

APPENDIX A:

GEOMETRIC ANALYSIS

Functional Classification = Rural Principal Arterial
Superelevation (e) max = 8%

Design Speed (Vd) = 55 mph therefore
Source: KYTC Highway Design Manual Exhibit 700-03

Min Radius (Rmin) = 960

County	Existing Horizontal Curve				Is the Radius Adequate?	Check	Field-Measured Superelevation
	Road	P.I. Station Number	Derived Milepoint	Radius (ft)			
Magoffin	US 460	27+78.1	15.096	5,729.7	Yes	0	
Magoffin	US 460	45+57.5	15.433	1,146.0	Yes	0	9.30%
Magoffin	US 460	66+33.3	15.826	7,640.0	Yes	0	
Magoffin	US 460	118+56.4	16.816	1,909.9	Yes	0	
Magoffin	US 460	118+86.3	16.821	1,805.9	Yes	0	
Magoffin	US 460	139+00.	17.203	2,546.7	Yes	0	
Magoffin	US 460	163+86.	17.673	2,546.7	Yes	0	
Magoffin	US 460	168+85.6	17.768	2,944.7	Yes	0	
Magoffin	US 460	200+63.9	18.370	1,310.0	Yes	0	
Magoffin	US 460	255+76.7	19.414	2,865.0	Yes	0	
Magoffin	US 460	300+21.2	20.256	5,730.0	Yes	0	
Magoffin	US 460	323+03.2	20.688	1,432.5	Yes	0	
Johnson	US 460	349+30.6	0.643	2,865.0	Yes	0	12.80%
Johnson	US 460	371+69.4	1.067	1,145.5	Yes	0	
Johnson	US 460	384+34.1	1.306	2,864.8	Yes	0	
Johnson	US 460	418+64.6	1.956	2,251.8	Yes	0	
Johnson	US 460	425+54.6	2.087	2,291.9	Yes	0	
Johnson	US 460	468+50.1	2.900	2,251.9	Yes	0	
Johnson	US 460	531+88.7	4.101	1,041.7	Yes	0	10.70%
Johnson	US 460	553+60.5	4.512	1,041.7	Yes	0	
Johnson	US 460	615+18.4	5.678	1,432.4	Yes	0	
Johnson	US 460	643+55.5	6.216	1,432.2	Yes	0	
Johnson	US 460	661+76.	6.560	7,638.4	Yes	0	
Johnson	US 460	688+82.9	7.073	4,583.7	Yes	0	
Total Number of HC's =					24	24	
Number of Deficient HC's =					0	0	

Functional Classification = Rural Principal Arterial

Terrain = Rolling

Vd = 55 mph

Vd = 55 mph

therefore ht Distance =

495 ft

therefore Max. Grade =

5 %

Source: KYTC Highway Design Manual Exhibit 700-03

Source: KYTC Highway Design Manual Exhibit 700-03

Crest Vertical Curves

County	Road	VPI Station Number	Existing Vertical Curve					SSD < L ¹		SSD >= L ²		Controlling SSD	Meet SSD Req.
			Derived Milepoint	G1 (%)	G2 (%)	Length of Curve (ft)	Required SSD	SSD	Is SSD<L	SSD	Is SSD>=L		
Magoffin	US 460	92+00.	16.312	6.000	-6.000	1,500.00	495	519.37	Yes	839.92	No	519.37	yes
Magoffin	US 460	223+00.	18.793	1.632	-5.000	3,000.00	495	988.02	Yes	1,662.70	No	988.02	yes
Magoffin	US 460	329+00.	20.801	-0.413	-1.275	1,000.00	495	1,582.24	No	1,751.74	Yes	1751.74	yes
Johnson	US 460	370+00.	1.035	2.567	1.035	1,000.00	495	1,186.85	No	1,204.31	Yes	1204.31	yes
Johnson	US 460	375+50.	1.139	5.000	-5.000	1,600.00	495	587.61	Yes	907.90	No	587.61	yes
Johnson	US 460	565+00.	4.728	3.565	-3.690	1,200.00	495	597.44	Yes	748.73	No	597.44	yes
Johnson	US 460	685+00.	7.001	0.500	-0.584	2,000.00	495	1,995.38	Yes	1,995.39	No	1995.38	yes

¹ Source: 2011 Green Book Formula 3-43

² Source: 2011 Green Book Formula 3-44

Total Number of Crest VC's =	7	
Number of Def. Crest VC's =	0	0%

Sag Vertical Curves

County	Road	VPI Station Number	Existing Vertical Curve					HSSD < L ¹			HSSD >= L ²			Meet SSD Req.
			Derived Milepoint	G1 (%)	G2 (%)	Existing Length (ft)	Required SSD	HSSD #1 (+)	HSSD #2 (-)	Is HSSD<L	HSSD*	Is HSSD>=L	Controlling SSD	
Magoffin	US 460	4+50.	14.655	-0.362	0.300	1000	495	5,398.93	-111.92	no	-488.05	No	-488.05	TRUE
Magoffin	US 460	42+50.	15.375	0.300	2.642	600	495	999.23	-102.56	no	1,524.66	Yes	1524.66	TRUE
Magoffin	US 460	72+60.	15.945	3.600	6.000	600	495	977.32	-102.32	no	1,415.38	Yes	1415.38	TRUE
Magoffin	US 460	126+00.	16.956	-6.000	1.125	800.00	495	485.52	-92.51	yes	567.46	No	485.52	FALSE
Magoffin	US 460	155+90.	17.523	1.129	1.617	200	495	1,539.35	-106.39	no	-197.27	No	-197.27	TRUE
Magoffin	US 460	172+50.	17.837	1.617	2.333	400	495	2,063.60	-108.29	no	-331.91	No	-331.91	TRUE
Magoffin	US 460	253+90.	19.379	-5.000	-1.528	1500	495	1,618.85	-106.75	no	1,628.34	Yes	1628.34	TRUE
Magoffin	US 460	291+00.	20.081	-1.322	-0.413	1000	495	3,959.35	-111.08	no	-779.00	No	-779.00	TRUE
Magoffin	US 460	313+00.	20.498	-1.271	-0.801	1000	495	7,565.74	-112.59	no	-339.58	No	-339.58	TRUE
Magoffin	US 460	334+00.	20.896	-0.801	1.250	2000	495	3,523.66	-110.70	no	7,478.41	Yes	7478.41	TRUE
Magoffin	US 460	335+00.	20.915	1.250	2.567	1000	495	2,767.31	-109.75	no	-1,982.68	No	-1982.68	TRUE
Johnson	US 460	360+50.	0.855	1.035	5.000	1000	495	985.13	-102.41	yes	985.33	No	985.13	TRUE
Johnson	US 460	423+50.	2.048	-5.000	-1.485	1000	495	1,099.37	-103.52	no	1,109.20	Yes	1109.20	TRUE
Johnson	US 460	475+00.	3.023	-1.485	-0.500	1000	495	3,662.68	-110.83	no	-905.96	No	-905.96	TRUE
Johnson	US 460	512+00.	3.724	-0.500	1.300	1000	495	2,052.70	-108.26	no	22,000.00	Yes	22000.00	TRUE
Johnson	US 460	536+00.	4.179	1.300	3.565	800	495	1,341.52	-105.31	no	2,147.57	Yes	2147.57	TRUE
Johnson	US 460	603+00.	5.448	-3.696	-1.160	1000	495	1,486.25	-106.13	no	1,867.68	Yes	1867.68	TRUE
Johnson	US 460	661+00.	6.546	-1.160	0.500	1000	495	2,217.12	-108.68	no	-11,444.44	No	-11444.44	TRUE

* Note: A Negative Sign Indicates Unlimited Sight Distance

¹ Source: AASHTO Green Book Formula 3-48

² Source: AASHTO Green Book Formula 3-50

Total Number of Sag VC's =	18	
Number of Def. Sag VC's =	1	6%

Total Number of VC's =	25	
Number of Deficient VC's =	1	4%