



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
U.S. ARMY INSTALLATION MANAGEMENT COMMAND, PACIFIC REGION
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
745 WRIGHT AVENUE, BUILDING 107, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5000

IMHW-PW

4 April 2017

MEMORANDUM FOR All Military Personnel and Department of Defense (DoD)
Civilian Personnel Within United States Army Garrison, Hawaii (USAG-HI) Installations

SUBJECT: Standard Physical Termite Barrier Guidance for Sustainment, Restoration,
Renovation, Modernization and Military Construction Projects

1. References.

a. Department of Defense Instruction (DODI) 4150.07, DoD Pest Management Program, 29 May 08.

b. Armed Forces Pest Management Board (AFPMB) Technical Guide No. 29, Integrated Pest Management (IPM) In and Around Buildings, Aug 09.

c. Unified Facilities Guide Specifications (UFGS) 31-31-16.13, Chemical Termite Control, Aug 16.

d. UFGS 31-31-16.19, Termite Control Barriers, Feb 16.

2. Applicability. This policy applies to any and all new construction and existing structures undergoing repair, restoration, renovation or modernization.

3. Policy. This policy shall be the USAG-HI standard in regard to physical and chemical termite barrier methods and treatment standards used during the construction, sustainment, restoration, renovation, and modernization of facilities on USAG-HI installations. This policy emphasizes requirements identified in the references above, with special considerations to the unique situations for USAG-HI installations. This provides the USAG-HI Directorate of Public Works (DPW) with a formal process necessary to maintain responsible environmental stewardship, protect historic wooden structures, prevent subterranean termite infestations in government facilities, ensure long-term cost savings, and provide standard methods of economical termite damage repair and treatment. The enclosed guidelines outline the required actions to be taken for termite prevention, control, and treatment for all facilities undergoing construction, sustainment, restoration, renovation, or modernization. These guidelines are living documents subject to revisions and addendums as determined by the DPW Engineering and Environmental Divisions.

4. The Standard Physical Termite Barrier Guidance for Sustainment, Restoration, Renovation, Modernization and Military Construction Projects shall be given widest dissemination. This policy memorandum will be available for download at:

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www.garrison.hawaii.army.mil/sites/policies/policies.asp and available to the public upon request.

5. This policy supersedes Policy Memorandum USAG-HI-30, dated 24 Jul 15 and remains in effect until cancelled or superseded in writing.

6. Point of contact for the content of this policy memorandum is the USAG-HI Pest Management Coordinator, Environmental Division, DPW, at (808) 656-3093.

FOR THE COMMANDER:

3 Encls

1. Guide, New Construction
2. Guide, Existing Facilities
3. Guide, Active Infestations



KENT K. WATASE, PE
Director of Public Works

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Enclosure 1
New Construction Termite Prevention Guidelines for USAG-HI Installations

1. All new construction, regardless of building materials to be used, will require a termite barrier and will adhere to the following guidelines.

2. Physical barrier methods will be required in all new construction but may also be used in conjunction with soil treatment. Chemical barriers may be considered with the approval of the Installation Pest Management Coordinator (IPMC) and Army Environmental Command (AEC) Pest Management Consultant (PMC). Exceptions to the physical termite barrier methods for new construction can be found in section 4.

a. Physical termite barrier installation and site preparation shall comply with the following specifications:

(1) Installation of physical termite barriers shall comply with criteria in the latest edition of the UFGS 31-31-16.19 Termite Control Barriers.

(2) Site preparation shall include:

(a) Compliance with the most stringent requirements and manufacturer's written instructions for preparing foundation substrate.

(b) Complete removal of standing water and all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil and around foundations.

(c) Installation of a biobarrier or equivalent along the perimeter excavation face as required to prevent roots from entering into, or otherwise damaging, the integrity of the termite barrier.

(d) Grading of the site to ensure rainwater and condensation drainage are directed away from the foundation or, if conditions do not allow such grading work, installation of a drainage system to prevent accumulation of standing water or moisture around the perimeter of the foundation.

(e) Verification that no irrigation lines will be placed adjacent to the completed building and sprinkler heads will be directed to not spray on the building.

(3) Application of a chemical barrier to building perimeter in accordance with guidelines as outlined in section (3)i.

b. Physical termite barriers for new construction shall be provided as follows:

(1) Basaltic Termite Barriers (BTB) shall be:

(a) Used in conjunction with physical termite mesh barrier or chemical soil barrier. BTB will **NOT** be used as the only termite barrier in any construction.

(b) Installed beneath concrete slabs in between the footings or walls or both and beneath footings where necessary such that all joints, expansion joints, utility and security penetrations, and pipes are sealed or encased as required.

(c) Placed over a minimum of 4 inches of compacted capillary water barrier (CWB, ASTM C33 Size No. 67) material. BTB over CWB is required under all slabs-on-grade.

(d) Installed along the perimeter of a concrete slab, foundation or retaining wall, and extended from ground level or beneath any abutting sidewalk or slab-on-grade down to the base of the footings. Cap or splash blocks are required over otherwise exposed BTB.

(e) Placed along and around the base or footings of interior foundations. Cap or splash blocks are required where disturbance of BTB by personnel, animals or environmental conditions is likely.

(f) Placed around and entirely surrounding the buried base of wood utility poles or wood support posts. Cap blocks or other methods of protection are required to prevent disturbance of the BTB by personnel, animals or environmental conditions.

(2) Mesh Termite Barriers (MTB) shall be:

(a) Installed beneath concrete slabs in between the footings or walls or both and beneath footings where necessary such that all joints, expansion joints, utility and security penetrations, and pipes are sealed as required. Or, installed in between the slabs and walls along all joints and expansion joints, and at all utility and security penetrations with all foundation cracks showing up during construction being filled with epoxy having a Shore D Hardness (ASTM 2240) greater than 85.

(b) Placed beneath the concrete slabs or under the perimeter of slab edges and joints according to manufacturer's installation methods after vapor barrier and reinforcing steel are in place.

(c) Installed along the perimeter of a concrete slab, foundation or retaining wall, and into any abutting sidewalk or slab-on-grade to seal all perimeter joints.

(3) Physical termite barriers for new construction shall be furnished with a three-year written warranty against infestations or reinfestation of buildings or building additions by subterranean termites and will include annual inspections of the buildings or building additions. Annual inspections by the contractor must be coordinated and witnessed by a DoD Pest Management Quality Assurance Evaluator (PMQAE). If live

subterranean termite infestation or subterranean termite damage is discovered during the warranty period and building conditions have not been altered in the interim, the contractor shall:

(a) Correct defective physical termite barrier installation and perform other treatment as may be necessary for elimination of subterranean termite infestation.

(b) Repair damage caused by termite infestation.

(c) Reinspect the building or building addition approximately 180 calendar days after the repair.

3. Chemical Termite Control for new construction will be provided as follows :

b. Application of a non-repellant chemical termite barrier shall comply with criteria in the latest edition of the UFGS 31-31-16.13, Chemical Termite Control. Applications must be made at the highest labeled rate. Chemical barriers will not be used as a substitute for physical control barriers as a cost saving measure for new construction and will only be used for new construction that meets the exception standards as described in section 4 or as an extra barrier for building perimeters when used in conjunction with physical barriers.

c. Site preparation shall include:

(1) Compliance with the most stringent requirements and manufacturer's written instructions for preparing foundation substrate.

(2) Complete removal of standing water and all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil and around foundations.

(3) Installation of a biobarrier or equivalent along the perimeter excavation face as required to prevent roots from entering into or otherwise damaging the integrity of the termite barrier.

(4) Grading of the site to ensure rainwater and condensation drainage are directed away from the foundation or, if conditions do not allow such grading work, installation of a drainage system to prevent accumulation of standing water or moisture around the perimeter of the foundation.

(5) Verification that no irrigation lines will be placed adjacent to the completed building and sprinkler heads will be directed to not spray on the building.

a. Prior to work being performed, the following must be accomplished:

(1) The pesticide contractor will provide a submittal to the contracting officer (CO) and IPMC that contains the following information:

- (a) Quantity of pesticide to be used;
- (b) Rate of dispersion;
- (c) Percent of use;
- (d) Total amount used.

b. Provide copies of applicator license and certification to CO and IPMC.

c. Provide copies of SDS and labels to be used to CO and IPMC for approval.

d. Deliver termiticide material to work site in original, unopened containers for inspection by the PMQAE.

e. Ensure all applicator personnel have and wear required safety equipment to include site safety. Applicators may fill treatment tanks only at designated sites that contain a backflow preventer and under the supervision of a contractor's representative or PMQAE. Empty chemical containers must be disposed of off government property. Spill kits must be present on pest control vehicles to provide adequate spill response.

f. Site conditions must be addressed as follows prior to treatment:

(1) Soils to be treated shall be tested immediately before application for moisture content. Test to a minimum depth of 75 mm and no more than three inches. Termiticide will not be applied if soil moisture exceeds manufacture's recommendation.

(2) Determine wind speed and chance for precipitation. Termiticides shall not be applied when wind speeds are greater than 10 mph. Termiticides shall not be applied during or just before heavy rains or when conditions may cause runoff or create an environmental hazard.

(3) Termiticide will be applied prior to placement of a vapor barrier or waterproof membrane. Ensure the soil is dry before placing membrane and that personnel do not disturb the treated soil.

(4) Prior to application, heating, ventilation, and air conditioning (HVAC) ducts and vents located in treatment area shall be turned off and blocked to protect people and animals from termiticide. Submit written verification that utilities and vents have been located and treated as specified.

(5) Place concrete covering treated soils as soon as the termiticide has reached maximum penetration into the soil. Time for maximum penetration shall be as recommended by the manufacturer.

a. Termiticide application shall be performed as follows:

(1) Performed by an applicator who is licensed and certified in the State of Hawaii, or holds a DoD certification. Termiticide applicators will also be certified in the U.S. Environmental Protection Agency (EPA) pesticide applicator category which includes structural pest control. Copies of license and certificate shall be provided prior to work being performed.

(2) Calibration of mixing equipment will be performed immediately prior to application and observed by a contract representative and PMQAE.

(3) Formulating, mixing, and application shall be performed in the presence of a DoD certified pesticide applicator, PMQAE, or IPMC. Prior to use, equipment must be checked for leaks, clogging, wear, or damage. Any repairs are to be fixed immediately.

(4) Surface application shall be used for establishing horizontal barriers. Surface applicants shall be applied as a coarse spray and provide uniform distribution over the soil surface. Termiticide shall penetrate a minimum of 1 inch into the soil, or as recommended by the manufacturer.

(5) Use rodding and or trenching for establishing vertical soil barriers. Trenching shall be to the depth of the foundation footing. Width of trench shall be as recommended by the manufacturers, or as indicated. Rodding or other approved method may be implemented for saturating the base of the trench with termiticide. Immediately after termiticide has reached maximum penetration as recommended by the manufacturer, backfilling of the trench shall commence. Backfilling shall be in six inch rises or layers. Each rise shall be treated with termiticide.

(6) Once termiticide application has been completed, measure tank contents to determine the remaining volume. The total volume measurement of used contents for the application shall equal the established application rate of the project site conditions. Provide written verification that the volume of termiticide used meets the application rate.

(7) Immediately after the application, the area shall be protected from other use by erecting barricades and providing signage as required or directed. Signage shall be in accordance with Section 10 14 01 EXTERIOR SIGNAGE. Signage shall be placed inside the entrances to crawl spaces and shall identify the space as treated with termiticide and not safe for children and animals. Treated areas should be covered with plastic if slab is not to be poured immediately following termiticide application.

(8) Soil and fill material disturbed after treatment shall be re-treated before placement of slabs or other covering structures.

(9) The contractor shall provide a five year written warranty against infestations or reinfestations by subterranean termites of the buildings or building additions

constructed under the contract. The warranty shall include annual inspections of the buildings or building additions. Annual inspections by the contractor must be

coordinated and witnessed by a DoD PMQAE. If live subterranean termite infestation or subterranean termite damage is discovered during the warranty period, and the soil and building conditions have not been altered in the interim, the contractor will:

(a) Retreat the soil and perform other treatment as may be necessary for elimination of subterranean termite infestation.

(b) Repair damage caused by termite infestations.

(c) Reinspect the building approximately 180 days after the retreatment.

4. Exceptions to the required installation of physical termite barriers for new construction shall be allowed as follows:

a. Utility buildings, pavilions or shelters not intended for occupation may be exempt from physical termite barrier installation provided **all** of the following criteria are met:

(1) The structure or facility is constructed entirely out of non-cellulose building materials.

(2) Other than insignificant sources of cellulose such as labels on containers, tags on equipment and signage, no wood-based furnishings, products, containers or materials of any kind will be placed, kept or stored on the premises.

(3) In the event that the building, pavilion or shelter is repurposed for occupation, physical termite barriers for existing structures shall be provided as required in section 2 unless chemical soil treatment was used as required in section 3.

b. Buildings or structures with concrete slabs-on-grade subject to vehicular loading such as vehicle maintenance, parking or storage facilities may be partly or entirely exempt from termite barrier installation provided **all** the following criteria are met:

(1) BTB, MTB physical termite barrier materials and methods are installed and used as required in section 2 above, or chemical termite treatment is used as required in section 3 above to prevent subterranean termite intrusion into office spaces, work and storage rooms, and equipment rooms that may contain cellulose materials. Floor to ceiling protection must be assured where the possibility of termites bypassing foundation level barriers exists.

(2) The unprotected areas of the structure or facility are constructed entirely out of non-cellulose building materials.

(3) Other than insignificant sources of cellulose such as labels on containers, tags on equipment and signage, no wood-based furnishings, products, containers or materials of any kind will be placed, kept or stored in or on the unprotected areas of the structure.

(4) In the event that the unprotected areas of the building or structure are repurposed for occupation, physical termite barriers for existing structures shall be provided as required in section 2 unless chemical soil treatment was used as required in section 3.

c. Exterior pavements may be exempt from termite barrier installation provided:

(1) Construction is entirely out of non-cellulose building materials.

(2) Other than insignificant sources of cellulose such as labels on containers, tags on equipment and signage, no wood-based furnishings, products, containers or materials of any kind will be placed, kept or stored on the pavement.

(3) In the event that a paved area is repurposed for occupation or storage of any wood-based materials, physical termite barriers for existing structures shall be provided as required in section 2 unless chemical soil treatment was used as required in section 3.

5. Supporting termite prevention and control methods, materials and corrective actions shall be provided as follows:

a. The area immediately adjacent to and extending up to three (3) feet from the perimeter of building foundations shall be kept clear of plants, trees, large equipment, stored items and other accumulations in order to allow for easy access to conduct inspections for termite activity.

b. All extraneous sources of wood cellulose and other edible materials such as wood debris, leaves, branches, tree stumps and roots, miscellaneous lumber, and construction waste wood shall be removed from beneath buildings and around foundations.

c. Wood building materials shall be:

(1) Naturally resistant, or effectively treated or manufactured to be resistant to termite infestation, other wood-inhabiting insect damage, fungi and decay. Cut ends of lumber shall be dipped or brush-treated as required in UFGS 06 10 Rough Carpentry, and UFGS 06 20 00 Finish Carpentry.

(2) Kept out of contact with soil and other ground surfaces, or pavements that may accumulate moisture and remain wet, except where allowed by manufacturer's written instructions and protected by BTB or MTB.

b. Moisture accumulation in, above, beneath and around building foundations shall be prevented or abated by:

(1) Keeping the foundation perimeter area free of thick ground cover, overgrowth from plants and trees, leaf accumulation and any other materials that may promote high water retention on the ground.

(2) Ensuring rainwater and condensation drainage are directed away from the foundation of a building through proper grading of the site or installation of a drainage system.

(3) Repairing all leaks in roofs, walls, foundations, rain gutters or existing drainage systems.

(4) Repairing all leaking irrigation lines, water pipes or plumbing.

(5) Direct sprinkler heads not to spray on the building.

Enclosure 2

Termite Prevention Guidelines for Sustainment, Restoration, Renovation, and Modernization of Existing Facilities

1. All facilities undergoing sustainment, restoration, renovation, or modernization will adhere to the following termite prevention guidelines if:

a. Sub-slab penetration will occur to include installation of new plumbing, piping, or removal of piping or other items within the slab.

b. Removal, displacement or disturbance of concrete and soil adjacent and up to three feet from the facility.

c. Building additions that will abut facilities to include pouring of new supporting slabs such as elevator shafts, new stairwells, or storage facilities.

2. All termite barrier installations shall comply with criteria described in the latest editions of UFGS 31 31 16.13 Chemical Termite Control, and UFGS 31 31 16.19 Termite Control Barriers.

3. Chemical soil barriers are the preferred termite barrier method for existing facilities.

4. Physical Termite Barriers for existing structures shall be provided as follows:

a. Basaltic Termite Barriers shall be:

(1) Installed beneath any added, excavated or replaced concrete slabs such that all new joints, expansion joints, utility and security penetrations, and pipes are sealed or encased as required.

(2) Placed over a minimum of four inches of compacted capillary water barrier (CWB, ASTM C33 Size No. 67) material. BTB over CWB is required under all slabs-on-grade.

(3) Installed along the perimeter of any added, excavated or replaced concrete slab, foundation or retaining wall, and extended from ground level or beneath any abutting sidewalk or slab-on-grade down to the base of the footings. Cap or splash blocks are required over otherwise exposed BTB.

(4) Placed along and around the base or footings of any added, excavated or replaced interior foundations. Cap or splash blocks are required where disturbance of BTB by personnel, animals or environmental conditions is likely.

(5) Placed around and entirely surrounding the buried base of any added or replaced wood support posts. Cap blocks or other method of protection is required to prevent disturbance of the BTB by personnel, animals or environmental conditions.

(6) Installed along or around a utility or security penetration, concrete slab, exterior or interior foundation, or retaining wall where subterranean termite intrusion into the structure above has occurred, or as required to provide physical barrier protection for structures previously designed to be unoccupied and free of cellulose materials. Cap or splash blocks are required as needed, installation of the BTB must be complete enough to prevent termites from bypassing the installed barrier, and all foundation cracks shall be filled with epoxy having a Shore D Hardness (ASTM 2240) greater than 85.

(7) BTB **must** be installed in conjunction with either MTB or chemical soil treatment.

b. Mesh Termite Barriers shall be:

(1) Installed beneath or in between any added, excavated or replaced concrete slabs such that all new joints, expansion joints, utility and security penetrations, and pipes are sealed as required.

(2) Placed beneath the concrete slabs or under the perimeter of slab edges and joints according to manufacturer's installation methods after vapor barrier and reinforcing steel are in place.

(3) Installed along the perimeter of any added, excavated or replaced concrete slab, foundation or retaining wall, and into any abutting sidewalk or slab-on-grade to seal perimeter joints.

(4) Placed around and entirely surrounding the buried base of any added or replaced wood utility poles or wood support posts. The MTB is required to extend at least six inches above grade.

(5) Installed along cracks, in joints between concrete slabs and walls, or around utility and security penetrations through which subterranean termite intrusion into the structure above has occurred, or as required to provide physical barrier protection for structures previously designed to be unoccupied and free of cellulose materials. All other foundation cracks shall be filled with epoxy having a Shore D Hardness (ASTM 240) greater than 85 and the MTB must be complete enough to prevent termites from bypassing the installed barrier.

c. Metal flashing and metal plates shall be:

(1) Replaced as needed to maintain barrier protection and ease of termite inspection between foundation slabs, walls, footings or posts and structure above, especially wooden structures.

(2) Installed between foundation slabs, walls, footings or posts and the structure above, especially wooden structures, where the use of BTB or MTB is limited or impractical. If BTB or MTB is not used, chemical soil treatment will be required.

(3) Installed between wooden structural elements as needed to help prevent or as required to limit the movement of termites between posts, beams, framing, walls and roofs.

5. Chemical termite barriers for existing structures shall be provided as follows:

a. Applied beneath any added, excavated or replaced concrete slabs such that all new joints, expansion joints, utility and security penetrations, and pipes are treated as required. If BTB is used without MTB, chemical treatment is required.

b. Applied along the perimeter of any added, excavated or replaced concrete slab, foundation or retaining wall, soil disturbance adjacent to the facility and into any abutting sidewalk or slab-on-grade to protect perimeter joints.

c. Performed by an applicator who is licensed and certified in the State of Hawaii, or holds a DoD certification. Termiticide applicators will also be certified in the U.S. Environmental Protection Agency (EPA) pesticide applicator category which includes structural pest control. Copies of license and certificate shall be provided prior to work being performed.

d. Made at the highest labeled rate and with only non-repellent termiticides.

e. Performed to industry standards and may include sub-slab injection, trenching, rodding or a combination in order to provide the best protection from subterranean termite infestations.

6. Physical and chemical termite barriers for existing structures shall be furnished with a one-year written warranty against infestations or reinfestation of buildings or building additions by subterranean termites and will include an annual inspection of the building or building additions. All inspections will be performed in the company of a DoD PMQAE. If live subterranean termite infestation or subterranean termite damage is discovered during the warranty period and building conditions have not been altered in the interim, the Contractor shall:

(1) Correct defective physical termite barrier installation and perform other treatment as may be necessary for elimination of subterranean termite infestation.

(3) Repair damage caused by termite infestation. Reinspect the building or building addition approximately 180 calendar days after the repair.

Enclosure 3

Treatment Guidelines for Active Termite Infestations

1. All termite infestations require prompt treatment using a safe and effective non-repellant termiticide, fumigation or other appropriate chemical control method to prevent further damage and spread. Treatments will be performed by a DoD or State Certified applicator. If contracted, the treatment plan, copies of sds and labels, and copies of the applicator's license and certification will be submitted to the IPMC and AEC PMC for approval prior to the contract being performed. A PMQAE will be present during all treatments performed by a contractor. Treatments may vary depending on:

- a. Species of termite.
- b. Infestation location.
- c. Facility purpose.
- d. Historical significance.
- e. Facility Design.

2. Termite infestation treatments shall adhere to the following guidelines:

- a. For subterranean termites:

(1) For ground-originating infestations, appropriately labeled non-repellant termiticide treatment injection methods such as sub-slab injection, rodding, or trenching may be used where appropriate. Treatment options will be dependent on ease of accessibility, warranties, and historical/cultural issues related to the facility. Application must be made at the highest labeled rate.

(2) For infestations that preclude the use of traditional sub-slab injections or rodding/trenching, appropriate baiting systems will be used and monitored as recommended by the manufacturer. Monitoring will be performed in the presence of a DoD PMQAE. Every effort will be used to ensure long term prevention of reinfestation.

(3) For Formosan infestations not originating from the soil, installation of an above ground termite baiting system will be used as described above in addition to soil treatment as previously described.

(4) In all infestations, necessary repairs to eliminate termite contributing conditions will be made.

- b. For drywood termites:

(1) Drywood termite infestations will be spot-treated with an appropriately labeled non-repellent termiticide if the infestation is contained to a small and easily accessible area.

(2) Large infestations will require fumigation treatment by a licensed and certified applicator.

(3) Repair or replacement of damaged wood after treatment should be considered. If wood is replaced, the new wood should be pressure-treated or of a type that is termite resistant.

3. The IPMC will be consulted for appropriate treatment requirements.

4. All buildings with extensive termite infestations will require site designation as a High Priority Building and will require mandatory, annual termite inspections. This designation will be determined by the IPMC.