CHAPTER 4

SOIL TREATMENT FOR SUBTERRANEAN TERMITES

LEARNING OBJECTIVES

After completely studying this chapter, you should:

- Know the basic types of building foundations.
- Understand the techniques used to treat soil for control of subterranean termites.
- Understand how cracks and voids in foundations are treated to control subterranean termites.
- Know the various types of pre- and postconstruction methods for controlling termites.
- Know the techniques used to treat subterranean termite infestations for various types of building construction.
- Understand how termite entry points vary, depending on factors such as foundation type, walls, and flooring.
- Know how to calculate linear feet and square feet and to interpret a termiticide label so that the right amount of termiticide will be applied in both vertical and horizontal treatments.

This chapter discusses termite control procedures used for various types of building construction. It is important to remember that foundations can be of three general types: slab, basement, and conventional (crawl space). Each of these types of construction has structural features that require specialized attention to establish a physical or chemical barrier that prevents termite entry into a building. For example, treatment outside the structure may involve **trenching** and treating or **rodding** to treat the soil on the outside of the foundation, rodding beneath slabs, or vertical drilling and treating of outside slabs, stoops, or porches. Treatments inside may involve trenching and treating the soil along foundation walls in crawl spaces, vertical drilling and treating slab foundations, rodding around bath traps and other utility openings, or treating wood directly. The examples that follow will outline the procedures to use in controlling subterranean termites for these and other elements of construction.

FOUNDATION TYPES

There are three basic foundation types pest management professionals may encounter in termite control operations—**slab-on-ground, crawl space** (including **plenum**

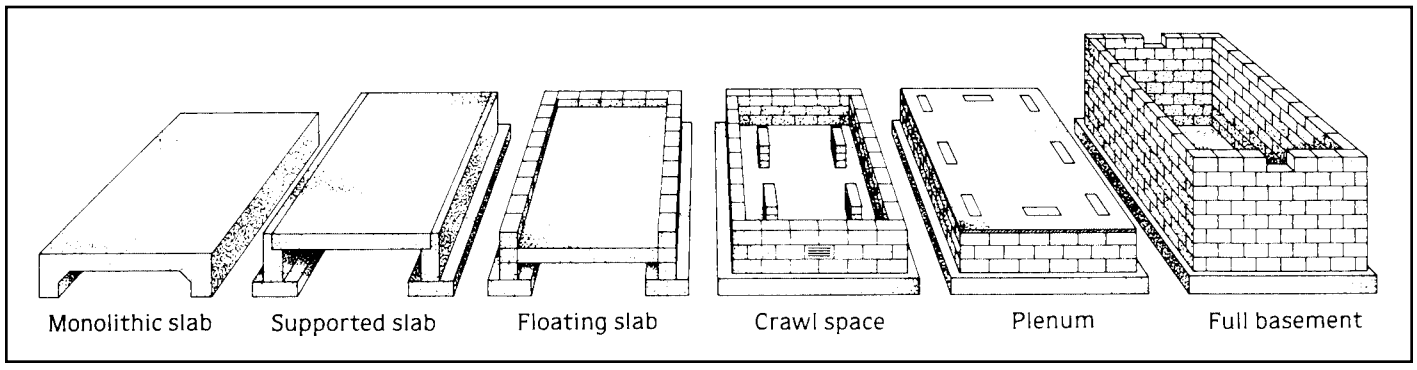


Figure 4.1. Foundation types (Mallis, *Handbook of Pest Control*, 7th Edition).

crawl space) and **basement**. Treatment procedures for each foundation type will differ somewhat. Slab-on-ground construction consists of three types—**floating**, **monolithic**, and **suspended slab**. Termite entry points vary in each slab type, thus different treatment procedures are required. Plenum crawl space construction will be encountered more rarely and is covered in Chapter 5. Finally, basement construction is common in Michigan and requires special consideration especially where there is a French drain or a sump pump (see Chapter 5).

Slab-on-ground

This type of construction is used extensively. Because of the hazard of drilling through heat pipes or ducts, electric conduits, and plumbing imbedded in the floor, it may be advisable to treat from the outside by drilling through the foundation wall. Mechanical alteration is not usually necessary with this type of construction. The three basic types of slab-on-ground construction are floating slab, monolithic slab, and suspended slab (Figures 4.1-4.3).

In **floating slab** construction, the foundation wall and footing are separated from the slab floor by an expansion joint. The slab floor is concrete; the foundation wall can be a variety of materials, such as solid block, hollow block, or concrete.

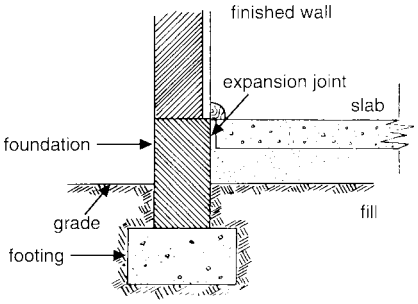


Figure 4.2. Floating slab construction.

In **monolithic slab** construction, the foundation footing and the slab floor are formed as one continuous unit. Concrete is the material used in this type of slab foundation.

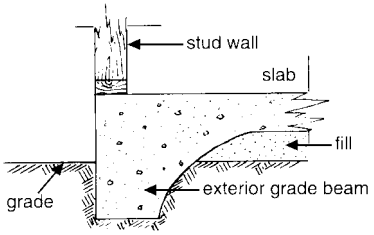


Figure 4.3. Monolithic slab construction.

In **suspended slab** construction, the slab floor and the foundation wall are separate units, with the slab floor extending over the top of the foundation wall. The slab floor is concrete; the material used for the foundation wall may vary.

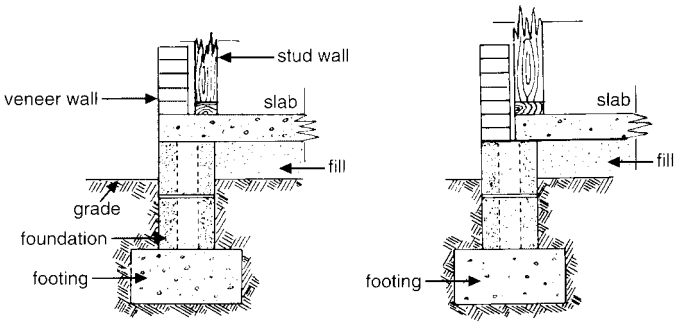


Figure 4.4. Suspended slab construction.

Crawl Space Construction

A **crawl space** is a shallow space below the living quarters of at least a partially basementless house. It is normally enclosed by the foundation wall (see Figure 4.4). Crawl spaces are usually less than 3 feet high with exposed soil underneath. This type of construction is common in many parts of the country. The exposed soil and the short distance to floor joists and sills make crawl spaces an ideal place for termites to find and infest wood.

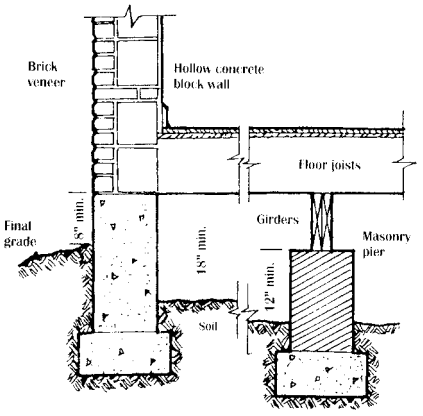


Figure 4.5. Crawl space construction.

Basement Construction

Though buildings with basements are less susceptible to termite attacks than slab-on-ground construction, basements do have their unique areas vulnerable to termite entry. It is important to remember that termites can enter though any crack or crevice as small as 1/32 of an inch.

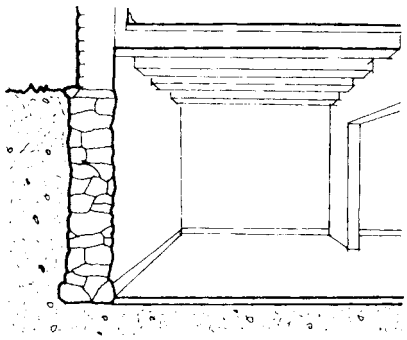


Figure 4.6. Basement construction.

SOIL AND FOUNDATION TREATING

Soil treating consists of applying termiticides to the soil under and adjacent to a building to create an impervious chemical barrier. A continuous barrier should be established along the inside and the outside of the foundation, under slabs, and around utility entrances.

Traditionally, soil is treated with chemicals to establish a barrier that is lethal or repellent to termites. The chemical must be adequately dispersed in the soil to provide a barrier to all routes of termite entry. A thorough and uniform barrier also prevents the termites that are feeding in the structure from returning to the soil for moisture. This causes their death by either dehydration or contact with residual termiticide.

Effective soil treatment depends on dispensing a sufficient amount of chemical to establish a barrier wherever

there are termite entry points in each type of construction. The amount of chemical applied is determined by the concentration of the formulation used and the rate of application specified on the product label.

Proper uniform soil treatment eliminates the need for wood treatment except where there is a moisture source that could sustain the termite colony above the soil level. However, additional wood treatment may accelerate the elimination of infestations.

Foundation treating is the application of termiticide to a foundation to make it impervious to termites. The objective is to place termiticide in all cracks at the footing as well as through cracks in the foundation wall that may lead to the ground outside. Treating the inside of hollow concrete block walls is another example of foundation treating.

PRECONSTRUCTION TREATMENT

The easiest time to apply a chemical barrier is before construction, and pretreatment should be encouraged whenever possible. The soil below all slabs should be treated before they are poured. Treatment should be both under horizontal surfaces and adjacent to vertical surfaces. The concentration and rate specified on the product label must be strictly followed. It is illegal to use less than or more than any rate or concentration specified on the label for preconstruction treatment.

Termite baiting systems also may be used to detect and treat termites entering buildings under construction, especially where groundwater contamination is a concern.

POSTCONSTRUCTION TREATMENT

Depending on the type of construction, a treatment will include one or more of the following: mechanical alteration, soil treatment, foundation void treatment, wood treatment, and baiting.

GENERAL TREATMENT GUIDELINES

The following general treating specifications apply to all slab types and may also apply to crawl space and basement construction.

Exterior Soil Treatment

Soil may be treated by rodding or trenching. **Rodding** is the injection of termiticide into the soil through a long pipe inserted at appropriate intervals (4 to 12 inches apart, depending on the soil type and other factors). In this way, termiticide can be carried to the level of the footing. Another method for applying termiticide to soil is by **trenching**. In this method, soil is removed to within about 1 foot above the footing. As the soil is replaced, it is treated with termiticide at the rate of 4 gallons per 10 linear feet for each foot of depth from grade level to footing. Whenever possible and practical, the soil should be saturated with termiticide to the footing. If treatment of the exterior soil to the top of the footing is not possible, it will be necessary to indicate clearly to the customer that your treatment is considered either a "spot treatment" or "limited treatment." Many pest management professionals use a combination of trenching and rodding, especially if the footing is very far below grade level.

Figure 4.7. A typical basement treatment will also include trenching and rodding the outside perimeter of the foundation.

Exterior Slab Treatment

An exterior concrete slab that abuts the structure complicates outside treatment. Poured slabs such as sidewalks, patios, and carports should be vertically drilled and treated no more than 12 inches apart. It may be necessary to vary the concentration and volume, as allowed by the termiticide label, to treat thoroughly under slabs.

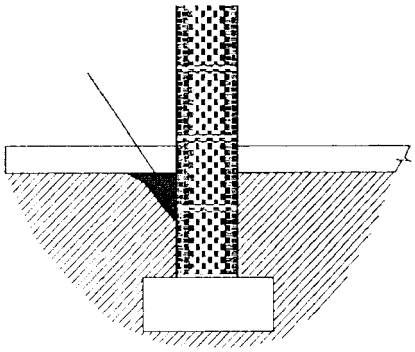


Figure 4.8. Exterior slab treatment (dark shading shows area treated).

Treatment of Foundation Voids in Slab Construction

Drill and treat concrete block foundation voids. It is very important that the holes be drilled at a height that is as close to the outside grade level as possible but not above the top of the slab

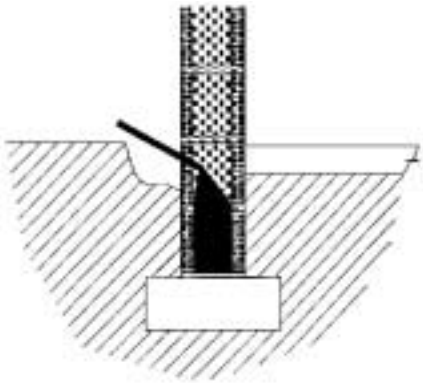


Figure 4.9. Foundation void treatment (dark shading shows area treated).

inside. Every void should be treated in the block. In the event of spillage, the area around all leaky drill holes must be cleaned. After cleaning, fill all holes to prevent exposure to the occupants.

Caution: Special care must be taken to ensure that the chemical does not puddle and flow out over the inside slab floor. If the soil line is above the slab line, it may be necessary to trench below the slab line to safely treat block voids at a point of entry below the inside slab line.

Treatment of Brick or Stone Veneer

Drill and chemically treat brick veneer voids only where the brick ledge is below grade level. Holes measuring approximately 1/4 or 3/8 inch in size must be drilled from the outside into the masonry between bricks and the void chemically treated. Generally, these holes should be drilled in every other brick.

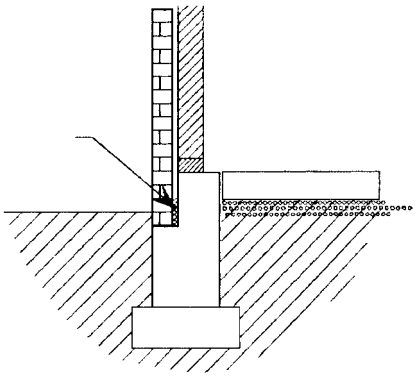


Figure 4.10. Treatment of brick or stone veneer (arrow points to treatment of void).

Introduce enough termiticide to completely flood the void to the footing or base. The holes should not be drilled above the top of the foundation for basements or above the level of the interior slab in slab construction unless the slab is at exterior grade level or lower. Use enough pressure to spread the chemical and completely cover the voids. Holes drilled in outside brick walls should be sealed after treatment.

Where it is not possible to drill and treat below the top of the foundation or interior slab level, it may be necessary to trench and treat the soil to below the brick ledge. This method will eliminate the need to drill and treat the void and also reduce the risk of accidental spillage into the interior of the structure.

Interior Treatment Methods

Soil treatment of the inside perimeter of a slab adjacent to the foundation can be accomplished by any one of three methods: **vertical drilling**, **short rodding**, or **long rodding**.

Vertical drilling

Vertical drilling is the most common method of interior slab treatment. Vertically drill through the slab floor adjacent to the perimeter foundation with holes no more than 12 inches apart. Inject the termiticide under low pressure so that it will overlap in the soil between holes adjacent to the foundation.

In addition, treat along each support wall and wood partition within the structure. In the case of a masonry support foundation that extends through the floor and rests on a footing, it will be necessary to drill and treat soil adjacent to both sides of the wall. Clean up the drill dust as you proceed. After treatment, be sure to plug the holes and finish the surface in a manner that the customer has previously agreed upon.

Caution: Take special care to identify the location of any heating ducts, water lines, or electrical conduits embedded in the slab before beginning treatment to prevent damage, injury, or contamination.

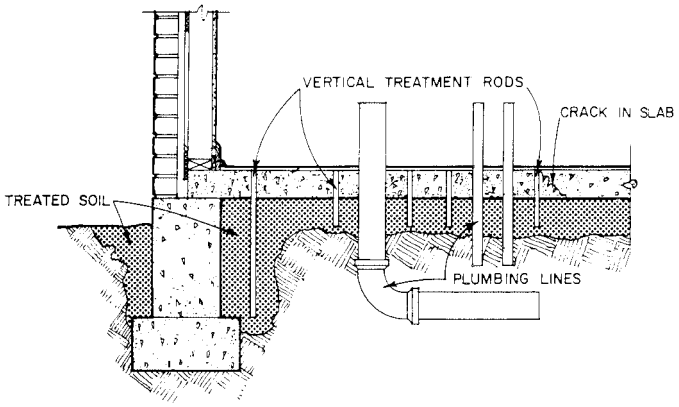


Figure 4.11. Treatment under concrete with vertical drilling at joints, cracks and openings, and around plumbing.

Short Rodding

Short rodding refers to a procedure conducted from outside a structure. Short rodding from the outside may be preferable when no access is available inside. Floor coverings; plumbing such as bathtubs, sinks or showers; cabinets or other furnishings may obstruct access to drilling from the inside. Damage to finished flooring inside the structure may prevent drilling through the slab.

To reach the subslab soil area, drill a series of holes through the foundation about 12 inches apart. Drill through both sides of the concrete into the area precisely below the expansion joint at the edge of the slab. Then, insert the rod into the area to receive treatment. Apply the chemical under low pressure. Saturate as much as possible all of the soil around the expansion joint area. This will cause treatment to overlap in the spaces between the holes and produce a continuous barrier. If you have properly spaced the holes, all important parts of the structure and the soil interface will receive treatment.

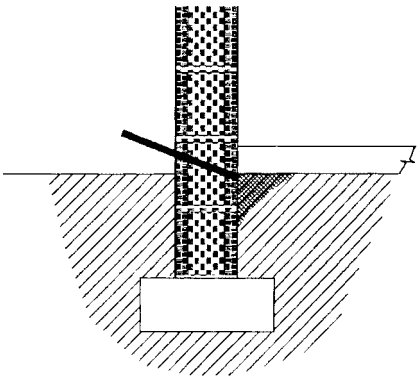


Figure 4.12. Short rodding (dark shading shows area treated).

Long Rodding

Long rodding horizontally through the exterior foundation just below the slab level and under the slab adjacent to the foundation is another treatment method for slab construction where the bottom of the interior slab can be accessed. As in short rodding, it is necessary to determine the precise location of the bottom of the slab to ensure that no untreated soil layer remains above the treatment zone and to allow for easier insertion of the rod for the length of the treatment to be achieved. This method has similar benefits to the short rod method, with the added advantage of possible access behind concrete porches. However, long rodding for any significant distance may leave untreated areas if the rod veers away from the foundation down into the soil.

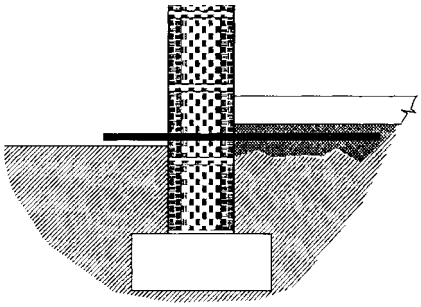


Figure 4.13. Long rodding (dark shading shows area treated).

TREATMENT GUIDELINES—SLAB CONSTRUCTION SPECIAL CASES

Termite treatment guidelines will vary, depending on factors such as the type of slab construction, the foundation type, the materials used for the frame walls or flooring, and the termite entry points under certain elements of construction. Described below are some building construction situations that affect treatment guidelines.

Floating Slab Construction with Concrete Block Foundation and Walls

When the walls and foundation are made of concrete blocks, preventing termite entry through block voids is a primary concern. The block voids need to be treated with termiticide below the soil line.

Termite entry points

In this type of construction, there are three major entry points. Termites may come from the subslab area, up through the expansion joint at the edge of the slab and into the furred wall as shown, and up through a crack in the floor beneath a wood partition. They may proceed up this space to feed on door jambs, window frames, and even the roof.

Termites can gain access into the concrete block voids and travel upwards into the same areas. This allows them access to nearly all of the wood structural members in the house, as well as to any framing and molding.

Another less common method of termite entry is from the outside soil, up over the block surface, into a crack or void in the masonry, and upward through the concrete block voids or directly over into the furred wall. This is more common when there is an attached outside slab such as a sidewalk or carport that abuts the exterior structure, leaving an expansion joint as well as a protected cover for termite activity.

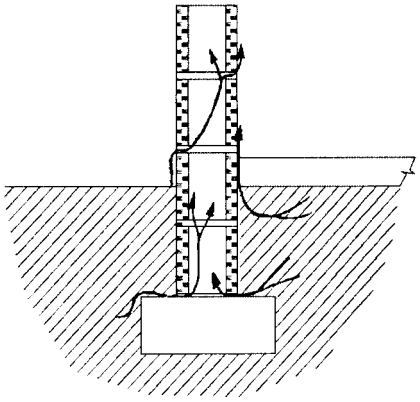


Figure 4.14. Block foundation–floating slab (arrows indicate possible termite entry points).

Treatment procedures

- Trench and/or rod exterior soil.
- Drill and treat beneath exterior slabs adjacent to foundation.
- Treat interior foundation walls by vertical drilling, short rodding, and/or long rodding.
- Vertically drill and treat adjacent to interior walls and partitions, where necessary.
- Drill and treat foundation voids.
- Treat wood that has accessible termite galleries.
- Repair and plug all drilling holes.

Completion

This composite diagram shows the total protection of the structure by thoroughly treating the voids in the concrete blocks, the soil in the subslab area at the expansion joint, and the soil around the outside perimeter of the building. The wood should be treated whenever a need is indicated.

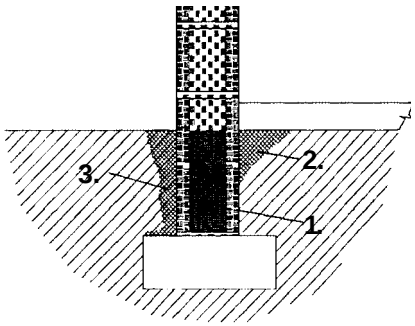


Figure 4.15. Completed treatment of block foundation—floating slab showing treatment of 1. the voids in the concrete blocks, 2. the soil in the subslab area at the expansion joint, and 3. the soil around the outside perimeter of the building.

Floating Slab Construction with Concrete Foundation and Brick Veneer on Wood Frame

In this type of construction, treating brick veneer voids to prevent infestation of the wood frame is a primary concern.

Termite entry points

A solid concrete foundation eliminates some of the voids that commonly permit termite entry, but termites frequently will penetrate up through the slab expansion joint. They also will move from the outside soil area, through the brick veneer, into the void space, and directly into the wood framing.

Less commonly, termites may build tubes up over the exterior brick veneer surface, find openings through the

masonry, and gain access to the void space and wood structural members.

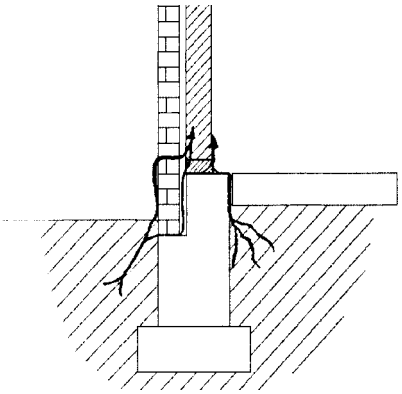


Figure 4.16. Poured foundation—brick veneer (arrows indicate possible termite entry points).

Treatment procedures

- Trench and/or rod exterior soil.
- Drill and treat beneath exterior slabs adjacent to foundation.
- Treat interior foundation walls by vertical drilling and/or long rodding.
- Vertically drill and treat adjacent to interior walls and partitions.
- Drill and treat brick veneer voids.
- Treat wood that has accessible termite galleries.
- Repair and plug all drilling holes.

Completion

This composite diagram shows the total protection afforded to the structure by thoroughly treating the voids in the brick veneer, the subslab soil area along the expansion joint, and the soil around the outside perimeter of the building to a point lower than the bottom of the veneer.

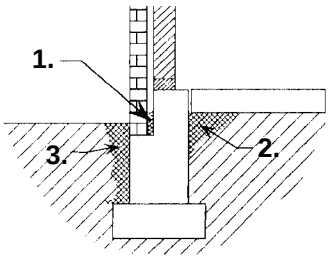


Figure 4.17. Completed treatment of poured foundation—brick veneer showing treatment of 1. the voids in the brick veneer, 2. the subslab soil area along the expansion joint, and 3. the outside perimeter of the building.

Monolithic Slab with Tile or Terrazzo Finished Floor

Terrazzo consists of white or colored grout with ornamental stones divided into sections with brass strips and ground to a smooth finish. This type of floor is common in commercial and institutional buildings and is considered high-quality flooring. The property owner must thoroughly understand the necessity of drilling the terrazzo and the various methods of repairing the drill holes. A sharp bit and steady pressure are required when drilling terrazzo to prevent chipping around the edge of the drill hole. One method is to apply light pressure on the drill while quickly hitting and releasing the trigger. This prevents the bit from jumping about and damaging the surface of the floor.

Terrazzo may be patched by saving the drilling dust so that a portion of the dust can be mixed with quality cement. With experience, the mixture can be made to closely match the original floor. If this method of repair is not acceptable to the property owner, then a professional terrazzo floor company can be contacted to patch the drill holes. How the patching will be done should be established before any drilling is started.

Termite entry points

The arrows indicate the very few possible entry points for termites under a perfectly formed monolithic slab. The figure shows how termites might travel up the outside wall and into the brick veneer, particularly if the brick veneer extends down below the soil line. With concrete block construction, termites would have to come up over the solid foundation and into the block masonry to gain access to the house. Therefore, these areas are not the main source of problems in monolithic slabs. Problem areas are limited to the openings for pipes and plumbing, the soil line, any faults or cracks in the slab, and any grading stakes or other embedded articles that termites might use to gain access through the slab. Void treatment is not necessary unless there is a veneer of brick, stone, or stucco that extends below grade.

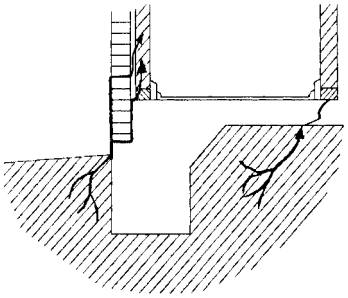


Figure 4.18. Monolithic slab—tile floor (arrows indicate possible termite entry points).

Treatment procedures

- Trench and treat exterior soil.
- Drill and treat beneath exterior slabs adjacent to foundation.
- Vertically drill and treat adjacent to interior partition walls where necessary.
- Drill and treat brick veneer or foundation voids where they extend below outside soil.
- Treat wood that has accessible termite galleries.
- Repair and plug all drilling holes.

Completion

This composite diagram shows the total protection afforded the structure by thoroughly treating the soil around the exterior perimeter of the building to a point lower than the bottom of the veneer and the soil beneath interior wood partition walls. Foundation voids should be treated if they extend below exterior grade level.

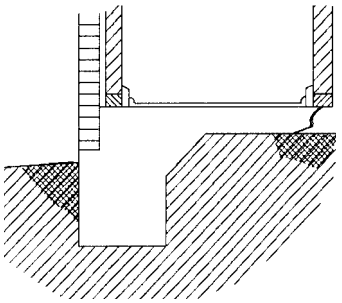


Figure 4.19. Completed treatment of monolithic slab—tile floor (dark shading shows areas treated).

Special considerations—monolithic slabs

Treating soil next to the interior perimeter of the foundation, which is required in almost all other types of construction, may not be necessary in this case. However, soil treatment around the exterior is very important, particularly if there are veneers (such as brick) near the soil line.

Trenching and treating is the most practical method. Remember to treat any backfill.

Rodding does not need to be done because there is no advantage here in deep soil chemical treatment. Wood treatment also is not required unless there is a reason for doing so. No routine treatment of wood is done in monolithic slab construction.

When drilling and rodding, use caution around sewer pipes, heating ducts, plumbing, plenums, electrical wiring, etc.

On monolithic slabs, a very careful inspection needs to be made to determine exactly how termites have gained access and to find those areas where they might gain access. The construction of access plates, doors and panels to permit inspection of the entry points of plumbing, bath traps, conduits, etc., constitutes the major part of treatment to this type of structure, together with soil treatment around the outside perimeter.

Wood Over Slab

To treat the soil under a slab covered by a wood floor, both the wood and the slab should be drilled and treated in a checkerboard pattern to ensure adequate coverage. It may also be advisable to treat the wood with borates. The wooden floor may also need to be removed to facilitate treatment. After treatment, all holes in both the slab and wood floor must be plugged and filled.

TREATMENT GUIDELINES FOR CRAWL SPACE CONSTRUCTION

All cellulose-containing trash and debris must be removed from the crawl space to aid in proper treatment, reduce chances of future attack, and aid in future inspections. Treat the soil adjacent to both sides of foundation and support walls and around piers, plumbing lines, or other points of access by trenching and/or rodding. If the foundations or piers have hollow voids, these areas also must be treated to prevent termite access through a crack in the footing. The soil beneath exterior porches next to the foundation should be treated by vertical drilling, horizontal rodding, or excavation to gain access for treatment.

To control infestations occurring along interior walls or around supporting piers of houses with crawl spaces, dig a trench 6 to 8 inches wide and a few inches deep next to the walls or piers, taking care not to go below the top of the footing. When the top of the footing is exposed, the commercial pesticide applicator must treat the soil adjacent to the footing to a depth not to exceed the bottom of the footing. If the land slopes or if the footing is more than 12 inches deep, make crowbar, pipe, or rod holes about 1 inch in diameter and a foot apart in the bottom of the trench. The holes should go to the footing(this will help distribute the chemical evenly along the wall.

The trench along the exterior foundation wall is also made 6 to 8 inches wide, and up to a foot deep. If needed, holes are also made in the trench bottom, as described for the trench along the interior wall.

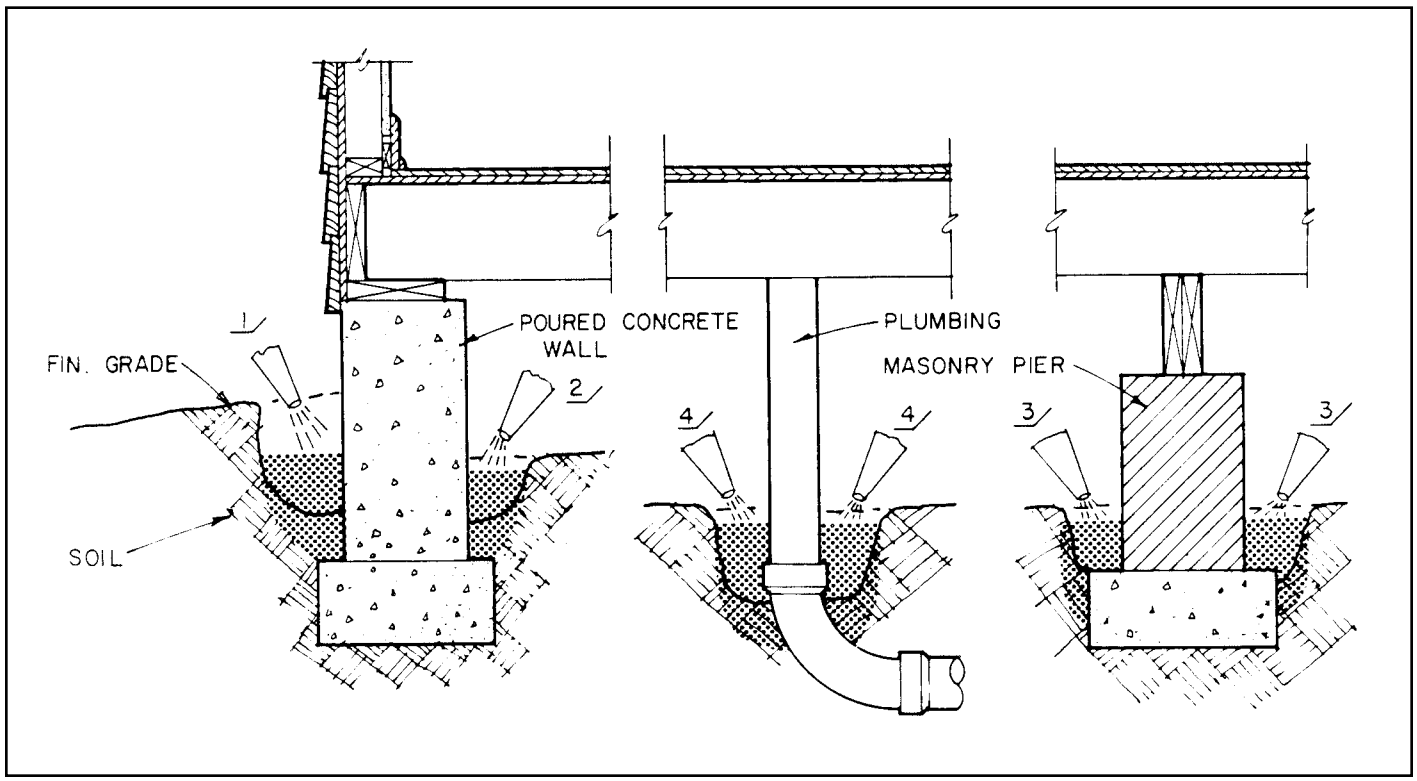


Figure 4.20. Application of chemical to crawl space construction. Soil treatment (1) along outside and (2) inside foundation wall; (3) around pier and (4) plumbing (adapted from USDA).

TREATMENT GUIDELINES FOR BASEMENT CONSTRUCTION

Where termites are coming from beneath the concrete floor in the basement, remove any wood that may extend into the ground, treat the soil, and then seal cracks or holes with a dense cement mortar. When the infestation is located between the floor and wall (expansion joint) or around a furnace, make a series of holes, spaced about 1 foot apart, through which a chemical can be poured or injected. Holes along a wall should be made about 6 to 8 inches from it, so as to clear the footing and reach the soil beneath.

When the infestation occurs along the exterior foundation wall in houses having full basements, it is necessary to treat the soil to a greater depth than is required for other types of houses. The trench is prepared in the same way, but the pipe or rod holes should extend down to the top of the footing to aid in proper distribution of the chemical to all parts of the wall. This is especially important in masonry foundations with numerous mortar joints below grade that may be susceptible to termite attack.

Termite entry points

Typical entry points to basements are marked. These will be the same as in a floating slab construction i.e., up through the slab expansion joint or from the outside soil area through the brick veneer. They may also come up from cracks in concrete slabs and into wooden support members.

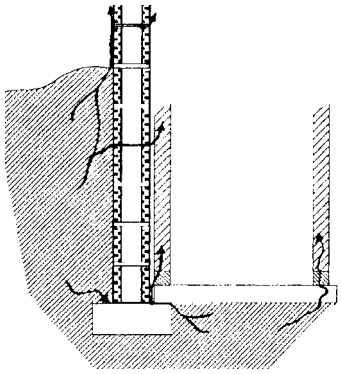


Figure 4.21. Basement construction (arrows indicate possible termite entry points).

Treatment Procedures

- Trench and/or rod exterior soil.
- Drill and treat beneath exterior slabs adjacent to the foundation.
- Treat adjacent to interior foundation walls by vertical drilling.
- Vertically drill and treat adjacent to interior partition walls where necessary.
- Drill and treat any brick veneer voids.
- Drill and treat any foundation voids.
- Treat wood that has accessible termite galleries.
- Repair and plug all drilling holes.

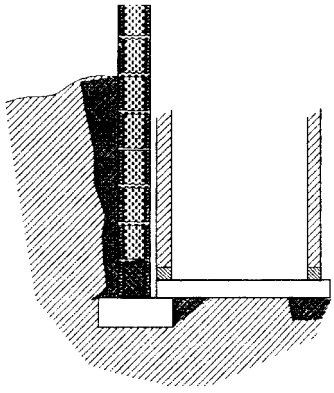


Figure 4.22. Completed treatment of basement construction (dark shading indicates areas treated).

Completion

The composite diagram, Fig. 4.22, shows the total protection afforded by completing the recommended treatment procedures.

Special Considerations—Basements

The soil treatment techniques for basements are the same as described for floating slab construction on the exterior and interior of the structure. If treatment of the exterior soil to the top of the footing is not possible or practical, it will be necessary to indicate clearly to the customer that your treatment is considered either a "spot treatment" or "limited treatment." Brick and stone veneer should be drilled and treated only if it extends below grade level, and then treatment should be made only below the top of the foundation wall to prevent accidental contamination of the interior. Treat hollow foundations from the interior in the case of unfinished walls, and then only at the bottom course of block just above basement floor level. In the case of a block, rubble, or other masonry foundation wall construction with interior finished walls, use extreme caution in treating exterior soil and voids in the foundation—the termiticide may seep into and contaminate the structure.

RETREATMENTS FOR SOIL-APPLIED TERMITICIDES

Never make routine or annual retreatments. Retreatments are generally made only if there is evidence of reinfestation, if the initial treatment was inadequate, or if the chemical barrier has been broken by moving soil around the structure. The retreatment is normally a partial treatment in the areas of infestation or soil disturbance and should be recorded as a partial or spot treatment on the statement of services.

TERMITE CALCULATION PROBLEMS AND SOLUTIONS

Use of a termiticide involves determining the area to be treated in **linear feet** or **square feet**. In some cases, both measures must be determined, depending on the type of treatment (pre- or postconstruction) and construction features. At the end of this chapter, you will find examples that illustrate methods of calculating area and linear measure, as well as linear measure per foot of depth. The examples are illustrations only and are not given as values to be used in determining the volume of water emulsion or solution needed to treat a structure of similar shape and dimension because construction features may vary from site to site. These samples are provided to assist with interpretation of real pesticide labels and with calculation of the right amount of pesticide to be applied to a given area. These problems can be solved using the "Termite-Icide" label following the problems.

SUMMARY

Whenever possible, preconstruction treatment to prevent termite infestations is the best method for controlling termite problems. Whenever pre- or postconstruction treatment is needed, the pest management professional must be aware of the various aspects of building construction to apply termiticide to the appropriate places. The goal is to establish a continuous chemical barrier that will eliminate the termite colony and prevent reinfestation.

CHAPTER 4

Review Questions

Chapter 4: Soil Treatment for Subterranean Termites

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

1-4. Match the following construction types to the appropriate description:

A. Floating slab

B. Monolithic slab

C. Suspended slab

D. Crawl space

____ 1. The foundation footing and the floor are formed as one continuous unit.

____ 2. Exposed soil and short distance to floor joists and sills (usually less than 3 feet) make ideal places for termites to find and infest wood.

____ 3. The floor and the foundation wall are separate units, with the floor extending over the top of the foundation wall.

____ 4. A common termite entry point is through the expansion joint between the foundation wall and floor.

5. Which is true about soil treating?

A. Spot treatment of the soil is usually sufficient to control termites.

B. The objective is to establish a continuous barrier along the inside and outside of the foundation, under slabs, and around utility entrances.

C. Soil treating includes treatment of hollow concrete block walls.

D. Soil treating is the application of termiticide to a foundation to make it impervious to termites.

E. A & B

6. Which is true about foundation treating?

A. Foundation treating consists of the application of termiticides to the soil under and adjacent to a building to create an impervious chemical barrier.

B. Treating the hollows in concrete block voids is not necessary.

C. The objective is to place termiticide in all cracks at the footing as well as through cracks in the foundation wall.

D. It is useful only if done as a preconstruction treatment.

E. A & D

7. The easiest time to apply a barrier treatment for termite control is:

A. April to June.

B. During construction.

C. When water is around the footings.

D. August to October.

8. Describe rodding vs. trenching for exterior soil treatment.

9. When trenching or rodding building exteriors, saturate the soil to the level of:

A. The foundation floor.

B. One foot below the foundation.

C. The top of the footing.

D. Six inches below the footing.

10. When an exterior concrete slab abuts the structure, it should also be vertically drilled and treated no more than 12 inches apart.

A. True

B. False

11. Holes drilled to treat concrete block foundation voids in slab construction should:

A. Be drilled at a height that is close to the outside grade level but not above the top of the inside slab.

B. Be drilled at a height above the outside grade level but not above the top of the inside slab.

C. Be drilled at a height below the outside grade level but above the top of the inside slab.

D. Be drilled at a height that is close to the outside grade level but above the top of the inside slab.

12. Drill and treat brick or stone veneer only when the brick ledge is:

A. 2 feet above grade.

B. 1 1/2 feet above grade.

C. 1 foot above grade.

D. Below grade.

13. The most common method of interior slab treatment is:

A. Vertical drilling.

B. Short rodding.

C. Long rodding.

D. Trenching.

14. A preferred option to vertical drilling, when no access is available from inside, is:

A. Direct wood treatment.

B. Trenching.

C. Short rodding.

D. Subslab fumigation.

15. When might vertical drilling from inside not be possible?

16. Vertically drilled holes should be no more than _____ apart and injected under _____ pressure.

A. 12 inches…low

B. 12 inches…high

C. 18 inches…low

D. 18 inches…high

17. Long rodding has similar advantages to _____ for treating under interior slab construction.

A. Short rodding

B. Vertical drilling

C. Subslab fumigation

D. Trenching

18. List an advantage and a disadvantage of long rodding.

19. What are three major termite entry points in floating slab construction with concrete block foundation and walls? What is a fourth possible entry point?

20. What precautions must be taken when drilling terrazzo flooring? How can drill holes be repaired?

21. What are the main problem areas for termite entry in monolithic slab construction?

22. When is void treatment necessary in monolithic slab construction?

23. What is the most practical method to treat soil in monolithic slab construction?

A. Vertical drilling

B. Short rodding

C. Long rodding

D. Trenching

24. Most kinds of construction require interior perimeter treating of the foundation. The exception is:

A. Monolithic slab.

B. Block foundation with floating slab.

C. Basement construction.

D. Crawl space.

25. Wood treatment is most likely required in monolithic slab construction.

A. True

B. False

26. Postconstruction treatment of a crawl space should include treating the foundation, around the piers, support walls, and:

A Floor joists.

B. Sill plates.

C. Plumbing lines.

D. Wall studs.

27. What are treatment recommendations to control termite infestations along interior walls or around supporting piers of houses with crawl spaces? What should be done if the land slopes or if the footing is more than 12 inches deep?

28. What are the treatment recommendations to control termite infestations along the exterior foundation wall of houses with crawl spaces?

29. Typical termite entry points for basement construction are the same as for:

A. Monolithic slab.

B. Floating slab.

C. Crawl space.

D. Plenum.

30. What is different about exterior foundation treatment in houses with full basements?

31. What should be done to treat basements where the termites are coming in from beneath the concrete floor? What treatments are recommended when the infestation is located between the floor and wall (expansion joint)?

32. Why is it important to be extremely cautious when treating exterior soil and voids in basements with block, rubble, or other masonry foundation wall construction with interior finished walls?

33. Routine soil retreatments for termite control should:

A. Never be made.

B. Be applied every 2 years.

C. Be applied every 3 years.

D. Be applied every 4 years.

TERMITE CALCULATION PROBLEMS (for solutions, refer to Appendix A)

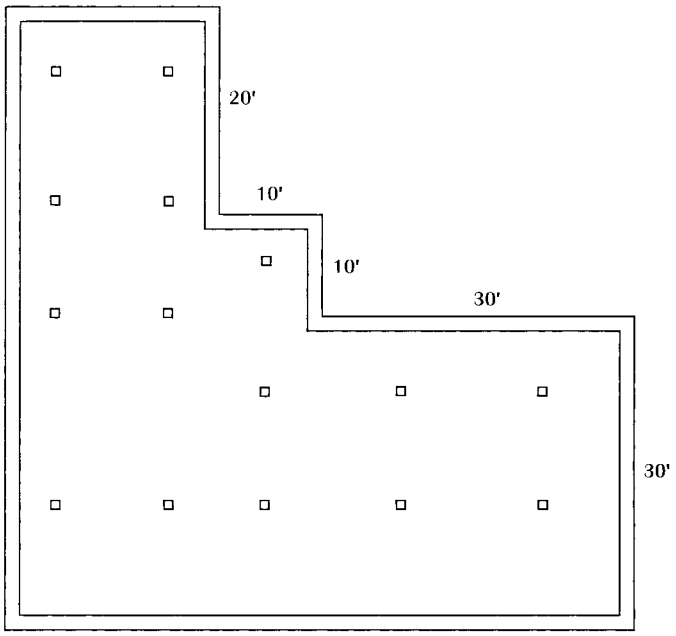
Solve the problems below by using the sample termiticide label at the end of this chapter.

Example 1: Pier and Beam Foundation

Foundation wall is 1 foot thick.

Piers are 3 feet in circumference.

Depth from grade to footing is 2 feet for piers and foundation wall.



34. How many linear feet are there in the structure above, including interior, exterior, and piers?

35. How many gallons of spray mix would be needed to treat the linear feet in this structure using the standard rate of mixture (4 gal./10 linear ft./ft. of depth) for vertical treatment?

36. How many gallons of "Termit-Icide" would be needed to treat the linear feet at the 0.5 percent rate?

37. How many square feet are within the foundation wall of the drawing above?

38. How many gallons of spray mix would be needed to treat the horizontal surface (square feet) using the standard volume for a 0.5 percent rate if the substrate is fill sand?

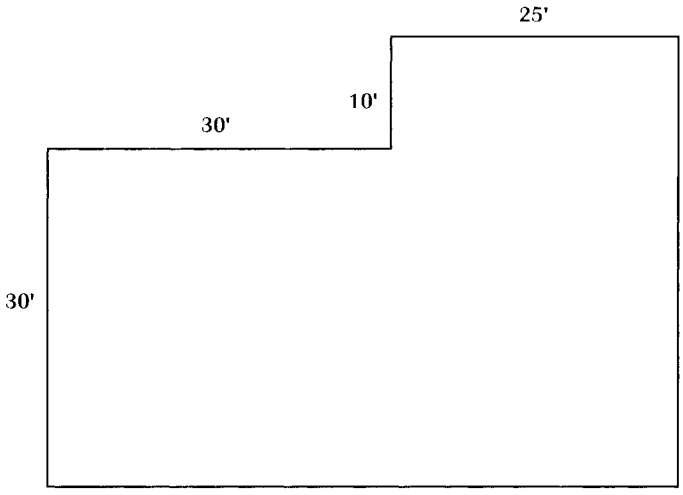
39. How many square feet are in the monolithic slab sur face?

40. How many linear feet would be treated for a perimeter treatment?

41. If "Termite-Icide" costs $97 for a 2.5-gallon jug, what will be the chemical cost to treat the horizontal surface of the monolithic slab at the 0.5 percent rate?

Example 2: Monolithic Slab

Monolithic slab with 1 foot from grade to bottom of perimeter beam.



42. How much would it cost to treat the perimeter at the 0.5 percent rate?

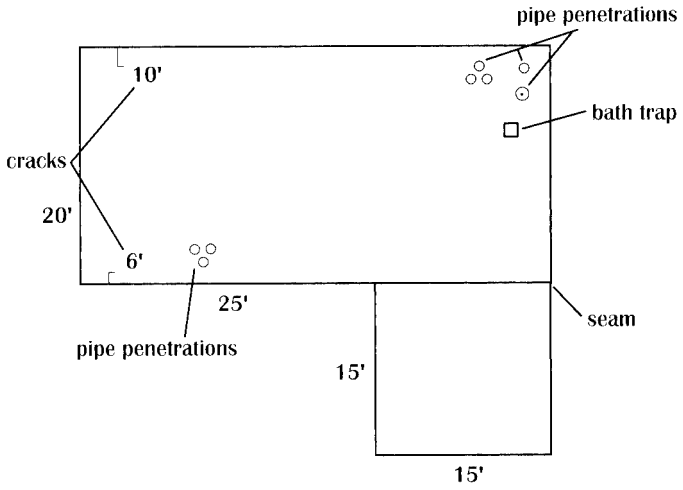
Example 3: Monolithic Slab with a Patio

Depth from soil grade to bottom of slab is 2 feet.

Bath trap is 2 square feet.

Seven pipe penetrations are less than 6 inches in diameter.

One pipe penetration is 8 inches in diameter.



43. Using the label instructions, how many holes would be drilled in the slab to treat cracks, seam, and pipe penetrations in the drawing above?

44. How many gallons of 0.5 percent emulsion would be required to treat the cracks, seam, pipe penetrations, and bath trap?

45. How many gallons of emulsion would be needed to treat the building perimeter?

PRECAUTIONARY STATEMENTS

Hazards to Humans (and Domestic animals)

CAUTION: Harmful if swallowed, inhaled, or absorbed through the skin. Avoid contact with skin, eyes, or clothing. Avoid breathing dust (vapor or spray mist). Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

All pesticide handlers (mixers, loaders, and applicators) must wear long-sleeved shirt and long pants, socks, shoes, and chemical-resistant gloves. In addition, all pesticide handlers must wear a respiratory protection device (air-purifying respirator with NIOSH approved TC-23C pesticide cartridges) when working in a non-ventilated space. All pesticide handlers must wear protective eyewear when working in a non-ventilated space or when applying termiticide by rodding or subslab injection.

When treating adjacent to an existing structure, the applicator must check the area to be treated, and immediately adjacent areas of the structure, for visible and accessible cracks and holes to prevent any leaks or significant exposures to persons occupying the structure. People present or residing in the structure during application must be advised to remove their pets and themselves from the structure if they see any signs of leakage. After application, the applicator is required to check for leaks. All leaks resulting in the deposition of termiticide in locations other than those prescribed on this label must be cleaned up prior to leaving the application site. Do not allow people or pets to contact contaminated areas or to reoccupy contaminated areas of the structure until the clean-up is completed.

Termite-Icide

Termiticide/Insecticide

For use by individuals/firms licensed or registered by the state to apply termiticide products. States may have more restrictive requirements regarding qualifications of persons using this product. Consult the structural pest control regulatory agency of your state prior to use of this product.

Active Ingredient: Pestoff-tri-salicyclic acid:	36.8%
Inert Ingredients*:	63.2%
Total:	100.0%

* Contains petroleum distillates.
Contains 3.2 pounds Pestoff per gallon.

KEEP OUT OF REACH OF CHILDREN

CAUTION

See other panels for additional precautionary information.

XYZ Corporation
Entomology Group
Anywhere, USA

EPA REG. NO. 000000-000
EPA Est. 000000-TX-01
U.S. Patent No. 0000000

Net Contents: 2.5 gallons

Environmental Hazards

This product is highly toxic to bees exposed to direct treatment or residues on crops or weeds. Do not apply this product or allow it to drift to crops or weeds on which bees are actively foraging. Additional information may be obtained from your Cooperative Extension Service. This product is extremely toxic to fish and aquatic invertebrates. Do not apply directly to water or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters. Do not apply when weather conditions favor drift from treated areas.

Physical/Chemical Hazards

Do not use or store near heat or open flame.

DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

STORAGE AND DISPOSAL

PESTICIDE STORAGE: Store at temperatures above 40 degrees F (5 degrees C).

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL

Plastic containers: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

SUBTERRANEAN TERMITE CONTROL

APPLICATION RATE: Use a 0.5% emulsion for subterranean termites. For other pests on the label, use specific listed rates.

MIXING DIRECTION: Mix the termiticide dilution in the following manner: Fill tank 1/4 to 1/3 full. Start pump to begin bypass agitation and place end of treating tool in tank to allow circulation through hose. Add appropriate amount of Termite-Icide termiticide/insecticide. Add remaining amount of water. Let pump run and allow recirculation through the hose for 2 to 3 minutes. Termite-Icide may also be mixed into full tanks of water, but it requires substantial agitation to ensure uniformity of the emulsion. To prepare a 0.5% water emulsion, ready to use, dilute 1.25 gallons of Termite-Icide with 94.75 gallons of water.

MIXING: For the desired application rate, use the chart below to determine the amount of Termite-Icide for a given volume of finished emulsion:

AMOUNT OF TERMITE-ICIDE
(Gall1ons except where noted)

Emulsion Concentration	Amount of Termite-Icide	Amount of Water	Desired Gal. of Finished Emulsion
0.5%	1 2/3 fl. oz	7.9 pints	1
	6 2/3 fl. oz.	31.6 pints	4
	8 1/3 fl. oz.	39.5 pints	5
	16 2/3 fl. oz.	9.9	10
	0.25	18.75	19
	0.5	37.5	38
	0.75	57.25	58
	1.25	94.75	96
	2.5	189.5	192

Common units of measure:
1 pint = 16 fluid ounces (oz.)
1 gallon = 4 quarts = 8 pints =128 fluid ounces (oz.)
* For termite applications, only use these rates in conjunction with the application volume adjustments as listed in the section below or in the foam or under ground service application sections.

Preconstruction Subterranean Termite Treatment

Pre-Construction Treatment: Do not apply at a lower dosage and/or concentration than specified on this label for applications prior to the installation of the finished grade.

When treating foundations deeper than 4 feet, apply the termiticide as the backfill is being replaced, or if the construction contractor fails to notify the applicator to permit this, treat the foundation to a minimum depth of 4 feet after the backfill has been installed. The applicator must trench and rod into the trench or trench along the foundation walls and around pillars and other foundation elements at the rate prescribed from grade to a minimum depth of 4 feet. When the top of the footing is exposed, the applicator must treat the soil adjacent to the footing to a depth not to exceed the bottom of the footing. However, in no case should a structure be treated below the footing.

Horizontal Barriers: Create a horizontal barrier wherever treated soil will be covered, such as footing trenches, slab floors, carports, and the soil beneath stairs and crawl spaces. For a 0.5% rate, apply 1 gallon of dilution per 10 square feet. Applications shall be made by a low pressure spray (less than 20 p.s.i.) using a coarse spray nozzle. If slab will not be poured the same day as treatment, cover treated soil with a water-proof barrier such as polyethylene sheeting.

Vertical Barriers: Vertical barriers should be established in areas such as around the base of foundations, plumbing, utility entrances, backfilled soil against foundation walls, and other critical areas.
For a 0.5% rate, apply 4 gallons of dilution per 10 linear feet per foot of depth.

Postconstruction Subterranean Termite Treatment

Application Volume:

Volume Adjustment Chart

Rate (% emulsion)	0.5%	1.0%	2.0%
Volume allowed Horizontal (gallons emulsion/10 sq. ft.)	1.0 gallons	0.5 gallons	0.25 gallons*
Vertical (gallons emulsion/10 lin. ft.)	4.0 gallons	2.0 gallons	1.0 gallons*

After Treatment:

Cracks and expansion joints

To establish a vertical barrier along cracks and expansion joints in a slab, drill holes through the slab at a 12-inch spacing near one side of the crack or joint and apply a 0.5% emulsion evenly at the rate of 4 gallons per 10 linear feet.

Pipe and Conduit Penetrations

To establish a vertical barrier for pipes and conduits 6 inches or less in diameter, drill a hole through the slab on one side and apply 1 1/2 gallons of 0.5% emulsion. For penetrations in excess of 6 inches in diameter, drill additional hole(s) per each additional 6 inches in diameter or fraction thereof, evenly spaced around the penetration, and apply 1 1/2 gallons of 0.5% emulsion per drill hole.

Bath Trap

Apply 3 gallons of 0.5% emulsion per square foot of opening.

Vertical Barriers

Should be established around foundation walls and perimeter of monolithic slabs.

Attention:

- Do not apply to pets, crops, or sources of electricity.
- Do not allow people or pets on treated surfaces such as carpets until the spray has dried.
- Do not use concentrate or emulsion in fogging equipment.
- Firewood is not to be treated.
- During any application to overhead areas of structure, cover surfaces below with plastic sheeting or similar material (except where exempt).
- Do not allow spray to contact food, foodstuffs, food-contacting surfaces, food utensils, or water supplies.
- Thoroughly wash dishes and food-handling utensils with soap and water if they become contaminated by application of this product.
- Do not treat areas where food is exposed.
- During indoor surface applications, do not allow dripping or runoff to occur.
- Do not apply this product in patient rooms or in any rooms while occupied by the elderly or infirm.
- Do not apply when occupants are present in the immediate area in institutions such as libraries, sport facilities, etc.
- Do not apply to classrooms when in use.
- Do not touch treated surface until dry.
- Not for use in voids insulated with rigid foam.