SECTION 096543 - LINOLEUM FLOORING

Revise this Section by deleting and inserting text to meet Project-specific requirements.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
   * + 1. RELATED DOCUMENTS
          1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
       2. SUMMARY
          1. Section Includes:

Linoleum floor tile.

Linoleum sheet flooring.

* + - 1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Product Data: For each type of product.
         5. Sustainable Design Submittals:

Retain "Shop Drawings" paragraph below if required for complex patterns.

* + - * 1. 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.

Show details of special patterns.

Retain "Samples" paragraph below for single-stage Samples, with a subordinate list if applicable. Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs for two-stage Samples.

* + - * 1. 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.

Linoleum sheet flooring is usually specified for seamless installation produced by heat-welding seams. Retain "Heat-Welding Bead" subparagraph below if heat-welded seams are required.

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

* + - * 1. Samples for Initial Selection: For each type of linoleum flooring indicated.
        2. Samples for Verification: For each type of linoleum flooring, in manufacturer's standard size, but not less than 6-by-9-inch sections of each different color and pattern required.

Linoleum sheet flooring is usually specified for seamless installation produced by heat-welding seams. Retain "Heat-Welding Bead" subparagraph below if heat-welded seams are required.

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

Retain "Heat-Welded Seam Samples" paragraph below if heat-welded seams are required for linoleum sheet flooring.

* + - * 1. 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.
        2. Product Schedule: For linoleum flooring. Use same designations indicated on Drawings.

Coordinate "Qualification Data" paragraph below with qualification requirements in "Quality Assurance" Article.

* + - * 1. Qualification Data: For Installer.
      1. CLOSEOUT SUBMITTALS
         1. Maintenance Data: For each type of linoleum flooring to include in maintenance manuals.
      2. MAINTENANCE MATERIAL SUBMITTALS
         1. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Revise "Floor Tile" and "Sheet Flooring" subparagraphs below to suit Project.

Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

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. QUALITY ASSURANCE
         1. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for flooring installation and seaming methods indicated.

Flooring Installers and their Supervisor to be experienced in linoleum flooring installation, including the requirements of the flooring manufacturer, and have been regularly employed by a company engaged in installation of resilient flooring for 5 years minimum.

Furnish to the Director’s Representative the names and addresses of 5 similar projects which the foregoing people have worked on during the past 3 years.

* + - * 1. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

Coordinate mockups in this Section with mockups specified in other Sections.

Size: Minimum 100 sq. ft. for each type, color, and pattern [**in locations indicated**] [**in locations directed by Director’s Representative**].

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Director’s Representative specifically approves such deviations in writing.

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - 1. DELIVERY, STORAGE, AND HANDLING
         1. 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.

Floor Tile: Store on flat surfaces.

Sheet Flooring: Store rolls upright.

* + - 1. FIELD CONDITIONS

Ambient temperature range for installation varies among manufacturers. Consult manufacturers for recommendations and revise first paragraph below to suit Project.

* + - * 1. 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 periods:

72 hours before installation.

During installation.

72 hours after installation.

* + - * 1. 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.
        2. Close spaces to traffic during flooring installation.
        3. Close spaces to traffic for 72 hours after flooring installation.
        4. Install flooring after other finishing operations, including painting, have been completed.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and Masterworks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 1. PERFORMANCE REQUIREMENTS

Retain "Fire-Test-Response Characteristics" paragraph below if fire-test-response testing is required by authorities having jurisdiction. In most building codes, linoleum flooring is exempt from fire-test-response requirements. See "Fire-Test-Response Characteristics" Article in the Evaluations for additional information.

* + - * 1. Fire-Test-Response Characteristics: For linoleum flooring, as determined by testing identical products according to ASTM E648 or NFPA 253 by a qualified testing agency.

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

* + - 1. LINOLEUM FLOOR TILE <**Insert drawing designation**>

Copy this article and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. [Products:](http://www.specagent.com/Lookup?ulid=7596) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Forbo Industries, Inc](http://www.specagent.com/Lookup?uid=123457061366).; Marmoleum® Modular.

Approved equivalent.

* + - * 1. Linoleum Floor Tile: ASTM F2195, Type I, linoleum floor tile with fibrous backing.

Nominal Floor Tile Size: [**Manufacturer's standard**] [**13 by 13 inches**] [**20 by 20 inches**] [**24 by 24 inches**].

Generally, 0.08-inch-thick linoleum is suitable for residential traffic only. Before retaining an option in "Thickness" paragraph below, consult manufacturers for recommendations.

* + - * 1. Thickness: 0.10 inch.

Large-size tiles can be heat welded. If required, insert requirements for heat-welding bead for seamless installation.

Retain "Colors and Patterns" paragraph below if colors and patterns are not indicated in a separate schedule.

* + - * 1. Colors and Patterns: [**As indicated by manufacturer's designations**] [**Match Director’s Representative's samples**].
      1. LINOLEUM SHEET FLOORING <**Insert drawing designation**>

Copy this article and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. [Products:](http://www.specagent.com/Lookup?ulid=7597) Subject to compliance with requirements, provide one of the following:

[Forbo Industries, Inc](http://www.specagent.com/Lookup?uid=123457061369).; Marmoleum® Sheet.

[Johnsonite; a Tarkett company](http://www.specagent.com/Lookup?uid=123457070600); Lino xf2™.

Approved equivalent.

* + - * 1. Linoleum Sheet Flooring: ASTM F2034, Type I, linoleum sheet with backing.

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

Generally, 0.08-inch-thick linoleum is suitable for residential traffic only. Before retaining an option in "Thickness" paragraph below, consult manufacturers for recommendations.

* + - * 1. Thickness: 0.10 inch.

Revise "Heat-Welding Bead" paragraph below for seamless installation. See "Product Characteristics" Article in the Evaluations for a discussion of seamless installation.

* + - * 1. Heat-Welding Bead: For seamless installation, solid-strand product of linoleum flooring manufacturer.

Colors: [**As selected by Director’s Representative from manufacturer's full range to contrast with linoleum flooring**] [**Match linoleum flooring**].

* + - * 1. Integral-Flash-Cove-Base Accessories:

Cove Strip: 1-inch radius, provided or approved by manufacturer.

Cove-Base Cap Strip: [**Square metal, vinyl, or rubber cap**], provided or approved by manufacturer.

Retain "Colors and Patterns" paragraph below if colors and patterns are not indicated in a separate schedule.

* + - * 1. Colors and Patterns: [**As indicated by manufacturer's designations**] [**Match Director’s Representative's sample**][**As selected by Director’s Representative from manufacturer's full range**].
      1. INSTALLATION MATERIALS
         1. 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.
         2. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit products and substrate conditions indicated.
         3. Floor Polish: Provide protective, liquid floor-polish products recommended by linoleum flooring manufacturer.

1. EXECUTION
   * + 1. EXAMINATION

Coordinate requirements specified in other Sections for substrate construction and tolerances to ensure that they are appropriate for flooring.

* + - * 1. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

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.

* + - * 1. Proceed with installation only after unsatisfactory conditions have been corrected.
      1. PREPARATION

Extensive surface preparation is required over substrates from which existing flooring has been removed. Requirements vary among manufacturers. Insert requirements to suit Project. On rehab. projects check that necessary removal and preparatory work is clearly indicated.

* + - * 1. Prepare substrates according to linoleum flooring manufacturer's written instructions to ensure adhesion of flooring.

Retain Article below if installation on concrete is required.

* + - * 1. Concrete Substrates: Prepare according to ASTM F710.

Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

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.

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.

Retain "Moisture Testing" subparagraph below; excessive moisture vapor can cause failure of resilient products adhered to concrete. ASTM F1869 (anhydrous calcium chloride test) and ASTM F2170 (relative humidity test) both recommend one test per 1000 sq. ft., but no fewer than three tests per test area.

Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

Retain "Anhydrous Calcium Chloride Test" or "Relative Humidity Test" subparagraph below, or both.

When tested according to ASTM F1869, a maximum moisture-emission level of 3 lb of water/1000 sq. ft. of slab area in a 24-hour period is generally accepted in resilient flooring industry.

Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.

Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

* + - * 1. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
        2. Do not install flooring until materials are the same temperature as space where they are to be installed.

At least 72 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.

* + - * 1. Immediately before installation, sweep and vacuum clean substrates to be covered by flooring.
      1. INSTALLATION, GENERAL
         1. Comply with manufacturer's written instructions for installing flooring.

If built-in items are required to be set on top of flooring, indicate on Drawings and revise first paragraph below.

* + - * 1. Scribe and cut flooring to butt neatly and tightly to vertical surfaces and permanent fixtures, including built-in furniture, cabinets, pipes, outlets, edgings, thresholds, door frames, and nosings.
        2. Extend flooring into toe spaces, door reveals, closets, and similar openings.
        3. 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.

Retain first paragraph below for flooring installed on floor covers.

* + - * 1. Install 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.
        2. 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.

Retain "Heat-Welded Seams" paragraph below if seamless installation is required.

* + - * 1. Heat-Welded Seams: For seamless installation, comply with ASTM F1516. Rout joints and heat weld with welding bead to fuse sections permanently into a seamless flooring installation. Prepare, weld, and finish seams to produce surfaces flush with adjoining flooring surfaces.
      1. LINOLEUM FLOOR TILE INSTALLATION
         1. Lay out linoleum floor tiles from center marks established with principal walls, discounting minor offsets, so floor tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

Lay floor tiles [**square with room axis**] [**at a 45-degree angle with room axis**] [**in pattern indicated**].

* + - * 1. Match linoleum floor tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed floor tiles.

Lay floor tiles [**with grain running in one direction**] [**with grain direction alternating in adjacent floor tiles (basket-weave pattern)**] [**in pattern of colors and sizes indicated**].

* + - 1. LINOLEUM SHEET FLOORING INSTALLATION
         1. Unroll linoleum sheet flooring and allow it to stabilize before cutting and fitting.
         2. Lay out linoleum sheet flooring as follows:

Maintain uniformity of flooring direction.

Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in flooring substrates.

Match edges of flooring for color shading at seams.

Avoid cross seams.

Eliminate deformations that result from hanging method used during drying process (stove bar marks).

* + - * 1. Integral-Flash-Cove Base: Cove flooring [**6 inches**] [**to dimension indicated**] up vertical surfaces. Support flooring at horizontal and vertical junction with cove strip. Butt at top against cap strip.

Retain paragraph below if being installed on masonry or irregular surfaces.

On masonry and other irregular surfaces, fill voids behind base with filler/wall patch.

* + - 1. CLEANING AND PROTECTION
         1. Comply with manufacturer's written instructions for cleaning and protecting linoleum flooring.
         2. Perform the following operations immediately after completing linoleum flooring installation:

Remove adhesive and other blemishes from surfaces.

Sweep and vacuum surfaces thoroughly.

Damp-mop surfaces to remove marks and soil.

* + - * 1. Protect linoleum flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

Before retaining "Floor Polish" paragraph below, verify manufacturer's written instructions for floor polish.

* + - * 1. Floor Polish: Remove soil, adhesive, and blemishes from linoleum flooring surfaces before applying liquid floor polish.

Revise subparagraph below to suit products.

Apply [**two**] [**three**] coat(s).

* + - * 1. After allowing drying room film (yellow film caused by linseed oil oxidation) to disappear, cover linoleum flooring until Substantial Completion.

END OF SECTION 096543