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USACE / NAVFAC / AFCEA / NASA UFGS-09 65 33 (April 2006)

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Preparing Activity: USACE Replacing without change  
UFGS-09660 (August 2002)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2008

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### SECTION TABLE OF CONTENTS

#### DIVISION 09 - FINISHES

#### SECTION 09 65 33

#### CONDUCTIVE VINYL FLOORING

04/06

#### PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 SUBMITTALS
- 1.3 QUALIFICATION OF APPLICATOR
- 1.4 DELIVERY AND STORAGE
- 1.5 ENVIRONMENTAL REQUIREMENTS
- 1.6 SCHEDULING
- 1.7 WARRANTY

#### PART 2 PRODUCTS

- 2.1 CONDUCTIVE VINYL TILE
- 2.2 ADHESIVE
- 2.3 WALL BASE
  - 2.3.1 Resilient Base
  - 2.3.2 Self-Coving
- 2.4 ACCESSORIES
- 2.5 ELECTRICAL GROUND CONNECTION
- 2.6 COLOR

#### PART 3 EXECUTION

- 3.1 SURFACE CONDITIONS
- 3.2 INSTALLATION OF CONDUCTIVE VINYL TILE
- 3.3 INSTALLATION OF WALL BASE
  - 3.3.1 Topset Cove Base
  - 3.3.2 Self-Coving
- 3.4 CLEANING AND PROTECTING
- 3.5 TESTING
- 3.6 TESTING FOR EXPLOSIVE AND AMMUNITION FACILITIES

-- End of Section Table of Contents --

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### SECTION 09 65 33

#### CONDUCTIVE VINYL FLOORING 04/06

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NOTE: This guide specification covers the requirements for conductive vinyl tile over a concrete surface.

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).

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

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## PART 1 GENERAL

### 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 D 2240 (2005) Standard Test Method for Rubber Property - Durometer Hardness

ASTM F 1066 (2004) Standard Specification for Vinyl Composition Floor Tile

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 99 (2005; Errata 2005) Health Care Facilities

UNDERWRITERS LABORATORIES (UL)

UL 779 (1995; Rev thru Nov 2005) Electrically Conductive Floorings

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

##### Conductive Vinyl Tile

Manufacturer's data composed of catalog cuts, brochures and product information.

##### Installation of Conductive Vinyl Tile

Manufacturer's preprinted material describing product installation. Cleaning and maintenance instructions shall be included.

#### SD-04 Samples

##### Conductive Vinyl Tile

Three samples of each color and type of flooring and base. Sample size shall be minimum 75 x 75 mm 3 x 3 inch.

#### SD-06 Test Reports

##### Testing

Reports of tests, including analysis and interpretation of test results. Each report shall be properly identified. The test methods used shall be identified and the test results shall be recorded.

#### SD-07 Certificates

##### Conductive Vinyl Tile

##### Adhesive

##### Qualification of Applicator

Certificate attesting that the tile and adhesive meet the requirements specified. Certificate indicating approval of the flooring applicator by the flooring manufacturer.

### 1.3 QUALIFICATION OF APPLICATOR

Applicator shall be approved by the flooring manufacturer and shall have a minimum of 3 years experience in the application of the materials to be used.

### 1.4 DELIVERY AND STORAGE

Materials shall be delivered to the building site in original unopened containers. Materials shall be stored in a clean dry area with temperature maintained above 21 degrees C 70 degrees F for two days prior to installation.

### 1.5 ENVIRONMENTAL REQUIREMENTS

Areas to receive conductive vinyl flooring shall be maintained at a temperature above 21 degrees C 70 degrees F for two days before, during, and after application. A minimum temperature of 13 degrees C 55 degrees F shall be maintained thereafter.

### 1.6 SCHEDULING

Conductive vinyl flooring work shall be scheduled after any other work which would damage the finished surface of the flooring.

### 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 CONDUCTIVE VINYL TILE

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NOTE: Insert tiles will be installed in visible areas as required, and drawings will indicate locations.

Conductive tiles are not recommended for use in areas where contamination can be caused by explosive dust.

Conductive floors will be used at operations where explosives having an electrostatic sensitivity of 0.1 joule or less such as primer, detonator, igniter, and incendiary mixtures are exposed. Conductive floors are also required where the following are performed:

- a. Loose unpacked ammo with electric primers.
- b. Exposed electro-explosive devices.
- c. Electrically initiated items with exposed electric circuitry.
- d. Hazardous materials that could be ignited by static discharge from humans.

The specification may be modified to provide for seamless installation. If seamless installation is

specified, the tile shall be routed at the seams and heat welded. Manufacturer's instructions should be reviewed when revising the specification to provide for seamless installation.

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Conductive vinyl tile shall conform to ASTM F 1066. Tile shall meet the test requirements of UL 779. Tile shall be [300 x 300 mm 12 x 12 inch,] [600 x 600 mm 24 x 24 inch,] [900 x 900 mm 36 x 36 inch, with heat welded seams,] 3 mm 1/8 inch thick. Insert tiles shall be conductive tiles with lettering in contrasting color reading "Conductive Floor, Do not Wax."

## 2.2 ADHESIVE

Adhesive shall be a conductive adhesive specifically recommended by the manufacturer of the flooring.

## 2.3 WALL BASE

### 2.3.1 Resilient Base

Base shall be [Type I (rubber)] [or] [Type II (vinyl)] Style B, (coved). Base shall be [100] [150] mm [4] [6] inch high and a minimum 3 mm 1/8 inch thick. [Preformed outside] [Job formed] corners shall be furnished.

### 2.3.2 Self-Coving

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NOTE: Self-coving will be used when highest standard of cleanliness is required.

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Self-coving shall consist of conductive floor tile over a cove stick and shall have [cove cap] [and optional metal corners] as recommended by the manufacturer of the tile.

## 2.4 ACCESSORIES

Accessories shall be as recommended by the manufacturer of the flooring.

## 2.5 ELECTRICAL GROUND CONNECTION

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NOTE: The conductive vinyl tile is installed in a conductive adhesive. The floor system is grounded to an external ground by a short grounding strip, usually on a room-by-room basis. Designer must provide for connection to an external ground and should coordinate with conductive tile manufacturers during design stage regarding connections to external ground. Designer will show ground connection to the external ground on the drawings.

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Connection between the conductive floor system and the external grounding system shall be provided. Contact with the conductive floor system shall be with conductive grounding strip and shall have the greater of the following: a minimum contact area of 5806 square mm 9 square inch or the dimensions recommended by the manufacturer. The grounding conductor shall

be as recommended by the manufacturer of the flooring.

## 2.6 COLOR

Color shall be [in accordance with Section 09 06 90 COLOR SCHEDULE] [\_\_\_\_\_].

## PART 3 EXECUTION

### 3.1 SURFACE CONDITIONS

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NOTE: Curing and sealing compounds should not be used on concrete surfaces to receive conductive vinyl tile. If a curing compound is required, it must be coordinated for compatibility with the flooring adhesive.  
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Before any work under this section is begun, defects such as rough or scaling concrete, low spots, high spots, and uneven surfaces shall have been corrected, and damaged portions of concrete slabs shall have been repaired. Floor shall be in a level plane with a maximum variation of 3 mm 1/8 inch every 3 m 10 feet, except where indicated as sloped. Cracks and irregularities shall be patched with a portland cement underlayment with a liquid latex binder.

### 3.2 INSTALLATION OF CONDUCTIVE VINYL TILE

Conductive vinyl tile flooring shall be installed with conductive adhesive in accordance with the approved manufacturer's installation instructions. Tile lines and joints shall be kept square, symmetrical, tight, and even. Tile at the perimeter of the area to be finished shall vary as necessary to maintain full-size tiles in the field, but no perimeter tile shall be less than one-half the field tile size, except where irregular shaped rooms make it impossible. Tile shall be cut, fitted, and scribed to walls, partitions, and projections after field flooring has been applied. A grounding strap shall be installed.

### 3.3 INSTALLATION OF WALL BASE

#### 3.3.1 Topset Cove Base

Topset cove base shall be installed in a manner recommended by the manufacturer of the base.

#### 3.3.2 Self-Coving

The conductive vinyl flooring shall be coved 100 150 mm 4 6 inch up all walls, columns and pilasters. The coving shall be terminated at the top against a cove cap. A cove stick shall be placed at the floor-wall junction to support the coving at the bend. Metal corners, where indicated, shall be installed at outside and inside corners.

### 3.4 CLEANING AND PROTECTING

The flooring shall be cleaned in accordance with the manufacturer's recommendations. Flooring shall be protected by a covering of heavy-duty building paper before foot traffic is permitted. Boardwalks shall be placed over flooring in areas where subsequent building operations might

damage the floor. Tiles that become loose, broken, or curled prior to acceptance, or tiles that do not conform to resistance requirements of **UL 779** shall be removed and replaced.

### 3.5 TESTING

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**NOTE: For explosive and ammunition facilities,  
delete this paragraph.**  
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Between 4 and 30 days after flooring installation is completed, and prior to its use, the flooring shall be tested in accordance with the test methods and electrode construction of **NFPA 99**. The resistance average shall be less than 1,000,000 ohms and more than 25,000 ohms. The measurements shall be made between five or more points of contact on the floor in each room. In addition at least one surface to ground measurement shall be made for each point pair measured. In rooms where more than **93 square meters 1000 square feet** of conductive tile has been installed a minimum of one surface and one surface to ground measurement shall be made for each **19 square meters 200 square feet** of conductive tile and the results averaged. No individual floor to ground measurement shall be less than 10,000 ohms. Tests shall be made by a technician experienced in such work.

### 3.6 TESTING FOR EXPLOSIVE AND AMMUNITION FACILITIES

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**NOTE: For explosive and ammunition facilities, edit  
the following paragraph. For all other facilities  
delete this paragraph.**  
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Electrical resistance test shall be performed on the installed floor. Instruments used in making tests shall be used only when the room is free from exposed explosives and flammable gas mixtures. Maximum floor resistance shall be measured with a suitably calibrated ohmmeter, which may operate on a normal open-circuit output voltage of 500 volts dc and a short circuit current of 2.5 milliamperes with an effective internal resistance of approximately two million ohms. Minimum floor resistance will be measured with a suitably calibrated ohmmeter appropriate for the task. Each electrode shall weigh **2.3 kg 5 pounds** and shall have a dry, flat, circular contact area **63.5 mm 2-1/2 inches** in diameter, which shall comprise a surface of aluminum or tin foil **0.0125 to 0.025 mm 0.0005 to 0.001 inch** thick, backed by a layer of rubber **6 mm 1/4 inch** thick and measuring between 40 and 60 durometer hardness as determined with a Shore Type A durometer **ASTM D 2240**. The floor shall be clean and dry, "electrode jelly" such as brushless shaving soap or saline solution shall not be used. The resistance of the floor at any one location shall be more than 5,000 ohms in areas with 110-volts service and 10,000 ohms in areas with 220-volt service, and an average of less than 1,000,000 ohms in all areas as measured between a permanent ground connection and an electrode placed at any point on the floor and also as measured between two electrodes placed **914.4 mm 3 feet** apart at any point on the floor. Measurements shall be made at five or more locations in each room. If the resistance changes appreciably with time during a measurement, the value observed after the voltage has been applied for above 5 seconds shall be considered to be the measured value.



-- End of Section --