# HVAC SYMBOL LEGEND

| SYMBOL | DESCRIPTION |
|---|---|
| | -CEILING DIFFUSER, ROUND NECK (CEILING DIFFUSERS ARE 4-WAY THROW UNO) |
| | -ROUND DIFFUSER |
| | -CEILING RETURN |
| | -CEILING EXHAUST |
| | -CEILING DIFFUSER, RECTANGULAR OR SQUARE NECK (CEILING DIFFUSERS ARE 4-WAY THROW UNO) |
| | -SUPPLY REGISTER OR GRILLE (VERTICAL MOUNT, SIDEWALL) |
| | -RETURN/EXHAUST REGISTER OR GRILLE (VERTICAL MOUNT, SIDEWALL) |
| 1 | -REVISION REFERENCE |
| 1 / M-1 | -DETAIL REFERENCE: TOP-DETAIL#, BOTTOM-DRAWING# SHOWN ON |
| T | -THERMOSTAT/TEMPERATURE SENSOR |
| H | -HUMIDISTAT/HUMIDITY SENSOR |
| | -DUCT SMOKE DETECTOR |
| | -CONNECT TO EXISTING |
| | -DEMOLISH TO POINT INDICATED |
| M | -MOTORIZED CONTROL DAMPER |
| TS | -TEMPERATURE SENSOR |
| P | -PRESSURE SENSOR |
| BD | -BACKDRAFT DAMPER |
| N | -NEUTRAL RELATIVE PRESSURE |
| + | -POSITIVE RELATIVE PRESSURE |
| - | -NEGATIVE RELATIVE PRESSURE |
| 1 | -SHEET NOTE CALLOUT |
| 1 | -SHEET NOTE CALLOUT |
| 1 | -SHEET NOTE CALLOUT |
| | -CEILING MOUNTED ACCESS DOOR |
| | -SQUARE THROAT ELBOW W/TURNING VANES |
| | -RADIUS ELBOW |
| | -RECTANGULAR/ROUND BRANCH TAKE-OFF OR ROUND/ROUND BRANCH TAKE-OFF |
| | -EXHAUST DUCT UP THROUGH SLAB W/ FAN ON ROOF ABOVE |
| | -EXHAUST FAN ON ROOF W/ DUCT DOWN THROUGH ROOF |

| SYMBOL | DESCRIPTION |
|---|---|
| | -FIRE DAMPER (WITH ACCESS PANEL) |
| | -COMBINATION FIRE & SMOKE DAMPER (WITH ACCESS PANEL) |
| | -SMOKE DAMPER (WITH ACCESS PANEL) |
| M | -MOTOR OPERATED CONTROL DAMPER (MOD) |
| | -MANUAL BALANCING DAMPER |
| SA-1 | -SOUND ATTENUATOR |
| FM | -AIR FLOW MEASURING STATION |
| | -DOOR GRILLE |
| H | -UNDERCUT DOOR |
| | -ACCESS DOORS, VERTICAL OR HORIZONTAL |
| | -STAINLESS STEEL DUCTWORK |
| | -FLEXIBLE CONNECTION |
| 12 / 8 | -NEW FLAT OVAL DUCT |
| 24x12 | -NEW DUCTWORK, FIRST DIMENSION IS SIDE SHOWN |
| 24x12 | -EXISTING DUCTWORK TO REMAIN |
| 24x12 | -EXISTING DUCTWORK TO BE REMOVED |
| 24x12 DOWN / UP W/IN FLOOR | -DUCT ELBOW, POSITIVE PRESSURE (SUPPLY), FIRST DIMENSION INDICATES SIDE TO WHICH ARROW IS POINTING |
| | -DUCT ELBOW, EXHAUST |
| | -DUCT ELBOW, NEGATIVE PRESSURE, RETURN |
| | -DUCT ELBOW UP THROUGH ROOF OR SLAB ABOVE |
| | -RECTANGULAR DUCT SECTION UP, POSITIVE PRESSURE, SUPPLY OR OUTSIDE AIR |
| | -RECTANGULAR DUCT SECTION UP, NEGATIVE PRESSURE, RETURN |
| | -RECTANGULAR DUCT SECTION UP, EXHAUST |
| | -ROUND DUCT SECTION UP |
| | -FLAT OVAL DUCT SECTION UP |

| SYMBOL | DESCRIPTION |
|---|---|
| | -TERMINAL UNIT, VARIABLE/CONSTANT AIR VOLUME WITH ELECTRIC HEAT |
| | -TERMINAL UNIT, VARIABLE/CONSTANT AIR VOLUME WITH ELECTRIC HEAT |
| | -TERMINAL UNIT, VARIABLE/CONSTANT AIR VOLUME, FAN POWERED |
| | -TERMINAL UNIT, VARIABLE/CONSTANT AIR VOLUME, FAN POWERED, WITH ELECTRIC HEAT |
| | -ELECTRIC DUCT HEATER (W/ PANEL CLEARANCE) |
| | -HYDRONIC REHEAT COIL |
| | -INLINE CENTRIFUGAL FAN |
| | -PACKAGED TERMINAL AIR CONDITIONER (PTAC) |
| UP / DN | -CHANGE OF ELEVATION |
| | -FLEXIBLE DUCT |
| | -TRANSITION, CONCENTRIC |
| | -TRANSITION, ECCENTRIC |
| 10x8 / 8" | -TRANSITION, SQUARE TO ROUND |
| | -SQUARE THROAT TEE |
| 12x8 | -RADIUS TEE |
| | -RECTANGLE-TO-ROUND TAKE-OFF |
| | -STANDARD BRANCH TAKE-OFF |
| | -SPIN-IN TAKE-OFF |

# HVAC PIPING SYMBOL LEGEND

| SYMBOL | DESCRIPTION |
|---|---|
| CD | -CONDENSATE |
| RL | -REFRIGERANT LIQUID |
| RS | -REFRIGERANT SUCTION |
| | -TEE, OUTLET DOWN |
| | -TEE, OUTLET UP |
| D / D | -45° PIPE RISE (R) / DROP (D) |
| | -PIPE ANCHORS |
| | -CONCENTRIC REDUCER |
| | -ECCENTRIC REDUCER |

| SYMBOL | DESCRIPTION |
|---|---|
| | -FLOW DIRECTION |
| | -GATE VALVE |
| | -BALL VALVE |
| | -CALIBRATING BALANCING VALVE |
| | -BUTTERFLY VALVE |
| | -GAS COCK |
| | -UNION |
| | -STRAINER |
| | -CONTROL VALVE |
| | -SOLENOID VALVE |
| | -PSI REG. |
| | -CHECK VALVE |
| | -FLOW SWITCH |
| | -SLOPE DIRECTION (DOWN) |
| | -FLEX CONNECTION |
| | -THERMOMETER |

| SYMBOL | DESCRIPTION |
|---|---|
| EQUIP. | - P-TRAP |
| | -TWO-WAY CHECK VALVE |
| MV | -MANUAL VENT |
| | -PRESSURE GAUGE |
| | -RELIEF VALVE |
| FM | -FLOW METER |
| M | -WATER METER |
| | -INLINE PUMP |
| | -INLINE PUMP |
| | -VALVE ON RISER |
| | -CAP |
| | -CONNECTION, BOTTOM |
| | -CONNECTION, TOP |
| | -COUPLING |
| | -ELBOW, 90° |
| | -ELBOW, 45° |
| | -ELBOW, TURNED DOWN |
| | -ELBOW, TURNED UP |

NOTE: SOME SYMBOLS SHOWN ON THIS LEGEND MAY NOT PERTAIN TO THIS PROJECT

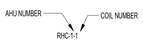
# HVAC ABBREVIATIONS

| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
|---|---|---|---|
| AFD | -ADJUSTABLE FREQUENCY DRIVE | LD | -LINEAR DIFFUSER |
| AFF | -ABOVE FINISHED FLOOR | MBH | -THOUSAND BTUs PER HOUR |
| AFR | -ABOVE FINISHED ROOF | MCA | -MINIMUM CIRCUIT AMPS |
| AHU | -AIR HANDLING UNIT | MOCP | -MAXIMUM OVER CURRENT PROTECTION |
| AP | -ACCESS PANEL | MOD | -MOTOR OPERATED CONTROL DAMPER (MOD) |
| BOP | -BOTTOM OF PIPE | NC | -NORMALLY CLOSED |
| BHP | -BRAKE HORSEPOWER | NO | -NORMALLY OPEN |
| BTU | -BRITISH THERMAL UNIT | NTS | -NOT TO SCALE |
| CL | -CENTER LINE | OA | -OUTSIDE AIR |
| CFM | -CFM (CUBIC FEET PER MINUTE) | OAL | -OUTSIDE AIR LOUVER |
| CD | -CEILING DIFFUSER | OAU | -OUTSIDE AIR UNIT |
| CT | -COOLING TOWER | PRV | -PRESSURE REDUCING VALVE |
| CV | -CONSTANT AIR VOLUME | PRS | -PRESSURE REDUCING STATION |
| ΔP | -CHANGE IN PRESSURE | PSI | -POUNDS PER SQUARE INCH |
| ΔT | -CHANGE IN TEMPERATURE | PSIG | -PSI GAUGE |
| CFM | -CUBIC FEET PER MINUTE | PTAC | -PACKAGED TERMINAL AIR CONDITIONER |
| CU | -CONDENSING UNIT | PVC | -POLYVINYL CHLORIDE PIPE |
| DDC | -DIRECT DIGITAL CONTROLS | RA | -RETURN AIR |
| DN | -DOWN | RHC | -REHEAT COIL |
| EAT | -ENTERING AIR TEMPERATURE | RHP | -ROOFTOP HEAT PUMP |
| ESP | -EXTERNAL STATIC PRESSURE | RPM | -REVOLUTIONS PER MINUTE |
| EWT | -ENTERING WATER TEMPERATURE | RS/L | -REFRIGERANT SUCTION & LIQUID LINES |
| FCU | -FAN COIL UNIT | RTU | -ROOFTOP AIR HANDLING UNIT |
| FD | -FIRE DAMPER | SA | -SUPPLY AIR |
| FF | -FINAL FILTERS | SP | -STATIC PRESSURE |
| FLA | -FULL LOAD AMPS | TSP | -TOTAL STATIC PRESSURE |
| FPM | -FEET PER MINUTE | UNO | -UNLESS NOTED OTHERWISE |
| GPM | -GALLONS PER MINUTE | V/PH | -VOLTS/PHASE |
| KW | -KILOWATT | VAV | -VARIABLE AIR VOLUME |
| LAT | -LEAVING AIR TEMPERATURE | VFD | -VARIABLE FREQUENCY DRIVE |
| LWT | -LEAVING WATER TEMPERATURE | | |

# HVAC EQUIPMENT TAGS

-AIR DISTRIBUTION DEVICE

-AIR HANDLING UNIT



-REHEAT COIL

VARIABLE/CONSTANT AIR VOLUME TERMINAL UNITS


# APPLICABLE CODES AND STANDARDS

STATE AND NATIONAL CODE REQUIREMENTS: CONFIRM IN STRICT COMPLIANCE TO THE LATEST ENFORCED EDITION OF THE STATE OF FLORIDA DEPARTMENT OF PROFESSIONAL REGULATION, AND THE FOLLOWING CODES:

FLORIDA FIRE PREVENTION CODE, 8TH EDITION (2023)
FLORIDA BUILDING CODE, 8TH EDITION (2023)
FLORIDA PLUMBING CODE, 8TH EDITION (2023)
FLORIDA MECHANICAL CODE, 8TH EDITION (2023)
FLORIDA FUEL GAS CODE, 8TH EDITION (2023)
FLORIDA ENERGY CODE, 8TH EDITION (2023)

NFPA 70, 2020 EDITION, NATIONAL ELECTRICAL CODE.
NFPA 72, 2019 EDITION, NATIONAL FIRE ALARM AND SIGNALING CODE.
NFPA 90A, 2021 EDITION, STANDARD FOR THE INSTALLATION OF AIR-CONDITIONING AND VENTILATING SYSTEMS.
NFPA 90B, 2021 EDITION, STANDARD FOR THE INSTALLATION OF WARM AIR HEATING AND AIR-CONDITIONING SYSTEMS.
NFPA 101, 2021 EDITION, LIFE SAFETY CODE.

ASHRAE STANDARD 15, 2019 EDITION
ASHRAE STANDARD 34, 2019 EDITION
ASHRAE STANDARD 62.1, 2019 EDITION
SMACNA HVAC DUCT CONSTRUCTION STANDARDS, 2020 EDITION.

ASME/ANSI A17.1-2019, SAFETY CODE FOR ELEVATORS AND ESCALATORS.
ASME BOILER & PRESSURE VESSEL CODE, 2019 EDITION
ASME CSD-1, 2021 EDITION

PRODUCTS SHALL BE LISTED BY UNDERWRITERS LABORATORY, OR OTHER INDUSTRY-APPROVED TESTING AGENCY.

# MECHANICAL ADD ALTERNATE SCOPE OF WORK

A. BASE BID: SELECTIVELY DEMO HVAC SYSTEMS. PROVIDE MINIMUM REQUIREMENTS FOR VENTILATION, TEMPERATURE, AND HUMIDITY CONTROL IN UNFINISHED SPACES. BUILD MEN'S RESTROOMS/SHOWERS/LOCKERS 183, WOMEN'S RESTROOMS/SHOWERS/LOCKERS 182, CORRIDOR 100, AND MAT ROOM 171, INCLUDING ALL WALL, CEILING, AND FLOOR EQUIPMENT AND FINISHES.

ADD ALTERNATES:

B. ALTERNATE 1A: GYM RESTROOM ROUGH IN:
PROVIDE ROUGH IN FOR ALL MECHANICAL EQUIPMENT.

C. ALTERNATE 1B: GYM RESTROOM FIT OUT
PROVIDE MECHANICAL EQUIPMENT AND ASSOCIATED DUCTWORK FOR WOMEN'S RESTROOMS/SHOWERS/LOCKERS 177, AND MEN'S RESTROOMS/SHOWERS/LOCKERS 178.

# HVAC GENERAL NOTES

1. CONNECTION TO EQUIPMENT SHALL BE VERIFIED WITH MANUFACTURER'S CERTIFIED DRAWINGS. TRANSITIONS TO ALL EQUIPMENT SHALL BE VERIFIED AND PROVIDED FOR EQUIPMENT FURNISHED.
2. DIMENSIONS SHALL BE FIELD-VERIFIED AND COORDINATED PRIOR TO PROCUREMENT OR FABRICATION. COORDINATE THE WORK WITH OTHER TRADES INVOLVED. FIELD MODIFICATIONS SUCH AS OFFSETS IN PIPING OR DUCTWORK (INCLUDING DIVIDED DUCTWORK) NEEDED DUE TO OBSTRUCTIONS OR INTERFERENCES SHALL BE PROVIDED AT NO ADDITIONAL COST. FOR PROJECTS INVOLVING RENOVATION, COORDINATE NEW WORK WITH EXISTING ELEMENTS SUCH AS THE BUILDING STRUCTURE AND ARCHITECTURAL FEATURES, SPRINKLER PIPING, LIGHTS, PLUMBING, AND ELECTRICAL CONDUIT.
3. DUCT CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE SMACNA HVAC DUCT CONSTRUCTION STANDARD.
4. SEE SPECIFICATIONS FOR GAUGES, THICKNESS, BRACING, REQUIREMENTS, ETC., OF DUCTWORK.
5. PROVIDE AIR TURNING VANES IN ALL 90 DEGREE RECTANGULAR DUCT ELBOWS.
6. DUCT SIZES AND ALL OPENINGS THROUGH BUILDING CONSTRUCTION SHALL SUIT EQUIPMENT FURNISHED.
7. COORDINATE DIFFUSER, GRILLE AND REGISTER LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS AND EQUIPMENT OF ALL TRADES.
8. LOCATE THERMOSTATS, TEMPERATURE SENSORS, HUMIDISTATS, AND HUMIDITY SENSORS AT 48" ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE. COORDINATE LOCATIONS WITH OTHER EQUIPMENT, FURNITURE, AND DOOR SWINGS.
9. ALL EQUIPMENT, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED AND/OR SPECIFIED. PROVIDE ADDITIONAL SUPPORTS AS REQUIRED TO PROVIDE A VIBRATION-FREE, RIGID INSTALLATION.
10. ALL DUCT SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS.
11. DAMPERS AND INSIDES OF DUCTS VISIBLE THROUGH GRILLES, REGISTERS AND DIFFUSERS SHALL BE PAINTED FLAT BLACK.
12. REFER TO TYPICAL DETAILS FOR PIPING AND INSTALLATION OF EQUIPMENT.
13. TRAPPED CONDENSATE DRAINS FROM ALL MECHANICAL EQUIPMENT SHALL BE PROVIDED FOR PROPER DRAINAGE TO SUIT EQUIPMENT FURNISHED.
14. ACCESS PANELS IN DUCTWORK AND CEILINGS SHALL BE PROVIDED WHERE REQUIRED FOR OPERATION, BALANCING OR MAINTENANCE OF ALL MECHANICAL EQUIPMENT.
15. ALL DUCTWORK AND PIPING IS SHOWN SCHEMATICALLY. PROVIDE ALL TRANSITIONS, TURNING VANES, ELBOWS, FITTINGS, ETC., TO ALLOW SMOOTH FLOWS. ALL SPLIT DUCT FITTINGS SHALL TRANSITION TO FULL SIZE OF THE SUM OF BOTH BRANCHES, UPSTREAM OF SPLIT.
16. VERIFY FINISH WITH ARCHITECT PRIOR TO PURCHASING GRILLES, REGISTERS, DIFFUSERS, LOUVERS AND OTHER AIR DISTRIBUTION DEVICES.
17. PROVIDE FLEXIBLE DUCT CONNECTIONS ON ALL DUCTWORK CONNECTING TO EACH FAN, AIR HANDLING UNITS, AND FAN COIL UNITS.
18. PROVIDE TRANSITIONS AT DIFFUSER NECKS AS REQUIRED TO MATCH SIZES OF FLEX DUCTS TO BE CONNECTED.
19. INTERRUPTIONS TO EXISTING SERVICES SHALL BE SCHEDULED FOR TIMES OTHER THAN NORMAL OPERATING HOURS (SUCH AS NIGHTS AND WEEKENDS). SUCH INTERRUPTIONS TO SERVICES SHALL NOT BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF THE OWNER'S REPRESENTATIVE AND PROPER COORDINATION WITH OTHER TRADES. PRE-WORK SHALL BE PERFORMED TO MAKE THE SHUTDOWN PERIOD AS BRIEF AS POSSIBLE.
20. ALL EQUIPMENT, DUCTWORK, ETC., TO BE REMOVED SHALL REMAIN PROPERTY OF THE OWNER OR DISPOSED OF LEGALLY, AS DIRECTED BY OWNER.
21. MAINTAIN CLEARANCE OF A MINIMUM OF 6" BETWEEN DUCTWORK, PIPING, EQUIPMENT, ETC., AND ALL FIRE RATED AND FIRE/SMOKE RATED PARTITIONS, TO ALLOW FOR INSPECTIONS OF RATED WALLS.
22. LOCATE ALL OUTSIDE AIR INTAKES A MINIMUM OF 10' CLEAR FROM ALL PLUMBING VENTS AND EXHAUST AIR DISCHARGE LOCATIONS.
23. DUCT RUNOUTS TO DIFFUSERS SHALL MATCH THE SIZE OF THE DIFFUSER NECK.
24. UNLESS OTHERWISE NOTED, ALL EQUIPMENT AND VALVE DRAINS SHALL BE INDEPENDENTLY PIPED FULL SIZE TO THE NEAREST PLUMBING DRAIN.
25. SLEEVE AND SEAL ALL PIPING PENETRATIONS THROUGH BUILDING PARTITIONS.
26. PIPING, DUCTWORK, LEAK PROTECTION APPARATUS, OR OTHER EQUIPMENT FOREIGN TO ELECTRICAL SWITCHBOARDS, PANELBOARDS, DISTRIBUTION BOARDS, OR MOTOR CONTROL CENTERS SHALL NOT BE INSTALLED WITHIN THE REQUIRED SPACE FOR WORKING CLEARANCES OR DEDICATED SPACES OF THE ELECTRICAL EQUIPMENT, EXTENDING IN FRONT OF AND FROM FLOOR TO STRUCTURAL CEILING WITH A WIDTH AND DEPTH OF THE ELECTRICAL EQUIPMENT IN ACCORDANCE WITH NEC-110.26.
27. ALL MATERIALS AND EQUIPMENT INSTALLED IN RETURN AIR PLENUMS SHALL BE NON-COMBUSTIBLE AND UL APPROVED FOR USE IN A RETURN AIR PLENUM SPACE. IF MATERIALS ARE NOT NON-COMBUSTIBLE IN RETURN AIR PLENUMS, THEY SHALL BE REPLACED OR WRAPPED WITH A UL LISTED FIRE RATED FIRE WRAP (I.E. FYREWRAP 0.5 PLENUM INSULATION OR APPROVED EQUAL) AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURES UL LISTED DETAILS AND RECOMMENDATIONS AT NO ADDITIONAL COST.

# MECHANICAL DRAWING INDEX

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HILLSBOROUGH COUNTY SHERIFF'S OFFICE
TRAINING ACADEMY - PHASE 1
10210 WINDHORST ROAD, TAMPA, FL 33619
PERMIT DOCUMENTS

Comm. No: 23106.01
Date: 8/15/2025
Drawn by: KBH
Checked by: TNT

| Revisions | | |
|---|---|---|
| No. | Date | Revision Description |

This item has been digitally signed and sealed by Peter A. Makris, PE on the date adjacent to the seal.
PETER A. MAKRIS LICENSE No. 96819 STATE OF FLORIDA PROFESSIONAL ENGINEER
Signature must be verified on all electronic versions.

MECHANICAL SYMBOLS, LEGEND, NOTES AND INDEX

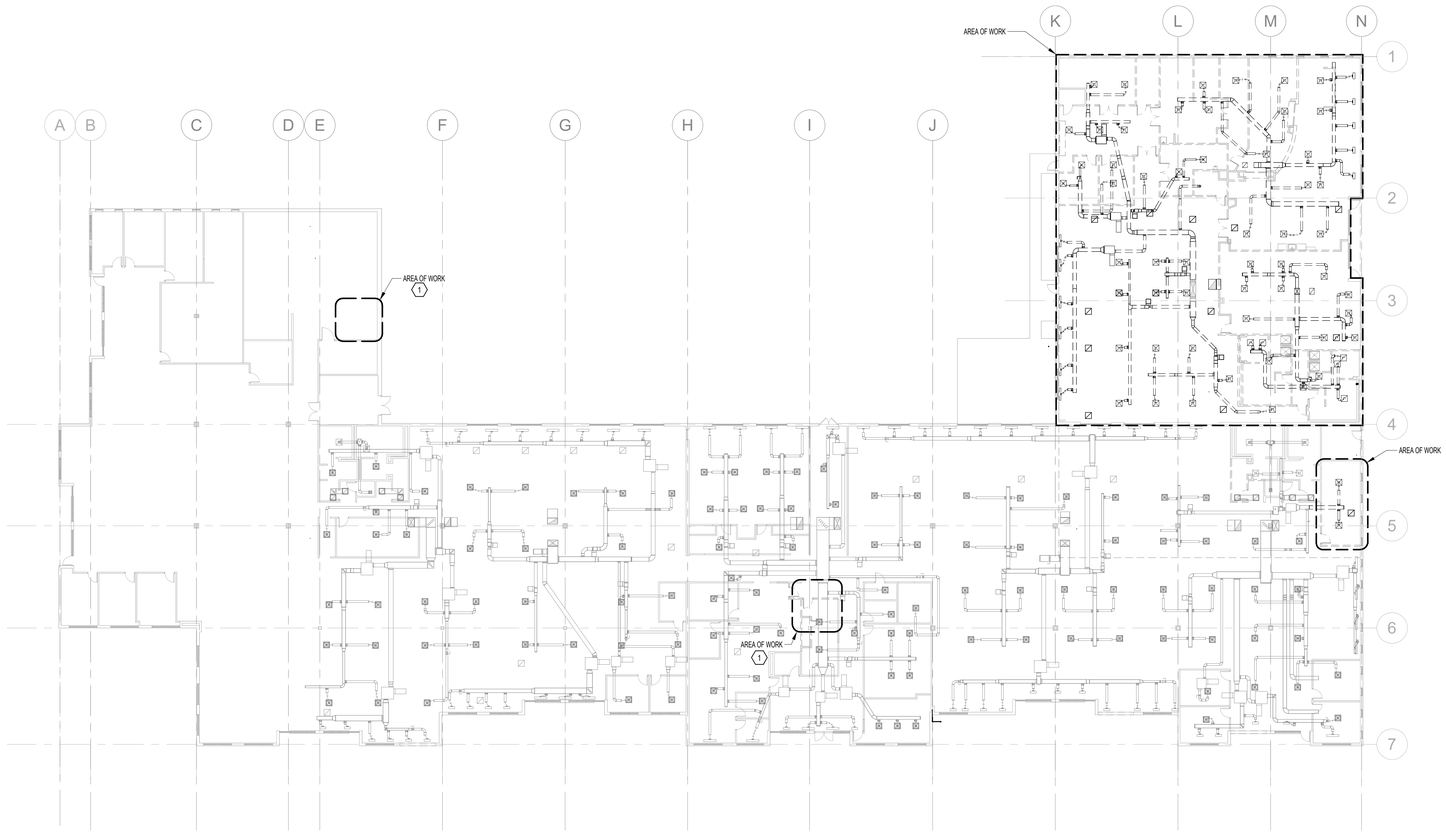
M-001

## DEMOLITION GENERAL NOTES

1. PERFORM PREVENTATIVE MAINTENANCE BALANCE REPORT TO RECORD EXISTING PERFORMANCE AND PROVIDE REPORT TO ENGINEER PRIOR TO DEMOLITION.
2. EXISTING CONDITIONS ARE BASED ON TLC SITE VISITS AND EXISTING DRAWINGS DATED 06-12-2023.
3. FIELD VERIFY ALL EXISTING MECHANICAL EQUIPMENT PRIOR TO START OF DEMOLITION.
4. DEMOLITION SHALL BE PERFORMED IN A CONTROLED AND ORGANIZED MANNER WITH MINIMUM DISRUPTION TO THE BUILDING ACTIVITIES AND OCCUPANTS.
5. REMOVE ALL EXISTING HANGERS AND SUPPORTS ASSOCIATED WITH THE DEMOLITION WORK.
6. WHERE A PORTION OF EXISTING DUCTWORK IS INDICATED TO BE REMOVED, THE REMAINING DUCTWORK SHALL BE CAPPED AND REINSULATED TO MATCH EXISTING CONDITIONS, UNLESS OTHERWISE NOTED.
7. ALL EQUIPMENT AND MATERIALS BEING REMOVED, AND NOT INDICATED TO BE GIVEN TO THE OWNER, SHALL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL LAWS, ORDINANCES, RULES, AND REGULATIONS.
8. ALL EQUIPMENT AND MATERIAL INDICATED TO BE REUSED OR GIVEN TO THE OWNER SHALL BE CAREFULLY REMOVED SO AS NOT TO DAMAGE THE EQUIPMENT OR MATERIALS OR AFFECT ITS REUSE. ANY SUCH EQUIPMENT AND MATERIALS DAMAGED BY THE CONTRACTOR SHALL BE REPLACED WITH NEW BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.
9. ALL WORK SHALL BE COORDINATED WITH THE BUILDING ENGINEER FOR AVAILABILITY AND ACCESS TO AREA OF FACILITY. COORDINATE SHUT DOWN AND DEMOLITION OF OLD EQUIPMENT AND ANY UTILITY DISRUPTION FOR THE INSTALLATION OF THE NEW EQUIPMENT WITH OWNER AND ALL RESPECTIVE TRADES AFFECTED.
10. ALL ITEMS SHOWN WITH A DASH PATTERN ARE TO BE REMOVED.

## KEYNOTES

1 NO MECHANICAL DEMOLITION WORK IS REQUIRED FOR OUTLINED AREA OF WORK.




1 LEVEL 1 - OVERALL MECHANICAL DEMOLITION FLOOR PLAN
1" = 20'-0"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PETER A. MAKRIS LICENSE No. 96819 STATE OF FLORIDA PROFESSIONAL ENGINEER

Signature must be verified on all electronic versions.

MECHANICAL OVERALL DEMOLITION PLAN

M-100

N

0 10" 20" 60"

FILE PATH: Autodesk Docs://HillsbCSO_23106.01_Training Academy/724104_HCSO_MEP_R23.rvt
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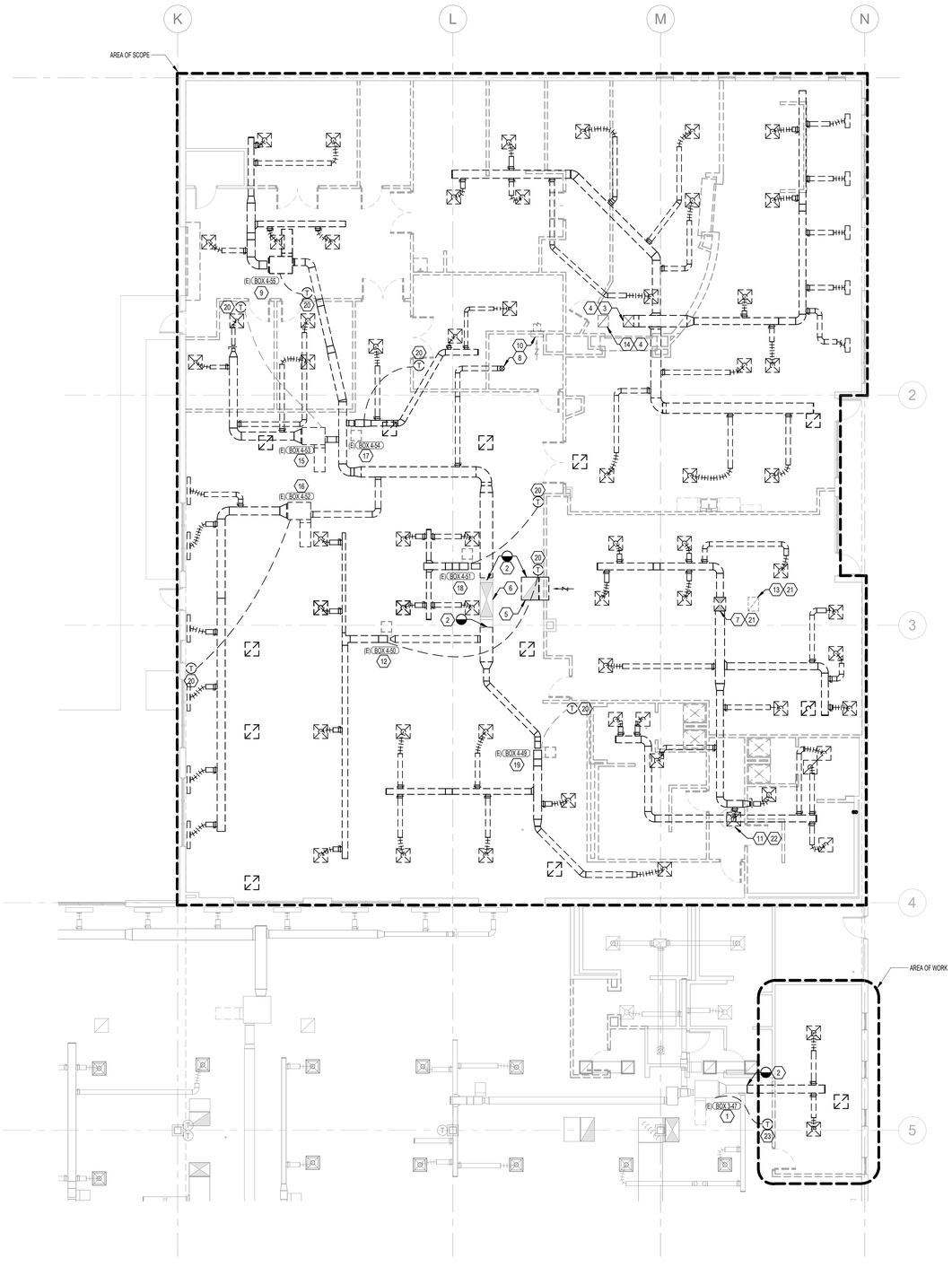


1 LEVEL 1 - ENLARGED MECHANICAL DEMOLITION FLOOR PLAN PHASE 1
1/8" = 1'-0"

## DEMOLITION GENERAL NOTES

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2. EXISTING CONDITIONS ARE BASED ON TLC SITE VISITS AND EXISTING DRAWINGS DATED 06-12-2023.
3. FIELD VERIFY ALL EXISTING MECHANICAL EQUIPMENT PRIOR TO START OF DEMOLITION.
4. DEMOLITION SHALL BE PERFORMED IN A CONTROLED AND ORGANIZED MANNER WITH MINIMUM DISRUPTION TO THE BUILDING ACTIVITIES AND OCCUPANTS.
5. REMOVE ALL EXISTING HANGERS AND SUPPORTS ASSOCIATED WITH THE DEMOLITION WORK.
6. WHERE A PORTION OF EXISTING DUCTWORK IS INDICATED TO BE REMOVED, THE REMAINING DUCTWORK SHALL BE CAPPED AND REINSULATED TO MATCH EXISTING CONDITIONS, UNLESS OTHERWISE NOTED.
7. ALL EQUIPMENT AND MATERIALS BEING REMOVED, AND NOT INDICATED TO BE GIVEN TO THE OWNER, SHALL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL LAWS, ORDINANCES, RULES, AND REGULATIONS.
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9. ALL WORK SHALL BE COORDINATED WITH THE BUILDING ENGINEER FOR AVAILABILITY AND ACCESS TO AREA OF FACILITY. COORDINATE SHUT DOWN AND DEMOLITION OF OLD EQUIPMENT AND ANY UTILITY DISRUPTION FOR THE INSTALLATION OF THE NEW EQUIPMENT WITH OWNER AND ALL RESPECTIVE TRADES AFFECTED.
10. ALL ITEMS SHOWN WITH A DASH PATTERN ARE TO BE REMOVED.

## KEYNOTES

| | |
|---|---|
| 1 | EXISTING VARIABLE AIR VOLUME TERMINAL UNIT SHALL REMAIN. BALANCE AIRFLOW TO ALLOW REMAINING DIFFUSERS AIRFLOW TO BE UNCHANGED FROM EXISTING CONDITIONS. |
| 2 | REMOVE AND DISCARD DUCTWORK BACK TO POINT INDICATED AND MAINTAIN FOR CONNECTION TO NEW. |
| 3 | EXISTING SUPPLY AIR DOWN FROM (E)RTU-6. |
| 4 | DEMOLISH ALL AIR-DISTRIBUTION ASSOCIATED TO (E)RTU-6. |
| 5 | EXISTING RETURN AIR UP TO (E)RTU-4. |
| 6 | EXISTING SUPPLY AIR DOWN FROM (E)RTU-4. |
| 7 | EXISTING SUPPLY AIR DOWN FROM (E)RTU-5. |
| 8 | EXISTING SUPPLY AIR DUCT OPEN TO SPACE. |
| 9 | REMOVE AND SALVAGE (E)BOX 4-55 AT OWNER'S DISCRETION. |
| 10 | REMOVE AND SALVAGE EXISTING INLINE FAN AT OWNER'S DISCRETION. |
| 11 | EXISTING EXHAUST DUCT UP TO EXHAUST FAN. |
| 12 | REMOVE AND SALVAGE (E)BOX 4-50 AT OWNER'S DISCRETION. |
| 13 | EXISTING RETURN AIR UP TO (E)RTU-5. |
| 14 | EXISTING RETURN AIR UP TO (E)RTU-6. |
| 15 | REMOVE AND SALVAGE (E)BOX 4-53 AT OWNER'S DISCRETION. |
| 16 | REMOVE AND SALVAGE (E)BOX 4-52 AT OWNER'S DISCRETION. |
| 17 | REMOVE AND SALVAGE (E)BOX 4-54 AT OWNER'S DISCRETION. |
| 18 | REMOVE AND SALVAGE (E)BOX 4-51 AT OWNER'S DISCRETION. |
| 19 | REMOVE AND SALVAGE (E)BOX 4-49 AT OWNER'S DISCRETION. |
| 20 | REMOVE THERMOSTAT AND ASSOCIATED WIRING. |
| 21 | DEMOLISH ALL AIR DISTRIBUTION ASSOCIATED TO (E) RTU-5. |
| 22 | DEMOLISH ALL AIR DISTRIBUTION ASSOCIATED TO (E) EF-2. |
| 23 | PROTECT AND RELOCATE THERMOSTAT. PROVIDE NEW WIRING FROM NEW LOCATION. REFER TO SHEET M-201 FOR NEW THERMOSTAT LOCATION. |

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| Comm. No: | 23106.01 |
| Date: | 8/15/2025 |
| Drawn by: | KBH |
| Checked by: | TNT |

Revisions

| No. | Date | Revision Description |
|---|---|---|

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MECHANICAL DEMOLITION PLAN PHASE 1

M-101

N
0 4' 8' 24"

FILE PATH: Autodesk Docs://HillsbCSO_23106.01_Training Academy/724104_HCSO_MEP_R23.rvt
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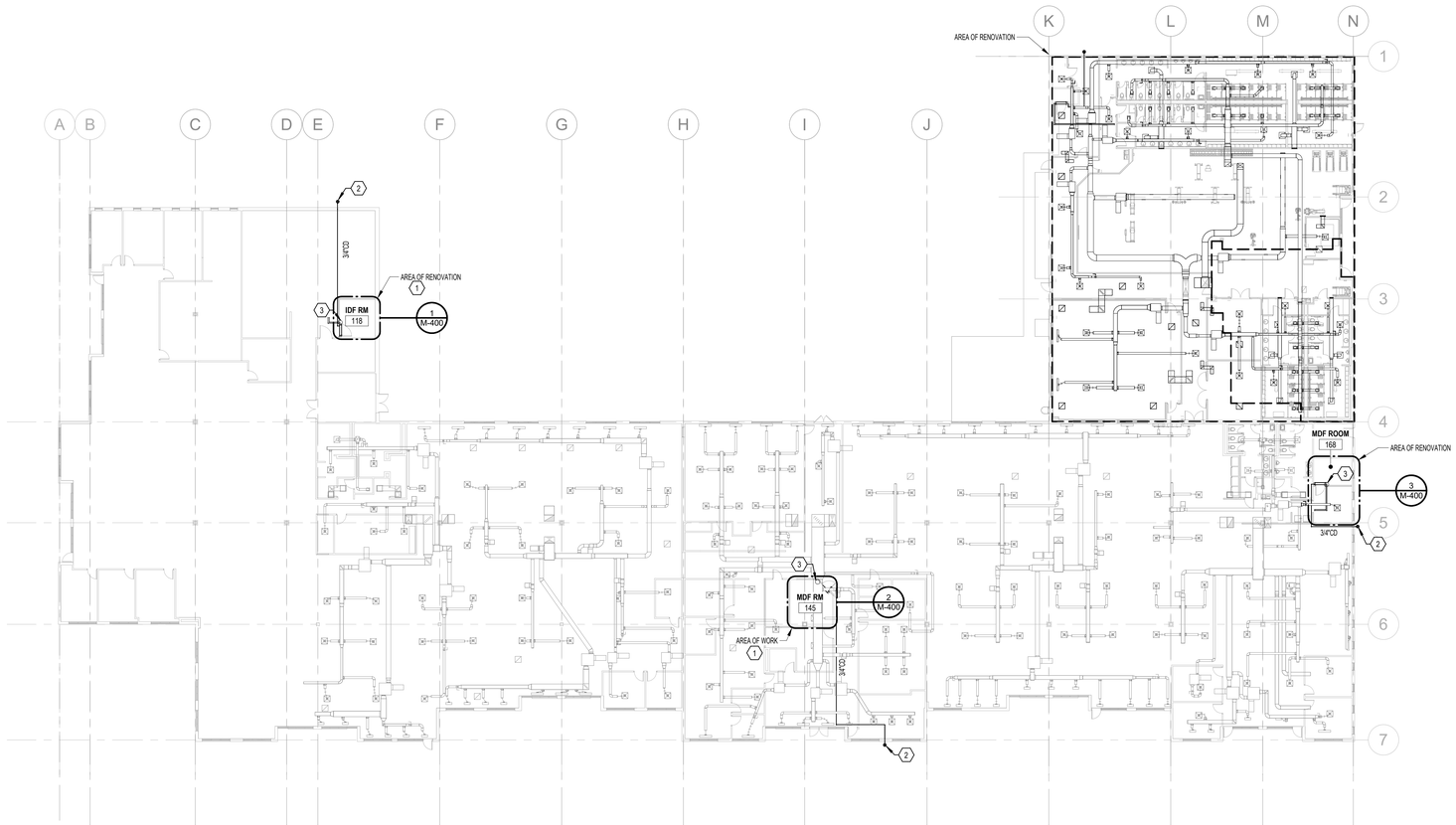
## GENERAL NOTES

1. EXISTING CONDITIONS ARE BASED ON TLC SITE VISITS AND EXISTING DRAWINGS DATED 06-12-2023.
2. PERFORM PREVENTATIVE MAINTENANCE BALANCE REPORT TO RECORD EXISTING PERFORMANCE AND PROVIDE REPORT TO ENGINEER PRIOR TO DEMOLITION.
3. PERFORM AN ABOVE CEILING SURVEY OF THE EXISTING SPACE ALONG WITH THE COMMON CORRIDOR SPACE. PRIOR TO SUBMITTING BID.
4. ALL EXISTING DUCTWORK TO REMAIN SHALL BE INSPECTED, CLEANED, AND REPAIRED TO PREVENT ANY LEAKS.
5. PAINT ALL DUCTWORK VISIBLE THROUGH RETURN AIR GRILLES FLAT BLACK.
6. MAINTAIN ALL EXISTING CLEARANCES FOR VARIABLE TERMINAL UNITS.
7. BALANCE ALL AIRFLOW AS SHOWN.

## KEYNOTES

1 PROVIDE FAN COIL UNIT AND ALL ASSOCIATED APPURTENANCES.
2 ROUTE CONDENSATE DRAINAGE DOWN WITHIN EXTERIOR WALL TO DRY-WELL ON GRADE. MAINTAIN 2" AIR GAP. REFER TO DETAIL 7/M-701. DISCHARGE TO GREEN SPACE IS ACCEPTABLE ALTERNATIVE WITH AHJ APPROVAL AND CREDIT TO OWNER.
3 SIZE REFRIGERANT LINES PER MANUFACTURER'S RECOMMENDATIONS BASED ON ACTUAL ROUTING.




1 LEVEL 1 - OVERALL MECHANICAL RENOVATION FLOOR PLAN
1" = 20'-0"

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MECHANICAL OVERALL RENOVATION PLAN

M-200

N

0 10' 20' 60'

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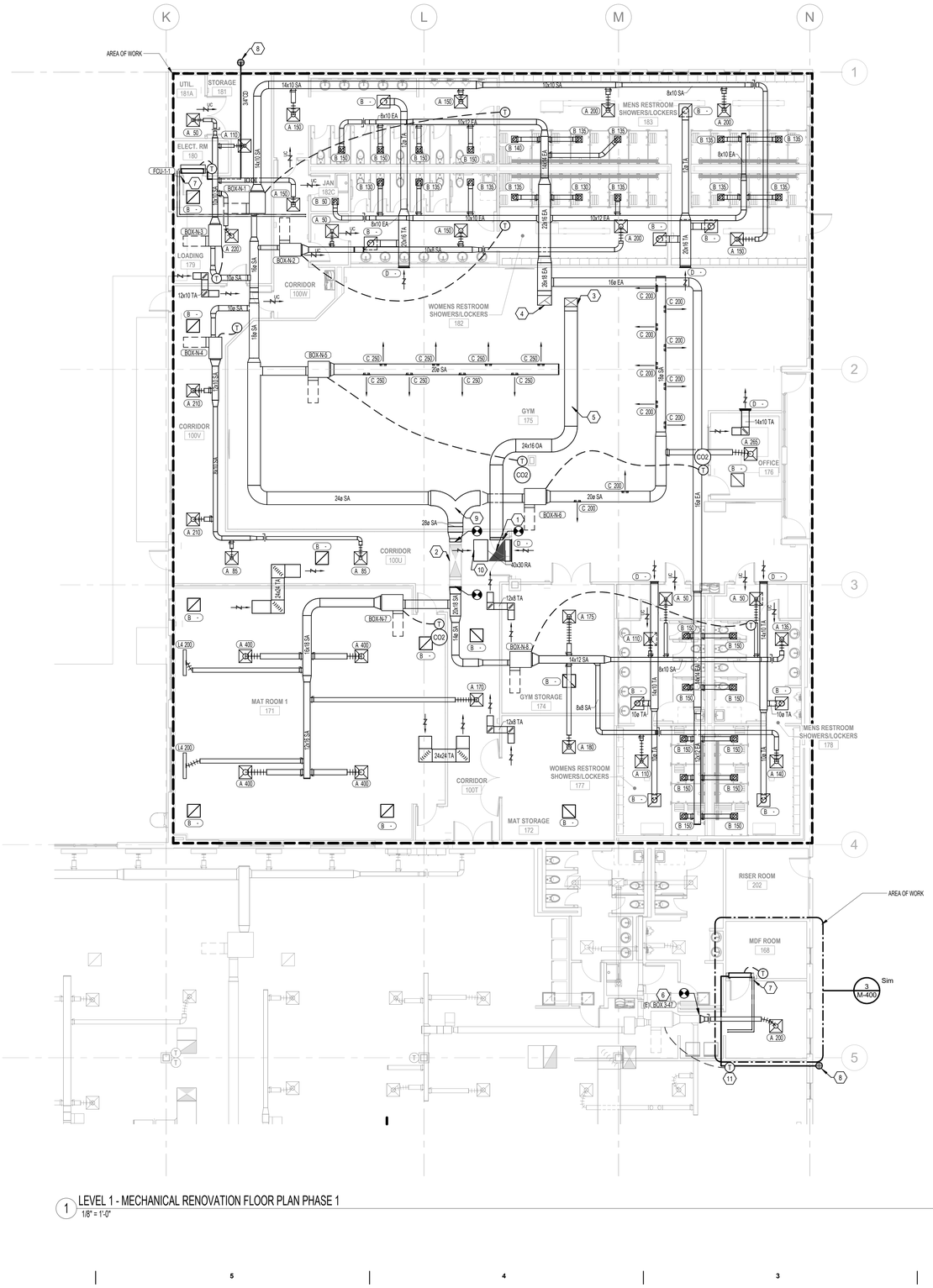


1 LEVEL 1 - MECHANICAL RENOVATION FLOOR PLAN PHASE 1
1/8" = 1'-0"

## GENERAL NOTES

1. EXISTING CONDITIONS ARE BASED ON TLC SITE VISITS AND EXISTING DRAWINGS DATED 06-12-2023.
2. PERFORM PREVENTATIVE MAINTENANCE BALANCE REPORT TO RECORD EXISTING PERFORMANCE AND PROVIDE REPORT TO ENGINEER PRIOR TO DEMOLITION.
3. PERFORM AN ABOVE CEILING SURVEY OF THE EXISTING SPACE ALONG WITH THE COMMON CORRIDOR SPACE. PRIOR TO SUBMITTING BID.
4. ALL EXISTING DUCTWORK TO REMAIN SHALL BE INSPECTED, CLEANED, AND REPAIRED TO PREVENT ANY LEAKS.
5. PAINT ALL DUCTWORK VISIBLE THROUGH RETURN AIR GRILLES FLAT BLACK.
6. MAINTAIN ALL EXISTING CLEARANCES FOR VARIABLE TERMINAL UNITS.
7. BALANCE ALL AIRFLOW AS SHOWN.
8. ALL EXPOSED SUPPLY, EXHAUST, AND OUTSIDE AIR DUCTWORK SHALL BE PAINTABLE GALVANIZED STEEL (OUTER SHELL), DOUBLE WALLED, SPIRAL DUCTWORK. DUCTWORK SHALL HAVE A SPIRAL LOCKSEAM WITH AN INTERLOCKING HELICAL SEAM THAT RUNS THE LENGTH OF THE DUCT'S OUTER PRESSURE WALL. INSULATION SHALL BE FIBEROUS AT 1.0 PCF DENSITY. DUCTWORK IS TO BE MATTE BLACK.

## KEYNOTES

1. EXISTING RETURN AIR UP TO (E)RTU-4.
2. EXISTING SUPPLY AIR DOWN FROM (E)RTU-4.
3. OUTSIDE AIR DUCT RISE TO OAU.
4. EXHAUST AIR DUCT RISE TO OAU.
5. 24X16 OUTSIDE AIR DUCT IS TO BE ROUTED TIGHT TO STRUCTURE.
6. EXISTING VARIABLE AIR VOLUME TERMINAL. BALANCE ASSOCIATED AIR DEVICES TO EXISTING MEASURED VALUES.
7. SIZE REFRIGERANT LINES PER MANUFACTURER'S RECOMMENDATIONS BASED ON ACTUAL ROUTING.
8. ROUTE CONDENSATE DRAINAGE DOWN WITHIN EXTERIOR WALL TO DRY-WELL ON GRADE. MAINTAIN 2" AIR GAP. REFER TO DETAIL 7/M-701. DISCHARGE TO GREEN SPACE IS ACCEPTABLE ALTERNATIVE WITH AHJ APPROVAL AND CREDIT TO OWNER.
9. PROVIDE SPLITTER DAMPER.
10. TERMINATE DUCT OPEN-ENDED WITH 1/2"X1/2" WIRE MESH. SECURE WIRE MESH WITH WING NUTS TO ALLOW ACCESS TO DAMPERS.
11. RELOCATED THERMOSTAT. PROVIDE NEW WIRING TO VARIABLE AIR TERMINAL UNIT.

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Checked by: TNT

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MECHANICAL RENOVATION PLAN PHASE 1

M-201

N
0 4' 8' 24'

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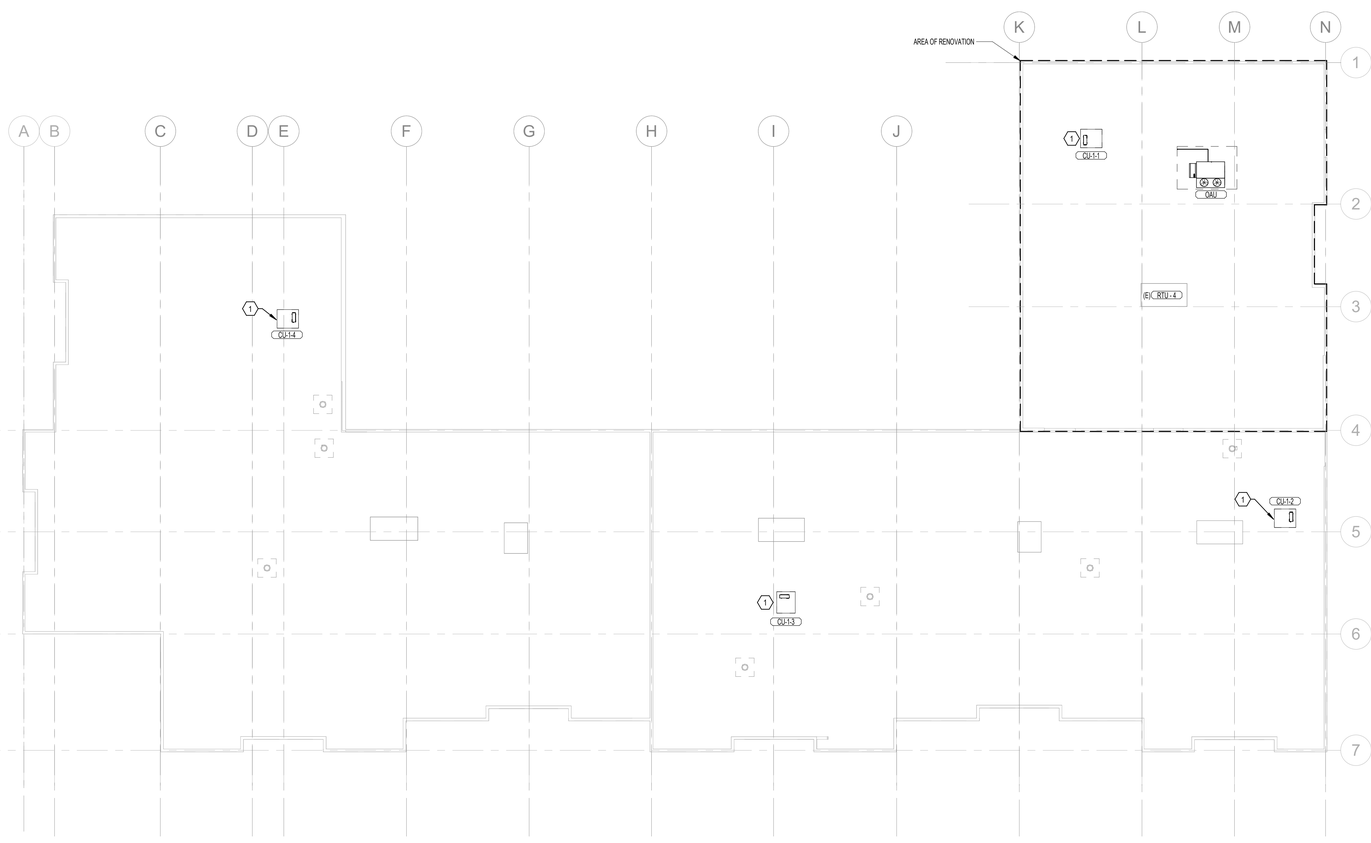
## GENERAL NOTES

1. EXISTING CONDITIONS ARE BASED ON TLC SITE VISITS AND EXISTING DRAWINGS DATED 06-12-2023.
2. PERFORM PREVENTATIVE MAINTENANCE BALANCE REPORT TO RECORD EXISTING PERFORMANCE AND PROVIDE REPORT TO ENGINEER PRIOR TO DEMOLITION.
3. FIELD VERIFY ALL EXISTING MECHANICAL EQUIPMENT.

## KEYNOTES

1 SIZE REFRIGERANT LINES PER MANUFACTURER'S RECOMMENDATIONS BASED ON ACTUAL ROUTING.




1 MECHANICAL RENOVATION ROOF PLAN OVERALL
1" = 20'-0"

N

0 10' 20' 60'

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OVERALL MECHANICAL ROOF PLAN

M-300

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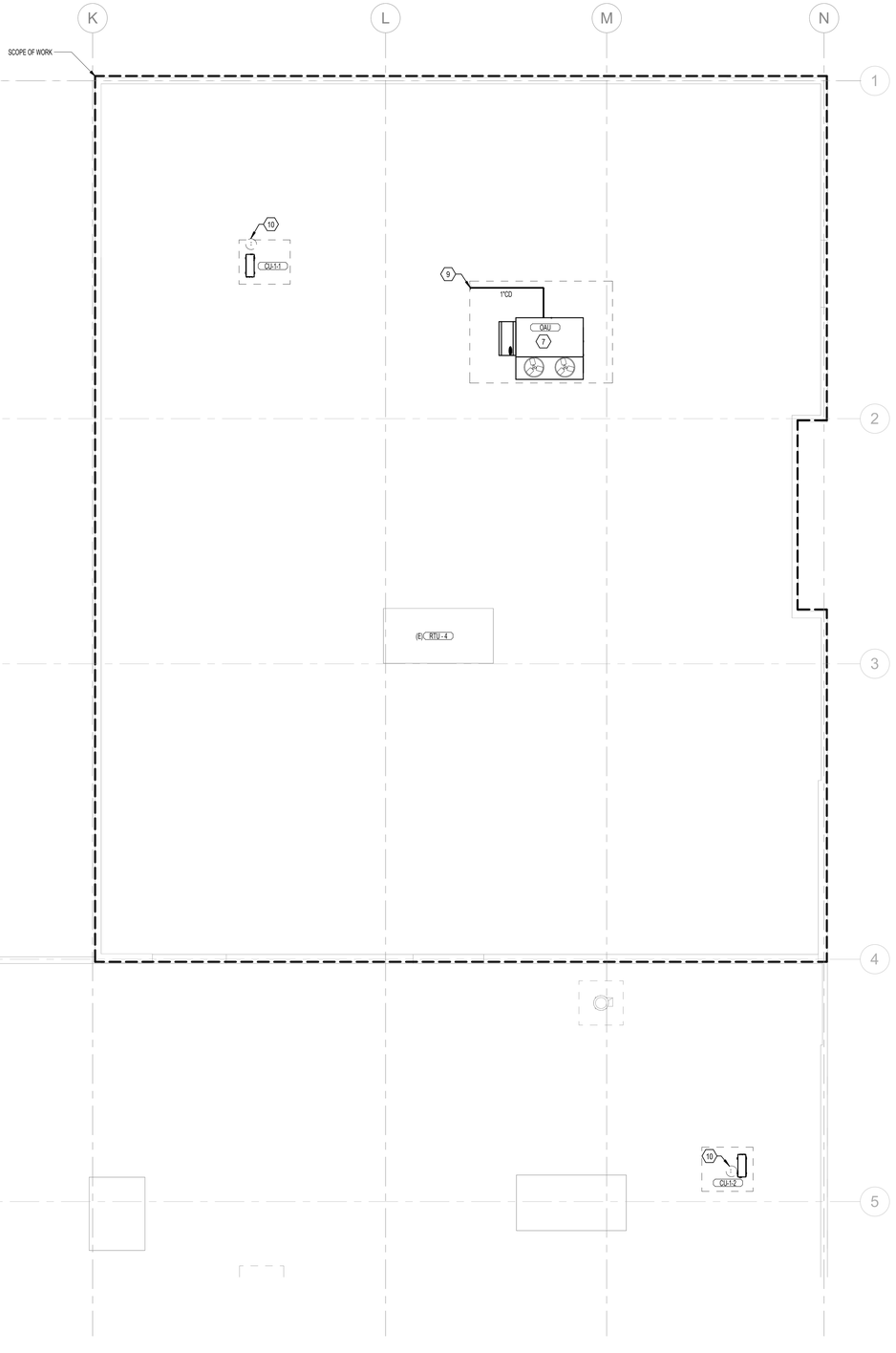
## GENERAL NOTES

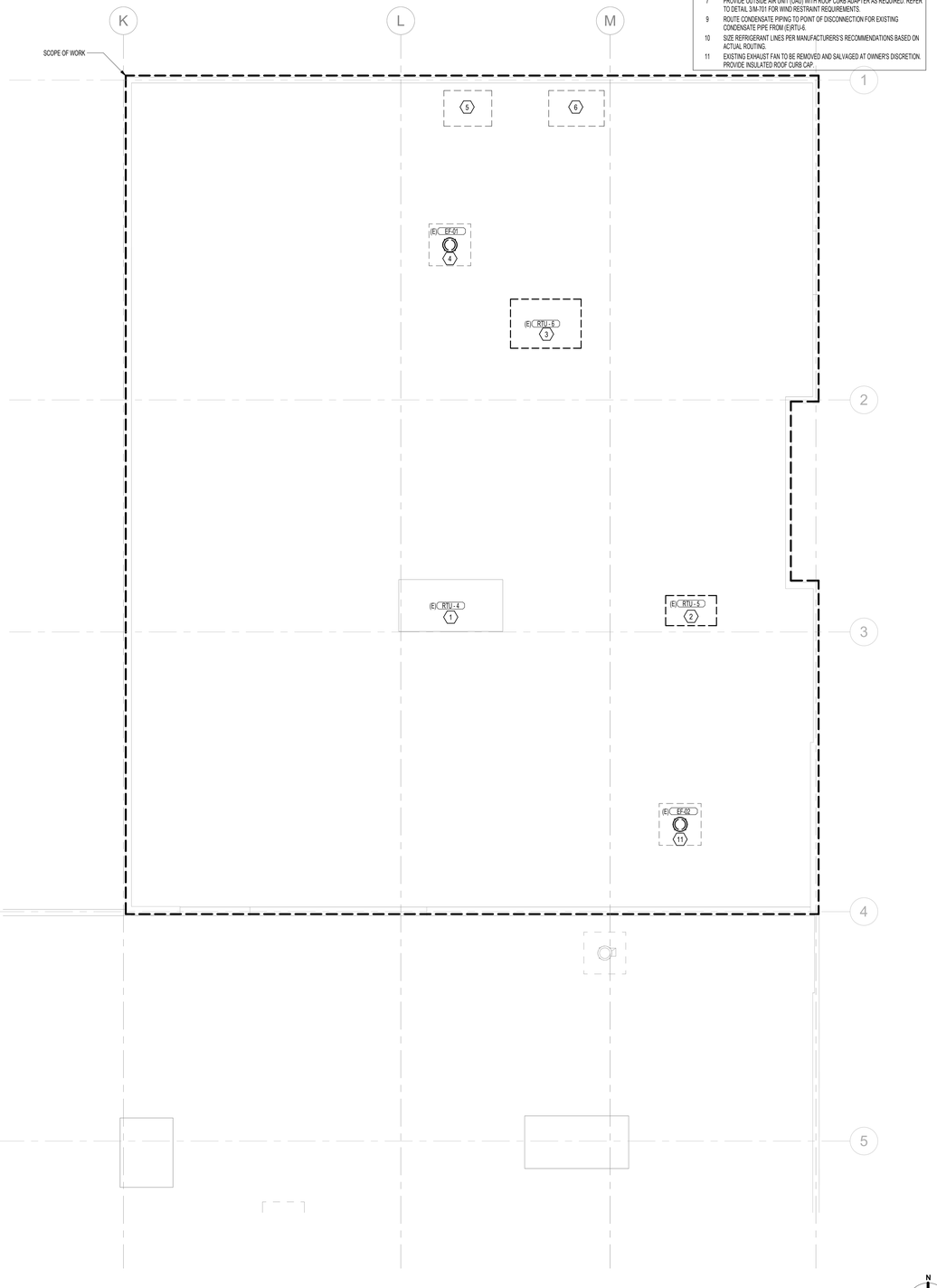
1. EXISTING CONDITIONS ARE BASED ON TLC SITE VISITS AND EXISTING DRAWINGS DATED 06-12-2023.
2. PERFORM PREVENTATIVE MAINTENANCE BALANCE REPORT TO RECORD EXISTING PERFORMANCE AND PROVIDE REPORT TO ENGINEER PRIOR TO DEMOLITION.
3. FIELD VERIFY ALL EXISTING MECHANICAL EQUIPMENT.

## KEYNOTES

1. EXISTING RTU-4 IS TO REMAIN. TEST AND RECORD EXISTING CONDITIONS.
2. EXISTING RTU-5 TO BE REMOVED AND SALVAGED AT OWNER'S DISCRETION. PROVIDE INSULATED ROOF CURB CAP.
3. REMOVE (E)RTU-6 AND SALVAGE AT OWNER'S DISCRETION. PREPARE NEW DUCTWORK AND ROOF CURB ADAPTOR FOR OUTSIDE AIR UNIT (OAU). DISCONNECT CONDENSATE PIPE AND PREPARE FOR NEW PIPING CONNECTION.
4. REMOVE (E)EF-1 AND SALVAGE AT OWNER'S DISCRETION. PROVIDE INSULATED ROOF CURB CAP.
5. EXISTING KITCHEN EXHAUST FAN AND ALL ASSOCIATED DUCTWORK SHALL BE DEMOLISHED AND HANDED TO THE OWNER. PROVIDE INSULATED ROOF CURB CAP.
6. EXISTING KITCHEN MAKEUP AIR UNIT SHALL BE DEMOLISHED AND HANDED TO THE OWNER. PROVIDE INSULATED ROOF CURB CAP.
7. PROVIDE OUTSIDE AIR UNIT (OAU) WITH ROOF CURB ADAPTER AS REQUIRED. REFER TO DETAIL 3/M-701 FOR WIND RESTRAINT REQUIREMENTS.
9. ROUTE CONDENSATE PIPING TO POINT OF DISCONNECTION FOR EXISTING CONDENSATE PIPE FROM (E)RTU-6.
10. SIZE REFRIGERANT LINES PER MANUFACTURER'S RECOMMENDATIONS BASED ON ACTUAL ROUTING.
11. EXISTING EXHAUST FAN TO BE REMOVED AND SALVAGED AT OWNER'S DISCRETION. PROVIDE INSULATED ROOF CURB CAP.




2 MECHANICAL RENOVATION ROOF PLAN
1/8" = 1'-0"




1 MECHANICAL DEMOLITION ROOF PLAN
1/8" = 1'-0"

N

0 4' 8' 24'

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TRAINING ACADEMY - PHASE 1

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| Checked by: | TNT |

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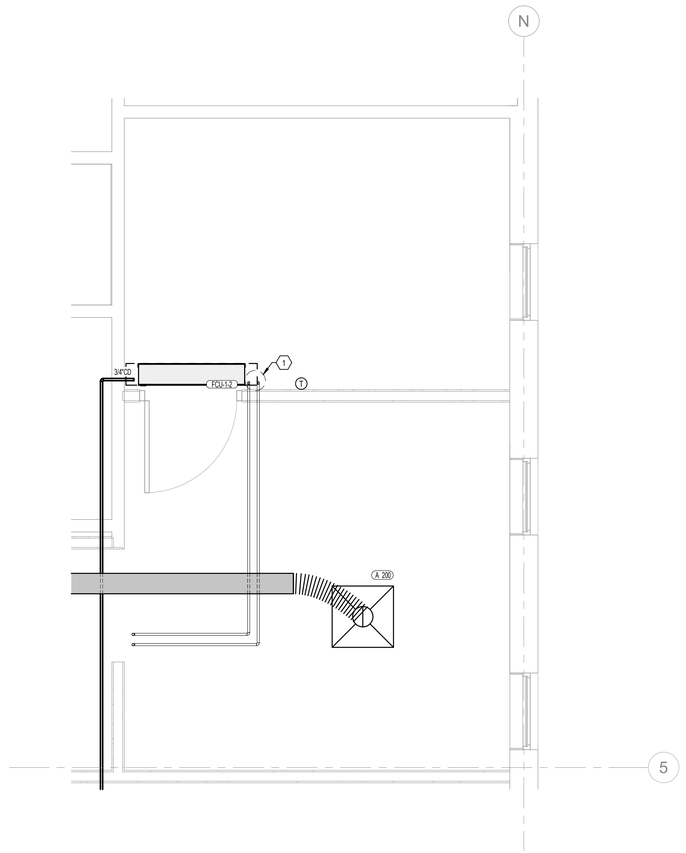
MECHANICAL ROOF PLAN PHASE 1

M-301

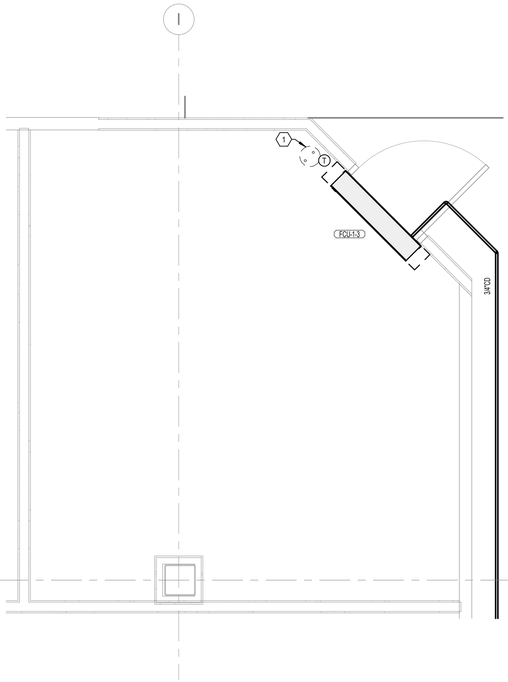
| GENERAL NOTES |
|---|
| 1. EXISTING CONDITIONS ARE BASED ON TLC SITE VISITS AND EXISTING DRAWINGS DATED 06-12-2023. |

## KEYNOTES

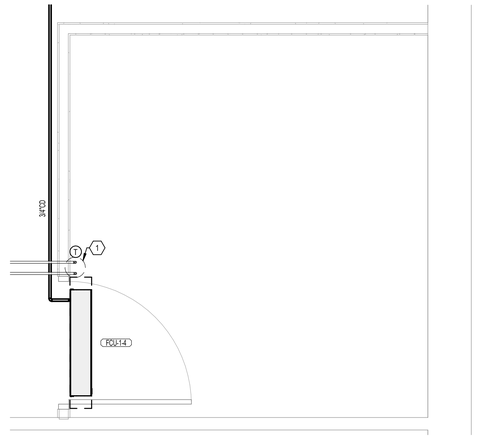
| | |
|---|---|
| 1 | SIZE REFRIGERANT LINES PER MANUFACTURER'S RECOMMENDATIONS BASED ON ACTUAL ROUTING. |




3 MECHANICAL ENLARGED IDF ROOM 168
1/2" = 1'-0"




2 MECHANICAL ENLARGED MDF 145
1/2" = 1'-0"




1 MECHANICAL ENLARGED MDF 118
1/2" = 1'-0"

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MECHANICAL ENLARGED PLANS

M-400

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# AIR SIDE SYSTEM CONTROL DIAGRAM LEGEND

| | |
|---|---|
| AI | ANALOG INPUT |
| AO | ANALOG OUTPUT |
| BI | BINARY/DIGITAL INPUT |
| BO | BINARY/DIGITAL OUTPUT |
| AFMS | AIR FLOW MEASURING STATION |
| BAS | BUILDING AUTOMATION SYSTEM |
| DM | DAMPER MOTOR |
| DPS | DIFFERENTIAL PRESSURE SWITCH |
| DPT | DIFFERENTIAL PRESSURE TRANSDUCER |
| ERU | ENERGY RECOVERY UNIT |
| FZ | FREEZESTAT |
| HS | HUMIDITY SENSOR |
| NC | NORMALLY CLOSED |
| NO | NORMALLY OPEN |
| SD | SMOKE DETECTOR |
| SHS | SPACE HUMIDITY SENSOR |
| SPS | STATIC PRESSURE SWITCH |
| STS | SPACE TEMPERATURE SENSOR |
| TS | TEMPERATURE SENSOR |

| | |
|---|---|
| | DIFFERENTIAL PRESSURE SWITCH (DPS) OR TRANSMITTER (DPT) |
| | AVERAGING TEMPERATURE SENSOR |
| | PROBE TYPE TEMPERATURE SENSOR |
| | HUMIDITY SENSOR |
| | TWO-WAY CONTROL VALVE |
| | THREE-WAY CONTROL VALVE |
| | DUCT MOUNTED SMOKE DETECTOR |
| | MOTORIZED DAMPER AND ACTUATOR |
| SD | SMOKE DAMPER AND ACTUATOR |
| | STARTER DISCONNECT |
| | DISCONNECT |
| | FAN |

| | |
|---|---|
| D / X | DIRECT EXPANSION COIL |
| E / H | HEATING ELECTRIC COIL |
| | AIRFLOW DIRECTION (BREAK INDICATES SEPARATION FROM AHU.) |
| VFD | VARIABLE FREQUENCY DRIVE |
| EDH | ELECTRIC DUCT HEATER |
| | INTERLOCK RELAY |
| R | RELAY |
| | AIR FLOW MEASUREMENT STATION |
| | CURRENT SWITCH (CS) W/ HIGH AND LOW CURRENT SETTINGS OR TRANSMITTER (CT) |
| P / M | POWER MONITOR |
| | CABLE OR WIRE |
| | END SWITCHES |
| | AIR FILTER |
| | WALL-MOUNTED THERMOSTAT/TEMP. SENSOR HUMIDITY SENSOR, CO2 SENSOR, ETC. AS NOTED |

GENERAL CONTROL NOTES:

1. SET-POINTS, RESET SCHEDULES AND DEAD BANDS SHALL BE USER ADJUSTABLE.
2. ALL INPUTS AND OUTPUTS SHALL BE TRENDED LOCALLY.
3. ALL PROCESS VARIABLES, I/O, AND EQUIPMENT, SHALL HAVE LOCAL ALARMS AND NOTIFICATION UPON FAILURE OR NON STANDARD OPERATING CONDITIONS.

SCHEDULE OF TEMPERATURE SETPOINTS (ADJUSTABLE)

| ZONE TYPE | OCCUPIED | | UNOCCUPIED | |
|---|---|---|---|---|
| | COOLING | HEATING | COOLING | HEATING |
| CONDITIONED OCCUPIED SPACES | 75 °F | 68 °F | 80 | 58 |

# CONTROLS GENERAL NOTES

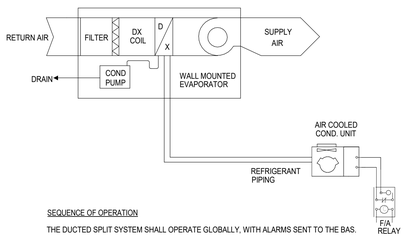
1. GENERAL NOTES ARE APPLICABLE AS STATED BELOW OR EXCEPT WHERE SPECIFICALLY INDICATED ON THE CONSTRUCTION DOCUMENTS.
2. THE EXISTING FACILITY IS TO IMPLEMENT NEW BAS.
3. WORK AND MATERIALS SHALL CONFORM TO THE LATEST REQUIREMENTS OF ASHRAE GUIDELINE 36, FLORIDA BUILDING CODES - EIGHTH EDITION AND OTHER APPLICABLE AND APPROPRIATE CODES, STANDARDS AND GUIDELINES.
4. FURNISH ELECTRICAL MATERIALS AND CONTROL EQUIPMENT PER THE "NATIONAL ELECTRICAL CODE". ALLOW REQUIRED WORKING SPACE PER THE "NATIONAL ELECTRICAL CODE".
5. ELECTRICAL EQUIPMENT (AC AND DC) SHALL HAVE APPLICABLE U.L. OR ETL. LABEL.
6. REFER TO THE GENERAL CONDITIONS OF THE PROJECT SPECIFICATIONS FOR RESTRICTIONS OF THE NEW AND RENOVATED WORK.
7. VERIFY SITE CONDITIONS AND COORDINATE WITH OTHER WORK. CONFIRM SUBMITTAL REVIEW COMMENTS PRIOR TO PROCEEDING WITH INSTALLATION.
8. PRIOR TO THE START OF WORK, FIELD VERIFY EXACT LOCATIONS OF MECHANICAL AND ELECTRICAL EQUIPMENT, FIELD SENSORS, AND EQUIPMENT REQUIRING INTERFACE WITH CONTROLS.
9. SINGLE LINE DIAGRAMS, SCHEMATICS, DETAILS AND CONDUIT PATHS ARE CONCEPTUAL AND ILLUSTRATE THE FUNCTIONAL RELATIONSHIPS AMONG SYSTEM COMPONENTS. ACCORDINGLY, BUILDING CONTROL APPLICATION ENGINEERING IS REQUIRED TO ACHIEVE THE SPECIFIED REQUIREMENTS.
10. OUTDOOR CONDUIT FITTINGS, CONNECTIONS, JUNCTION BOXES, PANELS AND PULL BOXES ARE TO BE WATERPROOF AND CORROSION RESISTANT (NEMA 4X). EXTERIOR CONTROL DEVICES AND EQUIPMENT SHALL BE WEATHERPROOF.
11. CONDUIT ROUTINGS ARE SHOWN DIAGRAMMATICALLY. PROVIDE ANY ADDITIONAL CONDUITS AS REQUIRED TO ACCOMMODATE FIELD CONDITIONS.
12. REFER TO DIVISION 26 FOR ELECTRICAL COMPONENT PRODUCT STANDARDS.
13. PANELS TO HAVE LOCKING DOORS AND BE KEYED ALIKE.
14. BUILDING CONTROLS CONTRACTOR SHALL FULLY INTEGRATE THE EXISTING CONTROLS WITH THE NEW EQUIPMENT. BUILDING CONTROLS CONTRACTOR SHALL PROVIDE ALL NECESSARY COMMISSIONING SUPPORT TO DEMONSTATE A COMPLETE AND FULLY FUNCTIONAL SYSTEM.
15. COORDINATE SHOP DRAWINGS WITH OTHER TRADES, INDICATING LOCATIONS OF LIGHT FIXTURES, CABLE TRAYS, BEAMS, ELECTRICAL AND DATA CONDUITS, WIRING AND OTHER RELATED ITEMS.
16. REVIEW SPECIFICATIONS FOR WORK REQUIREMENTS.
17. CONTROLS CONTRACTOR TO REVIEW ALL EQUIPMENT QUANTITIES WITH MECHANICAL, ELECTRICAL AND PLUMBING PLANS.
18. EMERGENCY POWER TO SERVE CONTROLS ON EQUIPMENT SERVED BY EMERGENCY POWER.
19. ALL INPUTS, OUTPUTS, SET-POINTS AND DEADBANDS SHALL HAVE GRAPHIC INDICATION.
20. ALL EQUIPMENT SHALL HAVE INDEPENDENT EQUIPMENT GRAPHIC PAGES WITH DYNAMIC LINKS.
21. CONTROLS GRAPHICS PACKAGE SHALL INCLUDE FLOORPLANS WITH DYNAMIC GRAPHIC LINKS TO RESPECTIVE EQUIPMENT GRAPHIC PAGES. CONTROLS GRAPHICS PACKAGES SHALL ALSO INCLUDE, BUT NOT BE LIMITED TO, OVERALL SITE PLAN, OVERALL FLOOR PLANS AND ENLARGED FLOOR PLANS WITH DYNAMIC GRAPHIC LINKS.
22. SET-POINTS, RESET SCHEDULES AND DEAD BANDS SHALL BE USER ADJUSTABLE.
23. ALL INPUTS AND OUTPUTS SHALL BE TRENDED.
24. ALL PROCESS VARIABLES AND EQUIPMENT SHALL HAVE ALARMS AND NOTIFICATION UPON FAILURE OR NON STANDARD OPERATING CONDITIONS.
25. SOFTWARE LICENSING AND MAINTENANCE WILL BE PROVIDED FOR A PERIOD OF 10 YEARS FROM THE DATE OF SUBSTANTIAL COMPLETION OR FINAL COMMISSIONING TEST APPROVAL WHICHEVER IS LATER AT NO ADDITIONAL COSTS TO THE OWNER. THESE COST WILL BE PART OF THE BASE BID.

# CONTROLS CABLE SCHEDULE

| FUNCTION | TYPE |
|---|---|
| 10/100 MBAUD ETHERNET CABLE (TIER 1 LAN), CATEGORY 5e 4 PAIR, 24 AWG, SOLID, 100% SHIELD, NON-PLENUM 15 pF/ft, 300 V RMS. | BELDEN 1533R OR EQUAL |
| 10/100 MBAUD ETHERNET CABLE (TIER 1 LAN), CATEGORY 5e 4 PAIR, 24 AWG, SOLID, 100% SHIELD, PLENUM 15 pF/ft, 300 V RMS. | BELDEN 1533P OR EQUAL |
| BACNET MTSP CABLE (TIER 2 LAN), RS-485 1 PAIR, 24 AWG, STRANDED, 100% SHIELD, NON-PLENUM 12.8 pF/ft, 300 V RMS, 120 IMPEDANCE. | BELDEN 9841 OR EQUAL |
| BACNET MTSP CABLE (TIER 2 LAN), RS-485 1 PAIR, 24 AWG, STRANDED, 100% SHIELD, NON-PLENUM 12 pF/ft, 300 V RMS, 120 IMPEDANCE. | BELDEN 89841 OR EQUAL |
| 1 PAIR, 18 AWG, WITH SHIELD, I/O CABLE, NON-PLENUM RATED | BELDEN 8760 OR EQUAL |
| 1 PAIR, 18 AWG, WITH SHIELD, I/O CABLE, PLENUM RATED | BELDEN 88760 OR EQUAL |
| 1 PAIR, 18 AWG, NO SHIELD, I/O CABLE, NON-PLENUM RATED | BELDEN 9740 OR EQUAL |
| 1 PAIR, 18 AWG, NO SHIELD, I/O CABLE, PLENUM RATED | BELDEN 82740 OR EQUAL |
| 3 CONDUCTOR, 18 AWG, WITH SHIELD, I/O CABLE, NON-PLENUM RATED | BELDEN 88770 OR EQUAL |
| 3 CONDUCTOR, 18 AWG, WITH SHIELD, I/O CABLE, PLENUM RATED | BELDEN 8770 OR EQUAL |
| 3 CONDUCTOR, 18 AWG, NO SHIELD, I/O CABLE, NON-PLENUM RATED | BELDEN 83653 OR EQUAL |
| 3 CONDUCTOR, 18 AWG, NO SHIELD, I/O CABLE, PLENUM RATED | BELDEN 8791 OR EQUAL |
| | |

# CONTROLS SCOPE OF WORK MATRIX

| WORK SCOPE | DIVISION 23 - MECHANICAL | DIVISION 26 | DIVISION 23 - CONTROLS | NOTES/COMMENTS |
|---|---|---|---|---|
| 120VAC/1PH/60~ WITH GROUND EMERGENCY POWER TO CONTROLS DEVICES AND CONTROLLERS | | POWER TO CONTROLS DEVICES, ENCLOSURES AND DAMPERS. (CONDUIT, WIRE, CIRCUIT BREAKER) | PROVIDE AND MOUNT U.L. APPROVED CONTROLS TRANSFORMERS IN ENCLOSURE WITH CLASS II TRANSFORMERS | CONTROLS CONTRACTOR TO COORDINATE CONTROL VOLTAGES OF DAMPERS AND ACTUATORS. CONTROLS CONTRACTOR TO PROVIDE 120VAC CONDUIT AND WIRE NOT INDICATED ON ELECTRICAL DRAWINGS |
| 120VAC/1PH/60~ WITH GROUND POWER (NORMAL OR E. POWER) TO ZONE TERMINAL UNIT CONTROLLERS | | | PROVIDE CONDUIT AND WIRE TO CONTROL PANELS | MUST INCLUDE GROUND WIRE |
| 120VAC/1PH/60~ WITH GROUND EMERGENCY POWER TO BAS CONTROLLERS/ENCLOSURES (FCU'S, AHU'S, PLANT, TOWER, ETC.) AND FILE SERVER(S) AND WORKSTATIONS | | PROVIDE ALL CONDUIT, WIRE, AND CIRCUIT BREAKER | PROVIDE UPS AND CONFIGURATION | |
| ZONE TERMINAL UNITS | PROVIDE FLOW CROSS, ENCLOSURE, SHIPPING. | | PROVIDE CONTROLLER SHIPPING TO BOX MANUFACTURER FOR MOUNTING | MOUNTING FEES BY BOX MANUFACTURER |
| TIER 1 BACNET TCP/IP CABLE | | | PROVIDE CABLE, CONDUIT, CONNECTORS, TERMINATIONS, ETC. | |
| FILE SERVERS, WORK-STATIONS, HUBS, PRINTERS, CABLES, UPS | | | PROVIDE FILE SERVER(S), WORKSTATIONS, HUBS, PRINTERS, MONITORS, CABLES. SOFTWARE INSTALLATION AND CONFIGURATION (APPLICATION SPECIFIC) | MUST CONFORM TO OWNERS IT EQUIPMENT STANDARD |
| TIER 2 BACNET MS/TP CABLE | | | PROVIDE CABLE, CONDUIT, TERMINATIONS | |
| PERIPHERAL DEVICES - AS APPLICABLE (SUPPLIED) | FLOW CONTROL DAMPERS<br>TEMPERATURE CONTROL DAMPERS<br>AIR HANDLING UNIT BASED AIR FLOW METERS/STATIONS<br>BOILER FUEL FLOW METERS AND TRANSMITTERS<br>HIGH PRESSURE/LOW PRESSURE<br>COMBINATION SMOKE/FIRE DAMPERS WITH OPEN & CLOSED STATUS SWITCHES<br>TEMPERATURE INDICATION (GAUGES)<br>PRESSURE INDICATION (GAUGES)<br>DIFFERENTIAL PRESSURE INDICATION (GAUGES)<br>DUCT SMOKE DETECTORS | 3 PHASE MOTOR STARTERS, DISCONNECTS | CHILLED WATER FLOW METERS AND FLOW TRANSMITTERS<br>HOT WATER FLOW METERS AND FLOW TRANSMITTERS<br>AIR HANDLING UNIT BASED AIR FLOW TRANSMITTERS<br>FLOW CONTROL DAMPER ACTUATORS<br>TEMPERATURE CONTROL DAMPER ACTUATORS<br>TEMPERATURE SWITCHES<br>TEMPERATURE ELEMENTS<br>TEMPERATURE TRANSMITTERS AND THERMOWELLS<br>PRESSURE TRANSMITTERS<br>DIFFERENTIAL PRESSURE TRANSMITTERS<br>FLOW CONTROL VALVES<br>TEMPERATURE CONTROL VALVES<br>CURRENT SENSORS AND SWITCHES<br>PROVIDE: CONDUIT AND WIRE TERMINATIONS FOR FLOW SWITCHES AND DIFFERENTIAL PRESSURE TRANSMITTERS FOR THE FOLLOWING EQUIPMENT: DOMESTIC WATER BOOSTER STATIONS<br>PROVIDE: CONDUIT AND WIRE TERMINATIONS FOR COOLING TOWER VIB SW<br>PROVIDE CONTROL CONDUIT, WIRE, AND WIRING TERMINATIONS FOR CHEMICAL FEED SYSTEMS<br>PROVIDE WIRE TERMINATIONS FOR FIRE LIFE SAFETY SHUTDOWN/INTERLOCK WIRING. COORDINATE WITH FA. | |
| SYSTEM INTERFACES - AS APPLICABLE (GATEWAYS) | VFD'S (BACNET) | | FIRE LIFE SAFETY-GATEWAY<br>LIGHTING CONTROLS - GATEWAY | |




SEQUENCE OF OPERATION

THE DUCTED SPLIT SYSTEM SHALL OPERATE GLOBALLY, WITH ALARMS SENT TO THE BAS.

ALARM:
HIGH TEMPERATURE - TEMPERATURE READING MORE THAN 3-DEGREES F ABOVE SETPOINT THAN 10 MINUTES.
CONDENSATE FLOAT SWITCH TRIP.

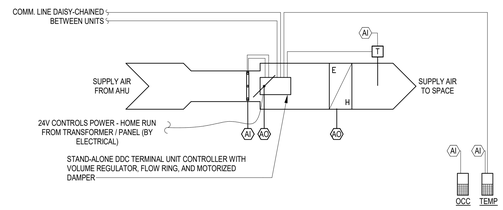
THE SUPPLY FAN AND CONDENSING UNIT SHALL SHUT DOWN WHENEVER ANY AUTOMATIC OR MANUAL FIRE ALARM DEVICE IS PLACED INTO ALARM BY THE BUILDING FIRE ALARM CONTROL PANEL. UPON FIRE ALARM PANEL BEING RESET TO NORMAL OPERATION, THE SYSTEM SHALL AUTOMATICALLY RESUME SCHEDULED OPERATION. THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY DURING NORMAL OPERATION.

SPACE TEMPERATURE TO BE CONTROLLED THROUGH A MICROPROCESSOR CONTROL SYSTEM W/REMOTE MOUNTED SPACE TEMPERATURE SENSOR.

UPON ACTIVATION OF CONDENSAT FLOAT SWITCH, THE SUPPLY FAN AND CONDENSING UNIT SHALL SHUT DOWN AND AN ALARM BE SENT TO THE BAS

## DX FCU
No Scale

**3**




| SETPOINTS | | |
|---|---|---|
| **POINT NAME** | **VALUE** | **NOTES** |
| COOLING SPACE TEMP | 75°F | OCCUPANT ADJ. |
| HEATING SPACE TEMP | 68°F | OCCUPANT ADJ. |
| HEATING AIRFLOW | - | REFER TO SCHEDULE |
| MAX AIRFLOW | - | REFER TO SCHEDULE |
| OCCUPIED MIN AIRFLOW | - | REFER TO SCHEDULE |
| MAX SUPPLY AIR TEMP | 95°F | ADJ. |
| UNOCC. COOLING SPACE TEMP | 80°F | ADJ. |
| UNOCC. HEATING SPACE TEMP | 58°F | ADJ. |
| MIN SPACE RH | 20% | ADJ. |
| MAX SPACE RH | 60% | ADJ. |
| MAX SPACE CO2 | 1000 PPM | ADJ. |

A. GENERAL
PRESSURE INDEPENDANT VARIABLE AIR VOLUME CONTROL TO MAINTAIN SPACE TEMPERATURE SETPOINT. SETPOINTS SHALL RESET BASED ON ZONE OCCUPANCY. OCCUPIED/UNOCCUPIED SIGNAL SHALL BE BASED ON EITHER A SPACE SENSOR, OR TIME OF DAY SCHEDULE. SPACE HUMIDITY AND CO2 SENSORS ARE FOR MONITORING PUPOSES ONLY. REFER TO FLOOR PLANS FOR WHICH SPACES REQUIRED HUMIDTY AND/OR CO2 MONITORING.

B. OCCUPIED MODE
VAV CONTROLLER SHALL MODULATE DAMPER POSITION TO MAINTAIN AIRFLOW BETWEEN MAX AIRFLOW AND OCCUPIED MINIMUM AIRFLOW IN ORDER TO MAINTAIN COOLING SPACE TEMP SETPOINT.

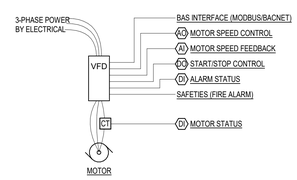
IF THE BOX IS AT MINIMUM AIRFLOW AND THE SPACE TEMPERATURE FALLS BELOW HEATING SPACE TEMP SETPOINT, THE SUPPLY AIR TEMPERATURE SHALL INCREASE UNTIL THE SPACE IS SATISFIED, OR UNTIL REACHING MAX SUPPLY AIR TEMP SETPOINT. IF THE SPACE IS STILL UNSATISFIED, AIRFLOW SHALL INCREASE UP TO HEATING AIRFLOW SETPOINT, WHILE MAINTAINING DISCHARGE AIR TEMPERATURE.

C. UNOCCUPIED MODE
IN UNOCCUPIED MODE, CONTROL SHALL OPERATE AS IN OCCUPIED MODE, COOLING SPACE TEMP, HEATING SPACE TEMP SHALL RESET TO THEIR UNOCC. VERSIONS.

| ALARMS | |
|---|---|
| **ALARM TYPE** | **SETPOINT** |
| HIGH SUPPLY AIRFLOW | >110% SP |
| LOW SUPPLY AIRFLOW | <90% SP |
| HIGH SPACE TEMPERATURE | SP + 3°F |
| LOW SPACE TEMPERATURE | SP - 3°F |
| HIGH SUPPLY AIR TEMPERATURE | >110% SP |
| LOW SUPPLY AIR TEMPERATURE | <90% SP |
| HIGH SPACE RH | >110% SP |
| LOW SPACE RH | <90% SP |
| HIGH SPACE CO2 | 1000 PPM |
| ALARM WHEN MEASURED VALUES EXCEED SETPOINTS FOR 10 MIN (ADJ.). | |

## VAV BOX - ELECTRIC REHEAT
No Scale

**2**




## VARIABLE FREQUENCY DRIVE
No Scale

**1**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| Comm. No: | 23106.01 |
| Date: | 8/15/2025 |
| Drawn by: | KBH |
| Checked by: | TNT |

Revisions

| No. | Date | Revision Description |
|---|---|---|

This item has been digitally signed and sealed by Peter A. Makris, PE on the date adjacent to the seal.


Signature must be verified on all electronic versions.

MECHANICAL CONTROLS

M-500


FILE PATH: Autodesk Docs://HillsbCSO_23106.01_Training Academy/7241041_HCSO_MEP_R23.rvt
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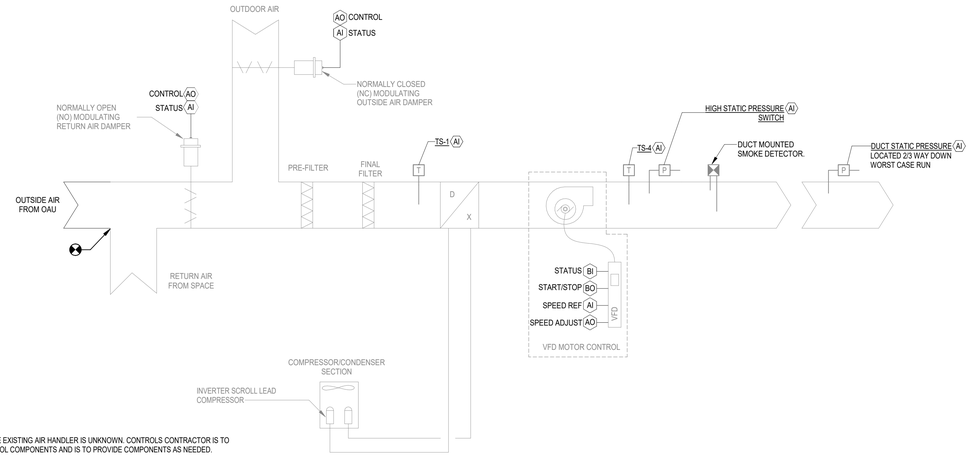



THE EXTENT OF THE CONTROLS IN THE EXISTING AIR HANDLER IS UNKNOWN. CONTROLS CONTRACTOR IS TO VERIFY EXISTING AIR HANDLER CONTROL COMPONENTS AND IS TO PROVIDE COMPONENTS AS NEEDED.

A. GENERAL
THIS UNIT IS A VARIABLE AIR VOLUME-SINGLE PATH FAN SYSTEM WITH SUPPLY FAN, DX COOLING COIL, FILTERS, OUTSIDE AND RETURN AIR MOTORIZED DAMPERS, AIR COOLED CONDENSING UNIT.

B. OCCUPIED MODE (24-7 OPERATION)
THE UNIT SHALL RECEIVE A RUN SIGNAL FROM THE SYSTEM TO OPERATE DURING OCCUPIED HOURS TO MAINTAIN DESIGN SUPPLY AIRFLOWS. UNIT SHALL DE-ENERGIZE UPON CALL FOR UNOCUPIED MODE.

C. SUPPLY FAN CONTROL
UNIT FANS SHALL BE AUTOMATICALLY ENABLED BY THE UNIT CONTROLLER START/STOP RELAY WHEN IN "AUTO" POSITION AT THE FAN VFDS OR MANUALLY WHEN IN "HAND". WHEN SCHEDULED "ON" VIA THE UNIT CONTROLLER, THE VARIABLE FREQUENCY DRIVES (VFD) SHALL BE ENERGIZED AND THE SUPPLY FANS SHALL RUN CONTINUOUSLY. UPON PROOF OF FAN OPERATION (VIA THE AIR DIFFERENTIAL PRESSURE SWITCH), THE CONTROLS SHALL BE ENABLED.

D. COOLING COIL CONTROL
COOLING COIL OPERATING SEQUENCE: MONITOR COOLING COIL DISCHARGE AIR TEMPERATURE SENSOR FOR CONTROL OF THE DX COOLING COIL. THROUGH A SEPARATELY ADJUSTABLE PID ALGORITHM, MODULATE THE COMPRESSORS TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT 53 DEG F (ADJUSTABLE). AS THE TEMPERATURE DROPS BELOW SETPOINT THE COMPRESSORS SHALL MODULATE TOWARD THEIR MINIMUM SPEED. SHOULD THE SUPPLY AIR SENSOR FAIL, DRIVE THE COMPRESSORS TO FULL COOLING SPEED. IF THE RTU REACHES MINIMUM COOLING AIRFLOW AND THE SPACE CONTINUES TO BE OVERCOOLED, THE COOLING COIL LAT SHALL BE RESET UPWARD BY TWO DEGREES. IF AFTER FIVE MINUTES (ADJUSTABLE) THE SAME CONDITION EXISTS, THE COOLING COIL DISCHARGE TEMPERATURE SHALL BE INDEXED UPWARD ANOTHER TWO DEGREES. IF THE AMBIENT OUTSIDE AIR TEMPERATURE IS GREATER THAN 55 DEGREES F (ADJUSTABLE), THIS WILL CONTINUE UNTIL THE LEAVING AIR TEMPERATURE IS AT A MAXIMUM OF 58 DEGREES F (ADJUSTABLE). IF THE AMBIENT OUTSIDE AIR TEMPERATURE IS LESS THAN 55 DEGREES F (ADJUSTABLE) THEN THE COOLING COIL SHALL BE ALLOWED TO SHUT DOWN.

E. HUMIDITY CONTROL
WHEN THE SPACE HUMIDITY RISES ABOVE 60% RH (ADJUSTABLE) FOR 5 MINUTES (ADJUSTABLE), MODULATE THE SUPPLY AIR COOLING COIL TO 100%. THE VAV TERMINAL UNIT ELECTRIC HEATING COILS SHALL ENERGIZE AND MODULATE TO MAINTAIN SPACE TEMPERATURE SETPOINT. WHEN THE SPACE HUMIDITY FALLS BELOW THE SPACE SETPOINT OF 50% RH (ADJUSTABLE) FOR 5 MINUTES (ADJUSTABLE), NORMAL OPERATION CAN RESUME. THE HUMIDITY CONTROL SEQUENCE SHALL TAKE PRECEDENCE OVER THE COOLING SEQUENCE.

F. DUCT STATIC PRESSURE RESET
THE SYSTEM WILL RESET THE STATIC PRESSURE SETPOINT SO THAT 1 TERMINAL BOX DAMPER IS ALWAYS 95% OPEN. THE SYSTEM WILL POLL TERMINAL BOX DAMPER POSITION EVERY 5 MINUTES (ADJ.) IF ALL BOXES ARE <95%, DUCT STATIC PRESSURE SETPOINT WILL BE REDUCED BY 0.05" (ADJ) TO MIN DUCT STATIC PRESSURE SETPOINT. IF ANY ONE TERMINAL BOX IS AT 100% OR TWO OR MORE ARE AT 95%, THE SETPOINT WILL BE INCREASED BY 0.10" (ADJ).

G. OUTSIDE AIR CONTROL
CLOSE OUTSIDE AIR DAMPER ON EXISTING RTU-4. RETURN AIR DAMPER ON EXISTING RTU-4 SHALL REMAIN OPEN DURING OPERATION.

ALARMS
a. HIGH AND LOW STATIC PRESSURE SWITCHES SHALL SHUT DOWN UNIT AND SHALL BE MANUALLY RESET AND NOT INTERFACED W/ THE UNIT CONTROLLER.

LIFE SAFETY:
a. A SMOKE DETECTOR IN THE SUPPLY DUCT SHALL AUTOMATICALLY SHUT DOWN THE UNIT.
b. ON ACTIVATION OF THE FIRE ALARM RELAY THE UNIT SHALL SHUT DOWN AND CLOSE ALL THE SYSTEMS FIRE/SMOKE DAMPERS.

| SETPOINTS | | |
|---|---|---|
| POINT NAME | VALUE | NOTES |
| OA MIN AIRFLOW | SCHEDULE | ADJ. |
| OA MAX AIRFLOW | SCHEDULE | ADJ. |
| MAX RA HUMIDITY | 60% RH | ADJ. |
| TS-4 | 55°F | ADJ. |
| MIN TS-4 | 49°F | ADJ. |
| MAX TS-4 | 60°F | ADJ. |
| MIN SAT RESET ENABLE | 57°F | ADJ. |
| MAX SAT RESET ENABLE | 59°F | ADJ. |
| MIN DUCT STATIC PRESSURE | 0.25" W.G. | ADJ. |

| MODES OF OPERATION | | | | |
|---|---|---|---|---|
| MODE | OA DAMPER | RA DAMPER | COMPRESSOR | SUPPLY FANS |
| NORMAL (OCCUPIED) | CLOSED | OPEN | STAGED | MODULATING |
| MAINTENANCE SHUTDOWN | CLOSED | OPEN | OFF | OFF |
| FIRE ALARM | CLOSED | CLOSED | OFF | OFF |
| HIGH/LOW STATIC SHUTDOWN | CLOSED | OPEN | OFF | OFF |

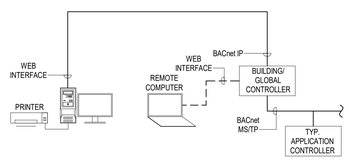
NOTE: REFER TO OAU SCHEDULE FOR EXHAUST FAN INTERLOCKS

| ALARMS | | |
|---|---|---|
| ALARM TYPE | SETPOINT | NOTES |
| SUPPLY FAN FAILURE | - | - |
| HIGH STATIC PRESSURE SAFETY | 4" W.G. | MANUAL RESET |
| LOW STATIC PRESSURE SAFETY | -4" W.G. | MANUAL RESET |
| EXHAUST FAN FAILURE | - | - |
| HIGH SUPPLY AIR TEMPERATURE | 68°F | - |
| LOW SUPPLY AIR TEMPERATURE | 40°F | - |
| ENERGY WHEEL FAILURE | - | - |

ALARM WHEN MEASURED VALUES EXCEED SETPOINTS FOR 10 MIN (ADJ).

## EXISTING RTU-4 CONTROL DIAGRAM
No Scale

1



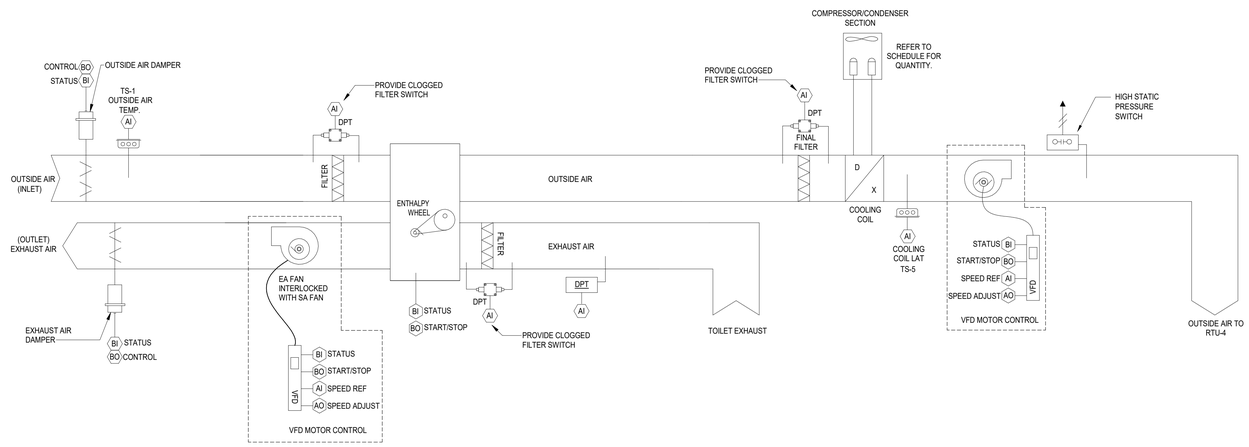

SYSTEM SHALL BE A NATIVE BACnet OPEN PROTOCOL SYSTEM.

PROVIDE GRAPHICS FOR FLOOR PLANS, FOR MECHANICAL EQUIPMENT, PROVIDE A QUICK-LOOK SCREEN FOR AN "AT A GLANCE VIEW" FOR ALL EQUIPMENT.

NETWORK AREA CONTROLLER SHALL BE LICENSED TO HANDLE A MINIMUM OF 100 NODES TO ALLOW CONNECTION TO FUTURE BACnet REPLACEMENT CONTROLLERS. ALL GRAPHICS ARE HELD IN NETWORK AREA CONTROLLER AND A COPY OF THE FINAL DATABASE WILL BE HANDED OVER TO THE OWNER UPON COMPLETION.

## CONTROL SYSTEM NETWORK ARCHITECTURE DIAGRAM
No Scale

3




OAU ENERGY RECOVERY VENTILATOR CONTROL SEQUENCE:
A. GENERAL: THIS UNIT IS A PACKAGED DX CONSTANT VOLUME FAN SYSTEM. WITH ONE SUPPLY FAN, ONE EXHAUST FAN, VARIABLE CAPACITY SCROLL COMPRESSORS, COOLING COIL, AND INTEGRAL ENERGY RECOVERY ENTHALPY CORE, SUPPLYING COOLING VENTILATION AIR DIRECTLY TO EXISTING RTU-4
a. OAU FANS SHALL BE AUTOMATICALLY ENABLED BY THE UNIT CONTROLLER START/STOP RELAY. WHEN SCHEDULED "ON" VIA PRESET SCHEDULE THROUGH THE BAS, THE SUPPLY AND EXHAUST FANS SHALL BE ENERGIZED AND THE FANS SHALL RUN CONTINUOUSLY. UPON PROOF OF FAN OPERATION (VIA THE AIR DIFFERENTIAL PRESSURE SWITCH), THE CONTROLS SHALL BE ENABLED.
B. FAN OPERATION: FANS SHALL RUN CONTINUOSLY DURING OCCUPIED HOURS TO MAINTAIN DESIGN SUPPLY AND EXHAUST AIRFLOWS. FANS SHALL DE-ENERGIZE, THEN OUTSIDE AIR AND EXHAUST AIR DAMPERS CLOSE UPON CALL FOR UNOCUPIED MODE.
C. COOLING COIL OPERATING SEQUENCE: MONITOR COOLING COIL LAT FOR CONTROL OF THE DX COOLING COIL. THROUGH A SEPARATELY ADJUSTABLE PID ALGORITHM, MODULATE THE COMPRESSORS TO MAINTAIN THE COOLING COIL DISCHARGE AIR TEMPERATURE AT 52 DEG. F (ADJUSTABLE). AS THE TEMPERATURE DROPS BELOW SETPOINT THE COMPRESSORS SHALL MODULATE TOWARD THEIR MINIMUM SPEED. SHOULD THE COOLING COIL LAT SENSOR FAIL, DRIVE THE COMPRESSORS TO FULL COOLING SPEED. IF THE AMBIENT OUTSIDE AIR TEMPERATURE IS LESS THAN 55 DEGREES F (ADJUSTABLE) THEN THE COOLING COIL SHALL BE ALLOWED TO SHUT DOWN.
D. ENERGY RECOVERY: DURING OCCUPIED MODE, THE OA AND EA FANS SHALL RUN CONTINUOUSLY AND ENTHALPY WHEEL MOTOR ENERGIZE. FANS AND ENTHALPY WHEEL MOTOR SHALL DE-ENERGIZE, THEN OUTSIDE AIR AND EXHAUST AIR DAMPERS CLOSE UPON CALL FOR UNOCUPIED MODE.
E. OCCUPIED MODE: WHEN THE BUILDING IS SCHEDULED IN "OCCUPIED" MODE. THE SYSTEM SHALL OPERATE CONTINUOUSULY, FOLLOWING THE ABOVE PROCEDURES.
F. UNOCCUPIED/NIGHT SETBACK: WHEN THE BUILDING IS SCHEDULED TO BE UNOCCPIED, THE UNIT SHALL DE-ENERGIZE AND THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL CLOSE.
G. HIGH AND LOW STATIC PRESSURE SWITCHES SHALL SHUT DOWN UNIT AND SHALL BE MANUALLY RESET. PRESSURE SWITCHES SHALL HAVE CONTACTS TO REPORT TO OPERATOR HIGH OR LOW STATIC PRESSURE TRIP.
H. ENTHALPY WHEEL ABLE/DISABLE MODEL: THE WHEEL SHALL OPERATE WHEN THE OUTSIDE AIR AMBIENT TEMPERATURE IS ABOVE 75 DEGREES F. (ADJ.) OR BELOW 50 DEGREES F (ADJ.). THE WHEEL MOTOR SHALL NOT OPERATE WHEN THE OUTSIDE AIR AMBIENT TEMPERATURES ARE BETWEEN 51 AND 75 DEGREES F (ADJ.).

## DOAS AHU WITH INTEGRAL ENERGY RECOVERY VENTILATOR DIAGRAM

2

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|---|---|
| Comm. No: | 23106.01 |
| Date: | 8/15/2025 |
| Drawn by: | KBH |
| Checked by: | TNT |

Revisions

| No. | Date | Revision Description |
|---|---|---|

This item has been digitally signed and sealed by Peter A. Makris, PE on the date adjacent to the seal.

PETER A. MAKRIS LICENSE No. 96819 STATE OF FLORIDA PROFESSIONAL ENGINEER

Signature must be verified on all electronic versions.

MECHANICAL CONTROLS

M-501

FILE PATH: Autodesk Docs://HillsbCSO_23106.01_Training Academy/723104_HCSO_MEP_R23.rvt
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## OUTSIDE AIR UNIT WITH ENERGY RECOVERY VENTILATOR

| MARK | MODEL NO. | BASIS OF DESIGN MANUDACTURER | ENTHALPY WHEEL DATA | | | | | | | | | | | | | | | | | | | | | | COOLING COIL DATA | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | OUTSIDE AIR DATA | | | | | | | | | | | | EXHAUST AIR DATA | | | | | | | | | | | | | | | | | |
| | | | AIRFLOW (CFM) | FILTERS | | | SUMMER EAT | | SUMMER LAT | | WINTER EAT | | WINTER LAT | | AIRFLOW (CFM) | PRE-FILTERS | | | SUMMER EAT | | SUMMER LAT | | WINTER EAT | | WINTER LAT | | AIR FLOW (CFM) | FILTERS | | | SENSIBLE COOLING CAPACITY (MBH) | TOTAL COOLING CAPACITY (MBH) | REFRIGERANT | EAT | | LAT | |
| | | | | TYPE | EFFICIENCY | DEPTH (IN.) | DB (°F) | WB (°F) | DB (°F) | WB (°F) | DB (°F) | WB (°F) | DB (°F) | WB (°F) | | TYPE | EFFICIENCY | DEPTH (IN.) | DB (°F) | WB (°F) | DB (°F) | WB (°F) | DB (°F) | WB (°F) | DB (°F) | WB (°F) | | TYPE | EFFICIENCY | DEPTH (IN.) | | | | DB (°F) | WB (°F) | DB (°F) | WB (°F) |
| OAU | RNA-020-C-A-3-GAB0C-00000) | AAON | 4,100 | PLEATED | MERV 13 | 2" | 96.0 | 81.9 | 81.7 | 71.7 | 35.0 | 30.0 | 61.2 | 55.1 | 3,500 | PLEATED | MERV 13 | 2" | 75.0 | 65.3 | 91.4 | 78.3 | 75.0 | 65.3 | 43.6 | 40.5 | 4,100 | PLEATED | MERV 13 | 2" | 130 | 248 | R-454B | 81.7 | 71.7 | 52 | 52 |

## AIR DISTRIBUTION SCHEDULE

| MARK | SYMBOL | CFM | NECK SIZE (UNO) | FACE SIZE LENGTH | CONN. SIZE | DESCRIPTION |
|---|---|---|---|---|---|---|
| A | | 000-90<br>91-200<br>201-330<br>331-400<br>401-535<br>536-815 | 6"Ø<br>8"Ø<br>10"Ø<br>12"Ø<br>14"Ø<br>15"Ø | 24x24<br>24x24<br>24x24<br>24x24<br>24x24<br>24x24 | EQUALS NECK SIZE | BASIS OF DESIGN: PRICE ASPD<br>TYPE: PLAQUE FACE<br>MATERIAL: ALUMINUM<br>OPPOSED BLADE DAMPERS: NO<br>MOUNTING: LAY-IN / SURFACE |
| | | 000-90<br>91-175 | 6"Ø<br>8"Ø | 12x12<br>12x12 | | |
| B | 12x12<br>RETURN<br>EXHAUST<br>24x24<br>RETURN<br>EXHAUST<br>48x24<br>RETURN<br>EXHAUST | 000-150<br>155-225<br>230-350<br>355-550<br>555-700<br>705-950<br>955-1250<br>1255-2500 | 8x8 FOR 12x12 MODULES<br>20x20 FOR 24x24 MODULES<br>44x20 FOR 48x24 MODULES | 12x12, 24x24, OR 48x24 AS SHOWN ON PLANS | 6ø<br>8ø<br>10ø<br>12ø<br>14ø<br>16ø<br>18ø<br>24ø | BASIS OF DESIGN: PRICE 630<br>MATERIAL: ALUMINUM<br>OPPOSED BLADE DAMPERS: NO |
| C | SIDEWALL SUPPLY | ALL | REFER TO PLANS | | EQUALS NECK SIZE | BASIS OF DESIGN: PRICE SDG WITH AIR SCOOP<br>MATERIAL: ALUMINUM<br>OPPOSED BLADE DAMPERS: VSC3<br>DOUBLE DEFLECTION, 3/4" BLADE SPACING |
| D | SIDEWALL RETURN/ EXHAUST | ALL | REFER TO PLANS | | EQUALS NECK SIZE | BASIS OF DESIGN: PRICE 630<br>MATERIAL: ALUMINUM<br>OPPOSED BLADE DAMPERS: NO<br>3/4" BLADE SPACING |
| LX | LINEAR SLOT | REFER TO PLANS | 8Ø (UNO) | X = LENGTH (IN FEET) | EQUALS NECK SIZE | BASIS OF DESIGN: PRICE<br>AS215 WITH ASPI (INSULATED PLENUM BOX)<br>MATERIAL: ALUMINUM<br>PLENUM BOX LENGTH TO MATCH "X" DIMENSION IN MARK<br>(1) 1.5" SLOT WITH CONCEALED BORDER |

NOTES:
1. AIR DISTRIBUTION DEVICES LOCATED WITHIN ACOUSTICAL TILE CEILINGS SHALL BE PROVIDED WITH BORDER TYPE 3 FOR LAY-IN MOUNTING. AIR DISTRIBUTION DEVICES LOCATED WITHIN GYPSUM BOARD CEILINGS OR WALLS SHALL BE PROVIDED WITH BORDER TYPE 1 FOR SURFACE MOUNTING. REFER TO ARCHITECTURAL DOCUMENTS FOR CEILING TYPES.
2. AIR DISTRIBUTION DEVICES LOCATED IN SMALL ROOMS WHERE FULL 24"X24" GRID ARE NOT AVAILABLE SHALL BE PROVIDED WITH SURFACE MOUNTING BORDERS IN LIEU OF LAY-IN. SECURE EACH DEVICE TO CEILING GRID WITH FIELD-FABRICATED SUPPORTS.
3. WHERE ROUND DUCT CONNECTIONS ARE INDICATED, PROVIDE AIR DEVICE MANUFACTURER'S SQUARE TO ROUND TRANSITION WITH THE AIR DEVICE IN ACCORDANCE WITH THIS SCHEDULE.
4. SUBMIT COLOR SELECTION CHART TO ARCHITECT FOR SELECTION.

## OUTSIDE AIR UNIT WITH ENERGY RECOVERY VENTILATOR CONTINUED

| OUTSIDE AIR FAN DATA | | | | | | | | EXHAUST FAN DATA | | | | | | | | OPERATING WEIGHT (LBS) | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ESP (IN. W.G.) | TSP (IN. W.G.) | FAN (QTY) | DESIGN SPEED (RPM) | MOTOR (BHP EACH) | MOTOR (HP EACH) | ELECTRICAL (VOLT/PHASE) | VFD | ESP (IN. W.G.) | TSP (IN. W.G.) | FAN (QTY) | DESIGN SPEED (RPM) | MOTOR (BHP EACH) | MOTOR (HP EACH) | ELECTRICAL (VOLT/PHASE) | VFD | | |
| 1.5" | 4.26 | 1 | 1,760 | 5.05 | 7.5 | 460/3 | YES | 1.5" | 2.2 | 1 | 1,479 | 2.01 | 3.0 | 460/3 | YES | 3,537 | 1-24 |

NOTES:
1. PROVIDE FACTORY CUT INTAKE AND DISCHARGE OPENINGS.
2. TOTAL PRESSURE DROP SHALL INCLUDE EXTERNAL PRESSURE DROP SCHEDULED PLUS ACTUAL PRESSURE DROP OF INTERNAL COMPONETS OF UNIT SUBMITED, WITH ALLOWANCE FOR MID-LIFE FILTER PRESSURE DROP.
3. PROVIDE BACKDRAFT DAMPER AT EACH FAN DISCHARGE.
4. FILTER EFFICIENCY BASED ON ASHRAE 52.2 TEST METHOD.
5. PROVIDE CAV/MAU UNIT CONTROLLER WITH BACNET IP OR MSTP. CONTROL TO SUPPLY AIR TEMPERATURE SEPOINT (52-DEGREES F).
6. PROVIDE SUPPLY AND EXHAUST FAN PIEZON RINGS FOR AIRFLOW MONITORING.
7. UNIT SHALL BE ABLE TO TURNDOWN FOR DAY 1 OPERATION, BUT SHALL ALSO BE CAPABLE OF DELIVERING 52-DEGREE TEMPERATURES AT DESIGN CONDITION.
8. ECONOMIZER (FULLY MODULATING ACTUATOR) + POLYMER TOTAL-ENERGY RECOVERY WHEEL.
9. PROVIDE SINGLE POINT CONNECTION.
10. SUPPLY FAN ESP: 1" (WITHOUT RESTROOM AND GYM BUILDOUT), 1.5" (WITH RESTROOM AND GYM BUILDOUT)
11. EXHAUST FAN ESP: 1" (WITHOUT RESTROOM AND GYM BUILDOUT), 1.5" (WITH RESTROOM AND GYM BUILDOUT)
12. DIRTY FILTER ALLOWANCE: 1.5"
13. PROVIDE CLOGGLED FILTER SWITCH.
14. (1) VARIABLE CAPACITY COMPRESSOR + (1) TWO-STEP COMPRESSOR.
15. NO HEAT/HOT GAS REHEAT.
16. 2,500 HOUR SALT SPRAY RATING ON EXTERIOR CABINET.
17. PROVIDE NON-FUSED DISCONNECT SWITCH.
18. FACTORY WIRED CONVENIENCE OUTLET.
19. PROVIDE PHASE AND BROWNOUT PROTECTION.
20. STAINLESS STEEL DRAIN PAN AND CONDENSATE OVERFLOW SWITCH.
21. CONDENSER COIL GUARDS AND ECM CONDENSET FANS FOR HEAD PRESSURE CONTROL (COOLING DOWN TO 35-DEGREE F AMBIENT)
22. VCCX2 UNIT CONTROLLER WITH BACNET IP COMMUNICATION.
23. MINIMUM ISMRE VALUE TO BE 6.08.
24. CAPACITIES SHOWN ARE MINIMUM VALUES. PRESSURE DROPS SHOWN ARE MAXIMUM VALUES.

## DX FAN COIL UNIT SCHEDULE

| PLAN MARK | MODEL | MANUFACTURER | SERVING | ARRANGEMENT | REFRIGERANT | COOLING COIL DATA | | | | | | ELECTRICAL DATA | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | AIR FLOW (CFM) | NOMINAL COOLING CAPACITY (MBH) | EAT | | LAT | | FAN MOTOR (QTY) | MOCP | VOLTS/ PHASE | |
| | | | | | | | | DB (°F) | WB (°F) | DB (°F) | WB (°F) | | | | |
| FCU-1-1 | RNX24AMD | SAMSUNG | ELECTRICAL ROOM 180 | WALL MOUNTED | R-32 | 600 | 21,000 | 80.0 | 67.0 | 55.0 | 54.0 | 1 | 30 | 208/1 | 1-11 |
| FCU-1-2 | RNX24AMD | SAMSUNG | MDF ROOM 168 | WALL MOUNTED | R-32 | 600 | 21,000 | 80.0 | 67.0 | 55.0 | 54.0 | 1 | 30 | 208/1 | 1-11 |
| FCU-1-3 | RNX24AMD | SAMSUNG | MDF ROOM 145 | WALL MOUNTED | R-32 | 600 | 21,000 | 80.0 | 67.0 | 55.0 | 54.0 | 1 | 30 | 208/1 | 1-11 |
| FCU-1-4 | RNX24AMD | SAMSUNG | IDF ROOM 118 | WALL MOUNTED | R-32 | 600 | 21,000 | 80.0 | 67.0 | 55.0 | 54.0 | 1 | 30 | 208/1 | 1-11 |

NOTES:
1. ROUTE CONDENSATE AS SHOWN ON DRAWINGS.
2. PROVIDE INTEGRAL CONDENSATE PUMP.
3. PROVIDE FLOAT SWITCH IN THE AUXILIARY DRAIN PAN TIED INTO THE FAN AND BAS ALARM SHUTDOWN FOR SECONDARY CONDENSATE DRAINAGE SYSTEM.
4. DISCONNECT PROVIDED BY DIVISION 26.
5. PROVIDE REMOVABLE, WASHABLE FILTER SCREEN. CONTRACTOR SHALL REMOVE, WASH, AND REINSTALL FILTER SCREENS AT SUBSTANTIAL COMPLETION.
6. PROVIDE ALL CODE AND MANUFACTURER REQUIRED CLEARANCES.
7. MOUNT THE FAN COIL UNIT TO MEET MANUFACTURER'S INSTALLATION RECOMMENDATIONS AND GUIDELINES.
8. SEE OUTDOOR CONDENSING UNIT SCHEDULE FOR DETAILS REGARDING CONNECTION CAPACITY, OUTDOOR CONDITIONS AND OTHER FACTORS ASSOCIATED WITH CORRECTED CAPACITIES.
9. INDOOR AND OUTDOOR UNITS SHALL BE FROM THE SAME MANUFACTURER.
10. MECHANICAL CONTRACTOR SHALL SIZE REFRIGERANT LINES PER MANUFACTURER'S RECOMMENDATIONS BASED ON ACTUAL ROUTING.
11. AIRFLOW IS BASED ON THE HIGH SPEED SETTING.

## AIR BALANCE

| OUTSIDE AIR | | EHXUAST AIR | | BUILDING PRESSURIZATION |
|---|---|---|---|---|
| OAU | 4,100 | OAU | 3,500 | 600 CFM |

## EXISTING ROOF TOP UNIT (FOR REBALANCING)

| PLAN MARK | SIZE | SUPPLY AIR (CFM) | RETURN AIR (CFM) | OUTSIDE AIR (CFM) | MANUFACTURER | MODEL |
|---|---|---|---|---|---|---|
| (E) RTU-4 | 27.5 | 9,750 | 5,650 | 4,100 | TRANE | TCD330B40-0A1BEBA |

## SPLIT SYSTEM CONDENSING UNIT SCHEDULE

| PLAN MARK | MODEL | MANUFACTURER | SERVING | CAP (TON) | REFRIGERANT TYPE | ELECTRICAL DATA | | | | | WEIGHT (LBS) | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | AMBIENT DBT (F) | FLA | MCA | MOCP | VOLTS/ PHASE | | |
| CU-1-1 | RXX24AMD | SAMSUNG | FCU-1-1 | 2 | R-32 | 95.0 | 1 | 20 | 30 | 208/1 | 150 | 1-3 |
| CU-1-2 | RXX24AMD | SAMSUNG | FCU-1-2 | 2 | R-32 | 95.0 | 1 | 20 | 30 | 208/1 | 150 | 1-3 |
| CU-1-3 | RXX24AMD | SAMSUNG | FCU-1-3 | 2 | R-32 | 95.0 | 1 | 20 | 30 | 208/1 | 150 | 1-3 |
| CU-1-4 | RXX24AMD | SAMSUNG | FCU-1-4 | 2 | R-32 | 95.0 | 1 | 20 | 30 | 208/1 | 150 | 1-3 |

NOTES:
1. ELECTRICAL CONTRACTOR SHALL PROVIDE POWER AND DISCONNECTION MEANS TO UNITS.
2. PROVIDE FIELD-APPLIED "SEA-COAST" BRONZ-GLO OR HERESITE COATING ON CONDENSING COILS.
3. CONDENSING UNIT IS TO BE MOUNTED ON THE ROOF.

## PHASE 1 OUTSIDE AIR CALCULATION

| ZONE NAME AND NUMBER | OCCUPANCY CATEGORY | *ZONE FLOOR AREA, Az (SQFT)* | ZONE POPULATION (PEOPLE) | *PEOPLE OUTDOOR AIR RATE, Rp (CFM PER PERSON)* | PEOPLE BREATHING ZONE OUTDOOR AIRFLOW (CFM) | AREA BREATHING ZONE OUTDOOR AIRFLOW Ra (CFM/SQF.) | *TOTAL BREATHING ZONE OUTDOOR AIRFLOW, Vbz (CFM)* |
|---|---|---|---|---|---|---|---|
| MAT ROOM 1 | HEALTH CLUB/AEROBICS ROOM | 1578 | 30 | 20 | 600 | 0.06 | 694.7 |
| CORRIDOR 100 T | CORRIDORS | 368 | 0 | 0 | 0 | 0.06 | 22.1 |
| GYM 175 | HEALTH CLUB/WEIGHT ROOMS | 3613 | 50 | 20 | 1000 | 0.06 | 1216.8 |
| GYM STORAGE 174 | OCCUPIABLE STORAGE ROOMS FOR DRY MATERIALS | 346 | 0 | 5 | 0 | 0.06 | 20.8 |
| MAT STORAGE 172 | OCCUPIABLE STORAGE ROOMS FOR DRY MATERIALS | 337 | 0 | 5 | 0 | 0.06 | 20.3 |
| WOMENS RESTROOM SHOWERS/LOCKERS 177 | N/A | 522 | 0 | 0 | 0 | 0 | 0 |
| MENS RESTROOM SHOWERS/LOCKERS 178 | N/A | 515 | 0 | 0 | 0 | 0 | 0 |
| OFFICE 176 | OFFICE SPACE | 147 | 1 | 5 | 5 | 0.06 | 13.9 |
| CORRIDOR 100 U | CORRIDORS | 350 | 0 | 0 | 0 | 0.06 | 21 |
| CORRIDOR 100 V | CORRIDORS | 416 | 0 | 0 | 0 | 0.06 | 25 |
| CORRIDOR 100 W | CORRIDORS | 159 | 0 | 0 | 0 | 0.06 | 9.6 |
| LOADING 179 | CORRIDORS | 179 | 0 | 0 | 0 | 0.06 | 10.8 |
| ELECT. RM 180 | N/A | 43 | 0 | 0 | 0 | 0 | 0 |
| STORAGE 181 | OCCUPIABLE STORAGE ROOMS FOR DRY MATERIALS | 134 | 0 | 5 | 0 | 0.06 | 8.1 |
| UTILITY 181A | OCCUPIABLE STORAGE ROOMS FOR DRY MATERIALS | 48 | 0 | 5 | 0 | 0.06 | 2.9 |
| JANITOR 182C | N/A | 34 | 0 | 0 | 0 | 0 | 0 |
| WOMENS RESTROOM SHOWERS/LOCKERS 182 | N/A | 737 | 0 | 0 | 0 | 0 | 0 |
| MENS RESTROOM SHOWERS/LOCKERS 183 | N/A | 1448 | 0 | 0 | 0 | 0 | 0 |

| | | |
|---|---|---|
| System area (sq ft) | ∑Az (sq ft) | 10,974 |
| System population | ∑Pz (people) | 81 |
| Outdoor air intake flow (Required 62.1-2019) | ∑Vot (cfm) | 2,070 |
| Outdoor air intake flow provided (measured or design) | (cfm) | 4,100 |

## VARIABLE TERMINAL UNIT SCHEDULE

| VTU | NECK SIZE | DESIGN (CFM) | MIN (CFM) | HEATING (CFM) | HEATING COIL | | | | | | ELECTRICAL | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ELECTRIC COIL | | | AIRSIDE | | | | | |
| | | | | | CAP (MBH) | POWER (KW) | NOMINAL POWER (KW) | SCR | EAT (F) | LAT (F) | VOLT | PHASE | |
| BOX-N-1 | 10 | 850 | 340 | 425 | 14 | 4.1 | 4.5 | YES | 55 | 85 | 277 | 1 | 1-9 |
| BOX-N-2 | 8 | 400 | 160 | 200 | 7 | 2.1 | 2.5 | YES | 55 | 85 | 277 | 1 | 1-9 |
| BOX-N-3 | 8 | 530 | 215 | 265 | 9 | 2.6 | 3 | YES | 55 | 85 | 277 | 1 | 1-9 |
| BOX-N-4 | 8 | 590 | 240 | 295 | 10 | 2.9 | 3 | YES | 55 | 85 | 277 | 1 | 1-9 |
| BOX-N-5 | 16 | 2000 | 800 | 1000 | 33 | 9.7 | 10 | YES | 55 | 85 | 480 | 3 | 1-9 |
| BOX-N-6 | 16 | 2265 | 910 | 1135 | 37 | 10.8 | 11 | YES | 55 | 85 | 480 | 3 | 1-9 |
| BOX-N-7 | 16 | 2170 | 870 | 1085 | 35.5 | 10.4 | 11 | YES | 55 | 85 | 480 | 3 | 1-9 |
| BOX-N-8 | 10 | 950 | 380 | 475 | 15.5 | 4.5 | 5 | YES | 55 | 85 | 277 | 1 | 1-9 |
| (E) BOX 4-49 | 10 | - | - | - | - | - | - | - | - | - | - | - | 10-13 |
| (E) BOX 4-50 | 10 | - | - | - | - | - | - | - | - | - | - | - | 10-13 |
| (E) BOX 4-51 | 10 | - | - | - | - | - | - | - | - | - | - | - | 10-13 |
| (E) BOX 4-52 | 10 | - | - | - | - | - | - | - | - | - | - | - | 10,11,13 |
| (E) BOX 4-53 | 10 | - | - | - | - | - | - | - | - | - | - | - | 10,11,13 |
| (E) BOX 4-54 | 8 | - | - | - | - | - | - | - | - | - | - | - | 10-13 |
| (E) BOX 4-55 | 12 | - | - | - | - | - | - | - | - | - | - | - | 10,11,13 |

NOTES:
1. VARIABLE TERMINAL UNIT BASIS OF DESIG: PRICE SDV.
2. MAX REHEAT COIL FACE VELOCITY = 800 FPM.
3. PROVIDE WITH AIRFLOW SWITCH AND PROGRAMMABLE THERMOSTAT.
4. PROVIDE DOUBLEWALL CASING WITH NO FIBERS IN THE AIRSTREAM.
5. PROVIDE WITH DOOR INTERLOCKING DISCONNECT.
6. NC TO NOT EXCEED 30. NC RATING IS AT 1" WG STATIC.
7. MAXIMUM AIR PRESSURE DROP TO BE NO GREATER THAN 0.5" WG.
8. ALL CONTROLLERS SHALL BE FACTORY MOUNTED.
9. REFER TO PLANS FOR LEFT-HANDED OR RIGHT-HANDED CONFIGURATION.
10. EXISTING VOLUME AIR TERMINAL UNIT.
11. INLET SIZES SHOWN ARE BASED ON TLC'S VISUAL INSPECTION, AND MAY NOT BE THE ACTUAL SIZE.
12. EXISTING VARIABLE TERMINAL UNIT DOES NOT HAVE HEATING.
13. EXISTING VARIABLE TERMINAL UNIT IS TO BE REMOVED AND SALVAGED AT OWNER'S DISCRETION.

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HILLSBOROUGH COUNTY SHERIFF'S OFFICE
TRAINING ACADEMY - PHASE 1
10210 WINDHORST ROAD, TAMPA, FL 33619
PERMIT DOCUMENTS

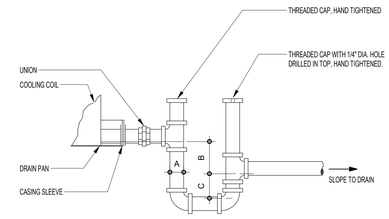
Comm. No: 23106.01
Date: 8/15/2025
Drawn by: KBH
Checked by: TNT

| Revisions | | |
|---|---|---|
| No. | Date | Revision Description |

This item has been digitally signed and sealed by Peter A. Makris, PE on the date adjacent to the seal.
Signature must be verified on all electronic versions.

MECHANICAL SCHEDULES

M-600




FOR ALL EQUIPMENT!

CONDENSATE DRAIN PIPING DIMENSIONS:

A = FULL SIZE OF UNIT DRAIN CONNECTION
B > 1-1/2" TIMES FAN SUCTION STATIC PRESSURE
C > FAN DISCHARGE STATIC PRESSURE PLUS 1/2" INCH

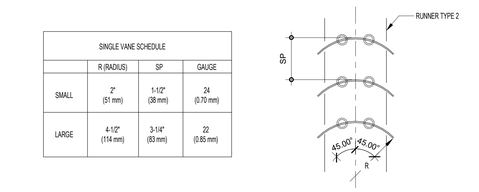
COORDINATE MOUNTING/CURB HEIGHT AS REQUIRED TO PROVIDE PROPER CONDENSATE DRAINAGE.

## AHU/FCU CONDENSATE DRAIN TRAP — 9
No Scale




## VARIABLE VOLUME TERMINAL — 10
No Scale

| SINGLE VANE SCHEDULE | | | |
|---|---|---|---|
| | R (RADIUS) | SP | GAUGE |
| SMALL | 2" (51 mm) | 1-1/2" (38 mm) | 24 (0.70 mm) |
| LARGE | 4-1/2" (114 mm) | 3-1/4" (83 mm) | 22 (0.85 mm) |

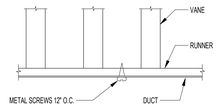



* MAXIMUM UNSUPPORTED VANE LENGTH

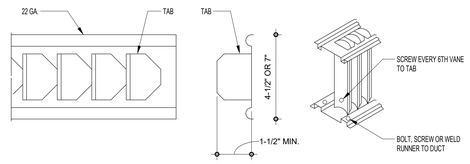
SMALL SINGLE VANE 36"
LARGE SINGLE VANE 36"
SMALL DOUBLE VANE 48"
LARGE DOUBLE VANE 72"

NOTE:
INSTALL VANES IN SECTIONS OR USE TIE RODS TO LIMIT THE UNBRACED VANE LENGTH

NOTES:
1. VANES SHALL BE SECURELY FASTENED TO RUNNERS
2. ALL VANES SHALL BE SECURE AND STABLE IN INSTALLED OPERATING POSITION.



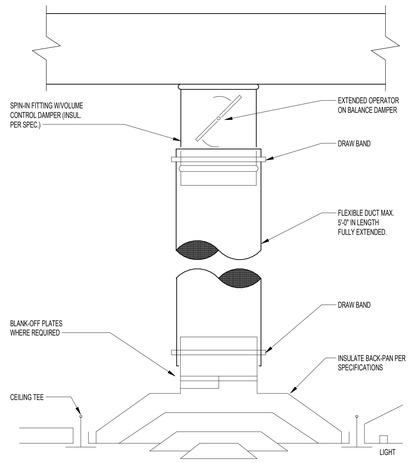

VANE SUPPORT



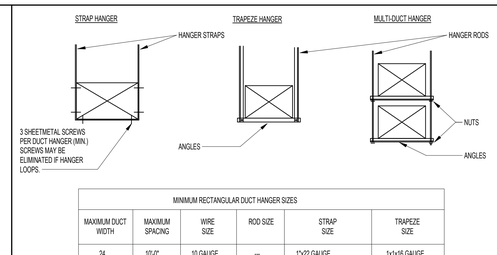

RUNNER TYPE 1

NOTE:
SEE MECHANICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.

## TURNING VANES — 7
No Scale



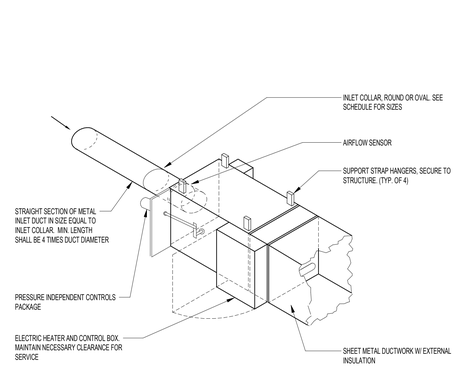

## DIFFUSER MOUNTING — 4
No Scale



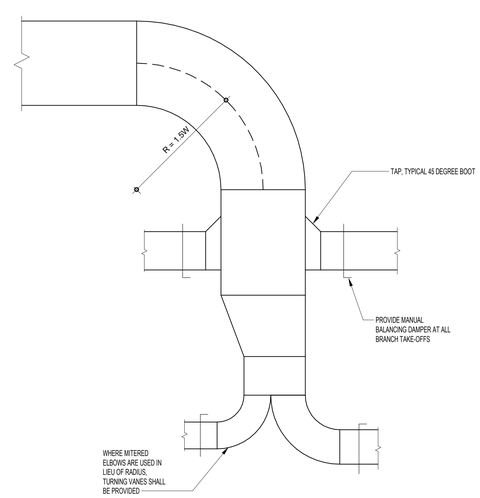

| MINIMUM RECTANGULAR DUCT HANGER SIZES | | | | | |
|---|---|---|---|---|---|
| MAXIMUM DUCT WIDTH | MAXIMUM SPACING | WIRE SIZE | ROD SIZE | STRAP SIZE | TRAPEZE SIZE |
| 24 | 10'-0" | 10 GAUGE | --- | 1"X22 GAUGE | 1x1x16 GAUGE |
| 58 | 10'-0" | --- | 3/8" | 1"X18 GAUGE | 1x1x18 |
| 77 | 10'-0" | --- | 3/8" | 1"X16 GAUGE | 1.5x1.5x1/8 |
| 96 | 10'-0" | --- | 1/2" | 1-1/2"X16 GAUGE | 1.5x1.5x1/4 |
| 134 | 10'-0" | --- | 1/2" | 1-1/2"X16 GAUGE | 2.5x2.5x1/8 |
| 154 | 8'-0" | --- | 1/2" | 1-1/2"X16 GAUGE | 2.5x2.5x3/16 |
| 155 | --- | --- | --- | --- | --- |

NOTES:
1. STRAPS ARE GALVANIZED STEEL; RODS ARE UNCOATED OR GALVANIZED STEEL; WIRE IS BLACK ANNEALED, BRIGHT BASIC OR GALVANIZED STEEL, ALL ARE ALTERNATIVES.
2. TABLE ALLOWS FOR CONVENTIONAL WALL THICKNESS, AND JOINT SYSTEMS PLUS ONE LB/SF OF INSULATION WEIGHT. IF HEAVIER DUCTS ARE TO BE INSTALLED, ADJUST HANGER SIZES TO BE WITHIN THEIR LOAD LIMITS.
3. WHEN STRAP HANGERS ARE LAP JOINED USE THESE MINIMUM FASTENERS:
   1" x 18, 20, 22 GAUGE — 2 - #10 OR 1/4" BOLT
   1" x 16 GAUGE — 2 - 1/4" BOLTS
   1" x 14 GAUGE — 2 - 3/8" BOLTS
4. REFER TO SMACNA HVAC CONSTRUCTION STANDARDS FOR ADDITIONAL INFORMATION.

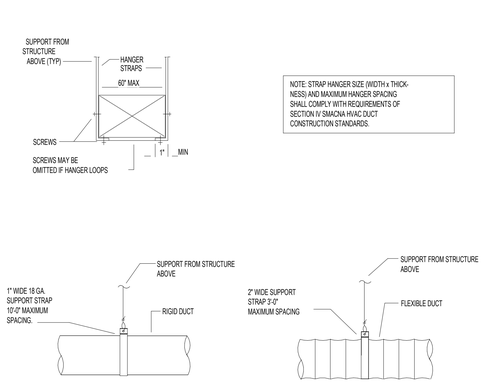
## RECTANGULAR DUCT SUPPORT DETAIL — 1
No Scale




## VARIABLE VOLUME TERMINAL W/ ELECTRIC HEAT — 11
No Scale

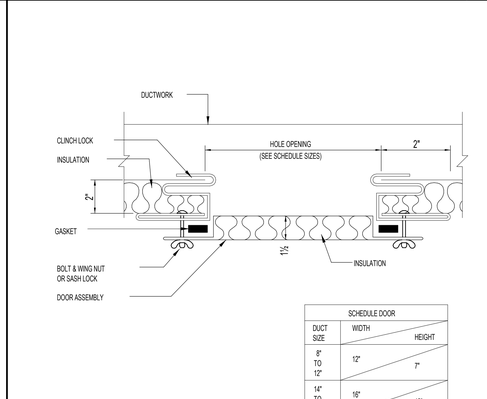



## TYPICAL LOW PRESSURE DUCTWORK — 8
No Scale



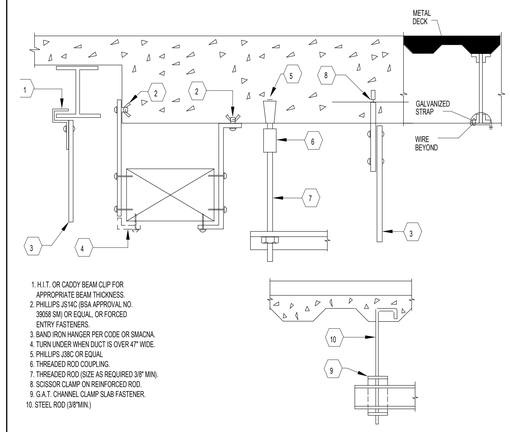

STRAP HANGER - ROUND DUCT

## TYPICAL DUCT SUPPORT — 6
No Scale




| SCHEDULE DOOR | | |
|---|---|---|
| DUCT SIZE | WIDTH | HEIGHT |
| 8" TO 12" | 12" | 7" |
| 14" TO 18" | 16" | 10" |
| 20" TO UP | 16" | 16" |

## DUCT ACCESS PANEL DETAIL — 3
No Scale




## METHOD OF HANGING DUCTWORK — 2
No Scale

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Tampa, FL 33609
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TLC No.: 724104


HILLSBOROUGH COUNTY SHERIFF'S OFFICE
TRAINING ACADEMY - PHASE 1
10210 WINDHORST ROAD, TAMPA, FL 33619

PERMIT DOCUMENTS

Comm. No: 23106.01
Date: 8/15/2025
Drawn by: KBH
Checked by: TNT

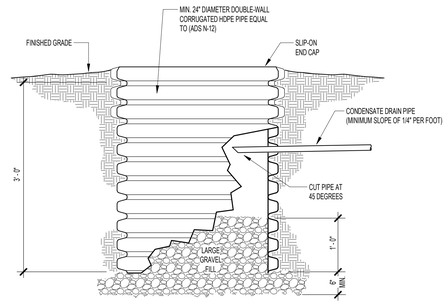
| Revisions | | |
|---|---|---|
| No. | Date | Revision Description |

This item has been digitally signed and sealed by Peter A. Makris, PE on the date adjacent to the seal.

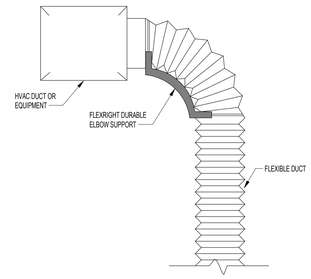

Signature must be verified on all electronic versions.

MECHANICAL DETAILS

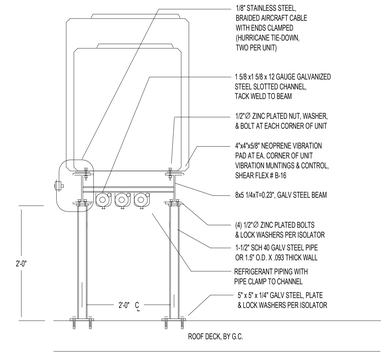
M-700




## DRYWELL DETAIL
No Scale — 7

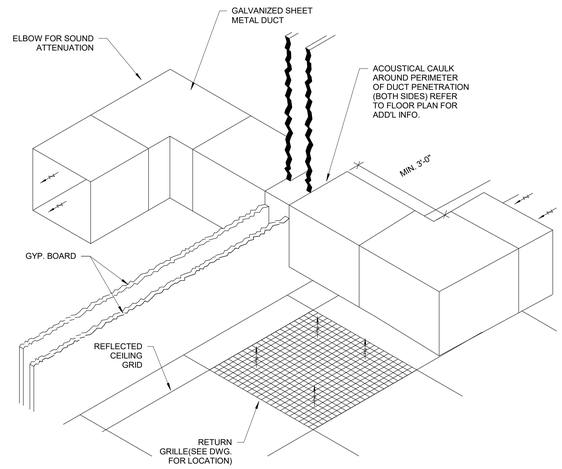



## FLEXIBLE DUCT CONNECTION (1)
No Scale — 4

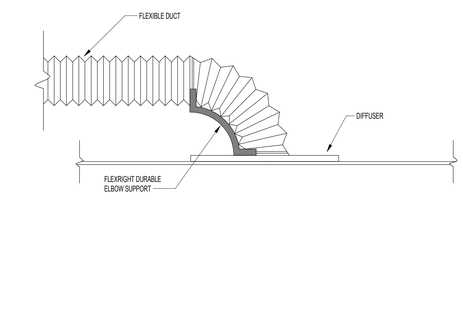



TYPICAL END VIEW

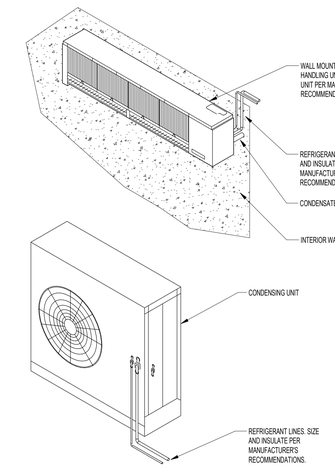
## CONDENSING UNIT RACK DETAIL
No Scale — 1



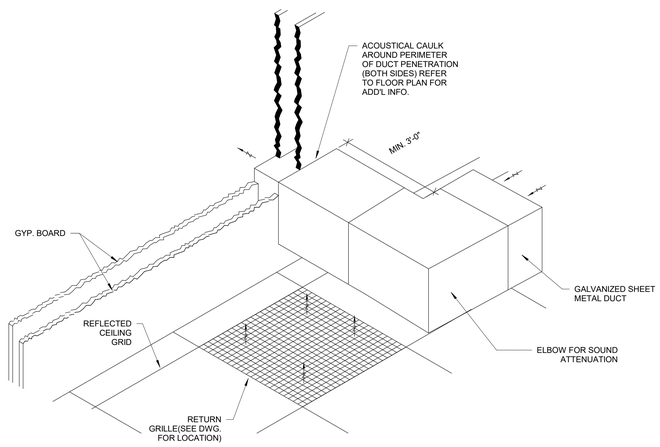

## PLENUM RETURN TRANSFER BOOT (1)
No Scale — 8



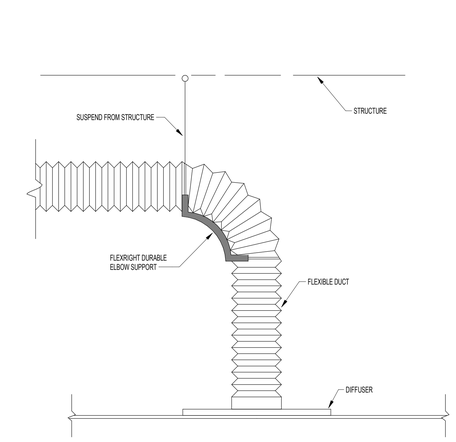

## CEILING DIFFUSER CONNECTION (2)
No Scale — 5




## DUCTLESS DX SPLIT SYSTEMS
No Scale — 2




## PLENUM RETURN TRANSFER BOOT (2)
No Scale — 9




## CEILING DIFFUSER CONNECTION (3)
No Scale — 6

WIND RESTRAINT REQUIREMENTS:

1. ALL ROOF-MOUNTED MECHANICAL EQUIPMENT (GRAVITY VENTILATORS, CONDENSING UNITS) SHALL BE FABRICATED TO RESIST THE EFFECTS OF WIND. WIND LOADS SHALL BE BASED ON CODE REQUIREMENT WIND SPEEDS, ACTING NORMAL TO THE BUILDING FACE. DESIGN ROOF-MOUNTED MECHANICAL EQUIPMENT, INCLUDING COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER, USING STRUCTURAL AND WIND PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.

2. ALL ROOF-MOUNTED MECHANICAL EQUIPMENT (GRAVITY VENTILATORS, CONDENSING UNITS) SHALL BE ANCHORED TO RESIST THE EFFECTS OF WIND. WIND LOADS SHALL BE BASED ON CODE REQUIREMENT WIND SPEEDS, ACTING NORMAL TO THE BUILDING FACE. DESIGN ROOF-MOUNTED MECHANICAL EQUIPMENT ANCHORAGE, INCLUDING COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER, USING STRUCTURAL AND WIND PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED. CONTRACTOR SHALL PREPARE WIND-RESTRAINT DETAILS INDICATED TO COMPLY WITH PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA, INCLUDING ANALYSIS DATA SIGNED AND SEALED BY THE QUALIFIED PROFESSIONAL ENGINEER RESPONSIBLE FOR THEIR PREPARATION.

3. DESIGN ANALYSIS AND CALCULATIONS: PROVIDE TO SUPPORT SELECTION AND ARRANGEMENT OF WIND RESTRAINTS. INCLUDE CALCULATIONS OF COMBINED TENSILE AND SHEAR LOADS. PROVIDE REACTIONS AT CONNECTION POINTS TO THE BUILDING STRUCTURE.

4. FABRICATION AND ARRANGEMENT DETAILS: DETAIL ATTACHMENTS OF RESTRAINTS TO THE RESTRAINED ITEMS AND TO THE STRUCTURE. SHOW ATTACHMENT LOCATIONS, METHODS, AND SPACING. IDENTIFY COMPONENTS, LIST THEIR STRENGTHS, AND INDICATE DIRECTIONS AND VALUES OF FORCES TRANSMITTED TO THE STRUCTURE DURING WIND EVENTS. INCLUDE FABRICATION REQUIREMENTS OF THE EQUIPMENT CURB AND ITS ABILITY TO SUPPORT THE LATERAL LOAD IMPARTED BY THE EQUIPMENT DURING A WIND EVENT.

5. PREAPPROVAL AND EVALUATION DOCUMENTATION: PROVIDE, BY AN AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, SHOWING MAXIMUM RATINGS OF RESTRAINT ITEMS AND THE BASIS FOR APPROVAL (TESTS OR CALCULATIONS).

6. WIND RESTRAINT QUALIFICATION CERTIFICATES: PROVIDE, FROM THE MANUFACTURER, FOR ALL ROOF-MOUNTED MECHANICAL EQUIPMENT, INCLUDE DIMENSIONED OUTLINE DRAWINGS OF EQUIPMENT UNIT, IDENTIFYING CENTER OF GRAVITY AND LOCATION AND DESCRIPTION OF MOUNTING AND ANCHORAGE PROVISIONS. INCLUDE DETAILED DESCRIPTION OF EQUIPMENT ANCHORAGE DEVICES ON WHICH THE CERTIFICATION IS BASED AND THEIR INSTALLATION REQUIREMENTS.

## WIND RESTRAINT REQUIREMENTS
No Scale — 3

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TRAINING ACADEMY - PHASE 1
10210 WINDHORST ROAD, TAMPA, FL 33619
PERMIT DOCUMENTS

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| Comm. No: | 23106.01 |
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| Drawn by: | KBH |
| Checked by: | TNT |

| Revisions | | |
|---|---|---|
| No. | Date | Revision Description |

This item has been digitally signed and sealed by Peter A. Makris, PE on the date adjacent to the seal.
PETER A. MAKRIS LICENSE No. 96819 STATE OF FLORIDA PROFESSIONAL ENGINEER
Signature must be verified on all electronic versions.

MECHANICAL DETAILS

M-701

FILE PATH: Autodesk Docs://HillsbCSO_23106.01_Training Academy/724104_HCSO_MEP_R23.rvt
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