CSI Master Format® for PVC-Free Sheet Flooring Division 9 section 096516.43. Refer to Construction Specification Institute (CSI)’s Master Format® for other section numbers and titles, including 09 60 00 Flooring: 09 65 00 Resilient Flooring.

This specification is for PVC-Free sheet flooring, marketed under the PURLINE brand name, as manufactured by Windmoeller.

**DIVISION 09 - FINISHES**

**SECTION 09 65 16.43**

**PVC FREE SHEET FLOORING**

**PART 1-GENERAL**

**1.1 GENERL PROVISIONS**

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections – General Requirements which are hereby made a part of this Section of this the specification.

**1.2 SUMMARY OF WORK**

1. This section includes the following PVC-Free Sheet Flooring: PURLINE Bio-based Polyurethane Sheet Flooring

*Note: Revise paragraph below to suit project requirements.  Add section numbers and titles per CSI Master Format®*

1. Sections related to this section include:
2. Concrete: Refer to Division 3 Concrete Sections for cast-in-place concrete, concrete toppings, and cementitious underlayments.
3. Wood Subflooring: Refer to Division 6 Carpentry Section for wood subflooring and wood underlayment.
4. Finishes: Refer to Division 9 Finishes Section for maintenance of flooring.
5. Resilient Flooring Accessories: Refer to Division 9 Finishes Sections for resilient wall bases, reducer strips, metal edge strips and other resilient flooring accessories.
6. Expansion Joint Covers: Refer to Division 10 Specialties Section for expansion joint covers to be used with resilient flooring.

*Note: The article below may be omitted when specifying manufacturer's proprietary products and recommended installation. This article does not require compliance with standard but is merely a listing of references used.  The article below should list only those industry standards referenced in this section.*

**1.3 REFERENCES AND INDUSTRY STANDARDS**

1. PURLINE Technical Data Sheet
2. PURLINE Installation Guide
3. PURLINE Cleaning Guide
4. Safety Data Sheets (MSDS or SDS)
5. American Society for Testing and Materials (ASTM):
6. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials
7. ASTM E 492 – Standard Test Method for Laboratory Measurement of lmpact Sound Transmission through Floor-Ceiling Assemblies Using the Tapping Machine
8. ASTM E 648 – Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
9. ASTM E 662 – Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
10. ASTM E 989 – Standard Classification for Determination of lmpact lnsulation Class (llC)
11. ASTM E 1745 – Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
12. ASTM F 141 – Standard Terminology Relating to Resilient Floor Coverings
13. ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
14. ASTM F 1482 – Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
15. ASTM F 1861 – Standard Specification for Resilient Wall Base
16. ASTM F 1869 – Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
17. ASTM F 2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
18. ASTM F 2419 – Standard Practice for Installation of Thick Poured Gypsum Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring
19. ASTM F 2471 – Standard Practice for Installation of Thick Poured Lightweight Cellular Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring
20. ASTM F 2659 – Standard Guide for Preliminary Evaluation of Comparative Moisture Condition of Concrete, Gypsum Cement and other Floor Slabs and Screeds Using a Non- Destructive Electronic Moisture Meter
21. ASTM F 2678 – Standard Practice for Preparing Panel Underlayments, Thick Poured Gypsum Concrete Underlayments, Thick Poured Lightweight Cellular Concrete Underlayments, and Concrete Subfloors with Underlayment Patching Compounds to Receive Resilient Flooring
22. ASTM F 3191 – Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrates to Receive Resilient Flooring
23. ASTM F 3403 - Heterogeneous Polyurethane Sheet Flooring
24. National Fire Protection Association (NFPA):
25. NFPA 253 – Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
26. NFPA 258 – Test Method for Specific Optical Density of Smoke Generated by Solid Materials
27. Standards Council of Canada:
28. CAN/ULC S102 – Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

**1.4 SUBMITTTTALS**

1. General: Submit each item in this Article according to the "Conditions of the Contract" and Division 1 Specification Sections.
2. Product Data: Submit three (3) copies of the manufacturer’s technical data, installation, and cleaning recommendations for each type of flooring.
3. Shop Drawings:
4. Submit shop drawings showing layout, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
5. Show details of profiles and product components, including anchorage, accessories, finish colors, patterns, and textures.
6. Samples: Submit three (3) sets of representative samples of each type, color and finish of flooring product specified, with an indication of full range of color, pattern, and texture variation for verification.  Provide samples with a minimum size of 6” x 9” for the flooring product.
7. Quality Assurance Submittals:
8. Submit three (3) copies of the manufacturer’s Product Data Sheet, specifying performance characteristics, criteria, and physical requirements.
9. Closeout Submittals:
10. Submit three (3) copies of the maintenance and operations data.  This should include methods for maintaining the installed products and any precautions against cleaning materials or methods that are detrimental to the product and their performance.
11. Submit three (3) copies of the warranty as specified herein.
12. Installer Certification: Submit proof from the manufacturer that the installers comply with the specified requirements.
13. Replacement Material: After completion of work, deliver to project site replacement materials from the same manufactured lot as materials installed.  Package materials with protective covering and identify each with descriptive labels.
14. Flooring Materials: No less than 50 square feet of each type, pattern and color installed.

*Note: The following section is not necessary but has been added to the specification for projects going for LEED certification or if the specifier has special sustainability/environmental requirements.*

1. Sustainability Submittals:
2. Product Data for Credit MR 2.1 and Credit MR 2.2: Construction Waste Management as required by Division 01.  (LEED 2009)
3. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content.  (LEED 2009, LEED v4/v4.1)
4. Include statement indicating costs for each product having recycled content.
5. Product Data for Credit MR 6: For products having Rapidly Renewable content, documentation indicating percentages by weight of Rapidly Renewable content as required by Division 01.
6. Include statement indicating costs for each product having Rapidly Renewable content.  (LEED 2009)
7. Product Data for Credit EQ 4.1: Low–Emitting Materials – Adhesives and Sealants, including printed statement of VOC content as required by Division 01.  (LEED 2009)
8. Product Data for Indoor Environmental Quality Credit Low-Emitting Materials – Flooring products must be tested and determined compliant in accordance with California Department of Public Health (CDPH) Standard Method v1.2, using the applicable exposure scenario.  The default scenario is the private office scenario. If a product specified has not been tested as noted, provide a substitution to the Architect for review and approval of an equal product meeting the noted California Department of Health standard.  (LEED 2009, LEED v4/v4.1)
9. Building Product Disclosure and Optimization – Environmental Product Declarations; Products must meet one of the disclosure criteria: (LEED v4/v4.1)
10. Product-specific Type III EPD (Environmental Product Declaration) – Products with third-party certification (Type III)
11. Industry-wide (generic) EPD – Products with third-party certification (Type III)
12. Product-specific declaration – Products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044)
13. Building Product Disclosure and Optimization – Sourcing of Raw Materials; Option 2 – Leadership Extraction Practices, products containing one or more of the following attributes: (LEED v4/v4.1)
14. Bio-based products meeting Sustainable Agriculture Standard
15. Wood products certified to FSC/SFI standards (See further explanation, Calculating FSC/SFI Credit Contributions)
16. Reused materials
17. Post-consumer recycled materials
18. Pre-consumer recycled materials
19. Extended producer responsibility
20. Building Product Disclosure and Optimization – Material Ingredients; Option 1 – Material Ingredient Reporting Health, products using any of the following programs: (LEED v4/v4.1)
21. Product Declaration (HPD) Health Product Declaration
22. Declare Label
23. Cradle to Cradle v2 Basic level
24. Cradle to Cradle v3 Bronze level
25. Emissions and Content Requirements General Emissions Evaluation:  Building products must be tested and determined compliant in accordance with California Department of Public Health (CDPH) Standard Method v1.2, using the applicable exposure scenario – flooring.  (LEED v4)
26. Additional VOC Content Requirements for Wet-Applied Products: All adhesives and sealants wet-applied on site must meet the applicable chemical content requirements of SCAQMD Rule 1168 – July 1, 2005.  (LEED v4)]

*Note: The article below should include prerequisites, standards, limitations, and criteria which establish an overall level of quality for products and workmanship for this section. Coordinate the article below with Division 1 Quality Assurance Section.*

**1.5 QUALITY ASSURANCE**

1. Manufacturer Qualifications: Manufacturer must be capable of providing technical field service representation. Whenever possible, provide each type of flooring as provided by a single manufacturer, including recommended primers, adhesives, sealants, patching and leveling compounds.
2. Pre-Installation Meetings: Conduct pre-installation meetings to verify project requirements, substrate conditions, manufacturer's installation and floor care recommendations and manufacturer's warranty requirements.  Comply with requirements according to the “Project Management and Coordination” in Division 1 Project Meetings Section.
3. Pre-Installation Testing: Conduct and document pre-installation testing as specified by manufacturer in accordance with the latest version of the specified test methods.
4. pH testing: ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
5. In-situ Relative Humidity Testing: ASTM F 2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
6. Calcium Chloride Testing: ASTM F 1869 – Standard Test Method for Measuring Moisture Vapor Emissions Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
7. Bond Testing: Conduct testing and document results in accordance with the manufacturer’s recommendations.
8. Flooring Contractor Qualifications:
9. The awarded flooring contractor shall be an established firm, experienced in the installation of the specified product and shall have access to all manufacturer’s required specifications, technical, installation and maintenance related documents.
10. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work like that required for this project and having sufficient professional liability insurance coverage (aka Errors and Omissions Insurance) for the project.
11. If a certified or approved installer is required, then proof of valid certification or approval must be submitted to the General Contractor and verified by Windmoeller prior to the start of the project.

*Note: For commercial projects it is always encouraged for quality purposes to require an installation mock-up. Mock-ups, when accepted or approved, establish standards by which work will be judged.  Coordinate below with Division 1 Quality Control (Mock-Up Requirements) Section.*

1. Standard of Quality Mock-Up: For the purpose of evaluating the quality of workmanship, install a mock-up of the specified flooring completed by the pre-qualified installers following the manufacturer’s installation recommendations.  Obtain Owner's and Architect's acceptance of finish color, texture and pattern, and workmanship standard.  Comply with requirements according to the “Quality Control” in Division 1 Mock-Up Requirements Section.
2. Size and Location of Mock-Up: [Specify the size and location of the mock-up.]
3. Maintenance of Mock-Up: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up if no longer required.
4. Approval of Mock-Up: Upon approval of the mock-up, this installation shall be considered the standard of quality and basis of comparison for the balance of the project.  Areas to be found deficient by specification standards or application procedures shall be repaired or replaced at the contractor’s expense.
5. Incorporation of Mock-Up: The mock-up may be incorporated into final construction upon Owner's approval.
6. Post-Installation Meetings: Conduct post-installation meetings to review methods and procedures related to cleaning and maintenance, and warranty requirements.

**1.6 DELIVERY, STORAGE, AND HANDLING**

1. General: Comply with the Division 1 Product Requirements Sections.
2. Ordering: Comply with the manufacturer's ordering instructions and lead time requirements to avoid construction delays.
3. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
4. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.
5. All flooring materials should be stored in areas that are fully enclosed and weathertight. The permanent HVAC should be fully operational and controlled and set at a minimum temperature 65° F (18° C).  If this is not possible, the areas should be acclimated and controlled by means of temporary HVAC to the service level conditions expected during occupancy.
6. Store cartons stacked per the manufacturer’s recommendations.
7. Comply with the manufacturer’s recommendation for the acclimation of all materials in the space where they will be installed for at least 48 hours prior to the installation unless longer conditioning periods are required by the manufacturer. See manufacture guidelines for storage and handling.

**1.7 PROJECT CONDITIONS**

1. Environmental Requirements/Conditions:
2. Areas to receive material should be clean, fully enclosed and weather tight. The permanent HVAC should be fully operational and controlled and set at a minimum temperature 65° F (18° C) and maximum 80o F (27o C).  If this is not possible, the areas should be acclimated and controlled by means of temporary HVAC to the service level conditions expected during occupancy.  The ambient relative humidity should range from a minimum of 35% to a maximum of 65%.  These conditions MUST be established at 72 hours prior to beginning the installation, maintained during the installation, and continued for at least 72 hours following the installation.
3. The flooring material should be conditioned in the same manner for at least 48 hours prior to the installation.
4. Substrate evaluation and preparation should not begin until a stable, conditioned environment has been established as described in this section.
5. Areas to receive flooring must have adequate lighting to allow for proper inspection and preparation of the substrate, installation of the flooring and final inspection.
6. Substrate Conditions:
7. Existing Conditions: [*Specify existing conditions affecting product use and installation*.]
8. Concrete Curing: Do not install flooring over concrete substrates until substrates have cured and are dry to bond with adhesive as determined by the concrete and flooring manufacturer's recommendations.
9. [*Owner and GC responsibility*]
10. [*Flooring Contractor assigned to report responsibility back to Owner and/or Architect*.]
11. Testing Results: Conduct and document pre-installation testing as specified by manufacturer in accordance with the latest version of the specified test methods.
12. pH testing: ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
13. In-situ Relative Humidity Testing: ASTM F 2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
14. Calcium Chloride Testing: ASTM F 1869 – Standard Test Method for Measuring Moisture Vapor Emissions Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
15. Bond Testing: Conduct testing and document results in accordance with the manufacturer’s recommendations.
16. Close spaces to traffic during flooring installation and for the period after installation recommended in writing by the manufacturer.
17. Installation should not begin until the work of other trades has been completed, especially overhead trades.
18. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings.  Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

**1.8 WARRANTY**

1. Project Warranty: Comply with requirements according to the "Conditions of the Contract" in Division 1 Closeout Submittals Warranty Section for project warranty provisions.
2. Manufacturer's Limited Warranty:  Submit the manufacturer's standard warranty document executed by authorized company official for Owner's acceptance.  Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
3. Warranty Period: Fifteen (15) year limited warranty commencing on Date of Original Purchase from manufacturer.
4. Installation Warranty: Submit the flooring contractor’s installation warranty signed by the General Contractor and Installer for Owner’s Acceptance, agreeing to repair or replace work which has failed because of defects in workmanship.  Failures shall include, but are not limited to, tearing, cracking, separation, deterioration or loosening from substrate, seam failure, ripples, bubbling or puckering.  Upon notification of such installation deficiencies, within the warranty period, make necessary repairs or replacement at the convenience of the Owner.  Other guaranties or warranties may not be substituted by the Contractor for the terms of this warranty.  Installation warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents

**PART 2 – PRODUCTS**

*Note: Information below can be used for proprietary specification. Product attributes performance characteristics, material standards, and descriptions as applicable.  Using "Equal" or "Approved Equal," or similar phrases may cause ambiguity in the specification.  Such terms would require verification (procedural, legal, and regulatory) and assignment of responsibility for determining "Equal" products.*

**2.1 HETEROGENEOUS POLYURETHANE SHEET FLOORING – WINDMOELLER INC.**

1. Manufacturer Address:

NA Headquarters

1395 South Marietta Parkway

Building 200, Suite 208

Marietta, GA 30067

Phone: 1-678-381-1001

[www.windmoellerinc.com](http://www.windmoellerinc.com/)

Representative Contact [Specify representative name and contact information]

1. Proprietary Product Information:
2. Material Name: PURLINE 1500 series Flooring [Roll]
3. Description: Heterogeneous commercial-rated floor covering constructed of the ArmorOx® Pro+, *ecuran* bio-based polyurethane, and FleeceTECTM backing
4. Size: 2 m x 20 m (78.74” x 65.62 lin ft) 430.56 sq ft per roll
5. Gauge: 2.5mm (0.0984 inches)
6. Color and Pattern: Colors and patterns shall be selected by Specifier/A&D. All selections shall be made from the manufacturer’s full product line. See Architectural drawings for color schedule list in reference to this material.
7. Adhesive: Manufacturer’s recommended adhesive Purfix UltraTech Adhesive

*Note: Use this article to suit project requirements. If substitutions are permitted, edit text below.  Add text to refer to Division 1 Project Requirements (Product Substitutions Procedures) Section.*

**2.2 PRODUCT SUBSTITUTIONS**

1. Substitutions:  No substitutions permitted

*Note: Add article below for alternates required for project; state work covered. Coordinate with Part 1 General Summary Article herein, applicable Division 1 Sections, and other Bid and Contract Documents.*

**2.3 RELATED MATERIALS**

1. Related Materials: Refer to other sections for related materials as follows.
2. Concrete: Refer to Division 3 Concrete Sections for cast in place concrete, concrete toppings, and cementitious underlayments.
3. Wood Subflooring: Refer to Division 6 Carpentry Section for wood subflooring and wood underlayment.
4. Finishes: Refer to Division 9 Finishes Section for maintenance of flooring.
5. Resilient Flooring Accessories: Refer to Division 9 Finishes Sections for resilient wall bases, reducer strips, metal edge strips and other resilient flooring accessories.
6. Expansion Joint Covers: Refer to Division 10 Specialties Section for expansion joint covers to be used with resilient flooring.

**2.4 SOURCE QUALITY**

1. Source Quality: Obtain flooring product materials from a single manufacturer.

**PART 3- EXECUTION**

* 1. **MANUFACTURERS RECOMMEDATIONS / GENERAL CONTRACTOR RESPONCIBILITIES**

1. Compliance: Comply with manufacturer's product technical data, including product technical bulletins, installation recommendations and floor care recommendations.

* 1. **INSPECTION**

1. Site Verification of Conditions:  The Flooring Contractor and Installer shall examine and verify conditions previously described in other sections under which flooring, and accessories are to be installed to be in accordance with the manufacturer’s installation recommendations and must notify the General Contractor in writing of conditions detrimental to proper and timely completion of work. Work shall not proceed until all unsatisfactory conditions are corrected to acceptable conditions to the Owner and Architect.
2. Material Inspection: Visually inspect all materials prior to installation in accordance with the manufacturer’s installation recommendations.  Material with visual defects shall not be installed and shall not be considered as a legitimate claim if they are installed.

* 1. **PREPARATION**

1. General: Comply with manufacturer’s written installation recommendations for preparing substrates indicated to receive flooring products.
2. Below Grade Installations: On and below grade concrete subfloors require a confirmed effective vapor retarder with a low permeance (≤ 0.1) having a minimum thickness of 10 mils or meeting the requirements of ASTM E1745 — Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs. Confirm it was placed directly underneath the concrete, above the granular fill. If this is not possible, use a topically applied moisture mitigation system that conforms to ASTM F3010 – Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings. It must be applied following the manufacturer’s written instructions. Chemical adhesive removers must not be used.
3. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.
4. Surface Preparation:
5. General: Prepare substrate in accordance with manufacturer's recommendations and ASTM industry standards.  Work shall not proceed until all unsatisfactory conditions are corrected to acceptable conditions to the Owner and Architect.
6. Substrate: Substrates to receive flooring must be structurally sound, rigid, smooth, flat, clean, and permanently dry. The substrates must be free of all foreign materials including, but not limited to, dust, solvent, paint, wax, oils, grease, residual adhesive, adhesive removers, film-forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds, alkaline salts, excessive carbonation or laitance, mold, mildew, and other foreign materials that might affect the rate of moisture dissipation from the concrete, the adhesion of flooring to the concrete or cause a discoloration of the flooring from below.
7. Concrete Substrate: Concrete substrates shall be cured per the concrete manufacturer’s recommendations. They must have a minimum compressive strength of 3,000 psi and a minimum dry density of 150 pounds per cubic foot.  Refer to Division 3 Concrete Sections for patching, repairing crack materials and leveling compounds with Portland cement-based compounds.
8. Refer to Division 3 Concrete Sections for cast in place concrete, concrete toppings, and cementitious underlayments.
9. Reference Standard: Comply with the latest version of ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
10. Wood Substrates: Wood substrates must be double construction with a minimum total thickness of 1 inch.  Wood substrates must be rigid, free from movement and have at least 18" of well-ventilated air space below.  wineo products should not be installed over wooden subfloors built on sleepers over on or below grade concrete floors without first making sure that adequate precautions have been taken to ensure the structural integrity of the system, and to prevent moisture migration from the concrete slab.
11. Refer to Division 6 Carpentry Section for wood substrates and wood underlayment.
12. Reference Standard: Comply with the latest version of ASTM F 1482 – Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring.
13. Substrate Testing:  In order to ensure that the moisture condition of concrete substrates is within acceptable limits, it is essential that moisture testing be conducted and documented on ALL concrete substrates regardless of age or grade level, including those where resilient flooring has already been installed.  Moisture testing should only be conducted once a stable, conditioned environment has been established in accordance with the latest version of the specified test methods. All other testing types shall be conducted on all substrate types. A diagram of the area showing the location and results of each test should be submitted to the Architect, General Contractor, or End User.  If at the time of testing the test results exceed the limitations set forth by the flooring manufacturer, the installation must not proceed until the problem has been corrected.  The Contractor responsible for the substrate shall be responsible for the costs associated with analysis of the substrate and subsequent remediation requirements.
14. In-situ Relative Humidity Testing: ASTM F 2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
15. The concrete internal relative humidity must not exceed 95% when using wineo Purfix UltraTech Adhesive.
16. Conduct three (3) tests for the first 1,000 square feet (100 square meters) and at least one additional test for each additional 1,000 square feet (100 square meters).
17. Calcium Chloride Testing: ASTM F 1869 – Standard Test Method for Measuring Moisture Vapor Emissions Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
18. [The concrete moisture vapor emissions rate must not exceed 12 lbs per 1,000 sq ft in 24 hours when using Purfix UltraTech Adhesive.]
19. Conduct three (3) tests for the first 1,000 square feet (100 square meters) and at least one additional test for each additional 1,000 square feet (100 square meters).
20. pH testing: ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
21. The concrete surface pH should not exceed pH 12 using Purfix UltraTech Adhesive]
22. Conduct testing at each In-situ RH test location.
23. Bond Testing
24. Conduct testing in accordance with the manufacturer’s recommendations in various locations throughout the area where flooring is to be installed.  Although the number of tests required may vary, enough tests should be performed to allow an evaluation of the entire area where material will be installed.
25. When evaluating adhesive mat bond tests using Purfix UltraTech Adhesive a significant force should be required to remove the test sample. The bond failure should occur within the adhesive layer when the test sample is removed.  There should be approximately the same amount of adhesive on the substrate and the material backing.

* 1. **INSTALLATION**

1. Carefully clean the surface of all debris and contamination and confirm the subfloor is properly prepared and complies with installation and adhesive requirements before proceeding. Follow all preparation details (previously covered in this document) and the detailed layout drawings provided or agreed upon by the specifier. Use either a utility knife and/or hook blade knife to make cuts. Calculate and mark out your start lines using a string line, straight edge, and pencil. (White chalk lines may be used if all loose powdered chalk is removed by vacuum before applying adhesive). Any loose dust, debris, etc. left on the subfloor during layout marking will act as a contaminant and may cause bond failure. Cuts should be laid in the same direction. The factory edges must always be trimmed a minimum of ½” before installing. Dry-lay (without adhesive) the flooring lengthwise in the correct positions (alternating direction, if necessary) following your start lines while lapping up the wall at each end and overlapping the seams by at least 1” (2.5 cm). For non-wood visuals, cut the drop 2-3 inches longer than needed for finished final cuts. Cut the drop for wood visuals 4-6 inches longer than needed to allow for offset of the wood plank design. All ‘non-wood visual’ sheet installations must be installed in alternating roll directions. Pattern matching is not required for PURLINE; however, wood designs must be installed with rolls running in the same direction, and they must be lined up properly. Install all rolls in increasing roll number sequence. When cutting the seam for wood grain styles, make sure that the cut runs directly next to the wood joint and that the wood joint remains on the other side. If the flooring is to be heat welded, the seam cut should run directly in the wood joint. For all final or finish cuts, first partially cut through the flooring using a straight utility knife, then finish the cut using a hook blade. It is recommended to scribe or cut in the sides to a snug fit. Fold back the sheets to the center of the room. If necessary, use a white chalk line for a straight adhesive line. Be sure you remove any dust. Apply adhesive evenly and lane by lane according to installation instructions. Push the sheets into the wet adhesive approximately 4 inches (10 cm) to avoid possible adhesive marks. Allow the adhesive to flash off according to the manufacturer's instructions, considering the room climate conditions. Now place the covering in the adhesive. To achieve an optimum installation result, the covering must be carefully rubbed from the center to the sides immediately after it has been placed in the adhesive. Cut the seam directly after laying and rubbing the covering with a suitable seam cutter or using an under scribe and knives   resulting in a snug fit. Press the sheets together and roll with a hand roller for proper adhesive transfer. Do not cut a tight seam or it could result in peaking seams and possible seam failure. Roll the installed material with a 100-150 lb. 3 section roller first through the width and then the length. Use a hand roller along the walls and around door frames. Pull back the material at the edge and check to make sure proper adhesive transfer has been made. Repeat the process on the opposite side. Rolling multiple times during the installation and at the end of installation is recommended.
2. Adhesive Application:
   * 1. Use trowel recommended by flooring manufacturer for Purfix UltraTech Adhesive- 1/16” x 1/16” x 1/16” Flat V-notched trowel,
     2. Spread rate for Purfix UltraTech is approximately 125-145 ft2/gallon
3. Additional Installation Recommendations
4. Scribe, cut, fit flooring to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture, including pipes, outlets, edgings, thresholds, nosings, and cabinets.
5. Do not install resilient flooring over expansion joints.  Use expansion joint covers manufactured for use with resilient flooring.  Refer to other specification sections for expansion joint covers.
6. Adhere resilient flooring to substrate without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in completed installation.
7. Use Purfix UltraTech applied to the substrate in compliance with the flooring manufacturer’s recommendations, including those for proper spreading of the adhesive, adhesive missing and adhesive open and working times.
8. Finished Flooring Patterns [details as selected by specifier/ A&D]
9. **PROTECTION**

1. Protection: Do not allow normal foot traffic for 24 hours and rolling loads for at least 72 hours following the installation. Protect installed product and finish surfaces from damage during construction with protective covering.

1. **CLEANING**

*Note: Coordinate with Division 1 Execution Requirements (Cleaning) Section*

1. Initial Maintenance: To allow the adhesive to dry and cure properly, wait a minimum of 72 hours following the installation before conducting initial cleaning procedures. During this period only sweeping, dry mopping or vacuuming with a non-beater bar vacuum is recommended. Wet mopping can be done after 1 week.
2. Procedure:
3. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's recommendations prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.
4. Remove visible adhesive and other surface blemishes using cleaning methods recommended by floor manufacturer.
5. Remove all surface soil, debris, sand, and grit by dust mopping, sweeping the floor or vacuuming with a non-beater bar vacuum.
6. Use a neutral pH cleaning solution according to the label directions and apply the solution to the floor as recommended by the manufacturer. Do not flood the floor.
7. Clean the floor with an auto scrubbing or swing type low speed (175rmp) wet buffer using a 3M™ Red Buffer Pad #5100 or equivalent.
8. Remove the scrubbing solution with a wet vacuum or an automatic scrubber.
9. Rinse the entire floor surface with a clean mop using clean, cool water.
10. Allow the floor to dry thoroughly before allowing traffic.

1. **SCHEDULES AND (PRODUCT CRITERIA) FORMS**

*Note: This article may be used to describe specific criteria requirements.*

1. Schedules: [Specify reference to applicable schedules.]

**END OF SECTION 09 65 16.43**