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NAVFAC PTS-C10 (September 2022)  
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Preparing Activity: NAVFAC SUPERSEDING PTS-C10 (December 2018)  
  
PERFORMANCE TECHNICAL SPECIFICATION  
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SECTION C10  
  
INTERIOR CONSTRUCTION  
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. In addition, there may be special requirements for a particular project that are not addressed at all. The RFP preparer will need 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 subparagraphs numerical extension (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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**C10 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.

**C10 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 that are 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 standard at the time of contract award.

**C10 1.1.1 Industry Standards and Codes**

Sealant, Waterproofing & Restoration Institute

**C10 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 |

**C10 1.2 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING**

Provide verification of satisfactory interior construction assemblies' performance via Performance Verification Testing, as detailed in this section of the RFP. Provide special tests and special inspections in accordance with Part 2 Section 01 45 00, *Quality Control* at no additional cost to the Government.

**C10 1.2.1 Slump and Compressive Strength Tests for Grout**

Slump between 8 and 11 inches (200 and 275 mm). Provide minimum grout strength of 2000 PSI in 28 days, as tested in accordance with American Society for Testing and Materials (ASTM) C 1019.

**C10 1.2.2 Field Test for Sprayed Fire-Resistive Materials**

Engage a qualified testing and inspection agency to prepare testing and adhesion reports to test for bond strength. Test bond strength in accordance with ASTM E 736 and be found to meet the requirements in UL's *Fire Resistance Directory* for coating materials.

**C10 1.3 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 3-301-01, *Structural Engineering*.

**C10 1.4 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) must approve the following submittals as a minimum:

Doors, door hardware, windows and glazing, cabinets and countertops, casework, and fireproofing/firestopping.

All structural elements necessary for construction

**C10 1.5 SUSTAINABILITY**

Provide products and systems in accordance with Part 2 Section 01 33 29, *Sustainability Requirements and Reporting*.

**C1010 PARTITIONS**

For general use, metal studs and standard grade GWB, CMU with prime filler coat, or CMU/cast-in-place concrete with GWB or skim coat plaster are acceptable unless stated otherwise in the Project Program. Reinforce points where doorknobs can strike a wall and anchorage points for wall mounted equipment.

Provide control joints and installation techniques as recommended by the manufacturer. See PTS Section C30, *Interior Finishes*, for additional information.

Provide painted GWB with access panels at surfaces furred for HVAC, plumbing and other utility services and controls behind wall surfaces.

Acceptable systems where "IMPACT RESISTANCE" (areas subject to physical abuse or wear) is designated in the project program requirements for impact resistance systems include:

a. CMU/cast-in-place concrete with or without plaster or furred impact resistant GWB or surface applied impact resistant textured acrylic architectural coating system.

b. GWB/metal stud system reinforced for impact resistance with a double layer of gypsum board using at least one layer of impact resistant gypsum board to resist denting and puncturing on the impact surface. If wall is subjected to impact on both sides, both sides of the stud require a double layer of gypsum board. Structural, mechanical, and acoustical design requirements effect the metal stud/gypsum support configuration.

**C101001 FIXED PARTITIONS**

Provide fixed partitions, to include masonry and cast-in-place concrete walls. Sound-rated partition assemblies must have a minimum Sound Transmission Coefficient (STC) as required by the project program. Construct sound-rated bulkheads above partition assemblies for continuity to the deck above.

**C101001 1.1 CAST-IN-PLACE INTERIOR CONCRETE WALLS**

Accomplish work in accordance with UFC 1-200-01, *DoD Building Code (General Building Requirements)*, American Concrete Institute (ACI) 117 and 301/301M. Concrete Mix Design must be suitable for the job conditions.

**C101001 1.2 MASONRY PARTITIONS**

Accomplish work in accordance with ACI 530.1/American Society of Civil Engineers (ASCE) 6/The Masonry Society (TMS) 602 and associated ASTM Standards for concrete masonry wall construction.

**C101001 1.2.1 Testing**

Determine masonry strength in accordance with ACI 530.1. Where fire-rated assemblies are indicated, provide concrete masonry units that have been tested in conformance with ASTM E 119. Provide certificate of compliance to the Designer of Record (DOR) that the materials and assemblies meet the fire ratings indicated on the drawings.

**C101001 1.2.2 Masonry Units Types**

**C101001 1.2.2.1 Concrete Masonry Units**

Units of modular dimensions and air, water or steam cured. Surfaces of units to be plastered or stuccoed must be sufficiently rough to provide bond and exposed surfaces of units must be smooth and of uniform texture.

a. Hollow Load-Bearing Units: ASTM C 90, Type I or II, made of lightweight or normal weight aggregate.

b. Hollow Non-Load-Bearing Units: ASTM C 129, Type I or II, made with lightweight or normal weight aggregate.

c. Special Shapes: Provide special shapes as necessary to complete the work.

d. Fire-Rated CMU: Products must be tested and approved by United Laboratories (UL) according to testing methods described in ASTM E 119, and listed as 2, 3 or 4-hour fire-rated.

**C101001 1.2.2.2 Pre-Faced Concrete Masonry Units**

Provide pre-faced concrete masonry units conforming to ASTM C 744, load-bearing or non-load-bearing, lightweight, Grade N, Type I.

**C101001 1.2.3 Masonry Partition Materials**

a. Mortar - Provide ASTM C 270, Type N or S for non-shear-wall interior masonry.

b. Portland Cement - ASTM C 150, Type I, II, or III.

c. Masonry Cement - ASTM C 91, Type N, S, or M.

d. Sand - ASTM C144.

e. Grout - ASTM C 476, Fine aggregate for grouting cells / spaces 3" (75 mm) or less, or coarse aggregate for grouting cells / spaces greater than 3" (75 mm). Slump between 8 and 11 inches (200 and 275 mm). Provide minimum grout strength of 2000 PSI in 28 days, as tested in accordance with ASTM C 1019.

**C101001 1.2.4 Masonry Accessories**

a. Horizontal Joint Reinforcement – Fabricate from cold drawn steel wire, ASTM A 82. Wire must be hot-dipped galvanized after fabrication in accordance with ASTM A 153/ A 153M, Class B-2, 1.5 ounces of zinc per square foot (42.52 g / 0.0929 sq. meter ).

b. Anchors and Wall Ties – Provide of stainless steel, ASTM A 167, Type 304, or zinc-coated steel.

c. Reinforcing Bars – ASTM A 615 / A 615M.

**C101001 1.3 COLD-FORMED METAL FRAMING**

Provide Cold-Formed Metal Framing in accordance with the provisions of UFC 1-200-01, *General Building Requirements*, and the International Building Code (IBC).

**C101001 1.3.1 Studs**

Galvanized steel, ASTM A 653 / A 653M, SS Grade 50, G60

**C101001 1.3.2 Framing Accessories**

Fabricate steel-framing accessories of the same material and finish used for framing members, with minimum yield strength of 33,000 psi (230 Mpa). Accessories include, but are not limited to, the following: bracing, bridging, blocking, web stiffeners, end and foundation clips, gusset plates, stud kickers, knee braces, girts, joist hangers, reinforcing and backer plates.

Provide permanent metal-to-metal contact separation from stud to electrical conduits, plumbing pipes, and other internal wall system components, such as electrical wires.

**C101001 1.4 METAL SUPPORT ASSEMBLIES**

Provide steel materials for metal support systems with galvanized coating in accordance with ASTM A 653/ A 653M, G60; aluminum coating ASTM A 463/ A 463M, T1-25; or a 55% aluminum-zinc coating ASTM A 792.

**C101001 1.4.1 Suspended and Furred Ceiling Systems, and Wall Furring**

ASTM C 841(for lath); ASTM C 645 (for GWB).

**C101001 1.4.2 Non-load-Bearing Wall Framing / Furring**

ML/SFA MLF (for lath); ASTM C 645, but not thinner than 0.0179 inch (0.4547 mm) thickness. Provide 0.0329 inch (0.8357 mm) minimum thickness for supporting wall hung items such as cabinetwork, equipment and fixtures and for GWB.

**C101001 1.5 ROUGH CARPENTRY**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Parts of this paragraph may not apply if wood framed construction will not be allowed. However, portions of the project may require the wood blocking portion of the specification.  
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Unless otherwise noted, conceal all rough carpentry from view. All framing and board lumber shall be graded and marked by a recognized association or independent inspection agency. Certification of grade is acceptable in lieu of grade markings. Framing lumber such as studs, plates, caps, bucks and nailers must be of the minimum grade for the application in accordance with the grading rules for the local species of framing and board lumber.

**C101001 1.5.1 Moisture Content**

Air-dry or kiln dry lumber as follows:

a. Framing lumber and boards – 19% maximum

b. Timbers 5" and thicker – 25% maximum

**C101001 1.5.2 Fire-retardant Treatment**

Comply with AWPA C20 or AWPA C27.

**C101001 1.5.3 Preservative Treated Lumber**

Preservative treated lumber must be in accordance with AWPA Standards.

**C101001 1.5.4 Structural Lumber**

Provide of species and grade as listed in AF&PA 101 that have the following minimum allowable unit stresses: 1050 Fb, 700 Fc with 1,200,000 E (for engineered uses) but not less than required by structural calculations.

**C101001 1.5.5 Plywood, Structural**

PS-1, PS-2.

a. Plywood (Concealed) - C-D grade, exposure 1 durability classification, span rating of 24/16 or greater.

b. Plywood Shear Walls - Structural I, C-C or C-D grade, and a minimum thickness of 1/2 inch (12.5 mm), but not less than required by structural calculations.

**C101005 INTERIOR WINDOWS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: If the following paragraphs are to be included in the RFP, confirm that the referenced paragraphs have been retained in the RFP also.  
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For fixed interior windows, assemblies include frames, glazing, caulking, and other associated work. For other window types, see PTS Section B20, *Exterior Enclosure*. Glazing for windows specified under this section is located in C101007, "Interior Glazing."

**C101005 1.1 ALUMINUM WINDOWS**

Each window unit must be a complete factory assembled unit with or without glass installed. Fabrication of window units must comply with American Architectural Manufacturers Association (AAMA) 101.

a. Fixed and Operable Windows - HC40 for non-residential (commercial).

b. Sliding Glass Pass Windows - Frames and glass channels must be of heavy type 6063-TS aluminum extrusions. Provide 1/4-inch (6.35 mm) clear tempered glass.

**C101005 1.2 VISION PANELS**

a. Hollow Metal Vision Panels – must meet the requirements of hollow metal frames, paragraph C102001.

**C101005 1.3 FINISHES**

Finish exposed aluminum or steel window surfaces as follows:

a. Anodic Coating  
  
Architectural Class I (0.7 mil or thicker), designation AA-M10-C22-A41, clear (natural) or A42, integral color or A44, electrolytically deposited color anodized.

b. Organic Coating  
  
Provide a high-performance coating in accordance with AAMA 2605 with a total dry film thickness not less than 1.2 mils (0.03 mm).

**C101006 GLAZED PARTITIONS & STOREFRONTS**

This paragraph covers fixed interior glazed partitions, including interior storefronts with doors. Assemblies include frames, glazing, caulking, and other associated work. See Section B20, *Exterior Enclosure*, for aluminum storefront framing components and performance requirements.

**C101006 1.1 GLASS**

Refer to "Interior Glazing".

**C101006 1.2 SETTING AND SEALING MATERIALS**

Provide as specified in the *GANA Glazing Manual*, SIGMA TM-3000 and SIGMA TB-3001, and in accordance with manufacturers recommendations.

**C101007 INTERIOR GLAZING**

ASTM C 1036, unless specified otherwise. Provide patterned glass where required to obscure view into bathrooms and dressing rooms.

Provide setting and sealing materials, stops and gaskets as recommended by the glass or acrylic sheet manufacturer.

Glazing thickness indicated in the following paragraphs is the minimum acceptable thickness. Provide thicker glazing if required by the code or the manufacturer for the given application.

**C101007 1.1 GLASS**

**C101007 1.1.1 Clear Glass**

Type I, class I (clear), quality q4 or q5 for patterned glass.

**C101007 1.1.2 Wire Glass**

Provide glazing of Type II, Class I, Form I, Quality q8 mesh stainless steel, diamond pattern, 1/4 inch (6.35 mm) thick. Glass must comply with ASTM E 163.

**C101007 1.1.3 Tempered Glass**

ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated), Type I, Class 1 (clear), quality q3.

**C101008 INTERIOR JOINT SEALANT**

Sealant joint design and application must be in accordance with the general requirements of *Sealants: A Professionals’ Guide* from the Sealant, Waterproofing & Restoration Institute. Refer to manufacturers' recommendations for chemical resistance.

**C101008 1.1 JOINT SEALANT TYPES FOR INTERIOR WORK**

Sealants must be paintable, and must match the color of adjacent surfaces.

a. Vertical Surfaces - ASTM C 920, Type M, Grade NS, Class 25, Use NT.

b. Horizontal Surfaces - ASTM C 920, ASTM D 1190 for traffic surfaces, Type M, Class 25, Use T.

c. Food Service – Use a Vinyl Acetate Homopolymer, or other low VOC, non-toxic sealant approved for use in food preparation areas.

d. Chemical Resistance - Ensure that all sealants are chemically compatible or resistant to adjacent materials, or materials that may come into contact with the sealants in the course of the building life.

**C1020 INTERIOR DOORS**

Provide door hardware as specified in "Interior Door Hardware" in this section.

**C102001 STANDARD INTERIOR DOORS**

This paragraph covers all interior wood or hollow metal doors with frames, hardware, locks, and finish.

**C102001 1.1 STEEL DOORS**

Hardware preparation must be in accordance with Steel Door Institute (SDI) 17, American National Standards Institute/Door and Hardware Institute (ANSI/DHI) A115 and ANSI/SDI 100. Doors must be hung in accordance with ANSI/SDI 100.

**C102001 1.1.1 Standard Steel Doors**

Level 4, (for all door used by the general public, high use, high abuse types), with a physical performance level of 'A'. Maximum door undercut must not exceed 3/4 inch (19 mm).

**C102001 1.1.2 Sound Insulated Doors and Frames**

Provide sound insulated door and frame assemblies into rooms requiring wall assemblies to be sound insulated with a Sound Transmission Class (STC) rating as required.

**C102001 1.1.3 Accessories**

a. Provide stationary, sight-proof type louvers which comply with SDI 111-C. Use lightproof louvers if function of room requires darkness. Louver frames must be 20-gage steel with louver blades minimum 24 gage.

**C102001 1.2 STANDARD STEEL FRAMES**

ANSI A 250.8. Form frames with welded corners for installation in masonry partitions. Set frames in accordance with SDI 105. Form stops and beads with 20-gauge steel.

Provide a minimum of three jamb anchors and base steel anchors per frame, zinc-coated or painted with rust-inhibitive paint, not lighter the 18 gauge. Secure frames to previously installed concrete or masonry with expansion bolts in accordance with SDI 11-F. Provide mortar infill of frames in masonry walls.

**C102001 1.3 FINISHES**

a. Factory-Primed Finish. Doors and frames in non-humid, non-corrosive environments must be factory primed with a rust inhibitive coating as specified in ANSI A 250.8. Factory prime doors on six sides of the door.

b. Zinc-Iron Alloy Coating (Galvanealed) and Factory Primed Finish

c. Fabricate interior doors and frames (for installation in such rooms as kitchens, laboratories, battery charging, utility rooms and humid areas such as shower/drying areas, areas with frequent floor mopping, or corrosive chemical atmospheres) from zinc coated steel, alloyed type, complying with ASTM A 653/ A 653M. Factory prime doors and frames as specified in ANSI A 250.8.

d. Manufacturer’s primer must be compatible with door finish system in C30, Interior Coatings.

**C102001 1.4 WOOD DOORS**

**C102001 1.4.1 Wood Doors**

Install wood doors according to workmanship requirements of the Architectural Woodwork Institute Quality Standard 900-T-4 Custom Grade. Provide metal door frames for wood doors in non-residential construction.

For non-residential buildings provide extra-heavy doors.

Wood doors shall be solid wood doors with wood core and solid wood edge bands. Vertical edge bands must be one piece or laminated two-piece solid lumber to match face veneer species for natural finish wood doors. Reinforce door at all hardware attachments to door with sound grade hardwood. Horizontal edge bands must be solid wood or structural composite lumber.

a. Interior Flush Doors - Flush doors must conform to Window and Door Manufacturers Association (WDMA) I.S.6A-01. Doors must be premium grade, heavy duty, or otherwise as required by the project program.

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NOTE: Retain particle board core option unless facility anticipates using hardware to suspend items from doors, such as BEQ's.  
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Provide WDMA I.S. 1A-04 SCLC-5 structural composite lumber core, or staved lumber core. Do not use particleboard cores. Provide hardwood or softwood veneers cut for the best presentation for natural finishing of doors. Set match veneers of all components of a door opening. Face veneers must be 1/20" thick before sanding.

b. Closet Doors – Provide flush doors of premium or custom grade, conforming to WDMA I.S.1A-01, premium or custom grade, heavy duty. Doors must be hinged or sliding.

**C102001 1.4.2 Wood Door Accessories**

a. Door Louvers - Louver must comply with SDI 111-C. Louver frames must be 20-gage steel with louver blades minimum 24 gage.

b. Door Light Openings - Provide glazed openings with the manufacturer's standard wood moldings. Moldings for doors to receive a natural finish must be of the same species and color of the face veneer.

**C102001 1.4.3 Fabrication**

a. Marking - Each door must bear a stamp, brand or other identifying mark indicating quality and construction of the door.

b. Adhesives and Bonds - WDMA I.S. 1-A. Use Type I (water-proof) adhesive for assembly of interior doors and for the fabrication of stiles, rails, crossbands, and veneers. Adhesive for doors to receive a natural finish must be non-staining. Type II (water resistant) is allowed for fabrication of core parts.

**C102001 1.4.4 Finishes**

Unless required otherwise by the project program, typically provide natural finish wood doors. Factory prime and or seal on all six sides of doors.

a. Factory Finish - Provide doors finished at the factory as follows: Architectural Woodwork Institute (AWI) Quality Standards Section 1500, specification for Conversion varnish, alkyd urea catalyzed polyurethane, or acrylated UV curable epoxy. The coating must be AWI Quality Standards premium, medium rubbed sheen, with an open or closed grain effect. Poly-wrap prefinished wood doors at factory for shipping.

**C102002 GLAZED INTERIOR DOORS**

This paragraph covers all glazed interior doors with glass, frames, hardware and locking devices. See paragraph entitled "Interior Glazing" in this section for glazing options.

**C102002 1.1 ALUMINUM DOORS, FRAMES AND STOREFRONT**

Provide swing-type aluminum doors and frames complete with framing members, transoms, side-lites, and accessories. Fabricate of ASTM B 221, Alloy 6063-TS for extrusions.

**C102002 1.2 FABRICATION**

**C102002 1.2.1 Aluminum Frames**

Provide frames with removable glass stops and glazing beads to accommodate fixed glazing. Countersink screws for exposed fastenings. Jointing of framing members must obtain hairline fit, be reinforced, and mechanically secured.

**C102002 1.2.2 Aluminum Doors**

Doors must not be less than 1-3/4 inches (44 mm) thick, with a minimum wall thickness of 0.125 inch (3.2 mm), except beads and trim, 0.050 inch (1.27 mm). Full glazed stile and rail doors must have medium or wide stiles and rails. Maximum water leakage of the door and frame must be "no uncontrolled water penetrating systems or appearing on systems' normally exposed interior surfaces from sources other than condensation." Water controlled by flashing and gutters that is drained to exterior and cannot damage adjacent materials or finishes is not considered water leakage.

**C102002 1.2.3 Welding and Fastening**

Locate welds and fasteners on unexposed surfaces, where possible. Exposed welds must be dressed smoothly. Exposed fasteners must have counter-sunk heads. Weld concealed reinforcements for hardware in place. Hardware reinforcements must be of stainless steel or steel with a hot-dipped galvanized finish, and must be secured with stainless steel screws.

**C102002 1.2.4 Finishes**

Provide exposed aluminum surfaces with factory finish of anodic or organic coating. Anodic coatings must conform to AA 45, with an Architectural Class I finish, 0.7 mil or thicker. Organic coatings must be a baked enamel finish in accordance with AAMA 2605 with a total dry film thickness not less than 1.2 mil. Exposed fasteners to match the door finish.

**C102003 FIRE DOORS**

This paragraph covers all interior fire doors, including all necessary frames, hardware, closing devices, and alarms associated with the door.

**C102003 1.1 FIRE AND SMOKE DOORS AND FRAMES**

Provide in conformance with National Fire Protection Association (NFPA) 80 an NFPA 105. Fire doors and frames must bear the label of UL, Factory Mutual (FM) or WHI attesting to the rating required. Door and frame assemblies must be tested for conformance with NFPA 252 or UL 10C (for positive pressure). Wood fire doors must also comply with ASTM E 152.

Provide stainless steel astragals complying with NFPA 80 for fire-rated assemblies and NFPA 105 for smoke control assemblies.

**C102007 INTERIOR DOOR HARDWARE**

**C102007 1.1 DOOR HARDWARE**

Provide the services of an Architectural Hardware Consultant (AHC), Certified Door Consultant (CDC), or an Electrified Hardware Consultant (EHC) to assist the Designer of Record in preparation of the door hardware schedule and product selection. The hardware consultant must sign and seal the door hardware construction submittal. Provide, as far as feasible, locks, hinges, pivots, and closers from one lock, hinge, pivot, or closer manufacturer's make. All door hardware must be clearly and permanently marked by the manufacturer, on a location to be visible after installation. Modify hardware as necessary to provide features indicated or specified. For necessary hardware items not indicated in these specification sections, provide American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA) grade 1 rated hardware.

**C102007 1.1.1 Hardware for Fire Doors**

All hardware provided must meet the requirements of NFPA 80 for Fire Doors and NFPA 101 for exit doors. Hardware must bear the label of Underwriter's Laboratories, Inc., and be listed in UL BMD or labeled and listed by another testing laboratory acceptable to the contracting officer. Comply with NFPA 105 for smoke control assemblies.

**C102007 1.1.2 Hinges**

BHMA A156.1, Grade 1, 4-1/2 x 4-1/2 inches (108 x 108 mm) with non-removable pin or anti-friction bearing hinges.

**C102007 1.1.3 Locks and Latches**

For non-residential buildings use Series 1000, Operational Grade 1, Security Grade 2 for stairways, building entrances, corridors, assembly spaces, and other high use interior doors. Use Series 4000, Grade 1 for non-residential locations not using Series 1000 hardware.

a. Mortise Locks and Latches - BHMA A 156.13, Series 1000, Operation Grade 1, Security Grade 2.

b. Bored Locks and Latches - BHMA A 156.2, Series 4000, Grade 1.

**C102007 1.1.4 Card Key System**

Provide card key type access units for specialized entries as required by the program. Provide lithium battery powered, magnetic stripe keycard locksets that are ANSI/BHMA A156.13, Series 1000, Grade 1, mortise or ANSI/BHMA A156.2, Series 4000, Grade 1, cylindrical locks, tamper resistant, UL listed with 1 inch (25 mm) throw deadbolt, 3/4-inch (19 mm) throw latch bolt, auxiliary dead-locking latch, and 2-3/4 inch (68.75 mm) backset. The latch bolt and the dead bolt must be operated simultaneously by rotating inside lever. Locks with mechanical override lock cylinders are not acceptable. Locks must be operated only by a correctly encoded keycard. Use of a newly issued keycard automatically re-keys the lock and voids the previous keycard. The lock must re-lock immediately after outside lever is turned and latch retracted. Locks must have memory that is capable of recording up to 140 entries into each room, identification of the keycard used to access the room, the date and time of entry. Entry information of the lock must be retrievable by a data key that can be inserted into the lock and then taken to the front desk printer to display information. Other components that are required for this system at the front desk are a personal or laptop computer, printer and encoder to program each key.

For exit device locks with card key access, provide mortise type, narrow stile exit devices with 24-volt DC, solenoid option for card key exterior access at aluminum storefront doors. Provide mortise type exit devices with 24-volt DC, solenoid option with alarm and remote exterior access for card key access at insulated hollow metal doors. The alarmed exit device must sound when exiting only.

System must be capable of accepting a minimum of 12 keycard access levels, security auditing and computer interfacing with the existing or new management system. Provide a single point of contact customer service representative accessible by telephone with a 10-digit telephone number without additional dialing hierarchies except that a maximum 4-digit extension is permissible. On-site service must be provided within 3 hours from request within the first 12 months of occupancy. Provide a 5-year parts and labor warranty.

**C102007 1.1.5 Exit Devices**

BHMA A 156.3, Grade 1. Provide touch bars in lieu of conventional crossbars and arms. Use manufacturer's integral touch bars in aluminum storefront doors.

**C102007 1.1.6 Cylinders and Cores**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: When an extension of an existing system is required, the manufacturer's name and type of locks should be indicated.  
  
Arrow, Best and Falcon make interchangeable cores, which are fully compatible with each other. Corbin, Russwin, Sargent, Schlage, and Yale make locksets, which can receive the interchangeable cores made by Arrow, Best, or Falcon. Corbin, Russwin, Sargent, Schlage, and Yale each make their own interchangeable core system, which are not compatible with any other manufacturer's system. Specify the system, which will best meet the activity's needs without restricting competition.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Provide cylinders and cores for new locks, including locks provided under other sections of this specification. Cylinders and cores must have seven pin tumblers. Cylinders must be products of one manufacturer, and cores must be the products of one manufacturer. Rim cylinders, mortise cylinders, and knobs of bored locksets must have interchangeable cores, which are removable by special control keys. Stamp each interchangeable core with a key control symbol in a concealed place on the core.

**C102007 1.1.7 Keying System**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Do not require higher levels of master keying than necessary because each level decreases the security of the locks.   
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Provide a master key system for the facility unless more than one tenant/tenant command resides in a facility. Provide a grand master keying system, or great, grand master keying system if multiple tenants or multiple buildings are required. Provide an extension of the existing keying system for existing facility additions. Name the manufacturer of the existing locks, and indicate if they have interchangeable cores. Provide construction interchangeable cores when subcontractors require keys during construction.

Coordinate a keying system meeting. The Contractor's Project Manager, Superintendent, Hardware Subcontractor, Electrical Subcontractor (if keying hardware is electric), Designer of Record, Contracting Officer, Public Works Base Hardware Specialist, and the Using Activity must attend this meeting to establish the keying system for the project. This meeting is intended to identify base limitations, the necessary security, and access control within the facility. The meeting must produce a marked up copy of the floor plan indicating the doors to receive locks and the doors to be keyed together, and any master keying or grand master keying

**C102007 1.1.8 Keys**

Furnish one file key, one duplicate key and one working key for each key exchange and for each master and grand master keying system.

**C102007 1.1.9 Key Cabinet and Control System**

BHMA A 156.5. Provide key cabinet with 25% more key hooks than required for interior and exterior doors.

**C102007 1.1.10 Lock Trim**

Cast, forged or heavy wrought construction and commercial plain in design.

a. Knobs and Roses - Knobs and roses must meet test requirements of BHMA A 156.2 and BHMA A 156.13.

b. Lever Handles - Provide lever handles in lieu of knobs, as required by DoD Architectural Barriers Act (ABA) Standards. All lever handles must have the freewheeling feature.

**C102007 1.1.11 Door Bolts**

BHMA A 156.16. Provide automatic latching flush bolts for double doors with both door leafs active, BHMA A 156.3, Type 25.

**C102007 1.1.12 Closers**

BHMA A 156.4, Series C02000, Grade 1, with PT 4C, 1-1/2 inch piston, heavy duty forged arm, with full size cover.

**C102007 1.1.13 Overhead Holders**

BHMA A 156.8, Grade 1.

**C102007 1.1.14 Closer Holder-Release Devices**

BHMA A 156.15, Grade 1.

**C102007 1.1.15 Door Protection Plates**

Provide armor, mop, and kick plates conforming to BHMA A 156.6. Provide door kick plates on all doors with closers and doors leading to corridors or circulation spaces. Provide armor plates on all doors that receive cart traffic. Provide mop plates on all doors in rooms that have a mop-able floor finish.

**C102007 1.1.16 Door Stops and Silencers**

BHMA A 156.16, Type L03011, three per single door and four per double door.

**C102007 1.1.17 Thresholds**

BHMA A 156.21.

**C102007 1.1.18 Door Gasketing**

BHMA A 156.22. Use light-proof gasketing for room functions that require darkness and integral sound-proof gasketing on acoustically rated doors.

**C102007 1.1.19 Finishes**

Provide one of the following hardware finish systems, matching the exterior hardware finish system.

a. BHMA A156.18. Hardware must have BHMA 630 finish (satin stainless steel), unless specified otherwise. Provide items not manufactured in stainless steel in BHMA 626 finish (satin chromium plated) over brass or bronze, except surface door closers which must have aluminum paint finish, and except steel hinges which must have BHMA 652 finish (satin chromium plated). Hinges for exterior doors must be stainless steel with BHMA 630 finish or chromium plated brass or bronze with BHMA 626 finish. Exit devices may be provided in BHMA 626 finish in lieu of BHMA 630 finish except where BHMA 630 is specified under paragraph entitled "Hardware Sets". Exposed parts of concealed closers must have finish to match lock and door trim. Hardware for aluminum doors must be finished to match the doors.

**C102090 OTHER INTERIOR SPECIALTY DOORS**

**C102090 1.1 ACCESS DOORS**

Provide manufactured access doors and frames of 16-gage steel minimum with concealed pivots or a continuous piano hinge and flush stainless steel cam latch. Finish with manufacturer's standard primer coat finish and paint to match the wall or ceiling unless a stainless steel finish is required in the Project Program. Provide UL Rated access doors in fire rated assemblies. Access panels located in furred wall spaces must have an inserted material to match adjacent wall surface. Size access doors large enough to allow convenient hand and tool access and operation of controls and equipment beyond the door. If maintenance of controls or equipment beyond the door requires removal, size access door to allow removal and reinstallation of new equipment through the access door. Provide access panels capable of receiving finish material inserts in visible wall locations of habitable spaces.

**C102091 OTHER INTERIOR PERSONNEL DOORS**

Interior personnel doors not described by the assembly categories listed above.

**C1030 SPECIALTIES**

**C103001 COMPARTMENTS, CUBICLES AND TOILET PARTITIONS**

This paragraph covers assemblies for individual compartments, cubicles, toilet partitions and urinal screens.

**C103001 1.1 TOILET PARTITIONS**

FS A-A-60003. Provide toilet compartments at multi-fixture toilet rooms of Type I, Style B-Ceiling Hung, C-Overhead Braced, or F-Overhead braced-alcove. Reinforce panels to receive partition-mounted accessories. Steel and Plastic toilet partitions must have a recovered materials content of 20 to 30 percent.

**C103001 1.2 URINAL SCREENS**

FS A-A-60003. Type III, Style A, floor supported and wall hung or Style D, wall hung. Wall hung urinal screens must be secured with continuous flanges to urinal screen and wall.

**C103001 1.3 HARDWARE AND FITTINGS**

Chrome-plated or stainless steel door latches and coat hooks. Provide one coat hook per compartment door. Latches and hinges for handicapped compartments must comply with DoD ABA Standards.

**C103001 1.4 FINISHES**

Finishes must comply with FS A-A-60003. Use only one type of partition per building.

a. Metal toilet partitions and urinal screens must be made of stainless steel.

b. Solid plastic partitions (HDPE) must be fabricated of polymer resins (polyethylene) formed under high pressure forming a single component section one inch thick. Color must extend throughout the panel thickness.

c. Phenolic core panels.

d. Laminated plastic partitions are acceptable in low or limited use applications (one or two toilet stalls per toilet room).

**C103002 TOILET AND BATH ACCESSORIES**

This paragraph covers toilet and bath accessories including, but not limited to, soap dispensers, paper holders, towel receptacles, grab bars, and bathroom mirrors.

**C103002 1.1 TOILET AND BATH ACCESSORIES**

**C103002 1.1.1 Toilet Tissue Dispensers**

Provide surface or recessed mounted dispensers fabricated of stainless steel. Provide one horizontally or vertically mounted double-roll dispenser per toilet compartment, unless otherwise indicated.

**C103002 1.1.2 Paper Towel Dispensers**

Provide one per pair of sinks in toilet rooms without electric hand dryers, and one per room with electric hand dryers, unless otherwise indicated. Provide surface or recessed mounted towel dispenser constructed of a minimum 0.7mm 0.03 inch Type 304 stainless steel.

**C103002 1.1.3 Combination Paper Towel Dispenser / Waste Receptacle**

Provide a recessed or semi-recessed type with a capacity of 400 sheets of C-fold, single-fold, or quarter-fold towel and be constructed of 22-gage stainless steel. Provide one per pair of sinks, unless otherwise indicated. Provide the towel compartment door with a tumbler key lock locking mechanism.

**C103002 1.1.4 Sanitary Napkin Disposal Units**

Units must be toilet partition or wall mounted of not less than 22 gage stainless steel, with top and bottom hinged access doors. Provide one in each Woman's toilet stall, unless otherwise indicated. Each unit must have leak-proof receptacle for disposable liners. Provide fifty disposable liners of the type standard with the manufacturer.

**C103002 1.1.5 Medicine Cabinets**

Provide units with plate or float glass mirrors on doors. Provide doors and frames of 16-gage steel with a continuous piano hinge and flush magnetic latch.

**C103002 1.1.6 Towel Bars**

Provide stainless steel towel bars with a minimum thickness of 0.015 inch (0.4 mm).

**C103002 1.1.7 Grab Bars**

Provide stainless steel grab bars in accordance wtih DoD ABA Standards.

**C103002 1.1.8 Robe Hooks**

Provide stainless steel two-hook shape with integral wall flange, with a projection not less than 1-5/8 inches (41 mm).

**C103002 1.1.9 Mirrors**

Provide one manufactured framed electro-copper plated mirror per sink, or one full-size mirror for all sinks, unless otherwise indicated.

**C103002 1.1.10 Soap Dispensers**

Provide one soap dispenser per two sinks, with mechanical action dispensing valve. Do not mount soap dispenser on mirror. Surface mounted liquid type must consist of a vertical Type 304 stainless steel tank with holding capacity of 1.2L (40 fluid ounces) with a corrosion-resistant all-purpose valve.

**C103002 1.1.11 Electric Hand Dryer**

Provide wall mount and electric hand dryer designed to operate at 110/125 volts, 60 cycles, single phase alternating current with a heating element core rating of a maximum 2100 watts. Provide dryer housing of single piece construction and of chrome plated steel. Provide one unit per three sinks, unless otherwise indicated.

**C103003 MARKER BOARDS AND TACK BOARDS**

This paragraph covers all marker boards, tack boards and fastening devices.

**C103003 1.1 MATERIALS**

a. Porcelain Enamel - Marker board writing surface must be composed of porcelain enamel fused to a nominal 28 gage thick steel sheet, laminated to a 1/4-inch (6.35 mm) thick core material with a steel or foil backing sheet.

b. Cork must be a continuous resilient sheet made from soft, clean, granulated cork, relatively free from hardback and dust and bonded with a binder suitable for the intended purpose. The cork sheet must have a tensile strength of not less than 40 PSI (275.8 kPa) when tested in accordance with ASTM F 152.

c. Tack-board Covers - Provide woven fabric or vinyl wall covering over cork tack surface.

d. Aluminum - Aluminum frame extrusions must be alloy 6063-T5 or 6063-T6, conform to ASTM B 221, and be a minimum of 0.06 inches (1.5 mm) thick.

**C103004 IDENTIFYING DEVICES**

This paragraph covers all signs, plaques, and traffic markers.

**C103004 1.1 ASSEMBLIES**

The signage system assemblies must consist of three primary elements; a structural rail (with coordinating rail joiners to increase sign height in the field), removable copy inserts, and interlocking end caps or frame, and trim.

**C103004 1.1.1 Inserts**

The signage rails must be designed as to accept ABS plastic signage inserts.

**C103004 1.1.1.1 Insert Fabrication**

The insert is the signage member to which message signage copy in the form of letters, numbers, and symbols must be applied, and must be interchangeable with similar sized rails of any other sign of equal or greater width and height. The ends of the rail and insert assembly must be enclosed by end caps of prefinished 6064T5 extruded aluminum. Inserts must be fabricated from 0.090 minimum ultra-violet resistant thickness extruded ABS Acrylic sheet core with 20.003 polycarbonate non-glare clear cap bonded to the core during the extrusion texturing process.

**C103004 1.1.2 End Caps**

End caps must be injection-molded ABS plastic with integral color. The end caps must be interchangeable to either end of each sign type, and any other similar sign of equal height. The end caps must be interlocking mechanically with the inserts, and rail, requiring no tools for assembly. End caps must utilize straight corners (instead of radius corners). Spring clips must be steel. Plastic spring clips are not acceptable.

**C103004 1.1.3 Trim**

Optional accessory top and bottom trim frames of prefinished (color as indicated) 6063T5 extruded aluminum must be provided to the signage types indicated.

**C103004 1.1.4 Mounting**

Mounting of the modular signage system must include surface mounting with screw-on applications for interior and exterior walls and on selected doors as indicated, at the locations indicated, and other mounting devices as indicated.

**C103004 1.1.5 Graphics Application**

a. Tactile Letters and Symbols  
  
Chemically weld tactile letters and symbols to front surface of signage inserts where indicated and where required by DoD ABA Standards. Tactile letters and symbols must be sized as indicated.

b. Braille  
  
Grade II Braille. Provide Grad II Braille inlaid strip as indicated to match sign color.

**C103004 1.2 ALUMINUM ALLOY PRODUCTS**

Provide ASTM B 209 for aluminum sheet or plate, ASTM B 221 for aluminum extrusions and ASTM B 26/B 26M or ASTM B 108 for aluminum castings. Provide aluminum extrusions at least 1/8-inch (3.2 mm) thick and aluminum plate or sheet at least 16 gage thick. Provide aluminum castings of solid aluminum cast certified by AA 46 alloy designation B443.0. Where anodic coatings are specified, alloy must conform to Aluminum Association’s alloy designation 514.0 or A514.0.

**C103004 1.2.1 Aluminum Finishes**

Provide exposed aluminum finishes with either mill finish, factory finished with anodic coating or organic coating. Anodized finishes must conform to AA 45, Architectural Class I or II, with a coating thickness 0.7 mil or thicker. Organic coatings must be a baked enamel finish with a dry film thickness not less than 1.2 mils, conforming to AAMA 605.2.

**C103004 1.3 STEEL PRODUCTS**

Provide ASTM A 36/A 36M for structural steel, ASTM A 167 for sheet and plates.

**C103004 1.4 CAST METAL**

a. Cast Aluminum, ASTM B 108

b. Cast Bronze, ASTM B 62

**C103004 1.5 GLASS**

ASTM C 1036, Type 1, Class 1, Quality q3

**C103004 1.6 FIBER-REINFORCED POLYESTER (FRP)**

ASTM D 3841, Type II, Grade 1

**C103004 1.7 ACRYLIC SHEET**

ASTM D 4802, Type III

**C103004 1.8 POLYCARBONATE SHEET**

SAE AMS 3611

**C103004 1.9 EXTERIOR POST AND PANEL SIGNS**

**C103004 1.9.1 Posts and Panels**

Provide one-piece extruded aluminum posts with not less than 0.125 inch (3.2 mm) wall thickness. Posts must permit attachment of panel framing system. Provide cap for each post. Panel framing system must consist of aluminum extrusions and interlocking track components designed to interlock with concealed fasteners. Panels must be fabricated of rectangular extruded tubular aluminum with a minimum wall thickness of 0.125 inches. Panels must be removable and interchangeable. Posts must be embedded in solid concrete foundation.

**C103004 1.9.2 Illumination**

Provide concealed lighting within panel framing members. Provide T-12 slim-line lamps,. Ballast must be integrally mounted with high power factor and rated for use in up to minus 20 degrees F (minus 29 degrees C) ambient starting temperature.

**C103005 LOCKERS**

**C103005 1.1 STEEL CLOTHING LOCKERS**

**C103005 1.1.1 FS AA-L-00486 (Rev J), enameled steel.**

Provide ventilated, Single Tier Units (unless multi-tier permitted by Project Program), fully framed. Provide galvanized or galvaneal shelves and bottoms for all lockers, and fully galvanized or galvaneal lockers in locker spaces adjoining shower rooms. Provide full height door stiffeners.

**C103006 SHELVING**

Assemblies include all types of shelving with brackets and all supporting materials and finish, if required.

**C103007 FIRE EXTINGUISHER CABINETS**

Cabinet must be constructed of 16 gauge cold-rolled steel door panel / front, and a 22 gauge cold-rolled steel tub. Cabinet must be fire-rated if located in a fire rated wall assembly, and have a full-length piano hinge, and baked enamel finish. Provide a stainless steel cabinet door if cabinet is exposed to the environment. Size and locate fire extinguisher cabinets to encase extinguisher as required by NFPA 10 & 101.

**C103008 COUNTERS**

**C103008 1.1 ACRYLIC COUNTER TOPS**

Provide 100% acrylic counter tops for use in non-residential construction.

Solid surfacing material must consist of 100% pure acrylic polymer, mineral fillers, and pigments. The material must be homogenous, not coated or laminated. Superficial damage to a depth of 0.010 inch (.254 mm) must be repairable by sanding or polishing. Install with factory recommended fasteners/adhesives/sealant. Provide the following performance characteristics:

a. Tensile strength, ASTM D 638: 5800 psi minimum

b. Hardness, ASTM D 2583: Barcol Impressor 55 minimum

c. Flammability, ASTM E 84: Class I/A, flame spread 25 maximum; smoke developed 30 maximum

d. Thermal Expansion, ASTM D 696:.00002 in/in/F maximum

e. Boiling water resistance, NEMA LD 3: No effect

f. High temperature resistance, NEMA LD 3: No effect

g. Liquid absorption, ASTM D 570 (24 hours): 0.10 percent maximum

h. Mold and mildew growth, ASTM G 21: No growth, no effect

i. Bacteria growth, ASTM G 22: No growth, no effect

j. Sanitation, NSF 51: "Food Contact" approval for food area applications

k. Impact resistance, NEMA LD 3 (1/2 lb. ball drop): 1/4 inch material, 36 inch drop, no failure 1/2 inch material, 120 inch drop, no failure

**C103009 CABINETS**

This paragraph includes casework items that are permanently fixed in-place. Included are all cabinetry and millwork items with their associated accessories and anchoring devices.

**C103009 1.1 WALL AND BASE CABINETS**

Wall and base cabinets must be of the same construction and appearance, with solid ends and frame fronts, or with frames all around. Frames must not be less than 3/4 inch by 1 1/2 inches (19 mm by 38 mm) hardwood. All ends, bottoms, backs, and partitions must be hardwood plywood. Cabinet doors and drawer fronts must be a minimum 3/4 inch (19 mm) hardwood.

**C103009 1.1.1 Quality Standards**

Wall and base cabinets must be constructed to meet "Custom" quality grade as defined in AWI Quality Standards, except where this specification exceeds AWI Custom.

**C103009 1.1.2 Hardware**

Provide cabinet hardware including two self-closing hinges for each door and two side-mounted metal drawer slides for each drawer and pulls for all doors and drawers as follows. All cabinet hardware exposed to view must be ANSI/BHMA 156.9, Grade 1, and comply with the following requirements:

a. Concealed Euro-Style, back mounted hinges with opening to 165 degrees and a self-closing feature at less than 90 degrees. Mount to door with plastic insertion dowels and Euroscrews.

b. Full Extention drawer slides must have a static rating capacity of 100 lbs. (444 N).

c. Provide adjustable shelving standards with shelf support hardware for wall cabinets.

d. Provide heavy-duty magnetic latch and door and drawer catch

**C103009 1.1.3 Finish**

Provide plastic laminate (NEMA LD3) or transparent finish with sealer and varnish as selected by Designer of Record.

**C103011 CLOSETS**

This paragraph includes all built-in closets with associated work and finishes.

**C103012 FIRESTOPPING PENETRATIONS**

This paragraph covers fire-stopping assemblies to include sleeves, caulking and flashing. See PTS Section D40, *Fire Protection*, for additional requirements.

**C103012 1.1 FIRESTOPPING**

Provide firestopping materials, supplied from a single domestic manufacturer, consisting of commercially manufactured, asbestos-free, nontoxic products that are FM Approval Guide approved, or UL listed, for use with applicable construction and penetrating items, complying with the following minimum requirements.

**C103012 1.1.1 Fire Hazard Classification**

Material must have a flame spread of 25 or less, and a smoke developed rating of 50 or less, when tested in accordance with ASTM E84 or UL 723. Material must be an approved firestopping material as listed in UL Fire Resistance Directory or by a nationally recognized testing laboratory.

**C103012 1.1.2 Toxicity**

Material must be nontoxic and carcinogen free to humans at all stages of application or during fire conditions and must not contain hazardous chemicals or require harmful chemicals to clean material or equipment. Firestop material must be free from Ethylene Glycol, Polychlorinated Biphenyl (PCB), Methyl Ethyl Ketone (MEK), or other types of hazardous materials.

**C103012 1.1.3 Firestopping Rating**

Firestop systems must be UL Fire Resistance Directory listed or FM Approval Guide approved with "F" and "T" rating at least equal to the fire-rating of the fire wall or floor in which penetrating openings are to be protected.

**C103012 1.1.3 Through-Penetrations**

Firestopping materials for through-penetrations must provide "F", "T", and "L" fire resistance ratings in accordance with ASTM E814 or UL 1479.

**C103013 SPRAYED FIRE-RESISTIVE MATERIALS**

See PTS Section D40, *Fire Protection*, for additional requirements.

**C103013 1.1 SPRAYED FIRE-RESISTIVE MATERIALS**

**C103013 1.1.1 Quality Assurance**

A pre-installation conference must be held with the manufacturer’s approved installer prior to the application of the sprayed fire-resistive materials. See Paragraph C10 1.2 for field testing requirements for the fire-resistive material. Products provided must not contain asbestos to comply with 40 CFR 763.

**C103013 1.1.2 Warranty**

Provide manufacturer's standard materials and workmanship warranty stating that the manufacturer agrees to repair or replace materials that fail within 2 years, or as required by the project program, from date of Substantial Completion.

**C103013 1.1.3 Material Composition**

Provide sprayed fire-resistive material consisting of factory-mixed, dry formulation of gypsum or Portland cement binders and light-weight mineral or synthetic aggregates mixed with water at the Project site, or provide sprayed-fiber fire-resistive material consisting of factory-mixed, dry formulation of inorganic binders, mineral fibers, fillers, and additives conveyed in a dry state by pneumatic equipment and mixed with water at a spray nozzle to form a damp, as-applied product.

**C103013 1.1.4 Physical Properties**

a. Dry Density: 15 lb/cubic foot (240 kg/cubic meter) for referenced fire-resistance design to attain the ratings indicated, in accordance with ASTM E 605.

b. Thickness: Provide minimum average thickness required for fire-resistance design indicated according to the following criteria, but not less than 0.375 inch (9 mm), per ASTM E 605:   
  
1) Where the referenced fire-resistance design lists a thickness of 1 inch (25 mm) or greater, the minimum allowable individual thickness of sprayed fire-restive material is the design thickness minus 0.25 inch (6 mm).   
  
2) Where the referenced fire-resistance design lists a thickness of less than 1 inch (25 mm) but more than 0.375 inch (9 mm), the minimum allowable individual thickness of sprayed fire-resistive material is the greater of 0.375 inch (9 mm) or 75 percent of the design thickness.   
  
3) No reduction in design thickness is permitted for those fire-resistance designs whose fire-resistance ratings were established at densities of less than 15 lb/cubic foot (240 kg/cubic meter).

c. Bond Strength: 150 lb/sq. ft. (7.2 kPa) minimum in accordance with ASTM E 736.

d. Compressive Strength: 5.21 lb/sq. in. (35.9 kPa) as determined in accordance with ASTM E 761. Minimum thickness of sprayed fire-resistive material tested must be 0.75 inch (19 mm) and minimum dry density must be as specified, but not less than 15 lb/cubic foot (240 kg/cubic meter).

e. Corrosion Resistance: No evidence of corrosion in accordance with ASTM E 937.

f. Deflection: No cracking, spalling, or delaminating in accordance with ASTM E 759.

g. Effect of Impact on Bonding: No cracking, spalling, or delaminating in accordance with ASTM E 759.

h. Air Erosion: Maximum weight loss of 0.025 g/sq. foot (0.270 g/sq. meter) in 24 hours in accordance with ASTM E 859.

i. Fire-Test-Response Characteristics: Provide sprayed fire-resistive materials with the following surface-burning characteristics in accordance with ASTM E 84 by United Laboratories: flame-spread index of 10 or less and a smoke developed index of 0.

j. Fungal Resistance: No observed growth on specimens in accordance with ASTM G 21.

**C103014 ENTRANCE FLOOR GRILLES AND MATS**

Provide entrance mats at all entrances to the facility. Comply with Architectural Barriers Act (ABA) Standards for installed entrance mats and frames. Provide recessed entrance mats at building entrances with enclosed vestibule and surface applied entranceway mats or entranceway floor tiles at all other entrances. Entranceway mats and entranceway floor tile require the use of a transition edge where the mat adjoins other floor materials. Mat system must meet ASTM D-2047 coefficient of friction requirements of minimum 0.60 for accessible routes and be structurally capable of withstanding a uniform floor load of 300 lbs/sq. ft. (14 kPa). All portions of mat system must comply with ASTM E 648, Class I, Critical Radiant Flux, minimum 0.45 watts/m2 for flammability.

**C103014 1.1 ROLL-UP MATS**

Roll-up mats with tread rails spaced a maximum 2 inch (51 mm) on center and running counter to the traffic flow. Mats must allow debris to fall to sub-floor. Tread rails are connected by aluminum or vinyl hinges, with a continuous noise reducing vinyl cushion and an aluminum or vinyl edge around the perimeter. Roll-up mats must be recessed or surface mounted and provided with tread inserts:

**C103014 1.1.1 CARPET INSERTS**

Carpet insert fiber must be colorfast, solution dyed, anti-static, anti-microbial, and waterproof. Fiber must be 100% nylon or polypropylene, minimum 30 oz. per square yard. Each carpet fiber must be bonded to rigid ply backing to prevent fraying and supplied in continuous splice-free lengths.

**C103014 1.1.2 VINYL OR RUBBER INSERTS**

Vinyl or rubber inserts must be removable and be made from recycled materials wherever possible. Inserts must have serrated edges and textured surfaces for scraping purposes, bonded to a rigid vinyl or rubber tread insert.

**C103014 1.4 RECESSED MAT THERMOPLASTIC FRAME PROPERTIES**

Thermoplastic frame must be colorfast and UV-resistant. Tensile strength of frame must comply with ASTM D 638. Tensile impact of frame must comply with ASTM D 1822. Flexural strength of frame must comply with ASTM D 790. Shore D hardness of frame must comply with ASTM D 2240. Rockwell R hardness of frame must comply with ASTM D 785. Coefficient of thermal expansion of frame must comply with ASTM D 696.

**C103014 1.5 RECESSED MAT ALUMINUM FRAME REQUIREMENTS**

Aluminum frame and rail must comply with ASTM B 221, alloy 6063-T5. Frame must have butted corners and be factory coated with zinc chromate or manufacturer's standard protective finish where surfaces are in contact with concrete. Provide standard mill finish, color anodized finish complying with AAMA 606.1, clear anodized finish complying with AAMA 607.1, or bronze complying with ASTM B455, alloy 385.

**C103014 1.2 RECYCLED RUBBER TIRE TILES AND MATS**

Recycled rubber tire tiles and mats must be made from recycled truck, bus and aircraft tires with sidewall cords and buffed to a chenille finish. Product is bonded to woven flexible backing to form 3/8 to 7/16 inch (9.5 to 11.1 mm) thick, 12 inch (300 mm) square tiles or 12 inch (300 mm) wide rolls up to 25 feet (7.5 m) long.

**C103014 1.7 SURFACE MOUNTED/LOOSE-LAY ENTRANCE MATS**

Loose-lay mats must have beveled vinyl or rubber transition edge and must have surface of carpet or vinyl/rubber surfaces. Edges must conform to ABA Standards. Mats must be easily removed yet remain adhered to floor to prevent mat from moving as pressure from walking is applied.

**C103014 1.3.1 RUBBER OR VINYL MATS**

Non-slip mats minimum of 3/8 inch (9.5 mm) thick with square edges for recessed installations or beveled edges for surface applications. Mats must be solid sheet (no perforations), perforated style or corrugated style with knob or flat base bottom surface. Provide surface texture to suite project requirements. Ensure mats are a prime quality compound free of calendaring and curing defects and resistant to weather aging and ozone in normal concentrations.

**C103014 1.3.2 CARPET TYPE MATS**

Nylon or polypropylene carpet bonded to 1/8 to 1/4 inch (3 to 6 mm) thick, flexible vinyl backing minimum3/8 inch (9.5 mm) thick overall. Carpet has anti-static, anti-staining, non-raveling and anti-microbial properties.

**C103014 1.10 SURFACE APPLIED ENTRANCEWAY FLOOR TILE**

Applied entranceway floor tiles must be in the form of carpet tiles, carpet tiles with vinyl or rubber scrubbing surfaces, or tiles of thermoplastic scrubbing surfaces only. Tiles must be installed in areas where permanent mat is required but slab is not recessed to receive permanent recess mat. Tiles must be securely installed without obvious seams, cleanable, dimensionally stable, and with maximum finished tile thickness of 1/2" above finished floor line. Carpet fibers must be 100% nylon or polypropylene, anti-static, anti-microbial, colorfast, solution dyed, mold and mildew resistant, and waterproof with minimum face weight of 30 oz/yd2. Thermoplastic only tiles must be PVC free and UV-resistant.