

Design Assumptions

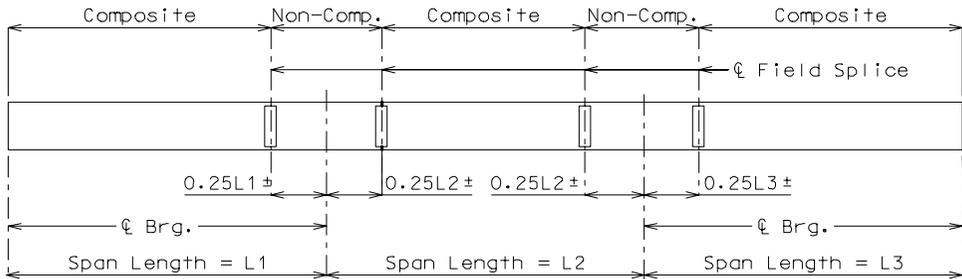
GENERAL

This section pertains to structures composed of steel girders with concrete slab connected by shear connectors.

The stresses of composite girders and slab shall be computed based on the composite cross-section properties and shall be consistent with the properties of the various materials used.

The regions subjected to positive moment are considered as composite and the regions subjected to negative moment are considered as non-composite.

For the initial girder design, composite/non-composite regions can be approximately assumed as:



SECTION PROPERTIES

Cross-section properties of the composite section shall include concrete slab and steel section.

Cross-section properties of the non-composite section shall include steel section only.

Use composite property for positive moment section.

Use non-composite property for negative moment section. The effect of reinforcing steel in the section is not considered.

The ratio of modulus of elasticity of steel to that of concrete, n , shall be assumed to be eight. The effect of creep shall be considered in the design of composite girders which have dead loads acting on the composite section. In such structures, $n=24$ shall be used.

DESIGN UNIT STRESSES (also see note A1.1 in Section 4)

Reinforcement Concrete

Reinforcing Steel (Grade 60)	$f_s = 24,000 \text{ psi}$	$f_y = 60,000 \text{ psi}$
Class B-2 Concrete (Superstructure)	$f_c = 1,600 \text{ psi}$	$f'c = 4,000 \text{ psi}$

Structural Steel

Structural Carbon Steel (ASTM A709 Grade 36)	$f_s = 20,000 \text{ psi}$	$f_y = 36,000 \text{ psi}$
Structural Steel (ASTM A709 Grade 50)	$f_s = 27,000 \text{ psi}$	$f_y = 50,000 \text{ psi}$
Structural Steel (ASTM A709 Grade 50W)	$f_s = 27,000 \text{ psi}$	$f_y = 50,000 \text{ psi}$