
USACE / NAVFAC / AFCEC / NASA UFGS-09 64 23 (August 2016)
Change 1 - 08/17

Preparing Activity: USACE Superseding
UFGS-09 64 23 (August 2010)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2017

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08/16

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SECTION 09 64 23

WOOD PARQUET FLOORING 08/16

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).

PART 1 GENERAL

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.

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 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.

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 (2009) Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing

ASTM E648 (2017) 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 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	(2000) 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	(2004) Architectural Coatings
SCAQMD Rule 1168	(1989; R 2005) 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

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.

Use the "S" classification only in SD-11 Closeout Submittals. 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.

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.] 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 Wood; G[, [_____]]

Indoor Air Quality; G[, [_____]]

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

Certified Sustainably Harvested Hardwood Parquet Flooring; S

Indoor Air Quality for Hardwood Parquet Flooring; S

Indoor Air Quality for Wax Finish Material; S

Indoor Air Quality for Primer; S

Indoor Air Quality for Adhesive; S

Warranty

1.3 CERTIFICATIONS

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.

Designer must 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.

[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.

[1.3.2.1 Floor Covering Materials

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

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 validation by other third-party program that products meet the requirements of this paragraph. Product must meet emissions requirements of CDPH SECTION 01350. Provide current product certification documentation from certification body.

]1.3.2.2 Paints and Coatings

Provide wax finish and primer products 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 current product certification documentation from certification body.

1.3.2.3 Adhesives and Sealants

Provide sealants and 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 current product certification documentation from certification body.

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

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 PRODUCT SUSTAINABILITY CRITERIA

For products in this section, where applicable and to extent allowed by performance criteria, provide and document the following:

[2.1.1 Certified Sustainably Harvested Wood

NOTE: Use certified sustainably harvested wood where suitable for application and cost effective. Designer must verify suitability, availability within the region, cost effectiveness, and adequate competition before specifying these certifications.

Certified sustainably harvested wood is identified for some products in this section; provide documentation in accordance with Section 01 33 29 SUSTAINABILITY REPORTING paragraph BIOBASED PRODUCTS. Other products listed in this section may be available as certified sustainably harvested wood; identify those products that meet project requirements for certified sustainably harvest wood, and provide documentation in accordance with Section 01 33 29 SUSTAINABILITY REPORTING paragraph BIOBASED PRODUCTS.

12.1.2 Reduce Volatile Organic Compounds (VOC) (LOW-EMITTING MATERIALS) for Products

Reduced VOC content is identified for some products in this section; provide documentation in accordance with Section 01 33 29 SUSTAINABILITY REPORTING paragraph REDUCE VOLATILE ORGANIC COMPOUNDS (VOC) (LOW-EMITTING MATERIALS). Other products listed in this section may be available with reduced VOC content; identify those products that meet project requirements for reduced VOC content, and provide documentation in accordance with Section 01 33 29 SUSTAINABILITY REPORTING paragraph REDUCE VOLATILE ORGANIC COMPOUNDS (VOC) (LOW-EMITTING MATERIALS).

2.2 FLOORING MATERIALS

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. Designer must verify suitability, availability within the region, cost effectiveness, and adequate competition before specifying this certification.

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

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 certified sustainably harvested hardwood parquet flooring.]

Provide certification of indoor air quality for hardwood parquet flooring.]

2.2.1 Laminated Block Flooring

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.

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.

2.2.2 Slat Block Flooring

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.

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.

2.2.3 Solid Block Flooring

2.2.3.1 Grading

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.

[[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.

2.2.3.2 Construction

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.

[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.

2.2.3.3 Dimensions

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.

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.

2.2.3.4 Moisture Content

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

2.2.3.5 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.]

2.2.4 Premolded Cork Strips

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

by flooring manufacturer.

2.2.5 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.

2.2.5.1 Wax Finish

As recommended by flooring manufacturer. Provide certification of indoor air quality for wax finish material.

2.2.5.2 Asphalt Saturated Felt

ASTM D226/D226M.

2.2.5.3 Adhesive

Waterproof, suitable for use with [subflooring] [underlayment] used, and as recommended by flooring manufacturer. Provide certification of indoor air quality for adhesive.

2.2.5.4 Primer

Primer shall be of a type recommended by flooring manufacturer. Provide certification of Indoor Air Quality for Primer

2.2.5.5 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.

2.3 FLOORING SYSTEMS

NOTE: Select flooring system to be used.

2.3.1 Flooring on Concrete Slabs

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

2.3.2 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

**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.

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 00.00 10 CAST-IN-PLACE CONCRETE] [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]

NOTE: Wood or plywood subflooring or hardboard underlayment should be specified in Section 06 10 00 ROUGH CARPENTRY of the project specifications.

[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

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

If prefinished flooring is used, delete this paragraph.

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 --