

PROJECT:
RENOVATE 412 FOR DCSA

PROJECT NUMBER: MAHG 20-1091

13 JULY 2020

KEESLER AIR FORCE BASE BILOXI, MISSISSIPPI



Keesler AFB 508 L Street
Keesler AFB, MS 39534

INDEX

SECTION	NAME
00 10 20	DRAWING LIST
06 10 00	ROUGH CARPENTRY
06 20 00	FINISH CARPENTRY
06 40 20	INTERIOR ARCHITECTURAL WOODWORK
06 65 00	SOLID SURFACE FABRICATIONS
07 20 00	INSULATION
07 92 00	JOINT SEALANTS
08 10 10	STEEL DOORS AND FRAMES
08 20 00	WOOD DOORS
08 71 00	DOOR HARDWARE
08 72 00	THRESHOLDS
09 22 16	NON-STRUCTURAL METAL FRAMING
09 25 50	GYPSUM BOARD ASSEMBLIES
09 51 10	ACCOUSTICAL PANEL CEILINGS
09 65 00	LUXURY VINYL TILE
09 65 13	RUBBER WALL BASE
09 65 50	RESILENT ACCESSORIES
09 68 13	TILE CARPETING
09 91 00	PAINT
09 93 23	STAINS AND TRANSPARENT FINISHES
22 00 00	PLUMBING AND PIPING
23 00 00	DUCT CONSTRUCTION AND ACCESSORIES
23 01 30	DUCT CLEANING

SECTION 00 10 20

LIST OF DRAWINGS

PART 1 GENERAL

1.1 SUMMARY

This document lists the drawings for the project.

1.2 CONTRACT DRAWINGS

Contract drawings are as follows:

<u>DRAWING No.</u>	<u>TITLE</u>
T1.0	Title Sheet
D1.0	Demolition Floor Plan
D1.1	Reflective Ceiling Plan Demolition
A1.0	Floor Plan
A1.1	Reflective Ceiling Plan
A2.0	Interior Elevations, Sections
A3.0	Door Schedule, Elevations, Details and Finish Schedule
A4.0	Interior Elevations
A5.0	Building Exterior
M1.0	Mechanical Demolition
M2.0	Mechanical Plan
M3.0	Mechanical Air Balance Diagram
P1.0	Plumbing
E0.0	Symbols
E1.0	Power/Lighting
E2.0	Communication

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 – GENERAL

1.1 SUMMARY

- A. Rough carpentry includes carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated. Types of work in this Section include rough carpentry for:
1. Wood nailers and blocking
 2. Other rough carpentry indicated

1.2 DELIVERY STORAGE, AND HANDLING

- A. Keep materials dry at all times. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and provide air circulation within stacks.

1.3 PROJECT CONDITIONS

- A. Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, and similar supports to allow proper attachment of other work.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Framing Lumber:
1. Miscellaneous Lumber:
 - a. Provide wood for support or attachment of other work including bucks, nailers, blocking, furring, stripping and similar members. Provide lumber of sizes shown or specified worked into shapes shown.
 - b. Grade: Standard or No. 2 Southern Pine.
 - c. Treated wood for exterior applications and at locations where wood meets concrete.
- B. Plywood:
1. Plywood Backing Panels: For mounting IT equipment, millwork, etc. Provide fire retardant treated plywood panels with grade designation, APA C-C Plugged INT with exterior glue, in 3/4" thickness, 6 ply construction.

2.2 ACCESSORIES

1. Fasteners and Anchorages: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nail, staples, screws, bolts, nuts, washers and anchoring devices.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. General Requirements:
1. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.
 2. Framing lumber and other rough carpentry shall be fitted closely, set accurately to the required lines and levels and shall be secured in place in a rigid and substantial manner.
 3. All framing and support members, not indicated or specified, shall be provided as necessary for the proper completion of the work.
 4. Spiking, nailing and bolting shall be done in an approved manner; spikes, nails and bolts shall be of the proper size, and care shall be used so as not to split the members.
 5. Provide framing to support all edges of covering material.
- B. Wood Nailers and Blocking:
1. Provide wherever shown and where required for attachment of other work. Form to shapes as shown or required and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
 2. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise shown. Build into masonry during installation of masonry work.
 3. 12" o.c. along intermediate supports, and 3/8" minimum from panel edge.

END OF SECTION

SECTION 06 20 00 - FINISH CARPENTRY

PART I - GENERAL

1.01 DESCRIPTION

- A. The work required under this Section consists of all finish carpentry, "custom" grade millwork and casework for stain finish and related items to complete the work as indicated on the Drawings and described in the Specifications.
- B. Related Specifications:
 - 1. Section 061000 – Rough Carpentry
 - 2. Section 064020 – Interior Architectural Woodwork
 - 3. Section 066500 – Solid Surface Fabrications

1.02 SUBMITTALS

- A. Submit shop drawings in accordance with the requirements within the Statement of Work (SOW).
- B. Shop drawings shall include but not be limited to the following:
 - 1. Complete elevations of all millwork units
 - 2. Sections and details of construction
 - 3. Finishes
 - 4. Methods of assembling sections
 - 5. Location and installation of hardware
 - 6. Size, shape and thickness of materials
 - 7. Joint and connection details
 - 8. Details of joining with other work.

1.03 INDUSTRY STANDARDS

- A. Sizes, thicknesses and grades shall be defined by the rules of the recognized Association of Lumber Manufacturers producing the materials specified, but defects or blemishes prohibited by this Specification, even though permissible in grade, shall not appear in the materials used.
- B. Each panel of softwood plywood shall be identified with the DFPA Grade trademark of the American Plywood Association and shall meet the requirements of the latest edition of U. S. Product Standards PS 166 for Softwood Plywood.
- C. Finish carpentry shall be governed by "Quality Standards" of the Architectural Woodwork Institute.

1.04 HANDLING AND STORAGE

- A. Insure proper protection from weather and damage during delivery and job site storage of all materials of this Section.
- B. Wood materials shall not be stored within the structure until work is reasonably dry. Store all carpentry materials and millwork in an area protected from weather, moisture, and damage.
- C. Handle all products so as to prevent damage or soiling.

PART 2 - MATERIALS

2.01 LUMBER

- A. All lumber shall from sound stock, thoroughly seasoned and free from defects. Moisture content of finish lumber shall not exceed eleven (11) percent. Each piece of lumber must bear the grade and trademark of the association under which it is graded.
- B. Framing lumber shall be "B or Better" grade kiln dried, Ponderosa Pine.

2.02 PLYWOOD AND SHEET PRODUCTS

- A. All plywood for uses where shown on Drawings shall conform to the industry standards specified.
- B. All plywood which has any edge or surface exposed to the weather shall be exterior type glued.
- C. Use Grade AD where one side is exposed and Grade AA where both sides are exposed to view.
- D. Plastic laminates shall be Formica, Wilson Art, Westinghouse, or approved equal, horizontal grade.
- E. Pre-finished high impact wall panels shall be Fibertite textured Fiberglass (FRP) laminated to ¼" for exterior plywood by Nudo Furnish Products or equal in factory standard color matching existing with vinyl moldings for joint covers, caps, end panels caps, inside and outside corners and division bars. Attach with stainless steel white painted drive screw shank nails.

2.03 FINISH WOOD

- A. Furnish free from defects impairing durability or fitness for receiving finish, from sound stock and thoroughly seasoned. Properly sand all materials at mill and hand sand as required at job.
- B. Furnish wood of "B or Better" kiln-dried plain sawn White Oak, mill sanded, for custom grade work.
- C. Furnish wood of "B or Better" grade Poplar mill sanded, for economy grade work.

2.04 HARDWARE

- A. Furnish all screws, nails, bolts, plates and other items necessary to complete work.
- B. All finish carpentry shall conform to the latest edition of grade requirement of the AWI Quality Standards, custom grade or economy grade as applicable.
- C. All finish carpentry of every sort shall be put up plumb or level, and straight and true.
- D. In every case, put up trim and firmly secure to proper grounds. Fit and scribe all parts to other work in a careful manner so as not to injure the surfaces in any way.
- E. Blind nail wherever possible, but where not possible, drive and set nails so as to not be visible in the finish.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install all items of finish carpentry including trim of every description, with edges fitted tightly to surfaces on which applied and securely nailed to supporting members with finishing nails, set ready for putty, with tight fitting metered joints and flush surfaces.

3.02 HARDWARE

- A. Receive, store and install hardware furnished under Section 064020 – Interior Architectural Woodwork. Apply hardware in accordance with manufacturer's instructions and templates, fit accurately, apply securely, and adjust carefully. Use care not to injure work when applying hardware.
- B. Remove or cover knobs and pulls with heavy cloth until painting is completed.

3.03 PROTECTION

- A. All surfaces are to be left clean, ready for painting or staining and all damaged surfaces or items shall be repaired or replaced.
- B. Protect all finish surfaces and hardware, including door knobs, rim locks, etc., until painting is completed.

3.04 CLEANING AND ADJUSTMENT

- A. After installation clean all surfaces of dirt and remove all debris.
- B. Prior to completion of construction, examine all doors and other movable parts; adjust as required and leave hardware in good working order.

END OF SECTION

SECTION 06 40 20 – INTERIOR ARCHITECTURAL WOODWORK

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Architectural cabinets.
 - 2. Accessories
- B. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips unless concealed within other construction before woodwork installation.
- C. Related Section include the following:
 - 1. Section 06 10 00 - Rough Carpentry
 - 2. Section 06 20 00 - Finish Carpentry
 - 3. Section 06 65 00 - Solid Surface Fabrications

1.2 SUBMITTALS

- A. Product Data: For cabinet hardware and accessories.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1.3 QUALITY ASSURANCE

- A. Quality standards - except as otherwise shown or specified, comply with specified provisions of the following:
 - 1. Architectural Woodwork Institute (AWI) "Architectural Woodwork Quality Standards".

1.4 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Wood Products:
 - 1. Softwood Plywood: DOC PS 1, Medium Density Overlay (for use with painted plywood only).
 - 2. Interior Hardwood: as specified in Section 06 20 00 Finish Carpentry.

2.2 ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural woodwork.
- B. Hinges:
 - 1. 5 Knuckle Hinges: Hinges shall be .95" steel five-knuckle hospital-tip institutional grade quality with .187" diameter tight pin. Hinge shall permit door to swing 270 degrees without binding, and self-closing.
- C. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter.
- D. Drawer Slides: Side mounted; full-extension type; zinc-plated steel ball-bearing slides.
- E. Door Locks: BHMA A156.11, E07121.
- F. Drawer Locks: BHMA A156.11, E07041.
- G. Shelf Supports:

1. Where shelving is indicated as "adjustable shelf standards" or "pin type", provide Hafele standard, 25mm, silver anodized aluminum finish or equal. Include metal shelf supports in matching finish.
- H. Round Grommets: ZG "Flip Top" Series, 2" hole, by Doug Mockett & Company, or approved equal. Color to be selected by Contracting Officer.
- I. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 1. Satin Stainless Steel: BHMA 630.
- J. Adhesives, General: Do not use adhesives that contain urea formaldehyde.

2.3 FABRICATION

- A. General: Complete fabrication to maximum extent possible before shipment to Project site. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting.
 1. Interior Woodwork Grade: Custom
 2. Shop cut openings to maximum extent possible. Sand edges of cutouts to remove splinters and burrs. Seal edges of openings in countertops with a coat of varnish.
- B. Architectural Cabinets and Shelving, Paneling, Standing and Running Trim, Transparent Finish
 1. As specified in Section 06 20 00 Finish Carpentry.

2.4 FINISHING

- A. Finish woodwork per Section 06 20 00 Finish Carpentry.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas. Examine shop-fabricated work for completion and complete work as required, including removal of packing and back priming.
- B. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.
- C. Install woodwork level, plumb, true, and straight to a tolerance of 1/8 inch in 96 inches. Shim as required with concealed shims.
- D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails for exposed fastening, countersunk and filled flush with woodwork.
- F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.
- G. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c.
- H. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop. Caulk space between counter and wall with sealant specified in Section 07 92 00 Joint Sealants.

END OF SECTION

SECTION 06 65 00

SOLID SURFACE FABRICATIONS

PART I - GENERAL

1.01 DESCRIPTION

- A. The work required under this Section consists of acrylic (polymer) solid surface material used for reception counter surfacing and counter top surfacing to complete the work as indicated on the Drawings and described in the Specifications.
- B. Related Sections:
 - 1. Section 06 10 00 - Rough Carpentry
 - 2. Section 06 20 00 - Finish Carpentry
 - 3. Section 06 40 20 - Interior Architectural Woodwork

1.02 REFERENCES

- A. Applicable Standards: Standards of the following, as referenced herein:
 - 1. American National Standards Institute (ANSI)
 - 2. American Society for Testing and Materials (ASTM)
 - 3. National Electrical Manufacturers Association (NEMA)

1.03 SUBMITTALS

- A. Shop Drawings: Indicate dimensions, component sizes, fabrication details, attachment provisions and coordination requirements with adjacent work.
- B. Samples: Submit minimum 2" x 2" (50 mm x 50 mm) samples. Indicate full range of color and pattern variation. Approved samples will be retained as standards for work.
- C. Product Data: Indicate product description, fabrication information and compliance with specified performance requirements.
- D. Maintenance Data: Submit manufacturer's care and maintenance data, including repair and cleaning instructions. Include in project closeout documents.

1.04 QUALITY ASSURANCE

- A. Allowable Tolerances:
 - 1. Variation in component size: $\pm 1/8"$ (3 mm).
 - 2. Location of openings: $\pm 1/8"$ (3 mm) from indicated location.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver no components to project site until areas are ready for installation. Store components indoors prior to installation.
- B. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.06 WARRANTY

- A. Provide manufacturer's ten (10) year warranty against defects in materials. Warranty shall provide material and labor to repair or replace defective materials. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.

PART 2 - PRODUCTS

2.01 SOLID SURFACE FABRICATIONS

- A. Specifications are based on solid surface materials manufactured by Dupont Corian, P.O. Box 80702, Wilmington DE 19880-0702; Phone (800) 426-7426.
- B. Or Approved Equal.
- C. Material: Homogeneous filled acrylic; not coated, laminated or of composite construction; meeting ANSI Z124.3.
 - 1. Superficial damage to a depth of 0.010" (25mm) shall be repairable by sanding and polishing.
- D. Reception Counter and Counter Tops: Horizontal surfaces and vertical surfaces shall be thick solid polymer material adhesively joined with inconspicuous seams; edge details as indicated on the drawings.
- E. Color: Color shall be selected by the Contracting Officer from the Private and Terra Collections.

2.02 ACCESSORIES

- A. Joint Adhesive: Manufacturer's standard two part adhesive kit to create inconspicuous, non-porous joints, with a chemical bond.

2.03 FABRICATION

- A. For warranty coverage, fabricator/installer shall be approved or certified by solid polymer manufacturer.
- B. Fabricate components in shop to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and solid polymer manufacturer requirements.
- C. Form joints between components using manufacturer's standard joint adhesive. Joints shall be inconspicuous in appearance and without voids. Attach 2" (50 mm) wide reinforcing strip of solid polymer material under each joint.
- D. Provide holes and cutouts for plumbing and bath accessories as indicated on the drawings.
- E. Rout and finish component edges to a smooth, uniform finish. Rout all cutouts and sand all edges smooth. Repair or reject defective or inaccurate work.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install components plumb and level, in accordance with approved shop drawings and product installation details.
- B. Form filed joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work. Keep component and hands clean when making joints.
- C. Adhere top-mount sink/bowls to countertops using manufacturer's recommended adhesives and color matched silicone sealant.
- D. Provide backsplashes and endsplashes as indicated on drawings. Adhere to countertops using manufacturer's standard color matched silicone sealant.
- E. Keep components and hands clean during installation. Remove adhesives, sealants and other stains.
- F. Protect surfaces from damage. Repair or replace damaged work that cannot be repaired to Architect's satisfaction.

END OF SECTION

SECTION 07 20 00

INSULATION

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The work required under this Section consists of batt insulation, blanket insulation and related items to complete the work as indicated on the Drawings and described in the Specifications.

1.02 SUBMITTALS

- A. Submit data in accordance with the Statement of Work (SOW).
- B. Submittals shall include, but not be limited to, the following;
 - 1. Technical literature
 - 2. Performance data
 - 3. Spec-Data sheets
 - 4. Manufacturer's installation instructions

1.03 COORDINATION

- A. Efficient utilization of this product requires minimum damage thereto and maximum surface integrity. Therefore, allow others adequate time and space in which to work to complete their requirements prior to commencing insulation work.
- B. Insulation which must be installed as other trades perform their work will be installed in a timely manner and protected so that the work of adjacent trades does not damage or displace insulation.

1.04 HANDLING AND STORAGE

- A. Deliver all materials to the job site in the original manufacturer's sealed packages.
- B. Store all materials off-ground and cover to keep dry.

PART 2 – MATERIALS

2.01 Manufacturer

- A. Owens-Corning.
- B. Or Approved equal

2.02 SOUND ATTENUATION BATTS

- A. Type: Unfaced glass fiber acoustical insulation complying with ASTM C 665, Type I.
- B. Size:
 - 1. Thickness 3½", Width 16".
 - 2. Thickness 6", Width 24".
- C. Surface Burning Characteristics:
 - 1. Maximum flame spread: 10
 - 2. Maximum smoke developed: 10
 - 3. When tested in accordance with ASTM E 84.
- D. Combustion Characteristics:
 - 1. Passes ASTM E 136.
- E. Fire Resistance Ratings:
 - 1. Passes ASTM E 119 as part of a complete fire tested wall assembly.
- F. Sound Transmission Class: STC 44
- G. Dimensional Stability:
 - 1. Linear Shrinkage less than 0.1%

PART 3 – EXECUTION

3.01 WALL INSULATION (Sound Attenuation Batt Fiberglass)

- A. Install 3 ½" sound attenuation batts in stud spaces of perimeter partition walls and elsewhere as indicated. Chink loose spots, holes and gaps with insulation.

3.02 CEILING INSULATION (Sound Attenuation Batt Fiberglass)

- A. Install 6" sound attenuation batts on suspended lay-in ceiling system and elsewhere as indicated. Chink loose spots, holes and gaps with insulation.

3.03 WORKMANSHIP

- A. All work of this Section shall be done by competent craftsmen in a neat workmanlike manner. All insulation shall be left in good condition and neat appearance.

3.04 CLEAN UP

- A. Remove all debris from the site upon completion of insulation work.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 – GENERAL

1.1 SUMMARY

- A. The extent of each form and type of joint sealer is indicated on drawings and by provisions of this section.
- B. The applications for joint sealers as work of this section include the following:
 - 1. Wall joints at metal roof deck.
 - 2. Wall joints at floors.
 - 3. Joints between metal door frames and adjacent construction.
 - 4. At locations where dissimilar metals and/or materials come together.
 - 5. Other locations indicated.

1.2 SUBMITTALS

- A. Product Literature
 - 1. Submit product data sheets and the manufacturer's installation instructions. If two or more different sealants are to be in physical contact with each other, obtain from each manufacturer confirmation that its product is compatible with the proposed and adjacent products, including any other products which may be used by other sub-contractors. Include primer literature with the submittal document unless the manufacturer's sealant submittal specifically eliminates the need for a primer.
 - 2. If a stain type primer is required for the sealant selected, such information shall be specifically included on submittal documents calling attention to the need for such staining type primer and noting the planned precautions to prevent exposed stain residue.
 - 3. Include Safety Data Sheets for sealants.
- B. Color Samples: Submit manufacturer's standard color chart. Submit cured samples of each chosen color for verification of actual color to be installed. Multiple cured samples may be required for selection.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Deliver in manufacturer's original unopened container, clearly identifying each product specified, relating it to the product literature submitted.
- B. Store in accordance with manufacturer's recommendation, with proper precautions concerning shelf life, temperature, humidity, and similar storage factors to ensure the fitness of the material when installed.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. General Sealer Performance Requirements
 - 1. Provide colors indicated or, if not otherwise indicated, as selected by Contracting Officer from manufacturer's standard colors. Select materials for compatibility with joint surfaces and other indicated exposures, and except as otherwise indicated, select modulus of elasticity and hardness or grade recommended by manufacturer for each application indicated.
- B. Non-Elastomeric Sealants (Caulking)
 - 1. Single component siliconized acrylic latex caulking compound: ASTM C834, gun grade; flexible, paintable, non-staining, non-bleeding, acrylic emulsion.
 - 2. Use: Interior sealing around doors and gypsum board.

3. Acceptable Manufacturers/Products, or Approved Equal:
 - a. GE Silicones RCS 20
 - b. Bostik, Chem-Calk 600
 - c. DAP, Inc., DAP ALEX PLUS Acrylic-latex Caulk Plus Silicone
 - d. Pecora, AC-20 + Silicone
 - e. Sonneborn, Sonolac
 - f. Tremco, Tremflex 834 Acrylic Latex Caulk

C. Acoustical Sealants

1. Use: Roof deck-to-wall, top of wall, wall penetrations, wall-to-wall, and floor-to-wall.
2. Non-hardening, non-drying, non-sag, and is effective in reducing sound transmission through perimeter joints, and openings in building construction.
3. Acceptable Manufacturers/Products, or Approved Equal:
 - a. Green Glue, Inc. Noise Proofing Sealant
 - b. GE Acoustical Sealant RCS20
 - c. DAP MONO Acoustical Sealant
 - d. Pecora Corp AC-20 FTR Acoustical and Insulation Sealant
 - e. Tremco Acoustical Sealant

2.2 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Primer/Sealer: Provide type of joint primer/sealer recommended by sealant manufacturer for joint surfaces to be primed or sealed.
- C. Sealant Backer Rod: Compressible rod stock of open or closed cell polyethylene or polyurethane as recommended by sealant manufacturer for compatibility with sealant.
- D. Bond Breaker Tape: An acceptable polyethylene or similar type bond breaker tape used to prevent three-sided adhesion in locations where backer rod cannot be used.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Inspect substrate surface to assure that no bond breaker materials contaminate the surface to which the sealant is to adhere and to ensure that unsound substrates are repaired. Installation of sealant shall be evidence of acceptance of the substrate.
- B. Verify joint dimensions prior to installation of the sealant to ensure that all dimensions are within tolerance established in the manufacturer's literature. Unacceptable variations shall be called to the Contracting Officers attention for resolution prior to installing any material.

3.2 PREPARATION

- A. Clean joint surfaces immediately before installation of sealant or caulking compound. Remove dirt, insecure coatings, moisture and other substances which could interfere with bond of sealant or caulking compound. Etch concrete and masonry joint surfaces as recommended by sealant manufacturer.
- B. Prime or seal joint surfaces where indicated, and where not indicated if recommended by sealant manufacturer, prior to installation of any backer rod or bond breaker tape. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.

3.3 INSTALLATION

- A. General: Comply with manufacturer's printed instructions, except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.
- B. Set joint filler units full depth of joint or position in joint to coordinate with other work, including installation of backer rods and sealants. Do not leave voids or gaps between ends of joint filler units.
- C. Install sealant backer rod for liquid elastomeric sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for application indicated in which case a bond breaker tape shall be used to prevent 3 sided adhesion. Apply backer rod

using blunt or rounded tools which will ensure a uniform depth without puncturing the material. Use a rod oversized a minimum of 33% for closed cell and 50% for open cell, unless otherwise required by the manufacturer.

- D. Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces, with a smooth, even finish.
- E. Install sealant to depths as shown or, if not shown, as recommended by sealant manufacturer but within the following general limitations, measured at center (thin) section of bead.
 - 1. For joints sealed with non-elastomeric sealants, fill joints to a depth in range of 75% to 125% of joint width.
- F. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces or to migrate into voids of adjoining surfaces. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.
- G. Curing: Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength and surface durability.

END OF SECTION

SECTION 08 10 10
STEEL DOORS AND FRAMES

1.0 GENERAL

1.1 Summary

A. Scope of Specification

This specification includes but does not necessarily limit, materials and labor to furnish, unload, store, and install metal doors and frames for a complete, operational system.

B. Related Specifications

The following specifications prescribe items of related Work:

- Section 07 92 00: Joint Sealants
- Section 08 71 00: Finish Hardware
- Section 09 91 00: Paint

Coordinate Work prescribed by this specification with Work prescribed by the above listed specifications.

1.2 References

Referenced publications within this specification shall be the latest revision, unless otherwise specified; and applicable parts of the referenced publications shall become a part of this specification as if fully included.

- ASTM (American Society for Testing and Materials)
- FM (Factory Mutual Engineering Corporation)
- NFPA (National Fire Protection Association)
- IBC (International Building Code, latest version)
- UL (Underwriters Laboratories)

1.3 Submittals

A. Product Data: Submit manufacturer's specifications for fabrication and installation, including data substantiating that products comply with requirements.

B. Shop Drawings: Submit for fabrication and installation of steel doors and frames. Include details of each door and frame type, elevations of door and frame design types, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcement, and details of joints and connections. Show anchoring methods and accessory items.

C. Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.

D. Indicate coordination of glazing doors and frames and stops with plans and glazing requirements.

1.4 Delivery, Storage and Handling:

A. Deliver hollow metal work cartoned or crated to provide protection during transit and job storage.

B. Inspect hollow metal components upon delivery for damage. Minor damages may be repaired provided finished items are equal in all respects to new work and acceptable to the Contracting Officer. Otherwise remove and replace damaged items as directed.

- C. Store frames at building site under cover. Place units on wood sills at least 4" high. Do not use non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door or frame becomes wet, remove carton immediately. Provide a 3 inch space between stacked doors to promote air circulation.

2.0 PRODUCTS

2.1 Door & Frame Manufacturers, Or Approved Equal

- Curries Door Products
- Metal Products, Inc.
- CECO
- Republic

2.2 Materials

A. Doors

Extra Heavy Duty: One and three-fourths-inch-thick medallion, full flush, and seamless, Grade III.

B. Metal Door and Frames

Form frames of steel to sizes and shapes indicated on the drawings. Frames shall be fully welded construction. Contact edges shall be closed tight. Exterior frames shall be fabricated from hot-dipped galvanized steel. Interior frames shall have each leg, 12" above floor, galvanized.

2.3 Door Fabrication

A. Doors

1. Fabricate exterior doors from prime quality galvanized steel sheets complying with ASTM A526, commercial quality, with ASTM A525, G90 zinc coating, mill phosphatized. Steel shall be degreased, primed, and ready for field painting according to Specification 09 91 00 Paint.
2. Hardware Locations and General Reinforcements:
 - a. Locate hardware on doors in accordance with Door and Hardware Preparation ANSI 115 and manufacturer's requirements for maintaining listings and certifications. Coordinate communication between door supplier and finish hardware supplier to ensure doors are prepped correctly.
 - b. Hardware reinforcements are to be in accordance with the minimum standard gauges as listed in SDI-100.
 - c. Doors shall be mortised, reinforced and function holes provided at the factory in accordance with the hardware schedule and templates provided by the hardware supplier. Through bolt holes, attachment holes, or drilling and tapping for surface hardware, shall be the responsibility of the installer in the field.

B. Door Construction

1. Doors at interior openings are to meet or exceed standards established by using Curries Brand – 607, or equal, series door factory standards (20 ga face skins, 18 ga top/bottom channels) as the minimum standard reference. All components to be fabricated using Galvanized Steel Sheets: Zinc coated carbon steel sheets of a quality complying with ASTM A 591, zinc coating.

2. Doors at exterior openings are to meet or exceed the design standards below. G90 is the base metal rust resistance level. Doors are to be cleaned, and chemically treated to insure maximum finish paint adhesion. All surfaces of the door exposed to view shall receive a factory applied coat of rust inhibiting primer. Doors shall meet or exceed the following design requirements:

- Certified for Wind Load Minimum 160 MPH, Exposure B, Risk Category II.
- Design pressure (+/- 45 psf)
- Steel Stiffened
- 16 Gauge Top & Bottom Channels
- 1-3/4 Inches Thick
- 22 Gauge Stiffeners
- Fiberglass Insulation between Stiffeners
- 16 Gauge Face Skins
- 6" Stiffener Spacing

- a. Fill exterior doors with the Manufacturer's standard foam insulation. Insulation shall not be considered as part of the interior reinforcement. Turn the legs of the top and bottom channels toward the door interior.

C. Clearances

Allow proper clearance for hanging and operation without binding. Lock edges of door stiles shall be beveled 1/8 inch in 2 inches. Close top and bottom edges of all exterior metal doors to provide a weather seal.

D. Reinforcing

The door Manufacturer shall obtain the necessary hardware templates to facilitate the correct location and size of mortising, reinforcing, drilling, and tapping of doors at the factory. Provide a minimum of 3/16 inch reinforcing plates for locks and latches and 12-gage reinforcing plates for other hardware. Refer to Section 08 71 00 Finish Hardware.

E. Labeled Doors

1. Fire door assemblies shall meet the requirements of ASTM E152.
2. Fabricate according to UL requirements for scheduled labels. Factory-attach appropriate label. Comply with NFPA 80 and with UL labels scheduled as required by IBC.
3. Temperature rise ratings, on the cool side of the door shall not exceed that allowed by the IBC. Temperature rise ratings shall be complied with where required by IBC.
4. Fire doors shall have a label or other identification showing the name of the Manufacturer, the fire resistance rating, and the maximum transmitted temperature end point (for stairway fire doors only). Such label shall be approved and shall be permanently affixed. The label shall be applied at the door factory where fabrication and assembly are carried out.
5. Doors and frames scheduled to be used as fire-rated openings shall have corresponding raised letter embossed labels

2.4 Door Frames

- A. All components to be fabricated using Galvanized Steel Sheets: Zinc coated carbon steel sheets of commercial quality, complying with ASTM A 591, zinc coating.

1. Supports and Anchors: Fabricate of not less than 14 gauge galvanized sheet steel.
2. Inserts, Bolts, and Fasteners: Manufacturer's standard units,
3. Shop Applied Paint:

4. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified Finish paints.

B. Fabrication, General:

1. Fabricate steel frame units to be rigid, neat in appearance and free from defects, warp or buckle.
2. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and molding from galvanized sheet steel.
3. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips heads for exposed screws and bolts.
4. Finish Hardware Preparation: Prepare frames to receive mortised and concealed finish hardware in accordance with final finish hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A 115 series specifications for frame preparation for hardware.
5. Reinforce frames to receive surface applied hardware. Drilling and tapping for surface applied finish hardware may be done at project site.
6. Locate finish hardware as shown on final shop drawings or, if not shown, in accordance with "Recommended Locations of Builder's Hardware," published by Door and Hardware Institute.

C. Frame Anchors

Provide metal anchors of shapes, types, and sizes required for the adjoining type of wall construction. Fabricate anchors of steel no lighter than gage used for frames. Anchors shall be corrugated or deformed. Provide floor anchors, spot welded.

D. Labeled Frames

Fabricate according to UL requirements scheduled labels. Factory-attach appropriate UL label. Provide approved anchors for type wall frame in which frame is to be installed.

E. Astragals

Provide an overlapping metal astragal on pairs of labeled doors except when the doors are equipped with an approved rim type exit hardware and provided with a removable mullion. Where astragals are prohibited by code, provide fire rated units tested without astragals in accordance with NFPA 80.

2.5 Shop Cleaning and Painting

- A. Clean, treat and paint exposed surfaces of steel frame unit including galvanized surfaces.
- B. Clean steel surfaces of mill scale, rust, oil, grease, dirt and other foreign materials before application of paint.
- C. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

2.6 Standard Steel Frames:

- A. Provide metal frames for doors, windows, and other openings, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated.
- B. Fabricate frames with mitered and continuously welded corners. Provide drywall returns at frames indicated to be installed in drywall construction.

- C. Throat openings for drywall frames shall be 1/8" larger than the thickness of the wall in which the frame is to be installed.
- D. Form exterior frames of 14 U.S. gauge galvanized steel and interior frames of 16 U.S. gauge galvanized steel.
- E. Door Silencers: Except on weather-stripped frames, drill stops to receive 3 silencers on strike jambs of single-swing and 2 silencers on heads of double-swing frames.

3.0 EXECUTION

3.1 Inspection:

- A. Installer must examine substrate and conditions under which steel frames are to be installed and must notify contractor in writing of any conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to installer.

3.2 Installation:

A. Frame Installation:

1. General: Install standard steel frames and accessories in accordance with final shop drawings and manufacturer's data, and as herein specified.
2. Placing Frames: Comply with provisions of ANSI/SDI-A250.8 "Recommended Erection Instructions for Steel Frames," unless otherwise indicated.
 - a. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
3. Install fire-rated frames in accordance with NFPA Standard No. 80.
 - a. Double steel studs shall be installed on each side of opening and secured to structure above.

B. Door Installation:

1. Examination

- a. Compliance: Comply with manufacturer's product recommendations, including product technical bulletins, product catalogue installation instructions and product carton instructions for installation.
- b. Site Verification of Conditions: Verify conditions are acceptable for product installation in accordance with manufacturer's instructions.
- c. Do not begin installation until areas, supporting construction and substrates have been properly prepared.
- d. Notify CO of unsatisfactory preparation before proceeding with installation.

2. Preparation

- a. Clean surfaces thoroughly prior to installation.
- b. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions. Install for smooth, easy operation with no sag, drag, bow, or wrap. Hang true, plumb, and square.

3. Installation
 - a. Comply with manufacturer's written instructions and recommendations for installation.
 - b. Check and adjust operation to ensure proper latching and locking.
 - c. Coordinate with Section 08710 Finish Hardware.
4. Install doors as follows:
 - a. Labeled Doors : Install according to UL and FM requirements and as scheduled on drawings.

3.3 Finish Painting

Refer to Section 09 91 00 Paint.

3.4 Cleaning

1. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to acceptance.
2. Remove construction debris from project site and legally dispose of debris. Upon completion of the installation, clean exposed surfaces of door and frames thoroughly, and touch-up as recommended by the Manufacturer, ready to receive finish painting.

3.5 Protection

1. Protect installed products until completion of project. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 08 20 00

WOOD DOORS

PART I - GENERAL

1.1 DESCRIPTION

- A. The work required under this Section consists of wood doors and related items to complete the work as indicated on the Drawings and described in the Specifications.

1.2 SUBMITTALS

- A. Submit shop drawings and brochures in accordance with the Statement of Work (SOW).
- B. Submittal data shall include, but not be limited to, the following:
 - 1. Size and location
 - 2. Hardware preparation
 - 3. Details of core and edge construction
 - 4. Trim for openings
 - 5. Opening sizes and trim

1.3 QUALITY ASSURANCE

- A. Comply with requirements of the following standards unless otherwise indicated.
 - 1. Non-Fire Rated Flush Wood Doors: Comply with "Quality Standards" of Architectural Woodwork Institute (AWI) and (WDMA) Window & Door Manufacturer's Association.
 - 2. Fire-Rated Wood Doors: Where fire-resistance classifications are shown or scheduled for wood door assemblies, provide doors which comply with requirements of NFPA No. 80 "Standard for Fire Doors and Windows" and which have been tested and rated with single point hardware. Provide label of an approved nationally recognized independent testing laboratory on each door.
 - 3. All laminate-faced doors shall meet the criteria for the latest edition of WDMA "Premium Grade". Doors shall be pre-fit and beveled at the factory to fit the opening. Pre-fit tolerances shall be in accordance with the requirements of WDMA.

1.4 HANDLING AND STORAGE

- A. Products shall be delivered to the job site in original wrappings and packaging by manufacturer. Handling, storage and installation of doors shall conform to the recommendations of the manufacturer.
- B. Insure proper protection from weather and damage during delivery and job site storage of specified doors. Handle products so as to prevent damage or soiling. All doors stored at site shall be stacked together on edge or end and not laid flat.

1.5 GUARANTEE

- A. All wood doors shall be guaranteed in writing for life of the installation for interior use by the manufacturer to be free from any defects which make them unsuitable for the use for which they are intended. A warp in excess of ¼ inch in 7 feet shall be termed a defect under the terms of this guarantee. Guarantee shall provide for replacement, re-hanging and refinishing as required at no cost to the Owner.
- B. Guarantee shall be the (WDMA) Window & Door Manufacturer's Association 1.S.1-A.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Unless noted otherwise, provide wood doors complying with the applicable requirements of WDMA I.S.1 for the kinds and types of doors indicated and as further specified, Provide manufacturer's standard 2 or 3 ply face panels, unless otherwise specified. Provide same exposed surface material on both faces of each door, unless otherwise indicated.
- B. Fire rated doors: Provide exposed faces and edges to match non-rated doors in same area of building unless otherwise indicated. Provide metal vision panel frames, which have been tested and listed for kind of door and rating indicated.
- C. Cut and trim openings through doors and panels as shown. Comply with the applicable trim requirements of the referenced standards for the kinds of doors required.

2.2 FLUSH WOOD DOORS

- A. All interior wood doors shall be 1¾" inch, flush, particle board or wood staved core doors meeting the requirements of (WDMA) Window & Door Manufacturer's Association 1.S.1-A, " Industry Standard for Wood Flush Doors" and Federal Specification LLLD-581 Type 1."
- B. Construction:
 1. Cores shall be solid wood block, or wood particle board, as required by the door manufacturer to comply with specified warranty period and required fire rating. Particleboard core doors shall have 1½" minimum width hardwood stiles. The core shall be grooved to receive the edge bands.
 2. Edge bands shall be two ply 1½" minimum thickness outer band same species as face veneer.
 3. Crossbands shall be 1/16" extending to all far edges of door width grain at right angles to face veneer grain.
 4. Face veneers shall be rotary cut Birch. Face veneer shall be (WDMA) Premium Grade. Avoid sharp contrast at veneer joints, unless otherwise indicated. Provide exposed edges and other exposed solid wood components of same species as face veneers, unless otherwise required for fire rating.
 5. Provide automatic door bottoms equal to Pemco 434_RL in door: 107.
- C. Finish shall be mill-sanded.
- D. Comply with the tolerance requirements of (WDMA) for pre-fitting. Machine doors for hardware requiring cutting of doors. Comply with final hardware templates and other essential information required to ensure proper fit of doors and hardware. Take accurate field measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with machining.

3.1 PREPARATION

- A. Installer must examine doorframes and verify that frames are of the correct type and have been installed as required for proper hanging of corresponding doors. Fire rated doors are to be installed in corresponding fire rated frames in accordance with requirements of NFPA No. 80.
- B. Installer shall notify the Contractor in writing of conditions detrimental to the proper and timely installation of wood doors. Do not proceed with installation until unsatisfactory conditions have been corrected in a manner acceptable to the Installer. Commencement of work will constitute acceptance of conditions affecting installation.

3.2 INSTALLATION

- A. Condition doors to average prevailing humidity in installation area prior to hanging. Install wood doors in accordance with manufacturer's instructions and as shown. Fit doors to frame for proper fit and uniform clearance at each edge and machine for hardware. Seal cut surfaces after fitting and machining. Bevel non-fire rated doors 1/8 inch in 2 inches at lock and hinge edges. Bevel fire-rated doors 1/16" in 2" at lock edges.
- B. Fit to frames and machine for hardware to whatever extent required for proper fit and uniform clearance at each edge. For non-fire doors provide clearances of: 1/8 inch at jambs and heads 1/8 inch at meeting stiles for pairs of doors and 1/2 inch from bottom of door to top of decorative floor finish or covering where threshold is shown or should provide 1/4" clearance from bottom of door to top of threshold. For fire-rated doors, provide clearances complying with the limitations of the authority having jurisdiction.

3.3 HARDWARE AND ACCESSORIES

- A. Doors shall be fitted for hardware specified in Section 08 71 00 – Door Hardware.

3.4 FINISHING

- A. Prepare and finish doors in accordance with the requirements of Section 09 93 23 Stains and Transparent Finishes. Edges must be sealed immediately after trimming. Pre-finished doors are acceptable with prior approval. Pre-finished doors equal to Graham Doors by ASSA ABLOY (plain sliced red oak).

3.5 ADJUST AND CLEAN

- A. Re-hang or replace doors, which do not swing or operate freely, Refinish or replace doors damaged during installation.
- B. Manufacturer shall advise Contractor of proper procedures required for protection of installed wood doors from damage or deterioration until acceptance of the work.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.
- B. This Section includes the following:
 - 1. Hinges
 - 2. Continuous hinges
 - 3. Lock cylinders and keys
 - 4. Lock and latch sets
 - 5. Bolts
 - 6. Closers
 - 7. Overhead stops and holders
 - 8. Miscellaneous door control devices
 - 9. Viewers
 - 10. Door trim units
 - 11. Protection plates
 - 12. Astragals or meeting seals on pairs of doors
 - 13. Thresholds
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 8 Section "Steel Doors and Frames"
 - 2. Division 8 Section "Flush Wood Doors"
 - 3. Division 8 Section "Aluminum Entrances and Storefronts"
- D. Products furnished but not installed under this Section to include:
 - 1. Final replacement cores and keys to be installed by GOVERNMENT.

1.2 REFERENCES

- A. Standards of the following as referenced:
 - 1. American National Standards Institute (ANSI)
 - 2. Door and Hardware Institute (DHI)
 - 3. Factory Mutual (FM)
 - 4. National Fire Protection Association (NFPA)
 - 5. Underwriters' Laboratories, Inc. (UL)
 - 6. UL 10C - Fire Tests Door Assemblies
 - 7. Warnock Hersey
- B. Regulatory standards of the following as referenced:
 - 1. Department of Justice, Office of the Attorney General, Americans with Disabilities Act, Public Law 101-336 (ADA).
 - 2. CABO/ANSI A117.1: Providing Accessibility and Usability for Physically Handicapped People, 1992 edition.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and the SOW.

- B. Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements. For items other than those scheduled in the "Headings" of Section 3, provide catalog information for the specified items and for those submitted.
- C. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into vertical format "hardware sets" indicating complete designations of every item required for each door or opening. Use specification heading numbers with any variations suffixed a, b, etc. Include the following information:
 - a. Type, style, function, size, and finish of each hardware item.
 - b. Name and manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of each hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
 - e. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for hardware.
 - g. Door and frame sizes and materials.
 - h. Keying information.
 - i. Cross-reference numbers used within schedule deviating from those specified.
 - j. Column 1: State specified item and manufacturer.
 - k. Column 2: State prior approved substituted item and its manufacturer.
 2. Furnish complete wiring diagrams, riser diagrams, elevation drawings and operational descriptions of electrical components and systems, listed by opening in the hardware submittals. Elevation drawings shall identify locations of the system components with respect to their placement in the door opening. Operational descriptions shall fully detail how each electrical component will function within the opening, including all conditions of ingress and egress. Provide a copy with each hardware schedule submitted for approval. Supply a copy with delivery of hardware to the jobsite and another copy to the Government at the time of project completion.
 3. Submittal Sequence: Submit final schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the Project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.
- D. Samples of each type of exposed hardware unit in finish indicated and tagged with full description for coordination with schedule. Submit samples prior to submission of final hardware schedule.
1. Samples will be returned to the supplier. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated in the Work, within limitations of keying coordination requirements.
- E. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- F. Contract closeout submittals:
1. Operation and maintenance data: Complete information for installed door hardware.
 2. Warranty: Completed and executed warranty forms.

1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Unless otherwise indicated, obtain each type of hardware (latch and locksets, hinges, closers, etc.) from a single manufacturer.
- B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced Architectural Hardware Consultant (AHC) who is available for consultation to Contracting Officer, and Contractor, at reasonable times during the course of the Work.
- C. Coordination Meetings:
 - 1. Supplier shall set up and attend the following:
 - a. Supplier to meet with the Contracting Officer to finalize lock functions and keying requirements and to obtain final instructions in writing.
 - b. Supplier to meet with the installer prior to beginning of installation of door hardware.
 - 2. General Contractor shall set up and attend the following:
 - a. Supplier to meet with the Contracting Officer, General Contractor, electrical and security contractors to coordinate all electrical hardware items. Supplier to provide riser diagrams, elevation drawings, wiring diagrams and operational descriptions as required by the General and sub-contractors.
- D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and tested by UL or Warnock Hersey for given type/size opening and degree of label. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in the Hardware Schedule or not. All hardware shall comply with standards UBC 702 (1997) and UL 10C.
 - 1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL labels indicating "Fire Door to be equipped with Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".

1.5 PRODUCT HANDLING

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.
- C. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- D. Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).
- E. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

1.6 WARRANTY

- A. Special warranties:
 - 1. Door Closers: Ten year period
 - 2. Exit Devices: Three year period
 - 3. Locks and Cylinders: Three year period

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

(*Denotes manufacturer referenced in the Hardware Headings)

- A. Hinges:
1. Acceptable manufacturers, or Approved Equal:
 - a. Ives*
 - b. Bommer
 - c. PBB
 2. Characteristics:
 - a. Templates: Provide only template-produced units.
 - b. Screws: Provide Phillips flat-head screws complying with the following requirements:
 - 1) For metal doors and frames install machine screws into drilled and tapped holes.
 - 2) For wood doors and frames install threaded-to-the-head wood screws.
 - 3) For fire-rated wood doors install #12 x 1-1/4 inch, threaded-to-the-head steel wood screws.
 - 4) Finish screw heads to match surface of hinges or pivots.
 - c. Hinge pins: Except as otherwise indicated, provide hinge pins as follows:
 - 1) Out-Swing Exterior Doors: Non-removable pins.
 - 2) Out-Swing Corridor Doors with Locks: Non-removable pins.
 - 3) Interior Doors: Non-rising pins.
 - 4) Tips: Flat button and matching plug. Finished to match leaves.
 - d. Size: Except as otherwise indicated, size hinges as follows:
 - 1) Doors up to 3'-0" in width: Standard weight, ball bearing, 4-1/2 x 4-1/2
 - 2) Doors over 3'-0" in width and labeled doors over 8'-0" in height: Heavy weight, ball bearing, 5 x 4-1/2
 - 3) Exterior doors: Heavy weight, ball bearing, 5 x 4-1/2
 - e. Quantity: Furnish one pair of hinges for all doors up to 5'-0" high. Furnish one hinge for each additional 2-1/2 feet or fraction thereof.
- B. Continuous Hinges:
1. Acceptable manufacturers, or Approved Equal:
 - a. Ives*
 - b. Select
 - c. Stanley
 2. Characteristics:
 - a. Continuous gear hinges to be manufactured of extruded 6063-T6 aluminum alloy with anodized finish, or factory painted finish as scheduled.
 - b. All hinges are to be manufactured to template. Uncut hinges shall be non-handed and shall be a pinless assembly of three interlocking extrusions applied to the full height of the door and frame without mortising.
 - c. Vertical door loads shall be carried on chemically lubricated polyacetal thrust bearings. The door and frame leaves shall be continually geared together for the entire hinge length and secured with a full cover channel. Hinge to operate to a full 180o.
 - d. Hinges to be milled, anodized and assembled in matching pairs. Fasteners supplied shall be 410 stainless steel, plated and hardened.
 - e. Provide UL listed continuous hinges at fire doors. Continuous hinges at fire doors (suffix-FR) shall meet the required ratings without the use of auxiliary fused pins or studs.
- C. Cylinders:
1. Contractor shall install and use temporary 'construction cores'. Contractor shall not install permanent cores.
 2. All permanent lock cores should be Small Format Interchangeable Core (Base Standard).

3. Provide all permanent blank cores to the Contracting Officer for the Base Locksmith to key and install.
 4. All blank keys shall be provided to the Contracting Officer for the Base Locksmith for keying.
 5. All Characteristics:
 - a. Equip locksets with core cylinders to match existing Base Standard.
 - b. Metals: Construct lock cylinder parts from brass or bronze, stainless steel, or nickel silver.
 - c. Key Material: Provide keys of nickel silver only.
 - d. Key Quantity:
 - 1) Furnish 3 blank keys for each lock.
- D. Locksets, Latchsets, Deadbolts:
1. Acceptable manufacturers, or Approved Equal:
 - a. Schlage*
 - b. Sargent
 - c. Best
 - d. Stanley-National Hardware
 2. Mortise Locksets and Latchsets: as scheduled.
 - a. Chassis: Cold-rolled steel.
 - b. Latchbolts: 3/4-inch throw stainless steel anti-friction type.
 - c. Lever Trim: Through-bolted, accessible design, cast or solid rod lever as scheduled. Spindles: Independent break-away.
 - d. Thumbturns: Accessible design not requiring pinching or twisting motions to operate.
 - e. Deadbolts: Stainless steel 1-inch throw.
 - f. Electric operation: Manufacturer-installed continuous duty solenoid.
 - g. Strikes: 16 gage curved stainless steel, bronze or brass with 1" deep box construction, lips of sufficient length to clear trim and protect clothing.
 - h. Basis of Design: Schlage L series, design 017.
 - i. Acceptable Substitution: Sargent 8200 series; Best 45H series.
 - j. Certifications:
 - 1) ANSI A156.13, 1994, Grade 1 Operational, Grade 1 Security.
 - 2) ANSI/ASTM F476-84 Grade 30 UL Listed.
- E. Exit Devices:
1. Acceptable manufacturers, or Approved Equal:
 - a. Von Duprin*
 - b. Sargent
 - c. Percision
 2. Characteristics:
 - a. Exit devices shall be "UL" listed for life safety. All exit devices for fire rated openings shall have "UL" labels for "Fire Exit Hardware."
 - b. All exit devices mounted on labeled wood doors shall be mounted on the door per the door manufacturer's requirements.
 - c. All trim shall be thru-bolted to the lock stile case. Lever design to match locksets.
 - d. All exit devices shall be made of brass, bronze, stainless steel, or aluminum material, powder coated, anodized, or plated to the standard architectural finishes to match the balance of the door hardware.
 - e. Provide glass bead conversion kits to shim exit devices on doors with raised glass beads.
 - f. Except as otherwise indicated for doors complying with FEMA 361, all exit devices shall be one manufacturer. No deviation will be considered.
 - g. All series exit devices shall incorporate a fluid damper, which decelerates the touchpad on its return stroke and eliminates noise associated with exit device operation. All exit devices shall be non-handed. Touchpad shall extend a minimum of 1/2 of the door width and shall extend to the height of the cross rail housing for a "no pinch" operation. Plastic touchpads are not acceptable. All latchbolts to be the deadlocking type. Latchbolts shall

have a self-lubricating coating to reduce wear. Plated or plastic coated latchbolts are not acceptable. Plastic linkage and “dogging” components are not acceptable.

- h. Lever trim shall be solid case material with a break-away feature to limit damage to the unit from vandalism.
- i. Surface vertical rod devices shall be UL labeled for fire door applications without the use of bottom rod assemblies. Where bottom rods are required for security applications, the devices shall be UL labeled for fire doors applications with rod and latch guards by the device manufacturer.
- j. Exit devices to include impact resistant, flush mounted end cap design to avoid damage due to carts and other heavy objects passing through an opening. End cap shall be of heavy-duty metal alloy construction and provide horizontal adjustment to provide alignment with device cover plate. When exit device end cap is installed, no raised edges will protrude.
- k. Basis of Design: Von Duprin 98 series
- l. Acceptable Substitution: Sargent HC80 series, Precision (FL)2000 Apex series x V3900 trim

F. Closers and Door Control Devices:

- 1. Acceptable manufacturers, or Approved Equal:
 - a. LCN Closers 4041*
 - b. Sargent 281
 - c. Corbin Russwin DC8000
- 2. Characteristics:
 - a. Door closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder and metal cover.
 - b. All closers shall utilize a stable fluid withstanding temperature range of 120oF to -30oF without seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with standards UBC 7-2 (1997) and UL 10C.
 - c. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force for the physically handicapped. Spring power adjustment allows for quick and accurate power adjustment by way of dial adjustment gauge located on closer spring tube. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed and back check.
 - d. All closers shall have solid forged steel main arms (and forearms for parallel arm closers). All parallel arm mounted closers shall have “EDA” type arms.
 - e. All surface closers shall be certified to exceed ten million (10,000,000) full load cycles by a recognized independent testing laboratory. All closers (overhead, surface and concealed) shall be of one manufacturer and carry manufacturer's ten year warranty (electric closers to have two year warranty).
 - f. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped provide adjustable units complying with ADA and ANSI A-117.1 provisions for door opening force.
 - g. Closers to be installed to allow door swing as shown on plans. Doors swinging into exit corridors shall provide for corridor clear width as required by code. Where possible, mount closers inside rooms.
 - h. Powder coating finish to be certified to exceed 100 hours salt spray testing by ETL, an independent testing laboratory used by BHMA for ANSI certification.
 - i. Basis of Design: LCN 4041 series
 - j. Acceptable Substitution: Sargent 281 series x SRI, Corbin Russwin DC8000 series x SRI.
 - k. Overhead Door Stops and Holders:
- 3. Acceptable manufacturers, or Approved Equal:
 - a. Glynn Johnson*
 - b. Architectural Builders Hardware

4. Characteristics:
 - a. Provide heavy duty, stainless steel door stops and holders (concealed and/or surface mounted as scheduled).
 - b. Concealed holders to be installed with the jamb bracket mortised flush with the bottom of the jamb. The arm and channel to be mortised into the door.
 - c. Surface holders to be installed with the jamb bracket mounted on the stop.
- G. Floor Stops and Wall Bumpers:
 1. Acceptable manufacturers, or Approved Equal:
 - a. Trimco
 - b. Ives*
 - c. Rockwood
- H. Door Bolts/Coordinators:
 1. Acceptable manufacturers, or Approved Equal:
 - a. Trimco
 - b. Ives*
 - c. Rockwood
 2. Characteristics:
 - a. Flush bolts to be forged brass 6-3/4" x 1", with 1/2" diameter bolts. Plunger to be supplied with milled surface one side that fits into a matching guide.
 - b. Automatic flush bolts to be UL listed as top and bottom bolts on a pair of classified fire doors. Bolt construction to be of rugged steel and brass components.
 - c. Self-latching flush bolts to be UL listed as top and bottom bolts on a pair of classified fire doors. Bolt construction to be of rugged steel and brass components.
 - d. Automatic flush bolts and self-latching flush bolts shall be UL listed for fire door application without bottom bolts (LBB).
 - e. Furnish dust proof bottom strikes.
 - f. Coordinator to be soffit mounted non-handed fully automatic UL listed coordinating device for sequential closing of paired doors with or without astragals.
 - g. Provide filler pieced to close the header. Provide brackets as required for mounting of soffit applied hardware.
 - h. Protective Plates:
 3. Acceptable manufacturers, or Approved Equal:
 - a. Trimco
 - b. Ives*
 - c. Rockwood
 4. Characteristics:
 - a. Provide manufacturers standard exposed fasteners for door trim units consisting of either machine screws or self-tapping screws.
 - b. Materials:
 - c. Metal Plates: Stainless Steel, .050 inch (U.S. 18 gage).
 - d. Fabricate protection plates not more than 2 inches less than door width on push side and not more than 1 inch less than door width on pull side.
 - e. Heights:
 - 1) Kick plates to be 8 inches in height.
 - 2) Mop plates to be 8 inches in height.
 - 3) Armor plates to be 36 inches in height. Armor plates on fire doors to comply with NFPA 80.
- I. Door Seals/Gasketing:
 1. Acceptable manufacturers, or Approved Equal:
 - a. National Guard Products*
 - b. Reese Industries
 - c. Zero Weatherstripping
- J. Silencers:
 1. Acceptable manufacturers, or Approved Equal:
 - a. Hager
 - b. Ives*

- c. Rockwood
- 2. Three for each single door; two for each pair of doors.
- 3. Omit on doors provided with perimeter gasketing.
- K. Thresholds:
 - 1. Acceptable manufacturers, or Approved Equal:
 - a. Pemko
 - 2. Products/Systems: Thresholds, including the following:
 - a. Saddle Thresholds:
 - 1) Material: Extruded tempered aluminum 6063-T6.
 - 2) Finish (ANSI/BHMA 156.18): Mill finish aluminum.
 - 3) Manufacturer Model Number: 271.
 - b. Threshold Stop Strips:
 - 1) Material: Extruded tempered aluminum 6063-T6.
 - 2) Finish (ANSI/BHMA 156.18): Mill finish aluminum.
 - 3) Seal: Pemko SiliconSeal.
 - 4) Manufacturer Model Number: 290_SStop.

2.1 MATERIALS AND FABRICATION

- A. Manufacturer's Name Plate: Do not use manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise acceptable to Contracting Officer.
 - 1. Manufacturer's identification will be permitted on rim of lock cylinders only.
- B. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI/BHMA A156 series standards for each type of hardware item and with ANSI/BHMA A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.
- C. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
 - 1. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
 - 2. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
 - 3. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners.
 - 4. Do not use thru-bolts or sex bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of adequately fastening the hardware, or otherwise found in the Hardware Headings. Coordinate with wood doors and metal doors and frames. Where thru-bolts are used, provide sleeves for each thru-bolt as a means of reinforcing the work, or use sex screw fasteners.

2.2 HARDWARE FINISHES

- A. Match items to the manufacturer's standard color and texture finish for the latch and lock sets (or push-pull units if no latch or lock sets).
- B. Provide finishes that match those established by ANSI.
- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

- D. Provide protective lacquer coating on all exposed hardware finishes of brass, bronze, and aluminum, except as otherwise indicated. The suffix "-NL" is used with standard finish designations to indicate "no lacquer."
- E. The designations used to indicate hardware finishes are those listed in ANSI/BHMA A156.18, "Materials and Finishes," including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.
 - 1. Hinges: 630 (US32D) Satin Stainless Steel
 - 2. Continuous Hinges: 628 (US28) Clear Anodized Aluminum
 - 3. Flush Bolts: 630 (US32D) Satin Stainless Steel
 - 4. Locks: 630 (US32D) Satin Stainless Steel
 - 5. Exit Devices: 630 (US32D) Satin Stainless Steel
 - 6. Door Closers: 689 Powder Coat Aluminum
 - 7. Protective Plates: 630 (US32D) Satin Stainless Steel
 - 8. Door Stops: 630 (US32D) Satin Stainless Steel
 - 9. Overhead Holders: 630 Satin Stainless Steel and 689 Powder Coated Steel (as scheduled)

PART 3 EXECUTION

3.1 INSTALLATION

- A. Mount hardware units at heights indicated in following applicable publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Contracting Officer.
 - 1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
 - 2. "Recommended Locations for Builders Hardware for Custom Steel Doors and Frames" by the Door and Hardware Institute.
 - 3. NWWDA Industry Standard I.S.1.7, "Hardware Locations for Wood Flush Doors."
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- C. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- E. Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.

3.2 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
 - 1. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to function properly with final operation of heating and ventilating equipment.
 - B. Clean adjacent surfaces soiled by hardware installation.
 - C. Door Hardware Supplier's Field Service:

1. Inspect door hardware items for correct installation and adjustment after complete installation of door hardware.
 2. Instruct Government's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.
 3. File written report of this inspection to Contracting Officer.
- D. Door Hardware Manufacturer's Field Service:
1. Prior to project completion, representatives of the lock, exit device and overhead closer manufacturers shall inspect and certify that all units are installed in accordance with the manufacturer's instructions, and are regulated properly and functioning correctly.
 2. A written report of the inspection results and recommendations shall be provided to the Contracting Officer and shall include the appropriate certificates.

END OF SECTION

Hardware Schedule: (To be used in conjunction with the information above)

Hardware Set #1: (101A, 101B)

2 each - Cylinder 26D - Mortise or Rim. Small format interchangeable core.

Hardware Set #2: (103)

1 each – Proximity Reader. Equal to: Scramble Smart Prox – HE Standard (model DS47L-SSP-HE) reader with a mounting box slope front faceplate.

1 each – Control Unit: Equal to DIGI & TRAC Model 2N-2 door (model M2N). Mount control unit in the LAN room on plywood back board. (±12in.x20in.x4in.)

Provide functioning access control system and training.

1 each – LKM7003, and CDX-10 with override key, and small format interchangeable core.

1 each – Electric strike. UL 1034 listed.

1 each – Astragal plate

1 each – Heavy duty neoprene sweeps and frame head and jamb gaskets. Equal to PEMKO 434_RL automatic door bottom.

3 each – Pinned hinges (if exposed to the outside), cam lift, power hinge.

1 each – Non-hold door closer. Installed internal to the space.

1 each – Door stop

6 each - Door silencers

Hardware Set #3: (107)

1 each – LKM7003, and CDX-10 with override key and small format interchangeable core.

1 each – Heavy duty neoprene sweeps and frame head and jamb gaskets. Equal to PEMKO 434_RL automatic door bottom.

3 each – Hinges. Cam lift.

1 each - Door stop

6 each - Door silencers

Hardware Set #4: (108, 109, 110, 111D)

1 each – Standard medium security office lever lockset with small format interchangeable core.

1 each - Door stop

6 each - Door silencers

Hardware Set #5 (111A)

- 1 each – Standard medium security closet lever lockset with small format interchangeable core.
- 3 each - Hinges
- 6 each - Door silencers

Hardware Set # 6 (111B, 111C)

- 1 each – Proxy Reader
- 1 each – Standard medium security closet lever lockset with small format interchangeable core.
- 3 each - Hinges
- 6 each - Door silencers

Hardware Set #7 (105A, 111D)

- 1 each – Panic device, re-locking meeting ADA/ABA. Provide audible alarm when door is opened.
 - 3 each – Pinned hinges (if exposed to the outside).
 - 1 each – Non-hold door closer. Installed internal to the space.
 - 1 each – Rain drip guard
 - 6 each - Door silencers
 - 1 each - Door threshold.
- No hardware is to be installed on the exterior of the door.

SECTION 08 72 00

THRESHOLDS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Commercial Thresholds

1.02 REFERENCES

- A. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):
 - 1. ANSI/BHMA A156.18: Materials and Finishes.
 - 2. ANSI/BHMA A156.21 Thresholds.
- B. Underwriters Laboratories, Inc. (UL):
 - 1. UL 10B Fire Tests of Door Assemblies.
 - 2. UL 10C Fire Tests of Door Assemblies.
 - 3. UL 410 Slip Resistance for Floor Surface Materials.
- C. Federal Government:
 - 1. U.S. Architectural & Transportation Barriers Compliance Board. Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG), 1992.
 - 2. Federal Standard FED-STD-795-1988 (Revised 1989) Uniform Federal Accessibility Standards.
 - 3. Federal Specification P-F-430C Finish, Floor, Water Emulsion (for Use On Light Colored Floors).
- D. International Code Council (ICC):
 - 1. UBC 7-2 Fire Test of Door Assemblies (Positive Pressure).
 - 2. International Building Code (IBC) latest version (Positive Pressure).
 - 3. ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities.

1.03 SYSTEM DESCRIPTION

- A. Design Requirements: Provide threshold and seal products which have been manufactured, fabricated and installed to meet the following design criteria:
 - 1. Performance obtained from test procedures ICC/ANSI A117.1.
 - 2. Compliant with UL 410.

1.04 SUBMITTALS

- A. General: Submit in accordance with the Statement of Work for submittal procedures.
- B. Product Data: Submit manufacturer's product data and installation instructions.
- C. Shop Drawings: Provide drawings indicating required component locations, interface with adjacent materials, installation, anchorage, fastening and similar information.
- D. Quality Assurance/Control Submittals: Submit the following:
 - 1. Test Reports: Upon request, submit Sound and Durability test reports from recognized testing laboratory.

- 2. Certificates: Submit manufacturer's certificate that products meet or exceed specified requirements.
- E. Closeout Submittals: Submit the following:
 - 1. Warranty documents specified herein.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.

1.06 DELIVERY, STORAGE & HANDLING

- A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

1.07 WARRANTY

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under contract documents.
 - 1. Warranty Period (Standard Products): 3 years against defects in materials or workmanship, beginning with Date of Substantial Completion.
 - 2. Warranty Period (PemKote Finish): 10 years against defects in materials or workmanship, beginning with Date of Substantial Completion.

1.08 MAINTENANCE

- A. Extra Materials: Provide additional five (5) percent material for use by owner in building maintenance and repair.

PART 2 PRODUCTS

2.01 THRESHOLDS

- A. Manufacturer: Pemko Manufacturing Company (or equal).
 - 1. Contact: PO Box 3780, 4226 Transport Street, Ventura, CA 93003; Telephone: (800) 283-9988, (805) 642-2600; Fax: (805) 642-4109; E-mail: pemkosales@pemko.com; website: www.pemko.com.
- B. Proprietary Products/Systems: Thresholds, including the following:
 - 1. Saddles (ADA complaint):
 - a. Material: Extruded tempered aluminum 6063-T6.
 - b. Finish (ANSI/BHMA 156.18): Mill finish aluminum.
 - c. Manufacturer Model Number: PEMKO 205 – T with thermoseal, or approved equal.

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Comply with the instructions and recommendations of the threshold manufacturer.

3.02 EXAMINATION

- A. Site Verification of Conditions:
 - 1. Verify that site conditions are acceptable for installation of thresholds.
 - a. Examine doors and frames for compliance with requirements for door and frame manufacturer's installation tolerances, labeled fire door assembly construction, wall

and floor construction and other conditions affecting performance.

2. Do not proceed with installation of thresholds until unacceptable conditions are corrected.

3.03 INSTALLATION

- A. Mounting Location: Comply with drawings and approved shop drawings.
- B. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
- C. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

3.04 ADJUSTING

- A. Perform adjustments required to ensure that thresholds function in compliance with manufacturer's performance criteria prior to acceptance by Owner.

3.05 CLEANING

- A. Remove any protective films and clean components as necessary following manufacturer's recommended procedures.

3.06 PROTECTION

- A. Protect installed work from damage due to subsequent construction activity on the site.

END OF SECTION

SECTION 09 22 16
NON-STRUCTURAL METAL FRAMING

1.0 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior gypsum board assemblies.

B. Related Requirements:

Section 06 10 00:	Rough Carpentry
Section 08 11 13:	Steel Doors and Frames
Section 09 25 50:	Gypsum Board Assemblies

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Certification: Submit manufacturer's certification of product compliance with codes and standards along with product literature and data sheets for specified products.

1.4 QUALITY ASSURANCE

- A. Contractor shall provide effective, full time quality control over all fabrication and erection complying with the pertinent codes and regulations of government agencies having jurisdiction. Conduct pre-installation meeting to verify project requirements, substrate conditions, and manufacturer's installation instructions.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Notify manufacturer of damaged materials received prior to installation.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI's "Code of Standard Practice".

2.0 PRODUCTS

2.1 PERFORMANCE / DESIGN CRITERIA

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by, and displaying a classification label from, an independent testing agency acceptable to the authority having jurisdiction.
 1. Construct fire-resistance rated partitions where indicated on drawings.
 2. Rated assemblies to be substantiated from applicable testing using proposed products, by Contractor.
- B. Design framing systems in accordance with American Iron and Steel Institute Publication "North American Specification for the Design of Cold-Formed Steel Framing – NonStructural Members", except as otherwise shown or specified.
- C. Design loads: As indicated on the Architectural Drawings or 5 PSF minimum as required by the International Building Code.

- D. Design framing systems to accommodate deflection of primary building structure and construction tolerances and to withstand design loads.

2.2 FRAMING SYSTEMS

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Framing Members, General: Comply with ASTM C 645 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 - 2. Protective Coating: Comply with ASTM C 645; roll-formed from hot-dipped galvanized steel; complying with ASTM A 1003/A 1003M and ASTM A 653/A 653M G40 (Z120) or having a coating that provides equivalent corrosion resistance. A40 galvanized products are not acceptable.
 - 3. Standard framing materials meeting the design standards in these documents.
- C. Studs and Runners: ASTM C 645.
 - 1. Non-Structural Studs: Cold-formed galvanized steel C-studs as per ASTM C 645.
 - 2. Non-Structural Track: Cold-formed galvanized steel runner tracks, drywall track, in conformance with ASTM C 645.
 - 3. "EQ" (Equivalent Gauge Thickness) Steel Studs and Runners: Members that can show certified third party testing with gypsum board in accordance with ICC ES AC86 (Approved February 2010 Effective March 1, 2010) need not meet the minimum thickness limitation or minimum section properties set forth in ASTM C 645. The submission of a recognized evaluation report is acceptable to show conformance to this requirement.
 - 4. Steel Framing Stud and Track Wall System: Self-locking metal studs, and telescoping stud extensions and tracks.
 - 5. Steel Framing Stud and Deflection Track Wall System: Self-locking metal studs with telescoping stud extension with knockout in each flange to allow for 1/2 inch of deflection for fire-rated head-of-wall deflection system.
- D. Slip-Type Head Joints: Where indicated, provide the following:
 - 1. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- E. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- F. Control Joint Backer: Metal profile which supports intumescent materials located inside and spanning gap between opposing drywall edge at control joint locations.
- G. Backing Plate: Proprietary fire-resistance-treated blocking and bracing in width indicated.
- H. Channel Bridging and Bracing: Steel, 0.0538-inch (1.37-mm) minimum base-metal thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
- I. U-Channel Bridging: Steel, 0.0538-inch (1.37-mm) minimum base-metal thickness, with

minimum 1/2-inch- (13-mm-) wide flanges.

- J. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
- K. Resilient Furring Channels: 1/2-inch- (13-mm-) deep, steel sheet members designed to reduce sound transmission.
- L. Carrying Channels: 0.0538-inch (1.37-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
 - 1. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.0296 inch (0.75 mm).
 - 2. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.57-mm-) diameter wire, or double strand of 0.048-inch-(1.21-mm-) diameter wire.
- M. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (32 mm), wall attachment flange of 7/8 inch (22 mm), minimum uncoated-metal thickness of 0.018 inch (0.45 mm), and depth required to fit insulation thickness indicated.
- N. Radius Framing: Steel sheet runner for non-load-bearing curves, bends, variable radii and arches using a work-hardened steel base strip.
- O. Headers and Jambs: Manufacturer's proprietary shape used to form header beams and jambs, columns or posts, of web depths indicated, unpunched, with stiffened flanges.
- P. Framed Openings: Galvanized steel one piece header and jamb studs meeting or exceeding the requirements of ASTM C 754 for conditions indicated below.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
 - 1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
 - 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.
- C. Drywall Penetration Barrier Mesh: Supply and install Barrier Mesh steel expanded metal panels as a penetration barrier behind gypsum wallboard walls and/or ceilings, where noted on the drawings.

3.0 EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 - 1. Gypsum Plaster Assemblies: Also comply with requirements in ASTM C 841 that apply to framing installation.
 - 2. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C 1063 that apply to framing installation.
 - 3. Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C 844 that apply to framing installation.
 - 4. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.
- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.3 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 - 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 - 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Install fire-resistant partitions using manufacturer's proprietary equivalent

- gauge studs in compliance with requirements of UL U419.
- b. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
 6. Curved Partitions:
 - a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
 - b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6 inches (152 mm) o.c.
- E. Direct Furring:
1. Screw to wood framing.
 2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
- F. Z-Furring Members:
1. Erect insulation, specified in Section 072100 "Thermal Insulation," vertically and hold in place with Z-furring members spaced 24 inches (610 mm) o.c.
 2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
 3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches (305 mm) from corner and cut insulation to fit.
- G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

3.6 INSTALLING DRYWALL PENETRATION BARRIER MESH

- A. Install Drywall Penetration Barrier Mesh as follows:
1. Barrier Mesh sheets may be installed with diamond running in direction most suitable.
 2. BM-Clips shall be installed to secure the mesh to the framing members.
 3. Mesh joints occurring on framing members may either join staggered or butt together.
 4. It is acceptable to overlap mesh joints to achieve tie-in.
 5. BM sheets shall join, begin and terminate on a framing member.
 6. BM sheets not joining on framing member shall be wire tied with 18GA steel tie wire. Wire tying shall be no less frequent than the installation of Mesh Clips.

END OF SECTION

SECTION 09 25 50

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Interior gypsum wallboard – regular
 - 2. Interior fire rated gypsum wall board
 - 3. Interior gypsum tile backer board
 - 4. Interior screw type support systems
 - 5. Wallboard finishing (joint tape-and-compound treatment)
 - 6. Gypsum wallboard accessories including control joints
 - 7. Levels of Gypsum Board Finish
- B. Related Sections include the following:
 - 1. Section 07 92 00 – Joint Sealants
 - 2. Section 09 22 16 – Non-Structural Metal Framing
 - 3. Section 09 91 00 - Paint

1.2 SUBMITTALS

- A. Product Data:
 - 1. Submit manufacturer's product specifications and installation instructions for each gypsum board component, including other data as may be required to show compliance with these specifications.

1.3 QUALITY ASSURANCE

- A. Gypsum Board:
 - 1. GA-216, "Specifications for the Application and Finishing of Gypsum Board" by Gypsum Association
 - 2. GA-214-96, "Recommended Levels of Gypsum Board Finish" by Gypsum Association.
- B. Metal Support System Installation: ASTM C754
- C. Manufacturer: Obtain gypsum board products from a single manufacturer, or from manufacturers recommended by the prime manufacturer of gypsum boards
- D. Allowable Tolerances: 1/8" in 8' - 0" variation in finish surface

1.4 WARRANTY

- A. Manufacturer standard warranty against delamination of facing and degradation of sheet for a period of 12 months from installation of board.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packaged, containers or bundles bearing brand name and identification of manufacturer or supplier
- B. Store materials inside under cover and in a manner to keep them dry, protected from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.
- C. Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal corner beads and trim from being bent or damaged.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements, General: Comply with requirements of referenced gypsum board application standards and recommendations of gypsum board manufacturer, for environmental conditions before, during and after applications of gypsum board
- B. Cold Weather Protection: When ambient outdoor temperatures are below 55 degrees Fahrenheit maintain continuous, uniform, comfortable building working temperatures of not less than 55 degrees Fahrenheit for a minimum period of 48 hours prior to, during and following application of gypsum board and joint reinforcement materials or bonding of adhesives.
- C. Ventilation: Ventilate building spaces as required to remove water in excess of that required for drying of joint treatment material immediately after its application. Avoid drafts during dry, hot weather to prevent too rapid drying.

PART 2 PRODUCTS

2.1 MANUFACTURERS, or Approved Equal

- A. Gypsum Board:
 1. USG Corporation
 2. G-P Gypsum Corporation
 3. National Gypsum Company
 4. Certainteed Corporation
 5. Temple Inland
 6. Or Approved Equal
- B. Metal Support System:
 1. Dietrich Metal Framing, Inc.
 2. MarinoWare; a Division of Ware Industries
 3. Or Approved Equal

2.2 NON-LOAD-BEARING STEEL FRAMING, GENERAL

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
 2. Protective Coating: ASTM A 653/A 653M, G60, hot-dip galvanized zinc coating, unless otherwise indicated.

2.3 STEEL FRAMING FOR FRAMED ASSEMBLIES

- A. Steel Studs and Runners: ASTM C 645.
 1. Double 18 gage stud framing at all openings including door and view panels.
 2. 22 gauge at 16" o.c. for other locations.
 3. Use 18 gauge for all runners.
- B. Slip-Type Head Joints: Where indicated or at a minimum where required by the Steel Stud Manufacturers Association (SSMA), provide the following:
 1. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
 2. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- C. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
 1. Minimum Base Metal Thickness: 25 gauge
 2. Depth: 1-1/2 inches unless otherwise noted.

2.4 STEEL FRAMING ACCESSORIES

- A. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

2.5 Provide stud manufacturer's standard clips, shoes, ties, reinforcement, and other accessories as needed for a complete partition framing system.

2.6 GYPSUM BOARD MATERIALS

- A. Gypsum Wallboard: ASTM C 1396, of types, edge configuration and thickness indicated below; in maximum lengths available to minimize end-to-end butt joints.
 - 1. Types:
 - a. Regular, unless otherwise indicated.
 - b. Fire rated, Type X, when tested in accordance with ASTM E 119.
 - 2. Edges: Tapered.
 - 3. Thickness: 5/8", unless otherwise indicated.
- B. Tile Backer Board (provide at all locations where wall tile occurs and other areas indicated):
 - 1. 1/2" and 5/8" Dens Shield Tile Backer Board as manufactured by Georgia Pacific Corporation.
 - 2. 1/2" and 5/8" Fiber Brand Sheathing – Aqua Tough Tile Backerboard as manufactured by USG Corporation.
 - 3. Equal as approved.

2.7 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 - 1. Material: Sheet steel zinc coated by the hot dip process or electrolytic process, or sheet steel coated with aluminum.
 - 2. Shapes:
 - a. Cornerbead: use at outside corners, unless otherwise indicated.
 - b. U-Bead: J-shaped; exposed short flange does not receive joint compound, use at exposed panel edges
 - c. Expansion (control) joint: One piece control joint formed with V-shaped slot and removable strip covering slot opening.

2.8 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475.
- B. Joint Tape:
 - 1. Interior Gypsum Wallboard: Paper.
 - 2. Tile Backing Panels: As recommended by panel manufacturer.
- C. Setting Type Joint Compound: Factory prepackaged, job mixed chemical-hardening powder products for bedding and filling, formulated for uses indicated.
 - 1. For taping and filling only.
 - 2. For prefilling gypsum board joints.
 - 3. For filling joints and treating fasteners of mold and mildew resistant backing board behind base for ceramic tile.
 - 4. For topping compound, use sandable formulation.
- D. Drying-Type Joint Compounds: Factory prepackaged vinyl-based products complying with the following requirements for formulation and intended use.
 - 1. Ready-Mix Formulation: Factory-mixed product.
 - 2. All-purpose compound formulated for use as both taping and topping compound (use for finish (third and above) coats only.)
- E. Joint Compound for Tile Backing Panels: As recommended by backing panel manufacturer.

2.9 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

PART 3 EXECUTION

3.1 PREPARATION

- A. Do not deliver or install gypsum board until building is fully enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

3.2 EXAMINATION

- A. Examine substrates to which gypsum board construction attaches or abuts, installed hollow metal frames, cast-in anchors and structural framing with Installer present for compliance with requirements for installation tolerances and other conditions affecting performance of gypsum board assemblies specified in this Section.
 1. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. Metal Support Systems:
 1. Wall/Partition Support System: Support systems shall extend from floor to heights indicated on partition types/schedule.
 - a. Install runner tracks at floors and bottom of roof or floor framing members and where stud system abuts other construction. Where partitions parallel, but are not directly beneath framing members, where there is no floor above, provide runner, or stud, headers between beams, spaced 4 feet on center, attached at each end, and secure top runner of partition thereto.
 - b. Space studs 16 inches on center, unless otherwise indicated.
 - c. Frame door openings with 20 gage vertical studs. Provide runner track header of same gage as jamb studs, and jack studs same as partition studs across head of opening.
 - d. Frame other openings same as door openings and frame above and below openings same as above door head.
 - e. Install supplementary framing, runners, blocking and bracing at openings and terminations in the work, and at locations required to support fixtures, equipment, services, heavy trim and similar work which cannot be adequately supported on gypsum board alone.
 - f. Secure perimeter framing to structural elements with suitable fasteners located 2 inches from each end and 24 inches apart between, except top runner parallel to, but not directly under, framing members will be attached with 2 screws to headers provided at 48 inches on center. Anchor studs adjacent to door and fixed light openings, partition intersections, and corners to top and bottom runner flanges. Make web-flange bend at each end of runner over openings and screw to jamb studs with 2 screws each end.
- B. Gypsum Board
 1. Install, fasten and finish gypsum wallboard and accessories in strict accordance with manufacturer's printed directions and recommendations, with GA-216.
 2. Install gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16" open space between boards. Do not force into place.
 3. Locate edge and end joints over supports. Position boards so that both tapered edge joints abut, and mill-cut or field-cut end joints abut. Do not place tapered edges against cut edges or ends.
 4. Stagger end joints on horizontal applications.

5. Space fasteners in gypsum boards in accordance with referenced standards and manufacturer's recommendations, except as otherwise indicated.
 - a. Fasten base layer to metal supports with screws, spaced 12" o.c. along supported edges and 24" o.c. along intermediate supports.
 - b. Fasten single layer and face layer to metal supports with screws, spaced 12" o.c. for 24" stud spacing and 16" o.c. for 16" stud spacing, unless otherwise indicated. Stagger screws on abutting edges and ends.
- C. Trim Accessories
 1. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges by nailing or stapling in accordance with manufacturer's instructions and recommendations.
 2. Install metal corner beads at all exposed external corners of gypsum board work.
 3. Install metal edge trim when edge of gypsum board would otherwise be exposed or semi-exposed and where work is tightly abutted to other work.
 4. Control Joints:
 - a. Install control joints at locations indicated, or if not indicated, at spacings and locations required by ASTM C 840 and manufacturer's recommendations; and approved by Contracting Officer for visual effect.
 - 1) Provide not more than 30 feet apart on walls and ceilings.

3.4 FINISHING OF GYPSUM WALL BOARD

- A. General: Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim and control joints; penetrations; fastener heads, surface defects and elsewhere as required to prepare work for decoration.
- B. Prefill open joints using setting-type joint compound.
- C. Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.
- D. Finish interior gypsum wallboard by applying the following joint compounds in three coats (not including prefill of openings in base), sand between coats, and after last coat.
 1. Embedding and First Coat: Setting-type joint compound.
 2. Fill (Second) Coat: Setting-type joint compound.
 3. Finish (Third) Coat: Ready-mix drying all-purpose or topping compound.
- E. Glass-Mat Water Resistant Backer Board: Comply with glass mat backer board manufacturer's recommendations.
- F. Partial Finishing: Omit third coat and sanding on concealed drywall construction indicated for drywall finishing or which requires finishing to achieve sound rating.
- G. Levels of Finish: Provide in accordance with Gypsum Association GA 214, "Recommended Levels of Gypsum Board Finish".
 1. Level 1: Concealed areas, except provide higher level of finish as required to comply with acoustical ratings.
 - a. All joints and interior angles shall have tape set in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.
 2. Level 2: All joint and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Fastener heads and accessories shall be covered with a coat of joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.
 3. Level 3: not used
 4. Level 4: all Gypsum board surfaces, except where another finish level is indicated.

- a. All joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges.
5. Level 5: not used.

3.5 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 09 51 10

ACOUSTICAL PANEL CEILINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Extent of each type of acoustical ceiling is shown on drawings.
- B. Types of acoustical ceilings specified in this section include the following:
 - 1. Acoustical panel ceilings, exposed suspension.

1.2 SUBMITTALS

- A. Product Data: Manufacturer's product specifications and installation instructions for materials and suspension system, including certified laboratory test reports and other data as required showing compliance with these specifications.
- B. Coordination Drawings: layout of ceilings drawn to scale coordinating acoustical tile ceiling installation and spacing with hanger attachment to building structure and ceiling mounted items. Include locations of all mechanical and electrical items. Reproduction of Contract Documents is not acceptable and will be rejected if submitted.
- C. Samples: Provide samples of acoustical unit, showing color and texture, and set of 12" long samples of suspension system. Approved samples will be retained as standards for work.

1.3 QUALITY ASSURANCE

- A. Installer: Firm with not less than three years of successful experience in installation of acoustical ceilings similar to requirements for this project and which is acceptable to manufacturer of acoustical units.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical ceiling units to project site in original unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination or other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way. Minor damages may be repaired, provide finish items are equal in all respects to new work and acceptable to Contracting Officer; otherwise, remove and replace damaged items as directed.

1.5 PROJECT CONDITIONS

- A. Space enclosure - Do not install interior acoustical ceilings until wet work in space is completed and nominally dry, until work above ceilings is completed, and until ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Acoustical Ceiling Tile: Full-size units equal to 5 percent of amount installed.

PART 2 PRODUCTS

2.1 MANUFACTURERS, Or Approved Equal

- A. Armstrong World Industries
- B. USG Interiors, Inc.
- C. CertainTeed (BPB America)

2.2 MINERAL FIBER ACOUSTICAL PANELS

- A. 2' x 2' x 3/4" Fine Fissured with tegular edge (#1756) Equal to Armstrong World Industries, color: white.
- B. Where units less than 6 inches wide would occur at edges of room with 24 X 24 inch pattern, provide 24 X 48 inch panels cut to extend to wall, eliminating the tee near the wall.

2.3 METAL SUSPENSION SYSTEM

- A. Metal Suspension System for lay in ceiling: Ceiling grid shall be intermediate duty, 15/16" Prelude Plus, Armstrong or an approved equal. Ceiling grid shall conform to ASTM C635. Exposed system shall be tab lock double web.
- B. Finish: Finish exposed parts of suspension systems with baked enamel, color white.
- C. Hanger Wire: 12-gage galvanized wire, or as recommended by the Manufacturer to meet building code and complete system load.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Installer must examine conditions under which acoustical ceiling work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to installer.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling – in accordance with approved coordination layout drawing.

3.3 INSTALLATION

- A. General: Install materials in accordance with manufacturer's printed instructions and to comply with governing regulations, fire resistance rating requirements as indicated, and industry standard applicable to work.
- B. Install acoustical panels in coordination with suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.

3.4 CLEANING

- A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09 65 00

RESILIENT AND LVT FLOORING

PART1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the Statement of Work (SOW).

1.2 SUMMARY

- A. Section includes luxury vinyl tile and plank flooring.

1.3 PREINSTALLATION MEETINGS

- A. Pre-installation Conference:
 - 1. Review methods and procedures related to luxury vinyl tile installation including, but not limited to, the following:
 - a. Review delivery, storage, and handling procedures.
 - b. Review ambient conditions and ventilation procedures.
 - c. Review subfloor preparation procedures.
 - d. Follow manufacturer's installation guidelines.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written specifications and lab documents for any physical testing.
 - 2. Include preparation instructions and installation recommendations for each type of substrate as specified in manufacturer's installation guidelines.
 - 3. Adhesive specifications and documents.
 - 4. Include storage, handling and maintenance requirements and recommendations.
- B. Samples: For each product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
 - 1. Luxury Vinyl planks and tile: Full-size Sample.
 - 2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch long Samples.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For tests performed by a qualified independent testing agency.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For vinyl planks to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining vinyl tiles, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 - 2. Precautions for cleaning materials and methods that could be detrimental to vinyl tile.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Luxury Vinyl Tile: Full-size units equal to 10 percent of amount installed for each type indicated, but not less than 10.67 sq. yd.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Tile manufacturer shall have no less than 5 years experience of producing luxury vinyl planks and shall have published product literature clearly indicating compliance with requirements of this section.
- B. Installer Qualifications: An installer with a minimum of 5 years commercial vinyl floorings installation experience, and who is certified by the International Certified Floorcovering Installers Association.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Handle materials to avoid damage.

1.10 FIELD CONDITIONS

- A. Comply Temperature Requirements: Maintain materials and areas of work at temperatures between 70 degrees F and 90 degrees F for not less than 48 hours before, during and 48 hours after installation. Maintain a minimum temperature of 55 degrees F thereafter.

1.11 WARRANTY

- A. Provide manufacturer's standard limited warranty to cover manufacturing defects.

PART 2 PRODUCTS

2.1 LUXURY VINYL TILE and/or PLANK

- A. Basis-of-Design Product: Flexco Natural Elements Wood and/or Stone vinyl tile, or equal. Subject to compliance with requirements, Color and style: to be chosen by owner through Contracting Officer.
- B. Source Limitations:
 1. Single Source Responsibility: Provide products that have components manufactured by a single source.
 2. Commitment to sustainability: Tile manufacturer must practice environmental responsibility through programs of source reduction, recycling, reuse, and conservation.
- C. Color: As selected by Contracting Officer from manufacturer's full range.
- D. Thickness: 3.0 mm, may vary according to product selected.
- E. Class: Class III printed film vinyl tile
- F. Nominal dimensions: may vary according to product selected.
- G. Finish: To be chosen by Contracting Officer.
- H. Slip Resistance ASTM D2047: ADA Compliant
- I. Interior Floor Finish: Class I
- J. Installation: Glue down.
- K. Recommended adhesive Shaw 4100 or S150 or approved equal.

3.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by vinyl tile manufacturer.
- B. Trowelable Adhesives: Water-resistant, mildew-resistant, nonstaining, premium grade pressure-sensitive type to suit products and subfloor conditions, that complies with flammability

requirements for installed vinyl tile and is recommended by vinyl tile manufacturer.

1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 4 EXECUTION

4.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing moisture and pH tests as recommended by carpet tile manufacturer.
 2. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
 3. Where previous surface treatments are unknown, or where other concerns exist as to the ability of the adhesive to bond to the substrate, a 24 hour bond test is recommended.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. If substrate preparation is the responsibility of another installer, notify CO of unsatisfactory preparation before proceeding.

4.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Use trowelable leveling and patching compounds that contain a cementitious base with a latex additive, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.
- D. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by vinyl tile manufacturer.
- E. Broom and vacuum clean substrates to be covered immediately before installing vinyl tile.

4.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent materials.

4.4 CLEANING AND PROTECTION

- A. Protect installed products until completion of project.
- B. Perform the following operations immediately after installing vinyl tile:
 1. Remove excess adhesive, and other surface blemishes using cleaner recommended by vinyl tile manufacturer.
- C. Touch-up, repair or replace damaged products before Substantial Completion.
- D. When construction or move-in activities will continue where new carpet is installed, provide non-staining building material paper/plastic to protect vinyl planks.

END OF SECTION

SECTION 09 65 13
RUBBER WALL BASE

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Rubber wall base

1.2 SUBMITTALS

- A. Submit under provisions of the Statement of Work.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Verification Samples: Provide product samples, on chain, for selection. Color by Contracting Officer.
- D. Extra Stock: Submit extra stock equal to 2% of total installed.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
- B. Installer Qualifications: Minimum 2 year experience installing similar products.
- C. Performance: Fire performance meeting requirements of building code and local authorities.

1.4 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to starting work of this section.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Handling: Handle materials to avoid damage.

1.6 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.7 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PART 2 PRODUCTS

- 2.1 Rubber Wall Base – Specification based on Johnsonite Traditional Wall Base; Rubber Wall Base product - submitted by Contractor - must meet or exceed the criteria put forth in this specification.
- 2.2 Manufacturer: Johnsonite, Inc., Or Approved Equal
 Phone (800) 899-8916
 16910 Munn Road (440) 543-8916
 Chagrin Falls, Ohio 44023 Tech: Ext 9297
 Web: www.johnsonite.com Samples: Ext 9299
 Email: info@johnsonite.com Fax: (440) 543-8920
- 2.3 Product Description:
- a. 1.2.1 Construction: Johnsonite Traditional Wall Base (or equal) is to be manufactured from a proprietary rubber formulation designed specifically to meet the performance and dimensional requirements of ASTM F-1861, Type TV and TP, Group 1 (solid), Style A and B, Standard Specification for Resilient Wall Base.
 - b. 1.2.2 Physical Characteristics:
 - i. Rubber Wall Base: Traditional: DC-XX with toe (coved), 0.125" thickness, 4" height.
 - ii. Provide inside and outside corners.
 - iii. Available in 4' (1.22 m) straight lengths and 120' (36.58 m) coiled lengths.

2.0 PRODUCT PERFORMANCE AND TECHNICAL DATA

- A. Meets or exceeds the performance requirements for resistance to heat/light aging, chemicals, and dimensional stability when tested to the methods, as described, in ASTM F-1861.
- B. Flexibility: Will not crack, break, or show any signs of fatigue when bent around a 1/4" (6.4 mm) diameter cylinder.
- C. Chemical resistance (ASTM F 925): Passes – 5% acetic acid, 70% isopropyl alcohol, mineral oil, 5% sodium hydroxide solution, 5% hydrochloric acid solution, 5% sulfuric acid solution, 5% household ammonia solution, and 5.25% household bleach solution.
- D. Resistance to light (ASTM F 1515): $\Delta E < 8$
- E. Fire Resistance: Rubber Wall Base
 1. ASTM E 84/NFPA 255 (Flame/Smoke) – Class A, < 450
 2. ASTM E 648 (NFPA 253): Critical Radiant Flux – Class I

PART 2 EXECUTION

2.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

2.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

2.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction. Test for proper operation and adjust until satisfactory results are obtained.

- B. Comply with recommendations of Carpet and Rug Institute 'Specifier's Handbook'.

PROTECTION

Protect installed products until completion of project.

Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 09 65 50
RESILIENT ACCESSORIES

PART 1 – GENERAL

1.1 SUMMARY

- A. Extent of resilient accessories is shown on Drawings and in schedules. Work includes vinyl edge strips between carpet and vinyl flooring.

1.2 SUBMITTALS

- A. Product Data: Provide technical data, care and maintenance recommendations, and Safety Data Sheets for adhesives.
- B. Samples: Submit 6" long sample of each type, color and finish of resilient accessory required, indicating full range of color and pattern variation. Type, color and finish to be selected by Contracting Officer.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Provide each type of resilient flooring and accessories as produced by a single manufacturer, including recommended primers, adhesives and sealants.

1.4 PROJECT CONDITIONS

- A. Maintain minimum temperature of 65 degrees (18 Celsius) in spaces to receive resilient flooring for at least 40 hours prior to installation, and during installation. Subsequently, maintain minimum temperature 55 degrees (13 Celsius) in areas where work is completed.
- B. Install resilient accessories after other finishing operations, including painting, have been completed.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Accessories, Or Approved Equal
 1. Flexco – resilient tile to carpet transition
 2. Johnsonite, Inc.
 3. Roppe Corporation

2.2 ACCESSORIES

- A. Adhesives (Cements):
 1. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.
 2. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Cove Base Adhesives: Not more than 50 g/L.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Installer must examine wall surfaces to determine that they are satisfactory. A satisfactory surface is defined as one that is smooth and free from cracks, holes, ridges, and coatings preventing adhesive bond, and other defects impairing performance or appearance.
- B. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- C. Start of flooring installation indicates acceptance of conditions and full responsibility for completed work.

3.2 INSTALLATION

- A. Accessories:
 - 1. Apply resilient base to walls, columns, pilasters, and other permanent fixtures in rooms or areas where base is required. Install base in lengths as long as practicable, with field formed outside corner units, and with mitered or coped inside corners. Tightly bond base to backing throughout length of each piece, with continuous contact at horizontal and vertical surfaces.
 - a. On irregular surfaces, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
 - 2. Apply vinyl transition edge strip to all areas where carpet meets non-carpet floor finishes. Where carpet meets carpet or existing metal thresholds no edge strip is required; join carpet to existing carpet and metal thresholds in a professional manner contingent upon approval of Contracting Officer.

3.3 CLEANING

- A. Perform following operations immediately upon completion of resilient accessories:
 - 1. Remove any excess adhesive or other surface blemishes, using appropriate cleaner recommended by resilient manufacturer.

END OF SECTION

SECTION 09 68 13
TILE CARPETING

PART1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the Statement of Work (SOW).

1.2 SUMMARY

- A. Section includes modular, tufted carpet tile.

1.3 PREINSTALLATION MEETINGS

- A. Pre-installation Conference:
 - 1. Review methods and procedures related to carpet tile installation including, but not limited to, the following:
 - a. Review delivery, storage, and handling procedures.
 - b. Review ambient conditions and ventilation procedures.
 - c. Review subfloor preparation procedures.
 - d. Follow manufacturer's modular carpet installation guidelines and/or Carpet & Rug Institute Installation Standard (the most recent version), where applicable.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written specifications and lab documents for any physical testing.
 - 2. Include installation recommendations for each type of substrate as specified in carpet manufacturer's installation guidelines and/or Carpet & Rug Institute Installation Standard (the most recent version), where applicable.
 - 3. Include carpet maintenance recommendations as outlined by carpet manufacturer.
 - 4. Carpet Manufacturer shall also submit a plan for recycling the specified carpet at the end of the useful life of the carpet.
- B. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
 - 1. Carpet Tile: Full-size Sample.
 - 2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch long Samples.
- C. Product Schedule: For carpet tile. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For carpet tile, for tests performed by a qualified independent testing agency.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.

2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10.67 sq. yd.

1.8 QUALITY ASSURANCE

- A. Contractor must comply with mandatory use Air Force Furnishings Commodity Council Tier 1 contracts manufacturers. The Carpet Program is covered under North American Industry Classification System (NAICS) code 314110 - Carpet and Rug Mills. The Product Service Code (PSC) for the Carpet Program is 7220 – Floor Coverings.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Comply with carpet manufacturer's installation recommendations and the Carpet & Rug Institute Installation Standard (the most recent version), where applicable.

1.10 FIELD CONDITIONS

- A. Comply with carpet manufacturer's installation recommendations and the Carpet & Rug Institute Installation Standard (the most recent version) for temperature, humidity, and ventilation limitations.
- B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weather-tight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.
- C. HVAC system should be operational and running prior to carpet installation and remain running after carpet installation.
- D. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to allow bond between adhesive and concrete. Concrete slabs should have moisture and have pH readings that are within the specified tolerance of the adhesive to be used.
- E. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

2.11 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 2. Failures include, but are not limited to, more than 10 percent face fiber loss, edge raveling, dimensional instability, excess static discharge, loss of tuft bind strength, delamination, and where face fiber is 100 percent solution dyed, inability to remove acid based stains, lack of colorfastness to light, and lack of colorfastness to atmospheric contaminants.
 3. Carpet and fiber must be manufactured and warrantied by same manufacturer.
 4. Warranty Period: Lifetime Commercial Limited Warranty.

PART 3 PRODUCTS

3.1 MANUFACTURERS:

- A. Carpet Tile/plank: Shall comply with mandatory use Air Force Furnishings Commodity Council carpet ordering. Carpet shall be acquired by a small business installer, dealer, or contractor using the following mandatory manufacturers holding Tier 1 contracts:

Approved manufacturers:

1. **Shaw, Inc.**
Kenneth Thaller Kenneth.thaller@shawinc.com
www.airforce.shawinc.com 225-605-7535
2. **J+J Flooring Group**
George Taylor usaf@jjflooringgroup.com
www.jjflooringgroup.com/usaf/ 800-241-4586 ext. 7992
3. **Mohawk Group:**
Vickie Small
Vickie_Small@Mohawkind.com
<https://www.mohawkgroup.com/sitefiles/microsites/mg/airforce/> 504-432-3183
4. **CMA Milliken:**
Tamlin Antoine Tamlin.antoine@milliken.com
Paul.snyder@cma-purchasing.com
<http://www.cma-purchasing.com/wp-content/uploads/2018/08/AirForceProgramProductPortfolio.pdf> 202-480-6461 Or
Paul Snyder 240-215-9700 ext 106

- B. Contractor to choose one of the following: Shaw's 59576 Disperse Ecoworx; Mohawk Group's BT355 Riot QS Tile; J+J Flooring's Indew; CMA Milliken's Nordic Stories (Organic) – Tectonic, and must comply with the mandatory use Air Force Furnishings Commodity Council Tier 1 contracts.
- C. Color must be chosen by owner. Confirm pattern / style and color with Contracting Officer. Install per manufacturer recommendations and instructions. Provide attached cushion backing in compliance with NSF/ANSI 140 sustainability standards. Provide low VOC wet adhesive, moisture proof, thermoplastic hard or thermoset backing option with a maximum thickness no greater than 0.250" for modular carpet tile.

3.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Trowelable Adhesives: Water-resistant, mildew-resistant, nonstaining, premium grade pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 4 EXECUTION

4.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects prior to installation. See manufacturer's requirements for substrate conditions and ambient conditions.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
 - 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing moisture and pH tests as recommended by carpet tile manufacturer.
 - 2. Subfloor finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" for slabs receiving carpet tile.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
 - 4. Lightweight concrete and gypcrete subfloors may require a primer such as Shaw 9050 or equivalent to reduce surface porosity.
 - 5. Where previous surface treatments are unknown, or where other concerns exist as to the ability of the adhesive to bond to the substrate, a 24 hour bond test is recommended.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

4.2 PREPARATION

- A. General: Comply with Carpet & Rug Institute Installation Standard (the most recent version), "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- B. Use trowelable leveling and patching compounds that contain a cementitious base with a latex additive, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

4.3 INSTALLATION

- A. General: Comply with Carpet & Rug Institute Installation Standard (the most recent version), "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive or with a non-spreadable dry adhesive system, such as LokDots. Any non-spreadable adhesive system must adhere the carpet to the substrate.
- C. Maintain dye lot integrity. Do not mix dye lots in same area unless the specific carpet tile style is manufactured as a merge-able dye lot product.
- D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in

furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

- E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, non-staining marking device.
- G. Install pattern parallel to walls and borders.
- H. Roll the entire installation with a 75 lb roller once installation is completed.

4.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with Carpet & Rug Institute Installation Standard (the most recent version), "Protecting Indoor Installations."
- C. When construction or move-in activities will continue where new carpet is installed, provide non-staining building material paper to protect carpet. Do not use plastic sheeting as it can trap moisture, and self-sticking plastic sheeting can transfer adhesive residue to carpet that will attract soil.
- D. When heavy objects are moved over carpet within 24 hours of installation, use plywood over carpet to prevent buckling and wrinkling.
- E. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION

SECTION 09 91 00

PAINT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Interior Primer.
- B. Interior Paint.
- C. Wall/Ceiling Preparation.

1.2 RELATED SECTIONS

- A. Section 08 11 13 – Steel Doors and Frames
- B. Section 09 25 50 – Gypsum Board Assemblies

1.3 REFERENCES

- A. MPI (APL) - Master Painters Institute.
- B. SCAQMD 1168 - South Coast Air Quality Management District Rule #1168; October 3, 2003.
- C. SSPC (PM1) - Steel Structures Painting Manual, Vol. 1, Good Painting Practice; Society for Protective Coatings; 1993, Third Edition.
- D. SSPC (PM2) - Steel Structures Painting Manual, Vol. 2, Systems and Specifications; Society for Protective Coatings; 1995, Seventh Edition.
- E. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

1.4 DEFINITIONS

- A. Paints are available in a wide range of sheens or glosses, as measured by a gloss meter from a 60 degree angle from vertical, as a percentage of the amount of light that is reflected. The following terms are used to describe the gloss of our products.
 - 1. Flat - Less than 5 units.
 - 2. Matte - 0 - 10 units.
 - 3. Eggshell - 10 - 25 units.
 - 4. Satin - 20 - 35 units.
 - 5. Semi-Gloss - 35 - 70 units.

1.5 SUBMITTALS

- A. Submit under provisions of the Statement of Work.
- B. Product Data: Provide a complete list of all products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category.
 - 2. Cross-reference to specified paint system(s) that the product is to be used in; include description of each system.
- C. Samples: Submit paint sample fan deck for color selection. Color by Contracting Officer.
- D. Manufacturer's Instructions: Indicate special surface preparation procedures.
- E. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: a single manufacturer with a minimum of ten (10) years' experience will supply all primary products specified in this section.

- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Disposal:
 1. Never pour leftover coating down any sink or drain. Use up material on the job or seal can and store safely for future use.
 2. Do not incinerate closed containers.
 3. For specific disposal or recycle guidelines, contact the local waste management agency or district. Recycle whenever possible.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

- A. At project closeout, provide to the Owner or owner's representative an executed copy of the Manufacturer's standard form outlining the terms and conditions of and any exclusions to their Limited Warranty against Manufacturing Defect.

1.10 EXTRA MATERIALS

- A. At project closeout, supply the Owner or owner's representative one gallon of each product for touch-up purposes.
- B. At project closeout, provide the color mixture name and code to the Owner or owner's representative for accurate future color matching.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer, or Approved Equal:
 1. PPG Paints
 2. Benjamin Moore & Co Approved Manufacturers
 3. Sherwin Williams

2.2 MATERIALS – GENERAL

- A. Volatile Organic Compound (VOC) Content:
 1. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

- B. Compatibility: Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.3 MIXING AND TINTING

- A. Except where specifically noted in this section, all paint shall be ready-mixed and pre-tinted. Agitate all paint prior to and during application to ensure uniform color, gloss, and consistency.
- B. Thinner addition shall not exceed manufacturer's printed recommendations. Do not use kerosene or other organic solvents to thin water-based paints.
- C. Where paint is to be sprayed, thin according to manufacturer's current guidelines.

2.4 INTERIOR PRIMERS - NEW CONSTRUCTION

- A. Gypsum Board, Plaster:
 - 1. Latex:
 - a. One (1) Coat - Ultra Spec® 500 Interior Latex Primer #N534 (MPI listed Product, Categories 50, 50-X, 149, 149-X)
- B. Ferrous Metals:
 - 1. Alkyd:
 - a. One (1) Coat - Super Spec® HP Alkyd Metal Primer #P06.

2.5 INTERIOR PRIMERS - PREVIOUSLY PAINTED SURFACES

- A. Previously Painted:
 - 1. Latex:
 - a. One (1) Coat - Ultra Spec® 500 Interior Latex Primer #N534 (MPI listed Product, Categories 50, 50-X, 149, 149-X)
- B. Ferrous Metals:
 - 1. Alkyd:
 - a. One (1) Coat - Super Spec® HP Alkyd Metal Primer #P06.

2.6 INTERIOR FINISH COAT

- A. Eggshell Finish:
 - 1. Latex:
- B. Two (2) Coats – Ultra Spec® 500 Interior Eggshell Finish N538 (MPI Listed Product Categories 52, 52-X Green)
- C. Satin/Semi-Gloss Finish:
 - 1. Latex:
 - a. Two (2) Coats – Ultra Spec® 500 Interior Semi-Gloss Finish N539 (MPI Listed Product Categories 43, 43-X Green)
 - b. Two (2) Coats Ultra Spec® 500 Interior Gloss Finish N540 (MPI Listed Product Categories 54, 54-X Green)
- D. High Gloss Finish:
 - 1. Latex:
 - a. Two (2) Coats Ultra Spec® 500 Interior Gloss Finish N540 (MPI Listed Product Categories 54, 54-X Green)
- E. High Gloss Finish (Metals):
 - 1. Latex:
 - a. Two (2) Coats Super Spec HP® D.T.M. Acrylic Gloss Enamel P28 (MPI Listed #114, 154)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Ensure that surfaces to receive paint are dry immediately prior to application.
- C. Ensure that moisture-retaining substrates to receive paint have moisture content within tolerances allowed by coating manufacturer. Where exceeding the following values, promptly notify Contracting Officer and obtain direction before beginning work.
 - 1. Concrete and Masonry: 13 percent. Allow new concrete to cure a minimum of 28 days.
 - 2. Exterior Wood: 17 percent.
 - 3. Interior Wood: 15 percent.
 - 4. Interior Finish Detail Woodwork, Including Trim, and Casework: 10 percent.
 - 5. Plaster and Gypsum: 15 percent.
 - 6. Concrete Slab-On-Grade: Perform calcium chloride test over 24 hour period or other acceptable test to manufacturer. Verify acceptable moisture transmission and pH levels.
- D. Examine surfaces to receive coatings for surface imperfections and contaminants that could impair performance or appearance of coatings, including but not limited to, loose primer, rust, scale, oil, grease, mildew, algae, or fungus, stains or marks, cracks, indentations, or abrasions.
- E. Correct conditions that could impair performance or appearance of coatings in accordance with specified surface preparation procedures before proceeding with coating application.

3.2 PREPARATION – GENERAL

- A. Clean surfaces thoroughly prior to coating application.
- B. Do not start work until surfaces to be finished are in proper condition to produce finished surfaces of uniform, satisfactory appearance.
- C. Stains and Marks: Remove completely, if possible, using materials and methods recommended by coating manufacturer; cover stains and marks which cannot be completely removed with isolating primer or sealer recommended by coating manufacturer to prevent bleed-through.
- D. Remove Mildew, Algae, and Fungus using materials and methods recommended by coating manufacturer.
- E. Remove dust and loose particulate matter from surfaces to receive coatings immediately prior to coating application.
- F. Remove or protect adjacent hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items not indicated to receive coatings.
- G. Move or protect equipment and fixtures adjacent to surfaces indicated to receive coatings to allow application of coatings.
- H. Protect adjacent surfaces not indicated to receive coatings.
- I. Prepare surfaces in accordance with manufacturer's instructions for specified coatings and indicated materials, using only methods and materials recommended by coating manufacturer.

3.3 SURFACE PREPARATION

- A. Concrete and Concrete Masonry: Clean surfaces free of loose particles, sand, efflorescence, laitance, form oil, curing compounds, and other substances which could impair coating performance or appearance.
- B. Existing Coatings:
 - 1. Remove surface irregularities by scraping or sanding to produce uniform substrate for coating application; apply one coat primer of type recommended by coating manufacturer for maximum coating adhesion.
 - 2. If presence of lead in existing coatings is suspected, cease surface preparation and notify Contracting Officer immediately.

- C. Gypsum Board: Repair cracks, holes and other surface defects with joint compound to produce surface flush with adjacent surfaces.
- D. Metals - Aluminum, Mill-Finish: Clean and etch surfaces with a phosphoric acid- water solution or water based industrial cleaner. Flush with clean water and allow to dry, before applying primer coat.
- E. Metals - Ferrous, Unprimed: Remove rust or scale, if present, by wire brush cleaning, power tool cleaning, or sandblast cleaning; remove grease, oil, and other contaminants which could impair coating performance or appearance by solvent cleaning, with phosphoric-acid solution cleaning of welds, bolts and nuts; spot-prime repaired welds with specified primer.
- F. Metals - Ferrous, Shop-Primed: Remove loose primer and rust, if present, by scraping and sanding, feathering edges of cleaned areas to produce uniform flat surface; solvent-clean surfaces and spot-prime bare metal with specified primer, feathering edges to produce uniform flat surface.
- G. Metals - Galvanized Steel (not passivated): Clean with a water-based industrial strength cleaner, apply an adhesion promoter followed by a clean water rinse. Alternately, wipe down surfaces using clean, lint-free cloths saturated with xylene or lacquer thinner; followed by wiping the surface dry using clean, lint-free cloths.
- H. Metals - Galvanized Steel, Passivated: Clean with water-based industrial strength cleaner. After the surface has been prepared, apply recommended primer to a small area. Allow primer to cure for 7 days, and test adhesion using the "cross-hatch adhesion tape test" method in accordance with ASTM D 3359. If the adhesion of the primer is positive, proceed with a recommended coating system for galvanized metal.
- I. Wood:
 1. Seal knots, pitch streaks, and sap areas with sealer recommended by coating manufacturer; fill nail recesses and cracks with filler recommended by coating manufacturer; sand surfaces smooth.
 2. Apply primer coat to back of wood trim and paneling.

3.4 APPLICATION – GENERAL

- A. Apply each coat to uniform coating thickness in accordance with manufacturer's instructions, not exceeding manufacturer's specified maximum spread rate for indicated surface; thins, brush marks, roller marks, orange-peel, or other application imperfections are not permitted.
- B. Allow manufacturer's specified drying time, and ensure correct coating adhesion, for each coat before applying next coat.
- C. Inspect each coat before applying next coat; touch-up surface imperfections with coating material, feathering, and sanding if required; touch-up areas to achieve flat, uniform surface without surface defects visible from 39".
- D. Remove dust and other foreign materials from substrate immediately prior to applying each coat.
- E. Where paint application abuts other materials or other coating color, terminate coating with a clean sharp termination line without coating overlap.
- F. Where color changes occur between adjoining spaces, through framed openings that are of same color as adjoining surfaces, change color at outside stop corner nearest to face of closed door.
- G. Re-prepare and re-coat unsatisfactory finishes; refinish entire area to corners or other natural terminations.

3.5 CLEANING

- A. Clean excess coating materials, and coating materials deposited on surfaces not indicated to receive coatings, as construction activities of this section progress; do not allow to dry.
- B. Re-install hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items that have been removed to protect from contact with coatings.
- C. Reconnect equipment adjacent to surfaces indicated to receive coatings.
- D. Relocate to original position equipment and fixtures that have been moved to allow application of coatings.
- E. Remove protective materials.

3.6 PROTECTION

- A. Protect completed coating applications from damage by subsequent construction activities.
- B. Repair to Contracting Officer's acceptance coatings damaged by subsequent construction activities. Where repairs cannot be made to Contracting Officer's acceptance, re-apply finish coating to nearest adjacent change of surface plane, in both horizontal and vertical directions.

END OF SECTION

SECTION 09 93 23

STAINS AND TRANSPARENT FINISHES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Exterior and Interior coating with transparent and semi-transparent finishes.

1.2 REFERENCES

- A. SSPC-SP 1 - Solvent Cleaning.
- B. SSPC-SP 2 - Hand Tool Cleaning.
- C. SSPC-SP 3 - Power Tool Cleaning.
- D. SSPC-SP 13 / NACE No. 6 Surface Preparation for Concrete.
- E. EPA-Method 24

1.3 SUBMITTALS

- A. Submit under provisions of the Statement of Work.
- B. Product Data: Manufacturer's data sheets on each paint and coating product should include:
 - 1. Product characteristics
 - 2. Surface preparation instructions and recommendations
 - 3. Primer requirements and finish specification
 - 4. Storage and handling requirements and recommendations
 - 5. Application methods
 - 6. Cautions
- C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacture's color samples available for color selection. Color selected by Contracting Officer.

1.4 MOCK-UP

- A. Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of painting on the project.
 - 1. Finish surfaces for verification of products, colors, & sheens
 - 2. Finish area designated by Contracting Officer
 - 3. Provide samples that designate prime & finish coats
 - 4. Do not proceed with remaining work until the Contracting Officer approves the mock-up samples

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacture's name, label, and the following list of information:
 - 1. Product name, and type (description)
 - 2. Application & use instructions
 - 3. Surface preparation
 - 4. VOC content
 - 5. Environmental issues
 - 6. Batch date
 - 7. Color number

- B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.
- C. Handling: Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

1.6 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers, or Approved Equal:
 1. Sherwin-Williams Company
 2. Benjamin Moore Company

2.2 APPLICATIONS/SCOPE

- A. Surfaces To Be Coated:
 1. Wood Interior Systems - Transparent

2.3 SCHEDULE

- A. Wood Interior Systems (vertical) - Semi-Transparent
 1. Water Reducible Polyurethane (topcoat)
 - a. Semi-Transparent Stain
 - 1st Coat: S-W WoodClassics Oil Stain, A49 Series (450-500 sq ft/gal)
 - 2nd Coat: S-W WoodClassics Waterborne Polyurethane Varnish, A68 Series
 - 3rd Coat: S-W WoodClassics Waterborne Polyurethane Varnish, A68 Series (400-500 sq ft/gal)
 2. Alkyd (topcoat)
 - a. Semi-Transparent Stain
 - 1st Coat: S-W WoodClassics Oil Stain, A49 Series (450-500 sq ft/gal)
 - 2nd Coat: S-W WoodClassics Oil Base Varnish, A66-300 Series
 - 3rd Coat: S-W WoodClassics Oil Base Varnish, A66-300 Series (350-400 sq ft/gal)
 3. Polyurethane (topcoat)
 - a. Semi-Transparent Stain
 - 1st Coat: S-W WoodClassics Oil Stain, A49 Series (450-500 sq ft/gal)
 - 2nd Coat: S-W WoodClassics Polyurethane Varnish, A67 Series
 - 3rd Coat: S-W WoodClassics Polyurethane Varnish, A67 Series (350-400 sq ft/gal)

2.4 MATERIALS - GENERAL REQUIREMENTS

- A. Paints and Coatings - General:
 1. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

2.5 ACCESSORIES

- A. Coating Application Accessories:
 1. Provide all sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin application of coatings until substrates have been properly prepared. Notify Architect of unsatisfactory conditions before proceeding.
- B. If substrate preparation is the responsibility of another installer, notify Contracting Officer of unsatisfactory preparation before proceeding.
- C. Proceed with work only after conditions have been corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

3.2 SURFACE PREPARATION

- A. Proper product selection, surface preparation, and application affect coating performance. Coating integrity and service life will be reduced because of improperly prepared surfaces. Selection and implementation of proper surface preparation ensures coating adhesion to the substrate and prolongs the service life of the coating system.
- B. Selection of the proper method of surface preparation depends on the substrate, the environment, and the expected service life of the coating system. Economics, surface contamination, and the effect on the substrate will also influence the selection of surface preparation methods.
- C. The surface must be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.
- D. Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.
- E. Surface Preparation
 1. Wood—Interior

All surfaces must be sanded smooth, with the grain, never across it. Surface blemishes must be corrected and the area cleaned of dust before coating. Patching compounds will generally be visible through clear coatings.

3.3 INSTALLATION

- A. Testing: Due to the wide variety of substrates, preparation methods, application methods and environments, one should test the product in an inconspicuous spot for adhesion and compatibility prior to full-scale application.
- B. Apply all coatings and materials with manufacturer's specifications in mind. Mix and thin coatings according to manufacturer's recommendation.
- C. Do not apply to wet or damp surfaces. Wait until wood is fully dry after rain, fog or dew.
- D. Apply coatings using methods recommended by manufacturer.
- E. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.
- F. Apply coatings at spreading rate required to achieve the manufacturer's recommended dry film thickness.
- G. Regardless of number of coats specified, apply as many coats as necessary for complete hide and uniform appearance.
- H. Inspection: The coated surface must be inspected and approved by the Contracting Officer just prior to each coat.

3.4 PROTECTION

- A. Protect finished coatings from damage until completion of project.
- B. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch-up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

END OF SECTION

SECTION 22 00 00
PLUMBING and PIPING

This specification is derived from UFC 03 420 01, UFGS 22 00 00, UFGS 23 05 15, and UFGS 23 23 00 for the B0412 DCSA Renovation.

This specification covers the following plumbing and piping work needed for the B0142 DCSA renovation project scope.

- Replace plumbing fixtures in Restrooms
- New sink fixture at abandoned piping in new Break Room
- HFW & CFW piping to support plumbing work
- Drain piping to support plumbing work
- Refrigerant piping to support replacement of AHU1.
- Refrigerant piping to support install of new 3/4TON LAN RM cooler
- Natural gas supply piping to support replacement of AHU1.
- Flue gas vent work to support replacement of AHU1.
- Condensate drain piping to support replacement of AHU1.

PLUMBING WORK SHALL BE IN ACCORDANCE WITH ICC IPC.

The plumbing fixtures in Men's & Women's restrooms (113 & 115) are to be replaced. None of these plumbing fixtures is to be moved or relocated in any way.

Further, a Break Room (106) sink is to be added at the location of a previously removed plumbing fixture.

Provide five new sink fixtures with automatic faucets and thermostatic mixing valves.

Provide two new urinals and four new water closets with automatic flush valves.

Two floor drains in Men's & Women's restrooms (113 & 115) are to remain as existing.

A water fountain and vanity mounted sink in Corridor 103 are also to remain as existing.

Contractor shall provide new replacement fixture appurtenances (traps, fittings, wall sleeves, stop valves and accessories) for these new plumbing fixtures.

PIPE MATERIAL

CFW, HFW, Condensate drain tubing shall be copper per ASTM B88, Type K, L or M.

Waste drain piping must be Cast Iron Soil Pipe per ASTM A74, AWWA 606.

Gas duct furnace flue shall use 4", 6" single wall flue pipe of minimum 22gauge galvanized steel per ASTM A653& ASTM A924, lock-forming quality, with G90 zinc coating of 1.25oz/sf for each side.

SECTION 22 00 00
PLUMBING and PIPING

Natural gas supply piping shall be 1-1/4", 1/2" SCH40 TYPE BCS black carbon steel per ASTM A53.

Refrigerant piping, valves, fittings, and accessories shall be in accordance with ASHRAE 15 & 34 and ASME B31.5.

Refrigerant piping shall be of copper tubing per ASTM B280 annealed or hard drawn as required. Copper tubing shall be soft annealed where bending is required and hard drawn where no bending is required.

Contractor shall retain the existing sight glass indicator for reinstallation in new AHU1 DX refrigerant piping.

PIPE JOINT MATERIAL

Refrigerant piping joints shall be brazed. Joints on lines <7/8" may be flared.

Cast copper alloy fittings for flared copper tube shall conform to ASME B16.26 and ASTM B62. Joints and fittings for brazed joint shall be wrought-copper.

Cast sweat-type joints and fittings shall not be allowed.

Bronze adapters for brazed tubing may be used for connecting tubing to flanges and to threaded ends of valves and equipment.

Brazing Filler Metal shall conform to AWS A5.8/A5.8M, Type BA5-5 with AWS Type 3 flux, Type BCuP-5 or BCuP-6 for these copper-to-copper joints.

Perform brazing in accordance with AWS BRH. During brazing, fill the pipe and fittings with a pressure regulated inert gas, such as nitrogen, to prevent the formation of scale. Before brazing copper joints, clean both the outside of the tube and the inside of the fitting with a wire fitting brush until the entire joint surface is bright and clean. Do not use brazing flux. Remove surplus brazing material at all joints. Protect tubing against oxidation during brazing by continuous purging of the inside of the piping using nitrogen. Support piping prior to brazing and do not spring or force.

HFW, CFW, Condensate piping joints shall use bronze fittings which will be brazed or threaded.

Brazed joints shall be made in conformance with AWS B2.2, ASME B16.50, and CDA A4015 with flux and are acceptable for all pipe sizes.

Brazing material shall conform to AWS A5.8, BCuP-5. Brazing flux shall be in paste or liquid form appropriate for use with brazing material. Flux must be as follows: lead-free; have a 100 percent flushable residue; contain slightly acidic reagents; contain potassium borides; and contain fluorides.

Threaded joints shall have standard taper pipe threads conforming to ASME B1.20.1.

Only male pipe threads shall be coated with graphite or shall have a PTFE tape applied.

SECTION 22 00 00
PLUMBING and PIPING

Natural Gas supply piping joints shall be 1-1/4", 1/2" size and of banded black malleable iron screwed joint fittings, per ASTM A197 and ASME B16.3. Union connection fittings of same size shall be black malleable iron female, screwed, fittings with brass-to-iron seat, and ground joint, conforming to ASME B16.39.

Gas duct furnace flue shall use 4", 6" single wall flue duct fittings of minimum 22gauge galvanized steel per ASTM A653& ASTM A924 with G90 zinc coating of 1.25oz/sf for each side.

Waste drain piping will require an initial steel threaded joint to new sink, urinal, and toilet fixtures. Contractor shall provide new replacement fixture appurtenances (traps, fittings, wall sleeves, stop valves and accessories) for these new plumbing fixtures.

Polished chrome-plated pipe and fittings shall be provided, if exposed to view.

Confirm that each existing sink and urinal fixture is equipped with a trap.

Threaded joints shall have standard taper pipe threads conforming to ASME B1.20.1.

Only male pipe threads shall be coated with graphite have a PTFE tape applied.

VALVES AND ACCESSORIES

Thermostatic Mixing Valves must be provided at lavatory faucets. Mixing valves, thermostatic type, pressure-balanced or combination thermostatic and pressure-balanced shall be same as CFW and HFW line size, normally 3/8".

The valves, if exposed to view, shall be chromium or nickel plated or polished stainless steel. If not exposed to view, the valves shall have rough finish with no plating required.

Each valve shall be constructed to control the mixing of hot (195degF max) and cold (40degF min) water and to deliver water at a desired temperature (no greater than 120degF) regardless of pressure (145psi max) or input temperature changes. Mixing valves shall maintain water temperature within 5degF of any setting. The control element shall be of an approved per ASSE 1070.

The valve bodies shall be of heavy cast bronze, and interior parts shall be brass, bronze, or copper. The valve shall be equipped with necessary stops, check valves, unions, and sediment strainers on the inlets.

Use ZURN ZW3870XLT Aqua-Gard (3-PORT, 3/8" fittings) or equal.

The mixing valve is NOT factory pre-set. Contractor must use thermometer to set mixing valve outlet temperature between 95-115degF.

Contractor shall provide new replacement fixture appurtenances (traps, fittings, wall sleeves, stop valves and accessories) for these new plumbing fixtures.

Polished chrome-plated pipe and fittings shall be provided, if exposed to view.

Confirm that each existing sink and urinal fixture is equipped with a trap.

SECTION 22 00 00
PLUMBING and PIPING

CFW, HFW stop valves to be procured at Break Room sink shall be similar to existing Restroom lavatory sink stop valves.

PLUMBING FIXTURES

Fixtures for use by the physically handicapped shall be in accordance with ICC A117.1.

Polished chrome-plated pipe and fittings shall be provided, if exposed to view.

Confirm that each existing sink and urinal fixture is equipped with a trap.

Confirm that existing fixtures with the supply discharge below the rim are equipped with back-flow preventers.

FLUSH VALVE WATER CLOSETS

Water closets shall be per ASME A112.19.2/CSA B45.1.

Water closets shall be of white vitreous china, siphon jet, elongated bowl, wall mounted. Top of toilet seat height above floor shall be 14-15 inches, except 17-19 inches for two ADA wheelchair water closets.

Provide wax bowl ring including plastic sleeve. Provide white solid plastic elongated closed-front seat with cover.

Provide ASME A112.6.1M concealed chair carriers with vertical steel pipe supports.

Water Closet shall be equal to SLOAN ST-2469, QTY 4.

Flush Valves must meet the EPA WaterSense product definition specified, and must be labeled as EPA WaterSense products. Provide data identifying WaterSense label for flush valve water closet.

Water flush volume of water closet, flush valve shall not exceed 1.28 gallons per flush.

Flush valves shall be non-hold open type.

Flush valves shall be auto-sensing flush type, with DC actuators and wall mounted sensor boxes. Auto-sensing flush valves shall be hard-wired, not battery operated.

Provide manual over-ride button. Added plumbing wall penetration is required for DC actuator wiring.

Provide large diameter flush valve including angle control-stop valve, vacuum breaker, tail pieces, slip nuts, and wall plates.

Flush valve components, if exposed to view, shall be chromium-plated or polished stainless steel.

Mount flush valves not less than 11 inches above the fixture. Mounted height of flush valve shall not interfere with the hand rail in ADA stalls.

SECTION 22 00 00
PLUMBING and PIPING

Flush Valve shall be equal to ZURN, ZEMS6000AV-MOB-W1-ONE-HW6, QTY 4. The P6000-HW6 power converter and 120VAC, 1PH, 60HZ, 2A power supply specified with electrical design.

FLUSH VALVE URINALS

Urinals shall be per ASME A112.19.2/CSA B45.1.

Urinals shall be of white vitreous china, wall-mounted, wall outlet, siphon jet, integral trap, and extended side shields.

Provide one urinal with the rim 24 inches above the floor and a minimum 13-1/2 inches from the wall from which urinal is mounted.

Provide one ADA urinal with front rim a maximum of 17 inches above floor and a minimum 13-1/2 inches from the wall from which urinal is mounted.

Provide ASME A112.6.1M concealed chair carriers with vertical steel pipe supports.

Urinal shall be equal to SLOAN SU-1019, QTY 2.

Flush valves must meet the EPA WaterSense product definition specified, and must be labeled as EPA WaterSense products. Provide data identifying WaterSense label for flush valve urinal.

Water flush volume of urinal, flush valve shall not exceed 0.5 gallons per flush.

Flush valves shall be non-hold open type.

Flush valves shall be auto-sensing flush type, with DC actuators and wall mounted sensor boxes. Auto-sensing flush valves shall be hard-wired, not battery operated.

Provide manual over-ride button. Added plumbing wall penetration is required for DC actuator wiring.

Provide large diameter flush valve including angle control-stop valve, vacuum breaker, tail pieces, slip nuts, and wall plates.

Flush valve components, if exposed to view, shall be chromium-plated or polished stainless steel.

Mount flush valves not less than 11 inches above the fixture.

At ADA urinal, flush valve handle shall be a maximum of 44 inches above floor.

Flush Valve shall be equal to ZURN, ZEMS6000AV-MOB-W1-EWS-HW6, QTY 2. The P6000-HW6 power converter and 120VAC, 1PH, 60HZ, 2A power supply specified with electrical design.

WALL HUNG LAVATORIES

Lavatories shall be per ASME A112.19.2/CSA B45.1.

Lavatories shall be of white vitreous china, straight back type, wall mounted.

Lavatories must be a minimum of 19 inches wide by 17 inches front to rear, with single hole water supply opening for use with top mounted center-set auto-sensing faucets.

SECTION 22 00 00
PLUMBING and PIPING

Mount sinks with the front rim of bowl 34 inches above floor and with 29 inches minimum clearance from bottom of the sink fixture to floor.

Provide ASME A112.6.1M concealed chair carriers with vertical steel pipe supports and concealed arms for the lavatory.

Lavatory shall be equal to ZURN Z5311 sinks, QTY 4 each.

Faucets must meet the EPA WaterSense product definition specified, and must be labeled as EPA WaterSense products. Provide data identifying WaterSense label for lavatory faucet fixture.

Provide faucet aerator with a maximum flow rate of 0.5 gpm at a flowing pressure of 60 psi. Water volume must be limited to 0.25 gal per metering cycle.

Provide top mounted, washer-less, center-set auto-sensing lavatory faucets.

Auto-sensing faucets shall be hard-wired, not battery operated.

Polished chrome-plated pipe and fittings shall be provided, if exposed to view.

Provide filters for chlorine in supply piping to faucets.

Faucets shall be ZURN Z6915-XL-N-HW6, or equal, QTY 4.

The P6000-HW6 power converter and 120VAC, 1PH, 60HZ, 2A power supply specified with electrical design.

BREAK RM SINK

Sink shall be per ASME A112.19.3/CSA B45.4.

Sink shall be of 20 gage stainless steel under-counter-top mounted sink.

Sink shall be of minimum dimensions of 30 inches wide by 17 inches front to rear, two bowl compartments of minimum 8" deep. A single hole supply opening is required for use with top mounted washer-less sink faucet. Provide two stainless steel 1-1/2" drain outlets and stainless steel cup strainers for connection at a single 2.5 inch drain outlet. Provide separate 1-1/2" P-traps and drain piping to vertical vent piping from each bowl compartment of sink.

Break Room sink shall be equal to PlumberFriendly PFSSU31188, QTY 1

Faucets must meet the EPA WaterSense product definition specified, and must be labeled as EPA WaterSense products. Provide data identifying WaterSense label for lavatory faucet fixture.

Provide faucet aerator with a maximum flow rate of 0.5 gpm at a flowing pressure of 60 psi. Water volume must be limited to 0.25 gal per metering cycle.

Provide top mounted, washer-less, center-set, auto-sensing lavatory faucets.

Auto-sensing faucets shall be hard-wired, not battery operated.

Polished chrome-plated pipe and fittings shall be provided, if exposed to view.

Provide filters for chlorine in supply piping to faucets.

Faucets shall be ZURN Z6920-XL- CP4-GC-N-HW6, or equal, QTY 1.

SECTION 22 00 00
PLUMBING and PIPING

The P6000-HW6 power converter and 120VAC, 1PH, 60HZ, 2A power supply specified with electrical design.

REFRIGERANT PIPING INSTALLATION

Refrigerant pipe, fitting installation shall conform to the requirements of ASME B31.1. Cut pipe accurately to measurements established at the jobsite, and work into place without springing or forcing, completely clearing all windows, doors, and other openings.

Cutting or other weakening of the building structure to facilitate piping installation are not permitted without written approval.

Make changes in pipe direction with fittings. Mitering or notching pipe or other similar construction to form elbows or tees is not permitted.

Bending of soft annealed copper pipe <4" is permitted, provided a pipe bender is used and wide sweep bends are formed. Bending of hard drawn copper pipe is not permitted. The centerline radius of bends shall not be less than 6 diameters of the pipe. Bent pipe showing kinks, wrinkles, flattening, or other malformations will not be accepted.

Refrigerant piping shall be installed on a drain slope of 1/2"/10 ft pipe in the direction of flow to ensure adequate oil drainage.

Open ends of refrigerant lines or equipment shall be properly capped or plugged during installation to keep moisture, dirt, or other foreign material out of the system. Piping shall remain capped until installation.

Equipment piping shall be in accordance with the equipment manufacturer's recommendations and the contract drawings.

Equipment and piping arrangements shall fit into space allotted and allow adequate acceptable clearances for installation, replacement, entry, servicing, and maintenance.

REFRIGERANT PIPING SYSTEM TESTING

After all components of the refrigerant systems have been installed and connected, the entire refrigeration system shall be tested via pneumatic pressure test, evacuation test, and operational startup testing.

Each stage of this refrigerant system testing must be scheduled and coordinated thru Vectrus CM.

Provide the services of a manufacturer's representative to perform operational start-up testing and confirmation of equipment warranty.

Provide test reports for each stage of testing noted.

Preliminary Procedures

Prior to pneumatic testing, equipment which has been factory tested and refrigerant charged as well as equipment which could be damaged or cause personnel injury by

SECTION 22 00 00
PLUMBING and PIPING

imposed test pressure, positive or negative, shall be isolated from the test pressure or removed from the system.

Pneumatic Test

Pressure control and excess pressure protection shall be provided at the source of test pressure. Valves shall be wide open, except those leading to the atmosphere.

Test gas shall be dry nitrogen.

Test pressure shall be applied in two stages before any refrigerant pipe is insulated or covered.

First stage test shall be at 10 psi with every joint being tested with a thick soap or color indicating solution.

Second stage testing shall be run in increments up to 400psi (1.25X 318psi R410A SCP). Pressure above 100 psig shall be raised in 10% (or 40psi) increments with a pressure settling time period between increments. The initial test pressure shall be recorded along with the ambient temperature. Final second stage test increment pressure shall be maintained on the system for a minimum of 24 hours. After this 24 hour period, the system pressure will be recorded along with the ambient temperature to which the system is exposed. (Apply a pressure correction factor of 0.3 psi per degF change between initial and final ambient temperatures, add pressure for increase temperature and reduce pressure for a decrease in pressure). If the corrected system pressure is not exactly equal to the initial system test pressure, then the system shall be investigated for leaking joints.

To repair refrigerant leaks, joints shall be taken apart, thoroughly cleaned, and reconstructed as a new joint. Joints shall NOT be repaired by caulking, remelting, or back-welding/brazing. Following repair, the entire system shall be retested using the pneumatic tests described above. The entire system shall be reassembled once the pneumatic tests are satisfactorily completed.

Evacuation Test

Following satisfactory completion of the pneumatic tests, the pressure shall be relieved and the entire system shall be evacuated to an absolute pressure of 300 micrometers. During evacuation of the system, the ambient temperature shall be higher than 35degF. Once the desired vacuum pressure has been reached, the vacuum line shall be closed and the system shall stand for 1 hour. If the pressure rises over 500 micrometers after the

1 hour period, then the system shall be evacuated again down to 300 micrometers and let set for another 1 hour period.

The system shall not be charged until a vacuum of at least 500 micrometers is maintained for a period of 1 hour without the assistance of a vacuum line. If during the testing the pressure continues to rise, check the system for leaks, repair as required, and repeat the evacuation procedure.

SECTION 22 00 00
PLUMBING and PIPING

During evacuation testing, vacuum pressures shall be recorded by a thermocouple-type, electronic-type, or a calibrated-micrometer type gauge at start and end of each 1 hour standing increment.

System Charging and Startup Test

Following satisfactory completion of both pneumatic and evacuation tests, the refrigerant system shall be charged with the required amount of refrigerant by raising pressure to normal operating pressure and in accordance with manufacturer's procedures.

Following charging, the system shall operate with high-side and low-side pressures and corresponding refrigerant temperatures, at design or improved values. The entire system shall be tested for leaks. Fluorocarbon systems shall be tested with halide torch or electronic leak detectors.

Refrigerant Leakage

If a refrigerant leak is discovered after the system has been charged, the system refrigerant shall be pumped into the system receiver or other suitable container. Under no circumstances shall the refrigerant be discharged into the atmosphere.

At all times during the installation and testing of the refrigeration system, Contractor shall take steps to prevent the release of refrigerants into the atmosphere. At no time shall more than 3ozs of refrigerant be released to the atmosphere in any one occurrence. Any system refrigerant leaks within the first year shall be repaired in accordance with the requirements herein at no cost to the Government including material, labor, and refrigerant if the leak is the result of defective equipment, material, or installation.

CFR, HFW PIPING SYSTEM TESTING

CFW, HFW piping shall be visually inspected for leaks during operational testing of plumbing fixtures.

WASTE DRAIN TESTING

Waste drain piping shall be sufficiently flushed to insure no clogging exists within the existing drainage system. Waste drain piping shall be visually inspected for leaks during operational testing of plumbing fixtures.

CONDENSATE DRAIN TESTING

Condensate drain piping shall be gravity tested. Each drain in Mech Rm, HW heater drain, AHU1 & AHU2 condensate drains rerouted with the replacement of AHU1 shall be gravity tested and visually inspected for leaks, with piping full of water using a plug at Mech Rm floor drain. When plug is removed from each drain, all effluent shall be captured by floor drain, without running over Mech Rm floor.

SECTION 22 00 00
PLUMBING and PIPING

NATURAL GAS TESTING

Initially, natural gas piping shall be pressure tested with nitrogen to 38psig (1.5X max. operating pressure, 25psig) for a duration of 15minutes. (See NFPA 54.7.1)

Test pressure gage must have scale range limited to <0-125psig. No leak of test pressure will be acceptable. Leak detection, if required, shall be accomplished with approved gas detection device. Repair of leaking section of natural gas piping shall will require replacement and re-test.

Secondly, all B0412 natural gas piping and connected equipment (new and existing) must be leak tested using fuel gas, before new equipment is to be placed into operation. Fuel gas leak test must be conducted at 25psig. (See NFPA 54.7.2) Repair of leaking section of natural gas piping or equipment (new or existing) shall will require repair or replacement and re-test.

Start-Up testing of equipment to be accomplished with contractor and manufacturer's representative to insure warranty is granted.

REFRIGERANT PIPE INSULATION

Refrigerant pipe, joints, fittings, and valves shall be insulated with factory pre-molded, precut or field-fabricated insulation. The type and thickness of insulation required shall be as listed herein.

Refrigerant piping shall use black flexible EPDM elastomeric-based unicellular insulation with aluminum jacket per ASTM C534, Type I, Tubular Gr 1; see Armacell, AP Armaflex Tube or equal.

Seal all insulation joints with adhesive, per ArmaFlex 520 adhesive or equal.

Insulation shall be continuous through hangers. Extend all surface finishes to protect all surfaces, ends, and raw edges of insulation. Bevel and seal the edges of exposed insulation. Where pipes penetrate fire walls, provide mineral-fiber insulation inserts and sheet-metal sleeves. Insulate flanges, unions, valves and fittings in accordance with manufacturer's published instructions. Cover circumferential joints with butt strips, not less than 3-inches wide, of material identical to the jacket material. Overlap longitudinal laps of jacket material not less than 1-1/2 inches. Use a vapor barrier coating on the ends of section of insulation that butt against flanges, unions, valves and fittings and joints. Apply this vapor barrier coating at all longitudinal and circumferential laps. At penetrations by pressure gauges and thermometers, fill the voids with the vapor barrier coating. Seal with a brush coat of the same coating.

MISCELLANEOUS INSTALLATION ITEMS

- a. Pipe Penetrations and Sleeves in Masonry, Concrete

SECTION 22 00 00
PLUMBING and PIPING

Sleeves shall not be installed in structural members.

Sleeves in non-load bearing surfaces shall be galvanized 20gauge sheet metal, conforming to ASTM A653/A653M G90.

Sleeves in load bearing surfaces shall be uncoated SCH40 carbon steel pipe, conforming to ASTM A53/A53M.

Core drilling of masonry and concrete may be provided in lieu of pipe sleeves when cavities in the core-drilled hole are completely grouted smooth.

Provide sealants for all pipe penetrations. All pipe penetrations shall be sealed to prevent infiltration of air, insects, and vermin. Sealants shall be applied to moisture and oil-free surfaces.

Fire Seal shall be used where pipes pass through fire walls, fire-partitions, fire-rated pipe chase walls or floors above grade.

b. Support for Concrete-Masonry Wall Construction

Chair carrier shall be anchored to floor slab. Where a floor-anchored chair carrier cannot be used, a suitable wall plate shall be fastened to the concrete wall using through bolts and a back-up plate.

Where wall-mounted plumbing fixtures are provided, reinforced wax, treated felt, or neoprene gaskets shall be provided. The type of gasket furnished shall be as recommended by the chair-carrier manufacturer.

c. Access Panels

Access panels shall be provided for concealed valves and controls, or any item requiring inspection or maintenance. Access panels shall be of sufficient size and located so that the concealed items may be serviced, maintained, or replaced.

d. Manufacturer's Nameplate

Each item of plumbing equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place. The nameplate of ONLY the distributing agent will not be acceptable.

e. Accessibility of Equipment

Install all work so that parts requiring periodic inspection, operation, maintenance, and repair are readily accessible. Install concealed valves, expansion joints, controls, dampers, and equipment requiring access, in locations freely accessible through access doors.

f. Delivery, Storage, and Handling

Handle, store, and protect equipment and materials to prevent damage before and during installation in accordance with the manufacturer's recommendations, and as approved by the Contracting Officer. Replace damaged or defective items.

g. Protection of Fixtures, Materials, and Equipment

Pipe openings shall be closed with caps or plugs during installation.

Fixtures and equipment shall be tightly covered and protected against dirt, water, chemicals, and mechanical injury. Upon completion of the work, the fixtures, materials, and equipment shall be thoroughly cleaned, adjusted, and operated.

Safety guards shall be provided for exposed rotating equipment.

h. Pipe Identification:

Piping within Mech Rm shall be labeled similar to existing pipe.

Label pipe with direction of flow and system clarification, as noted.

SECTION 22 00 00
PLUMBING and PIPING

NATURAL GAS	Yellow	Natural Gas Supply
CONDENSATE	NA	Condensate Drain
DRAIN	NA	HW Heater Drain
REFRIGERANT	NA	Refrigerant

Use plastic tape pipe markers. Plastic tape pipe markers shall be of flexible, vinyl film tape with adhesive backing and printed markings as manufactured by W.H. Brady Company. For insulated & non-insulated indoor pipe use Brady B350. Pipe identification is to be installed at ten foot intervals, as a maximum.

END OF SECTION

SECTION 23 00 00
DUCT CONSTRUCTION & ACCESSORIES

This specification is derived from UFC 03 410 01, UFGS 23 00 00, UFGS 23 31 13, UFGS 23 41 13, and UFGS 23 37 13 for the B0412 DSCA Renovation.

SPECIFICATION OF LOW PRESSURE STEEL DUCTWORK:

- Construction, metal gauge, and reinforcements shall conform with NFPA 90A/B, UL181A/B and SMACNA Low Pressure Duct construction standards (<2"wc, <2000fpm) for metal and flexible ductwork.
 - Fabricate duct from ASTM A653& ASTM A924 galvanized sheet steel, lock-forming quality, with G90 zinc coating of 1.25oz/sf for each side.
 - Minimum sheet metal fabrication thickness of ductwork shall be as follows:
 - Duct Width < 12", Use 26ga
 - Duct Width < 30", Use 24ga
 - Duct components shall fit so that joints are not mis-matched. Do not use sealant and/or tape to compensate for mismatched connections.
 - Duct sections shall not vibrate or pulsate when system is in operation.
 - Fabricate ducts so that the gauge markings are on the outside of the duct.
 - Ductwork shall conform to SMACNA Seal Class B. Allowable air leakage rate limited to 3-10% of system capacity.
 - Joints and Laps: Make longitudinal & transverse joints substantially airtight.
 - Joint Mastic Sealant shall be elastomeric sealant per ASTM C920, Type S (single component), Grade NS (non-sag), Class 50 (non-traffic). Euclid Chemical, Eucolastic 1NS or equal.
 - Seam Sealant shall be one-part, non-sag, solvent release curing, polymerized butyl sealant, with minimum of 75% solids. Duro-Dyne DLSN or equal.
 - Joint & Seam Tape systems shall not be used unless approved.
- **INSTALLATION OF LOW PRESSURE STEEL DUCTWORK:**
 - Installation shall conform with NFPA90A, NFPA90B, and SMACNA.
 - Provide mounting and supporting of ductwork and accessories including, but not limited to, structural supports, hangers, vibration isolators, stands, clamps and brackets, access doors and dampers.
 - Install ductwork accessories as indicated in accordance with the manufacturer's printed instruction. Allow clearance for inspection, repair, replacement and service.
 - The contractor shall be responsible to re-fabricate ductwork to fit at no additional cost to the owner if it is fabricated and then determined that it will not fit in the area intended.
 - **Duct Supports:** See SMACNA, HVAC Duct Construction Standards – Metal and Flexible for details. Duct shall be supported by not less than two 1 inch wide by 1/16 inch thick galvanized strap of sheet steel hangers located one on each side of duct, spaced not over 6 feet on centers for ducts up to 24 inches wide. Support flexible ducts every 3

SECTION 23 00 00
DUCT CONSTRUCTION & ACCESSORIES

feet. And steel trapeze hangers shall be of ASTM A36 steel. Provide sway bracing as required.

Attach supports only to structural framing members and concrete slabs. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.

Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.

Provide suitable metal intermediate framing where supports are required between structural framing members. Do not support ducts from metal decking.

- **Duct Insulation:** Complete ductwork leak test with satisfactory results prior to applying insulation to ductwork exterior or concealing ductwork.
- Duct insulation shall be field applied blanket insulation of R3.3 minimum in accordance ASHRAE 90.1 and acceptable per ASTM C553, Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications
For AHU SA, RA ducts, Use Owens-Corning SOFTR Duct Wrap FRK Type75 @ 2"thick R5.6 or equal.
- Provide CFC and HCFC free insulation.
- Insulation must have a maximum flame spread index of 25 and a maximum smoke developed index of 50 per ASTM E84 and UL 723 testing.
- Provide insulation with insulation manufacturer's standard reinforced fire-retardant jacket with integral vapor barrier. Insulation exterior shall be cleanable, grease resistant, non-flaking and non-peeling.
- Vapor barrier/weatherproofing jacket shall be laminated self-adhesive (min. 2 mils adhesive, 3mils embossed) less than 0.05 perms.
- Insulation materials shall be compatible and shall not contribute to corrosion, soften, or otherwise attack surfaces to which applied in either wet or dry state.
- **Insulation Adhesives:** Insulation adhesives must meet ASTM C916, Standard Specification for Adhesives for Duct Thermal Insulation. Provide non-aerosol adhesive products used on the interior of the building that meet VOC content requirements of SCAQMD Rule 1168 and SCAQMD Rule 1168 for sealants. Provide aerosol adhesives used on the interior of the building that meet either emissions requirements of CDPH SECTION 01350 or VOC content requirements of GS-36. Provide certification or validation of indoor air quality for adhesives.
- Provide insulation systems in accordance with the approved MICA National Insulation Standards plates as supplemented by this specification.
- Submit a complete list of materials, including manufacturer's descriptive technical literature, performance data, catalog cuts, and installation instructions. The product number, k-value, thickness and furnished accessories including adhesives, sealants and jackets for each mechanical system requiring insulation shall be included. The product data must be copyrighted, have an identifying or publication number, and shall have been published prior to the issuance date of this solicitation. Materials furnished under this section shall be submitted together in a booklet and in conjunction with the MICA plates booklet. Annotate the product data to indicate which MICA plate is applicable.

SECTION 23 00 00
DUCT CONSTRUCTION & ACCESSORIES

• **DUCTS ACCESSORIES:**

- **Fire Dampers:** Provide (2) fire dampers that conform to the requirements of NFPA 90A and UL 555. Use 1.5 hour rated fire dampers with 165degF fusible links. Provide curtain type vertical in-wall mounted fire dampers with damper blades out of the air stream, for use in dynamic air system. However dampers will not install in wall, but in duct adjacent to an in wall security barrier.
Use RUSKIN, DIBD2 (Style B) fire dampers or equal for (2) dampers required. (2) 20x16, H=19" in SA & RA ducts at stud wall between Mech Rm, Phone Rm. See reference drawing sheet M2.0 for size and location of both fire dampers. Detail is given for fire damper, security barrier, and access door.
- Comply with the installation details given in SMACNA 1819 and in manufacturer's instructions for fire dampers.
- Install dampers that do not reduce the duct or the air transfer opening cross-sectional area. Install dampers so that the centerline of the damper depth or thickness is located in the centerline of the wall, partition or floor slab depth or thickness.
- Equip fire dampers with a steel sleeve or adequately sized frame installed in such a manner that disruption of the attached ductwork, if any, does not impair the operation of the damper. Equip sleeves or frames with perimeter mounting angles attached on both sides of the wall or floor opening.
- Damper Acceptance Test: Submit the proposed schedule to Vectrus CM, at least 2 weeks prior to the start of test. Perform the fire damper test as outlined in NFPA 90A. Operate all fire dampers under normal operating conditions, prior to the occupancy of a building to determine that they function properly. Test each fire damper equipped with fusible link by having the fusible link cut in place. Test dynamic fire dampers with the AHU running. Reset all fire dampers with the fusible links replaced after acceptance testing. To ensure optimum operation and performance, install the damper so it is square and free from racking.
- **Supply Air (SA) Diffusers:** Air diffusion devices to be tested, rated per ASHRAE 113.
- Square 24x24, 14x14 rectangular neck, 4-WAY throw, LAY-IN type ceiling diffusers which simultaneously diffuse air at 20 to 50 fpm. Include pattern adjustments horizontal, vertical projection, and an intermediate position or range. Diffuser shall have Aluminum diffuser with standard #26 WHITE, baked enamel finish. Diffuser shall be equipped with an equalizing grid air straightener. Diffuser shall have an integral volume/balancing damper.
Use: TITUS, D-TDC-AA, 14x14 RECT NECK, LAY-IN BORDER TYP 3, A4-4 WAY SQUARE 24X24 MODULE, A=14, with model EG equalizing grid, and AG-100 damper (QTY: 10) or equal.
- **Return Air (RA) Grilles:**

SECTION 23 00 00
DUCT CONSTRUCTION & ACCESSORIES

- Louvered return grilles shall be square 24x24, 14x14 neck, single deflection type with fixed face bars (35deg deflection and 3/4" blade spacing)
Louvered grille shall be of aluminum, with standard #26 WHITE, baked enamel finish. Louvered grille shall have an integral opposed blade volume/balancing damper. Damper shall have screw driver accessible adjustment thru face of grille.
Use: TITUS, 350FL, 24x24 ceiling module, 14x14 neck, LAY-IN BORDER TYP 3, with AG-15 neck mounted damper. (QTY: 13) or equal.
- **Manual Balancing Dampers:** Provide (7) new dampers per design. Location of NEW volume (manual, balancing) dampers is given within reference drawing sheets M2.0 & 3.0.
- Dampers shall be of galvanized steel to same specification as duct. Dampers shall be to the following parameters:
Qty 7 Rect </=20"W, 16ga frame/blade, 1/2"sq axle, L=3"min.
Use RUSKIN CD36, OPPOSED BLADE, ENHANCED TEMP or equal
1-14x4, 4-14x8, 2-20x14 to be field verified by contractor.
- Furnish manual balancing dampers with accessible operating mechanisms. Operators shall be locking-type quadrant operators. For operators, provide stand-off mounting brackets, bases, or adapters at a minimum 2" off metal duct surface to clear duct insulation. Provide stand-off mounting items that are integral with the operator or standard accessory of the damper manufacturer.
- Contractor and TAB contractor shall survey all existing building 0412 duct runs to determine if sufficient existing volume dampers exist to accomplish a satisfactory TAB testing. If no, contractor shall notify VECTRUS CM in writing providing a listing of volume dampers required.
- **Duct Access Doors:** Provide duct access doors at regular intervals to facilitate the cleaning of duct systems and access to fire dampers, duct sensors, and equipment.
- Only (2) 12x12 duct side-mounted, insulated access doors are required at each new fire damper.
- Access doors shall conform to SMACNA 1966 in ductwork at all HVAC apparatus requiring service and inspection in the duct system.
- Use insulated type doors in insulated ducts.
- Contractor and TAB contractor shall survey all existing building 0412 duct runs to determine if sufficient duct access doors exist to accomplish maintenance of old, new equipment. If no, contractor shall notify VECTRUS CM in writing providing a listing of access doors required.
- **Duct Security Barrier:** Fabricate & install (2) duct security barriers conforming to reference drawing M2.0, Details 2. The security barriers must install in wall between Mech Rm 112, and Phone Rm 111C within both the SA & RA 20x16 duct penetrations. Fire dampers are to be installed adjacent to the security barriers.
- **Disposable Air Filters:** Air filters must be UL 900, Class 2 extended surface pleated panel filters, of nonwoven cotton and synthetic fiber mat media, with wire support grid bonded to the media to a moisture resistant fiberboard frame. All four edges of the

SECTION 23 00 00
DUCT CONSTRUCTION & ACCESSORIES

filter media must be bonded to the inside of the frame to prevent air bypass and increase rigidity.

- With AHU 1, Two 20x25 filters will be required for initial install & testing. Contractor shall provide three replacements sets of filters.
- Filters shall be 2" deep, sectional, type filters to MERV 8 per ASHRAE 52.2. Initial resistance at 500 fpm shall be < 0.36" WG, with Arrestance of 75%, and a Dust Holding Capacity of 190 gram/SF.

USE AAF Intl.-Flanders 2" Pre-Pleated LPD-MERV8 SC/HC Filters, or equal (10-15 pleats per foot), nominal size of 20x25x2. (QTY=8)

NEW SPLIT HVAC UNIT @ DSCA: (AHU-1)

DX Condensing (OUTDOOR) Unit:

TRANE, TTA12043C-AB00A-x0400000

120MBH, 10TON nominal DX CONDENSING UNIT SEER 14 (or equal)

Refrigerant R410A with POE OIL

Electrical Service, 208VAC/3PH/60HZ, MOA: 41A, MCP: 50A

Refrigeration, 2-compressors, single line, 2 stages with manifold

Weight & Dimensions, 39H X 38W X 51D, WT=416#

Condenser coil shall as Complete Coat MCHE

To install on existing concrete pad.

Use existing 1-1/2" OD, 5/8" OD refrigerant lines buried in PVC conduit, with reducers to make 1-3/8" OD, 1/2" OD unit connections.

Manufacturer Warranty:

Full Unit warranty for 12months from start-up.

Heat Exchanger & Compressors warranty for 5years from start-up.

DX Evaporator Coil (INDOOR) Unit:

TRANE, UCCAx06A0-XX-xxxxx00000xx0000xA0B00000xxx0

Indoor AHU with DX coil, Supply fan, and flat filter mixing box.

9.25TON (10TON nominal) capacity @ 2600CFM

2600CFM NOMINAL @ APPROX 2.8" WG TSP (or equal)

Electrical Service 208VAC/3PH/60HZ, MOA 12A, MCP 20A, 3hp motor

Weight & Dimensions,

AHU, 61H X 47W X 37L, WT=330# (w/ access to coil, motor, filter)

Mixing Box, 33H X 47W X 37L, 227# (w/ opening at XXX)

Drain Pan-12; Coil-13,14,15,22; Controls-16, 30,31,32; Mixing Box-28,37,38,39

Constant volume fan supply, No volume control required.

Filter shall be QTY 4, 2" thick MERV 8 disposable, pleated filters.

Manufacturer Warranty:

Full Unit warranty for 12months from start-up.

GAS Fired "Clamshell" Duct Furnace (INDOOR) Unit:

TRANE, GLND120ADA3-000-AxCxxH0x0-00-xA0xWX00x7xx8

Indoor gas fired (120MBHinput/100MBHoutput) duct furnace with AHU1 (or equal)

1/2" Natural Gas supply @ 6-45scfm max

13 JULY 2020

SECTION 23 00 00
DUCT CONSTRUCTION & ACCESSORIES

Electrical Service 120VAC/1PH/60HZ, MOA: 21A, MCP: 25A –OPD 2hp mtr
Weight & Dimensions, GLND120, 21H X 26-37W X 26D, WT=186#
Stainless steel heat exchanger, burners, flue collector
Inlet & Discharge duct flanges. (no discharge splitter, or nozzles)
No T-STAT with unit. To interlock with EMCS controls.
Manufacturer Warranty:
Full duct furnace unit shall have 1 year warranty from start.

NEW MINI-SPLIT Heat Pump Unit @ LAN ROOM:

Fujitsu-Halcyon, 9RL2,
9000MBH 3/4 TON CLG, 10MBH HTG (SEER 16)
AOU09RL2, (OUTDOOR) Condensing Unit (or equal)
Refrigerant R410A, POE OIL
Electrical Service 115VAC/1PH/60HZ, MOA: 13A, MCP: 20A
Weight & Dimensions 24H X 31W X 16D, WT=68#
to be centered on NEW 6H X 37W X 23D concrete pad
ASU09RL2, (INDOOR) wall mounted Evaporator Unit (or equal)
Supply air 190-440 CFM
11H X 33W X 8D, WT=20# to be mounted @ 4" from ceiling on wall
Manufacturer Warranty:
Full Unit parts warranty for 5years from start-up.
Compressor warranty for 7years from start-up.
Controls & Accessories warranty for 90days from start-up.

END OF SECTION

SECTION 23 01 30
DUCT CLEANING

This specification is derived from UFGS 23 01 30 for the B0412 DSCA Renovation.

Contractor shall accomplish duct cleaning work per National Air Duct Cleaners Association guidelines given within the following documents:

- a. NADCA Standard for Assessment, Cleaning, and Restoration of HVAC Systems
- b. NADCA HVAC Inspection Manual (2016)

The scope of this work specification shall include building 0412 HVAC systems. AHU 1, AHU 2 and all distribution ductwork. The scope shall also include, the exhaust fans and ductwork in both Mens & Womens Restrooms and the OA intake ductwork in Mech Rm.

Note, that AHU 1 is being replaced. AHU 2 is not being replaced.

Note, that other project work scope includes the removal, replacement of all existing SA diffusers and RA grilles in renovated DSCA area. The existing SA diffusers and RA, EA grilles in NON-DSCA areas will be cleaned as noted in this specification.

Note, that other project work scope includes the removal, replacement of all duct insulation throughout the building 0142.

Definition of HVAC System

HVAC system includes any interior surface of the facility's air distribution system for conditioned spaces and/or occupied zones. This includes the entire heating, air-conditioning and ventilation system from the points where the air enters the system to the points where the air is discharged from the system. The return air grilles, return air ducts (except ceiling plenums and mechanical room) to the air handling unit (AHU), the interior surfaces of the AHU, mixing box, coil compartment, condensate drain pans, humidifiers and dehumidifiers, supply air ducts, fans, fan housing, fan blades, air wash systems, spray eliminators, turning vanes, filters, filter housings, reheat coils, and supply diffusers are all considered part of the HVAC system. The HVAC system may also include other components such as dedicated exhaust and ventilation components and make-up air systems.

Contractor shall maintain a copy of all current Safety Data Sheet (SDS) documentation and safety certifications on site at all times.

Submit all Safety Data Sheets (SDS) for all chemical products proposed used in the cleaning process, including all VOC ratings.

Contractor shall comply with all applicable Federal, State, and local requirements for protecting the safety of the contractors' employees, building occupants, and the

environment. In particular, follow all applicable standards of the Occupational Safety and Health Administration (OSHA) when working in accordance with this specification.

Dispose of all debris removed from the HVAC System in accordance with applicable Federal, State and local requirements.

Work Execution Schedule

Contractor shall conduct a site evaluation, and establish a specific, coordination plan which details how each area of the building is protected during the various phases of the project. Include this coordination plan with a "Work Execution Schedule"
Submit this "Work Execution Schedule" within 10 working days of the contract award.

Record of Existing Conditions

Perform a visual inspection of the HVAC system, coordinated with Vectrus CM, to determine appropriate methods, tools, and equipment required to satisfactorily complete this project. Document damaged system components found during the inspection.

Submit "Record of Existing Conditions" to Vectrus CM prior to the start of any cleaning work.

Post-Project Report

At the conclusion of the project, submit a Testing Procedures Summary and Post-Project Report indicating success of the cleaning project, as verified through visual inspection and/or gravimetric analysis. List also areas of the system found to be damaged and/or in need of repair.

General HVAC System Cleaning Requirements

Containment

Collect debris removed during cleaning and take precautions to ensure that debris is not otherwise dispersed outside the HVAC system during the cleaning process.

Particulate Collection

Where the Particulate Collection Equipment (PCE) is exhausting inside the building, use HEPA filtration with 99.97 percent collection efficiency for 0.3-micron size (or greater).

When the PCE is exhausting outside the building, undertake mechanical cleaning operations only with PCE, including adequate filtration to contain debris removed from the HVAC system. When the PCE is exhausting outside the building, take precautions to locate the equipment down wind and away from all air intakes and other points of entry into the building.

Controlling Odors

Take all reasonable measures to control offensive odors and/or mist vapors during the cleaning process.

Component Cleaning

Employ cleaning methods such that all HVAC system components are Visibly Clean as defined in applicable standards. Upon completion, return all components to those settings recorded just prior to cleaning operations.

Air-Volume Control Devices

Mark the position of dampers and any air-directional mechanical devices inside the HVAC system prior to cleaning and, upon completion, restore to their marked position.

Service Openings

Utilize service openings, as required for proper cleaning, at various points of the HVAC system for physical and mechanical entry, and inspection. Utilize the existing service openings already installed in the HVAC system where possible.

Create other openings where needed in conformance with NADCA Standard 05. Place closures so they do not significantly hinder, restrict, alter the air-flow within the system, or compromise the structural integrity of the system. Properly insulate closures to prevent heat loss/gain or condensation on surfaces within the system. Conform construction techniques used in the creation of openings to requirements of applicable building and fire codes, and applicable NFPA, SMACNA and NADCA Standards.

Cutting service openings into flexible duct is not permitted. Disconnect flexible duct at the ends as needed for proper cleaning and inspection.

Reseal rigid fiber glass duct-board duct systems in accordance with NAIMA recommended practices; NAIMA AH112, NAIMA AH122, and NAIMA AH127. Only closure techniques which comply with UL 181, UL 181A, or UL 181B are suitable for fiber glass duct system closures.

Clearly mark all service openings, capable of being re-opened for future inspection or remediation, and report their location in project report documents.

Ceiling Sections (Tile)

Carefully remove and reinstall ceiling sections to gain access to HVAC systems during the cleaning process. Replace any damaged ceiling sections caused by the removal at no cost to the Government.

Air Distribution Devices (Registers, Grilles and Diffusers)

Clean all air distribution devices.

Air Handling Units, Terminal Units, Blowers and Exhaust Fans

Ensure that supply, return, and exhaust fans and blowers are thoroughly cleaned.

Areas for cleaning include blowers, fan housings, plenums (except ceiling supply and return plenums), scrolls, blades, or vanes, shafts, baffles, dampers and drive assemblies. Remove all visible surface contamination deposits in accordance with NADCA Standards.

- a. Clean all air handling unit (AHU) internal surfaces, components and

- condensate collectors and drains.
- b. Assure that a suitable operative drainage system is in place prior to beginning wash down procedures.
- c. Clean all coils and related components, including evaporator fins.

Duct Systems

- a. Create service openings in the system as necessary in order to accommodate cleaning of otherwise inaccessible areas.
- b. Mechanically clean all duct systems to remove all visible contaminants, such that the systems are capable of passing NADCA Cleaning Verification Testings Standards.

Mechanical Cleaning Methodology

Source Removal Cleaning Methods

Clean the HVAC system using Source Removal mechanical cleaning methods designed to extract contaminants from within the HVAC system and safely remove contaminants from the facility. Select Source Removal methods which will render the HVAC System Visibly Clean and capable of passing NADCA cleaning verification methods Standards and other specified standards and tests, in accordance with all general requirements. Use no cleaning method, or combination of methods, which could potentially damage components of the HVAC system or negatively alter the integrity of the system.

Incorporate the use of vacuum collection devices that are operated continuously during cleaning for all methods used. Connect a vacuum device to the downstream end of the section being cleaned through a predetermined opening. Use a vacuum collection device of sufficient power to render all areas being cleaned under negative pressure, such that containment of debris and the protection of the indoor environment is assured.

Equip all vacuum devices exhausting air inside the building, including hand-held vacuums and wet-vacuums, with HEPA filters (minimum efficiency).

Equip all vacuum devices exhausting air outside the facility with Particulate Collection including adequate filtration to contain Debris removed from the HVAC system, in a manner that does not allow contaminants to re-enter the facility. Release of debris outdoors which violates any outdoor environmental standards, codes or regulations is not allowed.

All methods require mechanical agitation devices to dislodge debris adhered to interior HVAC system surfaces, such that debris may be safely conveyed to vacuum collection devices. Acceptable methods include those which will not potentially damage the integrity of the ductwork, nor damage porous surface materials such as liners inside the ductwork or system components.

Methods of Cleaning Fibrous Glass Insulated Components

Thoroughly clean thermal & acoustic insulation elements present in any equipment or ductwork with HEPA vacuuming equipment. Clean while the HVAC system is under

constant negative pressure, and not permitted to get wet in accordance with applicable NADCA and NAIMA standards and recommendations.

Do not use cleaning methods that cause damage to fibrous glass components or renders the system capable of passing Cleaning Verification Tests NADCA Standards.

Damaged Fibrous Glass Material

If there is any evidence of damage, deterioration, delamination, friable material, mold or fungus growth, or moisture such that fibrous glass materials cannot be restored by cleaning or resurfacing with an acceptable insulation repair coating, identify them to the Contracting Officer for replacement.

When requested or specified, remediate exposed damaged insulation in air handlers and/or ductwork requiring replacement.

Replacement Material

If replacement of fiber glass materials is required, conform all materials to applicable industry codes and standards, including those of UL and SMACNA 1966.

Replacement of damaged insulation is not covered by this specification.

Cleaning of Coils

Use any cleaning method which renders the coil visibly clean and capable of passing NADCA Coil Cleaning Verification Standards. Coil drain pans are subject to Non-Porous Surfaces Cleaning Verification. Maintain operability of the drain for the condensate at all times. Do not damage, displace, inhibit heat transfer, or cause erosion of the coil surface or fins, and conform to coil manufacturer recommendations when available.

Thoroughly rinse coils with clean water to remove any latent residues.

Antimicrobial Agents and Coatings

Only apply antimicrobial agents if active fungal growth is reasonably suspected, or where unacceptable levels of fungal contamination have been verified through testing.

Perform application of any antimicrobial agents used to control the growth of fungal or bacteriological contaminants after the removal of surface deposits and debris.

Use only antimicrobial agents registered by the U.S. Environmental Protection Agency (EPA 402-F-91-102)(EPA 402-C-01-001) specifically for use within HVAC system.

Apply antimicrobial agents in strict accordance with manufacturer's instructions.

Use only antimicrobial coating products, for both porous and non-porous surfaces which are EPA registered, water soluble solutions with supporting efficacy data and SDS records.

Apply antimicrobial coatings according to manufacturer's instructions. Spray coatings directly onto interior ductwork surfaces, rather than "fog" downstream onto surfaces. Achieve a continuous film on the surface treated by the coating application, and apply in

strict accordance with manufacturer's minimum millage surface application rate standards for effectiveness.

FIELD QUALITY CONTROL

Cleanliness Verification

Verification of HVAC System cleanliness is determined after mechanical cleaning and before the application of any treatment or introduction of any treatment-related substance to the HVAC system, including antimicrobial agents and coatings.

Visual Inspection

Visually inspect the HVAC system to ensure that no visible contaminants are present.

If no contaminants are evident through visual inspection, consider the HVAC system clean; however, further verification of the system cleanliness through gravimetric or wipe testing analysis testing may be requested at the discretion of the Contracting Officer.

If visible contaminants are evident through visual inspection, re-clean those portions of the system where contaminants are visible, and subject to re-inspection for cleanliness.

Gravimetric Analysis

At the expense of the Contractor, test sections of the HVAC system for cleanliness using the NADCA Vacuum Test (gravimetric analysis) as specified in applicable NADCA Standards. Ensure levels of debris collected are equal to or less than acceptable levels defined in applicable NADCA Standards.

If gravimetric analysis determines that levels of debris are equal to or lower than those levels specified, the system is considered clean and to have passed cleanliness verification.

If gravimetric analysis determines that levels of debris exceed those specified in applicable NADCA standards, the system will not be considered clean, and re-cleaning of those sections of the system which failed cleanliness verification will be required at the expense of the HVAC system cleaning contractor.

Perform cleanliness verification immediately after mechanical cleaning and before the HVAC system is restored to normal operation.

Verification of Coil Cleaning

Cleaning is to restore the coil pressure drop to within 10 percent of the pressure drop measured when the coil was first installed. If the original pressure drop is not known, the coil will be considered clean only if the coil is free of foreign matter and chemical residue, based on a thorough visual inspection (see NADCA HVAC Inspection Manual Standards).

END OF SECTION