



SUBMITTAL COVER SHEET

PROJECT

Cincinnati Classical Academy

ENGINEER

Cunning and Associates

ARCHITECT

Silverpeak Engineering

SPECIFICATIONS NO.

ITEM

MAU-1, DOAS 1 - 4

Submittal #: 004.1

- Approved
- Disapproved

Date: 11/13/2024

Submitted by: Cole Kendig

Proudly Serving Dayton, Cincinnati & Columbus Ohio

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DDAS/RTU FAN SCHEDULE -- JOB#7142471

| FAN UNIT NO | TAG | QTY | FAN INFORMATION | | | | ELECTRICAL INFORMATION | | | | COOLING INFORMATION | | | | REHEAT INFORMATION | | | | GAS HEAT INFORMATION | | | | ABL MINIMUM ROOM VOLUME | | | NOTES | | | | | | | | | | | | | | |
|-------------|--------|-----|-----------------------------|--------------|------------|----------------|------------------------|-----------|--------------|-------|---------------------|-------|------|-------|--------------------|-------------------|-----------------|-------------------|----------------------|----------------|--------|--------|-------------------------|------------------|------|-------|-----------------------|----------|------------|-------------|-------------|-----------------------------|------------------------------|---------------|-------------|--------------------------|-------|------|-----|---|
| | | | DDAS/RTU MODEL # | MANUFACTURER | BLDWR | RETURN AIR CFM | MAX OUTSIDE AIR CFM | TOTAL CFM | WEIGHT (LBS) | ESP | HP | PHASE | VOLT | MCA | MDCP | OUTSIDE AIR DB WB | MIXED AIR DB WB | LEAVING AIR DB WB | DP | TOTAL CAPACITY | IEER | ISMRE | DISCHARGE DB WB | CAPACITY DESIRED | MAX | | MOISTURE REMOVAL RATE | GAS TYPE | INPUT BTUH | OUTPUT BTUH | TEMP RISE | REQUIRED INPUT GAS PRESSURE | ROOM AREA (FT ²) | AIRFLOW (CFM) | HEIGHT (FT) | | | | | |
| 2 | MAU-1 | 1 | EARTU3-1400-20-12.5T-DDAS | ECON-AIR | 20P-3 | 0 | 4200 | 4200 | 2346 | 0.600 | 3.00 | 3 | 460 | 30A | 35A | 94.0°F | 74.0°F | --- | --- | 69.7°F | 63.7°F | 60.6°F | 149.4 MBH | 104.0 MBH | 21.3 | 4.1 | 90.0°F | 70.0°F | 90.7 MBH | 0.3 MBH | 41.2 LBS/HR | NATURAL | 395062 | 320000 | 65°F | 7 IN. W.C. - 14 IN. W.C. | 484.6 | 872 | 7.2 | 1,2,3,4,5,6,7,8,9,10,11,16,17,18,19 |
| 3 | DDAS-1 | 1 | CAS-HVAC4-1500-22-22T-ERV | CAPTIVEAIRE | 22Z-4 | 0 | 5245 | 5245 | 5900 | 0.750 | 5.00 | 3 | 460 | 48A | 50A | 94.0°F | 74.0°F | 80.7°F | 66.2°F | 51.9°F | 51.9°F | 52.0°F | 214.1 MBH | 157.1 MBH | 18.1 | 5.1 | 70.0°F | 59.1°F | 104.1 MBH | 260 MBH | 52.5 LBS/HR | NATURAL | 500000 | 405000 | 65°F | 7 IN. W.C. - 14 IN. W.C. | 822.4 | 1480 | 7.2 | 1,2,3,4,5,6,7,8,9,10,12,13,16,17,19,20,21,22,23,24,25 |
| 4 | DDAS-2 | 1 | CAS-HVAC3-1400-24-20T-ERV | CAPTIVEAIRE | 24MF-3-RTU | 0 | 4255 | 4255 | 3590 | 0.750 | 7.50 | 3 | 460 | 53.6A | 60A | 94.0°F | 74.0°F | 82.3°F | 67.2°F | 50.8°F | 50.8°F | 50.9°F | 200.5 MBH | 139.6 MBH | 18.2 | 6.0 | 70.0°F | 58.6°F | 89.8 MBH | 129.6 MBH | 56.0 LBS/HR | NATURAL | 389519 | 315510 | 63°F | 7 IN. W.C. - 14 IN. W.C. | 602.1 | 1084 | 7.2 | 1,2,3,4,5,6,7,8,9,10,12,13,16,17,19,20,21,22,23,24,26 |
| 5 | DDAS-3 | 1 | CAS-HVAC3-1300-18-12.5T-ERV | CAPTIVEAIRE | 18P-3 | 0 | 2860 | 2860 | 3285 | 0.750 | 5.00 | 3 | 460 | 40A | 45A | 94.0°F | 74.0°F | 80.5°F | 66.1°F | 52.5°F | 52.5°F | 52.6°F | 111.8 MBH | 83.5 MBH | 21.3 | 4.1 | 70.0°F | 59.6°F | 54.8 MBH | 101 MBH | 26.0 LBS/HR | NATURAL | 261815 | 212070 | 63°F | 7 IN. W.C. - 14 IN. W.C. | 499.3 | 899 | 7.2 | 1,2,3,4,5,6,7,8,9,10,12,14,16,17,19,20,21,22,23,24,26 |
| 6 | DDAS-4 | 1 | CAS-HVAC4-1600-30-22T-ERV | CAPTIVEAIRE | 30MF-4-RTU | 0 | 5670 | 5670 | 6213 | 0.750 | 10.00 | 3 | 460 | 57.8A | 70A | 94.0°F | 74.0°F | 81.0°F | 66.4°F | 52.4°F | 52.4°F | 52.5°F | 227.7 MBH | 168.6 MBH | 18.1 | 5.1 | 70.0°F | 65.9°F | 109.4 MBH | 260 MBH | 54.5 LBS/HR | NATURAL | 600000 | 486000 | 73°F | 7 IN. W.C. - 14 IN. W.C. | 822.4 | 1480 | 7.2 | 1,2,3,4,5,6,7,8,9,10,12,15,16,17,19,20,21,22,23,24,26 |

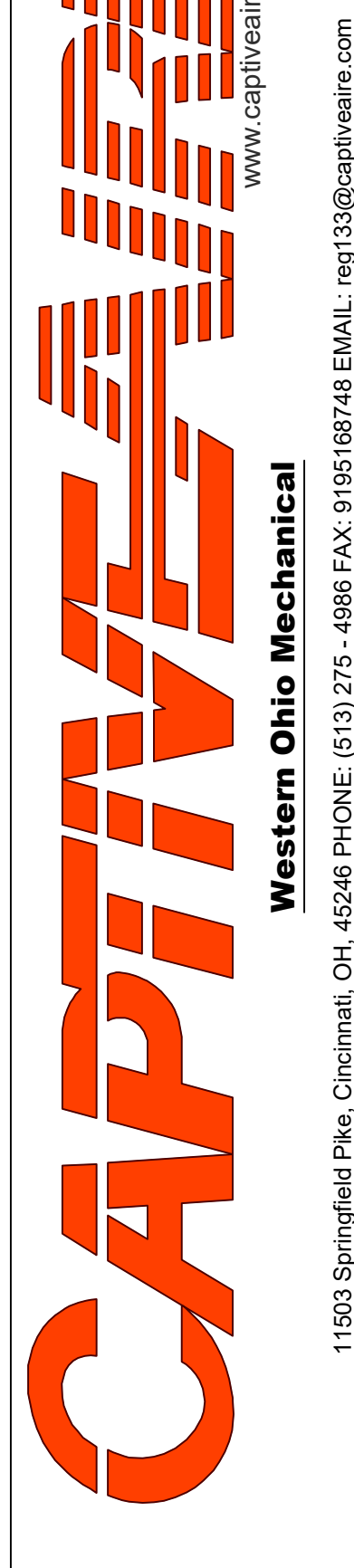
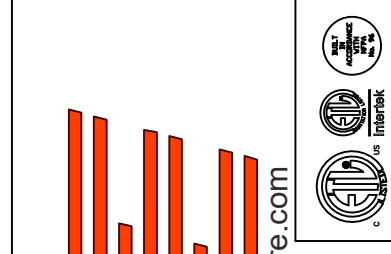
NOTES:
1. INVERTER SCROLL COMPRESSOR WITH INTEGRATED OIL SENSOR. DIGITAL OR STAGED SCROLL NOT AN APPROVED EQUAL
2. DIRECT DRIVE PLENUM BLOWER. BELT DRIVEN BLOWERS ARE NOT ACCEPTABLE
3. INTEGRATED MONITORING VIA CELLULAR CONNECTION BY MANUFACTURER
4. REFRIGERATION PRESSURE MONITORING ON HIGH AND LOW PRESSURE SIDE OF SYSTEM INCLUDED THROUGH DIGITAL INTERFACE
5. ECM MOTOR CONDENSING FANS
6. ELECTRONIC EXPANSION VALVE. TXV NOT ACCEPTABLE
7. SUCTION LINE ACCUMULATOR
8. FACTORY COMMISSIONING WITH 5 YEAR PARTS WARRANTY, 25 YEAR WARRANTY ON STAINLESS STEEL HEAT EXCHANGER
9. AVERAGING INTAKE, EVAP AND DISCHARGE TEMPERATURE SENSORS DISCHARGE SENSOR TO BE FACTORY MOUNTED WITHIN UNIT
10. EXTERIOR DUAL-WALL CONSTRUCTION W/ R-19 INSULATION-MINIMUM 20GA EXTERIOR W/ 14GA BASE
11. BIX EFFICIENT FURNACE, WITH MODULATING INDUCER TO MAINTAIN CONSTANT COMBUSTION EFFICIENCY ACROSS FIRING RANGE. 6:1 TURNDOWN WITH NG AND 5:1 TURNDOWN WITH LP
12. TOTAL ENERGY RECOVERY WHEEL WITH SPEED CONTROLS FOR FROST PROTECTION AND MODULATION TO CAPACITY. INCLUDES SUPPLY AND EXHAUST FILTER & WHEEL MONITORING
13. BIX EFFICIENT FURNACE, WITH MODULATING INDUCER TO MAINTAIN CONSTANT COMBUSTION EFFICIENCY ACROSS FIRING RANGE. 15:1 TURNDOWN WITH NG AND 12:1 TURNDOWN WITH LP
14. BIX EFFICIENT FURNACE, WITH MODULATING INDUCER TO MAINTAIN CONSTANT COMBUSTION EFFICIENCY ACROSS FIRING RANGE. 14:1 TURNDOWN WITH NG AND 12:1 TURNDOWN WITH LP
15. BIX EFFICIENT FURNACE, WITH MODULATING INDUCER TO MAINTAIN CONSTANT COMBUSTION EFFICIENCY ACROSS FIRING RANGE. 16:1 TURNDOWN WITH NG AND 13:1 TURNDOWN WITH LP
16. SUPPLY CFM MONITORING INTEGRAL TO UNIT WITH CFM MEASUREMENT INCLUDED THROUGH DIGITAL INTERFACE
17. FULLY MODULATING HOT GAS REHEAT
18. DOWN DISCHARGE/NO RETURN
19. MINIMUM ROOM AREA ASSUMED 7.2" SUPPLY DIFFUSER HEIGHT AND IS CALCULATED PER UL60335-2-40 4TH ED. VALUES BASED ON FACTORY CHARGE. ACTUAL SITE CHARGE MAY DIFFER.
20. EXHAUST CFM MONITORING INTEGRAL TO UNIT WITH CFM MEASUREMENT INCLUDED THROUGH DIGITAL INTERFACE
21. FILTERED SUPPLY AND EXHAUST AIR STREAMS WITHIN ENERGY RECOVERY VENTILATOR MODULE
22. FACTORY INSTALLED COMPRESSOR SOUND BLANKET
23. BAROMETRIC RELIEF DAMPER
24. DOWN DISCHARGE/DOWN RETURN
25. DIRECT DRIVE ECM PLENUM BLOWER. BELT DRIVEN AND NON-ECM BLOWERS ARE NOT ACCEPTABLE
26. STATIC PRESSURE CONTROLLED BLOWER

DDAS/RTU ENERGY RECOVERY SCHEDULE

| FAN UNIT NO | TAG | EXHAUST AIR FAN (ECM) | | | | SUPPLY AIR SUMMER | | | RETURN AIR (DB/WB TEMP<F>) | | | DESIGN RECOVERED SUMMER CAPACITY | | | SUPPLY AIR WINTER | | | RETURN AIR (DB/WB TEMP<F>) | | | DESIGN RECOVERED WINTER CAPACITY | | | |
|-------------|--------|-----------------------|-----|----------|----------|------------------------------|-----------------------------|------------------------------|----------------------------|----------|----------|----------------------------------|-----------------------------|-----------|-------------------|-----------|------------------------------|-----------------------------|-------|----------|----------------------------------|--|--|--|
| | | CFM | ESP | MOTDR HP | V/Ø/HZ | ENTERING AIR (DB/WB TEMP<F>) | LEAVING AIR (DB/WB TEMP<F>) | ENTERING AIR (DB/WB TEMP<F>) | TOTAL | SENSIBLE | LATENT | ENTERING AIR (DB/WB TEMP<F>) | LEAVING AIR (DB/WB TEMP<F>) | TOTAL | SENSIBLE | LATENT | ENTERING AIR (DB/WB TEMP<F>) | LEAVING AIR (DB/WB TEMP<F>) | TOTAL | SENSIBLE | LATENT | | | |
| 3 | DDAS-1 | 5245 | 0.5 | 4.8 | 460/3/60 | 94.0/74.0 | 80.7/66.2 | 75.0/62.0 | 147.2 MBH | 70.1 MBH | 77.1 MBH | 10.0/7.5 | 49.7/42.3 | 69.0/55.0 | 313.2 MBH | 222.8 MBH | 90.4 MBH | | | | | | | |
| 4 | DDAS-2 | 4255 | 0.5 | 4.8 | 460/3/60 | 94.0/74.0 | 82.3/67.2 | 75.0/62.0 | 103.3 MBH | 49.3 MBH | 54.0 MBH | 10.0/7.5 | 44.4/38.5 | 69.0/55.0 | 220.4 MBH | 157.3 MBH | 63.1 MBH | | | | | | | |
| 5 | DDAS-3 | 2860 | 0.5 | 4.8 | 460/3/60 | 94.0/74.0 | 80.5/66.1 | 75.0/62.0 | 81.1 MBH | 38.6 MBH | 42.5 MBH | 10.0/7.5 | 50.3/42.8 | 69.0/55.0 | 172.6 MBH | 122.8 MBH | 49.8 MBH | | | | | | | |
| 6 | DDAS-4 | 5670 | 0.5 | 4.8 | 460/3/60 | 94.0/74.0 | 81.0/66.4 | 75.0/62.0 | 155.1 MBH | 73.9 MBH | 81.2 MBH | 10.0/7.5 | 48.7/41.6 | 69.0/55.0 | 330.1 MBH | 234.8 MBH | 95.2 MBH | | | | | | | |

REVISIONS

| NO. | DESCRIPTION | DATE: |
|-----|-------------|-------|
| | | |
| | | |
| | | |
| | | |



Cincinnati Classical Academy R2 - R454B
CINCINNATI, OH, 45242

DATE: 11/13/2024
DWG.#: 7142471
DRAWN BY: grant.homan
SCALE: 1/2" = 1'-0"
MASTER DRAWING

SHEET NO. 5

| FAN UNIT NO | TAG | QTY | DESCRIPTION | IMPORTANT NOTE |
|-------------|--------|-----|--|----------------|
| 1 | URF-1 | 1 | GREASE BOX | |
| | | 1 | FAN BASE CERAMIC SEAL - DU/BR24RFA - INSTALLED AT PLANT - FOR GREASE DAPTS | |
| | | 1 | LOAD REACTOR MOUNTED IN FAN | |
| | | 1 | WAV PACKAGE W/ DUCT STATIC PRESSURE CONTROL - "H" -150" TO +150" OF VC (57) VFD INCLUDED | |
| | | 1 | 2 YEAR PARTS WARRANTY | |
| | | 1 | INLET PRESSURE GAUGE, 0-35" | |
| | | 1 | MANIFOLD PRESSURE GAUGE, 0 TO 10" VC, 1 FURNACE | |
| | | 1 | SNIP LEASE GAS STRAINER 1" | |
| | | 1 | SINGLE POINT ELECTRICAL CONNECTION FOR RTU 750VA TRANSFORMER USED IF A NON-DCV PREVIEW CONTROLS THIS UNIT, THE #38, #47, #49, OR #52 PREVIEW OPTION MUST BE SELECTED. DOES NOT PROVIDE SUPPLY STARTER IN PREVIEW | |
| | | 1 | CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED | |
| 2 | MAU-1 | 1 | CONSTRUCTION HOSE - MODIFIES START-UP SETTINGS TO ALLOW TEMPERING A BUILDING STILL UNDER CONSTRUCTION | |
| | | 1 | RTU DOWN DISCHARGE, 400, 500 MHH | |
| | | 1 | 2" MERV 8 FILTERS FOR RTU3 (QTY: 4) | |
| | | 1 | OVERHEAT STAT | |
| | | 1 | RTU FIXED 300S DA INTAKE CONTROL | |
| | | 1 | COMMERCIAL SMOKE DETECTOR/ALARM INTERLOCK - ALARM SUPPLIED BY OTHERS | |
| | | 1 | RAVAC FIRE INPUT | |
| | | 1 | RTU2 NO RETURN - IMH DA | |
| | | 1 | TOTAL CFM MONITORING | |
| | | 1 | INTAKE FIRESTAT SET TO 150°F | |
| 3 | DOAS-1 | 1 | PREHEAT/STAT | |
| | | 1 | DISCHARGE FIRESTAT SET TO 240°F | |
| | | 1 | RTU2 CURB DUCT HANGER | |
| | | 1 | WAV PACKAGE W/ MANUAL/SDC CONTROL (57) VFD INCLUDED | |
| | | 1 | LOAD REACTOR MOUNTED IN FAN | |
| | | 1 | VFD FACTORY MOUNTED AND WIRED IN RTU COMMERCIAL CONTROL VESTIBULE | |
| | | 1 | RA548 - 185 TON MODULATING COOLING OPTION, 460/480V, R454B REFRIGERANT, VARIABLE SPEED COMPRESSOR, ECM CONDENSING FANS | |
| | | 1 | RA548 LEAK DETECTOR OPTION FOR RTUS | |
| | | 1 | ENERGY RECOVERY VENTILATOR FOR RTUS | |
| | | 1 | REHEAT - 1ST DRY COIL | |
| 4 | DOAS-2 | 1 | 5 YEAR ENTIRE UNIT PARTS WARRANTY, 10 YEAR ENTIRE UNIT PARTS WARRANTY WITH REMOTE MONITORING AND CONTINUOUS SERVICE CONTRACT, 25 YEAR STAINLESS STEEL FURNACE PARTS WARRANTY (SEE ADDITIONAL DETAILS) | |
| | | 1 | EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET | |
| | | 1 | TOTAL CFM MONITORING | |
| | | 1 | INTAKE FIRESTAT SET TO 150°F | |
| | | 1 | PREHEAT/STAT | |
| | | 1 | DISCHARGE FIRESTAT SET TO 240°F | |
| | | 1 | SNIP LEASE GAS STRAINER 1" | |
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| | | 1 | CONSTRUCTION HOSE - MODIFIES START-UP SETTINGS TO ALLOW TEMPERING A BUILDING STILL UNDER CONSTRUCTION | |

| FAN UNIT NO | TAG | QTY | DESCRIPTION | IMPORTANT NOTE |
|-------------|--------|-----|--|----------------|
| 5 | DOAS-3 | 1 | HIGH TURNDOWN OPTION FOR DOAS UNITS | |
| | | 1 | LOW BUST STATIC PRESSURE CONTROL | |
| | | 1 | ENERGY RECOVERY VENTILATOR FOR 460/480V RTU4 - ERV MIDDLE SHIPS LODGE, AND SHALL BE CONNECTED TO THE MAIN UNIT IN THE FIELD PER THE INSTRUCTIONS OUTLINED IN THE OWNER INSTALL MANUAL | |
| | | 1 | RTU4 DOWN RETURN | |
| | | 1 | RTU4 ECONOMIZER BAROMETRIC RELIEF | |
| | | 1 | 2" MERV 13 SUPPLY FILTERS FOR ERV4 | |
| | | 1 | ERV EXHAUST FAN - MANUAL CONTROL VIA IMH | |
| | | 1 | RTU4 CURB DUCT HANGER | |
| | | 1 | COMMERCIAL SMOKE DETECTOR/ALARM INTERLOCK - ALARM SUPPLIED BY OTHERS | |
| | | 1 | 2" MERV 13 FILTERS FOR RTU4 (QTY: 12) | |
| 6 | DOAS-4 | 1 | INLET PRESSURE GAUGE, 0-35" | |
| | | 1 | TOTAL CFM MONITORING | |
| | | 1 | INTAKE FIRESTAT SET TO 150°F | |
| | | 1 | PREHEAT/STAT | |
| | | 1 | DISCHARGE FIRESTAT SET TO 240°F | |
| | | 1 | SNIP LEASE GAS STRAINER 1" | |
| | | 1 | SINGLE POINT ELECTRICAL CONNECTION FOR RTU 750VA TRANSFORMER USED IF A NON-DCV PREVIEW CONTROLS THIS UNIT, THE #38, #47, #49, OR #52 PREVIEW OPTION MUST BE SELECTED. DOES NOT PROVIDE SUPPLY STARTER IN PREVIEW | |
| | | 1 | CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED | |
| | | 1 | CONSTRUCTION HOSE - MODIFIES START-UP SETTINGS TO ALLOW TEMPERING A BUILDING STILL UNDER CONSTRUCTION | |
| | | 1 | RTU4 DOWN DISCHARGE | |

SUBMITTAL REVIEW

Submission of information by the Contractor is taken as evidence that the Contractor has prepared the information for the specific application, and has verified that adequate and complete conditions for installation and subsequent operation and maintenance will exist.

Engineers review is for general conformance with the design concepts of the project, and for general compliance with the information given in the contract documents. The Contractor is responsible for access and clearance code compliance, work methods and conditions, coordination of trades, safety, all in satisfactory performance of work.

- NO EXCEPTIONS TAKEN
- REJECTED-RESUBMIT
- EXCEPTIONS AS NOTED
- REVISE AND RESUBMIT

CUNNING & ASSOCIATES MCE

Date: Dec 31 2024 By: Norm Cunning

SUBMITTAL REVIEW

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- REVISE AND RESUBMIT

CUNNING & ASSOCIATES MCE

Date: Dec 31 2024 By: Norm Cunning

| FAN UNIT NO | TAG | QTY | DESCRIPTION | IMPORTANT NOTE |
|-------------|--------|-----|--|----------------|
| 7 | DOAS-5 | 1 | INLET PRESSURE GAUGE, 0-35" | |
| | | 1 | TOTAL CFM MONITORING | |
| | | 1 | INTAKE FIRESTAT SET TO 150°F | |
| | | 1 | PREHEAT/STAT | |
| | | 1 | DISCHARGE FIRESTAT SET TO 240°F | |
| | | 1 | SNIP LEASE GAS STRAINER 1" | |
| | | 1 | SINGLE POINT ELECTRICAL CONNECTION FOR RTU 750VA TRANSFORMER USED IF A NON-DCV PREVIEW CONTROLS THIS UNIT, THE #38, #47, #49, OR #52 PREVIEW OPTION MUST BE SELECTED. DOES NOT PROVIDE SUPPLY STARTER IN PREVIEW | |
| | | 1 | CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED | |
| | | 1 | CONSTRUCTION HOSE - MODIFIES START-UP SETTINGS TO ALLOW TEMPERING A BUILDING STILL UNDER CONSTRUCTION | |
| | | 1 | RTU4 DOWN DISCHARGE | |

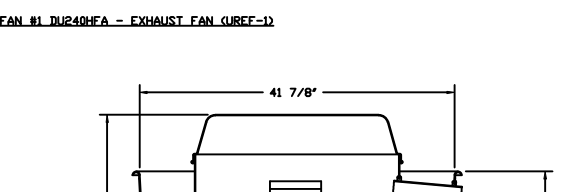
It appears that equipment containing a wheel in lieu of a core has been submitted. Provide additional information on control sequences or supplemental heater being employed to keep the wheel from frosting during winter conditions. The installation instruction indicate that the wheel is shipped loose and installed in the field, does the unit electrical reflect the requirements with the wheel installed or do additional amps need to be added for the fan HP associated with the wheel module. This comment is universal for all DOAS systems.

Per our conversation with the vendor the wheel has been programmed to slow down to prevent frosting. Additional heat has been added to compensate for when the wheel is running at a slower rate. Electrical listed is for the entire unit, field coordinated breaker and wire sizes based on actual equipment purchased.

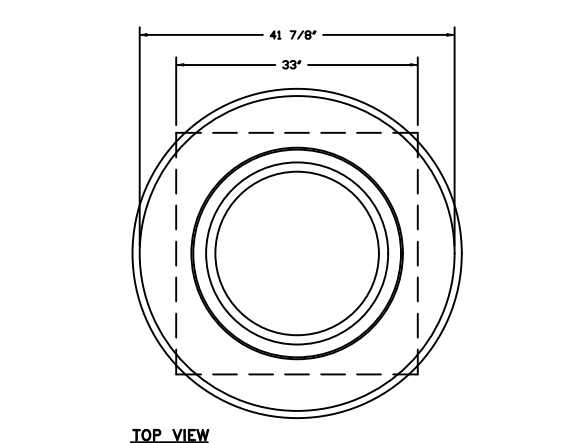
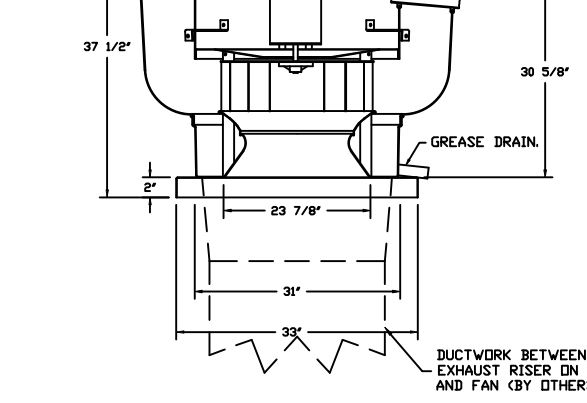
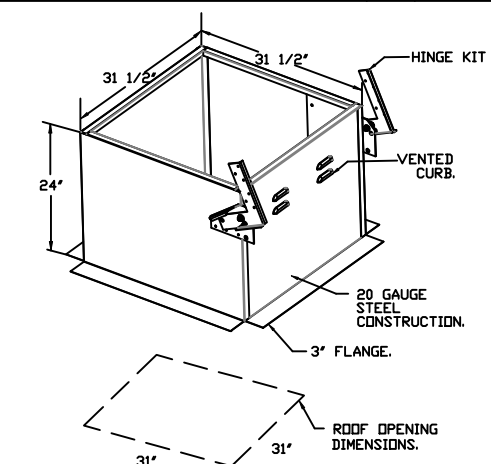
| FAN UNIT NO | TAG | EXHAUST | SUPPLY |
|-------------|-------|---------|--------|
| 1 | URF-1 | YES | NO |

| NO | DN | TAG | WEIGHT | ITEM | SIZE |
|----|-----|--------|---------|------|---|
| 1 | # 1 | URF-1 | 43 LBS | CURB | 36.000" V X 36.000" X 24.000" VENTED HINGED. |
| 2 | # 2 | MAU-1 | 252 LBS | CURB | 59.500" V X 96.000" X 18.000" INSULATED 16 GAUGE. |
| 3 | # 3 | DOAS-1 | 248 LBS | CURB | 60.000" V X 125.000" X 18.000" INSULATED. |
| 4 | # 4 | DOAS-2 | 154 LBS | CURB | 59.500" V X 142.000" X 18.000" INSULATED. |
| 5 | # 5 | DOAS-3 | 154 LBS | CURB | 59.500" V X 142.000" X 18.000" INSULATED. |
| 6 | # 6 | DOAS-4 | 248 LBS | CURB | 60.000" V X 125.000" X 18.000" INSULATED. |

| UNIT NUMBER | HMI # | HMI LOCATION | TEMP AVERAGING | MODBUS ADDRESS |
|-------------|--------|--------------|----------------|----------------|
| FAN #2 | HMI #1 | UNIT | NOT AVERAGED | 55 |
| FAN #3 | HMI #1 | UNIT | NOT AVERAGED | 55 |
| FAN #3 | HMI #2 | SPACE | AVERAGED | 56 |
| FAN #4 | HMI #1 | UNIT | NOT AVERAGED | 55 |
| FAN #4 | HMI #2 | SPACE | AVERAGED | 56 |
| FAN #5 | HMI #1 | UNIT | NOT AVERAGED | 55 |
| FAN #5 | HMI #2 | SPACE | AVERAGED | 56 |
| FAN #6 | HMI #1 | UNIT | NOT AVERAGED | 55 |
| FAN #6 | HMI #2 | SPACE | AVERAGED | 56 |



- FEATURES:**
- DIRECT DRIVE CONSTRUCTION ON BELTS/PULLEYS.
 - ROOF MOUNTED FANS.
 - REINFORCED METAL.
 - ULTRON AND ULTRON ILL-5645
 - VARIABLE SPEED CONTROL.
 - INTERNAL WIRING.
 - THERMAL OVERLOAD PROTECTION (EMERGENCY STOP).
 - HIGH HEAT OPERATION 300°F (150°C).
 - GRADE CLASSIFICATION TESTING.
 - NOW 3R SAFETY DISCONNECT SWITCH.



REVISIONS

| DESCRIPTION | DATE: |
|-------------|-------|
| | |
| | |
| | |
| | |

CAPTIVE

Western Ohio Mechanical

www.captiveair.com

11503 Springfield Pike, Cincinnati, OH, 45246 PHONE: (513) 275-4986 FAX: (513) 275-4986 EMAIL: reg133@captiveair.com

Cincinnati Classical Academy R2 - R454B

CINCINNATI, OH, 45242

DATE: 11/13/2024

DWG.#: 7142471

DRAWN BY: grant.homan

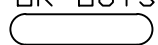
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MASTER DRAWING

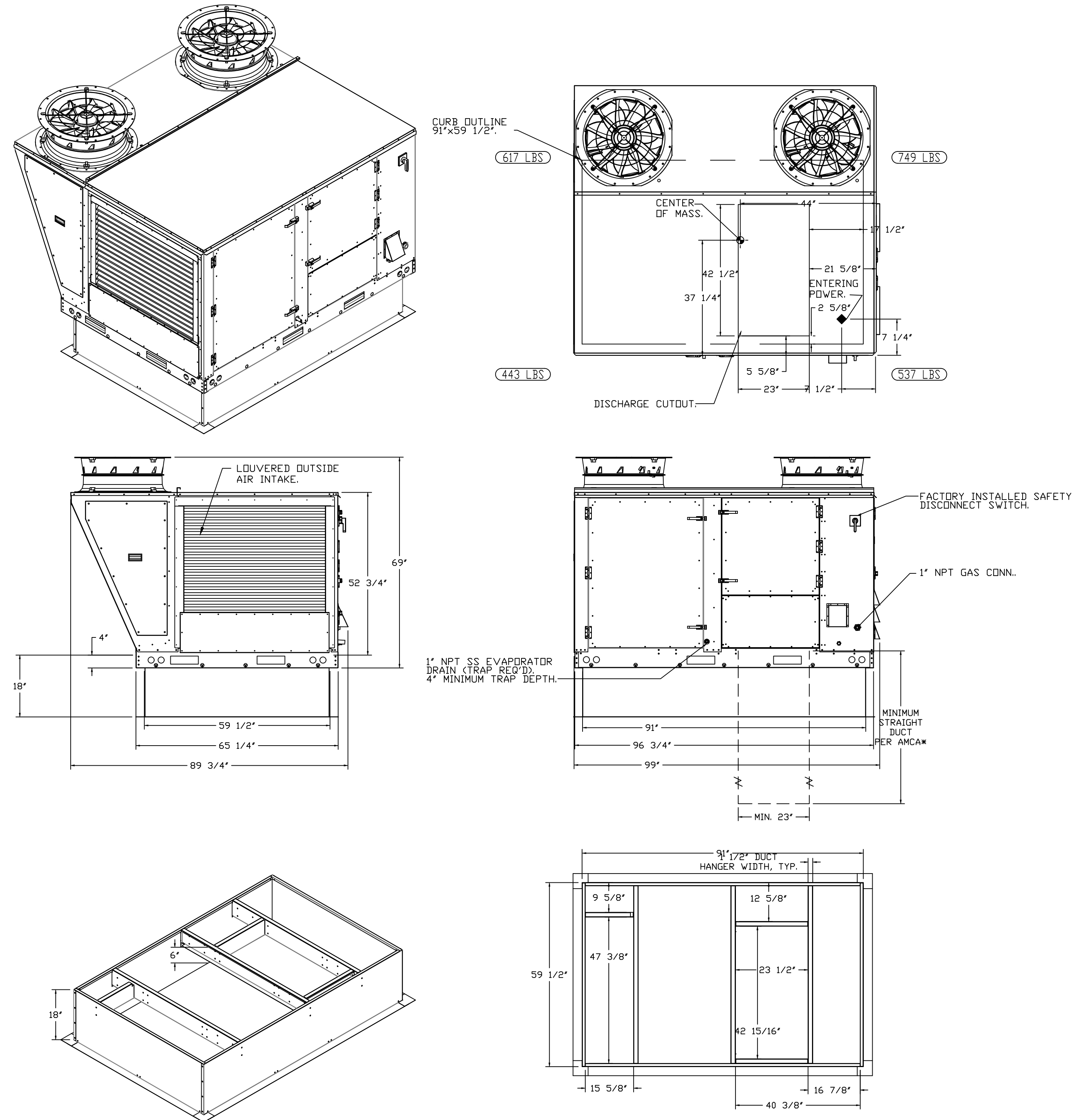
SHEET NO. 6

FAN #2 EARTU3-1.400-20-12.5T-DOAS - HEATER (MAU-1)

NOTES:

- DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
-  DENOTES CORNER WEIGHT.
- ROOF OPENING MUST BE 2" SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.
- CONNECTION FROM BREAKER TO UNITS SAFETY DISCONNECT SWITCH TO BE COPPER WIRE ONLY.
- EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET.

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Cincinnati Classical Academy R2 - R454B
CINCINNATI, OH, 45242

DATE: 11/13/2024
DWG.#: 7142471
DRAWN BY: grant.homan
SCALE: 1/2" = 1'-0"
MASTER DRAWING

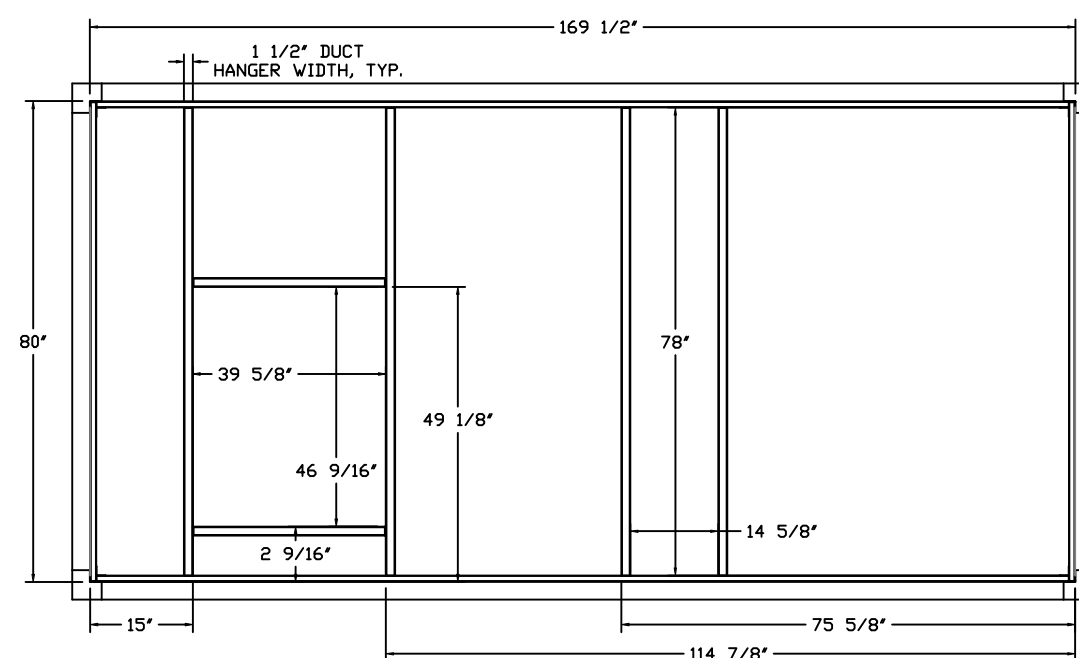
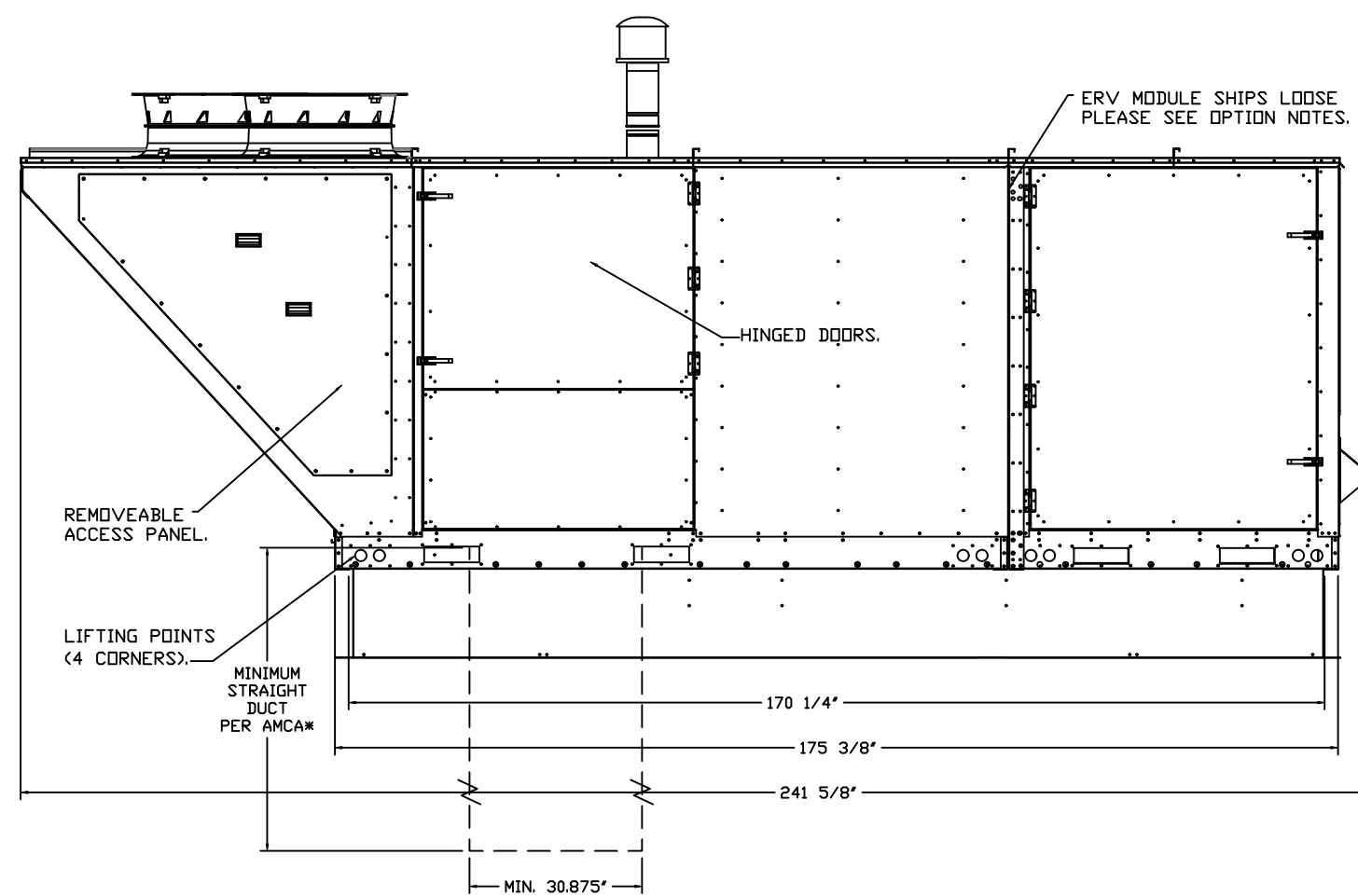
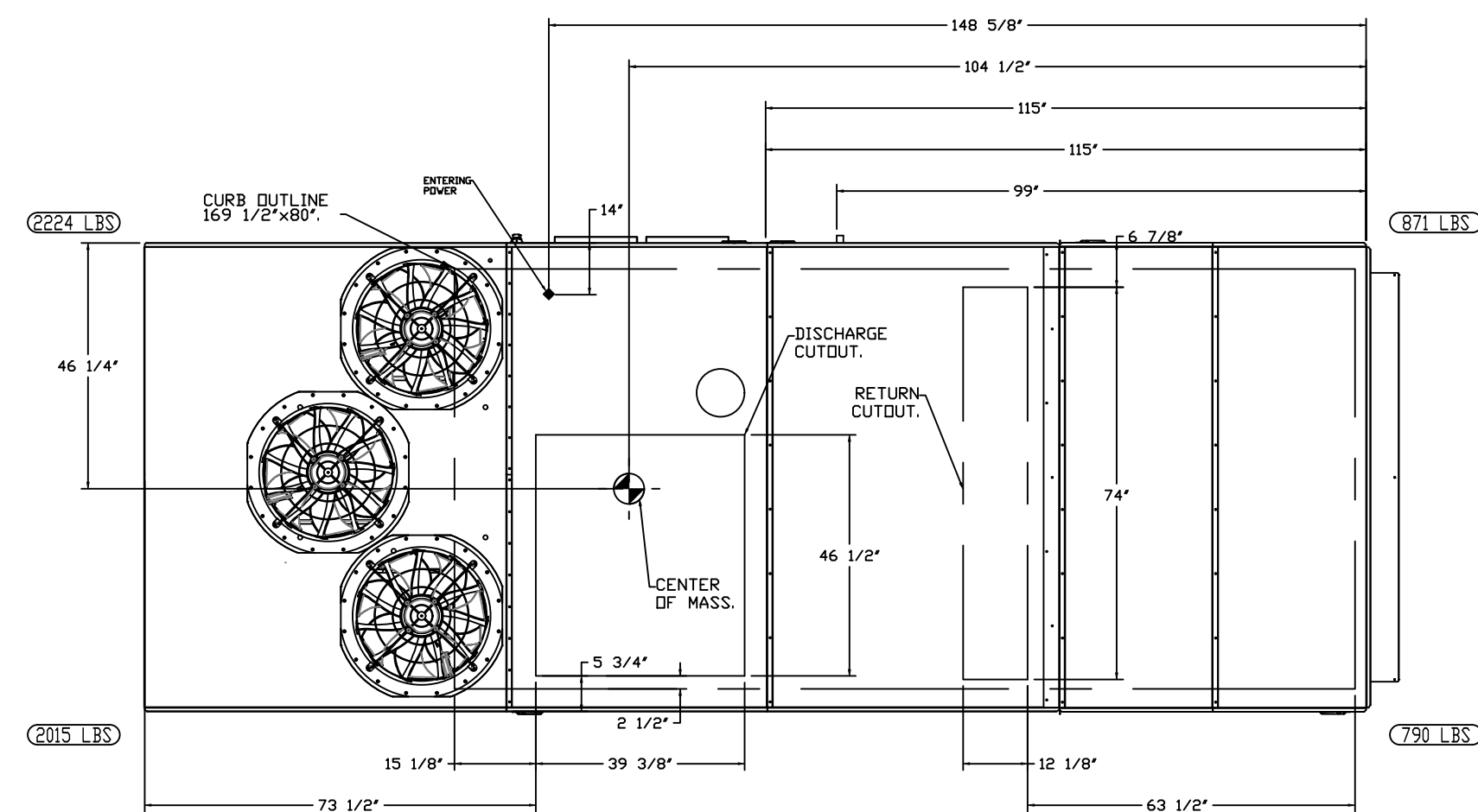
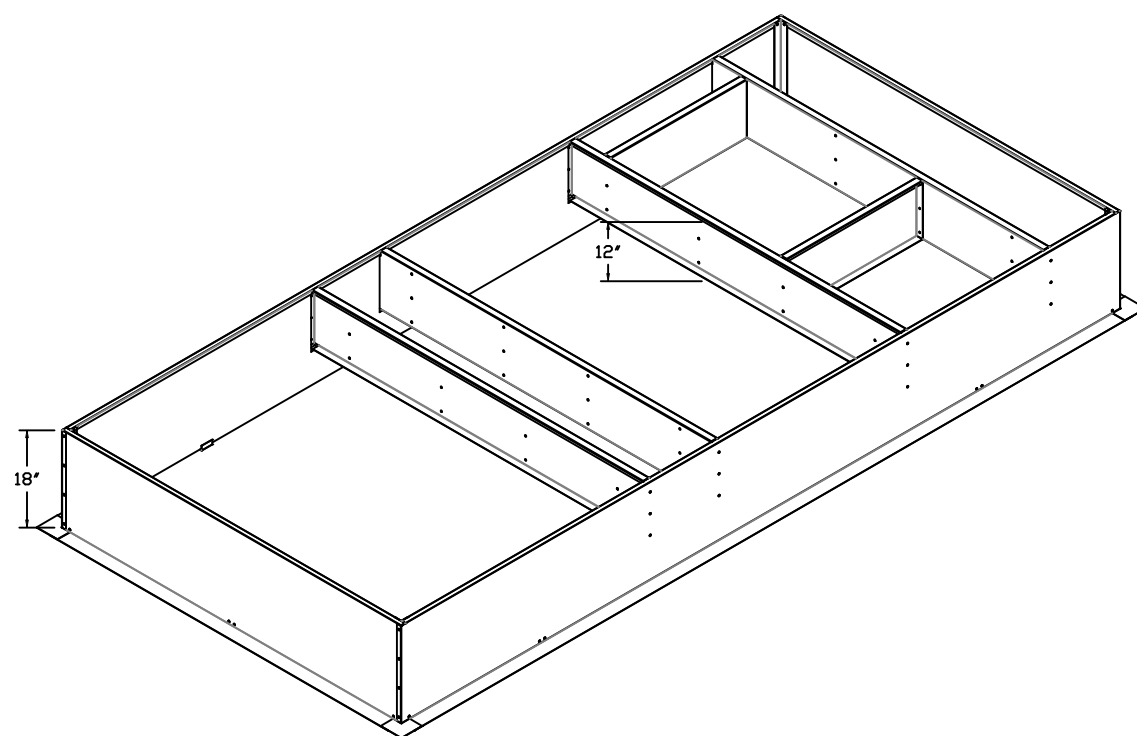
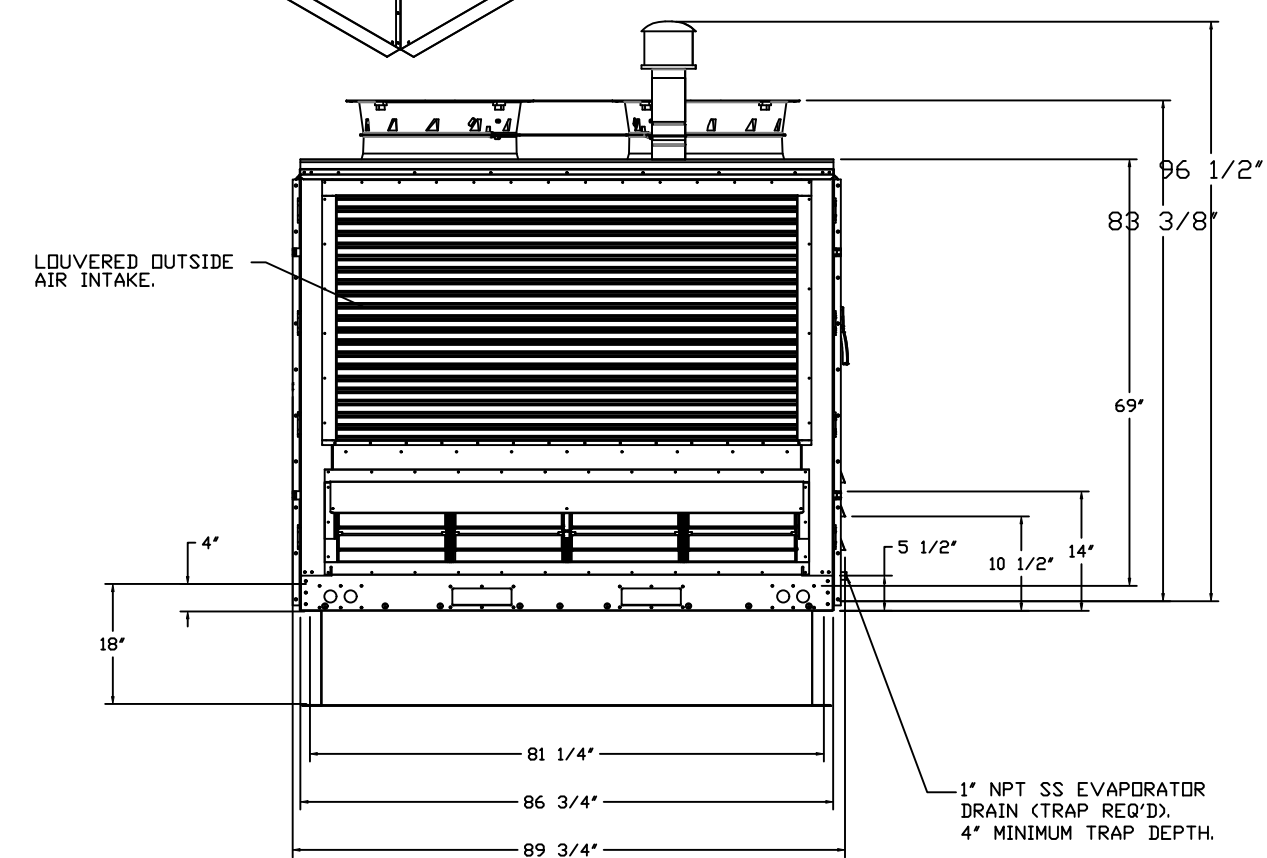
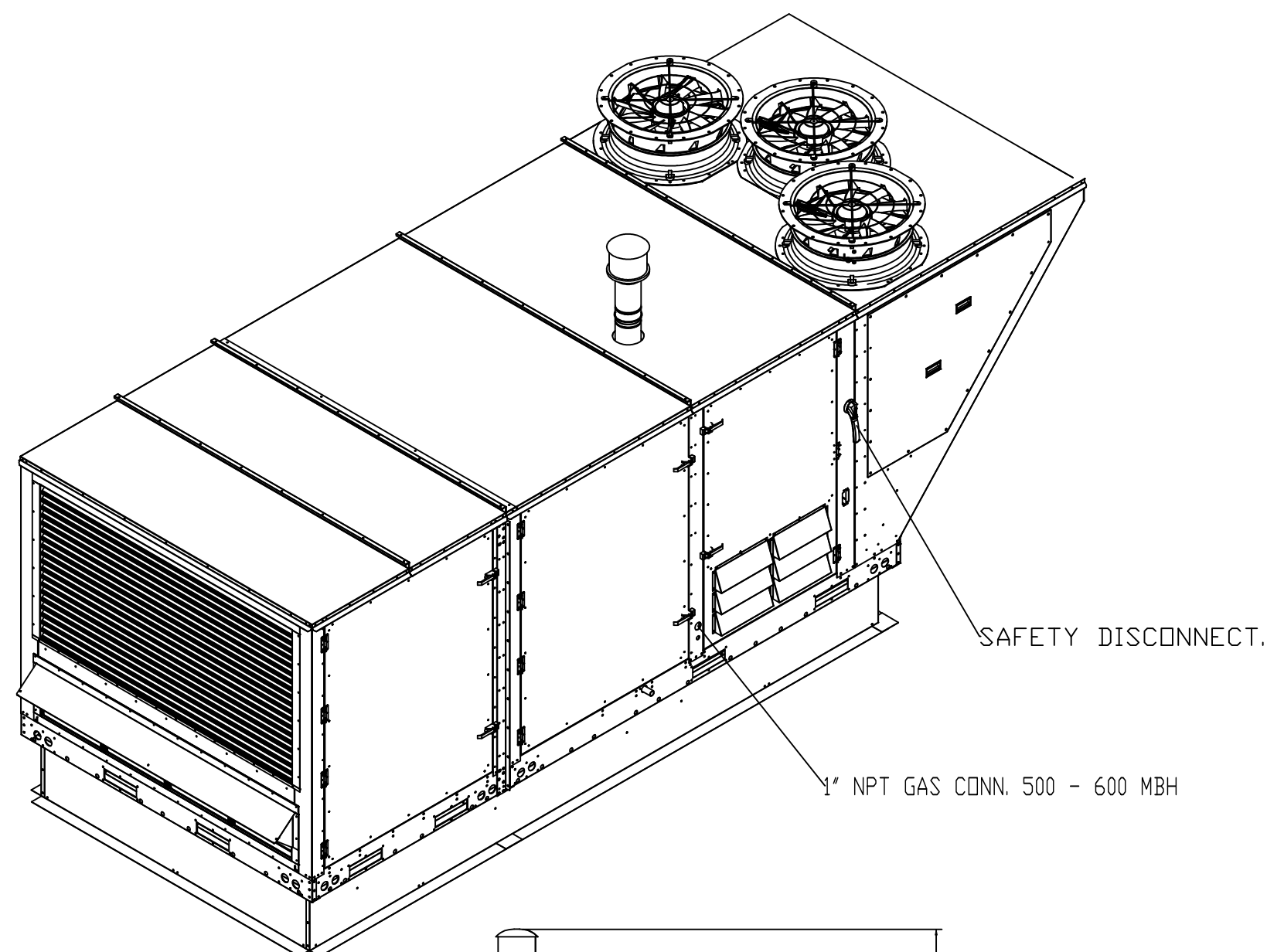
SHEET NO.
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FAN #3 CAS-HVAC4-1500-22Z-22T-ERV - HEATER (DDAS-1)

NOTES:

- DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
- DENOTES CORNER WEIGHT.
- ROOF OPENING MUST BE 2" SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.
- CONNECTION FROM BREAKER TO UNITS SAFETY DISCONNECT SWITCH TO BE COPPER WIRE ONLY.
- EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET.

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Cincinnati Classical Academy R2 - R454B

CINCINNATI, OH, 45242

DATE: 11/13/2024

DWG.#: 7142471

DRAWN BY: grant.homan

SCALE: 3/8" = 1'-0"

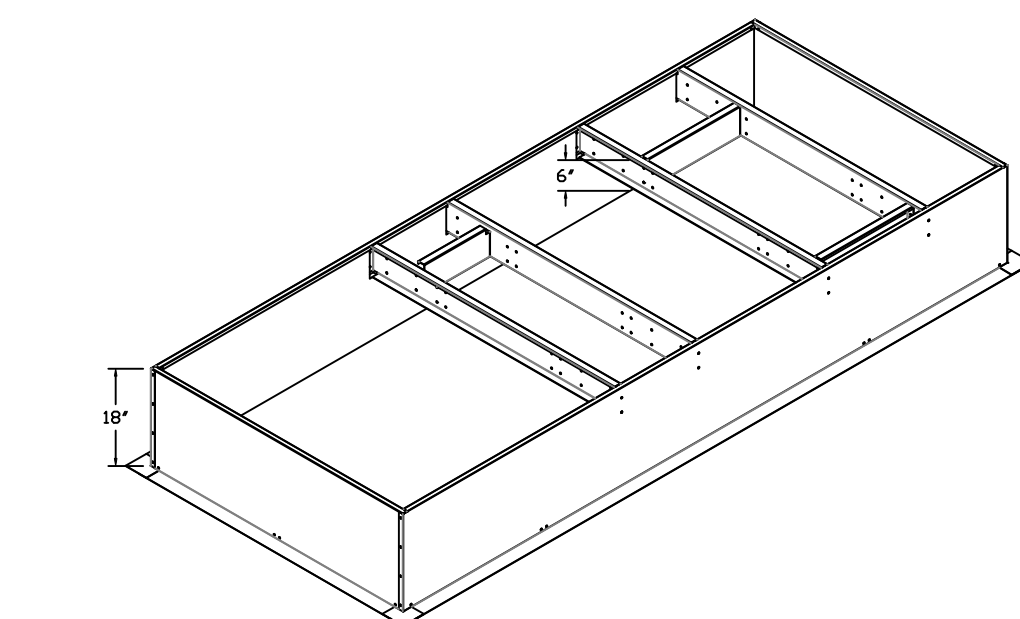
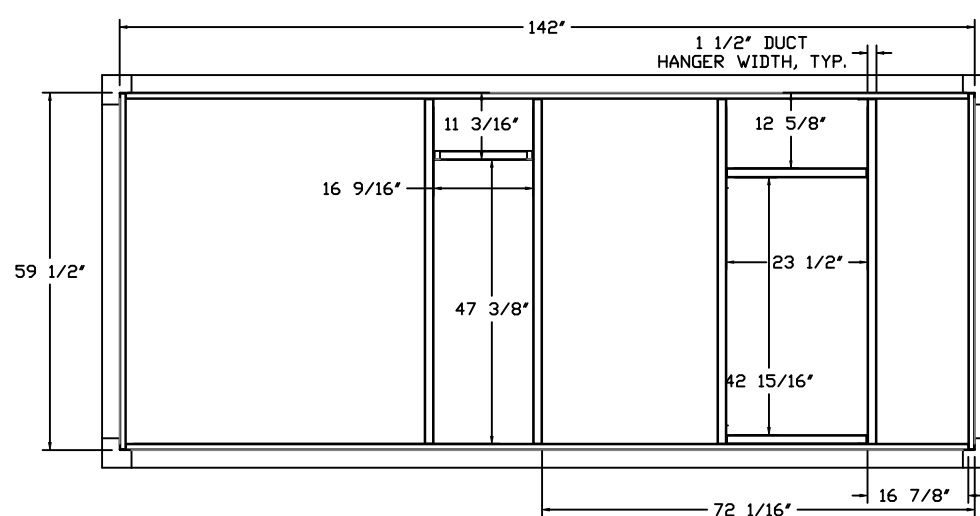
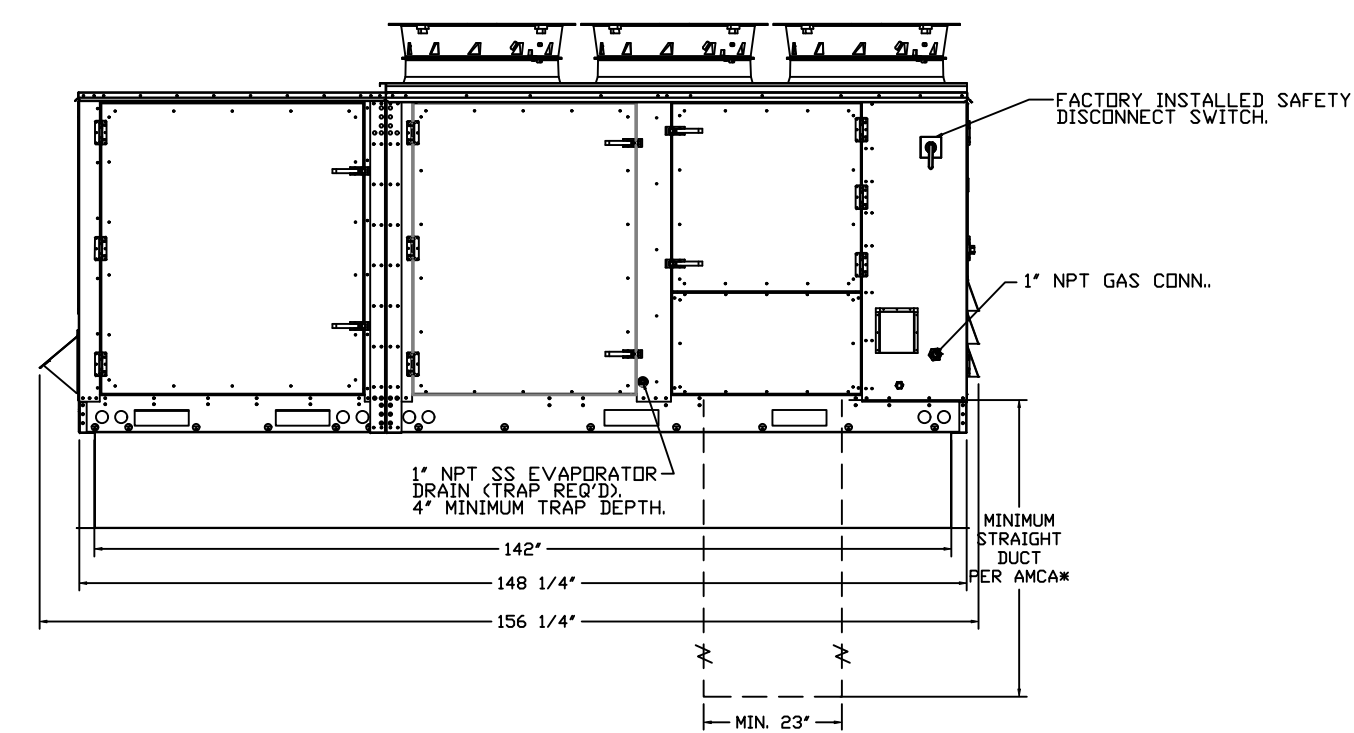
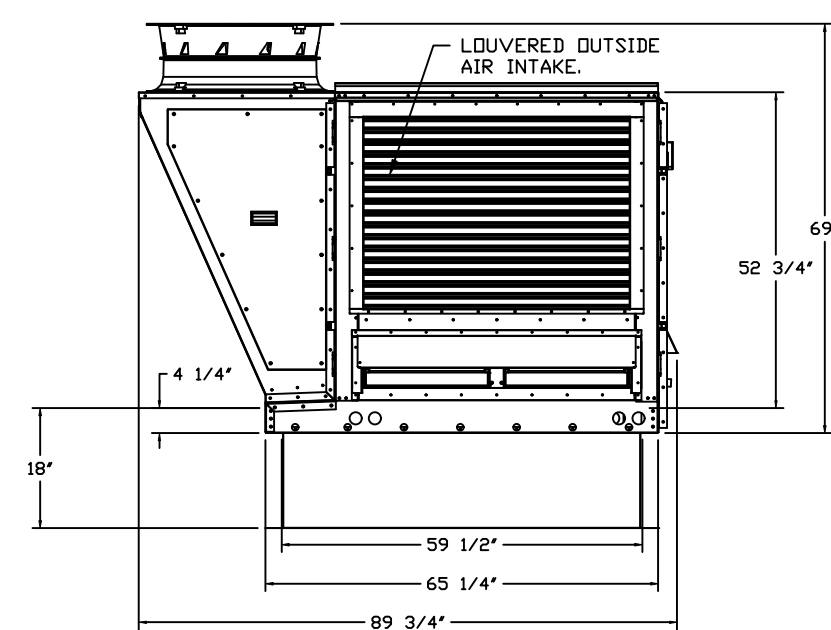
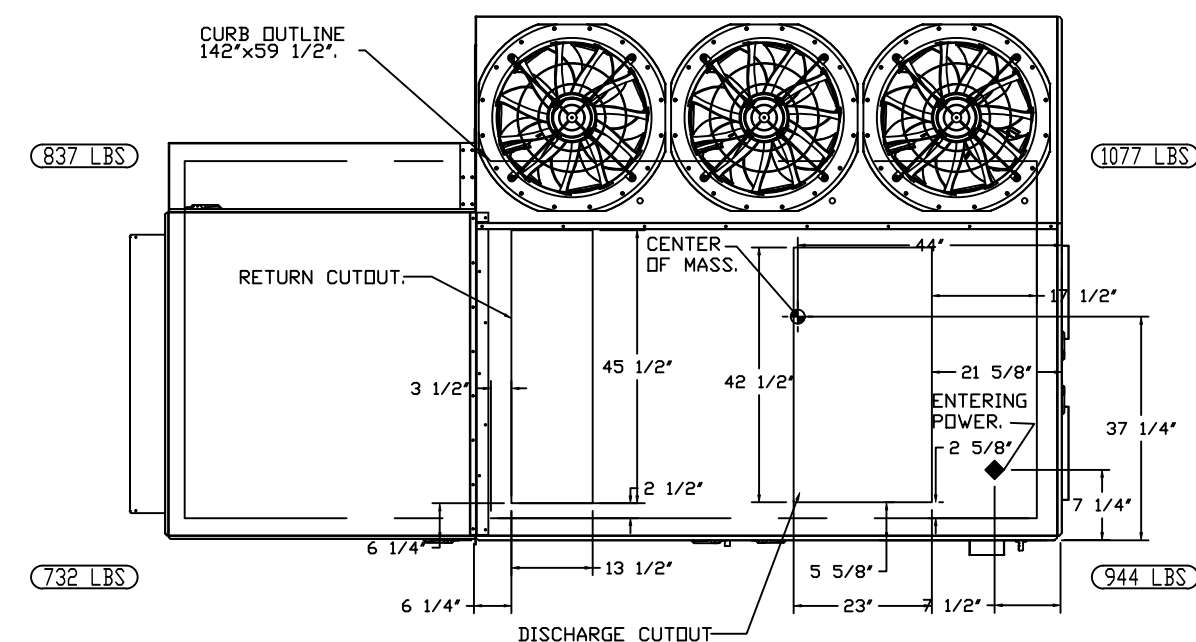
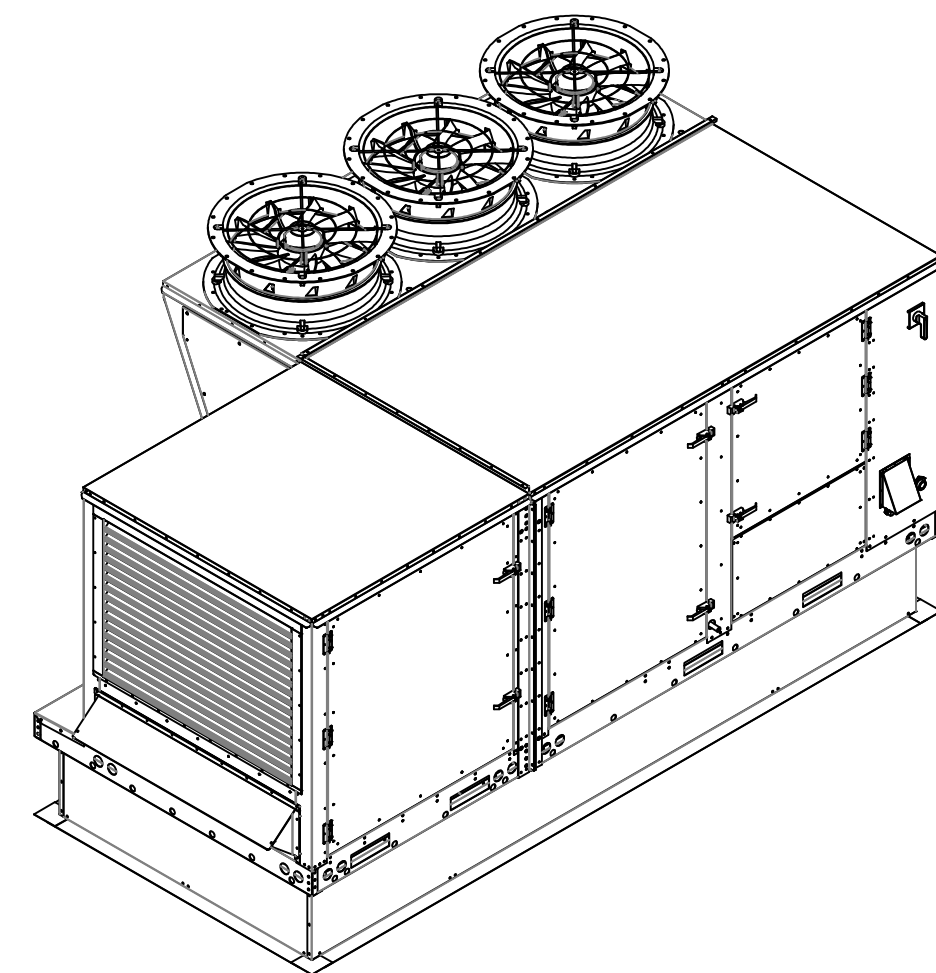
MASTER DRAWING

SHEET NO. 8

FAN #4 CAS-HVAC3-1400-24MF-20T-ERV - HEATER (DDAS-2)

- NOTES:
- DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
 - ⊖ DENOTES CORNER WEIGHT.
 - ROOF OPENING MUST BE 2" SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.
 - CONNECTION FROM BREAKER TO UNITS SAFETY DISCONNECT SWITCH TO BE COPPER WIRE ONLY.
 - EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET.

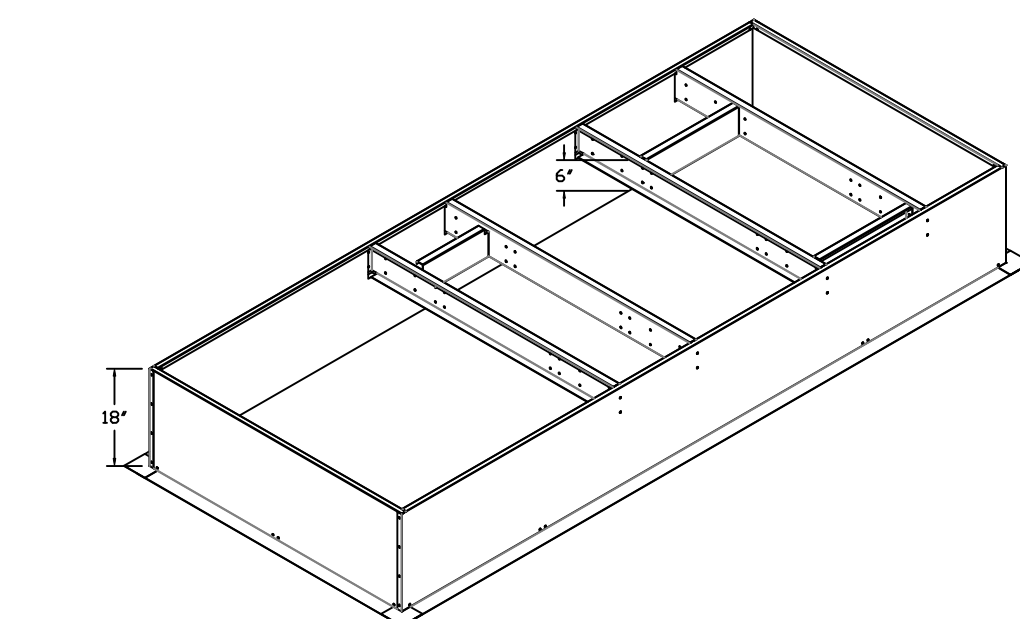
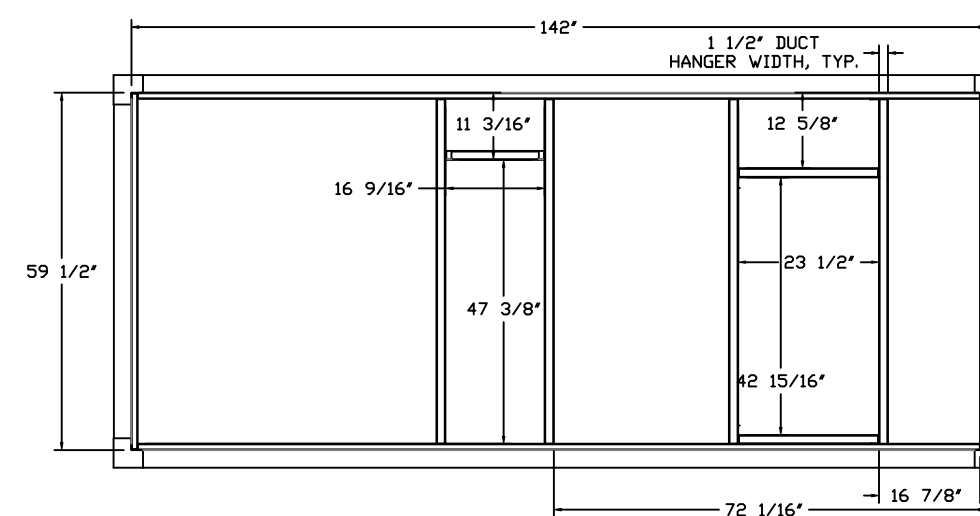
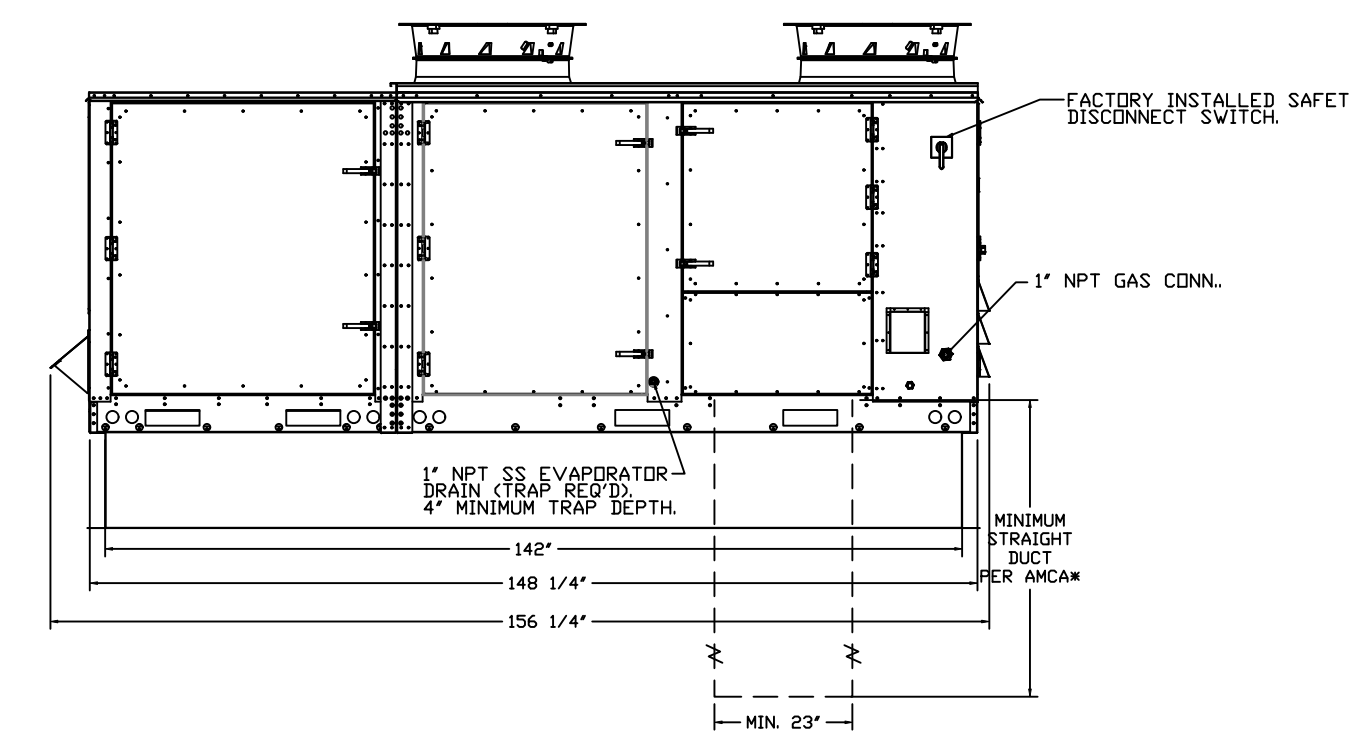
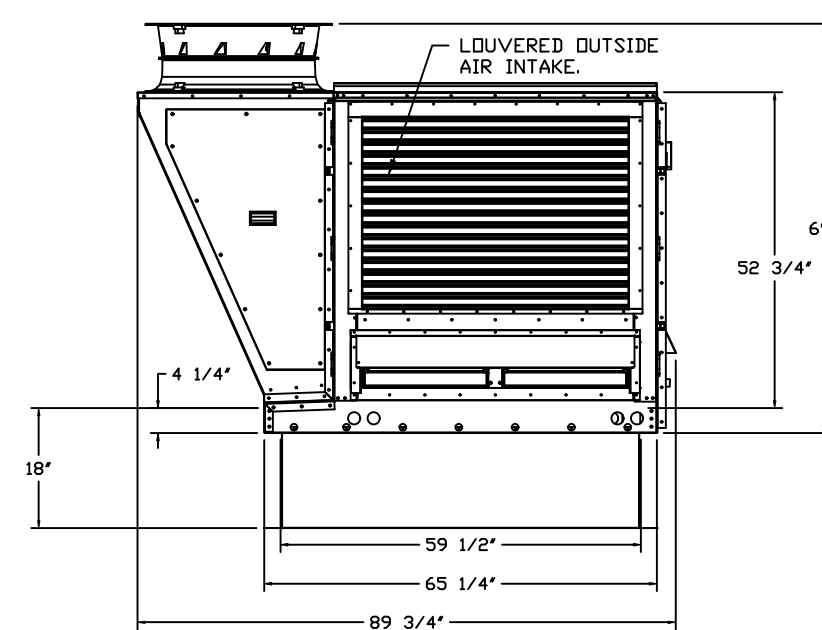
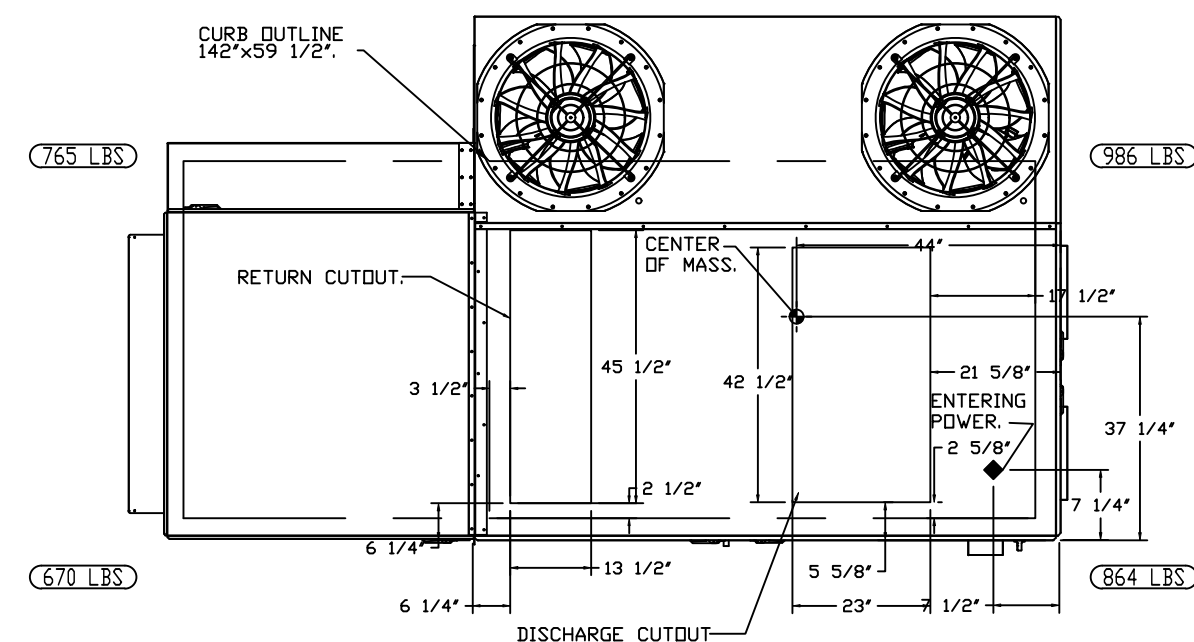
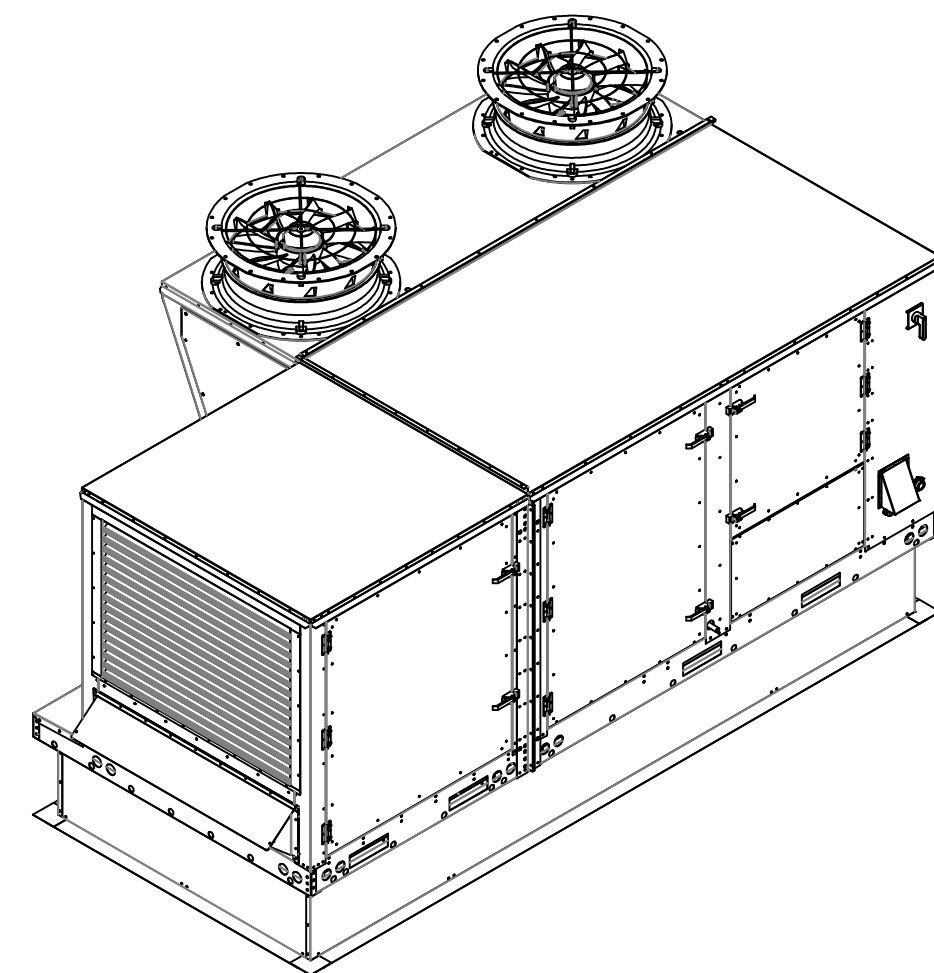
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FAN #5 CAS-HVAC3-1300-18-12.5T-ERV - HEATER (DDAS-3)

- NOTES:
- DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
 - ⊖ DENOTES CORNER WEIGHT.
 - ROOF OPENING MUST BE 2" SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.
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Cincinnati Classical Academy R2 - R454B

CINCINNATI, OH, 45242

DATE: 11/13/2024

DWG.#: 7142471

DRAWN BY: grant.homan

SCALE: 3/8" = 1'-0"

MASTER DRAWING

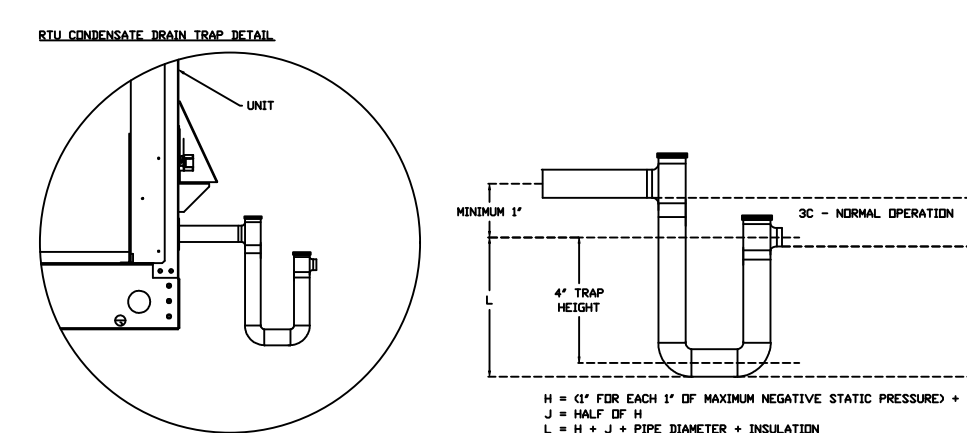
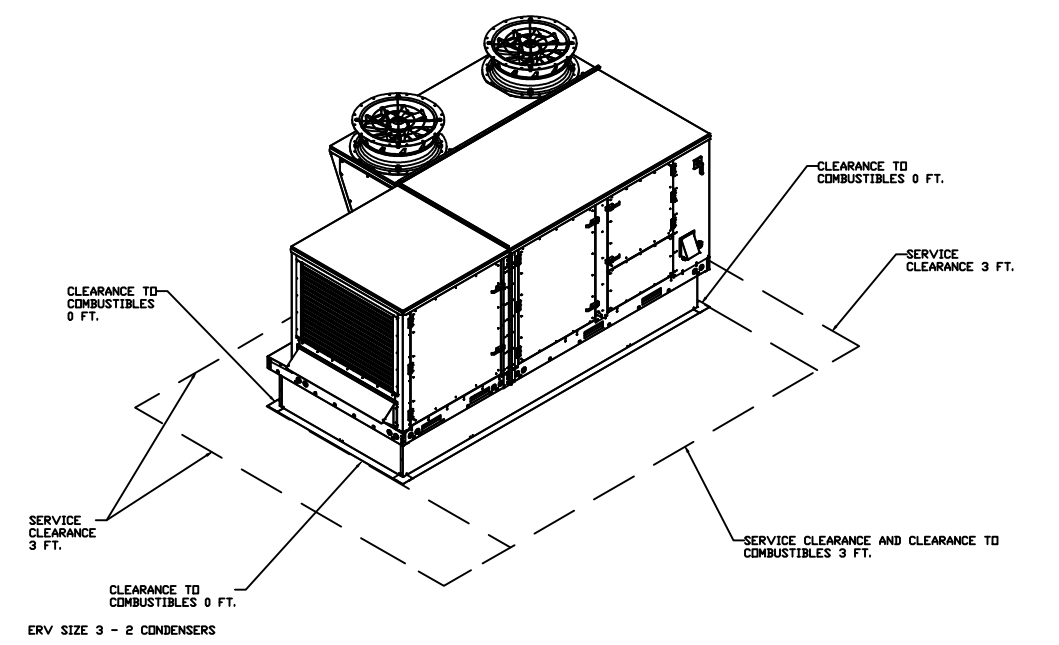
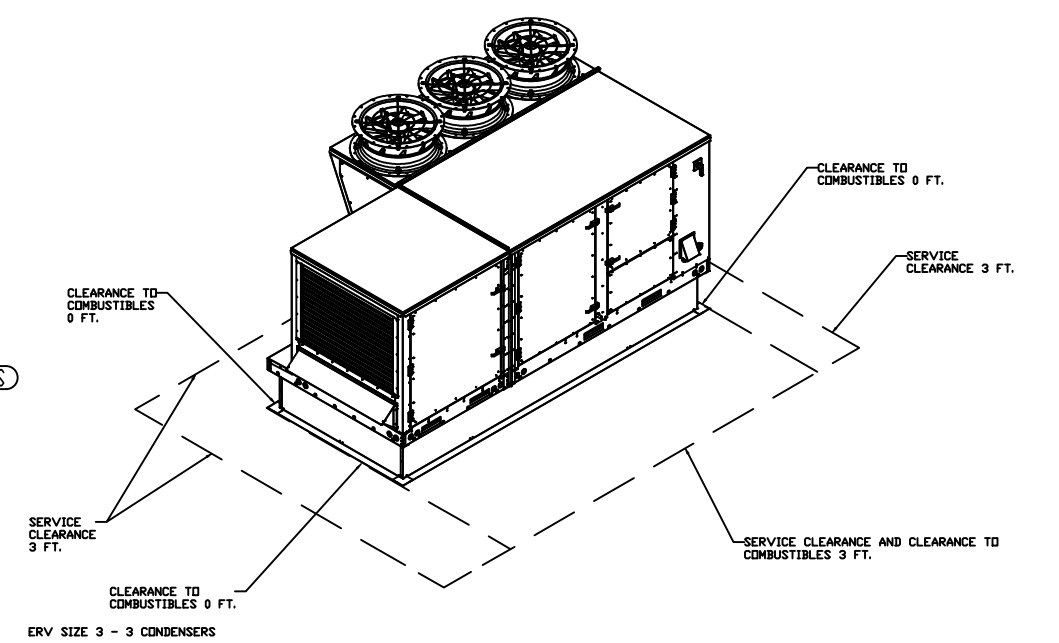
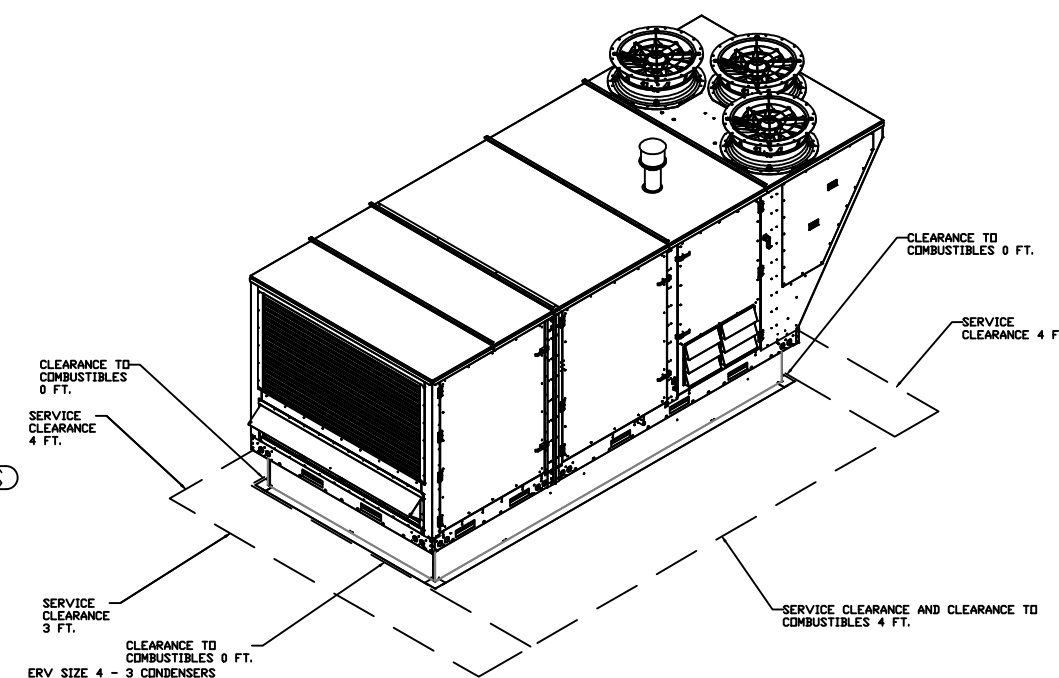
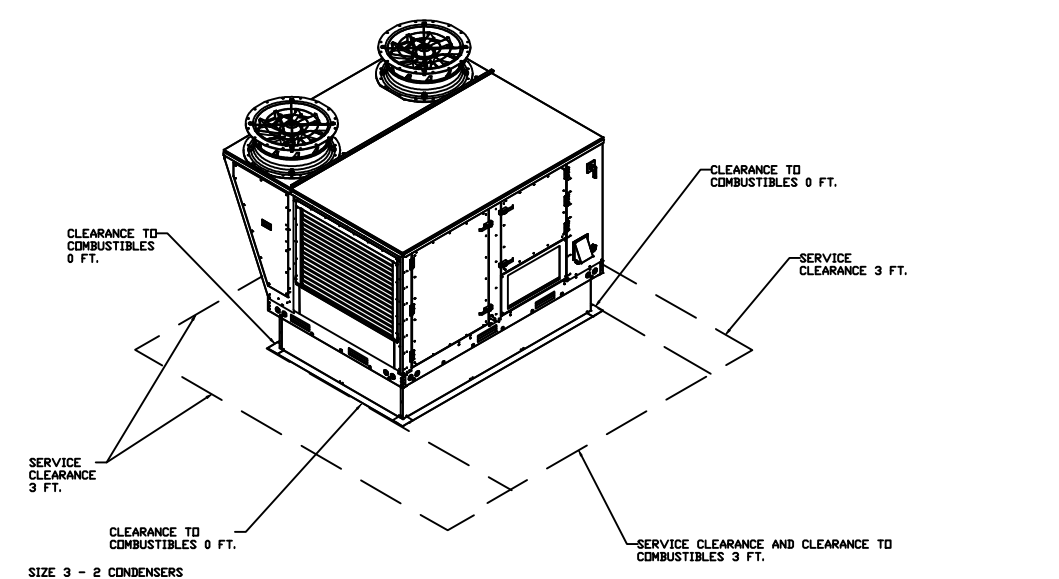
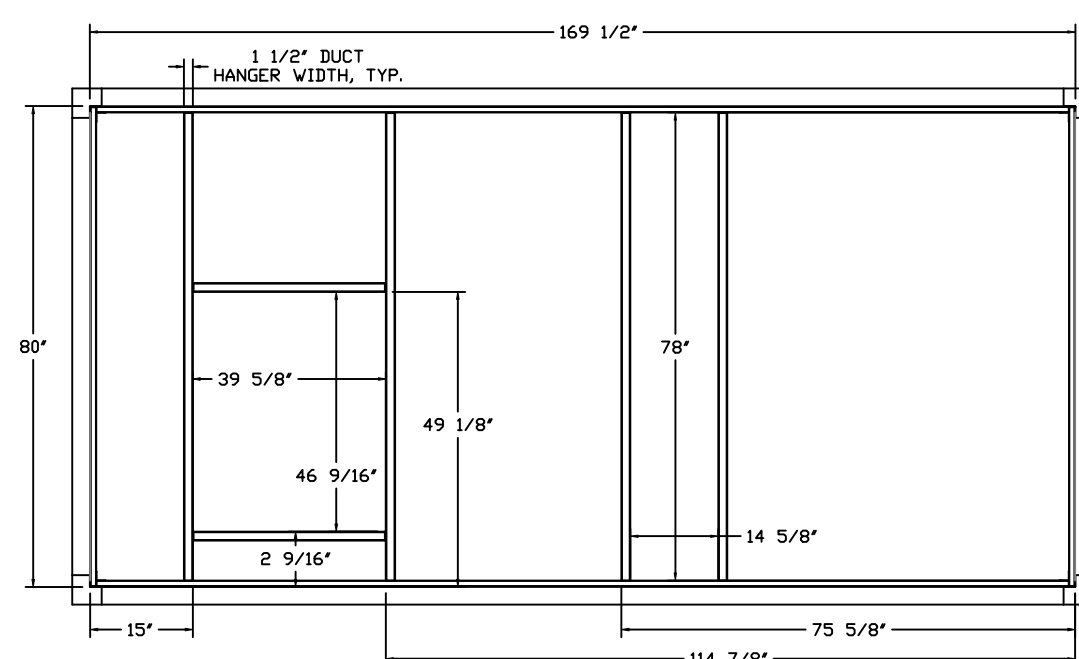
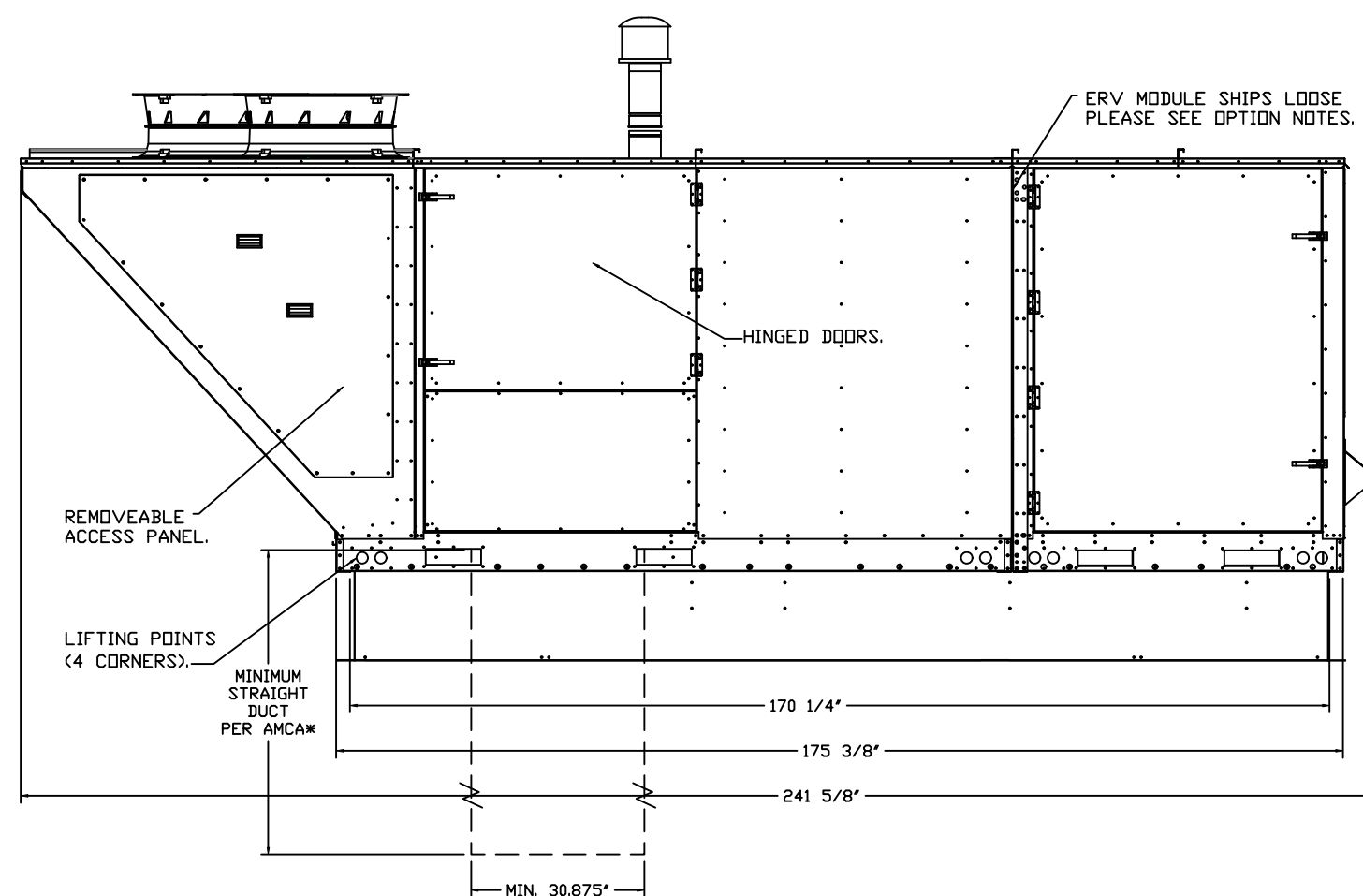
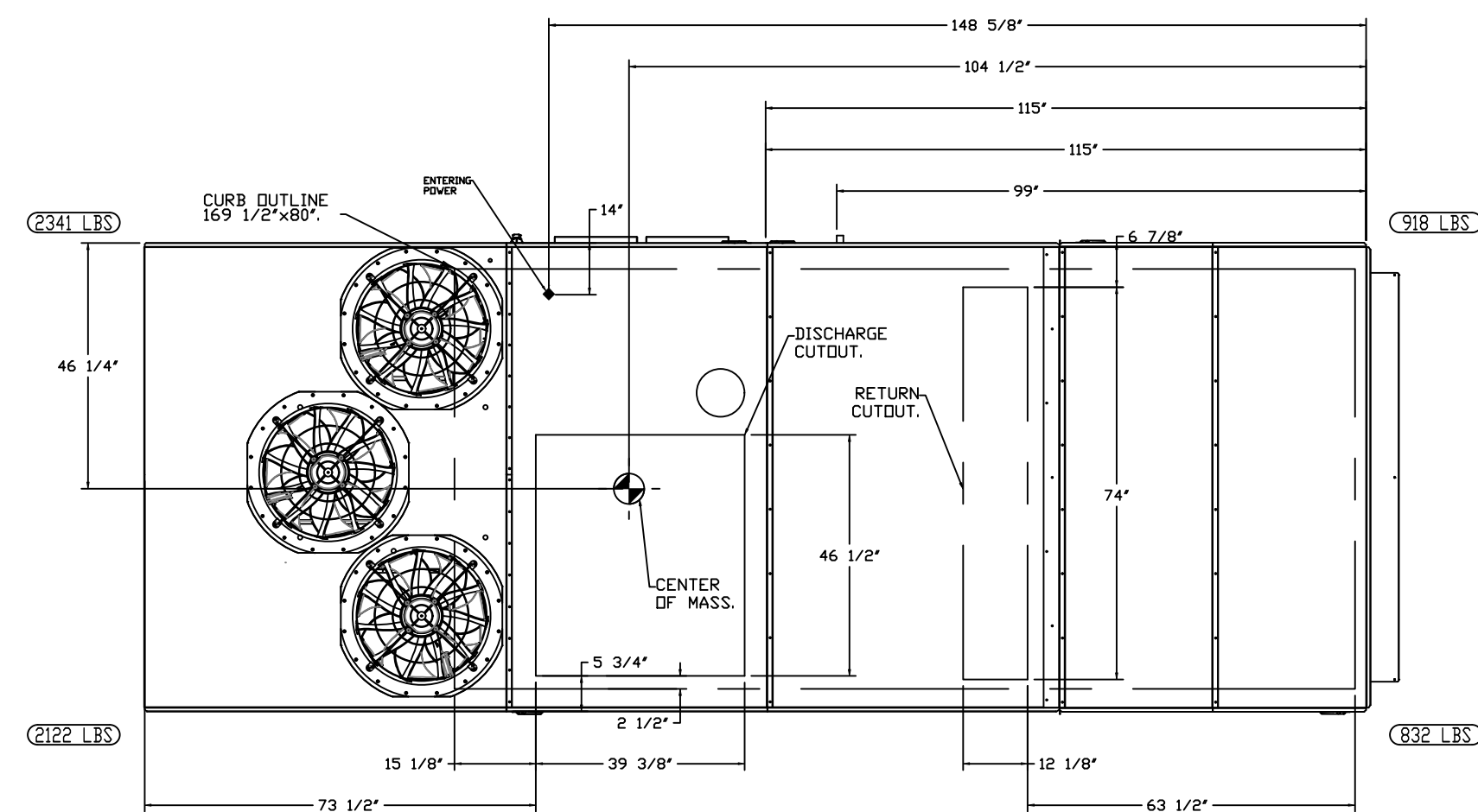
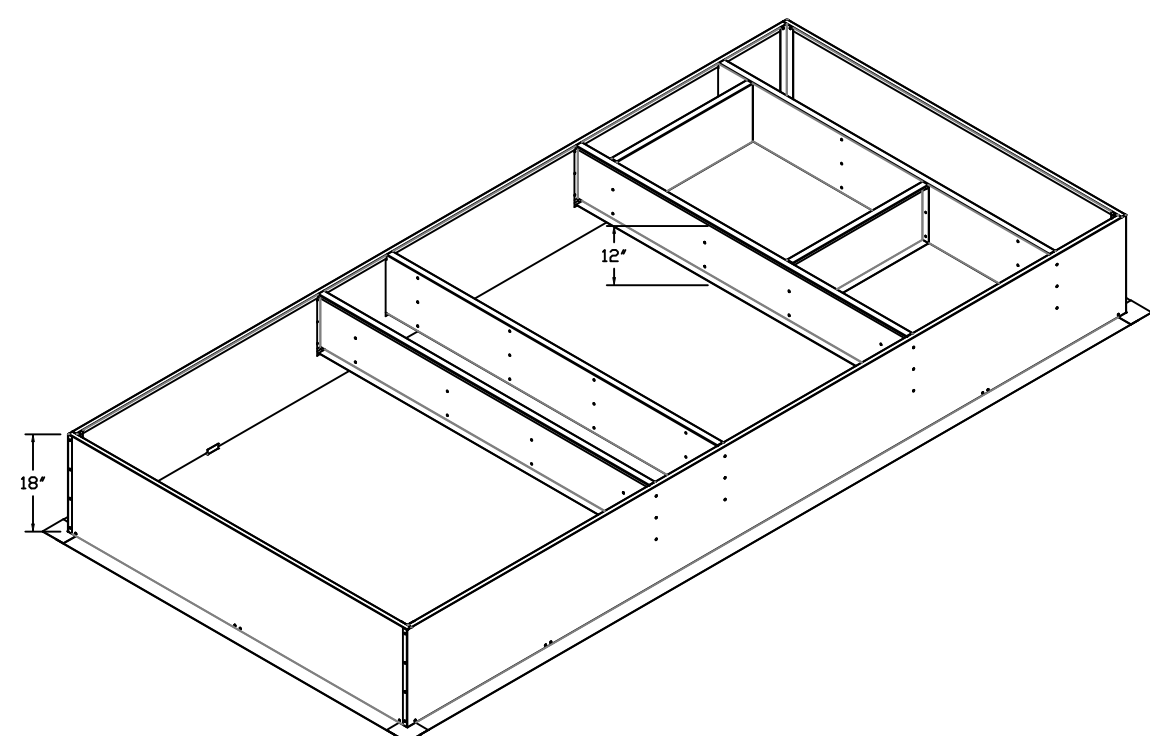
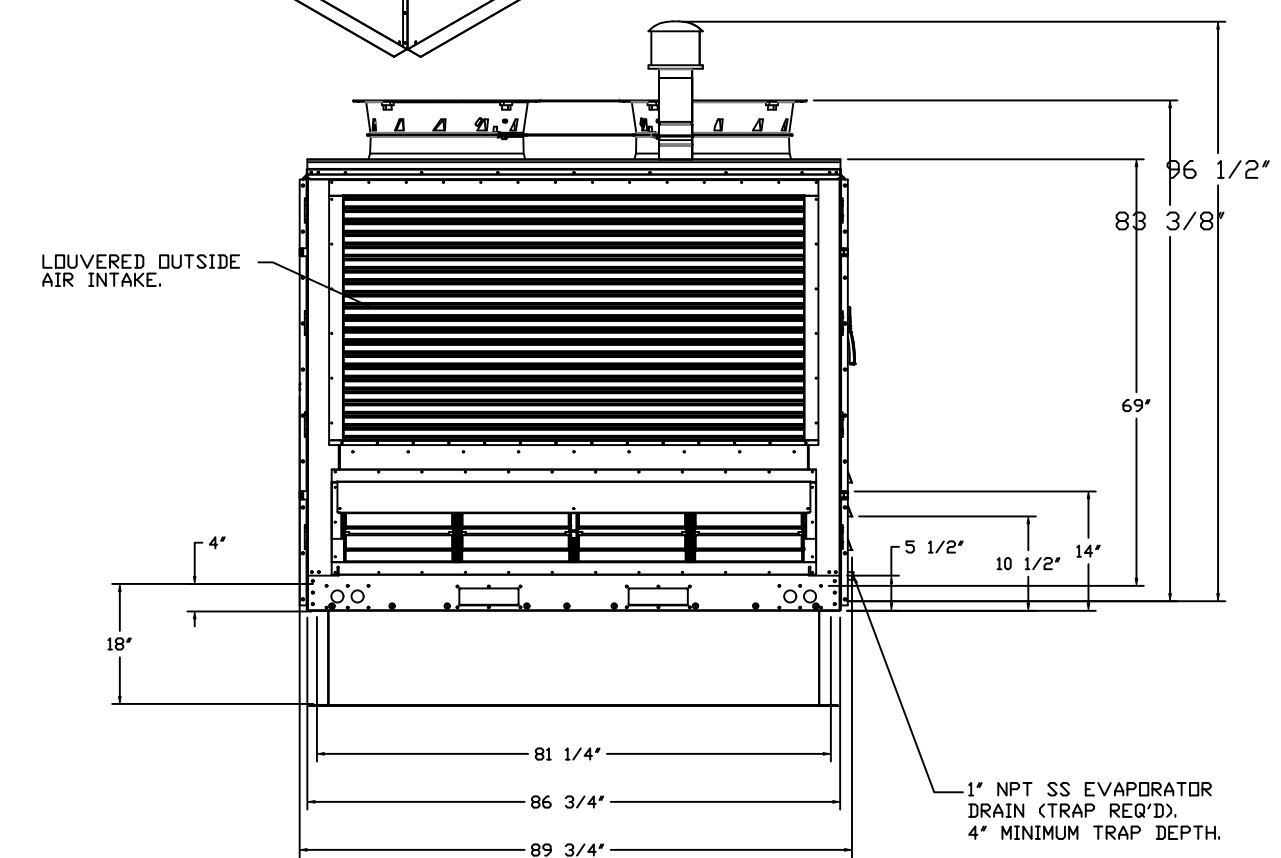
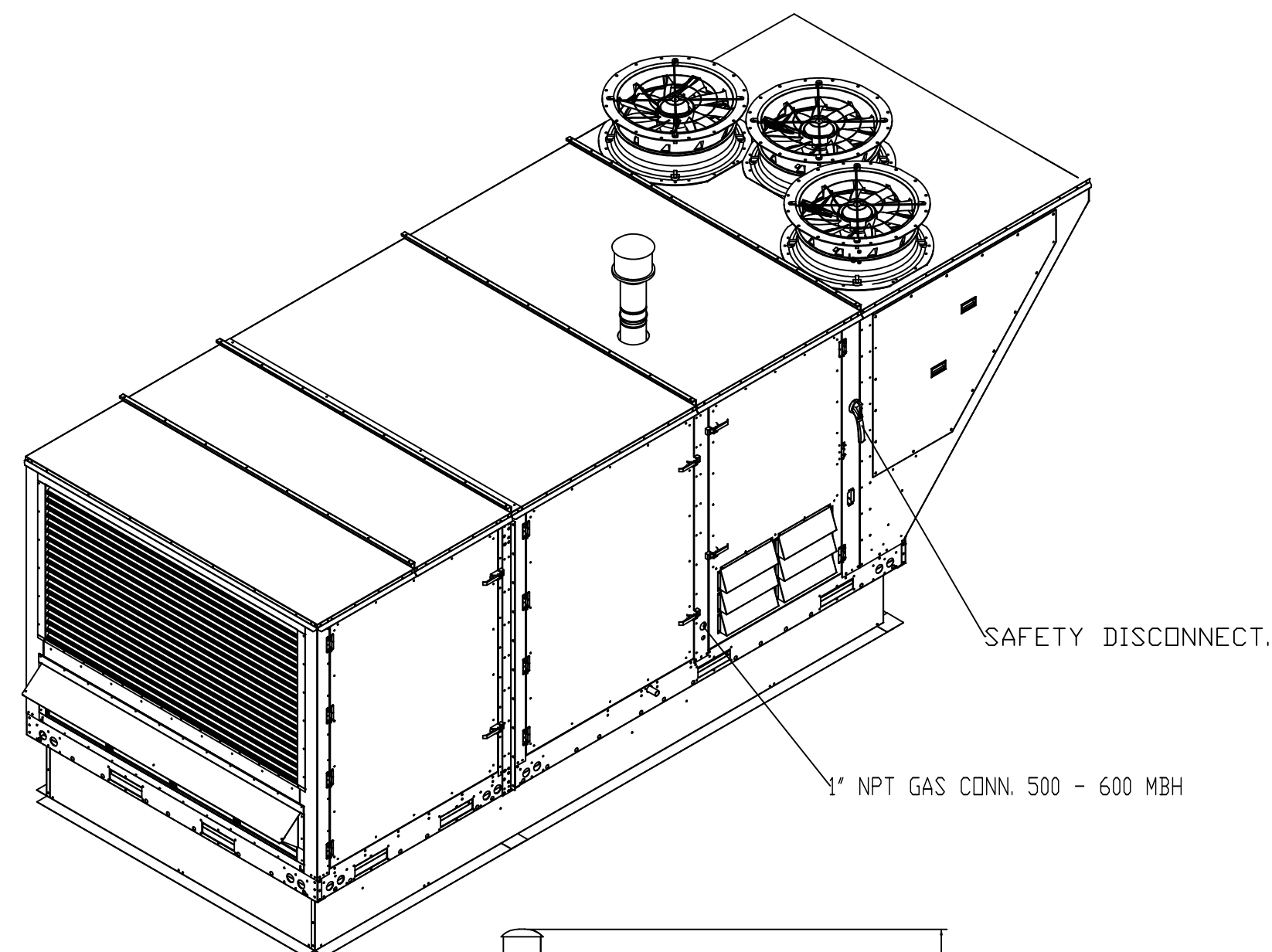
SHEET NO. 9

FAN #6 CAS-HVAC4-1.600-30MF-22T-ERV - HEATER (DDAS-4)

NOTES:

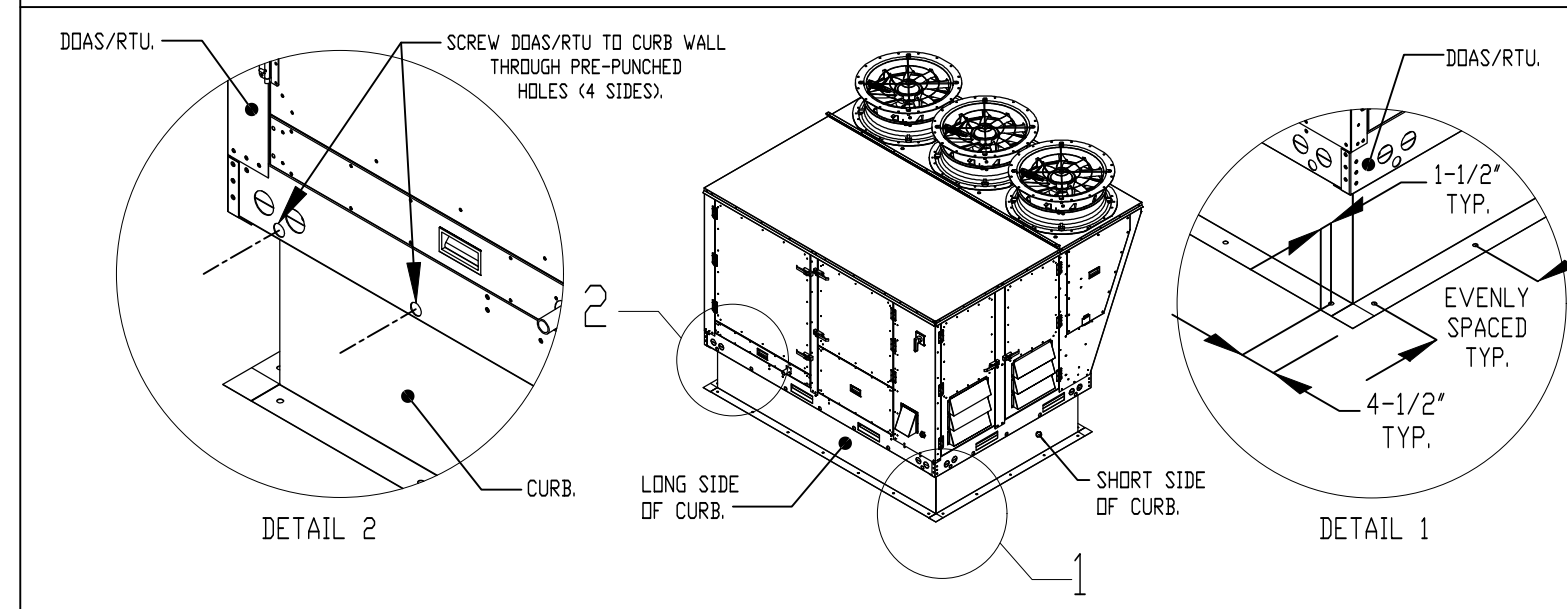
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TYPICAL DDAS/RTU ROOF MOUNTING INSTALLATION INSTRUCTIONS

- SECURE THE CURB TO THE ROOF FRAMING MEMBERS BY DRILLING 1/4" PILOT HOLES IN THE CURB FLANGES AT LOCATIONS SHOWN IN THE DIAGRAM BELOW, USING 3/8" X 2" ZINC PLATED STEEL LAG BOLTS, AND ZINC PLATED WASHERS. SCREW THROUGH THE CURB FLANGES AND INTO THE ROOF FRAMING MEMBERS. A MINIMUM OF (3) LAG BOLTS ON EACH SHORT SIDE, AND (7) LAG BOLTS ON EACH LONG SIDE IS REQUIRED.
- SECURE THE UNIT BASE TO THE SIDE WALLS OF THE CURB USING (24) 1/4"-14 X 2" SELF-DRILLING, STEEL ZINC PLATED SCREWS. PRE-PUNCHED HOLES HAVE BEEN PROVIDED FOR EACH SCREW LOCATION.



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CINCINNATI, OH, 45242

DATE: 11/13/2024

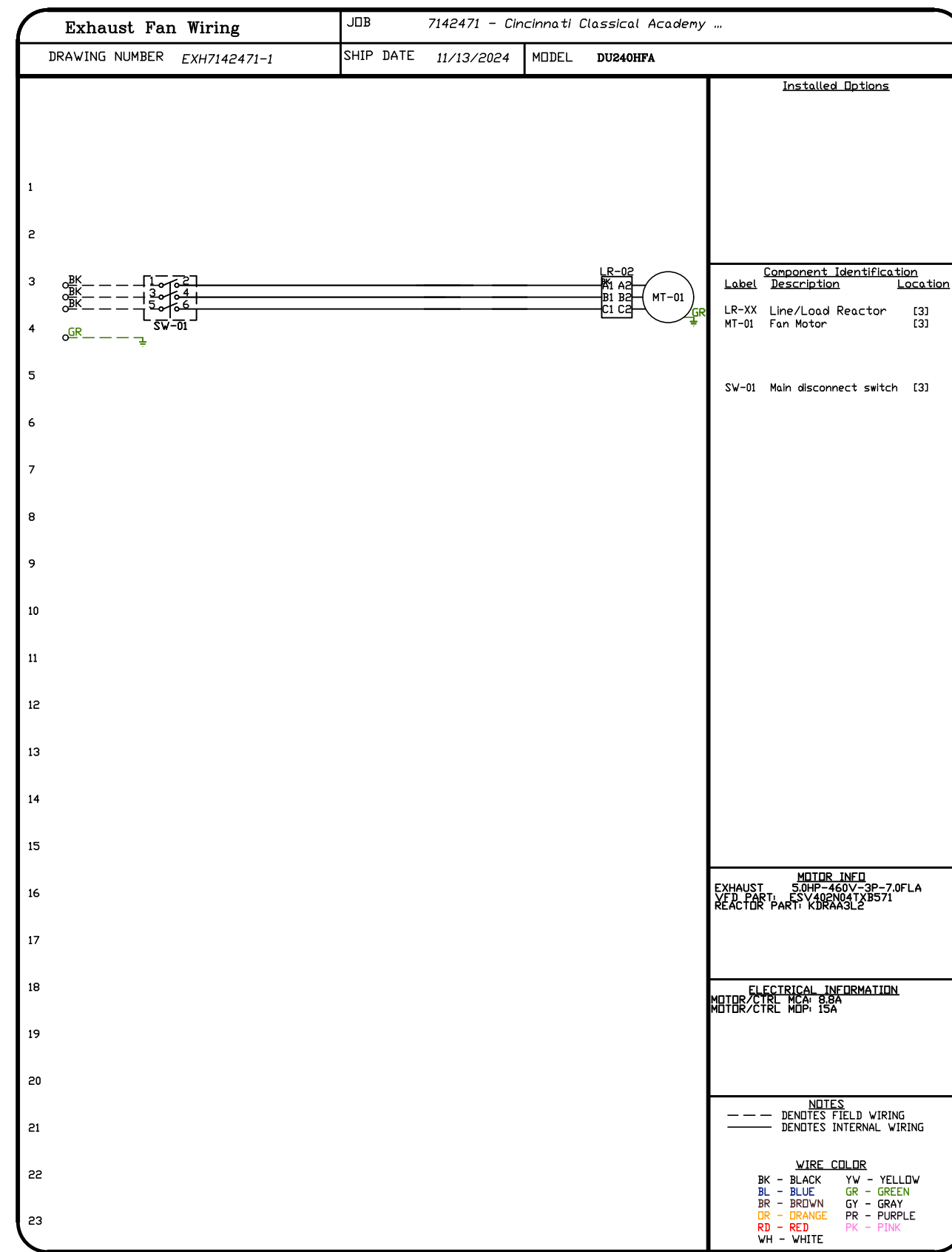
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DRAWN BY: grant.homan

SCALE: 3/8" = 1'-0"

MASTER DRAWING

SHEET NO. 10



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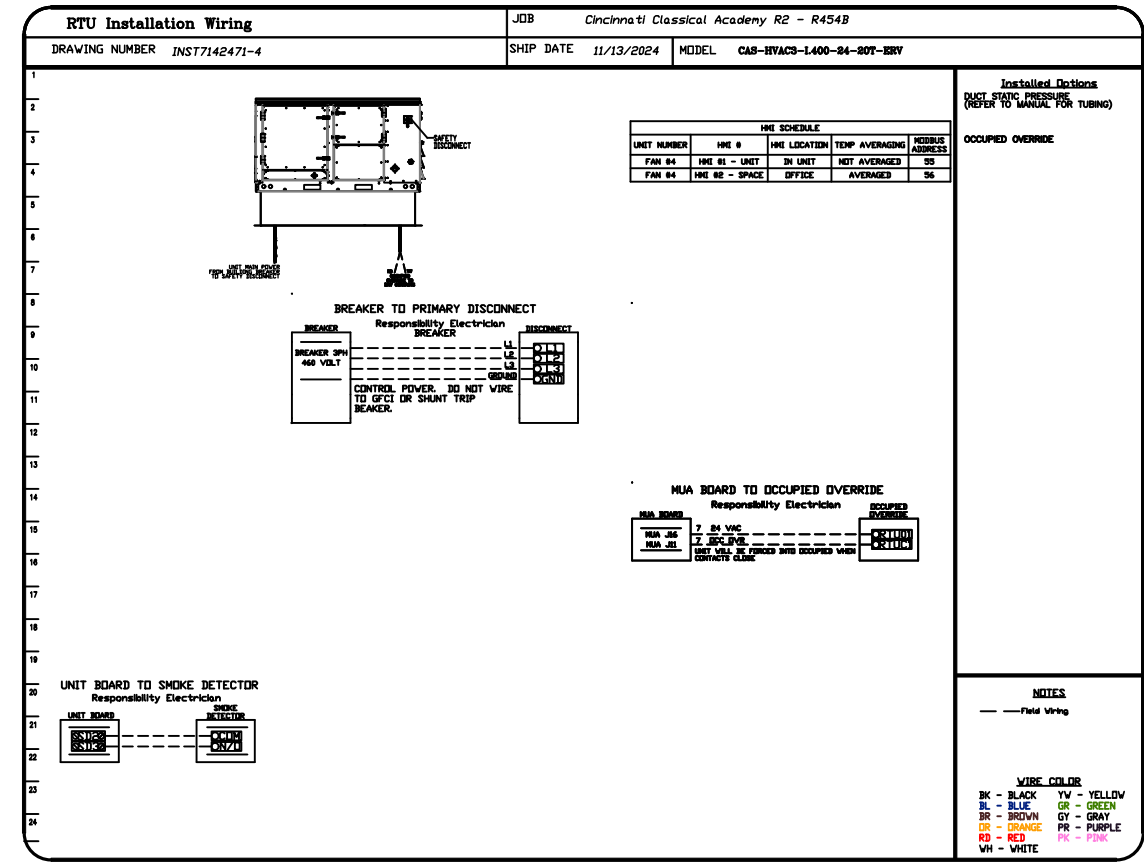
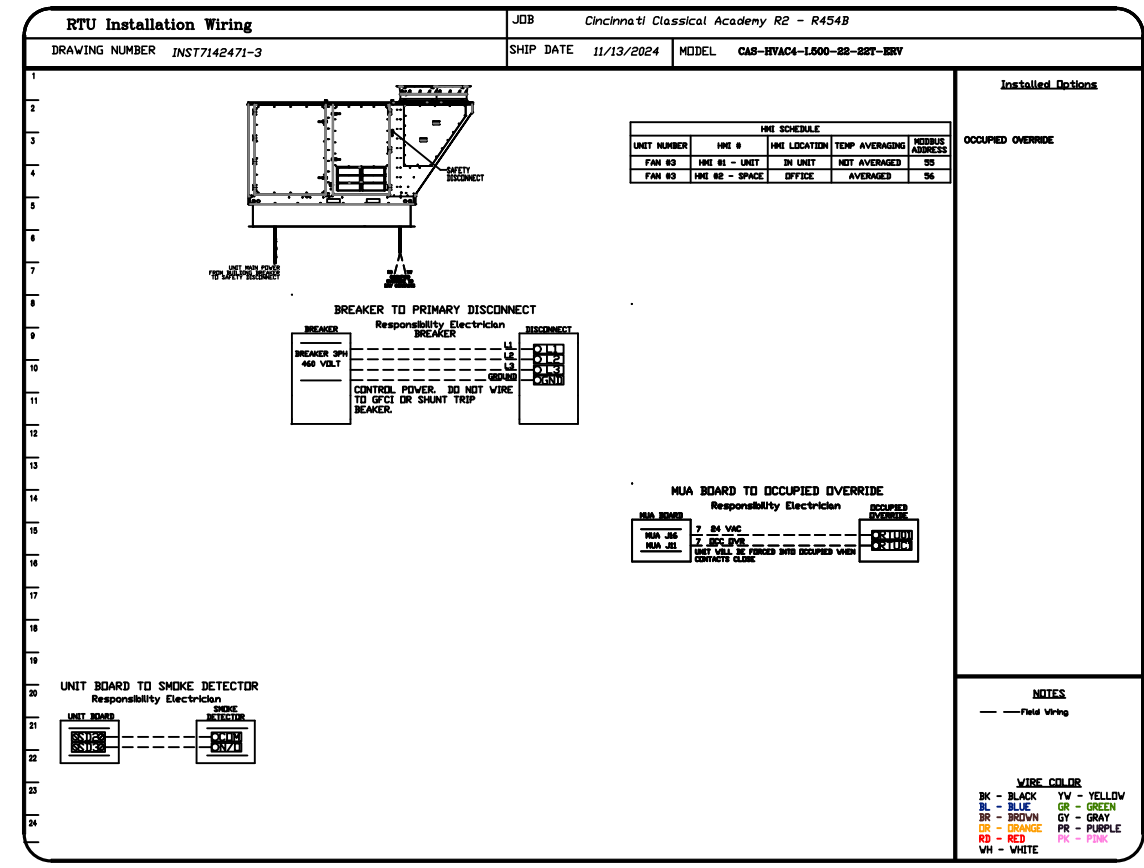
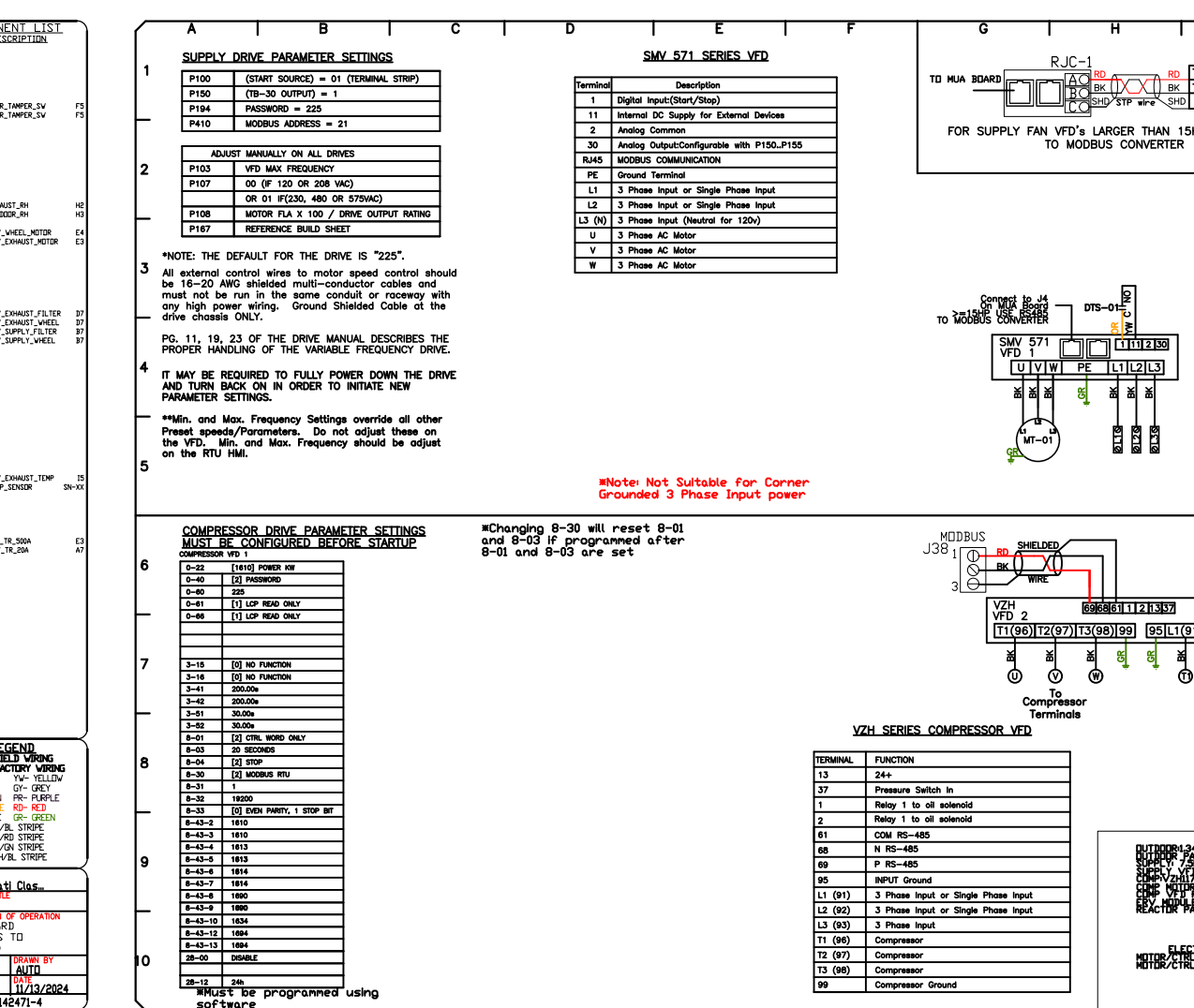
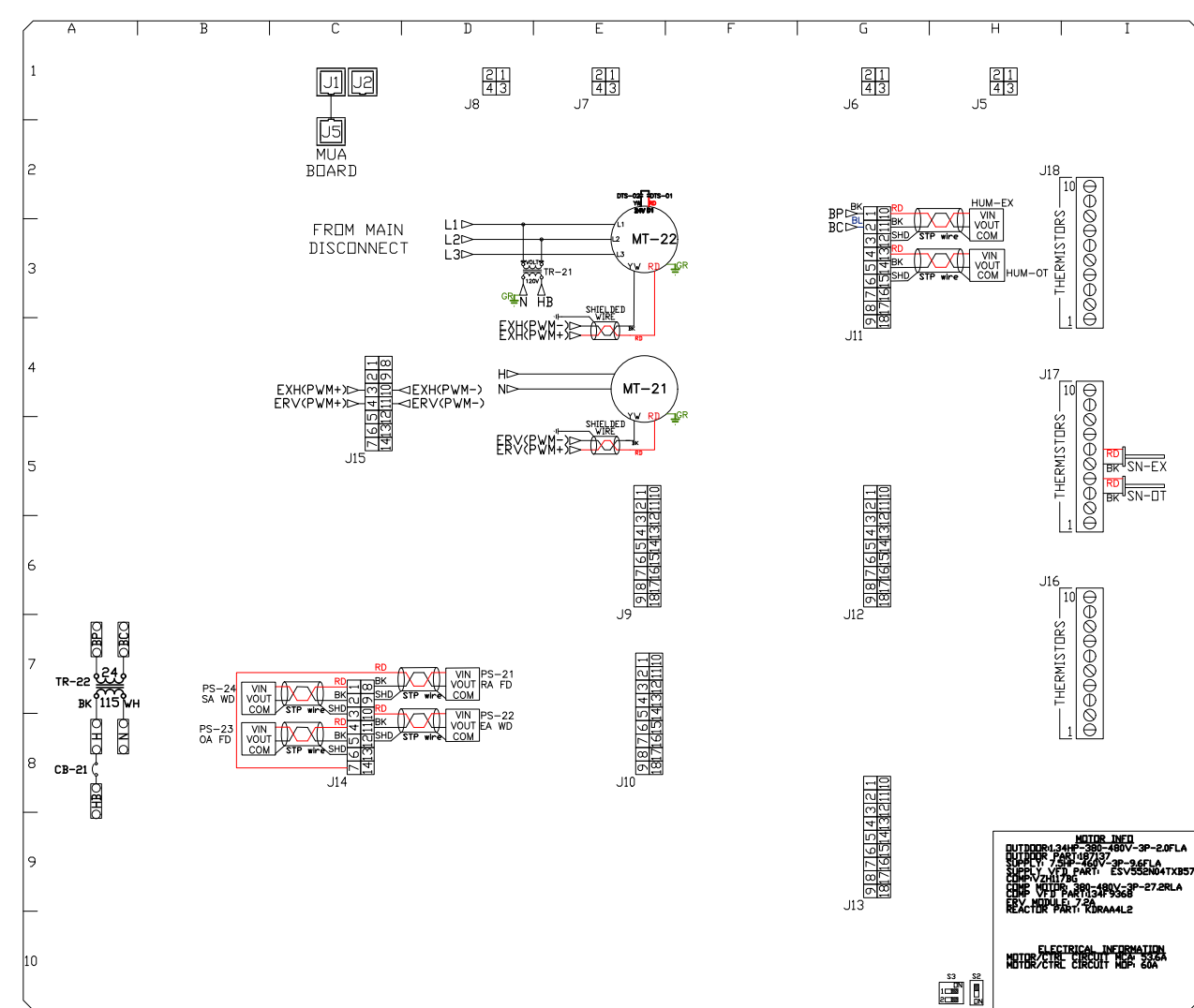
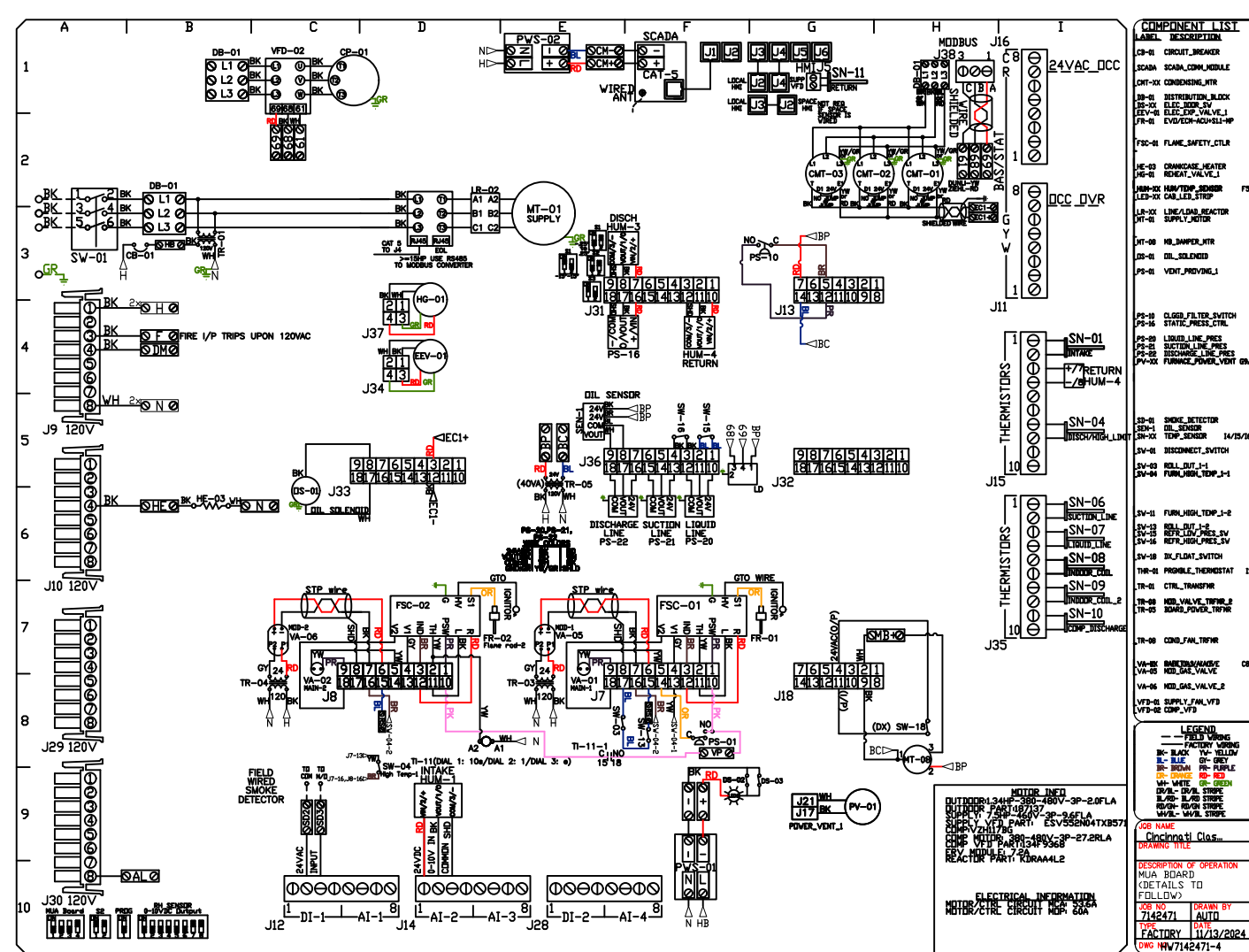
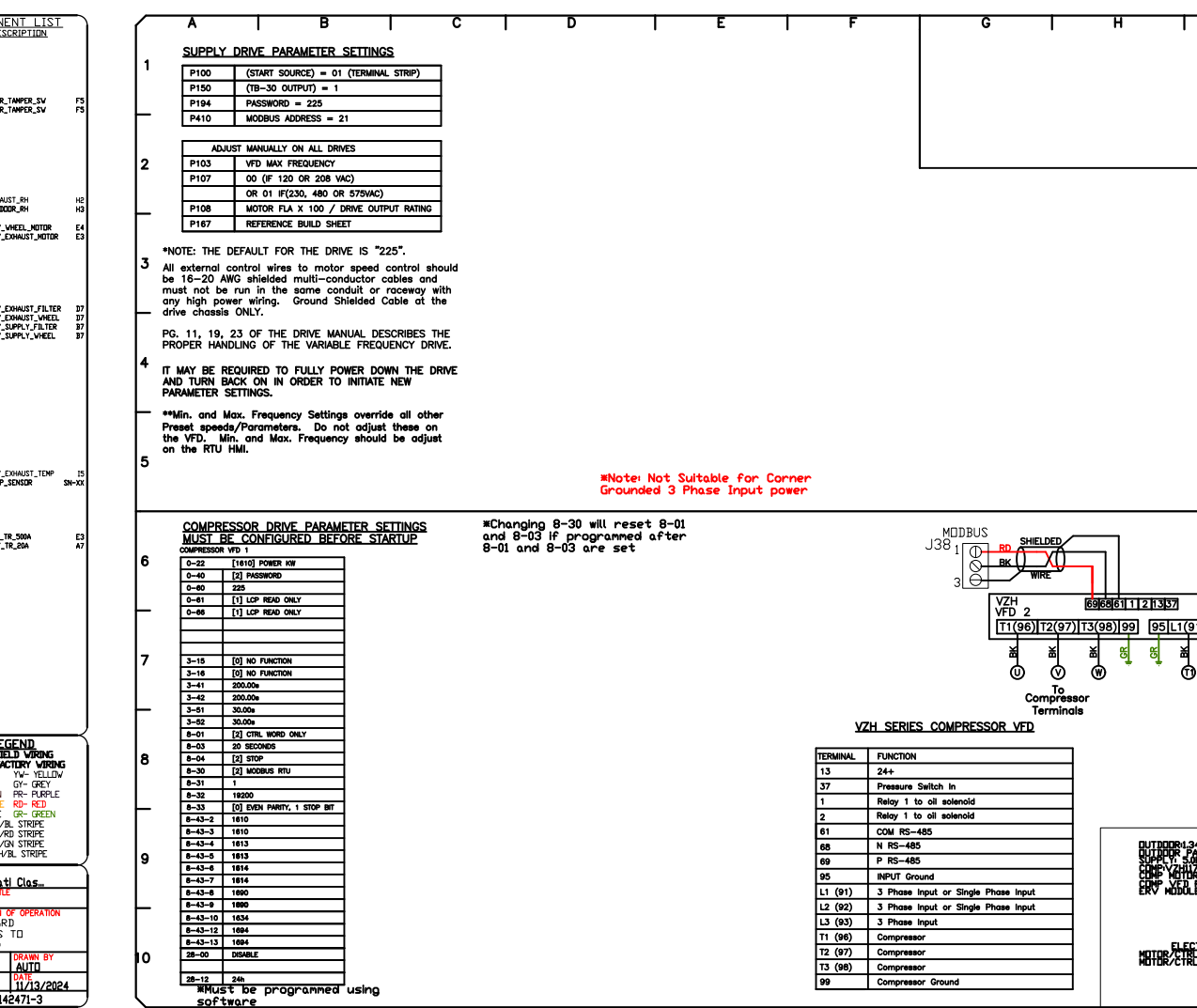
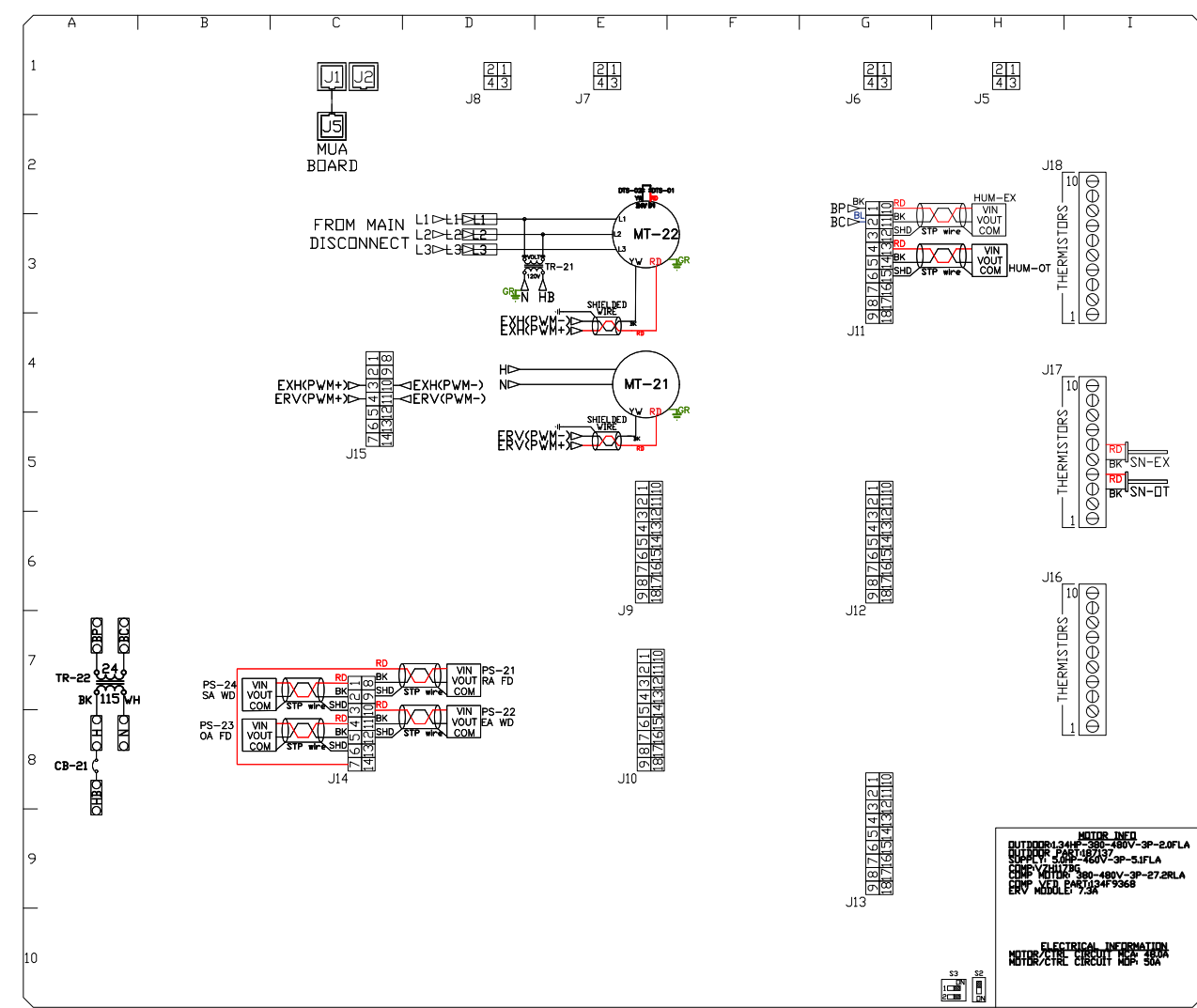
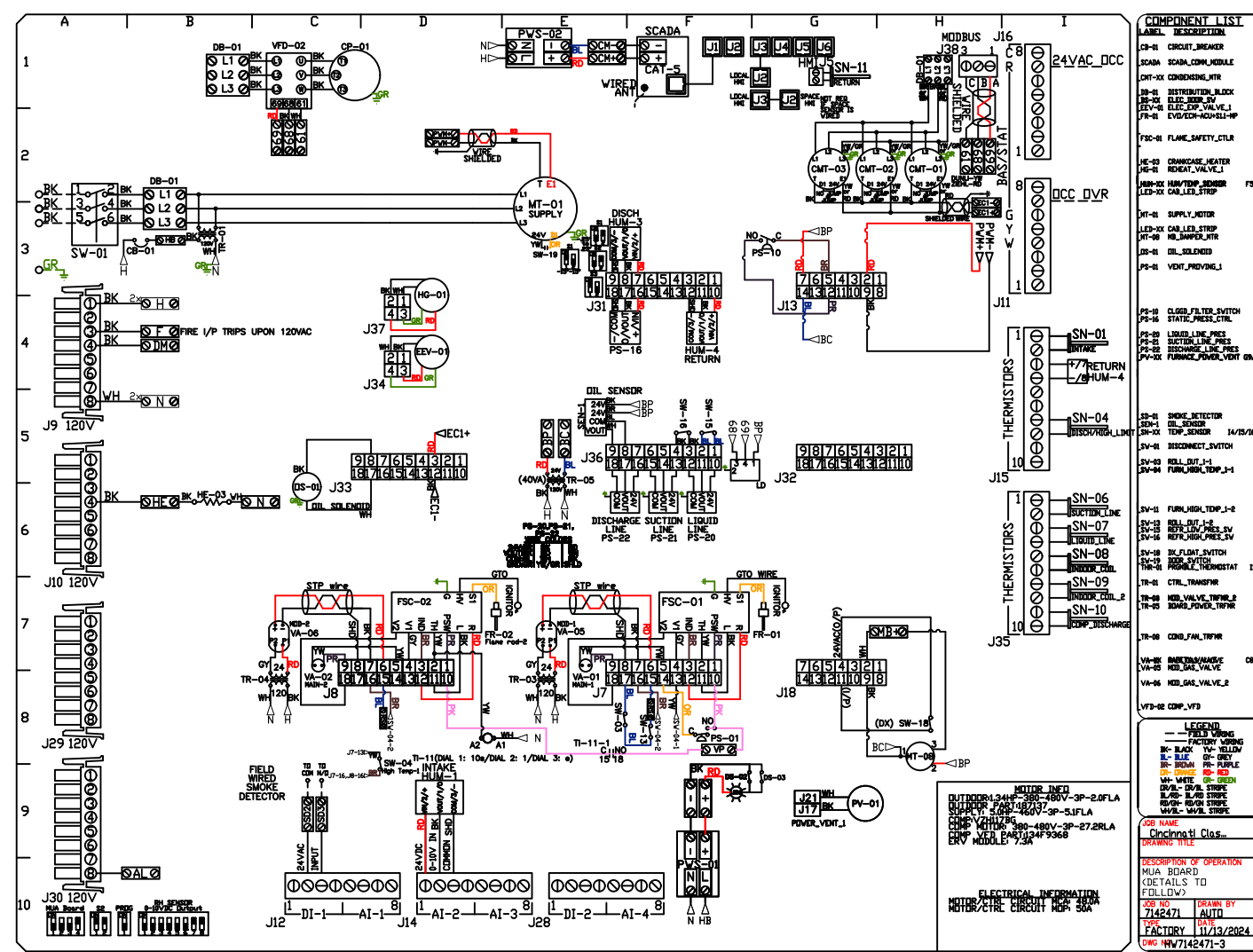
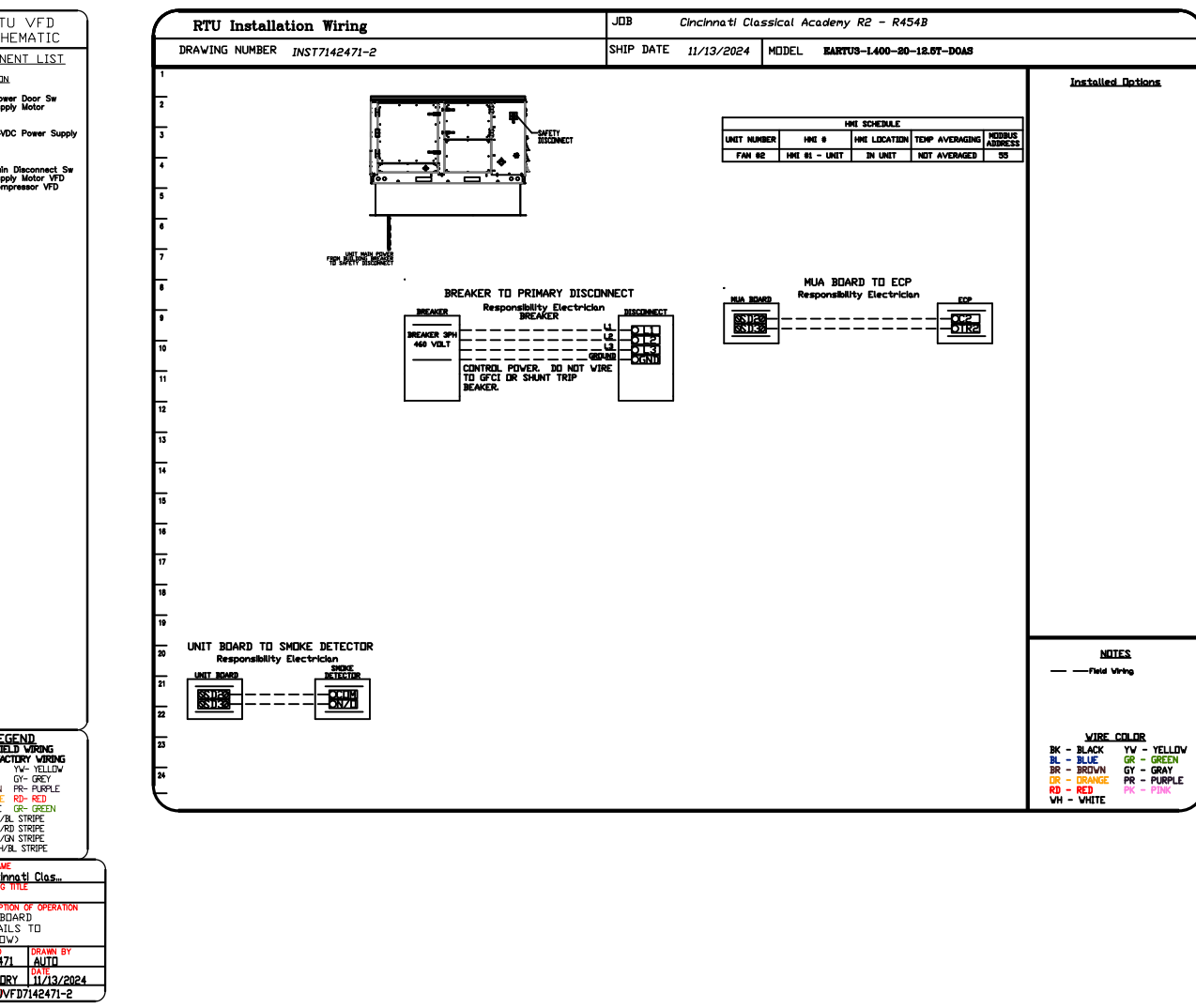
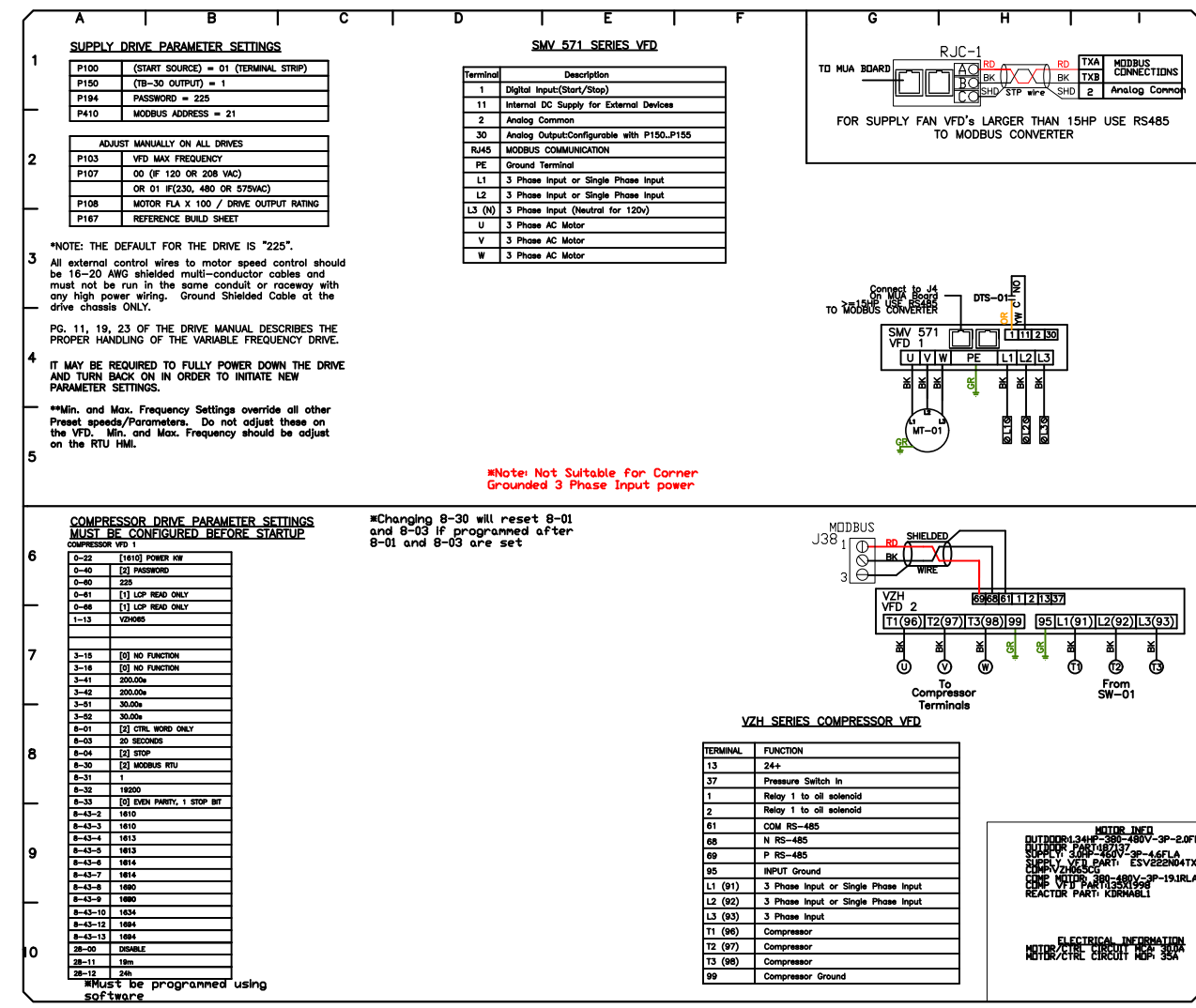
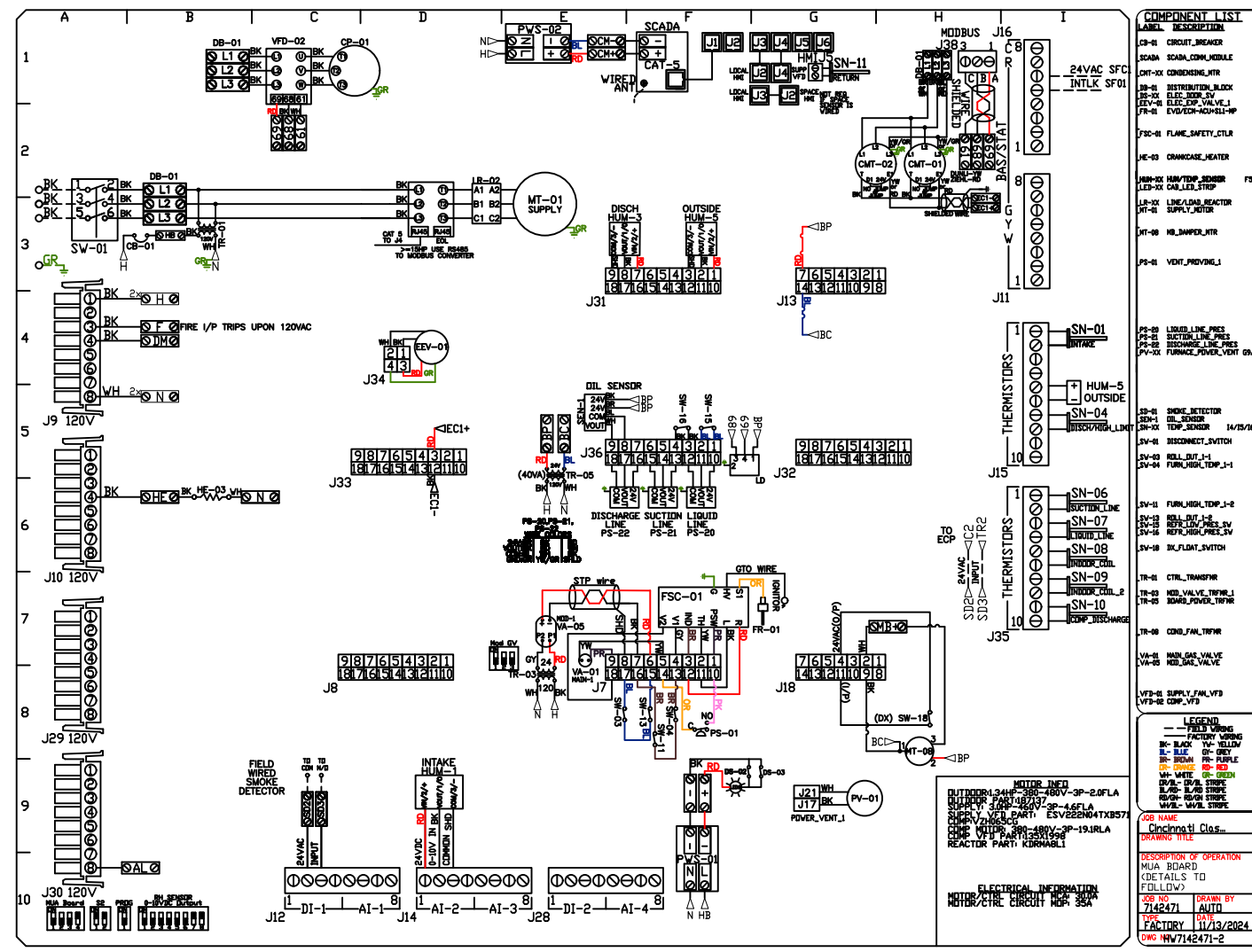
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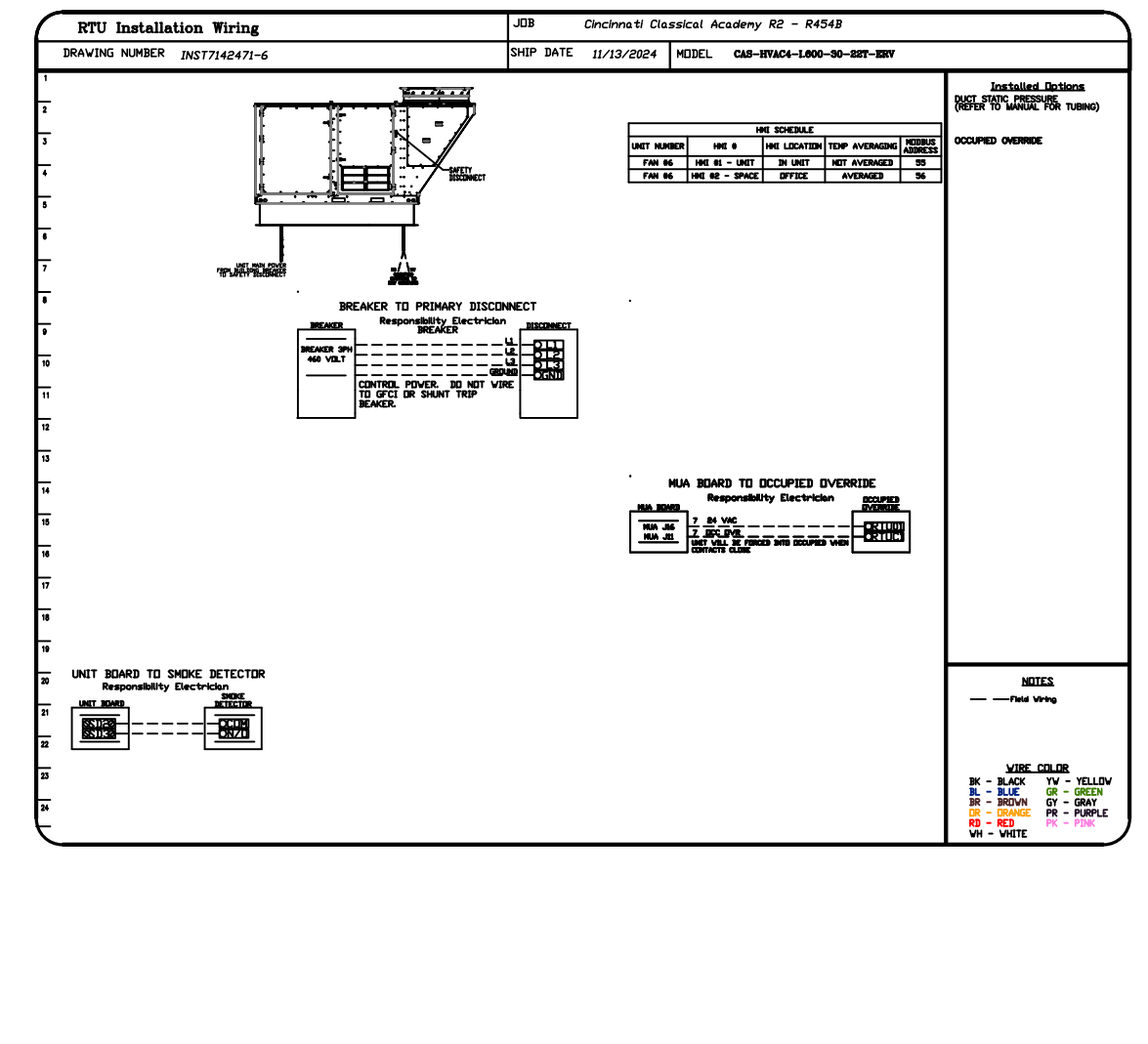
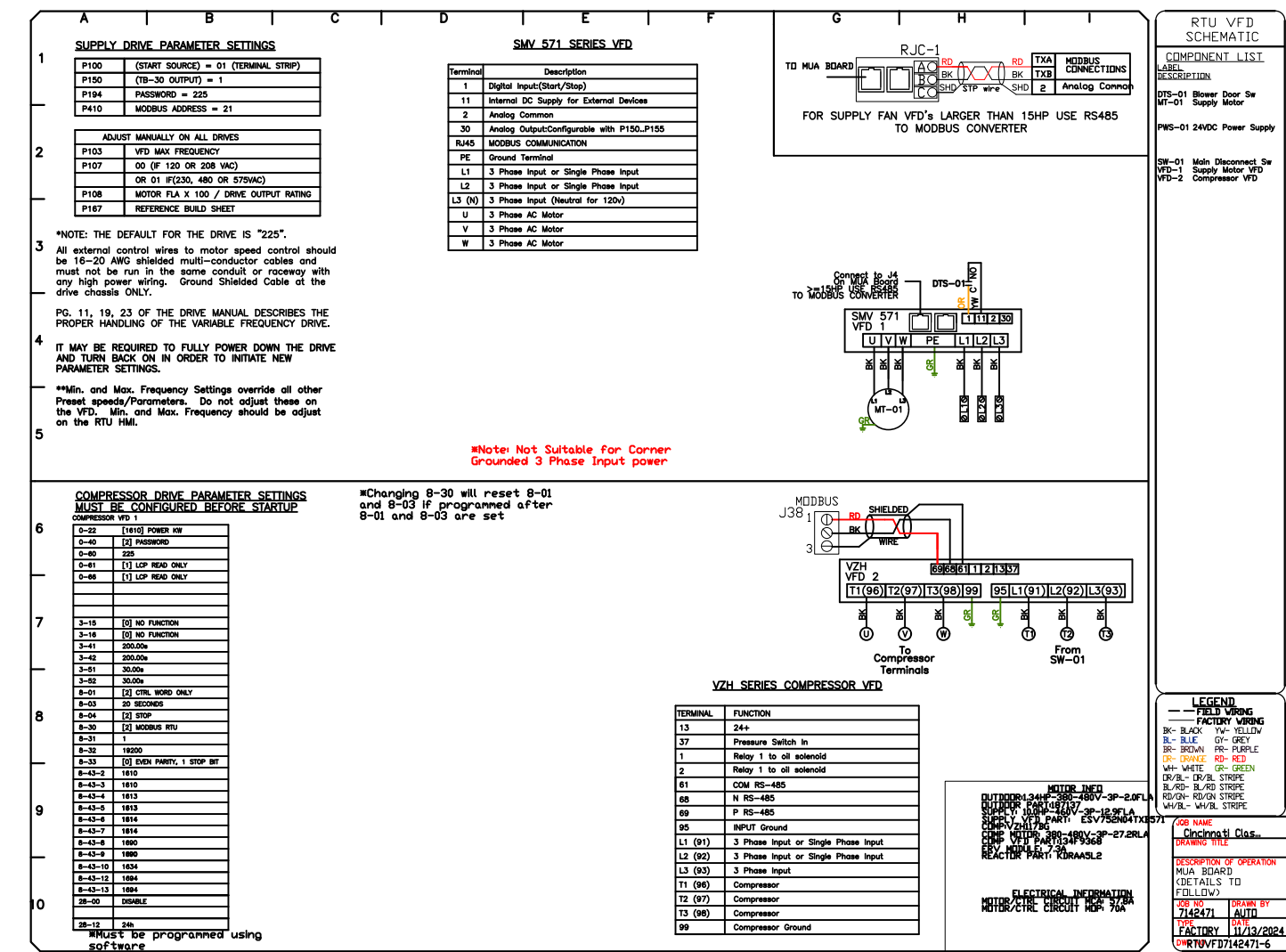
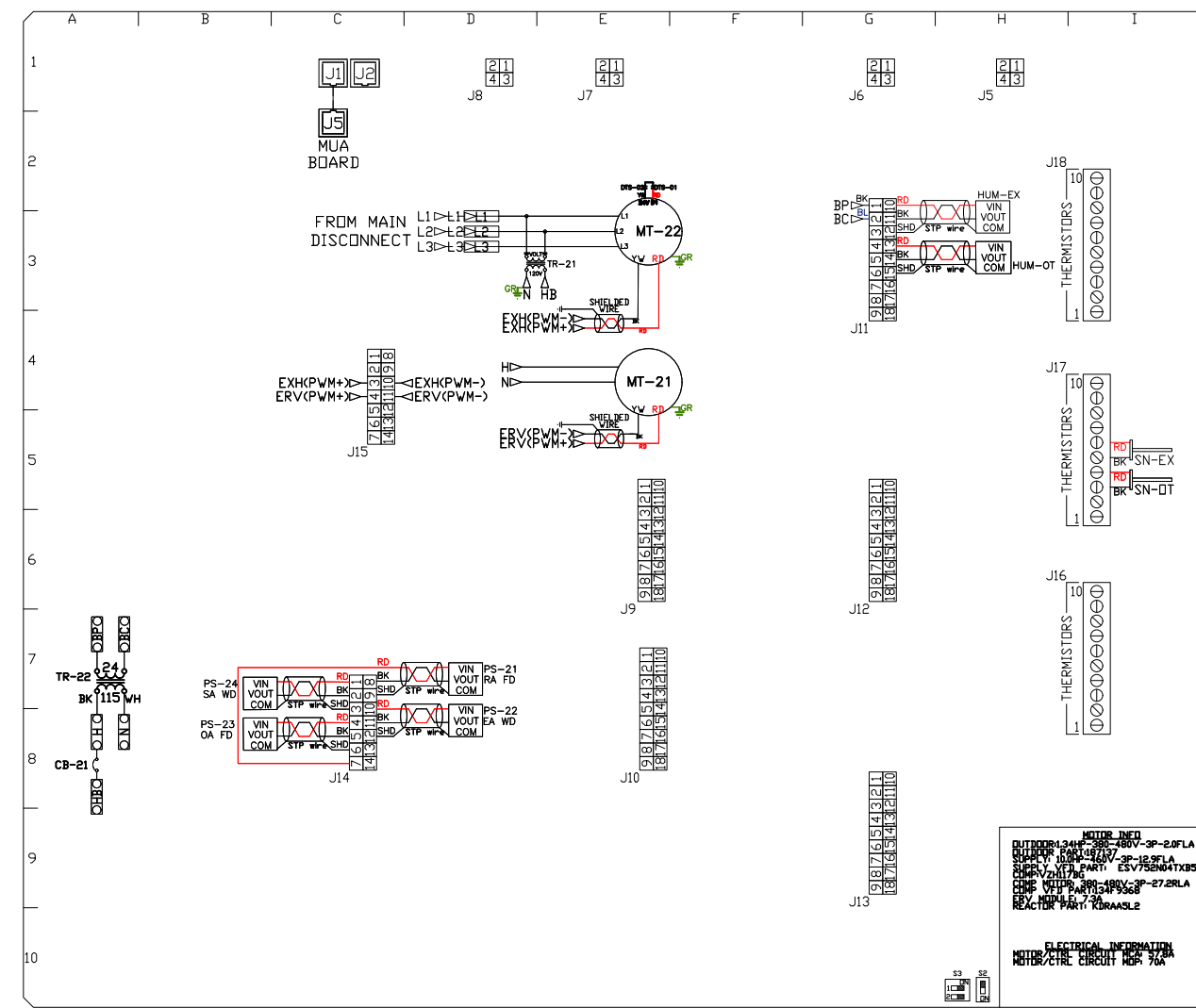
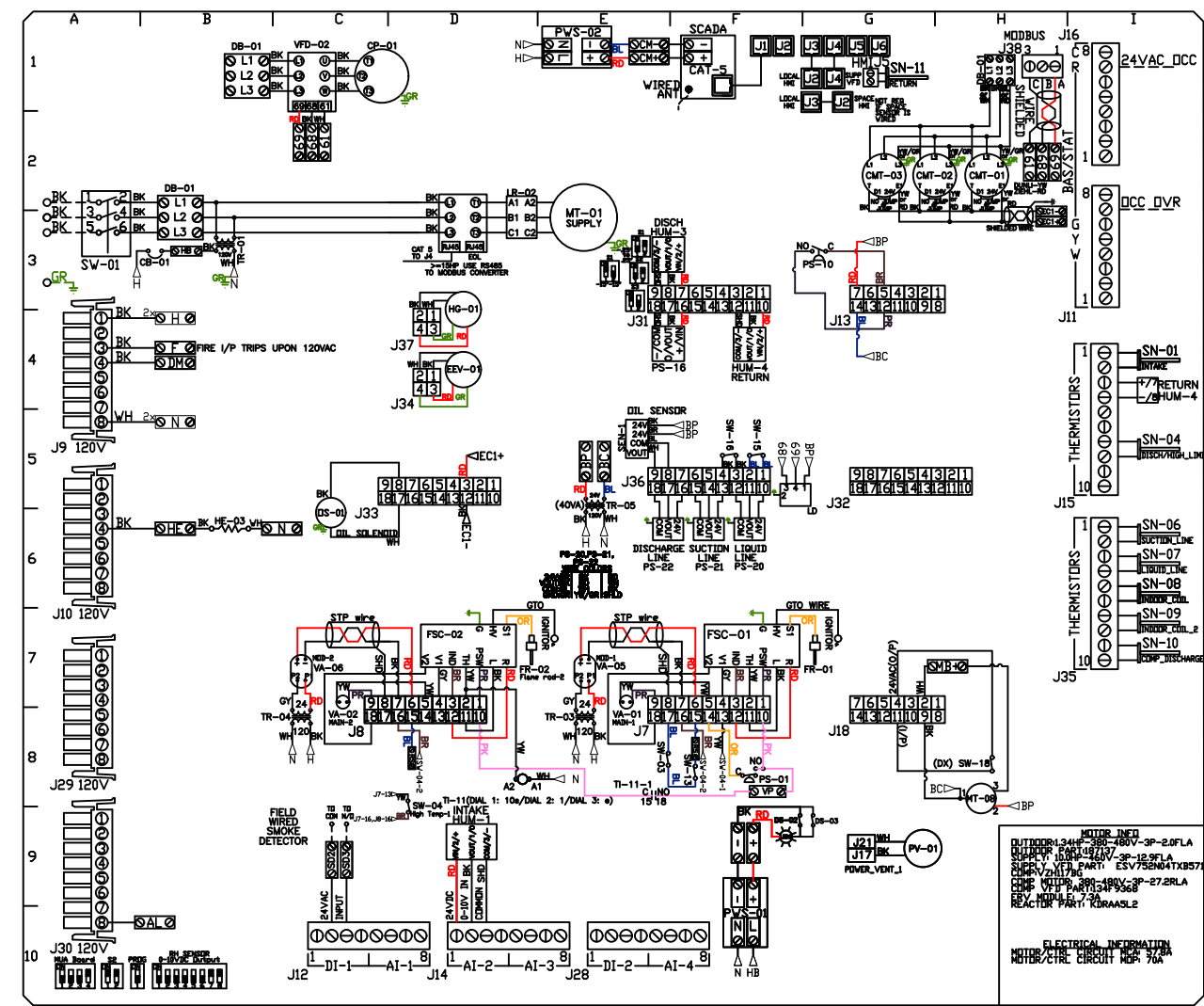
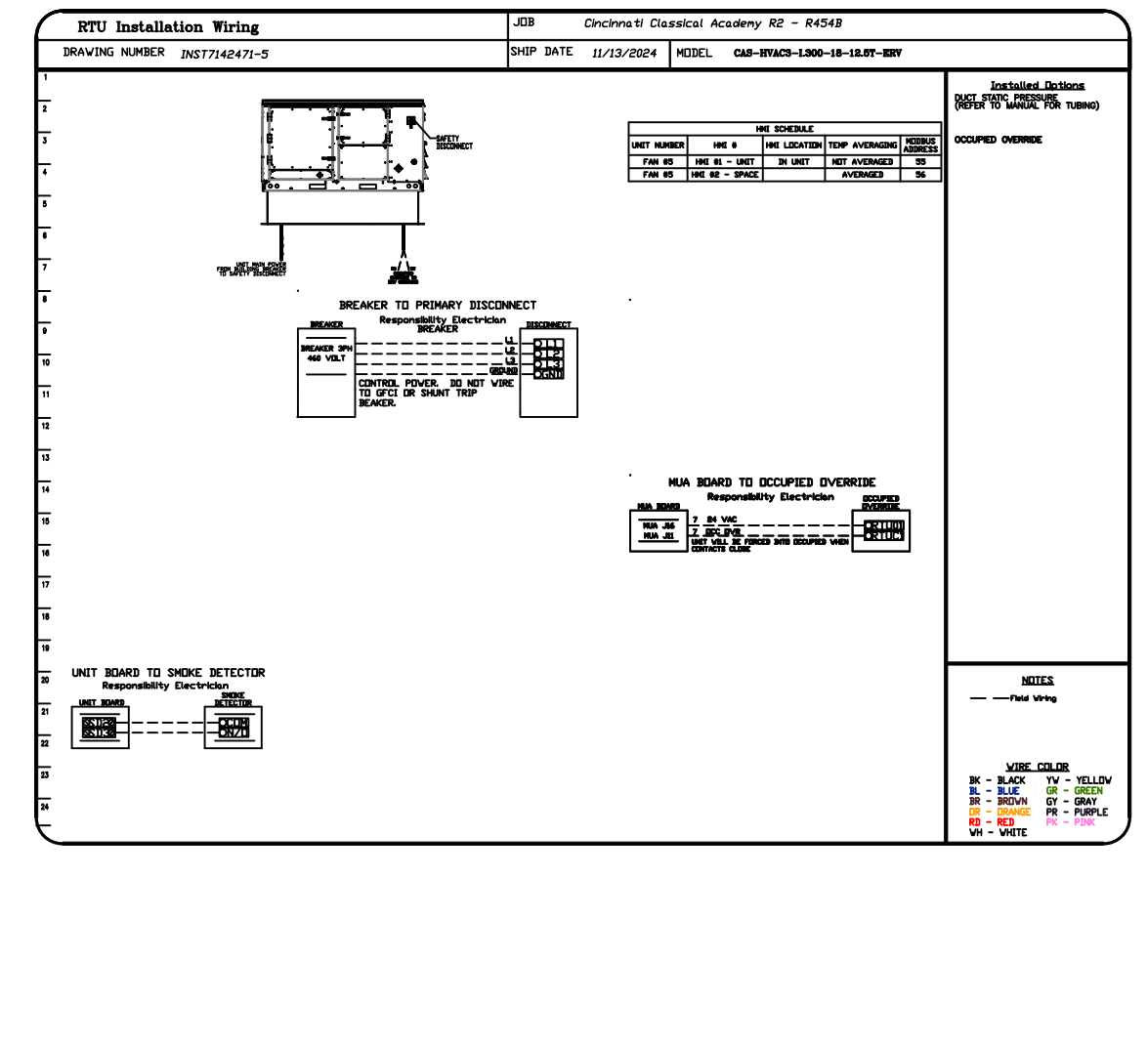
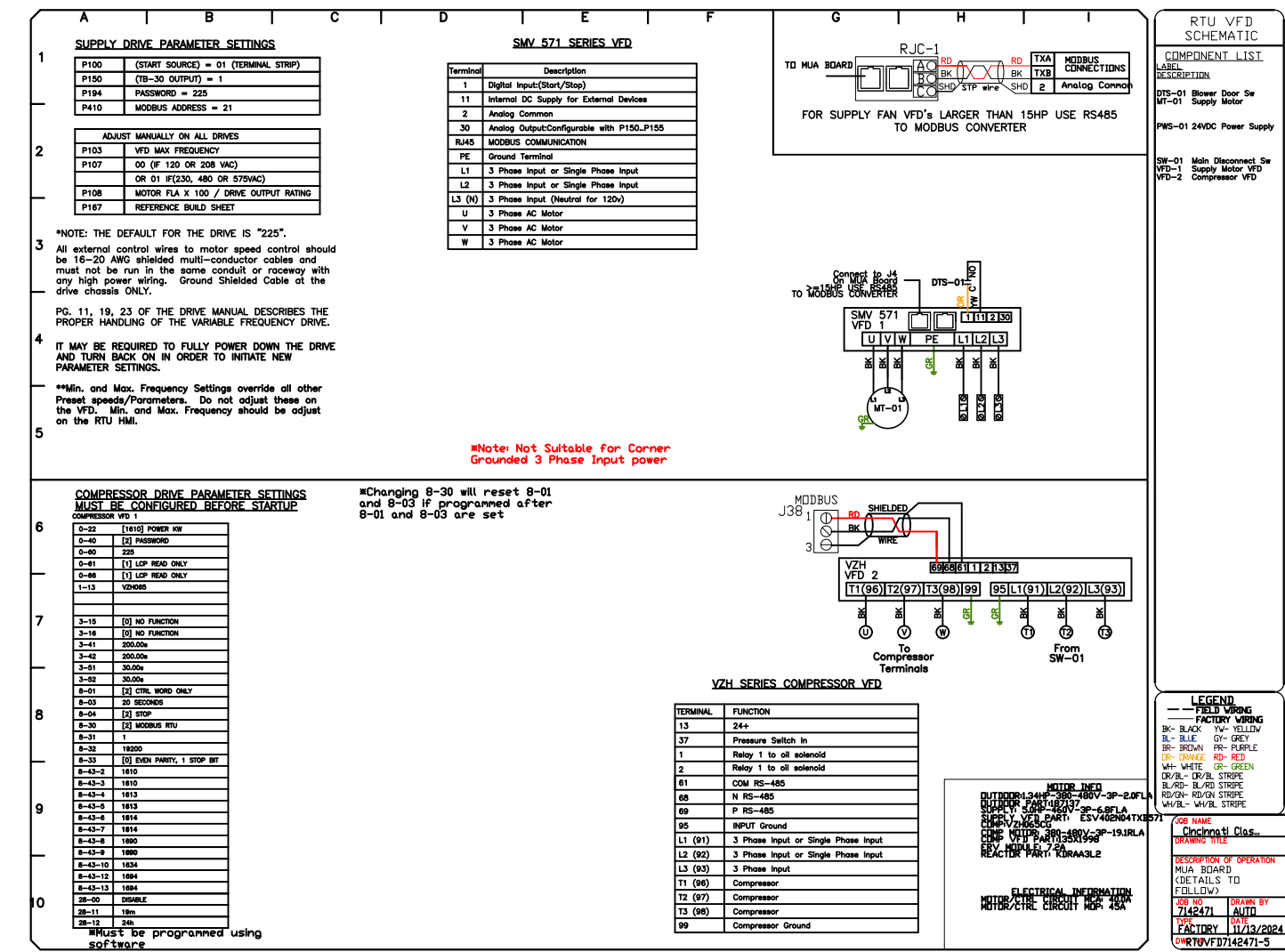
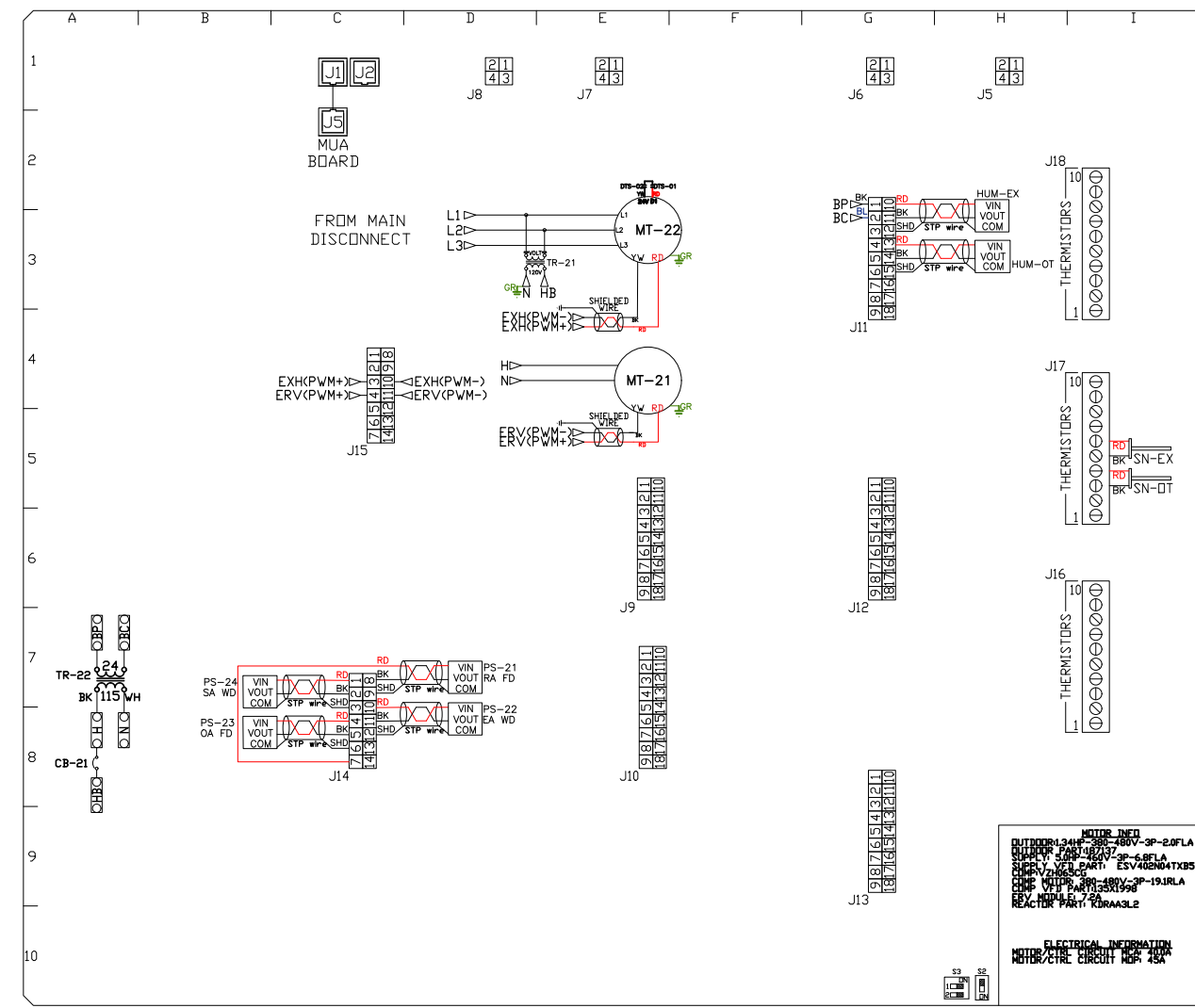
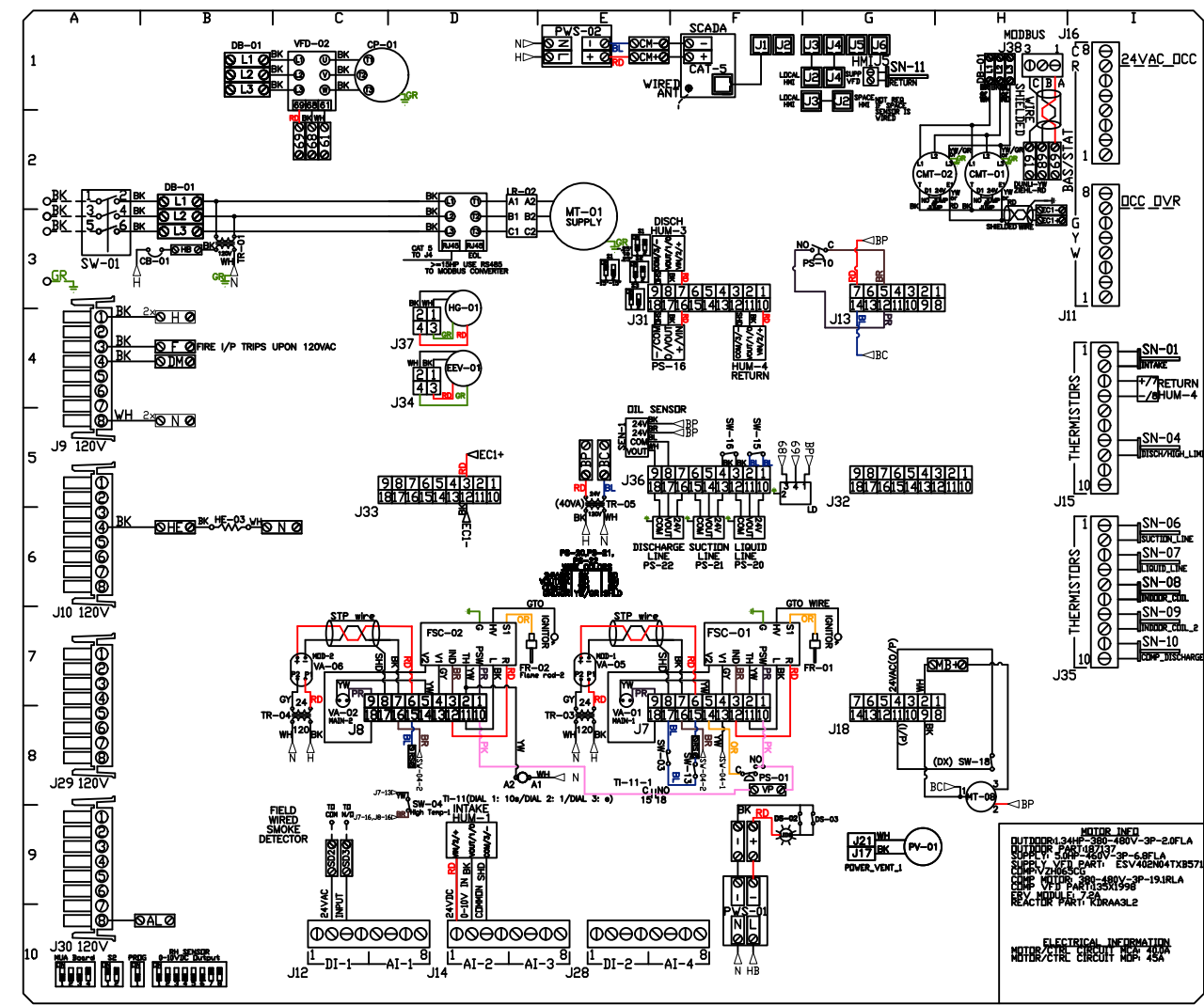
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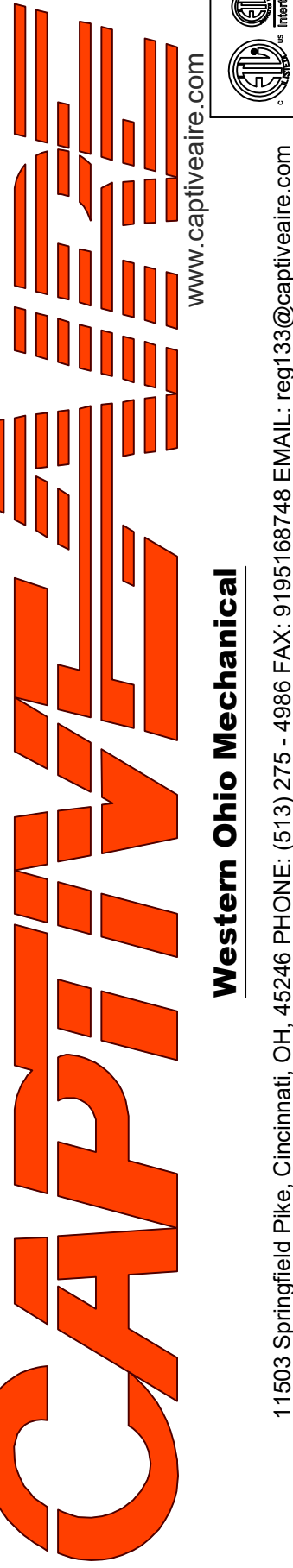
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SCALE: 1/2" = 1'-0"
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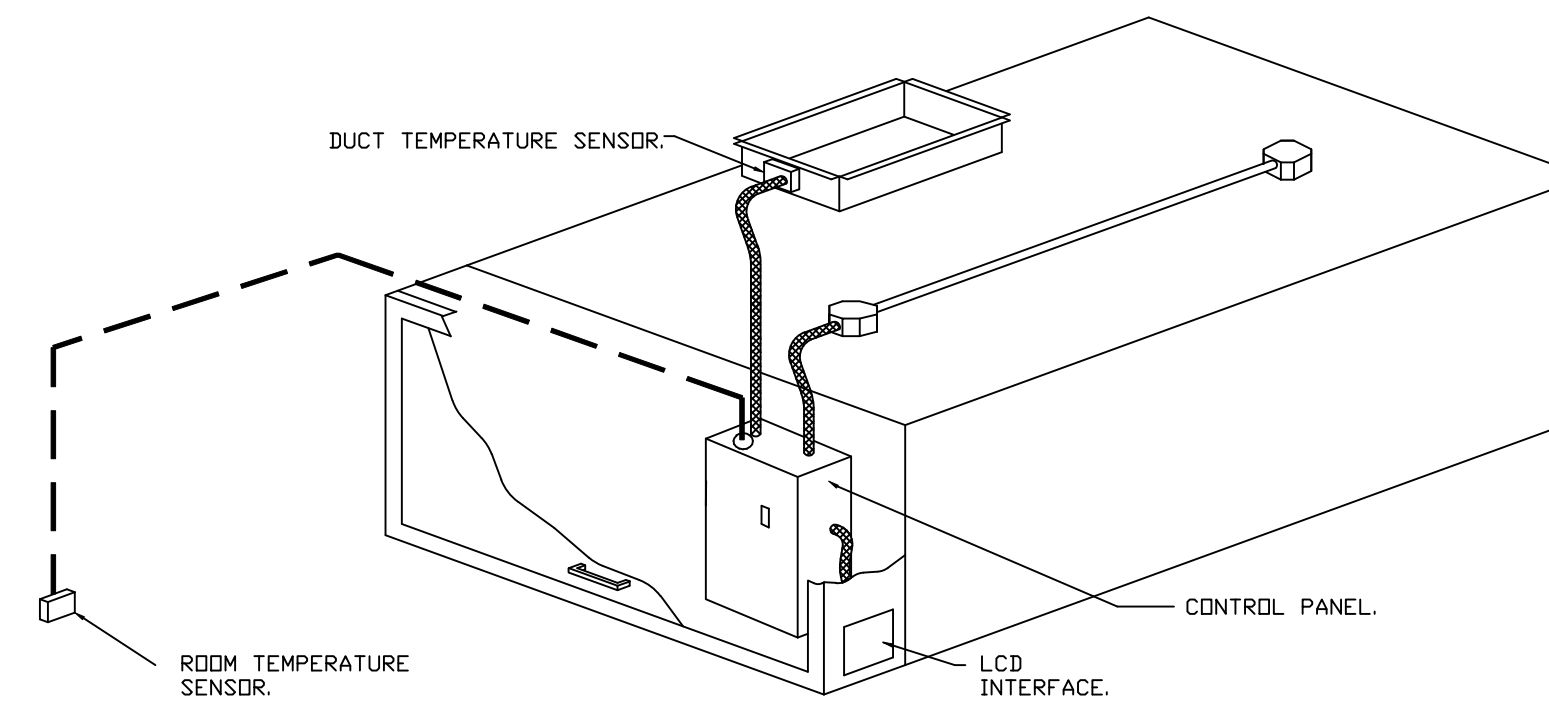
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DATE: 11/13/2024
DWG.#: 7142471
DRAWN BY: grant.homan
SCALE: 1/2" = 1'-0"
MASTER DRAWING

SHEET NO. 13

DEMAND CONTROL VENTILATION HOOD CONTROL PANEL SPECIFICATIONS:

- CONTROLS SHALL BE LISTED BY ETL (UL 508A) AND SHALL COMPLY WITH DEMAND VENTILATION SYSTEM TURNDOWN REQUIREMENTS OUTLINED IN IECC 403.7.5 (2021).
- THE CONTROL ENCLOSURE SHALL BE NEMA 1 RATED AND LISTED FOR INSTALLATION INSIDE OF THE EXHAUST HOOD UTILITY CABINET. THE CONTROL ENCLOSURE MAY BE CONSTRUCTED OF STAINLESS STEEL OR PAINTED STEEL.
- TEMPERATURE PROBE(S) LOCATED IN THE EXHAUST DUCT RISER(S) SHALL BE CONSTRUCTED OF STAINLESS STEEL.
- A DIGITAL CONTROLLER SHALL BE PROVIDED TO ACTIVATE THE HOOD EXHAUST FANS DYNAMICALLY BASED ON A FIXED DIFFERENTIAL BETWEEN THE AMBIENT AND DUCT TEMPERATURES SENSORS. THIS FUNCTION SHALL MEET THE REQUIREMENTS OF IMC 507.1.1.
- A DIGITAL CONTROLLER SHALL PROVIDE ADJUSTABLE HYSTERESIS SETTINGS TO PREVENT CYCLING OF THE FANS AFTER THE COOKING APPLIANCES HAVE BEEN TURNED OFF AND/OR THE HEAT IN THE EXHAUST SYSTEM IS REDUCED.
- A DIGITAL CONTROLLER SHALL PROVIDE AN ADJUSTABLE MINIMUM FAN RUN-TIME SETTING TO PREVENT FAN CYCLING.
- VARIABLE FREQUENCY DRIVES (VFDs) SHALL BE PROVIDED FOR FANS AS REQUIRED. THE DIGITAL CONTROLLER SHALL MODULATE THE VFDs BETWEEN A MINIMUM SETPOINT AND A MAXIMUM SETPOINT ON DEMAND. THE DUCT TEMPERATURE SENSOR INPUT(S) TO THE DIGITAL CONTROLLER SHALL BE USED TO CALCULATE THE SPEED REFERENCE SIGNAL.
- THE VFD SPEED RANGE OF OPERATION SHALL BE FROM 0% TO 100% FOR THE SYSTEM, WITH THE ACTUAL MINIMUM SPEED SET AS REQUIRED TO MEET MINIMUM VENTILATION REQUIREMENTS.
- AN INTERNAL ALGORITHM TO THE DIGITAL CONTROLLER SHALL MODULATE SUPPLY FAN VFD SPEED PROPORTIONAL TO ALL EXHAUST FANS THAT ARE LOCATED IN THE SAME FAN GROUP AS THE SUPPLY FAN.
- THE SYSTEM SHALL OPERATE IN PREP MODE DURING LIGHT COOKING LOAD OR COOL DOWN MODE WHEN SUFFICIENT HEAT REMAINS UNDERNEATH THE HOOD SYSTEM AFTER COOKING OPERATIONS HAVE COMPLETED. OPERATION DURING EITHER OF THESE PERIODS WILL DISABLE THE SUPPLY FANS AND PROVIDE AN EXHAUST FAN SPEED THAT IS EQUAL TO THE MINIMUM VENTILATION REQUIREMENT.
- A DIGITAL CONTROLLER SHALL DISABLE THE SUPPLY FAN(S), ACTIVATE THE EXHAUST FAN(S), ACTIVATE THE APPLIANCE SHUNT TRIP, AND DISABLE AN ELECTRIC GAS VALVE AUTOMATICALLY WHEN FIRE CONDITION IS DETECTED ON A COVERED HOOD.
- A DIGITAL CONTROLLER SHALL ALLOW FOR EXTERNAL BMS FAN CONTROL VIA DRY CONTACT (EXTERNAL CONTROL SHALL NOT OVERRIDE FAN OPERATION LOGIC AS REQUIRED BY CODE).
- AN LCD INTERFACE SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
 - A. ON/OFF PUSH BUTTON FAN & LIGHT SWITCH ACTIVATION.
 - B. INTEGRATED GAS VALVE RESET FOR ELECTRONIC GAS VALVES (NO RESET RELAY REQUIRED).
 - C. VFD FAULT DISPLAY WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
 - D. DUCT TEMPERATURE SENSOR FAILURE DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
 - E. MIS-WIRED DUCT TEMPERATURE SENSOR DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
 - F. A SINGLE LOW VOLTAGE CAT-5 RJ45 WIRING CONNECTION.
 - G. AN ENERGY SAVINGS INDICATOR THAT UTILIZES MEASURED KWH FROM THE VFDs.



TYPICAL HOOD CONTROL PANEL INSTALLATION

SEQUENCE OF OPERATIONS:

- THE HOOD CONTROL PANEL IS CAPABLE OF OPERATING IN ONE OR MORE OF THE FOLLOWING STATES AT ANY GIVEN TIME:
- **AUTOMATIC:** THE SYSTEM OPERATES BASED ON THE DIFFERENTIAL BETWEEN ROOM TEMPERATURE AND THE TEMPERATURE AT THE HOOD CAVITY OR EXHAUST DUCT COLLAR. FANS ACTIVATE AT A CONFIGURABLE TEMPERATURE DIFFERENTIAL THRESHOLD. DEPENDING ON THE JOB CONFIGURATION EACH FAN ZONE CAN BE CONFIGURED AS STATIC OR DYNAMIC. THESE TERMS REFER TO WHETHER A VARIABLE MOTOR (SUCH AS EC MOTORS OR VFD DRIVEN MOTORS) MODULATE WITH TEMPERATURE. IF THE PANEL IS EQUIPPED WITH VARIABLE SPEED FANS AND THE ZONE IS DEFINED AS 'DYNAMIC', THESE WILL MODULATE WITHIN A USER-DEFINED RANGE BASED ON THE TEMPERATURE DIFFERENTIAL. PANELS EQUIPPED WITH VARIABLE SPEED FANS AND A FAN ZONE DEFINED AS 'STATIC', FANS WILL RUN AT A SET SPEED CALCULATED FOR THE DRIVE. DEMAND CONTROL VENTILATION SYSTEMS ARE CAPABLE OF MODULATING EXHAUST AND MAKE UP AIR FAN SPEEDS PER THE REQUIREMENTS OUTLINED IN IECC 403.7.5 (2021).
 - **MANUAL:** THE SYSTEM OPERATES BASED ON HUMAN INPUT FROM AN HMI.
 - **SCHEDULE:** A WEEKLY SCHEDULE CAN BE SET TO RUN FANS FOR A SPECIFIED PERIOD THROUGHOUT THE DAY. THERE ARE THREE OCCUPIED TIMES PER DAY TO ALLOW FOR THE USER TO SET UP A TIME THAT IS SUITABLE TO THEIR NEEDS. ANY TIME THAT IS WITHIN THE DEFINED OCCUPIED TIME, THE SYSTEM WILL RUN AT MODULATION MODE AND FOLLOW THE FAN PROCEDURE ALGORITHM BASED ON TEMPERATURE DURING THIS TIME. DURING UNOCCUPIED TIME, THE SYSTEM WILL HAVE AN EXTRA OFFSET TO PREVENT UNINTENDED ACTIVATION OF THE SYSTEM DURING A TIME WHERE THE SYSTEM IS NOT BEING OCCUPIED.
 - **OTHER:** THE SYSTEM OPERATES BASED ON THE INPUT FROM AN EXTERNAL SOURCE (DDC, BMS OR HARD-WIRED INTERLOCK).
 - **FIRE:** UPON ACTIVATION OF THE HOOD FIRE SUPPRESSION SYSTEM, THE EXHAUST FAN WILL COME ON OR CONTINUE TO RUN, THE HOOD MAKEUP AIR WILL SHUTDOWN, AND A SIGNAL WILL BE SENT FOR ACTIVATING THE SHUNT TRIP BREAKER PROVIDED BY THE ELECTRICIAN. FUEL GAS WILL SHUT OFF VIA A MECHANICAL/ELECTRICAL GAS VALVE ACTUATED BY THE HOOD FIRE SUPPRESSION SYSTEM.

SYSTEM DESIGN VERIFICATION (SDV)

IF ORDERED, CAS SERVICE WILL PERFORM A SYSTEM DESIGN VERIFICATION (SDV) ONCE ALL EQUIPMENT HAS HAD A COMPLETE START UP PER THE OPERATION AND INSTALLATION MANUAL. TYPICALLY, THE SDV WILL BE PERFORMED AFTER ALL INSPECTIONS ARE COMPLETE.

ANY FIELD RELATED DISCREPANCIES THAT ARE DISCOVERED DURING THE SDV WILL BE BROUGHT TO THE ATTENTION OF THE GENERAL CONTRACTOR AND CORRESPONDING TRADES ON SITE. THESE ISSUES WILL BE DOCUMENTED AND FORWARDED TO THE APPROPRIATE SALES OFFICE. IF CAS SERVICE HAS TO RESOLVE A DISCREPANCY THAT IS A FIELD ISSUE, THE GENERAL CONTRACTOR WILL BE NOTIFIED AND BILLED FOR THE WORK. SHOULD A RETURN TRIP BE REQUIRED DUE TO ANY FIELD RELATED DISCREPANCY THAT CANNOT BE RESOLVED DURING THE SDV, THERE WILL BE ADDITIONAL TRIP CHARGES.

DURING THE SDV, CAS SERVICE WILL ADDRESS ANY DISCREPANCY THAT IS THE FAULT OF THE MANUFACTURER. SHOULD A RETURN TRIP BE REQUIRED, THE GENERAL CONTRACTOR AND APPROPRIATE SALES OFFICE WILL BE NOTIFIED. THERE WILL BE NO ADDITIONAL CHARGES FOR MANUFACTURER DISCREPANCIES.

| REVISIONS | |
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| DATE: 11/13/2024 |
| DWG.#: 7142471 |
| DRAWN BY: grant.homan |
| SCALE: 3/4" = 1'-0" |
| MASTER DRAWING |

SHEET NO.

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