

## When is Preservative-Treated Wood Required?

How much is too much when it comes to treated wood?

by Jim Vogt, P.E.

**P**reservative-treated wood should be used when conditions are favorable for attack by decay causing organisms and/or wood eating insects. The building codes identify several conditions when this might occur and provide minimum construction practices to prevent such attacks. Component manufacturers should be aware of the code requirements pertaining to the use of preservative-treated wood so they can assist their customers in using these materials in the appropriate applications.

### Question

We are a wall panel manufacturer and recently reviewed construction documents for two different multi-story projects in which preservative-treated wood sill plates are specified for the exterior walls at each floor level. For both projects, the typical exterior wall assembly consists of masonry veneer, an air space, weather-resistant sheathing (e.g., Tyvek®), OSB sheathing, 2x\_ wood studs, fiberglass batt insulation, a 6 MIL poly vapor retarder and 5/8" gypsum board. The typical floor/ceiling assembly



consists of 3/4" light-weight concrete topping, 3/4" tongue and groove plywood, parallel chord wood trusses, resilient furring channel, sound attenuation batt insulation, and a 5/8" gypsum board ceiling. The exterior wall-to-floor details for the upper floors appear to be fairly standard and show the bottom plate of the wall bearing directly on the plywood floor sheathing, which in turn is supported by the ends of the floor trusses. A slight gap is shown between the top of the plywood floor sheathing and the bottom edge of the gypsum wall board and is to be filled with a flexible sealant. The 3/4" gypsum floor topping is flush with the face of the gypsum wall board and sits directly on top of the plywood floor sheathing. The floor-to-wall detail at the first level is similar except the first floor consists of a precast concrete hollow core slab. The bottom wall plate at this level bears directly on the concrete.

These two projects are located in different states and were designed by different building designers. No other treated lumber is specified in the exterior wall and floor assemblies. I can certainly understand the use of a preservative-treated wood sill plate at the first floor level, but the requirement for the treated plates at the upper floors seems to be a bit much. Has there been a change in the building code that now requires this?

### Answer

"Naturally durable wood" or preservative-treated wood is typically required for applications where deterioration of the wood by decay causing organisms and/or wood eating insects (e.g., termites) is likely. This includes applications where the wood will be:

- a) in direct contact with the ground or fresh water,
- b) used above the ground and exposed to the weather,
- c) used above the ground within a specified distance of exposed earth,
- d) used above the ground and in contact with moisture permeable materials (such as concrete or masonry) that are in direct contact with the ground or exposed to the weather, or
- e) in areas with inadequate ventilation.

Section 2304.11 of the International Building Code® (IBC®) identifies the conditions where protection from decay and termites is required. (See page 12 for specific language.) Except for some minor revisions, these provisions have remained relatively unchanged from the 2003 to 2009 editions of the IBC.

Note that Section 2304.11.2.2 requires the use of naturally durable wood or preservative-treated wood when wood framing members bear on exterior foundation walls and are within eight inches of exposed earth. Note also Section 2304.11.2.4 requires that sill plates be naturally durable or preservative-treated if they bear on a concrete or masonry slab that is in direct contact with the earth. Depending on the site conditions for your two projects, both of these provisions could explain the use of the preservative-treated sill plate at the first floor level. However, neither these, nor any of the other provisions in Section 2304.11 explain the requirement for using preservative-treated sill plates on the upper floors, especially since no other durable or treated wood has been specified for the floor and wall assemblies.

Keep in mind that building codes establish minimum requirements and the building designer can certainly specify more stringent requirements. You will want to contact both building designers to verify that a preservative-treated wood plate is actually required for the exterior walls of the upper floors.

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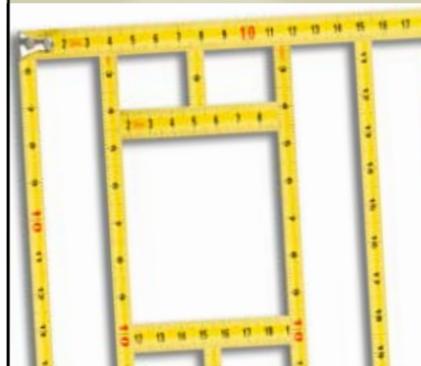
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## Technical Q&A • Continued from page 11

Wood that has been treated with waterborne preservatives usually has higher moisture content, which can result in additional shrinkage in the walls unless the treated lumber has been kiln dried after treatment (KDAT) or allowed to air dry after treatment (ADAT). Unless already provided in the construction documents, the building designer will also need to clarify the required Use Category (UC), preservative system, and corrosion potential of the preservative system, so that you can use fasteners in your wall panels with the proper corrosion resistance. Finally providing guidance on the additional cost of preservative-treated wood and several alternatives to the building designer and your customer will make you a more valuable supplier to them. **SBC**

To pose a question for this column, email [technicalqa@sbcmag.info](mailto:technicalqa@sbcmag.info) or call 608/274-4849.

### Section 2304.11 from the 2009 IBC

#### 2304.11 Protection against decay and termites.

**2304.11.1 General.** Where required by this section, protection from decay and termites shall be provided by the use of naturally durable or *preservative-treated* wood.

**2304.11.2 Wood used above ground.** Wood used above ground in the locations specified in Sections 2304.11.2.1 through 2304.11.2.7, 2304.11.3 and 2304.11.5 shall be naturally durable wood or *preservative-treated* wood using water-borne preservatives, in accordance with AWPA U1 (Commodity Specifications A or F) for above-ground use.

**2304.11.2.1 Joists, girders and subfloor.** Where wood joists or the bottom of a wood structural floor without joists are closer than 18 inches (457 mm), or wood girders are closer than 12 inches (305 mm) to the exposed ground in crawl spaces or unexcavated areas located within the perimeter of the building foundation, the floor construction (including posts, girders, joists and subfloor) shall be of naturally durable or *preservative-treated* wood.

**2304.11.2.2 Wood supported by exterior foundation walls.** Wood framing members, including wood sheathing, that rest on exterior foundation walls and are less than 8 inches (203 mm) from exposed earth shall be of naturally durable or *preservative-treated* wood.

**2304.11.2.3 Exterior walls below grade.** Wood framing members and furring strips attached directly to the interior of exterior masonry or concrete walls below grade shall be of approved naturally durable or *preservative-treated* wood.

**2304.11.2.4 Sleepers and sills.** Sleepers and sills on a concrete or masonry slab that is in direct contact with earth shall be of naturally durable or *preservative-treated* wood.

**2304.11.2.5 Girder ends.** The ends of wood girders entering exterior masonry or concrete walls shall be provided with a 1/2-inch (12.7 mm) air space on top, sides and end, unless naturally durable or *preservative-treated* wood is used.

**2304.11.2.6 Wood siding.** Clearance between wood siding and earth on the exterior of a building shall not be less than 6 inches (152 mm) or less than 2 inches (51 mm) vertical from concrete steps, porch slabs, patio slabs and similar horizontal surfaces exposed to the weather except where siding, sheathing and wall framing are of naturally durable or *preservative-treated* wood.

**2304.11.2.7 Posts or columns.** Posts or columns supporting permanent structures and supported by a concrete or masonry slab or footing that is in direct contact with the earth shall be of naturally durable or *preservative-treated* wood.

#### Exceptions:

1. Posts or columns that are either exposed to the weather or located in basements or cellars, supported by concrete piers or metal pedestals projected at least 1 inch (25 mm) above the slab or deck and 6 inches (152 mm) above exposed earth, and are separated there from by an impervious moisture barrier.
2. Posts or columns in enclosed crawl spaces or unexcavated areas located within the periphery of the building, supported by a concrete pier or metal pedestal at a height

greater than 8 inches (203 mm) from exposed ground, and are separated there from by an impervious moisture barrier.

**2304.11.3 Laminated timbers.** The portions of glued-laminated timbers that form the structural supports of a building or other structure and are exposed to weather and not fully protected from moisture by a roof, eave or similar covering shall be pressure treated with preservative or be manufactured from naturally durable or *preservative-treated* wood.

**2304.11.4 Wood in contact with the ground or freshwater.** Wood used in contact with the ground (exposed earth) in the locations specified in Sections 2304.11.4.1 and 2304.11.4.2 shall be naturally durable (species for both decay and termite resistance) or preservative treated using water-borne preservatives in accordance with AWPA U1 (Commodity Specifications A or F) for soil or fresh water use.

**Exception:** Untreated wood is permitted where such wood is continuously and entirely below the groundwater level or submerged in fresh water.

**2304.11.4.1 Posts or columns.** Posts and columns supporting permanent structures that are embedded in concrete that is in direct contact with the earth, embedded in concrete that is exposed to the weather or in direct contact with the earth shall be of *preservative-treated* wood.

**2304.11.4.2 Wood structural members.** Wood structural members that support moisture-permeable floors or roofs that are exposed to the weather, such as concrete or masonry slabs, shall be of naturally durable or *preservative-treated* wood unless separated from such floors or roofs by an impervious moisture barrier.

**2304.11.5 Supporting member for permanent appurtenances.** Naturally durable or *preservative-treated* wood shall be utilized for those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances where such members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering to prevent moisture or water accumulation on the surface or at joints between members.

**Exception:** When a building is located in a geographical region where experience has demonstrated that climatic conditions preclude the need to use durable materials where the structure is exposed to the weather.

**2304.11.6 Termite protection.** In geographical areas where hazard of termite damage is known to be very heavy, wood floor framing shall be of naturally durable species (termite resistant) or preservative treated in accordance with AWPA U1 for the species, product preservative and end use or provided with *approved* methods of termite protection.

**2304.11.7 Wood used in retaining walls and cribs.** Wood installed in retaining or crib walls shall be preservative treated in accordance with AWPA U1 (Commodity Specifications A or F) for soil and fresh water use.

**2304.11.8 Attic ventilation.** For *attic* ventilation, see Section 1203.2.

**2304.11.9 Under-floor ventilation (crawl space).** For under-floor ventilation (crawl space), see Section 1203.3

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