

<b>Date</b>	January 06, 2026
<b>Project Title</b>	Southern State Community College IT Center of Excellence
<b>To</b>	All Plan Holders
<b>Purpose</b>	Modify the Construction Documents
<b>Distribution</b>	Plan Holders Southern State Community College OFCC Design Team

---

This Addendum supplements and amends the original Plans and Specifications and shall be taken into account in preparing proposals and shall become a part of the contract documents.

**Pre-Bid Meeting:**

Pre-Bid meeting agenda and attendees list is attached.

**SPECIFICATION REVISIONS:**

- Item 1. 00 01 10 - TABLE OF CONTENTS
  - A. Added spec section 01 25 14 to the table of contents.
- Item 2. 00 10 00 - SOLICITATION
  - A. Removed EDGE requirements for this project.
- Item 3. 00 41 13 - BID FORM
  - A. Removed EDGE requirements for this project.
- Item 4. 01 25 14 - Substitution Request Form
  - A. Spec Section has been created and added into the project's specification book.
- Item 5. 08 33 23 - Overhead Doors
  - A. Revised 2.02 Door Assembly, D. has been updated to reflect and sectional architectural overhead door.
- Item 6. 08 80 00 - GLAZING
  - A. Revised 3.8 Glass schedule to match what is on the drawings for G1 and G2.
- Item 7. 10 14 23 Panel Signage
  - A. Revised 2.2 PANEL SIGNS, A, 1 & 2 have been updated to reflect campus standard for signage.
- Item 8. 23 74 33 DEDICATED OUTDOOR-AIR UNITS
  - A. Revised 2.16 CONTROLS.
- Item 9. 23 81 46 WATER-SOURCE UNITARY HEAT PUMPS
  - A. Revised 2.13 DDC SENSORS.

**ARCHITECTURAL DRAWING REVISIONS:****Item 1. A101 - FIRST FLOOR PLAN & RCP**

- A. Revised keynotes 109 & 115 accurately reflect the basis of design for the metal shelving within the scope of work.

**Item 2. A410 - GLAZING / STOREFRONT ELEVATIONS**

- A. Revised glazing types on elevations A10, A18, D13, D17, G12, G16, G18, K10, N13 & N17. Doors to be G1 and storefront glazing to be G2.
- B. Added/Revised dimensions on elevations D13, K10 & N17.
- C. Added missing door tags on elevations K10 & N13.
- D. Added missing mullion on elevation K10.

**Item 3. A601 - OPENING SCHEDULES, ELEVATIONS, AND DETAILS**

- A. Removed duplicating glazing type / material in legend.
- B. Removed unused frame types.
- C. Removed unused door types.
- D. Added door type FG2.
- E. Revised opening types from AG to FG in the opening schedule.
- F. Added frame types in the opening schedule for all doors.
- G. Added frame glazing to opening schedule for storefronts.

**Item 4. A700 - FIRST FLOOR FINISH PLAN, LEGEND, & DETAILS**

- A. Revised 3D Printer/Storage Room 101.1 floor finish.

**HVAC DRAWING REVISIONS:****Item 3. M001 - GENERAL INFORMATION - MECHANICAL**

- A. Included note for airflow testing prior to construction/demolition.

**Item 4. MD101 - FIRST FLOOR PLAN - MECHANICAL - DEMOLITION**

- A. Revised existing duct branch from existing ventilation unit to remain.

**Item 5. M101 - FIRST FLOOR PLAN - HVAC**

- A. Revised existing duct branch from existing ventilation unit to remain.
- B. Removed paint booth exhaust and revised transfer ducts.
- C. Moved Tstat in Office 116.
- D. Added airflows for existing to remain supply air devices.
- E. Revised which existing heat pumps new DOAS is providing ventilation to.

**Item 6. M201 - FIRST FLOOR PLAN - HVAC PIPING**

- A. Revised pipe tagging.

**Item 7. M501 - DETAILS - MECHANICAL**

- A. Revised details.

**Item 8. M601 - SCHEDULES - MECHANICAL**

- A. Revised DOAS schedule and sequences.
- B. Revised Water Sourced Heat Pump schedule.

**ELECTRICAL DRAWING REVISIONS:****Item 9. E101 - FIRST FLOOR PLAN - LIGHTING**

- A. Makers Space 101: Added occupancy sensor.

**Item 10. E201 - FIRST FLOOR PLAN - POWER AND SYSTEMS**

- A. Added power to DOAS rooftop receptacle.

**Item 11. E601 - SCHEDULES - ELECTRICAL**

- A. Revised electrical data on motor schedule per mechanical updates.

**ATTACHMENTS:**

Spec Section 00 01 10 - Table of Contents

Spec Section 00 10 00 - Solicitation

Spec Section 00 41 13 - Bid Form

Spec Section 01 25 14 - Substitution Request Form

Spec Section 08 33 23 - Overhead Doors

Spec Section 08 80 00 - Glazing

Spec Section 10 14 23 - Panel Signage

Spec Section 23 74 33 - Dedicated Outdoor-Air Units

Spec Section 23 81 46 - Water-Source Unitary Heat Pumps

Sheet A101 - FIRST FLOOR PLAN & RCP

Sheet A410 - GLAZING STOREFRONT ELEVATIONS

Sheet A601 - OPENING SCHEDULES, ELEVATIONS, AND DETAILS

Sheet A700 - FIRST FLOOR FINISH PLAN, LEGEND, & DETAILS

Sheet M-001 - GENERAL INFORMATION - MECHANICAL

Sheet MD101 - FIRST FLOOR PLAN - MECHANICAL - DEMOLITION

Sheet M-101 - FIRST FLOOR PLAN - HVAC

Sheet M-201 - FIRST FLOOR PLAN - HVAC PIPING

Sheet M-501 - DETAILS - MECHANICAL

Sheet M-601 - SCHEDULES - MECHANICAL

Sheet E-101 - FIRST FLOOR PLAN - LIGHTING

Sheet E-201 - FIRST FLOOR PLAN - POWER AND SYSTEMS

Sheet E-601 - SCHEDULES - ELECTRICAL

Pre-Bid Attendance List

Pre-Bid Meeting Agenda

Bidding RFI Log

**END OF ADDENDUM No. 01**

**PRE-BID MEETING**  
**December 15, 2025**  
**SOC-250003**  
**SSCC Technology & Innovation Center Renovation**

1. Introductions and general overview of the Project scope of work.
2. Summary of the work is located in Specifications and includes but is not limited to the performance of all work as indicated in the Construction Documents.
3. OFCC will receive bids for Prime Contractor.

The Project is located at:

100 Hobart Drive  
Hillsboro, Ohio 45133, Highland County

4. State funded project following typical in accordance with Agency **State** rules, & requirements; except where noted otherwise.
5. This Project will be utilizing the OFCC "General Contracting" Requirements (aka) "Front End" dated **Oct. 2025**. **These are the most current documents**. Please read and become familiar with them including latest special conditions as related to Milestone Dates. Documents are available at [ofcc.ohio.gov](http://ofcc.ohio.gov).
6. Estimates of the Contract work is included in solicitation and bid form Notice to Bidders.
7. Section 00 21 13, Instruction to Bidders (electronic: Bid-express version) from January 2016:
  - a) Article 2.5: Substitution Prior to Bid Opening: No substitution will be allowed to the items specified unless the proposed item has been submitted for approval in a timely manner and has been noted in an Addendum. The bids are to reflect the use of items as specified or "approved" equals only. Proposed Substitutions received by the A/E less than 10 days prior to the bid opening shall not be considered. No write-in substitutions are allowed. See IB section 2.5.
  - b) Article 2.6, Bid Form: Each Bid shall be submitted on an electronic Bid Form using the State's electronic bidding software. The Bidder shall fill in all relevant spaces on the electronic Bid Form. Bidder's will need to be registered with Bid Express if not already. This can take up to 5 days typically.
  - c) Article 2.10.3. & 2.10.3.8, Submittals with Bid Form: Submittal of the Responsible Bidder Background Information (RBI) with bids is not required but **STRONGLY** encouraged. This section will require at the request of the Contracting Authority either:
    - d) An annual financial statement prepared within the twelve (12) months prior to the Bid by an independent licensed accounting firm; and the name, address, contact person and phone number of the bank normally used by the Bidder for its primary banking; or,
    - e) A financial report generated within 30 days prior to the Bid from Standard and Poors, Dun and Bradstreet or a similar company documenting the financial condition of the Bidder; and the name, address, contact person and phone number of the bank normally used by the Bidder for its primary banking;
  - f) This above financial information is not a public record under Section 149.43, ORC; and will remain confidential, except under proper order of a court.
  - g) The Bidder is encouraged to submit background information with its Bid using the Bidder's Qualification Form.

- h) Article 2.10.3.14: Out of State Contractors need to secure a certificate of Good Standing from the Ohio Secretary of State.
  - i) Article 2.10.1 The Contracting Authority shall reject a Bid as non-responsive if the Bidder fails to submit a Bid Guaranty as stated in Article 5. Bid Guaranty and Bond: Paragraphs 5.1 and 5.4.: Bidders have the option to include along with the Bid Guaranty and Power of Attorney from the Surety, a Contract Bond with their Bids. The latter is required before signing the Contract Form. We strongly recommend that the Bidders use the "Bid Security Form" (combined Bid Guaranty and Bond) and "Performance and Payment Bond Form" included in our Standard Conditions, Section 00 43 13. In lieu of a Bid Guaranty and Contract Bond, the Bidder may submit a Letter of Credit or cashier's check in accordance with Article 5.1.6. Bidders need to include their full company name on this document. Failure to utilize the correct Bond form will result in the Bidders rejection as being non-responsive.
  - j) Article 6.1.3, Ohio Workers' Compensation Certificate: A current Certificate must be provided as precedent for execution of a Contract.
  - k) Article 6.1.9: By submitting its Bid, the Bidder warrants that it is not subject to an unresolved finding for recovery under O.R.C. Section 9.24. O.R.C. Section 9.24 prohibits the State from awarding a Contract to any Bidder against whom the Auditor of State has issued a finding for recovery if the finding for recovery is unresolved at the time of award. If the Contract is awarded to a Bidder subject to an unresolved finding for recovery under O.R.C. Section 9.24, the Contract is void on its face and the Contractor shall immediately repay to the Owner any funds paid under the Contract.
  - l) Article 6.2, Non-compliance with Conditions Precedent: The award of the Contract and execution of the Contract Form require the Contractor to comply with all conditions precedent for execution of the Contract within 10 days of the date of the Notice of Intent to Award, and the Bidder's Qualification Form, not previously provided within 3 business days of receiving request.
  - m) Article 6.3, Time Limits: The Contracting Authority's failure to award the Contract and execute the Contract Form-within 60 days of the bid opening invalidates the entire bid process and all Bids submitted, unless the time is extended by written consent of the apparent lowest responsive and responsible Bidder to the Contracting Authority.
  - n) Article 6.4, The Contracting Authority shall issue a Notice to Proceed to the contractor which establishes the date of commencement and calendar days allocated for Substantial Completion of all work.
  - o) Article 6.5, Wage Rates: Prevailing wage rates are required for this Project.
8. Section 00 72 13 General Conditions from Oct. 2025.
- a) Article 1.6: Drug Free Safety Program Participation
    - 1.) By entering into this Contract, the Contractor agrees that it will require each of its Subcontractors, or tiered subcontractors, which provide labor on the Project site to be enrolled in an OBWC approved DFSP. Per 0072 13 General Conditions, if the current DFSP certificates have expired, contractors/subcontractors are to reapply under the new program Substance Use Prevention and Recovery (SUPR) Program.
    - 2.) Prior to authorizing a Subcontractor to commence work on the Project Site, the Contractor shall submit written confirmation of the Subcontractor's enrollment to the A/E and Department.

In addition to OBWC approved DFSP Level 1 requirements, the Department requires that the Contractor and each Subcontractor that provides labor on the Project site to perform random drug testing of five (5) percent of its employees who perform labor on the Project construction site(s). The random drug testing percentage shall also include the onsite supervisors of

the Contractor and applicable Subcontractors. Level 1 random drug testing shall otherwise comply with the same testing guidelines and criteria as required for OBWC approved Level 2 testing.”

- b) Article 6.5, General Conditions-Construction Progress Scheduling: Refer to this section and the specification section 01 32 16 for requirements pertaining to electronic scheduling and coordination. Provide at minimum monthly up-dates and additional where recovery is needed. Include milestone dates. Use of Primavera, P-6.xml (latest version), scheduling software will be required. See other sections of this Article pertaining to required construction procedures.
  - c) Prime contractors please review Article 1 your contractual responsibilities and obligations.
  - d) Substantial Completion Time is **184 days** (consecutive calendar days) after Notice To Proceed.
  - e) There will be weekly job progress and coordination meetings. For each progress meeting the Contractor shall provide written progress reports, for work recently done, work underway, applicable logs, and 1 and 2 week look-ahead reports for expected work.
  - f) Ohio law requires the use of **DOMESTIC STEEL**.
  - g) The Owner has submitted and paid for the Plan Approvals through the A/E from the Ohio Department of Industrial Compliance. The respective Contractors shall provide all inspections as needed and provide inspection approval certificates to the A/E for Project record documentation as may be applicable, such as, related to fire protection, plumbing, mechanical, and electrical work, etc. The Contractor shall obtain all regulatory approvals and pay all other fees as may be needed to obtain Fire Marshal, Life Safety, OSHA and OEPA approvals for the work.
  - h) The Contracting Authority does plan on utilizing the Oaks CI module system for this Project.
  - i) Bidders are highly encouraged to set up Oaks Fin account before bidding in the Ohio Supplier Portal through the following link, <https://supplier.ohio.gov/> (Need acct. ID #). This is very important to ensure avoidance of related Project delays.
9. Section 00 72 13 General Conditions, Article 10, Contractor's General Insurance and Builder's Risk Insurance: The Prime Contractor shall provide and maintain, during the progress of the Work and until the execution of the final Certification of Contract Completion by the Contracting Authority, a Builder's Risk insurance policy to cover all Work in the course of construction. This insurance shall be on a special cause of loss form, which provides coverage on an open perils basis insuring against the direct physical loss of, or damage to, covered property including, but not limited to, theft, vandalism, malicious mischief, earthquake, tornado, lightning, explosion, breakage of glass, flood, collapse, water damage, and hot and cold testing. This insurance shall also include debris removal, and/or demolition occasioned by enforcement of Applicable Law. General Condition Section 00 72 13, Article 10 also requires professional liability insurance coverage.
10. A Pre-bid Site Visit is scheduled for today, after this Pre-bid meeting to view the area where construction is planned to take place. Cameras/photos are permitted in designated areas.
11. **Bids are due to be submitted electronically through the State Bidding Software Program by 1-15-2026 at 1:00 pm.**
- a) Bidders shall fill in all relevant spaces on the electronic Bid Form, including completion of the “Bidder Affirmation and Disclosure” section.
  - b) Bid Form shall include full legal name of the Bidder.
  - c) There are 3 Alternates. #1 for Garage doors in lieu of storefront windows, #2 for Built-in mill- work at 3D Printer/Storage 101.1, & #3 for Furring out of CMU walls in Instructional Lab 103.

- d) Allowances and Unit Pricing. Any required Allowances or requested Unit Prices that are included on this Project will be indicated on the Bid Form. See IB sections 2.7 and 2.8 respectively. There are no Unit Prices or Allowances.
- e) Article 2.3: If a Bidder finds any perceived ambiguity, conflict, error, omission, or discrepancy within the Contract Documents and Applicable Law, the Bidder shall submit a written Request for Interpretation (“RFI”) to the A/E for an interpretation or clarification. The A/E shall respond to RFI’s received more than seven (7) days before the bid opening. This allows the A/E time to prepare and issue any necessary Addendum.
- f) Any changes in the Contract Documents, prior to bidding, will be issued in an Addendum 72 hours before the scheduled bid opening (excluding weekends and legal holidays).
- g) Bid Evaluation Procedure. Contractors, subcontractors, and material suppliers will be subject to a pre-award evaluation procedure per IB 3.5.
- h) Rejection of Bid. If the lowest Bidder is not responsive or responsible the Contracting Authority shall reject the Bid and commence with evaluating the next lowest Bidder for award consideration. The “10% Rule” may also affect the ability to accept any or all Bids.

Once the responsive and responsible low Bidder has been determined, a “Notice of Intent to Award” a contract will be issued. Once a Contract is awarded (within 60 days) the Contractor can expect to receive a “Notice to Proceed”. This sets the Project commencement date. Within 10 days of this notice, the Contractor shall submit to the A/E the following information:

- Schedule of Values
- Preliminary schedule of shop drawing submittals
- Subcontractor and Material Supplier Declaration Form
- Qualifications and resumes of proposed Project Manager & Superintendent
- Evidence that an automatic deposit authorization agreement for state warrants has been submitted to the Auditor of the State of Ohio, using the electronic funds transfer form, provided on the internet per IB section 6.4.1.5.
- Schedule of dates during the Contract term when the Contractor shall pay employee wages for the Project

#### 12. Owner Items

- a) Security-worker background information will need to be submitted to the College and for contractor passes. Any existing background information is only good for 1 year.
- b) Work hours
- c) Secure work areas
- d) Staging areas: site office, and stored materials
- e) Site access and Parking
- f) Facility and Utility usage
- g) Protection-secure from damage existing property, dust and noise limitations.

#### 13. Project Review

- a) Site Logistics
- b) Anticipated Phasing (if needed) and Coordination of the Work.
- c) Coordination with facility and notifications.

#### 14. Permit Documents

- a) Permit documents have been submitted and paid for by the A/E.

#### 15. Questions

Please address any specific questions in writing to:

**Brian Darrow, Project Manager**

**BHDP, Architects  
274 Marconi Blcd.; Suite 201**

Columbus, Ohio 43215  
Phone: 614-246-5010  
Cell: 765-212-5080  
BDarrow@bhdp.com

Nothing presented in this Pre-bid Meeting is intended to conflict with the Contract Documents. Where conflicts may occur, Contract Documents take precedence. Verbal interpretations of the Contract documents, and any statements made at the Pre-Bid meeting by the A/E, the Owner, or its representatives will not be binding. Any and all changes to the Contract Documents will be made by written addendum.

Site Visit/Facility Walk-through: conducted on 12/15/2025 at approximately 2:00 pm, for interested bidders. It is highly important that any and all questions to be directed to the A/E, exclusively and preferably at the post site-walk huddle.

# BHDP Pre-Bid Meeting Attendance List

---

Date December 15th, 2025 @ 1PM  
Project No. SOC-250003  
Project Southern State Community College  
It Center of Excellence  
Meeting Location 100 Hobart Dr  
Hillsboro, OH 45133  
Participants See List Below  
Distribution All Participants, Plan Holders, BHDP File

---

## Sign-In Sheet / Attendance

<u>Name</u>	<u>Company</u>	<u>Email</u>
1. Chris Miggo	2K General Co.	chris.miggo@2kgeneral.com
2. Trent Douthett	AJ Stockmeister	tdouthett@stockmeister.com
3. Mike Ahlers	Waibel Energy Systems	Mike.Ahlers@GoWaibel.com
4. Brandon Pouchot	K&T Construction	Brandon@ktconstructioninc.com
5. Jennifer Stachler	Servants Heart GC	Jennifer@servantsheartgc.com
6. Bracken McEwan	NorthRise GC	bracken@northrisegc.com
7. Jason Stevens	Distel Construction	DISTELCO@midohio.twebc.com
8. Matt Emery	Commercial HVAC	MEMER1@commhvac.com
9. Brian Day	Commercial HVAC	BDAY@commhvac.com
10. Zach Evans	Perkins/Carmack	zachevans@PerkinsCarmack.com
11. Dan Lowis	FAST Sign	Dan.Lewis@FASTSIGN.COM
12. <del>E Ferguson</del> Ed Ferguson	Rubicon	eferguson@rubiconps.com
13.		

# BHDP Pre-Bid Meeting Attendance List

---

Date December 15th, 2025 @ 1PM  
Project No. SOC-250003  
Project Southern State Community College  
It Center of Excellence  
Meeting Location 100 Hobart Dr  
Hillsboro, OH 45133  
Participants See List Below  
Distribution All Participants, Plan Holders, BHDP File

---


## Sign-In Sheet / Attendance

<u>Name</u>	<u>Company</u>	<u>Email</u>
1. Jeff Schroeder	Rubicon	jschroeder@RubiconPS.com
2. Mike Ahlers	Waibel	Mike.Ahlers@GoWaibel.Com
3. Loren O'Connell	SSCC	LOConnell@SSCC.edu
4. Brian Rice	SSCC	brice@SSCC.edu
5. Brian Darrow	BHDP	bdarrow@bhdp.com
6. Michael Covault	OFCC	michael.covault@ofcc.ohio.gov
7. Brent Nichols	BHDP	bnichols@bhdp.com
8. Zach Evans	Perkins/Carmack	ZachEvans@PerkinsCarmack.com
9.		
10.		
11.		
12.		
13.		

Matt Whisler  
ERIC SZUCS

Adena Corporation  
JUSTIN

matt.whisler@adenacorporation.com  
eszucs@jostinconstruction.com

		Request for Information		
<b>Project:</b>	Southern State Community College - IT Center of Excellence (SOC-250003)			
<b>Address:</b>	100 Hobart Dr, Hillsboro, OH 45133	Bid RFIs		Date Updated:01/06/2026
<b>Attn:</b>	BHDP			
RFI#	Description / Question	Date Added	Type	Response / Answer
1	<p><b>Coded Note/ Specification Clarification</b></p> <p>Sheet A101 coded note 109 and 115 Call out a Wire shelving that is 48 x 24 x 60 in the 3d printing storage area.</p> <p>Spec Section 10 56 13 Metal Storage Shelving States:</p> <p>Wedge-lock type consisting of uprights, shelves, and shelf supports, designed to be assembled without fasteners or clips. Shelves shall not have any holes on exposed surfaces. Front and back flanges shall be flush with outside faces of posts. Design shall permit individual shelf adjustment and/or removal anywhere along the entire height of uprights.</p> <p>B. Materials and Workmanship:</p> <p>1. Fabricate units from Class 1, cold-rolled steel sheet with all bends sharp and true and no exposed "knife" edges.</p> <p>a. All units shall be free of burrs, sharp edges and projecting hardware with smooth, non-abrasive surfaces and edges.</p> <p>b. After fabrication, shelving shall exhibit no dents, "oil canning", buckling or other surface irregularities.</p> <p>That are 48 x 24 x 72</p> <p><i>What is the Designer intent of the Metal Storage Shelving?</i></p>	12/29/25	Spec Clarification	Sheet A101 - FIRST FLOOR PLAN & RCP Keynotes 109 & 115 have been revised
2	<p><b>Signage Clarification</b></p> <p>The proposed signage specification is different then the campus standard. Can you confirm that the college wants to go in this direction?</p>	12/30/25	Signage Clarification	<p>Follow Campus Standard. Every door into a room will get room signage. Room naming and numbers to be coordinated with SSCC. Revised specification is included in addendum 01.</p> 
3	<p><b>SPEC Clarification</b></p> <p>Is there a substitution request form I can use to submit a lighting fixture type equal?</p>	12/29/25	SPEC Clarification	Substitution request form has been included in addendum 01.

		<b>Request for Information</b>		
<b>Project:</b>	Southern State Community College - IT Center of Excellence (SOC-250003)			
<b>Address:</b>	100 Hobart Dr, Hillsboro, OH 45133			
<b>Attn:</b>	BHDP		Bid RFIs	Date Updated:01/06/2026
<b>RFI#</b>	<b>Description / Question</b>	<b>Date Added</b>	<b>Type</b>	<b>Response / Answer</b>
4	<b>Overhead Door Clarification</b> The door schedule and track detail clearly show a sectional overhead door that appears to be all glass but the specs describe a rolling steel door. Can you please confirm for me what type of door is needed for this bid?	01/05/26	Door Clarification	SPEC Section 08 33 23 - Overhead Doors revised to include specific language regarding Architectural Series Sectional Overhead Doors and their materiality.
5	<b>MM Distribution</b> Will the sign in sheet and pre-bid meeting minutes be made available?	01/05/26	MM Distribution	Sign in sheet and pre-bid meeting minutes are included in addendum 01.
6	<b>SPEC Clarification</b> There are no control specs...Will the Owner be responsible the controls portions of this project?	01/05/26	SPEC Clarification	All equipment associated with this project will have packaged factory controls, and be BACnet compatible. There is a controls project that the college is pursuing separate from this project's scope of work to implement an overall BAS and tie all equipment into in the future.
7	<b>HVAC Clarification</b> Will the HVAC contractor be responsible for any coordination for the controls?	01/05/26	HVAC Clarification	The equipment controls associated with this project will be packaged factory controls.
8	<b>HVAC Clarification</b> Will the Owner provide the DOAS & WSHP as noted on the drawings?	01/05/26	HVAC Clarification	Yes, DOAS & WSHPs are provided by the Owner (stored on site), contractor is responsible for installation. OFCI
9	<b>HVAC Clarification</b> What items/equipment will be provided with the DOAS & WSHP?	01/05/26	HVAC Clarification	DOAS & WSHPs will be provided by the Owner with items as scheduled on M-601. OFCI
10	<b>Finish Clarification</b> In 3D Printer/Storage Room 101.1, the hatched finish is shown as FR1, but the finish legend tags it as FG1. Please confirm which flooring type is desired for this room.	01/06/26	Finish Clarification	This should be FR1.
11	<b>Furniture Clarification</b> Is the contractor for the Southern State Community College IT project supposed to furnish and install furniture?	01/06/26	Furniture Clarification	Furniture is OFOI.
12	<b>Door Clarification</b> In the 088000 Glazing Specification Section 3.8 it has G1 as 1/4" Clear Tempered Glass, however in the elevations of the storefronts its labeled as safety glass, can you confirm this?	01/07/26	Door Clarification	Spec and Drawings have been updated to match in addendum 01. G1 is 1/4" clear tempered safety glass and G2 is 1/2" clear tempered safety glass.
12	<b>Door Clarification</b> In the door schedule there are multiple doors that are labeled as All Glass doors, but in the elevations, they are drawn as Wide Stile Aluminum Storefront doors.	01/07/26	Door Clarification	Door schedule has been updated in addendum 01 to change the AG and AG2 to FG and FG2. There are no AG or AG2 doors in this project. AG & AG2 door type elevations have been removed from A601

## 00 01 10 - TABLE OF CONTENTS

### PROCUREMENT AND CONTRACTING REQUIREMENTS GROUP

#### DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

00 01 01.....	Project Title Page
00 01 10.....	Table of Contents
00 10 00.....	Solicitation
00 21 13.....	Instructions to Bidders
00 22 00.....	2 Year Supplementary Instructions
00 26 00.....	Procurement Substitution Procedures
00 41 13.....	Bid Form
00 43 13.....	Bid Security Forms
00 45 13.....	Bid Qualifications
00 52 00.....	Agreement Form
00 52 14.....	Subcontract Form
00 71 00.....	Contracting Definitions
00 72 13.....	General Conditions
00 73 00.....	2 Year Supplementary Conditions

### SPECIFICATIONS GROUP

#### *General Requirements Subgroup*

#### DIVISION 01 - GENERAL REQUIREMENTS

01 10 00.....	Summary
01 21 00.....	Allowances
01 22 00.....	Unit Prices
01 23 00.....	Alternates
01 25 00.....	Substitution Procedures
<b>01 25 14.....</b>	<b>Substitution Request Form</b>
01 26 00.....	Contract Modification Procedures
01 29 00.....	Payment Procedures
01 31 00.....	Project Management and Coordination
01 32 00.....	Construction Progress Documentation
01 33 00.....	Submittal Procedures
01 40 00.....	Quality Requirements
01 42 00.....	References
01 43 39.....	Mockups
01 50 00.....	Temporary Facilities and Controls
01 60 00.....	Product Requirements
01 73 00.....	Execution
01 74 19.....	Construction Waste Management and Disposal
01 77 00.....	Closeout Procedures
01 78 23.....	Operation and Maintenance Data
01 78 39.....	Project Record Documents
01 79 00.....	Demonstration and Training
01 91 13.....	General Commissioning Requirements

***Facility Construction Subgroup***

**DIVISION 02 – EXISTING CONDITIONS**

02 41 19.....Selective Demolition

**DIVISION 03 - CONCRETE**

03 35 43.....Polished Concrete Finishing

**DIVISION 04 - MASONRY**

04 20 00.....Unit Masonry

**DIVISION 05 – METALS**

05 40 00.....Cold-Formed Metal Framing

**DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES**

06 10 00.....Rough Carpentry

06 25 30.....Slatwall Panel Systems

06 41 16.....Plastic Laminate Clad Architectural Cabinets

**DIVISION 07 - THERMAL AND MOISTURE PROTECTION**

07 21 00.....Thermal Insulation

07 81 00.....Applied Fire Protection

07 84 13.....Penetration Firestopping

07 84 43.....Joint Firestopping

07 92 00.....Joint Sealants

07 92 19.....Acoustical Joint Sealants

**DIVISION 08 - OPENINGS**

08 11 13.....Hollow Metal Doors and Frames

08 12 13.....Hollow Metal Frames

08 14 16.....Flush Wood Doors

08 33 23.....Overhead Coiling Doors

08 41 26.....All Glass Entrances

08 43 13.....Aluminum-Framed Storefronts

08 71 00.....Door Hardware

08 80 00.....Glazing

**DIVISION 09 - FINISHES**

09 22 16.....Non-Structural Metal Framing

09 29 00.....Gypsum Board

09 30 13.....Ceramic Tiling

09 51 13.....Acoustical Panel Ceilings

09 65 13.....Resilient Base and Accessories

09 65 36.....Static Control Resilient Flooring

09 68 13.....Tile Carpeting

09 91 23.....Interior Painting

**DIVISION 10 – SPECIALTIES**

- 10 11 00.....Visual Display Units
- 10 14 23.....Panel Signage
- 10 26 00.....Wall and Door Protection
- 10 28 00.....Toilet, Bath, and Laundry Accessories
- 10 44 13.....Fire Protection Cabinets
- 10 44 16.....Fire Extinguishers
- 10 56 13.....Metal Storage Shelving

**DIVISION 11 – EQUIPMENT**

- 11 30 13.....Residential Appliances

**DIVISION 12 – FURNISHINGS**

- 12 24 13.....Roller Window Shades
- 12 36 61.16....Solid Surfacing Countertops

**Facility Services Subgroup**

**DIVISION 21 – FIRE SUPPRESSION**

- 21 05 17..... Sleeves and Seals for Fire Protection
- 21 05 18..... Escutcheons for Fire-Suppression Piping
- 21 05 29..... Hangers and Supports for Fire Protection Piping and Equipment
- 21 05 53..... Identification for Fire-Suppression Piping and Equipment
- 21 13 13..... Wet-Pipe Sprinkler Systems

**DIVISION 22 – PLUMBING**

- 22 05 17.....Sleeves and Seals for Plumbing Piping
- 22 05 18.....Escutcheons for Plumbing Piping
- 22 05 23.....General-Duty Valves for Plumbing Piping
- 22 05 29.....Hangers and Supports for Plumbing Piping and Equipment
- 22 05 53.....Identification for Plumbing Piping and Equipment
- 22 05 53.....Plumbing Piping Insulation
- 22 11 16.....Domestic Water Piping
- 22 11 19.....Domestic Water Piping Specialties
- 22 11 24.....Facility Natural-Gas Piping
- 22 13 16.....Sanitary Waste and Vent Piping
- 22 40 00.....Plumbing Fixtures

**DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)**

- 23 05 00 HVAC General Requirements
- 23 05 17 Sleeves and Seals for HVAC Piping
- 23 05 23 General-Duty Valves for HVAC Piping
- 23 05 29 Hangers and Supports
- 23 05 48.13 Vibration Controls for HVAC
- 23 05 53 Identification for HVAC
- 23 05 93 Testing Adjusting and Balancing for HVAC
- 23 07 13 HVAC Duct Insulation

23 07 19	HVAC Piping Insulation
23 21 13	Hydronic Piping
23 21 16	Hydronic Piping Specialties
23 31 00	Ductwork
23 33 00	Air Duct Accessories
23 34 23	HVAC Power Ventilators
23 37 13	Diffusers, Registers, and Grilles
23 37 23	HVAC Gravity Ventilators
23 74 33	Dedicated Outdoor-Air Units
23 81 46	Water-Source Unitary Heat Pumps

### **DIVISION 26 – ELECTRICAL**

26 00 10.....	Electrical General Requirements
26 00 15.....	Submittals
26 00 20.....	Basic Electrical Materials and Methods
26 00 25.....	Electrical Demolition
26 05 00.....	Common Work Results for Electrical
26 05 19.....	Low-Voltage Electrical Power Conductors and Cables
26 05 26.....	Grounding & Bonding for Electrical Systems
26 05 29.....	Hangers and Supports for Electrical Systems
26 05 33.....	Raceways and Boxes for Electrical Systems
26 05 36.....	Cable Trays for Electrical Systems
26 05 53.....	Identification for Electrical Systems
26 05 72.....	Short Circuit, Overcurrent Protective Device Coordination, and Arc Flash Study
26 09 23.....	Lighting Control Devices
26 24 16.....	Panelboards
26 27 26.....	Wiring Devices
26 28 13.....	Fuses
26 28 16.....	Enclosed Switches and Circuit Breakers
26 51 19.....	LED Interior Lighting
26 52 13.....	Emergency and Exit Lighting

### **DIVISION 28 – ELECTRONIC SAFETY AND SECURITY**

28 31 11.....	Digital, Addressable Fire-Alarm Systems
---------------	-----------------------------------------

**END OF SECTION**

# Document 00 10 00 - Solicitation (General Contracting / Electronic Bid) State of Ohio Standard Requirements for Public Facility Construction

---

Electronic bids will be received by:

Ohio Facilities Construction Commission  
<https://bidexpress.com>

for the following Project:

Project SOC-250003  
Southern State Community College – IT Center of Excellence  
Southern State Community College  
100 Hobart Dr, Hillsboro, OH 45133

in accordance with the Contract Documents prepared by:

BHDP Architecture  
274 Marconi Blvd #200, Columbus, OH 43215  
614-246-5010  
Brian Darrow – Senior Project Manager  
bdarrow@bhdp.com  
<https://www.bhdp.com/>

In compliance with Section 153.08 of the Ohio Revised Code and Section 153:1-8-01 of the Ohio Administrative Code, Bids for this Project are being received, opened, and published through electronic means using the State’s electronic bidding service.

To access this Project through the electronic bidding service, you must first register at <https://bidexpress.com> by clicking on the “REGISTER FOR FREE” button and following the instructions. In order to bid, you must create and enable a digital ID within the service. This process requires the submission of notarized paperwork and may take up to five business days to complete. There are no fees to register, create and enable a digital ID, or to download bid documents. There is a small expense on a monthly or per bid basis to submit a bid. The electronic bidding service offers customer support that may be reached at 888.352.2439 or via email at [support@bidexpress.com](mailto:support@bidexpress.com).

Bidders may submit requests for consideration of a proposed Substitution for a specified product, equipment, or service to the Architect/Engineer (“A/E”) no later than 10 days prior to the bid opening. Additional products, equipment, and services may be accepted as approved Substitutions only by written Addendum.

From time to time, the Commission issues new editions of the “State of Ohio Standard Requirements for Public Facility Construction” and may issue interim changes. Bidders must submit Bids that comply with the version of the Standard Requirements included in the Contract Documents.

Prevailing Wage rates and Equal Employment Opportunity requirements are applicable to this Project.

The Bidder may be subject to a Pre-Award Affirmative Action Compliance Review in accordance with Section 123:2-5-01 of the Ohio Administrative Code including a review of the Bidder’s employment records and an on-site review.

The Bidder must indicate on the electronic Bid Form, the locations where its services will be performed in the spaces provided or by attachment in accordance with the requirements of Executive Order 2019-12D related to providing services only within the United States and the requirements of Executive Order 2022-02D prohibiting purchases from or investment in any Russian institution or company. Failure to do so may cause the Bid to be rejected as non-responsive.

**DOMESTIC STEEL USE REQUIREMENTS AS SPECIFIED IN OHIO REVISED CODE SECTION 153.011 APPLY TO THIS PROJECT. COPIES OF OHIO REVISED CODE SECTION 153.011 CAN BE OBTAINED FROM ANY OF THE OFFICES OF THE OHIO FACILITIES CONSTRUCTION COMMISSION.**

Bidders are encouraged to be enrolled in and to be in good standing in a Drug-Free Safety Program (“DFSP”) approved by the Ohio Bureau of Workers' Compensation (“OBWC”) prior to submitting a Bid and provide, on the Electronic Bid Form with its Bid, certain information relative to their enrollment in such a program; and, if awarded a Contract, shall comply with other DFSP criteria described in **Section 1.6** of the **General Conditions**.

Electronic bids will be received for:

<u>Trade</u>	<u>Estimate</u>
<b>General Contract</b> .....	<b>\$1,645,840.48</b>
<b>Alternate 1</b> .....	<b>\$14,500</b>
<b>Alternate 2</b> .....	<b>\$18,400</b>
<b>Alternate 3</b> .....	<b>\$8,000</b>

until **1/15/2026**, at **1:00pm.**, when all Bids will be electronically opened. Bid tabulations will be posted no later than 5:00 p.m. on the day Bids are opened.

All Bidders are strongly encouraged to attend the Pre-Bid Meeting on **12/15/2025**, at **1:00pm**, at the following location:

100 Hobart Dr, Hillsboro, OH 45133, Lobby

The Contractor is responsible for scheduling the Project, coordinating the Subcontractors, and providing other services identified in the Contract Documents.

The Contract Documents are available for purchase from ARC Document Solutions, 1159 Dublin Rd Ste 300, Columbus, OH 43215, 614 224-5149 at the non-refundable cost of **\$250.00** per set, plus shipping, if requested.

The Contract Documents may be downloaded as electronic PDF files from the State’s electronic bidding service at <https://bidexpress.com> at no charge.

**END OF DOCUMENT**

# Document 00 41 13 - Bid Form (General Contract / Electronic Bid)

## State of Ohio Standard Requirements for Public Facility Construction

THIS SAMPLE BID FORM IS PROVIDED WITH THE PROJECT MANUAL AS A PLACEHOLDER ONLY – SUBMIT YOUR BID USING THE ELECTRONIC BID FORM ON [HTTPS://BIDEXPRESS.COM](https://bidexpress.com)

General Info	Alt Total:	Bid Total:
<p><b>Deadline</b> 1/15/2026 1:00 PM EDT/EST</p> <p><b>Advertised</b> 12/8/2026</p> <p><b>Number</b> SOC-250003</p> <p><b>Business Name</b> Ohio Facilities Construction Commission</p>		<p><b>Description</b> THIS PROJECT WILL RENOVATE APPROXIMATELY 6,000 SF OF THE HILLSBORO CAMPUS OF SOUTHERN STATE COMMUNITY COLLEGE (SSCC). THE RENOVATION WILL TRANSFORM EXISTING CLASSROOM AND COMPUTER LAB SPACE TO CREATE A NEW IT CENTER OF EXCELLENCE, MODERNIZING AND EXPANDING THE COMPUTER SCIENCE FACILITIES TO ACCELERATE TRAINING AND PROJECT-BASED LEARNING FOR INFORMATION TECHNOLOGY AND CYBERSECURITY TRAINING. THE CURRENT SPACES AFFECTED INCLUDE ROOMS 191, 102, 103, AND SMALLER INTERNAL SUPPORT SPACES.</p>

**Procurement Documents**

«insert Public Bid Advertisement file name»  
→ Public Bid Advertisement

«insert Solicitation file name»  
→ Notice to Bidders

«insert Project Manual file name»  
→ Procurement & Contracting Requirements and Specifications

«insert Drawings file name»  
→ Plans, elevations, sections, details, and schedules

«4» Attachments

**Contract Times and Addenda**

**Contract Times**  
The time for Substantial Completion of all Work is 184 consecutive days from the Notice to Proceed.

**Acknowledgement of receipt of Addenda**

Date Addendum #1 Received	Date Addendum #2 Received	Date Addendum #3 Received	Date Addendum #4 Received
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Revise this Bid Form to be Project-specific, the items listed below and their titles; approved Alternates, their numbers and titles. List each approved Allowance and Unit Price.

**Allowance Instructions**

Allowance amounts are fixed and no entry of data is required by the Bidder. Include each and every Allowance amount in the Base Bid. The Bidder's Fee (overhead and profit) and costs for unloading and handling on the Site, labor, installation costs, and other expenses contemplated for the Allowance must be included in the Base Bid and NOT in the Allowance amount.

*Allowances require approval of the Contracting Authority. Duplicate lines for additional Allowances. Delete lines for unused Allowances. If no Allowances are bid, edit the instructions for Allowances above and delete the entire Allowances block below.*

■ Allowances (General Contract)				
Item	Description	Allowance Amount*	Extension	
Allowance A-«1»	«enter description of allowance item»	«\$NN.NN»	«\$NN.NN»	
Allowance A-«2»	«enter description of allowance item»	«\$NN.NN»	«\$NN.NN»	
Allowance A-«3»	«enter description of allowance item»	«\$NN.NN»	«\$NN.NN»	
Allowance A-«4»	«enter description of allowance item»	«\$NN.NN»	«\$NN.NN»	
Allowance A-«5»	«enter description of allowance item»	«\$NN.NN»	«\$NN.NN»	
«5» Items		<b>Total:</b>		

■ Unit Price Instructions

Enter the price per unit of measure in the Bid Form and the extension will be automatically calculate. Include the Extension for each and every Unit Price in the Base Bid. Unit prices will be used solely for the purpose of determining the adjustment to the Contract Sum for differences between the estimated quantities on the electronic Bid Form and the actual quantities provided.

*Unit Price bids require approval of the Contracting Authority. Duplicate lines for additional Unit Prices. Delete lines for unused Unit Prices. If no Unit Prices are bid, edit the instructions for Unit Prices above and delete the entire Unit Prices block below.*

■ Unit Prices (General Contract)					
Item	Description	Quantity	Unit Price*	Unit of Measure	Extension
Unit Price U-«1»	«enter description of unit price item»	«NNN.N»	_____	Square Feet	
Unit Price U-«2»	«enter description of unit price item»	«NNN.N»	_____	Cubic Yards	
Unit Price U-«3»	«enter description of unit price item»	«NNN.N»	_____	Each	
Unit Price U-«4»	«enter description of unit price item»	«NNN.N»	_____	Each	
Unit Price U-«5»	«enter description of unit price item»	«NNN.N»	_____	Lump Sum	
«5» Items					<b>Total:</b>

■ Base Bid Instructions

Enter the amount of the Base Bid for ALL LABOR AND MATERIALS to complete the scope of Work. Include the amount of each Allowance (if applicable) and the subtotal of each Unit Price Extension (if applicable) in the Base Bid amount. Failure to include Allowance or Unit Price Extensions in the Base Bid is the responsibility of the Bidder and will not be sufficient reason for adjustment of the Bid amount after the Bid deadline. Do not include Alternates (if applicable) in the Base Bid amount.

**■ Base Bid (General Contract)**



Item	Description	Base Bid Amount*	Extension
Base Bid	All Labor and Materials (include Allowances and Unit Price Extensions above)	_____	
1 Item			<b>Total:</b>

**■ Alternate Instructions**

Enter the amount of each and every Alternate to ADD TO or DEDUCT FROM the Base Bid. Indicate amounts to DEDUCT FROM the Base Bid by entering a minus sign (-) before the amount entered. Do not include Alternate amounts in the Base Bid.

*Alternates require approval of the Contracting Authority. Duplicate lines for additional Alternates. Delete lines for unused Alternates. If no Alternates are bid, edit the instructions for Alternates above and delete the entire Alternates block below.*

**■ Alternates (General Contract)**

Item	Description	Alternate Amount*	Extension
	Alternate: Owner-agency may award independently from entire bid.		
	Alternates are not included in bid total.		
Alternate «1»	«enter description of alternate item»	_____	
Alternate «2»	«enter description of alternate item»	_____	
Alternate «3»	«enter description of alternate item»	_____	
Alternate «4»	«enter description of alternate item»	_____	
Alternate «5»	«enter description of alternate item»	_____	
«5» Items		<b>Alternate Total:</b>	<b>Total:</b>

**■ Bidder Affirmation and Disclosure**

The Bidder acknowledges that by submitting its Bid, the Bidder has read and understands the applicable Executive Orders regarding the prohibitions of performance of offshore services, locating State data offshore in any way, or purchasing from Russian institutions or companies. If awarded a Contract, the Bidder will become the Contractor and affirms that both the Contractor and its Subcontractors shall perform no services requested under this Contract outside of the United States.

The Bidder shall provide the locations where services under this Contract will be performed in the spaces provided below or by attachment. Failure to provide this information as part of its Bid may cause the Bidder to be deemed non-responsive and no further consideration will be given to its Bid. If the Bidder will not be using Subcontractors, indicate "Not Applicable" in the appropriate spaces.

1. Principal business location of Contractor: \_\_\_\_\_

**Contractor Address\***

**City, State, and Zip\***

--	--

Name / Principal business location of Subcontractor(s), if known at time of Bid deadline:

**Subcontractor Name\***

**Address, City, State, and Zip\***

2. Location(s) where services will be performed by Contractor (Project Sites):

**Name\***

**Address, City, State, and Zip\***

Name(s) / Location(s) where services will be performed by Subcontractors (Project Sites):

**Subcontractor Name**

**Address, City, State, and Zip**

3. Location(s) where State data will be located by Contractor:

**Address\***

**City, State, and Zip\***

Location(s) where State data will be located by Subcontractor(s), if known at time of Bid deadline:

**Subcontractor Name**

**Address, City, State, and Zip**

Bidder also affirms, understands and agrees that the Contractor and its Subcontractors are under a duty to disclose to the State any change or shift in location of services performed by the Contractor or its Subcontractors before, during and after execution of any Contract with the State. Bidder agrees it shall so notify the State immediately of any such change or shift in location of its services. The State has the right to immediately terminate the contract, unless a duly signed waiver from the State has been attained by the Contractor to perform the services outside the United States.

On behalf of the Bidder, I acknowledge that I am duly authorized to execute this electronic Bid Form including this Bidder Affirmation and Disclosure form and have read and understand that this form is a part of any Contract that Bidder may enter into with the State and is incorporated therein.

### ■ Certifications (Non-Prevailing Wage)

1. The Bidder has read and understands the proposed Contract Documents and agrees to comply with all requirements of the proposed Contract Documents, regardless of whether the Bidder has actual knowledge of the requirements and regardless of any statement or omission made by the Bidder, which might indicate a contrary intention.
2. The Bidder represents that the Bid is based upon the Basis of Design and Acceptable Components specified by the proposed Contract Documents.
3. The Bidder has visited the Site, become familiar with local conditions, and has correlated personal observations about the requirements of the proposed Contract Documents. The Bidder has no outstanding questions regarding the interpretation or clarification of the proposed Contract Documents.
4. The Bidder understands that the execution of the Project will require sequential, coordinated, and interrelated operations, which may involve interference, disruption, hindrance, or delay in the progress of the Bidder's Work. The Bidder agrees that the Contract Sum, as amended from time to time, shall cover all amounts due from the State resulting from interference, disruption, hindrance, or delay that is not caused by the State or its agents and employees. The Bidder agrees that any such interference, disruption, hindrance, or delay is within the contemplation of the Bidder and the State and that the Contractor's sole remedy from the State for any such interference, disruption, hindrance, or delay shall be an extension of time in accordance with the proposed Contract Documents.

5. During the performance of the Contract, the Bidder agrees to comply with Ohio Administrative Code ("OAC") Chapters 123:2-3 through 123:2-9 and agrees to incorporate the monthly reporting provisions of OAC Section 123:2-9-01 into all subcontracts on the Project, regardless of tier. The Bidder understands the State's Equal Opportunity Coordinator or the Contracting Authority may conduct pre-award and post-award compliance reviews to determine if the Bidder maintains nondiscriminatory employment practices, maintains an affirmative action program, and is exerting good faith efforts to accomplish the goals of the affirmative action program. For a full statement of the rules regarding Equal Employment Opportunity in the Construction Industry, see OAC Chapters 123:2-1 through 123:2-9.
6. The Bidder and each Person submitting a Bid on behalf of the Bidder certifies, and in the case of a Bid by a joint venture each member thereof certifies as to such member's entity, under penalty of perjury, that to the best of the undersigned's knowledge and belief: (a) the Base Bid, any Unit Prices, and any Alternate bid in the Bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition as to any matter relating to such Base Bid, Unit Prices or Alternate bid with any other Bidder; (b) unless otherwise required by law, the Base Bid, any Unit Prices and any Alternate bid in the Bid have not been knowingly disclosed by the Bidder and shall not knowingly be disclosed by the Bidder prior to the bid opening, directly or indirectly, to any other Bidder who would have any interest in the Base Bid, Unit Prices, or Alternate bid; (c) no attempt has been made or shall be made by the Bidder to induce any other Person to submit or not to submit a Bid for the purpose of restricting competition.
7. The Bidder shall execute the Agreement with the Contracting Authority, if a Contract is awarded on the basis of this Bid, and if the Bidder does not execute the Agreement for any reason, other than as authorized by law, the Bidder and the Bidder's Surety are liable to the State as provided in Article 5 of the Instructions to Bidders.
8. The Bidder certifies that the upon the award of a Contract, as the Contractor it shall make a good faith effort to ensure that all of the Contractor's employees, while working on the Site, shall not purchase, transfer, use, or possess illegal drugs or alcohol or abuse prescription drugs in any way.
9. The Bidder acknowledges that it read all of the Instructions to Bidders, and in particular, Section 2.10 - Submittals With Bid Form, and by submitting its Bid certifies that it has read the Instructions to Bidders and it understands and agrees to the terms and conditions stated in them.
10. The Bidder agrees to furnish any information requested by the Contracting Authority or the Architect/Engineer to evaluate the responsibility of the Bidder.
11. The Bidder agrees to furnish the submittals required by Section 6.1 of the Instructions to Bidders for execution of the Agreement within 10 days of the date of the Notice of Intent to Award.
12. When the Bidder is a corporation, partnership or sole proprietorship, an officer, partner or principal of the Bidder, as applicable, shall enter the legal name of the Bidder and the name of the officer, partner or principal of the Bidder (in lieu of signing the Bid Form) in the data fields provided.
13. When the Bidder is a joint venture, an officer, partner or principal, as applicable, of each member of the joint venture shall enter the legal name of the applicable member and the name of the officer, partner or principal (in lieu of signing the Bid Form) in the data fields provided.
14. The Bidder represents that the individual that is submitting and digitally signing the electronic Bid is legally authorized to do so.
15. Bidder acknowledges that by the act of submitting an electronic Bid that it is digitally signing the actual Bid, which shall serve as the Bidder's authorization for the further consideration and activity in the bidding and contract process.
- The Bidder hereby acknowledges that the above representations in this Bid are material and not mere recitals.\*

## ■ Procurement Forms

### [Document 00 43 13 - Bid Security Form](#)

→ Upload below and provide original document within 3 days

### [Document 00 45 13 - Bidder's Qualifications](#)

→ Upload below or provide within 3 days of request

### [Document 00 45 39 - EDGE Affidavit](#)

→ Upload below or provide within 3 days of request

3 Attachments

## ■ Instructions for Providing Bid Submittals

**Submission of Electronic Facsimile of Bid Guaranty with Electronic Bid**

The Bidder SHALL UPLOAD and ATTACH TO ITS BID an ELECTRONIC FACSIMILE (scanned PDF document) OF ITS BID GUARANTY, payable to the Contracting Authority, in the form of either: (1) the signed and sealed Document 00 43 13 - "Bid Security Form" contained in the Contract Documents (and provided for the Bidder's convenience in the block above) for the amount of the Base Bid plus all additive Alternates; or (2) a certified check, cashier's check, or letter of credit, for 10 percent of the Base Bid, plus all additive Alternates – a letter of credit shall expressly provide that it is revocable only by the Contracting Authority. Refer to Sections 2.10.1.1 and 5.1 of Document 00 21 13 - "Instructions to Bidders."

**Submission of Original Bid Guaranty**

In addition to the Electronic Facsimile above, the Bidder SHALL DELIVER ITS ORIGINAL UNALTERED BID GUARANTY to the Project Coordinator at the address identified below WITHIN 3 BUSINESS DAYS AFTER THE BID DEADLINE as provided in Ohio Administrative Code Section 153:1-8-01(H). THIS REQUIREMENT APPLIES TO ALL BIDDERS. Refer to Section 2.10.1.2 of the Instructions to Bidders.

Katherine Offenburger  
 Project Coordinator  
 Ohio Facilities Construction Commission  
 30 West Spring Street, 4th Floor, Columbus, OH 43215

**Non-responsive Bid for Failure to Submit Bid Guaranty**

Each Bidder MUST SUBMIT BOTH THE ELECTRONIC FACSIMILE AND THE ORIGINAL UNALTERED BID GUARANTY as described above. The Contracting Authority SHALL REJECT A BID AS NON-RESPONSIVE if the Bidder fails to submit BOTH elements of the Bid Guaranty. The checkboxes below are to identify that you have uploaded the other form of Bid Guaranty. DO NOT CHECK ALL BOXES. Refer to Section 2.10.1 of the Instructions to Bidders.

**Submission of Bidder's Qualifications and EDGE Affidavit**

The Bidder is encouraged to submit background information with its Bid using Document 00 45 13 - "Bidder's Qualifications" and Document 00 45 39 - "EDGE Affidavit" with the EDGE-certified Business(es) the Bidder proposes to use on the Project (forms provided for the Bidder's convenience in the block above). If the Bidder does not submit the Bidder's Qualifications form and/or the EDGE Affidavit form and related information attached to the electronic Bid Form, the Bidder shall provide it within 3 days of request. Refer to Sections 2.10.3 and 3.5.4 of the Instructions to Bidders.

Required Bid Guaranty Upload	
Name	File*
Document 00 43 13 - Bid Security Form → Upload a scan of the fully executed Bid Security Form AND submit the original document to the Contracting Authority within 3 days of the bid deadline	<input type="button" value="Select file..."/> no file selected <input type="checkbox"/> I am NOT enclosing this document because the <a href="#">omission terms</a> have been met. (Bidder submitted a Cashier's check below)
Power of Attorney → Upload a scan of the fully executed Power of Attorney AND submit the original document to the Contracting Authority within 3 days of the bid deadline	<input type="button" value="Select file..."/> no file selected <input type="checkbox"/> I am NOT enclosing this document because the <a href="#">omission terms</a> have been met. (Bidder submitted a Cashier's check below OR included with the Bid Security Form above)
Cashier's Check for 10% of the Bid → Upload a scan of the Cashier's Check AND submit the original check to the Contracting Authority within 3 days of the bid deadline	<input type="button" value="Select file..."/> no file selected <input type="checkbox"/> I am NOT enclosing this document because the <a href="#">omission terms</a> have been met. (Bidder submitted the Bid Security Form AND Power of Attorney above)
3 Required Documents	

<b>■ Bidder Signatory Information</b>		
Bidder Signatory		
<b>Name of Bidder's Authorized Signatory:*</b>	<b>Title of Authorized Signatory:*</b>	
<input type="text"/>	<input type="text"/>	
<b>All Bidders complete all information in this form. Duplicate and complete the block below for each Joint Venturer:</b>		
Bidder Information		
<b>Business Name:*</b>		
<input type="text"/>		
<b>Business Mailing Address, City, State, Zip:*</b>		
<input type="text"/>		
<b>Telephone Number:*</b>	<b>Facsimile Number:</b>	<b>Email Address:*</b>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Federal Tax ID Number:*</b>	<b>State of Incorporation (if applicable):</b>	
<input type="text"/>	<input type="text"/>	
<b>Contact person for Contract processing:*</b>	<b>Date enrolled in an OBWC-approved DFSP (month/date/year):</b>	
<input type="text"/>	<input type="text"/>	
<b>President or Chief Executive Officer's Name:*</b>	<b>President or Chief Executive Officer's Title:*</b>	
<input type="text"/>	<input type="text"/>	

**END OF DOCUMENT**

# SUBSTITUTION REQUEST FORM

(Submit 2 copies)

Date: \_\_\_\_\_

Request No.: \_\_\_\_\_

To: BHDP Architecture  
274 Marconi Blvd, Suite 200  
Columbus, Ohio 43215  
Phone 614.486.1960  
Fax 614.486.1978

Project: SSCC - IT Center of Excellence

Proposer: \_\_\_\_\_

Address: \_\_\_\_\_

Note: Use separate form for each submittal.

Hereby request approval of the following product or system as an "approved substitution"

## NAME AND DESCRIPTION OF SPECIFIED PRODUCT OR SYSTEM:

\_\_\_\_\_  
\_\_\_\_\_

SPECIFICATION SECTION NO. \_\_\_\_\_ , PAGE(S) \_\_\_\_\_ , PARAGRAPH(S) \_\_\_\_\_

DRAWING NO(S) \_\_\_\_\_ , DETAIL OR SECTION NO(S) \_\_\_\_\_

### SPECIFIED PRODUCT

### PROPOSED SUBSTITUTION

#### Material Properties:

#### Material Properties:

Flammability:  
Smoke Density \_\_\_\_\_  
Fuel Contributed \_\_\_\_\_  
Flame Spread \_\_\_\_\_  
Moisture Absorption \_\_\_\_\_  
Elasticity \_\_\_\_\_  
Water Resistance \_\_\_\_\_

Flammability:  
Smoke Density \_\_\_\_\_  
Fuel Contributed \_\_\_\_\_  
Flame Spread \_\_\_\_\_  
Moisture Absorption \_\_\_\_\_  
Elasticity \_\_\_\_\_  
Water Resistance \_\_\_\_\_

#### Substrate Compatibility:

#### Substrate Compatibility:

Installation On:  
Concrete \_\_\_\_\_  
Steel Frame \_\_\_\_\_  
Masonry \_\_\_\_\_  
Drywall \_\_\_\_\_  
\_\_\_\_\_

Installation On:  
Concrete \_\_\_\_\_  
Steel Frame \_\_\_\_\_  
Masonry \_\_\_\_\_  
Drywall \_\_\_\_\_  
\_\_\_\_\_

**Test Reports:**

Is exact condition covered? \_\_\_\_\_  
Rated assembly? \_\_\_\_\_

**Physical Restrictions:**

Substrate:  
Floor \_\_\_\_\_  
Roof \_\_\_\_\_  
Wall (non-rated) \_\_\_\_\_  
Wall (rated) \_\_\_\_\_  
\_\_\_\_\_

Structure:  
Steel \_\_\_\_\_  
Concrete \_\_\_\_\_  
Curtain wall \_\_\_\_\_

**Environmental Restrictions:**

Outside Air Temperature \_\_\_\_\_  
Inside Air Temperature \_\_\_\_\_  
Relative Humidity \_\_\_\_\_  
Wind Load \_\_\_\_\_  
Snow Load \_\_\_\_\_  
Equipment Loads \_\_\_\_\_  
Moisture Tests Required? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Guarantee:**

\_\_\_\_\_

**Availability:**

\_\_\_\_\_

**Costs:**

\_\_\_\_\_

**REASON FOR NOT GIVING PRIORITY TO SPECIFIED ITEMS:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Test Reports:**

Is exact condition covered? \_\_\_\_\_  
Rated assembly? \_\_\_\_\_

**Physical Restrictions:**

Substrate:  
Floor \_\_\_\_\_  
Roof \_\_\_\_\_  
Wall (non-rated) \_\_\_\_\_  
Wall (rated) \_\_\_\_\_  
\_\_\_\_\_

Structure:  
Steel \_\_\_\_\_  
Concrete \_\_\_\_\_  
Curtain wall \_\_\_\_\_

**Environmental Restrictions:**

Outside Air Temperature \_\_\_\_\_  
Inside Air Temperature \_\_\_\_\_  
Relative Humidity \_\_\_\_\_  
Wind Load \_\_\_\_\_  
Snow Load \_\_\_\_\_  
Equipment Loads \_\_\_\_\_  
Moisture Tests Required? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Guarantee:**

\_\_\_\_\_

**Availability:**

\_\_\_\_\_

**Costs:**

\_\_\_\_\_

---

**SUBSTITUTION AFFECTS OTHER MATERIALS OR SYSTEMS:**

\_\_\_\_\_ YES, \_\_\_\_\_ NO - IF YES, ATTACH COMPLETE DATA.

**SUBSTITUTION REQUIRES DIMENSIONAL REVISION OR REDESIGN OF STRUCTURE OR MEP WORK:**

\_\_\_\_\_ YES, \_\_\_\_\_ NO - IF YES, ATTACH COMPLETE DATA.

**SAVINGS OR CREDIT TO UNIVERSITY FOR ACCEPTING SUBSTITUTE:**

\$ \_\_\_\_\_

**THE ATTACHED DATA IS FURNISHED HERewith TO SUPPORT EVALUATION OF SUBSTITUTE:**

\_\_\_\_\_ CATALOG, \_\_\_\_\_ DRAWINGS, \_\_\_\_\_ SAMPLES, \_\_\_\_\_ TESTS,  
\_\_\_\_\_ REPORTS, \_\_\_\_\_ OTHER

**THE UNDERSIGNED (PROPOSER) HEREBY CERTIFIES THAT THE SUBSTITUTION HAS BEEN FULLY CHECKED AND COORDINATED WITH THE CONTRACT DOCUMENTS AND WILL ASSUME ALL COSTS OF REDESIGN REQUIRED TO INCORPORATE THE SUBSTITUTION.**

\_\_\_\_\_ By: \_\_\_\_\_  
FIRM NAME

\_\_\_\_\_  
ADDRESS

\_\_\_\_\_ PHONE \_\_\_\_\_ FAX

**THE FOLLOWING TO BE COMPLETED BY THE A/E:**

**SUMMARY:**

SUBSTITUTION APPROVED: YES OR NO

**APPROVED WITH RESTRICTIONS:**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

RESUBMITTAL REQUIRED: YES OR NO

REMARKS: \_\_\_\_\_  
\_\_\_\_\_



## SECTION 08 33 23 - OVERHEAD DOORS

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Section includes **Architectural Series Sectional Overhead Doors**.
- B. Related Requirements:
  - 1. Section 05 50 00 "Metal Fabrications" for miscellaneous steel supports, door-opening framing, corner guards, and bollards.

#### 1.02 ACTION SUBMITTALS

- A. Product Data: For each type and size of overhead door and accessory.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
  - 1. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
  - 2. Show locations of controls, locking devices and other accessories.
- C. Samples: For each exposed product and for each color and texture specified.

#### 1.03 INFORMATIONAL SUBMITTALS

- A. Sample warranty.

#### 1.04 CLOSEOUT SUBMITTALS

- A. Maintenance data.

#### 1.05 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.

#### 1.06 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of doors that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.01 PERFORMANCE REQUIREMENTS

- A. Structural Performance, Exterior Doors: Capable of withstanding the following design wind loads:
  - 1. Design Wind Load: Uniform pressure (velocity pressure) of 20 lbf/sq. ft., acting inward and outward.

### 2.02 DOOR ASSEMBLY

- A. Sectional Overhead Door: Overhead door formed with curtain of interlocking metal slats.
  - 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. ACME Rolling Doors.
    - b. Alpine Overhead Doors, Inc.
    - c. C.H.I. Overhead Doors, Inc.
    - d. Clopay Building Products.
    - e. McKeon Rolling Steel Door Company, Inc.
    - f. Raynor.
    - g. Wayne-Dalton Corp.
- B. Operation Cycles: Door components and operators capable of operating for not less than 20,000.
- C. Curtain R-Value: 6.0 deg F x h x sq. ft./Btu.
- D. **Door Curtain Material: Aluminum Full View Sectional Door, Polyurethane Insulated.**
  - 1. **Door Curtain Panel Sections: 2-1/8 inches (54 mm) thick extruded 6053-T5 aluminum.**
  - 2. **Astragal: U-shaped flexible PVC in retainer of full-length 0.055 inch (1.4 mm) rigid PVC.**
  - 3. **Air Infiltration: 0.15cfm/ft<sup>2</sup>**
  - 4. **Aluminum Finish – Clear Anodized**
  - 5. **Windows – 1/2" (13mm)**
    - a. **Glazing Type – Tempered Glass**
    - b. **Glazing Tint - Clear**
- E. Bottom Bar: Two angles, each not less than 1-1/2 by 1-1/2 by 1/8-inch-thick; fabricated from hot-dip galvanized steel and finished to match door.
- F. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats.
- G. Hood: Match curtain material and finish.
  - 1. Mounting: Face of wall.
- H. Manual Door Operator: Chain-hoist operator.

- I. Curtain Accessories: Equip door with weatherseals.
- J. Door Finish:
  - 1. Baked-Enamel or Powder-Coated Finish: Color matching curtain wall system.
  - 2. Interior Curtain-Slat Facing: Finish as selected by Architect from manufacturer's full range.

## 2.03 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead 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. Insulation: Fill slats for insulated doors with manufacturer's standard thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84 or UL 723. Enclose insulation completely within slat faces.
  - 2. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face, with minimum steel thickness of 0.010 inch.
- 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.

## 2.04 LOCKING DEVICES

- A. 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: As specified in Section 08 71 00 "Door Hardware" and keyed to building keying system.
  - 2. Keys: Three for each cylinder.
- B. Chain Lock Keeper: Suitable for padlock.

## 2.05 CURTAIN ACCESSORIES

- A. Weatherseals for Exterior Doors: Equip each exterior door with weather-stripping gaskets fitted to entire exterior perimeter of door for a weather-resistant installation unless otherwise indicated.

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

## 2.07 MANUAL DOOR OPERATORS

- A. General: Equip door with manual door operator by door manufacturer.
- B. Chain-Hoist Operator: Consisting of endless steel hand chain, chain-pocket wheel and guard, and gear-reduction unit with a maximum 25-lbf force for door operation. Provide alloy-steel hand chain with chain holder secured to operator guide.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

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

END OF SECTION 08 33 23

## **SECTION 088000 - GLAZING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Glass products.
  - 2. Laminated glass.
  - 3. Glazing sealants.
  - 4. Glazing tapes.
  - 5. Miscellaneous glazing materials.
- B. Related Requirements:
  - 1. Section 084313 "Aluminum-Framed Storefronts."

#### **1.2 COORDINATION**

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances to achieve proper safety margins for glazing retention under each design load case, load case combination, and service condition.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Product Certificates: For glass.
- B. Product Test Reports: For fabricated glass, for tests performed by a qualified testing agency.
- C. Preconstruction adhesion and compatibility test report.
- D. Sample Warranties: For special warranties.

#### **1.5 QUALITY ASSURANCE**

- A. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

## 1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F.

## 1.8 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
  - 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
  - 1. Warranty Period: 10 years from date of Substantial Completion.
- C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is obstruction of vision by dust, moisture, or film on interior surfaces of glass.
  - 1. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined in accordance with the IBC and ASTM E1300:

1. Design Wind Pressures: As indicated on Drawings.
  2. Design Snow Loads: As indicated on Drawings.
  3. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.
  4. Thermal Loads: Design glazing to resist thermal stress breakage induced by differential temperature conditions and limited air circulation within individual glass lites and insulated glazing units.
- C. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
1. U-Factors: Center-of-glazing values, in accordance with NFRC 100 and based on most current non-beta version of LBL's WINDOW computer program, expressed as Btu/sq. ft. x h x deg F.
  2. SHGC and Visible Transmittance: Center-of-glazing values, in accordance with NFRC 200 and based on most current non-beta version of LBL's WINDOW computer program.
  3. Visible Reflectance: Center-of-glazing values, in accordance with NFRC 300.

## 2.2 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
1. NGA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
  2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR A7, "Sloped Glazing Guidelines."
  3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
  4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than thickness indicated.
- D. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated,

provide fully tempered float glass.

### **2.3 GLASS PRODUCTS**

- A. Clear Annealed Float Glass: ASTM C1036, Type I, Class 1 (clear), Quality-Q3.
- B. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
- C. Heat-Strengthened Float Glass: ASTM C1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
- D. Ceramic-Coated Spandrel Glass: ASTM C1048, Type I, Condition B, Quality-Q3.

### **2.4 LAMINATED GLASS**

- A. Laminated Glass: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
  - 1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.
  - 2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
  - 3. Interlayer Color: Clear unless otherwise indicated.

### **2.5 GLAZING SEALANTS**

- A. General:
  - 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
  - 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of industry colors.
- B. Neutral-Curing Silicone Glazing Sealant, Class 25: Complying with ASTM C920, Type S, Grade NS, Use NT.
  - 1. Applications: Non-rated Interior Applications.
- C. Acid-Curing Silicone Glazing Sealant, Class 25: Complying with ASTM C920, Type S, Grade NS, Use NT.
  - 1. Applications: Non-rated Interior Applications.

### **2.6 GLAZING TAPES**

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers

for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
  2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
  3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
  2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

## **2.7 MISCELLANEOUS GLAZING MATERIALS**

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks:
1. Elastomeric with Shore A durometer hardness of 85, plus or minus 5.
  2. Type recommended in writing by sealant or glass manufacturer.
- D. Spacers:
1. Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
  2. Type recommended in writing by sealant or glass manufacturer.
- E. Edge Blocks:
1. Elastomeric with Shore A durometer hardness per manufacturer's written instructions.
  2. Type recommended in writing by sealant or glass manufacturer.
- F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

## **2.8 MIRROR PRIVACY FILM**

- A. Description: Mirror Privacy film for uses in creating a one-way mirror effect.
1. Basis of Design: 3M Privacy Mirror Film
  2. Material Properties: Vinyl
  3. Thickness: 2 mils
  4. Fire Performance: Surface burning characteristics when tested in accordance with ASTM E84, Class A

- a. Flame Spread: 25 maximum
- b. Smoke Development Index: 450 Maximum
5. Visible Light Reflected – Interior 64%
6. Visible Light Reflected – Exterior 18%

## **2.9 FABRICATION OF GLAZING UNITS**

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
  1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
    - a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
  1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  2. Presence and functioning of weep systems.
  3. Minimum required face and edge clearances.
  4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

### **3.3 GLAZING, GENERAL**

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken

glass, impair performance, or impair appearance.

- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches.
  - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  - 2. Provide 1/8-inch- minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended in writing by gasket manufacturer.

### **3.4 TAPE GLAZING**

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.

- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

### **3.5 GASKET GLAZING (DRY)**

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

### **3.6 SEALANT GLAZING (WET)**

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

### **3.7 CLEANING AND PROTECTION**

- A. Immediately after installation, remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
  - 1. If, despite such protection, contaminating substances do contact with glass,

remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

### **3.8 MONOLITHIC GLASS SCHEDULE**

- A. Glass Type G1 Clear Fully Tempered safety float glass**
  - 1. Minimum Thickness: 1/4"**
  - 2. Safety Glazing required.**
- B. Glass Type G2 Clear Fully Tempered safety float glass**
  - 1. Minimum Thickness: 1/2"**
  - 2. Safety Glazing required.**

**END OF SECTION**

## SECTION 101423 - PANEL SIGNAGE

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Panel signs.

#### 1.2 ACTION SUBMITTALS

A. Product Data:

1. Panel signs.

B. Shop Drawings: For panel signs.

1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.

C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.

1. Include representative Samples of available typestyles and graphic symbols.

D. Samples for Verification: For each type of sign assembly showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:

1. Panel Signs: Full-size Sample.
2. Full-size Samples, if approved, will be returned to Contractor for use in Project.

E. Product Schedule: For panel signs. Use same designations indicated on Drawings or specified.

#### 1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manual.

#### 1.4 FIELD CONDITIONS

A. Field Measurements: Verify locations of anchorage devices embedded in permanent construction by other installers by field measurements before fabrication and indicate measurements on Shop Drawings.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in [the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1

## 2.2 PANEL SIGNS

- A. Panel Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
  - 1. **Follow design and fabrication standards of the owner. Coordinate text copy, room numbering, fonts, messaging, etc. with owner for final installation requirements.**
  - 2. **Interior Panel Signs: Provide smooth sign panel surfaces construction to remain flat under installed conditions within a tolerance of plus or minus 1/16" measured diagonally from corner to corner.**
    - a. **Mounting: Unframed**
      - 1) **Wall mounted with concealed anchors or two-face tape.**
      - 2) **Manufacturer's standard anchors for substrates encountered**

## 2.3 ACCESSORIES

- A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following unless otherwise indicated:
  - 1. Use concealed fasteners and anchors unless indicated to be exposed.
  - 2. Sign Mounting Fasteners:
    - a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material or screwed into back of sign assembly unless otherwise indicated.
    - b. Projecting Studs: Threaded studs with sleeve spacer, welded or brazed to back of sign material or screwed into back of sign assembly, unless otherwise indicated.
- B. Adhesive: As recommended by sign manufacturer.
- C. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick, with adhesive on both sides.

## 2.4 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- 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.

## 2.5 FABRICATION

- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
  - 1. Preassemble signs in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
- B. Surface-Engraved Graphics: Machine engrave characters and other graphic devices into indicated sign surface to produce precisely formed copy, incised to uniform depth.
  - 1. Engraved Metal: Fill engraved graphics with manufacturer's standard baked enamel.
  - 2. Engraved Opaque Acrylic Sheet: Fill engraved graphics with manufacturer's standard

- enamel.
- 3. Face-Engraved Clear Acrylic Sheet: Fill engraved copy with manufacturer's standard enamel. Apply manufacturer's standard opaque background color coating to back face of acrylic sheet.
- 4. Engraved Plastic Laminate: Engrave through exposed face ply of plastic-laminate sheet to expose contrasting core ply.
- C. Subsurface-Applied Graphics: Apply graphics to back face of clear face-sheet material to produce precisely formed image. Image is to be free of rough edges.
- D. Subsurface-Engraved Graphics: Reverse engrave back face of clear face-sheet material. Fill resulting copy with manufacturer's standard enamel. Apply opaque manufacturer's standard background color coating over enamel-filled copy.
- E. Shop- and Subsurface-Applied Vinyl: Align vinyl film in final position and apply to surface. Firmly press film from the middle outward to obtain good bond without blisters or fishmouths.
- F. Signs with Changeable Message Capability: Fabricate signs to allow insertion of changeable messages as follows:
  - 1. For slide-in changeable inserts, fabricate slot without burrs or constrictions that inhibit function. Furnish initial changeable insert.
- G. Brackets: Fabricate brackets, fittings, and hardware for bracket-mounted signs to suit sign construction and mounting conditions indicated. Modify manufacturer's standard brackets as required.
  - 1. Aluminum Brackets: Factory finish brackets with baked-enamel or powder-coat finish to match sign-background color unless otherwise indicated.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.
- C. Verify that anchorage devices embedded in permanent construction are correctly sized and located to accommodate signs.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
  - 1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
  - 2. Install signs so they do not protrude or obstruct according to the accessibility standard.
  - 3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
- B. Accessible Signage: Install in locations on walls as indicated on Drawing

- C. Signs Mounted on Glass: Provide opaque sheet matching sign material and finish onto opposite side of glass to conceal back of sign and two-face tape.
- D. Field-Applied, Vinyl-Character Signs: Clean and dry substrate. Align sign characters in final position before removing release liner. Remove release liner in stages and apply and firmly press characters into final position. Press from the middle outward to obtain good bond without blisters or fishmouths. Remove carrier film without disturbing applied vinyl film.
- E. Signs Mounted on Glass: Provide opaque sheet matching sign material and finish onto opposite side of glass to conceal back of sign and two-face tape

### **3.3 ADJUSTING AND CLEANING**

- A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as signs are installed.
- C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

**END OF SECTION**

## SECTION 23 74 33 - DEDICATED OUTDOOR-AIR UNITS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Owner furnished equipment, installed by contractor.
- B. Section includes factory-packaged units capable of supplying outdoor air conditioned for room distribution.

#### 1.2 SUBMITTALS

##### A. Action Submittals:

##### 1. Product Data: For each type of product:

- a. Unit dimensions and weight. Include shipping splits and weight by segment. Include shipping and installed weights.
- b. Cabinet material, metal thickness, finishes, insulation, and accessories.
- c. Fans:
  - 1) Certified fan-performance curves with system operating conditions indicated. Include flow, pressure drop, speed, brake HP, drive losses, and fan efficiency.
  - 2) Certified fan-sound power ratings.
  - 3) Fan construction and accessories (including plenum fan cages, and piezometer rings).
  - 4) Motor ratings, electrical characteristics, and motor accessories. Include efficiencies and statement of VFD compatibility.
  - 5) Vibration isolation and restraint, including thrust restraints.
- d. Certified coil-performance ratings with system operating conditions indicated, tube thickness, fin thickness, and materials.
- e. Dampers, including housings, linkages, operators, and linkage ratings.
- f. Filters with performance characteristics including initial and final pressure drops at rated airflow. Include information on differential pressure gages and filter clips.
- g. Sound ratings for overall unit performance: Radiated sound, discharge air sound and entering air sound.
- h. Pressure drop across each segment of the air handling unit.
- i. Wiring diagrams: Power, signal and control wiring. Differentiate between factory-installed components and wiring and field-installed components and wiring.

- j. Electrical component information, including lights, receptacle, conduit and junction boxes.
- k. Access door construction, including door thickness, door operator type and material, handle locations and hinge information, thermal pane window information and test port locations.
- l. Drain pan construction with invert of drain pan dimensioned from the bottom of unit. Identify drain piping with trap heights detailed.
- m. Airflow measuring probe calibration data.
- n. Test reports on leakage and vibration.
- o. All furnished specialties and accessories.
- p. Installation and startup instructions include fan bearing lubrication schedule and requirements.

B. Informational Submittals:

- 1. Startup service reports.
- 2. Sample Warranty: For special warranty.

C. Closeout Submittals:

- 1. Operation and Maintenance Data: For units to include in emergency, operation, and maintenance manuals.

D. Maintenance Material Submittals:

- 1. Furnish additional materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - a. Filters: One set for each unit.
  - b. Paint: If unit has a painted finish, one quart-size can of touch-up paint for the exterior finish of each air handling unit provided.

### 1.3 PERFORMANCE REQUIREMENTS

- 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.
- B. Comply with AHRI 410 for components, construction and rating. Certify coils to AHRI 410.
- C. NFPA Compliance: Comply with NFPA 90A for design, fabrication, and installation of air-handling units and components.
- D. ASHRAE Compliance: Comply with applicable sections of the following:
  - 1. ASHRAE 52.1.
  - 2. ASHRAE 62.1.

3. ASHRAE 90.1.

1.4 SOURCE QUALITY CONTROL

- A. AHRI 430 Certification: Air-handling units and their components shall be factory tested according to AHRI 430 and shall be listed and labeled by AHRI.
- B. AHRI 1060 Certification: Air-handling units that include air-to-air energy recovery devices shall be factory tested according to AHRI 1060 and shall be listed and labeled by AHRI.
- C. AMCA 301 or AHRI 260: Air-handling unit fan sound ratings shall comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data," or AHRI 260, "Sound Rating of Ducted Air Moving and Conditioning Equipment."
- D. Fan Sound-Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Fans shall bear AMCA-certified sound ratings seal.
- E. Fan Performance Rating: Factory test fan performance for airflow, pressure, power, air density, rotation speed, and efficiency. Rate performance according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating."
- F. Refrigerant Coils: Factory tested to minimum 450-psig internal pressure and to minimum 300-psig internal pressure while underwater, according to AHRI 410 and ASHRAE 33.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Protect, pack, and secure loose-shipped items within the air-handling units. Include detailed packing list of loose-shipped items, including illustrations and instructions.
- B. Protect, pack and secure control devices, motor control devices, and other electronic equipment. Do not store electronic equipment in wet or damp areas even when they are sealed and secured.
- C. Enclose and protect control panels, electronic devices, and variable frequency drives. Do not store equipment in wet or damp areas even when they are sealed and secured.
- D. Seal openings to protect against damage during shipping, handling, and storage.
- E. Wrap indoor units with a tight sealing membrane. Wrapping membrane shall cover entire AHU during shipping and storage. Cover equipment, regardless of size or shape. Alternatively, AHU must be tarped for shipment and storage.

- F. Wrap equipment, including electrical components, for protection against rain, snow, wind, dirt, sun fading, road salt/chemicals, rust, and corrosion. Keep equipment clean and dry.
- G. Tarp outdoor units to protect against rain and road debris during shipping.
- H. Clearly mark AHU sections with unit tag number, segment sequence number, and direction of airflow. Securely affix safety-warning labels.

## 1.6 WARRANTY

- A. The manufacturer shall provide 12-month parts only warranty. Defective parts shall be repaired or replaced during the warranty period at no charge. The warranty period shall commence at startup or six months after shipment, whichever occurs first.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis of Design: Daikin Applied

### 2.2 GENERAL DESCRIPTION

- A. Furnish as shown on plans, Daikin Applied Rebel Single Zone Packaged Heat Pump Unit model DPS. Unit performance and electrical characteristics shall be per the job schedule.
- B. Configuration: Fabricate as detailed on prints and drawings:
  - 1. Return plenum / economizer section
  - 2. Filter section
  - 3. Cooling coil section
  - 4. Supply fan section
  - 5. Exhaust fan section
  - 6. Gas heating section
  - 7. Enthalpic core section
  - 8. Condensing unit section
- C. The complete unit shall be cETLus listed.
- D. The unit shall be ASHRAE 90.1-2019 compliant and labeled.
- E. Each unit shall be specifically designed for outdoor rooftop application and include a weatherproof cabinet. Each unit shall be completely factory assembled and shipped in one piece. Packaged units shall be shipped fully charged with R-32 Refrigerant and oil.

- F. The unit shall undergo a complete factory run test prior to shipment. The factory test shall include a refrigeration circuit run test, a unit control system operations checkout, a unit refrigerant leak test and a final unit inspection.
- G. All units shall have decals and tags to indicate caution areas and aid unit service. Unit nameplates shall be fixed to the main control panel door. Electrical wiring diagrams shall be attached to the control panels. Installation, operating and maintenance bulletins and start-up forms shall be supplied with each unit.
- H. Performance: All scheduled EER, IEER, capacities and face areas are minimum accepted values. All scheduled amps, kW, and HP are maximum accepted values that allow scheduled capacity to be met.

### 2.3 CABINET, CASING, AND FRAME

- A. Panel construction shall be double-wall construction for all panels. All floor panels shall have a solid galvanized steel inner liner on the air stream side of the unit to protect insulation during service and maintenance. Insulation shall be a minimum of 1" thick with an R-value of 7.0, and shall be 2 part injected foam. Panel design shall include no exposed insulation edges. Unit cabinet shall be designed to operate at total static pressures up to 5.0 inches w.g.
- B. Exterior surfaces shall be constructed of painted galvanized steel, for aesthetics and long-term durability. Paint finish will include a base primer with a high-quality polyester resin topcoat. Finished, unabraded panel surfaces shall be exposed to an ASTM B117 salt spray environment and exhibit no visible red rust at a minimum of 3,000 hours exposure. Finished, abraded surfaces shall be tested per ASTM D1654, having a mean scribe creepage not exceeding 1/16" at 1,000 hours minimum exposure to an ASTM B117 salt spray environment. Measurements of results shall be quantified using ASTM D1654 in conjunction with ASTM D610 and ASTM D714 to evaluate blister and rust ratings.
- C. Service doors shall be provided on the fan section, filter section, enthalpic core section, control panel section, and heating vestibule in order to provide user access to unit components. All service access doors shall be mounted on multiple, stainless-steel hinges and shall be secured by a latch system. Removable service panels secured by multiple mechanical fasteners are not acceptable.
- D. The unit base shall overhang the roof curb for positive water runoff and shall seat on the roof curb gasket to provide a positive, weathertight seal.

### 2.4 OUTDOOR/RETURN AIR SECTION

- A. Unit shall be provided with an outdoor air economizer section. The economizer section shall include outdoor, return, and exhaust air dampers. The economizer operation shall be fully integral to the mechanical cooling and allow up to 100% of mechanical cooling if needed to maintain the cooling discharge air temperature. The outdoor air hood shall

be factory installed and constructed from galvanized steel finished with the same durable paint finish as the main unit. The hood shall include moisture eliminator filters to drain water away from the entering air stream. The outside and return air dampers shall be sized to handle 100% of the supply air volume. The dampers shall be parallel blade design. Damper blades shall be gasketed with side seals to provide an air leakage rate of 1.5 cfm / square foot of damper area at 1" differential pressure in accordance with testing defined in AMCA 500. A barometric exhaust damper shall be provided to exhaust air out of the back of the unit. A bird screen shall be provided to prevent infiltration of rain and foreign materials. Exhaust damper blades shall be lined with vinyl gasketing on contact edges. Dampers shall have a factory installed direct coupled actuator. Damper actuator shall be of the modulating, spring return type. Damper actuators shall be controlled by third party controller.

## 2.5 ENTHALPIC CORE ENERGY RECOVERY

- A. The fixed plate energy recovery core is equipped with a bypass damper on the outside air path. If the RTU has an economizer internal to it, then the bypass damper will open when the unit enters the economizer operating state and close when the unit leaves the economizer operating state.
- B. When the outside air is below 32F (adjustable) the bypass damper will open for 5 minutes (adjustable) every 60 minute period (adjustable). Exhaust air continues to run through the core during this time to remove frost buildup.
- C. The ERV core shall transfer both sensible and latent energy between the incoming fresh air stream and the exhaust stale air stream.
- D. The ERV core shall be in either a crossflow or counter cross-flow orientation and **have no moving parts**.
- E. The ERV core shall be certified by AHRI under its Standard 1060 for Energy Recovery Ventilators. Products not currently AHRI certified will not be accepted.
- F. The ERV core shall achieve the minimum effectiveness value as indicated in the schedule.
- G. The fresh air stream must have complete separation from the stale air stream to prevent cross contamination.
- H. The ERV core shall have Exhaust Air Transport Ratio of 0.5% as tested to AHRI 1060 (EATR) to prevent cross-over of gases, contaminants or odors.
- I. The ERV core's Outdoor Air Correction Factor (OACF) shall not exceed 1.0 as tested to AHRI 1060 (OACF) Standard.
- J. The ERV core shall not be degraded or promote the growth of mold and bacteria with a rating of zero in testing according to ISO846 A and C.

- K. The ERV core must be able to tolerate freezing temperatures of -22°F and not have an increase in EATR or decrease in performance after being frozen.
- L. The ERV core must be able to tolerate high temperatures of 140°F and not have an increase in EATR or decrease in performance at these elevated temperatures.
- M. The ERV core must be freeze tolerant tested to 40 freeze thaw cycles from -4°F to 68°F while maintaining the energy recovery effectiveness and EATR rating of 0.5%.
- N. The ERV core must be water washable to remove dust and contaminants.
- O. The ERV core must be flame proof and comply with UL 723 with a flame spread index that shall not be over 25 and a smoke index that shall not be over 50.
- P. The ERV cores should have particulate filters positioned before the incoming air streams.
- Q. Accepted manufacturer: CORE Energy Recovery Solutions or approved equal, subject to compliance with requirements.

## 2.6 EXHAUST FAN

- A. Exhaust fan shall be a single width, single inlet (SWSI) airfoil centrifugal fan. The fan wheel shall be Class II construction with aluminum fan blades that are continuously welded to the hub plate and end rim. The exhaust fan shall be a direct drive fan mounted to the motor shaft. Belts and sheaves are not acceptable due to the additional maintenance.
- B. The fan motor shall be a totally enclosed EC motor that is speed controlled by the third party unit controller. The motor shall include thermal overload protection and protect the motor in the case of excessive motor temperatures. The motor shall have phase failure protection and prevent the motor from operation in the event of a loss of phase. Motors shall be premium efficiency.
- C. The field installed DDC controller shall provide building static pressure control. The controller shall provide proportional control of the exhaust fans from 25% to 100% of the supply air fan designed airflow to maintain the adjustable building pressure setpoint. The field shall mount the required sensing tubing from the building to the factory mounted building static pressure sensor. Special sequences for the exhaust fan will be needed when paint booth exhaust is enabled. Refer to drawings for Sequences of Operation.

## 2.7 FILTERS

- A. Unit shall be provided with a draw-through filter section. The filter rack shall be designed to accept a 2" prefilter. The unit design shall have a hinged access door for the filter section. The manufacturer shall ship the rooftop unit with 2" MERV 13

construction filters. The contractor shall furnish and install, at building occupancy, the final set of filters per the contract documents.

## 2.8 COOLING COIL

- A. The indoor coil section shall be installed in a draw through configuration, upstream of the supply air fan. The coil section shall be complete with a factory piped cooling coil and an ASHRAE 62.1 compliant double sloped drain pan.
- B. The direct expansion (DX) cooling coils shall be fabricated of seamless high efficiency copper tubing that is mechanically expanded into high efficiency aluminum plate fins. Coils shall be a multi-row, staggered tube design with a minimum of 3 rows. All cooling coils shall have an interlaced coil circuiting that keeps the full coil face active at all load conditions. All coils shall be factory leak tested with high pressure air under water.
- C. The cooling coil shall have an electronic controlled expansion valve. The factory installed unit controller shall control the expansion valve to maintain liquid subcooling and the superheat of the refrigerant system.
- D. The refrigerant suction lines shall be fully insulated from the expansion valve to the compressors.
- E. The drain pan shall be stainless steel and positively sloped. The slope of the drain pan shall be in two directions and comply with ASHRAE Standard 62.1. The drain pan shall have a minimum slope of 1/8" per foot to provide positive draining. The drain pan shall extend beyond the leaving side of the coil. The drain pan shall have a threaded drain connection extending through the unit base.

## 2.9 HOT GAS REHEAT

- A. Unit shall be equipped with a fully modulating hot gas reheat coil with hot gas coming from the unit condenser.
- B. Hot gas reheat coil shall be a Micro Channel design. The aluminum tube shall be a micro channel design with high efficiency aluminum fins. Fins shall be brazed to the tubing for a direct bond. The capacity of the reheat coil shall allow for a 20°F temperature rise at all operating conditions.
- C. The modulating hot gas reheat systems shall allow for independent control of the cooling coil leaving air temperature and the reheat coil leaving air temperature. The cooling coil and reheat coil leaving air temperature setpoints shall be adjustable through the unit controller. During the dehumidification cycle the unit shall be capable of 100% of the cooling capacity. The hot gas reheat coil shall provide discharge temperature control within +/- 2°F.
- D. Each coil shall be factory leak tested with high-pressure air under water.

## 2.10 SUPPLY FAN

- A. Supply fan shall be a single width, single inlet (SWSI) airfoil centrifugal fan. The fan wheel shall be Class II construction with fan blades that are continuously welded to the hub plate and end rim. The supply fan shall be a direct drive fan mounted to the motor shaft. Belts and sheaves are not acceptable due to the additional maintenance.
- B. Supply fan and motor assembly combinations larger than 8 hp or 22" diameter shall be internally isolated on 1" deflection, spring isolators and include removable shipping tie downs.
- C. The fan motor shall be a totally enclosed EC motor that is speed controlled by the rooftop unit controller. The motor shall include thermal overload protection and protect the motor in the case of excessive motor temperatures. The motor shall have phase failure protection and prevent the motor from operation in the event of a loss of phase. Motors shall be premium efficiency.
- D. The supply fan shall be capable of airflow modulation from 30% to 100% of the scheduled designed airflow. The fan shall not operate in a state of surge at any point within the modulation range.

## 2.11 VARIABLE AIR VOLUME CONTROL

- A. The third party unit controller shall proportionally control the ECM motors on the supply fan. The unit controller shall provide discharge air temperature control with the compressor modulation.
- B. The temperature controls contractor shall install all power and control wiring.
- C. The supply air fan drive output shall be controlled by the third party unit controller. Drive status and operating speed shall be monitored and displayed at the third party unit controller.

## 2.12 HEATING SECTION

- A. The rooftop unit shall include a natural gas heating section. The gas furnace design shall be one natural gas fired heating module factory installed downstream of the supply air fan in the heat section. The heating module shall be a tubular design with in-shot gas burners.
- B. The module shall be complete with furnace controller and control valve capable of 10:1 modulating operation.
- C. The heat exchanger tubes shall be constructed of stainless steel.
- D. The module shall have an induced draft fan that will maintain a negative pressure in the heat exchanger tubes for the removal of the flue gases.

- E. Each burner module shall have two flame roll-out safety protection switches and a high temperature limit switch that will shut the gas valve off upon detection of improper burner manifold operation. The induced draft fan shall have an airflow safety switch that will prevent the heating module from turning on in the event of no airflow in the flue chamber.
- F. The factory installed DDC unit control system shall control the gas heat module. Field installed heating modules shall require a field ETL certification. The manufacturer's rooftop unit ETL certification shall cover the complete unit including the gas heating modules.

#### 2.13 HEAT PUMP HEATING

- A. The evaporator coil, condenser coil, compressors and refrigerant circuit shall be designed for heat pump operation. The refrigerant circuit shall contain a 4-way reversing valve for the heat pump operation. The outdoor coil shall have an electronic expansion valve to control the refrigerant flow. The factory unit controller shall modulate the expansion valve to maintain compressor operation within the compressor operational envelope.
- B. The refrigerant system shall have a pump-down cycle.
- C. The unit shall have a natural gas furnace for hybrid heating. When the heat pump operation cannot maintain the discharge air temperature setpoint the natural gas furnace shall temper the airstream to the discharge air temperature setpoint.

#### 2.14 CONDENSING SECTION

- A. Outdoor coils shall have seamless copper tubes, mechanically bonded into aluminum plate-type fins. The fins shall have full drawn collars to completely cover the tubes. A sub-cooling coil shall be an integral part of the main outdoor air coil. Each outdoor air coil shall be factory leak tested with high-pressure air under water.
- B. Fan motors shall be an ECM type motor for proportional control. The factory unit controller shall proportionally control the speed of the condenser fan motors to maintain the head pressure of the refrigerant circuit in ambient conditions up to 125°F. Mechanical cooling shall be provided to 0°F. Heat Pump Heating shall be provided to -10F. The motor shall include thermal overload protection and protect the motor in the case of excessive motor temperatures. The motor shall have phase failure protection and prevent the motor from operation in the event of a loss of phase.
- C. The condenser fan shall be low noise blade design. Fan blade design shall be a dynamic profile for low tip speed. Fan blade shall be of a composite material.
- D. The unit shall have scroll compressors. One of the compressors shall be an inverter compressor providing proportional control. The factory unit controller shall control the speed of the compressor to maintain the discharge air temperature. The inverter

compressor shall have a separate oil pump and an oil separator for each compressor that routes oil back to the compressor instead of through the discharge line.

- E. Pressure transducers shall be provided for the suction pressure and head pressure. Temperature sensor shall be provided for the suction temperature and the refrigerant discharge temperature of the compressors. All of the above devices shall be an input to the unit controller and the values be displayed at the unit controller.
- F. Refrigerant circuit shall have a bypass valve between the suction and discharge refrigerant lines for low head pressure compressor starting and increased compressor reliability. When there is a call for mechanical cooling the bypass valve shall open to equalizing the suction and discharge pressures. When pressures are equalized the bypass valve shall close and the compressor shall be allowed to start.
- G. Each circuit shall be dehydrated and factory charged with R32 Refrigerant and oil.

## 2.15 ELECTRICAL

- A. Unit wiring shall comply with NEC requirements and with all applicable UL standards. All electrical components shall be UL recognized where applicable. All wiring and electrical components provided with the unit shall be number and color-coded and labeled according to the electrical diagram provided for easy identification. The unit shall be provided with a factory wired weatherproof control panel. Unit shall have a single point power terminal block for main power connection. A terminal board shall be provided for low voltage control wiring. Branch short circuit protection, 115-volt control circuit transformer and fuse, system switches, and a high temperature sensor shall also be provided with the unit. Each compressor and condenser fan motor shall be furnished with contactors and inherent thermal overload protection. Supply fan motors shall have contactors and external overload protection. Knockouts shall be provided in the bottom of the main control panels for field wiring entrance.
- B. A GFI receptacle shall be unit mounted that is field powered.
- C. A single non-fused disconnect switch shall be provided for disconnecting electrical power at the unit. Disconnect switches shall be mounted internally to the control panel and operated by an externally mounted handle.

## 2.16 CONTROLS (ADDENDUM 01)

- A. **Provide a complete integrated microprocessor based Direct Digital Control (DDC) system to control all unit functions including temperature control, scheduling, monitoring, unit safety protection, including compressor minimum run and minimum off times, and diagnostics. This system shall consist of all required temperature sensors, pressure sensors, controller and keypad/display operator interface. All MCBs and sensors shall be factory mounted, wired and tested.**

- B. The DDC control system shall permit starting and stopping of the unit locally or remotely. The control system shall be capable of providing a remote alarm indication. The unit control system shall provide for outside air damper actuation, emergency shutdown, remote heat enable/disable, remote cool enable/disable, heat indication, cool indication, and fan operation.**
- C. The DDC control system shall permit starting and stopping of the unit locally or remotely. The control system shall be capable of providing a remote alarm indication. The unit control system shall provide for outside air damper actuation, emergency shutdown, remote heat enable/disable, remote cool enable/disable, heat indication, cool indication, and fan operation.**
- D. All digital inputs and outputs shall be protected against damage from transients or incorrect voltages. All field wiring shall be terminated at a separate, clearly marked terminal strip.**
- E. The DDC controller shall have a built-in time schedule. The schedule shall be programmable from the unit keypad interface. The schedule shall be maintained in nonvolatile memory to ensure that it is not lost during a power failure. There shall be one start/stop per day and a separate holiday schedule. The controller shall accept up to sixteen holidays each with up to a 5-day duration. Each unit shall also have the ability to accept a time schedule via BAS network communications.**
- F. The keypad interface shall allow convenient navigation and access to all control functions. The unit keypad/display character format shall be 4 lines x 20 characters. All control settings shall be password protected against unauthorized changes. For ease of service, the display format shall be English language readout. Coded formats with look-up tables will not be accepted. The user interaction with the display shall provide the following information as a minimum:
  - 1. Return air temperature**
  - 2. Discharge air temperature**
  - 3. Outdoor air temperature**
  - 4. Space air temperature**
  - 5. Outdoor enthalpy, high/low**
  - 6. Compressor suction temperature and pressure**
  - 7. Compressor head pressure and temperature**
  - 8. Expansion valve position**
  - 9. Condenser fan speed**
  - 10. Inverter compressor speed**
  - 11. Dirty filter indication**
  - 12. Airflow verification**
  - 13. Cooling status**
  - 14. Control temperature (Changeover).**
  - 15. VAV box output status**
  - 16. Cooling status/capacity**
  - 17. Unit status**
  - 18. All time schedules****

19. All time schedules
  20. Previous alarms with time and date
  21. Optimal start
  22. Supply fan and exhaust fan speed
  23. System operating hours
- G. The user interaction with the keypad shall provide the following:
1. Controls mode
  2. Cooling and heating change-over temperature with deadband
  3. Cooling discharge air temperature (DAT)
  4. Supply reset options
  5. Temperature alarm limits
  6. Lockout control for compressors
  7. Compressor interstage timers
  8. Night setback and setup space temperature
  9. Building static pressure
  10. Economizer changeover
  11. Currently time and date
  12. Tenant override time
  13. Occupied/unoccupied time schedule
  14. One event schedule
  15. Holiday dates and duration
  16. Adjustable set points
  17. Service mode
- H. If the unit is to be programmed with a night setback or setup function, an optional space sensor shall be provided. Space sensors shall be available to support field selectable features. Sensor options shall include:
1. Zone sensor with tenant override switch
- I. To increase the efficiency of the cooling system the DDC controller shall include a discharge air temperature reset program for part load operating conditions. The discharge air temperature shall be controlled between a minimum and a maximum discharge air temperature (DAT) based on one of the following inputs:
1. Airflow
  2. Outside air temperature
  3. Space temperature
  4. Return air temperature
  5. External signal of 1-5 vdc
  6. External signal of 0-20 mA
  7. Network signal
- J. Units shall contain eight programmable input/output control ports to be controlled using the connected building automation system. These ports shall be input/output capable of utilizing the following signal types:
1. mA signal (0-20 mA – Adjustable)
  2. VDC (0-10 VDC – Adjustable)
  3. 10k Thermistor
  4. Digital on/off

- 2.17 A2L Leak Mitigation Refrigerant Detection System (RDS) for compressorized rooftop equipment using A2L refrigerant.
- A. Compressorized rooftop equipment using A2L refrigerant shall come equipped with a factory installed Refrigerant Detection System (RDS) in compliance with UL60335-2-40. The factory-installed unit controller will respond and control the unit to comply with UL60335-2-40 according to the alarm status of the refrigerant detection system. See the unit Operations Manual for a detailed sequence of operations.
  - B. The Refrigerant Detection System (RDS) shall consist of the following components:
    - 1. Dedicated A2L Refrigerant Detection Control Board
    - 2. Refrigerant Sensor or Sensors. The number of sensors will vary based on the product and configuration as needed to comply with UL requirements.
  - C. Operation and Monitoring:
    - 1. The refrigerant sensor or sensors communicate with the refrigerant detection control board. The refrigerant sensors detect the presence of the A2L refrigerant outside of the sealed refrigeration piping and communicate the levels to the refrigerant detection control board. The refrigerant detection controller communicates the RDS status to the factory-installed unit controller.
    - 2. Alarm Communication: The unit controller will communicate RDS alarms based on the RDS status in the same way as any other alarm. Alarms are triggered by the following: 1) Refrigerant detected above 15% of the refrigerant lower flammability level (LFL); 2) Refrigerant Sensor Fault.
      - a. A customer relay is provided for the field to connect directly to the refrigerant detection control board as an alternative means to receive the above two alarm statuses.
  - D. Factory unit wiring diagrams must show the refrigerant leak detection system wiring.

## 2.18 ROOF CURB

- A. A prefabricated heavy gauge galvanized steel, mounting curb shall be provided for field assembly on the roof decking prior to unit shipment. The roof curb shall be a full perimeter type with complete perimeter support of the air handling section and condensing section. The curb shall be a minimum of 24" high and include a nominal 2" x 4" wood nailing strip. Gasket shall be provided for field mounting between the unit base and roof curb.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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

- B. Examine roughing-in for piping, ducts, and electrical systems to verify actual locations of connections before equipment installation.
- C. Examine roof curbs and equipment supports for suitable conditions where units will be installed.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.
- E. Comply with manufacture's start-up checklist.

### 3.2 INSTALLATION

- A. Comply with manufacturer's rigging and installation instructions for unloading units and moving to final locations.
- B. Curb Support: Install roof curb on roof structure according to "The NRCA Roofing Manual."
  - 1. Install and secure units on curbs and coordinate roof penetrations and flashing with roof construction.
  - 2. Coordinate size, installation, and structural capacity of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 7.
  - 3. Coordinate size, location, and installation of unit manufacturer's roof curbs and equipment supports with roof Installer.
- C. Install wall- and duct-mounted sensors furnished by manufacturer for field installation. Install control wiring and make final connections to control devices and unit control panel.
- D. Comply with requirements for gas-fired furnace installation in NFPA 54, "National Fuel Gas Code."
- E. Install separate devices furnished by manufacturer and not factory installed.
- F. Install new filters at completion of equipment installation and before testing, adjusting, and balancing.
- G. Install drain pipes from unit drain pans to sanitary drain.
  - 1. Drain Piping: Drawn-temper copper water tubing complying with ASTM B 88, Type M, with soldered joints.
  - 2. Pipe Size: Same size as condensate drain pan connection.

### 3.3 CONNECTIONS

- A. Where installing piping adjacent to units, allow space for service and maintenance.

B. Gas Piping Connections:

1. Comply with requirements in Division 22.
2. Connect gas piping to furnace, full size of gas train inlet, and connect with sufficient clearance for burner removal and service.

C. Duct Connections:

1. Comply with requirements in other Division 23 sections.
2. Drawings indicate the general arrangement of ducts.
3. Connect ducts to units with flexible duct connectors. Comply with requirements for flexible duct connectors in Division 23.

D. Electrical Connections: Comply with requirements for power wiring, switches, and motor controls in electrical Sections. Install electrical devices furnished by unit manufacturer but not factory mounted.

3.4 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
- B. After startup, change filters, verify bearing lubrication, and adjust belt tension.
- C. Remove and replace components that do not properly operate and repeat startup procedures as specified above.
- D. Prepare written report of the results of startup services.

3.5 ADJUSTING

- A. Adjust initial temperature and humidity set points.
- B. Set field-adjustable switches and circuit-breaker trip ranges as indicated.
- C. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.6 DEMONSTRATION

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

**END OF SECTION 23 74 33**

## **SECTION 23 81 46 - WATER-SOURCE UNITARY HEAT PUMPS**

### **PART 1 - GENERAL**

#### 1.1 SUMMARY

- A. Owner furnished equipment, installed by contractor.
- B. Section includes unitary heat pumps with refrigerant-to-water heat exchangers, refrigeration circuits, and refrigerant compressor(s).

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each water-source unitary heat pump.
  - 2. Include rated capacities, operating characteristics, furnished specialties, and accessories.
- B. Shop Drawings:
  - 1. Include plans, elevations, sections, and mounting and attachment details.
  - 2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 3. Include diagrams for power, signal, and control wiring.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of water-source unitary heat pump, signed by product manufacturer.
- B. Field quality-control reports.
- C. Sample Warranty: For manufacturer's warranty.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For water-source unitary heat pumps to include in emergency, operation, and maintenance manuals.

#### 1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

## 1.6 WARRANTY

- A. ClimateMaster shall warranty equipment for a period of 12 months from start up or 18 months from shipping (whichever occurs first).
  - 1. Extended 4-year compressor warranty covers compressor for a total of 5 years.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Furnish and install ClimateMaster Tranquility® SY & SC water-source heat pumps, as indicated on the plans. Equipment shall be completely assembled, piped, and internally wired. Capacities and characteristics as listed in the schedule and the specifications that follow.
- B. Units shall be supplied completely factory built capable of operating over an entering water temperature range from 20° to 120°F as standard. Equivalent units from other manufacturers may be proposed provided approval to bid is given 10 days prior to bid closing. All equipment listed in this section must be rated and certified in accordance with Air-Conditioning, Heating and Refrigeration Institute/International Standards Organization (AHRI/ISO 13256-1). All equipment must be tested, investigated, and determined to comply with the requirements of the standards for Heating and Cooling Equipment UL 60335-2-40 4th Edition, UL 60335-1 6th Edition for the United States and Can/CSA C22.2 No. 60335-2-40:22, by Intertek Testing Laboratories (ETL). The units shall have AHRI/ISO and ETL-US-C labels.
  - 1. All units shall pass a factory acceptance test. The quality control system shall automatically perform the factory acceptance test via computer. A detailed report card from the factory acceptance test shall be shipped with each unit.
  - 2. Note: If a unit fails the factory acceptance test, it shall not be allowed to ship. Unit serial number will be recorded by factory acceptance test and furnished on report card for ease of unit warranty status.

### 2.2 BASIC CONSTRUCTION

- A. Horizontal units shall have one of the following air flow arrangements: Left Inlet/Straight (Right) Discharge; Right Inlet/Straight (Left) Discharge; Left Inlet/Back Discharge; or Right Inlet/Back Discharge as shown on the plans. Units must have the ability to be field convertible from straight to back or back to straight discharge with no additional parts or unit structure modification. Horizontal units will have factory installed hanger brackets with rubber isolation grommets packaged separately.

- B. If units with these arrangements are not used, the contractor is responsible for any extra costs incurred by other trades. All units must have multiple access panels for serviceability of compressor compartment.
  - 1. Units having only one access panel to compressor/heat exchangers/ expansion device/refrigerant piping shall not be acceptable.
- C. Compressor section interior surfaces shall be lined with 1/2-inch thick, 1-1/2 lb/ft<sup>3</sup> acoustic type glass fiber insulation. Air handling section interior surfaces shall be lined with 1/2-inch thick, 1-1/2 lb/ft<sup>3</sup> foil-faced, glass-fiber insulation for ease of cleaning. Insulation placement shall be designed in a manner that will eliminate any exposed edges to prevent the introduction of glass fibers into the air stream.
  - 1. Units without foil-faced insulation in the air handling section will not be accepted.
- D. The heat pump cabinets shall be fabricated from heavy gauge galvanized steel.
- E. Standard insulation must meet NFPA Fire Hazard Classification requirements 25/50 per ASTM E84, UL 723, CAN/ULC S102-M88 and NFPA 90A requirements; air erosion and mold growth limits of UL 181; stringent fungal resistance test per ASTM-C1071 and ASTM G21; and shall meet zero level bacteria growth per ASTM G22. Unit insulation must meet these stringent requirements or unit(s) will not be accepted.
- F. All units must have an insulated panel separating the fan compartment from the compressor compartment. Units with the compressor in the air stream are not acceptable.
- G. Cabinets shall have separate holes and knockouts for entrance of line voltage and low voltage control wiring. All factory-installed wiring passing through factory knockouts and openings shall be protected from sheet metal edges at openings by plastic ferrules. Supply- and return-water connections shall be copper FPT fittings. All water connections and electrical knockouts must be in the compressor compartment corner post as to not interfere with the serviceability of unit. Contractors shall be responsible for any extra costs involved in the installation of units that do not have this feature.
- H. Contractors must ensure that units can be easily removed for servicing and coordinate locations of electrical conduit and lights with the electrical contractor.
- I. The unit will be supplied with factory installed 1-inch or 2-inch air filter frames with filter access door and return air duct flanges. The contractor shall install 1-inch or 2-inch MERV-rated pleated media disposable air filters on all units.
  - 1. The contractor shall purchase one spare set of filters and replace factory shipped filters on completion of startup. Filters shall be standard sizes. If units utilize non-standard filter sizes, then the contractor shall provide 12 spare filters for each unit.

## 2.3 BLOWER AND MOTOR ASSEMBLY

- A. Blowers shall have inlet rings to allow removal of wheel and motor from one side without removing housing. Units shall have a direct-drive centrifugal fan. The fan motor

shall be an EC variable speed ball bearing type motor. The EC fan motor shall provide soft starting, maintain constant CFM over its static operating range and provide airflow adjustment in 25 CFM increments via its control board. The fan motor shall be isolated from the housing by rubber grommets. The motor shall be permanently lubricated and have thermal-overload protection. A special dehumidification mode shall be provided to allow lower airflows in cooling for better dehumidification. The dehumidification mode may be constant or automatic (humidistat controlled).

- B. Airflow/Static pressure rating of the unit shall be based on a wet coil and a clean filter in place. Ratings based on a dry coil, and/or no air filter, shall NOT be acceptable.

#### 2.4 REFRIGERANT CIRCUIT

- A. All units shall contain an R-454B sealed refrigerant circuit including a high efficiency scroll or rotary compressor designed for heat pump operation, a thermostatic expansion valve for refrigerant metering, an enhanced corrugated aluminum lanced fin and rifled copper tube refrigerant to air heat exchanger, reversing valve, coaxial (tube in tube) refrigerant to water heat exchanger, and safety controls including a high-pressure switch, low-pressure (loss-of-charge) switch, water coil low-temperature sensor, and air coil low-temperature sensor. Access fittings shall be factory installed on high- and low-pressure refrigerant lines to facilitate field service. Activation of any safety device shall prevent compressor operation via a microprocessor lockout circuit. The lockout circuit shall be reset at the thermostat or at the contractor-supplied disconnect switch. Units that cannot be reset at the thermostat shall not be acceptable.
- B. Hermetic compressors shall be internally sprung. The compressor shall have a dual level vibration isolation system. The compressor will be mounted on specially engineered sound-tested EPDM vibration isolation grommets to a large heavy gauge compressor mounting plate, which is then isolated from the cabinet base with EPDM grommets for maximized vibration attenuation. All units shall include a discharge muffler to further enhance sound attenuation. Compressors shall have thermal-overload protection. Compressors shall be located in an insulated compartment away from air stream to minimize sound transmission.
- C. Refrigerant to air heat exchangers shall utilize enhanced corrugated lanced aluminum fins and rifled copper tube construction rated to withstand 625 PSIG (4309 kPa) refrigerant working pressure.
- D. Refrigerant to water heat exchangers shall be of copper inner water tube and steel refrigerant outer tube design, rated to withstand 625 PSIG working refrigerant pressure and 500 PSIG working water pressure. The refrigerant to water heat exchanger shall be "electro-coated" with a low cure cathodic epoxy material a minimum of 0.4 mils thick on all surfaces. The black colored coating shall provide a minimum of 1,000-hour salt spray protection per ASTM B117-97 on all external steel and copper tubing. The material shall be formulated without the inclusion of any heavy metals and shall exhibit a pencil hardness of 2H (ASTM D3363-92A), crosshatch adhesion of 4B-5B (ASTM D3359-95), and impact resistance of 160 in-lbs direct (ASTM D2794-93).

- E. Refrigerant metering shall be accomplished by thermostatic expansion valve only. Expansion valves shall be dual port balanced types with external equalizer for optimum refrigerant metering. Units shall be designed and tested for operating ranges of entering water temperatures from 20° to 120°F. The reversing valve shall be four-way solenoid activated refrigerant valve, which shall default to heating mode should the solenoid fail to function. If the reversing valve solenoid defaults to cooling mode, an additional low-temperature thermostat must be provided to prevent over-cooling an already cold room.
- F. Units shall be supplied with a Refrigerant Detection System (RDS) with sensors to be strategically placed within the cabinet. In the event of a refrigerant leak, the RDS disables compressor operation, and the unit blower runs to disperse any concentration of leaked refrigerant in compliance with UL 60335-2-40 safety standards for flammable refrigerants.
  - 1. Units that do not have an RDS shall not be acceptable.

## 2.5 DRAIN PAN

- A. The drain pan shall be constructed of corrosion resistant polymer material. The drain outlet shall be connected from pan using provided polymer coupling and clamps that meet UL 2043 as required for discrete products by the IMC and UMC when located in a plenum. If steel material is used for drain pan it shall be fully insulated on all sides and must meet the stringent 1,000-hour salt spray test per ASTM B117. Drain outlet shall be located at pan as to allow unobstructed drainage of condensate. Drain outlet shall be connected from pan directly to plumbing via a rubber coupling that couples to ¾-inch schedule 40/80 PVC fitting. No hidden internal tubing extensions from pan outlet extending to unit casing (that can create drainage problems) will be accepted. The unit as standard will be supplied with solid-state electronic condensate overflow protection.
  - 1. Mechanical float switches will NOT be accepted.

## 2.6 ELECTRICAL

- A. A control box shall be located within the unit compressor compartment and shall contain a 75VA transformer, 24V activated, two or three-pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation. The control box on sizes 024 through 060 shall have a door to protect the internal components. The entire control box shall be capable of rotating out of the unit to allow access to the components behind the control box. Low voltage wires shall enter the box through a hole in the lower left side and high voltage wires shall enter the box through a hole in the upper left side. Reversing valve and blower motor wiring shall be routed through this electronic controller. Units shall be name-plated for use with time delay fuses or HACR circuit breakers.
  - 1. Unit controls shall be 24V and provide heating or cooling as required by the remote thermostat/sensor.
- B. Disconnect Switch, Non-Fused, classified as motor disconnect

## 2.7 SOLID STATE CONTROL SYSTEM (DXM2.5)

- A. Units shall have a solid-state control system. Units utilizing electro-mechanical control shall not be acceptable. The control system microprocessor board shall be specifically designed to protect against building electrical system noise contamination, EMI, and RFI interference. The control system shall have the following features:
1. Anti-short cycle time delay on compressor operation.
  2. Random start on power-up mode.
  3. Low-voltage protection.
  4. High-voltage protection.
  5. Unit shutdown on high- or low-refrigerant pressures.
  6. Unit shutdown on low water temperature.
  7. Condensate-overflow electronic protection.
  8. Option to reset unit at thermostat or disconnect.
  9. Automatic intelligent reset. Unit shall automatically reset the unit 5 minutes after trip if the fault has cleared. If a fault occurs three times sequentially without thermostat meeting
  10. temperature, then lockout requiring manual reset will occur.
  11. Ability to defeat time delays for servicing.
  12. Light emitting diode (LED) on circuit board to indicate high pressure, low pressure, low voltage, high voltage, low water/air temperature cut-out, condensate overflow, and control voltage status.
  13. The low-pressure switch shall not be monitored for the first 120 seconds after a compressor start command to prevent nuisance safety trips.
  14. 24V output to cycle a motorized water valve or other device with compressor contactor.
  15. Unit Performance Sentinel (UPS). The UPS warns when the heat pump is running inefficiently.
  16. Water coil low-temperature sensing (selectable for water or antifreeze).
  17. Air coil low-temperature sensing.
  18. Removable thermostat connector.
  19. Night setback control.
  20. Random start on return from night setback.
  21. Minimized reversing-valve operation (Unit control logic shall only switch the reversing valve when cooling is demanded for the first time. The reversing valve shall be held in this position until the first call for heating, ensuring quiet operation and increased valve life.).
  22. Override temperature control with 2-hour timer for room occupant to override setback temperature at the thermostat.
  23. Dry contact night setback output for digital night setback thermostats.
  24. Ability to work with heat pump (Y, O) or heat/ cool (Y, W) type thermostats.
  25. Ability to work with heat pump thermostats using O or B reversing valve control.
  26. Emergency-shutdown contacts.
  27. Boilerless system heat control at low loop water temperature.
  28. Ability to allow up to three units to be controlled by one thermostat.
  29. Relay to operate an external damper.
  30. Ability to automatically change fan speed from multi-stage thermostat.
  31. Relay to start system pump.

32. 75VA control transformer. Control transformer shall have load side short circuit and overload protection via a built in circuit breaker.
    - a. NOTE: Units not providing the eight safety protections of anti-short cycle, low voltage, high voltage, high refrigerant pressure, low pressure (loss of charge), air coil low temperature cut-out, water coil low temperature cut-out, and condensate overflow protections will not be accepted.
    - b. NOTE: To achieve full benefit of the two-stage compressor and EC fan, a 2-Heat/2-Cool thermostat should be employed.
  - B. When DXM2.5 is connected to AWC99U01 communicating thermostat or handheld service tool, the installer/service technician can:
    1. Check and set CFM and check DIP switch S1, S2, and S3 settings.
    2. Run operation modes manually.
    3. Check all physical inputs from thermostat and refrigerant pressure switches status, (Y1, Y2, W, O, G, H, ESD, NSB, OR, HP switch, and LOC switch).
    4. Current or at time of fault the following temperatures - water coil (LT1), air coil (LT2), compressor discharge, leaving air, leaving water, entering water and control voltage.
    5. Record last five faults, list possible reasons, and clear faults.
  - C. When the AWC99U01 communicating thermostat is used this same functionality can be viewed and adjusted remotely with the only portal or mobile app. Systems not providing remote access, diagnosis, and adjustment functionality will not be accepted.
  - D. This control system coupled with a multi-stage thermostat will better dehumidify room air by automatically running the heat pump's fan at lower speed on the first stage of cooling thereby implementing low sensible heat ratio cooling. On the need for higher cooling performance the system will activate the second stage of cooling and automatically switch the fan to the higher fan speed setting.
  - E. This system may be further enhanced with a humidistat. Units not having automatic low sensible heat ratio cooling will not be accepted; as an alternate a hot gas reheat coil may be provided with a control system for automatic activation.
- 2.8 DIGITAL NIGHT SETBACK WITH PUMPRESTART (DXM2.5 WITH ATP32U03C/04C, AWC99U01)
- A. The unit will be provided with a Digital Night Setback feature using an accessory relay on the DXM2.5 controller with an ATP32U03C/04C or AWC99U01 thermostat and an external, field-provided time clock. The external time clock will initiate and terminate the night setback period. The thermostat will have a night setback override feature with a programmable override time period. An additional accessory relay on the unit DXM2.5 controller will energize the building loop pump control for the duration of the override period. (Note: This feature requires additional low voltage wiring. Consult Application Drawings for details.)

## 2.9 REMOTE SERVICE SENTINEL

- A. The solid-state control system shall communicate with thermostat to display (at the thermostat) the unit status, fault status, and specific fault condition, as well as retrieve previously stored fault that caused unit shutdown. The Remote Service Sentinel allows building maintenance personnel or service personnel to diagnose units from the wall thermostat. The control board shall provide a signal to the thermostat fault light, indicating a lockout.
- B. Upon cycling the G (fan) input three times within a 60 second time period, the fault light shall display the specific code as indicated by a sequence of flashes. A detailed flashing code shall be provided at the thermostat LED to display unit status and specific fault status such as over/under voltage fault, high pressure fault, low pressure fault, low water temperature fault, condensate overflow fault, etc.
  - 1. Units that do not provide this remote service sentinel shall not be acceptable.

#### 2.10 MPC (Multiple Protocol Control) Interface System

- A. Units shall have all the features listed above and the control board will be supplied with a Multiple Protocol interface board. Available protocols are BACnet MS/ TP, Modbus, or Johnson Controls N2. The choice of protocol shall be field selectable/changeable via the use of a simple selector switch. Protocol selection shall not require any additional programming or special external hardware or software tools. This will permit all units to be daisy chain connected by a 2-wire twisted pair shielded cable. The following points must be available at a central or remote computer location:
  - 1. Space temperature.
  - 2. Leaving-water temperature.
  - 3. Discharge-air temperature.
  - 4. Command-of-space temperature setpoint.
  - 5. Cooling status.
  - 6. Heating status.
  - 7. Low-temperature sensor alarm.
  - 8. Low-pressure sensor alarm.
  - 9. High-pressure switch alarm.
  - 10. Condensate-overflow alarm.
  - 11. High-/low-voltage alarm.
  - 12. Fan "ON/AUTO" position of space thermostat as specified above.
  - 13. Unoccupied / occupied command.
  - 14. Cooling command.
  - 15. Heating command.
  - 16. Fan "ON/AUTO" command.
  - 17. Fault-reset command.
  - 18. Itemized fault code revealing reason for specific shutdown fault (any one of seven).

#### 2.11 FIELD-INSTALLED OPTIONS

- A. Hose Kits

1. All units shall be connected with hoses. The hoses shall be 2-feet (61 cm) long, braided stainless steel; fire rated hoses complete with adapters. Only fire rated hoses will be accepted.

B. Valves

1. The following valves are available and will be shipped loose:
  - a. Ball valve; bronze material, standard port full flow design, FPT connections.
  - b. Ball valve with memory stop and PT port.
  - c. "Y" strainer with blowdown valve; bronze material, FPT connections.
  - d. Motorized water valve; slow acting, 24V, FPT connections.
  - e. Hose Kit Assemblies
  - f. The following assemblies ship with the valves already assembled to the hose described:
    - g. Supply and return hoses having ball valve with PT port.
    - h. Supply hose having ball valve with PT port; return hose having automatic flow regulator valve with PT ports, and ball valve.
    - i. Supply hose having "Y" strainer with blowdown valve, and ball valve with PT port; return hose having automatic flow regulator with PT ports, and ball valve.
    - j. Supply hose having "Y" strainer with blowdown valve, and ball valve with PT port; return hose having ball valve with PT port.

2.12 THERMOSTATS

- A. The thermostat shall be a ClimateMaster mechanical or electronic type thermostat as selected below with the described features:
  1. Multi-stage Automatic or Manual Changeover Programmable 7-Day with Humidity Control (ATP32U04C)
    - a. The thermostat shall be 7-day programmable (with up to four setpoints per day), multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO-EM HEAT system settings and fan ON-AUTO settings.
    - b. Separate dehumidification and humidification setpoints shall be configurable for discreet outputs to a dehumidification option and/or an external humidifier.
    - c. Installer configuration mode shall allow the thermostat to operate with EC fan dehumidification mode via settings changes.
    - d. The thermostat shall have a blue backlit dot matrix LCD display with temperature, relative humidity, setpoints, mode, and status indication.
    - e. The temperature indication shall be selectable for °F or °C.
    - f. Time display shall be selectable for 12- or 24-hour clock.
    - g. Fault identification shall be provided to simplify troubleshooting by providing specific unit fault at the thermostat with red backlit LCD during unit lockout.
    - h. The thermostat shall provide permanent memory of setpoints without batteries.
    - i. Thermostat shall provide heating setpoint range limit, cooling setpoint range limit, temperature display offset, keypad lockout, dead-band range setting, and inter-stage differential settings.

- j. The thermostat shall provide progressive recovery to anticipate time required to bring space temperature to the next programmed event.
- k. The thermostat shall provide an installer setup for configuring options and for setup of servicing contractor name and contact information.
- l. The thermostat shall allow the use of an accessory remote and/or outdoor temperature sensor (AST008).
- m. Thermostat navigation shall be accomplished via five buttons (up/down/right/left/select) with menu-driven selections for ease of use and programming.

## 2.13 DDC SENSORS

- A. ClimateMaster wall mounted DDC sensor to monitor room temperature and interfaces with optional interface system described above. Several types as described below:
  - 1. Sensor **with setpoint adjustment and override, LCD display, status/fault indication (MPC). (ADDENDUM 01)**

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for piping and electric installations for water-source unitary heat pumps to verify actual locations of piping connections and electrical conduits before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Suspend water-source, unitary heat pumps from structure with all-thread hanger rods and vibration hangers.
- B. Install wall-mounting thermostats and switch controls in electrical outlet boxes at heights to match lighting controls.

### 3.3 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties. Specific connection requirements are as follows:

1. Connect supply and return hydronic piping to heat pump with unions and shutoff valves or hose kits.
- B. Install electrical devices furnished by manufacturer but not specified to be factory mounted.
- C. Install piping adjacent to machine to allow space for service and maintenance.

### 3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- B. Perform the following field tests and inspections:
  1. After installing heat pumps and after electrical circuitry has been energized, test units for compliance with requirements.
  2. Inspect for and remove shipping bolts, blocks, and tie-down straps.
  3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
  4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Heat pumps will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

### 3.5 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
  1. Complete installation and startup checks according to manufacturer's written instructions.
  2. Inspect for visible damage to unit casing.
  3. Inspect for visible damage to compressor and coils.
  4. Inspect internal insulation.
  5. Verify that labels are clearly visible.
  6. Verify that clearances have been provided for servicing.
  7. Verify that controls are connected and operable.
  8. Adjust vibration isolators.
  9. Start unit according to manufacturer's written instructions.
  10. Complete startup sheets and attach copy with Contractor's startup report.
  11. Inspect and record performance of interlocks and protective devices; verify sequences.
  12. Operate unit for an initial period as recommended or required by manufacturer.
  13. Verify thermostat calibration.

14. Inspect controls for correct sequencing of heating, refrigeration, and normal and emergency shutdown.

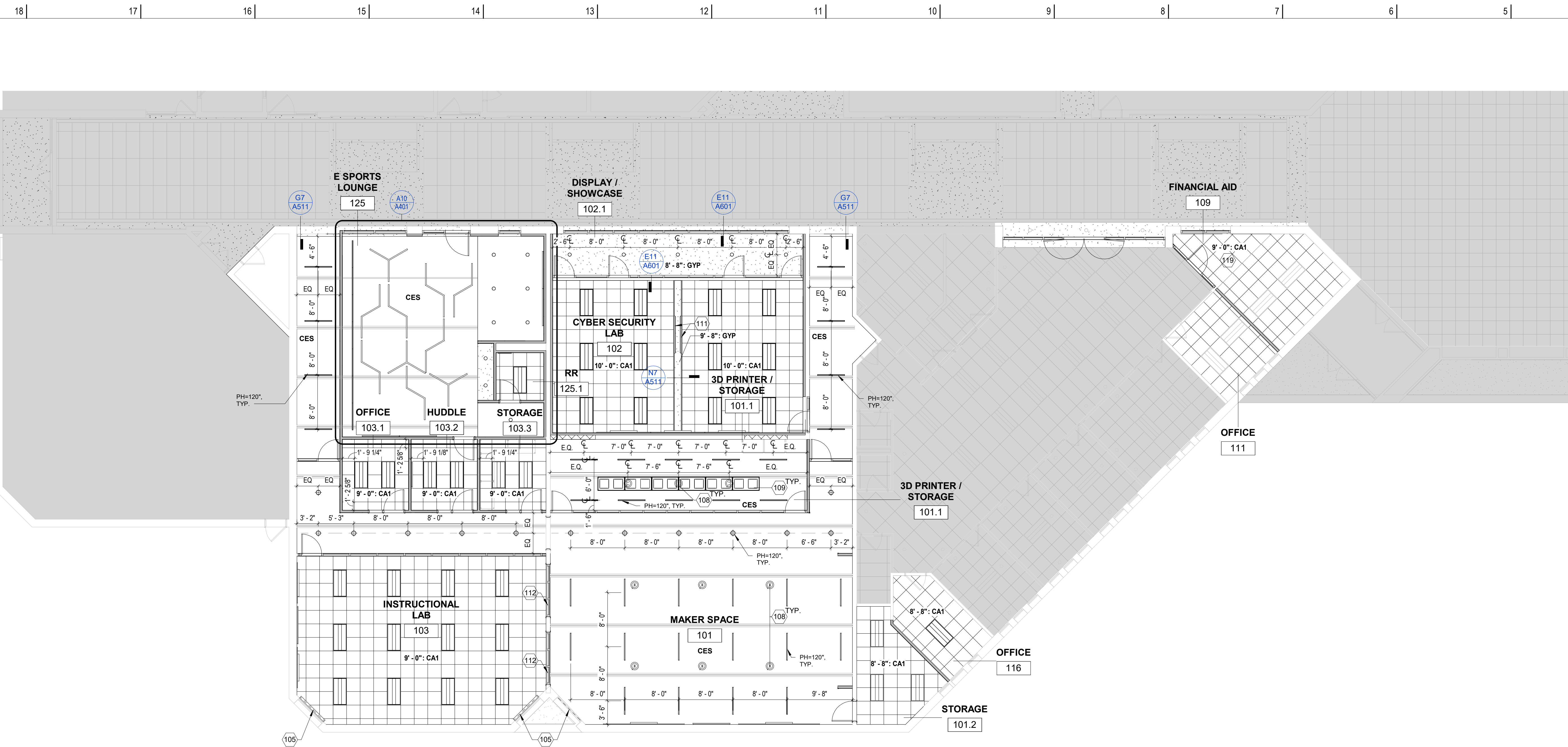
### 3.6 ADJUSTING

- A. Adjust initial temperature set points.
- B. Set field-adjustable switches and circuit-breaker trip ranges as indicated.
- C. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

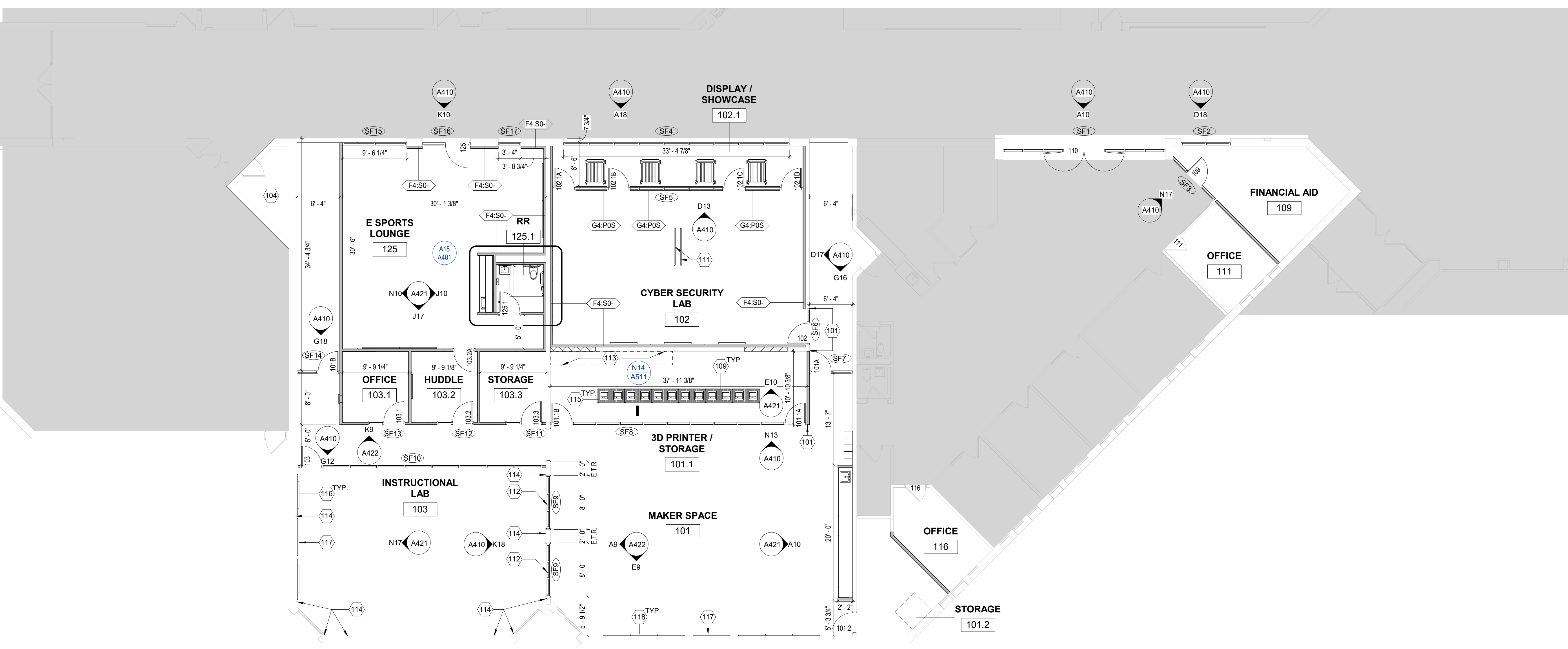
### 3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain water-source unitary heat pumps.

END OF SECTION 23 81 46



**H18 A101 1/8" = 1'-0"**  
**FIRST FLOOR - REFLECTED CEILING PLAN**



**A18 A101 1/8" = 1'-0"**  
**FIRST FLOOR - FLOOR PLAN**

**ARCHITECTURAL PLAN NOTES**

- A. REFERENCE G SERIES SHEETS FOR GENERAL PROJECT NOTES AND LEGENDS.
- B. REFERENCE SHEET A700 FOR FINISH LEGEND.
- C. ALL NEW PARTITIONS NOT INDICATED WITH A WALL TYPE TAG ON THIS PLAN ARE TO BE TYPE G3-S0 (PARTITION BETWEEN TWO SPACES), UNLESS NOTED OTHERWISE. ALL FURRED OUT PARTITIONS ARE TYPE F4-S0 (PARTITION DIVIDING A SPACE AND A COLUMN OR OTHER NON-OCCUPIED SPACE), UNLESS NOTED OTHERWISE ON THIS PLAN. ALL PARTITION INFILL FROM DEMOLISHED DOORS ARE TO MATCH THE EXISTING ADJACENT WALL TYPE. REFERENCE SHEET G201 FOR PARTITION LEGEND AND TYPES.
- D. DIMENSIONS INDICATED ON PLANS ARE TO FINISHED FACE OF PARTITION AND/OR COLUMN CENTERLINE, UNLESS NOTED OTHERWISE.
- E. WHERE COLUMN WRAPS HAVE ONLY ONE PARTITION TAG, THAT PARTITION TAG IS TYPICAL OF THE ENTIRE WRAP, UNLESS NOTED OTHERWISE.
- F. PROVIDE IN-WALL FIRE RETARDANT TREATED (FRT) BLOCKING FOR ALL WALL-MOUNTED ITEMS NOTED AND ALL CASEWORK/MILLWORK, GENERAL CONTRACTOR TO COORDINATE ALL BLOCKING WITH MILLWORK CONTRACTOR, GENERAL CONTRACTOR TO COORDINATE LOCATION AND QUANTITY OF OWNER FURNISHED CONTRACTOR INSTALLED (OFCI) ITEMS WITH THE OWNER.
- G. DOOR OPENINGS NOT LOCATED BY DIMENSION SHALL BE 4" FROM THE FACE OF FINISHED PARTITION TO OUTSIDE EDGE OF DOOR FRAME / JAMB AT HINGE SIDE.
- H. PLUMBING FIXTURES: SINKS, DRINKING FOUNTAINS, WATER CLOSETS AND URINALS ARE TO BE CENTERED WITH CABINETS, BETWEEN PARTITIONS, TOILET PARTITIONS OR FRAMED OPENINGS, UNLESS INDICATED OTHERWISE.
- I. REFERENCE THIS PLAN FOR LOCATIONS OF ALL LEVEL FIVE FINISHES.
- J. REFERENCE FINISH PLAN AND FINISH LEGEND FOR FINISH LOCATED ON THESE WALLS.
- K. REFERENCE FINISH PLANS FOR LOCATIONS OF ALL CORNER GUARDS.

**SHEET KEYNOTES**

- 101 ALIGN.
- 104 NEW IT RACK, OFCI.
- 105 OT1 - SURFACE MOUNTED MANUALLY-OPERATED WINDOW ROLLER SHADE; SEE A700 FOR ADDITIONAL INFORMATION.
- 108 SUSPENDED PENDANT LIGHT FIXTURE. SEE ELECTRICAL DRAWINGS.
- 109 48" x 24" x 72" FOUR-POST SHEET STEEL SHELVING 3D PRINTER STORAGE.
- 111 CEILING MOUNTED TELEVISION/DISPLAY MONITOR TO BE RELOCATED FROM EXISTING LOCATION IN CURRENTLY CYBER SECURITY LAB; PROVIDE BLOCKING PER MOUNTING BRACKET MANUFACTURER'S RECOMMENDATIONS. MOUNTING BRACKET AND ALL POWER/COMMUNICATIONS CONNECTIONS TO BE OFCI; REFER TO ELECTRICAL DRAWINGS.
- 112 BID ALTERNATE #1 - PROVIDE POWER-OPERATED OVERHEAD DOORS WITH GLASS PANELS THAT ARE 96" WIDE X 104 1/2" TALL, AS INDICATED ON DRAWINGS SHEET A601, DETAILS A14, C14, E14 AND H14. COORDINATE FINAL LOCATION OF OPENINGS PRIOR TO DEMOLITION.
- 113 BID ALTERNATE #2 - PROVIDE BASE CABINETS, WALL CABINETS AND COUNTERTOP IN 3D PRINTER/STORAGE 101.1 AS INDICATED IN DRAWINGS DETAIL E10A421.
- 114 BID ALTERNATE #3 - PROVIDE PARTITION TYPE F4A 6" ONE LAYER 5/8x6 GYPSUM WALLBOARD ON 3-5/8x6 METAL STUDS, UP TO 48" ABOVE FINISH CEILING & ON ALL EXPOSED WALLS WITHIN SPACE. FINISH WITH PAINT AND BASE AS INDICATED ON FINISH PLAN. ALL WALL POWER, DATA, DEVICES, ETC. TO BE RECESSED AS APPLICABLE WITHIN WALL CONSTRUCTION.
- 115 FOUR-POST SHEET STEEL SHELVING FOR 3D PRINTER TO BE BOLTED TO THE CONCRETE SLAB IN ADDITION TO BEING AFFIXED TO THE STRUCTURE ABOVE VIA UNISTRUT SYSTEM. SEE DETAIL N14/A511 FOR UNISTRUT ATTACHMENT METHOD.
- 116 48" x 72" WHITEBOARD & TACKBOARD, OFCI.
- 117 75" FLAT SCREEN TELEVISION, OFCI COORDINATE POWER & DATA REQUIREMENTS WITH ELECTRICAL DRAWINGS.
- 118 48" x 144" WHITEBOARD & TACKBOARD, OFCI.
- 119 EXTEND GRID IN THIS AREA TO MATCH ADJACENT EXISTING TO REMAIN CONDITION. INFILL NEW PORTION OF GRID WITH OWNER FURNISHED ATTC STOCK TILE.

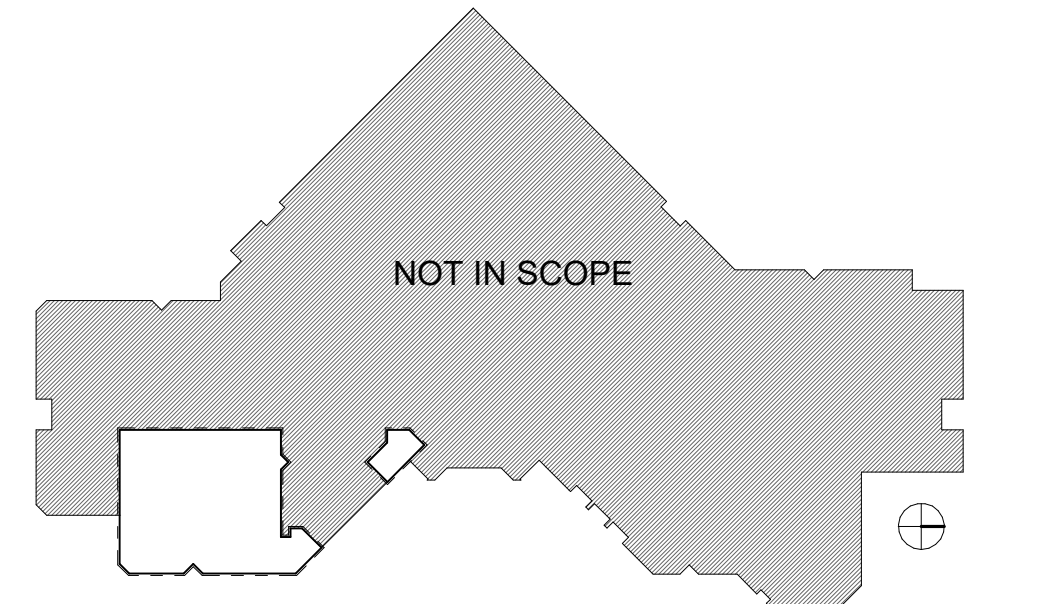
**REFLECTED CEILING PLAN LEGEND**

- 1'-0": CLG1 CEILING HEIGHT AND TYPE TAG
- 2'-0" X 2'-0" GRID WITH ACOUSTICAL PANELS - REFERENCE FINISH TAG AND LEGEND
- 2'-0" X 4'-0" GRID WITH ACOUSTICAL PANELS - REFERENCE FINISH TAG AND LEGEND
- GYPSUM BOARD CEILING (PAINTED)
- RECESSED 2'-0" X 4'-0" FIXTURE
- RECESSED DOWNLIGHT FIXTURE
- PENDANT FIXTURE - LINEAR
- PENDANT FIXTURE - DECORATIVE (VARIES) PH=XX" PENDANT HEIGHT AFF TO UNDERSIDE
- EMERGENCY LIGHT FIXTURE
- MECHANICAL SUPPLY DIFFUSER
- MECHANICAL RETURN DIFFUSER
- ACCESS PANEL

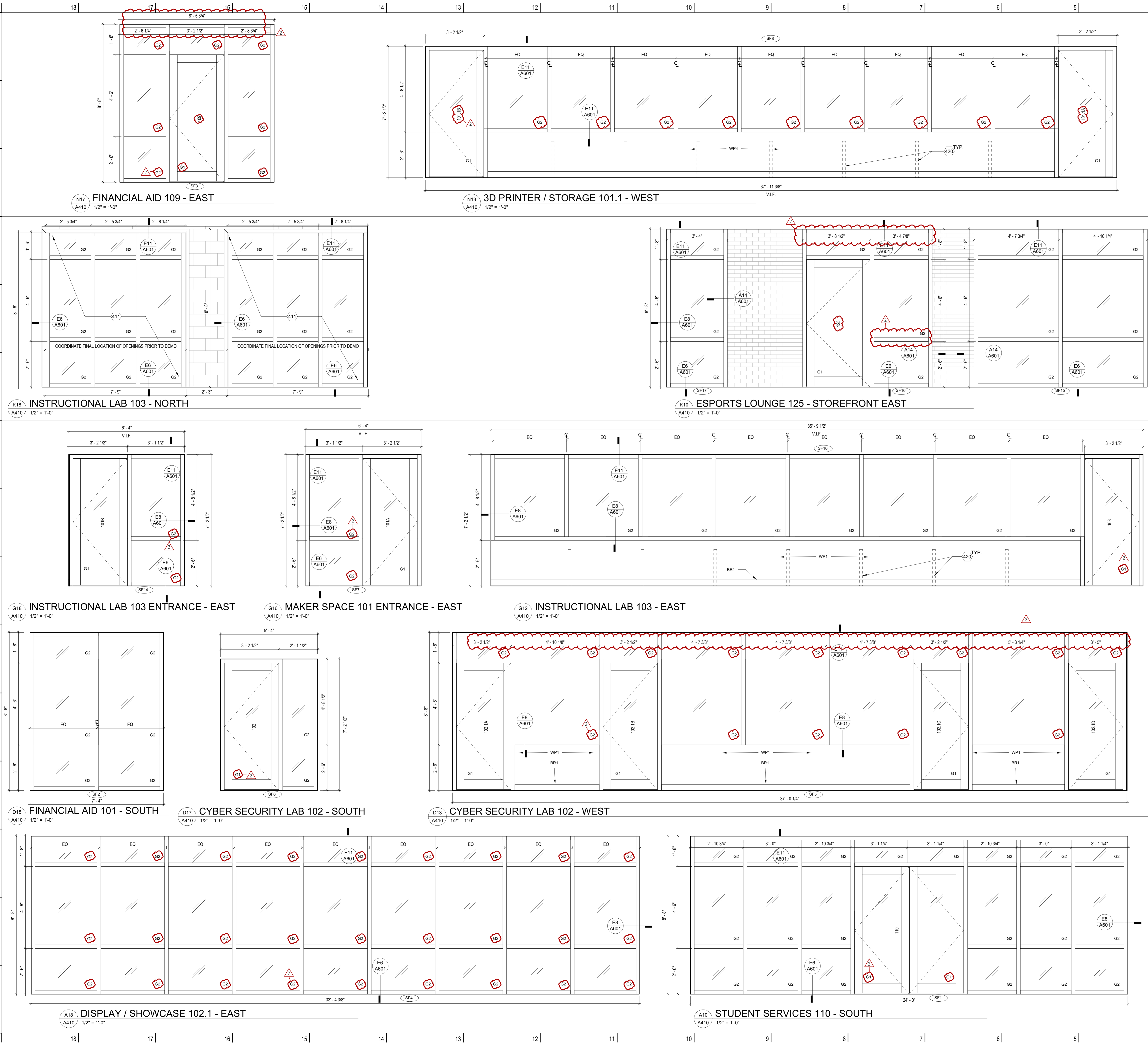
**ARCHITECTURAL PLAN LEGEND**

- EXISTING TO REMAIN
- NEW CONSTRUCTION
- 1-HR RATED ASSEMBLY
- 2-HR RATED ASSEMBLY
- HATCH AREA NOT IN ARCHITECTURAL SCOPE
- REFERENCE MEP DRAWINGS FOR NON-ARCHITECTURAL SCOPE IN THESE AREAS

**KEY PLAN**



This document is the property of BDP Architecture, Inc. Neither the document nor the information contained herein may be copied, reproduced, or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without the written consent of BDP Architecture, Inc.



### GENERAL INTERIOR ELEVATION NOTES

- A. REFERENCE G SERIES SHEETS FOR PROJECT NOTES AND PLAN SHEETS FOR ARCHITECTURAL NOTES.
- B. REFER TO PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION RELATED TO ASSOCIATED WORK NOT INDICATED ON THESE DRAWINGS.
- C. REFERENCE SPECIFICATIONS FOR GENERAL AND SUPPORT INFORMATION. REFERENCE AWS (ARCHITECTURAL WOODWORKING STANDARDS) CUSTOM GRADE REQUIRED AS MINIMUM OR AS INDICATED IN SPECIFICATIONS.
- D. PROVIDE IN-WALL FIRE RETARDANT TREATED (FRT) BLOCKING FOR ALL WALL-MOUNTED ITEMS NOTED AND ALL CASEWORK/MILLWORK. GENERAL CONTRACTOR TO COORDINATE ALL BLOCKING WITH MILLWORK CONTRACTOR.
- E. REFERENCE FINISH LEGEND ON SHEET A700 FOR THE FINISH INFORMATION.
- F. PROVIDE FILLER PANELS WHERE CABINETS TERMINATE INTO A SIDE PARTITION. FILLERS TO BE A MAXIMUM OF 1" WIDE UNLESS INDICATED OTHERWISE ON ELEVATION.
- G. ALIGN FINISHED END OF WALL CABINETS ABOVE WITH FINISHED END OF BASE CABINETS BELOW WHERE SHOWN IN ELEVATIONS.
- H. FINISH ALL EXPOSED EDGES OF COUNTERTOPS AND BACKSIDE SPLASHES.
- I. ALL CASEWORK IS FLUSH OVERLAY UNLESS NOTED AND/OR DETAILED OTHERWISE.
- J. COORDINATE ALL CABINET LOCKING REQUIREMENTS WITH ARCHITECT AND OWNER PRIOR TO FABRICATIONS.
- K. EXTEND SCHEDULED FLOORING UNDER ALL MILLWORK TO PARTITION, U.N.O.
- L. ALL CASEWORK TO RECEIVE RESILIENT BASE ON TOE KICKES AND ON FINISHED END PANELS. BR1, U.N.O.
- M. CONFIRM SIZES AND CLEARANCE REQUIREMENTS OF ALL EQUIPMENT, APPLIANCES AND PLUMBING FIXTURES PRIOR TO PREPARATION OF CASEWORK SHOP DRAWINGS.
- N. ITEMS IDENTIFIED AS "EQUIPMENT/FURNITURE, OFO" ARE SHOWN FOR REFERENCE ONLY.

### SHEET KEYNOTES

- 411. BASE BID: THE WALL SEPARATING MAKERS SPACE 101 AND INSTRUCTIONAL LAB 103 IS TO HAVE TWO WINDOW OPENINGS THAT ARE 8'-0" X 8'-8" TALL WITH ALUMINUM FRAME AND 1/2" TEMPERED GLAZING. BID ALTERNATE #1 - PROVIDE POWER-OPERATED OVERHEAD DOORS WITH GLASS PANELS THAT ARE 96" WIDE X 104" TALL, AS INDICATED ON DRAWINGS SHEET A601, DETAILS A14, C14, E14 AND H14. COORDINATE FINAL LOCATION OF OPENINGS PRIOR TO DEMOLITION.
- 420. PROVIDE PONY WALL SUPPORT MEMBER 48" O.C.

### GLAZING LEGEND

- G1: 1/4" CLEAR TEMPERED SAFETY GLASS
- G2: 1/2" CLEAR TEMPERED SAFETY GLASS

**SOUTHERN STATE COMMUNITY COLLEGE**

**BHPDP ARCHITECTURE**  
COLUMBUS, OH 43201  
RALEIGH, OH 43081  
www.bhpdp.com

**DELMAX CONSTRUCTION SERVICES LLC**  
1555 Shaw Ct., East, Ulen, OH 43079  
+1 614 748 6233

**ADVANCED ENGINEERING CONSULTANTS**  
1405 S. Ash St., Columbus, OH 43215  
+1 614 896 2172

01.08.2026  
10.31.2025  
Date

2 / ADDENDUM 01  
1. BID & PERMIT DOCUMENTS  
Issue/Revision/Submission  
No.

Southern State Community College Renovations  
100 Hobart Dr., Hillsboro, OH 45133

**GLAZING / STOREFRONT ELEVATIONS**

Paul B. Gribble  
PAUL B. GRIBBLE  
REGISTERED ARCHITECT  
No. 127272  
12.7.2025

PROJECT MANAGER  
**B. DARRROW**

DRAWN  
**B. NICHOLS**

CHECKED  
**M. PLOUCHA**

INITIAL DRAWING DATE  
2025.10.31

PROJECT NUMBER  
SSA0201

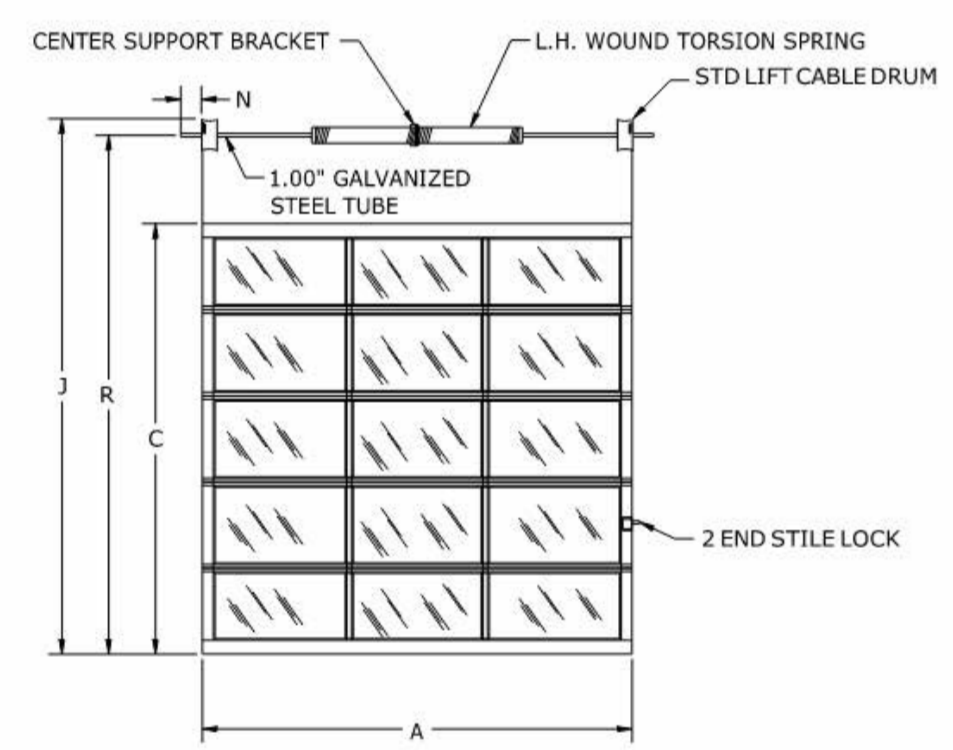
**A410**

Autodesk Docs/Southern State Community College IT Center of Excellence/SSA0201-ARCH.rvt 1/12/2026 5:43:45 AM

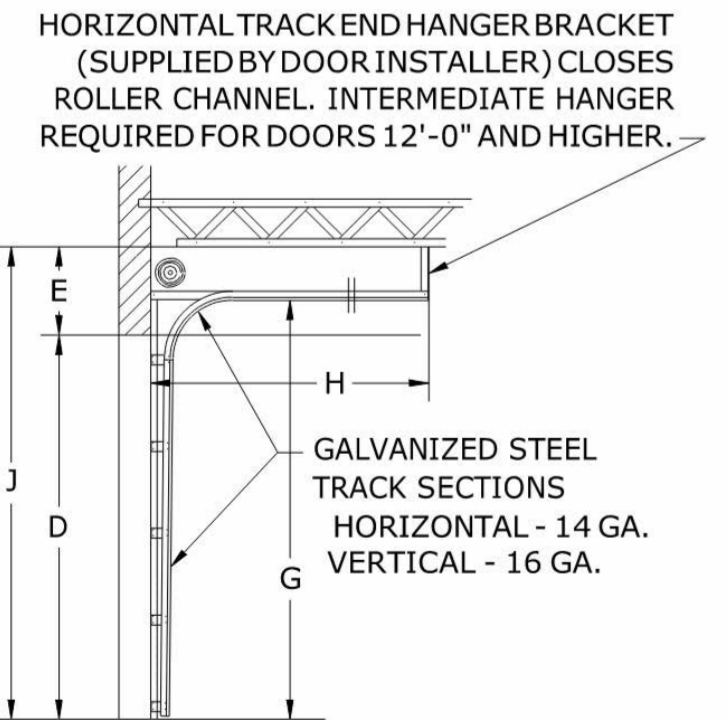
18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1  
 Q  
P  
N  
M  
L  
K  
J  
H  
G  
F  
E  
D  
C  
B  
A  
 Revit 2023 Template Update 2023  
 This document is the property of Baker-Holcomb (Donnelly) Inc. Neither the document nor the information contained herein may be copied or used for other than the specific project for which it was prepared without the written consent of Baker-Holcomb (Donnelly) Inc.

DIM.	DESCRIPTION	DIMENSIONS
A	DOOR WIDTH	8'-0"
B	OPENING WIDTH	8'-2"
C	DOOR HEIGHT	8'-8"
D	OPENING HEIGHT	8'-8"
	QUANTITY OF PANELS WIDE	3
	QUANTITY OF SECTIONS HIGH	5
E	HEADROOM (MIN.)	1'-3.5"
F	JAMB HEIGHT (MIN.)	9'-11.5"
G	OVERHEAD CLEARANCE	9'-3"
H	BACKROOM (MIN.)	11'-5"
J	FLOOR TO CEILING (MIN.)	9'-11.5"
K	SPRING PAD OFFSET 1	5'-6"
L	SPRING PAD OFFSET 2	
M	TRACK SIDEROOM	0'-4.5"
N	COUNTERBALANCE SIDEROOM	0'-4.5"
R	SHAFT CENTER LINE	9'-6.5"
S	TRACK BACKROOM	0'-4.5"

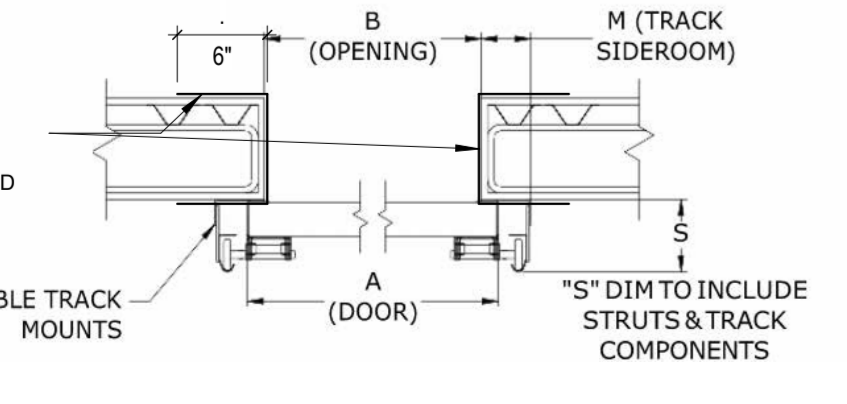
**J18**  
A601  
**ALT 1 - OVERHEAD DOOR DIMENSIONS**  
1" = 1'-0"



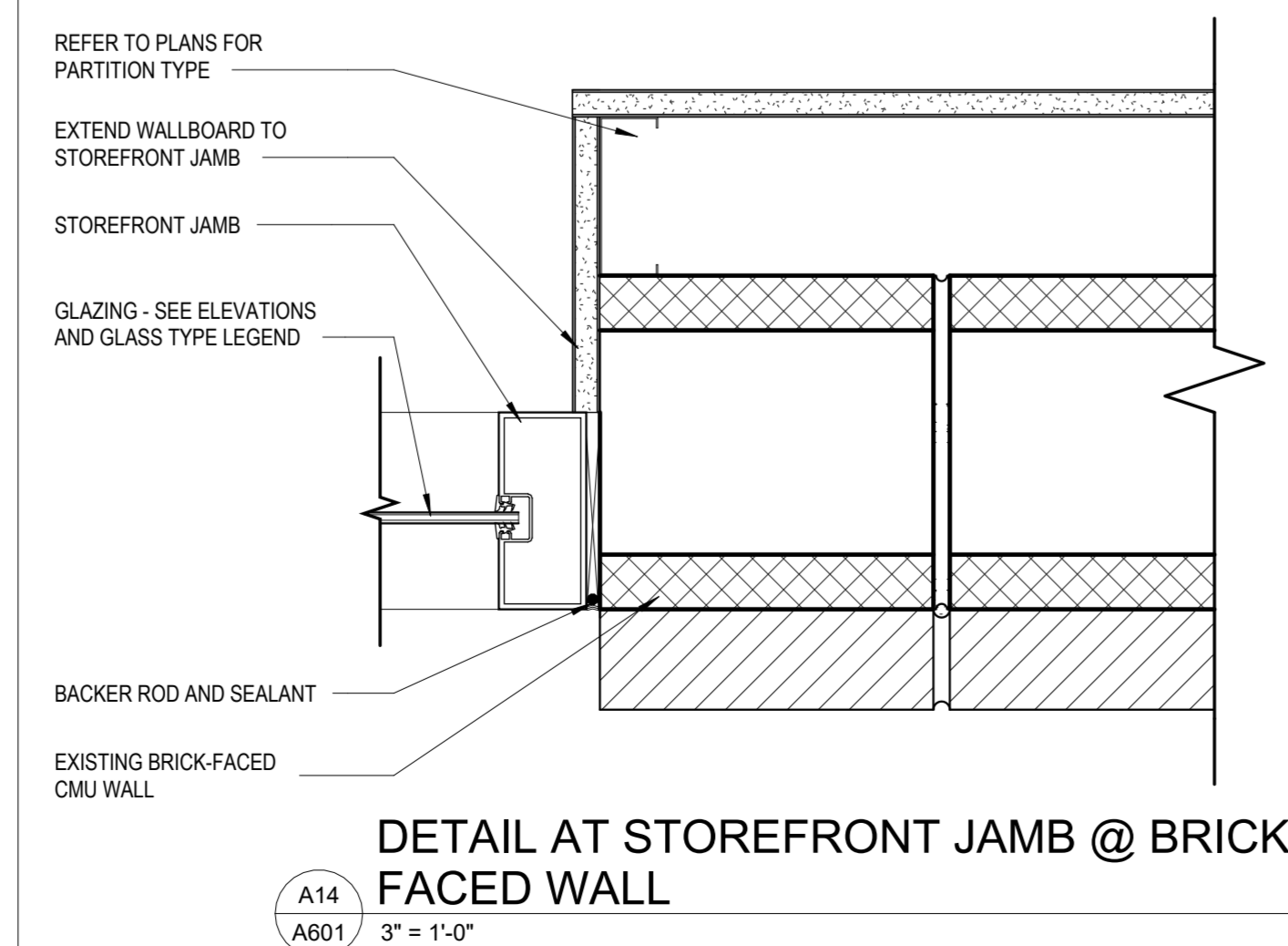
**F18**  
A601  
**ALT 1 - OVERHEAD DOOR ELEVATION DETAIL**  
1" = 1'-0"



**C18**  
A601  
**ALT 1 - OVERHEAD DOOR TRACK DETAIL**  
1" = 1'-0"



**A18**  
A601  
**ALT 1 - OVERHEAD DOOR JAMB DETAIL**  
1" = 1'-0"



**A14**  
A601  
**DETAIL AT STOREFRONT JAMB @ BRICK FACED WALL**  
3" = 1'-0"

MARK	FIRE RATING	OPENING			FRAME			DETAILS			HARDWARE SET				
		WIDTH	HEIGHT	TYPE	MATERIAL	FINISH	GLAZING	TYPE	MATERIAL	FINISH		GLAZING	HEAD	JAMB	SILL
101.1A		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	E11/A601	E8/A601	E6/A601	8.0
101.1B		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	E11/A601	E8/A601	E6/A601	8.0
101.2		3'-0"	7'-0"	FG	HM	PT	G1	1	HM	PT	G2	C8/A601	A8/A601		9.0
101A		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	E11/A601	E8/A601	E6/A601	4.0
101B		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	E11/A601	E8/A601	E6/A601	4.0
102		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	E11/A601	E8/A601	E6/A601	5.0
102.1A		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	E11/A601	E8/A601	E6/A601	8.0
102.1B		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	E11/A601	E8/A601	E6/A601	8.0
102.1C		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	E11/A601	E8/A601	E6/A601	8.0
102.1D		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	E11/A601	E8/A601	E6/A601	8.0
103		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	E11/A601	E8/A601	E6/A601	8.0
103.1		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	C8/A601	A8/A601		2.0
103.2		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	C8/A601	A8/A601		2.0
103.2A		3'-0"	7'-0"	HG	HM	PT	G1	1	HM	PT	G2	C8/A601	A8/A601		10.0
103.3		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	C8/A601	A8/A601		1.0
109		3'-0"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	C8/A601	A8/A601		8.0
110		6'-0"	7'-0"	FG2	AL	PF	G1	SF	AL	PF	G2	E11/A601	E8/A601	E6/A601	7.0
125		3'-6"	7'-0"	FG	AL	PF	G1	SF	AL	PF	G2	C8/A601	A8/A601		3.0
125.1		3'-0"	7'-0"	F	HM	PT	G1	1	HM	PT	G2	C8/A601	A8/A601		11.0

**GENERAL DOOR SCHEDULE NOTES**

A. ALL HARDWARE TO MEET ADA REQUIREMENTS AND BE LEVER HANDLE OPERATED, UNO.

B. EGRESS DOOR MUST BE READILY OPENED FROM THE SIDE FROM WHICH EGRESS IS TO BE MADE AT ALL TIMES WHEN THE SPACE SERVED IS OCCUPIED.

C. SOUND BATTS OMITTED FROM HEAD, JAMB AND SILL DETAILS FOR CLARITY.

D. ALL DOORS SHALL BE 1 3/4" THICK.

E. ALL DOORS TO ALLOW CLEARANCE AT DOOR BOTTOM AS REQUIRED FOR PROPER OPERATION.

F. ALL NARROW LITE GLASS SIZE TO MATCH EXISTING DOORS.

G. DOORS TO BE CONNECTED TO NEW ELECTRONIC DOOR ACCESS SYSTEM AND EXISTING FIRE ALARM RELAY PANEL.

H. NEW WOOD DOOR FINISH AND TYPE TO MATCH EXISTING ADJACENT WOOD DOORS.

**SCHEDULE NOTES**

1. PROVIDE NEW TRANSFER GRILL IN EXISTING HOLLOW METAL DOOR. PAINT TO MATCH NEW DOOR FINISH.

2. INSTALL SECURE ACCESS KEY SWITCH.

**DOOR TYPES**

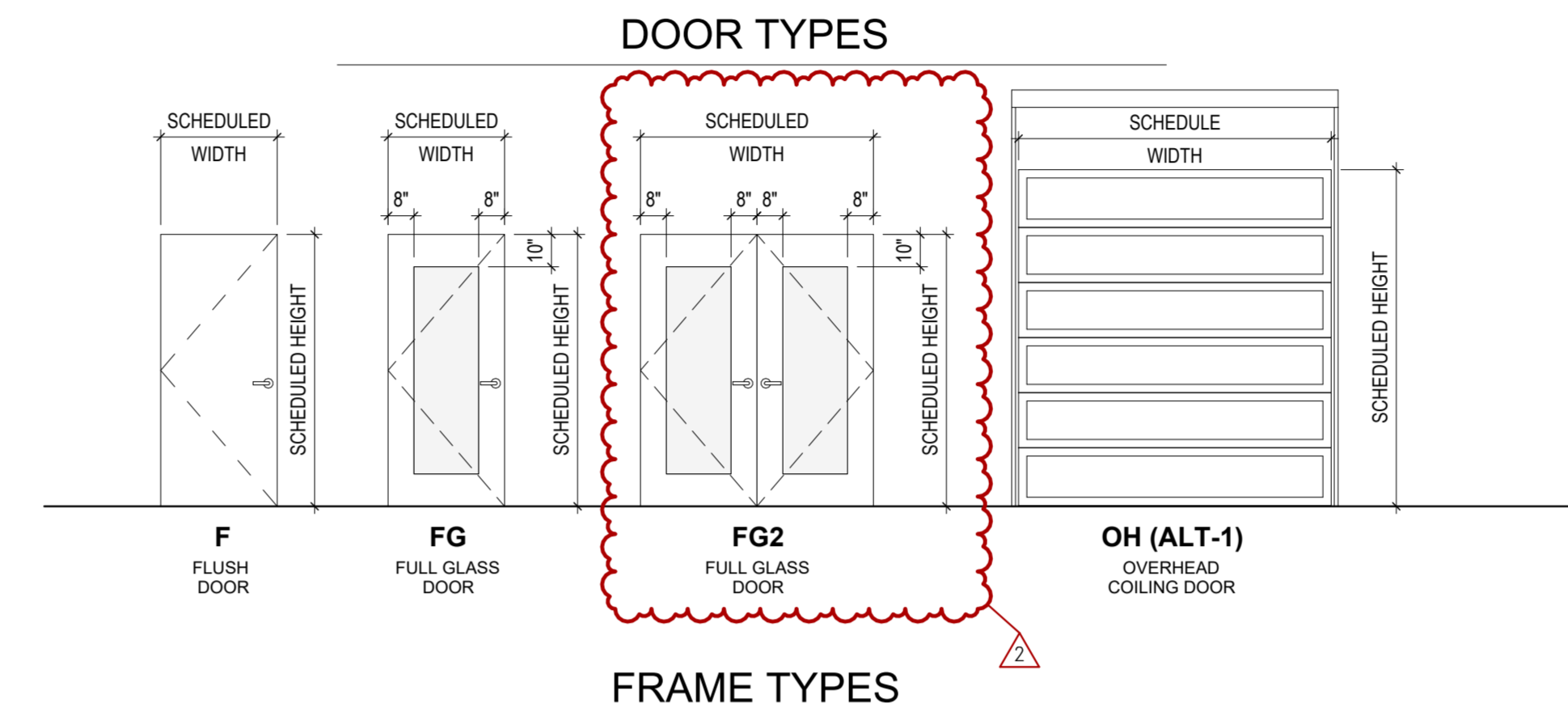
F: FLUSH  
F2: DOUBLE FLUSH  
FG: FULL GLASS  
HG: HALF GLASS  
NL: NARROW LITE

**DOOR & FRAME MATERIALS**

PT = PAINT  
PF = PREFINISHED, ANODIZED ALUMINUM  
HM = HOLLOW METAL  
WD = WOOD

**DOOR HARDWARE**

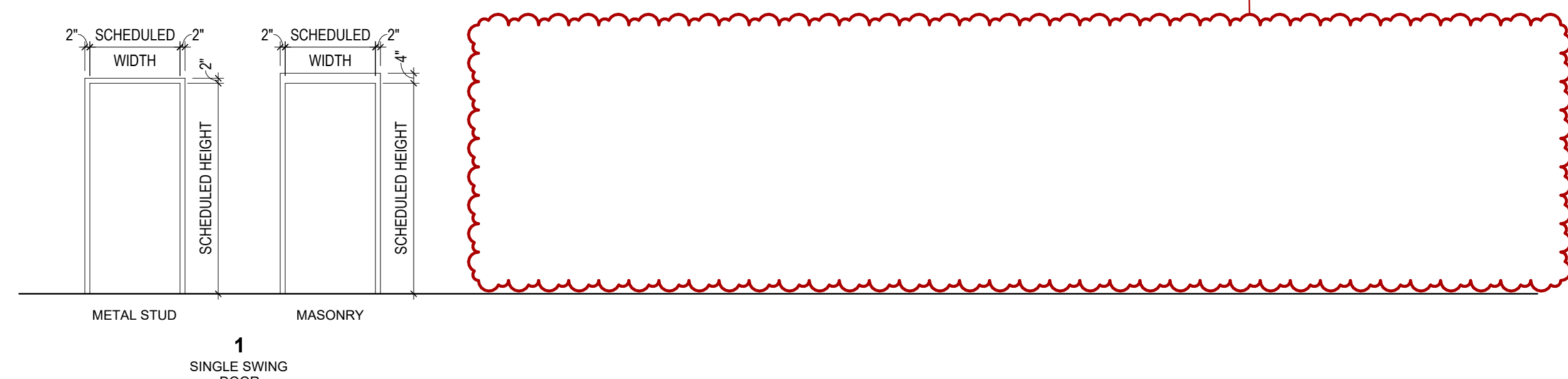
BB = BALL BEARING



**FRAME NOTES**

1. FRAME WIDTHS ARE 2" FOR HOLLOW METAL FRAMES.

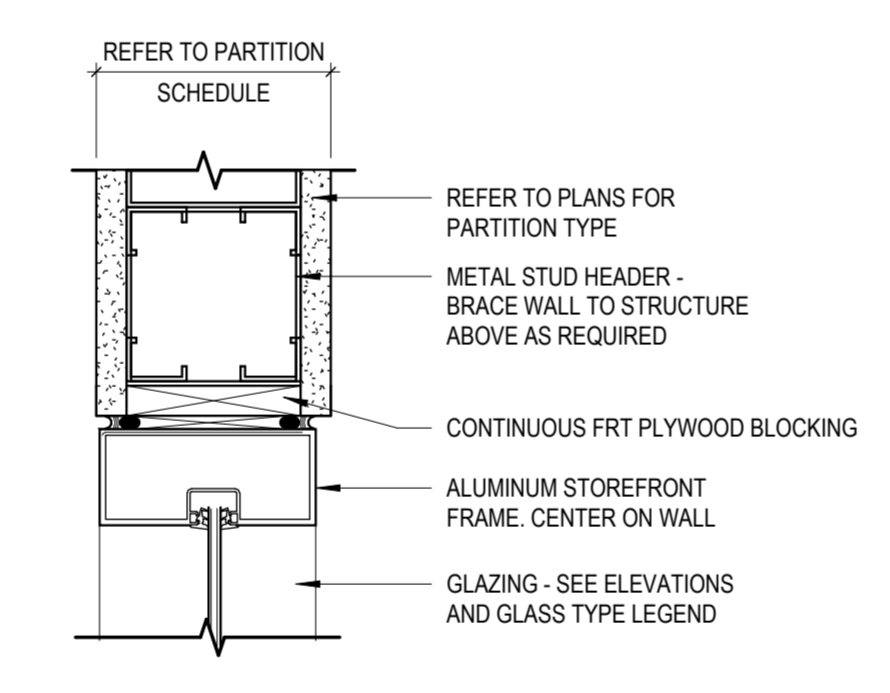
2. FRAME HEAD HEIGHTS AT HOLLOW METAL DOORS SET IN MASONRY ARE 4"



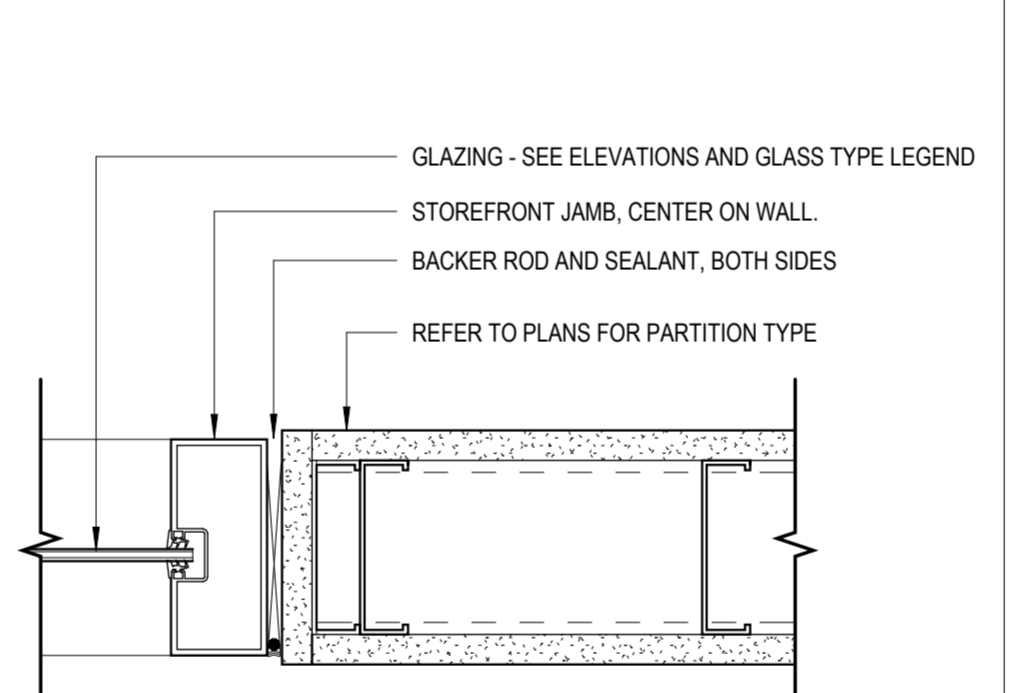
**GLAZING TYPES**

G1 1/4" CLEAR TEMPERED SAFETY GLASS

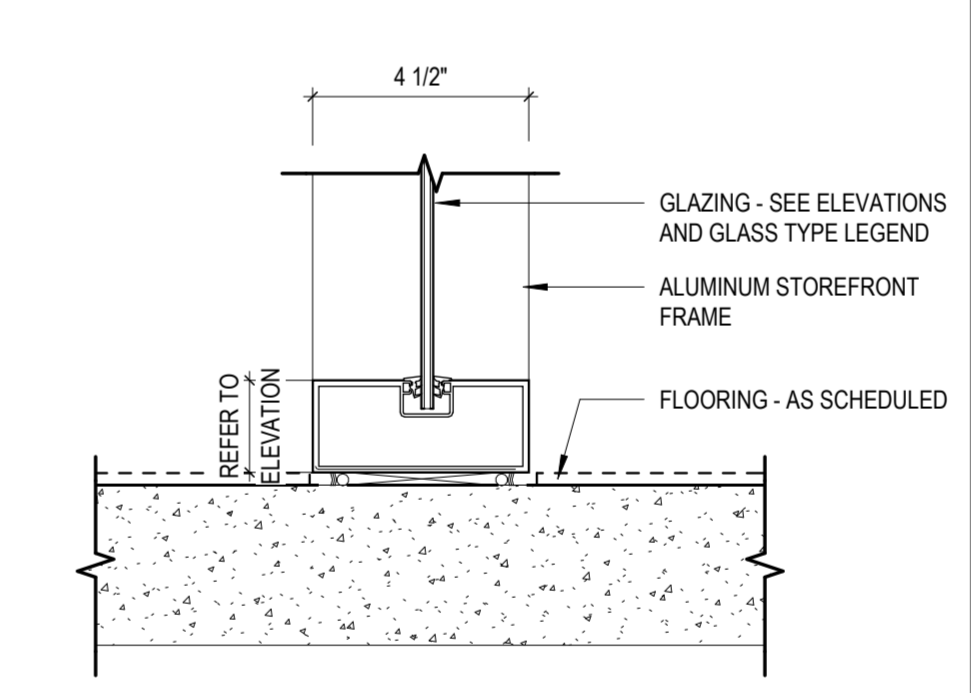
G2 1/2" CLEAR TEMPERED SAFETY GLASS



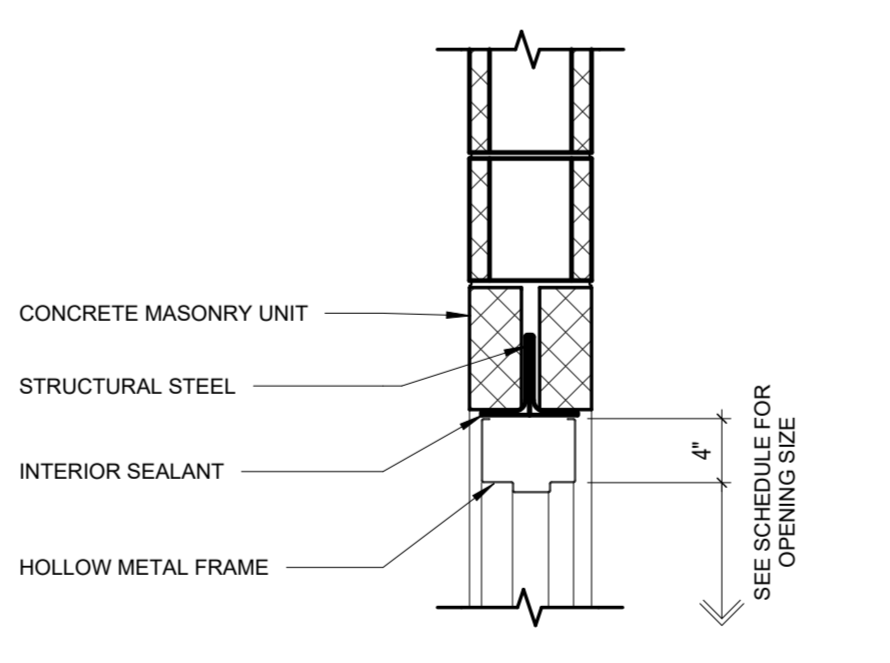
**E11**  
A601  
**DETAIL AT STOREFRONT HEAD & SILL**  
3" = 1'-0"



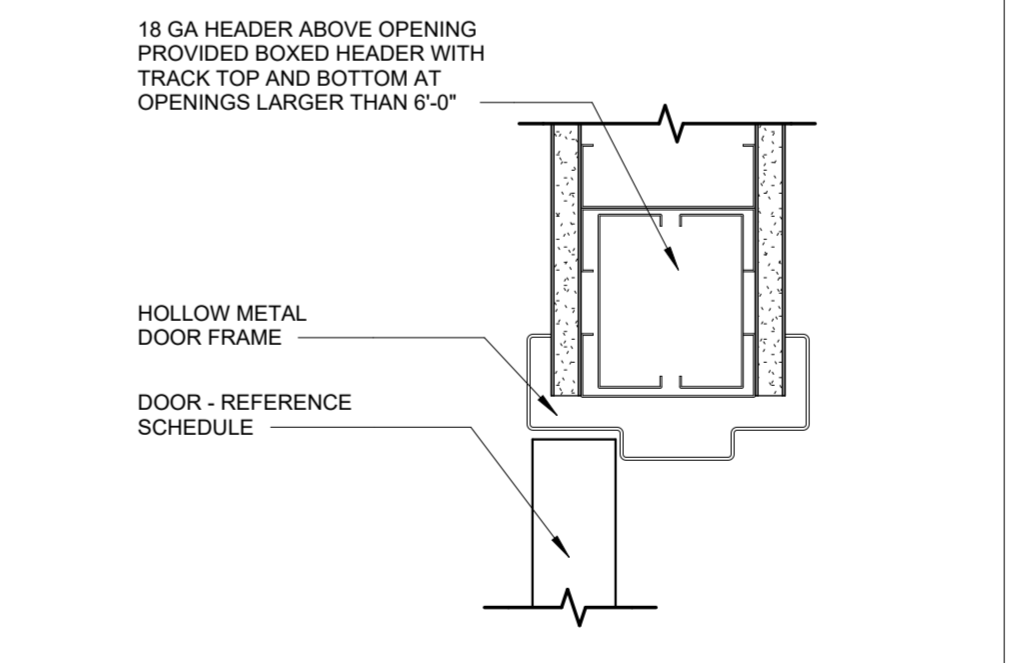
**E8**  
A601  
**DETAIL AT STOREFRONT JAMB**  
3" = 1'-0"



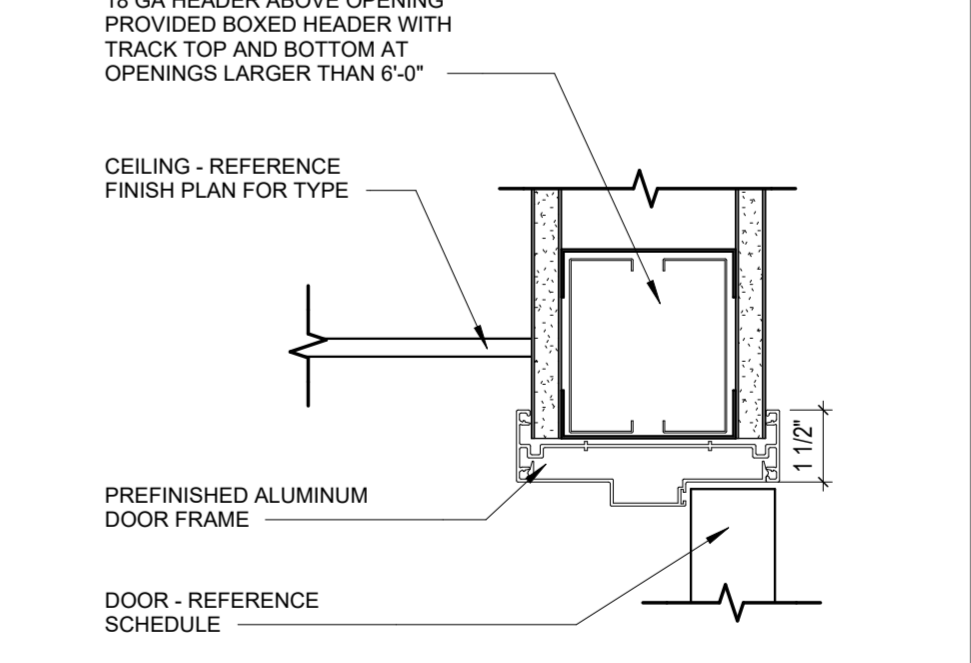
**E6**  
A601  
**DETAIL AT STOREFRONT SILL**  
3" = 1'-0"



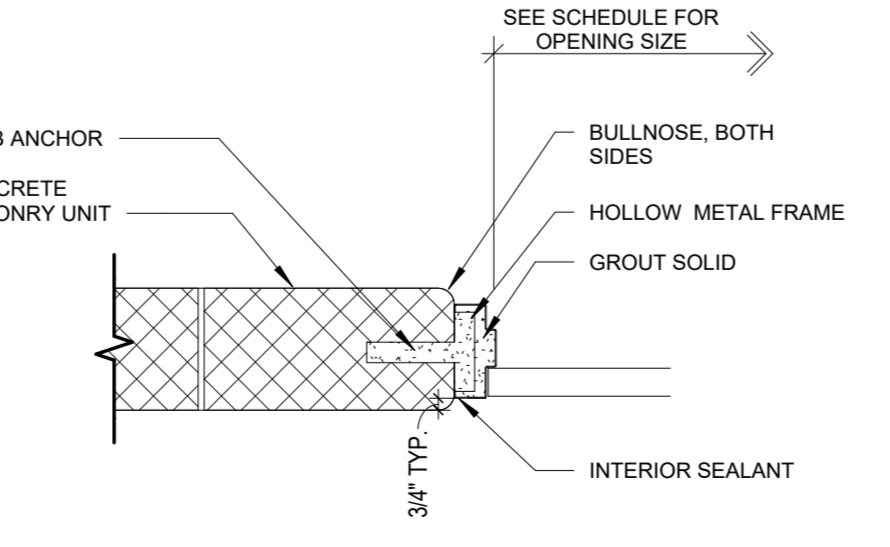
**C11**  
A601  
**DOOR HEAD DETAIL**  
1" = 1'-0"



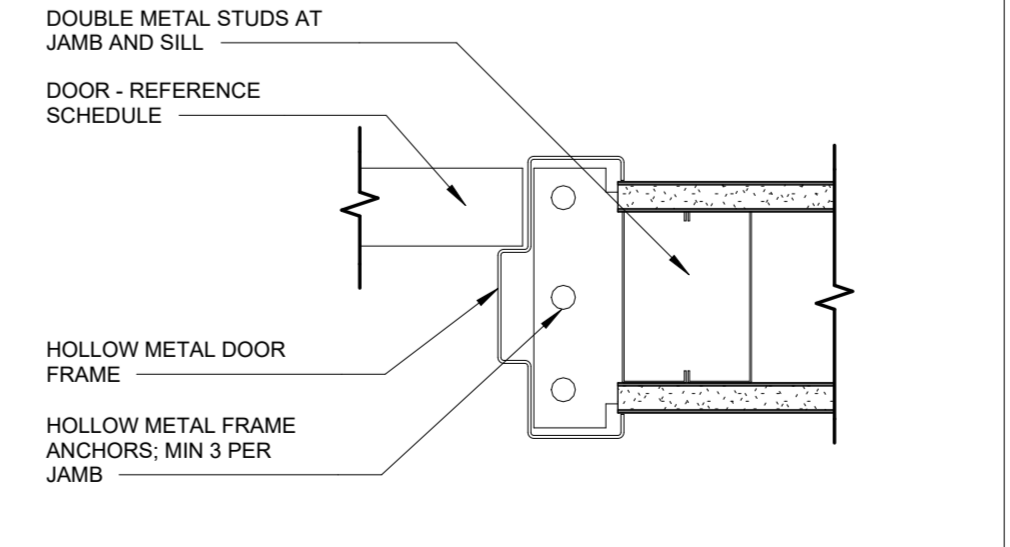
**C8**  
A601  
**DETAIL AT HM HEAD**  
3" = 1'-0"



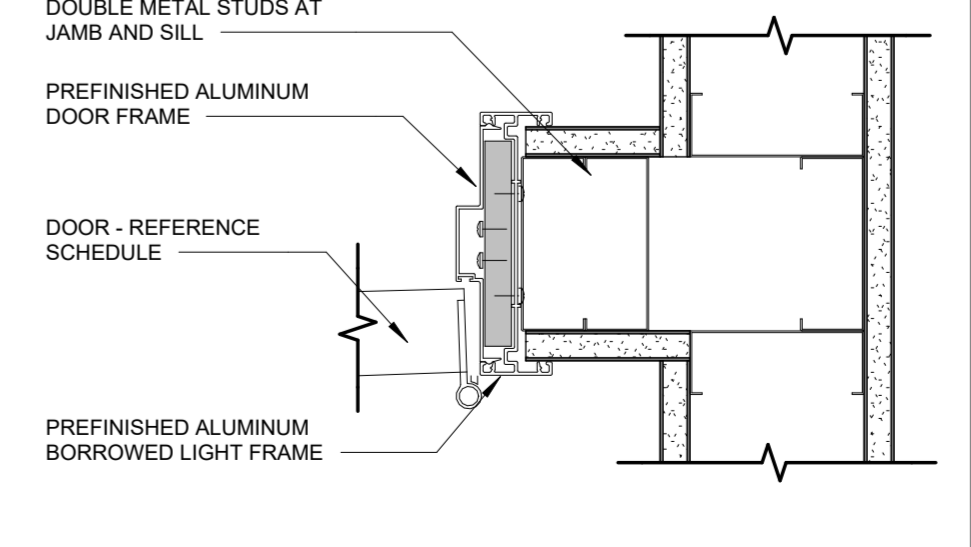
**C6**  
A601  
**DETAIL AT AL HEAD**  
3" = 1'-0"



**A11**  
A601  
**CMU DOOR JAMB DETAIL**  
1" = 1'-0"

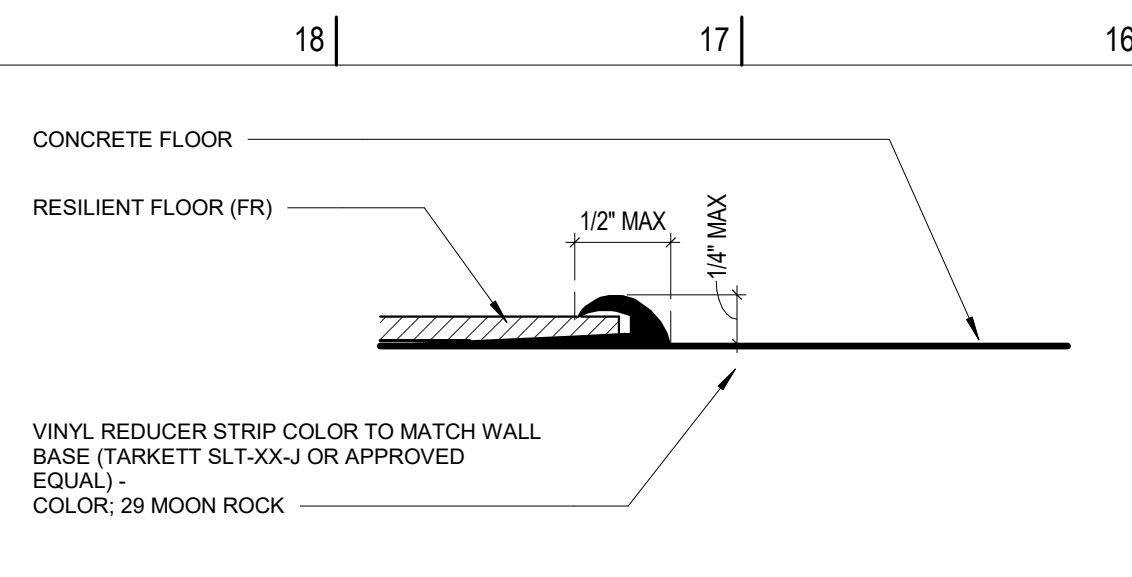


**A8**  
A601  
**DETAIL AT HM JAMB**  
3" = 1'-0"



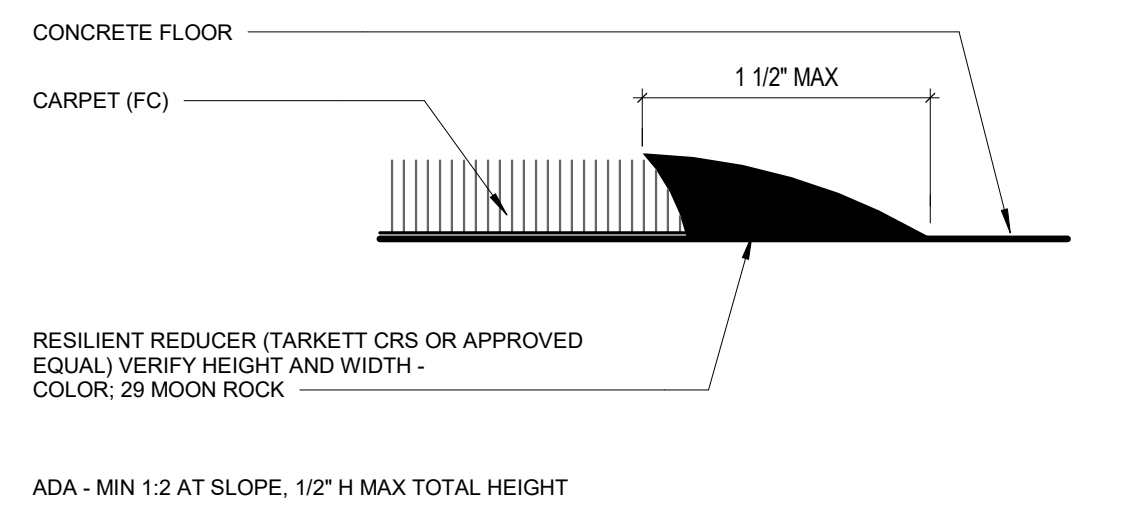
**A6**  
A601  
**DETAIL AT AL JAMB**  
3" = 1'-0"

**SOUTHERN STATE COMMUNITY COLLEGE**  
 BHPD ARCHITECTURE  
 COLUMBUS, OH 43201  
 CHARLOTTE, NC 28202  
 www.bhp.com  
 DELMAX CONSTRUCTION SERVICES LLC  
 1550 Shaw Ct., Ste. 100, Ulenia, OH 43075  
 +1 614 896 1712  
 ADVANCED ENGINEERING CONSULTANTS  
 1405 S. 4th St., Ste. 100, Columbus, OH 43215  
 +1 614 896 1712  
 01.08.2025  
 10.31.2025  
 Date  
 ADDENDUM 01  
 1 BIG & PERMIT DOCUMENTS  
 2 No.  
 Issue/Revision/Submission  
 Southern State Community College Renovations  
 100 Hobart Dr., Hillsboro, OH 45133  
 OPENING SCHEDULES, ELEVATIONS, AND DETAILS  
 Paul B. Gribak  
 P.E. REGISTERED ARCHITECT  
 10.27.2025  
 PROJECT MANAGER  
**B. DARROW**  
 DRAWN  
**B. NICHOLS**  
 CHECKED  
**M. PLOUCHA**  
 INITIAL DRAWING DATE  
 2025.10.31  
 PROJECT NUMBER  
 SSA0201  
**A601**  
 1/12/2026 5:41:37 AM



RESILIENT TO CONCRETE

N18 FT - RESILIENT TO CONCRETE A700 1/2" = 1'-0"



CARPET TO CONCRETE

K18 FT - CARPET TO CONCRETE A700 1/2" = 1'-0"

FLOORS (F):

Table for Floor Carpet (FC) with details for FC1: Interface Modern Trio Collection, 250M X 1M, Ashlar finish.

Table for Floor Resilient (FR) with details for FR1: Nora by Interface Noraplan Sentic, 3.0MM thickness, 1-22M sheet width.

Table for Floor Resilient (FR) with details for FR2: Nora by Interface Noraplan Sentic, 3.0MM thickness, 1-22M sheet width.

Table for Floor Resilient (FR) with details for FR3: Nora by Interface Noraplan Sentic, 3.0MM thickness, 1-22M sheet width.

Table for Floor Resilient (FR) with details for FR4: Nora by Interface Noraplan Sentic, 3.0MM thickness, 1-22M sheet width.

Table for Floor General (FG) with details for FG1: Polished concrete w/ penetrating stain, 4th Cove finish.

Table for Specialty Products (SP) with details for SP1: CS Group Acrovyn Corner Guard, 8" length, 1-1/2" leg.

FINISH LEGEND

Table for Walls (W) with details for WP1: Sherwin Williams Sw7013 Ivory Lace, Eggshell finish.

Table for Walls (W) with details for WP2: Sherwin Williams Sw6959 Blue Chip, Eggshell finish.

Table for Walls (W) with details for WP3: Sherwin Williams Sw6871 Positive Red, Eggshell finish.

Table for Walls (W) with details for WP4: Sherwin Williams Sw7069 Iron Ore, Eggshell finish.

Table for Walls (W) with details for WP5: Sherwin Williams Sw7069 Iron Ore, Semi-gloss finish.

Table for Wall Tile (WT) with details for WT1: DalTile Color Wheel Linear, Black K11, Glossy finish.

Table for Laminate (L) with details for L1: Formica Inked Oak, Pure Grain finish.

Table for Laminate (L) with details for L2: Formica Scandi Rift Oak, Oiled Wood Finish.

Table for Solid Sheet / Slab (SS) with details for SS1: Wilsonart Solid Surface, Grey Lace 923433.

Table for Opening Treatment (OT) with details for OT1: Mechoshade Ecovex 1550 Series, 3% openness.

CEILING (C):

Table for Ceiling Acoustic (CA) with details for CA1: Armstrong Ultima 1913Lec, 24" x 24" square.

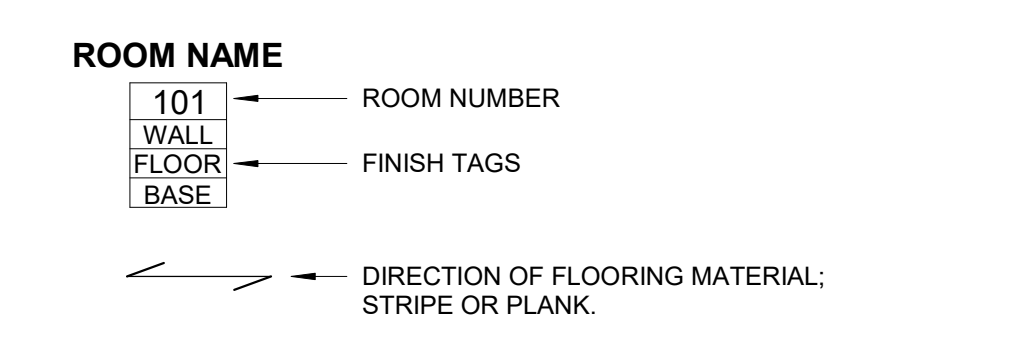
Table for Ceiling Paint (CP) with details for CP1: Sherwin Williams Sw7007 Ceiling Bright White, Flat finish.

Table for Ceiling Exposed (CES) with details for CES: Exposed structure, Dryfall paint to match WP4.

FINISH PLAN NOTES

- Notes A through P detailing finish requirements, transition strips, leveling materials, and material specifications.

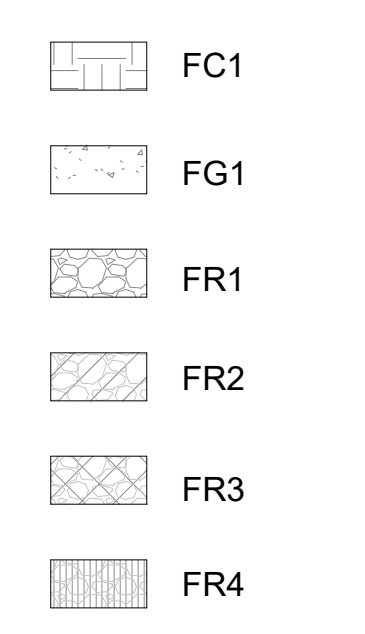
FLOOR FINISH PLAN KEY



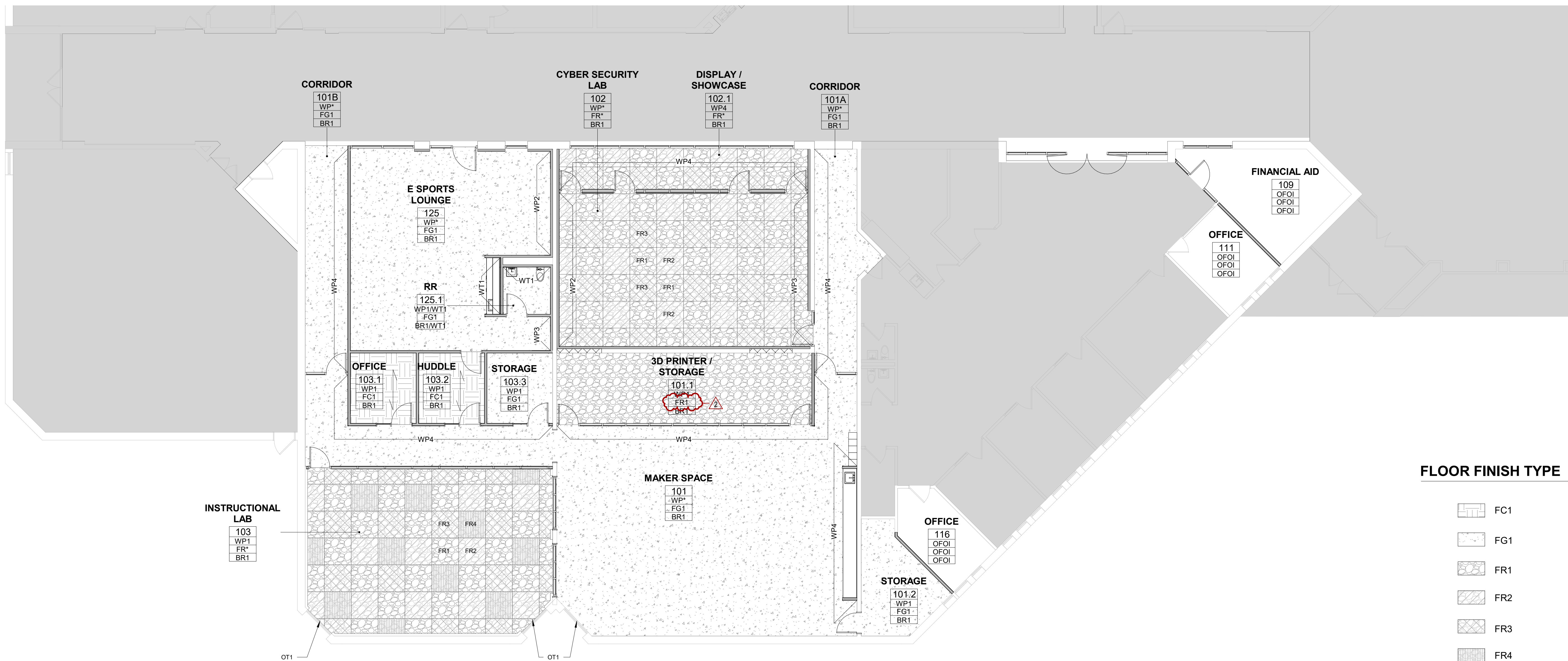
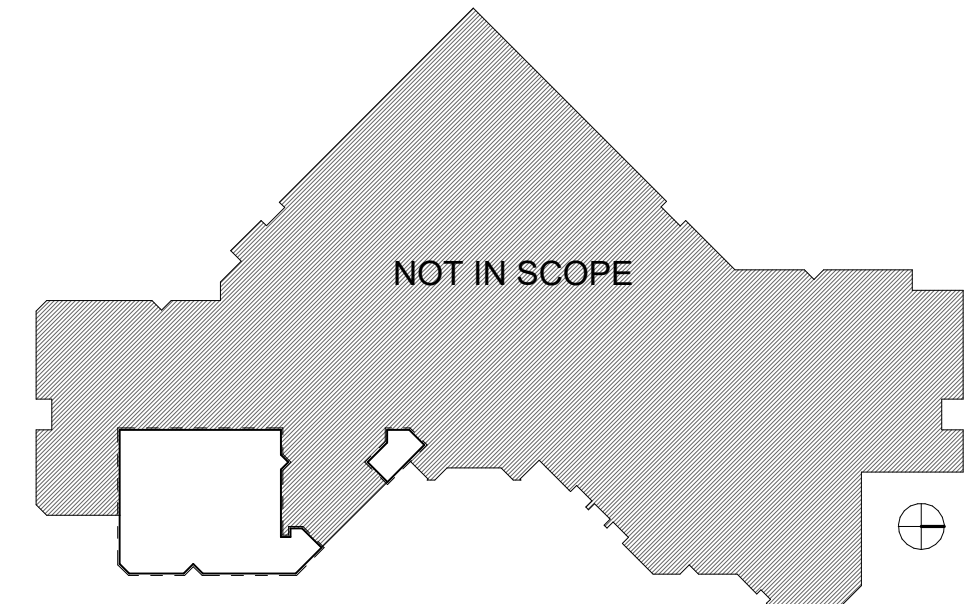
FINISH AND MATERIAL ABBREVIATIONS

- Legend for finish abbreviations: FC (Carpet), FG (General - Concrete), FR (Resilient Floor - Rubber), WP (Paint), WT (Tile), BR (Resilient), CA (Acoustic Tile Ceiling), CES (Exposed Ceiling to Structure), SP (Specialty Product - Screen, Resin, 3D), L (Plastic Laminate), SS (Sheet/Slab - Stone, Quartz, Solid Surface), OT (Opening Treatments - Shades, Drapes, Blinds).

FLOOR FINISH TYPE



KEY PLAN



A18 FIRST FLOOR - FINISH PLAN A700 1/8" = 1'-0"

18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

MECHANICAL SYMBOLS LIST		NOT ALL SYMBOLS MAY BE USED	
GENERAL LINE STYLES		PIPING	
---	NEW WORK (VISIBLE)	---	PIPE CAPPED
---	EXISTING WORK (VISIBLE)	---	PIPE DROP
---	EXISTING WORK (HIDDEN)	---	PIPE RISE
---	EXISTING TO BE DEMOLISHED	---	PIPE TEE DOWN
---	FUTURE	---	PIPE TEE UP
GENERAL		PIPING	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	KEYNOTE		PIPE CAPPED
	REVISION TRIANGLE		PIPE DROP
	CONNECT TO EXISTING		PIPE RISE
	BEGINNING AND/OR END OF DEMOLITION (ONLY USED WHERE CLARIFICATION IS NEEDED)		PIPE TEE DOWN
	PHOTO CALLOUT		PIPE TEE UP
DUCTWORK		PIPING	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AND OUTDOOR AIR RECTANGULAR DUCT ELBOW UP		EXPANSION JOINT
	ROUND/OVAL DUCT ELBOW UP		HEAT TRACED PIPE
	RETURN, RELIEF AND EXHAUST AIR RECTANGULAR DUCT ELBOW UP		GENERAL SERVICE VALVE (SEE SPECS FOR VALVE TYPE PER APPLICATION)
	RETURN, RELIEF AND EXHAUST AIR ROUND/OVAL DUCT ELBOW UP		CHECK VALVE (ARROW INDICATES DIRECTION OF FLOW)
	SUPPLY AND OUTDOOR AIR RECTANGULAR DUCT ELBOW DOWN		STRAINER WITH BLOW DOWN VALVE
	SUPPLY AND OUTDOOR AIR ROUND/OVAL DUCT ELBOW DOWN		PRESSURE REDUCING VALVE
	RETURN, RELIEF AND EXHAUST AIR RECTANGULAR DUCT ELBOW DOWN		RELIEF VALVE
	RETURN, RELIEF AND EXHAUST AIR ROUND/OVAL DUCT ELBOW DOWN		AUTOMATIC AIR VENT
	SUPPLY DIFFUSER WITH FLEXIBLE DUCT TAG - NECK SIZE TAG EXAMPLE: S1-58 AIRFLOW (CFM) 100		MANUAL AIR VENT
	SUPPLY DIFFUSER TAG - NECK SIZE TAG EXAMPLE: S1-58 AIRFLOW (CFM) 100		TEMPERATURE/PRESSURE TEST PLUG (PETE'S PLUG)
	RETURN/EXHAUST GRILLE TAG - NECK SIZE TAG EXAMPLE: R1-22/10 AIRFLOW (CFM) 500 500		PRESSURE GAUGE WITH STOPOCK
	(WITH PLENUM) SIDEWALL SUPPLY DIFFUSER TAG - NECK SIZE TAG EXAMPLE: S2-12/8 AIRFLOW (CFM) 100 100		THERMOMETER
	(WITH PLENUM) SIDEWALL RETURN/EXHAUST GRILLE TAG - NECK SIZE TAG EXAMPLE: R2-10/10 AIRFLOW (CFM) 100 100		DRAIN VALVE WITH HOSE END ADAPTER
	AIRFLOW ARROW		TWO-WAY CONTROL VALVE
	MECHANICAL EQUIPMENT (WITH CLEARANCE SHOWN)		THREE-WAY CONTROL VALVE
	GENERIC FAN		TWO-WAY PRESSURE INDEPENDENT CONTROL AND BALANCE VALVE
	TERMINAL BOXES TERMINAL BOX (WITH REHEAT)		MANUAL BALANCING VALVE
	TERMINAL BOX NOTES 1. IF MIN COOLING CFM IS NOT SHOWN ON PLANS, THEN MIN COOLING CFM IS EQUAL TO 30% OF MAX COOLING CFM. 2. HEATING CFM IS EQUAL TO MIN COOLING CFM.		AUTOMATIC BALANCING VALVE
	DUCTWORK PLANS TAG MAX COOLING CFM / MIN COOLING CFM		PUMP
	PIPING PLANS TAG		STEAM TRAP
	DAMPERS/DUCT ACCESSORIES BDD: BACKDRAFT DAMPER FSD: FIRE/SMOKE DAMPER FD: FIRE DAMPER MD: MOTORIZED DAMPER SD: SMOKE DAMPER VD: VOLUME DAMPER SB: SECURITY BARS		BACK PRESSURE REGULATING VALVE
	ACCESS DOOR		STACK/LOW PREVENTER
			SIGHT FLOW INDICATOR
			CLEAN OUT
GENERAL LINE STYLES		CONTROLS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	NEW WORK (VISIBLE)		HUMIDISTAT WITH ADJUSTABLE CONTROL
	EXISTING WORK (VISIBLE)		THERMOSTAT WITH ADJUSTABLE CONTROL
	EXISTING WORK (HIDDEN)		HUMIDITY SENSOR
	EXISTING TO BE DEMOLISHED		TEMPERATURE SENSOR
	FUTURE		HYDROGEN SENSOR
	KEYNOTE		CARBON DIOXIDE SENSOR
	REVISION TRIANGLE		CARBON MONOXIDE SENSOR
	CONNECT TO EXISTING		NITROGEN DIOXIDE SENSOR
	BEGINNING AND/OR END OF DEMOLITION (ONLY USED WHERE CLARIFICATION IS NEEDED)		OCCUPANCY SENSOR
	PHOTO CALLOUT		AIR FLOW MEASURING DEVICE
	SUPPLY AND OUTDOOR AIR RECTANGULAR DUCT ELBOW UP		AIR SWITCH
	ROUND/OVAL DUCT ELBOW UP		CONDUCTIVITY TRANSMITTER
	RETURN, RELIEF AND EXHAUST AIR RECTANGULAR DUCT ELBOW UP		CURRENT SENSOR
	RETURN, RELIEF AND EXHAUST AIR ROUND/OVAL DUCT ELBOW UP		DIFFERENTIAL PRESSURE TRANSMITTER
	SUPPLY AND OUTDOOR AIR RECTANGULAR DUCT ELBOW DOWN		ELECTRONICALLY COMMUTATED MOTOR
	SUPPLY AND OUTDOOR AIR ROUND/OVAL DUCT ELBOW DOWN		END SWITCH
	RETURN, RELIEF AND EXHAUST AIR RECTANGULAR DUCT ELBOW DOWN		FLOW METER
	RETURN, RELIEF AND EXHAUST AIR ROUND/OVAL DUCT ELBOW DOWN		HAND-OFF-AUTO SWITCH
	SUPPLY DIFFUSER WITH FLEXIBLE DUCT TAG - NECK SIZE TAG EXAMPLE: S1-58 AIRFLOW (CFM) 100		LEVEL TRANSMITTER
	SUPPLY DIFFUSER TAG - NECK SIZE TAG EXAMPLE: S1-58 AIRFLOW (CFM) 100		METER
	RETURN/EXHAUST GRILLE TAG - NECK SIZE TAG EXAMPLE: R1-22/10 AIRFLOW (CFM) 500 500		PH TRANSMITTER
	(WITH PLENUM) SIDEWALL SUPPLY DIFFUSER TAG - NECK SIZE TAG EXAMPLE: S2-12/8 AIRFLOW (CFM) 100 100		PRESSURE SWITCH
	(WITH PLENUM) SIDEWALL RETURN/EXHAUST GRILLE TAG - NECK SIZE TAG EXAMPLE: R2-10/10 AIRFLOW (CFM) 100 100		PRESSURE TRANSMITTER
	AIRFLOW ARROW		CONDENSATE
	MECHANICAL EQUIPMENT (WITH CLEARANCE SHOWN)		DUCT MOUNTED SMOKE DETECTOR
	GENERIC FAN		STARTER WITH DISCONNECT
	TERMINAL BOXES TERMINAL BOX (WITH REHEAT)		TEMPERATURE SWITCH
	TERMINAL BOX NOTES 1. IF MIN COOLING CFM IS NOT SHOWN ON PLANS, THEN MIN COOLING CFM IS EQUAL TO 30% OF MAX COOLING CFM. 2. HEATING CFM IS EQUAL TO MIN COOLING CFM.		VARIABLE FREQUENCY DRIVE
	DUCTWORK PLANS TAG MAX COOLING CFM / MIN COOLING CFM		VIBRATION TRANSMITTER
	PIPING PLANS TAG		WATER FLOW SWITCH
	DAMPERS/DUCT ACCESSORIES BDD: BACKDRAFT DAMPER FSD: FIRE/SMOKE DAMPER FD: FIRE DAMPER MD: MOTORIZED DAMPER SD: SMOKE DAMPER VD: VOLUME DAMPER SB: SECURITY BARS		ELECTRONIC PNEUMATIC TRANSDUCER
	ACCESS DOOR		

MECHANICAL ABBREVIATIONS		NOTE: NOT ALL ABBREVIATIONS MAY BE USED.	
ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
(A)	EXISTING TO BE ABANDONED	(I)	EXISTING TO BE ABANDONED
(D)	EXISTING TO BE DEMOLISHED	(R)	FUTURE
(E)	EXISTING TO REMAIN	(AE)	ARCHITECT/ENGINEER
(F)	FUTURE	(AFF)	ABOVE FINISHED FLOOR
(R)	EXISTING TO BE RELOCATED	(AFG)	ABOVE FINISHED GRADE
(AE)	ARCHITECT/ENGINEER	(APD)	AIR PRESSURE DROP
(AFF)	ABOVE FINISHED FLOOR	(AVG)	AVERAGE OR AVERAGING
(AFG)	ABOVE FINISHED GRADE	(BAS)	BUILDING AUTOMATION SYSTEM
(APD)	AIR PRESSURE DROP	(BHP)	BRAKE HORSEPOWER
(AVG)	AVERAGE OR AVERAGING	(BOB)	BOTTOM OF BEAM
(BAS)	BUILDING AUTOMATION SYSTEM	(BOD)	BOTTOM OF DUCT
(BHP)	BRAKE HORSEPOWER	(BOP)	BOTTOM OF PIPE
(BOB)	BOTTOM OF BEAM	(BOS)	BOTTOM OF STRUCTURE
(BOD)	BOTTOM OF DUCT	(BTUH)	BRITISH THERMAL UNITS PER HOUR
(BOP)	BOTTOM OF PIPE	(CAV)	CONSTANT AIR VOLUME
(BOS)	BOTTOM OF STRUCTURE	(CFM)	CUBIC FEET PER MINUTE
(BTUH)	BRITISH THERMAL UNITS PER HOUR	(CMR)	COMPRESSOR
(CAV)	CONSTANT AIR VOLUME	(COP)	COEFFICIENT OF PERFORMANCE
(CFM)	CUBIC FEET PER MINUTE	(DB)	DRY BULB OR DECIBELS
(CMR)	COMPRESSOR	(DDC)	DIRECT DIGITAL CONTROLS
(COP)	COEFFICIENT OF PERFORMANCE	(DIA)	DIAMETER
(DB)	DRY BULB OR DECIBELS	(DN)	DOWN
(DDC)	DIRECT DIGITAL CONTROLS	(EAT)	ENTERING AIR TEMPERATURE
(DIA)	DIAMETER	(ECM)	ELECTRONICALLY COMMUTATED MOTOR
(DN)	DOWN	(EER)	ENERGY EFFICIENCY RATIO
(EAT)	ENTERING AIR TEMPERATURE	(EFF)	EFFICIENCY
(ECM)	ELECTRONICALLY COMMUTATED MOTOR	(EG)	ETHYLENE GLYCOL
(EER)	ENERGY EFFICIENCY RATIO	(ESP)	ENTERING STATIC PRESSURE
(EFF)	EFFICIENCY	(EWT)	ENTERING WATER TEMPERATURE
(EG)	ETHYLENE GLYCOL	(FEI)	FAN EFFICIENCY INDEX
(ESP)	ENTERING STATIC PRESSURE	(FLLA)	FULL LOAD AMPS
(EWT)	ENTERING WATER TEMPERATURE	(FPM)	FEET PER MINUTE
(FEI)	FAN EFFICIENCY INDEX	(FPS)	FEET PER SECOND
(FLLA)	FULL LOAD AMPS	(FT)	FEET
(FPM)	FEET PER MINUTE	(GAL)	GALLONS
(FPS)	FEET PER SECOND	(GPM)	GALLONS PER MINUTE
(FT)	FEET	(HD)	HEAD
(GAL)	GALLONS	(HP)	HORSEPOWER
(GPM)	GALLONS PER MINUTE	(ID)	INNER DIAMETER
(HD)	HEAD	(IEER)	INTEGRATED ENERGY EFFICIENCY RATIO
(HP)	HORSEPOWER	(IN)	INCHES
(ID)	INNER DIAMETER	(IPLV)	INTEGRATED PART LOAD VALUE
(IEER)	INTEGRATED ENERGY EFFICIENCY RATIO	(KW)	KILOWATTS
(IN)	INCHES	(LAT)	LEAVING AIR TEMPERATURE
(IPLV)	INTEGRATED PART LOAD VALUE	(LBS)	POUNDS
(KW)	KILOWATTS	(LWT)	LEAVING WATER TEMPERATURE
(LAT)	LEAVING AIR TEMPERATURE	(MBH)	BRITISH THERMAL UNIT (THOUSAND)
(LBS)	POUNDS	(MCA)	MINIMUM CIRCUIT AMPACITY
(LWT)	LEAVING WATER TEMPERATURE	(MERV)	MINIMUM EFFICIENCY REPORTING VALUE
(MBH)	BRITISH THERMAL UNIT (THOUSAND)	(MOP)	MAXIMUM OVERCURRENT PROTECTION
(MCA)	MINIMUM CIRCUIT AMPACITY	(NA)	NOT APPLICABLE
(MERV)	MINIMUM EFFICIENCY REPORTING VALUE	(NC)	NORMALLY CLOSED OR NOISE CRITERIA
(MOP)	MAXIMUM OVERCURRENT PROTECTION	(NO)	NORMALLY OPEN
(NA)	NOT APPLICABLE	(NPLV)	NONSTANDARD PART LOAD VALUE
(NC)	NORMALLY CLOSED OR NOISE CRITERIA	(NPSH)	NET POSITIVE SUCTION HEAD
(NO)	NORMALLY OPEN	(NTS)	NOT TO SCALE
(NPLV)	NONSTANDARD PART LOAD VALUE	(OD)	OUTSIDE DIAMETER
(NPSH)	NET POSITIVE SUCTION HEAD	(PD)	PRESSURE DROP
(NTS)	NOT TO SCALE	(PG)	PROPYLENE GLYCOL
(OD)	OUTSIDE DIAMETER	(PH)	POUNDS PER HOUR
(PD)	PRESSURE DROP	(PPM)	PARTS PER MILLION
(PG)	PROPYLENE GLYCOL	(PSI)	POUNDS PER SQUARE INCH (GAUGE)
(PH)	POUNDS PER HOUR	(REFRIG)	REFRIGERANT
(PPM)	PARTS PER MILLION	(RH)	RELATIVE HUMIDITY
(PSI)	POUNDS PER SQUARE INCH (GAUGE)	(RPM)	REVOLUTIONS PER MINUTE
(REFRIG)	REFRIGERANT	(SEER)	SEASONAL ENERGY EFFICIENCY RATIO
(RH)	RELATIVE HUMIDITY	(SP)	STATIC PRESSURE
(RPM)	REVOLUTIONS PER MINUTE	(TSP)	TOTAL STATIC PRESSURE
(SEER)	SEASONAL ENERGY EFFICIENCY RATIO	(TYP)	TYPICAL
(SP)	STATIC PRESSURE	(UNO)	UNLESS NOTED OTHERWISE
(TSP)	TOTAL STATIC PRESSURE	(VAV)	VARIABLE AIR VOLUME
(TYP)	TYPICAL	(VFD)	VARIABLE FREQUENCY DRIVE
(UNO)	UNLESS NOTED OTHERWISE	(VRF)	VARIABLE REFRIGERANT FLOW
(VAV)	VARIABLE AIR VOLUME	(W)	WATTS
(VFD)	VARIABLE FREQUENCY DRIVE	(WB)	WET BULB
(VRF)	VARIABLE REFRIGERANT FLOW	(WG)	WATER GAUGE
(W)	WATTS	(WPD)	WATER PRESSURE DROP
(WB)	WET BULB		
(WG)	WATER GAUGE		
(WPD)	WATER PRESSURE DROP		

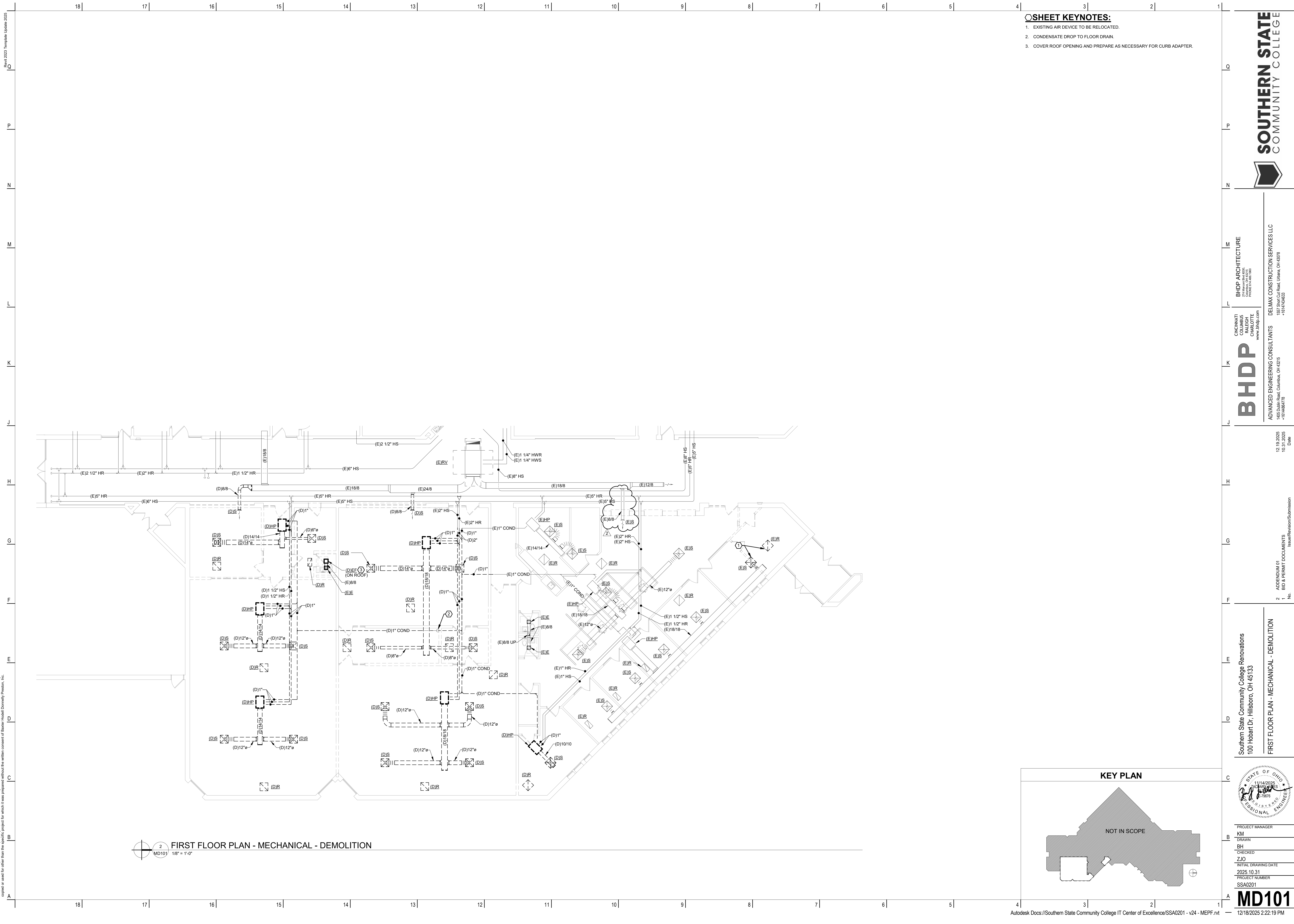
MECHANICAL SYSTEM TYPES		NOTE: NOT ALL ABBREVIATIONS MAY BE USED.	
ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
CA	COMBUSTION AIR	CHR	CHILLED WATER RETURN
CHR	CHILLED WATER RETURN	CHS	CHILLED WATER SUPPLY
CHS	CHILLED WATER SUPPLY	COND	CONDENSATE
COND	CONDENSATE	CR	CONDENSER WATER RETURN
CR	CONDENSER WATER RETURN	CS	CONDENSER WATER SUPPLY
CS	CONDENSER WATER SUPPLY	EA	EXHAUST AIR
EA	EXHAUST AIR	FLUE	FLUE
FLUE	FLUE	GR	GEOTHERMAL RETURN
GR	GEOTHERMAL RETURN	GS	GEOTHERMAL SUPPLY
GS	GEOTHERMAL SUPPLY	HR	HEAT PUMP RETURN
HR	HEAT PUMP RETURN	HS	HEAT PUMP SUPPLY
HS	HEAT PUMP SUPPLY	HWR	HEATING WATER RETURN
HWR	HEATING WATER RETURN	HWS	HEATING WATER SUPPLY
HWS	HEATING WATER SUPPLY	OA	OUTDOOR AIR
OA	OUTDOOR AIR	PC	PUMPED CONDENSATE
PC	PUMPED CONDENSATE	RA	RETURN AIR
RA	RETURN AIR	REF	REFRIGERANT
REF	REFRIGERANT	REL	RELIEF AIR
REL	RELIEF AIR	SA	SUPPLY AIR
SA	SUPPLY AIR		

MECHANICAL SHEET LIST	
SHEET NUMBER	SHEET NAME
M-001	GENERAL INFORMATION - MECHANICAL
MD101	FIRST FLOOR PLAN - MECHANICAL - DEMOLITION
M-101	FIRST FLOOR PLAN - HVAC
M-201	FIRST FLOOR PLAN - HVAC PIPING
M-501	DETAILS - MECHANICAL
M-601	SCHEDULES - MECHANICAL

### GENERAL MECHANICAL NOTES

- VISIT THE SITE OF THE WORK TO GAIN AN ACCEPTABLE KNOWLEDGE OF CONDITIONS AFFECTING THE EXECUTION OF THE WORK. AFTER VISITING THE SITE, REQUEST INFORMATION AND/OR CLARIFICATIONS AS NECESSARY TO FULLY UNDERSTAND THE WORK REQUIRED AND TO PROPERLY ESTIMATE COSTS.
- REVIEW ALL CONSTRUCTION DOCUMENTS TO VERIFY EXTENT AND SCHEDULING OF ALL DEMOLITION ACTIVITIES PRIOR TO COMMENCING WORK. TO AID IN DRAWING CLARITY, ALL EXISTING SYSTEMS MAY NOT BE SHOWN. FIELD VERIFY ALL SIZES AND LOCATIONS OF EXISTING DUCTWORK, PIPING, EQUIPMENT, ETC. NOTIFY ARCHITECT/ENGINEER OF DEVIATIONS WHICH AFFECT RENOVATION WORK PRIOR TO PROCEEDING WITH THE WORK. COORDINATE DISPOSAL/SALVAGE OF ALL FIXTURES, DEVICES, EQUIPMENT, ETC. INDICATED FOR DEMOLITION WITH THE OWNER. ALL EQUIPMENT TO BE REUSED OR RETURNED TO OWNER SHALL BE REMOVED AS TO NOT DAMAGE THE EQUIPMENT OR AFFECT ITS REUSE. IF ANY REUSED OR RETURNED EQUIPMENT OR MATERIAL IS DAMAGED BY THE CONTRACTOR, IT SHALL BE REPLACED BY THE CONTRACTOR, WITH NO EXPENSE TO THE OWNER.
- ITEMS NOTED TO BE DEMOLISHED INCLUDE BUT ARE NOT LIMITED TO ALL ASSOCIATED COMPONENTS, CONTROL WIRING, PIPING, DUCTWORK, ELECTRICAL CONNECTIONS, SUPPORTS, INSULATION, ETC. COORDINATE WITH OTHER TRADES AS REQUIRED.
- ALL WORK IS TO BE PHASED AS INDICATED ON THE CONSTRUCTION DOCUMENTS. CONTRACTOR SHALL COORDINATE PHASING OF ALL DEMOLITION, RENOVATION, AND NEW WORK WITH OTHER TRADES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE AND PHASE ALL TIE-INS AND INTERRUPTIONS OF EXISTING SERVICES TO MINIMIZE OR ELIMINATE DOWNTIME. CLOSELY COORDINATE PHASING OF WORK WITHIN CORRIDORS WITH THE OWNER. CORRIDORS MAY NOT BE ABLE TO BE COMPLETELY CLOSED OFF TO PEDESTRIAN TRAFFIC. TO ACCOMMODATE PHASING, CORRIDOR ACCESS WORK MAY NEED TO BE PERFORMED DURING OFF PEAK PERIODS. PRIOR TO MOVING ON TO THE NEXT PHASE, ALL WORK IN PREVIOUSLY PHASED AREAS SHALL BE COMPLETELY OPERATIONAL. THE CONTRACTOR SHALL INSTALL ALL NEW SERVICES AND EQUIPMENT AND HAVE THEM TESTED AND FULLY AND RELIABLY FUNCTIONAL PRIOR TO INTERRUPTING, RELOCATING, OR REMOVING ANY EXISTING SERVICES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO BARE ANY AND ALL COSTS ASSOCIATED WITH THIS PHASING, INCLUDING TEMPORARY SERVICES, TEMPORARY RELOCATION, PREMIUM TIME WORK, ETC.
- ENSURE THAT THE WORK WILL NOT INTERFERE OR INTERRUPT SERVICES TO AREAS OUTSIDE OF THE DESIGNATED CONTRACT AREAS. SCHEDULE ALL WORK AS TO CAUSE MINIMAL SERVICE INTERRUPTIONS FOR THE OWNER. UNAVOIDABLE INTERRUPTIONS ARE TO BE SCHEDULED WITH THE OWNER NO LESS THAN TWO WEEKS PRIOR TO THEIR EXPECTED COMMENCEMENT. WORK SHALL BE PERFORMED AT SUCH TIMES AS DIRECTED BY THE OWNER AND, IF POSSIBLE, ARE TO OCCUR DURING OFF HOURS OR PEAK PERIODS.
- THE CONTRACTOR IS TO VERIFY THE EXACT SERVICE OF ANY EXISTING PIPING OR DUCTWORK PRIOR TO INSTALLING ANY NEW CONNECTIONS. ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS OR THE DESIGN INTENT AND ACTUAL CONDITIONS ARE TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY, PRIOR TO FABRICATION OR INSTALLATION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION AND SHALL REPAIR ADJACENT SURFACES, AREAS, EQUIPMENT, SYSTEMS, AND PROPERTY THAT MAY BE DAMAGED AS A RESULT OF DEMOLITION AND/OR NEW WORK. CONTRACTOR SHALL REMOVE AND REPLACE EXISTING LAY-IN CEILING GRID AND TILES AS NECESSARY TO COMPLETE ABOVE CEILING WORK. RETURN CEILING TO ORIGINAL CONDITION FOLLOWING COMPLETION OF CONSTRUCTION.
- ALL PATCH AND REPAIR WORK IN ARCHITECTURAL TYPE SURFACES SHALL BE PERFORMED BY THE GENERAL CONTRACTOR. PATCH AND REPAIR FLOOR SLAB AND WALL PENETRATIONS TO MATCH EXISTING WHERE THE PIPING, DUCT OR EQUIPMENT IS BEING REMOVED OR INSTALLED. MECHANICAL CONTRACTOR TO COORDINATE WITH GENERAL CONTRACTOR.
- ALL ROOFING MODIFICATIONS SHALL BE DONE BY OWNER'S ROOFING VENDOR TO MAINTAIN ANY AND ALL WARRANTIES. COST TO BE INCLUDED IN THIS CONTRACT UNLESS SPECIFICALLY INCLUDED IN GENERAL TRADES CONTRACTOR'S SCOPE OF WORK. CONFIRM OWNER'S ROOFING VENDOR PRIOR TO BID.
- INSULATE DUCTWORK AND PIPING WHERE EXISTING INSULATION HAS BEEN DAMAGED AND/OR REMOVED IN THE PERFORMANCE OF WORK FOR THIS PROJECT.
- FOR RENOVATION WORK, IT IS PROHIBITED TO SUSPEND NEW WORK FROM THE EXISTING FLOOR SLAB OR ROOF DECK. ALL NEW WORK SHALL BE SUPPORTED FROM STRUCTURE THAT IS ADEQUATELY SIZED FOR THE ADDED LOAD.
- THE CONTRACTOR IS HEREBY ADVISED THAT IT IS POSSIBLE THAT ASBESTOS, LEAD BASED PAINTS, AND/OR OTHER HAZARDOUS MATERIALS ARE OR WERE PRESENT IN THIS BUILDING(S), ANY WORKER, OCCUPANT, VISITOR, ETC., WHO ENCOUNTERS ANY MATERIAL OF WHOSE CONTENT THEY ARE NOT CERTAIN SHALL PROMPTLY REPORT THE EXISTENCE AND LOCATION OF THAT MATERIAL TO THE OWNER. FURTHERMORE, THE CONTRACTOR SHALL ENSURE THAT NO ORANGE MATERIAL, FUMES, OR DUST UNTIL ITS CONTENT CAN BE ASCERTAINED TO BE NON-HAZARDOUS. THE ENGINEER HAS NO EXPERTISE IN THE DETERMINATION OF THE PRESENCE OF ANY HAZARDOUS MATERIAL. THEREFORE, NO ATTEMPT HAS BEEN MADE BY THE ENGINEER TO IDENTIFY THE EXISTENCE OR LOCATION OF ANY SUCH HAZARDOUS MATERIAL. FURTHERMORE, THE ENGINEER NOR ANY AFFILIATE HEREOF WILL NOT OFFER OR MAKE ANY RECOMMENDATIONS RELATIVE TO THE REMOVAL, HANDLING, OR DISPOSAL OF SUCH MATERIAL. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS, APPROVALS, AND HOLD THE ENGINEER, ARCHITECT, AND/OR EXISTING COMPONENTS WHICH CONTAIN OR BEAR ANY HAZARDOUS MATERIAL. THEN IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO CONTACT THE OWNER AND SO ADVISE THE OWNER IMMEDIATELY. THE CONTRACTOR, BY EXECUTION OF THE CONTRACT FOR ANY WORK AND/OR BY THE ACCOMPLISHMENT OF ANY WORK, THEREBY AGREES TO BRING NO CLAIM RELATIVE TO OTHER SUCH ITEM AGAINST THE ENGINEER, ITS PRINCIPALS, EMPLOYEES, AGENTS, OR CONSULTANTS. CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE ENGINEER, ARCHITECT, AND/OR EXISTING PRINCIPALS, EMPLOYEES, AGENTS, AND CONSULTANTS HARMLESS FROM ANY SUCH RELATED CLAIMS WHICH MAY BE BROUGHT BY ANY SUBCONTRACTORS, SUPPLIERS OR ANY OTHER THIRD PARTIES.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE AND COMPLY WITH ALL LAWS, ALL REGULATIONS, INSURANCE CARRIER REQUIREMENTS, CODES, AND STANDARDS (FEDERAL, STATE, AND LOCAL) AS ADOPTED BY THE AUTHORITIES HAVING JURISDICTION, WHERE ANY DIFFER, THE MOST STRINGENT SHALL APPLY.
- CONTRACTOR SHALL COMPLY WITH THE ENTIRE SET OF CONSTRUCTION DOCUMENTS (DRAWINGS AND SPECIFICATIONS) FOR ALL DIVISIONS/TRADES. CONTRACTOR SHALL PAY CLOSE ATTENTION TO ADDITIONAL REQUIREMENTS THAT MAY BE LISTED IN THE GENERAL CONDITIONS ON THE ARCHITECTURAL DRAWINGS AND IN THE DIVISION 01 FRONT-END SPECIFICATIONS.
- IN CASE OF CLARIFICATIONS OR DISCREPANCIES, THE CONTRACTOR SHALL PROMPTLY NOTIFY THE ARCHITECT/ENGINEER IN WRITING FOR FINAL DETERMINATION PRIOR TO THE BID.
- THE ARCHITECT/ENGINEER DOES NOT DEFINE THE SCOPE OF INDIVIDUAL DIVISIONS/TRADES, SUBCONTRACTORS, MATERIAL SUPPLIERS AND VENDORS. ANY SHEET NUMBERING OR SPECIFICATION NUMBERING SYSTEM USED WHICH IDENTIFIES DISCIPLINES IS SOLELY FOR THE ARCHITECT/ENGINEER'S CONVENIENCE AND IS NOT INTENDED TO DEFINE A SUBCONTRACTOR'S SCOPE OF WORK. INFORMATION REGARDING INDIVIDUAL TRADES, SUBCONTRACTORS, MATERIAL SUPPLIERS AND VENDORS MAY BE DETAILED, DESCRIBED, AND INDICATED AT DIFFERENT LOCATIONS THROUGHOUT THE CONTRACT DOCUMENTS. NO CONSIDERATION WILL BE GIVEN TO REQUESTS FOR CHANGE ORDERS FOR FAILURE TO OBTAIN AND REVIEW THE COMPLETE SET OF CONTRACT DOCUMENTS WHEN PREPARING BIDS, PRICES, AND QUOTATIONS, UNLESS STATED OTHERWISE. THE SUBDIVISION AND ASSIGNMENT OF WORK UNDER THE VARIOUS SECTIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR HOLDING THE PRIME CONTRACT.
- CONTRACT DOCUMENTS FOR MECHANICAL WORK ARE SCHEMATIC IN NATURE AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY. ALL OFFSETS, TURNS, FITTINGS, TRIM, DETAIL, ETC., MAY NOT BE INDICATED, BUT SHALL BE PROVIDED BY THE CONTRACTOR. CONTRACTOR SHALL BE RESPONSIBLE FOR START-UP PER MANUFACTURER'S RECOMMENDATIONS OF ALL EQUIPMENT AND SYSTEMS. WORK SHALL BE INSTALLED FROM THE COORDINATION AND FABRICATION DRAWINGS WHICH ARE FULLY COORDINATED, CONTRACTOR GENERATED, DIMENSIONED DRAWINGS.
- PROVIDE ALL MATERIALS, EQUIPMENT, FEES, AND PERMITS TO PERFORM ALL THE LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE SYSTEMS AS STATED, IMPLIED, OR INTENDED IN THE DRAWINGS AND SPECIFICATIONS. INCLUDE IN THE BID AS PART OF THE CONTRACT, ALL NECESSARY AND APPLICABLE SUPPLIES, MATERIALS, AND APPURTENANCES, WHETHER INDICATED OR NOT.
- ALL MATERIALS, EQUIPMENT, SEALS, BEARINGS, PACKINGS, ACCESSORIES, AND PIPING SPECIALTIES SHALL BE SUITABLE FOR THE CONTINUOUS OPERATIONAL TEMPERATURES, PRESSURES, AND CHARACTERISTICS OF THE SYSTEM THEY SERVE.
- WHERE CEILING ARE INDICATED, ALL DUCTS, PIPES, AND WIRING SHALL BE ROUTED ABOVE CEILING, UNLESS NOTED OTHERWISE. IN EXPOSED CONDITIONS, INSTALL DUCTWORK, PIPING, AND WIRING TIGHT TO THE BOTTOM OF STRUCTURE UNLESS NOTED OTHERWISE.
- ALL SUPPORTS FOR EQUIPMENT, DUCTWORK AND PIPING SYSTEMS, AND DEVICES SHALL BE FROM THE BUILDING STRUCTURE. SUPPORT FROM STRUCTURAL BRIDGING IS UNACCEPTABLE. SUPPORTS SHALL BE IN ACCORDANCE WITH LATEST ANSI AND SMANCA STANDARDS.
- FIRESTOP AND SEAL WATER TIGHT ALL FLOOR PENETRATIONS AND ALL RATED WALL PENETRATIONS. THE ANNULAR SPACE AROUND THE PENETRATING DUCT/PIPE SHALL BE PROTECTED WITH AN APPROVED NONCOMBUSTIBLE MATERIAL THAT RESISTS THE FREE PASSAGE OF FLAME AND THE PRODUCTS OF COMBUSTION. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS AND TYPE OF FIRE AND/OR SMOKE RATED BUILDING ELEMENTS.
- INSTALL EQUIPMENT, MATERIALS, ETC. IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND DIRECTION. PROVIDE STRAIGHT INLET AND OUTLET DUCTS/PIPS BASED ON EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR START-UP PER MANUFACTURER'S RECOMMENDATIONS OF ALL EQUIPMENT AND SYSTEMS INSTALLED, MODIFIED, OR REVERSE. IF IN CONFLICT WITH THE CONTRACT DOCUMENTS, ADVISE THE ARCHITECT/ENGINEER IN WRITING PRIOR TO INSTALLATION FOR CLARIFICATION.
- ALL ITEMS THAT REQUIRE MAINTENANCE OR ADJUSTMENT MUST BE INSTALLED IN ACCESSIBLE LOCATIONS WITH PROPER CLEARANCES MAINTAINED. WHERE POSSIBLE INSTALL IN LOCATIONS THAT ARE ACCESSIBLE FROM FLOOR LEVEL. PROVIDE APPROPRIATELY SIZED ACCESS DOORS AS REQUIRED AT NO ADDITIONAL COST TO OTHERS WHETHER SHOWN OR NOT ON THE PLANS, FOR ACCESS AND MAINTENANCE.
- ANY DEVIATIONS FROM THE BASIS OF DESIGN THAT REQUIRE ADDITIONAL PROVISIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- COORDINATE THE EXACT REQUIREMENTS, LOCATION, AND CLEARANCES OF WORK WITH THE WORK OF OTHER TRADES PRIOR TO FABRICATION AND INSTALLATION. PROVIDE ADDITIONAL OFFSETS AND SECTIONS IN DUCTWORK AND/OR PIPING REQUIRED TO MEET THE APPLICABLE JOB CONDITION REQUIREMENTS. VERIFY JOB SITE ELEVATIONS, DIMENSIONS, AND CONDITIONS, PRIOR

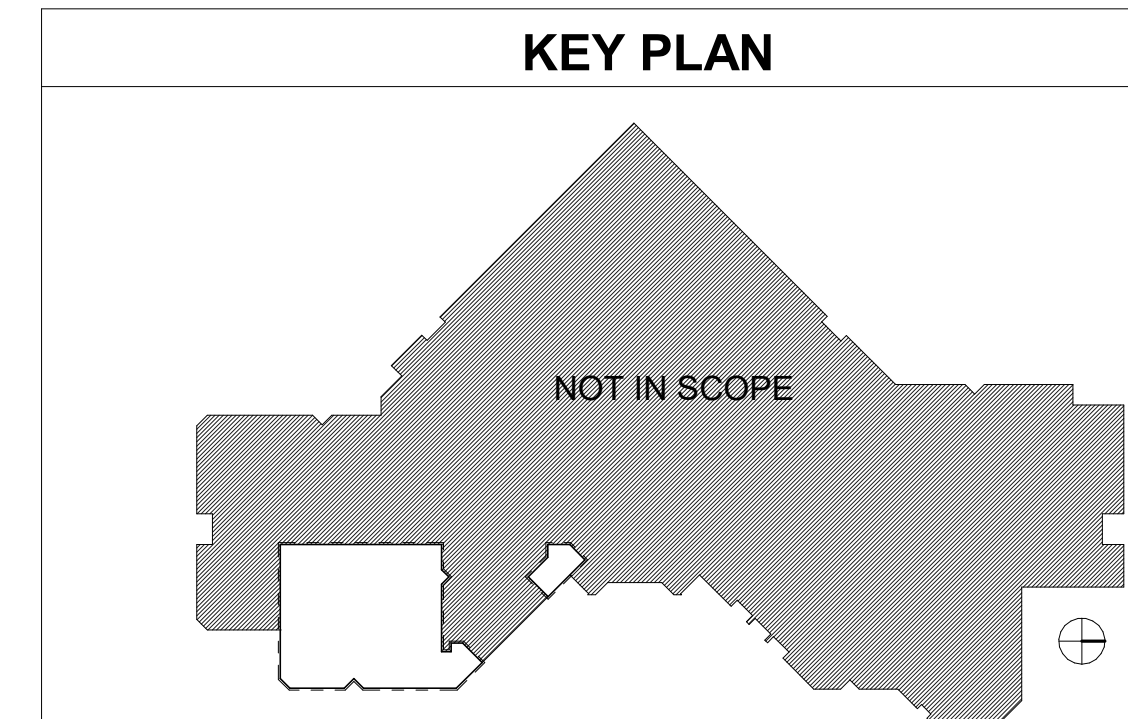
Revit 2025 Template Update 2025



This document is the product and property of Bunker Model Donnelly Preston, Inc. Neither the document nor the information it contains may be copied or used for any other project without the written consent of Bunker Model Donnelly Preston, Inc.

2 FIRST FLOOR PLAN - MECHANICAL - DEMOLITION  
MD101 1/8" = 1'-0"

- SHEET KEYNOTES:**
1. EXISTING AIR DEVICE TO BE RELOCATED.
  2. CONDENSATE DROP TO FLOOR DRAIN.
  3. COVER ROOF OPENING AND PREPARE AS NECESSARY FOR CURB ADAPTER.



**SOUTHERN STATE COMMUNITY COLLEGE**

**BHDP ARCHITECTURE**  
 BUNKER MODEL DONNELLY PRESTON  
 CHARLOTTE, NC 28202  
 PHONE: 704.468.1960  
 www.bhdp.com

**BHDP**  
 ADVANCED ENGINEERING CONSULTANTS  
 1405 Duane Road, Columbus, OH 43215  
 +1 614 862 4178

**DELMAX CONSTRUCTION SERVICES LLC**  
 159 Shaw Ct., Union, OH 43079  
 +1 614 743 4533

12.19.2025  
 10.31.2025  
 Date

ADDITIONAL 01  
 1 BID & PERMIT DOCUMENTS  
 No. Issue/Revision/Submission

Southern State Community College Renovations  
 100 Hobart Dr., Hillsboro, OH 45133

FIRST FLOOR PLAN - MECHANICAL - DEMOLITION

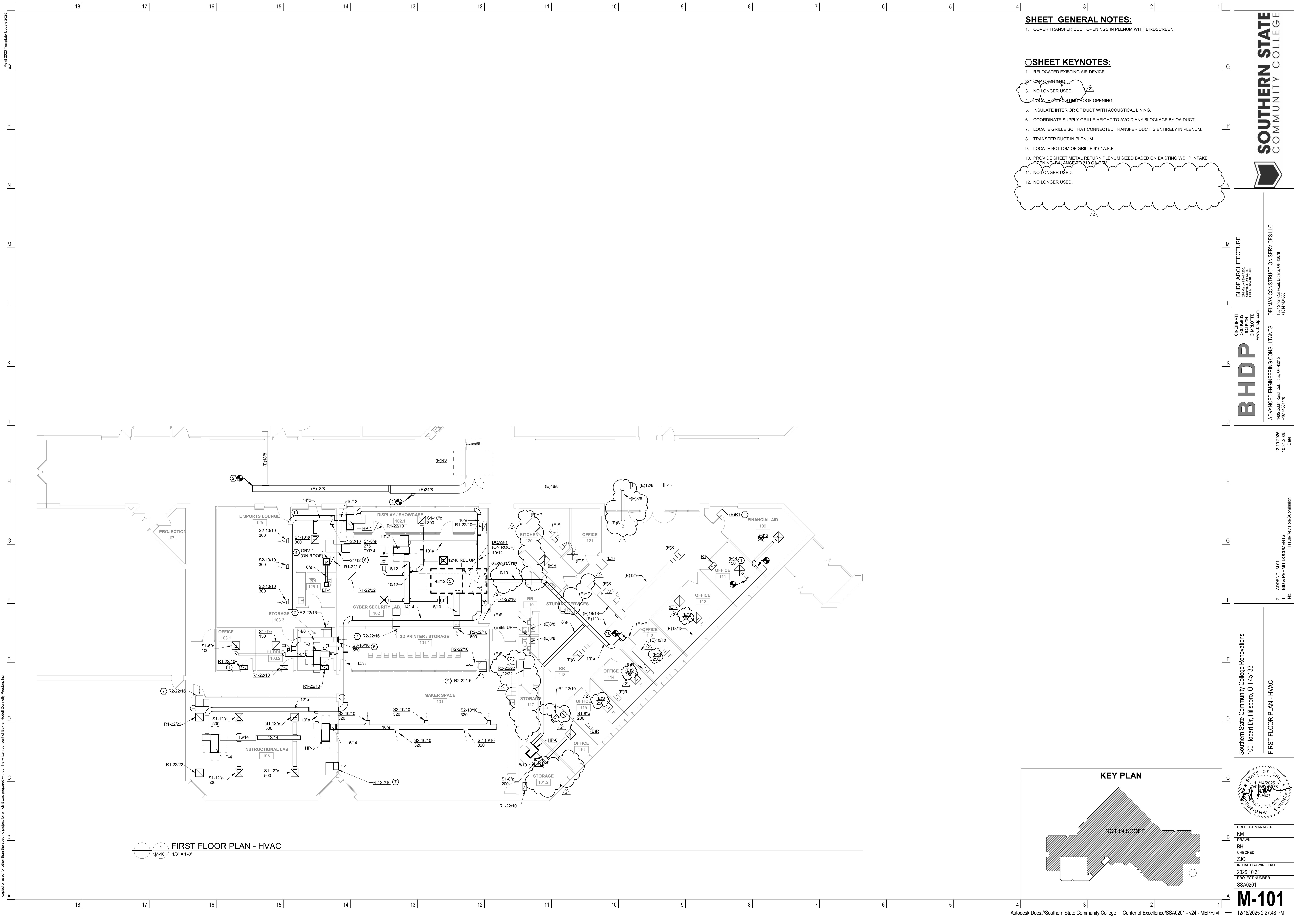
STATE OF OHIO  
 11/14/2025  
 7:45:19 AM  
 11/14/2025  
 7:45:19 AM  
 PROFESSIONAL ENGINEER

PROJECT MANAGER  
 KM  
 DRAWN  
 BH  
 CHECKED  
 ZJO  
 INITIAL DRAWING DATE  
 2025 10 31  
 PROJECT NUMBER  
 SSA0201

**MD101**

Autodesk Docs://Southern State Community College IT Center of Excellence/SSA0201 - v24 - MEPP.rvt 12/18/2025 2:22:19 PM

Revit 2025 Template Update 2025



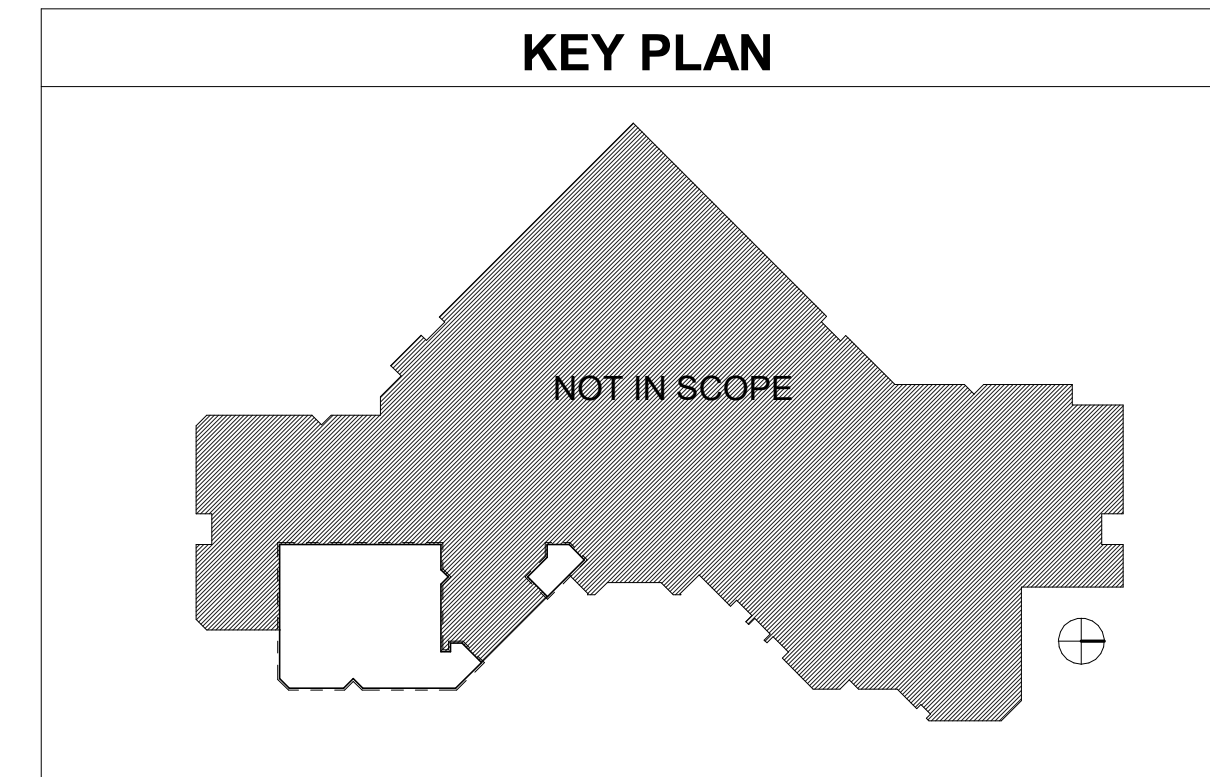
1 FIRST FLOOR PLAN - HVAC  
M-101 1/8" = 1'-0"

**SHEET GENERAL NOTES:**

- COVER TRANSFER DUCT OPENINGS IN PLENUM WITH BIRDSCREEN.

**SHEET KEYNOTES:**

- RELOCATED EXISTING AIR DEVICE.
- CAP OPENING.
- NO LONGER USED.
- LOCATE AN EXISTING ROOF OPENING.
- INSULATE INTERIOR OF DUCT WITH ACOUSTICAL LINING.
- COORDINATE SUPPLY GRILLE HEIGHT TO AVOID ANY BLOCKAGE BY OA DUCT.
- LOCATE GRILLE SO THAT CONNECTED TRANSFER DUCT IS ENTIRELY IN PLENUM.
- TRANSFER DUCT IN PLENUM.
- LOCATE BOTTOM OF GRILLE 9'-6" A.F.F.
- PROVIDE SHEET METAL RETURN PLENUM SIZED BASED ON EXISTING WSHWP INTAKE OPENING - BALANCE TO 310 OA-FRM.
- NO LONGER USED.
- NO LONGER USED.



**SOUTHERN STATE COMMUNITY COLLEGE**

**BHPD ARCHITECTURE**  
COLUMBUS, OH 43215  
RALEIGH, OH 43081  
CHARLOTTE, NC 28202  
www.bhp.com

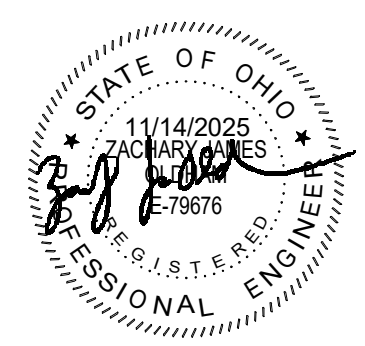
**BHDP**  
ADVANCED ENGINEERING CONSULTANTS  
14550 Lake Road, Columbus, OH 43215  
+1 614 862 7172

**DELMAX CONSTRUCTION SERVICES LLC**  
1551 Shaw Col Road, Urbana, OH 43079  
+1 614 743 4533

12.19.2025	Date
10.31.2025	Issue/Revision/Submission
2	ADDENDUM 01
1	BID & PERMIT DOCUMENTS
No.	

Southern State Community College Renovations  
100 Hobart Dr, Hillsboro, OH 45133

FIRST FLOOR PLAN - HVAC



PROJECT MANAGER	KM
DRAWN	BH
CHECKED	ZJO
INITIAL DRAWING DATE	2025.10.31
PROJECT NUMBER	SSA0201

**M-101**

- SHEET KEYNOTES:**
- EXISTING DROP TO EXISTING FLOORDRAIN. TERMINATION TO BE BY INDIRECT CONNECTION WITH A MINIMUM AIR GAP OF TWO PIPE DIAMETERS.
  - APPROXIMATE CONNECTION POINT TO EXISTING CONDENSATE LINES. DEMOLISH AS REQUIRED TO MAINTAIN SLOPE PER SPECIFICATIONS FOR NEW AND EXISTING CONDENSATE SYSTEM.
  - SLOPE CONDENSATE PIPING PER SPECIFICATIONS TO ALLOW CONDENSATE TO DRAIN BY GRAVITY.



**BHDP ARCHITECTURE**  
 CHICAGO, ILLINOIS  
 COLUMBUS, OHIO  
 RALEIGH, NORTH CAROLINA  
 CHARLOTTE, NORTH CAROLINA  
 www.bhdp.com

**DELMAX CONSTRUCTION SERVICES LLC**  
 1555 Shaw Ct. South, Union, OH 43075  
 +1 614 862 4778

**BHDP**  
 ADVANCED ENGINEERING CONSULTANTS  
 1455 S. Main Road, Columbus, OH 43215  
 +1 614 862 4778

12.19.2025  
 10.31.2025  
 Date

ADDITIONUM 01  
 1 BID & PERMIT DOCUMENTS  
 Issue/Revision/Submission  
 No.

Southern State Community College Renovations  
 100 Hobart Dr, Hillsboro, OH 45133

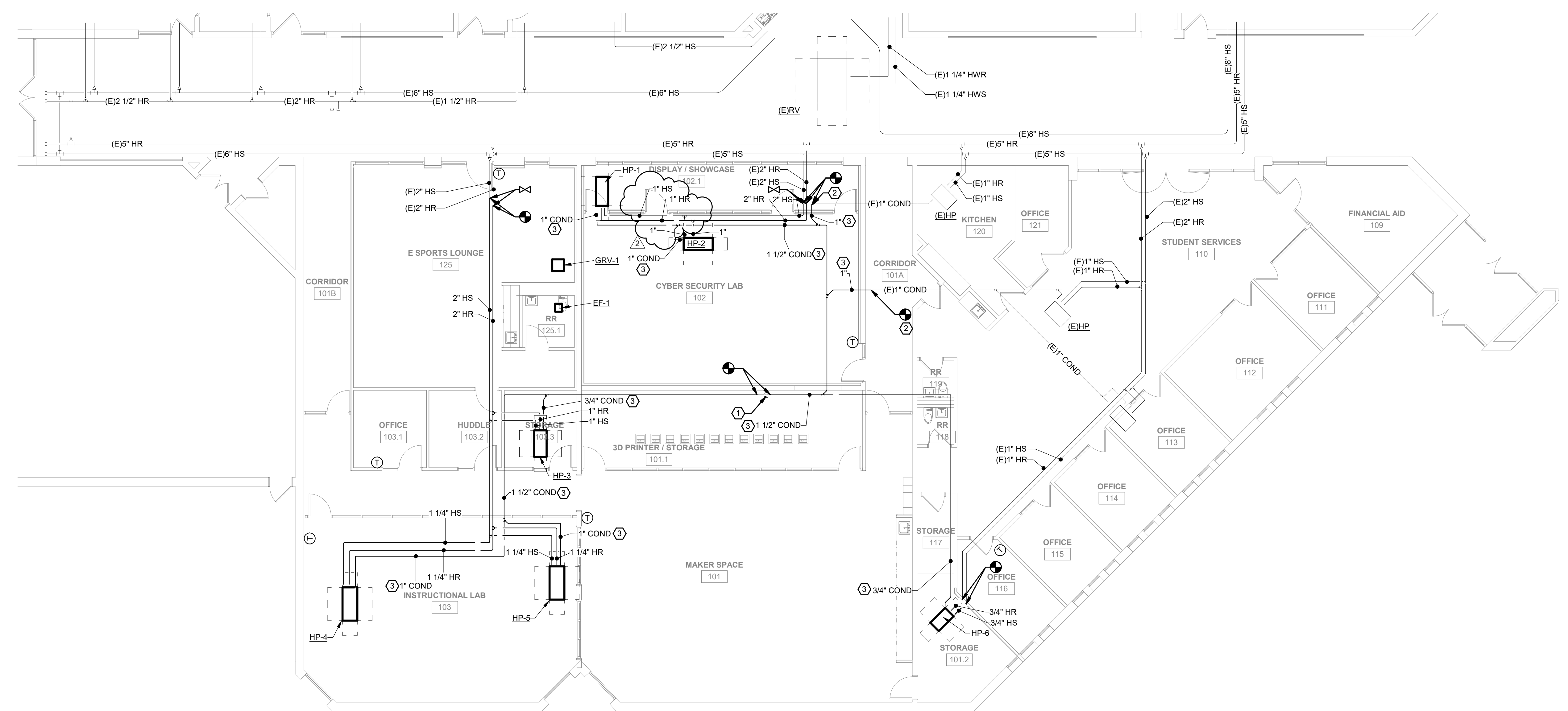
FIRST FLOOR PLAN - HVAC PIPING

PROJECT MANAGER  
 KM  
 DRAWN  
 BH  
 CHECKED  
 ZJO  
 INITIAL DRAWING DATE  
 2025 10 31  
 PROJECT NUMBER  
 SSA0201

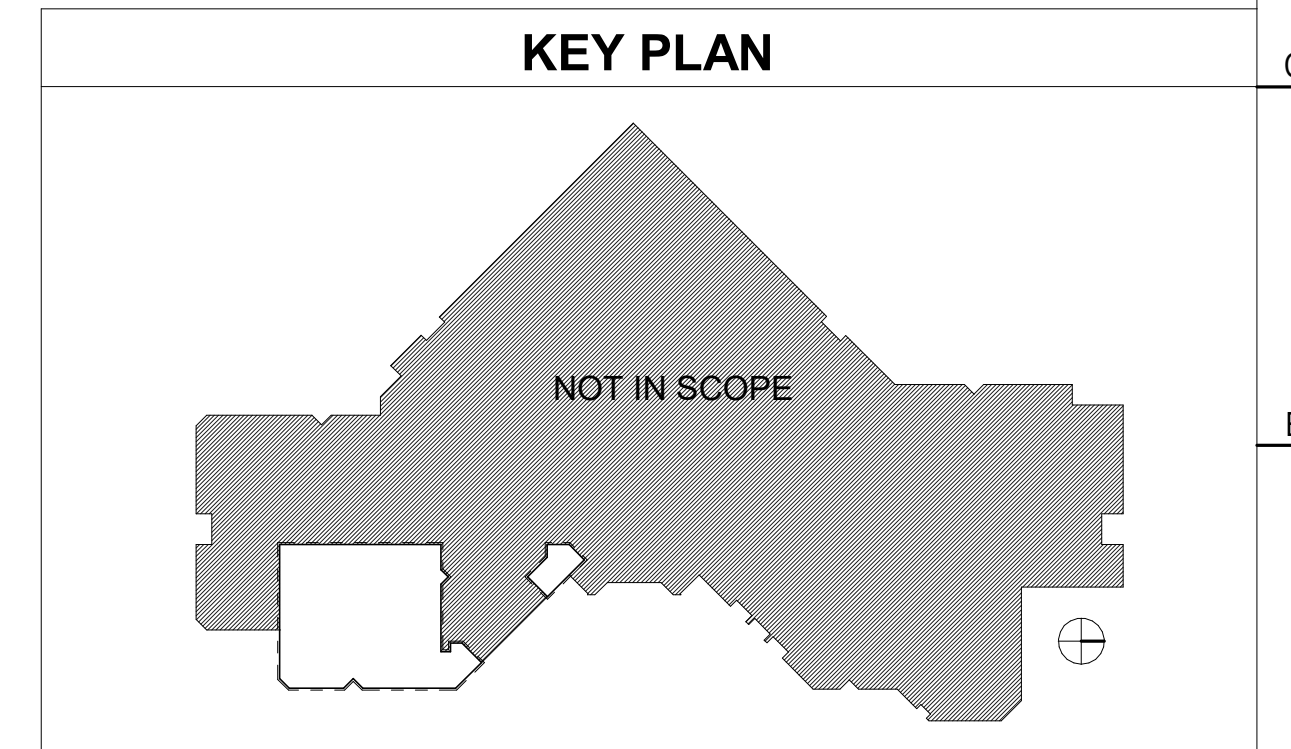
**M-201**

12/18/2025 2:22:20 PM

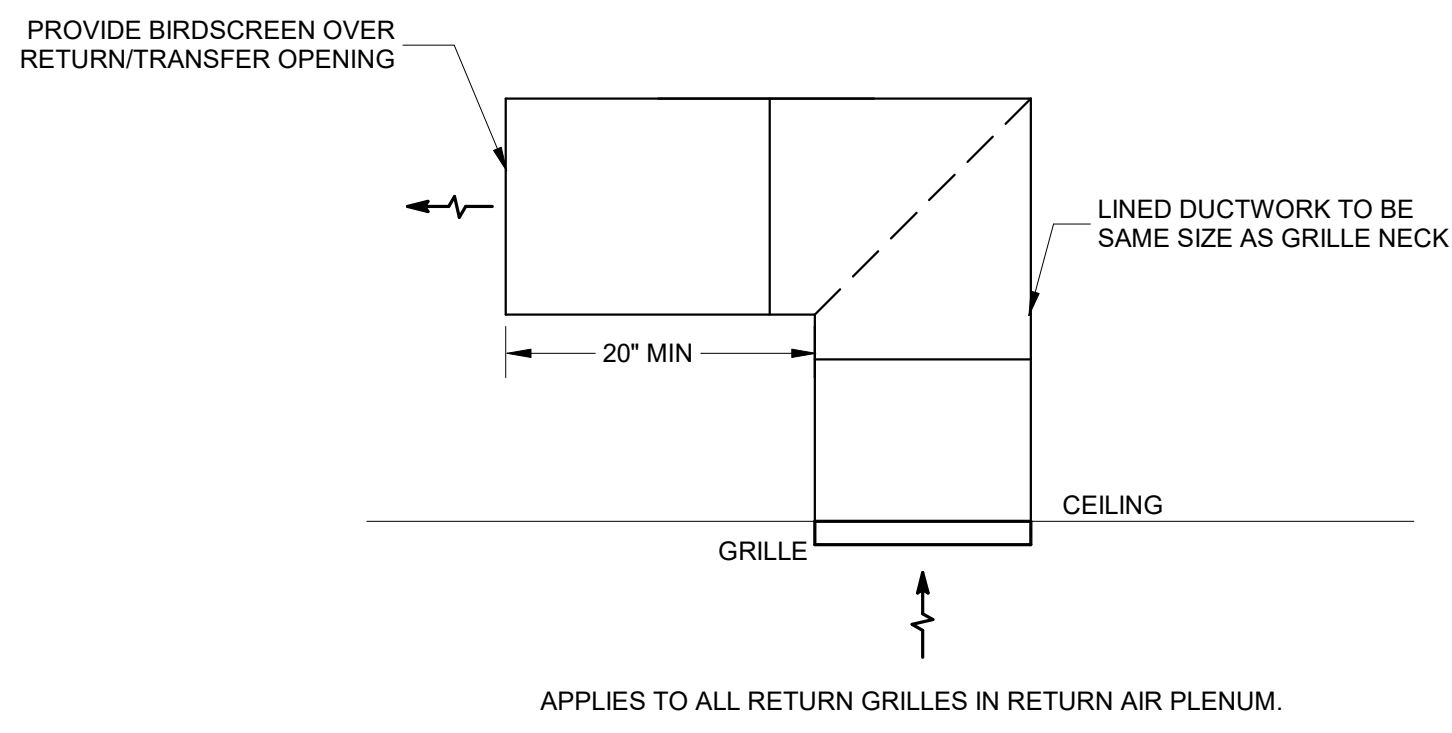
This document is the product and property of Bunker Model/Donnelly/Preston, Inc. Neither the document nor the information it contains may be copied or used for any other project without the written consent of Bunker Model/Donnelly/Preston, Inc.



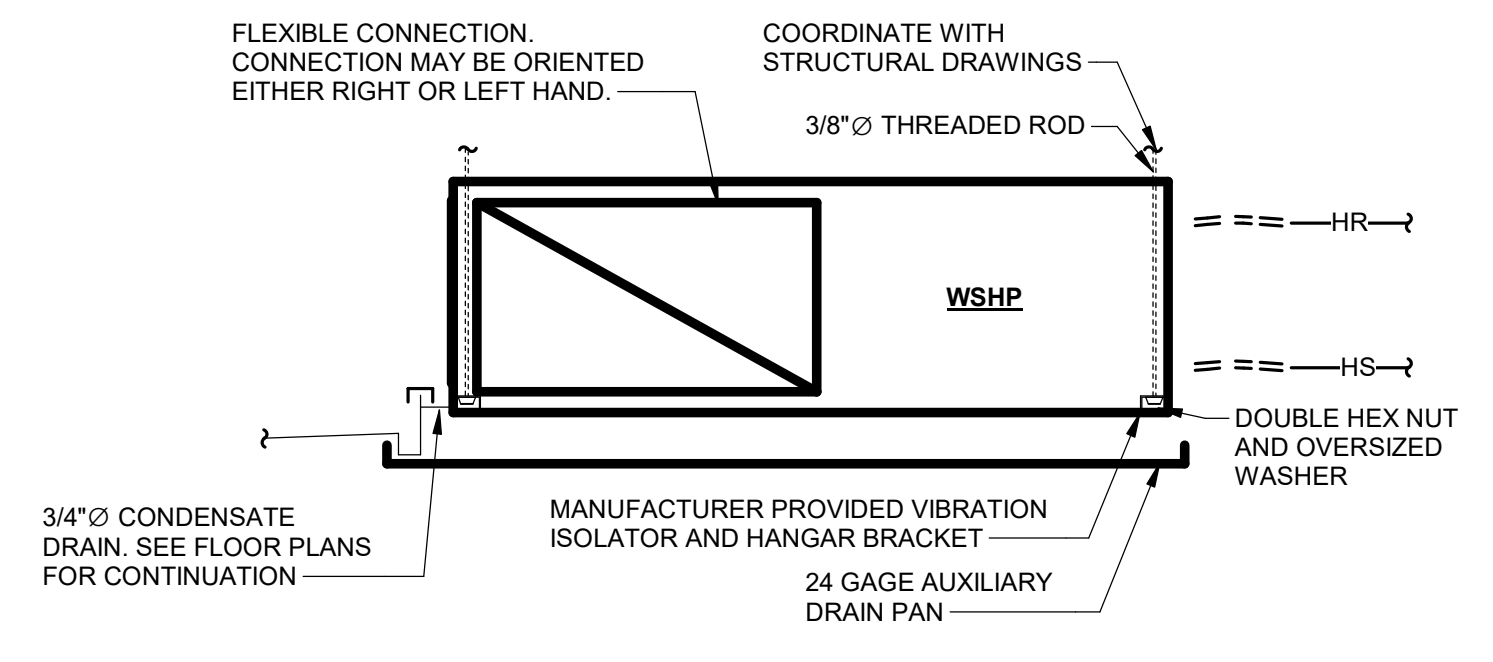
**FIRST FLOOR PLAN - HVAC PIPING**  
 1  
 M-201 1/8" = 1'-0"



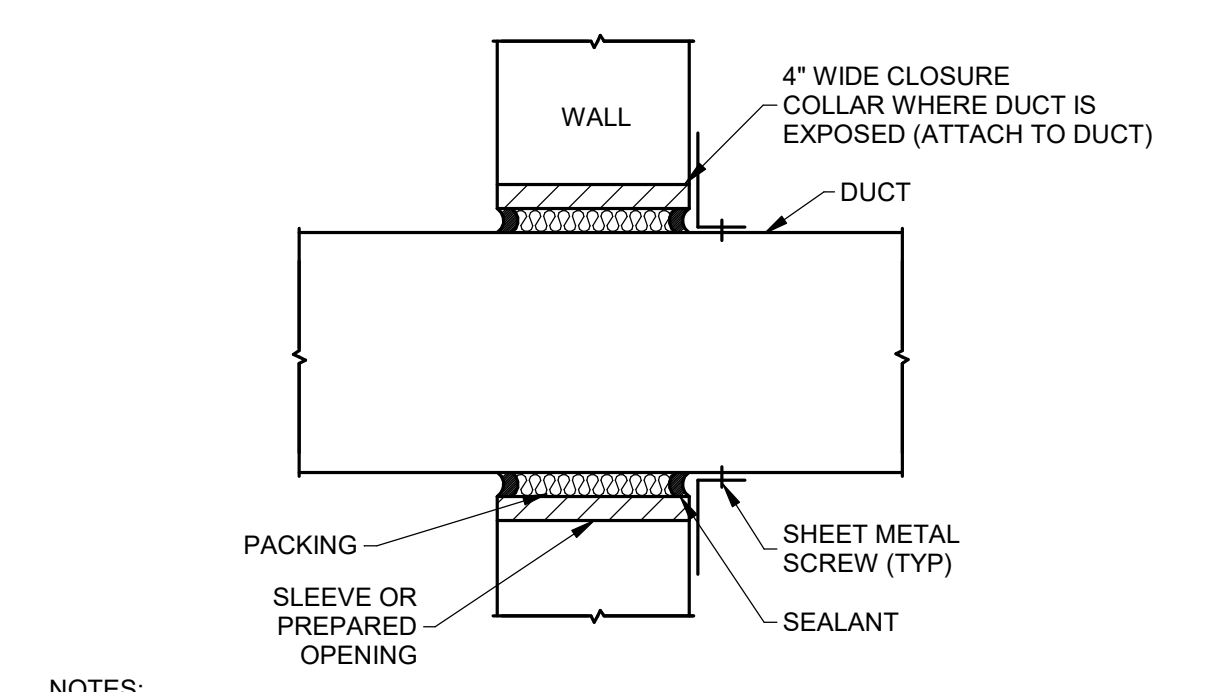
Revised 2025 Template Update 2025  
This document is the product and property of BHP Architecture, Inc. Neither the document nor the information it contains may be copied or used for any other project without the written consent of BHP Architecture, Inc.



1 RETURN-TRANSFER AIR BOOT DETAIL  
NTS

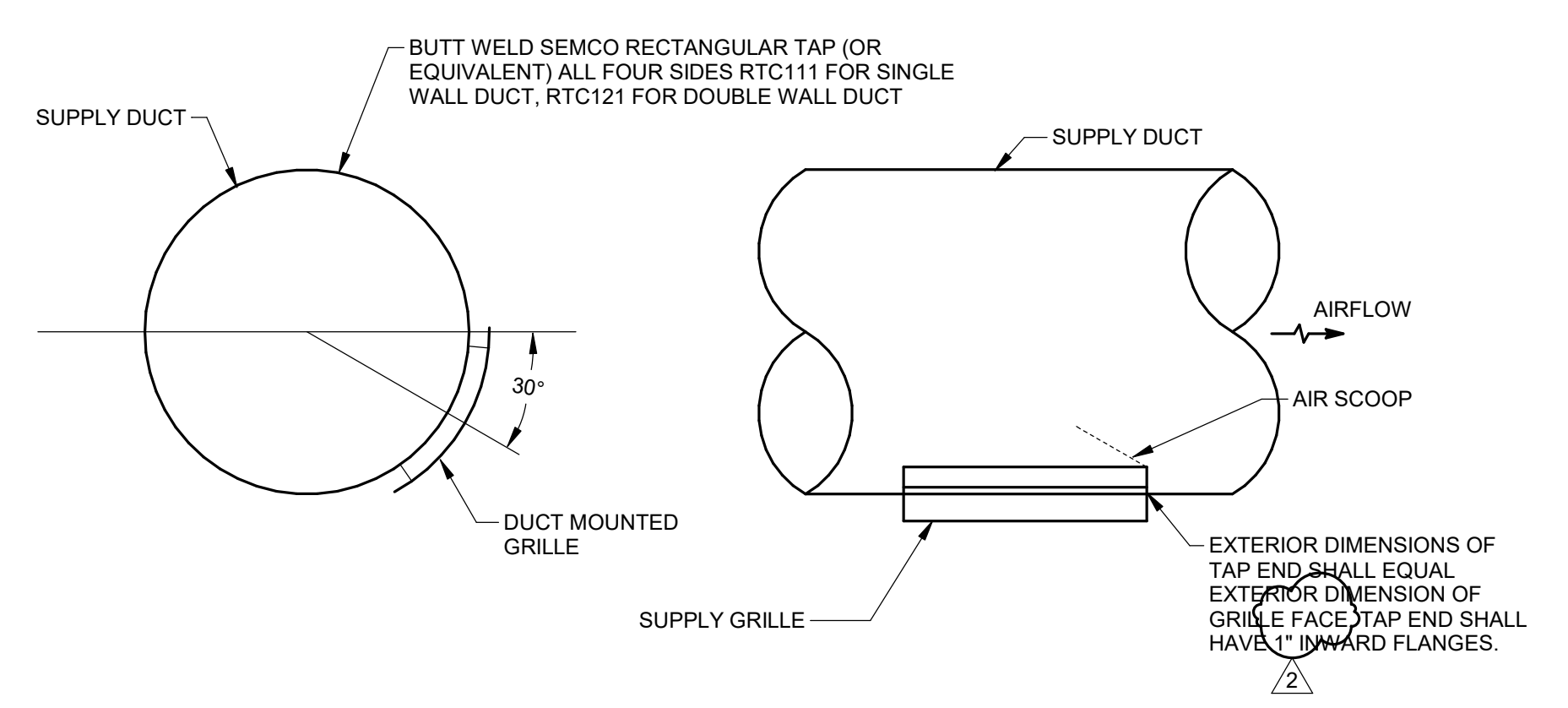


2 DETAIL - WATER SOURCE HEAT PUMP MOUNTING  
NTS

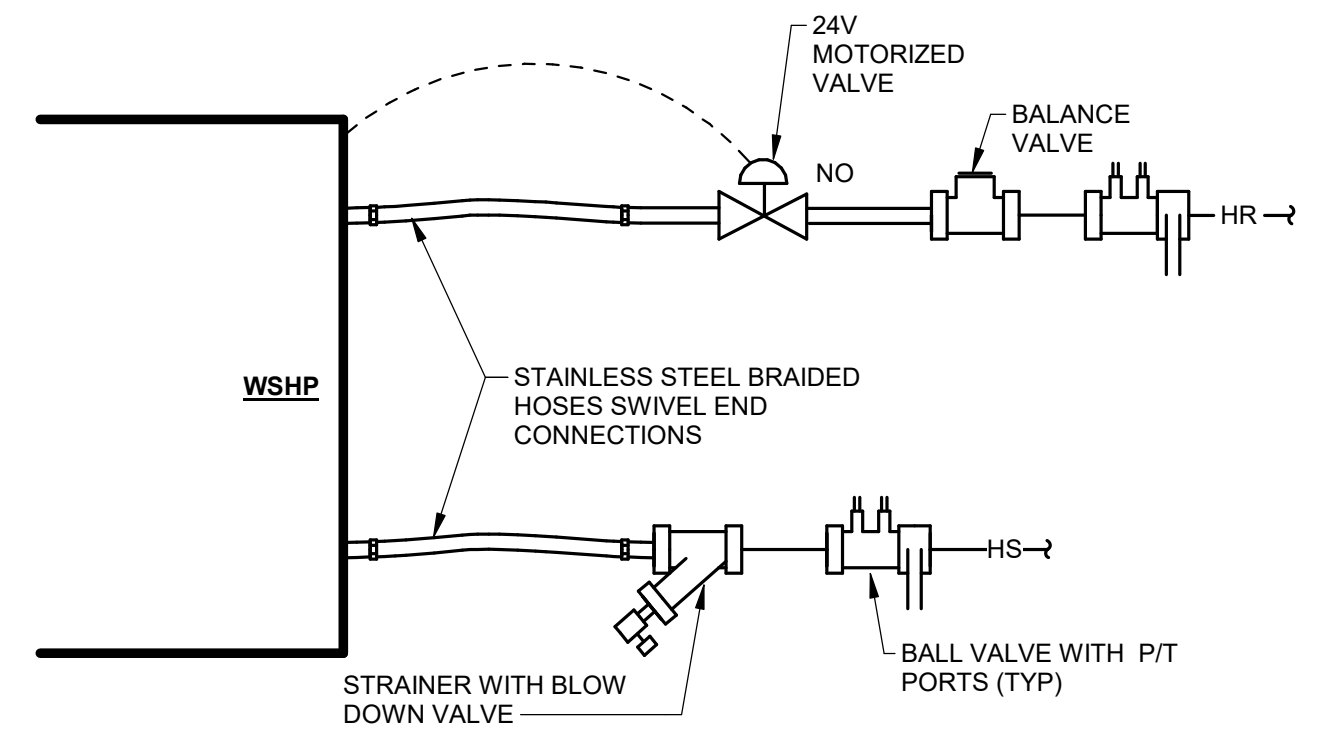


- NOTES:
1. DETAIL IS NOT APPLICABLE WHERE FIRE DAMPER, REGISTER, SECURITY PENETRATION, OR DIFFUSER IS PROVIDED.
  2. PROVIDE SEPARATE AND UNCONNECTED SLEEVES WHERE DUCTS PENETRATE DOUBLE (FLOATING) FLOOR SLABS TO PREVENT "SHORT CIRCUITING" THE VIBRATION ISOLATING MATERIAL.
  3. EXTERNALLY INSULATED SHALL BE CAULKED TO PROVIDE A COMPLETE SEAL BETWEEN THE INSULATION AND CLOSURE COLLAR.

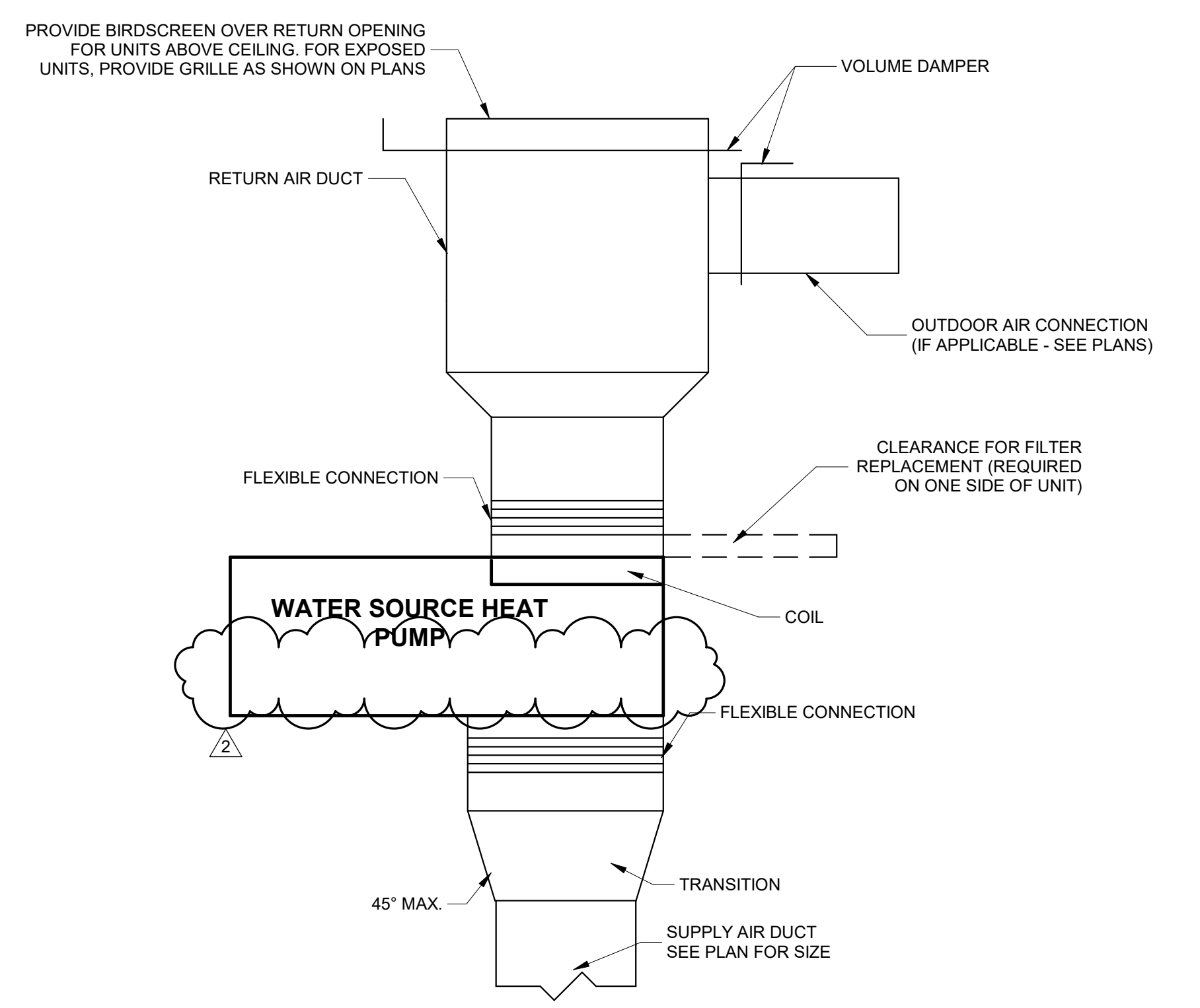
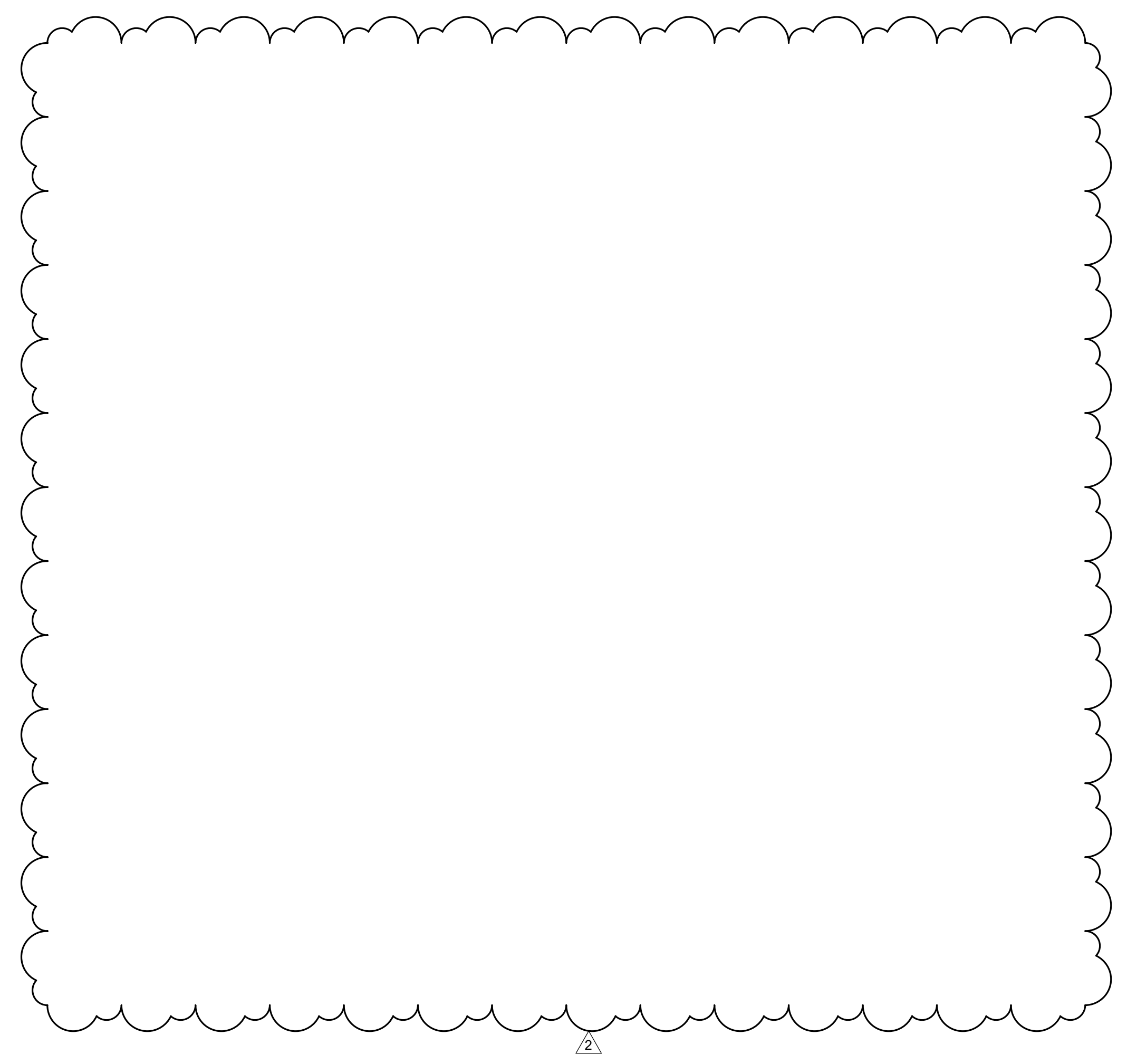
3 DETAIL - DUCT PENETRATION THRU WALLS  
NTS



4 DETAIL - DUCT MOUNTED GRILLE  
NTS



5 DETAIL - WATER SOURCE HEAT PUMP CONNECTION  
NTS



7 HORIZONTAL WATER SOURCE HEAT PUMP  
INSTALLATION DETAIL  
NTS

Revised 2025 Template Update 2025  
P  
N  
M  
L  
K  
J  
H  
G  
F  
E  
D  
C  
B  
A

**SOUTHERN STATE**  
COMMUNITY COLLEGE  
BHPD ARCHITECTURE  
COLUMBUS CHARLOTTE  
ADVANCED ENGINEERING CONSULTANTS  
DELMAX CONSTRUCTION SERVICES LLC  
12.19.2025  
10.31.2025  
Date  
Issue/Revision/Submission  
PROJECT MANAGER  
KM  
DRAWN  
BH  
CHECKED  
ZJO  
INITIAL DRAWING DATE  
2025.10.31  
PROJECT NUMBER  
SSA0201  
**M-601**  
12/18/2025 2:22:21 PM

### DEDICATED OUTDOOR AIR SYSTEM (DOAS) WITH ENERGY RECOVERY CORE SCHEDULE (DX/NATURAL GAS) (PART 1 OF 2)

UNIT DATA		BASIS OF DESIGN		PERFORMANCE DATA				SUPPLY FAN DATA				EXHAUST FAN DATA				HEAT EXCHANGER (EFF = 56 % SUMMER / 61% WINTER)																										
TAG	LOCATION	FUNCTION	MANUFACTURER	MODEL	AMBIENT (°F)	ISMREZ	ISCOP2	AIRFLOW (CFM)	MIN OA (CFM)	ESP (IN WG)	TSP (IN WG)	FAN TYPE	MOTOR/DRIVE TYPE	# OF FANS	HP (EACH)	BHP (EACH)	VFD	AIRFLOW (CFM)	ESP (IN WG)	TSP (IN WG)	FAN TYPE	MOTOR/DRIVE TYPE	# OF FANS	HP (EACH)	BHP (EACH)	VFD	SUMMER SA EAT DB (°F)	SUMMER SA LAT WB (°F)	SUMMER EA EAT DB (°F)	SUMMER EA LAT WB (°F)	WINTER SA EAT DB (°F)	WINTER SA LAT WB (°F)	WINTER EA EAT DB (°F)	WINTER EA LAT WB (°F)								
DOAS-1	ROOF	OUTSIDE AIR	DAIKIN	DPSH07B	95.0	12	5.3	2,200	2,200	2.00	3.70	AIR FOIL	ECM DIRECT	1	3.00	2.05	Yes	1,700	1.50	3.30	AIR FOIL	ECM DIRECT	1	2.10	1.46	Yes	95.0	75.0	84.9	69.6	75.0	62.0	84.9	69.6	0.0	-1.0	35.5	28.3	70.0	50.0	35.5	28.3

### DEDICATED OUTDOOR AIR SYSTEM (DOAS) WITH ENERGY RECOVERY CORE SCHEDULE (DX/NATURAL GAS) (PART 2 OF 2)

UNIT DATA		DX COOLING DATA				COMPRESSOR DATA				GAS HEATING DATA				FILTER DATA				ELECTRICAL DATA				GENERAL DATA								
TAG	LOCATION	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	EAT DB (°F)	LAT WB (°F)	REFRIG TYPE	TYPE	# OF COMP	# OF CIRCUITS	HEATING AIRFLOW (CFM)	EAT DB (°F)	LAT WB (°F)	INPUT CAPACITY (MBH)	OUTPUT CAPACITY (MBH)	EFF (%)	TURNDOWN RATIO	INLET PRESSURE RANGE (IN WG)	CORE-FILTER (MERV)	APD CLEAN (IN WG)	APD DIRTY (IN WG)	APD CLEAN (IN WG)	APD DIRTY (IN WG)	MCA	MOC	VOLTS	PHASE	GENERATOR POWER	REDUNDANT	WEIGHT (LBS)	SCHEDULE NOTES
DOAS-1	96.08	67.15	84.9	69.6	55.2	R32	INVERTER SCROLL	1	2	2,200	35.5	103.3	200.00	162.00	81	10:1	5-14	8	0.07	0.14	0.12	0.12	27.4	35	460	3	No	No	4,100	1

1. OWNER HAS PURCHASED THIS UNIT (PROVIDED WITH FACTORY CONTROLLER, HOT GAS REHEAT, FIELD POWERED 115V GFI OUTLET, FIELD INSTALLED SINGLE DISCONNECT, 24" TALL CURB KIT, AND BYPASS DAMPERS ON OA SIDE OF PLATE ERV) FROM A DISTRIBUTOR AND HAS STORED IT ONSITE. CONTRACTOR IS RESPONSIBLE FOR INSTALLATION.

### WATER SOURCED HEAT PUMP SCHEDULE (PART 1 OF 2)

UNIT DATA		BASIS OF DESIGN		SUPPLY FAN DATA				COOLING DATA																
TAG	LOCATION	FUNCTION	MANUFACTURER	MODEL	AIRFLOW (CFM)	MIN OA (CFM)	ESP (IN WG)	MOTOR/DRIVE TYPE	# OF FANS	FLA	VOLTS	PHASE	FILTER TYPE	MIN. TOTAL CAPACITY (MBH)	MIN. SENSIBLE CAPACITY (MBH)	COOLING EFFICIENCY	FLOW (GPM)	EWT (°F)	LWT (°F)	MAX WPD (FT HD)	EAT DB (°F)	LAT WB (°F)	EAT DB (°F)	LAT WB (°F)
HP-1	ABOVE CEILING	HEAT/COOL	CLIMATEMASTER	SY036	1,200	375	0.30	ECM DIRECT	1	4.80	460	3	WATER	29.40	24.90	13.4 EER	7.5	85.0	96.6	4.90	80.0	67.0	60.0	58.1
HP-2	ABOVE CEILING	HEAT/COOL	CLIMATEMASTER	SY042	1,400	340	0.30	ECM DIRECT	1	4.80	460	3	WATER	36.20	32.40	14.3 EER	8.8	85.0	97.4	6.00	80.0	67.0	58.9	57.3
HP-3	ABOVE CEILING	HEAT/COOL	CLIMATEMASTER	SY024	800	160	0.30	ECM DIRECT	1	3.40	460	3	WATER	21.20	1.60	14.3 EER	5.0	85.0	96.5	3.50	80.0	67.0	59.4	58.0
HP-4	ABOVE CEILING	HEAT/COOL	CLIMATEMASTER	SY065	2,000	445	0.30	ECM DIRECT	1	6.20	460	3	WATER	52.20	46.30	14.3 EER	12.5	85.0	96.6	11.00	80.0	67.0	60.2	58.0
HP-5	ABOVE CEILING	HEAT/COOL	CLIMATEMASTER	SY048	1,600	485	0.30	ECM DIRECT	1	4.80	460	3	WATER	43.80	39.30	14.1 EER	10.0	85.0	96.6	6.50	80.0	67.0	58.9	58.1
HP-6	ABOVE CEILING	HEAT/COOL	CLIMATEMASTER	SC012	400	55	0.30	ECM DIRECT	1	0.80	265	1	WATER	9.90	7.20	12 EER	2.5	85.0	96.1	8.50	80.0	67.0	62.5	58.2

### WATER SOURCED HEAT PUMP SCHEDULE (PART 2 OF 2)

UNIT DATA		HEATING DATA				FILTER DATA		ELECTRICAL DATA				GENERAL DATA						
TAG	LOCATION	CAPACITY (MBH)	HEATING EFFICIENCY	FLOW (GPM)	EWT (°F)	LWT (°F)	MAX WPD (FT HD)	EAT DB (°F)	LAT WB (°F)	FILTER (MERV-A)	MCA	MOC	VOLTS	PHASE	GENERATOR POWER	REDUNDANT	WEIGHT (LBS)	SCHEDULE NOTES
HP-1	46.80	4.8 COP	7.5	70.0	60.0	5.10	70.0	106.1	8	10.4	15	460	3	No	No	233	ALL	
HP-2	52.10	4.7 COP	8.8	70.0	60.5	6.20	70.0	104.5	8	12.9	15	460	3	No	No	244	ALL	
HP-3	29.50	5 COP	5.0	70.0	60.5	3.70	70.0	104.1	8	8.2	15	460	3	No	No	208	ALL	
HP-4	69.40	4.8 COP	12.5	70.0	61.1	11.60	70.0	102.1	8	14.1	20	460	3	No	No	314	ALL	
HP-5	57.50	4.7 COP	10.0	70.0	60.9	7.00	70.0	105.4	8	15.3	20	460	3	No	No	298	ALL	
HP-6	15.60	4.4 COP	2.5	70.0	60.2	0.30	70.0	108.0	8	5.5	15	265	1	No	No	114	ALL	

1. OWNER HAS PURCHASED THIS UNIT (PROVIDED WITH FACTORY FILTER FRAME, FIELD INSTALLED SINGLE DISCONNECT, 7 DAY PROGRAMMABLE THERMOSTAT, BACNET COMPATIBILITY, AND HOSE/VALVE KITS) FROM A DISTRIBUTOR AND HAS STORED IT ONSITE. CONTRACTOR IS RESPONSIBLE FOR INSTALLATION.  
2. HORIZONTAL CONFIGURATION. CONTRACTOR TO VERIFY HANDING OF UNITS ORDERED AND ADJUST CONNECTIONS ACCORDINGLY.

### AIR DEVICE SCHEDULE

UNIT DATA		BASIS OF DESIGN		LINEAR DATA		GENERAL DATA					
TAG	FUNCTION	MANUFACTURER	MODEL	NECK SIZE	FACE SIZE	LENGTH (IN)	# OF SLOTS	SLOT WIDTH (IN)	MATERIAL	INTEGRAL VOLUME DAMPER	MAX NC
S1	SUPPLY	PRICE	ASPD	SEE PLANS	24" x 24"				ALUMINIUM	No	20
S2	SUPPLY	PRICE	SDGE	10" x 10"	NECK SIZE + 2"				ALUMINIUM	No	20
S3	SUPPLY	PRICE	620L	16" x 10"	NECK SIZE + 1.75"				ALUMINIUM	No	20
R1	RETURN	PRICE	80	<varies>	NECK SIZE + 1.75"				ALUMINIUM	No	20
R2	RETURN	PRICE	630L	<varies>	NECK SIZE + 1.75"				ALUMINIUM	No	20

### FAN SCHEDULE

UNIT DATA		BASIS OF DESIGN		PERFORMANCE DATA				MOTOR DATA				GENERAL DATA								
TAG	LOCATION	FUNCTION	MANUFACTURER	MODEL	AIRFLOW (CFM)	ESP (IN WG)	FAN TYPE	MOTOR/DRIVE TYPE	SOUND RATING (SONES)	WATTS (EACH)	BHP (EACH)	VOLTS	PHASE	VFD	GENERATOR POWER	DAMPER TYPE	REDUNDANT	GREASE RATED	SMOKE RATED	WEIGHT (LBS)
EF-1	RR 125.1	EXHAUST	GREENHECK	SP-A125	100	0.25	FORWARD CURVED	ECMDIRECT	0.7	20.00	0.01	115	1	No	No	BACKDRAFT	No	No	No	17

### GRAVITY VENTILATOR HOOD SCHEDULE

UNIT DATA		BASIS OF DESIGN		PERFORMANCE DATA		GENERAL DATA				
TAG	LOCATION	FUNCTION	MANUFACTURER	MODEL	TOTAL AIRFLOW (CFM)	TSP (IN WG)	THROAT SIZE (IN)	DEPTH (IN)	DAMPER TYPE	SCHEDULE NOTES
GRV-1	ROOF	EXHAUST	GREENHECK	GRSR-8	100	0.01	8	8	NONE	ALL

1. PROVIDE WITH 14" CURB ADAPTER.

#### DEDICATED OUTSIDE AIR SYSTEM (DOAS) WITH ENERGY RECOVERY CORE:

- THIS SEQUENCE OF OPERATION APPLIES TO THE FOLLOWING UNITS:
  - DOAS-1
- DOAS IS A CONSTANT AIR VOLUME UNIT. THE UNIT CONSISTS OF A SUPPLY FAN, EXHAUST FAN, ENERGY RECOVERY CORE, FILTERS, MODULATING NATURAL GAS BURNER, DIRECT EXPANSION (DX) COOLING COIL, MODULATING HOT GAS REHEAT, OUTSIDE AIR DAMPER, AIR FLOW SENSORS, AND CONTROLS. THE UNIT IS PROVIDED WITH SUPPLY AND EXHAUST AIR FLOW SENSORS FOR BALANCING PURPOSES ONLY. ONCE DOAS IS BALANCED, VFDs SHALL BE LOCKED AT THAT SPEED.
- SEQUENCE OF OPERATION SHALL BE ACCOMPLISHED BY INTERNAL FACTORY CONTROLLER. CONTROLLER TO BE BACNET COMPATIBLE WITH FUTURE TRIDIUM-NIAGARA BAS.
- SYSTEM OPERATION: THE DOAS SHALL OPERATE BASED ON AN OCCUPIED/UNOCCUPIED TIME OF DAY SCHEDULE. OCCUPANCY SHALL BE PREDETERMINED BY THE OWNER AND PROGRAMMED INTO THE DOAS CONTROL SYSTEM.
- SYSTEM START (UNOCCUPIED MODE): WHEN DOAS IS ENABLED TO START, THE UNITS EXHAUST AND OUTSIDE AIR DAMPERS SHALL FULLY OPEN AND BE PROVIDED VIA END SWITCHES. THE SUPPLY FAN AND EXHAUST FAN SHALL START AND OPERATION SHALL BE PROVIDED VIA CURRENT SWITCHES. THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL BE NORMALLY CLOSED.
- UNOCCUPIED MODE: THE DOAS CONTROL SHALL START UPON THE DOAS BEING TRIP TO TELL FROM OWNERS SENSORS. THE SUPPLY FAN AND EXHAUST FAN SHALL BE DEACTIVATED. THE OUTSIDE AIR DAMPER AND EXHAUST AIR DAMPER SHALL BE FULLY CLOSED. THE NATURAL GAS BURNER AND DX COOLING COIL SHALL BE DISABLED.
- SUPPLY FAN CONTROL: THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE AN ADJUSTABLE MINIMUM RUNTIME. THE SUPPLY FAN SHALL OPERATE AT A CONSTANT SPEED DURING OPERATION. SUPPLY FAN SHALL BE MONITORED FOR FAILURE, STATUS, START/STOP, RUNTIME, AND HAND POSITION THROUGH THE THIRD PARTY CONTROLLER.
- EXHAUST FAN CONTROL: THE EXHAUST FAN SHALL BE INTERLOCKED IN UNISON WITH THE SUPPLY FAN AND RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES OR IN PAINT BOOTH OPERATION. TO PREVENT SHORT CYCLING, THE EXHAUST FAN SHALL HAVE AN ADJUSTABLE MINIMUM RUNTIME. THE EXHAUST FAN SHALL OPERATE AT A CONSTANT SPEED DURING OPERATION. EXHAUST FAN SHALL BE MONITORED FOR FAILURE, STATUS, START/STOP, RUNTIME, AND HAND POSITION THROUGH THE THIRD PARTY CONTROLLER.
- DISCHARGE SUPPLY AIR TEMPERATURE CONTROL: CONTROLLER SHALL MONITOR OUTSIDE AIR TEMPERATURE. WHEN OUTSIDE AIR IS ABOVE 55°F (ADJ) THE DOAS INTERNAL CONTROLS SHALL OPERATE TO A DISCHARGE SUPPLY AIR TEMPERATURE OF 54°F (ADJ.) WHEN OUTSIDE AIR IS BELOW 55°F (ADJ) THE DOAS INTERNAL CONTROLS SHALL OPERATE TO A DISCHARGE SUPPLY AIR TEMP OF 70°F (ADJ.) THE DOAS SHALL SUPPLY A DISCHARGE AIR TEMPERATURE FOR A MINIMUM OF 30 MINUTES (ADJ) TO PREVENT SHORT CYCLING.
- DEHUMIDIFICATION MODE: DEHUMIDIFICATION SHALL BE ENABLED AND FOLLOW THE MANUFACTURER'S INTERNAL CONTROLS. WHEN THE SUPPLY FAN STATUS IS ON AND EXHAUST AIR HUMIDITY EXCEEDS 60% RH (ADJ.) FOR 5 MINUTES (ADJ.) DEHUMIDIFICATION SHALL REMAIN ACTIVE UNTIL THE EXHAUST AIR HUMIDITY DROPS BELOW A 5% RH DEADBAND (ADJ.).
- CONTROLLER SHALL MONITOR:
  - THE SUPPLY AND EXHAUST FANS STATUS VIA CURRENT SENSORS AND FAN VFD.
  - EXHAUST AIR AND OUTSIDE AIR TEMPERATURES UPSTREAM AND DOWNSTREAM OF THE ENERGY CORE. SUPPLY FAN DISCHARGE AIR, COOLING COIL DISCHARGE AIR, AND SUPPLY AIR TEMPERATURES.
  - EXHAUST AIR AND OUTSIDE AIR HUMIDITY UPSTREAM AND DOWNSTREAM OF THE ENERGY CORE. SUPPLY FAN DISCHARGE AIR, COOLING COIL DISCHARGE AIR, AND SUPPLY AIR HUMIDITY.
  - COOLING AND HEATING STATUS.
  - PRESSURE DROP ACROSS ALL FILTERS.
  - MOTORIZED DAMPERS POSITIONS AND DAMPER END SWITCHES.
  - EXHAUST, OUTSIDE, AND SUPPLY AIRFLOWS VIA AIRFLOW MONITORS.
  - ALL ALARMS FROM MANUFACTURER'S INTEGRAL CONTROLLER.
  - SYSTEMS ALARMS AND SAFETIES.
    - IF A FAN IS NOT SENSED TO BE OPERATING OR THE MOTORIZED DAMPERS FAIL TO OPEN OR CLOSE WHEN REQUIRED, GENERATE AN ALARM.
    - HIGH STATIC PRESSURE: IF THE SUPPLY AIR DUCT STATIC PRESSURE EXCEEDS 2" W.G. (ADJ.) OR THE EXHAUST AIR DUCT STATIC PRESSURE EXCEEDS 2" W.G. (ADJ.), A HIGH PRESSURE SWITCH SHALL TRIP THE SUPPLY AND EXHAUST FANS AND AN ALARM SHALL BE GENERATED.
    - DIRTY FILTERS: WHEN THE DIFFERENTIAL PRESSURE EXCEEDS THE FILTER MANUFACTURER'S RECOMMENDATIONS FOR DIRTY FILTERS, AN ALARM SHALL BE GENERATED THROUGH THE BAS. CONTRACTOR TO FIELD VERIFY MANUFACTURER'S RECOMMENDED DIFFERENTIAL SETTINGS.
    - HIGH HUMIDITY: GENERATE AN ALARM IF THE SUPPLY AIR HUMIDITY LEVEL RISES TO ABOVE 80% RH (ADJ.).
    - CONDENSATE DRAIN PAN OVERFLOW PROTECTION: PROVIDE A CONDENSATE DRAIN PAN FLOAT OR HIGH LIMIT WATER SENSOR TO PREVENT DRAIN PAN OVERFLOW DUE TO A CLOG IN ASSOCIATED DRAIN PIPING. IF HIGH LIMIT IS DETECTED, GENERATE AN ALARM.
    - SUPPLY AND EXHAUST FAN FAILURE, HAND POSITION, RUNTIME EXCEEDED.
    - HIGH AND LOW EXHAUST AIR HUMIDITY GREATER THAN 70% (ADJ.) AND LESS THAN 35% (ADJ.).
    - HIGH AND LOW EXHAUST AIR TEMPERATURE GREATER THAN 90°F (ADJ.) AND LESS THAN 45°F (ADJ.).
    - HIGH AND LOW SUPPLY AIR TEMPERATURE GREATER THAN 120°F (ADJ.) AND LESS THAN 45°F (ADJ.).

#### WATER SOURCE HEAT PUMPS:

- THIS SEQUENCE OF OPERATION APPLIES TO THE FOLLOWING UNITS:
  - HP-1 - HP-6
- THE SEQUENCE OF OPERATION FOR THE WATER SOURCE HEAT PUMP SYSTEM SHALL BE THE MANUFACTURER'S HARDWARE AND SOFTWARE WITH STANDARD OPERATING FUNCTIONS. THE WSPH SYSTEM SHALL OPERATE UNDER THEIR INTERNAL CONTROLS.
- ALL SETPOINTS, SCHEDULES, ALARMS, AND OPERATION FEATURES SHALL BE THROUGH THE MANUFACTURER'S CONTROLS. ALL FEATURES SHALL ALSO BE CAPABLE OF BEING MONITORED, ADJUSTED AND TRENDED THROUGH THE FUTURE TRIDIUM-NIAGARA BAS.
- THE FACTORY SUPPLIED, WALL MOUNTED THERMOSTAT/CONTROLLER SHALL SEQUENCE THE DX COOLING AND HEATING FOR THE INDIVIDUAL INDOOR WATER SOURCE HEAT PUMP UNITS TO MAINTAIN SPACE TEMPERATURE SETPOINT. AFTER STARTUP/COMMISSIONING IS COMPLETE, THERMOSTAT SHALL HAVE BUTTONS DIGITALLY LOCKED OUT. SPECIFIC LOCKOUTS TO BE COORDINATED WITH OWNER.
- THE HEAT PUMPS SHALL OPERATE ON A TIME OF DAY OCCUPIED/UNOCCUPIED SCHEDULE. OCCUPANCY SHALL BE PREDETERMINED BY THE OWNER AND PROGRAMMED INTO THE WATER SOURCE HEAT PUMP CONTROL SYSTEM. DURING OCCUPIED MODE, ZONE FAN SHALL BE ON, AND UNIT SHALL CYCLE COOLING OR HEATING OPERATION. DURING UNOCCUPIED MODE, ZONE FAN SHALL BE OFF, AND CYCLE ON AS NEEDED TO COOL OR HEAT.
- OCCUPIED MODE: SPACES SERVED BY THE WATER SOURCE HEAT PUMP SYSTEM SETPOINT SHALL BE 73°F SUMMER AND 70°F WINTER (ALL ADJ.).
- UNOCCUPIED MODE: SPACES SERVED BY THE WATER SOURCE HEAT PUMP SYSTEM SETPOINT SHALL BE 75°F SUMMER AND 65°F WINTER (ALL ADJ.).
- A BAS COMMUNICATIONS INTERFACE SHALL BE PROVIDED BY THE UNIT MANUFACTURER FOR ALARM AND MONITORING THROUGH THE FUTURE BAS.
- ALL FAN COIL UNITS SHALL HAVE AN AUXILIARY CONDENSATE OVERFLOW SWITCH INTERLOCKED TO SHUTDOWN THE FAN COIL UNITS AND GENERATE AN ALARM.

#### EXHAUST FAN:

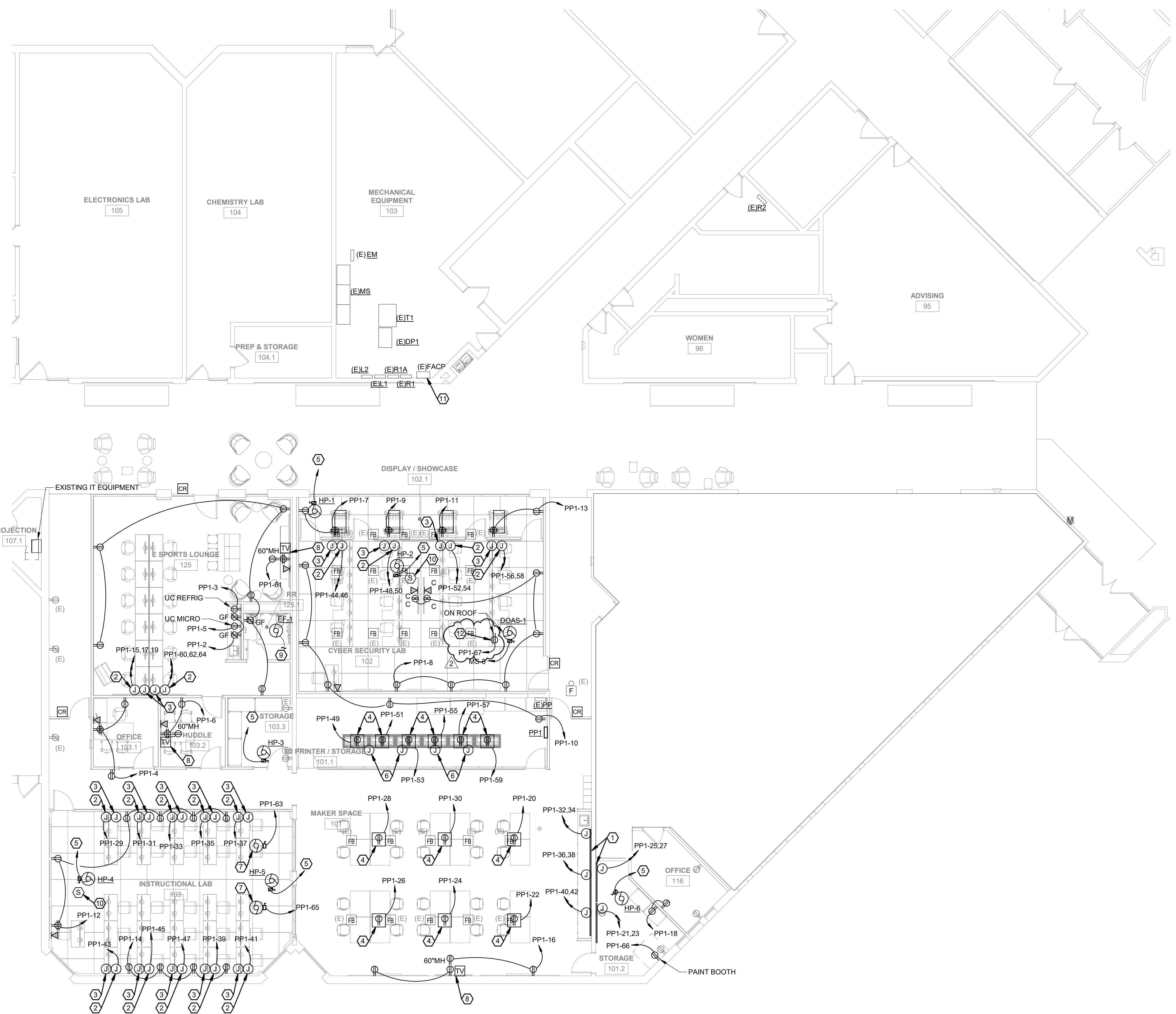
- THIS SEQUENCE OF OPERATION APPLIES TO THE FOLLOWING UNITS:
  - EF-1
- EXHAUST FAN SHALL RUN WHEN COMMANDED ON VIA OCCUPANCY SENSOR.
- FAN SHALL RUN AT CONSTANT VOLUME ON A 5 MINUTE TIMER (ADJ.) AFTER OCCUPANCY SENSOR IS TRIPPED.

This document is the product and property of Basher Model Donnelly Preston, Inc. Whether the document or the information contained herein is copied or used for other than the specific project for which it was prepared without the written consent of Basher Model Donnelly Preston, Inc.

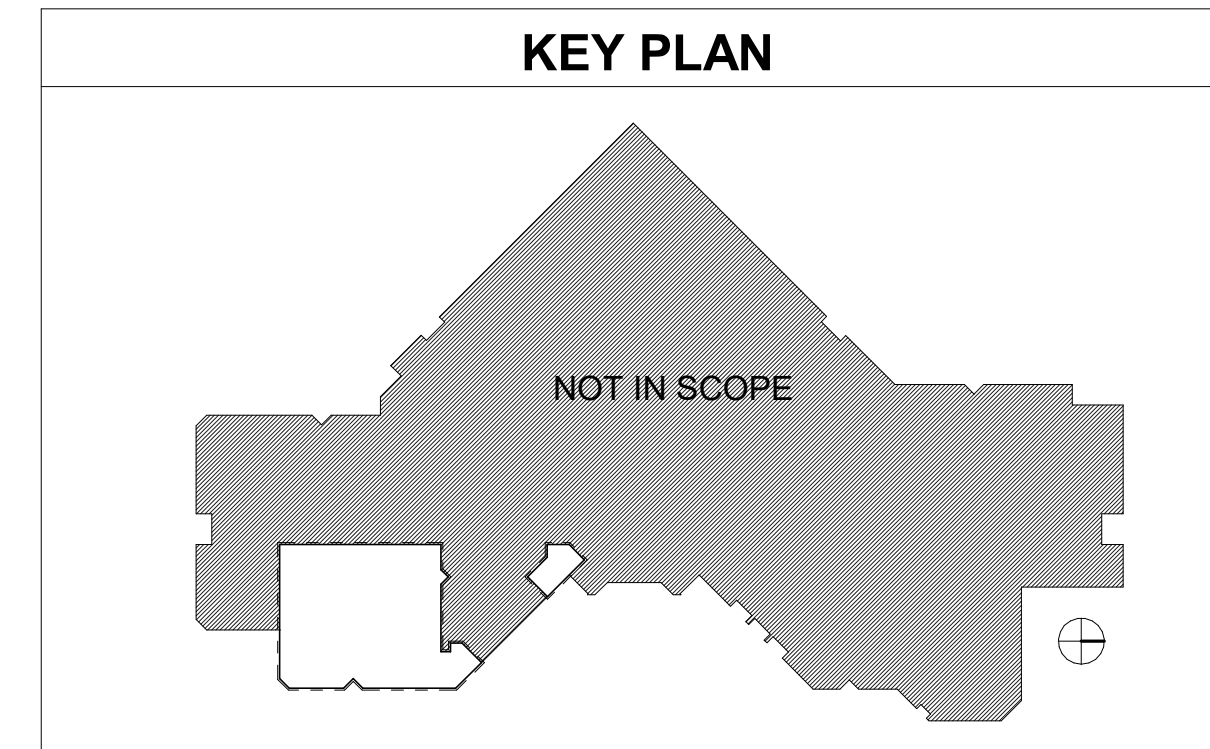


- GENERAL SHEET NOTES:**
- A. ALL RECEPTACLES LOCATED WITH GENERAL PUBLIC ACCESS SHALL BE TAMPER RESISTANT TYPE.
  - B. COORDINATE ALL ROUGH-IN REQUIREMENTS AND EQUIPMENT LOCATIONS WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.
  - C. PROVIDE FINAL CONNECTIONS TO ALL EQUIPMENT SHOWN PER MANUFACTURER'S PUBLISHED INSTRUCTION.
  - D. ALL EXTERIOR CONNECTIONS AND DEVICES SHALL BE LISTED WEATHER RESISTANT AND WATER TIGHT. COORDINATE DEVICE COLOR SELECTIONS WITH ARCHITECT/OWNER.
  - E. REFER TO DEVICE ORIENTATION DETAIL 1/E501 FOR WALL BOX DEVICES.

- SHEET KEYNOTES:**
1. PROVIDE LEGRAND 2000 SERIES PLUGMOLD, TWO CIRCUIT, ALTERNATING DEVICE, 12" SPACING, STEEL CONSTRUCTION, LENGTH PER PLANS ABOVE COUNTERTOP. COORDINATE EXACT LOCATION AND HEIGHT WITH COUNTERTOP.
  2. JUNCTION BOX FOR HARD WIRED FURNITURE CONNECTION.
  3. TELECOM JUNCTION BOX FOR HARD WIRED FURNITURE CONNECTION. EXTEND 1" CONDUIT AND PULL STRING 6" ABOVE ACCESSIBLE CEILING.
  4. CEILING MOUNTED CORD REEL WITH 2 DUPLEX RECEPTACLES. P/N HUBBELL HBL2523R20 OR APPROVED EQUAL. PROVIDE DUPLEX RECEPTACLE MOUNTED TO STRUCTURE ADJACENT TO CORD REEL. REFER TO DETAIL 2/E501.
  5. INTERCEPT EXISTING POWER CIRCUIT AND EXTEND TO NEW HEAT PUMP. PROVIDE JUNCTION BOXES, SPLICES AND SUPPORTS AS REQUIRED TO MAKE FINAL CONNECTION TO DISCONNECT. NEW UNIT IS OF SIMILAR SIZE AND LOAD OF DEMOLISHED UNIT.
  6. CEILING MOUNTED DATA CONNECTION TO PRINTER RACK.
  7. ALTERNATE 1: PROVIDE POWER CONNECTION TO OVERHEAD DOOR (1000W, 120V). MAKE FINAL CONNECTIONS TO SAFETY SENSORS AT UPPER AND LOWER EDGES OF DOOR PER MANUFACTURER'S WRITTEN INSTRUCTIONS. PROVIDE LOW VOLTAGE CABLE (#24AWG MINIMUM IN 1/2" CONDUIT TO SENSORS. COORDINATE EXACT LOCATION PRIOR TO ROUGH-IN. PROVIDE 20A DISCONNECT SWITCH.
  8. PROVIDE DUAL SERVICE TV OUTLET. REFER TO DETAIL 3/E501.
  9. EXHAUST FAN POWERED/CONTROLLED BY LIGHTS WITHIN SPACE.
  10. SMOKE DETECTOR IN RETURN AIR PLENUM WITH INTEGRAL FAN SHUTDOWN RELAY. PENDANT MOUNT SMOKE DETECTOR IN FRONT OF UNIT RETURN OPENING.
11. EXISTING PRE-ABOVE CONTROL PANEL (SIMPLE 1100S)
12. RECEPTACLE INCLUDED WITH DOAS, MAKE FINAL CONNECTIONS.



**FIRST FLOOR PLAN - POWER AND SYSTEMS**  
 1  
 E-201 1/8" = 1'-0"



This document is the property of Bunker Model/Donnelly Preston, Inc. Neither the document nor the information it contains may be copied or used for any other project without the written consent of Bunker Model/Donnelly Preston, Inc.

### Switchboard: MS (EXISTING)

Location: MECHANICAL...		Volts: 480/277 Wye		A.I.C. Rating: EXISTING	
Supply From: MCB		Phases: 3		Main Type: MLO	
Mounting: SURFACE		Wires: 4		Mains Rating: 2000 A	
Enclosure: 1				MCB Rating: 2000 A	

CKT	Circuit Description	# of Poles	Frame Size	Tripp Rating	Load	Remarks
1	HP ELECT MECH/ELECTRONIC/HP1, HP...	3	60 A	60 A	32.6 kVA	
2	(E) HP CYBER SECURITY	3	60 A	60 A	11.0 kVA	
3	4A2-4A1	3	400 A	100 A	50.0 kVA	
4	HP-1	3	400 A	20 A	1.3 kVA	
5	H3/H4 HOT WATER PUMP	3	30 A	30 A	2.7 kVA	
6	H40	3	60 A	60 A	2.0 kVA	
7	HP CLASSROOMS HP6,HP6,HP6,HP6	3	60 A	60 A	21.6 kVA	
8	DOAS	3	60 A	35 A	23.0 kVA	
9	HP-1, HP3, HP5 (E-SPORTS, INSTRUCT LAB)	3	60 A	45 A	21.3 kVA	
10	HP GENERAL OFFICES HP2, HP5,HP7, HP8	3	60 A	60 A	24.7 kVA	
11	LH VEST 45	3	60 A	60 A	28.3 kVA	
12	HP LIBRARY HP4,HP4,HP6,HP8	3	60 A	60 A	23.5 kVA	
13	T1	3	600 A	600 A	290.5...	
14	HP FACULTY OFFICE HP1, HP6,HP8	3	60 A	60 A	17.2 kVA	
15	DP3	3	600 A	600 A	125.0...	
16	DP1	3	600 A	600 A	192.7...	
17	H17A HEAT REJECTION FAN	3	60 A	60 A	28.3 kVA	
18	AHU-2	3	30 A	30 A	2.0 kVA	
19	COOLING TOWER HEATER	3	30 A	30 A	10.0 kVA	
20	AHU-1	3	30 A	30 A	2.0 kVA	
21	H16 HOT WATER PUMP	3	60 A	60 A	21.6 kVA	
22	H15 HOT WATER PUMP	3	60 A	60 A	21.6 kVA	
23	H18 HEAT REJECTION PUMP	3	100 A	60 A	2.8 kVA	
24	TRANSFER SWITCH	3	60 A	60 A	0.0 kVA	
25	L2	3	200 A	200 A	50.4 kVA	
26	L1	3	200 A	200 A	63.1 kVA	
27	EM	3	400 A	100 A	7.9 kVA	
28						
Total Conn. Load:					1068.8 kVA	
Total Amps:					1286 A	

Conn. Load	Demand Load	Demand Current
1068.8 kVA	985.9 kVA	1186 A

### Switchboard: DP1(EXISTING)

Location: MECHANICAL...		Volts: 120/208 Wye		A.I.C. Rating: EXISTING	
Supply From: T1		Phases: 3		Main Type: MLO	
Mounting: SURFACE		Wires: 4		Mains Rating: 1000 A	
Enclosure: 1				MCB Rating:	

CKT	Circuit Description	# of Poles	Frame Size	Tripp Rating	Load	Remarks
1	R1	3	200 A	200 A	34.5 kVA	
2	R2	3	200 A	200 A	34.5 kVA	
3	R3	3	200 A	200 A	30.9 kVA	
4	R4	3	200 A	200 A	16.6 kVA	
5	P3	3	200 A	200 A	50.5 kVA	
6	P1	3	100 A	100 A	17.6 kVA	
7	SPARE	3	100 A	0 A	0.0 kVA	
8	R1A	3	100 A	100 A	12.7 kVA	
9	SPARE	3	100 A	0 A	0.0 kVA	
10	RP1	3	200 A	200 A	18.0 kVA	
11	RP2	3	200 A	200 A	15.0 kVA	
12	PP1	3	200 A	200 A	61.4 kVA	
13						
14						
15						
Total Conn. Load:					290.5 kVA	
Total Amps:					806 A	

Conn. Load	Demand Load	Demand Current
290.5 kVA	202.3 kVA	562 A

### Panel: PP1

Location: 3D PRINTER /...		Volts: 120/208 Wye		A.I.C. Rating: 10KAIC	
Supply From: R2		Phases: 3		Main Type: MLO	
Mounting: Surface		Wires: 4		Mains Rating: 200 A	
Enclosure: Type 1				MCB Rating:	

CK T	Circuit Description	Pole s	A	B	C	Pole s	Tripp	Circuit Description	CK T
1	RECP E-SPORTS 125	20 A	1	1.1	0.4	1	20 A	RECP KITCHEN 125	2
3	(GF)UC REFRIGERATOR	20 A	1	1.2	0.7	1	20 A	RECP OFFICE 103.1	4
5	(GF)UC MICROWAVE	20 A	1	1.2	0.7	1	20 A	RECP OFFICE 103.2	6
7	RECP DISPLAY 102.1	20 A	1	0.5	0.9	1	20 A	RECP CYBER SEC 102	8
9	RECP DISPLAY 102.1	20 A	1	0.4	0.9	1	20 A	RECP CYBER SEC 102	10
11	RECP DISPLAY 102.1	20 A	1	0.4	0.9	1	20 A	RECP LAB 103	12
13	RECP DISPLAY 102.1	20 A	1	0.5	0.7	1	20 A	RECP LAB 103	14
15	RECP DESK E-SPORTS	20 A	1	1.2	0.7	1	20 A	RECP MAKER 101	16
17	RECP DESK E-SPORTS	20 A	1	1.2	0.4	1	20 A	RECP STORAGE 101.2	18
19	RECP DESK E-SPORTS	20 A	1	1.2	0.4	1	20 A	CORD MAKER 101	20
21	RECP STORAGE 101.2	20 A	1	1.2	0.4	1	20 A	CORD MAKER 101	22
23	RECP STORAGE 101.2	20 A	1	1.2	0.4	1	20 A	CORD MAKER 101	24
25	RECP STORAGE 101.2	20 A	1	1.2	0.4	1	20 A	CORD MAKER 101	26
27	RECP STORAGE 101.2	20 A	1	1.2	0.4	1	20 A	CORD MAKER 101	28
29	RECP DESK LAB 103	20 A	1	1.2	0.4	1	20 A	CORD MAKER 101	30
31	RECP DESK LAB 103	20 A	1	1.2	1.2	1	20 A	RECP MAKER 101	32
33	RECP DESK LAB 103	20 A	1	1.2	1.2	1	20 A	RECP MAKER 101	34
35	RECP DESK LAB 103	20 A	1	1.2	1.2	1	20 A	RECP MAKER 101	36
37	RECP DESK LAB 103	20 A	1	1.2	1.2	1	20 A	RECP MAKER 101	38
39	RECP DESK LAB 103	20 A	1	1.2	1.2	1	20 A	RECP MAKER 101	40
41	RECP DESK LAB 103	20 A	1	1.2	1.2	1	20 A	RECP MAKER 101	42
43	RECP DESK LAB 103	20 A	1	1.2	1.2	1	20 A	RECP DESK LAB 102	44
45	RECP DESK LAB 103	20 A	1	1.2	1.2	1	20 A	RECP DESK LAB 102	46
47	RECP DESK LAB 103	20 A	1	1.2	1.2	1	20 A	RECP DESK LAB 102	48
49	CORD PRINTER 101.1	20 A	1	0.4	1.2	1	20 A	RECP DESK LAB 102	50
51	CORD PRINTER 101.1	20 A	1	0.4	1.2	1	20 A	RECP DESK LAB 102	52
53	CORD PRINTER 101.1	20 A	1	0.4	1.2	1	20 A	RECP DESK LAB 102	54
55	CORD PRINTER 101.1	20 A	1	0.4	1.2	1	20 A	RECP DESK LAB 102	56
57	CORD PRINTER 101.1	20 A	1	0.4	1.2	1	20 A	RECP DESK LAB 102	58
59	CORD PRINTER 101.1	20 A	1	0.4	1.2	1	20 A	RECP DESK E-SPORTS	60
61	RECEPTACLE	20 A	1	0.5	1.2	1	20 A	RECP DESK E-SPORTS	62
63	GARAGE DOOR	20 A	1	1.0	1.2	1	20 A	RECP DESK E-SPORTS	64
65	GARAGE DOOR	20 A	1	1.0	1.6	1	20 A	RECEPTACLE	66
67	RECEPTACLE	20 A	1	0.2	0.0	1	20 A	SPARE	68
69	SPARE	20 A	1	0.0	0.0	1	20 A	SPARE	70
71	SPARE	20 A	1	0.0	0.0	1	20 A	SPARE	72
73	SPARE	20 A	1	0.0	0.0	1	20 A	SPARE	74
75	SPARE	20 A	1	0.0	0.0	1	20 A	SPARE	76
77	SPARE	20 A	1	0.0	0.0	1	20 A	SPARE	78
79	SPARE	20 A	1	0.0	0.0	1	20 A	SPARE	80
81	SPARE	30 A	2	0.0	0.0	1	20 A	SPARE	82
83	SPARE	30 A	2	0.0	0.0	1	20 A	SPARE	84
Total Load:					19.5 kVA	20.7 kVA	21.2 kVA		
Total...					163 A	174 A	178 A		

Conn. Load	Demand Load	Demand...
61.4 kVA	37.0 kVA	103 A

### Panel: PP (EXISTING)

Location: 3D PRINTER /...		Volts: 120/208 Wye		A.I.C. Rating: 10KAIC	
Supply From: R2		Phases: 3		Main Type: MLO	
Mounting: Surface		Wires: 4		Mains Rating: 100 A	
Enclosure: Type 1				MCB Rating:	

CK T	Circuit Description	Pole s	A	B	C	Pole s	Tripp	Circuit Description	CK T
1	LTG CYBER SECURITY	20 A	1	1.0	0.8	1	20 A	LTG MAKERS	2
3	LTG E-SPORTS...	20 A	1	1.0	0.0	1	20 A	(E)SPARE	4
5	LTG INSTRUTIONAL	20 A	1	0.0	0.0	1	20 A	(E)SPARE	6
7	(E)SPARE	20 A	1	0.0	0.0	1	20 A	(E)SPARE	8
9	(E)SPARE	20 A	1	0.0	0.0	1	20 A	(E)SPARE	10
11	(E)SPARE	20 A	1	0.0	0.0	1	20 A	(E)SPARE	12
13	(E)SPARE	20 A	1	0.0	0.0	1	20 A	(E)SPARE	14
15	(E)SPARE	20 A	1	0.0	0.0	1	20 A	(E)SPARE	16
17	(E)SPARE	20 A	1	0.0	0.0	1	20 A	(E)SPARE	18
19	(E)SPARE	20 A	1	0.0	0.0	1	20 A	(E)SPARE	20
21	SPACE	--	1	--	--	1	--	SPACE	22
23	SPACE	--	1	--	--	1	--	SPACE	24
25	SPACE	--	1	--	--	1	--	SPACE	26
27	SPACE	--	1	--	--	1	--	SPACE	28
29	SPACE	--	1	--	--	1	--	SPACE	30
Total Load:					1.7 kVA	1.0 kVA	0.6 kVA		
Total...					15 A	9 A	5 A		

Conn. Load	Demand Load	Demand...
3.4 kVA	3.4 kVA	9 A

### LUMINAIRE SCHEDULE

TYPE	DIMENSI ONS	MOUNTING	CONSTRUCTION AND FINISH	DESCRIPTION AND OPTIONS	LAMPS	BALLAST(S)	VOLTAGE/OAD	APPROVED MANUFACTURER(S)
CV1	5" x 22" 5"	SURFACE	ALUMINUM CHANNEL	RGB LINEAR CHANNEL MOUNT TAPE PROVIDE ALL MOUNTING HARDWARE, POWER SUPPLIES, CONTROLLERS ETC TO MAKE A COMPLETE WORKING SYSTEM	INTEGRAL LED RGB	REMOTE RGB	120/277V 55W	LUMINI LINE LED RGBW 36 LTRGBW36-SO-X-X-22" BOSC-F OTI KLUS ACOLYTE SURELITES APEL EXTRONIX COMPASS
EM	5" x 9" 3"	SURFACE	THERMOPLASTIC	DUAL HEAD EMERGENCY LIGHT 90 MINUTE BATTERY BACKUP	INTEGRAL LED	N/A	120/277V 3W	METALUX FP 24FP4740C ABOVE ALL
R1	2" x 4" 1" DEEP	RECESSED GRID	ALUMINUM HOUSING	RECESSED EDGE LIT TROFFER	INTEGRAL LED 4000K 4000LU	INTEGRAL 0-10V	120/277V 42W	PORTFOLIO LD4C-05-0010/EU4C-40-4LB-M-1-LI LIGHTOLIER PRESCOLITE
R3A	4" DIA	RECESSED GRID/GYP	STEEL HOUSING	RECESSED DOWN LIGHT SPECULAR CLEAR REFLECTOR	INTEGRAL LED 4000K 500LU	INTEGRAL 0-10V	120/277V 5W	PORTFOLIO LD4C-05-0010/EU4C-40-4LB-M-1-LI LIGHTOLIER PRESCOLITE
R3B	4" DIA	RECESSED GRID/GYP	STEEL HOUSING	RECESSED DOWN LIGHT SPECULAR CLEAR REFLECTOR	INTEGRAL LED 4000K 2000LU	INTEGRAL 0-10V	120/277V 18W	PORTFOLIO LD4C-05-0010/EU4C-40-4LB-M-1-LI LIGHTOLIER PRESCOLITE
S1A	2" x 4" 5"	SUSPENDED	EXTRUDED ALUMINUM HOUSING	SUSPENDED LINEAR DIRECT	INTEGRAL LED 4000K 2400LU	INTEGRAL 0-10V	120/277V 18W	FOCALPOINT SEEM 2 F5M2LS-BW-825LF-40K-1C-UNV-LD1-X-X-X-4' LUMENWERX LEDALITE
S1B	2" x 4" 5"	SUSPENDED	EXTRUDED ALUMINUM HOUSING	SUSPENDED LINEAR DIRECT	INTEGRAL LED 4000K 2400LU	INTEGRAL 0-10V	120/277V 27W	FOCALPOINT SEEM 2 F5M2LS-BW-825LF-40K-1C-UNV-LD1-X-X-X-4' LUMENWERX LEDALITE
S2	6" DIA 12" HIGH	SUSPENDED PENDANT	SPUN ALUMINUM HOUSING	SUSPENDED CYLINDER SPECULAR CLEAR REFLECTOR	INTEGRAL LED 4000K 1500LU	INTEGRAL 0-10V	120/277V 14W	HALO HCC4S-15-0010-X-PENDANT KIT XX' LENGTH /HM4-0525-840-41-MD-C LIGHTOLIER PRESCOLITE
S3	4" x 4"	SUSPENDED	STEEL HOUSING ACRYLIC LENS	SUSPENDED INDUSTRIAL	INTEGRAL LED 4000LU	INTEGRAL 0-10V	120/277V 14W	METALUX SNLED 4SNLED-LD5-LW-UNV-L840-CD-1-U-AYC DAYBRIGHT COLUMBIA
S4	2" C LENGTH AS SHOWN	SUSPENDED	EXTRUDED ALUMINUM HOUSING PET ACOUSTIC	SUSPENDED LINEAR DIRECT ACOUSTIC Y SHAPE	INTEGRAL LED 4000LU	INTEGRAL 0-10V	120/277V 50W	LUMENWERX VIA2ACOPY3-D-8IN-HLO-FH-NA-SW-XXCRI-4000LM-N-A-XXK-UNV-D1-1-MOUNTING-W-FELT COLOR-NA FOCALPOINT SABIAN
S5	2" C LENGTH AS SHOWN	SUSPENDED	EXTRUDED ALUMINUM HOUSING PET ACOUSTIC	SUSPENDED LINEAR DIRECT ACOUSTIC Z SHAPE	INTEGRAL LED 4000K XXLIFT	INTEGRAL 0-10V	120/277V 50W	LUMENWERX MP4815-VIA2ACOP-D-HLO-FH-NA-SW-XXCRI-3000LM-NA-XXK-9FT-2LEVC(120)-8IN-UNV-D1-1-MOUNTING-W-FELT COLOR-NA FOCALPOINT SABIAN
S6	2" C LENGTH AS SHOWN	SUSPENDED	EXTRUDED ALUMINUM HOUSING PET ACOUSTIC	SUSPENDED LINEAR DIRECT ACOUSTIC Z SHAPE	INTEGRAL LED 4000K XXLIFT	INTEGRAL 0-10V	120/277V 50W	LUMENWERX MP4815-VIA2ACOP-D-HLO-FH-NA-SW-XXCRI-3000LM-NA-XXK-9FT-2LEVC(120)-8IN-UNV-D1-1-MOUNTING-W-FELT COLOR-NA FOCALPOINT SABIAN
S7	2" x 28"	SUSPENDED	EXTRUDED ALUMINUM HOUSING	SUSPENDED LINEAR WALL WASHER ASYMMETRIC LENS	INTEGRAL LED 4000K 1000LU	INTEGRAL 0-10V	120/277V 84W	FOCALPOINT SEEM 2 F5M2LS-S-35LFL-40K-1C-UNV-LD1-X-X-X-28" LUMENWERX SABIAN
W1	29" x 24" 4"	WALL/SURFACE	STEEL HOUSING ACRYLIC LENS, ALUMINUM END CAPS	LIGHTED MIRROR	INTEGRAL LED 4000K 1000LU	INTEGRAL	120/277V 20W	ASI MODEL 0641 APPROVED EQUAL
X1	13" x 8" 2"	UNIVERSAL WALL/CEILING	THERMOPLASTIC	DUAL HEADS AND 90 MINUTE BATTERY BACKUP	INTEGRAL LED	N/A	120/277V 3W	SURELITES LPXC-25 EXTRONIX DUALITE

### SHEET KEYNOTES:

- PROVIDE NEW FUSES IN EXISTING BUCKET.
- PROVIDE NEW BUCKET / FUSES IN EXISTING SPACE.

### MOTOR SCHEDULE