

## GENERAL DISCUSSION

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MR. LYMAN W. WOOD.<sup>1</sup>—Most of the tests that have been reported here this morning used static loading; I would like to ask Mr. Degenkolb what he thinks about the need for dynamic loading in tests of these lateral diaphragms?

MR. H. J. DEGENKOLB (*author*).—I think it is very desirable to subject some panels to shock or dynamic loading. The testing of a large diaphragm takes a full day and sometimes more. As far as earthquake forces are concerned, a short duration of load test may indicate that much more load could safely be applied in design, similar to the 100 per cent allowable impact factor now permitted in timber bridge design.

MR. E. GEORGE STERN.<sup>2</sup>—The number of feasible variations in the design of structural wood diaphragms is large and only few could be subjected to tests. An unexplored variable of major influence on the stiffness and rigidity of wood diaphragms covers the selection of the nails used in fastening the lumber sheathing to the structural framing.

All the diaphragms tested were assembled with low-carbon-steel, plain-shank, common wire nails which bend during transmission of relatively small diaphragm loads. For a number of years, (1) bright and (2) hardened (heat-treated

and tempered), high-carbon-steel nails have been in mass production. These nails can be considerably stiffer than common wire nails. Consequently, their use can result in high rigidity of the joints of sheathing and framing. Since the rigidity of wood diaphragms is directly influenced by the rigidity of these joints, the wood diaphragms are more effective whenever the stiffer nails are used.

With the introduction of automatically fed nailing machines in the building field, it became feasible and practical to use a larger number of smaller nails, since automatic handling of the larger number of smaller nails can be more economical. Such smaller nails have to provide, of course, sufficient holding power to prevent their withdrawal under load application. For this reason, such smaller nails must be provided with properly threaded shanks.

When a large number of such stiff, threaded nails is used for fastening sheathing to framing, it should be possible to utilize the full strength of the lumber to transmit lateral diaphragm loads.

The results of an investigation of diaphragms assembled with such large numbers of small, stiff, and properly threaded nails might be interesting and valuable.

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