



# INDIANA DEPARTMENT OF TRANSPORTATION

## *Driving Indiana's Economic Growth*

### **Design Memorandum No. 10-18** **Policy Change**

July 9, 2010

**TO:** All Design, Operations, and District Personnel, and Consultants

**FROM:** /s/ Anthony L. Uremovich  
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**SUBJECT** Bridge Construction-Loads Considerations

**ADDS** *Indiana Design Manual Section 60-3.10*

**EFFECTIVE:** October 1, 2010 Stage 3 Submission

Construction loadings shall be evaluated in accordance with AASHTO *LRFD* Article 3.4.2. Article 3.4.2.1 addresses evaluation at the Strength Limit State. Article 3.4.2.2 addresses the evaluation of deflections at the Service Limit State.

Construction loadings are typically not accurately known during the design stage. As a minimum, the values listed in Figure 10-18A or 10-18B, Construction Loading, shown below, should be used. However, these values may be increased if information supporting increased construction loads is available during the design stage. The source of this information should be documented in the design calculations. The magnitude and location of the assumed construction loadings used for design should be shown in the contract documents.

For a beam or girder structure, the information shown in Figure 10-18A for an english-units project (Figure 10-18B for a metric-units project) should be shown on the General Plan. If increased loads are permitted, the appropriate values in the figure should be changed accordingly. The exterior beam or girder should be checked for the specified construction loadings.

PDF versions of the required information to be incorporated onto the General Plan sheet are attached herewith.

### CONSTRUCTION LOADING

The exterior girder has been checked for strength, deflection, and overturning using the construction loads shown below. Cantilever overhang brackets were assumed for support of the deck overhang past the edge of the exterior girder. The finishing machine was assumed to be supported 6 in. outside the vertical coping form. The top overhang brackets were assumed to be located 6 in. past the edge of the vertical coping form. The bottom overhang brackets were assumed to be braced against the intersection of the girder bottom flange and web.

Deck Falsework Loads:      Designed for 15 lb/ft<sup>2</sup> for permanent metal stay-in-place deck forms, removable deck forms, and 2-ft exterior walkway.

Construction Live Load:      Designed for 20 lb/ft<sup>2</sup> extending 2 ft past the edge of coping and 75 lb/ft vertical force applied at a distance of 6 in. outside the face of coping over a 30-ft length of the deck centered with the finishing machine.

Finishing-Machine Load:      4500 lb distributed over 10 ft along the coping.

Wind Load:                      Designed for 70 mph horizontal wind loading of 50 lb/ft<sup>2</sup> in accordance with AASHTO *Guide Design Specifications for Bridge Temporary Works* (1995), Figure 2.1.

### **CONSTRUCTION-LOADINGS INFORMATION TO BE SHOWN ON GENERAL PLAN, ENGLISH-UNITS PROJECT**

**Figure 10-18A**

## CONSTRUCTION LOADING

The exterior girder has been checked for strength, deflection, and overturning using the construction loads shown below. Cantilever overhang brackets were assumed for support of the deck overhang past the edge of the exterior girder. The finishing machine was assumed to be supported 150 mm outside the vertical coping form. The top overhang brackets were assumed to be located 150 mm past the edge of the vertical coping form. The bottom overhang brackets were assumed to be braced against the intersection of the girder bottom flange and web.

Deck Falsework Loads: Designed for  $720 \text{ N/m}^2$  for permanent metal stay-in-place deck forms, removable deck forms, and 600-mm exterior walkway.

Construction Live Load: Designed for  $960 \text{ N/m}^2$  extending 600 mm past the edge of coping and 1100 N/m vertical force applied at a distance of 150 mm outside the face of coping over a 9-m length of the deck centered with the finishing machine.

Finishing-Machine Load: 20 kN distributed over 3 m along the coping.

Wind Load: Designed for 110 km/h horizontal wind loading of  $2400 \text{ N/m}^2$  in accordance with AASHTO *Guide Design Specifications for Bridge Temporary Works* (1995), Figure 2.1.

### **CONSTRUCTION-LOADINGS INFORMATION TO BE SHOWN ON GENERAL PLAN, METRIC-UNITS PROJECT**

**Figure 10-18B**

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