ADDENDUM NO. 1
to
CONTRACT DOCUMENTS

for
RENOVATIONS TO PRINCETON HIGH SCHOOL
located at 151 Moore Street, Princeton, NJ 08540

for the
PRINCETON PUBLIC SCHOOLS
Princeton, Mercer County, New Jersey

FVHD PROJECT NO. 5516A2

Issued: February 24, 2026

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INTENT: **This Document supersedes all conflicting and contrary information in said Bid Documents. Said documents are hereby amended in certain particulars as described herein after. Unless specifically noted or specified hereinafter all work shall conform to the applicable provisions of the Bid Documents. Bidders shall acknowledge receiving this document on the Bid Proposal Form.**

This Addendum includes four (4) pages and the following:

1. Pre-Bid Meeting Sign-In Sheet, dated 2/12/26, 2-pages.
2. New Form: Sworn Contractor Certification Form, 1-page.
3. Revised Specifications: 08700, 15725, 15763.
4. Revised Drawing: A601.

REQUESTS FOR INFORMATION (RFI'S)

1. Question: Please provide the existing BMS vendor's name/email/phone contact information for the building.

   Response: Refer to Drawing M1.0, Electrical General Note #29.

2. Question: Please provide name/email/phone contact information for the Data/LV vendor for this facility.

   Response: Refer to Drawing E1.0, Electrical General Note #83.

3. Question: Please provide the name/email/phone contact information for the fire alarm vendor for this facility.

   Response: Refer to Drawing E1.0, Electrical General Note #85.

4. Question: Who terminates the jack side and patch panel side? Is it turnkey by GC or is the wire and terminations all by owner?

   Response: Refer to Drawing E1.0, Low Voltage Device Legend.

5. Question: For data/tele/security card access, is this backbone by GC and final devices by owner or complete turnkey by GC? Please provide current vendor if applicable.

   Response: Refer to Drawing E1.0, Low Voltage Device Legend.

6. Question: Does existing ductwork to remain have to be cleaned and tested with a report filed for record?

   Response: No, most existing ductwork is to be removed and discarded, see plans for more details.

7. Question: Does this project have a PLA?

   Response: There is no PLA on this project.

8. Question: Who pays for permits?

   Response: Contractor to pay for permits and will be reimbursed by the owner.

REFER TO DRAWINGS

The following Drawings and/or Sketches are attached to this Addendum:

DRAWING NO.	TITLE
A601	DOOR TYPES & SCHEDULES

The following Drawings to be revised or corrected as follows:

DRAWING NO.	CHANGES AND CORRECTIONS
A601	Delete drawing A601 in its entirety and substitute with the enclosed revised drawing.

REFER TO SPECIFICATIONS

TABLE OF CONTENTS

Under Part - 5 HVAC Work, change the following section's number of pages to read:

15725 Indoor Air-Handling Units, 11 pages.
15763 4-Pipe Fan Coil Unit, 7 pages.

BIDDING INFORMATION

Add the attached Sworn Contractor Certification Form.

PART 1 - SECTION 01900 - GUARANTEES AND WARRANTIES

Page 01900-6 Paragraph 1.4 Add the following new subparagraphs:

B. Indoor Air-Handling Units as specified in Section 15725.

1. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Bid Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Bid Documents.

2. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of compressor that fail in materials or workmanship within specified warranty period.

3. Warranty Period: **Two (2) years** from date of Substantial Completion.

C. 4-Pipe Fan Coil Unit as specified in Section 15763.

1. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other

provisions of the Bid Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Bid Documents.

2. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of compressor that fail in materials or workmanship within specified warranty period.

3. Warranty Period: **Two (2) years** from date of Substantial Completion.

PART 2 - SECTION 08700 - DOOR HARDWARE

Delete Section 08700 in its entirety and substitute with the enclosed revised document.

PART 5 - SECTION 15725 - INDOOR AIR-HANDLING UNITS

Delete Section 15725 in its entirety and substitute with the enclosed revised document.

PART 5 - SECTION 15763 - 4-PIPE FAN COIL UNIT

Delete Section 15763 in its entirety and substitute with the enclosed revised document.

END OF ADDENDUM NO. 1

William D. Hopkins III, AIA, LEED AP, NCARB
Jason J. Dubowitch, AIA, NCARB
Stephen W. Schreyer Jr., AIA, NCARB, LEED AP BD+C

FVHD architects planners
Fraytak Veisz Hopkins Duthie, P.C.

PROJECT NAME: Renovations to Princeton High School for the Princeton Public School District

DATE: Thursday, 2/12/2026 at 3:00 PM

FVHD PROJECT#: 5516A2

PRE-BID SIGN-IN SHEET

REPRESENTATIVE NAME (Please Print)	COMPANY NAME & ADDRESS	CONTRACT NUMBER	TELEPHONE#	FAX#	E-MAIL
Don Douglas	Dandrea	856 767-7750			DANDREA@DANDREACONST.COM
Nick Scozzari	Scozzari Builders	609 9891221		609 989-1262	NSCOZZARI@SCOZZARI.COM
Johnnie Whitington	SMWLU27		609 495 4090		JOHNW@SMWLU27.ORG
Steven Klein	NewRoad.com		732-865-2396		SKLEIN@NewRoadCm.com
Joxley	Leng Construction		~~609-~~ 547-0707	609-547-2454	Joxley@Construction.com
Gorop Postolovski	White Rock Corp	732-999 0979			Wrockcorp@gmail.com
Dan Schiffone	FVHD		609 883.7191		DSchiffone@FVHDPC.com

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J. Airaj Hasan	Blackstone		973-624-1302	ahasan@ G360.us	

SWORN CONTRACTOR CERTIFICATION; QUALIFICATIONS AND CREDENTIALS
(Bidder's Certification)

Pursuant to N.J.S.A. 18A:7G-37, a pre-qualified contractor seeking to bid on school facilities projects, and any subcontractors, that are required to be named under N.J.S.A. 18A:7G-1 et seq. shall, as a condition of bidding, submit this Sworn Contractor Certification regarding qualifications and credentials.

I,_____, the principal owner or officer of the company, certify that the forging statements are true and our firm has the following qualifications and credentials:

- A current, valid certificate of registration issued pursuant to "The Public Works Contractor Registration Act," N.J.S.A. 34:11-56:48 et seq. A copy of which is submitted with its bid;

- A current, valid Certificate of Authority to perform work in New Jersey issued by the Department of Treasury, a copy of which is submitted with its bid;

- A current valid contractor trade license required under applicable New Jersey Law for any specialty trade or specialty area in which the firm seeks to perform work, a copy of which is submitted with its bid;

During the term of the school facilities project, I as principal owner or officer of the company or corporation, as the contractor, will have in place a suitable quality control and quality assurance program and appropriate safety and health plan.

I certify that, at the time of bidding, the amount of the bid proposal and the value of all of its outstanding incomplete contracts do not exceed the firm's existing aggregate rating limit.

Name of Company_____

Name of Owner or Officer_____

Signature of Owner or Officer_____

Notarized before me this_____day of_____, _____
Month Year

_____ _____
NOTARY PUBLIC SIGNATURE Print Name of Notary Public

My commission expires_____,_____.
Month Day Year

-SEAL- **STAMP**

To be completed, signed, notarized and returned with Bid

SECTION 08700 - DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware
2. Electronic access control system components

B. Section excludes:
1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:
1. Division 01 "General Requirements" sections for Allowances, Alternates, Owner Furnished Contractor Installed, Project Management and Coordination.
2. Division 06 Section "Rough Carpentry"
3. Division 06 Section "Finish Carpentry"
4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
5. Division 08 Sections:
   a. "Metal Doors and Frames"
   b. "Flush Wood Doors"
   c. "Stile and Rail Wood Doors"
   d. "Interior Aluminum Doors and Frames"
   e. "Aluminum-Framed Entrances and Storefronts"
   f. "Stainless Steel Doors and Frames"
   g. "Special Function Doors"
   h. "Entrances"
6. Division 16 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
7. Division 16 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

1.02 REFERENCES

A. UL LLC

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
   a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
   b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit 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.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
   a. Wiring Diagrams: For power, signal, and control wiring and including:
      1) Details of interface of electrified door hardware and building safety and security systems.
      2) Schematic diagram of systems that interface with electrified door hardware.
      3) Point-to-point wiring.
      4) Risers.

3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.
    a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. Door Hardware Schedule:
    a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
    b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
    c. Indicate complete designations of each item required for each opening, include:
        1) Door Index: door number, heading number, and Architect's hardware set number.
        2) Quantity, type, style, function, size, and finish of each hardware item.
        3) Name and manufacturer of each item.
        4) Fastenings and other pertinent information.
        5) Location of each hardware set cross-referenced to indications on Drawings.
        6) Explanation of all abbreviations, symbols, and codes contained in schedule.
        7) Mounting locations for hardware.
        8) Door and frame sizes and materials.
        9) Degree of door swing and handing.
        10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.

5. Key Schedule:
    a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
    b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
    c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
    d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
    e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
    f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:
   a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
   b. Include warranties for specified door hardware.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
   a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
   b. Catalog pages for each product.
   c. Final approved hardware schedule edited to reflect conditions as installed.
   d. Final keying schedule
   e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
   f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
   a. Fire door assemblies, in compliance with NFPA 80.
   b. Required egress door assemblies, in compliance with NFPA 101.

1.04 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
   a. For door hardware: DHI certified AHC or DHC.
   b. Can provide installation and technical data to Architect and other related Subcontractors.

c. Can inspect and verify components are in working order upon completion of installation.
d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.

4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

1. Fire-Rated Door Openings:
   a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
   b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to Authorities Having Jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

2. Smoke and Draft Control Door Assemblies:
   a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
   b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.

3. Electrified Door Hardware
   a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to Authorities Having Jurisdiction.

4. Accessibility Requirements:
   a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.

C. Pre-Installation Meetings

1. Keying Conference
   a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
      1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
      2) Preliminary key system schematic diagram.
      3) Requirements for key control system.
      4) Requirements for access control.
      5) Address for delivery of keys.

2. Pre-installation Conference
   a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   b. Inspect and discuss preparatory work performed by other trades.

c. Inspect and discuss electrical roughing-in for electrified door hardware.
d. Review sequence of operation for each type of electrified door hardware.
e. Review required testing, inspecting, and certifying procedures.
f. Review questions or concerns related to proper installation and adjustment of door hardware.

3. Electrified Hardware Coordination Conference:
   a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.

C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.

D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.06 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.07 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.

1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
    a. Mechanical Warranty
        1) Locks
            a) Schlage ND Series; or approved equal: **Ten (10) years**
        2) Exit Devices
            a) Von Duprin; or approved equal: **Ten (10) years**
        3) Closers
            a) LCN 4050 Series; or approved equal: **Twenty-five (25) years**
        4) Automatic Operators
            a) LCN; or approved equal: **Two (2) years**
    b. Electrical Warranty
        1) Locks
            a) Schlage; or approved equal: **Three (3) years**
        2) Exit Devices
            a) Von Duprin; or approved equal: **Three (3) years**
        3) Closers
            a) LCN; or approved equal: **Two (2) years**

1.08 MAINTENANCE

A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Approval of alternate manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category are only to be considered by official substitution request in accordance with AIA A232 and Section 00800.

B. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

C. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

A. Fabrication

1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer's recognized installation standards for application intended.
2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with "Metal Doors and Frames", "Flush Wood Doors", "Stile and Rail Wood Doors" to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

C. Cable and Connectors:

1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.
3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

2.03 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Ives 5BB series; or approved equal.

2. Acceptable Manufacturers and Products:
   a. Hager BB1191/1279 series; or approved equal.
   b. Best FBB series; or approved equal.

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.

2. Provide five knuckle, ball bearing hinges.
3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
   a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
   b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high

4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
   a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high

5. 2 inches or thicker doors:
   a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high

6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
8. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   a. Steel Hinges: Steel pins
   b. Non-Ferrous Hinges: Stainless steel pins
   c. Out-Swinging Exterior Doors: Non-removable pins
   d. Out-Swinging Interior Lockable Doors: Non-removable pins
   e. Interior Non-lockable Doors: Non-rising pins

9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

2.04 ELECTRIC POWER TRANSFER

A. Manufacturers:

1. Scheduled Manufacturer and Product:
   a. Von Duprin EPT-10
   b. Or approved equal.

2. Acceptable Manufacturers and Products:
   a. ABH PT1000
   b. Precision EPT-12C
   c. Or approved equal.

B. Requirements:

1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

2.05 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage ND series
   b. Or approved equal.

2. Acceptable Manufacturers and Products:
   a. Sargent 11-Line
   b. Corbin-Russwin CL3100 series
   c. Or approved equal.

B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3-hour fire doors.
2. Indicators: Where specified, provide escutcheon with lock status indicator window on top of lockset rose:
   a. Escutcheon height (including rose) 6.05 inches high by 3.68 inches wide.
   b. Indicator window measuring a minimum 3.52-inch by .60 inch with 1.92 square-inches of front facing viewing area and 180-degree visibility with a total of .236 square-inches of total viewable area.
   c. Provide snap-in serviceable window to prevent tampering. Lock must function if indicator is compromised.
   d. Provide messages color-coded with full text and symbol, as scheduled, for easy visibility.
   e. Unlocked and Unoccupied message will display on white background, and Locked and Occupied message will display on red background.
3. Cylinders: Refer to "KEYING" article, herein.
4. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
5. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
6. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
7. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
8. Provide electrified options as scheduled in the hardware sets.
9. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
   a. Lever Design: Rhodes

2.06 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Von Duprin 98/35A series
   b. Or approved equal.

2. Acceptable Manufacturers and Products:
   a. Precision APEX 2000 series

b. Falcon 24/25 series
c. Or approved equal.

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide smooth touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
7. Provide flush end caps for exit devices.
8. Provide exit devices with manufacturer's approved strikes.
9. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
10. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
11. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
14. Provide electrified options as scheduled.
15. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
16. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

2.07 POWER SUPPLIES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage/Von Duprin PS900 Series
   b. Or approved equal.

2. Acceptable Manufacturers and Products:
   a. Precision ELR series
   b. Security Door Controls 600 series
   c. Or approved equal.

B. Requirements:

1. Provide power supplies approved by manufacturer of supplied electrified hardware.
2. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
3. Provide regulated and filtered 24 VDC power supply, and UL class 2 listed.
4. Provide power supplies with the following features:
   a. 12/24 VDC Output, field selectable.
   b. Class 2 Rated power limited output.
   c. Universal 120-240 VAC input.
   d. Low voltage DC, regulated and filtered.
   e. Polarized connector for distribution boards.
   f. Fused primary input.
   g. AC input and DC output monitoring circuit w/LED indicators.
   h. Cover mounted AC Input indication.
   i. Tested and certified to meet UL294.
   j. NEMA 1 enclosure.
   k. Hinged cover w/lock down screws.
   l. High voltage protective cover.

2.08 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer and Product:
   a. Existing Best Key System
   b. Or approved equal.

B. Requirements:

1. Provide cylinders/cores to match Owner's existing key system, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.

2.09 KEYING

A. Scheduled System:

1. Existing factory registered system:
   a. Provide cylinders/cores keyed into Owner's existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Requirements:

1. Construction Keying:
   a. Replaceable Construction Cores.

1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
   a) 3 construction control keys
   b) 12 construction change (day) keys.
2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.

2. Permanent Keying:
   a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
      1) Master Keying system as directed by the Owner.
   b. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
   c. Provide keys with the following features:
      1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
      2) Patent Protection: Keys and blanks protected by one or more utility patent(s).
   d. Identification:
      1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
      2) Identification stamping provisions must be approved by the Architect and Owner.
      3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
      4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
      5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
   e. Quantity: Furnish in the following quantities.
      1) Permanent Control Keys: 3.
      2) Master Keys: 6.
      3) Change (Day) Keys: 3 per cylinder/core that is keyed differently
      4) Key Blanks: Quantity as determined in the keying meeting.

2.10 KEY CONTROL SYSTEM

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Telkee
   b. Or approved equal.

2. Acceptable Manufacturers:
   a. HPC
   b. Lund
   c. Or approved equal.

B. Requirements:

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
    a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
    b. Provide hinged-panel type cabinet for wall mounting.

2.11 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
    a. LCN 4050A series
    b. Or approved equal.

2. Acceptable Manufacturers and Products:
    a. Falcon SC70A series
    b. Norton 7500 series
    c. Or approved equal.

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with cast aluminum cylinder.
3. Closer Body: 1-1/2-inch (38 mm) diameter with 11/16-inch (17 mm) diameter heat-treated pinion journal and full complement bearings.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and all weather requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and back check.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide stick on templates, special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.12 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives
   b. Or approved equal.

2. Acceptable Manufacturers:
   a. Burns
   b. Trimco
   c. Or approved equal.

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

2.13 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives
   b. Or approved equal.

2. Acceptable Manufacturers:
   a. Burns
   b. Trimco
   c. Or approved equal.

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

2.14 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer:

a. Ives
b. Or approved equal.

2. Acceptable Manufacturers:
a. Burns
b. Trimco
c. Or approved equal.

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.15 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

B. Scheduled Manufacturer:

1. Zero International
2. Or approved equal.

C. Acceptable Manufacturers:

1. National Guard
2. Reese
3. Or approved equal.

D. Seals and Gasketing: Provide continuous gasketing on exterior openings, to the head and jambs, forming a continuous seal between the door and the frame. Provide smoke, light, or sound gasketing on interior doors where indicated.

1. Provide self-tapping fasteners for aluminum extruded gasketing being applied to hollow metal frames.
a. Provide non-corrosive fasteners for all exterior applications.
b. Provide security fasteners where indicated.

2. Provide neoprene, EPDM, silicone, or nylon brush inserts as specified in hardware sets. Provide non brush inserts of solid or sponge cell, as specified in hardware sets. Vinyl inserts are not allowed except where specified in hardware sets.

E. Smoke Labeled Gasketing: At all smoke labeled openings, provide smoke listed perimeter gasketing assemblies complying with NFPA 105 listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for smoke control ratings indicated based on testing according to UL 1784.

F. Fire Listed Gasketing: Assemblies complying with NFPA 80 that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction for fire ratings indicated based on testing according to UL-10C.

1. Where frame-applied intumescent seals are required by the manufacturer, provide gaskets that comply with UL10C Standard for Positive Pressure Fire Tests of Door Assemblies and UBC 7-2, Fire Tests of Door Assemblies.

G. Sound-Rated Gasketing: Provide acoustic gasketing to meet Sound Transmission Class (STC) rating required.

H. Meeting-Stile Gasketing: Provide meeting-stile gasketing that fastens to the meeting stiles forming a continuous seal when doors are closed.

I. Door Sweeps or Shoes: Apply to the bottom of the door to close the gap between the door bottom and finished floor or saddle threshold.

1. Provide solid neoprene, EPDM, silicone, or nylon brush type of seal as specified in hardware sets. Vinyl inserts are not allowed except where specified in hardware sets.

J. Automatic Door Bottoms:

1. Provide closed cell sponge, bulb neoprene. or EPDM type of seal as specified in hardware sets.
2. Door bottom to be mortised, semi mortised, or surface mount as with a minimum thickness as specified in hardware sets.

K. Rain Drips:

1. Provide overhead rain drips for out-swinging hollow metal doors that are not covered against 45 degree blowing rain. Aluminum extrusion to be a minimum of .088 inches thick and extend 2.50 inches from the face of the frame, in anodized finish to match door.
2. Door sweeps or shoes with integral rain drip must meet ADA requirements

L. Thresholds: Provide threshold units not less than 4 inches wide, formed to accommodate change in floor elevation where indicated, and fabricated to accommodate door hardware and fit door frames.

1. Threshold extrusion to be a minimum thickness as specified in hardware sets.

2.16 COAT HOOKS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives
   b. Or approved equal.

2. Acceptable Manufacturers:
   a. Trimco

b. Burns
c. Or approved equal.

B. Provide coat hooks as specified.

2.17 FINISHES

A. FINISH: BHMA 626/652 (US26D); EXCEPT:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Aluminum Geared Continuous Hinges: BHMA 628 (US28)
3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
4. Protection Plates: BHMA 630 (US32D)
5. Overhead Stops and Holders: BHMA 630 (US32D)
6. Door Closers: Powder Coat to Match
7. Wall Stops: BHMA 630 (US32D)
8. Latch Protectors: BHMA 630 (US32D)
9. Weatherstripping: Clear Anodized Aluminum
10. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
4. Installation Guide for Doors and Hardware: DHI TDH-007-20

B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.

C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.

I. Lock Cylinders:

1. Install construction cores to secure building and areas during construction period.
2. Replace construction cores with permanent cores as indicated in keying section.
3. Furnish permanent cores to Owner for installation.

J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:

1. Conduit, junction boxes and wire pulls.
2. Connections to and from power supplies to electrified hardware.
3. Connections to fire/smoke alarm system and smoke evacuation system.
4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
5. Connections to panel interface modules, controllers, and gateways.
6. Testing and labeling wires with Architect's opening number.

K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

L. Continuous Hinges: Re-locate the door and frame fire rating labels where they will remain visible so that the hinge does not cover the label once installed.

M. Door Closers & Auto Operators: Mount closers/operators on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers/operators so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.

N. Overhead Stops/Holders: Mount overhead stops/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

O. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.

P. Thresholds:

1. Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
2. Aluminum thresholds to be cut-in, and scribed around mullions, frame members, and stops. Do not butt to thresholds. Provide a continuous surface across full width of opening from jamb to jamb.
3. Where aluminum panic-type (rabbeted) thresholds with neoprene inserts are specified, undercut doors as required to properly mate with seal in threshold.

Q. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

R. Perimeter Gasketing:

1. Apply to head and jamb, forming seal between door and frame.
2. Install gasketing in a manner eliminating need to cut any seal to install surface mounted hardware. Install compatible mounting bracket for surface mounted hardware unless minimum 1/4 inch thick solid aluminum seals are provided for mounting of surface applied hardware.

S. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

T. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

3.03 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.
2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.04 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items per manufacturer's instructions to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.05 DOOR HARDWARE SCHEDULE

A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.

C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.

D. Hardware Sets:

LEGEND

↯ Electrified Opening

Hardware Group No. 00B

For use on Door #(s):
027A-2

Provide each CO door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CASED/ TRIMMED OPENING	NO HARDWARE REQ		

Hardware Group No. CRS-04

For use on Door #(s):
035

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	ENTRANCE/OFFICE LOCK W/ INSIDE INDICATOR	ND50HD RHO IS-LOC	626	SCH
1	EA	BEST PERM CORE	TO MATCH EXISTING BEST SYSTEM		BES
1	EA	SURFACE CLOSER	4050A RW/PA	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

Hardware Group No. EXD-1D

For use on Door #(s):
S1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	POWER TRANSFER	EPT10 CON	✓	689	VON
1	EA	ELEC PANIC HARDWARE	LD-98-L-M996-06-FS	✓	626	VON
1	EA	SURFACE CLOSER	4050A RW/PA		689	LCN
1	EA	P KICK LATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CCV		630	IVE
1	EA	THRESHOLD	545A		A	ZER
3	EA	SILENCER	SR64		GRY	IVE
1	EA	WIRE HARNESS	CON-XX-P LENGTH AS REQUIRED FOR USE WITH DOOR	✓		SCH
1	EA	WIRE HARNESS	CON-6W	✓		SCH
1	EA	CARD READER	BY SECURITY			BYO
1	EA	DOOR CONTACT	BY SECURITY	✓		BYO
1	EA	SPOWER UPPLY	PS902 FA900 120/240 VAC	✓	LGR	SCE

DOOR NORMALLY LOCKED AND CLOSED
ENTRY UPON VALID CREDENTIAL OR KEY OVERRIDE
FREE EGRESS AT ALL TIMES
UPON LOSS OF POWER OR FIRE ALARM DOOR IS UNLOCKED AND LATCHED
DOOR CONTACT MONITORS DOOR POSITION

Hardware Group No. EXD-1E

For use on Door #(s):
027B-1 037A 037B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-F-2SI-06	626	VON
1	EA	C RIM YLINDER	1E72	626	BES
1	EA	RIM CYL THUMBTURN	XB11-979	626	SCH
1	EA	SURFACE LOSER	4050A EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

Hardware Group No. EXD-1E.1

For use on Door #(s):
027B-2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-F-2SI-06	626	VON
1	EAC	RIM YLINDER	1E72	626	BES
1	EA	RIM CYL THUMBTURN	XB11-979	626	SCH
1	EA	SURFACE LOSER	4050A SCUSH	689	LCN
1	EA P	KICK LATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

Hardware Group No. EXD-1G

For use on Door #(s):
C001-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-06	626	VON
1	EA	SURFACE CLOSER	4050A EDA	689	LCN
1	EA P	KICK LATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FIRE/LIFE WALL MAG	SEM 7800	689	LCN
1	EA	GASKETING	188SBK PSA	BK	ZER
	EA	WALL MAG PART	SEM 7810- EXTENSION AS REQ		

Hardware Group No. EXD-2F

For use on Door #(s):
027A-1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
2	EA	FIRE EXIT HARDWARE	9827-L-F-2SI-LBR-06-499F	626	VON
2	EAC	RIM YLINDER	1E72	626	BES
2	EA	RIM CYL THUMBTURN	XB11-979	626	SCH
2	EA	SURFACE LOSER	4050A EDA	689	LCN
2	EA P	KICK LATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER
1	SET	MEETING TILE	328AA-S	AA	ZER

Hardware Group No. EXD-2G

For use on Door #(s):
C002-1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
2	EA	FIRE EXIT HARDWARE	9827-L-F-2SI-LBR-06-499F	626	VON
2	EAC	RIM YLINDER	1E72	626	BES
2	EA	RIM CYL THUMBTURN	XB11-979	626	SCH
2	EA	SURFACE LOSER	4050A EDA	689	LCN
2	EA P	KICK LATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM 7800	689	LCN
1	EA	GASKETING	188SBK PSA	BK	ZER
1	SET	MEETING TILE	328AA-S	AA	ZER
	EA	WALL MAG PART	SEM 7810- EXTENSION AS REQ		

Hardware Group No. OF-01

For use on Door #(s):
036

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRANCE/OFFICE LOCK W/ INSIDE INDICATOR	ND50HD RHO IS-LOC	626	SCH
1	EA	BEST PERM CORE	TO MATCH EXISTING BEST SYSTEM		BES
1	EA	SURFACE CLOSER	4050A RW/PA	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

Hardware Group No. OF-01.1

For use on Door #(s):
034-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	ENTRANCE/OFFICE LOCK W/ INSIDE INDICATOR	ND50HD RHO IS-LOC	626	SCH
1	EA	BEST PERM CORE	TO MATCH EXISTING BEST SYSTEM		BES
1	EA	SURFACE CLOSER	4050A SCUSH	689	LCN
1	EA	GASKETING	188SBK PSA	BK	ZER

Hardware Group No. STO-01

For use on Door #(s):
032 033

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80HD RHO	626	SCH
1	EA	BEST PERM CORE	TO MATCH EXISTING BEST SYSTEM		BES
1	EA	SURFACE CLOSER	4050A RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

Hardware Group No. STO-02

For use on Door #(s):
034-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
2	EA	MANUAL FLUSH BOLT	FB358	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	ND80HD RHO	626	SCH
1	EA	BEST PERM CORE	TO MATCH EXISTING BEST SYSTEM		BES
2	EA	OHS TOP	90S	630	GLY
2	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. TRS-04

For use on Door #(s):
030 031

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK W/ OUTSIDE INDICATOR	ND40S RHO OS-OCC	626	SCH
1	EA	SURFACE CLOSER	4050A RW/PA	689	LCN
1	EA P	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	COAT AND HAT HOOK	571	A26D	IVE
3	EA	SILENCER	SR64	GRY	IVE

END OF SECTION 08700

SECTION 15725 - INDOOR AIR-HANDLING UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes constant-volume or variable-volume, air-handling units with fans, coils, filters, and dampers for indoor installations.

1.3 SUBMITTALS

A. Product Data: For each type of air-handling unit indicated. Include the following:

1. Certified fan-performance curves with system operating conditions indicated.
2. Certified fan-sound power ratings.
3. Certified coil-performance ratings with system operating conditions indicated.
4. Motor ratings, electrical characteristics, and motor and fan accessories.
5. Material gages and finishes.
6. Filters with performance characteristics.
7. Dampers, including housings, linkages, and operators.
8. Wiring Diagrams: Power, signal, and control wiring.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain air-handling units through one source from a single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. NFPA Compliance: air-handling units and components shall be designed, fabricated, and installed in compliance with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."

D. ARI Certification: air-handling units and their components shall be factory tested according to ARI 430, "Central-Station Air-Handling Units," and shall be listed and labeled by ARI.

E. Comply with NFPA 70.

1.5 COORDINATION

A. Coordinate installation with Section 15 "Vibration Isolation and Seismic Restraints."

B. Coordinate size and location of structural-steel support members.

1.6 Warranty

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Bid Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Bid Documents.

B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components that fail in materials or workmanship within specified warranty period.

C. Warranty Period: 2 year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Trane.
   2. Carrier.
   3. Or approved equal

2.2 MANUFACTURED UNITS

A. The air handler shall be furnished as a horizontal draw-through dual temperature water coil.

2.3 CABINET

A. The entire air handler shall be constructed of galvanized steel. Casing finished to meet ASTM B117 500-hour salt-spray test. The removal of access panels or access doors shall not affect the structural integrity of the unit. All removable panels shall be gasketed. All doors shall have gasketing around full perimeter to prevent air leakage. Contractor shall be responsible to provide connection flanges and all other framework that is needed to properly support the unit.

B. All panels shall be 2-inch double wall construction to facilitate cleaning of unit interior. Casing deflection shall not exceed .005-inch deflection per linear inch under negative or positive pressure, up to unit 6" of pressure.

C. Unit floor shall be of sufficient strength to support 300-lb load during maintenance activities, and shall deflect no more than .005-inches when sitting on a support structure.

D. Panel insulation shall provide a minimum thermal resistance (R) value of 13 ft^2*h*F/Btu throughout the entire unit. Insulation shall completely fill the panel cavities in all directions so that no voids exist and settling of insulation is prevented. Panel assembly shall comply with NFPA 90A.

E. Access panels and/or access doors shall be provided in all sections to allow easy access to drain pan, coil(s), motor, drive components and bearings for cleaning, inspection, and maintenance.

F. Access panels and doors shall be fully removable without the use of specialized tools to allow complete access of interior surfaces.

2.4 ACCESS DOORS

A. Access doors shall be 2-inch double-wall construction. Interior and exterior shall be of the same construction as the interior and exterior wall panels.

B. Gasketing shall be provided around the full perimeter of the doors to prevent air leakage.

C. Door hardware shall be surface-mounted to prevent through-cabinet penetrations that could likely weaken the casing leakage and thermal performance.

D. Handle hardware shall be designed to prevent unintended closure.

E. Access doors shall be hinged and removable without the use of specialized tools to allow.

F. All doors shall be a 60-inch high when sufficient unit height is available, or the maximum height allowed by the unit height.

2.5 FAN SECTION

A. Fan sections shall have a minimum of one hinged and latched access door located on the drive side of the unit to allow inspection and maintenance of the fan, motor, and drive components. Construct door(s) per Section 2.04.

B. Direct drive fans provided with ECM motors shall have a welded-aluminum impeller that is dynamically balanced as an assembly. Fan shall be maintenance free throughout its operating life. Fans shall be balanced to G6.3 per AMCA 204. No vibration isolation is necessary. Motor contains integrated PID controller and accepts 0-10VDC input for variable speed control.
   1. Fan shall be maintenance free throughout its operating life
   2. Fans shall be balanced to a G6.3 per AMCA 204. No vibration isolation base is necessary
   3. Access to motor and fan assembly though hinged access door must be provided. Access door shall be sized for removal of entire motor and fan assembly.
   4. Motor shall contain integrated PID controller and accept a 0-10VDC input signal for variable speed control.
   5. Motorized impeller fans shall be rated in accordance with AHRI Standard 430.

2.6 BEARINGS AND DRIVES

A. Basic load rating computed in accordance with AFBMA - ANSI Standards, L-50 life at 200,000 hours heavy duty pillow block type, self-aligning, grease-lubricated ball bearings.

B. Shafts shall be solid, hot rolled steel, ground and polished, keyed to shaft, and protectively coated with lubricating oil. Hollow shafts are not acceptable.

C. V-Belt drives shall be cast iron or steel sheaves, dynamically balanced, bored to fit shafts and keyed. Variable and adjustable pitch sheaves selected so required RPM is obtained with sheaves set at mid-position and rated based on motor horsepower. Contractor to furnish fixed sheaves at final RPM as determined by balancing contractor

2.7 COILS

A. Coils section header end panel shall be removable to allow for removal and replacement of coils without impacting the structural integrity of the unit.

B. Install coils such that headers and return bends are enclosed by unit casing to ensure that if condensate forms on the header or return bends, it is captured by the drain pan under the coil.

C. Coils shall be manufactured with plate fins to minimize water carryover and maximize airside thermal efficiency. Fin tube holes shall have drawn and belled collars to maintain consistent fin spacing to ensure performance and air pressure drop across the coil as scheduled. Tubes shall be mechanically expanded and bonded to fin collars for maximum thermal conductivity. Use of soldering or tinning during the fin-to-tube bonding process is not acceptable due to the inherent thermal stress and possible loss of bonding at that joint.

D. Construct coil casings of stainless steel. End supports and tube sheets shall have belled tube holes to minimize wear of the tube wall during thermal expansion and contraction of the tube.

E. All coils shall be completely cleaned prior to installation into the air handling unit. Complete fin bundle in direction of airflow shall be degreased and steam cleaned to remove any lubricants used in the manufacturing of the fins, or dirt that may have accumulated, in order to minimize the chance for water carryover.

F. With two coils in the airstream, space shall be provided by the unit manufacturer to facilitate cleaning and inspection of the fin surfaces. Access door(s) shall be located in the unit casing between the two coils.

G. Dual Temperature Water Coil
   1. Heating performance shall be as specified on the unit schedule.
   2. Dual Temperature water coil fins shall have full drawn collars to provide a continuous surface cover over the entire tube for maximum heat transfer. Seamless copper tubes shall be mechanically expanded into the fins to provide a continuous primary-to-secondary compression bond over the entire finned length for maximum heat transfer rates. Bare copper tubes shall not be visible between fins.
   3. Water coils shall be provided with headers of seamless copper tubing with intruded tube holes to permit expansion and contraction without creating undue stress or strain. Coil connections shall be carbon steel connections with connection size to be determined by manufacturer based upon the most efficient coil circuiting. Vent and drain connections shall be furnished on the coil connection, external to the cabinet. Vent connections provided at the highest point to assure proper venting. Drain connections shall be provided at the lowest point.

2.8 COIL/ACCESS SECTION

A. Unit(s) shall include a separate section housing a coil section and access section as one assembly. Refer to drawings to determine which unit(s) includes the additional section.

B. Section shall include a stainless steel drainpan and an access door of sufficient size to allow for visual inspection of the leaving face of the first coil in the airstream and entering face of the second coil in the airstream shall be included as standard in this section.

C. Access door shall be of the same construction as all other doors on the unit. Refer to door specification for location of door(s).

2.9 DAMPERS

A. General: Leakage rate, according to AMCA 500, "Laboratory Methods for Testing Dampers for Rating," shall not exceed 2 percent of air quantity at 2000-fpm face velocity through damper and 4-inch wg pressure differential.

B. Damper Operators: Electric specified in Section 15900 "HVAC Instrumentation and Controls for HVAC."

C. Low-Leakage, Outside-Air Dampers: Double-skin, airfoil-blade galvanized-steel dampers with compressible jamb seals and extruded-vinyl blade edge seals, in opposed or parallel-blade arrangement with steel operating rods rotating in stainless-steel sleeve bearings mounted in a single galvanized-steel frame, and with operating rods connected with a common linkage. Leakage rate shall not exceed 5 cfm/sq. ft. at 1-inch wg and 9 cfm/sq. ft. at 4-inch wg.

D. Mixing Boxes: Parallel-blade galvanized-steel dampers mechanically fastened to steel operating rod in reinforced, galvanized-steel cabinet. Connect operating rods with common linkage and interconnect linkages so dampers operate simultaneously.

E. Combination Filter and Mixing Box: Parallel-blade galvanized-steel dampers mechanically fastened to steel operating rod in reinforced, galvanized-steel cabinet. Connect operating rods with common linkage and interconnect linkages so dampers operate simultaneously. Cabinet support members shall hold 2-inch thick, pleated or throwaway filters. Provide hinged access panels or doors to allow removal of filters from both sides of unit.

2.10 FILTER SECTION

A. Provide factory-fabricated filter section of the same construction and finish as unit casings. Filter section shall have side access filter guides and access door(s) extending

the full height of the casing to facilitate filter removal. Construct doors in accordance with Section 2.04. Provide fixed filter blockoffs as required to prevent air bypass around filters. Blockoffs shall not need to be removed during filter replacement. Filters to be of size, and quantity needed to maximize filter face area of each particular unit size.

B. Provide 4" thick MERV 14 filter.

C. Filter media shall be UL 900 listed, Class I or Class II.

2.11 ELECTRIC

A. Motor shall be a premium efficiency open drip-proof type. Electrical characteristics shall be as shown on the schedule.

B. A variable frequency drive with fused disconnect switch shall be furnished and mounted by fan manufacturer for field power connection.

2.12 EXTERNAL SUPPORT KIT (INDOOR UNIT)

A. A galvanized steel support, minimum 10-gauge, shall be provided on the base of the unit. An external support kit may be used for ceiling suspension, external isolation, or housekeeping pad.

2.13 COMBINATION VARIABLE FREQUENCY DRIVES/DISCONNECTS

A. A combination variable frequency drive/disconnect package shall be factory mounted and wired by the air handling unit manufacturer. The package shall include:

1. Variable frequency drive.
2. Pulse width modulated drive with IGBT transistors.
3. LCD display and keypad.
4. English language electrical values, parameters, self-test, faults, and diagnostics.
5. Power, pending fault, and fault LED indicator lights.
6. Form C fault contacts.
7. 4-20 mA or 0-10 V speed input signal.
8. Circuit breaker disconnect.
9. Hand-Off-Auto (HOA) selector switch.
10. Current limiting NEMA Class T fuses.
11. NEMA 1 enclosure.
12. Auto restart after momentary power loss.
13. Critical frequency avoidance.
14. Power wiring in "liquid tight" conduit and junction boxes from VFD to motor.

15. Voltage and FLA shall be factory-set for exact motor used in the air handler.
16. Optional three-contactor bypass with a key operated drive-off-bypass selector switch.

2.14 AUTOMATIC TEMPERATURE CONTROLS

A. See the drawings for control schematics and sequence of operation. See the specification Section 15 "HVAC Instrumentation and Controls for HVAC." for additional information.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine roughing-in of steam, hydronic, and condensate drainage piping systems and electrical services to verify actual locations of connections before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install air-handling units with the following vibration control devices.

1. Suspended Units: Suspend units from structural-steel support frame using threaded steel rods and spring hangers.

B. Arrange installation of units to provide access space around air-handling units for service and maintenance.

3.3 CONNECTIONS

A. Piping installation requirements are specified in other mechanical Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to machine to allow service and maintenance.

C. Connect piping to air-handling units mounted on vibration isolators with flexible connectors.

D. Connect condensate drain pans using NPS 1-1/4, Type M copper tubing. Extend to nearest equipment or floor drain. Construct deep trap at connection to drain pan and install cleanouts at changes in direction.

E. Hot-Water Piping: Comply with applicable requirements in Section "Hydronic Piping." Connect to supply and return coil tappings with shutoff or balancing valve and union or flange at each connection.

F. Steam and Condensate Piping: Comply with applicable requirements in Section "Steam and Condensate Piping." Connect to supply and return coil tappings with shutoff valve and union or flange at each connection.

G. Refrigerant Piping: Comply with applicable requirements in Section "Refrigerant Piping." Connect to supply and return coil tappings with shutoff valve and union or flange at each connection.

H. Duct installation and connection requirements are specified in other mechanical Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connections.

I. Electrical: Comply with applicable requirements in Electrical Sections for power wiring, switches, and motor controls.

J. Ground equipment according to Electrical Section 16060, "Grounding and Bonding."

K. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.

1. Leak Test: After installation, fill water and steam coils with water and test coils and connections for leaks. Repair leaks and retest until no leaks exist.
2. Charge refrigerant coils with refrigerant and test for leaks. Repair leaks and retest until no leaks exist.
3. Fan Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Remove malfunctioning units, replace with new units, and retest.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.5 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

B. Final Checks before Startup: Perform the following:

1. Verify that shipping, blocking, and bracing are removed.
2. Verify that unit is secure on mountings and supporting devices and that connections to piping, ducts, and electrical systems are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
3. Perform cleaning and adjusting specified in this Section.
4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify free fan wheel rotation and smooth bearing operations. Reconnect fan drive system, align belts, and install belt guards.
5. Lubricate bearings, pulleys, belts, and other moving parts with factory-recommended lubricants.
6. Set outside- and return-air mixing dampers to minimum outside-air setting.
7. Comb coil fins for parallel orientation.
8. Install clean filters.
9. Verify that manual and automatic volume control and fire and smoke dampers in connected duct systems are in fully open position.

C. Starting procedures for air-handling units include the following:

1. Energize motor; verify proper operation of motor, drive system, and fan wheel. Adjust fan to indicated rpm. Replace fan and motor pulleys as required to achieve design conditions.
2. Measure and record motor electrical values for voltage and amperage.
3. Manually operate dampers from fully closed to fully open position and record fan performance.

D. Refer to Section "Testing, Adjusting, and Balancing" for air-handling system testing, adjusting, and balancing.

3.6 ADJUSTING

A. Adjust damper linkages for proper damper operation.

3.7 CLEANING

A. Clean air-handling units internally, on completion of installation, according to manufacturer's written instructions. Clean fan interiors to remove foreign material

and construction dirt and dust. Vacuum clean fan wheels, cabinets, and coils entering air face.

B. After completing system installation and testing, adjusting, and balancing air handling and air-distribution systems, clean filter housings and install new filters.

3.8 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain indoor air-handling units.

B. The contractor shall provide general HVAC system training of 40 hours which shall include operating instruction, and review of wiring and control diagram showing complete layout of each system. Contractor shall engage a factory certified technician and ATC vendor to assist during training.

END OF SECTION 15725

SECTION 15763 – 4-Pipe Fan Coil Unit

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes constant-volume or variable-volume, air-handling units with fans, coils, filters, and dampers for indoor installations.

1.3 SUBMITTALS

A. Product Data: For each type of air-handling unit indicated. Include the following:

1. Certified fan-performance curves with system operating conditions indicated.
2. Certified fan-sound power ratings.
3. Certified coil-performance ratings with system operating conditions indicated.
4. Motor ratings, electrical characteristics, and motor and fan accessories.
5. Material gages and finishes.
6. Filters with performance characteristics.
7. Dampers, including housings, linkages, and operators.
8. Wiring Diagrams: Power, signal, and control wiring.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain air-handling units through one source from a single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. NFPA Compliance: air-handling units and components shall be designed, fabricated, and installed in compliance with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."

D. ARI Certification: air-handling units and their components shall be factory tested according to ARI 430, "Central-Station Air-Handling Units," and shall be listed and labeled by ARI.

E. Comply with NFPA 70.

1.5 COORDINATION

A. Coordinate installation with Section 15 "Vibration Isolation and Seismic Restraints."

B. Coordinate size and location of structural-steel support members.

1.6 Warranty

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Bid Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Bid Documents.

B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of components that fail in materials or workmanship within specified warranty period.

C. Warranty Period: 2 year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Aquatherm.
2. Trane.
3. Carrier.
4. Or approved equal

2.2 MANUFACTURED UNITS

A. The air handler shall be furnished as a ceiling cassette.

2.3 General:

A. Unit shall be a factory assembled and tested water fan coil.
B. Unit shall be assembled with high quality.
C. Contained within the unit shall be all factory wiring, piping, and associated controls.

2.4 Unit Cabinet and Cover:

A. Cabinet is constructed of galvanized sheet metal.
B. Cover composed of high impact polymers.
C. Internally and externally insulated to ensure quiet operation.

2.5 Fan Motor and Blower Wheels:

A. Available in 208/230-1-50/60 VAC.
B. Fan motor shall be three speed, direct drive, and PSC type.
C. Fan motor shall be totally enclosed.
D. Fan motor shall be internal overload protected.
E. Radial blower wheel is dynamically balanced.

2.6 Air Distribution:

A. Unit contains four manually adjustable discharge air louvers.

2.7 Water Coil:

A. Manufactured with water coils containing copper tubing mechanically bonded to aluminum fins.
B. Maximum operating pressure is 150 psig.
C. Coils are designed to accept an entering water temperature not to exceed 160°F
D. Pressure independent flow control required on both coils to not exceed max flow for each coil. Consult primary coil and secondary coil data for proper sizing

2.8 Drain Pan:

A. Constructed of injected molded polystyrene.

2.9 Filters:

A. Unit shall contain a woven panel washable filter.

2.10 Fresh Air:

A. Unit shall be able to receive up to 50% filtered fresh air.
B. Fresh air introduced shall be externally fan forced and externally controlled.

2.11 EXTERNAL SUPPORT KIT (INDOOR UNIT)

A. A galvanized steel support, minimum 10-gauge, shall be provided on the base of the unit. An external support kit may be used for ceiling suspension, external isolation, or housekeeping pad.

2.12 AUTOMATIC TEMPERATURE CONTROLS

A. See the drawings for control schematics and sequence of operation. See the specification Section 15 "HVAC Instrumentation and Controls for HVAC." for additional information.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine roughing-in of hydronic, and condensate drainage piping systems and electrical services to verify actual locations of connections before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install air-handling units with the following vibration control devices.

1. Suspended Units: Suspend units from structural-steel support frame using threaded steel rods and spring hangers.

B. Arrange installation of units to provide access space around air-handling units for service and maintenance.

3.3 CONNECTIONS

A. Piping installation requirements are specified in other mechanical Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to machine to allow service and maintenance.

C. Connect piping to air-handling units mounted on vibration isolators with flexible connectors.

D. Connect condensate drain pans using NPS 1-1/4, Type M copper tubing. Extend to nearest equipment or floor drain. Construct deep trap at connection to drain pan and install cleanouts at changes in direction.

E. Hot-Water Piping: Comply with applicable requirements in Section "Hydronic Piping." Connect to supply and return coil tappings with shutoff or balancing valve and union or flange at each connection.

F. Steam and Condensate Piping: Comply with applicable requirements in Section "Steam and Condensate Piping." Connect to supply and return coil tappings with shutoff valve and union or flange at each connection.

G. requirements are specified in other mechanical Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connections.

H. Electrical: Comply with applicable requirements in Electrical Sections for power wiring, switches, and motor controls.

I. Ground equipment according to Electrical Section 16060, "Grounding and Bonding."

J. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.

1. Leak Test: After installation, fill water and steam coils with water and test coils and connections for leaks. Repair leaks and retest until no leaks exist.
2. Charge refrigerant coils with refrigerant and test for leaks. Repair leaks and retest until no leaks exist.
3. Fan Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Remove malfunctioning units, replace with new units, and retest.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.5 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

B. Final Checks before Startup: Perform the following:

1. Verify that shipping, blocking, and bracing are removed.
2. Verify that unit is secure on mountings and supporting devices and that connections to piping, ducts, and electrical systems are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
3. Perform cleaning and adjusting specified in this Section.
4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify free fan wheel rotation and smooth bearing operations. Reconnect fan drive system, align belts, and install belt guards.
5. Lubricate bearings, pulleys, belts, and other moving parts with factory-recommended lubricants.
6. Set outside- and return-air mixing dampers to minimum outside-air setting.
7. Comb coil fins for parallel orientation.
8. Install clean filters.
9. Verify that manual and automatic volume control and fire and smoke dampers in connected duct systems are in fully open position.

C. Starting procedures for air-handling units include the following:

1. Energize motor; verify proper operation of motor, drive system, and fan wheel. Adjust fan to indicated rpm. Replace fan and motor pulleys as required to achieve design conditions.
2. Measure and record motor electrical values for voltage and amperage.
3. Manually operate dampers from fully closed to fully open position and record fan performance.

D. Refer to Section "Testing, Adjusting, and Balancing" for air-handling system testing, adjusting, and balancing.

3.6 ADJUSTING

A. Adjust damper linkages for proper damper operation.

3.7 CLEANING

A. Clean air-handling units internally, on completion of installation, according to manufacturer's written instructions. Clean fan interiors to remove foreign material and construction dirt and dust. Vacuum clean fan wheels, cabinets, and coils entering air face.

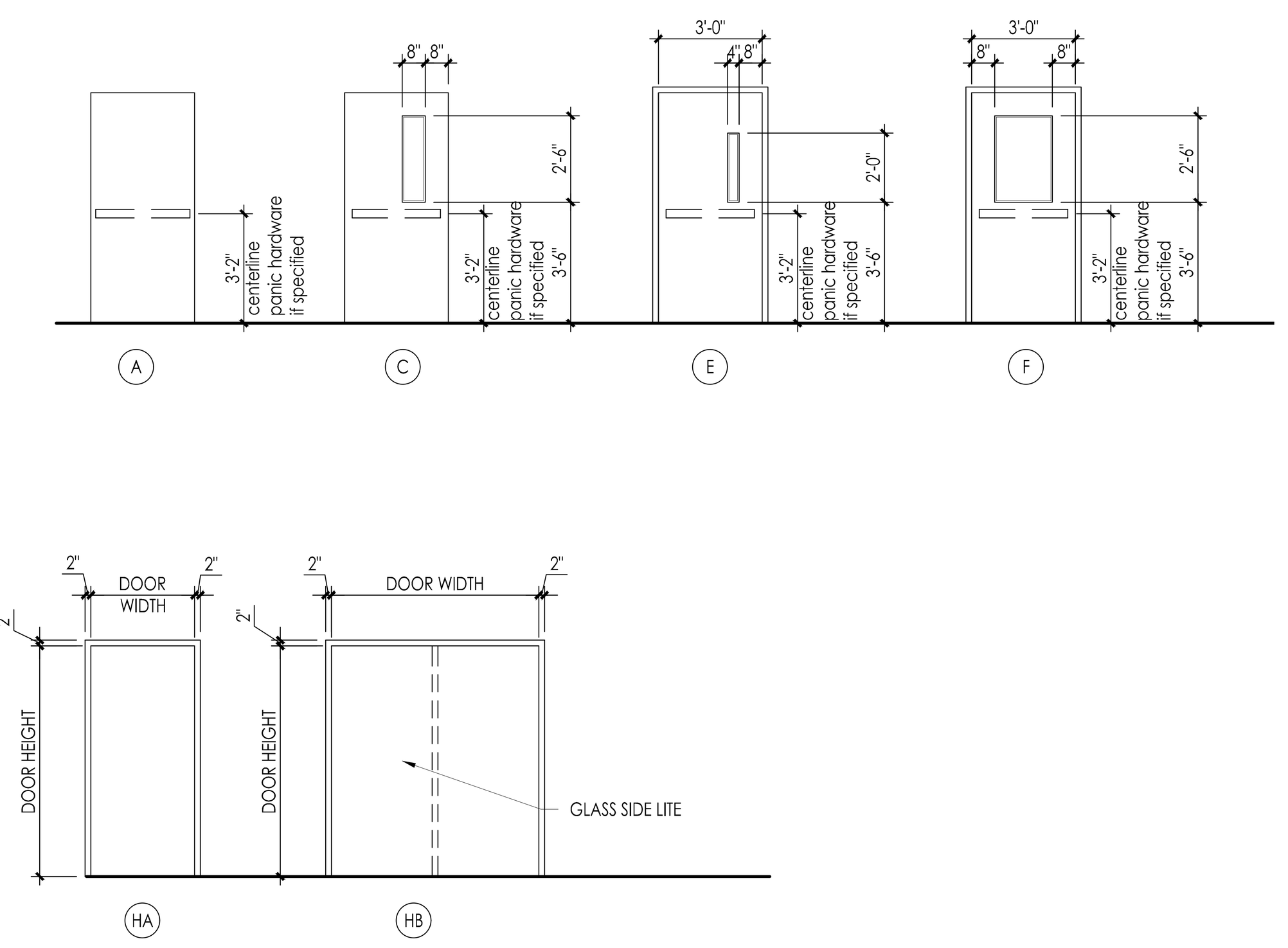
B. After completing system installation and testing, adjusting, and balancing air handling and air-distribution systems, clean filter housings and install new filters.

3.8 DEMONSTRATION

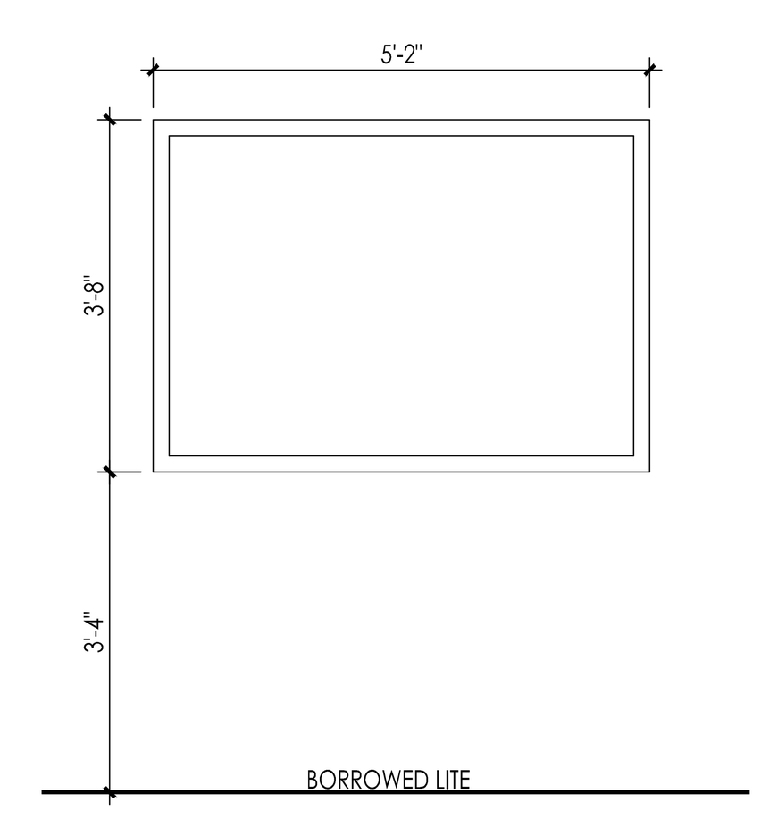
A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain indoor air-handling units.

B. The contractor shall provide general HVAC system training of 40 hours which shall include operating instruction, and review of wiring and control diagram showing complete layout of each system. Contractor shall engage a factory certified technician and ATC vendor to assist during training.

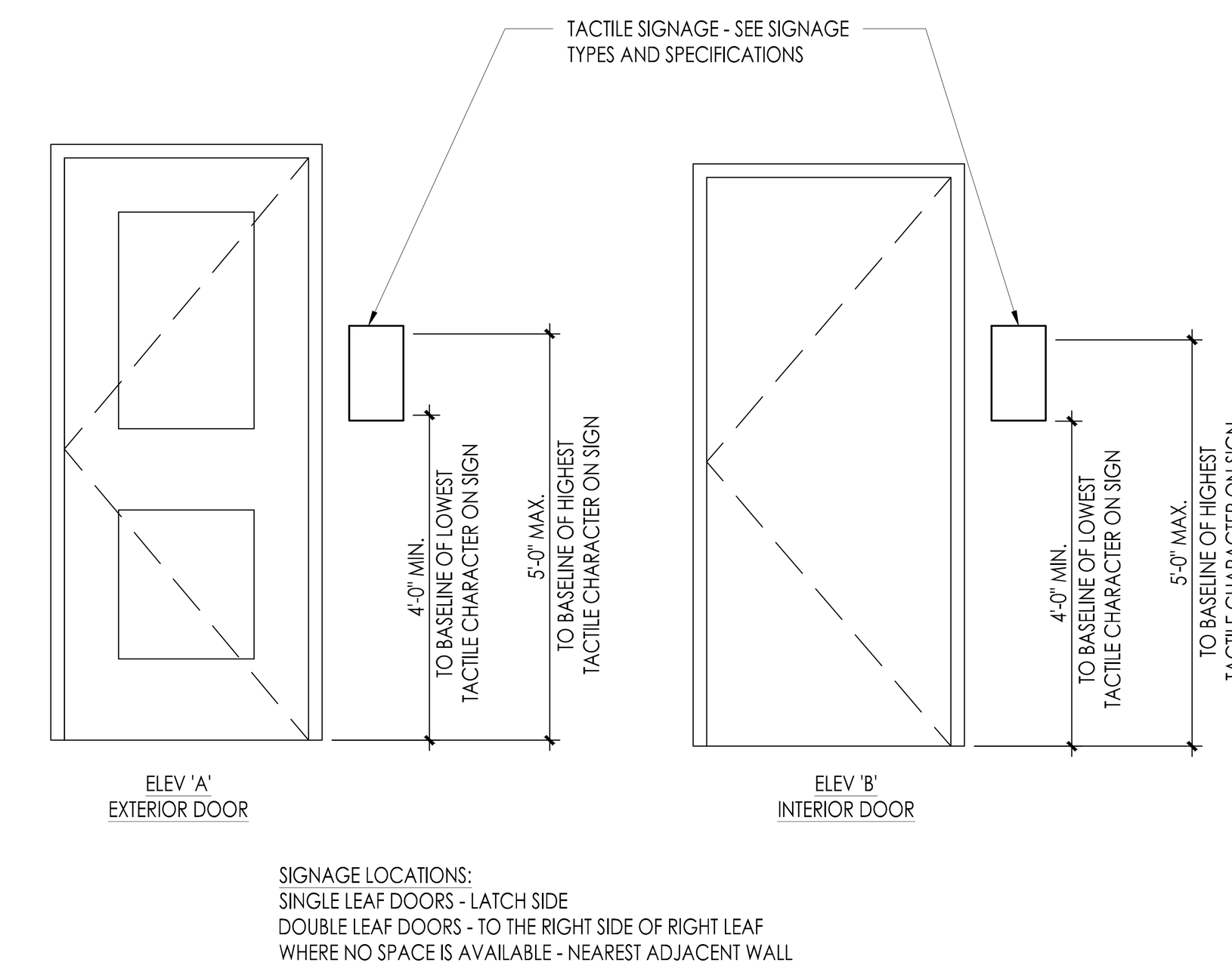
END OF SECTION 15725



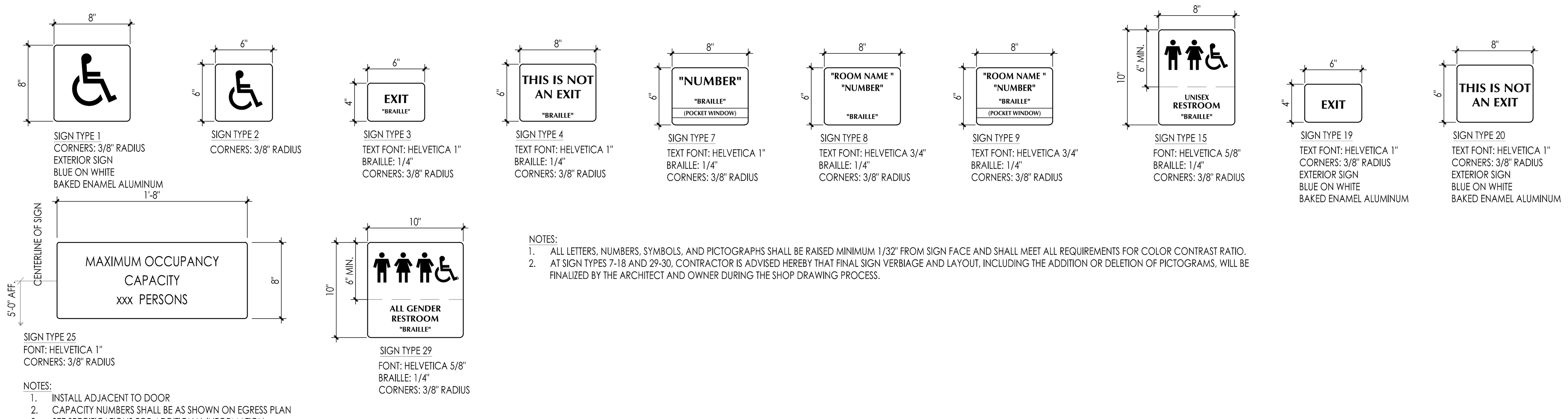
1 DOOR AND FRAME TYPES
1/4" = 1'-0"



2 BORROWED LITE ELEVATION
1/2" = 1'-0"

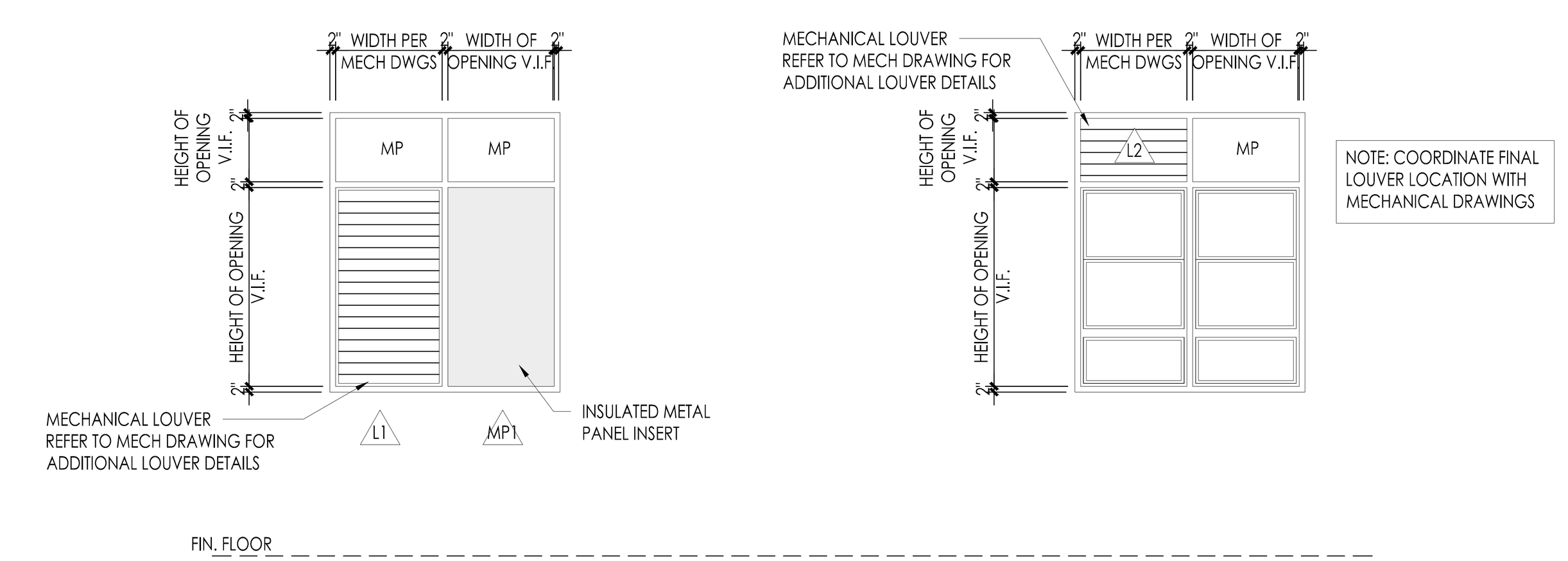


3 SIGNAGE LOCATION DETAILS
1/2" = 1'-0"

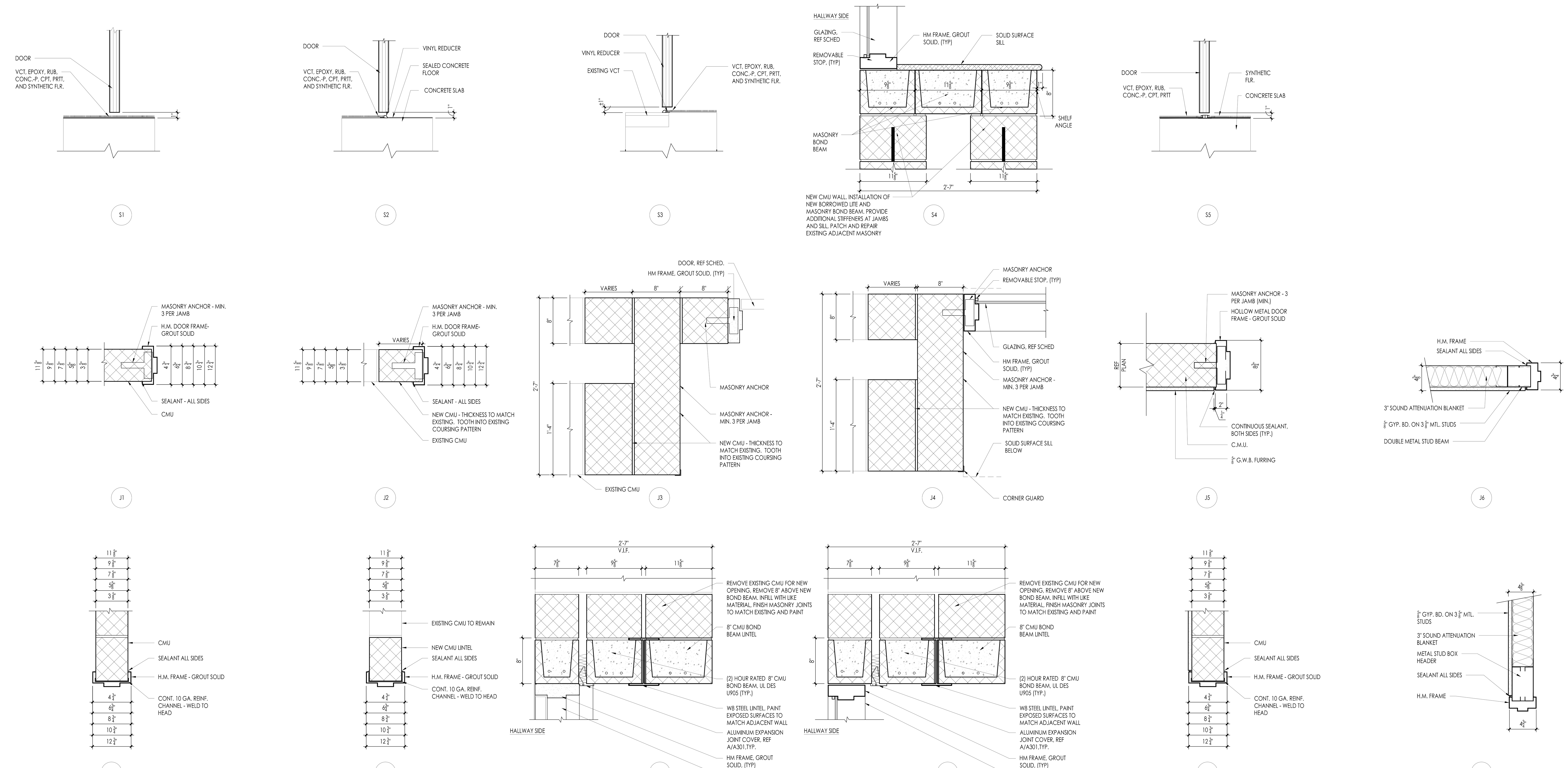


NOTES:
1. ALL LETTERS, NUMBERS, SYMBOLS, AND PICTOGRAPHS SHALL BE RAISED MINIMUM 1/32" FROM SIGN FACE AND SHALL MEET ALL REQUIREMENTS FOR COLOR CONTRAST RATIO.
2. AT SIGN TYPES 7-18 AND 29-30, CONTRACTOR IS ADVISED HEREBY THAT FINAL SIGN VERBIAGE AND LAYOUT, INCLUDING THE ADDITION OR DELETION OF PICTOGRAMS, WILL BE FINALIZED BY THE ARCHITECT AND OWNER DURING THE SHOP DRAWING PROCESS.

4 SIGNAGE TYPES
1-1/2" = 1'-0"



5 WINDOW INFILL TYPES
1/4" = 1'-0"



6 DOOR HEAD, JAMB, AND SADDLE DETAILS
1-1/2" = 1'-0"

DOOR AND FRAME SCHEDULE

DR NO	DOOR LOCATION	DOOR SIZE	DOOR TYPE	DOOR MATL	DOOR GLAZING	FRAME TYPE	FRAME MATL	DETAIL HEAD	DETAIL JAMB	DETAIL SADDLE	HARDWARE	RATING	SIGN TYPE	NOTES
027A-1	GALLERYA 027A	2 @ 3'-0" x 7'-0"	F	WD	FRIG-1	HB	HM	S2	J5	H5	EXD-2F	20 MIN.	9	6
027A-2	GALLERYA 027A	4'-10" x 3'-4"	--	--	FRIG-1	HA	HM	S4	J4	H4	00B	90 MIN.	--	4, 6
027B-1	GALLERYB 027B	3'-0" x 7'-0"	F	WD	FRIG-1	HA	HM	S2	J5	H5	EXD-1E	20 MIN.	9	6
027B-2	GALLERYB 027B	3'-2" x 7'-0"	F	WD	FRIG-1	HA	HM	--	--	--	EXD-1E.1	20 MIN.	8	3, 6
030	TLT. RM. 030	3'-0" x 7'-0"	A	WD	--	HA	HM	S5	J1	H1	TRS-04	20 MIN.	29	6
031	TLT. RM. 031	3'-0" x 7'-0"	A	WD	--	HA	HM	S5	J1	H1	TRS-04	20 MIN.	29	6
032	STORAGE 032	3'-0" x 7'-0"	A	WD	--	HA	HM	S2	J1	H1	STO-01	20 MIN.	29	6
033	STOR./MECH. 033	3'-0" x 7'-0"	A	WD	FRIG-1	HA	HM	S2	J1	H1	STO-01	20 MIN.	8	6
034-1	CONFERENCEROOM 034	3'-0" x 7'-0"	C	WD	FRIG-1	HA	HM	S1	J2	H2	OF-01.1	20 MIN.	9	6
034-2	CONFERENCE IT	2 @ 4'-0" x 7'-0"	A	WD	--	HB	HM	S1	J6	H6	STO-02	--	--	6
035	CLASSROOM 035	2'-8" x 7'-8"	C	WD	FRIG-1	HA	HM	S1	J2	H2	CRS-04	20 MIN.	8	6
036	OFFICE 036	2'-8" x 7'-8"	C	WD	FRIG-1	HA	HM	--	--	--	OF-01	20 MIN.	9	3, 6
037A	FLEXCLASSROOM 037A	3'-0" x 7'-0"	C	WD	FRIG-1	HA	HM	S1	J1	H1	EXD-1E	20 MIN.	8	6
037B	FLEXCLASSROOM 037B	3'-0" x 7'-0"	C	WD	FRIG-1	HA	HM	S1	J1	H1	EXD-1E	20 MIN.	8	6
C001-1	CORRIDOR C001	3'-6" x 7'-0"	E	WD	FRIG-1	HA	HM	S3	J1	H3	EXD-1G	90 MIN.	--	5, 6
C002-1	CORRIDOR C002	2 @ 2'-10" x 6'-10"	E	WD	FRIG-1	HB	HM	S3	J3	H3	EXD-2G	90 MIN.	--	5, 6
S1	STAIR S1	3'-0" x 7'-8"	E	WD	FRIG-1	HA	HM	--	--	--	EXD-1D	45 MIN.	4	1, 2, 3, 6

DOOR SCHEDULE NOTES

1. PROXIMITY READER BY OWNER'S VENDOR - SEE GENERAL DOOR NOTE 7 AND ELECT. DRAWINGS.
2. DOOR RATED FOR STAIR TOWER CONSTRUCTION.
3. EXISTING DOOR & FRAMED REPLACED WITH NEW, VERIFY EXISTING OPENING WIDTH IN FIELD.
4. BORROWED LITE IN HOLLOW METAL FRAME, REFER TO FRAME TYPES FOR DETAILS.
5. DOOR HOLD OPENS, COORDINATE WITH ELECTRICAL PLANS.
6. PAINT HOLLOW METAL FRAMES, P-5.

GENERAL DOOR NOTES

1. ALL DOORS ARE 1 3/4" THICK UNLESS OTHERWISE NOTED.
2. SEE DOOR TYPES, HOLLOW METAL FRAME TYPES AND ALUMINUM FRAME TYPES ON THIS DRAWING.
3. SEE SIGNAGE TYPES AND DETAILS ON THIS DRAWING.
4. SEE HEAD, JAMB, SADDLE AND SILL DETAILS ON DRAWING Axxx.
5. SEE STOREFRONT TYPES AND DETAILS ON DRAWING Axxx.
6. SEE CURTAIN WALL TYPES AND DETAILS ON DRAWING Axxx.
7. COORDINATE ALL ACCESS CONTROL PREP AND WIRING WITH ELECTRICAL CONTRACTOR AND OWNER'S VENDOR (TYP.)

ABBREVIATIONS

AL - ALUMINUM
ETR - EXISTING TO REMAIN
FRIG-1 - FIRE-RATED IMPACT-RESISTANT GLAZING - TYPE 1
FRIG-1-F - FIRE-RATED IMPACT-RESISTANT GLAZING - TYPE 1 W/ SECURITY WINDOW FILM
FRP - FIBERGLASS REINFORCED POLYESTER
HM - HOLLOW METAL
INSUL - INSULATED TINTED TEMPERED GLASS
INSUL-F - INSULATED TINTED TEMPERED GLASS W/ SECURITY WINDOW FILM
TPG - TEMPERED PLATE GLASS
TPG-F - TEMPERED PLATE GLASS W/ SECURITY WINDOW FILM
WD - WOOD

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Project Name
Renovations to Princeton High School

Project Owner Name
Princeton Public Schools

Project Location
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Checked By
WDH
Drawn By
BMP
Scale
AS NOTED

Drawing Name
DOOR TYPES & SCHEDULES

Revisions

No.	Date	Description
1	02.24.26	ADDENDUM 1

Drawing Number
A601