CERTIFIED COPY OF ORDER

216 -2021

STATE OF MISSOURI } ea.
County of Boone

May Session of the April Adjourned **Term. 20** 21

In the County Commission of said county, on the 20th **day of** May **20** 21

the following, among other proceedings, were had, viz:

Now on this day, the County Commission of the County of Boone does hereby approve the Purchasing Departments request to dispose of the attached list of surplus equipment by recycle with MRC Recycling Center.

Done this 20th day of May 2021.

Daniel K. Atwill
Presiding Commissioner

Justin Aldred
District I Commissioner

Janet M. Thompson
District II Commissioner

ATTEST:
Brianna L. Lennon
Clerk of the County Commission

Boone County Purchasing
David Eagle
Purchasing Assistant

613 E. Ash Street
Columbia, MO 65201
Phone: (573) 886-4394

MEMORANDUM

TO: Boone County Commission
FROM: David Eagle
RE: Surplus Disposal - Recycle of Room Air Conditioners
DATE: May 20, 2021

The Purchasing Departments requests permission to dispose of the following list of surplus equipment by recycle with MRC Recycling Center.

	Asset #	Description	Make & Model	Department	Condition of Asset	
1	NO TAG	ROOM AIR CONDITIONER	G.E. MODEL - AJCS12DCBM2 SN-M343457	JOINT COMMUNCIATIONS	BROKEN	RECYCLE WITH ELECTRONICS
2	NO TAG	ROOM AIR CONDITIONER	G.E. MODEL – AJCS12DCAM1 SN-AA614035	JOINT COMMUNCIATIONS	BROKEN	RECYCLE WITH ELECTRONICS

cc: Heather Acton, Jacob Flowers, Auditor's office
Surplus File

C:\USERS\JVANSKIKE\APPDATA\LOCAL\MICROSOFT\WINDOWS\INETCACHE\CONTENT.OUTLOOK\IH48ZDAB\COMMISSION MEMO 05-12-21.DOC

BOONE COUNTY

Request for Disposal/Transfer of County Property

Complete, sign, and return to Auditor's Office

Date: 04/19/2021 Fixed Asset Tag Number:

REMOVED FROM THE BROWN ANNEX BUILDING AT THE B.C.J.C.

Description of Asset: G.E. ROOM AIR CONDITIONER

Requested Means of Disposal: ☐Sell ☐Trade-In ☒Recycle/Trash ☐Other, Explain:

RECEIVED
APR 28 2021
BOONE COUNTY AUDITOR

Other Information (Serial number, etc.): MOD/AJCS12DECBM2
SER/LM343457

Condition of Asset: BROKE

Reason for Disposition: BROKE

Location of Asset and Desired Date for Removal to Storage: OUTSIDE BASEMENT DOOR AT THE B.C.J.C.

Was asset purchased with grant funding? ☐YES ☒NO

If "YES", does the grant impose restriction and/or requirements pertaining to disposal? ☐YES ☐NO

If yes, attach documentation demonstrating compliance with the agency's restrictions and/or requirements.

Dept Number & Name: ROADBEER SCHLINK Signature _____

To be Completed by: AUDITOR

Original Acquisition Date N/A G/L Account for Proceeds 1190-3836 F

Original Acquisition Amount _____

Original Funding Source _____

Account Group _____

To be Completed by: COUNTY COMMISSION / COUNTY CLERK

Approved Disposal Method:

_____Transfer Department Name_____ Number_____

Location within Department_____

Individual_____

_____Trade _____Auction _____Sealed Bids

_____Other Explain_____

Commission Order Number 216-2021

Date Approved 5.20.2021

Signature _____

K:\All Things COUNTY\County forms\Fixed Asset Disposal Form 2017.docx
Revised: September 2016

BOONE COUNTY

Request for Disposal/Transfer of County Property

Complete, sign, and return to Auditor's Office

RECEIVED
APR 28 2021

Date: 04/23/2021 Fixed Asset Tag Number:

Description of Asset: 6. E. ROOM AIR CONDITIONER

Requested Means of Disposal: ☐Sell ☐Trade-In ☒Recycle/Trash ☐Other, Explain:

Other Information (Serial number, etc.): MOD/AJCS12DCAM1
SER/AA614035

Condition of Asset: BROKE

Reason for Disposition: BROKE BAD COMPRESSOR

Location of Asset and Desired Date for Removal to Storage: OUTSIDE BASEMENT DOOR AT THE B.C.J.C.

Was asset purchased with grant funding? ☐YES ☒NO

If "YES", does the grant impose restriction and/or requirements pertaining to disposal? ☐YES ☐NO

If yes, attach documentation demonstrating compliance with the agency's restrictions and/or requirements.

Dept Number & Name: PEGGY SCHLINK Signature _____

To be Completed by: AUDITOR

Original Acquisition Date N/A G/L Account for Proceeds 1190-3836-J

Original Acquisition Amount _____

Original Funding Source _____

Account Group _____

To be Completed by: COUNTY COMMISSION / COUNTY CLERK

Approved Disposal Method:

_____Transfer Department Name_____ Number_____

Location within Department_____

Individual_____

_____Trade _____Auction _____Sealed Bids

_____Other Explain_____

Commission Order Number 216-2021

Date Approved 5.20.2021

Signature _____

K:\All Things COUNTY\County forms\Fixed Asset Disposal Form 2017.docx
Revised: September 2016

217 -2021

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STATE OF MISSOURI } ea.
County of Boone

May Session of the April Adjourned **Term. 20** 21

In the County Commission of said county, on the 20th **day of** May **20** 21

the following, among other proceedings, were had, viz:

Now on this day, the County Commission of the County of Boone does hereby approve a variance to allow a minimum sag vertical curve K Value of 26 in lieu of the 40 required for Local Roads in Table A – Road Construction Minimum Standards, Appendix 'A' of the Chapter II Roadway Regulations for the sag vertical curve near station 12+50.00 of the proposed Amicus Drive in Midway Crossings Plat 3 contingent upon the Developer providing street lighting at the Developer's expense prior to County acceptance of the roadway for maintenance.

Done this 20th day of May 2021.

Daniel K. Atwill
Presiding Commissioner

Justin Aldred
District I Commissioner

Janet M. Thompson
District II Commissioner

ATTEST:
Brianna L. Lennon
Clerk of the County Commission

Boone County Resource Management

ROGER B. WILSON BOONE COUNTY GOVERNMENT CENTER
801 E. WALNUT ROOM 315
COLUMBIA, MISSOURI 65201-7730
PLANNING (573) 886-4330 ★ INSPECTION (573) 886-4339 ★ ENGINEERING (573) 886-4480
FAX (573) 886-4340

BILL FLOREA, DIRECTOR **JEFF MCCANN, CHIEF ENGINEER**

MEMO

DATE: May 13, 2021

TO: Boone County Commission

FROM: Jeff McCann, P.E., Chief Engineer, Boone County Resource Management JM

RE: Recommendation for Variance Request to the Chapter II Roadway Regulations Midway Crossings Plat 3

Mr. Cody Darr with A Civil Group is requesting one (1) variance to the Boone County Chapter II Roadway Regulations for the proposed residential development known as Midway Crossings Plat 3 on behalf of Amicus Terra Development. Mr. Darr's request letter and the executed Consent To Proceed Before County Commission For A Road Regulations Variance Request are attached for reference.

Variance Criteria:

As set forth in Paragraph 2.16 of the Boone County Chapter II Roadway Regulations;

"No variance from any requirement contained within Appendices of these regulations shall be granted unless the Committee finds: (a) the applicant will incur unreasonable and unnecessary hardship if a variance is not granted and the variance is not sought primarily to avoid financial expense in complying with the requirements of these regulations (b) grant of a variance will not endanger the health, safety or welfare of the public, and (c) grant of a variance will not hinder, thwart or circumvent the general intent or any specific purpose of these regulations."

Background:

The proposed single-family residential development is located in the Midway area near the intersection of Rollingwood Blvd. and Golden Willow Drive as shown on the attached Exhibit A – Location Map. Twenty-six (26) lots are proposed for Plat 3 which will be the final phase of the Midway Crossings subdivision as shown on the attached Exhibit B – Preliminary Plat. Plat 3 has a proposed 32' wide with curb and gutter internal loop street, Amicus Drive, that will connect to existing Black Walnut Drive, White Cypress Drive and Ely Avenue.

Request:

Allow a minimum sag vertical curve K Value of 26 in lieu of the 40 required for Local Roads in Table A – Road Construction Minimum Standards, Appendix 'A' of the Chapter II Roadway Regulations for the sag vertical curve near station 12+50.00 of the proposed Amicus Drive in Midway Crossings Plat 3 contingent upon the Developer providing street lighting at the Developer's expense. The requested variance area is shown on the attached Exhibit C – Amicus Drive Plan & Profile.

Staff Recommendation:

The K Value of a vertical curve indicates the abruptness of street grade changes. Sag vertical curves are at dips in the street. The higher the K Value the smoother the dip. As Mr. Darr explains in his request letter, headlight sight distance is the controlling design for K Value on non-lighted roadways.

The headlight sight distance for the proposed K Value of 26 is approximately 49 feet less than the K Value of 40. The vertical curve in question is located within a horizontal curve which limits the headlight sight distance more than the K Value difference. Proper drainage and lot elevations in this area are also important safety factors to consider. The reduced headlight sight distance can be mitigated by street lighting.

Staff supports this variance request to allow a minimum sag vertical curve K Value of 26 in lieu of the 40 required for Local Roads in Table A – Road Construction Minimum Standards, Appendix 'A' of the Chapter II Roadway Regulations for the sag vertical curve near station 12+50.00 of the proposed Amicus Drive in Midway Crossings Plat 3 contingent upon the Developer providing street lighting at the Developer's expense prior to County acceptance of the roadway for maintenance.

A CIVIL GROUP
CIVIL ENGINEERING - PLANNING - SURVEYING

April 21, 2021

Jeff McCann, P.E.
Chief Engineer
Boone County Resource Management
801 E. Walnut Street
Columbia, MO 65201

RE: Midway Crossings Plat 3 – Amicus Drive K-Value Variance

Dear Mr. McCann,

On behalf of Amicus Terra Development (Owner/Developer, c/o Glen Wylie) d/b/a ATD, L.L.C., we would like to formally request a variance to the Boone County Road Regulations, Appendix A – Table A - Road Construction Minimum Standards:

K Value – Sag Curves. The minimum value = 40 for local streets. (Table attached)

It is our understanding that the County's K Value requirement is based on a stopping sight distance of 200' for a design speed of 30 mph, as defined in the AASHTO Green Book (see attached AASHTO Sag Vertical Curve Design Criteria, Exhibit 3-75 shows design K Value of 37 for the above described situation). However, the limiting factor causing this K value is headlight sight distance. As part of this development and variance request, we would make contingent that Street Lighting be installed along Amicus Dr.

Therefore, the new limiting criteria, as outlined in AASHTO Green Book, would be passenger comfort. This criterion is reported as being approximately 50% of that needed to satisfy the headlight sight distance criterion, or approximately 37/2 = 18.5.

We propose to self-impose the minimum K Value to be allowed along Amicus Drive to be K=26.

Typical considerations and responses below:

- **The applicant will incur unreasonable and unnecessary hardship if a variance is not granted and the variance is not sought to avoid financial expense in complying with the requirements of these regulations**
  - Meeting the required K-Value will require raising the entire road causing likely earth import, and either increased steepness of lots, therefore reduction in usability of the lots, or, shifting of the low point of the road which would still cause increased steepness of lots and also potentially the 100-year event runoff to bypass the dry detention basin resulting in concentrated discharge to the adjacent property to the north.

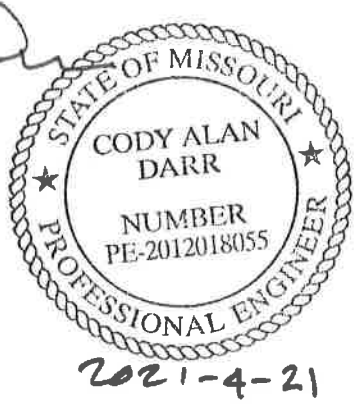
3401 Broadway Business Park Ct, Suite 105 Columbia, Missouri 65203
PHONE: 573-817-5750 FAX: 573-817-1677 EMAIL: cody@acivilgroup.com

- **Grant of the variance will not hinder, thwart, or circumvent the general intent or any specific purpose of these regulations.**
  - We do not believe the proposed width would do any of the above. Based on the circumstances (lighted streets) the apparent methodology for regulations does not apply, and other criteria, as set out by industry standards (AASHTO) for sag curves, is being met or exceeded.

Feel free to contact me with any questions or concerns regarding this variance application.

Sincerely,

Cody Darr, PE, PLS



2021-4-21

3401 Broadway Business Park Ct, Suite 105 Columbia, Missouri 65203
PHONE: 573-817-5750 FAX: 573-817-1677 EMAIL: cody@acivilgroup.com

TABLE A

ROAD CONSTRUCTION MINIMUM STANDARDS				
	Arterial	**Collector**	**Local**	**Commercial / Industrial**
ADT	>2500	750-2500	<750	By Land Use
Right of Way Width	100 ft.	66 ft.	50 ft.	66 ft.
Cul-de-sac R.O.W. Radius	N/A		47 ft.	66 ft.
Paving	Yes			
Curb and Gutter	See note #1			Yes
Design Speed	40 mph	30 mph	30 mph	30 mph
Minimum Pavement Radius at Intersecting Streets	30'			
Minimum Curve Radius	730 ft.	575 ft.	100 ft.	250 ft.
Maximum Grade	7%	8%	10%	7%
Minimum Grade	1 %			
Stopping Sight Distance	275-325 ft.	200 ft.		
K Value - Sag Curves	60-70	40		
Clear Zone	10 ft.			
Driveway Locations	See Appendix B-1, Drawings 410.01A & 410.01B			
Bridge Design Loading	HS20-44/3S2			
Roadway Cross-Sections	See Appendix B-1, Drawings 110.01-110.11			

NOTES:

1. **Curb and gutter** requirements for new subdivisions will be stated in the Boone County Land Use Regulations, Chapter I, Subdivision Regulations dated June 17, 1995 as amended.

2. **All Corner Lots** – Driveway approaches and sidewalks shall be placed according to these regulations before roadways will be accepted for maintenance.

3. **All utilities** to be located within Right of Way must be installed before roadways will be accepted for maintenance.

4. **All cul-de-sacs** shall be less than 1000 feet from the nearest street that has 2 outlets within the roadway system. Distance is measured from the centerline of the adjacent street to the center of the cul-de-sac.

5. **In cases** where the Subdivision Regulations and the Roadway Regulations conflict, the most stringent Standard shall apply

distance on crest vertical curves may be practical on roads with unusual combinations of low design speeds and gentle grades or higher design speeds with very small algebraic differences in grades. Ordinarily, passing sight distance is provided only at locations where combinations of alignment and profile do not need the use of crest vertical curves.

Sag Vertical Curves

At least four different criteria for establishing lengths of sag vertical curves are recognized to some extent. These are (1) headlight sight distance, (2) passenger comfort, (3) drainage control, and (4) general appearance.

Headlight sight distance has been used directly by some agencies and for the most part is the basis for determining the length of sag vertical curves recommended here. When a vehicle traverses a sag vertical curve at night, the portion of highway lighted ahead is dependent on the position of the headlights and the direction of the light beam. A headlight height of 600 mm [2 ft] and a 1-degree upward divergence of the light beam from the longitudinal axis of the vehicle is commonly assumed. The upward spread of the light beam above the 1-degree divergence angle provides some additional visible length of roadway, but is not generally considered in design. The following equations show the relationships between S, L, and A, using S as the distance between the vehicle and point where the 1-degree upward angle of the light beam intersects the surface of the roadway:

Metric	US Customary	
When S is less than L, $$L = \frac{AS^2}{200\left[0.6 + S(\tan 1^\circ)\right]}$$	When S is less than L, $$L = \frac{AS^2}{200\left[2.0 + S(\tan 1^\circ)\right]}$$	(3-47)
or, $$L = \frac{AS^2}{120 + 3.5S}$$	or, $$L = \frac{AS^2}{400 + 3.5S}$$	(3-48)
When S is greater than L, $$L = 2S - \frac{200\left[0.6 + S(\tan 1^\circ)\right]}{A}$$	When S is greater than L, $$L = 2S - \frac{200\left[2.0 + S(\tan 1^\circ)\right]}{A}$$	(3-49)
or, $$L = 2S - \left(\frac{120 + 3.5S}{A}\right)$$	or, $$L = 2S - \left(\frac{400 + 3.5S}{A}\right)$$	(3-50)
where: L = length of sag vertical curve, m; S = light beam distance, m; A = algebraic difference in grades, percent	where: L = length of sag vertical curve, ft; S = light beam distance, ft; A = algebraic difference in grades, percent	

For overall safety on highways, a sag vertical curve should be long enough that the light beam distance is nearly the same as the stopping sight distance. Accordingly, it is appropriate to use stopping sight distances for different design speeds as the value of S in the above equations. The resulting lengths of sag vertical curves for the recommended stopping sight distances for each design speed are shown in Exhibit 3-74 with solid lines using rounded values of K as was done for crest vertical curves.

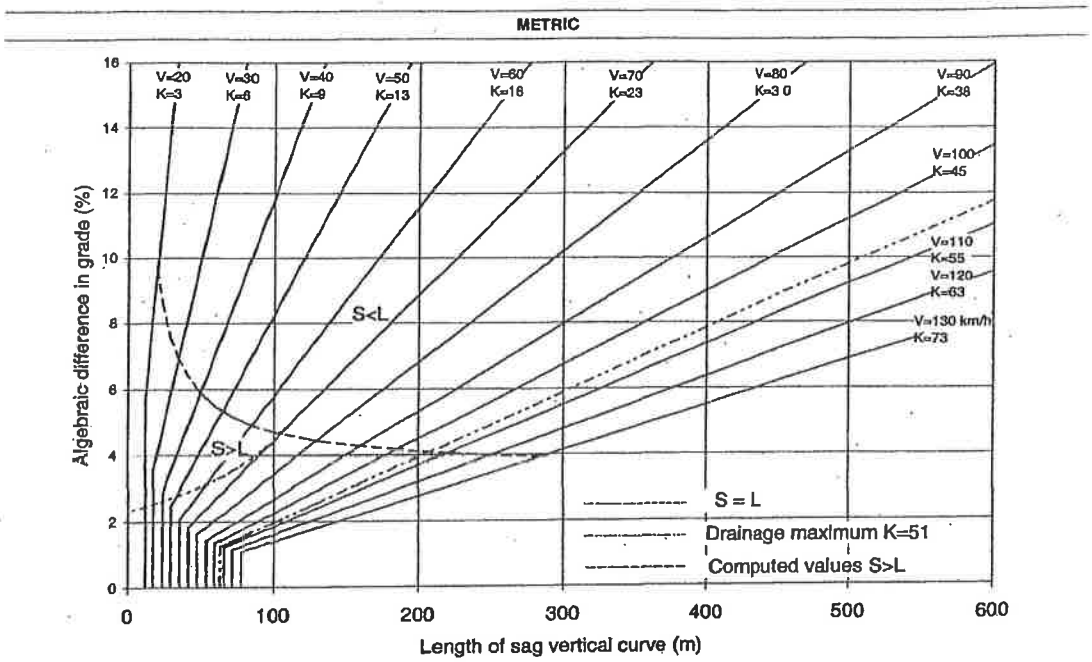
The effect on passenger comfort of the change in vertical direction is greater on sag than on crest vertical curves because gravitational and centripetal forces are in opposite directions, rather than in the same direction. Comfort due to change in vertical direction is not readily measured because it is affected appreciably by vehicle body suspension, vehicle body weight, tire flexibility, and other factors. Limited attempts at such measurements have led to the broad conclusion that riding is comfortable on sag vertical curves when the centripetal acceleration does not exceed 0.3 m/s^2 [1 ft/s^2]. The general expression for such a criterion is:

Metric	US Customary
$L = \frac{AV^2}{395}$	$L = \frac{AV^2}{46.5}$ (3-51)
where: L = length of sag vertical curve, m; A = algebraic difference in grades, percent; V = design speed, km/h	where: L = length of sag vertical curve, ft; A = algebraic difference in grades, percent; V = design speed, mph

The length of vertical curve needed to satisfy this comfort factor at the various design speeds is only about 50 percent of that needed to satisfy the headlight sight distance criterion for the normal range of design conditions.

Drainage affects design of vertical curves of Type III (see Exhibit 3-69) where curbed sections are used. An approximate criterion for sag vertical curves is the same as that expressed for the crest conditions (i.e., a minimum grade of 0.30 percent should be provided within 15 m [50 ft] of the level point). This criterion corresponds to K of 51 m [167 ft] per percent change in grade, which is plotted in Exhibit 3-74 as the drainage maximum. The drainage criterion differs from other criteria in that the length of sag vertical curve determined for it is a maximum, whereas, the length for any other criterion is a minimum. The maximum length of the drainage criterion is greater than the minimum length for other criteria up to 100 km/h [65 mph].

For general appearance of sag vertical curves, some use was formerly made of a rule-of-thumb for minimum curve length of 30A [100A] or, in Exhibit 3-74, K = 30 [K = 100]. This approximation is a generalized control for small or intermediate values of A. Compared with headlight sight distance, it corresponds to a design speed of approximately 80 km/h [50 mph]. On high-type highways, longer curves are appropriate to improve appearance.



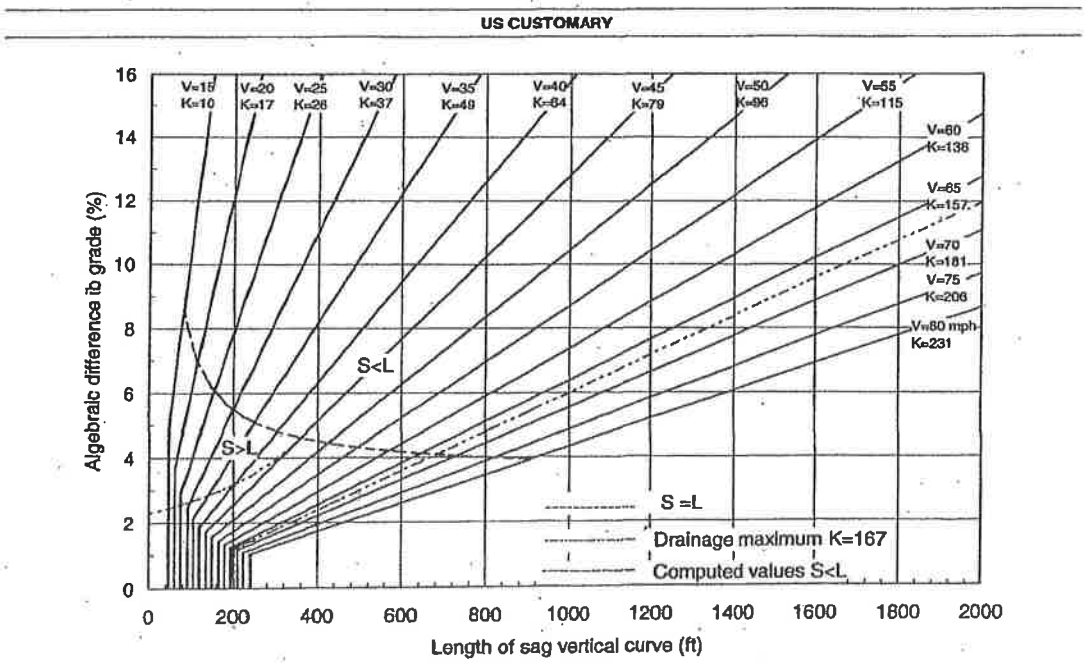


Exhibit 3-74. Design Controls for Sag Vertical Curves—Open Road Conditions

From the preceding discussion, it is evident that design controls for sag vertical curves differ from those for crests, and separate design values are needed. The headlight sight distance appears to be the most logical criterion for general use, and the values determined for stopping sight distances are within the limits recognized in current practice. The use of this criterion to establish design values for a range of lengths of sag vertical curves is recommended. As in the case of crest vertical curves, it is convenient to express the design control in terms of the K rate for all values of A. This entails some deviation from the computed values of K for small values of A, but the differences are not significant. Exhibit 3-75 shows the range of computed values and the rounded values of K selected as design controls. The lengths of sag vertical curves on the basis of the design speed values of K are shown by the solid lines in Exhibit 3-74. It is to be emphasized that these lengths are minimum values based on design speed; longer curves are desired wherever practical, but special attention to drainage should be exercised where values of K in excess of 51 [167] are used.

Minimum lengths of vertical curves for flat gradients also are recognized for sag conditions. The values determined for crest conditions appear to be generally suitable for sags. Lengths of sag vertical curves, shown as vertical lines in Exhibit 3-74, are equal to 0.6 times the design speed in km/h [three times the design speed in mph].

Sag vertical curves shorter than the lengths computed from Exhibit 3-75 may be justified for economic reasons in cases where an existing feature, such as a structure not ready for replacement, controls the vertical profile. In certain cases, ramps may also be designed with shorter sag vertical curves. Fixed-source lighting is desirable in such cases. For street design, some engineers accept design of a sag or crest where A is about 1 percent or less without a length of calculated vertical curve. However, field modifications during construction usually result in constructing the equivalent to a vertical curve, even if short.

Metric				US Customary			
Design speed (km/h)	Stopping sight distance (m)	Rate of vertical curvature, K[a]		Design speed (mph)	Stopping sight distance (ft)	Rate of vertical curvature, K[a]	
		Calculated	Design			Calculated	Design
20	20	2.1	3	15	80	9.4	10
30	35	5.1	6	20	115	16.5	17
40	50	8.5	9	25	155	25.5	26
50	65	12.2	13	30	200	36.4	37
60	85	17.3	18	35	250	49.0	49
70	105	22.6	23	40	305	63.4	64
80	130	29.4	30	45	360	78.1	79
90	160	37.6	38	50	425	95.7	96
100	185	44.6	45	55	495	114.9	115
110	220	54.4	55	60	570	135.7	136
120	250	62.8	63	65	645	156.5	157
130	285	72.7	73	70	730	180.3	181
				75	820	205.6	206
				80	910	231.0	231

[a] Rate of vertical curvature, K, is the length of curve (m) per percent algebraic difference intersecting grades (A). $K = L/A$

Exhibit 3-75. Design Controls for Sag Vertical Curves

USING HEADLIGHT SIGHT DISTANCE CRITERIA

Sight Distance at Undercrossings

Sight distance on the highway through a grade separation should be at least as long as the minimum stopping sight distance and preferably longer. Design of the vertical alignment is the same as at any other point on the highway except in some cases of sag vertical curves underpassing a structure as illustrated in Exhibit 3-76. While not a frequent problem, the structure fascia may cut the line of sight and limit the sight distance to less that otherwise is attainable. It is generally practical to provide the minimum length of sag vertical curve discussed above at grade separation structures, and even where the recommended grades are exceeded, the sight distance should not need to be reduced below the minimum recommended values for stopping sight distance.

For some conditions, the designer may wish to check the available sight distance at an undercrossing, such as at a two-lane undercrossing without ramps where it would be desirable to provide passing sight distance. Such checks are best made graphically on the profile, but may be performed through computations.

BEFORE THE BOONE COUNTY COMMISSION
BOONE COUNTY, MISSOURI

In Re The Matter of:	)
	)
Amicus Terra Development	)
Midway Crossings Plat 3	)

CONSENT TO PROCEED BEFORE COUNTY COMMISSION
FOR A ROAD REGULATIONS VARIANCE REQUEST

The undersigned, a person with knowledge and authority to act on behalf of Amicus Terra Development, hereby makes the following representations:

1. The real party in interest in connection with a variance request involving Midway Crossings Plat 3, a proposed Boone County subdivision, is Amicus Terra Development, the applicant herein.
2. The undersigned acknowledges that the Boone County Road Regulations contemplate that variance requests would be first heard by the Road and Bridge Advisory Committee and appeals from that Committee's decisions would be heard by the County Commission.
3. The undersigned acknowledges that the Road and Bridge Advisory Committee lacks any current members and therefore has no quorum to act on applicant's variance request.
4. In order to proceed with the variance request made by A Civil Group on behalf of the applicant, the applicant hereby waives any and all rights applicant has to present their request first to the Road and Bridge Advisory Committee, and hereby consents to proceeding directly to the County Commission for the County Commission's consideration of applicant's variance request.
5. On behalf of applicant, the real party in interest, I consent to this matter proceeding directly before the County Commission and I waive any rights I have to proceed before the Road and Bridge Advisory Committee.

Amicus Terra Development

By: _____

Printed Name: GLEN WILLIE

Title: MEMBER

Date: 4/29/21

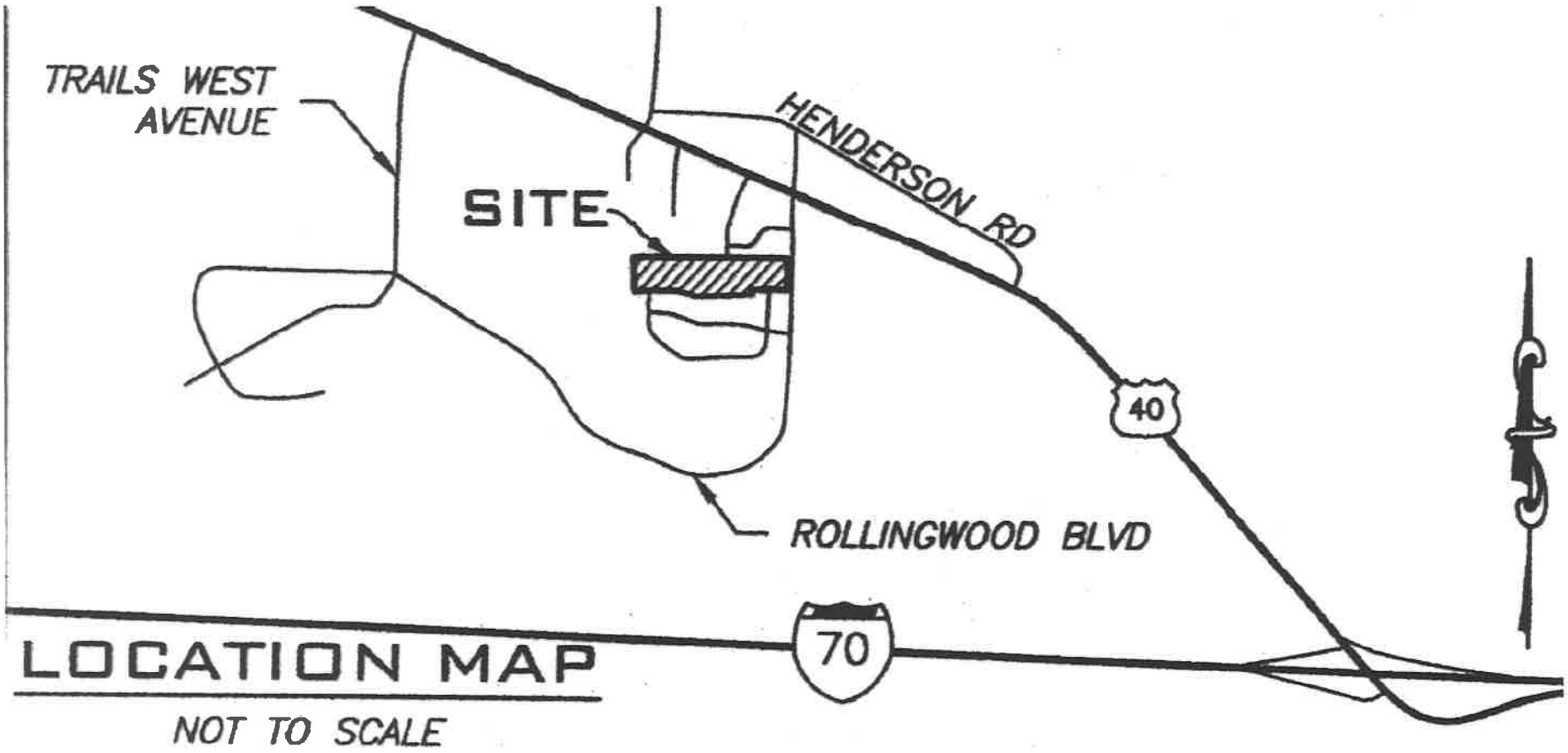


Exhibit A – Location Map