Preparing Activity: NAVFAC Superseding
UFGS-31 31 16.19 (February 2016)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023
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08/22

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USACE / NAVFAC / AFCEC / NASA	**UFGS-31 31 16.19 (August 2022)**

Preparing Activity: NAVFAC	**Superseding**
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SECTION 31 31 16.19

TERMITE CONTROL BARRIERS
08/22

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NOTE: This guide specification covers the requirements for termite control barriers, including both steel mesh and basaltic sand barriers. Project requirements and local conditions will dictate which barrier system is to be used.

This section is tailored for STEEL MESH and BASALTIC SAND termite barrier systems.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).
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NOTE: This specification consists of furnishing and installing a complete stainless steel mesh barrier system or graded basaltic barrier sand at all penetrations, joints, and perimeter foundations as a physical barrier below the concrete slabs and foundations of a structure to prevent the entry of Formosan and other ground termites into wood components of the structure, similar to laying down a chemical barrier of soil termiticide treatments.

The use of these materials does not preclude the use

of other preventive measures, such as chemical treatment and pressure treated lumber for construction, to provide maximum protection to the structure. In fact, it is recommended that these materials be used in conjunction with chemical treatment at all vulnerable areas, such as penetration areas around electrical conduits and plumbing pipes that penetrate the slab, as well as the foundation perimeter and shoulder portions of the barrier. These termite barriers must comply with all codes. It is also recommended that pressure treated lumber be used to provide maximum protection to the structure.

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NOTE: For Air Force, termite control barriers are not recommended by the Air Force Civil Engineer Center as a cost-effective method of termite prevention or control for Air Force real property. Instead use Section 31 31 16.13, CHEMICAL TERMITE CONTROL.

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NOTE: To download UFGS Forms, Graphics, and Tables, go to: http://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs/forms-graphics-tables

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PART 1 GENERAL

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NOTE: Termite infestation exists throughout the United States and overseas areas with the exception of Alaska. Steel mesh termite barriers or graded basaltic sand can be prescribed for installation at all sites where termites are likely to establish colonies and make concealed entries to wood construction, when it is deemed appropriate and cost effective.

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1.1 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.
****

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A478	(1997; R 2019) Standard Specification for Chromium-Nickel Stainless Steel Weaving and Knitting Wire
ASTM A580/A580M	(2023) Standard Specification for Stainless Steel Wire
ASTM C128	(2022) Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate
ASTM C131/C131M	(2020) Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136/C136M	(2019) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

1.2 ADMINISTRATIVE REQUIREMENTS

1.2.1 Pre-Installation Meetings

Convene a pre-installation meeting at least one week prior to beginning installation to review conditions of preparation, storage and handling, installation procedures, sequencing, protection, and coordination with other related work. The project superintendent, installer, installer's crew leader, and representatives of the trades affected by this work are required to attend. Notify the Contracting Officer at least 10 calendar days before the meeting.

1.3 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G". Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force, and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Steel Mesh Shop Drawings; G[, [_____]]

Basaltic Sand Shop Drawings; G[, [_____]]

SD-03 Product Data

Steel Mesh Materials

Accessories

Steel Mesh System

Written Warranty

SD-04 Samples

Steel Mesh Materials; G[, [_____]]

SD-06 Test Reports

Basaltic Sand; G[, [_____]]

SD-07 Certificates

System Installers

Steel Mesh Materials

Written Verification

SD-08 Manufacturer's Instructions

Manufacturer's Installation Instruction Manual

Manufacturer's Guidance

Manufacturer's Installation Instructions

SD-09 Manufacturer's Field Reports

Site Conditions

SD-11 Closeout Submittals

Written Warranty

1.4 QUALITY CONTROL

1.4.1 Qualifications

1.4.1.1 Steel Mesh Barrier System

a. Only employee system installers trained in the behavior of termites and installation techniques of the mesh barrier, and accredited by the system's manufacturer. Submit certification that system installers meet the requirements specified and for the effective time period of accreditation.

b. Only employ workers trained and accredited at the appropriate level by the system's manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the site in original, unbroken packaging and containers, with original labels in place, to include any U.S. Environmental Protection Agency (EPA) designation. Store materials in conformance with system manufacturer's recommendations.

Store and handle the material so as to prevent contamination by dirt, water, and organic material.

1.6 SITE CONDITIONS

1.6.1 Environmental Requirements

In addition to the manufacturer's installation instructions and before placing material, ensure project site is free from standing water.

1.7 WARRANTY

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NOTE: Choose the first sentence for minimum 1-year written warranty for existing building repair or renovation projects. Choose the second sentence for 5-year written warranties on new building or

addition projects.
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[Provide a minimum 1-year written warranty against infestations or reinfestation by subterranean termites of existing buildings with barrier installed during repair or renovation.][Furnish a 5-year written warranty against infestations or reinfestation by subterranean termites of the buildings or building additions constructed under this contract.] Written warranty must be jointly signed by an officer of the Contractor and the supplier. Perform annual inspections of the building[s] or building addition[s]. 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, take the following actions:

a. Correct defective steel mesh basaltic sand installation and perform other treatment as may be necessary to eliminate subterranean termite infestation.

b. Repair damage caused by termite infestation.

c. Reinspect the building approximately 180 calendar days after the repair.

PART 2 PRODUCTS

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NOTE: Check with local agencies to determine the local building code requirements and specifications to ensure conformance where required.
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2.1 SYSTEM DESCRIPTION

2.1.1 Steel Mesh System Description

A complete termite control barrier system encompasses a fine steel mesh placed across all termite entry points to the building. Principal entry points include all cracks, joints, penetrations, and other termite entry points within the concrete slabs and cavities in walls. The steel mesh and fastening system physically prevents the termites from entering the building. The mesh is too fine for the termites to pass through, too hard to chew through, and highly corrosion resistant against future break down.

2.1.2 Basaltic Sand System Description

A complete termite control barrier system composed of a graded basaltic sand as a physical barrier below the concrete slab or foundation of a structure to prevent the entry of Formosan ground termites into wood components of the structure, similar to laying down a chemical barrier of soil termiticide. The use of this preventive measure does not preclude the use of other preventive measures such as chemical treatment, steel mesh barrier system, and pressure treated lumber to provide maximum protection to the structure. It is recommended that this material be used in conjunction with chemical treatments of vulnerable areas such as around electrical conduits, plumbing pipes that penetrate the slab, and the shoulder portions of the barrier and with pressure treated lumber to provide maximum protection to the structure.

2.2 MATERIALS

2.2.1 Asbestos Prohibition

No asbestos containing materials or equipment are permitted at the job site. Ensure materials proposed for the project are asbestos free.

2.2.2 Steel Mesh Materials

Provide stainless steel mesh that conform to ASTM A478 and ASTM A580/A580M, Type A1AA marine grade 316 stainless steel mesh of 0.18 mm 0.007 inches diameter wire with mesh openings of 0.66 by 0.465 mm 0.026 by 0.018 inches.

2.2.2.1 Steel Mesh Material Submittals

Submit statements signed by responsible officials of the manufacturer of material attesting that material meets specification requirements. These statements must be dated after award of the project contract and clearly name the project.

Submit samples of steel mesh materials. Provide 102 by 102 mm 4 by 4 inch samples of steel mesh to be used in this work.

2.2.3 Accessories

Provide parging adhesives, bonding cement, high grade stainless steel clamps, ties, and other accessories as recommended by system's manufacturer.

2.2.4 Basaltic Sand

Provide clean, dry sand material manufactured from crushed basalt rock that meets the following requirements.

a. Material gradation, ASTM C136/C136M.

Sieve Size	Percent Passing
4.75 mmNo. 4	100
2.36 mmNo. 8	95-100
2 mmNo. 10	75-95
1.7 mmNo. 12	35-50
1.18 mmNo. 16	1-10

b. Specific gravity, ASTM C128, 2.80.

c. Silica (S102) content, 45 percent.

d. Abrasion loss, after 500 revolutions, 20 percent, when tested in accordance with ASTM C131/C131M.

PART 3 EXECUTION

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NOTE: Provide stainless steel mesh graded basaltic sand in a manner to provide maximum protection to the dwelling. The material provides a physical barrier against termites, thus, preventing entry. A range of techniques and material widths may be required to meet site conditions. The designer is required to determine the extent of openings to be covered to provide quantity estimates for the material installed.

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NOTE: The stainless steel mesh must be installed in a manner to provide maximum protection to the dwelling. The material provides a physical barrier to the termites, thus, preventing entry. A range of techniques and material widths may be required to meet site conditions. The designer is required to determine the extent of openings to be covered to provide quantity estimates for the material installed.

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3.1 EXAMINATION

Examine the substrates and conditions under which work of this section will be performed. Coordinate with this specification all work related to final grades, landscape plantings, foundations, or any other alternations to finished construction that might alter the condition of the site. Do not proceed until any unsatisfactory conditions detrimental to timely and proper completion of the work have been corrected. Submit written verification that site conditions are as required and other site work will not disturb the installation.

3.2 PREPARATION

In addition to the manufacturer's requirements and before placing material, remove any visible plant roots, construction wood scraps such as ground stakes, form boards, scrap lumber, and standing water from the excavated area. Inspect the utility trenches to ensure they are sufficiently wide to permit adequate cover under, around, and over pipes and conduit that will be encapsulated with the basaltic sand materials. In addition, inspect the foundation perimeter to ensure there is sufficient room between the sides of the excavations and the edges of the foundations to provide the required barrier depth and width.

Provide finished or temporary site grading to remove standing water from the project site (i.e., excavated areas or adjacent areas). Grading must provide positive drainage towards temporary, new or existing drainage features. Grading must not result in low spots that hold water or direct water towards new or existing facilities.

3.2.1 Surface Preparation

Perform work related to final grades, landscape plantings, foundations, or any other operations that might alter the condition of the site, in

accordance with this specification. Before installing the steel mesh, ensure that the following have been completed:

a. Eliminate termite food sources by removing wood debris, such as ground stakes, form boards, scrap lumber, and any cellulose containing material from the work area.

b. The work area has been filled with finely graded soil consisting of particle sizes no larger than 25 mm 1 inch and compacted to eliminate soil movement. Ensure the site conditions meet the manufacturer's recommendations for installing the steel mesh.

c. Footings, foundations, and outer forms are in place.

d. Penetrating pipes for communications, electrical, and plumbing are in place.

e. Submit site conditions certificate documenting that the site conditions are acceptable for the steel mesh barrier system.

3.3 INSTALLATION

Install a basaltic sand system in accordance with the manufacturer's installation instructions.

Submit basaltic sand shop drawings of the basaltic sand installation at all interior and perimeter foundations, joints, and penetration conditions to the Contracting Officer for approval before installation.

3.3.1 Steel Mesh Instructions

Strictly follow the manufacturer's instructions published in Manufacturer's Installation Instruction Manual. In addition to the system manufacturer's instructions, place the stainless steel mesh across all openings, joints, penetrations, and other termite entry points to the building (including all shrinkage cracks in concrete slabs and built penetrations in slabs and walls that termites may use for access points)and in accordance with manufacturer's recommendations. Clamp, parge adhere, bond, or embed the steel mesh to the material surrounding the opening in accordance with the manufacturer's recommendations. Install with no gaps, penetrations, or damage to the mesh system. Submit steel mesh shop drawings of the termite steel mesh installation at all perimeter foundations, joints, and penetration conditions to the Contracting Officer for approval before installation.

To avoid an electrolytic reaction, do not place dissimilar metals in contact with the steel mesh.

3.3.1.1 Installation Sequence

a. Install the steel mesh barrier in accordance with the manufacturer's recommendations. Fit and clamp the mesh around all pipe penetrations, and terminate the mesh at the perimeters, as appropriate for the building construction and as described in the manufacturer's installation manual. Lap joint the mesh 10 to 15 mm 0.39 to 0.59 inches and the joint may be strengthened by using bonding cement for a minimum distance of 500 mm 20 inches along the joint.

b. Install special fittings that are appropriate to the construction, as

described in manufacturer's installation manual.

c. Following installation of mesh and vapor barrier, install reinforcing steel and concrete, as specified under other sections. Seal penetrations and shrinkage cracks through concrete slabs in accordance with manufacturer's recommendations.

d. To maintain resistance to termites, complete the system and do not disturb, penetrate, or damage during the remaining contract time period.

3.3.1.2 Steel Mesh Integration

Where required, integrate mesh into subsequent construction, as described in manufacturer's installation manual.

3.3.2 Placement

Place the basaltic sand barrier under slabs, in utility trenches, along edges of concrete pavement, in concrete masonry unit (CMU) cells, along retaining walls, and other areas that termites may use for access points and in accordance with manufacturer's recommendations.

Place material in one lift for thicknesses of 150 mm 6 inches or less and in successive lifts of 100 to 150 mm 4 to 6 inches where the indicated thickness is greater than 150 mm 6 inches. Compact each lift prior to placing successive lifts. Use power driven, vibrating-plate type tampers for large areas and rod-and-plate type hand tampers for small areas such as utility trenches and foundation and walk edges.

3.3.2.1 Slab on Grade

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NOTE: Show the required depths on the drawings. 100 mm Four inches depth is the minimum required. For areas where capillary action is a problem, consult a soils engineer if the depth should be increased or other capillary prevention measures are required.
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Provide a barrier of the depth indicated. Rake smooth and machine tamp, making at least three passes over the entire area. Hand tamp around pipe and conduit risers.

3.3.2.1.1 Utility Trenches

Place the required depth of material for bedding in the trenches prior to placing pipes and conduits and hand tamp the material. For pipes 75 mm 3 inches and larger in diameter: after placing the pipe, bring material up to the top of the pipe and carefully hand tamp the material. Then, bring the material up to the top of the trench and tamp. For pipes smaller than 75 mm 3 inches in diameter and for conduit: bring material up to the top of the trench and tamp.

3.3.2.1.2 Edges

After concrete is placed and the form is removed, remove any dirt, loose concrete, and other debris and hand place and tamp additional material to

the existing grade

3.3.2.2 CMU Block Walls

Place the material in non-grouted cells at a height of at least one course above grade of the wall.

3.3.2.3 Fence Posts and Utility Poles

Line the designated hole with a geotextile or similar material before proceeding with the work.

Once the geotextile is in place, put a 100 to 150 mm 4 to 6 inch layer of the basaltic sand at the bottom of the hole. Hand tamp the material. After positioning the fence post or utility pole in the middle of the hole, fill around the sides, compacting the material after successive lifts of 150 to 300 mm 6 to 12 inches until the hole is completely filled. Ensure that a 100 to 150 mm 4 to 6 inch basaltic sand barrier exists around the perimeter of the post or pole.

3.3.2.4 Retaining Walls

Place the required amount of material below the footing and up to the grade level of the wall. Place lifts of 100 to 150 mm 4 to 6 inches with compaction of each lift prior to placing successive lifts.

3.4 FIELD QUALITY CONTROL

3.4.1 Inspection

Provide Manufacturer's Guidance for performing a visual inspection of the installed mesh to ensure the steel mesh provides the designed termite physical barrier.

3.4.2 Manufacturer Field Services

Before installing the steel mesh, verify that final grades are as indicated and smooth grading has been completed. Provide written verification that the site conditions under the proposed slabs are proper for the installation of the termite barrier system in accordance with the manufacturer's recommendations.

3.5 PROTECTION

Protect the installed steel mesh system, attachments, and accessories before, during, and after the work of all trades, as required by the system manufacturer or as directed by the Contracting Officer.

In the event that subsequent trades on the site move or damage the mesh, clamps, or parging mix, immediately contact the mesh installer for a recommendation of the necessary repairs.

-- End of Section --