12-3 CAMBER OF STEEL-CONCRETE COMPOSITE GIRDERS

Definition

Camber of a structural member is defined as the difference between the shape of the member (the final geometric profile/grade of the member) under full dead load and normal temperature, and its shape at the no-load condition and shop temperature. For a steel-concrete composite girder, camber is the curvature/deformation intentionally induced by a fabrication process to compensate for dead load deflections.

Camber Components

Camber of a steel-concrete composite girder is based on three loads*: Deck Slab Dead Load, Steel Girder Dead Load* and *Added Dead Load*. Each camber component has the same magnitude as and the opposite direction from the following deflection component.

Deflection Components

Deck Slab Dead Load Deflection: This is the deflection due to the weight of the deck slab. **When the permanent steel deck forms are used, 10% additional deck slab dead load shall be included (MTD 8-7).** It is assumed that all deck concrete is placed at once under unshored construction, i.e., the deck slab dead load is resisted by the steel girder only. **An additional 10% deflection shall be added to account for the deflection induced by concrete shrinkage effects.**

Steel Girder Dead Load Deflection: This is the deflection due to the weight of the steel girder, diaphragms and cross frames and other attachments. It is assumed that all steel girders are erected at once under unshored construction, i.e., the steel girder dead load is resisted by the steel girder itself.

Added Dead Load Deflection: This is the deflection due to the weight of the barriers, soundwalls, utilities and future overlay. Added dead load is resisted by the long term composite section girder using transformed section properties with three times the ratio of modulus of the elasticity of steel to that of concrete ($3n$).