GENERAL SPECIFICATIONS,
ACCORDING TO WHICH THE
DESIGNS OF CLARKE, REEVES & CO.’S BRIDGES,
GIVEN IN THIS CIRCULAR,
ARE PROPOSED TO BE CONSTRUCTED.

1. These structures are proportioned to sustain the passage of the heaviest cars and engines in use, for coal, freight, or passenger traffic, at a speed of not less than thirty miles per hour, viz.: two locomotives coupled, weighing thirty tons on drivers, in space of twelve feet; total weight of engine and tender, loaded, sixty-five tons each, and followed by the heaviest cars in use, viz.: loaded coal cars, weighing twenty tons each, in twenty-two feet. The iron-work will be so proportioned that the above loads, in addition to the weights of the structures themselves, shall not strain the iron over 10,000 pounds per square inch tensile, or 7500 pounds per inch shearing strain, and reducing the strain in compression, in proportion to the ratio of length to diameter, by Gordon’s formula.

2. The iron used under tensile strains shall be of tough and ductile quality, and be capable of sustaining the following tests:

**PHOENIX DOUBLE REFINED OR “BEST BEST” IRON.**

**ROUND BAR,—1/2 INCHES DIAMETER BY 12 INCHES LONG.**

- Ultimate strength: 55,000 to 60,000 lbs. per square inch.
- No permanent set under: 25,000 to 30,000 lbs.
- Reduction of area at breaking point, average: 25 per cent.
- Elongation: 15%
- Cold bend without signs of fracture, from 90 to 180 degrees.

3. All workmanship shall be first-class. In work having pin connections, all abutting joints shall be planed or turned, and no bars of wrought-iron having an error of over 1/64th of an inch in length between pin-holes, or over 1/100th of diameter of pin or hole, shall be allowed. In riveted work, all plates and joint plates shall be square and truly dressed, so as to form close joints. Rivet holes shall be spaced accurately and truly opposite. Rivets shall be of the best quality of rivet iron, shall completely fill the holes, and shall have full heads.

Chord-links, main ties, and suspension bolts, shall be die-forged without welds. Screw-bars shall have threads enlarged beyond diameter of bar, and shall be fitted with radial nuts and washers.

All bars subject to tensile strains may be tested to 20,000 pounds per square inch, and struck a smart blow with a hammer while under tension; and if any show signs of imperfection they shall be rejected.

All the iron-work shall be painted, before leaving the Works, with one coat of metallic paint and oil. All machine-cut work shall be covered with white lead and tallow before leaving the Works.

4. These bridges shall not deflect, under the passage of a train of locomotives moving at thirty miles per hour, over 1/1200th of their length, and shall return to their original camber after the passage of the train.