

Live Loads and Stresses Historical Background

When preparing plans to modify existing structures, it is often necessary to know the live load and stress criteria used in the original design. Since about 1927, with few exceptions, California Highway System structures have been designed for loads and stresses specified by AASHTO.

The table on the next page summarizes the history of vehicular live loads and selected allowable stresses specified for most structures. Entries in the table for each edition of the AASHTO Specifications for Highway Bridges include items introduced or retained in that edition or introduced in Interim Specifications between that and the next previous edition. Items not taken directly from AASHTO Standards are indicated by footnote.

For more certain and complete information on particular structures, see the General Notes of as-built plans, appropriate editions of the AASHTO Standards (available in the Transportation Library), and the historical file of Volume I of the Bridge Planning and Design Manual (available in the Technical Services Section).

LIVE LOADS AND ALLOWABLE STRESSES

| Edition | Live Load | Concrete Stress (Extreme fiber in flexure, psi) | Reinforcing Steel (Tension in flexure, Psi) | Structural Steel (Extreme fiber in tension, psi) |
|----------------------------------|---|--|--|---|
| 1926-1928 | H 15 | 650 | 16,000 | 16,000 |
| 1931 | H 15 | 800 1,200* | 16,000 24,000* | 16,000 24,000* |
| 1935 | H 15 | 900 | 16,000 | 18,000 |
| 1941 | H 15 | 1,000 | 18,000 | 18,000 |
| 1944,1949 | H 20 - S 16 - 44 | 1,000 | 18,000 ^a 20,000 ^b | 18,000 |
| 1953 | H 20 - S 16 - 44 | 1,000 ^c 1,250 ^c | 20,000 ^b | 18,000 |
| 1957,1961 | H 20 - S 16 - 44 & Alt. ^d | 1,200 | 20,000 ^b | 18,000 |
| 1965 | HS 20 - 44 | 1,200 | 20,000 ^b | 20,000 (A36) |
| 1969 | HS 20 - 44 | 1,300 ^e | 24,000 ^{e,f} | 20,000 (A36) |
| 1973 | HS 20 - 44 & P 13 ^e | 1,300 ^e & LFD ^g | 24,000 ^f & LFD ^g | 20,000 (A36) & LFD ^g |
| 1977,1983 & later interims | HS 20 & P13 ^e | 1,300 ^e & LFD ^g | 24,000 ^f & LFD ^g | 20,000 (A36) & LFD ^g |

- * For dead load, temperature and shrinkage
- a Structural grade
- b Intermediate, hard and rail grades
- c Caltrans - 1,000, except 1,200 for box girders, arch ribs, retaining walls and pumphouse
- d Bureau of Public Roads, PPM 20-4, 8-10-56
- e Caltrans
- f Grade 60
- g Load factor Design


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