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USACE / NAVFAC / AFCEA UFGS-09421 (August 2004)  
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Preparing Activity: USACE Superseding  
UFGS-09421A (January 2004)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated 25 June 2004

Latest change indicated by CHG tags

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SECTION 09421

TERRAZZO TILE  
08/04

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NOTE: This guide specification covers the requirements for cast marble or granite terrazzo tile of various sizes and thicknesses).

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

This guide specification includes tailoring options for resilient base, terrazzo base, and metal edge strips. Selection or deselection of a tailoring option will include or exclude that option in the section, but editing the resulting section to fit the project is still required.

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PART 1 GENERAL

1.1 REFERENCES

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NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest guide specification. Use of SpecsIntact automated reference checking is recommended for projects based on older guide specifications.

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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 C 109/C 109M	(2002) Compressive Strength of Hydraulic Cement Mortars (Using 2-in. [50-mm] Cube Specimens)
ASTM C 501	(1984; R 2002) Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser
ASTM C 97	(2002) Absorption and Bulk Specific Gravity of Dimension Stone
ASTM D 2047	(1999) Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine
ASTM E 648	(2003) Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
ASTM E 84	(2003) Surface Burning Characteristics of Building Materials

1.2 GENERAL REQUIREMENTS

1.2.1 Standard Products

Materials shall be the standard products of a manufacturer regularly engaged in the manufacture of the material and shall essentially duplicate products that have been in satisfactory use at least 2 years prior to bid opening.

1.2.2 Verification of Dimensions

The Contractor shall become familiar with details of the work, verify dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing the work.

1.3 SUBMITTALS

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NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's

Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation 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 projects.

Submittal items not designated with a "G" are considered as being for information only for Army projects and for Contractor Quality Control approval for Navy projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.] [for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

#### SD-02 Shop Drawings

Terrazzo Tile[; G][; G, [\_\_\_\_]]

Drawings indicating pattern, size, style, and color of tiles.

#### SD-03 Product Data

Installation

The manufacturer's printed installation instructions for the conditions indicated.

#### SD-04 Samples

Terrazzo Tile  
Resilient Base  
Terrazzo Base/Strips  
Metal Edge Strips

Two 150 by 150 mm 6 by 6 inch minimum samples of each color and pattern of terrazzo tile to be used, one 150 mm 6 inch long sample of metal edge strip and two 100 mm 4 inch long samples of each type and color of trim pieces and base.

#### SD-07 Certificates

Terrazzo Tile  
Adhesive

## Resilient Base

Certificates indicating that the materials conform to the specified requirements and flooring manufacturer's approval of underlayment, adhesive, and cleaners.

## SD-10 Operation and Maintenance Data

### Manufacturer's Maintenance Instructions

[Six] [\_\_\_\_\_] copies of the manufacturer's maintenance literature.

## 1.4 INSTALLER QUALIFICATIONS

Installer shall possess, to the satisfaction of the Contracting Officer, the technical qualifications, experience, trained personnel, and facilities to properly install the specified items.

## 1.5 DELIVERY AND STORAGE

Materials shall be delivered to the jobsite in the manufacturer's original unopened containers marked with the manufacturer's brand name, color, and pattern. Materials delivered and placed in storage shall be stored to protect from damage, weather, humidity and temperature variation, dirt and dust, or other contaminants. Temperature of storage area shall not be lower than 10 degrees C 50 degrees F or higher than 32 degrees C 90 degrees F.

## 1.6 SITE CONDITIONS

Tiles shall not be installed until other work that could cause damage to the finished flooring has been completed. A temperature of not less than 21 degrees C 70 degrees F shall be maintained in all areas where tile is to be installed for a period of not less than [48] [\_\_\_\_\_] hours before, during and after laying of tiles. Tiles shall be brought into installation areas and allowed to condition at not less than 21 degrees C 70 degrees F for a period of [48] [\_\_\_\_\_] hours prior to installation. After installation of tiles, a minimum temperature of 13 degrees C 55 degrees F shall be maintained.

## 1.7 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a one year period shall be provided.

## PART 2 PRODUCTS

### 2.1 TERRAZZO TILE

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NOTE: Designer will select the chip requirements  
and also determine whether flexible or rigid resin  
is required or either give the Contractor the option.  
  
Coordinate with data of manufacturers of terrazzo  
tile when determining the patterns, styles, sizes  
and thicknesses of tiles.  
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Terrazzo tile shall be of the indicated colors and shall consist of [marble] [or] [granite] chips embedded in a [flexible] [or] [rigid] thermoset resin matrix. Tiles shall be [5] [\_\_\_\_\_] mm [3/16] [\_\_\_\_\_] inch thick and nominal [300 by 300] [\_\_\_\_\_] mm [12 by 12] [\_\_\_\_\_] inches. Tiles shall have a [polished] [polished and [honed] [textured]] [honed] [textured] finish with uniform color distribution of chips. [Marble chips shall be graded to [16] [6] mm [5/8] [1/4] inch maximum size.] [Granite chips shall be manufacturer's standard gradation.] Tile shall have the following properties:

#### TERRAZZO TILE PROPERTIES

PROPERTY	TEST METHOD	VALUE
Compressive Strength	ASTM C 109/C 109M	20 MPa 3000 psi minimum
Water Absorption	ASTM C 97	0.7 percent maximum
Abrasive Wear	ASTM C 501	Index 28
Coefficient of Friction	ASTM D 2047	0.5 wet
Flame Spread	ASTM E 84	Class A
Critical Radiant Flux	ASTM E 648	Class I

#### 2.2 ADHESIVE

Adhesive shall be flooring and resilient base manufacturer's standard product or a product recommended by the manufacturer.

#### 2.3 RESILIENT BASE

Resilient base shall be [[rubber] [or] [vinyl] type, coved style.] [butt toe cove installed with 3 mm 1/8 inch thick flooring.] Base shall be 100 mm 4 inches high and a minimum 3 mm 1/8 inch thick. [Preformed outside] [Job formed] corners shall be furnished.

#### 2.4 TERRAZZO BASE/STRIPS

Terrazzo base/strips shall be colors as indicated, shall meet the requirements of paragraph TERRAZZO TILE and shall be of the manufacturer's standard product. Base/strips shall be [10] [20] mm thick by [\_\_\_\_\_] mm wide by [\_\_\_\_\_] mm long [3/8] [3/4] in thick by [\_\_\_\_\_] in wide by [\_\_\_\_\_] in long. Base/strips shall a [polished] [honed] [textured] finish.

#### 2.5 METAL EDGE STRIPS

Metal edge strips shall be extruded aluminum, butt type, approximately 40 mm 1-1/2 inches wide with thickness to set top surface flush with top of tile and with bevel at exposed edge. Edge strips shall have countersunk holes near each end and spaced not more than 200 mm 8 inches on center for securement.

## 2.6 COLOR

Color shall be [in accordance with Section 09915 COLOR SCHEDULE] [\_\_\_\_\_].

## PART 3 EXECUTION

### 3.1 GENERAL

Flooring and base shall be provided on floor surfaces and walls where indicated. Resilient base required over metal base of casework shall be as specified in Section [\_\_\_\_\_]. Except as required for installation of new tile, traffic shall be kept off new tile for at least [24] [\_\_\_\_\_] hours after installation.

### 3.2 SUBSTRATE PREPARATION

Holes and cracks shall be filled with mortar. Floors shall be free of curing compounds, grease, dirt, loose particles and other foreign matter that would prevent adhesion. Projecting irregularities shall be chipped or ground smooth. Depressions shall be filled and uneven surfaces leveled. Subfloors shall then be rinsed and allowed to dry prior to applying adhesive.

### 3.3 INSTALLATION

#### 3.3.1 Tile

Tile shall be installed in accordance with the manufacturer's approved installation instructions, except as specified herein. Tile shall be laid symmetrical about center lines of rooms or areas. Joints shall be tight, inconspicuous as possible, and in alignment. Tile shall be cut to fit snugly at pipes and other vertical surfaces. Joints at pipes shall be sealed with adhesive. Remove spots or smears of adhesive immediately. Entire surface of finished tile floor shall be smooth, straight, and free from bleeding adhesive, buckles, waves, or projecting tile edges upon completion. Bleeding of adhesive on finished floors is cause for rejection by the Contracting Officer. Damaged or rejected tiles shall be removed and replaced.

#### 3.3.2 Metal Edge Strips

Edge strips shall be secured with No. 10 aluminum alloy, counter-sunk, flathead machine screws with expansion sleeves. Exposed edges of tile shall be provided with one-piece metal edge strips.

#### 3.3.3 Terrazzo Base/Strips

Terrazzo base/strips shall be continuous and adhesively applied. Joints shall be tight and inconspicuous in same manner as floor tile.

#### 3.3.4 Base

Standard length resilient base of height shown shall be set straight, level and with close flush joints hermetically sealed by adhesive. Wherever resilient base is used in conjunction with wall covering, adhesive shall be spread to within 6 mm 1/4 inch from top of base and wall covering shall be cut off at a point 6 mm 1/4 inch below top of base. Straight base shall be used in rooms or areas that have carpets. All spots or smears of adhesive shall be immediately removed from exposed surfaces.

#### 3.4 MOISTURE TEST

After concrete floor surfaces have been cleaned, small patches of adhesive to be used shall be spread in several locations in each room or area to receive tile and allowed to dry overnight. If the adhesive can be peeled easily from the floor surfaces, the surface is not sufficiently dry. The steps shall be repeated until the adhesive adheres properly. Tiles shall not be applied until adhesive adheres tightly to the floor.

#### 3.5 CLEANING

Upon completion of the installation and after adhesive has cured, flooring shall be thoroughly cleaned in accordance with the manufacturer's recommendations.

#### 3.6 PROTECTION

The terrazzo tile work shall be covered and protected from damage until completion of the work of all other trades. Defects which develop, such as loose, broken, or curled tiles, shall be removed and replaced. The Contractor shall submit Manufacturer's Maintenance Instructions.

-- End of Section --