Supersedes TED 403-1

SUBJECT: DESIGN CRITERIA FOR STRAIN POLE
                            TRAFFIC SIGNAL SUPPORTS

In order to establish a uniform method for the design of strain poles, the following criteria shall be used:

DESIGN LOADING OF SIGNAL HEADS

	Weight	
Type	**Metallic**	**Non-Metallic**
1-Way,3 Section	60 lbs	30 lbs
1-Way,4 Section	80 lbs	40 lbs
1-Way,5 Section	100 lbs	50 lbs

When signal head configurations other than the above are specified, the weight shall be increased by 15 lbs per metallic signal head section and 10 lbs for non-metallic signal head section.

SPAN WIRE

Span wire plus control cable shall be considered a uniform load of 2 lbs/foot over the entire span with a design sag of 3.5 percent.

STRAIN POLES

The following analysis for STRENGTH and DEFLECTION shall be made on all strain poles:

(1)   STRENGTH: The STRINGING TENSION (horizontal loading) resulting from the DESIGN and SPAN WIRE LOADING and computed by application of the GENERAL CABLE THEOREM, shall be applied at a point 24 inches from the top of the strain pole. The GENERAL CABLE THEOREM may be stated as follows: "At any point on a cable acted upon by vertical loads, the product of the horizontal component of cable stress and the vertical distance from that point to the cable chord equals the moment which would occur at that section if the loads carried by the cable were acting on an end-supported beam of the same span as that of the cable."

After computation of the **STRINGING TENSION,** that value shall then be multiplied by a factor of **2.5** to arrive at the **LOADED TENSION (design load),** which includes consideration for wind and other dynamic loadings of relatively hort duration. Using **LOADED TENSION** as the basis for design, the stress on the most critical section of the strain pole shall not exceed the yield stress of **55 KSI.** In all cases, the **DESIGN LOAD** shall be the highest loading from all considerations, including luminaire arms and multiple span wire attachments applied through the most critical cross section of the pole.

(2)   **DEFLECTION: Using the DESIGN LOAD** computed above, the maximum allowable deflection in the pole shall not exceed **2.67 percent** of the length of the shaft measured from the base to the point of application of the load. (Allowable Deflection in feet = Height (in feet) ´ 12"/" ´ 0.0267) When more than one span wire is attached to a pole, the deflection shall be computed using the largest load that can be realized from consideration of all **STRINGING TENSIONS** as applied singly or in any combination with each other.

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