

# CHAPTER 5

## OTHER TREATMENTS FOR SUBTERRANEAN TERMITES

### LEARNING OBJECTIVES

After completely studying this chapter, you should:

- Know the difference between plenum and non-plenum crawl spaces and how they should be treated for termite control.
- Know how to locate subslab heating ducts and how to prevent termiticide contamination of the air flowing through the ducts.
- Be familiar with situations in basements that require special consideration when applying termiticide and know how to treat each.
- Know the avenues of termite entry for a dirt-filled concrete porch on a frame house and how to control termites in that area.
- Know what should be done to prevent and control termite entry in the case of wooden porches.
- Know how to prevent leaking of termiticide through hollow block, tile, and rubble foundations.
- Know how to apply termiticide safely to soil when wells, cisterns, and other water sources are located on a property.
- Know how to control termite infestations when rigid foam insulation board is present.
- Know what wood treatments are available when soil treatment is not possible in a structure.

Certain features of building construction require special consideration when you are attempting to control termites. In some situations, it may be advisable not to treat with liquid termiticides but to use some other method, such as termite baiting, borates, or mechanical alteration. This is particularly true when liquid termiticides might

cause contamination of air-handling systems or water sources. If a structure or an area may pose problems in treatment, it is advisable to have one person inside to monitor the application while another performs exterior treatment of the soil, brick veneer, hollow block, or rubble foundation.

### PLENUM AND NON-PLENUM CRAWL SPACES

Several types of construction are extremely difficult (and occasionally impossible) to treat with termiticides. The plenum concept uses the area under the subfloor (crawl space) as a giant heating-cooling duct. There are no vents or access doors in the foundation; thus, termiticide odor can be circulated with heated or cooled air through the structure. Therefore, conventional liquid termiticide treatment is not recommended. Termite baits may be an option for treating plenum housing.

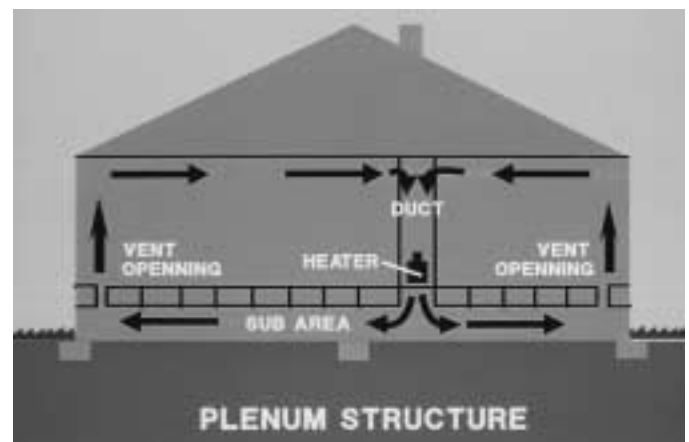


Figure 5.1. Plenum houses use the area under the subfloor as a giant heating/cooling air chamber. Because of this, use of conventional liquid termiticide is not recommended.

In non-plenum structures, air ducts in the crawl area should be examined before treatment. If breaks or leaks at joints are found, they should be repaired before treatment is made. Some air-handling units are located in crawl spaces and draw air from the crawl area. They should be ducted to draw in air from outside the structure before treatment. It is also recommended that all crawl areas have adequate ventilation to prevent the buildup of odor and airborne termiticide residues.

If a structure has inaccessible crawl areas within the foundation, access will have to be created. Visually inspect the area to determine the best method of treatment. If there is sufficient clearance, treatment should be made as in any other crawl area. If there is insufficient clearance between the floor joists and the soil, remove sufficient soil for access and treat the area (see Figure 5.2). It may also be acceptable to drill the floor and treat by rodding or to treat by horizontal drilling and rodding. Vent the area, if possible.

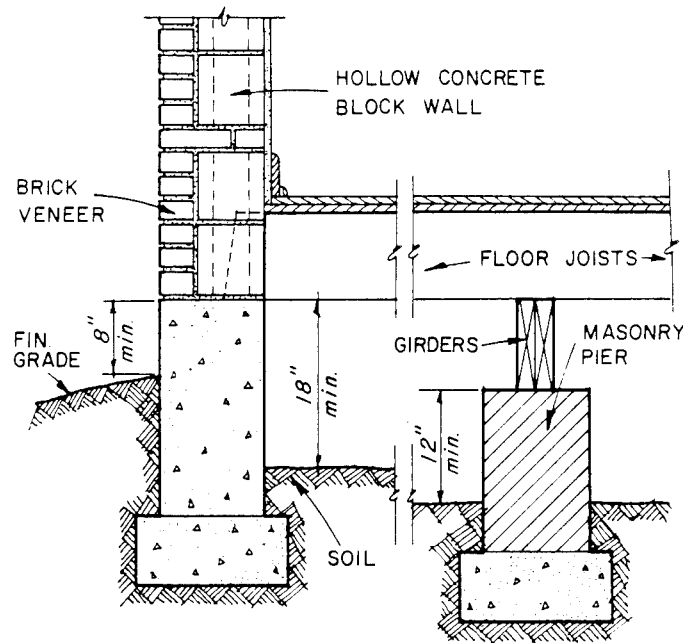


Figure 5.2. Where the superstructure of a building is masonry, provide for adequate clearance between wood and ground both outside and inside the building (adapted from USDA).

## SUBSLAB HEATING DUCTS

Another common type of construction that requires special consideration in treating for termites is houses with heating systems under or imbedded within the concrete slab of the structure (see Figure 5.3). The accidental introduction of a termiticide into ducts can result in a serious contamination of the air that flows through these ducts and into living quarters. Termite baits might be a useful alternative in these situations.

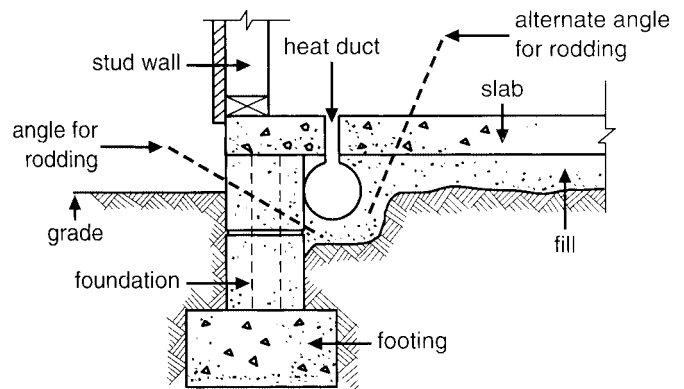


Figure 5.3. Rod treating adjacent to a perimeter heat duct.

Inspect the ducts as much as possible using a mirror and flashlight. If it appears that the ducts are made of material containing cellulose, that they have soil or sand bottoms, that they contain standing water, or that they are not properly sealed, reconsider treatment. Such ducts should be sealed with concrete and an alternative air-handling system installed before treatment. To locate ducts in slabs, turn on the heating system and place damp newspapers over the suspected location of the ducts. The newspapers will begin drying in the areas immediately over the ductwork. (This will not work on carpeted floors.)

Applying termiticide under or around the ducts must be done carefully. Greatly reduced pressure (less than 30 pounds at the nozzle tip) or gravity (percolation) methods should be used. The use of a subslab injector should be limited. If holes are drilled in the interior slab, knowledge of the exact location, directions of the system, and depth and width of the ducts is important. If possible, the pest management specialist will want to get the chemical under the ducts (see Figure 5.3). Reducing the pressure will keep the termiticide from backing up into the duct. Rodding from the outside by drilling the foundation and running a rod in under the ductwork may be the best treatment procedure. Again, knowing the depth of a duct in or under the slab is essential so that the drill or rod does not puncture the duct. Horizontal rodding under the slab is the correct procedure where radiant heat pipes are imbedded in the slab of the structure.

After drilling is completed but before treatment, close off all vents. Turn on the fan for the air system. Check each hole for airflow. If airflow is detected, plug the holes and do not treat them. It is also essential to check periodically during treatment and immediately after treatment for signs of contamination. The heating system should be turned on and checked for odors. If an odor is present, shut off the unit and determine why the odor is present. Odors could be coming from the moist, treated soil beneath the slab. If this is the case, the odors will usually not be strong and should persist for only a day or two. Charcoal filters in heat registers can be used to minimize the odor.

If a strong odor persists, there is probably a termiticide deposit in a duct. This must be cleaned out. An industrial wet vac is the best method to get any liquid material out of the ducts, and charcoal filters should be used over

heat registers. Removal of the deposit may require expertise in chemical deactivation. Termiticide manufacturers all have deactivation and odor control information available, and they should be contacted for up-to-date recommendations.

## SPECIAL CONSIDERATIONS FOR TREATING BASEMENTS

French drains in basements can be a problem. French drains are used to drain water into a sump, storm sewer or other area. They are usually found around the perimeter of a finished basement. You may want to drill test holes before proceeding with treatment. If there is a sump pump, turn it off and inspect the sump. If water is present, remove some and observe the water level for 15

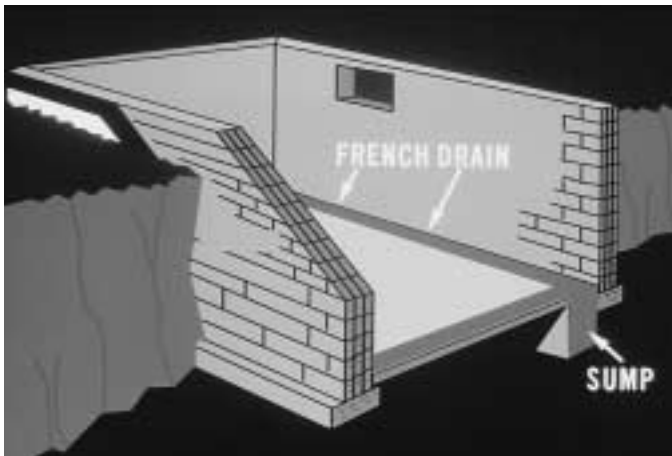


Figure 5.4. A French drain is a below grade drainage system that is level with or beneath the basement floor and usually runs around its perimeter. When water gets into the basement it goes through the French drain and runs into a sump or sometimes outdoors.



Figure 5.5. If the basement has a sump pump, care should be taken to avoid getting chemical into the “sump” or pit in which the pump sits. This is important because sump pumps usually discharge into non-target areas, such as a driveway, street gutter, or underground sewer.

minutes. If the level of the water rises, delay treatment until a time when the soil is drier. Also observe the sump during the course of treatment for the presence of termiticide. If termiticide is present, remove the contaminated water and dispose of it in a safe and legal manner.

One of the most common problems in the control of subterranean termites is wooden members that extend through the concrete in the basement floor (see Figure 5.6). Supporting posts, stair risers, and doorframes are common examples. To correct this, cut the wooden members at least 4 inches above floor level, then remove the portion that extends through the floor. The soil underneath should be thoroughly treated with termiticide, and then concrete poured into the hole and into a form extending to the remaining portion of the wooden members for support. In the case of stairways, it is advisable to make the entire lower step out of concrete, if possible. It is generally undesirable to attempt to treat buried wooden supports by chemical means alone.

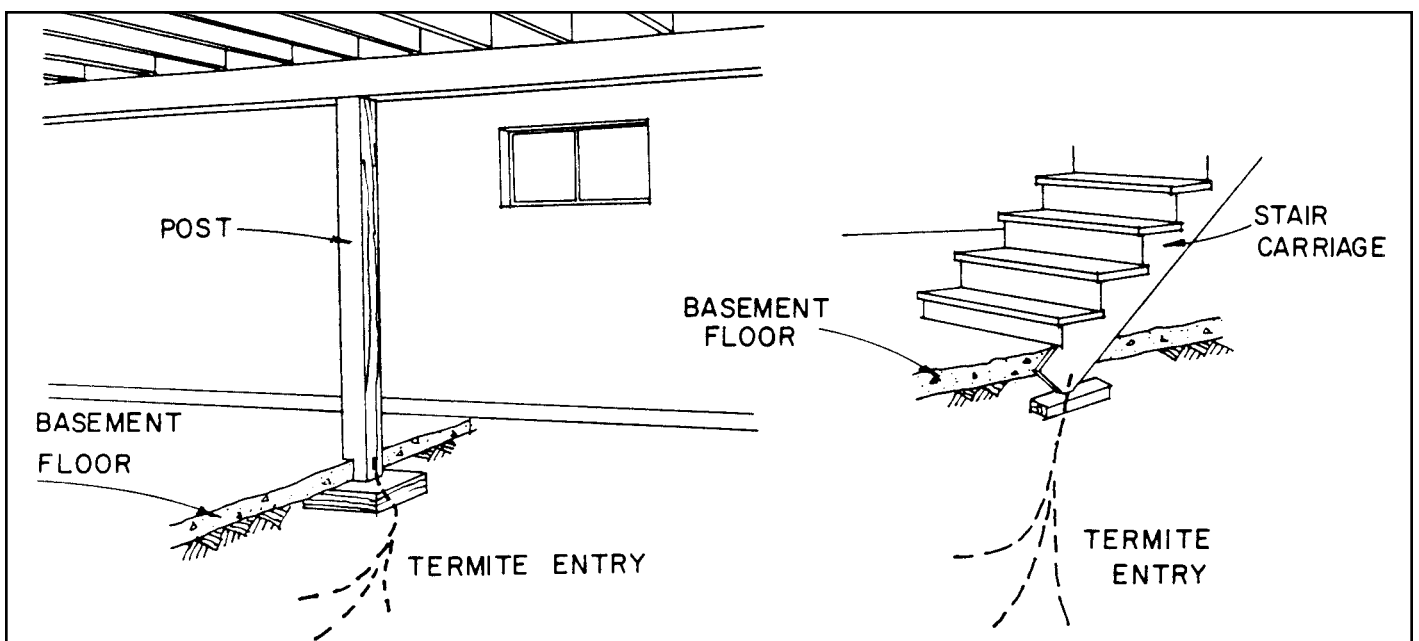
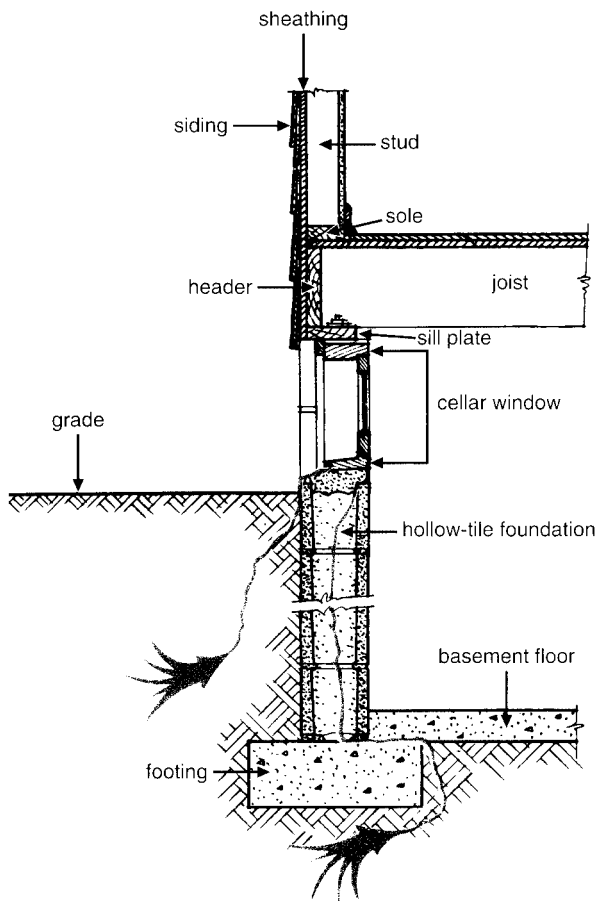


Figure 5.6. Wood post and basement steps extending through concrete (adapted from NPMA).

Before treating in basements, inspect the foundation walls for cracks where seepage of termiticide may occur when the soil outside is treated. If the foundation wall contains cracks or void areas, or if inspection cannot be made, a second staff member should be in the basement to watch for any leakage through the wall while the soil outside is being treated. Also check the basement wall when treating the front and back porches to be sure that the termiticide does not seep over the sill plate. If the basement has an exposed soil floor, cover the treated area with 2 to 4 inches of untreated soil or other impervious barrier after treatment is completed.

Concrete block foundation walls that extend down through the basement floor present a special problem. The usual practice is to drill holes through the floor on both sides of the wall and treat the soil underneath.

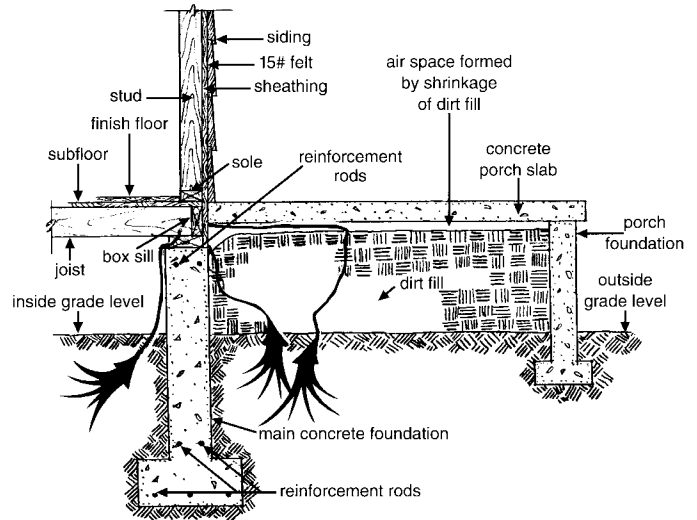
Basement windows, with or without outside window wells, are another problem (see Figure 5.7). Normally, the windowsills are close to the ground. If the sills are made of wood, they provide a good source of food for termites as well as being subject to rot. Ideally, wooden sills should be replaced with concrete. Walls with voids in them should be treated with termiticide, starting as close as possible beneath the window to ensure thorough coverage. The ground outside the window should also be treated. Ideally, window wells should be floored solidly with concrete, but they may be treated with termiticide by rodding next to the foundation.



**Figure 5.7.** An example of a concrete block foundation with basement window. Avenues of termite access are indicated by the heavy arrows in the soil (NPMA).

## DIRT-FILLED CONCRETE PORCH ON A FRAME HOUSE

This is a common type of construction throughout the country, and the principles involved apply to stoops and poured outside slabs at ground level, such as sidewalks and driveways (see Figure 5.8).



**Figure 5.8.** A common type of construction that involves a dirt-filled concrete porch attached to a frame house. Avenues of termite access are indicated by the heavy areas in the soil (NPMA).

Soil contact where the porch joins the house should be eliminated by tunneling along the foundation wall and removing the dirt. This is usually done by removing a portion of the porch wall at either or both ends and installing an access door. Soil removal can also be accomplished by knocking out portions of the foundation wall from inside the crawl space and then excavating soil from beneath the porch.

Where the tunneling leaves the porch poorly supported, it is necessary to install supplementary support, such as masonry piers. The soil along the outside of the foundation wall is then treated at the rate of 4 gallons of chemical per 10 linear feet, and the remainder of the accessible soil under the slab is flooded at the rate of 1 gallon of chemical per 10 square feet.

Some recommend that the entire area under the porch should be flooded sufficiently to treat all the soil under the porch. Others do not think this is necessary. If all of the soil is treated, termiticide is applied by drilling vertically through the porch slab at intervals along the porch foundation and at sufficient other points to ensure all the soil under the porch is reached. Foam applications may be of the most value in these situations.

## WOODEN PORCHES

Wooden porches with outside ground contact should have all wood cut off above ground level and supporting concrete placed under it. Wherever possible, wooden piers should be removed and replaced with concrete or

set on a concrete footing that extends at least 4 inches above grade level. Where this is not possible, treat the soil according to termiticide label directions. The soil all around the base of the pier should also be treated.

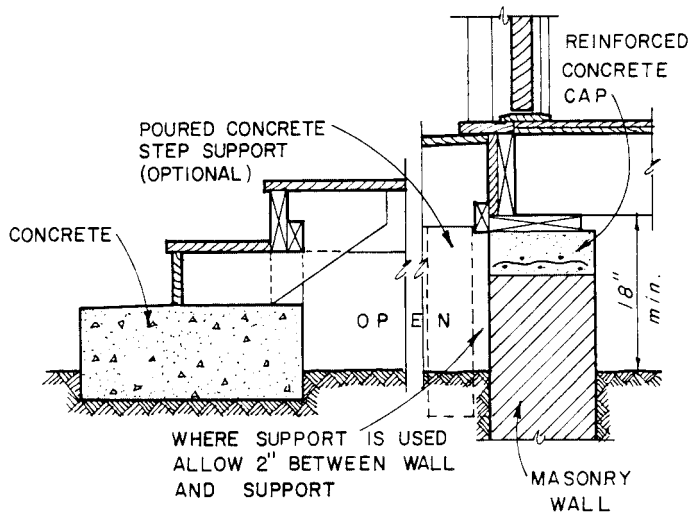


Figure 5.9. Construction of wooden steps of porch to prevent hidden termite entry (adapted from USDA).

## HOLLOW BLOCK, TILE, AND RUBBLE FOUNDATIONS

Sometimes termiticide will leak through these types of construction materials or vapor will escape from the uncapped tops of hollow blocks, causing residue problems. If this may be a problem, make sure all cracks and openings are sealed. If the mortar joints of rubble walls are in poor condition, the wall should be sealed with concrete. Low pressure or gravity should be used whenever treating the voids.

## WELLS, CISTERNS, AND OTHER WATER SOURCES

It is often difficult to control termites effectively where cisterns or wells exist without contaminating the water supply. Mechanical alteration, baiting, and direct wood treatment should be relied on as much as possible, even though the cost may be high. If soil treating is done, it should be done only sparingly and carefully.

Do not treat the soil beneath structures that contain wells, cisterns, or springs within the foundation walls. Unused wells should be filled, not just capped. The closer a water source is to the foundation, the greater the potential for contamination. In very dry weather, termiticides can move considerable distances along cracks and fissures in the soil. They also can move through small void areas between the soil, pipes, and casings. Swimming pools might be contaminated in the same manner. Sandy soils lessen the potential for these problems. Treat with extreme care adjacent to walls through which any water lines run. If the well is extremely close to the foundation, consider not treating that wall (with

the written permission and understanding of the owner). When wells are in the vicinity, be sure to check with the local authorities and comply with any special distance requirements.

A good general practice for treating soil next to foundation walls near wells and cisterns is to remove the soil from the grade to the footing and place it on plastic sheeting. Treat this soil outside of the foundation and let it dry thoroughly. Return the treated soil to the trench.

If the soil around a water pipe is to be treated, remove the soil completely from around the pipe and treat as above. Be sure that the treated backfill is completely dry before placing it in the trench. If the pipe is leaking, postpone the treatment until the leak is repaired. Alternative treatments to consider when well water contamination is a concern include the use of borate wood treatments and/or termite baiting systems.

## RIGID FOAM INSULATION BOARD

*When buildings contain foam insulation that directly contacts the soil, it is virtually impossible to eliminate termites with a soil treatment.*

Building methods that cause problems include:

- Concrete foundations between insulation boards.
- Rigid foam insulation board extending below grade level.
- Foam-filled concrete blocks.

Termites do not eat the foam but tunnel through the insulation to get to wood in the structure. This allows them to avoid contact with soil treatment barriers.

Termite infestations in foam insulation board often are not visible during an inspection. The property owner should remove outside foam to 6 inches above and below grade level to allow for proper treatment and future inspection. In crawl spaces, remove the insulation from the inside foundations in the same manner.

Control may be achieved by trenching and treating soil and backfilling where insulation board has been removed to below grade. This will create a soil barrier that interrupts termite access through the insulation.

Soil treatments will not prevent termite entry into structures that contain foam-filled hollow block foundations because voids cannot be properly treated. Termites can enter through a crack in the footing in this type of construction. The best treatment method for structures with in-ground foam insulation is to use termite baits.

## WOOD TREATMENT

Since the advent of soil treatment for termites, there has been little need for extensive wood treatment of structures; however, soil treatment is not possible for all structures, and in such cases the following wood treatment techniques provide some protection from termite attack.

## Borates

Borates are applied to wooden structural components in a water-based dilution that is absorbed into the wood fibers. They are applied to prevent termite attack. Because borates are stomach poisons and must be ingested by the termites to be effective, they will not prevent termites from tubing across treated wood to reach untreated portions of the structure. They generally do not have any contact residual effect. Borates are highly soluble in water and can leach out of treated wood. On the positive side, borates are easy to work with and generally considered low hazard. The borates will remain effective in the wood indefinitely if the treated wood is kept dry and out of contact with the soil. In addition to termites, the borates give protection against powderpost beetles and wood-destroying fungi.

## Wood Injection

Aerosol or liquid emulsion formulations of residual insecticides can be injected directly into termite galleries where termites are actively feeding in wood portions of the structure. The termiticide will bond with soil particles in the termite galleries as it does in soil to provide some extended residual. Treating wood surfaces with contact residual insecticides provides some short-term barrier effect but will not provide extended protection as does soil application. It may also be possible to inject aerosol

insecticides directly into holes drilled in wood, but it is difficult to achieve the complete saturation of all wood fibers necessary to prevent termite attack.

Wood treatment is most commonly used as a supplement to either a soil treatment or termite baiting because of the difficulty in treating all wooden components. Wood treatment can, however, provide limited control where soil cannot be treated because of the risk of groundwater contamination or subslab heating duct contamination.

## SUMMARY

To apply termiticides safely and effectively, you need to understand and recognize situations where application of liquid termiticides could lead to contamination of airflow systems or water sources. These situations include plenum crawl spaces, air ducts in non-plenum crawl spaces, subslab heating ducts, drains leading into basement sumps, and wells, cisterns, or other water sources located on a property. The pest management professional must be trained in methods for preventing termiticide contamination and leaks. In some situations, use of liquid termiticides may not be possible and the pest management professional may need to rely on alternative methods such as termite baits, mechanical alteration, and/or wood treatment for control.

---

**CHAPTER**  
**5**

# Review Questions

## Chapter 5: Other Treatments for Subterranean Termites

---

Write the answers to the following questions and then check your answers with those in the back of the manual.

1. Soil treatment with most termiticides should NOT be done:
  - A. As a subslab injection.
  - B. In a crawl space used as a plenum.
  - C. Under a hollow block foundation.
  - D. Under a poured foundation.
  - E. All of the above.
2. Which is true about non-plenum crawl spaces?
  - A. Air vents should be ducted to draw in air from outside the structure before treatment.
  - B. Air vents should be ducted to draw in air from inside the structure before treatment.
  - C. There is no danger of termiticide odor problems.
  - D. Never treat non-plenum crawl spaces with liquid termiticide.
  - E. All of the above.
3. When treating slabs containing or covering heating ducts, you should reconsider treating if the ducts:
  - A. Are made of material containing cellulose.
  - B. Have soil or sand bottoms.
  - C. Have standing water.
  - D. All the above.
4. What is true concerning application of termiticide under or around subslab heating ducts?
  - A. Use high pressure to keep termiticide from backing up into the duct.
  - B. Use of a subslab injector is highly recommended.
  - C. Rodding from outside may be the best treatment procedure.
  - D. Vertical drilling through the duct may be the best treatment procedure.
5. In treating under and around subslab heating ducts, what should be done after drilling is completed but before treatment?
6. After treating a structure with subslab heating ducts, what should be done if a strong odor persists?
7. Which is true about controlling termites in basements with French drains and sump pumps?
  - A. It is best to treat when the soil is wet.
  - B. There is no danger of draining contaminated water into the sump.
  - C. It is not necessary to observe the sump during treatment.
  - D. It may be best to drill test holes first before proceeding with treatment.

8. What should be done to correct situations in which wooden members extend through the concrete in the basement floor?
9. Before treating a basement on the outside:
- A. Turn all electric outlets off.
  - B. Fill the sump (if present) with water.
  - C. Check foundation walls for cracks.
  - D. Close all doors and windows.
10. How should termite infestations be controlled around basement windows with wooden sills?
11. The principles used to control termites in dirt-filled concrete porches also apply to:
- A. Plenum crawl spaces.
  - B. Rigid foam insulation board.
  - C. Wells, cisterns, and other water sources.
  - D. Stoops, sidewalks, and driveways.
12. Which is NOT true about termite control operations around dirt-filled concrete porches on frame houses?
- A. Soil contact where the porch joins the house should be eliminated by tunneling along the foundation wall and removing the dirt.
  - B. Removing dirt and installing termite bait stations provides the best control.
  - C. Termiticide may be applied using horizontal rods under the slab.
  - D. It may be necessary to install temporary support such as masonry piers.
  - E. B & D
13. What are the recommendations for termite control around wooden porches?
14. What problem might occur with termiticides applied around hollow block, tile, and rubble foundations, and how can it be prevented?
15. Which is true about termite control around wells, cisterns, and other water sources?
- A. The closer a water source is to the foundation, the smaller the likelihood of contamination with liquid termiticides.
  - B. Sandy soils increase the potential for contamination with liquid termiticide.
  - C. In dry weather, termiticides cannot move great distances in the soil.
  - D. Mechanical alteration and direct wood treatment should be relied on as much as possible.

16. If soil treatment is to be made near foundation walls near wells or cisterns, a good general practice is to:
- A. Trench only.
  - B. Short rod only.
  - C. Remove the soil to the footing, place it on plastic sheeting and treat, then replace it.
  - D. Treat the soil surface with a light spray and cover with bark chips.
17. Rigid foam insulation board below grade:
- A. Repels termites 100 percent.
  - B. Allows termites to avoid soil treatment barriers.
  - C. Provides a good food source for termites.
  - D. Is never a factor in termite control.
18. What should be done to allow proper inspection and control of termites around rigid foam insulation board?
19. What is the best treatment method for structures with in-ground foam insulation (i.e., foam-filled hollow block foundations)?
- A. Termite baits
  - B. Long rodding
  - C. Trenching
  - D. Short rodding
20. Soil treatment to control termites is not always possible in all structures.
- A. True
  - B. False
21. Which is true about the use of borates to control termites?
- A. Borates are contact poisons that are absorbed through the skin.
  - B. They prevent termites from tubing across treated wood to reach untreated portions of the structure.
  - C. They are highly soluble in water and can leach out of treated wood.
  - D. They have a residual effect.
  - E. A & D
22. Which is true about wood injection of aerosol or liquid emulsion formulations of insecticides to control termites?
- A. They can be injected directly into termite galleries and have some extended residual effect.
  - B. Treating the wood surface will provide a long-term effect as in soil treatment.
  - C. It is commonly used as a replacement for soil treatment.
  - D. Aerosol insecticides easily achieve complete saturation of all wood fibers when injected into holes.
  - E. A & D

