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References are in agreement with UML dated 23 June 2005

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SECTION 09643

PORTABLE (DEMOUNTABLE) WOOD FLOORING 08/04

NOTE: This guide specification covers the requirements for portable (demountable) wood flooring for use in enclosed multipurpose areas.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

NOTE: On the drawings, show:

1. Elevation of top of concrete slab on which floor system is to be installed
2. Location of equipment around which flooring is to be installed
3. Locations of, and structural provisions for, anchor-plate assemblies for sports equipment
4. Plan of floor system showing overall dimension of portable panels, sizes and installation pattern of floor panels, and game line markings
5. Storage spaces for floor panels and flat bed, four-wheel storage trucks.

PART 1 GENERAL

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.

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

AWPA C1	(2000) All Timber Products - Preservative Treatment by Pressure Processes
AWPA C2	(2001) Lumber, Timber, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes

MAPLE FLOORING MANUFACTURERS ASSOCIATION (MFMA)

MFMA FFL/HDGF	(2003) Athletic Floor Sealer and Finish Specifications and Conformance List #22
MFMA GRHM	(2000) Grading Rules for MFMA Northern Hardwood Maple

1.2 SUBMITTALS

NOTE: Review submittal description (SD) definitions in Section 01330 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

A "G" following a submittal item indicates that the submittal requires Government approval. Some

submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" 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.] [for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Flooring system

Submit drawings indicating the overall layout, the panel numbers, and the complete details of the floor system. Include all assembly and disassembly instructions.

SD-04 Samples

Wood floor unit[; G][; G, [_____]]

Accessories

Submit one wood floor unit, which shall consist of two completely finished, interlocked partial panels. Each partial panel shall be 915 by 915 mm 36 by 36 inches.

SD-08 Manufacturer's Instructions

Wood flooring unit assembly

Wood flooring unit storage

Finishing

SD-10 Operation and Maintenance Data

Finish Maintenance, Data Package 1; [; G][; G, [____]]

Submit in accordance with Section 01781 OPERATION AND
MAINTENANCE DATA.

1.3 DELIVERY AND STORAGE

Deliver floor materials to the building site in original containers, properly assembled and thoroughly protected by providing flat-strapped wire, fiberboard protectors, blocking, and bulkheading, as necessary. Before the initial assembly and erection, store the floor materials under cover in a well-ventilated, enclosed area so that the floor materials are not exposed to extreme changes in temperature and humidity. Do not store the floor materials in an enclosed area under construction until the concrete, masonry, ceramic tile work, terrazzo, and plaster are dry.

1.4 STANDARD PRODUCT

The portable (demountable) wood flooring system shall be the product of a manufacturer regularly engaged in the production of such wood flooring systems. The Contractor shall provide all accessories required for a finished installation.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Wood Framing Members

NOTE: The pressure-preservative treatment specified herein shall be modified in accordance with the recommendations made by the special assistant for entomology and wood preservation assigned by NAVFAC directives.

Use kiln-dried, 50 by 75 mm 2 by 3 inch (nominal size), S4S, No. 1 common and better Douglas fir or No. 2 dimension southern pine lumber. The moisture content of the lumber shall not exceed 15 percent. Provide pressure-preservative treatment of the lumber in accordance with AWPA C1 and AWPA C2.

2.1.2 Finish Wood Flooring

**NOTE: Select the appropriate flooring as follows:
First Grade--where fine appearance is desired, e.g., churches, offices, hospitals; Second and Better Grade--stores, schools, factories, and other similar locations; Third and Better Grade--recreation rooms, factories, warehouses, grain storage bins, farm buildings, and other similar locations.**

The flooring shall be First Grade hard maple (acer saccharum), graded in accordance with the MFMA GRHM "Grading Rules for Hard Maple." The flooring shall be [26.2 mm 33/32 inch] [19.8 mm 25/32 inch] thick with a 57 mm 2 1/4

inch face. The flooring shall be kiln dried, continuous tongue-and groove, and end-matched. The flooring shall be clearly stamped: [First Grade] [Second and Better Grade] [Third and Better Grade]. The moisture content of the flooring shall not exceed 8 percent at the time of arrival and shall be not greater than [8 to 10] [8 to 9] percent when installed.

2.1.3 Portable Flooring Subfloor

The subfloor shall be 12.7 mm 1/2 inch thick fir or pine plywood, C-D grade with exterior grade glue, Exposure 1.

2.1.4 Floor Finish Material

The floor finish material shall be selected by the flooring manufacturer from the latest MFMA FFL/HDGF "Floor Finish List." The finish material shall be suitable for the service requirements imposed on the type of portable flooring specified herein.

2.1.5 Kiln Drying

Only flooring which has been kiln dried will be considered to be standard grade.

2.1.6 Edge Grain Flooring

Use edge grain hardwood flooring consisting of pieces with annual rings that range from 30 degrees horizontal to 90 degrees vertical.

[2.1.7 Game Line Marking Materials

Use game line marking materials recommended by the wood floor finish manufacturer.

]2.1.8 Nails

Use coated casing nails, screw nails, staples, or nailing cleats recommended by the flooring manufacturer.

[2.1.9 Storage Trucks

NOTE: If trucks are to be used for storage of floor panels, one truck will be required for each row of floor panels. An 18 by 34 meter A 60 by 112 foot floor will have 15 rows of floor panels, will require 15 storage trucks and 48 square meters 480 square feet of floor space for storage with each row approximately 1065 mm 42 incheshigh.

Use manufacturer-recommended flatbed, four-wheel roller-bearing trucks of approximately 1200 by 2400 mm 4 by 8 feet on which to stack the panels.

]2.1.10 Coating for Flooring Panels

NOTE: Use Group II finish for multipurpose, high-wear areas; use Group III for floors to be utilized solely for sports.

The coating shall conform to MFMA FFL/HDGF "Heavy-Duty and Gymnasium Finishes for Maple, Beech, and Birch Floors"; Group [II] [III] finish.

2.1.11 Moisture, Insect, and Fungi Protection

Prior to shipment, apply to the unfinished portion of the floor system a heavy coating of pigmented, moisture-repellent resin paint with additives to control moisture absorption and to prevent attack by termites and fungi.

2.2 FLOORING SYSTEM

2.2.1 Design

NOTE: The overall dimensions specified cover the optimum floor size for an official basketball court as required by the National Collegiate Athletic Association (NCAA).

NOTE: The section of the project specification pertaining to the subfloor should include the requirement that the subfloor shall not vary more than 6 mm 1/4 inch within an area 3 by 3 meters 10 by 10 feet. If the intent is to install the portable floor over an existing floor, specify the 6 mm 1/4 inch tolerance in paragraph entitled "Inspection of the Subfloors."

Design and construct the system for use over [a concrete floor slab as specified in Section 03300N CAST-IN-PLACE CONCRETE.] [a wood subfloor as specified in Section 06100 ROUGH CARPENTRY.] [an ice rink surface.] [a synthetic floor surface.] The flooring system shall consist primarily of 1200 by 2400 mm and 1200 by 1200 mm 4 by 8 foot and 4 by 4 foot self-aligning and interlocking panels. Each panel shall consist of hardwood strip flooring nailed to subflooring which is nailed to rigid lumber frames.

2.2.2 Assembly and Construction

When assembled, the entire floor surface shall be smooth and level and shall have the overall appearance of being a permanent floor by being properly aligned. No bolts, screws or other fastening or locking devices shall be visible on the floor surface. Design and construct the flooring panels in a manner affording simple and recurrent assembling, interlocking, disassembling, and storing without the use of special tools or equipment. Ensure that all like panels are interchangeable and replaceable. The method of panel assembling and locking shall preclude inadvertent disassembling under all types of playing conditions. Where they are used, the projecting tongues interlocking the flooring sections shall be wood, metal, metal-clad, or another material approved by the Contracting Officer.

2.3 SHOP FABRICATION AND PREASSEMBLY

2.3.1 Framing

Use jigs for each fabrication operation to provide for maximum accuracy. Space the framing members at a maximum of 300 mm 12 inches on center. Fasten the framing members and blocking from the top. The bottom surfaces of the framing and blocking shall be free of protrusions or sharp edges that could prevent proper seating of the finished panel or could prevent stacking of the panels for storage or shipment. The frames shall be rigid, square, level, and true.

2.3.2 Finished Flooring

Lay the finished flooring over [the subflooring and] the framing members, running the flooring parallel with the long dimensions of the panels. Stagger the adjacent ends of the flooring strips so that there will be at least two strips of flooring between the joints.

2.3.2.1 Fastening the Finished Flooring

Fasten the finished flooring to [the subflooring and] the framing members with coated nails, screw nails, staples, or nailing cleats. Fasten each strip of flooring at each bearing. Provide for any normal expansion, contraction, or aeration in each panel.

2.3.3 Preassembly

Prior to shipment, preassemble the entire floor at the factory with all panels interlocked, and prepare for the sanding and finishing operations specified herein. Maintain proper temperatures and humidity conditions necessary to retain the quality of the flooring. During the preassembling of the flooring, note any inaccuracies, misalignments, or other defects, and make the necessary corrections before shipping the panels. Letter or number each panel on its the ends to indicate its position in the assembling of the floor.

2.4 [SHOP] [FIELD] SANDING, FINISHING, AND MARKING

**NOTE: If it is preferred to have the sanding,
finishing, and marking performed at the jobsite, the
specification should be modified accordingly.**

2.4.1 Sanding

Machine sand the surface of the wood floor and edging using coarse, medium, and fine grades of sandpaper, respectively, to provide for smooth and level surfaces. Following this perform a final disc sanding of the wood floor.

2.4.2 Finishing

Within 24 hours after the final sanding, sweep the floor clean using a tacky rag with a solvent recommended by the manufacturer of the floor finish material. Apply a liberal coat of sealer to the floor, and thoroughly dry and burnish the floor with No. 2 steel wool using an industrial-type power machine. Repeat this procedure with each coat, as specified in MFMA FFL/HDGF specifications. [After the final burnishing but

prior to the application of the final two finish coats, lay out and mark the game lines as specified herein. After the game lines are thoroughly dry, apply the final two finish coats.]

[2.4.3 Game Line Marking

Lay out the game lines [,] [and] the fields, [and the patterns,] as indicated, masking the edges to provide for sharp, clean edges. The edges shall be straight, and the widths shall be uniform. Apply the markings of colors the indicated, providing a minimum dry film thickness of one mil.

]PART 3 EXECUTION

3.1 INSPECTION OF THE SUBFLOORS

NOTE: The section of the project specification pertaining to the subfloor should include the requirement that the subfloor shall not vary more than 6 mm 1/4 inch within an area 3 by 3 meters 10 by 10 feet. If the intent is to install the portable floor over an existing floor, specify the 6 mm 1/4 inch tolerance in paragraph entitled "Inspection of the Subfloors."

Do not install portable floor systems on subfloors having defects that could prevent proper installation. Before the initial installation of the floor, correct all defects in the subfloor.

3.2 FIELD ASSEMBLY, INSTALLATION, DISASSEMBLY, AND STORAGE

Do not install the floor in an enclosed area under construction until the concrete, masonry, ceramic tile work, terrazzo, and plaster are dry.

3.2.1 Assembly and Installation

Assemble and install the entire floor system at the designed location Unless directed otherwise, the floor system shall remain in place for a minimum of one week to permit inspection by the Contracting Officer.

3.2.2 Disassembly

After the floor system has been inspected and accepted, disassemble the floor system in the manner prescribed by the floor system manufacturer. Correct all deficiencies prior to the storage of the floor system.

3.2.3 Storage

Following the disassembling of the floor system, store the panels within the enclosed area at the location(s) [indicated] [designated by the Contracting Officer] and in accordance with the floor system manufacturer's printed instructions.

3.3 SCHEDULE

Metric measurements in this section are based on mathematical conversion of English unit measurement, and not on metric measurement commonly agreed to by the manufacturers or other parties. The English and metric units for

the measurements shown are as follows:

<u>Products</u>	<u>English Units</u>	<u>Metric Units</u>
Framing members	2 x 3 inches nominal	50 x 75 mm
Flooring	33/32 inch 25/32 inch 2 1/4 inches	26.2 mm 19.8 mm 57 mm
Plywood	1/2 inch	12.7 mm
-- End of Section --		