

**MECHANICAL - FLOOR PLAN**  
SCALE: 1/4" = 1'-0"  
1 of M1.0

- REQUIRED TESTING**
1. CONDUCT A LIGHT-TEST TO CHECK WELDS ON KITCHEN GREASE DUCTS. THE TEST MUST BE WITNESSED BY THE FIRE DEPARTMENT. NOTE: INSPECTORS MAY REQUIRE ALTERNATIVE TESTING UNDER CERTAIN CIRCUMSTANCES.
  2. A PUFF TEST IS REQUIRED ON THE KITCHEN SUPPRESSION SYSTEM. SUBMITTED TO OWNERSHIP.
  3. AN AIR-CAPTURE TEST IS REQUIRED ON THE KITCHEN HOOD(S). SUBMITTED TO OWNERSHIP.
  4. A TEST AND BALANCE REPORT IS REQUIRED TO BE SUBMITTED TO OWNERSHIP AND REVIEWED BY ENGINEER.

- HVAC PLAN NOTES**
1. EC TO FURNISH RETURN DUCT MOUNTED SMOKE DETECTOR AND PROVIDE COMPATIBLE REMOTE ANNUNCIATOR/TEST SWITCH. MC TO INSTALL SMOKE DETECTOR IN RETURN DUCT. PRIOR TO ANY OUTDOOR AIR CONNECTIONS. MC TO PROVIDE INTERLOCK WIRING BETWEEN SMOKE DETECTOR AND UNIT TO SHUT DOWN UNIT UPON DETECTION OF SMOKE. EC SHALL PROVIDE WIRING FOR FINAL CONNECTION TO CENTRAL FIRE ALARM SYSTEM, IF APPLICABLE, AND WIRING TO REMOTE ANNUNCIATOR/TEST SWITCH.
  2. TYPICAL SUPPLY AIR DROP FROM MAKEUP AIR UNIT. PROVIDE DIRECTIONAL VANES AT BOTTOM OF DROP INSIDE DUCT. KEEP ALL MAKEUP AIR DUCTS ABOVE THE CEILING.
  3. TYPICAL SUPPLY FROM RTU. PROVIDE DIRECTIONAL VANES AT BOTTOM OF DROP INSIDE DUCT. 22 GA. MATERIAL. UNIT FURNISHED BY LANDLORD.
  4. RUN A 4" EXHAUST DUCT FROM EACH EXHAUST FAN AND COMBINE INTO 6" EXHAUST DUCT AND RUN UP THROUGH ROOF. SEAL PENETRATION WATER TIGHT. PROVIDE THERMOSTAT AND MOUNT ON WALL 4 FEET A.F.F.

**HVAC SYMBOL LEGEND**

| SYMBOL | DESCRIPTION   | SIZE     | COLOR                        |
|--------|---|----------|------------------------------|
|        | 2' X 2' SQUARE CONE DIFFUSER (FIXED AIR PATTERN), "PRICE" - ASCD4C/B12 ALUMINUM W/ 3800-SERIES BUTTERFLY DAMPER   | 2' x 2'  | FACTORY WHITE                |
|        | 2' X 2' DIFFUSER (PERFORATED LOW-VELOCITY) PRICE - PDS W/ 3800-SERIES BUTTERFLY DAMPER  | 2' x 2'  | FACTORY WHITE                |
|        | SLOT CEILING DIFFUSER.  | 4' x 48" | FACTORY WHITE                |
|        | RETURN AIR GRILLE, MFR: PRICE. LOUVERED RETURN GRILLE. REMOVABLE FOR CLEANING. #530-FR. 6070 RETURN 22" X 22" / 600 / TB/ 24X24 B12 DO NOT INSTALL FILTER (FILTER COVERED BY HVAC UNIT), ANGLE DIFFUSERS AWAY FROM WALL, SPRAY PAINT PAN & COLLAR OF COLD AIR RETURN BLACK. | 2' x 2'  | FACTORY WHITE                |
|        | HONEYWELL VISIONPRO 8000 WIFI TOUCHSCREEN THERMOSTAT @ 4'-6" AFF PER HVAC PLAN.   | -        | WHITE                        |
|        | DRYWALL CEILING DIFFUSER.   | 8" Ø     | FACTORY WHITE                |
|        | NEMA TYPE 3R (OUTDOOR RATED) DISCONNECT @ EACH PIECE OF ROOF EQUIPMENT. NUMBER INDICATES AMERAGE  | -        | FACTORY                      |
|        | SMOKE DETECTOR  | -        | INSTALLED IN RETURN AIR DUCT |
|        | ALARM - SMOKE DETECTOR  | -        | INSTALLED ABOVE THERMOSTAT   |

USE BUTTERFLY DAMPERS FOR ALL TEMPERED SUPPLY DIFFUSERS (FEED FROM HVAC UNITS).  
USE LOUVERS AND DAMPERS w/ LOCKING QUADRANTS FOR ALL MAKE-UP AIR FEEDS

- HVAC GENERAL NOTES**
- SUPPLY DUCT SHALL BE IN THE FOLLOWING GAUGES (U.N.O.):  
ROUND:  
- UP TO 12" Ø = 28 GAUGE  
- 14" Ø AND LARGER = 26 GAUGE  
SQUARE / RECTANGULAR:  
- UP TO 10" X 12" = 28 GAUGE  
- 10" X 14" OR 12" X 12" AND LARGER = 26 GAUGE
  - SUPPLY DROPS SHALL BE GALVANIZED IN 24 GAUGE MATERIAL.
  - RETURN DUCT SHALL BE GALVANIZED IN 22 GAUGE MATERIAL.
  - FOR ALL SQUARE / RECTANGULAR DUCT AND RETURN AIR DUCT, THE FIRST NUMBER = DUCT HEIGHT AND THE SECOND NUMBER = DUCT WIDTH (EXAMPLE: FOR 6' X 10' DUCT, IT IS 6' HIGH AND 10' WIDE).
  - INSTALL ALL BOOTS FROM INSIDE DUCTWORK.
  - ALL DUCTWORK WITHIN CEILING CAVITIES SHALL BE WRAPPED w/ INSULATION AND COVERED WITH A VAPOR RETARDER HAVING A MAXIMUM PERMEANCE OF 0.05 PERM OR ALUMINUM FOIL HAVING THICKNESS OF 2 MILS.
  - FLEXIBLE DUCT CONNECTORS SHALL BE TESTED IN ACCORDANCE WITH UL181 AND SHALL BE LISTED AND LABELED AS CLASS O OR CLASS I DUCT.
  - DUCT COVERINGS SHALL HAVE A FLAME SPREAD INDEX NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX NOT MORE THAN 50.
  - ALL JOINTS, SEAMS, AND CONNECTIONS SHALL BE SECURELY SEALED AND FASTENED.
  - RETURN AIR DUCT SMOKE DETECTORS SHALL BE IN COMPLIANCE WITH (SECTION 606 2015 IMC).
  - VERIFY LOCATION OF ACCESS TO CONTROLS AND USE ALTERNATE POSITION IF REQUIRED.
  - IF A BUILDING FIRE ALARM SYSTEM EXISTS, ALL HVAC DUCT SMOKE DETECTORS AND HOOD CONTROL PANEL MUST REPORT TO IT. COORDINATE W/ LANDLORD.

- MECHANICAL SPECIFICATIONS**
- HVAC SYSTEMS SHALL INCLUDE HIGH & LOW PRESSURE CONTROL SAFETY SWITCHES AND SHALL BE CHECKED FOR LOCAL CODE COMPLIANCE BY THE MECHANICAL CONTRACTOR.
  - COORDINATE ALL WORK WITH THE EQUIPMENT CONTRACTOR IN TERMS OF ITEMS PROVIDED, SCOPE OF WORK, AND HOOK UP REQUIREMENTS.
  - HOOD SUPPLIER SHALL PROVIDE SHOP DRAWINGS FOR EXHAUST HOOD INSTALLATION.
  - GENERAL NOTES  
A. NO PENETRATIONS SHALL OCCUR THROUGH THE TILE BASE  
B. GAS LINE PENETRATIONS BEHIND SERVICE LINE MUST BE SUCH THAT OVEN, GRILLE AND FRYER CAN BE PULLED OUT TO NEAR FULL LENGTH. OF FLEXIBLE GAS LINE CONNECTION LOCATIONS ON THESE PIECES OF EQUIPMENT, BUT NOT SO CLOSE THAT FITTINGS INTERFERE WITH EACH OTHER WHEN EQUIPMENT IS AGAINST THE WALL. GAS LINE MUST RUN INSIDE WALLS EXCEPT AT EQUIPMENT FEEDS. SEE "CABLE RESTRAINT DETAIL" ON SHEET A6.0.
  - GENERAL CONTRACTOR MUST COORDINATE THE HVAC & HOOD CONTRACTORS SUCH THAT HVAC & HOOD SYSTEMS ARE INSTALLED TOGETHER PRIOR TO STORE OPENING. BOTH HVAC & HOOD SYSTEMS MUST BE COMPLETED AT LEAST 4 WORKING DAYS PRIOR TO AIR TEST & BALANCE TO ALLOW ENOUGH TIME FOR BALANCE TO TAKE PLACE. CHECKLIST SCHEDULE MUST BE COMPLETED AND TURNED IN TO NATIONAL T & B.
  - LIMIT FLEX-PIPE RUNS TO 5'-0" MAXIMUM LENGTH.
  - USE HARD-PIPE, 90° ELBOWS AT ALL DIFFUSERS UNLESS DIRECTLY UNDER A MAIN TRUNK LINE.
  - ALL HANGERS AND INSTALLATION METHODS FOR HVAC DUCTWORK SHALL MEET SMACNA STANDARDS.
  - PROVIDE 4" X 48", LINEAR DIFFUSERS ALONG COOK LINE. PROVIDE DAMPERS FOR EACH DIFFUSER.
  - REFER TO CAPTIVEAIRE SHOP DRAWINGS FOR ELECTRICAL FEED DETAILS & LOCATIONS @ EXHAUST FANS.
  - EXHAUST FANS BY NUTRONE OR EQUAL. EXHAUST TO EXTERIOR. WHITE. PROVIDE TWO INDIVIDUAL SINGLE PORT IN-LINE VENTILATOR TYPE FANS. COMBINE DUCTS AT END OF LINE FOR SINGLE ROOF OR WALL PENETRATION IF FIELD CONDITIONS PERMIT. (REFER TO ROOF / HVAC PLAN FOR EXIT TYPE).
  - IN OCCUPIED MODE, THE HVAC UNIT FANS SHALL BE IN THE ON MODE FOR STORE CONSTANT BALANCE.

- DAMPER NOTES:**
- INSTALL KEYED BUTTERFLY DAMPERS AT ALL SQUARE & ROUND DIFFUSERS (NOT LINEARS)  
  
WHEN INSTALLING DIFFUSERS, ALIGN ALL BUTTERFLY DAMPERS IN THE SAME DIRECTION OF AIRFLOW.
  - INSTALL IN-LINE DAMPERS WITH LOCKING HAND QUADRANT IN EACH TRIBUTARY DUCT WHERE IT LEAVES THE MAIN DUCT. AND IN LOCATION INDICATED BY THE FOLLOWING SYMBOL: MATCH DUCT DIAMETER.  
  
YOUNG REGULATOR CO.  
MODEL 5020R

**VENTILATION SCHEDULE**  
Penn Station - Union, KY - IMC-2015-403.3.1.1

| ROOM # | ROOM NAME      | Az   | Table 403.3.1.1 | Rp    | Ra       | Pz     | Vbz = Az x Ra + Rp x Pz |         |     |     |        |      |     |      |           |      | Vot = |
|--------|----------------|------|-----------------|-------|----------|--------|-------------------------|---------|-----|-----|--------|------|-----|------|-----------|------|-------|
|        |                |      |                 |       |          |        | Rp x Pz                 | Az x Ra | CFM | Eff | Vo =   | CFM  | OA  | Zp = | Voz =     | Ev   |       |
|        |                |      |                 | CFM/F | CFM/SQFT | people | CFM                     | CFM     | Vbz | Ez  | Vbz/Ez | Vpz  | CFM | OA   | Voz / Vpz | Ev   |       |
| 100    | Dining         | 723  | Dining          | 7.5   | 0.18     | 39     | 293                     | 130     | 423 | 0.8 | 528    | 4500 | 540 | 12%  | 0.12      | 1.00 | 528   |
| 101    | Front of house | 338  | Kitchen         | 7.5   | 0.12     | 4      | 30                      | 41      | 71  | 0.8 | 88     | 750  | 90  | 0.12 | 1.00      | 88   |       |
| 102    | Restroom       | 48   | Restroom        | 0     | 0        | 0      | 0                       | 0       | 0   | 0.8 | 0      | 50   | 6   | 0.00 | 1.00      | 0    |       |
| 103    | Restroom       | 67   | Restroom        | 0     | 0        | 0      | 0                       | 0       | 0   | 0.8 | 0      | 50   | 6   | 0.00 | 1.00      | 0    |       |
| 104    | Back of House  | 316  | Kitchen         | 7.5   | 0.12     | 3      | 23                      | 38      | 60  | 0.8 | 76     | 650  | 78  | 0.12 | 1.00      | 76   |       |
|        | RTU-1          | 1492 |                 |       |          |        | 46                      |         |     |     | 692    | 6000 | 720 |      |           | 692  |       |



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**SHEET CONTENTS:**  
MECHANICAL - FLOOR PLAN



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**NEW TENANT FINISH FOR:**  
**PENN STATION**  
EAST COAST SUBS  
US HWY 42 UNION, KY 41091

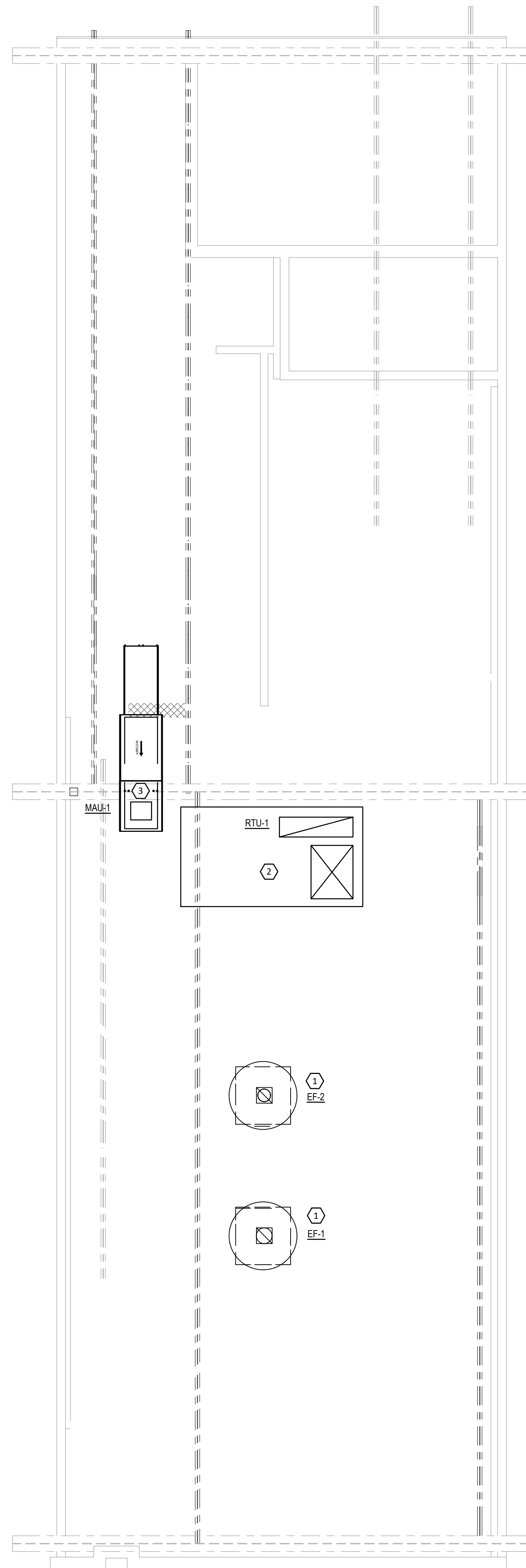
REV. DATE CK'D

Drawn By: JJR Checked: JG



Date: 08-13-2025 Job No: MQE: 13246

**M1.0**  
of



**MECHANICAL - ROOF PLAN**

SCALE: 1/4" = 1'-0"

1  
M2.0

**ROOF PLAN GENERAL NOTES**

- A. SAND, PRIME AND PAINT EXISTING AND NEW EXPOSED GAS PIPING ON ROOF. (FEEDING PENN STATION ONLY) USE SAFETY YELLOW - OIL BASE.

**ROOF PLAN KEY NOTES**

- HINGE SIDE OF EXHAUST CURB. EXHAUST FAN TO BE AT LEAST 10' FROM THE EDGE OF BUILDING OR FROM ADJACENT TENANT SPACES.
- NEW ROOFTOP UNIT AND CURB ADAPTER PROVIDED AND INSTALLED BY LANDLORD. ROUTE SUPPLY/RETURN DROPS DOWN THROUGH ROOF. REFER TO HVAC PLAN FOR CONTINUATION. COORDINATE ROOFTOP UNIT LOCATION WITH STRUCTURE BELOW. PROVIDE NEW THERMOSTAT, CONTROL WIRING, AND STAND ALONE CONTROLS FOR RTU OPERATION. ROUTE CONDENSATE TO ROOF. BALANCE SUPPLY AND OUTSIDE AIRFLOW AS SCHEDULED.
- PROVIDE NEW MAKE UP AIR UNIT, CURB, CONTROL WIRING, AND STAND ALONE CONTROLS FOR UNIT OPERATION. ROUTE SUPPLY DUCT ALONG ROOF. UTILIZE PATE, OR EQUIVALENT DUCT SUPPORTS AND ROUTE DUCT THROUGH ROOF. UTILIZE ROOF CURB FOR DUCT PENETRATION. FLASH DUCT PENETRATION FOR A WEATHERPROOF SEAL. MAINTAIN MINIMUM 10' SEPARATION BETWEEN MAKEUP AIR UNIT INTAKE AND ALL EXHAUST FANS AND VENT THROUGH ROOFS.

**AIR BALANCE**

|        |                   |
|--------|-------------------|
| - 1970 | EXHAUST HOODS     |
| - 150  | R.R. EXHAUST FANS |
| - 2120 | CFM               |
| <hr/>  |                   |
| +1630  | MAKEUP AIR UNIT   |
| +720   | RTU-1             |
| + 2350 | CFM               |
| <hr/>  |                   |
| TOTAL  |                   |
| +230   | CFM POSITIVE      |

**NOTE:**

COORDINATE ALL PENETRATIONS WITH OWNERS ROOFER SO AS NOT TO VOID WARRANTY.

MOUNT UNITS LEVEL TO ENSURE PROPER CONDENSATE DRAINING.

ALL VENTING SHALL BE DONE THROUGH THE ROOF AND NOT THE BACK WALL.

NOTE:  
SEE CAPTIVEAIRE SHOP DRAWINGS FOR DETAIL INFORMATION REGARDING HOODS AND EXHAUST FANS.

**ROOF TOP UNIT INFORMATION**

| (E)RTU-1 | QTY | MANUFACTURER | MODEL NO.    | SIZE TONS | ELECTRICAL |    |     |      | SUPPLY CFM | OSA CFM | GAS LOAD - MBH |        | SIZE (W x D x H)             | WEIGHT | RATING   | NOTES         |
|----------|-----|--------------|--------------|-----------|------------|----|-----|------|------------|---------|----------------|--------|------------------------------|--------|----------|---------------|
|          |     |              |              |           | VOLT       | PH | MCA | MCCP |            |         | INPUT          | OUTPUT |                              |        |          |               |
|          | 1   | CARRIER      | 48FEEM16A2A5 | 15.0      | 208        | 3Ø | 69  | 80   | 6000       | 720     | 240.0          | 195.0  | 63-3/8" x 115-7/8" x 57-3/8" | 1,734  | 10.8 EER | REFER TO A4-1 |

**REMARKS**

1. RTUS TO BE PROVIDED WITH 2 POSITION OSA MOTORIZED DAMPER AT OUTSIDE AIR HOOD OF RTU. FACTORY OR FIELD INSTALLED. DAMPER TO OPEN TO 900 CFM WHEN CONTROLS ARE IN OCCUPIED MODE.

**NATURAL GAS MAKEUP AIR UNIT**

| MAU-1 | QTY | MANUFACTURER | MODEL NO.    | BLOWER     | HEATING BTUS |        | GAS TYPE | BURNER EFF. | COOLING BTUS |          | ELECTRICAL |    |     |      | SUPPLY CFM | ESP. | WEIGHT |
|-------|-----|--------------|--------------|------------|--------------|--------|----------|-------------|--------------|----------|------------|----|-----|------|------------|------|--------|
|       |     |              |              |            | INPUT        | OUTPUT |          |             | TOTAL        | SENSIBLE | VOLT       | PH | FLA | MCCP |            |      |        |
|       | 1   | CAPTIVEAIRE  | A1-D.250-15D | 15MF-1-MOD | 110,372      | 101542 | NATURAL  | 92%         | -            | -        | 208        | 3Ø | 4.4 | 15   | 1630       | 0.44 | 648    |

**EXHAUST FAN SCHEDULE**

| ITEM No. | QTY | DESCRIPTION | MANUFACTURER | MODEL # | ELECTRICAL |    |                 | FLA | EXHAUST CFM | SIZE (W x D x H)              | NOTES       |
|----------|-----|-------------|--------------|---------|------------|----|-----------------|-----|-------------|-------------------------------|-------------|
|          |     |             |              |         | VOLT       | PH | LOAD            |     |             |                               |             |
| EF-1     | 1   | GRIDDLE     | CAPTIVE-AIRE | DUBSHFA | 120        | 1Ø | 1.8 AMP/ 1 hp   | 8.9 | 1120        | 33 3/4" DIA. x 30 1/2" x CURB | REFER TO H1 |
| EF-2     | 1   | FRYER FAN   | CAPTIVE-AIRE | DUBSHFA | 120        | 1Ø | 1.8 AMP/ 1/2 hp | 8.8 | 850         | 33 3/4" DIA. x 30 1/2" x CURB | REFER TO H3 |

**HVAC TEST & BALANCE SPECIFICATIONS**

ALL BALANCING IS CONTRACTED BY THE GENERAL CONTRACTOR AND PERFORMED BY OUR PREFERRED TAB FIRM-NATIONAL TAB. NATIONAL TAB ASSIST THE OWNER IN THE BALANCING PROCESS FROM INITIAL PLANNING THRU DOCUMENTATION CLOSEOUT. ANY QUESTIONS AND QUOTATION, PLEASE CONTACT NATIONAL TAB AT (855)-682-8822 EXT. 706 (JENNIFER) OR SUBMIT REQUEST TO [BIOS@NATIONALTAB.COM](mailto:BIOS@NATIONALTAB.COM)

1.0 GENERAL REQUIREMENTS: TEST AND BALANCE (TAB) OVERVIEW IS A GENERAL GUIDELINE OF THE PROPER FLOW OF PLANNING & BALANCING OF THE SYSTEM. IT MANDATES ALL TRADES, OWNERS, CONSTRUCTION PERSONNEL, VENDORS, & BALANCING FIRM PARTICIPATE IN THE PROCESS. PLANNING ENSURES PREPAREDNESS, PROPER INSTALLATION, AND SYSTEM READINESS. BALANCING ENSURES FUNCTION & PERFORMANCE OF THE VENTILATION SYSTEM. THE SPECIFIC TRADE REQUIREMENTS ARE TO BE CARRIED OUT TO ITS FULLEST EXTENT. EACH ASSIGNED TRADE WILL BE HELD ACCOUNTABLE. FINAL RETAINAGE (PAYMENT) IS NOT TO BE PAID BY THE OWNER UNTIL THE SPECIFIC TRADE REQUIREMENTS HAVE BEEN MET.

2.0 PHASE I (INITIAL PLANNING & REVIEW): PLANS & SUBMITTALS DISBURSED FOR REVIEW AND SCHEDULING. TAB PROCEDURES FINALIZED AND JOB READINESS CONFIRMED.

2.1 OWNER RESPONSIBILITIES: DISTRIBUTE ALL ARCHITECT PLANS/SUBMITTALS TO NATIONAL TAB AND PROVIDE THE REQUIRED OPENING DATES FOR THE RESTAURANT.

2.2 GENERAL CONTRACTOR RESPONSIBILITIES: CONSTRUCT A JOB SCHEDULE BASED UPON OWNER REQUIREMENTS, DATA & SCHEDULES COLLECTED FROM ALL TRADES. COMMUNICATE THE INFORMATION TO NATIONAL TAB. OBTAIN THE PRELIMINARY FIELD CHECKLIST FROM THE BALANCING CO. MANAGE ALL TRADES TO ENSURE THEY COMPLETE & SIGNOFF ON THEIR REQUIREMENTS BEFORE THE BALANCER IS SCHEDULED TO PERFORM ONSITE WORK. ENSURE THE GENERAL CONDITION OF THE BUILDING IS SIGNED-OFF BY THE JOB SUPERVISOR.

2.3 NATIONAL TAB (BALANCING) RESPONSIBILITIES: REVIEW ANY PLANS & SUBMITTALS FOR ANY POSSIBLE DEFICIENCIES AND DISCREPANCIES IN DATA OR DRAWINGS. FINALIZE FINAL TAB START DATE WITH THE GENERAL CONTRACTOR AND THE PRELIMINARY CHECKLIST IS COMPLETED OR ACTION STEPS DOCUMENTED FOR ITEMS ON THE CHECKLIST THAT ARE NOT COMPLETED BEFORE EXECUTION OF BALANCING.

3.0 PHASE II (PRELIMINARY FIELD PROCEDURE): VERIFICATION OF SITE AND EQUIPMENT CONDITIONS. ANALYSIS OF PROPER INSTALLATION AND PERFORM OPERATIONAL AND FUNCTIONAL TEST.

3.1 GENERAL CONTRACTOR RESPONSIBILITIES: ENSURE ALL REQUIRED TRADES ARE PRESENT OR READILY AVAILABLE FOR THE BALANCER'S INITIAL "WALK-THRU" & START-UP VERIFICATION. ENSURE ALL TRADES IMMEDIATELY FIX ANY ISSUE THAT THE BALANCER MAY UNCOVER DURING THE INITIAL "WALK-THRU" THAT MAY AFFECT EQUIP. PERFORMANCE.

3.2 NATIONAL TAB (BALANCING) RESPONSIBILITIES: BALANCER TO PERFORM A "WALK-THRU" IMMEDIATELY UPON ARRIVAL. ALL REQUIRED TRADES ARE TO BE PRESENT DURING THIS PROCESS OR READILY AVAILABLE. THE BALANCER MUST INFORM THE REGIONAL MANAGER AND OWNER OF ANY DEFICIENCIES THAT THE BALANCER AND TRADES NEED RESOLUTION BEFORE THE BALANCING IS COMPLETED. THE FOLLOWING GENERAL TASKS ARE TO BE PERFORMED.

3.2.1 VERIFICATION OF PROPER EQUIPMENT INSTALLED ON SITE.

3.2.2 VERIFICATION OF PROPER INSTALLATION OF MECHANICAL SYSTEMS.

3.2.3 START-UP ALL EQUIPMENT TO ENSURE IT WAS PROPERLY STARTED UP BY TRADES.

3.2.4 COORDINATE WITH SPECIFIC TRADES ANY DEFICIENCIES THAT NEED TO BE RESOLVED BEFORE INITIATING ANY BALANCING ON EACH SPECIFIC SYSTEM.

3.3 BALANCING & TESTING PROCEDURE: INITIATE & COMPLETE ALL REQUIRED BALANCING PROCEDURES AS STIPULATED FOR THE ACCOUNT.

3.3.1 NATIONAL TAB (BALANCING) RESPONSIBILITIES: INITIATE BALANCING OF THE SYSTEMS AS REQUIRED UNDER STRICT GUIDELINES SET FORTH UNDER NATIONAL NEBB STANDARDS & PROCEDURES.

3.3.2 NATIONAL TAB (BALANCING) RESPONSIBILITIES: ANY ISSUES THAT ARISE DURING THE BALANCING SHALL BE DISCUSSED EXCLUSIVELY OR INCLUSIVELY WITH THE GENERAL CONTRACTOR, OWNER/CONSTRUCTION MANAGER, AND THE NATIONAL TAB BALANCING MANAGER.

3.4 FINAL ON-SITE ANALYSIS & PERFORMANCE TEST: ENSURES PERFORMANCE AND COMFORT.

3.4.1 OWNER/GENERAL CONTRACTOR RESPONSIBILITIES: PROVIDE REPRESENTATIVE TO BE PRESENT FOR ALL FINAL TESTS (SMOKE, BUILDING, ETC.) THAT THE BALANCER WILL PERFORM. SIGN OFF ON TEST IF IT MEETS REQUIREMENTS.

IF THERE STILL REMAINS ANY DEFICIENCIES UPON THE COMPLETION OF THE BALANCING, COORDINATE WITH THE REQUIRED TRADE AND OWNER TO RESOLVE THE ISSUE. IF THE BALANCER IS REQUIRED TO RETURN DUE TO THE INEFFICIENCY, A FEE MAY BE ASSESSED. THE FEE SHOULD BE PASSED ON TO THE TRADE WHO WAS DEFICIENT DURING THE BALANCING OF THE SYSTEM.

3.4.2 NATIONAL TAB (BALANCING) RESPONSIBILITIES: PERFORM A KITCHEN HOOD SMOKE TEST, AND BUILDING PRESSURE TEST IN WITNESS OF THE OWNER AND/OR GENERAL CONTRACTOR. PERFORM A FINAL WALK-THRU TO ENSURE NO EXTREME CONDITIONS OCCUR DUE TO AIRFLOW MOVEMENTS. ANY DEFICIENCIES OR UNSATISFACTORY CONDITIONS BY PERSONNEL WITNESSING THE TEST SHALL BE RESOLVED & RETESTED. IF FINAL ADJUSTMENTS ARE REQUIRED THAT ARE NOT WITHIN 10% OF DESIGN CRITERIA TO ENSURE EFFECTIVENESS OR COMFORT, CONTACT OWNER AND/OR MANAGING MEMBER FOR FURTHER EXECUTION. FINALIZE & SUBMIT FINAL DOCUMENTS FOR FINAL TAB SUPERVISOR REVIEW.

3.4.2.1 NATIONAL TAB TO ENSURE THERMOSTATS ARE PROGRAMMED AS FOLLOWS:

OCCUPIED TIME: 8:00 AM TO 10:00 PM / UNOCCUPIED TIME: 10:00 PM TO 8:00 AM

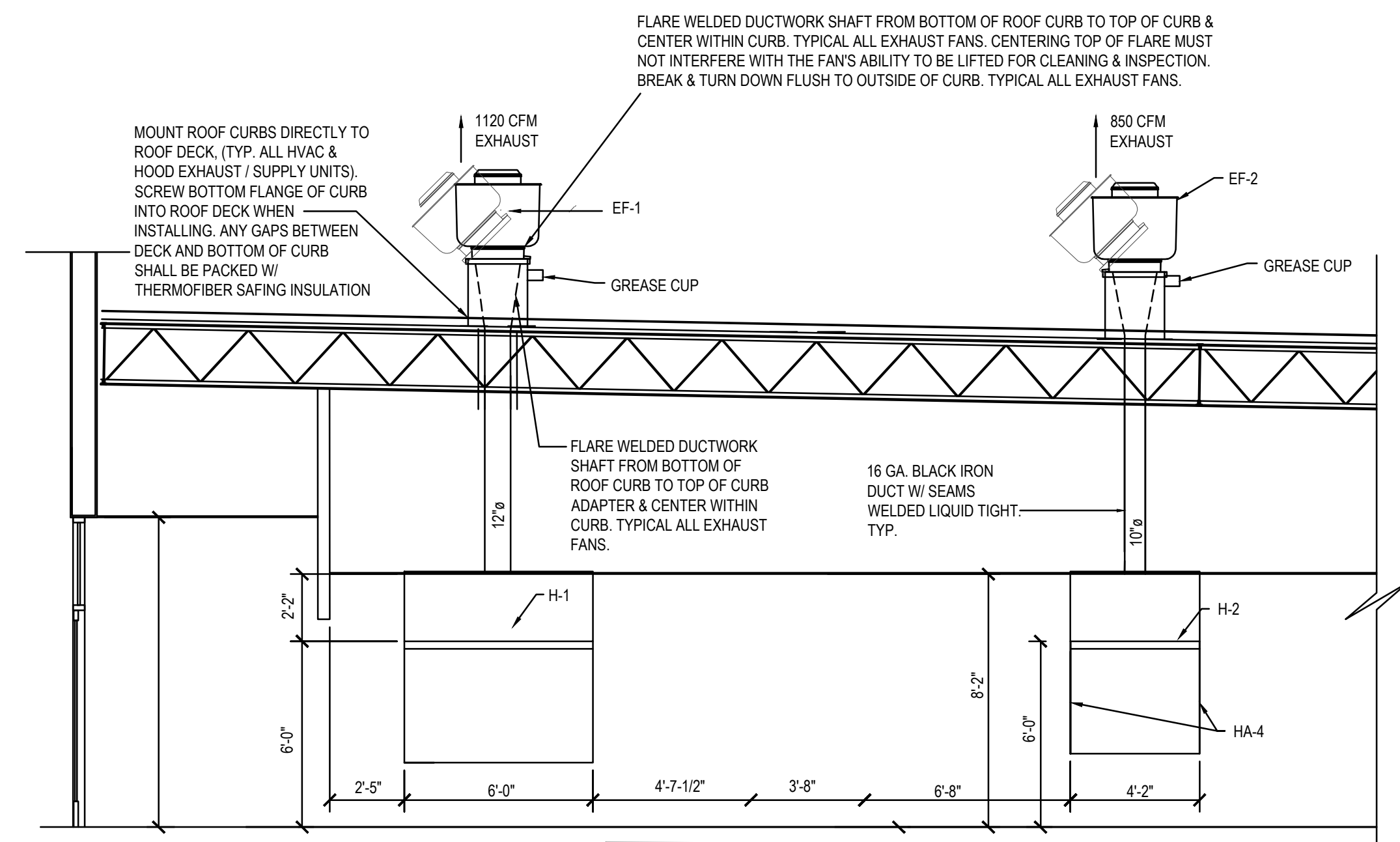
OCCUPIED MODE: FANS ON, HEATING TEMP SET POINT 68, COOLING TEMP SET POINT 70

UN-OCCUPIED MODE: FANS AUTO, HEATING TEMP SET POINT 65, COOLING TEMP SET POINT 73

4.0 PHASE III (FINAL DOCUMENTATION & CLOSEOUT): SUBMISSION AND APPROVAL OF BALANCE WORK.

4.1 OWNER RESPONSIBILITIES: ASSIST ON THE EXECUTION OF RESOLUTION ITEMS NOT RESOLVED DURING BALANCING.

4.2 NATIONAL TAB (BALANCING) RESPONSIBILITIES: ENSURE BALANCER DOCUMENTATION HAS BEEN SUBMITTED FOR MANAGEMENT & OWNER REVIEW IN A TIMELY FASHION. VERIFY COMPLETENESS OF BALANCING REPORT & DEFICIENCIES. IF ANY BALANCING ISSUES ARE UNCOVERED BY THE MANAGEMENT TEAM DURING REVIEW, IT WILL REQUIRE THE BALANCER TO PROVIDE RESOLUTION.



**EXHAUST DETAIL**  
SCALE: NONE

**NOTE:**

SEE CAPTIVEAIRE SHOP DRAWINGS (H-SHEETS) FOR DETAILED INSTALLATION INFORMATION REGARDING HOODS AND EXHAUST FANS

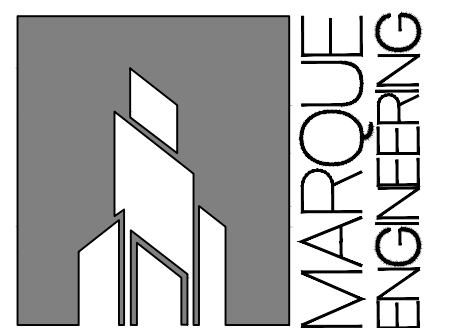
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**SHEET CONTENTS:**  
MECHANICAL - ROOF PLAN AND  
SCHEDULES & DETAILS



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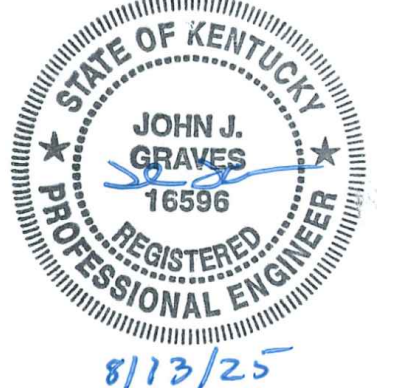
NEW TENANT FINISH FOR:



US HWY 42 UNION, KY 41091

REV. DATE CK'D

Drawn By: JJR Checked: JG



Date: 08-13-2025 Job No: MQE: 13246

**M2.0**  
of

DIVISION 23 MECHANICAL SPECIFICATIONS

23 05 01 COMMON REQUIREMENTS FOR HVAC

ALL MECHANICAL WORK AND TESTS SHALL BE DONE IN STRICT ACCORDANCE WITH THE LATEST STATE, COUNTY, AND LOCAL REGULATIONS, LAWS, AND ORDINANCES WHICH MAY BE APPLICABLE.

BEFORE SUBMITTING A BID, EXAMINE DOCUMENTS OF ALL OTHER TRADES, VISIT THE SITE AND GET ACQUAINTED WITH ALL CONDITIONS THAT MAY IN ANY WAY AFFECT THE EXECUTION OF THIS CONTRACT. TAKE MEASUREMENTS AND BE RESPONSIBLE FOR EXACT SIZE AND LOCATIONS OF ALL OPENINGS REQUIRED. VERIFY INSTALLATION MAY BE MADE IN COMPLETE ACCORDANCE WITH ALL PERTINENT CODES AND REGULATIONS. IN THE EVENT OF DISCREPANCY, IMMEDIATELY NOTIFY THE PROFESSIONAL ENGINEER OF RECORD. DO NOT PROCEED WITH THE INSTALLATION IN AREAS OF DISCREPANCY UNTIL ALL SUCH DISCREPANCIES HAVE BEEN FULLY RESOLVED.

IT IS NOT THE INTENT OF THE DRAWINGS THAT EXISTING CONDITIONS BE ACCURATELY SHOWN. EXISTING MECHANICAL WORK IS SHOWN TO LIMITED EXTENT ON DRAWINGS AND IS SHOWN FOR GENERAL REFERENCE ONLY. LOCATIONS AND INFORMATION WERE DERIVED FROM CURSORY SITE VISUAL OBSERVATIONS OR FROM DOCUMENTS THAT WERE PREPARED FOR PREVIOUSLY INSTALLED WORK WHEN AVAILABLE.

THE WORK COVERED BY THESE SPECIFICATIONS SHALL CONSIST OF PROVIDING ALL NEW MATERIAL, LABOR, EQUIPMENT, AND SERVICES NECESSARY FOR A COMPLETE MECHANICAL INSTALLATION AS SPECIFIED HEREIN. WORK IN THIS SECTION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING ITEMS:

- TOILET EXHAUST FANS
- KITCHEN HOOD AND EXHAUST FAN
- LOW VOLTAGE THERMOSTATS
- DUCT
- DAMPERS
- DIFFUSERS, REGISTERS, AND LOUVERS

WHENEVER THE WORDS "CONTRACTOR" APPEAR ON MECHANICAL DRAWINGS OR IN THESE SPECIFICATIONS, IT SHALL REFER TO THE MECHANICAL SUB-CONTRACTOR. WHENEVER THE WORD "PROVIDE" APPEARS IN THESE DOCUMENTS, IT SHALL BE INTERPRETED TO MEAN "FURNISH AND INSTALL".

COORDINATE ALL WORK WITH THE OWNER TO MINIMIZE INTERRUPTION OF BUILDING OPERATION.

COORDINATE THE INSTALLATION OF MECHANICAL ITEMS WITH THE SCHEDULES FOR WORK OF ALL OTHER TRADES TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.

THIS CONTRACTOR SHALL VERIFY AND SATISFY HIMSELF THAT ALL EQUIPMENT FURNISHED WILL PROPERLY FIT IN THE SPACE PROVIDED, THAT IT WILL FUNCTION PROPERLY, AND THAT ALL PARTS OF EQUIPMENT REQUIRING SERVICE ARE READILY ACCESSIBLE.

ALL PIPING SHALL BE RUN PARALLEL OR PERPENDICULAR TO BUILDING WALLS AND FRAMING SYSTEM. ALL VERTICAL RISERS SHALL BE HELD AGAINST WALLS, COLUMNS, ETC., AS POSSIBLE TO PERMIT MAKING OF PIPE JOINTS.

CONTRACTOR SHALL PROVIDE A GUARANTEE IN WRITTEN FORM STATING THAT ALL WORK SHALL BE FREE OF DEFECTS OR ERRORS, AND ALL EQUIPMENT, MATERIALS, OR PARTS FOR A PERIOD OF ONE YEAR FROM THE DATE OF OWNER'S FINAL ACCEPTANCE AND SHALL REPAIR, REVISE OR REPLACE AT NO COST TO THE OWNER ANY SUCH DEFECTS OCCURRING WITHIN THE GUARANTEE PERIOD.

CONTRACTOR SHALL ALSO STATE IN WRITTEN FORM THAT ANY ITEMS OR OCCURRENCES ARISING DURING THE GUARANTEE PERIOD WILL BE ATTENDED TO IN A TIMELY MANNER AND WILL IN NO CASE EXCEED THREE (3) WORKING DAYS FROM DATE OF NOTIFICATION BY OWNER.

PROVIDE A COMPLETE INSTALLATION IN CONFORMANCE WITH THE FOLLOWING STANDARDS.

- AGA: AMERICAN GAS ASSOCIATION
- ASHRAE: AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS
- NFPA: NATIONAL FIRE PROTECTION ASSOCIATION
- SMACNA: SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION.
- STATEWIDE BUILDING CODE
- INTERNATIONAL MECHANICAL CODE

CONTRACTOR SHALL DO ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF THIS WORK. ALL OPENINGS IN WALLS, FLOORS OR CEILINGS SHALL BE PROPERLY SEALED AND RESTORED IN KIND. FLASH AND COUNTERFLASH AT ROOF OPENINGS.

ALL EQUIPMENT SHALL BE LISTED AND LABELED, UNLESS OTHERWISE APPROVED.

ALL WIRING SHALL MEET THE REQUIREMENTS LISTED IN THE ELECTRICAL SPECIFICATIONS. ALL CONTROL AND INTERLOCK WIRING AND CONDUIT (120V OR 24V) SHALL BE BY THE MECHANICAL CONTRACTOR.

EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE CONDITIONS OF LISTING AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND THIS CODE.

CLEANING: THIS CONTRACTOR SHALL REMOVE FROM THE PREMISES ALL ACCUMULATION OF DIRT, DEBRIS, WASTE MATERIALS AND RUBBISH CAUSED BY HIS EMPLOYEES OR WORK, AT LEAST ONCE A WEEK, EXCEPT THAT COMBUSTIBLE MATERIALS SHALL BE REMOVED DAILY.

DURING PROGRESS OF THE WORK, MAINTAIN ON DRAWINGS AT THE SITE, AN ACCURATE RECORD OF THE INSTALLATION OF THE MECHANICAL SYSTEM, INDICATING ALL ITEMS WHICH HAVE BEEN CHANGED OR ADDED.

APPLY FOR AND PAY FOR ALL PERMITS AND INSPECTIONS REQUIRED BY LOCAL AUTHORITY, FOR THE APPROVAL OF WORK.

A CERTIFICATE OF FINAL INSPECTION AND APPROVAL SHALL BE SUBMITTED WITH THE CONTRACTOR'S REQUEST FOR FINAL PAYMENT. NO FINAL PAYMENT WILL BE APPROVED WITHOUT THIS CERTIFICATE.

GUARANTEE ALL WORKMANSHIP, MATERIAL, AND EQUIPMENT AND REPLACE ANY FOUND DEFECTIVE WORK WITHOUT COST TO THE OWNER, FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE.

EXISTING CONDITIONS

DO NOT RELIEVE REMOVED MECHANICAL MATERIALS UNLESS SPECIFICALLY INDICATED ON DRAWINGS. EXISTING SYSTEMS MAY BE UTILIZED ONLY TO THE EXTENT INDICATED ON DRAWINGS.

IF REQUIRED TO ACCOMMODATE CONSTRUCTION RELATED ACTIVITIES TEMPORARILY REMOVE, STORE IN PROTECTED LOCATION ON SITE, AND REINSTALL CONFLICTING MECHANICAL EQUIPMENT, OR DEVICES THAT ARE TO REMAIN OR TO BE RELOCATED.

WHERE THE TERM "DEMOLITION" IS USED HEREIN, INTERPRET IT TO MEAN "DEMOLITION" OR "SELECTIVE DEMOLITION" WHERE APPLICABLE.

PROVIDE MECHANICAL DEMOLITION WORK AS REQUIRED TO ACCOMMODATE PROJECT DEMOLITION AND AS REQUIRED TO ACCOMMODATE NEW CONSTRUCTION. DISCONNECT AND REMOVE WORK TO BE ABANDONED, AND AS REQUIRED TO ACCOMMODATE WORK OF OTHER TRADES, IN AREAS AFFECTED BY THIS PROJECT.

LEGALLY DISPOSE OF MATERIALS TO SALVAGED OR RETAINED.

23 05 03 SUBMITTALS FOR MECHANICAL SYSTEMS

DESIGN BASIS MANUFACTURERS OF MATERIAL AND EQUIPMENT ARE SPECIFIED AND PLANS ARE DETAILED ACCORDING TO THIS MATERIAL. CONTRACTOR SHALL BASE HIS BID ON FURNISHING AND INSTALLING THIS MAKE OF MATERIAL AND EQUIPMENT.

AN ACCEPTABLE MANUFACTURER'S NAME AND MODEL NUMBER OF A PRODUCT MAY BE PROVIDED IN THESE DOCUMENTS. THIS IS THE EQUIPMENT INCLUDED DURING THE DESIGN PROCESS AND FORMS THE BASIS OF A STANDARD OF QUALITY, WHERE WORK MORE THAN ONE MAKE OF MATERIAL OR EQUIPMENT IS SPECIFIED, THE CONTRACTOR SHALL STATE IN HIS BID WHICH MAKE HE PROPOSES TO FURNISH AND INSTALL. SHOP DRAWING APPROVAL SHALL BE OBTAINED PRIOR TO SHIPMENT OF EQUIPMENT.

VERIFY THE MODEL NUMBER OR PRODUCT IS STILL ACCURATE AND MEETS ALL REQUIREMENTS SHOWN ON THE DRAWINGS. IF THERE IS A DISCREPANCY BETWEEN THE REQUIREMENTS AND THE PRODUCT OR MODEL NUMBER, THE STRICTER OF THE TWO SHALL GOVERN.

SUBMIT SHOP DRAWINGS AND/OR PRODUCT DATA (ELECTRONIC COPIES) ON THE FOLLOWING ITEMS FOR REVIEW BEFORE FABRICATION OR SHIPMENT:

- TOILET EXHAUST FANS
- KITCHEN HOOD AND EXHAUST FAN
- LOW VOLTAGE THERMOSTATS
- DUCT
- DAMPERS
- DIFFUSERS, REGISTERS, AND LOUVERS

MAINTENANCE MANUALS: INCLUDE WIRING DIAGRAMS, MAINTENANCE AND OPERATING INSTRUCTIONS, PARTS LISTINGS, AND COPIES OF OTHER SUBMITTALS INDICATED FOR INCLUSION.

REVIEW AND CORRECTIONS OR COMMENTS MADE ON SHOP DRAWINGS, PRODUCT DATA: CATALOGS, CUT SHEETS, CHARTS, AND OTHER ITEMS DURING CONSTRUCTION PHASE SUBMITTAL REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE CONTRACT DOCUMENTS, FOR PROVIDING A COMPLETE AND FUNCTIONING PROJECT, NOR SHALL THEY RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR DEVIATIONS OR ERRORS OF ANY SORT. THIS REVIEW IS FOR THE LIMITED PURPOSE OF CHECKING FOR CONFORMANCE WITH INFORMATION GIVEN AND THE DESIGN CONCEPT EXPRESSED IN THE CONTRACT DOCUMENTS. CONTRACTOR REMAINS RESPONSIBLE FOR DETERMINING THE ACCURACY AND COMPLETENESS OF OTHER DETAILS SUCH AS DIMENSIONS AND QUANTITIES, FOR SUBSTANTIATING INSTRUCTIONS FOR INSTALLATIONS, VERIFYING MATERIALS REQUIRED, OBTAINING FIELD MEASUREMENTS AND RELATED CRITERIA, COORDINATING WORK WITH OTHER DISCIPLINES AND PERFORMING WORK IN COMPLIANCE WITH THE CONTRACT DOCUMENTS.

ANY CHANGES TO ITEMS SPECIFIED MUST BE SUBMITTED AS A SUBSTITUTION, WITH COMPLETE DOCUMENTATION OF PRICE DIFFERENTIAL AND EQUIPMENT DETAILS. ANY SUBSTITUTIONS PROVIDED SHALL BE REVIEWED AT MARQUE ENGINEERING'S HOURLY RATES. REVIEW SHALL BE PAID FOR BY THE CONTRACTOR TO MARQUE ENGINEERING AT NO COST TO THE OWNER. BY USING PRE-APPROVED SUBSTITUTIONS, THE CONTRACTOR ACCEPTS ALL RESPONSIBILITY AND ASSOCIATED COSTS FOR ALL REQUIRED MODIFICATIONS TO THE CONTRACT DOCUMENTS TO INCLUDE BUT NOT LIMITED TO MATERIAL OR EQUIPMENT COSTS FOR THEIR OR OTHER TRADES, AND ENSURING THAT SUBSTITUTED MATERIALS AND EQUIPMENT TO BE FURNISHED FIT INTO SPACE AVAILABLE.

EXTENSIVE REVISIONS NECESSITATED TO THE CONTRACT DOCUMENTS, OR SUBSTITUTION ACTIONS RELATED TO ANY SPECIFIED PRODUCT NOT ABLE TO BE PROVIDED DUE TO A FAILURE TO COMMENCE WORK, RELEASE PRODUCT OR COORDINATE CONSTRUCTION ACTIVITIES SHALL BE PROVIDED AT MARQUE ENGINEERING'S HOURLY RATES. COSTS SHALL BE BORNE BY THE CONTRACTOR AT NO COST TO THE OWNER.

23 05 29 HANGERS AND SUPPORTS

SUPPORT ALL PIPING, DUCTWORK AND EQUIPMENT BY HANGERS OR BRACKETS. FURNISH STRUCTURAL STEEL MEMBERS WHERE REQUIRED TO SUPPORT PIPING AND EQUIPMENT. NO PORTION OF PIPING OR VALVES SHALL BE SUPPORTED BY EQUIPMENT.

DUCTWORK - SUPPORT BY MEANS OF HANGERS AS FOLLOWS:

DUCT WIDTH 30 OR LESS  
HANGER SIZE (16 GAUGE)  
TYPE MAX. SPACING 8

A PAIR OF HANGERS SHALL BE LOCATED AT EVERY TRANSVERSE JOINT AND ELSEWHERE ACCORDING TO THE TABLE.

23 05 93 HVAC SYSTEM TESTING, ADJUSTING AND BALANCING FOR HVAC

ALL SYSTEMS AND EQUIPMENT SHALL BE CAREFULLY ADJUSTED TO PROVIDE COMFORTABLE AND UNIFORM CONDITIONS IN EACH AND EVERY SPACE TO THE OWNER'S SATISFACTION. PROVIDE ANY REQUIRED DRIVES TO SATISFY QUANTITIES INDICATED. PROVIDE A CERTIFIED AIR BALANCE OF THE DIFFUSERS AND AIR HANDLERS.

AIR SYSTEM:

AIR BALANCE AND TESTING SHALL NOT BEGIN UNTIL THE SYSTEM HAS BEEN COMPLETED AND IS IN FULL WORKING ORDER. CONTRACTOR SHALL PUT ALL HEATING, VENTILATING AND AIR CONDITIONING SYSTEM AND EQUIPMENT INTO FULL OPERATION AND SHALL CONTINUE THE OPERATION OF SAME DURING EACH WORKING DAY OF TESTING AND BALANCING. CONTRACTOR SHALL SUBMIT WITHIN 30 DAYS AFTER RECEIPT OF CONTRACT, COPIES OF SUBMITTAL DATA FOR THE TESTING AND BALANCING OF THE AIR CONDITIONING, HEATING, AND VENTILATING SYSTEMS. THE AIR BALANCE AND TESTING AGENCY SHALL PROVIDE PROOF OF HAVING SUCCESSFULLY COMPLETED AT LEAST FIVE PROJECTS OF SIMILAR SIZE AND SCOPE.

CONTRACTOR SHALL PROCURE THE SERVICES OF AN INDEPENDENT AIR BALANCE AND TESTING AGENCY, APPROVED BY THE ENGINEER, AND A MEMBER OF AABC OR NEBB, WHICH SPECIALIZES IN THE BALANCING AND TESTING OF HEATING VENTILATION AND AIR CONDITIONING SYSTEMS, TO BALANCE, ADJUST AND TEST AIR MOVING EQUIPMENT AND AIR DISTRIBUTION OR EXHAUST SYSTEMS AS HEREIN SPECIFIED.

ALL WORK BY THIS AGENCY SHALL BE DONE UNDER THE DIRECT SUPERVISION OF A QUALIFIED HEATING AND VENTILATING ENGINEER EMPLOYED BY THIS AGENCY. ALL INSTRUMENTS USED BY THIS AGENCY SHALL BE ACCURATELY CALIBRATED AND MAINTAINED IN GOOD WORKING ORDER.

23 07 13 DUCT INSTALLATION

INSULATE ALL SUPPLY, DIFFUSER PLENUMS, AND OUTSIDE AIR DUCTWORK OF ALL UNITS WITH OWENS CORNING "ALL SERVICE DUCT WRAP" TYPE 150 GLASS FIBER INSULATION UNLESS OTHERWISE NOTED. INSULATION SHALL BE 1-1/2" THICK 1/2" THICK FOR SUPPLY AND RETURN IN TRUSS SPACE), 1.5 PCF. DENSITY WITH FRK JACKET .002 THICK REINFORCED ALUMINUM FOIL VAPOR BARRIER. INSULATION SHALL CONFORM TO NFPA 90A AND 90B PER ASTM E-84 FOR FLAME SPREAD AND SMOKE DEVELOPED RATING.

INSULATE ALL EXTERIOR SUPPLY AND RETURN DUCTWORK WITH RIGID FIBERGLASS BOARD INSULATION WITH OUTDOOR JACKET. INSULATION SHALL BE 2" THICK WITH A K' VALUE OF 0.23 AT 75 F. INSTALL ON DUCTWORK USING IMPALE ANCHORS AND WIRES. SEAL VAPOR BARRIER WITH VAPOR BARRIER ADHESIVE.

SPREAD INSULATION ON ALL CONCEALED SUPPLY, RETURN DUCTWORK. ALL LINERS, INSULATION AND ADHESIVES SHALL HAVE A FLAME SPROE INDEX NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50.

RIGID FIBERGLASS DUCTWORK INSULATION: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 612, TYPE IB, WITHOUT FACING AND WITH VAPOR BARRIER ALL-SERVICE JACKET MANUFACTURED FROM KRAFT PAPER, REINFORCING SCRIM, ALUMINUM FOIL, AND VINYL FILM. INSULATION SHALL HAVE A MINIMUM R VALUE AS REQUIRED BY CODE.

FLEXIBLE FIBERGLASS DUCTWORK INSULATION: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 553, TYPE II, WITHOUT FACING AND WITH VAPOR BARRIER ALL-SERVICE JACKET MANUFACTURED FROM KRAFT PAPER, REINFORCING SCRIM, ALUMINUM FOIL, AND VINYL FILM. INSULATION SHALL HAVE A MINIMUM R VALUE AS REQUIRED BY CODE.

VAPOR BARRIER MATERIAL FOR DUCTWORK: PAPER-BACKED ALUMINUM-FOIL, EXCEPT AS OTHERWISE INDICATED; STRENGTH AND PERMEABILITY RATING EQUIVALENT TO FACTORY-APPLIED VAPOR BARRIERS ON ADJOINING DUCTWORK (INSULATION), WHERE AVAILABLE; WITH FOLLOWING ADDITIONAL CONSTRUCTION CHARACTERISTICS:

- HIGH PUNCTURE RESISTANCE: LOW VAPOR TRANSMISSION (FOR DUCTS IN EXPOSED AREAS: MECH. ROOMS, ETC.)
- MODERATE PUNCTURE RESISTANCE: MEDIUM VAPOR TRANSMISSION (FOR DUCTS IN CONCEALED AREAS).

INSTALLATION IS NOT PERMITTED ABOVE DRYPWALL CEILINGS AND INACCESSIBLE CEILINGS.

23 09 93 SEQUENCE OF OPERATION

PACKAGED ROOFTOP UNIT STARTUP

THE UNIT SHALL OPERATE ON A 7 DAY/NIGHT PROGRAMMABLE THERMOSTAT. DURING STARTUP, THE FAN SHALL RUN WITH THE DAMPERS IN THE FULL RECIRCULATION POSITION. PROVIDE OCCUPIED CHANGEOVER SEQUENCE WITH OPTIMUM START FUNCTION. WHEN THE RETURN AIR TEMPERATURE REACHES OCCUPIED SETPOINT (ADJUSTABLE), THE MINIMUM OUTSIDE AIR DAMPER SHALL OPEN TO THE CONTROLLED MINIMUM OUTDOOR AIR POSITION.

SUPPLY FAN CONTROL

THE SUPPLY FAN SPEED SHALL BE CONSTANT AND SET TO THE REQUIRED CFM.

SPACE TEMPERATURE CONTROL

PROVIDE LOCAL WALL MOUNTED ROOM TEMPERATURE THERMOSTAT WITH DIGITAL DISPLAY OF ROOM TEMPERATURE AND SETPOINT (+/- DEG. F, ADJUSTABLE), AND OVERRIDE FEATURE. PROVIDE REMOTE SENSOR TO MONITOR SPACE TEMPERATURE AND MAINTAIN THERMOSTAT SETPOINT.

MINIMUM OUTSIDE AIR CONTROL

DURING OCCUPIED MODE THE MINIMUM OUTSIDE AIR DAMPER SHALL BE OPEN. PROVIDE MOTORIZED OUTDOOR AIR DAMPER.

ECONOMIZER CONTROL

DRY BULB CONTROLLED ECONOMIZER: OPERATED TO AUTOMATICALLY USE OUTDOOR AIR FOR "FREE COOLING" WHEN OUTDOOR AIR TEMPERATURE IS AT ACCEPTABLE LEVELS. AUTOMATICALLY MODULATED OUTDOOR AND RETURN AIR DAMPERS MAINTAIN PROPER DISCHARGE AIR TEMPERATURE INTO THE CONDITIONED SPACE. ADJUSTABLE MINIMUM POSITION CONTROL IS STANDARD. ECONOMIZER SHALL HAVE POWERED OR BAROMETRIC RELIEF, AS SCHEDULED.

HEATING CONTROL

FURTHER CALL FOR COOLING, ENABLE THE ECONOMIZER MODE. ON A FURTHER CALL FOR COOLING, DISABLE THE ECONOMIZER MODE AND THE MECHANICAL COOLING SHALL BE STAGED ON. THE HEATING SHALL BE OFF. ON A FURTHER CALL FOR HEATING, THE MECHANICAL COOLING SHALL BE OFF. ON A CALL FOR HEATING, THE MECHANICAL COOLING SHALL BE OFF. ON A FURTHER CALL FOR HEATING, THE ECONOMIZER MODE SHALL BE DISABLED. ON A FURTHER CALL FOR HEATING THE GAS HEATING SHALL BE STAGED ON.

DEHUMIDIFICATION

PROVIDE HOT GAS REHEAT FOR DEHUMIDIFICATION. PROVIDE SPACE HUMIDITY SENSOR. WHEN THE SPACE HUMIDITY RISES ABOVE 60% (ADJUSTABLE), PROVIDE FULL COOLING AND MODULATE THE HOT GAS REHEAT TO MAINTAIN SPACE TEMPERATURE SETPOINT. WHEN THE SPACE HUMIDITY REACHES SETPOINT, RESUME WITH NORMAL HEATING & COOLING OPERATION.

SMOKE DETECTOR

WHEN THE SMOKE DETECTOR IS ALARMED, THE SYSTEM SHALL BE ALARMED AND THE AIR HANDLER SHALL FAIL SAFE WITH MANUAL RESET. ELECTRICAL CONTRACTOR SHALL FURNISH, HVAC CONTRACTOR SHALL MOUNT & ELECTRICAL CONTRACTOR SHALL WIRE A UL LISTED PHOTOELECTRIC SMOKE DETECTOR PER LOCAL CODE AUTHORITY HAVING JURISDICTION.

UNOCCUPIED MODE

DURING THE UNOCCUPIED MODE OF OPERATION, THE RTU CONDENSING FURNACE SHALL GO INTO NIGHT SETBACK MODE. AT NIGHT SETBACK/SHUTDOWN THE RTU CONDENSING FURNACE SHALL GO TO FAIL SAFE POSITION. FAIL SAFE POSITION IS DEFINED BY THE FOLLOWING: THE SUPPLY FAN IS OFF, THE OUTDOOR AIR INTAKE DAMPER IS CLOSED, THE HEATING IS OFF AND THE MECHANICAL COOLING IS OFF. THE SUPPLY FAN SHALL CYCLE IN CONJUNCTION WITH EITHER THE HEATING OR COOLING SYSTEM TO MAINTAIN A MINIMUM/MAXIMUM SPACE TEMPERATURE DEPENDING ON THE SEASON.

LOW VOLTAGE THERMOSTATS SHALL BE PROVIDED AND WIRED BY THE HVAC CONTRACTOR. ELECTRICAL CONTRACTOR SHALL PROVIDE 4" SQUARE X 1-1/2" DEEP WALL OUTLET BOXES (WITH SINGLE-GANG RINGS) FOR ALL THERMOSTATS/SENSORS. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE 3/4" EMPTY CONDUIT FROM EACH THERMOSTAT/SENSOR LOCATION, TURNED OUT ABOVE ACCESSIBLE CEILINGS (IN JOIST SPACE OR AGAINST OVERHEAD SLAB/DECK). HVAC/TEMPERATURE CONTROL CONTRACTOR SHALL PROVIDE ALL OTHER NECESSARY CONDUIT, RACEWAY AND WIRING RELATED WORK. CONDUIT SHALL BE IDENTIFIED IN CEILING CAVITY AND SHALL BE PROVIDED WITH SWEEP BENDS, BUSHINGS AND DRAGLINE.

EXHAUST FANS SHALL BE TIED TO LIGHT SWITCH, WHICH SHALL BE FURNISHED, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR. WHEN ACTIVATED, EXHAUST FAN MOTOR DAMPER SHALL OPEN AND FAN SHALL START.

**KITCHEN HOOD EXHAUST FANS:** PROVIDE HEAT DETECTOR IN HOOD COLLAR INTERLOCKED TO FAN OPERATION. KITCHEN HOOD EXHAUST SYSTEM SHALL BE INITIATED BY THE HEAT DETECTOR. PROVIDE INDICATOR LIGHT ON FACE OF HOOD. AT STARTUP, EMERGE EXHAUST FAN MOTOR. INTERLOCK TO MAKEUP AIR SYSTEM (WHETHER DETICATED MAKEUP AIR OR MAKEUP AIR FROM HVAC SYSTEM), SO THAT MAKEUP AIR IS PROVIDED WHENEVER EXHAUST FAN IS RUNNING. EXHAUST FAN SHALL RUN CONTINUOUSLY AT CONSTANT SPEED. AT SHUTDOWN, THE EXHAUST FAN SHALL STOP.

PROVIDE ALL CONTROLS AND WIRING FOR COMPLETE INTERLOCK AND OPERATION OF KITCHEN HOOD, EXHAUST FAN, ROOFTOP UNIT, ETC. AND ALL ASSOCIATED MOTOR DAMPERS.

ALL DUCT SMOKE DETECTORS, FOR SMOKE DETECTORS, WILL BE FURNISHED PROVIDED AND WIRED BY ELECTRICAL CONTRACTOR, INSTALLED BY THE HVAC CONTRACTOR, AND WIRED BY THE ELECTRICAL CONTRACTOR PER LOCAL CODES. HVAC CONTRACTOR WILL INTERLOCK FAN WITH SMOKE DETECTOR.

**MOTOR OPERATED DAMPERS:** ALL FRESH AIR INTAKES AND EXHAUST LOUVERS SHALL HAVE MOTOR OPERATED DAMPERS. DAMPERS SHALL BE LOW LEAK WITH BLADE AND EDGE SEALS. 24 V MOTOR OPERATED DAMPERS SHALL BE PROVIDED AND WIRED BY THE MECHANICAL CONTRACTOR, UNLESS OTHERWISE NOTED. PROVIDE ALL NECESSARY TRANSFORMERS, CONTACTORS, CONTROLS AND WIRING FOR INTERLOCKING EQUIPMENT TO MOTOR OPERATED DAMPERS.

SMOKE DAMPER: SMOKE DAMPERS TO BE FABRICATED IN ACCORDANCE WITH NFPA 90A AND UL 555 S.

DAMPERS: UL CLASS 1 AIRFOIL BLADE TYPE SMOKE DAMPER, NORMALLY OPEN, AUTOMATICALLY OPERATED BY ELECTRIC ACTUATOR BLADES TO INCLUDE SILICONE BLADE SEALS. JAMBS TO INCLUDE STAINLESS STEEL JAMB SEALS.

23 22 00 CONDENSATE DRAIN PIPING

INSTALL TRAP AT EVAPORATOR COIL DRAIN. EXTEND DRAIN LINE FROM COIL TRAP TO DRAIN. PIPING SHALL BE STANDARD WEIGHT, PVC PIPE AND FITTINGS AND WITH JOINTS OF PVC SOLVENT CEMENT. PROVIDE CLEANOUTS THROUGHOUT RUN AND AT TOPS OF TRAPS.

23 30 00 AIR DISTRIBUTION SYSTEM

CEILING AIR DIFFUSERS:

SQUARE: SQUARE HOUSING, CORE OF SQUARE CONCENTRIC LOUVERS, SQUARE OR ROUND DUCT CONNECTION.

VAV DIFFUSER: THE VAV SQUARE PLAQUE DIFFUSER SHALL BE SUPPLIES TO DELIVER A 360 DEGREE RADIAL, HORIZONTAL AIR FLOW PATTERN. THE BACK CONE SHALL BE A ONE-PIECE DIE-FORMED DESIGN WITH SMOOTH, AERODYNAMICALLY DESIGNED SURFACES AND NO CORNER JOINTS.

CONSTRUCTION: DIFFUSER CONSTRUCTION SHALL BE 24x24 STEEL WITH ONE-PIECE BACK PAN, AERODYNAMICALLY DESIGNED INNER CONE DAMPER ASSEMBLY, AND PLAQUE FACEPLATE.

A PLAQUE ASSEMBLY SHALL BE INCORPORATED AND SHALL DROP NO MORE THAN 1/4 INCH BELOW THE CEILING PLAN TO ASSURE PROPER AIR DISTRIBUTION PERFORMANCE

THE PLAQUE ASSEMBLY SHALL BE COMPLETELY REMOVABLE FROM THE DIFFUSER FACE TO ALLOW FOR FULL ACCESS TO ANY DAMPERS OR OTHER DUCTWORK COMPONENTS LOCATED NEAR THE DIFFUSER NECK.

POWER REQUIREMENTS: THE VAV DIFFUSERS SHALL BE POWERED BY 24VAC, 3.0 VA PER UNIT, WITH SUPPLY POWER FREQUENCY: 60 HZ

MODULATING DAMPER ASSEMBLY: THE MODULATING DAMPER ASSEMBLY SHALL HAVE THE FOLLOWING FEATURES:

- QUIET, ULTRA-LONG LIFE BRUSHLESS A DRIVE MOTOR
- DIRECT DRIVE SYSTEM WITHOUT GEARS, BELTS, OR LEVERS, RESULTING IN ZERO MAINTENANCE AND LONG LIFE

DIFFUSER SHALL BE SUPPLIED WITH A 120 VOLT 27T 227, 24 VAC 20 VA TRANSFORMER

A PRESSURE RELIEF COLLAR SHALL BE FITTED TO THE INLET COLLAR OF THE VAV DIFFUSER TO RELIEVE EXCESS PRESSURE ARISING FROM MODULATION OF THE AIR FLOW.

A WALL MOUNTED THERMOSTAT WILL PROVIDE ROOM TEMPERATURE SENSING AS WELL AS SET-POINT ADJUSTMENT FOR HEATING AND COOLING.

LINEAR: EXTRUDED ALUMINUM CONTINUOUS SLOT, SINGLE OR MULTIPLE.

DIFFUSER MOUNTING: SURFACE MOUNT: DIFFUSER SHALL HAVE ROLLED EDGE BELOW FINISHED CEILING FOR SURFACE MOUNTING OR DIFFUSER SHALL BE FURNISHED WITH ACCESSORY PLASTER FRAME.

LAY-IN: DIFFUSER HOUSING SIZED TO FIT BETWEEN CEILING EXPOSED SUSPENSION TEE BARS AND REST ON TOP SURFACE OF TEE BAR.

DIFFUSER ACOUSTIC PERFORMANCE: NC LESS THAN OR EQUAL TO 30

DIFFUSER ACCESSORIES: PLASTER RING: PERIMETER RING DESIGNED TO ACT AS PLASTER STOP AND DIFFUSER ANCHOR.

DIFFUSER FINISHES: WHITE ENAMEL: SEMI-GLOSS WHITE ENAMEL PRIME FINISH.

CEILING AND WALL REGISTERS & GRILLES: STEEL CONSTRUCTION: MANUFACTURER'S STANDARD STAMPED SHEET STEEL FRAME AND ADJUSTABLE BLADES.

REGISTER AND GRILLE FINISHES: WHITE ENAMEL: SEMI-GLOSS WHITE ENAMEL PRIME FINISH.

REGISTER AND GRILLE ACOUSTIC PERFORMANCE: NC LESS THAN OR EQUAL TO 30

23 31 13 METAL DUCTS

CONSTRUCTION, INSTALLATION AND SUPPORT OF ALL DUCTWORK SHALL CONFORM TO THE LATEST EDITION OF SMACNA "HVAC DUCT CONSTRUCTION STANDARD- METAL AND FLEXIBLE".

ASSEMBLE AND INSTALL DUCTWORK IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ACHIEVE AIR-TIGHT (5% LEAKAGE FOR SYSTEMS RATED 3" AND UNDER; 1% AND NOISELESS (NO OBJECTIONABLE NOISE) SYSTEMS. INSTALL EACH RUN WITH MINIMUM NUMBER OF JOINTS. ALIGN DUCTWORK ACCURATELY AT CONNECTIONS, WITHIN 1/8" MISALIGNMENT TOLERANCE AND WITH INTERNAL SURFACES SMOOTH.

SUPPORT VERTICAL DUCTS AT EVERY FLOOR. SUPPORT DUCT WITH APPROVED HANGERS AT INTERVALS NOT EXCEEDING 10 FEET.

DUCTS SHALL BE GALVANIZED SHEET METAL OF STANDARD GAUGES. DUCTWORK SHALL HAVE A MINIMUM THICKNESS OF 24 GAUGE. ALL DUCT ELBOWS SHALL BE EITHER FULL RADIUS OR WITH TURNING VANES.

WHERE DUCTWORK IS INDICATED TO BE EXPOSED IN OCCUPIED SPACES, PROVIDE MATERIALS WHICH ARE FREE FROM VISUAL IMPERFECTIONS INCLUDING PITTING, SEAM MARKS, ROLLER MARKS, STAINS AND DISCOLORATIONS, AND OTHER IMPERFECTIONS, INCLUDING THOSE WHICH WOULD IMPAIR PAINTING.

EXPOSED DUCTWORK WHICH IS TO BE PAINTED SHALL HAVE PAINT GRIP APPLIED.

PROVIDE VOLUME DAMPERS IN ALL BRANCH DUCTS OR AS REQUIRED FOR BALANCING TO REQUIRED AIR FLOWS.

PROVIDE RADIUS TYPE FITTINGS FABRICATED OF MULTIPLE SECTIONS WITH MAXIMUM 15 DEG. CHANGE OF DIRECTION PER SECTION, UNLESS DETAILED OTHERWISE. USE 45 DEG. LATRALS AND 45 DEG. ELBOWS FOR BRANCH TAKEOFF CONNECTIONS. WHERE 90 DEG. BRANCHES ARE INDICATED, PROVIDE CONICAL TYPE TEES.

PROVIDE DUCT SEALANT AND/OR CEMENT WHICH IS NON-HARDENING, NON-MIGRATING MASTIC OR OF LIQUID ELASTIC SEALANT, TYPE APPLICABLE FOR FABRICATION/INSTALLATION DETAIL, AS COMPOUNDED AND RECOMMENDED BY MANUFACTURER SPECIALLY FOR SEALING JOINTS AND SEAMS IN DUCTWORK.

FLEXIBLE DUCTS SHALL EITHER BE SPIRAL-WOUND SPRING STEEL WITH FLAMEPROOF VINYL SHEATHING OR CORRUGATED ALUMINUM. THE MAXIMUM LENGTH OF FLEX DUCT ON THE SUPPLY EQUALS 5 FEET. FLEX IS NOT ALLOWED FOR RETURN, RELIEF OR EXHAUST APPLICATIONS.

FLEXIBLE DUCTS SHALL CONFORM TO THE REQUIREMENTS OF UL 181 FOR CLASS 0 OR CLASS 1 FLEXIBLE AIR DUCTS AND SHALL BE SO IDENTIFIED.

WHERE INSTALLED IN UNCONDITIONED SPACES OTHER THAN RETURN AIR PLENUMS, PROVIDE 1" THICK 1-1/2 LB. CONTINUOUS FLEXIBLE FIBERGLASS SHEATH WITH VINYL VAPOR BARRIER JACKET.

SHOP FABRICATE DUCTWORK IN 4, 8, 10 OR 12-FT LENGTHS, OR REQUIRED TO COMPLETE RUNS.

FABRICATE DUCTWORK WITH DUCT LINER IN EACH SECTION OF DUCT WHERE INDICATED. LAMINATE LINER TO INTERNAL SURFACES OF DUCT IN ACCORDANCE WITH INSTRUCTIONS BY MANUFACTURERS OF LINING AND ADHESIVE, AND FASTEN WITH MECHANICAL FASTENERS. DUCT LINER TO BE 3-LB DENSITY FOR ACOUSTIC REQUIREMENTS 1" THICK OR AS NOTED. SIZE OF DUCTWORK SHOWN ON THE DRAWINGS IS FREE NET AREA, OUTSIDE DIMENSION OF DUCTS WILL NEED TO BE INCREASED IF LINED DUCT IS USED.

DUCT LINER SHALL BE OF FIBROUS GLASS OF THICKNESS INDICATED. 3-LB DENSITY. ALL LINERS, INSULATION AND ADHESIVES SHALL HAVE A FLAME SPREAD INDEX NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50.

23 33 13 DAMPERS

DAMPERS WITH LOCKING DEVICE, WHERE ACCESSIBLE, SHALL BE RUSKIN MD-35. OPPOSED BLADE FOR RECTANGULAR DUCTS 12 INCHES AND ABOVE, AND MODEL MD-25 PARALLEL BLADE FOR DUCTS 10 INCHES AND BELOW, AND MODEL MDRS-25 FOR ROUND DUCTS. INSTALL PER MANUFACTURER'S INSTRUCTIONS. SINGLE BLADE ROUND DAMPERS WITH LOCKING DEVICE SHALL BE IN SPIN-IN COLLARS.

FIRE DAMPERS SHALL BE RUSKIN MODEL 1BD, STYLE B WITH BLADE PACKAGE OUT OF AIR STREAM. HORIZONTAL, INSTALL WHERE INDICATED ON DRAWINGS AND AS REQUIRED BY AUTHORITY HAVING LOCAL JURISDICTION.

ELECTRIC MOTORIZED DAMPER SHALL BE SIZED TO OPERATE WITH SUFFICIENT RESERVE POWER TO PROVIDE SMOOTH MODULATING ACTION OR TWO-POSITION ACTION. INSTALL PER MANUFACTURER'S INSTRUCTIONS.

23 38 13 00 - COMMERCIAL KITCHEN HOODS AND DUCTWORK

**TYPE I HOOD**

**REFER TO CAPTIVE AIRE DRAWINGS FOR SPECIFICATIONS.**

**INSPECTION**  
GENERAL: EXAMINE AREAS AND CONDITIONS UNDER WHICH EQUIPMENT IS TO BE INSTALLED. DO NOT PROCEED WITH WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

**INSTALLATION**  
COORDINATE WORK WITH WORK OF ROOFING, WALLS, AND CEILINGS, AS NECESSARY FOR PROPER INTERFACING.

DUCT CONNECTIONS TO BE PROVIDED BY THE HVAC CONTRACTOR.

REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.

ELECTRICAL WIRING: INSTALL ELECTRICAL DEVICES FURNISHED BY MANUFACTURER BUT NOT SPECIFIED TO BE FACTORY-MOUNTED. FURNISH COPY OF MANUFACTURER'S WIRING DIAGRAM SUBMITTAL TO ELECTRICAL INSTALLER.

VERIFY THAT ELECTRICAL WIRING INSTALLATION IS IN ACCORDANCE WITH MANUFACTURER'S SUBMITTAL AND INSTALLATION REQUIREMENTS OF DIVISION-16 SECTIONS.

ENSURE THAT ROTATION IS IN DIRECTION INDICATED AND INTENDED FOR PROPER PERFORMANCE.

DO NOT PROCEED WITH CENTRIFUGAL FAN START-UP UNTIL WIRING INSTALLATION IS ACCEPTABLE TO FAN INSTALLER.

**FIELD QUALITY CONTROL**  
TESTING: AFTER INSTALLATION OF HOOD EXHAUST SYSTEM HAS BEEN COMPLETED, TEST EACH SYSTEM TO DEMONSTRATE PROPER OPERATION OF UNITS AT PERFORMANCE REQUIREMENTS SPECIFIED. WHEN POSSIBLE, FIELD CORRECT MALFUNCTIONING UNITS, THEN RETEST TO DEMONSTRATE COMPLIANCE. REPLACE UNITS WHICH CANNOT BE SATISFACTORILY CORRECTED.

PROVIDE TESTING, PERMITS AND APPROVALS AS REQUIRED BY STATE AND LOCAL AUTHORITIES.

**ADJUSTING AND CLEANING**  
CLEAN FACTORY FINISHED SURFACES.  
REPAIR ANY MARRED OR SCRATCHED SURFACES.



COMcheck Software Version COMcheckWeb  
Mechanical Compliance Certificate

Project Information

Energy Code: 2012 IECC  
Project Title: 13246 - Penn Station - Union, KY  
Location: Union, Kentucky  
Climate Zone: 4a  
Project Type: Alteration

Construction Site: Owner/Agent: Designer/Contractor:  
John Quillen  
Marque Engineering  
4850 Smith Rd Suite 101  
Cincinnati, Ohio 45212

Mechanical Systems List

Quantity System Type & Description

- 1 RTU-1 (Single Zone):  
Heating: 1 each - Central Furnace, Gas, Capacity = 240 kBtu/h  
Proposed Efficiency = 81.00% Et, Required Efficiency: 80.00 % Et  
Cooling: 1 each - Single Package DX Unit, Capacity = 185 kBtu/h, Air Economizer  
Proposed Efficiency = 10.80 EER, Required Efficiency = 10.80 EER  
Proposed Part Load Efficiency = 14.50 IEEER, Required Part Load Efficiency = 11.00 IEEER
- 1 MAU-1 (Single Zone):  
Heating: 1 each - Central Furnace, Gas, Capacity = 110 kBtu/h  
Proposed Efficiency = 92.00% Et, Required Efficiency: 80.00 % Et (or 78% AFUE)

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2012 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

John J. Graves - Signature Date: 8/13/2025

Project Title: 13246 - Penn Station - Union, KY Report date: 08/13/25  
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COMcheck Software Version COMcheckWeb  
Inspection Checklist

Energy Code: 2012 IECC

Requirements: 100.0% were addressed directly in the COMcheck software  
Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

| Section # & Req.ID | Plan Review  | Complies?  | Comments/Assumptions     |
|--------------------|--|--|--------------------------|
| C103.2 (F92)       | Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks. | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Project Title: 13246 - Penn Station - Union, KY Report date: 08/13/25  
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| Section # & Req.ID | Footing / Foundation Inspection  | Complies?  | Comments/Assumptions     |
|--------------------|--|--|--------------------------|
| C403.2.4 (F09)     | Freeze protection and snow/ice melting system sensors for future connection to controls. | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Project Title: 13246 - Penn Station - Union, KY Report date: 08/13/25  
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| Section # & Req.ID | Mechanical Rough-In Inspection   | Complies?  | Comments/Assumptions                        |
|--------------------|--|--|---|
| C403.2.3 (ME55)    | HVAC equipment efficiency verified.  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | See the Mechanical Systems list for values. |
| C403.2.5 (ME59)    | Demand control ventilation provided for spaces >500 sq.ft. and >25 people/1000 sq.ft. occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >=3.000 cfm.                | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Exception: Requirement does not apply.      |
| C403.2.7 (ME60)    | HVAC ducts and plenums insulated. Where ducts or plenums are installed in or under a slab, verification may need to occur during Foundation Inspection.  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met.                    |
| C403.2.8 (ME7)     | Piping insulation exposed to weather is protected from damage (due to sun, moisture, wind, etc.).  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met.                    |
| C403.2.8 (ME1)     | Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met.                    |
| C403.2.7 (ME10)    | Ducts and plenums sealed based on static pressure and location.  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met.                    |
| C403.2.7 (ME11)    | Ductwork operating >=3 in. water column requires air leakage testing.  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Exception: Requirement does not apply.      |
| C403.2.7 (ME11)    | Ductwork operating >=3 in. water column requires air leakage testing.  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Exception: Requirement does not apply.      |
| C403.3.1 (ME62)    | Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off integrated economizer control, and provide a means to relieve excess outside air during operation. | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met.                    |
| C403.4.1 (ME16)    | Economizer operation will not increase heating energy use during normal operation.   | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met.                    |
| C408.2.2 (ME53)    | Air outlets and zone terminal devices have means for air balancing.  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met.                    |
| C403.4.2 (ME66)    | VAV fan motors >=7.5 hp to be driven by variable speed drive, have a vane-axial fan with variable pitch blades, or have controls to limit fan motor demand.  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Exception: Requirement does not apply.      |

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Project Title: 13246 - Penn Station - Union, KY Report date: 08/13/25  
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| Section # & Req.ID | Mechanical Rough-In Inspection  | Complies?  | Comments/Assumptions                   |
|--------------------|---|--|--|
| C403.4.2 (ME66)    | VAV fan motors >=7.5 hp to be driven by variable speed drive, have a vane-axial fan with variable pitch blades, or have controls to limit fan motor demand. | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Exception: Requirement does not apply. |
| C403.2.6 (ME57)    | Exhaust air energy recovery on systems meeting Table C403.2.6   | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Exception: Requirement does not apply. |
| C403.2.11 (ME71)   | Unenclosed spaces that are heated use only radiant heat.  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Exception: Requirement does not apply. |

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Project Title: 13246 - Penn Station - Union, KY Report date: 08/13/25  
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| Section # & Req.ID | Final Inspection  | Complies?  | Comments/Assumptions     |
|--------------------|---|--|--------------------------|
| C403.2.4 (F147)    | Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system. | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C403.2.4 (F147)    | Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system. | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C403.2.4 (F138)    | Thermostatic controls have a 5°F deadband.  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C403.2.4 (F120)    | Temperature controls have setpoint overlap restrictions.  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C403.2.4 (F139)    | Each zone equipped with setback controls using automatic time clock or programmable control system.   | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C403.2.4 (F140)    | Automatic Controls: Setback to 55°F (heat) and 85°F (cool), 7-day clock, 2-hour occupant override, 10-hour backup   | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C408.2.5 (F17)     | Furnished HVAC as-built drawings submitted within 90 days of system acceptance.   | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C303.3 (F18)       | Furnished O&M manuals for HVAC systems within 90 days of system acceptance.   | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C408.2.5 (F143)    | An air and/or hydronic system balancing report is provided for HVAC systems.  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C408.2.3 (F110)    | HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.   | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C403.2.2 (F127)    | HVAC systems and equipment capacity does not exceed calculated loads.   | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C408.2.1 (F128)    | Commissioning plan developed by registered design professional or approved agency.  | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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| Section # & Req.ID | Final Inspection   | Complies?  | Comments/Assumptions     |
|--------------------|--|--|--------------------------|
| C408.2.4 (F129)    | Preliminary commissioning report completed and certified by registered design professional or approved agency. | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C408.2.5 (F130)    | Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.        | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C408.2.3 (F131)    | HVAC equipment has been tested to ensure proper operation.   | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |
| C408.2.3 (F132)    | Economizers have been tested to ensure proper operation.   | <input type="checkbox"/> Complies<br><input type="checkbox"/> Does Not<br><input type="checkbox"/> Not Observable<br><input type="checkbox"/> Not Applicable | Requirement will be met. |

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

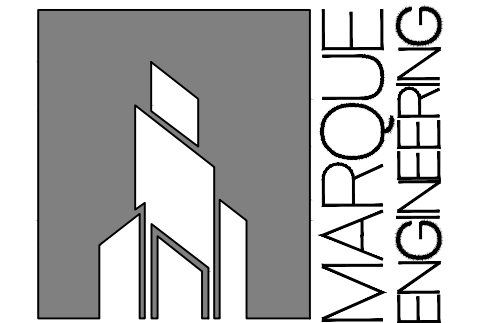
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SHEET CONTENTS:  
MECHANICAL - ENERGY COMPLIANCE



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NEW TENANT FINISH FOR:



US HWY 42 UNION, KY 41091

REV. DATE CK'D

Drawn By: JJR Checked: JG



Date: 08-13-2025 Job No: MQE: 13246

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