Florida Building Code
Advanced Training: Termites

Florida Building Commission
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(850) 487-1824
http://www.floridabuilding.org

Florida Department of Agriculture and Consumer Services

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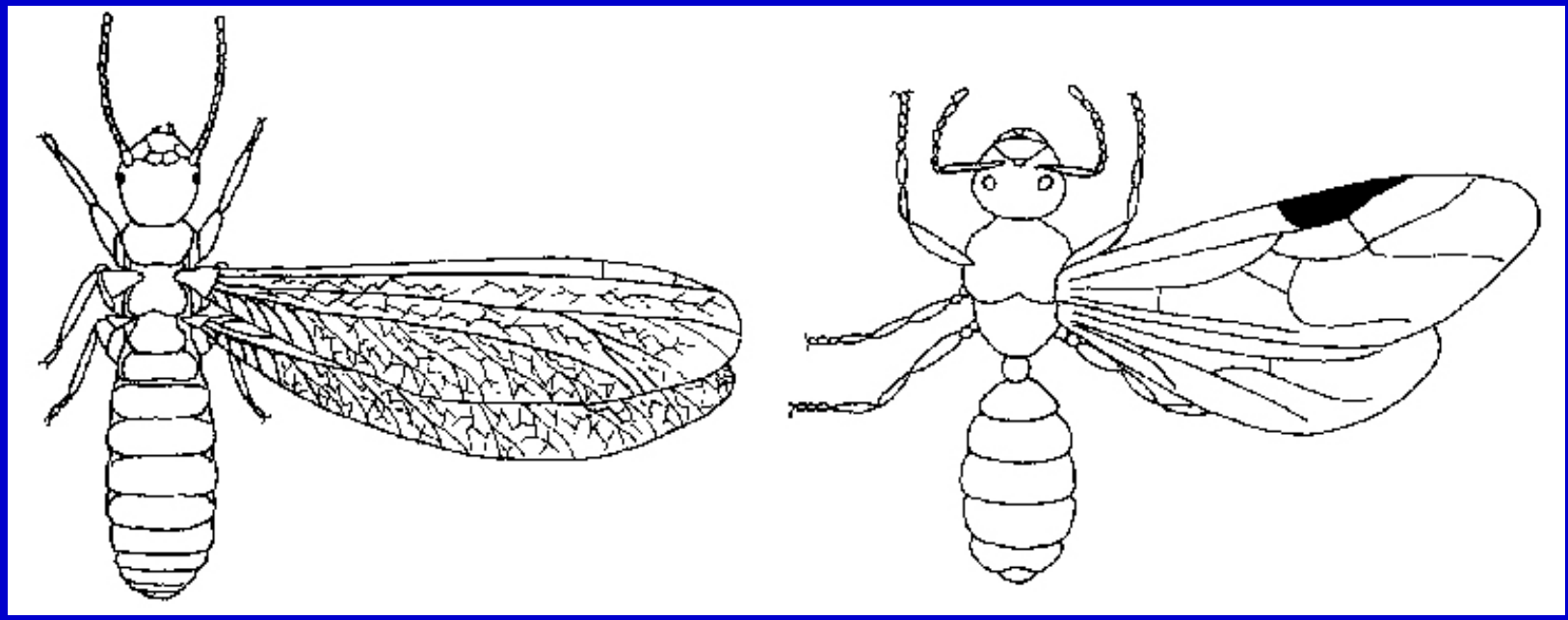
Termite vs. Ant Swarmers

A Source of Common Confusion



Termite
(Isoptera)

Ant
(Hymenoptera)

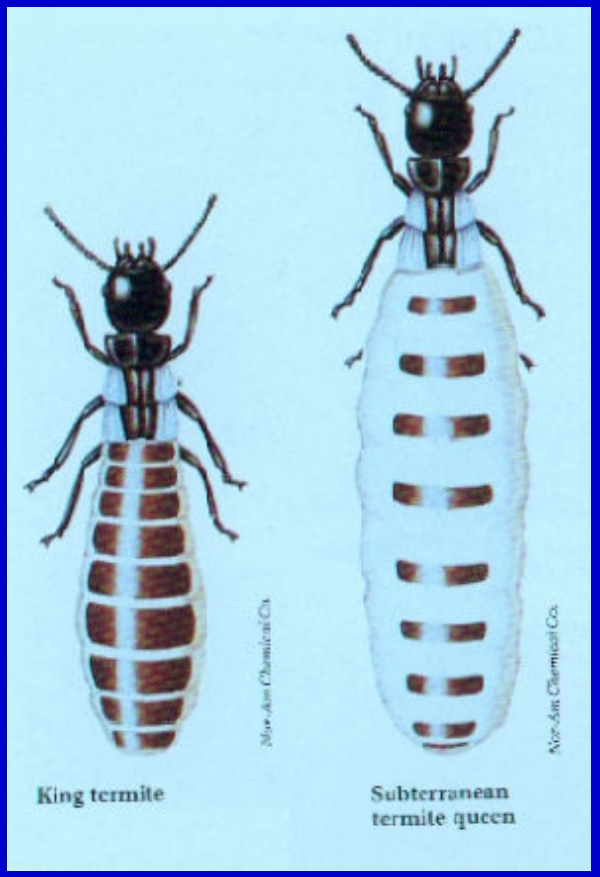
Colony Dynamics (castes)

- Three castes:
  - Worker
  - Reproductives
    - Primary
    - Secondary
  - Soldier

Workers

- Feed queen and king
- Feed the soldiers
- Brood care
- Cause wood damage

Reproductives & Alates



Soldiers

Wood Damage & Fecal Pellets (Drywood termites)

Drywood Termites

Subterranean Termites

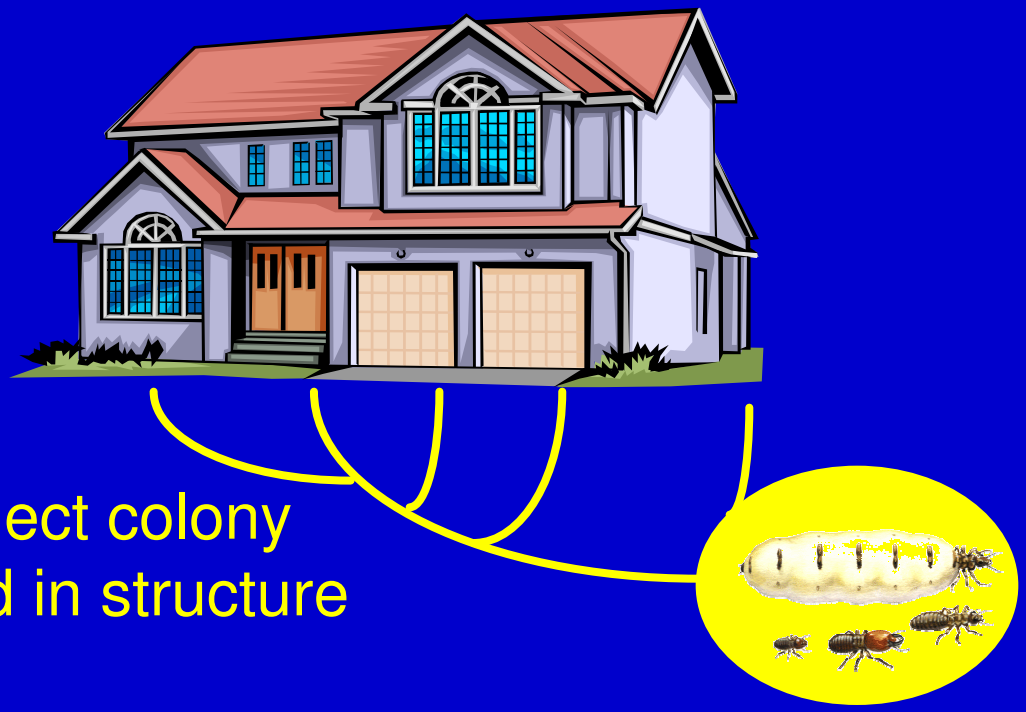
Eastern Subterranean Termites

- Feed in the soft portion of the wood
- Create galleries
- Feed on anything containing cellulose
- An active colony can consume one pound of wood per day

Mud Tubes

- Entry into buildings
- Protection from
  - Desiccation
  - Predators

Subterranean Termites



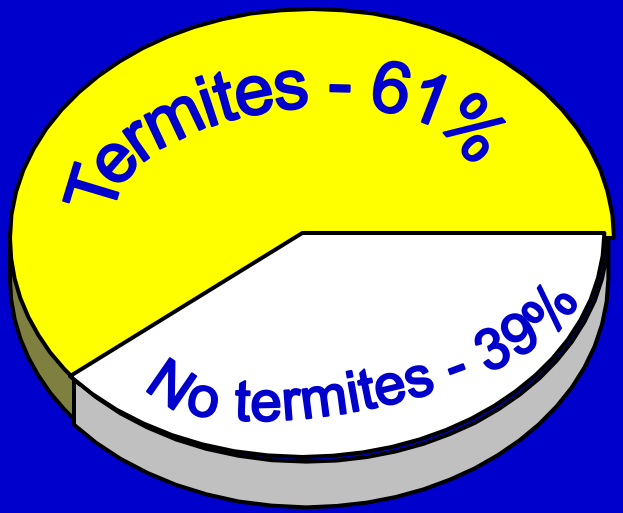
Mud tubes connect colony
in soil with wood in structure

- Nest in soil (generally)
- Colonies range in size from a few thousand up to 10 million termites

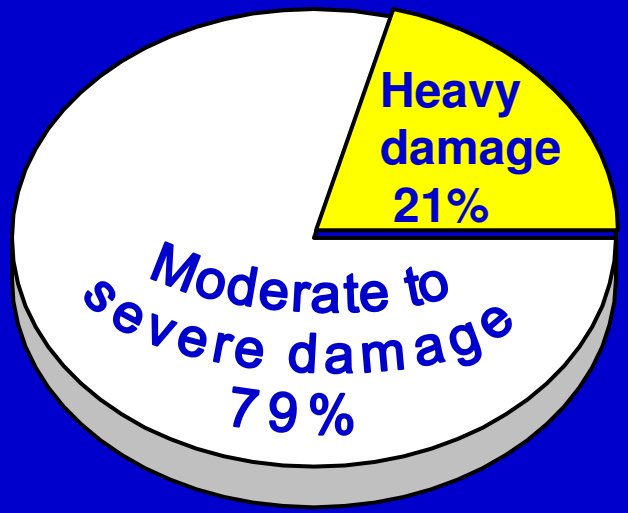
Cracks in foundation

Why include termite-related sections in the Florida Building Code?

Infested with Termites



Damage



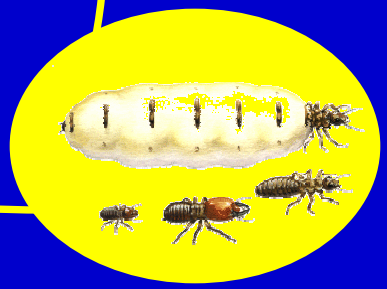
St. Johns County Survey of five-year-old houses

Why is subterranean termite control so important now?

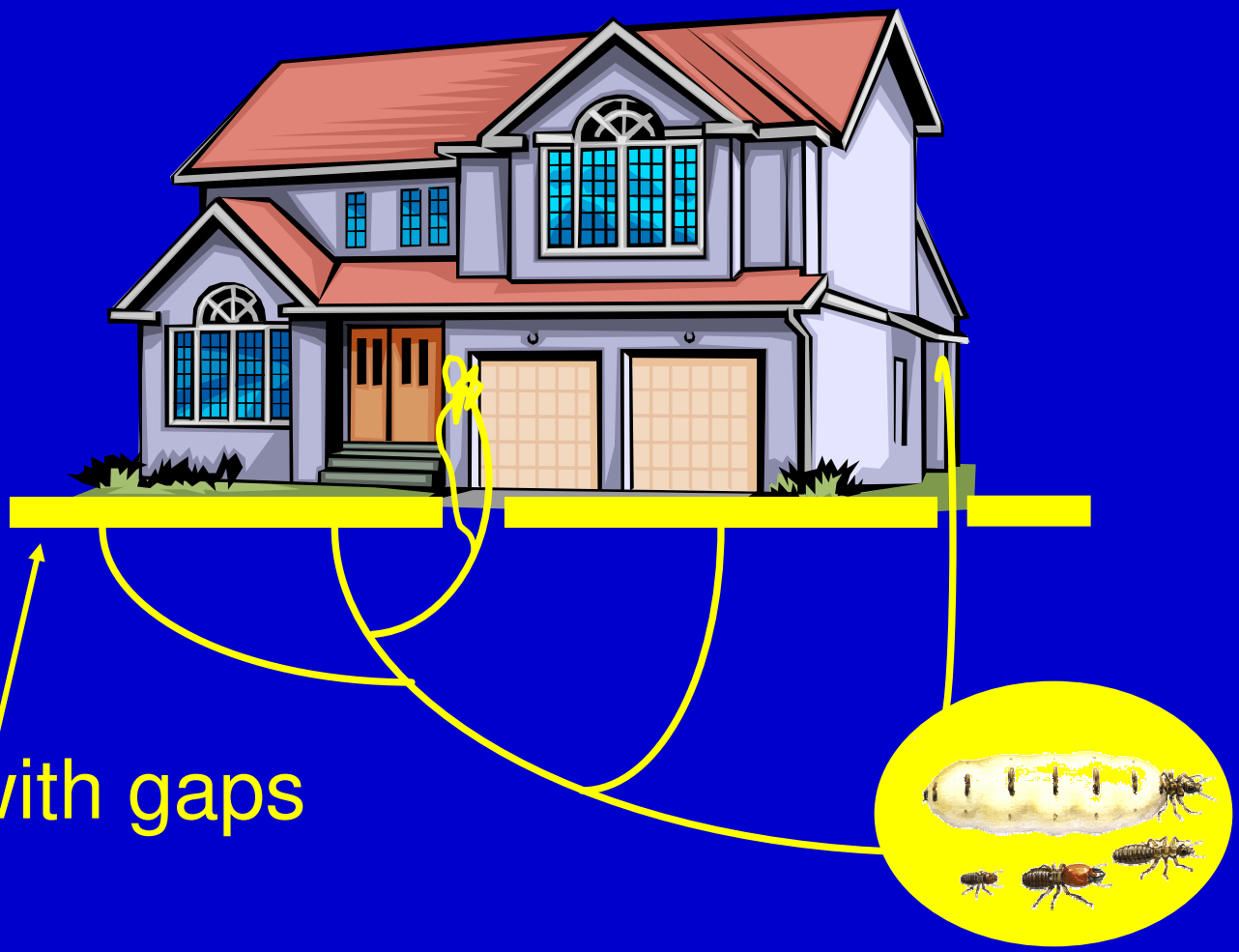
- Before 1988 chlordane, heptachlor, and aldrin were used as barriers and lasted over 30 years
- After 1988 (post chlorinated hydrocarbon era) repellent termiticides replaced old chemistries
- Termiticides are now required to provide 5 years of 100% protection…when applied at the labeled rate

The Ideal Situation

Barrier free from gaps



Reality



1816 Termite Protection

1816.1. Requires the following:

- all buildings have pre-construction treatment protection against subterranean termites;
- the rules and laws of the Florida Department of Agriculture and Consumer Services apply to pre-construction soil treatment;
- a Certificate of Compliance—containing specific language—is issued to the building department by the licensed pest control company

105 Permits

105.10 Certificate of Protective Treatment for Prevention of Termites

- Requires a weather-resistant board on the jobsite for posting of Termite Treatment Certificates
- Certificate must include:
  - Product used
  - Applicator
  - Treatment time and date
  - Site location
  - Area treated
  - Chemical used
  - Concentration
  - Gallons used
- The final exterior treatment applies only to cases where a soil chemical barrier method is used

1816 Termite Protection

1816.1 Termite Protection. Termite protection shall be provided by registered termiticides, including soil applied pesticides, baiting systems, and pesticides applied to wood, or other approved methods of termite protection labeled for use as a preventative treatment to new construction. See §202, REGISTERED TERMITICIDE. Upon completion of the application of the termite protective treatment, a Certificate of Compliance shall be issued to the building department by the licensed pest control company that contains the following statement: "The building has received a complete treatment for the prevention of subterranean termites. Treatment is in accordance with rules and laws established by the Florida Department of Agriculture and Consumer Services."

2304 Construction Requirements

2304.13 Preparation of building site and removal of debris

- 2304.13.1 Building sites shall be graded to provide drainage under all portions of the building not occupied by basements
- 2304.13.2 The foundation and area within 1 ft must have all vegetation, stumps, dead roots, cardboard, trash, and foreign material removed. Any fill material must be free of vegetation and foreign material, as well.

2304 Construction Requirements

2304.13 Preparation of building site and removal of debris

- 2304.13.3 Lists items that must be removed under and within 1 foot of building
  - 2304.11.10.1 Materials of naturally durable wood—or pressure treated for ground contact—with at least a 6 inch space for inspection and treatment, are excepted
- 2304.13.4 Prohibits burying of construction and other materials within 15 feet of any building

Wood left on
the ground

Termite swarmers
at certain times
of the year

2304.11 Protection Against Decay and Termites

2304.11.1 If protection of wood members is required by this section, it must be by using naturally durable or preservative-treated wood.

- 2302.1 Definitions: "naturally durable wood" refers to the heartwood of the following species
  - ✓ Decay resistant: Redwood, Cedars, Black Locust
  - ✓ Termite resistant: Redwood, Eastern Red Cedar
- an occasional piece with corner sapwood may be included if 90% or more of the width on each side of it is heartwood

2304.11 Protection Against Decay and Termites

- 2302.1 PRESERVATIVE-TREATED WOOD. The expression “preservative treated wood” refers to Wood (including plywood) pressure treated with preservatives in accordance with Section 2303.1.8.
- 2304.11.2 through 2304.11.6 Wood subject to damage from both decay and termites shall be: a naturally durable species resistant to termites or preservative-treated

109 Inspections

109.3.4 Termites

- Building components and surroundings that must be protected from termite damage:
  - in accordance with 1503.6, Section 2304.13, Section 2304.11.6 or
  - specifically required to be inspected for termites in accordance with 2114, or
  - required to have chemical soil treatment in accordance with 1816
- shall not be covered or concealed until released by the building official

1816 Termite Protection

1816.1.1 – 1816.1.2 Include requirements that if soil treatment is used:

- Initial treatment inside the foundation perimeter shall be done
  - after all excavation, backfilling, and compaction, and
  - any soil area disturbed after the initial treatment shall be retreated, including spaces boxed or formed

1816 Termite Protection

1816.1.4 If soil treatment is used, requires:

- a minimum 6 mil vapor retarder to protect against rainfall dilution
- retreatment if rainfall occurs before vapor retarder placement
- that any work—including placement of reinforcing steel—done after chemical treatment until the concrete floor is poured, be done to avoid penetrating or disturbing treated soil

The 6-mil vapor retarder aids in avoiding displacement of the chemical termiticide.

Use care not to create any holes in the material…

1816 Termite Protection

1816.1.3 If soil treatment is used, requires:

- In concrete floors, spaces boxed out/formed for installation of plumbing traps, drains or any other purpose, must:
  - Be of plastic or metal permanently-placed forms
  - Be placed deep enough to eliminate any soil disturbance after the initial chemical soil treatment

1816 Termite Protection

1816.2 Penetration

If soil treatment is used protective sleeves around metallic piping penetrating concrete slab-on-grade floors:

- Must not be made of cellulose-containing materials
- Must have a termiticide applied in the space between the sleeve and the pipe

2114 Termite Inspection

2114.1 Includes removal of all non-preservative treated on or non-naturally durable wood or other cellulose-containing material in cells and cavities in masonry units and air gaps between brick, stone or masonry veneers and the structure prior to concrete placement

2114 Termite Inspection

2114.2 Brick, stone, or other veneer must be supported by a concrete bearing ledge at least equal to the total thickness of the brick, stone or other veneer, which is poured integrally with the concrete foundation.

- No hidden cold joints are permitted without a supplemental treatment in the foundation, unless there is an approved physical barrier.
- An approved physical barrier must also be installed from below the wall sill plate or the first block course to horizontally embed in a mortar joint.
- If masonry veneer extends below grade and there is no physical barrier, a treatment must be applied to the cavity created between the veneer and the foundation.

2304.11 Protection Against Decay and Termites

2304.11.2.3 Sleepers, sills and sole plates on a concrete or masonry slab, which is in direct contact with earth, must be made of approved naturally durable or preservative-treated wood.

- 2304.11.4.2 Wood structural members supporting moisture- permeable floors or roofs which are exposed to the weather—such as concrete or masonry slabs—must be approved naturally durable wood or preservative-treated wood unless separated from the floors or roofs by an approved impervious moisture barrier.

Hidden subterranean termite damage

2304.11 Protection Against Decay and Termites

2304.11.2.4 Girder Ends

- Ends of wood girders entering exterior masonry or concrete walls must be:
  - provided with ½ inch (12.7 mm) air space on tops, sides, and ends, unless
  - made of approved naturally durable or preservative-treated wood.

- 2304.11.2.2 Wood furring strips, or other wood framing members, attached directly to the interior of exterior masonry or concrete walls below grade must be made of approved naturally durable or preservative-treated wood.

1403 Performance Requirements

1403.8 There must be a clearance of at least 6 inches (152 mm) between exterior wall coverings and final earth grade on the exterior of a building to allow for inspection of termite infestation.

Exceptions listed on next slide

1403 Performance Requirements

1403.8 (cont'd)

Exceptions:

1. paint or decorative cementitious finish less than 5/8 inch thick adhered directly to the masonry foundation sidewall
2. access or vehicle ramps which rise to the interior finish floor elevation for only the width of the ramp
3. a 4-inch inspection space above patio and garage slabs and entry areas
4. if the patio has been soil treated for termites, the finish elevation may match the building interior finish floor elevations on masonry construction only
5. masonry veneers

2304.11 Protection Against Decay and Termites

2304.11.2.5 There must be clearance on the exterior of a building between the wood siding and the earth of at least 6 inches (152 mm), except where siding, sheathing and wall framing are made of preservative-treated or naturally durable wood.

Wood and siding (on right)
in contact with soil

Mud tubes

2304.11.10 Foam Plastic Insulation

- 2304.11.10.1 The provisions of Section 2603. 9 shall apply to the installation of foam plastic insulation in close proximity to the ground.
- Exception: Materials which are of naturally durable wood or are pressure treated for ground contact, and which are installed with at least 6 inches (152 mm) clear space from the structure to allow for inspection and treatment for termites.
- In order to reduce chances of termite infestation, no wood, vegetation, stumps, dead roots, cardboard, trash, or other cellulose-containing material shall be buried on the building lot within 15 feet (4.6 m) of any building or the position of any building proposed to be built.

2603.9 Protection from termite damage

2603.9.2 Clearance between earth and foam plastics applied to the exterior wall must be at least 6 inches (152 mm).

2603 Foam Plastic Insulation

2603.9 Protection from termite damage

- 2603.9.1 Foam plastic insulation—including, but not limited to extruded or expanded polystyrene or polyisocyanurate—cannot be installed below grade on foundation walls or the exterior of slab foundations.

  Exceptions listed on next slide

2603.9 Protection from termite damage

2603.9.1 (cont'd):

Exceptions

1. When—in addition to the requirements of 2304.11.6—an approved method is provided of protecting the foam plastic and structure from subterranean termite damage
2. Within Types I, or II-B, construction.
3. On the interior side of basement walls.

1503 Weather Protection

1503.6 Protection against decay and termites

- Condensate lines and roof downspouts must discharge at least 1 foot (305 mm) away from the structure sidewall.
- All buildings with eaves of less than 6 inches horizontal projection—except for gable end rakes, or on a roof above another roof—are required to have gutters with downspouts.
- FBC, Plumbing 316.1 Irrigation/sprinkler systems and risers for spray heads cannot be installed within 1 foot of the building sidewall.

1816 Termite Protection

1816.1.5 – 1816.1.6 Includes requirements that if soil treatment is used:

- concrete overpour or mortar accumulated along the exterior foundation perimeter must be removed prior to exterior chemical soil treatment
- chemical soil treatments must also be applied under all exterior concrete or grade within one (1) foot of the primary structure sidewalls
- also, a vertical chemical barrier must be applied promptly after construction is completed, including initial landscaping and irrigation/sprinkler installation
- any soil disturbed after the chemical vertical barrier is applied must be promptly retreated.

2304.11 Protection Against Decay and Termites

2304.11.4.3 (Wood) Decks, fences, patios, planters, or other wooden building components that directly abut the sidewall of the foundation or structure must be constructed with:

- 18 inch (457 mm) clearance beneath or,
- 6 inch (152 mm) clearance between the top of the component and the exterior wall covering or,
- components that are easily removable by screws or hinges to allow access for inspection of the foundation sidewall and treatment for termites.

105 Permits

105.11 Notice of termite protection

A permanent sign with the name of termite treatment provider and the need for re-inspection and contract renewal must be posted near the water heater or electric panel.

Special Situations

- Crawl spaces
- Wood in retaining or crib walls
- One story buildings under 400 sq ft
- Wood quality and use issues
- High velocity hurricane zones

2304.11 Protection Against Decay and Termites

2304.11.2.2 Framing

All wood framing and sheathing

- less than 8 inches (203 mm) from exposed earth in exterior walls
- that rests on preservative-treated wood, concrete or masonry foundations

must be made of approved naturally durable or preservative-treated wood.

2304.11 Protection Against Decay and Termites

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 assembly (including posts, girders, joists and subfloor) shall be of naturally durable or preservative-treated wood.

2304.11 Protection Against Decay and Termites

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

2304.11 Protection Against Decay and Termites

2304.11.7 Wood used in retaining or crib walls

- Shall be of preservative-treated wood treated in accordance with AWPA C2 or C9 for soil and fresh water contact

2303.1.8.1 Identification

2301.4.6 Wood required by 2304.11 to be preservative-treated must bear the quality mark of an approved inspection agency. This mark must include the following information:

- Identification of the treating manufacturer
- The type of preservative used
- The minimum preservation retention (pcf)
- The end use for which the product is treated
- The AWPA standard to which the product was treated
- The name of the accredited inspection agency

2304.11 Protection Against Decay and Termites

2304.11.5 Naturally durable or preservative-treated wood must be used for wooden structural supports of buildings when the supports are exposed to the weather without protection (by a roof or other covering) from moisture or water accumulation on the surface or at joints.

2304.11 Protection Against Decay and Termites

2304.11.4 Wood in contact with ground or below ground level which supports permanent structures must be approved preservative-treated wood suitable for ground contact use.

Exceptions:

Wood not preservative-treated used for supports when:

- entirely below ground water level or
- continuously submerged in fresh water

2304.11 Protection Against Decay and Termites

2304.11.4.1 All posts, poles, and columns supporting permanent structures, and embedded in concrete which is in contact with ground, shall be approved preservative-treated wood

2304.11 Protection Against Decay and Termites

- 2304.11.2.6 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 continued next slide:

2304.11.2.6 Post or Columns 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 Protection Against Decay and Termites

2304.11.3 If the structural supports of a building are made of glued laminated timbers, which are exposed to weather without protection, they must be made of preservative-treated or naturally durable wood.

1820 High Velocity Hurricane Zones—Concrete Slabs on Fill

1820.2 and 1820.5

- All fill placed under slabs must be clean sand or rock, free of debris. Max size of rock within 12” below slab is 3”
- Fill must be thoroughly compacted

Subterranean Termite Treatment Methods and Practices

- Soil treatment with residual termiticides
- Installation of termite colony monitoring and baiting systems
- Treatment of structural wood with borate-containing compounds
- Installation of physical barriers to termite infestation