

### Limit States and Load Factors for Load and Resistance Factor Rating (LRFR)

| Bridge Type          | Limit State | Dead Load<br>$\gamma_{DC}$ | Dead Load<br>$\gamma_{DW}$ | Design Load                |                            | Legal Load<br>$\gamma_{LL}$ |
|----------------------|-------------|----------------------------|----------------------------|----------------------------|----------------------------|-----------------------------|
|                      |             |                            |                            | Inventory<br>$\gamma_{LL}$ | Operating<br>$\gamma_{LL}$ |                             |
| Steel                | Strength I  | 1.25                       | 1.50                       | 1.75                       | 1.35                       | 1.40 <sup>†</sup>           |
|                      | Service II  | 1.00                       | 1.00                       | 1.30                       | 1.00                       | 1.30                        |
|                      | Fatigue     | 0.00                       | 0.00                       | 0.75                       | –                          | –                           |
| Prestressed Concrete | Strength I  | 1.25                       | 1.50                       | 1.75                       | 1.35                       | 1.40 <sup>†</sup>           |
|                      | Service III | 1.00                       | 1.00                       | 0.80                       | –                          | 0.80 <sup>†</sup>           |

<sup>†</sup> – Variance from the AASHTO *Manual for Bridge Evaluation*.

### Allowable Tensile Stress in Prestressed Concrete at Service Limit State

| Exposure                       | Girder Type | $\sigma_{allow}$ <sup>‡</sup>          | $\sigma_{allow}$                          |
|--------------------------------|-------------|--|---|
|                                |             | Initial Rating<br>ksi (MPa)            | Future Rating<br>ksi (MPa)                |
| Non-Corrosive                  | Cored Slabs | 0                                      | $0.19\sqrt{f'_c}$ ( $0.5\sqrt{f'_c}$ )    |
|                                | Box Beams   | 0                                      | $0.19\sqrt{f'_c}$ ( $0.5\sqrt{f'_c}$ )    |
|                                | I-Girders   | $0.19\sqrt{f'_c}$ ( $0.5\sqrt{f'_c}$ ) | $0.24\sqrt{f'_c}$ ( $0.62\sqrt{f'_c}$ )   |
| Corrosive and Highly Corrosive | Cored Slabs | 0                                      | $0.0948\sqrt{f'_c}$ ( $0.25\sqrt{f'_c}$ ) |
|                                | Box Beams   | 0                                      | $0.0948\sqrt{f'_c}$ ( $0.25\sqrt{f'_c}$ ) |
|                                | I-Girders   | 0                                      | $0.0948\sqrt{f'_c}$ ( $0.25\sqrt{f'_c}$ ) |

<sup>‡</sup> – As required for design, see Chapter 2 for details.

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LRFR Load Factors and Prestressed Concrete Stress Limits

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**Figure 6-134**