

Figure 10-6 Sag Low Point, Vertical Spans and Uplift

weight of the loaded conductor from the lower support to the low point of sag. Uplift exists at a structure (see Structure No. 4 in Figure 10-6) when the total vertical span from the ahead and back spans is negative. Uplift has to be avoided for suspension, pin-type, and post insulator construction. For structures with suspension insulators, the check for allowable insulator swing is usually the controlling criteria on vertical span. A rapid method to check for uplift is shown by Figure 10-5. There is no danger of uplift if the cold curve passes below the point of conductor support on a given structure with the curve on the point of conductor support at the two adjacent structures.

Designing for uplift, or minimizing its effects, is similar to the corrective measures listed for excessive insulator swing, except that adding of excessive weights should be avoided. Double deadends and certain angle structures can have uplift as long as the total force of uplift does not approach the structure weight. If it does, hold-down guys are necessary.

Care should be exercised to avoid locating structures that result in poor line grading (see Paragraph 10.1.4a of this chapter).

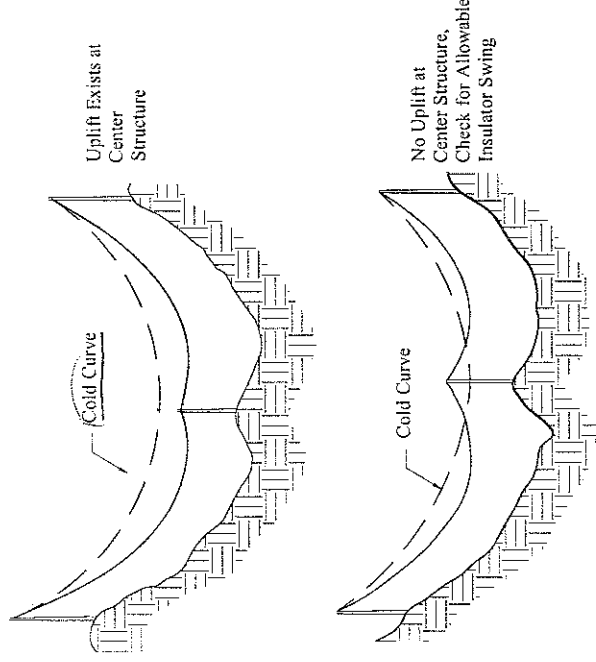


FIGURE 10-5: CHECK FOR UPLIFT

10.4.8 Other Considerations: If maximum conductor tension or other limits are not exceeded, it may be preferable to use one long span with adequate conductor separation over a depression in the profile rather than use two short spans with a deadend structure at the bottom of the depression. A structure at the bottom of the depression may be subjected to considerable uplift at minimum conductor temperature. Also, poorer soil foundation conditions usually exist in the depression.

Care has to be exercised at locations where the profile falls sharply away from the structure to see that the maximum allowable vertical span as limited by the strength of the crossarm or insulator is not exceeded. Structure No. 2 in Figure 10-6 illustrates this condition. For maximum accuracy in the heavy or medium loading zone, the vertical span for this purpose should be determined with a curve made for the sag under ice load, no wind, at 32°F. For most conductors, however, the maximum temperature final sag curve will closely approximate the