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This chapter takes the nonprofit developer from finding a manufactured or modular home manufacturer or dealer, to accepting delivery of the home, and focuses on the many issues that will arise in between. The following topics will be discussed in this chapter:

- Finding a manufacturer or dealer
 - Modular manufacturers or dealers
 - Manufactured home producers or dealers
- Finding a contractor
- Selecting the house
- Determining the delivery date
- Placing the order
- Preparing the site
- Building the foundation
- Using finishing crews to complete utility connections and construct site-built elements

FINDING A MANUFACTURER

Finding the right manufactured or modular housing producer is key to a successful project. Remember that manufacturers of both modular and manufactured homes are more accustomed to developments in suburban and rural settings, so there may be a learning curve for the housing manufacturer to become accustomed to providing housing in urban neighborhoods.

Try to get as much information on the manufacturer as possible and much is readily available from company websites or from such organizations as the Manufactured Housing Institute. If it is a public company it will be easy to track down company profiles and financial records. If it is a private company, ask for references, association memberships, Chamber of Commerce standings, and Better Business Bureau reports.

With both modular and manufactured housing companies, be sure to be clear on financing terms, lead time between placing an order and delivery, and cost breakdowns for any plan customization, as well as cost information on having exterior elements such as garages, porches, and decks constructed on site.

An important consideration to keep in mind when deciding on a manufacturer is the location of the production plant. Too great a distance between the factory and the housing site, generally up to 500 miles, can defray cost savings and can cut down on the level of personal service. Code issues with using out-of-state housing producers won't come into play with manufactured homes, which are regulated by the national HUD Code. Many modular plants serve several states and will have plans on hand that are pre-approved for different states.

MODULAR HOUSING MANUFACTURERS

Modular homes are generally sold through independent or franchised dealers who see the project through from start to finish, or directly from the factory itself, particularly if it is for a large custom development or if it is close to the construction site. Most dealers have a building background and are hence termed "builder-dealers."

Modular manufacturers will generally offer a higher level of service than manufactured home producers and usually offer two types of service plans:

- Modular manufacturers offer a "turn-key" option where the manufacturer pulls all permits, oversees construction of the foundation, delivers the home to the site, sets it on the foundation, seals up the mating joints, and performs all finishing work, such as garages, trims, porches, decks, siding, and roofing, or patching in siding and roofing at joint areas, and even landscaping. They even coordinate with utility services to come in and complete the hookups.
- The other alternative is known as "rough set," in which the manufacturer's work ends when the house is set and sealed. It is up to the developer to find and hire a contractor to prep the site and build the foundation. The finish work is also the responsibility of the developer's contractor and subcontractors.

Since modular home manufacturers often compete directly with site builders they're apt to offer a wider range of floor plans, upgrades, and combinations and allow for more customization. There is a wide spectrum of modular home manufacturers who deal in anything from low-end no-frills models to multi-million dollar mansions. The modular companies that will probably appeal most to nonprofit groups will likely fall somewhere in between. Here are some points to consider: Because urban sites are generally small and narrow as they face the street, two-story or even three-



Modular homes are available in a wide array of floor plans and styles (courtesy, Unibilt Industries, Inc.).

story homes (especially zero-lot-line attached units) will often be desirable, because they will offer more square footage of space on a smaller “footprint.” Two-story homes also may fit in better with the surrounding neighborhood than single-story homes. Modular home producers routinely produce two-story models, and in general have more models to choose from (because they share a number of site-built home characteristics) than manufactured homes. Higher roof peaks are also standard for modular homes because manufacturers are more likely to offer “tilt-up” roof designs that allow steeper pitches. (The case studies in Chapter 7 are a good illustration of the design options available in modular homes.)

The best way to find a modular dealer is to network with other nonprofit developers who might be able to suggest manufacturers they have used. Industry publications such as *Building Systems Magazine* or *Automated Builder* also list manufacturers and occasionally publish articles about particularly innovative modular producers working in urban neighborhoods. The Automated Builders Consortium, co-sponsored by *Automated Builder*, actually promotes use of factory-built homes in urban neighborhoods. The Building Systems Councils of the National Association of Home Builders are also a good source of information on manufacturers (Building Systems Councils of NAHB, 1201 15th Street, NW, Washington, DC 20005). Of course, the Yellow Pages and the Internet are always good places to find local manufacturers.

MANUFACTURED HOUSING PRODUCERS

Manufactured housing is sold through independent or manufacturer-owned retailers. Some manufactured home projects, however, have involved nonprofit housing developers working directly with the manufacturers. Conflicts of interest between the manufacturer and local dealers are mitigated because many retailers don’t work in urban areas. Working directly with the manufacturer can help nonprofit developers keep margins razor thin while maintaining housing quality.

Producers of manufactured homes run the gamut from those whose focus is the low-end, bare bones unit to the higher end “semi-custom” home. Generally the manufactured home producer will have the home delivered and assist with set up and sealing up of the homes. All site preparation and foundation work is left up to the general contractor. Any site-built elements are completed by the developer’s contractor as well.



New models of manufactured homes are particularly suitable for infill sites in traditional neighborhoods (courtesy, SWA).

Houses in a manufactured home plant generally move through the production line quickly with no room for modifications during production. Manufacturers who offer a variety of plans and options and who are willing to make some “custom” adjustments will likely be the ones who can best serve nonprofit developers in urban areas, but these adjustments must be completed and held firm well before production time, as they are included in production documents and “locked in” with enough lead time for ordering of special parts and materials.

Because the manufactured housing industry is relatively new at providing models that are suitable for urban infill sites, here are a number of factors to consider when choosing the appropriate manufactured housing producer:

- Look for an array of designs and floor plans. First find a manufactured home producer that already has plans on hand that meet the nonprofit developer's needs, then focus on any customization that is desirable.
- If considering using two-story units with higher-pitched roofs, often a prevailing architectural style in urban neighborhoods, look for a manufactured housing producer who has used or will consider using two-story models and higher-pitched roofs (created by using a hinged-roof assembly). Although they are becoming more common, most manufacturers do not offer two-story models.
- Some of the changes that manufactured home producers may need to make to satisfy the needs of the nonprofit developer may require going through the Alternative Construction (AC) Letter process. AC letters are written approvals from HUD which allow manufacturers to produce and ship individually identified homes which may be, in some way, out of strict compliance with the HUD Code (see Chapter 2). Prior to building Noji Gardens, a manufactured home community in Seattle, Washington (and a case study found in Chapter 7), Tony To of the nonprofit developer HomeSight says the company had to obtain several AC letters because they were installing two-story units with a unique roof-hinging system that allowed for a steeper roof pitch.
- Remember that manufacturers will also face a learning curve. Mike Wolf, president of Marlette Homes in Hermiston, Oregon, who worked with nonprofit developer HomeSight on Noji Gardens, said that he had to get his own employees to buy into the novel design because it would cause some plant disruption (the chassis had to be reworked to allow for the two-story design, and the 8-in-12 pitch roof was accomplished with a tilt-up, double-hinged roof). Wolf held several meetings with the entire plant and employees became familiar with the new construction methods that would be employed. When the first unit was completed employees observed the units being set up.
- The best way to find a good manufactured housing producer for an urban site is to get a recommendation from another nonprofit developer who has used one successfully. The Manufactured Housing Institute website, www.mfghome.org, lists all state associations which can provide referrals. The Yellow Pages and Internet are also good sources of leads.

Whether manufactured or modular housing is chosen, it is essential to learn as much about the process as possible. Visit the plant (and read the "Factory Tour" at the end of this chapter).

Become educated on the assembly-line building procedures. Learn about the unique materials used. Most manufacturers have educational programs for developers who have never used manufactured homes before. Some manufacturers require developers unfamiliar with the manufactured housing process to take such courses.

FINDING A CONTRACTOR

In the case of modular homes, if a “turnkey” option is selected through a modular manufacturer, the company will see the project through from start to finish and the services of a general contractor may not be required. Otherwise, a general contractor will need to be hired. The contractor will oversee all site and foundation-related work and may also supervise site-built elements if they will be added after the main house is delivered. The general contractor can also assist with the selection and ordering of the house. He or she can help find and supervise foundation contractors, finish contractors, HVAC contractors, and other trades.

If a manufactured home is chosen, there are several ways to locate a contractor familiar with this housing technology. The manufactured home producer can provide leads. Most states have local chapters of the Manufactured Housing Institute that will probably have manufactured home installer members. Network with other nonprofit developers familiar with manufactured housing to acquire company names. It might be necessary to seek experienced professionals who come from rural areas and are familiar with this type of construction.

If the contractor is unfamiliar with manufactured or modular housing, help him or her get up to speed. Bring the contractor in from the beginning of the project during the ordering of the home and formulating a plan to manage the site and foundation work. Have the contractor learn as much as possible about the factory-built house he or she will be working with by having a briefing with a manufacturer’s representative and by sending the contractor on a factory tour.



Site-built elements are the responsibility of the developer’s contractor (courtesy, MHI).

SAMPLE MODULAR HOME SPECIFICATION FROM MANUFACTURER

❖ For Structural Integrity . . .

- 2 x 10 floor joists, 16" on center
- 3/4" tongue and groove subfloor
- 2 x 6 exterior wall studs, 16" on center
- 2 x 4 interior wall studs, 16" on center
- 2 x 4 marriage wall studs, 16" on center
- 7/16" wood subsiding on entire exterior
- 5/12 pitch engineered truss roof for ranches & two-stories (a 7/12 pitch available)
- 10/12 pitch engineered truss roof for cape cods (a 12/12 pitch available)
- 7/16" wood roof sheathing

❖ For Energy Efficiency . . .

- R-19 fiberglass batt exterior wall insulation
- R-30 fiberglass batt attic insulation
- Continuous attic ridge vent
- Andersen® high performance - TW, tilt-in, wood, insulated windows
- Stanley metal clad insulated exterior doors
- 52 gallon electric water heater

❖ For a Care Free Exterior Finish . . .

- Mastic maintenance free vinyl siding
- Maintenance free vented vinyl soffit with aluminum fascia
- Decorator vinyl shutters on front of windows
- 30# roof felt with aluminum drip edge
- Certainteed® 25 year fiberglass self-sealing shingles
- Exterior coach lights at all entry doors

❖ For a Luxurious Interior Finish . . .

- 1/2" gypsum drywall - walls
- 5/8" gypsum drywall - ceiling with smooth or stomped finish
- Full 8' ceiling height
- Solid poplar hardwood baseboards and window casings
- Birch veneer doors
- Solid oak faced kitchen cabinets
- Formica post-formed kitchen countertops
- Vented closet shelving
- Plush Philadelphia wall to wall carpeting over premium 1/2" rebond pad
- Congoleum vinyl flooring
- Solid oak faced bathroom vanities
- Cultured marble bathroom vanity tops
- Delta plumbing fixtures

❖ For Safety and Peace of Mind . . .

- Multiple inter-connected smoke alarms with battery back-up
- Anti-scald balancing valves on all bath tub and showers
- 200 amp electrical service
- GFI receptacles in kitchen and baths

❖ For Comfort and Convenience . . .

- Exterior weatherproof GFI protected electrical receptacles front and rear
- Individually controlled electric zone heating
- Decorator medicine cabinets in all bathrooms
- One-piece fiberglass tub and shower units
- Washer and dryer connections in utility room
- Dual tone front door chime
- Exterior frost free hose bib (for site installation)

This sample spec delineates materials and products used in a typical modular home.

WORKING WITH THE MANUFACTURER ON MODEL SELECTION AND

ORDERING THE HOUSE

When choosing a house or houses to place on urban lots, a deciding factor should be how well the house blends with the houses in the surrounding neighborhood. This probably will, in some way, be required by the zoning board. Keep in mind that, while plans are myriad and customization is possible, there are more dimensional constraints with factory-built housing than there are with stick building.

Here are some tips to specifying the home that will fit in best:

- A list of “specific” requirements that a home will meet is known as a “specification” or “spec” sheet. Requirements range from levels of insulation in the ceiling, to the types of windows used, to the thickness of the wall gypsum. These need to be spelled out in detail so that manufacturer and general contractor have a complete list of specifications to work with. An example of a specification sheet for a modular home is shown on the previous page.
- Because infill projects are normally on lots whose narrow dimension faces the street, the home often requires entry on its short side. Most modular manufacturers have models that are entered in this fashion. Some manufactured housing producers have developed so-called gable-end entry plans entered from the narrow end. The industry refers to these models as “front loaders.”
- To blend in with the neighborhood, urban homes are often designed with porches, garages, decks, and basements. These can either be shipped as additional modules or built on site and the most cost-effective method can be discussed with the housing producer.
- Another issue to keep in mind is that if site-built elements are planned, the manufacturer must make the necessary adjustments for added structural loads and for construction junctions between a module and a site-built element. It is important to consult the manufacturer about what is allowable in terms of on-site additions to the house, either modular or manufactured.
- Before ordering a home, see the sections below on establishing a transport date and being sure a wide-load vehicle and the erector cranes can access the site.



Wide-load delivery vehicles must have unencumbered access to the site (courtesy, MHI).

DETERMINING THE DELIVERY DATE

When ordering the home, a delivery date is usually set. Modular and manufactured home sections are normally transported over interstate highways with little trouble. In rural and suburban areas, transporting the home from the factory to the site is barely an item to be considered, as homes are transported mainly on highways and low-traffic roads. Sites are often large tracts of land that have been cleared to receive the homes. However, delivery to an urban infill site may necessitate permits and restrictions to certain times of the day (not during commuter rush hours, or only on Sunday mornings, for example). One New York City development received a permit to ship 18-foot-wide modules, but they could only be shipped late at night. In such urban neighborhoods it is imperative to thoroughly research transportation issues as they can cause serious delays and cost overruns if they are not understood and planned for by the manufacturer or dealer making the delivery.

Here are some of the factors that can delay the delivery of the house:

- A wide-load permit must be obtained in order to bring a modular or manufactured house into most city limits. Expect that cities will have restricted times when delivery is not allowed. These times can be during rush hours, large-scale city events, inclement weather, and certain times of the year when roads could be damaged by heavy loads. Make sure that the manufacturer or the dealer is aware of these limits.
- Many times wide-load transports require escorts, which will add to the cost of transport. In the city, escorts may be either state or local police cars or can be privately contracted. This needs to be set up as soon as a delivery date is established. Remember a city emergency could mean that the house delivery will be stopped until the roads are accessible or the police are available.
- Plan in advance to make certain that a wide-load vehicle can maneuver to the site through narrow, tree-lined streets with mazes of overhead power lines and utility poles. Be sure that cranes can access the site and are able to maneuver. Ask a trucking company representative to look at the site and be sure there is an appropriate route. A representative of the crane company should also be aware of the site's location and restrictions to access.
- Parking restrictions may be necessary to ensure clear roadway access to the site. Again, it should be the manufacturer or the dealer's responsibility to make sure that parking restrictions are in place by the scheduled delivery time.

PLACING THE HOME ORDER

Once cost and design plans have been finalized and delivery conditions have been discussed, it is time to place the order with the manufactured or modular home producer.

Industry expert Steve Hullibarger says this is where nonprofit developers have to be particularly cautious. “Manufactured and modular home producers live in a different world than developers,” says Hullibarger, when it comes to how homes are sold. Hullibarger says he has seen situations where orders have been mistakenly put through and homes built before the developer thought they had placed the order. Deals and agreements should be formalized and in writing. This is more common when working with an over-eager retailer salesperson who mistakes a cost estimate or price-out for an order.

To keep everything clear, controlled, and in writing, Hullibarger recommends using a purchase-order system well known to builders and most developers. This system should be clearly understood by both manufacturer or retailer and nonprofit developer. Basically the home is not officially ordered until the manufacturer or retailer receives the purchase order. The purchase order number should appear on the invoice.

Although the home will speed through construction, the nonprofit developer can still add provisions whereby changes can be made. Change orders will be severely limited but some manufacturers and developers can add in absolute cut-off dates for changing orders or even for canceling them.

Manufactured and modular home producers are usually paid in full either at the time of shipment or within 15 days of shipment date.

ONCE THE ORDER IS PLACED, PREPARATIONS MUST FALL IN LINE

Once the home is ordered, those involved in the development team, the contractor, and the various subcontractors should be notified in advance, ready, and in place at delivery time or at the time their services are needed so that the house can be set, sealed, connected, and secured in a timely fashion.

The entire construction schedule will revolve around the delivery date of the home. Aside from transport issues that may arise, the manufacturer will be far more precise about providing an up-front delivery date than any builder can predict when a home will be finished.



Foundations are generally the responsibility of the developer's contractor (courtesy, Venture, Inc.).

The length of time between ordering the house and its delivery and set up can be very short compared to site-built construction (which can run from three to six months). So it is imperative to be sure everything proceeds like clockwork and that all the trades are lined up to appear when they're needed.

PREPARING FOR THE FOUNDATION

Nonprofit developers who have built on urban lots know how to ensure that the lot is ready for the foundation of any new house. Above-grade debris such as trees and rocks must be cleared, as well as any other site obstructions. Also of concern on lots that once contained houses are such buried items as septic tanks, foundation sections, fuel tanks, and abandoned supply lines, which can slow down site preparation. These and any other below-grade items must be unearthed and hauled away.

One modular homebuilder has devised a creative solution to deal with large items discovered below grade. Doug Sholz, president of modular home producer Unibilt Homes, which is working on an urban infill development program in Toledo, Ohio, says they plan for these items by building partial basements. These three-part systems include basement space (room for mechanical systems and for storage), crawlspace, and an empty space to bury debris.

Access to the site is a major concern when working with factory-built homes. The location of the foundation will have an impact on access. The site must be able to accommodate the vehicles necessary to truck the home or modules and to set them on the foundation. A transport company representative can help plan for this. A representative of the crane company should also be sure to order a crane that is the proper size and radius for the home or module.

INSTALLING THE FOUNDATION

It should be noted that although slab-on-grade foundations are the norm for much new site-built construction, they are not applicable to modular or manufactured homes, which have an integral floor already built in. Manufactured and modular homes must be placed on piers, crawlspaces, or full basements.

The foundation should be constructed by the general contractor or by a subcontractor who

specializes in foundations. Just as a specification sheet drawn up with the manufacturer will list in detail everything involved in building the home, a specification sheet should also list in detail the design characteristics of the foundation. This is done through an architect or engineer.

It is imperative that the foundation be precise in its layout, dimensions, and structural properties. With a site-built house it is relatively easy for builders to make slight adjustments for foundation errors or imprecise measurements. With factory-built homes, an entire home or module of an exact dimension is set on the foundation at once, leaving little room for error.

To ensure accurate dimensions, the foundation contractor who is not accustomed to building for modular or manufactured homes should consider the following tips:

- Measure, re-measure, and then painstakingly stake out the foundation so that it will accommodate the factory-built home (the dimensions of which can be obtained from the manufacturer or retailer).
- Use a laser level to ensure that tops of forms or blocks are flat and level all around.
- If using a poured foundation, brace the forms extra firmly to avoid any shifting during the pour.

Another option is to use precast concrete foundation panels with steel-reinforced concrete studs, reinforced top and bottom beams, and concrete facings. These systems offer dimensional consistency and precise measurements. A typical panelized foundation can be erected in four to five hours with no on-site concrete work. Cost savings can be realized because precast systems, at about \$45 a linear foot, are competitive with concrete block walls. They also go up much quicker, saving on labor costs. Cold-weather erection is common as no concrete pouring or curing is necessary. This enables work to be done during the colder winter months when many factory-built housing manufacturers offer discounts or at least are somewhat more flexible in pricing.

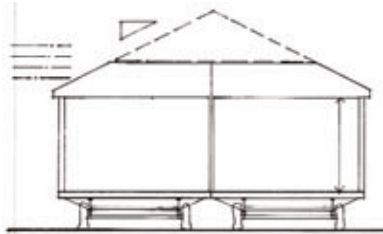
The goal should be to have the foundation completed and inspected by the local building inspector a few days before the scheduled home arrival date. On the delivery day, everything should be in place so that the house can be completely installed on the foundation and buttoned up tightly so that by the end of that day the house will be secured.

MODULAR HOME FOUNDATIONS

Modular units are usually placed on foundations that are either crawlspaces or full basements. The developer's contractor is typically responsible for excavation, construction of the foundation, and



Precast concrete foundation systems (courtesy, SWA).



HUD-Code home sections joined on site (courtesy, SWA).

final grading. A modular home will likely be built using a standard non-slab foundation system identical to a site-built home consisting of a monolithic pad perimeter concrete pour, plus either poured walls or a post-and-beam system for the interior of the home, set at the maximum distance the floor structure is calculated to span. Full walls are poured at mating lines, where the modules join.

If the “turnkey” approach is selected, the modular manufacturer will provide for the construction of the foundations. If not, it’s up to the developer’s general contractor or foundation subcontractor to build the foundation.

MANUFACTURED HOME FOUNDATIONS



Permanent foundations for manufactured homes (courtesy, SWA).

The foundation for a manufactured home can be similar to the foundation used for a modular home. In rural areas, manufactured homes are often placed on block pier foundations, which are not considered permanent. On urban infill lots, this technique WILL NOT BE ACCEPTED and should not be used. Rather, permanent poured concrete or block foundations should be used. Permanent foundations are recommended for other reasons. First, eventual owners can qualify for a conventional mortgage loan, homeowner’s insurance, and FEMA flood insurance. Wind and seismic

bracing is possible without having to use strap ties. Also, the foundation will not require the tell-tale, less desirable “skirt” used when houses are placed on blocks.

The main difference between perimeter foundations for modular and manufactured homes is that the manufactured home will require interior footings and concrete or block posts to support the steel chassis beams. Where the floors join at mating walls, support posts and footings are placed per the manufacturer’s instructions. The footing size at every mating-line support is governed by the weight load data, which can be obtained from the manufacturer.

Permanent foundations for manufactured homes need to respond to the nature of this building technology—especially in the way that the floors are constructed. A typical manufactured home has floor joists made of 2x6s or 2x8s, spanning 14 to 16 feet. The floor system is supported inboard from the ends. The supports are the two steel chassis beams running the length of the manufactured home, which also provide a convenient place to attach the wheel assemblies (see drawing on previous page). To hold up the outside walls (which in turn hold up the roof), Z-shaped steel plates called “outriggers” are welded to the chassis beams approximately every 6 feet. A small steel channel runs crosswise between the chassis beams, welded to their bottom flanges, at each outrigger. The whole assembly varies from 16 inches to 20 inches deep.

Supporting the chassis beams on a permanent foundation requires cross-beams spanning from the basement wall to the center support beam. These beams add cost by increasing the thickness of the floor system, which in turn increases the basement excavation depth and wall height. A complex grid of steel framing is visible in the basement.

A much cheaper solution is to strengthen the outriggers and steel channels to create a side-to-side supporting frame that will hold up the chassis beams without cross-beams. This system is used by most producers of manufactured homes to be set on permanent foundations because it requires only minor modifications to standard floor construction and doesn’t add much cost. Verify that a floor system of this type is available before a manufacturer is selected.

More expensive floor systems have been devised to allow basement stair openings to be placed anywhere. The best known of these is the Lindsay floor system, used by several manufacturers. The heavy Lindsay system is as deep or deeper than a typical system, and is patented. Only



Manufactured home section installed on foundation (courtesy, MHI).



Modular home is slid on steel beams onto foundation (courtesy, Venture, Inc.).

the wheel wells and the 2-inch-deep steel shackles interrupt an otherwise flat basement ceiling after the home has been set.

In making overall cost comparisons, thicker floor systems are typically cheaper to build, but can add other costs (deeper basement excavation and sidewalls, more siding between floors, longer stairs). Systems that limit stair locations cannot be used with many floor plans. A system that results in a flat basement ceiling is often preferred to one that exposes the steel beams.

INSTALLING THE HOME

Once the foundation is ready and the utilities are in place and ready for hook up, the manufactured or modular home can be delivered and set up by a professional setting crew. The most common ways to set manufactured home sections or home modules are: using roller systems and rolling the sections or modules over the foundation walls, or to lift and place them with a crane. The manufacturer will also send along installation manuals with each home.

WHAT TO LOOK FOR AND INSPECT UPON DELIVERY OF THE HOUSE

Once the manufactured or modular home arrives on site, it should be thoroughly inspected. Check for any indications of damage including nicks, dents, cracks, and loosened seams. Minor cosmetic damage is typical and not covered by warranty. Such imperfections are fairly common, shouldn't be alarming, and are usually easily fixed by the developer's contractor or the manufacturer's finishing crew. Check inside for drywall problems such as seam cracks or punctures that may require re-taping or re-mudding, appliance or fixture damage, or flaws in flooring or paint.

If serious damage is noted, prepare a list and fax or email it immediately to both the transport company and the housing manufacturer's office. This way the manufacturer cannot later assert that the damage was caused during the time the home was under the buyer's warranty. Send in a report on the condition of the delivery even if there is no damage. When selecting a manufacturer, ask how they typically respond to damages due to shipping; and if they have a set policy, ask for a written copy.

UTILITY CONNECTIONS AND SITE-BUILT ELEMENTS

If a “turnkey” service approach from a modular home manufacturer is selected, a finishing crew sent by the manufacturer will complete utility connections, do additional finish work, and construct any site-built elements. If a turnkey approach is not used, then it is the responsibility of the developer’s general contractor or subcontractors to schedule this work. For connections to water, electricity, gas, and sewer, the manufacturer may be able to recommend someone familiar with all jobs. Or contact local utilities to set up a time for this work to be completed.

After the home is set, manufacturers will usually provide builders with a list of finish work that requires completion. Ask for explicit instructions for the general contractor. These tasks can include installing exterior finishing materials on the site, building garages, decks, or porches. Most of these tasks can be performed by the same tradespeople who would do them on a conventional stick-built home.

WORKING WITH INSPECTORS

Both modular and manufactured homes have the majority of inspection work done in the plant, consistent with the laws and codes that govern. Local building inspectors should be made aware of this, as they do not always realize that they don’t have regulatory authority over factory-inspected elements. It would be advantageous to get copies of the manufacturer’s inspection policies so they realize the extent to which the home has been inspected, and what needs to be inspected on site.

Modular homes generally must meet the same code requirements as site-built homes. In most cases they are built according to a state-wide or locally amended code. Plans have to first be inspected and approved by the state or its agents. During production, licensed third-party inspectors and occasional state-sponsored inspectors will check the modules during all phases of construction and put an approval seal on each module before it leaves the plant. Installation, finish work, utility connections, and any site-built elements fall under the local code jurisdiction and local building department procedures. There can be misunderstandings, conflicts, and delays if the local inspector and developer disagree about who has code jurisdiction over what. It is best to discuss and resolve all issues with the local inspector long before the factory-built sections arrive on the site.



Finishing crew constructs site-built elements such as porches (courtesy, Unibilt Industries, Inc.).

Manufactured homes are treated in much the same way except that they meet, instead, the requirements set forth by the HUD Code, which is also preemptive and, as such, overrides any state or local codes. The completed units do not need to be inspected on site. HUD's state inspectors or third-party inspectors are present to inspect and authorize the placement of a HUD seal on the homes as they are produced. As with modular homes, foundation work, utility connections, and site-built elements fall under local code standards.

SUMMARY

As is clear from the discussion above, there are several steps between deciding to use a manufactured or modular home and the day the home is delivered. Once a manufacturer has been selected, most of the preparations involve finding a knowledgeable general contractor (if a turnkey approach is not used), preparing the site, making certain that the foundation is in place and ready for delivery day, verifying that any necessary permits for delivery have been secured, making sure that the setting crew does its required work, inspecting the home for serious damage due to transport and setting, and working with inspectors on site-built items that require their oversight. The checklist on the next page should be a useful tool for the reader.

RESOURCES

Publications

"Adelante Modular project Houses Seven Families." *Automated Builder*, April 1999, p. 25.

Bevier, Charles. "Maximum Modular Muscle." *Building Systems Magazine*, July/August 1999, p. 17.

Bevier, Charles. "Modular Momentum: How Four Builders in Four States are Out-Classing the Competition." *Building Systems Magazine*, July/August 2000. Highlights four builders who discover that they save money by building modular homes and who have discovered that design and product choices abound. Focuses on some of the hurdles they face along the way.

Bevier, Charles. "Signs of Momentum in Modular Housing." *Building Systems Magazine*, March/April 2001, p. 4.

Resources continue on page 46

FACTORY-BUILT HOME CHECKLIST

Finding a Manufacturer

- Modular manufacturer
- Manufactured home producer
- Price
- Design flexibility
- Design variety
- Experience with urban sites
- Reputation

Finding a Contractor for On-Site Work

- Experience with modular or manufactured housing
- Location

Selecting the House

- Compatible with neighborhood
- Accommodate lot shape
- Design modifications
- Accommodate site-built additions
- Apply for and obtain building permit

Determining the

Delivery Date

- Factory lead time
- Transportation time
- Escort car
- Delivery permits within city limits
- Site access
- Parking restrictions

Placing the Order

- Specifications review
- Price
- Deposit
- Balance due

Preparing the Site

- Demolition of existing structures
- Removal of surface debris
- Underground debris removal
- Initial grading

Building the Foundation

- Foundation design
- Material choice
- Layout and construction

- Utility stub installations
- Inspection by building inspector

Home Delivery

- Contractor availability
- Subcontractor availability
- Transport company requirements
- Setting and sealing
- Damage inspection
- File inspection report

Home Finishing

- Complete utility connections
- Finish exterior envelope
- Finish interior
- Construct steps, decks, porches, garage
- Finish grading
- Walkways and driveways
- Landscaping
- Final inspection and Certificate of Occupancy

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Websites

www.huduser.org. Go directly to the search category and search on “manufactured” or “modular” to pull up excellent reports and information pieces on these home types, most of which are downloadable.

www.mfghome.org. The official site of the Manufactured Housing Institute is a centralized source for anyone contemplating using manufactured homes. This site houses information on manufactured homes including downloadable publications, news updates, photo galleries, special reports. A special research section lists all completed, current, and future research projects being undertaken.

www.mhousing.com. A gateway to a wealth of information on manufactured housing. Has an entry for consumers and one for professionals.

A Factory Tour

To see how factory-built homes are constructed, following is a “tour” of a house being built. The tour considers both manufactured and modular home construction techniques.

Inside the factory, home sections are created on separate assembly lines.

- First a basic plan is chosen and reworked if necessary. A specific plan is then prepared using Computer Aided Design (CAD) software. Some stock plans are pre-approved by either HUD or approved agencies for manufactured homes (or, in the case of modular homes, a state agency). If there are plan variations they may need to be resubmitted to the appropriate agency for approval.

- All manufactured homes are required to be built with a permanent chassis that will attach to the running gear that will be used to transport the home. (1, 2) The flooring frame is attached to the chassis system and the subfloor laid atop that. Modular homes are made using floor framing systems similar to those used for site-built homes. The floor is finished.

- Interior walls are framed into the home.

- Exterior walls (3) are constructed in a jig to ensure straight, true walls.

- Sections are inspected several times during construction by manufacturer’s quality control inspectors and by a third-party government-approved inspector.

- The roof is built separately from the home sections (4, 5), often using factory-made truss systems. The roof is then lifted onto and secured to the wall systems.



1



2



3



4



5



6



7



8



9



10



11



12

Photos courtesy of MHI, Randall Homes, Unibilt Industries, and SWA.

- Once the main structures are in place, plumbing lines are installed (6) and pressure tested for leaks. Plumbing lines are then insulated for further protection and fixtures are installed. Electrical lines are added through previously drilled holes and voltage tested. Wires leading into the home are caulked to be weather-tight.
- Exterior walls are insulated (7), generally using code-required batt insulation, then sheathing is applied (8). For extra comfort and energy conservation, additional exterior insulation may be specified. Windows and exterior doors are installed and sealed up tightly (9). Siding is then factory applied (10). Exterior walls can also be finished to receive siding materials and trim on site.
- Roof decking is set atop the trusses, then covered, generally, with composite shingles.
- Inside, drywall is installed, taped, mudded, and sanded, and generally painted or papered (11). Cabinets are either purchased or built in the factory and installed, as are all appliances and kitchen and bath fixtures and fittings. Carpet is put in place—sometimes in the plant, sometimes in the field.
- The home receives a final inspection and a sticker is applied (a HUD label for a manufactured home; a state-approved seal for a modular home).
- The home is prepared for shipping, often wrapped in a moisture-resistant barrier to protect it from the elements during transport.
- The home is then shipped off (12) in sections to the waiting site.

4

Obtaining permits for manufactured and modular homes might be more time-consuming than securing permits for site-built homes, because local authorities may be unfamiliar with these building technologies. This will vary from city to city.

In some cities manufactured homes are, in fact, zoned out. This is changing but can present a big hurdle if this is the case. Some resistance by building and zoning officials might stem from erroneous preconceptions. Officials may perceive a manufactured home to be nothing more than a trailer and, as such, not up to standards. Modular homes are often grouped with manufactured homes, thus suffering from the same negative perception.

The information in this chapter is more applicable to nonprofit developers using manufactured homes that are zoned out in some urban areas.

WORKING WITH BUILDING OFFICIALS

Chances are city building officials will have little, if any, experience with manufactured and modular homes and this can translate into significant delays in moving a project through the approval processes.

Brad Lovin of the North Carolina chapter of the Manufactured Housing Institute was involved in a pilot house situated in Raleigh, where manufactured homes were previously zoned out. Lovin says to obtain the permit they had to go through public hearings, committee meetings, several committee votes, and even before the town historic commission (he explains that the home wasn't even in a historic area). The city required the developer to submit pictures of surrounding homes and show their plan along with the existing houses to be sure the home would visually fit into the neighborhood. The city council kept a close eye on progress, requiring photographic evidence as the project progressed.

Once the project got through the lengthy approval process, the house was erected and sold. Lovin says that the project was recently commended by the mayor. "We're glad we were able to get through the process so that now it will be feasible for others to build manufactured homes," says Lovin. He cautions nonprofit developers not to underestimate the time it might require to talk the project through with building officials.

HUD-CODE HOME ACCEPTANCE IN CONTINENTAL U.S.
State Laws Regulating Local Zoning of Manufactured Housing
1999



- Have no specific, mandatory state legislation addressing exclusion of manufactured housing
- Prohibit exclusion from specified districts, i. e. within agricultural areas or urban growth boundaries
- Exclusion not prohibited but some protection is available for manufactured housing
- Prohibit exclusion of some (or all) units, unless based on criteria applicable to other types of housing
- Prohibit exclusion from single-family districts if aesthetic, installation, age size and/or other standards are met.
- Prohibit total exclusion from the jurisdiction, but permit special criteria to be applied to manufactured housing

Adapted from *Home Builders Guide to Manufactured Housing*, U.S. Department of Housing and Urban Development, 2000.

TIPS ON THE APPROVAL PROCESS

Expect to invest some time up front when first proposing to build a modular or, more significantly, a manufactured home. Following are some practical measures that can be followed when confronted with opposition. Or better yet, to avoid opposition altogether:

- If zoning board hearings are necessary, work carefully on the presentation to the board. When describing the home, call it a “single-family” home as often as possible. Point out how either the infill house or urban development will breathe new life into a downtrodden area and help beautify a neighborhood. And mention how it will bring needed affordable housing to an area.
- Consider hiring a consultant. The first time around might be daunting so consulting with an expert can yield tips that can save both time and money and help the nonprofit developer handle



Developers should show examples of factory-built homes that fit with the neighborhood (courtesy, MHI).

building officials and zoning boards unfamiliar with and skeptical about factory-built housing.

- Ask the housing producer for assistance. Some manufacturers, such as manufactured home producer R-Anell Custom Homes, Inc., in Denver, North Carolina, offer builders and developers a pack of materials they may need to secure a permit. And it can be tailored to a specific project. For example it will cite zoning regulations and show how the roof pitch, square footage, and appearance meet single-family zoning requirements.
- Come with information. Pamela Beck Danner—an attorney who specializes in manufactured home permits—recommends bringing in supporting materials, particularly visual aids. If there are concerns about what the manufactured home will look like, bring examples of units that are representative of styles in the neighborhoods where the home will be sited. Manufacturer’s brochures are helpful, as are testimonial letters from satisfied customers. Be prepared to show how well a manufactured home can blend with the neighborhood to overcome any fears and negative preconceptions.
- Bring in official documentation. For a manufactured home, bring in the HUD Code, show the language stating that it is a pre-emptive code and that the home will be built to a federal standard and approved as such. Do the same with modular homes, bringing in documentation showing that homes are built to a state-approved code with which they are familiar.
- Get the neighbors involved (see next chapter). When Brad Lovin of the North Carolina chapter of MHI set out to build a manufactured home in an impoverished area of town in need of quality affordable housing, he mitigated some of the official resistance by getting a neighborhood group that supported the urban renewal aspect of the project to come to open meetings and rally for the cause.
- Enlist the local news media. Often they are looking for new and creative solutions to housing problems. They can help promote market acceptance by featuring positive stories on television, radio, and print media. Public officials are generally amenable to being associated with a publicized good cause.

WHAT IF PERMITS ARE WITHHELD OR IF MANUFACTURED HOMES ARE ZONED OUT?

If zoning clearly states that manufactured homes are not permitted and city officials withhold approval, apply for a variance. According to Pamela Danner, if all else fails, have the zoning

board or zoning officer issue an opinion in writing stating the reason why the permit was not issued. Take the case to the county attorney and see if he or she will help, which, says Danner, has been successful in several cases.

Discrimination against manufactured housing is no longer permissible in certain states and localities. These laws are slowly being phased out across the country. Thanks, in part, to years of pressure from the manufactured housing industry and its one of trade associations, the Manufactured Housing Institute, some states and localities are revising local codes to allow for manufactured homes provided they are placed on a permanent foundation and meet the same construction and, if required, aesthetic guidelines as site-built homes.

There was a flurry of activity to implement non-discrimination codes in the early 1980s after California became the first state to do so. Several areas, mainly in the Midwest and Pacific Northwest, quickly followed suit. Slowly over the past decade, more nondiscrimination statutes have been ushered in.

To help keep builders and developers up to date, the Manufactured Housing Industry has a valuable resource tool—a page on its website that tracks and regularly updates state laws and court decisions regarding the zoning, placement, and tax treatment of manufactured homes. This website can be accessed at http://216.167.103.115/DR_state_laws.html. Follow the prompts to see the latest state updates. If the city or state where the home is sited has addressed the discrimination issue, print out pertinent information and offer it to building officials and zoning boards.

WILL USING MANUFACTURED OR MODULAR HOMES AFFECT FINANCIAL SOURCES, WARRANTIES, AND INSURANCE?

Financial Sources

For community development corporations and other nonprofit groups using manufactured or modular housing, there should be little impact on financing programs. Nonprofit developers interviewed for this book indicated that there was no change in their financing arrangement because they were using factory-built homes and that they used the typical financing arrangements they have in place.

There is one vital caveat here: Without favorable appraisals, financing may be severely affected. Appraisers must be educated about modular and especially manufactured homes. Some nonprofit developers report resistance from appraisers when it comes to using modular or manufactured homes. According to Paulette Huber with Neighborhood Housing Services of Toledo, Ohio, nonprofit developers might need to work diligently with appraisers on a one-on-one basis to educate them about modular and manufactured homes. She suggests reassuring them about overall neighborhood development using these housing technologies, and showing drawings, photos, specifications, and the use of permanent foundations for manufactured homes.

Steve Hullibarger of the Home Team adds that the appraiser should use manufactured home comps that are recent and local. As there are huge variations in manufactured homes, and even wider variations in how they are sited, the information that the appraiser uses should be accurate to reflect the house to be built. Failing the use of manufactured home comps, the appraiser can use site-built homes as comps. As in all appraisals, which use market comparables as an indicator of value, adjustments are made for location, square footages, bedrooms, baths, obsolescence, etc. But value adjustments should not be made by the appraiser strictly on the distinction that the subject property is a manufactured home.

For the eventual homeowners, modular homes and manufactured homes converted to real property generally will not have problems in terms of obtaining typical mortgage financing. The terms should be comparable to site-built housing. FHA, VA, and FMHA loan programs are also available to purchasers of modular and manufactured homes. Recently, Fannie Mae and Freddie Mac have stepped up their support of manufactured homes, and Fannie Mae now offers a booklet touting the positive attributes of manufactured homes.

Warranties

Most modular and manufactured home producers offer homeowner warranties that cover the home's structure and all factory-installed components such as plumbing, heating, and electrical systems. There will be separate warranties for appliances, roofing, windows, doors, carpets, and more. A notebook with this information neatly compiled should be given to the homeowner.

Warranties can last from one to two years and some manufacturers offer up to five years of coverage against structural defects.

At the housing plant, manufacturers use detailed checklists to ensure that homes leave the factory undamaged and in pristine condition. If damage is found, the home will be repaired before it is transported.

The transport aspect is one to research seriously. Though the home will presumably leave the plant undamaged, a long highway trip can mean a home may arrive on site in less than perfect condition.

Check in advance with the manufacturer's transport company. Have the company assure that there is a good route from the plant to the building site. Be sure to get a comprehensive written warranty and understand the provisions therein. Remember to check the terms of the warranty, as certain problems that arise later might be warranted by the manufacturer and either will be repaired by the manufacturer or be reimbursable to the nonprofit developer if they contract for repairs.

Once on site, the home should be carefully inspected, as mentioned in Chapter 3. Note, in writing, any visible damage inside and out. Also list any differences in design or materials that weren't contracted for. Immediately fax or email a list of any damages or uncontracted materials to both the manufacturer and the transport company.

Insurance

General contractors and subcontractors who have not worked with manufactured or modular homes should be able to safely continue with the general builder liability insurance they use and should not have to reconsider any insurance issues.

In fact, says insurance expert Bill Stegman of the Foremost Insurance Company, going from using site-built to factory-built homes can actually result in less insurance exposure. Many risks associated with building are assumed by the production plant.

For the owner, homeowner insurance is the same for modular and site-built homes and should be the same for manufactured housing, says Stegman. Though rates for factory-built homes were once 20 percent higher than rates for site-built homes, they are now much more comparable. Foremost does not distinguish between factory- and site-built homes, says Stegman.

Insurance rates may vary slightly but are tightly regulated and there is not a lot of difference among companies. Insurance should be discussed with an insurance professional prior to starting the project.

SUMMARY

Being informed about the permitting process, and the differences in inspections and approvals of manufactured and modular homes, will aid the nonprofit developer when working with local zoning boards and building officials. Keeping these parties informed and sharing information to bely preconceptions about factory-built homes should smooth the way. Remember, these officials may have a learning curve regarding manufactured and modular homes if they are unfamiliar with these affordable housing alternatives. Another part of the equation regards warranties, insurance, and financing. Today, there are more options available in each of these realms for manufactured and modular housing.

RESOURCES

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Websites

http://216.167.103.115/DR_state_laws.html. Direct link to the Manufactured Housing Institute's compiled list of state statutes on nondiscrimination laws. The section is updated regularly so if a state or locality does not have nondiscrimination laws in place, check back.

www.mfghome.org. The official site of the Manufactured Housing Institute is a centralized source for anyone contemplating using manufactured homes. This site houses information on manufactured homes including downloadable publications, news updates, photo galleries, special reports. A special research section lists all completed, current, and future research projects being undertaken.

www.mhousing.com. A gateway to a wealth of information on manufactured housing. Has an entry for consumers and one for professionals.

5

BEING A GOOD NEIGHBOR

Any successful affordable housing development is a good neighbor. With manufactured and modular houses the developer will probably need to conduct outreach and education for those in the established neighborhood. Neighbors should be presented with important information about the factory-built housing that will be coming to their neighborhood. Based on the misinformed preconception that a “trailer home” will be built, many might have concerns that need to be addressed. It’s important to stress that factory-built homes can be an asset to the neighborhood, and fit in with its existing character.

Neighborhood opposition can be a stumbling block for some nonprofit developers wishing to use factory-built homes. Brad Lovin of the North Carolina chapter of MHI reports that a pilot manufactured home slated for a traditional neighborhood met with such strident opposition that a new site had to be chosen.

On the other hand, neighborhood approval can help guarantee a project’s success. When the MHI pilot home was knocked out of one area, the developer chose a new one where neighbors were actually enthused about the turn-around of a blighted piece of land and rallied behind the project. Lovin said they even helped persuade city officials to allow the home in despite a restrictive zoning ordinance.

Working with neighborhood groups is somewhat similar to dealing with zoning boards, as discussed in Chapter 4. Information, visuals, and reassurances that the new home is meant to help revitalize the neighborhood can be powerful tools.

REACHING OUT TO THE NEIGHBORS

Any nonprofit developer of affordable housing is already aware of neighborhood sensitivities. Factory-built housing can magnify neighborhood concerns. Several of the nonprofit developers interviewed for this book reported that they were unprepared for the neighborhood opposition that arose when it became public knowledge that factory-built housing was coming to their neighborhood.

The previous chapter discussed the need to explain factory-built housing to uninformed zoning and design-review boards. Many of the same strategies apply here.

Following are some additional suggestions culled from the many good ideas of nonprofit

developers who actually succeeded in getting their manufactured and modular housing projects built despite initial protest.

- Meet with the neighborhood groups and answer their questions. Bring pictures and hand outs so they can see what the homes will look like.
- Emphasize that the houses will be placed on permanent foundations, when this is the case, and won't be something the owner will hitch to a trailer and drive south for the winter.
- Bring in plans of houses that are more in line with their neighborhood architecture. Remember, they'll be picturing older style manufactured homes with lackluster boxy shapes, skirting, and the telltale flat roof. Explain the technology that allows manufactured housing producers to create homes with high roof pitches with two-story models and a variety of styles.
- If all else fails, take some of the more vocal opponents on a trip either to another site where a manufactured or modular home was successfully used or to a housing plant. A trip to a home site helped assuage the concerns of neighbors who opposed HomeSight's Noji Gardens project in downtown Seattle. HomeSight deputy director Tony To says looking at other quality homes not only helped the neighbors drop their opposition but actually got them excited about revitalizing the look and value of their community.

ACT IN A NEIGHBORLY MANNER

Once the neighborhood comes on board, remember to maintain a good relationship:

- Be considerate with parking and vehicle traffic caused by incoming construction and delivery trucks and workers.
- Keep noise to a minimum.
- Make sure the site is cleaned up at the end of each workday.
- Keep the closest neighbors abreast of what is happening; for example, give them a heads-up if a lot of trucks will be present for foundation pouring and give them advance notice of the day the house is arriving and being set.



Well-designed factory-built homes can be sympathetic with existing housing (courtesy, SWA).



Keep neighbors informed on when house will be delivered (courtesy, MHI).

SHOW HOW MODULAR AND MANUFACTURED HOMES CAN IMPROVE

APPRECIATION

One of the common concerns about having modular and especially manufactured homes in a neighborhood is that they will devalue surrounding properties. But experience suggests that manufactured and modular homes placed on permanent foundations and built with an attention to style and amenities appreciate in line with other area homes.

Several studies of property values and manufactured homes have been conducted by Auburn University-Montgomery, the University of Michigan, and the North Carolina Manufactured Housing Institute. In the Auburn study, manufactured homes generally appreciated in value and do not have a significant impact on the value of adjacent site-built homes.

Industry consultant Steve Hullibarger has been tracking manufactured home sales for two decades now and reports that appreciation rates have kept up with site-built neighboring homes. In general, Hullibarger concludes that manufactured homes resembling site-built homes are accepted by the market at the same prices as site-built homes. Manufactured homes that look like old-style mobile homes are pariahs in most markets.

Hullibarger has 1,261 manufactured homes in a database, all on individual urban lots, all converted to real property. The first units were sited 20 years ago and Hullibarger has tracked resale amounts for the 273 units that have changed ownership. A recent review of the data yields the following observations:

- Manufactured homes that look like plain manufactured homes lag behind the market in valuation.
- Many new manufactured homes were originally sold for less than comparable site-built homes. Lower hard costs permitted this to happen in many cases. Developers were able to move homes more quickly because lower costs meant lower sale prices, with equal margins.
- Some developers priced their new homes at the market and achieved absorption in normal time frames, with larger profit margins.
- Manufactured homes that are finished to be indistinguishable from site-built homes assume parity with their site-built brethren in the neighborhood. In the early 1990s they declined in value, along with neighboring homes. In the late-'80s and late-'90s, they rose in value like site-built homes.



Factory-built homes that look site-built retain their value (courtesy, SWA).

SUMMARY

Just as zoning boards and building officials unfamiliar with modular and manufactured homes may need to be better informed to overcome negative stereotypes about these housing technologies, so too must neighbors be assured that the factory-built housing proposed will fit into the architectural character of the neighborhood and not threaten property values. Meeting with neighborhood groups, sharing information, and inviting them to visit other factory-built housing developments will go a long way in winning them over to the idea. When a neighborhood group turns into a proponent of factory-built housing, it can be a key ingredient in the project's success.

RESOURCES

Publications

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Site-built porches lend scale to factory-built homes (courtesy, MHI).