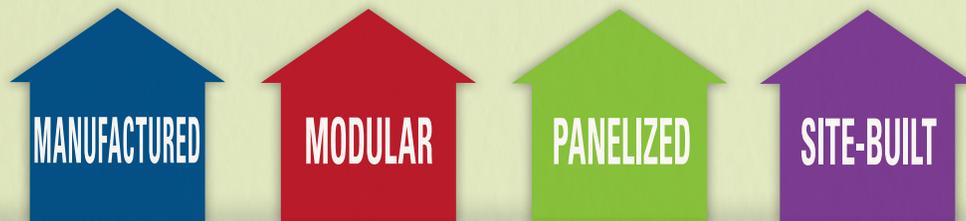


Pre-Disaster Planning for Permanent Housing Recovery

volume one OVERVIEW



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Pre-Disaster Planning for Permanent Housing Recovery

VOLUME 1: Overview

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U.S. Department of Housing and Urban Development
Office of Policy Development and Research

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Forest Homes
Louisiana Systems Built Homes
Palm Harbor Homes

About the NAHB Research Center

Located in Upper Marlboro, MD, the NAHB Research Center promotes innovation in housing technology to improve the quality, durability, affordability, and environmental performance of homes and home building products. Created more than 40 years ago as a subsidiary of the National Association of Home Builders (NAHB), the NAHB Research Center has established itself as the source for reliable, objective information and research on housing construction and development issues. Through its various testing and certification services, the Research Center seal is internationally recognized as a mark of product quality and an assurance of product performance.

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Foreword

Since Hurricane Katrina, many lessons have been learned about the importance of disaster preparedness planning and the impact of such planning on permanent residential housing recovery. The U.S. Department of Housing and Urban Development continues to explore new strategies for supporting state and local governments as they prepare and plan for disasters. In cooperation with the Federal Emergency Management Agency and the National Disaster Housing Task Force, we continue to address the temporary, interim, and permanent housing challenges that communities confront in a post-disaster environment.

This report introduces pre-disaster planning tools for permanent housing, with a special emphasis on community involvement in the planning process. We believe that when the community participates, a plan has a greater chance of success because it will reflect the specific housing needs and preferences of the residents. Our national disaster housing strategy recognizes that a “one-size-fits-all” approach is not sufficient for any disaster plan; thus, a flexible approach is encouraged within this report. In fact, the strength of this report is based on its utility and flexibility, which is captured within the electronic tool, worksheets, and checklist.

Planners will be able to use this report to guide the community through the planning process by identifying hazards, housing capabilities, and additional resources needed to implement a pre-disaster housing recovery plan. During the planning process, the community will discover what housing resources are needed to rebuild within a specified time and better understand if it is prepared based on current resources. By considering multiple rebuilding options, the community will be able to weigh the cost and benefits of any given recovery plan.

The planning tools presented in this report are limited to single-family housing needs. This is driven by a desire to keep this volume to a manageable size and not because of a view that other aspects are unimportant. It is vital that communities plan for multifamily and rental housing recovery as well.

Pre-disaster planning can provide a foundation for remaking neighborhoods into dynamic new communities following a disaster. This report provides tools to help make this a reality at the local level. Importantly, it does not direct but rather empowers the planner and community with the tools they need to find the right answer for their circumstance. This approach is aligned with our national disaster preparedness strategy, which emphasizes local involvement in the disaster planning process.



Raphael W. Bostic, Ph.D.

Assistant Secretary for Policy Development and Research

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Executive Summary

Disaster preparedness planning is important to communities and local governments throughout the country, and particularly relevant to those communities located in regions prone to frequent natural disasters. As a result, it is important to develop strategic planning tools that can assist the local communities and governments to prepare before, during, and after a disaster.

The objective of this study is to provide communities and governments with strategic planning tools they can use before a disaster to prepare for rapid reconstruction. These tools are intended to aid with hastening reconstruction of housing during the recovery phase. The planning tools presented within this document are designed to be used by federal, state, or local officials that are responsible for disaster recovery planning. Nonetheless, the authors envision the planners and community working together to develop a permanent housing recovery plan based on the unique needs of the residents and the natural hazards they may experience.

The content is presented in four short volumes. The first volume provides an overview of the permanent housing options, which include manufactured, modular, panelized, and site-built housing. The second volume provides a summary of the national disaster housing strategy, and describes a straightforward planning approach for estimating potential losses and expediting rebuilding. The third volume presents the House Capacity Calculator, which is an easy-to-use application that estimates required rebuilding time based on available house production capacity. The fourth volume describes the basic plant design requirements for manufactured, modular, and panelized housing.

This document serves as both a primer on the subject of permanent housing recovery and a guide to planning for the rebuilding of housing after a disaster. The step-by-step layout of this document allows the reader to progress through the planning process, which makes it ideal for the community participant who is not a disaster management professional. The planning tools have been designed to (1) identify critical planning issues, (2) identify various options available to the community, and (3) compare options in a straightforward manner. The reader is encouraged to use the House Capacity Calculator when considering multiple strategies for the long-term rebuilding of permanent housing. We also have included several worksheets and checklists to facilitate the planning process.

1

Introduction



Volume 1 provides an overview of typical permanent housing options, which include manufactured, modular, panelized, and site-built housing. This volume is a primer for the reader who is unfamiliar with these housing types, the construction permitting process, building codes, local zoning ordinances, inspections, and financing. It also serves as a key reference during the development of a pre-disaster plan.

During the planning process, the community must consider single family, multifamily and rental housing needs. This document and the planning tools are designed to address the community's single-family housing needs, which is one aspect of the strategic disaster recovery plan. It is important to use the planning tools without neglecting multifamily and rental housing concerns.

After reviewing the permanent housing options, the community may decide to consider rebuilding with certain housing types that are not currently used. If the housing type is currently recognized for use by the state,

the community can easily allow it to be used through its local building code department. If the housing type is not recognized by the state, the community will have to work with the state, local government, and industry organizations to establish a new construction process that recognizes the housing type. This process is very involved and may require several years to complete; thus, it should be pursued before a disaster event occurs.

This volume encourages the planner and community to work with key government agencies (such as HUD and FEMA), housing manufacturers, builders, and industry organizations. To assist the community, we have identified the key agencies and organizations that can facilitate the planning process for all permanent housing types. Please refer to the Resources Chapter for contact information.

2

Overview: Four Housing Types

Manufactured Housing

Overview

Manufactured homes are built to the Manufactured Home Construction and Safety Standards (HUD Code), a federal code established under the National Manufactured Housing Construction and Safety Standards Act of 1974. Manufactured homes are built in the controlled environment of a manufacturing plant and are transported to the installation site in one or more sections on a permanent chassis.¹ The exterior of each transportable section displays a red certification label, which certifies that the manufactured home meets the HUD Code.

With few exceptions, manufactured housing is available in one-story designs and may be one to two or more sections in width. The multiple sections include plumbing, heating, and electrical systems, which are joined together at the installation site. When the home is transported to the site, the axles and wheels are removed from the frame; however, the frame remains as part of the home.

Manufactured housing can be installed with or without a permanent foundation, as a temporary or permanent structure with anchors. The foundation is typically constructed using concrete block piers placed under the frame. A non-load bearing wall (or skirt) is often installed around the perimeter of the home to conceal the piers and frame. When connected to utilities, a manufactured home is ready to be used as a residential dwelling. A typical manufactured home is shown in Photo 2-1.

The Construction Process—Approval and Inspection

Manufacturing plants are monitored by HUD-approved third parties to ensure the facilities comply with the HUD Code. For each plant, the manufacturer must establish primary inspection agency agreements with two third-party agencies: (1) a Design Approval Primary

Inspection Agency (DAPIA) and (2) a Production Inspection Primary Inspection Agency (IPIA). DAPIAs and IPIAs can be state agencies or private corporations. A current list of all inspection agencies is maintained by HUD and the Institute for Building Technology and Safety (IBTS), HUD's contract monitoring agent for the Federal Manufactured Housing Program as of 2010. IBTS is responsible for the monitoring and annual assessment of the business processes and procedures of the manufacturers, third-party agencies (DAPIA/IPIA), and state government agencies that participate in the federal program.²

Before a manufactured housing unit is constructed, the DAPIA must review and approve the home design and the plant's quality assurance manual. Then the IPIA must certify the plant, monitor the manufacturer's quality control program, inspect each manufactured home at one stage of construction, and issue the HUD certification label that is attached to each housing unit after it is completed. The manufactured home is then transported to the installation site and installed on a foundation that must meet HUD's Manufactured Home Installation Standards. The manufacturer must provide installation instructions and certification by a professional engineer or registered architect confirming that the foundation



Photo 2-1: A Typical Manufactured Home

Source: Palm Harbor Homes

Overview: Four Housing Types

support and anchoring meets the Manufactured Home Installation Standards. Third-party monitoring and inspection of the installation are typically provided by a representative from the state or local government. After the manufactured home is installed and occupied, any consumer complaints are addressed by the manufacturer of the home or the State Administrative Agencies (SAAs), which are authorized by HUD to assist with consumer complaints and corrective actions.

Real Property Status, Financing, & Local Zoning

Manufactured housing may or may not become real property depending on whether the home is installed permanently or temporarily on a lot owned by the homeowner, or on a lot leased by the homeowner. FHA provides insured mortgages for manufactured housing through several programs. FHA's Title II program provides mortgages for manufactured homes affixed to permanent foundations, and the Title I program also provides loans for purchase of manufactured homes or lots.³

When the manufactured home is not installed on a permanent foundation, it is not treated as real property for financing purposes. Instead, the manufactured home has been historically financed as personal property. When a manufactured home is treated as personal property, the value tends to depreciate. The Fannie Mae Selling Guide defines detailed appraisal requirements for manufactured housing, which are based on "market-based property valuations for manufactured homes," by comparing the "sales of manufactured homes that are truly comparable to the subject property." In September 2009, Fannie Mae launched the *MH Select*TM Appraisal Guideline "to appeal to a broader consumer market and compete head-on with site-built housing." The initiative aims to collaborate with manufacturers to "ensure that *MH Select*TM homes are on-par [aesthetically and architecturally] with site-built housing."⁴

Nonetheless, several challenges persist in terms of local zoning and code restrictions for manufactured housing. Many of these challenges were evident after Hurricane Katrina during the long-term housing recovery effort in the Gulf Coast region. As part of disaster preparedness planning, local jurisdictions should review their local zoning and code requirements to ensure a manufactured housing solution can be implemented with ease.

Modular Housing

Overview

A modular home is built to the same state building code used by conventional site builders. Although state building codes vary across the nation, most states have adopted a version of the International Codes (e.g., IBC, IRC) published by the International Code Council (ICC). While the ICC⁵ and other resources⁶ maintain updated directories that identify the building codes used by each U.S. state or territory, the process for constructing an approved modular home will vary from state to state, so it is important to know the requirements of the state agency that regulates modular home construction. HUD maintains a list of state regulators for modular housing.⁷

A modular home is built to near completion in a factory in one or more sections. The home is typically designed and constructed using wood floor systems. It is not required to be built on a permanent metal frame or chassis. Instead, a modular chassis is used to transport the home to the installation site and then returned to the factory to transport other homes.

A wide range of house designs—including one-story ranch style, split- and bi-levels, one-and-a-half-story Cape Cod styles, two-stories, three-stories, townhouses, and a variety of contemporary designs—can be built as a modular home.

All modular homes are installed on permanent foundations and are never relocated. The permanent raised foundations are load-bearing structures virtually identical to those used by conventional site builders. A typical modular home is shown in Photo 2-2.



Photo 2-2: A Typical Modular Home

Source: Palm Harbor Homes

The Construction Process—Approval and Inspection

The modular manufacturing plant must comply with the state building code. To ensure adherence, the construction process is monitored by the state agency or a state-approved third party. Generally, the state licenses a manufacturer to build modular homes in accordance with the state building code. This process varies state by state, but all will include a house design review to confirm the design meets the state building code, in-plant inspections of the house to ensure it is being built in accordance with the state building code, and site inspections during the construction of the foundation and installation of the house.

The IBTS works with 31 state-regulated modular programs to produce a Modular Home State Certification Label. The label certifies that a modular home meets HUD's Technical Suitability of Products (TSP) Program—"under this program, modular and closed-cell construction encompasses factory-built structures and complex structural assemblies (not including manufactured homes) that are inspected and labeled under state-regulated programs. This permits such structures and assemblies to be eligible for HUD-associated building construction and FHA-insured financing without HUD approval, or inspection of specific plans or individual unit construction."⁸

The states of Minnesota, New Jersey, and Rhode Island jointly created the Industrialized Buildings Commission to streamline the design, manufacture, delivery, and installation of modular homes. According to the Industrialized Buildings Commission, the goal of the organization is "to eliminate costly duplication of reviews and inspections by multiple jurisdictions. The coordinating compact enables member states to improve their efficiency and reduce their costs by consolidating similar services while continuing to operate, staff, and enforce industrialized (modular) buildings programs. Improved compliance through uniform rules, regulations and procedures; better enforcement through sharing of information and findings; and reduced costs through elimination of redundant reviews and inspections are just some of the compact's benefits."

Real Property Status, Financing, & Local Zoning

Since modular homes are built to the same state building code used by conventional builders and installed on a permanent foundation, the homes are considered real property. Typically, modular homes will appreciate at the same value as comparable conventional, site-built homes. In fact, the Fannie Mae Selling Guide does not make any appraisal distinctions between modular houses and site-built homes provided the modular home is “designed as a one-family dwelling, assumes the characteristics of site-built housing, is legally classified as real property, is permanently affixed to a foundation system that is appropriate for the soil conditions of the site, and meets local and state codes.”⁹

Modular homes are typically purchased through a home builder and financed using conventional mortgage financing. Generally, modular homes are permitted in the same residential zones and subdivisions as are conventional site-built homes. Nonetheless, the regulating state agency must have a modular program in place and the local jurisdictions must be familiar with the construction process to avoid confusion or zoning restrictions.

Panelized Housing

Overview

Similar to modular homes, panelized homes are built to the same state building code used by conventional site builders. Although state building codes vary across the nation, most states have adopted a version of the International Codes (e.g., IBC, IRC, etc.) that are published by the International Code Council (ICC). To identify the building codes in a given state, contact the state government and local jurisdiction where the panelized home will be built. While the ICC¹⁰ and other resources¹¹ maintain updated directories that identify the building codes used by each U.S. state or territory, the process for approving the use of panelized components will vary from state to state, so it is important to know the requirements of the state agency that regulates panelized home construction. HUD maintains a list of state regulators for panelized housing.¹²

A panelized home manufacturer prefabricates all housing components and delivers these components to the installation site. Panelized homes are delivered as a complete set of engineered exterior and interior wall panels, structural floor systems, exterior decks, and roof and floor trusses. Although some manufacturers only provide panels for one type of housing component (e.g., roof truss or flooring), this study focuses on the panelized home manufacturer that provides prefabricated panel components for the “whole house solution,” including everything from windows and doors to siding, paint, and even appliances. A panelized home manufacturer typically utilizes advanced technology to build all housing components, including computer-aided design and manufacturing tools to produce detailed drawing plans and the panelized components that will be transported to the installation site and assembled to complete the home. A typical panelized home is shown in Photo 2-3.

The Construction Process—Approval and Inspection

The panelized manufacturing plant must comply with the state building code. To ensure adherence, the construction process is monitored by the state agency or a state-approved third party. Generally, the state licenses a manufacturer to build panelized components for the home in accordance with the state building code. This

process varies state by state, but all will include a house design review to confirm the design meets the state building code; in-plant inspections of all “closed-wall” panel components to ensure compliance with the state building code; and site inspections of all “open-wall” panel components and the foundation—the same as building inspections for site-built housing.

Similar to modular homes, IBTS works with 31 state-regulated programs to ensure that panelized components produced in a factory meet HUD’s Technical Suitability of Products (TSP) Program, which “permits such structures and assemblies to be eligible for HUD-associated building construction and FHA-insured financing without HUD approval, or inspection of specific plans or individual unit construction.”¹³

Real Property Status, Financing, & Local Zoning

Since panelized homes are built to the same state building code used by conventional builders and installed on a permanent foundation, the homes are considered real property. Typically, panelized homes will appreciate at the same value as comparable conventional, site-built homes. In fact, the Fannie Mae Selling Guide does not make any appraisal distinctions between “prefabricated housing” and site-built homes provided the panelized home is “designed as a one-family dwelling, assumes the characteristics of site-built housing, is legally classified as real property, is permanently affixed to a foundation system that is appropriate for the soil conditions of the site, and meets local and state codes.”¹⁴

Panelized homes are typically purchased through a home builder and financed using conventional mortgage financing. Generally, panelized homes are permitted in the same residential zones and subdivisions as are



Photo 2-3: A Typical Panelized Home
Source: Forest Homes

Overview: Four Housing Types

conventional site-built homes. Nonetheless, the regulating state agency must have a panelized program in place and the local jurisdictions must be familiar with the construction process to avoid confusion or zoning restrictions.¹⁵

Site-Built Housing

Overview

Site-built homes are constructed using the local building code, which is based on the state building code. Although state building codes vary across the nation, most states have adopted a version of the International Codes (e.g., IBC, IRC, etc.), which are published by the International Code Council (ICC). A few local jurisdictions still use the legacy building codes (i.e., BOCA, SBCCI, ICBO, or CABO). The ICC maintains an updated directory¹⁶ that identifies the building codes used by each U.S. state or territory; nonetheless, the construction process will vary locally and the builder must follow the state and local jurisdiction requirements for residential construction in terms of building practices, permitting, and inspection.

In 2010, site-built housing represented approximately 82 percent of all of the residential housing built in the United States. Most site-built home builders construct wood-frame housing using the local building code. All materials and house components are delivered to the construction site, where the house is built from “the ground up.” First, the site is prepared and the foundation is installed. Second, the structural framing is completed and the house is “closed-in.” Third, the exterior and interior of the house are finished, which includes exterior cladding, roofing materials, insulation, electrical, plumbing, HVAC, interior drywall, windows, doors, fixtures, appliances, cabinets, floor coverings, painting, and final landscaping. During the entire construction process, building permits and inspections are required. Nonetheless, even on well-managed projects, weather-related



Photo 2-4: A Typical Site-Built Home

Source: NAHB Research Center

delays are common. For site-built homes, the construction process will typically take about 90 days. A typical site-built home is shown in Photo 2-4.

The Construction Process—Approval and Inspection

To ensure adherence to the state and local building codes, the construction process is monitored and inspected by the local building code official. This process varies from locality to locality, but every jurisdiction will have a building permit procedure to confirm the house and plot design meets the state building code and the local zoning ordinance, respectively. Once the building permit is issued, the builder can begin construction. During the construction process, several inspections will be required; generally, this will include a foundation inspection, open framing inspection, electrical inspection, plumbing inspection, mechanical inspection, and a final inspection. After each inspection, the builder will need to address any construction compliance or safety issues identified by the inspector. Once the final inspection is complete and the construction is approved, the builder will be issued a certificate of occupancy by the local building code department.

Real Property Status, Financing, & Local Zoning

Since site-built homes are constructed in accordance with state/local building code and installed on a permanent foundation, the homes are considered real property. Typically, the value of site-built homes will appreciate, but this depends upon the current housing market condition. The Fannie Mae Selling Guide defines the appraisal process for any home, which is site built or has the characteristics of site-built housing.¹⁷ New site-built homes are typically purchased through a home builder and financed using conventional mortgage financing based on the appraised value of the house.

Generally, local zoning will define where residential housing can be built. Site-built homes must meet both local building code and zoning requirements. The zoning official will review the plot plans to ensure that all zoning ordinances are met. Lastly, many communities or subdivisions are also governed by home owner associations, which define covenants, conditions, and restrictions for use of the property.

Overview: Four Housing Types

¹ <http://www.hud.gov/offices/hsg/ramh/mhs/faq.cfm>
(HUD's definition for manufactured homes)

² http://www.ibts.org/manu_housing.shtml
(IBTS Services)

³ Programs of HUD: Major Mortgage, Grant, Assistance, and Regulatory Programs, (HUD 2006).
<http://archives.hud.gov/pubs/ProgOfHUD06.pdf>

⁴ <https://www.efanniemae.com/sf/guides/ssg/>
(Fannie Mae Selling Guide)

⁵ <http://www.iccsafe.org/gr/Documents/stateadoptions.pdf>
(ICC Building Code Directory per State)

⁶ <http://www.reedconstructiondata.com/building-codes/>
(Reed Construction Data Building Code Directory)

⁷ <http://www.hud.gov/offices/hsg/ramh/mhs/mhscat3.cfm>
(State Regulator Contacts for Modular Homes)

⁸ http://www.ibts.org/mod_home.shtml
(IBTS and Certified Modular Labels for State Programs)

⁹ <https://www.efanniemae.com/sf/guides/ssg/>
(Fannie Mae Selling Guide)

¹⁰ <http://www.iccsafe.org/gr/Documents/stateadoptions.pdf>
(ICC Building Code Directory per State)

¹¹ <http://www.reedconstructiondata.com/building-codes/>
(Reed Construction Data Building Code Directory)

¹² <http://www.hud.gov/offices/hsg/ramh/mhs/mhscat3.cfm>
(State Regulator Contacts for Panelized Homes)

¹³ IBTS web page

¹⁴ <https://www.efanniemae.com/sf/guides/ssg/>
(Fannie Mae Selling Guide)

¹⁵ *Steve Winter Associates and HUD, Integrating Panels into the Homebuilding Process*, (HUD 2005), page 19.

¹⁶ <http://www.iccsafe.org/gr/Documents/stateadoptions.pdf>

¹⁷ <https://www.efanniemae.com/sf/guides/ssg/>
(Fannie Mae Selling Guide)

Resources

Manufactured Housing

There are several resources that support manufactured housing, including HUD's Office of Manufactured Housing Programs, the IBTS, and the Manufactured Housing Institute (MHI).

<http://www.hud.gov/offices/hsg/ramh/mhs/mhshome.cfm> (HUD's Office of Manufactured Housing Programs)

<http://www.ibts.org/index.shtml> (IBTS website)

<http://www.factorybuilthousing.com/Default.asp> (MHI website)

Modular Housing

There are several resources that support modular housing, including the NAHB Building Systems Council, the IBTS, and the IBC.

<http://www.nahb.org/page.aspx/category/sectionID=809> (NAHB Building Systems Council—Modular Homes)

http://www.ibts.org/mod_home.shtml (IBTS Modular Home State Certification Labels)

<http://www.interstateibc.org/about.htm> (IBC Function and Modular Home State Certification Labels)

Panelized Housing

There are several resources that support panelized housing, including the NAHB Building Systems Council and the IBTS.

<http://www.nahb.org/page.aspx/category/sectionID=809> (NAHB Building Systems Council—Panelized Homes)

http://www.ibts.org/mod_home.shtml (IBTS support for factory-built systems)

Site-Built Housing

There are several resources that support site-built housing including the National Association of Home Builders (NAHB), and NAHB's local Home Builders' Associations.

http://www.nahb.org/local_association_search_form.aspx, and International Code Council <http://www.iccsafe.org>

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