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ENGINEERING INSTRUCTION

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

SUBJECT: DESIGNATION OF TENSION ZONES ON GIRDER FLANGES

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Guideline Drawing Sheets GLD-G3 and GLD-G7 presently designate the tension zones on steel girders to terminate 10' ± (nominally 10 feet) beyond the dead load point of contraflexure when live load is applied. This limit controls the requirements for welding, material toughness, and nondestructive testing, as specified in the Steel Construction Manual.

In cases where continuous span lengths must be set in a poorly balanced ratio, live loads may alter the tension zone so that it extends well beyond 10 feet from the point of dead load contraflexure. Guideline Drawings Sheets GLD-G3 and GLD-G7 are therefore being revised to show that the designer shall calculate the limits of tensile stress, rather than specify a fixed dimension.

A sufficiently accurate approximation of the point of combined load contraflexure may be obtained from moment diagrams alone. Using the moment tables shown in accordance with GLD-G5, the designer can total dead load moment, superimposed dead load moment, and the appropriate live load moment at incremental points along the girder. The point where zero combined moment occurs can be found by interpolation. This point will reasonably represent the end of a tension zone and shall be shown as such on the plans.

If stress calculations are available, stresses may be used instead of moments. Designers need not calculate stresses for this purpose alone. The moment diagram method produces a conservative estimate of the tension zone limits. Stress calculations improve on this estimate by factoring in the effect of differing section moduli. However, actual loadings and section moduli may vary from the assumed values. The designer should use discretion in choosing the theoretically more precise method over the conservative method.