

PAPERS ON BUILDING CONSTRUCTIONS

INTRODUCTION

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The intimate relationship of the properties and characteristics of wood and other materials to actual building construction is exemplified more and more in modern design and practices. Not only the use of new materials but also the many new uses of older materials require more exact knowledge and measurement of their properties than ever before.

Through the efforts of ASTM Committees D-7 on Wood and E-6 on Methods of Testing Building Constructions, both having a vital interest in modern building construction, a group of papers was sponsored and presented in three sessions, which furnish a wealth of information to those interested in many aspects of testing and design of structures.

The rapid expansion in the field of structural glued laminated lumber has led to the need for a sound means of quality control and inspection for these custom-built products and highly specialized operations. This has been a difficult but very necessary task.

The long-established "rule of thumb" criteria for deflection in timber design is given scientific treatment in one of the papers in the Symposium. It is of interest to note that the author feels that the 1/360 rule, though not necessarily adequate for all conditions, has served a very useful purpose and has avoided difficulty.

Diaphragms have come into considerable use, particularly in areas subject to earthquake shock and strong wind forces. Such diaphragms, many consisting of wood sheathing and plywood, when used as roof and floor decking, transmit loads to the end walls, thus serving a double duty. Considerable testing has been accomplished in this area and two papers discuss this subject. Both papers emphasize the need for coordination in establishing working values of materials and for standard test methods.

Laminated timber is dependent on satisfactory end joints between pieces in the individual lamination. The scarf joint has proven to be the most effective type used. Tests on laminated wood beams are reviewed in one of the papers. These results give very enlightening information on the use of single hooked and end-stepped scarf joints, treatment of the end steps and feather edges, and the effect of various spacings of these joints.

The screw-holding properties of wood and wood-base products has long been an important consideration in the design of wood structures. A paper on this subject adds valuable data to the literature on not only the details of testing but also conclusions on effects of screw size and proper pilot-hole sizes. Emphasis should be placed on the author's statement that with the development of hardboard and particle

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board and the universal use of plywood, the establishment of standard screw-holding test procedures is imperative. It is of interest to note that ASTM Committee D-7 on Wood has recommended a tentative method of test for this purpose to the Society at the 1960 Annual Meeting.

Departing from the field of wood construction, a paper is included on light gage steel building construction. Building code requirements necessitated a series of tests to establish lateral shear data since the mathematical design to resist lateral wind loadings did not fall within the realm of rational design. The erection of a complete building provided a test setup where all elements or units were subjected to their actual design conditions and restraints.

Getting back to wood construction, a paper on wood pole - type buildings is timely in view of the increase in use of this type of construction for industrial buildings, such as warehouses. Earlier, this construction was limited generally to farm-type buildings. This type of construction provides unique features that make its construction costs quite low as compared to conventional buildings. Floor loads are supported independently by the ground and no elaborate or expensive foundations are required.

It would be remiss to omit reference to the very extensive research program on wood poles, sponsored by Committee D-7 on Wood, and described in one of the papers. This program has provided very valuable data, hitherto not available under one authentic source, covering strength of several species both treated and untreated, and the relationship between tests of entire poles and of small clear specimens.

Attention has been given in one of the papers to the large quantities of common grades of yard lumber used in framing, especially in house construction. Since these grades are not stress-graded a standard method of evaluating the probable strength is discussed. A statistical method is described for providing a means of better utilization of this lumber.

Quite a far cry from the design and testing of building structures is the problem of termite control in wood construction. Even though this paper is a review of the methods of approach used in California where perhaps the most extensive infestation occurs, this experience should be of great interest and value throughout the country. The magnitude of termite control work in California is quite astounding, reflecting the importance and effect of control measures on the building industry.