

Manufactured Home Update

Oregon Department of Consumer & Business Services Building Codes Division

November 1996

From the editor

What's new at OSU?

While we plan to continue to be active in helping the Building Codes Division monitor manufactured home installations, OSU will be doing fewer inspections and more technical assistance visits in the coming year. We've been conducting survey inspections for roughly three years now and we've got a pretty good idea of what goes wrong with installations.

More education

Technical assistance visits are intended to improve installation quality by training and education on-site, rather than through inspections. OSU has two full-time and three part-time field people who are part of the project and are available to meet on-site with installers, dealers, building inspectors, and others. They can answer questions about installation or evaluate potential weaknesses in installation procedures and inspection details.

So far we've been able to help building inspectors, installers, and dealers with problem areas such as the three-step inspection process, perimeter block skirting, heat ducts, crawl space ventilation and requirements for sites with fill. If you or your crews could use some on-site help, you can arrange it by calling Dan Crane or Leon Creswell at (503) 378-6056, or Ted Haskell (503) 731-4104.

If you have contributions or ideas for the *Manufactured Home Update*, contact me:

Ted Haskell

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Tips from the Installation Monitoring Program

Mark Campion, Building Codes Division

The On-Site Installation Monitoring program relies on the honor system to be effective. When a monitoring inspection finds noncompliances that require correction, we send a copy of the list of corrections to the dealer. The dealer is expected to follow up with the installer and coordinate repairs. The Manufactured Dwellings section of the Building Codes Division considers the dealer's written response as proof that the corrections were made. However, random re-inspections are done to insure compliance and at the same time inspect skirting installation and final site grading.

Concrete runners and slabs

Section 304(c) of the Oregon Manufactured Dwelling Standard (OMDS) specifically states that poured-in-place and precast footings will have a smooth surface.

Tips continued on Page 3

News from the installation survey

As of early August, OSU inspectors have examined over 220 homes installed to the 1996 Oregon Manufactured Dwelling Standard (OMDS). For the most part, the most frequently found problems haven't changed

since the last *Manufactured Home Update*, (see "How are we doing with the new Installation Standard?" August, 1996), but there are a couple of things we've seen that you ought to know about.

Site grading

This is a new addition to our "most common problems list." We typically do our inspections before site grading is complete, so it's taken us a while to see enough sites to find out whether this is a problem or not. So far, one-fifth of the homes we've seen where grading was complete didn't have adequate slope to drain water away from the stand. Section 302(c) of the OMDS details grade requirements. It is crucial to provide enough slope so that water doesn't stand under or next to the manufactured dwelling or adjacent structures.

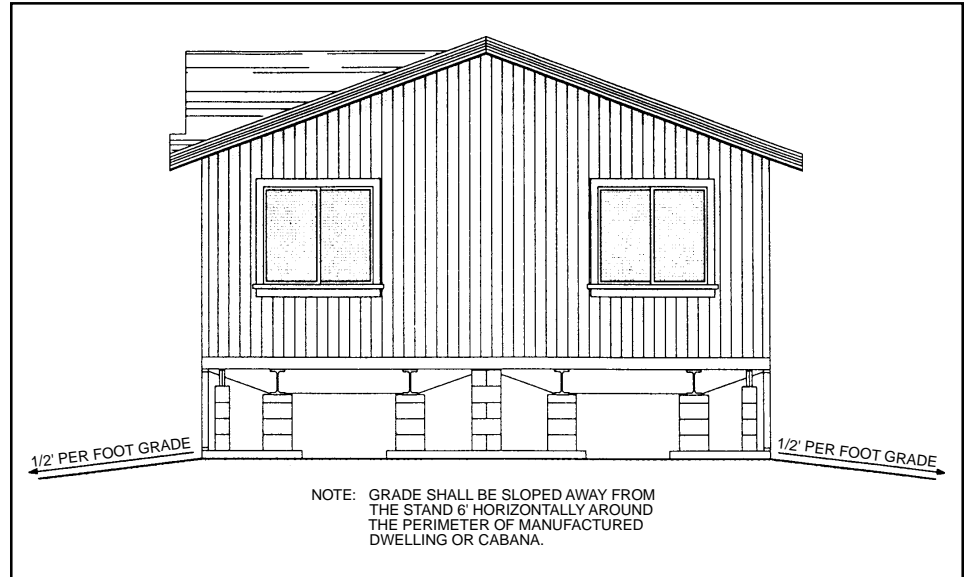


Figure 302.1 "Grading and Drainage"

Crawl space vapor retarder

This is the 6 mil black polyethylene sheeting placed under the home to prevent soil moisture from causing problems. Nearly 15 percent of the homes in this survey had problems with this. The most common problem is that the sheeting hasn't been weighted down on the overlaps so large gaps have opened up. This allows soil moisture to evaporate into the crawl space where it can condense and cause problems, or find its way into the structure. We've also found unrepaired damage that leaves large sections of bare earth.

Some good news?

We've been finding fewer cases of inadequate crawl space ventilation. From a high of more than 80 percent a little over a year ago, we're down to near 50 percent at last count. We haven't inspected crawl space ventilation in a lot of homes, so this may be just luck of the draw, but it's an encouraging trend. While 50 percent is still a large number, we now have reason to hope that soon this will be an infrequent problem. ■

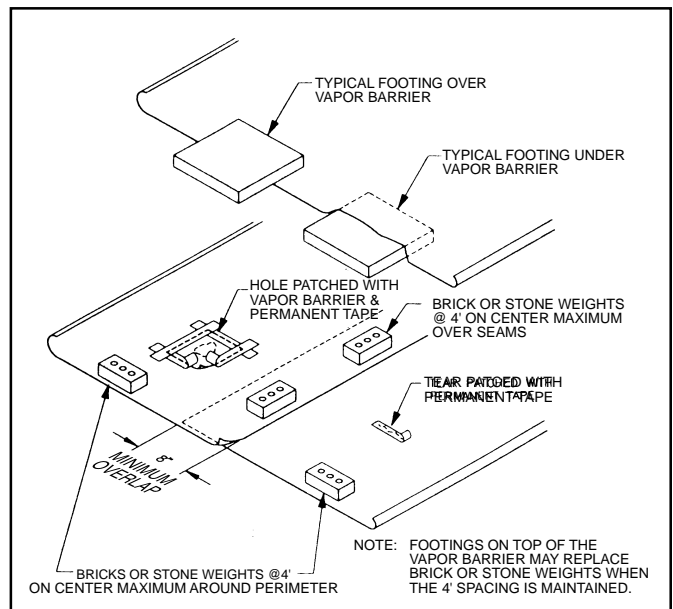


Figure 302.2 "Vapor Retarder Installation"

Alteration permit process explained

The Building Codes Division (BCD) has found alterations are being made by dealerships before the sale of new homes without alteration permits. Here are some answers to typical questions about alterations in new manufactured homes:

What is an alteration?

Any change, repair, conversion, replacement, modification, or removal of any equipment or installation that may affect the operation, construction, or occupancy of the manufactured home. Appendix A “Definitions” of the Oregon Manufactured Dwelling Standard (OMDS) also explains which minor repairs and maintenance aren’t considered alterations.

What standards and codes apply to alterations?

Alterations performed before, or as part of, the initial sale of a home must conform to the federal Manufactured Home Construction and Safety Standards, the National Electrical Code, and the DAPIA-approved design package. If the alterations are made after the initial sale to the first consumer, they must conform to Chapter 10 of OMDS.

Who inspects alterations?

Alterations performed before, or as part of, the initial sale must be inspected by BCD. Alteration performed after this sale must be inspected by the authority having jurisdiction where the home is installed.

What standards are there for appliances and wood burning equipment?

Appliances, wood stoves, and pellet stoves must be listed for use in manufactured dwellings or meet requirements of Oregon Administrative Rules 918 Division 520.

What about permits? All alterations require permits. For any alteration done on the dealer’s lot or as part of the initial sale, a permit must be obtained through BCD, phone (503) 378-5975. An exception — local jurisdiction issues permits for solid fuel-burning fireplaces, wood stoves, heat pumps, and air conditioners. When the alteration is carried out after the initial sale, the permit is issued by the local jurisdiction.

If you have questions, contact BCD’s Albert Endres at (503) 378-5975 or Brian Lamb at (503) 378-3731. ■

Tips *continued from Page 1*

Although the OMDS doesn’t address the finer points of flat work, local jurisdictions and dealers may want to remind concrete contractors (and those homeowners pouring their own) that the surface of all poured-in-place footings should be floated flat and smooth.

If the surface of the runner or slab isn’t smooth, concrete cell blocks are prone to shattering as they rest on ridges or other imperfections when the weight of the home is brought to bear on the pier. This slows the installer down, since he must replace shattered cell blocks. Also, steel piers are less stable if they aren’t placed on a smooth surface.

Flues for gas appliances and wood burning equipment

Since the end of the Manufacturers’ Acquisition Program (MAP), we’ve seen an increase in the number of manufactured homes with gas appliances installed. In some cases, the flue pipe installation isn’t completed in the factory due to height limitations for transporting the home. The final assembly and installation of these

appliances is completed during installation and installers must follow the appliance manufacturers’ installation instructions.

Fireplaces and wood stoves must vent into a listed factory-built chimney that must be equipped with a spark arrestor. When the chimney is completed, it must extend at least 3 feet above the section of roof it passes through and 2 feet above any part of the structure within 10 feet of the chimney.

In addition to the portions of the flue or chimney that must be assembled on-site, the installer should check each flue installed at the factory to assure that transportation has not affected the flue. ■

Attention: footing size table correction

In our last issue of *Manufactured Home Update*, we printed a table called “Pier and Footing Size and Spacing Schedule.” This is Table 304 from the 1996 Oregon Manufactured Dwelling Standard. Unfortunately, there was a typo in the table that could lead to incorrect footing sizes. The Footing

Size column shows the correct footing sizes in square inches, but the last three entries show the wrong number of 16 x 16 pads. The corrected table is printed below. If you are using a copy of the table from the last issue of *Manufactured Home Update*, dispose of it and replace it with this one. ■

Table 304 Pier and footing size and spacing schedule		
Location of pier	Pier spacing	Footing size
Main frame pier supports	5 feet, 4 inches (1.62 meters) on center	256 sq. inches (1,652 sq. cm.) or one 16 inch x 16 inch pad (41 cm. x 41 cm.)
Main frame pier supports	6 feet, 8 inches (2.03 meters) on center	On any approved continuous footing or concrete slab.
Perimeter pier supports	8 feet (2.44 meters) on center, and at each door and each window or opening over 4 feet wide (1.22 meters)	256 sq. inches (1,652 sq. cm.) or one 16 inch x 16 inch pad (41 cm. x 41 cm.)
Center line wall pier supports	4 feet (1.22 meters) on center	256 sq. inches (1,652 sq. cm.) or one 16 inch x 16 inch pad (41 cm. x 41 cm.)
Center line column supports for ridge beam spans up to 14 feet (3.5 meters)	At each end of ridge beam span	512 sq. inches (3,303 sq. cm.) or two 16 inch x 16 inch pads (41 cm. x 82 cm.)
Center line column supports for ridge beam spans up to 20 feet (6.1 meters)	At each end of ridge beam span	768 sq. inches (4,956 sq. cm.) or three 16 inch x 16 inch pads (41 cm. x 123 cm.)
Center line column supports for ridge beam spans up to 26 feet (7.93 meters)	At each end of ridge beam span	1,024 sq. inches (6,607 sq. cm.) or four 16 inch x 16 inch pads (82 cm. x 82 cm.)
Center line column supports for ridge beam spans up to 38 feet (11.59 meters)	At each end of ridge beam span	1,536 sq. inches (9,912 sq. cm.) or six 16 inch x 16 inch pads (82 cm. x 123 cm.)

Notes:

- (1) This table is designed to support a manufactured dwelling with a roof live load of 30 PSF (146.4 kgs per sq. m) and a dead load of 10 PSF (48.8 kgs per sq. m).
- (2) This table shall be used in conjunction with Section 304 of this standard using the materials described in Section 303 of this standard.
- (3) This table is not applicable for the installation of approved earthquake-resistant bracing systems or listed or approved engineered full foundation systems.
- (4) See manufacturer's installation instructions for centerline column support location if not marked on the manufactured dwelling center line or otherwise apparent to the installer.
- (5) Where a single column support post supports a ridge beam in the middle of a combined span (two adjacent spans) and there is no adjacent center line wall, the footing size under that column support post shall be equivalent to the sum of the footings required for each span. (i.e. If one single span requires two 16 inch x 16 inch pads and the adjacent span requires four 16 inch x 16 inch pads, the column support post in the middle of the two adjacent spans would require six 16 inch x 16 inch pads.)
- (6) Manufactured dwellings constructed for snow loads in excess of 30 PSF (146.4 per sq. m) may, at the owner's option, be installed to the manufacturer's installation instructions.
- (7) The local authority having jurisdiction may not require manufactured dwellings to be built or installed to heavier snow load requirements than those prescribed in 24 CFR 3280.305(c)(3) and this standard.

Are footing pads required on top of slabs? _____

At the Building Codes Division, we're often asked whether it's necessary to install additional footing pads under the centerline pier supports to distribute concentrated loads when the manufactured dwelling is placed over a full-size concrete slab or over continuous concrete footings.

The answer is no. Section 303(a) of the Oregon Manufactured Dwelling Standard (OMDS) lists a number of approved footings, any of which are suitable for the support of the manufactured dwelling. If you're using a concrete slab or continuous footing that meets the requirements of Section 303(a), it has already been designed to distribute the loads of the column supports with the piers placed directly on the concrete. If you're using individual footings, the only thing you need to do is increase the size of the footings when they are located under centerline column supports as determined by Table 304.

If you have questions, call Allen Aschim at (503) 373-1256 or Patrick Lewis at (503) 373-1266 with the Technical Advisory Group. ■

Use the right contractor for the job _____

Inspectors often find evidence of repairs during consumer assistance inspections. For the most part, these repairs have been made efficiently, they usually follow manufacturers' recommended repair methods, and are done according to the approved design. Now and then inspectors find repairs that don't meet these criteria. Homeowners sometimes describe a situation where the contractor or individual sent out to do specific repairs will try to repair something else "since I'm already out here." In some cases, the contractor was sent because their expertise is in one area, but the added repair may be in an area they know little about. For example, a contractor who usually does tape and texture work may not be the best one to repair a floor joist.

While this is not the norm, and it may be done with good intentions, it can cause problems. It's best when people make the repairs they're most familiar with. This also reduces the chances of having to fix the same problem twice. ■

Who installed this house anyway? _____

Most dealers employ their own setup crews or at least use the same crew much of the time. So often they know who did the work. However, some dealers use several installers, but don't keep records of who installed which house. If the installer neglected to attach the Installer Certification Tag to the home, it can be difficult to discover who actually set the home.

There are times when a dealer or installer needs to respond to a state consumer inspection concerning the installation, but no one has a record of who did the installation. One solution is for the dealer to record in each file the installer's name, address, phone number, MDI number, and the number of the installation certificate on each home. Then the information is immediately available. ■

Keep the owner in the loop _____

Servicing new homes, especially in the first year's warranty period, is a vital part of the manufactured housing industry today. In the past, most dealerships and manufacturers had their own service crews to handle the fine-tuning of a home once it was setup. Now that home production rates are high, due in part to a stronger economy, factories and dealerships have to rely on contracted help to keep up with customer service.

On occasion, the Building Codes Division (BCD) is asked to mediate when there's a stalemate between homeowners, manufacturers, and dealers over a problem with a home. BCD sometimes encounters problems where the manufacturers and dealers don't fully communicate with contractors and homeowners about who is doing what and when.

For example, a homeowner informs the dealership that the front door binds and won't close. The dealership contacts the manufacturer, who contacts a contractor to fix the problem. The contractor agrees to do the work, but is busy and schedules the work for a week later. Four days later, the owner, thinking he or she is being ignored, contacts BCD's Consumer Assistance Program in hopes of getting some action. Consumer Assistance contacts the dealer only to find that the repair is scheduled and their assistance is not needed after all. In fact, the homeowner never would have

Keep the owner *continued on Page 6*

Formaldehyde and health notices

Formaldehyde used to be in the news a lot more, but now phrases like “formaldehyde emissions” and “parts per million” don’t mean much to the average home buyer. But they’re still important to the manufactured home industry and to federal regulators.

In June 1976, the Department of Housing and Urban Development (HUD) took over regulation of manufactured housing. HUD wrote federal standards, including section 3280.308 which sets maximum formaldehyde emissions for plywood at 0.2 parts per million and particle board at 0.3 parts per million. Before this standard, building products emitted enough formaldehyde to cause eye, skin, and respiratory irritations, especially in hot weather. HUD still requires a health notice explaining the possibility of formaldehyde emissions to be posted in kitchens at the time of manufacture. This notice must remain in the kitchen until all terms of the sales agreement have been completed.

While doing dealer lot inspections, Oregon Building Codes Division inspectors find that when the health notices are missing, it is usually because the dealership has hired someone to clean the homes without explaining which of the stickers and notices are to remain in place. If a dealer finds that a health notice is missing, he or she is permitted to make a photocopy of another to replace it. ■

Keep the owner *continued from Page 5*

called BCD if he or she had known that the repair was scheduled.

When the homeowner is in the loop and knows when his or her problem will be repaired, the operation goes much smoother. Even if there is a delay, as long as the homeowner is notified in advance, he or she knows what’s going on and doesn’t feel abandoned. ■

Owner packets and warranty information

When assisting owners or during site inspections, the Consumer Assistance Program often hears from the owner that they didn’t receive the owner’s manual or warranty information on appliances, shingles, siding, and other items. Dealers have also reported this problem. Federal regulations require that the manufacturer provide this information as well as the installation manual with all addenda that apply to a particular model. It saves everyone time if the owner has the owner’s manual, maintenance requirements, and the warranty information. While the manufacturer is responsible for sending this information with the home, dealerships can help by developing a program that insures buyers receive the manuals and understand the contents. ■

Missing roof shingles

We don’t know what the weather will be like when you read this, but we do know that winter is approaching. Every year, with the start of the cold, wet season come the inevitable complaints about shingles blowing off roofs during transit and during bad winter and spring weather. Some of these losses can be prevented. Several manufacturers provide a hand-tabbing option that dealerships can offer their customers. When properly done, with the correct asphalt adhesive, hand-tabbing can significantly reduce in shingle loss.

As winter approaches, dealers should advise their sales staff to offer this option to buyers. This is especially important when a home is going into a high-wind area, such as the coast, the Columbia River, or the eastern side of the Cascades.

When you figure the time and money spent on working out who is responsible and making repairs, it’s likely that hand tabbing costs less in the long run. Offering the hand-tabbing option also will help maintain a good relationship between the owner and the dealership. ■

Approval of "over-height" manufactured dwelling foundations clarified

The Building Codes Agency in Clatsop County sent in a request for a clarification regarding when a jurisdiction can approve foundations that have more than 25 percent of the piers more than 36 inches high. Thanks to the Clatsop County request, the Oregon Building Codes Division can include a clarification in the draft of the 1997 edition of the Oregon Manufactured Dwelling Standard (OMDS).

Section 304(j) of the 1996 OMDS requires a foundation system to be engineered by an Oregon professional engineer or architect, and have approval from the appropriate jurisdiction, when more than 25 percent of the piers under a manufactured dwelling are more than 36 inches high between the main frames and the footing or slab.

Clatsop County asked whether manufacturers' installation instructions could be used for cases where this height limitation was exceeded. The answer is yes. A foundation system detailed in a manufacturer's installation instruction manual that specifically identifies piers exceeding the 36 inch limit can be approved as an engineered foundation system that meets the intent of Section 304(j). However, before a jurisdiction approves the use of manufacturers' installation instructions for over-height foundations, all of the following conditions must be met:

1. The manufacturer's installation instructions have been approved by a Design Approval Primary Inspection Agency (DAPIA).
2. The DAPIA-approved manufacturer's installation instructions are applicable to the particular model being sited.
3. The site preparation is consistent with the site conditions identified in the DAPIA-approved manufacturer's installation instructions.
4. The loads used for the DAPIA-approved foundation system are consistent with those identified in Section 301(b) of the OMDS.
5. The manufactured dwelling is installed exactly to the DAPIA-approved manufacturer's installation instructions.

A related question is whether the out-of-state engineer stamps on the manufacturers' installation instructions are acceptable in Oregon. Again the answer is yes.

Because the federal manufactured home regulations preempt state regulations, DAPIA-approved manufacturers' installation instructions containing engineers' stamps from other states are acceptable in Oregon.

We thank Clatsop County for sending us these questions. If you have questions concerning the manufactured dwelling, recreational vehicle, park trailer, or park and camp programs, you can fax your questions to Patrick Lewis at (503) 378-2322. ■

Manufactured Home Update is a regular publication of the Building Codes Division of the Oregon Department of Consumer & Business Services and the Oregon State University Extension Program.

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Alternate construction — getting the roofs right

You've probably noticed that almost every issue of *Manufactured Home Update* has had at least one article about Alternate Construction (AC). We thought you'd be interested in an update on what we've found in AC houses so far. As of July 10, there have been 128 homes built under the AC letter process. Of these, 83 have not yet been installed, 31 have been completed, and 14 homes are awaiting repairs.

Of the homes that have required repairs, here's what we've found:

- 1. Outlooker blocks.** State inspectors find that the outlooker blocks that are designed to support the front and rear eaves either are not installed or are 2x3s instead of 2x4s. In one case, the top chords of the roof trusses were cut through to accommodate the outlookers, weakening the roof.
- 2. Plumbing vents.** ABS plumbing vents were not always installed through the roof or were only placed into the roof and not attached with glue to the existing pipe.
- 3. Roof ventilation.** Roof ventilation holes in the subsheathing need to be 4 feet on center.
- 4. Exposed staples.** When checking shingle application, inspectors are finding lots of exposed staples both below the tar strips and at the add-on roof vent fasteners.

Use the right plans

Installers and contractors need to know that there are designs located in the kitchen drawers of all these homes. These designs show explicitly how the trusses and roofs are to be assembled — be sure to use them. Because these homes are built under federal HUD regulation, the factory plans must be used rather than typical framing practice as illustrated in CABO and UBC codes.

Inspection and reinspection fees and procedures

When inspections are called for, Building Codes Division would like to be able to see as much of the completed roof as possible, while still being able to see the inside of the roof cavity. Ideally, there would be trusses installed, the vent holes cut out, and some sheathing and shingles installed.

For inspections inside Oregon, the dealers will be charged a fee of \$95. Reinspections for incomplete work or repairs required will be at a rate of \$45 per hour and 25 cents per mile, not to exceed \$95. Inspections and reinspections outside Oregon will be charged at \$45 per hour and 25 cents per mile.

If you have questions, contact Brian Lamb at (503) 378-3731 or Tony Clifton at (503) 378-2620. ■



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