
USACE / NAVFAC / AFCEA / NASA UFGS-09 65 00 (August 2010)

Preparing Activity: USACE Superseding
UFGS-09 65 00 (February 2009)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2012

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RESILIENT FLOORING

08/10

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SECTION 09 65 00

RESILIENT FLOORING 08/10

NOTE: This guide specification covers the requirements for resilient floor coverings, base materials, and accessory items.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

PART 1 GENERAL

NOTE: Resilient flooring may be used over wood subfloor provided that the subfloor underside is well ventilated and the installation conforms to the manufacturer's recommendations. Note that not all products are recommended for installation over panel type underlayment.

Flooring such as nonslip tile is not included in this specification; appropriate wording must be added when it is required.

Show location of resilient flooring, including types, on the drawings.

1.1 REFERENCES

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D4078	(2002; R 2008) Water Emulsion Floor Polish
ASTM D5603	(2001; R 2008) Rubber Compounding Materials - Recycled Vulcanizate Particulate Rubber
ASTM E2129	(2010) Standard Practice for Data Collection for Sustainability Assessment of Building Products
ASTM E648	(2010e1) Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
ASTM F1066	(2004e1; R 2010) Standard Specification for Vinyl Composition Floor Tile
ASTM F1303	(2004; R 2009) Sheet Vinyl Floor Covering with Backing
ASTM F1344	(2010) Rubber Floor Tile
ASTM F1482	(2004; R 2009e1) Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
ASTM F1700	(2004; R 2010) Solid Vinyl Floor Tile
ASTM F1859	(2010) Rubber Sheet Floor Covering Without Backing

ASTM F1860	(2010) Rubber Sheet Floor Covering With Backing
ASTM F1861	(2008) Resilient Wall Base
ASTM F1869	(2011) Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
ASTM F1913	(2004; R 2010) Vinyl Sheet Floor Covering Without Backing
ASTM F2034	(2008) Sheet Linoleum Floor Covering
ASTM F2169	(2002; R 2008) Resilient Stair Treads
ASTM F2170	(2011) Determining Relative Humidity in Concrete Floor Slabs in situ Probes
ASTM F2195	(2007) Linoleum Floor Tile
ASTM F710	(2011) Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
GREEN SEAL (GS)	
GS-36	(2000) Commercial Adhesives
GREENGUARD ENVIRONMENTAL INSTITUTE (GEI)	
GEI	Greenguard Standards for Low Emitting Products
INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)	
ISO 3813	(2004) Resilient Floor Coverings - Cork Floor Tiles
SCIENTIFIC CERTIFICATION SYSTEMS (SCS)	
SCS	Scientific Certification Systems (SCS) Indoor Advantage
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)	
SCAQMD Rule 1168	(1989; R 2005) Adhesive and Sealant Applications
U.S. GREEN BUILDING COUNCIL (USGBC)	
LEED GBDC	(2009) LEED Reference Guide for Green Building Design and Construction
LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

1.2 SYSTEM DESCRIPTION

1.2.1 Local/Regional Materials

NOTE: Using local materials can help minimize transportation impacts, including fossil fuel consumption, air pollution, and labor. Using materials harvested and manufactured within a 800 km (500 mile) radius from the project site contributes to the following LEED credit: MR5. Coordinate with Section 01 33 29 LEED(tm) DOCUMENTATION. Use second option if Contractor is choosing local materials in accordance with Section 01 33 29 LEED(tm) DOCUMENTATION. First option will not be used for USACE projects. Army projects will include second option only if pursuing this LEED credit.

[Use materials or products extracted, harvested, or recovered, as well as manufactured, within a [800] [] km [500] [] mile radius from the project site, if available from a minimum of three sources.] [See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total local/recycled material requirements. Flooring materials may be locally available.] Flooring and accessories may contain post-consumer or post-industrial recycled content.

1.2.2 Environmental Data

[Submit Table 1 of ASTM E2129 for the following products: [].]

1.2.3 Fire Resistance Requirements

NOTE: Choice of critical radiant flux level as it applies to building type and area of application will be made in accordance with the latest edition of UFC 3-600-01 and NFPA 101. Wherever the use of Class II (0.22) watts finish is required, Class I (0.45) watts will be permitted. Critical radiant flux will be a minimum average of 0.45 watts when used in corridors in bachelor enlisted quarters, bachelor officer quarters, hospital, child care centers, temporary lodging facilities, and new construction detention and correctional facilities. Generally the critical radiant flux will be a minimum of 0.22 for corridors of other type facilities. Where an approved automatic sprinkler system is installed, Class II interior floor finish may be used where Class I floor finish is required, and where Class II is required, no critical radiant flux rating is required. Omit paragraph if not applicable.

Provide a minimum average critical radiant flux of [0.22] [0.45] watts per square centimeter for flooring in corridors and exits when tested in accordance with ASTM E648.

1.2.4 Other Submittal Requirements

NOTE: Drawings are required for projects with floor
patterns.

The following shall be submitted in accordance with LEED NC:

- a. documentation indicating percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar value of products included in project.
- b. documentation indicating distance between manufacturing facility and the project site. Indicate distance of raw material origin from the project site. Indicate relative dollar value of local/regional materials to total dollar value of products included in project.
- c. documentation indicating type of biobased material in product and biobased content. Indicate relative dollar value of biobased content products to total dollar value of products included in project.
- d. documentation relative to local/regional materials credit in accordance with LEED GBDC. Include in LEED Documentation Notebook.
- e. documentation relative to recycled content credit in accordance with LEED GBDC. Include in LEED Documentation Notebook.
- f. documentation relative to low-emitting materials credit in accordance with LEED GBDC. Include in LEED Documentation Notebook.
- g. documentation relative to rapidly renewable materials credit in accordance with LEED GBDC. Include in LEED Documentation Notebook.

1.3 SUBMITTALS

NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project.

The Guide Specification technical editors have designated those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item, if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office

(Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.] [information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Resilient Flooring and Accessories[; G][; G, [____]]

SD-03 Product Data

Resilient Flooring and Accessories[; G][; G, [____]]

Adhesives; (LEED NC)

Vinyl Composition Tile

Sheet Vinyl Flooring

Rubber Tile

Rubber Sheet Flooring

Solid Vinyl Tile

Cement-Fiber Board

Wall Base

Stair Treads, Risers and Stringers

[Local/Regional Materials]

[Environmental Data]

[Sheet Linoleum]

Linoleum Tile

Cork

Certification

SD-04 Samples

Resilient Flooring and Accessories[; G][; G, [____]]

SD-06 Test Reports

Moisture, Alkalinity and Bond Tests[; G][; G, [____]]

SD-08 Manufacturer's Instructions

Surface Preparation[; G][; G, [____]]

Installation[; G][; G, [____]]

SD-10 Operation and Maintenance Data

Resilient Flooring and Accessories[; G][; G, [____]]

SD-11 Closeout Submittals

[Local/Regional Materials]
 Resilient Flooring and Accessories
 Adhesives
 Sheet Linoleum
 Linoleum Tile
 Cork

1.4 SUSTAINABLE DESIGN CERTIFICATION

Product shall be third party certified by **GEI** Greenguard Indoor Air Quality Certified, **SCS** Scientific Certification Systems Indoor Advantage or equal. Certification shall be performed annually and shall be current.

1.5 DELIVERY, STORAGE, AND HANDLING

 NOTE: Materials which are woven, fibrous, or porous
 in nature have a high capacity to adsorb VOC
 emissions; for instance, acoustical ceilings,
 carpet, textiles, and unprimed gypsum wall board.
 If specifying porous materials include bracketed
 text and indicate materials to be protected.

Deliver materials to the building site in original unopened containers bearing the manufacturer's name, style name, pattern color name and number, production run, project identification, and handling instructions. Store materials in a clean, dry, secure, and well-ventilated area **free from strong contaminant sources and residues** with ambient air temperature maintained above **20 degrees C 68 degrees F** and below **30 degrees C 85 degrees F**, stacked according to manufacturer's recommendations. **Remove resilient flooring products from packaging to allow ventilation prior to installation.** Protect materials from the direct flow of heat from hot-air registers, radiators and other heating fixtures and appliances. Observe ventilation and safety procedures specified in the MSDS. **Do not store rubber surface products with materials that have a high capacity to adsorb volatile organic compound (VOC) emissions, including [_____]. Do not store exposed rubber surface materials in occupied spaces. [Do not store [_____]** near materials that may offgas or emit harmful fumes, such as kerosene heaters, fresh paint, or adhesives.]

1.6 ENVIRONMENTAL REQUIREMENTS

Maintain areas to receive resilient flooring at a temperature above **20 degrees C 68 degrees F** and below **30 degrees C 85 degrees F** for 3 days before application, during application and 2 days after application, unless otherwise directed by the flooring manufacturer for the flooring being installed. Maintain a minimum temperature of **13 degrees C 55 degrees F** thereafter. Provide adequate ventilation to remove moisture from area and to comply with regulations limiting concentrations of hazardous vapors.

1.7 SCHEDULING

Schedule resilient flooring application after the completion of other work which would damage the finished surface of the flooring.

1.8 WARRANTY

Provide manufacturer's standard performance guarantees or warranties that extend beyond a one year period.

1.9 EXTRA MATERIALS

NOTE: To ensure matching flooring that may become damaged and require spot replacement, a supply of extra flooring of same types, colors and dye lot is recommended. Coordinate requirement for extra stock with customer; warehousing may not be available.

Provide extra flooring material of each color and pattern at the rate of [[_____] [5] tiles for each 1000 tiles] [and] [[_____] [0.5] square m [5] square feet for each 92 square m 1000 square feet of sheet flooring] installed. Provide extra wall base material composed of 6 m 20 linear feet of each type, color and pattern. Package all extra materials in original properly marked containers bearing the manufacturer's name, brand name, pattern color name and number, production run, and handling instructions. Provide extra materials from the same lot as those installed. Leave extra stock at the site in location assigned by Contracting Officer.

PART 2 PRODUCTS

NOTE: Appropriate flooring material should be determined by:
-Amount and type (foot, cart, wheelchair, etc.)
of traffic
-Abrasion of local soil conditions
-Exposure to water, chemicals, grease, and burns
-Exposure to in-use damage (cuts, tears, gouges)
-Exposure to direct sunlight (fading potential)
-Anticipated type of and frequency of maintenance
-Cost of maintenance
-Appearance expectations
Verify proposed use of flooring with manufacturer's recommendations.

Sheet flooring should be considered for areas such as health care facilities due to the reduced amount of seams. Seam welded sheet flooring without backing provides a monolithic floor impervious to moisture penetration.

Specify special adhesive for resilient flooring installed on floors with radiant heating, wet areas and areas with heavy rolling loads.

If more than one type of resilient flooring is required, a separate paragraph for each type will be used. Each type will be designated with a letter or number symbol. Use the same symbols to key flooring to locations on the drawings and in Section 09 06 90 COLOR SCHEDULE. Delete reference to type symbol if not used.

VOC emissions from the wax and strip cycle required by many flooring products may far exceed the VOC emissions that follow installation.

Use of materials with recycled content, calculated on the basis of post-industrial and post-consumer percentage content, contributes to the following LEED credit: MR4. Coordinate with Section 01 33 29 LEED(tm) DOCUMENTATION. Designer must verify suitability, availability and adequate competition (including verification of bracketed percentages included in this guide specification) before specifying product recycled content requirements. Use second option if Contractor is choosing recycled content products in accordance with Section 01 33 29 LEED(tm) DOCUMENTATION. Army projects will specify recycled content exceeding EPA requirements only if pursuing this LEED credit.

2.1 VINYL COMPOSITION TILE [TYPE [A] [____]]

NOTE: The 3.2 mm (1/8 inch) thick vinyl composition tile (VCT) should be utilized in high traffic commercial type installations.

Solid color tiles are tiles with uniform color throughout. These are recommended for use as an accent only in small quantities and not as the floor field color. These tiles do not hide soiling well and show scratches easily.

Through pattern tiles are tiles with patterning distributed through the entire thickness.

Ingredients in vinyl flooring include polyvinyl chloride (PVC) which is made from petroleum, chlorine from salt, and plasticizers. Vinyl flooring made from 100 percent recycled-content PVC is available in tile and plank sizes.

Conform to ASTM F1066 [Class 1, (solid color tile),] [Class 2, (through pattern tile),] Composition 1, asbestos-free, [300] [____] mm [12] [____] inch square and [2.4] [3.2] mm [3/32] [1/8] inch thick. Provide color and pattern uniformly distributed throughout the thickness of the tile. Tile shall contain a minimum of [90] [100] [____] percent recycled material.

2.2 SHEET VINYL FLOORING [TYPE [A] [____]]

NOTE: Not all sheet vinyl flooring is available with chemically bonded and/or heat welded seams. Research available products and coordinate with facility requirements.

100 percent recycled PVC flooring will meet accepted

industry standards at a minimum. Designer must verify compliance with ASTM F1303 before specifying. Determine appropriate product technical requirements and/or referenced standards for reliable products and include in this paragraph.

Conform to [ASTM F1303, Type I, Grade 1, [Class A-non-asbestos formulated fibrous backing] [or] [Class B-nonfoamed plastic backing] (minimum wear layer thickness 0.5 mm 0.020 inch and minimum overall thickness 2 mm 0.080 inch) and a minimum [1800 mm 6 feet] [3660 mm 12 feet] wide.] [ASTM F1303, Type II, Grade 1, without backing (minimum wear layer thickness 2 mm 0.080 inch and minimum overall thickness 2 mm 0.080 inch), and a minimum 1800 mm 6 feet wide. Extend color and pattern through the total thickness of the material.] [ASTM F1303, Type II, Grade 1, [Class A non-asbestos formulated fibrous backing] [or] [Class B nonfoamed plastic backing] (minimum wear layer thickness 1.27 mm 0.050 inch and minimum overall thickness 2 mm 0.080 inch) and a minimum 1800 mm 6 feet wide. Extend color and pattern throughout the thickness of the wear layer.] [ASTM F1913, (minimum wear layer thickness 1.9 mm 0.075 inch and minimum overall thickness 1.9 mm 0.075 inch) and a minimum 1800 mm 6 feet wide. Extend color and pattern through the total thickness of the material.] [Flooring shall contain 100 percent post-industrial recycled PVC plastic.] [See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total recycled content requirements. Sheet vinyl flooring may contain post-consumer or post-industrial recycled content.] As required, provide welding rods as recommended by the manufacturer for heat welding of joints.

2.3 RUBBER TILE [TYPE [A] [_____]]

NOTE: Rubber flooring provides slip resistance not usually found with other type floor tiles. Consider for areas such as stairwell landings and ramps. Rubber flooring has a cushioning quality that reduces leg weariness and fatigue.

Some rubber flooring is not resistant to oil and grease and can perform poorly against certain reagents and stain spills. Determine project needs, research available product and add verbiage to paragraph if rubber flooring needs to be resistant to oil and grease and perform against certain reagents and stain spills.

Research available sizes. Manufacturer's sizes vary and not all manufacturers offer all sizes.

Ingredients in rubber flooring may include either natural rubber or synthetic materials. Natural rubber is a renewable raw material that is extracted from the sap of the tropical rubber plant without harming the plant. Typically, no waxes are required to maintain rubber floors.

Rubber floor tiles are EPA designated products for recycled content. See Section 01 62 35 RECYCLED/RECOVERED MATERIALS and include recycled content options unless designer determines that

justification for non-use exists. EPA recycled content requirements must be addressed in all projects regardless of optional LEED/other recycled content goals. Designer must verify suitability, availability and adequate competition (including verification of bracketed percentages included in this guide specification) before specifying products meeting EPA minimum recycled content.

Conform to **ASTM F1344** [Class 1 homogeneous] [Class 2 layered], [Type A (solid color)] [Type B (through mottled)], [300] [450] [600] [900] [_____] mm [12] [18] [24] [36] [_____] inch square. Provide [smooth] [_____] [raised [round] [square] [diamond] surface studs with chamfered edges. Provide [high] [low]] stud profile. Provide [3.2] [_____] mm [0.125] [_____] inch overall thickness. [Rubber tile shall contain a minimum of [90] [100] percent post-consumer recycled material. With Vulcanizate Particulate Rubber, use recycled tire treads in accordance with **ASTM D5603**, fine mesh size particulate, [Grade 1, 2, or 3] [Grade 4] [Grade 5] [Grade 6]]

2.4 RUBBER SHEET FLOORING [TYPE [A] [_____]]

NOTE: Rubber sheet flooring provides slip resistance not usually found with other type floor tiles. Consider for areas such as stairwell landings and ramps. Rubber flooring has a cushioning quality that reduces leg weariness and fatigue.

Some rubber flooring is not resistant to oil and grease and can perform poorly against certain reagents and stain spills. Determine project needs, research available product and add verbiage to paragraph if rubber flooring needs to be resistant to oil and grease and perform against certain reagents and stain spills.

The following thicknesses of rubber flooring are recommended for the traffic type shown: 2.0 mm (0.080 inch) thickness - low traffic; 2.5 mm (0.100 inch) thickness - medium traffic; 3 mm (0.118 inch) thickness or greater - heavy traffic.

Research available widths. Manufacturer's widths vary and not all manufacturers offer all sizes.

Rubber sheet flooring shall conform to [**ASTM F1859** (flooring without backing), [Type I homogeneous] [Type II layered]] [or] [**ASTM F1860** (flooring with backing), [Type I homogeneous] [Type II layered]], [minimum] [1 m 36 inch] [_____] wide. Provide [smooth] [embossed] [_____] surface. Provide [2] [2.5] [3] [_____] mm [0.080] [0.100] [0.118] [_____] inch overall thickness. [Rubber sheet flooring shall contain a minimum of [90] [100] [_____] percent post-consumer recycled material. With Vulcanizate Particulate Rubber, use recycled tire treads in accordance with **ASTM D5603**, fine mesh size particulate, [Grade 1, 2, or 3] [Grade 4] [Grade 5] [Grade 6].]

2.5 SOLID VINYL TILE [TYPE [A] [_____]]

NOTE: Plastic floor tiles are an EPA designated product for recycled content. See Section 01 62 35 RECYCLED/RECOVERED MATERIALS and include recycled content options unless designer determines that justification for non-use exists. EPA recycled content requirements must be addressed in all projects regardless of optional LEED/other recycled content goals. Designer must verify suitability, availability and adequate competition (including verification of bracketed percentages included in this guide specification) before specifying products meeting EPA minimum recycled content.

100 percent recycled PVC flooring will meet accepted industry standards at a minimum. Designer must verify compliance with ASTM F1700 before specifying. Determine appropriate product technical requirements and/or referenced standards for reliable products and include in this paragraph.

The product Luxury Vinyl Tile is a Class III tile.

Conform to ASTM F1700 [Class I monolithic (minimum wear layer thickness 3 mm 0.125 inch and minimum overall thickness 3 mm 0.125 inch) [Class III printed film minimum wear layer thickness 0.50 mm 0.020 inch and minimum overall thickness 3 mm 0.125 inch], Type [A (smooth)] [B (embossed)]. Provide [300] [400] [450] [600] [900] [_____] mm [12] [16] [18] [24] [36] [_____] inch square tile. [Tile shall contain a minimum of [90] [100] [_____] percent recycled content.]

2.6 SHEET LINOLEUM [TYPE [A] [_____]]

NOTE: The 2002 Farm Bill - Section 9002, Federal Procurement of Biobased Products, requires each Federal Agency to develop a procurement program which will ensure that items composed of biobased products will be purchased to the maximum extent practicable and which is consistent with applicable provisions of Federal procurement law. Biobased materials like linoleum shall have preference over inert or non-recycled alternatives.

Linoleum contains rapidly renewable materials. Use of rapidly renewable materials contributes to the following LEED credit: MR6. Coordinate with Section 01 33 29 LEED (tm) DOCUMENTATION.

Conform to ASTM F2034 and consist of a homogeneous layer of a mixture of linoleum cement (binder in linoleum consisting of a mixture of linseed oil, pine rosin, fossil, or other resins or rosins, or an equivalent oxidized oleoresinous binder), cork and/or wood flour, mineral fillers, and pigments bonded to a jute backing. Provide a minimum 1800 mm 6 feet wide and overall thickness not less than [2.0 mm 0.080 inch] [2.5 mm 0.100 inch] [

3.2 mm 0.125 inch] for linoleum. Provide welding rods as recommended by the manufacturer for heat welding of joints.

2.7 LINOLEUM TILE [TYPE [A] [____]]

Conform to ASTM F2195 and consist of a homogeneous layer of a mixture of linoleum cement (binder in linoleum consisting of a mixture of linseed oil, pine rosin, fossil, or other resins or rosins, or an equivalent oxidized oleoresinous binder), cork and/or wood flour, mineral fillers, and pigments bonded to a [jute] [____] backing. Provide square tiles a minimum [450 mm 18 inch] [____] square and overall thickness [2.5 mm 0.100 inch] [____] minimum for linoleum tile.

2.8 CORK

NOTE: Cork is a sustainably harvested rapidly renewable biobased resource. Cork granules used for cork flooring and linoleum are by-products from bottle-cork manufacturing. Some cork floors use synthetic binders in the manufacturing process and synthetic finishes to provide more durable walking surfaces. Typically available only in tile form, cork usually provides better sound absorption characteristics than most vinyl flooring but is less durable than commercial vinyl and rubber flooring. Using rapidly renewable materials contributes to the following LEED credit: MR6. Coordinate with Section 01 33 29 LEED(tm) DOCUMENTATION.

Conform to ISO 3813, and be [300] [____] mm [12] [____] inches square and [0.05] [____] m [3/16] [____] inches to [0.08] [____] m [5/16] [____] inches thick. [Provide cork-faced MDF tongue-and-groove planks with cork facing.] [Cork shall contain a minimum of [85] [95] [____] percent biobased content.] Do not use products made with urea-formaldehyde binder.

2.9 WALL BASE

NOTE: Job formed corners are recommended. The return on preformed corners is not always long enough to hold the piece in place and the corners can be knocked off during vacuuming and other cleaning operations.

Base is available in different lengths ranging from 1220 mm (4 feet) pieces to 30480 mm (100 feet) or 36576 mm (120 feet) rolls. Availability and roll lengths vary dependent on manufacturer. Identify required length if it impacts design intent. Some manufacturers of Type TS (vulcanized thermoset rubber) base offer only 1220 mm (4 feet) lengths and not roll goods.

Conform to ASTM F1861, [[Type TS (vulcanized thermoset rubber)] [or] [Type TP (thermoplastic rubber)]] [, or] [Type TV (thermoplastic vinyl)], [Style A (straight - installed with carpet)] [,] [and] [Style B (coved -

installed with resilient flooring)] [,] [and] [Style C (butt toe cove installed with 3 mm 1/8 inch thick flooring)]. Provide [100] [150] mm [4] [6] inch high and a minimum 3.175 mm 1/8 inch thick wall base. Provide [preformed] [job formed] corners in matching height, shape, and color. [Rubber shall contain a minimum of [90] [100] [_____] percent post-consumer recycled material. With Vulcanizate Particulate Rubber, use recycled tire treads in accordance with ASTM D5603, fine mesh size particulate, [Grade 1, 2, or 3] [Grade 4] [Grade 5] [Grade 6].] [See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total recycled content requirements. Rubber sheet flooring may contain post-consumer or post-industrial recycled content.]

2.10 INTEGRAL COVE BASE

NOTE: Integral coves can be used in many situations in which sheet vinyl and linoleum flooring are used to enhance the sanitary capacity inherent in seamless construction.

Consider specifying corner protectors in high traffic areas and areas that may receive some abuse.

Corner protectors are preferred in naval installations.

Extend integral coved base for [[sheet vinyl] [and] [sheet linoleum] flooring up the wall [100] [150] mm [4] [6] inch]. Provide a [vinyl] [or] [rubber] [clear anodized aluminum], [square] [round] cap strip and vinyl, rubber, or wood fillet strip with a minimum radius of 19 mm 3/4 inch for integral coved bases [at perimeter and fixed vertical interruptions to flooring] [as shown]. Provide integral cove of the same material as flooring. [Provide inside and outside corner protectors of [[_____] -colored anodized aluminum] [clear anodized aluminum] [or] [plastic] approved by flooring manufacturer.]

2.11 STAIR TREADS, RISERS AND STRINGERS

NOTE: 100 percent recycled PVC Treads, risers, and stringers will meet accepted industry standards at a minimum. Designer must verify compliance with ASTM F2169 before specifying. Determine appropriate product technical requirements and/or referenced standards for reliable products and include in this paragraph.

Conform to ASTM F2169, [[Type TS (vulcanized thermoset rubber)] [or] [Type TP (thermoplastic rubber)]] [or] [Type TV (thermoplastic vinyl)]. Conform to ASTM F2169 for surface of treads [Class 1 smooth] [[Class 2 raised [round] [square] [diamond] stud] [ribbed] pattern] [and have [Group 1 abrasive non-slip strip] [Group 2 strip for visually impaired of contrasting [_____] color of [same] [abrasive] material]]. Provide [square] [or] [round] nosing. Provide either a one piece nosing/tread/riser or a two piece nosing/tread design with a matching coved riser. [Rubber shall contain a minimum of [90] [100] [_____] percent post-consumer recycled material. With Vulcanizate Particulate Rubber, use

recycled tire treads in accordance with ASTM D5603, fine mesh size particulate, [Grade 1, 2, or 3] [Grade 4] [Grade 5] [Grade 6].] [Vinyl shall contain 100 percent post-industrial recycled PVC plastic.] [See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total recycled content requirements. [Rubber] [Vinyl] may contain post-consumer or post-industrial recycled content.]

2.12 FEATURE STRIP

Provide feature strips with [vinyl composition tile and conform to ASTM F1066, Class 1, (solid color tile),] [rubber tile and conform to ASTM F1344 Class 1 homogeneous] [____], and be [25 mm1 inch] [50 mm2 inch] [____] wide, and of thickness to match the flooring.

2.13 MOULDING

Provide tapered mouldings of [[vinyl] [or] [rubber]] [[____]-colored anodized aluminum] [clear anodized aluminum] and types as recommended by flooring manufacturer for both edges and transitions of flooring materials specified. Provide vertical lip on moulding of maximum 6 mm 1/4 inch. Provide bevel change in level between 6 and 13 mm 1/4 and 1/2 inch with a slope no greater than 1:2.

2.14 ADHESIVES

NOTE: Conformance with South Coast Air Quality Management District (SCAQMD) Rule 1168 as noted complies with LEED requirements.

Adhesives may be a source of VOCs. Some styles of plastic flooring are available in loose-laid design (puzzle pieces that are tapped together with a rubber mallet) that can be installed without adhesive. Using low-VOC products contributes to the following LEED credit: EQ4. Coordinate with Section 01 33 29 LEED(tm) DOCUMENTATION. Designer must verify availability and adequate competition (including verification of bracketed VOCs included in this guide specification) before specifying product VOC requirements. Army projects shall specify bracketed LEED VOC option only if pursuing this LEED credit.

Provide adhesives for flooring, base and accessories as recommended by the manufacturer and comply with local indoor air quality standards. [Interior adhesives shall meet the requirements of LEED low emitting materials credit.] [VOC content shall be less than [50 grams/L] [the current VOC content limits of [GS-36] [and] [SCAQMD Rule 1168]].] Submit manufacturer's descriptive data, documentation stating physical characteristics, and mildew and germicidal characteristics. Provide Material Safety Data Sheets (MSDS) for all primers and adhesives to the Contracting Officer. Highlight VOC emissions.

2.15 SURFACE PREPARATION MATERIALS

NOTE: Panel type underlayments, such as plywood and

hardboard, are specified in Section 06 10 00 ROUGH CARPENTRY. Coordinate underlayments requirements with the ROUGH CARPENTRY specifications.

Provide surface preparation materials, such as panel type underlayment, lining felt, and floor crack fillers as recommended by the flooring manufacturer for the subfloor conditions. Comply with ASTM F1482 for panel type underlayment products. Use one of the following substrates:

- [a. Particleboard: As specified in Section 06 10 00 ROUGH CARPENTRY.]
- [b. Fiberboard: As specified in Section 06 10 00 ROUGH CARPENTRY.]
- [c. Cork: As specified in Section 06 10 00 ROUGH CARPENTRY]
- [d. Cement-fiber board: Portland cement, sand, recycled cellulose[with a minimum of [5] [10] [_____] percent post-consumer recycled content, or [20] [40] [_____] percent post-industrial recycled content].]
- [e. Plywood: As specified in Section 06 10 00 ROUGH CARPENTRY.]
- [f. Concrete.]

2.16 POLISH/FINISH

Provide polish finish as recommended by the manufacturer and conform to ASTM D4078 for polish.

2.17 CAULKING AND SEALANTS

Provide caulking and sealants in accordance with Section 07 92 00 JOINT SEALANTS.

2.18 MANUFACTURER'S COLOR, PATTERN AND TEXTURE

NOTE: Editing of color reference sentence(s) shall be coordinated with the Government. Generally the Section 09 06 90 COLOR SCHEDULE or drawings are used when the project is designed by an Architect or Interior designer. Color shall be selected from manufacturer's standard colors or identified in this specification only when the project has minimal finishes.

When the government directs that color be located in the drawings, a note will be added that states: "Where color is shown as being specific to one manufacturer, an equivalent color by another manufacturer may be submitted for approval. Manufacturers and materials specified are not intended to limit the selection of equal colors from other manufacturers. The word "color" as used herein includes surface color and pattern."

When more than one type, pattern or color is specified identify location.

When a manufacturer's name, stock number, pattern, and color is specified for color, be certain that the product conforms to the specification, as edited.

NOTE: Drawings are required for projects with floor patterns.

Provide color, pattern and texture for resilient flooring and accessories [in accordance with Section 09 06 90 COLOR SCHEDULE] [as indicated on the drawings] [selected from manufacturer's standard colors] [____]. Color listed is not intended to limit the selection of equal colors from other manufacturers]. [Provide floor patterns as specified on the [drawings Sheet No. [____]] [____].] Provide flooring in any one continuous area or replacement of damaged flooring in continuous area from same production run with same shade and pattern. Submit scaled drawings indicating patterns (including location of patterns and colors) and dimensions. Submit manufacturer's descriptive data and [three] [____] samples of each indicated color and type of flooring, base, mouldings, and accessories sized a minimum 60 by 100 mm 2-1/2 by 4 inch. Submit Data Package 1 in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

PART 3 EXECUTION

3.1 EXAMINATION

Examine and verify that site conditions are in agreement with the design package. Report all conditions that will prevent a proper installation. Do not take any corrective action without written permission from the Government. Work will proceed only when conditions have been corrected and accepted by the installer. Submit manufacturer's printed installation instructions for all flooring materials and accessories, including preparation of substrate, seaming techniques, and recommended adhesives.

3.2 SURFACE PREPARATION

Provide a smooth, true, level plane for surface preparation of the flooring, except where indicated as sloped. Floor to be flat to within 4.75 in 3048 mm 3/16 inch in 10 feet. Prepare subfloor in accordance with flooring manufacturer's recommended instructions. Prepare the surfaces of lightweight concrete slabs (as defined by the flooring manufacturer) as recommended by the flooring manufacturer. Comply with ASTM F710 for concrete subfloor preparation. Floor fills or toppings may be required as recommended by the flooring manufacturer. Install underlayments, when required by the flooring manufacturer, in accordance with manufacturer's recommended printed installation instructions. Comply with ASTM F1482 for panel type underlayments. Before any work under this section is begun, correct all defects such as rough or scaling concrete, chalk and dust, cracks, low spots, high spots, and uneven surfaces. Repair all damaged portions of concrete slabs as recommended by the flooring manufacturer. Remove concrete curing and sealer compounds from the slabs, other than the type that does not adversely affect adhesion. Remove paint, varnish, oils, release agents, sealers, waxes, and adhesives, as required by the flooring product in accordance with manufacturer's printed installation instructions.

3.3 MOISTURE, ALKALINITY AND BOND TESTS

Determine the suitability of the concrete subfloor for receiving the resilient flooring with regard to moisture content and pH level by moisture

and alkalinity tests. Conduct moisture testing in accordance with ASTM F1869 or ASTM F2170, unless otherwise recommended by the flooring manufacturer. Conduct alkalinity testing as recommended by the flooring manufacturer. Determine the compatibility of the resilient flooring adhesives to the concrete floors by a bond test in accordance with the flooring manufacturer's recommendations. Submit copy of test reports for moisture and alkalinity content of concrete slab, and bond test stating date of test, person conducting the test, and the area tested.

3.4 PLACING VINYL COMPOSITION, LINOLEUM AND SOLID VINYL TILES

Install tile flooring and accessories in accordance with manufacturer's printed installation instructions. Prepare and apply adhesives in accordance with manufacturer's directions. Keep tile lines and joints square, symmetrical, tight, and even. Keep each floor in true, level plane, except where slope is indicated. Vary edge width as necessary to maintain full-size tiles in the field, no edge tile to be less than one-half the field tile size, except where irregular shaped rooms make it impossible. Cut flooring to fit around all permanent fixtures, built-in furniture and cabinets, pipes, and outlets. Cut, fit, and scribe edge tile to walls and partitions after field flooring has been applied.

3.5 PLACING SHEET VINYL FLOORING

Install sheet vinyl flooring and accessories in accordance with manufacturer's printed installation instructions. Prepare and apply adhesives in accordance with manufacturer's printed directions. Provide square, symmetrical, tight, and even flooring lines and joints. Keep each floor in true, level plane, except where slope is indicated. Cut flooring to fit around all permanent fixtures, built-in furniture and cabinets, pipes, and outlets. Lay out sheets to minimize waste. Cut, fit, and scribe flooring to walls and partitions after field flooring has been applied. [Provide [chemically bonded] [or] [heat welded] seams and edges [in rooms [____]] [shown on the drawings] in accordance with the manufacturer's written installation instructions. Finish joints flush, free from voids, recesses, and raised areas.] [Install flooring with an integral coved base.]

3.6 PLACING SHEET LINOLEUM FLOORING

Install sheet linoleum flooring and accessories in accordance with manufacturer's printed installation instructions. Prepare and apply adhesives in accordance with manufacturer's printed directions. Provide square, symmetrical, tight, and even flooring lines and joints. Keep each floor in true, level plane, except where slope is indicated. Cut flooring to fit around all permanent fixtures, built-in furniture and cabinets, pipes, and outlets. Lay out sheets to minimize waste. Cut, fit, and scribe flooring to walls and partitions after field flooring has been applied. Cut seams by overlapping or underscribing as recommended by the manufacturer. [Provide heat welded seams [in rooms [____]] [as shown on the drawings] in accordance with there manufacturer's written installation instructions.] Finish joints flush, free from voids, recesses, and raised areas. [Install flooring with an integral coved base.]

3.7 PLACING RUBBER TILE

Install rubber tile and accessories in accordance with manufacturer's printed installation instructions. Prepare and apply adhesives in accordance with manufacturer's printed directions. Provide square,

symmetrical, tight, and even flooring lines and joints. Keep each floor in true, level plane, except where slope is indicated. Vary width of edge tiles as necessary to maintain full-size tiles, except where irregular-shaped rooms makes it impossible. Cut flooring to fit around, all permanent fixtures, built-in furniture and cabinets, pipes, and outlets. Cut, fit, and scribe flooring to walls and partitions after field flooring has been applied.

3.8 PLACING RUBBER SHEET FLOORING

Install rubber sheet flooring and accessories in accordance with manufacturer's printed installation instructions. Prepare and apply adhesives in accordance with manufacturer's printed directions. Provide square, symmetrical, tight, and even flooring lines and joints. Keep each floor in true, level plane, except where slope is indicated. Cut seams by overlapping or underscribing as recommended by the manufacturer. Lay out sheets to minimize waste. Cut flooring to fit around all permanent fixtures, built-in furniture and cabinets, pipes, and outlets. Cut, fit, and scribe flooring to walls and partitions after field flooring has been applied.

3.9 PLACING CORK

Cork [tile] [plank flooring] and accessories shall be installed in accordance with manufacturer's installation instructions. Adhesives shall be prepared and applied in accordance with manufacturer's directions. Flooring lines and joints shall be square, symmetrical, tight, and even. Keep each floor in true, level plane, except where slope is indicated. [Vary width of edge tiles as necessary to maintain full-size tiles in field, but no edge tile shall be less than one-half full size, except where irregular-shaped rooms makes it impossible.] Flooring shall be cut to, and fitted around, all permanent fixtures, built-in furniture and cabinets, pipes, and outlets. Flooring shall be cut, fitted, and scribed to walls and partitions after field flooring has been applied.

3.10 PLACING FEATURE STRIPS

Install feature strips in accordance with manufacturer's printed installation instructions. Prepare and apply adhesives in accordance with manufacturer's printed directions.

3.11 PLACING MOULDING

Provide moulding where flooring termination is higher than the adjacent finished flooring and at transitions between different flooring materials. When required, locate moulding under door centerline. Moulding is not required at doorways where thresholds are provided. [Secure moulding with adhesive as recommended by the manufacturer. Prepare and apply adhesives in accordance with manufacturer's printed directions.] [Anchor aluminum moulding to floor surfaces as recommended by the manufacturer.]

3.12 PLACING WALL BASE

Install wall base in accordance with manufacturer's printed installation instructions. Prepare and apply adhesives in accordance with manufacturer's printed directions. Tighten base joints and make even with adjacent resilient flooring. Fill voids along the top edge of base at masonry walls with caulk. Roll entire vertical surface of base with hand roller, and press toe of base with a straight piece of wood to ensure

proper alignment. Avoid excess adhesive in corners.

3.13 PLACING STAIR TREADS, RISERS, AND STRINGERS

NOTE: Installation of stringers can be labor intensive. Dependent on the project requirements consider other stringer finish alternatives, an example would be a painted stringer.

Secure and install stair treads, risers, and stringers in accordance with manufacturer's printed installation instructions. Cover the surface of treads and risers[the full width of the stairs][within 150 mm6 inch to the stair edges]. Provide equal length pieces butted together to cover the treads and risers for stairs wider than manufacturer's standard lengths. [Provide stringer angles on both the wall and banister sides of the stairs, and landing trim.]

3.14 PLACING INTEGRAL COVED BASE

Install integral cove base in accordance with manufacturer's printed installation instructions. Prepare and apply adhesives in accordance with manufacturer's printed directions. Shape integral coved base by extending the flooring material [100] [150] [_____] mm [4] [6] [_____] inch onto the wall surface. Support cove by a filler. Provide a cap strip at the top of the base. Fill voids along the top edge of base at masonry walls with caulk.

3.15 CLEANING

NOTE: Some activities prefer no-wax maintenance; others prefer waxing. Pre-waxed flooring and flooring that does not require wax need not be waxed after installation if properly protected. Coordinate any requirements for application of polish/floor finish with the end user. Modify paragraph accordingly.

Immediately upon completion of installation of flooring in a room or an area, dry/clean the flooring and adjacent surfaces to remove all surplus adhesive. Clean flooring as recommended in accordance with manufacturer's printed maintenance instructions. No sooner than 5 days after installation, wash flooring with a nonalkaline cleaning solution, rinse thoroughly with clear cold water, and, except for rubber flooring and stair treads, risers and stringers, vinyl and other flooring not requiring polish finish by manufacturer, apply the number of coats of polish in accordance with manufacturer's written instructions. Clean and maintain all other flooring as recommended by the manufacturer.

3.16 WASTE MANAGEMENT

NOTE: Diverting waste from the landfill contributes to the following LEED credit: MR2. Coordinate with Section 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT. Designer will verify that items are

able to be disposed of as specified.

Separate offcuts and waste materials and reuse or recycle in accordance with the Waste Management Plan, keeping sheet materials larger than 0.2 square m 2 square feet and tiles larger than 1/2 tiles separate for reuse. Identify manufacturer's policy for collection or return of construction scrap, unused material, demolition scrap, and/or packaging material. [Shred scrap cork and linoleum for composting on site.]Place materials defined as hazardous or toxic waste in designated containers and dispose of properly. Close and seal tightly partly used sealant and adhesive containers and store protected in a well ventilated fire-safe area at moderate temperature.

3.17 PROTECTION

From the time of installation until acceptance, protect flooring from damage as recommended by the flooring manufacturer. Remove and replace flooring which becomes damaged, loose, broken, or curled and wall base which is not tight to wall or securely adhered.

-- End of Section --