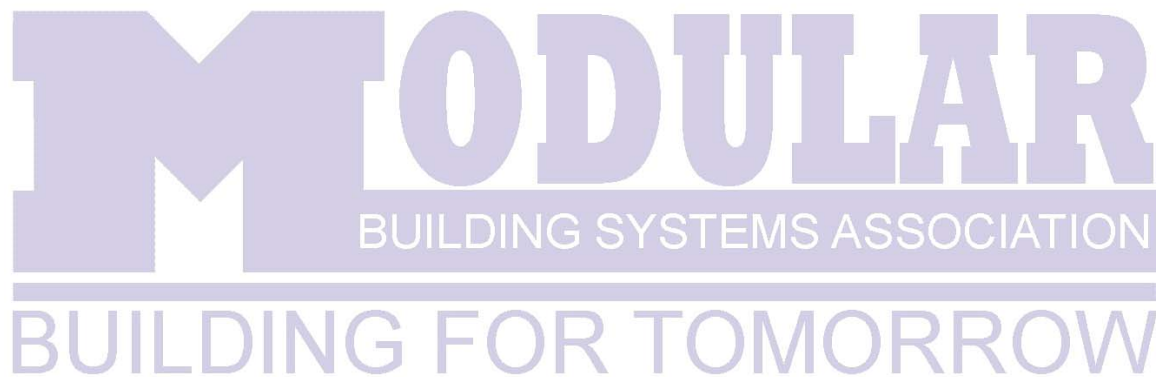


Building Modular Homes:

A Builder's Guide to Residential Modular Construction



Introduction

This publication is intended to serve as a reference for builders, contractors, developers or other construction professionals who are interested in becoming a modular homebuilder. It is published by the Modular Building Systems Association (MBSA) and is a collaborative effort between the MBSA staff and Mr. Clyde Krieder. This document should serve as a starting point for individuals to learn more about modular housing and the steps that are necessary to become involved with the modular housing industry.

About the MBSA

The Modular Building Systems Association, or MBSA, is a trade association headquartered in Harrisburg, Pennsylvania that is dedicated to representing the interests of the residential modular housing industry. The MBSA's mission statement mandates that it "be the primary organization advancing the legislative and regulatory interests of the modular industry in the United States. The MBSA strives to increase awareness of the value of modular construction by consumers, suppliers, builders, government officials, and other publics; it advocates public policies that make modular building systems available on a cost-effective basis. The MBSA serves as a forum where members, suppliers, and builders work together for the purpose of fostering the exchange of information and innovation in the modular industry."

BUILDING SYSTEMS ASSOCIATION

About Mr. Clyde Krieder

Mr. Clyde Krieder is an experienced modular builder, MBSA member and a long time advocate of the modular housing industry. With a solid background in the field of education, he also holds certificates in the "Graduate Builder" and "Certified Graduate Remodeler" programs from NAHB Builder's Institute. Currently, Clyde is part owner of Meadow Lake Partners, L.P. Prior to Meadow Lake, he owned and operated Harmony Home Builder's Inc., which included site-built homes, modular homes and remodeling. He remains active in the PA Builders Workforce Development programs and is a member of the Governor's "Team PA Workforce Investment Board." Clyde has also served as an instructor for the Modular Housing Training Institute (MHTI) course since its inception in 1999 and he continues to serve on that organization's advisory board.

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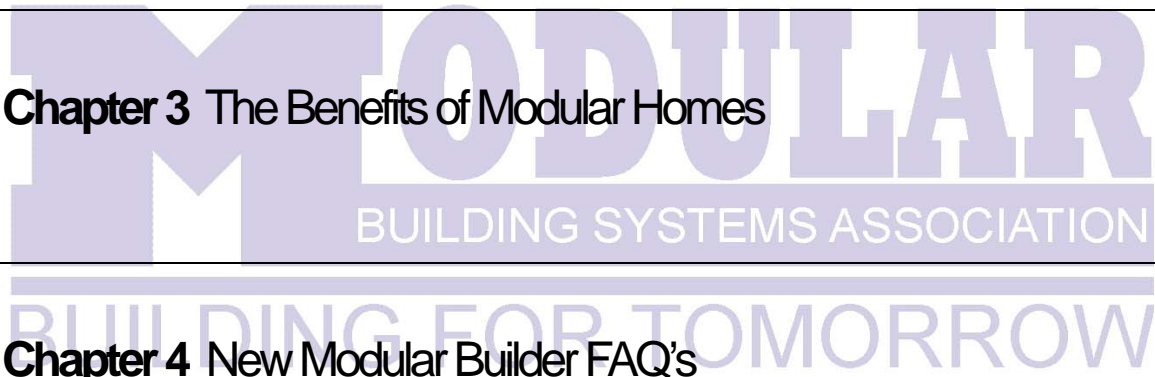
Chapter 1 The Players

Chapter 2 The Modular Process

Chapter 3 The Benefits of Modular Homes

Chapter 4 New Modular Builder FAQ's

Chapter 5 New Builder Checklist



Modular Home: A modular home is a home constructed in multiple sections in a factory. It is built to the same building code used by conventional site-builders and is transported to the new home site where it is placed on a permanent foundation.

Modular Manufacturer: A company that constructs modular homes in multiple sections inside an environmentally controlled factory.

Modular Builder: The company that sells the home to the homebuyer and is responsible for ordering the home from the manufacturer. The modular builder constructs the foundation for the permanent installation of the home and is responsible for final finish work after the home has been installed.

Modular Installer: A subcontractor who specialized in the installation of the modular home on the foundation.

Stick-built / Site-built home: A home constructed at the site the home will occupy on a permanent foundation. This is the “traditional” method of home construction.

THE FACTORY/MANUFACTURER

Modular homes are built in a factory setting where raw materials and design and assembly personnel are brought together in a controlled environment to create a finished product. Construction within a factory eliminates the possibility of damage from weather and allows all materials to be assembled in a protected climate-controlled environment. This is important given the recent problems with mold as it eliminates the possibility of any water infiltrating the house during construction.

THE BUILDER/SELLER

The modular manufacturer generally does not sell directly to the homebuyer. Instead, homebuyers purchase a modular home from a modular builder, who is responsible for working with the buyer to determine the type and design of home they want. The modular builder then orders the home from the manufacturer. The modular builder is not an agent of the manufacturer, but an independent business owner.

CUSTOMIZATION

As mentioned in the previous paragraph, the builder and manufacturer will work with the homeowner to determine the type and design of modular home that best suits the purchaser's needs. Home purchasers are unlimited in the style and size of the home they can have built. Modular homes are totally customizable and no two are the same.

CONSTRUCTION & PLAN REVIEW

Before a modular manufacturer begins construction, all building plans must be reviewed and approved in each state where the manufacturer intends to sell homes. Homes must be designed and built to the code for the state where the home will be shipped for final location. The manufacturers contract with state approved third party plan review agencies which conduct plan review on behalf of the state. The modular manufacturer also contracts with a third party inspection agency that is licensed by the states to perform the in-plant inspection while the home is in production. When the housing sections or modules are complete, the third party places a label on the home certifying that the home has been manufactured in conformance with the approved plans and complies with all provisions of the building code.

SHIPPING, STABILITY & SUPERIOR STRENGTH

After construction in the factory the separate modules are loaded for transport. To deal with the rigors of shipping, each modular home has been constructed with roughly *twenty to thirty percent more materials* than a traditional stick-built home. (For example, drywall is typically glued with a special adhesive and then screwed to the framing). These additional materials greatly increase the structural strength of the home as noted in a recent FEMA study on 1992's Hurricane Andrew. The study concluded that "the module-to-module combination of units appears to have provided an inherently more rigid system that performed much better than conventional residential framing." Building Performance: Hurricane Andrew in Florida, FIA-22, Item 3-0180.

FINAL ASSEMBLY

After the builder orders the home from the manufacturer, the manufacturer will give the builder specifications for the foundation. The builder is then responsible for preparing the foundation for the modular home. When the home is constructed, it is shipped to the job site. The next day, a crane is used to place the housing modules on the foundation and set the roof in place. By the end of the day, the home has been completely installed and is closed up and secured. In the subsequent weeks, the builder will finish the home. This finish work includes securing any remaining roofing shingles, attaching siding and finishing some interior drywall work. Generally, the home is ready for occupancy within several weeks. Prior to moving in, a local building code inspector will make a final inspection and issue an occupancy permit.

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Limited Number of Subcontractors

Generally, the modular builder contracts with a limited number of subcontractors. Since the majority of construction is performed in the factory, the modular builder has limited responsibilities. Most modular builders will subcontract out the foundation construction. In addition, the crane company and the installation crew are usually subcontractors. This eliminates the possibility that your builder will have delays from a “no-show” subcontractor.

Manufacturer Responsibility

Since most of the work is performed in a factory, the manufacturer is responsible for the work that they have done. When a problem results from work done in the factory (which is rare), the manufacturer corrects it. Consequently, ongoing problems with modular homes are relatively unheard of.

Regulation & Inspection

As a result of the intense regulation and inspection of the home during construction, it is extremely rare that a home leaves the factory with a defect in design or manufacturing. The third party inspection services see to this and assume liability for their plan review and inspection responsibility. Additionally, since modular construction is regulated by the state, the state is typically involved in correcting the problem.

Superior Construction

The larger quantity of construction material used in the modular home results in enhanced structural stability. The material that is used is also often of higher quality than what a stick builder uses and the material is stored indoors until needed. Additionally, better construction techniques and higher quality control techniques greatly reduce the chances for unforeseen defects. This includes problems such as mold that could arise from moist lumber.

The Southern Pine Inspection Bureau reported in August 2001 that “most mold . . . which are observed on lumber . . . can normally be attributed to the transportation, storage and construction stages.” Keeping an Eye on Mold, Kent J. Pagel, Structural Building Components Magazine, May 2002 citing to August 2001 SPIB report. The fact that modular homes are constructed in a controlled factory environment eliminates the possibility that lumber with mold will be used in the home.

As noted previously in this Guide, a FEMA study on 1992's Hurricane Andrew concluded, "The module-to-module combination of units appears to have provided an inherently more rigid system that performed much better than conventional residential framing." Building Performance: Hurricane Andrew in Florida, FIA-22, Item 3-0180. The inherent strength of modular homes that FEMA noted was demonstrated more recently by the performance of modular homes during the 2004 hurricane system. For more information on this please see the special report in the November/December 2004 issue of Building Systems Magazine titled "Modular Building System Stands Strong Against Hurricanes." On the web at <http://www.buildingsystems.com>.

Reduced Construction & Assembly Time

The modular home is completed in the factory in approximately one-third of the time it takes a stick built home to be completed. This eliminates the possibility of on-site construction-related damage or other problems. The factory controlled conditions also eliminate the possibility of bad weather delaying the completion of your home. The shortened construction time also benefits you by reducing the duration of your construction loans. A modular home is also not subject to delays from back-ordered materials or unreliable subcontractors. Once the home is delivered it is closed and sealed within days and the remaining on site work is completed very quickly. Within weeks, the home is available for the buyer to move in. Consequently, the neighborhood children won't have a chance to play in your uncompleted house and there is no chance for vandals to damage the interior of your home.

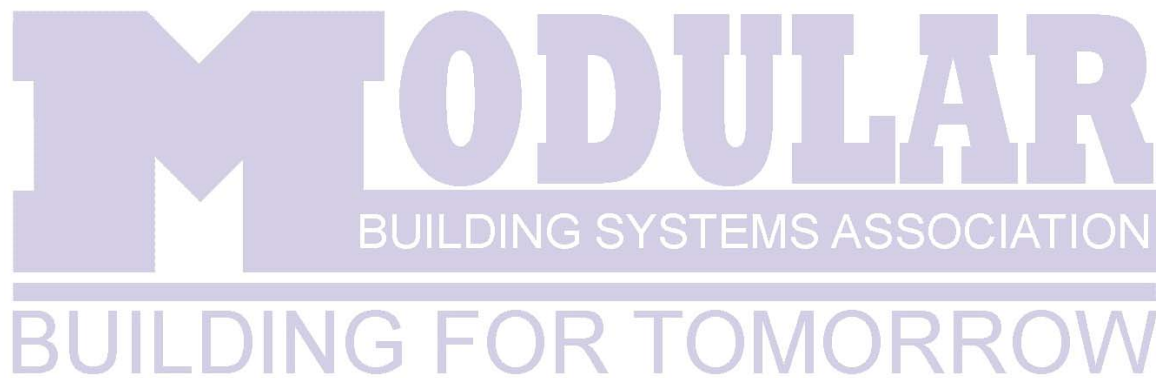
Skills and Specialized Training of Modular Builders and Installers

Modular Manufacturers do not choose to deal with builders that are under-skilled and poorly capitalized. Manufacturers have a set list of builders they deal with and are in constant communication with these builders to update them on new techniques and changes in the industry.

Many manufacturers require their builders to complete a modular home training course. The Modular Housing Training Institute (MHTI) located at Pennsylvania College of Technology, a Penn State University campus located in Williamsport, Pennsylvania, has developed a comprehensive training program for modular builders and installers. This program is available to modular builders and installers throughout the United States. The MHTI also travels throughout the country to offer the training on location. For more information on this course, please visit <http://www.pct.edu/mhti/>.

Financing

Modular homes are financed in the same manner as conventional homes. The MBSA web site lists a number of mortgage companies (some with programs specific to modular homes) that can assist you in learning more about financing. Please visit their individual web sites to learn more about financing modular homes. A listing of these companies may be found under the “Financial” subsection of the “Vendors & Suppliers” area of the MBSA web site at <http://www.modularhousing.com/partners.html>.



■ *Which magazines are read by people in the modular building industry?*

Building Systems Magazine is the most popular magazine read by modular builders. Information about Building Systems Magazine is available on their web site at: <http://www.buildingsystems.com/>. To subscribe to Building Systems Magazine please visit their web site or contact them by phone at (800) 826-3893.

■ *Where can I get training that is specific to modular home builders?*

Pennsylvania State University's Penn College of Technology offers a two day course known as the Modular Housing Training Institute (MHTI). The course is a partnership between Pennsylvania College of Technology, the Pennsylvania Department of Community and Economic Development and the Modular Building Systems Association. For more information on the MHTI course please visit their web site at <http://www.pct.edu/mhti/> or contact them by telephone at (570) 327-4768, ext. 3301.

■ *Am I the middleman between manufacturers and homeowners or do I sell the home directly to the end purchaser?*

In most instances the manufacturer sells the home directly to the modular builder. The builder then completes any necessary finish work to the home at the job site and then sells the home to the homeowner. Other business models exist but this is the traditional (and prevalent) model used by the modular housing industry.

■ *How do I go about purchasing a modular home?*

You will need to establish a business relationship with a modular manufacturer.

■ *Where can I find a list of modular home manufacturers and who do you recommend?*

A comprehensive list of modular home manufacturers is available on the MBSA web site at <http://www.modularhousing.com/members.html>. All manufacturers who are members of the MBSA are committed to producing a quality product and we recommend every manufacturer equally. Many have been in business for several decades and are family-owned companies with a long history of customer satisfaction. For a list of manufacturers that are located in or ship to your state, please visit the "Find a Builder" section of the MBSA web site at <http://www.modularhousing.com/members.html>.

■ *Who will transport the modular home to me?*

Some manufacturers transport modules directly to the job site using their own carriers. Other manufacturers contract with a third party to transport the modules for them. When establishing a relationship with a modular manufacturer be sure to inquire who will be transporting the modules.

■ *How complete will the home be when shipped from the manufacturer and how long does it take to complete the “finish work?”*

As a general rule, modular homes are anywhere from 60% to 90% finished when they are delivered. The amount of remaining “finish” work will take anywhere from two (2) to eight (8) weeks depending on the layout, size and intricacy of the house.

■ *What type of work will I need to complete that is not done by the manufacturer?*

Major considerations such as excavating a foundation and constructing garages or bump-outs will need to be completed by you. Depending on the area, it may also be necessary to drill a well and arrange for a septic system. In addition, any “finish” work that is not completed by the manufacturer will need to be done by you. Examples of “finish work” are:

- Utility connections – Complete the electrical service connection to the panel box as well as any sewer and water connections
- Testing electrical system and install any remaining light fixtures
- HVAC System completion – You may need to install the central air unit, furnace and make duct work connections
- Exterior concrete work – Arrange for the pouring of any concrete slabs, patios, sidewalks, curbs or driveways (don’t forget to contract with a paving company if you’re not using concrete for the driveway)
- Construction of wood decks or porches
- Final grading of lot
- Landscaping – Arrange for final landscaping work such as sod placement and tree planting
- Seal any drywall cracks that may have occurred during transport
- Interior clean up and paint touch up

The following checklist has been compiled by the MBSA to assist the new modular builder in launching their business.

- 1) Obtain General Liability insurance: The MBSA offers a variety of insurance products for modular builders through the MBSA Insurance Program. Information about the program is available by phoning (800) 945-1810 or on the web at <http://www.mbsainsurance.com>. Please contact the MBSA Insurance Program directly to inquire whether you qualify for coverage.
- 2) Check to see whether you require Worker's Compensation insurance. If you are a sole proprietor with no employees you may be able to avoid purchasing Worker's Compensation insurance.
- 3) Attend the Modular Housing Training Institute (MHTI). Information about MHTI is available by phoning (570) 327-4768, ext. 3301 or on the web at <http://www.pct.edu/mhti/>.
- 4) Join the Modular Building Systems Association (MBSA) as a Builder member. This will give you access to industry-specific information that is unavailable to the general public as well as access to the MBSA Insurance Program. Membership forms and additional information about the MBSA are available by phoning (717) 238-9130 or on the web at <http://www.modularhousing.com/join.html>.
- 5) Visit one or more modular home manufacturers. Tour the facility and ask questions about both the construction process and the products they produce. The best way to be successful in the modular industry (as in many others) is to be informed. A listing of modular home manufacturers is available on the "Find a Builder" section of the MBSA web site at <http://www.modularhousing.com/members.html>. While at the factory, you should also ask to see a copy of the company's sales contract.
- 6) Choose a manufacturer to do business with and decide on the first model of home you would like to sell. Choosing a modular manufacturer will also enable you to contact subcontractors for quotes using the attached estimate sheet.
- 7) Establish a business relationship with the subcontractors that you will need to finish the home. Secure bids from these subcontractors and record it using the form attached to this guide.

MBSA

DATE:

Subcontractor Estimate Sheet

<u>HOUSE MODEL:</u>	<u>QUOTE</u>	<u>QUOTE</u>	<u>QUOTE</u>	<u>ACTUAL</u>
Permits				
Survey				
Drafting				
Well				
Septic Testing				
Mod. Deposit				
Mod. Balance				
Excavation				
Foundation				
Chimney / Basement & Garage Slabs				
Piers				
Set Crew				
Crane				
Carpentry - Labor				
Garage				
Sun Room				
Decks				
Bump-outs				
Construction - Material				
Garage				
Garage Doors				
Deck				
Sun Room				
Bump Outs				
Windows / Screening L&M				
Electrical - Labor				
Fixtures				
Plumbing - Labor				
Water Heater				
Material (including faucets)				
Hardwood floors - Labor				
Materials				

MBSA

DATE:

Subcontractor Estimate Sheet

	<u>QUOTE</u>	<u>QUOTE</u>	<u>QUOTE</u>	<u>ACTUAL</u>
Tile - Labor				
Tile Materials				
Carpet - Labor				
Material				
HVAC				
Interior Finish - Labor				
Materials				
Sheetrock - L&M				
Exterior Finish - Siding - Labor				
Materials				
Stonework - Materials & Labor				
Appliances				
Refrigerator				
Range				
Dishwasher				
Washer / Dryer				
Insulation				
Crawl Space / Basement				
Garage				
Granite / Corian - Kitchen				
Bath 1				
Bath 2				
Rough in Bath				
Full basement bath				
Finish basement				
Gutters & Leaders				
Landscaping				
Clean House				
Warranty				
Dumpster & chem toilets				
Miscellaneous				