



**Specifications for SWC #102
Building Materials**

A. Scope of Contract

The purpose of this Contract is to provide building material products, including carpet, resilient tile, resilient base, ceiling tile and grid, paint, lighting, and doors and door hardware as well as installation services for carpet and resilient tile for State of Tennessee (“State”) Agencies. Other Governmental Bodies, members of the University of Tennessee or Tennessee board of regents systems, and the nonprofit entities identified in Tenn. Code Ann. § 33-2-1001 (“Authorized Users”) may utilize the awarded Contract. Contractor agrees to extend this Contract to Authorized Users. This Contract is not limited to the buildings that are leased or owned by the State at the time of Contract award. The State of Tennessee reserves the right to add or remove buildings at any time.

The specifications for each product category are grouped into the following sections:

- A. Scope of Contract (p.1)
- B. Definitions (p.2)
- C. Contract Requirements (p.3) – applies to all product categories
- D. Carpet (p.4)
- E. Resilient Tile (p.7)
- F. Resilient Base (p.9)
- G. Ceiling Tile and Grid (p.10)
- H. Paint (p.12)
- I. Lighting (p.18)
- J. Doors and Door Hardware (p.25)

Contractor may propose on one or more product categories. Each product category will be awarded individually. Some product categories may include multiple Contractor awards and some may include a single Contractor award, please see Special Terms and Conditions #24 and #25 in the Terms and Conditions regarding the intended award structure. Contractor must be a manufacturer, dealer, or distributor of the proposed product category bid. For carpet, resilient tile, and paint product categories, the Contractor must be a manufacturer. Please see the product category specifications below for more specific information about Contractor and product requirements.

Jobs that are estimated to be over one hundred thousand dollars (\$100,000) are excluded from being conducted under this contract without the prior approval of the State Building Commission (SBC) per By-Laws, Policy, and Procedure of the State Building Commission of Tennessee Item 2. Agencies should maintain SBC approval documentation for a minimum of one year following the end of the contract period for audit purposes of all contract release orders that are valued at one-hundred thousand dollars

(\$100,000) or more. Agencies should contact the Contract Administrator to determine what the proper approval procedures.

B. Definitions

Agency	Each State of Tennessee board, commission, committee, department, officer, or any other unit of State government, except for those governmental entities identified in Tenn. Code Ann. §12-3-102(a).
ANSI	American National Standards Institute.
ASCE	American Society of Civil Engineers.
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers.
BHMA	Builders Hardware Manufacturers Association.
CFR	Code of Federal Regulations.
Contract Administrator	Contractor's main point of contact at the Central Procurement Office.
CPO	Central Procurement Office. Division of the Tennessee Department of General Services (DGS).
CRI	Carpet and Rug Institute.
DHI	Door and Hardware Institute.
End User	Using Agency, local government, or other entity of the statewide contract.
EPA	Environmental Protection Agency.
Facility	The building, site, or location owned or leased by the State of Tennessee or Other Governmental Bodies.
Installer	Carpet or resilient tile installation service provider approved by the product manufacturer.
ISO	International Organization for Standardization.
LEED	Leadership in Energy and Environmental Design.
MPI	Master Painters Institute.
NEMA	National Electrical Manufacturers Association.
NVLAP	National Voluntary Laboratory Accreditation Program.
Other Governmental Bodies	Other Governmental Bodies, members of the University of Tennessee or Tennessee Board of Regents systems, and the nonprofit entities identified in Tenn. Code Ann. § 33-2-1001 ("Authorized Users") may utilized the awarded Contract.
RFCI	Resilient Floor Covering Institute
SBC	State Building Commission. Created by the Tennessee Legislature in 1955 (Tenn. Code Ann. § 4-15-101) to oversee construction of all State public buildings.
STREAM	State of Tennessee Real Estate Asset Management. Division of the Tennessee Department of General Services (DGS).
UL	Underwriters Laboratories.
UNSPSC	United National Standard Product and Services Codes.

VOC	Volatile Organic Compounds.
WDMA	Window and Door Manufacturers Association.

C. Contract Requirements:

C.1. Catalogs and Line Items:

a. Catalog - Carpet, Resilient Tile, Paint, Lighting, Doors and Door Hardware:

1. Contractors shall provide a catalog with products that meet the specifications as detailed below within each product category. Only products that meet the specifications and fall within the scope of the Contract may be included in the catalog.
2. Catalogs must be submitted in a searchable digital format and/or hosted as an interactive webpage on a website maintained by the Contractor that is easily accessible by Tennessee’s End Users. A physical copy of the catalog may also be requested by the State.
3. Catalogs must include detailed product item descriptions, unit of measure (UOM), pricing, item UNSPSC code, and identification of the State Contract number. Catalogs should also include product pictures and product data when possible. Catalog should group products and provide group headers that align with the groupings and labeling within the specifications for each product category, where appropriate.
 - i. The most detailed UNSPSC level must be indicated by segment, family, class, and commodity for each line item.

b. Line Items – Resilient Base, Ceiling Tile and Grid:

1. Contractor shall provide products that meet the specifications as detailed below within each product category. The line items on contract shall have detailed product descriptions, unit of measure (UOM), pricing, and item UNSPSC code.

C.2. Services:

- a. Contractors shall provide sales services with staff to respond to interested End Users and trained to assess project requirements to make product recommendations and provide quotes and product samples as appropriate.
- b. Contractor shall provide customer service staff to answer inquiries and assist with invoicing questions, warranty claims, and other related customer services issues.

C.3. Data and Sample Requirements

a. Upon request, Contractor shall provide the following for each item proposed:

1. Product data.

2. Product test reports.
3. Product samples.

C.4. Outside Entities

- a. Contractors may extend the Contract offer to outside entities acting on behalf of the State or Other Governmental Body, such as a property owner of a facility leased by the State or Other Governmental Body. Such an agreement would be solely between the Contractor and the outside entity. Outside entity must provide documentation to the Contractor verifying the entity is acting on behalf of the State or Other Governmental Body in regards to the building materials job order. The outside entity must provide documentation to the State or Other Governmental Body as documentation proof of cost for the materials obtained from the Contractor.

D. **Carpet Tile and Broadloom Carpet**: Contractor shall propose a product list for carpet tile and broadloom carpet that includes products meeting specifications outlined below. Contractor must be a carpet manufacturer with service and sales personnel and a network for installation services throughout Tennessee.

D.1. General Requirements:

- a. Running Line: All carpet offered must be commercially available as running line products with no modifications. Custom carpets should not be offered through this Contract.
- b. Warranty: Contractor must offer the manufacturer's standard warranty for carpet products or a minimum of 10 years, whichever is greater. Products that fail under normal use as a result of a defect in design, materials, workmanship, or installation (if installed by manufacturer-approved/certified service provider) shall be repaired or replaced free of charge (including labor, delivery, travel, and installation) throughout the warranty period. Products that require warranty repair or replacement must be repaired or replaced within a reasonable time frame that is agreed to by End User. This process is to ensure sufficient lead-time for ordering products and scheduling installation during the entire warranty period. See section D.3.b. Installation Services for more information regarding warranty and guarantee requirements around carpet installation.
- c. Maintenance Requirements: Applicable warranties will be honored so long as reasonable routine maintenance is performed and the failure of the goods to perform as warranted is not shown to be the direct result of such routine maintenance or lack thereof. Reasonable means shall be deemed to have been met by End User by using cleaning equipment, chemicals and processes that meet the cleaning industry standards established by CRI.

D.2. Carpet Product Requirements:

- a. TARR: Carpet products offered must meet be rated heavy or above (≥ 3.0 TARR) under the CRI's Texture Appearance Retention Rating (TARR) testing standards.
TARR Classification | Traffic Level Classification

Moderate	≥ 2.5 TARR
Heavy	≥ 3.0 TARR
Severe	≥ 3.5 TARR
Special	≥ 3.5 TARR

- b. Fiber System: All carpet proposed must be manufactured from high performance premium branded nylon that has been third-party certified post-consumer recyclable and defined as a commercial grade nylon fiber from a carpet or fiber manufacturer nationally recognized by the flooring industry. The fiber system must comply with ASTM D2859. The nylon fiber shall have a 5 year minimum successful testing period. Olefin fiber is not acceptable.
- c. Pile Characteristic: Level-loop, cut-and-loop pile, shear-and-loop pile.
- d. Dye System: Minimum of 50% solution dyed or yarn dyed (Type 6, Type 6.6 or proven equal).
- e. Backing System:
1. Primary Backings: Tufted carpets will have a primary backing material into which the pile yarns are tufted. Woven slit fiber 100% polypropylene, nonwoven 100% polypropylene, nonwoven polyester, polyester, or polyester/nylon blends may be used for the primary backing material.
 2. Secondary Backings: Acceptable secondary backings include attached cushion, rubber, thermoplastic, unitary, or vinyl. Fabric secondary backing is to be bonded to the primary backing using premium synthetic latex or other bonding agents that meet or exceed the manufacturer warranty. Jute backing is not acceptable.
 - i. Attached Cushion: Must comply with ASTM D 3676 and ASTM D 3574 with a minimum density of 16.2 lbs./ft., a minimum compression resistance of 5 psi, a maximum compression set of 15%, a 3 to 5 oz. nonwoven secondary backing attached, and an ash content at a maximum of 50% in accordance with ASTM D 297.
 - ii. Rubber: Must comply with ASTM D 3676 with a minimum density of 18 lbs./cu. ft., a minimum compression resistance of 5 psi, a maximum compression set of 10%, and an ash content at a maximum of 50% in accordance with ASTM D 297.
 - iii. Thermoplastic: Must comply with ASTM B 1667 with a thickness of .040" .170", a density of 15 lbs./cu. ft. 36 lbs./cu. ft., a compression deflection of 25% 5.0 psi 50 psi, and a compression set of 25% - 10%.
 - iv. Unitary Backing: Use of a chemical back-coating, such as direct glue-down, applied directly on the primary backing without a secondary backing, such as direct glue-down, is also acceptable when it is requested by the End User for installations.
 - v. Vinyl: A synthetic backing which may be applied in either a "hard" or "cushioned" form is also acceptable.
- f. Size: Carpet tile must be 24x24 inches (610 by 620 mm) or larger. Broadloom must be 6 ft. or 12 ft.

- g. Applied Soil-Resistance Treatment: Duratech, Protech, or equivalent (specify soil-resistance treatment with proposal)
- h. Environmental Standard: Must achieve Gold or better on the NSF 140 sustainability assessment and must be comprised of a minimum of 10% post-consumer recycled content.

D.3. Service Requirements:

- a. Maintenance: Contractor shall provide information to End Users regarding proper care, cleaning, and maintenance of the carpet products purchased upon End User's request. Contractor may provide this information in physical or digital formats. Contractor must also have service personnel available to answer questions regarding maintenance.
- b. Installation Services: Contractor shall provide installation services for all carpet products purchased through the Contract upon End User's request. Installation may be provided by employees of the carpet manufacturer or by a network of service providers approved by the manufacturer. Contractor will be responsible for coordinating, managing, and submitting payment to the installation service providers. Note that the End User may elect to only purchase the carpet product and complete installation outside of the Contract agreement.
 - 1. Installer will be responsible for advising the End User on the proper products and installation method for the individual project, preparation work including substrate preparation, installation, and cleanup.
 - 2. Installation shall be in accordance with CRI Installation Standard 2011 and in accordance with the manufacturer's written installation specifications.
 - 3. Installation shall be in full compliance with all federal, state, and local regulations and ordinances.
 - 4. Installer and End User must comply with applicable federal, state, and local building codes, requirements, and standards and to the manufacturing, carpet industry and CRI specifications that pertain to Asbestos, Asbestos Testing, and Asbestos Abatement.
 - 5. Installation and Labor Warranty Guarantee:
 - i. Contractor shall guarantee in writing to reinstall or re-stretch any carpet that is wrinkled and to correct any other condition due to faulty installation, such as 'peaks' or 'valleys' in seaming, seam failure, or other quality issues if Contractor provided installation services through Contract. Quality issues pertaining to the product itself, such as non-performance, product failure, inconsistency in dye lots, or other quality issues shall be the responsibility of both the Installer and manufacturer consistent with the manufacturers' warranty.
 - ii. The guarantee shall be effective for five (5) years, for both broadloom and tile. Guarantee shall follow final acceptance of the installation.
 - iii. The Installer shall guarantee that all other materials supplied (i.e. adhesive) shall be as specified and shall further guarantee them for a five (5) year period following final acceptance of the installation.
 - iv. The Installer and/or the manufacturer at no cost to the End User shall provide any repairs or replacements made under the guarantee. This includes any overtime/weekend/holiday pay for installers, and the moving of furniture

required as a result of replacement of defective material, improper installation services, and/or performance issues related to materials or labor services.

- v. The Installer shall replace defective material and/or repair installation deficiencies within forty-five (45) days after being notified by the End User, without any additional expense to the End User. In the event the Installer fails to correct all defective materials or workmanship within the specified time, the End User may proceed to have the work done by another firm at the Contractor's expense, and the Contractor shall honor and pay the cost and charges on demand.

E. Resilient Tile: Contractor shall propose a product list for vinyl composition tile, solid vinyl/luxury vinyl tile, rubber tile, sheet vinyl floor covering, sheet and tile linoleum that includes products meeting specifications outlined below. Contractor must be a resilient tile manufacturer with service and sales personnel and a network for installation services throughout Tennessee.

E.1. General Requirements:

- a. Warranty: Contractor must offer the manufacturer's standard warranty for resilient tile products. Products that fail under normal use as a result of a defect in design, materials, workmanship, or installation (if installed by manufacturer-approved/certified service provider) shall be repaired or replaced free of charge (including labor, delivery, travel, and installation) throughout the warranty period. Products that require warranty repair or replacement must be repaired or replaced within a reasonable time frame that is agreed to by End User. This process is to ensure sufficient lead-time for ordering products and scheduling installation during the entire warranty period. See section E.3.b. Installation Services for more information regarding warranty and guarantee requirements around tile installation.
- b. Maintenance Requirements: Applicable warranties will be honored so long as reasonable routine maintenance is performed and the failure of the goods to perform as warranted is not shown to be the direct result of such routine maintenance or lack thereof.

E.2. Resilient Tile Product Requirements:

- a. All resilient tile products offered through the contract shall meet the following specifications:
 - 1. Fire-Test-Response Characteristics: Products must meet ASTM E 648 or NFPA 253 standards.
 - i. The Critical Radiant Flux Classification should be Class I, not less than 0.45 W/sq. cm.
- b. Vinyl Composition Tile (VCT): Meet ASTM F 1066 04 (2010) and ISO 10582 and/or ASTM F 1700 13a standards, Class 2, through-pattern tile.
 - 1. Wearing Surface: Smooth.
 - 2. Thickness: 0.100 inch (2.5 mm).
 - 3. Size: 12x12 inches (305 by 305 mm).

- c. Solid Vinyl Tile (SVT) / Luxury Vinyl Tile (LVT): Meet ASTM F 1700 13a and/or ISO 10582.
 - 1. Thickness: minimum of 0.120 inch (3.0 mm).
 - 2. Seaming Method: Standard.
- d. Sheet Vinyl: Meet ASTM F 1303 04 (2014), ASTM F 1516, ASTM F 1913 04 (2010), ISO 10581, and ISO 10582 and/or ASTM F 1700 13a.
- e. Sheet and Tile Linoleum: Meet ASTM F2034 (2013), ASTM F2195, ASTM F137, ASTM F925, ASTM F1514, ASTM F1515, and ASTM F1516.
- f. Rubber Tile Flooring: Meet ASTM D 412, ASTM D 2240, and ASTM F 1344 12e.
- g. Installation Materials:
 - 1. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
 - i. Gypsum-based materials are not acceptable.
 - 2. Adhesives: Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - i. VCT Adhesives – not more than 50 g/L.
 - ii. Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - 3. Seamless-Installation Accessories: Use manufacturer’s product for chemically bonding seams. Use chemical-bonding compound that has a VOC content of 350 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 4. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.

E.4. Service Requirements:

- a. Maintenance: Contractor shall provide information to End Users regarding proper care, cleaning, and maintenance of the resilient tiles purchased upon End User’s request. Contractor may provide this information in physical or digital formats. Contractor must also have service personnel available to answer questions regarding maintenance.
- b. Installation Services: Contractor shall provide installation services for all resilient tile products purchased through the Contract upon End User’s request. Installation may be provided by employees of the tile manufacturer or by a network of service providers approved by the manufacturer. Contractor will be responsible for coordinating, managing, and paying the installation service providers. Note that the End User may elect to only purchase the tile product and complete installation outside of the Contract agreement.
 - 1. Installer will be responsible for advising the End User on the proper products and installation method for the individual project, preparation work including substrate preparation, installation, and cleanup.

2. Installation shall be in accordance with the RFCI and in accordance with the manufacturer's written installation specifications.
3. Installation shall be in full compliance with all federal, state, and local regulations and ordinances.
4. Installer and End User must comply with applicable federal, state, and local building codes, requirements, and standards that pertain to Asbestos, Asbestos Testing, and Asbestos Abatement.
5. Installation and Labor Warranty Guarantee:
 - vi. Contractor shall guarantee in writing to repair, replace, or remedy any conditions due to faulty installation, such as loose materials, product failure to bond to the sub-floor for any reason, peaks, valleys, or gaps in seaming, seam failure, or other quality issues. Quality issues pertaining to the product itself, such as non-performance, product failure, inconsistency in dye lots, or other quality issues shall be the responsibility of both the Installer and manufacturer consistent with the manufacturers' warranty.
 - vii. The guarantee shall be effective for five (5) years, for both sheet goods and tile. Guarantee shall follow final acceptance of the installation.
 - viii. The Installer shall guarantee that all other materials supplied (adhesive, transition strips, cove base, and other materials supplied) shall be as specified and shall further guarantee them for a five (5) year period following final acceptance of the installation.
 - ix. The Installer and/or the manufacturer at no cost to the End User shall provide any repairs or replacements made under the guarantee. This includes any overtime/weekend/holiday pay for installers, and the moving of furniture required as a result of replacement of defective material, improper installation services, and/or performance issues related to materials or labor services.
 - x. The Installer shall replace defective material and/or repair installation deficiencies within forty-five (45) days after being notified by the End User, without any additional expense to the End User. In the event the Installer fails to correct all defective materials or workmanship within the specified time, the End User may proceed to have the work done by another firm at the Contractor's expense, and the Contractor shall honor and pay the cost and charges on demand.

F. **Resilient Base:** Contractor shall provide resilient rubber base that includes products meeting specifications outlined below.

F.1. **Resilient Base Product Requirements:**

- a. All resilient base products offered through the contract shall meet the following specifications:
 1. **Fire-Test-Response Characteristics:** Products must meet ASTM 648 or NFPA 253 standards.
 - i. The Critical Radiant Flux Classification should be Class I, not less than 0.45 W/sq. cm.

2. **Material:** Type TS (rubber, vulcanized thermoset) or Type TP (rubber, thermoplastic).
 3. **Standard:** Must meet ASTM F 1861.
 4. **Manufacturing Method:** Group I (solid, homogeneous) or Group II (layered).
 5. **Style:** Cove (base with toe).
 6. **Thickness:** Minimum of 0.125 inch (3.2 mm).
 7. **Height:** 4 inches (102 mm)
 8. **Length:** Coils in manufacturer's standard length.
 9. **Corners:** Inside and outside corners job formed.
 10. **Finish:** Satin.
- b. All resilient base installation materials offered through the contract shall meet the following specifications:
1. **Trowelable Leveling and Patching Compounds:** Latex-modified, Portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
 2. **Adhesives:** Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - i. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 1. Cove Base Adhesives – not more than 50 g/L.
 2. Rubber Floor Adhesives – not more than 60 g/L.

G. Ceiling Tile and Grid: Contractor shall provide acoustical panel ceiling tiles and grid that includes products meeting specifications outlined below.

G.1. Ceiling Tile and Grid Product Requirements

- a. All ceiling tile and grid products offered through the contract shall meet the following specifications:
1. **Acoustical Panel Standard:** Comply with ASTM E 1264.
 2. **Metal Suspension System Standard:** Comply with ASTM C 635.
 3. **Attachment Devices:** Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
 4. **Seismic Standard:** If site is determined to be in Seismic Class C or higher, provide acoustic panel ceilings designed and installed to withstand the effects of earthquake motions according to the following:
 - i. International Building Code edition adopted by the local code jurisdiction.
 - ii. ASCE 7 "Minimum Design Loads for Buildings and Other Structures" Chapter 13 – "Seismic Design Requirements for Nonstructural Components."
 5. **Surface-Burning Characteristics:** Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - i. **Flame-Spread Index:** Comply with ASTM E 1264 for Class A materials.

- ii. Smoke-Developed Index: 50 or less.
- 6. Testing Agency Qualifications: Qualified according to NVLAP.

G.2. Ceiling Tile and Grid Specifications

- a. In addition to meeting the general quality requirements outlined in G.1.a., all Contractors shall provide the following acoustical panels or a comparable product by one of the following manufacturers:
 - 1. Subject to compliance with requirements, provide CertainTeed Ceilings, BET-197 (2x4) and BET-154 (2x2) or comparable product by one of the following:
 - i. Armstrong World Industries, Inc. Cirrus mineral fiber ceiling
 - ii. CertainTeed Corp. ceilings Cashmere mineral fiber ceiling
 - iii. USG Interiors, Inc.; Subsidiary of USG Corporation Eclipse Clima Plus mineral fiber ceiling or Millenia China Plus.
 - 2. Classification: Type III, Form 2, Pattern C, D.
 - 3. Color: White.
 - 4. Light Reflectance: Minimum of 0.83.
 - 5. NRC: Minimum of 0.60, Type E-400 mounting according to ASTM E 795.
 - 6. CAC: Minimum of 33.
 - 7. Edge/Joint Detail: Square, reveal for 15/16 inches grid, narrow reveal for 9/16 inches grid.
 - 8. Thickness: Minimum 5/8 inch (15 mm).
 - 9. Modular Size: 24 by 24 inches (610 by 610 mm) and 24 by 48 inches (610 by 1220 mm).

- b. In addition to meeting the general quality requirements outlined in G.1.a., all Contractors shall provide the following metal suspension systems or a comparable product by one of the following manufacturers:
 - 1. Subject to compliance with requirements, provide product(s) by one of the following:
 - i. CertainTeed Corp.
 - ii. Armstrong World Industries, Inc.
 - iii. USG Interiors, Inc.; Subsidiary of USG Corporation
 - 2. Ceiling Grid 1: Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, pre-painted, hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 coating designation, with prefinished 15/16-inch (24-mm) wide metal caps on flanges.
 - i. Product: Armstrong World Industries, Inc.: Prelude Grid.
 - ii. Structural Classification: Intermediate and Heavy-duty system.
 - iii. End Condition of Cross Runners: Override (stepped) or butt-edge type.

- iv. Face Design: Flat, flush.
 - v. Cap Material: Steel cold-rolled sheet.
 - vi. Cap Finish: Painted white.
3. Ceiling Grid 2: Narrow-Face 1/4 inch center regress, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, pre-painted, hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 coating designation, with prefinished 9/16-inch (15-mm) wide metal caps on flanges.
- i. Product: Armstrong World Industries, Inc.; 9/16 inch Silhouette XL.
 - ii. Structural Classification: Intermediate and Heavy-duty system.
 - iii. End Condition of Cross Runners: Override (stepped) or butt-edge type.
 - iv. Face Design: Reveal.
 - v. Cap Material: Steel cold-rolled sheet.
 - vi. Cap Finish: Painted white.

H. Paint Contractor shall provide a catalog for paint that includes products meeting specifications outlined below. Contractor shall provide at least one paint product for each category listed below. Contractor must be a paint manufacturer with service and sales personnel and store locations throughout Tennessee.

H.1. General Requirements

- a. Paint systems should include paint (with all applicable coat paints) for the following interior substrates:
- 1. Concrete, non-traffic surfaces (institutional low-odor/VOC latex system)
 - i. Prime Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - ii. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - iii. Topcoat: Institutional low-odor/VOC interior latex.
 - 2. Concrete, traffic surfaces (clear sealer system)
 - i. First Coat: Interior/exterior clear concrete floor sealer (solvent based).
 - ii. Topcoat: Interior/exterior clear concrete floor sealer (solvent based).
 - 3. Concrete masonry units (CMU) (institutional low-odor/VOC latex system)
 - i. Prime Coat: Interior/exterior latex block filler.
 - ii. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - iii. Topcoat: Institutional low-odor/VOC interior latex eggshell.
 - 4. Steel (institutional low-odor/VOC latex system)
 - i. Prime Coat: Rust-inhibitive primer (water based).
 - ii. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - iii. Topcoat: Institutional low-odor/VOC interior latex semigloss.
 - 5. Galvanized metal (institutional low-odor/VOC latex system)
 - i. Prime Coat: Waterborne galvanized-metal primer.
 - ii. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - iii. Topcoat: Institutional low-odor/VOC interior latex semigloss.
 - 6. Wood/Dressed Lumber, including doors (institutional low-odor/VOC latex system)
 - i. Prime Coat: Interior latex-based wood primer.

- ii. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - iii. Topcoat: Institutional low-odor/VOC interior latex semigloss.
7. Gypsum board
 8. Plaster
 9. Cotton or canvas insulation covering
 10. Exposed Pipes – pipes to be painted for identification in accordance with the standards below
 - i. Natural Gas Piping: Safety Purple (ANSI Z535 Color Chart); Acceptable brand/model, or equal: Sherwin Williams No. 6981, Passionate Purple.
 - ii. Propane Piping: Safety Red (ANSI Z535 Color Chart); Acceptable brand/model, or equal: Sherwin Williams No. 4081, Safety Red.
 - iii. Fuel Oil Piping: Safety Brown (ANSI Z535 Color Chart); Acceptable brand/model, or equal: Sherwin Williams No. 4001, Bolt Brown.
 - iv. Steam Piping: Safety Orange (ANSI Z535 Color Chart); Acceptable brand/model, or equal: Sherwin Williams No. 4083, Safety Orange.
 - v. Standpipe and Sprinkler Piping: Red; Acceptable brand/model, or equal: Sherwin Williams No. 6866, Heartthrob.
 - vi. Steam Condensate Piping: Light Orange; Acceptable brand/model, or equal: Sherwin Williams No. 6345, Sumptuous Peach.
 - vii. Chilled Water Piping: Pale Green; Acceptable brand/model, or equal: Sherwin Williams No. 6189, Opaline.
 - viii. Condenser Water Piping: Blue-Green; Acceptable brand/model, or equal: Sherwin Williams No. 6502, Loch Blue.
 - ix. Heating Hot Water Piping: Pink; Acceptable brand/model, or equal: Sherwin Williams No. 6303, Rose Colored.
 - x. Domestic Cold Water Piping: Dark Blue; Acceptable brand/model, or equal: Sherwin Williams No. 6244, Naval.
 - xi. Domestic Hot Water Piping: Rose Red; Acceptable brand/model, or equal: Sherwin Williams No. 6863, Lusty Red.

b. All paints offered through the contract shall meet the following specifications:

1. Material Compatibility:
 - i. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - ii. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
2. VOC Content of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24); these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:
 - i. Flat Topcoat Paints: VOC content of not more than 50 g/L.
 - ii. Nonflat Topcoat Paints: VOC content of not more than 150 g/L.

- iii. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
 - iv. Floor Coatings: VOC not more than 100 g/L.
 - v. Shellacs, Clear: VOC not more than 730 g/L.
 - vi. Shellacs, Pigmented: VOC not more than 550 g/L.
 - vii. Primers, Sealers, and Undercoaters: VOC content of not more than 200 g/L.
 - viii. Zinc-Rich Industrial Maintenance Primers: VOC content of not more than 340 g/L.
 - ix. Pre-Treatment Wash Primers: VOC content of not more than 420 g/L.
3. Chemical Components of Field-Applied Interior Paints and Coatings: Provide topcoat paints and anti-corrosive and anti-rust paints applied to ferrous metals that comply with the following chemical restrictions; these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:
- i. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
 - ii. Restricted Components: Paints and coatings shall not contain any of the following:
 1. Acrolein.
 2. Acrylonitrile.
 3. Antimony.
 4. Benzene.
 5. Butyl benzyl phthalate.
 6. Cadmium.
 7. Di (2-ethylhexyl) phthalate.
 8. Di-n-butyl phthalate.
 9. Di-n-octyl phthalate.
 10. 1,2-dichlorobenzene.
 11. Diethyl phthalate.
 12. Dimethyl phthalate.
 13. Ethylbenzene.
 14. Formaldehyde.
 15. Hexavalent chromium.
 16. Isophorone.
 17. Lead.
 18. Mercury.
 19. Methyl ethyl ketone.
 20. Methyl isobutyl ketone.
 21. Methylene chloride.
 22. Naphthalene.
 23. Toluene (methylbenzene).
 24. 1,1,1-trichloroethane.
 25. Vinyl chloride.

H.2. Paint Product Requirements

- a. Block Fillers All block fillers offered through the contract shall meet the following specifications:
1. Interior/Exterior Latex Block Filler: Waterborne, high solids, emulsion type pigmented coating with bridging and filling properties for interior or exterior concrete masonry units.
 - i. Acceptable Brands/Models, or equal:
 1. Benjamin Moore; Moorecraft Super Craft Latex Block Filler No. 285-01.
 2. Duron; Dura Crete H.P. Acrylic Block Filler No. 16-110.
 3. ICI Paints; Devoe Coatings Bloxfil Acrylic Block Filler No. 4000-1000.
 4. PPG; SpeedhideInt/Ext. Latex Block Filler No. 6-15.
 5. Sherwin-Williams; PrepRiteInt/Ext Block Filler No. B25W25.
 2. Epoxy Block Filler: Solvent based, two component, epoxy, high solids coating for unfilled interior and exterior block surfaces.
 - i. Acceptable Brands/Models, or equal:
 1. ICI Paints; Devoe Coatings Bar-Rust 231 No. 231.
 2. PPG; Aquapon Epoxy Block Filler No. 97-685.
 3. Sherwin-Williams; Industrial & Marine KemCati-Coat HS Epoxy Filler/Sealer No. B42W400/V400 S
- b. Primers/Sealers All primers/sealers offered through the contract shall meet the following specifications:
1. Interior Latex Primer/Sealer: White, pigmented, waterborne latex sealer used on new interior plaster, concrete and gypsum wallboard surfaces.
 - i. Acceptable Brands/Models, or equal:
 1. Benjamin Moore; Regal First Coat Latex Primer/Undercoater No. 216.
 2. Duron; Interior Acrylic Drywall Primer No. 04-124.
 3. Duron; Interior Acrylic Latex Undercoater No. 04-123.
 4. ICI Paints; Prep-N-Prime Interior Latex Wall Primer No. 1000-1200.
 5. PPG; Speedhide Int. Latex Primer Sealer No. 6-2.
 6. Sherwin-Williams; PrepRite 400 Interior Latex Primer No. B28W400.
 2. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for use in paint systems indicated.
 3. Alkyd Anticorrosive Metal Primer: Solvent based, alkyd type, anticorrosive primer for ferrous metals in industrial or light marine exposures.
 - i. Acceptable Brands/Models, or equal:
 1. Benjamin Moore; Industrial Alkyd Metal Primer No. M06.
 2. ICI Paints; Devguard Alkyd Metal Primer No. 4100-7100.
 3. Sherwin-Williams; Industrial & Marine KemKromik Metal Primer – White No. B50WZ1.

4. Rust-Inhibitive Primer (Water Based): Water based, emulsion type, anticorrosive primer for interior or exterior ferrous metals exposed to mildly corrosive environments.
 - i. Acceptable Brands/Models, or equal:
 1. Benjamin Moore; Acrylic Metal Primer No. M04.
 2. Duron; Duron Paints Dura Clad Universal Acrylic Metal Primer No. 33-105.
 3. ICI Paints; Devoe Coatings Devflex DTM Flat Int/Ext W.B. Primer No. 4020.
 4. PPG; Pitt-Tech Rust Inhibitive Primer (WB) No. 90-712.
 5. Sherwin-Williams; DTM Acrylic Primer/Finish (B66W1).

5. Waterborne Galvanized-Metal Primer: Waterborne metal primer, composed of anticorrosive pigments and acrylic resins, for cleaned/etched galvanized metal.
 - i. Acceptable Brands/Models, or equal:
 1. Benjamin Moore; Benjamin Moore Acrylic Metal Primer No. M04.
 2. Duron; Dura Clad Acrylic Galvanized Metal Primer No. 33-100.
 3. ICI Paints; Devoe Coatings Devflex WB DTM Primer Finish No. 4020.
 4. PPG; Pitt-Tech DTM High Performance Primer/Finish No. 90-712.
 5. Sherwin-Williams; Industrial & Marine DTM Acrylic Primer/Finish No. B66W1.

- c. Latex Paint All latex paints offered through the contract shall meet the following specifications:
 1. Interior Latex-Based Wood Primer: Latex based primer for use on interior surfaces such as doors, casings, and trim where odor or VOC concerns may not permit the use of solvent-based products.
 - i. Acceptable Brands/Models, or equal:
 1. Benjamin Moore; Fresh Start Interior/Exterior Primer No. 023.
 2. Duron; American Paints Terminator T2 WB Primer/Sealer No. 71-218.
 3. ICI Paints; Prep-N-Prime 100% Acrylic Latex Primer No. 2000-1200.
 4. PPG; Seal Grip Plastic Primer (Waterborne) No. 17-921.
 5. Sherwin-Williams; PrepRiteProBlockInt/Ext Latex Primer/Sealer No. B51W20.

 2. Institutional Low-Odor/VOC Latex (Flat) Gypsum board ceilings only: White or colored latex paint with low odor characteristics and a VOC of less than 10 grams per liter.
 - i. Acceptable Brands/Models, or equal:
 1. Benjamin Moore; Pristine Eco Spec Int. Latex Flat No. 219.
 2. ICI Paints (Canada); CIL Select-Int. Acrylic Velvet Flat No. 7100.
 3. M.A.B. Paints; Enviro Pure Latex Flat No. 040.
 4. PPG; Pure Performance Interior Latex Flat No. 9-100.
 5. Sherwin-Williams; ProMar 200 Zero VOC Interior Flat (B30-2600).

3. Institutional Low-Odor/VOC Latex (Low Sheen): White or colored latex paint with low odor characteristics and a VOC of less than 10 grams per liter.
 - i. Acceptable Brands/Models, or equal
 1. Benjamin Moore; Pristine Eco Spec Int. Latex Eggshell Enamel No. 223.
 2. ICI Paints (Canada); CIL Select - Int. Acrylic Eggshell No. 7150.
 3. M.A.B. Paints; Enviro Pure Latex Eggshell No. 045.
 4. PPG; Pure Performance Interior Eggshell Latex No. 9-300.
 5. Sherwin-Williams; ProMar 200 Zero VOC Interior Egshel (B20-2600).

4. Institutional Low-Odor/VOC Latex (Semigloss): White or colored latex paint with low odor characteristics and a VOC of less than 10 grams per liter.
 - i. Acceptable Brands/Models, or equal:
 1. Benjamin Moore; Pristine Eco Spec Int. Latex Semi-Gloss Enamel No. 224.
 2. Duron; Genesis Odor Free High-Performance Int. Latex S.G. No. 83-914.
 3. ICI Paints; Lifemaster 2000 Interior Semi-Gloss No. LM 9200.
 4. PPG; Pure Performance Interior Semi-Gloss Latex No. 9-500.
 5. Sherwin-Williams; ProMar 200 Zero VOC Interior Semigloss (B31-2600).

- d. Floor Coatings All floor coatings offered through the contract shall meet the following specifications:
 1. Interior/Exterior Clear Concrete Floor Sealer (Water Based): Water based, acrylic co-polymer emulsion type, clear sealer for interior and exterior horizontal concrete floors, decks and exposed aggregate driveways and walkways.
 - i. Acceptable Brands/Models, or equal
 1. PPG; PERMA-CRETE Flex-Seal WB, No. 4-6200.
 2. Sherwin-Williams; H & C Concrete & Masonry Waterproofing Sealer No. 50.043054.

 2. Interior/Exterior Clear Concrete Floor Sealer (Solvent Based): Solvent based, acrylic type, clear sealer for interior and exterior horizontal concrete floors, decks and exposed aggregate driveways and walkways.
 - i. Acceptable Brands/Models, or equal
 1. Sherwin-Williams; Sherwin-Williams Concrete & Terrazzo Sealer No. B44V22.

- e. Custom Paint Contractor shall provide a custom interior/exterior gloss alkyd oil enamel paint for the Tennessee Department of Correction (TDOC) in a custom color called "TDOC Battleship Gray."
 1. Custom Interior/Exterior Gloss Alkyd Oil Enamel: Product specifications include volume solids equal to or greater than 41%, weight solids equal to or greater than 56%, film thickness of 3.3 wet mils or greater and 1.5 dry mils or greater, coverage of 450 sq. ft. per gallon or greater (at recommended dry film smooth surface),

drying time of recoat 12 hours (approximately 70 degrees at 50% RH), mineral spirits reducer, and gloss finish

- i. Acceptable Brands/Models, or equal
 1. PPG; Porter Guard PP2749.
 2. Sherwin-Williams; B54 Series.

H.3. Paint Data and Sample Requirements

a. Upon request, Contractor shall provide the following for each item proposed:

1. Product data.
2. Product samples (labeled with manufacturer's name, finish, color, and texture).
3. Printout (may be requested in a digital format) of the current "MPI Approved Products List" for each product category for each proposed product.
4. LEED product data for the Indoor Environmental Quality EQ Credit 4.2 shall be provided for paints, including a printed statement (may be requested in a digital format) of the VOC content and chemical components.

I. **Lighting** Contractor shall provide a catalog for lighting systems that includes products meeting specifications outlined below. Lighting systems shall include interior lighting fixtures, incandescent and fluorescent lamps, ballasts, LEDs, emergency lighting units, exit signs, and lighting fixture supports.

I.1. General Requirements

- a. Products must comply with NFPA 70 and must be listed and labeled as defined in NFPA 70 Article 100.
- b. For incandescent fixtures, Contractor must provide labels with the maximum lamp wattages.

I.2. Warranty

- a. **Emergency Lighting Batteries:** Requires a manufacturer's standard form in which manufacturer of battery-power emergency lighting unit agrees to repair or replace components of rechargeable batteries that fail in workmanship within specified warranty period.
 1. The warranty period for emergency lighting unit batteries is 10 years from the date of substantial completion. Full warranty shall apply for the first year and a prorated warranty will apply for the remaining 9 years.
 2. The warranty period for emergency fluorescent ballast and self-power exit sign batteries is 7 years from the date of substantial completion. Full warranty shall apply for the first year and a prorated warranty will apply for the remaining 6 years.

- b. Ballasts: Requires a manufacturer's standard form in which ballast manufacturer agrees to repair or replace ballasts that fail in materials or workmanship within specified warranty period.
 - 1. The warranty period for emergency ballasts is 5 years from the date of substantial completion.
- c. T8 Fluorescent Lamps: Requires a manufacturer's standard form, made out to the owner and signed by the lamp manufacturer, agreeing to replace lamps that fail in materials or workmanship within specified warranty period with FOB delivery to the nearest shipping point to the project site.
 - 1. The warranty period for T8 fluorescent lamps is 1 year from the date of substantial completion.

I.3. Lighting Product Requirements

- a. Lamps: Contractor must provide incandescent and fluorescent lamp products by one of the following manufacturers:
 - 1. G.E. Lighting
 - 2. Osram Sylvania Inc.
 - 3. Philips Lighting Company
- b. Ballasts: Contractor must provide ballast products for fluorescent and high intensity discharge lamps by one or more of the following manufacturers:
 - 1. Advance Transformer Co.
 - 2. G.E. Lighting
 - 3. Howard Lighting Products
 - 4. Osram Sylvania Inc.
 - 5. The Bodine Company
 - 6. Universal Lighting Technologies
 - 7. Venture Lighting International
- c. Light Emitting Diodes (LED): Contractor must provide LED products used for illumination arrays by one or more of the following manufacturers:
 - 1. Cree Inc.
 - 2. Nichia Corporation
 - 3. OSRAM Opto Semiconductors GmbH
 - 4. Philips Lumileds Lighting Company.
- d. LED Systems: Contractor must provide LED systems meeting all specifications listed below:
 - 1. LED fixtures must be dimmable and 0-10 volt controllable.

2. All 2x2 and 2x4 LED troffers shall be capable of integrating with an embedded ZigBee certified chip provided by the manufacturer.
 3. All LED lighting systems shall be capable of integrating with a Lighting Control System (LCR) that is interoperable utilizing the open ZigBee standard as adopted by ASHRAE Standard 135-2008 Addendum q for its wireless communications.
- e. Lighting Fixtures and Components: Contractor must provide the lighting fixtures and components, meeting all specifications, listed below.
4. Recessed Fixtures: Must comply with NEMA LE 4 for ceiling compatibility.
 5. Incandescent Fixtures: Must comply with UL 1598. Where the Luminaire Efficacy Rating (LER) is specified, test according to NEMA LE 5A.
 6. Fluorescent Fixtures: Must comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable. Provide trim, type, and accessories required for installations in ceiling system where installed.
 7. HID Fixtures: Must comply with UL 1598. Where LER is specified, test according to NEMA LE 5B.
 8. Metal Components: Must be free of burrs and sharp corners and edges.
 9. Sheet Metal Components: Steel, unless otherwise indicated. Must provide form and support to prevent warping and sagging.
 10. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
 - i. White Surfaces: 85%
 - ii. Specular Surfaces: 83%
 - iii. Diffusing Specular Surfaces: 75%
 - iv. Laminated Silver Metallized Film: 90%
 11. Plastic Diffusers, Covers, and Globes:
 - i. Acrylic Lighting Diffusers: 100% virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation. Must have a lens thickness of at least 0.125 inch (3.175 mm) minimum unless otherwise specified. Must be UV stabilized.
 - ii. Glass: Annealed crystal glass, unless otherwise specified.
- f. Ballasts for Linear Fluorescent Lamps: Contractor must provide ballasts for linear fluorescent lamps meeting all specifications listed below.
1. Electronic Ballasts: Must comply with ANSI C82.11. Must be instant-start type, unless otherwise specified, and designed for the types and quantity of lamps served. Ballasts shall be designed for full light output unless dimmer or bi-level control is indicated. Must meet the specifications listed below.
 - i. Sound Rating: A
 - ii. Total Harmonic Distortion Rating: Less than 10%
 - iii. Transient Voltage Protection: IEEE C62.41, Category A or better
 - iv. Operating Frequency: 20 to 40 kHz or higher
 - v. Lamp Current Crest Factor: 1.7 or less
 - vi. Power Factor: 0.95 or higher.

- vii. Parallel Lamp Circuits: Multiple lamp ballasts shall comply with ANSI C 82.11 and shall be connected to maintain full light output on surviving lamps if one or more lamps fail.
2. Electronic Programmed-Start Ballasts for T5 and T5HO Lamps: Must comply with ANSI C82.11. Must meet the specifications listed below.
 - i. Sound Rating: A
 - ii. Lamp end-of-life detection and shutdown circuit for T5 diameter lamps
 - iii. Automatic lamp starting after lamp replacement
 - iv. Sound Rating: A
 - v. Total Harmonic Distortion Rating: Less than 20 percent
 - vi. Transient Voltage Protection: IEEE C62.41, Category A or better
 - vii. Operating Frequency: 20 kHz or higher
 - viii. Lamp Current Crest Factor: 1.7 or less
 - ix. Power Factor: 0.95 or higher.
 3. Ballasts for Low Temperature Environments: Must meet the specifications listed below.
 - i. Temperatures 0 deg. F (Minus 17 deg. C) and Higher: Electronic type rated for 0 deg. F (minus 17 deg. C) starting and operating temperature with indicated lamp types
 - ii. Temperatures Minus 20 deg. F (Minus 29 deg. C) and Higher: Electromagnetic type designed for use with indicated lamp types
 4. Ballasts for Dimmer-Controlled Lighting Fixtures: Electronic type. Must meet the specifications listed below.
 - i. Dimming Range: 100 to 5 percent of rated lamp lumens
 - ii. Ballast Input Watts: Can be reduced to 20 percent of normal
 - iii. Compatibility: Certified by manufacturer for use with specific dimming control system and lamp type indicated.
 5. Ballasts for Bi-Level Controlled Lighting Fixtures: Electronic type. Must meet the specifications listed below.
 - i. Operating Modes: Ballast circuit and leads provide for remote control of the light output of the associated lamp between high- and low-level and off
 - ii. High-Level Operation: 100 percent of rated lamp lumens
 - iii. Low-Level Operation: 30 percent of rated lamp lumens
 - iv. Ballast shall provide equal current to each lamp in each operating mode
 - v. Compatibility: Certified by manufacturer for use with specific bi-level control system and lamp type indicated.
- g. Emergency Fluorescent Power Units Lamps: Contractor must provide emergency fluorescent power units meeting all specifications listed below.

1. Internal Type: Self-contained, modular, battery-inverter unit, factory mounted within lighting fixture body and compatible with ballast. Must comply with UL 924. Must meet the specifications listed below.
 - i. Emergency Connection: Operate 1 fluorescent lamp continuously at an output of 1400 lumens each. Connect un-switched circuit to battery-inverter unit and switched circuit to fixture ballast.
 - ii. Night-Light Connection: Operate 1 fluorescent lamp continuously.
 - iii. Test Push Button and Indicator Light: Visible and accessible without opening fixture or entering ceiling space.
 - iv. Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - v. Indicator Light: LED indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 - vi. Battery: Sealed, maintenance-free, nickel-cadmium type.
 - vii. Charger: Fully automatic, solid-state, constant-current type with sealed power transfer relay.
 - viii. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required interval. Test failure is annunciated by an integral audible alarm and flashing red LED.

2. External Type: Self-contained, modular, battery-inverter unit, suitable for powering one or more fluorescent lamps, remote mounted from lighting fixture. Must comply with UL 924. Must meet the specifications listed below.
 - i. Emergency Connection: Operate 1 fluorescent lamp continuously. Connect un-switched circuit to battery-inverter unit and switched circuit to fixture ballast.
 - ii. Night-Light Connection: Operate 1 fluorescent lamp in a remote fixture continuously.
 - iii. Battery: Sealed, maintenance-free, nickel-cadmium type.
 - iv. Charger: Fully automatic, solid-state, constant-current type.
 - v. Housing: NEMA 250, Type 1 enclosure.
 - vi. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - vii. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 - viii. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and flashing red LED.

- h. Exit Signs: Contractor must provide exit signs meeting all specifications listed below.
 1. Description: Must comply with UL 924 and NFPA 101; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction. Provide directional chevrons and use universal mounting type.
 2. Internally Lighted Signs:
 - i. Lamps for AC Operation: LEDs, 70,000 hours minimum rated lamp life.

- ii. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
 - 1. Battery: Sealed, maintenance-free, nickel-cadmium type.
 - 2. Charger: Fully automatic, solid-state type with sealed transfer relay.
 - 3. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80% of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
 - 4. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - 5. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 - 6. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and flashing red LED.
- iii. Master/Remote Sign Configurations:
 - 1. Master Unit: Comply with requirements above for self-powered exit signs, and provide additional capacity in LED power supply for power connection to remote unit.
 - 2. Remote Unit: Comply with requirements above for self-powered exit signs, except omit power supply, battery and test features. Arrange to receive full power requirements from master unit. Connect for testing concurrently with master unit as a unified system.
- i. Emergency Lighting Units: Contractor must provide emergency lighting units meeting all specifications listed below.
 - 1. Description: Self-contained units complying with UL 924.
 - i. Battery: Sealed, maintenance-free, lead-acid type.
 - ii. Charger: Fully automatic, solid-state type with sealed transfer relay.
 - iii. Operation: Relay automatically turns lamp on when power supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
 - iv. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - v. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 - vi. Integral Time-Delay Relay: Holds unit on for fixed interval of 15 minutes when power is restored after an outage.
 - vii. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and flashing red LED.

j. Fluorescent Lamps: Contractor must provide fluorescent lamps meeting all specifications listed below.

1. Low-Mercury Lamps: Comply with EPA's toxicity characteristic leaching procedure test; shall yield less than 0.2 mg of mercury per liter when tested according to NEMA LL 1.
2. T8 rapid-start low-mercury lamps, rated 32 W maximum, nominal length of 48 inches (1220 mm), 2800 initial lumens (minimum), CRI 75 (minimum), color temperature 3500 K, and average rated life 20,000 hours, unless otherwise indicated.
3. T8 rapid-start low-mercury lamps, rated 17 W maximum, nominal length of 24 inches (610 mm), 1300 initial lumens (minimum), CRI 75 (minimum), color temperature 3500 K, and average rated life of 20,000 hours, unless otherwise indicated.
4. T5 rapid-start low-mercury lamps, rated 28 W maximum, nominal length of 45.2 inches (1150 mm), 2900 initial lumens (minimum), CRI 85 (minimum), color temperature 3000 K, and average rated life of 20,000 hours, unless otherwise indicated.

k. Lighting Fixture Support Components: Contractor must provide lighting fixture support components meeting all specifications listed below.

1. Must comply with Division 26 Section "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.
2. Single-Stem Hangers: 1/2-inch (13-mm) steel tubing with swivel ball fittings and ceiling canopy. Finish should be the same as fixture.
3. Twin-Stem Hangers: Two, 1/2-inch (13-mm) steel tubes with single canopy designed to mount a single fixture. Finish should be the same as fixture.
4. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage (2.68 mm).
5. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 12 gage (2.68 mm).
6. Rod Hangers: 3/16-inch (5-mm) minimum diameter, cadmium-plated, threaded steel rod.
7. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

I.4. Lighting Data and Sample Requirements

a. Upon request, Contractor shall provide the following for each item proposed:

1. Product data.
 - a. Physical description of lighting fixture including dimensions.
 - b. Energy-efficiency data.
 - c. Photometric data, in IESNA format, based on laboratory tests of each lighting fixture type. Photometric data shall be certified by a manufacturer's laboratory with a current accreditation under the NVLAP

for Energy Efficient Lighting Products. Documentation of the laboratory's accreditation must also be provided.

- d. Information indicating maximum wattage consumption.
- e. Lamps: life and output data.
- f. Ballast bi-level and dimmer-controlled fixtures: product certificates signed by product manufacturer.

2. Product test reports, which may include field quality-control test reports.

J. Doors and Door Hardware Contractor shall provide a catalog for doors and door hardware that includes products meeting specifications outlined below. Doors and door hardware shall include hollow metal doors and frames, flush wood doors, and door hardware.

J.1. Doors and Door Hardware Product Requirements

a. Hollow Metal Doors and Frames:

- 1. Products must be fire-rated, borrowed-light frame assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.
- 2. Subject to compliance with requirements, provide product(s) by one of the following manufacturers:
 - i. Amweld Building Products, LLC
 - ii. Ceco Door Products; an Assa Abloy Group company.
 - iii. Curries Company; an Assa Abloy Group company.
 - iv. Firedoor Corporation.
 - v. Fleming Door Products Ltd.; an Assa Abloy Group company.
 - vi. Steelcraft; an Ingersoll-Rand company.
- 3. Materials: Materials for hollow metal doors and frames must meet the standards as outlined below.
 - i. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS, Type B; suitable for exposed applications.
 - ii. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS, Type B.
 - iii. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
 - iv. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
 - v. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
 - vi. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
 - vii. Mineral-Fiber Insulation: ASTM C 665, Type I. H. Glazing: Division 08 Section "Glazing."

- viii. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat.
- 4. Standard Hollow Metal Doors:
 - i. Comply with ANSI/SDI A250.8.
 - ii. Design: Flush panel.
 - iii. Core Construction: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core.
 - iv. Fire Door Core: As required to provide fire-protection ratings indicated.
 - v. Thermal-Rated (Insulated) Doors: R-value of not less than 6.0 deg F x h x sq. ft./Btu (1.057 K x sq. m/W) when tested according to ASTM C 1363.
 - vi. Vertical Edges for Single-Acting Doors: Square edge.
 - vii. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- (1.0-mm-) thick, end closures or channels of same material as face sheets.
 - viii. Tolerances: SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
 - ix. Interior Doors: Face sheets fabricated from cold-rolled steel sheet unless metallic-coated sheet is indicated. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
 - 1. Level 2 and Physical Performance Level B (Heavy Duty), Model 2 (Seamless).
 - x. Hardware Reinforcement: ANSI/SDI A250.6.
- 5. Standard Hollow Metal Frames:
 - i. Comply with ANSI/SDI A250.8.
 - ii. Exterior Frames: Fabricated from metallic-coated steel sheet.
 - 1. Fabricate frames as full profile welded unless otherwise indicated.
 - 2. Fabricate frames with drywall returns.
 - iii. Interior Frames: Fabricated from cold-rolled steel sheet.
 - 1. Provide hot-dip galvanized sheet steel for frames installed in concrete and concrete masonry walls.
 - 2. Fabricate frames with full profile welded unless otherwise indicated.
 - 3. Fabricate frames with throat dimension 1/4 inch greater than the cut-to-cut dimension of gypsum board and wall frame assembly.
 - 4. Fabricate frames with drywall returns.
 - 5. Frames for Borrowed Lights: 0.053-inch- (1.3-mm-) thick steel sheet.
 - 6. Frames to be 2 inches and 1 and 1/2 inches profile. Refer to unit price list.
 - iv. Hardware Reinforcement: ANSI/SDI A250.6.
- 6. Frame Anchors:
 - i. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (50 mm) wide by 10 inches (250 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
 - 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.

3. Post-installed Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- ii. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0 mm) thick, and as follows:
 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (50-mm) height adjustment. Terminate bottom of frames at finish floor surface.
7. Stops and Moldings: Loose stops for glazed lites in frames at minimum thickness of 0.032 inch (0.8 mm), same material as frames.
8. Accessories:
 - i. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
 - ii. Ceiling Struts: Minimum 1/4-inch-thick by 1-inch- (6.4-mm-thick by 25.4-mm-) wide steel.
 - iii. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.
 - iv. Safety Chains: Provide through bolted safety chains at all exterior penthouse/ powerhouse doors.
 1. Acceptable Manufacturers: Don-Jo Mfg., Inc. (DJo), Hager Companies (HAG), and IVES Hardware; an Ingersoll-Rand Company (IVS).
9. Fabrication:
 - i. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.
 - ii. Hollow Metal Frames: Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 2. Sidelight Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 3. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 4. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
 5. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
 6. Jamb Anchors: Provide number and spacing of anchors as follows:
 - (a) Masonry Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - i. Three anchors per jamb up to 86 inches (2184 mm) high.

- ii. Four anchors per jamb from 87 to 108 inches (2210 to 2743 mm) high.
 - iii. Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 108 inches (2743 mm) high.
 - (b) Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - i. Three anchors per jamb up to 86 inches (2184 mm) high.
 - ii. Four anchors per jamb from 87 to 108 inches (2210 to 2743 mm) high.
 - iii. Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 108 inches (2743 mm) high.
 - iv. Two anchors per head for frames more than 42 inches (1066 mm) wide and mounted in metal-stud partitions.
 - (c) Post-installed Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
7. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers.
- (a) Single-Door Frames: Three door silencers.
 - (b) Double-Door Frames: Two door silencers.
- iii. Hardware Preparation: Factory prepared hollow metal work to receive templated mortised hardware.
- 1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 - 2. Reinforce frames to receive non-templated, mortised and surface-mounted door hardware.
 - 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
 - 4. Coordinate locations of conduit and wiring boxes for electrical connections per the End User's request.
- iv. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
- 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.
 - 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
 - 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 - 4. Provide loose stops and moldings on inside of hollow metal work.
 - 5. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

10. Steel Finishes:

- i. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
 1. Shop Primer: ANSI/SDI A250.10.

b. Flush Wood Doors:

1. Products must meet minimum quality assurance requirements.
 - i. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.
 - ii. Quality Standard: In addition to requirements specified, comply with AWI's "Architectural Woodwork Quality Standards Illustrated."
 - iii. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252.
2. Subject to compliance with requirements, provide product(s) by one of the following manufacturers:
 - i. Algoma Hardwoods, Inc.
 - ii. Eggers Industries.
 - iii. Marshfield Door Systems, Inc.
 - iv. Oshkosh Architectural Door Company.
 - v. VT Industries Inc.
2. Door Construction:
 - i. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.
 - ii. WDMA I.S.1-A Performance Grade:
 1. Heavy Duty unless otherwise indicated.
 2. Extra Heavy Duty: Public toilets, janitor's closets, assembly spaces, and exits.
 - iii. Particleboard-Core Doors:
 1. Particleboard: ANSI A208.1, Grade LD-2, made with binder containing no urea- formaldehyde resin.
 2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
 3. Crossbands: Provide a 1/16-inch hardwood or high-density fiberboard crossband concealed at edge. Crossband is required under each face veneer from all manufacturers.
 - iv. Fire-Protection-Rated Doors: Provide core specified or mineral core as needed to provide fire- protection rating indicated.
 1. Fire-Rated Labels: Permanent type required on hinge edge of doors. Provide on top edge where doors have continuous hinge. Decal type is NOT acceptable.
 2. Stile Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.

3. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Comply with specified requirements for exposed edges.
4. Astragals: Provide surface applied overlapping astragals on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch (19mm) beyond edge of door on which astragal is mounted.
 - (a) Finish astragals to match door hardware (locksets or exit devices).
Coordinate with End User.
- v. Mineral-Core Doors:
 1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
 2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as needed to eliminate through-bolting hardware.
 3. Crossbands: Provide minimum 1/16 inch hardwood or high-density fiberboard crossbands concealed at edges. Crossbands required under each veneer from all manufacturers.
 4. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
3. Doors for Opaque Finish:
 - i. Interior Solid-Core Doors:
 1. Grade: Premium.
 2. Faces: Medium-density overlay.
 3. Core: Particleboard; Type II adhesive.
 4. Construction: Five plies. Stiles and rails are bonded to core, and then entire unit abrasive planed before veneering.
 - (a) Stiles: Provide one piece hardwood stiles in compatible species to veneer face.
 - (b) LSL stiles not allowed.
 4. Fabrication:
 - i. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
 1. Comply with requirements in NFPA 80 for fire-rated doors.
 2. Stile Edges: Beveled.
 - ii. Factory machine doors for hardware that is not surface applied.
 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 2. For doors with window lites, coordinate window height with panic hardware so that hardware does not cross window.
 3. Metal Astragals: Factory machine astragals for pairs of fire-rated doors.
 - iii. Openings: Cut and trim openings through doors in factory.

1. Light Openings: Trim openings with moldings of material and profile indicated.
 2. Glazing: Factory install glazing in doors indicated to be factory finished.
 3. Louvers: Factory installed louvers in prepared openings.
5. Shop Priming:
- i. Doors for Opaque Finish: Shop prime doors with one coat of wood primer as specified by the End User. Seal all four edges, edges of cutouts, and mortises with primer.
6. Factory Finishing: Field finish doors indicated to receive opaque finish.
- c. Door Hardware:
1. Products must meet minimum quality assurance requirements.
 - i. Source Limitations: Obtain each type of door hardware from a single manufacturer.
 - ii. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated.
 - iii. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
 - a. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at the tested pressure differential of 0.3-inch wg (75 Pa) of water.
 - iv. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
 - v. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
 - vi. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines ICC/ANSI A117.1.
 - a. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22.2 N).
 - b. Comply with the following maximum opening-force requirements:
 - i. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
 - ii. Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
 - iii. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - c. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.

- d. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.

2. Hinges:

- i. Quantity: Provide the following, unless otherwise indicated by the End User:
 - a. Two Hinges: For doors with heights up to 60 inches (1524 mm).
 - b. Three Hinges: For doors with heights 61 to 90 inches (1549 to 2286 mm).
 - c. Four Hinges: For doors with heights 91 to 120 inches (2311 to 3048 mm).
 - d. For doors with heights more than 120 inches (3048 mm), provide 4 hinges, plus 1 hinge for every 30 inches (750 mm) of door height greater than 120 inches (3048 mm).

- ii. Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

<i>Maximum Door Size (inches)</i>	<i>Hinge Height (inches)</i>	<i>Metal Thickness (inches)</i>	
		<i>Standard Weight</i>	<i>Heavy Weight</i>
36 by 84 by 1-3/4	4-1/2	0.134	0.180
42 by 90 by 1-3/4	4-1/2	---	0.190
48 by 120 by 1-3/4	4-1/2	---	0.190

- iii. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- iv. Hinge Weight: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy-weight ball-bearing hinges.
 - b. Doors with Closers: Heavy-weight ball bearing hinges.
 - c. Interior Doors: Standard-weight hinges, except where otherwise indicated in hardware sets and size table above.
- v. Hinge Base Metal: Unless otherwise indicated, provide the following:
 - a. Exterior Hinges: Stainless steel, with stainless-steel pin non-removable.
 - b. Interior Hinges: Brass, with stainless-steel pin body and brass protruding heads or Steel, with brass pin.
 - c. Hinges for Fire-Rated Assemblies: Steel, with steel pin except, at wet locations provide Stainless steel, with stainless-steel pin.
- vi. Fasteners: Comply with the following:
 - a. Use only fasteners supplied by hardware manufacturer.
 - b. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
 - c. Wood Screws: For wood doors and frames.
 - d. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
- vii. BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal frames.
- viii. Basis-of-Design Product: Subject to compliance with requirements, provide product(s) by one of the following:
 - a. Hager Companies.
 - b. Lawrence Hardware Inc.
 - c. McKinney Products Company; an ASSA ABLOY Group company.

- d. Stanley Commercial Hardware; Div. of The Stanley Works.
3. Mechanical Locks and Latches:
- i. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
 - a. Bored (Cylindrical) Locks: Minimum 1/2-inch (13-mm) latch bolt throw.
 - b. Mortise Locks: Minimum 3/4-inch (19-mm) latch bolt throw.
 - ii. Lock Backset: 2-3/4 inches (70 mm), unless otherwise indicated.
 - iii. Lock Trim:
 - a. Lockset Designs: Provide design designated below or, if sets are provided by another manufacturer, provide designs that match those designated.
 - i. Bored (Cylindrical) Locks:
 - (a) Best 9K series, 14D trim design.
 - (b) Corbin-Russwin CL3300 Series, Princeton trim design.
 - (c) Sargent 10 Line Series, "P" Lever Design trim design. No Substitutions.
 - (d) Schlage "ND" Series, Sparta trim design.
 - (e) Yale 5400LN Series, Pacific Beach trim design. No Substitutions.
 - ii. Mortise Locks:
 - (a) Best 40H series, 14D trim design.
 - (b) Corbin-Russwin ML2000 Series, Princeton trim design.
 - (c) Sargent 8200 Lever Lock Series, "P" Lever Design trim design.
 - (d) Schlage "L" Series, ND Sparta trim design.
 - (e) Yale 8800 Series, Pacific Beach trim design.
 - b. Levers: Cast.
 - c. Provide knurled/milled levers for all openings into hazardous areas, including but not limited to electrical and mechanical rooms, janitors closets, and elevator machine rooms.
 - d. Escutcheons (Roses): Wrought.
 - e. Where lead-lined latches are indicated, provide lead-lined escutcheons.
 - f. Dummy Trim: Match lever lock trim and escutcheons.
 - g. Operating Device: Lever with escutcheons (roses).
 - iv. Strikes: Provide manufacturer's standard strike for each lock bolt or latch bolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
 - a. Flat-Lip Strikes: For locks with three-piece antifriction latch bolts, as recommended by manufacturer.
 - v. Bored (Cylindrical) Locks: BHMA A156.2; Grade 1; Series 4000.
 - a. Subject to compliance with requirements, provide product(s) by one of the following:
 - i. Best Access Systems; Div. of Stanley Security Solutions, Inc.
 - ii. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group Company.
 - iii. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
 - iv. Schlage Commercial Lock Division; an Ingersoll-Rand company.
 - v. Yale Security Inc.; an ASSA ABLOY Group company.

- vi. Mortise Locks: BHMA A156.13; Operational Grade 1; stamped steel case with steel or brass parts; Series 1000.
 - a. Subject to compliance with requirements, provide product(s) by one of the following:
 - i. Best Access Systems; Div. of Stanley Security Solutions, Inc.
 - ii. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
 - iii. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
 - iv. Schlage Commercial Lock Division; an Ingersoll-Rand company.
 - v. Security Inc.; an ASSA ABLOY Group company.
 - vi. Yale Security Inc.; an ASSA ABLOY Group company.
4. Lock Cylinders:
- i. Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
 - ii. BHMA A156.5; Grade 1; permanent that are removable; face finished to match lockset.
 - iii. Number of Pins: Seven.
 - iv. Type: Mortise and Bored-lock type.
 - v. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.
5. Keying:
- i. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A.
 - a. Master Key System: Change keys and a master key operate cylinders.
 - b. Great-Grand Master Key System: Change keys, a master key, a grand master key, and a great-grand master key operate cylinders.
 - c. Existing System:
 - 1. Master key or grand master key locks to Owner's existing system.
 - 2. Re-key Owner's existing master key system into new keying system.
 - ii. Keys: Nickel silver
 - a. Quantity: In addition to one extra key blank for each lock, provide the following:
 - b. Cylinder Change Keys: Four.
 - c. Master Keys: Six.
 - d. Grand Master Keys: Six.
 - e. Great-Grand Master Keys: Six.
6. Accessories for Pairs of Doors:
- i. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release.
 - a. Subject to compliance with requirements, provide product(s) by one of the following:
 - 1. Glynn-Johnson; an Ingersoll-Rand Company.
 - 2. Hager Companies.
 - 3. IVES Hardware; an Ingersoll-Rand company.
 - ii. Carry-Open Bars: BHMA A156.3; prevent the inactive leaf from opening before the active leaf; provide polished brass or bronze carry-open bars with strike

plate for inactive leaves of pairs of doors unless automatic or self-latching bolts are used.

a. Material: Polished brass or bronze, with strike plate.

iii. Astragals: BHMA A156.22. Provide astragals on pairs of exterior doors and on interior doors indicated to have astragals.

a. Subject to compliance with requirements, provide product(s) by one of the following:

1. Hager Companies.
2. National Guard Products, Inc.
3. Pemko Manufacturing Co., Inc.
4. Reese Enterprises, Inc.

7. Surface Closers:

i. BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force. Provide type of arm required for closer to be located on non-public side of door, unless otherwise indicated.

a. Subject to compliance with requirements, provide product(s) by one of the following:

1. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
2. LCN Closers; an Ingersoll-Rand company.
3. Norton Door Controls; an ASSA ABLOY Group company.
4. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
5. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
6. Yale Security Inc.; an ASSA ABLOY Group company.

8. Concealed Closers:

i. BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

a. Subject to compliance with requirements, provide product(s) by one of the following:

1. LCN Closers; an Ingersoll-Rand company.
2. Norton Door Controls; an ASSA ABLOY Group company.
3. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
4. SARGENT Manufacturing Company; an ASSA ABLOY Group company.

9. Mechanical Stops and Holders:

i. Wall-Mounted Stops: BHMA A156.16; Grade 1; polished cast brass, bronze, or aluminum base metal.

a. Subject to compliance with requirements, provide product(s) by one of the following:

1. Baldwin Hardware Corporation.

2. Hager Companies.
3. IVES Hardware; an Ingersoll-Rand company.
4. Rockwood Manufacturing Company; an ASSA ABLOY Group company.
5. Trimco.

10. Metal Protective Trim Units:

- i. Plates: beveled top and 2 sides; 1-1/2 inches (38 mm) less than door width on push side and 1/2 inch (13 mm) less than door width on pull side, by height as follows:
 - a. Mop plate – 6 inches (152 mm).
 - b. Kick plate – 10 inches (254 mm).
 - c. Armor plate – 36 inches (914 mm).

11. Auxiliary Door Hardware:

- i. BHMA A156.16.
- ii. Silencers for Metal Door Frames: BHMA A156.16, Grade 1; neoprene or rubber, minimum diameter 1/2 inch (13 mm); fabricated for drilled-in application to frame.
 - a. Subject to compliance with requirements, provide product(s) by one of the following:
 1. Hager Companies.
 2. Rockwood Manufacturing Company.
 3. Stanley Commercial Hardware; Div. of The Stanley Works.
 4. Trimco.

12. Fabrication:

- i. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.
- ii. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
 - a. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
 - b. Fire-Rated Applications:
 1. Wood or Machine Screws: For the following:
 2. Hinges mortised to doors or frames; use threaded-to-the-head wood screws for wood doors and frames.
 3. Strike plates to frames.
 4. Closers to doors and frames.
 - c. Steel Through Bolts: For the following unless door blocking is provided:

1. Surface hinges to doors.
 2. Closers to doors and frames.
 3. Surface-mounted exit devices.
 - iii. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
 - iv. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
13. Finishes:
- i. Provide finishes complying with BHMA A156.18.
 - ii. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

J.2. Warranty

a. Door Hardware:

1. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fails in materials or workmanship within specified warranty period.
2. Failures include, but are not limited to, the following:
 - i. Structural failures including excessive deflection, cracking, or breakage.
 - ii. Faulty operation of doors and door hardware.
 - iii. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
3. Warranty Period: 10 years from date of substantial completion, unless otherwise indicated.
 - iv. Electromagnetic and Delayed-Egress Locks: Five years from date of substantial completion.
 - v. Exit Devices: Two years from date of substantial completion.
 - vi. Manual Closers: 10 years from date of substantial completion.

J.3. Doors and Door Hardware Data and Sample Requirements

b. Upon request, Contractor shall provide the following for each item proposed:

1. Product data.
 - a. Construction and installation details
 - b. Material descriptions
 - c. Dimensions of individual components and profiles
 - d. Finishes
2. Shop drawings.
 - a. Metal Doors: Include elevations, door edge details, frame profiles, metal thickness, and preparation for hardware.
 - b. Flush Wood Doors:
 1. Location, size, and hand of each door
 2. Elevation of each kind of door
 3. Construction details (if not covered in Product Data)

4. Location and extent of hardware blocking
 5. Dimensions and locations of mortises and holes for hardware
 6. Dimensions and locations of cutouts
 7. Requirements for veneer matching
- c. Electrified Door Hardware: Include factory wiring diagrams and narrative of operation of doors controlled by electrified door hardware
3. Fire-protection ratings for fire-rated doors.