DIVISION 09 - FINISHES
SECTION 096500 RESILIENT FLOORING

norament® 992
norament® 992 grano™

This document is provided to assist in the preparation of a Project or Master Specification and has been formatted in accordance with the Construction Specifications Institute (CSI)'s MasterFormat®.

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials, and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Resilient tile flooring for commercial traffic.
2. Resilient sheet flooring for commercial traffic.
3. Resilient sheet flooring for commercial traffic with pre-applied adhesive.
4. Resilient tile flooring for special fire requirements.
5. Resilient tile flooring for extra heavy traffic, ice skate, and golf spike resistant.
6. Resilient tile flooring for pre-installed raised access flooring, or releasable application.
7. Resilient tile flooring for electrostatic dissipative protection.
8. Resilient sheet flooring for electrostatic dissipative protection.
9. Resilient stair treads (one-piece nosing, tread, and riser).
10. Resilient stair accessories.
11. Resilient wall base, sanitary base, and accessories.
12. Substrate preparation.

B. Related Work: The following items are not included in this Section and are specified under the designated Sections:

1.	Section 033000	CAST-IN-PLACE CONCRETE for concrete substrate; slab surface tolerances; vapor retarder for applications on or below grade; requirement for 83/90-degree riser and tread edge angle for stair tread and nosings.
2.	Section 055100	METAL STAIRS AND RAILINGS; requirement for 83/90-degree riser and tread edge angle for stair tread and nosings.
3.	Section 061000	ROUGH CARPENTRY for plywood substrate and surface tolerances.
4.	Section 096900	ACCESS FLOORING for resilient floor covering for access panels.

C. References (Industry Standards):

1. American Association of Textile Chemists and Colorists (AATCC):
   a. AATCC 134 Electrostatic Propensity of Carpets
2. American National Standards Institute (ANSI):
   a. ANSI ESD STM97.2 Floor Materials and Footwear – Voltage Measurement on a Person
3. ASTM International (ASTM):
   a. ASTM C518 Standard Test Method for Steady State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
   b. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
   c. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine
   d. ASTM D2240 Standard Test Method for Rubber Property—Durometer Hardness
   e. ASTM D3389 Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform Abrader)
   f. ASTM D6499 Standard Test Method for the Immunological Measurement of Antigenic Protein in Hevea Natural Rubber (HNR) and its Products
   g. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
   h. ASTM E492 Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine
   i. ASTM E648 Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
   j. ASTM E662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
   k. ASTM E1745 Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
   l. ASTM E2179 Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors
   m. ASTM E2180 Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) in Polymeric or Hydrophobic Materials
   n. ASTM F150 Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring
   o. ASTM F386 Standard Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces
   p. ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
   q. ASTM F925 Standard Test Method for Resistance to Chemicals of Resilient Flooring
   r. ASTM F970 Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading
   s. ASTM F1344 Standard Specification for Rubber Floor Tile
   t. ASTM F1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring

u. ASTM F1514 Standard Test Method for Measuring Heat Stability of Resilient Flooring by Color
v. ASTM F1515 Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change
w. ASTM F1859 Standard Specification for Rubber Sheet Floor Covering Without Backing
x. ASTM F1860 Standard Specification for Rubber Sheet Floor Covering with Backing
y. ASTM F1861 Standard Specification for Resilient Wall Base
z. ASTM F2055 Standard Test Method for Size and Squareness of Resilient Floor Tile by Dial Gage Method
aa. ASTM F2169 Standard Specification for Resilient Stair Treads
bb. ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
cc. ASTM F2199 Standard Test Method for Determining Dimensional Stability and Curling Properties of Resilient Flooring after Exposure to Heat
dd. ASTM F2753 Standard Practice to Evaluate the Effect of Dynamic Rolling Load over Resilient Floor Covering System
ee. ASTM F3010 Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings
ff. ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

4. European Standards (EN):
   a. DIN EN 1399 Resilient floor coverings - Determination of resistance to stubbed and burning cigarettes
5. Federal Test Method Standard (FTMS):
   a. FTMS 101C 4046 Electrostatic Decay
5. International Organization for Standardization (ISO):
   a. ISO 10140-3 Laboratory measurement of sound insulation of building elements—Part 3: Measurement of impact sound insulation
   b. ISO 26987 Determination of staining and resistance to chemicals
6. National Fire Protection Association (NFPA):
   a. NFPA 253 Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
7. Standards Council of Canada (SCC):
   a. CAN/ULC-S102.2 Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product data, installation instructions and maintenance guidelines for each material and accessory proposed for use.

B. Samples: Submit three representative samples of each product specified for verification.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide resilient flooring manufactured by a firm with a minimum of 10 years' experience with resilient flooring of type equivalent to those specified.

1. Manufacturer's quality management system must have ISO 9001:2000 approval.
2. Provide resilient flooring products and accessories from one manufacturer to ensure compatibility.
3. Manufacturer shall be capable of providing technical training and technical field service representation.

B. Installer Qualifications: Acceptable to manufacturer of resilient flooring or INSTALL (International Standards & Training Alliance) resilient certified for the requirements of the project with a minimum of 4 years' experience with resilient flooring of type equivalent to those specified.

1. It is recommended to have a minimum of one installer per working party with the ability to provide proof of current credentials on request.
2. Has obtained and maintained current credentials from manufacturer's training program.
3. Installers shall be able to exhibit proficient skills with flash cove detailing, both hot and cold-welding techniques, adhesives, specialty adhesive systems and seam cutting.
4. The installing parties shall provide a submittal of their skills in the form of mock-ups of the specified material. These mock-ups will be accepted as proof of their skills and benchmarking for the proposed project.

C. Sustainable Design Requirements:

1. ISO 14001 Environmental Management Systems certification.
2. Construction waste take back program for the purpose of reducing jobsite waste by taking back uninstalled waste flooring. Details of the nora® program are available at www.nora.com.
3. Flooring surfaces that are easily cleaned and do not require coatings, stripping, or use of chemicals that may be hazardous to human health.
4. Supply all required products that are CA 01350 compliant.
5. Flooring that contains no polyvinyl chloride or phthalate plasticizers.
6. Flooring that contains no halogenated polymers.
7. Flooring that contains no asbestos.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer's recommendations. Protect from damage due to weather, excessive temperatures, and construction operations.

B. Deliver materials sufficiently in advance of installation to condition materials to the required temperature for 48-hours prior to installation.

1.6 PROJECT CONDITIONS

A. The installation area must be fully enclosed, weather tight, and climate controlled between 63°F and 75°F and 40% to 60% ambient relative humidity (RH) for at least 48 hours prior, during and 72 hours after installation (do not use gas fueled blowers). Dew point must be avoided. The substrate must be at least 5°F above dew point to be considered acceptable.

1.7 WARRANTY

A. Provide manufacturer's standard limited warranty for wear, defect, bond, and conductivity.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

A. Basis-of-Design: nora systems, Inc., 9 Northeastern Blvd., Salem, NH 03079; telephone 800-332-NORA or 603-894-1021.

2.2 RESILIENT TILE FLOORING FOR EXTRA HEAVY TRAFFIC, ICE SKATE AND GOLF SPIKE RESISTANT

A. Rubber Floor Tile:

Rubber tile meets the following product construction specifications:

1.	Product Name:	**norament® 992, Article 1955**
2.	ASTM Specification: ASTM F1344 Standard Specification for Rubber Floor Tile	Type IIA and Grade 2
3.	Material Composition:	nora vulcanized rubber compound 992 with environmentally compatible color pigments that are free of toxic heavy metals like lead, cadmium, or mercury
4.	Construction:	Heterogeneous rubber compound
5.	Limited Wear Warranty:	15 years
6.	Color:	1 standard color
7.	Surface:	Hammered
8.	Back of Tile:	Double-sanded smooth
9.	Material Size for Tile (ASTM F2055): ± 0.5 mm (± 0.02 in) is required	1002 mm by 1002 mm (~39.45 in by 39.45 in)
10.	Squareness (ASTM F2055): ± 0.254 mm (± 0.010 in) is required	Meets requirements
11.	Thickness (ASTM F386): + 0.381/- 0.127 mm (+ 0.015/-0.005 in) is required	9 mm (~0.36 in)
12.	Substrate Preparation:	Per ASTM F710 and the nora Installation Instructions
13.	Installation Method:	Directional installation
14.	Cleaning:	Cleaned and maintained effectively using water, nora® pads and a suitable cleaning machine, without the use of any factory and/or field-applied coatings. Also, without using any chemicals that may be hazardous or containing any teratogenic, mutagenic or any other ingredients known to be carcinogenic. Refer to nora Maintenance Guidelines for product specific details.
15.	Shine:	Higher shine achieved by buffing without any artificial topical applied coatings.
16.	Stain Removal:	Samples of the product must be provided for stain removal testing by the owner. Sample size must be 1002 mm by

		1002 mm, pre-cleaned by manufacturer per published recommendations. Samples must have no coatings, sealers, floor finish or other manually or mechanically applied finish on the surface of the product. Stain testing must consist of application of common healthcare related disinfectants and chemicals to include, but not limited to, Betadine, Methylene Blue, Silver Nitrate, and alcohol-based hand sanitizer. Duration of test period must be no less than one week. Removal of chemicals must be in accordance with manufacturers published cleaning and maintenance recommendations.

Rubber tile meets the following performance standards:

1.	Dimensional Stability (ASTM F2199): ≤ 0.15% in both directions is required	Meets requirements
2.	Flammability (E648/NFPA 253): ≥ 0.45 watts/sq cm for Class 1 is required	NBSIR 75 950, 0.56
3.	Smoke Density (ASTM E662): < 450 is required	NBS, 289 (flaming) and 373 (non-flaming)
4.	Surface Burning (CAN/ULC-S102.2):	FSC1 of 75 and SD of 1000
5.	Burn Resistance (DIN EN 1399):	Burn Resistance: Resistant to cigarette and solder burns
6.	Slip Resistance (ASTM D2047): ≥ 0.5 is required	Static coefficient of friction, Neolite dry 0.93, Neolite wet 0.93
7.	Bacteria Resistance (ASTM E2180/ASTM G21):	Resistant to bacteria, fungi, and micro-organism activity
8.	Latex Allergies (ASTM D6499):	Inhibition ELISA, results are below detection level
9.	Sound Absorption (ISO 10140-3):	Δ Lw 17dB (compare only Δ values)
10.	Hardness (ASTM D2240): ≥ 70 is required	Shore type A, 77
11.	Static Load (ASTM F970): ≤ 0.005 in with 250 lbs is required	Residual compression of 0.004 in with 800 lbs
12.	Rolling Load Limit (ASTM F2753):	≤ 850 lbs/sq in
13.	Abrasion Resistance (ASTM D3389): ≤ 0.035 oz (1.0 g) is required	1.1 lbs. (500 g) load on H-18 wheel with 1000 cycles, 0.005 oz (0.14 g) weight loss
14.	Elongation (ASTM D412): ≥ 300 lbs per sq in is required	Modulus @ 10% is 1076.9 lbs per sq in
15.	Oil & Grease Resistance (ISO 26987):	Yes
16.	Heat Resistance (ASTM F1514): Avg. ΔE ≤ 8.0 is required	Easily achieved with all batches and regular maintenance
17.	Static Generation (AATCC 134):	< 1000 Volts at 20% RH
18.	Total Recycled Content (Pre Consumer):	11%
19.	Indoor Air Quality:	GREENGUARD Gold Certified; CDPH 01350 compliant

20.	LEED v4:	Contributes to multiple IEQ and MR credits

B. Rubber Floor Tile:

Rubber tile meets the following product construction specifications:

1.	Product Name:	**norament® 992 grano™, Article 1955**
2.	ASTM Specification: ASTM F1344 Standard Specification for Rubber Floor Tile	Type IIB and Grade 2
3.	Material Composition:	nora vulcanized rubber compound 992 with environmentally compatible color pigments that are free of toxic heavy metals like lead, cadmium, or mercury
4.	Construction:	Heterogeneous rubber compound
5.	Limited Wear Warranty:	15 years
6.	Color:	6 standard colors
7.	Surface:	Hammered
8.	Back of Tile:	Double-sanded smooth
9.	Material Size for Tile (ASTM F2055): ± 0.5 mm (± 0.02 in) is required	1002 mm by 1002 mm (~39.45 in by 39.45 in)
10.	Squareness (ASTM F2055): ± 0.254 mm (± 0.010 in) is required	Meets requirements
11.	Thickness (ASTM F386): + 0.381/- 0.127 mm (+ 0.015/-0.005 in) is required	9 mm (~0.36 in)
12.	Substrate Preparation:	Per ASTM F710 and the nora Installation Instructions
13.	Installation Method:	Directional installation
14.	Cleaning:	Cleaned and maintained effectively using water, nora® pads and a suitable cleaning machine, without the use of any factory and/or field-applied coatings. Also, without using any chemicals that may be hazardous or containing any teratogenic, mutagenic or any other ingredients known to be carcinogenic. Refer to nora Maintenance Guidelines for product specific details.
15.	Shine:	Higher shine achieved by buffing without any artificial topical applied coatings.
16.	Stain Removal:	Samples of the product must be provided for stain removal testing by the owner. Sample size must be 1002 mm by 1002 mm, pre-cleaned by manufacturer per published recommendations. Samples must have no coatings, sealers, floor finish or other manually or mechanically applied finish on the surface of the product. Stain testing must consist of application of common healthcare related disinfectants and chemicals to include, but not limited to, Betadine, Methylene

		Blue, Silver Nitrate, and alcohol-based hand sanitizer. Duration of test period must be no less than one week. Removal of chemicals must be in accordance with manufacturers published cleaning and maintenance recommendations.

Rubber tile meets the following performance standards:

1.	Dimensional Stability (ASTM F2199): ≤ 0.15% in both directions is required	Meets requirements
2.	Flammability (E648/NFPA 253): ≥ 0.45 watts/sq cm for Class 1 is required	NBSIR 75 950, 0.56
3.	Smoke Density (ASTM E662): < 450 is required	NBS, 289 (flaming) and 373 (non-flaming)
4.	Surface Burning (CAN/ULC-S102.2):	FSC1 of 75 and SD of 1000
5.	Burn Resistance (DIN EN 1399):	Burn Resistance: Resistant to cigarette and solder burns
6.	Slip Resistance (ASTM D2047): ≥ 0.5 is required	Static coefficient of friction, Neolite dry 0.93, Neolite wet 0.93
7.	Bacteria Resistance (ASTM E2180/ASTM G21):	Resistant to bacteria, fungi, and micro-organism activity
8.	Latex Allergies (ASTM D6499):	Inhibition ELISA, results are below detection level
9.	Sound Absorption (ISO 10140-3):	Δ Lw 17dB (compare only Δ values)
10.	Hardness (ASTM D2240): ≥ 70 is required	Shore type A, 77
11.	Static Load (ASTM F970): ≤ 0.005 in with 250 lbs is required	Residual compression of 0.004 in with 800 lbs
12.	Rolling Load Limit (ASTM F2753):	≤ 850 lbs/sq in
13.	Abrasion Resistance (ASTM D3389): ≤ 0.035 oz (1.0 g) is required	1.1 lbs. (500 g) load on H-18 wheel with 1000 cycles, 0.005 oz (0.14 g) weight loss
14.	Elongation (ASTM D412): ≥ 300 lbs per sq in is required	Modulus @ 10% is 1076.9 lbs per sq in
15.	Oil & Grease Resistance (ISO 26987):	Yes
16.	Heat Resistance (ASTM F1514): Avg. $\Delta E \leq 8.0$ is required	Easily achieved with all batches and regular maintenance
17.	Static Generation (AATCC 134):	< 1000 Volts at 20% RH
18.	Total Recycled Content (Pre Consumer):	11%
19.	Indoor Air Quality:	GREENGUARD Gold Certified; CDPH 01350 compliant
20.	LEED v4:	Contributes to multiple IEQ and MR credits

PART 3 - GENERAL

3.1 GENERAL CONTRACTOR RESPONSIBILITIES

A. Supply a safe, climate-controlled building and subfloor as detailed in the nora Installation Instructions (available at www.nora.com)

B. A subfloor that meets the requirements of ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring is required, or as detailed in the nora Installation Instructions or nora nTx Installation Instructions as appropriate.

C. A secure storage area that is fully enclosed, weather tight, and climate controlled between 63°F and 75°F and 40% to 60% ambient relative humidity (RH) for at least 48-hours prior and during the installation, so the flooring contractor can acclimate all materials.

D. An installation area that is fully enclosed, weather tight, and climate controlled between 63°F and 75° and 40% to 60% ambient relative humidity (RH) for at least 48-hours prior, during, and 72-hours after installation (do not use gas fueled blowers). If this is not possible, contact the nora Technical Department.

E. Areas with direct prolonged exposure to sunlight should be protected with the use of Low E glass doors, windows or facades that reduce the UV transmissions to less than 1%.

F. Areas of the flooring subjected to direct sunlight, for example through doors or windows, must be covered using blind, curtains, cardboard, or similar materials for 24-hours before, during, and for a period of 72-hours after the installation to allow nora “wet” adhesives to cure. Do not allow traffic when using wet set adhesives for a minimum of 12-hours and prohibit rolling loads for 72-hours. When using nora® nTx™ or nora dryfix™, the flooring can be trafficked immediately with no restrictions. All flooring must be protected from damage during construction operations using Masonite, plywood, or a similar product. Before laying the panels, the flooring surface must be free of all debris. Lay panels so that they are edge to edge and tape the joints to prevent movement and debris entrapment. Inspect the flooring before covering and after removal for final acceptance.

G. Conduct post-installation cleaning after 72-hours for wet set adhesives. Conduct post-installation cleaning immediately for installations using nora dryfix or nora nTx. Refer to the appropriate nora Maintenance Guidelines for product specific details.

3.2 FLOORING CONTRACTOR RESPONSIBILITIES

A. Provide trained installers that have at least one of the following:

1. Approved by specified manufacturer (nora systems, Inc.) or INSTALL (International Standards & Training Alliance) certified for the requirements of the project.
2. It is recommended to have a minimum of one installer per working party with the ability to provide proof of current credentials on request.
3. An effective installation manager to manage the project, installers, and ensure that all the required procedures are followed as detailed in the nora Installation Instructions (available at www.nora.com).

B. Follow all requirements in the appropriate nora Installation Instructions or nora nTx Installation Instructions.

END OF SECTION

nora®, norament®, and noraplan® are trademarks owned by nora systems GmbH and registered in the United States, Canada, and other countries. Cradle to Cradle Certified® is a registered trademark of the Cradle to Cradle Products Innovation Institute. Other labels used here are trademarks of their respective owners.