



Facilities Design
and Construction

ADDENDUM No. 02
TO THE
CONTRACT DOCUMENTS
JUNE 1, 2023

PROJECT No. 9557320
EAST 3 PHASE 2 REACTIVATION

GENERAL

This addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated MAY 2023 and consists of pages AD02-1 and Specifications. The following changes, additions and/or deletions shall be made to the following documents; all other conditions shall remain the same.

ITEM NO. I – SPECIFICATIONS

1. REPLACE Cover Sheet, Certifications Pages and Table of Contents.
2. ADD Specification Sections: 08 11 13 - Hollow Metal Doors & Frames, 08 14 23 - Clad Wood Doors, 08 31 00 - Access Doors and Panels, 26 51 19 LED Interior Lighting.

DocuSigned by:

Timothy Tsukamoto

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East Wing 3rd Floor Bed Re-Licensure
M054016 / 9557320*

Project Manual

Construction Documents

ACD0007

HGA

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HGA Commission Number
1500-146-00

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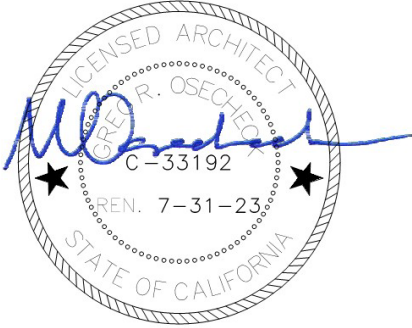
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5 AUG 2022

**DOCUMENT 00 01 05
CERTIFICATIONS PAGE**

ARCHITECTURAL



STRUCTURAL



MECHANICAL



ELECTRICAL



END OF DOCUMENT

00 01 10
TABLE OF CONTENTS

DIVISION 01 GENERAL REQUIREMENTS

- 01 11 00 Summary of the Work
- 01 14 00 Work Restrictions
- 01 25 00 Clarification/Information Procedures
- 01 25 50 Contract Modification Procedures
- 01 29 00 Measurement and Payment
- 01 31 00 Coordination
- 01 32 00 Contract Schedules
- 01 33 00 Shop Drawings, Product Data and Samples
- 01 34 00 Contractor(s) Emergency Procedures
- 01 35 00 Special Procedures
ILSM
- 01 39 00 Green Building Policy Implementation
EPA Collection Form
- 01 41 00 Regulatory Requirements
- 01 42 00 References
- 01 43 00 Mock-Ups
- 01 45 00 Quality Control
- 01 45 10 Seismic Control – HCAI
- 01 45 50 Inspection and Testing of Work
OSHPD Testing, Inspection & Observation (TIO)
- 01 51 00 Temporary Utilities
- 01 52 00 Construction Facilities
- 01 55 00 Vehicular Access and Parking
- 01 56 00 Temporary Barriers, Enclosures and Controls
- 01 56 10 Airborne Contaminants Control
ICRA Permit
- 01 56 10.13 Interim Life Safety Measures (ILSM)
- 01 56 20 Requirements for Ceiling Access to Spaces Containing Asbestos
- 01 57 13 Construction Noise Control
- 01 61 00 Product Requirements
- 01 73 00 Cutting and Patching
- 01 73 25 Seismic Restraint Requirements for Nonstructural Components
- 01 74 00 Cleaning
- 01 75 00 Starting and Adjusting Systems
- 01 76 00 Protection of Existing and Installed Construction
- 01 77 00 Closeout Procedures
- 01 78 00 Closeout Submittals
- 01 82 00 Demonstration and Training

DIVISION 02 EXISTING CONDITIONS

- 02 41 00 Selective Demolition (UCDH)
- 02 41 19 Selective Demolition
- 02 82 00 Asbestos Abatement and In-place Management
- 02 83 00 Hazardous Materials Management – Lead & Other Hazardous Materials

DIVISION 03 THROUGH 04

Refer to Drawings for information

DIVISION 05 METALS

Refer to Drawings for information
05 50 00 Metal Fabrications

DIVISION 06 WOOD, PLASTICS, AND COMPOSITES

06 40 00 Architectural Woodwork

UCDMC East Wing 3rd Floor Bed Re-Licensure M054016 / 9557320

DIVISION 07 THERMAL AND MOISTURE PROTECTION

- 07 81 00 Applied Fireproofing
- 07 84 00 Penetration Firestopping
- 07 84 43 Fire-Resistant Joint Systems
- 07 92 00 Joint Sealants

DIVISION 08 OPENINGS

- 08 11 13 Hollow Metal Doors and Frames
- 08 14 23 Clad Wood Doors
- 08 31 00 Access Doors and Frames

DIVISION 09 FINISHES

- 09 22 00 Non-Structural Metal Framing
- 09 29 00 Gypsum Board
- 09 65 00 Resilient Flooring
- 09 72 16 Rigid-Sheet Vinyl Wall Covering
- 09 77 00 Fiberglass Reinforced Panels
- 09 90 00 Painting

DIVISION 10 SPECIALTIES

- 10 21 23 Hospital Tracks & Cubicle Curtains
- 10 26 00 Wall & Door Protection
- 10 28 13 Toilet & Building Accessories

DIVISIONS 11 Through 21

Not Used

DIVISION 22 PLUMBING

- 22 05 00 Common Work Results for Plumbing
- 22 05 18 Escutcheons for Plumbing Piping
- 22 05 23.12 Ball Valves for Plumbing Piping
- 22 05 29 Hangers and Supports for Plumbing Piping and Equipment
- 22 05 53 Identification for Plumbing Piping and Equipment
- 22 07 19 Plumbing Piping Insulation
- 22 11 16 Domestic Water Piping
- 22 11 19 Domestic Water Piping Specialties
- 22 13 16 Sanitary Waste and Vent Piping
- 22 13 19 Sanitary Waste Piping Specialties
- 22 63 13 Gas Piping for Laboratory and Healthcare Facilities

DIVISION 23 HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

- 23 05 00 Common Work Results For HVAC
- 23 07 13 Duct Insulation
- 23 31 13 Metal Ducts
- 23 33 00 Air Duct Accessories
- 23 37 13 Diffusers, Registers, and Grilles

DIVISION 24 THROUGH 25

Not Used

DIVISION 26 ELECTRICAL

- 26 05 00 Common Work Results for Electrical
- 26 05 19 Low-Voltage Electrical Power Conductors and Cables
- 26 05 33 Raceways and Boxes for Electrical Systems
- 26 27 26 Wiring Devices
- 26 28 16 Enclosed Switches and Circuit Breakers
- 26 51 19 LED Interior Lighting

END OF SECTION

SECTION 08 11 13 HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Steel hollow metal doors and frames.
 - 2. Fire-rated hollow metal doors and frames.
 - 3. Hollow metal glazed openings, and other hollow metal frames for glass.
 - 4. Rough bucks, frame reinforcing, door reinforcing, door insulation, closure panels, clip angles and anchorage.
 - 5. Factory prime paint finish.

1.2 COORDINATION

- A. Anchorages: Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- B. Preparation for Hardware: Reinforced and machine hollow metal work for hardware.
 - 1. Obtain templates, shop drawings, jigs, or materials, and a copy of the accepted Hardware Schedule from the hardware distributor.
 - 2. Templates: Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
 - 3. Reinforcing: Reinforce the work of this Section to meet requirements for anchoring hardware using concealed fasteners.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, core descriptions, fire-resistance ratings, temperature-rise ratings, and finishes.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door type.
 - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4. Locations of reinforcement and preparations for hardware.
 - 5. Details of each different wall opening condition.
 - 6. Details of anchorages, joints, field splices, and connections.
 - 7. Details of accessories.
 - 8. Details of moldings, removable stops, and glazing.
 - 9. Details of conduit and preparations for power, signal, and control systems.
- C. Schedule: Provide a schedule, in electronic PDF format, of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each type of fire-rated hollow-metal door and frame assembly, for tests performed by a qualified testing agency.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch-high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.
- D. Handle hollow metal with care to prevent damage to hollow metal and to factory-applied primer and galvanized coatings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated, based on testing at positive pressure according to NFPA 252 (neutral pressure at 40" above sill) or UL 10C.
 - 1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105. Provide smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
 - 2. Temperature Rise Rating: At stair enclosures, provide doors with Temperature Rise Rating of 450 degrees F maximum in 30 minutes of fire exposure.
- B. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.

2.2 MANUFACTURERS

- A. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Ceco Door Products; an Assa Abloy Group company.
 - 2. Curries Company; an Assa Abloy Group company.
 - 3. Deansteel Manufacturing.
 - 4. Door Components, Inc.
 - 5. Hollow Metal Xpress.
 - 6. Pioneer Industries, Inc.
 - 7. Republic Doors and Frames.
 - 8. Steelcraft; an Ingersoll-Rand company.

2.3 MATERIALS AND COMPONENTS

- A. Steel Sheets:
 - 1. Cold-Rolled Steel Sheet: ASTM A1008, Commercial Steel (CS), Type B; suitable for exposed applications.
 - 2. Hot-Rolled Steel Sheet: ASTM A1011, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- B. Fastenings: Provide fastenings, anchors and clips as required to secure hollow metal work in place. Provide Jackson head screws, or flatter. Dimple metal work to receive screw heads. Set stops and other non-structural fastenings with #8 FHSMS.
- C. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.
- D. Steel Reinforcing: ASTM A36.

2.4 FABRICATION, GENERAL

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Construct doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
 - 1. Refer to Openings Schedule on Drawings for openings and locations.
 - 2. Door Thickness: 1-3/4 inches, unless otherwise indicated.
 - 3. Door Edge Construction: Model 2, Seamless.
 - 4. Minimum Thickness: Construct from base metal without coatings according to NAAMM-HMMA 803 and SDI A250.8. Provide heavier gage if required by details or specific condition. Entire frame and sidelight shall be of same gage.
- C. Interior Doors and Frames:
 - 1. Provide Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B; 0.042 inch minimum steel thickness, typical.

2.5 HOLLOW METAL FRAMES

- A. General: Provide frames as full profile welded unless otherwise indicated. Where necessary, alternate details will be considered provided design intent is maintained. Consider and provide for erection methods.
 - 1. Clearances: Provide and be responsible for proper clearances at metal frames, including for weatherstripping, sound stripping and smoke gasketing. Glass clearance shall be thickness of glass plus clearance each side (1/8 inch minimum exterior - 1/16 inch minimum interior), adjust for installation, glass thickness to allow for glazing and sealant. Where sealed double glazing is indicated, provide rebates minimum of 3/4 inch and provide 1/4 inch clearance at glass edges. Where units fit around concrete blocks (blocks built into frames) obtain actual dimensions of blocks being used to establish minimum clearances.
 - 2. Fire-Rated and Smoke-Rated Frames: Construct in accordance with requirements for labeled work. Attach proper U.L. label, Warnok Hersey. "B" labeled frames shall be 1-1/2 hour construction.
- B. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
- C. Mullions: Provide mullions, continuously reinforced, straight and without twist, of tubular design. For removable mullions provide fastenings of non-ferrous bolts at bottom, with sleeves at head of frame for mullion to clip over.
- D. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with [butted] [or] [mitered] hairline joints.
 - 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
 - 2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 - 3. Provide loose stops and moldings on inside of hollow-metal work.
 - 4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
- E. Jamb Anchors:
 - 1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.

2. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- F. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:
1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
- G. Fasteners:
1. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153.
 2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

2.6 HOLLOW METAL DOORS

- A. Flush Doors: Reinforce, stiffen and sound deaden. Provide cut-outs for glass and louvers with stops as shown.
1. Provide flush steel closure at top of exterior and interior doors and at bottom of exterior doors with drain holes in bottom closure. Following door construction types are acceptable.
 2. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch, steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches apart. Spot weld to face sheets no more than 5 inches o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
 3. Seamless Vertical Edges: Construct doors with smooth flush surfaces, without visible joints or seams on exposed faces or stile edges. Tack weld door edge seams, fill with body putty and grind smooth.
 4. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets.
 5. Bottom Edge Closures: Close bottom edges with end closures or channels of same material as face sheets.
 - a. Interior doors to receive sound gasket.
- B. Fire-Rated Doors: Insulate as required by Underwriters Laboratories. Build in special hardware and provide astragals as indicated.
1. At one hour and at 1-1/2 hour doors at enclosures, maximum transmitted temperature end point shall not exceed 450 degrees F above ambient at end of 30 minutes of fire exposure specified in NFPA 252 and UL 10 as applicable.
 2. Fire Door Cores: As required to provide fire-protection and temperature-rise ratings indicated.
 3. Astragals: Provide Z-style overlapping astragals as required by hardware application on one leaf of door pairs where required by NFPA 80 for fire-performance rating, and as indicated on other doors. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency. Flat bar astragals are not allowed.

2.7 FINISHES

- A. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting structure and conditions under which hollow metal is to be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install hollow metal in accordance with reviewed shop drawings and manufacturer's printed instructions. Securely fasten and anchor work in place without twists, warps, bulges or other unsatisfactory or defacing workmanship. Set hollow metal plumb, level, square to proper elevations, true to line and eye. Set clips and other anchors with Ramset "shot" anchors or drill in anchors as approved. Units and trim shall be fastened tightly together, with neat, uniform and tight joints.
- B. Placing Frames: Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
 - 1. At acoustic rated metal stud and gypsum board partitions, install insulation within frames.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - 3. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
 - 4. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- C. Place fire-rated frames in accordance with NFPA Standard #80.
- D. Door Installation: Fit hollow metal doors accurately in their respective frames, within following clearances: Jambs and head 3/32 inch, meeting edges pair of doors 1/8 inch, sill where no threshold or carpet 1/4 inch above finished floor, sill at threshold 3/4 inch maximum above finished floor, sill at carpet 1/4 inch above carpet. Place fire-rated doors with clearances as specified in NFPA Standard #80.
 - 1. Provide undercut no greater than 3/8-inch at doors equipped with automatic sound seal door bottoms.

3.3 INSTALLED WORK

- A. Remove grout and other bonding material from hollow-metal work immediately after installation.
- B. Touchup: Sand and clean rusted or abraded surfaces and apply compatible touchup finish:
 - 1. Primer: Apply air-drying, rust-inhibitive primer.
 - 2. Metallic-Coated Surface: Repair with galvanizing repair paint according to manufacturer's written instructions.
 - 3. Painting: As specified in Section 099000 - Painting.
- C. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.
- D. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

END OF SECTION

SECTION 08 14 23 CLAD WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Standard and fire rated type vinyl acrylic clad wood doors.
 - 2. Pre-fit and pre-machined acrylic-clad wood doors.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of door. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:
 - 1. Dimensions and locations of blocking.
 - 2. Dimensions and locations of mortises and holes for hardware.
 - 3. Dimensions and locations of cutouts.
 - 4. Undercuts.
 - 5. Doors to be factory finished and finish requirements.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Quality Standard: Comply with WDMA Industry Standard (I.S. IA-04 "Architectural Wood Flush Doors").
 - 1. Door shall meet all performance attributes for the following performance duty level: Extra Heavy Duty.
 - 2. Tolerances for warp, telegraphing, squareness and prefitting dimensions as per the latest edition of WDMA I.S. 1-A.
- B. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-ratings indicated, based on testing according to UL-10C Positive Pressure and NFPA 252.
 - 1. Where fire rated doors are required, provide doors labeled by Intertek/Warnock Hersey. Construction details and hardware application shall be as approved by the labeling agency.

2.2 PRODUCTS AND MANUFACTURERS

- A. Acceptable Products and Manufacturers:
 - 1. Design is based on Acrovyn Door Systems by Construction Specialties, Inc.
 - 2. Equivalent products from the following manufacturers may be acceptable provided they comply with the requirements of the Contract Documents:
 - a. InPro Architectural Products.
- B. Door Materials:
 - 1. Core: Particleboard cores comply with the following:
 - a. Particle board, 32 lb/ft³ density
 - b. Comply with ANSI A208.1, Grade LD-2
 - c. Blocking: 5-inch (125-mm) top rail blocking in doors indicated to have closers
 - d. Stiles and rails are to be securely bonded to the core
 - 2. Vinyl Acrylic Face Laminates: High impact .040 inch thick vinyl acrylic; integral color; apply to crossbanded core using Type I exterior waterproof adhesive.
 - a. Color: To be selected by Architect from manufacturer's full range.

- C. Door Construction:
 - 1. Construction Grade: WDMA Extra Heavy Duty Door
 - 2. Construction: Seven (7) ply, bonded, wood door construction
 - 3. Fire-Rating: non-fire rated and 20 minute fire-rated
 - 4. Thickness: Standard 1-3/4 inches.
 - 5. Crossbanding: 0.125" tempered hardboard.
 - 6. Doors shall be prefit and beveled at the factory to fit the openings. Prefit tolerances shall be in accordance with the requirements of WDMA I.S. 1-A, latest edition.
 - 7. Doors shall be machined in the factory for mortised hardware items.
 - 8. Provide internal reinforcement where surface mounted hardware is required.
 - 9. Top and bottom rails shall be factory sealed with an approved wood sealer.
 - 10. Door Stiles: 1-3/8" (before trimming) fixed interior stile.
 - 11. Exposed fixed door edges: Same as faces.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine doors and installed door frames before hanging doors. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs. Adjust frames to plumb condition before door installation. Tolerances for warp, squareness and pre-fitting dimensions shall be as per latest edition of WDMA I.S. IA-04.
- B. Manufacturer's written instructions: Install doors to comply with manufacturer's written instructions, referenced quality standard and as indicated.
- C. Factory fitted doors: Align in frames for uniform clearance at each edge.
- D. Hardware: For installation, see Division 8 Section "Door Hardware".
- E. Operating: Re-hang or replace doors that do not swing or operate freely.
- F. Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

SECTION 083100 ACCESS DOORS AND PANELS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Access panels and accessories.

1.2 COORDINATION

- A. Coordinate specific locations and sizes for access doors required for access to concealed equipment.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of door and frame indicated.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES

- A. Products and Manufacturers: Subject to compliance with specified requirements, provide Basis of Design or equivalent product as approved by Architect, by one of the following Manufacturers:
 - 1. Acudor Products Inc.
 - 2. Babcock-Davis.
 - 3. Balco.
 - 4. Bauco.
 - 5. Cesco Access Products.
 - 6. J.L. Industries.
 - 7. Karp Associates Inc.
 - 8. Milcor Inc.
 - 9. Nystrom Building Products.
 - 10. Williams Brothers Corporation of America.
- B. General:
 - 1. Sizes: As shown on Drawings. Provide custom sizes as necessary for indicated sizes.
 - 2. Latch and Lock Hardware:
 - a. Quantity: Furnish number of latches and locks required to hold doors tightly closed.
 - b. Keys: Furnish two keys per lock and key all locks alike.
 - 3. Accessories: Provide accessories as required for complete and operable installation.
 - a. Expansion shields.
 - b. Steel frame.
 - c. Continuous steel hinge.
 - d. Automatic closing and locking device.
 - e. Flush key operated cylinder lock.
 - f. Anchorage.
- C. Flush, Steel Access Panels: Flush panel style, with a perimeter flange that will accept drywall compound for a concealed frame appearance; with concealed hinges, cylinder locks all keyed alike, and factory-primed for field-applied painted finish.
 - 1. Basis of Design:
 - a. Milcor: Type DW.
 - b. JL Industries: Type WB.
 - c. Karp: Type KDW.
 - 2. Hardware:
 - a. Hinge: 175-degree steel piano hinge with removable pin concealed constant force closure spring type.
 - b. Lock: Screwdriver slot for quarter turn cam lock.
 - c. Provide two keys per lock.

UCDMC East Wing 3rd Floor Bed Re-Licensure M054016 / 9557320

2.2 MATERIALS

- A. Minimum Nominal Sheet Thicknesses:
 - 1. Non-Fire-Rated Panels and Doors:
 - a. Steel Sheet: 0.060 inch (16 gage).
 - b. Metallic-Coated Steel Sheet: 0.064 inch (16 gage).
- B. Steel:
 - 1. Sheet: Uncoated or electrolytic zinc coated, ASTM A 879, with cold-rolled steel sheet substrate complying with ASTM A 1008, Commercial Steel (CS), exposed.
 - 2. Plates, Shapes, and Bars: ASTM A 36.
 - 3. Metallic-Coated Steel Sheet: ASTM A 653, Commercial Steel (CS), Type B; with minimum G60 or A60 metallic coating.
- C. Frame Anchors: Same material as door face.
- D. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.3 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.
 - 1. For concealed flanges with drywall bead, provide edge trim for gypsum panels securely attached to perimeter of frames.
 - 2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded-metal lath and exposed casing bead welded to perimeter of frames.

2.4 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates and rough-in measurements as required.
- B. Before starting work notify Architect in writing of conflicts detrimental to installation or operation of units.
- C. Verify with Architect location of access panels.
- D. Advise installers of other work about specific requirements relating to access door and floor door installation, including sizes of openings to receive access door and frame, as well as locations of supports, inserts, and anchoring devices.

3.3 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access panels and frames, and floor doors and frames.
- B. Install plumb, square and level, securely fastened, properly anchored and ready for full, complete operation and use.
- C. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.
- D. Install access doors with trimless frames and floor doors flush with adjacent finish surfaces or recessed to receive finish material.
- E. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION

SECTION 26 51 19 LED INTERIOR LIGHTING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior solid-state luminaires that use LED technology.
 - 2. Lighting fixture supports.
- B. Related Requirements:
 - 1. Section 260923 "Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.

1.3 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color Rendering Index.
- C. Fixture: See "Luminaire."
- D. IP: International Protection or Ingress Protection Rating.
- E. LED: Light-emitting diode.
- F. Lumen: Measured output of lamp and luminaire, or both.
- G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Provide coversheet indicating project title, project location, and vendor contact information.
 - 2. Organize submittal into logical sections and provide table of contents.
 - 3. Provide itemized bill of materials indicating model number and quantity for each product.
 - 4. On datasheets with multiple products, indicate which product is provided under this project.
 - 5. Combine electronic submittals into one unified PDF document that is organized per the table of contents. The submittal shall be free of copyrighted files and proprietary file formats. Electronic links may be submitted to supplement product datasheets, but may not be used as a substitute for product datasheets that are required to be included in the unified PDF submittal.
 - 6. Manufacturers' catalog sheets with complete technical data for each item being furnished.
 - 7. Arrange in order of luminaire designation.
 - 8. Include data on features, accessories, and finishes.
 - 9. Include physical description and dimensions of luminaires.
 - 10. Include emergency lighting units, including batteries and chargers.
 - 11. Include life, output (lumens, CCT, and CRI), and energy efficiency data.
 - 12. Photometric data and adjustment factors based on laboratory tests IES LM-79 and IES LM-80.
 - a. Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
 - b. Provide certification of one of the following:
 - 1) LM-79-08 report at T=0 and at T=6000 hours with a summary table showing the percent lumen output change and percent input power change.

- 2) LM-80-08 test data for the LEDs at the three temperatures per LM-80-08. Provide extrapolation data using an exponential decay function to show the output at 50,000 hours. Provide the T_s value from the LM-79-08 and where the point falls in relation to the LM-80-08 extrapolated data. Interpolate between the LM-80-08 data for the T_s temperature.

B. Product Schedule: For luminaires and lamps. Use same designations indicated on Drawings.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For luminaires and lighting systems to include in operation and maintenance manuals.
1. Provide a list of all lamp types used on Project; use ANSI and manufacturers' codes.

1.6 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications:
1. Luminaire manufacturer's laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.
 2. Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7, accredited under the NVLAP for Energy Efficient Lighting Products, and complying with the applicable IES testing standards.
- B. Provide luminaires from a single manufacturer for each luminaire type.
- C. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.8 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: Five year(s) from date of Substantial Completion.
- C. Warranty Period for Light Sources: Five year replacement material warranty on all light sources (LED package, LED array, or LED module) including, but not limited to the LED die, encapsulate, and phosphor for the LEDs lumen maintenance not achieving L_{70} after 50,000 hours.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, product(s) indicated on Drawings.

2.2 PERFORMANCE REQUIREMENTS

- A. Seismic Performance:
1. Luminaires shall withstand the effects of earthquake motions determined according to ASCE 7
 2. Luminaires and lamps shall be labeled vibration and shock resistant.
 3. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified."
- B. Ambient Temperature: 41 to 104 deg F (5 to 40 deg C).
1. Relative Humidity: Zero to 95 percent.
- C. Altitude: Sea level to 1000 feet (300 m).

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2.3 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by UL, ETL, CSA, or other qualified testing agency, and marked for intended location and application.
- B. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
 - 1. Label shall include the following lamp characteristics:
 - a. "USE ONLY" and include specific lamp type.
 - b. Lamp diameter, shape, size, wattage, and coating.
 - c. CCT and CRI.
- C. Recessed luminaires shall comply with NEMA LE 4.
- D. California Title 24 compliant.
- E. CRI of minimum 65. CCT of 2700 K.
- F. Rated lamp life of 35,000 hours.
- G. Lamps dimmable from 100 percent to 0 percent of maximum light output.
- H. Internal driver.
- I. Nominal Operating Voltage: As scheduled.

2.4 LEDS

- A. LED sources must meet the following requirements:
 - 1. Operating temperature rating must be between -40°C and +50°C
 - 2. Correlated Color Temperature (CCT):
 - a. Nominal CCT: 2700 K (2725 ± 145)
 - b. Nominal CCT: 3000 K (3045 ± 175)
 - c. Nominal CCT: 3500 K (3465 ± 245)
 - d. Nominal CCT: 4000 K (3985 ± 275)
 - e. Nominal CCT: 4500 K (4503 ± 243)
 - f. Nominal CCT: 5000 K (5028 ± 283)
 - g. Nominal CCT: 5700 K (5665 ± 355)
 - h. Nominal CCT: 6500 K (6530 ± 510)
 - i. Du'v' tolerance of 0.001 ± 0.006
 - 3. Color Rendering Index (CRI): greater than or equal to 80.
 - 4. Luminaire manufacturer must submit reliability reports indicating that the manufacturer of the LED (chip, diode, or package) has performed JEDEC (Joint Electron Devices Engineering Council) reliability tests on the LEDs as follows:
 - a. High Temperature Operating Life (HTOL)
 - b. Room Temperature Operating Life (RTOL)
 - c. Low Temperature Operating Life (LTOL)
 - d. Powered Temperature Cycle (PTMCL)
 - e. Non-Operating Thermal Shock (TMSK)
 - f. Mechanical Shock
 - g. Variable Vibration Frequency
 - h. Solder Heat Resistance (SHR)

2.5 LED DRIVERS / POWER SUPPLYS

- A. LED drivers must meet the following requirements:
 - 1. Drivers must have a minimum efficiency of 85%.
 - 2. Starting Temperature: -40° C.
 - 3. Electrical Characteristics.
 - a. Volts: as indicated on Luminaire Schedule.
 - b. Phase: Single.
 - c. Hertz: 60.

4. Power supplies can be UL Class I or II output.
5. Drivers must have a Power Factor (PF) of greater than or equal to 0.90.
6. Drivers must have a Total Harmonic Distortion (THD) of less than or equal to 20%.
7. Drivers must comply with FCC 47 CFR Part 15 non-consumer RFI/EMI standards.
8. Drivers must be Reduction of Hazardous Substances (RoHS) compliant.
9. Inrush current <2A
10. Sound rating: Inaudible in a 24 dB ambient.
11. Class P thermally protected.
12. Drivers with 0-10V dimming capability must be isolated and not allow current to leak between the power source and the 0-10V control circuit.

2.6 LED LUMINAIRES

- A. Provide luminaires with integral LED thermal management system (heat sinking).
- B. Luminaires shall be equipped with an LED driver that accepts 120V through 277V, 50hz to 60hz (UNIV). Component-to-component wiring within the luminaire will carry no more than 80% of rated current and be listed by UL for use at 600 VAC at 302°F/150°C or higher. Plug disconnects shall be listed by UL for use at 600 VAC, 15A or higher.
- C. LED modules shall have a minimum L70 service life of 75,000 hours at 25°C ambient temperature and based on IESNA LM-80 methodology.
- D. Provide luminaires with individual LED arrays/ modules and drivers that are accessible and replaceable from exposed side of the luminaire. Luminaires requiring removal or replacement of entire luminaire to access LEDs and drivers will NOT be accepted.
- E. Luminaire efficiency shall be minimum of 70 lumens per watt.
- F. Warranty: 5 year warranty covering the LED arrays, and LED drivers.
- G. Continuous Flicker Free dimming range 100% to 10% measured relative light output.

2.7 MATERIALS

- A. Metal Parts:
 1. Free of burrs and sharp corners and edges.
 2. Sheet metal components shall be steel unless otherwise indicated.
 3. Form and support to prevent warping and sagging.
- B. Steel:
 1. ASTM A 36/A 36M for carbon structural steel.
 2. ASTM A 568/A 568M for sheet steel.
- C. Stainless Steel:
 1. 1. Manufacturer's standard grade.
 2. 2. Manufacturer's standard type, ASTM A 240/240 M.
- D. Galvanized Steel: ASTM A 653/A 653M.
- E. Aluminum: ASTM B 209.

2.8 METAL FINISHES

- A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

2.9 LUMINAIRE SUPPORT

- A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch (13-mm) steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.

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- C. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, 12 gage (2.68 mm).
- D. Rod Hangers: 3/16-inch (5-mm) minimum diameter, cadmium-plated, threaded steel rod.
- E. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before fixture installation. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with NECA/IESNA-500, "Recommended Practice for Installing Indoor Commercial Lighting Systems."
- B. Comply with NECA 1.
- C. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- D. Install lamps in each luminaire.
- E. Supports:
 - 1. Sized and rated for luminaire weight.
 - 2. Able to maintain luminaire position after cleaning and relamping.
 - 3. Provide support for luminaire without causing deflection of ceiling or wall.
 - 4. Luminaire mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and vertical force of 400 percent of luminaire weight.
- F. Suspended Luminaire Support:
 - 1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.
 - 2. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.
 - 3. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.
- G. Ceiling-Grid-Mounted Luminaires:
 - 1. Secure to any required outlet box.
 - 2. Secure luminaire to the luminaire opening using approved fasteners in a minimum of four locations, spaced near corners of luminaire.
 - 3. Use approved devices and support components to connect luminaire to ceiling grid and building structure in a minimum of four locations, spaced near corners of luminaire.
- H. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

3.3 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:

UCDMC East Wing 3rd Floor Bed Re-Licensure M054016 / 9557320

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
 - a. If 0-10V dimming does not perform to expectations, the contractor shall provide low pass filters at the 0-10V source to remedy performance issues.
 2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.
- B. Luminaire will be considered defective if it does not pass operation tests and inspections.
- C. Prepare test and inspection reports.
- D. Inspect each installed luminaire for damage. Replace damaged luminaires and components.
- E. Advance Notice: Give dates and times for field tests.
- F. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.
1. Corroded Fixtures: Replace during warranty period.

3.5 STARTUP SERVICE

- A. Comply with requirements for startup specified in Section 260943.16 "Addressable-Luminaire Lighting Controls."
- B. Comply with requirements for startup specified in Section 260943.23 "Relay-Based Lighting Controls."
- C. Clean luminaires internally and externally after installation. Use methods and materials recommended by manufacturer.

3.6 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions.
 1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
 2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
- B. Adjust aimable luminaires according to the directions shown on lighting drawings or per Owner's direction.

3.7 INTERIOR LUMINAIRE SCHEDULE

- A. See drawings for Luminaire Schedule.

END OF SECTION