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USACE / NAVFAC / AFCESA / NASA **UFGS-04 21 26 (April 2006)**

Preparing Activity: USACE **Replacing without change UFGS-04215 (August 2002)**

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2008
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SECTION TABLE OF CONTENTS

DIVISION 04 - MASONRY

SECTION 04 21 26

GLAZED STRUCTURAL CLAY TILE AND PREFACED CONCRETE MASONRY UNITS

04/06

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SECTION 04 21 26

GLAZED STRUCTURAL CLAY TILE AND PREFACED CONCRETE MASONRY UNITS
04/06

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NOTE: This guide specification covers the requirements for application methods for ceramic glazed structural clay facing tile units and prefaced concrete masonry units.

Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

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

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).
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PART 1 GENERAL

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NOTE: The following information should be indicated on the project drawings:

1. Schedule of location of types, bonds and colors of the facing tile or prefaced masonry units.

2. Location of control and expansion joints.

3. Connections to structural elements and lateral support.

4. Anchorage to floors, ceilings, and abutting walls.

5. Lintels.

6. Detail built-in electrical or mechanical equipment.

7. Fire Rating. Show special connections or details.

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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 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.

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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 A 153/A 153M	(2005) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 568/A 568M	(2007a) Standard Specifications for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for
ASTM A 82/A 82M	(2007) Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
ASTM C 126	(1999; R 2005) Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units
ASTM C 270	(2007a) Standard Specification for Mortar for Unit Masonry
ASTM C 476	(2007) Standard Specification for Grout

	for Masonry
ASTM C 744	(2005) Prefaced Concrete and Calcium Silicate Masonry Units
ASTM C 90	(2006b) Loadbearing Concrete Masonry Units

TILE COUNCIL OF AMERICA (TCA)

TCA Hdbk	(2007) Handbook for Ceramic Tile Installation

1.2 SUBMITTALS

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NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

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, Air Force, and NASA projects.

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" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.][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 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Ceramic Glazed Structural Clay Facing Tile
Prefaced Concrete Masonry Units

Manufacturer's descriptive data.

SD-04 Samples

Ceramic Glazed Structural Clay Facing Tile
Prefaced Concrete Masonry Units

Submit [three] [_____] individual units of each color showing texture and the extreme variations in each color. Submit one of each shaped unit in each color.

Ceramic Glazed Structural Clay Facing Tile
Prefaced Concrete Masonry Units

Before starting ceramic glazed structural clay facing tile and prefaced concrete masonry unit work, erect where directed, a sample panel, approximately 1200 mm long by 1200 mm high 4 feet long by 4 feet high of each type of unit approved by the Contracting Officer. Show the workmanship, bond, jointing, range of color of units, and mortar color. Match workmanship of panels throughout the project with that of the approved sample.

SD-07 Certificates

Ceramic Glazed Structural Clay Facing Tile
Prefaced Concrete Masonry Units

Certificates of compliance stating that the materials meet the specified requirements.

1.3 DELIVERY, STORAGE, AND HANDLING

a. Glazed structural clay tile and prefaced masonry shall be packed in the manufacturer's standard paper cartons, trays, or shrink wrapped pallets with a divider between each unit. Do not stack pallets. Do not remove units from cartons until cartons are placed on scaffolds or in the location where units are to be laid.

b. Furnish packaged cementitious materials in bags displaying the manufacturer's trademark and type. Material shall be dry and free of lumps when delivered. Store material in dry, weathertight, and properly ventilated structures. Different brands or types of mortar shall be stored separately.

c. Store and handle aggregates in a manner that will prevent intermixing with foreign matter.

d. Store anchors and ties in containers, in a dry and weathertight structure.

PART 2 PRODUCTS

2.1 SHAPES AND TOLERANCES

a. Provide units of shapes indicated or necessary for proper installation. Unless indicated otherwise, vertical external corners, sills, jambs, and caps shall be bullnosed; lintels and internal corners shall be square. Bases shall be flush with the

wall surface above. Where base course only is provided, the base shall be coved to ceramic tile or terrazzo floors.

b. Provide manufactured bond beam and open end units where required for placement of reinforcing.

2.2 CERAMIC GLAZED STRUCTURAL CLAY FACING TILE

****
NOTE: Give the designation of ceramic glazed structural clay facing tile indicated on the project drawings.

Specify Grade SS, Type I for walls laid in stack bond; Grade S, Type I is supplied if nothing is specified. Type II is double faced.

Normally, prefaced concrete masonry units will be specified as a Contractor's option to ceramic glazed structural clay facing units. Structurally the units will be considered as equal.
****

Provide facing tile indicated as [_____], conforming to ASTM C 126, Type I, Grade [SS] [S] glaze as indicated. In two-faced walls, Type II units may be used for the base course. All shapes and sizes shall be provided for a complete installation. Bullnose units shall be used along sills and caps and at vertical external corners including door jambs, window jambs, and other such openings. Base units shall be coved to meet finished floor surfaces where ceramic tile floor occurs. Backs of units exposed in unfinished rooms shall be smooth and free from glaze. Backs of units receiving plaster shall be scored, combed, or otherwise roughened. Surfaces receiving mortar shall be reasonably free from glaze and suitable for receiving mortar. Tile for fire rated walls shall have the percent of solid required for that rating.

2.2.1 Facing Tile Sizes and Colors

Provide as indicated. Variations in color and texture of finished surfaces of facing tile units shall not exceed the range of the approved samples. [Size and color of facing tile in spaces not scheduled shall be as selected from the manufacturer's standard colors.] [Tile glazing shall be opaque as tested in ASTM C 126.]

[2.2.2 Facing Tile Schedule

****
NOTE: Appropriate information should be indicated. Include this schedule for information that it is not convenient to indicate on the project drawings. Select colors from manufacturer's standard colors.
****

Location	Nominal Face Dimensions	Color of Field	Color of Base
[_____]	[_____]	[_____]	[_____]

]2.3 PREFACED CONCRETE MASONRY UNITS

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NOTE: Grade S block may be specified for interior units that are not subject to severe conditions. Shower rooms and food preparation areas should be Grade N. Check local availability.

Bullnose units will be specified only in cases where sharp corners are considered objectionable, such as in heavy traffic areas. If bullnose units are specified, the locations of use will be detailed on the drawings and/or listed in this paragraph.
****

Prefaced concrete masonry units [may] [may not] be provided in lieu of ceramic glazed structural clay facing tile units. Where prefaced concrete masonry units are provided, concrete masonry unit backing may be omitted when the nominal thickness of the prefaced concrete masonry units is the same as the total indicated nominal thickness of the facing tile plus the backing. Prefaced concrete masonry units shall conform to ASTM C 744 using masonry units conforming to ASTM C 90. The facing shall turn over the edges and ends of the unit at least 10 mm 3/8 inch in the direction of the thickness of the unit to form a lip at least 2 mm 1/16 inch thick. Variation in color and texture shall not exceed that of the approved samples. All shapes and sizes shall be provided for a complete installation. Bullnose units shall be used along sills and caps and at vertical external corners including door jambs, window jambs, and other such openings. Radius of the bullnose shall be 25 mm 1 inch. Base units shall be coved to meet finished floor surfaces where ceramic tile floor occurs.

2.4 MORTAR AND GROUT

****
NOTE: This section does not provide for specialized mortar uses such as chimney, structurally reinforced masonry, and acid resistant mortars.
****

2.4.1 Mortar

ASTM C 270, Type S or N, Type I portland cement, Type IP blended hydraulic cement, or masonry cement, standard gray in color [, except provide white portland cement shall be used for pointing mortar in [_____]]. Proportion to the requirements of Table 1, ASTM C 270. Admixtures containing calcium chloride, antifreeze liquids or salts will not be permitted.

2.4.2 Grout

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NOTE: Use fine grout for spaces less than 100 mm (4 inches) wide. Use coarse grout for spaces between 100 and 150 mm (4 and 6 inches). Over 150 mm (6 inches) concrete may be used.
****

ASTM C 476, [fine] [coarse], portland cement Type I or blended hydraulic cement Type IP.

2.4.3 Non-Staining, Chemical Resistant Grout

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NOTE: Use for food preparation areas, toilet rooms, and any areas subject to graffiti.
****

TCA Hdbk.

[2.4.4 Colored Mortar

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NOTE: Indicate location of colored mortar. Delete if colored mortar not used.
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Provide mortar coloring materials consisting of inorganic compounds in the proportions recommended by the manufacturer and as selected and approved, but not exceeding 15 percent of cement weight. Limit carbon black to 2 percent of cement weight. [Provide colored mortar for grouting in [_____]].

]2.4.5 Water

Water for mixing shall be potable.

2.5 ANCHORS AND TIES

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NOTE: Use rigid anchors for wall intersections. Use flexible anchors where movement will occur. For information on specific types see the National Concrete Masonry Association (NCMA) TEK NOTE 21-A. In walls where corrosion of ties is likely, use stainless steel ties.
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2.5.1 Galvanizing

ASTM A 153/A 153M, B-2. Anchors and ties shall be galvanized.

2.5.2 Rigid Anchors

ASTM A 568/A 568M. Intersecting wall anchors shall be as indicated.

2.5.3 Wire Ties

ASTM A 82/A 82M, 5 mm 3/16 inch diameter minimum.

2.5.4 Horizontal Truss

ASTM A 82/A 82M, minimum 9 gauge longitudinal and 12 gauge cross wires. Use at 400 mm 16 inches o.c. or every other row.

PART 3 EXECUTION

3.1 PROTECTION

Protect work from damage by other trades at all times. Provide plywood

barricades in heavy traffic areas. Protect cove base from damage by scaffold legs.

3.2 INSTALLATION

The ambient temperature where materials are to be installed shall be not less than 4 degrees C 40 degrees F and rising, but not more than 30 degrees C 85 degrees F. Maintain temperature requirements by methods approved by the Contracting Officer for the period the work is being performed and at least 48 hours after the work is completed. Do not use admixtures or antifreeze compounds.

a. Lay work out in advance to determine jointing and cutting and to obtain uniformity in the finished work. Joints in glazed structural clay facing-tile shall be approximately 6 mm 1/4 inch. Joints in pre-faced masonry units shall be 6 mm 1/4 inch on exposed glazed face(s), allowing standard 10 mm 3/8 inch joint between unglazed portions of the concrete masonry units.

b. Vertical joints shall be plumb from the top to the bottom of the panel, and courses level. Except where stack-bond or other special pattern is indicated, use running bond. Bond and interlock each course at corners and intersections. Exposed tile or masonry unit work shall be free from irregularities, waves, depressions, or other defects of workmanship.

c. Windows, door frames, loose lintels and miscellaneous steel, cabinets, mechanical and electrical work, expansion-joint material, flashing, anchors, ties, and accessories shall be built in as masonry work progresses. Fill spaces around metal door frames solidly with mortar. Solidly bed built-ins in mortar or grout.

3.3 MORTAR

a. Mix mortar in accordance with ASTM C 270. Mix mortar materials for at least 3 minutes in a mechanical batch mixer, with the minimum amount of water required to produce a working consistency.

b. Perform hand mixing, when permitted, in a tight mortar mixing box. Mixing time shall be not less than required to reproduce results obtained by machine mixing after the required amount of water has been added.

c. Place mortar in final position within 2 1/4 hours after mixing. Discard mortar not used within the specified time limit.

3.4 JOINTS

3.4.1 Tooled Joints

Except for joints to be sealed or raked, tool exposed joints to a dense concave profile, with surface and edges compacted and sealed. Perform tooling after joints are "thumbprint" hard.

3.4.2 Control Joints

Rake out joints to act as control joints to a depth of 13 mm 1/2 inch, clean, and leave ready for filler and sealant.

3.4.3 Non-Staining Grouted Joints

Where non-staining joints are required or indicated, rake setting mortar to the depth of 10 mm 3/8 inch and point the wall with a fine textured non-staining grout containing hardening [and] [or] waterproofing agents. Tool joints slightly concave, with glass or other non-staining tool to join rounded block edge.

3.4.4 Other Work

Rake out exterior and interior joints between metal frames and masonry, joints between mechanical equipment and masonry, and other joints as indicated to the required depth and leave ready for sealant.

3.5 BONDING AND ANCHORING

3.5.1 Anchor to Structural Elements

Anchor facing-tile or prefaced unit masonry panels to structural elements as indicated.

3.5.2 Double-Faced Bases or Partitions

Double-faced bases and partitions shall be of two-unit construction for clay units. Bond units by overlapping from opposite faces of the wall, 50 mm for 150 mm 2 inches for 6 inch thick partitions and 100 mm for 200 mm 4 inches for 8 inch thick or greater. A single wythe prefaced concrete masonry base or partition may be made with double faced units.

3.5.3 Ends of Partitions

Anchor ends of walls or partitions abutting columns, piers, or other walls as indicated. Intersecting walls shall have rigid tie anchors grouted into cells every course or the units shall be toothed into the other wall.

3.6 POINTING AND CLEANING

a. Remove excess mortar as work progresses.

b. Upon completion of the work, rake holes and defects in exposed mortar joints and fill with fresh mortar. Tool as previously specified. Replace cracked or defective blocks.

c. Facing tile shall be given a final cleaning with cleaning compound and method as recommended by the masonry manufacturer. Do not use muriatic acid on glazed finish.

d. Protect finished work from damage.

-- End of Section --