

for roller nests, in which segmental rollers are indicated, the lower bearing surface being a nest of rails. The segmental rollers are convenient because they occupy a minimum space for a large diameter. The rails are important because dust will not lie under the rollers, but will fall through, affording easy removal. Bearing plates should always be made thicker, to allow for rust of $\frac{1}{2}$ inch in thickness.

Stringers and Floor Beams.—These constitute the floor system in through plate girder spans. As the stringers are merely deck girders of reduced length, their design is similar. They should be made as deep as practicable, and should be riveted to the webs of the floor beams. Two lines of stringers per track is good practice, but four lines are more able to resist derailed trains, and do not require such large ties.

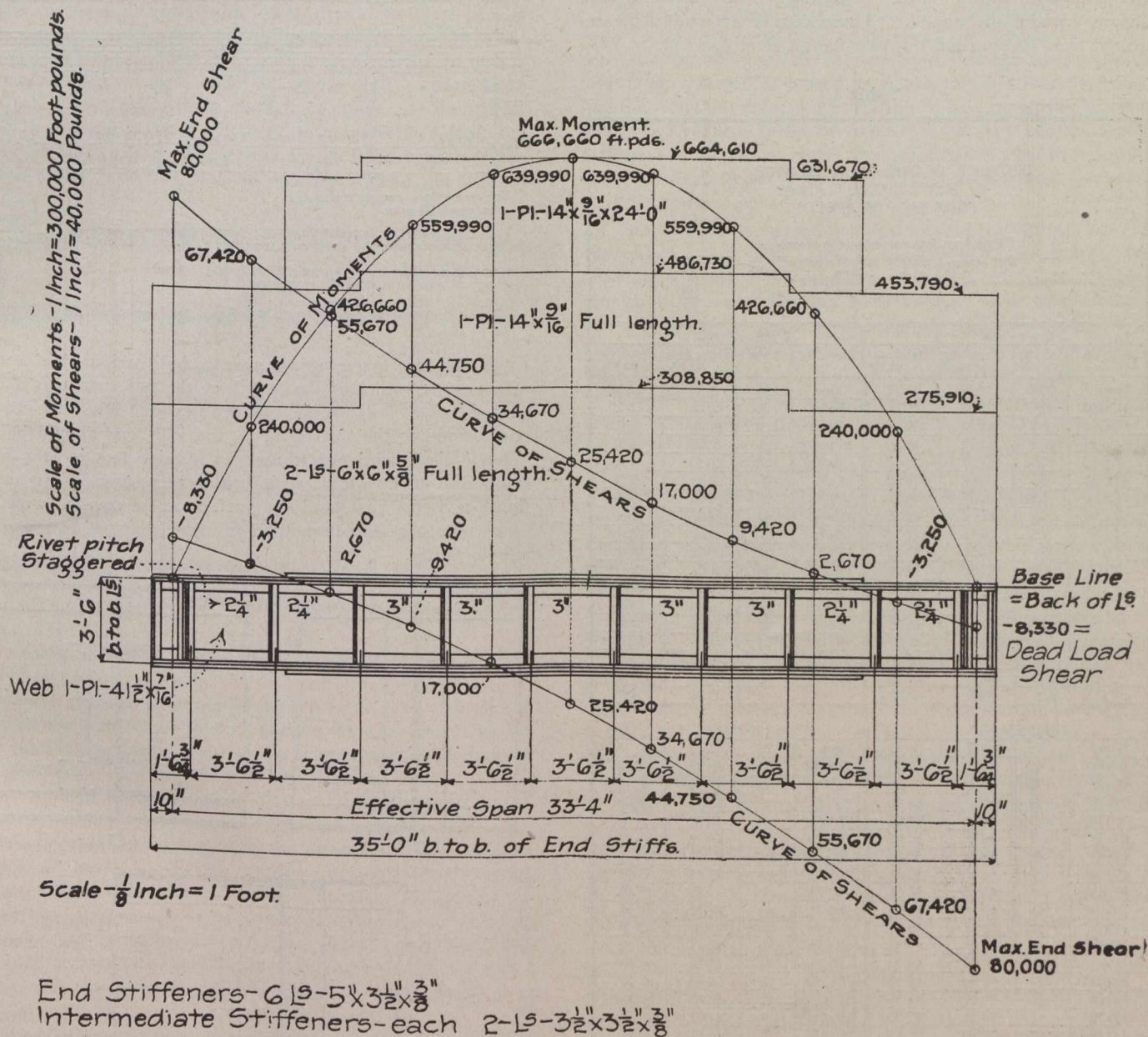


Fig. 4.—Stress and Section Diagram for Deck Plate Girder.

Lateral Angles.—Usually these are made heavier than the stresses require, to ensure stiffness of the bridge. In deck spans the entire lateral forces are considered to be carried by the top laterals, through the end brace frames to the anchors, while the bottom laterals are merely considered to stiffen the bottom flanges against wind. The latter are often omitted in deck spans under 50 feet long, as the interior brace frames give sufficient stiffness to the bottom flange.

In through plate girder spans there is only one system of bracing, which necessarily carries all the lateral stresses, and the traction stresses in addition.

When rods are used as laterals, an initial stress of 10,000 pounds should be added to the other stresses to take care of the tension induced in the rods by tightening the nuts or turnbuckles.

With four lines of stringers, the common method is to assume that the inner and outer stringers take their share of the wheel loads inversely in proportion to the distance they are spaced from the rail. As a matter of fact, when the rail is midway, the inner stringer gets a greater proportion of the wheel load, because the ties are continuous beams over four supports. Some account should be taken of this.

Floor beams should also be made as deep as practicable. When the top flange is of moderate width it should be about one inch below the base of rail, so that it will support derailed trains; but when the top flange is 18 in. or 20 in. wide, it is good practice to drop it three inches below the base of rail, so that a wood strip can be placed on it to support the rail, as well as to be useful in the event of wheels passing over it.