

Lessons from Crane Runways

Paper presented by JOHN E. MUELLER (January, 1965, Issue)

Discussion by J. J. MURRAY

MR. JOHN E. MUELLER's article in the January, 1965, issue of the *Engineering Journal* was most interesting. The writer would agree in practically every respect with the conclusions cited.

The writer cannot agree, however, with the suggestions submitted in the Discussions in the April issue of the *Engineering Journal*.

Mr. V. R. P. Saxe suggests the attachment of the crane girder web directly to the flange of the lower shaft of the crane columns. We have a large number of buildings in which a similar practice was used. We have had serious troubles with these structures.

The crane girder, when designed as a simple span, will rotate at the supports under live load. This rotation, unless permitted, will shear off the connection or produce web failure. We have had both phenomena occur. On our buildings the connections were riveted. However, whether riveted or welded the end connection, as illustrated by Mr. Saxe's Figs. 1 and 2, will attempt to induce negative moment in the crane girder. Unless designed as a continuous girder, high stresses will be induced at the supports. Our practice has been to outlaw this type of connection.

A further weakness in the illustrated design relates to the fact that there is no provision for transfer of the horizontal thrusts of the crane into the column shaft. Even on relatively lightly loaded runways, carrying 15 or 20 ton cranes, we have had trouble with this detail.

Under service conditions we have experienced horizontal cracking in the web as the horizontal thrust effects have bent the top flange back and forth. This detail we also do not allow in our work.

In the case of Mr. T. Klayton's Discussion in the April issue, the writer would again disagree (with his comment (b)). We have had trouble with long runways braced in the manner he suggests. In one case it was necessary to eliminate all longitudinal bracing except the bracing in the center of the building "run". When

intermittent bracing is used, thermal effects will induce large stresses in the runway. Unless the building is free to expand from the braced bay there is a tendency for the structure to "buckle" lengthwise because of the large induced forces, thus throwing the runway out of alignment.

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