# SECTION 09654 - LINOLEUM FLOOR COVERINGS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section includes linoleum sheet flooring.

### 1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of linoleum 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 pattern specified in manufacturer's standard size, but not less than 6-by-9-inch sections.

1. Heat-Welding Bead: Include manufacturer's standard-size Samples, but not less than 9 inches long, of each color required.

D. Samples for Initial Selection: For each type of linoleum flooring indicated.

E. Samples for Verification: In manufacturer's standard size, but not less than 6-by-9-inch sections of each different color and pattern of linoleum flooring required.

1. Heat-Welding Bead: Include manufacturer's standard-size Samples, but not less than 9 inches long, of each color required.

F. Heat-Welded Seam Samples: For each linoleum flooring product and welding bead color and pattern combination required; with seam running lengthwise and in center of 6-by-9-inch Sample applied to rigid backing and prepared by Installer for this Project.

G. Product Schedule: For linoleum 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 linoleum 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. Sheet Flooring: Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, in roll form and in full roll width for each type, color, and pattern of sheet flooring installed.

## 1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for flooring installation.

   1. Engage an installer who employs workers for this Project who are trained or certified by flooring manufacturer for installation techniques required.

B. Linoleum flooring must be ordered a minimum of sixty (60) days prior to the start of scheduled installation.

## 1.8 DELIVERY, STORAGE, AND HANDLING

A. Store flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 65 deg F or more than 90 deg F.

   1. Floor Tile: Store on flat surfaces.
   2. Sheet Flooring: Store rolls upright.

## 1.9 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive flooring during the following time periods:

   1. 72 hours before installation.
   2. During installation.
   3. 72 hours after installation.

B. The general contractor shall be responsible for conducting one calcium chloride test for every 1,000 square feet (minimum 3 tests) to ensure concrete moisture emissions do not exceed 5.0 lbs. per 1,000 square feet within a 24 hour period. A diagram of the area showing the location and results of each test shall be submitted to the Designer or General Contractor. If the test results exceed the limitations, the installation must not proceed until the problem has been corrected.

C. The flooring contractor shall verify in writing to the owner, a minimum of thirty (30) days prior to scheduled resilient flooring installation, the following substrate conditions:

1 Misture: initial emission rate, as tested with a calcium chloride test kit, per ASTM 1869-89 requirements.
2. Akalinity: Maximum pH of 10

D. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

E. Close spaces to traffic during flooring installation.

F. Close spaces to traffic for 72 hours after flooring installation.

G. Install flooring after other finishing operations, including painting, have been completed.

H. Where demountable partitions and other items are indicated for installation on top of resilient flooring material, install flooring material before these items are installed.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For linoleum flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

B. FloorScore Compliance: Flooring shall comply with requirements of FloorScore certification.

### 2.2 LINOLEUM SHEET FLOORING (L1, L2, L4, L5)

A. Basis-of-Design Product: Subject to compliance with requirements, provide Marmoleum Global 2 with Topshield Finish by Forbo Industries, Inc. or comparable product by one of the following with the Architect being the sole determinant of equivalency:

1. Armstrong World Industries, Inc.
2. Johnsonite; A Tarkett Company.

B. Linoleum Sheet Flooring: ASTM F 2034, Type I, linoleum sheet with backing.

1. Roll Size: In manufacturer's standard length but not less than 78 inches wide.

C. Thickness: 0.010 inch.

D. Heat-Welding Bead: For seamless installation, solid-strand product of linoleum flooring manufacturer.

1. Color: As selected by Architect from manufacturer's full range.

E. Static Load Limit 450 pounds per square inch (per ASTM F970.)

F. Heterogeneous linoleum of primarily natural material consisting of linseed oil produced from flax harvested in Saskatchewan, Canada, wood flour, rosin binders and pigments mixed and calendered using a two-layered process, ensuring the smoothest surface possible creating the optimal condition for easy maintenance and castor resistance (per EN425), onto a jute backing.

G. Materials to be constructed with a minimum 45% Post Industrial Recycled Content per FTC – Part 260. Guides for the use of environmental marketing claims and be considered rapidly renewable per USGBC LEED M&R Credit 6.0.

H. Upon request by the Architect, Flooring Manufacturer to provide independent testing labs verification of all applicable test results.

I. Colors and Patterns: As selected by Architect from full range of industry colors.

## 2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by linoleum flooring manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit products and substrate conditions indicated.

1. Adhesives shall have a VOC content of 50 g/L or less.
2. Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
3. Apply adhesive using a 1/16” x 1/16” x 1/16” square notched trowel and lay flooring onto wet adhesive and roll with a 100 pound roller to ensure proper bonding.

C. Heat-Welding Bead: Use manufacturers recommended heat-welding thread for areas thatrequire by specification for hygienic seams.

1. Hygienic Seam Welding Rods: Refer to Finish Plans for color.

D. Floor Polish: Provide protective, liquid floor-polish products recommended by linoleum 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 flooring.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

A. Prepare substrates according to linoleum flooring manufacturer's written instructions to ensure adhesion of 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 flooring adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by linoleum flooring manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by linoleum 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: Perform tests recommended by linoleum flooring manufacturer, but not less stringent than the following:

   a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
   b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have 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 flooring until it is the same temperature as space where it is to be installed.

1. At least 72 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 flooring.

## 3.3 INSTALLATION, GENERAL

A. Comply with manufacturer's written instructions for installing flooring.

B. Scribe and cut flooring to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings.

C. Extend flooring into toe spaces, door reveals, closets, and similar openings.

D. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on flooring as marked on substrates. Use chalk or other nonpermanent marking device.

E. Install flooring on covers for telephone and electrical ducts and similar items in finished floor 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.

F. Adhere 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.

G. Heat-Welded Seams: For seamless installation, 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.

## 3.4 LINOLEUM SHEET FLOORING INSTALLATION

A. Unroll linoleum sheet flooring and allow it to stabilize before cutting and fitting.

B. Lay out linoleum 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 away from parallel joints in flooring substrates.
3. Match edges of flooring for color shading at seams.
4. Avoid cross seams.
5. Eliminate deformations that result from hanging method used during drying process (stove bar marks).

## 3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting linoleum flooring.

B. Perform the following operations immediately after completing linoleum flooring installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect linoleum 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, visible adhesive, and surface blemishes from linoleum flooring before applying liquid floor polish.

1. Apply two coats.

E. After allowing drying room film (yellow film caused by linseed oil oxidation) to disappear, cover linoleum flooring until Substantial Completion.

END OF SECTION 09654