

SECTION 09 65 16 - RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes rubber sheet flooring.

1.2 References (Industry Standards)

- A. American Society for Testing and Materials (ASTM)
1. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine
 2. ASTM D2240 Standard Test Method for Rubber Property - Durometer Hardness
 3. ASTM D3389 Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform, Double-Head Abrader)
 4. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
 5. ASTM E648 Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
 6. ASTM E662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
 7. ASTM E2180 Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) in Polymeric or Hydrophobic Materials
 8. ASTM F150 Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring
 9. ASTM F511 Standard Test Method for Quality of Cut (Joint Tightness) of Resilient Floor Tile
 10. ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
 11. ASTM F970 Standard Test Method for Static Load Limit
 12. ASTM F1344 Standard Specification for Rubber Floor Tile
 13. ASTM F1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring

14. ASTM F1514 Standard Test Method for Measuring Heat Stability of Resilient Flooring by Color
 15. ASTM E1745 Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
 16. ASTM F1859 Standard Specification for Rubber Sheet Floor Covering Without Backing
 17. ASTM F1860 Standard Specification for Rubber Sheet Floor Covering With Backing
 18. ASTM F1861 Standard Specification for Resilient Wall Base
 19. ASTM F2055 Standard Test Method for Size and Squareness of Resilient Floor Tile by Dial Gage Method
 20. ASTM F2169 Standard Specification for Resilient Stair Treads
 21. ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using *in situ* Probes
 22. ASTM F2420 Standard Test Method for Determining Relative Humidity on the Surface of Concrete Floor Slabs Using Relative Humidity Probe Measurement and Insulated Hood
 23. ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
- B. Electro Static Discharge (ESD)
1. ESD S7.1 100 Resistive Characterization of Flooring Materials
 2. ESD STM 97.2 Floor Materials and Footwear – Voltage Measurement on a Person
- C. National Fire Protection Association (NFPA)
1. NFPA 253 Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source
 2. NFPA 258 Test Method for Specific Density of Smoke Generated by Solid Materials
- 1.3 ACTION SUBMITTALS
- A. Product Data: For each type of product.
 - B. Shop Drawings: For each type of flooring. Include flooring layouts, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.

1. Show details of special patterns.
 - C. Samples: For each exposed product and for each color and texture specified in manufacturer's standard size, but not less than 6-by-9-inch (150-by-230-mm) sections.
 1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches (230 mm) long, of each color required.
 - D. Samples for Initial Selection: For each type of resilient sheet flooring indicated.
 - E. Samples for Verification: In manufacturer's standard size, but not less than 6-by-9-inch (150-by-230-mm) sections of each different color and pattern of resilient sheet flooring required.
 1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches (230 mm) long, of each color required.
 - F. Welded-Seam Samples: For seamless-installation technique indicated and for each resilient sheet flooring product, color, and pattern required; with seam running lengthwise and in center of 6-by-9-inch (150-by-230-mm) Sample applied to a rigid backing and prepared by Installer for this Project.
 - G. Product Schedule: For resilient sheet flooring. Use same designations indicated on Drawings.
- 1.4 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For Installer.
- 1.5 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For each type of resilient sheet flooring to include in maintenance manuals.
- 1.6 MAINTENANCE MATERIAL SUBMITTALS
- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Resilient Sheet Flooring: Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, in roll form and in full roll width for each type, color, and pattern of flooring installed.
- 1.7 QUALITY ASSURANCE
- A. Manufacturer: Provide resilient flooring manufactured by a firm with a minimum of 10 years' experience with resilient flooring of types equivalent to those specified.

Manufacturers proposed for use, which are not named in this section, shall submit evidence of ability to meet performance requirements specified not less than 10 days prior to bid date.

1. Color Matching: Provide resilient flooring products, including wall base and accessories, from one manufacturer to ensure color matching.
 2. Manufacturer capable of providing technical training and field service representation.
- B. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for resilient sheet flooring installation and seaming method indicated.
1. Engage an installer who employs workers for this Project who are trained or certified by resilient sheet flooring manufacturer for installation techniques required.
 2. Installer Qualifications: Installer shall be nora approved for the requirements of the project or INSTALL (International Standards & Training Alliance) resilient certified for the requirements of the project.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build mockups for resilient sheet flooring including resilient base and accessories.
 - a. Size: Minimum 100 sq. ft. (9.3 sq. m) for each type, color and pattern in locations directed by Architect.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Store resilient sheet flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store rolls upright.
- 1.9 FIELD CONDITIONS
- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 85 deg F (29 deg C), in spaces to receive resilient sheet flooring during the following time periods:

1. 48 hours before installation.
 2. During installation.
 3. 72 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Close spaces to traffic during resilient sheet flooring installation.
- D. Close spaces to traffic for 48 hours after resilient sheet flooring installation.
- E. Install resilient sheet flooring after other finishing operations, including painting, have been completed.
- 1.10 WARRANTY
- A. Provide manufacturer's standard one-year warranty against defects in manufacturing and workmanship of all flooring products. Provide manufacturer's warranty as specified under each product as applicable, including limited wear, defect and conductivity.
- 1.11 EXTRA MATERIALS
- A. Furnish full size units equal to 2 percent of quantity of resilient flooring installed as extra materials. Properly label and package extra materials. Deliver to owners designated storage area.

PART 2 - PRODUCTS

- 2.1 ACCEPTABLE MANUFACTURER
- A. Provide resilient flooring by nora systems, Inc., 9 Northeastern Blvd., Salem, NH 03079; telephone 800-332-NORA, or 603- 894-1021; fax 603-894-6615..
- B. The manufacturer shall offer a construction waste take back program for the purpose of reducing jobsite waste by taking back their uninstalled waste flooring. Details of the nora program are available on www.nora.com/us.
- 2.2 RF-x, RESILIENT SHEET FLOORING FOR COMMERCIAL TRAFFIC
- A. Products: Subject to compliance with requirements, provide one of the following:
1. Product Name: noraplan® sentica, Article 1701.

2. Material: nora vulcanized rubber Compound 913 with abundant natural fillers and environmentally compatible color pigments
3. Surface: Smooth
4. Color: As selected by Architect from Manufacturers standard.
 - a. Provide for 3 color pattern.
5. Roll Size: 0.12 inches (3mm) thickness, 39.37 feet by 48 inches (12m by 1.22m)
6. Back of Roll: Smooth, double-sanded back
7. Composition: Homogeneous rubber compound 913 with a random scattered design
8. Limited Wear Warranty: 5 years
9. Hardness: ASTM D2240, Shore type A, required ≥ 85
10. Static Load: Per ASTM F970 Standard Test Method for Static Load Limit, residual compression, when tested with 800 lbs. ≤ 0.005 "
11. ISO 14001: Manufacturer shall be ISO 14001 Environmental Management Systems Certified
12. PVC Free: Product shall contain no polyvinyl chloride
13. Abrasion Resistance: Taber abrasion test, ASTM D3389, H-18 wheel, 500 gram load, 1000 cycles, gram weight loss ≤ 0.4
14. Slip Resistance: Static coefficient of friction (James Test): ASTM D2047, ≥ 0.8
15. Bacteria Resistance: Product shall be resistant to bacteria, fungi, and micro-organism activity, according to ASTM E2180 and ASTM G21
16. Halogen Free: Product shall contain no halogens
17. Sound Absorption: 10 dB per ISO 140-8 and 42 IIC per ASTM E2179
18. Burn Resistance: Cigarette and solder burn resistance
19. Heat Resistance: Avg. Delta E < 8.0 per ASTM F1514
20. Flammability: ASTM E648; NFPA 253; NBSIR 75 950, ≥ 0.45 watts per square centimeter, Class 1
21. Smoke Density: ASTM E662, NFPA 258, NBS smoke density, < 450
22. Asbestos Free: Product shall contain no asbestos

23. Static Generation: < 2000 Volts (2KV) at 20% RH as per AATCC 134
24. Non Hazardous: Flooring shall be made without any chemicals that may be hazardous or containing any teratogenic, mutagenic or any other ingredients known to be carcinogenic
25. Cleaning: Flooring surface shall have the ability to be cleaned and maintained without the use of any chemicals that may be hazardous or containing any teratogenic, mutagenic or any other ingredients known to be carcinogenic. Manufacturer shall make available a cleaning system that effectively cleans the flooring surface using water, cleaning pads and a suitable cleaning machine, without the use of factory and/or field-applied coatings.
26. Shine: Higher shine surfaces can be achieved by dry buffing without any artificial topical applied coatings.

2.3 INSTALLATION MATERIALS

- A. Installation System: Use only nora® pro install system products following the current nora Installation Guide that may consist of part or all of the following steps depending upon the substrate conditions and requirements of the specific project.
 1. Step 1 – nora® membrane (see Installation Guide for requirements).
 2. Step 2 – nora® primer (see Installation Guide for requirements).
 3. Step 3 – nora® leveler (see Installation Guide for requirements).
 - a. Trowelable Leveling Compounds: Formulation provided or approved by resilient sheet flooring manufacturer for applications indicated.
 4. Step 4 – nora® patch (see Installation Guide for requirements).
 - a. Trowelable Patching Compounds: Formulation provided or approved by resilient sheet flooring manufacturer for applications indicated.
 5. Step 5 – nora® adhesives, the flooring usage and substrate conditions will determine the appropriate adhesive.
 - a. Adhesives shall have a VOC content of 50 g/L or less.
- B. Seamless-Installation Accessories:
 1. Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams.
 - a. Color: As selected by Architect from manufacturer's full range to contrast with flooring.
- C. RB-2, Integral-Flash-Cove-Base Accessories:
 1. Cove Strip: 0.59-inch (15-mm) radius provided or approved by resilient sheet flooring manufacturer.
 2. Cap Strip: Square stainless steel.

3. Corners: Field fabricated in manner as approved by resilient sheet flooring manufacturer.
- D. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient sheet flooring manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient sheet flooring.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to resilient sheet flooring manufacturer's written instructions to ensure adhesion of resilient sheet flooring.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient sheet flooring manufacturer. Do not use solvents.
 3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient sheet flooring manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
 4. Moisture Testing: Proceed with installation only after substrates pass testing according to resilient sheet flooring manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform relative humidity test using in situ probes according to ASTM F 2170 using Wagner Rapid RH probes or approved equal. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.

- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient sheet flooring until it is the same temperature as the space where it is to be installed.
 - 1. At least 48 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient sheet flooring.

3.3 RESILIENT SHEET FLOORING INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient sheet flooring.
- B. Unroll resilient sheet flooring and allow it to stabilize before cutting and fitting.
- C. Lay out resilient sheet flooring as follows:
 - 1. Maintain uniformity of flooring direction.
 - 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches (152 mm) away from parallel joints in flooring substrates.
 - 3. Match edges of flooring for color shading at seams.
 - 4. Avoid cross seams.
- D. Scribe and cut resilient sheet flooring to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, and door frames.
- E. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient sheet flooring as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install resilient sheet flooring on covers for telephone and electrical ducts and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of flooring installed on covers and adjoining flooring. Tightly adhere flooring edges to substrates that abut covers and to cover perimeters.
- H. Adhere resilient sheet flooring to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising

and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

I. Seamless Installation:

1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to permanently fuse sections into a seamless flooring. Prepare, weld, and finish seams to produce surfaces flush with adjoining flooring surfaces.
2. Chemically Bonded Seams: Bond seams with chemical-bonding compound to permanently fuse sections into a seamless flooring. Prepare seams and apply compound to produce tightly fitted seams without gaps, overlays, or excess bonding compound on flooring surfaces.

J. Integral-Flash-Cove Base: Cove resilient sheet flooring 8 inches (203 mm) up vertical surfaces. Support flooring at horizontal and vertical junction with cove strip. Butt at top against cap strip.

1. Install metal corners at inside and outside corners.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient sheet flooring.
- B. Perform the following operations immediately after completing resilient sheet flooring installation:
 1. Remove adhesive and other blemishes from surfaces.
 2. Sweep and vacuum surfaces thoroughly.
 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient sheet flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, adhesive, and blemishes from flooring surfaces before applying liquid floor polish.
 1. Apply two coat(s).
- E. Cover resilient sheet flooring until Substantial Completion.

END OF SECTION