

This is a guidance document with sample specification language intended to be inserted into project specifications on this subject as appropriate to the agency's environmental goals. Certain provisions, where indicated, are required for U.S. federal agency projects. Sample specification language is numbered to clearly distinguish it from advisory or discussion material. Each sample is preceded by identification of the typical location in a specification section where it would appear using the SectionFormat™ of the Construction Specifications Institute; the six digit section number cited is per CSI Masterformat™ 2004 and the five digit section number cited parenthetically is per CSI Masterformat™ 1995.

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SECTION 31 31 00 (SECTION 02360) - SOIL TREATMENT

SPECIFIER NOTE:

resource management: For soil treatment options, resource management issues closely parallel toxicity issues. The more environmentally friendly alternative to canvassing the construction site with poison is to investigate, evaluate and adjust the local ecosystem such that the undesirable creatures are not attracted to materials and areas in which they are unwanted. For example, tree limbs or vegetation that touch the exterior walls or roof provide excellent transportation for unwanted, wood boring insects. Rather than spraying the yard, consider relocating and/or trimming plants.

toxicity/IEQ: This section typically specifies pesticides and herbicides to control unwanted vegetation, rodents, and insects. Soil treatments directly impact soil and groundwater; they directly impact the hydrologic cycle and the food chain. EO 13423 includes requirements for Federal Agencies to reduce "the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of by the agency"

Therefore, utilize the least toxic treatment possible. Alternative control methods include low-tech options such as soil solarization; refer to Section 32 90 00 (02900) – Planting. Alternative control methods include design options and maintenance procedures to control ; refer to Section 10 81 50 (10295) – Integrated Pest Management (IPM).

performance: Termite infestation exists throughout the United States and overseas areas with the exception of Alaska. Some construction systems, such as masonry, steel and concrete, are not considered to be susceptible to termite damage. Alternative termite-prevention systems, such as a termite sand barrier, generally require preventative maintenance on the part of the building owner, such as keeping vegetation and dead leaves away from the building. Verify that the owner understands the maintenance involved and is willing to perform such maintenance.

Alternative systems may be used in combinations. For example, a mesh barrier system may be used in combination with other preventive measures such as a sand barrier system and pressure treated lumber for construction.

Alternative systems may require a variance.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Sand barrier termite control.
 - 2. Mesh termite control.

SPECIFIER NOTE:

Coordinate requirements specified under this section with work specified under related sections. Edit below to suit project.

- B. Related Sections:

1. Section 10 81 50 (10295) – Integrated Pest Management (IPM).
2. Section 32 90 00 (02900) – Planting: Landscape maintenance program.

1.2 SUBMITTALS

- A. Product data. Unless otherwise indicated, submit the following for each type of product provided under work of this Section:

SPECIFIER NOTE:

Green building rating systems often include credit for materials of recycled content. USGBC-LEED™ v3, for example, includes credit for materials with recycled content, calculated on the basis of pre-consumer and post-consumer percentage content and it includes credit for use of salvaged/recovered materials. Green Globes US also provides points for reused building materials and components and for building materials with recycled content.

1. Recycled Content:
 - a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
 - b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
 - c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
 - d. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

SPECIFIER NOTE:

Specifying local materials may help minimize transportation impacts; however it may not have a significant impact on reducing the overall embodied energy of a building material because of efficiencies of scale in some modes of transportation.

Green building rating systems frequently include credit for local materials. Transportation impacts include: fossil fuel consumption, air pollution, and labor.

USGBC-LEED™ v3, for example, includes credits for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Green Globes US also provides points for materials that are locally manufactured.

2. Local/Regional Materials:
 - a. Sourcing location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
 - b. Manufacturing location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
 - c. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
 - d. Product Component(s) Value: Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

1.3 WARRANTY

- A. Mesh System Warranty: Provide a **[3] [5] [xxxx]** year written warranty against infestations **[and reinfestations]** by subterranean termites of the building**[s] [and building additions]** constructed under this contract.
1. Perform annual inspections of the building**[s] [and building additions]**. 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 mesh installation and perform other treatment as may be necessary for elimination of subterranean termite infestation;
- b. Repair damage caused by termite infestation; and,
- c. Reinspect the building approximately 180 calendar days after the repair.

PART 2 - PRODUCTS

SPECIFIER NOTE:

EO 13423 includes requirements for Federal Agencies to use “sustainable environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products”

Specifically, under the Sustainable Building requirements per Guiding Principle #5 Reduce Environmental Impact of Materials, EO13423 directs Federal agencies to “use products meeting or exceeding EPA’s recycled content recommendations” for EPA-designated products and for other products to “use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project.”

Executive Order 13514; *Federal Leadership in Environmental, Energy, and Economic Performance*; was signed on October 5, 2009. <http://www.ofee.gov/execorders.asp> It expands upon the environmental performance requirements of EO 13423.

http://www1.eere.energy.gov/femp/regulations/printable_versions/eo13423.html

EO 13514 sets numerous federal requirements in several areas, including sustainable buildings and communities. Federal agencies must implement high performance sustainable federal building design, construction, operation and management, maintenance, and deconstruction, including:

- Ensuring all new Federal buildings, entering the design phase in 2020 or later, are designed to achieve zero net energy by 2030.
- Ensuring all new construction, major renovations, or repair or alteration of Federal buildings comply with the Guiding Principles of Federal Leadership in High Performance and Sustainable Buildings <http://www1.eere.energy.gov/femp/pdfs/mouhighperfsustainfedfacs.pdf>
- Ensuring at least 15% of existing agency buildings and leases (above 5,000 gross square feet) meet the Guiding Principles by fiscal year 2015 and that the agency makes annual progress towards 100% compliance across its building inventory.

2.1 SAND BARRIER TERMITE CONTROL

SPECIFIER NOTE:

Because termites live in moist underground colonies and travel upwards into buildings only to feed on the wood, they build shelter tubes above ground where they would be exposed to the outside air, which would dry them out and kill them. Termites are very capable of digging through soil. But, they are unable to dig through sand of certain grain size. Grains of approximately 1.6 to 2.5 mm particle size range (mesh 12 to 8) are too large for them to move and the interstitial space too small for them to move between the grains.

When used in combination with a termite flashing shield, a rigid flashing between the sill plate and the foundation wall, the effectiveness of the system may be increased. If the termites do find an alternate route up the foundation to the wood sill plate, their shelter tube must extend around the angled drip of the flashing, exposing their location for spot chemical treatment.

- A. Sand: Clean, dry sand manufactured from crushed basalt rock meeting the following requirements.
 1. Material gradation, ASTM C 136:

<u>Sieve Size</u>	<u>Percent Passing</u>
4.75 mm	100

2.36 mm	95 - 100
2.00 mm	75 - 95
1.70 mm	35 - 50
1.18 mm	0 - 10

<u>Sieve Size</u>	<u>Percent Passing</u>
No. 4	100
No. 8	95 - 100
No. 10	75 - 95
No. 12	35 - 50
No. 16	0 - 10

2. Specific gravity, ASTM C 128, 2.80.
3. Silica (S102) content, ASTM C 289, 45 percent.
4. Abrasion loss, after 500 revolutions, 20 percent, when tested in accordance with ASTM C 131.

B. Termite shield:

1. Galvanized sheet metal; ASTM A 653/A 653M, G90 coating designation; structural quality; **[0.0276 inch (0.7 mm)] [xxxx]** thick profile as indicated on drawings.
2. Rigid plastic sheet, profile as indicated on drawings. **[Extruded and Compression Molded Basic Shapes Made from Thermoplastic Polyester (TPES), complying with ASTM D6261] [Extruded, Compression Molded, and Injection Molded Basic Shapes of Poly(aryl ether ketone) (PAEK), complying with ASTM D6262] [xxxx]**.
 - a. Recycled content: Minimum [50] [xxxx] percent post-consumer recycled content.

2.2 MESH TERMITE CONTROL

SPECIFIER NOTE:

A mesh system encompasses a fine 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 mesh and fastening system physically prevents the termites from entering the building. The mesh is too fine for the termites to squeeze through, too hard to chew through, and highly corrosion resistant for future break down.

- A. Barrier Mesh: 0.18 mm 0.007 in. diameter strands with mesh openings of 0.66 x 0.45 mm. 0.026 x 0.018 inches.
 1. Stainless steel mesh shall conform to ASTM A 478 and ASTM A 580/A 580M, Type A1AA marine grade 316 stainless steel mesh.
 2. Plastic.
- B. Accessories: Parging adhesives, bonding cement, high grade stainless steel clamps, ties, and other accessories as recommended by mesh system supplier.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the substrates and conditions under which work of this section will be performed. Do not proceed until unsatisfactory conditions detrimental to timely and proper completion of the work have been corrected.

- B. Verify that the site conditions under the slab(s) are proper for the installation of termite barrier system as specified **[and in accordance with manufacturer's printed instructions]**. Prior to installation, verify that:
1. The ground has been cleared of wood scraps such as ground stakes, forms and other termite food sources.
 2. The work area has been filled with finely graded soil consisting of particle sizes no larger than 25 mm 1 in and compacted to eliminate soil movement.
 4. Footings and foundations, and outer forms are in place.
 5. Communications, electrical and plumbing penetrating pipes are in place.
 6. Sand system: Prior to placing material, remove visible plant roots and standing water from the excavated area. Verify that utility trenches are sufficiently wide to permit adequate cover under, around, and over pipes and conduit that will be encapsulated with the termite sand barrier. Verify that the foundation perimeter has sufficient room between the sides of excavations and edges of foundations to provide the required barrier depth and width.

3.2 INSTALLATION – SAND BARRIER

SPECIFIER NOTE:

Show the required depths on the drawings. 100 mm (Four inch) depth is the minimum required at slabs on grade. For areas where capillary action is a problem, consult a soils engineer to determine if the depth should be increased or if other capillary prevention measures are required.

- A. Sand barrier: Install a sand barrier around perimeter of the foundation. 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. **[Provide depth and width as indicated on drawings.] [Unless otherwise indicated, provide 12 inches wide and 6 inches deep.]**
1. Slab-on-Grade: Rake smooth and machine tamp, giving at least three passes over the entire area. Hand tamp around pipe and conduit risers.
 2. Utility Trenches: Place the required depth of material for bedding in trenches prior to placing pipes and conduits. Hand tamp. For pipes 75 mm 3 inches and larger in diameter: After placing pipe, bring material up to the top of the pipe and carefully hand tamp the material. Then, bring 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. CMU Block Walls: Place the material in ungrouted cells at a height of at least one course above grade of the wall.
 4. 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 sand barrier at the bottom of the hole. Hand tamp. 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) sand barrier exists around the perimeter of the post or pole.
 5. 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.
- B. Termite shield: Install termite shield at perimeter of concrete slab edges as indicated on drawings. Fit tightly around pipe or other penetrations.

3.3 INSTALLATION – MESH SYSTEM

- A. Mesh barrier: Install in accordance with manufacturer's printed instructions and as indicated.
 - 1. Place the mesh barrier 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 point).
 - 2. Install mesh as required, fit and clamp mesh around all pipe penetrations, and terminate at perimeters as appropriate for the building construction. Clamp, parge adhere, bond and/or embed the termite mesh to the material surrounding the opening. Install with no gaps, penetrations or damage to the mesh system.
 - 3. Install special fittings appropriate to construction.
 - 4. Coordinate with vapor barrier, reinforcing steel and concrete specified under other work of other sections.

3.4 PROTECTION

- A. Protect the installed termite system, attachments and accessories before, during and after the work of all trades.
 - 1. Mesh system: In the event following trades on the site move or damage the mesh, clamps or parging mix, immediately contact the mesh installer, for recommendation of necessary repairs.
- B. Prevent contact of dissimilar metals and electrolytic reaction. Do not place dissimilar metals in contact with the **[stainless steel mesh] [metal termite shield]**.

END OF SECTION