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NAVFAC PTS-C30 (September 2022)  
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Preparing Activity: NAVFAC SUPERSEDING PTS-C30 (January 2020)  
  
PERFORMANCE TECHNICAL SPECIFICATION  
  
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SECTION C30  
  
INTERIOR FINISHES  
09/22

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NOTE: This section is intended to be used as a guide and contains requirements that are common to many different types of facilities; however, not all requirements and equipment items will be applicable to all projects. In addition, there may be special requirements for a particular project that are not addressed at all. The RFP preparer may have to incorporate additional information to address these special requirements in this PTS and corresponding Part 3 ESR. If the RFP preparer chooses to delete building elements that are not required for the project, do not change the remaining Uniformat paragraph designations (example - A102001). Uniformat designations are unique to the products they are assigned to. However, the subparagraph numerical extensions (example - 1.2 or a,b,c) of the Uniformat designations may change if subparagraphs are deleted.  
  
This guide specification is formatted utilizing Uniformat II, an industry recognized standard, ASTM E 1557. When the RFP preparer chooses to add a paragraph that does not apply to an existing building element already included in the specification, refer to the Uniformat/WBS located on the NAVFAC Design-Build Website for a listing of Uniformat II designations and definitions.  
  
NOTE: The RFP preparer may view or hide the criteria notes in this PTS section by modifying the WORD preferences for "Hidden text". To view the criteria notes, choose "File" then "Option". Click "Display" then check the "Hidden text" box under "Always show these formatting marks on the screen". In the same section, check the box for "Print hidden text" under "Printing options" to print the criteria notes.  
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**C30 GENERAL**

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

All interior finish products must be from manufacturers' standard running line offerings. Custom fabrications are not permitted unless otherwise noted.

**C30 1.1 DESIGN GUIDANCE**

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards referenced in the section text that are not found in the [Unified Master Reference List (UMRL)](http://www.wbdg.org/ffc/dod/unified-master-reference) in the [Federal Facility Criteria (FFC)](http://www.wbdg.org/ffc/federal-facility-criteria) at the [Whole Building Design Guide (WBDG)](http://www.wbdg.org/) website, are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the referenced standard at the time of contract award.

**C30 1.1.1 Industry Standards And Codes**

FLOOR COVERING INSTALLATION CONTRACTOR'S ASSOCIATION (FCICA)

FLOOR COVERING INSTALLATION BOARD (FCIB)

TILE COUNCIL OF NORTH AMERICA (TCNA)

**C30 1.1.2 Government Standards**

UNIFIED FACILITIES CRITERIA (UFC)

|  |  |
| --- | --- |
| UFC 1-200-01 | DoD Building Code (A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed therein, which includes the following significant UFC(s): UFC 3-101-01, Architecture UFC 3-120-10, Interior Design) |
| UFC 1-200-02 | High Performance and Sustainable Building Requirements |

**C30 1.2 QUALITY ASSURANCE**

**C30 1.2.1 Paint Applicator’s Qualifications**

**C30 1.3 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING**

Provide verification of satisfactory interior finish assemblies' performance via Performance Verification Testing, as detailed in this section of the RFP.

**C30 1.3.1**

Provide sample of textured ceiling application for Designer of Record (DOR) approval before resuming work. Sample must be used as a reference for remaining application.

**C30 1.3.2**

Provide sample of multicolor paint application for DOR approval before resuming work. Sample must be used as a reference for remaining application.

**C30 1.3.3**

Provide sample of terrazzo and/ or architectural cast-in-place concrete floor application for DOR approval before resuming work. Sample must be used as a reference for remaining application.

**C30 1.4 DESIGN SUBMITTALS**

Provide design submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*, Part 2 Section 01 33 10.05 20, *Design Submittal Procedures*, Facilities Criteria (FC) 1-300-09N, *Navy and Marine Corps Design Procedures,* UFC 3-101-01, *Architecture and UFC 3-120-10, Interior Design*.

In addition, UFGS sections listed below or in the body of the PTS text are to be used by the Designer of Record (DOR) as a part of the design submittal. If the UFGS products or systems are applicable to the project, the DOR must edit these referenced UFGS sections and submit them as a part of the design submittal specification. Edit the specification sections in accordance with the limitations stated in PTS Section Z10, *General Performance Technical Specifications*.

Changes must not be made to the finishes that are submitted in the plans, specifications, and Structural Interior Design submittals and approved by the Government during the design phase unless changes are requested by the Government. In the event that revisions may be required because of unforeseen conditions such as discontinued product, the revisions must be approved by the DOR and then submitted to the Government Interior Designer for approval before substitutions can be made.

**C30 1.5 CONSTRUCTION SUBMITTALS**

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) and the NAVFAC Interior Designer must approve the following construction submittals as a minimum:

Paint, Finish materials, Finish colors

Installation drawings for floors with carpet, tile, stone, architectural cast-in-place concrete or terrazzo to include locations and details of seams, color and material transitions, details of divider strips, control joints, and crack control solutions.

Changes must not be made to the finishes that are submitted and approved by the Government during the design phase. In the event that revisions may be required because of unforeseen conditions such as discontinued product, the revisions must be approved by the DOR and then submitted to the Government Interior Designer for approval before substitutions can be made.

**C3010 WALL FINISHES**

Provide moisture and mildew resistant interior wall finishes which are easily maintained, and suitable in accordance with industry standards for the architectural surface being finished. For painted wall finishes, refer to C3040 "INTERIOR PAINTING AND SPECIAL COATINGS".

**C301001 CONCRETE WALL FINISHES**

**C301001 1.1 SPECIAL OR ARCHITECTURAL FINISHES ON INTERIOR CONCRETE WALLS**

Cast-in-place or pre-cast concrete wall finishes include, but are not limited to, abrasive blasted surfaces, colored surfaces, exposed aggregate, grooved surfaces, or tooled surfaces.

**C301002 PLASTER WALL FINISHES**

Veneer plaster must be gypsum plaster veneer finish on gypsum base finishes, or cement plaster veneer finish on concrete or masonry. Refer to Section C3040 for paint system and gloss level.

**C301002 1.1 GYPSUM PLASTER**

Provide gypsum neat plaster or high strength gypsum plaster base coat conforming to American Society for Testing and Materials (ASTM) C28. High strength gypsum plaster must have a compressive strength of not less than 2,500 psi, when tested dry in accordance with ASTM C472.

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NOTE: High strength gaging plaster, when blended with finish lime-putty, produces a finish plaster with controlled set, early hardness and strength, and resistance to shrinkage cracks. If high strength gypsum gaging plaster finish is required, indicate requirement in the Project Program.  
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**C301002 1.1.1**

High strength gypsum gaging plaster finish coat must have a compressive strength of not less than 4,500 psi when tested dry in accordance with ASTM C472.

**C301002 1.1.2**

Provide gypsum molding plaster for ornamental plaster in accordance with ASTM C59.

**C301002 1.1.3**

Provide Keene's cement finish coat conforming to ASTM C61.

**C301002 1.1.4**

Provide acoustical gypsum plaster finish coat conforming to ASTM E1042 Type I or II Class A, noncombustible.

**C301002 1.2 CEMENT PLASTER**

**C301002 1.2.1**

Portland cement plaster base coat in accordance with ASTM C150, gray Portland cement. Use Type I when no special characteristics are required, Type II when plaster and stucco will be exposed to moderate sulfate (alkali) action, Type III when early strength is needed as in cold weather, and Type V when high resistance to sulfate is required.

**C301002 1.2.2**

Portland cement plaster finish coat in accordance with ASTM C150, gray Portland cement Type I when no special characteristics are required, Type II when plaster and stucco will be exposed to moderate sulfate (alkali) action, Type III when early strength is needed as in cold weather.

**C301002 1.2.3**

Factory-mixed finish coat according to the manufacturer's instructions.

**C301002 1.3 ACRYLIC PLASTER COATING**

High Performance (impact resistant) seamless interior acrylic coating system must be used as an interior wall finish over CMU that has been joint filled and smoothed with a water resistant manufactured recommended compound. Coating system to be mold and mildew resistant, have a minimum Barcoll Hardness Index of 38 and flame spread 15 or less per ASTM-E84 and have a minimum final film thickness of higher than 10 mils. Coating system must have been on the market and successfully used in commercial applications for a minimum of 10 years. Coating system must be applied by a manufacturer's factory trained applicator/installer.

**C301003 GYPSUM WALLBOARD FINISHES**

Conform to specifications, standards and requirements in accordance with Gypsum Association GA 214, GA 216 and GA 224. Provide asbestos free materials only. Provide Type X gypsum board in fire rated assemblies. Provide a foil back gypsum board when a vapor retarder is required.

**C301003 1.1 REGULAR GYPSUM BOARD**

ASTM C36/C36M and ASTM C1396/C1396M 1/2 or 5/8 inch (12.7 mm or 15.9 mm) thick in residential construction, and 5/8 inch (15.9 mm) thick in non-residential construction, tapered edges for exposed layers, square edges for concealed backer layers.

**C301003 1.2 MOISTURE RESISTANT GYPSUM BOARD**

ASTM C630/C630M, 1/2 or 5/8 inch (12.7 mm or 15.9 mm) thick in residential construction, and 5/8 inch (15.9 mm) thick in non-residential construction. Use in humid areas or spaces but not as a substrate in tiled areas where wall tile is exposed to direct moisture contact or condensation accumulation.

**C301003 1.3 CEMENTITIOUS BACKING UNITS**

Provide cementitious backer units, 1/2 inch (12 mm) thick, in accordance with Tile Council of North America Handbook; use as a substrate for ceramic tile in wet areas that are exposed to direct moisture contact or condensation accumulation for areas including, but not limited to, tubs, shower enclosures, saunas, steam rooms, gang shower rooms, and shower drying rooms. Provide screws specifically designed for use with cement panels.

**C301003 1.4 IMPACT RESISTANT GYPSUM BOARD**

Reinforced gypsum panel with imbedded fiber mesh or polycarbonate resin thermoplastic backing, 5/8 inch (15.9 mm) thick, tapered edges, in accordance with Structural Failure Test; ASTM E695 or ASTM D2394 and Indentation Test; ASTM D5420 or ASTM D1037. Provide metal framing of 20-gauge minimum. Provide fasteners that meet manufacturer requirements and specifications. Impact resistant gypsum board must have a flame spread rating of 25 or less and a smoke developed rating of 50 or less, ASTM E84. Finish with a high strength plaster veneer. Refer to PTS C10 for further requirements on impact resistant wall construction.

**C301003 1.5 JOINT TREATMENT**

ASTM C475, Joint compound must be specifically formulated and manufactured for use with and compatible with tape, substrate and fasteners as recommended by the manufacturer. Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Provide premanufactured joints at all structural expansion joints, crack control joints, and change of materials as recommended by the manufacturer and in accordance with GA 216.

**C301003 1.6 FASTENERS**

ASTM C514. Fasteners must be compatible with each type of gypsum board material as recommended by the gypsum board manufacturer and in accordance with GA 216 and GA 224.

**C301003 1.7 ACCESSORIES**

ASTM C1047. Fabricate from corrosion protected steel or plastic designed for intended use. Accessories manufactured with paper flanges are not acceptable. Flanges must be free of dirt, grease, and other materials that may adversely affect bond of joint treatment. Provide prefinished or job decorated materials. For predecorated gypsum board provide prefinished metal or plastic trim to match predecorated gypsum board. Install as recommended by GA 214, GA 216 and GA 224.

**C301003 1.8 LEVEL OF FINISH**

**C301003 1.8.1**

Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Plenum areas above ceilings must be finished to GA 214, Level 1. Water resistant gypsum backing board, ASTM C630/C630M, to receive ceramic tile must be finished to GA 214, Level 2. Walls to receive a heavy-grade wall covering or have textured finish before painting must be finished to GA 214 Level 3. Walls without wall wash lighting to receive paint (MPI Gloss Level 2), light textures, or wall coverings must be finished to GA 214 Level 4. Unless otherwise specified, all gypsum board walls, partitions must be finished to GA 214 Level 5. Provide joint, fastener depression, and corner treatment. Do not use fiberglass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only. Provide treatment for water-resistant gypsum board as recommended by the gypsum board manufacturer.

**C301003 1.8.2**

Wherever gypsum board is to receive eggshell (MPI Gloss Level 3), semigloss (MPI Gloss Level 5), or gloss (MPI Gloss Level 6) paint finish, finish gypsum wall surface to GA 214 Level 5.

**C301003 1.8.3**

Where wall wash lighting will accent the flatness of the wall and surface irregularities in gypsum board joints, provide feature edge gypsum board and two coat joint compound fillers. Provide this special joint treatment at up lighting, down lighting and horizontal lighting at the end of a passageway wall.

**C301004 TILE AND TERRAZZO WALL FINISHES**

**C301004 1.1 CERAMIC TILE WALL SYSTEM FINISHES**

Provide ceramic tile wall systems as defined in the Tile Council of North America (TCNA) handbook for ceramic tile installations suitable for the service requirements listed. Install systems in accordance with Tile Council of North America Handbook and American National Standards Institute (ANSI) A108/A118 series standards. Colored epoxy grout with sealer must be provided. Coordinate with ceramic bath accessories for modularity. Include all trim pieces, caps, stops, and returns to complete installation.

**C301004 1.1.1**

Ceramic Mosaic Wall Tile must be a minimum of 1/4 inch (6 mm) thick and installed from floor to ceiling, unless otherwise noted.

**C301004 1.1.2**

Wall tile must be glazed, matte glazed or unglazed finish. Refer to project program for tile type, pattern, and surface texture.

**C301004 1.1.3**

Porcelain wall tile must be through color, polished or unpolished. Refer to project program for tile type, pattern, and surface texture.

**C301004 1.1.4**

Provide wall tile color and style selections a minimum of one grade above base grade.

**C301004 1.1.5**

Provide Designer accent tile, accent strips and accessory ceramic tile shapes as an integral part of the ceramic wall tile system.

**C301005 WALL COVERINGS**

Wall coverings must be material designed specifically for the specified use. The wallcovering must contain a non-mercury based anti-microbial. The wallcovering must be the type made without the use of cadmium-based stabilizers. Wallcovering must have a Class A flame spread rating of 0-25 and smoke development rating of 0-50 when tested in accordance with ASTM E84. The wall preparation, trimming, adhesive and application must be according to the manufacturer’s printed directions. The manufacturer must approve the installers in writing. The material must be easily cleaned by traditional methods such as washing, wiping, or vacuuming. Primer and adhesive must be of a type recommended by the wallcovering manufacturer and must contain a non-mercury based anti-microbial. Adhesive must be strippable type. Do not apply wall coverings to the interior surface of exterior walls.

**C301005 1.1 VINYL WALL COVERING**

**C301005 1.1.1**

Vinyl wallcovering must be a vinyl coated woven or nonwoven fabric with germicidal additives and must conform to ASTM F793, Category V Type II, 13.1 to 22 ounces (371 g to 624 g) total weight per square yard and width of 54 inches (1370 mm). Provide ASTM F793, Category VI, Type III, 22 ounces (624 g) and above to cover rough textured walls such as masonry.

**C301005 1.1.2**

Provide a polyvinyl fluoride film, 0.0005 inch (0.012 mm) thick or thicker must be factory applied to the wall covering where additional resistance to staining and soiling from exposure to staining reagents or chemicals and resistance from abuse is required. The film must be transparent (clear), medium gloss.

**C301005 1.2 FABRIC WALL COVERING**

**C301005 1.2.1**

Fabric wallcovering must be woven material of Polyester or Polyolefin, or a combination of the two fibers with an acrylic backing. The face must be treated with a soil repellent finish. The material must be a minimum of 48 inches (1219 mm) wide. "Tackable" wall covering must be "self-healing" from tack penetration through the covering into the substrate. The material must be a minimum of 12 ounces (340 g) per square yard exclusive of backing. A tackable wall covering will not be required for smoother, less textured surface appearance.

**C301005 1.2.2**

Acoustical wallcovering must be textured, woven or non-woven material of polyester or polyolefin, or a combination of the two fibers with an acrylic backing. The material must be a minimum of 48 inches (1219 mm) wide and a minimum of 16 ounces (454 g) per square yard. The material must have an NRC rating of .15 on gypsum board in accordance with ASTM C423.

**C301005 1.3 WALLCOVERING BORDER**

Vinyl wallcovering border must be a vinyl coated woven or nonwoven fabric with germicidal additives and must conform to ASTM F793, Type I, 7 to 13 ounces (198 g to 368 g) or Type II, 13.1 to 22 ounces (371 g to 624 g) total weight per square yard.

**C301005 1.4 SURFACE PREPARATION FOR UNEVEN WALLS**

**C301005 1.4.1**

Wall liner must be a non-woven polyester cellulose blend having a minimum weight of 3.7 ounces (105 g) per square yard and a total minimum thickness of 0.013 inches (0.33 mm). Wall liner must have a Class A flame spread rating of 0-25 and smoke development rating of 0-50 when tested in accordance with ASTM E84. Use for masonry walls or walls with uneven surfaces.

**C301005 1.4.2**

For masonry or rough textured walls, use a veneer plaster finish to smooth the walls prior to wallcovering installation.

**C301005 1.5 CORNER GUARDS**

**C301005 1.5.1**

Corner guards must be 3/32 inch (2.4 mm) thick and must cover 1 inch (25 mm) each side of corner at right angles. Corner guards must be clear polycarbonate. Use in executive areas, office areas, and wall-covered areas subject to cart traffic as a minimum.

**C301005 1.5.2**

Corner guards must be 3/32 inch thick and must cover 2-1/2 inches (64 mm) each side of corner at right angles. Corner guards must be through color polycarbonate or rubber. Use in corridors or other high traffic areas.

If protective wall components from paragraphs C301090 – 1.5 and 1.6 are provided, corner guards must be from the same lot and color as protective wall components.

**C301005 1.6 WAINSCOT CAP**

**C301005 1.6.1**

Wainscot cap shall be satin-finished extruded aluminum approximately 3/4 inch (19 mm) high, feathered at bottom edge, with an approximate 3/16 inch (5 mm) exposed face on top edge, and grooved to receive the covering. Adhesive to install wainscot cap shall be of a type recommended by the manufacturer of the cap.

**C301005 1.6.2**

Wood wainscot cap must be 3-1/2 by 3/4 inch (89 mm by 19 mm) solid hardwood, Architectural Woodwork Institute (AWI) Custom grade, with painted or stained finish. Profile must be a molded shape.

**C301006 ACOUSTICAL PANELS ADHERED TO WALLS**

Acoustical wall treatment must be acoustical panels, sound absorbing wall units, or acoustical wall systems. Acoustical panel system must include manufacturer's standard concealed fasteners, splines, tracks, and other components necessary to complete the installation. Fire rating for the complete composite system must be Class A, 200 or less smoke density and flame spread less than 25, when tested in accordance with ASTM E84.

**C301006 1.1 ACOUSTICAL FABRIC COVERED WALL PANELS**

**C301006 1.1.1**

Prefinished factory assembled wall panels must consist of, seamless fabric covered fiberglass or mineral fiber core system. Perimeter edges must be reinforced by an aluminum frame or a formulated resin edge hardener. Fabric covering must be stretched free of wrinkles and then bonded to the edges and back or bonded directly to the panel face, edges, and back of panel a minimum distance standard with the manufacturer. Mounting must be by manufacturer's standard concealed spline, mechanical fasteners, magnetic fasteners, hook and loop or adhesive mounting.

**C301006 1.1.2**

Stretched fabric wall panel system must consist of continuous perimeter and butt seam mounting extrusions, site-fabricated and applied directly to the substrate. Facing fabric must be stretched over core materials and attached without adhesives, nails, tacks, screws or tapes so that fabric may be removed and replaced with framework in place.

**C301006 1.1.3**

Fabric must be seamless, 100% polyester or olefin or a blend of the two. Light fastness (fadeometer) must be approximately 40 hours in accordance with AATCC 16.

**C301006 1.1.3.1**

Non-woven, embossed texture, or needle punched 100 percent polyester, minimum 12 ounces (340 g) per linear yard. Tear strength must be minimum 25 pounds (11.25 kg) machine direction and minimum 40 pounds (18 kg) cross-machine direction in accordance with ASTM D1117. Tensile strength must be minimum 50 pounds (22.5 kg) machine direction and minimum 75 pounds (34 kg) cross-machine direction in accordance with ASTM D5034.

**C301006 1.1.3.2**

Woven, minimum 2-ply 100 percent polyester or olefin, minimum 12 ounces (340 g) per linear yard. Tear strength must be minimum 29 pounds (13 kg). Tensile strength must be 150 pounds (68 kg) minimum in accordance with ASTM D5034.

**C301006 1.1.3.3**

Perforated vinyl covering with fabric backing, minimum 20 ounces (567 g) per linear yard total weight.

**C301006 1.2 ACOUSTICAL WALL PANELS**

Aspen wood fibers bonded together with an inorganic hydraulic cement binder, formed in a continuous process under heat and pressure. Nominal overall panel thickness must be 1 inch (25 mm). Noise Reduction Coefficient must not be less than NRC 0.85 for Type C-40 and C-80 mounting.

**C301090 OTHER WALL FINISHES**

**C301090 1.1 SOLID SURFACING WALL FINISHES**

Solid surfacing material must consist of 100% pure acrylic polymer, mineral fillers, and pigments. The material must be homogenous, not coated or laminated, meeting ANSI Z124.3 and ANSI Z124.6 requirements. Superficial damage to a depth of 0.010 inch (.254 mm) must be repairable by sanding or polishing. Provide manufacturer's full range of colors and patterns. Flammability, ASTM E84: Class I/A, flame spread 25 maximum; smoke developed 30 maximum.

**C301090 1.1.1**

If used in a shower, solid surfacing wall finishes must extend from top of shower pan to a minimum of 84 inches (2130 mm) or to underside of ceiling and must surround the shower enclosure. Wall finish must extend from top of tub to 84 inches (2130 mm) and must surround tub shower. If used in a kitchen, solid surfacing wall finish must extend from top of kitchen countertop to underside of wall cabinet.

**C301090 1.1.2**

Provide solid surfacing with factory recommended fasteners/adhesives/caulk to complete the installation.

**C301090 1.2 PLASTIC LAMINATE WALL FINISHES**

Plastic laminate used for wall applications must be commercial grade, high-pressure laminate with a #60 finish, approved for vertical applications. National Electrical Manufacturers Association (NEMA) LD 3.

**C301090 1.2.1**

The kitchen wall area between the counter top backsplash and the bottom of the wall cabinet must be plastic laminate. Laminate wall finish must include factory recommended fasteners/adhesives/caulk to complete the installation.

**C301090 1.3 DECORATIVE PANELING SYSTEM**

Architectural paneling system applied to interior walls shall include associated furring, fastening, and trim to complete the installation. Wood paneling system finish shall be factory or field applied.

**C301090 1.4 WOOD TRIM AND DETAILING FINISHES**

Decorative panels, chair rail, standing and running trim, must be of AWI custom grade hardwood with a painted or stained finish. Refer to C3040 "INTERIOR PAINTING AND SPECIAL FINISHES" for finish system. Chair rail must be a minimum of 3-1/2 inches (89 mm) high. Profile of chair rail must be a molded shape. Wood trim must include associated furring, fastening, adhesives and trim to complete the installation.

**C301090 1.5 IMPACT RESISTANT PANEL OR WAINSCOT WALL FINISHES**

The wall covering panel system, or wainscot, must be an impact-resistant acrylic PVC sheet of a minimum 0.060 inch (1.5 mm) thickness in 4 foot by 8 foot (1219 mm by 2438 mm) sheets. The system must be Class A (ASTM E84), Underwriters Laboratories (UL) listed, and chemical and stain resistant. It must include all accessories, such as top caps, joint covers, and inside and outside corners, necessary for a complete installation. A full range of colors and textures must be included. The wall panel system must have coordinating color and pattern options for all components within the system. The wall panel system must offer a 21 ounce (595 g) fabric backed vinyl wallcovering laminated to a 0.020 inch (.51 mm) rigid acrylic/PVC backing capped with 1 mil of protective film.

**C301090 1.5.1**

Impact Resistant Trim Finishes - Impact resistant chair or handrail system must be a formed rigid PVC product. Chair or handrail must be a minimum of 3 inches (76 mm) high and be mounted with concealed hardware. Chair or handrail system must be chemical, stain, and bacteria resistant. Chair rail must be UL classified, conforming to National Fire Protection Association (NFPA)Class A fire rating and ASTM D256-90b for impact strength of 30.2 ft-lbs/inch thick.

**C301090 1.6 CORNER AND WALL GUARDS**

Corner and wall guards must be high-impact formed polyvinyl chloride a minimum of 0.078 inch (2 mm) with concealed mounting hardware and end closure. If used with an impact resistant panels system, the guards must be from the same manufacturer as the impact resistant wall panel system, chair or hand rail system and must include all accessories necessary for a complete installation. A full range of styles, colors and textures must be included.

**C3020 FLOOR FINISHES**

Refer to C3040 "INTERIOR PAINTING AND SPECIAL FINISHES" for painted floor coatings.

**C3020 1.1 RESILIENT SUBFLOOR PREPARATION**

Have third party independent concrete slab testing agent verify that concrete slabs comply with ASTM F710. Minimum values must not be below the following: Concrete floor flatness must meet minimum flatness of FF 60 when tested in accordance to ASTM E1155 - 96(2008). Concrete levelness on slab on grade must meet minimum levelness of FL 45 when tested in accordance with ASTM E1155 - 96(2008). This requirement does not apply to elevated concrete slabs.

**C3020 1.1.1 Floor Preparation**

Prior to installation of flooring materials the concrete sub-floors are to be dry, free of curing compounds, sweeping compounds, sealers, hardeners, and other materials which could interfere with bonding of adhesive. If curing compounds, sweeping compounds, bond breakers or sealers exist, they must be completely removed by mechanical means and methods, specifically grinding and shot blasting of concrete surface as necessary. Determine adhesion and dryness characteristics by performing bond and moisture tests. Prior to building being conditioned, perform a preliminary moisture test using in situ probe relative humidity testing as specified per ASTM F 2170.

**C3020 1.1.2 Testing**

All pre-installation moisture testing is to be performed by a qualified independent testing agency. Perform the following test as soon as building is enclosed, watertight, and conditioned, and a minimum of two months prior to floor covering installation.

a. Moisture Testing: Perform moisture and pH tests as recommended by the flooring and adhesive manufacturers. Perform test starting on the deepest part of the concrete structure. Proceed with installation only after concrete substrates meet or exceed floor covering manufacturer's requirements. In the absence of specific guidance from the flooring manufacturer the following must be the required minimum:

b. Perform concrete internal relative humidity testing using in situ probes in accordance with ASTM F 2170. Proceed with installation only after concrete reaches maximum 75 percent relative humidity level measurement.

**C3020 1.1.3 Additional Preparation**

If tested moisture levels exceed the allowable limits, shot blast the concrete subfloors to including grinding of areas not accessible to shot blasting equipment and install a 100% solids VOC free epoxy moisture and pH control system as recommended by the third party testing agent.

a. Install cement based self-leveling underlayment over epoxy moisture and pH control system to create a smooth substrate suitable for floor covering and approved by floor covering manufacturer for use with their products.

b. Correct conditions that will impair proper installation.

c. Fill cracks, joints and other irregularities in concrete with leveling compound.

d. Do not use adhesive for filling or leveling purposes.

**C3020 1.1.4 Final Cleaning Prior to Flooring Finish Installation**

Clean floor of oil, paint, dust, and deleterious substances. Leave floor dry and cured free of residue from existing curing or cleaning agents.

**C302001 TILE FLOOR FINISHES**

Provide ceramic tile floor systems as defined in the Tile Council of North America (TCNA) handbook for ceramic tile installation and materials for the service requirements listed. Provide installation and materials in accordance with ANSI A108/A118 series standards, except do not use organic adhesives. Provide manufacturer’s full range of colors and styles. Tile must be a minimum of two grades above base grade.

Mortar must be Portland cement, ANSI A108.1A/1B/1C/ A118.1, Latex-Portland cement, ANSI A108.5/A118.4 or Epoxy ANSI A108.6/A118.3.

Grout must be factory sanded Portland cement, ANSI A108.10/A118.6, Latex-Portland cement, ANSI A108.10/A118.7 or Epoxy ANSI A108.6/A118.3. Provide tile joint grout sealer on white, light colored areas that are routinely exposed to water and liquid cleaning materials, entrance areas, and areas that require a high degree of stain resistance, and as required by the manufacturer. Provide chemical resistant epoxy resin for kitchens and other areas where high resistance to staining and absorption are required, ANSI A118.3.

Slip resistant tile must have a minimum Dynamic Coefficient of Friction (wet and dry) of 0.42, ANSI A137.1-2012. Tile must have smooth, non-slip or textured surface and a glazed or unglazed finish. Non-slip or textured surface required for tile in areas where there is excessive water or grease and oils such as kitchens, dining facilities, shower rooms, toilets, and in industrial and maintenance facilities.

**C302001 1.1 CERAMIC GLAZED FLOOR TILES**

Ceramic glazed floor tiles shall be a minimum of 5/16 inch (8 mm) thick with a minimum of 1/8 inch (3 mm) grout width with cushioned edge. Tile shall have a 0.5 to 3.0 percent water absorption rate, ASTM C373. Do not use in areas where there is excessive water or grease and oils such as kitchens, dining facilities, toilets, showers, shower drying rooms, building entrance areas, and in industrial and maintenance facilities.

**C302001 1.2 CERAMIC MOSAIC UNGLAZED FLOOR TILES**

Ceramic Mosaic unglazed floor tiles must be a minimum of 1/4 inch (6 mm) thick with a maximum of 1/16 inch (1.6 mm) grout width with cushioned edge. Tile must have less than a 0.5 percent water absorption rate, ASTM C373.

**C302001 1.3 PORCELAIN FLOOR TILE**

Porcelain floor tiles must be a minimum of 5/16 inch (8 mm) thick with a maximum of 1/4 inch (6 mm) grout width with cushioned edge. Tile must have a minimum breaking strength of 300 pounds (202 kg), ASTM C648 and a maximum absorption rate of 0.5%, ASTM C373. Tile must be color through, impervious, unglazed or glazed finish with an unpolished, semi-polished, polished, or textured surface.

**C302001 1.4 QUARRY FLOOR TILE**

Quarry floor tiles must be a minimum of 1/2 inch (12.7 mm) thick tiles with a maximum of 1/4 inch (6 mm) grout width. Tile must have a minimum breaking strength of 350 pounds (158 kg), ASTM C648 and a maximum absorption rate of 3%, ASTM C373. Use grout release for darker pigmented grout colors. Tile must have a maximum of 3.0 percent water absorption rate when tested in accordance with ASTM C373. Non-slip, abrasive grain or textured surface required for tile in areas where there is excessive water or grease and oils. Tile must consist of semi-vitreous, vitreous or clay material with smooth or textured surface and unglazed finish.

**C302002 TERRAZZO FLOOR FINISHES**

Refer to Project Program for special design requirements.

**C302002 1.1 BONDED TERRAZZO**

Provide terrazzo, bonded to concrete, consisting of a terrazzo topping over an underbed. Where structural movement is anticipated which may injure the terrazzo, use the sand cushion (floating) method. Provide cementitious terrazzo in accordance with the NTMA bonded terrazzo specification. Patterns must have three (3) colors with (18 gauge) minimum zinc "L" divider strips.

Applicator must be approved by the NTMA and must have a minimum of 5 years experience in the application of the materials to be used and must have a completed 8 successful installations within the past 2 years.

**C302002 1.2 RESINOUS TERRAZZO**

The resinous terrazzo flooring must be an epoxy terrazzo. All terrazzo, auxiliary products and materials and application techniques used must be approved by National Terrazzo and Mosaic Association (NTMA) and epoxy terrazzo manufacturer, whichever is more stringent, prior to use. These requirements must include, but are not limited to the following;

Epoxy Terrazzo Minimum Requirements:

The contractor must be a member of NTMA and must have a minimum 10 years of application experience and have completed a minimum 5 successful installations over the past five years of similar scope, complexity and minimum of 75 percent of the square footage.

Products must not contain VOC's or formaldehydes. Thickness 3/8" cast in place. Hardness: 60-85 per ASTM D-2240. Tensile Strength: 3,000 psi (min) per ASTM D-638. Compressive Strength: 10,000 psi (min) per ASTM D-695. Chemical Resistance: No deleterious effects per ASTM D-1308

Divider strips/control joints in the terrazzo must be aluminum or brass must occur directly above control joints in the subfloor and be a minimum 18 gauge "L" shape. A flexible crack suppression membrane (elastomeric) installed over entire floor slab surfaces, including all cracks in the subfloor. Flatness tolerance of the slab must be less than 0.25-in flatness variation over 10ft span. Fill areas with 100% epoxy solids with fine aggregates per manufacturer's recommendations for areas which do not meet the flatness tolerance mentioned above. The concrete surface must use shot blasting only (no alternate method to be used). The concrete slab is to be tested for moisture transmission using ASTM F2170 Probe Test. Concrete slabs must be shot-blasted and cleaned to receive epoxy terrazzo moisture vapor primer system as specified by manufacturer and NTMA, whichever is more stringent.

Maintain the ambient room and floor temperature at 60Â°F or above for a period extending 72 hours before, during and after floor installation. Concrete to receive epoxy terrazzo must have cured for at least 28 days and be free of all curing compounds. Test concrete substrate to determine acceptable moisture levels prior to installation. Testing should be conducted according to ASTM F2170, Probe Test (determining relative humidity in concrete slabs using in situ probes). Concrete slabs must be shot-blasted and cleaned to receive epoxy terrazzo moisture vapor primer system as specified by manufacturer and NTMA, whichever is more stringent. The building must be enclosed and the HVAC system operational prior to and during each day of installation, the terrazzo contractor must verify that the dew point is at least 5Â° F (-15Â° C) less than the slab and air temperature.

Physical properties of the moisture migrating primer must have a maximum of 0.3 perms with 100% RH. Primer must be a material recommended by the resin manufacturer which will penetrate the pores of the substrate and bond with the topping to form a permanent monolithic bond between the substrate and the topping.

Five colors for various patterns and accents throughout the flooring area. Marble chips must not exceed #1 size. Provide a minimum of three 6" x 6" samples for each color and type of terrazzo for review prior to purchase and two 6" lengths of each type of divider strip. Use of post-industrial recycled marble or granite terrazzo chips. When completed, the terrazzo must show a minimum of 70% decorative aggregate chips on the surface.

The finished floor will be rinsed clean, allowed to dry and non-yellowing, slip-resistant & durable water based acrylic sealer. Confirm with user if high polish finish may be used in lieu of sealer. Coordinate with user sheen of polished finish. Use 100% epoxy solids flexible resin, tinted to match adjoining terrazzo matrix per manufacturer's specification.

For concrete slab requirements; See PTS A10-50 Slab on Grade, 1.1.1 Slab on Grade where Resinous Terrazzo Floor Finish is scheduled.

**C302003 WOOD FLOORING**

**C302003 1.1 WOOD FLOORING SYSTEM**

Wood strip flooring must be 3/4 inch (19 mm) thick by 2-1/4 inches (57 mm) face width, kiln dried, continuous tongue and groove and of standard lengths. Beech and birch must be second grade in accordance with NOFMA Grading Rules. Hard maple must be second and better in accordance with MFMA-01. Red and white oak must be select grade in accordance with NOFMA Grading Rules. Strip flooring must be marked with the trademark of the grading agency. The strip flooring must be NOFMA certified and installed in accordance with NOFMA publication *Installing Hardwood Flooring*. Nails must be as recommended by strip flooring manufacturer’s recommendations. Resilient pads must be pneumatic rubber, PVC, or polyurethane resilient mounts to fit the floor system. Moisture barrier must be 6 mil minimum thickness polyethylene.

**C302003 1.1.1**

Rooms where wood flooring is to be installed must have permanent heating and air conditioning installed and working or adequate arrangements for ventilation and temperature controls starting not less than 3 days prior to beginning the installation of flooring and continuing throughout the remainder of the contract period.

**C302003 1.1.2**

Concrete slab must be level, steel troweled to a tolerance of 1/8 inch (3 mm) plus or minus in a 10 foot (3048mm) radius. Slab surface must be clean, dry, and approved by wood floor manufacturer prior to start of installation.

**C302003 1.1.3**

Unless otherwise approved, flooring must be laid parallel to the length of the area to be floored. Strips must be laid with close joints, snugly driven up but providing for expansion in accordance with humidity conditions expected during the life of the flooring. End joints must be so alternated that there will be at least two boards between end joints in the same plane and at least 6 inches between end joints in adjacent boards. Space for expansion must be left along perimeter walls and around fixed projections through the floor surface.

**C302003 1.1.4**

Flooring must be sanded to a smooth, even, uniform finish without burns in accordance with the flooring manufacturer’s recommendations. The flooring must be left clean and ready to receive the finishing materials. Refer to C3040 "INTERIOR PAINTING AND SPECIAL FINISHES" for floor finishes.

**C302004 RESILIENT FLOOR FINISHES**

All resilient flooring must meet or exceed applicable Architectural Barriers Act (ABA) Standards horizontal requirements. Install each type of flooring with recommended adhesive in accordance with the manufacturers' written instructions. Installers must be approved by the manufacturer in writing and must have a minimum of 3 yrs experience for each type of flooring to be installed. Provide and store a minimum of 2% total quantity for each type flooring, color and pattern within each building for future replacement and patching. Provide manufacturers full line of color and pattern selections, including multi-color patterns. Use the resilient floor finishes as identified in the Project Program or as directed below.

**C302004 1.1 RESILIENT SHEET FLOORING SYSTEMS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Use linoleum in corridors and offices for floors with high durability, moderate maintenance, antistatic and antimicrobial requirements. This product is considered made from renewable resources. Indicate resilient linoleum sheet flooring in the Project Program if required.  
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**C302004 1.1.1**

Resilient linoleum sheet flooring must be made with natural raw materials including linseed oil, flour, and rosin or resin binders double calendared onto natural jute backing, ASTM F2034, Type I. Pattern and color must extend throughout thickness of material. Gage must be 0.10 inch (2.5 mm). Static load limit must be 250 psi per ASTM F970. Seal linoleum using manufacturer's recommended sealer for commercial application. The manufacturer's technical representative must review and approve each typical sample application on-site prior to resuming the installation and must spot check each 1,196 square yards (1000 square meters) for quality control. Work must not commence on any portion of work until the manufacturer's technical representative renders approval on site. A manufacturer's 5-year warranty is required.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Use rubber sheet flooring below in corridors and other high traffic areas, for floors with high durability, low maintenance, high slip-resistance requirements. Indicate resilient rubber sheet flooring in the Project Program if required.  
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**C302004 1.1.2**

Resilient rubber sheet flooring must be commercial quality, dimensionally stable, wear resistant, firm and slip resistant with integral color. The rubber sheet flooring must be a three-layer construction consisting of a rubber wear layer, a cushioned layer, and a polyester backing. All components of the construction must be thoroughly vulcanized to prevent delamination. The rubber sheet flooring must conform to ASTM F1860-98 and require no wax maintenance.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Use homogeneous vinyl sheet flooring below in break rooms, kitchenettes, and other similar areas requiring floors with high durability, low maintenance, and high stain-resistance. Indicate homogeneous vinyl sheet flooring in the Project Program if required.  
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**C302004 1.1.3**

Resilient homogeneous vinyl sheet flooring must be commercial quality, 0.080 inch (2.0 mm) overall nominal gauge with a minimum wear layer thickness of 0.066 inch (1.6 mm) and a minimum of 6 feet (1.83 m) wide. It must be non-layered, non-backed and include a protective urethane finish for ease of maintenance and conform to ASTM F1303, Type II Grade 1 Class A. Seams must be recess scribed and heat welded with patterned or solid color weld rods depending on the Contractor’s design intent to camouflage, blend or accent the seam lines. Resilient homogeneous vinyl sheet flooring must require no wax maintenance.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Use heterogeneous vinyl sheet flooring below in breakrooms, kitchenettes for floors of a moderate cost with moderate durability, low maintenance, water-resistance requirements. Indicate heterogeneous vinyl sheet flooring in the Project Program if required.  
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**C302004 1.1.4**

Resilient heterogeneous vinyl sheet flooring must be commercial quality, 0.080 inch (2.0 mm) overall nominal gauge with a minimum wear layer thickness of 0.066 inch (1.6 mm) and a minimum of 6 feet (1.83 m) or 12 feet (3.6 m) wide. It must include a protective urethane finish for ease of maintenance and conform to ASTM F1303, Type I Grade 1 Class A. Seams must be recess scribed and heat welded with patterned or solid color weld rods depending on the Contractor's design intent to camouflage, blend or accent the seam lines. Resilient heterogeneous vinyl sheet flooring must require no wax maintenance.

**C302004 1.2 RESILIENT TILE FLOORING SYSTEM**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Use VCT flooring below in corridors, offices, breakrooms, and other similar areas requiring floors with moderate durability, high maintenance, and low cost. Indicate VCT flooring in the Project Program if required.  
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**C302004 1.2.1**

Resilient vinyl composition tile (VCT) must be commercial grade, asbestos free, with a nominal overall gauge of 1/8 inch (3 mm) and a wear layer thickness of 1/8 inch (3 mm) nominal. The tile must be manufactured in accordance with ASTM F 1066, Type II, Comp. 1, Class 2, through pattern. Tile must be finished in accordance with manufacturer’s written instructions.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Use static dissipative SDT flooring below in computer areas, or areas with sensitive electronic for floors with high durability, low maintenance, high slip-resistance requirements. Indicate SDT flooring in the Project Program if required.  
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**C302004 1.2.2**

Resilient static dissipative vinyl composition tile (SDT) must be of commercial grade, asbestos free, with a nominal overall gauge of 1/8-inch (3 mm) and a wear layer thickness of 1/8-inch (3 mm) nominal; with an antistatic additive. The SDT tile must conform to ASTM F1066, Class 2 through pattern. The flooring must be installed with recommended adhesive and accessories; and finished in accordance with the manufacturer's written instructions. Use SDT floors in computer areas or areas with sensitive electronic where the Project Program requires tile.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Use vinyl tile flooring below in corridors and other high traffic areas, for floors with high durability, low maintenance, high slip-resistance requirements. Indicate resilient vinyl tile flooring in the Project Program if required.  
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**C302004 1.2.3**

Resilient solid vinyl tile/plank must be 0.1 inch (2.5 mm) thick, with a vinyl wear layer of 0.040 inches (1.mm) and must be planks or square tiles. It must include a protective urethane finish for ease of maintenance and conform to ASTM E648, Type III, Class 1 and ASTM F1700, Class III. Provide vinyl flooring that is easily cleaned with off-the-shelf products. Surface finishes requiring manufacturer supplied or special order cleaning solutions are not acceptable. Vinyl flooring must have a marble, granite, stone, terrazzo or wood grain pattern. A manufacturer's 25-year min warranty is required. Products must meet the Buy American Act and be manufactured in ISO 9001 and ISO 14001 compliant factories.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Use rubber tile flooring below in corridors, elevators, ramps, and high traffic areas, for floors with high durability, low maintenance, high slip-resistance requirements. Indicate resilient rubber tile flooring in the Project Program if required.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

**C302004 1.2.4**

Provide 100% synthetic resilient rubber tile with color through, slip resistance formulation, with a minimum base thickness of 0.125 inch (3.2 mm) and a minimum stud height of 0.024 inch (0.6 mm). Rubber tile must conform to ASTM F1344, Class I and ASTM E648, Class 1. The product shall require no wax maintenance. A manufacturer's 10-year warranty is required for a raised round or square surface profile. A manufacturer's 5-year warranty is required for other surface textures with slip resistant formulation.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Use linoleum in corridors and offices for floors with high durability, moderate maintenance, antistatic and antimicrobial requirements. This product is considered made from renewable resources. Indicate resilient linoleum tile flooring in the Project Program if required.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

**C302004 1.2.5**

Resilient linoleum tile must be made with natural raw materials including linseed oil, flour, and rosin or resin binders double calendared onto synthetic jute backing, ASTM F2034, Type I. Pattern and color must extend throughout thickness of material. Gage must be 0.10 inch (2.5 mm). Static load limit must be 250 psi per ASTM F970. Seal linoleum using manufacturer's recommended sealer for commercial application. The manufacturer's technical representative must review and approve each typical sample application on-site prior to resuming the installation and must spot check each 1,196 square yards (1000 square meters) for quality control. Work must not commence on any portion of work until the manufacturer's technical representative renders approval on site. A manufacturer's 5-year warranty is required.

**C302005 CARPETING**

**C302005 1.1 GENERAL**

Installer(s) must be approved by the manufacturer in writing. Carpet manufacturer must be established and in good standing with the industry. A minimum of 5% total quantity for each color and pattern must be provided and stored within the building for future replacement patching.

**C302005 1.2 CARPET PILE FIBER**

Provide one of the following:

a. 100% premium branded, yarn-dyed, Type 6.6 continuous hollow filament nylon

b. 100% premium branded, solution-dyed, Type 6 or Type 6.6 continuous hollow filament nylon

c. 100% premium branded, combination yarn dyed and solution-dyed, Type 6 or Type 6.6 continuous hollow filament nylon

**C302005 1.3 CARPET BACKING REQUIREMENTS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Select the type carpet backing required for each of the areas within the facility according to the project requirements. Indicate the backing type in the Project Program.  
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a. Provide manufacturer's standard high performance carpet backing.

b. Moisture resistant carpet backing must pass the 24-hour British Spill Test.

c. Moisture proof carpet backing must pass the 10,000 Impacts Test.

d. Provide moisture resistant carpet backing with an attached urethane cushion, minimum 18 lb. density.

e. Provide moisture proof carpet backing with integral high density cushion of thermoplastic, urethane, or PVC.

**C302005 1.4 CARPET PERFORMANCE CHARACTERISTICS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Select the appropriate choices from the following performance characteristics to suit the type carpet required for each of the areas within the facility. State these requirements in the Project Program.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

a. Flammability: Carpet must meet the Critical Radiant Flux Classification of not less than 0.45 W/sq. cm. when tested in accordance with ASTM E648. Carpet must generate less than 450 rating when tested in accordance with ASTM E662

b. Static Control: Carpet must include a permanent static control system to control static build-up to less than 3.0 KV in accordance with AATCC-134.

c. Dimensional Stability: Carpet must be permanently dimensionally stable with no delamination of components or any edge raveling or zippering. Edge Ravel: Minimum 1 lb. loop pile only - ASTM D-7267; Delamination: Minimum 3.5 lb. per inch of width - ASTM D-3936; Tuft Bind: Minimum 10 lb. average tuft bind for loop pile - ASTM D-1335; Tuft Bind: Minimum 8 lb. average tuft bind for (Modular Tile) loop pile - ASTM D-1335.

d. Colorfastness to Crocking: Not less than 4, wet and dry, per AATCC-165.

e. Colorfastness to Light: Not less than 4 after 40 AFU (AATCC fading units) per AATCC-16.

f. Antimicrobial Activity: Not less than 0.08-inch (2-mm) halo of inhibition for gram-positive bacteria; not less than 0.04-inch (1-mm) halo of inhibition for gram-negative bacteria; no fungal growth, per AATCC-174.

g. Appearance Retention: Provide carpet with a medium scale (>3" repeat) or large scale (>6" repeat), multi-color pattern for excellent appearance retention and soil hiding characteristics. Heathered yarn without a pattern is unacceptable unless approved by the NAVFAC Interior Designer as an accent carpet.

h. Sustainability: Provide carpets with recycled fiber content, and renewable material content in the attached cushion or backing materials certified by an independent testing agency. Recycle Content of the Total Product Weight: Must be either Pre-consumer or Post-consumer content or a combination of these. Broadloom: minimum of 10%; Modular Tile: minimum of 30%.

i. Product Sustainability Certification: To achieve superior performance in multiple environmental attribute areas, carpet must have third party certification in accordance with NSF/ANSI 140 Sustainable Carpet Assessment Standard at a "Gold" level minimum. Carpet manufacturer must supply certificate as part of the procurement documentation.

j. Indoor Air Quality: Provide carpets that meet the criteria of the CRI "Green Label Plus" Indoor Air Quality Testing Program. Carpet adhesive VOC's must be less than 50 g/L..

k. Reclamation of existing carpet to be determined with potential vendor. When carpet is replaced, submit certification documentation from the reclamation facility to the Contracting Officer.

l. Written Warranty: Lifetime commercial warranty for texture retention and edge raveling, zippering, de-lamination is required. Seam preparation and adhesives must be recommended by the carpet manufacturer in accordance with the warranty. Submit a copy of the manufacturer's standard warranty to the Contracting Officer within 60 days of BOD. Government must be a beneficiary of the terms of this warranty.

m. Texture Appearance Retention Rating (TARR): The carpet should be evaluated using ASTM D-5252, Hexapod Drum Test, as the commercial carpet test procedure and TARR classification determined by ASTM D-7330. Carpet must meet TARR ratings specified below:

|  |  |  |
| --- | --- | --- |
| **Space Definition** | **Traffic Classification** | **TARR Classification** |
| Private Offices | Moderate | > 3.0 TARR |
| Training, Conference, etc. | Heavy | > 3.0 TARR |
| Open Office, Corridors, Lobbies, etc. | Severe | > 3.5 TARR |

**C302005 1.5 CARPET INSTALLATION**

Install carpet by one of the following methods in accordance the manufacturer's recommendations and in accordance with the Carpet and Rug Institute, CRI-104, Standard for Installation Specification of Commercial Carpet, compatible with the construction, backing, and pattern characteristics of each carpet provided.

a. Direct Glue Down Carpet Installation

b. Double Glue Down Carpet and Pad Installation

c. Carpet with Attached-Cushion Installation

d. Preapplied releasable "dry" adhesive system installation.

e. Stretch-In Carpet Installation with tack strips and pad

**C302006 MASONRY AND STONE FLOORING**

**C302006 1.1 UNIT MASONRY FLOORING SYSTEM**

Unit masonry flooring system and coordinating base must be fired red clay brick, or chemical resistant brick unit masonry flooring. Provide unit masonry flooring systems in accordance with the Brick Industry Association recommendations and the Tile Council of America *Handbook for Ceramic Tile Installation*.

**C302006 1.2 STONE FLOOR AND BASE FINISHES**

**C302006 1.2.1**

Natural Stone Flooring and coordinating base must be of marble, granite, or travertine.

**C302006 1.2.2**

Aggregate Stone Tile and coordinating base must be a composite of marble or granite.

**C302006 1.2.3**

Install stone floor and base in accordance with the recommendations of the Marble Institute of America, the Indiana Limestone Institute of America, Inc. the National Building Granite Quarries Association, Inc. in addition to the Tile Council of America *Handbook for Ceramic Tile Installation* as applicable to the type of stone being installed.

**C302007 WALL BASE FINISHES**

Provide a wall base for transition between floor and wall finish. If no other type of base is required, provide rubber or vinyl straight base at carpet installations, rubber or vinyl cove base at exposed concrete or resilient tile floors, and a base to match the floor material at hard surface tile floors, or as required in the project program.

**C302007 1.1 RESILIENT WALL BASE FINISHES**

**C302007 1.1.1**

All rubber wall base must be 4 inch (100 mm) high and 1/8 inch (3.2 mm) thick as required unless indicated otherwise. The wall base must include inside and outside corners and must conform to ASTM F1861-98, Type TS. Provide wall base in rolls and not 4 foot lengths.

**C302007 1.1.2**

Flash-coved integral resilient sheet wall bases must be installed in accordance with the manufacturers' printed instructions to include a cove stick having a minimum radius of 3/4 inch (19 mm) and finished with an approved cap strip.

**C302007 1.2 CARPET WALL BASE FINISHES**

Carpet wall base finishes must consist of a strip of carpet matching or contrasting adjacent carpet, 4 inch (100 mm) high, with the top edge finished with an aluminum or vinyl edge profile; or an edge binding material matching the carpet.

**C302007 1.3 WOOD BASE FINISHES**

Wall base must be a minimum of 3-1/2 inches (90 mm) high and AWI custom grade hardwood molding with mitered inside and outside corners. Refer to C302008 – 1.1.2 for wood finishes.

**C302007 1.4 STONE AND MARBLE BASE FINISHES**

Stone and marble wall base must coordinate with the adjacent flooring and must be 4 inch (89 mm) and 3/4 inch (19 mm) thick.

**C302007 1.5 TILE BASE FINISHES**

Coordinate tile base with ceramic wall and floor tile for color, material match and modularity. Include all pre-manufactured trim pieces, special shapes, caps, stops, and returns to provide a complete installation. Provide coordinating wall, base and floor tile for curb construction at showers.

**C302008 STAIR FINISHES**

**C302008 1.1 RESILIENT STAIR TREADS, RISERS AND LANDINGS**

Refer to C302004 for resilient landing finishes. Provide rubber risers to match treads or one-piece tread/risers. Provide treads with raised patterns and visually impaired nosing inserts as required.

**C302008 1.2 PORCELAIN AND STONE STAIR TREADS, RISERS AND LANDINGS**

Refer to C302001 and C302006 for porcelain and stone stair finishes. Provide treads with textured surfaces or raised patterns and visually impaired nosing inserts as required.

**C302008 1.3 CARPETED STAIR TREADS, RISERS AND LANDINGS**

Refer to C302005 for carpeted stair finishes. Provide dense padding on treads and nosings for increased appearance retention and durability.

**C302009 FLOOR TOPPINGS AND TRAFFIC MEMBRANES**

Assemblies include floor toppings and membrane systems.

**C302009 1.1 REFLECTIVE, CHEMICAL AND SLIP RESISTANT FLOOR SYSTEMS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Use for aircraft maintenance facilities and vehicle maintenance facilities where the activity requires a light color floor finish to reflect light for maintenance. If floor coating system is required, indicate requirement in the Project Program.   
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**C302009 1.1.1 Thin Film Floor Coating**

The Designer of Record must utilize UFGS Section 09 67 23.15, *Fuel Resistive Resinous Flooring, 3-Coat System*, for the project specification submittal and for test patch, surface preparation, and installation requirements. Use MPI Product #212 "Thin Film Flooring System for Aircraft Maintenance Facilities" for product specifications.

**C302009 1.1.2 Dry Shake Floor Topping**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: If dry shake system is required, indicate requirement in the Project Program. The dry shake system is better than a thin film floor coating on a hangar floor but requires coordination with concrete mix design, strict environmental control regarding heat and dust, extra finish care, and a mechanical spreader system to achieve the desired results.  
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NOTE: Advise the Contracting Officer that there are two manufacturers that make products that comply with this specification. "Lumpiplate" as manufactured by ChemRex, a subsidiary of Master Builder Technologies and "Diamond Plate" as manufactured by The Euclid Chemical Company comply with this specification.**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

System must be a nonferrous, non-oxidizing metallic aggregate, dry-shake surface hardener system consisting of specially processed cementitious binder, plasticizer, and water-reducing admixtures, formulated and processed under the stringent quality control of the manufacturer. The hardener must be proportioned and sealed in standard moisture resistant bags. The manufacturer must guarantee their aggregate to be free of rust, corrosive materials, oil, petroleum, or other water-base materials when delivered. The manufacturer must replace any material found to contain any such materials, or any other material, which is deemed unsatisfactory. The manufacturer must provide a full-time technical representative, qualified in designing and adjusting concrete mixes, to assist in the application of the aggregate surface hardener system. A mono molecular surface evaporation retardant film, as recommended by ACI 305R and ACI 308R, must be provided for use under drying conditions, due to high concrete or ambient temperatures, low humidity, high winds, and so forth. This includes heated interiors during cold weather, to aid in maintaining concrete moisture during the early placement stages of the plastic concrete. Retarder must be certified by its manufacturer to be compatible with the surface hardener and shall be used in accordance with the manufacturer's recommendations. Curing and sealing materials and procedures must be as recommended by the manufacturer of the aggregate surface hardener system and ASTM C309 or ASTM C1315. All installation must be in accordance with manufacturer’s instructions. Coordinate the concrete mix design with the dry shake floor topping manufacturer to optimize bond of floor finish to slab. Spread topping mix with a mechanical spreader.

**C302010 HARDENERS AND SEALERS**

**C302010 1.1 HARDENED AND SEALED CURE CONCRETE FLOORS**

Harden and seal concrete floors in accordance with the finished floor manufacture requirements. Utilize other methods of concrete curing if the floor finish manufacturer does not recommend a chemical hardener or sealer. Concrete floors that can utilize a hardener-sealer and will be exposed to traffic must receive a minimum of two coats of hardener-sealer curing agent for dust protection. These hardener-sealer-cured floors must be finished with a curing agent that must penetrate the concrete to permanently seal the floor against moisture and the penetration of contaminants. The curing agent must be non-toxic, non-flammable, and non-combustible and must be installed in accordance with the manufacturer’s printed instructions. The finished floor must be dust-free.

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NOTE: If pigmented or colored concrete is desired, indicate requirement in the Project Program. Coordinate concrete mix design, choose topical dye method, integral color topping, or dry shake pigment application. If multiple colors are used, coordinate structural joints with color change joints.  
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**C302010 1.2 COLORED CONCRETE FLOORS**

Colored concrete floors must include a colored pigment either applied as a topical dye; or a concrete topping with integral color pigment; or a dry shake pigment application, as required by the project program. Concrete floor must be trowel applied in a pattern, or must include grit for slip resistance.

**C302011 RAISED ACCESS FLOORING**

**C302011 1.1 FLOORING SUPPORT SYSTEM**

Design support system to allow for 360-degree clearance in laying out cable and cutouts for service to machines and so that panel and stringer together take up maximum of 2 inches (50 mm).

**C302011 1.1.1 Pedestals, Shafts, and Caps**

Provide pedestals of steel or aluminum, each capable of carrying 4,960 pounds (2250 kg) axial load without permanent deformation. Provide permanent factory applied corrosion resistant finish for pedestals made of ferrous materials. Provide base plate not less than 4 inch by 4 inch by 1/8 inches (100 mm by 100 mm by 3 mm) thick, welded to shaft of pedestal. Approved die-formed bases of equivalent load spreading capacity and bearing area may be provided in lieu of flat base plates. Provide shafts to support design loads. Provide Pedestal Caps designed to fit precisely over pedestal shafts and to interlock with panels and stringers to prevent tilting, rocking, or vibrating of panels when live load is applied. Provide pedestals with adjusting threads or other devices that will permit leveling of floor system with adjustment range of approximately 2 inches (50 mm). Provide lock nuts, set screws, or other locking devices to positively lock final pedestal vertical adjustments in place, independent of floor panels. Do not use self-tapping screws, snap type connections, or spring-action lock-nuts. All adhesives used must be as recommended by the manufacturer.

**C302011 1.1.2 Stringers**

Fabricate from rolled or formed galvanized steel conforming to ASTM A591/A592M. Incorporate interlocking pedestal and stringers in pedestal stringer system, providing positive seating of panels to prevent tilting, rocking, or vibrating of panels when live load is applied. Provide stringers that can be added or removed after floor is in place. Fasten end of each stringer and mid-point of each four-foot stringer positively to pedestal heads, using manufacturer's standard screws. Provide screws that are removable from top.

**C302011 1.2 FLOOR PANELS**

Provide interchangeable 24 inch by 24 inch (610 mm by 610 mm) square module panels capable of supporting design loads. Panels must be of weight that can readily be removed and handled by one person using lifting tool furnished by access floor manufacturer. Panel finish surface to be Grade HW 120 high pressure plastic laminate conforming to NEMA LD. Use either factory attached carpet tile, factory attached - static dissipative grounded carpet tile or field installed carpet tile with seams overlapping the access floor grid panels or to transition areas where only part of the space is recessed for access floor.

a. Aluminum Panels - ASTM B85, SC84A, die-cast or extruded construction for rooms with MRI equipment.

b. Steel Panels - Die-formed construction. Weld flat steel top sheet to one or more formed steel stiffener sheets. Provide zinc-coating conforming to ASTM A591/A591M, Class C, with manufacturer's standard corrosive resistant electrically conductive epoxy paint finish . Wood, plastic and other combustible products are prohibited.

c. Cementitious or Concrete Filled Formed Steel Panels Entirely non-combustible steel shell and cementitious or concrete fill, corrosive resistant inside and out. Seal cut edges in accordance with manufacturer's recommendations.

d. All panels to be manufactured in USA and individually labeled "Made in USA"

**C302011 1.2.1 Gravity Held Factory Finished Panels with Bolted Stringer Understructure**

Fasten end of each stringer and mid-point of each four-foot stringer positively to pedestal heads, using manufacturer's standard screws. Provide corner lock system for all general office (bare for carpet tile) applications with screws that are removable from top.

**C302011 1.3 GROUNDING**

Ground access floor system for safety hazard and static suppression. Connection of access floor support system to building grounding electrodes is specified in another section of this RFP. Provide positive contact between components for safe, continuous electrical grounding of entire floor system. Total system resistance from wearing surface of floor to building grounding electrode must be within the range of 0.5 megohms to 20,000 megohms for computer rooms, electronics offices, data centers and control rooms, 0.2 megohms to 2.0 megohms for clean rooms and laboratories.

**C302011 1.4 THRESHOLD(S)**

Provide interior thresholds of nonferrous materials where flooring materials or floor levels change.

**C302011 1.5 RAMPS**

Provide ramps of required slip resistance and slope conforming to ABA Standards.

**C302011 1.6 INSTALLATION**

Install access floor system and accessories under supervision of the access flooring manufacturers authorized representative to insure rigid, firm installation free of vibration, rocking, rattle, squeaks, and other unacceptable performance. Install in accordance with the following;

a. Set pedestal in adhesive as recommended by the access flooring manufacturer to provide full bearing of the pedestal base on the sub floor.

b. Layout floor panel installation to keep the number of cut panels at the floor perimeter at a minimum. Scribe panel assemblies at the perimeter to provide a close fit with no voids greater than 1/18" where panels abut vertical surfaces. At spaces where access floor connects to the walls provide connection detail that seals the access floor to the wall to reduce air leakage.

c. Secure grid member to pedestal heads in accordance with access floor manufacturer’s instructions.

d. Thoroughly clean up dust, dirt and construction debris caused by floor installation.

e. Level installed access floor to within 0.060" of true level over the entire area and within 0.10" in any 10" distance.

**C3030 CEILING FINISHES**

Refer to C3040 "INTERIOR PAINTING AND SPECIAL COATINGS" for painted ceiling finishes.

**C303001 ACOUSTICAL CEILING TILES AND PANELS**

**C303001 1.1 ACOUSTICAL CEILING PANELS**

All acoustical ceiling panels must be 24 inch by 24 inch (610 mm by 610 mm), with a minimum light reflectance of .75 (except as noted), Class A, flame spread 25 or less and smoke development of 50 or less, ASTM E84. All acoustical ceiling panels must have minimum 60% recycled content except as noted. Acoustical ceiling panels must conform to ASTM E1264. Provide square edge except as noted.

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NOTE: Select square edge ceiling tile for basic building types and spaces. Select reveal edge for an upgraded look in areas noted. Indicate specific areas in the Project Program.  
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**C303001 1.1.1**

For typical open office areas, conference rooms, executive offices, provide non-asbestos mineral composition acoustical ceiling panels of Type III with factory-applied standard washable painted finish or Type IV with factory-applied plastic membrane-faced vinyl, Form: 1, 2, or 3. Provide reveal edge tiles unless otherwise noted.

**C303001 1.1.2**

For typical humid areas such as toilets and kitchens, provide non-asbestos mineral or glass composition acoustical ceiling panels bonded with ceramic, moisture resistant thermo-setting resin, or other moisture resistant material with factory-applied standard washable painted finish; and recycled content: minimum of 40%.

**C303001 1.1.3**

For areas with very high humidity, heavy soiling, staining, impact abrasion, or limited security concerns, provide Type V, Steel or Type VII, aluminum faces with white baked on enamel finish, and non-asbestos mineral composition absorbent backing.

**C303001 1.1.4**

For areas requiring a concealed grid system, provide non-asbestos mineral composition acoustical ceiling panels of Type III with factory-applied standard washable painted finish or Type IV with factory-applied plastic membrane-faced vinyl, Form: 1, 2, or 3; Size: 12 inch by 12 inch by 5/8 inch (305 mm by 305 mm by 19 mm), Edge: for concealed grid installation.

**C303001 1.1.5**

Provide NRC and CAC ratings as follows:

|  |  |  |
| --- | --- | --- |
| **Type of space** | **Minimum NRC** | **Minimum CAC** |
| Open Office Areas, Auditoriums | .70 | 35-39 |
| Conference Rooms, Classrooms | .60 | 35-39 |
| Activity spaces, Lobbies, Corridors | .60 | 35-39 |
| Executive and Private Offices | .60 | 35-39 |
| Toilets | .50 | 35-39 |
| Kitchens | .50 | 35-39 |
| Fitness/Locker Rms | .50 | 35-39 |
| All other spaces | .50 | 35-39 |

Base the tested NRC value on Mounting Type E-400 of ASTM E795.

**C303002 GYPSUM WALLBOARD CEILING FINISHES**

Conform to specifications, standards and requirements in accordance with Gypsum Association GA 214, GA 216 and GA 224. Provide asbestos free materials only. Provide featured edge gypsum board on all gypsum surfaces that flatness of joints will be visible, such as up-lighted ceilings, window lighted ceilings, and as recommended by the manufacturer. Provide Type X gypsum board in fire rated assemblies.

**C303002 1.1 REGULAR GYPSUM BOARD**

ASTM C36/C36M and ASTM C1396/C1396M, 1/2 or 5/8 inch (12.7 mm or 15.9 mm) thick, tapered edge. Provide 5/8 inch (15.9 mm) for all projects except for single family residential, which may utilize 1/2 inch (12.7 mm) if other requirements, such as sound control, are met.

**C303002 1.2 MOISTURE RESISTANT GYPSUM BOARD**

ASTM C630/C630M, 1/2 or 5/8 inch (12.7 mm or 15.9 mm) thick, tapered edges. Use for ceilings in humid areas. Do not use as a substrate in tiled areas where tile will be exposed to direct moisture contact or condensation accumulation. Support moisture resistant gypsum board at 12 inches (305 mm) on center. Provide 1/2 inch (12.7 mm) for single-family residential projects only. Provide 5/8 inch (15.9 mm) for all other projects.

**C303002 1.3 TEXTURED CEILING FINISH SYSTEM**

Applied textured ceiling finish must be plaster based. Refer to paragraph "C301002 – 1.1 GYPSUM PLASTER" for finish requirements.

**C303002 1.4 JOINT TREATMENT**

ASTM C475, Joint compound must be specifically formulated and manufactured for use with and compatible with tape, substrate and fasteners as recommended by the manufacturer. Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Provide premanufactured joints at all structural expansion joints, crack control joints, and change of materials as recommended by the manufacturer and in accordance with GA 216.

**C303002 1.5 FASTENERS**

ASTM C514, Fasteners must be compatible with each type of gypsum board material as recommended by the gypsum board manufacturer and in accordance with GA 216 and GA 224.

**C303002 1.6 ACCESSORIES**

ASTM C1047, Fabricate from corrosion protected steel or plastic designed for intended use. Accessories manufactured with paper flanges are not acceptable. Flanges must be free of dirt, grease, and other materials that may adversely affect bond of joint treatment. Provide prefinished or job decorated materials. Install as recommended by GA 214, GA 216 and GA 224.

**C303002 1.7 LEVEL OF FINISH**

**C303002 1.7.1**

Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Ceilings to receive a heavy-grade wall covering or heavy textured finish before painting must be finished to GA 214, Level 3. Ceilings without critical lighting to receive flat paints, light textures, or wall coverings must be finished to GA 214, Level 4. Unless otherwise specified, all gypsum board walls, partitions and ceilings must be finished to GA 214, Level 5. Provide joint, fastener depression, and corner treatment. Do not use fiberglass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only. Provide treatment for water-resistant gypsum board as recommended by the gypsum board manufacturer.

**C303002 1.7.2**

Wherever gypsum board is to receive eggshell, semigloss or gloss paint finish, or where severe, up or down lighting conditions occur, finish gypsum wall surface to GA 214 Level 5. In accordance with GA 214 Level 5, apply a thin skim coat of joint compound to the entire gypsum board surface, after the two-coat joint and fastener treatment is complete and dry.

**C303003 PLASTER CEILING FINISHES**

**C303003 1.1 VENEER PLASTER CEILING FINISHES SYSTEM**

Veneer plaster ceilings must be gypsum plaster veneer finish to gypsum base finishes. Refer to Section C3040 for paint system and gloss level. Provide gypsum neat plaster, gypsum ready-mixed plaster, or high strength gypsum plaster base coat conforming to ASTM C28. High strength gypsum plaster must have a compressive strength of not less than 2,500 psi, when tested dry in accordance with ASTM C472.

**C303004 WOOD CEILINGS**

Not Used.

**C303005 SUSPENSION SYSTEMS**

**C303005 1.1 EXPOSED SUSPENDED ACOUSTICAL CEILING GRID**

Provide 24 inch by 24 inch (610 mm by 610 mm) aluminum or steel non-corroding intermediate-duty standard grid system for lay-in acoustical panels (ASTM C635). Finish must be factory applied white baked enamel. Provide manufacturer's hold down clips for fire rated assemblies and wall or edge molding. Hang grid system as recommended by manufacturer but with no less than 0.106 inch (2.7 mm) diameter wires (ASTM A641A, A641M, Class 1), or with one by 3/16 inch (4.76 mm) galvanized steel straps conforming to ASTM A653A, A653M (for light commercial zinc coating) or ASTM A366A, A366M (with an electrodeposited zinc coating, Type RS). Install suspended grid system with acoustical sealant (ASTM C843, nonstaining and ASTM C636). Recycled content must be a minimum of 25%.

**C303005 1.2 CONCEALED SUSPENDED ACOUSTICAL CEILING GRID**

Provide 12 inch by 12 inch (305 mm by 305 mm) aluminum or steel non-corroding intermediate-duty concealed grid system for lay-in acoustical panels (ASTM C635). Finish must be factory applied white baked enamel. Provide manufacturer’s wall or edge molding. Hang grid system as recommended by manufacturer but no less than with 0.106 inch (2.7 mm) diameter wires (ASTM A641A, A641M, Class 1), or with one by 3/16 inch (4.76mm) galvanized steel straps conforming to ASTM A653A, A653M (for light commercial zinc coating) or ASTM A366A, A366M (with an electrodeposited zinc coating, Type RS). Install suspended grid system with acoustical sealant (ASTM C843, nonstaining) and in accordance with ASTM C636. Recycled content must be a minimum of 25%.

**C303005 1.3 SUSPENDED AND FURRED CEILING SYSTEMS**

ASTM C841 (for lath); ASTM C645 (for GWB).

Provide steel materials for metal support systems with galvanized coating per ASTM A653/A653M, G60; aluminum coating ASTM A463/A463M, T1-25; or a 55% aluminum-zinc coating. Provide suspended ceiling framing in accordance with ASTM C754, except framing members must be 16 inches (400mm) unless otherwise noted.

**C303006 METAL STRIP CEILINGS**

Not Used.

**C303090 OTHER CEILING AND CEILING FINISHES**

**C3040 INTERIOR COATINGS AND SPECIAL FINISHES**

Apply coatings directly to all non-prefinished surfaces of the interior construction. Comply with Master Painters Institute requirements for surface degradation analysis, surface preparation, paint and coating selection, paint application restrictions for substrate materials, and paint application.

**C304001 GENERAL REQUIREMENTS**

All paint must be suitable in accordance with the Master Painter Institute (MPI) standards for the interior architectural surface being finished. The current MPI, "Approved Product List" as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use a more current MPI "Approved Product List"; however, only one list may be used for the entire contract. All coats on a particular substrate, or a paint system, must be from a single manufacturer. No variation from the MPI Approved Products List is acceptable.

Select paint systems for the project in accordance with the MPI Architectural Painting Decision Tree available on the Whole Building Design Guide. Use this interactive MPI Decision Tree website to identify applicable paint system(s) for the project. The MPI Decision Tree identifies paint systems for each interior or exterior coated surface in "Normal" or "Aggressive" environmental conditions and generally lists the applicable paint systems in descending order of performance. The paint system at the top of each substrate list generally indicates the highest performing acceptable coating system.

Choose the "Aggressive" environmental conditions in the MPI Decision Tree for exterior systems that are used in moist humid conditions, abrasive conditions, chemical exposure conditions, or within five miles proximity of the ocean or a body of water. Also use "Aggressive " environmental conditions in interior spaces that are exposed to in moist humid conditions, abrasive conditions, chemical exposure conditions, such as bathrooms, shower rooms, kitchens, chemical storage area, swimming pools, laundry, sanitary areas, commercial kitchens, industrial production areas, and hospital operating rooms provide paint systems that comply with the MPI Decision Tree "Aggressive" environmental conditions.

Comply with the following rules when determining the appropriate paint or coating system from the MPI Decision Tree:

a. Some of these paint systems are identified with a "NAVFAC Anchor". This "NAVFAC Anchor" indicates the minimum performing system that NAVFAC will accept for that substrate and environmental conditions.

b. When multiple "NAVFAC Anchors" are indicated on a certain substrate and environmental condition, provide the "NAVFAC Anchor" paint or coating system that is most appropriate for the facility use.

c. If only one MPI Decision Tree choice is available for a certain substrate and environmental condition with no indicated NAVFAC preference, provide that sole option for NAVFAC projects.

d. If the MPI Decision Tree provides multiple choices and no NAVFAC preference is denoted**,** refer to the Additional RFP Requirements below to determine level of performance.

e. If the MPI Decision Tree does not identify all paint system applicable to the facility, utilize the *MPI Architectural Painting, Exterior Systems Manual* to identify other appropriate paint systems for the project. Utilize the "Premium Grade" systems and comply with all limitations stated in the MPI "Approved Product List" for each paint product. Products having an MPI VOC Range E3 must be given preferential consideration over lower VOC Ranges. Use higher performing paint systems unless the lower performing paint system can be justified based on a lifecycle cost to include surface preparation, application, disposal, environmental impact, and required recoating cycles. Only use paint products that have been tested for MPI'S "DETAILED PERFORMANCE" or "EVALUATED PERFORMANCE ". Do not use products that have only been tested for "INTENDED USE".

f. If an "Aggressive" environmental condition option is not available in the MPI Decision Tree for a certain substrate, use the "Normal" environmental condition option.

g. Refer to the Additional Exterior Paint and Coating System Requirements below for further system requirements.

Paints and coatings must comply with Master Painters Institute Green Performance Standard GPS-1-12 which is available at the following website; <http://www.specifygreen.com/EvrPerf/EnvironmentalPerformance.html>. Provide Interior flat intermediate and topcoats of a maximum of 50 g/L VOC and interior non-flat intermediate and topcoats of a maximum 150 g/L VOC. Choose paints that provide performance and are environmentally friendly by using total VOC budgeting to analyze the total impact of all flat, non-flat and special purpose coatings on the project.

**C304001 1.1 MPI GLOSS LEVELS**

Gloss levels must comply with the MPI system of determining gloss as defined in the Evaluation sections of the MPI Manuals. Utilize the performance characteristics of the paint gloss and sheen to categorize paint rather than manufactures' description of his product. The MPI Gloss Levels are indicated by the notation G1, G2, G3, G4, G5, G6, or G7. G1 is not used by Navy.

The MPI Decision Tree indicates a default gloss level for each paint system, however consider the appearance, anticipated conditions, and need for cleaning when choosing the correct gloss level for each coated surface of the project. Comply with the following guidance in choosing the appropriate gloss level.

a. Use G2 "Velvet-like" Flat for ceilings, residential walls away from human contact and low traffic areas.

b. Use G3 "Eggshell-like" in high traffic areas for ceilings and walls, when human contact with the wall is expected but limited, and for dark accent colors.

c. Use G5 Semigloss for walls, doors and trim for high durability and clean ability and when a surface is expected to have routine human contact.

d. Use G6 Gloss only in special situations such as piping identification or special effects.

The MPI Gloss and Sheen Standard values are measured per ASTM D523, and are as follows:

**Gloss Level Number Gloss@ 60 Degrees Sheen@85 Degrees**Gloss Level 1(G1) – Matte or Flat Max.5 units Max.10 units  
Gloss Level 2(G2) – "Velvet-like" Flat Max. 10 units 10-35 units  
Gloss Level 3(G3) – "Eggshell-like" Max. 10-25 units 10-35 units  
Gloss Level 4(G4) - "Satin-like" Max. 20-35 units Min. 35 units  
Gloss Level 5(G5) - Semi-Gloss 35-70 units  
Gloss Level 6(G6) – Gloss 70-85 units  
Gloss Level 7(G7) – High Gloss More than 85 units

**C304001 1.2 MPI SYSTEM DESIGNATIONS AND ABBREVIATIONS**

The MPI coating system number in each Division is found in either the *MPI Architectural Painting Specification Manual* or the *Maintenance Repainting Manual* and defined as an interior system (INT/RIN).

a. INT designates an interior coating system for new surfaces.

b. RIN designates an interior coating system used in repainting projects or over existing coating systems.

c. DSD – the MPI short-term designation for Degree of Surface Degradation as defined in the Assessment sections in the *MPI Maintenance Repainting Manual*. Degree of Surface Degradation designates the MPI Standard for description and appearance of existing condition of surfaces to be painted. This DSD classification is used to determine the proper surface preparation necessary for painting.

**C304001 1.3 SURFACE PREPARATION**

Comply with the "Interior Surface Preparation" section of the *MPI Architectural Painting Specification Manual* or the "Interior Surface Preparation” section of the *MPI Maintenance Repainting Manual*. All suggestive language such as "may" or "should" are deleted from the standard and "must" inserted in its place. Suggestive language such as "recommended" or "advisable" is deleted from the standard and "require" or 'required" inserted in its place. The results of these wording substitutions change this document to required procedures. For surface preparation, determine a MPI DSD Assessment of each surface and comply with the MPI Surface Preparation Requirements relating to the assessments. Notwithstanding MPI requirements, clean interior ferrous metal to a SSPC SP 10 level (near white) that have aggressive chemical environments (SSPC Zones 3A, 3B, 3C, 3D, and 3E) or waterfront exposure to open structures (SSPC Zones 2A or 2B). Examples of these types of facilities are indoor water training facilities, indoor swimming pools, and open or mostly open waterfront maintenance buildings/ waterfront warehouses/ canopies.

Remove dirt, splinters, loose particles, grease, oil, and other foreign matter and substances deleterious to coating performance as specified for each substrate before application of paint or surface treatments. For existing buildings, use MPI *Maintenance Repainting Manual* to determine the coatings that need to be removed. Remove deteriorated or loose coatings before repainting begins. Oil and grease must be removed prior to mechanical cleaning. Cleaning must be programmed so that dust and other contaminants will not fall on wet, newly painted surfaces. Exposed ferrous metals such as nail heads on or in contact with surfaces to be painted with water-thinned paints, must be spot-primed with a suitable corrosion-inhibitive primer capable of preventing flash rusting and compatible with the coating specified for the adjacent areas.

**C304001 1.4 ADDITIONAL INTERIOR PAINT AND COATING SYSTEMS**

In addition to the MPI Decision Tree, comply with the following paint system requirements:

**C304001 1.4.1 PAVEMENT COATINGS**

(1) INT 3.2 Concrete Horizontal Surfaces

Normal Environmental Conditions; Pigmented

Provide road and parking lot pavement marking in accordance with UFGS Section 32 17 23, *Pavement Markings*.

**C304007 SPECIAL COATINGS TO WALLS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Use for hallways, kitchens, bathrooms, laundries and hospitals where maintenance of sanitary conditions is an important requirement. Select special coating for utilitarian and industrial spaces that would usually have ceramic tile but ceramic tile is not required by RFP and according to characteristics provided by each coating system. Indicate Special Coatings in the Project Program if required.  
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**C304007 1.1 CMU Application**

High Performance seamless interior acrylic coating system must be used as an interior wall finish over CMU that has been joint-filled and smoothed with a water resistant manufactured recommended compound. Coating system to be mold and mildew resistant, flame spread 15 or less per ASTM-E84 and have a minimum final film thickness of 7 mils.

**C304007 1.2 Gypsum Wallboard Application**

High Performance seamless interior acrylic coating system must be used as an interior wall finish over gypsum wallboard. Do not prime or seal the drywall except as specifically recommended by the texture acrylic coating manufacturer. Coating system to be mold and mildew resistant, flame spread 8.5 or less per ASTM-E84 and have a minimum final film thickness of 20 mils.

**C304007 1.3 Installation**

Finish may only be installed by factory-qualified applicators in accordance with the manufacturer's printed instructions and recommendations, to fulfill warranty requirements. All coating system components must be products of the same manufacturer.

A minimum of one sample wall application must be provided. Edges at door and window frames must be feathered; hard edges are unacceptable. Upon approval of the sample wall by the project manager, the application must serve as a standard for the remaining work.

The manufacturer's certified representative shall provide an on-site training demonstration of the application and care of the finish for the end-user's facility manager or other representatives.

-- End of Section --

**C304007 1.4 HIGH PERFORMANCE ARCHITECTURAL COATING (HIPAC)**

HIPAC must be a durable, organic system applied to a continuous (seamless) high-build film and cure to a hard glaze finish. They must be resistant to continuous heat and humidity, abrasion, staining, chemicals, and biological growth. Coating must be installed as a complete system, and as recommended by the manufacturer and have a flame spread index of not more than 25 and a smoke developed index of not more than 50 when tested in accordance with ASTM E84.

**C304007 1.4.1**

Two-component, epoxy-polyamide must be chemical and corrosion-resistant, adhesive, alkali-resistant, and water-tolerant for metal, wood, concrete, masonry surfaces, and painted surfaces where high gloss or glaze type finish, extreme workability and resistance to abrasion and stains is required. Minimum dry film thickness is 3 mils for each of two coats. Furnish Gloss or Semigloss finish. Maximum volatile organic compounds (VOC) must be 340 grams/liter.

**C304007 1.4.2**

Single Component, Moisture-Curing Urethane must be a flexible, abrasion- and impact-resistant, use for floors, walls, machinery, equipment and other surfaces where good abrasion resistance, color retention, gloss retention, graffiti resistance and good resistance to acids, alkalis, solvents, strong cleaners and sanitizers, fuel and chemicals are necessary. Can also be used on concrete floors, brick and masonry surfaces (properly conditioned), metals (properly primed), and wood (properly prepared and sealed.) Minimum dry film thickness is 3 mils for each of 3 coats. Use Type I, Aliphatic, for exterior use except for oily or resinous exterior wood surfaces. Use Type II, Aromatic, for interior use.

-- End of Section --