

Table 3.23.1 Distribution of Wheel Loads in Longitudinal Beams for Calculation of Bending Moments in Interior Longitudinal Stringers

Kind of Floor	Bridge Designed for One Traffic Lane	Bridge Designed for Two or More Traffic Lanes	Range of Applicability ^j
Timber: ^a			
Plank ^b	S/4.0	S/3.75	N/A
Nail laminated ^c 4" thick or multiple layer ^d floors over 5" thick	S/4.5 S/5.0	S/4.0 S/4.25	N/A N/A
Nail laminated ^c 6" or more thick	If S exceeds 5' use footnote f.	If S exceeds 6.5' use footnote f.	
Glued Laminated ^e Panels on Glued Laminated Stringers			
4" thick	S/4.5	S/4.0	N/A
6" or more thick	S/6.0 If S exceeds 6' use footnote f.	S/5.0 If S exceeds 7.5' use footnote f.	N/A
On Steel Stringers			
4" thick	S/4.5	S/4.0	N/A
6" or more thick	S/5.25 If S exceeds 5.5' use footnote f.	S/4.5 If S exceeds 7' use footnote f.	N/A

S = average stringer spacing in feet.

^a Timber dimensions shown are for nominal thickness.

^b Plank floors consist of pieces of lumber laid edge to edge with the wide faces bearing on the supports (see Article 16.3.11—Division II).

^c Nail laminated floors consist of pieces of lumber laid edge to edge with the narrow edges bearing on the supports, each piece being nailed to the preceding piece (see Article 16.3.12—Division II).

^d Multiple layer floors consist of two or more layers of planks, each layer being laid at an angle to the other (see Article 16.3.11—Division II).

^e Glued laminated panel floors consist of vertically glued laminated members with the narrow edges of the laminations bearing on the supports (see Article 16.3.13—Division II).

^f In this case the load on each stringer shall be the reaction of the wheel loads, assuming the flooring between the stringers to act as a simple beam.

^g From Imbsen & Associates, Inc. (NCHRP Project 12-26).

^h The sidewalk live load (see Article 3.14) shall be omitted for interior and exterior box girders designed in accordance with the wheel load distribution indicated herein.

ⁱ Distribution factors for Steel Bridge Corrugated Plank set forth above are based substantially on the following reference: *Journal of Washington Academy of Sciences*, Vol. 67, No. 2, 1977, "Wheel Load Distribution of Steel Bridge Plank," by Conrad P. Heins, Professor of Civil Engineering, University of Maryland. These distribution factors were developed based on studies using 6" × 2" steel corrugated plank. The factors should yield safe results for other corrugation configurations provided primary bending stiffnesses is the same as or greater than the 6" × 2" corrugated plank used in the studies.

^j The range of applicability was established in NCHRP Project 12-26 from a database of bridges gathered from several states. These ranges were used to establish the formulas and do not necessarily represent the limits which can be used for design.