MECHANICAL SCOPE OF WORK

BUILDOUT OF SHELL SPACE FOR NEW SURGICAL SUITES.

APPLICABLE CODES AND STANDARDS

ALL MECHANICAL EQUIPMENT, MATERIALS, INSTALLATION, TESTING, CLEANING, SUPPORTS, AND WORKMANSHIP SHALL BE IN STRICT ACCORDANCE WITH THE BELOW LISTED APPLICABLE CODES INCLUDE BUT ARE NOT LIMITED TO:

CODE INFORMATION
2018 INTERNATIONAL BUILDING CODE (W/ HARRIS COUNTY AMENDMENTS)
2015 INTERNATIONAL MECHANICAL CODE (W/ HARRIS COUNTY AMENDMENTS)
2018 INTERNATIONAL FIRE CODE (W/ HARRIS COUNTY AMENDMENTS)
2015 INTERNATIONAL ENERGY CONSERVATION CODE (W/ HARRIS COUNTY AMENDMENTS)

2020 NFPA 70, NATIONAL ELECTRIC CODE
2015 NFPA 99, HEALTHCARE FACILITIES CODE
2013 NFPA 110, STANDARD FOR EMERGENCY AND STANDBY POWER SYSTEMS

TEXAS ADMINISTRATIVE CODE TITLE 25 CHAPTER 133 HOSPITAL LICENSING

MECHANICAL SHEET LIST

MECHANICAL ABBREVIATIONS

A	AMPS
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
APD	AIR PRESSURE DROP
BTU	BRITISH THERMAL UNIT
BHP	BRAKE HORSEPOWER
BMS	BUILDING MANAGEMENT SYSTEM
CD	CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHP	CHILLED WATER PUMP
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CO	CLEAN OUT
COND	CONDENSATE DRAIN
CP	CONDENSATE PUMP
CRAC	COMPUTER ROOM AIR CONDITIONING UNIT
CT	COOLING TOWER
CU	CONDENSING UNIT
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
DB	DRY BULT TEMPERATURE, °F
DN	DOWN
DOAS	DEDICATED OUTDOOR AIR SYSTEM
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAD	EXHAUST AIR DUCT
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
ERV	ENERGY RECOVERY VENTILATOR
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
EUH	ELECTRIC UNIT HEATER
EWT	ENTER WATER TEMPERATURE, °F
FA	FREE AREA
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FPTU	FAN POWERED TERMINAL UNIT
FSD	FIRE SMOKE DAMPER
GUH	GAS UNIT HEATER
GPM	GALLONS PER MINUTE
HHWR	HEATING HOT WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HP	HORSEPOWER
HX	HEAT EXCHANGER
HZ	HERTZ
IN. WG	INCHES OF WATER COLUMN
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE, °F
LP	LIQUID PROPANE
LV	LOUVER
LWT	LEAVING WATER TEMPERATURE, °F
MAU	MAKE-UP AIR
MBH	THOUSAND BTU PER HOUR
MOCP	MAXIMUM OVERCURRENT PROTECTION
N.C.	NORMALLY CLOSED
N.I.C.	NOT IN CONTRACT
N.O.	NORMALLY OPEN
NG	NATURAL GAS
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAD	OUTSIDE AIR DUCT
OED	OPEN END DUCT
OAHU	OUTSIDE AIR HANDLING UNIT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GUAGE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
RA	RETURN AIR
RAD	RETURN AIR DUCT
RCP	REFLECTED CEILING PLAN
RG	RETURN GRILLE
RH	RELATIVE HUMIDITY
RL	REFRIGERANT LIQUID
RPM	REVOLUTIONS PER MINUTE
RR	RETURN REGISTER
RS	REFRIGERANT SUCTION
RTU	ROOF TOP UNIT
RX	REMOVE EXISTING
SA	SUPPLY AIR
SAD	SUPPLY AIR DUCT
SD	SUPPLY DIFFUSER
SR	SUPPLY REGISTER
TYP	TYPICAL
UV	UNIT VENTILATOR
V	VOLTS
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE-FREQUENCY DRIVE
VRV	VARIABLE REFRIGERANT VOLUME
W/	WITH
WB	WET BULB TEMPERATURE, °F
WPD	WATER PRESSURE DROP
°F	DEGREES FAHRENHEIT
φ	PHASE

MECHANICAL LEGEND

- MECHANICAL EQUIPMENT
- PLENUM SLOT DIFFUSER
- SUPPLY AIR DEVICE
- RETURN AIR DEVICE
- EXHAUST AIR DEVICE
- CONCIAL TAP WITH DAMPER
- MOTORIZE DAMPER
- MANUAL BALANCING DAMPER
- RIGID DUCTWORK
- FLEX DUCT
- (T) ZONE THERMOSTAT @ 48" A.F.F.
- (S) ZONE TEMPERATURE SENSOR
- A/### DIFFUSER TAG / AIR FLOW
- FCU-# EQUIPMENT TAG
- KEY NOTE TAG
- POINT OF CONNECTION
- POINT OF DEMOLITION

MECHANICAL GENERAL NOTES

A. DRAWINGS ARE DIAGRAMMATIC; CONFIRM DIMENSIONS AND LOCATIONS IN THE FIELD.
B. RUNOUTS TO INDIVIDUAL AIR DEVICES ARE SAME SIZE AS AIR DEVICE NECK UNLESS OTHERWISE NOTED.
C. DUCT SIZES SHOWN ARE FREE AREA.
D. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR TYPE OF CEILING AND LOCATION OF CEILING DEVICES.
E. SEE ARCH ELEVATIONS FOR LOCATION OF WALL MTD DEVICES.
F. PLENUMS ARE CROWDED AND NOT ALL OBSTACLES ARE INDICATED. ALLOW FOR ADDITIONAL DUCT OR PIPE OFFSETS OR TRANSITIONS NOT INDICATED ON DRAWINGS.
G. SEAL ALL PENETRATIONS OF FLOORS, RATED WALLS, EXTERIOR WALLS
H. CONTRACTOR SHALL SUBMIT DRAWINGS FOR ALL PERMITS IN A TIMELY MANNER AND PAY ALL PERMIT FEES.
I. PROVIDE ANY REQUIRED TEMPORARY UTILITIES.
J. THE LISTING OF PRODUCT MANUFACTURERS, MATERIALS, AND METHODS ARE THE BASIS OF DESIGN AND ARE INTENDED TO ESTABLISH A STANDARD OF QUALITY. THE ENGINEER SHALLBE THE SOLE JUDGE OF QUALITY AND EQUIVALENCE OF EQUIPMENT, MATERIALS, AND METHODS. WHERE SUBSTITUTED OR ALTERNATIVE EQUIPMENT IS PROPOSED ON THE PROJECT BEFORE BIDDING, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THE EQUIPMENT WILL FIT THE SPACE AVAILABLE, INCLUDING ALL REQUIRED CODE AND MAINTENANCE CLEARANCES, AND TO COORDINATE ALL EQUIPMENT REQUIREMENTS WITH OTHER CONTRACTORS.
K. PROVIDE BID BREAKDOWN TO ALLOW FOR SELECTION OF EQUIPMENT FROM MULTIPLE MANUFACTURERS. MANUFACTURER'S REPRESENTATIVES AND/OR DISTRIBUTORS. BEING LISTED AS THE ONLY ACCEPTABLE MANUFACTURER FOR ONE LINE OF EQUIPMENT DOES NOT AUTOMATICALLY EXTEND TO ALL EQUIPMENT. BREAK BIDS ALONG RESPECTIVE SPECIFICATION SECTIONS.
L. INSTALL ALL EQUIPMENT TO PROVIDE CLEARANCE AROUND ALL HVAC EQUIPMENT CONFORMING TO MANUFACTURER'S MINIMUM RECOMMENDED SPACE FOR MAINTENANCE AND/OR AIR FLOW AND SUFFICIENT TO ALLOW INSPECTION, SERVICE, REPAIR, OR REPLACEMENT WITHOUT REMOVING ELEMENTS OF PERMANENT CONSTRUCTION OR DISABLING THE FUNCTION OF FIRE RESISTANCE RATED ASSEMBLIES.
M. DO NOT RUN DUCT OR PIPE ABOVE ELECTRICAL PANELS.
N. ALL WORK IN OR ABOVE OCCUPIED AREAS SHALL BE AT OWNER'S CONVENIENCE AND MAY BE DURING EVENINGS OR WEEKENDS. SCHEDULE ALL SERVICE INTERRUPTIONS IN ADVANCE WITH OWNER.
O. ONLY OWNER'S REPRESENTATIVE MAY SHUT OFF EQUIPMENT OR DISCONNECT UTILITIES.
P. BEFORE SUBMITTING A BID, IT WILL BE NECESSARY FOR EACH CONTRACTOR WHOSE WORK IS INVOLVED TO VISIT THE SITE AND ASCERTAIN FOR HIMSELF THE CONDITIONS TO BE MET IN INSTALLING THE WORK AND MAKE PROVISIONS FOR THE CONDITIONS IN HIS FINAL PRICE. FAILURE OF THE CONTRACTOR TO COMPLY WITH THIS REQUIREMENT SHALL NOT BE CONSIDERED JUSTIFICATION FOR THE OMISSION OR FAULTY INSTALLATION OF ANY WORK COVERED BY THE CONTRACT DOCUMENTS. THE BID SHALL INCLUDE ALL THE WORK REQUIRED OR NECESSARY TO COMPLY WITH THE WORK SHOWN ON THE DRAWINGS AND IDENTIFIED IN THE SPECIFICATIONS. NO EXTRAS WILL BE ALLOWED FOR CONDITIONS THA TCOULD BE READILY OBSERVED.
Q. REMOVE ALL UNUSED EXISTING DUCTWORK. CAP EXISTING TAPS OF DUCT MAINS WITH SHEET METAL CAPS AND SEAL AIRTIGHT.
R. REMOVE ALL EXISTING DEVICES AND EQUIPMENT THAT ARE NOT TO BE REUSED.
S. CONTRACTOR SHALL PROPERLY SEAL AND CAP ALL UNUSED DUCT TAPS AND NEW DUCTWORK. CONTRACTOR SHALL REPLACE ALL DAMAGED EXISTING FLEX DUCT AS REQUIRED.
T. CONTRACTOR SHALL COORDINATE ALL WORK WITH THE BUILDING ENGINEER.
U. ALL OTHER AREAS OF THE FLOOR NOT WITHIN THE SCOPE OF WORK SHALL REMAIN UNCHANGED.
V. REPAIR ALL EXISTING DUCTWORK LEAKS AND DAMAGED INSULATION AS REQUIRED.
W. EXISTING DUCTWORK WAS TAKEN FROM AS-BUILT DRAWINGS AND FIELD INVESTIGATION. CONTRACTOR SHALL FIELD VERIFY EXACT DUCTWORK CONDITIONS.
X. BUILDING IS A STEEL STRUCTURE WITH THE 2-HOUR RATING AT THE CONCRETE SLAB. CEILING IS NOT PART OF THE RATED ASSEMBLY. CEILING RADIATION FIRE DAMPERS ARE NOT REQUIRED.
Y. AIR IS RETURNED TO THE RTU VIA DUCTED RETURN AND RETURN AIR TRANSFER DUCTS. CONTRACTOR SHALL VERIFY THAT SUFFICENT RETURN AIR OPENINGS ARE PROVIDED.
Z. COORDINATE FINAL LOCATIONS AND LABELING REQUIREMENT OF THERMOSTATS WITH ARCHITECT AND BUILDING ENGINEER.
AA. LOCATE VOLUME DAMPERS ABOVE ACCESSIBLE CEILING. EVEN IN AREAS OF ACCESSIBLE CEILINGS, POSITION DAMPER HANDLE/OPERATOR ON BOTTOM SIDE OF DUCT OR ON CLEAR SIDE OF DUCT FOR EASE OF ADJUSTMENT.
BB. CONTRACTOR SHALL MAINTAIN MANUFACTURER CLEARANCES FOR ALL MECHANICAL EQUIPMENT AND ENSURE ALL SERVICEABLE COMPONENTS ARE READILY ACCESSIBLE, EVEN IN LAY-IN CEILING AREAS.
CC. CONTRACTOR SHALL COORDIANTE WITH OTHER TRADES TO ENSURE THAT ALL NEW PLASTIC PIPING IN RETURN AIR PLENUMS AND EXPOSED AREAS ARE INSULATED (MORGAN PLENUMWRAP+ OR EQUAL) TO MEET CODE FLAME AND SMOKE REQUIREMENTS.
DD. NOTE TO PLAN CHECKER: BUILDING IS EXISTING AND RENOVATED SPACE IS CONDITIONED. BUILDING ENVELOPE CALCULATIONS ARE NOT REQUIRED.

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Date	06/30/22
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06/30/22	ISSUE FOR CONSTRUCTION

SHEET TITLE
MECHANICAL LEGENDS AND NOTES

SHEET NO.
M001

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HVAC DESIGN CRITERIA:

OUTDOOR DESIGN CONDITIONS (TOMBALL, TEXAS) PER 2015 IECC TABLE C302.2:
- 96ºF DB, 80.5ºF WB SUMMER; 28ºF DB WINTER
- 7357 DEGREE DAYS COOLING; 1371 DEGREE DAYS HEATING
- CLIMATE ZONE 2A

HUMIDITY CONTROL: HUMIDIFICATION REQUIRED

75ºF COOLING (MINIMUM ALLOWED BY 2015 IECC, SECTION C302.1)
72ºF HEATING (MAXIMUM ALLOWED BY 2015 IECC, SECTION C302.1)

TEMPERATURE, HUMIDITY, AIR CHANGES, AND PRESSURIZATION PER FIGURE 25 TAC 133.169(c) BELOW:

Area Designation	Air movement relationship to adjacent areas[1,16]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	All air exhausted directly to outdoors[5]	Recirculated by means of room units[6]	Relative humidity[7] (%)	Design temperature[8] (degrees F)
SURGERY AND CRITICAL CARE							
Operating/Surgical, cystoscopic rooms[9,16]	Out	4	20	----	No	30-60	68-73[17]
Airborne infection isolation surgical rooms	In	4	15	Yes	No	30-60	68-73
Isolation anteroom (surgery)	In/Out[20]	----	10	Yes	No	----	----
Delivery room[9]	Out	3	15	----	No	30-60	68-73
Recovery room[9]	----	2	6	----	No	30-60	70-75
Critical and intensive care	----	2	6	----	No	30-60	70-75
Treatment room[10]	----	----	6	----	----	----	75
Trauma room[10]	Out	3	15	----	No	30-60	70-75
Anesthesia gas storage	In	----	8	Yes	----	----	----
Endoscopy	Out	2	6	----	No	30-60	68-73
Bronchoscopy	In	2	12	Yes	No	30-60	68-73
Intermediate care	----	2	6[18]	----	No	30-60	70-75
Newborn intensive care	----	2	6	----	No	30-60	72-78
Emergency suite waiting	In	2	12	Yes[19]	----	----	70-75
Triage	In	2	12	Yes[19]	----	----	70-75
Radiology waiting	In	2	12	Yes[19]	----	----	70-75
Procedure room	Out	4	20	----	No	30-60	70-75
Laser eye room	Out	4	20	----	No	30-60	70-75
X-ray (Surgical/Critical care, catheterization)	Out	3	15	----	No	30-60	70-75
NURSING							
Patient room	----	2	6[18]	----	----	----	70-75
Toilet room	In	----	10	Yes	----	----	70-75
Newborn nursery suite	----	2	6	----	No	30-60	72-78
Protective environment room[11]	Out	2	12	----	No	----	70-75
Protective environment anteroom[11]	In/In[21]	----	10	----	No	----	----
Airborne infection isolation room[12]	In	2	12	Yes	No	----	70-75
Isolation alcove or anteroom[12]	In/Out[20]	----	10	Yes	No	----	----
Labor, delivery, recovery (LDR)	----	2	6[18]	----	----	----	70-75
Labor, delivery, recovery, postpartum(LDRP)	----	2	6[18]	----	----	----	70-75
Patient corridor	----	----	2	----	----	----	----
ANCILLARY							
Radiology[13] X-ray (diagnostic and treatment)	----	----	6	----	----	----	75
Darkroom	In	----	10	Yes	No	----	----
Fluoroscopy	In	2	6	----	----	----	75
Laboratory General[13]	----	2	6	----	----	----	75
Bacteriology	In	2	6	Yes	No	----	75
Biochemistry[13]	In	2	6	Yes	No	----	75
Cytology	In	2	6	Yes	No	----	75
Glass washing	In	----	10	Yes	----	----	75
Histology	In	2	6	Yes	No	----	75
Microbiology[13]	In	2	6	Yes	No	----	75
Nuclear medicine	In	2	6	Yes	No	----	75
Pathology	In	2	6	Yes	No	----	75
Serology	In	2	6	Yes	No	----	75
Sterilizing	In	----	10	Yes	No	----	75
Media transfer	Out	2	4	----	----	----	----
Autopsy room	In	----	12	Yes	No	----	----
Nonrefrigerated body-holding room	In	----	10	Yes	----	----	70
Pharmacy	Out	----	4	----	----	----	75
Preparation/anteroom	Out	2	6	----	No	----	75
Examination room	----	----	6	----	----	----	75
Medication room	Out	----	4	----	----	----	75
Treatment room	----	----	6	----	----	----	75
Physical therapy and hydrotherapy	In	----	6	----	----	----	75
Soiled workroom or holding	In	----	10	Yes	No	----	----
Clean workroom or holding	Out	----	4	----	----	----	----
STERILIZING AND SUPPLY							
EO sterilizer room[15]	In	----	10	Yes	No	30-60	75
Sterilizer equipment room[2]	In	----	10	Yes	No	----	----
Central medical and surgical supply							
Soiled or decontamination room	In	----	6	Yes	No	----	68-73
Clean workroom	Out	----	4	----	No	30-60	75
Sterile storage	Out	----	4	----	----	70 Max	----
Equipment storage	----	----	2	----	----	----	----
SERVICE							
Food preparation center[14]	----	----	10	----	No	----	----
Ware washing	In	----	10	Yes	No	----	----
Dietary day storage	In	----	2	----	----	----	----
Laundry, general	----	----	10	Yes	----	----	----
Soiled linen (sorting and storage)	In	----	10	Yes	No	----	----
Clean linen storage	Out	----	2	----	----	----	----
Soiled linen and trash chute room	In	----	10	Yes	No	----	----
Bedpan room	In	----	10	Yes	----	----	----
Bathroom	In	----	10	Yes	----	----	75
Janitor's closet	In	----	10	Yes	No	----	----
ADMINISTRATIVE AND SUPPORT SERVICE							
Administrative and support service	----	----	2	----	----	30 Min	68-73

OUTSIDE AIR REQURIEMENTS PER ASHRAE 62.1-2013

OFFICE SPACES: 5 CFM PER PERSON, 0.06 CFM PER SQ. FT.
CORRIDORS: 0.06 CFM PER SQ. FT.
STORAGE: 0.06 CFM PER SQ. FT.

ENERGY CODE PER 2015 IECC CHAPTER 4 (NOT ASHRAE 90.1) - MANDATORY
HOUSTON IS ZONE 2A WARM-HUMID

SECTION C403 BUILDING MECHANICAL SYSTEMS

C403.2.1 Calculation of heating and cooling loads.
Engineer has performed HVAC load calculations using Trace 700

C403.2.2 Equipment sizing.
The output capacity of heating and cooling equipment shall be not greater than the loads calculated in accordance with Section C403.2.1. A single piece of equipment providing both heating and cooling shall satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.
Exceptions:
1. Required standby equipment and systems provided with controls and devices that allow such systems or equipment to operate automatically only when the primary equipment is not operating.
2. Multiple units of the same equipment type with combined capacities exceeding the design load and provided with controls that have the capability to sequence the operation of each unit based on load.

C403.2.3 HVAC equipment performance requirements.
Equipment shall meet the minimum efficiency requirements of Tables C403.2.3.

C403.2.4 HVAC system controls.
Each heating and cooling system shall be provided with thermostatic controls.

C403.2.4.1 Thermostatic controls.
The supply of heating and cooling energy to each zone shall be controlled by individual thermostatic controls capable of responding to temperature within the zone. Where humidification or dehumidification or both is provided, at least one humidity control device shall be provided for each humidity control system.

C403.2.4.1.1 Heat pump supplementary heat.
Heat pumps having supplementary electric resistance heat shall have controls that, except during defrost, prevent supplementary heat operation where the heat pump can provide the heating load.

C403.2.4.1.2 Deadband.
Where used to control both heating and cooling, zone thermostatic controls shall provide a temperature range or deadband of at least 5°F within which the supply of heating and cooling energy to the zone is capable of being shut off or reduced to a minimum.
Exceptions:
1. Thermostats requiring manual changeover between heating and cooling modes.
2. Occupancies or applications requiring precision in indoor temperature control as approved by the code official.

C403.2.4.1.3 Set point overlap restriction.
Where a zone has a separate heating and a separate cooling thermostatic control located within the zone, a limit switch, mechanical stop, or direct digital control systems with software programming shall be provided with the capability to prevent the heating set point from exceeding the cooling set point and to maintain a deadband in accordance with Section C403.2.4.1.2.

C403.2.4.2.1 Thermostatic setback capabilities.
Thermostatic setback controls shall have the capability to set back or temporarily operate the system to maintain zone temperatures down to 55°F or up to 85°F.

C403.2.4.3 Shutoff dampers.
Outdoor air intake and exhaust openings and stairway and shaft vents shall be provided with Class I motorized dampers. The dampers shall have an air leakage rate not greater than 4 cfm/ft² of damper surface area at 1.0 inch water gauge and shall be labeled by an approved agency when tested in accordance with AMCA 500D for such purpose.

Outdoor air intake and exhaust dampers shall be installed with automatic controls configured to close when the systems or spaces served are not in use or during unoccupied period warm-up and setback operation, unless the systems served require outdoor or exhaust air in accordance with the International Mechanical Code or the dampers are opened to provide intentional economizer cooling.

Stairway and shaft vent dampers shall be installed with automatic controls configured to open upon the activation of any fire alarm initiating device of the building's fire alarm system or the interruption of power to the damper.

Exception: Gravity (nonmotorized) dampers shall be permitted to be used as follows:
1. In buildings less than three stories in height above grade plane.
2. In buildings of any height located in Climate Zones 1, 2 or 3.
3. Where the design exhaust capacity is not greater than 300 cfm.

Gravity (nonmotorized) dampers shall have an air leakage rate not greater than 20 cfm/ft² where not less than 24 inches in either dimension and 40 cfm/ft² where less than 24 inches in either dimension. The rate of air leakage shall be determined at 1.0 inch water gauge when tested in accordance with AMCA 500D for such purpose. The dampers shall be labeled by an approved agency.

C403.2.4.4 Zone isolation.
HVAC systems serving zones that are over 25,000 square feet in floor area or that span more than one floor and are designed to operate or be occupied nonsimultaneously shall be divided into isolation areas. Each isolation area shall be equipped with isolation devices and controls configured to automatically shut off the supply of conditioned air and outdoor air to and exhaust air from the isolation area. Each isolation area shall be controlled independently by a device meeting the requirements of Section C403.2.4.2.2. Central systems and plants shall be provided with controls and devices that will allow system and equipment operation for any length of time while serving only the smallest isolation area served by the system or plant.
Exceptions:
1. Exhaust air and outdoor air connections to isolation areas where the fan system to which they connect is not greater than 5,000 cfm.
2. Exhaust airflow from a single isolation area of less than 10 percent of the design airflow of the exhaust system to which it connects.
3. Isolation areas intended to operate continuously or intended to be inoperative only when all other isolation areas in a zone are inoperative.

C403.2.4.7 Economizer fault detection and diagnostics (FDD).

Air-cooled unitary direct-expansion units listed in Tables C403.2.3(1) through C403.2.3(3) and variable refrigerant flow (VRF) units that are equipped with an economizer in accordance with Section C403.3 shall include a fault detection and diagnostics (FDD) system complying with the following:
1. The following temperature sensors shall be permanently installed to monitor system operation:
   1.1. Outside air.
   1.2. Supply air.
   1.3. Return air.
2. Temperature sensors shall have an accuracy of ±2°F over the range of 40°F to 80°F.
3. Refrigerant pressure sensors, where used, shall have an accuracy of ±3 percent of full scale.
4. The unit controller shall be capable of providing system status by indicating the following:
   1.1. Free cooling available.
   1.2. Economizer enabled.
   1.3. Compressor enabled.
   1.4. Heating enabled.
   1.5. Mixed air low limit cycle active.
   1.6. The current value of each sensor.
5. The unit controller shall be capable of manually initiating each operating mode so that the operation of compressors, economizers, fans and the heating system can be independently tested and verified.
6. The unit shall be capable of reporting faults to a fault management application accessible by day-to-day operating or service personnel, or annunciated locally on zone thermostats.
7. The FDD system shall be capable of detecting the following faults:
   1.1. Air temperature sensor failure/fault.
   1.2. Not economizing when the unit should be economizing.
   1.3. Economizing when the unit should not be economizing.
   1.4. Damper not modulating.
   1.5. Excess outdoor air.

C403.2.6 Ventilation.
Ventilation, either natural or mechanical, shall be provided in accordance with Chapter 4 of the International Mechanical Code. Where mechanical ventilation is provided, the system shall provide the capability to reduce the outdoor air supply to the minimum required by Chapter 4 of the International Mechanical Code.

shall include a bypass or controls which permit operation of the economizer as required by Section C403.3.

C403.2.9 Duct and plenum insulation and sealing.
Supply and return air ducts and plenums shall be insulated with a minimum of R-6 insulation where located in unconditioned spaces and where located outside the building with a minimum of R-8 insulation in Climate Zones 1 through 4 and a minimum of R-12 insulation in Climate Zones 5 through 8. Where located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by a minimum of R-8 insulation in Climate Zones 1 through 4 and a minimum of R-12 insulation in Climate Zones 5 through 8.
Exceptions:
1. Where located within equipment.
2. Where the design temperature difference between the interior and exterior of the duct or plenum is not greater than 15°F.
3. Ducts, air handlers and filter boxes shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded fabric systems or tapes.

C403.2.9.1 Duct construction.
Ductwork shall be constructed and erected in accordance with the International Mechanical Code.

C403.2.9.1.1 Low-pressure duct systems.
Longitudinal and transverse joints, seams and connections of supply and return ducts operating at a static pressure less than or equal to 2 inches w.g. shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems or tapes installed in accordance with the manufacturer's installation instructions. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the Mechanical Code.
Exception: Locking-type longitudinal joints and seams, other than the snap-lock and button-lock types, need not be sealed as specified in this section

C403.2.9.1.2 Medium-pressure duct systems.
Ducts and plenums designed to operate at a static pressure greater than 2 inches w.g. but less than 3 inches w.g. shall be insulated and sealed in accordance with Section C403.2.9. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the International Mechanical Code.

C403.2.12 Air System Design and Control
Each HVAC system having a total fan system motor nameplate horsepower (hp) exceeding 5 hp (3.7 kw) shall comply with the provisions of Sections C403.2.12.1 through C403.2.12.3

C403.2.12.1 Allowable fan motor horsepower.
Each HVAC system at fan system design conditions shall not exceed the allowable fan system motor nameplate hp (option 1) or fan system bhp (option 2) as shown in table C403.2.12.1(1). This includes supply fans, exhaust fans, return/relief fans, and fan-powered terminal units associated with systems providing heating or cooling capability. Single-zone variable air volume systems shall comply with the constant volume fan power limitation
Exceptions:
1. Hospital, vivarium and laboratory systems that utilize flow control devices on exhaust or return to maintain space pressure relationships necessary for occupant health and safety or environmental control shall be permitted to use variable volume fan power limitation.
2. Individual exhaust fans with motor nameplate horsepower of 1 hp (0.746 kW) or less are exempt from the allowable fan horsepower requirement.

C403.2.12.2 Motor nameplate horsepower.
For each fan, the fan brake horsepower shall be indicated on the construction documents and the selected motor shall be
not larger than the first available motor size greater than the following:
1. For fans less than 6 bhp (4413 W), 1.5 times the fan brake horsepower.
2. For fans 6 bhp (4413 W) and larger, 1.3 times the fan brake horsepower.
3. Systems complying with Section C403.2.12.1 fan system motor nameplate hp (Option 1).

C403.2.12.3 Fan Efficiency
Fans shall have a fan efficiency grade (FEG) of not less than 67 when deter-mined in accordance with AMCA 205 by an approved, independent testing laboratory and labeled by the manufacturer. The total efficiency of the fan at the design point of operation shall be within 15 percentage points of the maximum total efficiency of the fan.
Exception: The following fans are not required to have a fan efficiency grade:
1. Fans of 5 hp (3.7 kw) or less as follows:
2. Single fan with a motor nameplate horsepower of 5 hp or less, unless Exception 1.2 applies.
3. Multiple fans in series or parallel that have a combined motor nameplate horsepowerof 5 hp or less and are operated as the functionsl equivalent of a single fan.
4. Fans that are part of equipment covered under section C403.2.3.
5. Fans included in an equipment package certified by an approved agency for air or energy performance.
6. Powered wall/roof ventilators.
7. Fans outside the scope of AMCA 205.
8. Fans that are intended to operate only during emergency conditions.

403.2.10 Piping insulation.
Piping serving as part of a heating or cooling system shall be thermally insulated in accordance with Table C403.2.10.
Exceptions:
3. Factory-installed piping within HVAC equipment tested and rated in accordance with a test procedure referenced by this code.
4. Factory-installed piping within room fan-coils and unit ventilators tested and rated according to AHRI 440 (except that the sampling and variation provisions of Section 6.5 shall not apply) and AHRI 840, respectively.
5. Piping that conveys fluids that have a design operating temperature range between 60°F and 105°F.
6. Piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
7. Strainers, control valves, and balancing valves associated with piping 1 inch or less in diameter.
8. Direct buried piping that conveys fluids at or below 60°F.

C403.2.10.1 Protection of piping insulation.
Piping insulation exposed to the weather shall be protected from damage, including that due to sunlight, moisture, equipment maintenance and wind, and shall provide shielding from solar radiation that can cause degradation of the material. Adhesive tape shall not be permitted.

C403.2.11 Mechanical systems commissioning and completion requirements.
Mechanical systems shall be commissioned and completed in accordance with Section C408.2.

C403.3.1 Integrated economizer control.
Economizer systems shall be integrated with the mechanical cooling system and be capable of providing partial cooling even where additional mechanical cooling is required to provide the remainder of the cooling load. Controls shall not be capable of creating a false load in the mechanical cooling systems by limiting or disabling the economizer or any other means, such as hot gas bypass, except at the lowest stage of mechanical cooling.

Units that include an air economizer shall comply with the following:
1. Unit controls shall have the mechanical cooling capacity control interlocked with the air economizer controls such that the outdoor air damper is at the 100-percent open position when mechanical cooling is on and the outdoor air damper does not begin to close to prevent coil freezing due to minimum compressor run time until the leaving air temperature is less than 45°F.
2. Direct expansion (DX) units that control 75,000 Btu/h or greater of rated capacity of the capacity of the mechanical cooling directly based on occupied space temperature shall have not fewer than two stages of mechanical cooling capacity.
3. Other DX units, including those that control space temperature by modulating the airflow to the space, shall be in accordance with Table C403.3.1.

C403.3.2 Economizer heating system impact.
HVAC system design and economizer controls shall be such that economizer operation does not increase building heating energy use during normal operation.
Exception: Economizers on variable air volume (VAV) systems that cause zone level heating to increase due to a reduction in supply air temperature.

C403.3.3 Air economizers.
Air economizers shall comply with Sections C403.3.3.1 through C403.3.3.5.

C403.3.3.1 Design capacity.
Air economizer systems shall be capable of modulating outdoor air and return air dampers to provide up to 100 percent of the design supply air quantity as outdoor air for cooling.

C403.3.3.2 Control signal.
Economizer dampers shall be capable of being sequenced with the mechanical cooling equipment and shall not be controlled by only mixed-air temperature.
Exception: The use of mixed-air temperature limit control shall be permitted for systems controlled from space temperature (such as single-zone systems).

C403.3.3.3 High-limit shutoff.
Air economizers shall be capable of automatically reducing outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will no longer reduce cooling energy usage. High-limit shutoff control types for specific climates shall be chosen from Table C403.3.3.3. High-limit shutoff control settings for these control types shall be those specified in Table C403.3.3.3.

C403.3.3.4 Relief of excess outdoor air.
Systems shall be capable of relieving excess outdoor air during air economizer operation to prevent overpressurizing the building. The relief air outlet shall be located to avoid recirculation into the building.

C403.3.3.5 Economizer dampers.
Return, exhaust/relief and outdoor air dampers used in economizers shall comply with Section C403.2.4.3.

C403.3.4 Water-side economizers.
Water-side economizers shall comply with Sections C403.3.4.1 and C403.3.4.2.

C403.3.4.1 Design capacity.
Water economizer systems shall be capable of cooling supply air by indirect evaporation and providing up to 100 percent of the expected system cooling load at outdoor air temperatures of not greater than 50°F dry bulb/45°F wet bulb.
Exceptions:
1. Systems primarily serving computer rooms in which 100 percent of the expected system cooling load at 40°F dry bulb/35°F wet bulb is met with evaporative water economizers.
2. Systems primarily serving computer rooms with dry cooler water economizers which satisfy 100 percent of the expected system cooling load at 35°F dry bulb.
3. Systems where dehumidification requirements cannot be met using outdoor air temperatures of 50°F dry bulb/45°F wet bulb and where 100 percent of the expected system cooling load at 45°F dry bulb/40°F wet bulb is met with evaporative water economizers.

C403.3.4.2 Maximum pressure drop.
Precooling coils and water-to-water heat exchangers used as part of a water economizer system shall either have a water-side pressure drop of less than 15 feet of water or a secondary loop shall be created so that the coil or heat exchanger pressure drop is not seen by the circulating pumps when the system is in the normal cooling (noneconomizer) mode.

SECTION C408 SYSTEM COMMISSIONING

C408.1 General.
This section covers the commissioning of the building mechanical systems in Section C403 and electrical power and lighting systems in Section C405.

C408.2 Mechanical systems and service water-heating systems commissioning and completion requirements.
Prior to the final mechanical and plumbing inspections, the registered design professional or approved agency shall provide evidence of mechanical systems commissioning and completion in accordance with the provisions of this section.

Construction document notes shall clearly indicate provisions for commissioning and completion requirements in accordance with this section and are permitted to refer to specifications for further requirements. Copies of all documentation shall be given to the owner or owner's authorized agent and made available to the code official upon request in accordance with Sections C408.2.4 and C408.2.5.

Exceptions: The following systems are exempt:
1. Mechanical systems and service water heater systems in buildings where the total mechanical equipment capacity is less than 480,000 Btu/h cooling capacity and 600,000 Btu/h combined service water-heating and space-heating capacity.
2. Systems included in Section C403.3 that serve individual dwelling units and sleeping units.

C408.2.1 Commissioning plan.
A commissioning plan shall be developed by a registered design professional or approved agency and shall include the following items:
1. A narrative description of the activities that will be accomplished during each phase of commissioning, including the personnel intended to accomplish each of the activities.
2. A listing of the specific equipment, appliances or systems to be tested and a description of the tests to be performed.
3. Functions to be tested including, but not limited to, calibrations and economizer controls.
4. Conditions under which the test will be performed. Testing shall affirm winter and summer design conditions and full outside air conditions.
5. Measurable criteria for performance.

C408.2.2 Systems adjusting and balancing.
HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within the tolerances provided in the product specifications. Test and balance activities shall include air system and hydronic system balancing.

C408.2.2.1 Air systems balancing.
Each supply air outlet and zone terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the International Mechanical Code. Discharge dampers used for air-system balancing are prohibited on constant-volume fans and variable-volume fans with motors 10 hp and larger. Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1 hp, fan speed shall be adjusted to meet design flow conditions.
Exception: Fans with fan motors of 1 hp or less are not required to be provided with a means for air balancing.

C408.2.2.2 Hydronic systems balancing.
Individual hydronic heating and cooling coils shall be equipped with means for balancing and measuring flow. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the capability to measure pressure across the pump, or test ports at each side of each pump.
Exceptions: The following equipment is not required to be equipped with a means for balancing or measuring flow:
1. Pumps with pump motors of 5 hp or less.
2. Where throttling results in no greater than 5 percent of the nameplate horsepower draw above that required if the impeller were trimmed.

C408.2.3 Functional performance testing.
Functional performance testing specified in Sections C408.2.3.1 through C408.2.3.3 shall be conducted.

C408.2.3.1 Equipment.
Equipment functional performance testing shall demonstrate the installation and operation of components, systems, and system-to-system interfacing relationships in accordance with approved plans and specifications such that operation, function, and maintenance serviceability for each of the commissioned systems is confirmed. Testing shall include all modes and sequence of operation, including under full-load, part-load and the following emergency conditions:
1. All modes as described in the sequence of operation.
2. Redundant or automatic back-up mode.
3. Performance of alarms.
4. Mode of operation upon a loss of power and restoration of power.

Exception: Unitary or packaged HVAC equipment listed in Tables C403.2.3(1) through C403.2.3(3) that do not require supply air economizers.

C408.2.3.2 Controls.
HVAC and service water-heating control systems shall be tested to document that control devices, components, equipment and systems are calibrated and adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to document they operate in accordance with approved plans and specifications.

C408.2.3.3 Economizers.
Air economizers shall undergo a functional test to determine that they operate in accordance with manufacturer's specifications.

C408.2.4 Preliminary commissioning report.
A preliminary report of commissioning test procedures and results shall be completed and certified by the registered design professional or approved agency and provided to the building owner or owner's authorized agent. The report shall be organized with mechanical and service hot water findings in separate sections to allow independent review. The report shall be identified as "Preliminary Commissioning Report" and shall identify:
1. Itemization of deficiencies found during testing required by this section that have not been corrected at the time of report preparation.
2. Deferred tests that cannot be performed at the time of report preparation because of climatic conditions.
3. Climatic conditions required for performance of the deferred tests.

C408.2.4.1 Acceptance of report.
Buildings, or portions thereof, shall not be considered acceptable for a final inspection pursuant to Section C104.3 until the code official has received a letter of transmittal from the building owner acknowledging that the building owner or owner's authorized agent has received the Preliminary Commissioning Report.

C408.2.4.2 Copy of report.
The code official shall be permitted to require that a copy of the Preliminary Commissioning Report be made available for review by the code official.

C408.2.5 Documentation requirements.
The construction documents shall specify that the documents described in this section be provided to the building owner or owner's authorized agent within 90 days of the date of receipt of the certificate of occupancy.

C408.2.5.1 Drawings.
Construction documents shall include the location and performance data on each piece of equipment.

C408.2.5.2 Manuals.
An operating and maintenance manual shall be provided and include all of the following:
1. Submittal data stating equipment size and selected options for each piece of equipment requiring maintenance.
2. Manufacturer's operation manuals and maintenance manuals for each piece of equipment requiring maintenance, except equipment not furnished as part of the project. Required routine maintenance actions shall be clearly identified.
3. Name and address of at least one service agency.
4. HVAC and service hot water controls system maintenance and calibration information, including wiring diagrams, schematics and control sequence descriptions. Desired or field-determined set points shall be permanently recorded on control drawings at control devices or, for digital control systems, in system programming instructions.
5. Submittal data indicating all selected options for each piece of lighting equipment and lighting controls.
6. Operation and maintenance manuals for each piece of lighting equipment. Required routine maintenance actions, cleaning and recommended relamping shall be clearly identified.
7. A schedule for inspecting and recalibrating all lighting controls.
8. A narrative of how each system is intended to operate, including recommended set points.

C408.2.5.3 System balancing report.
A written report describing the activities and measurements completed in accordance with Section C408.2.2.

C408.2.5.4 Final commissioning report.
A report of test procedures and results identified as "Final Commissioning Report" shall be delivered to the building owner or owner's authorized agent. The report shall be organized with mechanical system and service hot water system findings in separate sections to allow independent review. The report shall include the following:
1. Results of functional performance tests.
2. Disposition of deficiencies found during testing, including details of corrective measures used or proposed.
3. Functional performance test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.

Exception: Deferred tests that cannot be performed at the time of report preparation due to climatic conditions.

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06/30/22	ISSUE FOR CONSTRUCTION

SHEET TITLE
MECHANICAL NOTES

SHEET NO.
M002

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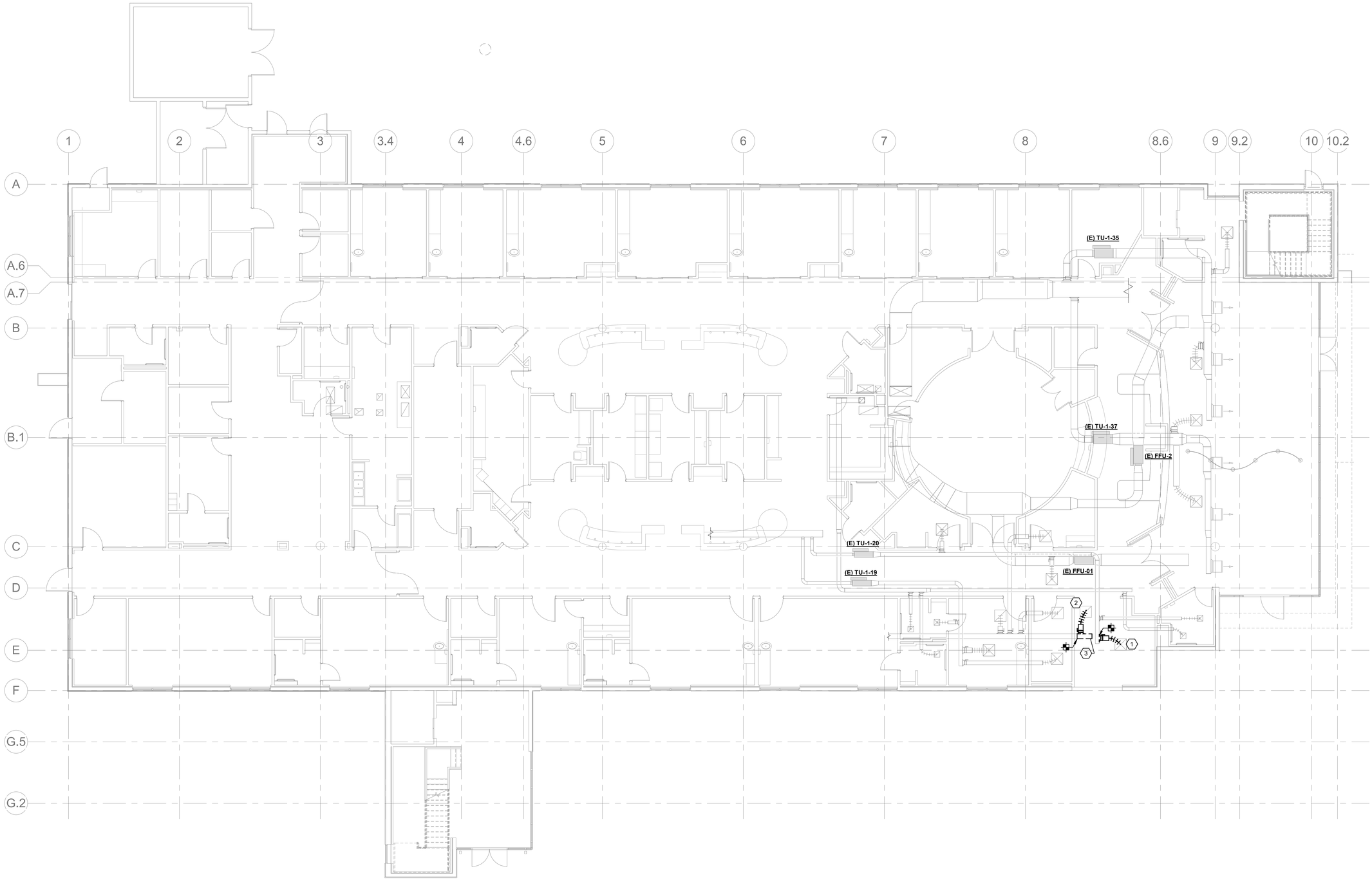
KEYED NOTES

1	EXISTING DIFFUSER TO BE RELOCATED. RE: M201 FOR NEW LOCATION.
2	EXISTING RETURN GRILLE TO BE RELOCATED. RE: M201 FOR NEW LOCATION.
3	DEMO EXISTING RETURN DUCT TO POINT INDICATED.



1 MECHANICAL FIRST FLOOR DEMO PLAN

1/8" = 1'-0"

8' 4' 0' 8' 16'

1/8" = 1'-0"

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SHEET TITLE
MECHANICAL
FIRST FLOOR
DEMO PLAN

SHEET NO.
M101

KEYED NOTES

1	DEMO EXISTING SUPPLY DUCT UP TO ASSOCIATED UNIT ON ROOF.
2	DEMO EXISTING RETURN AIR DUCT UP TO ASSOCIATED UNIT ON ROOF.
3	DEMO EXISTING EXHAUST DUCTWORK AND ASSOCIATED EXHAUST FAN ON ROOF.
4	DEMO EXISTING SIDE WALL GRILLE AND ASSOCIATED DUCTWORK.
5	DEMO EXISTING SIDE WALL SUPPLY DIFFUSER.
6	DEMO EXISTING RETURN AIR TRANSFER DUCT.
7	DEMO EXISTING VAV AND ASSOCIATED CONTROLS.
8	DEMO DUCT PENETRATION INTO 2 HOUR FIRE AND SMOKE BARRIER IN PREPARATION FOR INSTALLATION OF NEW FIRE SMOKE DAMPER.
9	DEMO EXISTING RETURN AIR GRILLE.
10	DEMO CHILLED WATER SUPPLY/RETURN PIPING TO MAIN AS INDICATED.
11	DEMO EXISTING SUPPLY DIFFUSER AND ASSOCIATED DUCTWORK.
12	DEMO EXISTING EXHAUST GRILLE AND ASSOCIATED DUCTWORK.
13	DEMO EXISTING SUPPLY DUCTWORK AS SHOWN. EXISTING DUCTWORK AND ASSOCIATED DUCT MOUNTED AIR DEVICES SHALL REMAIN FOR FUTURE CONNECTION. SEE MECHANICAL PLAN FOR FUTHER INSTRUCTION.

(TYP. ALL)

(TYP. ALL)

1 MECHANICAL SECOND FLOOR DEMOLITION PLAN

1/8" = 1'-0"

8' 4' 0' 8' 16'

1/8" = 1'-0"

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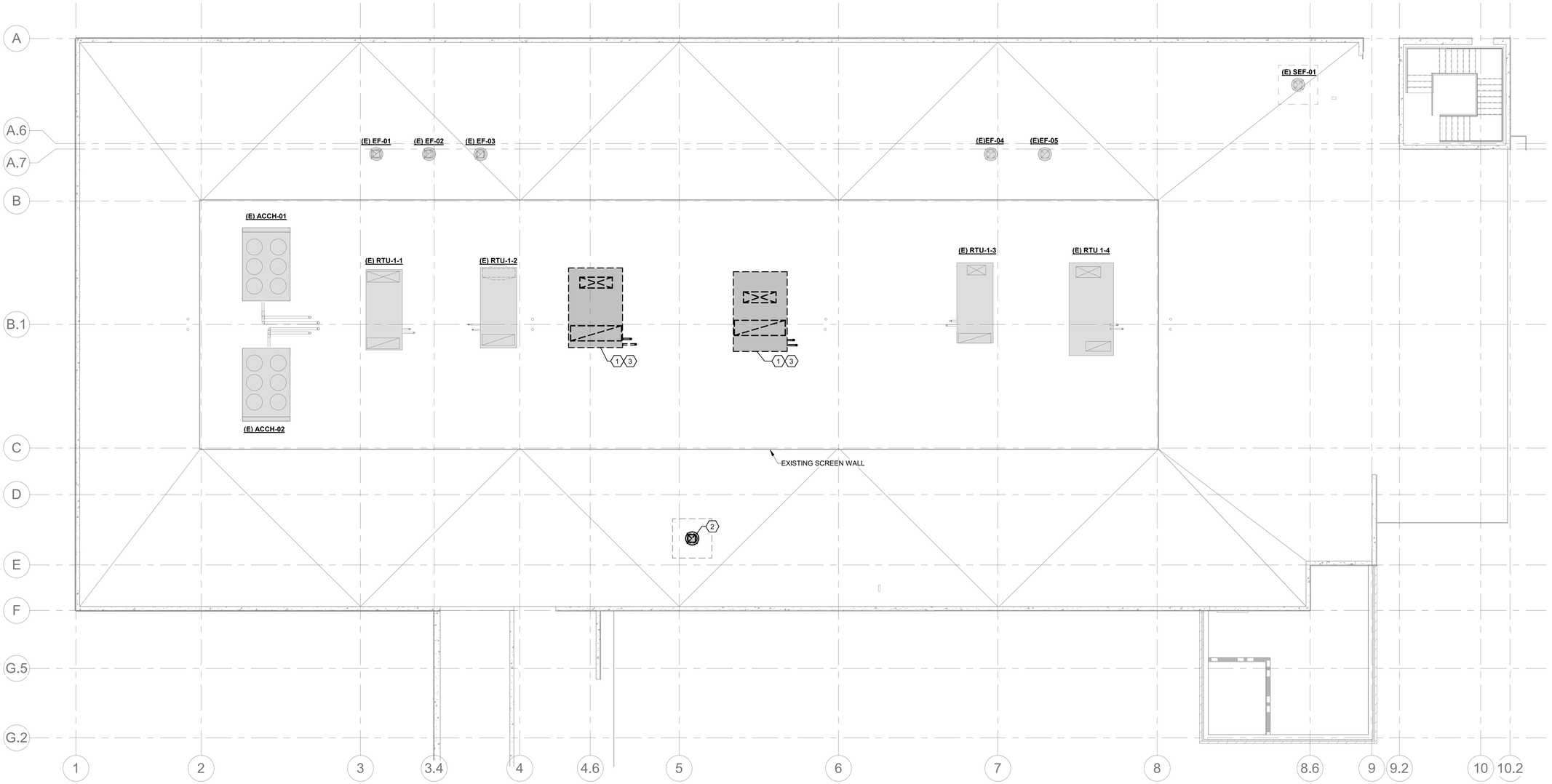
SHEET TITLE
MECHANICAL SECOND FLOOR DEMO PLAN

SHEET NO.
M102

KEYED NOTES

1	DEMO EXISTING CHILLED WATER RTU AND ASSOCIATED CHILLED WATER PIPING, CONDENSATE PIPING, DUCTWORK, CONTROLS, ETC.
2	DEMO EXISTING EXHAUST FAN.
3	REMOVE ASSOCIATED ROOF CURB AND PATCH AND SEAL ROOF WATER TIGHT.



1 MECHANICAL ROOF DEMOLITION PLAN

1/8" = 1'-0"

8' 4' 0' 8' 16'
1/8" = 1'-0"

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SHEET TITLE
MECHANICAL ROOF DEMOLITION PLAN

SHEET NO.
M103

KEYED NOTES

1	EXISTING SUPPLY DIFFUSER SHALL BE RELOCATED AS SHOWN. REBALANCE TO CFM INDICATED. PROVIDE NEW SPIN-IN AND FLEX DUCT. CAP AND SEAL UNUSED DUCT OPENING AIR TIGHT. REUSE EXISTING DUCT OPENINGS WHERE AVAILABLE. SEE SCHEDULE AND DETAIL.
2	EXISTING RETURN GRILLE SHALL BE RELOCATED AS SHOWN. REBALANCE TO CFM INDICATED. PROVIDE NEW SPIN-IN AND FLEX DUCT. CAP AND SEAL UNUSED DUCT OPENING AIR TIGHT. REUSE EXISTING DUCT OPENINGS WHERE AVAILABLE. SEE SCHEDULE AND DETAIL.
3	NEW SUPPLY AIR DIFFUSER SHALL BE LOCATED AS SHOWN. BALANCE TO CFM INDICATED. PROVIDE NEW SPIN-INS, SPIRAL DUCTWORK, AND FLEX DUCT. SEE SCHEDULE AND DETAILS.
4	RELOCATE EXISTING THERMOSTAT TO LOCATION INDICATED AND TIE INTO DESIGNATED EQUIPMENT CONTROLS.
5	REBALANCE EXISTING SUPPLY DIFFUSER TO CFM INDICATED.
6	REBALANCE EXISTING TERMINAL UNIT TO CFM OF ALL CONNECTED AIR DEVICES.
7	NEW RETURN GRILLE SHALL BE LOCATED AS SHOWN. BALANCE TO INDICATED CFM. SEE SCHEDULE.
8	REBALANCE EXISTING RETURN AIR GRILLE TO CFM INDICATED.

GENERATOR YARD
104

(E) TU-1-20
(E) TU-1-19

EX / 100
EX / 120
EX / 115
EX / 350
EX / 100
EX / 350
EX / 100

CHANGING
151

8"x12"
C / 50
C / 90
10"x14"
EX / 170
D / 345
EX / 345
C / 175
(TYP. ALL)

IMAGING HOLDING
150

AREA OF WORK

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

8' 4' 0' 8' 16'
1/8" = 1'-0"

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APPROVED FIRE CODE PLANS
Reviewer: A. Zepeda
All code deficiencies found in the field shall be corrected and made compliant prior to the Certificate of Compliance being issued.

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SHEET TITLE
MECHANICAL
FIRST FLOOR PLAN

SHEET NO.
M201

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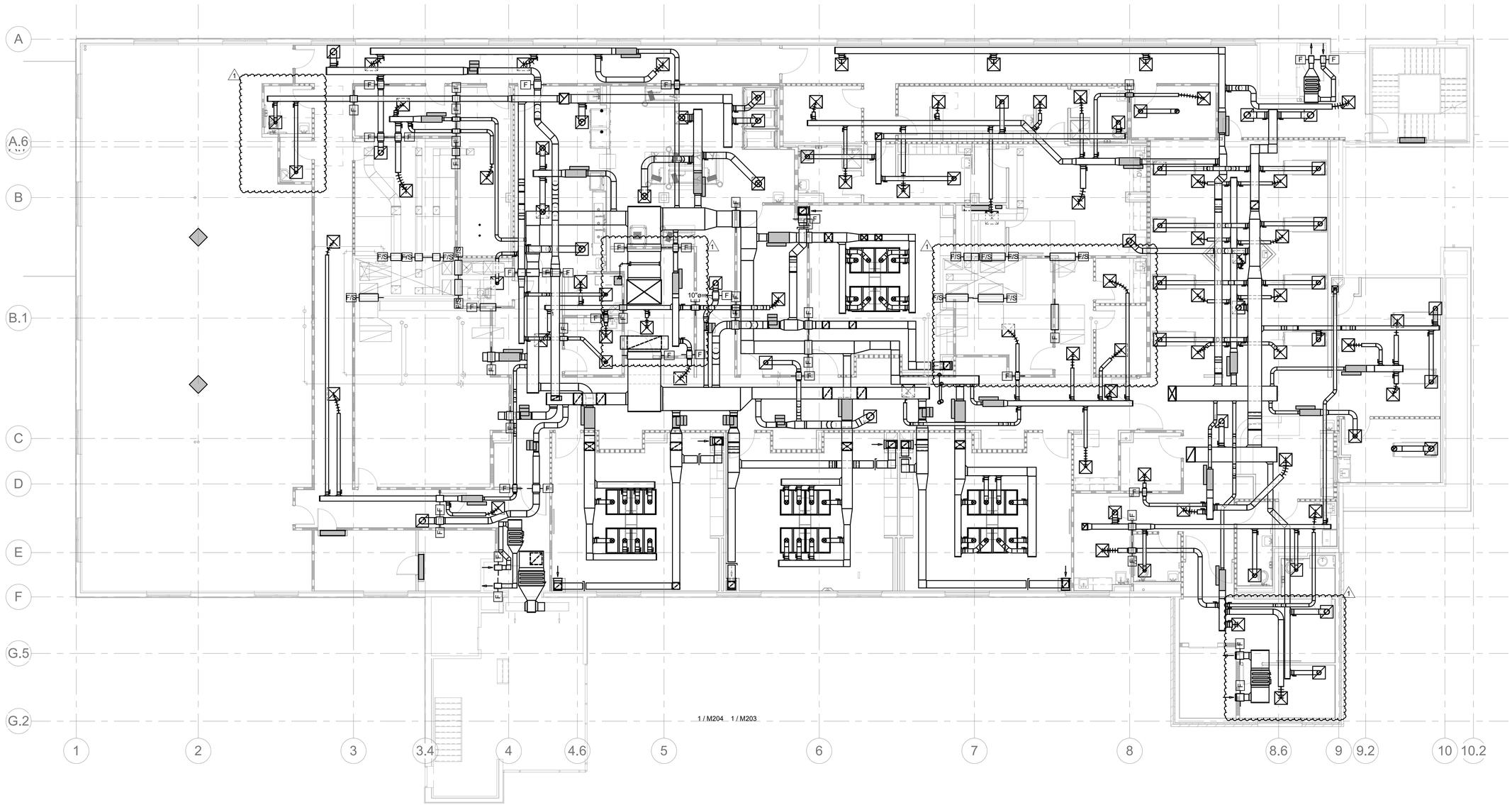

1 MECHANICAL SECOND FLOOR PLAN - OVERALL

1/8" = 1'-0"

8' 4' 0' 8' 16'

1/8" = 1'-0"

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APPROVED FIRE CODE PLANS
Reviewer: A. Zepeda
All code deficiencies found in the field shall be corrected and made compliant prior to the Certificate of Compliance being issued.

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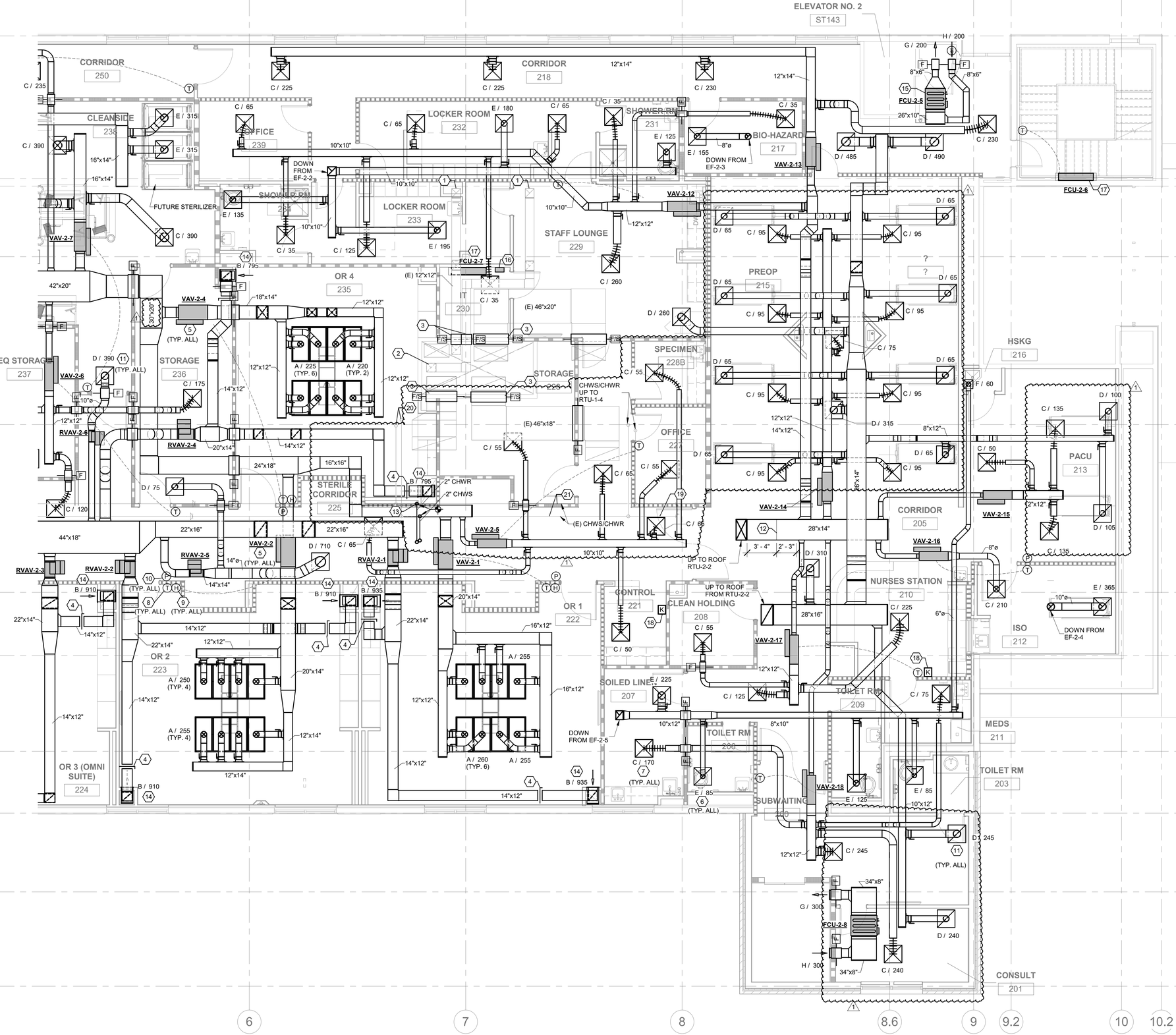
SHEET TITLE
MECHANICAL SECOND FLOOR PLAN - OVERALL

SHEET NO.
M202



KEYED NOTES

1	EXHAUST DUCT DOWN FROM EXISTING EXHAUST FAN SERVING LEVEL 1.
2	EXISTING EXHAUST DUCT DOWN IN CHASE TO SERVE FIRST FLOOR TO REMAIN.
3	PROVIDE NEW 1-1/2 HOUR FIRE/SMOKE DAMPER IN EXISTING DUCT AT EXISTING 2 HOUR FIRE AND SMOKE BARRIER. PROVIDE DAMPER WITH REMOTE TESTING CAPABILITY.
4	INSTALL REMOTE CABLE OPERATED BALANCING DAMPER SIMILAR TO ROTOTWIST MODEL RT-200 IN EXHAUST/RETURN DUCT AND BALANCE TO CFM INDICATED. ROUTE ADJUSTMENT CABLE TO ROTOTWIST ROUND MINIATURE CEILING CUP MODEL RT-CCM IN CEILING ADJACENT TO DAMPER.
5	NEW VAV BOX SHALL BE LOCATED AS SHOWN. BALANCE TO CFM INDICATED. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES AND ENSURE BOX IS READLY ACCESSIBLE FROM LAY-IN CEILING OR ACCESS PANEL. BALANCE TO CFM INDCIATED ON DRAWINGS. SEE DETAILS AND SCHEDULE.
6	NEW EXHAUST GRILLE SHALL BE LOCATED AS SHOWN. BALANCE TO INDICATED CFM. SEE SCHEDULE.
7	NEW SUPPLY AIR DIFFUSER SHALL BE LOCATED AS SHOWN. BALANCE TO CFM INDICATED. PROVIDE NEW SPIN-INS, SPIRAL DUCTWORK, AND FLEX DUCT. SEE SCHEDULE AND DETAILS.
8	NEW DDC ZONE THERMOSTAT/CONTROL. PROVIDE NEW CONTROL WIRING AS REQUIRED.
9	NEW HUMIDITY SENSOR. PROVIDE NEW CONTROL WIRING AS REQUIRED.
10	CONTRACTOR SHALL PROVIDE ANTEC PMT (OR APPROVED EQUAL) AT NOTED LOCATION. PROVIDE ALL REQUIRED WIRING AND ACCESSORIES. CONNECT BACK TO BAS. ROOM DIFFERENTIAL PRESSURE SET POINT SHALL BE SET TO 0.01 IN WG (ADJUSTABLE). THE CONTROL SYSTEM SHALL ANNUNCIATE AN ALARM AT THE NURSE STATION IF THE DOOR IS HELD OPEN FOR LONGER THAN 30 SECONDS (ADJUSTABLE) OR IF THE DOOR IS CLOSED AND ROOM DIFFERENTIAL PRESSURE DROPS BELOW SETPOINT FOR 30 SECONDS (ADJUSTABLE).
11	NEW RETURN GRILLE SHALL BE LOCATED AS SHOWN. BALANCE TO INDICATED CFM. SEE SCHEDULE.
12	AHU PRESSURE SENSOR SHALL BE PLACED IN APPROXIMATE LOCATION SHOWN. NOTED DIMENSIONS ARE THE MINIMUM SEPARATION DISTANCE REQUIRED BEFORE TRANSITIONS AND FITTINGS. PROVIDE ALL REQUIRED ACCESSORIES FOR COMPLETE OPERATION. CONNECT BACK TO AHU AND BAS. PRIMARY SENSOR SHALL BE USED TO CONTROL VFD ON FAN. SEE SEQUENCE OF OPERATIONS IN SPECIFICATIONS FOR FURTHER DETAILS.
13	PROVIDE BTU/H METER READOUT IN APPROXIMATE LOCATION. COORDINATE WITH ARCHITECT AND OWNER FOR EXACT LOCATION.
14	MOUNT LOW EXHAUST GRILLE AT 10" AFF. BALANCE TO CFM INDICATED.
15	NEW HORIZONTAL DX FAN COIL UNIT SHALL BE SUPPORTED FROM STRUCTURE IN APPROXIMATE LOCATION SHOWN. ROUTE UNIT'S REFRIGERANT PIPING TO ASSOCIATED CONDENSING UNIT. FIELD VERIFY EXACT LOCATION BEFORE INSTALLATION. PROVIDE S/R DUCTWORK AS SHOWN. PROVIDE UNIT WITH FACTORY PROVIDED FILTER RACK. ROUTE UNIT'S 3/4" PRIMARY CONDENSATE LINE TO LAV TAIL PIECE (NOT SHOWN). PROVIDE UNIT WITH FACTORY (OR EQUAL) 7 DAY PROGRAMMABLE THERMOSTAT AND LOCATE AS SHOWN. PROVIDE HIGH LEVEL SWITCH IN PRIMARY DRAIN PAN. PROVIDE ALL REQUIRED ACCESSORIES AND TRANSITIONS. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES. SEE SCHEDULE AND DETAILS.
16	NEW DDC CENTRAL CONTROLLER SHALL BE LOCATED IN AREA SHOWN. CONTROLLER SHALL COMMAND ALL MECHANICAL EQUIPMENT AND THEIR ASSOCIATED TERMINALS. COORDINATE FINAL LOCATION WITH ARCHITECT AND OWNER. PROVIDE NEW CONTROL WIRING AS REQUIRED. SEE SPECS.
17	NEW WALL MOUNTED DX MINI SPLIT SYSTEM SHALL BE LOCATED AS SHOWN. FIELD VERIFY EXACT LOCATION BEFORE INSTALLATION. PROVIDE CONCEALED CONDENSATE PUMP. ROUTE 3/4" CONDENSATE TO LAV TAIL PIECE / FUNNEL DRAIN AS INDICATED. ROUTE UNIT'S REFRIGERANT PIPING TO ASSOCIATED CONDENSING UNIT.
18	NEW MANUAL SHUTDOWN SWITCHES SHALL BE LOCATED IN APPROXIMATE AREA PER NFPA 90A. ONE MANUAL SHUTDOWN SWITCH SHALL COMMAND RTU-2-1 AND EF-2-1. ANOTHER MANUAL SHUTDOWN SWITCH SHALL CONTROL RTU-2-2, EF-2-2,3,4,5. MANUAL SHUTDOWN SWITCHES SHALL BE 48" A.F.F. COORDINATE FINAL LOCATION WITH ARCHITECT AND OWNER. SEE SPECS. PROVIDE ALL REQUIRED ACCESSORIES, CONTROLS, AND WIRING.
19	EXISTING MOTORIZED PRESSURE INDEPENDENT BYPASS VALVE AND VENTURI FLOW METER TO REMAIN.
20	CHWS/CHWR UP TO RTU-1-3.
21	EXISTING CHILLED WATER SUPPLY/RETURN LOCATED ABOVE CEILING. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF EXISTING AND RE-ROUTE AS REQUIRED TO MAINTAIN EQUIPMENT CLEARANCES AND CEILING HEIGHTS.

1 MECHANICAL SECOND FLOOR PLAN - PLAN EAST

3/16" = 1'-0"

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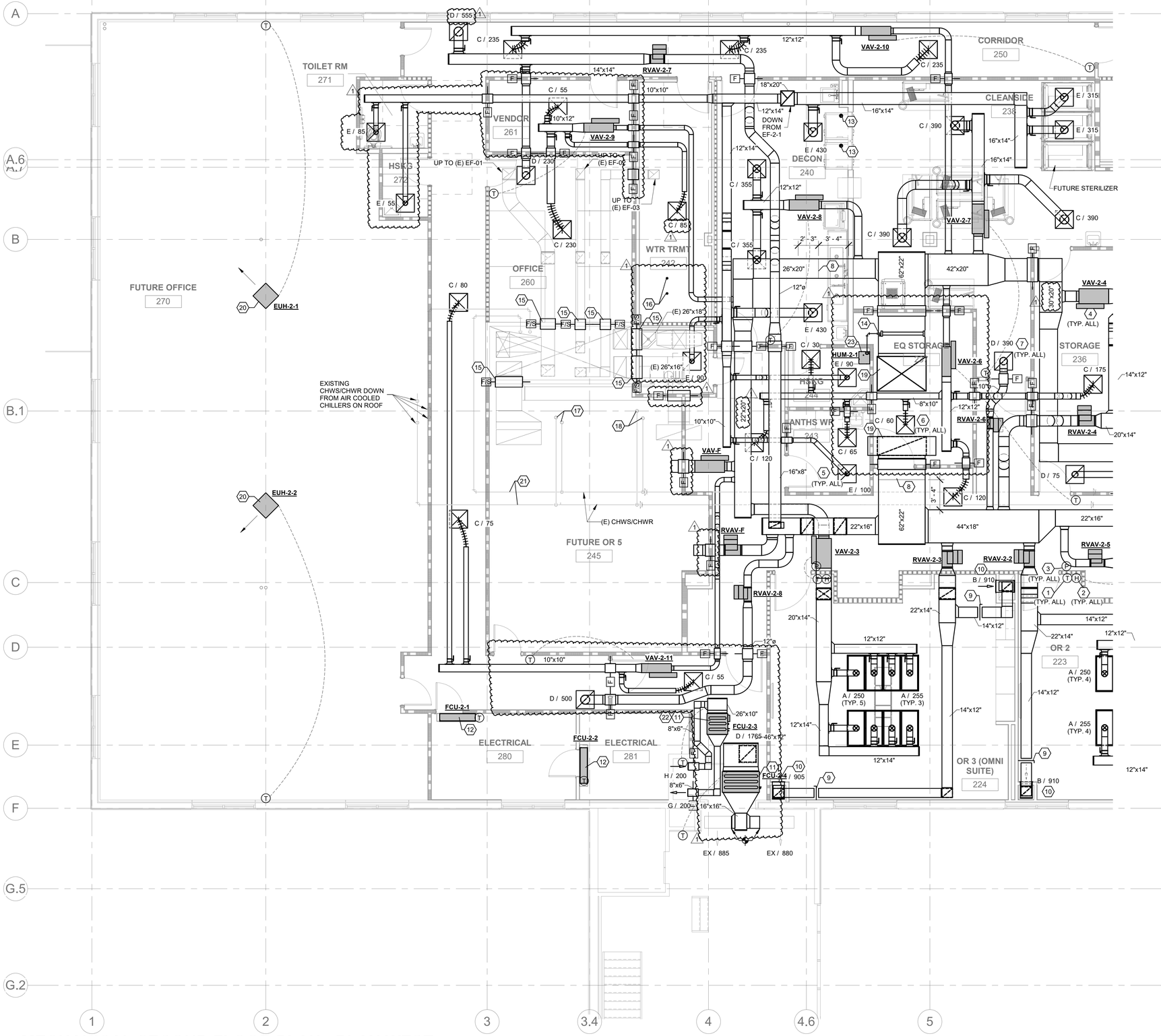
1 07/25/22	PR 3

SHEET TITLE
MECHANICAL SECOND FLOOR PLAN - ENLARGED PLAN EAST

SHEET NO.
M203



KEYED NOTES

1	NEW DDC ZONE THERMOSTAT/CONTROL. PROVIDE NEW CONTROL WIRING AS REQUIRED.
2	NEW HUMIDITY SENSOR. PROVIDE NEW CONTROL WIRING AS REQUIRED.
3	CONTRACTOR SHALL PROVIDE ANTEC PMT (OR APPROVED EQUAL) AT NOTED LOCATION. PROVIDE ALL REQUIRED WIRING AND ACCESSORIES. CONNECT BACK TO BAS. ROOM DIFFERENTIAL PRESSURE SET POINT SHALL BE SET TO 0.01 IN WG (ADJUSTABLE). THE CONTROL SYSTEM SHALL ANNUNCIATE AN ALARM AT THE NURSE STATION IF THE DOOR IS HELD OPEN FOR LONGER THAN 30 SECONDS (ADJUSTABLE) OR IF THE DOOR IS CLOSED AND ROOM DIFFERENTIAL PRESSURE DROPS BELOW SETPOINT FOR 30 SECONDS (ADJUSTABLE).
4	NEW VAV BOX SHALL BE LOCATED AS SHOWN. BALANCE TO CFM INDICATED. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES AND ENSURE BOX IS READILY ACCESSIBLE FROM LAY-IN CEILING OR ACCESS PANEL. BALANCE TO CFM INDCIATED ON DRAWINGS. SEE DETAILS AND SCHEDULE.
5	NEW EXHAUST GRILLE SHALL BE LOCATED AS SHOWN. BALANCE TO INDICATED CFM. SEE SCHEDULE.
6	NEW SUPPLY AIR DIFFUSER SHALL BE LOCATED AS SHOWN. BALANCE TO CFM INDICATED. PROVIDE NEW SPIN-INS, SPIRAL DUCTWORK, AND FLEX DUCT. SEE SCHEDULE AND DETAILS.
7	NEW RETURN GRILLE SHALL BE LOCATED AS SHOWN. BALANCE TO INDICATED CFM. SEE SCHEDULE.
8	AHU PRESSURE SENSOR SHALL BE PLACED IN APPROXIMATE LOCATION SHOWN. NOTED DIMENSIONS ARE THE MINIMUM SEPARATION DISTANCE REQUIRED BEFORE TRANSITIONS AND FITTINGS. PROVIDE ALL REQUIRED ACCESSORIES FOR COMPLETE OPERATION. CONNECT BACK TO AHU AND BAS. PRIMARY SENSOR SHALL BE USED TO CONTROL VFD ON FAN. SEE SEQUENCE OF OPERATIONS IN SPECIFICATIONS FOR FURTHER DETAILS.
9	INSTALL REMOTE CABLE OPERATED BALANCING DAMPER SIMILAR TO ROTOTWIST MODEL RT-200 IN EXHAUST/RETURN DUCT AND BALANCE TO CFM INDICATED. ROUTE ADJUSTMENT CABLE TO ROTOTWIST ROUND MINIATURE CEILING CUP MODEL RT-CCM IN CEILING ADJACENT TO DAMPER.
10	MOUNT LOW EXHAUST GRILLE AT 10" AFF. BALANCE TO CFM INDICATED.
11	NEW HORIZONTAL DX FAN COIL UNIT SHALL BE SUPPORTED FROM STRUCTURE IN APPROXIMATE LOCATION SHOWN. ROUTE UNIT'S REFRIGERANT PIPING TO ASSOCIATED CONDENSING UNIT. FIELD VERIFY EXACT LOCATION BEFORE INSTALLATION. PROVIDE S/R DUCTWORK AS SHOWN. PROVIDE UNIT WITH FACTORY PROVIDED FILTER RACK. ROUTE UNIT'S 3/4" PRIMARY CONDENSATE LINE TO LAV TAIL PIECE (NOT SHOWN). PROVIDE UNIT WITH FACTORY (OR EQUAL) 7 DAY PROGRAMMABLE THERMOSTAT AND LOCATE AS SHOWN. PROVIDE HIGH LEVEL SWITCH IN PRIMARY DRAIN PAN. PROVIDE ALL REQUIRED ACCESSORIES AND TRANSITIONS. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES. SEE SCHEDULE AND DETAILS.
12	NEW WALL MOUNTED DX MINI SPLIT SYSTEM SHALL BE LOCATED AS SHOWN. FIELD VERIFY EXACT LOCATION BEFORE INSTALLATION. PROVIDE CONCEALED CONDENSATE PUMP. ROUTE 3/4" CONDENSATE TO LAV TAIL PIECE / FUNNEL DRAIN AS INDICATED. ROUTE UNIT'S REFRIGERANT PIPING TO ASSOCIATED CONDENSING UNIT.
13	ROUTE 5" DIAMETER STAINLESS STEEL EXHAUST DUCT FROM STERILIZER UP THRU ROOF. COORDINATE EXACT LOCATION WITH ARCHITECT.
14	STEAM DISTRIBUTOR SHALL BE PLACED IN APPROXIMATE LOCATION SHOWN. NOTED DIMENSIONS ARE THE MINIMUM SEPARATION DISTANCE REQUIRED BEFORE TRANSITIONS, FITTINGS, AND ACCESSORIES. PROVIDE ALL REQUIRED ACCESSORIES FOR COMPLETE OPERATION. CONNECT BACK TO HUMIDIFIER. ROUTE CONDENSATE TO LOCATION SHOWN. AIR PROVING SWITCH AND HIGH LIMIT SENSOR (NOT SHOWN) SHALL ALSO BE PLACED IN RESPECTIVE SUPPLY DUCT; FOLLOW MANUFACTURER RECOMMENDED LOCATIONS FOR INSTALLATION.
15	PROVIDE NEW 1-1/2 HOUR FIRE/SMOKE DAMPER IN EXISTING DUCT AT EXISTING 2 HOUR FIRE AND SMOKE BARRIER. PROVIDE DAMPER WITH REMOTE TESTING CAPABILITY.
16	ROUTE INTAKE/EXHAUST DUCT UP THRU ROOF FROM VACUUM PUMP SIZED PER MANUFACTURERS RECOMMENDATIONS. TERMINATE DUCT PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
17	CHWS/CHWR UP TO RTU-1-1.
18	CHWS/CHWR UP TO RTU-1-2.
19	SUPPLY/RETURN DUCT DOWN FROM RTU-2-1.
20	NEW ELECTRIC UNIT HEATER SUPPORTED FROM STRUCTURE ABOVE. PROVIDE REMOTE THERMOSTAT.
21	EXISTING CHILLED WATER SUPPLY/RETURN LOCATED ABOVE CEILING. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF EXISTING AND RE-ROUTE AS REQUIRED TO MAINTAIN EQUIPMENT CLEARANCES AND CEILING HEIGHTS.
22	UNIT SHALL BE MOUNTED TIGHT TO STRUCTURE. MAINTAIN MANUFACTURER RECOMMENDED CLEARANCES.
23	CONTRACTOR SHALL PROVIDE WALL HUNG HUMIDIFIER AS SHOWN. COORDINATE FINAL LOCATION WITH ARCHITECT. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES. ROUTE STEAM SUPPLY/RETURN PIPING FROM HUMIDIFIER TO ASSOCIATED MANIFOLD IN SUPPLY DUCT. PROVIDE ALL REQUIRED PIPE FITTINGS, TRANSITIONS, AND ACCESSORIES. ROUTE DRAIN WITH AIR GAP FROM HUMIDIFIER TO FLOOR DRAIN IN ROOM.

1 MECHANICAL SECOND FLOOR PLAN - PLAN WEST
3/16" = 1'-0"

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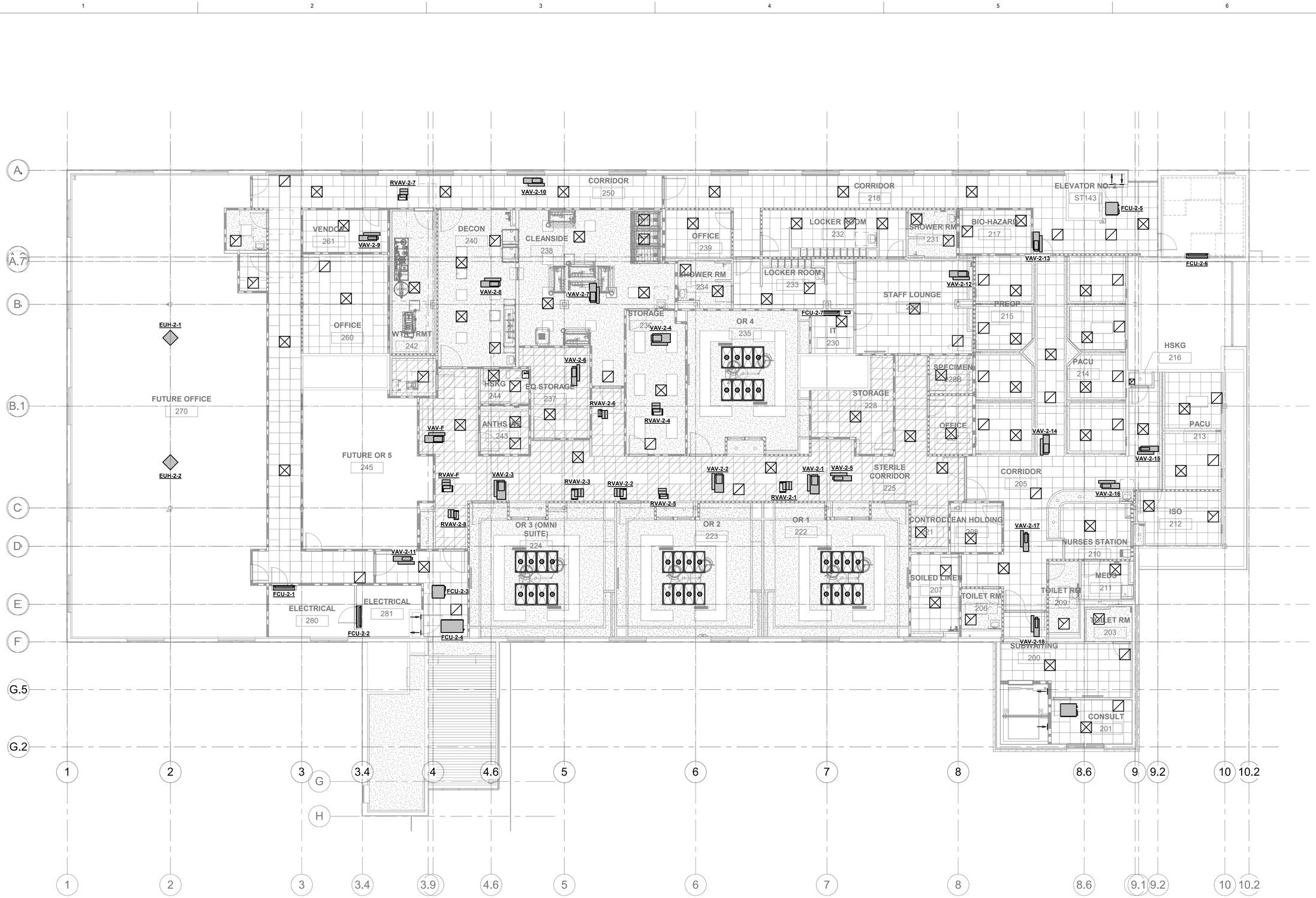
SHEET TITLE
MECHANICAL SECOND FLOOR PLAN - ENLARGED PLAN WEST

SHEET NO.
M204



1 MECHANICAL SECOND FLOOR CEILING PLAN

1/8" = 1'-0"

8' 4' 0' 8' 16'
1/8" = 1'-0"

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SHEET TITLE
MECHANICAL SECOND FLOOR CEILING COORDINATION PLAN

SHEET NO.
M205

KEYED NOTES

1	EXISTING EXHAUST FAN SERVING LEVEL 1 TO REMAIN.
2	ROOF MOUNTED EXHAUST FAN SERVING ISOLATION ROOM WITH HIGH VELOCITY DISCHARGE WITH NO RAIN CAP OR OTHER DEVICE TO IMPEDE THE VERTICAL MOMENTUM. THE TOP OF DISCHARGE SHALL BE AT LEAST 10 FEET ABOVE THE ROOF. EXHAUST DISCHARGE SHALL BE LOCATED NOT LESS THAN 25 FEET HORIZONTALLY FROM OUTSIDE AIR INTAKES. PROVIDE AT LEAST 5 DUCT DIAMETERS OF STRAIGHT DUCT PRIOR TO FAN INLET.
3	NEW ROOF MOUNTED EXHAUST FAN. CONTRACTOR SHALL SEAL WATER TIGHT ROOF PENETRATION. FAN SHALL BE 10 FEET FROM ALL ROOF EDGES. CONTRACTOR SHALL PROVIDE ROOF CURB AND ALL OTHER TRANSITIONS, FITTINGS, AND ACCESSORIES. SEE SCHEDULE.

KEYED NOTES

4	NEW ROOFTOP UNIT. COORDINATE FINAL LOCATION WITH STRUCTURAL. UNIT'S OUTSIDE AIR INTAKE SHALL BE MINIMUM OF 25 FEET FROM ALL EXHAUST AND PLUMBING VENTS. UNIT SHALL BE A MINIMUM OF 10 FEET FROM ALL ROOF EDGES. ROUTE NEW CONDENSATE LINE FROM UNIT AS SHOWN. CONTRACTOR SHALL PROVIDE ALL REQUIRED TRANSITIONS, FITTINGS, AND ACCESSORIES FOR FULL OPERATION. SEE SCHEDULE.
5	CONDENSING UNIT (CU) SHALL BE INSTALLED ON ROOF IN APPROXIMATE AREA. EQUIPMENT SHALL BE AT LEAST 10 FEET FROM ROOF EDGE. COORDINATE WORK WITH STRUCTURAL DRAWINGS, ARCHITECTURAL DRAWINGS, ROOFING AND ELECTRICAL CONTRACTOR. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES. ROUTE UNITS REFRIGERATION AND ELECTRICAL LINES THROUGH ROOF PENETRATION. PROVIDE NEW ROOF EQUIPMENT SLEEPER (THYBARTEMS-1 OR EQUAL) AND CAP (ROOFSCREEN DRYCAP). SEE SCHEDULE AND DETAIL.

KEYED NOTES

6	STERILIZER EXHAUST UP FROM BELOW. TERMINATE PER STERILIZER MANUFACTURER'S RECOMMENDATIONS.
7	PROVIDE WITH BIO-HAZARD IDENTIFICATION STICKER. SEE SPECIFICATIONS.
8	INTAKE/EXHAUST DUCTS FROM VACUUM PUMP BELOW. TERMINATE DUCT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
9	PROVIDE BLANK OFFS IN RTU AS REQUIRED TO MAKE DUCT CONNECTIONS.

EXISTING PLUMBING VENT
EXISTING PLUMBING VENT
EXISTING PLUMBING VENT
EF-2-1
(E) EF-01
(E) EF-02
(E) EF-03
EF-2-2
(E)EF-04
(E)EF-05
EF-2-3
(E) SEF-01
EXISTING PLUMBING VENT
EXISTING ROOF ACCESS DOOR
EXISTING PLUMBING VENT
(E) ACCH-01
(E) RTU-1-1
(E) RTU-1-2
RTU-2-1
6190 LBS
CU-2-7
CU-2-6
CU-2-5
(E) RTU-1-3
(E) RTU 1-4
(E) CHWS/R PIPING DOWN THRU ROOF
(E) ACCH-02
CU-2-1
CU-2-2
CU-2-3
CU-2-4
2" CHWR
2" CHWS
RTU-2-2
3220 LBS
28"x14"
DOWN THRU ROOF
R 25' - 0"
EF-2-4
320 LBS
13"ø
10"ø
PROVIDE 3 FAN WHEEL DIAMETERS OF STRAIGHT DUCT MINIMUM PER MFG.
EXISTING SCREEN WALL
28"x16"
DOWN THRU ROOF
EXISTING PLUMBING VENT
EXISTING PLUMBING VENT
EF-2-5
CU-2-8

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

8' 4' 0' 8' 16'
1/8" = 1'-0"

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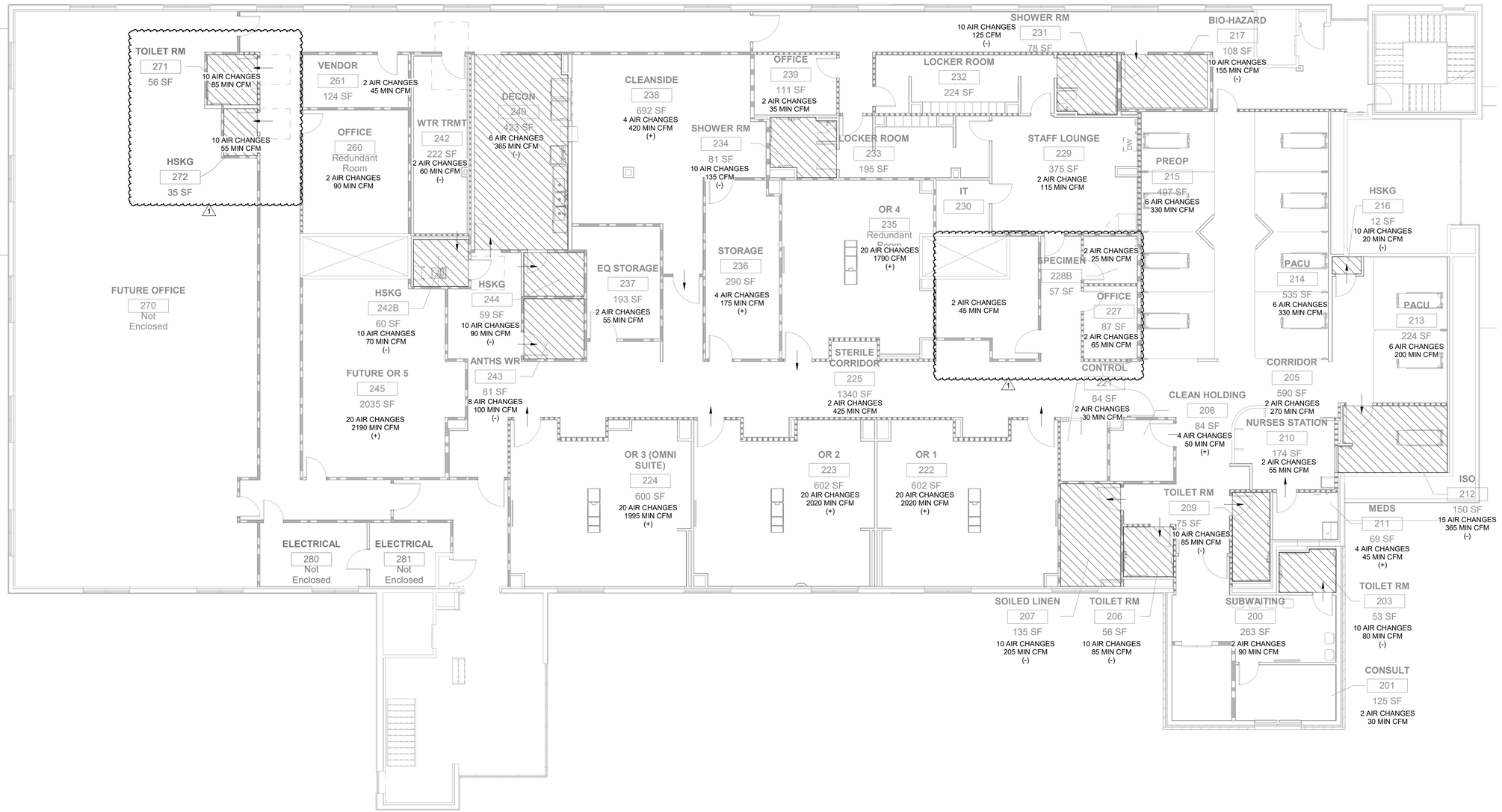
SHEET TITLE
MECHANICAL ROOF PLAN

SHEET NO.
M206

= ALL AIR EXHAUSTED DIRECTLY TO OUTDOORS



1 MECHANICAL PRESSURIZATION DIAGRAM

1/8" = 1'-0"

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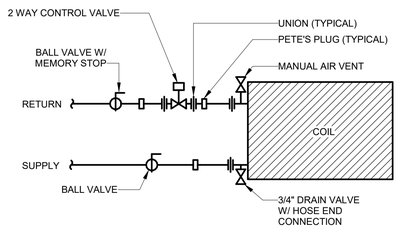
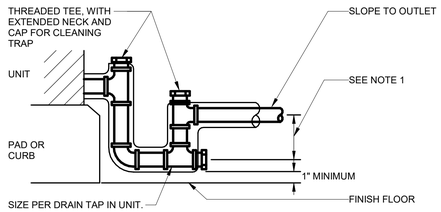
SHEET TITLE
MECHANICAL PRESSURIZATION DIAGRAM

SHEET NO.
M301



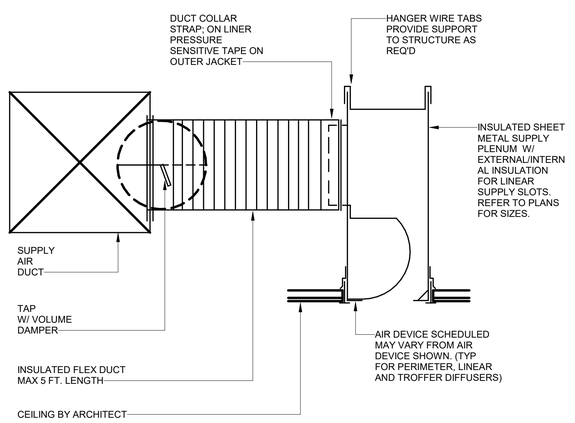
NOTES:
1. PIPE WATER FLOW COUNTER TO AIR FLOW
2. PROVIDE DIELECTRIC UNIONS WHERE MATERIALS DIFFER
3. PROVIDE CONCENTRIC REDUCERS WHERE REQUIRED

8 2-WAY VALVE CONNECTION
NOT TO SCALE



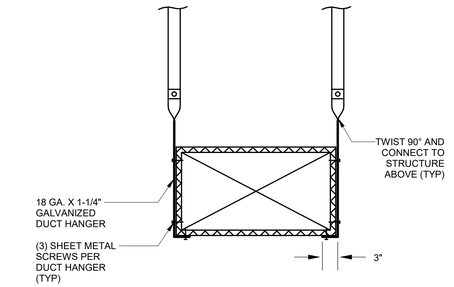
NOTE:
1. DRAW THRU UNITS: TRAP DEPTH = GREATER OF 2" OR 1/2" PLUS AHU TOTAL PRESSURE IN INCHES - WG PRESSURE IN INCHES - WG
2. PAD OR CURB HEIGHT DETERMINED BY SPACE REQD TO INSTALL TRAP

9 CONDENSATE DRAIN TRAP FOR RTUs
NOT TO SCALE

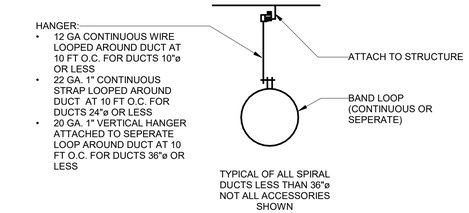


NOTE: SUPPORT FLEX DUCT FROM STRUCTURE SO THAT IT DOES NOT KINK, SAG OR REST ON LIGHT FIXTURES, CEILING SUPPORT TEES OR TILE.

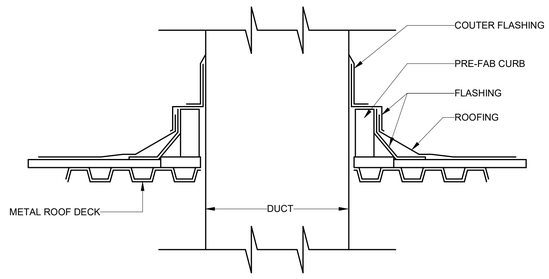
10 SLOT DIFFUSER
NOT TO SCALE



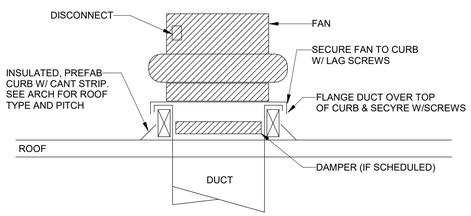
4 DUCT HANGER
NOT TO SCALE



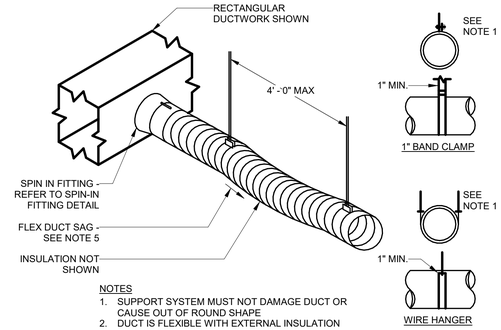
5 SPIRAL DUCT HANGER
NOT TO SCALE



6 DUCT THROUGH ROOF PENETRATION
NOT TO SCALE

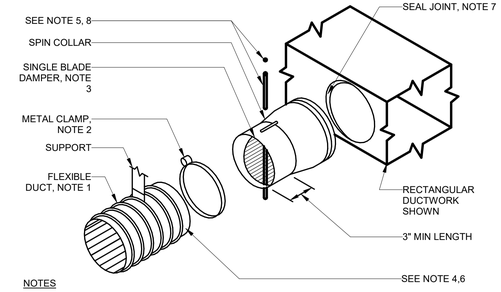


7 ROOF MOUNTED EXHAUST FAN
NOT TO SCALE



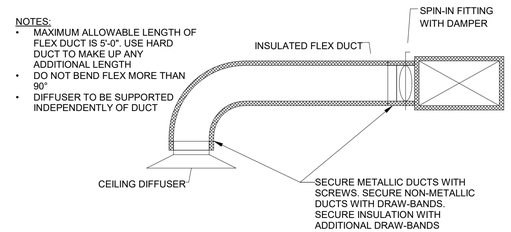
NOTES
1. SUPPORT SYSTEM MUST NOT DAMAGE DUCT OR CAUSE OUT OF ROUND SHAPE
2. DUCT IS FLEXIBLE WITH EXTERNAL INSULATION AND VAPOR BARRIER JACKETING
3. MINIMUM CENTER LINE BEND RADIUS IS ONE DIAMETER (OR INSIDE RADIUS OF D/2)
4. DUCT SHOULD EXTEND STRAIGHT FOR SEVERAL INCHES FROM A CONNECTION BEFORE BENDING
5. MAXIMUM SAG OF 1/2" PER FOOT OF SUPPORT SPACING

1 FLEX DUCT SUPPORT REQUIREMENTS
NOT TO SCALE



NOTES
1. SUPPORT AS REQUIRED
2. BAND FLEX TO COLLAR 1/2" MIN FROM OUTBOARD END OF COLLAR
3. INSTALL SPIN COLLAR DAMPER IN OPEN POSITION; FINAL ADJUSTMENT BY TAB CONTRACTOR
4. PULL FLEXIBLE DUCTWORK INSULATION UP TO END OF SPIN COLLAR AT EDGE OF RECTANGULAR DUCTWORK; SEAL VAPOR BARRIER W/ PRESSURE SENSITIVE TAPE (UL 181B-FX OR 181A-P) TO PREVENT MOISTURE MIGRATION
5. PROVIDE EXTENSION RODS TO ACCOMMODATE INSULATION, PULL TO EDGE OF DUCTWORK AS REQUIRED AND SEAL TO EFFECT VAPOR BARRIER
6. POP RIVET OR #10 SHEET METAL SCREWS, MIN 3 EACH AT 120° INTERVALS, CONNECTING STOVEPIPE TO COLLAR. ENSURE RIVETS OR SCREWS DO NOT INTERFERE W/ DAMPER
7. TAPE AND SEAL ALL JOINTS TO PREVENT LEAKAGE
8. INSTALL LOCKING QUADRANT AND HANDLE ON BOTTOM OF DUCT FOR EASE OF SERVICE (SHOWN ON TOP FOR EASE OF ILLUSTRATION ONLY)

2 SPIN-IN FITTING WITH DAMPER
NOT TO SCALE



3 DIFFUSER CONNECTION
NOT TO SCALE

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TOMBALL, TX 77375

APPROVED FIRE CODE PLANS
Reviewer: A. Zepeda
All code deficiencies found in the field shall be corrected and made compliant prior to the Certificate of Compliance being issued.

Drawn	BAR
Checked	SSM
Date	06/30/22
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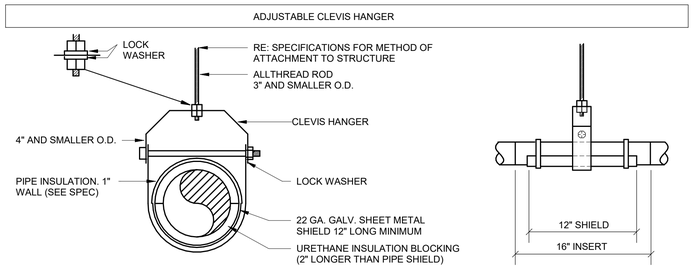
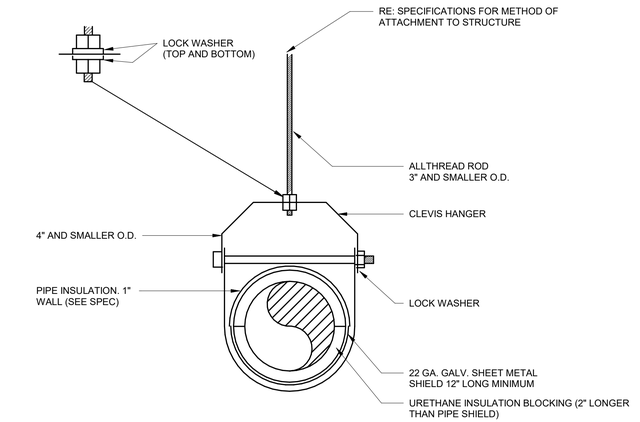
SHEET TITLE
MECHANICAL DETAILS

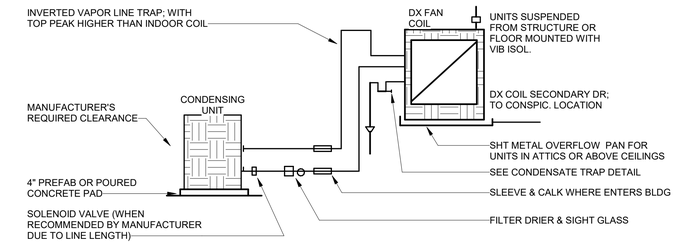
SHEET NO.
M510



4 PIPE HANGER DETAIL
NOT TO SCALE



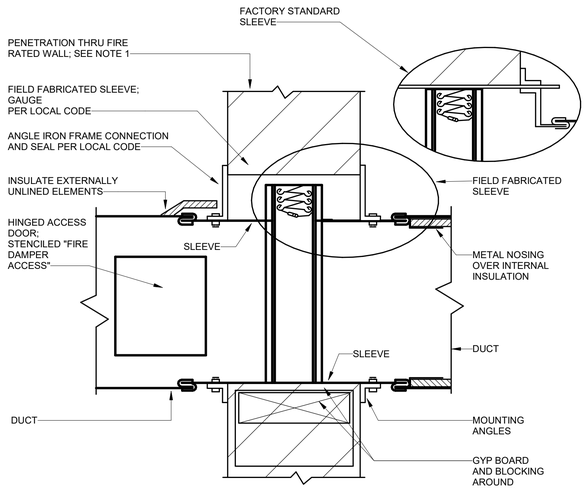
1 SINGLE PIPE HANGER
NOT TO SCALE



NOTES:

1. SUCITON LINE TO INSULATED; INSULATION INSIDE BUILDING TO HAVE 25/50 FLAME/SMOKE RATING
2. HVAC CONTRACTOR RESPONSIBLE FOR LOW VOLTAGE CONTROL WIRING; ELECTRICAL CONTRACTOR PROVIDES LINE VOLTAGE WIRING & DISCONNECTS
3. SIZE REFRIG LINES AS PER MANUFACTURER
4. DUCT SUPPLY & RETURN. PROVIDE FLEX DUCT CONNECTION ON SUPPLY & RETURN DUCT (UNLESS FIBERGLASS DUCT)

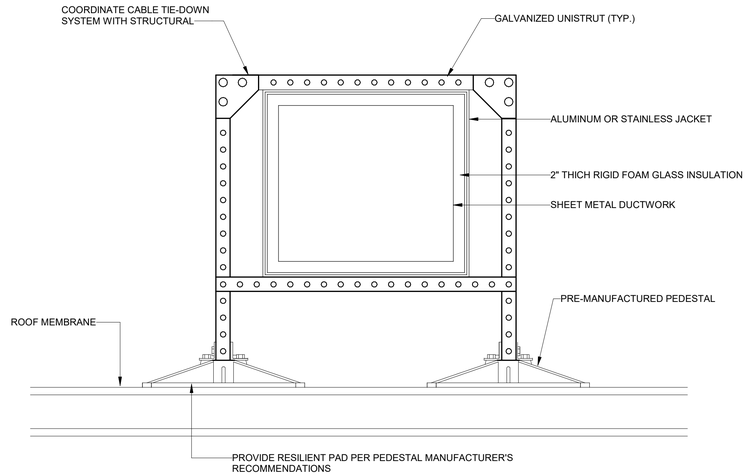
2 DIRECT EXPANSION COOLING COIL AND CONDENSING UNIT
NOT TO SCALE



NOTES:

1. MAKE OPENING 1/8" PER FOOT LARGER THAN DAMPER DIMENSIONS WITH 1/4" MIN REQD
2. MOUNTING ANGLES, SLEEVE GAUGE, LENGTH OF SLEEVE, SLEEVE ATTACHMENT, AND OTHER CONSTRUCTION DETAILS SHALL BE PER DAMPER SUPPLIERS INSTRUCTIONS TO MAINTAIN UL LISTING AND TO CONFORM WITH NFPA 90A OR LOCAL REQUIREMENTS
3. DAMPER CONSTRUCTED AND TESTED PER UL 555, UL LABLED, 1-1/2 HOUR FIRE RATING With 212°F FUSIBLE LINK
4. SEAL BETWEEN WALL AND SLEEVE W/ APPROVED FIRE STOP MATERIAL
5. TYPE 'B' DAMPER SHOWN; 'C' DAMPERS ARE SIMILAR. DO NOT USE TYPE 'A' WITH THE CURTAIN EXTENDING INTO THE AIR STREAM

5 CURTAIN TYPE FIRE DAMPER-VERIT. MTD. 1-1/2 HR
NOT TO SCALE



3 ROOF DUCT SUPPORT DETAIL
12" = 1'-0"

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SHEET TITLE
MECHANICAL DETAILS

SHEET NO.
M511

RTU DUAL FAN DIRECT DRIVE DX RTU SCHEDULE

TAG	AREA SERVED	MANUFACTURER/MODEL	DISCHARGE CONFIGURATION	INTAKE CONFIGURATION	SUPPLY FANS				RETURN FANS			COOLING COIL				HOT GAS REHEAT COIL		COMPRESSORS			PRIMARY FILTER	SECONDARY FILTER	ELECTRICAL		OPERATING WEIGHT (LBS)	NOTES
					QUANTITY	TOTAL AIRFLOW (CFM)	OUTSIDE AIRFLOW (CFM)	ESP	QUANTITY	TOTAL AIRFLOW (CFM)	ESP	TOTAL COOLING (MBH)	SENSIBLE COOLING (MBH)	AIR ENT. COIL, DB/WB (° F)	AIR LVG COIL, DB/WB (° F)	MINIMUM HEATING (MBH)	AIR LVG, DB/WB (°F)	QUANTITY	TYPE	REFRGRIGERANT	MERV	MERV	VOLTS/PH/HZ	FLA/MCA/MOCP (A)		
RTU-2-1	HOSPITAL OR	AAON - RNA-070-D-0-3	VERTICAL	VERTICAL	2	14180	2500	3.5	2	14180	1.0	740.2	400.0	73/62	47/45	123.0	55	4	FULLY MODULATING	R410A	8, 2" THICK	17	460/3/60	186/193/200	6190	ALL

NOTES:

1. ALL COMPRESSORS SHALL BE FULLY MODULATING.
2. PROVIDE THERMALLY BROKEN PANELS WITH EXPANDED FOAM INSULATION (R-13).
3. PROVIDE STAINLESS STEEL DRAIN PANS.
4. PROVIDE QTY.(2) DIRECT DRIVE MODULATING (VFD/ECM) PLENUM SUPPLY FANS.
5. PROVIDE QTY.(2) DIRECT DRIVE MODULATING (VFD/ECM) RETURN FANS.
6. PROVIDE MINIMUM 6 ROW EVAPORATOR COIL.
7. PROVIDE FULL MODULATING HOT GAS REHEAT.
8. PROVIDE VFD CONDENSER FANS WITH HEAD PRESSURE CONTROL.
9. PROVIDE FACTORY INSTALLED UV LIGHTS (SEE SPECIFICATIONS) DOWNSTREAM OF THE EVAPORATOR COIL.
10. PROVIDE FACTORY INSTALLED BACNET NATIVE CONTROLLER.
11. PROVIDE OUTSIDE AIR MONITOR OAM II AIRFLOW STATION (OR EQUAL). FACTORY PROVIDE UNIT WITH MOUNTING SCREEN (AMCA STANDARD 610 CERTIFICATION). IF UNABLE TO PROVIDE FROM FACTORY, CONTROLS CONTRACTOR PROVIDE AND COORDINATE INSTALLATION FOR STATED ASSEMBLY (OR EQUAL).
12. IF UNABLE TO PLACE FINAL FILTER IN UNIT, PROVIDE FINAL FILTER CURB WITH HEPA FILTER RACK.
13. PROVIDE WITH KIP-RT ROOFTOP EQUIPMENT PAD BETWEEN UNIT AND CURB.
14. REQUIRED BTU/H ARE NET; FAN HEAT HAS NOT BEEN SUBTRACTED.
15. EXTERNAL STATIC INCLUDES DUCTWORK, DIFFUSERS, & DIRT ACCUMULATION ON FILTERS.
16. EVAPORATOR SHALL BE PROVIDED WITH INTERNAL FLOAT SWITCH AND SHALL SHUT UNIT OFF IF PRIMARY DRAIN BECOMES RESTRICTED.
17. PROVIDE ALL MANUFACTURER'S RECOMMENDED CLEARANCES.
18. IF PROVIDED WITH FILTERED CURB, CONTRACTOR SHALL PROVIDE LEVEL EQUIPMENT PLATFORM. PLATFORM SHALL BE A MINIMUM OF 30" WIDE FROM EQUIPMENT WITH GUARDS A MINIMUM OF 42" HIGH WITH HORIZONTAL AND VERTICAL MEMBERS SPACED TO PREVENT A 21" SPHERE FROM PASSING THROUGH. OBTAIN STAMPED DRAWINGS AND PLATFORM FROM STEEL SOLUTIONS INC (OR EQUIVALENT MANUFACTURER). CONTRACTOR SHAL FIELD VERIFY EXISTING FIELD CONDITIONS AND EQUIPMENT BEFORE PURCHASE AND CONSTRUCTION. THE PLATFORM IS INTENDED TO BE A "DELEGATED DESIGN" ITEM.
19. MOTOR(S) SHALL BE PREMIUM EFFICIENCY.
20. COORDINATE FINAL CONTROLS REQUIREMENTS WITH OWNER'S VENDOR.
21. UNIT SHALL BE CONNECTED TO EMERGENCY GENERATOR.
22. PROVIDE WITH HAIL GUARDS.
23. PROVIDE ROOF CURB WITH SUFFICIENT HEIGHT SUCH THAT THE OUTSIDE AIR INTAKE IS A MINIMUM OF 36" ABOVE THE ROOF.
24. PROVIDE WITH SMOKE DETECTOR IN THE SUPPLY AND RETURN DUCTWORK. PROVIDE SUPPLY SIDE SMOKE DETECTOR DOWNSTREAM OF FINAL FILTER IN THE MAIN SUPPLY DUCT. UNIT OPERATION SHALL CEASE WHEN A SMOKE DETECTOR IS ENERGIZED.
25. PROVIDE WITH DIFFERENTIAL PRESSURE MEASURING DEVICE THAT IS READILY ACCESSIBLE AND PROVIDES READING OF DIFFERENTIAL STATIC PRESSURE ACROSS EACH FILTER BED TO INDICATE WHEN FILTER NEEDS CHANGED. CONNECT TO BAS. SEE SPECIFICATIONS.

CHILLED WATER RTU WITH ELECTRIC HEAT SCHEDULE

TAG	AREA SERVED	MANUFACTURER/MODEL	DISCHARGE CONFIGURATION	INTAKE CONFIGURATION	SUPPLY FAN			HEATING COIL - AIR SIDE					COOLING COIL - AIR SIDE				COOLING COIL-WATER SIDE		PRIMARY FILTER	DOWNSTREAM FILTER	ELECTRICAL		OPERATING WEIGHT (LBS)	NOTES
					TOTAL AIRFLOW (CFM)	OUTSIDE AIRFLOW (CFM)	ESP	AIRFLOW (CFM)	AIR ENT. COIL, DB (° F)	AIR LVG COIL, DB (°F)	KW REQUIRED	CONTROL	TOTAL COOLING (MBH)	SENSIBLE COOLING (MBH)	AIR ENT. COIL, DB/WB (° F)	AIR LVG COIL, DB/WB (° F)	FLOW RATE (GPM)	EWT-LWT (°F)	MERV	MERV	VOLTS/PH/HZ	FLA/MCA/MOCP(A)		
RTU-2-2	NON-CRITICAL	TEMTROL	HORIZONTAL	HORIZONTAL	4125	1030	3.0	2060	45	55	8	SCR	191.2	116.4	81 / 68	55/53	38.2	44-54	8, 2" DEPTH	14, 12" DEPTH	460/3/60	17/22/25	3005	ALL

NOTES:

1. PROVIDE WITH KIP-RT ROOFTOP EQUIPMENT PAD BETWEEN UNIT AND CURB.
2. PROVIDE WITH MERV 14 FILTER BED DOWNSTREAM OF THE SUPPLY FAN, COOLING COIL, AND HEATING COIL.
3. REQUIRED BTU/H ARE NET; FAN HEAT HAS NOT BEEN SUBTRACTED.
4. EXTERNAL STATIC INCLUDES DUCTWORK, DIFFUSERS, & DIRT ACCUMULATION ON FILTERS.
5. MOTOR(S) SHALL BE PREMIUM EFFICIENCY.
6. IF MODEL NUMBER & SCHEDULE CONFLICT; MOST STRINGENT REQUIREMENTS APPLY.
7. EVAPORATOR SHALL BE PROVIDED WITH INTERNAL FLOAT SWITCH AND SHALL SHUT UNIT OFF IF PRIMARY DRAIN BECOMES RESTRICTED.
8. PROVIDE ALL MAUNFACTURER'S RECOMMENDED CLEARANCES.
9. CONTROLS (CONTROLLERS, SENSORS, VALVES, ETC.) SHALL BE PROVIDED BY B.A.S. CONTRACTOR.
10. PROVIDE ROOF CURB WITH SUFFICIENT HEIGHT SUCH THAT THE OUTSIDE AIR INTAKE IS A MINIMUM OF 36" ABOVE THE ROOF.
11. PROVIDE WITH OUTSIDE AIR MONITOR OAM II AIFLOW STATION (OR EQUAL). MONITOR TO BE FACTORY MOUNTED.
12. PROVIDE WITH SMOKE DETECTOR IN THE SUPPLY AND RETURN DUCTWORK. PROVIDE SMOKE DETECTOR DOWNSTREAM OF FINAL FILTER IN THE MAIN SUPPLY DUCT. UNIT OPERATION SHALL CEASE WHEN A SMOKE DETECTOR IS ENERGIZED.
13. PROVIDE WITH HAIL GUARDS.
14. PROVIDE WITH FACTORY INSTALLED VFD'S FOR SUPPLY FAN INSIDE UNIT ENCLOSURE.
15. PROVIDE WITH DIFFERENTIAL PRESSURE MEASURING DEVICE THAT IS READILY ACCESSIBLE AND PROVIDES READING OF DIFFERENTIAL STATIC PRESSURE ACROSS EACH FILTER BED TO INDICATE WHEN FILTER NEEDS CHANGED. CONNECT TO BAS. SEE SPECIFICATIONS.

AIR DEVICE SCHEDULE

TAG	SERVICE	MANUFACTURER AND MODEL	DESCRIPTION	FACE SIZE	NECK SIZE	CFM	MATERIAL	NOTES
A	SUPPLY	TITUS TLF-AA	LAMINAR FLOW DIFFUSER W/ INSULATED PLENUM	24" x 48"	10" Ø	0-275	ALUMINUM	1,2,3,4,5,7
B	RETURN	TITUS 30R	SIDE WALL RETURN GRILLE	16" x 24"	-	0-950	ALUMINUM	3,4,7
C	SUPPLY	TITUS OMNI	SQUARE PLAQUE DIFFUSER	24" x 24"	6" Ø	0-100	ALUMINUM	1,2,4,7
					8" Ø	101-200		
					10" Ø	201-400		
					12" Ø	401-600		
D	RETURN	TITUS PAR	PERFORATED RETURN GRILLE	24" x 24"	6" Ø	0-100	ALUMINUM	1,4,7
					8" Ø	101-200		
					10" Ø	201-400		
					12" Ø	401-600		
					14" Ø	601-750		
					22" x 22"	751-1765		
E	EXHAUST	TITUS PAR	PERFORATED EXHAUST GRILLE	24" x 24"	6" Ø	0-100	ALUMINUM	1,4,7
					8" Ø	101-200		
					10" Ø	201-400		
					12" Ø	401-600		
F	EXHAUST	TITUS PAR	PERFORATED EXHAUST GRILLE	12" x 12"	6" Ø	0-60	ALUMINUM	1,4,7
G	SUPPLY	TITUS 300FL	SIDE WALL SUPPLY DIFFUSER	8" x 6"	-	0-200	ALUMINUM	2,4
H	RETURN	TITUS 350R	SIDE WALL RETURN GRILLE	8" x 6"	-	0-200	ALUMINUM	2,4

NOTES:

1. 4-WAY UNLESS SHOWN DIFFERENT.
2. PROVIDE BALANCING DAMPER AT RUNOUT TAKEOFF UNLESS DAMPER IS LOCATED OVER AN INACCESSIBLE CEILING. IF OVER INACCESSIBLE PROVIDE REMOTE CABLE DRIVEN DAMPER.
3. SUPPLY DIFFUSER SHALL BE INSTALLED TO ALLOW FOR INTERNAL CLEANING.
4. PROVIDE APPROPRIATE INSTALLATION TRIM KIT BASED ON THE CEILING/WALL TYPE THAT THE AIR DEVICE IS BEING INSTALLED ON.
5. PROVIDE WITH EQUALIZATION BAFFLE
6. EXTERNALLY INSULATE SLOT DIFFUSER PLENUMS.
7. FACTORY EXTERNALLY INSULATE ALL DIFFUSERS. NO LINERS.

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MECHANICAL SCHEDULES

SHEET NO.
M601

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FAN SCHEDULE

TAG	SERVICE	FAN TYPE	AIRFLOW (CFM)	ESP	DRIVE	MOTOR HP	VOLTAGE/PH/HZ	MANUFACTURER/MODEL	NOTES
EF-2-1	EXHAUST	ROOF UPBLAST	1910	1.0	DIRECT	3/4	115/1/60	GREENHECK CUE-140-VG	1,2,3,4,5,6
EF-2-2	EXHAUST	ROOF DOWNBLAST	630	0.6	DIRECT	1/6	115/1/60	GREENHECK G-095-VG	1,3,4,5,6
EF-2-3	EXHAUST	ROOF UPBLAST	155	0.3	DIRECT	1/10	115/1/60	GREENHECK CUE-080-VG	1,3,4,5,6
EF-2-4	EXHAUST	CENTRIFUGAL FUME EXHAUST FAN	365	0.5	DIRECT	1	460/3/60	GREENHECK FJI-10-BI-100	1,-4,7-12
EF-2-5	EXHAUST	ROOF DOWNBLAST	520	0.5	DIRECT	1/10	115/1/60	GREENHECK G-090-VG	1,3,4,5,6

NOTES:

1. PROVIDE WITH FACTORY DISCONNECT.
2. FAN SHALL BE CONTROLLED BY ROOM PRESSURE MONITOR.
3. FAN SHALL RUN CONTINUOUSLY (24/7/365).
4. CONNECT FAN BACK TO B.A.S.
5. PROVIDE WITH GREENHECK VARI-GREEN (HAND/OFF/AUTO) CONTROLLER.
6. PROVIDE WITH MOTORIZED DAMPER.
7. PROVIDE WITH RESTRAINED ISOLATORS AND GESS EQUIPMENT SUPPORTS.
8. PROVIDE WITH FACTORY VFD WITH MOUNTING BRACKET AND DISCONNECT HOUSED IN NEMA TYPE 3R RATED ENCLOSURE SUITALBE FOR MOUNTING ON ROOF.
9. PROVIDE WITH FIXED NOZZLE DISCHARGE.
10. PROVIDE WITH 10 FOOT VERTICAL STACK.
11. PROVIDE WITH HORIZONTAL CONNECTION TO FAN INLET.
12. FAN SHALL BE CIRCUITED TO EMERGENCY POWER.

DX SPLIT SYSTEM (HEAT PUMP) SCHEDULE

FAN COIL										CONDENSING UNIT						
TAG	MANUFACTURER/ MODEL	TYPE	AREA SERVED	FAN		COOLING COIL				TAG	MANUFACTURER/ MODEL	AMBIENT TEMP, (°F)	VOLTS/PH/HZ	MOP/MCA/FLA	OPERATING WEIGHT (LBS)	NOTES
				TOTAL AIRFLOW (CFM)	OUTSIDE AIRFLOW (CFM)	TOTAL COOLING (MBH)	SENSIBLE COOLING (MBH)	AIR ENT. COIL, DB/WB (° F)	AIR LVG COIL, DB/WB (° F)							
FCU-2-1	LG - LSN180HSV5	WALL MOUNTED	ELECTRICAL - 280	700	0	21.4	16.7	77/64	55/54	CU-2-1	LG - LSU180HSV5	100	208/1/60	20/13/9.9	120	1,2,3,4
FCU-2-2	LG - LSN180HSV5	WALL MOUNTED	ELECTRICAL - 281	700	0	21.4	16.7	77/64	55/54	CU-2-2	LG - LSU180HSV5	100	208/1/60	20/13/9.9	120	1,2,3,4
FCU-2-3	LG - LDN097HV4	HORIZONTAL DUCTED	ELEVATOR MACHINE ROOM	200	0	7.7	5.4	80/67	55/54	CU-2-3	LG - LUU097HV	100	208/1/60	15/12/9.6	90	1,2,3,4
FCU-2-4	LG - LHN488HV	HORIZONTAL DUCTED	STAIR - ST1	1765	0	40.5	38.3	75/62	55/54	CU-2-4	LG - LUU480HHV	100	208/1/60	40/32/25.6	210	1,2,3,4
FCU-2-5	LG - LDN097HV4	HORIZONTAL DUCTED	ELEVATOR MACHINE ROOM	200	0	7.7	5.4	80/67	55/54	CU-2-5	LG - LUU097HV	100	208/1/60	15/12/9.6	90	1,2,3,4
FCU-2-6	LG - LSN180HSV5	WALL MOUNTED	STAIR - ST2	700	0	16.1	15.2	75/62	55/54	CU-2-6	LG - LSU180HSV5	100	208/1/60	20/13/9.9	120	1,2,3,4
FCU-2-7	LG - LSN180HSV5	WALL MOUNTED	IT - 230	700	0	16.1	15.2	75/62	55/54	CU-2-7	LG - LSU180HSV5	100	208/1/60	20/13/9.9	120	1,2,3,4
FCU-2-8	LG - LDN127HV4	HORIZONTAL DUCTED	ELEVATOR NO. 3	300	0	11.5	9.6	80/67	55/54	CU-2-8	LG - LUU127HV	100	208/1/60	15/12.3/10.1	90	1,2,3,4,5

NOTES:

1. PROVIDE WITH SINGLE POINT ELEC CONNECTION THAT INCLUDES INTERNAL FUSING AND CONTACTORS FOR STARTERS FOR MOTORS.
2. PROVIDE WITH CONCEALED CONDENSATE PUMP.
3. PROVIDE WITH FACTORY DISCONNECT.
4. CONNECT BACK TO B.A.S.
5. PROVIDE TEMPERATURE SENSOR IN RETURN AIR DUCT.

HUMIDIFIER SCHEDULE

TAG	MANUFACTURER/ MODEL	UNIT SERVED	TYPE	DUCT SIZE	SUPPLY AIRFLOW RATE (CFM)	HUMIDIFICATION RATE (LB/HR)	WATER TYPE	CYLINDER QUANTIY	ELECTRICAL		NOTES
									TOTAL INPUT POWER (KW)	VOLTS/PH/HZ	
HUM-2-1	CONDAIR EL 100	RTU-2-1	ELECTRODE STEAM	62" x 22"	14180	75.7	TAP	1	37.4	480/3/60	ALL

NOTES:

1. PROVIDE DUCT MOUNTED STEAM DISTRIBUTOR, STEAM AND CONDENSATE PIPING, MOUNTING ACCESSORIES INCLUDING MOUNTED PLATES FOR RIGID SUPPORT OF DUCT MOUNTED DISTRIBUTOR.
2. PROVIDE WITH CONDENSATE RETURN PUMP AS REQUIRED.
3. PROVIDE ELECTRIC CONTROLS - ON/OFF AIR FLOW PROVING SWITCH, DUCT MOUNTED HIGH LIMIT SENSOR, & ROOM HUMIDITY SENSOR. B.A.S. SHALL CONTROL WHEN UNIT TURNS ON. COORDINATE WORK WITH B.A.S. CONTRACTOR.
4. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION.
5. VERIFY ABSORPTION DISTANCE TO BE WITHIN MANUFACTURER'S RECOMMENDATION BEFORE INSTALLING HUMIDIFIER AND DISTRIBUTOR.

SINGLE DUCT AIR TERMINAL UNIT SCHEDULE

	TAG	SYSTEM	INLET SIZE	AIRFLOW		ELECTRIC HEATING COIL					MANUFACTURER AND MODEL	NOTES
				MAX CFM	MIN CFM	EAT (°F)	LAT (°F)	KW	STAGES	VOLTAGE/PHASE		
SINGLE DUCT	VAV-2-1	RTU-2-1	14" Ø	2070	2070	55	75	13.5	SCR	460/3	TITUS DESV	1,2,3
	VAV-2-2	RTU-2-1	14" Ø	2020	2020	55	75	13	SCR	460/3	TITUS DESV	1,2,3
	VAV-2-3	RTU-2-1	14" Ø	2015	2015	55	75	13	SCR	460/3	TITUS DESV	1,2,3
	VAV-2-4	RTU-2-1	14" Ø	1790	1790	55	75	11.5	SCR	460/3	TITUS DESV	1,2,3
	VAV-2-5	RTU-2-1	8" Ø	410	325	55	75	3	SCR	277/1	TITUS DESV	1,2,3
	VAV-2-6	RTU-2-1	8" Ø	570	525	55	75	4	SCR	277/1	TITUS DESV	1,2,3
	VAV-2-7	RTU-2-1	12" Ø	1170	1170	55	75	7.5	SCR	460/3	TITUS DESV	1,2,3
	VAV-2-8	RTU-2-1	10" Ø	710	710	55	75	5	SCR	460/3	TITUS DESV	1,2,3
	VAV-2-9	RTU-2-1	6" Ø	370	195	55	75	2.5	SCR	277/1	TITUS DESV	1,2,3
	VAV-2-10	RTU-2-1	10" Ø	705	140	55	85	7	SCR	460/3	TITUS DESV	1,2,3
	VAV-2-11	RTU-2-1	6" Ø	210	210	55	75	1.5	SCR	277/1	TITUS DESV	1,2,3
SINGLE DUCT	VAV-2-12	RTU-2-2	10" Ø	720	500	55	75	5	SCR	277/1	TITUS DESV	1,2,3
	VAV-2-13	RTU-2-2	10" Ø	910	220	55	85	9	SCR	460/3	TITUS DESV	1,2,3
	VAV-2-14	RTU-2-2	10" Ø	835	735	55	75	5.5	SCR	460/3	TITUS DESV	1,2,3
	VAV-2-15	RTU-2-2	6" Ø	320	250	55	85	3.5	SCR	277/1	TITUS DESV	1,2,3
	VAV-2-16	RTU-2-2	6" Ø	210	210	55	85	2.5	SCR	277/1	TITUS DESV	1,2,3
	VAV-2-17	RTU-2-2	8" Ø	405	250	55	75	3	SCR	277/1	TITUS DESV	1,2,3
	VAV-2-18	RTU-2-2	10" Ø	720	420	55	85	7	SCR	460/3	TITUS DESV	1,2,3
	RVAV-2-1	RTU-2-1	14" Ø	1870	1870	-	-	-	-	-	TITUS DECV	1,2,3
	RVAV-2-2	RTU-2-1	14" Ø	1820	1820	-	-	-	-	-	TITUS DECV	1,2,3
	RVAV-2-3	RTU-2-1	14" Ø	1815	1815	-	-	-	-	-	TITUS DECV	1,2,3
	RVAV-2-4	RTU-2-1	14" Ø	1590	1590	-	-	-	-	-	TITUS DECV	1,2,3
	RVAV-2-5	RTU-2-1	10" Ø	785	785	-	-	-	-	-	TITUS DECV	1,2,3
	RVAV-2-6	RTU-2-1	8" Ø	390	390	-	-	-	-	-	TITUS DECV	1,2,3
	RVAV-2-7	RTU-2-1	10" Ø	790	790	-	-	-	-	-	TITUS DECV	1,2,3
	RVAV-2-8	RTU-2-1	10" Ø	500	500	-	-	-	-	-	TITUS DECV	1,2,3
	RVAV-F	RTU-2-1	14" Ø	2190	440	-	-	-	-	-	TITUS DECV	1,2,3
SINGLE DUCT	VAV-F	RTU-2-1	14" Ø	2190	440	55	75	14	SCR	460/3	TITUS DESV	1,2,3

NOTES:

1. PROVIDE INTEGRAL DISCONNECT SWITCH (DOOR INTERLOCK TYPE). COORDINATE WITH ELECTRICAL CONTRACTOR.
2. PROVIDE 24 VOLT CONTROL TRANSFORMER. COORDINATE DDC CONTROLS WITH CONTROLS CONTRACTOR PRIOR TO PURCHASE.
3. UNIT SHALL BE DOUBLE-WALLED.

ELECTRIC UNIT HEATER SCHEDULE

TAG	AREA SERVED	AIRFLOW (CFM)	HEATING OUTPUT (KW)	VOLTS/PH/HZ	MANUFACTURER/MODEL	NOTES
EUH-2-1	FUTURE OFFICE	310	5.0	480/3/60	REZNOR EGEB	1,2,3
EUH-2-2	FUTURE OFFICE	310	5.0	480/3/60	REZNOR EGEB	1,2,3

NOTES:

1. PROVIDE WITH SINGLE STAGE WALL THERMOSTAT.
2. PROVIDE CEILING BRACKET FOR HORIZONTAL DISCHARGE.
3. PROVIDE WITH FACTORY DISCONNECT.

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TOMBALL, TX 77375

Drawn	BAR
Checked	SSM
Date	06/30/22
PROJECT No.	
Revisions	
06/30/22	ISSUE FOR CONSTRUCTION
1 07/25/22	PR 3

SHEET TITLE
MECHANICAL SCHEDULES

SHEET NO.
M602

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