2 LOADS AND LOAD FACTORS

2.1 GENERAL

This Chapter contains information related to loads, loadings, load factors, and load combinations. It also contains deviations from ***LRFD*** regarding Loads and Load Factors as well as characteristics of a structure that affect each.

2.1.1 Load Factors and Load Combinations (LRFD 3.4.1)

A. In ***LRFD*** Table 3.4.1-1, under Load Combination: LL, IM, etc., Limit State: Extreme Event I, use $\gamma_{eq} = 0.0$

B. See ***SDG*** 2.7.2 for additional temperature gradient requirements.

C. For pretensioned/post-tensioned I-Beams and U-Girders, in addition to the load combinations required by ***LRFD***, satisfy the following limit state neglecting strand tendons that are grouted with cementitious material:

1.25(D) + 1.75(LL) ≤ 1.4(RN*)

Where:

D = All applicable permanent load components of ***LRFD*** Table 3.4.1-1

LL = All applicable transient load components of ***LRFD*** Table 3.4.1-1

RN* = Nominal capacity (moment or shear) at any section using only the replaceable strand tendons with flexible filler, all permanent bar tendons, mild reinforcing steel and pretensioning strands.

2.1.2 Live Loads (LRFD 3.6) (Rev. 01/22)

A. Replace bullet point 3 of ***LRFD*** 3.6.1.3.1 with the following:
For negative moment between points of contraflexure, and for reaction at all interior supports of multi-span structures regardless of superstructure continuity, 90 percent of the effect of the uniform lane load on all spans combined with 90% of the effect of two design trucks spaced a minimum of 50-feet between the lead axle of one truck and the rear axle of the other truck. The distance between the 32.0-kip axles of each truck shall be taken as 14-feet. The two design trucks shall be placed in adjacent spans to produce maximum force effects.

B. Investigate possible future changes in the physical or functional clear roadway width of the bridge. (***LRFD*** 3.6.1.1)

Commentary: Frequently bridges are widened and areas dedicated to pedestrian traffic become travel lanes for vehicular traffic. In the future, the sidewalk could also be simply eliminated in order to provide additional space to add a traffic lane.

Modification for Non-Conventional Projects:
Delete ***SDG*** 2.1.2.B~~A~~ and see the RFP for requirements.

C. In addition to the vehicular loads contained in ***LRFD***, satisfy the load rating requirements of ***SDG*** 1.7.

Commentary: Load Rating may control the design in some cases.

2.2 DEAD LOADS

A. Future Wearing Surface: See ***SDG*** Table 2.2-1 regarding the allowance for a Future Wearing Surface.

B. Sacrificial Concrete: Bridge decks subject to the profilograph requirements of ***SDG*** Chapter 4 require an added thickness of sacrificial concrete, which must be accounted for as added Dead Load but cannot be utilized for bridge deck section properties.

C. Stay-in-Place Forms: Design all beam and girder superstructures (except segmental box girder superstructures) to include the weight of stay-in-place metal forms, where permitted. For clear spans between beams or girders greater than 14-feet, verify the availability of non-cellular forms and include any additional dead load allowance greater than 20 psf or specify the use of cellular forms (where permitted) or non-cellular forms with cover sheets.

Modification for Non-Conventional Projects:
Delete ***SDG*** 2.2.C.

D. See Table 2.2-1 Miscellaneous Dead Loads for common component dead loads.

Table 2.2-1 Miscellaneous Dead Loads

ITEM	UNIT	LOAD
General		
Concrete, Counterweight (Plain)	Lb/cf	145
Concrete, Structural (Steel-RC/PC)	Lb/cf	150
Concrete, Structural (FRP-RC/PC)	Lb/cf	145
Future Wearing Surface	Lb/sf	15[1]
Soil; Compacted	Lb/cf	115
Stay-in-Place Metal Forms	Lb/sf	20[2]