PLACING CROSSARMS

GRADE CONSTRUCTION

Contents

1. GENERAL

1.01 This section covers the placing of crossarms at downward changes in grade and describes the use of grade gains.

2. CHANGES IN GRADE

2.01 The amount of a change in grade may be determined as outlined in other sections of the Practices. A change in grade may be expressed as a fraction, such as 1/10, 2/10 or 3/10. Likewise, a change in grade may also be expressed as a percentage, such as 2 per cent., 5 per cent., 20 per cent. or 30 per cent., in which case, a change in grade of 1/10 shall be considered as 10 per cent., etc.

2.02 Place single crossarms at upward changes in grade.

2.03 The following table indicates the type of construction to be employed at downward changes in grade.

USE OF CROSSARMS AT DOWNWARD CHANGE IN GRADE

HEAVY LOADING AREA

(1) Span Length	Downward Change in Grade (Expressed in Percent)							
	Over 1% To 2%	Over 2% To 3%	Over 3% To 4%	Over 4% To 5%	Over 5% To 10%	Over 10% To 15%	Over 15% To 20%	Over 20% To 30%
0 - 175								
176 - 250								(3) Dead End
251 - 350		Single Crossarm						Dead End
351 - 400							Reduce Grade (2)	
401 - 450				Double Crossarm (3)				
451 - 500						Dead End		
501 - 550					(3)			
551 - 600					Dead End			

MEDIUM LOADING AREA

(1) Span Length	Downward Change in Grade (Expressed in Percent)			
	0 To 10%	Over 10% To 15%	Over 15% To 20%	Over 20% To 30%
0 - 300				
301 - 350	Single Crossarm			
351 - 450			Double Crossarm	
451 - 600			(3) Dead End	

LIGHT LOADING AREA

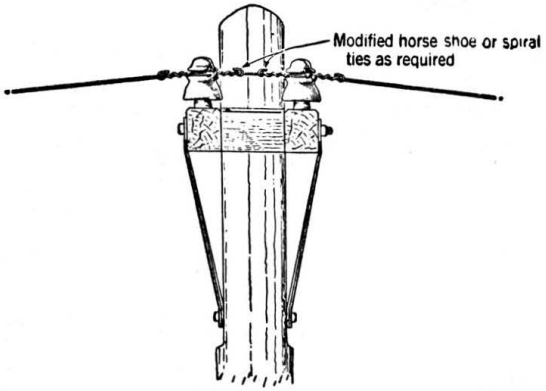
(1) Span Length	Downward Change in Grade (Expressed in Percent)	
	0 To 20%	Over 20% To 30%
0 - 350		
351 - 600	Single Crossarm	Double Crossarm

Notes: (1) If the two spans involved in the downward change in grade are different lengths, use the longer span.

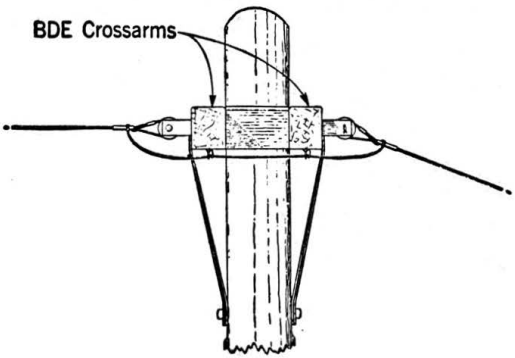
(2) Reduce the change in grade by placing additional poles of suitable length to bring the downward change in grade within allowable crossarm limits.

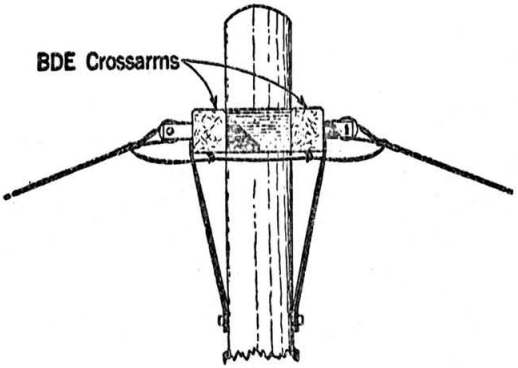
(3) Dead end on double crossarms.

2.04 Place double crossarms where required by the table in Paragraph 2.03 in the following manner.



2.05 Dead-end wires on double crossarms at downward changes in grade as indicated by the table in Paragraph 2.03. When dead-ending is required, attach opposing B dead-end brackets to the same carriage bolt extending through both arms.



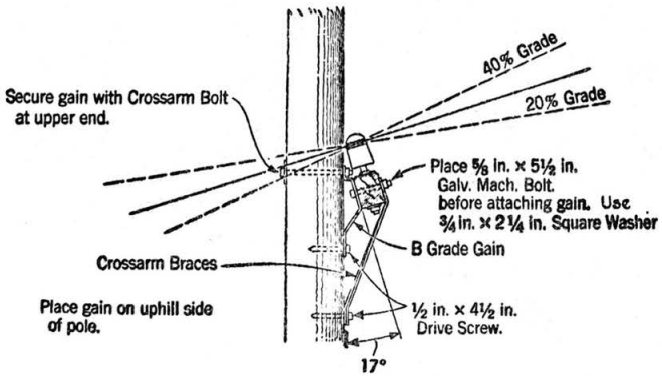


3. STEEP GRADES

3.01 Place crossarms on steep grades in excess of 20 per cent. (a rise of 20 feet in 100 feet measured along the grade) by means of B grade gains. The B grade gain permits the attachment of a crossarm at an angle of either 17^{0} or 34^{0} away from its normal vertical position.

3.02 Place B grade gains and crossarms as follows:

(a) Grades 20 per cent. to 40 per cent.



(b) Grades in excess of 40 per cent.