shall be subsidiary to Grade 4.0 Concrete.

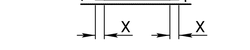


EXCAVATION DETAILS FOR TYPICAL PIERS

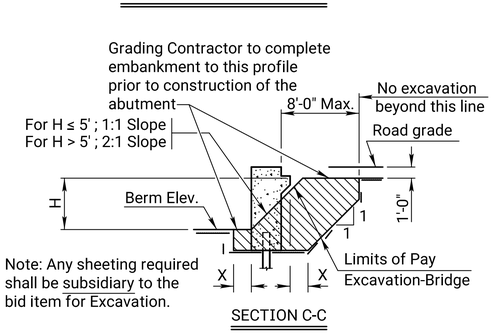
See detail when rock or shale (rock) is encountered. ❀







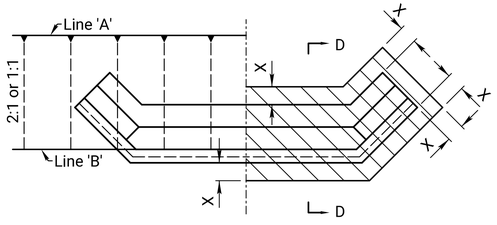
Note: Bridge Contractor shall finish the embankment and berms after the construction of the abutment and dispose of any excess material as approved by the Engineer.

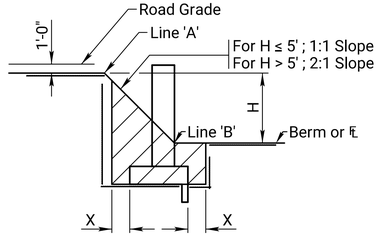


Note: Any sheeting required shall be subsidiary to the bid item for Excavation.

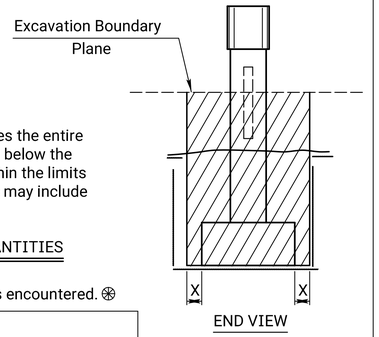
EXCAVATION DETAILS FOR TYPICAL ABUTMENTS

See detail when rock or shale (rock) is encountered. ❀





EXCAVATION DETAILS FOR ABUTMENTS WITH FLARED WINGWALLS



Note: Class II Excavation includes the entire volume of whatever nature found below the "Excavation Boundary Plane", within the limits specified for measurement. This may include water or air.

CLASS II EXCAVATION QUANTITIES

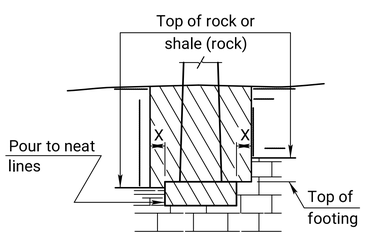
See detail when rock or shale (rock) is encountered. ❀

Note: All bridge excavation shall be computed on the basis of the cross-hatch areas and boundary lines indicated on this sheet and the Excavation Boundary Plane on the Construction Layout.

Sides of trenches in hard or compacted soil including embankments shall be shored, sheeted, braced or otherwise supported when the trench is more than 5 feet in depth and 8 feet or more in length. In lieu of the shoring, the sides of the trench above the 5 foot level may be sloped to preclude collapse. The slope for average soils shall be 1:1. If the angle of repose of the soil is less, flatter slopes shall be required.

Dimension "X" shall be 2'-0" unless indicated otherwise on the general plans.

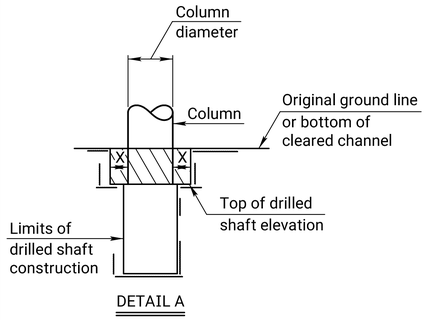
Dimension "Y" shall be 1'-6" unless indicated otherwise on the general plans.

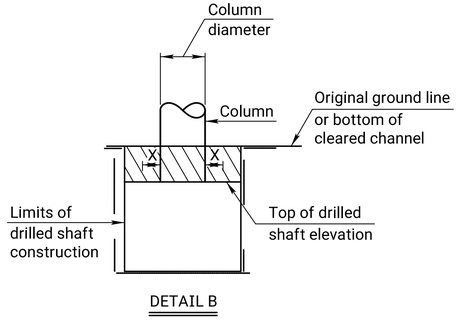


❀ EXCAVATION DETAIL FOR FOOTINGS IN ROCK OR SHALE (ROCK)

(Piers and Abutments)

Note: Excavation below top of rock, hard shale or below top of footing, whichever is lower, shall be to neat lines of the concrete construction.





DRILLED SHAFT DETAILS

Note: Whenever the limits of the drilled shaft construction are greater than the Column Diameter + 2X, the limits of Class I, II or III Excavation shall be the limits of the drilled shaft construction. (See Detail B)

NO.	DATE	REVISIONS	BY	APP'D
06	08-15-12	Embedment Excavation Subsidiary	J.P.J.	T.L.F.
05	05-15-12	Revised Wing Excavation	J.P.J.	T.L.F.
04	03-03-10	Revised Wing Excavation	J.P.J.	T.L.F.

KANSAS DEPARTMENT OF TRANSPORTATION

BRIDGE EXCAVATION (LRFD)

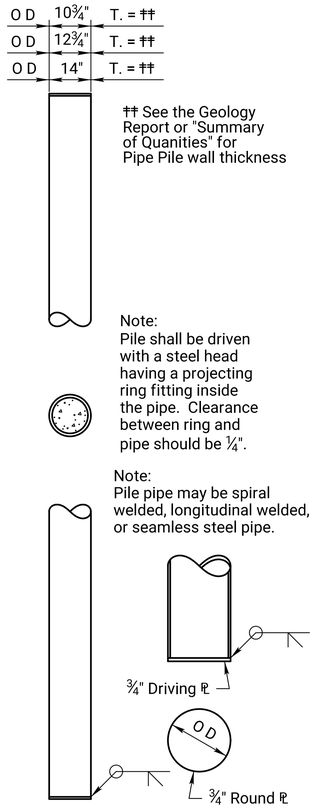
BR100B

FHWA APPROVAL		04-17-10	APP'D.	Terry L. Fleck
DESIGNED	DETAILED	R.D.R.	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	L.R.R.	QUAN.CK.	TRACE CK.

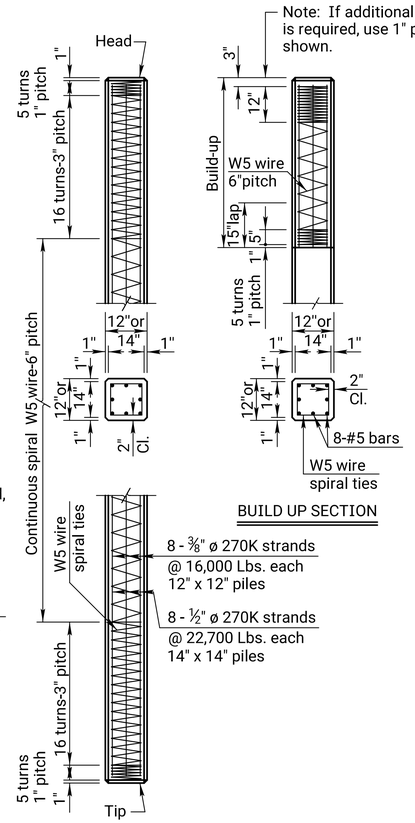
Sh. No. 98

Drawn By : mrockwell Plotted : 16-JAN-2025 07:43
File : ka601701bbr051-026.dgn

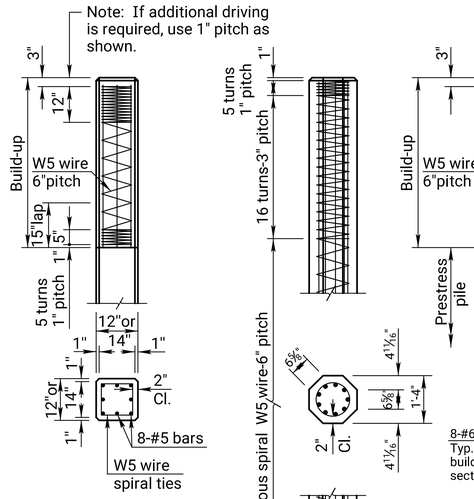
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	99	291



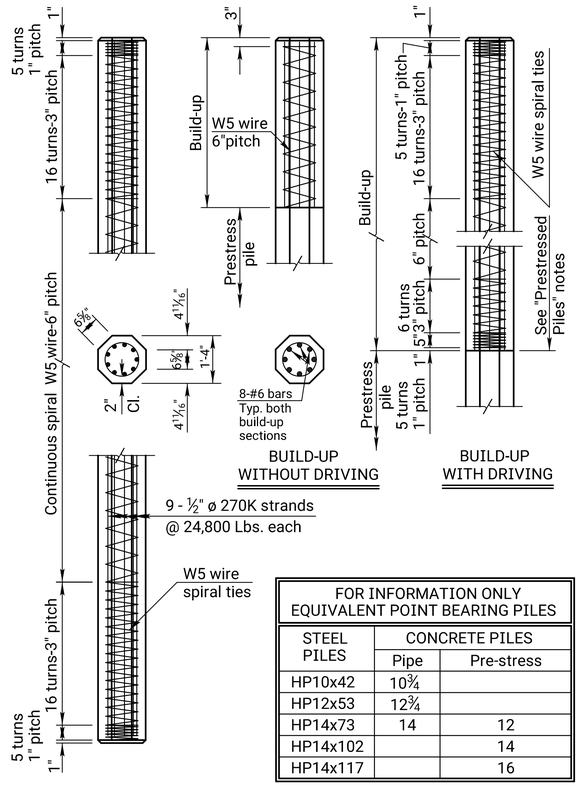
PLAIN ROUND
CAST-IN-PLACE CONCRETE PILES



12" OR 14"
PRESTRESSED
CONCRETE PILES



BUILD UP SECTION



16" PRESTRESSED
CONCRETE PILES

BUILD-UP
WITHOUT DRIVING

BUILD-UP
WITH DRIVING

FOR INFORMATION ONLY EQUIVALENT POINT BEARING PILES		
STEEL PILES	CONCRETE PILES	
	Pipe	Pre-stress
HP10x42	10¾	
HP12x53	12¾	
HP14x73	14	12
HP14x102		14
HP14x117		16

GENERAL NOTES

PRESTRESSED PILES: Fabricate prestressed concrete pile splices in accordance with the Manufacturer's recommendations subject to the approval of the Engineer.

Method of attachment of pile to build-up may be by any of the methods given in the notes on "Alternate Methods." If mild reinforcing steel is used for attachment, the area shall be no less than that used in the build-up.

ALTERNATE METHODS: Method of attachment of a pile to build-up may be by any of the following methods:

1. Cut off at least 2'-0" of pile and expose a minimum of 2'-0" of strands.
2. Cast 8-#6, or 8-#5 bars (equally spaced) into pile head. All bars shall extend into pile head and project from pile head a minimum of 2'-0".
3. Drill 8 holes in pile head (equally spaced) for installation of 8 grouted dowel bars of same size and length as in 2.
4. Provide cored holes for bars as in 3.

No bars or strands are to extend from head of pile or build-up into footing or pile cap unless approved by the Engineer.

TEST PILES: Drive test piles where called for on the bridge plans. The test piles located within the limits of the substructure will become a part of the bridge pile system.

DRIVING FORMULA: Driving formula shall conform to the Standard Specifications.

MEASUREMENT AND PAYMENT: Measurement and payment for all piles shall comply with the Standard Specifications.

REINFORCEMENT: Use reinforcing steel conforming to ASTM A615, Grade 60. Hoops and spirals may be either plain or deformed bars.

PRESTRESSING STEEL: Use uncoated seven-wire low relaxation prestressing strand conforming to ASTM A416, Gr. 270.

STEEL PILE: Steel pile shall conform to the requirements of the Standard Specifications.

PILE POINTS: Pile points shall conform to the dimensions shown and to requirements of the Standard Specifications.

SPECIFICATIONS: Standard Specifications for State Road and Bridge Construction as currently used by the Kansas Department of Transportation.

CONCRETE: Concrete for cast-in-place shall be f'c = 3,500 PSI. Concrete for prestressed shall be f'c = 5,000 PSI.

WELDING: All field welding shall meet the requirements of the Standard Specifications.

Use only Shielded Metal Arch Welding SMAW (stick welding) for pile splices.

Use only low hydrogen E7018, 7016, or 7015 series welding rod (electrode) for all welding applications during pile splicing.

New electrodes are to be purchased for each KDOT project. The electrodes shall arrive on the project in factory hermetically sealed containers, opened and labeled with indelible ink in front of the engineer. The label shall include the current date and the project number. If the container seal is questionable or shows signs of damage the electrode is to be dried in an oven at least one hour at a temperature of 700°F to 800°F.

Upon removal from intact hermetically sealed factory packaging or the drying oven the electrode is to be placed in a storage oven with a minimum temperature of 250°F.

When electrodes are removed from the hermetically sealed container or storage oven and exposed to the atmosphere for less than 4 hours place into the storage oven for at least 4 hours before removing for use.

If electrode is exposed to the atmosphere for 4 hours or more (or 9 hours for moisture resistant electrodes designated with an R in their labeling) then electrode can be dried in a drying oven at a temperature of 450°F to 550°F.

If the electrode is exposed to the atmosphere for 4 hours or more a second time or the rod becomes wet discard rod.

CAST-IN-PLACE SHELLS: Steel shells for cast-in-place concrete piles shall conform to the requirements of the Standard Specifications.

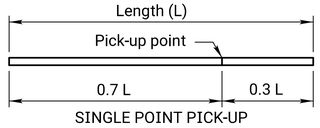
All piles driven without a mandrel shall be of the minimum thicknesses shown. Piles driven with a mandrel shall be of sufficient strength and thickness to withstand driving without injury and to resist harmful distortion and/or buckling due to soil pressure after the mandrel is removed.

Remove, replace or correct to the satisfaction of the Engineer improperly driven, broken or otherwise defective pipe piles. Otherwise drive an additional pile at no extra cost.

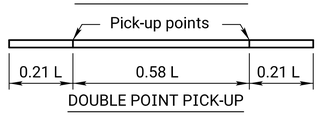
The Contractor shall maintain a light suitable for visual inspection of the pile on the job at all times prior to and during the filling of the pipe.

PAINT: All paint shall comply with the Standard Specifications, or as specified on the plans.

MILL TEST REPORTS: Steel piles test reports and steel shell test reports shall comply with the Standard Specifications.



SINGLE POINT PICK-UP



DOUBLE POINT PICK-UP

PICK-UP POINTS FOR PRESTRESSED PILING

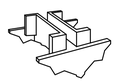
Max. length - 55' single point pick-up
Max. length - 80' double point pick-up

Note: Piles shall be marked at Pick-up points to indicate proper points for attaching handling lines.

Outside Flange

Inside Flange

SHELL PILE POINT



H-Pile Point

CAST STEEL PILE POINT

The pile point shall be a one-piece unit of cast steel. Weld pile points in accordance with manufacturer's recommendations to each steel pile before driving.

Weld Symbology Definition

Use grinder to bevel edges of splice as shown in weld symbology and drawing. In addition to bevels, produce clean, bare, and shiny surfaces at and around the splice welding location.

Lay full penetration root weld from beveled side of splice.

Back gouge root weld from side opposite of root welding application making sure to remove all foreign materials, porous steel, and inclusions from root weld. Finish welding the non beveled side of the splice.

Finish welding beveled side of the splice while removing slag, foreign materials, porous steel, and inclusions in between welding passes, use of a grinder may be needed.

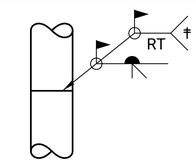
Verify that enough filler metal has been correctly placed in all weld locations to obtain a flush or convex surface with no concavity produced upon completion of the final welds.

SPLICES: Splices for steel piles and shell piling shall be in accordance with details shown on this sheet and the Standard Specifications.

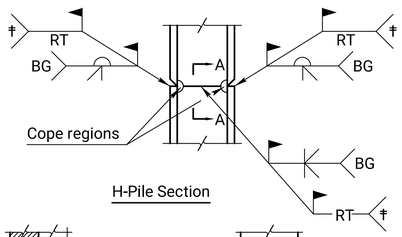
For integral pile bent abutments and piers, if a pile splice is required, do not locate the pile splice within a region extending 2'-0" above and 10'-0" below the bottom of the concrete web wall. For abutments, locate the pile splice at least 10'-0" below top of fill.

With the approval of the Engineer, one splice per bent may be allowed in the region described above without testing. If additional splices are anticipated, based on the geology, the Contractor prior to driving, will locate the splice so that the splice will not fall within the regions described above.

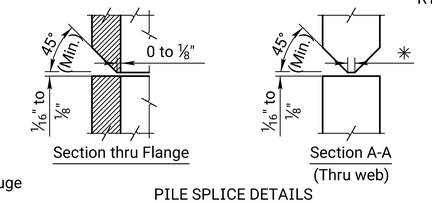
† For integral pile bent abutments and piers, if a splice is located within the regions described above, then the Contractor will test the welds by Radiograph (RT) test methods. Repair and retest any welds not passing the test(s). Each weld tested will have written confirmation of results. Report these results to the Engineer. This work is not paid for directly, but is subsidiary to "Piles".



Pipe Section



H-Pile Section



✳ Minimum as required by welding process.

BG = Backgouge

PILE SPLICE DETAILS

NO.	DATE	REVISIONS	BY	APP'D
04	08-16-18	Add splice web section, clarify note	M.L.L.	J.P.J.
03	09-15-15	Clarify Notes	J.P.J.	C.E.R.
02	06-18-12	Clarify f'c, rod type, use and weld	J.P.J.	T.L.F.

KANSAS DEPARTMENT OF TRANSPORTATION

STANDARD PILE DETAILS

BR110

FHWA APPROVAL		10-04-12	APP'D.	Terry L. Fleck
DESIGNED	J.P.J.	DETAILED	QUANTITIES	TRACED R.A.A.
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-20-2022 Sh. No. 99

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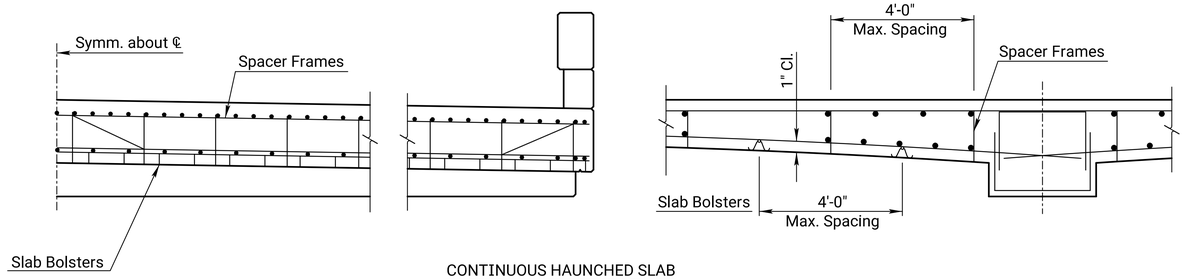
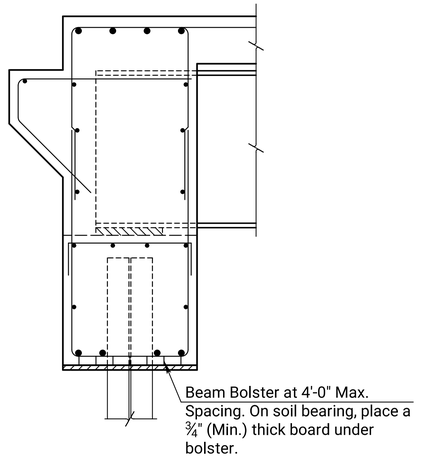
Drawn By : mrockwell Plotted : 16-JAN-2025 07:43
File : ka601701bbr051-027.dgn

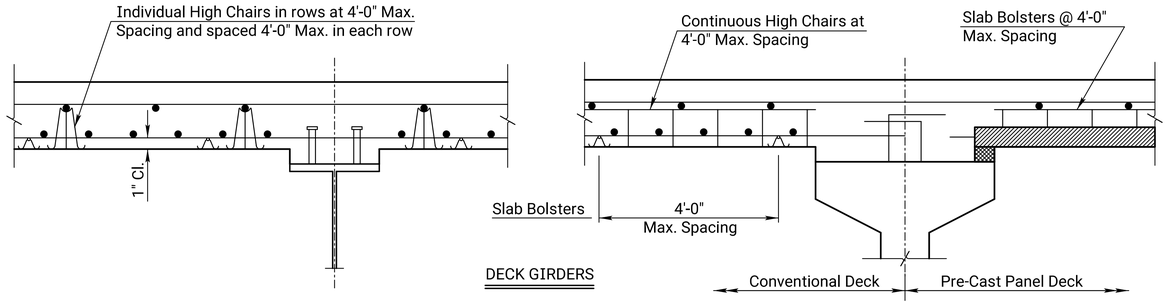
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	100	291



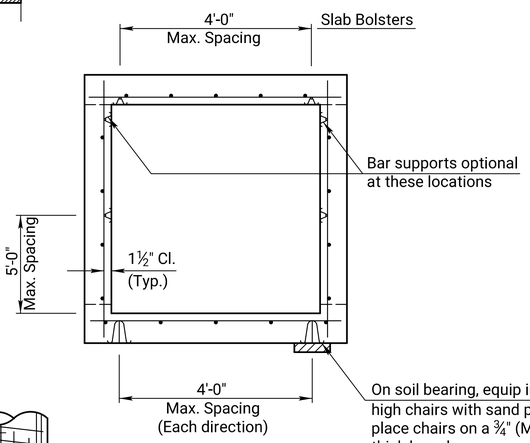
CONTINUOUS HAUNCHED SLAB



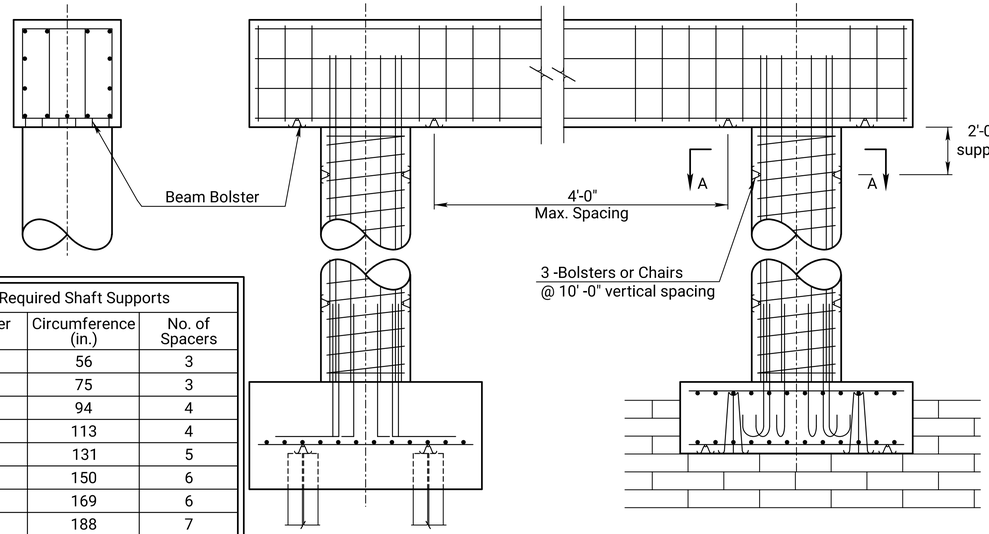
ABUTMENT



DECK GIRDERS

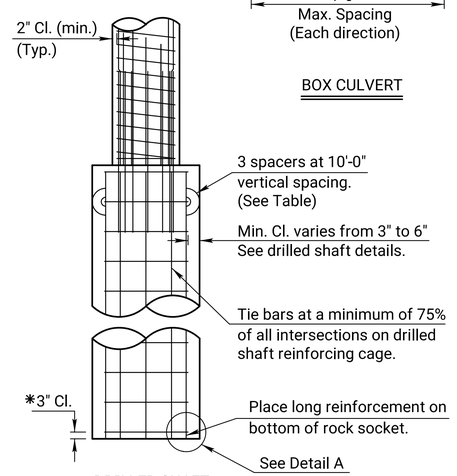


BOX CULVERT

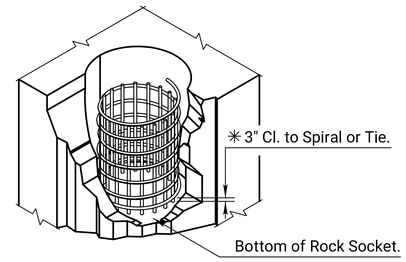


PIER

Required Shaft Supports		
Diameter (in.)	Circumference (in.)	No. of Spacers
18	56	3
24	75	3
30	94	4
36	113	4
42	131	5
48	150	6
54	169	6
60	188	7
66	207	7
72	226	8
78	244	9
84	263	9
90	282	10
96	301	11
102	320	11
108	339	12

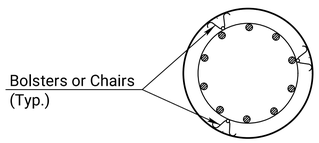


DRILLED SHAFT



DETAIL A

✳Note: Longitudinal reinforcing steel is placed on the bottom of the rock socket. Maintain 3" clearance from the bottom of rock socket to the first spiral or tie bar.



SECTION A-A

GENERAL NOTES

Reference is made to the latest edition of the CRSI "Manual of Standard Practice" for recommended industry practices concerning reinforcing steel.

Use only the following types of bar supports:

1) Wire Bar Supports:

   a) Epoxy coated reinforcing: Class 1 Protection
   b) Non-epoxy coated reinforcing: Class 1, 2, or 3 Protection

2) Plastic Bar Supports

3) Supplementary bars

When securing epoxy coated reinforcement, use tie wires or metal clips that are epoxy or plastic coated.

Do not weld reinforcing steel to bar supports or to other reinforcing steel. Shop weld spacer frames for haunched slabs.

Tie bars at all intersections around the perimeter of each mat and at not less than 2'-0" centers or at every intersection, whichever is greater.

Where more than one length of bar support is required, lap the end legs so they are locked or tied together.

Use proper height supports to maintain the distance between the reinforcing and the formed surface or the top surface of deck slabs within ¼" of that indicated on the plans.

Spacings shown are maximums. Use sufficient supports, as determined by the Engineer, to retain the reinforcing steel in position.

Construct any platforms, required for the support of workers and/or equipment during concrete placement, directly on the forms and not on the reinforcing steel.

Designs and arrangements of Supports or Spacers other than as shown on this sheet, may be used with the permission of the Engineer.

NO.	DATE	REVISIONS	BY	APP'D
05	11-10-10	Column Bar Supports Required	J.P.J.	T.L.F.
04	12-01-05	Drilled Shaft Spiral Steel Placement	J.P.J.	K.F.H.
03	08-21-00	Added Pre-Cast Panel Detail	R.A.M.	K.F.H.

KANSAS DEPARTMENT OF TRANSPORTATION

SUPPORTS AND SPACERS FOR REINFORCING STEEL

BR120

FHWA APPROVAL			11-17-10	APP'D.		Terry L. Fleck	
DESIGNED	R.A.M.	DETAILED	R.A.A.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	L.R.R.	DETAIL CK.	R.A.M.	QUAN.CK.		TRACE CK.	R.A.M.

KDOT Graphics Certified 06-20-2022 Sh. No. 100

KDOT Graphics Certified

Drawn By : mrockwell
File : ka6017 01bbr051-028.dgn
Plotted : 16-JAN-2025 07:43

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	101	291

SUMMARY OF PIPES

Station	Side	Size	Type	Pipe Extensions (FT)		Cross Road Pipe (Ft.)			Entrance Pipes (Ft.)	End Sections ◔					Conc. Pipe AASHTO Class No.	Crown Grade Elevation	Flowline Elevations		Degree of Rotation
						RC, CA			PVC, PE, PP, SRPE, ASC, CA, RC				TYPE I						
				LT	RT	24"	30"	36"	24"	24"	30"	36"	Lt.	Rt.			LT	RT	
330+12.00	RT	24"	CRP (RCP, CAP)			58				2			1	1	II	1279.43	1274.17	1275.41	8° RT
387+00.00	CL	30"	CRP (RCP, CAP)	10	10		20				2		1	1	II	1334.65	1329.93	1329.28	0
400+49.00	CL	30"	CRP (RCP, CAP)	22	4		26				2		1	1	II	1354.94	1342.26	1347.36	0
405+94.00	CL	30"	CRP (RCP, CAP)	18	16		34				2		1	1	II	1355.93	1348.68	1349.52	0
423+49.00	LT	24"	CRP (RCP, CAP)			52				2			1	1	II	1359.67	1356.24	1355.94	10° RT
423+55.00	RT	24"	EP (PVCP, PEP, PPP, SRPE, ACSP, CAP, RCP)						46	2			1	1	II	1360.05	1355.90	1355.78	2° LT
433+49.00	CL	30"	CRP (RCP, CAP)	22	10		32				2		1	1	II	1327.03	1315.34	1321.95	0
453+58.14	LT	24"	EP (PVCP, PEP, PPP, SRPE, ACSP, CAP, RCP)						66	2			1	1	II	1280.29	1272.80	1274.06	5° RT
482+66.00	CL	36"	CRP (RCP, CAP)					74				2	1	1	II	1278.37	1265.00	1264.46	0
TOTALS						110	112	74	112	8	8	2	9	9					

◔ - *See Pipe Culvert Summary Sheet for allowable End Section types.*

RCB QUANTITIES

Station	Side	Size	Type	Crown Grade	Flowline Elevation		Horizontal Roadway		Degree of Rotation	Height of fill Ft.	Extensions (FT)		CONC. GRADE 4.0 (CU. YDS.)	CONC. GRADE 4.0 AE (CU. YDS.)	BRIDGE BACKWALL PROTECTION SYSTEM (SQ. YDS.)	REINF. STEEL GRADE 60 (LBS.)	REINF. STEEL GRADE 60 EPOXY COATED (LBS.)	FOUND STAB. (CU. YDS.)	GRANULAR BACKFILL (WINGWALLS) (CU. YDS.)
					LT	RT	LT	RT			LT	RT							
323+45.00	CL	9'x4'	RCB (Extend Ex.)	1272.21	1264.38	1261.86	31.00	42.00	0	3.2	11	15.5	32.3		5.6	4230		11	24
328+77.00	CL	9'x3'	RCB (Extend Ex.)	1278.00	1270.20	1269.64	33.50	37.90	0	3.4	12.5	16.5	32.6		5.6	4370		11	24
351+00.00	CL	4'x6'	RCB (Extend Ex.)	1332.90	1323.99	1322.75	33.23	45.48	0	1.4	16	16	43		3.3	4480		16	54
439+24.00	CL	4'x4'x123'	RCB	1312.17	1295.48	1297.74	66.00	57.00	0	9.8			50.9			4800		24	24
450+73.00	CL	8'x8'x103'	RCB	1281.86	1265.96	1263.94	48.00	55.00	0	7.0			121.3			12460		36	104
461+53.00	CL	8'x8'x204'	RCB	1283.86	1257.43	1253.04	92.00	112.00	0	19.7			232.8			29930		61	104
TOTALS													512.9		# 14.5	60270		159	334

\# SUBSIDIARY

Note:
Quantities listed above match the Summary of Quantities shown on the RCB details and include quantities for related impact basins.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this item in the Summary of Quantities. See detail on this sheet and Sh. Nos. 68 & 70.

DRAINAGE STRUCTURES

Station	Location	Offset	Side	Type	Inlet Manhole (Special)	Manhole (Type II)	Depth	Top Elevation	Flowline Elevations				Remarks
					4.5' x 4.5'	4' x 4'							
					(Each)	(Each)	(Ft.)		Inflow	Inflow	Inflow	Outflow	
488+50.00	K-177	30.5	RT	Inlet Manhole	1		5	1240.27				1236.36	
488+50.00	K-177	30.5	LT	Inlet Manhole	1		6	1240.23			1235.14	1235.04	
488+70.90	K-177	30.5	LT	Manhole		1	6	1240.19			1234.73	1234.63	
Total					2	1							

See Sh. No. 37 for Schedule of Inlets and Manholes

NO.	DATE	REVISIONS	BY	APP'D
01	05-28-08	Initial Release	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF DRAINAGE STRUCTURES

RD049

FHWA APPROVAL	05-28-08	APP'D.	James. O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. S.W.K.

Sh. No. 101

Plotted : 16-JAN-2025 07:44
Drawn By : mrockwell
File : rd049.dgn

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	102	291

CONCRETE BRIDGE APPROACH SLAB PAVEMENT QUANTITIES

Location	Bridge	Direction of Travel	Station Begin	Station End	Concrete Pavement (10" Unif.)(AE)(Br. App)	Approach Slab Footing
					Sq. Yd.	Cu. Yd.
K-177 Over Fourmile Creek	177-645-63.50	EB	299+02.09	299+41.44	165.0	22.9
K-177 Over Fourmile Creek	177-645-63.50	WB	301+80.69	302+18.39	165.0	22.9
				TOTAL	330.0	45.8

* SALVAGED TOPSOIL

STATION	SIDE	QUANTITY (SQ.YDS.)
298+00 to 488+74	LT	105929.8
298+00 to 488+74	RT	99553.0
TOTALS		205482.8

* See geology report for areas where there is not sufficient topsoil

GUARDRAIL, STEEL PLATE (MGS)

Station to Station		Location	Offset	Side	Pay Length Lin. Ft.	End Terminal (MGS-FLEAT) Alt. 1 (EA)	End Terminal (MGS-SRT) Alt. 2 (EA)	Thrie Beam Bridge Connection (for info only)	Comments
298+06.19	299+46.69	K-177	15.73	RT	100.00	1	1	1	
298+45.76	299+36.24	K-177	21.74	LT	50.00	1	1	1	
301+73.70	302+76.64	K-177	14.73	LT	62.50	1	1	1	
301+84.15	302+74.63	K-177	15.73	RT	50.00	1	1	1	
Total					262.50	4	4	4	

CLEANING OF EXISTING STRUCTURES (FOR INFORMATION ONLY)

STATION	SIDE	ALIGNMENT	DESCRIPTION	REMARKS
323+45.00	CL	K-177	9' x 4' RCB (Extend Ex.)	
328+77.00	CL	K-177	9' x 3' RCB (Extend Ex.)	
351+00.00	CL	K-177	4' x 6' RCB (Extend Ex.)	
488+70.90	LT	K-177	30" x 273' RCP	

Removal of Existing Structures

For Information Only

Station	Location	Side	Item
298+75.34	K-177	NB	52.5' of Guardrail
298+76.20	K-177	SB	51.6' of Guardrail
300+45.15	K-177	CL	Br. No. 177-64-63.50 (026)
301+63.78	K-177	NB	52.8' of Guardrail
301+65.52	K-177	SB	50.6' of Guardrail
370+30.74	K-177	SB	138.9' of Guardrail
370+42.59	K-177	NB	127.4' of Guardrail
371+00	K-177	CL	Br. No. 177-64-64.83 (025)
423+49	K-177	LT	24" x 37' RCP
423+55	K-177	RT	24" x 43' RCP
439+25	K-177	CL	4' x 4' x 73' RCB
447+48.16	K-177	SB	363.6' of Guardrail
448+47.86	K-177	NB	364.5' of Guardrail
450+73	K-177	CL	8' x 8' x 64' RCB
453+58	K-177	LT	24" x 59' CMP
459+98.85	K-177	NB	476.6' of Guardrail
460+23.79	K-177	SB	475.6' of Guardrail
461+53	K-177	CL	7' x 7' x 113' RCB

For Information Only. This list may not be complete. Payment for structures or obstructions not listed, but whose removal is required by the construction as determined by the Engineer, shall not be paid for directly, but shall be included in the Bid item "Removal of Existing Structures".

MOWING

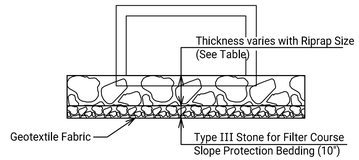
Location	Station	Station	Length (PMPS)
K-177	298+00.00	299+39.36	0.1
K-177	301+80.55	488+55.00	7.1
		TOTAL	7.2

FLY ASH SLURRY GROUT (HIGH STRENGTH)

Station	Side	Cu. Yds.	Remarks
349+85.00	CL	11	Fill 2' x 2' x 77' RCB
482+66.00	CL	10	Fill 2' x 2' x 70' RCB
TOTAL		21	

SLOPE PROTECTION (RIPRAP STONE)

STATION	SIDE	AVG. WIDTH	AVG. LENGTH	AREA	THICKNESS	100 lbs.	200 lbs.	10" BEDDING FOR SLOPE PROTECTION (TYPE III STONE)	GEOTEXTILE FABRIC	REMARKS
		(FT)	(FT)	(SQ.FT.)	(IN)	(CU.YDS.)	(CU.YDS.)	(CU.YDS.)	(SQ.YDS.)	
323+45	RT	45	14	640	27	54		20	71.1	
328+77	RT	23	31	845	27	71		27	93.9	
371+00	RT						1047			Riprap Basin
400+49	LT	9	15	131	27	11		5	14.6	
450+73	RT	54	17	1086	27	91		5	12.3	90% of bedding would be in BRS (R)
461+53	RT	33	16	525	27	44		17	58.3	
TOTAL						271	1,047	74	250.2	



Note:
RCB shown in section for example only. Dimensions apply to elliptical, arch and round papes.

Slope Protection Typical Section
w/ 10" Bedding

RECAPITULATION OF QUANTITIES

Item	Quantity	Unit
Cleaning Existing Structures	Lump Sum	Lump Sum
Contractor Construction Staking	Lump Sum	Lump Sum
Field Office and Laboratory (Type A)	1	Each
Foundation Stabilization	159	Cu. Yd.
Foundation Stabilization (Set Price)	1	Cu.Yd.
Granular Backfill (Wingwalls)	334	Cu. Yd.
Granular Backfill (Wingwalls)(Set Price)	1	Cu. Yd.
Mobilization	Lump Sum	Lump Sum
Mobilization (DBE)	Lump Sum	Lump Sum
Removal of Existing Structures	Lump Sum	Lump Sum
* Maintenance & Restoration of Haul Roads (Set Price)	Lump Sum	Lump Sum
Concrete for Seal Course (Set Price)	1	Cu. Yd.
Clearing and Grubbing	Lump Sum	Lump Sum
Common Excavation (Rural Large)	57,953	Cu. Yd.
Common Excavation (Contractor Furnished)	5,626	Cu. Yd.
Rock Excavation	21,334	Cu. Yd.
Rock Excavation (Non-Durable Shale)	12,551	Cu. Yd.
Water (Grading)(Set Price)	1	M Gal
Compaction of Earthwork (Type A)(MR-5-5)	82,449	Cu. Yd.
Compaction of Earthwork (Type AA)(MR-5-5)	7,949	Cu. Yd.
Salvaged Topsoil	205,483	Sq. Yd.
Concrete (Gr 4.0)(RCB)	513.0	Cu. Yd.
Reinforcing Steel (Grade 60)	60,270	Lbs.
Fly Ash Slurry Grout (High Strength)	22	Cu. Yd.
Cross Road Pipe (24")	110	Lin. Ft.
Cross Road Pipe (30")	112	Lin. Ft.
Cross Road Pipe (36")	74	Lin. Ft.
End Section (24")	8	Each
End Section (30")	8	Each
End Section (36")	2	Each
Entrance Pipe (24")	112	Lin. Ft.
Guardrail, Steel Plate (MGS)	262.50	Lin. Ft.
Guardrail End Terminal (MGS-FLEAT) Alt. 1	4	Each
Guardrail End Terminal (MGS-SRT) Alt. 2	4	Each
Inlet (Manhole)(Special)	2	Each
Manhole (Reinforced Concrete)	1	Each
Slope Protection (Riprap Stone)	1,318	Cu. Yd.
Bedding for Slope Protection	74	Cu. Yd.
Geotextile Fabric	250	Sq. Yd.
Storm Sewer (30")(RCP)	102	Lin. Ft.
Temporary Surfacing Material (Aggregate)(Set Price)	1	Cu. Yd.
6" Pipe Underdrains (FHT)	320	Lin. Ft.
6" Pipe Underdrains (GK)	40	Lin. Ft.
Guideposts	1	Each
Inertial Barrier System (TL-3)	2	Each
Replacement Modules (IBS)	15	Each
Concrete Safety Barrier (Type F3)(Temporary)	800	Lin. Ft.
Concrete Safety Barrier (Type F3)(Temporary-Relocate)	800	Lin. Ft.
Mowing	7.1	PMPS
Right-of-Way Survey Monuments	113	Each
Concrete Pavement (10" Uniform)(AE)(Br. App.)	330	Sq. Yd.
Bridge Approach Slab Footing	46	Cu. Yd.

*Federally Non-Participating

For Underdrain Quantities, See Sh. No. 39
For Br. No. 177-64-63.50 (051) Quantities, See Sh. No. 71
For Br. No. 177-64-64.83 (048) Quantities, See Sh. No. 96
For Surfacing Quantities, See Sh. No. 103
For Temporary Water Pollution Control Quantities, See Sh. No. 105
For Seeding Quantities, See Sh. No. 122
For Pavement Marking Quantities, See Sh. No. 132
For Signing Quantities, See Sh. No. 157
For Traffic Control Quantities, See Sh. No. 195
For Temporary Concrete Safety Barrier Quantities, See Sh. No. 197

EARTHWORK

STATION TO STATION	EXCAVATION: COMMON CU.YDS.	COMMON VMF	*(HAVENSVILLE SHALE) CU.YDS.	*(HAVENSVILLE SHALE) VMF	*(BLUE RAPIDS SHALE) CU.YDS.	*(BLUE RAPIDS SHALE) VMF	ROCK (PVMT. REMOVAL) CU.YDS.	(PVMT. REMOVAL) VMF	*(SPEISER SHALE) CU.YDS.	*(SPEISER SHALE) VMF	* (BLUE RAPIDS SHALE) CU. YDS	* (BLUE RAPIDS SHALE) VMF	(HAVENSVILLE SHALE) CU.YDS.	(HAVENSVILLE SHALE) VMF	(HAVENSVILLE SHALE) CU.YDS.	(HAVENSVILLE SHALE) VMF	(3 MILE LIMESTONE) CU.YDS.	(3 MILE LIMESTONE) VMF	(FUNSTON LIMESTONE) CU.YDS.	(FUNSTON LIMESTONE) VMF	(CROUSE LIMESTONE) CU.YDS.	(CROUSE LIMESTONE) VMF	COMMON EXCAVATION (CONTR. FURN.) CU.YDS.	COMMON EXCAVATION (CONTR. FURN.) VMF	COMPACTION TYPE AA MR-5-5 CU.YDS.	COMPACTION TYPE A MR-5-5 CU.YDS.	THROUGH CUTS NOT SUBGRADED COMM. CU.YDS.	THROUGH CUTS NOT SUBGRADED TYPE AA MR-5-5 CU.YDS.	EMBANKMENT (CU.YDS.) INITIAL CONSOL.	EMBANKMENT (CU.YDS.) SETTLE-MENT	PLACE SELECT SOIL CU.YDS.	WASTE Common CU.YDS.	WASTE Common VMF	WASTE Rock CU.YDS.	WASTE Rock Weighted VMF
Balance 1 (Phase 2, 3, & 4)	5,294	0.81		1.05		1.05	400	1.00		1.10		1.10		1.10		1.15		1.15		1.15		1.15	5,626	0.81		8,846	1,620	1,620							
STA. 293+14.23 TO 329+00.00																																			
Balance 2 (Phase 1)	18,598	0.81	83	1.05	490	1.05	86	1.00	1,391	1.10		1.10	799	1.10		1.15	762	1.15	1,793	1.15		1.15	0	0.81		25,575	3,553	3,553							
STA. 329+00.00 TO 423+00.00																																			
Balance 3 (Phase 1)	19,641	0.81	0	1.05	5,897	1.05	360	1.00	11,160	1.10		1.10	0	1.10	1,833	1.15	9,499	1.15	5,664	1.15	138	1.15	0	0.81		48,028	2,776	2,776					1,321	1.13	
STA. 423+00.00 TO 488+73.82																																			
TOTAL	43,534		83		6,387		846		12,551				799		1,833		10,261		7,457		138		5,626		0	82,449	7,949	7,949					1,321	

* Non-Durable
All pavement Removal is to be wasted (Assumed 14" Thickness).
Haul 4,036 C.Y. of Rock Excavation (Weighted VMF= 1.13) from Balance 3 to Balance 2
Waste 1,321 C.Y. of Rock Excavation (Weighted VMF = 1.13) in Balance 3

NO.	DATE	REVISIONS	BY	APP'D
2	1-14-08	Rem. Drainage Structure summary	S.W.K.	J.O.B.
1	1-9-91	Detailed on CADD	R.J.S	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES

RD050

FHWA APPROVAL 5-28-08		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. S.W.K.

CADconform Certify This File

Sh. No. 102

Plotted :16-JAN-2025 07:44
Drawn By: mrockwell
File : rd050.dgn

CADconform Certify This File

GENERAL NOTE:

On surfacing projects, the 6" of Compaction Type AA, shown for the center portion on the roadbed, is for the purpose of restoring the original Compaction Type AA which may have been lost since grading operations. The exact locations of this Compaction Type AA, which will be required, is to be determined by the Engineer at the time of construction. This work shall be paid under the bid item "Compaction of Earthwork (Type AA)(MR-5-5)".

~~Over all structures, unless otherwise directed by the Engineer, where the top of the hubguard is level with or above the finished shoulder grade, the earth cover over the structure slab shall be removed and backfilled with _____ material as directed by the Engineer. The removal of this material will be subsidiary. The _____ material used to backfill over the structure shall be paid for at the prices shown in the contract.~~

The earth shoulders shall be compacted full depth ((Type AA)(MR-5-5)) except, when ordered by the Engineer, the top 3" shall be left uncompacted for seeding.

All side roads and house entrances shall be surfaced with See Sh. No. 104 to the R/W line as indicated on the detail. All side roads and house entrances with existing asphalt surface shall be surfaced with See Sh. No. 104 at least to the R/W line or to the end of construction, as directed by the Engineer. Each mailbox turnout (ON PROJECTS WHERE STABILIZED SHOULDERS ARE NOT SPECIFIED) shall be surfaced with See Sh. No. 104 to the limits shown on the detail.

~~Surfacing material (SA_____) shall be used for surfacing house entrances and side roads (_____C.Y./SQ. YD.) beyond the limits of the asphalt surface to the limits of construction as determined by the Engineer.~~

The thickness of side road and entrance surfacing may be increased to the same thickness as the stabilized shoulder within the approximate limits of the shoulder.

On projects which specify both asphalt base and surface course materials, side roads, house entrances and mailbox turnouts may be surfaced with both materials at the contractors option, with the approval of the Engineer.

Quantities for aggregate for shoulders, AS-1, are calculated on the basis of 150 lbs. per cu. ft. Quantities for stabilized base course, AB-3, are calculated on the basis of 1 56 lbs. per cu. ft. Weight/cu. ft. includes moisture allowed by specification.

The base course shall be constructed to the plan thickness as shown.

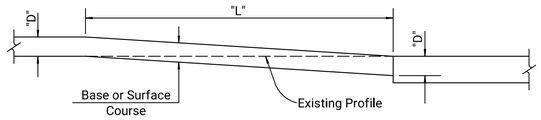
Thicknesses indicated for all construction which is paid for on a weight or volume basis are approximate and may vary to correct for unevenness in the foundations or for other normal unevenness encountered in placement operations.

A tack coat of SS-1HP shall be provided between each lift of all base courses and surface courses and under the first lift of base or surface courses when they are placed on an existing asphalt, brick, or concrete surface, when so ordered by the Engineer and at the rate designated by him. Quantities are included for these tacks calculated at the rate of 0.06 gal. /sq. yd.

Asphalt Material quantities are calculated on the basis of 8.328 lbs. per gal.

Shoulder rumble strips will not be constructed as part of this project.

Centerline rumble strips will not be constructed as part of this project.



TYPICAL PROFILE AT GRADE CONTROL POINTS

The Contractor shall cut the subgrade in accordance with this profile at all grade control points, i.e.; existing pavements, grade bridges and R.R. crossings, also at changes in thickness of base or surface courses. Corresponding dimensions of "D" and "L" shall be as given in the table below.

The work of cutting the subgrade and disposing of excess excavated material shall be subsidiary to other items in the contract.

TABLE OF DIMENSIONS											
D	L	D	L	D	L	D	L	D	L	D	L
1"	25'	3"	75'	5"	125'	7"	175'	9"	225'	11"	275'
2"	50'	4"	100'	6"	150'	8"	200'	10"	250'	12"	300'

SUMMARY OF QUANTITIES

ITEM	MAINLINE MILL & OVERLAY		MAINLINE RECONSTRUCTION		SIDEROADS		ENTRANCES	GUARDRAIL PADS	TOTALS		UNIT
	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2			Alt. 1	Alt. 2	
HMA Overlay (SR-12.5A) (PG64-28)	6,811.8		703.5		323.0				7,838.3	7,838.3	TONS
HMA Overlay (SR-19A)(PG64-22)	3,860.3	5,289.8	824.4						4,684.7	6,114.3	TONS
6" HMA COMMERCIAL GRADE (CLASS A)							230.5	17.0	247.5	247.5	TONS
EMULSIFIED ASPHALT (SS-1HP)	18.9		1.1						20.0	20.0	TONS
QUALITY CONTROL TESTING (HMA)	10,672.1	12,101.6	1,527.9						12,200.0	13,629.5	TONS
SURFACING MATERIAL (AB-3)					211.3				211.3	211.3	TONS
AGGREGATE SHOULDER (AS-1)(4")								269.5	269.5	269.5	SQ. YD.
AGGREGATE BASE (AB-3)(6")	20,140.8		3,576.7		1,033.0				20,140.8	4,609.7	SQ. YD.
WATER (AGGREGATE BASE)(SET PRICE)									1	1	MGAL
MANIPULATION (LIME TREATED SUBGRADE)			3,576.7		1,033.0				4,609.7	0	SQ. YD.
LIME			44.3		255.7				300.0	0	TONS
WATER (LIME TREATED SUBGRADE)			63.6		18.4				82.0	0	MGAL
AGGREGATE FOR SHOULDERS (AS-1)	5,230.3		336.6						5,566.9	5,566.9	TONS
CALCIUM CHLORIDE	19.5		1.3						20.8	20.8	TONS
MILLING	2,612.9								2,612.9	2,612.9	TONS

RATES OF APPLICATION				
RATE	UNIT	ITEM		
145	LB/CUFT	HMA Overlay		
145	LB/CUFT	HMA-Commercial Grade (Class A)		
110	LB/CUFT	Pavement Edge Wedge (Rock)		
150	LB/CUFT	Surfacing Material (SA-1 or SA-X)		
140	LB/CUFT	Surfacing Material (AB-3)		
* 110	LB/CUFT	Dry Unit Weight of Soil		
140	LB/CUFT	Aggregate Base (AB-3)		

* Lime computed at the rate of 5.0% of dry unit weight of soil

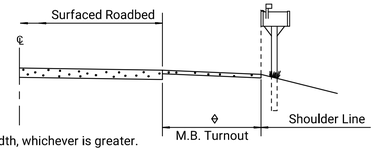
RECAPITULATION OF QUANTITIES ALTERNATIVE 1

ITEM	TOTALS	UNIT
HMA Overlay (SR-12.5A) (PG64-28)	7,838	TONS
HMA Overlay (SR-19A)(PG64-22) Alt #1	4,685	TONS
HMA-Commercial Grade (Class A)	247	TONS
EMULSIFIED ASPHALT (SS-1HP)	20	TONS
FIELD OFFICE AND LABORATORY (TYPE A)	1	EACH
QUALITY CONTROL TESTING (HMA) Alt #1	12,200	TONS
ASPHALT DENSITY PAY ADJUSTMENT	1	EACH
ASPHALT PAVEMENT SMOOTHNESS	1	EACH
ASPHALT AIR VOID PAY ADJUSTMENT	1	EACH
ASPHALT CORE (SET PRICE)	1	EACH
SURFACING MATERIAL (AB-3)	211	TONS
AGGREGATE BASE (AB-3)(6") Alt #1	20,141	SQ. YD.
WATER (AGGREGATE BASE)(SET PRICE)	1	MGAL
MANIPULATION (LIME TREATED SUBGRADE) Alt #1	4,610	SQ. YD.
LIME Alt #1	300	TONS
WATER (LIME TREATED SUBGRADE)(SET PRICE) Alt #1	1	MGAL
AGGREGATE SHOULDER (AS-1)(4")	270	SQ. YD.
AGGREGATE FOR SHOULDERS (AS-1)	5,567	TONS
CALCIUM CHLORIDE	21	TONS
WATER (AGGREGATE SHOULDERS) (SET PRICE)	1	MGAL
MILLING	2,613	TONS

RECAPITULATION OF QUANTITIES ALTERNATE 2

ITEM	TOTALS	UNIT
HMA Overlay (SR-19A)(PG64-22) Alt #2	6,114	TONS
QUALITY CONTROL TESTING (HMA) Alt #2	13,630	TONS
AGGREGATE BASE (AB-3)(6") Alt #2	4,610	SQ. YD.

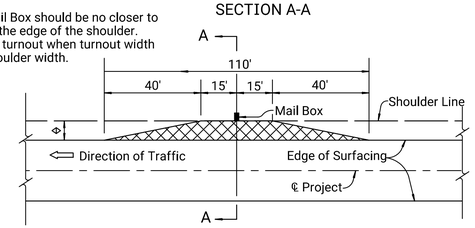
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	103	291



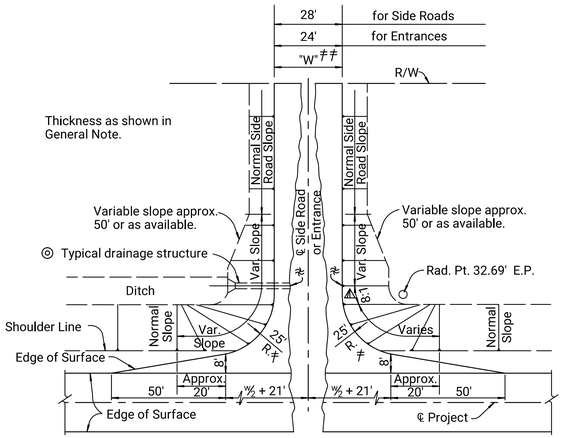
◊ Width shall be 8' or shoulder width, whichever is greater.

SECTION A-A

Note: The face of Mail Box should be no closer to the roadway than the edge of the shoulder. Align with edge of turnout when turnout width is greater than shoulder width.



DETAIL FOR SURFACING OF MAIL BOX TURNOUTS



WITH DRAINAGE STRUCTURE — MOUND ENTRANCE OR SIDE ROAD

DETAIL FOR SURFACING OF SIDE ROADS & HOUSE ENTRANCES

Note:
≠ 1. Sideroad Sta. 330+03.32 Lt. (4 Mile Road)
NW Return = 70' R.
SW Return = 35' R.
≠≠ 1. Sideroad Sta. 330+03.32 Lt. (4 Mile Road)
W = 26'

⚠ 8:1 Slope at the appropriate clear zone shall apply to all mound entrances and mound side roads to 10' fill height. Normal Slope (but not steeper than 6:1) for over 10' fill height.

◎ Normal Slope (but not steeper than 6:1) at approximate ℄ Structure or appropriate clear zone width.

≠ On side roads and entrances which slope toward the highway, a low point approx. 6" deep shall be constructed to divert surface drainage into the highway ditch, unless otherwise shown on the plans.

NO.	DATE	REVISIONS	BY	APP'D
12	1-10-07	Changed bituminous to asphalt	S.W.K.	J.O.B.
11	8-30-06	Changed tack type/rate	S.W.K.	J.O.B.
10	3-24-05	Revised compaction, tack type/rate	S.W.K.	J.O.B.
9	6-12-02	Added low point off shoulder.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES (Surfacing)

RD051

FHWA APPROVAL 9-06-06		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Hecht

Sh. No. 103

Plotted: 16-JAN-2025 07:44

Drawn By: mrockwell
File: rd051_01.dgn

CADconform Certify This File
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	104	291

ENTRANCES AND SIDEROADS

STATION	SIDE	Paved						Unpaved	LOCATION	REMARKS
				Base Alternate 2	Base Alternate 1					
		6" HMA Commercial Grade (Class A)	HMA Overlay (SR-12.5A) (PG64-28) (TON)	6" Aggregate Base (AB-3) (SY)	Manipulation (LTSG)(6")(SY)	Lime (TON)	Ø Water (LTSG) (MGAL)	Surfacing Material (AB-3) (TON)		
316+30.00	LT	131.2							House Mound Entrance	6" HMA beyond 3' Shoulder
330+03.32	LT		125.1	398.1	398.1	98.5	7.1	0.0	4-Mile Road	6" HMA beyond 3' Shoulder, AB-3 subgrade option
330+03.32	RT		65.0	208.2	208.2	51.5	3.7	45.4	4-Mile Road	6" HMA beyond 3' Paved Shoulder, then 6" AB-3 until tie in
423+54.98	LT		62.1	200.4	200.4	49.6	3.6	0.0	V Ave	6" HMA beyond 3' Shoulder,then 6" AB-3 until tie in
423+55.00	RT	74.4							Field Entrance	6" HMA beyond 3' Paved Shoulder
483+30.00	LT		70.8	226.3	226.3	56.0	4.0	166.0	900 Rd	6" HMA beyond 3' Paved Shoulder, then 6" AB-3 until tie in
486+15.00	RT	24.8							House Mound Entrance	6" HMA beyond 3' Shoulder
	TOTAL	230.5	323.0	1,033.0	1,033.0	255.7	18.4	211.3		

MAINLINE RECONSTRUCTION

STATION	STATION	SIDE	SURFACING					BASE ALTERNATIVE 1			BASE ALTERNATIVE 2	ASPHALT TACK COAT	COMMENTS
						SHOULDERS						Emulsified Asphalt	
			1.5" HMA Overlay (SR-12.5A)(PG64-28) (TON)	2.5" HMA Overlay (SR-12.5A)(PG64-28) (TON)	4.5" HMA Overlay (SR-19A)(PG64-22) (TON)	8.5" AS-1 (TON)	CaCl2 (TON)	Manipulation (LTSG) (6") (SY)	Lime (TON)	Ø Water (LTSG) (MGAL)	6.0" Aggregate Base (AB-3) (SY)	SS-1HP (TON)	
293+14.23	299+02.09	CL	65.5	112.2	211.6	170.6	0.6	948.3	11.7	16.9	948.3	0.3	
302+18.30	303+90.00	CL	60.4	102.2	188.7	49.8	0.2	811.2	10.0	14.4	811.2	0.3	
370+60.00	371+40.00	CL	21.9	37.2	69.2	23.2	0.1	302.2	3.7	5.4	302.2	0.1	
438+84.00	439+64.00	CL	21.9	37.2	69.2	23.2	0.1	302.2	3.7	5.4	302.2	0.1	
450+33.00	451+13.00	CL	21.9	37.2	69.2	23.2	0.1	302.2	3.7	5.4	302.2	0.1	
461+13.00	461+93.00	CL	21.9	37.2	69.2	23.2	0.1	302.2	3.7	5.4	302.2	0.1	
482+26.00	483+06.00	CL	21.9	37.2	69.2	23.2	0.1	302.2	3.7	5.4	302.2	0.1	
488+10.00	488+73.82	CL	25.1	42.4	78.1	0.0	0.0	306.1	3.8	5.4	306.1	0.1	Velie Street returns included in this quantity.
		TOTALS	260.6	442.9	824.4	336.6	1.3	3,576.7	44.3	63.6	3,576.7	1.1	

Note: Lime computed at the rate of 5.0% of weight of soil (110 lb./cu.ft.)
Ø Water computed at the rate of 30.0% of weight of soil (110 lb./cu.ft.)(For Information Only)
HMA computed at the rate of 145 lb./cu.ft. (Total Mix - Aggregate & Asphalt)
Water quantities are for information only.

AS-1 Unit weight = 150 pcf
Calcium Chloride (Type II) 7.453 LBS or 0.003726 Tons per Ton of AS-1 (Plan Weight)

GUARDRAIL PAVING

STATION	STATION	SIDE	6" HMA Commercial Grade (Class A) (TON)	4" AGGREGATE SHOULDER (SQ. YD.)
298+01.19	299+16.68	RT		100.5
298+40.76	299+06.24	LT		52.8
299+06.24	299+35.55	LT	4.2	
299+16.68	299+46.80	RT	4.3	
301+73.59	302+03.70	LT	4.2	
301+84.84	302+14.15	RT	4.3	
302+03.70	302+81.64	LT		65.9
302+14.15	302+79.75	RT		50.2
		TOTALS	17.0	269.5

MAINLINE MILL & OVERLAY

STATION	STATION	SIDE	SURFACING					BASE ALTERNATIVE 1		BASE ALTERNATIVE 2	ASPHALT TACK COAT	LOCATION
					SHOULDERS		Millings					
			1.5" HMA Overlay (SR-12.5A) (PG64-28) (TON)	2.5" HMA Overlay (SR-12.5A) (PG64-28) (TON)	8.5" AS-1 (TON)	CaCl2 (TON)	(TON)	4.5" HMA Overlay (SR-19A)(PG64-22) (TON)	6.0" Aggregate Base (AB-3) (SY)	6" HMA Overlay (SR-19A)(PG64-22) (TON)	Emulsified Asphalt (SS-1HP) (TON)	
303+90.00	370+60.00	CL	1,836.3	701.2	1936.0	7.2	967.2	1,447.1	7,529.7	1,982.4	7.0	
371+40.00	438+84.00	CL	1,846.9	692.7	1957.4	7.3	977.9	1,433.9	7,493.3	1,965.2	7.0	
439+64.00	450+33.00	CL	292.8	109.8	310.3	1.2	155.0	227.3	1,187.8	311.5	1.1	
451+13.00	461+13.00	CL	273.9	102.7	290.3	1.1	145.0	212.6	1,111.1	291.4	1.0	
461+93.00	482+26.00	CL	556.8	208.8	590.1	2.2	294.8	432.2	2,258.9	592.4	2.1	
483+06.00	488+10.00	CL	138.0	51.8	146.3	0.5	73.1	107.2	560.0	146.9	0.5	
		TOTALS	4,944.7	1,867.1	5,230.3	19.5	2,612.9	3,860.3	20,140.8	5,289.8	18.9	

Note: HMA computed at the rate of 145 lb./cu.ft. (Total Mix - Aggregate & Asphalt)

NO.	DATE	REVISIONS	BY	APP'D
12	1-10-07	Changed bituminous to asphalt	S.W.K.	J.O.B.
11	8-30-06	Changed tack type/rate	S.W.K.	J.O.B.
10	3-24-05	Revised compaction, tack type/rate	S.W.K.	J.O.B.
9	6-12-02	Added low point off shoulder.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES
(Surfacing)

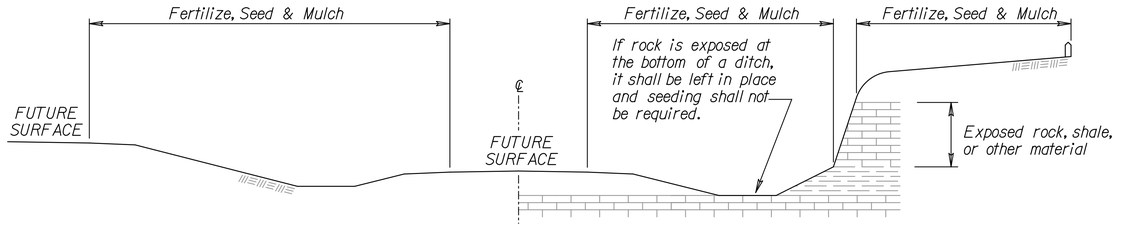
RD051

FHWA APPROVAL 9-06-06		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Hecht

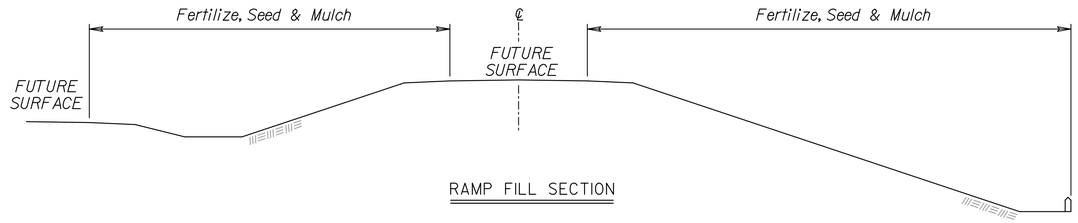
Plotted :16-JAN-2025 07:44
Drawn By : mrockwell
File : rd051_02.dgn

CADconform Certify This File

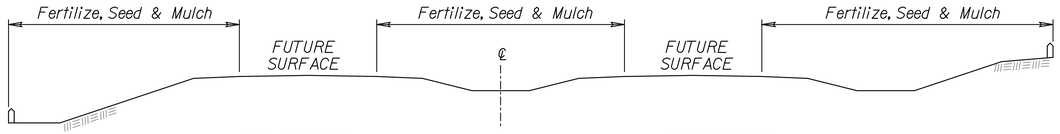
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	105	291



RAMP CUT SECTION



RAMP FILL SECTION



TYPICAL SECTION - DUAL PAVEMENT

FERTILIZER: A ratio and application rate that equals or exceeds the required minimum rate per acre of N, P_2O_5, K_2O listed in Summary of Quantities will be acceptable.

- ** - N = Nitrogen Rate of Application*
- *** - P_2O_5 = Phosphorous Rate of Application*
- **** - K_2O = Potassium Rate of Application*

The Contractor will be required to finish areas of excavation, borrow and embankment in accordance with the specifications. Areas that require installation or construction of temporary water pollution control items will be finished in reasonable close conformity to the alignment, grade and cross section shown on the plans or as established by the Engineer.

CLT = Construction Limit Tract. This area is defined by the entire disturbed area of the project that requires seeding and erosion control measures to be placed. Any impervious areas (i.e. pavement, gravel, riprap, etc.) shall not be included in this measurement.

Slope = Defined by the area of the project that requires Class 1 erosion control material to be placed. This area shall be seeded using the Soil Erosion Mix prior to placement of the material. Drilling seed is preferred, however, broadcasting is acceptable if drilling is not possible.

Channel = Defined by the area of the project that requires Class 2 erosion control material to be placed. This area shall be seeded using the Soil Erosion Mix prior to placement of the material. Drilling seed is preferred, however, broadcasting is acceptable if drilling is not possible.

GENERAL NOTES

The entire disturbed area, excepting the paved or surfaced areas, steep rocky slopes and areas of undisturbed native sod or other desirable vegetation shall be fertilized (limed when required), seeded, and mulched. Soil preparation shall conform to the Standard Specifications.

Temporary seeding shall be done during any time of the year that the soil can be cultivated. After the temporary seeding has been completed on the entire project, permanent seeding shall be done during the normal seeding season.

MULCHING: Mulch shall be spread uniformly over all disturbed areas and punched in the soil, unless otherwise noted on the plans. The rate of application per acre, thickness in place, for the mulching materials is generally as follows:

1¾ - 2¼ Tons per Acre = 1½" loose depth spread uniformly over acre.

Agricultural products, such as native prairie hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards.
Other vegetative mulches are acceptable only with the Engineer's concurrence.

The above rate is a guide. It will be at the discretion of the Engineer to determine what rate is sufficient for adequate protection of newly seeded areas.

SUMMARY OF SEEDING / EROSION CONTROL QUANTITIES

P.L.S. RATE/ ACRE		ACRES		BID ITEM	QUANTITY	UNIT
CLT	SL/CH	CLT	SL/CH			
150	150	40.40	2.00	Temporary Fertilizer (16 - 20 - 0)	6,360.0	LB
20		40.40		Temporary Seed (Canada Wildrye)	808.0	LB
45		40.40		Temporary Seed (Grain Oats)	1,817.9	LB
45		40.40		Temporary Seed (Sterile Wheatgrass)	1,817.9	LB
	48.8		2.00	Soil Erosion Mix	97.7	LB
				Erosion Control (Class 1, Type C)	4,771	SQ YD
				Erosion Control (Class 2, Type E)	2,452	SQ YD
				Erosion Control (Class 2, Type F)	2,466	SQ YD
				Sediment Removal (Set Price)	1	CU YD
				Synthetic Sediment Barrier		LF
				Temporary Berm (Set Price)	1	LF
				Temporary Ditch Check (Rock)	2,968	CU YD
				Temporary Ditch Check (Non-Rock)		CU YD
				Temporary Inlet Sediment Barrier		EACH
				Temporary Sediment Basin		CU YD
				Temporary Slope Drain		LF
				Temporary Stream Crossing		EACH
				Biodegradable Log (9")	241	LF
				Biodegradable Log (12")	321	LF
				Biodegradable Log (20")	6,352	LF
				Filter Sock (12")	241	LF
				Filter Sock (18")	5,349	LF
				Geotextile (Erosion Control)		SQ YD
				Silt Fence	3,009	LF
				SWPPP Design †	1	LS
				SWPPP Inspection †	77	EACH
				Water Pollution Control Manager †	77	EACH
900 lbs / acre		40.40		Mulch Tacking Slurry	54,538	LB
2 tons / acre		40.40		Mulching	121	TON
				Water (Erosion Control) (Set Price)	1	MGAL

NOTE: Projects less than 1 acre shall be bid as "Seeding" by the lump sum. See Permanent Seeding Summary of Seeding Quantities sheet LA850 for further details.

Geotextile (Erosion Control) shall be removed prior to placement of permanent slope protection.

Regreen and Quick Guard are the approved sterile wheatgrass products.

† If the total disturbed area of the project, not just the seeding area, is 1 acre or more, then these bid items must be included.

***** List size of material.*

The amount of mulch and mulch tacking slurry in the bid quantities is estimated. Mulch and Slurry Mulch estimated calculations are as follows:
Mulch = Acres of Seeding X 1.5 X 2 Tons/Acre
Mulch Tacking Slurry = Acres of Seeding X 1.5 X 900 Lbs/Acre
The estimated quantity includes mulching associated with both temporary and permanent seeding operations. The total mulch and mulch tacking slurry required shall be determined in the field. The bid item for mulching and mulch tacking slurry shall be paid for according to the Standard Specifications.

Quantities for all erosion control items are estimated to give full flexibility for compliance with the NPDES permit. Final quantities will be determined in the field.

SOIL EROSION MIX

PLS RATE	NAME	QTY (lb)
1	Blue Grama Grass Seed (Lovington)	2.0
24.5	Buffalograss Seed (Treated)	49.1
1	Sand Dropseed Grass Seed	2.0
6.3	Side Oats Grama Grass Seed (El Reno)	12.6
10	Sterile Wheatgrass (Regreen/Quick Guard)	20.0
6	Western Wheatgrass Seed (Barton)	12.0
48.8	Total (lb)	97.7

The Soil Erosion Mix is to be placed under the Class 1 and/or Class 2 erosion control material.

The Soil Erosion Mix consists of the Shoulder Area of the Permanent Seed Mix used on the project.

NO.	DATE	REVISIONS	BY	APP'D
3	08/03/20	Added Note	MRD	ML
2	12/01/17	Revised Standard	MRD	SHS
1	06/01/17	Revised Standard	MRD	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL

~~LA852A~~

FHWA APPROVAL		1/26/2018	APP'D	Scott H. Shields	
DESIGNED	MRD	DETAILED	MRD	QUANTITIES	CADD
DESIGN CK.	SHS	DETAIL CK.	SHS	QUAN.CK.	CADD CK.

Std. Base File:
Plotted By: mrockwell | Plot Location:
File: la852a.dgn
Plot Date: 16-JAN-2025 07:44

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117064 KA-6017-01	2024	106	291

EROSION CONTROL (CLASS I, TYPE C)						
STATION TO STATION		SIDE	ALIGN.	LENGTH	WIDTH	SQ YARD
323+17.77	323+71.02	LT	K-177	53.25	26.74	158
323+18.79	323+72.04	RT	K-177	53.25	31.99	189
328+51.20	329+02.35	RT	K-177	51.15	26.18	149
328+51.52	329+02.67	LT	K-177	51.15	25.22	143
329+63.15	329+74.72	LT	K-177	11.57	45.63	59
329+75.13	329+90.13	RT	K-177	15.00	21.67	36
330+00.39	330+13.12	LT	K-177	12.73	45.63	65
330+26.17	330+39.98	RT	K-177	13.81	21.67	33
350+73.21	351+26.41	RT	K-177	53.20	44.98	266
350+73.36	351+26.56	LT	K-177	53.20	37.47	221
370+54.82	371+45.18	LT	K-177	90.36	52.11	523
370+54.82	371+45.18	RT	K-177	90.36	60.92	612
386+88.03	387+11.12	RT	K-177	23.09	22.85	59
386+88.05	387+11.14	LT	K-177	23.09	21.65	56
400+37.48	400+60.57	LT	K-177	23.09	24.82	64
400+37.81	400+60.90	RT	K-177	23.09	21.14	54
405+82.41	406+05.50	LT	K-177	23.09	27.03	69
405+83.11	406+06.20	RT	K-177	23.09	19.45	50
423+19.67	423+33.52	LT	K-177	13.85	21.67	33
423+28.63	423+42.87	RT	K-177	14.24	21.67	34
423+63.49	423+78.49	LT	K-177	15.00	21.67	36
423+67.18	423+81.43	RT	K-177	14.25	21.67	34
433+37.23	433+60.32	LT	K-177	23.09	21.25	55
433+37.65	433+60.74	RT	K-177	23.09	17.10	44
438+98.22	439+49.30	LT	K-177	51.08	31.20	177
438+98.22	439+49.30	RT	K-177	51.08	27.74	157
450+40.76	451+05.74	LT	K-177	64.98	42.06	304
450+40.76	451+05.74	RT	K-177	64.98	48.51	350
453+18.22	453+33.22	LT	K-177	15.00	21.67	36
453+75.76	453+90.76	LT	K-177	15.00	21.67	36
461+21.46	461+84.32	LT	K-177	62.86	38.86	271
461+21.46	461+84.32	RT	K-177	62.86	39.24	274
482+53.71	482+78.21	LT	K-177	24.50	19.54	53
482+53.79	482+78.29	RT	K-177	24.50	26.15	71
TOTAL EROSION CONTROL (CLASS I, TYPE C) =						4,771

EROSION CONTROL - CLASS II, TYPE E						
STATION TO STATION		SIDE	ALIGN.	LENGTH	WIDTH	SQ YARD
325+50.00	327+00.00	RT	K-177	150.00	24.84	414
370+00.00	371+00.00	LT	K-177	100.00	16.60	184
376+00.00	376+50.00	LT	K-177	50.00	10.73	60
376+50.00	377+00.00	LT	K-177	50.00	12.91	72
428+50.00	429+75.00	LT	K-177	125.00	13.30	185
431+00.00	432+00.00	LT	K-177	100.00	14.12	157
448+50.00	450+69.00	RT	K-177	219.00	13.30	324
459+25.00	460+50.00	LT	K-177	125.00	13.30	185
461+57.00	464+25.00	LT	K-177	268.00	15.10	450
481+00.00	482+25.00	LT	K-177	125.00	13.30	185
482+60.00	483+00.00	RT	K-177	40.00	15.82	70
485+00.00	486+00.00	LT	K-177	100.00	14.95	166
TOTAL EROSION CONTROL (CLASS II, TYPE E) =						2,452

EROSION CONTROL - CLASS II, TYPE F						
STATION TO STATION		SIDE	ALIGN.	LENGTH	WIDTH	SQ YARD
323+49.00	325+50.00	RT	K-177	201.00	22.37	500
367+25.00	368+00.00	LT	K-177	75.00	15.77	131
371+00.00	372+25.00	RT	K-177	125.00	17.42	242
372+25.00	373+50.00	RT	K-177	125.00	18.25	253
432+00.00	433+49.00	LT	K-177	149.00	14.12	234
439+22.00	441+75.00	LT	K-177	253.00	21.54	606
460+50.00	461+50.00	LT	K-177	100.00	15.77	175
483+00.00	484+00.00	RT	K-177	100.00	14.99	167
484+00.00	484+50.00	RT	K-177	50.00	14.16	79
484+50.00	485+00.00	RT	K-177	50.00	14.16	79
TOTAL EROSION CONTROL (CLASS II, TYPE F) =						2,466

Std. Base File: _____
Plotted By: mrockwell | Plot Location:
File: la852a-ec.dgn
Plot Date: 16-JAN-2025 07:44

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

EROSION CONTROL
SEEDING-SODDING

LA852A-EC

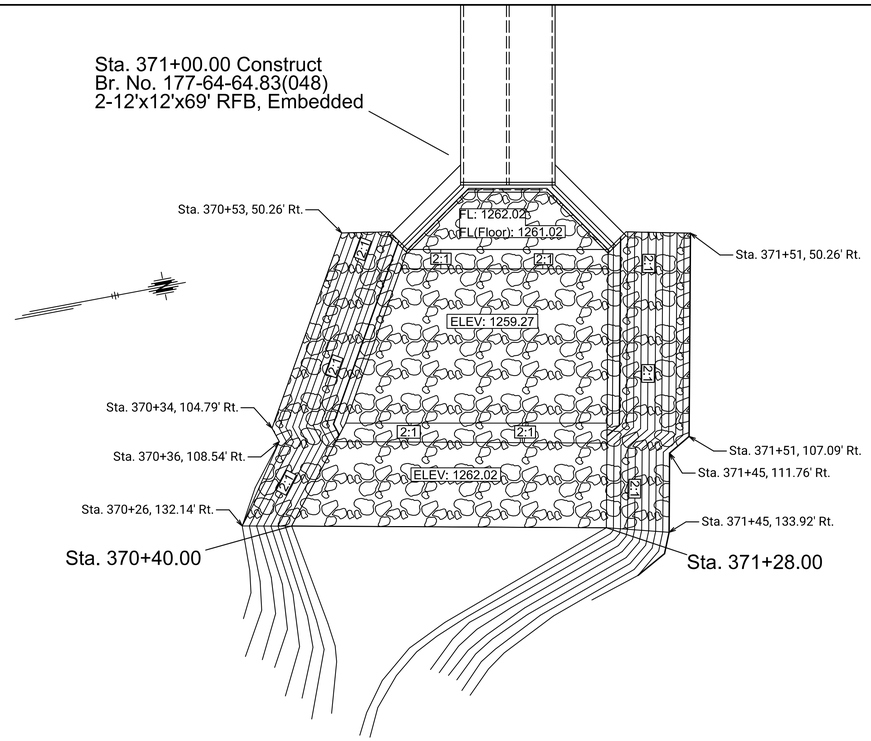
FHWA APPROVAL		1/04/2006	APP'D	Scott H. Shields	
DESIGNED	MRM	DETAILED	MRM	QUANTITIES	CADD MRM
DESIGN CK.	SHS	DETAIL CK.	SHS	QUAN.CK.	CADD CK. SHS

CADconform Certify This File

CADconform Certify This File

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	107	291

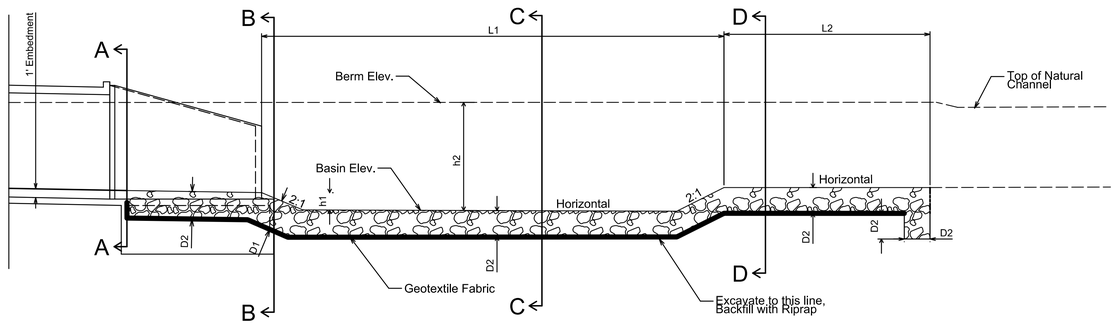
	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021



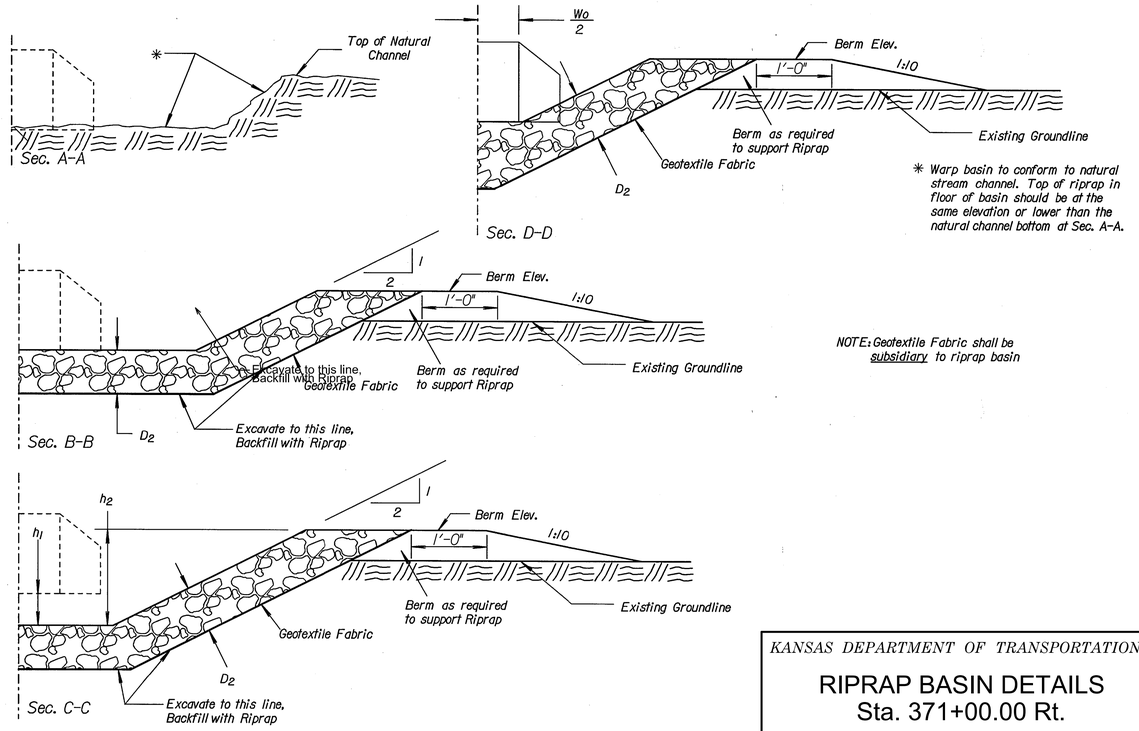
GENERAL NOTE

All work and materials required for this construction shall be paid for by the cubic yard of "Slope Protection (Riprap)(Stone)". Placed aggregate shall be spread in reasonable conformity with the section as shown and as directed by the Engineer. Slope Protection (Riprap)(Stone) shall be measured and paid for by the cubic yard in the vehicle at the location designated by the Engineer and shall be fully compensated for excavation for undercutting, furnishing, hauling, placing and maintaining the material as specified to complete the work.

NOT3510 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# gradation as described in Division 1100 placed to the limits shown on the plans.



Station	Side	Wo Ft	h1 Ft	h2 Ft	L1 Ft	L2 Ft	D1 Ft	D2 Ft	CLASS	RCB Outlet Ft	Basin Elev. Ft	Berm Elev. Ft	Slope Protection (Riprap Stone) (200 lbs.) Cu. Yds.
371+00.00	Rt	24	2.75	10.73	55	24	4	3	LIGHT STONE	1262.02	1259.27	1270	1047



KANSAS DEPARTMENT OF TRANSPORTATION

RIPRAP BASIN DETAILS
Sta. 371+00.00 Rt.

Drawn By : mrockwell
File : Riprap Basin Details.dgn
Plotted : 16-JAN-2025 07:44

CADconform Certify This File

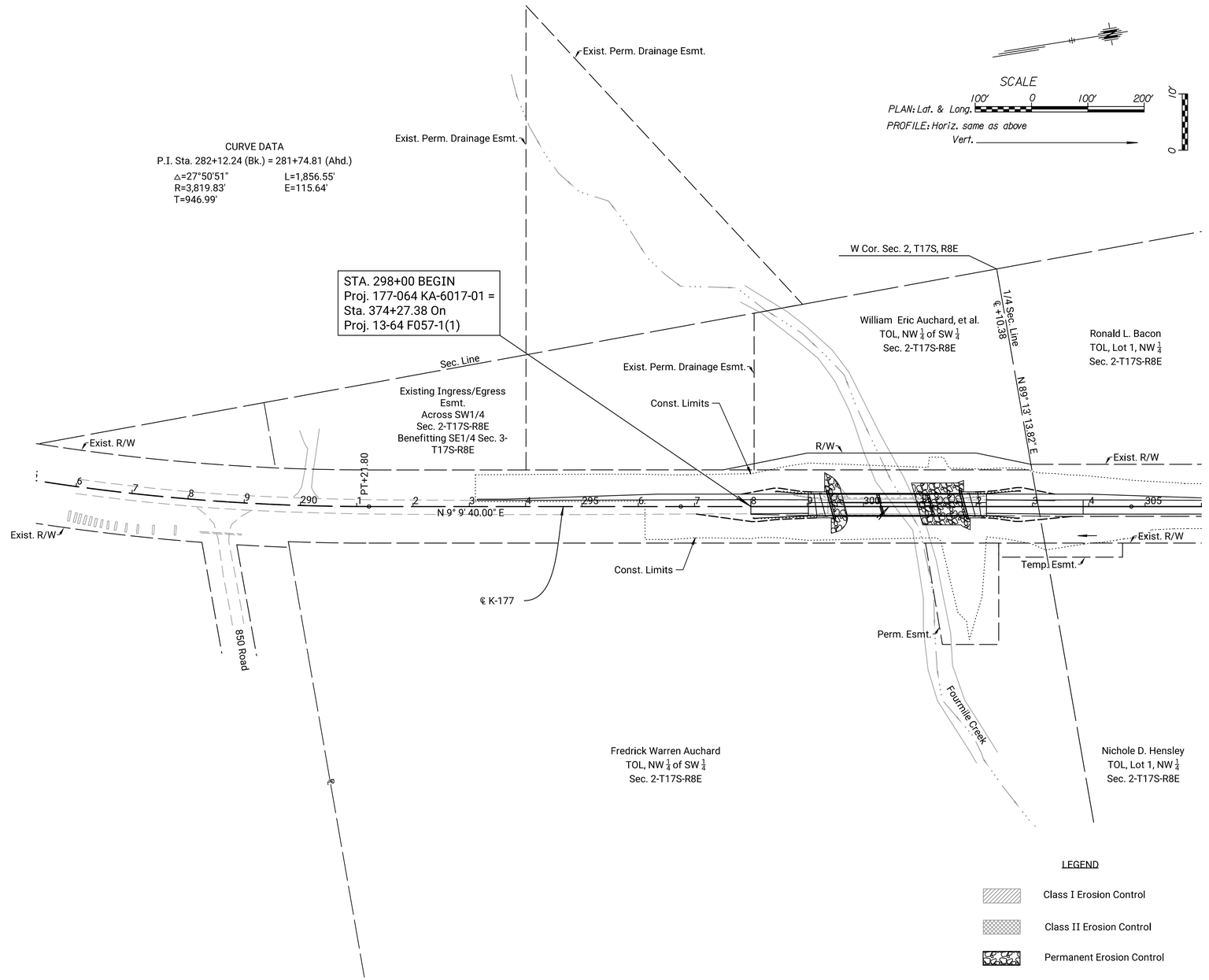
STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	108	291

DATE	BY
10-2021	J. Unruh - Benesch
10-2021	R. Nuessen - Benesch

REFERENCES NOTED
REFERENCES CHECKED

CURVE DATA
P.I. Sta. 282+12.24 (Bk.) = 281+74.81 (Ahd.)
△=27°50'51" L=1,856.55'
R=3,819.83' E=115.64'
T=946.99'

SCALE
100' 0 100' 200'
PLAN: Lat. & Long.
PROFILE: Horiz. same as above
Vert.
10' 0



LEGEND

Class I Erosion Control

Class II Erosion Control

Permanent Erosion Control

KANSAS DEPARTMENT OF TRANSPORTATION

PROPOSED FINAL
EROSION CONROL PLAN
STA. 280+00 TO STA. 306+00

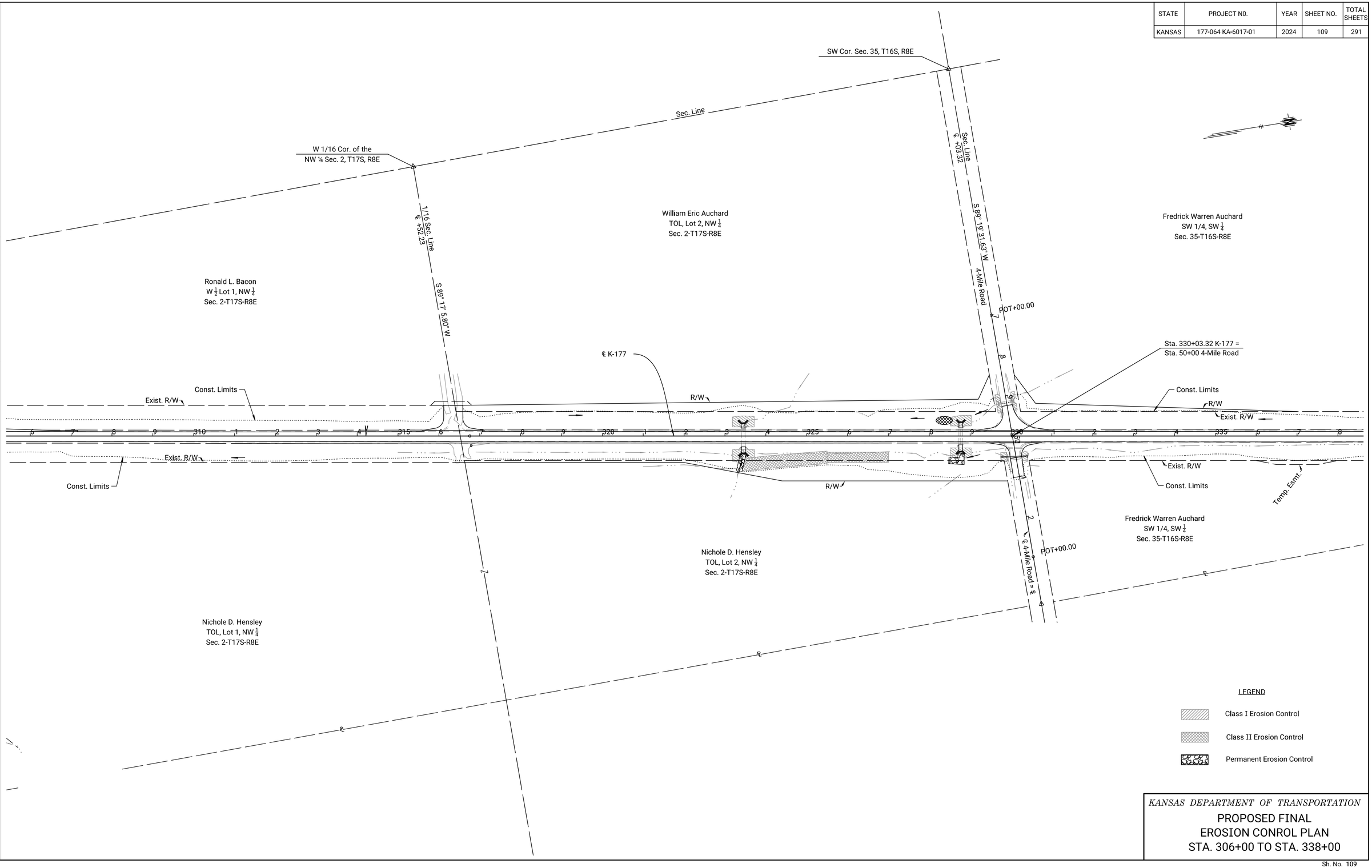
KDOT Graphics Certified 09-14-2023 Sh. No. 108

KDOT Graphics Certified

Plotted : 16-JAN-2025 07:45
Drawn By : mrockwell
File : ka601701ewp-01-2.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	109	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021



KANSAS DEPARTMENT OF TRANSPORTATION

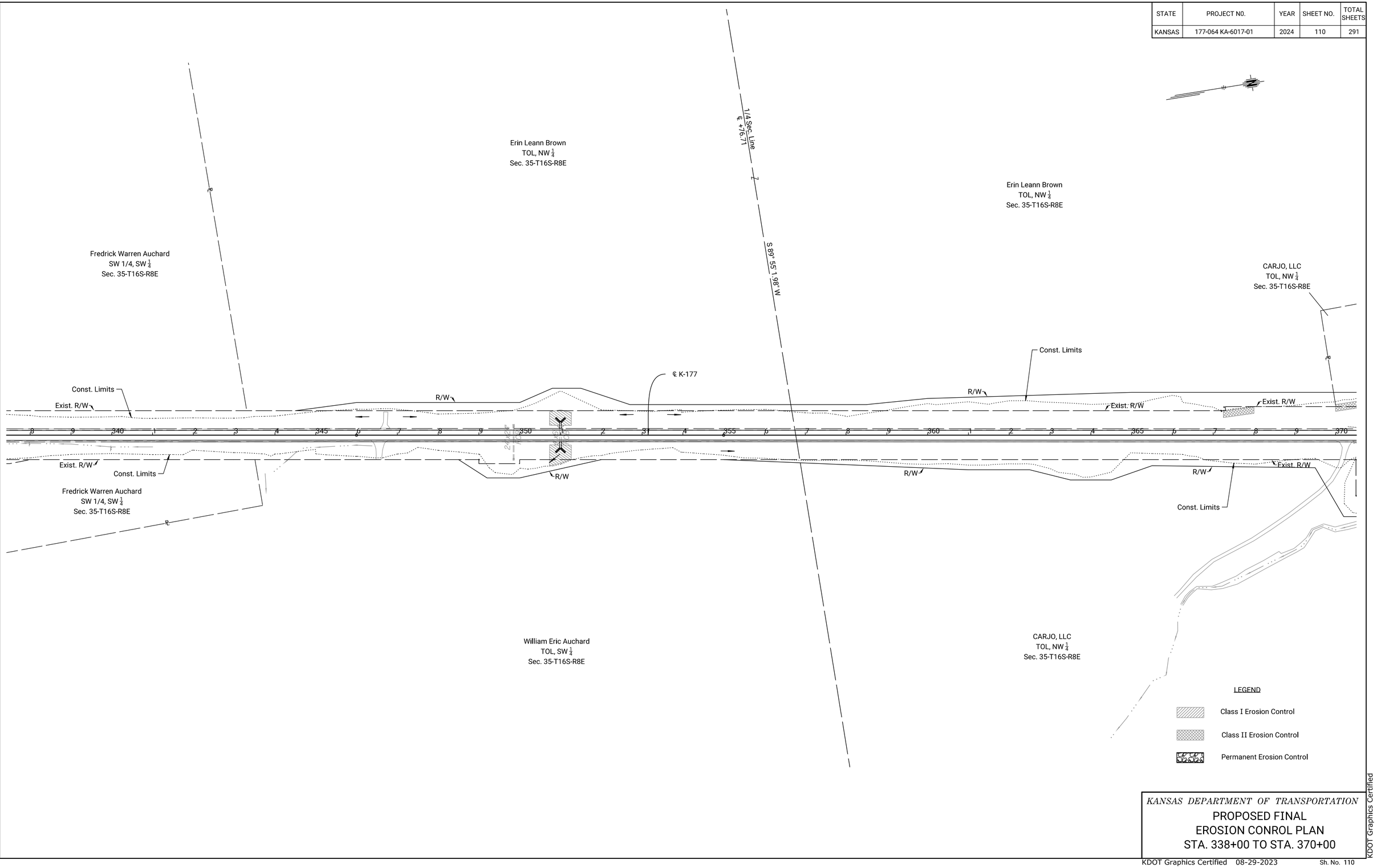
PROPOSED FINAL
EROSION CONROL PLAN
STA. 306+00 TO STA. 338+00

Sh. No. 109

Plotted : 16-JAN-2025 07:45
Drawn By : mrockwell
File : ka601701ewp-02-2.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	110	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021



KANSAS DEPARTMENT OF TRANSPORTATION

PROPOSED FINAL EROSION CONROL PLAN STA. 338+00 TO STA. 370+00

KDOT Graphics Certified 08-29-2023 Sh. No. 110

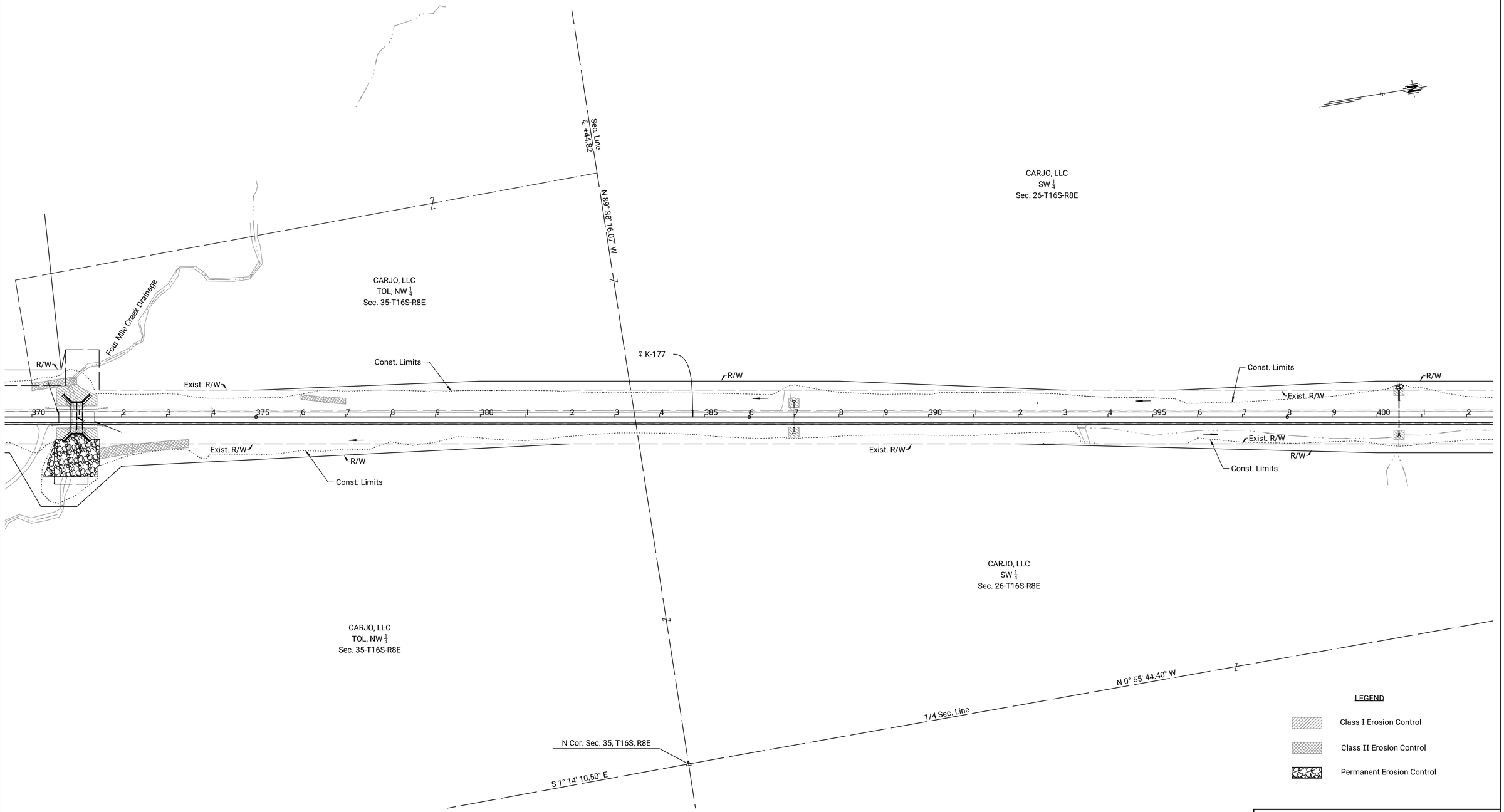
KDOT Graphics Certified

Plotted : 16-JAN-2025 07:45

Drawn By : mrockwell
File : ka601701ewp-03-2.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	111	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021



Plotted : 16-JAN-2025 07:45
Drawn By : mrockwell
File : ka601701ewp-04-2.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

PROPOSED FINAL
EROSION CONROL PLAN
STA. 370+00 TO STA. 402+00

Sh. No. 111

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	112	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

CARJO, LLC
SW $\frac{1}{4}$
Sec. 26-T16S-R8E

CARJO, LLC
S $\frac{1}{2}$, NW $\frac{1}{4}$
Sec. 26-T16S-R8E

OH6, LLC
NE $\frac{1}{4}$, NW $\frac{1}{4}$
Sec. 26-T16S-R8E

1/4 Sec. Line
℄ +14.10
N 89° 41' 10.92" W

℄ K-177

V Avenue
℄ +34.75
N 89° 24' 5.50" W
℄ V Avenue
POT+50.00

Const. Limits
Exist. R/W
R/W

Exist. R/W = 1/4 Sec. Line
℄ +15.30

CARJO, LLC
SW $\frac{1}{4}$
Sec. 26-T16S-R8E

CARJO, LLC
S $\frac{1}{2}$, NW $\frac{1}{4}$
Sec. 26-T16S-R8E

N 0° 55' 44.42" W

Sta. 423+54.98 K-177 =
Sta. 50+00 V Avenue

S 0° 55' 44.40" E
1/4 Sec. Line

T16S
R8E
26

OH6, LLC
N $\frac{1}{2}$, NE $\frac{1}{4}$
Sec. 26-T16S-R8E

LEGEND

- Class I Erosion Control
- Class II Erosion Control
- Permanent Erosion Control

KANSAS DEPARTMENT OF TRANSPORTATION

PROPOSED FINAL EROSION CONROL PLAN STA. 402+00 TO STA. 434+00

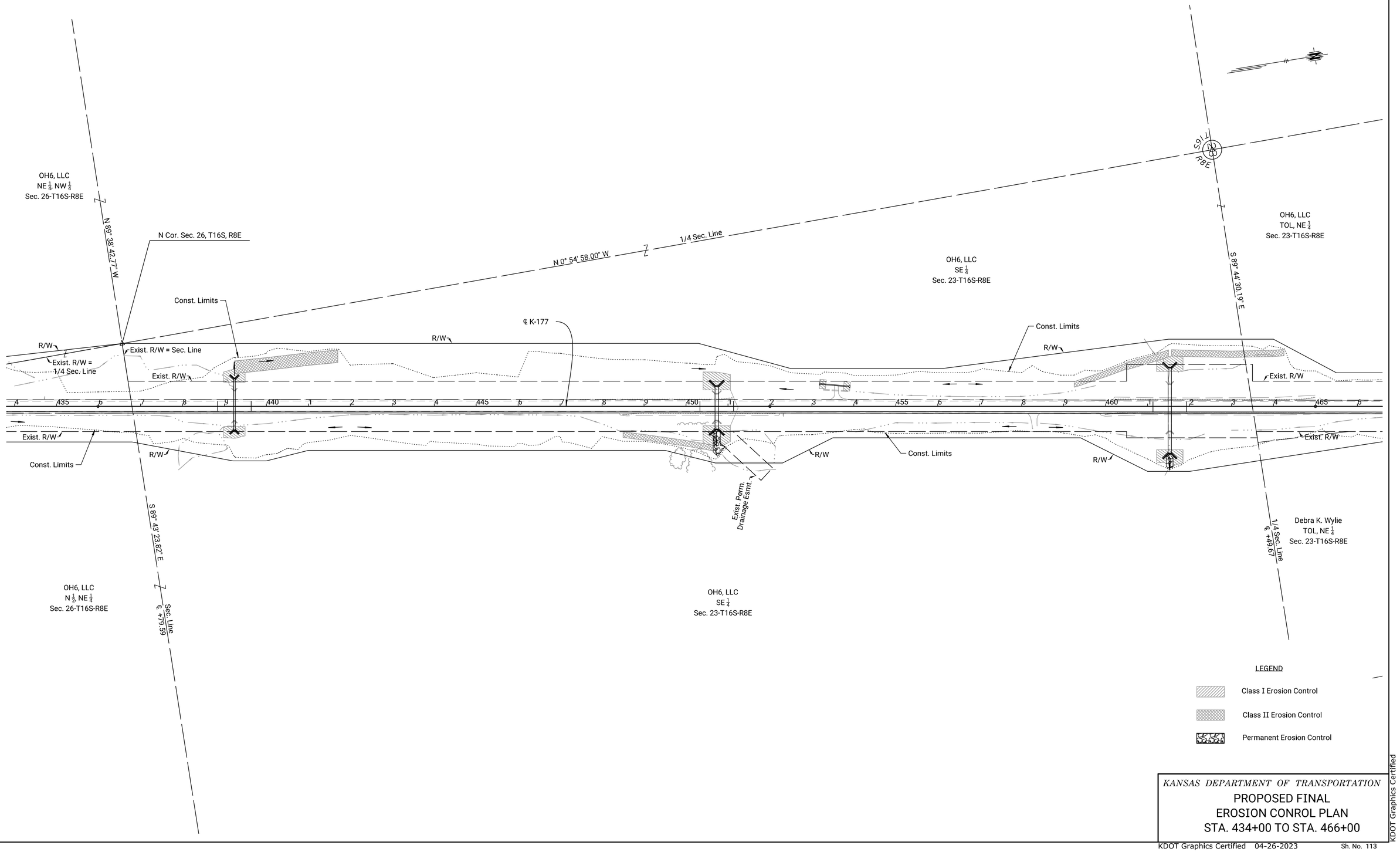
KDOT Graphics Certified 08-29-2023 Sh. No. 112

KDOT Graphics Certified

Plotted : 16-JAN-2025 07:45
Drawn By : mrockwell
File : ka601701ewp-05-2.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	113	291

	DATE	BY
REFERENCES NOTED	10-2021	J. Unruh - Benesch
REFERENCES CHECKED	10-2021	R. Nuessen - Benesch



KANSAS DEPARTMENT OF TRANSPORTATION

PROPOSED FINAL EROSION CONROL PLAN STA. 434+00 TO STA. 466+00

KDOT Graphics Certified 04-26-2023 Sh. No. 113

KDOT Graphics Certified

Drawn By : mrockwell
File : ka601701ewp-06-2.dgn
Plotted : 16-JAN-2025 07:45

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	114	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

N 0° 54' 58.70" W

1/4 Sec. Line

OH6, LLC
TOL, NE 1/4
Sec. 23-T16S-R8E

Jason D. Leeds
TOL, NE 1/4
Sec. 23-T16S-R8E

Jason D. Leeds
Lot 71
Samples Subdivision

P.I. Sta. 49+05.74 (Bk.)
△ = 68° 45' 33" (RT)
D = 114° 35' 30"
R = 50.00'
T = 34.21'
L = 60.00'
E = 10.58'

Michelle J. Marquez, et al.
Lot 60, 61 & 62
Samples Subdivision

℄ K-177

Jason D. Leeds
Lot 71
Samples Subdivision

R/W

Exist. R/W

Const. Limits

900 Road

POT+50.00

℄ 900 Road

PCT+71.53

PT+37.53

Velie Street

POT+50.00

Exist. R/W

S 9° 9' 40.00" W

Debra K. Wylie
TOL, NE 1/4
Sec. 23-T16S-R8E

Duane Devries
Lots 68, 69 & 70
Samples Subdivision

Sta.483+30.00 K-177 =
Sta. 50+00 900 Road

℄ Velie Street

POT+00.00

Lois Ann Bluhm
TOL, Lot 63
Samples Subdivision

JoDee Romo
TOL, Lot 63
Samples Subdivision

S 89° 48' 7.14" E

Sec. Line
℄ +19.09

LEGEND

Class I Erosion Control

Class II Erosion Control

Permanent Erosion Control

KANSAS DEPARTMENT OF TRANSPORTATION

PROPOSED FINAL EROSION CONROL PLAN STA. 466+00 TO STA. 493+00

KDOT Graphics Certified 08-29-2023 Sh. No. 114

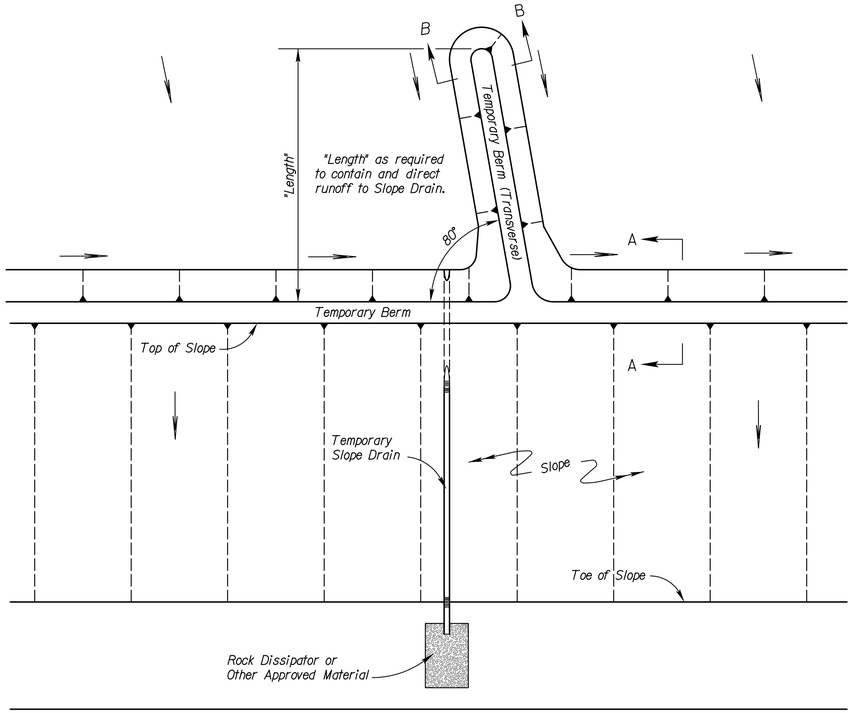
KDOT Graphics Certified

Plotted : 16-JAN-2025 07:45

Drawn By : mrockwell

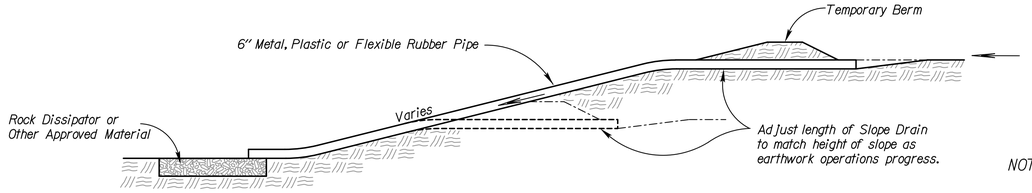
File : ka60170ewp-07-2.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	115	291



TYPICAL PLAN VIEW OF TEMPORARY BERM AND TEMPORARY SLOPE DRAIN

NO SCALE



TYPICAL PROFILE OF TEMPORARY SLOPE DRAIN

NO SCALE

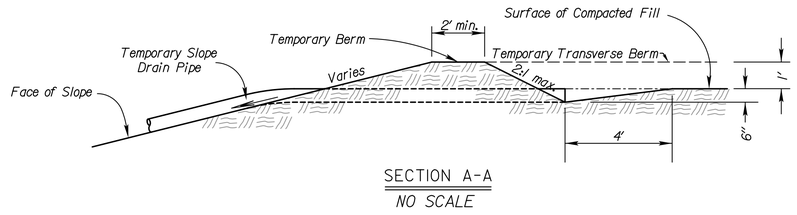
NOTES:

1) Temporary Slope Drain and Temporary Berm may be used on either project foreslopes or project backslopes.

2) Discharge of Slope Drains shall be into stabilized ditch or area, or into Sediment Basin.

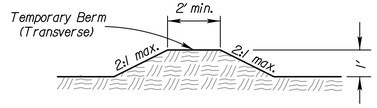
3) Pipe shall be secured in place as approved by Engineer.

4) Temporary Berms under 2,000 feet shall be bid by Set Price.



SECTION A-A

NO SCALE

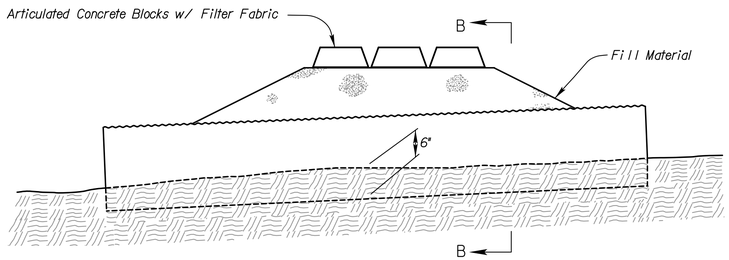


SECTION B-B

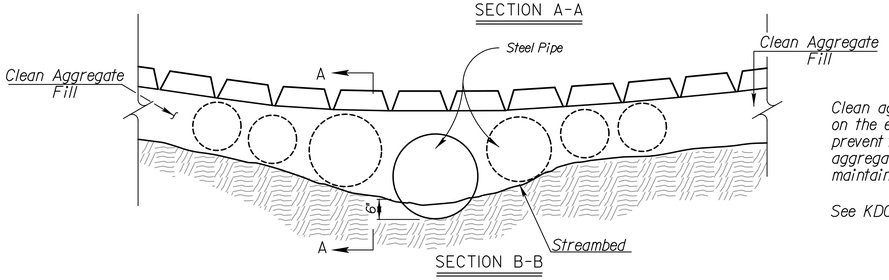
NO SCALE

TYPICAL PROFILE OF TEMPORARY BERM

NO SCALE



SECTION A-A



SECTION B-B

Pipe size may vary.

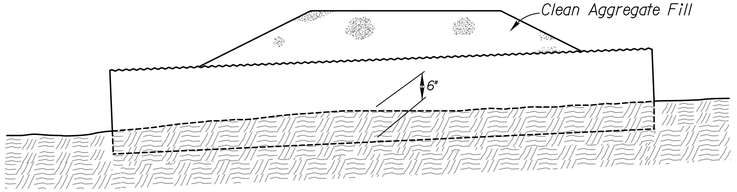
Place 1 pipe buried 6" into stream bottom, in the lowest point of the channel to allow the passage of aquatic organisms, with additional pipes placed along the remainder of the stream channel bottom such that ordinary high water (OHW) flows designated in the Contract Documents shall flow through the pipes without overtopping the crossing.

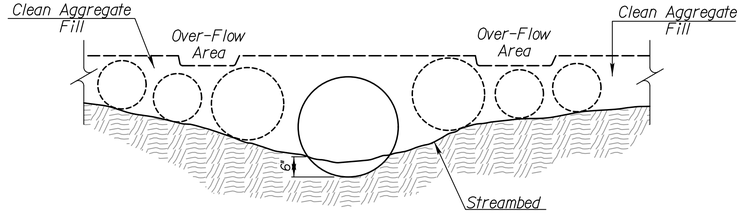
Clean aggregate fill will extend a minimum of 50' on the entrance and exit side of the crossing to prevent tracking. The aggregate shall be clean aggregate and a minimum of 6" thick and will be maintained through the use of the crossing.

See KDOT Specifications for more information.

TEMPORARY STREAM CROSSING (ARTICULATED CONCRETE BLOCKS)

NO SCALE





SECTION B-B

Pipe size may vary.

Place 1 pipe buried 6" into stream bottom, in the lowest point of the channel to allow the passage of aquatic organisms, with additional pipes placed along the remainder of the stream channel bottom such that ordinary high water (OHW) flows designated in the Contract Documents shall flow through the pipes without overtopping the crossing.

Clean aggregate fill will extend a minimum of 50' on the entrance and exit side of the crossing to prevent tracking. The aggregate shall be clean aggregate and a minimum of 6" thick and will be maintained through the use of the crossing.

See KDOT Specifications for more information.

TEMPORARY STREAM CROSSING (AGGREGATE)

NO SCALE

NO.	DATE	REVISIONS	BY	APP'D
3	1/21/22	Temp Stream Crossing - Clean Aggregate Fill Note Added	MRD	ML
2	8/24/21	Temp Stream Crossing - Clean Aggregate Fill Note Added	MRD	ML
1	6/11/13	Revised Standard	MRM	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL

TEMPORARY SLOPE DRAIN

TEMPORARY STREAM CROSSING (AGGREGATE)

TEMP. STREAM CROSS. (ARTC. CONC. BLOCKS)

LA852B

FHWA APPROVAL		1/21/2022	APP'D	Mervin Lare
DESIGNED	ML	DETAILED	QUANTITIES	CADD
DESIGN CK.	ML	DETAIL CK.	QUAN.CK.	CADD CK.

CADconform Certify This File

Sh. No. 115

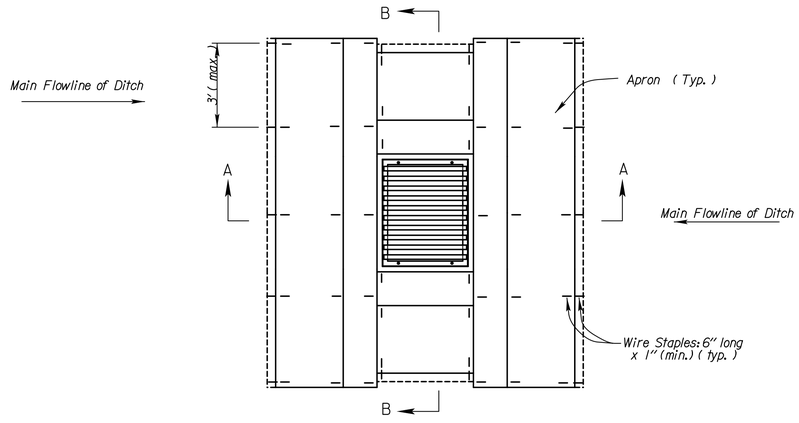
Std. Base File: _____ Plot Location:

Plotted By: mrockwell

File: la852b.dgn

Plot Date: 16-JAN-2025 07:45

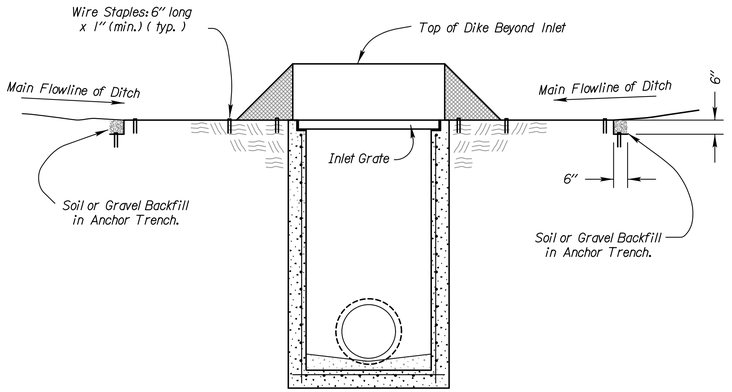
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	116	291



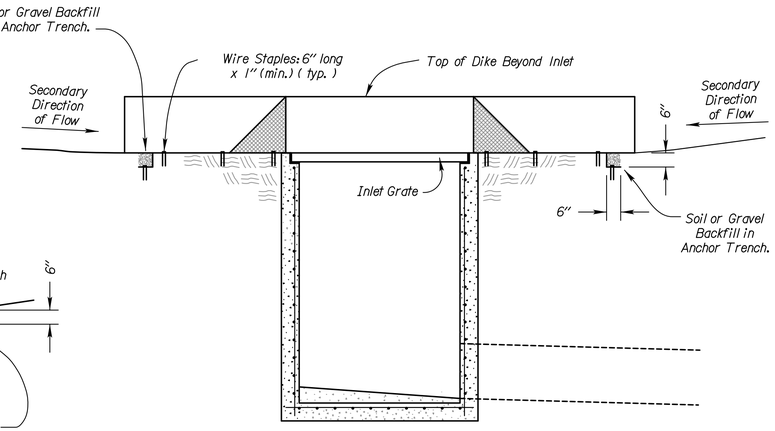
PLAN

TEMPORARY INLET SEDIMENT BARRIER
(TRIANGULAR SILT DIKE METHOD)

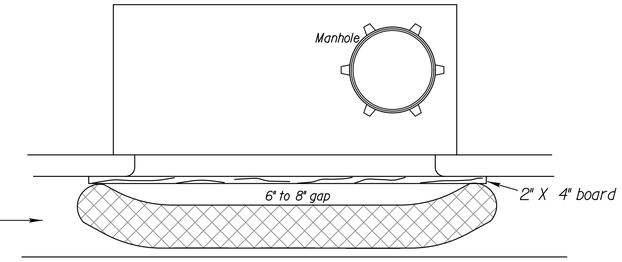
NO SCALE



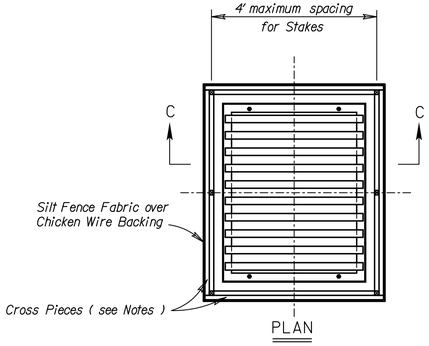
SECTION A - A



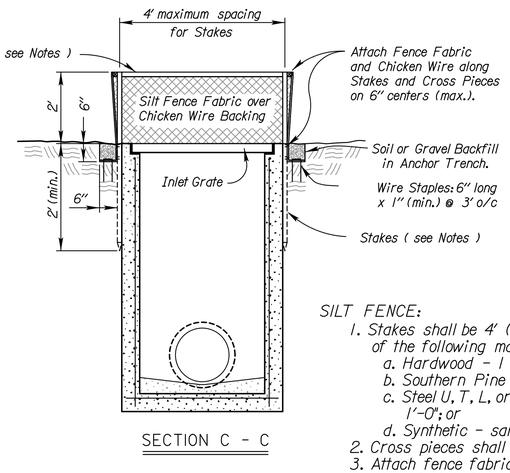
SECTION B - B



CURB INLET PROTECTION



PLAN



SECTION C - C

TEMPORARY INLET SEDIMENT BARRIER
(SILT FENCE METHOD)

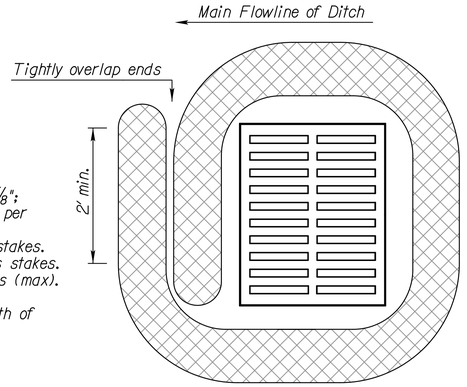
NO SCALE

SILT FENCE:

1. *Stakes shall be 4' (min.) long and of one of the following materials:*
   a. *Hardwood - 1 3/16" x 1 3/16";*
   b. *Southern Pine (No. 2) - 2 5/8" x 2 5/8";*
   c. *Steel U, T, L, or C Section - .95 lbs. per 1'-0"; or*
   d. *Synthetic - same strength as wood stakes.*
2. *Cross pieces shall be of same material as stakes.*
3. *Attach fence fabric securely on 6" centers (max).*
4. *Use of high flow material is acceptable.*
5. *Refer to plan sheets to estimate the length of silt fence required.*

Bags = synthetic net (3mm mesh) or burlap bags

Rock = approximately 1" to 2" diameter



Drop inlet use 1'-6" TO 1'-8" diameter log

BIODEGRADABLE LOG/FILTER SOCK
DROP INLET PROTECTION

Note: 25% of log shall be keyed into ground during installation.

Stake every 4'

1. *If multiple gravel bags are required, place them in such a way that no gaps are evident.*
2. *Height of bags (8" minimum diameter) must not be above top of curb.*
3. *Alternative products may be used other than gravel bags such as the "Gutter Buddy". Products must be approved by the Engineer.*
4. *Curb inlet protection will be measured and paid for as Filter Sock.*

Material Requirements
Use 100% shredded mulch or other non-compost biodegradable material as fill for logs.
No compost or fines.
No hay or straw.
Do not use material which prohibits water infiltration.
Log Mesh: *Use mesh with 1/4" openings or larger. Mesh must allow water infiltration but also hold fill material in place.*

NO.	DATE	REVISIONS	BY	APP'D
3	9/26/19	Changed Direction of Main Flowline of Ditch Arrow	MRD	SHS
2	3/10/15	Revised Standard	RA	SHS
1	6/01/13	Revised Standard	MRM	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL

TEMP. INLET SEDIMENT BARRIER (SILT FENCE)
TEMP. INLET SEDIMENT BARRIER (T.S.D.)
CURB INLET PROTECTION
DROP INLET PROTECTION

LA852C

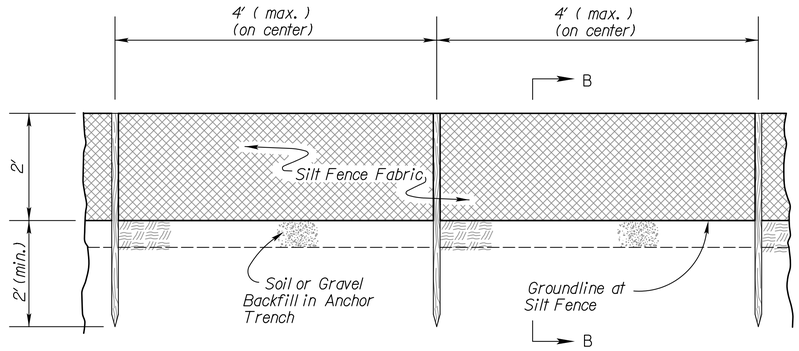
FHWA APPROVAL	3/10/2015	APP'D	Scott H. Shields
DESIGNED RA	DETAILED RA	QUANTITIES	CADD
DESIGN CK. SHS	DETAIL CK. SHS	QUAN.CK.	CADD CK.

Std. Base File: _____ | Plot Location:
Plotted By: mrockwell
File: la852c.dgn
Plot Date: 16-JAN-2025 07:45

CADconform Certify This File

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	117	291



TYPICAL ELEVATION

SILT FENCE BARRIER

NO SCALE

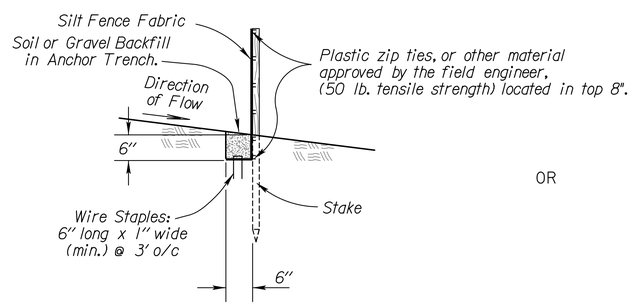
INSTALLATION NOTES

SILT FENCE:

1. Stakes shall be 4' (min.) long and of one of the following materials:
   a. Hardwood - 1 3/16" x 1 3/16";
   b. Southern Pine (No. 2) - 2 5/8" x 2 5/8";
   c. Steel U, T, L, or C Section - .95 lbs. per 1'-0"; or
   d. Synthetic - same strength as wood stakes.
2. Attach fence fabric with 3 zip ties within the top 8" of the fence
   Alternate attachment methods may be approved by the Engineer on a performance basis.
3. Use of high flow material is acceptable.
4. Refer to plan sheets to estimate the length of silt fence required.

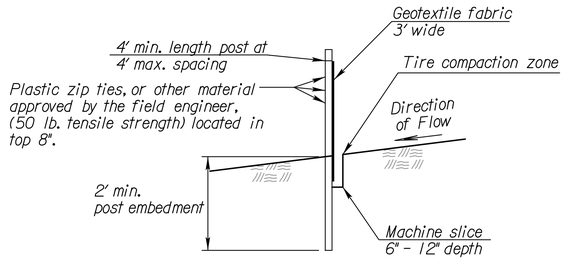
BIODEGRADABLE LOG OR FILTER SOCK

1. Place biodegradable logs or filter sock tightly together minimum overlap of 18".
2. Wood stakes shall be 2" x 2" (nom.).
3. Refer to plan sheets to estimate length of biodegradable log and filter sock required.
4. Each log or sock (except compost filter socks) should be keyed into the ground at a minimum of 25% of its height. Compost filter socks should be placed on smooth prepared ground with no gaps between the sock and soil.
5. Length of stakes should be 2 times the height of the log at a minimum with minimum ground embedment equal to the height of the log / sock.



SECTION B-B

OR



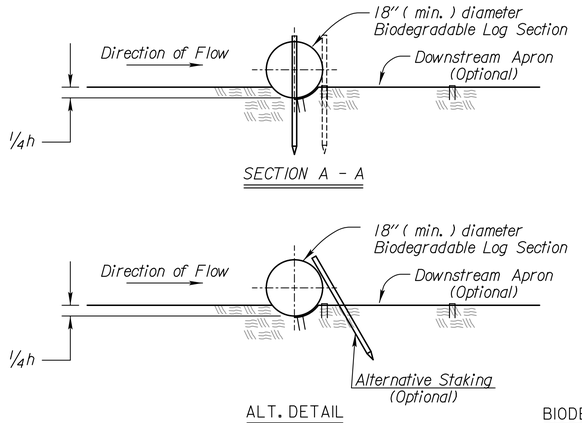
SECTION B-B

Biodegradable Log or Filter Sock Slope Interruptions

Slope Gradient	PRODUCT: 9" Sediment Log or 8" Filter Sock (ft)	12" Sediment Log or 12" Filter Sock (ft)	20" Sediment Log or 18" Filter Sock (ft)
≤4H:1V	40	60	80
3H:1V	30	45	60

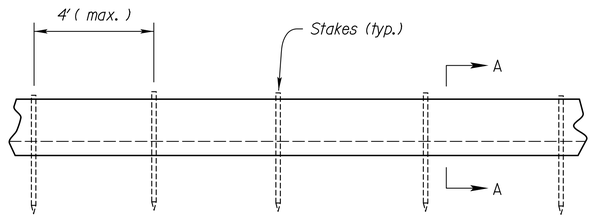
Deviations should be approved by the Field Engineer.

BIODEGRADABLE LOG MATERIAL		
	LOW FLOW	HIGH FLOW
9"	Straw/Compost	Excelsior / Wood Chips / Coconut Fiber
12"	Straw/Compost	Excelsior / Wood Chips / Coconut Fiber
18"-20"	Straw/Compost	Excelsior / Wood Chips / Coconut Fiber



ALT. DETAIL

OPTIONAL



TYPICAL ELEVATION

BIODEGRADABLE LOG SLOPE INTERRUPTIONS

OR Filter Sock

GENERAL NOTES

1) Slope interruptions shall be placed along contour lines, with a short section turned upgrade at each end of the barrier.
2) The maximum length of the slope interruptions shall not exceed 250 feet, and the barrier ends need to be staggered.
3) Interruptions damaged by Contractor's negligence, including improper maintenance or lack of maintenance, shall be repaired immediately by Contractor at no additional cost to KDOT.
4) Agricultural products, such as native prairie hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards.

NO.	DATE	REVISIONS	BY	APP'D
3	6/28/16	Revised Standard	RA	SHS
2	3/01/15	Revised Standard	RA	SHS
1	6/01/13	Revised Standard	MRM	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL

SLOPE INTERRUPTIONS BIODEGRADABLE LOG / SILT FENCE

LA852D

FHWA APPROVAL		9/14/2016	APP'D	Scott H. Shields	
DESIGNED	SHS	DETAILED RA	QUANTITIES	CADD	
DESIGN CK.	SHS	DETAIL CK.	QUAN.CK.	CADD CK.	

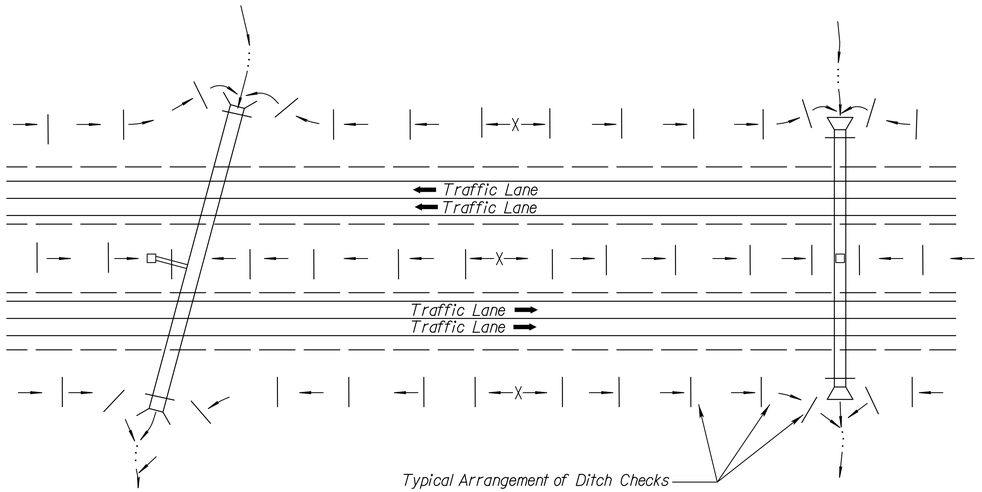
CADconform Certify This File

Sh. No. 117

Std. Base File:	
Plotted By: mrockwell	Plot Location:
File: la852d.dgn	
Plot Date: 16-JAN-2025 07:45	

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	118	291



Typical Arrangement of Ditch Checks

TYPICAL DITCH CHECK LAYOUT PLAN

NO SCALE

20" BIOLOG CHECK SPACING	
DITCH ℄ SLOPE (%)	SPACING INTERVAL (FEET)
1.0	*125*
2.0	*60*
3.0	*40*
4.0	*30*
5.0	*25*
NOTE: Use this spacing for all except Rock Ditch Checks.	

18" FILTER SOCK CHECK SPACING	
DITCH ℄ SLOPE (%)	SPACING INTERVAL (FEET)
1.0	*110*
2.0	*55*
3.0	*35*
4.0	*25*
5.0	*20*
NOTE: Use this spacing for all except Rock Ditch Checks.	

GENERAL NOTES

1) *The choice of ditch check methods is at the option of the Contractor.*

2) *Use only rock checks in situations where the ditch slope is 6 percent or greater.*

2) *Ditch checks damaged by Contractor's negligence, including improper maintenance or lack of maintenance, shall be repaired by Contractor at no extra cost to KDOT.*

Std. Base File:	
Plotted By: *mrockwell*	Plot Location:
File: *la852e.dgn*	
Plot Date: *16-JAN-2025 07:45*	

NO.	DATE	REVISIONS	BY	APP'D
3	8/10/16	Revised Standard	RAA	SHS
2	6/28/16	Revised Standard	RAA	SHS
1	6/01/13	Revised Standard	MRM	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL

DITCH CHECKS

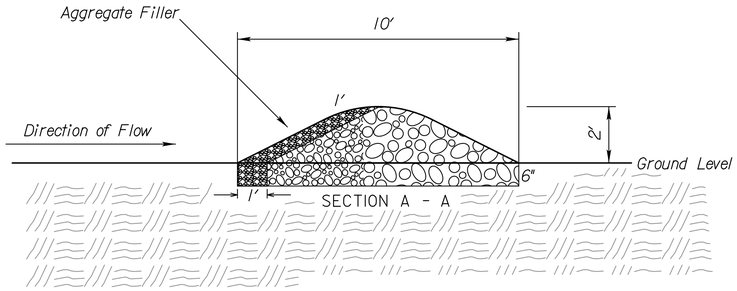
LA852E

FHWA APPROVAL		9/14/2016		APP'D		Scott H. Shields	
DESIGNED	SHS	DETAILED	RAA	QUANTITIES		CADD	RAA
DESIGN CK.	SHS	DETAIL CK.	SHS	QUAN.CK.		CADD CK.	SHS

CADconform Certify This File

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	119	291



TYPICAL ELEVATION

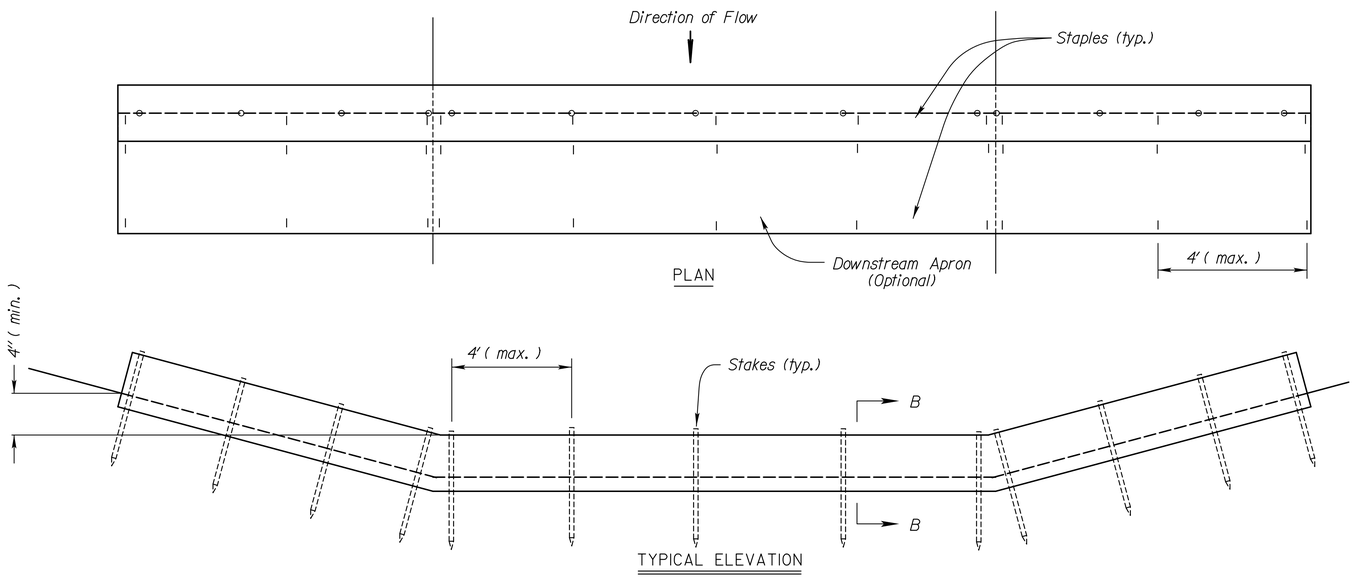
ROCK DITCH CHECK

NO SCALE

TEMPORARY ROCK DITCH CHECK SPACING	
DITCH ℄ SLOPE (%)	*SPACING INTERVAL (FEET)*
5.0	60
6.0	50
7.0	43
8.0	36
9.0	33
10.0	29
NOTE: Use this spacing for Rock Ditch Checks only.	

ROCK DITCH CHECK NOTES

1. *Rock shall be clean aggregate, D50-6" and aggregate filler.*
2. *Place rock in such manner that water will flow over, not around ditch check.*
3. *Do not use rock ditch checks in clear zone.*
4. *Excavation: The ditch area shall be reshaped to fill any eroded areas. Prior to placement of the rock, the ditch shall be excavated to the dimensions of the Rock Ditch Check and to a minimum depth of 6" (150mm). After placement of the rock, backfill and compact any over-excavated soil to ditch grade. This work shall be subsidiary to the bid item Temporary Ditch Check (Rock).*
5. *Aggregate excavated on site may be used as an alternate to the 6" rock, if approved by the Engineer.*
6. *The Engineer may approve the use of larger aggregates for the downstream portion of the check when conditions warrant their use.*
7. *When the use of larger rock is approved, D50-6" rock will be placed between the larger aggregate and the aggregate filler.*
8. *Aggregate filler will be placed on the upstream face of the ditch check. Aggregate filler will comply with Filter Course Type I, Division 1114.*

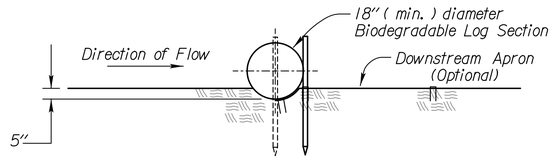


TYPICAL ELEVATION

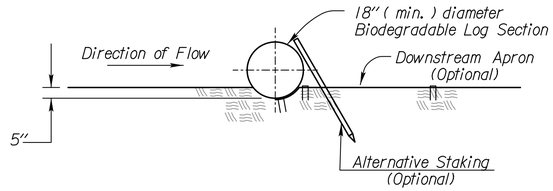
BIODEGRADABLE LOG DITCH CHECK

OR Filter Sock Ditch Check

NO SCALE



SECTION B - B



ALT. DETAIL
OPTIONAL

BIODEGRADABLE LOG DITCH CHECK NOTES

1. *Use as many biodegradable log sections as necessary to ensure water does not flow around end of ditch check.*
2. *Overlap sections a minimum of 18".*
3. *Stakes shall be wood or steel according to Section 2114 of the Standard Specifications. Length of stakes shall be a minimum of 2 x the diameter of the log.*
4. *Use Erosion Control (Class 1) (Type C) as the downstream apron when required.*
5. *A downstream apron is required when directed by the Engineer. Apron material will be paid at the contract unit price.*
6. *Each log or sock (except compost filter socks) should be keyed into the ground at a minimum of 25% of its height. Compost filter socks should be placed on smooth prepared ground with no gaps between the sock and soil.*

NO.	DATE	REVISIONS	BY	APP'D
3	11/19/20	Revised Standard	MRD	ML
2	8/10/16	Revised Standard	RAA	SHS
1	10/21/15	Revised Standard	RAA	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL
ROCK DITCH CHECKS
BIODEGRADABLE LOG DITCH CHECKS

LA852G

FHWA APPROVAL		11/19/2020	APP'D		Mervin Lare		
DESIGNED	ML	DETAILED	DK	QUANTITIES		CADD	RAA
DESIGN CK.	ML	DETAIL CK.	ML	QUAN.CK.		CADD CK.	RAA

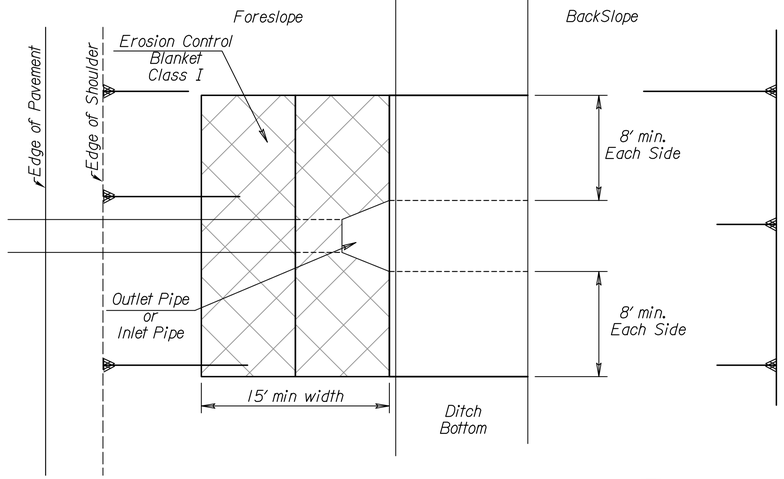
CADconform Certify This File

Sh. No. 119

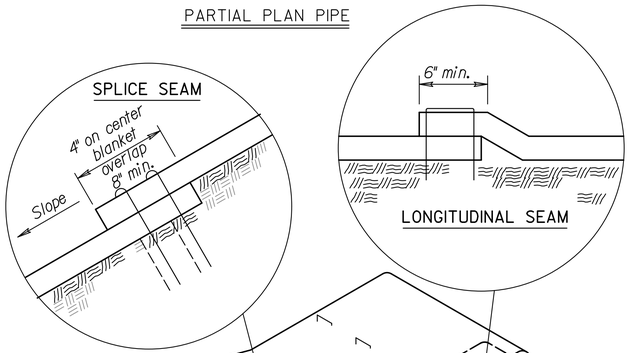
Std. Base File: la852g.dgn
Plotted By: mrockwell | Plot Location:
File: la852g.dgn
Plot Date: 16-JAN-2025 07:46

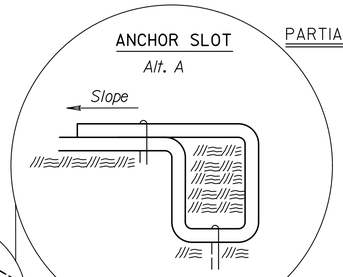
CADconform Certify This File

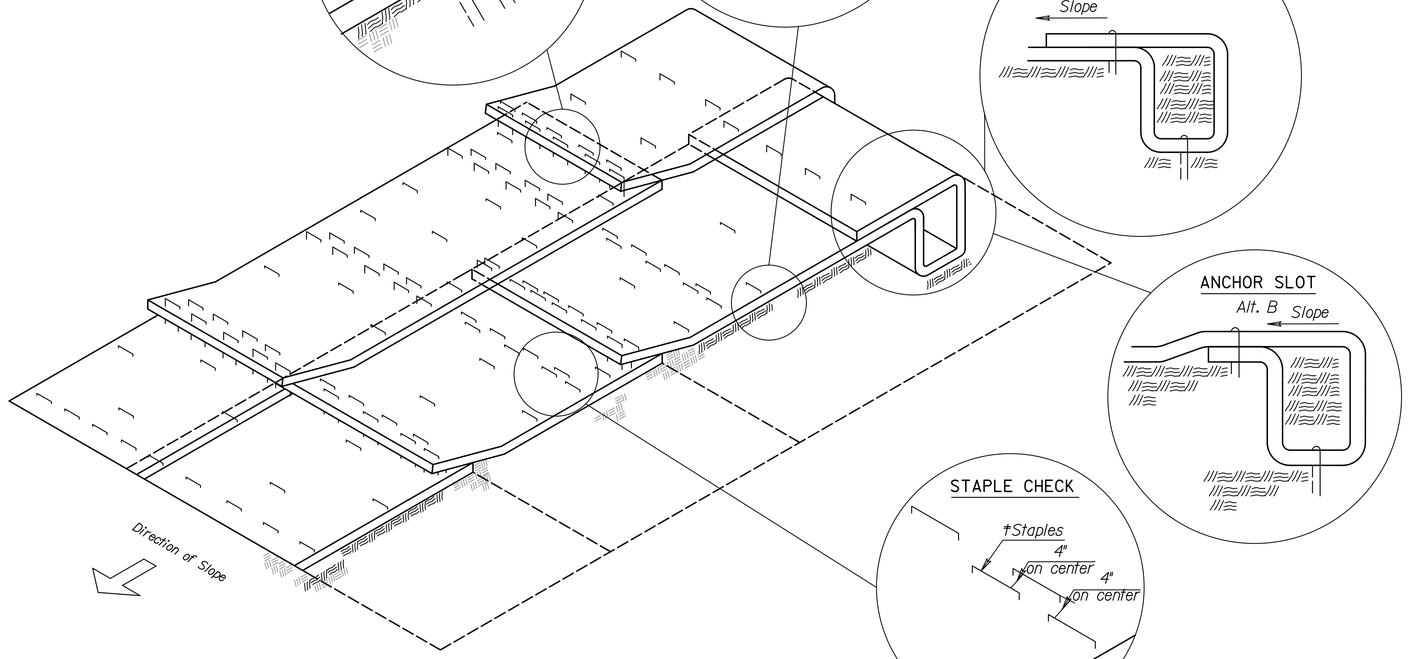
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	120	291



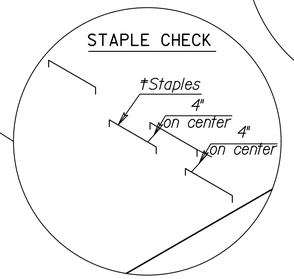
PARTIAL PLAN PIPE

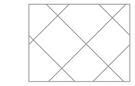




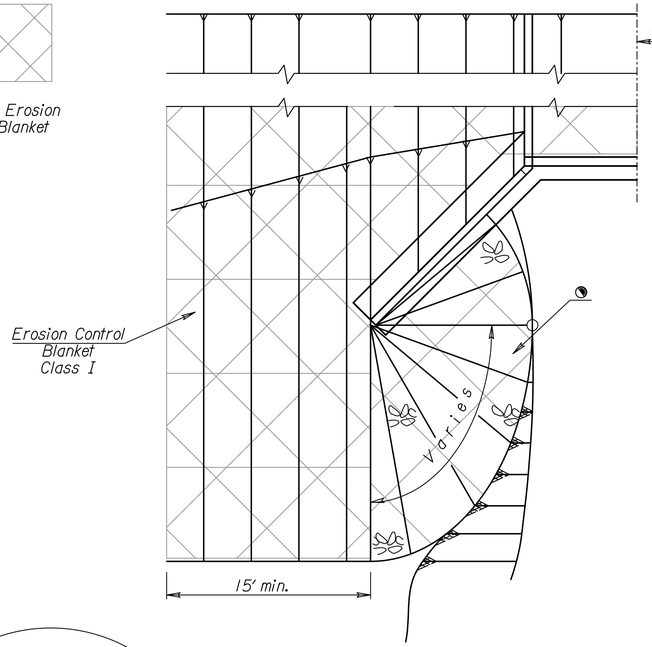


ISOMETRIC VIEW





Limits of Erosion Control Blanket



PARTIAL PLAN BOX CULVERT

◔ Erosion Control Class I may be omitted if the area is immediately covered by permanent slope protection (where directed by the plans).

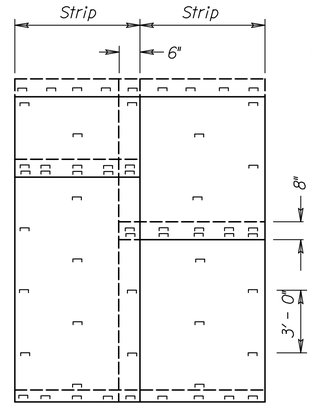
INSTALLATION DETAILS FOR EROSION CONTROL CLASS I

Erosion Control Blankets shall be laid loosely in the direction of the slope, beginning at the bottom of the slope. In order for blanket to be in contact with the soil, lay blanket loosely, avoiding stretching.

1. ANCHOR SLOTS: The top of the blanket should be "slotted in" at the top of the slope and anchored in place with anchors 6 inches apart. The slots should be 6 inches wide x 6 inches deep with the blanket anchored in the bottom of the slot, then backfilled, tamped and seeded.
2. LONGITUDINAL SEAMS: The edges of the blanket should overlap each other a minimum of 6 inches, with anchors catching the edges of both blankets.
3. SPLICE SEAM: When splices are necessary, overlap end a minimum of 8 inches in direction of water flow. Stagger splice seams.
4. TERMINAL FOLD: The bottom edge of the blanket shall be turned under a minimum of 4 inches, then anchored in place with anchors 9 inches apart.
5. TYPICAL ANCHORS: Anchor design shall be as recommended by the manufacturer.
6. STAPLE CHECK: †Establish Staples in 2 rows 4" on center apart. Staple Checks - shall be 30' apart.

NOTE:
Agricultural products, such as native prairie hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards.

Single post ring and shank staple is acceptable.



PLAN VIEW - ANCHORING DIAGRAM

NO.	DATE	REVISIONS	BY	APP'D
4	3/01/15	Revised Standard	RAA	SHS
3	2/23/15	Revised Standard	RAA	SHS
2	9/15/14	Revised Standard	MRM	SHS
1	9/10/07	Revised Standard	MRM	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

INSTALLATION DETAIL EROSION CONTROL CLASS I SLOPE PROTECTION

LA855

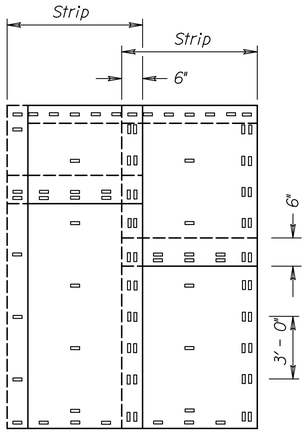
FHWA APPROVAL		3/10/2015	APP'D	Scott H. Shields	
DESIGNED	RAA	DETAILED	RAA	QUANTITIES	CADD RAA
DESIGN CK.		DETAIL CK.		QUAN.CK.	CADD CK. RAA

KDOT Graphics Certified 10-02-2023 Sh. No. 120

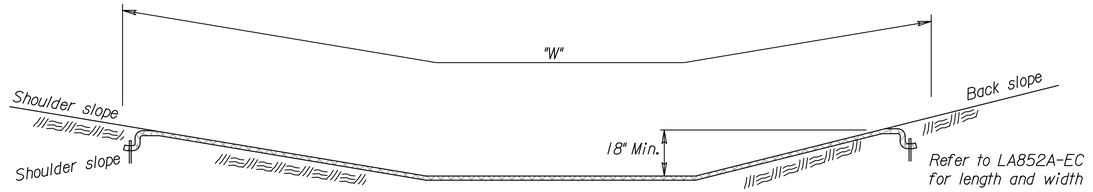
KDOT Graphics Certified

Std. Base File: lg855.dgn
Plotted By: mrockwell
File: lg855.dgn
Plot Date: 16-JAN-2025 07:46
Plot Location:

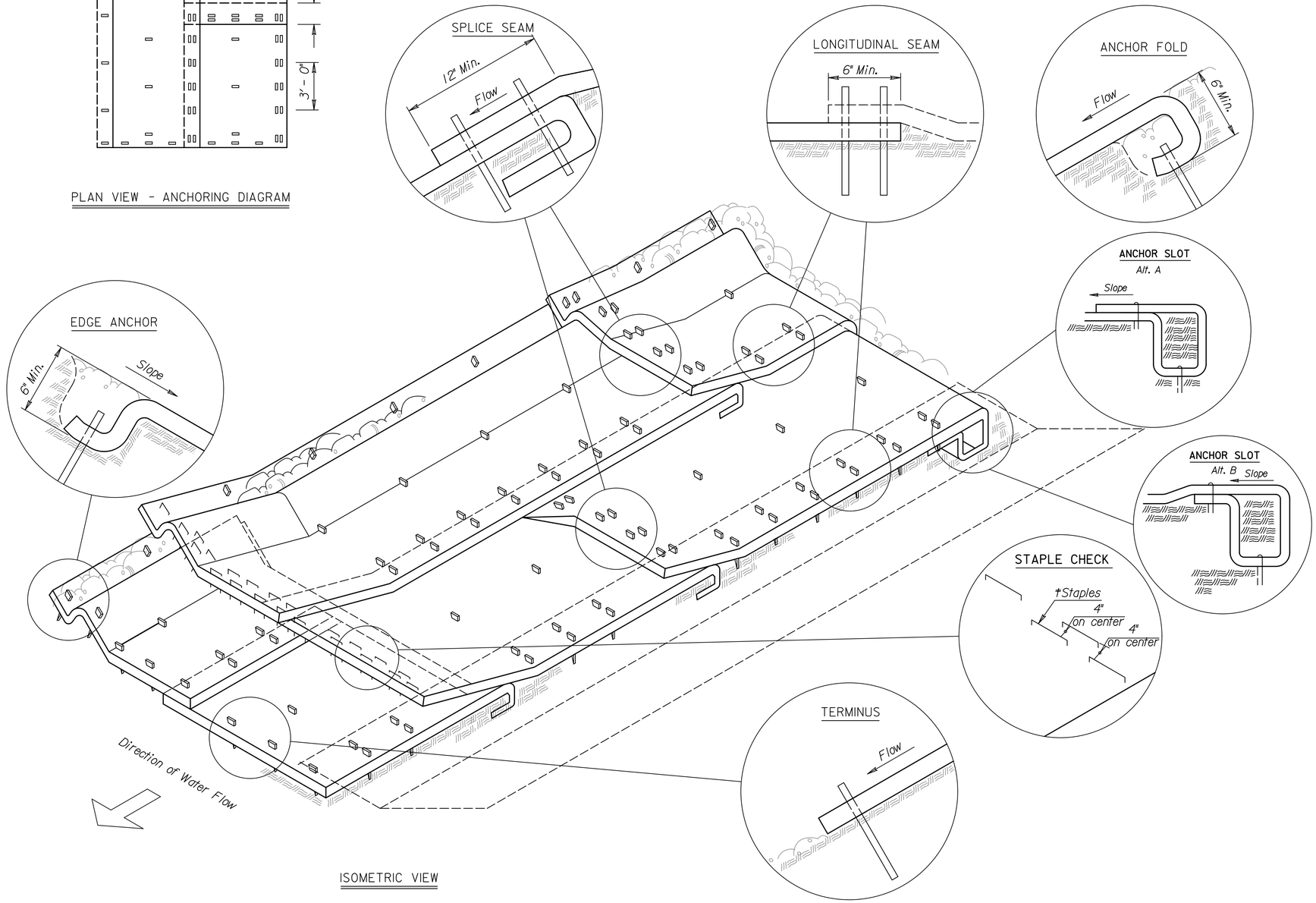
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	121	291



PLAN VIEW - ANCHORING DIAGRAM



CROSS SECTION (Ditch Lining)



ISOMETRIC VIEW

INSTALLATION DETAILS FOR EROSION CONTROL CLASS 2

Erosion Control Mats shall be laid loosely in the direction of the flow, with the first course at the centerline of channel, where applicable. In order for the mat to be in contact with the soil, lay the mat loosely, avoiding stretching.

1. *ANCHOR FOLD: The top of the mat should be folded under, buried and secured with approved anchors placed 6 inches apart. The top edge of the mat should be buried in a slot, 6 inches wide x 6 inches deep; anchored in the bottom of the slot, backfilled, and the mat folded over the top as shown in detail.*

2. *LONGITUDINAL SEAMS: The adjacent edges of the mat should overlap a minimum of 6 inches, with anchors catching the edges of both mats.*

3. *SPLICE SEAM: When splices are necessary, overlapend a minimum of 12 inches in direction of water flow. Stagger splice seams.*

4. *STAPLE CHECK: †Establish Staples in 2 rows 4" on center apart. Staple Checks - shall be 30' apart.*

5. *EDGE ANCHOR: Lay outside edge of mat into trench at top of side slope. Anchor at 3 foot intervals along trench.*

6. *TERMINUS: The bottom edge of the mat shall be anchored in place with anchors spaced at 9 inch intervals along the terminating edge.*

7. *TYPICAL ANCHORS: Anchor design shall be as recommended by the manufacturer.*

4	9/25/15	Modified Staple Check	RAA	SHS
3	9/15/14	Revised Standard	RAA	SHS
2	3/01/13	Revised Standard	MRM	SHS
1	9/22/99	Revised Standard	WCL	RDR
NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

INSTALLATION DETAIL
EROSION CONTROL CLASS 2
FLEXIBLE CHANNEL LINER

LA856

FHWA APPROVAL		11/02/2015	APP'D	Scott H. Shields	
DESIGNED	RAA	DETAILED	RAA	QUANTITIES	CADD RAA
DESIGN CK.	SHS	DETAIL CK.	SHS	QUAN.CK.	CADD CK.

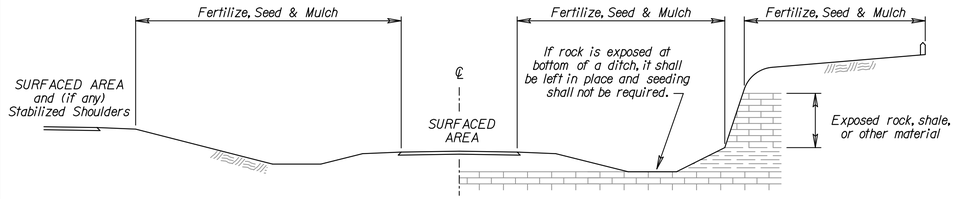
CADconform Certify This File

Sh. No. 121

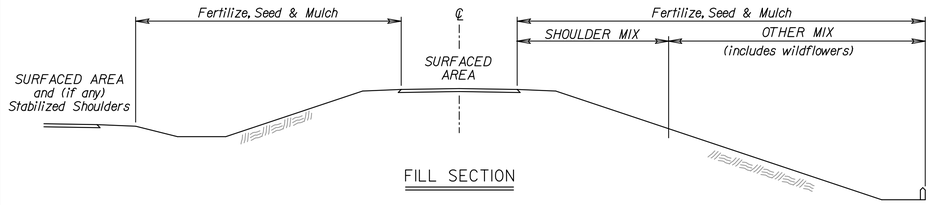
Std. Base File:	la856.dgn
Plotted By:	mrockwell
File:	la856.dgn
Plot Date:	16-JAN-2025 07:46
Plot Location:	

CADconform Certify This File

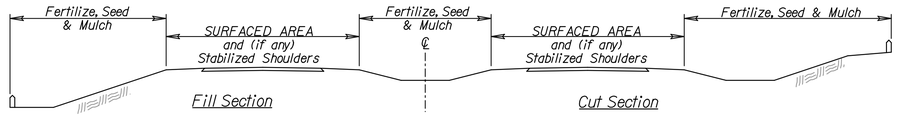
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	122	291



CUT SECTION



FILL SECTION



TYPICAL SECTION - DUAL PAVEMENT

GRASS & WILDFLOWER SEEDING SEASONS

COOL SEASON GRASSES February 15 thru April 20 August 15 thru September 30	WARM SEASON GRASSES & WILDFLOWERS November 15 thru June 1
SPECIES	SPECIES
Bluegrasses	Bermuda Grass
Brome Grasses	Big Bluestem
Canada Wildrye	Blue Grama
Fescues	Buffalo Grass
Prairie Junegrass	Indiangrass
Ryegrasses	Little Bluestem
Sterile Wheatgrass	Sand Bluestem
Tall Dropseed	Sand Dropseed
Western Wheatgrass	Sand Lovegrass
	Side Oats Grama
	Switchgrass
	Wildflower Mixes

When the area to be seeded is 1 acre or more, if Cool Season grasses are mixed with Warm Season grasses, seed the area during the Warm Season.

When the area to be seeded is less than 1 acre, seed the area any time of the year.

SODDING SEASONS

COOL SEASON GRASSES March 1 thru April 15 September 1 thru November 15	WARM SEASON GRASSES May 15 thru September 1
SPECIES	SPECIES
Bluegrass Sod	Buffalo Grass Sod
Fescue Sod	

If the soil is workable, the Engineer may allow placement of sod between November 15 and March 1. If sod is placed during this time, maintain the sod until 20 days after the beginning of the spring sodding season.

GENERAL NOTES

The entire disturbed area, excepting the paved or surfaced areas, steep rocky slopes and areas of undisturbed native sod or other desirable vegetation shall be fertilized (limed when required), seeded and mulched. Soil preparation shall conform to the Standard Specifications except as noted below.

All borrow areas shown on the plans are to be fertilized, seeded, and mulched. However, operation in borrow areas where crops are growing may be omitted when requested by the owner.

If temporary cover has provided stable slopes with no erosion, seed the permanent grasses into the existing cover. If there has been erosion that requires repair prior to seeding, then it may be necessary to regrade the area, resulting in bare ground.

FERTILIZER: A ratio and application rate that equals or exceeds the required minimum rate per acre of N, P_2O_5, K_2O listed in Summary of Seeding Quantities will be acceptable.

MULCHING: Mulch shall be spread uniformly over all disturbed areas and punched in the soil, unless otherwise noted on the plans. The rate of application per acre, thickness in place, for the mulching material is generally as follows:

1¾ - 2¼ Tons per Acre = 1½" loose depth spread uniformly over acre.

Agricultural products, such as native prairie hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards.

Other vegetative mulches are acceptable only with the Engineer's concurrence.

The above rate is a guide. It will be at the discretion of the Engineer to determine what rate is sufficient for adequate protection of newly seeded areas.

NATIVE WILDFLOWER MIX 1

PLS RATE	NAME	QTY (lb)
0.3	Butterfly Milkweed	8.20
0.3	Common Milkweed	8.20
0.3	Black Eyed Susan	8.20
0.5	Blanket Flower	13.67
0.5	False Sunflower	13.67
0.5	Lance-Leaf Coreopsis	13.67
0.2	Maximilian Sunflower	5.47
0.1	New England Aster	2.73
0.2	Pinnate Prairie Coneflower	5.47
0.2	Plains Coreopsis	5.47
0.3	Purple Coneflower	8.20
0.3	Upright Prairie Coneflower	8.20
0.3	Dames Rocket	8.20
0.3	Lemon Mint	8.20
0.2	Pitcher Sage	5.47
0.2	Wild Bergamot	5.47
1.0	Illinois Bundleflower	27.35
0.2	Common Evening Primrose	5.47
0.1	Hoary Verbena	2.73
0.8	Purple Prairie Clover	21.88
0.3	Roundhead Lespedeza	8.20
3.0	Showy Partridge Pea	82.04
0.2	White Prairie Clover	5.47
10.3	Total (lb)	281.69

Note: 27.35 Acres used for Native Wildflower Mix 1

NATIVE WILDFLOWER MIX 2

PLS RATE	NAME	QTY (lb)
0.3	Butterfly Milkweed	
0.3	Black Eyed Susan	
0.5	Black Sampson Coneflower	
1.0	Blanket Flower	
0.2	Maximilian Sunflower	
0.2	Plains Coreopsis	
0.2	Upright Prairie Coneflower	
0.2	Western Yarrow	
0.3	Lemon Mint	
0.4	Pitcher Sage	
1.5	Illinois Bundleflower	
0.2	Common Evening Primrose	
1.0	Blue Wild Indigo	
0.4	Leadplant	
0.4	Purple Prairie Clover	
0.3	White Prairie Clover	
7.4	Total (lb)	

Package and deliver the wildflower seed separately from the grass seed mix. Package and deliver the Tall Drop Seed separately from the grass seed and the wildflower mix. Place the grass seed (except Tall Drop Seed) in the large seed box and drill (cover) seed 1/8" - 1/4". Place the wildflower seed in a separate seed box and drill (cover) seed 1/16" maximum. Place the Tall Drop Seed in a separate (third) seed box and place the seed (using the seed drill) on the soil surface.

OPTION: Broadcast Tall Drop Seed on the soil surface.

SUMMARY OF SEEDING QUANTITIES

P.L.S. RATE/ACRE SHLDR	P.L.S. RATE/ACRE OTHER	ACRES SHLDR	ACRES OTHER	BID ITEM	QUANTITY	UNIT
200		13.05		Fertilizer (13 - 13 - 13)	2,610.0	Lbs.
	80		27.35	Fertilizer (16 - 20 - 0)	2,187.9	Lbs.
	2		27.35	Seed (Big Bluestem Grass Seed) (Kaw)	54.7	Lbs.
0.5		13.05		Seed (Blue Grama Grass Seed) (Lovington)	6.5	Lbs.
4.5		13.05		Seed (Buffalograss Seed) (Treated)	58.7	Lbs.
	10		27.35	Seed (Canada Wildrye Grass Seed)	273.5	Lbs.
	2		27.35	Seed (Indiangrass Seed) (Osage)	54.7	Lbs.
	2		27.35	Seed Little (Bluestem Grass Seed) (Aldous)	54.7	Lbs.
45		13.05		Seed (Perennial Ryegrass)	587.3	Lbs.
2.6		13.05		Seed (Prairie Junegrass)	33.9	Lbs.
6.3	6.3	13.05	27.35	Seed (Side Oats Grama Grass Seed) (El Reno)	254.5	Lbs.
	10		27.35	Seed (Sterile Wheatgrass) (Regreen/Quick Guard)	273.5	Lbs.
	1		27.35	Seed (Switchgrass Seed) (Blackwell)	27.3	Lbs.
	0.5		27.35	Seed (Tall Dropseed)	13.7	Lbs.
45		13.05		Seed (Tall Fescue) (EndophyteFree)	587.3	Lbs.
6	4	13.05	27.35	Seed (Western Wheatgrass Seed) (Barton)	187.7	Lbs.
	10.3		27.35	Seed (Native Wildflower Mix 1)	281.7	Lbs.
				Mulching *		

SHLDR = Seeded with the Shoulder Mix. Typically 15 feet for 2-lane roads and 30 feet for 4-lane roads. Includes outside roadsides, turfed portions of shoulders, and turfed portion of the median.

OTHER = Seeded with the "Other" Mix. Designated as all other turf areas, except the Shoulder. Usually includes a Native Wildflower Mix.

NOTE: Projects less than 1 acre shall be bid as "Seeding" by the lump sum. All disturbed areas shall be seeded, fertilized and mulched at the listed rate per acre. The acres are estimated.

Refer to the Standard Specifications, Division 900, Section 904 'Seeding', and Section 907 'Sodding', for the seeding and sodding seasons.

** See LA852A for mulching quantity. The quantity of mulch is estimated (Acres of Seeding X 1.5 X 2 Tons/Acre). The total mulch required shall be determined in the field. The bid item for mulching shall be paid for according to the Standard Specifications.*

NO.	DATE	REVISIONS	BY	APP'D
2	11/25/20	Updated Seeding / Sodding Periods Charts	MRD	ML
1	08/03/20	Revised Standard	MRD	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

PERMANENT SEEDING
SUMMARY OF SEEDING QUANTITIES

LA850

FHWA APPROVAL	05/06/2019	APP'D	Mervin Lare		
DESIGNED	MRD	DETAILED	MRD	QUANTITIES	CADD
DESIGN CK.		DETAIL CK.		QUAN.CK.	CADD CK.

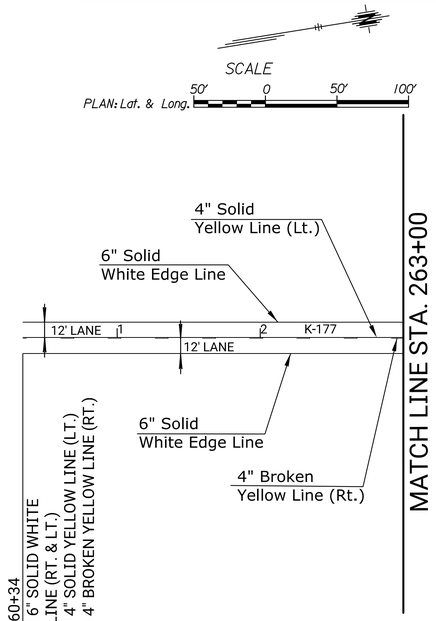
CADconform Certify This File

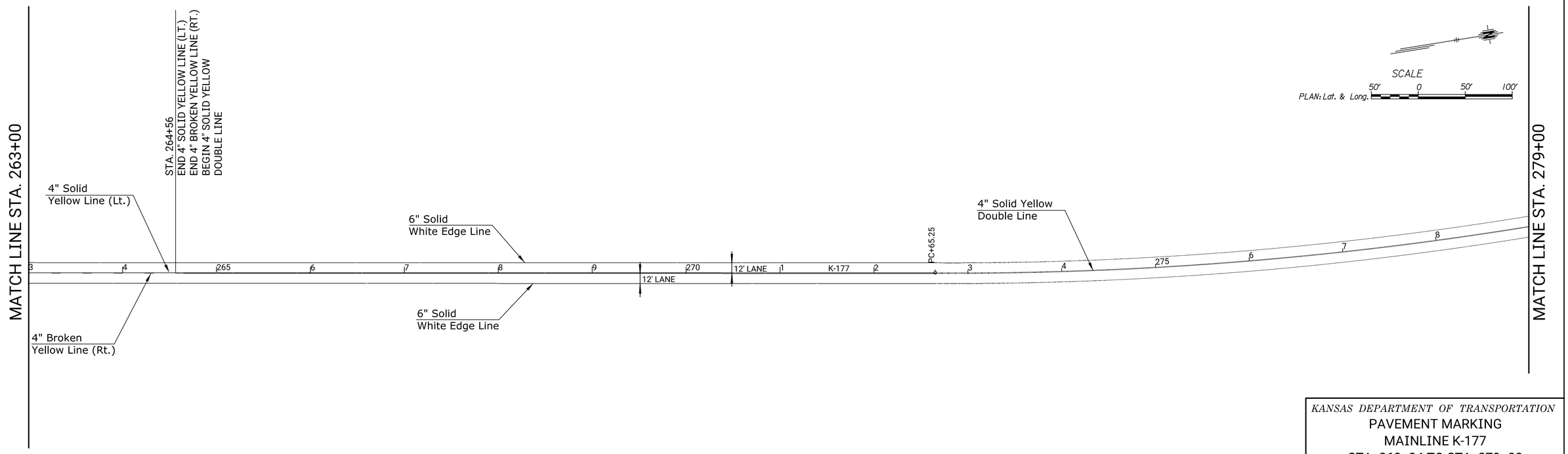
Sh. No. 122

Std. Base File: ----------
Plotted By: mrockwell | Plot Location:
File: la850.dgn
Plot Date: 16-JAN-2025 07:46

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	123	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





KANSAS DEPARTMENT OF TRANSPORTATION

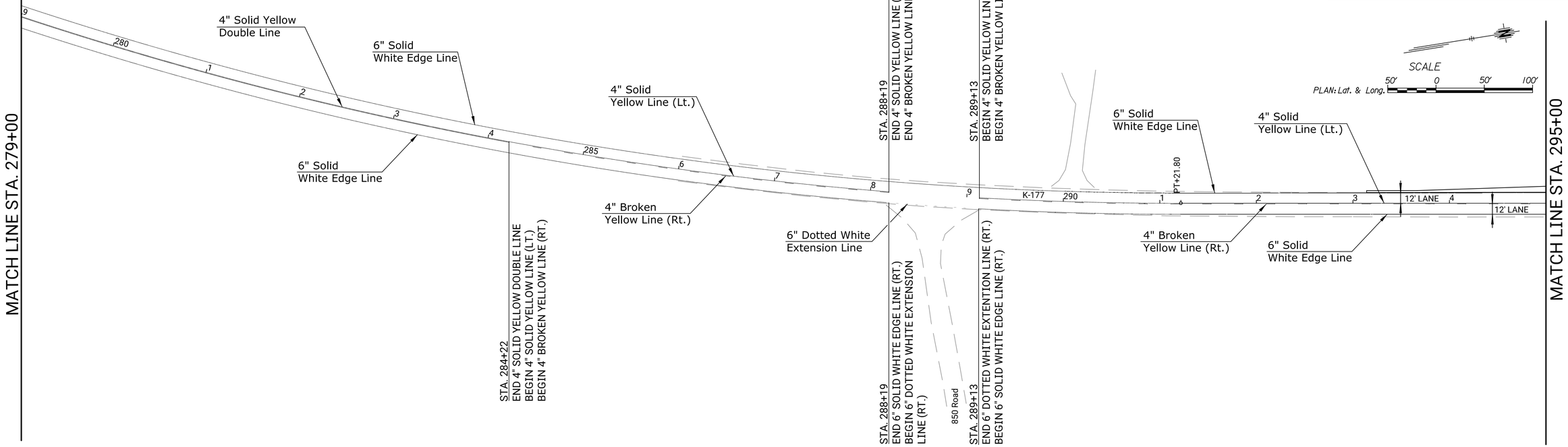
PAVEMENT MARKING
MAINLINE K-177
STA. 260+34 TO STA. 279+00

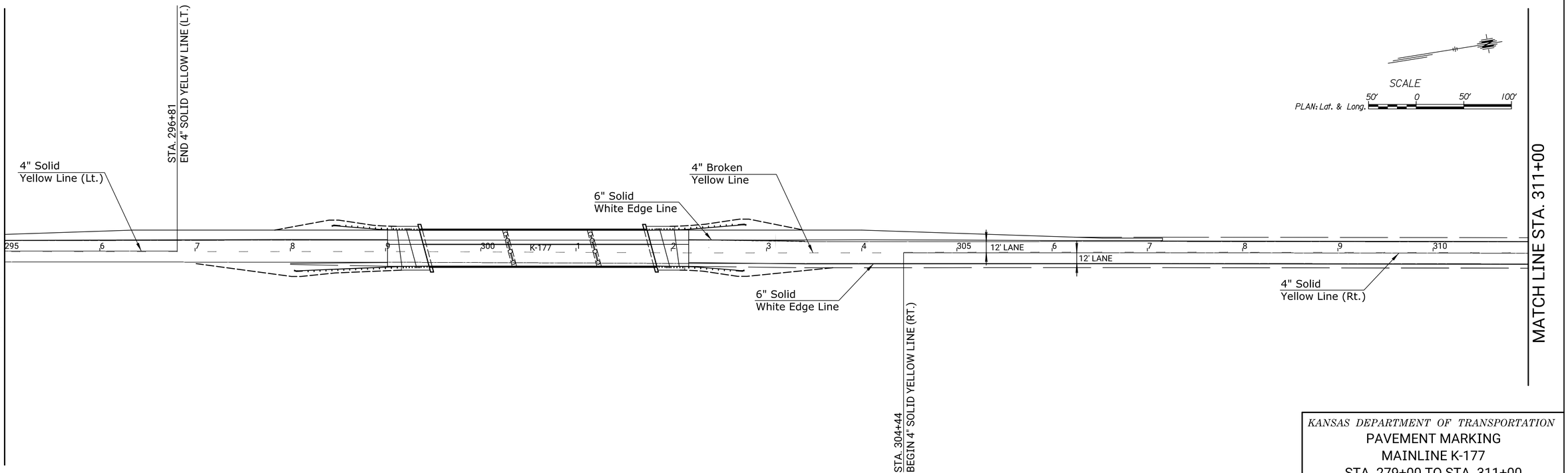
Sh. No. 123

Plotted : 16-JAN-2025 07:46
Drawn By : mrockwell
File : ka601701mpl-00.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	124	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





KANSAS DEPARTMENT OF TRANSPORTATION

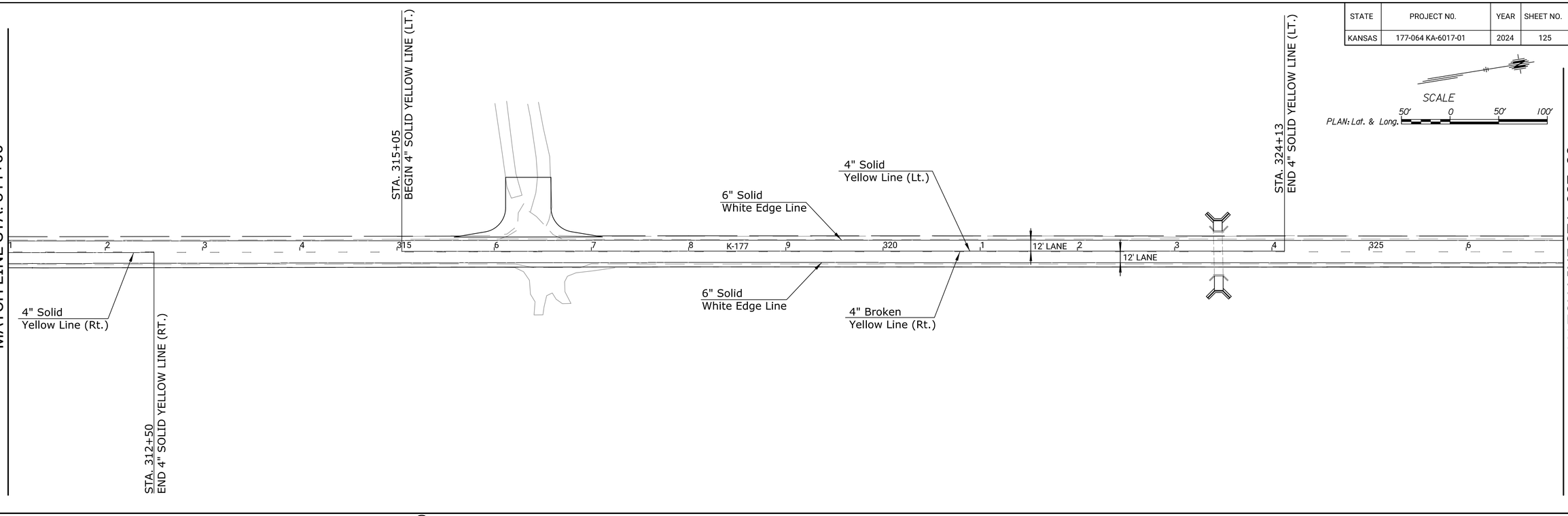
PAVEMENT MARKING
MAINLINE K-177
STA. 279+00 TO STA. 311+00

Sh. No. 124

Plotted : 16-JAN-2025 07:46
Drawn By : mrockwell
File : ka6017701mpl-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	125	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021



Drawn By : mrockwell
File : ka601701mpl-02.dgn

Plotted : 16-JAN-2025 07:46

KANSAS DEPARTMENT OF TRANSPORTATION

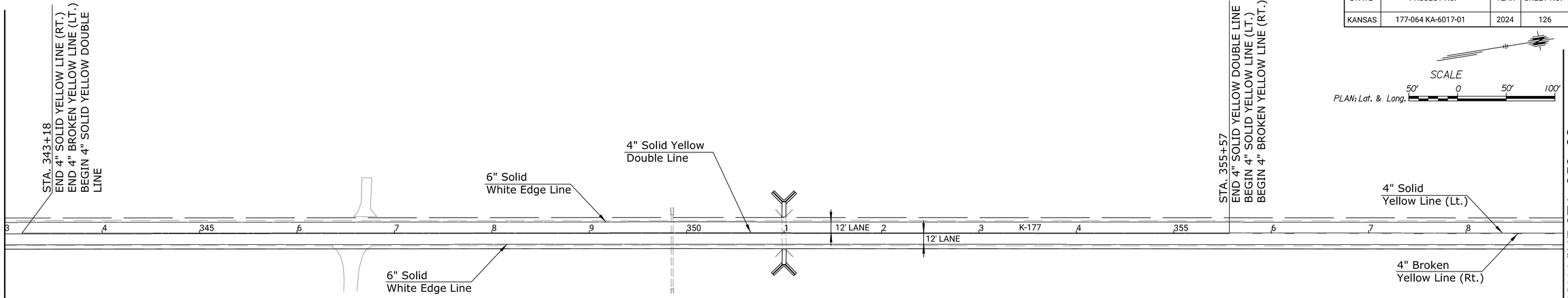
PAVEMENT MARKING
MAINLINE K-177
STA. 311+00 TO STA. 343+00

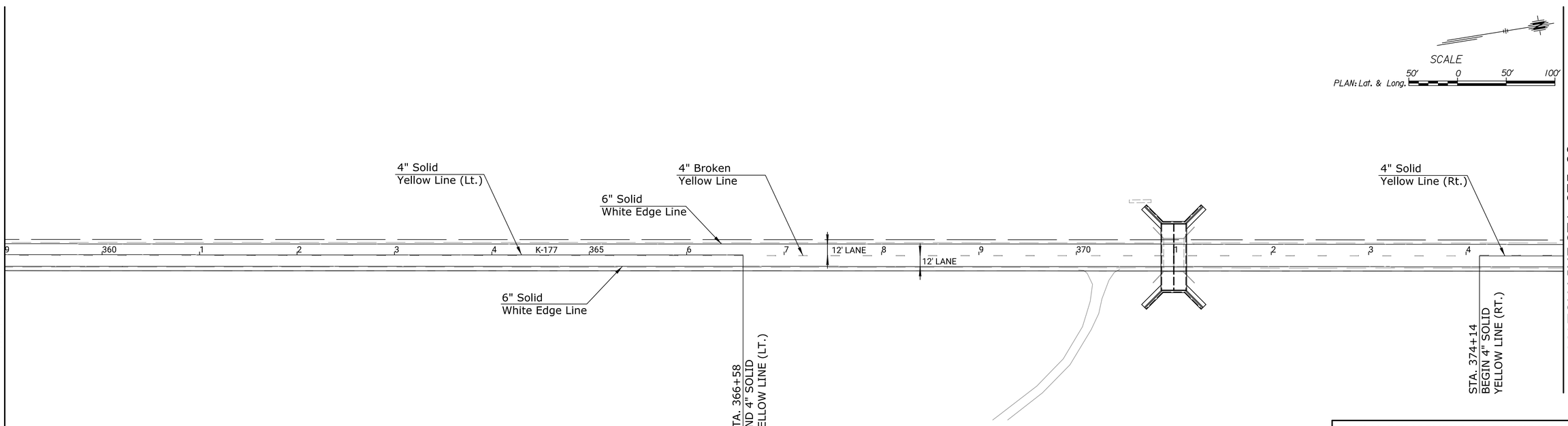
KDOT Graphics Certified 06-11-2024 Sh. No. 125

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	126	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





KANSAS DEPARTMENT OF TRANSPORTATION

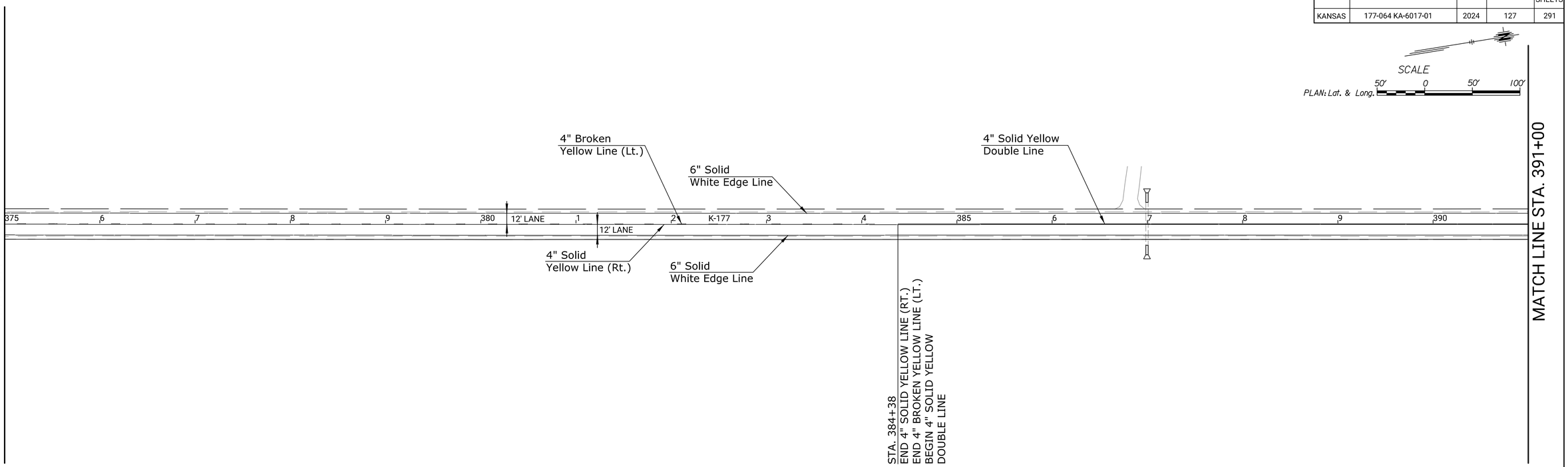
PAVEMENT MARKING
MAINLINE K-177
STA. 343+00 TO STA. 375+00

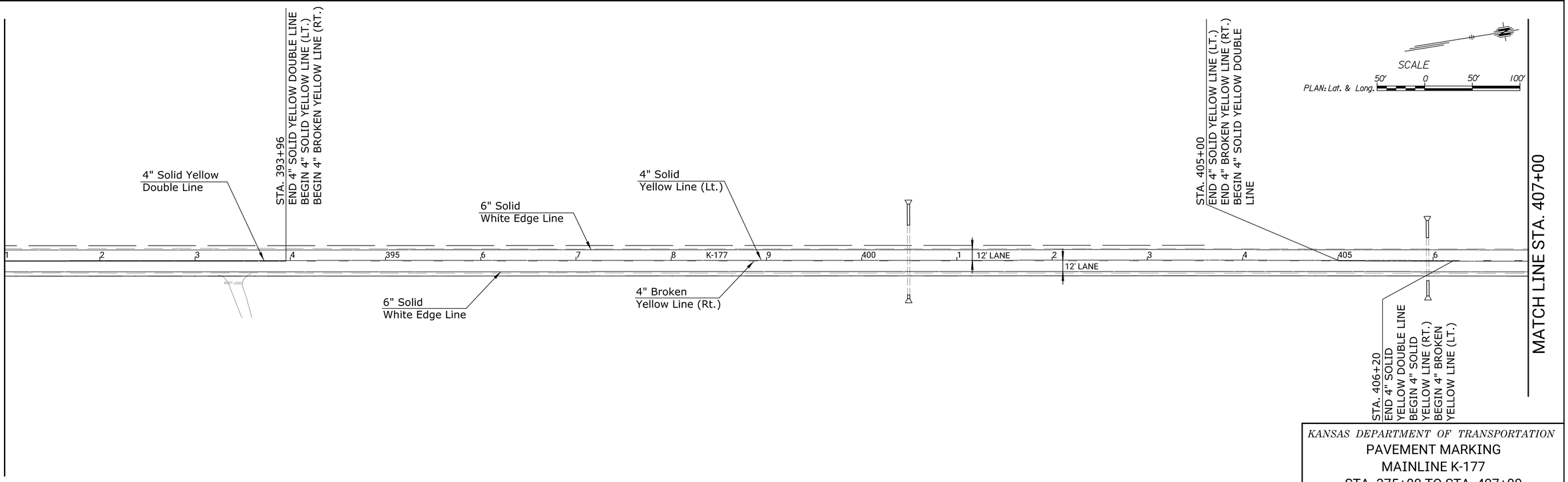
Sh. No. 126

Drawn By : mrockwell
File : ka6017701mpl-03.dgn
Plotted : 16-JAN-2025 07:46

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	127	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





KANSAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING
MAINLINE K-177
STA. 375+00 TO STA. 407+00

Drawn By : mrockwell
File : ka601701mpl-04.dgn
Plotted : 16-JAN-2025 07:46

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	128	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

SCALE
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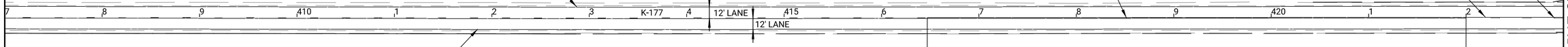
PLAN: Lat. & Long.

MATCH LINE STA. 407+00

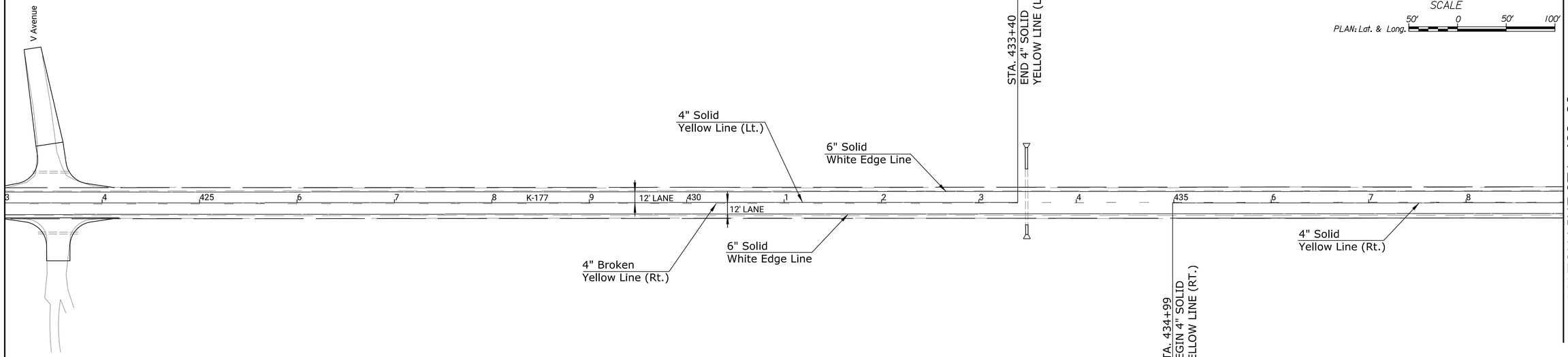


STA. 416+47
END 4" SOLID YELLOW LINE (RT.)
END 4" BROKEN YELLOW LINE (LT.)
BEGIN 4" SOLID YELLOW DOUBLE LINE

STA. 422+00
END 4" SOLID YELLOW DOUBLE LINE
BEGIN 4" SOLID YELLOW LINE (LT.)
BEGIN 4" BROKEN YELLOW LINE (RT.)

MATCH LINE STA. 423+00

MATCH LINE STA. 423+00



STA. 433+40
END 4" SOLID
YELLOW LINE (LT.)

STA. 434+99
BEGIN 4" SOLID
YELLOW LINE (RT.)

SCALE
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PLAN: Lat. & Long.

MATCH LINE STA. 439+00

KANSAS DEPARTMENT OF TRANSPORTATION

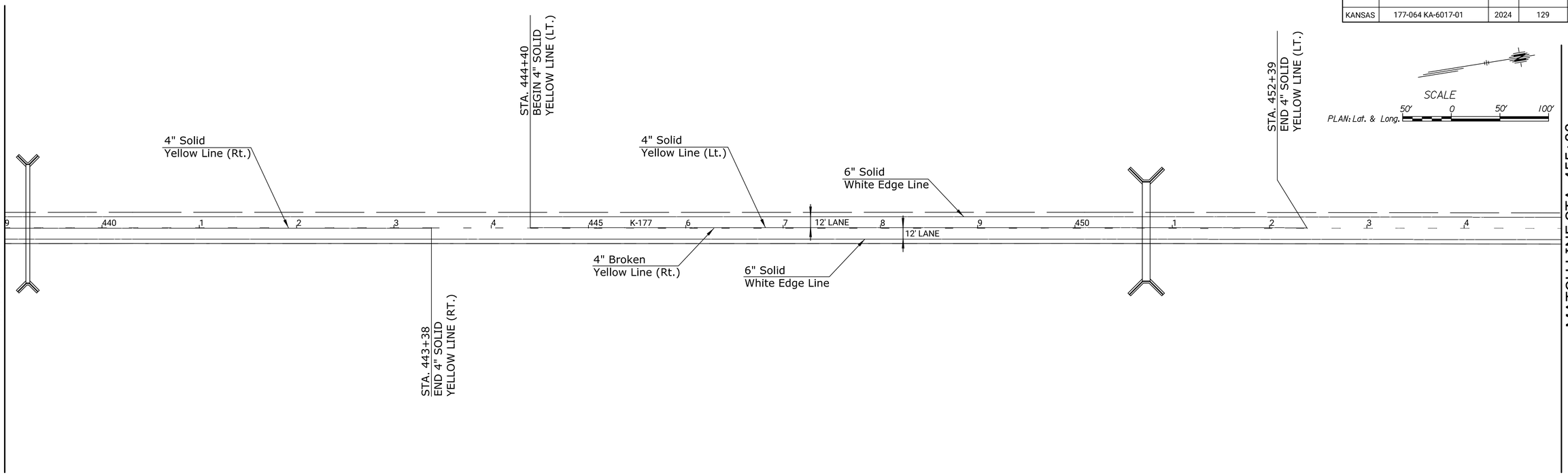
PAVEMENT MARKING
MAINLINE K-177
STA. 407+00 TO STA. 439+00

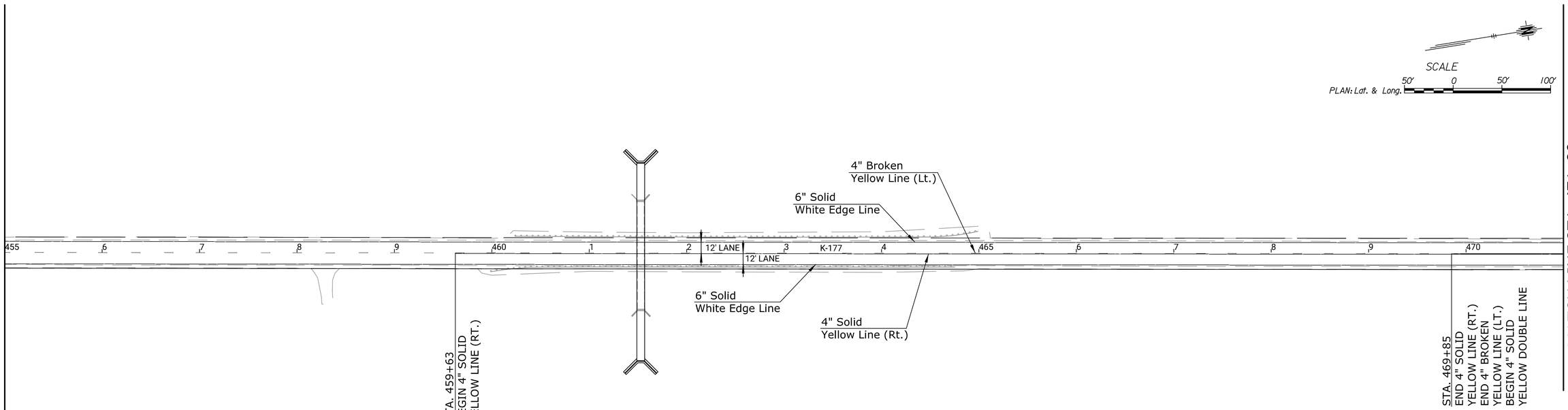
Sh. No. 128

Drawn By : mrockwell
File : ka601701mpl-05.dgn
Plotted : 16-JAN-2025 07:46

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	129	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





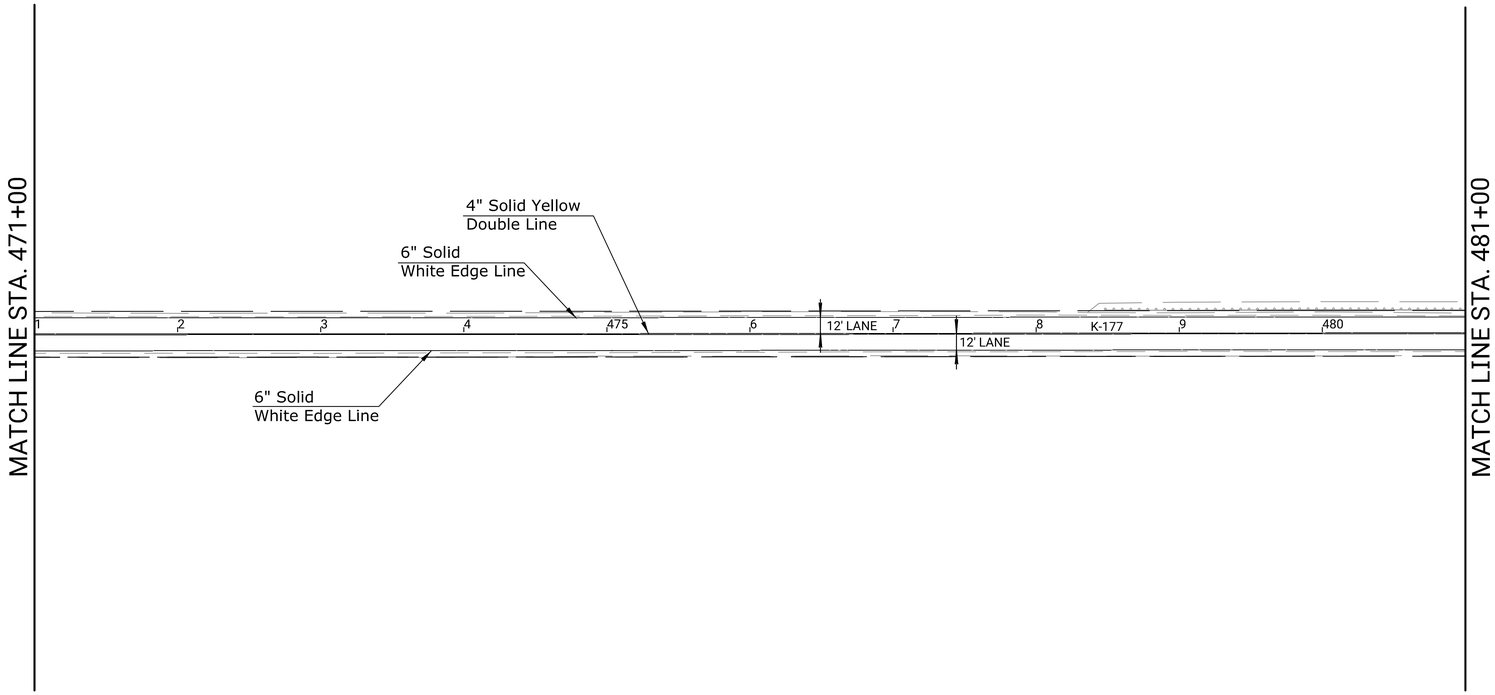
KANSAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING
MAINLINE K-177
STA. 439+00 TO STA. 471+00

Sh. No. 129

Drawn By : mrockwell
File : ka601701mpl-06.dgn
Plotted : 16-JAN-2025 07:47

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	130	291



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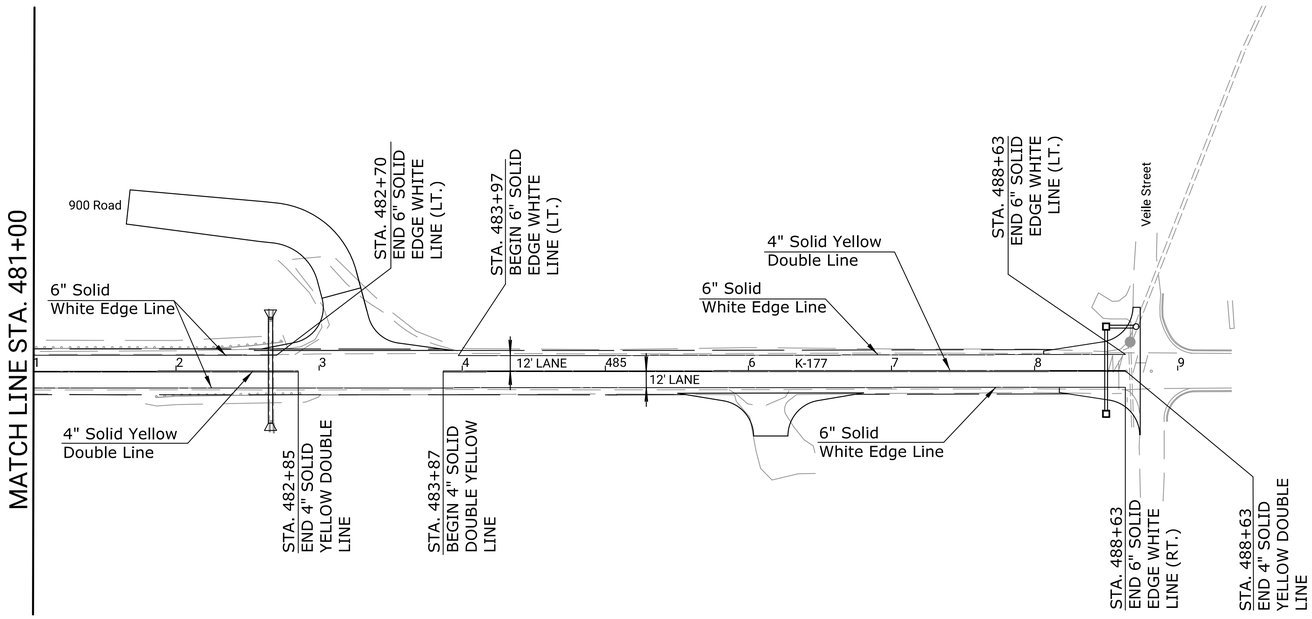
PLAN: Lat. & Long.



SCALE
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PLAN: Lat. & Long.

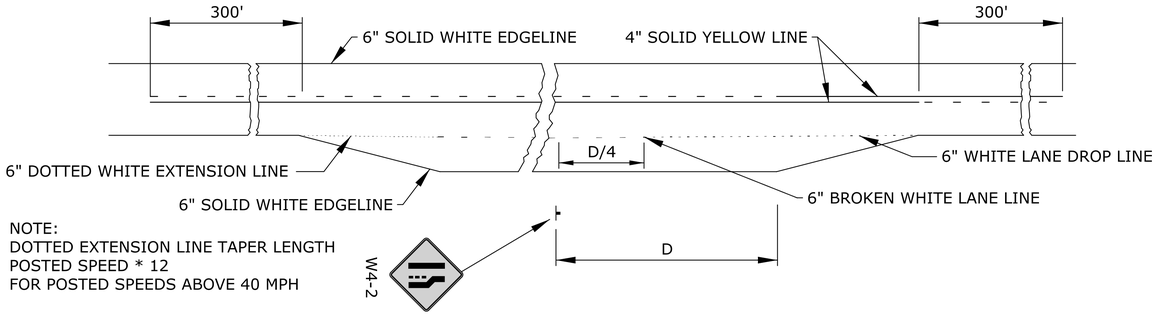
	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

Drawn By : mrockwell
File : ka601701mpl-07.dgn
Plotted : 16-JAN-2025 07:47

KANSAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING
MAINLINE K-177
STA. 471+00 TO STA. 488+63

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	131	291

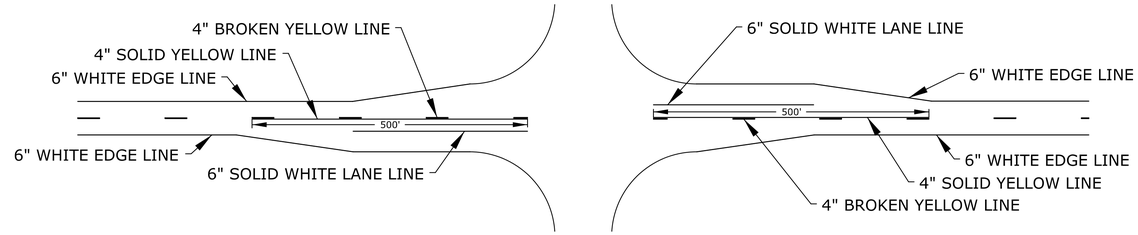


NOTE:
DOTTED EXTENSION LINE TAPER LENGTH
POSTED SPEED * 12
FOR POSTED SPEEDS ABOVE 40 MPH

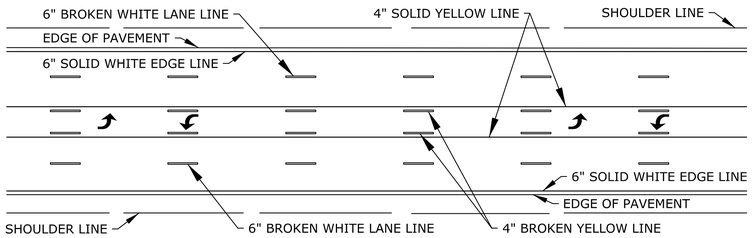
TYPICAL MARKING FOR AUXILIARY PASSING LANE

NOTE:
ALL PAVEMENT MARKINGS SHALL BE BROKEN AT CROSS ROADS.

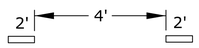
FOR HIGHWAY JUNCTIONS THE NO PASSING ZONE WILL EXTEND 1000' FROM INTERSECTION.



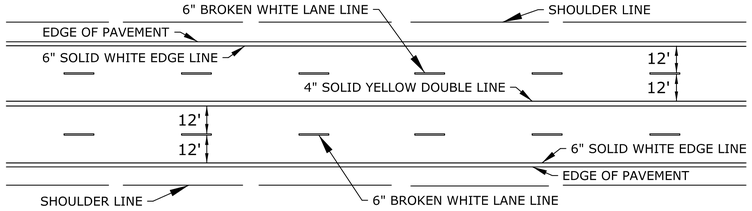
TYPICAL ROAD JUNCTION MARKINGS WITH BYPASS LANES



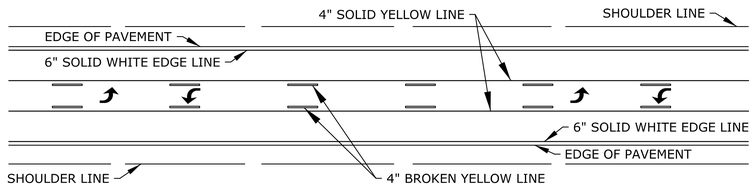
TWO-WAY LEFT TURN DETAIL FOR FIVE LANE ROADWAY



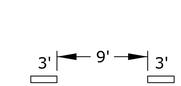
TYPICAL SPACING FOR DOTTED EXTENSION LINES, UNLESS OTHERWISE NOTED ON PLANS.



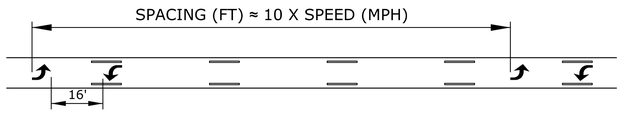
TYPICAL MARKINGS FOR FOUR LANE ROADWAY



TWO-WAY LEFT TURN DETAIL FOR THREE LANE ROADWAY

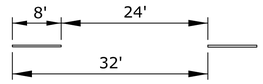


TYPICAL SPACING FOR LANE DROP. UNLESS OTHERWISE NOTED ON PLANS.

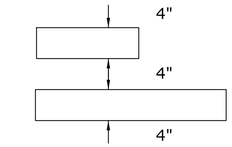


TWO-WAY LEFT TURN ARROW SPACING DETAIL

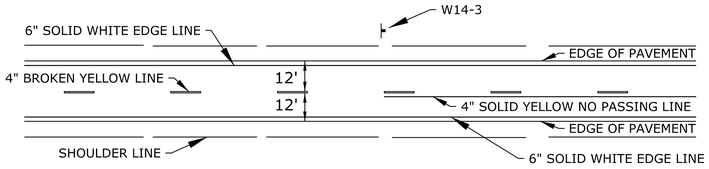
NOTE:
IF ARROWS ARE USED SPACE THE ARROWS AS SHOWN IN THE SPACING DETAIL.



TYPICAL SPACING FOR BROKEN LINES UNLESS OTHERWISE NOTED ON PLANS



TYPICAL SPACING FOR NO PASSING LINES UNLESS OTHERWISE NOTED ON PLANS



TYPICAL TWO LANE MARKINGS

NOTE:
LONGITUDINAL PAVEMENT MARKING LINES SHALL BE OFFSET A MINIMUM OF 2" FROM LONGITUDINAL PAVEMENT JOINTS.

NOTE:
ON NON I, US, AND K ROUTES, 4" EDGE LINES MAY BE INSTALLED.
6" EDGE LINES ARE NOT REQUIRED ON NON I, US, AND K ROUTES.

NO.	DATE	REVISIONS	BY	APP'D
3	5/25/12	Added Dotted Extension and Lane Drop Lines	B.A.H.	B.D.G.
2	9/20/05	Removed Aux. Passing Lane Dotted Ext. Line	J.F.F.	B.D.G.
1	7/26/05	New FHWA Approval Date	J.F.F.	B.D.G.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL PAVEMENT MARKING DETAILS FOR UNDIVIDED ROADWAYS

TE308

FHWA APPROVAL		5/25/2012	APP'D	Brian D. Gower	
DESIGNED	J.F.F.	DETAILED	J.F.F.	QUANTITIES	TRACED
DESIGN CK.	B.D.G.	DETAIL CK.	B.D.G.	QUAN. CK.	TRACE CK.

KDOT Graphics Certified 07-17-2018

Sh. No. 131

KDOT Graphics Certified

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Drawn By : mrockwell
File : te308.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	132	291

SUMMARY OF PAVEMENT MARKINGS

LOCATION	4" Solid WHITE Edge Line	6" Solid WHITE Edge Line	6" Broken WHITE Lane Line	6" Broken WHITE Lane Line (PCP)	6" Dotted WHITE Extension Line	6" Broken WHITE Lane Drop Line	6" Solid WHITE Lane Line	8" Broken WHITE Lane Drop Line	8" Solid WHITE Gore Line	8" Dotted WHITE Extension Line	12" Solid WHITE Diagonal Line	12" Solid WHITE Chevron Line	12" Solid WHITE Type I Crosswalk Line	24" Solid WHITE Type II Crosswalk Line	24" Solid WHITE Stop Line	4" Solid YELLOW Edge Line	4" Solid YELLOW Double Line	4" Solid YELLOW Line	4" Broken YELLOW Line	6" Solid YELLOW Edge Line	12" Solid YELLOW Diagonal Line
MAINLINE K-177																					
STA: 260+34 - STA: 279+00		3,732															1,444	422	422		
STA: 279+00 - STA: 311+00		6,306			94												522	1,821	2,584		
STA: 311+00 - STA: 343+00		6,164																2,133	3,076		
STA: 343+00 - STA: 375+00		6,400															1,239	1,205	1,961		
STA: 375+00 - STA: 407+00		6,400															1,078	2,195	2,195		
STA: 407+00 - STA: 439+00		6,400															553	2,488	2,647		
STA: 439+00 - STA: 471+00		6,400															115	2,259	3,085		
STA: 471+00 - STA: 488+63		3,297															1,661				
TOTALS		45,099			32												13,224	12,523	3,993		

RECAPITULATION OF QUANTITIES

ITEMS	TOTAL	UNITS
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(4")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(6")	45,130	FT
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(8")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(12")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(4")	29,740	FT
PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(6")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(12")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(4")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(6")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(8")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(12")		FT
PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(4")		FT
PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(6")		FT
PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(12")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(4")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(6")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(8")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(12")		FT
PAVEMENT MARKING (EPOXY)(YELLOW)(4")		FT
PAVEMENT MARKING (EPOXY)(YELLOW)(6")		FT
PAVEMENT MARKING (EPOXY)(YELLOW)(12")		FT
PAVEMENT MARKING (INTERSECTION GRADE)(WHITE)(12")		FT
PAVEMENT MARKING (INTERSECTION GRADE)(WHITE)(24")		FT
PAVEMENT MARKING (INTERSECTION GRADE)(YELLOW)(12")		FT
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(US-SHIELD)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(US-SHIELD)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(K-SHIELD)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(I-SHIELD)( )		EACH
PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(6")		FT
PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(8")		FT
PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(12")		FT
PAVEMENT MARKING REMOVAL		FT

SUMMARY OF WORD & SYMBOL MARKINGS

LOCATION							STOP	ONLY	X-ING	SCHOOL	70	435	24	400	18							
TOTALS																						

NOTE: FOR SPECIFIC PAVEMENT MARKING DETAILS AND DIMENSIONS SEE PLAN SHEETS

NOTE: ALL TOTALS REFLECT ACTUAL QUANTITY OF PAVEMENT MARKING MATERIALS REQUIRED.

NOTE:
WORDS & SYMBOLS SHALL CONFORM TO THE LATEST EDITION OF "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" PRINTED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

PRIOR TO COMMENCEMENT OF PAVEMENT MARKING WORK THE ENGINEER WILL ESTABLISH THE LIMITS FOR "NO PASSING" ZONES. THESE LIMITS SHALL BE USED FOR THE LOCATION OF "NO PASSING" LINES AND FOR THE COMPUTATION OF ACTUAL MARKING QUANTITIES FOR THIS LINE TYPE.

NO.	DATE	REVISIONS	BY	APP'D
02	05-25-12	Added Line Types, Symbols, and Shields	B.A.H.	B.D.G.
01	07-26-05	New FHWA Approval Date	J.F.F.	B.D.G.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY AND RECAPITULATION OF PAVEMENT MARKING QUANTITIES

TE311

FHWA APPROVAL		05-25-12	APP'D.	Brian D. Gower	
DESIGNED	J.F.F.	DETAILED	J.F.F.	QUANTITIES	TRACED
DESIGN CK.	B.D.G.	DETAIL CK.	B.D.G.	QUAN.CK.	TRACE CK.

CADconform Certify This File

Sh. No. 132

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Drawn By : mrockwell
File : te311.dgn

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	133	291

SYMBOL KEY

- REMOVE SIGN
- REMOVE POST
- REMOVE FOOTING
- REMOVE SIGN & POST
- REMOVE POST & FOOTING
- REMOVE SIGN, POST, & FOOTING
- MOUNT ON WOOD POST IN CONCRETE FOOTING
- MOUNT ON WOOD POST IN SOIL
- MOUNT ON STEEL BEAM BREAKAWAY POST
- MOUNT ON STEEL U-POST
- MOUNT ON PSST POST
- MOUNT ON EXISTING POST
- MOUNT ON VERTICAL SUPPORT
- SHOULDER MOUNTED INSTALLATION
- OFFSET MOUNTED INSTALLATION
- EXISTING SIGN
- EXISTING SIGN TO BE OVERLAID
- SIGN IS NOT PART OF PROJECT
- TYPE 'A' DELINEATOR (RIGID)
- TYPE 'A' DELINEATOR (RIGID) (BK-BK)
- TYPE 'B' DELINEATOR (RIGID)
- TYPE 'A' DELINEATOR (FLEXIBLE)
- TYPE 'A' DELINEATOR (FLEXIBLE) (BK-BK)
- TYPE 'B' DELINEATOR (FLEXIBLE)
- TYPE 2 OBJECT MARKER
- TYPE 3 OBJECT MARKER
- TYPE 3 OBJECT MARKER (BK-BK)

GENERAL NOTES

In order to expedite the completion of the project for traffic service, the signing and delineator work shall be sequenced with any other contract work such that the phases of construction may proceed and be completed at the same time.

New signs erected on the project which are in conflict with existing signing are to be completely covered until the existing signs are removed or the new signing is applicable. The existing signs that are being replaced, removed, or do not follow the current MUTCD signing standards are to be removed when the project is completed or as determined by the Engineer.

The Contractor shall exercise caution at all times when installing sign supports in and around areas where utilities exist, either underground or overhead, and will be held responsible for any damage incurred to the system. The installation of sign supports shall include the excavation, drilling, or driving the support footing and the erection of the sign support. The contractor shall exercise caution when working around any existing signs that are to remain and will be held responsible for any damage to the signs, supports, or footings. The Contractor shall exercise care when working around shrubbery while removing or installing signs or sign supports.

An existing sign post installation shall be plumb and the compaction of the backfill soil shall comply with the specifications after the removal and resetting of a sign, the removal and replacement of a sign, or the installation of a new sign.

The Contractor shall provide mounting bolts that are of a length that does not extend more than a nominal 1 inch beyond the sign post. The Contractor shall not make any field modifications to the mounting bolt prior to or after the sign is installed.

Specific service (LOGO) signs that are to be removed shall have the business logo plaques removed and transported to location determined by KDOT, at which time the plaques become the property of KDOT. The Contractor will be assessed a replacement cost for any damage to a business logo plaque prior to the plaque becoming the property of KDOT.

The materials and fabrication for signing and delineation work shall conform to the Standard Specifications for State Road and Bridge Construction (2015 edition) and Special Provisions.

INDEX OF SHEETS

SIGNING INDEX, SYMBOLS, & GENERAL NOTES
POST SPACING & SIGN ANGLE DETAILS
HEIGHT & LATERAL DISTANCE FOR ERECTION
POSITIONING, DESIGN, & MOUNTING OF DELINEATORS
POSITIONING, DESIGN, & MOUNTING FOR OBJECT MARKERS (TYPE 2 & 3)
POSITIONING FOR CHEVRON (W1-8) SIGNS
PLAN SHEETS (INSTALLATIONS)
PLAN SHEETS (REMOVALS)
QUANTITIES SHEETS (INSTALLATIONS)
QUANTITIES SHEET (DELINEATORS & OBJECT MARKERS)
SUMMARY SHEET (INSTALLATIONS & REMOVALS)
SUMMARY SHEET (REMOVAL & RESET)
RECAPITULATION SHEET
STANDARD STRUCTURAL SIGN SUPPORTS (WOOD & STEEL POSTS)
MOUNTING OF SIGNS ON WOOD POSTS
MOUNTING OF FLAT SHEET SIGNS ON STEEL I-BEAM POSTS
MOUNTING OF REINFORCED PANEL SIGNS ON I-BEAM POSTS
DETAILS FOR FLAT SHEET SIGN BLANKS
DETAILS FOR PROCESSED SIGNS
DETAILS FOR REINFORCED PANELS
DETAILS FOR GUIDE SIGN LEGEND
DETAILS FOR GUIDE SIGNS
DETAILED SIGN SPECIFICATIONS

NO.	DATE	REVISIONS	BY	APP'D
2	10/01/19	Changed symbols, notes, & index	D.D.G.	E.W.N.
1	7/23/10	Changed General Notes and Spec Book Date	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING SYMBOL KEY
GENERAL NOTES
AND INDEX

TE402 7/1/03

FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	W.S.B.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

KDOT Graphics Certified 12-17-2019

Sh. No. 133

KDOT Graphics Certified

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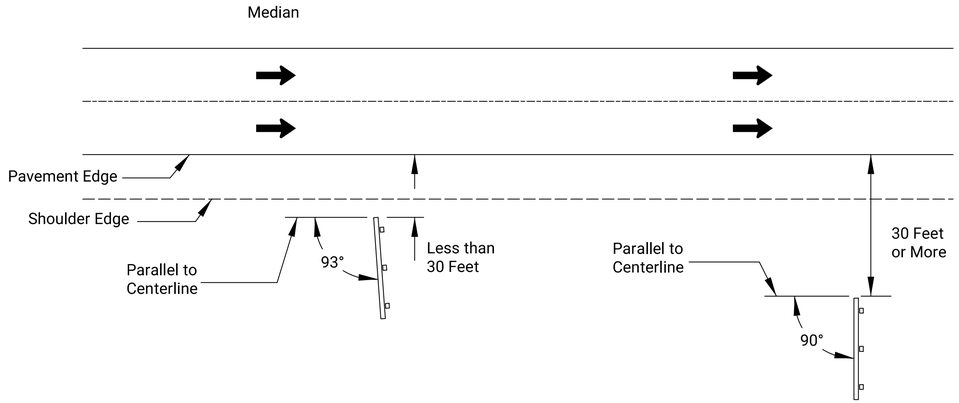
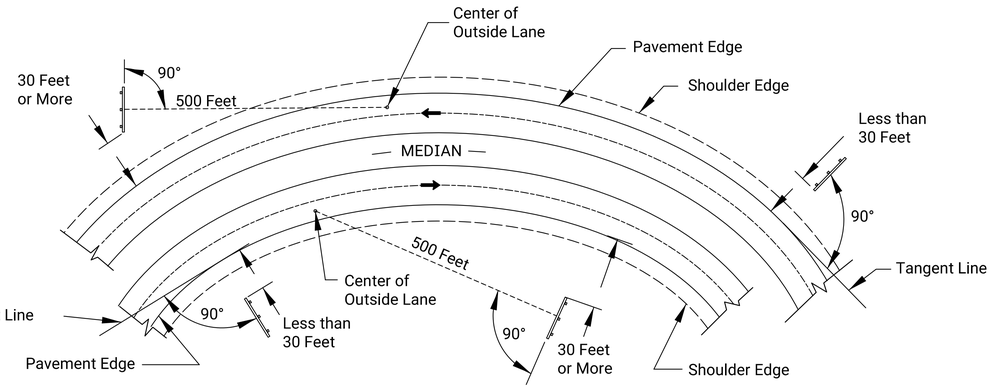
File : te402.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	134	291

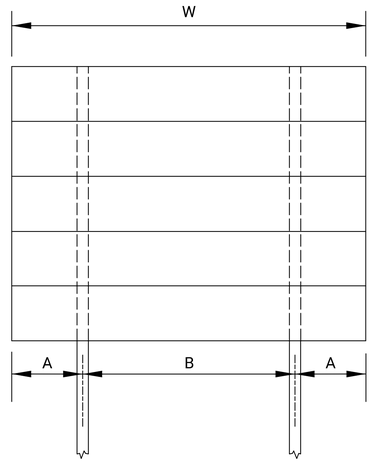


ANGLE OF SIGNS ERECTED ON STRAIGHT ROADWAY



ANGLE OF SIGNS ERECTED ON CURVED ROADWAY

GENERAL NOTE:
Gore and median signs shall normally be erected such that the sign face is truly vertical and rotated 93 degrees away from the center of the lane which the sign serves. All angles are measured to the face of the sign.



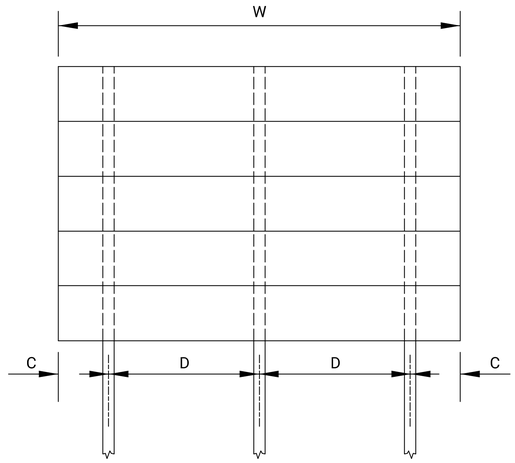
TWO POST SPACING

Wood Post		
A	B	W
6" (Min.)	⅗ W (Min.)	NA

Steel Beam Post (Width less than or equal to 13'-0")		
A	B	W
12" (Min.)	8'	10'-0" (Min.)

Steel Beam Post (Width greater than 13'-0")		
A	B	W
32" (Min.)	8' (Min.)	13'-6" (Min.)

Spacing Pattern: A+B+A
W= Sign Width
A= ⅕ W
B= ⅗ W



THREE POST SPACING

Wood Post		
C	D	W
6" (Min.)	4' (Min.)	9'-0" (Min.)

Steel Beam Post (Width less than or equal to 21'-0")		
C	D	W
12" (Min.)	8'	18'-0" (Min.)

Steel Beam Post (Width greater than 21'-0")		
C	D	W
32" (Min.)	8' (Min.)	21'-6" (Min.)

Spacing Pattern: C+D+D+C
W= Sign Width
C= ⅛ W
D= ⅜ W

NOTE: All spacing dimensions are measured to the centerline of the posts.

POST SPACING FOR REINFORCED PANEL SIGNS

NO.	DATE	REVISIONS	BY	APP'D
1	10/01/19	Changed the post spacing tables and notes	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

POST SPACING FOR REINFORCED PANEL SIGNS AND ANGLE OF SIGNS

TE404 7/1/03

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	W.S.B.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

KDOT Graphics Certified 12-17-2019

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KDOT Graphics Certified

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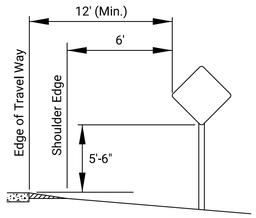
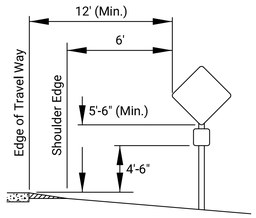
File : te404.dgn

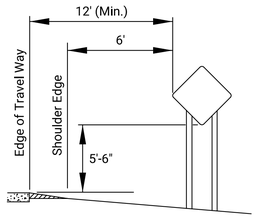
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	135	291



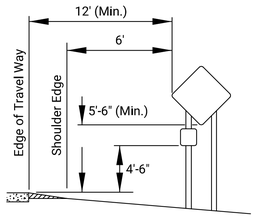
ONE POST



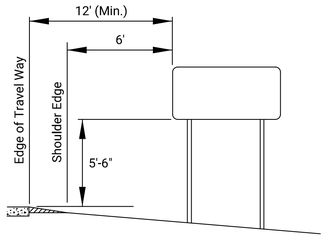
ONE POST WITH SUPPLEMENTAL SIGN



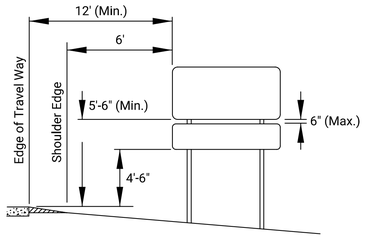
TWO POSTS



TWO POSTS WITH SUPPLEMENTAL SIGN

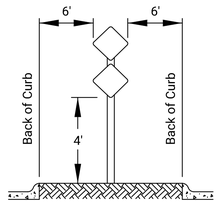


MULTIPLE POSTS

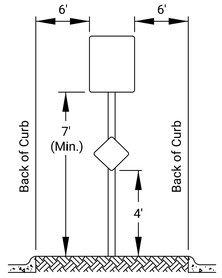


MULTIPLE POSTS WITH SUPPLEMENTAL SIGN

CONVENTIONAL HIGHWAY AND SIDE ROADS

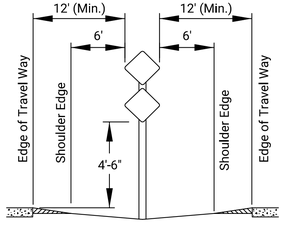


ONE OR TWO OM1-3

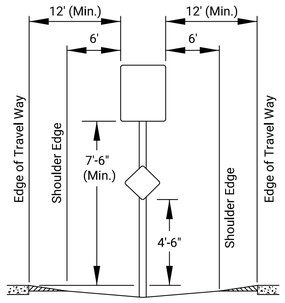


PRIMARY SIGN WITH OM1-3

RAISED



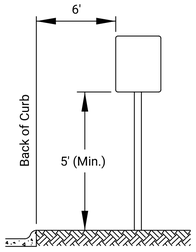
ONE OR TWO OM1-3



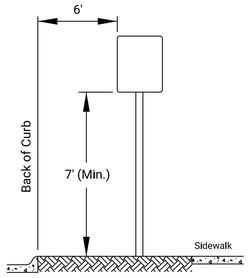
PRIMARY SIGN WITH OM1-3

DEPRESSED

MEDIANS AND ISLANDS

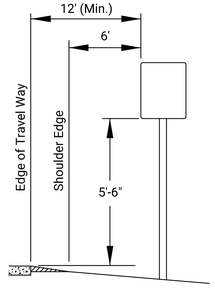


NO PARKING OR SIDEWALK



PARKING OR SIDEWALK

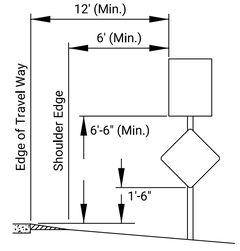
CURB



TYPICAL

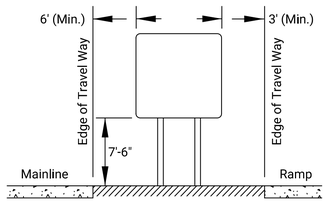
NO CURB

URBAN ROADWAYS

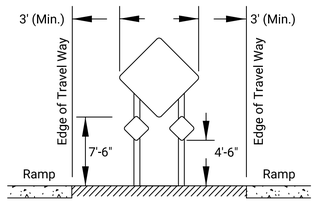


TYPICAL

ADOPT A HIGHWAY

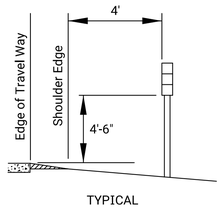


MAINLINE/RAMP



RAMP/RAMP

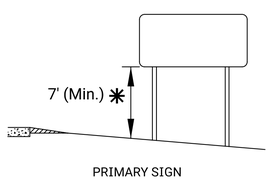
HIGHWAY GORES



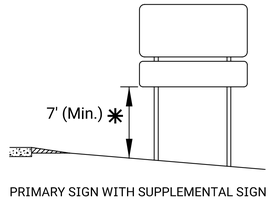
TYPICAL

Reference Marker Post: 2 Lb/Ft "U" Post

REFERENCE MARKERS



PRIMARY SIGN



PRIMARY SIGN WITH SUPPLEMENTAL SIGN

✱NOTE: Measured from the nearest point between the sign and the groundline.

GROUND CLEARANCE FOR STEEL BEAM POSTS

NOTES

The "Edge of Travel Way" is the edge line or the edge of the driving lane.

The outer edge of the sign shall not extend beyond the right of way line.

A minimum lateral clearance of 6' from pavement edge may be used where lateral offsets are limited.

In business, commercial, or residential districts where with limited lateral offsets, a minimum lateral clearance of 2' with a 7'-6" minimum mounting height may be used.

When signs are behind guard rail, the near edge of the sign shall not extend beyond the back side of the guard rail and the nearest sign post shall be a minimum of 5' from the face of the guard rail. Shoulder mounted shall not be located between 100' in advance of and 50' beyond the nose of the guard rail.

When the median or island is too narrow for the typical lateral placement, the sign may be placed a minimum of 2' from the back of the curb. In no case shall the sign edge extend beyond the back edge of the curb.

The gore sign shall be installed in the paved gore area. The edges of the gore sign shall not extend beyond the shoulder edge. The minimum distance from the centerline of the posts to the back of the paved gore area is 2'.

Signs may be moved laterally or longitudinally if it will improve visibility of the sign or other signs or if it will protect the sign more. The maximum allowable longitudinal adjustment is 100', with the exception of the reference marker which is 50'.

The minimum spacing between signs, excluding reference markers is 100'.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

MOUNTING HEIGHT & LATERAL OFFSET FOR CONVENTIONAL HIGHWAYS, SIDE ROADS, MEDIANS, ISLANDS, GORES, AND URBAN ROADWAYS

TE407 10/01/19

FHWA APPROVAL		10/01/2019	APP'D	Eric W. Nichol	
DESIGNED	D.D.G.	DETAILED	D.D.G.	QUANTITIES	TRACED
DESIGN CK.	E.W.N.	DETAIL CK.	E.W.N.	QUAN. CK.	TRACE CK.

KDOT Graphics Certified 12-17-2019

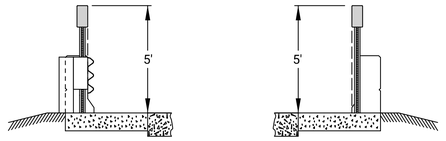
Sh. No. 135

KDOT Graphics Certified

Plotted : 16-JAN-2025 07:47

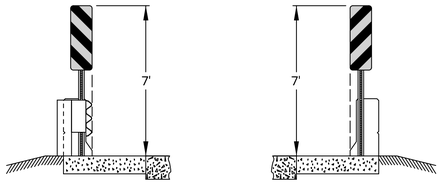
Drawn By : mrockwell
File : te407.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	136	291



WITH GUARDRAIL WITHOUT GUARDRAIL

SHOULDER WIDTH 6 FEET OR GREATER (TYPE 2 OBJECT MARKER)

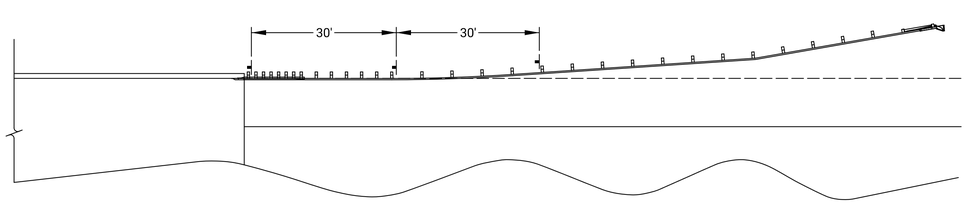


WITH GUARDRAIL WITHOUT GUARDRAIL

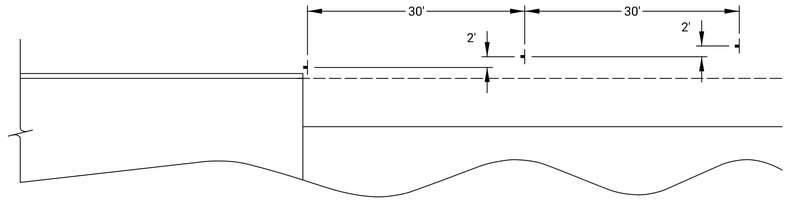
SHOULDER WIDTH LESS THAN 6 FEET (TYPE 3 OBJECT MARKER)

NOTE:
The longitudinal location of the object markers from the structure end shall be a maximum spacing of 42".

END OF STRUCTURE

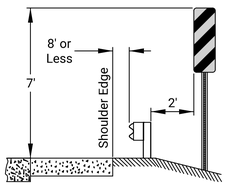


LONGITUDINAL PLACEMENT

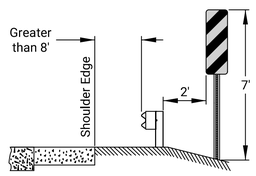


LONGITUDINAL PLACEMENT

NOTE:
The lateral offset is measured from the centerline of the object markers.

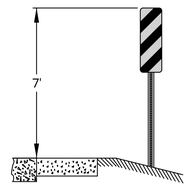


GUARDRAIL 8' OR LESS FROM SHOULDER EDGE



GUARDRAIL GREATER THAN 8' FROM SHOULDER EDGE

STRUCTURE APPROACH GUARDRAIL WITHOUT MARKERS



STRUCTURE APPROACH WITHOUT GUARDRAIL

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

DESIGN DETAILS FOR
OBJECT MARKERS (TYPE 2 & 3)
FOR STRUCTURES WITH PARAPETS

TE415 10/01/19

FHWA APPROVAL			10/01/2019	APP'D	Eric W. Nichol		
DESIGNED	D.D.G.	DETAILED	D.D.G.	QUANTITIES		TRACED	
DESIGN CK.	E.W.N.	DETAIL CK.	E.W.N.	QUAN. CK.		TRACE CK.	

KDOT Graphics Certified 12-17-2019

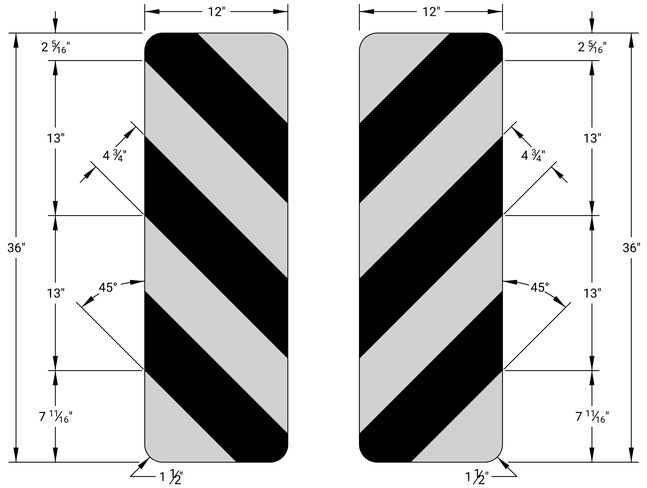
Sh. No. 136

KDOT Graphics Certified

Plotted : 16-JAN-2025 07:47

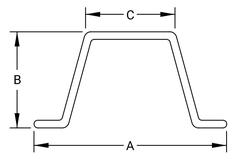
Drawn By : mrockwell
File : te415.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	137	291



OM3-L

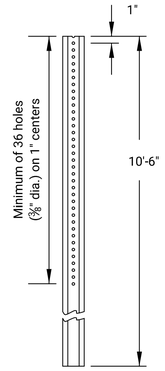
OM3-R



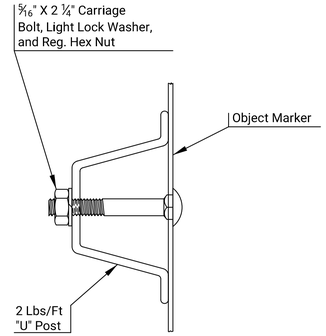
DIMENSIONS	
A	3 1/8
B	1 17/32
C	1 1/4

(Dimensions are nominal)

2 lb/ft "U" POST



PUNCHING DETAILS



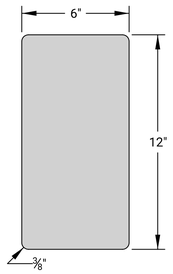
MOUNTING DETAILS

COLORS:
Yellow Background (Reflective)
Black Stripes (Non-reflective)

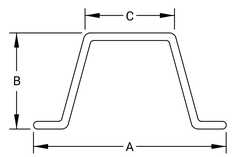
TYPE 3 OBJECT MARKER

GENERAL NOTE:
See flat sheet sign blank standard sheets for the 6" x 12" and 12" x 36" sign blank details.

The object markers shall be covered with Type XI High Intensity yellow retroreflective sheeting.



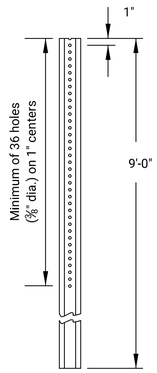
OM2



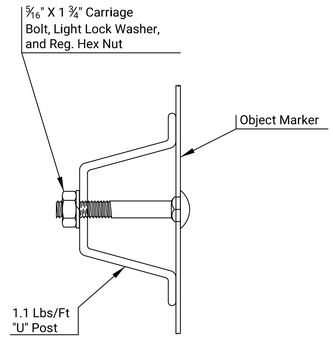
DIMENSIONS	
A	2 1/16
B	7/8
C	13/16

(Dimensions are nominal)

DELINEATOR POST
(1.1 lb/ft "U" Post)



PUNCHING DETAILS



MOUNTING DETAILS

COLOR:
Yellow Background (Reflective)

TYPE 2 OBJECT MARKER

All dimensions are in inches unless otherwise noted.
See standard plan sheet TE590 for detailed specifications.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION
DESIGN DETAILS
FOR OBJECT MARKERS
TYPE 2 AND TYPE 3

TE416 10/01/19

FHWA APPROVAL			10/01/2019	APP'D	Eric W. Nichol		
DESIGNED	D.D.G.	DETAILED	D.D.G.	QUANTITIES		TRACED	
DESIGN CK.	E.W.N.	DETAIL CK.	E.W.N.	QUAN. CK.		TRACE CK.	

KDOT Graphics Certified 12-17-2019

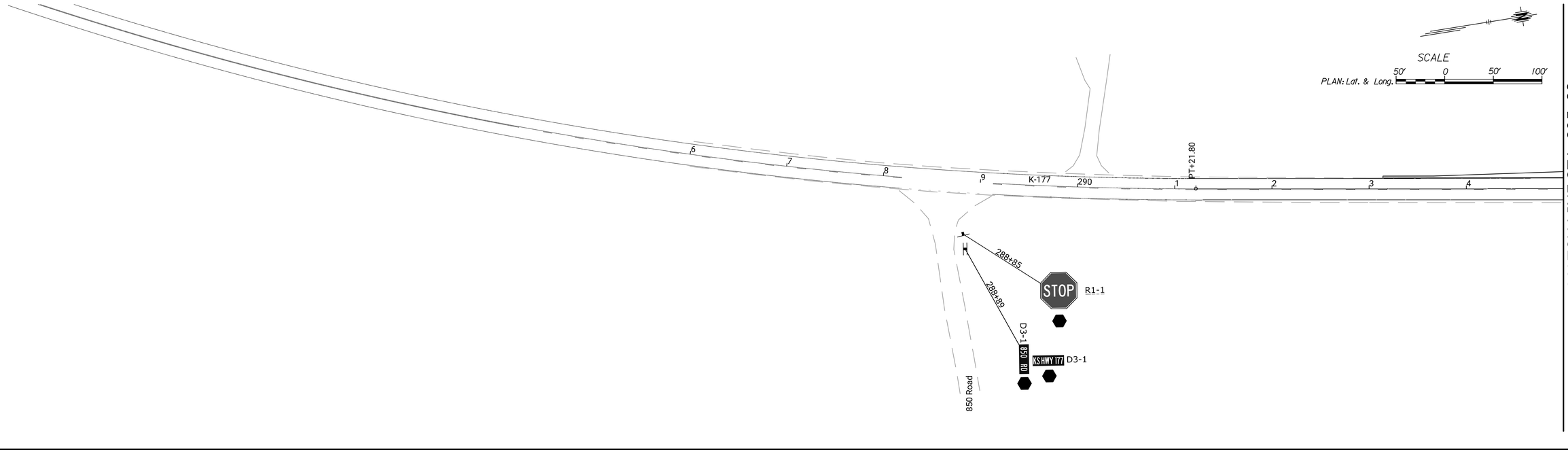
Sh. No. 137

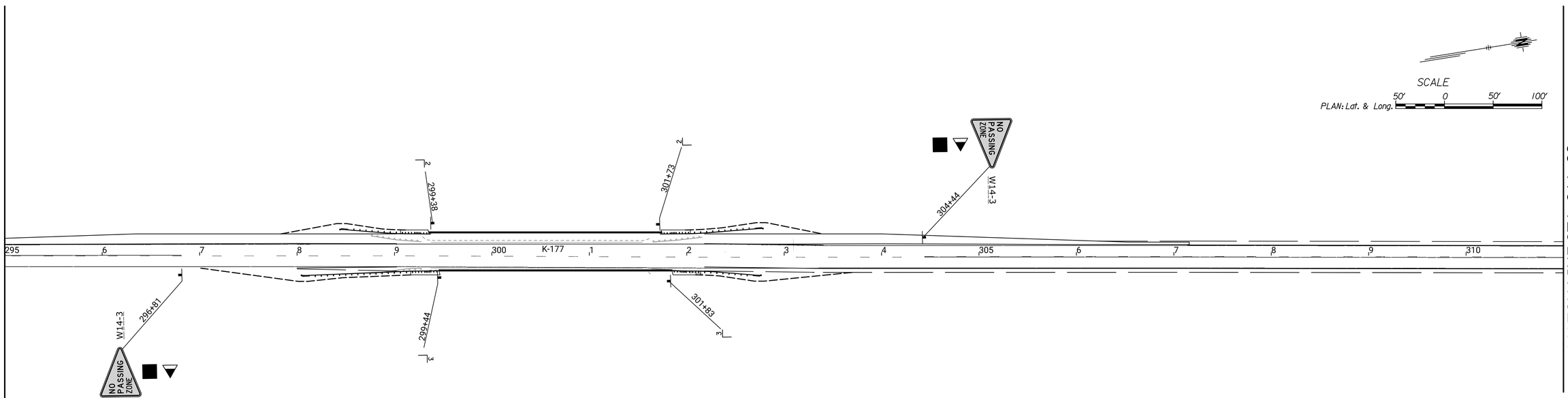
KDOT Graphics Certified

Plotted : 16-JAN-2025 07:47
Drawn By : mrockwell
File : te416.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	138	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
STA. 298+00 TO STA. 311+00

KDOT Graphics Certified 06-25-2024 Sh. No. 138

KDOT Graphics Certified

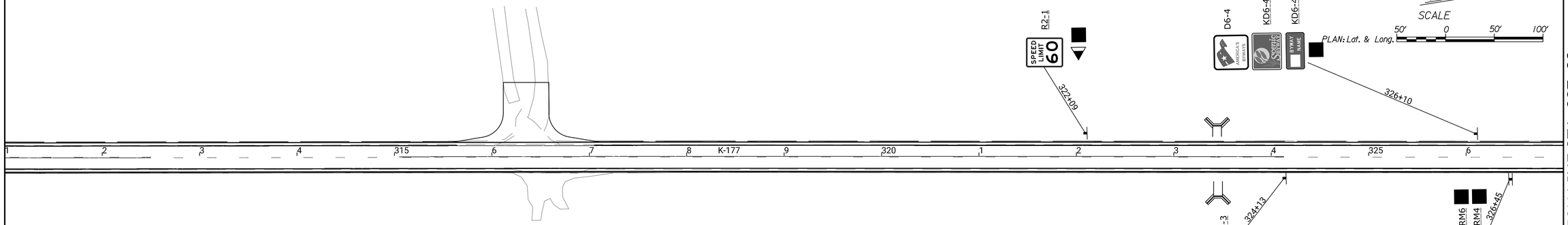
Drawn By : mrockwell
File : ka601701ppl-01.dgn

Plotted : 16-JAN-2025 07:47

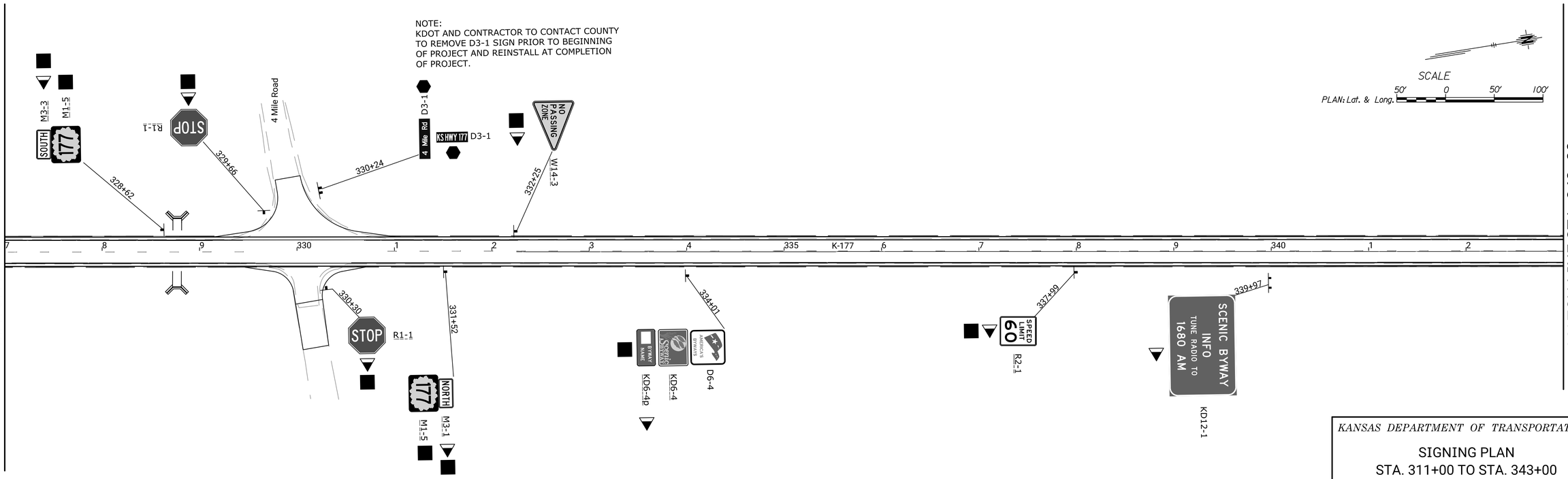
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	139	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

MATCH LINE STA. 311+00



MATCH LINE STA. 327+00



KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
STA. 311+00 TO STA. 343+00

KDOT Graphics Certified 06-25-2024 Sh. No. 139

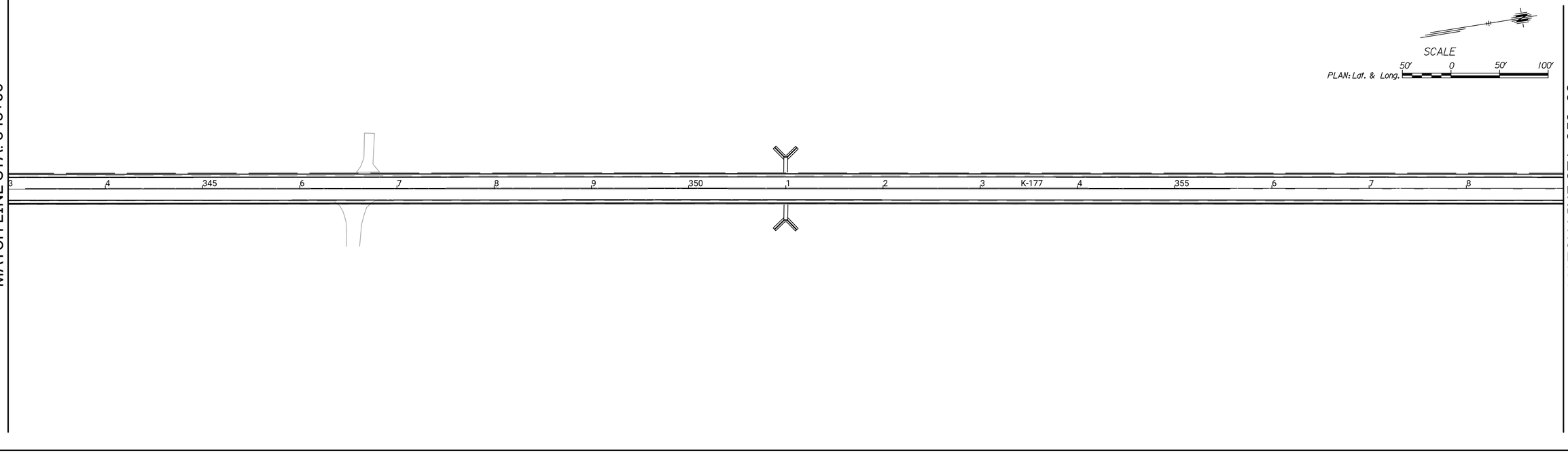
KDOT Graphics Certified

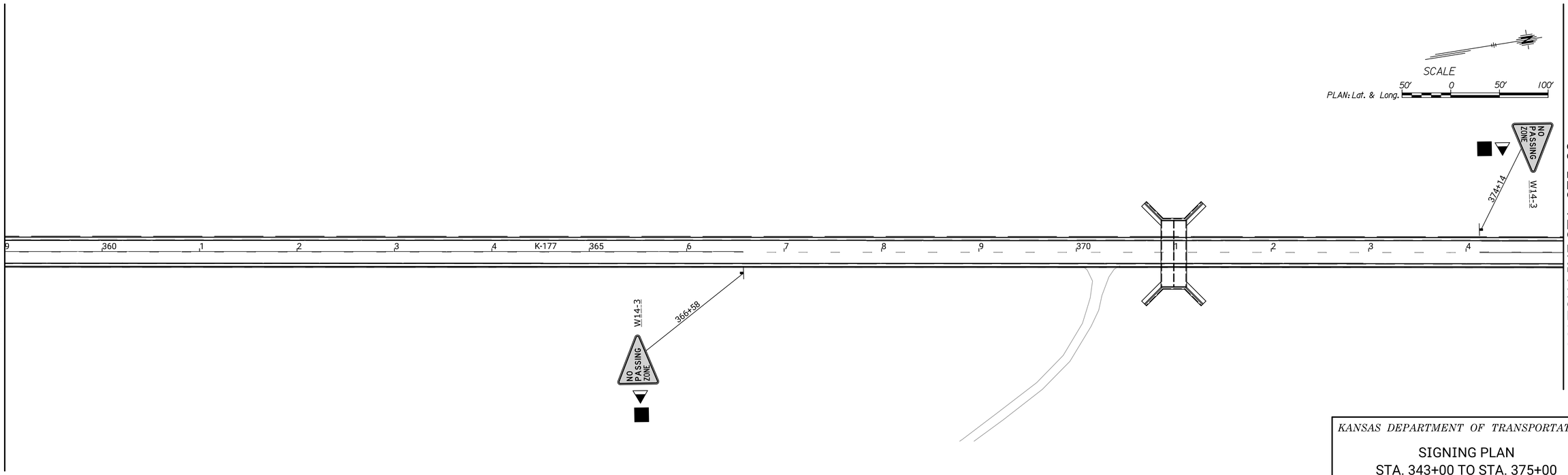
Drawn By : mrockwell
File : ka601701ppl-02.dgn

Plotted : 16-JAN-2025 07:47

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	140	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
STA. 343+00 TO STA. 375+00

KDOT Graphics Certified 06-25-2024 Sh. No. 140

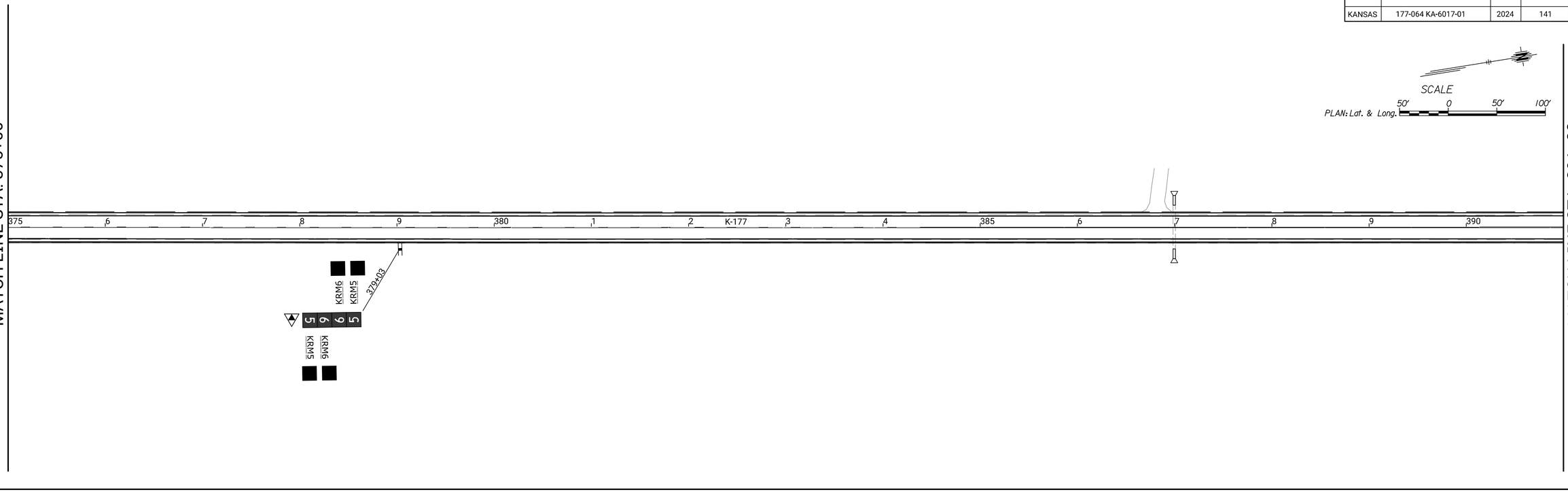
KDOT Graphics Certified

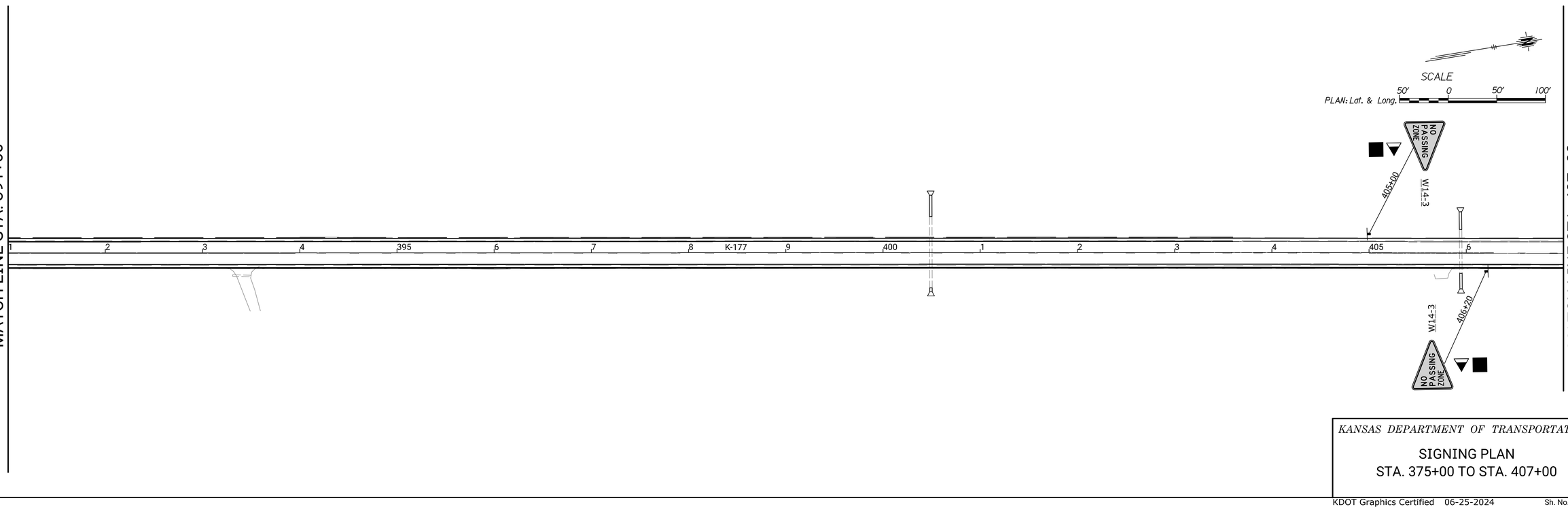
Drawn By : mrockwell
File : ka601701ppl-03.dgn

Plotted : 16-JAN-2025 07:47

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	141	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
STA. 375+00 TO STA. 407+00

KDOT Graphics Certified 06-25-2024 Sh. No. 141

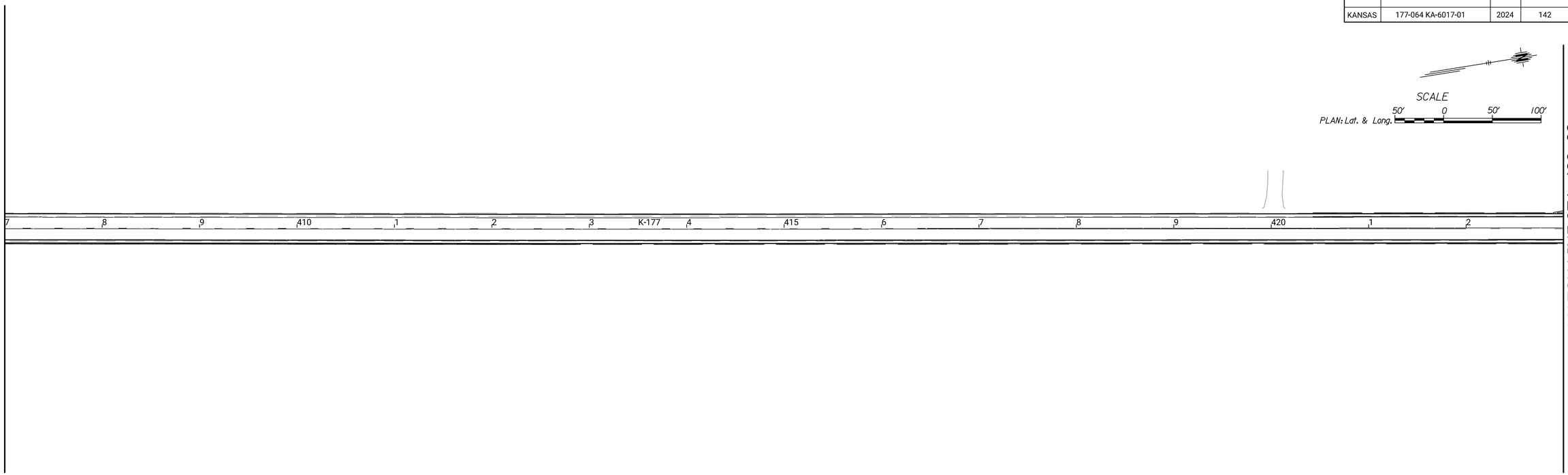
KDOT Graphics Certified

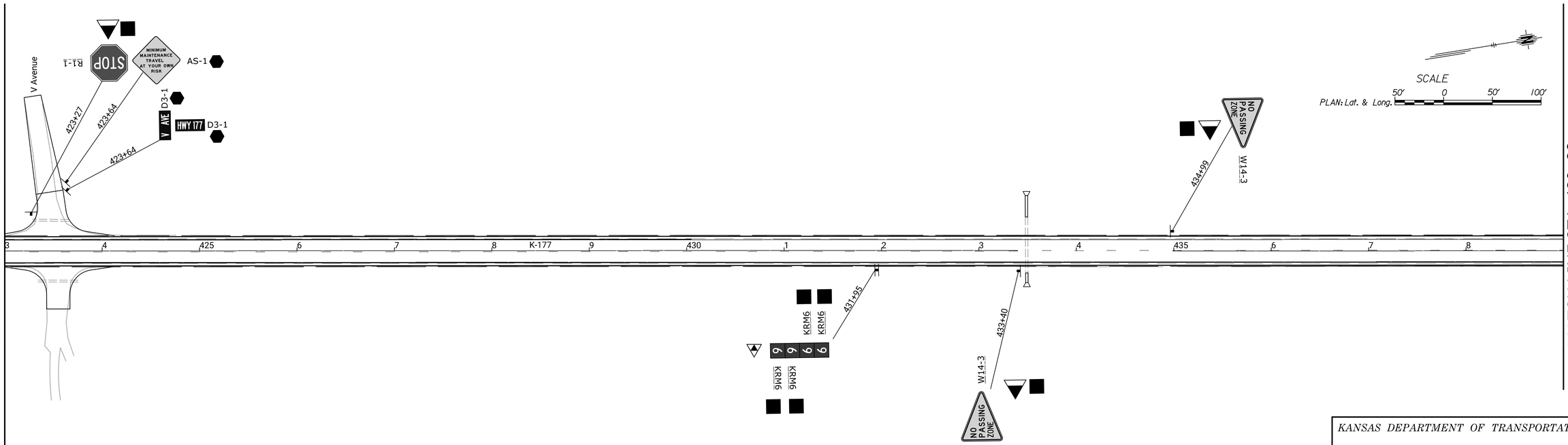
Drawn By : mrockwell
File : ka601701ppl-04.dgn

Plotted : 16-JAN-2025 07:48

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	142	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
STA. 407+00 TO STA. 439+00

KDOT Graphics Certified 06-25-2024 Sh. No. 142

KDOT Graphics Certified

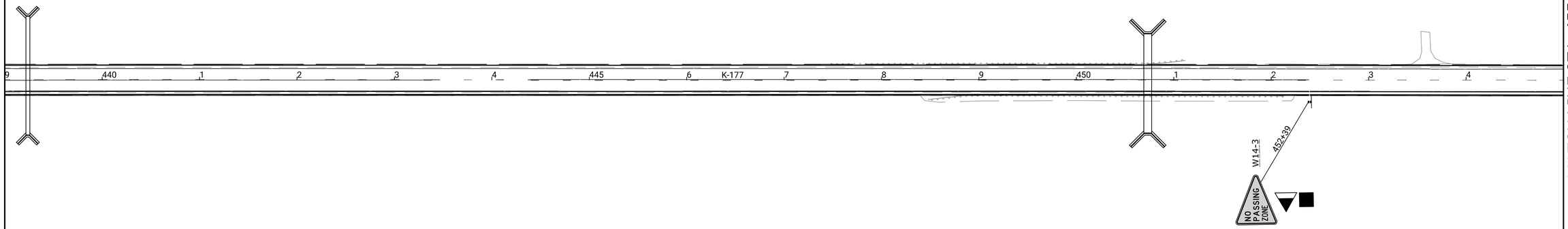
Drawn By : mrockwell
File : ka601701ppl-05.dgn
Plotted : 16-JAN-2025 07:48

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	143	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

MATCH LINE STA. 439+00

SCALE
50' 0 50' 100'
PLAN: Lat. & Long.



MATCH LINE STA. 455+00

MATCH LINE STA. 455+00

SCALE
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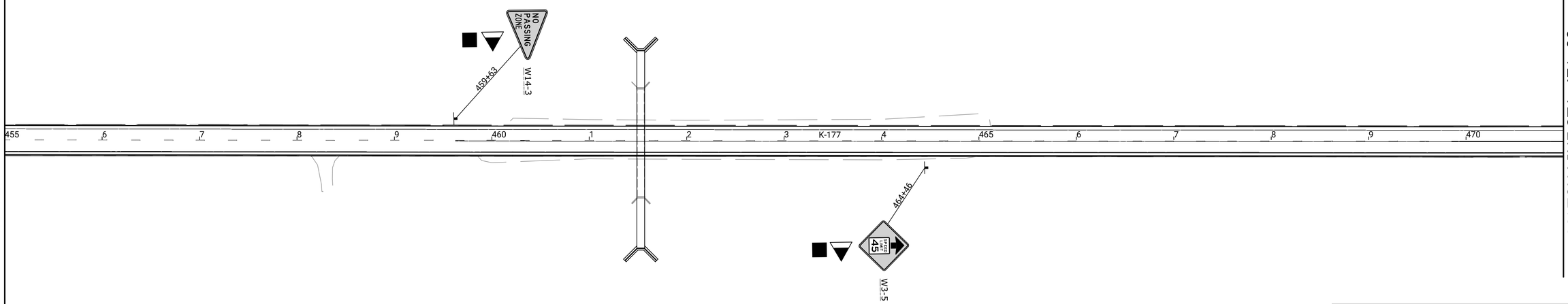
PLAN: Lat. & Long.



MATCH LINE STA. 471+00

KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
STA. 439+00 TO STA. 471+00

KDOT Graphics Certified 06-25-2024 Sh. No. 143

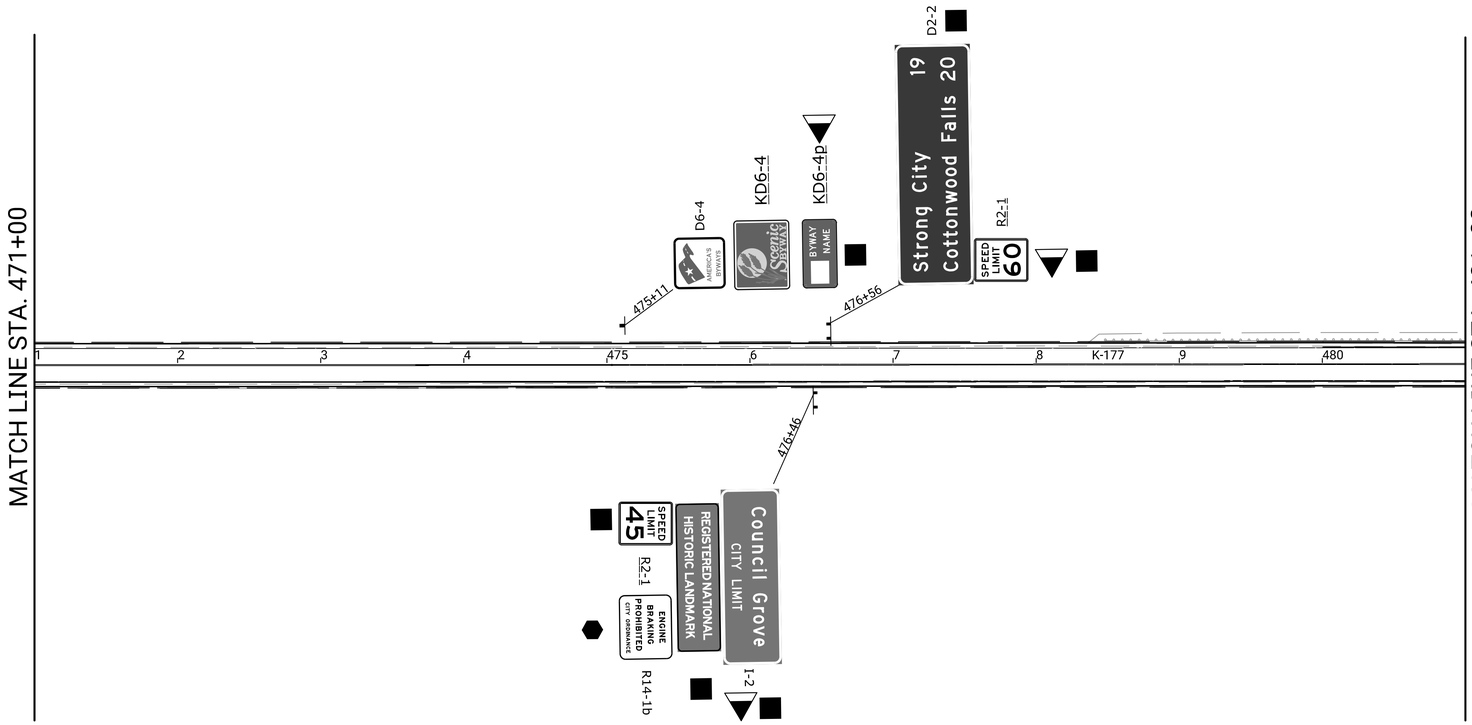
KDOT Graphics Certified

Drawn By : mrockwell
File : ka601701ppl-06.dgn

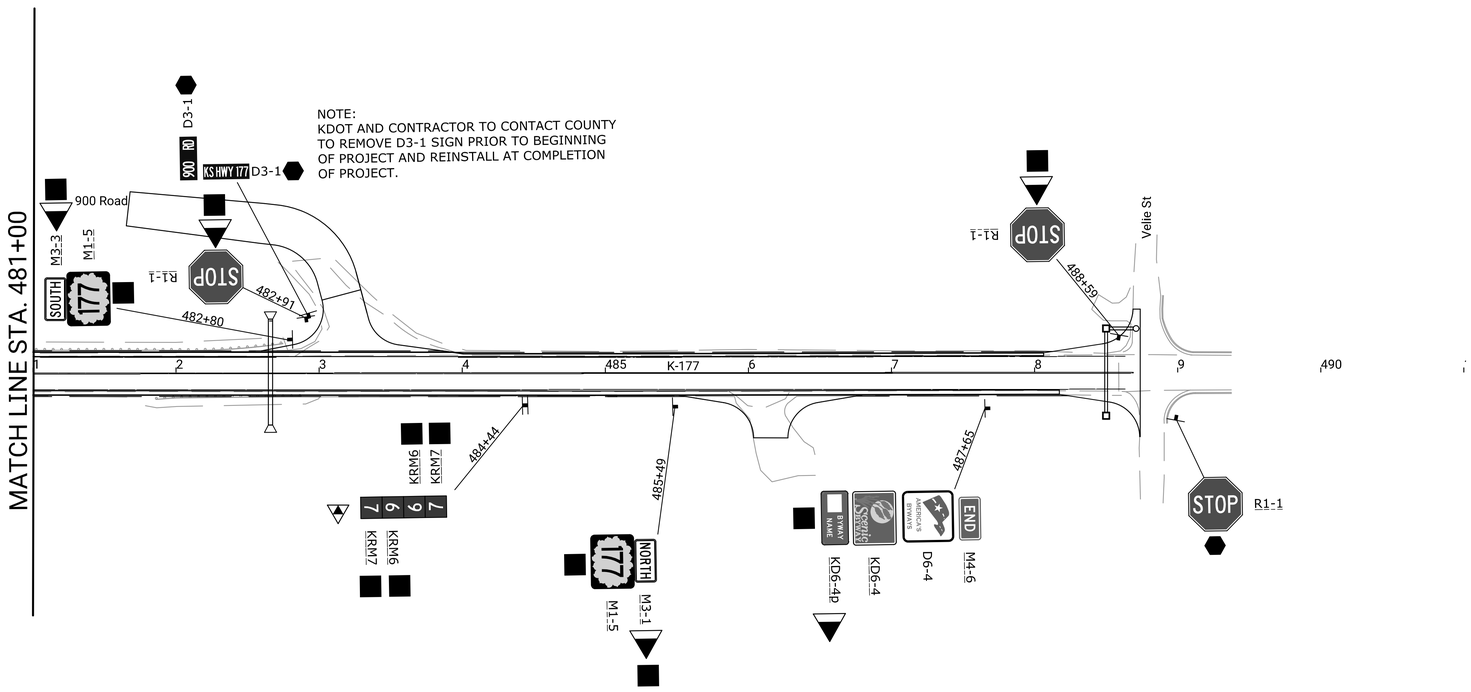
Plotted : 16-JAN-2025 07:48

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	144	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021



SCALE
50' 0 50' 100'
PLAN: Lat. & Long.



SCALE
50' 0 50' 100'
PLAN: Lat. & Long.

KANSAS DEPARTMENT OF TRANSPORTATION

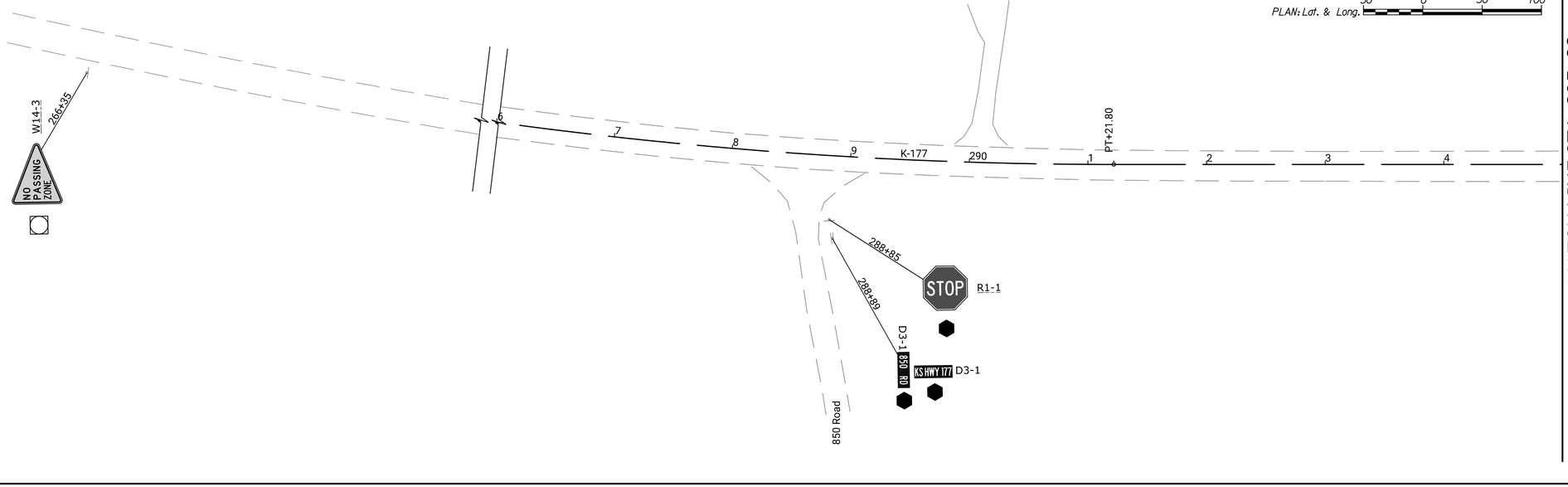
SIGNING PLAN
STA. 471+00 TO STA. 488+59

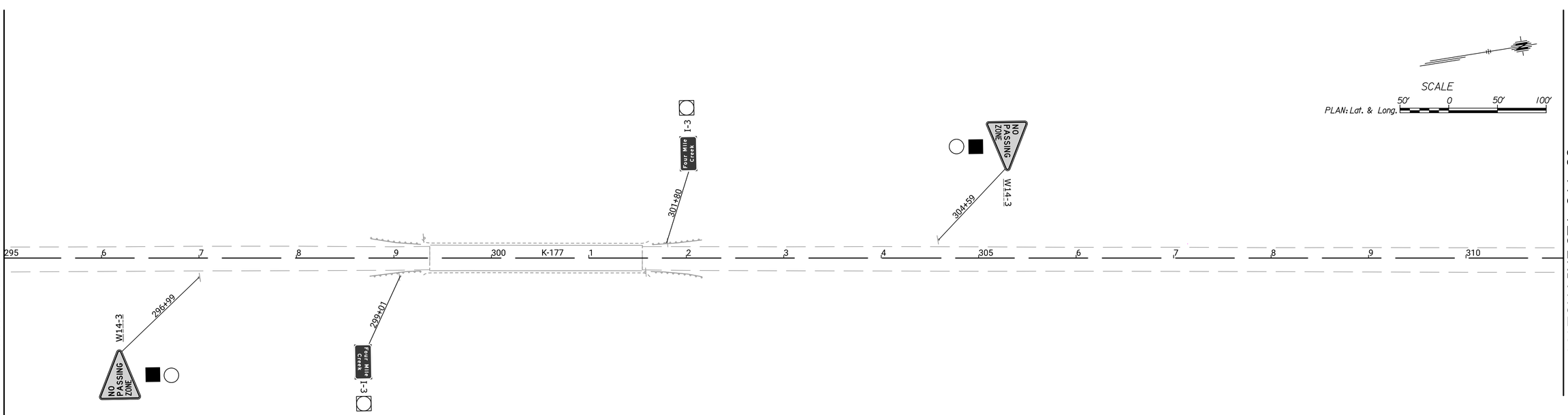
Sh. No. 144

Plotted : 16-JAN-2025 07:48
Drawn By : mrockwell
File : ka601701ppl-07.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	145	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING REMOVAL PLAN
STA. 298+00 TO STA. 311+00

KDOT Graphics Certified 06-11-2024 Sh. No. 145

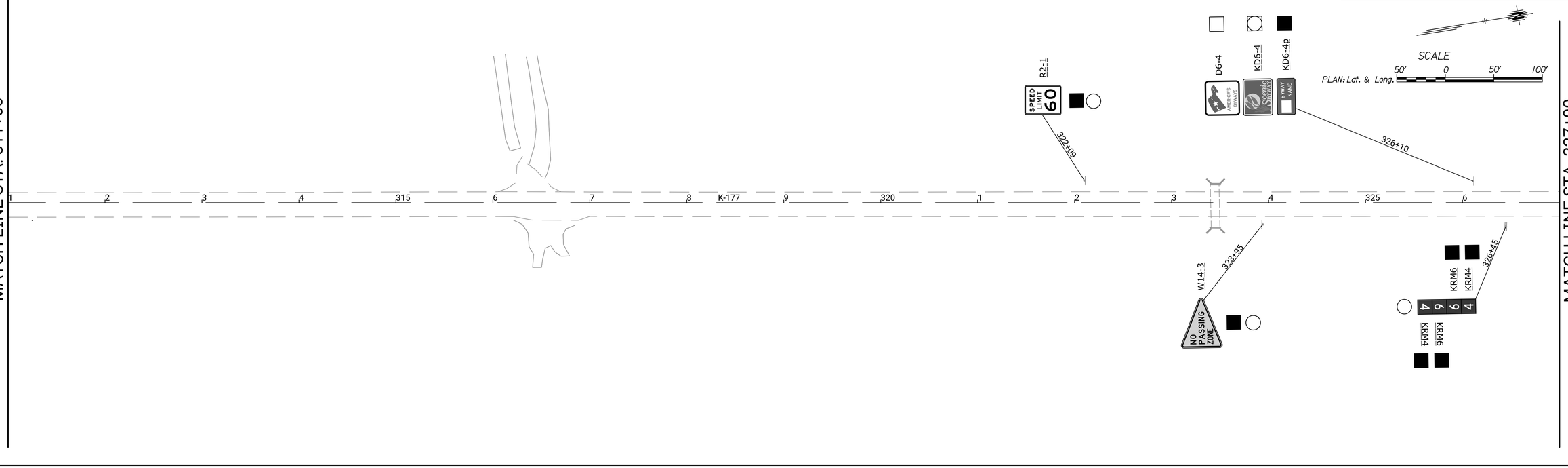
KDOT Graphics Certified

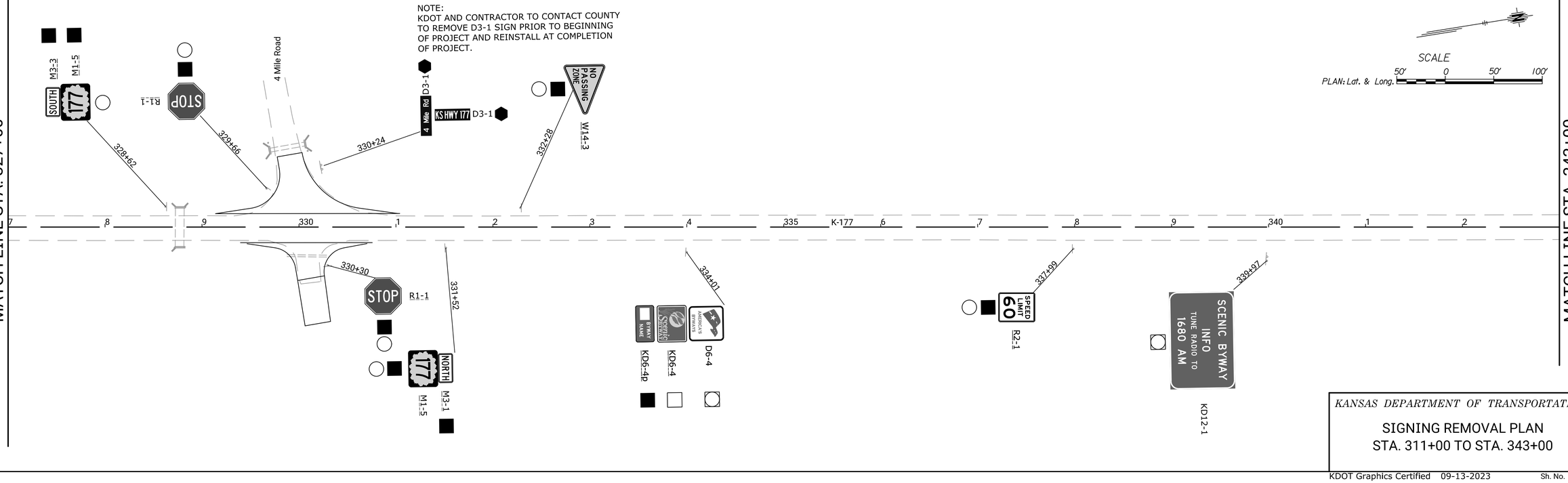
Drawn By : mrockwell
File : ka601701prm-01.dgn

Plotted : 16-JAN-2025 07:48

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	146	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING REMOVAL PLAN
STA. 311+00 TO STA. 343+00

KDOT Graphics Certified 09-13-2023 Sh. No. 146

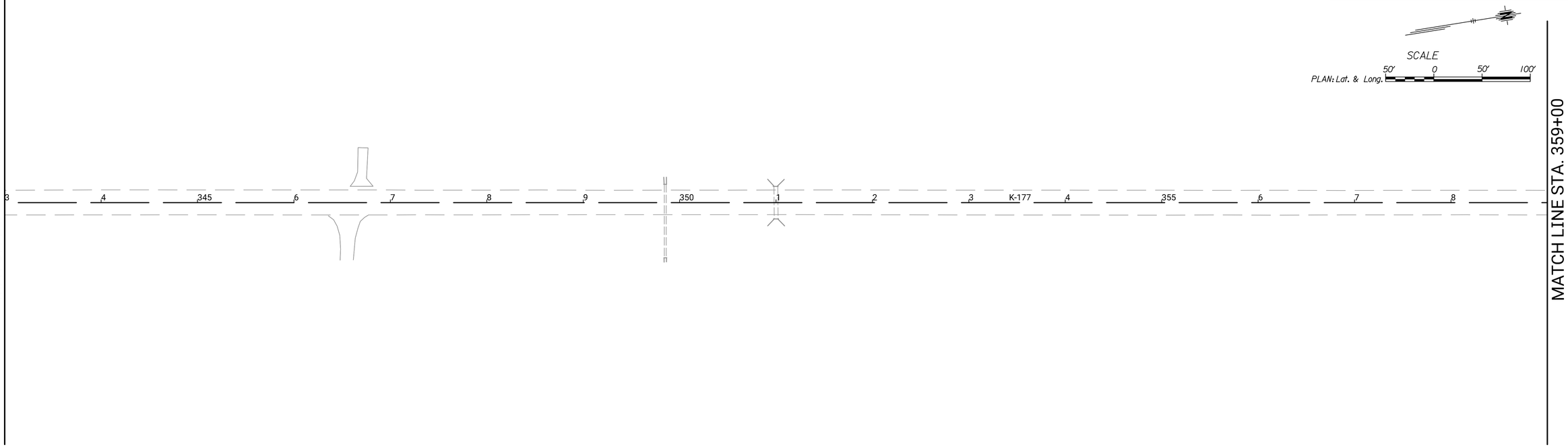
KDOT Graphics Certified

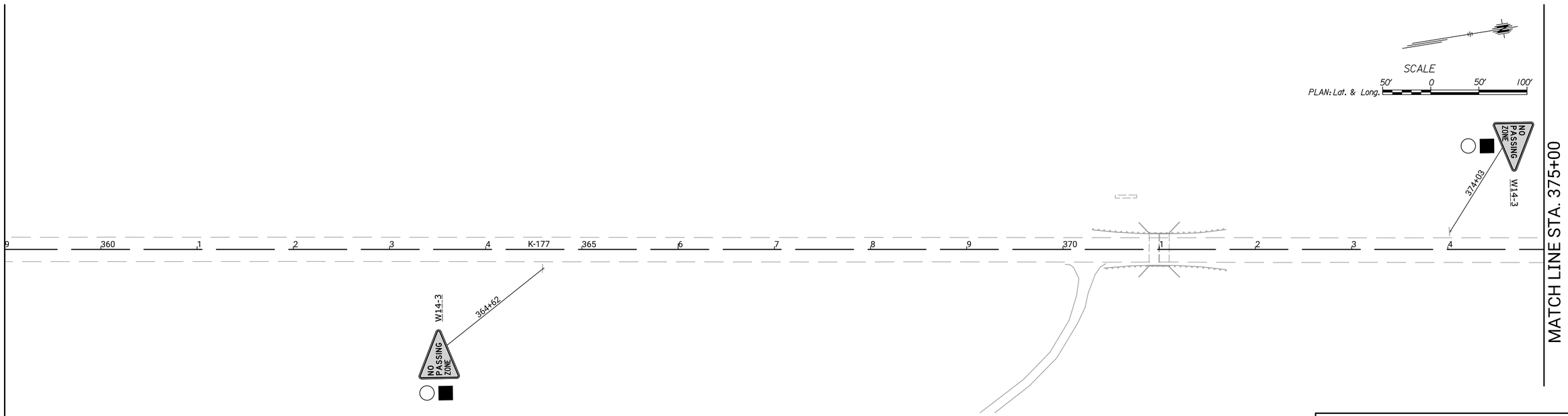
Drawn By : mrockwell
File : ka601701prm-02.dgn

Plotted : 16-JAN-2025 07:48

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	147	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING REMOVAL PLAN
STA. 343+00 TO STA. 375+00

KDOT Graphics Certified 06-25-2024 Sh. No. 147

KDOT Graphics Certified

Drawn By : mrockwell
File : ka601701prm-03.dgn

Plotted : 16-JAN-2025 07:49

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	148	291

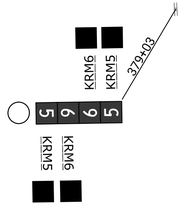
	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

MATCH LINE STA. 375+00

MATCH LINE STA. 391+00

SCALE
PLAN: Lat. & Long.
50' 0 50' 100'

375 6 7 8 9 380 1 2 K-177 3 4 385 6 7 8 9 390

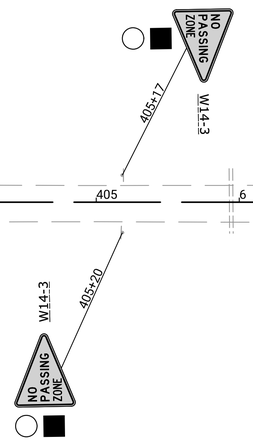


MATCH LINE STA. 391+00

MATCH LINE STA. 407+00

SCALE
PLAN: Lat. & Long.
50' 0 50' 100'

1 2 3 4 395 6 7 8 K-177 9 400 1 2 3 4 405 6



KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING REMOVAL PLAN
STA. 375+00 TO STA. 407+00

KDOT Graphics Certified 06-25-2024 Sh. No. 148

KDOT Graphics Certified

Drawn By : mrockwell
File : ka601701prm-04.dgn
Plotted : 16-JAN-2025 07:49

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	149	291

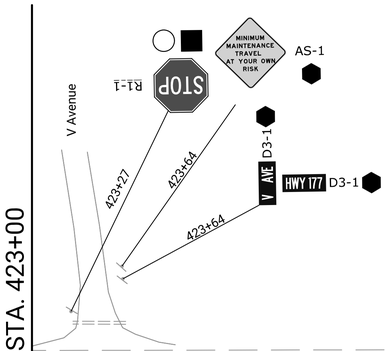
	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

SCALE
50' 0 50' 100'
PLAN: Lat. & Long.

MATCH LINE STA. 407+00

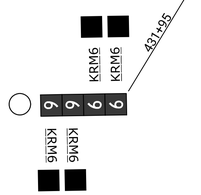
7 8 9 410 1 2 3 4 415 K-177 6 7 8 9 420 1 2

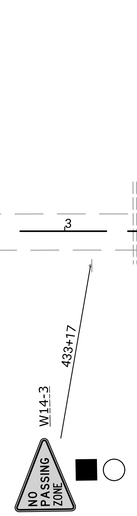
MATCH LINE STA. 423+00

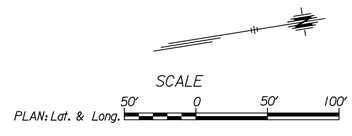


NOTE:
KDOT AND CONTRACTOR TO CONTACT COUNTY TO REMOVE D3-1 SIGN PRIOR TO BEGINNING OF PROJECT AND REINSTALL AT COMPLETION OF PROJECT.

3 4 425 6 7 8 K-177 9 430 1 2 3 4 435 6 7 8







MATCH LINE STA. 439+00

KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING REMOVAL PLAN
STA. 407+00 TO STA. 439+00

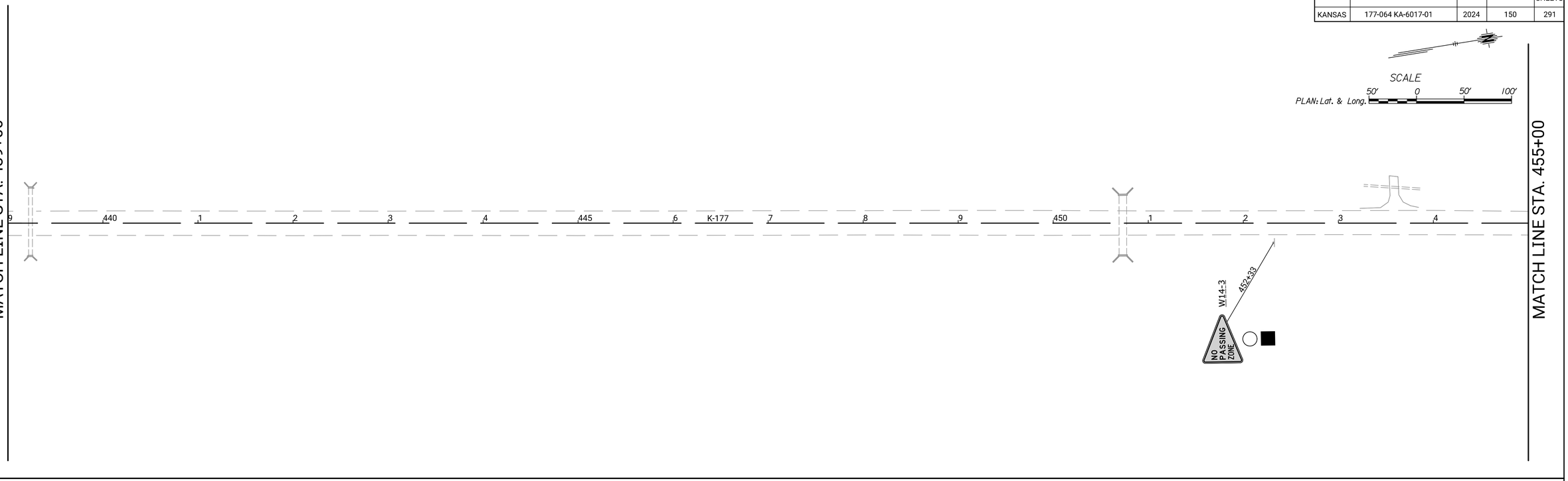
KDOT Graphics Certified 06-25-2024 Sh. No. 149

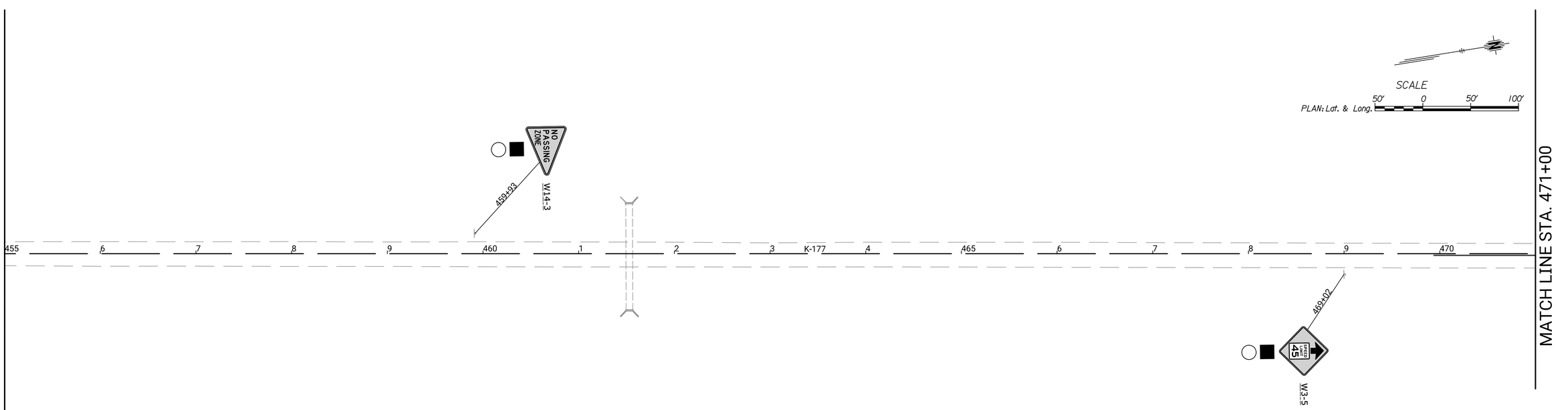
KDOT Graphics Certified

Drawn By : mrockwell
File : ka601701prm-05.dgn
Plotted : 16-JAN-2025 07:49

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	150	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING REMOVAL PLAN
STA. 439+00 TO STA. 471+00

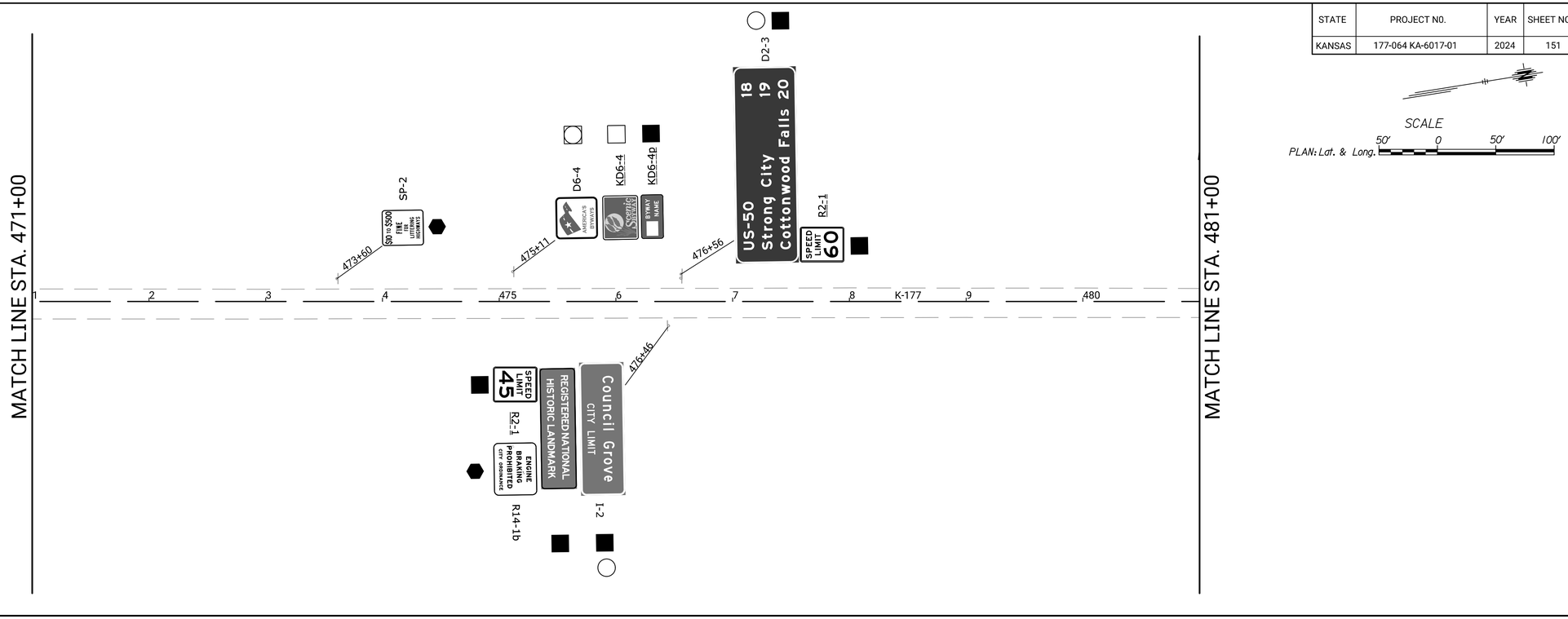
KDOT Graphics Certified 06-25-2024 Sh. No. 150

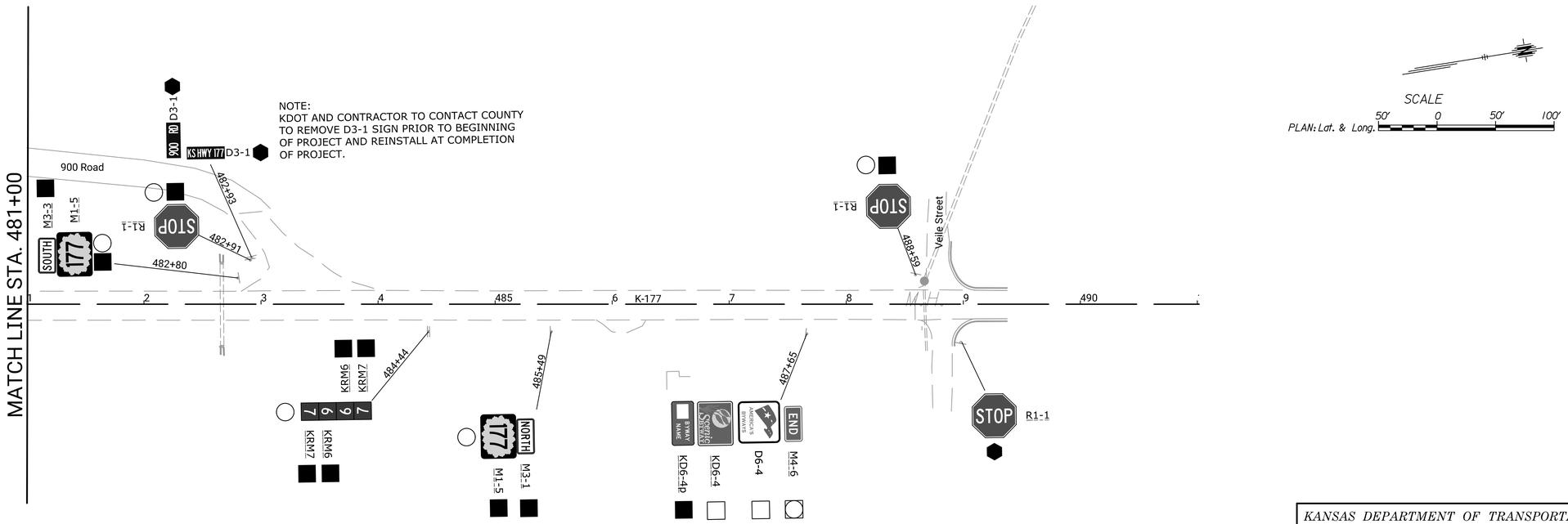
KDOT Graphics Certified

Drawn By : mrockwell
File : ka601701prm-06.dgn
Plotted : 16-JAN-2025 07:49

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	151	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021





KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING REMOVAL PLAN
STA. 471+00 TO STA. 488+59

KDOT Graphics Certified 09-13-2023 Sh. No. 151

KDOT Graphics Certified

Drawn By : mrockwell
File : ka601701prm-07.dgn

Plotted : 16-JAN-2025 07:49

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	152	291

QUANTITIES SHEET

SIGNS, POSTS, & FOOTINGS TO BE INSTALLED ON PROJECT

PLAN SHEET NUMBER	PLAN STATION NUMBER	CENTERLINE LOCATION / INSTALL POSITION	SIGN DESIGNATION	SIGN SIZE	SIGN LAYOUT SHEET NUMBER	TYPE OF SIGN FABRICATION			4" X 6" POSTS			3|2.25 ALUMINUM BEAM	U-POSTS		GALVANIZED STEEL BEAM POSTS						PERFORATED SQUARE STEEL TUBE (PSST) POSTS										CONCRETE FOOTINGS					SIGN STRUCTURE TYPE						VERTICAL SUPPORT MOUNT	MOUNT ABOVE GUIDE SIGN DESIGNATION
									WOOD		STEEL				W6x9		W10x12		W10x22		1 3/4"			2"			2 1/4"			2 1/2"				WOOD POST	STEEL BEAM POST									
																																	A36		A572 (ALT)								
						FLAT SHEET	REINFORCED PANEL	OVERLAY	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING		2 LB PER FT	3 LB PER FT	A36	A572 (ALT)	A36	A572 (ALT)	A36	A572 (ALT)	POST	FOOTING	BRACKET	POST	FOOTING	BRACKET	POST	FOOTING	POST	FOOTING			18" DIA.	24" DIA.	30" DIA.	24" DIA.	30" DIA.	OVERHEAD	CANTILEVER	BUTTERFLY	BRIDGE MOUNT ATTACHMENT	MAST ARM	SINGLE TAPERED TUBE		
K-177																																									
138	296+81	R	W14-3	48" X 48" X 36"		EXISTING			1																																	
138	304+44	L	W14-3	48" X 48" X 36"		EXISTING			1																																	
139	322+09	L	R2-1	24" X 30"		EXISTING			1																																	
139	324+13	R	W14-3	48" X 48" X 36"		EXISTING			1																																	
139	326+10	L	D6-4	24" X 24"		X			1																																	
		L	KD6-4	30" X 24"		X																																				
		L	KD6-4p	30" X 15"		EXISTING																																					
139	326+45	R	KRM6	6" X 6"		EXISTING							1																														
		R	KRM4	6" X 6"		EXISTING																																					
		R	KRM6	6" X 6"		EXISTING																																					
		R	KRM4	6" X 6"		EXISTING																																					
139	328+62	L	M3-3	24" X 12"		EXISTING			1																																	
		L	M1-5(3)	30" X 24"		EXISTING																																					
139	329+66	L	R1-1	36" X 36"		EXISTING			1																																	
139	330+30	R	R1-1	36" X 36"		EXISTING			1																																	
139	331+52	R	M3-1	24" X 12"		EXISTING			1																																	
		R	M1-5(3)	30" X 24"		EXISTING																																					
139	332+25	L	W14-3	48" X 48" X 36"		EXISTING			1																																	
139	334+01	R	D6-4	24" X 24"		X			1																																	
		R	KD6-4	30" X 24"		X																																				
		R	KD6-4p	30" X 15"		EXISTING																																					
139	337+99	R	R2-1	24" X 30"		EXISTING			1																																	
139	339+97	R	KD12-1	72" X 48"	168	X			2																																	
140	366+58	R	W14-3	48" X 48" X 36"		EXISTING			1																																	
140	374+14	L	W14-3	48" X 48" X 36"		EXISTING			1																																	
141	379+03	R	KRM6	6" X 6"		EXISTING							1																														
		R	KRM5	6" X 6"		EXISTING																																					
		R	KRM6	6" X 6"		EXISTING																																					
		R	KRM5	6" X 6"		EXISTING																																					
141	405+00	L	W14-3	48" X 48" X 36"		EXISTING			1																																	
141	406+20	R	W14-3	48" X 48" X 36"		EXISTING			1																																	
142	423+27	L	R1-1	36" X 36"		EXISTING			1																																	
142	431+95	R	KRM6	6" X 6"		EXISTING							1																														
		R	KRM6	6" X 6"		EXISTING																																					
		R	KRM6	6" X 6"		EXISTING																																					
		R	KRM6	6" X 6"		EXISTING																																					
142	433+40	R	W14-3	48" X 48" X 36"		EXISTING			1																																	
142	434+99	L	W14-3	48" X 48" X 36"		EXISTING			1																																	
143	452+39	R	W14-3	48" X 48" X 36"		EXISTING			1																																	
143	459+63	L	W14-3	48" X 48" X 36"		EXISTING			1																																	
143	464+46	R	W3-5	36" X 36"		EXISTING			1																																	

L or LL - Left of Centerline
R or RR - Right of Centerline
C - On the Centerline

S - Shoulder Mount
O - Offset Mount
G - Gore Mount

M - Median Mount
OH - Overhead Mount

NOTE: See standard plan sheet TE590 for detailed specifications.

NO.	DATE	REVISIONS	BY	APP'D
2	10/01/19	Added Tapered Tube. Removed Couplers.	D.D.G.	E.W.N.
1	7/23/10	Added Coupler and Coupler/Footing Quantity	D.D.G.	D.B.

FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	K.S.	QUANTITIES		TRACED	B.B.
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

TE430

7/1/03

Sh. No. 152

Plotted : 16-JAN-2025 07:49
Drawn By : mrockwell
File : te430.dgn

CADconform Certify This File
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	153	291

QUANTITIES SHEET

SIGNS, POSTS, & FOOTINGS TO BE INSTALLED ON PROJECT

PLAN SHEET NUMBER	PLAN STATION NUMBER	CENTERLINE LOCATION / INSTALL POSITION	SIGN DESIGNATION	SIGN SIZE	SIGN LAYOUT SHEET NUMBER	TYPE OF SIGN FABRICATION			4" X 6" POSTS			3I2.25 ALUMINUM BEAM	U-POSTS		GALVANIZED STEEL BEAM POSTS						PERFORATED SQUARE STEEL TUBE (PSST) POSTS										CONCRETE FOOTINGS					SIGN STRUCTURE TYPE						VERTICAL SUPPORT MOUNT	MOUNT ABOVE GUIDE SIGN DESIGNATION
									WOOD		STEEL				W6x9		W10x12		W10x22		1 3/4"			2"			2 1/4"			2 1/2"				WOOD POST	STEEL BEAM POST									
																																		A36		A572 (ALT)								
						FLAT SHEET	REINFORCED PANEL	OVERLAY	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING		2 LB PER FT	3 LB PER FT	A36	A572 (ALT)	A36	A572 (ALT)	A36	A572 (ALT)	POST	FOOTING	BRACKET	POST	FOOTING	BRACKET	POST	FOOTING	POST	FOOTING				18" DIA.	24" DIA.	30" DIA.	24" DIA.	30" DIA.	OVERHEAD	CANTILEVER	BUTTERFLY	BRIDGE MOUNT ATTACHMENT	MAST ARM	SINGLE TAPERED TUBE		
K-177																																									
144	475+11	L	D6-4	24" X 24"		X			1																																	
		L	KD6-4	30" X 24"		X																																				
		L	KD6-4p	30" X 15"		EXISTING																																				
144	476+46	R	I-2	72" X 24"		EXISTING			2																																	
		R	R2-1	24" X 30"		EXISTING																																				
144	476+56	L	D2-2	150" X 48"		EXISTING			2																																	
		L	R2-1	24" X 30"		EXISTING																																				
144	482+80	L	M3-3	24" X 12"		EXISTING			1																																	
		L	M1-5(3)	30" X 24"		EXISTING																																				
144	482+91	L	R1-1	36" X 36"		EXISTING			1																																	
144	484+44	R	KRM6	6" X 6"		EXISTING							1																														
		R	KRM7	6" X 6"		EXISTING																																				
		R	KRM6	6" X 6"		EXISTING																																				
		R	KRM7	6" X 6"		EXISTING																																				
144	485+49	R	M3-1	24" X 12"		EXISTING			1																																	
		R	M1-5(3)	30" X 24"		EXISTING																																				
144	487+65	R	M4-6	24" X 12"		X			1																																	
		R	D6-4	24" X 24"		X																																				
		R	KD6-4	30" X 24"		X																																				
		R	KD6-4p	30" X 15"		EXISTING																																				
144	488+59	L	R1-1	36" X 36"		EXISTING			1																																	

CENTERLINE LOCATION
L or LL - Left of Centerline
R or RR - Right of Centerline
C - On the Centerline

INSTALL POSITION
S - Shoulder Mount
O - Offset Mount
G - Gore Mount
M - Median Mount
OH - Overhead Mount

NOTE: See standard plan sheet TE590 for detailed specifications.

NO.	DATE	REVISIONS	BY	APP'D
2	10/01/19	Added Tapered Tube. Removed Couplers.	D.D.G.	E.W.N.
1	7/23/10	Added Coupler and Coupler/Footing Quantity	D.D.G.	D.B.

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	K.S.	QUANTITIES	TRACED B.B.
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

TE430

7/1/03

Sh. No. 153

Plotted : 16-JAN-2025 07:49
Drawn By : mrockwell
File : te430_2.dgn

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	154	291

QUANTITIES SHEET

DELINEATORS AND OBJECT MARKERS

			RIGID DELINEATORS												FLEXIBLE DELINEATORS												OBJECT MARKERS				
			TYPE 'A'								TYPE 'B'				TYPE 'A'								TYPE 'B'				TYPE 2	TYPE 3			
			WHITE		WHITE (BACK TO BACK)		YELLOW		YELLOW (BACK TO BACK)		WHITE		YELLOW		WHITE		WHITE (BACK TO BACK)		YELLOW		YELLOW (BACK TO BACK)		WHITE		YELLOW						
BEGINNING STATION	ENDING STATION	LOCATION DESCRIPTION	'U' POST	BRACKET MOUNT	'U' POST	BRACKET MOUNT	'U' POST	BRACKET MOUNT	'U' POST	BRACKET MOUNT	'U' POST	BRACKET MOUNT	'U' POST	BRACKET MOUNT	TYPE I ANCHOR	TYPE III ANCHOR	TYPE I ANCHOR	TYPE III ANCHOR	TYPE I ANCHOR	TYPE III ANCHOR	TYPE I ANCHOR	TYPE III ANCHOR	TYPE I ANCHOR	TYPE III ANCHOR	TYPE I ANCHOR	TYPE III ANCHOR	'U' POST	LEFT	RIGHT	CENTER	BACK TO BACK
299+38	299+44	K-177																									1		1		
301+73	301+83	K-177																									1	1			

NO.	DATE	REVISIONS	BY	APP'D
1	10/01/19	Added delineator & object marker types	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

QUANTITIES SHEET
DELINEATORS & OBJECT MARKERS

TE436 7/1/03

FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	K.D.S.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

CADconform Certify This File
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	155	291

SUMMARY OF QUANTITIES

SIGNS

TYPE	NUMBER	SQUARE FEET
FLAT SHEET	10	62.00
REINFORCED PANEL		
OVERLAY		

DELINEATORS

TYPE	FLEXIBLE DELINEATOR		RIGID DELINEATOR	
	TYPE I ANCHOR	TYPE III ANCHOR	"U" POST	BRACKET MOUNT
TYPE 'A' WHITE				
TYPE 'A' YELLOW				
TYPE 'B' WHITE				
TYPE 'B' YELLOW				
TYPE 'A' WHITE (BACK TO BACK)				
TYPE 'A' YELLOW (BACK TO BACK)				

OBJECT MARKERS

TYPE		NUMBER
TYPE 2 ("U" POST)		2
TYPE 3 ("U" POST)		2
INFORMATION ONLY	OM3-L	1
	OM3-R	1
	OM3-C	
TYPE 3 ("U" POST) (BACK TO BACK)		

POSTS AND ALUMINUM BEAMS

	4" x 6" POST			3I2.25 ALUMINUM BEAM	"U" POST		GALVANIZED STEEL BEAM POST						PERFORATED SQUARE STEEL TUBE (PSST)			
	WOOD		STEEL				W6x9		W10x12		W10x22					
	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING		2 LBS/FT	3 LBS/FT	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	1-3/4"	2"	2-1/4"	2-1/2"
NUMBER	34				4											
FEET	476				48											

POST FOOTINGS AND BRACKETS

	CONCRETE FOOTING (DIA.)					PERFORATED SQUARE STEEL					
	WOOD	A36 STEEL		A572 STEEL (ALT)		TUBE FOOTING				BRACKET	
	18"	24"	30"	24"	30"	1-3/4"	2"	2-1/4"	2-1/2"	1-3/4"	2"
NUMBER											
FEET											

BASE PLATES AND STUB POSTS

	W6x9		W10x12		W10x22	
BREAKAWAY BASES	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)
BASE PLATE (TOP)						
STUB POST WITH BASE PLATE						
NON-BREAKAWAY BASES						
BASE PLATE						

REMOVALS

TYPE	NUMBER
SIGNS	14
POSTS	39
FOOTINGS	
SIGN STRUCTURES	

NUMBER & LENGTHS OF POSTS & ALUMINUM BEAMS (INFORMATION ONLY)

LENGTH OF POST OR BEAM	4" x 6" POST			3I2.25 ALUMINUM BEAM	"U" POST		GALVANIZED STEEL BEAM POST						PERFORATED SQUARE STEEL TUBE (PSST)			
	WOOD		STEEL				W6x9		W10x12		W10x22					
	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING		2 LBS/FT	3 LBS/FT	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	1-3/4"	2"	2-1/4"	2-1/2"
2.1' - 4'																
4.1' - 6'																
6.1' - 8'																
8.1' - 10'																
10.1' - 12'														4		
12.1' - 14'	34															
14.1' - 16'																
16.1' - 18'																
18.1' - 20'																
20.1' - 22'																
22.1' - 24'																
24.1' - 26'																
26.1' - 28'																
28.1' - 30'																
30.1' - 32'																

SIGN STRUCTURES

TYPE	NEW	MODIFIED	REMOVE AND RESET	RESET
OVERHEAD STRUCTURE				
CANTILEVER STRUCTURE				
BUTTERFLY STRUCTURE				
BRIDGE MOUNT ATTACHMENT				
MAST ARM SIGN SUPPORT				
SINGLE TAPERED TUBE SIGN SUPPORT				

NO.	DATE	REVISIONS	BY	APP'D
2	10/01/19	Revised Tables	D.D.G.	E.W.N.
1	7/23/10	Revised Tables	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES
FOR
INSTALLATIONS AND REMOVALS

TE439 7/1/03

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	K.D.S.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

CADconform Certify This File

Sh. No. 155

Plotted : 16-JAN-2025 07:49
Drawn By : mrockwell
File : te439.dgn

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	156	291

SUMMARY OF QUANTITIES

REMOVAL AND RESETTING OF SIGNS ON PROJECT

EXISTING PLAN STATION NUMBER	NEW PLAN STATION NUMBER	SIGN TYPE	SIGN SIZE
296+99	296+81	W14-3	48" X 48" X 36"
304+59	304+59	W14-3	48" X 48" X 36"
322+09	322+09	R2-1	24" X 30"
323+95	324+13	W14-3	48" X 48" X 36"
326+10	326+10	KD6-4p	30" X 15"
326+45	326+45	KRM6	6" X 6"
		KRM4	6" X 6"
		KRM6	6" X 6"
		KRM4	6" X 6"
328+62	328+62	M3-3	24" X 12"
		M1-5(3)	30" X 24"
329+66	329+66	R1-1	36" X 36"
330+30	330+30	R1-1	36" X 36"
331+52	331+52	M3-1	24" X 12"
		M1-5(3)	30" X 24"
332+28	332+25	W14-3	48" X 48" X 36"
334+01	334+01	KD6-4p	30" X 15"
337+99	337+99	R2-1	24" X 30"
364+62	366+58	W14-3	48" X 48" X 36"
374+03	374+14	W14-3	48" X 48" X 36"
379+03	379+03	KRM6	6" X 6"
		KRM5	6" X 6"
		KRM6	6" X 6"
		KRM5	6" X 6"
405+17	405+00	W14-3	48" X 48" X 36"
405+20	406+20	W14-3	48" X 48" X 36"
423+27	423+27	R1-1	36" X 36"
431+95	431+95	KRM6	6" X 6"
		KRM6	6" X 6"
		KRM6	6" X 6"
		KRM6	6" X 6"
433+17	433+40	W14-3	48" X 48" X 36"
434+70	434+99	W14-3	48" X 48" X 36"
452+33	452+39	W14-3	48" X 48" X 36"
459+93	459+63	W14-3	48" X 48" X 36"

EXISTING PLAN STATION NUMBER	NEW PLAN STATION NUMBER	SIGN TYPE	SIGN SIZE
469+02	464+46	W3-5	36" X 36"
475+11	475+11	KD6-4p	30" X 15"
476+46	476+46	I-2	72" X 24"
		R2-1	24" X 30"
476+56	476+56	D2-3	150" X 48"
		R2-1	24" X 30"
482+80	482+80	M3-3	24" X 12"
		M1-5(3)	30" X 24"
482+91	482+91	R1-1	36" X 36"
484+44	484+44	KRM6	6" X 6"
		KRM7	6" X 6"
		KRM6	6" X 6"
		KRM7	6" X 6"
485+49	485+49	M3-1	24" X 12"
		M1-5(3)	30" X 24"
487+65	487+65	KD6-4p	30" X 15"
488+59	488+59	R1-1	36" X 36"

EXISTING PLAN STATION NUMBER	NEW PLAN STATION NUMBER	SIGN TYPE	SIGN SIZE

EXISTING PLAN STATION NUMBER	NEW PLAN STATION NUMBER	SIGN TYPE	SIGN SIZE

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES FOR REMOVAL AND RESETTING OF SIGNS

TE445 07-01-03

FHWA APPROVAL			07-22-03	APP'D.	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	K.D.S.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.		TRACE CK.	

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Sh. No. 156

Plotted : 16-JAN-2025 07:49

Drawn By : mrockwell

File : te445.dgn

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	157	291

RECAPITULATION OF SIGNING & DELINEATION BID ITEMS

BID ITEMS	APPROXIMATE QUANTITIES		UNITS
SIGN (FLAT SHEET) (HIGH PERFORMANCE)	62		SQUARE FOOT
SIGN (REINFORCED PANEL) (HIGH PERFORMANCE)			SQUARE FOOT
SIGN (OVERLAY) (HIGH PERFORMANCE)			SQUARE FOOT
SIGN POST (4" x 6" WOOD) (FLAT SHEET SIGN)	476		LINEAR FOOT
SIGN POST (4" x 6" WOOD) (REINFORCED PANEL SIGN)			LINEAR FOOT
SIGN POST (2 LB/FT "U" STEEL)	48		LINEAR FOOT
SIGN POST (3 LB/FT "U" STEEL)			LINEAR FOOT
SIGN POST (1-3/4" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (2" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (2-1/4" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (2-1/2" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (4" X 6" STRUCTURAL STEEL)			LINEAR FOOT
SIGN POST (3 I 2.25 ALUMINUM)			LINEAR FOOT
	A36	A572(ALT)	
SIGN POST (W6X9 STEEL BEAM)			LINEAR FOOT
SIGN POST (W10X12 STEEL BEAM)			LINEAR FOOT
SIGN POST (W10X22 STEEL BEAM)			LINEAR FOOT
SIGN POST STUB WITH BREAKAWAY BASE PLATE (W6X9)			EACH
SIGN POST STUB WITH BREAKAWAY BASE PLATE (W10X12)			EACH
SIGN POST STUB WITH BREAKAWAY BASE PLATE (W10X22)			EACH
SIGN POST BREAKAWAY BASE PLATE (W6X9)			EACH
SIGN POST BREAKAWAY BASE PLATE (W10X12)			EACH
SIGN POST BREAKAWAY BASE PLATE (W10X22)			EACH
SIGN POST FOOTING (24" Dia. CONCRETE)(STEEL BEAM POST)			LINEAR FOOT
SIGN POST FOOTING (30" Dia. CONCRETE)(STEEL BEAM POST)			LINEAR FOOT
SIGN POST FOOTING (18" Dia. CONCRETE)(WOOD POST)			LINEAR FOOT
SIGN POST FOOTING (1-3/4" PERFORATED SQUARE STEEL TUBE)			EACH
SIGN POST FOOTING (2" PERFORATED SQUARE STEEL TUBE)			EACH
SIGN POST FOOTING (2-1/4" PERFORATED SQUARE STEEL TUBE)			EACH
SIGN POST FOOTING (2-1/2" PERFORATED SQUARE STEEL TUBE)			EACH
SIGNING OBJECT MARKER (TYPE 2)	2		EACH
SIGNING OBJECT MARKER (TYPE 3)	2		EACH
SIGNING DELINEATOR (TYPE A)(WHITE RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE A)(YELLOW RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE B)(WHITE RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE B)(YELLOW RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE A)(WHITE FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE A)(YELLOW FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(WHITE FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(YELLOW FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE A)(WHITE FLEXIBLE)(TYPE 3 ANCHOR)			EACH
SIGNING DELINEATOR (TYPE A)(YELLOW FLEXIBLE)(TYPE 3 ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(WHITE FLEXIBLE)(TYPE 3 ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(YELLOW FLEXIBLE)(TYPE 3 ANCHOR)			EACH

BID ITEMS	APPROXIMATE QUANTITIES	UNITS
SIGN (REMOVE AND RESET)	LUMP SUM	LUMP SUM

Note:
The contract bid for steel beam posts, stub posts, base plates, and footings will be based on A36 Grade steel quantities. When furnishing the A572 Grade alternate steel, the payment will be based on the equivalent A36 steel unit prices in the contract.

NO.	DATE	REVISIONS	BY	APP'D
2	10/01/19	Removed PSST coupler and changed the tables	D.D.G.	E.W.N.
1	7/23/10	Changed Bid Items as per Spec Book (2007)	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

RECAPITULATION OF SIGNING & DELINEATION BID ITEMS

TE450 7/1/03

FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	K.D.S.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

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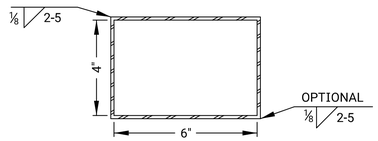
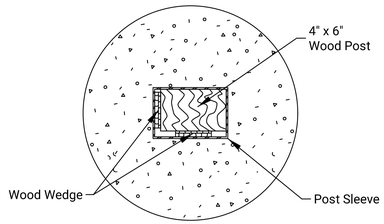
Plotted : 16-JAN-2025 07:49
Drawn By : mrockwell
File : te450.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	158	291

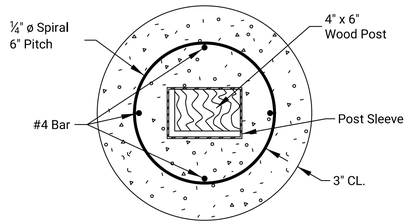


NOTE: Dimensions are to inside of post sleeve.

POST SLEEVE



SECTION A-A



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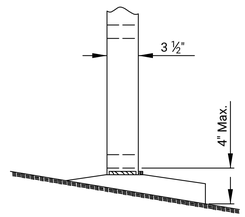
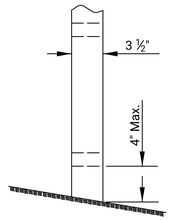


FRONT ELEVATION
CONCRETE FOOTING



FRONT ELEVATION
SOIL

NOTE TO THE ENGINEER:
The intent of the "AASHTO Roadside Design Guide" and these plans is to have a 4" or less projection above the finished ground line after impact.

BREAKAWAY CLEARANCE

GENERAL NOTES

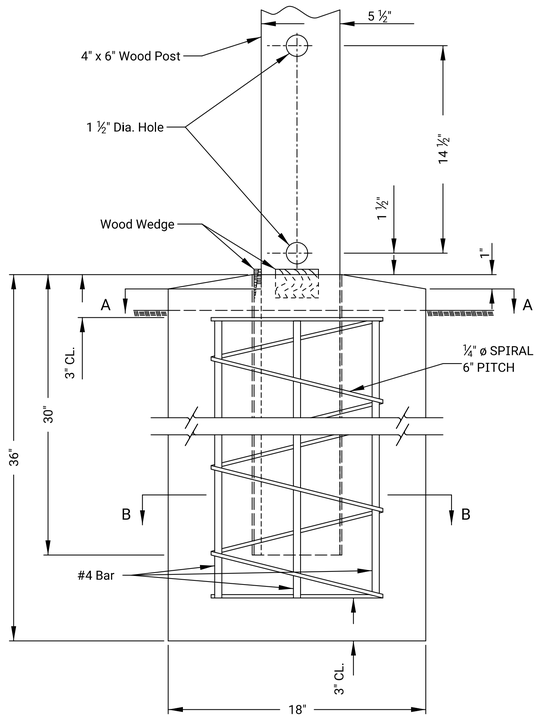
The post sleeve shall be formed from 10 gauge sheet steel to meet the requirements of ASTM A653 and zinc coated to meet the requirements of coating designation A123. If galvanized sheet steel is used, no other galvanization is required. It is permissible to close the bottom of the sleeve with a metal plate. Basis of acceptance shall be visual inspection of the finished sleeve and determination of zinc thickness by magnetic gage.

All sign mounting holes in the wood posts shall be drilled prior to treating.

Breakaway holes, field drilled sign mounting holes, and field cuts shall be treated in accordance with the preservative treatment specifications.

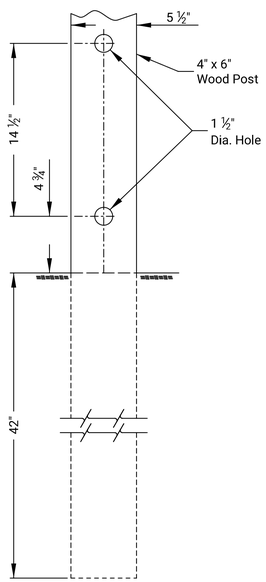
Prior to sealing the opening between the wood post and the top of the concrete footing, secure the post by placing 3" wide by 2" long wood wedges into the opening on two adjacent sides of the post. The wedges are be flush with up to a maximum of ⅜" sticking up above the top of the footing.

Commercial grade concrete may be substituted for sign support footings.



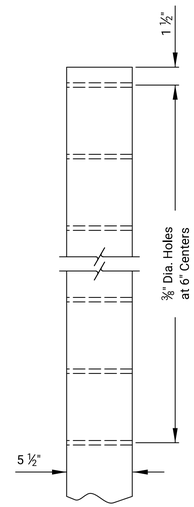
SIDE ELEVATION

WOOD POST IN CONCRETE FOOTING



SIDE ELEVATION

WOOD POST IN SOIL



SIGN POST

SIGN MOUNTING HOLES

All dimensions in inches unless otherwise noted.

NO.	DATE	REVISIONS	BY	APP'D
1	10/01/19	Change details and note	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR WOOD POSTS

TE460 7/1/03

FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

KDOT Graphics Certified 12-17-2019

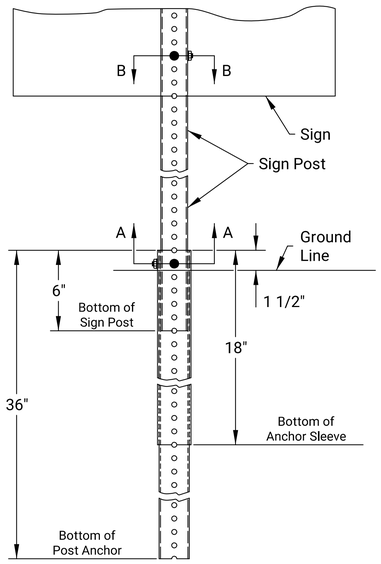
Sh. No. 158

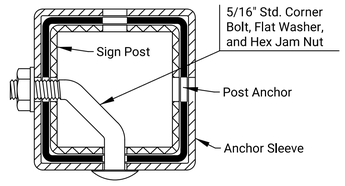
KDOT Graphics Certified

Plotted : 16-JAN-2025 07:50

Drawn By : mrockwell
File : te460.dgn

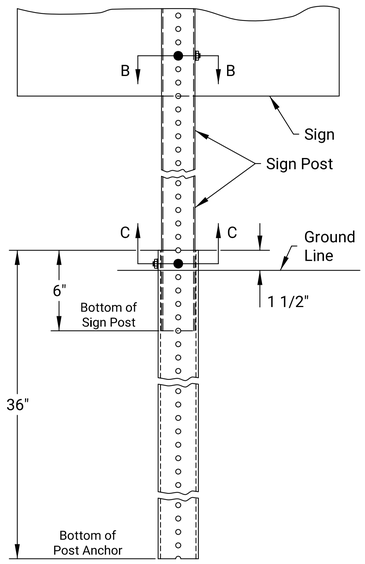
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	159	291

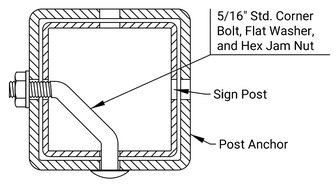




SECTION A-A

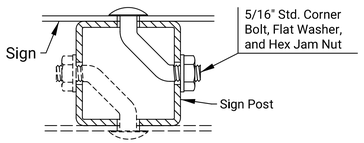
1 ¾", 2", OR 2 ¼" PSST SIGN POST





SECTION C-C

2 ½" PSST SIGN POST



SECTION B-B

MATERIALS TABLE FOR SIGN POST AND FOOTING		
SIGN POST 12 GA. OR 14 GA.	FOOTING	
	POST ANCHOR	ANCHOR SLEEVE
1 ¾" X 1 ¾"	2" X 2" X 12 GA.	2 ¼" X 2 ¼" X 12 GA.
2" X 2"	2 ¼" X 2 ¼" X 12 GA.	2 ½" X 2 ½" X 12 GA.
2 ¼" X 2 ¼"	2 ½" X 2 ½" X 12 GA.	3" X 3" X 7 GA.
2 ½" X 2 ½"	3" X 3" X 7 GA.	Not Required

NOTE: 14 ga. posts must meet a certified minimum yield strength of 60,000 p.s.i.

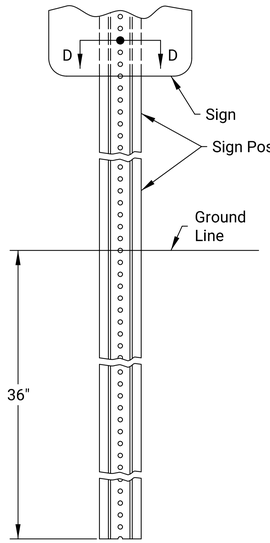
INSTALLATION PROCEDURES

1. Plumb and drive post anchor into the ground 18", if anchor sleeve is required, or to the specified height above the ground line.

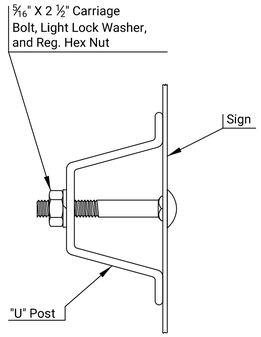
2. Install anchor sleeve (if required) on the post anchor and align the first holes above the ground line. Plumb and drive post anchor with anchor sleeve into the ground to the specified height above the ground line.

3. Install sign post into the post anchor.

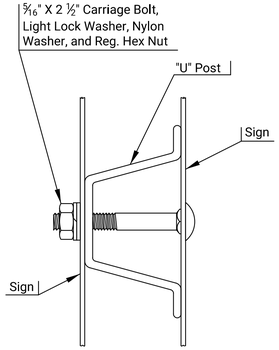
PERFORATED SQUARE STEEL TUBE POST (PSST)



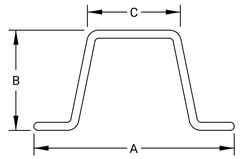
TYPICAL



SECTION D-D
(TYPICAL)



SECTION D-D
(BACK TO BACK)



DIM.	2 LBS/FT	3 LBS/FT
A	3 1/8 "	3 1/2 "
B	1 17/32 "	1 3/4 "
C	1 1/4 "	1 5/8 "

(Dimensions are nominal)

"U" POST

STEEL "U" POST

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR PERFORATED SQUARE STEEL TUBE POSTS (PSST) AND STEEL "U" POSTS

TE466 10/01/19

FHWA APPROVAL			10/01/2019	APP'D	Eric W.Nichol		
DESIGNED	D.D.G.	DETAILED	D.D.G.	QUANTITIES		TRACED	
DESIGN CK.	E.W.N.	DETAIL CK.	E.W.N.	QUAN. CK.		TRACE CK.	

KDOT Graphics Certified 12-17-2019

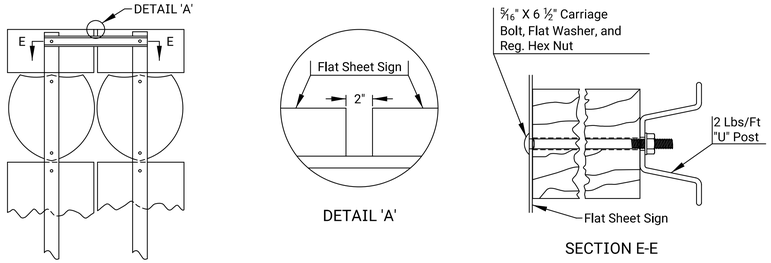
Sh. No. 159

KDOT Graphics Certified

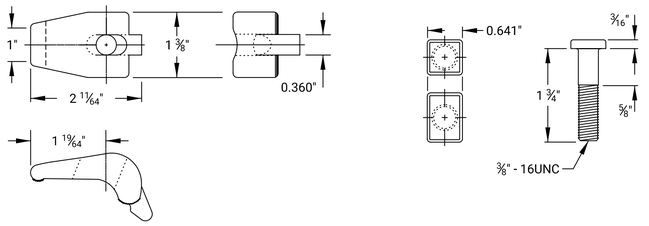
Plotted : 16-JAN-2025 07:50

Drawn By : mrockwell
File : te466.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	160	291



ROUTE MARKER ASSEMBLIES ATTACHMENT



ALUMINUM POST CLIP AND POST CLIP BOLT

NOTES:

The top of the post shall not extend above the top of the sign.

When signs are mounted back to back, the signs shall be mounted at their prescribed height. In general installations, the bottom holes of the signs should be aligned. In order to prevent having to drill holes in the signs or posts, the sign on the back should be raised and positioned such that the holes are aligned. When a sign is mounted on the back of the R1-1 (Stop) sign, that sign is to be centered vertically on the R1-1 sign. When a sign is mounted on the back of the R1-2 (Yield) sign, the top holes of the signs should be aligned.

The primary sign and supplemental sign are to be mounted at their prescribed height, but under no circumstances shall the signs overlap each other. If the primary sign cannot be mounted without overlapping, then it shall be raised above the supplemental sign.

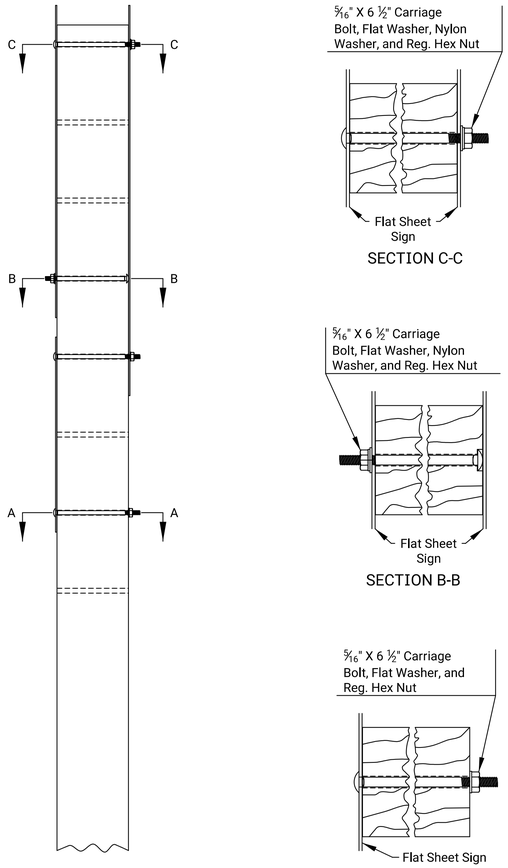
Any additional mounting holes, either through the sign or post, shall be drilled by the contractor. All holes drilled in the post shall be treated with a perservative. All holes drilled in the sign shall be free of any defects and the sheeting around the hole shall not be damaged.

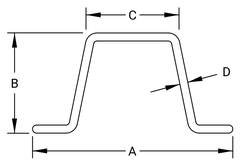
A nylon washer shall be placed against the sheeting when a nut is to be tightened against the sign face.

The 3 lb/ft steel "U" post used for reinforced panel sign installations is to be included in the bid item 'SIGN POST (4" x 6" WOOD) (REINFORCED PANEL SIGN)'.

When the 2 lb/ft steel "U" post is used for the route marker assemblies attachment, it shall be subsidiary to the bid item 'SIGN POST (4" x 6" WOOD) (FLAT SHEET SIGN)'.

The aluminum post clip bolt may have a rectangular head if the smaller dimension is equal to the square head dimension.

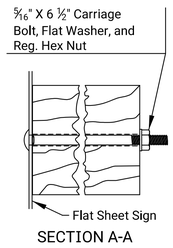




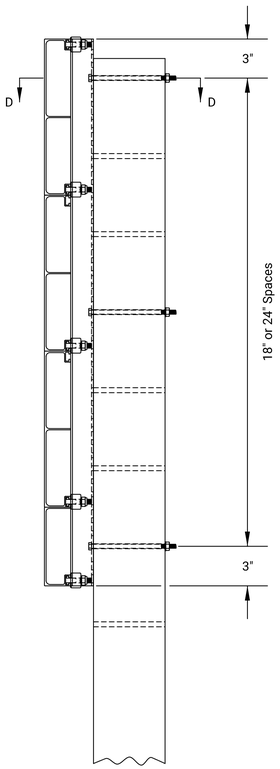
DIM.	2 LBS/FT	3 LBS/FT
A	3 1/8 "	3 1/2 "
B	1 17/32 "	1 3/4 "
C	1 1/4 "	1 5/8 "
D	1/8 "	9/64 "

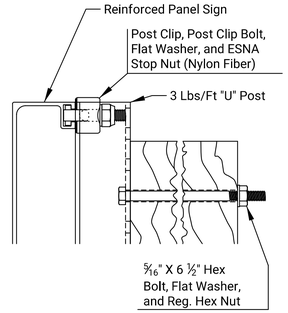
(DIMENSIONS ARE NOMINAL)

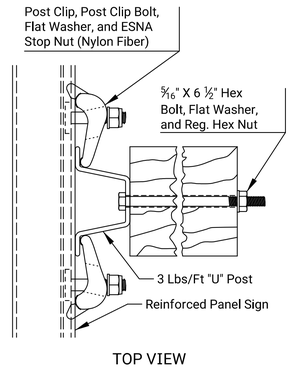
"U" POST



TYPICAL MOUNTING OF FLAT SHEET SIGNS







TYPICAL MOUNTING OF REINFORCED PANEL SIGNS

All dimensions are in inches

NO.	DATE	REVISIONS	BY	APP'D
1	10/01/19	Revised drawings and notes	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR MOUNTING SIGNS ON WOOD POSTS

FLAT SHEET AND REINFORCED PANEL

TE481 7/1/03

FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

KDOT Graphics Certified 12-17-2019

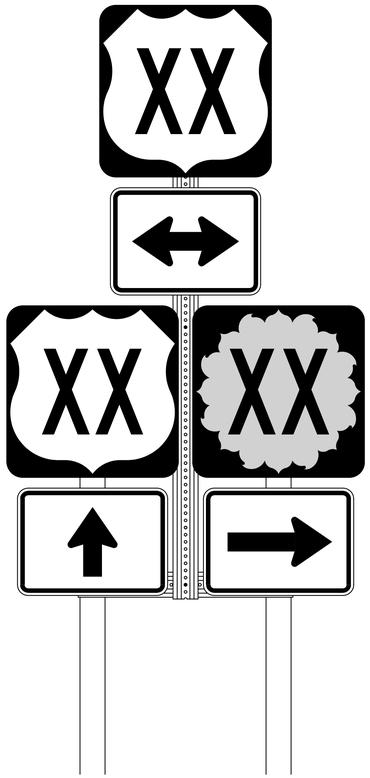
Sh. No. 160

KDOT Graphics Certified

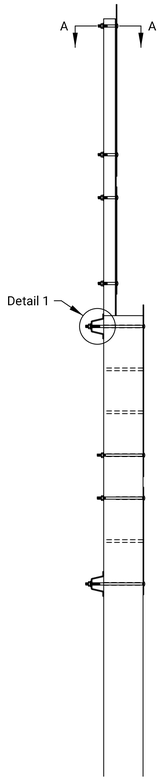
Plotted : 16-JAN-2025 07:50

Drawn By : mrockwell
File : te481.dgn

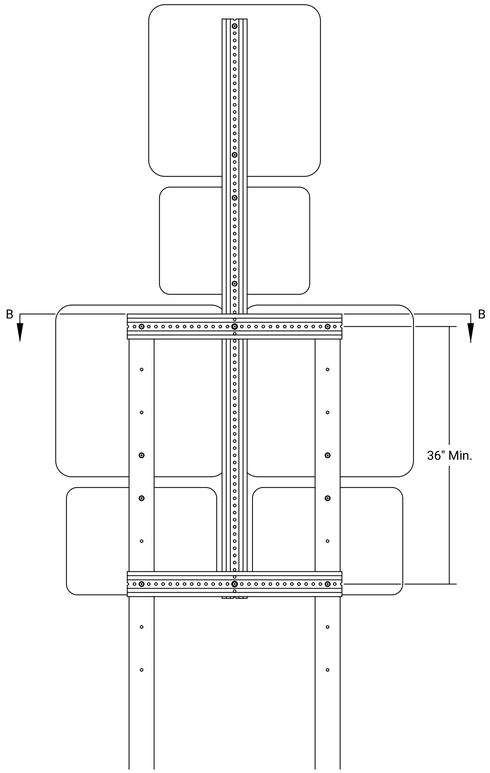
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	161	291

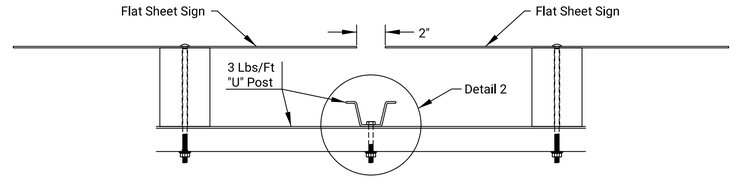


SIDE VIEW

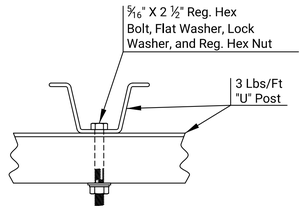


BACK VIEW





SECTION B-B



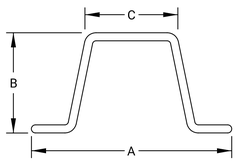
DETAIL 2

NOTES:
The top of the post shall not extend above the top of the sign.

Any additional mounting holes, either through the sign or post, shall be drilled by the contractor. All holes drilled in the post shall be treated with a perservative. All holes drilled in the sign shall be free of any defects and the sheeting around the hole shall not be damaged.

A nylon washer shall be placed against the sheeting when a nut is to be tightened against the sign face.

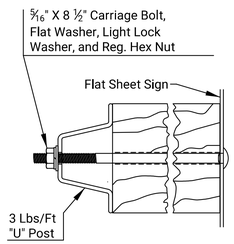
The 3 lb/ft steel "U" post shall be subsidiary to the bid item 'SIGN POST (4" x 6" WOOD) (FLAT SHEET SIGN)'.



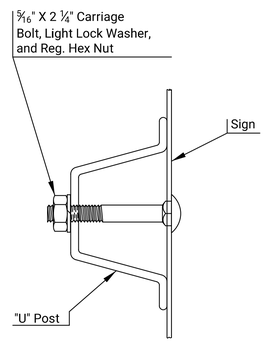
DIM.	3 LBS/FT
A	3 1/2"
B	1 3/4"
C	1 5/8"

(DIMENSIONS ARE NOMINAL)

"U" POST



DETAIL 1



SECTION A-A

NO.	DATE	REVISIONS	BY	APP'D
1	10/01/19	Revised drawings and notes	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR MOUNTING SIGNS ABOVE TURN ASSEMBLIES

WOOD POST

TE484 7/1/03

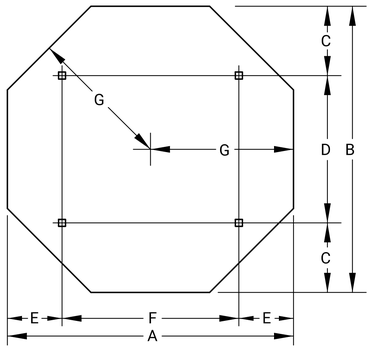
FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

KDOT Graphics Certified 12-17-2019

Plotted : 16-JAN-2025 07:50
Drawn By : mrockwell
File : te484.dgn

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	162	291



SIGN SIZE	A	B	C	D	E	F	G	T	AREA
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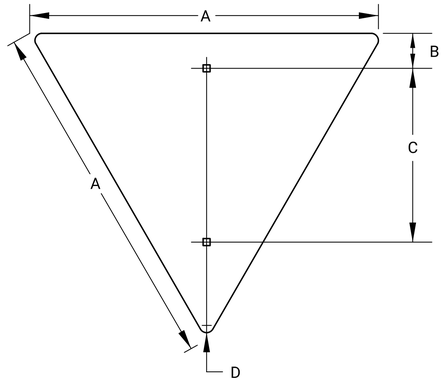
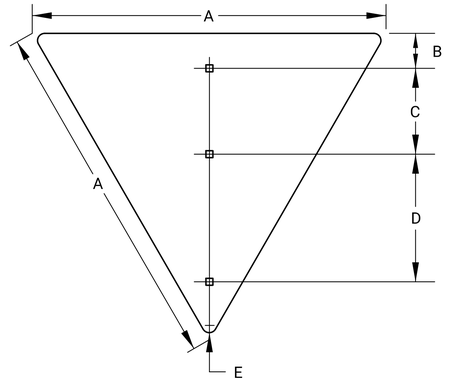
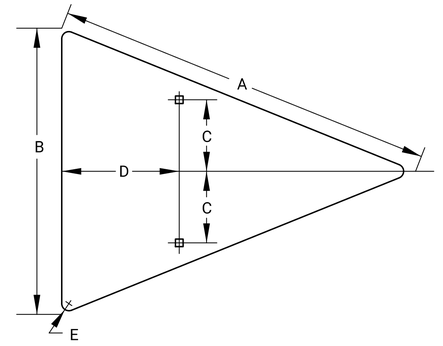


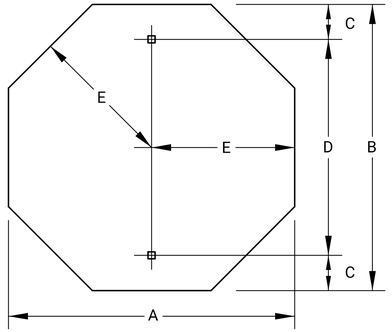
SIGN SIZE	A	B	C	D	T	AREA
36 X 36	36	3	18	2	0.080	3.90



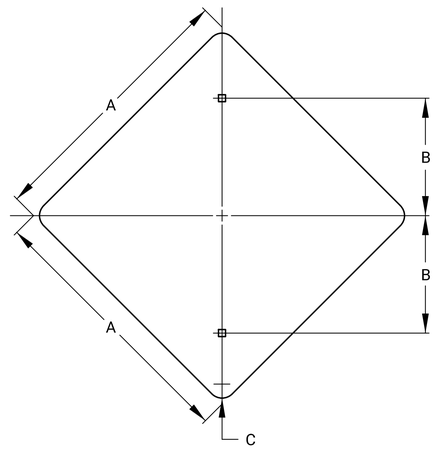
SIGN SIZE	A	B	C	D	E	T	AREA
48 X 48	48	3	12	18	3	0.080	6.93
60 X 60	60	3	18	18	4	0.100	10.83



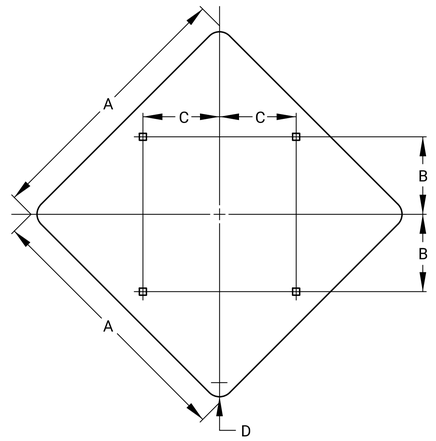
SIGN SIZE	A	B	C	D	E	T	AREA
48 X 36	48	36	9	14 ¾	2 ¼	0.125	5.56



SIGN SIZE	A	B	C	D	E	T	AREA
30 X 30	30	30	3	24	15	0.080	5.18
36 X 36	36	36	6	24	18	0.080	7.46



	SIGN SIZE	A	B	C	T	AREA
	18 X 18	18	6	1 ½	0.080	2.25
	24 X 24	24	12	1 ½	0.080	4.00
	30 X 30	30	12	1 ⅞	0.080	6.25
(1)	36 X 36	36	18	2 ¼	0.080	9.00



SIGN SIZE	A	B	C	D	T	AREA
48 X 48	48	12	15	3	0.100	16.00

NOTE:
All holes are 3/8 " square unless otherwise noted.

The dimension "t" is the thickness of the aluminum blank.

(1) Center hole is required.

All dimensions are in inches.

NO.	DATE	REVISIONS	BY	APP'D
	10/01/19	Update sign blank details and dimensions	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

SIGN BLANK DETAILS FOR FLAT SHEET SIGNS

TE503 7/1/03

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

KDOT Graphics Certified 12-17-2019

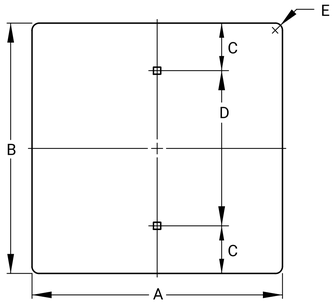
Sh. No. 162

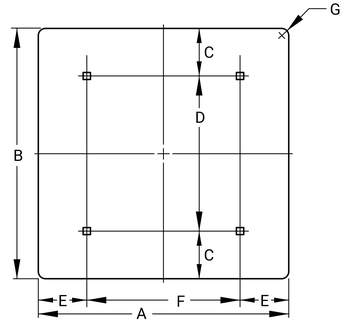
KDOT Graphics Certified

Plotted : 16-JAN-2025 07:50

Drawn By : mrockwell
File : te503.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	163	291





	SIGN SIZE	A	B	C	D	E	T	AREA
(1)	3 X 8	3	8	1	6	3/8	0.040	0.17
(1)	6 X 12	6	12	3	6	3/8	0.063	0.50
	12 X 6	12	6	1 1/2	3	3/4	0.063	0.50
	12 X 9	12	9	1 1/2	6	1 1/2	0.063	0.75
	12 X 18	12	18	3	12	1 1/2	0.063	1.50
	12 X 24	12	24	3	18	1 1/2	0.080	2.00
	12 X 36	12	36	6	24	1 1/2	0.080	3.00
	12 X 48	12	48	6	36	1 1/2	0.080	4.00
	18 X 6	18	6	1 1/2	3	1 1/2	0.063	0.75
	18 X 18	18	18	3	12	1 1/2	0.063	2.25
	18 X 30	18	24	3	24	1 1/2	0.080	3.75
	18 X 36	18	24	6	24	1 1/2	0.080	4.50
	18 X 42	18	24	6	30	1 1/2	0.080	5.25
	18 X 48	18	24	6	36	1 1/2	0.080	6.00
	21 X 15	21	15	1 1/2	12	1 1/2	0.080	2.19
	24 X 6	24	6	1 1/2	3	1 1/2	0.080	1.00
	24 X 12	24	12	3	6	1 1/2	0.080	2.00
	24 X 18	24	18	3	12	1 1/2	0.080	3.00
	24 X 24	24	24	3	18	1 1/2	0.080	4.00
	24 X 30	24	30	3	24	1 1/2	0.080	5.00
	24 X 36	24	36	6	24	1 1/2	0.080	6.00
	30 X 12	30	12	3	6	1 7/8	0.080	2.50
	30 X 15	30	15	1 1/2	12	1 7/8	0.080	3.13
	30 X 18	30	18	3	12	1 7/8	0.080	3.75
	30 X 21	30	21	1 1/2	18	1 1/2	0.080	4.38
	30 X 24	30	24	3	18	1 7/8	0.080	5.00
	30 X 30	30	30	3	24	1 7/8	0.080	6.25
	30 X 36	30	36	6	24	1 7/8	0.080	7.50
	36 X 12	36	12	3	6	1 1/2	0.080	3.00
	36 X 18	36	18	3	12	1 1/2	0.080	4.50
	36 X 24	36	24	3	18	1 1/2	0.080	6.00
	36 X 30	36	30	3	24	2 1/4	0.080	7.50
	36 X 36	36	36	6	24	2 1/4	0.080	9.00
(3)	45 X 36	45	36	3	30	2 1/4	0.100	11.25

	SIGN SIZE	A	B	C	D	E	F	G	T	AREA
	36 X 12	36	12	3	6	3	30	1 1/2	0.080	3.00
	36 X 30	36	30	3	24	3	30	2 1/4	0.080	7.50
	36 X 48	36	48	9	30	6	24	0	0.100	12.00
	36 X 60	36	60	12	36	6	24	0	0.100	15.00
(2)	36 X 72	36	72	6	60	6	24	0	0.100	18.00
	42 X 12	48	12	3	6	6	30	1 1/2	0.080	3.50
	42 X 18	48	18	3	12	6	30	1 1/2	0.080	5.25
	42 X 24	48	24	6	12	6	30	1 7/8	0.080	7.00
	42 X 36	48	36	6	24	6	30	0	0.100	10.50
	48 X 12	48	12	3	6	9	30	1 1/2	0.080	4.00
	48 X 18	48	18	3	12	9	30	1 1/2	0.080	6.00
	48 X 24	48	24	6	12	9	30	1 7/8	0.080	8.00
	48 X 30	48	30	6	18	9	30	0	0.100	10.00
	48 X 36	48	36	6	24	9	30	0	0.100	12.00
	48 X 42	48	42	6	30	9	30	0	0.100	14.00
	48 X 48	48	48	9	30	9	30	0	0.100	16.00
	48 X 60	48	60	12	36	9	30	0	0.100	20.00
(2)	48 X 72	48	72	6	60	9	30	0	0.100	24.00
(2)	48 X 96	48	96	12	72	9	30	0	0.100	32.00
	60 X 12	60	12	3	6	12	36	0	0.100	5.00

SIGN SIZE	A	B	C	D	E	F	G	T	AREA
60 X 18	60	18	3	12	12	36	0	0.100	7.50
60 X 24	60	24	6	12	12	36	0	0.100	10.00
60 X 30	60	30	6	18	12	36	0	0.100	12.50
60 X 36	60	36	6	24	12	36	0	0.100	15.00
60 X 42	60	42	6	30	12	36	0	0.100	17.50
60 X 48	60	48	9	30	12	36	0	0.100	20.00
72 X 12	72	12	3	6	15	42	0	0.100	6.00
72 X 18	72	18	3	12	15	42	0	0.100	9.00
72 X 24	72	24	6	12	15	42	0	0.100	12.00
72 X 30	72	30	6	18	15	36	0	0.100	15.00
72 X 36	72	36	6	24	15	42	0	0.100	18.00
72 X 42	72	42	6	30	15	42	0	0.100	21.00
72 X 48	72	48	9	30	15	42	0	0.100	24.00
84 X 12	84	18	3	6	18	48	0	0.100	7.00
84 X 18	84	18	3	12	18	48	0	0.100	10.50
84 X 24	84	24	6	12	18	48	0	0.100	14.00
84 X 30	84	30	6	18	18	48	0	0.100	17.50
84 X 36	84	36	6	24	18	48	0	0.100	21.00
84 X 42	84	42	6	30	18	48	0	0.100	24.50
84 X 48	84	48	9	30	18	48	0	0.100	28.00

NOTE:
All holes are 3/8" square, unless otherwise noted.

The dimension "T" is the thickness of the aluminum blank.

(1) Holes shall be 5/16" diameter.

(2) Dimension "D" requires a center hole.

(3) Additional hole 12" below top hole.

All dimensions are in inches.

NO.	DATE	REVISIONS	BY	APP'D
1	10/01/19	Update sign blank details and dimensions	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

SIGN BLANK DETAILS FOR FLAT SHEET SIGNS

TE506 7/1/03

FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

KDOT Graphics Certified 12-17-2019

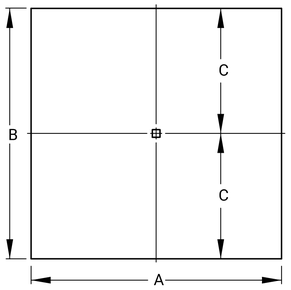
Sh. No. 163

KDOT Graphics Certified

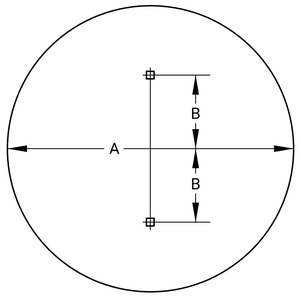
Plotted : 16-JAN-2025 07:50

Drawn By : mrockwell
File : te506.dgn

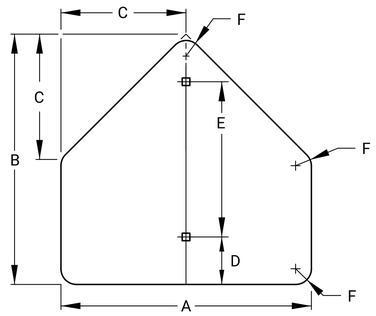
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	164	291



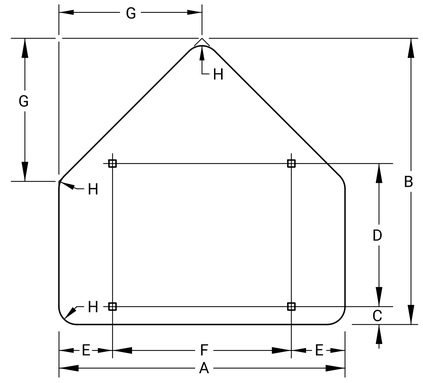
SIGN SIZE	A	B	C	T	AREA
6 X 6	6	6	3	0.063	0.25



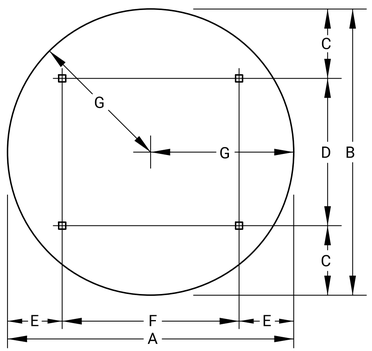
SIGN SIZE	A	B	T	AREA
36 DIA	36	12	0.080	7.07



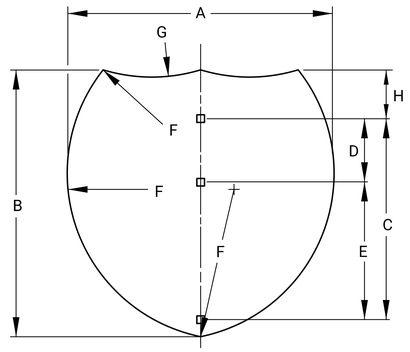
SIGN SIZE	A	B	C	D	E	F	T	AREA
30 X 30	30	30	15	3	24	1 ⅞	0.080	4.69
36 X 36	36	36	18	6	24	2 ¼	0.080	6.75



SIGN SIZE	A	B	C	D	E	F	G	H	T	AREA
48 X 48	48	48	3	24	9	30	24	3	0.100	12.00



SIGN SIZE	A	B	C	D	E	F	G	T	AREA
48 X 48	48	48	12	24	9	30	24	0.100	12.57



INDEPENDENT USE

DIMENSIONS										
SIZE	A	B	C	D	E	F	G	H	T	AREA
24 X 24	24	24	18	-	-	15	15	3	0.080	3.20
36 X 36	36	36	30	12	18	22 ½	22 ½	3	0.080	7.20
30 X 24	30	24	18	-	-	17	24	3	0.080	3.99
45 X 36	45	36	30	12	18	25 ½	36	3	0.100	8.99

NOTE:
All holes are ⅜" square, unless otherwise noted.
Dimension "T" is the thickness of the aluminum blank.

All dimensions are in inches.

NO.	DATE	REVISIONS	BY	APP'D
	10/01/19	Update sign blank details and dimensions	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

SIGN BLANK DETAILS FOR FLAT SHEET SIGNS

TE509 7/1/03

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

KDOT Graphics Certified 12-17-2019

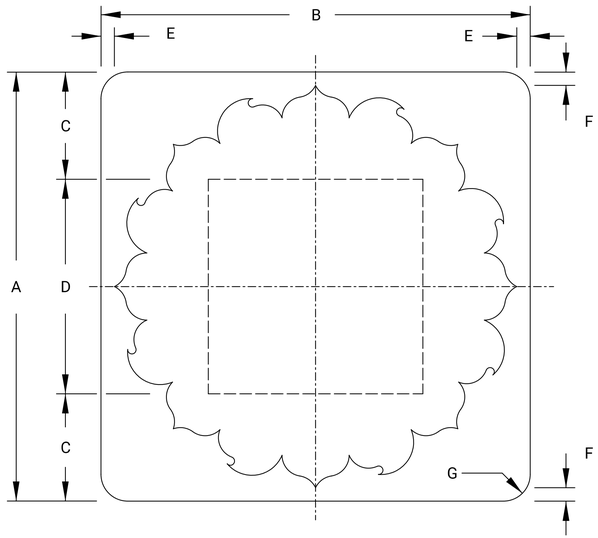
Sh. No. 164

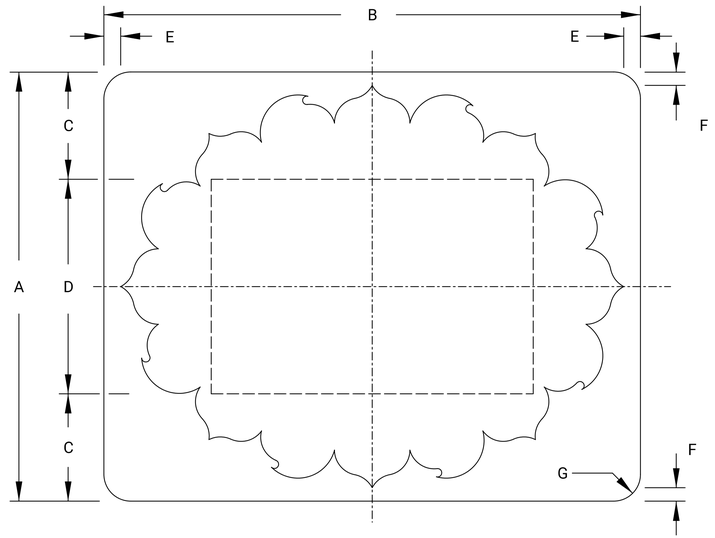
KDOT Graphics Certified

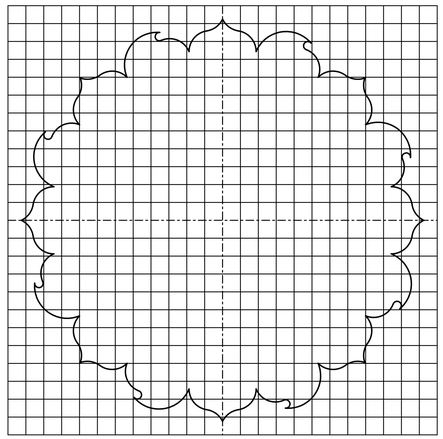
Plotted : 16-JAN-2025 07:50

Drawn By : mrockwell
File : te509.dgn

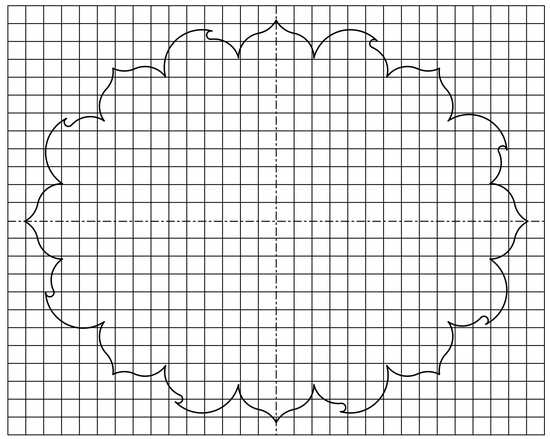
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	165	291







1 OR 2 DIGITS



3 DIGITS

SIZE	A	B	C	D	E	F	G
24 X 24	24	24	6	12	¾	¾	1 ½
30 X 24	24	30	6	12	1	¾	1 ½
36 X 36	36	36	9	18	1 ⅛	1 ⅛	2 ¼
45 X 36	36	45	9	18	1 ½	1 ⅛	2 ¼

All dimensions in inches.

COLORS:
Background around sunflower - Black
Sunflower - Yellow
Numerals - Black

NOTE:
See plan, quantity, or sign design layout sheets for numerals to be used. The numerals shall be Series "D" legend. The numerals are to be optically spaced about the vertical centerline.

See standard plan sheet TE590 for detailed specifications.

NO.	DATE	REVISIONS	BY	APP'D
	10/01/19	Added 36" route shields.	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

PROCESSED SIGN DETAILS
KANSAS ROUTE MARKERS

TE515 7/1/03

FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	B.A.H.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

KDOT Graphics Certified 12-17-2019

Sh. No. 165

KDOT Graphics Certified

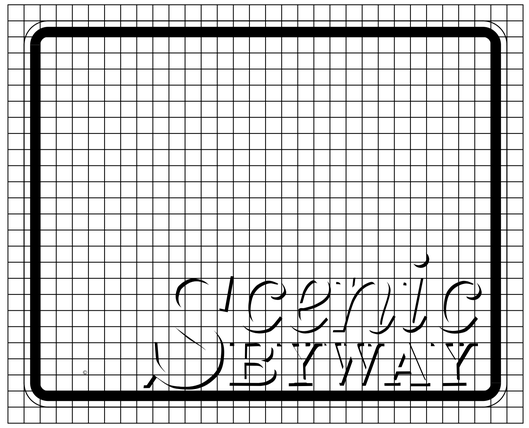
Plotted : 16-JAN-2025 07:50
Drawn By : mrockwell
File : te515.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	166	291

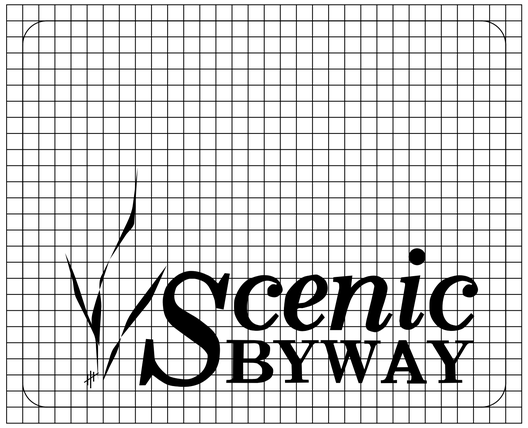
KD6-4 ;

1.50" Radius, 0.63" Border, 0.38" Indent;

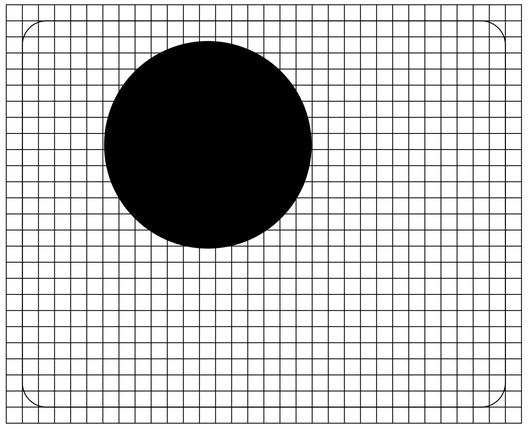
Background: Blue; Border: White



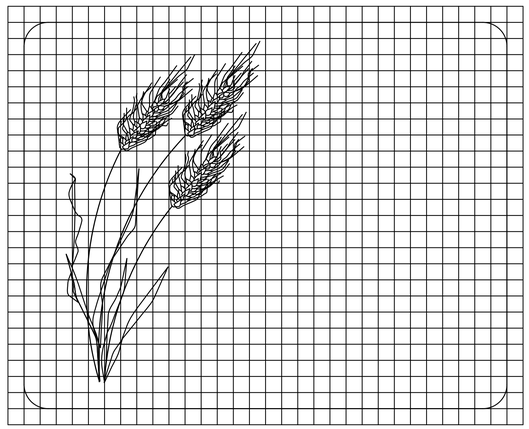
WHITE



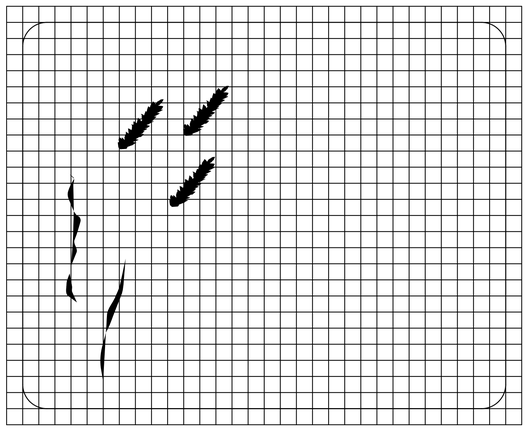
YELLOW (PMS #122)



YELLOW (PMS #122)
(SCREEN DARKER BOTTOM TO TOP)



BROWN (PMS #146)



GOLD (PMS #143)

NOTE:
See standard plan sheet TE590
for detailed specifications.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

PROCESSED SIGN DETAILS FOR KD6-4 SIGN

TE518 10-01-19

FHWA APPROVAL		10-01-19	APP'D.	Eric W. Nichol			
DESIGNED	D.D.G.	DETAILED	D.D.G.	QUANTITIES		TRACED	
DESIGN CK.	E.W.N.	DETAIL CK.	E.W.N.	QUAN.CK.		TRACE CK.	

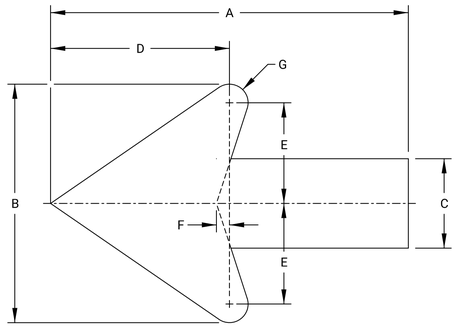
KDOT Graphics Certified 07-29-2022 Sh. No. 166

KDOT Graphics Certified

Plotted : 16-JAN-2025 07:50

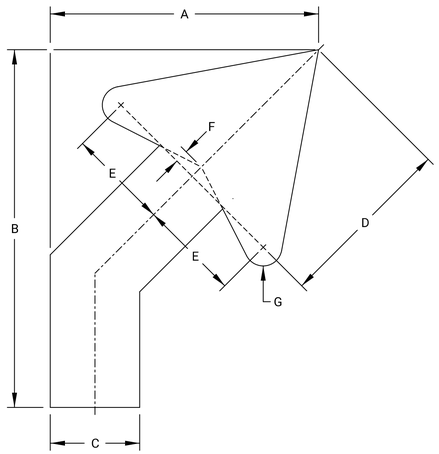
Drawn By : mrockwell
File : te518.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	167	291



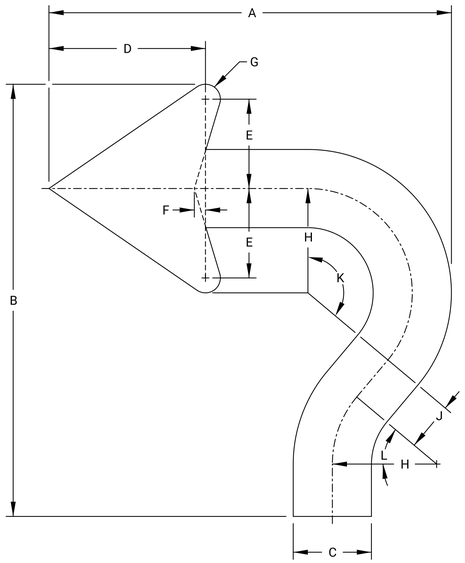
LETTER HEIGHT	A	B	C	D	E	F	G
4"	6	4	1 ½	3	1 11/16	7/32	5/16
6"	9	6	2 ¼	4 ½	2 9/16	5/16	7/16
8"	12	8	3	6	3 3/8	7/16	5/8

STANDARD



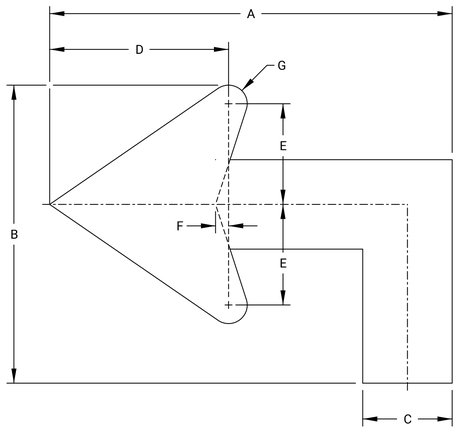
LETTER HEIGHT	A	B	C	D	E	F	G
6"	6 ¾	9	2 ¼	4 ½	2 9/16	5/16	7/16
8"	9	12	3	6	3 3/8	7/16	5/8

ADVANCE TURN (45°)



LETTER HEIGHT	A	B	C	D	E	F	G	H	J	K	L
6"	10	11	2	4 3/16	2 3/16	3/16	3/8	2 5/8	1 ¼	130°	40°
8"	13 ½	14 ½	2 5/8	5 ¼	3	3/8	½	3 ½	1 5/8	130°	40°

ROUNDABOUT LEFT TURN



LETTER HEIGHT	A	B	C	D	E	F	G
6"	10 ⅛	7 ½	2 ¼	4 ½	2 9/16	5/16	7/16
8"	13 ½	10	3	6	3 3/8	7/16	5/8

ADVANCE TURN (90°)

NOTE:
All dimensions are in inches.
See standard plan sheet TE590 for detailed specifications.

NO.	DATE	REVISIONS	BY	APP'D
01	10/01/19	Removed hyphen & added roundabout arrow	DDG	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

GUIDE SIGN
LEGEND DETAILS
FOR ARROWS

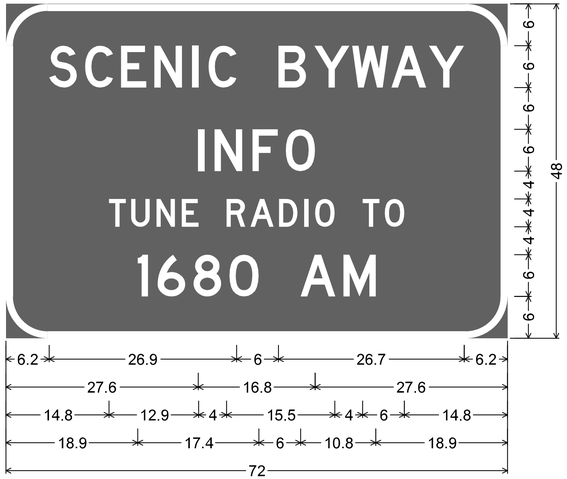
TE563 7/1/03

FHWA APPROVAL				10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	W.S.B.		QUANTITIES		TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.		QUAN. CK.		TRACE CK.

Plotted : 16-JAN-2025 07:50
Drawn By : mrockwell
File : te563.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	168	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021



KD12-1;
6.0" Radius, 1.0" Border, White on Blue;
"SCENIC BYWAY", D; "INFO", D; "TUNE RADIO TO", D;
"1680 AM", D;
Table of distances between letter and object lefts

	S	C	E	N	I	C	B	Y	W	A	Y	
6.2	5.2	5.1	4.8	5.4	2.4	10.0	5.2	5.4	5.6	5.4	5.1	6.2

	I	N	F	O		
27.6	2.4	5.4	4.8	4.2	27.6	

	T	U	N	E	R	A	D	I	O	T	O		
14.8	3.2	3.6	3.6	6.5	3.4	4.1	3.6	1.6	6.8	3.2	2.8	14.8	

	I	6	8	O	A	M		
18.9	2.9	5.1	5.2	10.2	6.1	4.7	18.9	

Plotted : 16-JAN-2025 07:50
Drawn By : mrockwell
File : ka601701psl-01.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC
SIGN LAYOUT

CADconform Certify This File

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	169	291

DETAILED SPECIFICATIONS FOR FLAT SHEET SIGNS AND OVERLAY PANELS

All new flat sheet sign blanks shall be of the fabrication and thickness shown on the flat sheet blank detail sheets, unless other details are shown in the plans.

Flat sheet blanks shall be used for signs that are less than or equal to 7'-0" in length and/or less than or equal to 4'-0" in height, unless other details are shown in the plans. Flat sheet blanks shall also be used for signs that are 4'-0" in length and less than or equal to 8'-0" in height, unless other details are shown in the plans.

The design details for signs (color, letter height, and letter series) shall be as shown in the FHWA Standard Highway Signs and Markings book (2004 edition and supplements), unless other details are shown in the plans.

All sign faces shall be covered with Type IV high intensity retroreflective sheeting, unless otherwise noted in the plans.

The sheeting used for the direct applied legend and borders shall be Type IV high intensity retroreflective sheeting, unless otherwise noted in the plans.

The school warning signs, the "SCHOOL" portion of the S5-1 sign, S4-3p plaque, and any supplemental plaques used with these warning signs shall have a fluorescent yellow-green background, unless otherwise noted in the plans.

The type of adhesive used for retroreflective sheeting or lettering film shall be heat activated or pressure sensitive.

DETAILED SPECIFICATIONS FOR REINFORCED PANEL SIGNS

All new reinforced sign panels shall be of the fabrication and thickness shown on the reinforced panel detail sheets. If extrusheet fabricated sign panels are used, they shall be of the length, width and in the position shown. If extrusheet fabricated panel dimensions are not shown, a line of legend should be placed entirely on one panel. If extruded fabricated sign panels are used, either 1'-0" or 6" panels shall be used. The 6" panels shall be used only at the top or bottom of signs.

Reinforced panels shall be used for signs that are greater than 7'-0" in length or greater than 4'-0" in height, unless other details are shown in the plans.

All sign faces shall be covered with Type IV high intensity retroreflective sheeting, unless otherwise noted in the plans.

The sheeting used for the direct applied legend and borders shall be Type IV high intensity retroreflective sheeting, unless otherwise noted in the plans.

The type of adhesive used for retroreflective sheeting or lettering film shall be heat activated or pressure sensitive.

Letters and numbers on reinforced panel signs are modified Series "E" unless otherwise shown.

Spacing table dimensions are in inches.

NO.	DATE	REVISIONS	BY	APP'D
2	10/01/19	Changed notes	D.D.G.	E.W.N.
1	7/23/10	Changed Notes and Sheeting Type	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS SPECIFICATIONS FOR REINFORCED SIGN PANELS AND FLAT SHEET SIGNS

TE590 7/01/03

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	K.D.S.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

KDOT Graphics Certified 12-17-2019

Sh. No. 169

KDOT Graphics Certified

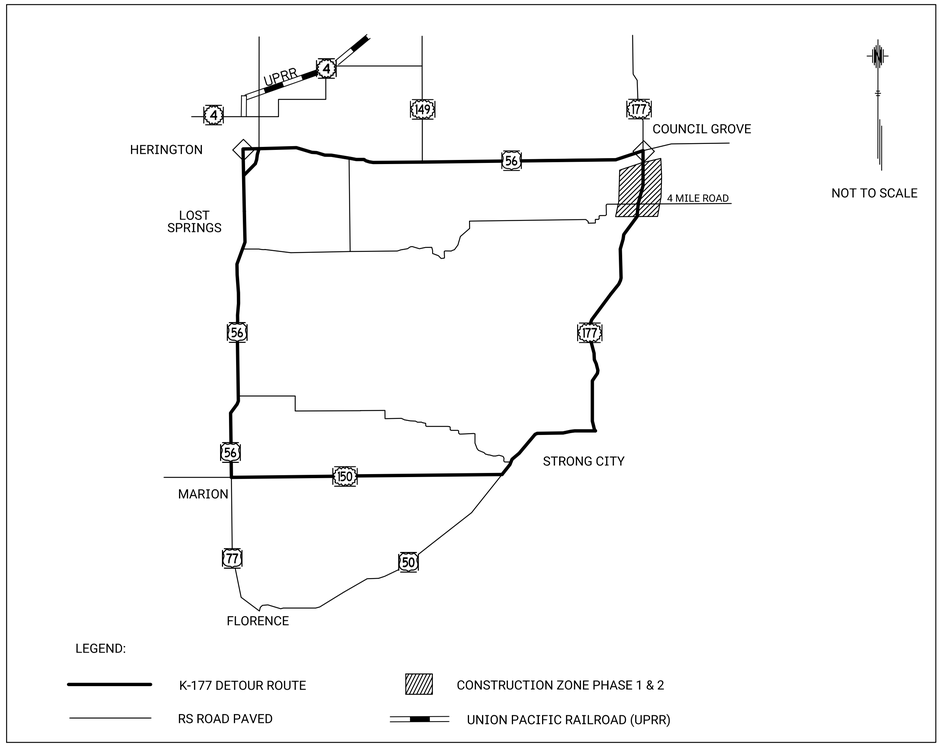
Plotted : 16-JAN-2025 07:50

Drawn By : mrockwell
File : te590.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	170	291

CONSTRUCTION SEQUENCE

PHASE	SUBPHASE	CONSTRUCTION	TRAFFIC	REMARKS
1		1. Construct new shoulders beginning at STA. 330+50 to STA. 448+73.82 (End of Project). 2. Complete Mill and Overlay beginning at STA. 330+50 to STA. 448+73.82. 3. Extend RCB structures from STA. 349+85 to end of project. 4. Replace RFB-Bridge (048). 5. Construct cross road drainage structure replacements at STA. 439+24, STA. 450+73, STA. 461+93, & STA. 482+26 including the storm sewer system at Velie Street. 6. Construct all driveway entrances north of 4-Mile Road.	1. Install detour route for K-177 road closure. 2. Close K-177 to traffic from 4-Mile Road to STA. 448+68.91 (End of Project). 3. Install road closure signage and barricades per TE704. Full closure barricades with "Road Closed" sign (R11-2) shall be installed at Velie Street, STA. 488+69.	1. During drainage structure replacements, additional road closure barricades and advance warning signing will be required. 2. Contractor shall maintain access to all properties during construction. If no other access is possible, entrances shall be constructed ½ at a time unless coordinated with the property owner.
2	A	1. Construct west half of Bridge No. 177-64-63.50(051) located at STA. 300+45. 2. Construct shoulders on west side from STA. 293+14 to STA. 306+52.	1. Close existing southbound K-177 Lane. 2. Install temporary traffic signal at STA. 290+74 for Phase 2A construction. 3. Install temporary traffic signal at STA. 308+52 for phase 2A construction.	1. Contractor shall maintain access to all properties during construction. If no other access is possible, entrances shall be constructed ½ at a time unless coordinated with the property owner.
	B	1. Construct east half of Bridge No. 177-64-63.50(051) located at STA. 300+45. 2. Construct shoulders on east side from STA. 293+14 to STA. 306+52.	1. Close existing northbound K-177 lane. 2. Install temporary traffic signal at STA. 290+74 for Phase 2B construction. 3. Install temporary traffic signal at STA. 308+52 for phase 2B construction.	1. Contractor shall maintain access to all properties during construction. If no other access is possible, entrances shall be constructed ½ at a time unless coordinated with the property owner.
3	A	1. Construct ¾ of 4-Mile Road Intersection. 2. Extend east side of RCB's located at STA. 323+45 and STA. 328+77. 3. Construct shoulders on east side from STA. 323+00 to 4-Mile Road.	1. Close the east leg of 4-Mile Road and the north leg of K-177 prior to installing temporary traffic signal at 4-Mile Road. 2. Install temporary traffic signal at STA. 319+50 for Phase 3A construction. 3. Install temporary traffic signal at 4-Mile Road for Phase 3A construction.	1. Contractor shall maintain access to all properties during construction. If no other access is possible, entrances shall be constructed ½ at a time unless coordinated with the property owner. 2. Construction can be completed concurrently with Phase 2A.
	B	1. Construct shoulders on west side from STA. 323+00 to 4-Mle Road. 2. Construct remaining portion of 4-Mile Road Intersection. 3. Extend west side of RCB's located at STA. 323+45 and STA. 328+77	1. East leg of 4-Mile Road and north leg of K-177 will remain closed. 2. Install temporary traffic signal at STA. 319+50 for Phase 3A construction. 3. Install temporary traffic signal at 4-Mile Road for Phase 3A construction.	1. Contractor shall maintain access to all properties during construction. If no other access is possible, entrances shall be constructed ½ at a time unless coordinated with the property owner. 2. Upon the completion of Phase 3A, construction can be completed concurrently with Phase 2A/2B.
4		1. Construct shoulders on both sides from STA. 306+52 to STA. 323+45, using standard details. 2. Construct all driveways from Bridge No. 177-64-63.50(051) to 4-Mile Road, using standard details.	1. Open 4-Mile Road to traffic.	1. Contractor shall maintain access to all properties during construction. If no other access is possible, entrances shall be constructed ½ at a time unless coordinated with the property owner.
5		1. Perform mill and overlay using standard details with flagging operations.	1. Maintain two way traffic with flagging operations during Mill and Overlay.	1. Prior to construction shall place signing, pilot cars, and flaggers per standard mill and overlay operating procedures. 2. Contractor shall maintain access to all properties during construction. If no other access is possible, entrances shall be constructed ½ at a time unless coordinated with the property owner.



DETOUR SKETCH

GENERAL NOTES

The sequence shown addresses major construction items only. The Contractor shall be responsible for coordination of all items. The Contractor may vary from the sequence shown only as approved by the Engineer.

The construction phases as outlined will require partial or total closure of side roads to complete the improvements. No two adjacent side roads may be closed at the same time. When a side road is closed, the Contractor shall work diligently to reopen as soon as feasible. Access shall be maintained to all properties throughout construction except as noted on the plans or as approved by the Engineer.

The traffic control requirements shown on these plans are minimum reuqirements only. The Engineer reserves the right to require additional or supplemental traffic control devices and implmentation procedures not shown on the plans, but which may be necessary for effective traffic control.

BY	DATE
J. Unruh - Benesch	10-2021
R. Nuessen - Benesch	10-2021
REFERENCES NOTED	
REFERENCES CHECKED	

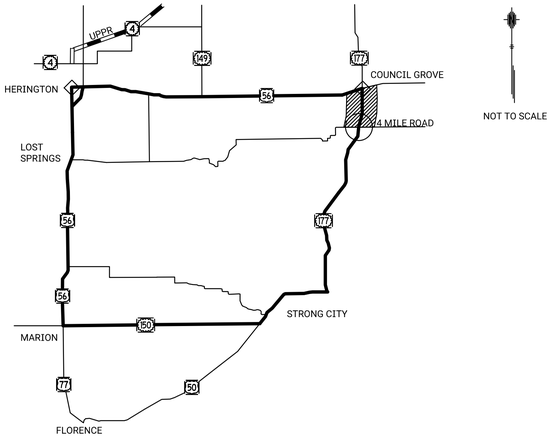
Plotted : 16-JAN-2025 07:50

Drawn By : mrockwell
File : ka601701cdt_0.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

K-177 CONSTRUCTION SEQUENCE & DETOUR PLAN

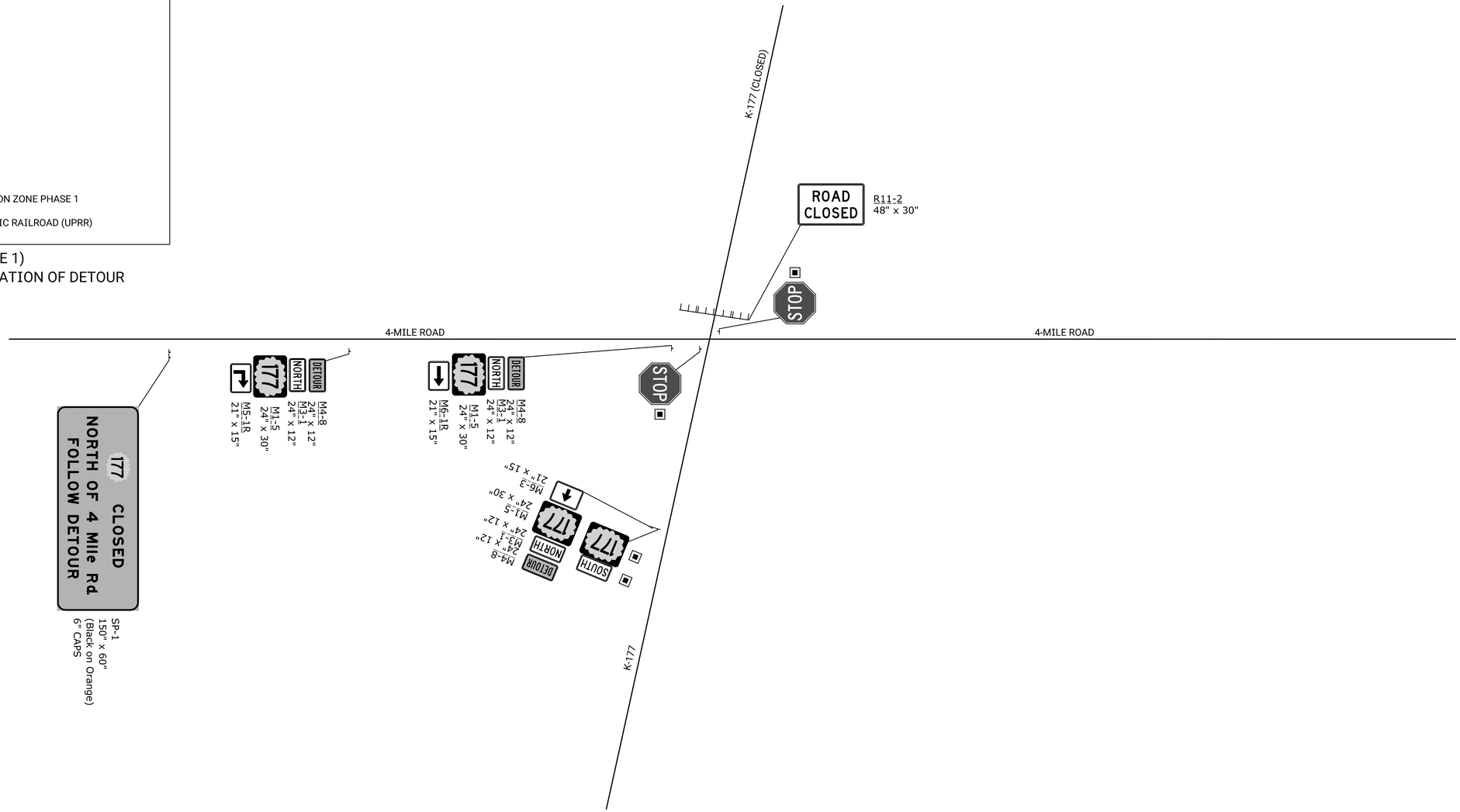
STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	171	291



NOT TO SCALE

DETOUR SKETCH (PHASE 1)
NOTE: CIRCLE ON MAP DENOTES LOCATION OF DETOUR

NOT TO SCALE



GENERAL NOTES

ALL CONFLICTING ROUTE MARKERS ALONG DETOUR ROUTE SHALL BE COVERED OR REMOVED.

EXISTING SIGNS NOT SHOWN AT THESE JUNCTIONS SHALL REMAIN IN PLACE UNLESS OTHERWISE DIRECTED BY THE ENGINEEER.

ERECT DETOUR CONFIRMATION ASSEMBLIES IN CONJUCTION WITH EXISTING ROUTE MARKER ASSEMBLIES ALONG DETOUR ROUTE

LEGEND:

- TYPE A LOW INTENSITY WARNING LIGHT
- TYPE III BARRICADES
- EXISTING

KANSAS DEPARTMENT OF TRANSPORTATION

CONSTRUCTION SEQUENCE
K-177 DETOUR

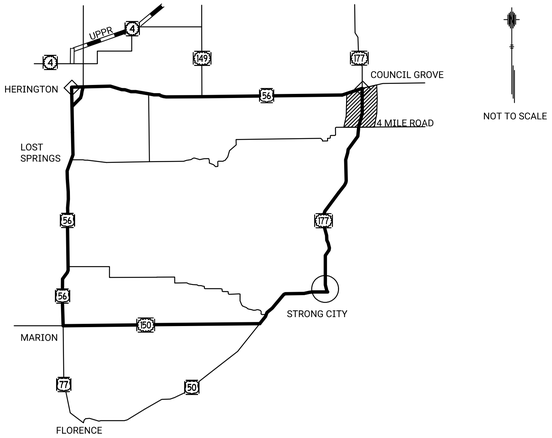
Sh. No. 171

BY	DATE
J. Unruh - Benesch	10-2021
R. Nuessen - Benesch	10-2021

REFERENCES NOTED
REFERENCES CHECKED

Drawn By: : mrockwell
File : ka017017cdt_1-01.dgn
Plotted : 16-JAN-2025 07:50

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	172	291



DETOUR SKETCH (PHASE 1)
NOTE: CIRCLE ON MAP DENOTES LOCATION OF DETOUR

NOT TO SCALE

K-177
Council Grove 19 — COVER OR REMOVE
NORTH — COVER OR REMOVE
177 — COVER OR REMOVE
Emporia Newton
ROAD CLOSED 15 MILES AHEAD LOCAL TRAFFIC ONLY — R11-3a 60" x 30" — COVER PORTION
Cottonwood Falls Council Grove
STOP
STOP
COVER OR REMOVE
50 EAST
WEST 50
K-177 ON RAMP
15 M.P.H.
Council Grove
D1-1 84" x 18" (Black on Orange) 6" CAPS
Newton Cottonwood Falls Council Grove
COVER PORTION
US-50 ON RAMP (DETOUR K-177)
W1-6L 48" x 24"
ROAD CLOSED TO THRU TRAFFIC — R11-4 60" x 30"
50 EAST Emporia
WRONG WAY
US-50 (K-177 DETOUR)
Tallgrass Prairie National Preserve VIA 177 NORTH
Pioneer Bluffs Ranch VIA 177 SOUTH
Emporia Cottonwood Falls Council Grove
COVER PORTION
MISSING THE NPS SYMBOL
COVER OR REMOVE
Newton Emporia
DETOUR AHEAD
W20-2 48" x 48"
M4-8 24" x 12"
M3-1 24" x 12"
M3-3 24" x 12"
M1-5 24" x 30"
M1-5 24" x 24"
M1-5R 21" x 15"
M6-1L 21" x 15"
M6-3 21" x 15"
M5-1L 24" x 12"
M5-1R 21" x 15"
M5-1 24" x 30"
M5-1R 21" x 15"
M4-8A 24" x 18"
DETOUR
NORTH
SOUTH
EAST
WEST
END DETOUR
UCT
NCT

GENERAL NOTES

ALL CONFLICTING ROUTE MARKERS ALONG DETOUR ROUTE SHALL BE COVERED OR REMOVED.

EXISTING SIGNS NOT SHOWN AT THESE JUNCTIONS SHALL REMAIN IN PLACE UNLESS OTHERWISE DIRECTED BY THE ENGINEEER.

ERECT DETOUR CONFIRMATION ASSEMBLIES IN CONJUCTION WITH EXISTING ROUTE MARKER ASSEMBLIES ALONG DETOUR ROUTE

LEGEND:

- ○ TYPE A LOW INTENSITY WARNING LIGHT
- TYPE III BARRICADES
- ▣ EXISTING

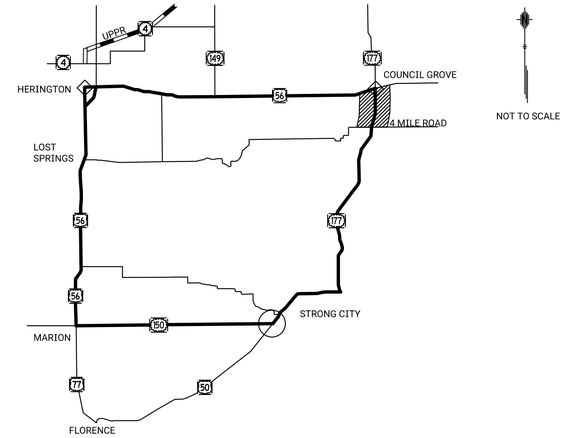
KANSAS DEPARTMENT OF TRANSPORTATION

CONSTRUCTION SEQUENCE
K-177 DETOUR

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

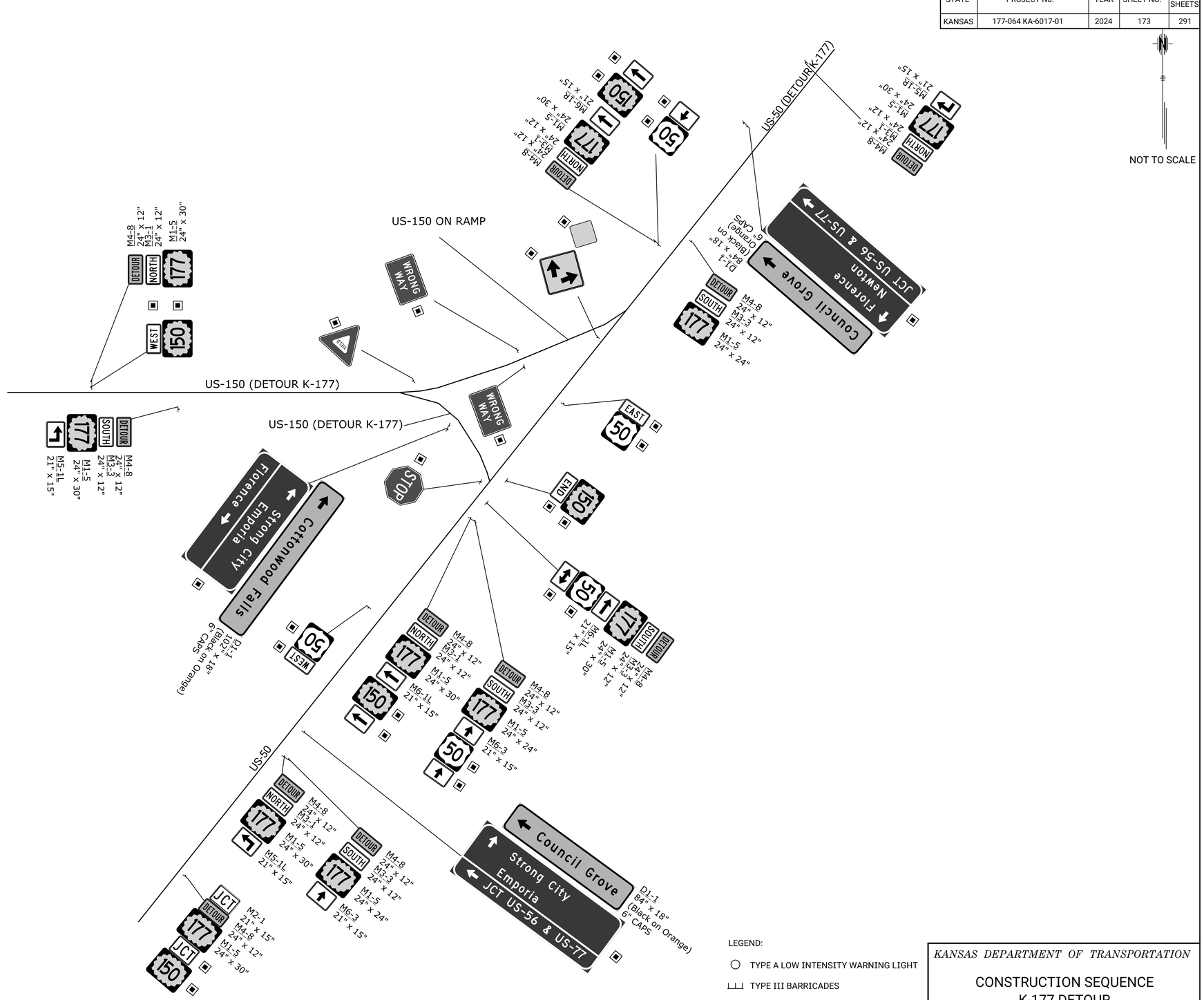
Drawn By : mrockwell
File : ka601701cdt_2-01.dgn
Plotted : 16-JAN-2025 07:50

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	173	291



NOT TO SCALE

DETOUR SKETCH (PHASE 1)
NOTE: CIRCLE ON MAP DENOTES LOCATION OF DETOUR



NOT TO SCALE

GENERAL NOTES

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ERECT DETOUR CONFIRMATION ASSEMBLIES IN CONJUCTION WITH EXISTING ROUTE MARKER ASSEMBLIES ALONG DETOUR ROUTE

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

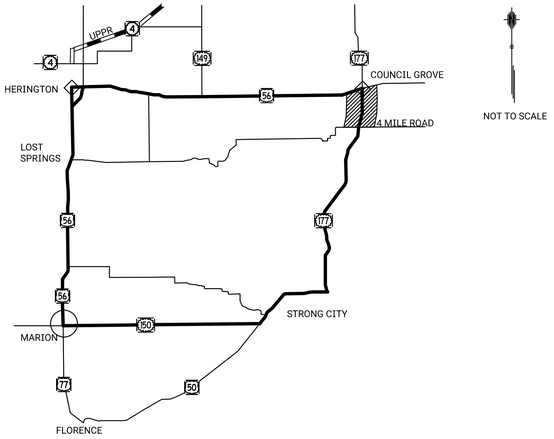
KANSAS DEPARTMENT OF TRANSPORTATION

CONSTRUCTION SEQUENCE
K-177 DETOUR

Sh. No. 173

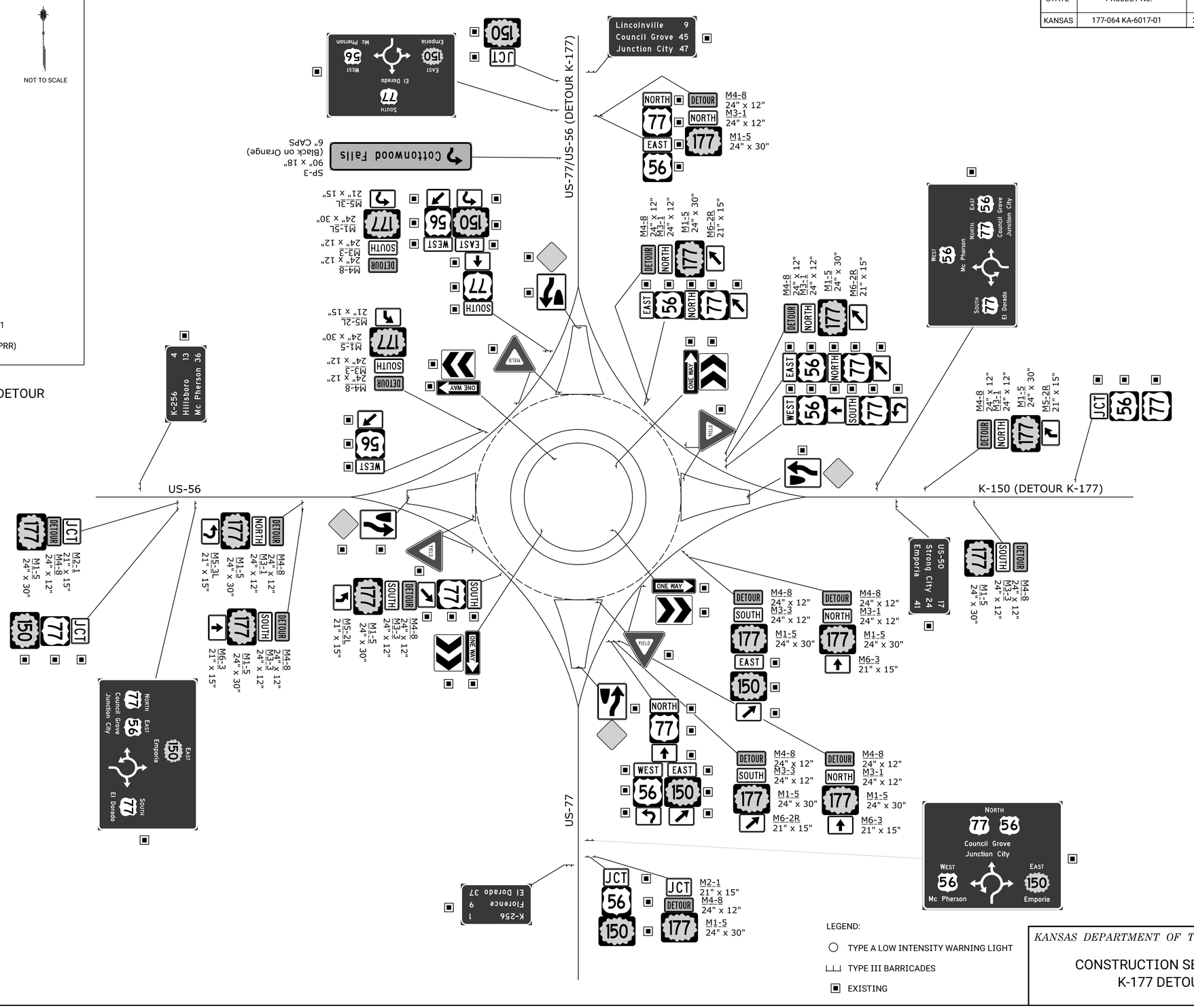
Drawn By : mrockwell
File : ka601701cdt_3-01.dgn
Plotted : 16-JAN-2025 07:50

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	174	291



NOT TO SCALE

DETOUR SKETCH (PHASE 1)
NOTE: CIRCLE ON MAP DENOTES LOCATION OF DETOUR



GENERAL NOTES

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ERECT DETOUR CONFIRMATION ASSEMBLIES IN CONJUCTION WITH EXISTING ROUTE MARKER ASSEMBLIES ALONG DETOUR ROUTE

LEGEND:

- TYPE A LOW INTENSITY WARNING LIGHT
- TYPE III BARRICADES
- EXISTING

KANSAS DEPARTMENT OF TRANSPORTATION

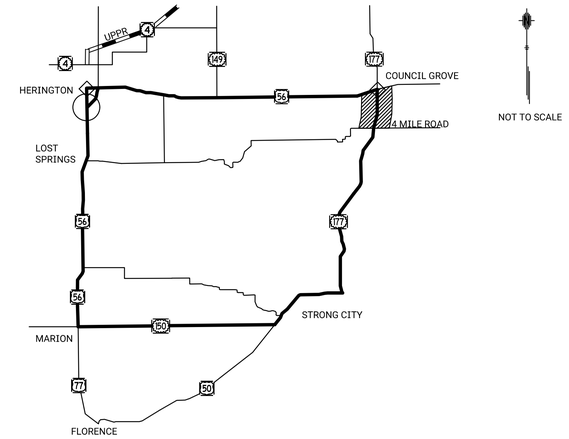
CONSTRUCTION SEQUENCE
K-177 DETOUR

Sh. No. 174

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

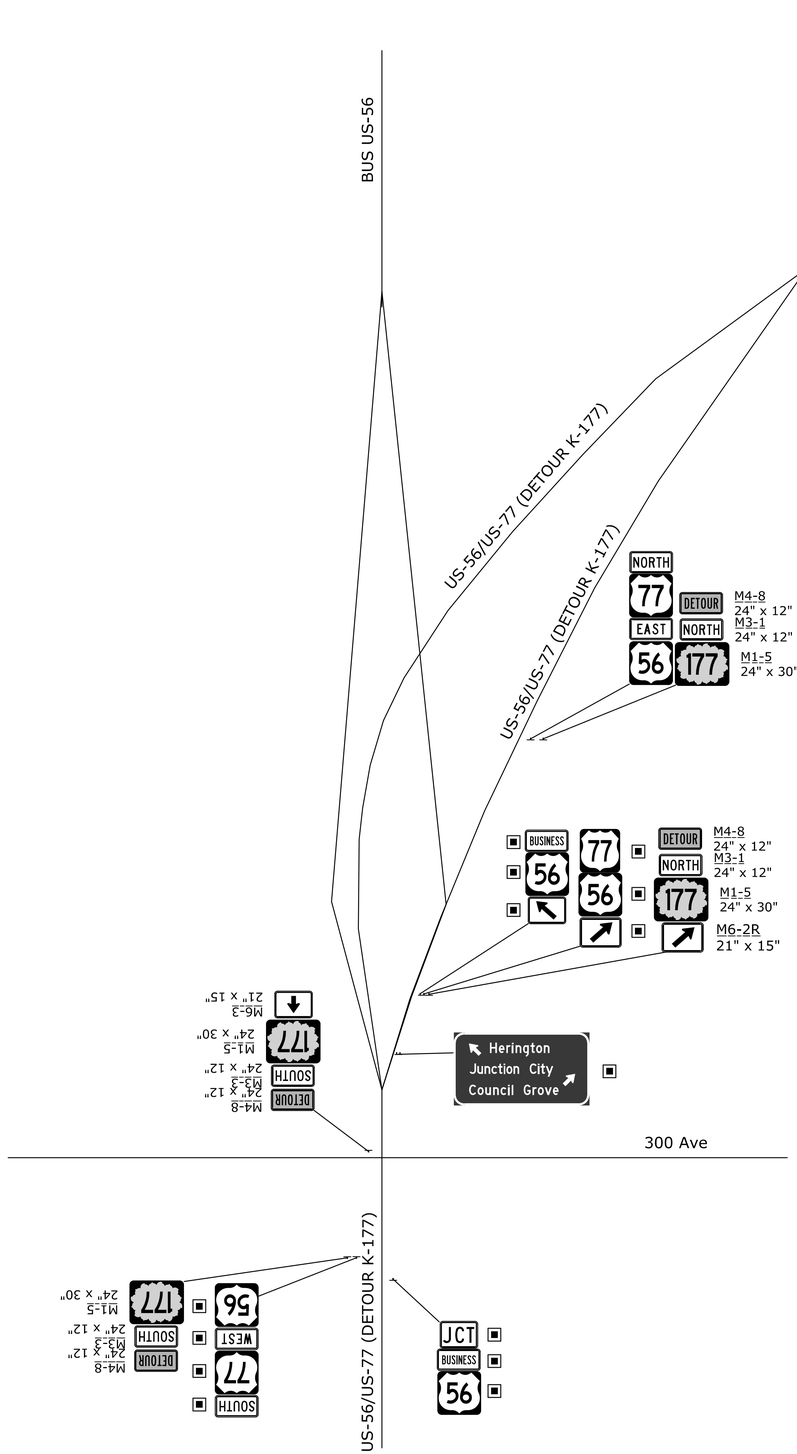
Drawn By : mrockwell
File : ka601701cdt_4-01.dgn
Plotted : 16-JAN-2025 07:50

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	175	291



NOT TO SCALE

DETOUR SKETCH (PHASE 1)
NOTE: CIRCLE ON MAP DENOTES LOCATION OF DETOUR



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- TYPE III BARRICADES
- EXISTING

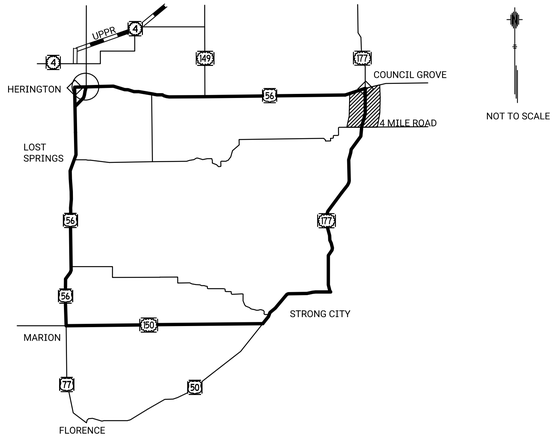
KANSAS DEPARTMENT OF TRANSPORTATION

CONSTRUCTION SEQUENCE
K-177 DETOUR

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

Drawn By : mrockwell
File : ka601701cdt_5-01a.dgn
Plotted : 16-JAN-2025 07:50

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	176	291



NOT TO SCALE

DETOUR SKETCH (PHASE 1)
NOTE: CIRCLE ON MAP DENOTES LOCATION OF DETOUR

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
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LEGEND:

- ○ TYPE A LOW INTENSITY WARNING LIGHT
- ⊔⊔ TYPE III BARRICADES
- ▣ EXISTING

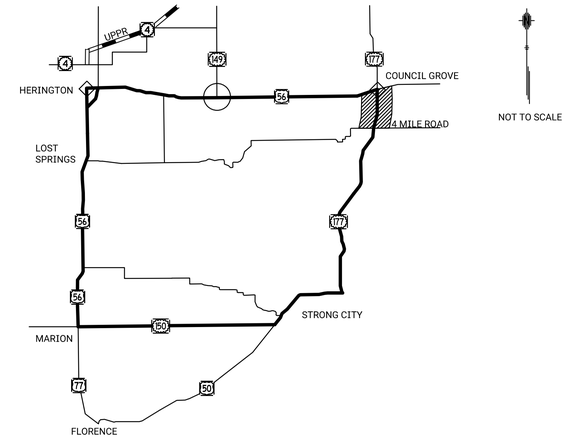
KANSAS DEPARTMENT OF TRANSPORTATION

CONSTRUCTION SEQUENCE
K-177 DETOUR

Sh. No. 176

Drawn By : mrockwell
File : ka601701cdt_5-01b.dgn
Plotted : 16-JAN-2025 07:50

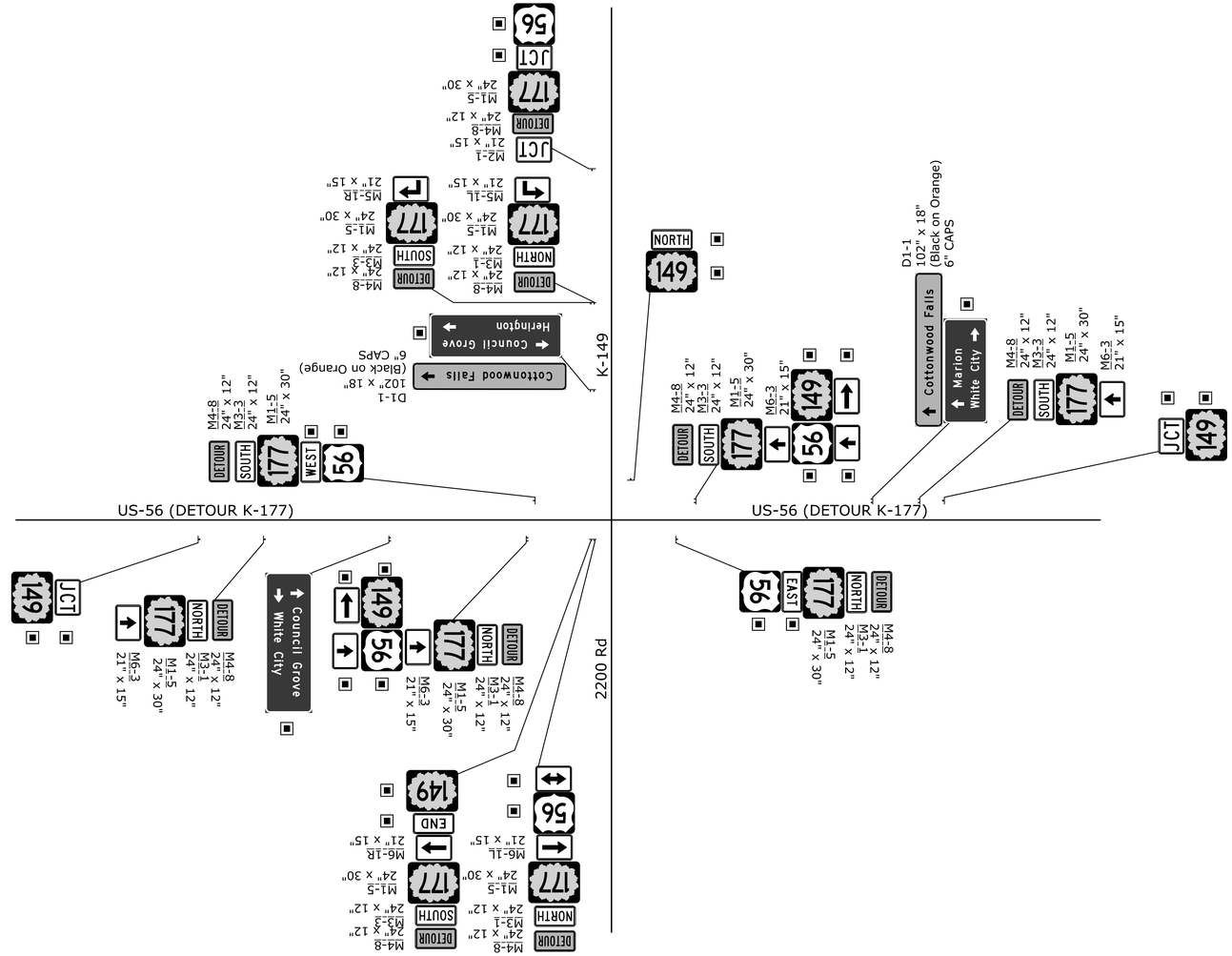
STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	177	291



NOT TO SCALE

DETOUR SKETCH (PHASE 1)
NOTE: CIRCLE ON MAP DENOTES LOCATION OF DETOUR

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021



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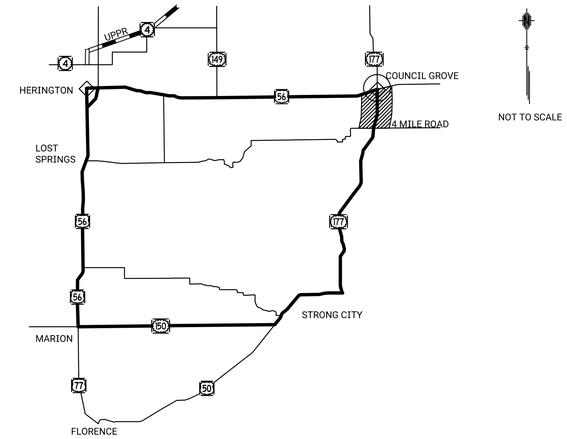
KANSAS DEPARTMENT OF TRANSPORTATION

CONSTRUCTION SEQUENCE
K-177 DETOUR

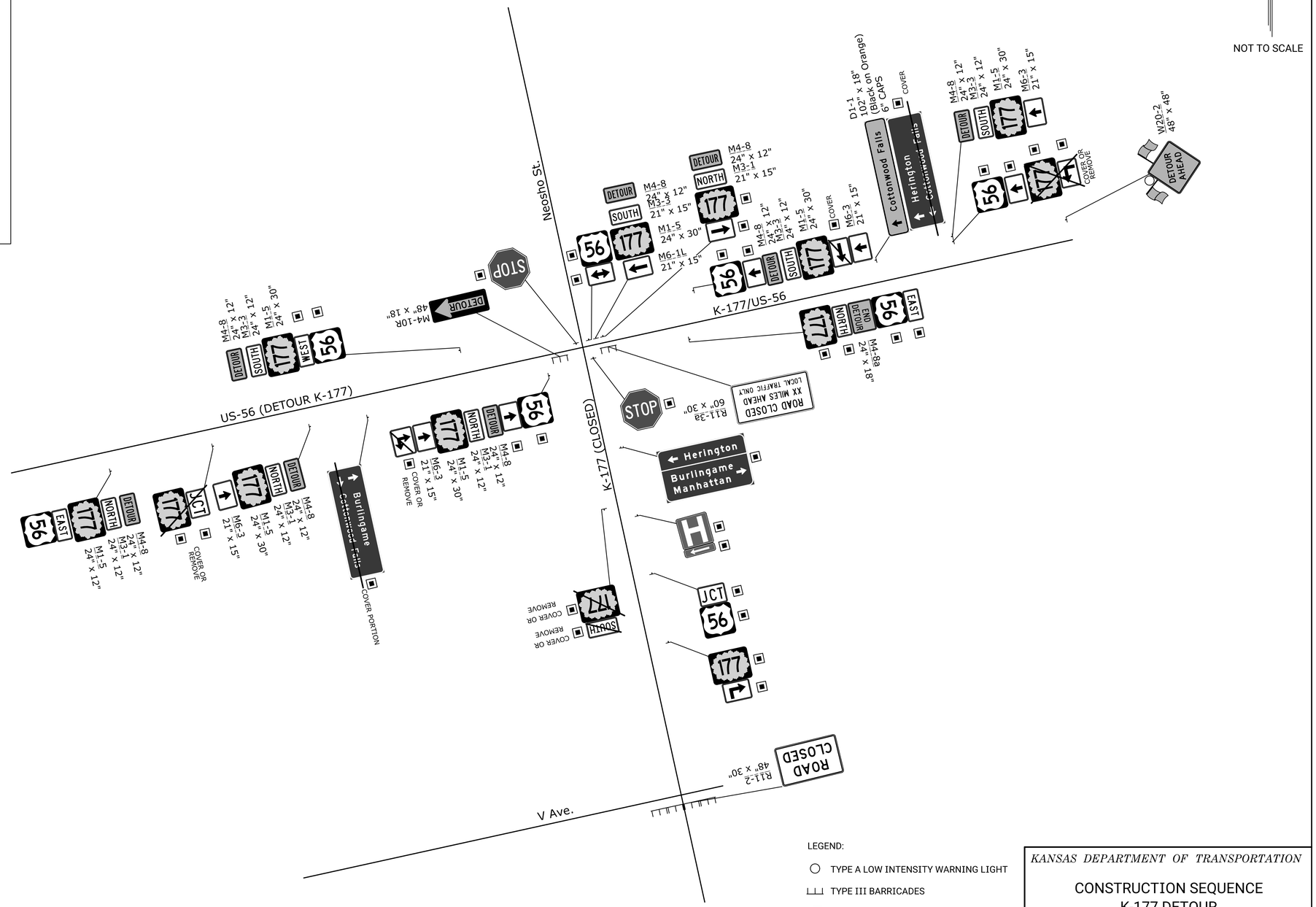
Plotted : 16-JAN-2025 07:50
Drawn By : mrockwell
File : ka601701cdt_6-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	178	291



NOT TO SCALE

DETOUR SKETCH (PHASE 1)
NOTE: CIRCLE ON MAP DENOTES LOCATION OF DETOUR



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- TYPE A LOW INTENSITY WARNING LIGHT
- TYPE III BARRICADES
- EXISTING

KANSAS DEPARTMENT OF TRANSPORTATION

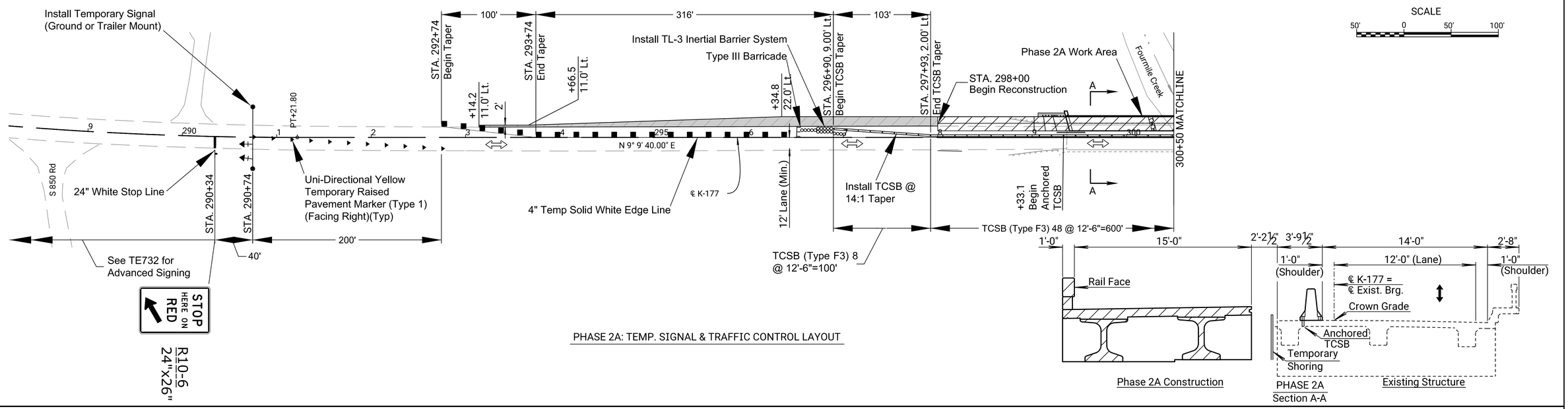
CONSTRUCTION SEQUENCE
K-177 DETOUR

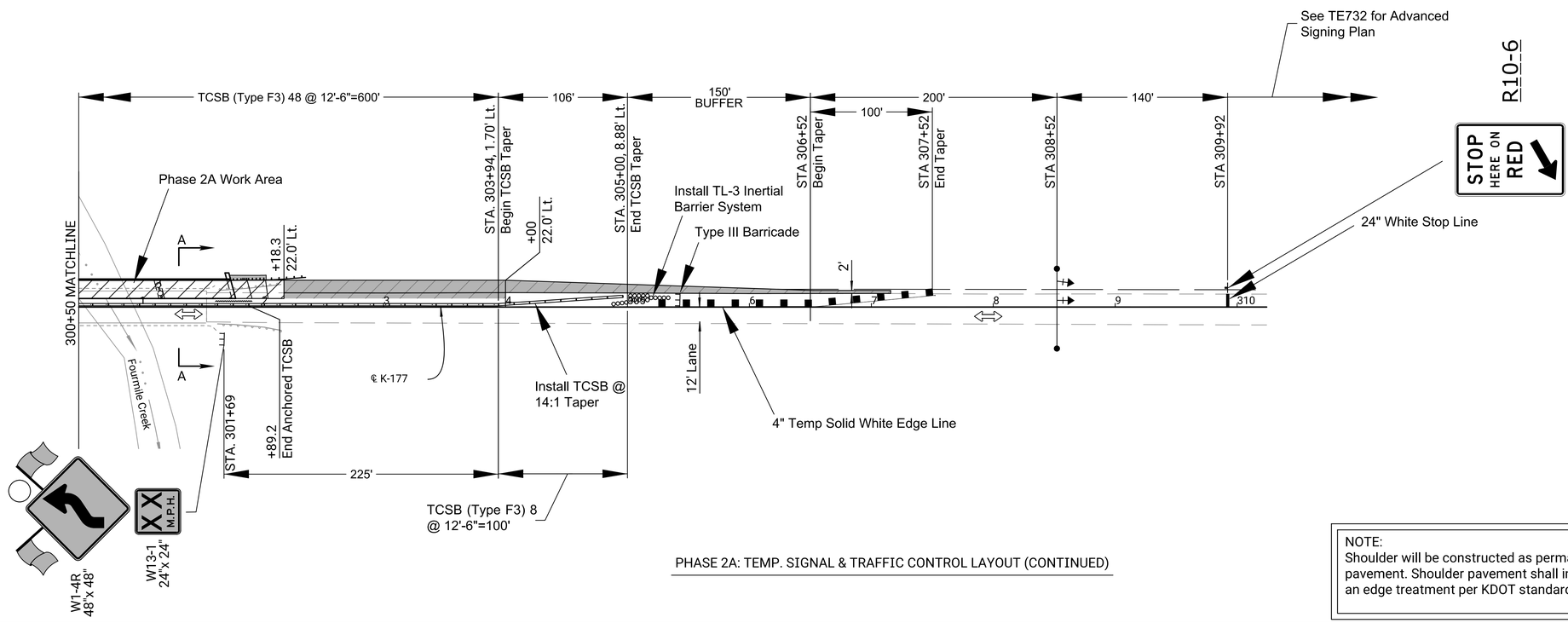
	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

Plotted : 16-JAN-2025 07:51
Drawn By : mrockwell
File : ka601701cdt_7-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	179	291

DATE	BY
10-2021	J. Unruh - Benesch
10-2021	R. Nuessen - Benesch
REFERENCES NOTED	
REFERENCES CHECKED	





PHASE 2A: TEMP. SIGNAL & TRAFFIC CONTROL LAYOUT (CONTINUED)

LEGEND

- Construction Area
- Shoulder Construction
- Traffic Flow Direction
- Type III Barricades
- Portable Channelizers
- Uni-Directional Temporary Raised Pavement Marker
- TCSB= Concrete Safety Barrier (Type F3)(Temporary)
- Temporary Shoring

NOTE:
Shoulder will be constructed as permanent pavement. Shoulder pavement shall include an edge treatment per KDOT standards.

KANSAS DEPARTMENT OF TRANSPORTATION

PHASE 2A TEMPORARY SIGNAL
STA. 198+00 to STA. 311+00
BRIDGE STA. 300+45

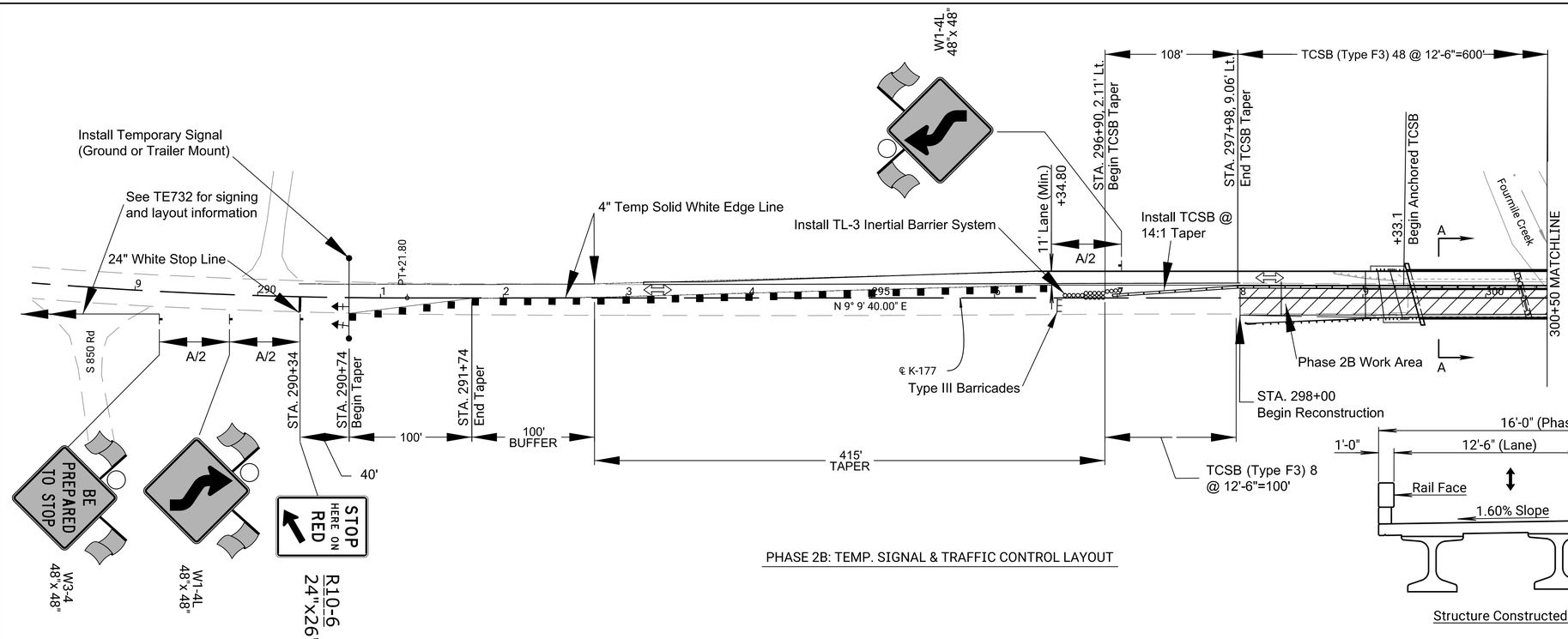
Sh. No. 179

Plotted : 16-JAN-2025 07:51
Drawn By : mrockwell
File : ka601701cpl-02A.dgn

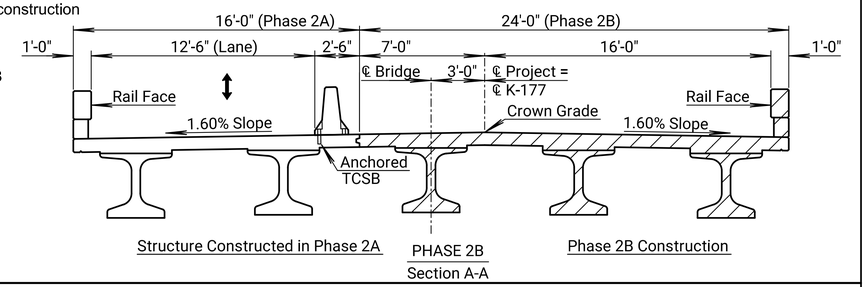
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	180	291

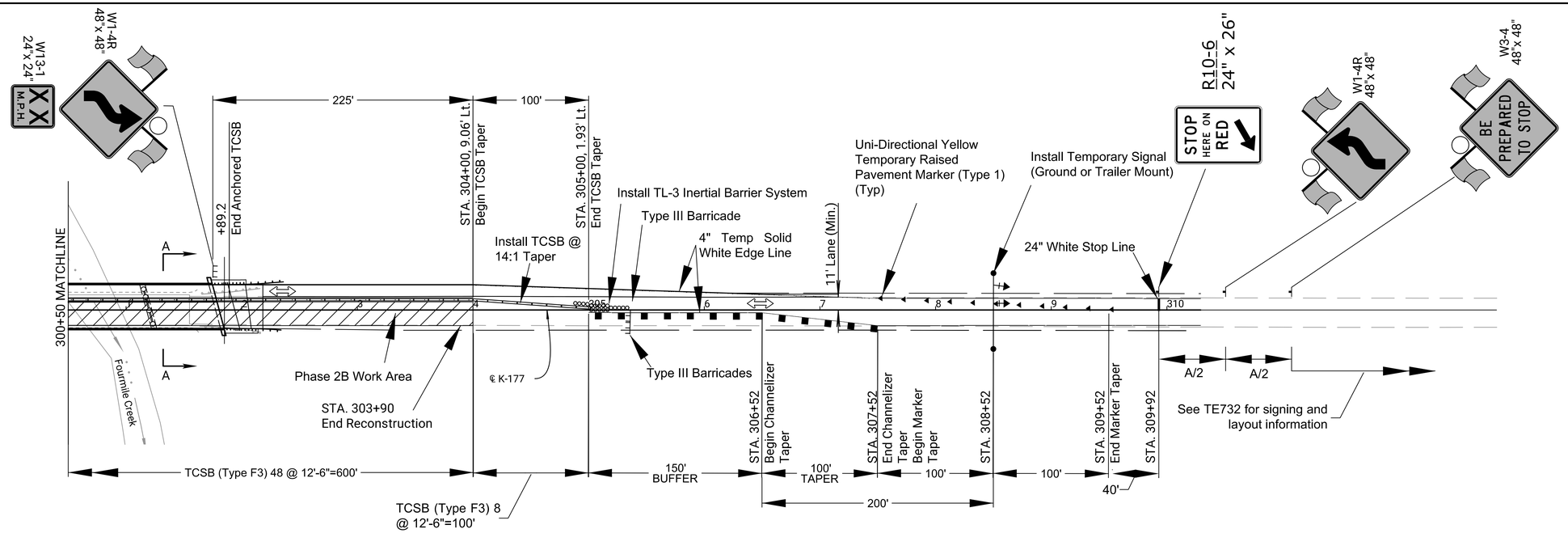
BY	DATE
J. Unruh - Benesch	10-2021
R. Nuessen - Benesch	10-2021

REFERENCES NOTED
REFERENCES CHECKED

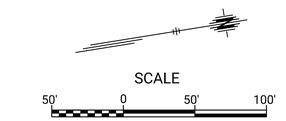


PHASE 2B: TEMP. SIGNAL & TRAFFIC CONTROL LAYOUT





PHASE 2B: TEMP. SIGNAL & TRAFFIC CONTROL LAYOUT (CONTINUED)



LEGEND

- Construction Area
- Traffic Flow Direction
- Type III Barricades
- Portable Channelizers
- Uni-Directional Temporary Raised Pavement Marker
- TCSB=Concrete Safety Barrier (Type F3)(Temporary)

KANSAS DEPARTMENT OF TRANSPORTATION

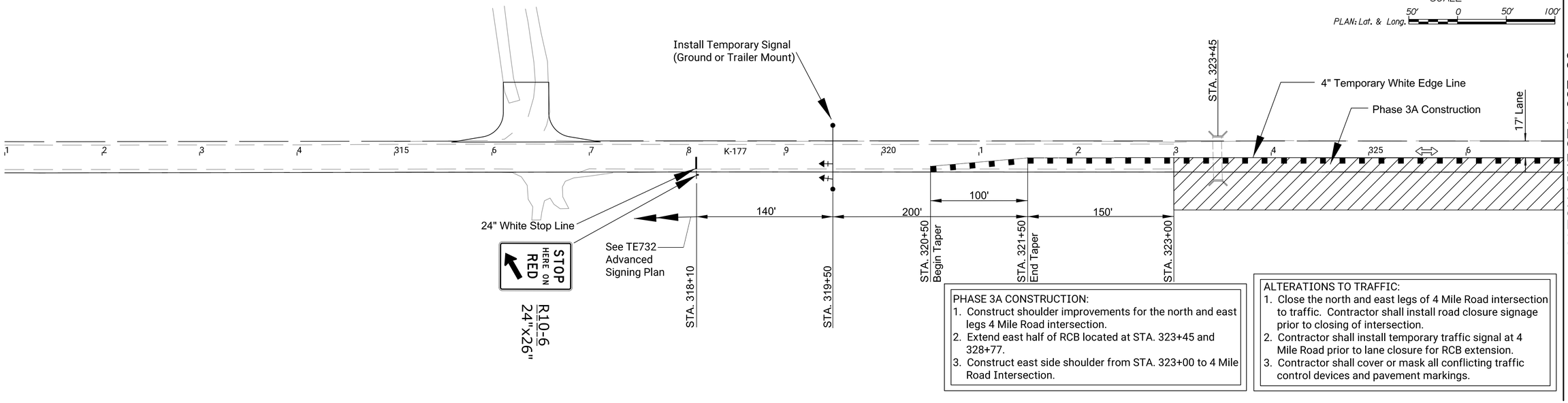
PHASE 2B TEMPORARY SIGNAL
STA. 198+00 to STA. 311+00
BRIDGE STA. 300+45

Sh. No. 180

Plotted : 16-JAN-2025 07:51
Drawn By : mrockwell
File : ka601701cpl-02B.dgn

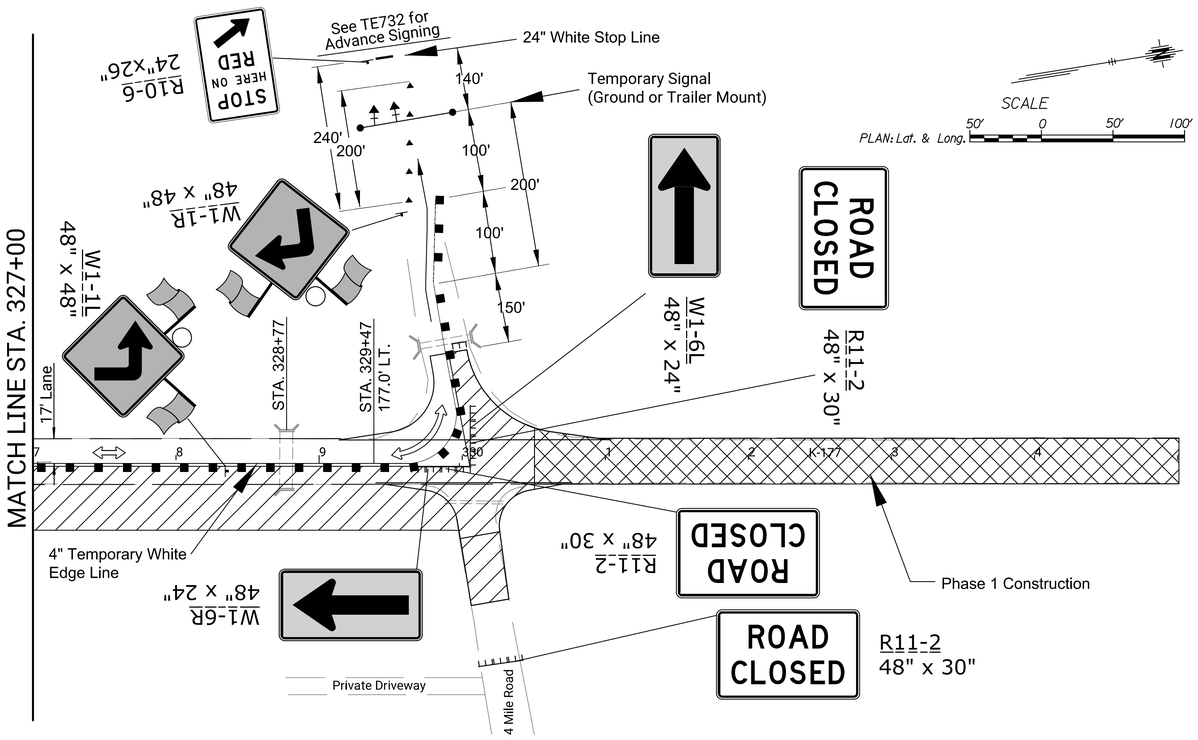
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	181	291

	BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

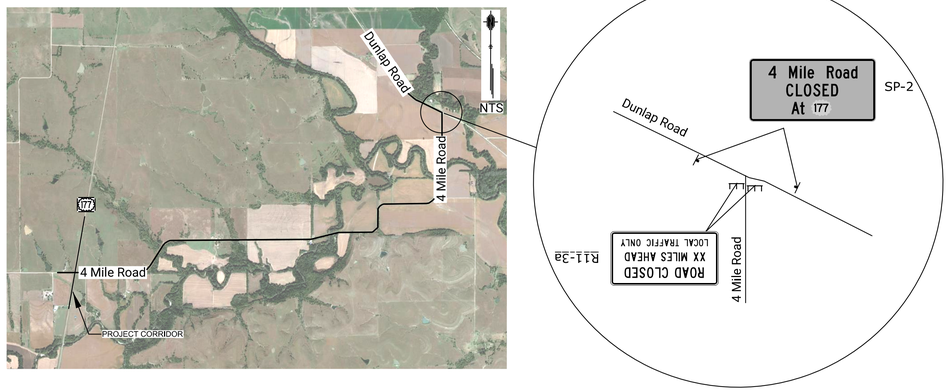


PHASE 3A CONSTRUCTION:
1. Construct shoulder improvements for the north and east legs 4 Mile Road intersection.
2. Extend east half of RCB located at STA. 323+45 and 328+77.
3. Contractor east side shoulder from STA. 323+00 to 4 Mile Road Intersection.

ALTERATIONS TO TRAFFIC:
1. Close the north and east legs of 4 Mile Road intersection to traffic. Contractor shall install road closure signage prior to closing of intersection.
2. Contractor shall install temporary traffic signal at 4 Mile Road prior to lane closure for RCB extension.
3. Contractor shall cover or mask all conflicting traffic control devices and pavement markings.



4 Mile Road & Dunlap Road Road Closed Detail



LEGEND
- Construction Area
- Traffic Flow Direction
- Type III Barricades
- Portable Channelizers
- Uni-Directional Temporary Raised Pavement Marker

KANSAS DEPARTMENT OF TRANSPORTATION

PHASE 3A TEMPORARY SIGNAL
STA. 311+00 TO STA. 343+00
4 MILE ROAD

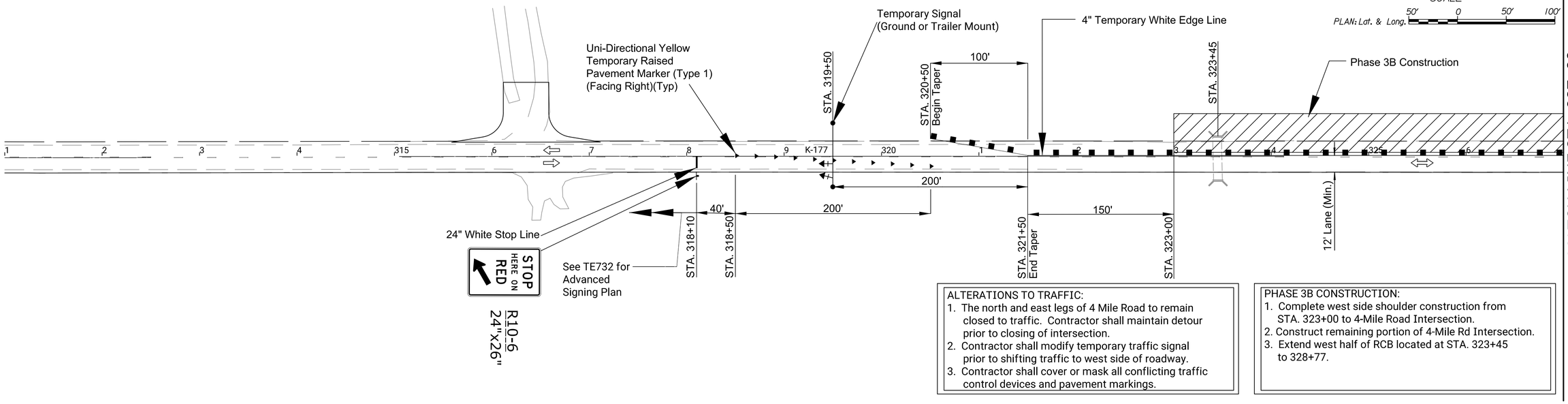
Drawn By : mrockwell
File : ka601701mpl-3A.dgn
Plotted : 16-JAN-2025 07:51

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	182	291

BY	DATE
REFERENCES NOTED	J. Unruh - Benesch	10-2021
REFERENCES CHECKED	R. Nuessen - Benesch	10-2021

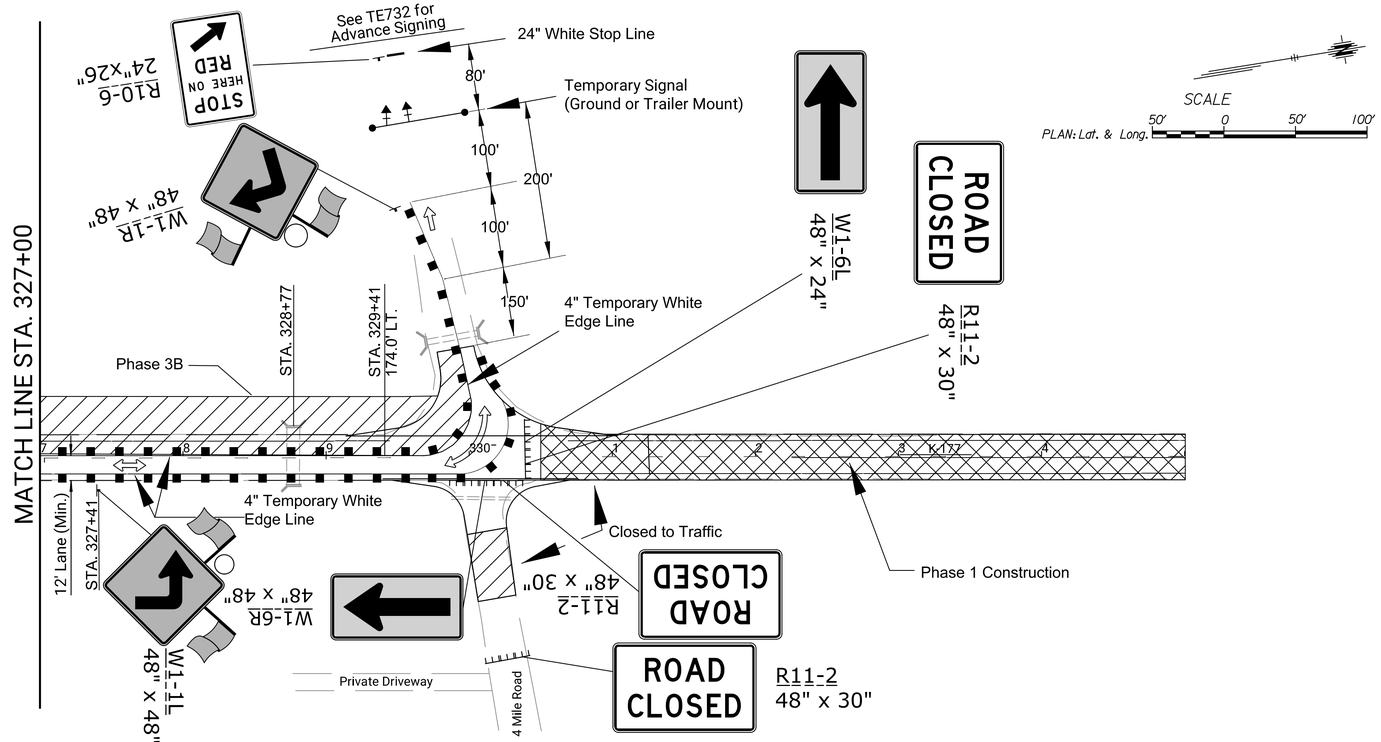
SCALE
PLAN: Lat. & Long. 50' 0 50' 100'



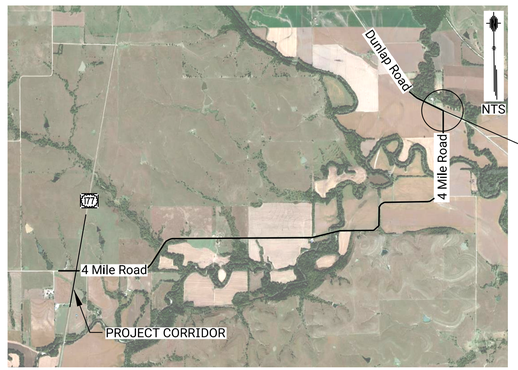
ALTERATIONS TO TRAFFIC:
1. The north and east legs of 4 Mile Road to remain closed to traffic. Contractor shall maintain detour prior to closing of intersection.
2. Contractor shall modify temporary traffic signal prior to shifting traffic to west side of roadway.
3. Contractor shall cover or mask all conflicting traffic control devices and pavement markings.

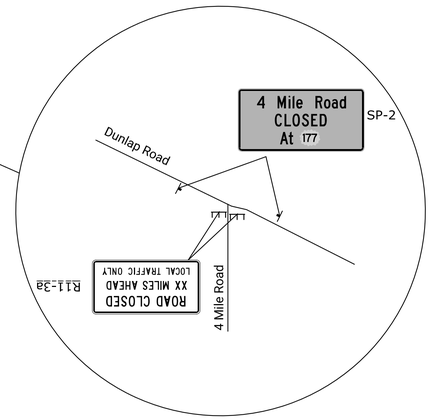
PHASE 3B CONSTRUCTION:
1. Complete west side shoulder construction from STA. 323+00 to 4-Mile Road Intersection.
2. Construct remaining portion of 4-Mile Rd Intersection.
3. Extend west half of RCB located at STA. 323+45 to 328+77.

SCALE
PLAN: Lat. & Long. 50' 0 50' 100'



4 Mile Road & Dunlap Road Road Closed Detail





LEGEND
- Construction Area
- Traffic Flow Direction
- Type III Barricades
- Portable Channelizers

KANSAS DEPARTMENT OF TRANSPORTATION
PHASE 3B TEMPORARY SIGNAL
STA. 311+00 TO STA. 343+00
4 MILE ROAD

Drawn By : mrockwell
File : ka601701mpl-3B.dgn
Plotted : 16-JAN-2025 07:51

CADconform Certify This File

1) Design Speed: Those items delegated to temporary traffic control should be designed and installed using the posted/legal speed of the roadway prior to work starting.

2) Minimum Lane Width: Lane widths shall be a minimum of 11' (measured between centerlines of pavement markings) or as shown on the plans, or as directed by the engineer. A lane width less than 11' may require restricted roadway width signing.

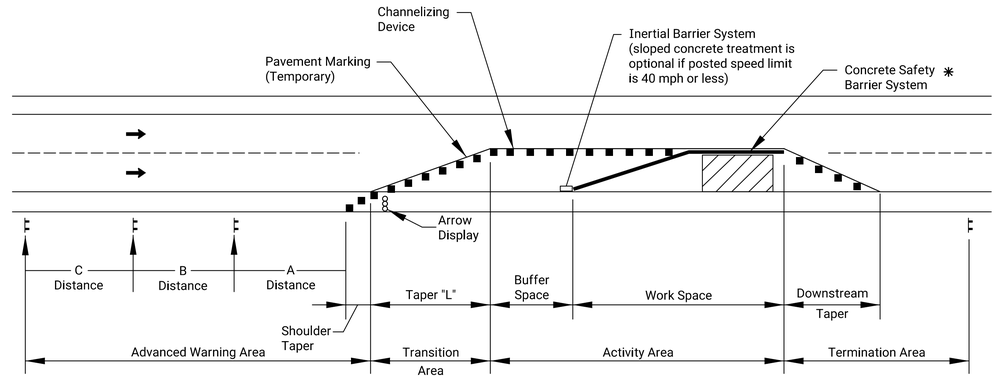
3) Consideration should be made to separate pedestrian and, if needed, bicycle movements from both work site activity and vehicular traffic. Unless a reasonable safe route that does not involve crossing the roadway can be provided, pedestrians should be appropriately directed with advance signing that encourages them to cross to the opposite side of the roadway. In urban and suburban areas with high vehicular traffic volumes, these signs should be placed at intersections (rather than midblock locations) so that pedestrians are not confronted with midblock work sites that will induce them to attempt skirting the work site or making a midblock crossing.

4) When existing pedestrian facilities are disrupted, closed, or relocated, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.

5) When the driving surface open to traffic is milled or is a temporary surface made of loose material, or when directed by the engineer a W8-15 (Grooved Pavement) or W8-7 (Loose Gravel) sign shall be used on mainline approaches. This sign should be placed a "C" distance after the W20-1 (Road Work Ahead) sign. A W8-15p motorcycle plaque shall be used to supplement the W8-15 or W8-7 signs. All signs shall be displayed as long as the condition is present.

6) Alternative temporary rumble strip options may be available. Please contact the Temporary Traffic Control Unit for more information at 785-296-1179 or 785-296-1183.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	183	291



TYPICAL WORK ZONE COMPONENTS

✳ When concrete barrier system is used, portable channelizing devices are not needed along the tangent barrier section.

Minimum advance warning sign spacing (in feet):

SPEED (MPH) ✳	*A*	*B*	*C*
URBAN (40 MPH OR LOWER)	*100*	*100*	*100*
URBAN (45 MPH OR HIGHER)	*350*	*350*	*350*
RURAL (55 MPH OR LOWER)	*500*	*500*	*500*
RURAL (60 MPH OR HIGHER)	*750*	*750*	*750*
EXPRESSWAY/FREEWAY	*1000*	*1500*	*2640*

✳ Posted speed prior to work starting

The minimum spacing between signs shall be no less than 100', unless directed by the engineer.

The spacing between any signs may be increased beyond the minimum values in the table above as approved by the engineer in order to maximize visibility.

Taper Formulas:

L = WS for speeds of 45 MPH or more

$L = WS^2/60$ for speeds of 40 MPH or less

Where: L = Minimum length of taper in feet
S = Numericial value of posted speed prior to work starting in MPH
W = Width in offset feet

Shifting Taper=1/2 L
Shoulder Taper=1/3 L

Channelizer Placement:

(1) The spacing between devices in transition area (taper) should not exceed a distance in feet equal to 1/2 the posted speed limit in mph prior to work starting.

(2) The spacing between devices in the advanced warning area and the activity area should not exceed a distance in feet equal to two times the posted speed limit in mph prior to work starting.

(3) Channelizing devices shall be placed for optimum visibility, normally at right angles to the traffic flow.

(4) Place directional indicator barricades in series to direct traffic onto the new path. The arrow sign should not be visible to opposing traffic.

(5) Alternating diagonal orange and white striping must slope downward in the direction traffic is expected to pass.

Buffer Space

SPEED (MPH) ✳	*20*	*25*	*30*	*35*	*40*	*45*	*50*	*55*	*60*	*65*	*70*	*75*
LENGTH (ft)	*115*	*155*	*200*	*250*	*305*	*360*	*425*	*495*	*570*	*645*	*730*	*820*

✳ Posted speed prior to work starting

Neither work activity nor storage of equipment, vehicles, or material should occur in the buffer space. When a protection vehicle is placed in advance of the work space, only the space upstream of the vehicle constitutes the buffer space.

If temporary concrete safety barrier system is used to separate approaching traffic from the work space, the barrier system shall be considered part of the activity area. A full lane width should be available throughout the length of the buffer space. See typical work zone components above.

NO.	DATE	REVISIONS	BY	APP'D
3				
2	03/13/18	W8-15p usage changed to Shall	R.W.B.	E.G.K.
1	08/18/15	Channelizer spacing info	R.W.B.	K.E.

KANSAS DEPARTMENT OF TRANSPORTATION

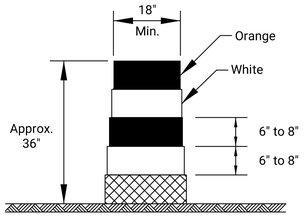
TRAFFIC CONTROL
GENERAL NOTES

TE700

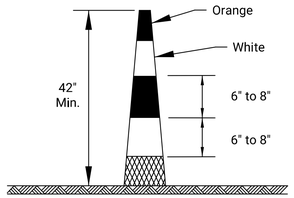
FHWA APPROVAL		03/13/18	APP'D	Eric Kocher	
DESIGNED	B.A.H.	DETAILED	R.W.B	QUANTITIES	TRACED
DESIGN CK.		DETAIL CK.		QUAN. CK.	TRACE CK.

Plotted : 16-JAN-2025 07:51
Drawn By : mrockwell
File : te700.dgn

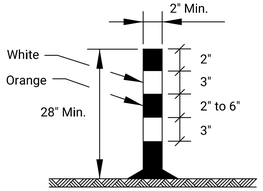
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	184	291



DRUM

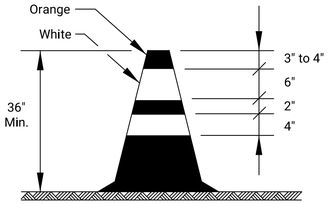


CONICAL DELINEATOR

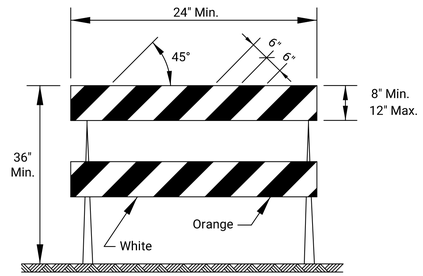


TUBULAR MARKER

Striping as shown for up to 42".

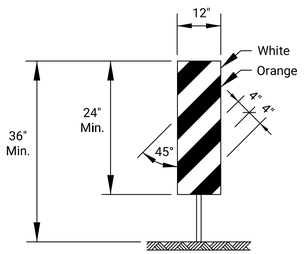


TRAFFIC CONE



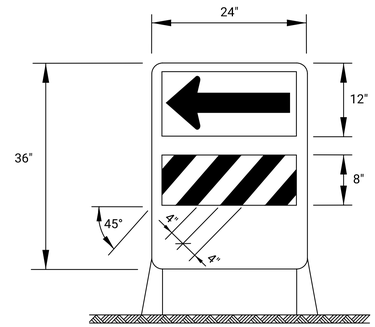
TYPE 2 BARRICADE

For rails less than 36" long, 4" wide stripes may be used. All stripes shall slope downward to the traffic side for channelization.



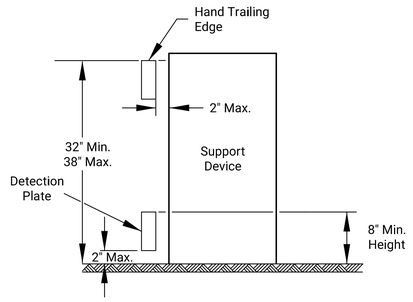
VERTICAL PANEL

The stripes shall slope downward to the traffic side for channelization.



DIRECTION INDICATOR BARRICADE

The stripes shall slope downward in the direction traffic is to pass. The direction indicator barricade shall be used in series to direct the motorist into the intended lane of travel.



PEDESTRIAN CHANNELIZER

1. Support device shall not project beyond the detection plate into the pathway.
2. Hand trailing edges and detection plates are optional for continuous walls.
3. Interconnect pedestrian channelizers to prevent displacement and to provide continuous guidance through or around work.
4. Alternate pathways shall be firm, stable, and slip resistant.
5. Treat height differentials > 1/2" in the surfaces of alternate paths with a firm, stable, and slip resistant temporary ramp having a slope of 12:1 or flatter and having a width equal to the alternate path.
6. Use alternating orange/white on interconnected devices.

Item	Location	Cross-overs	Shoofly Diversions	Tangents	Tapers	Ramps	Head to Head	Object Identifier	Lead-in Devices	Gores
Portable										
	Drums	Yes	Yes	Yes	Yes	Yes	(1)	Yes	Yes	Yes
	Conical Delineators	Yes	Yes	Yes	Yes	Yes	(1)	Yes	Yes	Yes
	Vertical Panels	(2)	(2)	(2)	(2)	(2)	(1,2)	Yes	(2)	(2)
	Direction Indicator Barricade	No	No	No	Yes	No	No	No	No	No
	Type 2 Barricade	(2)	(2)	(2)	(2)	No	No	Yes	No	No
	Traffic Cones	No	No	(4)	(4)	(4)	No	(4)	(4)	(4)
Fixed										
	Tubular Markers	(3)	(3)	(3)	No	(3)	Yes	No	Yes	Yes
	Vertical Panels	(3)	(3)	(3)	(3)	(3)	(3)	Yes	(2,3)	(2)

(1) Not allowed on centerline delineation along freeways or expressways.
(2) The stripes shall slope downward to the traffic side for channelization.
(3) May be used upon the approval of the engineer.
(4) Daytime operations only.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
CHANNELIZING DEVICES

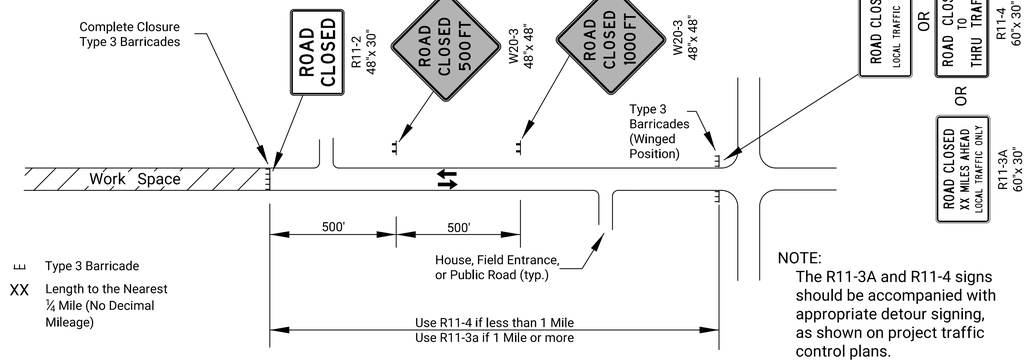
TE702

FHWA APPROVAL		06/01/15	APP'D	Kristina Ericksen	
DESIGNED	L.E.R.	DETAILED	R.W.B.	QUANTITIES	TRACED
DESIGN CK.		DETAIL CK.		QUAN. CK.	TRACE CK.

Plotted : 16-JAN-2025 07:51
Drawn By : mrockwell
File : te702.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	185	291

Note: Signs shown for one approach to work zone.



NOTE:
The R11-3A and R11-4 signs should be accompanied with appropriate detour signing, as shown on project traffic control plans.

FIGURE 1: TYPICAL SIGNING FOR ROAD CLOSURE (MAINLINE OR SIDE ROAD)

Note: Sign shown for one approach to intersection (work zone).

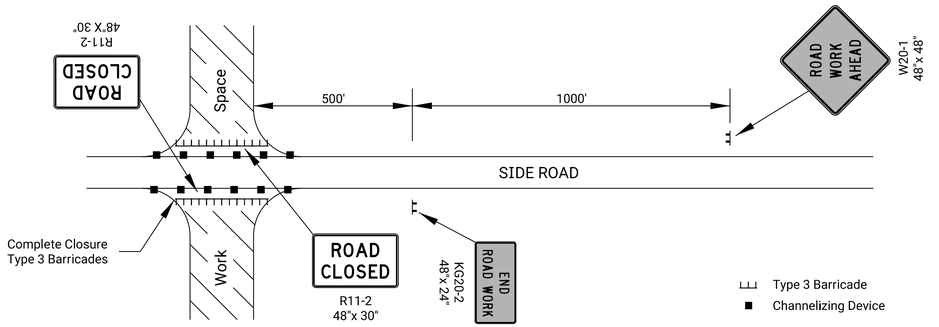


FIGURE 2: TYPICAL SIGNING FOR SIDE ROAD OPEN

Note: Signs shown for one approach to work zone.

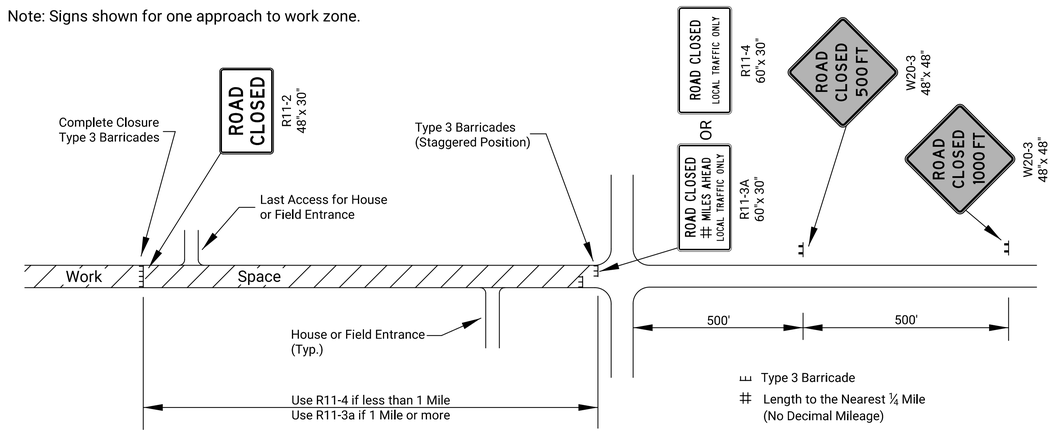


FIGURE 3: TYPICAL SIGNING FOR ROAD CLOSURE - LOCAL TRAFFIC ACCESS

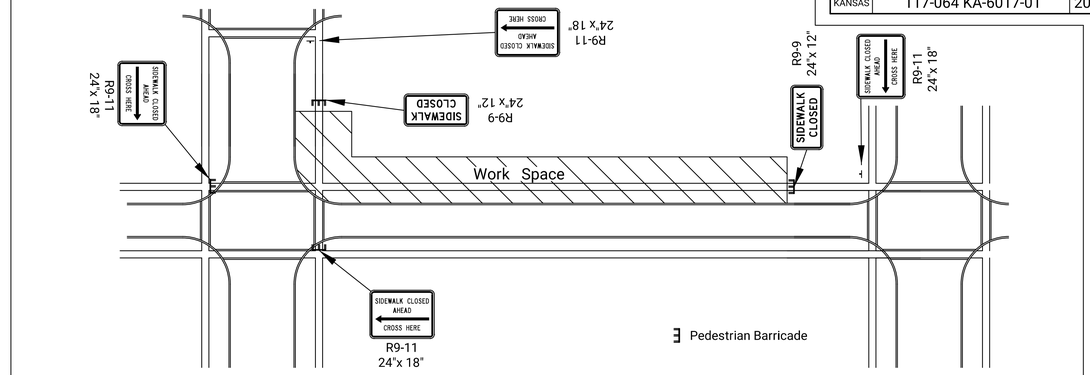
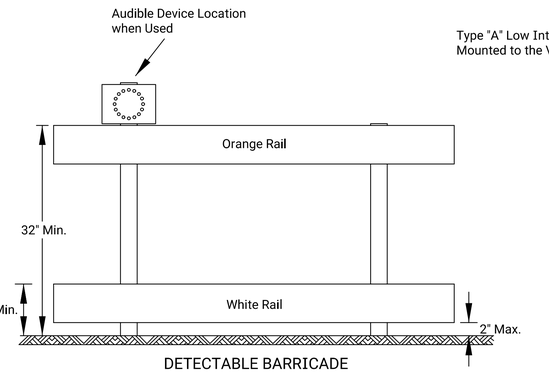
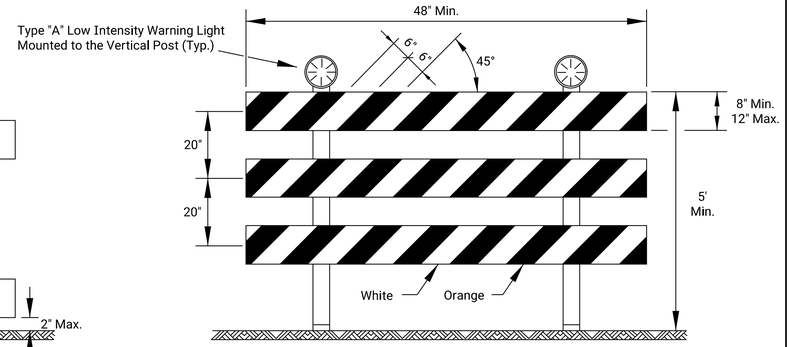


FIGURE 4: TYPICAL SIGNING FOR SIDEWALK CLOSED WITH OPPOSITE SIDEWALK AVAILABLE



DETECTABLE BARRICADE

1. Support device shall not project beyond the detection plate into the pathway.
2. Barricades shall be used to close the entire width of the pathway.
3. Do not use warning lights on pedestrian barricades.
4. Do not use warning lights on audible devices.



TYPE 3 BARRICADE WITH LIGHTS

Approved signs mounted on Type 3 barricades should not cover more than 50% of the top two rails or 33% of the total area of the three rails.

When barricades are placed end-to-end or staggered, a Type "A" low intensity warning light shall be mounted to the vertical post near each outside corner of the end barricades.

ROAD CLOSED GENERAL NOTES

As shown in Figure 1, at the point where thru traffic must detour and local traffic can proceed to the location where the roadway is completely closed, the R11-3a (ROAD CLOSED # MILES AHEAD LOCAL TRAFFIC ONLY) or R11-4 (ROAD CLOSED LOCAL TRAFFIC ONLY or ROAD CLOSED TO THRU TRAFFIC) sign shall be used with Type 3 barricades (winged position), placed on the shoulders of roadway.

As shown in Figure 3, when local traffic must be allowed access into the work zone, Type 3 barricades shall be longitudinally staggered to maintain the appearance of a closed roadway. A second line of end-to-end Type 3 barricades shall be placed just beyond the last access point in the work zone, to completely close the roadway.

The R11-4 (ROAD CLOSED TO THRU TRAFFIC or ROAD CLOSED LOCAL TRAFFIC ONLY) sign shall be used when the distance to the point of complete closure of the roadway is less than 1 mile.

The R11-3a (ROAD CLOSED # MILES AHEAD LOCAL TRAFFIC ONLY) sign shall be used when the distance to the point of complete closure of the roadway is 1 mile or greater.

The words "BRIDGE OUT" (or BRIDGE CLOSED) may be substituted for the words "ROAD CLOSED" on the R11-3a or R11-4 sign where applicable.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL CLOSURES

TE704

FHWA APPROVAL			06/01/15	APP'D	Kristina Ericksen		
DESIGNED	B.A.H.	DETAILED	R.W.B.	QUANTITIES		TRACED	
DESIGN CK.		DETAIL CK.		QUAN. CK.		TRACE CK.	

KDOT Graphics Certified 03-29-2018

Sh. No. 185

Plotted : 16-JAN-2025 07:51
Drawn By : mrockwell
File : te704.dgn

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	186	291

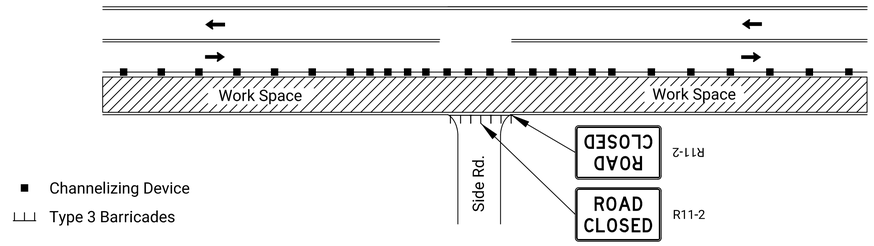


FIGURE 1: SIDE ROAD OR ENTRANCE CLOSED THROUGH WORK AREA

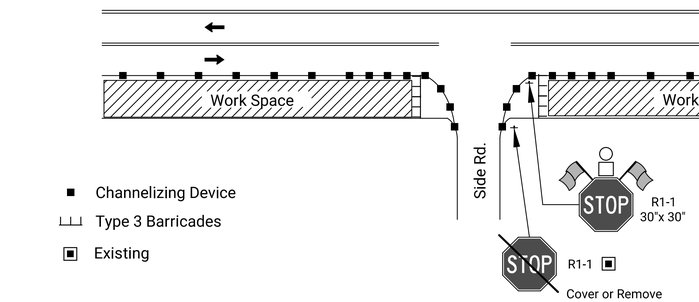


FIGURE 2: SIDE ROAD OR ENTRANCE OPEN THROUGH WORK AREA

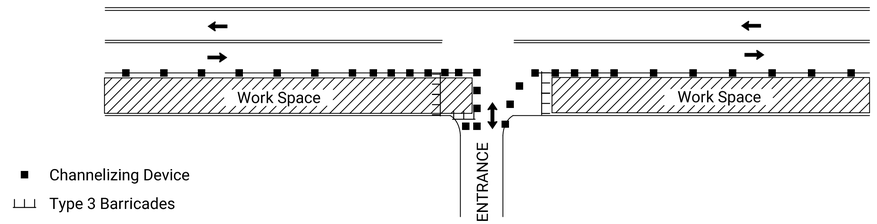


FIGURE 3: LOW VOLUME ENTRANCE CONTRUCTED HALF AT A TIME

Note: Consider large vehicles making right turns into and out of entrance
and use figure 4 as needed

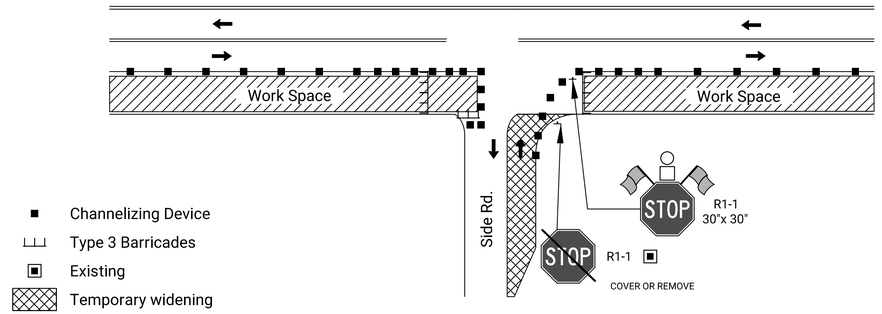


FIGURE 4: SIDE ROAD OR ENTRANCE CONSTRUCTED HALF AT A TIME:
TWO WAY TRAFFIC REQUIRED

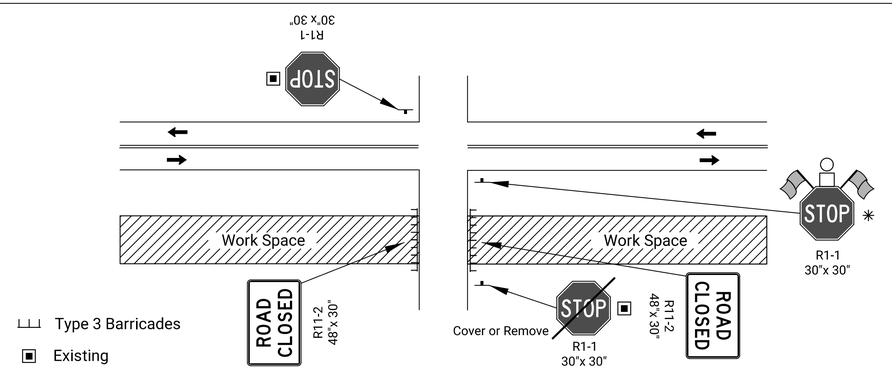


FIGURE 5: SIDE ROAD OPEN THROUGH WORK AREA ON DIVIDED ROADWAY

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
ACCESS THROUGH THE WORK AREA

TE705

FHWA APPROVAL		06/01/15	APP'D Kristina Ericksen	
DESIGNED R.W.B.	DETAILED	R.W.B.	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN. CK.	TRACE CK.

KDOT Graphics Certified 03-29-2018

Sh. No. 186

Plotted : 16-JAN-2025 07:51
Drawn By : mrockwell
File : te705.dgn

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	187	291

SIGN LAYOUT INFORMATION

KG20-2

Std. Size Expwy/Freeway
6" C
48"x 24"

KG20-5

Std. Size Expwy/Freeway
6" C
48"x 24"

KM4-20

Std. Size: 3" C, 24"x 6"
Expwy/Freeway: 6" C, 48"x 12"

W7-3a

Mileage to be Determined by the Engineer.

W8-17

Std. Size Expwy/Freeway
48"x 48"

W8-15

Std. Size Expwy/Freeway
8" D
48"x 48"

W8-7

Std. Size Expwy/Freeway
8" D
48"x 48"

W8-15p

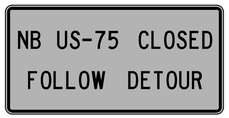
Std. Size Expwy/Freeway
30"x 24"

W8-11

Std. Size Expwy/Freeway
8" D
48"x 48"

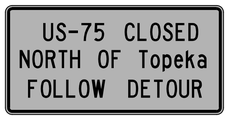
W8-17P
(Optional)

Std. Size Expwy/Freeway
30"x 24"



SP-01
(Special Sign)

Std. Size: 6" C
Expwy/Freeway: 10" D

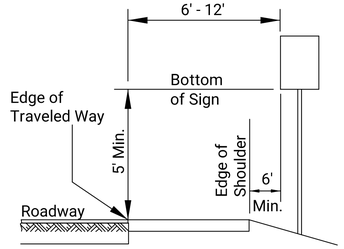


SP-02
(Special Sign)

Std. Size
Uppercase: 6" C
Lowercase: 4.5" C

Expwy/Freeway
Uppercase: 10" D
Lowercase: 8" D

All city names and street names on special signs and destination signs must have upper and lower case letters.

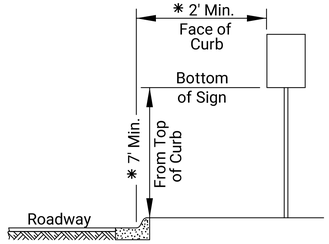


RURAL

1) Ground-mounted signs shall be mounted at a minimum height of 5' measured from the bottom of sign to the near edge of the pavement.

2) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.

3) The height of the secondary sign mounted below another sign may be 4' measured from the bottom of the sign to the near edge of the pavement. Signs shall not overlap each other.



URBAN

1) Signs shall be mounted at a minimum height of 7' measured from the bottom of sign to the near edge of the pavement.

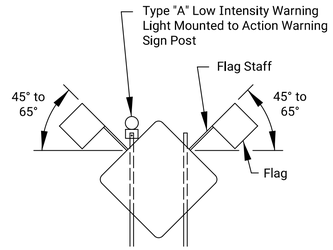
2) Neither portable nor permanent sign supports should be located on sidewalks or areas designated for pedestrian or bicycle traffic.

3) Signs mounted lower than 7' should not project more than 4" into pedestrian facilities.

4) The height from of the secondary sign mounted below another sign may be 6' measured from the bottom of sign to the near edge of the pavement. Signs shall not overlap each other.

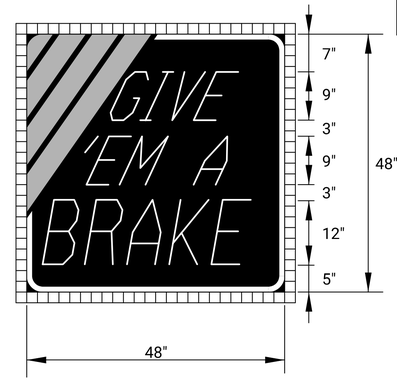
5) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.

✱ 6) Pedestrian detour signing shall be a minimum of 2' measured from the top of the pedestrian pathway to the bottom of the sign and shall not protrude into the walkway nor shall it project beyond the back of curb.



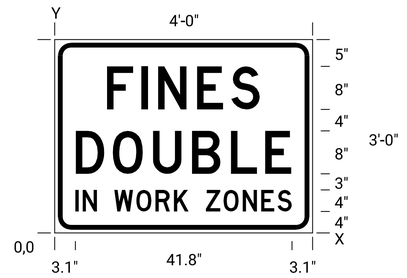
When the sign width is equal to or greater than 9', three or more wood posts may be used with a minimum of 4' between the centerline of each post. All signs less than 9' in width shall use a maximum of two wood posts.

In the case of hitting rock when driving posts
1. Shift the sign location. Do not violate minimum sign spacing.
2. With the engineer's approval, use acceptable alternative sign stands.



KI-104a

Sign Number	GIVE EM A BRAKE
Width x Height	4'-0" x 4'-0"
Border Width	1.0"
Corner Radius	4.0"
Stripe Width	3.0"
Mounting	Ground
Background	Type: Non-Reflective
	Color: Black
Legend/Border	Type: Reflective
	Color: White
Legend Font	Dutch 801 Roman SWC 25 Degree Slant
Stripes	Type: Reflective
	Color: Orange



KI-105a

Sign Number	FINES DOUBLE
Width x Height	4'-0" x 3'-0"
Border Width	0.9"
Corner Radius	3.0"
Mounting	Ground
Background	Type: Reflective
	Color: White
Legend/Border	Type: Non-Reflective
	Color: Black

Dimensions in inches — Spacings are to start of next letter

Y FONT	LETTER SPACINGS															HT LEN
23.0 D	X	F	I	N	E	S	X									8.0
	9.7	6.4	3.2	7.3	6.4	5.4	9.7									28.6
11.0 D	X	D	O	U	B	L	E	X								8.0
	3.9	6.9	7.5	7.3	7.3	6.4	4.9	3.9								40.3
4.0 D	X	I	N	X	W	O	R	K	X	Z	O	N	E	S	X	4.0
	3.1	1.6	2.7	3.2	4.3	3.8	3.6	2.8	3.2	3.4	3.8	3.6	3.2	2.7	3.1	41.8

Notes:

Typically, there are two sets of informational signs installed per project: one for each direction of traffic.

Install signs a minimum of 500' in advance of the road work ahead sign. The engineer may designate a more appropriate location if conditions dictate.

The informational signs are not to interfere with the traffic control signs for the project.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
SIGN INFORMATION

TE710

FHWA APPROVAL		06/01/15	APP'D	Kristina Pyle	
DESIGNED	R.W.B.	DETAILED	R.W.B.	QUANTITIES	TRACED
DESIGN CK.		DETAIL CK.		QUAN. CK.	TRACE CK.

KDOT Graphics Certified 03-29-2018

Sh. No. 187

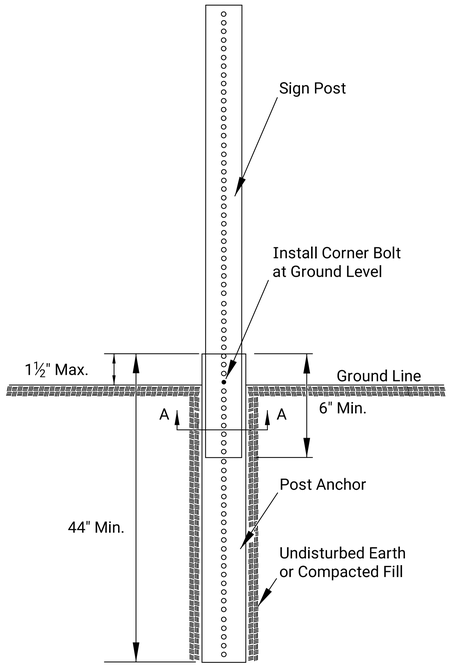
KDOT Graphics Certified

Plotted : 16-JAN-2025 07:51

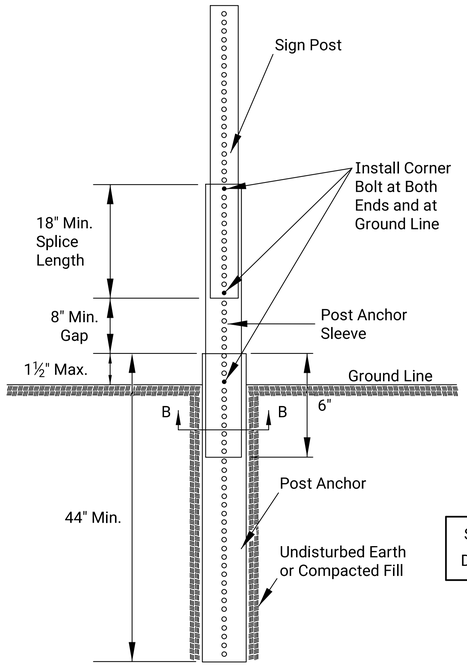
Drawn By : mrockwell
File : te710.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	188	291

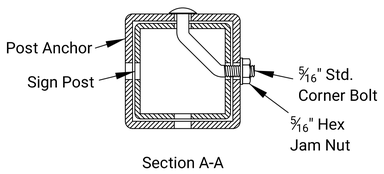
PERFORATED SQUARE STEEL TUBE (P.S.S.T.) POST SETUP



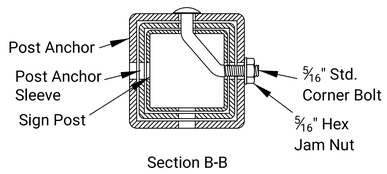
P.S.S.T. Detail



Telescoping P.S.S.T. Detail



Section A-A

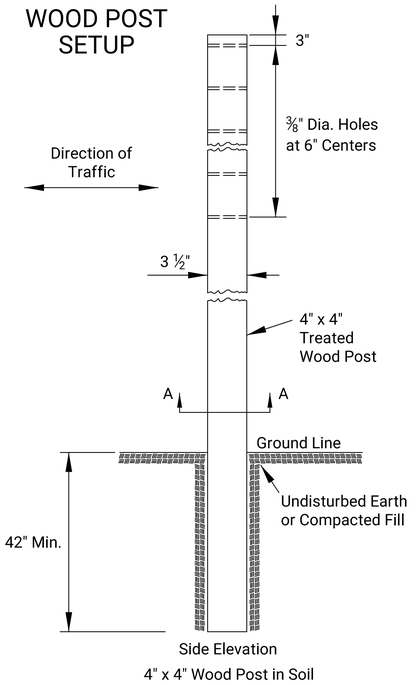


Section B-B

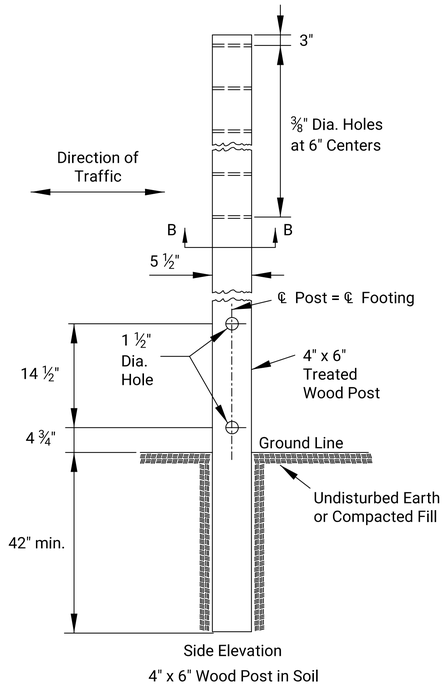
Details for 2", 2 ¼", or 2 ½" sign posts

Place bolts in the same corner along each sign post.

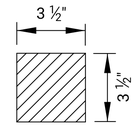
WOOD POST SETUP



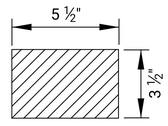
Side Elevation
4" x 4" Wood Post in Soil



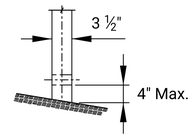
Side Elevation
4" x 6" Wood Post in Soil



Section A-A



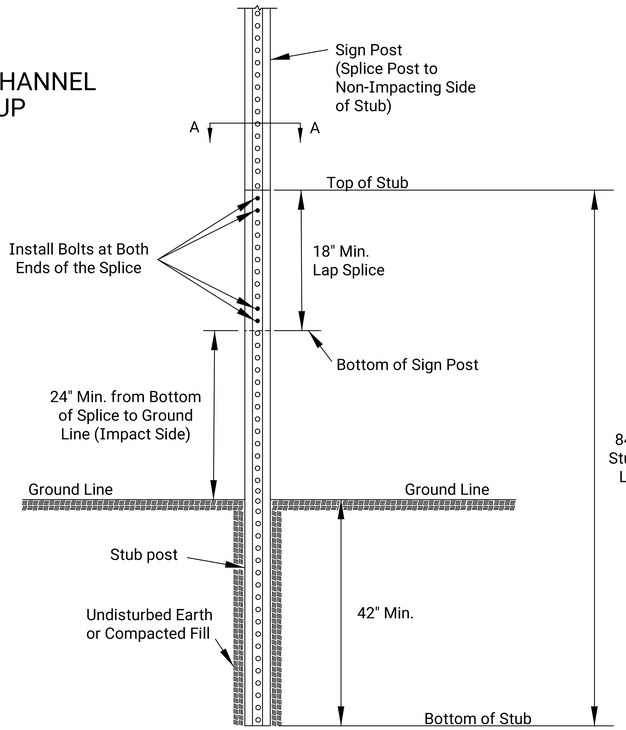
Section B-B



Front Elevation

See TE710 for Additional Details and Requirements

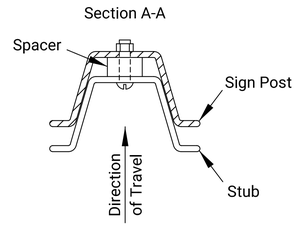
3 LB/F U-CHANNEL SETUP



Notes:

Place two bolts at both ends of the splice through the holes nearest the ends of the splice.

Use manufacturer recommended spacers over the bolts between the spliced pieces of U-Channel.



NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIGN POSTS

TE712

FHWA APPROVAL			06/01/15	APP'D	Kristina Pyle		
DESIGNED	B.A.H.	DETAILED	R.W.B.	QUANTITIES		TRACED	
DESIGN CK.		DETAIL CK.		QUAN. CK.		TRACE CK.	

KDOT Graphics Certified 03-29-2018

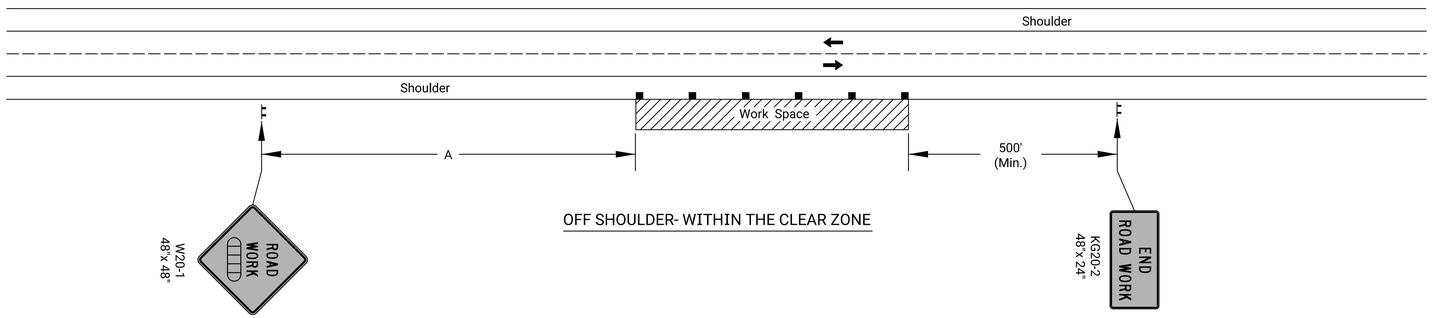
KDOT Graphics Certified

Sh. No. 188

Plotted : 16-JAN-2025 07:51

Drawn By : mrockwell
File : te712.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	189	291

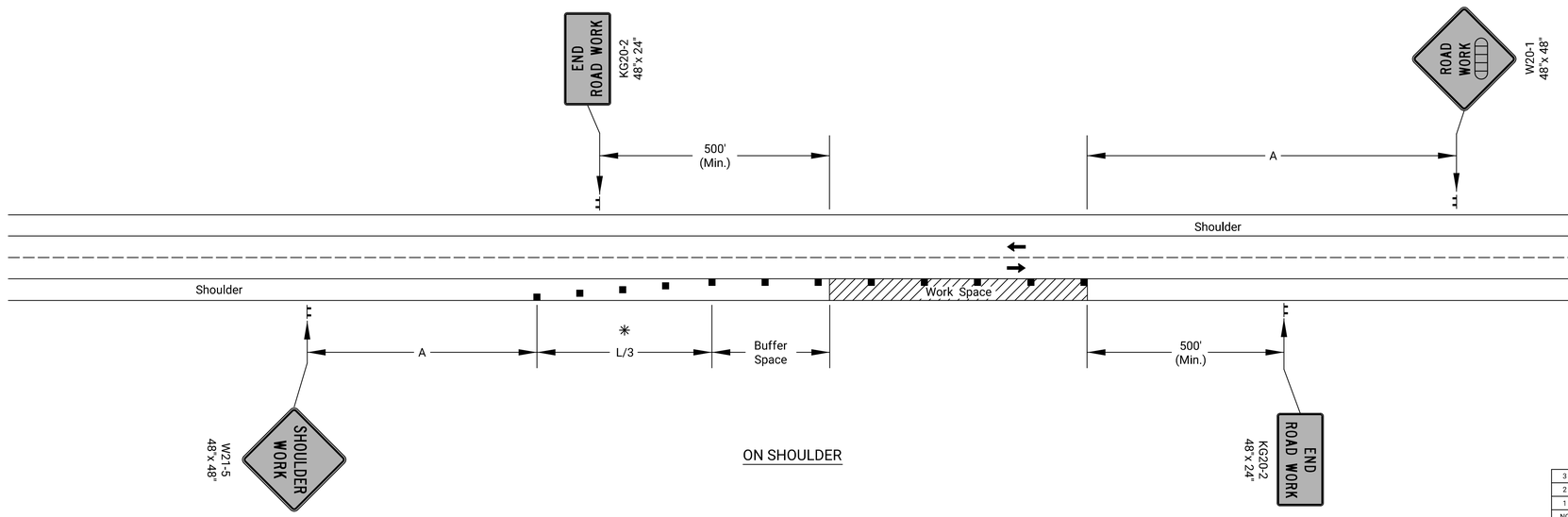


OFF SHOULDER- WITHIN THE CLEAR ZONE

Notes:

No traffic control is required if the Work Space is located outside of the clear zone.

For operations of 60 minutes or less, all signs and channelizing devices may be eliminated if a vehicle with high-intensity rotating, flashing, oscillating, or strobe lights is used.



ON SHOULDER

✳ Omit taper if paved shoulder is less than 8' wide.

■ Channelizing Device

Ahead, 1500 ft, or 1 Mile

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
SHOULDER WORK
UNDIVIDED ROADWAY

TE720

FHWA APPROVAL		06/01/15	APP'D	Kristina Ericksen	
DESIGNED	L.E.R.	DETAILED	R.W.B.	QUANTITIES	TRACED
DESIGN CK.		DETAIL CK.		QUAN. CK.	TRACE CK.

CADconform Certify This File

Sh. No. 189

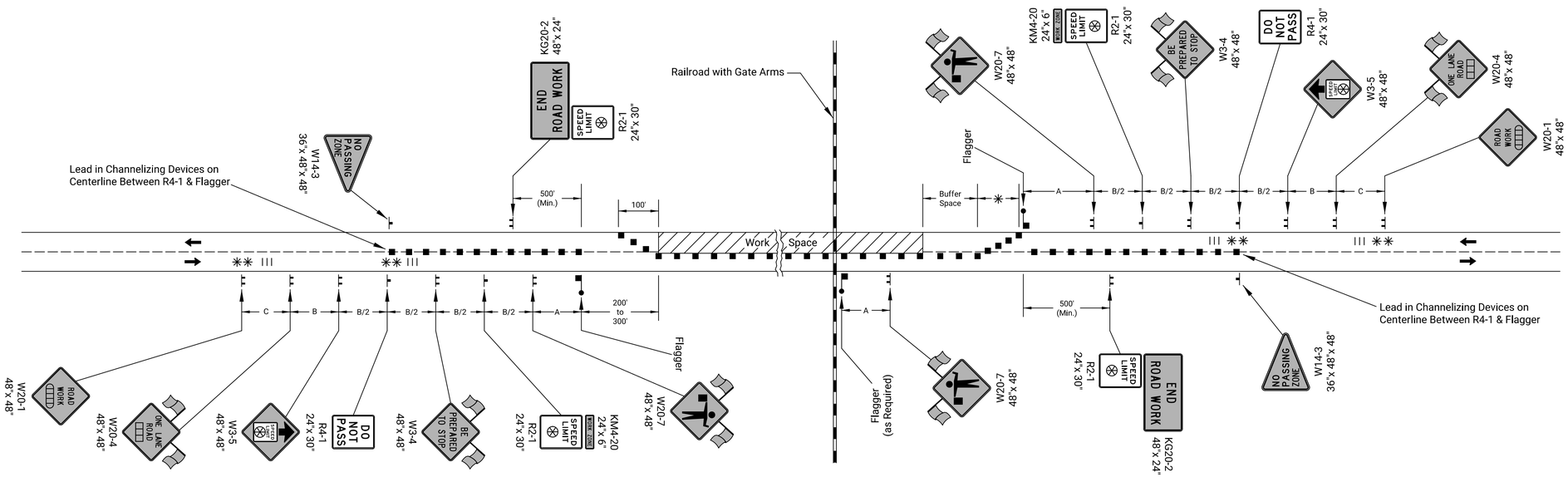
Plotted : 16-JAN-2025 07:51

Drawn By : mrockwell
File : te720.dgn

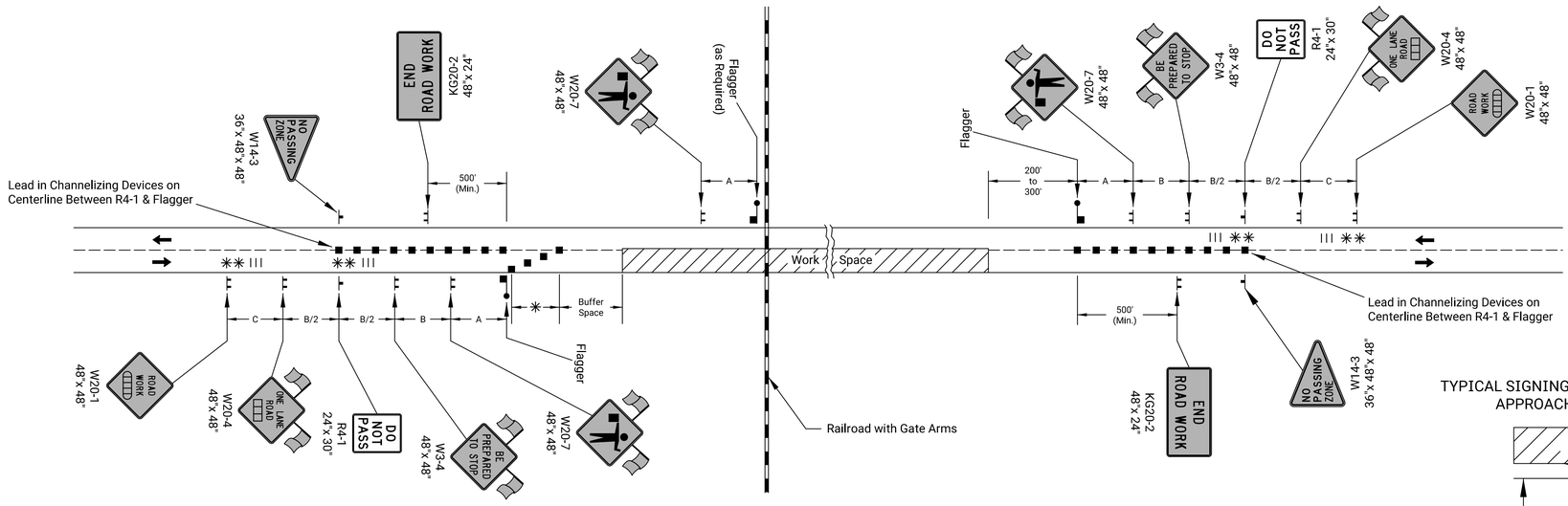
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	190	291

FLAGGER



FLAGGER AND PILOT CAR



- ■ Channelizing Device
- Ahead, 1500 ft, or 1 Mile
- Ahead, 1000 ft, 1500 ft, or ½ Mile
- ⊗ Speed to be Determined by the Engineer
- ○ Type "A" Low Intensity Warning Light
- III Temporary Portable Rumble Strips

USE TE731 FOR FLAGGER OR PILOT CAR ON ROADWAYS WITH CONCRETE SHOULDERS GREATER THAN 8 FT.

Notes:

Trucks hauling material to the project should STOP at the Flagger. After stopping, upon approval of the Engineer, trucks may be allowed to move around the Flagger.

Place a Flagger at all highway and major collector intersections and at-grade railroad intersections with lights and gates in the work space to control traffic crossing the tracks to the left of the gate arm. The need for a Flagger at minor side road intersections shall be determined by the Engineer. Place a W20-7 (Flagger symbol) sign on each side road that is controlled by a Flagger.

Existing signs shall not be covered or removed between Flagger stations.

Temporary rumble strips may be used in lieu of lead in channelizing devices when the roadway is less than or equal to 30' including paved shoulders. When extenuating circumstances exist, the Area Engineer may elect to eliminate both the lead in channelizers and the rumble strips.

✳ Minimum six (6) channelizers spaced at 20' intervals.

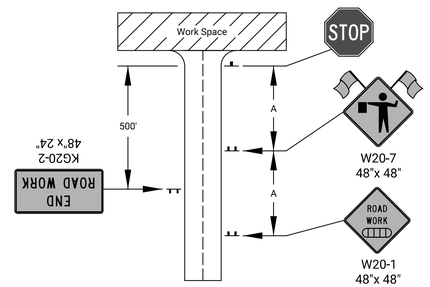
✳✳ Optional rumble strips may be placed: One set between the W20-1 and W20-4, and one set between the R4-1 and W3-4, on each approach.

△ Not required on substantial maintenance projects (1R).

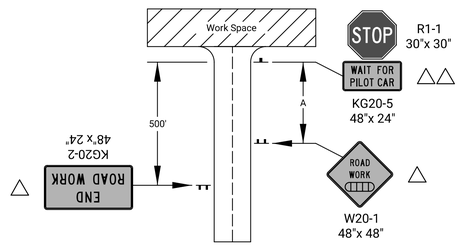
△△ The KG20-5 (WAIT FOR PILOT CAR) sign shall be mounted on an approved portable support and not attached to the existing stop sign post.

The KG20-5 sign shall be placed immediately in front of the existing stop sign, a minimum of 6" below the bottom of the stop sign. The sign should be removed or covered when there is no pilot car.

TYPICAL SIGNING FOR HIGHWAY OR MAJOR COLLECTOR APPROACH TO WORK SPACE



TYPICAL SIGNING FOR A MINOR SIDE ROAD APPROACH TO WORK SPACE



NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
FLAGGER OR PILOT CAR

TE730

FHWA APPROVAL		06/01/15	APP'D Kristina Ericksen	
DESIGNED B.A.H.	DETAILED R.W.B.	QUANTITIES		TRACED
DESIGN CK.	DETAIL CK.	QUAN. CK.		TRACE CK.

KDOT Graphics Certified 03-29-2018

Sh. No. 190

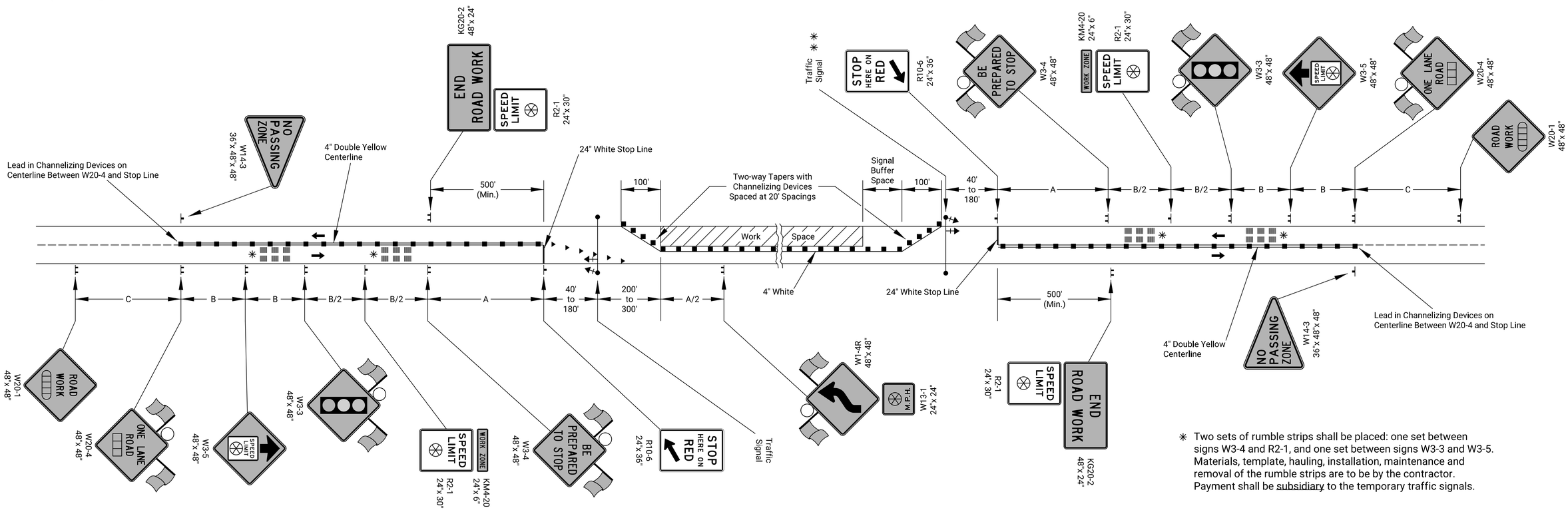
KDOT Graphics Certified

Plotted : 16-JAN-2025 07:51

Drawn By : mrockwell
File : te730.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	191	291

NOTE: Refer to TE733 and TE734 for additional temporary traffic signal details.



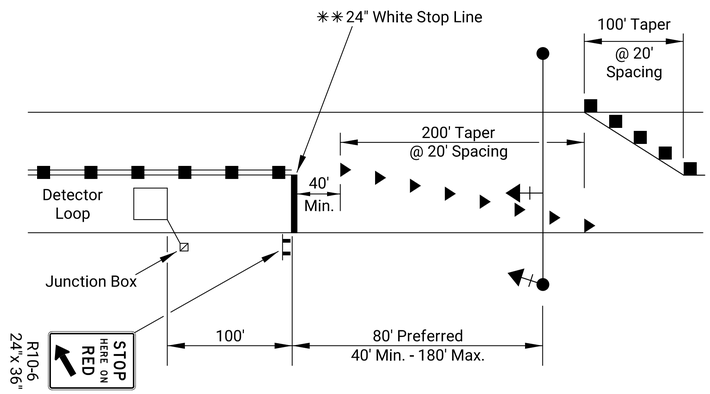
✳ Two sets of rumble strips shall be placed: one set between signs W3-4 and R2-1, and one set between signs W3-3 and W3-5. Materials, template, hauling, installation, maintenance and removal of the rumble strips are to be by the contractor. Payment shall be subsidiary to the temporary traffic signals.

SIGNAL BUFFER SPACE

SPEED (MPH) ⚠	20	25	30	35	40	45	50	55	60	65	70
LENGTH (FT)	35	50	65	85	100	115	130	150	165	165	165

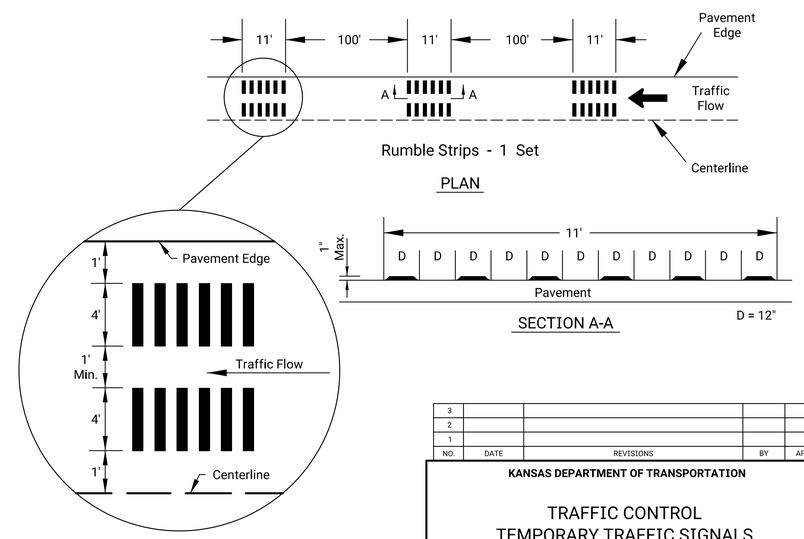
Neither work activity nor storage of equipment, vehicles, or material should occur in the buffer space. When a protection vehicle is placed in advance of the work space, only the space upstream of the vehicle constitutes the buffer space.

⚠ Posted speed prior to work starting



✳✳ Stop Line Created Using (6) 4" Strips of Temporary Tape

TYPICAL ASPHALT RUMBLE STRIP DETAILS



- ▸ Uni-Directional Yellow Temporary Raised Pavement Marker (Type 1) (Facing Right)
- ■ Channelizing Device
- Ahead, 1500 ft, or 1 Mile
- Ahead, 1000 ft, 1500 ft, or ½ Mile
- Speed to be determined by the Engineer
- Signal Head with Back Plate
- Temporary Signal Pole or Trailer
- ○ Type "A" Low Intensity Warning Light

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
TEMPORARY TRAFFIC SIGNALS

TE732

FHWA APPROVAL		06/01/15	APP'D Kristina Ericksen	
DESIGNED	B.A.H.	DETAILED R.W.B.	QUANTITIES	TRACED
DESIGN CK.		DETAIL CK.	QUAN. CK.	TRACE CK.

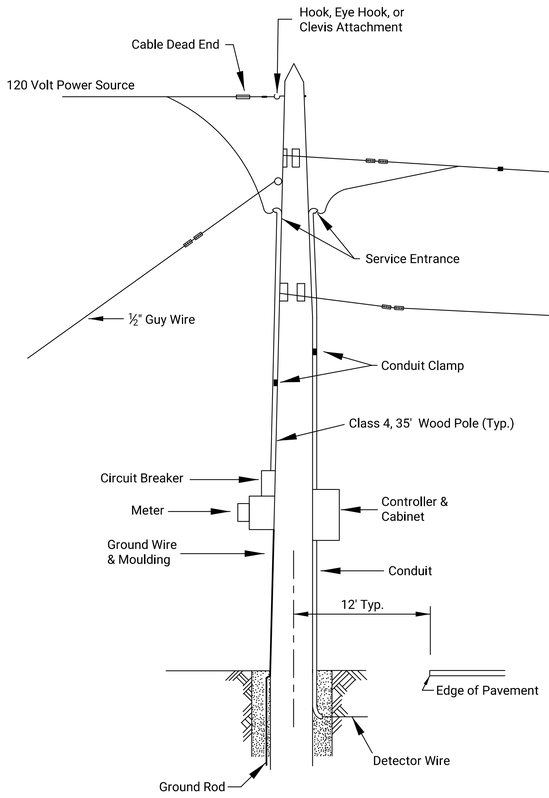
KDOT Graphics Certified 08-05-2021

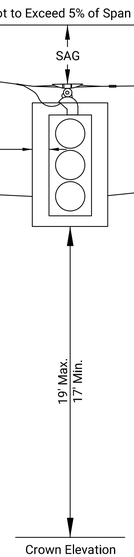
Sh. No. 191

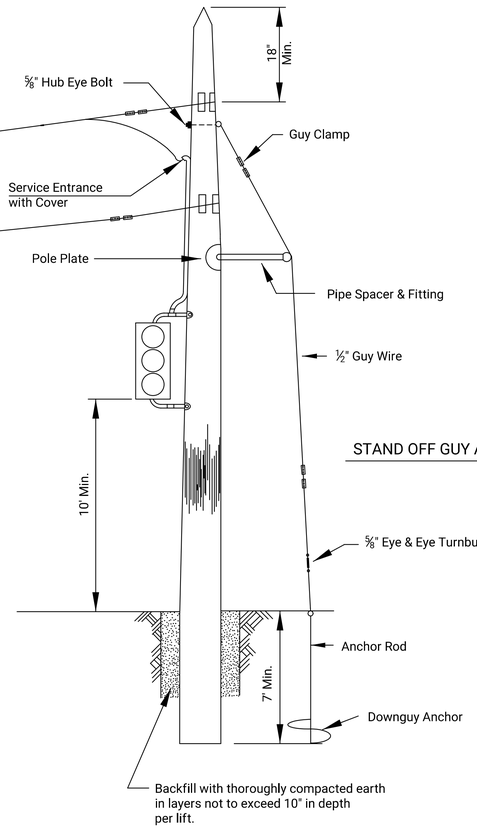
KDOT Graphics Certified

Plotted : 16-JAN-2025 07:51
Drawn By : mrockwell
File : te732.dgn

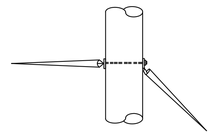
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	192	291



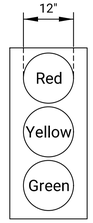




STAND OFF GUY ALTERNATE



Alternate method of mounting for spanwire & downguy traffic signal support pole.



SIGNAL INDICATIONS

GENERAL NOTES

The engineer in charge of construction will need to approve all locations for traffic signals to be installed. Final positions & aiming of signal faces to be determined in the field.

Trailer mounted portable traffic signals may be substituted for span wire signals.

The traffic signal system shall conform to and be operated according to the requirements of the M.U.T.C.D.

Contact local utility companies to advise them of installation and coordinate power hook-up if needed.

All wiring installed shall conform to the national electrical code and local ordinances & requirements.

The power supply and the operation & maintenance of the signal system shall be the responsibility of the contractor.

Note:
See TE734 for additional information.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
TEMPORARY TRAFFIC SIGNAL DETAILS

TE733

FHWA APPROVAL			06/01/15	APP'D	Kristina Ericksen
DESIGNED	L.E.R.	DETAILED	R.W.B.	QUANTITIES	TRACED
DESIGN CK.		DETAIL CK.		QUAN. CK.	TRACE CK.

KDOT Graphics Certified 03-29-2018

Plotted : 16-JAN-2025 07:51
Drawn By : mrockwell
File : te733.dgn

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	193	291

The control equipment shall be designed in such a manner that the normal dwell condition shall be an all red" signal display. Upon receipt of a detector actuation from one approach, the signals facing that approach shall cycle to a green indication for a minimum period (minimum green). Subsequent detector actuations from the same direction shall result in additional green time being allocated to that movement (unit extension). In the event that an actuation exists for the direction of travel not having the right of way, a maximum green time setting shall provide a preset time limit for the direction having the right of way.

The control equipment shall provide for different clearance sequences, one for each required phase.

If the green indication has been displayed to one approach to the zone, no vehicle actuation exists on the opposite approach and another actuation occurs during the yellow display to the approach just serviced, the display shall proceed to an all red display for a period of time (red revert) to prevent the display of green - yellow - green indications to the motorist.

If the right of way is to be transferred to another approach, an all red indication shall be provided so that opposing traffic does not meet within the one way zone.

Response to a vehicle actuation from another approach shall be immediate if all timings have expired. In the event that all time settings have not expired at the point at which a vehicle actuation occurs, the system shall continue to provide the appropriate clearance interval timings before acting upon an actuation input.

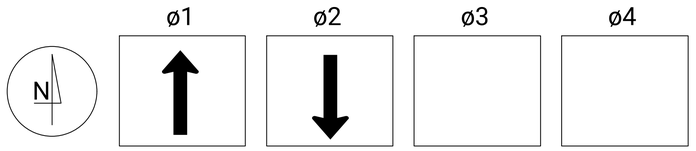
Vehicle actuations received from the detector at approaches other than that which last received a green indication shall have preference over additional actuations received from the end which last had the right of way in the event that any clearance interval timings have not expired when the actuation(s) occurs. If all timings have expired, response shall be on a first come, first served basis.

All time settings shall be user adjustable and shall be accomplished from the equipment front panel by way of a keyboard and menu screen format. All applicable portions of the
KDOT standard specifications for vehicle actuation shall apply except that a standard NEMA conflict monitor shall be acceptable.

Signals shall be capable of actuation. On asphalt roadways, detection loops may be sawed into the road. Commercially made loop mats may also be used. Do not cut loops into concrete pavement. Other types of detection may be used if approved prior to installation by the Engineer. Do not use microwave detection systems in urban areas. Detector shall be set to operate in the locking mode.

If used, detection loops shall be 6' by 6' and have three turns of wire (see detail). Center loops in the lane of traffic and locate 100' behind the stop line. Cut slots in pavement for loops $\frac{5}{16}$" wide with 1"
minimum depth. Fill slots with asphalt or an approved elastic epoxy sealant (concrete pavement) to within $\frac{1}{8}$" of pavement surface. Other than a "western union" type splice or approved connector at their junction, feeder cable and loop wire shall be of continuous run with no splices. The loop and the feeder cable connection shall be twisted 2 turns per foot.

SIGNAL PHASING AND TIMING

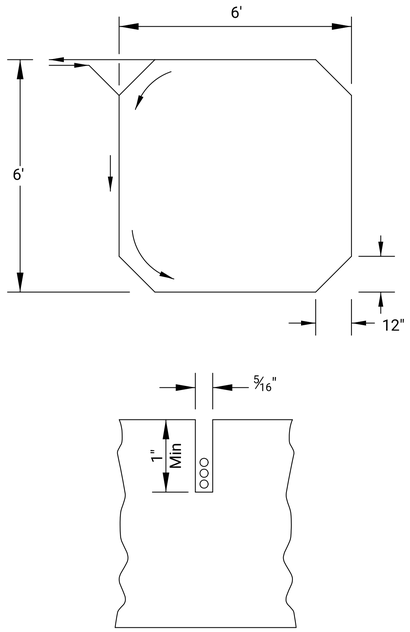


Phase	Minimum Green	Maximum Green	Yellow	All Red
1	10	60	4	50
2	10	60	4	50

Phase		Stationing
1	Stopline	290+34
1	Signal	290+74
2	Signal	308+52
2	Stopline	309+92

All times in seconds.
Normal dwell shall be "all red".
Unit extension shall be 3.0 seconds.
Red revert shall be 5.0 seconds.

LOOP DETECTOR DETAIL



Note: See TE733 for additional information.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
TEMPORARY TRAFFIC SIGNAL DETAILS
BRIDGE STA. 330+45

TE734

FHWA APPROVAL			06/01/15	APP'D	Kristina Ericksen		
DESIGNED	L.E.R.	DETAILED	R.W.B.	QUANTITIES		TRACED	
DESIGN CK.		DETAIL CK.		QUAN. CK.		TRACE CK.	

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Sh. No. 193

Plotted : 16-JAN-2025 07:51
Drawn By : mrockwell
File : te734-02.dgn

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	194	291

The control equipment shall be designed in such a manner that the normal dwell condition shall be an all red" signal display. Upon receipt of a detector actuation from one approach, the signals facing that approach shall cycle to a green indication for a minimum period (minimum green). Subsequent detector actuations from the same direction shall result in additional green time being allocated to that movement (unit extension). In the event that an actuation exists for the direction of travel not having the right of way, a maximum green time setting shall provide a preset time limit for the direction having the right of way.

The control equipment shall provide for different clearance sequences, one for each required phase.

If the green indication has been displayed to one approach to the zone, no vehicle actuation exists on the opposite approach and another actuation occurs during the yellow display to the approach just serviced, the display shall proceed to an all red display for a period of time (red revert) to prevent the display of green - yellow - green indications to the motorist.

If the right of way is to be transferred to another approach, an all red indication shall be provided so that opposing traffic does not meet within the one way zone.

Response to a vehicle actuation from another approach shall be immediate if all timings have expired. In the event that all time settings have not expired at the point at which a vehicle actuation occurs, the system shall continue to provide the appropriate clearance interval timings before acting upon an actuation input.

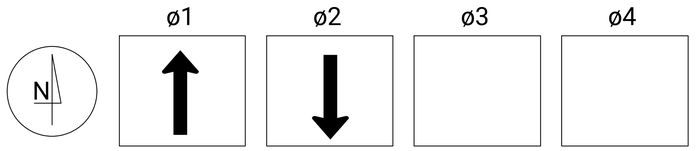
Vehicle actuations received from the detector at approaches other than that which last received a green indication shall have preference over additional actuations received from the end which last had the right of way in the event that any clearance interval timings have not expired when the actuation(s) occurs. If all timings have expired, response shall be on a first come, first served basis.

All time settings shall be user adjustable and shall be accomplished from the equipment front panel by way of a keyboard and menu screen format. All applicable portions of the
KDOT standard specifications for vehicle actuation shall apply except that a standard NEMA conflict monitor shall be acceptable.

Signals shall be capable of actuation. On asphalt roadways, detection loops may be sawed into the road. Commercially made loop mats may also be used. Do not cut loops into concrete pavement. Other types of detection may be used if approved prior to installation by the Engineer. Do not use microwave detection systems in urban areas. Detector shall be set to operate in the locking mode.

If used, detection loops shall be 6' by 6' and have three turns of wire (see detail). Center loops in the lane of traffic and locate 100' behind the stop line. Cut slots in pavement for loops $\frac{5}{16}$" wide with 1"
minimum depth. Fill slots with asphalt or an approved elastic epoxy sealant (concrete pavement) to within $\frac{1}{8}$" of pavement surface. Other than a "western union" type splice or approved connector at their junction, feeder cable and loop wire shall be of continuous run with no splices. The loop and the feeder cable connection shall be twisted 2 turns per foot.

SIGNAL PHASING AND TIMING

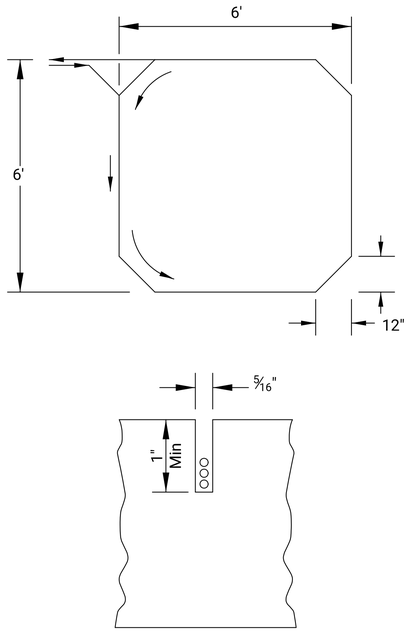


Phase	Minimum Green	Maximum Green	Yellow	All Red
1	10	60	4	45
2	10	60	4	45

Phase		Stationing
1	Stopline	318+10
1	Signal	319+50
2	Signal	4 MILE RD 350'
2	Stopline	4 MILE RD 430'

All times in seconds.
Normal dwell shall be "all red".
Unit extension shall be 3.0 seconds.
Red revert shall be 5.0 seconds.

LOOP DETECTOR DETAIL



Note: See TE733 for additional information.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
TEMPORARY TRAFFIC SIGNAL DETAILS
4 MILE ROAD

TE734

FHWA APPROVAL			06/01/15	APP'D	Kristina Ericksen		
DESIGNED	L.E.R.	DETAILED	R.W.B.	QUANTITIES		TRACED	
DESIGN CK.		DETAIL CK.		QUAN. CK.		TRACE CK.	

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Sh. No. 194

Plotted : 16-JAN-2025 07:51
Drawn By : mrockwell
File : te734.dgn

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	195	291

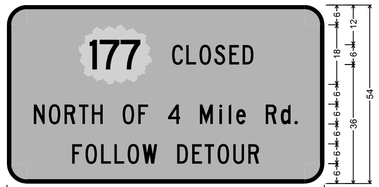
SUMMARY OF TRAFFIC CONTROL DEVICES (EACH)

Work Zone Sign (Special)		
Sign No.	16.25 Sq.Ft. & Less	16.26 Sq.Ft. & Over
SP-1		1
SP-2		2
SP-3	1	

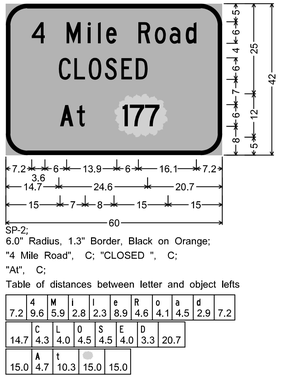
SUMMARY OF TRAFFIC CONTROL DEVICES (EACH PER DAY)

✳ Quantity most used on the project at any one time

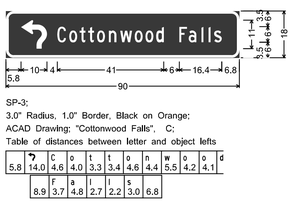
Work Zone Signs ✳			
Sign No.	Size - Sq.Ft.		
	0-9.25	9.26-16.25	16.26 & Over
W20-7		2	
KG20-2	2		
KM4-20	2		
R2-1	4		
R10-6	2		
R11-2		4	
R11-3a		4	
W1-1		2	
W1-4		4	
W3-3		2	
W3-4		2	
W3-5		2	
W13-1	1		
W14-3	2		
W20-1		2	
W20-4		2	
M4-8	87		
M3-1	40		
M3-3	38		
M1-5	80		
M6-1L	9		
M6-3	23		
M6-1R	6		
M5-1L	8		
M5-1R	8		
M5-3L	2		
M6-2R	4		
M4-8a	2		
W20-2		2	
D1-1		12	
W1-6R	1		
W1-6L	2		
M2-1	6		
M6-2L	3		
M5-2R	1		
M5-2L	2		
M4-10R	1		



SP-1;
6.0" Radius, 1.3" Border, Black on Orange;
"CLOSED", C; "NORTH OF 4 Mile Rd.", C;
"FOLLOW DETOUR", C;
Table of distances between letter and object lefts



SP-2;
6.0" Radius, 1.3" Border, Black on Orange;
"4 Mile Road", C; "CLOSED ", C;
"At", C;
Table of distances between letter and object lefts



SP-3:
3.0" Radius, 1.0" Border, Black on Orange;
ACAD Drawing; "Cottonwood Falls", C;
Table of distances between letter and object lefts

Barricades ✳		Channelizing Devices ✳		
Type 3 (4' to 12')	Pedestrian	Fixed	Portable	Pedestrian
28			81	

Lighted Devices ✳	
Work Zone Warning Light (Type "A" Low Intensity)	35
Work Zone Warning Light (Red Type "B" High Intensity)	
Arrow Display	
Portable Changeable Message Sign	

Recapitulation of Quantities		
Item	Quantity	Unit
Work Zone Signs (0 to 9.25 Sq.Ft.)	97,440	Each Per Day
Work Zone Signs (9.26 to 16.25 Sq.Ft.)	11,600	Each Per Day
Work Zone Signs (16.26 Sq.Ft. & Over)		Each Per Day
Work Zone Barricades (Type 3 - 4' to 12')	8,120	Each Per Day
Work Zone Barricades (Pedestrian)		Each Per Day
Channelizer (Fixed)		Each Per Day
Channelizer (Portable)	23,490	Each Per Day
Channelizer (Pedestrian)		Each Per Day
Work Zone Warning Light (Type "A" Low Intensity)	10,150	Each Per Day
Work Zone Warning Light (Red Type "B" High Intensity)		Each Per Day
Arrow Display		Each Per Day
Portable Changeable Message Sign		Each Per Day
Pavement Marking (Temporary)		
4" Solid (Type I)	475.4	Sta./Line
4" Solid (Type II)	155.9	Sta./Line
4" Broken (8.0') (Type I)	16.9	Sta./Line
4" Broken (8.0') (Type II)		Sta./Line
4" Broken (3.0') (Type I)		Sta./Line
4" Broken (3.0') (Type II)		Sta./Line
4" Dotted Extension (Type I)	0.6	Sta./Line
4" Dotted Extension (Type II)		Sta./Line
Solid (Line Masking Tape)		Sta./Line
Broken (Line Masking Tape)		Sta./Line
Symbol (Type I)		Each
Symbol (Type II)		Each
Flexible Raised Pavement Marker (4" Broken (8.0'))		Sta./Line
Flexible Raised Pavement Marker (4" Broken (3.0'))		Sta./Line
Pavement Marking Removal	22,083	Lin. Ft.
Work Zone Sign (Special) (16.25 Sq. Ft. & Less)	1	Each
Work Zone Sign (Special) (16.26 Sq. Ft. & More)	3	Each
Rigid Raised Pavement Marker (Type I)	44	Each
Rigid Raised Pavement Marker (Type II)		Each
Traffic Signal Installation (Temporary)	Lump Sum	Lump Sum
Traffic Control (Initial Set Up)	Lump Sum	Lump Sum
Traffic Control		Lump Sum
Flagger (Set Price)	1	Hour

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
SUMMARY OF DEVICES
RECAPITULATION OF QUANTITIES

~~TE795~~

FHWA APPROVAL			06/01/15	APP'D	Kristina Ericksen	
DESIGNED	B.A.H.	DETAILED	R.W.B.	QUANTITIES		TRACED
DESIGN CK.		DETAIL CK.		QUAN. CK.		TRACE CK.

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Sh. No. 195

Plotted : 16-JAN-2025 07:51
Drawn By : mrockwell
File : te795.dgn

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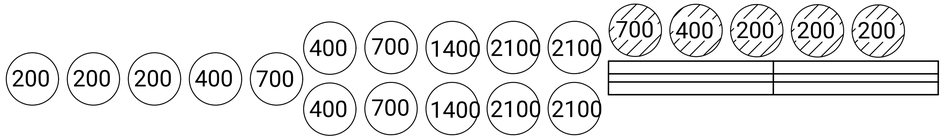
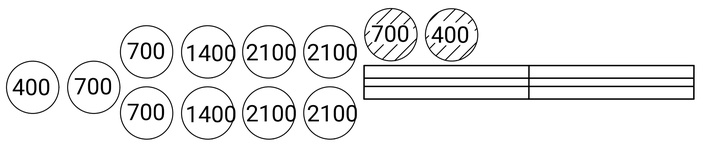
STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	196	291

HIGH SPEED TL-3
(V > 45 MPH)



LOW SPEED TL-2
(V ≤ 45 MPH)



INERTIAL BARRIER SYSTEM			
Station	Side	Design Speed	Comments
296+90	LT.	60 MPH	Phase 2A
296+90	RT.	60 MPH	Phase 2B
305+00	LT.	60 MPH	Phase 2A
305+00	RT.	60 MPH	Phase 2B

GENERAL NOTE

This drawing details general configurations for Inertial Barrier Systems. Some project specific conditions may require variations which are designed to meet prevailing criteria.

Use Inertial Barrier System consisting of the units as shown for the specified design speed, all hardware and attachments.

Install Inertial Barrier System on a flat, stable base with cross-slope no steeper than 10: 1. See Manufacturer's recommendations for module materials and method of installation.

See standard specifications for mixture to fill modules requirements.

Provide a 6" spacing between modules and one foot between the end of concrete barrier or other rigid object.

When installed as part of project traffic control, the bid item "Inertial Barrier" includes the original installation and required relocations.

Keep available replacement modules to replace any size module used on site, Engineer's direction.

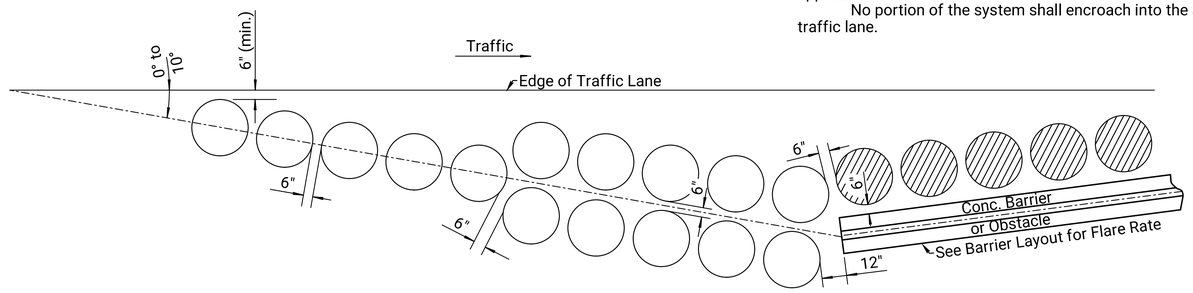
Inertial Barrier System modules damaged by the Contractor during relocation of Inertial Barrier System are replaced at the Contractor's expense.

Module weights shown are in pounds.

Install 270 square inches of Type II High Performance (vertical, rectangular or diamond shape) reflective sheeting on first module of Inertial Barrier System facing traffic.

Where sufficient space is available the Inertial Barrier System may be aligned at an angle, not to exceed 10°, in the direction of approach traffic.

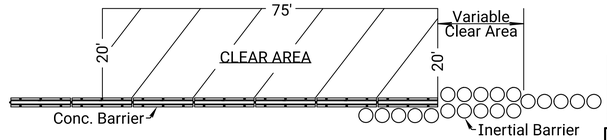
No portion of the system shall encroach into the approach traffic lane.



TYPICAL PLAN of INERTIAL BARRIER

When two-way traffic is adjacent to only one side of Concrete Barrier or Obstacle, these additional modules will be placed on the Traffic Side of Concrete Barrier or Obstacle. Traffic adjacent to both sides of the Concrete Barrier or Obstacle requires an additional set of modules each side if approach traffic is exposed to the back portion of the Inertial Barrier. These additional modules are not required along the sides of Concrete Barrier or Obstacle when it's location is outside the Clear Zone or one-way directional traffic.

PLAN
Replacement Module



PLAN - CLEAR AREA

NO.	DATE	REVISIONS	BY	APP'D
8	1-27-15	Rev. Layouts (TL-2/TL-3)	K.E.K.	J.O.B.
7	5-17-13	Added Detail, Clear Area	S.W.K.	J.O.B.
6	2-3-12	Revised General Note	S.W.K.	J.O.B.
5	6-27-11	Revised notes & Typical Plan detail	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

INERTIAL BARRIER
(TL2 or TL3)

RD620

FHWA APPROVAL	9-16-15	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

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Drawn By : mrockwell
File : rd620.dgn
Plotted :16-JAN-2025 07:51
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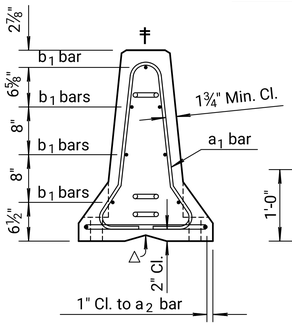
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	197	291

Note to Designer: Report the quantity for temporary concrete safety barrier in linear feet.
The quantity is calculated by multiplying the number of barrier units by 12'-6".

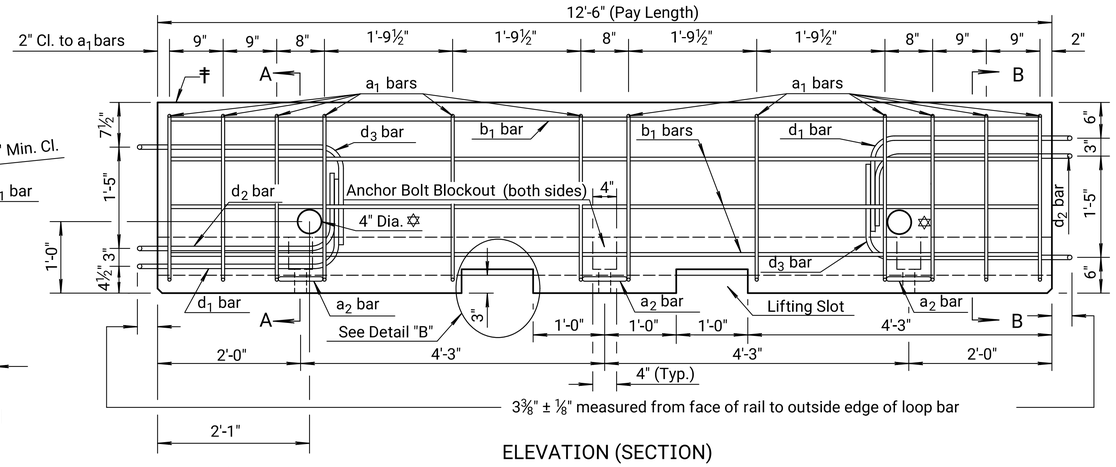
SUMMARY OF QUANTITIES

			⊙ CONCRETE SAFETY BARRIER (TYPE F3)					
LOCATION (ROUTE)	STATION (OR STATION RANGE)	SIDE	FLARE RATE (WHERE APPLICABLE)	TEMPORARY	TEMPORARY-RELOCATE	TEMPORARY-INSTALL ONLY	UNIT	COMMENTS
K-177								
	STA. 296+90-305+00	Lt.	14:1	800			FT	PHASE 2A
	STA. 296+90-305+00	Rt.	14:1		800		FT	PHASE 2B

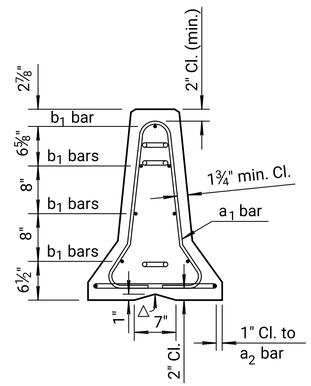
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	198	291



SECTION A-A
TYPICAL SECTION
(Stirrup Placement)

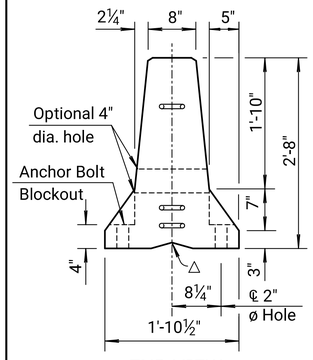


ELEVATION (SECTION)

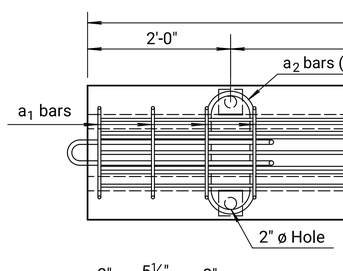


SECTION B-B
TYPICAL SECTION
(Stirrup Placement)

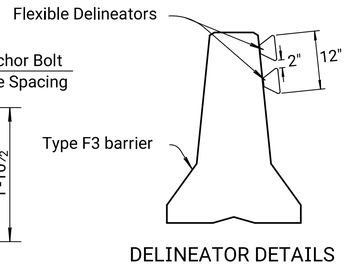
✝ Marked End
✡ 4" diameter - 11 gauge steel round mechanical tubing sleeve. These holes are optional.
△ V Notch is optional



END VIEW



PLAN (SECTION)



DELINEATOR DETAILS

GENERAL NOTES:

MATERIAL: Use ASTM A615, Grade 60 reinforcing bars, except for the loop bars (d_1, d_2 and d_3). The loop bars (d_1, d_2 and d_3) shall be ¾" smooth steel bars with a minimum yield of 60 ksi, a tensile strength of not less than 1.25 times the yield strength but a minimum of 80 ksi, a minimum 14% elongation in 8 inches, and passing a 180 degree bend test using a 3.5 D pin bend diameter. The loops shall be installed within ⅛" of the plan dimensions.

Use air-entrained concrete with f'c = 5,000 p.s.i.

SECTION: The section furnished must generally comply with dimensions shown. Requests for minor variations in section geometry and attachments may be submitted to the Engineer for approval.

LIFTING SLOTS: Lifting slots shall be constructed where specified on the plans to facilitate the drainage of water after installation on the roadway.

TEMPORARY CONCRETE SAFETY BARRIER: Furnishing and placing of all materials when required and all labor and equipment required to position the temporary barrier shall be included in the Contract unit price bid for "Concrete Safety Barrier (Type F3)(Temporary)". Any relocation of the barrier required for the project shall be paid in accordance with the Special Provisions under the bid item "Concrete Safety Barrier (Type F3) (Temporary-Relocate)". Unless otherwise noted on the Plans, the Temporary Concrete Safety Barrier shall become the property of the Contractor and shall be removed from the site upon acceptance of the completed project.

Approximate weight of one unit equals 2.7 tons.

PLACEMENT: Barrier shall be placed on a paved surface. All loose dirt and sand shall be removed from the roadway surface just prior to placement of the barrier.

After the barrier is placed and the connection pin is inserted, tension or pull the barrier such that the installation is taut and the connection pin cannot freely move vertically. If the connection pin or loop bar assembly are damaged during the tensioning process, it is the responsibility of the Contractor to repair the damaged area or replace the temporary barrier section.

MARKING: The left end (✝) of each barrier shall be permanently marked by stamping or forming into the barrier the following information:

- Type F3
- Manufacturer code (as specified by KDOT Bureau of Const. & Maint.)
- Date manufactured (month and year)

DELINEATION: Delineators shall be spaced on 50' centers, except through curves where they shall be spaced on 25' centers. See Standard Drawing RD610 for additional details.

The delineation shall be mounted on the side of the Temporary Concrete Safety Barrier with two delineators at each location. Each delineator shall have a minimum height-to-width ratio of 1.75, and a minimum reflective surface area of 7 sq. in.. The delineators shall be affixed to the Temporary Concrete Safety Barrier as recommended by the manufacturer.

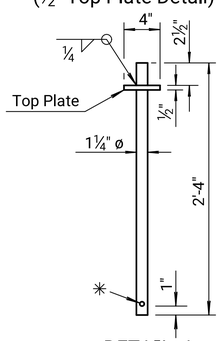
Delineators shall be attached to bridge rail or other structures in construction zones when roadway is narrowed and traffic is adjacent to the structure. The method and location of placement shall be similar to permanent barrier delineation.

When traffic flow is in one direction, the delineators shall be yellow when used on the left, white when used on the right. When traffic flow is in both directions delineators shall be placed back-to-back, and shall correspond to the color of the edge line.

The work and materials required for the installation of delineators as mentioned shall be subsidiary to the bid item "Concrete Safety Barrier (Type F3) (Temporary).

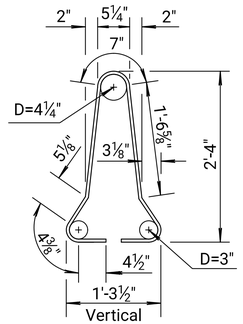
If necessary, include Standard Drawing RD622A for Taper Section, Standard drawing RD622B for anchor and tie down details, Standard Drawing RD622C for Bridges with thermal expansion of 1½" or greater and Standard Drawing RD622D for Barrier Layouts.

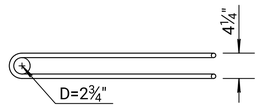
The Contractor shall be responsible for maintaining a clear area, shown as dimension "A" on Standard Drawing RD622B. The clear area is located behind the Temporary Concrete Safety Barrier and shall be kept free of any equipment, material stockpiles or other obstacles. For non-anchored roadway applications, dimension "A" shall be a minimum of 2'-0".



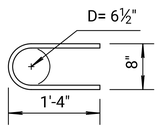
(½" Top Plate Detail)

DETAIL A
CONNECTION PIN
(A36 Steel) 10.9 lbs. each
✳ ⅝" ø hole for retainer bolt. The retainer bolt & nut are installed at Contractor's option.
Note: Retainer bolt & nut required with Tie Down Strap.

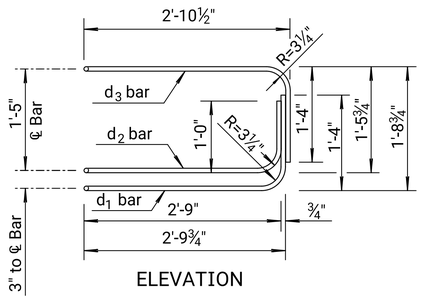




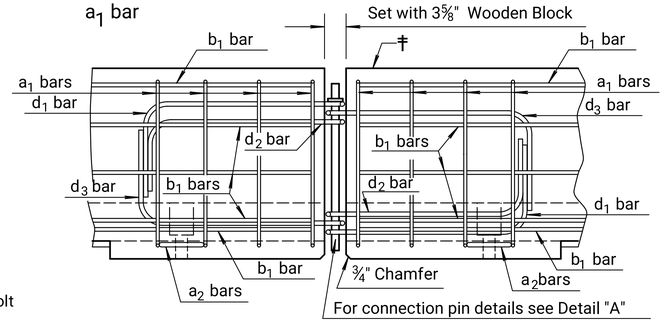
PLAN
LOOP BAR ASSEMBLY
(Marked end shown, invert for other end)
(Material as stated in General Notes)



a2 bar



ELEVATION

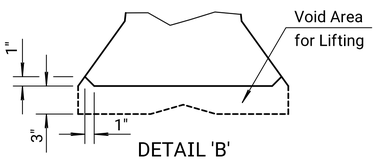


DETAILS OF BARRIER CONNECTION

Per 12'-6" Barrier Section

REINFORCING A615 Gr. 60					
Bar	Bar Size	Shape	No. of Bars	Length Ft.	Weight Lbs.
a_1	#4		12	6'-0"	48.1
a_2	#6		6	2'-11"	26.3
b_1	#5		7	12'-2"	88.8
LOOP ASSEMBLY					
d_1	#6		2	8'-5"	25.3
d_2	#6		2	7'-7"	22.8
d_3	#6		2	8'-6"	25.5

Concrete Quantity = 1.3 C.Y.
(Dimensions are out to out of bars unless otherwise noted.)



DETAIL 'B'
LIFTING SLOT DETAIL
(1" Chamfer to prevent spalling)

NOTE: At no time shall the barriers be lifted, moved, etc. by use of the loop bars: d_1, d_2 or d_3.

NO.	DATE	REVISIONS	BY	APP'D
07	09-11-17	Revised Markers	A.L.R.	S.W.K.
06	07-17-17	Revised General Note	A.L.R.	S.W.K.
05	08-27-15	Added Note, Pay Length	K.E.K.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY CONCRETE SAFETY BARRIER TYPE F3

RD622

FHWA APPROVAL	03-05-18	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

CADconform Certify This File

Sh. No. 198

Plotted : 16-JAN-2025 07:52
Drawn By : mrockwell
File : rd622.dgn

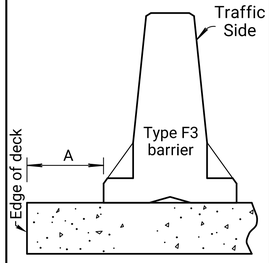
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	199	291

GENERAL NOTES:
INSTALLATION: Holes into the pavement to anchor the concrete safety barrier may be drilled after positioning barrier. When anchoring with 3 bolts on traffic side, install barrier with through anchor bolt where possible, use grouted anchor bolts where through bolt can't be used. Do not drill into or otherwise damage support beams, girders, or expansion joints. All work & materials required for the installation of the anchors are subsidiary to the bid item "Concrete Safety Barrier".
UTILITIES & STRUCTURES (Stakes): Verify buried utilities & structures within stake depth. If conflicts between stake & buried elements exist, up to 2 stakes maximum in a single barrier may be omitted if adjacent barriers have 3 stakes each.

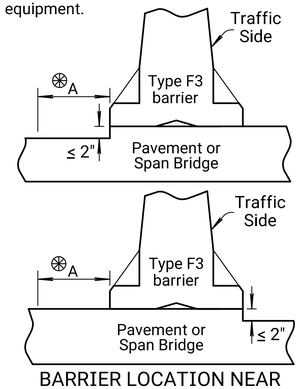
ANCHORAGE: Use galvanized grouted anchor bolts, through anchor bolts, nuts & washers that meet standard specifications. Install 3 anchor bolts or asphalt pins per barrier on the traffic side except on transition barrier as shown.
BARRIER REMOVAL: Completely remove all anchor systems. Remove grouted or drop-in anchor system by drilling the anchor with a core barrel 2x the diameter of the insert. Core to a depth equal to the installed depth & remove the core, prepare the hole by removing dust & debris. Fill hole with material that meets KDOT Pre-qualified "Non-shrink grouts for grouting anchor bolts & reinforcing into previously poured concrete". Follow the manufacturer's procedures for mixing, hole preparation & curing. To fill through bolt anchor or screw-in anchor system, remove & completely fill the hole using instructions for drop-in anchors except no coring is required.
For removed or relocated barrier on flexible pavement, fill stake holes completely with hot or cold asphalt patch material. Work & materials required to remove & patch anchor holes are subsidiary to the bid item "Concrete Safety Barrier".
TEMPORARY BARRIERS: Temporary Barriers shown in the details of this drawing are not allowed for permanent installations.
See KDOT Standard Drawing "Temporary Concrete Safety Barrier Type F3 Transition Layouts" for transition details between anchored & free-standing barriers. See KDOT Standard Drawing "Temporary Concrete Safety Barrier Type F3" for details & quantities not shown on this sheet.
SIGNING: For sign spacing, traffic control device details & reference notes, see Index of Sheets.

NO ANCHORAGE REQUIRED unless shown on plans

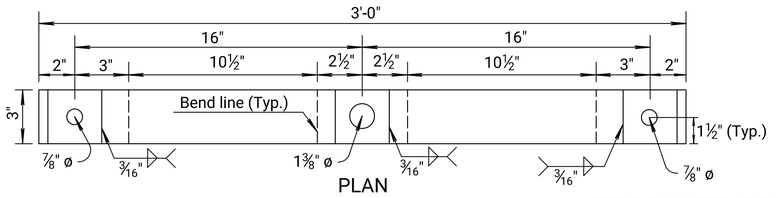
"A" DISTANCE	A ≥ 4'	A ≥ 2'
LOCATION	Span Bridge	⊛ Box Culverts Roadways - Flexible or Rigid Pvmnt.



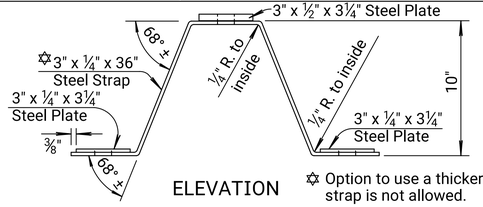
⊛Applies on span bridges when the action creates a height differential of ≤ 2". Measured from the toe of the barrier, the "A" distance should be free of obstacles and equipment.



BARRIER LOCATION NEAR HEIGHT DIFFERENTIAL



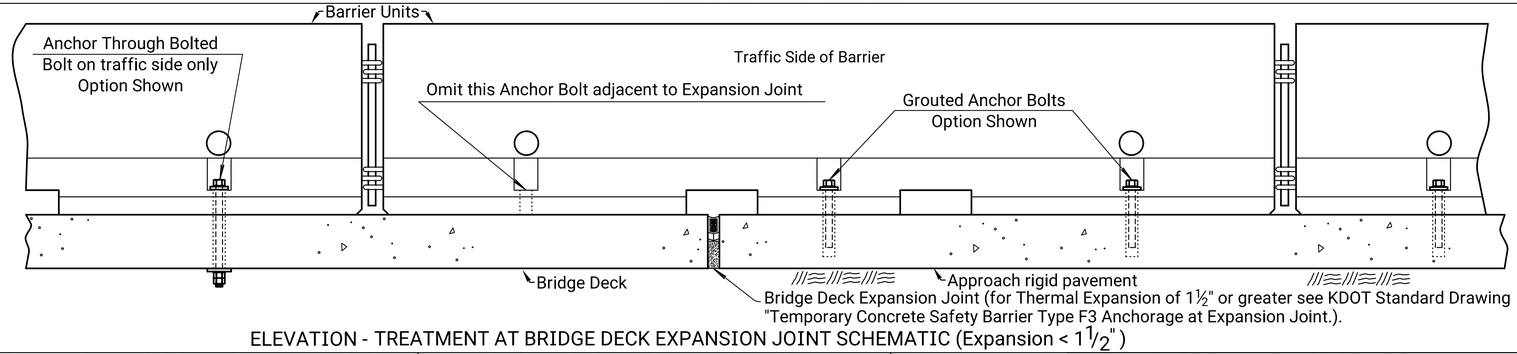
PLAN



ELEVATION

✡ Option to use a thicker steel strap is not allowed.

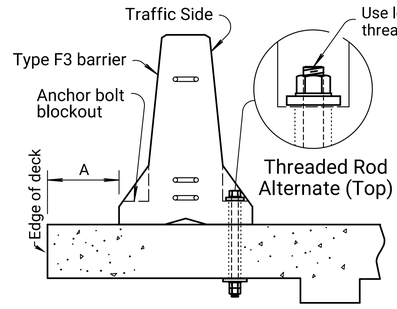
TIE-DOWN STRAP DETAILS

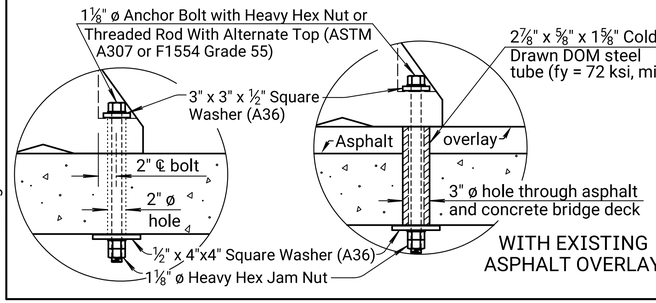


ELEVATION - TREATMENT AT BRIDGE DECK EXPANSION JOINT SCHEMATIC (Expansion < 1½")

ANCHORAGE	ANCHOR BARRIER with 3 BOLTS ON TRAFFIC SIDE	ANCHOR BARRIER with 3 BOLTS ON TRAFFIC SIDE		ANCHOR BARRIER with TIE-DOWN STRAP		ANCHOR BARRIER with STAKES
"A" DISTANCE	0' ≤ A < 2'	0' ≤ A < 2'		△ 2' ≤ A < 4'	6" ≤ A < 2'	6" ≤ A < 2'
LOCATION	Span Bridge	Span Bridge	Box Culverts Roadways - RIGID Pavement	Span Bridge	Box Culverts Roadways - RIGID Pavement	Box Culverts (ceiling below stake depth) Roadways - FLEXIBLE Pavement

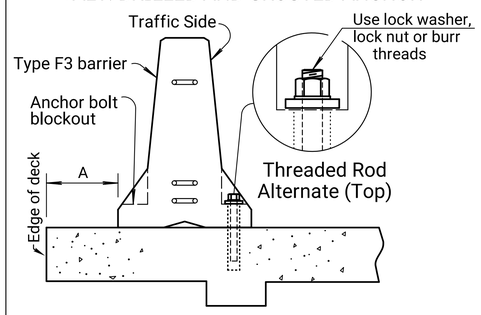
THROUGH BOLT (Preferred)



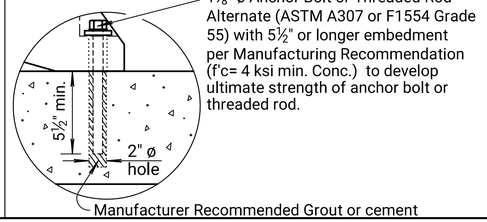


WITH EXISTING ASPHALT OVERLAY

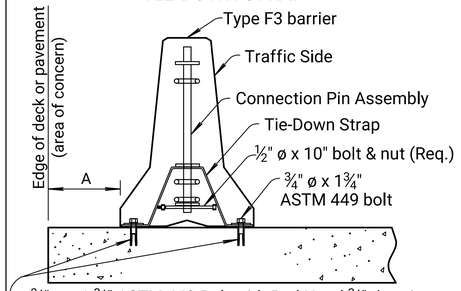
✧ALT. DRILLED AND GROUTED ANCHOR



✧ Note: Alternate Drilled and Grouted Anchor installation avoids damage to the support beams, girders or expansion joint. The State Bridge Office has approved the use of the Alternate Drilled and Grouted Anchor installation for use on this project at Bridge (051).

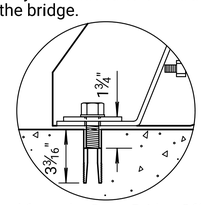


TIE-DOWN STRAP



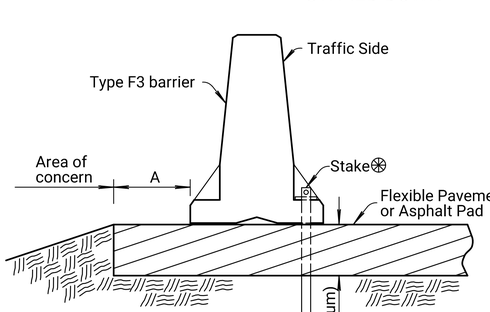
¾" ø x 1 ¾" ASTM 449 Bolt with Red Head ¾" drop in anchor, Red Head large diameter Tapcon (LDT) ¾" ø x 4 ½" long, or Simpson Titen HD ¾" ø x 5" long

△"A" distance may be reduced to 6" if traffic does not travel under the bridge.

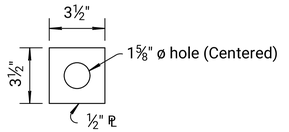


With prior approval from the State Bridge Office, anchoring the barrier with 3 bolts (Through Bolt OR Drilled & Grouted Anchor oprtions) on the traffic side may be used in lieu of tie-down straps.

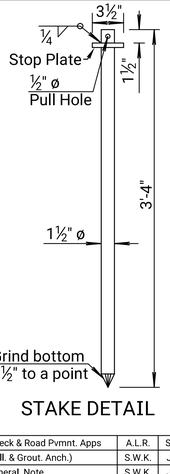
STAKED DOWN



⊛ Predrill 1½" ø holes in flexible pavement prior to installing stakes.



STOP PLATE DETAIL



STAKE DETAIL

NO.	DATE	REVISIONS	BY	APP'D
07	04-21-21	Revised Layouts for Br. Deck & Road Pvmnt. Apps	A.L.R.	S.W.K.
06	12-31-13	Rev. Note (Alt. Drill. & Grout. Anch.)	S.W.K.	J.O.B.
05	06-27-11	Revised General Note	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY CONCRETE SAFETY BARRIER TYPE F3 ANCHORAGE

~~RD622B~~

FHWA APPROVAL	04-21-21	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

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Sh. No. 199

Note to Designer: For use on Haunched slab bridges, the Road Designer shall coordinate with the Bridge Designer for "corridor in the reinforcing steel layout to accommodate barrier anchoring."
Road Designer shall coordinate barrier layout with Bridge Designer to accomodate for expansion during construction.

Plotted : 16-JAN-2025 07:52
Drawn By : mrockwell
File : rd622b.dgn

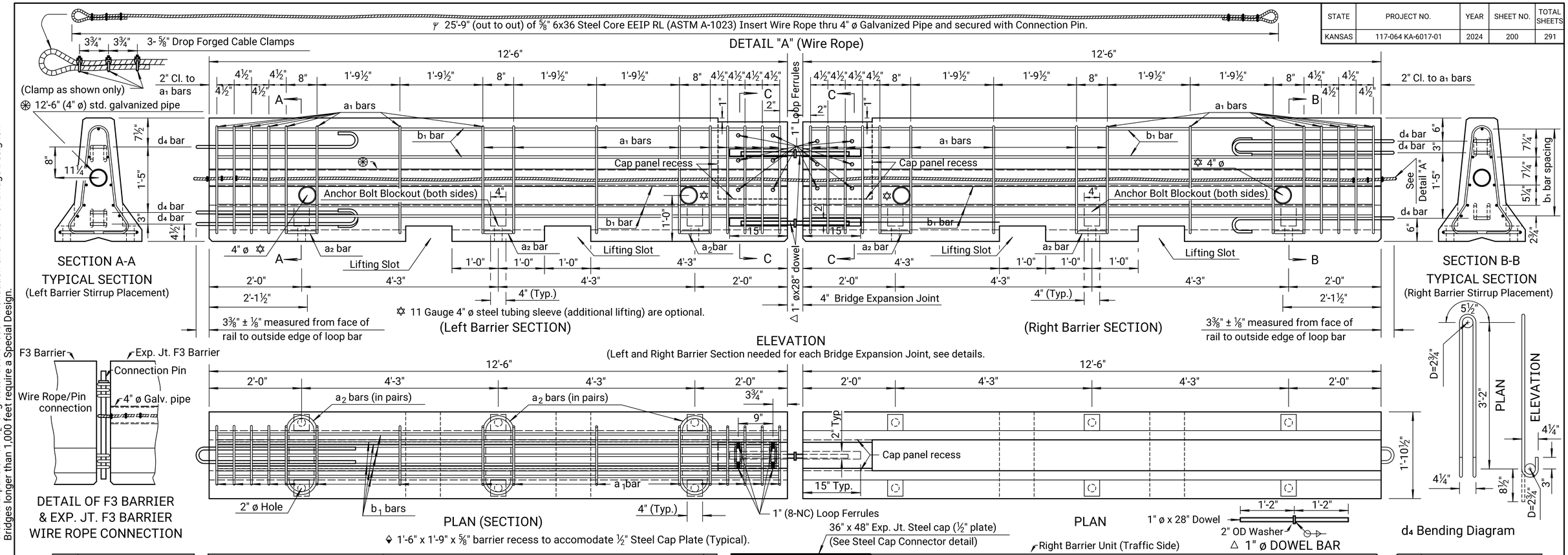
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	200	291

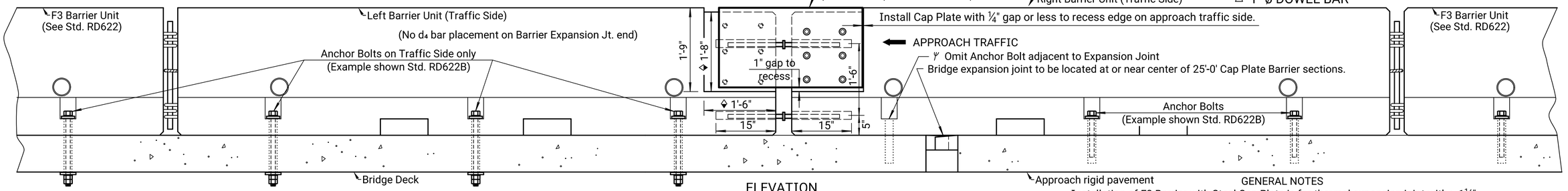
Note to Designer: This F3 Barrier Anchorage at Expansion Joint is only for use on bridges with thermal expansion of 1½" or greater at the recommendation and review of Bridge Designer. Bridges longer than 1,000 feet require a Special Design.

Drawn By : mrockwell
File : rd622c.dgn

Plotted : 16-JAN-2025 07:52



DETAIL OF F3 BARRIER
& EXP. JT. F3 BARRIER
WIRE ROPE CONNECTION



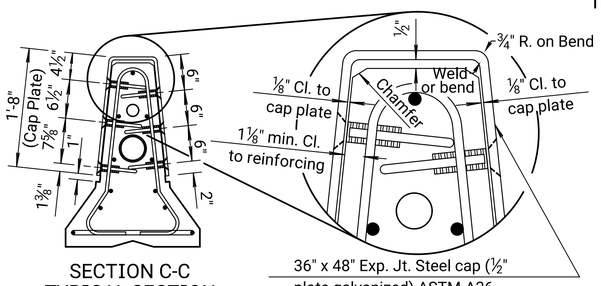
℣ If two or more Anchor Bolts are omitted, then add an additional cable.

ELEVATION
TREATMENT AT BRIDGE DECK EXPANSION JOINT SCHEMATIC

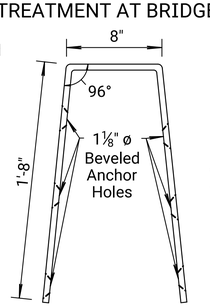
Per 12'-6" Barrier Section

REINFORCING A615 Gr. 60					
Bar	Bar Size	Shape	No.of Bars	Length Ft.	Weight Lbs.
a1	#4		16	6'-0"	64.1
a2	#6		6	2'-11"	26.3
b1	#5		9	12'-2"	114.2
LOOP ASSEMBLY					
d4	#6		3	8'-2"	36.8
½" Structural Steel Cap Plate					201.3

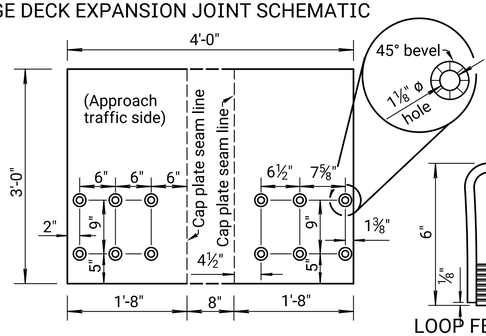
Concrete Quantity = 1.3 C.Y.
(Dimensions are out to out of bars unless otherwise noted.)
Reinf., Struct. and Concrete quantities are for "Information Only".



SECTION C-C
TYPICAL SECTION

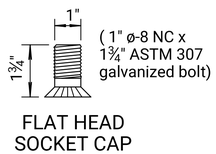


END VIEW
STEEL CAP PLATE



PLAN (STEEL CAP PLATE)

LOOP FERRULE
(1" Galvanized)



FLAT HEAD
SOCKET CAP
SCREW-Coarse

GENERAL NOTES

Installation of F3 Barrier with Steel Cap Plate is for thermal expansion joint with ≥ 1½".
This two barrier system (25'-0") is reversible to match with regular F3 Barrier layout. The Cap Plate sections are installed with no greater than 4" gap and pinned as shown in Expansion Jt. schematic. Install Cap Plate flush to recess on Traffic Approach side and bolt in place front and back of barrier with attachment types shown.

See Standard Drawing RD622 for reinforcing bending diagrams and additional details not shown on this sheet.

The State Bridge Office will review shop details before fabrication begins.

All materials, labor and equiptment needed for (Type F3) (25' Expansion Joint Unit) shall be bid as "Concrete Safety Barrier (Type F3) (Temporary)".

NO.	DATE	REVISIONS	BY	APP'D
03	07-26-07	Chg. flat head screw & ferrul to 1" ø	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY CONCRETE SAFETY BARRIER TYPE F3 ANCHORAGE at EXPANSION JT.

RD622C

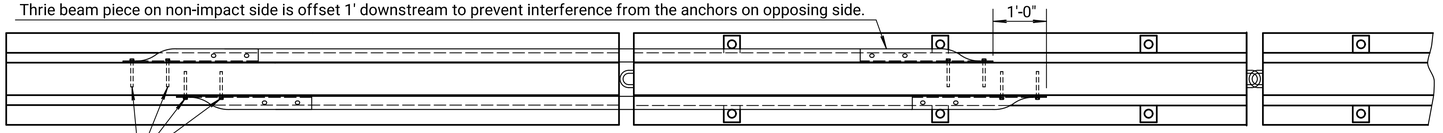
FHWA APPROVAL		10-05-07	APP'D.	James O. Brewer
DESIGNED	DETAILED		QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK. S.W.K.

KDOT Graphics Certified 05-13-2022 Sh. No. 200

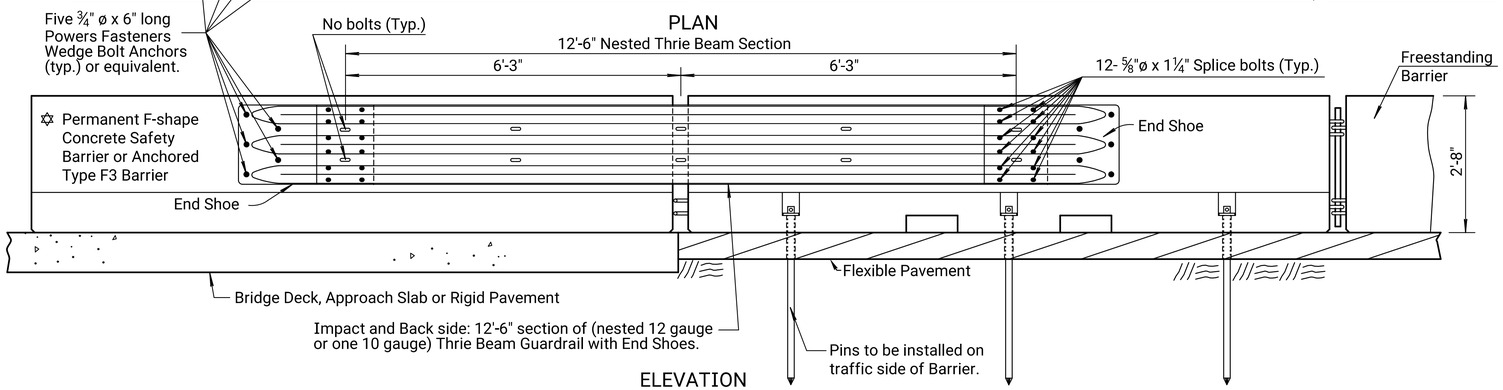
KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	117-064 KA-6017-01	2024	201	291

Thrie beam piece on non-impact side is offset 1' downstream to prevent interference from the anchors on opposing side.



PLAN

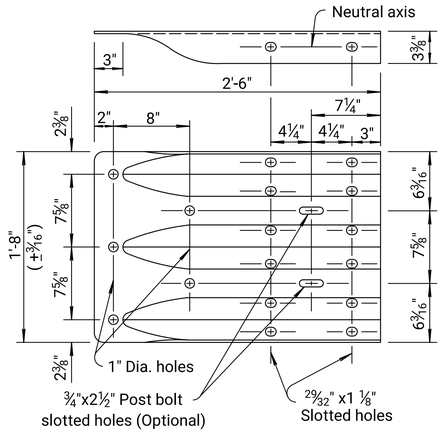


ELEVATION

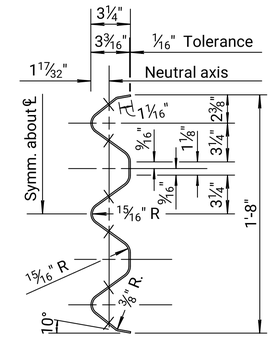
✡GUARDRAIL CONNECTION–ANCHORED/RIGID BARRIER TO FREESTANDING BARRIER

GENERAL NOTES:

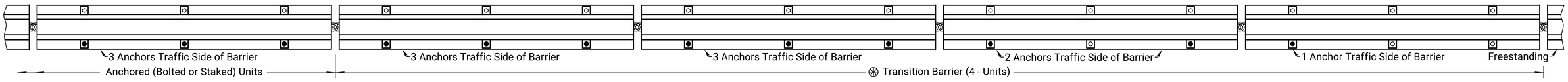
The work and materials required for the installation & removal of the guardrail connection and barrier anchors as shown on this sheet shall be subsidiary to the "Concrete Safety Barrier" bid item.



TERMINAL CONNECTOR

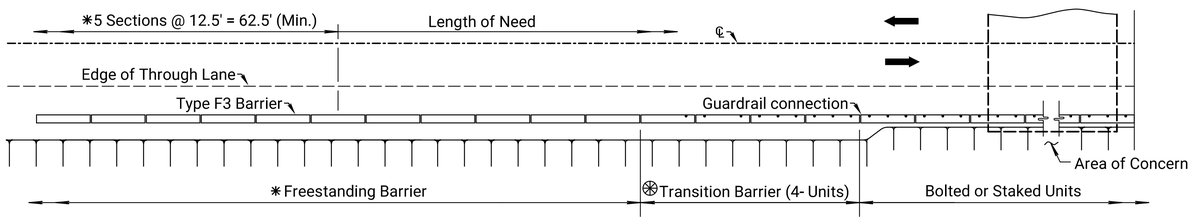


THRU RAIL ELEMENT TYPICAL THRIE BEAM

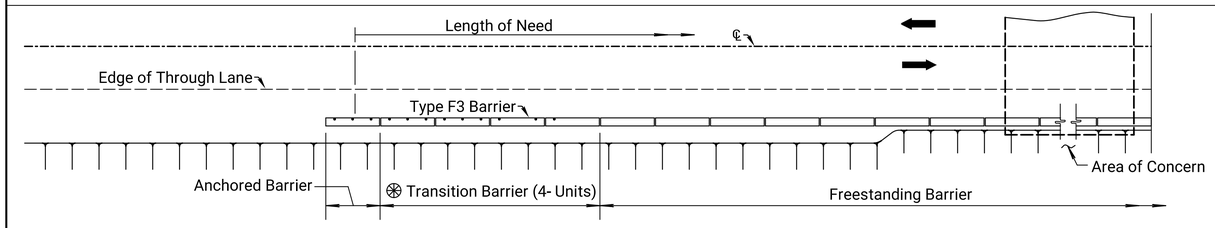


PLAN - TRANSITION BARRIER ⊛

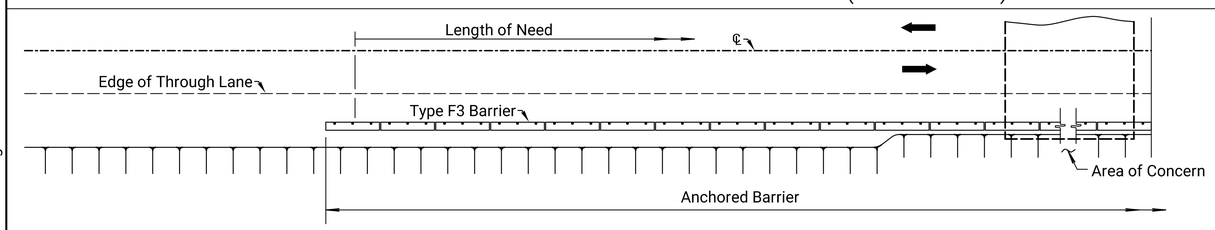
LENGTH OF NEED (LON)



LENGTH OF NEED WITH FREESTANDING TYPE F-3 CONCRETE BARRIER ENDING

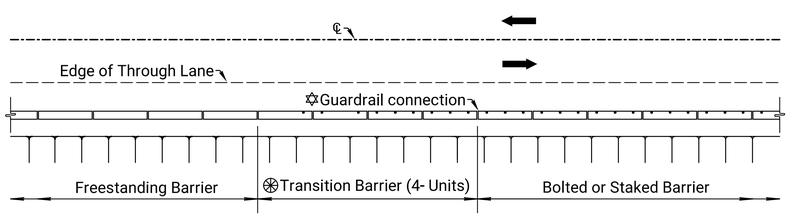


REDUCED LENGTH OF NEED WITH ALTERNATE END ANCHORAGE (FREESTANDING)



REDUCED LENGTH OF NEED WITH ALTERNATE END ANCHORAGE (ANCHORED)

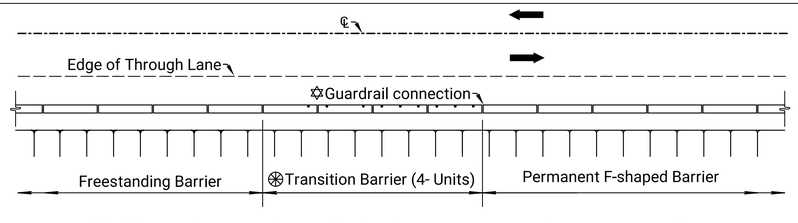
TRANSITION LAYOUTS



TRANSITION "From/To"	✡	⊛
Transition from a Freestanding Barrier to a Type F3 Barrier anchored to a rigid pavement with bolted connection or bolted to a bridge deck.	YES	YES
Transition from a Freestanding Barrier to a Type F3 Barrier pinned/staked to asphalt pavement.	NO	YES

✡ Guardrail Connection ⊛ Transition Barrier

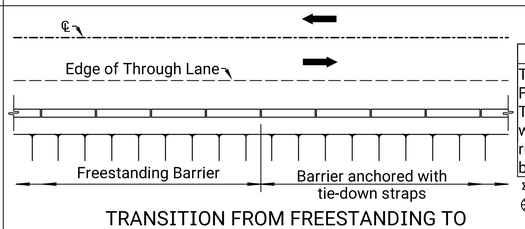
TRANSITION FROM FREESTANDING TO AN ANCHORED (BOLTED OR STAKED) TYPE F-3 BARRIER



TRANSITION "From/To"	✡	⊛
Transition from a Freestanding Barrier to a Permanent F-Shape Barrier.	YES	YES

✡ Guardrail Connection ⊛ Transition Barrier

TRANSITION FROM FREESTANDING TO PERMANENT F-SHAPED BARRIER



TRANSITION "From/To"	✡	⊛
Transition from a Freestanding Barrier to a Type F3 Barrier anchored with tie-down straps on a rigid pavement or a bridge deck.	NO	NO

✡ Guardrail Connection
⊛ Transition Barrier

TRANSITION FROM FREESTANDING TO TYPE F3 BARRIER ANCHORED WITH STRAPS

NO.	DATE	REVISIONS	BY	APP'D
02	07-19-19	Added LON & Transition Layouts	A.L.R.	T.T.R.
01	01-30-07	Rem. temp. details from perm. barrier	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY CONCRETE SAFETY BARRIER TYPE F3 TRANSITION LAYOUTS

RD622D

FHWA APPROVAL		08-07-19	APP'D.	
DESIGNED	DETAILED		QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-13-2022 Sh. No. 201

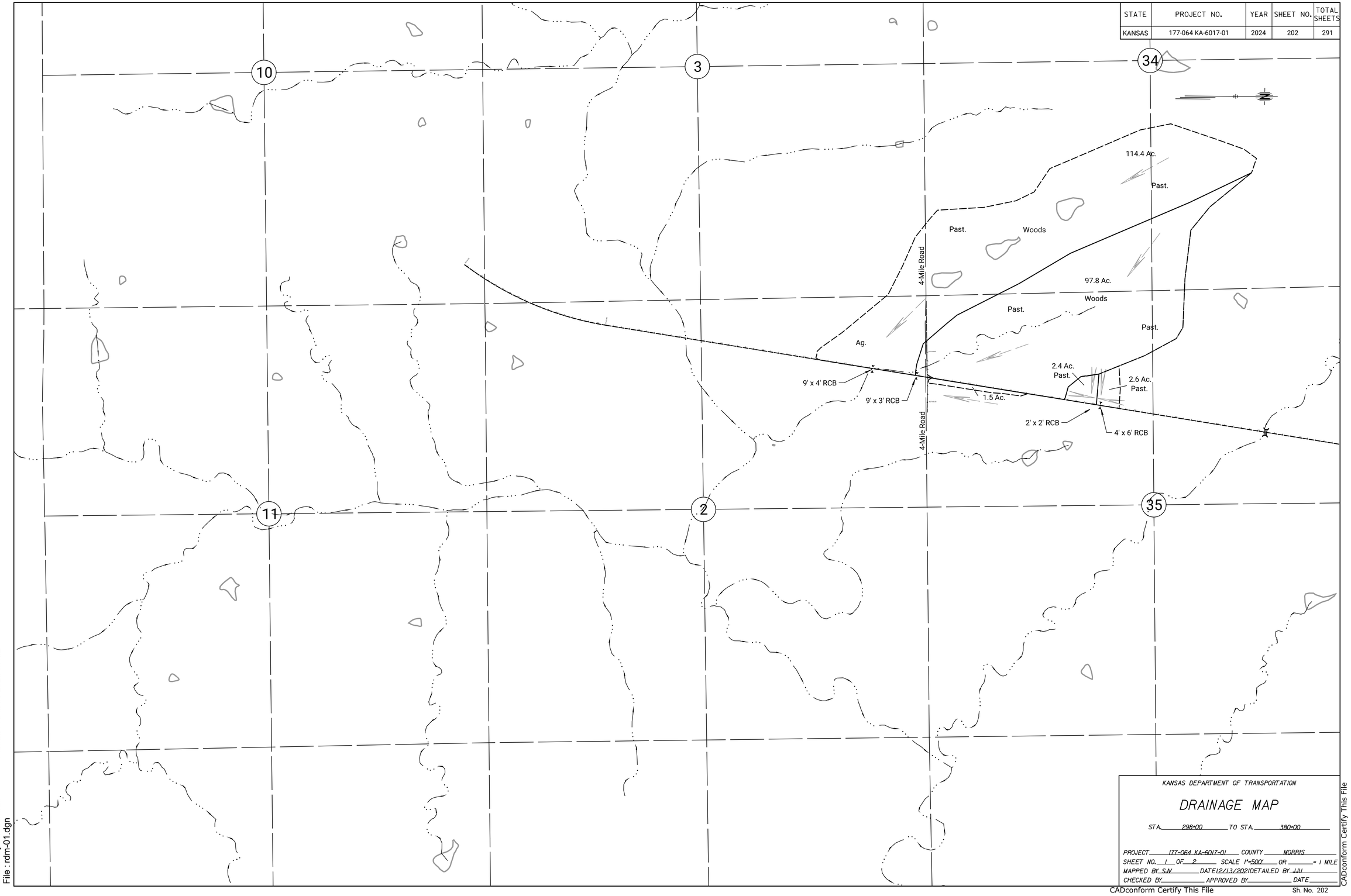
KDOT Graphics Certified

✱ Note to Designer: The minimum length for Freestanding Temporary Concrete Safey Barrier (TCSB) Installations is 11 sections @ 12.5' = 137.5'. In a Freestanding TCSB installation, if both ends are anchored, fewer than 11 sections of Freestanding TCSB may be used.
The 5 sections of Freestanding TCSB beyond the length of need may be reduced to 3 sections if the barrier is located on the exit end and traffic is traveling in a single direction.

Plotted : 16-JAN-2025 07:52

Drawn By : mrockwell
File : rd622d.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	202	291



Drawn By : mrockwell
File : rdm-01.dgn

Plotted : 16-JAN-2025 07:52

KANSAS DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

STA. 298+00 TO STA. 380+00

PROJECT 177-064 KA-6017-01 COUNTY MORRIS
SHEET NO. 1 OF 2 SCALE 1"=500' OR _____" = 1 MILE
MAPPED BY S.N. DATE 12/13/2021 DETAILED BY J.H.
CHECKED By _____ APPROVED BY _____ DATE _____

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CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-01	2024	203	291

27 22 15

Past.
Past.
Past.
Past.
278.5 Ac.
115.9 Ac.
Woods
Past.
Woods
Past.
Past.
Past.
Past.
2.9 Ac.
Past.
30" RCP
30" RCP
30" RCP
5.6 Ac.
Past.
2.2 Ac.
Past.
V Avenue
30" RCP
6.5 Ac.
Past.
4.0 Ac.
Past.
0.9 Ac.
Past.
2.8 Ac.
Woods
900 Road
30" RCP
2.6 Ac.
Past.
11.7 Ac.
Past.
9' x 9' RCB
8' x 8' RCB
5' x 5' RCB
2' x 2' RCB
41.2 Ac.
Past.
Vellie Street

26 23 14

Plotted : 16-JAN-2025 07:52

Drawn By : mrockwell
File : rdm-02.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

STA. 390+00 TO STA. 488+73.82

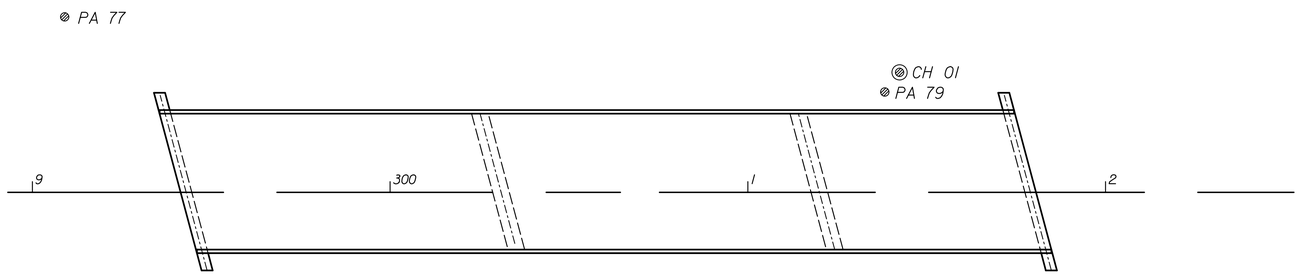
PROJECT 177-064 KA-6017-01 COUNTY MORRIS
SHEET NO. 2 OF 2 SCALE 1"=500' OR ____ = 1 MILE
MAPPED BY S.N DATE 12/13/2021 DETAILED BY JJU
CHECKED BY ____ APPROVED BY ____ DATE ____

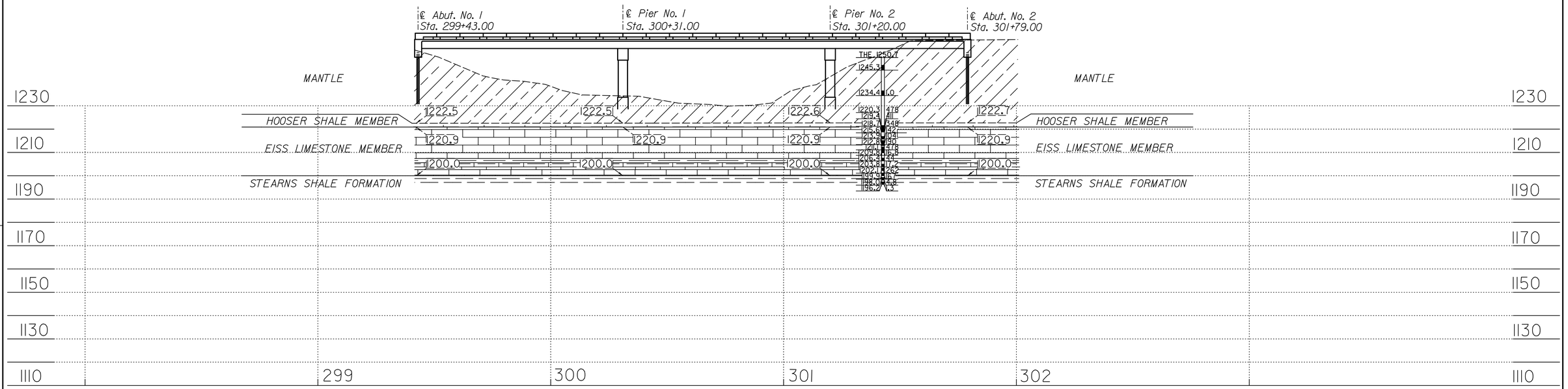
CADconform Certify This File

Sh. No. 203

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-64 KA-6017-01	2024	204	291





STANDARD GEOLOGIC SYMBOLS

- Clay or Underclay
- Silty Clay
- Silt
- Sand
- Gravel
- Boulders
- Caliche
- Silty or 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
- Sandy Limestone
- Bentonite
- Loess
- Mortarbed
- Coal
- Siltstone
- Chalk
- Wavy limestone
- Chalky limestone

SOUNDINGS

- Core drill
- Power auger
- Hand tools
- Cone (CPT) penetrometer
- Shelby tube
- Water level

GEOLOGIC PROFILE

- 000.0 Elevation interpolated or from adjacent soundings
- 000.0 Actual sounding elevation

UNCONFINED COMPRESSION TEST
Elevation
Tons/sq. ft.
000.0 00
000.0 00

STANDARD PENETRATION TEST
Elevation
Blows/ft.
000.0 00
000.0 00

CONE (CPT) PENETROMETER TEST
Scale: N60
Graphic representation of Cone Penetration Test in N60
0 100 200 300 400

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. 177-64-63.50 (051) Sta. 300+61.00

ENGINEERING GEOLOGY
K-177 OVER FOUR MILE CREEK

Proj 177-64 KA-6017-01 Morris Co.

SHEET NO. OF	SCALE	APP'D
DESIGNED	DETAILED	GEOLOGY DRAWN BY:
DESIGN CK.	DETAIL CK.	GEOLOGY LOCATION:

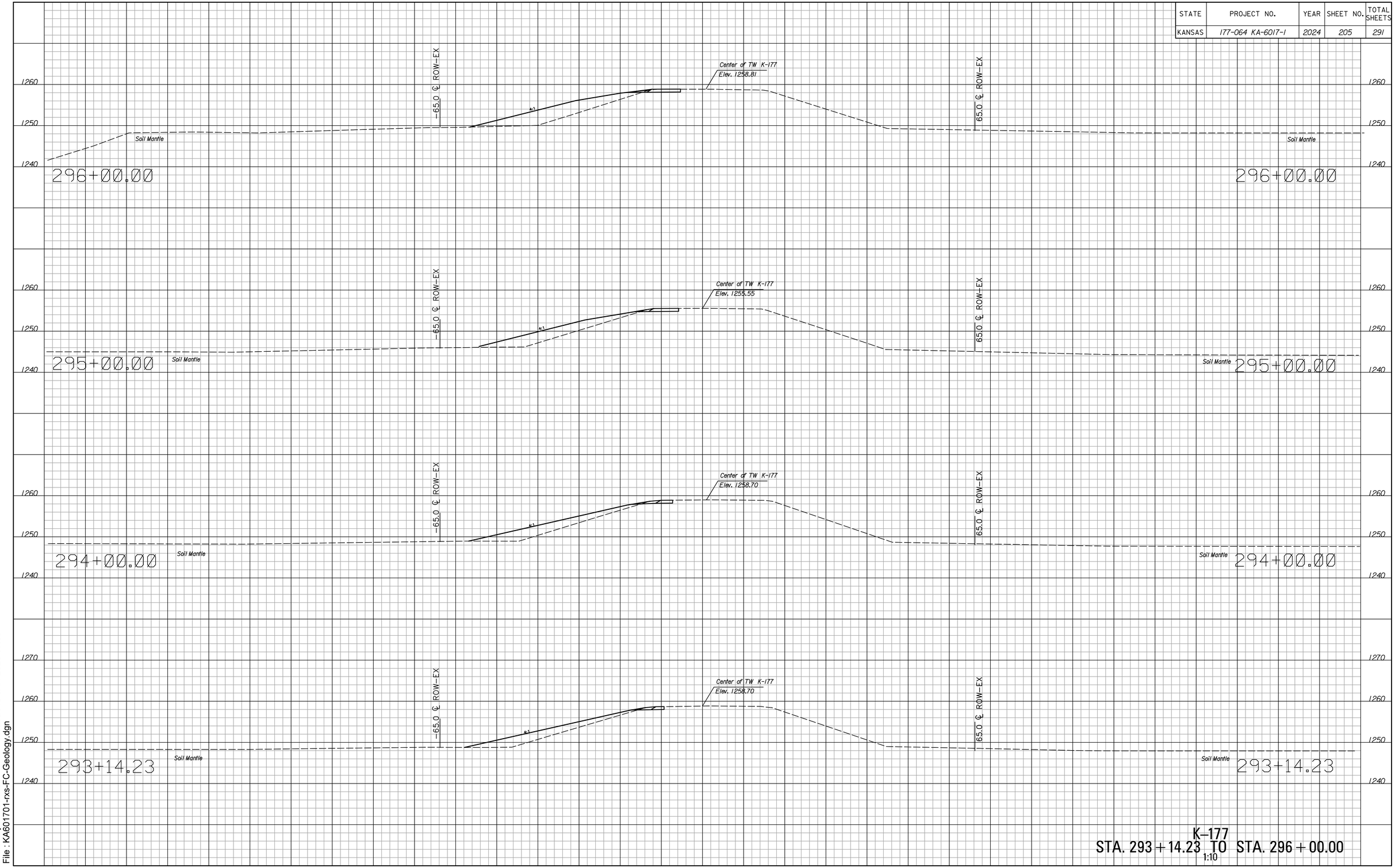
CADconform Certify This File

Sheet No. 204

Plotted By: mrockwell Plot Location:
File: ka6017101bbr051-003_for_Geology.dgn
Plot Date: 16-JAN-2025 07:52

CADconform Certify This File

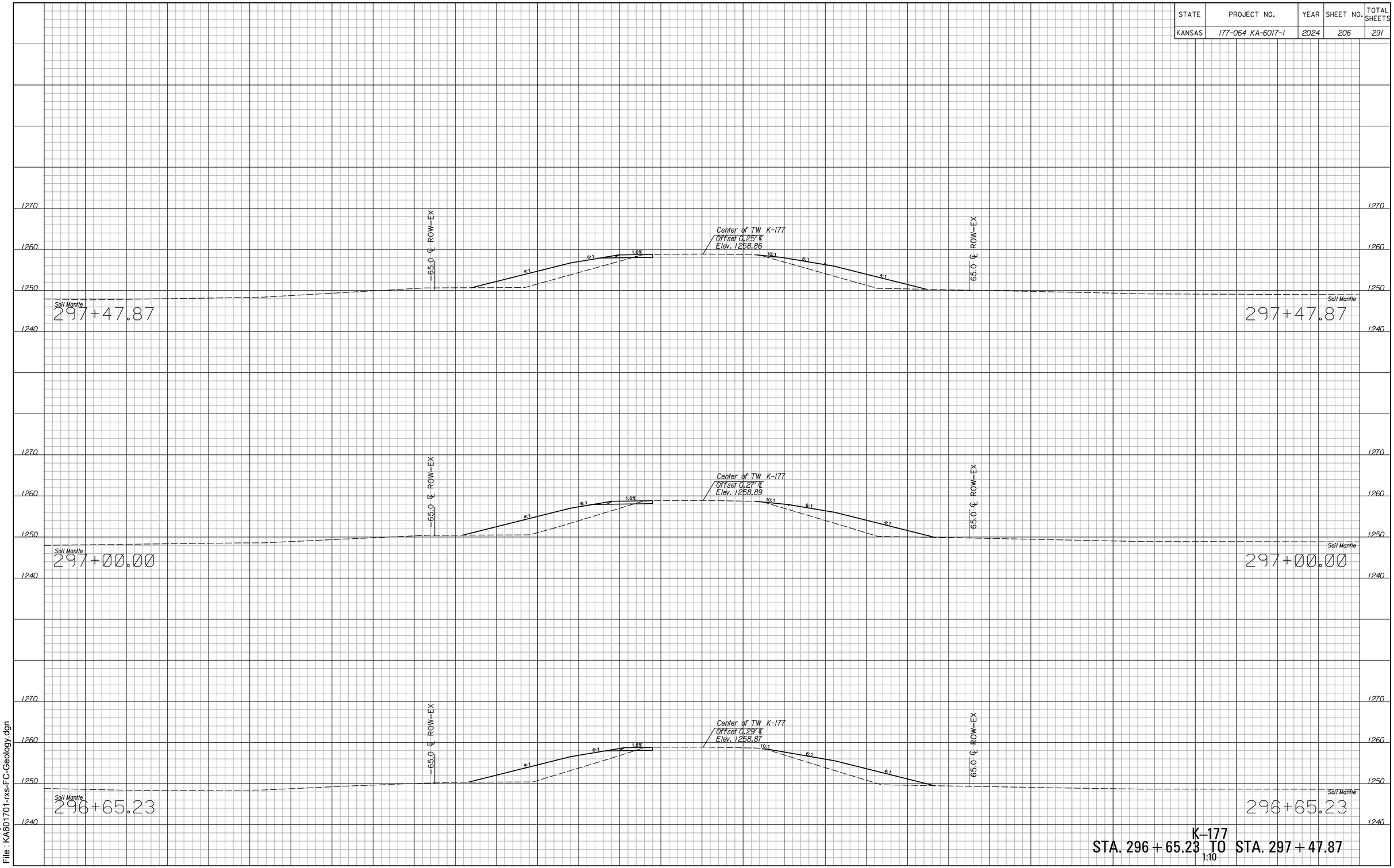
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	205	291



K-177
STA. 293+14.23 TO STA. 296+00.00
1:10

Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	206	291

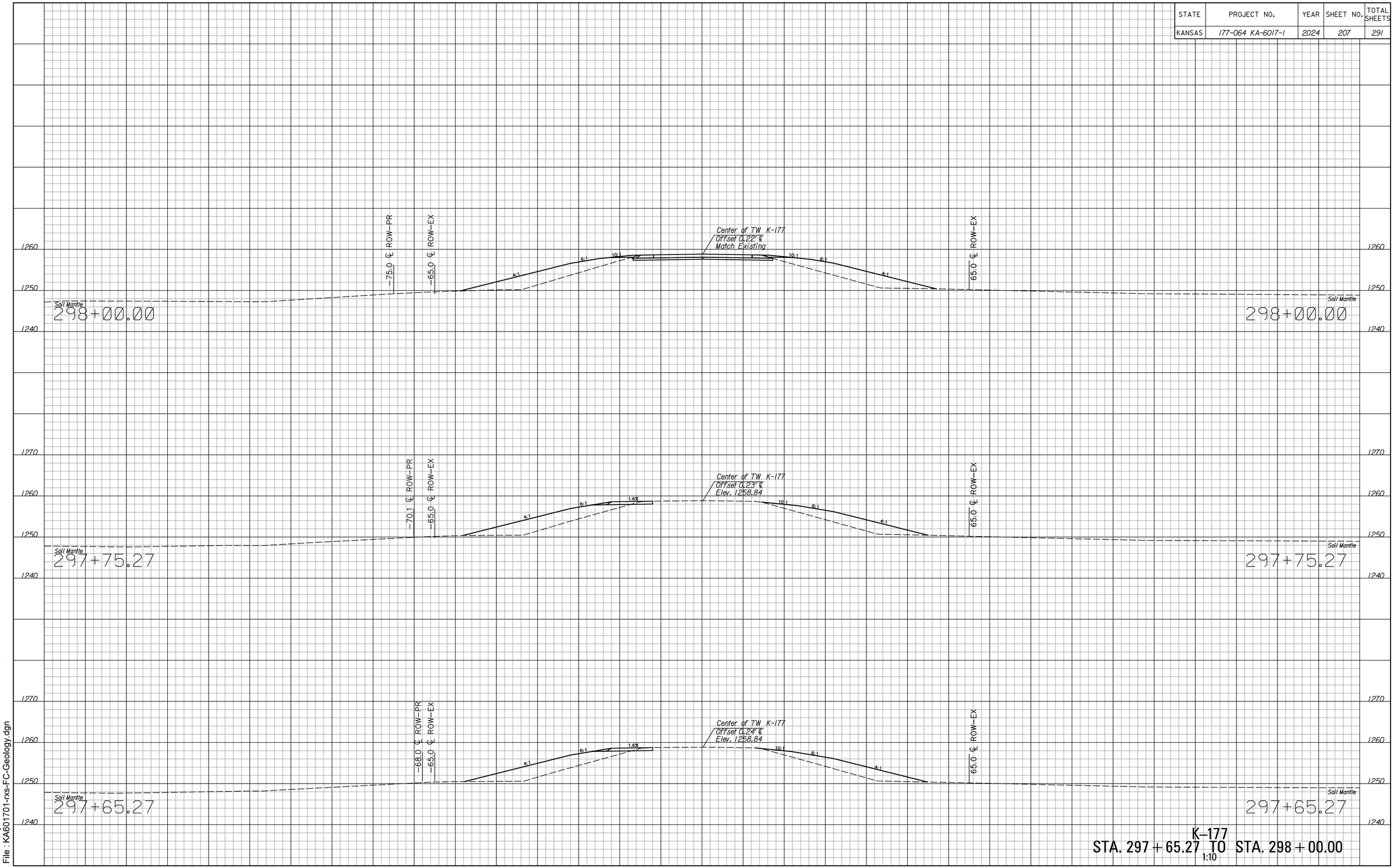


Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 296+65.23 TO STA. 297+47.87

1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	207	291



K-177
STA. 297+65.27 TO STA. 298+00.00
1:10

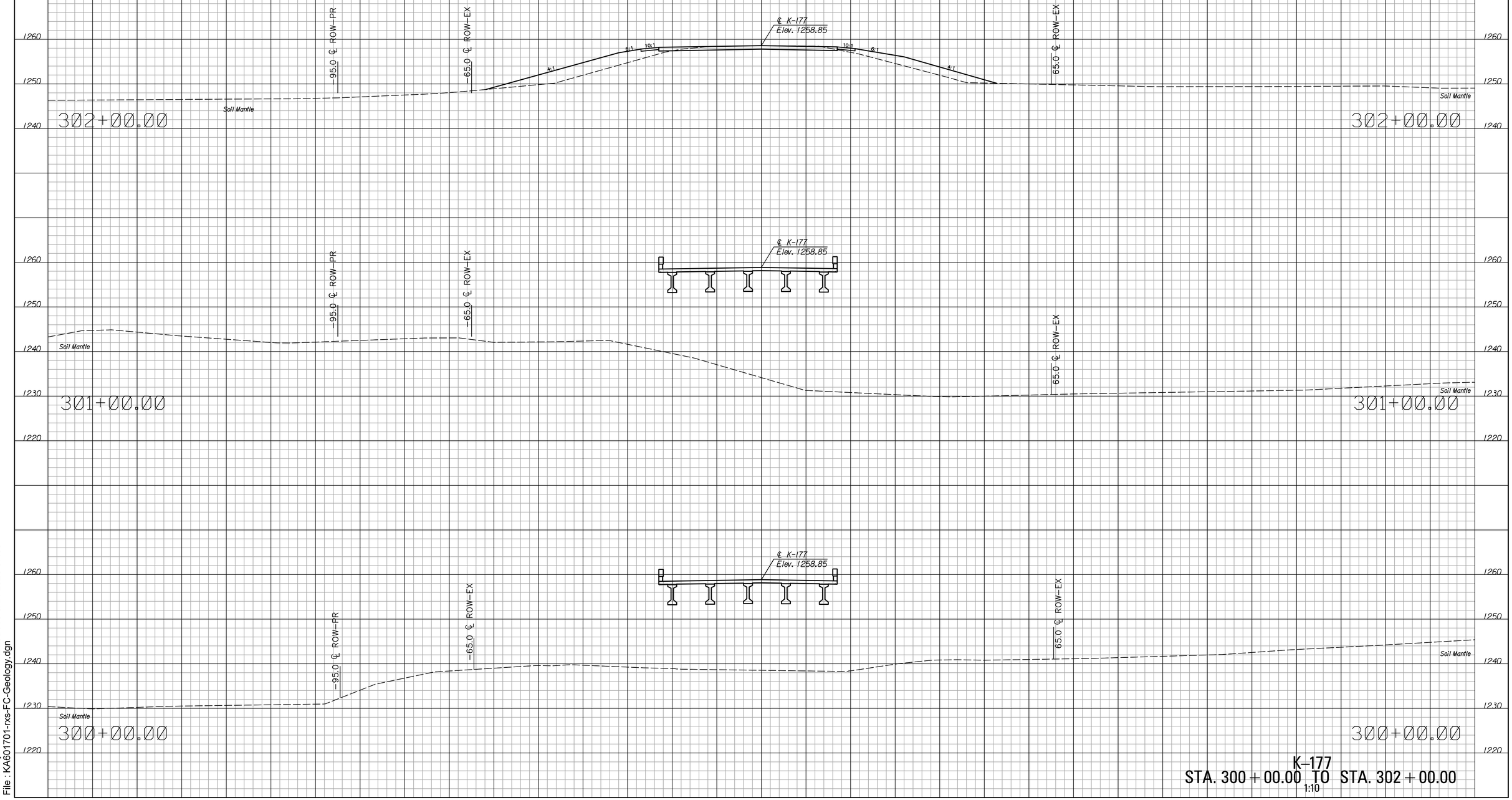
Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	208	291

Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 298+11.25 TO STA. 299+00.00
1:10

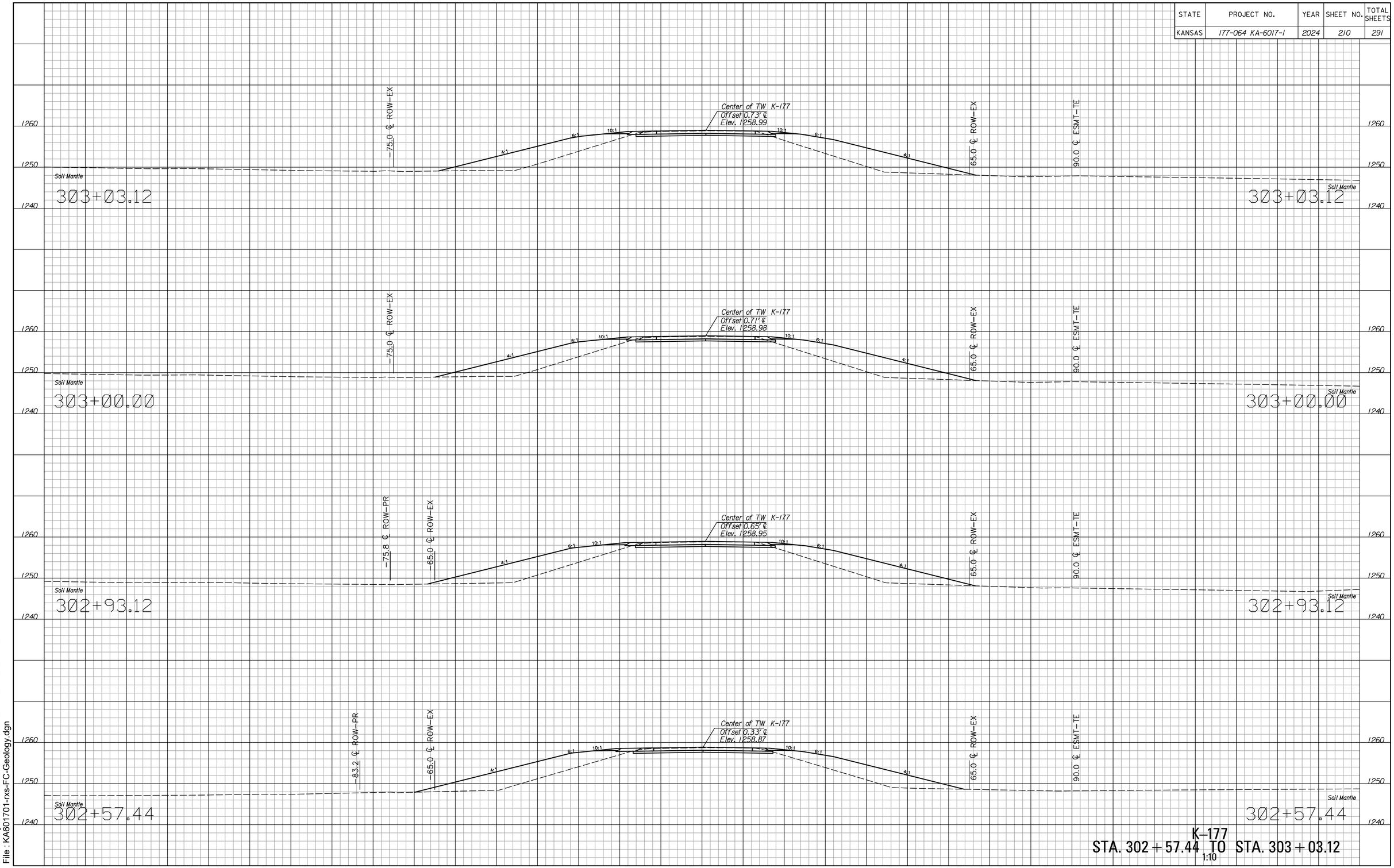
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	209	291



Plotted : 16-JAN-2025 07:53
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 300+00.00 TO STA. 302+00.00
1:10

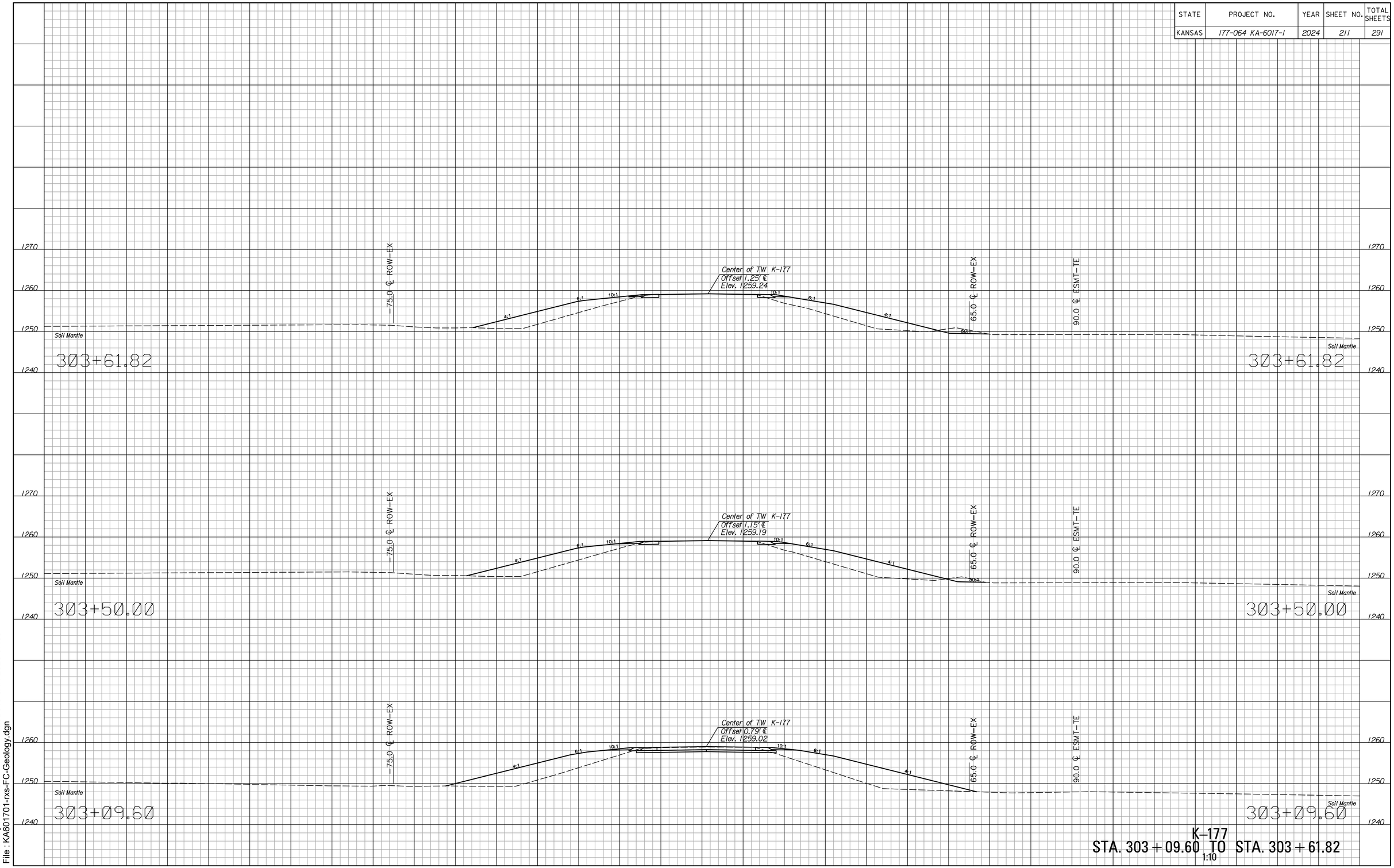
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	210	291



K-177
STA. 302+57.44 TO STA. 303+03.12
1:10

Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

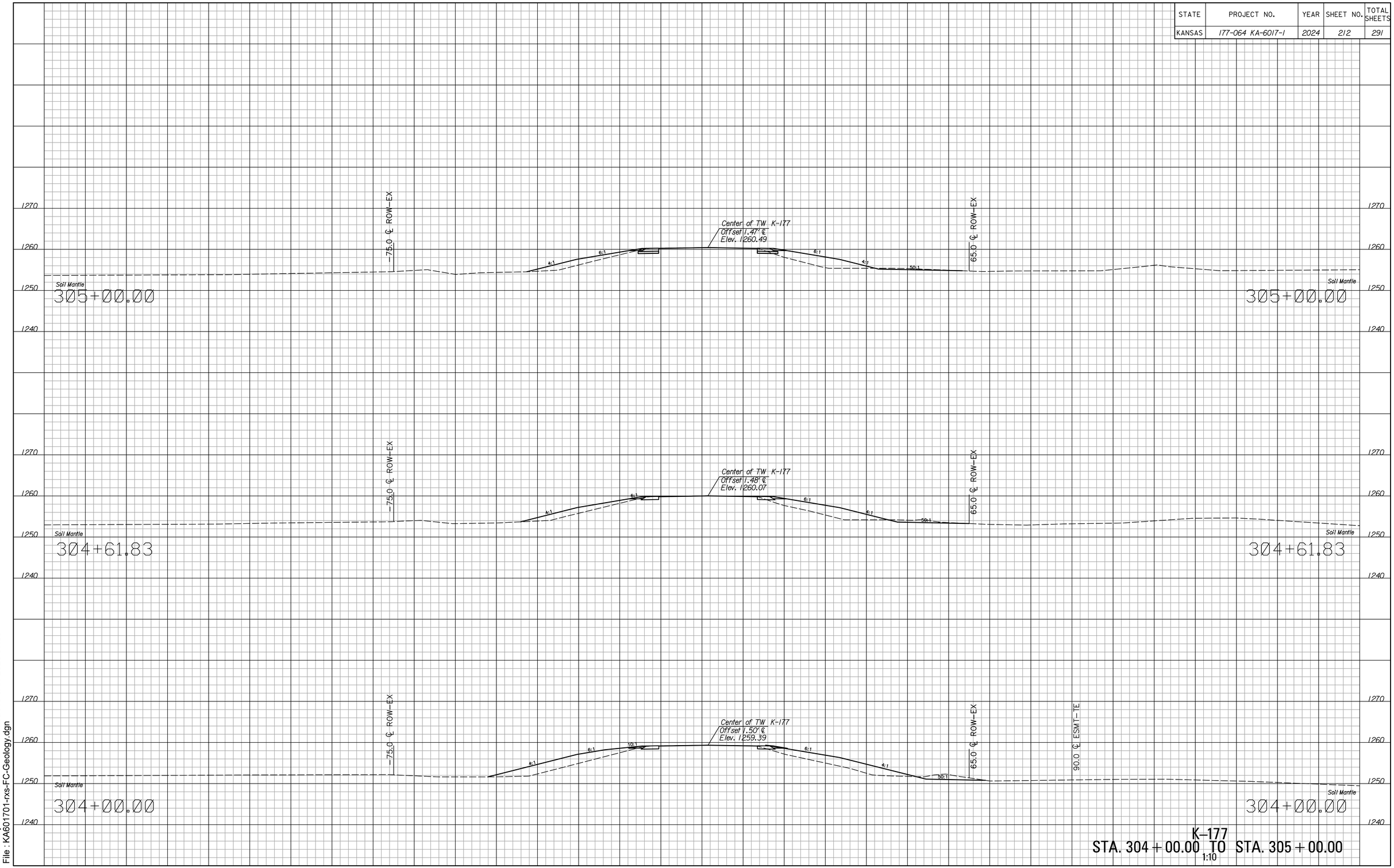
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	211	291



Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 303+09.60 TO STA. 303+61.82
1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	212	291

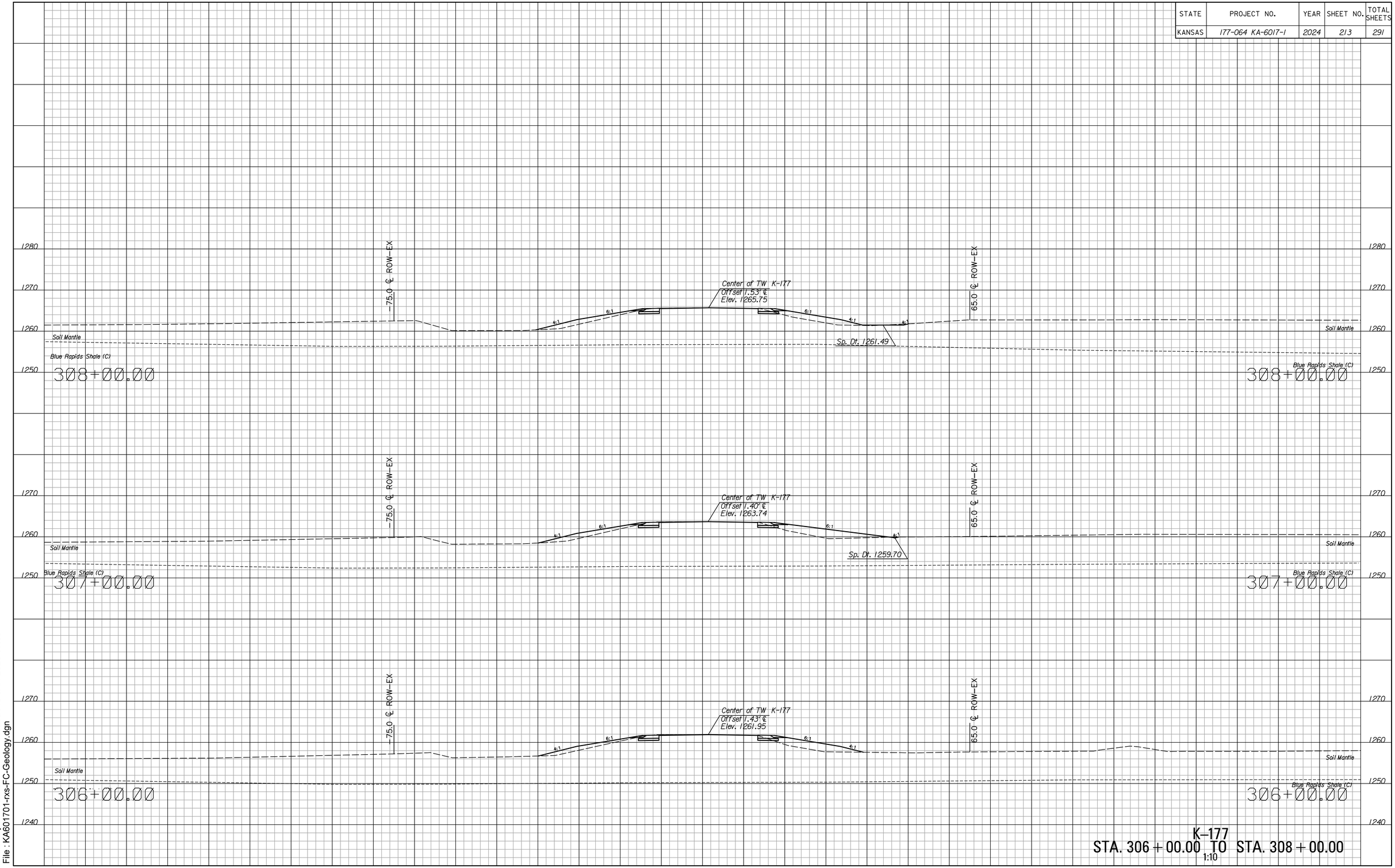


Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 304+00.00 TO STA. 305+00.00

1:10

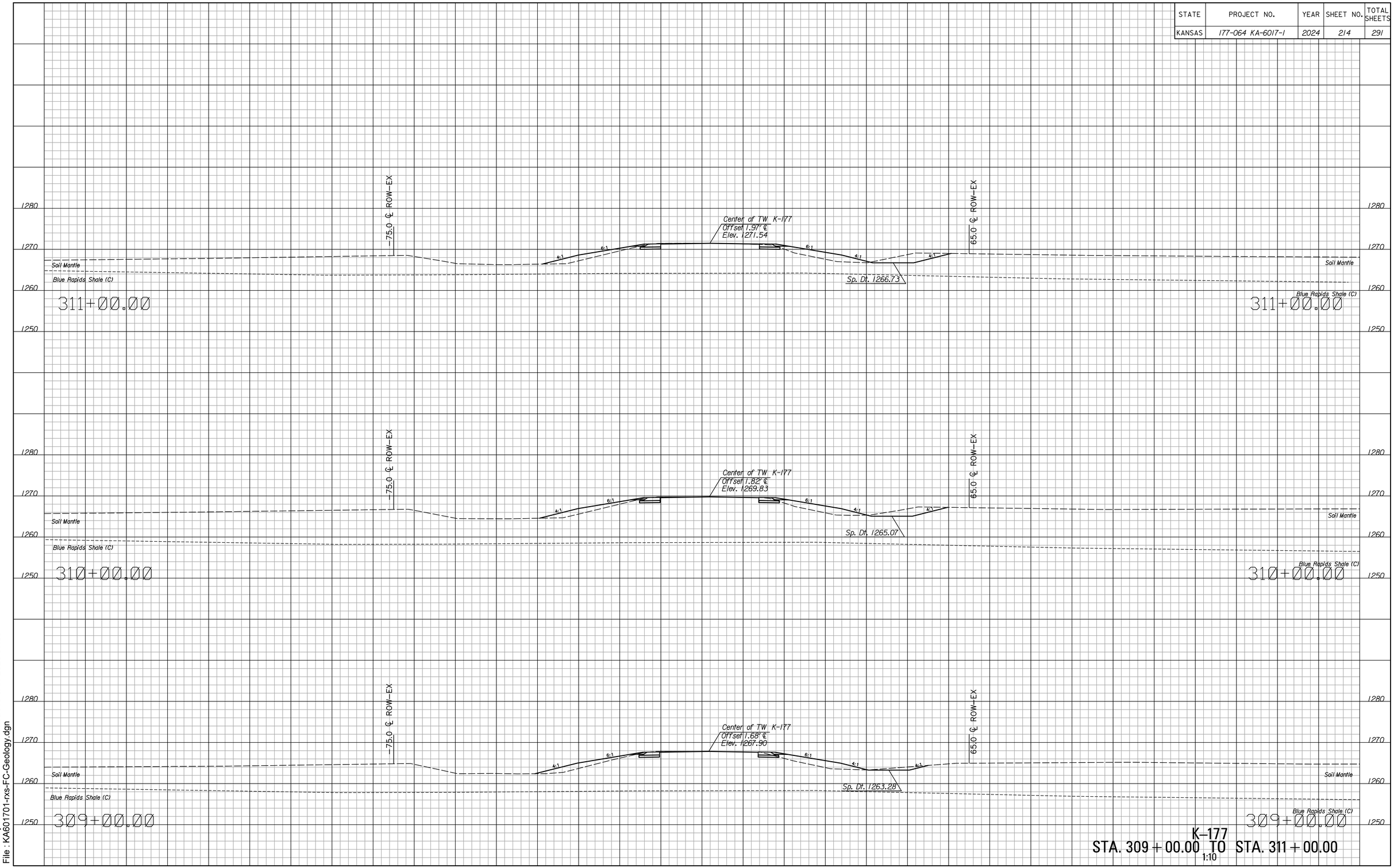
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	213	291



Plotted : 16-JAN-2025 07:53
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 306+00.00 TO STA. 308+00.00
1:10

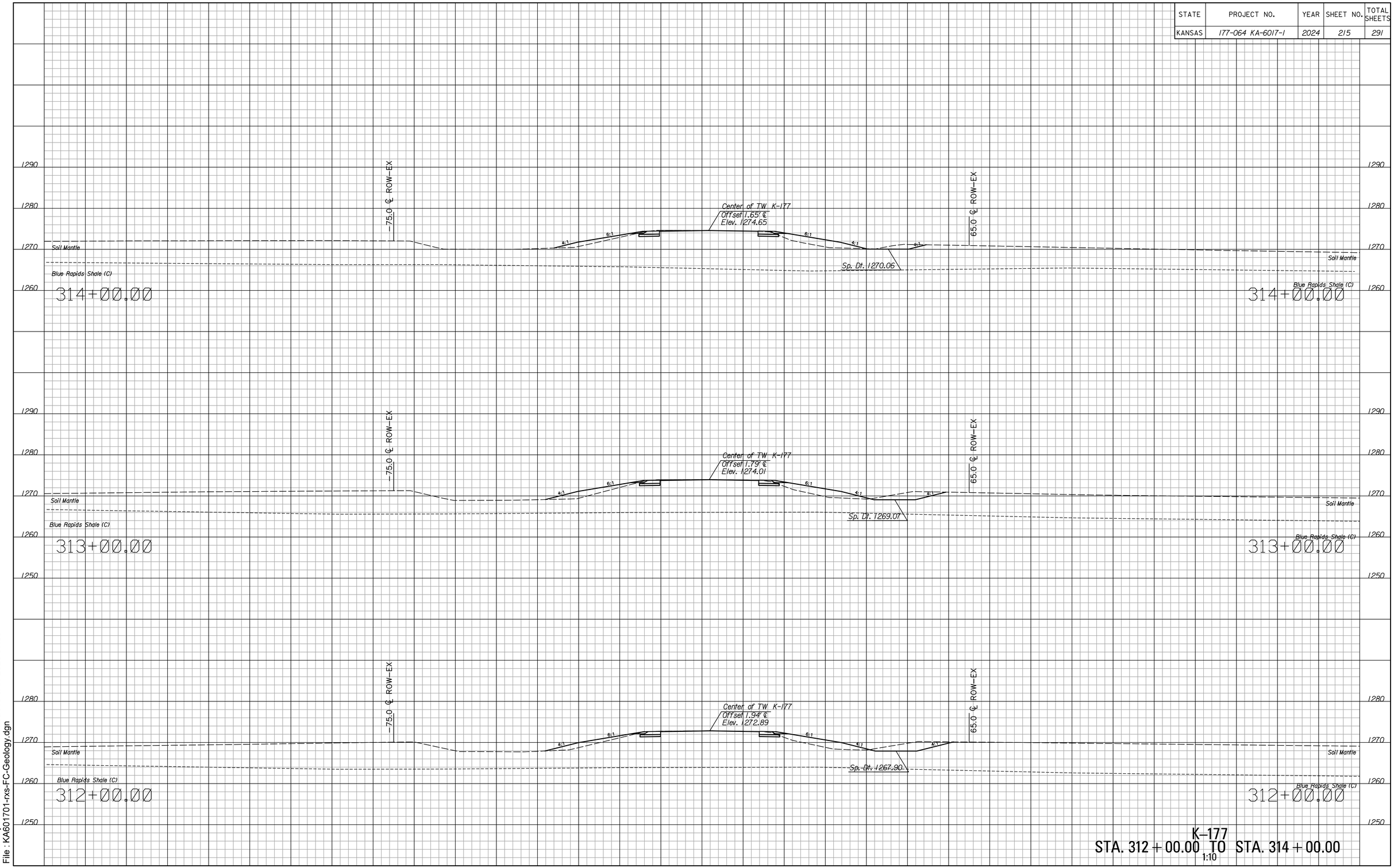
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	214	291



Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 309+00.00 TO STA. 311+00.00
1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	215	291



K-177
STA. 312+00.00 TO STA. 314+00.00
1:10

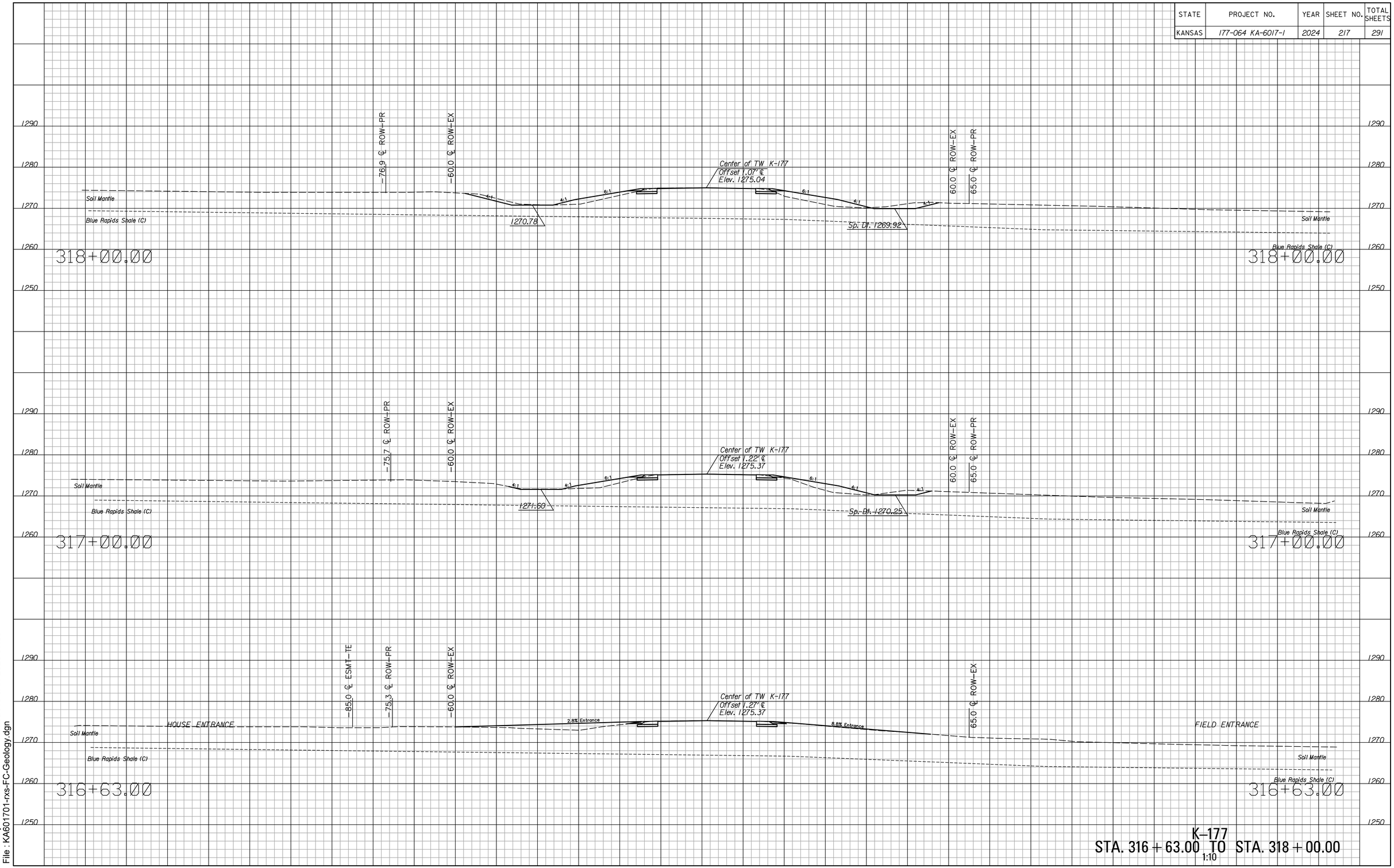
Plotted : 16-JAN-2025 07:53
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	216	291

Plotted : 16-JAN-2025 07:53
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 315 + 00.00 TO STA. 316 + 30.00
1:10

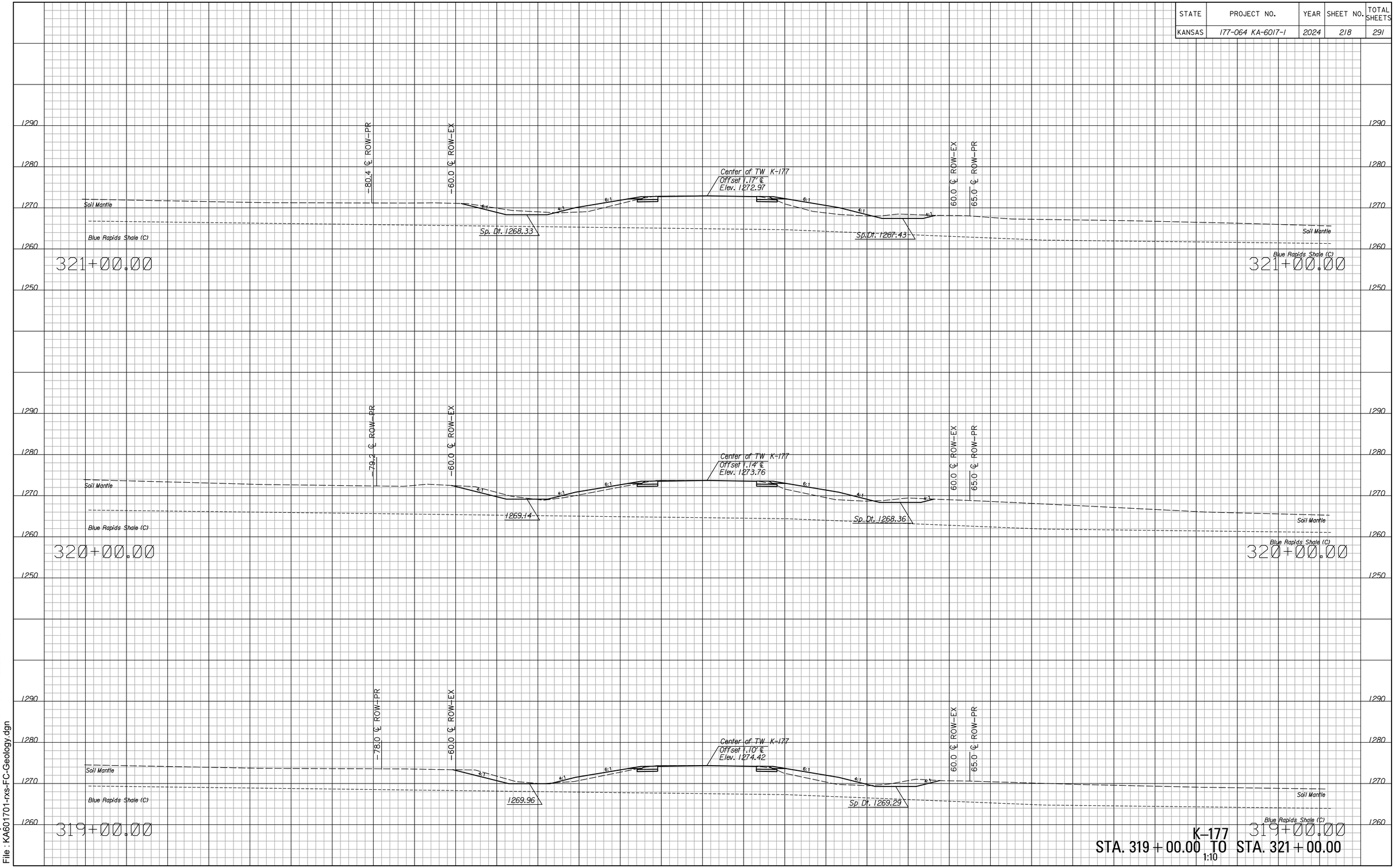
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	217	291



Plotted : 16-JAN-2025 07:53
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 316 + 63.00 TO STA. 318 + 00.00
1:10

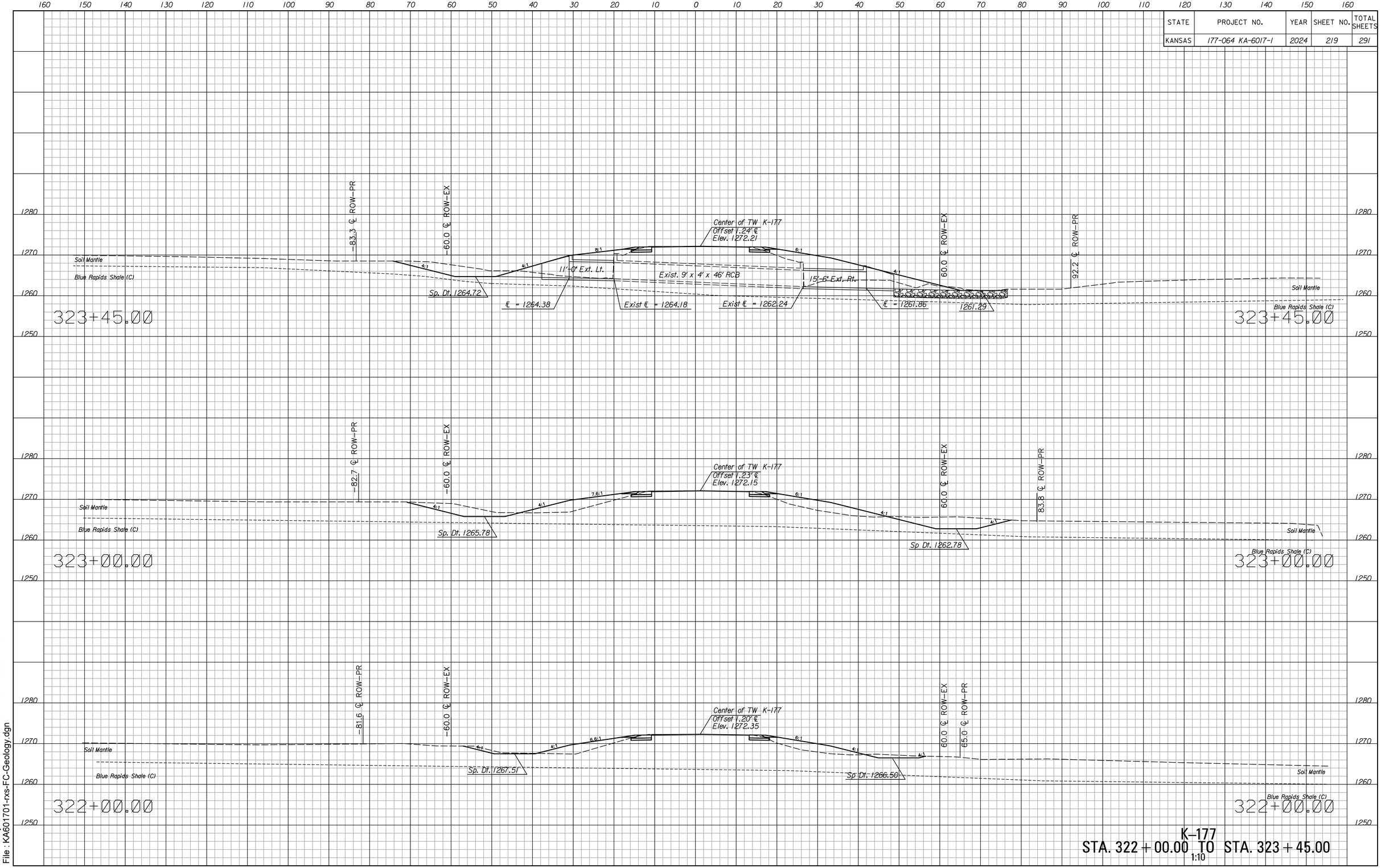
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	218	291



K-177
STA. 319+00.00 TO STA. 321+00.00
1:10

Plotted : 16-JAN-2025 07:53
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	219	291

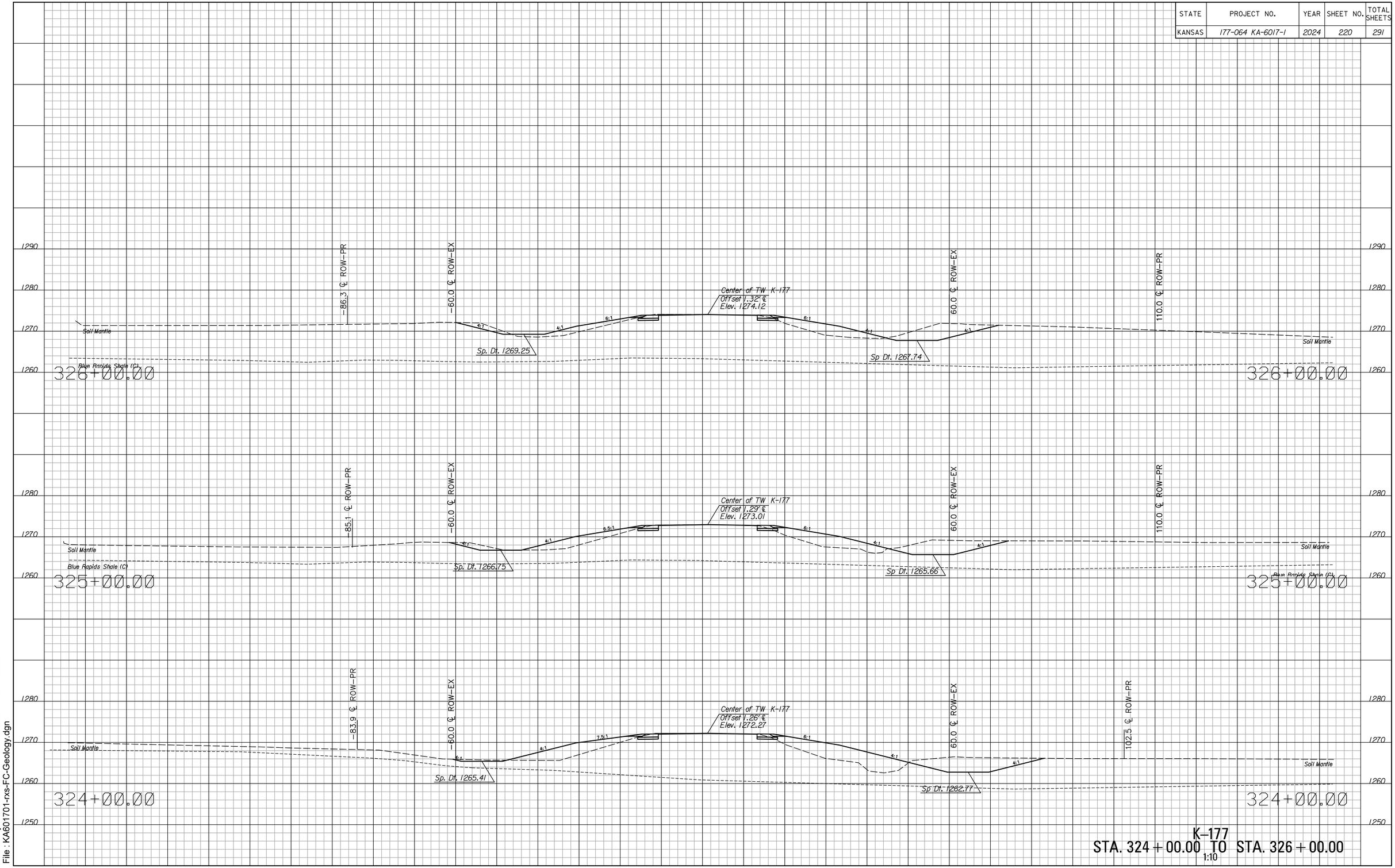


Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

K–177
STA. 322 + 00.00 TO STA. 323 + 45.00

1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	220	291



K-177
STA. 324+00.00 TO STA. 326+00.00
1:10

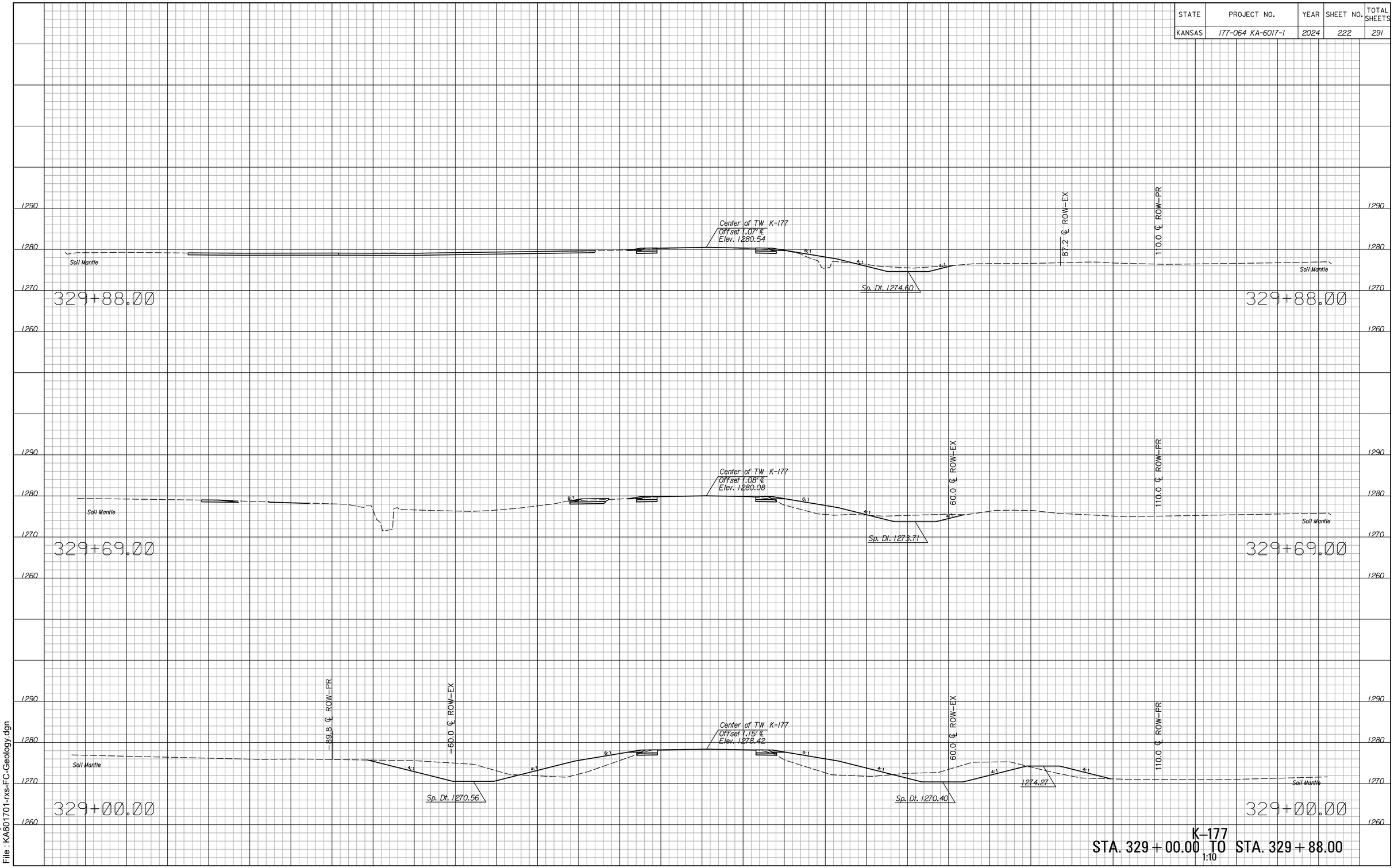
Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	221	291

K-177
STA. 327 + 00.00 TO STA. 328 + 77.00
1:10

Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

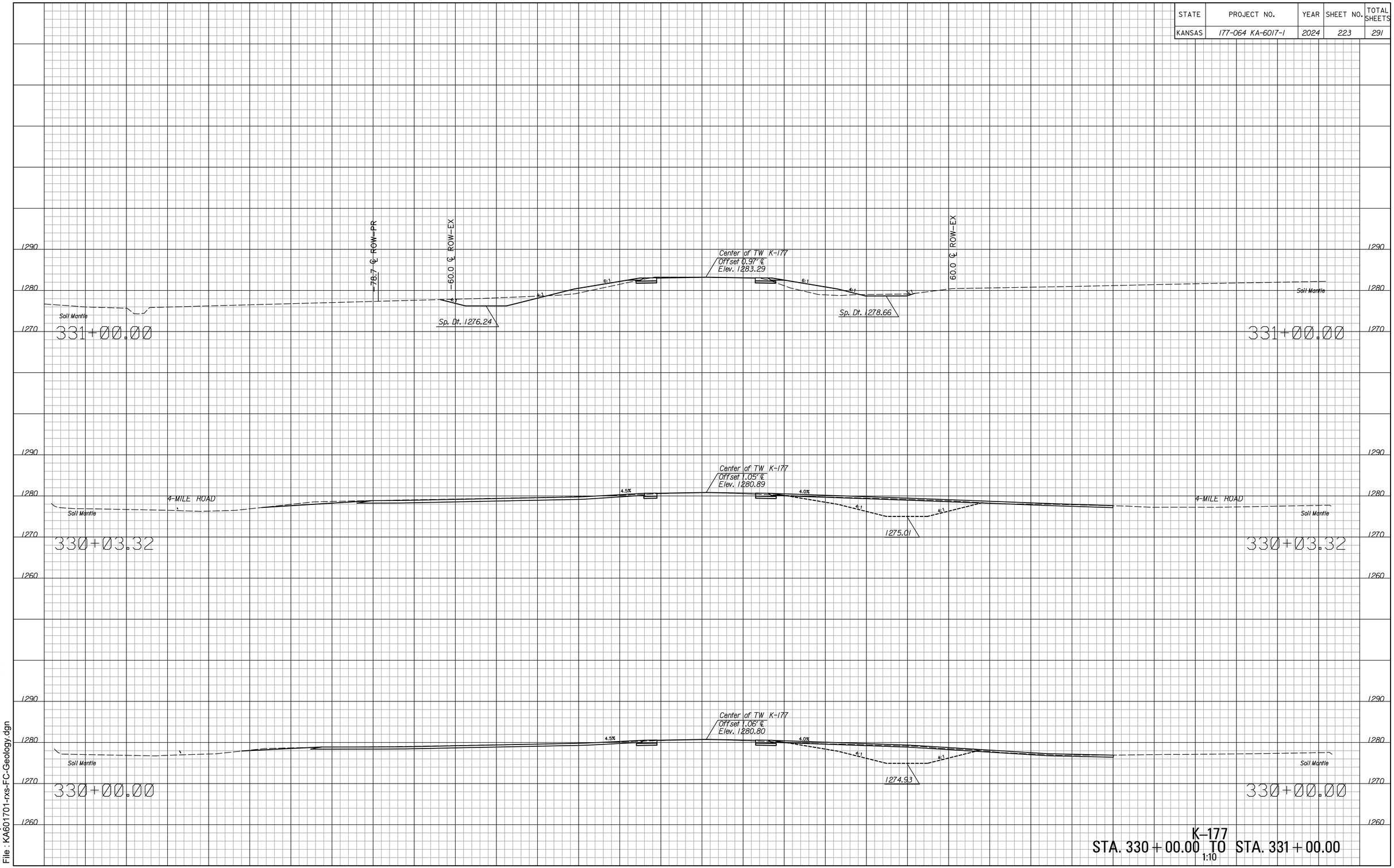
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	222	291



K-177
STA. 329+00.00 TO STA. 329+88.00
1:10

Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

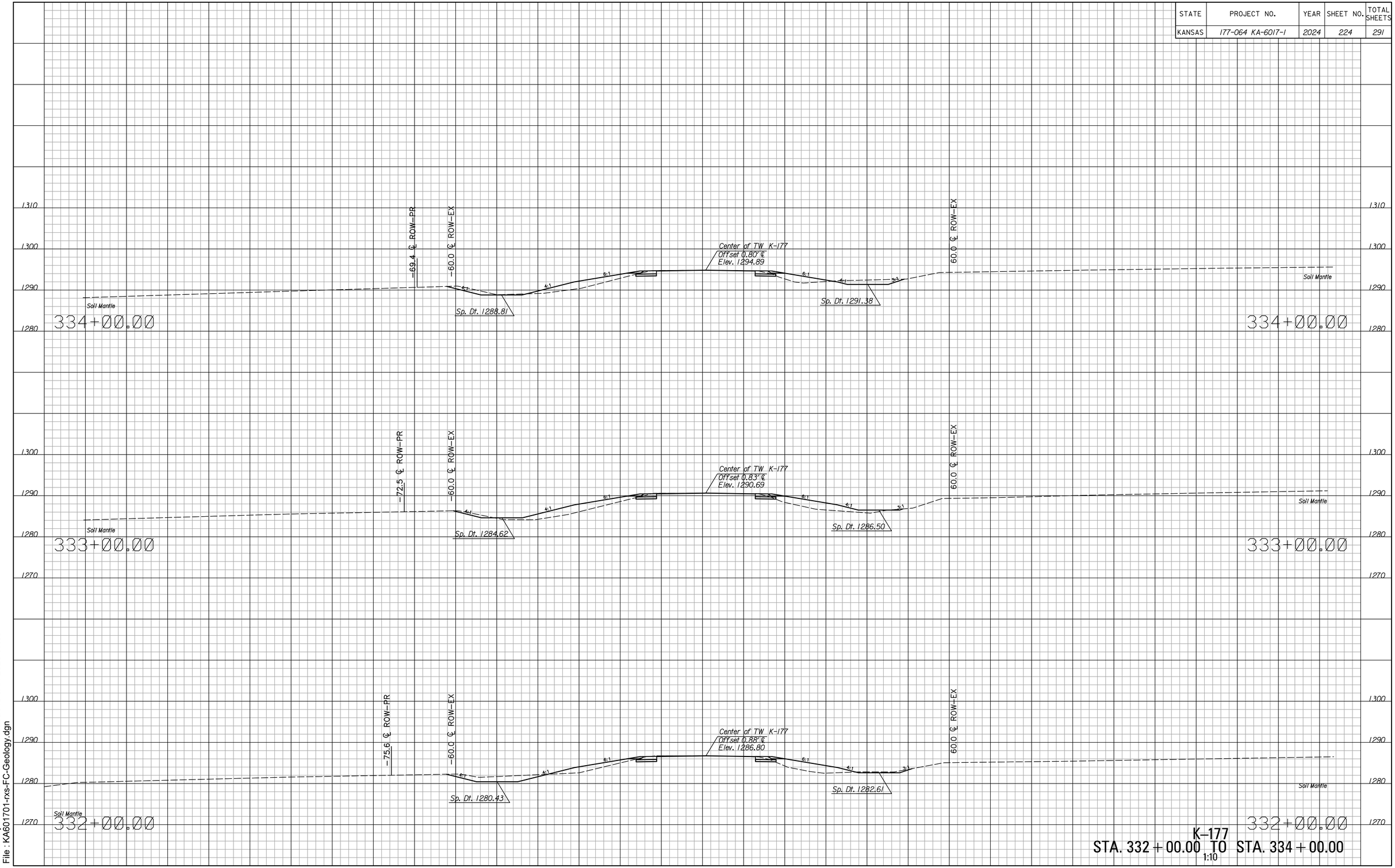
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	223	291



Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 330+00.00 TO STA. 331+00.00
1:10

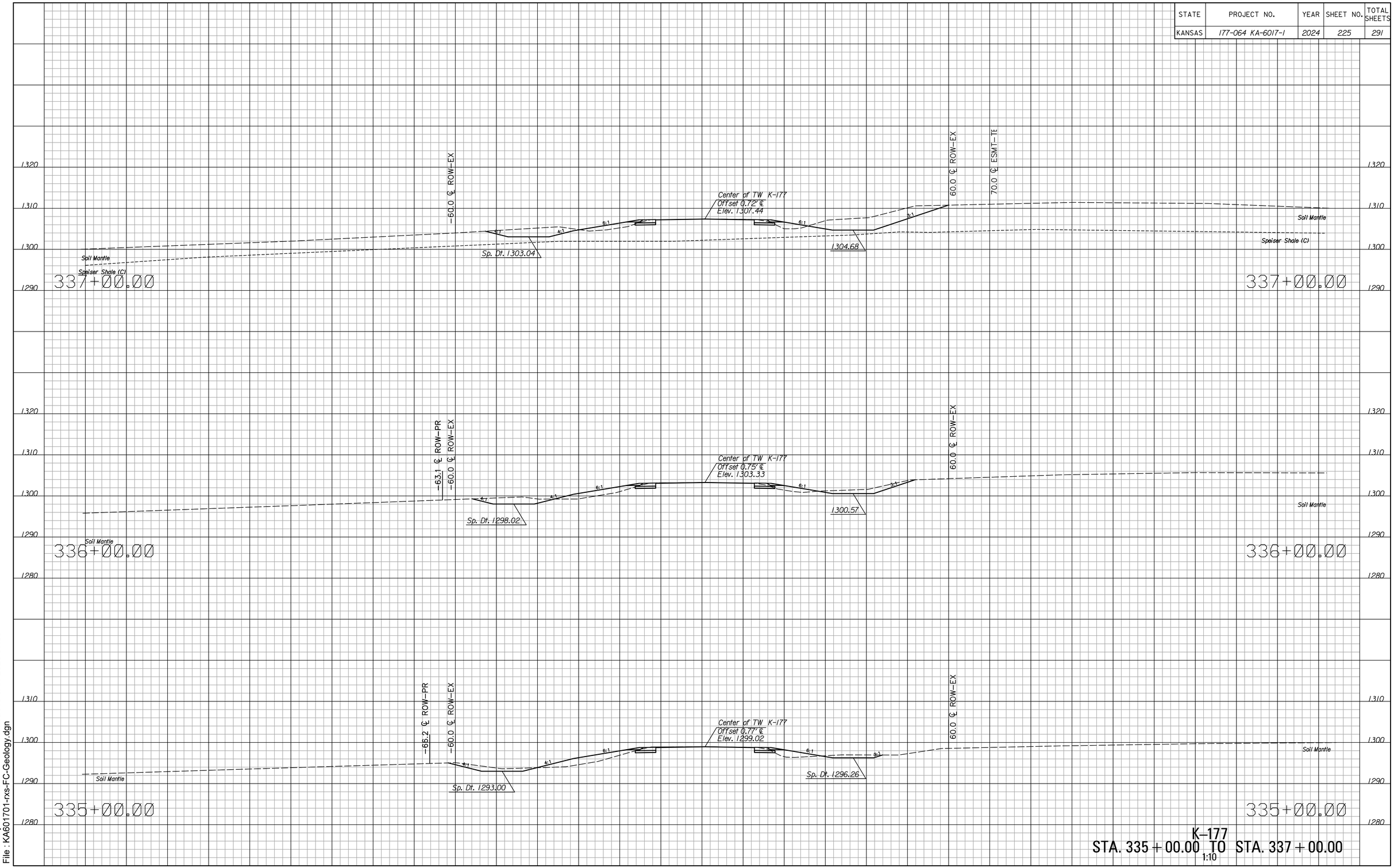
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	224	291



Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 332+00.00 TO STA. 334+00.00
1:10

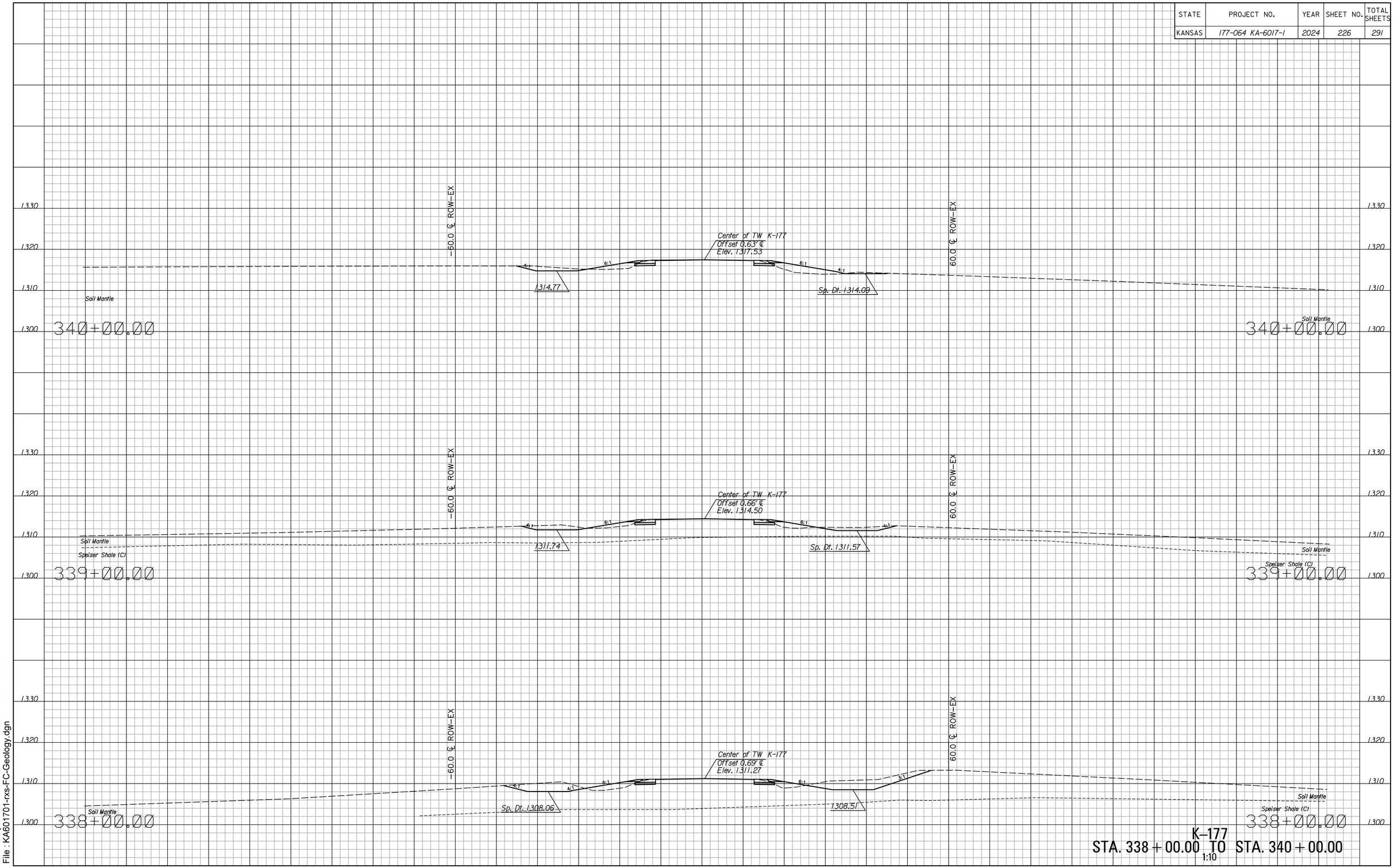
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	225	291



Plotted : 16-JAN-2025 07:53
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 335+00.00 TO STA. 337+00.00
1:10

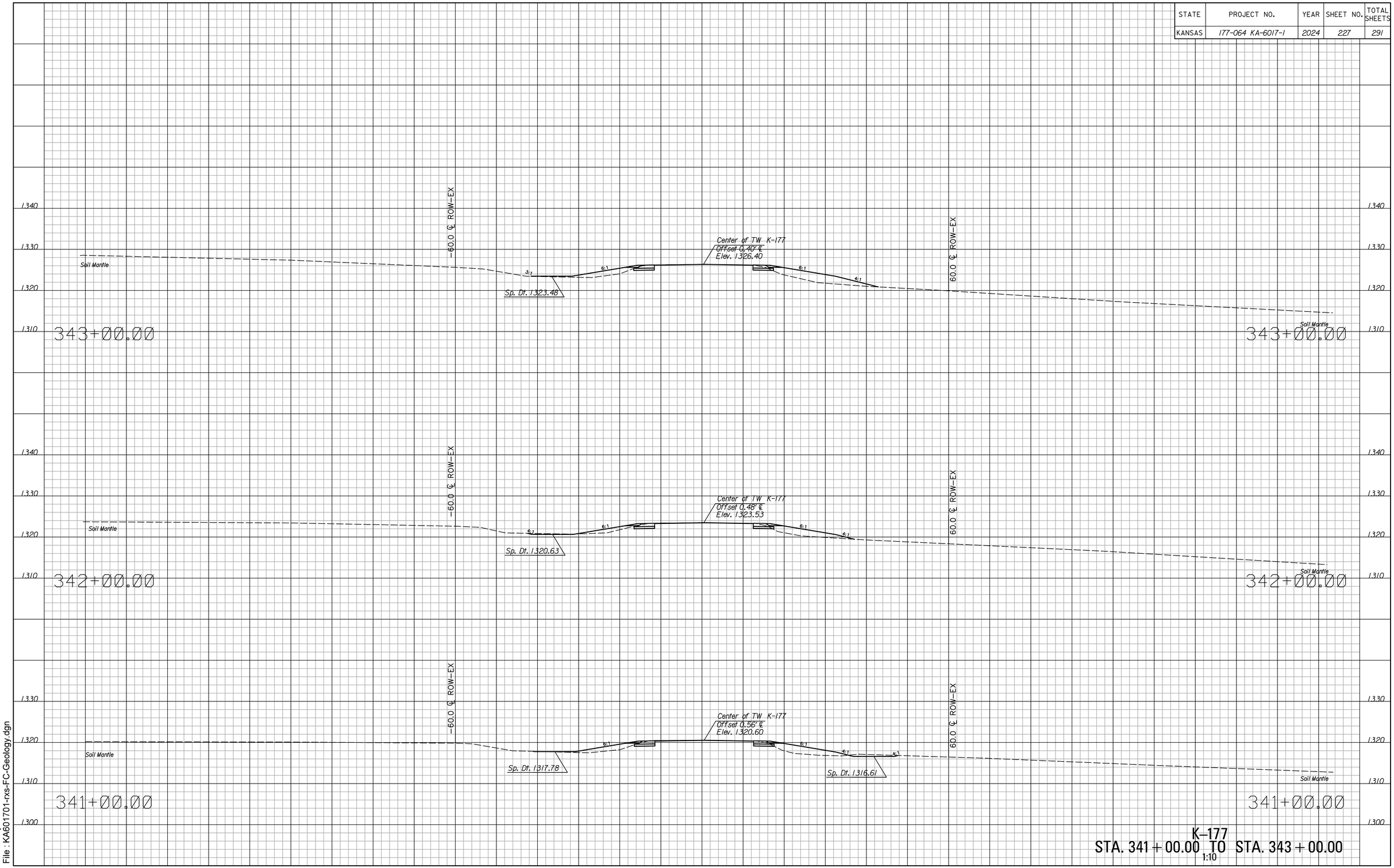
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	226	291



K-177
STA. 338+00.00 TO STA. 340+00.00
1:10

Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

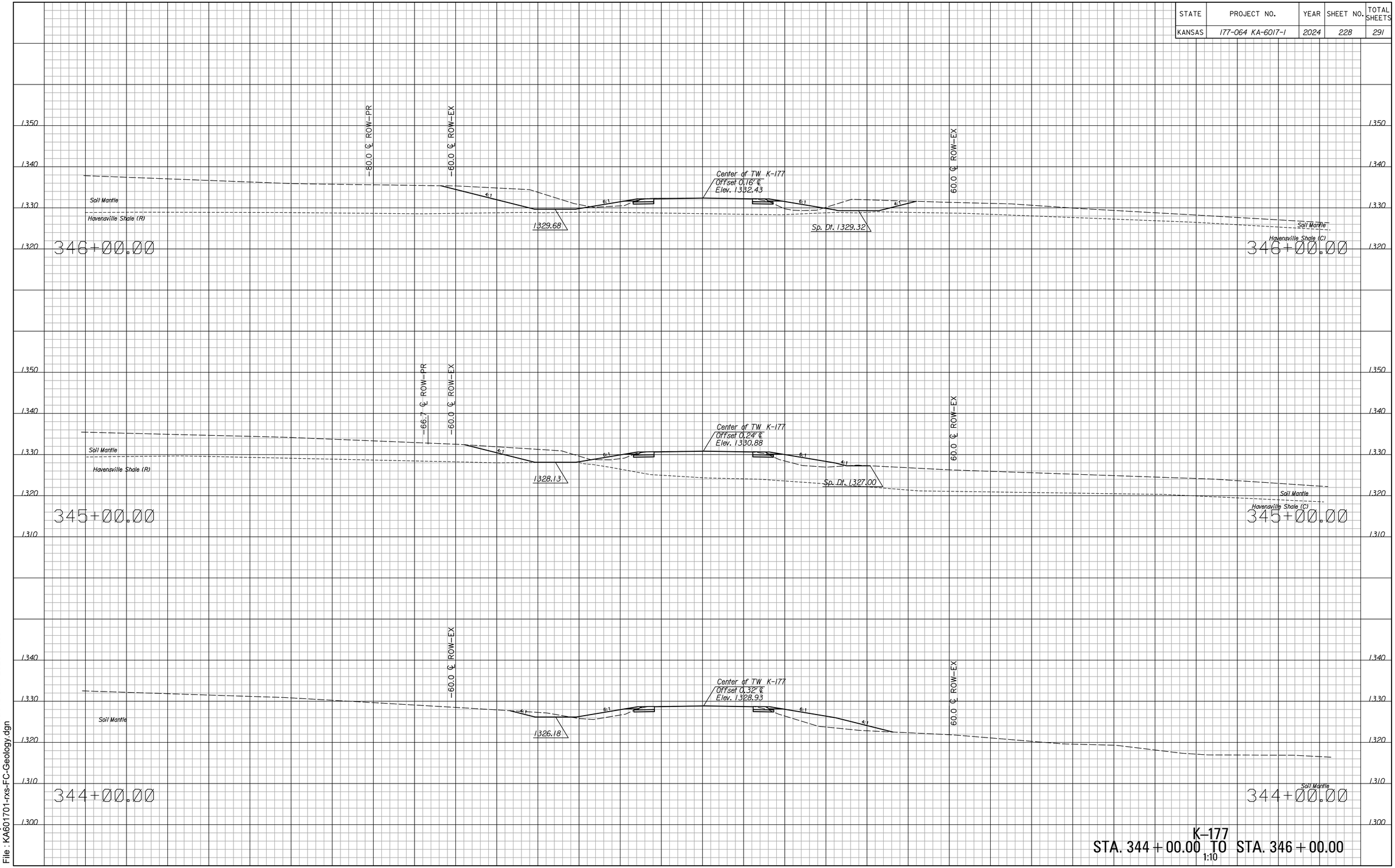
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	227	291



Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 341+00.00 TO STA. 343+00.00
1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	228	291

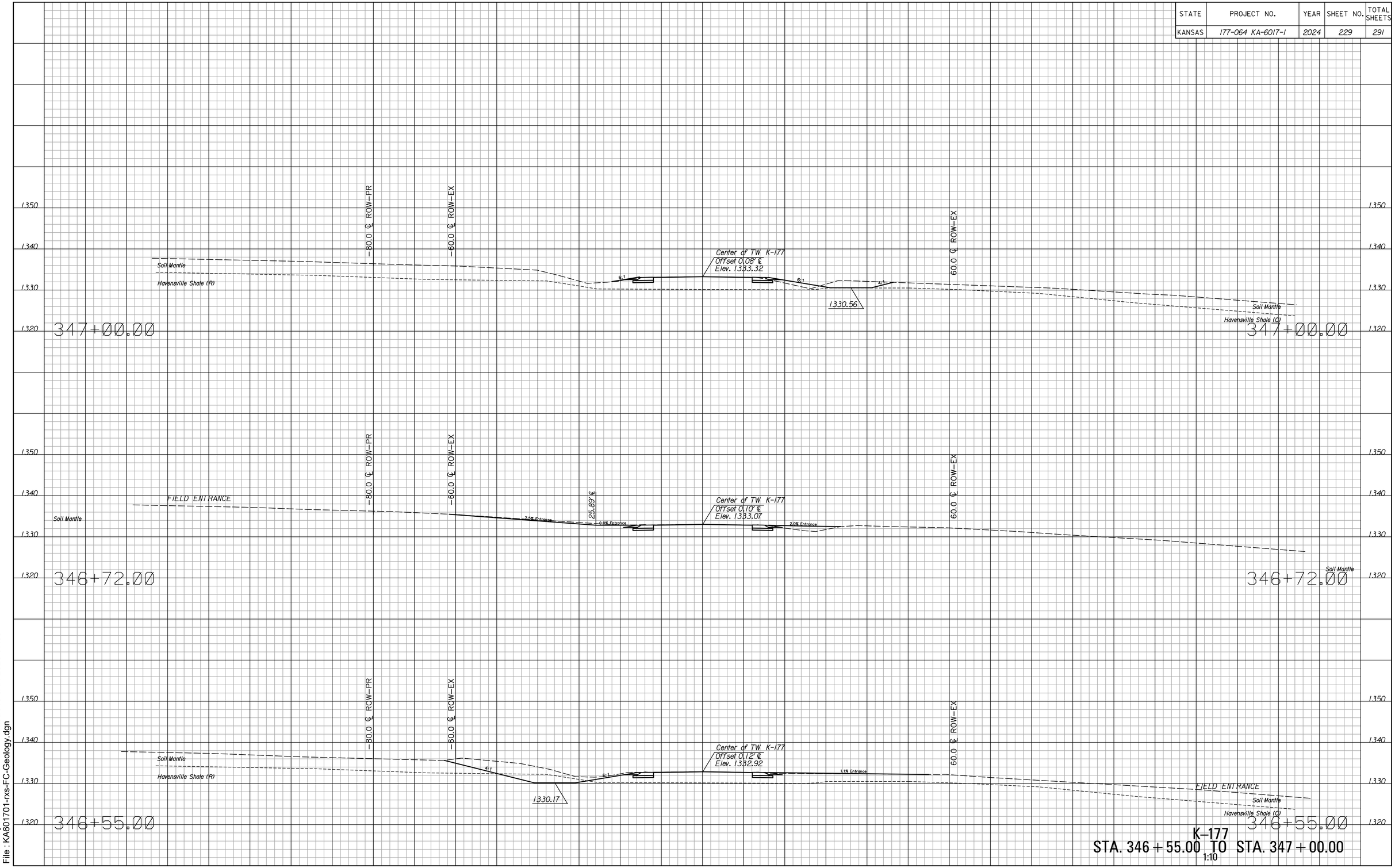


Drawn By: : mrockwell Plotted: 16-JAN-2025 07:53
File: KA601701-rxs-FC-Geology.dgn

K-177
STA. 344 + 00.00 TO STA. 346 + 00.00

1:10

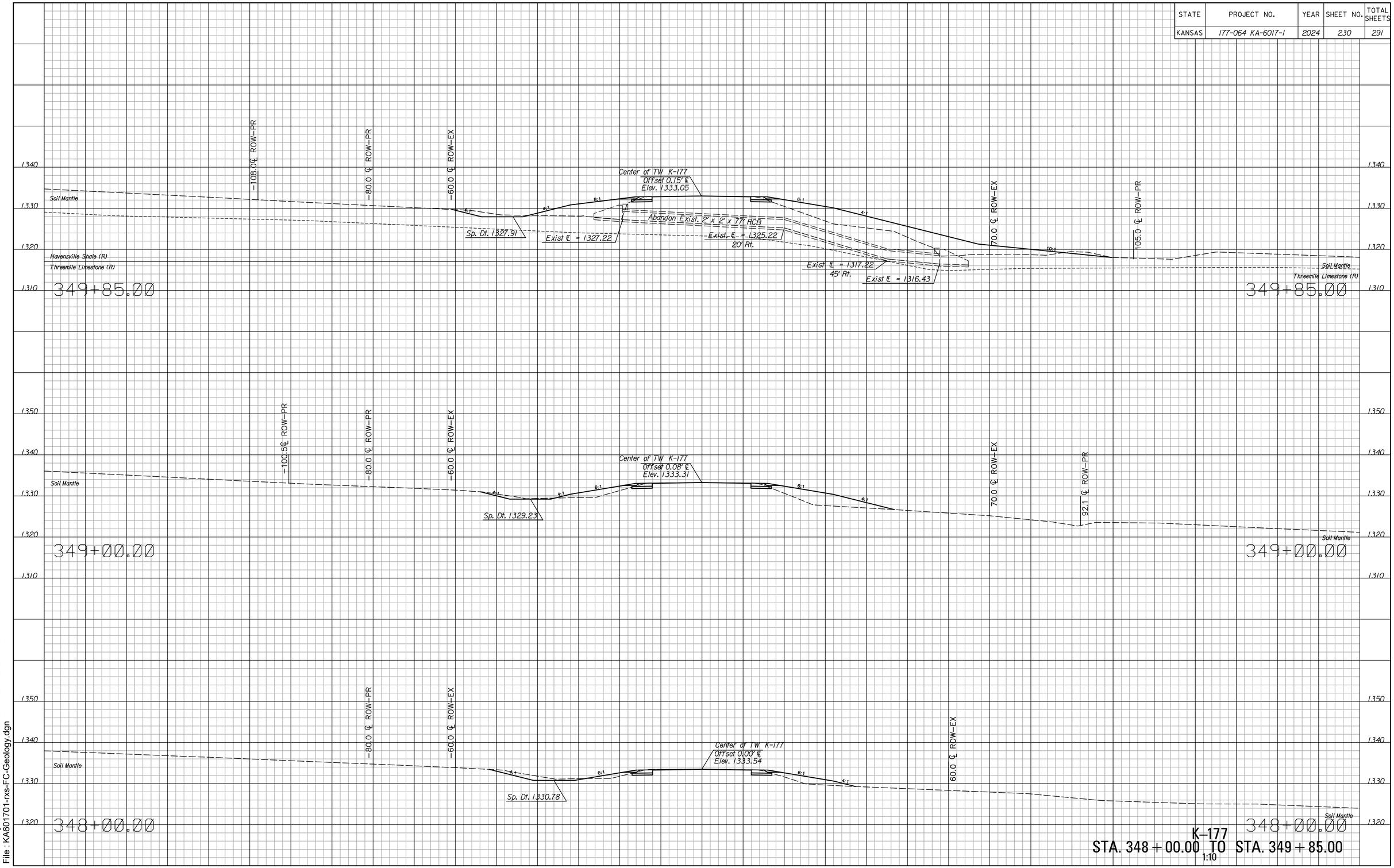
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	229	291



K-177
STA. 346 + 55.00 TO STA. 347 + 00.00
1:10

Plotted : 16-JAN-2025 07:53
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

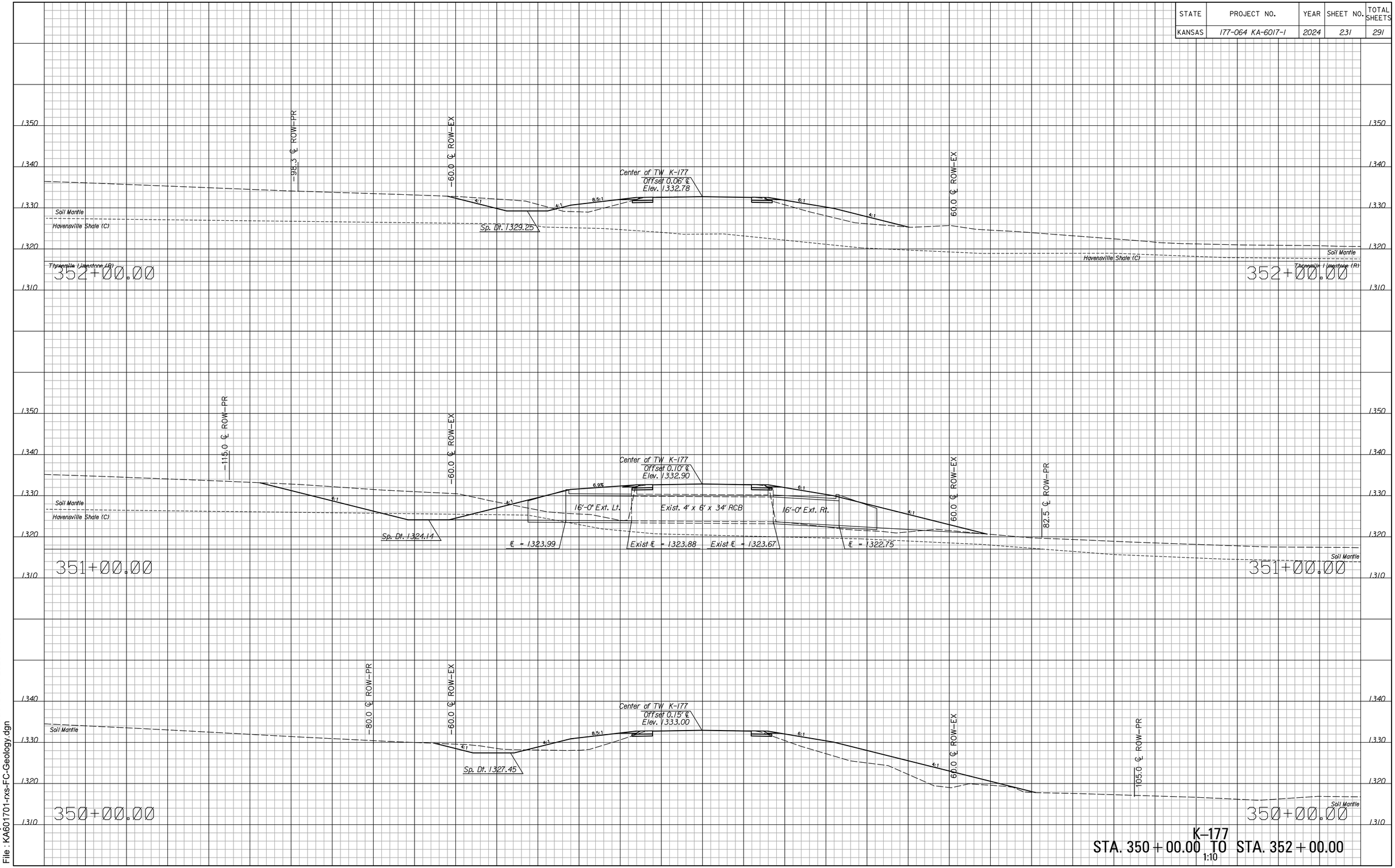
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	230	291



Plotted : 16-JAN-2025 07:53
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 348+00.00 TO STA. 349+85.00
1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	231	291

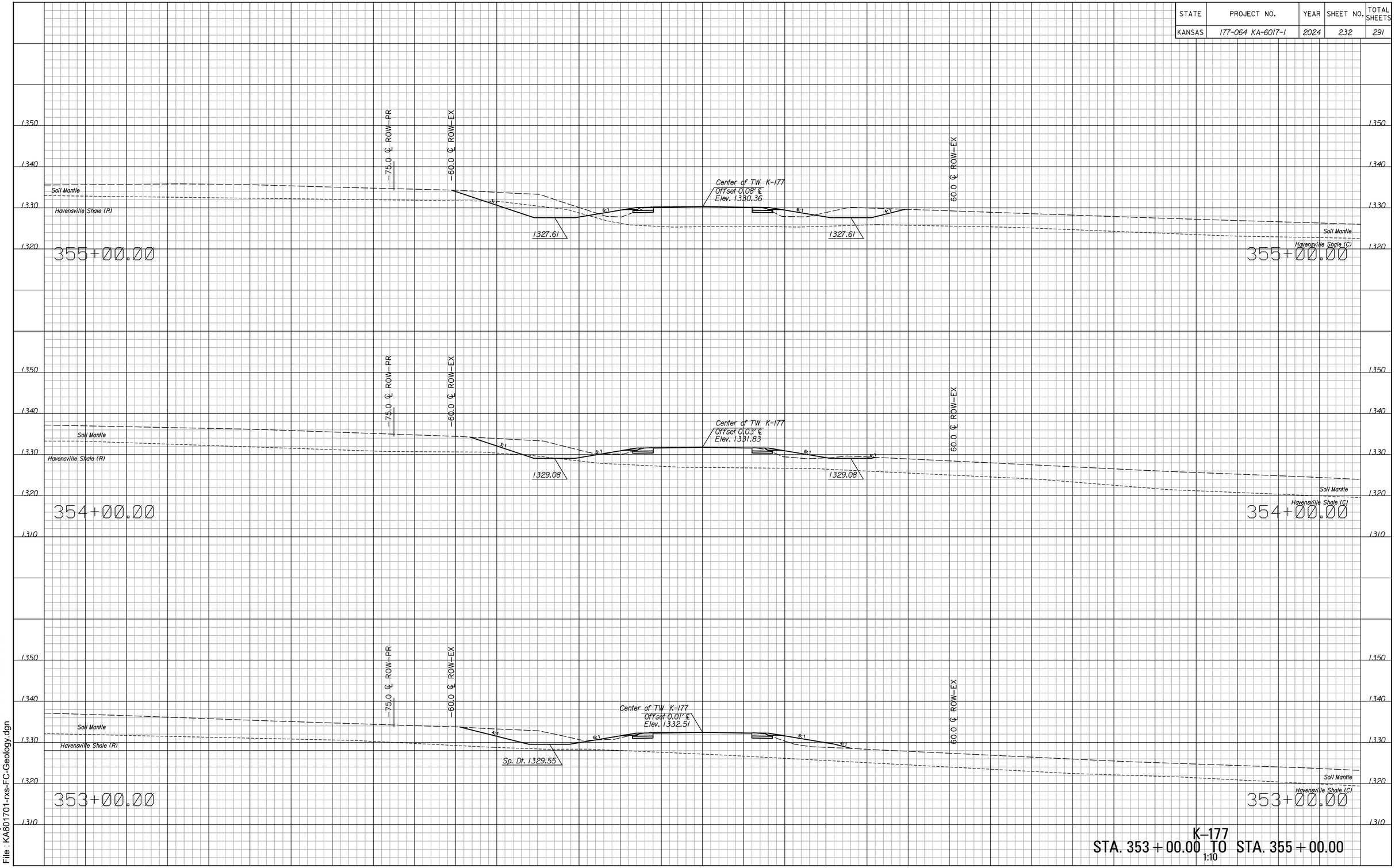


Drawn By : mrockwell
Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 350 + 00.00 TO STA. 352 + 00.00

1:10

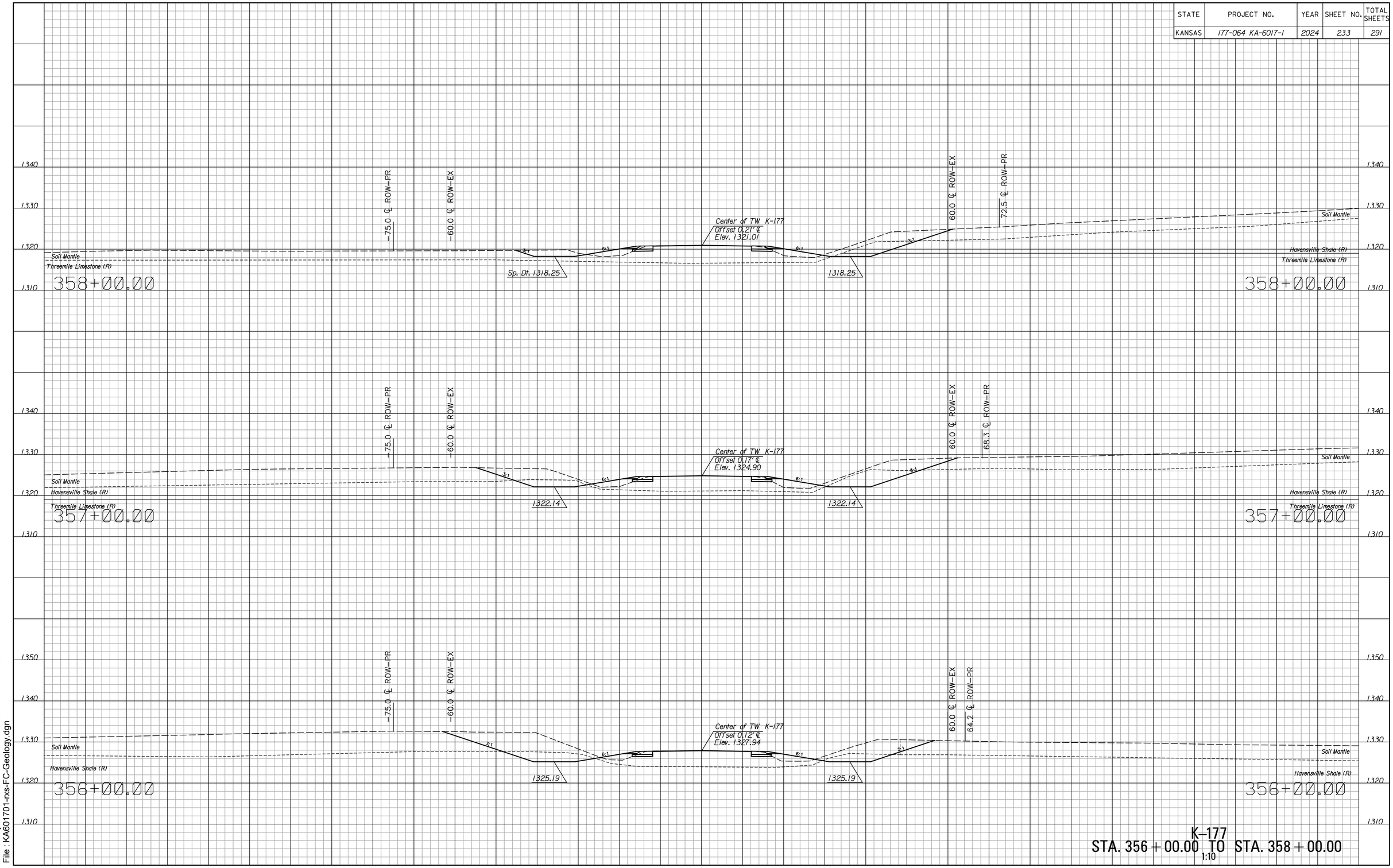
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	232	291



K-177
STA. 353+00.00 TO STA. 355+00.00
1:10

Plotted : 16-JAN-2025 07:53
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

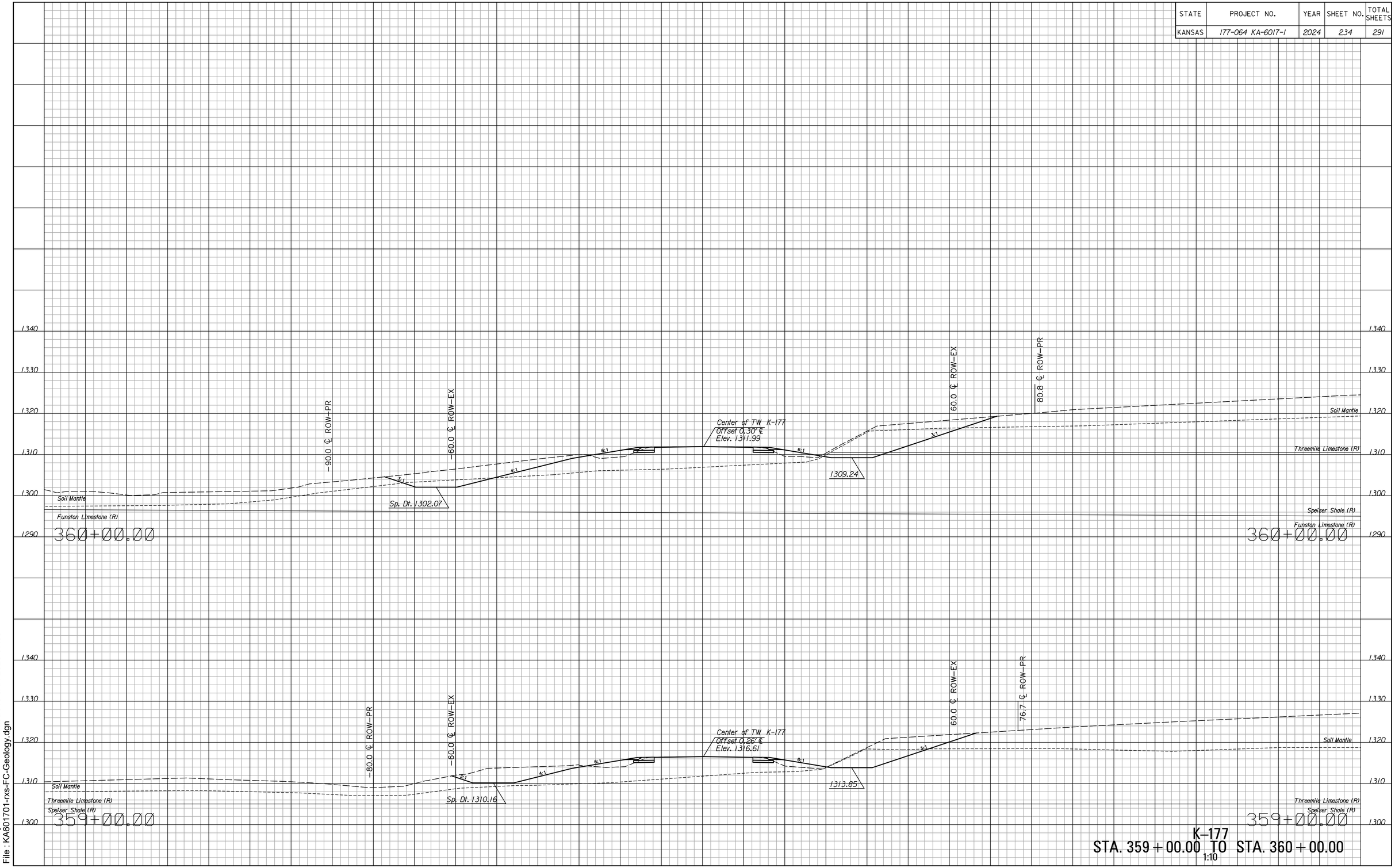
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	233	291



K-177
STA. 356+00.00 TO STA. 358+00.00
1:10

Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

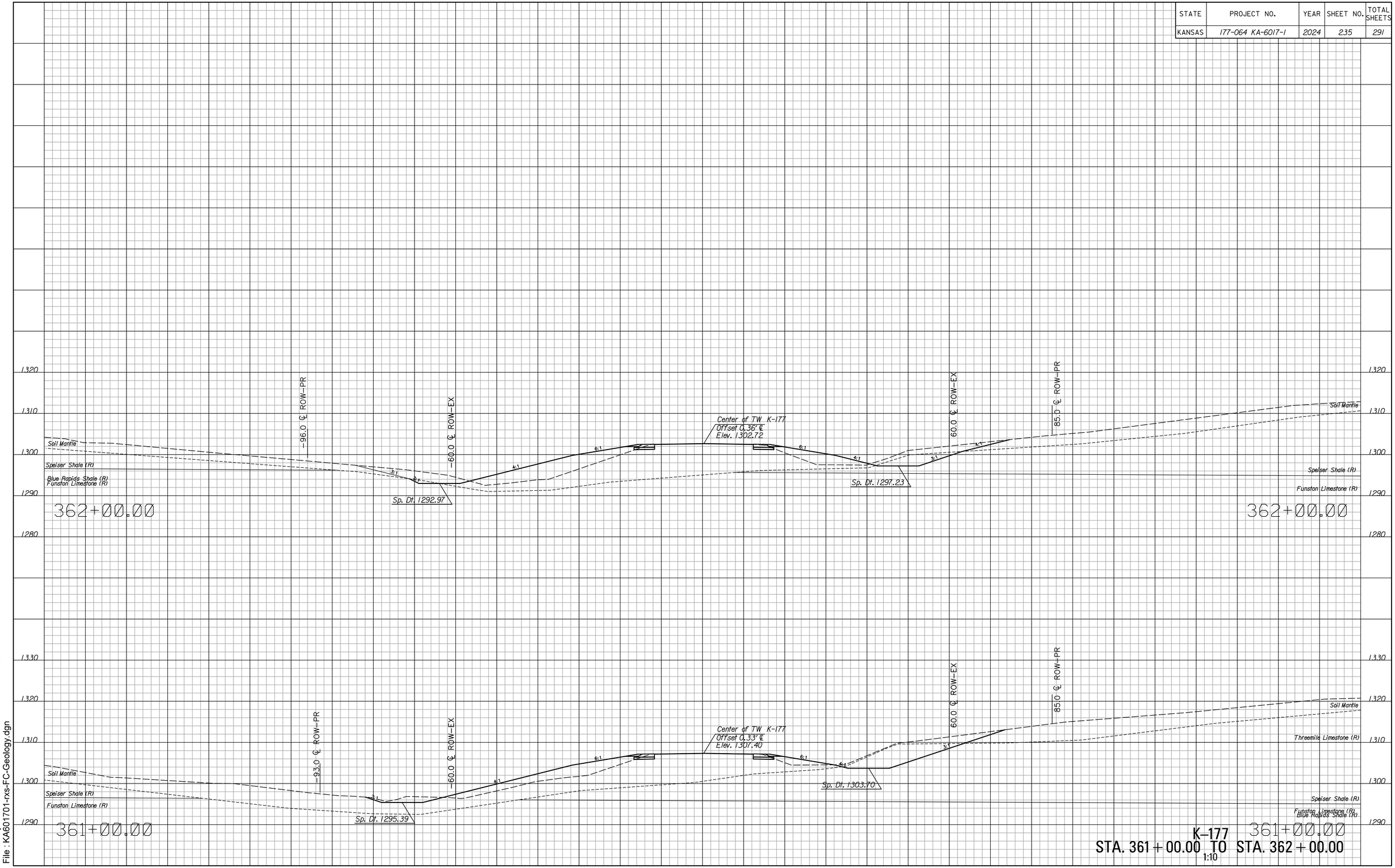
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	234	291



K-177
STA. 359+00.00 TO STA. 360+00.00
1:10

Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn
Plotted : 16-JAN-2025 07:53

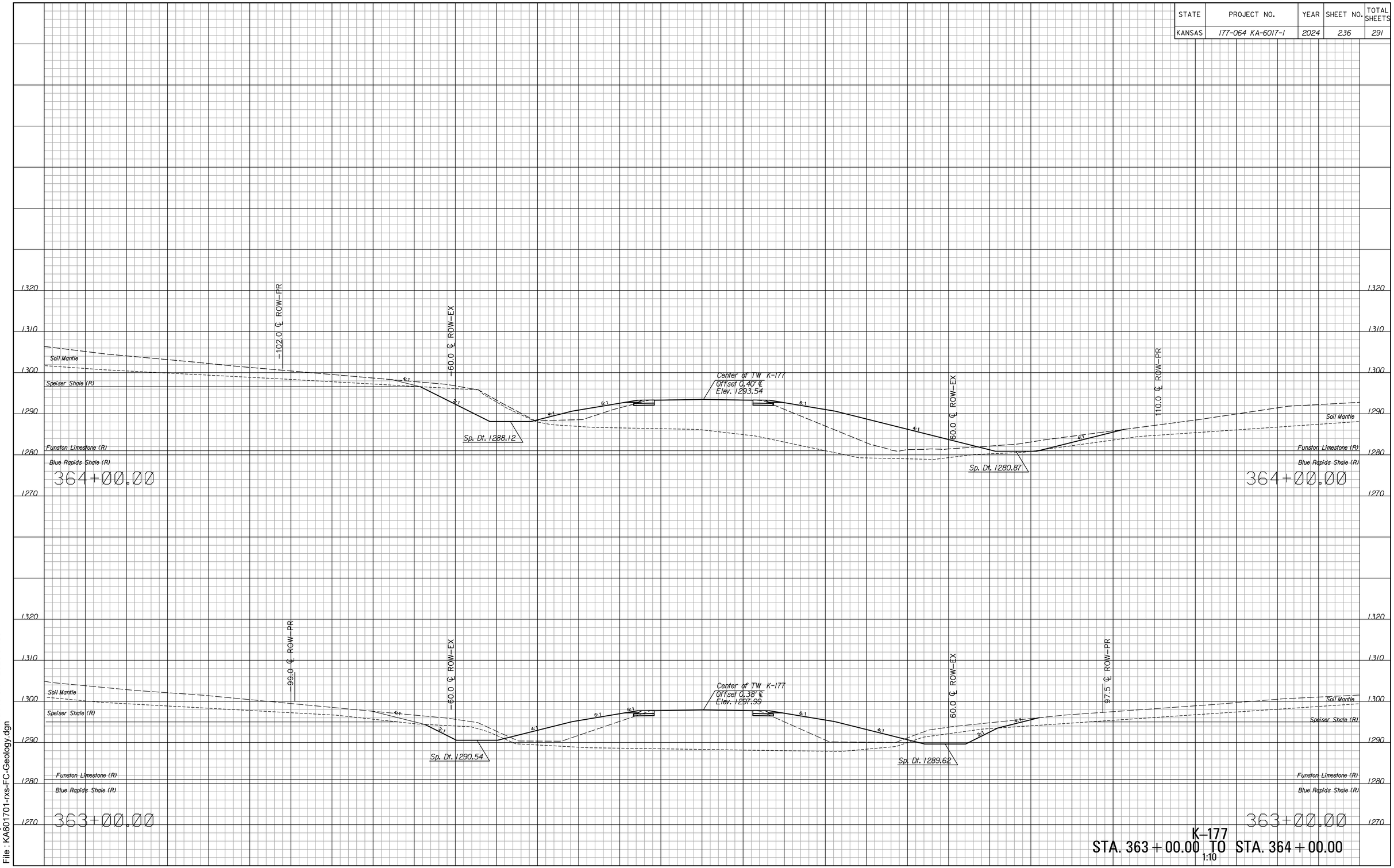
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	235	291



K–177 361+00.00
STA. 361+00.00 TO STA. 362+00.00
1:10

Drawn By : mrockwell Plotted : 16-JAN-2025 07:53
File : KA601701-rxs-FC-Geology.dgn

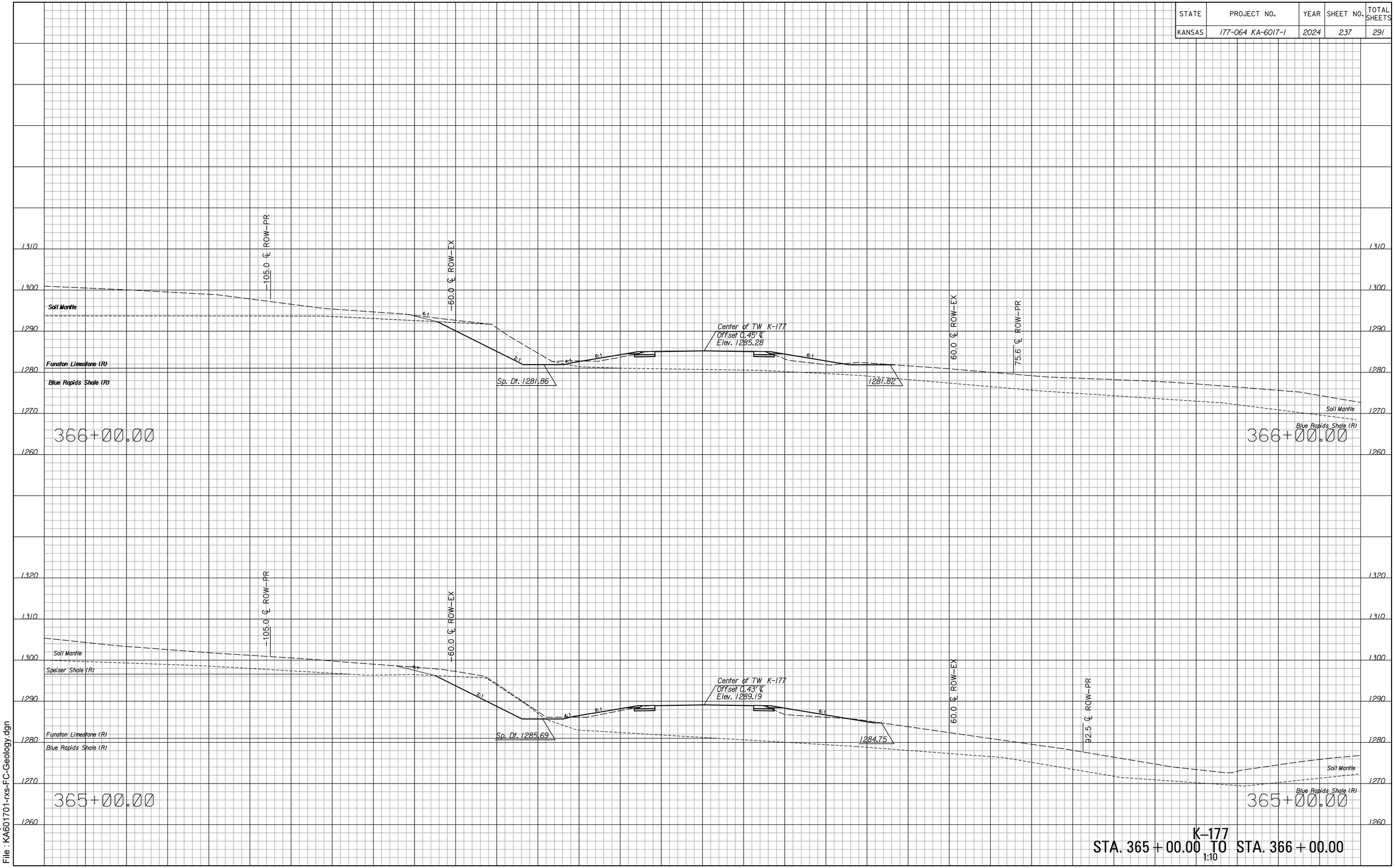
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	236	291



K-177
STA. 363+00.00 TO STA. 364+00.00
1:10

Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn
Plotted : 16-JAN-2025 07:53

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	237	291

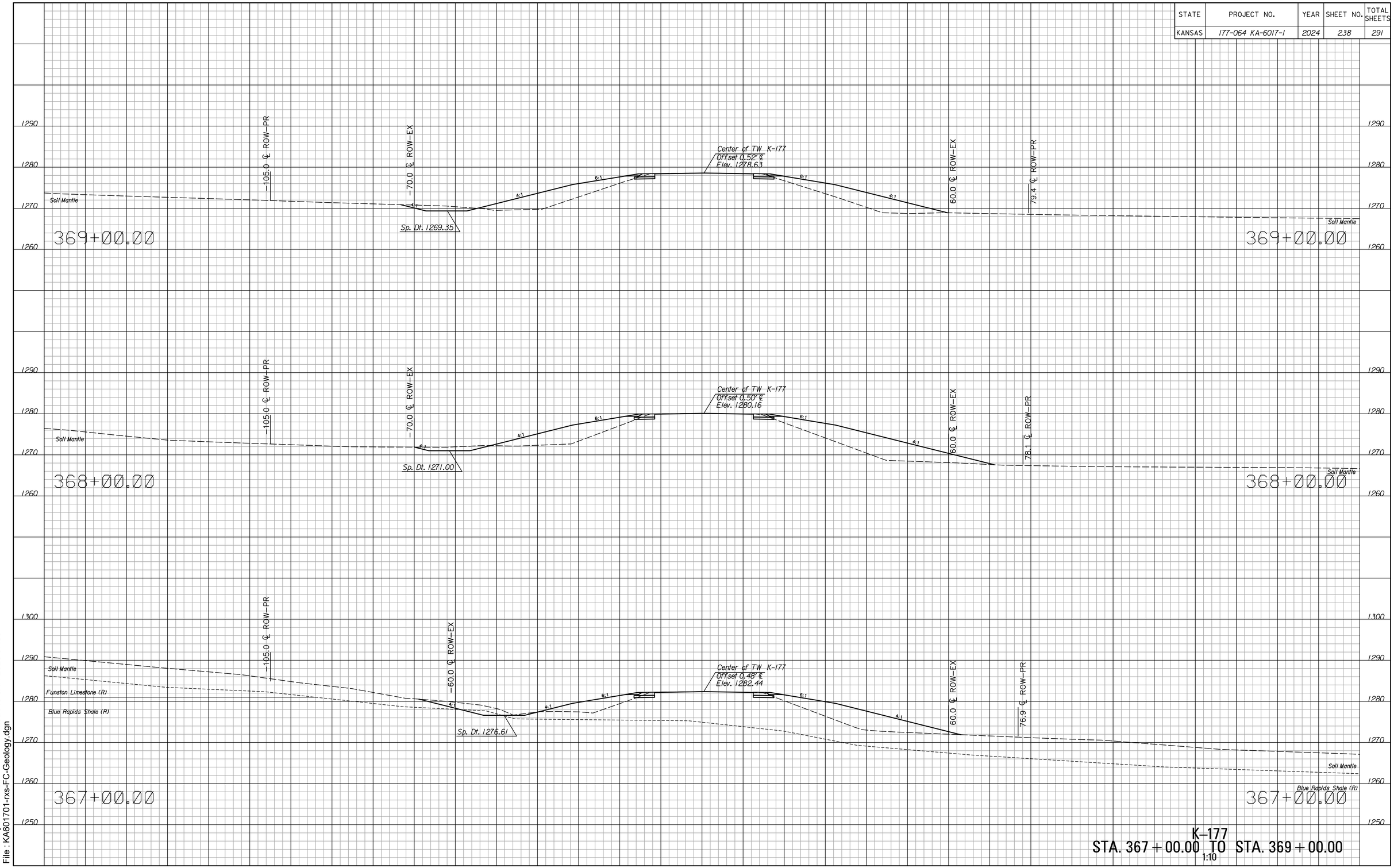


Plotted : 16-JAN-2025 07:53
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 365+00.00 TO STA. 366+00.00

1:10

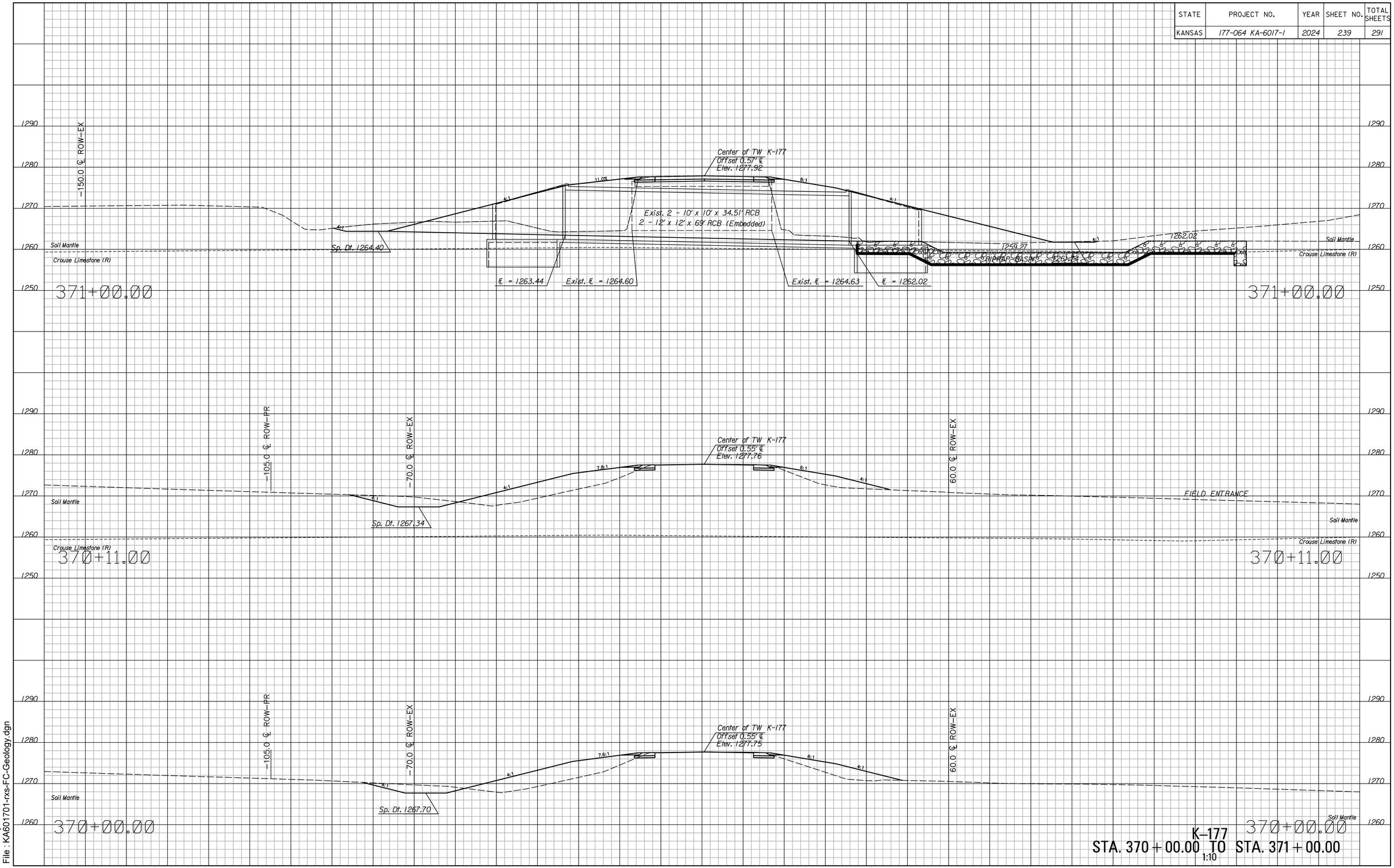
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	238	291



Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn
Plotted : 16-JAN-2025 07:53

K-177
STA. 367+00.00 TO STA. 369+00.00
1:10

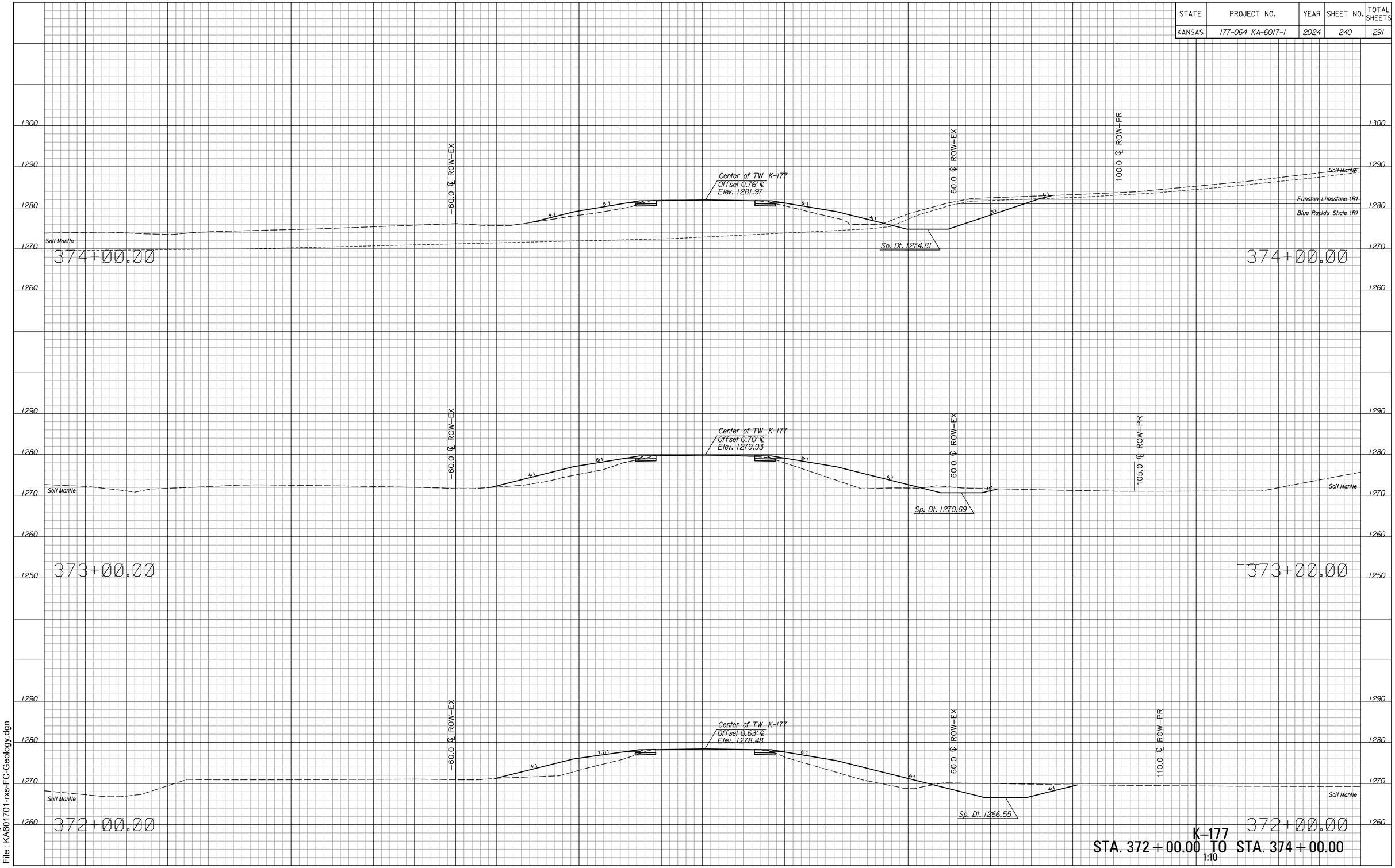
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	239	291



Plotted : 16-JAN-2025 07:53
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 370+00.00 TO STA. 371+00.00
1:10

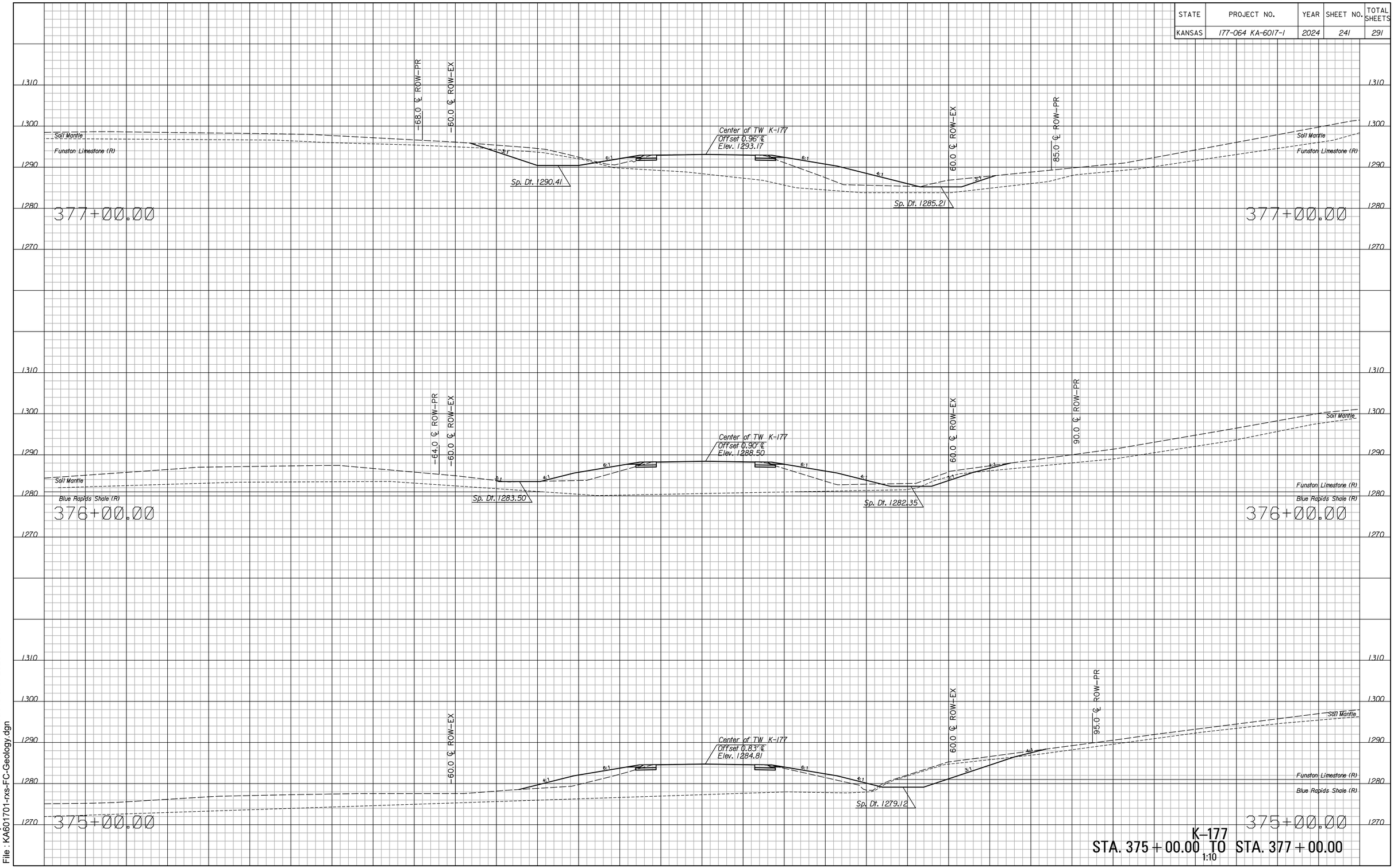
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	240	291



Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 372+00.00 TO STA. 374+00.00
1:10

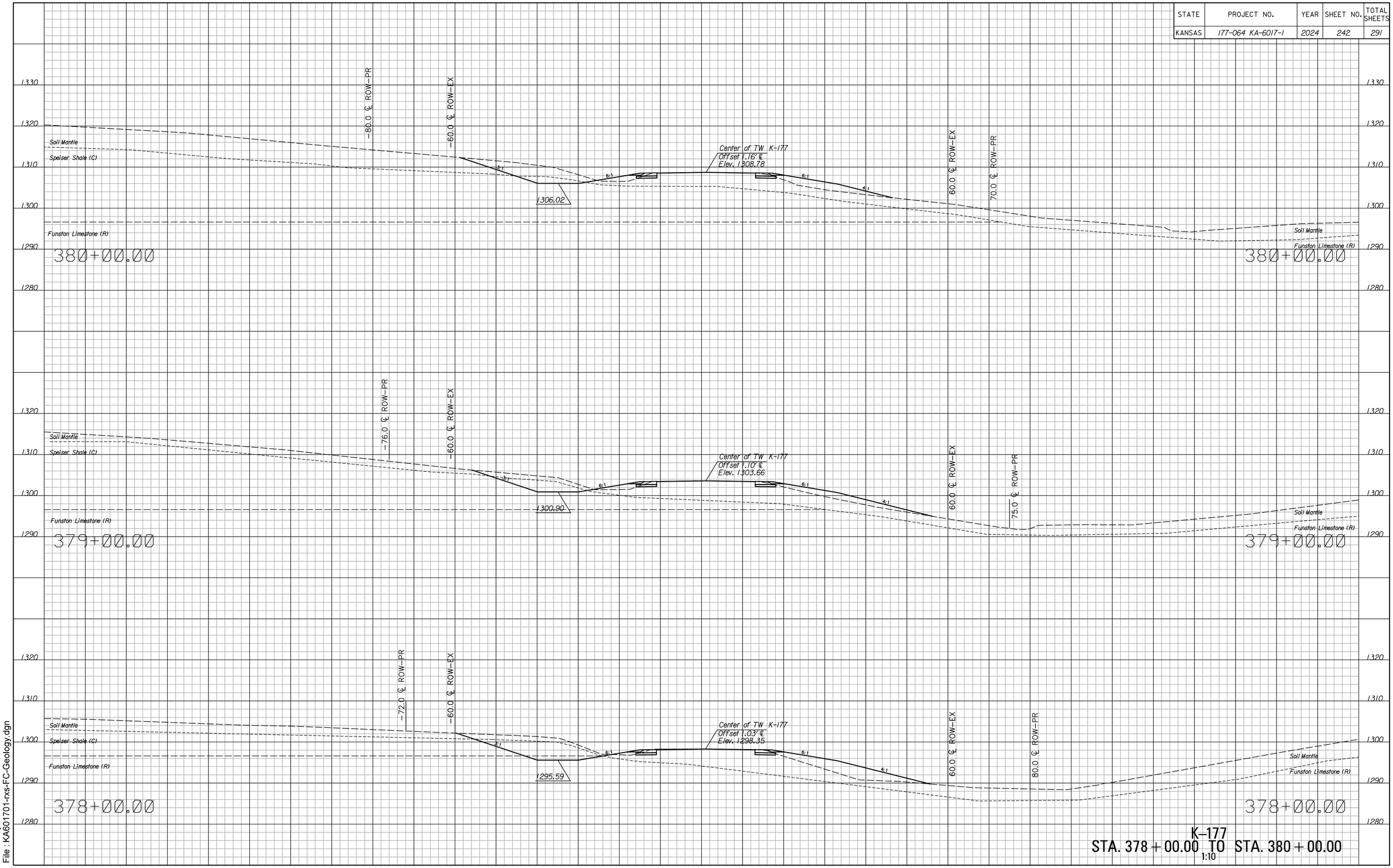
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	241	291



Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 375 + 00.00 TO STA. 377 + 00.00
1:10

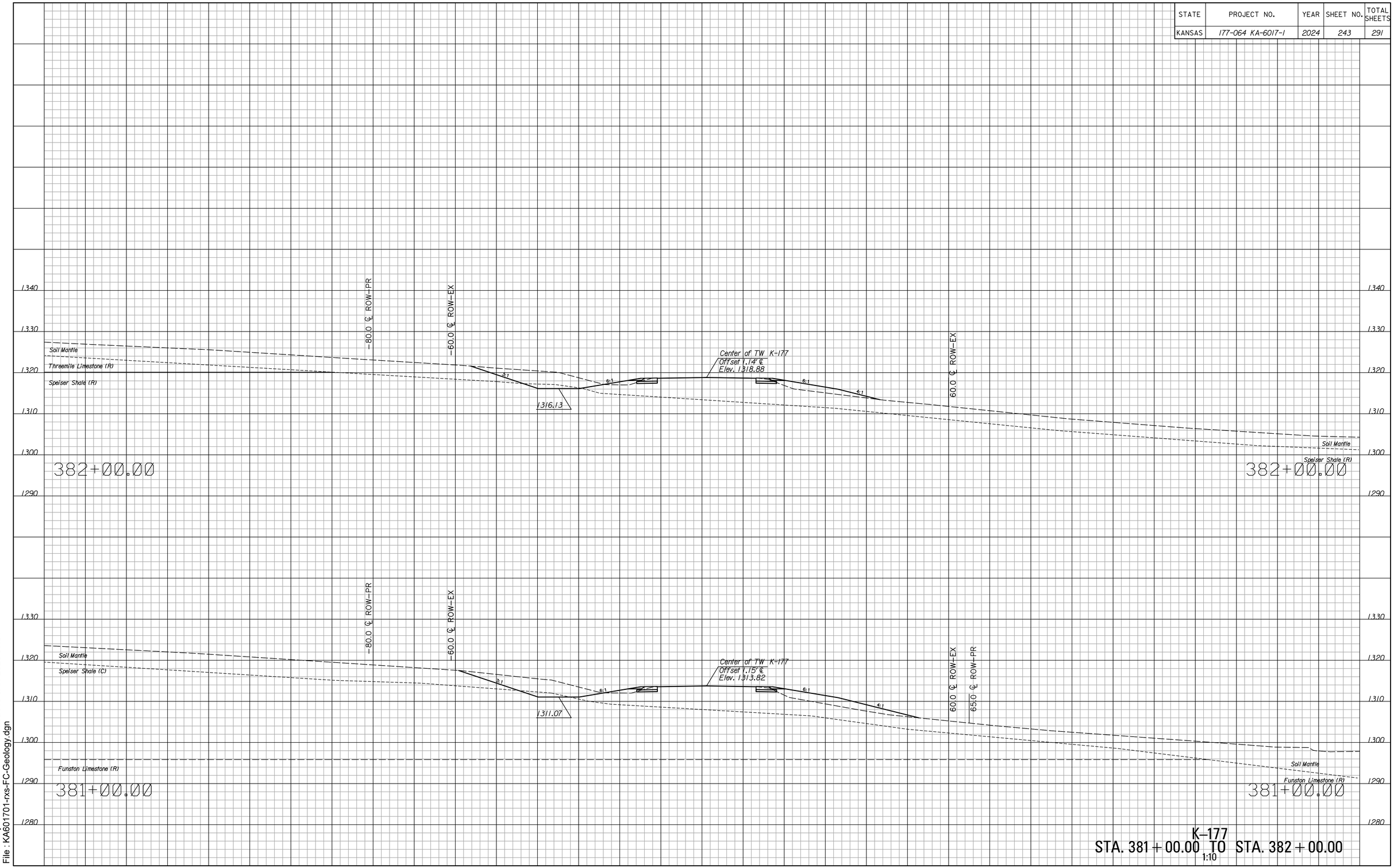
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	242	291



K-177
STA. 378+00.00 TO STA. 380+00.00
1:10

Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

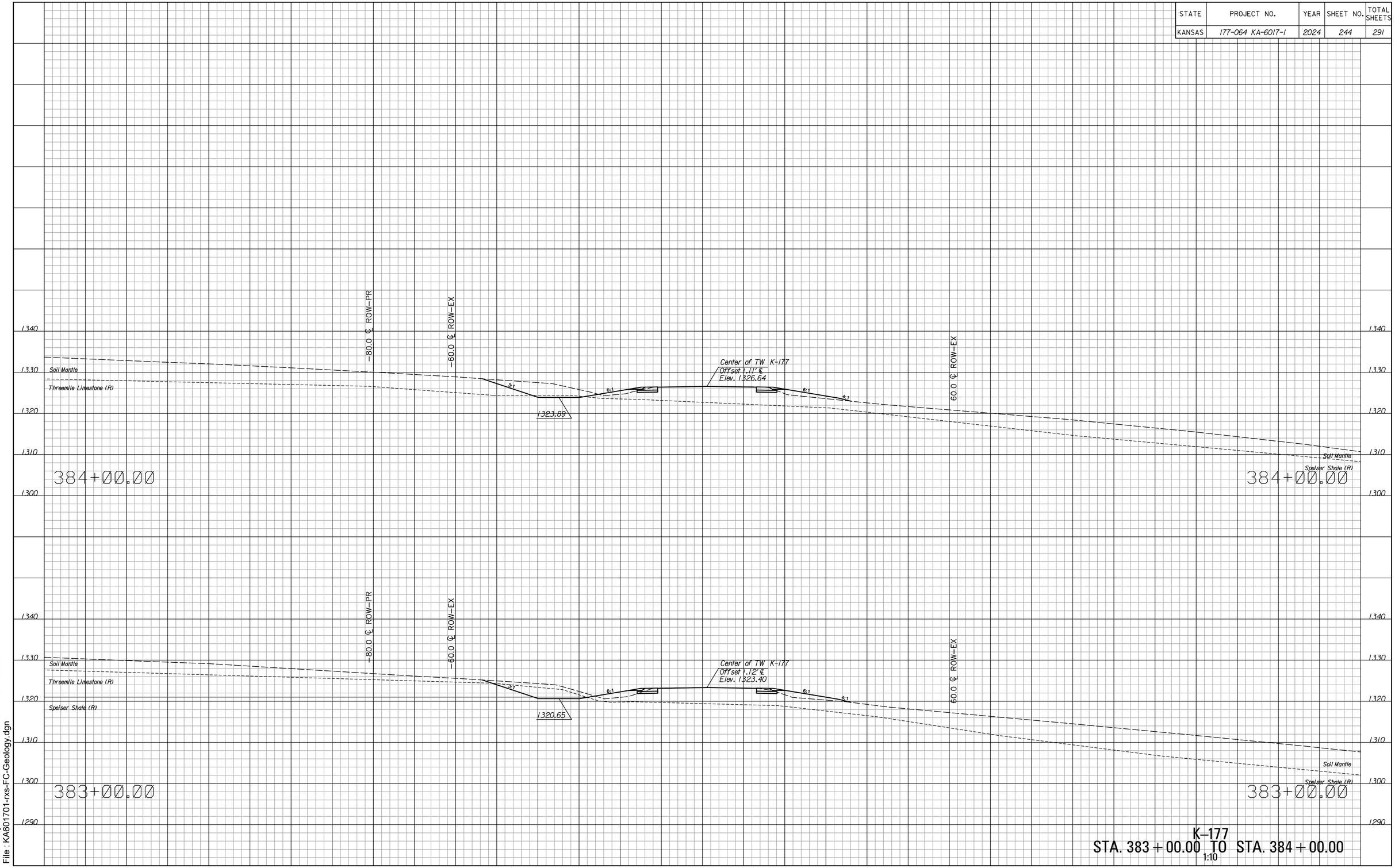
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	243	291



K-177
STA. 381+00.00 TO STA. 382+00.00
1:10

Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn
Plotted : 16-JAN-2025 07:54

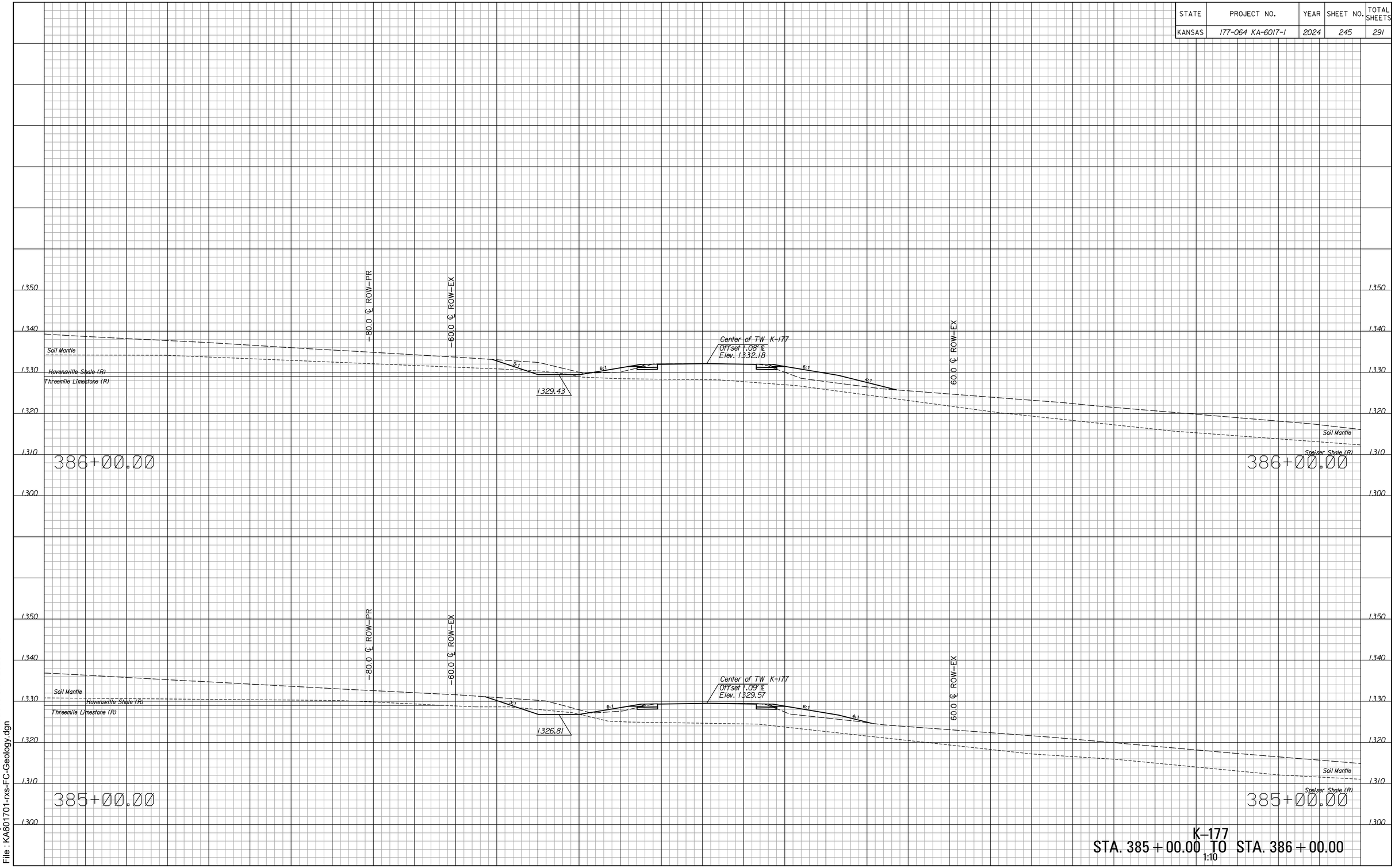
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	244	291



Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn
Plotted : 16-JAN-2025 07:54

K–177
STA. 383+00.00 TO STA. 384+00.00
1:10

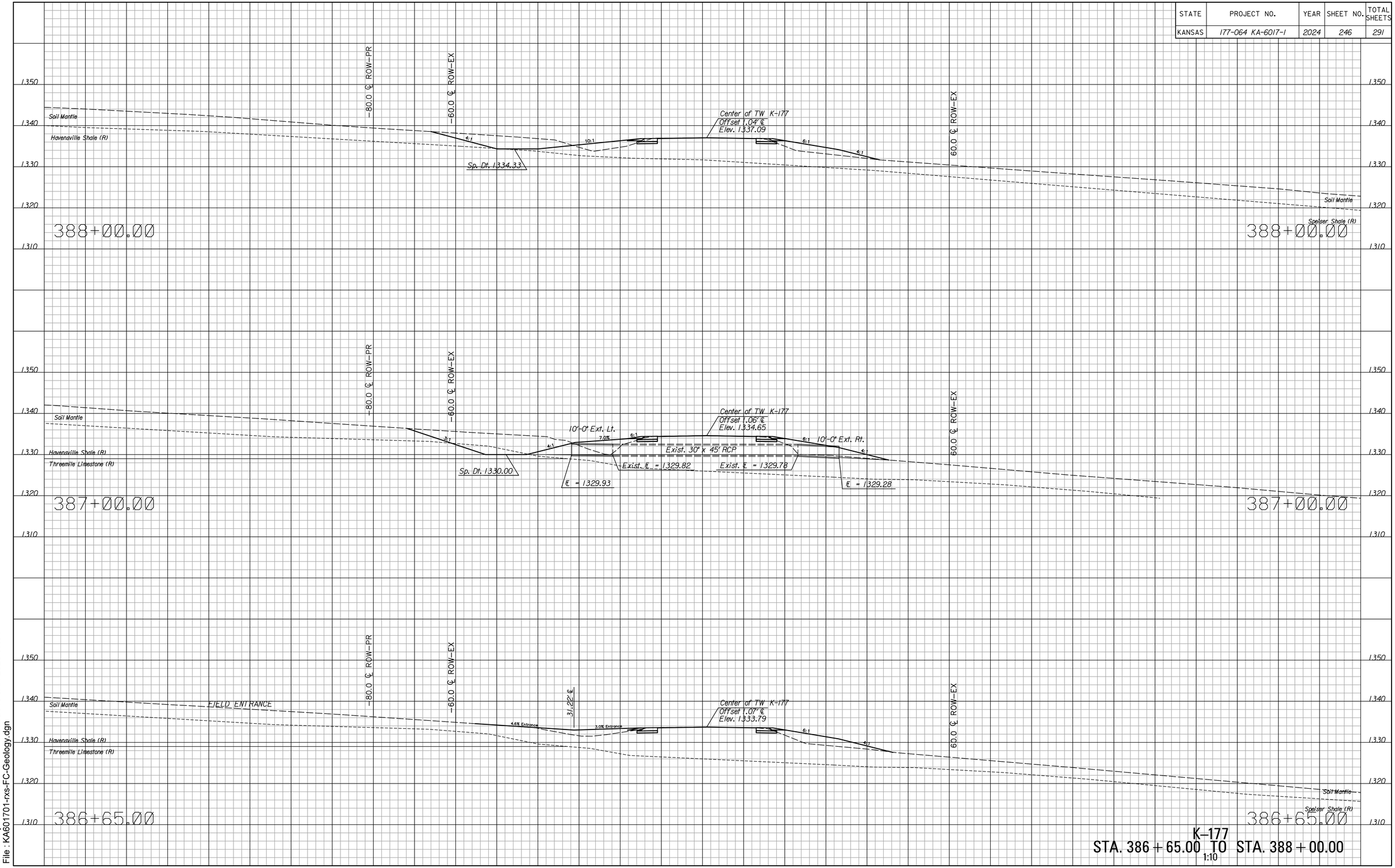
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	245	291



K-177
STA. 385+00.00 TO STA. 386+00.00
1:10

Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

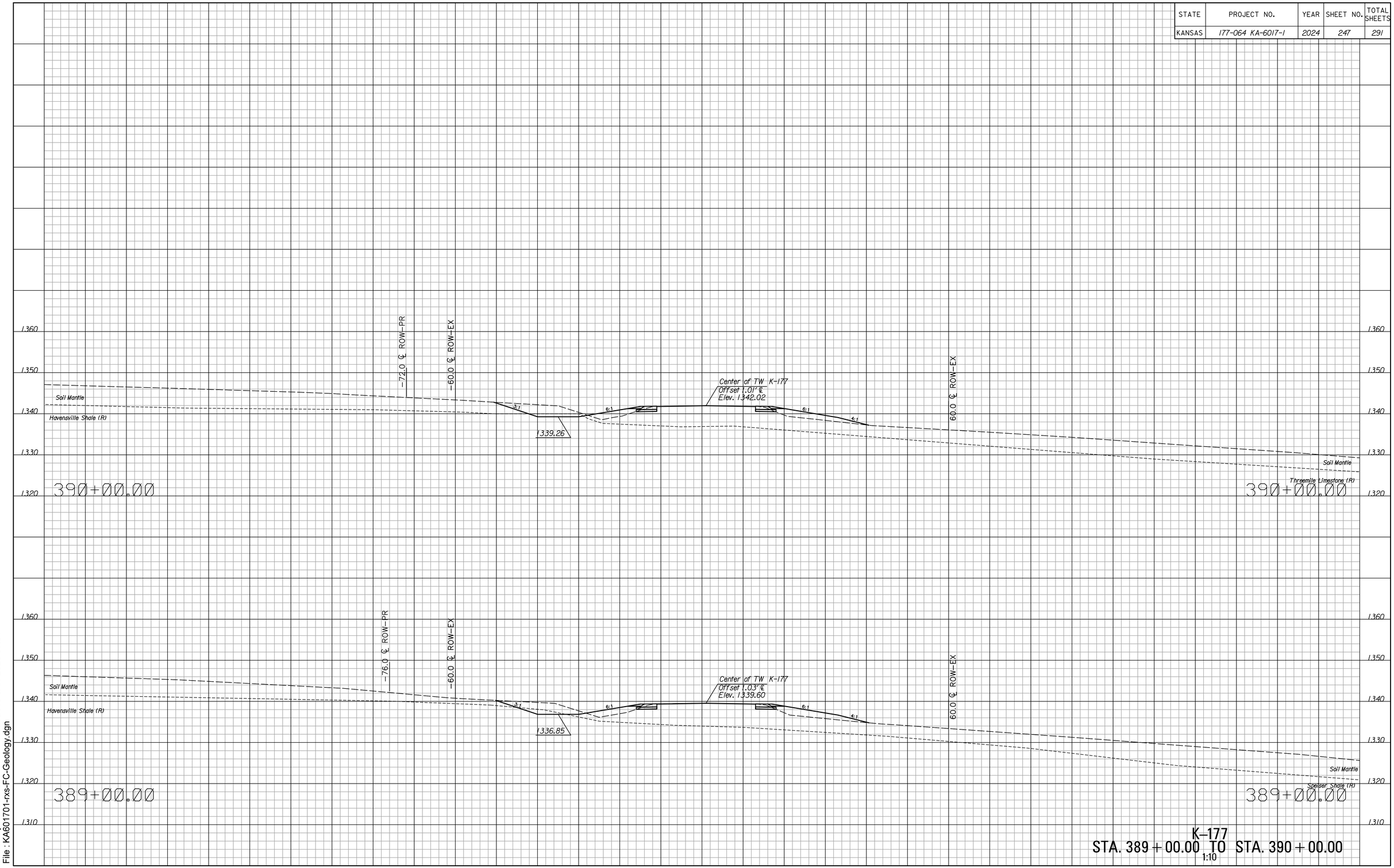
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	246	291



Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 386+65.00 TO STA. 388+00.00
1:10

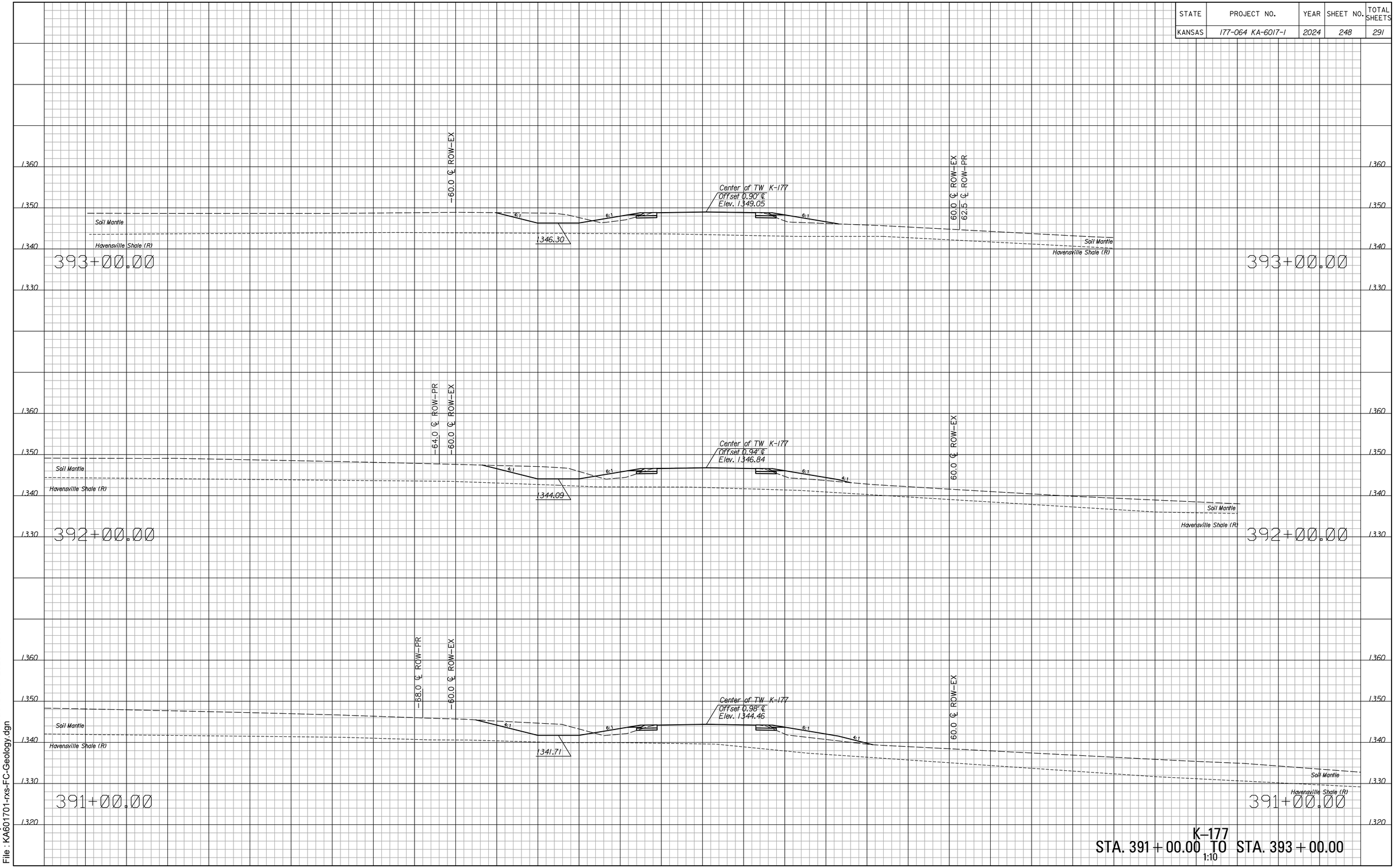
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	247	291



K-177
STA. 389+00.00 TO STA. 390+00.00
1:10

Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

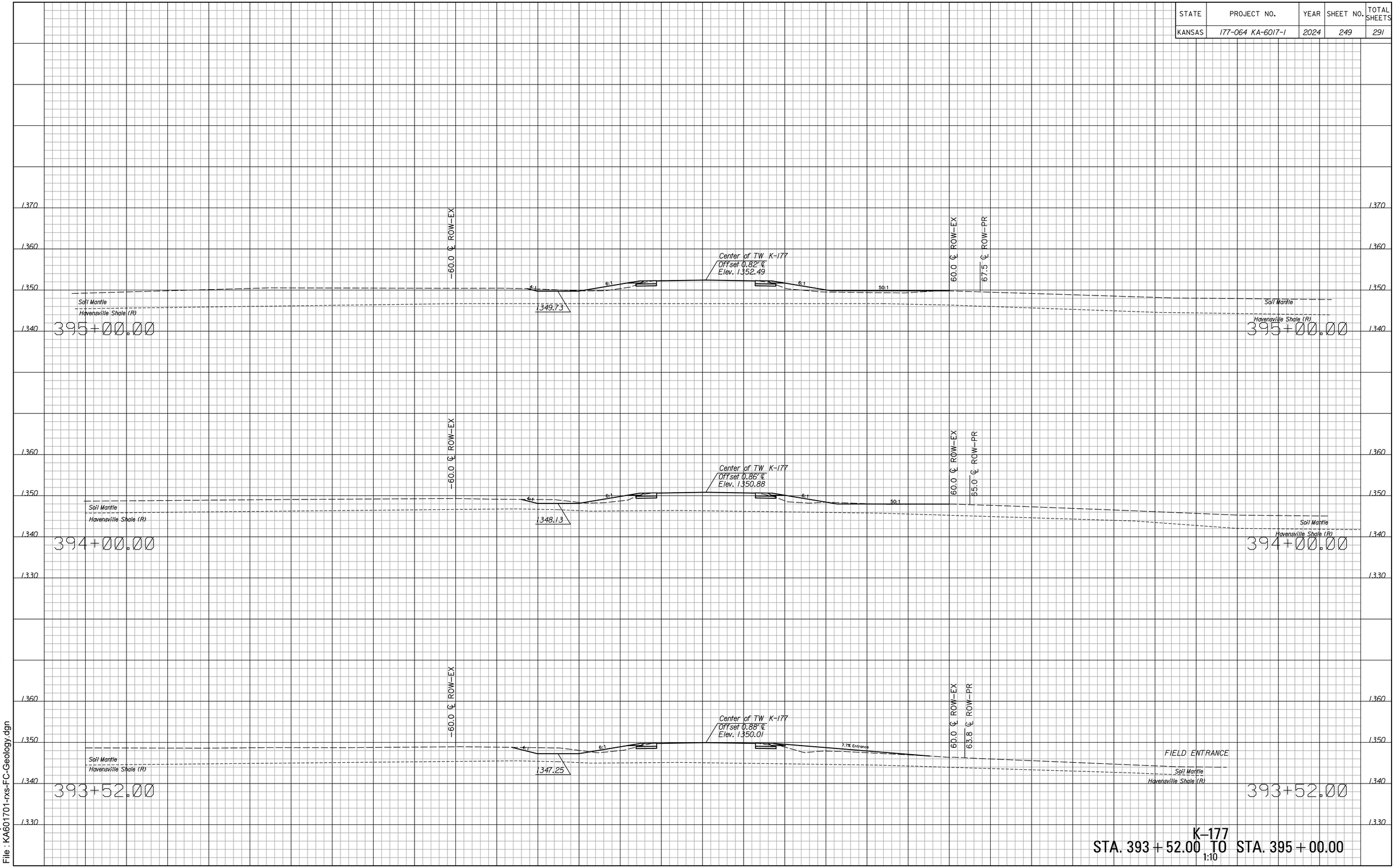
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	248	291



K-177
STA. 391+00.00 TO STA. 393+00.00
1:10

Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	249	291

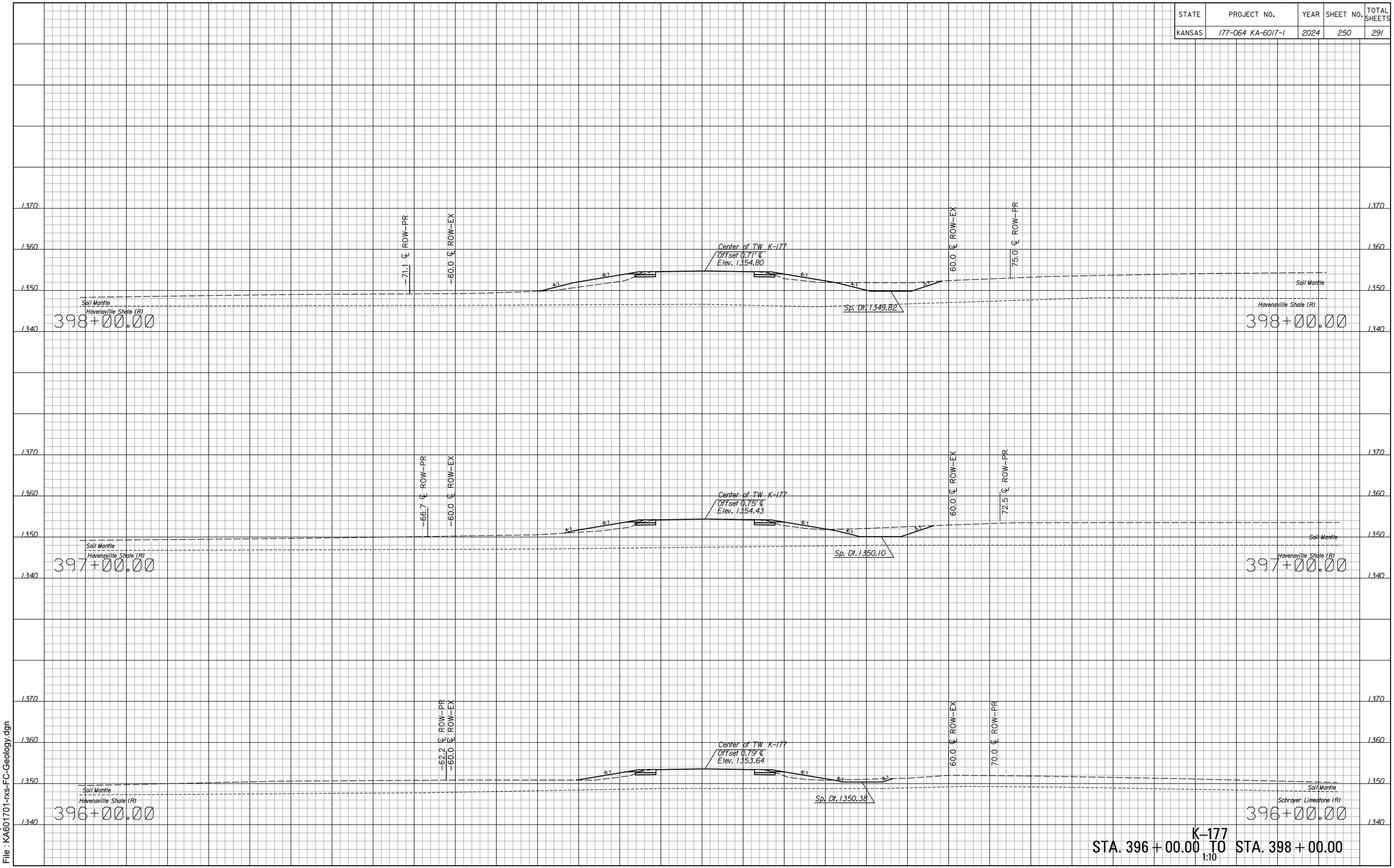


Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 393 + 52.00 TO STA. 395 + 00.00

1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	250	291



Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

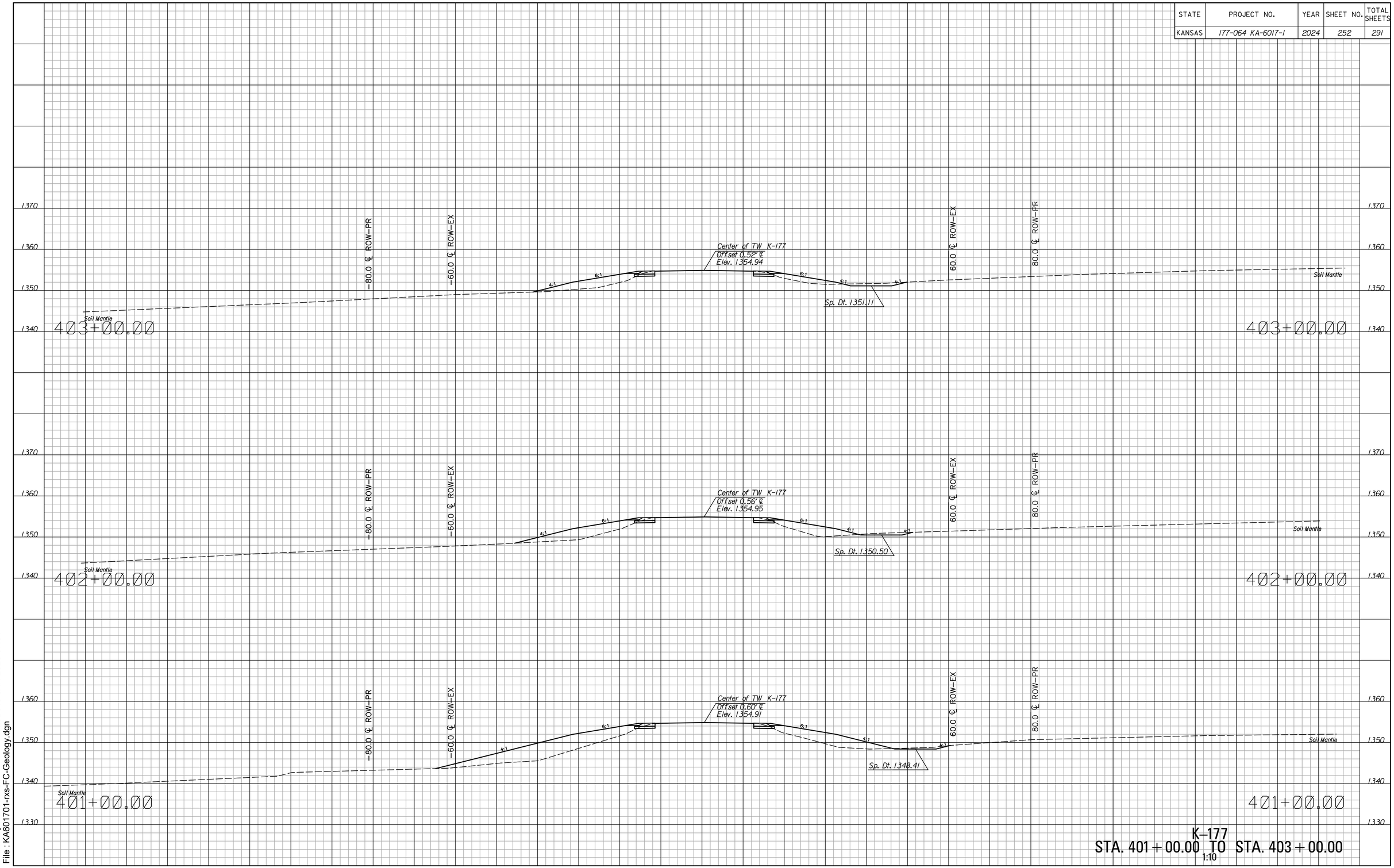
K-177
STA. 396+00.00 TO STA. 398+00.00
1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	251	291

K-177
STA. 399+00.00 TO STA. 400+49.00
1:10

Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

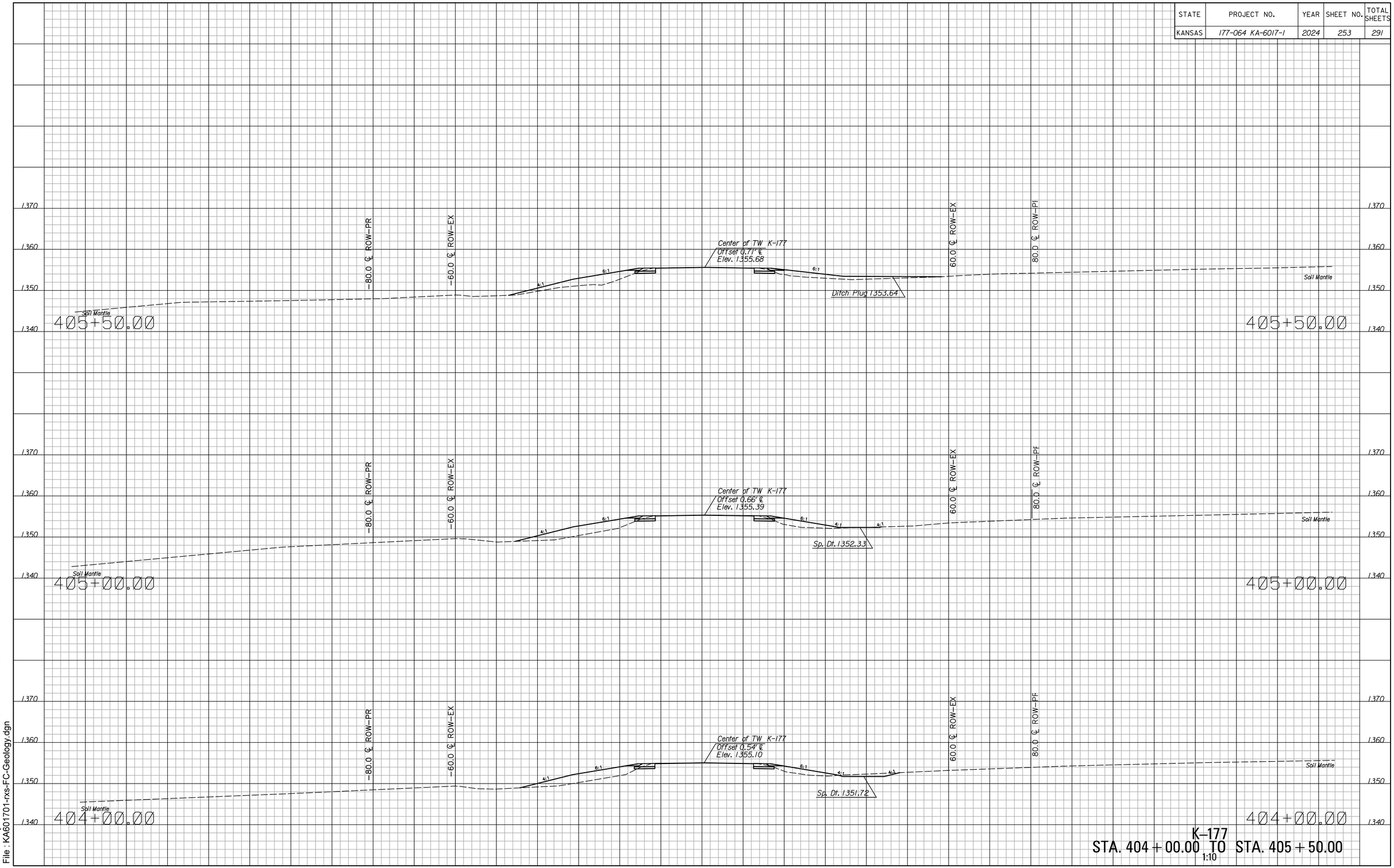
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	252	291



K-177
STA. 401+00.00 TO STA. 403+00.00
1:10

Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	253	291

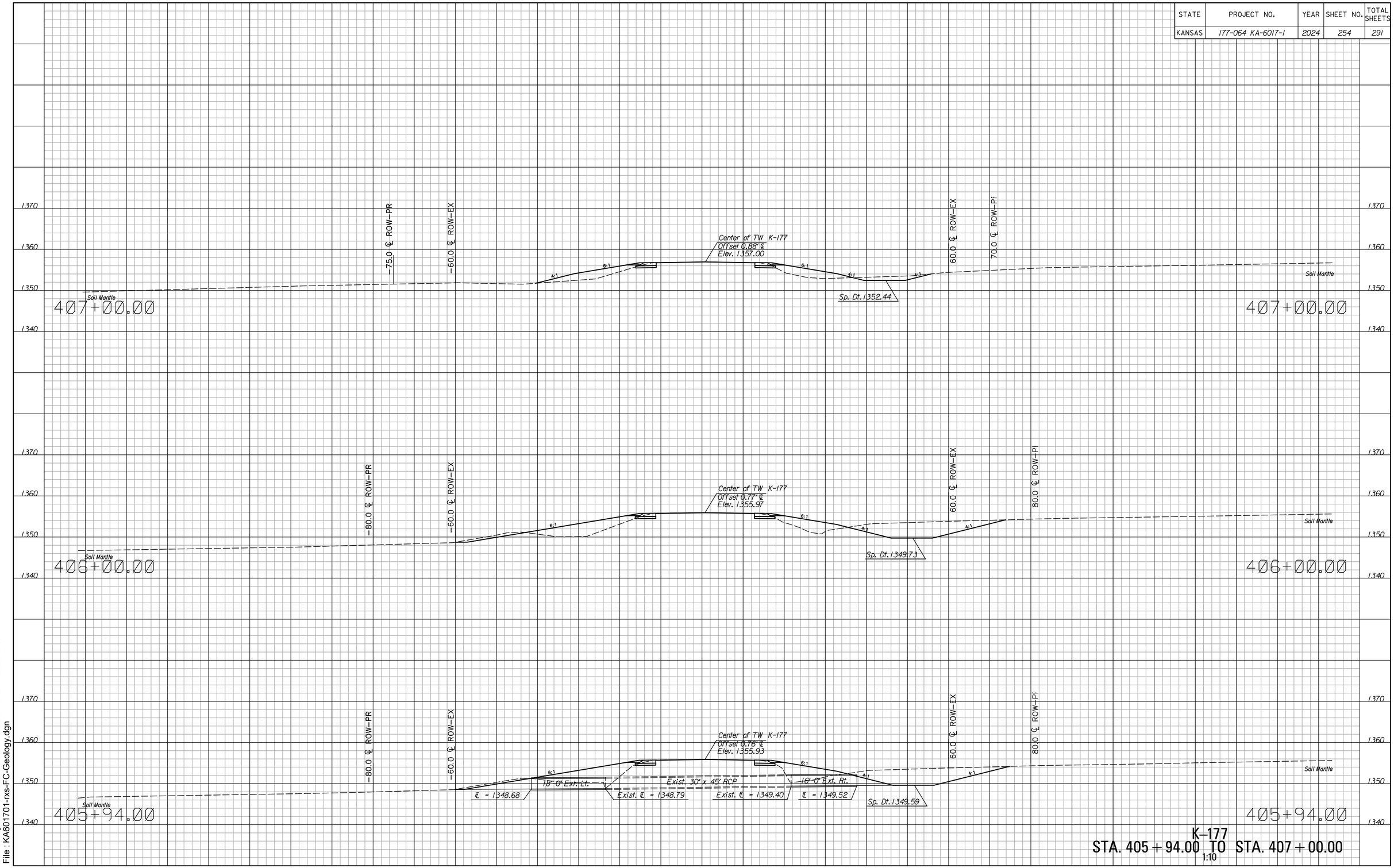


Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 404+00.00 TO STA. 405+50.00

1:10

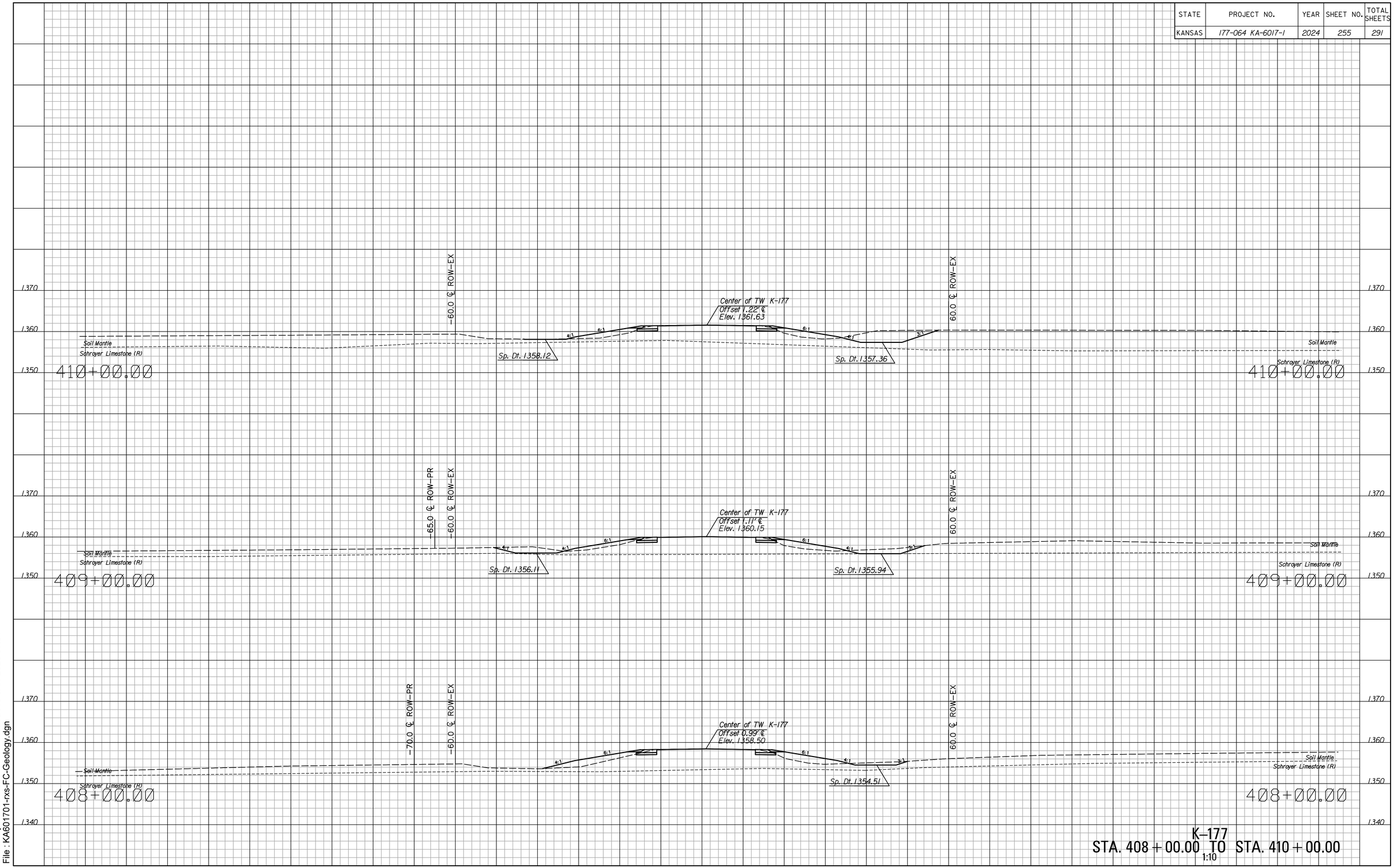
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	254	291



Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 405 + 94.00 TO STA. 407 + 00.00
1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	255	291



K-177
STA. 408+00.00 TO STA. 410+00.00
1:10

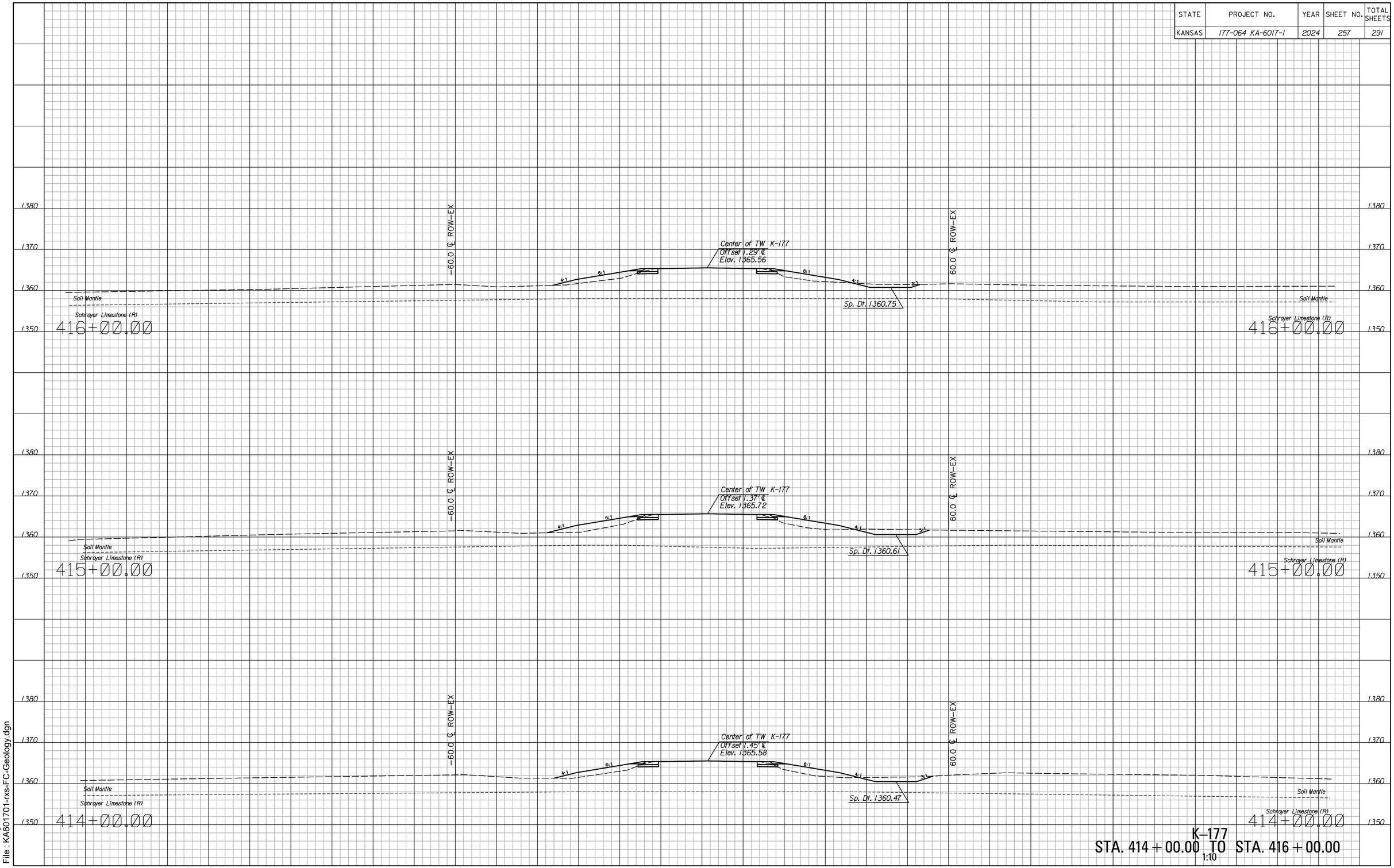
Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	256	291

Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 411+00.00 TO STA. 413+00.00
1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	257	291



K-177
STA. 414+00.00 TO STA. 416+00.00
1:10

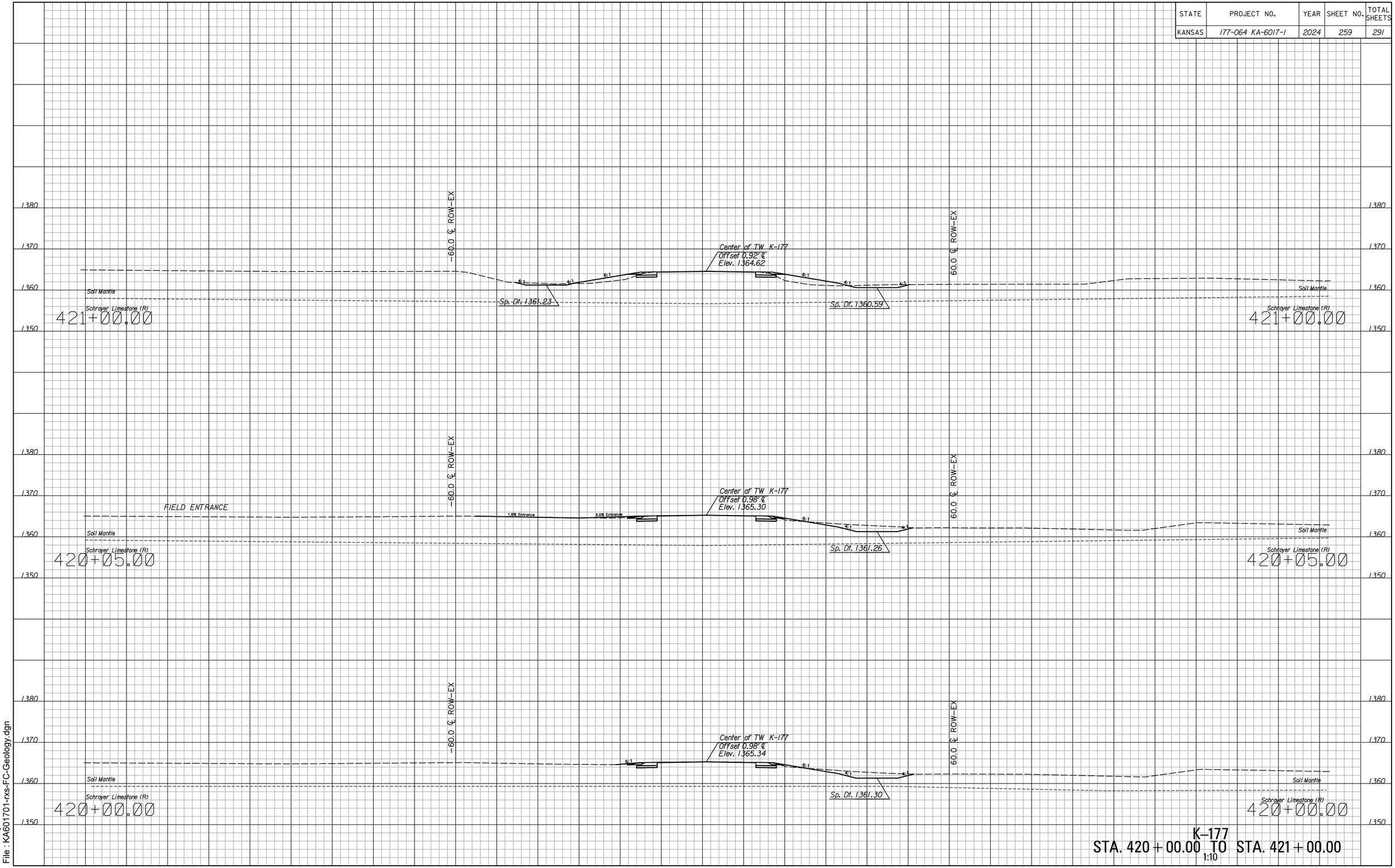
Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	258	291

K-177
STA. 417+00.00 TO STA. 419+00.00
1:10

Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

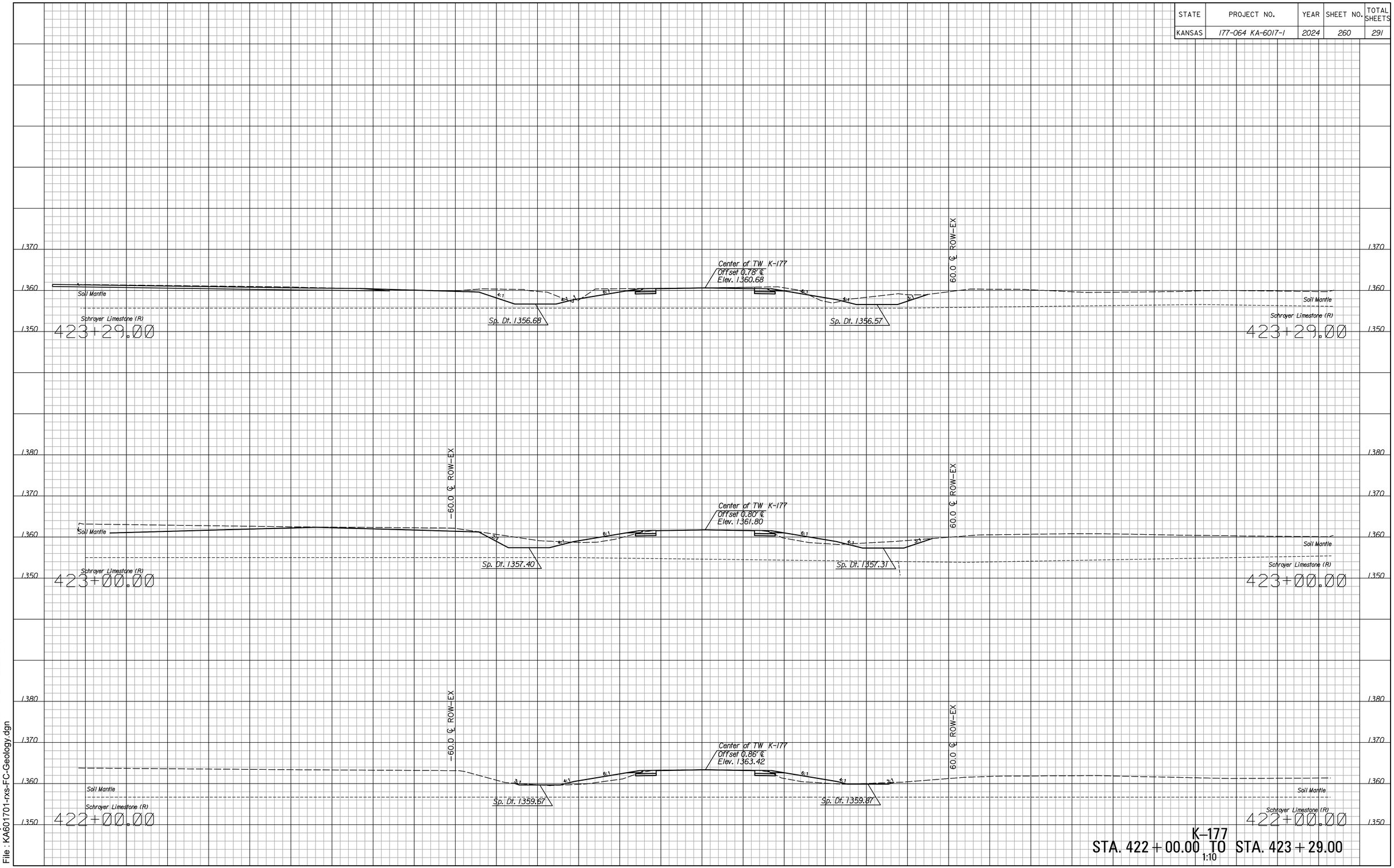
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	259	291



K-177
STA. 420+00.00 TO STA. 421+00.00
1:10

Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

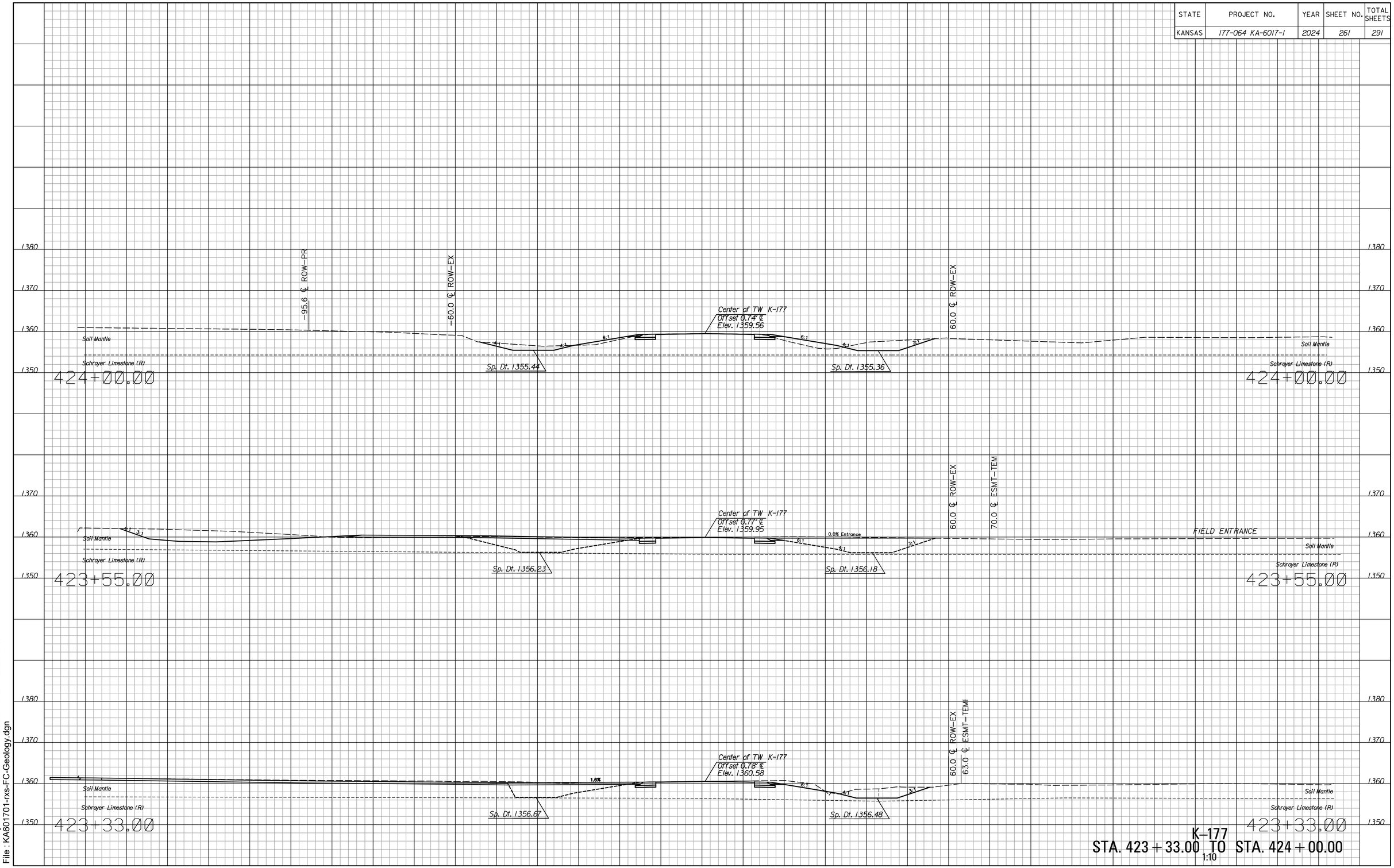
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	260	291



Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 422+00.00 TO STA. 423+29.00
1:10

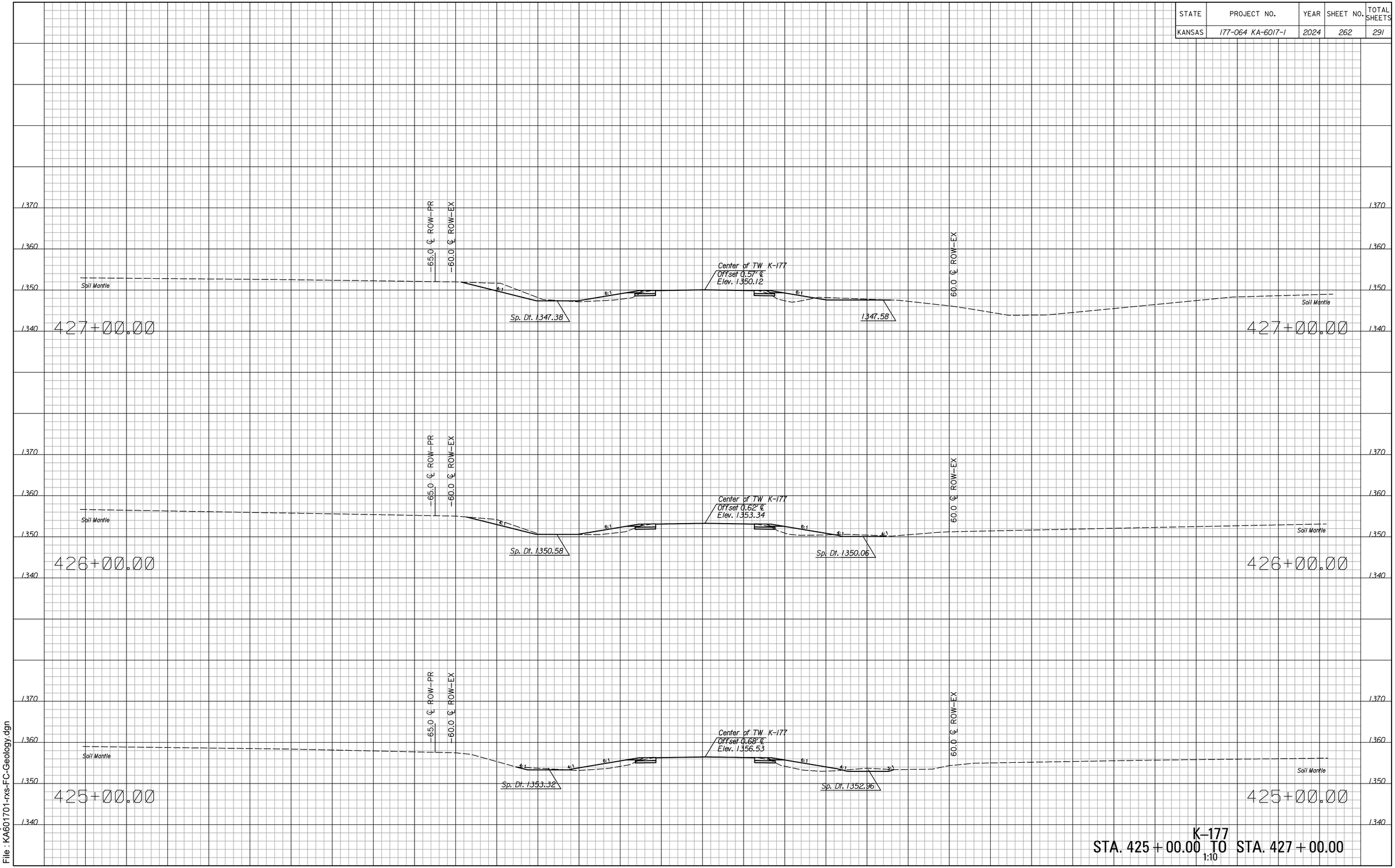
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	261	291



Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 423+33.00 TO STA. 424+00.00
1:10

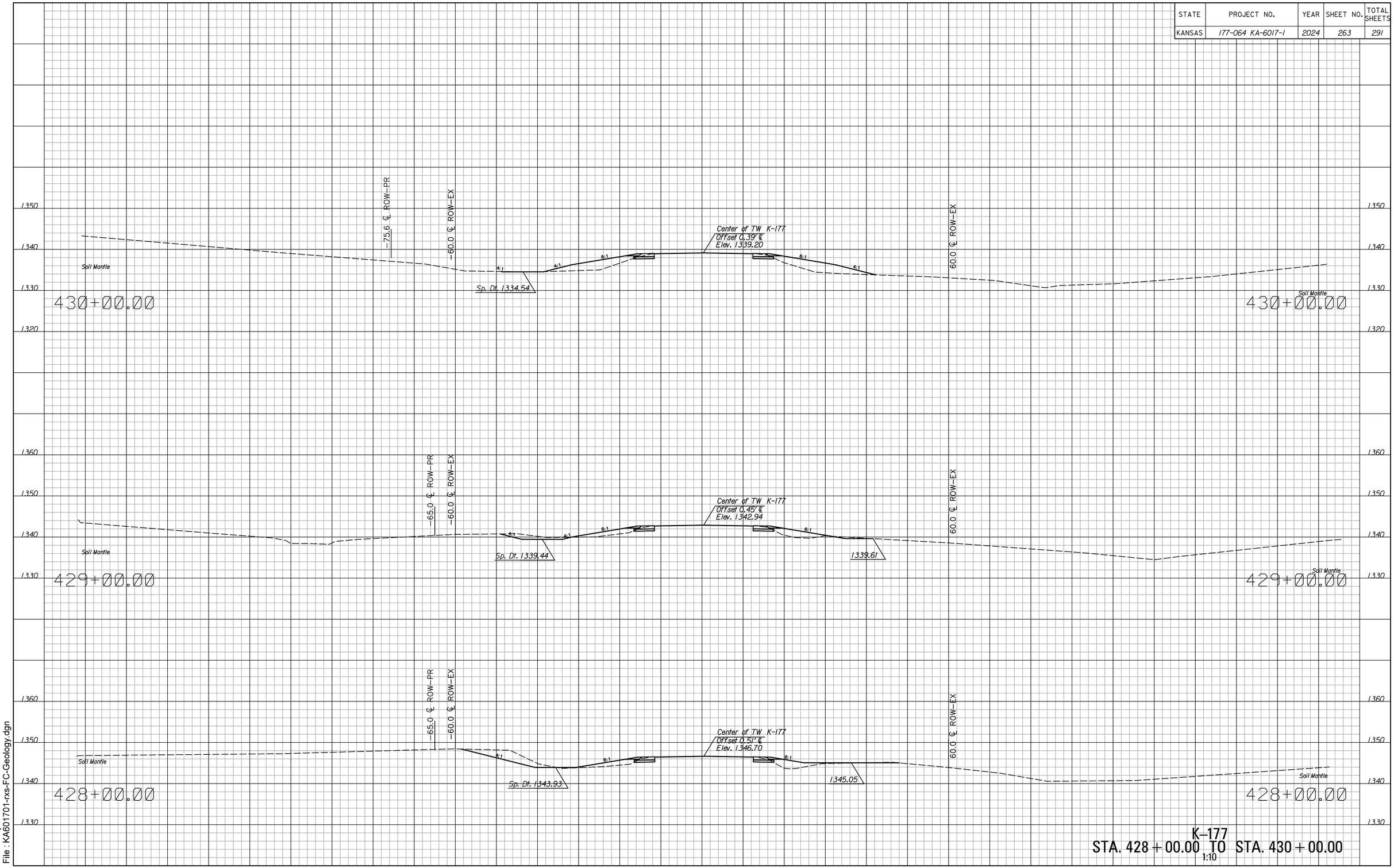
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	262	291



K-177
STA. 425+00.00 TO STA. 427+00.00
1:10

Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	263	291

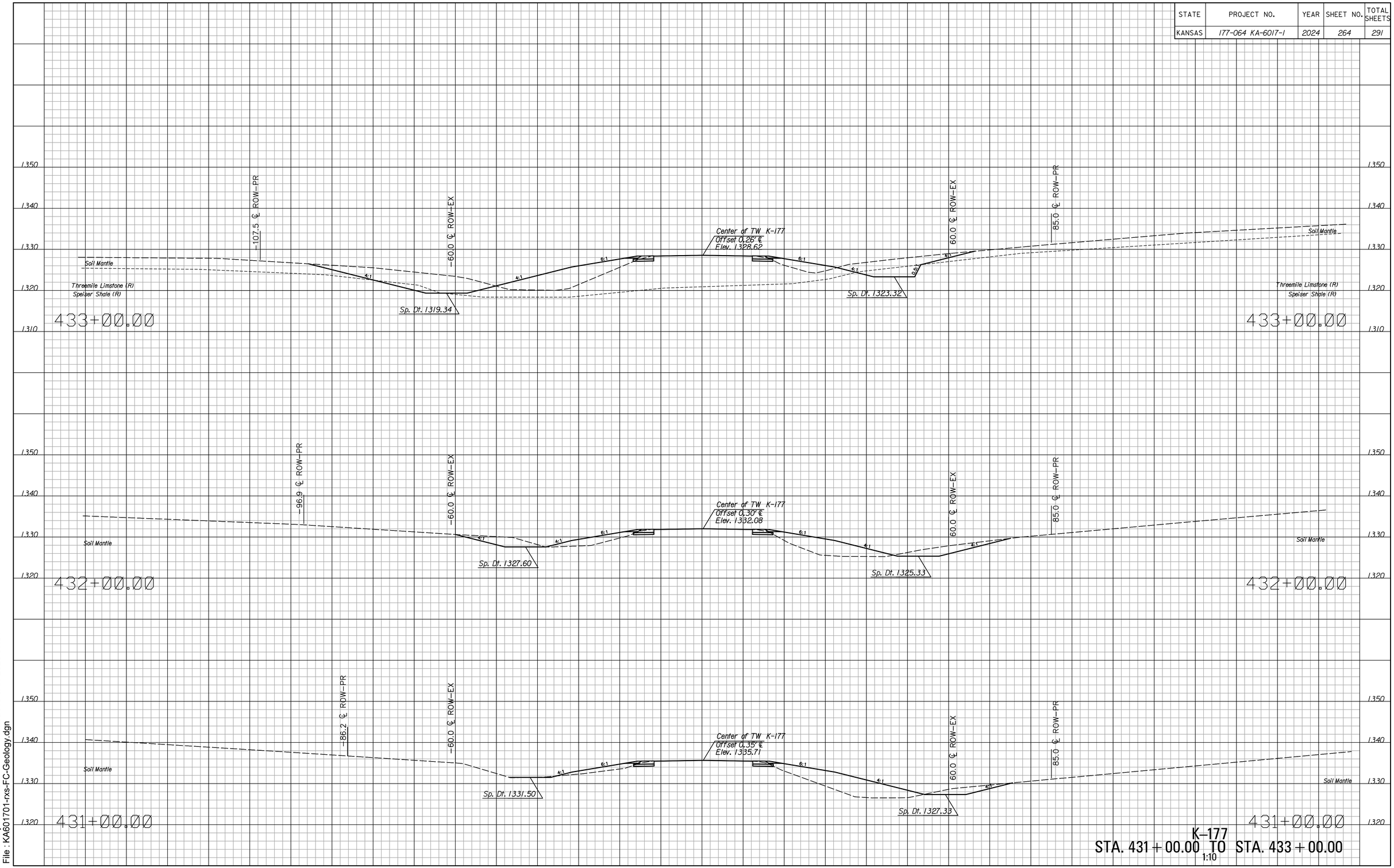


Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 428+00.00 TO STA. 430+00.00

1:10

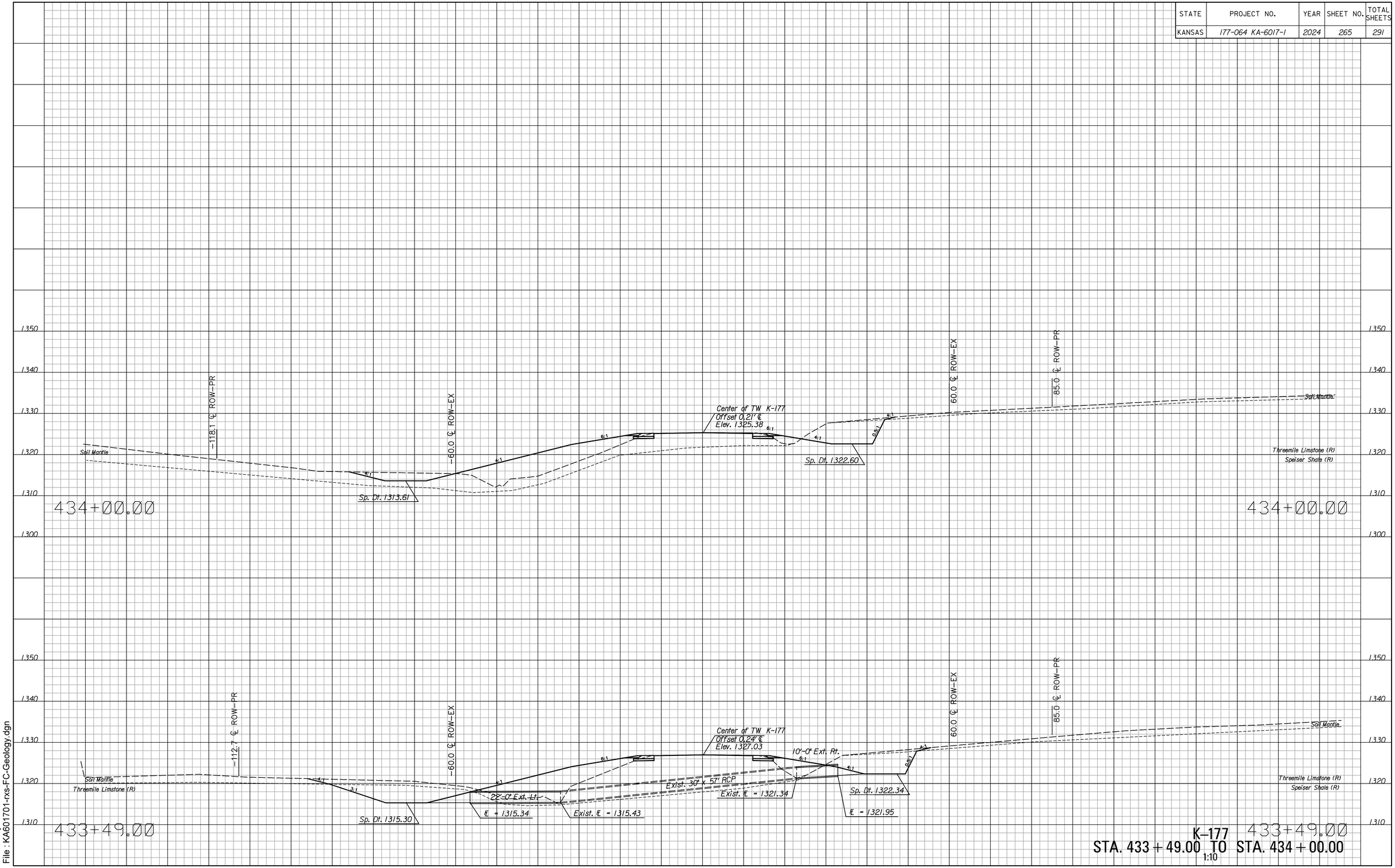
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	264	291



Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 431+00.00 TO STA. 433+00.00
1:10

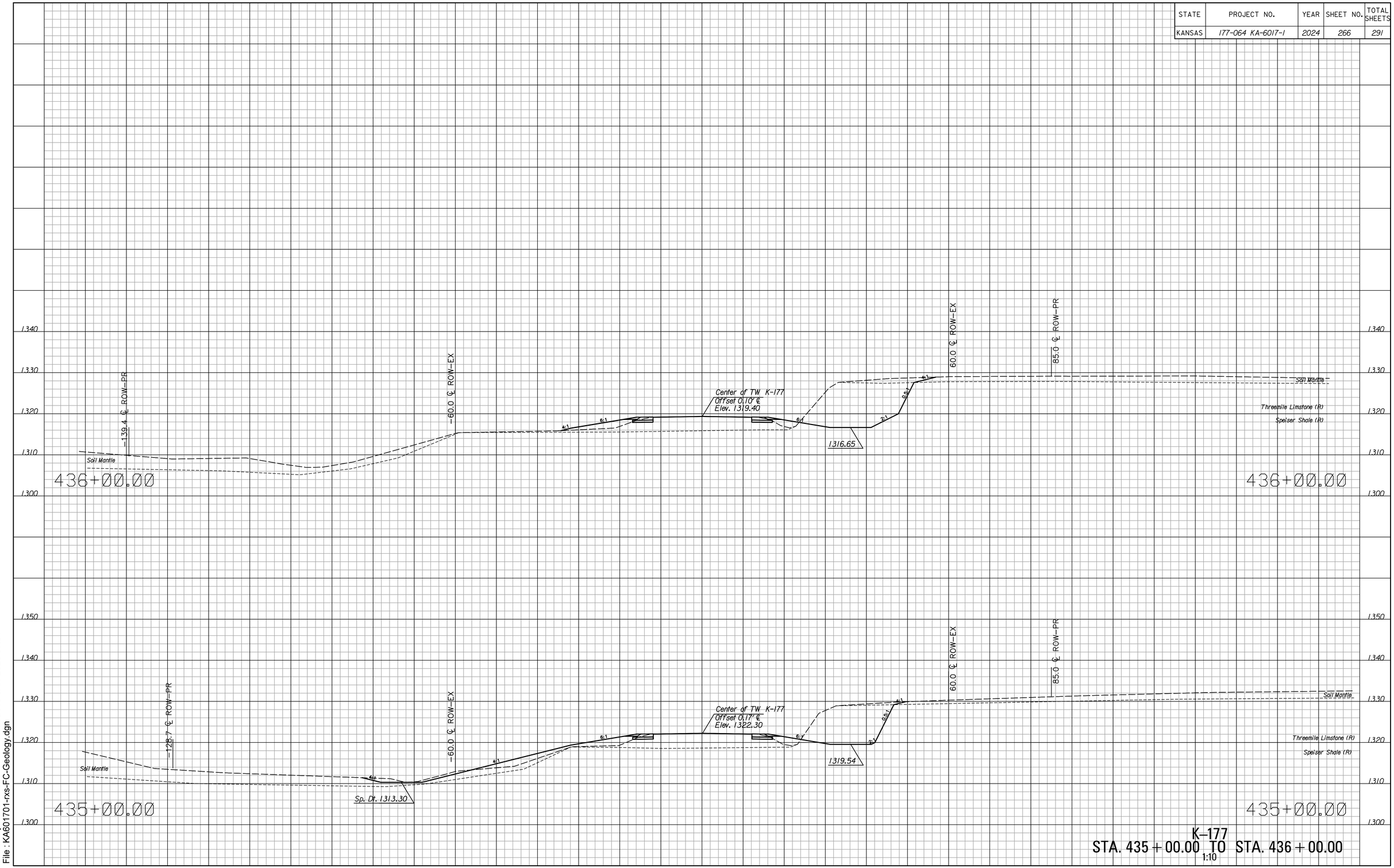
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	265	291



K-177
STA. 433 + 49.00 TO STA. 434 + 00.00
1:10

Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

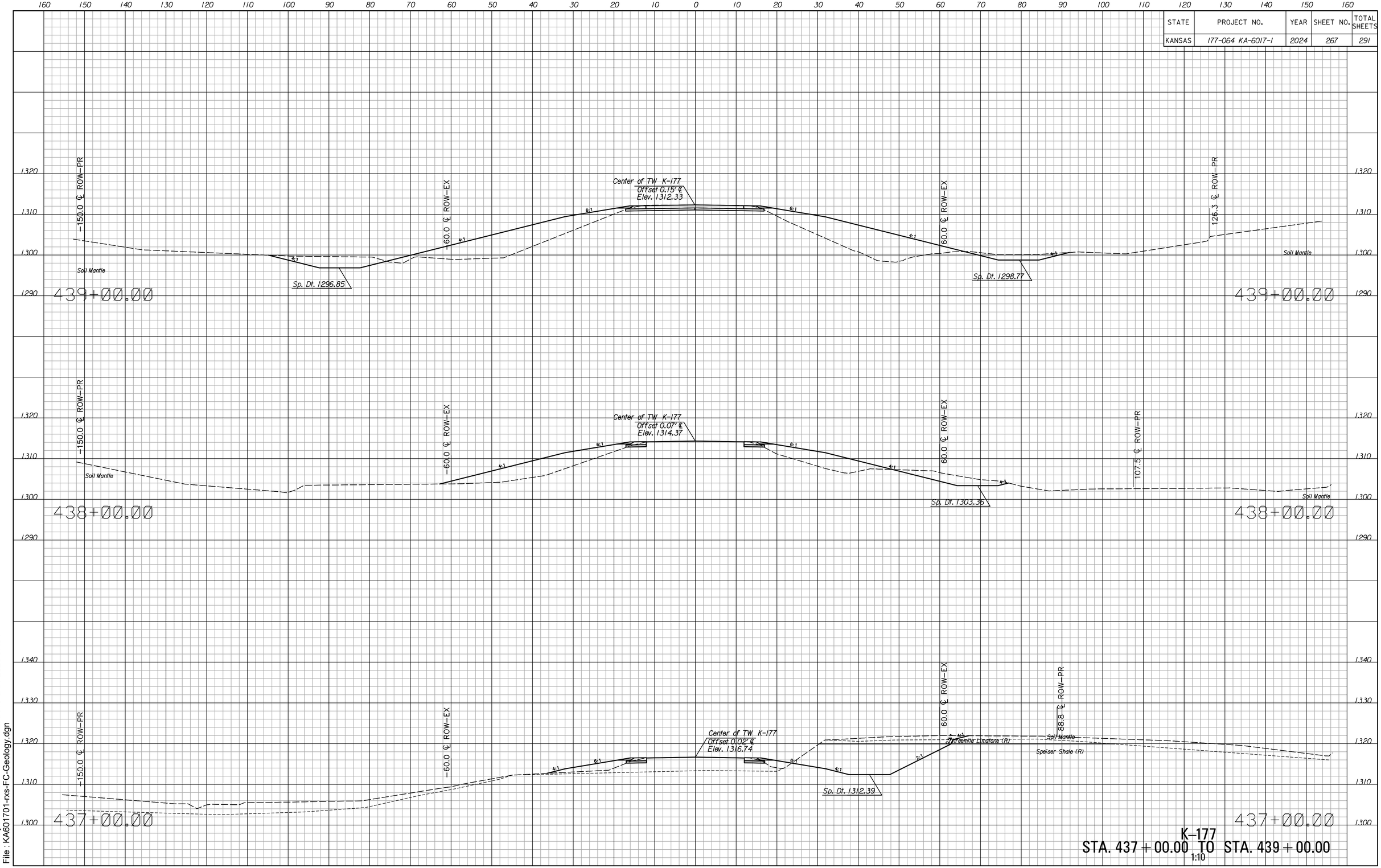
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	266	291



Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 435+00.00 TO STA. 436+00.00
1:10

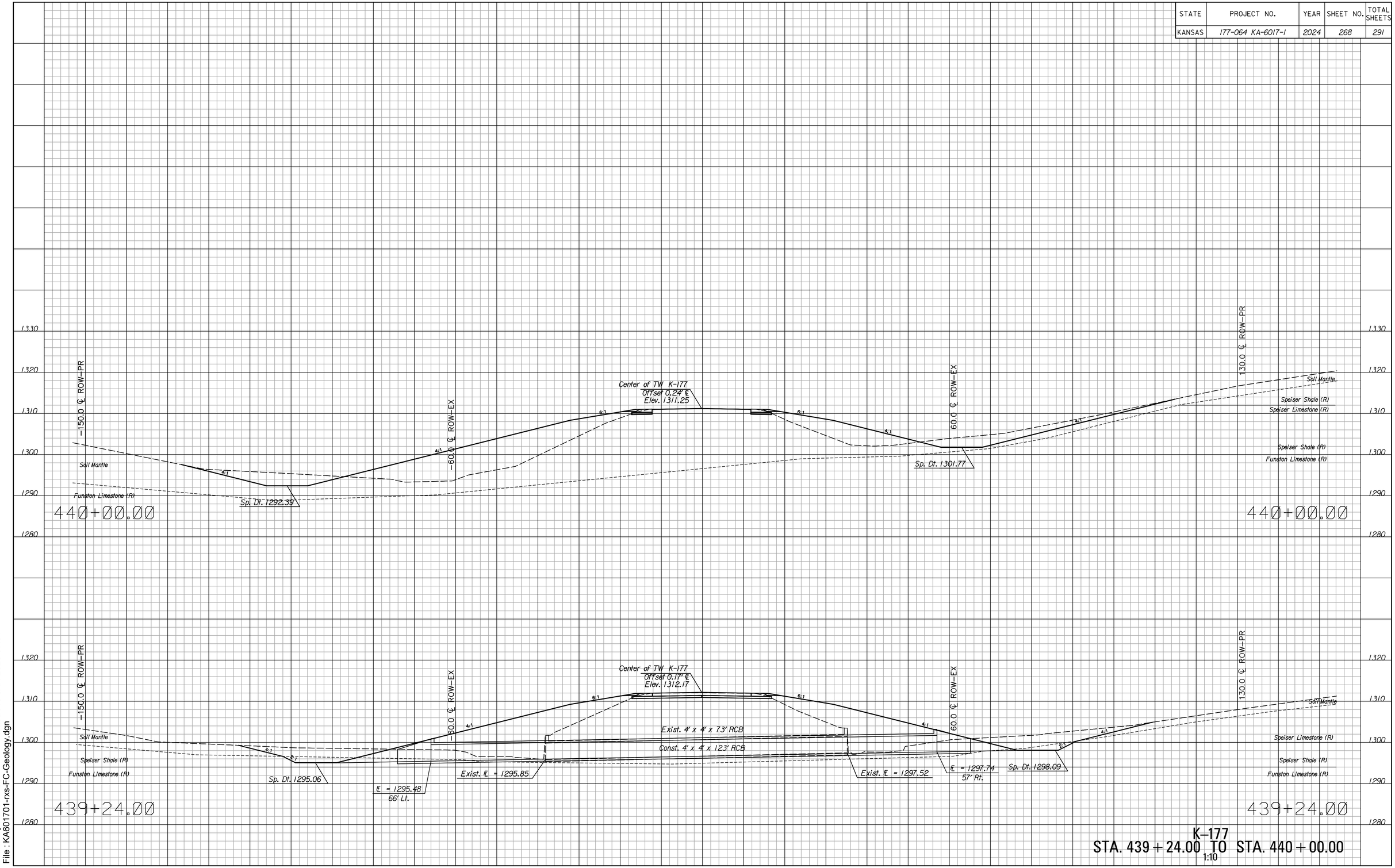
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	267	291



Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 437+00.00 TO STA. 439+00.00
1:10

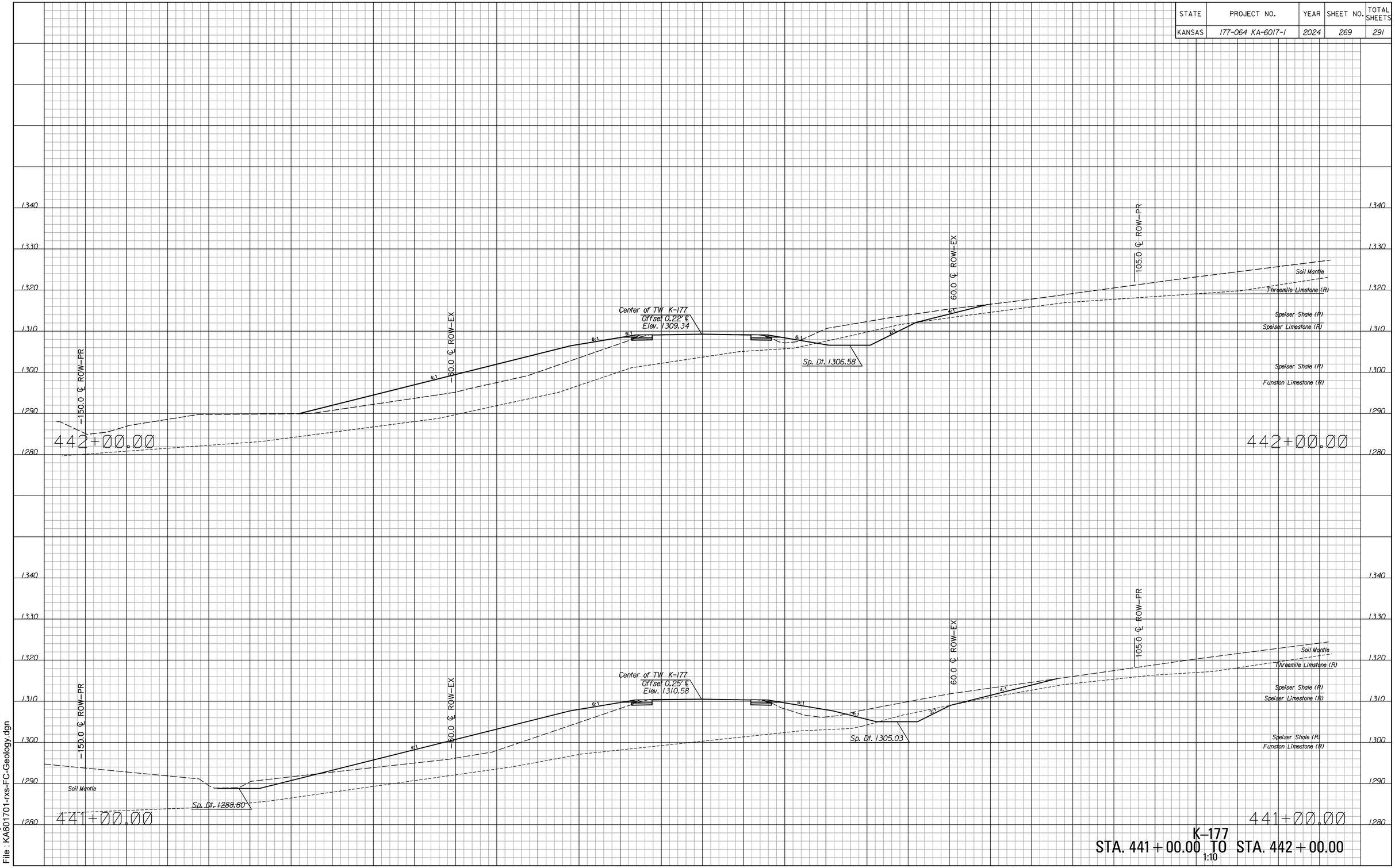
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	268	291



K-177
STA. 439+24.00 TO STA. 440+00.00
1:10

Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

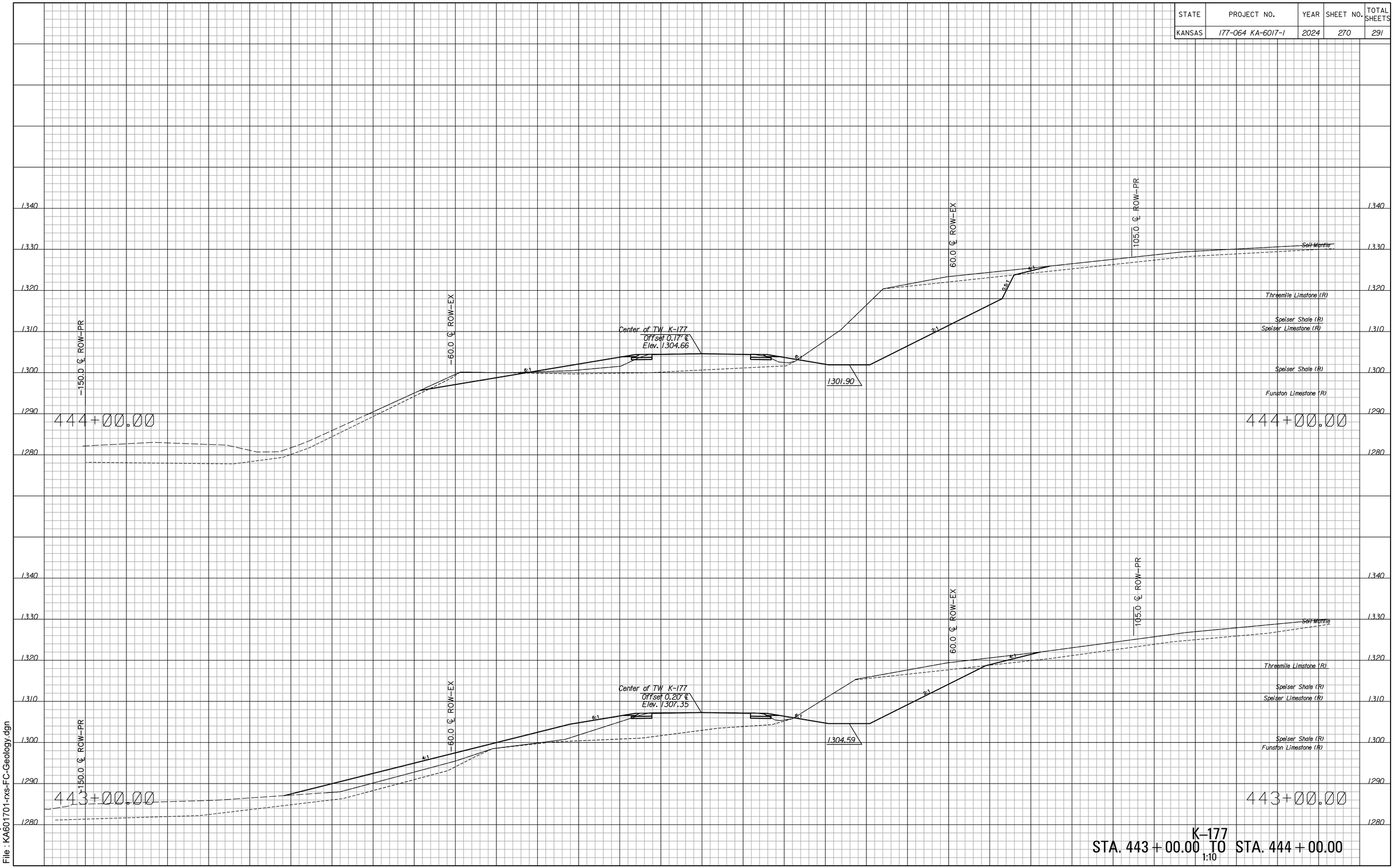
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	269	291



Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 441+00.00 TO STA. 442+00.00
1:10

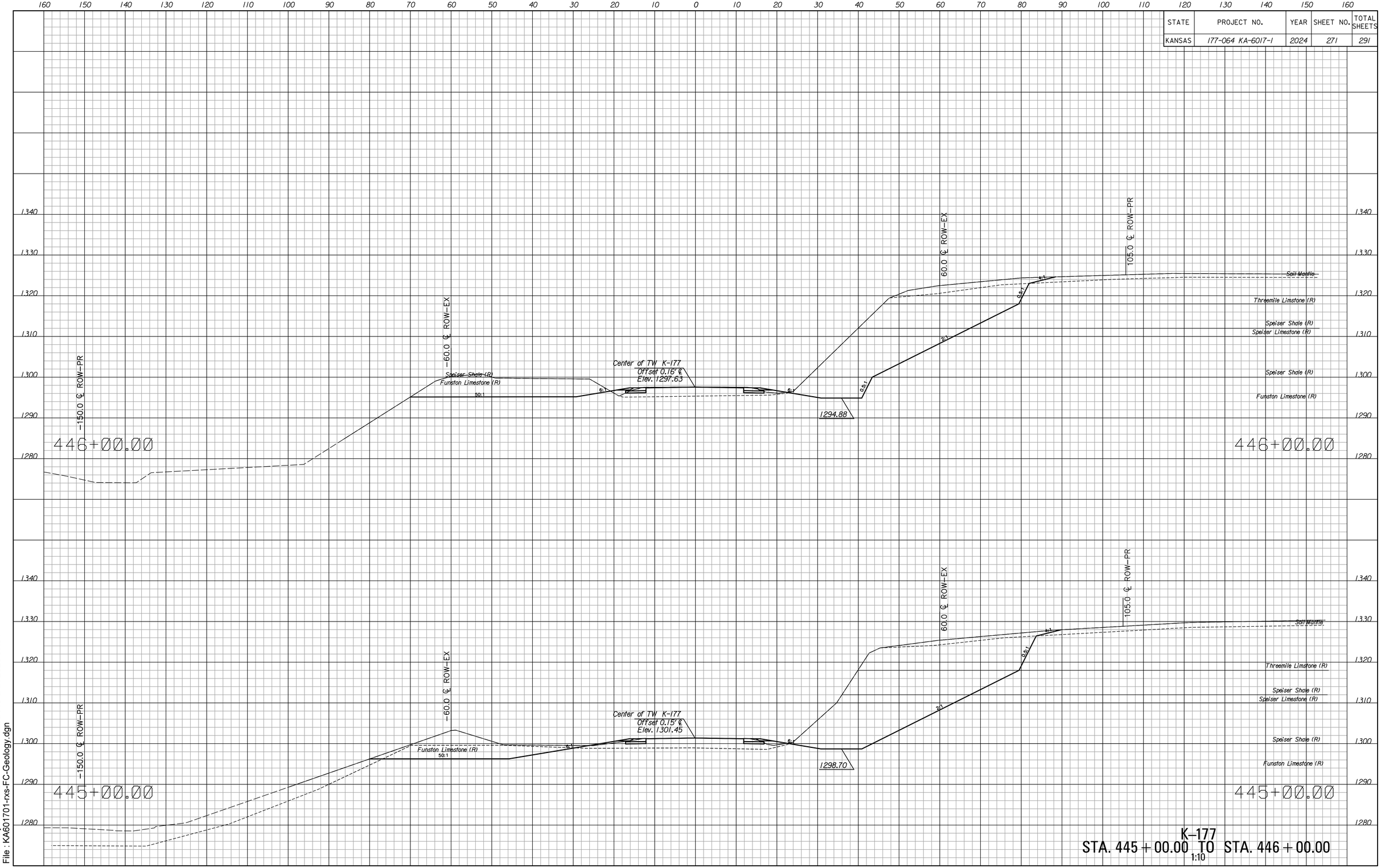
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	270	291



K-177
STA. 443 + 00.00 TO STA. 444 + 00.00
1:10

Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

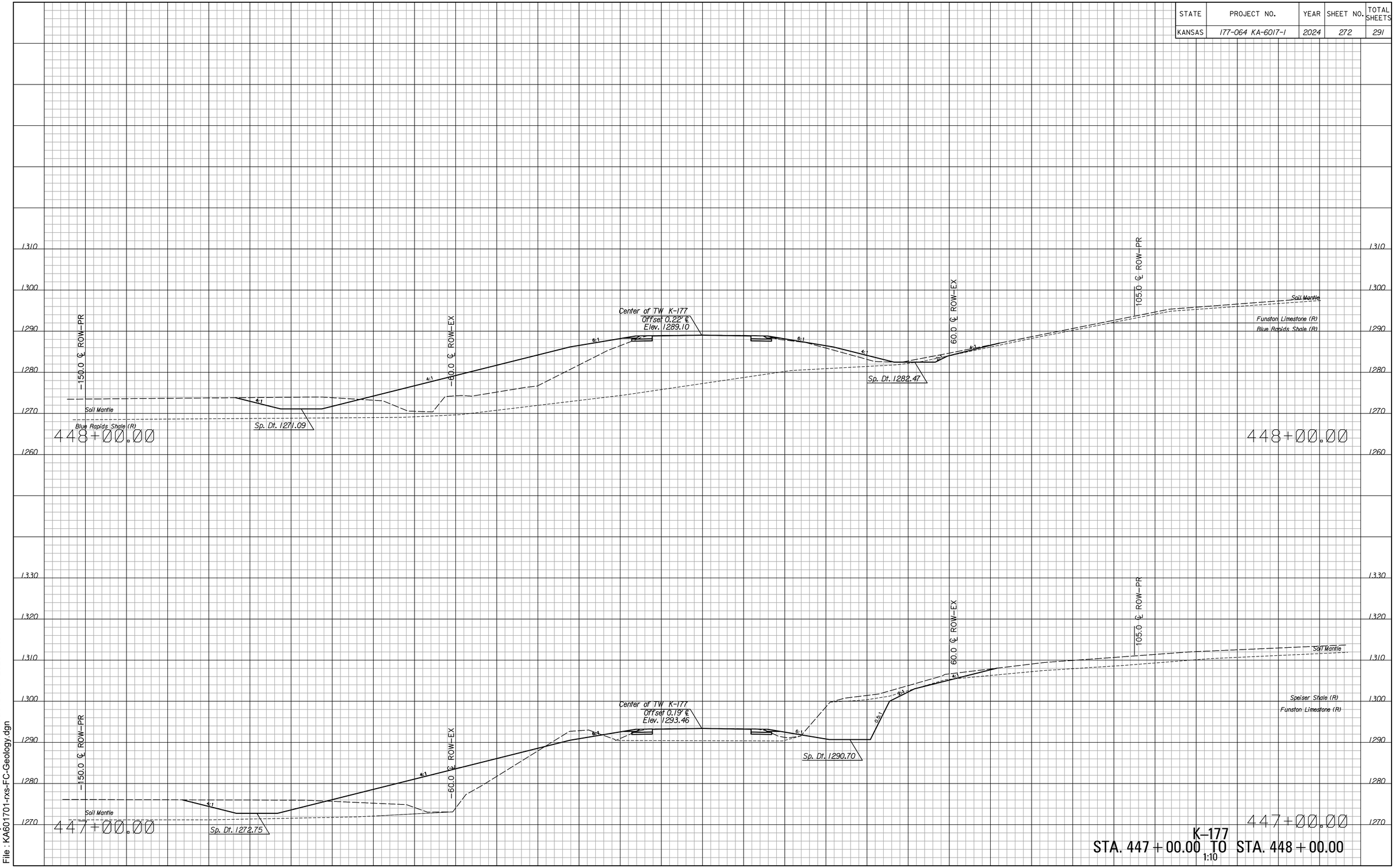
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	271	291



K-177
STA. 445 + 00.00 TO STA. 446 + 00.00
1:10

Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn
Plotted : 16-JAN-2025 07:54

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	272	291

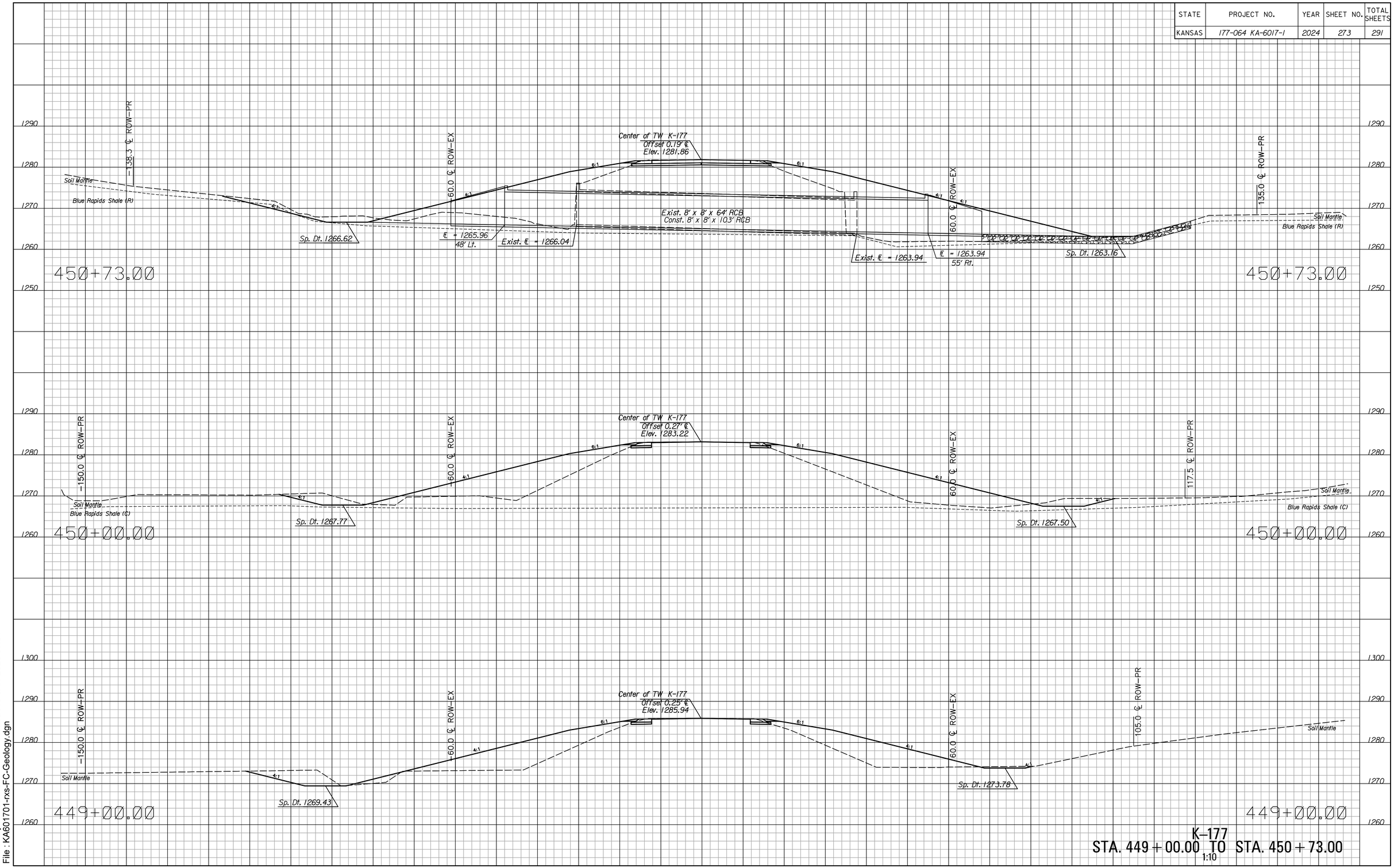


Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 447+00.00 TO STA. 448+00.00

1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	273	291

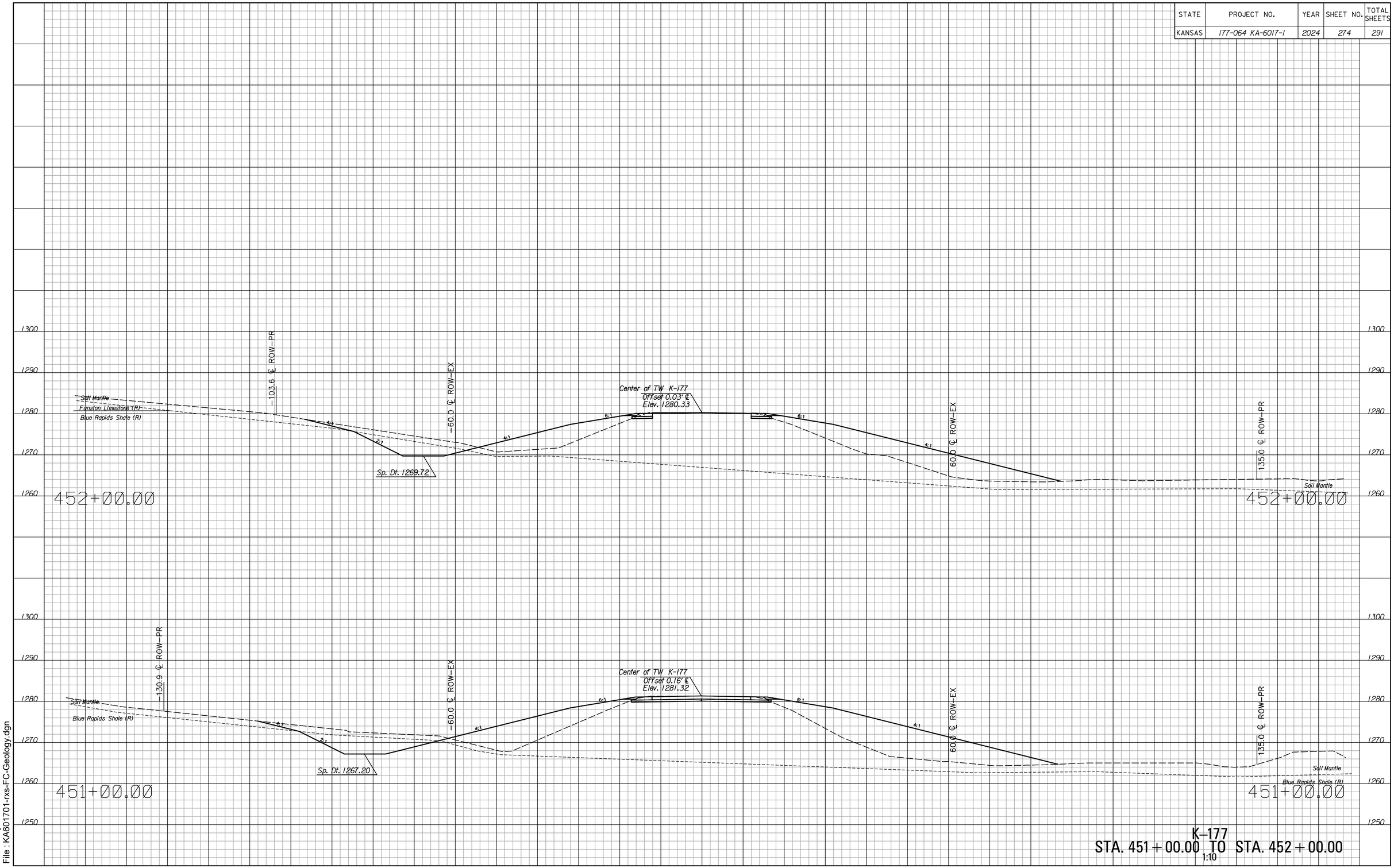


Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 449+00.00 TO STA. 450+73.00

1:10

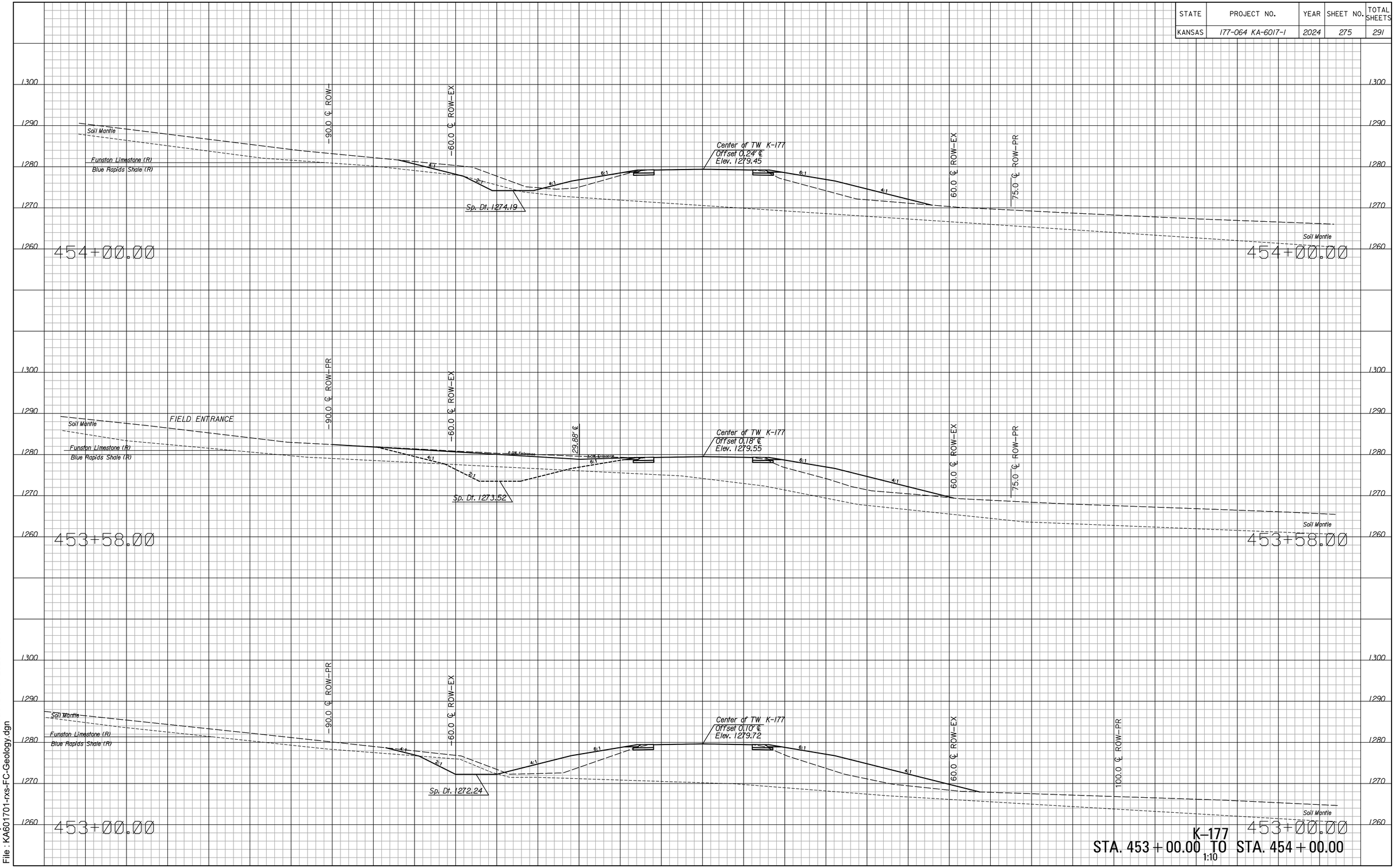
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	274	291



K-177
STA. 451+00.00 TO STA. 452+00.00
1:10

Drawn By: mrockwell Plotted: 16-JAN-2025 07:54
File: KA601701-rxs-FC-Geology.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	275	291

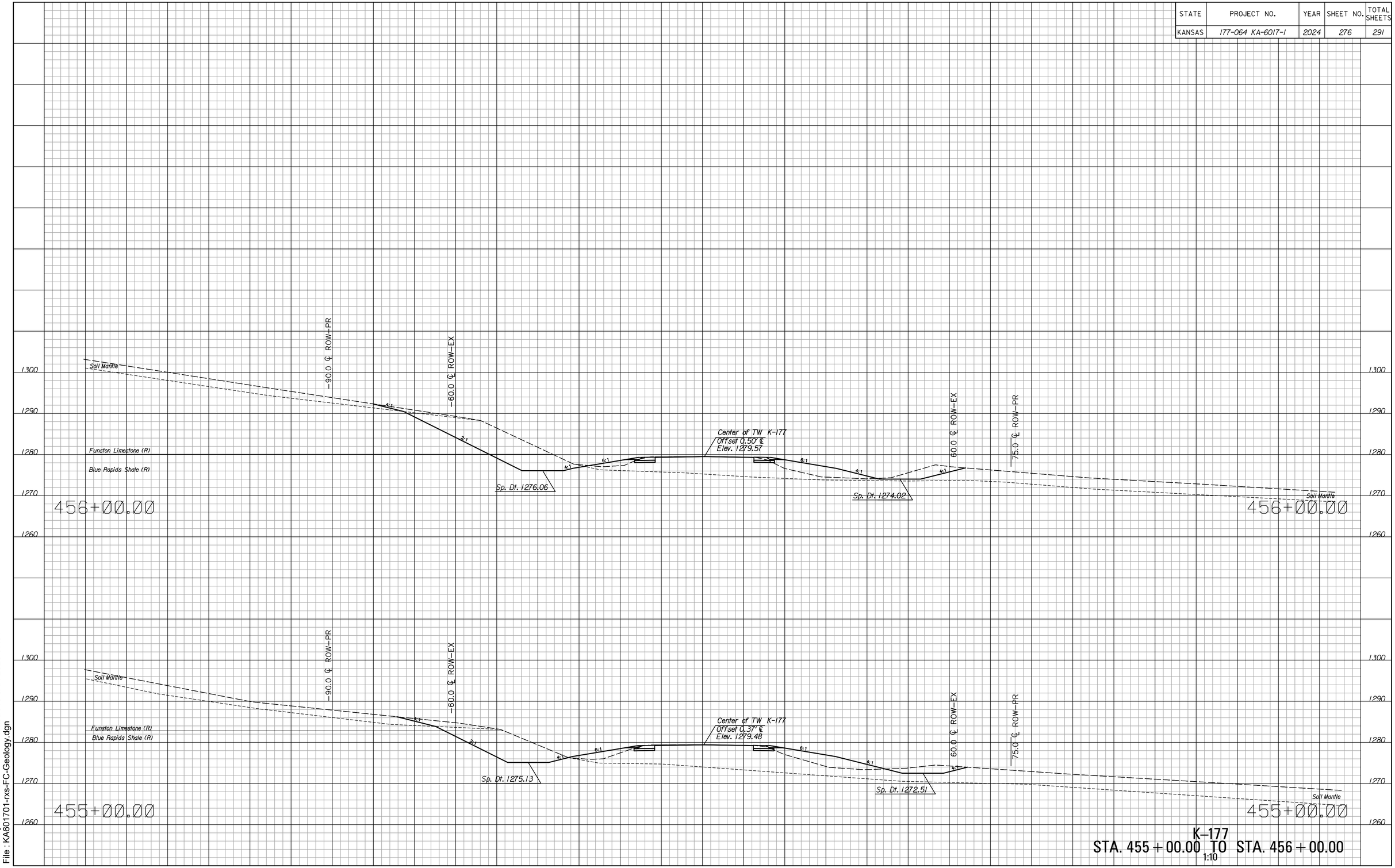


Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K–177
STA. 453 + 00.00 TO STA. 454 + 00.00

1:10

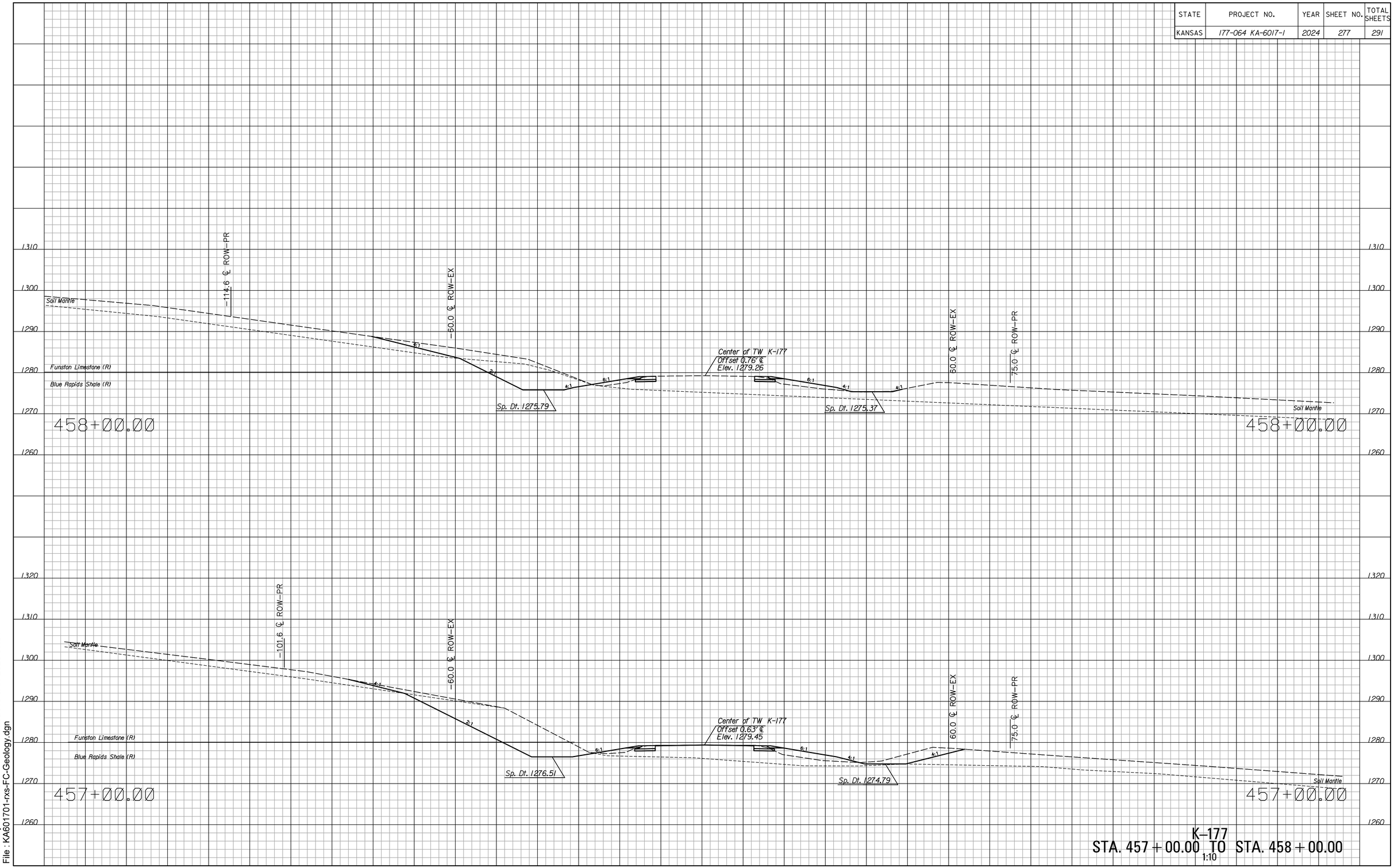
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	276	291



Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 455+00.00 TO STA. 456+00.00
1:10

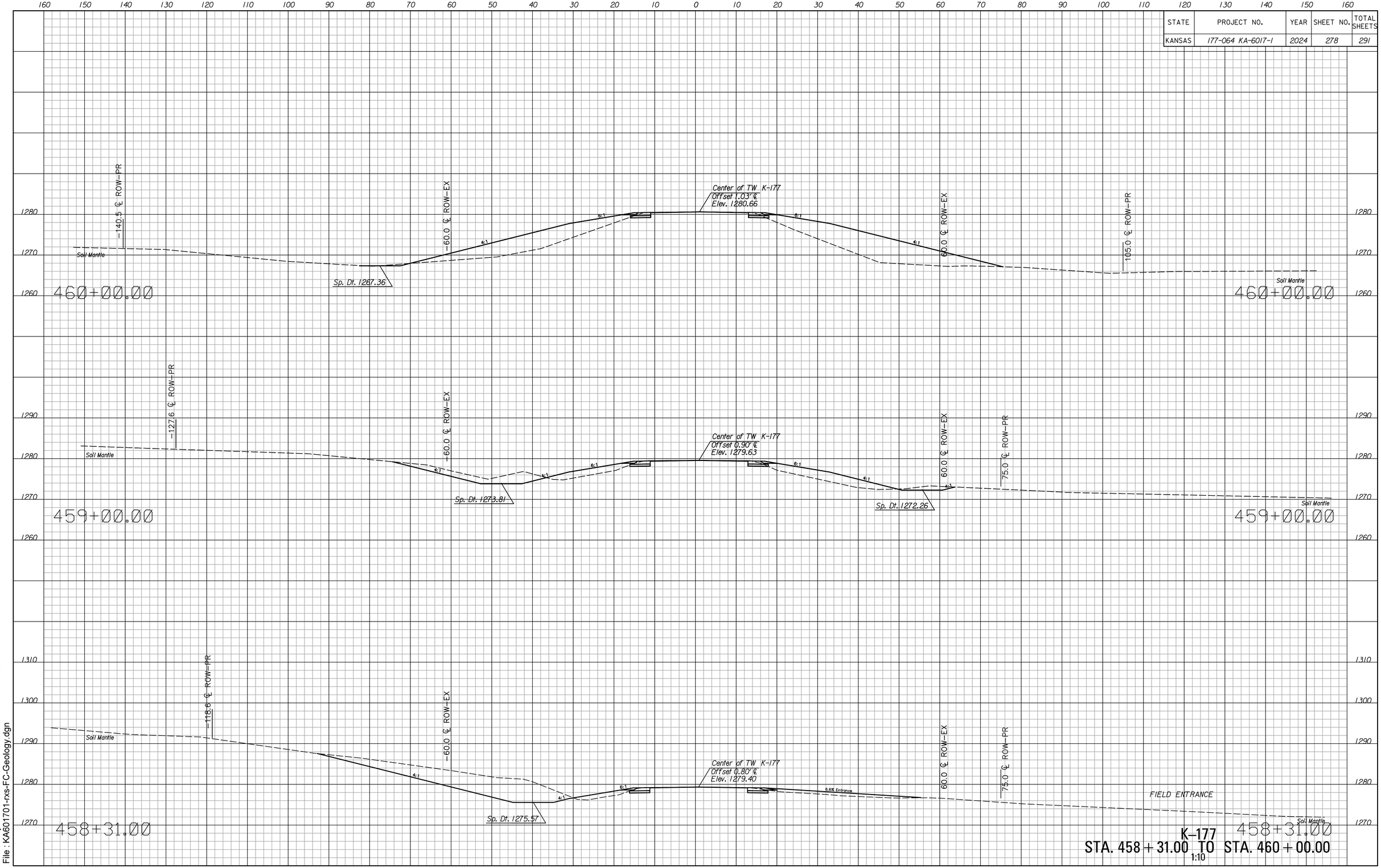
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	277	291



Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 457+00.00 TO STA. 458+00.00
1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	278	291

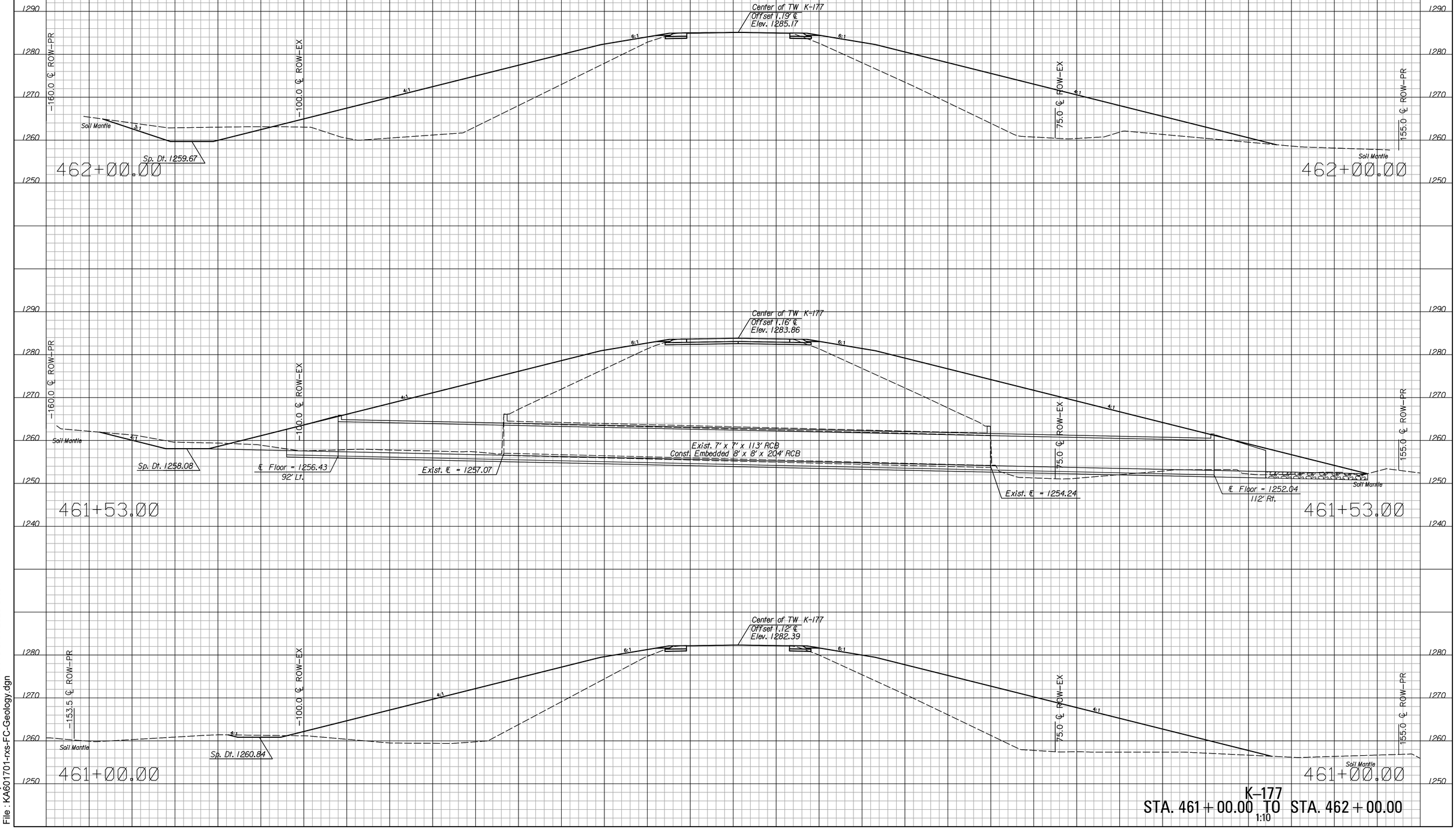


K-177
STA. 458+31.00 TO STA. 460+00.00

1:10

Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn
Plotted : 16-JAN-2025 07:54

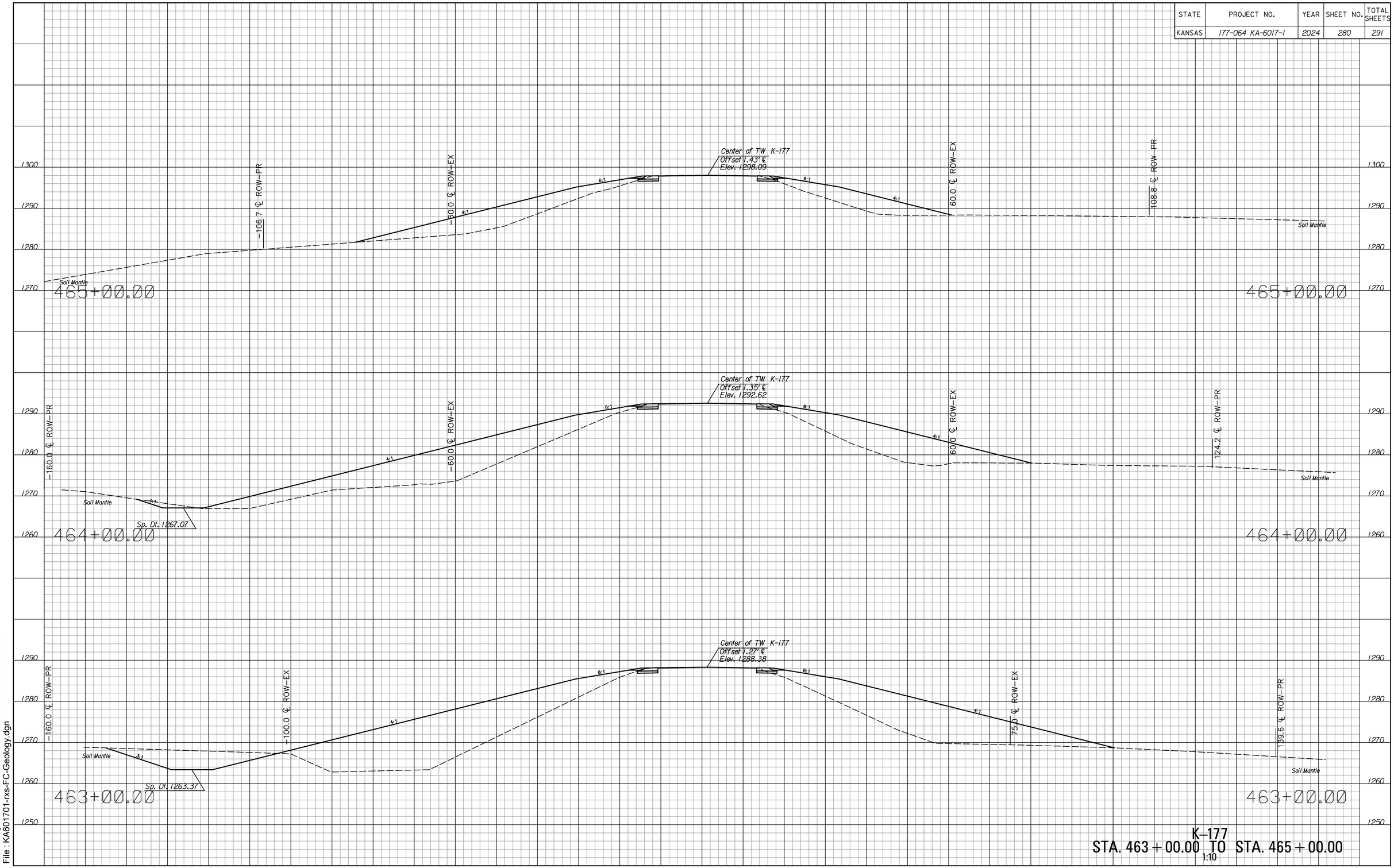
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	279	291



K-177
STA. 461+00.00 TO STA. 462+00.00
1:10

Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

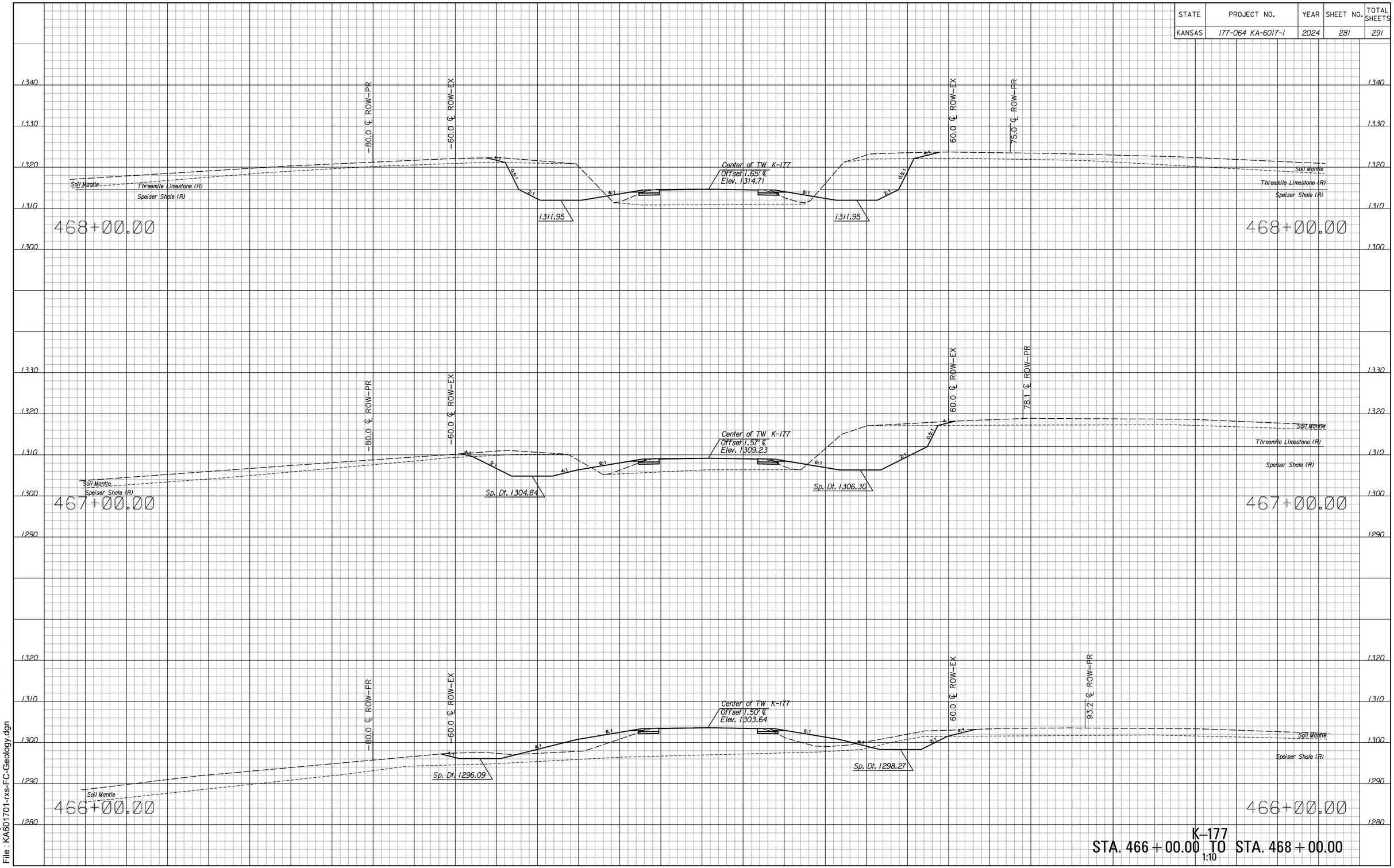
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	280	291



K-177
STA. 463+00.00 TO STA. 465+00.00
1:10

Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

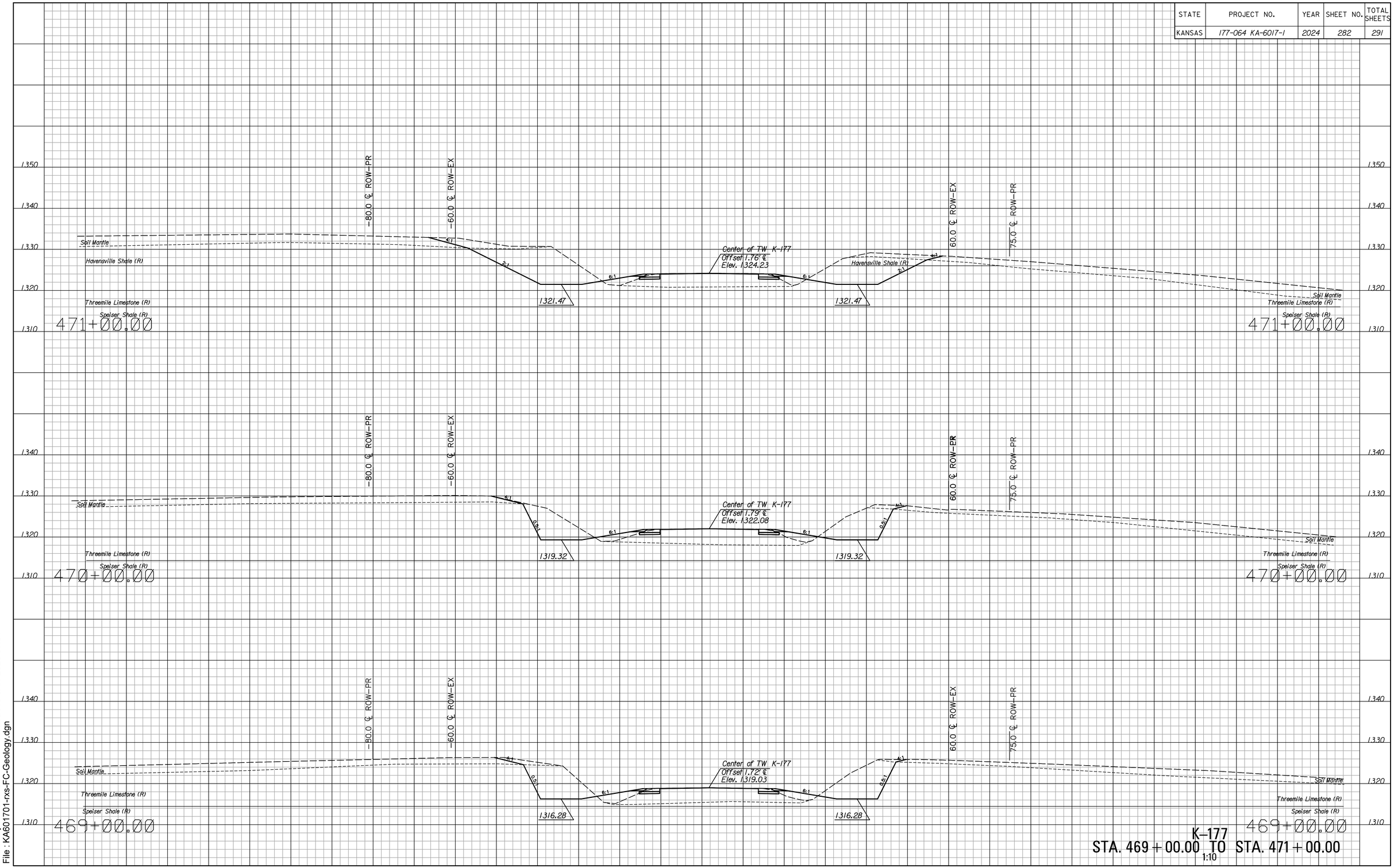
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	281	291



K-177
STA. 466+00.00 TO STA. 468+00.00
1:10

Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn
Plotted : 16-JAN-2025 07:54

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	282	291

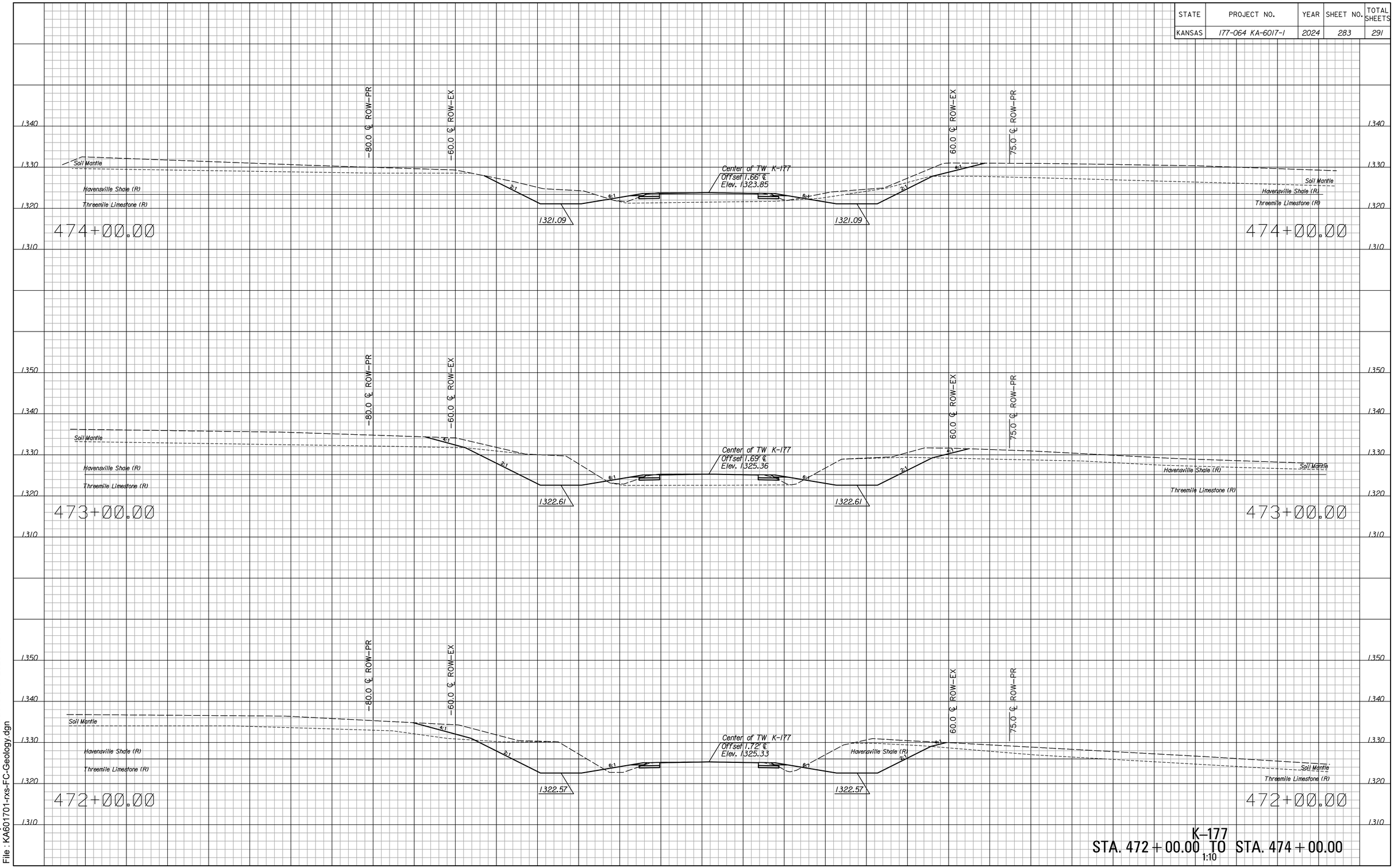


K-177
STA. 469+00.00 TO STA. 471+00.00

1:10

Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

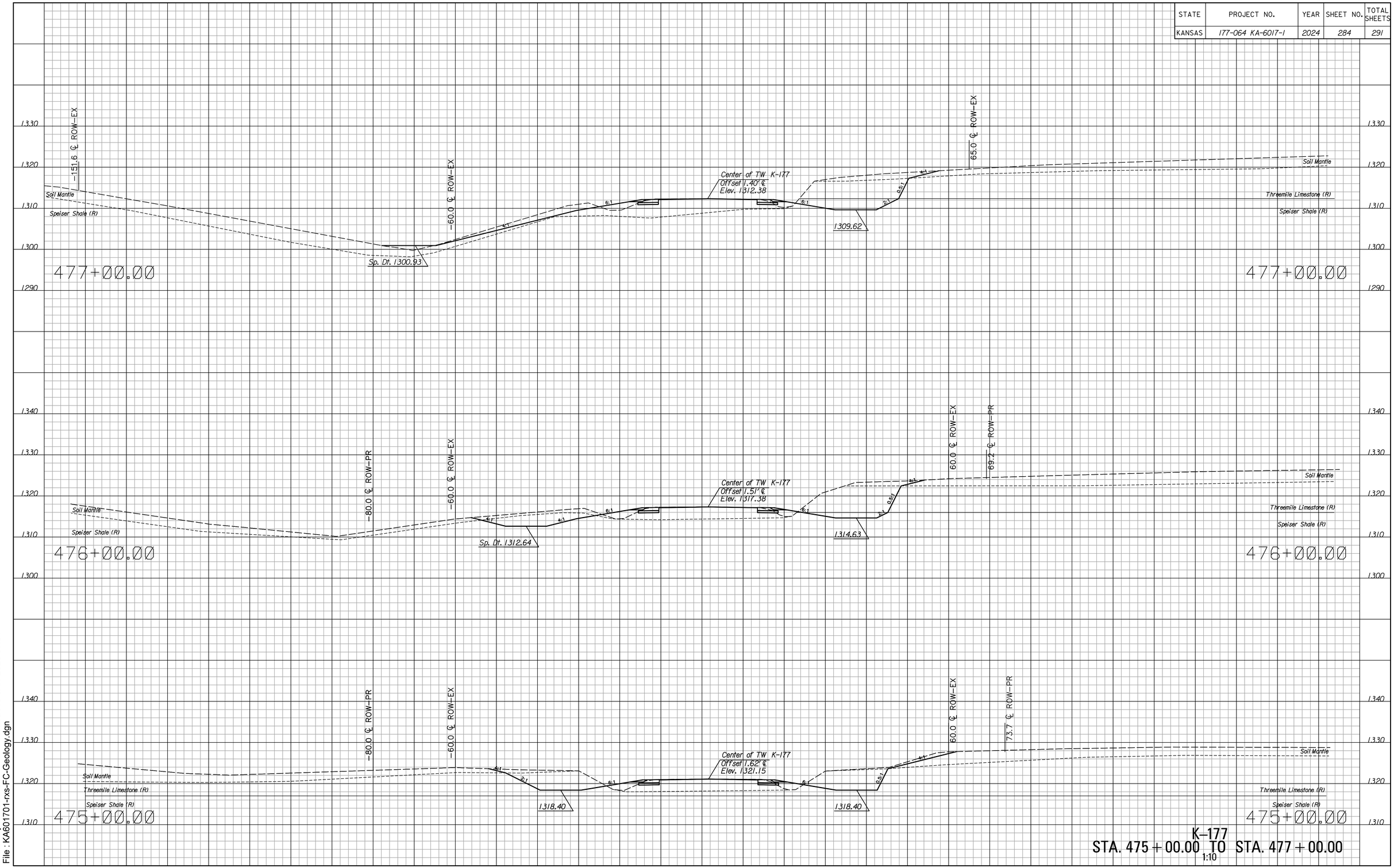
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	283	291



Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 472+00.00 TO STA. 474+00.00
1:10

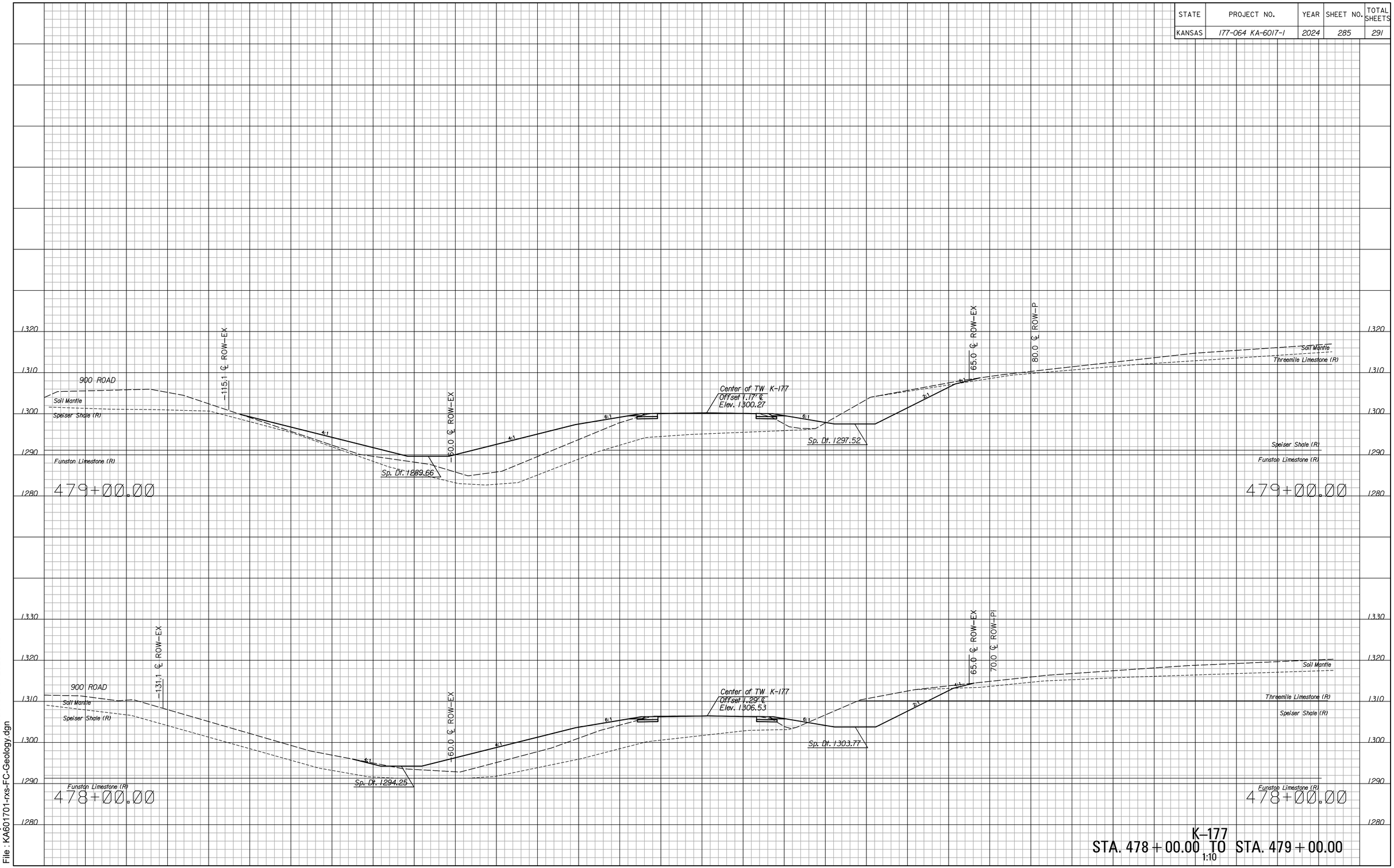
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	284	291



Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 475+00.00 TO STA. 477+00.00
1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	285	291



K-177
STA. 478+00.00 TO STA. 479+00.00
1:10

Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

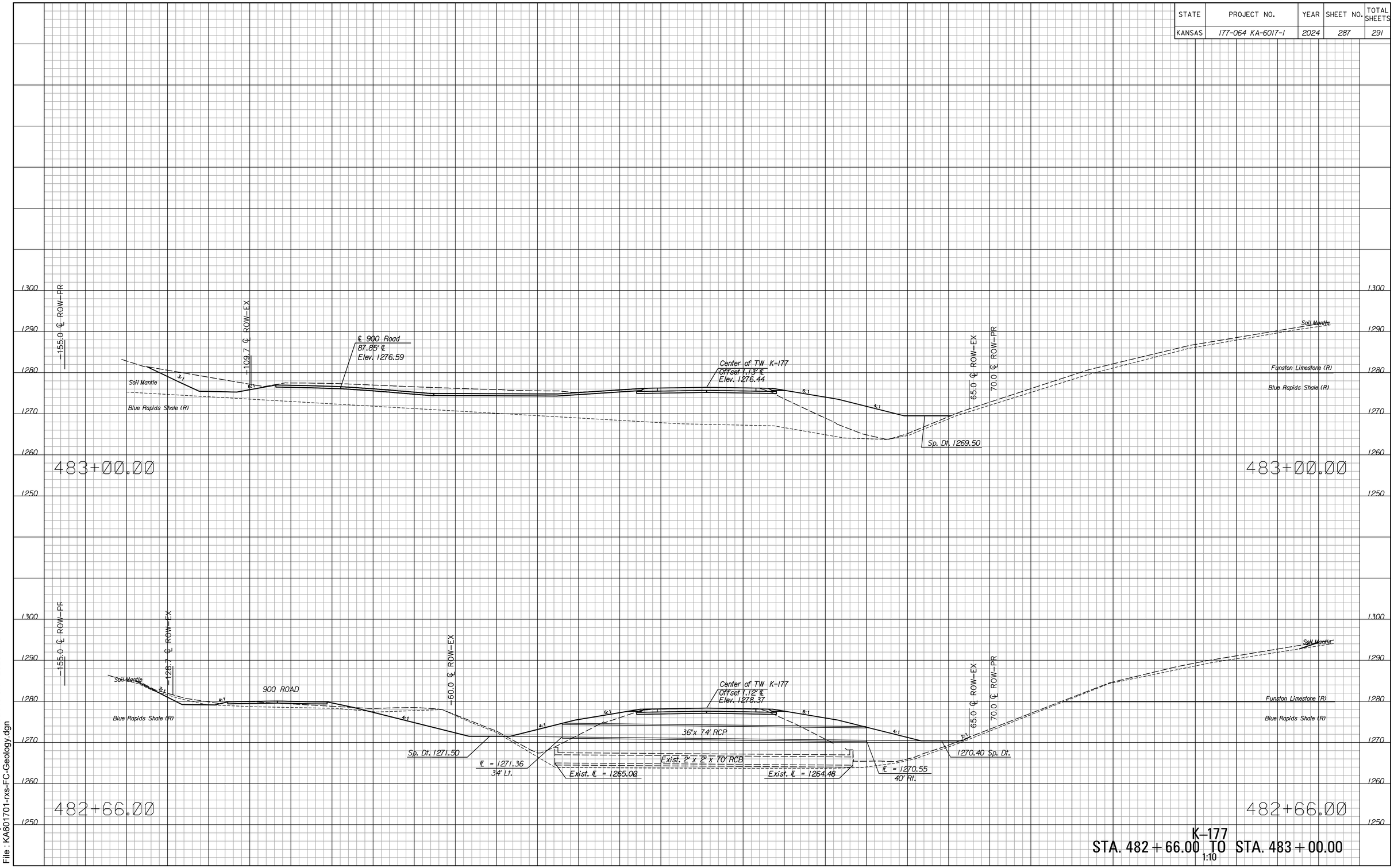
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	286	291

Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn
Plotted : 16-JAN-2025 07:54

K-177
STA. 480+00.00 TO STA. 482+00.00

1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	287	291



Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn
Plotted : 16-JAN-2025 07:54

K-177
STA. 482+66.00 TO STA. 483+00.00

1:10

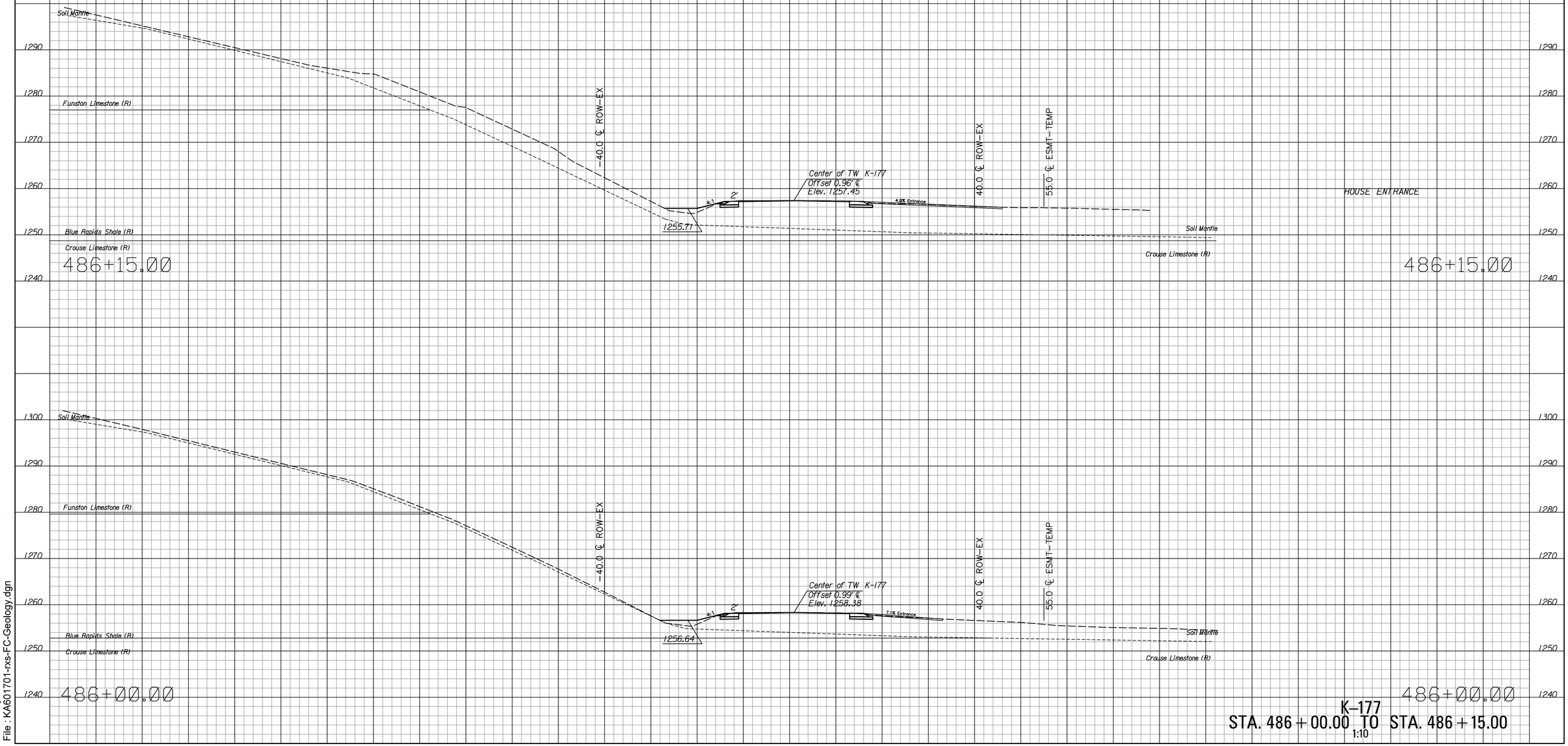
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	288	291

Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

K-177
STA. 483+30.00 TO STA. 485+00.00

1:10

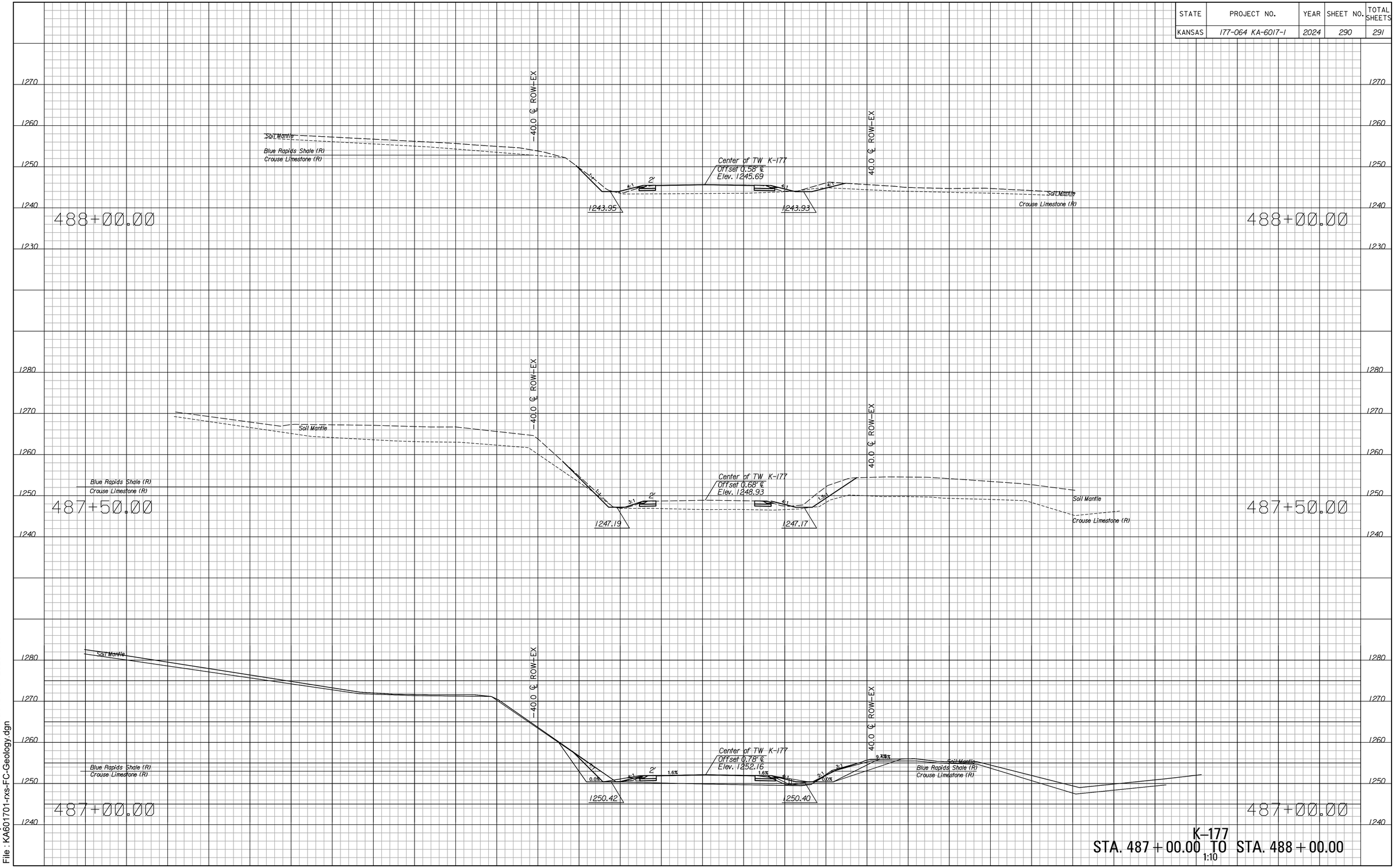
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	289	291



Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

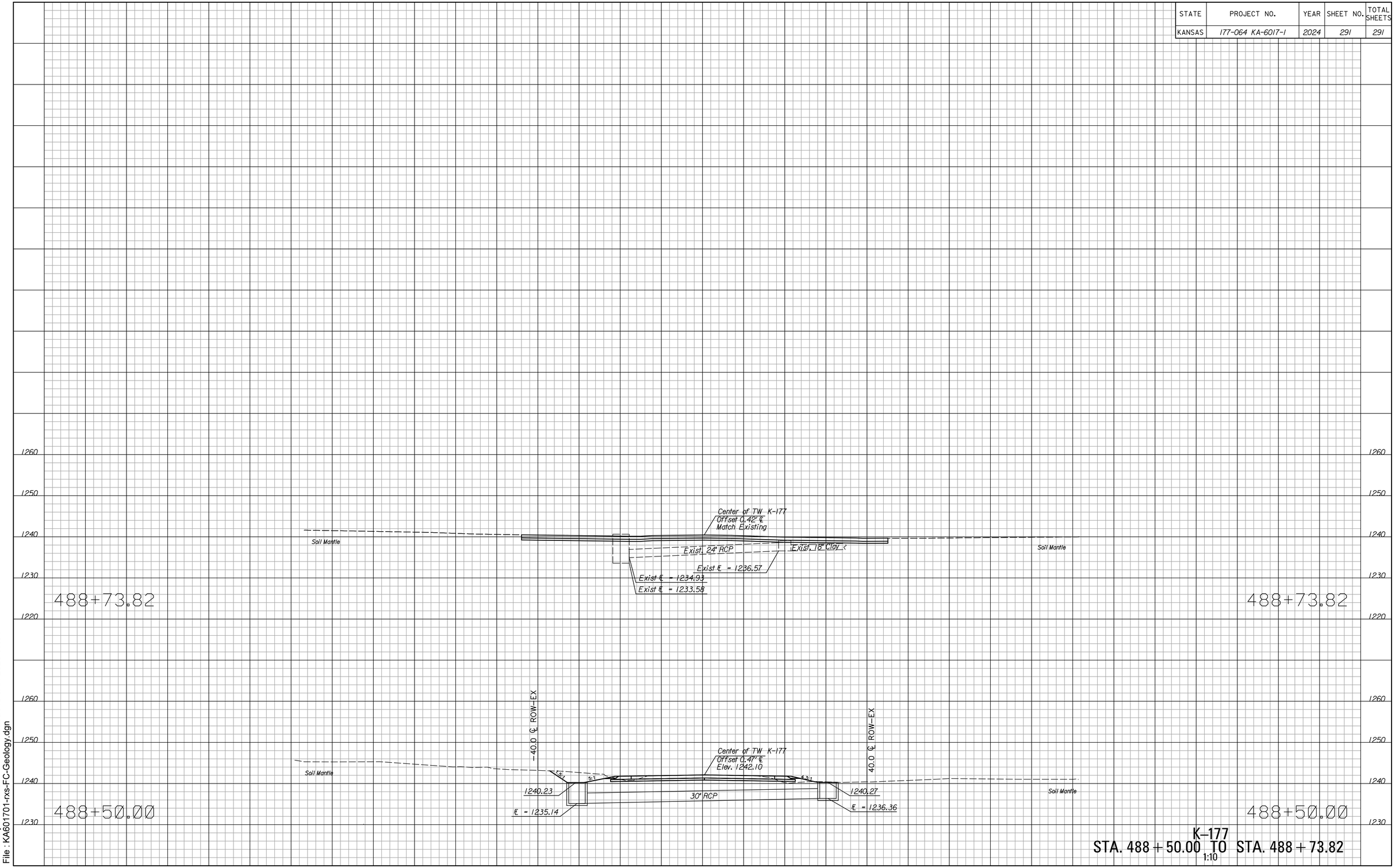
K-177
STA. 486+00.00 TO STA. 486+15.00
1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	290	291



Plotted : 16-JAN-2025 07:54
Drawn By : mrockwell
File : KA601701-rxs-FC-Geology.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	177-064 KA-6017-1	2024	291	291



K-177
STA. 488+50.00 TO STA. 488+73.82
1:10

Drawn By : mrockwell Plotted : 16-JAN-2025 07:54
File : KA601701-rxs-FC-Geology.dgn