**Altro Stronghold 30**

**Commercial Safety Sheet Vinyl Flooring**

**SECTION 09 65 16.23**

**RESILIENT VINYL SHEET FLOORING**

**(Commercial Slip Resistant Resilient Sheet Vinyl Flooring)**

Altro slip-resistant safety flooring is a modern solution, meeting the highest standards of safety and hygiene: Slip-resistant, even when wet, throughout lifetime of floor, impervious surface, grout-free; coves to wall to prevent dirt accumulation around the perimeter; incorporates Altro Easyclean Technology for improved cleanability. Typical applications include commercial kitchens, walk-in coolers and freezers, bar areas, food prep areas, cafeterias, storage closets and back of house areas. For more information, please call our toll-free number 800-377-5597 or visit our website, www.altro.com.

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. Work Included: Provide labor, materials and equipment necessary to complete the installation of safety resilient sheet vinyl flooring and accessories, including but not limited to the following:

Coordination of start date and timeframe.

Coordination of substrate preparation.

Coordination of moisture and pH testing.

Coordination with moisture mitigation if required.

Coordination of proper plumbing fixtures for connections with flooring.

Floor installation and heat welding of all seams, horizontal and vertical.

1. Conform with the requirements of all Sections of Division 1, General Requirements, as it applies to the work of this Section.
	* + - 1. Related Sections:

Section 01.45.00 Testing and Inspection Services

Section 02.41.00 Selective Demolition

Section 03.00.00 Concrete

Section 06.16.00 Rough Carpentry: Underlayment

Section 07.26.00 Vapor Retarders

Section 15.40.00 Plumbing Fixtures and Equipment

* + - * 1. References

ASTM D2047 Standard Test Method for Static Coefficient of Friction

ASTM E648 Standard Test Method of Critical Radiant Flux

ASTM E662 Standard Test Method of Specific Optical Density of Smoke

ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring

ASTM F970 Standard Test Method of Static Load Limit

ASTM F1482 Standard Guide of Wood Underlayment Products Available

ASTM F1303 Standard Specification for Sheet Vinyl Floor Covering with Backing

ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In Situ Probes.

ASTM F 3010 Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings

DIN 51130 Slip Resistance Test

ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials)

RFCI Recommended Work Practices for Removal of Resilient Floor Covering

* + - 1. SUBMITTALS
				1. Product Data: Submit manufacturer’s current printed product literature, specifications, and installation instructions, including the Altro Wet Area Installation Practices Guide and the Altro Kitchen Detailing Guide.
				2. Shop Drawings: Submit shop drawings indicating materials, details, and accessories including but limited to the following:

Floor plans indicating seam locations and roll direction.

Floor plans including notations at each drainage protrusion (drains, cleanouts, grease traps, and similar items) as to the method of connection.

Wall caps and transition to adjacent materials.

* + - * 1. LEED Submittals: For projects seeking USGBC LEED certification, submit manufacturer’s data for recycled content, adhesives, and FloorScore compliance; include printed statement of VOC content and chemical components.
				2. Samples for Verification: Submit manufacturer’s standard-size samples for each product and color specified including connection to drainage.
				3. Operations and Maintenance Data: Submit manufacturer’s operation and maintenance data for each installed product.
				4. Warranty: Submit executed copy of manufacturer’s standard limited warranty.
				5. Field Quality Control Reports: Submit reports indicating results of moisture testing, substrate preparation procedures and installation methods employed.
				6. Extra Stock Materials: Provide 2 percent extra materials and store where directed, properly packaged and labeled.
			1. QUALITY ASSURANCE
				1. Manufacturer: To the greatest extent practical, provide each type of resilient flooring and accessories by a single manufacturer, including recommended primers, adhesives, sealants, finish accessories, and leveling compounds.
				2. Installer Qualifications: Installer experience in performing work of this section who has specialized in installation of work similar to that required for this project.

Training: Installers who have attended an Altro Installation Clinic or have successfully installed Altro in three previous kitchens.

Awarded flooring contractor must use in-house installers.

Awarded flooring contractor must be able to provide recent Altro references with contacts.

* + - * 1. Regulatory Requirements: Provide slip resistant sheet vinyl safety flooring in compliance with the following:

Americans with Disabilities Act Architectural Guidelines (ADAAG)

Occupational Safety and Health Administration (OSHA).

* + - * 1. Mock-Ups: Install at project site a job mock-up using acceptable products and manufacturer approved installation methods, including concrete substrate testing.

Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.

Incorporation: Mock-up may be included into final construction upon Owner’s approval.

* + - * 1. Pre-Installation Meeting: Convene a pre-installation meeting to verify project requirements, substrate conditions, manufacturer’s installation instructions, manufacturer’s warranty requirements, and installer qualifications.
				2. Bond Test: Install multiple bond tests using a 3’x3’ pieces of material adhered with the appropriate adhesive to verify quality of adhesion. Remove half of each piece after 24 hours, then the other half after 48 hours. To help assess resistance to indentation, place end user equipment onto a sample for 72 hours. Document all results.
			1. DELIVERY, STORAGE, AND HANDLING
				1. Store rolls of sheet goods in a secured upright position. Store materials in dry spaces protected from the weather, with ambient temperatures not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).
			2. PROJECT CONDITIONS
				1. Comply with manufacturer’s requirements for project conditions including the following:

Maintain ambient temperatures of 68 deg F (18 deg C) and 80 deg F (26 deg C) in spaces to receive resilient products for 72 hours before installation, during installation and 24 hours after installation.

Maintain the ambient relative humidity between 40 percent and 60 percent during installation.

Allow sufficient time for proper preparation, installation and cuing.

Close spaces to traffic during resilient flooring installation until the installer is satisfied the adhesive has set.

Verify permanent HVAC is operational. If temporary heat is required, use electric or indirect heat sources. Do not use kerosene or propane in direct contact with the ambient air.

Verify other finishing operations, including painting, have been completed.

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

Coordinate with plumbing subcontractor that approved surface membrane clamping drainage connections will be used, including but not limited to, surface clamping round drains, surface clamping trench drains, surface clamping floor sinks, surface clamping grease traps, or use of Altro Gulley Angle/Edge, or employment of Altro’s Modified Surface Clamping Drain System.

Conform to all pertinent ASTM, ACI and Altro Standards listed in, but not limited to, this specification

* + - 1. WARRANTY
				1. Warranty: Provide manufacturer’s standard limited warranty.
1. PRODUCTS
	* + 1. MANUFACTURER
				1. Basis-of-Design Manufacturer: Altro USA, Inc., 80 Industrial Way, Wilmington, MA 01887. Toll-free 800-377-5597. Fax: 610-746-4325. www.altrofloors.com. No substitutions.
			2. SLIP-RESISTANT RESILIENT SHEET FLOORING
				1. Slip-Resistant Resilient Sheet Flooring: Altro Stronghold 30 by Altro USA, Inc. complying with the following:

Wear Layer/Overall Thickness: 3.0 mm (0.12 inches), with non-directional pattern and slip retardant particulate suspended evenly throughout the product thickness.

Roll/Sheet Width & Length: 6 feet 7 inches (2 m) x 66 feet

Backing: non-woven polyester/cellulose, glass fiber reinforcement.

Slip Resistance: ADA compliant, ASTM D 2047 James Machine, SCoF Dry .92 / Wet 0.88 DIN 51130 Ramp Test - R 12

Static Load Limit: ASTM F 970, Standard Test Method for Static Load Limit, Modified – 2000 psi.

Fire Performance: ASTM E 648, Standard Test method for Critical Radiant Flux of 0.45 watts/cm2 or greater, Class I, ASTM E662 Smoke Development.

Sustainable Properties: Phthalate-free, contains rapidly renewable bio-based content, 100 percent recyclable, SCS FloorScore Certified, meets CAL Section 01350, contributes to LEED credits for recycled content, adhesives, low VOC emitting material. EPD Environmental Product Declaration and HPD Health Product Declaration Available.

Warranty: 12 Year Limited Manufacturer Warranty

Colors: [Abyss K3001] [Biscuit K30907] [Dolphin K3010] [Midnight K30421] [Russet K30262] [Skyline K30332] [Tundra K30500] [As indicated on the Drawings] [As selected by Architect].

* + - * 1. System Accessories

[Altro Installation Guide: Finishing Details](https://www.altro.com/getmedia/93a3dee1-affa-47be-ad54-0825d8fbe3a8/6-Finishing-Details.pdf.aspx)

Vinyl Welding Rod: Acceptable Material

Altro Weld Rod (in matching color): to be used at seams, corners, drains, & transitions (with Gulley Angle/Edge, VisEdge)

Cover Former: Acceptable material, sized to suit application:

Altro Cove Former [38R -45mm (1.5”) radius]: to be used at base of walls when coving the flooring. Floor should be coved in ALL Wet Environment installations. Cove Former and Cove should be installed using Altro Double-Sided Contact Tape (Available in 1”, 4”, and 6” Widths)

Drains & Penetrations: Altro flooring MUST be mechanically fastened to all drain outlets and cleanouts to ensure a permanent watertight installation.

Existing or Non-Clamping Style: Round Drain Covers: Must be modified by the Flooring Sub Contractor. See Installation Guide for more information.

New Construction: Round Drain Covers: Architect should specify Surface-Clamping Style Drains in MEP Drawings/Details

Acceptable Surface-Clamping Style Drains:

Zurn Z 415-H

Mifab F1100 FC

Wade 110-FC

Josam 30000-AD

Watts FD 100-FC

Smith 2051

\*If Surface-Clamping Style Drains are not utilized, the Flooring Sub Contractor MUST modify the drain covers to mechanically fasten flooring to drain outlets

Rectangular Drains, Clean Outs, Trench Drains, Floor Sinks:

Altro Gulley Angle [GA 35/25]: This accessory is to be used around every square/rectangular drain, floor sink, and clean out. See Altro Installation Guide for more information. Colors: Rust, Black, Gray, Taupe.

Altro Gulley Edge [GE 35RE][GE25RE]: This accessory can be used around square/rectangular drains, floor sinks, or clean outs in lieu of the Altro Gulley Angle, if the drain has a flange that can be overlapped by the reducer edge on the Altro Gulley Edge. This accessory can also be used to make a transition from Altro flooring to concrete. See Altro Installation Guide for more information. Colors: Rust, Black, Gray, Taupe.

Pipes & Penetrations:

AltroMastic (color coordinating): To be used at around any pipe or penetration through the flooring (with the exception of drains)

Perimeters/Edging: Acceptable Material, vinyl, sized to suit application:

Altro Gulley Angle [GA 35/25]: This accessory is to be used around every square/rectangular drain, floor sink, and clean out or at edging/start/stop of Altro Flooring. See Altro Installation Guide for more information. Colors: Rust, Black, Gray, Taupe.

Altro Gulley Edge [GE 35RE][GE25RE]: This accessory can be used around square/rectangular drains, floor sinks, or clean outs in lieu of the Altro Gulley Angle, if the drain has a flange that can be overlapped by the reducer edge on the Altro Gulley Edge. This accessory can also be used to make a transition from Altro flooring to concrete or as edging/start/stop of Altro Flooring. See Altro Installation Guide for more information. Colors: Rust, Black, Gray, Taupe.

Altro Visedge [Visedge VR]: This accessory is to be used when when butting Altro safety floors to non-weldable products such as quarry tile, epoxy or concrete. See Altro Installation Guide for more information.

Cap Strip: Acceptable material, sized to suit application: [vinyl] [stainless steel]

Altro Cap Strip [C4]: Colors: White. Description: “h” shaped cap w/ 4mm shelf. Transition cap between Altro Flooring and Altro Puraguard Panels or FRP Wall Panels

Altro Cap Strip [C7]: Colors: Black, Dove Grey, and White. Transition cap between Altro Flooring and Existing Wall Coverings, CMU, and Painted Drywall

Altro Cap Strip [C8]: Color: White; Description: “h” shaped cap with 8mm shelf. Transition cap between Altro Flooring and Ceramic Tile, FRP, or Altro Puraguard Panel on Wall

Altro Cap Strip [C11]: Colors: Black. Transition cap to be used when installing Altro Flooring over existing Quarry Tile Coving Tiles.

Stainless Steel Cap Strip: Color: Steel.

Subfloor Filler and Leveler: Use only gray Portland cement-based “moisture tolerant” underlayments, and patching compounds with a 3000 PSI. Use for filling cracks, holes, or leveling. White gypsum materials may not be acceptable.

Stainless Steel Corner Guard:

3” height: Use at exposed corners with a 4” cove

5” height: Use at exposed corners with a 6” cove

Stainless Steel Deflector Plate: for use under stove equipment not fitted with such.

22”x22”

* + - * 1. Installation Materials:

Leveling and Patching Compounds: Latex-modified, moisture resistant, silicate free, Portland cement based or blended hydraulic-cement-based formulation with a 3000 PSI

Adhesives:

Altrofix 30 – 2 part polyurethane for areas with at least one drain or where heavy surface water use and/or heavy rolling loads

Altrofix 31 – 2 part polyurethane fast set version for repairs and small areas

The installation of Altro Stronghold 30 in a wet environment is a system installation. All circular drain covers must be modified in the field or specified by the architect to be Surface-Membrane Clamping Style Drains and installed per the instructions in the Altro Flooring installation guide. The Gulley Edge/Angle, AltroMastic, Cove Former, and Cap Strip Accessories are necessary accessories for a water-tight and manufacturer-compliant installation.

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates, with installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.
				2. 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 resilient products.
				3. Proceed with installation only after unsatisfactory conditions have been corrected.
				4. The general contractor shall test, preferably through an independent agency, substrate moisture content and field conditions to verify conditions are suitable for installation. Submit written reports in a timely manner and indicate remedial actions taken.
			2. PREPARATION
				1. Prepare substrates in accordance with manufacturer’s written instructions including the following:

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

Remove substrate paint, coatings and other substances that are incompatible with adhesives or contain soap, wax, oil, solvents, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

Mechanically remove contamination on the substrate that may cause damage to the resilient flooring material. Permanent and non-permanent markers, pens, crayons, and paint shall not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.

If chemical adhesive removal is used, comply with regulations of authorities having jurisdiction. If hazardous materials in existing conditions are present or suspected, notify the Owner in writing and stop work in that area until notified by Owner of actions to be taken.

* + - * 1. Concrete Subfloors: Testing by methods specified below to determine moisture content in concrete, for all concrete regardless of age or grade level:

Comply with recommendations of ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Slab Using in-situ probes. This test method covers the quantitative determination of percent relative humidity in concrete slabs for field or laboratory test.

The readings shall not exceed 90%.

Alkalinity Testing per ASTM F710 with an acceptable range of 7-9.9 pH.

Comply with ASTM and ACI Standards as listed in References.

* + - * 1. Contingency for High Moisture Readings in Concrete: If at the time of installation the moisture readings are in excess of Altro’s recommendations, the General Contractor shall employ a means of Moisture Mitigation. This includes, but is not limited to, the following methods:

Application of a Moisture Reduction Barrier (MRB)

Temporary use of dehumidification equipment.

Postponing of the flooring installation start time.

A budget should be provided to the general contractor for use of an MRB.

* + - * 1. Moisture Mitigation:

If remediation is required, methods for remediation performed by the General Contractor shall include the following:

Removal of all floor coverings, adhesive residue, curing compounds, parting compounds or other surface contaminants by mechanical means (shot-blasting), or other accepted method.

Identification and treatment of all cracks and joints, by the moisture resistant barrier manufacturers approved methods.

Application of a moisture resistant barrier, designed and warranted for the purpose of controlling excessive concrete moisture and the alkali it may carry.

Application of a minimum 1/8” thick moisture tolerant blotter layer of cementious underlayment over all Moisture Reduction Barriers.

* + - * 1. Wood Subfloors: Confirm wood subfloors meet the following requirements.

Must conform to ASTM F-1482 Standard Guide to Wood Substrates.

Wood subfloors shall have a minimum 18 inch (45.7 cm) of cross-ventilated space beneath the bottom of the joist. The floor must be rigid, free of movement.

Single wood and tongue and groove subfloors shall be covered with a minimum 1/4 inch (6.4 mm), 3/8 inch (9mm) or 1/2 inch (12.7 mm) APA approved underlayment plywood as follows.

Use 1/4 inch (6.4 mm) thick underlayment panels for boards with a face width of 3 inches (76 mm) or less.

Use 1/2 inch (12.7 mm) thick underlayment panels for boards with a face width wider than 3 inches (76 mm).

Do not install directly on OSB (Oriented Strand Board), particleboard, chipboard, luan or composite type panels unless specifically designed and approved by the panel manufacturer for use as a resilient flooring underlayment.

* + - * 1. Additional Preparation Requirements:

Fill cracks, holes, depressions and irregularities in the substrate with good quality, moisture tolerant, silicate free, latex modified, Portland cement based underlayment leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

Allow 16 hours curing time after leveling/patching compound has been applied.

Do not install floor covering over expansion joints.

Do not install resilient products until they are similar to the temperature as the space where they are to be installed. Move resilient products and installation materials into spaces where they will be installed at least 24 hours in advance of installation.

Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

When installing over existing floor coverings, completely degrease using a power washer and a high pH degreaser. Rinse repeatedly with clean water until runoff is clear and allow sufficient dry time.

* + - 1. INSTALLATION
				1. **Install products in strict accordance with manufacturer’s instructions and approved submittals**. Use installation method suitable for substrate and project conditions.

[Altro Safety Flooring Installation Guide](https://www.altro.com/getmedia/a485177c-e523-4e8c-92ef-718ae6c5c8fe/Altro-Installation-Guide-2016-web.pdf.aspx)

[Wet Environment Detailing Guide](https://www.altro.com/getmedia/54eccf35-fccd-46f0-afe0-52288f8b483d/Wet-areas-detailing-guide-2017.pdf.aspx)

The installation of Altro Stronghold 30 in a wet environment is a system installation. All circular drain covers must be modified in the field or specified by the architect to be Surface-Membrane Clamping Style Drains and installed per the instructions in the Altro Flooring installation guide. The Gulley Edge/Angle, AltroMastic, Cove Former, and Cap Strip Accessories are necessary accessories for a water-tight and manufacturer-compliant installation.

Proceeding with the installation means the installer’s acceptance that substrates are acceptable for installation of resilient flooring.

Install with Altro adhesive specified for the site conditions.

Install rolls in sequential order following roll numbers on the labels.

Do not reverse sheets unless instructed otherwise by manufacturer’s technical representative.

Immediately place the flooring into the wet adhesive. Roll spread adhesive with acceptable nap paint roller before setting flooring into adhesive.

Roll the flooring in both directions using a 100-150 lb 3 section roller.

Heat-weld all seams, vertical and horizontal. Allow 12 hours cure time before heat-welding.

When flash-coving, use manufacturer’s recommended accessories for cove former, cap, edging and other details.

* + - 1. CLEANING AND PROTECTION
				1. Comply with manufacturer's written instructions for cleaning and protection of resilient products. Perform the following operations immediately after completing resilient product installation:

Remove adhesive and other blemishes from exposed surfaces.

Sweep and vacuum surfaces thoroughly.

Damp-mop surfaces to remove marks and soil.

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

Never use tapes on the surface on the finish flooring

Never use Sharpies, pens, crayons or construction markers on either the finish flooring or the substrate.

No traffic for 24 hours after installation, unless approved by Altro technical.

No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.

* + - * 1. Wait 72 hours after installation before performing initial cleaning. Start a regular maintenance program after the initial cleaning as recommended by manufacturer.

Altro Recommended Maintenance

[Illustrated Cleaning Guide](https://www.altro.com/getmedia/84acad4d-5e3f-466e-ad58-89b1fa8f9bb4/ILLUSTRATED-CLEANING-GUIDE_ENGLISH_SPANISH_FRENCH.pdf.aspx)

For Cleaning Questions, Chemicals, and Equipment,

Contact our Partner: [www.1877floorguy.com](http://www.1877floorguy.com); 1-877-FLOOR GUY

Sweep debris

Mix AltroClean44 Cleaner to the Appropriate Dilution Ratio:

Normal Cleaning: 1:40 with warm water

Kitchen/Deep Cleaning: 1:10 with warm water

Apply Diluted Cleaning Solution to floor with pump-sprayer or synthetic-fiber mop

Allow 5 minutes work time for cleaning product on floor

Use Deck Brush or Altro Unipad to scrub floor

Rinse thoroughly

END OF SECTION