likely to be imposed in working, and a greater proportional strength shall be allowed for parts likely to be strained to the calculated intensity by every passing train or carriage, than for those upon which the assumed load can only come occasionally; thus, iron floor-beams and floor-hangers shall only be strained up to 6,750 pounds per square inch, while chord-bars may be strained up to the full average obtained from the combined dead and live loads. No part less than 5 feet long shall be strained in tension more than 7,000 pounds to the inch.

All tensile members shall be preferably of refined wrought-iron, of soft, fibrous texture, rolled twice from the puddle-bar, with an ultimate breaking strength of at least 50,000 pounds per square inch in long specimens, and an elastic limit of not less than 26,000 pounds per square inch. It shall elongate at least fifteen per cent before breaking, and the elastic limit shall be understood to be the point at which the elongation produced by the strain ceases to increase in the same proportion as the strain, being the point at which the bar shows the first signs of a considerable permanent set.

If designers propose to use steel in tension, they will be required to furnish evidence of its adaptability for this purpose, both as regards its resistance to tensile strains, to impacts and repeated vibrations, as well as to the absolute certainty of uniformity in its production, as ascertained by experiment.

**Compression Members** may be of cast or wrought-iron, or of mild steel.

For wrought-iron, when the length of square end pillars does not exceed twenty-four times the least radius of gyration, the part may be subjected to a strain of 8,000 pounds to the square inch.

When the member has a greater proportional length, its size, if of wrought-iron, shall be determined by Gordon’s formula for square end pillars, in the following modified form.

\[ P = \frac{40,000}{I^2} \left(1 + \frac{I}{40,000} r^2\right) \]

In which \( P \) denotes the ultimate strength per square inch of section, \( I \) the length, and \( r \) the least “radius of gyration” of cross section.

For this ultimate strength a factor of safety shall be used, of 3 for the dead load, and of 6 for the live load, or the equivalent dead load of both combined shall be arrived at by the formula:

\[ \frac{3 \text{ dead load} + 6 \text{ live load}}{3} = \text{equivalent dead load.} \]

For which the factor of safety shall be 3. From the results thus obtained, twenty (20) per cent shall be deducted for each pin-joint in a strut or post.