



Manufactured Home Update

Oregon Department of Consumer & Business Services ■ Building Codes Division

April 1997

Installer Contracts

By Albert Endres

In the course of inspecting and mediating “request for assistance investigations,” customer assistance staff members at Building Codes Division are continually faced with preventable situations. Many of our investigations could be avoided entirely if there was better communication among the parties. In addition to better verbal communication, it is clear that contractors, installers, and dealers need written contracts that both describe the work to be done and list who is responsible to do it. Contracts need to be signed. Contracts would provide a clearer trail for BCD inspectors to pursue when asked to assign accountability. The following examples are typical of situations we face over and over.

Scenario 1:

Who shims the home?

A dealer sells a home and hires an installer to set the home. The homeowner wants masonry skirting and contracts separately with a skirting mason to install the blocks. The installer finds out there will be masonry skirting, so he does not install the required perimeter

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Temporary Storage of Units

By Mark Campion

Dealers and factories all hope that their product moves as quickly as possible to the site. But in those situations where there are stock units or where ordered units are unavoidably delayed in delivery to the site, temporary piercing of homes in storage is now required in the Oregon Manufactured Dwelling Standard effective April 1, 1997. This applies to units stored more than 30 days. The requirements are that the home be adequately supported under each main frame beam by a minimum of four supports located within 2-ft. from each end and within 8-ft. of the front and rear axle. The home must also be sealed to resist exposure of the interior of the manufactured home to the elements.

Additional recommendations, not requirements, include supporting the perimeter of the homes at approximately 16-ft. centers at the marriage lines at the ends of the home and at each column support location. The reasons for these additional recommendations is that the weight of the homes may cause “sidewall sag,” with floors sloping toward the sidewalls. A similar sagging may occur at the centerline of the home. This distortion may develop memory and remain warped.

Fuel Burning Appliances in Manufactured Dwellings

By Patrick Lewis

The Technical Advisory Group (TAG) has been asked why code requirements for fuel burning equipment are different for manufactured dwellings and site-built housing.

The requirements for fuel burning equipment in new manufactured dwellings are derived from federal Manufactured Housing Construction and Safety Standards (24 CFR 3280). Federal standards require all fuel burning equipment (except cooking appliances) inside a manufactured dwelling to be sealed combustion (direct vent) units listed for manufactured home use. This means all the combustion air for the operation of the appliance comes directly from outside the manufactured dwelling. There are two reasons for this requirement: 1. Manufactured dwellings are required to be tightly constructed and may not provide adequate replacement air to assure a healthy environment if fuel is being burned within

the interior atmosphere of the home. 2. Manufactured dwellings may be as small as 320 square feet, which could make it possible for a combustion appliance to deplete the oxygen supply within a home if the appliance took combustion air from the interior space. Though most manufactured dwellings are much larger than the minimum allowed, codes are written to protect occupants should the worst-case scenario occur.

For after-market installations of fuel burning equipment in manufactured dwellings, Oregon has adopted similar safety requirements (sealed combustion, direct vent) for the same reasons mentioned above. However, after-market appliances are not required to be listed for manufactured home use. For more information on this subject, see chapters 6 and 11 of the 1997 Oregon Manufactured Dwelling Standard, or call Patrick Lewis at 503-373-1266.

Close-Up Plastic

By Brian Lamb

It's winter in Oregon. The weather is dry, the sun is shining, the temperature is 86 degrees — NOT! The reality is storms, wind, rain, and a flood every other month. Oregon weather is hard on manufactured homes that have left the protected conditions of a manufacturing plant and are exposed to the weather during an extended stay on a holding lot. Often, no one checks the home while it's on the lot to make sure it's secure.

Problems occur because the close-up plastic covers are cut open for various reasons. Sometimes plastic is damaged in transit. Sometimes plastic is torn loose by the wind. The point is, if it isn't repaired, water and wind will take their toll.

When the plastic is damaged, a home can be badly damaged by the weather. Rain can ruin floor decking, floor insulation, floor joists, and walls. Moisture left undried can encourage the growth of mold and mildew in floors and walls and make a new home smell like a 30-year-old trailer that was used for a chicken coop.

When the home arrives at its site, imagine how the customers will feel: their brand-new home, ruined —

before it's even set! The cost of this home now jumps about \$8,000 to cover repairs, not to mention legal costs if the homeowners choose to sue.

It happens all too often. Manufacturers and dealers should take every step possible to assure that homes are not weather or otherwise damaged enroute to the site. Transportation companies need to assure that homes on their holding lots are protected and delivered in good, dry condition. If water damage has occurred, dealers and installers should be notified so that they can take steps during installation to dry the home out. The worst thing involved parties can do is to ignore or cover up water damage.

Checking homes during transit storage and making sure the close-up plastic is in good condition are the simplest ways to avoid weather damage to the home. It's not always clear who is responsible for homes on holding lots. Logically, the transport company has a responsibility to repair or at least report damage to the dealer so that major problems can be avoided. If you have any suggestions for dealing with this problem, please contact Brian Lamb, Building Codes Division, 503-378-3731.

Why Are Manufactured Dwellings Built to a Different Code?

By Patrick Lewis

The Technical Advisory Group (TAG) is often asked why manufactured dwellings are not built to the same code as site-built housing. There are some very good reasons for this disparity.

If you look at the two codes side by side, it would be difficult to say one is better or worse than the other. Both codes provide a similar level of safety for the occupants, but each one achieves this a different way. While site-built homes are rigidly constructed and anchored to the ground, manufactured dwellings are built to be mobile, light-weight and highly flexible. Manufactured dwellings are built to travel down a highway at 55-plus miles per hour, to survive tremendous road shock and high wind speeds. Site-built housing is constructed to stay in one place and encounter the conditions of a single site.

Site-built homes are usually built with their main support being a perimeter foundation wall and the secondary support being foundation footings under an interior bearing wall. A manufactured dwelling's main support is the steel chassis beneath the home and the secondary supports at the centerline and perimeter. The main difference between the structural requirements of a manufactured dwelling and a site-built house is in the engineering. Site-built homes may be constructed to prescriptive standards in the site-built codes, but there is no prescriptive path in the federal Manufactured Home Construction and Safety Standards. Every manufactured dwelling is a complete

engineered structure. Engineered components, such as trusses, are required to be continuously tested up to 2.5 times their design loads.

There are many other differences between the codes. Electrical, mechanical, and fire-life-safety requirements are far more restrictive for manufactured dwellings than for site-built homes. Plumbing requirements for manufactured homes are less restrictive. The Manufactured Home Construction and Safety Standard is different from site-built codes because the needs of the manufactured housing industry are different. Because of these needs, far more testing and engineering are required for manufactured dwellings than for site-built housing. Manufacturers can easily spend \$40,000 or more on the engineering, testing, and approval of a single design before the first home is ever produced.

A contractor for site-built homes would have as much difficulty building to the federal Manufactured Home Construction and Safety Standards as a manufacturer would building to the site-built codes. The most important issue, though, is not that the codes are different, but that both codes meet the intent of providing safe and durable housing for the people of Oregon.

For a general overview of how the two codes compare, contact the Oregon Manufactured Housing Association at 503-364-2470.

Through-the-Roof Penetrations

By Mark Campion

Sealing roof penetrations is usually the responsibility of the home manufacturer. But the need to replace damaged vents on-site and the prevalence of alternate-construction homes with field-assembled roofs requires others along the line to pay attention to this potential point of water entry.

All roof penetrations should be fully sealed against the elements. As an example, the underside of flanges for plastic roof vents should have at least one continuous bead of (non-asphalt-based) caulk placed around the hole. Without the bead of caulk, low roof pitches allow wind-driven rain to be pushed up under the leading edge of the vent flange and into the roof cavity.

For metal soil stack and furnace vent flanges, it is okay to use asphalt-based sealants under the flange, as you would to tab down the shingle over the flange. For plastic vents, remember to use non-asphalt-based caulking to tab down shingles over the flange.

Shipping staples should be removed and holes sealed. Asphalt-based sealant can be daubed on or placed below the staple holes. If factory workers installing shipping plastic can keep staples to a minimum, workers in the field can do a better job of sealing the roof. About 38 percent of homes monitored for the setup survey have unsealed holes or exposed fasteners on the roof.

Decks, Stairs, Landings, and Electrical Service Equipment on Manufactured Dwellings

By Brian Lamb

When electrical service equipment is installed on the outside of manufactured dwellings, several factors must be considered. Most of the time, the home manufacturer will install the equipment in a standard location, unless the dealership requests otherwise. The National Electric Code (NEC) has requirements about the height of the service equipment and about working space in front of and beside the equipment.

When manufacturers install service equipment, it is common for them to locate the equipment near doors. The home is then shipped to the site and set. Frequently, steps and landings are built around the home. Often the person building the steps and landings has no knowledge of the NEC clearance and height requirements for electrical service equipment.

Frequently, when steps and landings are completed, the required working space has been compromised by the width of steps, landings, or handrails. Most steps are not wide enough to allow a person to inspect or repair electrical service equipment and maintain a 30-inch space. Steps too near a service panel may mean the panel; is out of compliance with NEC height requirements.

Section 110-16(a) of the NEC requires a minimum three-foot space directly in front of the meter socket enclosure and a minimum 30-inch space directly in front of the equipment. The required space shall be clear and extend to the bottom of the floor or platform, i.e. the porch or steps.

In addition, section 550-23(e) of the NEC requires that a disconnecting means — a panel disconnection switch — be installed so that the bottom of the disconnect is no more than two feet above the working platform. The handle for the disconnect shall be no more than six and a half feet above the platform. When steps or platforms are built below a meter or disconnect, the two-foot minimum clearance must be maintained.

If the home arrives with the meter socket in the wrong location, or in a location that will be wrong once the decks or steps are installed, section 403(5) of the Oregon Manufactured Dwelling Standards provides an exception that allows service equipment to be moved or altered in the field. If electrical service equipment needs to be moved in the field, an electrical permit must be obtained, the work must be performed by a

licensed Oregon electrician, and the work must be inspected and approved by the authority having jurisdiction.

When electrical service equipment is to be installed on a home in the factory, the dealership should contact the factory and provide information about the location of future decks and steps. This will allow the manufacturer to place the equipment in a location that will be in compliance with NEC once the decks, landings, or stairs are completed.

In short, we need to be doing a better job of letting accessory contractors know about NEC requirements for working space and clearance near electrical service equipment. And we need to be doing a better job of letting manufacturers know about future decks, steps and landings if service equipment is to be installed in the factory. It's a lot easier to communicate in advance than to change things once they are incorrectly installed.

Daniel K. Crane

Dec. 16, 1952- Feb. 19, 1997

On February 19, Dan Crane, 44, died at his home of a heart attack. For the past three years, Dan worked for OSU Extension Energy Program. He took a leading role as trainer and inspector in a statewide program sponsored by Oregon Building Codes Division and Oregon Manufactured Housing Association to upgrade manufactured home installations in Oregon.

Prior to his time with the OSU Extension Energy Program he worked for more than 20 years in the manufactured housing industry. He installed manufactured homes and modular office buildings as an independent contractor and served as a service manager for Fleetwood of Oregon and a supervisor/foreman at Redman Homes.

Dan's funeral was Feb. 25. He was buried at Restlawn Memory Gardens in Salem. He is survived by his companion, Cary Long; parents, Keith and Evelyn Crane of Salem; and sister, Christie Peron of Bend.

On-the-Job Training Opportunities for 1996 and 1997 Oregon Manufactured Dwelling Standards

By Al Rust

For the past year and a half, OSU Extension has worked with the manufactured home industry, OMHA, Building Codes Division, and local jurisdictions surveying manufactured home sets in the state.

Doing a survey, making notes, and requiring repairs when new standards are overlooked is one way of teaching people the new Oregon Manufactured Dwelling Standard. You might call it “re-active education.” Another way is being on site answering questions and covering details as homes are set. Pointing out new standards and frequently-overlooked details is “pro-active education.” On-the-job training — or OJT — is as good as it gets.

As the survey continues, I want to be sure that people know about our on-the-job training services. A year and a half into the survey, we know the things that are getting missed. I want us to do a better job of helping people correct these problems.

The training is free to installers, dealerships, local jurisdictions, and manufacturers. If you want to arrange a training, call us. Tell us when and where; we’ll show up and go through parts of the standard that may be giving you trouble. We can work in classrooms, on site during installations, or on site during inspections or quality-control visits. If it takes more than one day

or more than one visit, we can arrange it.

The 1997 Oregon Manufactured Dwelling Standard will be effective in April. If you call us, we can show you the new requirements on the job. The “pro-active” approach should minimize call-backs and be a good supplement to the annual certification classes.

We appreciate your help with the installation survey. If our on-the-job training services are of interest, please call us. We’ll do our best to accommodate your schedule.

We will continue to survey homes and write “Repairs Required” when items do not comply with the code. Repairs are important, and installers are accountable for installation errors.

By offering training, we hope to help you achieve a higher level of quality home installations. I hope this new direction demonstrates that the Oregon Manufactured Dwelling Standards have real meaning and purpose and that we will do whatever we can to achieve the highest standards of installation, with product quality and livability for the homeowner.

Al Rust, installation survey project manager, Building Codes Division, Salem phone: 503-378-8053, fax: 503-378-4101

Trimboards, Shims, and Perimeter Blocks

By A. B. Boe (with Mike Duncan and Albert Endres)

Who is responsible for installing the mudsill, or caps, and shims for a block perimeter that supports a manufactured home? Is it the manufactured dwelling installer’s (MDI) responsibility? Or should the licensed skirting installer (LSI) do it?

In a separate article in this issue of Manufactured Home Update, Albert Endres of the Oregon Building Codes Division points out that unless an LSI block mason agrees in a written contract to provide the mudsill and shims, current rules [OAR 918-515-0150(2) (e)] assign the responsibility for capping and shimming the home to the MDI. Endres emphasizes that it depends on the presence or absence of a signed written agreement.

In an interview Feb. 9, Mike Duncan, an LSI block mason presented his perspective. Duncan indicated that although he feels well-qualified to do block work, he does not feel qualified by experience or training to install or properly support a manufactured home. Duncan said, “The home is not my product, and I am not licensed to install homes.”

Duncan’s concerns are training and liability. “I’m not trained to shim homes,” he said. “If a home needs leveling, I don’t know how to level it. If the home’s walls are sagging, I don’t know how to fix them. I don’t want to be responsible if the doors or windows bind, and I don’t want to be responsible for fixing cracks in the sheetrock. And if I put the shims in and

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something goes wrong, I'm afraid the dealers and installers are going to say it's my fault, because I did the shims. So, I don't do shims."

Duncan also mentioned the difficulty of installing blocks when perimeter piers and support beams are used to support the sidewalls. To get his blocks in, he frequently has to cut out the back of a block or notch the block wall completely around the support beams. And sometimes, if the perimeter support beams poke out too far, they prevent the trim board from laying flat against the home and block enclosure, leading to leakage and potential water damage to the floor system. Duncan says he doesn't like to touch the perimeter piers because he does not want to do anything to affect the way the home is supported.

Even though perimeter piers and support beams are difficult for block masons when they are used, the home is supported while the skirting is installed. And, structurally, if perimeter piers are properly installed, shimming the block walls is not necessary, because the perimeter piers support the home. In those instances, the blocks function only as an enclosure system, not as part of the support system.

A worse situation occurs when installers leave the perimeters and centerline end piers out because the contract indicates that someone else will install a perimeter block foundation. In other words, when the installer leaves, the home is not properly supported. If the block perimeter wall goes in the next day, that amount of time unsupported probably won't hurt the home. If it takes several weeks or months for the blocks to go in, the home could be damaged. Without proper support, the floors can sag, the windows and doors can bind, the sheetrock can crack, and water can get into the floor. If there is confusion over who should provide the caps and shims, a real argument could develop. The loser is the homeowner, who sees the home damaged while people argue about who should do what.

In some cases, the homeowner has taken responsibility for the shims, and Duncan said that this includes homeowners who don't know any more about shimming homes than he does. He said that many homeowners don't complete the shims because no one has educated them about why they're needed.

Whoever installs the shims should do it right. See the 1997 OMDs Sections 304(d), (f), and (n) and Table 304.

If structurally-rated block or concrete stemwalls are used to complete the home's support system, caps (or a

mudsill) and shims must be installed at a minimum eight feet on center. If non-rated blocks, or wood pony walls are used, shims must be placed at 16 inches on center. In all cases, caps and shims should be placed at each endwall below the centerline to transfer loads from endwall ridgebeam columns to the foundation. If non-rated blocks are used, the blocks below the endwall column support must be filled with concrete.

In addition to shims on eight-foot or 16-inch centers, shims must be installed to support both sides of each door and any other openings in the wall, such as windows and patio sliders, that are over four feet wide. Shims should not impinge or bind on plumbing or electrical components near the home perimeter. To get adequate load transfer, shims should not bear directly over foundation vent openings.

Once the caps and shims are in, it's time for the bottom trim. According to Endres, unless there is a contractual agreement to the contrary, current rules [OAR 918-515-0490(1)] hold the block mason responsible for installing the bottom trim. It depends, again, on the written contract. ■

Portland COSAA Meeting in May

The Council of State Administrative Agencies (COSAA) will hold its semi-annual meeting in Portland May 5-8. Oregon Building Codes Division will host the meeting at the Lloyd Center Red Lion.

The agenda will include technical presentations, committee meetings, standards and regulation change proposals, regional meetings and a variety of breakout sessions.

Attendees will include representatives of the other 35 state administrative agencies and HUD Housing and Building Technology, manufacturers, dealers, owner's associations, suppliers and other interested parties.

COSAA is a group of State Administrative Agencies that works with HUD to provide a state presence and viewpoint concerning the manufactured housing industry. COSAA functions independently of other organizations.

More information concerning the COSAA meeting can be obtained by calling Howard Weisman of HUD Housing and Building Technology at 703-481-2003.

Installer Comments About Oregon's Manufactured Dwelling Program

By Al Rust, Installation monitoring program coordinator

Mike Humphrey (MDI 713) gave these comments about Oregon's manufactured dwelling program in an interview Jan. 28. Humphrey has installed homes for many years in Washington, and is now licensed in Oregon.

Q: Mike, Washington doesn't have a licensing program. What do you think about Oregon's licensing program?

A: I don't have any problems with it. I think it tends to keep all installers on a level playing field.

Q: What about on-site inspections?

A: It's good to monitor what's going on. Homeowners will get what they paid for, a home they can be proud of.

I thank Mr. Humphrey for his comments and plan to call on other installers in the future.

Q: What do you think of the on-site training we offer?

A: You can get specific questions answered. And people have different ways of doing things, so on-site we have a chance for two-way communication.

Q: What changes in the program would you like to see?

A: I would like to see all the inspections done the same way. Different inspectors in different parts of the state have their own opinions about how the code reads.

Customer Satisfaction: A Sign of the Times

By Tom Nicolai

Last issue, I briefly explained what one manufacturer is doing to ensure customer satisfaction and minimal problems after a home sale. Here's what another manufacturer is doing.

Once a home is set and ready for the customer to move in, the manufacturer sends out a crew of service technicians to walk through the home with the customer and dealer. During the walk-through, the electrical system (recepts, switches, appliances) and the plumbing system (faucets, sinks, tubs, showers) are tested. The walk-through allows the customer to point out areas of concern room by room. When the walk-through is completed, the technicians fix all items to the customer's satisfaction prior to the occupants moving in.

The manufacturer indicates that this approach instills in the customer a sense of security and satisfaction with the new home and also helps reduce the number of service calls in the future.

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piers, because he assumes that the skirting mason will cap and shim the perimeter. The skirting mason installs the blocks but does not install caps and shims. The home develops problems, and BCD is called in to assign responsibility. Who is responsible? If there is no written contract spelling out who is responsible among the installer, dealer, skirting mason and owner, Oregon Administrative Rules [918-515-0150(2) (e)] require us to hold the installer accountable for the missing caps and shims.

Who installs the bottom band of trim?

Continuing the scenario above, let's say the bottom band of trim was not addressed in any contract. When the skirting mason completes the blocks, there is a 3-inch gap between the top of the blocks and the bottom of the home. The skirting mason leaves the gap so the installer can place the caps and shims. The skirting mason assumes that, after the home is shimmed, the installer will install the trim. It doesn't happen. An argument develops about who is responsible. BCD is called to investigate. Without a contract, current Administrative Rules [918-515-0490(1)] require us to hold the skirting mason responsible for installing the

trim that completes the skirting. Dealers should communicate this information to homeowners, so that homeowners can include it in their contract with a skirting mason.

Scenario 2:

Who is responsible for diverting water run-off from an adjacent lot?

An installer is hired to set a home in a park. The lot adjacent to the park stand is uphill from the park. There does not appear to be any method in place to keep surface water from running downhill and onto the park stand where the home is to be set. Without a contract that spells out who is responsible for water diversion and final grading, Administrative Rules [918-515-0150(2) (a)] require us to hold the installer responsible if problems develop with the home.

In some cases, there are special circumstances that would change the way the BCD assigns responsibility. If you have a written contract that shows someone else is responsible for the work, you could save yourself considerable grief and expense. The point is, that without a contract, the first person liable for corrections is the one indicated in the examples above. ■



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