UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021
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08/16, CHG 1: 08/18

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SECTION 09 65 66

RESILIENT ATHLETIC FLOORING
08/16, CHG 1: 08/18

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NOTE: This guide specification covers the requirements for resilient athletic flooring.

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: Systems specified in this guide specification are recommended for indoor athletic rooms e.g., weight rooms, running tracks, recreational areas, aerobic centers, multi-purpose gym floors, etc. Hardwood flooring is preferable for basketball courts, handball, and racquetball courts. Rubber-base floorings can be used in outdoor installations like wet bars, running tracks, tennis courts, and swimming pool walks.
****

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.

ASTM INTERNATIONAL (ASTM)

ASTM C920	(2018) Standard Specification for Elastomeric Joint Sealants
ASTM D395	(2016; E 2017) Standard Test Methods for Rubber Property - Compression Set
ASTM D412	(2016) Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension
ASTM D624	(2000; R 2020) Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
ASTM D1054	(2002; R 2007) Rubber Property - Resilience Using a Rebound Pendulum
ASTM D1894	(2014) Static and Kinetic Coefficients of Friction of Plastic Film and Sheeting
ASTM D2240	(2015; E 2017) Standard Test Method for Rubber Property - Durometer Hardness
ASTM D2632	(2015; R 2019) Standard Test Method for Rubber Property-Resilience by Vertical Rebound
ASTM E648	(2019a) Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
ASTM F1303	(2004; R 2014) Sheet Vinyl Floor Covering with Backing

ASTM F1869	(2016a) Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
ASTM F2170	(2019a) Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
ASTM F2772	(2011) Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems
ASTM G21	(2015) Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

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

CARPET AND RUG INSTITUTE (CRI)

CRI GL CUSHION	Green Label Cushion Program
CRI GLP QM	(2017) Green Label Plus Quality Manual

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 9001	(2015) Quality Management Systems-Requirements
ISO 14001	(2015) Environmental Management Systems – Requirements with Guidance for Use

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

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, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified 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 Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters 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" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

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" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification 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

Approved Detail Drawings; G[, [_____]]

SD-03 Product Data

Installation

Indoor Air Quality for Rubber Poured-In-Place Flooring; S

Indoor Air Quality for Urethane Poured-In-Place Flooring; S

Indoor Air Quality for Adhesives; S

Indoor Air Quality for Primer; S

Indoor Air Quality for Game Line Marking Materials; S

SD-04 Samples

Flooring

SD-06 Test Reports

Laboratory Test Results

SD-07 Certificates

Indoor Air Quality for Indoor-Outdoor Carpeting; S

Indoor Air Quality for Rubber Composition Tile; S

Indoor Air Quality for Sheet Rubber Composition Flooring; S

Indoor Air Quality for Sheet Vinyl Composition Flooring; S

Indoor Air Quality for Resilient Mat Underlay; S

Indoor Air Quality for Wall Base; S

SD-11 Closeout Submittals

Warranty

1.3 QUALITY ASSURANCE

1.3.1 Shop Drawings

Provide approved detail drawings showing, as a minimum, installation details and locations of borders, patterns, and locations of floor seams.

1.3.2 Manufacturer Qualifications

Manufacturer must have at least ten years active experience in the manufacturing and marketing of indoor resilient athletic flooring, and be a certified manufacturer in accordance with ISO 9001 and ISO 14001. Manufacturer must also have an authorized installer training program.

1.3.3 Installer Qualifications

Installer must have at least five years of experience in the installation of resilient athletic flooring, and have experience on at least five projects of similar size, type and complexity as this Project. Installer must also utilize workers for this Project who are competent in techniques required by manufacturer of resilient athletic flooring installation indicated.

1.3.4 Laboratory Test Results

1.3.4.1 Performance Properties

Provide certification documents indicating testing per ASTM F2772 has been

performed and the product being supplied complies with the ASTM category/classification specified for this project. Information from product catalogs or sales literature is not sufficient.

1.3.4.2 Shock Absorption

Shock absorption (force reduction) test results certified by an independent testing laboratory certified to perform such testing.

a. ASTM test must be from certified North American laboratories.

b. EN and DIN test must be from certified European laboratories.

1.3.4.3 Fire Performance

Provide fire performance test results.

1.3.5 Fire Test Characteristics

As determined by testing identical products according to ASTM E648, Class 1, by a qualified testing agency acceptable to authorities having jurisdiction.

1.3.6 Athletic Performance Properties

Comply with ASTM F2772 Performance Level C2 for force reduction and ball rebound.

1.3.7 Adhesive Application

Adhesive applied and poured-in-place flooring must be installed by an experienced floor applicator approved by the manufacturer.

1.3.8 Flooring Material Samples

Submit three samples minimum 225 x 275 mm 9 x 11 inches of each color of flooring material required and manufacturer's certificates stating that the resilient athletic flooring materials conform to the specified requirements. Labels or markings affixed to manufacturer's products attesting that products meet requirements specified herein will be accepted in lieu of certificates.

1.4 CERTIFICATIONS

1.4.1 Indoor Air Quality Certifications

Submit required indoor air quality certifications in one submittal package.

1.4.1.1 Floor Covering Materials

Provide rubber composition tile, sheet rubber composition flooring, sheet vinyl composition flooring, and wall base products 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 resilient mat underlay products certified to meet indoor air quality requirements by FLOORSCORE, UL 2818 (GreenGuard) Gold, SCS Global Services Indoor Advantage Gold, CRI GL CUSHION or provide certification or validation by other third-party

program that products meet the requirements of this Section. Provide indoor-outdoor carpeting products certified to meet indoor air quality requirements by UL 2818 (GreenGuard) Gold, SCS Global Services Indoor Advantage Gold, CRI GLP QM 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.

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver Materials in manufacturer's original unopened containers with labels intact. Materials shall not be delivered to the installation area or installed before all work that may damage the materials or the finished floor, such as overhead work, is completed. Store materials in a clean, dry area. Materials in storage shall be maintained at temperatures recommended by the manufacturer. Protection boards shall be stored flat and off the ground.

a. Store flooring and installation materials in protected dry spaces, with ambient temperatures maintained within range recommended by manufacturer, but less than 13 degrees C 55 degrees F nor more than 29 degrees C 85 degrees F.

b. Store the indoor resilient athletic surfacing rolls in an upright position on a smooth flat surface immediately upon delivery to Project.

1.6 WARRANTY

1.6.1 Manufacturer's Warranty

Manufacturer's standard form in which manufacturer agrees to repair or replace sports flooring that fails within specified warranty period. Material warranty must be direct from the product manufacturer. Material warranties from separate or third party insurance providers are not valid. Material warranties from private label distributors are not valid.

Failures include, but are not limited to, the following:

a. Material manufacturing defects.

b. Surface wear and deterioration to the point of wear-through.

c. Failure due to substrate moisture exposure not exceeding 80 percent relative humidity when tested according to ASTM F2170 or 5 pounds moisture vapor emission rate when tested according to ASTM F1869.

1.6.1.1 Warranty Period

For materials: Minimum of 2 years from date of Substantial Completion. For surface wear: minimum of 15 years from date of Substantial Completion.

1.6.2 Installer's Warranty

Installer's standard form in which installer agrees to repair or replace sports flooring that fails due to poor workmanship or faulty installation within the specified warranty period.

1.7 COORDINATION

Coordinate layout and installation of flooring with other gymnasium equipment.

1.8 EXTRA MATERIALS

1.8.1 Floor Tiles

Furnish spare tiles of each color at the rate of [_____] [5] tiles for each 1000 tiles installed. Tiles must be from the same lot as those installed.

1.8.2 Carpeting

Extra material from same dye lot consisting of full width continuous broadloom must be provided for maintenance. A minimum of [_____] percent of total square meters square yards of each carpet type, pattern, and color must be provided.

PART 2 PRODUCTS

****
NOTE: If more than one type of resilient flooring is required, a separate paragraph for that type floor will be used. Each flooring type will be designated with a letter or number symbol. Use the same symbols to key flooring types to locations listed or shown on the drawings.

Floor types will be specified for a specific use such as, carpet for pool areas, multi-use areas, and pro shops, or rubber tile flooring for weight rooms, etc. Edit specification as required to meet project needs and omit text not applicable.
****

2.1 FLOORING MATERIALS

****
NOTE: If more than one type of resilient flooring is required, a separate paragraph for that type floor will be used. Each flooring type will be designated with a letter or number symbol. Use the same symbols to key flooring types to locations listed or shown on the drawings.

Floor types will be specified for a specific use such as, carpet for pool areas, multi-use areas, and pro shops, or rubber tile flooring for weight rooms, etc. Edit specification as required to meet project needs and omit text not applicable.
****

2.1.1 Indoor-Outdoor Carpeting Type [A] [_____]

****
NOTE: Carpeting shall be specially designed for indoor or indoor-outdoor environments as required,

e.g., weight rooms, outdoor playground areas, indoor/outdoor pool areas, and pro shops. Edit as required to meet project requirements.
****

Carpet-type flooring that is spike proof [[ribbed] [berber] pattern consisting of a top layer of rugged [polypropylene] [or] [nylon] fibers combined with an inorganic cut-resistant [non-skid] [_____]] [wet areas artificial turf pattern consisting of a top layer of rugged polypropylene fibers combined with an inorganic cut-resistant [porous rubber knob][foam] [_____]] backing. Minimum total thickness must be [10] [_____] mm [0.375] [_____] inches. Finished surface pile yarn weight (face weight) must be minimum [_____] kg/square meter ounces/square yard. Test results for resistance to soil bacteria or fungi must show no sustained growth or discoloration after 21 days when tested in accordance with ASTM G21. Product must meet emissions requirements of CDPH SECTION 01350. Provide certification or validation of indoor air quality for Indoor-Outdoor Carpeting.

2.1.2 Rubber Composition Tile Type [A] [_____]

Provide [interlocked] [_____] [600 x 600] [_____] mm [24 x 24] [_____] inches square, of solid first quality rubber, uniformly resilient material rubber tiles, designed to be applied [with] [without] adhesive. Provide tiles that are approximately [13] [_____] mm [1/2] [_____] inch thick, [smooth] [traction] [_____] texture, and [reversible] [non-reversible]. Flooring must be able to withstand [75 percent compression for 22 hours at 70 degrees C 158 degrees F] [_____] without residual deformation when tested in accordance with ASTM D395. Provide flooring with a durometer hardness Shore-A of 50-60 when tested in accordance with ASTM D2240. Product must meet emissions requirements of CDPH SECTION 01350. Provide certification or validation of indoor air quality for Rubber Composition Tile.

2.1.3 Rubber Poured-In-Place Flooring Type [A] [_____]

Provide resilient poured-in-place rubber surface composed of chloroprene rubber, chloroprene rubber sponge, aggregate, setting powders, and a top finish composed of acrylic resins. Flooring must be able to withstand 50 percent compression for 72 hours at 22 degrees C 72 degrees F with a residual deformation of less than 10 percent when tested in accordance with ASTM D395. Flooring must have a minimum compression modulus at 10 percent of 690 kPa 100 psi, a minimum elongation of 250 percent and a minimum tensile strength of 3800 kPa 550 psi plus or minus 34 kPa 5 psi when tested in accordance with ASTM D412. Provide flooring with a durometer hardness Shore-A of 55-60 when tested in accordance with ASTM D2240 and a minimum tear resistance of 10.5 kN/m 60 lbf/inch when tested in accordance with ASTM D624. For interior applications (defined as inside of the weatherproofing system) of rubber poured-in-place flooring, provide products meeting 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 validation of indoor air quality for Rubber Poured-In-Place Flooring.

2.1.4 Sheet Rubber Composition Flooring Type [A] [_____]

Provide prefabricated, homogeneous, natural and synthetic rubbers sheet rubber flooring, minimum [5] [_____] mm [3/16] [_____] inch thick, and

[smooth gymnasium] [textured all-purpose] finish. provide roll type flooring not less than 1500 [_____] mm 60 [_____] inches wide. Flooring must have a minimum tensile stress at 100 percent elongation of 1500 kPa 220 psi and a minimum ultimate elongation of 250 percent when tested in accordance with ASTM D412. Flooring must be able to withstand 50 percent compression for 72 hours at 22 degrees C 72 degrees F with a residual deformation of less than 10 percent when tested in accordance with ASTM D395. Flooring must provide a 55 plus or minus 5 percent rebound when tested in accordance with ASTM D1054. Product must meet emissions requirements of CDPH SECTION 01350. Provide certification or validation of indoor air quality for Sheet Rubber Composition Flooring.

2.1.5 Sheet Vinyl Composition Flooring Type [A] [_____]

Provide sheet vinyl flooring consisting of a solid polyvinyl chloride material that conforms to the chemical resistance requirements of ASTM F1303. Provide flooring not less than 1200 mm 48 inches wide and a minimum thickness of [3] [_____] mm [1/8] [_____] inch. Provide [smooth] [stipple] [track embossed] texture floor surface. Flooring must have a minimum coefficient of friction of 0.75 when tested in accordance with ASTM D1894. Provide flooring with an average thickness loss of 0.2 mm 8.0 mils plus or minus 0.025 mm 1 mil. Rebound resilience of flooring must be greater than 12 percent and less than 30 percent when tested in accordance with ASTM D2632. Product must meet emissions requirements of CDPH SECTION 01350. Provide certification or validation of indoor air quality for Sheet Vinyl Composition Flooring. [Provide an optional compatible top coating recommended by the sheet vinyl flooring manufacturer.]

2.1.6 Urethane Poured-In-Place Flooring Type [A] [_____]

****

NOTE: Urethane resilient flooring may be installed on a variety of substrates and in a variety of thicknesses from 3 to 25 mm 1/8 to 1 inch. Coordinate with manufacturer's literature. Edit specification as required.

****

The resilient poured-in-place urethane surface is composed of a seamless pigmented monolithic material. Provide minimum [3] [_____] mm [1/8] [_____] inch thick and [smooth gymnasium] [textured all-purpose] [textured track] finish flooring. Flooring must have a durometer hardness Shore-A of 55-60 when tested in accordance with ASTM D2240. Flooring must have a minimum ultimate elongation of 250 percent when tested in accordance with ASTM D412 and shall have a density of 1.25.

For interior applications (defined as inside of the weatherproofing system) of urethane poured-in-place flooring, provide products meeting 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 validation of indoor air quality for Urethane Poured-in-Place Flooring.

2.2 RESILIENT MAT UNDERLAY

****

NOTE: Resilient mat underlay may be used under a two-component polyurethane wear coat system, sheet

rubber surfacing system, or a vinyl sheet surfacing system. Deletion or specification and thickness of mat underlay will be determined by the athletic flooring requirements. Coordinate with manufacturer's literature.
****

Provide prefabricated resilient mat underlay consisting of granulated indoor/outdoor rubber mat bound with polyurethane for shock absorption. Mat thickness must be [_____] mm inches. Product must meet emissions requirements of CDPH SECTION 01350. Provide certification or validation of indoor air quality for Resilient Mat Underlay.

2.3 ADHESIVES

Adhesive must be as recommended by the flooring manufacturer and correspond to the specified flooring product and to the substrate. Adhesive products used on the interior of the building (defined as inside of the weatherproofing system) must 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 validation of indoor air quality for adhesives.

2.4 CRACK FILLER/LEVELER FOR CONCRETE SURFACES

Crack filler/leveler for concrete floor surfaces shall be as recommended by flooring manufacturer.

2.5 EDGING STRIPS

Provide strips of the same material and design as recommended by flooring manufacturer.

2.6 PRIMER

Concrete primer must be as recommended by flooring manufacturer and correspond to the specified flooring product and to the substrate. For interior applications (defined as inside of the weatherproofing system) of primer, provide products meeting 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 validation of indoor air quality for primer.

2.7 GAME LINE MATERIAL

Game line material must be as recommended by the flooring manufacturer and correspond to the specified flooring product. For interior applications (defined as inside of the weatherproofing system) of game line marking materials, provide products meeting 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 validation of indoor air quality for game line marking materials.

2.8 WALL BASE

****
NOTE: Include last bracketed sentences requiring products with indoor air quality certifications or

validations when product will be located in offices or classrooms.
****

Base must be [rubber] [vinyl], Type [straight] [coved] style. Base must be 100 mm 4 inches high and minimum 2 mm 0.080 inch thick.[

Product must meet emissions requirements of CDPH SECTION 01350. Provide certification or validation of indoor air quality for wall base.]

2.9 SEALANTS

provide sealants in accordance with Section 07 92 00 JOINT SEALANTS.

2.10 MANUFACTURERS COLOR

Color must be [in accordance with Section 09 06 00 SCHEDULES FOR FINISHES] [_____].

PART 3 EXECUTION

****
NOTE: Expansion joints under resilient athletic flooring should be avoided to the maximum extent possible by placing the joints at the perimeter of the floor area. For large areas such as gymnasiums, shrinkage compensating concrete may be advisable.
****

3.1 PREPARATION

Concrete surfaces must be completely cured and dry. Do not use curing agents, sealers, or hardeners to aid in the curing of the concrete slab. Surfaces must be free of paint spots, and other foreign materials. Surfaces must be ground down or leveled with an approved leveling compound to a tolerance of plus or minus 3 mm 1/8 inch within a 3 meters 10 foot radius. Cracks, construction joints, or damaged portions of floor must be filled with crack filler for concrete surfaces. Expansion joints must be filled and sealed in accordance with the approved installation instructions of the manufacturer. All sealants must be in accordance with ASTM C920. Expansion joints must not be filled with a material that will make them inoperable.

3.2 MOISTURE TEST

Confirm that the moisture content of concrete subfloors is in the range recommended by the flooring manufacturer before floor installation.

3.3 INSTALLATION

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

3.3.1 General Requirements

Installation must be in accordance with the approved installation instructions. Tile or sheet flooring must be rolled with a medium-sized roller in both directions to release entrapped air. Submit manufacturer's descriptive data and catalog cuts indicating materials of construction and

physical characteristics. Installation, cleaning and maintenance instructions must be included.

3.3.2 Molded Rubber Base

Install base in accordance with the approved installation instructions of the manufacturer of the base.

3.3.3 Indoor-Outdoor Carpeting

Apply flooring as recommended by the manufacturer.

3.3.4 Sheet Vinyl Composition Flooring

Prime the concrete slab in accordance with approved installation instructions. Install flooring as recommended by the manufacturer.

3.3.4.1 Seams

Cut and place end seams as recommended by the manufacturer. Weight seams weighted as required.

3.3.4.2 Hot-Welded Seams

Groove butted sheets to a depth of approximately two thirds of their total thickness using an electrical or hand grooving tool. Thermoweld grooved seams using a hot air welding tool and a PVC welding thread. After seam has cooled to room temperature, trim the excess off to provide a flush joint.

3.3.5 Sheet Rubber Composition Flooring

Sheet flooring must be dry cut and layed out flat a minimum of 24 hours prior to adhering to the substrate. Single cut end seams. Cut edge seams through overlapping sheets, then snap into place to ensure tight seams. Weight seams as required.

3.3.6 Rubber Composition Tile Flooring

****

NOTE: Tile flooring can be installed with adhesive or without adhesive using a mechanical locking technique. Edit to comply with the type flooring specified.

****

3.3.6.1 Application With Adhesive

Lay tiles on adhesive surface in pattern according to approved detail drawings. Joints of tiles must be even and tight. Cut tiles to fit tightly against the wall. Submit drawings showing game lines, location of anchor plate assemblies, floor outlets, and under-floor conduit or raceways.

3.3.6.2 Application Without Adhesive

Join tiles together using interlocking ears or other mechanical locking techniques. Interlock the ears into the adjoining tile 40 mm 1-1/2 inches and provide at least five interlocks for each 600 mm 24 inch edge. Where

required, supply a beveled transfer border to interlock with the flooring tiles. The borders must be 150 mm 6 inches wide and 600 mm 24 inches long and the same thickness as the matching tiles.

3.3.7 Rubber Poured-in-Place Flooring

Prime the concrete slab with primer recommended by manufacturer in a thin film covering approximately 10 square meters/L 400 square feet per gallon. Pour chloroprene rubber onto subfloor and trowel to a smooth and uniform layer of the required thickness. Apply a grout chloroprene rubber coat to fill possible voids in surface. After the chloroprene rubber is completely dry, apply a pigmented finish with a spray and roller.

3.3.8 Urethane Poured-in-Place Flooring

Prime the concrete slab with primer recommended by the manufacturer. Rate of application must be in accordance with approved installation instructions and be allowed to dry odor free. Cover concrete construction joints with 50 mm 2 inch wide PVC duct tape. Apply resin in a minimum of 2 lifts. Apply pigmented and textured coatings in accordance with manufacturer's recommendations.

3.3.9 Resilient Mat Underlay

Unroll the resilient mat underlay and allow to relax prior to cutting or fitting. Install the mat in accordance with manufacturers instructions.

3.3.10 Line Marking and Finishing

After installation is complete, clean the floor surface in accordance with installation instructions. Lay out, mask, and paint line marking according to approved detail drawings and approved installation instructions. Finish in accordance with the manufacturer's recommendations.

3.4 PROTECTION

Protect the installed flooring from soiling and damage with heavy reinforced, nonstaining kraft paper, plywood, or hardboard sheets as required. Lap and secure edges of kraft paper protection to provide a continuous cover. Remove protective covering when directed by the Contracting Officer.

-- End of Section --