

# Using the Termiticide Transport<sup>®</sup> 50 WP to Control Subterranean Termites around Structures in Southern Arizona

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## ABSTRACT

*The critical features needed for long-standing structural protection against subterranean termites are chemical efficacy and stability of termiticides. Federal regulations concerning minimum product performance of termiticide treatments stress the importance of field-testing existing and candidate termiticides. Field tests are designed to simulate typical application conditions and provide the regulated community non-penetration data. The purpose of this study was to evaluate the termiticide Transport<sup>®</sup> in terms of providing structural protection and consumer satisfaction against *Heterotermes aureus*. Five residential structures were selected in Tucson for the study. None of the homes had undergone any treatment for termites within 12 months and all were of one construction type, frame stucco with slab foundations. The effectiveness of the termiticide Transport<sup>®</sup> in controlling *Heterotermes aureus* based on the five homes was very good. Termites were cleared in under a month when inspections were performed. Standard difficulties were encountered in gaining access to structures for inspections. Coordination with homeowners varied greatly and required persistence by the inspectors.*

Keywords: termite, termiticides

## INTRODUCTION

Soil termiticides have been used to stop the invasion of subterranean termites for nearly four decades (Kard et al. 1999, Gold et al. 1996, Su et al. 1999). The critical features needed for long-standing structural protection against subterranean termites are chemical efficacy and stability of termiticides. How these should be measured has been debated for a number of years. Federal regulations concerning minimum product performance of termiticide treatments (EPA 1996, 1998) stress the importance of field-testing existing and candidate termiticides (Wagner 2003). The Environmental Protection Agency requires USDA Forest Service data on the efficacy of a termiticide at four standard continental U.S. sites for registration: Arizona (Pima County), Florida (Calhoun County), Mississippi (Harrison County) and South Carolina (Union County). The USDA Forest Service collects termiticide data by monitoring two testing designs, ground boards and 5-cm concrete slabs, annually. Termiticide concentrations are considered failures in these tests when termites penetrate more than 50% of the field replications (Kard 2003, Wagner 2003). These field tests are designed to simulate typical application conditions and provide the regulated community non-penetration data. In addition to the current USDA Forest Service protocols EPA requires the product manufacturers to provide application data around home or structures.

Despite being one of three major termite pests in the U.S., the desert subterranean termite, *Heterotermes aureus* (Snyder), has only limited control information. The USDA Forest Service provides most of this information. The purpose of this study is to evaluate the termiticide Transport<sup>®</sup> in terms of providing structural protection and consumer

satisfaction against *H. aureus*. Part of the objective is to determine how quickly the structures clear of termites after application of Transport<sup>®</sup>.

## MATERIALS AND METHODS

### Structures

Five residential structures were selected in Tucson for the study. All homes were pre-treated at the time of their construction. All of the homes were of one construction type, frame stucco with slab foundations. None of the homes were over 25 years of age. All but site 5 had been treated previously for subterranean termites. However, none of the homes had undergone any treatment for termites within 12 months prior to initiation of the study. All homes had live infestation of subterranean termite *Heterotermes aureus*.

The treatment consisted of the termiticide Transport<sup>®</sup> 50 WP a combination of 0.06% Bifenthrin and 0.05% Acetamiprid. All treatments were applied by Arizona Exterminating Company. A standard exterior treatment was performed in which a trench was dug approximately 6-8 inches deep completely around the structure and an application of termiticide was made at the current standard of 4 gallons per 10 linear feet. Where concrete slabs abutted the structures, the slabs were drilled and a sub-slab application of termiticide was applied to the structure. All initial applications took place between June 10, 2005 and July 26, 2005. The homes were monitored post-treatment both inside and outside by visual and Pestfinder inspections for the presence of live termites. The Pestfinder technology detects motion within walls as an indication of the presence of termites. The use of the Pestfinder equipment and access to the structures were limiting factors in the dates of inspections.

## RESULTS and DISCUSSION

The treatment dates, inspection dates, inspection type and results for each of the five southern Arizona homes in this study are reported in Table 1. The specific details of the treatment to each structure with Transport<sup>®</sup> and the results of the treatment are discussed below home by home. Standard difficulties were encountered in gaining access to structures for inspections. Coordination with homeowners varied greatly and required persistence by the inspectors.

Site 1 was a multi-level home with 416 linear feet of treatable area around the structure. At the time of treatment, five (5) termite tubes were active in an interior wall at the entry of the home. A schematic diagram of the treatment of this structure is represented in Figure 1a. A total of 166.4 gallons of finished product of 1% solution were applied by rod and trench or sub-slab applications. One and ¼ gallons of foam were also applied to an interior wall. The wall represented in Figure 1b was the main site of infestation within the structure. Pestfinder monitoring reported persistent termite activity in the wall following treatment. The homeowner had scheduled reconstruction of several interior walls and allowed inspection of the area by removal of the drywall. This action revealed multiple termite tubes radiating from near the initial termite infestation. This confirmed the accuracy of Pestfinder that had indicated on-going activity in this area. A follow-up application of Transport<sup>®</sup> was made on July 10, 2005. A week later no termites were found in the structure based on visual and Pestfinder readings. A total of 9

inspections were conducted over the 2 years. The site remained clear of termites during this period.

Site 2 was a relatively small structure of 180 linear feet with five (5) termite tubes located in the garage. A schematic diagram of the treatment of this structure is represented in Figure 2a. A total of 72 gallons of finished product of 1% solution were applied. Five and ½ ounces of foam were also applied to columns in the garage. The initial follow-up inspection less than 3 weeks later revealed no termites. All subsequent inspections over a 2-year period revealed the structure remained free of termite activity.

Site 3 was a structure with a monolithic slab foundation with ten (10) termite entry points both inside and outside the structure. The structure was treated by rod and trench and sub-slab applications of Transport<sup>®</sup>. One gallon of foam was applied to the rear interior wall facing the patio. A total of 109 gallons of finished product was applied to 388 linear feet of the structure. A schematic diagram of the treatment of this structure is represented in Figure 2b. The house quickly cleared of termites. Follow-up inspections revealed no live termites during 2 years of subsequent inspections.

Site 4 was a small structure with a post-tension foundation with multiple entry points on the outside stem wall and in the garage. A total of 85.2 gallons of finished product of 1% solution were applied to 213 linear feet. A schematic diagram of the treatment of this structure is represented in Figure 3a. A follow-up inspection within 3 weeks revealed the structure was free of live termites. Subsequent inspections over the next two years reported no termite activity and effective protection of the structure.

Site 5 was structure with a monolithic slab foundation with twenty termite (20) tubes and entry points on the exterior of the house, porch, and the garage. Transport<sup>®</sup> was applied by rod and trench and sub-slab applications. A schematic diagram of the treatment of this structure is represented in Figure 3b. A total of 116.4 gallons of finished product of 1% was applied to 488 linear feet. A follow-up inspection 2 weeks later revealed the house was clear of live termites. No live termites were reported during subsequent inspections over a 2-year period.

All structures in the study cleared quickly of live termites after the application of Transport<sup>®</sup>, and remained free of termite activity during the two-year project. Transport<sup>®</sup> was effective in controlling infestation by *Heterotermes aureus* termites in these homes. Site 1 demonstrates the importance of comprehensive application of any termiticide. Monitoring by Pestfinder (Figure 4) revealed persistent activity in an interior wall. The opening of the wall revealed the accuracy of this device, and termite activity between two abutting wall studs. The initial application of termiticide had not reached into this space. A subsequent application of Transport<sup>®</sup> to this area cleared the structure of termites. It is unclear whether post-treatment visual inspections alone of the area where active interior termite tubes had been present would have revealed persistent termite activity. In fact, without the subsequent monitoring using the Pestfinder further damage to the wall might have occurred. This presents an interesting example of the importance of proper application of an insecticide. Once Transport<sup>®</sup> was applied to this interior haven of termite activity, the house cleared of termite activity through the duration of the study. The termiticide Transport<sup>®</sup> was an effective agent of structural protection against *H. aureus* termite infestation in all five study homes.

## ACKNOWLEDGMENTS

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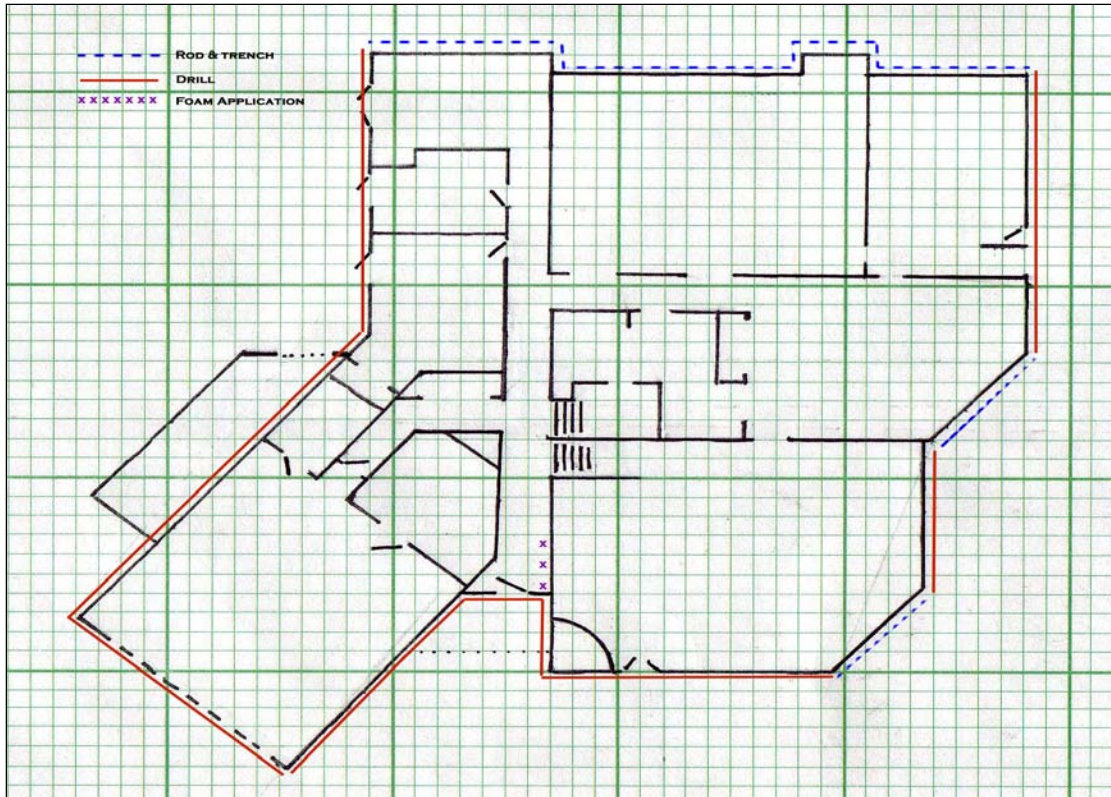
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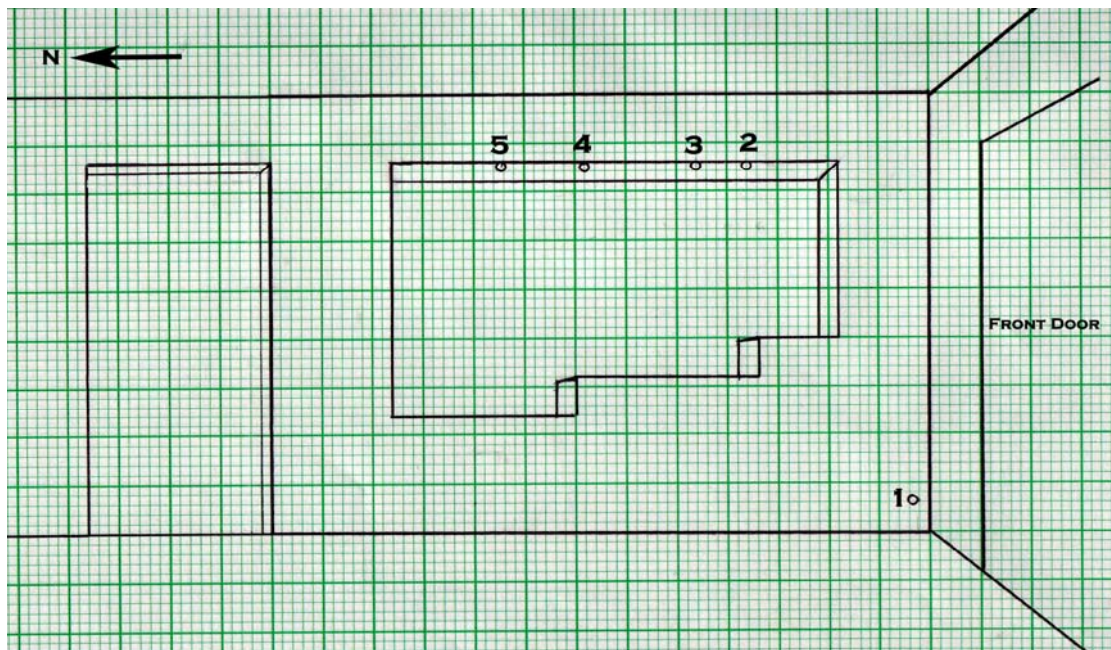
**Table 1. Summary of the inspections dates for Transport<sup>®</sup> 50WP applications to five structures in southern Arizona**

<b>Site</b>	<b>Name</b>	<b>Application date</b>	<b>Insp. 1</b>	<b>Insp.2</b>	<b>Insp. 3</b>	<b>Insp. 4</b>	<b>Insp. 5</b>
1	Woon	10-Jun-05	18-Jul-05	27-Jul-05	9-Dec-05	30-Mar-06	11-Jul-06
2	L'Armee	10-Jun-05	22-Jun-05	25-Jul-05	13-Dec-05	23-Mar-06	29-Jun-06
3	Jones	22-Jun-05	18-Jul	9-Dec-05	21-Mar-06	29-Jun-06	12-Feb-07
4	Riley	27-Jun-05	18-Jul-05	9-Dec-05	4-Apr-06	29-Jun-06	19-Feb-07
5	Helton	26-Jul-05	5-Aug-05	9-Dec-05	19-Feb-06	4-Apr-06	2-Apr-07
<b>Site</b>	<b>Name</b>	<b>Application date</b>	<b>Insp. 6</b>	<b>Insp. 7</b>	<b>Insp. 8</b>	<b>Insp. 9</b>	
1	Woon	10-Jun-05	9-Oct-06	19-Feb-07	2-Apr-07	7-Jul-07	
2	L'Armee	10-Jun-05	19-Feb-07	2-Apr-07	13-Jul-07		
3	Jones	22-Jun-05	2-Apr-07	9-Jul-07			
4	Riley	27-Jun-05	2-Apr-07	9-Jul-07			
5	Helton	26-Jun-05	10-Jul-07				

Figure 1



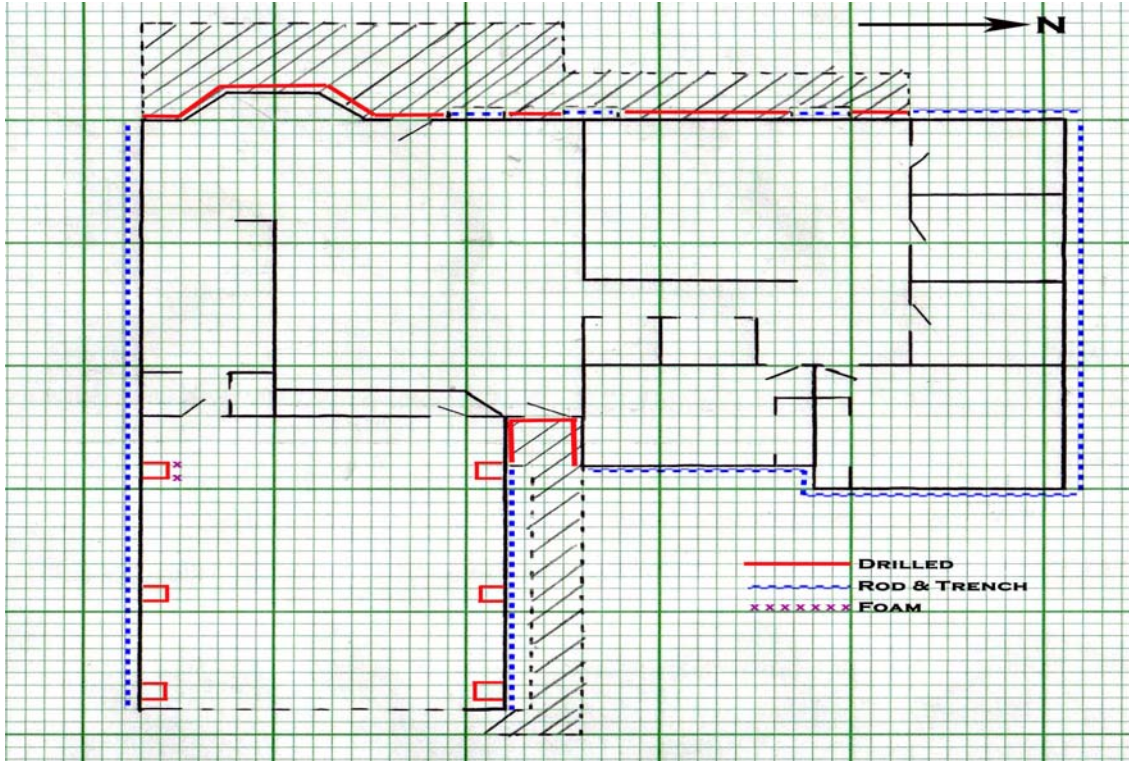
a) Schematic diagram of the application of Transport<sup>®</sup> to Site 1.



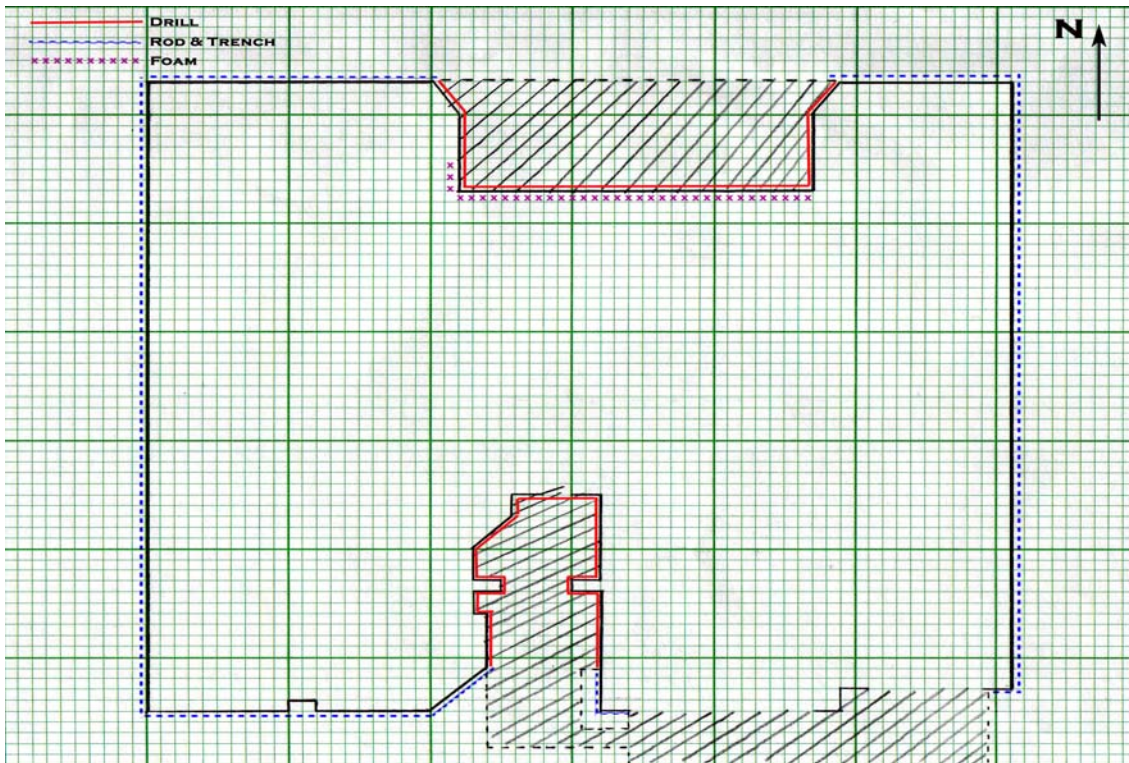
b) Diagram of the termite infestation of an interior wall in Site 1 with entry points at 1-5.



Figure 2



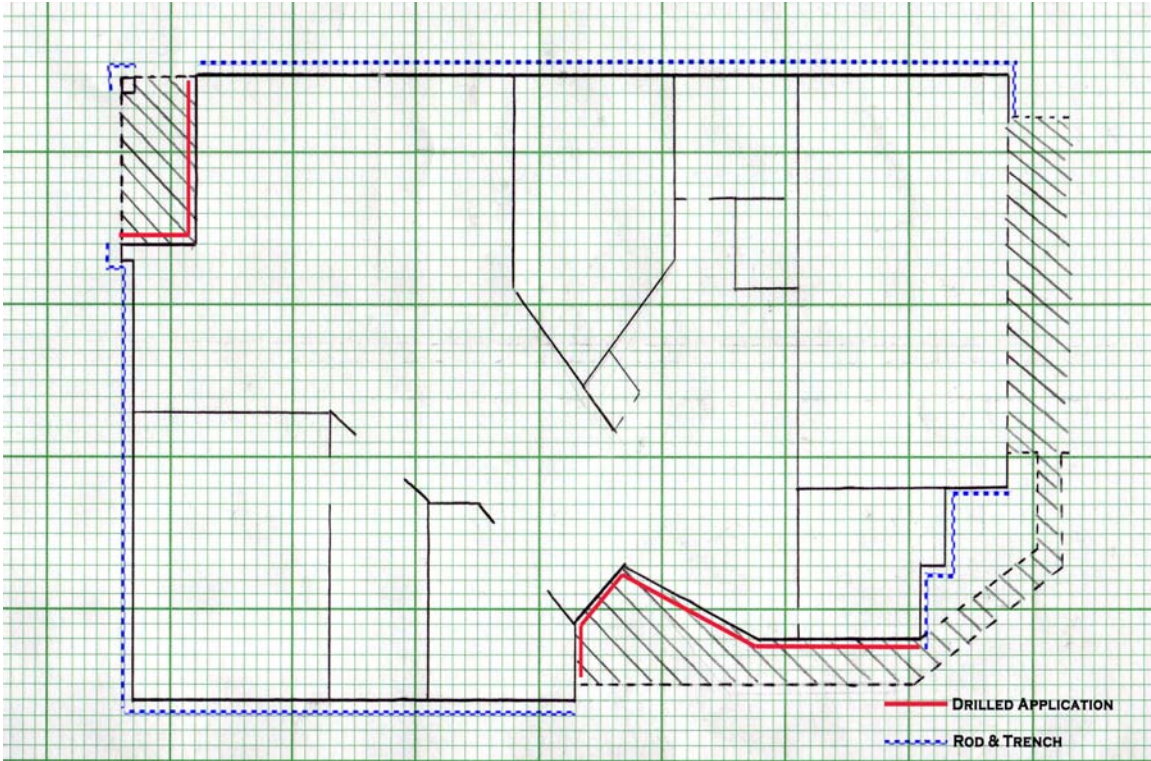
a) Schematic diagram of the application of Transport<sup>®</sup> to Site 2



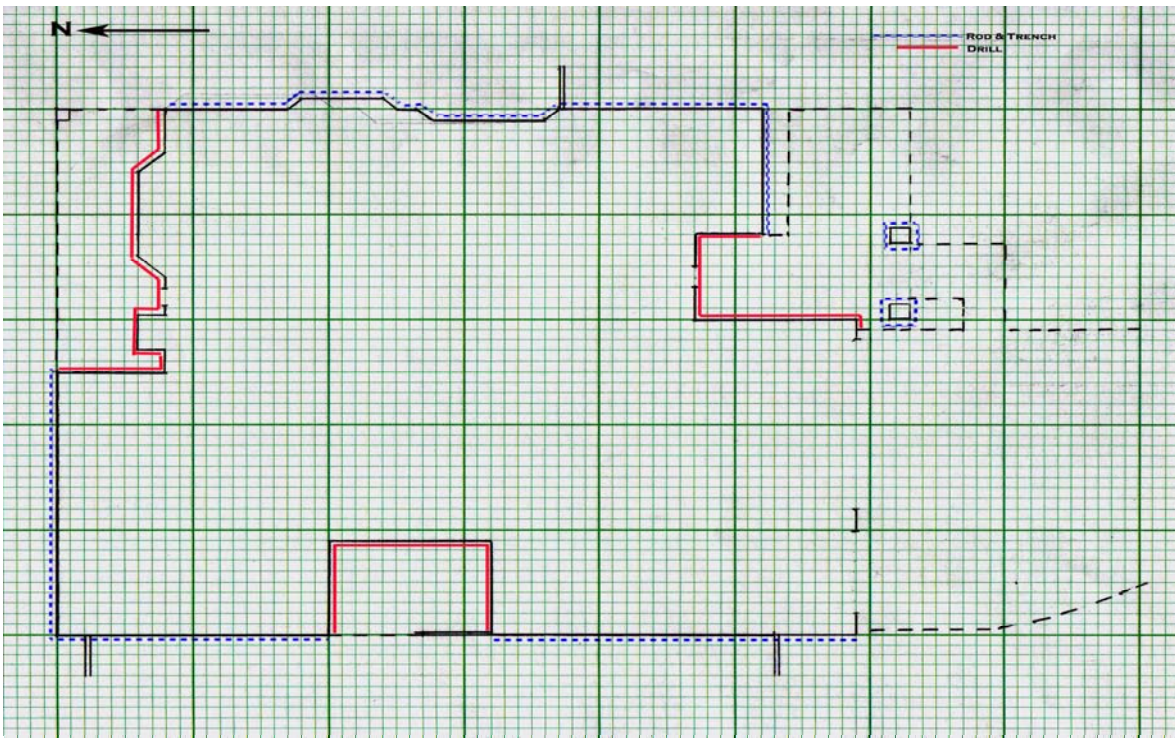
b) Schematic diagram of the application of Transport<sup>®</sup> to Site 3



Figure 3



a) Schematic diagram of the application of Transport<sup>®</sup> to Site 4



b) Schematic diagram of the application of Transport<sup>®</sup> to Site 5.



Figure 4



a) Motion detection of termites within a wall by Pestfinder.



b) Exposed wall showing termite trails where Pestfinder detected motion.