

Recommended Minimum Requirements for Small Dwelling Construction

From its beginning, NBS had studied properties of building materials in order to meet the construction industry's recognized need for specific technical information. It was not until 1921, however, when Herbert Hoover became Secretary of Commerce, that these activities were brought together under a Division of Building and Housing and grew into a significant and effective program. The impact of this effort was noted with the publication of the Building and Housing Series, and perhaps the most important document in the series was the very first publication, *Recommended Minimum Requirements for Small Dwelling Construction* [1]. This publication is often viewed as the first national model building code, and the Building and Housing Series [2] established NBS as an important source of information to serve the public and stimulate economic growth.

The significance of this publication and the events leading to its release are documented most clearly in the book, *Measures for Progress* [3].

"... Hoover entered office determined to recover the Nation, singlehandedly if necessary, from its wartime splurge, its consequent depletion of resources, and the general economic demoralization into which it had plunged. Recovery, by raising as rapidly as possible the level of productivity, was the first essential; reconstruction would follow.

"Hoover's plan for recovery, in order to open employment offices again and start the wheels of industry, was to stimulate building and housing, lend direct assistance to both new and established industries, and minister to the new aviation and radio industries. Reconstruction, providing long-range benefits to the economy, aimed at a progressive elevation of the standard of living, principally by a campaign to eliminate economic wastes.

"Although the building trades themselves badly needed reconstruction, they offered the most likely means of achieving immediate and massive results in reviving depressed industry and providing maximum employment across the Nation. The housing shortage as a result of the war was estimated at more than a million units. Stimulate homebuilding, and the

brick, lumber, glass, hardware, plumbing, appliance, textile, and furniture industries and all that served and supplied them would revive."

Hoover's new division of building and housing set its sights on revising an infrastructure consisting of poor housing designs, costly materials and labor, outdated building and zoning regulations that were barriers to development, and a shortage of mortgage funds. The circumstances at the time of issuance of *Recommended Minimum Requirements for Small Dwelling Construction* are summed up in a preliminary report of the 1920 Senate Committee on Reconstruction and Production:

"The building codes of the country have not been developed upon scientific data but rather on compromise; they are not uniform in practice and in many instances involve an additional cost to construction without assuring more useful or more durable buildings." [4]

NBS's program was announced with national publicity. Information was to be published on home building, home ownership, technical revisions to construction codes, plumbing codes, zoning ordinances, etc., suitable for adoption within codes or as separate ordinances. Beyond these recommended minimums, NBS was to provide standards for better construction practices that would improve workmanship, seek simplification and standardization of building materials, reduce dimensional variations and deviations, and otherwise serve to lower costs. To meet these objectives, *Recommended Minimum Requirements for Small Dwelling Construction* included an extended appendix in which information was presented on good construction going beyond the limits of minimum safe standards.

The spring of 1922 saw the start of a major spurt in the construction of housing. Secretary Hoover chaired the National Advisory Council of the Better Homes in America movement. This program mobilized chambers of commerce, women's clubs, and better homes and gardens organizations to promote more and better housing across the country. The Department of Commerce's housing division, working with NBS and in consultation with building officials, architects, engineers, fire chiefs, materials experts, and their related associations, gathered and organized technical

information, statistics, and other data. NBS published *Recommended Minimum Requirements for Small Dwelling Construction* as the first in the B&H Series [5]. The consumer-oriented documents sold hundreds of thousands of copies and were reprinted and serialized in newspapers and magazines.

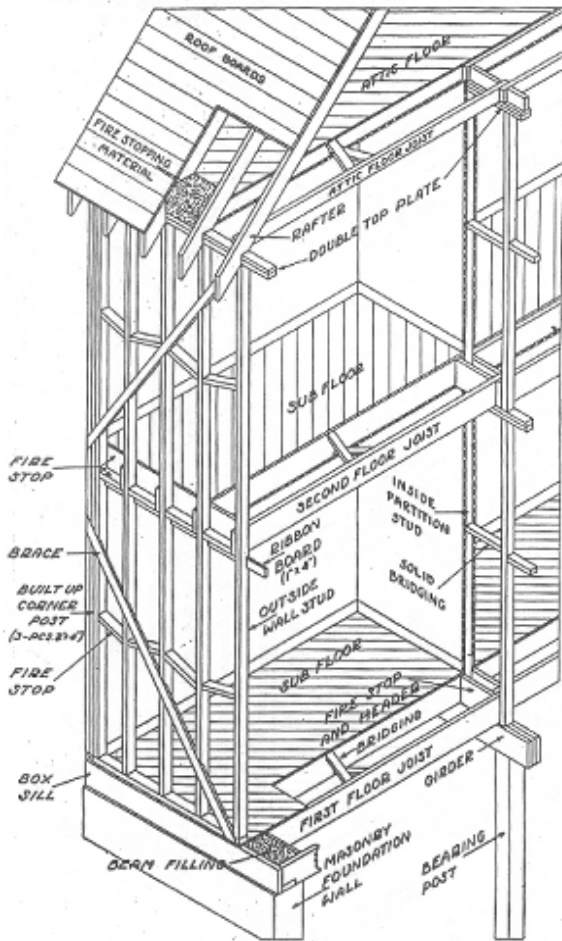


Fig. 1. Approved details of balloon frame construction.

New homes construction in 1922 was reported at over 700,000 units, nearly doubling the total from the prior year. By 1925 housing production had risen to 937,000 units. The 8-year period of 1922-1929 saw an average of 750,000 homes per year completed, far in excess of the 450,000 units per year estimated as being necessary to overcome the postwar shortage.

Recognition of the importance of sound and economical construction, coupled with home ownership as a significant contributor to the welfare of the nation, was manifested in December 1931 when over 3000 civic

leaders from around the country came to Washington to attend the President's Conference on Home Building and Home Ownership. The conference emphasized improvements in the building code situation and the importance of sound regulations.

In the spring of 1932 *Recommended Minimum Requirements for Small Dwelling Construction* was re-issued as Building and Housing Publication No.18 (BH18) [4] and superseded BH1. The 102 page publication consisted of three parts: Introduction, Minimum Requirements for Safe and Economical Construction of Small Dwellings, and Appendix. The introduction provides background, purpose and intent information for the reader. The minimum requirements are organized by types of construction with separate sections describing different types of horizontal and vertical space dividers and miscellaneous components (e.g., chimneys and fireplaces, heating appliances). The bulk of the document is the appendix, which provides detailed technical information on a wide variety of materials and methods of construction assembled from a number of industry sources.

BH18 was a continuation of the work of the Department of Commerce's Building Code Committee. The committee consisted of seven members (four of whom were members of the original group) and was chaired by William K. Hatt, professor of civil engineering and director, Laboratory for Testing Materials, Purdue University. The committee continued to operate under the Division of Building and Housing of NBS with James S. Taylor, Chief. George N. Thompson of NBS, who served as Secretary of the Committee from its inception, provided direct liaison with NBS and thereby contributed the scientific and engineering knowledge necessary to develop the technical information and answer committee questions throughout the deliberations.

Recommended Minimum Requirements for Small Dwelling Construction was the forerunner for the Federal Housing Administration's Minimum Property Standards, which provided quality requirements for the post World War II housing construction boom, and for the *One and Two Family Dwelling Code (OTFDC)* [6], published first in 1971 by the three model code organizations. In 1972 the Council of American Building Officials (CABO) was formed, and later in that decade CABO took over the publication of the OTFDC. This code provides the technical requirements for most of the Nation's conventionally constructed housing. In 1994 the CABO constituency formed the International Code Council (ICC), and in 2000 the ICC published the *International Residential Code* [7], which supersedes the OTFDC.

In 1933, as a result of an economy program in the Federal Government, the American Standards Association (ASA) established a Building Code Correlating Committee to take over the work of the Department of Commerce's Building Code Committee. Technical questions that arose in ASA sectional committees continued to form the basis for many scientific investigations at NBS. George N. Thompson became chairman of ASA's Building Code Correlating Committee, then chairman of its successor, the Construction Standards Board.

NBS provided leadership in many important construction standards activities by directly sponsoring the following American Standards: the National Electric Safety Code (ASA C2); the Safety Code for Elevators (ASA A17); Building Code Requirements for Minimum Design Loads in Buildings and other Structures (ASA A58); and Building Code Requirements for Masonry (ASA A41). In addition, NBS staff members participated actively in the development of other American Standards for building construction including: the National Electrical Code (ASA C1); the Safety Code for Building Construction (ASA A10); Building Code Requirements for Fire Protection and Fire Resistance (ASA A51); and the Safety Code for Mechanical Refrigeration (ASA B9). These standards were recognized in virtually all state, local, and model building codes in the U.S., and by all federal construction agencies. They unified technical requirements for buildings based on consensus of the construction industry, and contributed substantially to the efficiency and economy of construction while improving safety and quality. NBS research results, many of which are documented in the 150 titles of the NBS Building Materials and Structures Reports published between 1938 and 1957, provided the foundation for many of the provisions. Many of their technical requirements survive as the basis for today's construction standards and codes.

When the American Standards Association decided to incorporate in 1947, the U.S. Department of Commerce withdrew as a member body, and NBS

ceased to lead construction standards management activities until its participation in the renamed American National Standards Institute's Construction Standards Management Board was renewed in the 1970s. However, technical contributions to and participation in consensus standards committees has continued unabated to the present time. A number of particularly significant contributions are described elsewhere in this centennial publication.

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Bibliography

- [1] F. P. Cartwright and the Building Code Committee of the Department of Commerce, *Recommended Minimum Requirements for Small Dwelling Construction*, Building and Housing Publication BH1, National Bureau of Standards, U.S. Government Printing Office, Washington, DC, July 1922.
- [2] For a summary, see P. R. Achenbach, *Building Research at the National Bureau of Standards*, Building Science Series 0, National Bureau of Standards, U.S. Government Printing Office, Washington, DC, October 1970.
- [3] R. C. Cochrane (with J. R. Newman), *Measures for Progress, A History of the National Bureau of Standards*, NBS Miscellaneous Publication 275, National Bureau of Standards, U.S. Department of Commerce (1966).
- [4] Department of Commerce, Building Code Committee, *Recommended Minimum Requirements for Small Dwelling Construction*, Building and Housing Publication No. 18, National Bureau of Standards, U.S. Government Printing Office, Washington, DC (1932).
- [5] Additional publications included: BH2-*Recommended Minimum Requirements for Plumbing in Dwellings and Similar Buildings*; BH3-A *Zoning Primer*; BH4-*How to Own Your Home*; BH5-*A Standard State Zoning Enabling Act*; BH6-*Recommended Minimum Requirements for Masonry Wall Construction*; BH7-*Minimum Live Loads Allowable for Use in Design of Buildings*; BH8-*Recommended Practice for Arrangement of Building Codes*.
- [6] International Conference of Building Officials, Inc., Building Officials and Code Administrators International, Inc., and Southern Building Code Congress International, Inc., *One and Two Family Dwelling Code*, 1971.
- [7] International Code Council, Inc., *International Residential Code*, 2000.