Bid Addendum No. 2

Date: January 8, 2024

Project : **DNR- 230014.03** **FY23-24 Buck Creek State Park – New Nature Center**

To All Bidders: This Addendum updates the original Drawings and Project Manual designated "BID SET" and dated: December 13, 2023. Content within this Addendum shall become part of the Contract Documents.

See the end of this document for listing of revised Specifications or Drawings issued as part of this Addendum. Revised Drawings and Specifications shall include designation within the typical REVISION BLOCK within the typical drawing title block / specification header notating Addendum # and associated issuance date.

This Addendum contains **04** total pages, including this cover sheet and does not include any attachments noted herein.

A) General:

1) The Pre-Bid Meeting occurred on the project site on December 20, 2023 at 10am. Please find attached the Pre-Bid Attendance sign-in sheet for record and reference. NOTE: Contractors, at their discretion, may arrange site visits and access to interior of the existing facility through the Buck Creek State Park Manager, William Wigg at (937) 322-5284.
2) **NOTICE OF BID OPENING TIME EXTENSION**: **The Bid Opening Time has been extended from January 12, 2024 at 2:00pm EST to January 12, 2024 at 4:00pm EST. All other bidding provisions included within the Project Manual apply and remain unchanged.**
3) Partial Permit Approval has been secured from Commerce. Work may proceed once NTP is issued to the General Contractor.

B) **Substitutions:**

1) There are no Substitution requests.

C) Questions received during Pre-Bid Meeting and within RFI period are officially answered below:

ADD2.1: CLARIFICATION to Drawing A-0 – DEMOLITION PLAN: Regarding the existing ceiling-installed ANSUL kitchen hood and associated rooftop ventilator: The General Contractor shall salvage and remove various existing items and present to ODNR as part of the Demolition Process. Refer to Drawing A-0 for list of items to be salvaged. The existing ANSUL hood and rooftop ventilator shall be salvaged and presented to ODNR. ODNR shall remove equipment as needed to not interfere with construction services. There is NO interior evidence of underground connection from the grilling area / existing cooktop to the existing underground grease receptacle tank as noted with Coded Note #6. Per Drawing A-0, the Contractor shall include removal of an existing underground grease receptacle tank within bid.

Bid Addendum No. 2

ADD2.2: CLARIFICATION to Drawing A-0.1: The Coded Notes list have been revised to reflect proper conditions. Refer to Drawing A-0.1, issued as part of this Addendum.

ADD2.3: CLARIFICATION to Drawing A-1.2 and A-13.0: The project includes a 16'-0 wide x 9'-0" high overhead coiling aluminum slat door at the west end of the building as indicated on the floor plans, elevations and door schedule. Refer to Specification Section 08 33 23 – OVERHEAD COILING DOORS issued as part of this Addendum.

ADD2.4: Note 14 on A-3 states that the benches are to have similar stain to half picnic tables provided and installed by GC. On sheet A-0 it states that the picnic tables are existing to remain, refinish. Are the half tables new and supplied by GC or are they existing to remain?
A – CLARIFICATION to Drawing A-0 and Note #13 on Drawing A-3: The half-picnic tables flanking the waterway guardrails are existing to remain. The GC is responsible for painting the existing picnic -half table steel framework to match the roofing color and re-finishing the tabletops and bench seats to match the new glu-laminated beam color.

ADD2.5: CLARIFICATION to Drawing A-13.0 – Door & Window Schedules & Door Types: Revise Door Types Schedule to DELETE column for "HARDWARE SET". See Section 08 71 00 – Door Hardware, issued as part of Addendum #2, for governing Door Hardware Index.

D) **Specifications issued as part of this Addendum**

ADD2.6: Section 01 11 00 – TABLE OF CONTENTS
1. REVISE to ADD Section 08 33 23 – Overhead Coiling Doors

ADD2.7: Section 01 23 00 – ALTERNATES
1. ADD Bid Alternate #10 – Privacy Fence to Subparagraph 3.1 – SCHEDULE OF ALTERNATES.

ADD2.8: Section 08 33 23 – OVERHEAD COILING DOORS
1. ADD Section 08 33 23 – Overhead Coiling Doors in its entirety.

ADD 2.9 Section 08 71 00 – DOOR HARDWARE
1. REVISE Section 08 71 00 – Door Hardware to modify hardware sets as indicated. A Hardware Set Index has been added to the end of Section 08 71 00. **Disregard the Door Hardware designations included in the Door Types Schedule on Drawing A-13.0. The new Hardware Index in Section 08 71 00 governs.**

ADD2.10 Section 09 65 00 – RESILIENT FLOORING
1. REVISE Section 09 65 00 – Resilient Flooring Basis of Design manufacturer to Tarkett Series: iQ Optima, 24" x 24" x 2mm as indicated. The Basis-of-Design product from Armstrong has been discontinued.

ADD2.11 Section 10 28 00 – TOILET ACCESSORIES
1. REVISE subparagraph 2.03 Basis-of-Design manufacturer from Bobrick Toilet Tissue Dispenser # B-7685 to B-2890 (enclosed 10" diameter roll) as indicated.

ADD2.12 Section 22 07 19 - PLUMBING PIPING INSULATION

1. Paragraph 3.9, B was added to the specification, clarifying the insulation requirements for hot water and hot water return piping.

ADD2.13 Section 23 07 13 - DUCT INSULATION

1. Paragraph 3.7, A was modified to specification, clarifying duct systems requiring insulation.
2. Paragraphs 3.7, B, and 5 were added to the specification to clarify duct systems that do not require insulation.
3. Paragraph 3.8, A was modified, indicating all supply air ductwork is to be insulated.

ADD2.14 Specification 23 23 00 – REFRIGERANT PIPING

1. Paragraph 1.4, F was added to the specification, to indicate equipment supplier submittal requirement.

ADD2.15 Specification 23 31 13 – METAL DUCTS

1. Paragraph 2.3, B., 2. was modified to clarify the location of when exposed ductwork requires additional finishes

E) Drawings issued as part of Addendum

ADD2.16: Drawing L-0 – LIFE SAFETY / GENERAL INFORMATION

1. REVISE Life Safety Plan 1/L-0 to add tactile exit sign locations. Install signs at height and location shown on 2/L-0.

ADD2.17: Drawing A-0 – DEMOLITION PLAN

1. ADD General Note "I" to indicate extents of selective demolition of existing concrete floor slabs and exterior paving as indicated. New concrete slabs within conditioned space shall include vapor retarders beneath the slab.
2. REVISE coded note #8 and #9 and ADD coded notes #13 through 18 to denote existing items to be salvaged and presented to ODNR.

ADD2.18 Drawing A-0.1 – SITE UTILIZATION PLAN

1. ADD Box Note denoted Bid Alternate #10 – Privacy Fence around existing fuel storage tank and new HP-3 and HP-4 units. See Specification Section 01 23 00 – Alternates for description of Bid Alternate #10 accordingly.
2. REVISE coded notes to reflect required scope of work.
3. ADD denotation for new exterior concrete paving against existing waterway retaining wall.

ADD2.19: Drawing H-2-0 – GENERAL HVAC PLAN

1. HVAC Coded Notes #3 was modified to clarify how the underground conduit and refrigerant line would enter the building.
2. HP 3 and HP 4 underground conduit and refrigerant lines were adjusted to enter and stub up into the building in the southwest corner of the storage room.
3. Box Note added beneath HVAC Coded Notes to clarify installation of HP-3 and HP-4 near the existing fuel storage tank, including associated refrigerant shop drawing requirements.

Bid Addendum No. 2

ADD2.20: Drawing E-1-0 – GENERAL ELECTRICAL DEMOLITION PLAN

1. Added existing fuel tank pump controller and E-OFF pushbutton safety switch to NW corner of building with leader note.
2. Revised leader note for existing dock fuel pump controller and associated E-OFF pushbutton safety switch.
3. Added temporary power panel to power plan with leader note.
4. Added drawing notes 6 & 8: note 6 describes scope covering feeder to other buildings. Note 7 describes providing temporary mounting support for all existing E-OFF safety pushbutton switches and motor controllers.

ADD2.21 Drawing E-2-0 – ELECTRICAL POWER PLAN

1. Relocated heat pump disconnect switches to NW corner of building.
2. Added existing E-OFF safety pushbutton switch to exterior NW corner of building with leader note

End of Addendum #2

D) ATTACHMENTS:

1) REVISED SPECIFICATIONS

Section 00 11 00 – TABLE OF CONTENTS
Section 01 23 00 – ALTERNATES
Section 08 33 23 – OVERHEAD COILING DOORS
Section 08 71 00 – DOOR HARDWARE
Section 10 28 00 – TOILET ACCESSORIES
Section 22 07 19 – PLUMBING PIPING INSULATION
Section 23 07 13 – DUCT INSULATION
Section 23 23 00 – REFRIGERANT PIPING
Section 23 31 13 – METAL DUCTS

2) REVISED DRAWINGS

Drawing L-0 – LIFE SAFETY & GENERAL INFORMATION
Drawing A-0 – DEMOLITION PLAN
Drawing A-0.1 – SITE UTILIZATION PLAN
Drawing A-1 – SITE PLAN
Drawing H-2-0 – GENERAL HVAC PLAN
Drawing E-1-0 – GENERAL ELECTRICAL DEMOLITION PLAN
Drawing E-2-0 – ELECTRICAL POWER PLAN

SECTION 00 01 10 - TABLE OF CONTENTS

Ohio Department of Natural Resources
Buck Creek State Park
New Nature Center – Clark County, Ohio
Project No.: DNR-230014.03
FMS Project No. 22009

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

DIVISION 8 - DOORS AND WINDOWS

DIVISION 9 - FINISHES

DIVISION 10 – SPECIALTIES

DIVISION 11 - EQUIPMENT

NOT USED

DIVISION 21 – FIRE SUPPRESSION

NOT USED

DIVISION 22 – PLUMBING

SECTION 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate. Refer to Drawing A-12 – “Alternate F.F.E. Schedule” for description of Alternates

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. **Alternate No. 1: Shelving Unit**:
   a. Eleven (11) shelving units in Storage Room (108). See Drawing A-12 for list of acceptable manufacturers and shelf unit sizes.

B. **Alternate No. 2: Chest Freezer**:
   a. Mobile Chest Freezer Unit in Storage Room (108). See Drawing A-12 for list of acceptable manufacturers and related electrical requirements.

C. **Alternate No. 3: Freezer**:
   a. Commercial Upright Freezer Unit in Storage Room (108). See Drawing A-12 for list of acceptable manufacturers and related electrical requirements.

D. **Alternate No. 4: Bait Refrigerator**:
   a. Mobile freestanding Bait Refrigerator Unit in Camp Store (101). See Drawing A-12 for list of acceptable manufacturers and related electrical requirements.

E. **Alternate No. 5: Merchandise Display**:
   a. Two (2) Maple Wood Quad Slatwall Displays. See Drawing A-12 for display unit sizes.

F. **Alternate No. 6: Office Desk**:
   a. Two (2) Office Desks in Office (103). See Drawing A-12 for list of acceptable manufacturers and specific requirements.

G. **Alternate No. 7: Office Chair**:
   a. Two (2) Office Chairs in Office (103). See Drawing A-12 for list of acceptable manufacturers and specific requirements.

H. **Alternate No. 8: Office Storage Shelving**:
   a. Mobile Chest Freezer Unit in Office (103). See Drawing A-12 for list of acceptable manufacturers and related requirements.

I. **Alternate No. 9: Exterior Display Kayaks**:
   a. Four (4) 7’ long fiberglass Kayaks for exterior display. See Drawing A-3 for location and Drawing A-12 for related requirements.

J. Alternate No. 10: Privacy Fence:
   a. Install new privacy screen wall around the existing fuel storage tank and new HP-3 and HP-4 units as indicated in Box Note on Drawing A-0.1 – Site Utilization Plan, issued as part of this Addendum. The existing chain link fence and gates shall remain in place. The new privacy screen fence shall be installed 12” away from the existing fence. The new fence shall be installed as indicated to allow open

access to the existing chain link fuel tank service gates. The new fence shall be constructed of 6x6 PT posts with three (3) 2x4 horizontal rails with 1x6x6' high composite wood vertical fence boards. Provide one (1) access gate to the HP-2 and HP-4 enclosure as indicated. Gate shall include hardware (hasp, etc.) to allow gate to be locked. Basis of Design Composite Wood manufacturer is Trex. Acceptable equals by Moisture Shield, Fiberon and others based upon Architect's review and approval.

END OF SECTION 01 23 00

SECTION 08 33 23 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Service doors.

1.3 ACTION SUBMITTALS

A. Product Data: For each type and size of overhead coiling door and accessory.

1. Include construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, and mounting details.
2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
4. For exterior components, include details of provisions for assembly expansion and contraction and for excluding and draining moisture to the exterior.
5. Show locations of controls, locking devices, and other accessories.

C. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.

1. Include similar Samples of accessories involving color selection.

D. Samples for Verification: For each type of exposed finish on the following components, in manufacturer's standard sizes:

1. Curtain slats.
2. Bottom bar.
3. Guides.
4. Brackets.
5. Hood.
6. Locking device(s).
7. Include similar Samples of accessories involving color selection.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For overhead coiling doors to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

1. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, GENERAL

A. Source Limitations: Obtain overhead coiling doors from single source from single manufacturer.

1. Obtain operators and controls from overhead coiling door manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.

1. Design Wind Load: As indicated on Drawings.
2. Testing: According to ASTM E 330.
3. Deflection Limits: Design overhead coiling doors to withstand design wind load without evidencing permanent deformation or disengagement of door components.
4. Operability under Wind Load: Design overhead coiling doors to remain operable under uniform pressure (velocity pressure) of 20 lbf/sq. ft. (960 Pa) wind load, acting inward and outward.

2.3 DOOR ASSEMBLY

A. Service Door: Overhead coiling door formed with curtain of interlocking metal slats.

1. Basis of Design: Overhead Door Company

2. Acceptable equals: Cookson Door Products, Raynor, Ritehite.

B. Operation Cycles: Door components and operators capable of operating for not less than 50,000. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

1. Include tamperproof cycle counter.

C. Air Infiltration: Maximum rate of 1.0 cfm/sq. ft. (5.1 L/s per sq. m) at 15 and 25 mph (24.1 and 40.2 km/h) when tested according to ASTM E 283.

D. STC Rating: Not Applicable

E. Curtain R-Value: 4.5 deg F x h x sq. ft./Btu (0.792 K x sq. m/W.

F. Door Curtain Material: Aluminum.

G. Door Curtain Slats: Flat profile slats of 1-7/8-inch (48-mm) center-to-center height.
1. Gasket Seal. Manufacturer's standard continuous gaskets between slats.

H. Bottom Bar: Two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch (38 by 38 by 3 mm) thick fabricated from hot-dip galvanized steel and finished to match door.

I. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats.

J. Hood: Match curtain material and finish.

1. Shape: Round .
2. Mounting: Face of wall.

K. Locking Devices: Equip door with locking device assembly.

1. Locking Device Assembly: Cremone type, both jamb sides locking bars, operable from outside only, with cylinder .

L. Manual Door Operator: Push-up operation.

M. Curtain Accessories: Equip door with push/pull handles.

N. Door Finish:

1. Aluminum Finish: Clear anodized

2.4 MATERIALS, GENERAL

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.5 DOOR CURTAIN MATERIALS AND CONSTRUCTION

A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
1. Aluminum Door Curtain Slats: ASTM B 209 (ASTM B 209M) sheet or ASTM B 221 (ASTM B 221M) extrusions, alloy and temper standard with manufacturer for type of use and finish indicated; thickness of 0.050 inch (1.27 mm); and as required.

2. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face, with minimum aluminum thickness of 0.032 inch (0.80 mm).

B. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

2.6 HOODS

A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
1. Aluminum: 0.040-inch- (1.02-mm-) thick aluminum sheet complying with ASTM B 209 (ASTM B 209M), of alloy and temper recommended by manufacturer and finisher for type of use and finish indicated.

2.7 LOCKING DEVICES

A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.

B. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.

1. Lock Cylinders: Cylinders standard with manufacturer and keyed to building keying system.
2. Keys: Two for each cylinder.

C. .

2.8 CURTAIN ACCESSORIES

A. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.

2.9 COUNTERBALANCING MECHANISM

A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, seamless carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. (2.5 mm/m) of span under full load.

C. Counterbalance Spring: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.

D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.

E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.10 MANUAL DOOR OPERATORS

A. General: Equip door with manual door operator by door manufacturer.

B. Push-up Door Operation: Lift handles and pull rope for raising and lowering doors, with counterbalance mechanism designed so that required lift or pull for door operation does not exceed 25 lbf (111 N).

2.11 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM/NOMMA's "Metal Finishes Manual for Architectural and Metal Products (AMP 500-06)" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.12 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, [AA-M12C22A41, Class I, 0.018 mm] or thicker.

B. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.

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

3.2 INSTALLATION

A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

B. Install overhead coiling doors, hoods, controls, and operators at the mounting locations indicated for each door.

C. Accessibility: Install overhead coiling doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

3.3 STARTUP SERVICE

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

1. Perform installation and startup checks according to manufacturer's written instructions.
2. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.

1. Adjust exterior doors and components to be weather-resistant.

B. Lubricate bearings and sliding parts as recommended by manufacturer.

3.5 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of coiling-door Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for door operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

1. Perform maintenance, including emergency callback service, during normal working hours.
2. Include 24-hour-per-day, seven-day-per-week, emergency callback service.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 08 33 23

SECTION 087100 - 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. "Interior Aluminum Doors and Frames"
   d. "Aluminum-Framed Entrances and Storefronts"
   e. "Stainless Steel Doors and Frames"
   f. "Special Function Doors"
   g. "Entrances"
6. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
7. Division 28 "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) 3 years
        2) Exit Devices
            a) 3 years
        3) Closers
            a) 30 years
        4) Automatic Operators
            a) 2 years
    b. Electrical Warranty
        1) Exit Devices

a) 1 year

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. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."

1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.

B. 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 section 01 25 00.

C. 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.

D. 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 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

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

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 CONTINUOUS HINGES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Select
   b. Best

B. Requirements:

1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.05 ELECTRIC POWER TRANSFER

A. Manufacturers:

1. Scheduled Manufacturer and Product:
   a. Von Duprin EPT-10

2. Acceptable Manufacturers and Products:
   a. Securitron CEPT-10
   b. Precision EPT-12C

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.

2.06 FLUSH BOLTS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Burns
   b. Trimco

B. Requirements:

1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

2.07 COORDINATORS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Burns
   b. Trimco

B. Requirements:

1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers, surface vertical rod exit device strikes, or other stop mounted hardware. Factory-prepared coordinators for vertical rod devices as specified.

2.08 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage L9000 series

2. Acceptable Manufacturers and Products:
   a. Accurate 9000/9100 series
   b. Best 45H series

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3-hour fire doors.
2. Indicators: Where specified, provide indicator window measuring a minimum 2-3/5-inch x 3/5 inch with 180-degree visibility. Provide messages color-coded using ANSI Z535 Safety Red with full text and/or symbols, as scheduled, for easy visibility. When applicable allows for lock status indication on both sides of the door.
3. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
4. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
5. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latch-bolt. Provide deadbolt with full 1-inch (25 mm) throw, constructed of stainless steel.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide switches and sensors integrated into the locks and latches.
7. Provide motor based electrified locksets that comply with the following requirements:
   a. Universal input voltage – single chassis accepts 12 or 24VDC to allow for changes in the field without changing lock chassis.
   b. Fail Safe/Fail Secure – changing mode between electrically locked (fail safe) and electrically unlocked (fail secure) is field selectable without opening the lock case.
   c. Low maximum current draw – maximum 0.4 amps to allow for multiple locks on a single power supply.
   d. Low holding current – maximum 0.01 amps to produce minimal heat, eliminate “hot levers” in electrically locked applications, and to provide reliable operation in wood doors that provide minimal ventilation and air flow.
   e. Connections – provide quick-connect Molex system standard.

8. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
   a. Lever Design: 06A

2.09 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Von Duprin 99/33A series

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

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 grooved 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.
17. ~~Special Options:~~
    - a. ~~SI~~
      1) ~~Provide dogging indicators for visible indication of dogging status.~~
    - b. ~~XP~~
      1) ~~Rim Exit Devices: provide devices with non-tapered smart latchbolt with 90° latchbolt to strike engagement under stress and Static Load Resistance of 2000 pounds.~~
    - c. ~~QM~~
      1) ~~Rim Exit Devices: provide devices with damper-controlled re-latching to reduce operational noise. Where lever trim is specified, provide damper-controlled lever return.~~
    - d. ~~HH~~
      1) ~~Provide wind and impact rated hurricane exit devices and mullions certified to comply with Florida Building Code (FBC) TAS 201, 202, 203.~~
    - e. ~~HW~~
      1) ~~Provide wind rated hurricane exit devices and mullions certified to comply with ANSI-ASTM E330.~~
    - f. ~~CX~~
      1) ~~Provide delayed egress devices, where scheduled, that are UL 294 listed, meet National Fire Protection Association (NFPA) and International Building Code (IBC) governing delayed egress, and/or other local and national fire codes acceptable to authority having jurisdiction as required.~~
         a) ~~Provide non-handed and field sizable device with 3/4 (19mm) throw deadlocking latch bolt. Device incorporates an internal RX switch that detects attempt to exit from applying less than 15lbs to the push pad, which causes this switch to start an irreversible alarm cycle. Key switch in device is capable of arming, disarming, or resetting the device; and indicator lamp determines status of the device~~
         b) ~~Provide devices capable of standard 15 second release delay and indefinite release delay as required by code, when tied into fire alarm system will release immediately when an alarm condition exists.~~

c) Provide devices with all control inputs – door position input, external inhibit input, fire alarm input; auxiliary locking; nuisance alarm and internal horn; and, remote signaling output self-contained in the device assembly.

g. CVC

1) Provide cable-actuated concealed vertical latch system in two-point for non-rated or fire rated wood doors up to a 90 minute rating and less bottom latch (LBL) configuration for non-rated or fire rated wood doors up to 20 minute rating. Vertical rods not permitted.

a) Cable: Stainless steel with abrasive resistant coating. Conduit and core wire ends snap into latch and center slides without use of tools.

b) Wood Door Prep: Maximum 1 inch x 1.1875 inch x 3.875 inches top latch pocket and 1 inch x 1.1875 inch x 5 inches bottom latch pocket which does not require the use of a metal wrap or edge for non-rated or fire rated wood doors up to a 45 minute rating.

c) Latchbolts and Blocking Cams: Manufactured from sintered metal low carbon copper- infiltrated steel, with molybdenum disulfide low friction coating.

d) Top Latchbolt: Minimum 0.38 inch (10 mm) and greater than 90-degree engagement with strike to prevent door and frame separation under high static load.

e) Bottom Latchbolt: Minimum of 0.44-inch (11 mm) engagement with strike.

f) Product Cycle Life: 1,000,000 cycles.

g) Latch Operation: Top and bottom latch operate independently of each other. Top latch fully engages top strike even when bottom latch is compromised. Separate trigger mechanisms not permitted.

h) Latch release does not require separate trigger mechanism.

i) Cable and latching system characteristics:

i. Installed independently of exit device installation, and capable of functioning on door prior to device and trim installation.

ii. Connected to exit device at single point in steel and aluminum doors, and two points for top and bottom latches in wood doors.

iii. Bottom latch height adjusted, from single point for steel and aluminum doors and two points for wood doors, after system is installed and connected to exit device, while door is hanging

iv. Bottom latch position altered up and down minimum of 2 inches (51 mm) in steel and aluminum doors without additional adjustment. Bottom latch deadlocks in every adjustment position in wood doors.

v. Top and bottom latches in steel and aluminum doors and top latch in wood doors may be removed while door is hanging.

2.10 OFFLINE CONTROLLER

A. Manufacturer and Product:

1. Scheduled Manufacturer and Product:
   a. Schlage CTE Engage Controller

2. Acceptable Manufacturers and Products:
   a. No Substitute

B. Requirements:

1. Provide an offline single opening controller UL 294 listed and compatible with the Schlage Engage Application. Include a multi-technology reader kit.

2. Provide interfaces for a multi-technology credential reader, powered and dry output relays for strike, alarm, and auxiliary function, and with wireless communication capability.
3. Provide offline controller with the following power options:
   a. Power Over Ethernet (POE)
      1) .5A at 12 VDC for up to 500 feet.
      2) 1.5A at 24 VDC for up to 500 feet.
   b. 12 VDC in 2A at 12 VDC for up to 500 feet.
   c. 24 VDC in 2A at 24 VDC for up to 500 feet.

4. Provide offline controller with the following communication standards:
   a. Bluetooth low energy version 4.2.
   b. 2.4 GHz Wi-Fi (IEEE 802.11b/g/n).
   c. WPA2, WPA, WEP, 802.1x (PEAP).
   d. Transport Layer Security (TLS) version 12.
   e. Advanced Encryption Standard (AES) 256-bit.

5. Provide offline controller with the following signal inputs:
   a. One Schlage MT11-485 or MT15-485 reader.
   b. Request to Enter (REN).
   c. Request to Exit (REX).
   d. Remote Release – hardwired.
   e. Door Position Switch (DPS).
   f. Reader tamper (TAMP).

6. Provide offline controller with the following signal outputs:
   a. Card Reader 0.3A at 12 VDC for up to 500 feet.
   b. Locking mechanism: 2A at 30 VDC max.
   c. Auxiliary: 2A at 30 VDC max.
   d. Alarm: 2A at 30 VDC max.

7. Provide offline controller with the following with operating temperatures between -31 F (-35 C) to 151 F (66 C).
8. Provide offline controller with the following on board database:
   a. up to 5,000 users
   b. up to 2,000 audits (FIFO)
   c. up to 16 Time Zones
   d. up to 32 Holiday Schedules
   e. up to 16 Schedules (lock & unlock)

9. Provide offline controller with the following connectivity options:
   a. Apple or Droid smart phone – Bluetooth updates to CTE.
   b. Wi-Fi access point – automatic daily updates (one time per day) if connected to Wi-Fi.

C. Provide offline controller with "No-Tour" with MT20W enrollment reader and Schlage 1K smart credentials (13.56 MHz).

2.11 POWER SUPPLIES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage/Von Duprin PS900 Series

2. Acceptable Manufacturers and Products:
   a. Precision ELR series
   b. Sargent 3500 series

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.

2.12 CYLINDERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage Everest

2. Acceptable Manufacturers and Products:
   a. No Substitute

B. Requirements:

1. Provide cylinders/cores 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. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
   a. Patented Open: cylinder with interchangeable core with open keyway.

3. Patent Protection: Cylinders/cores requiring use of restricted, patented keys, patent protected.
4. Nickel silver bottom pins.

2.13 KEYING

A. Scheduled System:

1. New factory registered system:
   a. Provide a factory registered keying system, complying 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.

~~2.14 KEY CONTROL SYSTEM~~

~~A. Manufacturers:~~

~~1. Scheduled Manufacturer:~~
~~a. Telkee~~

~~2. Acceptable Manufacturers:~~
~~a. No Substitute~~
~~b. HPC~~
~~c. Lund~~

~~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.~~

2.15 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. LCN 4040XP series

2. Acceptable Manufacturers and Products:
   a. Corbin-Russwin DC8000 series
   b. Sargent 281 series

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 high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2-inch (38 mm) diameter piston with 5/8-inch (16 mm) diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and 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. Provide snap-on cover clip, with plastic covers, that secures cover to spring tube.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide 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.

2.16 ELECTRO-MECHANICAL AUTOMATIC OPERATORS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. LCN Senior Swing

2. Acceptable Manufacturers and Products:
   a. Besam Swingmaster MP
   b. Stanley Access Technoligies M-Force

B. Requirements:

1. Provide low energy automatic operator units that are electro-mechanical design complying with ANSI/BHMA A156.19.
   a. Opening: Powered by DC motor working through reduction gears.
   b. Closing: Spring force.
   c. Manual, hydraulic, or chain drive closers: Not permitted.
   d. Operation: Motor is off when door is in closing mode. Door can be manually operated with power on or off without damage to operator. Provide variable adjustments, including opening and closing speed adjustment.
   e. Cover: Aluminum.

2. Provide units with manual off/auto/hold-open switch, push and go function to activate power operator, vestibule interface delay, electric lock delay, hold-open delay adjustable from 1 to 32 seconds, and logic terminal to interface with accessories, mats, and sensors.
3. Provide drop plates, brackets, and adapters for arms as required to suit details.
4. Provide motion sensors and/or actuator switches, and receivers for operation as specified. Provide weather-resistant actuators at exterior applications.
5. Provide key switches, with LED's, recommended and approved by manufacturer of automatic operator as required for function as described in operation description of hardware sets. Cylinders: Refer to "KEYING" article, herein.
6. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators, key switches, and other controls as directed by Architect.

2.17 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Burns
   b. Trimco

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.

2.18 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers:
   a. Glynn-Johnson

2. Acceptable Manufacturers:
   a. Rixson
   b. Sargent

B. Requirements:

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.

2.19 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Burns
   b. Trimco

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.

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

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Zero International

2. Acceptable Manufacturers:
   a. Reese
   b. Legacy

B. Requirements:

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.

2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

2.21 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Burns
   b. Trimco

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.

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. 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.

L. 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.

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

N. 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.

O. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

P. 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.

Q. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

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

S. 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:

104935 OPT0355026 Version 1

Hardware Group No. 01

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	OFFICE/ENTRY LOCK	L9050T 06A L583-363	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 02

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	DBL CYL STORE LOCK	L9066T 06A XL11-897	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61	689	LCN

Hardware Group No. 03

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	L9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 04

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	L9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 05

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	429AA	AA	ZER
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER

DOORS REQUIRE SPECIAL 3/8 INCH UNDERCUT FOR ADA TYPE THRESHOLD.

Hardware Group No. 06

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CONST LATCHING BOLT	FB51P/FB61P (AS REQ'D)	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ *ACTIVE LEAF ONLY	689	LCN
1	EA	OVERLAPPING ASTRAGAL	BY DOOR/FRAME MANUFACTURER		B/O
2	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 07

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112XY	628	IVE
1	EA	CONST LATCHING BOLT	FB51P/FB61P (AS REQ'D)	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	COORDINATOR	COR X FL (MB AS REQ'D)	628	IVE
2	EA	OH STOP	100S	630	GLY
2	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
2	EA	KICK PLATE	8400 8" X 1" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	429AA	AA	ZER
1	EA	OVERLAPPING ASTRAGAL	BY DOOR/FRAME MANUFACTURER		B/O
2	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER

DOORS REQUIRE SPECIAL 3/8 INCH UNDERCUT FOR ADA TYPE THRESHOLD.

Hardware Group No. 08

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10	689	VON
1	EA	EU MORTISE LOCK	L9492TEU 06A L583-363 DM CON 12/24 VDC	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	EXTERIOR INDICATOR - OCCUPIED/VACANT	L283-414 626	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	630	IVE
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER
1	EA	CONTROLLER	CTE-MT15-485-B	B	SCE
1	EA	POWER SUPPLY	PS902 120/240 VAC	LGR	SCE

DOORS REQUIRE SPECIAL 3/8 INCH UNDERCUT FOR ADA TYPE THRESHOLD.

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. DURING DAYLIGHT HOURS, DOOR CAN BE UNLOCKED BY CONTROLLER TO ALLOW FOR USE OF RESTROOM. KEY OVERRIDE AVAILABLE FOR EMERGENCY INGRESS. FREE EGRESS AT ALL TIMES

Hardware Group No. 09

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	CD-99-L-NL-06	626	VON
1	EA	MORTISE CYLINDER	20-059 - CAM & BLOCKING RING AS REQUIRED.	626	SCH
1	EA	RIM HOUSING	20-079	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61	689	LCN
2	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER

DOORS REQUIRE SPECIAL 3/8 INCH UNDERCUT FOR ADA TYPE THRESHOLD.

PERIMETER WEATHER SEALS PROVIDED BY ALUMINUM SECTION.

Hardware Group No. 10

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10	689	VON
1	EA	ELEC PANIC HARDWARE	SD-QEL-99-L-NL-06 24 VDC	626	VON
1	EA	MORTISE CYLINDER	20-059 - CAM & BLOCKING RING AS REQUIRED.	626	SCH
1	EA	RIM HOUSING	20-079	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61	689	LCN
2	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER
1	EA	CONTROLLER	CTE-MT15-485-B	B	SCE
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC	LGR	SCE

DOORS REQUIRE SPECIAL 3/8 INCH UNDERCUT FOR ADA TYPE THRESHOLD.

PERIMETER WEATHER SEALS PROVIDED BY ALUMINUM SECTION.

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. PANIC DEVICE LATCHES ALSO CAPABLE OF BEING ELECTRONICALLY DOGGED DOWN (I.E. PUSH/PULL MODE) AS DESIGNATED BY CONTROLLER. FREE EGRESS AT ALL TIMES.

Hardware Group No. 11

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	CONT. HINGE	112XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10	689	VON
1	EA	PANIC HARDWARE	CD-9947-L-DT-06	626	VON
1	EA	ELEC PANIC HARDWARE	CD-LX-9947-L-NL-06	626	VON
2	EA	MORTISE CYLINDER	20-059 - CAM & BLOCKING RING AS REQUIRED.	626	SCH
1	EA	RIM HOUSING	20-079	626	SCH
3	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	SURF. AUTO OPERATOR	9540	ANCLR	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61	689	LCN
1	EA	ACTUATOR, TOUCH	8310-818	630	LCN
1	EA	ACTUATOR, TOUCH	8310-852	630	LCN
2	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER

DOORS REQUIRE SPECIAL 3/8 INCH UNDERCUT FOR ADA TYPE THRESHOLD.

PERIMETER WEATHER AND MEETING STYLE SEALS PROVIDED BY ALUMINUM SECTION.

NOTE: DOOR SHALL INCLUDE POWER ACTUATED OPENER ON ONE DOOR WITH REMOTE PEDESTAL-MOUNTED ACTUATOR BUTTON ON THE EXTERIOR – JAMB-MOUNTED ACTUATOR AT THE INTERIOR SIDE OF DOOR. SEE DRAWINGS FOR LOCATIONS OF DOOR OPENER PEDESTAL AND DOOR JAMB-LOCATED DOOR OPENER BUTTON. COORDINATE POWER REQUIREMENTS WITH ELECTRICAL DRAWINGS AND SPECIFICATIONS.

OPERATION: PANIC HARDWARE IS MECHANICALLY DOGGED DURING OPEN HOURS FOR MANUAL PUSH/PULL OPERATION OR FOR OPENING BY ADA OPERATOR. LX SWITCH IN PANIC DEVICE MONITORS POSITION OF LATCH BOLT. WHEN LATCH BOLT IS RETRACTED, OPERATOR IS ON AND ACTUATORS ARE ACTIVE. FREE EGRESS AT ALL TIMES.

Hardware Group No. 12

Provide each SGL door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR

ALL REQUIRED HARDWARE BY GATE MANUFACTURER

Hardware Group No. 13

Provide each RU door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR

ALL REQUIRED HARDWARE BY OVERHEAD DOOR MANUFACTURER

Door Hardware Set Index NOTE: See Door Schedule and Floor Plan in Drawings for Door locations.

Door#	HwSet#
100	11
101	09
102A	06
102B	04
103	01
104	03
105	08
106	08
107	05
108	07
110	10
111	02
112	13
113	12

END OF SECTION 08 71 00

SECTION 09 65 00 - RESILIENT FLOORING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.02 SUMMARY:

A. Extent of resilient flooring, base and accessories is shown on drawings & schedules. The work of this contract includes providing these items, and final waxing of resilient flooring.

1.03 QUALITY ASSURANCE:

A. General: Materials must be free of asbestos.

B. Manufacturer: Provide each type of resilient flooring & accessories as produced by single manufacturer, including recommended primers, adhesives, sealants,& leveling compounds.

C. Fire Test Performance: Provide resilient flooring which complies with the following fire test performance criteria as determined by an independent testing laboratory acceptable to authorities having jurisdiction.

1. Critical Radiant Flux (CRF): Not less than the following rating per ASTM E 648.
   a. Class 1, not less than 0.45 watts per sq. cm. or greater if required per code.
2. Flame Spread: Not more than 75 per ASTM E 84.
3. Smoke Developed: Not more than 450 per ASTM E 84.
4. Smoke Density: Not more than 450 per ASTM E 662.

D. Installer's Qualifications: Engage Installer who has had more than l0 years of successful experience installing similar applications.

1.04 SUBMITTALS:

A. Product Data: Submit mfgr's technical data for each type of resilient flooring & accessory.

B. Samples for Initial Selection Purposes: Submit manufacturer's standard color charts in form of actual sections of resilient flooring, including accessories, showing full range of colors and patterns available, for each type of resilient flooring required.

C. Samples for Verification Purposes: Submit the following samples of each type, color, and pattern of resilient flooring required, showing full-range of color and pattern variations.

1. Full size tile samples.
2. 2-1/2 long samples of resilient flooring accessories.
3. Other materials as requested.

D. Certification for Fire Test Performance: Submit certification from an independent testing laboratory acceptable to authorities having jurisdiction that resilient flooring complies with fire test performance requirements.

E. Certification for asbestos-free materials from manufacturers of products.

F. Certification of moisture content in substrate.

G. Provide plans showing extent of any color boarders, accent patterns, icons, or other resilient features.

H. Maintenance Instructions: Submit 2 copies of manufacturer's recommended maintenance practices for each type of resilient flooring and accessory required.

1.05 PROJECT CONDITIONS:

A. Maintain minimum temperature of 65 deg. F (18 deg. C) in spaces to receive resilient flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. Store resilient flooring materials in spaces where they will be installed for at least 48 hours before beginning installation. Subsequently, maintain minimum temperature of 55 deg. F (13 deg. C) in areas where work is completed.

B. Install resilient flooring and accessories after other finishing operations, including painting, have been completed. Do not install resilient flooring over concrete slabs until the latter have been cured and are sufficiently dry to achieve bond with adhesive as determined by resilient flooring manufacturer's recommended bond and results of moisture test which are in concurrence.

C. Do not install products until they are at the same temperature as the space where they are to be installed.

D. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by manufacturer.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. Manufacturer: Subject to requirements, provide products of one of the following:

1. Manufacturer of Vinyl Tile:
   Armstrong
   Tarkett
   Johnsonite
   Roppe
   Or approved equal

2.02 RESILIENT PRODUCTS COLORS AND PATTERNS:

A. Basis of Design- Luxury Vinyl Tile, pattern and orientation as shown in Drawings:
   ~~Armstrong Flooring 24" x 24" x 1/8" "Migrations" Vinyl Tile~~
   Tarkett Commercial Flooring, 24" x 24" x 2 mm Luxury Vinyl Tile,

1. Series: iQ Optima
2. Color: To be selected from standard colors within manufacturer's selected series for 24" x 24" tile.

2.03 TILE FLOORING:

A. Luxury Vinyl Tile: ASTM F 1700, Class 1 Fire Performance. ~~Class III, Type B Embossed surface:~~

2.04 RESILIENT ACCESSORIES:

A. Resilient Edge Strips: 1/8" thick, homogeneous vinyl or rubber composition, tapered or bull-nose edge, color to match flooring, or as selected by Architect from standard colors available; not less than 1" wide.

B. Adhesives (Cements): Waterproof, stabilized type as recommended by flooring manufacturer to suit material and substrate conditions.

C. Leveling & Patching Compounds: Latex types as recommended by flooring manufacturer. Leveling and patching compounds shall not be installed in thickness greater than ½".

E. Resilient/Carpet Transition: 1/8" high aluminum, by Schluter, National Guard or Zero.

PART 3 - EXECUTION

3.01 INSPECTION:

A. Require Installer to inspect sub-floor surfaces to determine that they are satisfactory. A satisfactory sub-floor surface is defined as one that is smooth and free from cracks, holes, ridges, coatings preventing adhesive bond, and other defects impairing performance or appearance. Verify that concrete slabs comply with ASTM F710.

B. Perform bond and moisture tests on concrete sub-floors to determine if surfaces are sufficiently cured and dry as well as to ascertain presence of curing compounds.

C. Do not allow resilient flooring work to proceed until sub-floor surfaces are satisfactory.

3.02 PREPARATION:

A. Prepare sub-floor surfaces as follows:
   1. Use leveling and patching compounds as recommended by resilient flooring manufacturer for filling small cracks, holes and depressions in sub-floors.
   2. Remove coatings from sub-floor surfaces that would prevent adhesive bond, including curing compounds incompatible with resilient flooring adhesives, paint, oils, waxes and sealers.

B. Broom clean, then vacuum surfaces to be covered, and inspect sub-floor.

3.03 INSTALLATION:

A. Install resilient flooring using method indicated in strict compliance with manufacturer's printed instructions. Extend resilient flooring into toe spaces, door reveals, and into closets and similar openings. Extend base over toe space of cabinets and shelving.

B. Scribe, cut, and fit resilient flooring to permanent fixtures, built-in furniture and cabinets, pipes, outlets and permanent columns, walls and partitions.

C. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on sub-floor. Use chalk or other non-permanent marking device.

D. Install resilient flooring on covers for telephone and electrical ducts, and similar items occurring within finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers. Tightly cement edges to perimeter of floor around covers and to covers.

E. Tightly cement resilient flooring to sub-base without open cracks, voids, raising, puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections. Hand roll resilient flooring at perimeter of each covered area to assure adhesion.

F. Metal transition strip (use between carpet and VCT).

3.04 INSTALLATION OF TILE FLOORS:

A. Lay tile from center marks established with principal walls, discounting minor offsets, so that tile at opposite edges of room area of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, unless otherwise shown.

B. Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged if so numbered. Cut tile neatly around all fixtures. Broken, cracked, chipped, or deformed tiles are not acceptable.

C. Adhere tile flooring to substrates using full spread of adhesive applied in compliance with flooring manufacturer's directions.

3.07 INSTALLATION OF ACCESSORIES:

A. Place resilient edge_strips tightly butted to flooring and secure with adhesive. Install edging strips at edges of flooring which would otherwise be exposed.

B. Apply butt type metal edge strips where shown on drawings, and before installation of resilient flooring. Secure units to substrate with countersunk stainless steel anchors, complying with manufacturer's recommendations.

C. Apply resilient accessories to stairs as indicated and in strict accordance with manufacturer's installation instructions.

3.06 CLEANING WAXING AND PROTECTION:

A. Perform following operations immediately upon completion of resilient flooring:
   1. Sweep or vacuum floor thoroughly.
   2. Do not wash floor until time period recommended by resilient flooring manufacturer has elapsed to allow resilient flooring to become well-sealed in adhesive.
   3. Damp-mop floor being careful to remove black marks and excessive soil.
   4. Remove any excess adhesive or other surface blemishes, using appropriate cleaner recommended by resilient flooring manufacturers.

B. Protect flooring against damage during construction period to comply with resilient flooring manufacturer's directions.
   1. Protect resilient flooring against damage from rolling loads for initial period following installation by covering with plywood or hardboard. Use dollies to move stationary equipment or furnishings across floors.
   2. Cover resilient flooring with undyed, untreated building paper until inspection for final completion.

C. Clean and wax resilient flooring not more than 30 days prior to date scheduled for inspections intended to establish date of final completion in each area of project. Clean and wax resilient flooring by method recommended by resilient flooring manufacturer.

3.07 EXTRA STOCK:

A. Deliver stock of maintenance materials to Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying label. Provide maintenance materials as follows, 5% of each color.

3.08 RESILIENT FLOORING COLOR SELECTIONS:

A. See Drawings for color selections and layout pattern for floor tiles in Kitchen area.

END OF SECTION 09 65 00

SECTION 10 28 00 - TOILET ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

A. Contractor shall provide and install new as follows:
1. Toilet tissue dispensers- provide one new at each restroom.
2. Grab bars- provide one new vertical and two new horizontal grab bars at each ADA compliant restroom.
3. Soap dispensers- provide one new at each restroom.
4. Mop and Broom Holder- provide one new at mop sink in Mechanical Room at location directed by architect.
5. Mirror: provide one new at each restroom.
6. Electric Hand Dryers- provide one new at each restroom.
7. Horizontal Diaper Changing Station- provide one at each ADA compliant restroom.
8. Semi-recessed waste container with removable trash receptacle

1.02 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specifications Sections.

B. Product Data for each toilet accessory item specified, including details of construction relative to materials, dimensions, gages, profiles, method of mounting, specified options, and finishes.

C. Samples: Full-size samples of each toilet accessory item for verification of design, operation, and finish requirements. Acceptable samples will be returned and may be used in the work.

D. Schedule: Indicating types, quantities, sizes, and installation locations (by room) for each toilet accessory item to be provided for project.

E. Setting Drawings: Where cutouts are required in other work, provide templates, substrate preparation instructions, and directions for preparing cutouts and for installation of anchorage devices.

1.03 QUALITY ASSURANCE

A. Inserts and Anchorages: Furnish inserts and anchoring devices that must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.

B. Single-Source Responsibility: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise acceptable to Architect.

1.04 PROJECT CONDITIONS

A. Coordination: Coordinate accessory locations, installation, and sequencing with other work to avoid interference and to assure proper installation, operation, adjustment, cleaning, and servicing of toilet accessory items.

1.05 WARRANTY

A. Special Project Warranty: Provide manufacturer's written 5-year warranty against silver spoilage of mirrors, agreeing to replace any mirrors that develop visible defects within warranty

period.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide toilet accessories by one of the following:
American Specialties, Inc.
*Bobrick Washroom Equipment, Inc.
Bradley Corporation.
* Specification is based on Bobrick Washroom Equipment, Inc.

2.02 MATERIALS, GENERAL

A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22-gage (.034-inch) minimum thickness, unless otherwise indicated.

B. Brass: Leaded and unleaded, flat products, ASTM B 19; rods, shapes, forgings, and flat products with finished edges, ASTM B 16, Castings, ASTM B-30.

C. Sheet Steel: Cold-rolled, commercial quality ASTM A 366, 20-gage (.040-inch) minimum, unless otherwise indicated. Surface preparation and metal pretreatment as required for applied finish.

D. Galvanized Steel Sheet: ASTM A 527, G60.

E. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.

F. Baked Enamel Finish: Factory-applied, gloss white, baked acrylic enamel coating.

G. Mirror Glass: Nominal 6.0 mm (0.23 inch) thick, conforming to ASTM C 1036, Type I, Class 1, Quality q2, and with silvering, electro- plated copper coating, and protective organic coating.

H. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.

I. Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

J. Keys: Unless otherwise indicated, provide universal keys for access to toilet accessory units requiring internal access for servicing, re-supply, etc. Provide minimum of six (6) keys to Owner's representative and obtain receipt.

2.03 TOILET TISSUE DISPENSERS

A. Surface mounted toilet paper dispenser: Shall be constructed of stainless steel, welded construction. All exposed surfaces shall have satin finish. Units shall hold one (1) 10” diameter roll. ~~dispense 1 standard toilet paper roll, 5 inch diameter, 1500 sheet toilet paper rolls~~. Install on wall as indicated.
1. Bobrick ~~B-7685~~ B-2890 or equal.

2.04 GRAB BARS

A. Stainless Steel Type: Provide new vertical and horizontal grab bars with wall thickness not less than .05 inches and as follows:
1. Mounting: Concealed, manufacturer's standard flanges and anchorages.

2. Clearance: 1-1/2 inches clearance between wall surface and inside face of bar.
3. Gripping Surfaces: Manufacturer's standard nonslip texture.
4. Heavy-Duty Size: Outside diameter of 1-1/2 inches. Length 18 inches.

B. The specification is based on Bobrick. Provide new vertical and horizontal grab bars at each restroom toilet: Vertical grab bar 18” long; rear wall toilet grab bar 36” long, sidewall toilet grab bar 42” long

2.05 SOAP DISPENSERS

A. Liquid Soap Dispenser, Provide one at men’s restroom. Soap dispenser shall be surface mounted type 304 stainless steel with satin finish. Corrosion resistant valve shall dispense viscous to thin free flowing lather. Valve shall be operable with one hand and with less than 5 pounds of force to comply with ADA accessibility guidelines. Container body and back plate shall be epoxy sealed to prevent warping and leakage. Soap dispenser shall have concealed, vandal resistant mounting, locked, hinged stainless steel lid for top filling shall require special key to open. Capacity shall be 40 fluid ounce.

2.06 MIRROR UNITS

A. Standard Stainless Steel Framed Mirror Units, one per lavatory: Mirror shall have a one piece, type 304 stainless steel angle frame, ¾ inch by ¾ inch with continuous integral stiffener on all sides and beveled front to hold frame tightly against mirror; corners shall be heliarc welded, ground and polished smooth; all exposed surfaces shall have satin finish with vertical grain. Float/plate glass mirror shall be guaranteed for 15 years against silver spoilage. All edges shall be protected by plastic filler strips and the back shall be protected by full size, shock absorbing water resistant nonabrasive 1/8 inch thick polyethylene padding. Galvanized steel back shall have integral hanging brackets for mounting on concealed rectangular wall hangers. Mirror shall be secured to hangers with concealed phillips head locking screws located in bottom of frame.
Bobrick B-290 2436 basis of design

2.07 HORIZONTAL DIAPER CHANGING STATIONS

A. General:
1. Height: 36”wide, 20” high, 4” deep closed, 15”+ 4” deep opened.
442 sq in. changing surface with safety straps and bag hooks.
1. Surface mounted, 18 ga #304 stainless steel exterior finish.
2. Child protection strap.
3. Sanitary bed liner dispenser, holds 25 chemical free liners.
4. High-impact polyethylene, no sharp corners.
5. Molded-in safety and usage instructions.
6. Manufacturers;
Koala Kare Products, KB110-SSWM (basis of specifications),
Equals by: Rubbermaid, World Dryer, Bradley, Medibaby
7. Warranty: Provide 5-year limited warranty.

2.08 SEMI-RECESSED WASTE RECEPTACLE

A. Classic Series by Bobrick, Unit #B-3644, satin-finish stainless steel with seamless beveled flange. Removable 12 gallon receptacle locks into cabinet. Rough wall opening: 16 inches wide, 29 ¼ inches high, 4 inch min. depth. Mount with receptacle opening at 42” AFF.

2.09 WALL-MOUNTED SHELF

A. Commercial Restroom Shelf by Bobrick, Unit #B-295x16, 18-gauge satin-finish B type 304

stainless steel. 5" W x 16"L. ¾" return edge with front edge hemmed for safety. 16-gauge brackets welded to underside of shelf. Anchor to wall with vandal-resistant screws per manufacturer recommendations. Mount as indicated on Drawings.

2.10 MISCELLANEOUS ACCESSORIES

A. Mop and Broom Holder: 18-gage Type 304 stainless steel "hat" channel with spring-loaded rubber cam-type mop/broom holders. Provide unit 36 inches long and complete with 4 holders. Provide one (1) centered over mop sink at Mechanical Room.

B. Electric Hand Dryers: Provide as shown on the drawings at each restroom. Furnish from ONLY ONE of the following manufacturers. Provide Cast Iron Cover White Porcelain Enamel Finish:
World Dryer Model A Hand Dryer- basis of design; or equal by:
American Specialties
American Dryer
Bradley Model
Bobrick
Excelerator
McKinney

2.11 FABRICATION

A. General: Only a maximum 1-1/2-inch diameter, unobtrusive stamped logo of manufacturer, as approved by Architect, is permitted on exposed face of toilet or bath accessory units. On either interior surface not exposed to view or back surface, provide additional identification by means of either a printed, waterproof label or a stamped nameplate, indicating manufacturer's name and product model number. 1 per janitor's closet.

B. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.

C. Recessed Toilet Accessories, General: Except where otherwise indicated, fabricate units of all welded construction, without mitered corners. Hang doors or access panels with full-length stainless steel piano hinge. Provide anchorage that is fully concealed when unit is closed.

D. Framed Mirror Units, General: Fabricate frames for glass mirror units to accommodate wood, felt, plastic, or other glass edge protection material. Provide mirror backing and support system that will permit rigid, tamperproof glass installation and prevent accumulation of moisture, as follows:
1. Provide galvanized steel backing sheet, not less than 22 gage (.034 inch) and full mirror size, with non-absorptive filler material. Corrugated cardboard is not an acceptable filler material.
2. Bobrick B-165 24" x 36" or equal.

E. Mirror Unit Hangers: Provide system of mounting mirror units that will permit rigid, tamperproof, and theft-proof installation, as follows:
1. Heavy-duty wall brackets of galvanized steel, equipped with concealed locking devices requiring special tool to remove.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install toilet accessory units in accordance with manufacturers' instructions, using fasteners appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations and at heights indicated.

B. Secure mirrors to walls in concealed, tamperproof manner with special hangers, toggle bolts, or screws. Set units plumb, level, and square at locations indicated, in accordance with manufacturer's instructions for type of substrate involved.

3.02 ADJUSTING AND CLEANING

A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.

B. Clean and polish all exposed surfaces in strict accordance with manufacturer's recommendations after removing temporary labels and protective coatings.

END OF SECTION 10 28 00

SECTION 22 07 19 - PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes insulating the following plumbing piping services:

1. Domestic cold-water piping.
2. Domestic hot-water and hot-water return piping.
3. Supplies and drains for handicap-accessible lavatories and sinks.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied, if any).

1.4 QUALITY ASSURANCE

A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

B. Comply with the following applicable standards and other requirements specified for miscellaneous components:

1. Supply and Drain Protective Shielding Guards: ICC A117.1.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.6 COORDINATION

A. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.7 SCHEDULING

A. Schedule insulation application after pressure testing systems. Insulation application may begin on segments that have satisfactory test results.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Mineral-Fiber, Preformed Pipe Insulation:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Fibrex Insulations Inc.; Coreplus 1200.
   b. Johns Manville; Micro-Lok.
   c. Knauf Insulation; 1000-Degree Pipe Insulation.
   d. Manson Insulation Inc.; Alley-K.
   e. Owens Corning; Fiberglas Pipe Insulation.

2. Type I, 850 Deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

D. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Aeroflex USA, Inc.; Aerocel.
    b. Armacell LLC; AP Armaflex.
    c. K-Flex USA; Insul-Lock, Insul-Tube, and K-FLEX LS.

2.2 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Flexible Elastomeric Adhesive: Comply with MIL-A-24179A, Type II, Class I.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Aeroflex USA, Inc.; Aeroseal.
    b. Armacell LLC; Armaflex 520 Adhesive.
    c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-75.
    d. K-Flex USA; R-373 Contact Adhesive.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-127.
    b. Eagle Bridges - Marathon Industries; 225.
    c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-60/85-70.
    d. Mon-Eco Industries, Inc.; 22-25.

2. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

D. ASJ Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-82.
b. Eagle Bridges - Marathon Industries; 225.
c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-20.
d. Mon-Eco Industries, Inc.; 22-25.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.3 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.

2.4 PROTECTIVE SHIELDING GUARDS

A. Protective Shielding Pipe Covers

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Engineered Brass Company.
b. Insul-Tect Products Co.; a subsidiary of MVG Molded Products.
c. McGuire Manufacturing.
d. Plumberex.
e. Truebro; a brand of IPS Corporation.
f. Zurn Industries, LLC; Tubular Brass Plumbing Products Operation.

2. Description: Manufactured plastic wraps for covering plumbing fixture hot- and cold-water supplies, trap piping, and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.

1. Verify that systems to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.

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

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

1. Install insulation continuously through hangers and around anchor attachments.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:

1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip.
3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge.

    a. For below-ambient services, apply vapor-barrier mastic over staples.

4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above-ambient services, do not install insulation to the following:
1. Testing agency labels and stamps.
2. Nameplates and data plates.
3. Cleanouts.

3.4 PENETRATIONS

A. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

B. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.

4. Seal jacket to wall flashing with flashing sealant.

C. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

D. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.

1. Comply with requirements in Division 07 sections for fire-stopping and fire-resistive joint sealers.

E. Insulation Installation at Floor Penetrations:

1. Pipe: Install insulation continuously through floor penetrations.

3.5 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:

1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.

3.6 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:

1. Install pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed valve covers manufactured of same material as pipe insulation when available.
2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.7 INSTALLATION OF MINERAL-FIBER INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward clinched staples.

4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

C. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.8 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
1. Underground piping.
2. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.9 INDOOR PIPING INSULATION SCHEDULE

A. Domestic Cold Water:

1. Insulation shall be one of the following:
   a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
   b. Flexible Elastomeric Pipe Insulation, 1 inch thick

B. Domestic Hot Water and Hot Water Return:

1. Insulation shall be one of the following:
   a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
   b. Flexible Elastomeric Pipe Insulation, 1 inch thick

C. Exposed Sanitary Drains, Domestic Water, Domestic Hot Water, and Stops for Plumbing Fixtures for People with Disabilities (ADA):

1. All Pipe Sizes: Insulation shall be the following:

a. Flexible Elastomeric: 1/2 inch

END OF SECTION 22 07 19

SECTION 23 07 13 - DUCT INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes insulating the following duct services:

1. Indoor, tempered air above ceiling

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied if any).

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.6 COORDINATION

A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."

B. Coordinate clearance requirements with duct Installer for duct insulation application. Before preparing ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.7 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in "Duct Insulation Schedule, General," "Indoor Duct and Plenum Insulation Schedule," and "Aboveground, Outdoor Duct and Plenum Insulation Schedule" articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

D. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type III with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. CertainTeed Corp.; SoftTouch Duct Wrap.
   b. Johns Manville; Microlite.
   c. Knauf Insulation; Friendly Feel Duct Wrap.
   d. Manson Insulation Inc.; Alley Wrap.

e. Owens Corning; SOFTR All-Service Duct Wrap.

2.2 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.

B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-127.
b. Eagle Bridges - Marathon Industries; 225.
c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-60/85-70.
d. Mon-Eco Industries, Inc.; 22-25.

2. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Use adhesive that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

C. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-82.
b. Eagle Bridges - Marathon Industries; 225.
c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-50.
d. Mon-Eco Industries, Inc.; 22-25.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Use adhesive that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

2.3 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.

1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.4 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.5 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. ABI, Ideal Tape Division; 428 AWF ASJ.
b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0836.
c. Compac Corporation; 104 and 105.
d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.

2. Width: 3 inches.
3. Thickness: 11.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. ABI, Ideal Tape Division; 491 AWF FSK.
b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0827.
c. Compac Corporation; 110 and 111.
d. Venture Tape; 1525 CW NT, 1528 CW, and 1528 CW/SQ.

2. Width: 3 inches.
3. Thickness: 6.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

C. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. ABI, Ideal Tape Division; 488 AWF.
b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0800.
c. Compac Corporation; 120.
d. Venture Tape; 3520 CW.

2. Width: 2 inches.
3. Thickness: 3.7 mils.
4. Adhesion: 100 ounces force/inch in width.
5. Elongation: 5 percent.
6. Tensile Strength: 34 lbf/inch in width.

D. Insulation Pins and Hangers:

1. Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.135-inch- diameter shank, length to suit depth of insulation indicated.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) AGM Industries, Inc.; CWP-1.
2) GEMCO; CD.
3) Midwest Fasteners, Inc.; CD.
4) Nelson Stud Welding; TPA, TPC, and TPS.

2. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.135-inch diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) AGM Industries, Inc.; CHP-1.
2) GEMCO; Cupped Head Weld Pin.
3) Midwest Fasteners, Inc.; Cupped Head.
4) Nelson Stud Welding; CHP.

3. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick, stainless-steel sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) AGM Industries, Inc.; RC-150.
2) GEMCO; R-150.
3) Midwest Fasteners, Inc.; WA-150.
4) Nelson Stud Welding; Speed Clips.

b. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.

E. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.

1. Verify that systems to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.

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

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.

B. Install insulation materials, vapor barriers or retarders, jackets, and thicknesses required for each item of duct system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Keep insulation materials dry during application and finishing.

G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

H. Install insulation with least number of joints practical.

I. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

J. Install insulation with factory-applied jackets as follows:

1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
3. Overlap jacket longitudinal seams at least 1-1/2 inches. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.

    a. For below ambient services, apply vapor-barrier mastic over staples.

4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct flanges and fittings.

K. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

L. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

M. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

3.4 PENETRATIONS

A. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

3.5 INSTALLATION OF MINERAL-FIBER INSULATION

A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

    a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
    b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
    c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    d. Do not overcompress insulation during installation.
    e. Impale insulation over pins and attach speed washers.
    f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

4. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Inspect ductwork, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to two location(s) for each duct system defined in the "Duct Insulation Schedule, General" Article.

C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.7 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation:

1. Supply air ducts located in concealed spaces, mechanical rooms and storage rooms.
2. Heated Air
3. Cooled Air
4. Outside air

B. Items Not Insulated:

1. Factory-insulated flexible ducts.
2. Flexible connectors.
3. Vibration-control devices.
4. Exhaust duct
5. Return air duct.
6. Exposed round supply air ducts located in public spaces. (IE Lobby, Camp Store and Exhibit Space)

3.8 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. All, supply-air duct insulation shall be the following:

1. Mineral-Fiber Blanket: 1 inches thick and 1.5-lb/cu. ft. nominal density.

END OF SECTION 23 07 13

SECTION 23 23 00 - REFRIGERANT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes refrigerant piping used for air-conditioning applications.

1.3 PERFORMANCE REQUIREMENTS

A. Line Test Pressure for Refrigerant R-410A:

1. Suction Lines for Air-Conditioning Applications: 300 psig.
2. Suction Lines for Heat-Pump Applications: 535 psig.

1.4 SUBMITTALS

A. Product Data: For each type of valve and refrigerant piping specialty indicated. Include pressure drop, based on manufacturer's test data, for the following:

1. Thermostatic expansion valves.
2. Solenoid valves.
3. Filter dryers.
4. Strainers.
5. Pressure-regulating valves.

B. Shop Drawings: Show layout of refrigerant piping and specialties, including pipe, tube, and fitting sizes, flow capacities, valve arrangements and locations, slopes of horizontal runs, oil traps, double risers, wall and floor penetrations, and equipment connection details. Show interface and spatial relationships between piping and equipment.

1. Refrigerant piping indicated on Drawings is schematic only. Size piping and design actual piping layout, including oil traps, double risers, specialties, and pipe and tube sizes to accommodate, as a minimum, equipment provided, elevation difference between compressor and evaporator, and length of piping to ensure proper operation and compliance with warranties of connected equipment.

C. Welding certificates.

D. Field quality-control test reports.

E. Operation and Maintenance Data: For refrigerant valves and piping specialties to include in maintenance manuals.

F. Equipment supplier: The mechanical contractor is to submit a shop drawing for the refrigerant piping system to the manufacturer's equipment supplier. The refrigerant shop drawing is to include the following:
1. The floor plan of the field determined refrigerant piping routing.
2. Riser diagram of the refrigerant piping with all actual pipe lengths, elbows, and refrigerant pipe devices.

As part of the submittal by the manufacturer's equipment supplier the refrigerant piping shop drawing above will be included with the equipment submittal to the engineer for approval. The refrigerant shop drawing shall include all pipe sizes and installation recommendations from the manufacturer based on the sketch provided by the contractor. If the contractor does not provide this information and/or installs this piping without the manufacturer's recommendations and engineers' approval, then the contractor shall assume all responsibility and liability for the refrigerant piping installation and warranty of the HVAC equipment.

1.5 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

B. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."

C. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."

1.6 PRODUCT STORAGE AND HANDLING

A. Store piping in a clean and protected area with end caps in place to ensure that piping interior and exterior are clean when installed.

1.7 COORDINATION

A. Coordinate size and location of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 07 Section "Roof Accessories."

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

A. Copper Tube: ASTM B 280, Type ACR.

B. Wrought-Copper Fittings: ASME B16.22.

C. Wrought-Copper Unions: ASME B16.22.

D. Solder Filler Metals: ASTM B 32. Use 95-5 tin antimony or alloy HB solder to join copper socket fittings on copper pipe.

E. Brazing Filler Metals: AWS A5.8.

F. Flexible Connectors:

1. Body: Tin-bronze bellows with woven, flexible, tinned-bronze-wire-reinforced protective jacket.
2. End Connections: Socket ends.
3. Offset Performance: Capable of minimum 3/4-inch misalignment in minimum 7-inch-long assembly.
4. Pressure Rating: Factory test at minimum 500 psig.
5. Maximum Operating Temperature: 250 deg F.

2.2 VALVES AND SPECIALTIES

A. Diaphragm Packless Valves:

1. Body and Bonnet: Forged brass or cast bronze; globe design with straight-through or angle pattern.
2. Diaphragm: Phosphor bronze and stainless steel with stainless-steel spring.
3. Operator: Rising stem and hand wheel.
4. Seat: Nylon.
5. End Connections: Socket, union, or flanged.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 275 deg F.

B. Check Valves:

1. Body: Ductile iron, forged brass, or cast bronze; globe pattern.
2. Bonnet: Bolted ductile iron, forged brass, or cast bronze; or brass hex plug.
3. Piston: Removable polytetrafluoroethylene seat.
4. Closing Spring: Stainless steel.
5. Manual Opening Stem: Seal cap, plated-steel stem, and graphite seal.
6. End Connections: Socket, union, threaded, or flanged.

7. Maximum Opening Pressure: 0.50 psig.
8. Working Pressure Rating: 500 psig.
9. Maximum Operating Temperature: 275 deg F.

C. Service Valves:

1. Body: Forged brass with brass cap including key end to remove core.
2. Core: Removable ball-type check valve with stainless-steel spring.
3. Seat: Polytetrafluoroethylene.
4. End Connections: Copper spring.
5. Working Pressure Rating: 500 psig.

D. Solenoid Valves: Comply with ARI 760 and UL 429; listed and labeled by an NRTL.

1. Body and Bonnet: Plated steel.
2. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
3. Seat: Polytetrafluoroethylene.
4. End Connections: Threaded.
5. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch conduit adapter.
6. Working Pressure Rating: 400 psig.
7. Maximum Operating Temperature: 240 deg F.
8. Manual operator.

E. Safety Relief Valves: Comply with ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.

1. Body and Bonnet: Ductile iron and steel, with neoprene O-ring seal.
2. Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Seat Disc: Polytetrafluoroethylene.
4. End Connections: Threaded.
5. Working Pressure Rating: 400 psig.
6. Maximum Operating Temperature: 240 deg F.

F. Thermostatic Expansion Valves: Comply with ARI 750.

1. Body, Bonnet, and Seal Cap: Forged brass or steel.
2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Packing and Gaskets: Non-asbestos.
4. Capillary and Bulb: Copper tubing filled with refrigerant charge.
5. Working Pressure Rating: 450 psig.

G. Straight-Type Strainers:

1. Body: Welded steel with corrosion-resistant coating.
2. Screen: 100-mesh stainless steel.
3. End Connections: Socket or flare.
4. Working Pressure Rating: 500 psig.

5. Maximum Operating Temperature: 275 deg F.

H. Angle-Type Strainers:

1. Body: Forged brass or cast bronze.
2. Drain Plug: Brass hex plug.
3. Screen: 100-mesh monel.
4. End Connections: Socket or flare.
5. Working Pressure Rating: 500 psig.
6. Maximum Operating Temperature: 275 deg F.

I. Moisture/Liquid Indicators:

1. Body: Forged brass.
2. Window: Replaceable, clear, fused glass window with indicating element protected by filter screen.
3. Indicator: Color coded to show moisture content in ppm.
4. Minimum Moisture Indicator Sensitivity: Indicate moisture above 60 ppm.
5. End Connections: Socket or flare.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 240 deg F.

J. Permanent Filter Dryers: Comply with ARI 730.

1. Body and Cover: Painted-steel shell.
2. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
3. Desiccant Media: Activated alumina or charcoal.
4. End Connections: Socket.
5. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 240 deg F.

K. Mufflers:

1. Body: Welded steel with corrosion-resistant coating.
2. End Connections: Socket or flare.
3. Working Pressure Rating: 500 psig.
4. Maximum Operating Temperature: 275 deg F.

L. Receivers: Comply with ARI 495.

1. Comply with ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.
2. Comply with UL 207; listed and labeled by an NRTL.
3. Body: Welded steel with corrosion-resistant coating.
4. Tappings: Inlet, outlet, liquid level indicator, and safety relief valve.
5. End Connections: Socket or threaded.
6. Working Pressure Rating: 500 psig.

7. Maximum Operating Temperature: 275 deg F.

M. Liquid Accumulators: Comply with ARI 495.

1. Body: Welded steel with corrosion-resistant coating.
2. End Connections: Socket or threaded.
3. Working Pressure Rating: 500 psig.
4. Maximum Operating Temperature: 275 deg F.

2.3 REFRIGERANTS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

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

1. Atofina Chemicals, Inc.
2. DuPont Company; Fluorochemicals Div.
3. Honeywell, Inc.; Genetron Refrigerants.
4. INEOS Fluor Americas LLC.

C. ASHRAE 34, R-22: Monochlorodifluoromethane.

D. ASHRAE 34, R-134a: Tetrafluoroethane.

E. ASHRAE 34, R-407C: Difluoromethane/Pentafluoroethane/1,1,1,2-Tetrafluoroethane.

F. ASHRAE 34, R-410A: Pentafluoroethane/Difluoromethane.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS FOR REFRIGERANT R-410A

A. Suction Lines NPS 1-1/2 and Smaller for Conventional Air-Conditioning Applications: Copper, Type ACR, annealed-temper tubing and wrought-copper fittings with brazed or soldered joints.

3.2 VALVE AND SPECIALTY APPLICATIONS

A. Install diaphragm packless valves in suction and discharge lines of compressor.

B. Install a check valve at the compressor discharge and a liquid accumulator at the compressor suction connection.

C. Except as otherwise indicated, install diaphragm packless valves on inlet and outlet side of filter dryers.

D. Install a full-sized, three-valve bypass around filter dryers.

E. Install solenoid valves upstream from each expansion valve. Install solenoid valves in horizontal lines with coil at top.

F. Install thermostatic expansion valves as close as possible to distributors on evaporators.

1. Install valve so diaphragm case is warmer than bulb.
2. Secure bulb to clean, straight, horizontal section of suction line using two bulb straps. Do not mount bulb in a trap or at bottom of the line.
3. If external equalizer lines are required, make connection where it will reflect suction-line pressure at bulb location.

G. Install safety relief valves where required by ASME Boiler and Pressure Vessel Code. Pipe safety-relief-valve discharge line to outside according to ASHRAE 15.

H. Install moisture/liquid indicators in liquid line at the inlet of the thermostatic expansion valve or at the inlet of the evaporator coil capillary tube.

I. Install strainers upstream from and adjacent to the following unless they are furnished as an integral assembly for device being protected:

1. Solenoid valves.
2. Thermostatic expansion valves.
3. Compressor.

J. Install filter dryers in liquid line between compressor and thermostatic expansion valve, and in the suction line at the compressor.

K. Install receivers sized to accommodate pump-down charge.

L. Install flexible connectors at compressors.

3.3 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.

B. Install refrigerant piping according to ASHRAE 15.

C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping adjacent to machines to allow service and maintenance.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Select system components with pressure rating equal to or greater than system operating pressure.

J. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.

K. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection. Install access doors or panels as specified in Division 08 Section "Access Doors and Frames" if valves or equipment requiring maintenance is concealed behind finished surfaces.

L. Install refrigerant piping in protective conduit where installed belowground.

M. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.

N. Slope refrigerant piping as follows:
1. Install horizontal suction lines with a uniform slope downward to compressor.
2. Install traps and double risers to entrain oil in vertical runs.
3. Liquid lines may be installed level.

O. When brazing or soldering, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.

P. Before installation of steel refrigerant piping, clean pipe and fittings using the following procedures:

1. Shot blast the interior of piping.
2. Remove coarse particles of dirt and dust by drawing a clean, lint less cloth through tubing by means of a wire or electrician's tape.
3. Draw a clean, lint less cloth saturated with trichloroethylene through the tube or pipe. Continue this procedure until cloth is not discolored by dirt.
4. Draw a clean, lint less cloth, saturated with compressor oil, squeezed dry, through the tube or pipe to remove remaining lint. Inspect tube or pipe visually for remaining dirt and lint.
5. Finally, draw a clean, dry, lint less cloth through the tube or pipe.

6. Safety-relief-valve discharge piping is not required to be cleaned but is required to be open to allow unrestricted flow.

Q. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.

3.4 PIPE JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Fill pipe and fittings with an inert gas (nitrogen or carbon dioxide), during brazing or welding, to prevent scale formation.

D. Soldered Joints: Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook."

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."

1. Use Type BcuP, copper-phosphorus alloy for joining copper socket fittings with copper pipe.
2. Use Type BAg, cadmium-free silver alloy for joining copper with bronze or steel.

F. Threaded Joints: Thread steel pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry-seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

G. Steel pipe can be threaded, but threaded joints must be seal brazed or seal welded.

H. Welded Joints: Construct joints according to AWS D10.12/D10.12M.

I. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.5 HANGERS AND SUPPORTS

A. Hanger, support, and anchor products are specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."

B. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal runs less than 20 feet long.
2. Roller hangers and spring hangers for individual horizontal runs 20 feet or longer.
3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet or longer, supported on a trapeze.
4. Spring hangers to support vertical runs.
5. Copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.

C. Install hangers for copper tubing with the following maximum spacing and minimum rod sizes:

1. NPS 1/2: Maximum span, 60 inches; minimum rod size, 1/4 inch.
2. NPS 5/8: Maximum span, 60 inches; minimum rod size, 1/4 inch.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:

1. Comply with ASME B31.5, Chapter VI.
2. Test refrigerant piping, specialties, and receivers. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in Part 1 "Performance Requirements" Article.
    a. Fill system with nitrogen to the required test pressure.
    b. System shall maintain test pressure at the manifold gage throughout duration of test.
    c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
    d. Remake leaking joints using new materials, and retest until satisfactory results are achieved.

3.7 SYSTEM CHARGING

A. Charge system using the following procedures:
1. Install core in filter dryers after leak test but before evacuation.
2. Evacuate entire refrigerant system with a vacuum pump to 500 micrometers. If vacuum holds for 12 hours, system is ready for charging.
3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig.
4. Charge system with a new filter-dryer core in charging line.

3.8 ADJUSTING

A. Adjust thermostatic expansion valve to obtain proper evaporator superheat.

B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.

C. Adjust set-point temperature of air-conditioning or chilled-water controllers to the system design temperature.

D. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:
   1. Open shutoff valves in condenser water circuit.
   2. Verify that compressor oil level is correct.
   3. Open compressor suction and discharge valves.
   4. Open refrigerant valves except bypass valves that are used for other purposes.
   5. Check open compressor-motor alignment and verify lubrication for motors and bearings.

E. Replace core of replaceable filter dryer after system has been adjusted and after design flow rates and pressures are established.

END OF SECTION 23 23 00

SECTION 23 31 13 - METAL DUCTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Single-wall rectangular ducts and fittings.
2. Single-wall round ducts and fittings.
3. Sheet metal materials.
4. Sealants and gaskets.
5. Hangers and supports.

B. Related Sections:

1. Division 23 Section "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for metal ducts.
2. Division 23 Section "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.

B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible".

C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum," for aluminum supports.
3. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-Up."

C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."

PART 2 - PRODUCTS

2.1 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.2 SINGLE-WALL ROUND DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Lindab Inc.
b. McGill AirFlow LLC.
c. SEMCO Incorporated.
d. Sheet Metal Connectors, Inc.
e. Spiral Manufacturing Co., Inc.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Transverse Joints in Ducts Larger Than 60 Inches in Diameter: Flanged.

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Fabricate round ducts larger than 90 inches in diameter with butt-welded longitudinal seams.

D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.3 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G60.
2. Finishes for Surfaces Exposed to View by the Public: Mill phosphatized.

C. Factory- or Shop-Applied Antimicrobial Coating:

1. Apply to the surface of sheet metal that will form the interior surface of the duct. An untreated clear coating shall be applied to the exterior surface.
2. Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.
3. Coating containing the antimicrobial compound shall have a hardness of 2H, minimum, when tested according to ASTM D 3363.
4. Surface-Burning Characteristics: Maximum flame-spread index of 25 and maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
5. Shop-Applied Coating Color: White.
6. Antimicrobial coating on sheet metal is not required for duct containing liner treated with antimicrobial coating.

D. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.

E. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.4 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Two-Part Tape Sealing System:

1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
2. Tape Width: 4 inches.
3. Sealant: Modified styrene acrylic.
4. Water resistant.
5. Mold and mildew resistant.
6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
7. Service: Indoor and outdoor.
8. Service Temperature: Minus 40 to plus 200 deg F.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.

10. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
11. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.
6. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

E. Round Duct Joint O-Ring Seals:

1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 10-inch wg static-pressure class, positive or negative.
2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

2.5 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."

C. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

D. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A 492.

E. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

F. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

G. Trapeze and Riser Supports:

1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install round ducts in maximum practical lengths.

D. Install ducts with fewest possible joints.

E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.

I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.

J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.

K. Protect duct interiors from moisture, construction debris and dust, and other foreign materials.

3.2 INSTALLATION OF EXPOSED DUCTWORK

A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.

B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.

C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.

D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

E. Repair or replace damaged sections and finished work that does not comply with these requirements.

3.3 DUCT SEALING

A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":

1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
2. Supply-Air Ducts: Seal Class A.
3. Exhaust Ducts: Seal Class B.
4. Return-Air Ducts: Seal Class C.
5. Outdoor-Air Ducts: Seal Class A.

3.4 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."

B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.

1. Where practical, install concrete inserts before placing concrete.
2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.

C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum

Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.

D. Hangers Exposed to View: Threaded rod and angle or channel supports.

E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.

F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.5 CONNECTIONS

A. Make connections to equipment with flexible connectors complying with Division 23 Section "Air Duct Accessories."

B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Leakage Tests:

1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
2. Test the following systems:

    a. Supply Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 100 percent of total installed duct area for each designated pressure class.

3. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
4. Test for leaks before applying external insulation.
5. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.
6. Give seven days' advance notice for testing.

C. Duct System Cleanliness Tests:

1. Visually inspect duct system to ensure that no visible contaminants are present.

2. Test sections of metal duct system, chosen randomly by Owner, for cleanliness according to "Vacuum Test" in NADCA ACR, "Assessment, Cleaning and Restoration of HVAC Systems."

    a. Acceptable Cleanliness Level: Net weight of debris collected on the filter media shall not exceed 0.75 mg/100 sq. cm.

D. Duct system will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.7 START UP

A. Air Balance: Comply with requirements in Division 23 Section "Testing, Adjusting, and Balancing for HVAC."

3.8 DUCT SCHEDULE

A. Fabricate ducts with galvanized sheet steel except as otherwise indicated and as follows:

B. Supply Ducts:

1. Ducts Connected to Discharge of Fans :

    a. Pressure Class: Positive 1-inch wg .

C. Return Ducts:

1. Ducts Connected to Intake of Fans

    a. Pressure Class: Negative 1-inch wg .

D. Intermediate Reinforcement:

1. Galvanized-Steel Ducts: Galvanized steel

E. Elbow Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
    a. Radius Type RE 1 with minimum 1.0 radius-to-diameter ratio.
    b. Mitered Type RE 4 with turning vanes

2. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "Round Duct Elbows."
    a. 1.0 radius-to-diameter ratio and three segments for 90-degree elbow.

b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.
c. Round Elbows, 14 Inches and Larger in Diameter: Standing seam.

F. Branch Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-6, "Branch Connection."

a. Rectangular Main to Rectangular Branch: 45-degree entry.
b. Rectangular Main to Round Branch: Spin in.

2. Round: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals,"

a. 90-degree tap.

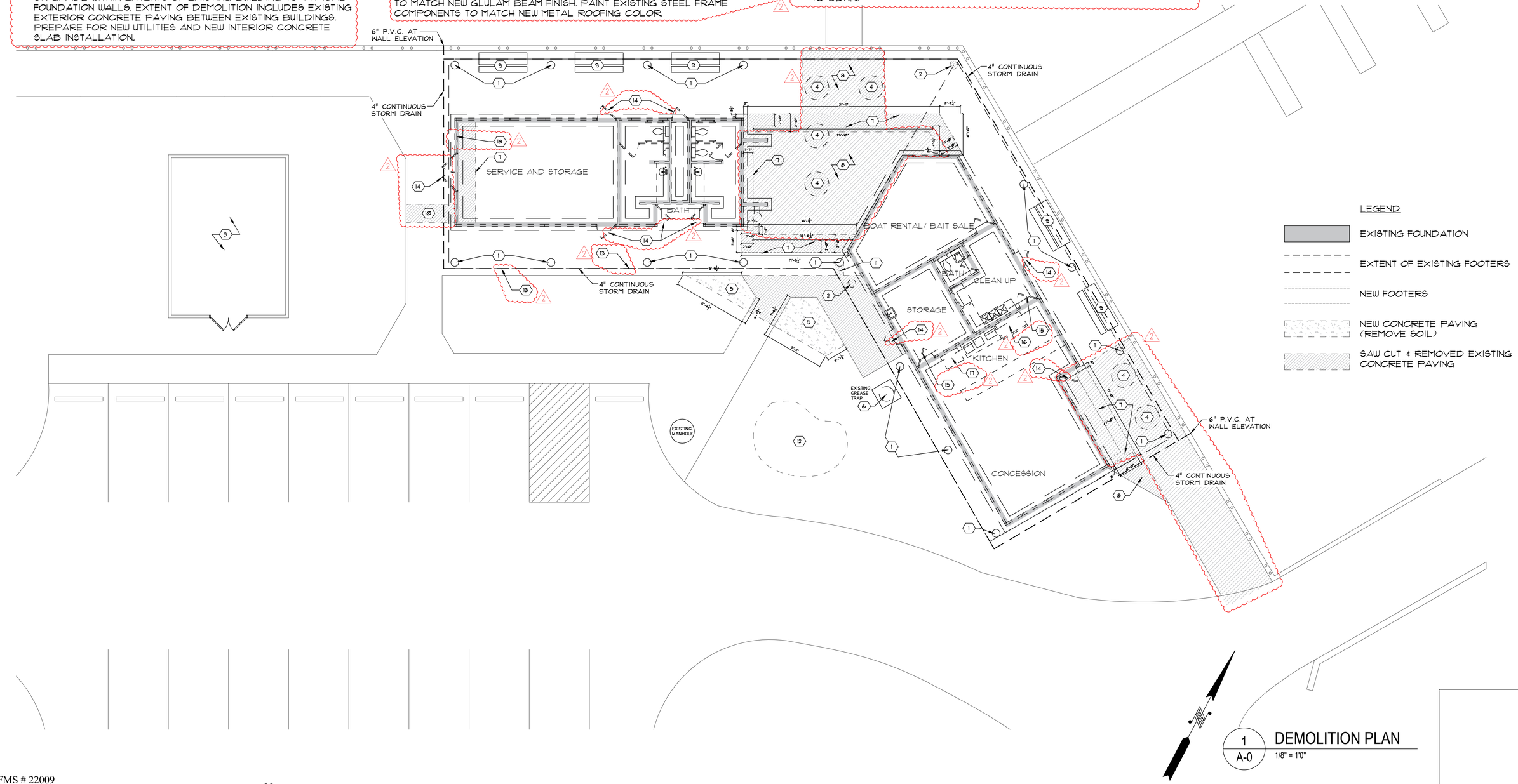
END OF SECTION 23 31 13

GENERAL NOTES

A. ALL EXISTING WALLS TO BE DEMOLISHED U.N.O.
B. ALL EXISTING FURNISHING AND FIXTURES TO BE DEMOLISHED AND REMOVED U.N.O.
C. ALL ROOFS TO BE REMOVED. ALL ROOF SUPPORT COLUMNS TO REMAIN U.N.O.
D. ALL EXISTING FOUNDATIONS TO REMAIN U.N.O.
E. DEMO FOUNDATION AS NEEDED FOR NEW CONCRETE FLOOR.
F. ALL PIERS, DOCKS, RAILINGS, AND ASSOCIATED WATERFRONT EQUIPMENT TO REMAIN. THERE IS TO BE NO WORK ON OR MATERIALS STORED ON THE DOCKS
G. ALL PAVING ON SITE TO REMAIN U.N.O.
H. SAW CUT JOINT PROVIDE BLOCKING AS NEEDED TO SUPPORT EXISTING CONCRETE.
I. SELECTIVELY DEMOLISH & REMOVE EXISTING CONCRETE SLAB ON GRADE WITHIN EXTENTS OF EXISTING BUILDING TO TYPICAL FOUNDATION WALLS. EXTENT OF DEMOLITION INCLUDES EXISTING EXTERIOR CONCRETE PAVING BETWEEN EXISTING BUILDINGS. PREPARE FOR NEW UTILITIES AND NEW INTERIOR CONCRETE SLAB INSTALLATION.

CODED NOTES

1. EXISTING STRUCTURAL COLUMNS AND COVERINGS TO REMAIN
2. STRUCTURAL COLUMN INCLUDING REINFORCING TO BE REMOVED TO 4" BELOW GRADE
3. EXISTING FUEL TANK AND FENCE TO REMAIN CLEAR. DO NOT STORE MATERIALS INSIDE OR AGAINST EXISTING FENCE
4. REMOVE EXISTING CONCRETE SEATS, DEMO TO 4" BELOW GRADE INCLUDING REINFORCING
5. REMOVE SOIL AS NEEDED FOR NEW PAVEMENT
6. EXISTING GREASE TRAP TO BE DEMOLISHED AND REMOVED.
7. NEW FOOTER- SEE STRUCTRUAL
8. SELECTIVELY DEMOLISH & REMOVE THE EXISTING CONCRETE PAVING FROM THE EXISTING BUILDING TO FACE OF EXISTING CONCRETE WATERWAY WALL. DEMOLITION EXTENDS FULL LENGTH TO EXISTING BOAT RAMP. PREPARE FOR NEW SLAB INSTALLATION.
9. EXISTING PICNIC TABLE TO REMAIN. REFINISH EXISTING WOOD COMPONENTS TO MATCH NEW GLULAM BEAM FINISH. PAINT EXISTING STEEL FRAME COMPONENTS TO MATCH NEW METAL ROOFING COLOR.
10. REMOVE EXISTING CONCRETE FOR REFRIGERANT PIPING.
11. REMOVE EXISTING CONCRETE AS NEEDED AROUND COLUMN TO CONNECT NEW DRAIN PIPE TO EXISTING STORM DRAIN, EXTEND STORM DRAIN AS NEEDED.
12. REMOVE EXISTING DIRT MOUND BOAT & SIGN. GRADE TO MATCH ADJACENT.
13. REMOVE & SALVAGE TWO (2) EXISTING EAVE-MOUNTED LIGHT FIXTURES. PRESENT TO ODNR.
14. REMOVE & SALVAGE EXISTING EXTERIOR DOOR & HARDWARE. PRESENT TO ODNR.
15. REMOVE & SALVAGE EXISTING INTERIOR SOLID WOOD DOOR & HARDWARE. PRESENT TO ODNR.
16. REMOVE & SALVAGE EXISTING COMMERCIAL FREEZER UNIT. PRESENT TO ODNR.
17. REMOV & SALVAGE EXISTING ANSUL SYSTEM HOOD & ROOFTOP EQUIPMENT. PRESENT TO ODNR.
18. REMOVE & SALVAGE EXISTING VEEDER-ROOT CABINET & SYSTEM. PRESENT TO ODNR.



1 A-0 DEMOLITION PLAN
1/8" = 1'0"

FMS # 22009

Feinknopf Macioce Schappa Architects, Inc.
995 WEST 3RD AVE
Columbus, Ohio 43212
adaskalov@fmsarchitects.com
general office (614) 297-1020

ENGINEERING
Ohio Department of Natural Resources

DESIGNED BY:	ASD
DRAWN BY:	ASD
CHECKED BY:	ASD
APPROVED BY:	DAY

NO	DATE	SUBJECT
-	12/13/2023	BID DOCUMENTS
1	1/8/2024	BID ADDENDUM #2

REVISION OR ISSUE

AS NOTED
SCALE

1/8/2024
DATE

BUCK CREEK STATE PARK
NEW CAMP STORE & NATURE CENTER
DNR-230014.03

DEMOLITION PLAN

A-0

CODED NOTES

1. NOT USED
2. NOT USED
3. EXISTING PICNIC TABLE TO REMAIN. G.C. TO PAINT EXISTING STEEL FRAME TO MATCH ROOFING COLOR. RE-FINISH EXISTING WOOD TABLE-TOP AND SEAT TO MATCH COLOR OF NEW GLU-LAM BEAMS
4. NEW LAWN AREA. REMOVE EXISTING MULCH BED AND REPLACE WITH SUITABLE TOP SOIL. SEED FOR NEW LAWN AREA.
5. 8" WIDE GRAVEL SURROUND OVER ROOT BARRIER FABRIC AT BUILDING EXTERIOR W/O PAVING
6. NOT USED
7. EXISTING CHAIN LINK FENCE AND GATE TO REMAIN
8. ABANDONED EXISTING STORM DOWNSPOUT BOOT AT PAVEMENT. REMOVE AND INFILL OPENING WITH CONCRETE.
9. NEW DOWNSPOUT RECEIVER BOOT TO UNDERGROUND STORM SEWER - DISCHARGE THROUGH EXISTING WATERWAY RETAINING WALL.
10. NOT USED
11. NOT USED
12. NOT USED
13. NEW CONCRETE PAVING
14. NOT USED
15. NOT USED
16. NOT USED
17. NOT USED
18. NOT USED
19. EXISTING ASPHALT TO REMAIN
20. WOOD BENCH W/ METAL FRAME - SIMILAR STAIN TO HALF PICNIC TABLES, INSTALLED BY GC

NEW CONCRETE

EXISTING COLUMN

NOTE: BID ALTERNATE #2:
INSTALL NEW PRIVACY FENCE AROUND EXISTING CHAIN-LINK FENCING AT FUEL TANK AND NEW ACC UNITS AS INDICATED. FENCE TO BE 6x6 PT POSTS INSTALLED IN 36" DEEP FOUNDATIONS. PROVIDE # OF POSTS INDICATED. PROVIDE THREE (3) HORIZONTAL MOUNTED 2x4 PT RAILS AT POSTS TO ACCOMMODATE 1x6x6' HIGH COMPOSITE WOOD (TREX OR EQUAL) FENCE BOARDS. PROVIDE 42" WIDE GATE AT ACCU ACCESS. HOLD BACK NEW FENCE TO ALLOW EXISTING CHAIN LINK FENCE GATES TO FULLY OPEN. PROVIDE 105' LINEAR FEET OF FENCING FOR SURROUND INDICATED. SEE SECTION 01 23 00 - ALTERNATES FOR DETAILS.

SEE ELECTRICAL DRAWINGS FOR FUEL PUMP POWER REQUIREMENTS DURING CONSTRUCTION

PORTION OF PIERS BELONG TO WORK AREA - 8FT OUT FROM THE EDGE

OUTLET TO RESERVOIR

EXISTING 4" CONTINUOUS STORM DRAIN. REPAIR/REPLACE WHERE DAMAGED IN DEMOLITION

EXISTING 4" CONTINUOUS STORM DRAIN.

PORTION OF PIERS BELONG TO WORK AREA - 8FT OUT FROM THE EDGE

NATURE CENTER

EXISTING 4" CONTINUOUS STORM DRAIN. REPAIR/REPLACE WHERE DAMAGED IN DEMOLITION

OUTLET TO RESERVOIR

EXISTING BOAT RAMP TO REMAIN

1 A-0.1 SITE UITILIZATION PLAN
3/32" = 1'0"

FMS # 22009

Feinknopf Macioce Schappa Architects, Inc.
995 WEST 3RD AVE
Columbus, Ohio 43212
adaskalov@fmsarchitects.com
general office (614) 297-1020

ENGINEERING
Ohio Department of Natural Resources

DESIGNED BY:	ASD
DRAWN BY:	ASD
CHECKED BY:	ASD
APPROVED BY:	DAY

NO	DATE	SUBJECT
-	12/13/2023	BID DOCUMENTS
1	1/8/2024	BID ADDENDUM #2

REVISION OR ISSUE

AS NOTED
SCALE

1/8/2024
DATE

BUCK CREEK STATE PARK
NEW CAMP STORE & NATURE CENTER
DNR-230014.03

SITE UTILIZATION PLAN

A-0.1

GENERAL NOTES

1. FOR DOOR TYPES & SCHEDULE, REFER TO SHEET A-13
2. FURNITURE ACCORDING TO ALTERNATE FFE SCHEDULE ON SHEET A-12
3. ALL WALLS ARE NEW

CODED NOTES

1. NEW CONCRETE PAVING
2. TRIM EXISTING CONCRETE PAVING AS REQUIRED
3. EXISTING PICNIC TABLE TO REMAIN, STAIN TO MATCH NEW GLUE-LAM
4. EXISTING MANHOLE
5. NEW SECTION OF CHAIN-LINK FENCING
6. NEW POST IN CONCRETE FOUNDATION
7. ALL CHAIN-LINK FENCING SHALL HAVE HDPE VERTICAL PRIVACY SLATS, COLOR TO BE CONFIRMED BY ARCHITECT
8. CAP EXISTING DOWNSPOUT CONNECTION AT GRADE
9. DOWNSPOUT CONNECTING TO EXISTING DRAIN PIPE
10. DOWNSPOUT CONNECT TO NEW DRAIN PIPE TO EXISTING STORM DRAIN, EXTEND STORM DRAIN AS NEEDED
11. FINAL GRADE & SEED AREA
12. DARK BRONZE ANODIZED BRAKE METAL OVER 2" POLYISOCYANURATE.
13. PEDESTAL-MOUNTED DOOR ACTIVATOR BUTTON
14. WALL-MOUNTED EGRESS DOOR OPERATOR ACTIVATION BUTTON
15. WOOD BENCH W/ METAL FRAME - SIMILAR STAIN TO HALF PICNIC TABLES, INSTALLED BY GC

NEW CONCRETE

EXISTING COLUMN

OUTLET TO RESERVOIR

EXISTING 4" CONTINUOUS STORM DRAIN, REPAIR/REPLACE WHERE DAMAGED IN DEMOLITION

EXISTING 4" CONTINUOUS STORM DRAIN.

EXISTING 4" CONTINUOUS STORM DRAIN, REPAIR/REPLACE WHERE DAMAGED IN DEMOLITION

OUTLET TO RESERVOIR

EXISTING 4" CONTINUOUS STORM DRAIN, REPAIR/REPLACE WHERE DAMAGED IN DEMOLITION

1 A-1.1 SITE PLAN
1/8" = 1'0"

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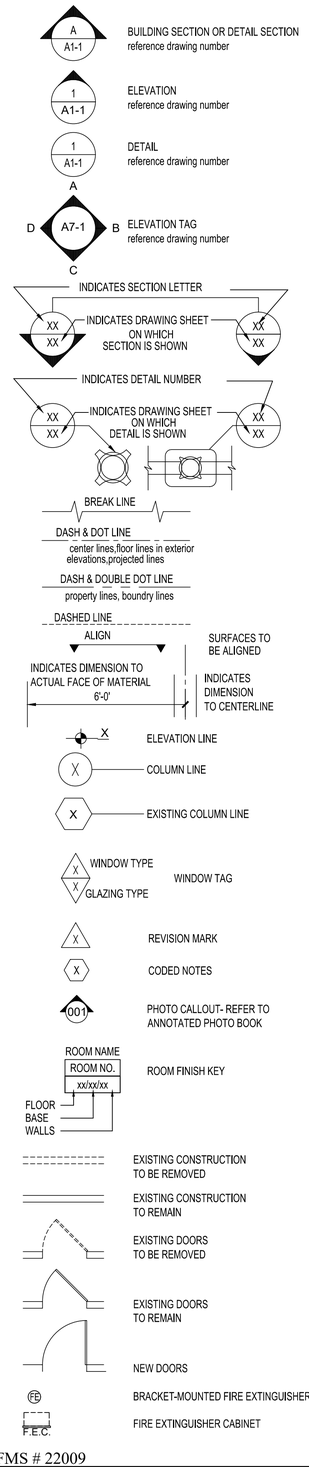
SITE PLAN

A-1.1

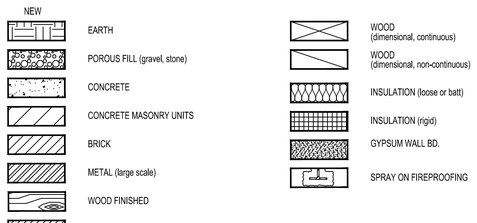
SYMBOLS



ABBREVIATIONS

ABV	ABOVE	FEC	FIRE EXTINGUISHER CABINET	PVC	POLYVINYL CHLORIDE
A.F.F.	ABOVE FINISHED FLOOR	FHC	FIRE HOSE CABINET	PCF	POUNDS PER CUBIC FOOT
ADD	ADDENDUM	FLG	FLASHING	PSF	POUNDS PER SQUARE FOOT
ADJ	ADJACENT	FLR	FLOOR(ING)	PSI	POUNDS PER SQUARE INCH
A/C	AIR CONDITIONING	FD	FLOOR DRAIN	PTD	PAPER TOWEL DISPENSER
ALT	ALTERNATE	FLUR	FLUORESCENT	QT	QUARRY TILE
ALUM	ALUMINUM	FTNG	FOOTING	RAD	RADIUS
A.B.	ANCHOR BOLT	FOUND	FOUNDATION	RWC	RAINWATER CONDUCTOR
∠	ANGLE	GA	GAGE, GUAGE	REF	REFERENCE
ANOD	ANODIZED	GALV	GALVANIZED	REFR	REFRIGERATOR
AP	ACCESS PANEL	GC	GENERAL CONTRACT(OR)	REG	REGISTER
APPROX	APPROXIMATE	GL	GLASS, GLAZING	REINF	REINFORCE (D), (ING)
ARCH	ARCHITECT(URAL)	GB	GRAB BAR	RCP	REINFORCED CONCRETE PIPE
AD	AREA DRAIN	GWB	GYPSUM WALL BOARD	RES	RESILIENT
@	AT	GYP	GYPSUM	RET	RETURN
BSMT	BASEMENT	HDWR	HARDWARE	RA	RETURN AIR
BM	BEAM	HVAC	HEATING/VENTILATING/AIR COND.	REV	REVISION (S), REVISED
B.M.	BENCH MARK	HT	HEIGHT	RH	RIGHT HAND
BVL	BEVELED	HTR	HEATER	R	RISER
BIT	BITUMINOUS	HEX	HEXAGONAL	RD	ROOF DRAIN
BLK	BLOCK	HC	HOLLOW CORE	RM	ROOM
BLKG	BLOCKING	HM	HOLLOW METAL	RO	ROUGH OPENING
BD	BOARD	HORZ	HORIZONTAL	SCH	SCHEDULE
BOT	BOTTOM	HB	HOSE BIB	SEC	SECTION
BLDG	BUILDING	HW	HOT WATER	SHTG	SHEATHING
CAB	CABINET	INCL	INCLUDE(D), (ING)	SHT	SHEET
CI	CAST IRON	ID	INSIDE DIAMETER	SIM	SIMILAR
CB	CATCH BASIN	INSUL	INSULATION	SC	SOLID CORE
CLG	CEILING	INT	INTERIOR	S	SOUTH
CM	CENTIMETER(S)	INV	INVERT	SPEC	SPECIFICATION (S)
℄	CENTER LINE	JAN	JANITOR	SQ	SQUARE
CER	CERAMIC	JT	JOINT	SS	STAINLESS STEEL
CH BD	CHALKBOARD	KIT	KITCHEN	STD	STANDARD
CHAN	CHANNEL	KO	KNOCKOUT	STL	STEEL
CIR	CIRCLE	LAB	LABORATORY	STO	STORAGE
CLR	CLEAR(ANCE)	LB	LAG BOLT	SA	SUPPLY AIR
CW	COLD WATER	LAV	LAVATORY	SUSP	SUSPENDED
COL	COLUMN	LH	LEFT HAND	SYM	SYMMETRY (ICAL)
CONC	CONCRETE	L	LENGTH	SYS	SYSTEM
CMU	CONCRETE MASONRY UNIT	LT	LIGHT	TKBD	TACKBOARD
CONST	CONSTRUCTION	LL	LIVE LOAD	TEL	TELEPHONE
CM	CONSTRUCTION MANAGER	MH	MANHOLE	TV	TELEVISION
CONT	CONTINUOUS, CONTINUE	MFGR	MANUFACTURE (ER)	THK	THICKNESS
CJ	CONTROL JOINT	MAS	MASONRY	TOL	TOLERANCE
CRS	COURSE(S)	MO	MASONRY OPENING	T&G	TONGUE AND GROOVE
CU FT	CUBIC FOOT	MAT	MATERIAL (S)	T	TREAD, TOP
CY	CUBIC YARD	MAX	MAXIMUM	TPD	TOILET PAPER DISPENSER
DET	DETAIL	MECH	MECHANIC (AL)	TYP	TYPICAL
DIAG	DIAGONAL	MED	MEDIUM	UN	UNFINISHED
DIAM(D)	DIAMETER	MTL	METAL	UR	URINAL
DIM	DIMENSION	MM	MILLIMETER (S)	VB	VAPOR BARRIER
DR	DOOR	MIN	MINIMUM	VERT	VERTICAL
DS	DOWNSPOUT	MISC	MISCELLANEOUS	WC	WATER CLOSET
DWG	DRAWING	MOD	MODULAR	WP	WATER PROOFING
DF	DRINKING FOUNTAIN	MOV	MOVABLE	WWF	WELDED WIRE FABRIC/MESH
E	EAST	NAT	NATURAL	W	WIDTH, WIDE, WEST
ELEC	ELECTRIC(AL)	NRC	NOISE REDUCTION COEFF.	W/O	WITHOUT
EC	ELECTRICAL CONTRACTOR	NOM	NOMINAL	WD	WOOD
EWC	ELECTRIC WATER COOLER	N	NORTH		
EL	ELEVATION	NIC	NOT IN CONTRACT		
ELEV	ELEVATOR	NTS	NOT TO SCALE		
EMER	EMERGENCY	OC	ON CENTER (S)		
EQ	EQUAL	OPNG	OPENING		
EQPT	EQUIPMENT	OPER	OPERABLE		
EXH	EXHAUST	OPP	OPPOSITE		
EX	EXISTING	OD	OUTSIDE DIAMETER		
EXP BT	EXPANSION BOLT	OH	OVERHEAD		
EXP JT	EXPANSION JOINT	OA	OVER ALL		
EXP	EXPOSED	PART	PARTITION		
EXT	EXTERIOR	PVMT	PAVEMENT		
FOC	FACE OF CONCRETE	PED	PEDESTAL		
FOF	FACE OF FINISH	PERF	PERFORATE (D)		
FOM	FACE OF MASONRY	PLAM	PLASTIC LAMINATE		
FOS	FACE OF STUDS	PL	PLATE, PROPERTY LINE		
FIN	FINISH(ED)	PC	PLUMBING CODE		
FA	FIRE ALARM / FRESH AIR	LBS	POUND		
FE	FIRE EXTINGUISHER				

MATERIAL INDICATIONS



GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN COMPLETE ACCORDANCE WITH ALL GOVERNING FEDERAL, STATE, AND LOCAL CODES.
2. TEXT DIMENSIONS SHALL TAKE PRECEDENCE OVER INFORMATION DETERMINED BY GRAPHIC SCALING OF THE DRAWINGS. DRAWINGS AR NOT TO BE SCALED. DIRECT ANY REQUESTS FOR DIMENSIONAL CLARIFICATION TO THE ARCHITECT.
3. THE CONTRACTOR SHALL PROVIDE A COMPLETE "TURN-KEY" PROJECT TO THE OWNER READY FOR FULL USE AND OCCUPANCY.
4. THE CONTRACTOR SHALL COORDINATE AND SECURE ADDITIONAL APPROVALS, INSPECTIONS, ETC. (BUILDING PERMIT WILL BE OBTAINED BY OWNER).
5. ALL WORK SHALL BE PERFORMED BY TRADESMEN THOROUGHLY EXPERIENCED IN THEIR RESPECTIVE TRADES.
6. ALL MANUFACTURED ITEMS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND/OR WITH THE STANDARDS OF THE INDUSTRIAL OR TRADE ORGANIZATION GOVERNING THEIR WORK.
7. ALL ELECTRICAL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE (NEC) AND OTHER APPLICABLE CODES AND IS SUBJECT TO THE APPROVAL OF THE ELECTRICAL INSPECTOR.
8. ALL HVAC WORK SHALL CONFORM TO ASHRAE STANDARDS AND SHALL BE INSTALLED IN ACCORDANCE WITH ITS UNDERWRITER APPROVAL, THE MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS, AND GOOD ENGINEERING PRACTICE.
9. ALL PLUMBING WORK SHALL COMPLY SHALL COMPLY WITH STATE BUILDING CODE AND OTHER CODES AND IS SUBJECT TO THE APPROVAL OF THE INSPECTOR.
10. DURING THE BIDDING PERIOD, CONFLICT OF DETAIL OR NOTING BETWEEN SPECIFICATIONS, WRITTEN NOTES, BID FORMS, AND/OR DRAWINGS SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ARCHITECT AND THE CONFLICT RESOLVED. SHOULD THE CONFLICT BE DISCOVERED AFTER THE START OF CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE HIGHEST QUALITY AND LARGEST QUANTITY CALLED FOR.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION. ANY VARIATION BETWEEN ACTUAL CONDITIONS AND THE CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT IMMEDIATELY. NO MONETARY CONSIDERATION WILL BE MADE FOR DISCREPANCIES BROUGHT FORTH ONCE BIDS HAVE BEEN SUBMITTED.
12. ANY TESTING REQUIRED BY SPECIFICATIONS OR TO COMPLETE THE PROJECT SHALL BE RETAINED AND PAID BY THE CONTRACTOR.
13. G.C. TO RETURN SITE TO EXISTING CONDITION AT CONCLUSION OF THE PROJECT.

DESCRIPTION OF JOB

THE NEW NATURE CENTER IS SITED AT THE PARK'S ABANDONED MARINA STRUCTURE. THE RENOVATED BUILDING WILL HAVE EDUCATIONAL EXHIBITS CENTERER AND BATHROOMS COMPLIANT WITH ADA ACCESSIBILITY STANDARDS OPEN YEAR ROUND. THE BUILDING ALSO INCLUDES A BAIT AND TACKLE SHOP AND WILL BE WINTERIZED. THIS STRUCTURE WILL REUSE MOST OF THE PERIMETER FOUNDATION WALLS AND STRUCTURAL COLUMN, PARKING, AND PAVED CONCRETE ACCESS SHALL BE COMPLIANT WITH ADA ACCESSIBILITY STANDARDS.

THE NATURE CENTER'S FUNCTIONS ARE ZONED: THE PUBLIC EXHIBITS ARE IN THE EAST, THE ENTRY & SHOP IS SITUATED IN THE MIDDLE, AND THE SUPPORT SPACES ARE IN THE WEST. THE SHOP AND EXHIBITS ARE SEPARATED BY A PARTITION WALL BUT OPEN TO ONE ANOTHER. IF STAFF ARE NOT PRESENT, A DOOR WILL SECURE THIS OPENING, BUT THE EXHIBITS WILL HAVE A SECONDARY EXTERIOR DOOR FOR VISITORS. ALL PUBLIC SPACES ARE DIRECTLY ACCESSED FROM OUTSIDE. THE PUBLIC RESTROOMS ARE ADA COMPLIANT AND LOCATED IN SIMILAR LOCATION TO THE EXISTING RESTROOMS.

THE SITE IS DIRECTLY ADJACENT TO THE DOCKS AND THE LAKE. THE EXISTING PARKING AND PAVING CAN LARGELY REMAIN IN PLACE. HOWEVER, ENCLOSING THE OPEN AIR "ELBOW" PORTION OF THE EXISTING BUILDING WILL REQUIRE REMOVAL OF SOME PAVING AND THE ROUND CONCRETE BENCHES. TO THE WEST, THE EXISTING FUEL TANKS ARE INTENDED TO BE SCREENED WITH POLLINATOR/ SENSORY/ EDUCATION GARDENS AND AN OUTDOOR KAYAK STORAGE RACK. BENCHES AND SEATING WITH BIRD FEEDERS WOULD BE APPRECIATED. THE EXISTING MARINA SIGNAGE WILL ALSO BE REMOVED AND REPLACED WITH A POLLINATOR GARDEN.

UTILITIES SHOULD BE ABLE TO REMAIN LARGELY AS-IS. THIS PROJECT WILL PROVIDE EMPTY CONDUIT WITH PULLSTRING TO ALLOW DATA TO BE BROUGHT IN SOON AFTER COMPLETION OF THE PROJECT.

CODE SYNOPSIS/ PROJECT DATA

JOB TYPE: NEW MARINA STORE W/ SUPPORTING SPACES WILL BE WINTERIZED; NATURE CENTER, RESTROOMS, & UTILITY WILL OPEN YEAR ROUND.

LOCATION: 2250 BUCK CREEK LN - SPRINGFIELD, OHIO 45502

ZONING CLASSIFICATION: N/A- STATE PROPERTY

TYPE OF WORK: NEW STRUCTURE_✓_____ ALTERATIONS_____

APPLICABLE CODES:

BUILDING:	2017 OHIO BUILDING CODE - 2015 IBC 2019 RESIDENTIAL CODE OF OHIO - 2018 IRC
MECHANICAL:	2017 OHIO MECHANICAL CODE - 2015 IMC
PLUMBING:	2017 OHIO PLUMBING CODE - 2015 IPC
ELECTRICAL:	2017 OHIO ELECTRICAL CODE - 2017 NFPA 70
FIRE:	2017 OHIO FIRE CODE - 2015 IFC
FUEL GAS:	2015 OHIO FUEL GAS CODE - 2015 IFGC
ENERGY:	2017 OHIO ENERGY CODE - 2012 IECC
ACCESSIBILITY:	2009 OHIO ACCESSIBILITY CODE/ 2009 ICC/ANSI A117.1

ACCESSIBILITY REQUIREMENTS:

ACCESSIBLE TO THE PHYSICALLY HANDICAPPED IN ACCORDANCE WITH 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN

NUMBER OF STORIES ABOVE GRADE: 1 STORY (TOTAL STORY OF 1)

CONSTRUCTION CLASSIFICATION: VB - NON SPRINKLED

ALLOWABLE STORIES, HEIGHT, & AREA: GROUP A & M — 1, 40 FT, & 6,000 SQFT

BUILDING STORIES, HEIGHT & AREA: 1, 23 FT, & 2,528 SQFT

BUILDING OCCUPANCY USE GROUP:

GROUP A-III - EXHIBIT GALLERY & MUSEUM	1,070 SQFT
GROUP M - CAMP STORE	1,066 SQFT
GROUP U - UTILITY	392 SQFT

OCCUPANT LOAD:

1,070	/30	=	36 ASSEMBLY - EXHIBIT GALLERY
703	/60	=	12 MERCANTILE - SALES
363	/300	=	2 MERCANTILE - OFFICE & STORAGE
262	/300	=	1 MECHANICAL EQUIPMENT ROOM
131	/300	=	1 UTILITIES
			52 TOTAL (26 MALE/26 FEMALE)

MINIMUM PLUMBING FIXTURES

CLASSIFICATION	WATER CLOSET	LAVATORIES	OTHER
ASSEMBLY - EXHIBITION HALL	MALE | FEMALE	MALE | FEMALE	
NUMBERS OF REQUIRED	1 PER 125 | 1 PER 65	1 PER 200	1 SERVICE SINK
NUMBERS OF PROVIDED	1 | 1	1 PER BATHROOM	1 SERVICE SINK

FIRE PROTECTION:

DEMISING WALL -	0 HOUR
SALES / NON-SALES WALL -	0 HOUR
SALES / NON-SALES DOOR -	0 HOUR
CEILING -	0 HOUR
COLUMNS -	0 HOUR
SERVICE CORRIDOR WALL	0 HOUR
SERVICE CORRIDOR DOOR	0 HOUR
SPRINKLERED:	NON SPRINKLERED

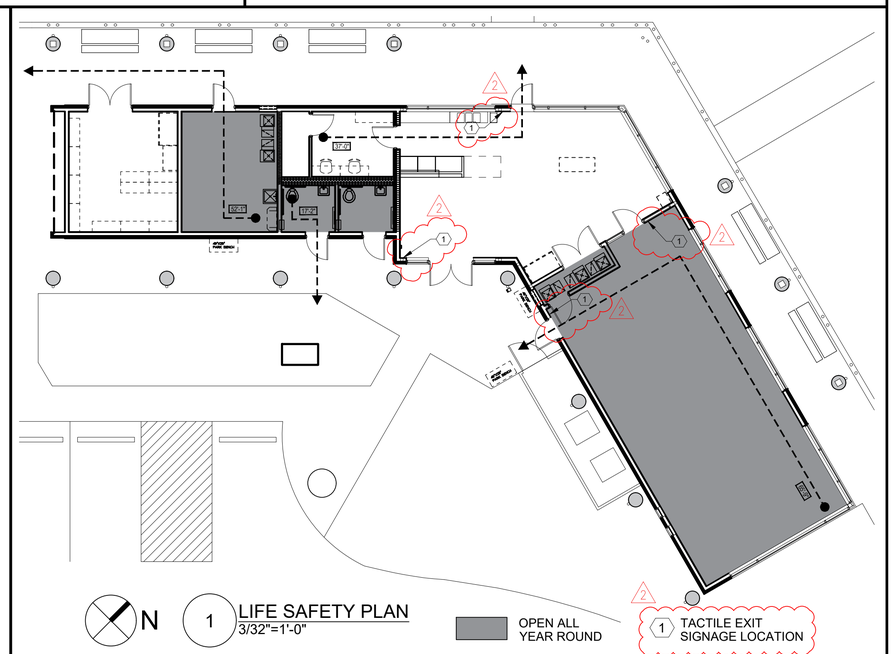
SMOKE EVACUATION SYSTEM: N/A

FLAME SPREAD REQUIREMENTS FOR GROUP 'A-III' NON SPRINKLERED
EXIT ENCLOSURES AND EXIT PASSAGEWAYS: MIN. CLASS A
CORRIDORS: MIN. CLASS A
ROOMS AND ENCLOSED SPACES: MIN. CLASS C

EGRESS REQUIREMENTS:

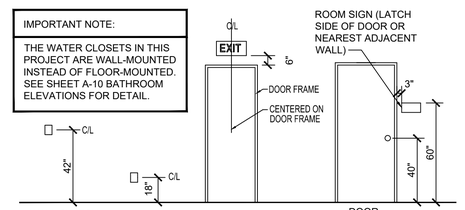
(2) EXITS REQUIRED - (3) EXITS PROVIDED) (SEE LIFE SAFETY PLAN
TRAVEL DISTANCE: 75' MAX.
EGRESS PATHWAY: 36" CLEAR

NOTE:
N/A



IMPORTANT NOTE:

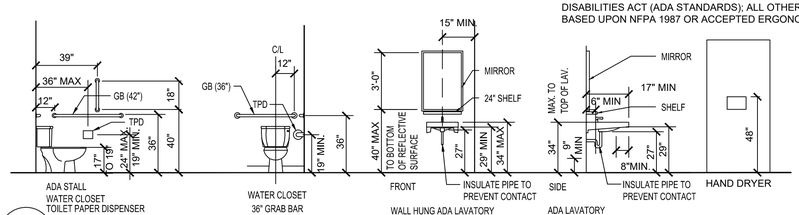
THE WATER CLOSETS IN THIS PROJECT ARE WALL-MOUNTED INSTEAD OF FLOOR-MOUNTED. SEE SHEET A-10 BATHROOM ELEVATIONS FOR DETAIL.



GENERAL NOTES:
FOR GENERAL MOUNTING HEIGHTS DIAGRAMS

1. GRAB BAR LOCATIONS ARE SHOWN ON FLOOR PLANS
2. ALL ITEMS SHOWN (EXCEPT SIGNAGE) SHALL BE ATTACHED DIRECTLY TO STUDS OR SOLID BLOCKING AS PER BUILDING CODE REQUIREMENTS
3. FOR MOUNTING HEIGHTS NOT INDICATED HERE OR ELSEWHERE IN THE DOCUMENTS, CONSULT THE ARCHITECT
4. IF CONFLICT ARISES BETWEEN THESE GENERAL MOUNTING HEIGHTS WITH MOUNTING HEIGHTS SHOWN ELSEWHERE IN THE DRAWINGS, OR WITH FIELD CONDITIONS OR OTHER INSTALLED EQUIPMENT IT SHALL BE BROUGHT TO ATTENTION OF THE ARCHITECT AND INSTALLED AS PER ARCHITECT'S DIRECTIVE
5. DIMENSIONAL PRIORITY
   A. ALIGN AS INDICATED
   B. LOCATE AS PER DIMENSION
   C. LOCATE AS PER MAX. DIMENSION
   D. LOCATED ANYWHERE BETWEEN MIN. & MAX. DIMENSION
   E. LOCATE AS PER MINIMUM DIMENSION6.
6. THE PLUMBING FIXTURE DIAGRAMS ARE SCHEMATIC ONLY. THE FIXTURE TYPES SPECIFIED/USED MAY DIFFER FROM THE DIAGRAMS
7. ACTUAL CONDITIONS MAYBE OPPOSITE HAND FROM THOSE SHOWN

NOTE: ADA MOUNTING HEIGHTS BASED UPON AMERICANS WITH DISABILITIES ACT (ADA STANDARDS); ALL OTHER MOUNTING HEIGHTS ARE BASED UPON NFPA 1987 OR ACCEPTED ERGONOMETRIC STANDARDS.



2 STANDARD MOUNTING HEIGHTS
1/4"= 1'-0"

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adaskalov@fmsarchitects.com
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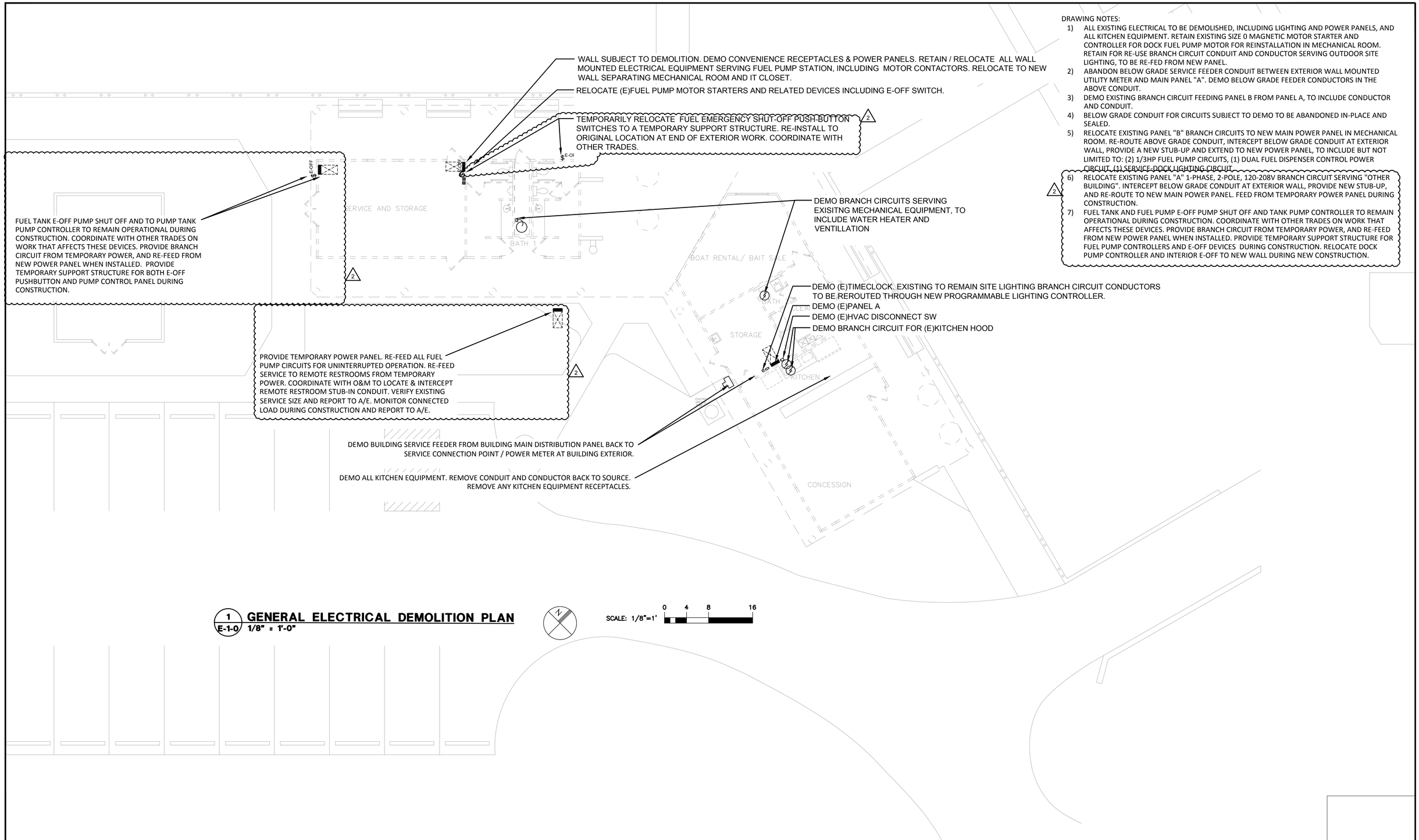
1/8/2024 DATE

BUCK CREEK STATE PARK
NEW CAMP STORE & NATURE CENTER
DNR-230014.03

LIFE SAFETY / GENERAL INFORMATION

L-0



DRAWING NOTES:

1) ALL EXISTING ELECTRICAL TO BE DEMOLISHED, INCLUDING LIGHTING AND POWER PANELS, AND ALL KITCHEN EQUIPMENT. RETAIN EXISTING SIZE 0 MAGNETIC MOTOR STARTER AND CONTROLLER FOR DOCK FUEL PUMP MOTOR FOR REINSTALLATION IN MECHANICAL ROOM. RETAIN FOR RE-USE BRANCH CIRCUIT CONDUIT AND CONDUCTOR SERVING OUTDOOR SITE LIGHTING, TO BE RE-FED FROM NEW PANEL.
2) ABANDON BELOW GRADE SERVICE FEEDER CONDUIT BETWEEN EXTERIOR WALL MOUNTED UTILITY METER AND MAIN PANEL "A". DEMO BELOW GRADE FEEDER CONDUCTORS IN THE ABOVE CONDUIT.
3) DEMO EXISTING BRANCH CIRCUIT FEEDING PANEL B FROM PANEL A, TO INCLUDE CONDUCTOR AND CONDUIT.
4) BELOW GRADE CONDUIT FOR CIRCUITS SUBJECT TO DEMO TO BE ABANDONED IN-PLACE AND SEALED.
5) RELOCATE EXISTING PANEL "B" BRANCH CIRCUITS TO NEW MAIN POWER PANEL IN MECHANICAL ROOM. RE-ROUTE ABOVE GRADE CONDUIT, INTERCEPT BELOW GRADE CONDUIT AT EXTERIOR WALL, PROVIDE A NEW STUB-UP AND EXTEND TO NEW POWER PANEL, TO INCLUDE BUT NOT LIMITED TO: (2) 1/3HP FUEL PUMP CIRCUITS, (1) DUAL FUEL DISPENSER CONTROL POWER CIRCUIT, (1) SERVICE DOCK LIGHTING CIRCUIT.

2

6) RELOCATE EXISTING PANEL "A" 1-PHASE, 2-POLE, 120-208V BRANCH CIRCUIT SERVING "OTHER BUILDING". INTERCEPT BELOW GRADE CONDUIT AT EXTERIOR WALL, PROVIDE NEW STUB-UP, AND RE-ROUTE TO NEW MAIN POWER PANEL. FEED FROM TEMPORARY POWER PANEL DURING CONSTRUCTION.
7) FUEL TANK AND FUEL PUMP E-OFF PUMP SHUT OFF AND TANK PUMP CONTROLLER TO REMAIN OPERATIONAL DURING CONSTRUCTION. COORDINATE WITH OTHER TRADES ON WORK THAT AFFECTS THESE DEVICES. PROVIDE BRANCH CIRCUIT FROM TEMPORARY POWER, AND RE-FEED FROM NEW POWER PANEL WHEN INSTALLED. PROVIDE TEMPORARY SUPPORT STRUCTURE FOR FUEL PUMP CONTROLLERS AND E-OFF DEVICES DURING CONSTRUCTION. RELOCATE DOCK PUMP CONTROLLER AND INTERIOR E-OFF TO NEW WALL DURING NEW CONSTRUCTION.

1 / E-1-0 GENERAL ELECTRICAL DEMOLITION PLAN

1/8" = 1'-0"

SCALE: 1/8"=1' 0 4 8 16

FMS # 22009 / MCDE# 22056

METRO CD ENGINEERING, LLC
5880 SAWMILL ROAD, SUITE 200
DUBLIN, OHIO 43017
(614) 923-3930
INFO@METROCDENGINEERING.COM

ENGINEERING
Ohio Department of Natural Resources

DESIGNED BY:	JA/ WB
DRAWN BY:	JA
CHECKED BY:	WB
APPROVED BY:	MC

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.	12/13/2023	BID DOCUMENTS

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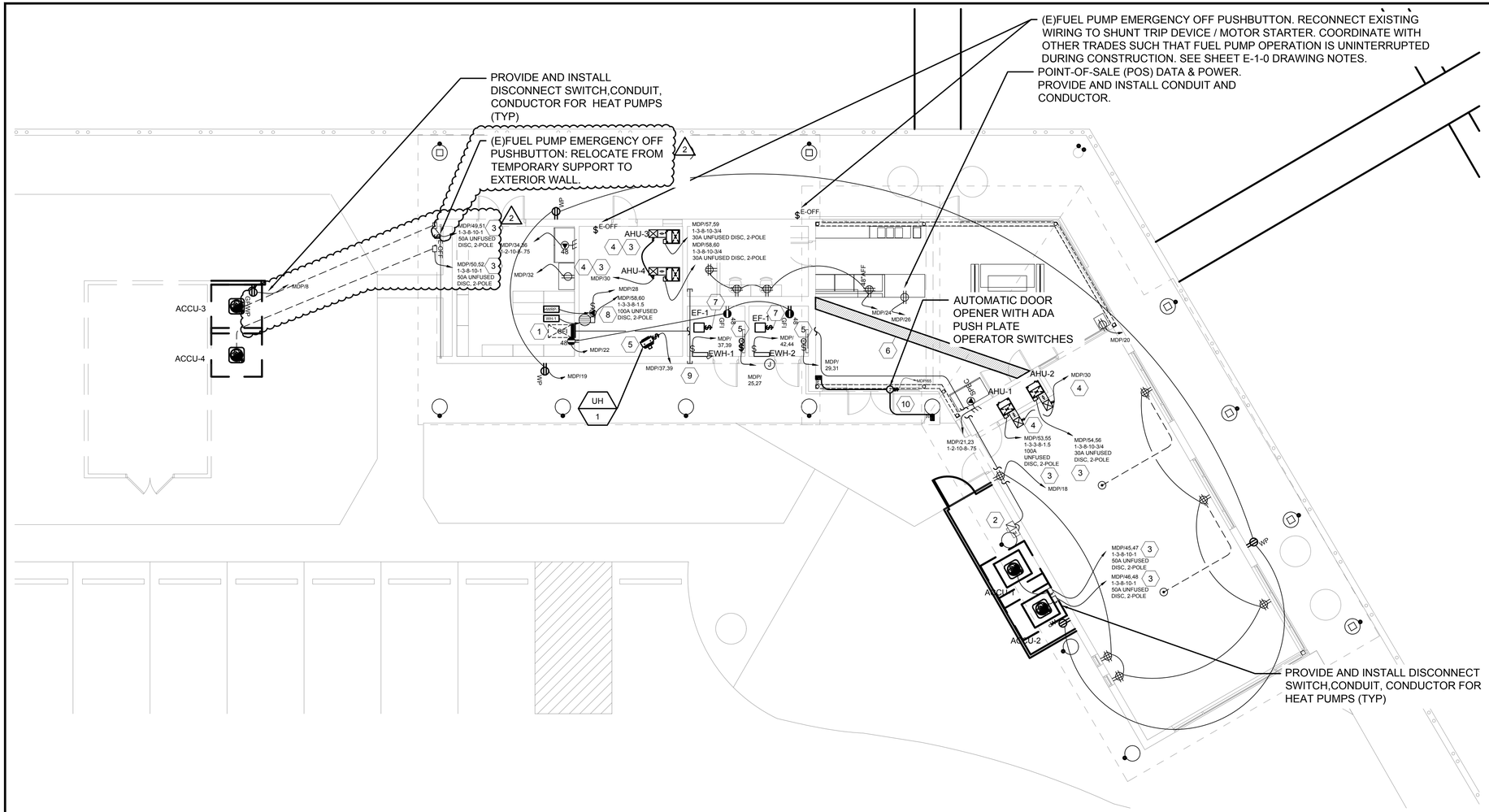
BUCK CREEK STATE PARK
NEW CAMP STORE & NATURE CENTER
DNR-230014.03

GENERAL ELECTRICAL DEMOLITION PLAN

E-1-0



1 E-2-0 ELECTRICAL POWER PLAN

1/8" = 1'-0"

SCALE: 1/8"=1' 0 4 8 16

CODED NOTES

x	
1	PROVIDE NEW POWER PANEL: MDP. PANEL TO BE SERVICE RATED AND INCLUDES MAIN 300A CIRCUIT BREAKER. REFERENCE 1-LINE ON SHEET E-5-0 FOR CONDUIT AND CONDUCTOR SIZES. RELOCATE EXISTING TO REMAIN CIRCUITS FROM EXISTING PANELS "A" & "B" TO NEW PANEL MDP.
2	PROVIDE NEW 300A FUSED UTILITY DISCONNECT SWITCH BETWEEN EXISTING ELECTRIC METER AND NEW PANEL MDP.
3	PROVIDE NEW DISCONNECT SWITCH, CONDUIT AND CONDUCTOR FOR NEW AIR HANDLER & ACCUMULATOR (BY HVAC). PROVIDE BRANCH CIRCUIT. COORDINATE WITH HVAC CONTRACTOR ON CONDUIT AND WIRING BETWEEN AIR HANDLER AND OUTDOOR ACCUMULATOR UNIT.
4	PROVIDE 24V HVAC CONTROL POWER TRANSFORMER. PROVIDE HVAC CONTROL RELAY. DEVICES TO BE MOUNTED TO 4X4 J-BOX. COORDINATE WITH HVAC CONTRACTOR TO WIRE 24V CONTROL POWER THROUGH RELAY CONTACTS AND TO INTAKE LOUVER ACTUATOR. COORDINATE WITH HVAC CONTRACTOR TO CONNECT RELAY COIL TO AIR HANDLER CONTROLLER.
5	ELECTRIC WALL HEATER: & UNIT HEATER: PROVIDE LOCAL DISCONNECT SWITCH, SIZE WIRING AS SHOWN.
6	NEW CONCRETE FLOOR TO BE BY OTHERS. PROVIDE BELOW GRADE TRENCH FOR ELECTRICAL CONDUITS SERVING NATURE CENTER AND STORE AREA EQUIPMENT. TRENCH DEPTH TO BE 12" FOR PVC CONDUIT WITH 2" CONCRETE SLAB. SURVEY FLOOR FOR ANY EXISTING BURIED PLUMBING OR ELECTRICAL BEFORE WORK.
7	EXHAUST FAN TO BE TIED TO LOCAL UCCUPANCY CONTROLLED LIGHTING SUCH THAT EXHAUST OPERATES WHILE RESTROOM IS OCCUPIED. PROVIDE LOCAL HEAVY DUTY RATED TOGGLE SWITCH TYPE DISCONNECT SWITCH AT EXHAUST UNIT.
8	PROVIDE CIRCUIT AND DISCONNECT, SIZED AS SHOWN FOR NEW WATER HEATER AND RECIRCULATION PUMP.
9	PROVIDE 4" EMPTY PVC CONDUIT. FOR FUTURE TELCO USE. INCLUDE PULL STRING ACCESSIBLE FROM EITHER END, CAP AND LABEL.
10	PROVIDE BRANCH CIRCUIT AND FIELD WIRING FOR DOOR OPENER AND CORRESPONDING ADA TYPE PUSH-PLATE SWITCHES. DOOR HARDWARE AND SWITCHES PROVIDED BY GC. INTERIOR PUSH-PLATE TO BE MULLION OR JAMB MOUNTED. ROUTE WIRING THROUGH BACKSIDE OF JAMB TO DOOR OPERATOR. EXTERIOR PUSH-PLATE TO BE PEDESTAL MOUNTED. PROVE BELOW GRADE TRENCH & CONDUIT FROM PEDESTAL TO BUILDING. REFERENCE ARCHITECTURAL PLANS AND DETAILS FOR SPECIFIC LOCATIONS. VERIFY MANUFACTURER ELECTRICAL REQUIREMENTS PRIOR TO WORK.

FEEDER KEY

1 -3 -600 +2 -5"

- 1 — NO. OF SETS OF CONDUCTORS IN FEEDER.
- -3 — NO. OF POWER CONDUCTORS
- -600 — SIZE OF CONDUCTORS (AWG OR KCMIL)
- +2 — GROUND CONDUCTOR SIZE FOR EACH SET ("X" USED IF GROUND CONDUCTOR NOT USED)
- -5" — MINIMUM CONDUIT SIZE FOR EACH SET*

ALL CONDUCTOR SIZES BASED UPON 75 DEGREES C THWN/THHN FOR WET LOCATIONS USING COPPER CONDUCTORS UNLESS INDICATED OTHERWISE.

* REFER TO PLANS AND DETAILS FOR COMBINING CONDUCTORS FROM SEPARATE FEEDERS WITHIN SAME RACEWAY. MINIMUM SIZE CONDUIT SHOWN IS FOR SINGLE FEEDERS ONLY. NO SHARED NEUTRALS.

NOTE: THIS FEEDER KEY IS AN EXAMPLE. CONDUCTOR AND CONDUIT SIZES AND QUANTITIES IN THIS KEY ARE NOT INTENDED TO BE USED FOR PROJECT DESIGN.

TEMPORARY POWER NOTES:
PRIOR TO ANY WORK:
1. CONTRACTOR PROVIDE TEMPORARY POWER / NEMA3R LOAD CENTER AT EXISTING SERVICE ENTRANCE PRIOR TO DEMO WORK.
2. RELOCATE COMBINATION MOTOR STARTER AND E-OFF TO "SERVICE AND STORAGE" EXTERIOR NW WALL,
3. INTERCEPT BRANCH CIRCUITS GOING OUT TO FUEL PIER AT EXTERIOR WALL / FLOOR PENETRATION, AND EXTEND TO RELOCATED MOTOR STARTER, E-OFF AT NEW LOCATION.
4. PROVIDE NEW CONDUIT/CONDUCTOR BETWEEN MOTOR STARTER AND DISPENSER CIRCUITS TO TEMPORARY POWER PANEL.
5. UPON COMPLETION OF INSTALL OF NEW MAIN PANEL, RE-FEED FUEL DISPENSER CIRCUITS FROM NEW MAIN PANEL.

FMS # 22009 / MCDE# 22056

METRO CD ENGINEERING, LLC
5880 SAWMILL ROAD, SUITE 200
DUBLIN, OHIO 43017
(614) 923-3930
INFO@METROCDENGINEERING.COM

ENGINEERING
Ohio Department of Natural Resources

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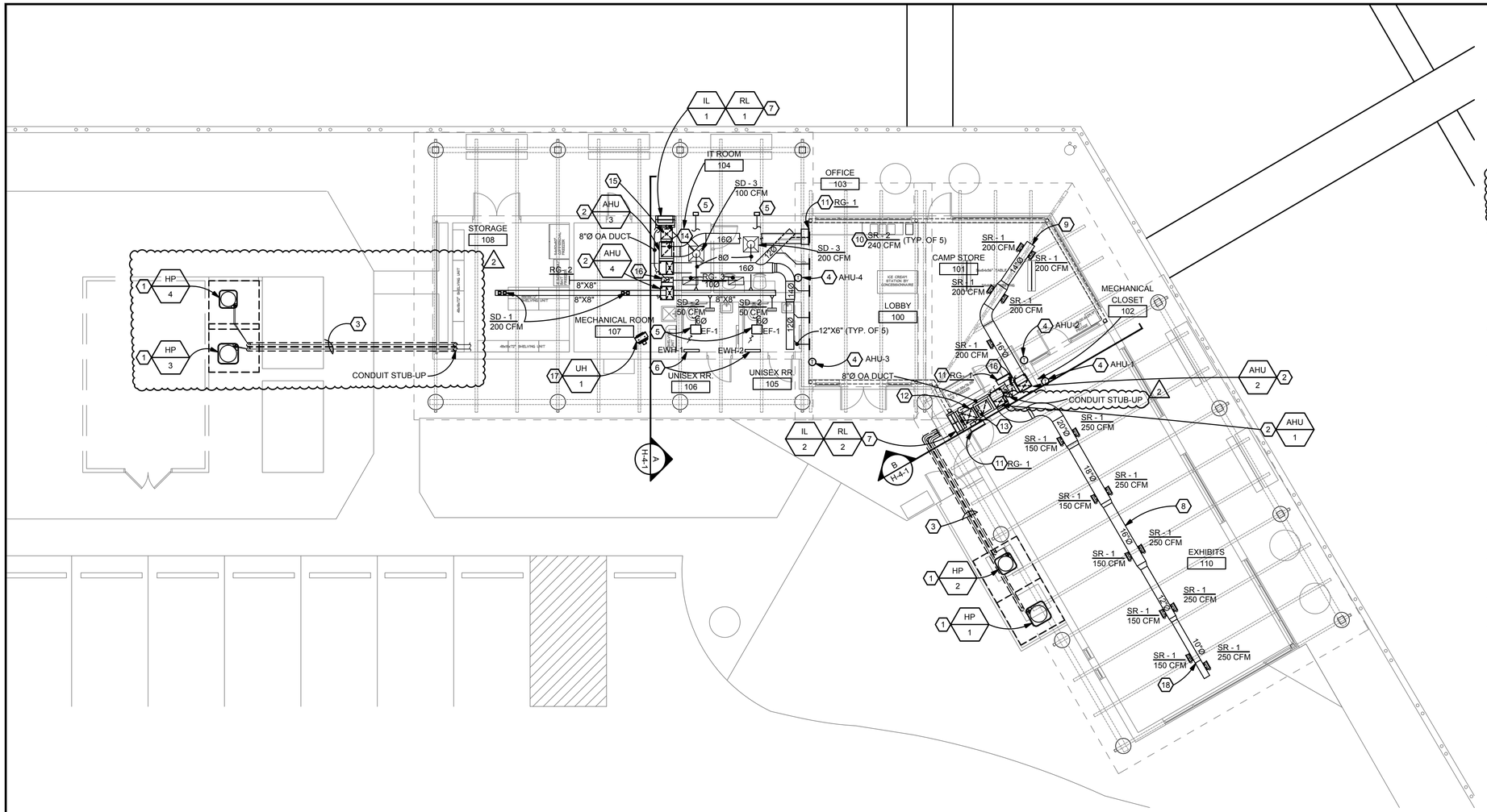
ELECTRICAL POWER PLAN

E-2-0



1 GENERAL HVAC PLAN
H-2-0 1/8" = 1'-0"

SCALE: 1/8"=1' 0 4 8 16

HVAC CODED NOTES

1. THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL AN AIR COOLED HEAT PUMP CONDENSING UNIT. CONTRACTOR IS SHALL FURNISH AND INSTALL CONCRETE HOUSE KEEPING PAD FOR UNIT. INSTALL WITH PROPER SERVICE CLEARANCE AREA AS RECOMMENDED BY MANUFACTURER. REFER TO "AHU/ HP EQUIPMENT SCHEDULE" ON SHEET H-3-0 FOR ADDITIONAL INFORMATION.
2. THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL A SPLIT DX AIR HANDLER UNIT. COORDINATE INSTALLATION OF UNIT WITH PLUMBING AND ELECTRICAL EQUIPMENT IN MECHANICAL ROOM(S). INSTALL WITH PROPER SERVICE CLEARANCE AREA AS RECOMMENDED BY MANUFACTURER. REFER TO "AIR HANDLER UNIT SCHEDULE" ON SHEET H-3-0 FOR ADDITIONAL INFORMATION. CONTRACTOR SHALL FURNISH AND INSTALL ALL UNITS ON CONCRETE HOUSE KEEPING PAD AND 1-1/4" ANGLE IRON SUPPORT FRAME. DUCT CONNECTIONS TO AHU AND ASSOCIATED MIXING BOXES IS TO BE FULL SIZE. TRANSITION AS NEEDED FOR DUCT DISTRIBUTION SIZES SHOWN ON PLANS.
3. THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL NEW 6"Ø PVC PIPE FROM SPLIT DX AIR HANDLER TO STUB-UP LOCATION INSIDE BUILDING AS SHOWN. CONTRACTOR SHALL FURNISH, INSTALL, AND ROUTE NEW REFRIGERANT LINES FROM THE SPLIT DX AIR HANDLER TO AIR COOLED HEAT PUMP CONDENSING UNIT AND MAKE FINAL CONNECTIONS. CONTRACTOR SHALL INSTALL REFRIGERANT PIPING PER MANUFACTURER'S REQUIREMENTS. 2
4. THE MECHANICAL CONTRACTOR SHALL FURNISH NEW ZONE THERMOSTAT IN LOCATION SHOWN ON PLAN FOR SPLIT DX HEAT PUMP HVAC SYSTEM TEMPERATURE CONTROL AND INSTALLED AND WIRED BY THE MECHANICAL CONTRACTOR AT 48" ABOVE FINISHED FLOOR. FURNISH WITH LOCKING COVER. VERIFY EXACT LOCATION OF THERMOSTAT WITH OWNER.
5. SUSPEND EXHAUST FAN WITH HANGER ROD FROM ROOF STRUCTURE. CONNECT AND INSTALL 6"Ø EXHAUST DUCTS INTO WALL CAP. 6"Ø EXHAUST VENT WITH WALL CAP. EXHAUST WALL CAP SHALL BE ALUMINUM CONSTRUCTION, WITH WEATHER HOOD, SPRING LOADED DAMPER, GASKET, AND BIRD SCREEN, FAMCO MODEL WVEB4 OR EQUAL.
6. MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL NEW ELECTRIC WALL HEATERS IN LOCATION SHOWN ON PLAN. ELECTRIC WALL HEATER SHALL BE INSTALLED 12" AWAY FROM DOOR LATCH.
7. INTAKE LOUVER IS INSTALLED 18" ABOVE GRADE. RELIEF LOUVER IS INSTALLED AT 24" ABOVE TOP OF INTAKE LOUVER. INTAKE/RELIEF LOUVERS ARE STACKED. SEE ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION OF THE LOUVERS. RELIEF LOUVER IS TO BE INSTALLED AT THE TOP LOUVER. INSTALL FULL SIZE 12" DEEP INSULATED PLENUM AT THE HIGHEST POINT IN THE TOP LOUVER FOR RELIEF AIR. INSTALL FULL SIZE 12" DEEP INSULATED PLENUM AT THE HIGHEST POINT IN THE BOTTOM LOUVER FOR OUTSIDE AIR. PLENUMS ARE TO BE SLOPED TO DRAIN TOWARDS THE LOUVER.
8. DUCT IS TO BE INSTALLED EXPOSED TIGHT TO BOTTOM OF GLUELAM BEAMS.
9. DUCT IS TO BE INSTALLED TO THE BOTTOM OF GLUELAM BEAM AND IS TO RISE PARALLEL TO THE BEAM AS IT SLOPES UP.
10. SIDE WALL SUPPLY AIR REGISTERS ARE TO BE INSTALLED WITH THE BOTTOM AT 8'-6" ABOVE FINISHED FLOOR.
11. RETURN AIR GRILLE IS TO BE INSTALLED ON SIDE WALL AS HIGH AS POSSIBLE. RETURN GRILLE IS TO HAVE A FULL SIZE INSULATED PLENUM 12" DEEP ON THE BACK OF GRILLE. REFER TO "HVAC ELEVATIONS" ON SHEET H-4-1 FOR ADDITIONAL INFORMATION.
12. EXTEND 18"X 16" DUCT FROM OUTSIDE AIR INTAKE PLENUM AT LOUVER TO OUTSIDE AIR CONNECTION TO MIXING BOX. TRANSITION AS NEEDED TO MAKE FULL SIZE CONNECTION TO MIXING BOX.
13. EXTEND 18"X 16" DUCT FROM RETURN AIR DUCT SYSTEM TO RETURN AIR CONNECTION AT MIXING BOX. TRANSITION AS NEEDED TO MAKE FULL SIZE CONNECTION TO MIXING BOX. EXTEND 18"X16" RELIEF AIR DUCT FROM RETURN AIR DUCT TO PLENUM AT RELIEF LOUVER. RELIEF DUCT IS ROUTED ABOVE OUTSID AIR DUCT.
14. EXTEND 16"X 14" DUCT FROM OUTSIDE AIR INTAKE PLENUM AT LOUVER TO OUTSIDE AIR CONNECTION TO MIXING BOX. TRANSITION AS NEEDED TO MAKE FULL SIZE CONNECTION TO MIXING BOX.
15. EXTEND 16"X 14" DUCT FROM RETURN AIR DUCT SYSTEM TO RETURN AIR CONNECTION AT MIXING BOX. TRANSITION AS NEEDED TO MAKE FULL SIZE CONNECTION TO MIXING BOX. EXTEND 16"X14" RELIEF AIR DUCT FROM RETURN AIR DUCT TO PLENUM AT RELIEF LOUVER. RELIEF DUCT IS ROUTED ABOVE OUTSID AIR DUCT.
16. 20"X10" RETURN AIR DROP TO AHU. TRANSITION AS NEEDED TO MAKE FULL SIZE CONNECTION RETRUN AIR CONNECTION AT UNIT.
17. UNIT HEATER TO BE INSTALLED WITH BOTTOM OF UNIT 8'-0" AFF.
18. LAST AIR DEVICE ON DCUT MAIN IS TO BE INSTALLED ON IT'S OWN SECTION OF DUCT TO ALLOW THE DIRECTION OF THE AIR DISCHARGE TO BE ADJUSTED. FINAL ADJUSTMENT/ROTATION OF DUCT WILL BE COORDINATED WITH THE DISPLAYS IN THE NATURE CENTER.

2

The mechanical contractor is to submit a shop drawing for the refrigerant piping system to the manufacturer's equipment supplier. Refrigerant shop drawing is to include the following:

1. **Floor plan of the field determined refrigerant piping routing.**
2. **Riser diagram of the refrigerant piping with all actual pipe lengths, elbows and refrigerant pipes devices.**

As part of the submittal by the manufacturer's equipment supplier the refrigerant piping shop drawing above will be included with the equipment submittal to the engineer for approval. The refrigerant shop drawing shall include all pipe sizes and installation recommendations from the manufacturer based on the sketch provided by the contractor.

If the contractor does not provide this information, and/or installs this piping without manufacturer's recommendations and engineers' approval, then contractor shall assume all responsibility and liability for the refrigerant piping installation and warranty of the HVAC equipment.

FMS # 22009 / MCDE# 22056

metro cd engineering
METRO CD ENGINEERING, LLC
5880 SAWMILL ROAD, SUITE 200
DUBLIN, OHIO 43017
(614) 923-3930
INFO@METROCDENGINEERING.COM

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