

## 09651 RESILIENT SHEET FLOORING

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CSI 2004 MasterFormat number: 09 65 16.

*SPECIFIER: Do not use resilient sheet flooring in food service areas or where oils, grease or high heat can cause slipping or deteriorate the surface.*

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### PART 1 GENERAL

#### 1.1 SUMMARY:

- A. This Section includes provisions for the installation of resilient sheet flooring, including accessories and resilient base molding, and the preparation of the substrate over which these materials will be installed.

#### 1.2 RELATED REQUIREMENTS

- A. Coordinate resilient sheet flooring with the following:
  - 1. 03300 Cast-in-Place Concrete.
  - 2. 15421 Drains and Cleanouts.
  - 3. 16132 Floor Boxes.

#### 1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM). Latest publications for:
  - 1. D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces, as Measured by the James Machine.
  - 2. E84 - Standard Test Method for the Surface Burning Characteristics of Building Materials.
  - 3. E648 - Critical Radiant Flux of Floor-Coverings Systems Using a Radiant Heat Energy Source.
  - 4. E662 - Standards Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
  - 5. F510 - Standards Test Method for Resistance to Abrasion of Resilient Floor Coverings Using an Abrader with a Grid Feed Method.
  - 6. F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
  - 7. F970 - Standard Test Method for Static Load Limit.
  - 8. F1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing.
  - 9. F1913 - Standard Specification for Vinyl Sheet Floor Covering Without Backing.
  - 10. F1516 - Standard Practice for Sealing Seams of Resilient Flooring Products By the Heat Weld Method.
  - 11. F1861 - Standard Specifications for Resilient Wall Base.
  - 12. F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subflooring Using Anhydrous Calcium Chloride.
  - 13. F1914 - Standard Test Method Short-Term Indentation and Residual Indentation of Resilient Floor Covering.

14. F2170 - Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In Situ Probes.
15. F2420 - Standard Test Method for Determining Relative Humidity on the Surface of Concrete Floor Slabs Using Relative Humidity Probe Measurement.

- B. Florida Building Code (FBC).
- C. Americans with Disabilities Act (ADA).
- D. Resilient Floor Covering Institute (RFCI) – Recommended Installation Practices for Homogeneous Sheet Flooring, Fully Adhered.
- E. All references indicating to follow manufacturer’s instructions shall imply using the latest manufacturer’s published information.

#### 1.4 SUBMITTALS

- A. Initial Submittals: Submit and obtain approval from A/E and M-DCPS, before making other submittals:
  1. Text of Special Warranties, on manufacturer’s and installer’s corporate letterheads, as will be signed at completion, including warranty duration.
  2. Certification of Installer: Submit resilient flooring manufacturer’s certification of its installer.
- B. Product Data: Submit manufacturer’s technical data for each type of product to be used, including resilient sheet flooring, flooring adhesives, sealers, accessories, etc., describing physical and performance characteristics, sizes, patterns and colors available for each.
- C. Provide manufacturer's printed documentation indicating compliance with slip-resistant (Static Coefficient of Friction) required by ADA and applicable Codes, for the area of intended use.
- D. Shop Drawings: Indicate seaming plan (for heat welds), borders and patterns.
- E. Submit manufacturer’s Material Safety Data Sheet (MSDS) indicating VOC content of all products.
- F. Certification for Fire Test and Smoke Performance: Submit to A/E and M-DCPS, certification from an independent testing laboratory acceptable to authorities having jurisdiction that resilient sheet flooring complies with fire test and smoke performance requirements.
- G. Samples for Initial Selection Purposes: Submit manufacturer’s standard color charts in form of actual sections of resilient flooring, including accessories, showing full range of colors and patterns available, for each type of resilient flooring required.
- H. Samples: Submit two 12" x 12" samples of the resilient sheet flooring, illustrating color and pattern for each color selected by A/E.
- I. Submit two 12" long samples of base and edge trim material for each color specified.

- J. Manufacturer's Adhesives Certification: Submit certification that adhesives are compatible with flooring and substrate and are recommended for intended use.
- K. Provider manufacturer's installation instructions, including special procedures and perimeter conditions requiring special attention.
- L. Closeout Submittals: Submit the following:
  - 1. Executed Special Warranties described below.
  - 2. Manufacturer's written verification that installer has followed manufacturer's installation instructions.
  - 3. Maintenance Manuals (at closeout): Two copies of Manufacturer's recommended maintenance practices for each type of resilient sheet flooring and required accessory. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning and finishing.
  - 4. Copy of transmittal letter signed by the M-DCPS Project Manager, indicating receipt of all extra stock materials called for in this document.
- M. When removal and recycling of existing flooring materials is part of the Contract, provide A/E and M-DCPS proper documentation indicating compliance with recycling requirements.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Have at least 15 years production experience with resilient sheet flooring and accessories similar to type specified.
- B. Installer Qualifications: Certified or trained and approved by the flooring manufacturer, having at least 5 years of experience in the installation of the specified products. Installer shall have completed at least three projects of similar magnitude, complexity and materials, and provide A/E and M-DCPS reference details including contact names and telephone numbers.
- C. Prior to commencing any resilient sheet flooring work, maintain ambient temperature as required by product manufacturers for a minimum of 72 hours prior to, during, and a minimum of 72 hours after installation of materials.
- D. Do not commence work until concrete slabs are sufficiently dry to achieve bond with adhesive. Follow resilient sheet flooring manufacturer's instructions and perform Bond test, Moisture test, pH test and Vapor Emission test in accordance with ASTM Standards indicated. Submit test results to A/E and M-DCPS for review prior to the start of work.
- E. Install resilient sheet flooring and accessories after other finishing work, including painting, have been completed.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Resilient sheet flooring, and all related accessories, shall be stored in weather protected, clean, dry areas, containing constant ambient conditions within limits specified by product manufacturers. Storage conditions must prevent product distortion.

- B. Store resilient sheet flooring, weld rods and adhesive, 3 days prior to installation, in area of installation to achieve temperature stability.

## 1.7 PERFORMANCE REQUIREMENTS

- A. Meet or exceed minimum static coefficients of friction (SCoF) in compliance with ADA, following ASTM D2047.
- B. Through-Pattern: The colors and pattern appearing on the resilient sheet flooring shall extend homogeneously through the entire thickness of the sheet flooring in a reasonably uniform pattern visible at each depth to which the sheet flooring is abraded.

## 1.8 SPECIAL WARRANTIES

- A. By Manufacturer: In addition to the warranty and the correction of work requirements of the General Conditions, provide a written and signed Special Warranty from the resilient sheet flooring manufacturer, endorsed by Contractor, to provide all labor and materials necessary to correct manufacturing defects in the resilient sheet flooring and base work as follows:
  - 1. Non-prorated, for 5 years after date of Substantial Completion of the Work.
  - 2. Agreeing to correct by replacing with new material, any sheet flooring having manufacturing defects such changes color, chalks, shrinks, crumbles or exhibits brittleness or excessive indentation due to manufacturing defect.
- B. By Installer: In addition to the warranty and correction of work requirements of the General Conditions, provide a written and signed Special Warranty from the resilient sheet flooring and base installer, endorsed by Contractor, to correct defects in resilient sheet flooring and base work as follows:
  - 1. Correct for 2 years after date of Substantial Completion of the Work.
  - 2. Agree to correct, by replacing using new material, all work showing defects such as loss of adhesion of flooring to concrete, or of base to floor and wall surfaces; adhesive squeeze-up; or any opening-up of the initial tight fit of flooring joints. This shall include, at no additional cost to M-DCPS, the labor necessary to move any furniture, equipment, etc. to access areas that require correction, and then placing back to their original locations all items that were moved.

## 1.9 EXTRA STOCK

- A. Provide extra stock in manufacturer original un-opened packaging of each type of sheet flooring and base that match the products (type, color and pattern) installed, for future repairs by the school staff. Provide a minimum of 2% of each resilient sheet flooring used, and 1% (or one full un-opened box whichever is greater) of base material.

## PART 2 PRODUCTS

### 2.1 GENERAL REQUIREMENTS

- A. Radiant panel fire test: Critical radiant flux of 0.45 W/cm sq., or greater, Class I; ASTM E648.

- B. Flame Spread: Not more than 75 per ASTM E 84.
- C. Smoke density test: Optical density of 450 or less in flaming mode; ASTM E662.
- D. Dimensional stability: <0.2% change; ASTM F2199.
- E. Static Load Limit: At least 500 lb/in sq.; ASTM F970.
- F. Standard: ASTM F1303, Type I, Grade 1, Class A or B.
- G. Compliance with ASTM F1066, Class 2, Through-Pattern.
- H. Static Coefficient of Friction (SCoF): Shall comply with ADA and applicable Code requirements for intended area of use.

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*SPECIFIER: Select resilient flooring materials and color patterns from the following manufacturers to match M-DCPS accepted color board and edit to suit requirements.*  
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## 2.2 MATERIALS: SHEET VINYL FLOORING

- A. Description: Homogeneous sheet Vinyl, Commercial grade, containing a factory installed protective wear-layer.
  - 1. Size: 6.0 to 6.5 ft wide x at least 70 ft long.
  - 2. Thickness: minimum 0.080 in. overall, with at least 0.020 in. commercial rated wear-layer.
  - 3. Color and Pattern: Marbled or speckled, as selected by A/E from manufacturer's standard colors and patterns.
- B. Manufacturer:
  - 1. Medley, by Armstrong, Inc.
  - 2. BioSpec MD, by Mannington, Inc.
  - 3. Forge Ahead, by Patcraft.
  - 4. Equal product in quality and performance as reviewed by A/E and approved by A/E and M-DCPS.

## 2.3 MATERIALS: SHEET LINOLEUM FLOORING

- A. Description: Homogeneous sheet linoleum, consisting of linseed oil, natural fillers and pigments, calendered onto a natural jute backing, and containing a factory installed protective wear-layer.
  - 1. Size: 6.0 to 6.5 ft wide x at least 70 ft long.
  - 2. Thickness: minimum 0.080 in. overall, with at least 0.020 in. polymeric resin wear layer.
  - 3. Color and Pattern: Marbled or speckled, as selected by A/E from manufacturer's standard colors and patterns.
- B. Manufacturer:

1. Marmoleum Composite Sheet (MCS) with TopShield<sup>2</sup> finish, by Forbo Flooring Inc.
2. Harmonium Veneto Linoleum with XF<sup>2</sup> finish, by Johnsonite.
3. Equal product in quality and performance as reviewed by A/E and approved by A/E and M-DCPS.

## 2.4 MATERIALS – SPECIALTY RESILIENT SHEET FLOORING – SLIP RETARDANT

- A. Slip-resistant sheet flooring for use in interior dry areas such as ramps that require an extra measure of safety. Sheet flooring color and pattern shall extend throughout total thickness of material.
1. Size: 6 feet wide (minimum).
  2. Gauge: 0.08 in.
  3. Finish: Fast Start Factory Finish.
  4. Color/Pattern: As approved by A/E and M-DCPS.
  5. Installation: Full Spread Adhesive per manufacturer's written instructions.
  6. Seams: Heat welded using color weld rods per manufacturer's written instructions.
- B. Product / Manufacturer:
1. Assurance II, by Mannington Commercial.
  2. Equal product in quality and performance as approved by A/E and M-DCPS.

## 2.5 RESILIENT BASE

- A. Description: Rubber (not vinyl). Provide in long rolls and cut as needed.
1. Height: 4 in. unless 6 in. is shown on the Drawings.
  2. Profile: Per ASTM F1861, Type TS, Group 1, Style B (cove bottom) except where Style A (straight bottom) is shown on Drawings.
  3. Outside and inside corners: Do not use pre-molded corner pieces. Instead follow resilient base installation instructions.
  4. Color: As selected by A/E from the base manufacturer's full palette of colors.
- B. Base adhesive: Waterproof, non-toxic, low-VOC, light colored, formulated for maximum adhesion of rubber base and in compliance with manufacture's requirements.
- C. Manufacturer: Burke Mercer, Flexco, Johnsonite, Roppe or Mannington.

## 2.6 ACCESSORIES

- A. Leveling Compound: Polymer-fortified cementitious compound with low VOC and as recommended by flooring manufacturer.
- B. Primers and Resilient Sheet Flooring Adhesive: Waterproof, antimicrobial, non-toxic, low-VOC, as will permit repair or removal of flooring without destroying sheets, as recommended by flooring producer.
- C. Heat Welding Rod: Per manufacturer's written instructions. Colors as selected by A/E from manufacturer's standard colors.

- D. Rubber Transition and Edge Strips: Per manufacturer's instructions, gently tapered profile, at least 2 in. wide, matching resilient sheet flooring thickness. Color as selected by A/E from manufacturer's standard colors. Provide units of maximum length to minimize number of joints. Manufactured by Burke Mercer, Flexco, Johnsonite, Roppe or Mannington.
- E. Metal Edge Strips: Of width shown on Plans and of required thickness to protect edge of resilient flooring. Provide units of maximum length available lengths to minimize number of joints, as produced by Pemko, Schluter or Zero.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify substrate conditions and lower wall surfaces are free from debris, and are acceptable for product installation in accordance with manufacturer's written instructions.
- B. Visually inspect all materials prior to installation. Do not install material with visual defects.

### 3.2 PREPARATION

- A. Protect adjacent work areas and finish surfaces from damage during product installation.
- B. Prepare floor substrate in accordance with manufacturer's instructions.
- C. Substrates shall be sound, smooth, flat, permanently dry, clean and free of all foreign materials including, but not limited to, dust, paint, grease, oils and solvents, curing and hardening compounds, sealers, asphalt and old adhesive residue. Vacuum substrate to ensure surface is clean and meets manufacturer's instructions.
- D. Perform Concrete Moisture tests, Alkalinity pH tests, and Hydrostatic Pressure tests in accordance with manufacturer's instructions and applicable ASTM Standards referenced in this document. All tests shall be performed by a certified testing firm at no additional cost to M-DCPS. Conduct a minimum of one test of each type for every 1,000 square feet of building area, or more frequently if required by the manufacturer's instructions. These tests shall be conducted on all concrete floors regardless of their age, grade level or the presence of existing flooring. A diagram of the areas showing the location and results of each test shall be submitted to the A/E and M-DCPS for their review. Installation of the resilient sheet flooring shall commence only after all test results indicate that conditions of the substrate comply with manufacturer's written instructions.
- E. Perform Bond tests of substrate in accordance with manufacturer's instructions.
- F. Remove ridges and bumps from sub floors and, using a patching compound recommended by the resilient sheet flooring manufacturer, fill minor low spots, cracks, holes, or other defects, to achieve a smooth, flat and hard surface.
- G. Prior to application of adhesive, apply a concrete slab primer if recommended by sheet flooring manufacturer. Apply adhesive in compliance with manufacturer's written instructions.

### 3.3 INSTALLATION

- A. Install resilient sheet flooring and base following manufacturer's latest published instructions, except as more stringently specified herein.
- B. Installing resilient sheet flooring.
  - 1. Install resilient sheet flooring with all seams heat welded tight. Scribe flooring to produce tight joints at penetrating items, then seal. Press sheets down for full adhesion. Wait the manufacturer's prescribed time after initial installation to allow the adhesive to cure before grooving the sheet product to receive the heat weld rod. All welded seams shall be protected from dust and traffic by appropriate weld covers as recommended by resilient sheet flooring manufacturer.
  - 2. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
  - 3. Tightly cement resilient sheet flooring to sub-base without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections. Hand-roll all resilient sheet flooring areas with heavy roller in compliance with manufacturer's instructions, to attain full adhesion to substrate.
  - 4. Install edge strips where flooring terminates and at unprotected or exposed edges. Secure resilient strips with adhesive.
- C. Installing resilient base.
  - 1. Install base in lengths as long as practicable.
  - 2. Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required.
  - 3. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.
  - 4. Fit joints tightly and make vertical. Miter internal corners. At external corners, V-cut back of base, strip to 2/3 of its thickness and fold. Permanently form corners with no joint within 4 in. of corner.
  - 5. Scribe and fit to door frames and other interruptions.
  - 6. On masonry surfaces, or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material. Color of adhesive filler material is to match wall base color.

### 3.4 CLEANING AND PROTECTION

- A. Remove excess adhesive from floor, base and wall surfaces without damage using methods and cleaners recommended by resilient sheet flooring and base manufacturers.
- B. Sweep and vacuum floor after installation.
- C. Protect resilient sheet flooring from damage by covering with clean, heavy duty, undyed building paper, until Substantial Completion or all work in the area is completed whichever occurs last. Remove and dispose of protective covering after all work is completed in the area.
- D. Sheet Linoleum Flooring: Perform initial maintenance "Starter Kit" procedures after completing flooring installation as recommended by linoleum flooring manufacturer.



END OF SECTION