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USACE / NAVFAC / AFCEC / NASA UFGS-09 64 23 (August 2016)  
Change 3 - 11/18  
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Preparing Activity: USACE Superseding  
UFGS-09 64 23 (August 2010)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated October 2020

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08/16

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#### SECTION 09 64 23

##### WOOD PARQUET FLOORING 08/16

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NOTE: This guide specification covers the requirements for wood parquet flooring systems.

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 item(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 \(CCR\)](#).

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#### PART 1 GENERAL

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NOTE: On the drawings, show:

1. Location and extent of wood parquet flooring.
2. Where flooring is to be installed on concrete slab, indicate elevation of the top(s) of concrete slab.
3. Locations of equipment, columns, and other permanent obstructions adjoining flooring and around which flooring is to be laid.
4. Floor pattern that differs from conventional checkerboard pattern and is not defined by file sample.

## 5. Profile of shoe mold.

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### 1.1 REFERENCES

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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 Reference Identifier (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.

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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.

#### AMERICAN FOREST FOUNDATION (AFF)

ATFS STANDARDS (2015) American Tree Farm System Standards of Sustainability 2015-2020

#### APA - THE ENGINEERED WOOD ASSOCIATION (APA)

APA E30 (2016) Engineered Wood Construction Guide

#### ASTM INTERNATIONAL (ASTM)

ASTM D226/D226M (2017) Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing

ASTM E648 (2019a) Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source

#### CALIFORNIA DEPARTMENT OF PUBLIC HEALTH (CDPH)

CDPH SECTION 01350 (2010; Version 1.1) Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers

CSA GROUP (CSA)

CSA Z809-08 (R2013) Sustainable Forest Management

FOREST STEWARDSHIP COUNCIL (FSC)

FSC STD 01 001 (2015) Principles and Criteria for Forest Stewardship

HARDWOOD PLYWOOD AND VENEER ASSOCIATION (HPVA)

HPVA EF (2012) American National Standard for Engineered Wood Flooring

NATIONAL WOOD FLOORING ASSOCIATION (NWFA) (formerly NOFMA)

NOFMA Grading Rules (1999) Official Flooring Grading Rules

PROGRAMME FOR ENDORSEMENT OF FOREST CERTIFICATION (PEFC)

PEFC ST 2002:2013 (2015) PEFC International Standard Chain of Custody of Forest Based Products Requirements

RESILIENT FLOOR COVERING INSTITUTE (RFCI)

FLOORSCORE FLOORSCORE IAQ Certification

SCIENTIFIC CERTIFICATION SYSTEMS (SCS)

SCS SCS Global Services (SCS) Indoor Advantage

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)

SCAQMD Rule 1113 (2016) Architectural Coatings

SCAQMD Rule 1168 (2017) Adhesive and Sealant Applications

SUSTAINABLE FOREST INITIATIVE (SFI)

SFI 2015-2019 (2015) Standards, Rules for Label Use, Procedures and Guidance

UNDERWRITERS LABORATORIES (UL)

UL 2818 (2013) GREENGUARD Certification Program For Chemical Emissions For Building Materials, Finishes And Furnishings

## 1.2 SUBMITTALS

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**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.

The "S" following a submittal item indicates that the submittal is required for the Sustainability eNotebook to fulfill federally mandated sustainable requirements in accordance with Section 01 33 29 SUSTAINABILITY REPORTING. Locate the "S" submittal under the SD number that best describes the submittal item.

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

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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.] Submittals with an "S" are for inclusion in the Sustainability eNotebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Hardwood Parquet Flooring

SD-04 Samples

Hardwood Parquet Flooring

SD-07 Certificates

Certified Sustainably Harvested Hardwood Parquet Flooring; S

Indoor Air Quality for Hardwood Parquet Flooring; S

Indoor Air Quality for Primer; S

Indoor Air Quality for Adhesive; S

## SD-08 Manufacturer's Instructions

Accessories and Supporting Materials

Adhesive

Finish

Premolded Cork Strips

Polyurethane Coating

Wax Finish

## SD-10 Operation and Maintenance Data

Flooring Materials; G[, [\_\_\_\_\_]]

## SD-11 Closeout Submittals

Warranty

### 1.3 CERTIFICATIONS

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NOTE: Use certified sustainably harvested wood where suitable for application and cost effective. Sustainably Harvested Wood is a product which comes from a third-party Forestry Certification Program and thus carries certain characteristics: 1) Protection of biodiversity, species at risk and wildlife habitat, sustainable harvest levels, protection of water quality, and prompt regeneration (e.g., replanting and reforestation); 2) Third-party certification audits performed by accredited certification bodies; 3) Publicly available certification audit summaries; 4) Multi-stakeholder involvement in a standards development process; 5) Complaints and appeals process.

Verify suitability, availability within the region, cost effectiveness and adequate competition before specifying these sustainably harvested wood certifications - if these conditions are verified for the project locale, include the following section. For projects pursuing LEED, delete certifications other than FSC; for all other projects pursuing third-party certification allow the entire list of third party certifications.

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#### [1.3.1 Certified Sustainably Harvested Wood

Provide wood certified as sustainably harvested by FSC STD 01 001[, ATFS STANDARDS, CSA Z809-08, SFI 2015-2019, or other third party program certified by PEFC ST 2002:2013]. Provide a letter of Certification of Sustainably Harvested Wood signed by the wood supplier. Identify certifying organization and their third party program name and indicate compliance with chain-of-custody program requirements. Submit sustainable

wood certification data; identify each certified product on a line item basis. Submit copies of invoices bearing certification numbers.

#### 1.3.2 Indoor Air Quality Certifications

Submit required indoor air quality certifications in one submittal package.

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**NOTE: Include this subpart requiring low VOC  
content products when product will be located in  
offices or classrooms**

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##### 1.3.2.1 Floor Covering Materials

Provide hardwood parquet flooring product certified to meet indoor air quality requirements by **FLOORSCORE**, **UL 2818** (GreenGuard) Gold, **SCS** Global Services Indoor Advantage Gold or provide certification or validation by other third-party program that products meet the requirements of this Section. Provide current product certification documentation from certification body. When product does not have certification, provide validation that product meets the indoor air quality product requirements cited herein.

##### 1.3.2.2 Paints and Coatings

Provide primer product certified to meet indoor air quality requirements by **UL 2818** (Greenguard) Gold, **SCS** Global Services Indoor Advantage Gold or provide certification or validation by other third-party program that products meet the requirements of this Section. Provide current product certification documentation from certification body. When product does not have certification, provide validation that product meets the indoor air quality product requirements cited herein.

##### 1.3.2.3 Adhesives and Sealants

Provide products certified to meet indoor air quality requirements by **UL 2818** (Greenguard) Gold, **SCS** Global Services Indoor Advantage Gold or provide certification or validation by other third-party program that products meet the requirements of this Section. Provide current product certification documentation from certification body. When product does not have certification, provide validation that product meets the indoor air quality product requirements cited herein.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the building site in original, unopened packages, bundles, or containers. Protect materials against dampness during shipment and after delivery. Store materials under cover in a well ventilated building where materials will not be exposed to extreme changes of temperature and humidity. Do not store materials in buildings under construction until all wet-applied building materials are dry. Do not open packages, bundles, or containers until the flooring is to be installed. Remove rejected material from Government property. Keep materials wrapped and separated from off-gassing materials, such as paints and adhesives. Do not use materials that have visible moisture or biological growth.

## 1.5 ENVIRONMENTAL REQUIREMENTS

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NOTE: Control of temperature and humidity prior to laying flooring is necessary to prevent buckling and cupping. Since climatic conditions vary due to geographical location and the trend is toward natural ventilation for energy conservation, it is imperative to check with flooring manufacturer and local installers to determine correct temperature and humidity ranges for the project area.  
\*\*\*\*\*

Store the parquet flooring in the building or space where the parquet flooring is to be laid for a minimum of 3 days to allow absorbed moisture to evaporate. Separate the wood parquet so that all pieces are exposed to the air during this 3-day period to allow uniform acclimation. Maintain the temperature of the building or space between [21 and 10] [[\_\_\_\_\_] and [\_\_\_\_\_] ] degrees C [70 and 50] [[\_\_\_\_\_] and [\_\_\_\_\_] ] degrees F, and maintain the relative humidity between [30 and 65] [[\_\_\_\_\_] and [\_\_\_\_\_] ] percent. Maintain the preceding temperatures and humidity conditions throughout the installation period.

## 1.6 SCHEDULING

Schedule parquet flooring work after completion of any other work which would raise the moisture content of the flooring or damage the finished surface of the flooring. See PART 3 for additional scheduling requirements.

## 1.7 WARRANTY

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

## PART 2 PRODUCTS

### 2.1 FLOORING MATERIALS

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NOTE: Select the type of flooring to be used on the appropriate project design requirements, availability, and relative cost. The method of specifying the pattern is optional, but the "file sample" is recommended for projects for which the design is sensitive.

Acrylic impregnated hardwood floors are recommended for commercial type facilities. Prefinished urethane and stain/wax prefinishes are normally for residential or light commercial usage.

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 or 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 sentence if not applicable.

Use certified sustainably harvested wood where suitable for application and cost effective. Verify availability within the region, cost effectiveness, and adequate competition before specifying this certification.

Include last bracketed sentences requiring certification for indoor air quality when product will be located in offices or classrooms.

In termite-prone areas, wood should be termite treated. Verify with manufacturers on availability and effect on finishes.

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Provide [hardwood parquet flooring](#) conforming to [NOFMA Grading Rules](#). [The flooring must match the color and pattern of the sample on file at the office of the Contracting Officer.] [Pattern must be [\_\_\_\_\_] [as indicated].] Hardwood flooring in corridors and exits must have a minimum average critical radiant flux of [0.22] [0.45] watts per square centimeter when tested in accordance with [ASTM E648](#). Provide wood products with no added urea-formaldehyde resins. Submit manufacturer's descriptive data, documentation stating physical characteristics and flame resistance, installation instructions and [two] [\_\_\_\_\_] samples of each type of parquet flooring. Provide samples, minimum [300 x 300 mm 12 x 12 inches](#). Submit statement from the manufacturer attesting that the materials meet the specified requirements. The statement must be dated after the award of the contract, stating the Contractor's name and address, showing the name of the project and location, and listing the specific requirements being certified. Submit Data Package 1 in accordance with Section [01 78 23 OPERATION AND MAINTENANCE DATA](#). [Provide a product treated for resistance to termite damage.] [Provide [certified sustainably harvested hardwood parquet flooring](#).]

Product must meet emissions requirements of [CDPH SECTION 01350](#). Provide certification or validation of [indoor air quality for hardwood parquet flooring](#).]

#### 2.1.1 Laminated Block Flooring

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NOTE: The species are listed in descending order of wear resistance and hardness. Limit the species, based on quality required and compatibility with color desired or selected for the file sample. Size

of units will depend on pattern selected and should be stated.

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HPVA EF, plain face, factory finished. Fabricate face veneer of each block from [hard maple,] [red oak,] [white oak,] [birch,] [ash,] [beech,] [walnut,] [or] [cherry]. Provide [\_\_\_\_\_] mm inches by [\_\_\_\_\_] mm inches flooring units.

#### 2.1.2 Slat Block Flooring

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NOTE: The species are listed in descending order of wear resistance and hardness. Limit the species, based on quality required and compatibility with color desired or selected for the file sample. Size of units will depend on pattern selected and should be stated.

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APA E30, unfinished, Select and Better Grade, fabricated from [hard maple,] [teak,] [red oak,] [white oak,] [ash,] [walnut,] [or] [cherry]. Provide finishing at the site as specified herein. Provide [\_\_\_\_\_] mm inches by [\_\_\_\_\_] mm inches flooring units.

#### 2.1.3 Solid Block Flooring

##### 2.1.3.1 Grading

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NOTE: The species are listed in descending order of wear resistance and hardness. Limit the species, based on quality required and compatibility with color desired or selected for the file sample. Size of units will depend on pattern selected and should be stated.

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[[Red oak] [or] [white oak] fabricated into [prime] [Standard and Better]] [or] [[hard maple,] [beech,] [or] [birch] fabricated into [First] [Second and Better]] Grade blocks, free from defects and discolorations. Blocks shall be graded in accordance with the rules of the association governing the grading of the species used.

##### 2.1.3.2 Construction

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NOTE: Quarter-sawn oak and edge-grain maple wear better, but the plain-sawn and flat-grain cuts are adequate and should be allowed for most projects.

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[Oak must be quarter-sawn [or plain-sawn].] [Maple must be edge-grain [or flat-grain].] Fasten the strips composing each block together tightly in a manner that will maintain the integrity of the block. Each block must have a standard flooring tongue or corresponding matching grooves on each of the four edges, so arranged that the blocks can be laid in the conventional checkerboard pattern with the strips of each block at right angles to the strips of the adjacent blocks. The back of each strip in

the block may be flat or channeled. Face edges of blocks must not be beveled.

#### 2.1.3.3 Dimensions

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NOTE: When red or white oak is specified, specify tolerances of plus or minus 0.80 mm 1/32 inch in length and plus or minus 0.40 mm 1/64 inch in width. When other species are specified, use first bracketed phrase.  
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Blocks must be 228.6 mm 9 inches square [plus or minus 0.40 mm 1/64 inch in length and width] [plus or minus 0.80 mm 1/32 inch in length and plus or minus 0.40 mm 1/64 inch in width] and must be not less than 19 mm 3/4-inch thick. The length of the face diagonals of each block must be within 0.80 mm 1/32 inch to ensure squareness.

#### 2.1.3.4 Moisture Content

Not less than 5 percent or more than 12 percent at time of shipment.

#### 2.1.3.5 Finish

[Apply finish at the factory.] [Ship flooring to the site with a smooth surface without applied finish. Provide finish specified herein at the site.]

#### 2.1.4 Premolded Cork Strips

Cork strips must be the same depth as the flooring and of width recommended by flooring manufacturer.

#### 2.1.5 Accessories and Supporting Materials

Submit manufacturer's safety data sheets for adhesives, finishes, and other materials which may be considered hazardous because of toxicity, flammability, VOC's, or reactivity.

##### 2.1.5.1 Wax Finish

As recommended by flooring manufacturer.

##### 2.1.5.2 Asphalt Saturated Felt

ASTM D226/D226M.

##### 2.1.5.3 Adhesive

Waterproof, suitable for use with [subflooring] [underlayment] used, and as recommended by flooring manufacturer. Provide non-aerosol adhesive products used on the interior of the building (defined as inside of the weatherproofing system) that are certified to meet either emissions requirements of CDPH SECTION 01350 (limit requirements for either office or classroom spaces regardless of space type) or VOC content requirements of SCAQMD Rule 1168. Provide certification or validation of indoor air quality for adhesive.

#### 2.1.5.4 Primer

Primer shall be of a type recommended by flooring manufacturer. Provide primer product certified to meet either emissions requirements of [CDPH SECTION 01350](#) (limit requirements for either office or classroom spaces regardless of space type) or VOC content requirements of [SCAQMD Rule 1113](#). Provide certification or validation of [Indoor Air Quality for Primer](#).

#### 2.1.5.5 Shoe Molds

[Hard maple,] [red oak,] [white oak,] [ash,] [beech,] [birch,] [walnut,] [or] [cherry]. Shape and size as indicated. Prefinish shoe molds to match flooring.

### 2.2 FLOORING SYSTEMS

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**NOTE: Select flooring system to be used.**  
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#### 2.2.1 Flooring on Concrete Slabs

The system consists of the application of block flooring on concrete slabs by means of adhesive.

#### 2.2.2 Flooring on [Subflooring] [Underlayment]

The system consists of the application of block flooring on [subflooring] [underlayment]. The provision of [subflooring] [underlayment] is specified in Section [\_\_\_\_]. The application of block flooring must be by means of [nails] [adhesive].

## PART 3 EXECUTION

### 3.1 PREPARATION OF SURFACES

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**NOTE: If flooring is to be applied on slab-on-ground construction, site grading and drainage should be such that water will not collect under slab. A polyethylene vapor barrier of not less than 0.15 mm 6 mils thick and at least 150 mm 6 inches of porous fill consisting of clean, washed gravel graded from 19 to 38 mm 3/4 inch to 1-1/2 inch sizes should be specified in Division 3. A single-ply, asphalt-saturated felt or 0.15 mm 6 mil polyethylene film set in asphalt may be applied to top of slab if acceptable to flooring manufacturer. Add to this paragraph, if warranted.**  
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#### 3.1.1 Concrete Slabs

Do not install flooring on surfaces that are unsuitable for proper installation. Before work is begun, correct defects such as rough or scaling concrete, low spots and high spots, uneven surfaces, and all damaged portions of concrete slabs. If concrete curing compounds or surface sealers have been applied to the concrete slabs, remove the

compounds and sealers from the slabs by an approved method. Concrete slabs must be level [within tolerance specified in the Section 03 30 00 CAST-IN-PLACE CONCRETE] [within a tolerance of 2 mm/meter 0.25 inch per 10 feet.]

#### 3.1.2 [Underlayment] [Subflooring]

Repair damaged portions, and replace defective boards with sound boards; renail loose or warped boards, and drive protruding or loose nails flush.

#### 3.1.3 Adhesive-Applied Wood Flooring on Concrete Slab

Clean concrete floor slabs that are to receive flooring. Remove spots of [paint,] [plaster,] [masonry droppings,] grease, dirt, and other foreign matter.

#### 3.1.4 Nailed Wood Flooring on [Subflooring] [Underlayment]

Cover [subflooring] [underlayment] over which nailed wood flooring is to be laid with a layer of asphalt saturated felt. Lap all edges at least 50 mm 2 inches.

#### 3.1.5 Adhesive-Applied Wood Flooring on [Subflooring] [Underlayment]

Prepare [subflooring] [underlayment] in accordance with the printed instructions of the flooring manufacturer.

### 3.2 INSTALLATION

Do not install flooring until other work that might cause damage to flooring has been completed, until all wet work is completed and has cured for [14] [\_\_\_\_\_] days, and until exterior openings are closed. Cure new concrete slabs to receive flooring a minimum of 60-days before application of flooring. Perform flooring installation, including sanding and finishing, in conformance with manufacturer's printed instructions. Provide mechanical ventilation of area receiving flooring as required to maintain concentrations of toxic gases and explosive vapors below permissible levels.

Do not install building construction materials that show visual evidence of biological growth.

#### 3.2.1 Flooring on Concrete Slabs

Apply block flooring on concrete slabs in accordance with the flooring manufacturer's printed instructions.

#### 3.2.2 Flooring on [Subflooring] [Underlayment]

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**NOTE: Wood or plywood subflooring or hardboard underlayment should be specified in Section 06 10 00 ROUGH CARPENTRY of the project specifications.**  
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[In applying wood blocks with nails, lay blocks with close joints when nailing to [subflooring] [underlayment]. Drive blocks firmly together, and blind-nail each block.] [In applying block flooring with an adhesive, use the materials and follow the methods stipulated in the manufacturer's

printed instructions.]

### 3.2.3 Expansion Spaces

Provide expansion spaces at walls and partitions. Size expansion spaces as recommended by flooring manufacturer. Install premolded cork strips in expansion spaces in accordance with flooring manufacturer's directions.

### [3.2.4 Shoe Molds

Nail shoe molds to baseboards. [Baseboards are specified in Section [\_\_\_\_].]

## ]3.3 SANDING AND FINISHING [SLAT] [SOLID] BLOCK FLOORING

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**NOTE: Coordinate these requirements with Section  
09 90 00 PAINTS AND COATINGS of the project  
specifications.**

**If prefinished flooring is used, delete this  
paragraph.**

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### 3.3.1 Sanding

Sand and buff floors to smooth and level surface, free of sanding marks and in proper condition to receive the finish specified. After final sanding and buffing, vacuum or tack floors in accordance with finish manufacturer's recommendations. Wipe off foot marks.

### 3.3.2 Finishing

After final sanding and buffing have been completed, apply two coats of finish; use **polyurethane coating** recommended by flooring manufacturer for type and specie of wood flooring specified. When floors are dry, apply two coats of wax, unless otherwise recommended in writing by manufacturer of flooring. Spread at rate of **0.07 L/10 square meters one gallon per 1,500 square feet**. Within 15 to 30 minutes after wax application, polish floors with weighted floor brush or electric polisher.

## 3.4 PROTECTION

After completion of laying [and the finishing and drying] of floors, cover flooring immediately with nonstaining kraft building paper. Lap and tape edges of paper. At project completion and acceptance, carefully take up and remove the protective paper.

-- End of Section --