

SECTION 09 65 16

RESILIENT SHEET FLOORING

CSI 3-PART **LONG-FORM** GUIDE SPECIFICATION
USE FOR CONTRACT DOCUMENT (CD) SPECIFICATION ISSUES
EDIT TO SUIT PROJECT

PART 1 - GENERAL

NOTE: Project specifications issued as contract documents legally set the level of quality. The descriptive language, reference standards and performance criteria listed in each Specification Section are what an architect uses to evaluate equals or equivalents submitted as substitution requests to the specified item.

This Guide Specification offers particular product design choices including descriptive language, reference standards and performance criteria that establish a standard of quality for the architect's use in evaluations.

1.1 SUMMARY

- A. Work of this Section consists of an inlaid wear surface embossed resilient sheet vinyl flooring and accessories including, but not limited to:
1. Takiron **Pathways**® Commercial Sheet Vinyl Flooring
 2. Adhesives
 3. Accessories
 - a. Trowel
 - b. Transition Strip
 - c. Heat and Cold Welding
 - d. Concrete Moisture Sealer
 - e. Cleaning products
- B. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. A list of those Documents and Sections include, but is not limited to the following:
1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and DIVISION 01 General Requirements, Specification Sections, apply to this Section.
 2. SECTION 033000, CAST-IN-PLACE CONCRETE: For proper concrete design, underslab vapor barrier and finished concrete surface required to accept sheet vinyl flooring (SVF).
 3. SECTION 035416, HYDRAULIC CEMENT UNDERLAYMENT: For leveling of existing concrete slabs.
 4. SECTION 061000, ROUGH CARPENTRY: For proper wood-based panel underlayment required to accept installation of sheet vinyl flooring (SVF).
 5. SECTION 079200, JOINT SEALERS: For exposed movement joints.

6. SECTION 079513, EXPANSION JOINT COVER ASSEMBLIES: For expansion joint assembly penetrating through sheet vinyl flooring (SVF).
7. SECTION 096513, RESILIENT BASE AND ACCESSORIES: For wall base, and expansion joint trim between sheet vinyl flooring (SVF) and other flooring surfaces.

NOTE: Edit Abbreviations, Acronyms, Definitions, and References below to suit project.

1.2 REFERENCES

NOTE: Coordinate and edit to the correct Section number below.

- A. Abbreviations and Acronyms per SECTION 011000, SECTION 014000, and as follows:
1. AHJ. Authority Having Jurisdiction from local, state and federal regulatory agencies.
 2. Per. In accordance with
 3. RH. Relative humidity.
 4. SCOF. Static Coefficient of Friction
 5. SVF. Sheet Vinyl Flooring

NOTE: Definitions are included here as an educational tool, but are not required for the final specification issue. Delete if desired.

- B. Definitions per SECTION 011000, SECTION 014000, and as follows:

NOTE: Blue underlined items throughout the section are direct hotlinks to website information in the Word document. Click on them to load the pertinent information.

1. HAP. Hazardous Air Pollutant
2. PVC: Poly vinyl chloride contains 57 percent chlorine by weight derived from salt with the remainder hydrogen and carbon (as ethylene) derived primarily from natural gas and petroleum. Ethylene and chlorine are combined using either direct chlorination or an oxychlorination process to make 1,2-dichloroethane (EDC), which is then converted, through polymerization with hydrochloric acid, into vinyl chloride monomer (VCM) resin particles. VCM resin can be further polymerized into the vinyl paste or plastisol used to make flooring. Plasticizer copolymers (phthalates) are typically added to provide flexibility along with other additives such as: stabilizers, processing aids, impact modifiers, pigments, inert fillers such as chalk, lubricants that aid in extrusion, flame retardants, smoke suppressants, and biocides.
3. Resilient: The property of an elastic material to recover its shape after it is deformed under loading and then unloaded.
4. SVF. Sheet Vinyl Flooring is produced by a rolled “calendering” process in which a layer of PVC compound (PVC resin with plasticizers and other additives such as fungicides) is applied over a backing material, usually an organic fiber such as paper or a foamed plastic material.
5. Thermoplastic: Plastic that is solid when cold, but which may flow and be re-formed or welded with the application of heat.

6. [VOC. Volatile Organic Compounds](#) are chemical compounds that have a high vapor pressure and low water solubility. They include a variety of chemicals, some of which may have short- and long-term adverse health effects when concentrated indoors.

C. Referenced Standards per SECTION 014000 and as follows:

1. ANSI. American National Standards Institute; www.ansi.org
2. ASTM. ASTM International; www.astm.org
 - a. Practices:
 - 1). ASTM F710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
 - 2). ASTM F1482, Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
 - 3). ASTM F1516, Sealing Seams of Resilient Flooring Products by the Heat Weld Method
 - 4). ASTM F1869, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
 - 5). ASTM F2170, Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
 - b. Specifications:
 - 1). ASTM F1303, Standard Specification for Sheet Vinyl Floor Covering with Backing
 - c. Terminology:
 - 1). ASTM F141, Standard Terminology Relating to Resilient Floor Coverings
 - d. Test Methods – Performance:
 - 1). ASTM C1028, Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method
 - 2). ASTM D5116, Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products
 - 3). ASTM E90, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (STC)
 - 4). ASTM E648, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
 - 5). ASTM E2179, Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors (IIC)
 - 6). ASTM F925, Standard Test Method for Resistance to Chemicals of Resilient Flooring
 - 7). ASTM F970, Standard Test Method for Static Load Limit

- 8). ASTM F1514, Standard Test Method for Measuring Heat Stability of Resilient Vinyl Flooring by Color Change.
 - 9). ASTM F1515, Standard Test Method for Measuring Light Stability of Resilient Vinyl Flooring by Color Change
 - 10). ASTM F1516, Practice for Sealing Seams of Resilient Flooring Products by the Heat Weld Method (when Recommended)
 - 11). ASTM F1914, Standard Test Method for Short-Term Indentation and Residual Indentation of Resilient Floor Covering
- e. Test Methods – Products and Materials:
- 1). ASTM F137, Standard Test Method for Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus
 - 2). ASTM F386, Standard Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces
 - 3). ASTM F410, Standard Test Method for Wear Layer Thickness of Resilient Floor Coverings by Optical Measurement
3. BAAQMD. Bay Area Air Quality Management District; www.baaqmd.gov
 4. CARB. California Air Resources Board; www.arb.ca.gov
 5. CA.GOV. California Integrated Waste Management Board; www.ciwmb.ca.gov
 - a. [Section 01350](#) standards
 6. EPA. U.S. Environmental Protection Agency; www.epa.gov
 7. GS. Green Seal; www.greenseal.org
 8. ISO. International Organization for Standardization; www.iso.org
 - a. ISO 140, Part 8, Acoustics -- Measurement of sound insulation in buildings and of building elements -- Part 8: Laboratory measurements of the reduction of transmitted impact noise by floor coverings on a heavyweight standard floor
 9. NFPA. National Fire Protection Association; www.nfpa.org
 - a. NFPA 253, Standard Method of Test for Critical Radiant Flux for Floor Covering Systems Using a Radiant Energy Source.
 10. RFCI. Resilient Floor Covering Institute; www.rfci.com
 - a. [Recommended Work Practices for Removal of Resilient Floor Coverings](#)
 11. SCAQMD. South Coast Air Quality Management District; www.aqmd.gov
 12. ULC. Underwriters' Laboratories of Canada;
http://www.ulc.ca/industry/building_construction_materials.asp
 - a. CAN/ULC-S102.2-03, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials
 13. USGBC. United States Green Building Council; www.usgbc.org

1.3 ADMINISTRATIVE REQUIREMENTS

NOTE: Coordinate and edit to the correct Section number below. The numbers shown indicate relevant broad-scope, medium-scope and narrow-scope numbers of the CSI MasterFormat® system.

A. Coordination per SECTION 013000 or 013100, and as follows:

1. Coordinate expansion joint system installation prior to installing resilient sheet flooring. Refer to SECTION 079200 and SECTION 079500, 079510 or 079513.

RED NOTE: Specifier to closely coordinate applicable sections between concrete and other subfloor finishes with floor covering.

2. Coordinate concrete topping finish per SECTION 035400 or 035416.

NOTE: Coordinate and edit to the correct Section number below.

B. Preinstallation Meetings per SECTION 013000 or 013100 and as follows:

1. Meeting purpose is to review site conditions, installation procedures, schedules, coordination with other work, and warranty requirements.

NOTE: Coordinate and edit to the correct Section number below.

C. Sequencing: Per SECTION 010000 or 011100.

NOTE: Coordinate and edit to the correct Section number below.

D. Scheduling: Per Section 010000 or 011100, and SECTION 013000 or 013200.

1.4 SUBMITTALS

NOTE: Coordinate and edit to the correct Section number below.

A. Product Data per SECTION 013000 or 013300 and as follows: Submit manufacturer's printed descriptions of materials, components and systems, performance criteria, use limitations, recommendations, installation information, and the following:

1. Typical section details indicating each specified system on proposed substrates and transitions to other flooring systems.
2. Sections indicating flooring system abutting walls.
3. Typical plan views of various layout patterns.

NOTE: Coordinate and edit to the correct Section number below.

B. Shop Drawings per SECTION 013000 or 013300 and as follows: Submit keyed location plans, plans indicating resilient sheet flooring type, layout, pattern direction, edge transitions, columns, doorways, enclosing partitions, built-in furniture, cabinets, cutouts, expansion and control joints, and attachment requirements.

NOTE: Coordinate and edit to the correct Section number below.

C. Samples per SECTION 013000 or 013300 and as follows:

1. Initial for Selection: Submit printed color charts, sample chains or Architectural Binder indicating manufacturer's complete range to determine color, texture, shape, and/or composition for each type of material finish.
 2. Final Selection: Submit two (2) cut 24 x 24 inch (610mm x 610mm) square samples of each different type, color and pattern selected for acceptance.
- D. Quality Assurance Submittals per SECTION 014000 and as follows:
1. Test and Evaluation Reports: Submit certified test results by a recognized testing laboratory in accordance with specified test methods for each product and/or system indicating physical, chemical and performance characteristics.
 2. Qualification Statements: Submit a letter, on printed letterhead and signed by an officer of the firm, for each listed quality assurance qualification listed, attesting to meeting each requirement called out.

NOTE: Edit LEED Requirements below to suit project.

- E. Sustainable Design (USGBC [LEED](#)®) Submittals: Submit the following in accordance with the requirements of SECTION 018113, LEED REQUIREMENTS:
1. LEED Credit MR, Materials & Resources. Submit completed LEED 2009-NC v.3 Submittal Templates, and other required paperwork as follows:
 - a. MR 4.1: Recycled Content: 10 Percent (post-consumer + 1/2 pre-consumer)
 - b. MR 4.2: Recycled Content: 20 Percent (post-consumer + 1/2 pre-consumer)
 - 1). Submit product data indicating percentage by weight of recycled content with a statement indicating costs for each.
 2. LEED Credit IEQ, Indoor Environmental Quality. Submit completed LEED 2009-NC v.3 Submittal Templates and required paperwork as follows:
 - a. IEQ 4.1: Low Emitting Materials, Adhesives & Sealants, VOC Data
 - 1). Submit manufacturers' product data for construction adhesives and sealants, including printed statement of VOC content and MSDS Sheets.
 - 2). Submit manufacturer's certification that products meet the requirements of SCAQMD Rule 1168 in areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur.
 - 3). Submit manufacturer's certification that products meet the requirements of BAAQMD Regulation 8, Rule 51 for containers larger than 16 oz and with CARB for containers 16 oz or less, for areas where freeze/thaw conditions do exist or direct exposure to moisture can occur.
 - b. IEQ 4.3: Low Emitting Materials, Carpet and Resilient Flooring Systems
 - 1). Submit manufacturer's product data for systems that includes printed statement of VOC content.

NOTE: Coordinate and edit to the correct Section number below.

- F. Closeout Submittals per SECTION 017000 or 017800, unless noted otherwise.

1. Operation and Maintenance Data: Including, but not limited to, methods for maintaining installed products and precautions against cleaning materials with methods detrimental to finishes and performance.
2. Executed Warranty Documentation: Manufacturers' material warranties and installers workmanship warranty.
3. Record Documents: Drawings, Specifications, and Product Data.

NOTE: Edit LEED Requirements below to suit project.

4. Sustainable Design Closeout Documentation: Submit completed USGBC LEED® Submittal [Worksheet Templates](#) for the following credits:
 - a. MR 4.1, MR 4.2
 - b. IEQ 4.1, IEQ 4.3

NOTE: Edit percentage below to suit scope of project.

- G. Maintenance Material Submittals - Extra Materials: Submit no less than five (5) percent additional full and unopened rolls of each type and pattern of sheet good used.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements

1. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E648 or NFPA 253 by a qualified testing agency.
 - a. Critical Radiant Flux Classification: Class I

B. Qualifications:

1. Manufacturer: A company with a minimum five (5) years experience in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.
 - a. Company shall be [ISO 9001](#) Certified.
 - b. Company shall be [ISO 14001](#) Certified.
2. Installer / Applicator: Perform installation with skilled, experienced and trained workmen supervised by trained personnel who shall have a minimum five (5) years successful experience in installations of similar size and scope.
3. Testing Agency: An independent testing agency with the experience and capability to conduct the testing indicated, meeting requirements of ISO/IEC Standard 17025 or ASTM E699 and ASTM E329.

C. Source Limitations: Obtain primary resilient sheet flooring materials through one source from a single manufacturer.

1. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.

NOTE: Edit sustainability standards and certifications below to suit project.

D. Sustainability Standards and Certifications:

1. Adhesive and Sealant VOC Limits: According to South Coast Air Quality Management District [Rule 1168](#) and [GS-36](#) for aerosols.
2. VOC Limits: As tested using U.S. EPA Reference Test Method 24 and as defined by
 - a. South Coast Air Quality Management District Rules: In areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur.
 - 1). SCAQMD [Rule 1113](#), Architectural Coatings
 - 2). SCAQMD [Rule 1168](#), Adhesive and Sealant Applications
 - b. Bay Area Air Quality Management District Regulation: For containers larger than 16 oz., for areas where freeze/thaw conditions do exist or direct exposure to moisture can occur.
 - 1). BAAQMD [Regulation 8, Rule 51](#)
 - c. California Air Resources Board: For areas where freeze/thaw conditions do exist or direct exposure to moisture can occur.
 - 1). CARB for containers 16 oz. or less.

- E. Field Samples per SECTION 014000: Provide field samples, dry laid, to demonstrate aesthetic effects of materials in situ, assisting the Architect and Owner in making final selections.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery, Storage and Handling per industry and manufacturer guidelines, SECTION 016000, and as follows:

1. Delivery and Acceptance Requirements
 - a. Deliver materials to Project site in an undamaged condition, in original unopened rolls or other packaging bearing manufacturer's intact label, names, brand names, types and sizes of contents, and proper handling, storing, unpacking, protecting, and installation instructions, as warranted.
 - b. Inspect shipped materials on delivery to ensure compliance with requirements of Contract Documents and to ensure that products are undamaged and properly protected.
 - 1). Reject damaged goods, and accept properly ordered, protected and undamaged goods.
2. Storage and Handling Requirements
 - a. Store materials in a dry, temperature-controlled interior area at 65-80 deg F (18-27 deg C). Avoid exposure to temperature extremes. Protect materials from damage from improper handling, and the action of other trades.
 - 1). Store rolls of sheet goods standing up, with capped end down. Do not lay flat.
3. Packaging Waste Management
 - a. Request that manufacturers, suppliers and shippers provide least amount of packaging that adequately and properly protects, supports and contains the items shipped, and is reusable, returnable or recyclable.

1.7 WARRANTY

- A. **Manufacturer Warranty.** Provide manufacturer's limited warranty to be free from defects in material and workmanship, under normal use and service, to repair or replace all defective sheet flooring.
1. **Warranty Period:** Five (5) years from the date of invoice to original end user. Warranty to include reasonable labor and is non-prorated.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. **Manufacturers List:** Subject to compliance with requirements, provide products by one of the following:

1. TAKIRON, a Division of CBC AMERICA LLC, 2000 Regency Parkway, Cary, NC 27518; Telephone: 919.230.8700; E-mail: technical@cbcflooring.com; website: www.cbcflooring.com

NOTE: Equals or equivalents may not be required and desired, edit paragraph to suit project.

2. **Substitution Limitations:** Manufacturers of equivalent products beyond those listed above shall be considered when submitted per DIVISION 01, using CSI Substitution Request Form 1.5C (During the Bidding Phase) or Form 13.1 (After the Bidding Phase.) [link](#)

- B. **Product Options**

1. **Flooring Type:** TAKIRON **Pathways**®
 - a. **TAKIRON Pathways:**
 - 1). **Size:** 6 x 66 feet by 0.100 inches (1.82m x 20m x 2.5mm)
 - 2). **Color and Pattern:** [Collection](#)
 2. **Interior & Non-Wet Area Acrylic Adhesives:**
 - a. CBC 5001 High Performance Resilient Flooring Adhesive
 - b. CBC ECOSpray U Universal Spray Resilient Flooring Adhesive
 3. **Wet Area & Exterior Adhesives:**
 - a. CBC 951 2-Part Epoxy Floor Covering Adhesive for Indoor (wet area) and Outdoor Installations
 4. **Accessories**
 - a. Trowel: TOLI Fine U-Notch Professional Trowel
 - b. TOLI Transition Strip
 - c. Underlayment leveling compound per SECTION 035416
 - d. Expansion joints per SECTIONS 079200 and 079513
 - e. Cleaning products

2.2 DESCRIPTION

NOTE: Select one of the following two descriptions, deleting the one not chosen.

- A. Takiron **Pathways®** has a Type II, Grade 1, inlaid embossed commercial wear layer with a Class B fused backing system.
- B. Sustainability Characteristics
 - 1. [USGBC](#) LEED Rating: Comply with project requirements intended to achieve the following Rating, as measured and documented according to the USGBC LEED® Green Building [Rating System](#), Version indicated:

NOTE: Each LEED Version requires a different credit total to achieve the desired LEED Rating.

NOTE. Select one of the following Ratings:

- a. Rating: Certified
- b. Rating: Silver
- c. Rating: Gold
- d. Rating: Platinum

NOTE. Select one of the following Versions:

- e. Version: [LEED 2009-NC](#) v. 3 (New Construction)
- f. Version: [LEED 2009-EB](#) v. 3 (Existing Building)
- g. Version: [LEED 2009-CI](#) v. 3(Commercial Interiors)
- h. Version: [LEED 2009 for Schools](#)
- i. Version: [LEED for Retail](#), v. 2 (July 2008) Draft (Commercial Interiors)
- j. Version: [LEED for Health Care](#)
- 2. Applicable LEED Credits: Performance requirements of the following LEED Categories and Credits apply to this Section and are met as follows:
 - a. Materials & Resources (MR):
 - 1). MR 4.1: Recycled Content: 10 Percent (post-consumer + 1/2 pre-consumer)
 - a). Takiron **Pathways®** contains 10.2% post-consumer + 1/2 11% pre-consumer, for an **16.1%** calculated recycled content.
 - b). **CBC 5001** adhesive comes packaged in a recyclable PET pail.
 - b. Indoor Environmental Quality (EQ):
 - 1). IEQ Credit 4.1, Low-Emitting Materials: Adhesives and Sealants: as applied to **CBC 5001 acrylic, ECOSpray U** and **CBC 951 Epoxy** adhesives.
 - a). SCAQMD Rule 1168 sets a limit of 50 grams / liter (g/L) for SVF adhesives.
 - b). BBAQMD Regulation 8, Rule 51, requires VOC limit of 150 g/L for Indoor Floor Covering Installation.
 - c). Acrylic Adhesive - **CBC 5001** VOC: **0 g/L**

- d). Acrylic Adhesive - **ECOSpray U** VOC: **0 g/L**
- e). Epoxy Adhesive – **CBC 951** VOC: **0 g/L**
- 2). IEQ Credit 4.3, Low-Emitting Materials: Carpet and Resilient Flooring Systems
 - a). Takiron **Pathways** Sample M48031: MAS Laboratory Certified Green® in accordance with California DHS Section 01350. Passes. Formaldehyde, acetaldehyde, and acrolein below 1/2 CREL value.

2.3 PERFORMANCE / DESIGN CRITERIA

A. Performance Capacities – TAKIRON **Pathways**®

- | | |
|--|--|
| 1. Average Thickness per ASTM F 386: | Pass - 0.100" ± 0.005' (2.4mm ± 2.6mm) |
| 2. Static Load Limit per ASTM F 970: | 750 psi ≤ 0.005" residual indentation |
| 3. Short Term Indentation per ASTM F 1914: | Pass; ≤ 0.012" residual indentation |
| 4. Critical Radiant Flux per ASTM E 648: | Class I ≥ 0.45 watts/squared |
| 5. Heat Resistance per ASTM F1514: | Pass; Max. avg. Delta E ≤ 8 |
| 6. Light Resistance per ASTM F1515: | Pass; Max. avg. Delta E ≤ 8 |
| 7. Flexibility per ASTM F137: | Pass; 1/4 inch (6.4mm) Mandrel |
| 8. Chemical Resistance per ASTM F925: | Pass |
| 9. TVOC Emissions per ASTM D5116: | Pass; CA Section 01350 Compliant |
| 10. Slip Resistance per ASTM C 1028: | ≥ 0.8 ADA Compliant |

2.4 MATERIALS

A. Takiron **Pathways**® **Sheet** per ASTM F1303: Type II, Grade 1, inlaid wear layer sheet vinyl.

- 1. Composition: Sheet vinyl formed under heat and pressure from a PVC layer formulated from polyvinyl esters and inorganic fillers materials, with a backing material of recycled PVC and virgin PVC from polyvinyl esters and inorganic filler materials.
- 2. Thickness: 0.100 inches (2.5 mm)
- 3. Roll Size: 6 x 66 feet (1.8m x 20m)

NOTE: Select 4 or 5 deleting item not chosen.

- 4. Color and Pattern - TAKIRON **Pathways**: As selected by Architect from Manufacturer's standard [Collection](#).

2.5 ACCESSORIES

A. Concrete Slab Leveling and Patching Compound per SECTION 035416.

- 1. Latex Patching Compound: Styrene-butadiene rubber, portland cement, and an aggregate mix.
- 2. Hydraulic Cement Underlayment per SECTION 035416.

- B. Expansion Joints: Refer to SECTION 079200 and SECTION 079500 or 079513.
- C. Transition Strips
 - 1. Manufacturer: TOLI
 - 2. Sizes: 0.080 to 0.120 inch (2.0mm to 3.0mm) high x 0.200 inch (5.1mm) wide by 36 inches (914mm) long
 - 3. Color: #3 medium-gray

NOTE: Select one of the following adhesive types, deleting that not chosen.

NOTE: Select CBC 951 Epoxy adhesive for all exterior installations or when expecting floors to be frequently washed or wet, or floors installed in extremely hot, cold or wet spaces, such as near outside entrances or freezer cases, or floors subject to heavy loads, including hospital beds, heavy carts, pallet jacks, rolling chairs, etc.

CBC 5001 and ECOSpray U adhesives are suitable for indoor dry area applications.

- D. Adhesive - Acrylic: Solvent-free, low odor, acrylic based, high tack type adhesive acceptable to resilient sheet flooring manufacturer to suit flooring product and substrate conditions indicated. (indoor non-wet applications only)
 - 1. Manufacturer / Product: CBC 5001 High Performance Resilient Floor Adhesive
 - 2. Manufacturer / Product: CBC EcoSpray U Universal Acrylic Spray Adhesive
- E. Adhesive – Heavy Duty Epoxy: 2-part solvent-free, low odor, flooring epoxy adhesive recommended for all exterior and flooring installations over porous and non-porous substrates under heavy static loads, areas that are subject to top down water, freezer cases, and areas exposed to extremes of temperature.
 - 1. Manufacturer / Product: CBC 951 2-Part Epoxy Floor Covering Adhesive for Indoor and Outdoor Installations

RED NOTE: Use of Non-CBC adhesives with TAKIRON sheet vinyl products will void TAKIRON Warranty adhesion claims.

- F. Edge Sealing- Required for all exterior and wet area non-clamped sheet vinyl edges
 - 1. Manufacturer / Product: Henkel Terostat MS939 sealant for Indoor wet area and all Outdoor Installations
- G. Adhesive Equipment: “V” notched professional adhesive application trowel for interior applications.
 - 1. V-notch 1/16 x 1/16 x 1/16 inch (1.59mm x 1.59mm x 1.59mm).
- H. Seam Sealing:
 - 1. Heat Welding:
 - a. Welding Rod: 3.5mm diameter Takiron weld rod as recommended for the product(s) specified.
 - b. Color: As selected by Architect from manufacturer’s full range.

2. Cold Welding: TOLI Cold Weld seam sealer as recommended for the product(s) specified. (interior non-wet areas only)
- I. Floor Cleaning Systems: Clean as recommended by flooring manufacturer's [Maintenance Product Guide](#)

PART 3 - EXECUTION

3.1 FIELD CONDITIONS

- A. Conditions and Measurements: Visit jobsite to verify installation conditions and floor measurements.

NOTE: Coordinate and edit to the correct Section number below.

- B. Ambient Conditions per manufacturer's recommendations, SECTION 017000 or 017100 or 017116, and as follows:
 1. New concrete slabs shall be flat, clean and dry meeting each moisture test, passing manufacturer's written requirements.
 2. Acclimate product to installation location.
 - a. Deliver materials to jobsite room in which it will be installed 48 hours before installation.
 - b. Maintain Temperature: Minimum 65 deg F (18 deg C), and maximum 80 deg F (27 deg C) for forty-eight (48) hours prior to, during and after installation.
 - 1). Thereafter, maintain minimum temperature of 50 deg F (10 deg C).
 - c. Maintain Humidity: 20 to 65 percent forty-eight (48) hours prior to, during and after installation.
- C. Environmental Limitations: Do not deliver or install until building is enclosed, wet work is complete, and HVAC system is operating and consistently maintaining temperature and relative humidity at occupancy levels for a minimum two (2) weeks in accordance with manufacturer's recommendations.

RED NOTE: Use of portable heaters may cause failure.

3.2 EXAMINATION

NOTE: Coordinate and edit to the correct Section number below.

- A. Examination per SECTION 017000 or 017100 or 017116, and as follows:
 1. Acceptance of Conditions: Carefully examine installation areas with Installer/Applicator present, for compliance with requirements affecting Work performance.
 - a. Verify that field measurements, surfaces, substrates, structural support, tolerances, levelness, plumbness, temperature, humidity, moisture content level, cleanliness and other conditions are as required by the manufacturer, and ready to receive Work.
 - 1). Verify that substrate meets ASTM F710 requirements and is flat to within 3/16 inch in 10 ft (4.8mm per 3m) or the equivalent of 1/32 inch in 12 inches (0.8mm in 300mm).

2. Test substrates as required by manufacturer to verify proper conditions.

NOTE: Coordinate and edit requirements to the project substrates present.

a. Concrete Substrate:

- 1). Provide moisture testing to verify that concrete substrates are sound and dry. Perform both of the following tests:
 - a). Perform relative humidity (RH) test using in situ probes per ASTM F2170. Proceed with installation only after each substrate measures a maximum 80 percent RH for CBC 5001 adhesive and CBC 951 adhesive.
 - b). CBC 5001 & CBC 951 only: Perform anhydrous calcium chloride testing per ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 5 lbs of water/1000 sf (2.27 kg of water/92.9m²) in 24 hours.
- 2). Perform alkalinity testing to verify pH level is between 7.0 and 10.0 per ASTM F710 for CBC 5001 adhesive and CBC 951 Epoxy.
- 3). Perform bond testing per ASTM F710 to determine compatibility of adhesive to concrete substrate.
- 4). Wood Substrate: Shall be dry, clean, structurally sound, and flat to within 3/16 inch in 10 ft (4.8mm per 3m) or the equivalent of 1/32 inch in 12 inches (0.8mm in 300mm), well nailed and/or glued, free of voids and with joints that do not exceed 1/16 inch (1.6mm) per underlayment manufacturer's installation instructions.
- 4). Perform pin meter reading to verify maximum 14 percent moisture with all readings to be within 2 percent of each other.

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

3.3 PREPARATION

NOTE: Coordinate and edit to the correct Section numbers below.

A. Preparation per manufacturer's instructions, SECTION 017000 or 017100 or 017123, and as follows:

1. General: Prepare substrate(s) in accordance with manufacturer's instructions that includes, but is not limited to, the following:
 - a. Clean substrates.
 - 1). Do not use bond inhibiting commercial adhesive removers, flux cleaning agents or acid etching cleaners.
 - b. HVAC system shall be in full operation a minimum two (2) weeks prior to substrate testing.

NOTE: Delete item below if there are no building expansion joints.

- c. Expansion Control: Install building expansion joint covering system prior to installing resilient sheet flooring. Refer to SECTION 079513.

- 1). Do not install over expansion joints, structural joints, insulation joints and other moving joints.
 - 2). Expansion joints, isolation joints or other moving joints in concrete shall not be filled with patching compound nor covered with resilient flooring.
- d. Hazardous Materials: If existing asbestos or other hazardous containing materials are known or suspected, review and comply with all applicable regulations prior to and during removal.

NOTE: Select correct substrate(s), edit to suit project, and delete items that do not suit project.

2. Concrete Substrates:

- a. Prepare and perform testing per ASTM F710 on all existing and new concrete substrates to receive product.
 - 1). Mechanically remove top layer of exceptionally porous, soft or dusty concrete, and other non-bonding type surfaces.
 - a). Test pH level after scarification is complete.
 - b). Use non-chemical methods of removal, such as abrasive cleaning or bead blasting, on existing slabs at a minimum 48 hours prior to testing.

RED NOTE: Use of plaster or gypsum patch for flooring repair or leveling is NOT acceptable.

- 2). Prime and/or cover surface cracks, grooves, depressions, control joints or other non-moving joints, and other irregularities with a Portland-based cementitious underlayment-patching compound with a 3,000 psi (20.68 MPa) minimum compressive strength. Refer to SECTION 035416.

RED NOTE: Lightweight concrete of <115 pcf is unsuitable. Coordinate with Engineer to place a minimum 1 inch (25mm) topping of >140 pcf normal weight concrete, or an acceptable panel underlayment.

- 3). Concrete substrates shall pass each testing requirement prior to beginning resilient flooring installation.
 - b. Level stair surfaces with Portland based patching compound and remove all raised materials, such as nails, screws, and dowels.
3. Wood Substrates and Panel Type Underlayment. Prepare and install per PS1, PS2, APA Form L335, and manufacturer's installation instructions as follows:

GREEN NOTE: Specify use of exterior glues in lieu of interior urea-formaldehyde glue to reduce amount of indoor air pollutants.

- a. Wood substrate shall be double layer construction minimum 1 inch (25.4mm) total thickness with a minimum 18 inches (457mm) of well-ventilated airspace beneath.
 - 1). Crawl spaces shall be insulated and protected by a vapor barrier.
- b. The top layer of a wood substrate shall be completely free of knots or surface voids and specified as underlayment grade for resilient flooring.

NOTE: Edit below to wood substrate type and thickness used. Delete APA item above if not used.

- c. [Insert wood product or panel type selected]
- d. Thickness: [Insert product thickness]
- e. Underlayment shall be smooth, dry and clean being free of paint, varnish, wax, oils, solvents or other foreign matter, structurally sound, and meets flatness requirements, well nailed or screwed per manufacturer's installation instructions
 - 1). Ensure that each nail or screw head is set flush with or below surface.

4. Existing Substrates:

RED NOTE: Unacceptable surfaces include, but are not limited to, luan, plywood with knots, underlayment made of pine or other soft woods, particleboard, Masonite® or other hardboard underlayment, hardwood flooring, textured or cushioned flooring or other uneven or unstable substrates.

- a. Properly prepare manufacturer acceptable substrates to accept SVF flooring.
 - 1). Mechanically scrape down residue to a flat bare minimum.
- b. Substrate shall be smooth, dry, clean, and meets flatness requirements, well nailed and/or glued and free of voids.
- c. Ensure that each nail head is set flush with or below surface.
- d. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps, ridges and other irregularities to produce a uniform and smooth substrate.
 - 1). Verify that substrate meets flatness requirements.
 - 2). Comply with manufacturer's recommendations for compatible products.

RED NOTE: Do not fill expansion and isolation joints with patching compound or cover with resilient flooring. Use an expansion joint covering system.

- 5. Doorway Moldings: Remove existing base moldings and undercut each doorjamb. Cover jambs with appropriate molding.
- 6. Product Preparation: Handle products in accordance with manufacturer's instructions and warranty requirement including, but not limited to:
 - a. Strictly adhering to manufacturer's handling and installation safety requirements.
 - b. Refer to each product's MSDS for use of personal protective equipment.
- 7. Sweep and vacuum clean flooring substrates immediately prior to installation of sheet flooring.

3.4 INSTALLATION

NOTE: Coordinate and edit to the correct Section number below and to project requirements.

- A. Installation per manufacturer's current written [instructions](#), SECTION 017000 or 017300 or 017316, and the following:
 - 1. Storage on site:
 - a. Store sheet rolls standing up, capped end down.

- b. Do not lay rolls on side or flat.
 - c. Protect flooring and adhesives from temperature extremes.
2. Acclimation:
- a. Deliver all materials to the job site at least 48 hours before installation.
 - b. Acclimate materials and job site to stable environmental conditions between 65-80 degrees Fahrenheit.
3. Seaming considerations:
- a. Establish layout to use as few seams as possible.
 - b. Make short seams rather than long seams as appropriate.
 - c. Place seams in low traffic areas when possible.
 - d. Avoid cross seams and utilize only length seams as they blend better with sheet flooring material.
4. Layout: TAKIRON **Pathways** sheet flooring products have no pattern match requirements in width or length.
- a. Determine if architectural plans specify pattern matching as this will require additional materials and planning.
 - b. In large open installations, for a better visual appearance, it may be desirable to pattern match, checking diagonal tracking.
5. Trial Laying: Dry Lay flooring without adhesive.
- a. Make cuts from rolls in sequential order and do not reverse sheets.
 - b. Cuts can be rolled face-in if the material will be installed the next day (2 days maximum).
 - c. It may be beneficial to lay sheets flat on subfloor overnight to relax material.
 - d. Trim materials longer than needed to allow for shifting sheets to offset wood plank end joints by at least 6 inches.
6. Cutting and Trimming: With the first cut dry laid, trim resilient sheet flooring starting along starting wall.
- a. Cut the first sheet closely to the wall using a utility knife.
 - b. Trim all factory edges at least 1/4 inch to remove shipping damage or deformities.
 - c. Cut all seams net. Do not leave a gap and do not cut seams tight so that material peaks. Preferred seam trimming methods are to 'double cut' or 'recess scribe'.
7. Adhesive Application and Rolling: Evenly comb adhesive perpendicular to length of sheet using proper trowel for conditions
- a. Allow for proper "flash-off" time before placing the flooring into adhesive.
 - b. Only spread as much adhesive as can be reasonably covered with current environmental conditions and adhesive working and open time.
 - c. Remove uncured residual adhesive per recommendations.

d. Carefully roll flooring into adhesive, and avoid trapping air or allowing wrinkles or stresses in material.

- 1). Acrylic Adhesives: Immediately roll flooring into adhesive with a 3-section 100 lb. roller.
 - a). Roll across the width to remove air bubbles and then roll in the length.
 - b). Ensure adhesive transfer to the back of the flooring.

NOTE: Edit to use ACRYLIC adhesive verbiage above or EPOXY adhesive language below, deleting the one not chosen as appropriate.

- 2). Epoxy Adhesive: Roll entire floor three (3) times every 30 minutes with a 3-section 100 lb. roller immediately after placing resilient sheet flooring into the adhesive bed.
 - a). Begin rolling across the width parallel to the adhesive ridges. This helps to force out all air bubbles from under the floor.
 - b). Carefully identify curled edges, seams or slight bubbles after the first rolling and correct.
 - c). Carefully apply heat to the bubble, immediately hand roll, and then cool area with a damp cloth.
- 3). Use a high wattage light to highlight remaining bubbles. (Do not allow the light to rest on the material)

8. Seam Sealing: Heat welding is the strongest and preferred seam sealing method.

a. Heat welding: Wait 24 hours after installation.

- 1). Rout/groove using a 4.0 mm blade or hand groover to 2/3 the thickness of the material.
- 2). Center groove on the seam so that both sides are equally grooved.
- 3). Use a hot-air gun, thermally weld proper weld rod into the grooved seam. Takiron welding thread is 4 mm. Do not use heat welding tip larger than 4.0 mm.

b. Cold Welding: Same day as installation using TOLI Cold Weld.

9. Edge sealing: Apply Henkel Terostat MS939 sealant for Indoor wet area and all Outdoor Installations ramping to and 1/8" above the sheet vinyl on all non-clamped sheet vinyl edges.

10. Flash Cove: Apply cove stick where wall meets the floor and install cap molding on the wall where the flooring ends. Adhere sheet flooring flash cove to wall and hand roll.

a. Weld inside and outside cove corners.

RED NOTE: Do not wet mop until adhesive has properly set per adhesive manufacturer's written instructions.

3.5 FIELD QUALITY CONTROL

NOTE: Coordinate and edit to the correct Section number below.

A. Site Tests and Inspections: Per SECTION 014000 or 014500 or 014523, and as follows:

1. Inspect floor installation for non-conforming work including, but not limited to, the following:
 - a. Improper substrate preparation as indicated by:
 - 1). Buckling or telegraphing
 - 2). Air blisters, buckles, and dirt or debris under the sheet flooring
 - b. Lack of adequate adhesion
 - 1). Loose edges or seams
 - c. Adhesive on top of the flooring
 - d. Edge sealant application workmanship
 - e. Wide or too tight joints
 - f. Damaged sheet flooring as indicated by dents, splits, cuts, cracks, punctures, melting, or burn marks

B. Non-Conforming Work per General Conditions and as follows:

1. Remove, Repair and Reinstall or Restore in Place damaged items.
 - a. Finish touch-up damaged surface finishes.
2. Replace damaged materials or items with New if repair not acceptable to Architect.

3.6 CLEANING

NOTE: Coordinate and edit to the correct Section number below.

A. Waste Management per SECTION 017000 or 017400 or 017419, and as follows:

1. Coordinate take-back program with manufacturer, if applicable.
 - a. Store and return pallets, containers and cartons to manufacturer or recycler for reuse or recycling.

NOTE: Coordinate and edit to the correct Section number below.

B. Provide Progress Cleaning per SECTION 017000 or 017400 or 017413, and as follows:

1. Work Areas: Continuously clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - a. Clean and maintain completed construction until Substantial Completion.

NOTE: Coordinate and edit to the correct Section number below.

C. Provide Final Cleaning immediately prior to Substantial Completion inspection per SECTION 017000 or 017400 or 017423.

1. Protection: Remove installed protection immediately prior to Substantial Completion inspection.
 - a. Replace protection after inspection and remove just prior to Final Completion.

3.7 CLOSEOUT ACTIVITIES

NOTE: Coordinate and edit to the correct Section number below.

- A. Substantial Completion Requirements per SECTION 017000 or 017700 and as follows:
 - 1. Perform Closeout Procedures per SECTION 017000 or 017700.
 - 2. Perform Demonstration and Training with Owner's designated staff per SECTION 017000 or 017900.
 - 3. Sustainable Design Closeout Documentation per SECTION 017000, 017800 or 017853: LEED credit worksheet paperwork.

3.8 PROTECTION

- A. Protect materials from construction operations until date of Final Completion or Owner occupancy, whichever occurs first.
 - 1. Protect finished floor from abuse and damage by using heavy non-staining kraft paper, drop cloths or equivalent. Use additional non-damaging protective materials as needed.

NOTE: Insert Light Traffic and Heavy Traffic Guidelines per Adhesive Manufacturers Recommendations.

- B. Acrylic Adhesive Installation: Permit light foot traffic after 3-4 hours.
 - 1. To prevent permanent indentations while the adhesive cures, use plywood or other panels to protect the floor from heavy traffic, point or rolling loads for 48 hours.

NOTE: Edit to use ACRYLIC adhesive verbiage above or EPOXY adhesive language below, deleting the one not chosen.

- C. Epoxy Adhesive Installation: Keep foot traffic off the new floor for a minimum 12 hours.
 - 1. To prevent permanent indentations while the adhesive cures, use plywood or other panels to protect the floor from heavy traffic, point or rolling loads for 48 hours.
- D. Keep furniture, fixtures and rolling traffic off the new floor for 48 hours.

3.9 MAINTENANCE

- A. Initial Maintenance per flooring manufacturer's written instructions and as follows:
 - 1. Begin initial maintenance only after the adhered sheet flooring has been properly cured and bonded to the subfloor.
 - 2. When floor adhesive is fully cured, sweep and lightly damp mop with well wrung mop.
 - 3. Wait 72 hours before wet cleaning.

NOTE: Contact manufacturer if area is high use and requires additional coatings

END OF SECTION

RED NOTE: Be sure to obtain the latest version of this Guide Specification.

This Guide Specification is not a completed document ready for use. It must be edited, deleting, adding, or modifying text, as required to suit project requirements.

The professional stamping and the contracting parties of the Contract Documents are responsible for the accuracy of issued project specifications, including any use of this TOLI sheet flooring Guide Specification.

TAKIRON AND CBC AMERICA LLC SHALL NOT BE LIABLE FOR DAMAGES ARISING OUT OF THE USE OF THIS GUIDE SPECIFICATION.