

**DESIGN CRITERIA:**

1. VERTICAL CURVES ARE REQUIRED FOR ALL GRADE BREAKS GREATER THAN 1 %
2. MINIMUM VERTICAL CURVE LENGTH (L) SHALL BE 10- FEET
3. LENGTH OF VERTICAL CURVE (L) = KA
4. GRADE BREAK (A)=S2-S1
5. K DETERMINE FROM TABLE 2

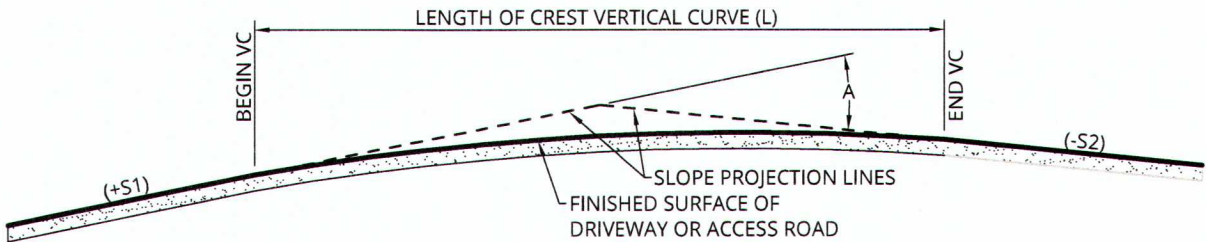
**TABLE 1: MINIMUM DESIGN SPEED**

	MIN DESIGN SPEED
DRIVEWAYS	15 mph
ACCESS ROADS	25 mph

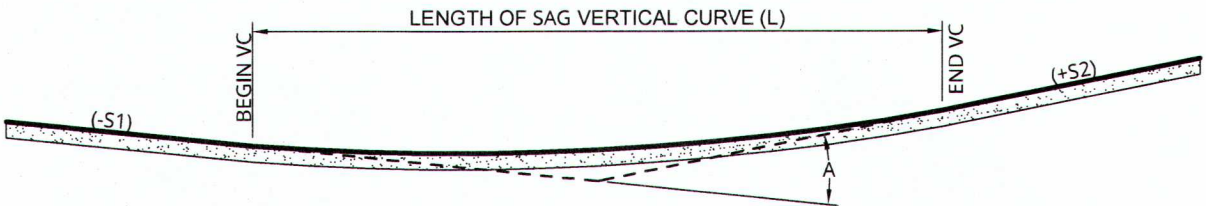
**TABLE 2: MINIMUM DESIGN K-VALUE**

DESIGN SPEED (mph)	SAG VERTICAL CURVE (minimum K-value, ft/ %)	CREST VERTICAL CURVE (minimum K-value, ft/ %)
15	3	10
20	7	17
25	12	26
30	19	37
35	29	49

FOR DESIGN SPEEDS GREATER THAN 35 MPH REFER TO COUNTY PUBLIC IMPROVEMENT STANDARDS, A-SERIES DRAWINGS



**FIG 1: CREST VERTICAL CURVE**



**FIG 2: SAG VERTICAL CURVE**

**EXAMPLE 1:**

DRIVEWAY WITH A DESIGN SPEED OF 20 MPH, SAG CONDITION, A DOWNHILL SLOPE IN (S1) OF -5 % AND A UPHILL SLOPE OUT (S2) OF +3%, DETERMINE THE MINIMUM VERTICAL CURVE LENGTH.

**SOLUTION:**

FROM TABLE 2 & FIG 2, SAG CONDITION, 20 MPH DESIGN SPEED, THEN K=7  
 GIVEN THAT S1=-5 & S2=+3, THEN A=S2-S1=(+3)-(-5)=8  
 REQUIRED MINIMUM LENGTH OF VERTICAL CURVE (L)=KA=7x8=56 ft

**EXAMPLE 2:**

**GIVEN:**

ACCESS ROAD WITH A DESIGN SPEED OF 20 MPH, CREST CONDITION, A UPHILL SLOPE IN (+S1) OF +3 % AND A DOWNHILL SLOPE OUT (S2) OF -10 %, DETERMINE THE MINIMUM VERTICAL CURVE LENGTH.

**SOLUTION:**

FROM TABLE 2 & FIG 1, CREST CONDITION, 20 MPH DESIGN SPEED, THEN K=17  
 GIVEN THAT S1=+3 & S2=-10, THEN A=S2-S1=(-10)-(+3)=-7, OR 7  
 REQUIRED MINIMUM LENGTH OF VERTICAL CURVE (L)=KA=17x7=119 ft



COUNTY OF SAN LUIS OBISPO FIRE DEPARTMENT / CAL FIRE

**VERTICAL CURVE DESIGN STANDARD**  
 FOR PRIVATE DRIVEWAYS & ACCESS ROADS

Adopted: Aug. 2014	Scale: NTS
Revised: Apr. 2017	Revision No.: 1
Drawing No.:	<b>FP-11</b>