

MECHANICAL LEGEND

<p>— SCHEDULE NUMBER</p> <p>— DIFFUSER DESIGNATION AND CFM</p> <p>— CFM</p> <p>TYP. OF ... NUMBER OF SIMILAR DEVICES</p>	<p>MAIN TRUNK AND BRANCH DUCT TAKEOFF WITH VOLUME DAMPER</p>
— G —	NATURAL GAS PIPING
— CD —	CONDENSATE PIPING
—	MANUAL VOLUME DAMPER
(MD)	MOTORIZED DAMPER
(BI)	BIPOLAR IONIZATION UNIT
(T)	THERMOSTAT
(TS)	TEMPERATURE SENSOR
(CC)	COMBINATION CARBON MONOXIDE NITROGEN DIOXIDE SENSOR
(H)	HUMIDITY SENSOR
(R)	REFRIGERANT MONITORING DEVICE
⊠	STANDARD 4-WAY BLOW SUPPLY DIFFUSER
⊠	3-WAY BLOW SUPPLY DIFFUSER
⊠	2-WAY BLOW SUPPLY DIFFUSER
⊠	1-WAY BLOW SUPPLY DIFFUSER
—	LINEAR DIFFUSER
⊠	ROOF EXHAUST FAN
⊠	RETURN OR EXHAUST AIR FLOW
⊠	SUPPLY AIR FLOW
⊠	RETURN OR TRANSFER GRILLE
⊠	EXHAUST GRILLE
(RD)	RADIATION DAMPER
(FD)	FIRE DAMPER
(SD)	SMOKE DAMPER
(FSD)	FIRE/SMOKE DAMPER
(-)	FSD IF NOT NOTED
⊠	LOUVERED DOOR (SEE ARCHITECTURAL DRAWINGS)
⊠	1" DOOR UNDER CUT
(SD)	DUCT MOUNTED SMOKE DETECTOR

ENERGY REQUIREMENTS: MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

METHOD OF COMPLIANCE

PRESCRIPTIVE PERFORMANCE ENERGY COST BUDGET

CLIMATE ZONE	3A
THERMAL ZONE	
WINTER DRY BULB	23
SUMMER DRY BULB	91
INTERIOR DESIGN CONDITIONS	
WINTER DRY BULB	70
SUMMER DRY BULB	75
RELATIVE HUMIDITY	50
BUILDING HEATING LOAD (MBH)	250
BUILDING COOLING LOAD (MBH)	290
MECHANICAL SPACING CONDITIONING SYSTEM	
UNITARY	
DESCRIPTION OF UNIT	SEE SCHEDULES
HEATING EFFICIENCY	SEE SCHEDULES
COOLING EFFICIENCY	SEE SCHEDULES
HEAT OUTPUT OF UNIT	SEE SCHEDULES
COOLING OUTPUT OF UNIT	SEE SCHEDULES
BOILER	
TOTAL BOILER OUTPUT, IF OVERSIZED, STATE REASON.	NA
CHILLER	
TOTAL CHILLER OUTPUT, IF OVERSIZED, STATE REASON.	NA
LIST EQUIPMENT EFFICIENCIES	SEE SCHEDULES
EQUIPMENT SCHEDULES WITH MOTORS (MECHANICAL SYSTEMS)	
MOTOR HORSEPOWER	SEE SCHEDULES
NUMBER OF PHASES	SEE SCHEDULES
MINIMUM EFFICIENCY	SEE SCHEDULES
MOTOR TYPE	SEE SCHEDULES
NUMBER OF POLES	SEE SCHEDULES

DESIGNER'S STATEMENT:
TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE DESIGN OF THIS BUILDING COMPLIES WITH THE MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT REQUIREMENTS OF THE N.C. ENERGY CODE.

SIGNED:

NAME: Brandon R. Dillard

TITLE: Mechanical Engineer P.E.

- ### GENERAL MECHANICAL NOTES
- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT IN STRICT ACCORDANCE WITH APPLICABLE CODES AND STANDARDS, AND PER MANUFACTURER'S DIRECTIONS.
 - THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS AND MATERIAL SUPPLIERS SHALL REVIEW AND BE FAMILIAR WITH ALL DRAWINGS ASSOCIATED WITH THIS PROJECT INCLUDING THE ARCHITECTURAL, CIVIL, STRUCTURAL, PLUMBING, MECHANICAL, AND ELECTRICAL DRAWINGS. SPECIFIC REQUIREMENTS DEPICTED ON ONE DRAWING PAGE OR IN ONE PORTION OF THE DRAWINGS SHALL BE APPLICABLE TO ALL DRAWING PAGES AND ALL PORTIONS OF THE DRAWINGS. SHOULD A CONFLICT OR DISCREPANCY BE DISCOVERED IN THE DRAWINGS DURING THE BIDDING OR NEGOTIATION PHASE, THE GENERAL CONTRACTOR, SUBCONTRACTOR OR MATERIAL SUPPLIER SHALL IMMEDIATELY NOTIFY THE ARCHITECT AND REQUEST ADDITIONAL INFORMATION AND CLARIFICATION. FAILURE TO DO SO WILL NOT RELIEVE THE GENERAL CONTRACTOR, SUBCONTRACTOR OR MATERIAL SUPPLIER FROM THE REQUIREMENTS OF ALL PORTIONS OF THE DRAWINGS.
 - THE CONTRACTOR SHALL SECURE AND PAY FOR ALL NECESSARY PERMITS, LICENSE, INSPECTIONS, APPROVALS, AND FEES.
 - THE CONTRACTOR SHALL PROVIDE A WRITTEN GUARANTEE THAT SHALL WARRANT ALL WORKMANSHIP AND MATERIALS FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE BY THE OWNER. ANY BREAKDOWN OCCURRING IN THE FIRST YEAR SHALL BE AT NO EXPENSE TO THE OWNER. ALL REFRIGERATION COMPRESSORS SHALL HAVE A FIVE YEAR (PARTS ONLY) WARRANTY, AND ALL NATURAL GAS HEAT EXCHANGERS SHALL HAVE A TEN YEAR (PARTS ONLY) WARRANTY.
 - DRAWINGS ARE SCHEMATIC, NOT ALL RISES AND DROPS ARE SHOWN. DO NOT SCALE DRAWINGS FOR MEASUREMENTS. DRAWINGS THAT HAVE NOT RECEIVED PERMIT APPROVAL FROM AUTHORITY HAVING JURISDICTION SHOULD NOT BE USED FOR FINAL OR GUARANTEED PRICING. ANY PRICING BASED ON UNAPPROVED DRAWINGS SHOULD BE NOTED AS PROVISIONAL. CONTRACTOR ACCEPTS ALL RESPONSIBILITY FOR GUARANTEED PRICING BASED ON UNAPPROVED DRAWINGS.
 - WHEN EXISTING EQUIPMENT IS REUSED CONTRACTOR SHALL ENSURE EQUIPMENT IS IN GOOD WORKING ORDER AND SHALL REPORT TO THE OWNER ANY REPAIRS REQUIRED TO BRING EQUIPMENT TO GOOD WORKING ORDER PRIOR TO TURN OVER.
 - TRADES ARE TO COORDINATE THEIR WORK WITH ALL OTHER TRADES TO AVOID CONFLICTS. GENERALLY, DUCTWORK SHALL BE KEPT AS HIGH AS POSSIBLE. MECHANICAL CONTRACTOR SHALL REVIEW ENTIRE SET OF CONTRACT DOCUMENTS INCLUDING BUT NOT NECESSARILY LIMITED TO ALL ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND ENTIRE PROJECT MANUAL. MECHANICAL CONTRACTOR SHALL ACKNOWLEDGE AND INCLUDE IN THE SCOPE OF WORK (CONTRACT) ALL CONDITIONS PERTINENT TO THE COMPLETION OF THE MECHANICAL WORK. MECHANICAL CONTRACTOR SHALL FULLY COORDINATE MECHANICAL WORK WITH THE INSTALLATION OF WORK BY ALL OTHER TRADES AND MAKE NECESSARY FIELD ADJUSTMENTS AS REQUIRED TO ACCOMMODATE THE MECHANICAL INSTALLATION. ALL OF THE ABOVE SHALL BE INCLUDED IN THE SCOPE OF WORK AT NO ADDITIONAL COST TO THE OWNER.
 - CONTRACTOR SHALL COORDINATE ELECTRICAL CHARACTERISTICS AND REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH ELECTRICAL DRAWINGS AND SHALL FURNISH EQUIPMENT WIRED FOR VOLTAGES SHOWN THEREIN.
 - CONTRACTOR SHALL COORDINATE THE INSTALLATION OF MECHANICAL EQUIPMENT, DUCTWORK, ETC. TO FIT WITHIN THE SPACE ALLOWED BY THE ARCHITECTURAL AND STRUCTURAL CONDITIONS. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO ORDERING ANY EQUIPMENT OR MATERIALS. ALL SUSPENDED MATERIALS AND EQUIPMENT SHALL BE INDIVIDUALLY SUPPORTED FROM THE BUILDING STRUCTURE. DO NOT SUSPEND ITEMS FROM THE CEILING OR ITS SUPPORT SYSTEM.
 - CUTTING OR OTHERWISE ALTERING ANY STRUCTURAL MEMBERS SHALL NOT BE PERMITTED WITHOUT WRITTEN PERMISSION FROM THE STRUCTURAL ENGINEER OF RECORD.
 - CONTRACTOR SHALL KEEP A SET OF MARKED UP PRINTS WITH ANY FIELD CHANGES MADE DURING CONSTRUCTION TO CREATE AN "AS-BUILT" SET OF PRINTS TO BE TURNED OVER TO THE OWNER AT THE COMPLETION OF THE PROJECT. NOTE PER ENERGY CODE SECTION 3 DESIGN SET POINTS OF EQUIPMENT AT A MAXIMUM OF NO LOWER THAN 75° IN COOLING AND NO HIGHER THAN 72° IN HEATING.
 - IN THE EVENT CONTRACTOR SUBSTITUTES ALTERNATE MANUFACTURERS THEN CONTRACTOR SHALL COORDINATE ALL ASPECTS OF SUBSTITUTED EQUIPMENT WITH ALL TRADES INCLUDING BUT NOT LIMITED TO GAS SERVICE, ELECTRICAL SERVICE, STRUCTURAL LOADS AND OPENINGS, ETC.
 - PROVIDE ACCESS PANELS IN CEILINGS AND WALLS TO ALLOW ACCESS TO VALVES, TRAPS, DAMPERS, CLEANOUTS, CONTROLS, ETC. MINIMUM ACCESS SIZE - 12"x12", UNLESS LIMITED BY PHYSICAL CONSTRAINTS.
 - ALL CONDENSATE DRAIN PIPING SHALL BE TYPE L HARD DRAWN COPPER, ASTM B-88, WITH TYPE DWV FITTINGS, ASME B16.23, OR SCHEDULE 40 PVC, ASTM D1785, WITH TYPE DWV FITTINGS, ASTM D2672. COPPER DRAIN PIPE AND FITTINGS SHALL BE JOINED USING 95-5 SILVER SOLDER, AND PVC PIPE AND FITTINGS SHALL BE JOINED USING SOLVENT CEMENT. PROVIDE TRAP WITH CLEANOUT AND UNIONS. SLOPE CONDENSATE DRAIN LINES A MINIMUM OF 1/8" PER FOOT AWAY FROM THE MECHANICAL EQUIPMENT. PROVIDE AUXILIARY WATER LEVEL MONITORING DEVICES PER SECTION 307.2.3. UNLESS OTHERWISE NOTED ROUTE CONDENSATE AT FULL SIZE OF EQUIPMENT CONNECTION FROM EQUIPMENT TO DRY WELL OR SITE STORM. IN CASES WHERE NEITHER IS AVAILABLE DISCHARGE TO NEAREST MOP SINK OR UTILITY SINK. PROVIDE CONDENSATE PUMP AS REQUIRED BY FIELD CONDITIONS.
 - SUBMITTALS: AS A MINIMUM, THE CONTRACTOR SHALL PROVIDE SUBMITTALS FOR ALL ITEMS SCHEDULED ON THE DRAWINGS, UNLESS DIRECTED OTHERWISE.
 - MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
 - OUTSIDE AIR FOR AIR CONDITIONING UNITS SHALL BE A MINIMUM OF 10 FEET FROM EXHAUST FANS, EXHAUST OPENINGS AND PLUMBING VENTS.
 - ALL DUCT DIMENSIONS SHOWN ARE INSIDE CLEAR DIMENSIONS.
 - ALL SUPPLY AND RETURN DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH THE LATEST SMACNA AND ASHRAE STANDARDS. DUCTWORK SHALL BE FABRICATED OF GALVANIZED STEEL FOR A PRESSURE RATING OF (-) 2" WG FOR RETURN AND (+) 2" WG FOR SUPPLY DUCTWORK. ALL EXHAUST DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH THE LATEST SMACNA AND ASHRAE STANDARDS. EXHAUST DUCTWORK SHALL BE FABRICATED OF GALVANIZED STEEL FOR A PRESSURE RATING OF 1" WG IN EXCESS OF THE SYSTEM FAN TOTAL STATIC PRESSURE RATING AT DESIGN FLOW RATE, UNLESS NOTED OTHERWISE.
 - SUPPORT DUCTWORK FROM BUILDING STRUCTURE IN ACCORDANCE WITH SMACNA STANDARDS.
 - RADIUS DUCTWORK ELBOWS SHALL HAVE A CENTERLINE RADIUS OF 1.5 TIMES THE DUCT WIDTH (OR DIAMETER) UNLESS NOTED OTHERWISE.
 - ALL MITERED ELBOWS (RECTANGULAR AND ROUND) SHALL HAVE DOUBLE THICKNESS TURNING VANES INSTALLED UNLESS NOTED OTHERWISE ON DRAWINGS.
 - SECURELY SEAL ALL JOINTS LONGITUDINAL AND TRANSVERSE SEAMS AND CONNECTIONS IN DUCTWORK USING WELDMENTS, MECHANICAL FASTENERS WITH SEALS OR GASKETS OR MASTICS, MESH AND MASTIC SEALING SYSTEMS OR TAPES. TAPES AND MASTICS MUST BE LISTED AND LABELED IN ACCORDANCE WITH UL181A OR UL181B.
 - DUCT CONNECTIONS TO FANS AND OTHER AIR DISTRIBUTION EQUIPMENT SHALL BE MADE USING MECHANICAL FASTENERS WITH SEALS, MASTICS OR GASKETS. ALL MECHANICAL EQUIPMENT SHALL BE PROVIDED WITH VIBRATION ISOLATION BETWEEN EQUIPMENT AND BUILDING STRUCTURE.
 - SUPPLY AIR AND RETURN AIR DUCTWORK SHALL BE INSULATED WITH A MINIMUM 2" THICK, 3/4 LB. PER CUBIC FOOT, FIBERGLASS DUCTWRAP, WITH FOIL FACED VAPOR BARRIER AND AN INSTALLED THERMAL RESISTANCE OF 6.0 (R VALUE). ALTERNATE INSULATION FOR RECTANGULAR SUPPLY AND RETURN DUCT SHALL BE AN INTERIOR DUCT LINING WITH A MINIMUM 1-1/2" THICK, 1.5 LB. PER CUBIC FOOT DUCT LINER. DUCT LINER SHALL CONTAIN AN ANTI-MICROBIAL AGENT WITHIN THE DUCT LINING ITSELF. MINIMUM "R" VALUE SHALL BE R-6.3. INCREASE DUCT SHEET METAL SIZE AS REQUIRED TO MEET INSIDE CLEAR DIMENSIONS GIVEN ON DRAWINGS.
 - ALL DUCT INSULATION SHALL MEET THE MINIMUM REQUIREMENTS OF U.L. 181 FOR FLAME SPREAD AND SMOKE DEVELOPMENT, AND SHALL BE U.L. LISTED.
 - TRANSFER DUCTS SHALL BE INTERNALLY LINED TO AID IN CANCELING NOISE TRANSFER.
 - EXHAUST DUCTWORK SHALL BE INSULATED UNLESS NOTED OTHERWISE.
 - EXPOSED DUCTWORK SHALL BE INTERNALLY LINED AND WHEN ROUND SHALL BE SPIRAL CONSTRUCTION. STANDING SEAM ROUND DUCT WORK SHALL NOT BE ALLOWED WHEN VISIBLE. INTERNAL INSULATION EXPOSED TO AIR STREAM SHALL BE CLOSED CELL ELASTOMERIC MATERIAL.
 - COORDINATE LOCATIONS OF GRILLES, REGISTERS AND DIFFUSERS WITH ARCHITECTURAL REFLECTED CEILING PLAN. LOCATIONS SHOWN ARE APPROXIMATE, ADJUST LOCATIONS IN THE FIELD AS REQUIRED BY CONSTRUCTION CONSTRAINTS.
 - PROVIDE EACH SUPPLY AIR OUTLET OR DIFFUSER WITH ITS OWN BALANCING DEVICE. DEVICES CAN BE LOCATED IN DUCTWORK OR SUPPLY AIR DEVICE ITSELF.
 - ALL MANUAL BALANCING DAMPERS SHALL HAVE A LOCKING QUADRANT.
 - FLEXIBLE DUCTWORK SHALL BE CLASSIFIED UNDER UL 181. PROVIDE A MINIMUM OF 3 FEET IN LENGTH AND A MAXIMUM OF 10 FEET IN LENGTH, SUPPORTED WITH 3" GALVANIZED SHEET METAL STRAPS AT 4 FEET CENTERS (MAX). FLEXIBLE DUCT RUNOUTS SHALL BE ROUND DUCTWORK REINFORCED WITH A WIRE HELIX AND INSULATED WITH 1-1/2" THICK FIBERGLASS (WITH A 6.0 "R" VALUE MINIMUM) COVERED WITH FLAMEPROOF VAPOR BARRIER OF ALUMINUM METALIZED POLYESTER FILM LAMINATED TO GLASS MESH. DUCT SHALL BE ATCO'S UPC #036 VALUFLEX CLASS 1 AIR DUCT OR EQUAL. CONNECTIONS TO DUCT MAINS SHALL BE MADE WITH FITTINGS PROVIDED WITH TWIST RINGS, BUTTERFLY DAMPERS, LOCKING HAND QUADRANTS, AND INSULATION GUARDS.
 - CONTRACTOR SHALL FURNISH, ROUTE, AND INSTALL CONTROL WIRING FOR ALL MECHANICAL SYSTEMS. FOR SYSTEMS WITH MULTIPLE COMPONENTS CONTRACTOR IS RESPONSIBLE FOR ALL WIRING BETWEEN COMPONENTS.
 - INSTALL THERMOSTATS AT 4'-0" A.F.F. UNLESS NOTED OTHERWISE. THERMOSTAT LOCATIONS SHALL BE COORDINATED WITH FINAL LOCATIONS OF WALL-MOUNTED ARCHITECTURAL AND ELECTRICAL EQUIPMENT. FINAL LOCATIONS MUST BE APPROVED BY THE ARCHITECT AND OWNER. THERMOSTATS SHALL NOT BE INSTALLED ON EXTERIOR WALLS IF INTERIOR WALLS ARE AVAILABLE WITHIN SPACE SERVED BY THERMOSTAT. SHOULD THE THERMOSTAT REQUIRE INSTALLATION ON AN EXTERIOR WALL AN INSULATED BACKING PLATE MUST BE PROVIDED TO PREVENT FALSE READINGS BY THE THERMOSTAT.
 - MECHANICAL CONTRACTOR SHALL PROVIDE A COMPLETE TEST AND BALANCE REPORT OF THE HVAC SYSTEMS PREPARED BY AN INDEPENDENT TEST AND BALANCE CONTRACTOR. A COPY OF THE TEST AND BALANCE REPORT SHALL BE TRANSMITTED TO THE LOCAL CODE OFFICIALS AS REQUIRED. THE TEST AND BALANCE REPORT SHALL INCLUDE COIL LEAVING TEMPERATURE, OUTSIDE AIR TEMPERATURE, RETURN AIR TEMPERATURE, AND BOTH OUTDOOR AND INDOOR HUMIDITY READINGS.
 - CONTRACTOR SHALL PROVIDE A COMPLETE COMMISSIONING REPORT OF THE HVAC SYSTEMS PREPARED BY AN INDEPENDENT COMMISSIONING CONSULTANT AS REQUIRED BY THE ENERGY CONSERVATION CODE IN EFFECT. A COPY OF THE COMMISSIONING REPORT SHALL BE TRANSMITTED TO THE LOCAL CODE OFFICIALS AS REQUIRED.
 - ALL PENETRATIONS THROUGH EXTERIOR WALLS & ROOF SHALL BE FLASHED & COUNTERFLASHED IN A WATERPROOF MANNER. (COLOR TO MATCH EXTERIOR).
 - CONTRACTOR SHALL VERIFY LOCATION OF ALL PENETRATIONS FOR RELIEF HOODS, OUTSIDE AIR HOODS, LOUVERS, AND WALL CAPS WITH ARCHITECT & OWNER PRIOR TO INSTALLATION.
 - PENETRATIONS OF RATED WALLS, PARTITIONS AND FLOORS OF NON-COMBUSTIBLE CONSTRUCTION SHALL BE FIRESTOPPED WITH NONCOMBUSTIBLE MATERIALS. PENETRATIONS OF NONRATED WALLS, PARTITIONS AND FLOOR OF COMBUSTIBLE CONSTRUCTION SHALL BE FIRESTOPPED WITH MATERIALS EQUIVALENT TO TWO INCHES OF WOOD. FIRESTOPPING SHALL COMPLY WITH ASTM E-814. CONTRACTOR SHALL COORDINATE PENETRATIONS WITH ARCHITECTURAL PLANS AND SHALL PROVIDE FIRE DAMPERS AT EVERY PENETRATION OF A RATED WALL AND SMOKE DAMPERS WHERE ARCHITECTURAL RATINGS REQUIRE INCLUDING THE PENETRATION OF CORRIDOR ENCLOSURES. WHERE BOTH A FIRE AND SMOKE DAMPER ARE REQUIRED A COMBINATION FIRE SMOKE DAMPER MAY BE PROVIDED. PROVIDE RADIATION DAMPERS FOR ALL AIR DEVICES PENETRATING A RATED CEILING. LISTING OF DAMPERS SHALL MEET OR EXCEED RATING OF ASSEMBLY WHERE INSTALLED.
 - REFRIGERANT PIPING, NOT SHOWN ON PLANS, SHALL BE SIZED & INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, INSTALLATION INSTRUCTIONS AND LOCAL CODES.
 - CONTRACTOR SHALL PREPARE ALL EXPOSED DUCT, GRILLES, PIPING, AND UNITS FOR PAINTING. GC WILL BE RESPONSIBLE FOR PAINTING.
 - AIR HANDLERS WITH AIRFLOWS GREATER THAN OR EQUAL TO 2000 CFM OR THAT SHARE A COMMON OUTSIDE AIR OR RETURN DUCT SHALL BE FURNISHED WITH SMOKE DETECTORS LOCATED IN THE SUPPLY AND RETURN SECTIONS FOR ALL UNITS.

WAVE ENGINEERING
3540 TORINGDON WAY, SUITE 200
CHARLOTTE, NC 28277
980.256.7789
INFO@WAVE-ENGINEERING.COM
NC CORP. LICENSE #P-1621

PRELIMINARY
NOT FOR CONSTRUCTION
OR PRICING

10/08/2021

SPIRITED CYCLIST

16601 OLD STATESVILLE ROAD
HUNTERSVILLE, NC 28078

SHEET TITLE
MECHANICAL NOTES AND LEGEND

PROJECT NO: 21167	DRAWN BY: MFM
SCALE: AS NOTED	ISSUE DATE: 10/01/2021

REVISIONS:

--	--

SHEET NUMBER:
MO.1

OUTSIDE AIR CALCULATIONS BASED ON TABLE 403.3.1.1												
UNIT TAG	SPACE USAGE	CLASSIFICATION OF AREA SERVED PER TABLE 403.3	AREA (SQ. FT.)	VENTILATION EFFECTIVENESS (Ez)	NO. OF PEOPLE PER 1000 SQ. FT. (TABLE 403.3)	PEOPLE QUANTITY	AIRFLOW PER PERSON (TABLE 403.3)	AIRFLOW PER SQFT (TABLE 403.3)	OUTSIDE AIR REQUIRED BY AREA SERVED (CFM)	TOTAL OUTSIDE AIR REQUIRED (CFM)	TOTAL OUTSIDE AIR PROVIDED (CFM)	
LOWER LEVEL												
RTU-1/2	RETAILS	SALES	5700	0.8	15	86	7.5	0.12	1661.3	1662.0	800	
* REFER TO ASHRAE 62.1 IAQ CALCUALIONS FOR OUTSIDE AIR REDUCTION									TOTAL	1661.3	1662.0	800
UPPER LEVEL												
RTU-3/4	OFFICE	OFFICE SPACE	1585	0.8	5	8	5	0.06	168.9	169.0	200	
TOTAL									168.9	169.0	200	

PRELIMINARY
 NOT FOR CONSTRUCTION
 OR PRICING

10/08/2021

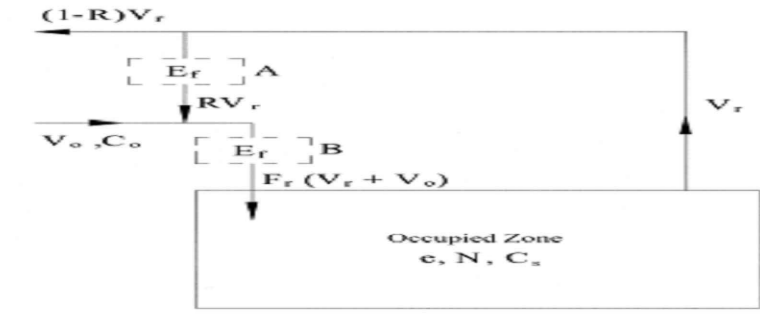
PACKAGED DX COOLING/GAS HEATING ROOF TOP UNIT SCHEDULE																			
TAG	MANUFACTURER/MODEL No.	SUPPLY - FAN DATA					NOMINAL TONNAGE	COOLING CAPACITY		HEATING CAPACITY		ELECTRICAL DATA			EFF. EER (SEER)	EFF. IEER	AFUE	UNIT WEIGHT (LBS)	NOTES
		SUPPLY (CFM)	OA (CFM)	MIN. EXT. S.P. (IN. WG)	MOTOR HP	FAN RPM		TOTAL (MBH)	SENS. (MBH)	INPUT (MBH)	OUTPUT (MBH)	V/PH	MCA (A)	MCCP (A)					
RTU-1	TRANE / YHC	4000	500	1	5.0	1100.0	10.0	116.0	100.0	200	160	208/3	46.1	60.0	12.4	14.5	80	1500	1-13
RTU-2	TRANE / YHC	2000	300	0.5	1.0	1075.0	5.0	61.0	55.0	80	64	208/3	30	45.0	12.9	15.0	80	925	1-13
RTU-3	TRANE / YHC	2000	100	0.5	1.0	1075.0	5.0	61.0	55.0	80	64	208/3	30	45.0	12.9	15.0	80	925	1-13
RTU-4	TRANE / YHC	2000	100	0.5	1.0	1075.0	5.0	61.0	55.0	80	64	208/3	30	45.0	12.9	15.0	80	925	1-13

NOTES:

- COOLING CAPACITIES ARE RATED IN ACCORDANCE WITH ARI STANDARD 210/ 290 AT 95 DEGREE FARHENHEIT AMBIENT OUTDOOR AIR TEMPERATURE, 80 DEGREE FARHENHEIT DRY BULB, AND 67 DEGREE FARHENHEIT WET BULB ENTERING AIR TEMPERATURE, AND NORMAL AIR QUANTITY LISTED.
- PROVIDE NEW FILTER IN EACH UNIT AT TURNOVER TO OWNER.
- PROVIDE MANUFACTURER'S 7-DAY PROGRAMMABLE AUTOMATIC CHANGE-OVER HEAT/ COOL THERMOSTAT. PROVIDE UNIT WITH DEMNAD CONTROL VENTILATION CONTROLS AND ASSOCIATED CO2 DETECTORS LOCATED PER PLAN. COORDINATE FINAL LOCATION WITH ARCHITECT AND OWNER. PROVIDE A 24V MOTORIZED DAMPER ON FRESH AIR RUN-OUT TO UNIT. DAMPER IS TO OPEN WHEN DEMAND CONTROL VENTILATION IS CALLED FOR, AND CLOSE TO 25% OPEN POSITION WHEN NOT IN ALARM.
- PROVIDE FACTORY ROOF CURB AND COMPARTIVE ENTHALPY AIR SIDE ECONOMIZER SECTION WITH BAROMETRIC RELIEF DAMPER FOR EACH UNIT.
- PROVIDE FACTORY INSTALLED DIRTY FILTER SWITCH, BLOWER PROVING SWITCH, AND WATER LEVEL MONITORING DEVICE PER NCMC 307.2.3.1.
- ELECTRICAL CONTRACTOR SHALL PROVIDE SMOKE DETECTORS ON THE RETURN DUCT DISCHARGES TO BE INSTALLED BY MECHANICAL CONTRACTOR. IF BUILDING HAS FIRE ALARM SYSTEM SMOKE DETECTORS SHALL BE BY FIRE ALARM CONTRACTOR.
- PROVIDE 1 YEAR PARTS AND LABOR WARRANTY. PROVIDE 5 YEAR PARTS WARRANTY ON COMPRESSORS. PROVIDE 10 YEAR PARTS WARRANTY ON HEAT EXCHANGERS.
- PROVIDE UNIT WITH THRU BASE PROVISION AND FACTORY FURNISHED NONFUSED DISCONNECT.
- PROVIDE UNIT WITH TOOLES ACCESS PANELS.
- HEATING CAPACITY BASED ON NATURAL GAS AT 1000 BTU PER CUBIC FOOT AND 0.6 SPECIFIC GRAVITY. PROVIDE PRESSURE REGULATOR TO REDUCE PRESSURE TO 7" W.C. AS NEEDED.
- MECHANICAL CONTRACTOR SHALL PROVIDE A START UP CHECKLIST CONFIRMING ALL UNITS HAVE BEEN PROPERLY STARTED AND CONFIRMED RUNNING PROPERLY.
- CATALOG NUMBERS AND MANUFACTURERS ARE TO INDICATE TYPE AND QUALITY OF UNIT DESIRED. SUBMIT CUTSHEETS OF THESE AND ALTERNATE MANUFACTURERS FOR ARCHITECT AND OWNER APPROVAL PRIOR TO PURCHASE OF ANY UNITS. INFORMATION ON ALTERNATE UNITS PROPOSED BY THE CONTRACTOR SHALL INCLUDE THE ADD/ DEDUCT ASSOCIATED WITH ACCEPTANCE OF THAT UNIT (OR THE ALTERNATE PACKAGE AS A WHOLE).
- ACCEPTABLE ALTERNATE MANUFACTURERS: DAIKIN, CARRIER, & LENNOX

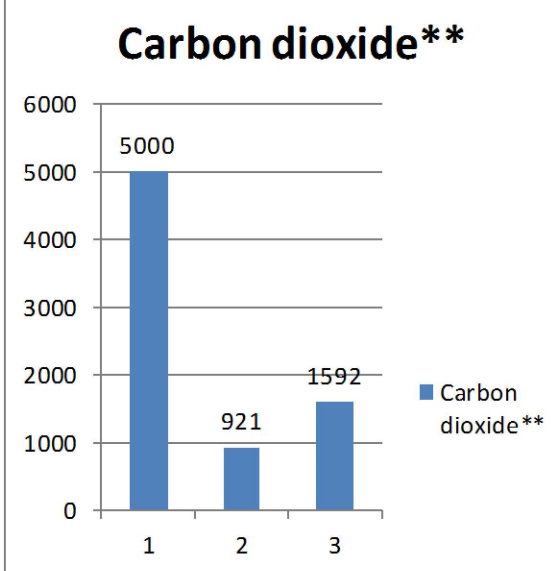
Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft) Az	Zone Max Occupancy Pz	Table 6.1 OA per Occupant Rp	Table 6.1 cfm/#2 Ra	Pz * Rp	Az * Ra	Table 6.2 Ventilation Effectiveness Ez	Outdoor Air to Zone (CFM) with Ez correction (Vbz/Ez)
RTU-1/2	Retail	Sales	5,700.0	86.0	7.5	0.12	645	684	0.8	1661

Zone Height (feet)	10.0
Desired Outside Air (Vo) IAQF	800
Supply Air (Vs)	6,000
Return Air (Vr)	5200
Recirc. Flow Factor (R)	0.87
Ventilation Effectiveness (Ez)	0.8
Level of Physical Activity	Standing (desk work)
Filter Location	B
HVAC Flow Type	Constant
Outdoor Air Flow Type	Constant



Air Changes Per Hour	6.3	VRP OA CFM per person	19.3
Outside Air Per VRP	1661 CFM	IAQ OA CFM per person	9.3
Outside Air Per IAQ	800 CFM		
Outside Air Savings	861 CFM	Winter Heating Savings	
OA Summer Drybulb	94.0	OA Winter Design DB (F)	45
OA Summer Wetbulb	76.0	Supply Air DB Setpoint (F)	85
Coil Leaving Air Drybulb (F)	55.0	MBH Saved Winter	37.4
Coil Leaving Air Wetbulb (F)	55.0	KW Saved Winter	11.0
OA MBH Saved Summer*	62.9		
OA Tons Saved Summer*	5.2		

*OA = Outside Air
 ***ASHRAE, NIOSH & WHO most conservative values used
<http://www.cdc.gov/niosh/npg/npgsyn-a.html>



1 = ASHRAE & NIOSH CO2 Limit
 2 = CO2 Level at Ventilation Rate OA Flow Rate
 3 = CO2 Level at IAQ Procedure OA Flow Rate
 **Carbon dioxide has been provided for reference only for gathering demand control ventilation (DCV) setpoints. The National Research Council was commissioned by the US Navy to prove CO2 is not a contaminant of concern when using air purification to control the other contaminants of concern, as found on submarines.

Indoor Contaminants	Maximum Threshold Value (PPM)	Steady State Using the VRP* (Prescribed OA) Plasma Off	Steady State Using the IAQ Method (Reduced OA) Plasma On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate (PPM)	Filtration Effectiveness	Cognizant Authority***
Acetaldehyde	100.0	0.01112	0.00132	Yes	0.00048	50%	OSHA
Acetone	250.0	0.00169	0.00036	Yes	0.00654	50%	NIOSH
Ammonia	25.00	0.01561	0.00699	Yes	0.21460	50%	NIOSH
Benzene	1.0000	0.00252	0.00030	Yes	0.00022	50%	OSHA
2- Butanone (MEK)	200.0	0.00019	0.00005	Yes	0.00133	50%	NIOSH
Carbon dioxide**	5000	921	1592	Yes	441	0%	NIOSH
Chloroform	2.0000	0.00011	0.00001	Yes	0.00004	50%	NIOSH
Dioxane	100.0	0.00000	0.00000	Yes	0.00000	50%	OSHA
Hydrogen Sulfide	10.0	0.00000	0.00000	Yes	0.00000	50%	NIOSH
Methane	NA	1.68094	1.68094	Yes	0.00000	0%	NA
Methanol	200.0	0.00000	0.00000	Yes	0.00000	0%	NIOSH
Methylene Chloride	25.0	0.00077	0.00012	Yes	0.00121	50%	OSHA
Propane	1000.0	0.00998	0.00998	Yes	0.00000	0%	NIOSH
Tetrachloroethane	5.0000	0.00000	0.00000	Yes	0.00000	50%	OSHA
Tetrachloroethylene	100.0000	0.00037	0.00004	Yes	0.00001	50%	OSHA
Toluene	100.0000	0.00533	0.00063	Yes	0.00032	50%	NIOSH
1,1,1 - Trichloroethane	350.0000	0.00077	0.00010	Yes	0.00058	50%	NIOSH
Xylene	100.0000	0.00230	0.00027	Yes	0.00000	50%	OSHA

Building materials and furnishings assumed to have no VOCs and off-gassing is complete.	Is IAQ acceptable at reduced outside air levels?	Yes
---	--	-----

Air Purification Schedule

Zone Tag	Flow CV	S/A Flow	O/A Flow	GPS Model	GPS Quantity	Pressure Drop	Voltage (AC)	Watts	Mounting Location	Min Ion Density (ions/cc)	Notes
RTU-1/2	CV	6000	800	GPS-FC48-AC	2	0.05" W.C.	24-240	20.0	RTU	200 Million	1 to 7

- Basis of Design: Global Plasma Solutions: Approved equals by Airgenics and Bioxgen subject to specification compliance
- Mount bi-polar ion generator where indicated on schedule
- If contractor substitutes basis of design with another manufacturer, contractor shall coordinate all electrical and mechanical changes
- Bi-polar ionization systems requiring perishable glass tubes are not acceptable
- All manufacturers must pass UL-867-2007 ozone chamber testing by either UL or ETL
- Provide with integral BAS alarm contacts
- Provide with integral self-cleaning system. Systems without self-cleaning shall not be acceptable

FAN SCHEDULE												
TAG	MANUFACTURER & MODEL NO.	AREA SERVED	SERVICE	CFM	S.P. IN. WG.	DRIVE TYPE	NOMINAL RPM	FAN TYPE	ELECTRICAL V/PH/Hz	MOTOR HP (WATTS)	CONTROL METHOD	NOTES
EF-1	GREENHECK / SP-A110	TOILET	EXHAUST	75	0.25	DIRECT	950	CABINET	120/1/60	(19.4)	A	1-12
EF-2	GREENHECK / SP-A190	TOILET / SHOWER	EXHAUST	150	0.25	DIRECT	1400	CABINET	120/1/60	(54.4)	A	1-12

NOTES:

- SCREEN
- BACKDRAFT DAMPER
- GRILLE COLOR SELECTED BY ARCHITECT
- INTEGRAL DISCONNECT SWITCH
- PROVIDE UNIT WITH VIBRATION ISOLATION
- UNIT SHALL BE UL LISTED AND AMCA CERTIFIED.
- PROVIDE MOTOR WITH THERMAL OVERLOAD PROTECTION.
- PROVIDE UNIT WITH INSULATED HOUSING FOR SOUND ATTENUATION.
- PROVIDE WITH MANUFACTURER'S PAIRED FLUSH LOUVER.
- PROVIDE MOTOR STARTER AS REQUIRED
- SPEED CONTROLLER NEAR FAN
- ACCEPTABLE EQUALS SHALL BE ACME, BREIDERT, CARNES, COOK, AND PENN.

CONTROL METHOD:
 A) W/ ROOM LIGHTS B) W/ THERMOSTAT C) W/ SWITCH D) CONTINUOUS OPERATION E) W/ CLOCK

AIR DISTRIBUTION SCHEDULE										
TAG	MANUFACTURER & MODEL NO.	NECK SIZE	FACE SIZE	FRAME TYPE	PATTERN	DAMPER	MATERIAL	SERVICE	FINISH	NOTES
S-1	PRICE / 520	18x6	18x6	DUCT	4-WAY	YES	STEEL	SUPPLY	PAINT GRIP	1,2
S-2	PRICE / 520	16x6	16x6	SIDEWALL	4-WAY	YES	STEEL	SUPPLY	PAINT GRIP	1,2
S-3	PRICE / 520	20x10	20x10	SIDEWALL	4-WAY	YES	STEEL	SUPPLY	PAINT GRIP	1,2
S-4	PRICE / SDGE	16x4	16x4	DUCT	4-WAY	YES	STEEL	SUPPLY	PAINT GRIP	1,2
R-1	PRICE / 510	30x14	30x14	SIDEWALL	SING. DEFF.	NO	STEEL	RETURN	PAINT GRIP	2
T-1	PRICE / 510	30x14	30x14	SIDEWALL	SING. DEFF.	NO	STEEL	TRANSFER	PAINT GRIP	2
C-1	RUSKIN / CDF-18	PER MFG	PER MFG	DUCT	-	YES	STEEL	SUPPLY	PAINT GRIP	1,2

NOTES:

- PROVIDE OPPOSED BLADE DAMPERS IN NECK OF DIFFUSER OR REGISTER. WITH ACCESS TO DAMPER THROUGH FACE OF DIFFUSER OR REGISTER.
- ACCEPTABLE EQUALS SHALL BE ANEMOSTAT, CARNES, KRUEGER, NAILOR, TITUS AND TUTTLE & BAILEY.

SPIRITED CYCLIST
 16601 OLD STATESVILLE ROAD
 HUNTERSVILLE, NC 28078
SHEET TITLE
MECHANICAL SCHEDULES

PROJECT NO: 21167 DRAWN BY: MRFM

SCALE: AS NOTED ISSUE DATE: 10/01/2021

REVISIONS:

SHEET NUMBER:

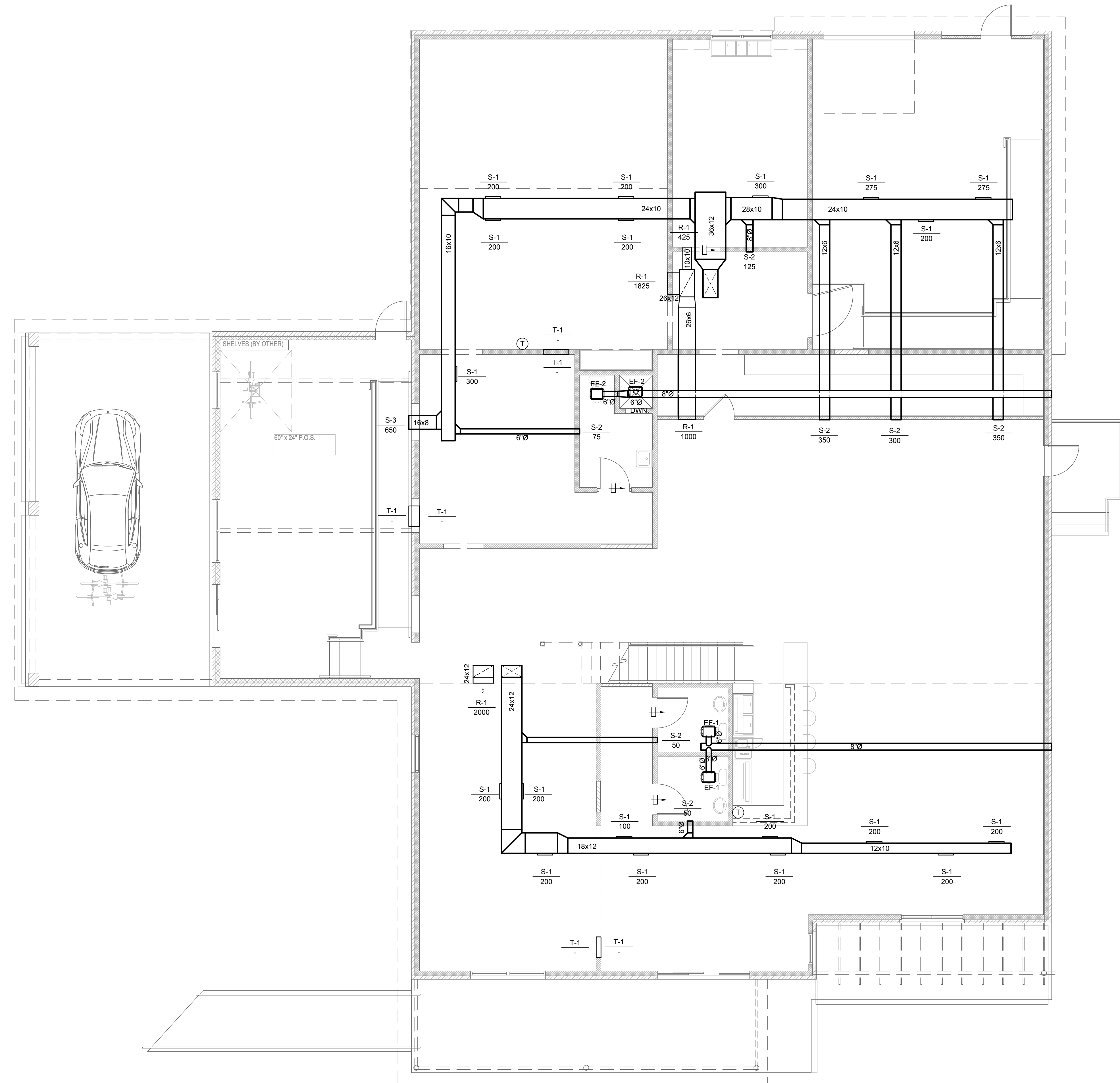
MO.2



WAVE ENGINEERING
 3540 TORINGDON WAY, SUITE 200
 CHARLOTTE, NC 28277
 980.256.7789
 INFO@WAVE-ENGINEERING.COM
 NC CORP. LICENSE #P-1621

PRELIMINARY
 NOT FOR CONSTRUCTION
 OR PRICING

10/08/2021



SPIRITED CYCLIST

16601 OLD STATESVILLE ROAD
 HUNTERVILLE, NC 28078

SHEET TITLE
MECHANICAL FIRST FLOOR PLAN

PROJECT NO: 21167
 DRAWN BY: MRM
 SCALE: AS NOTED
 ISSUE DATE: 10/01/2021

REVISIONS:

SHEET NUMBER:

M1.1

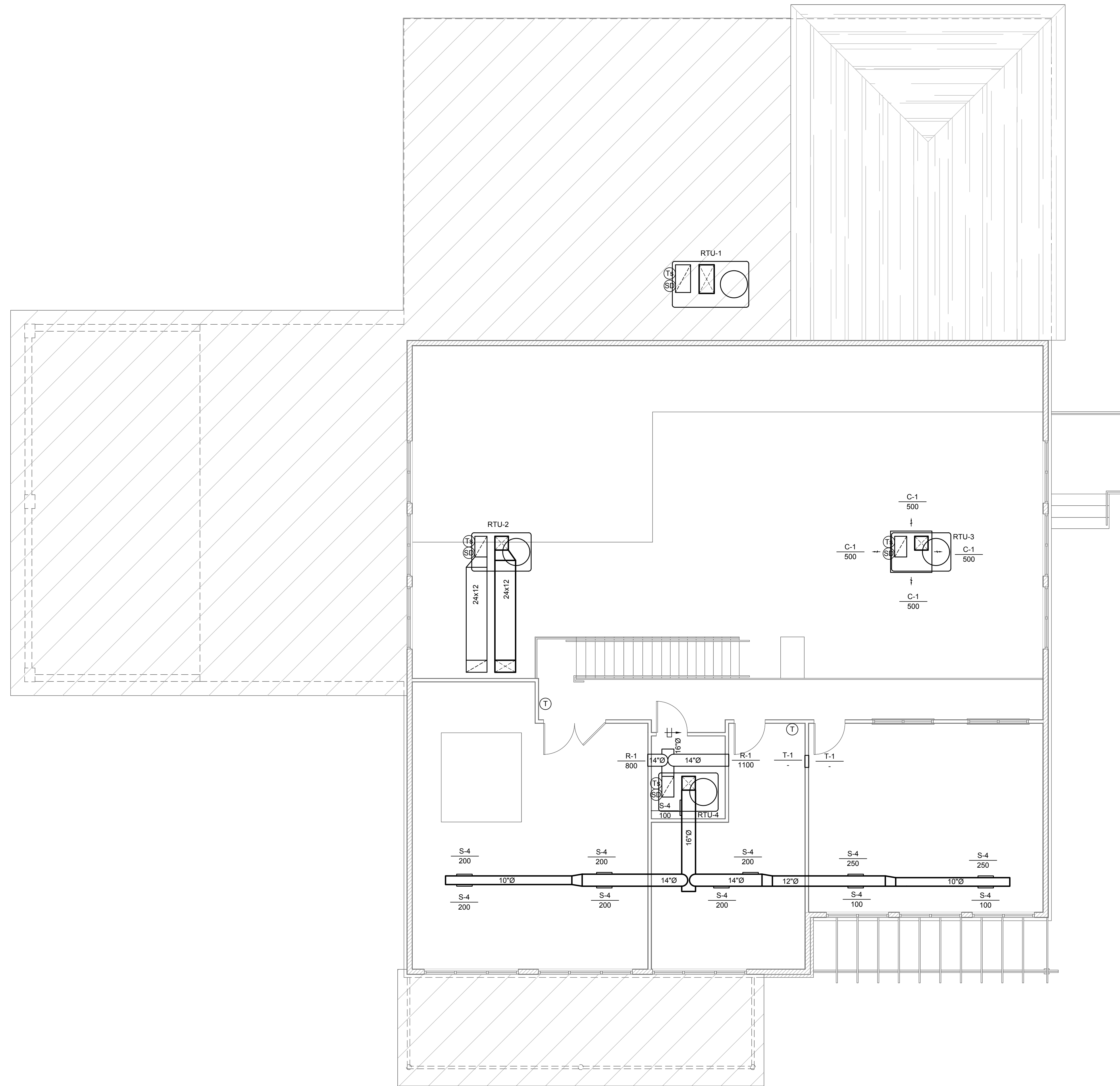
1 MECHANICAL FIRST FLOOR PLAN
 M1.1 SCALE: 3/16" = 1'-0"



WAVE ENGINEERING
 3540 TORINGDON WAY, SUITE 200
 CHARLOTTE, NC 28277
 980.256.7789
 INFO@WAVE-ENGINEERING.COM
 NC CORP. LICENSE #P-1621

— PRELIMINARY —
 NOT FOR CONSTRUCTION
 OR PRICING

10/08/2021



SPIRITED CYCLIST

16601 OLD STATESVILLE ROAD
 HUNTERVILLE, NC 28078

SHEET TITLE
MECHANICAL SECOND FLOOR PLAN

PROJECT NO: 21167 DRAWN BY: MRM

SCALE: AS NOTED ISSUE DATE: 10/01/2021

REVISIONS:

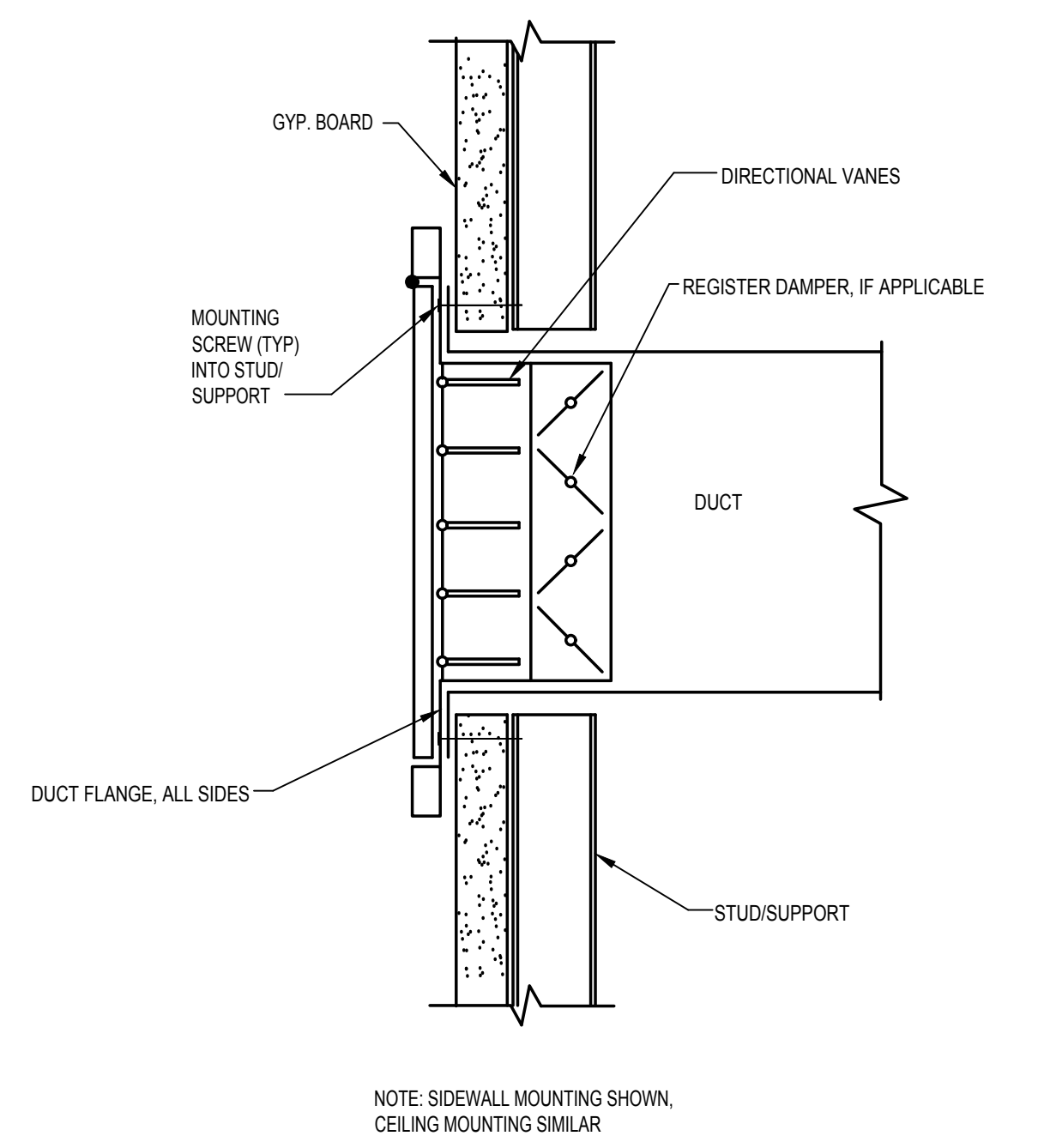
SHEET NUMBER:

M1.2

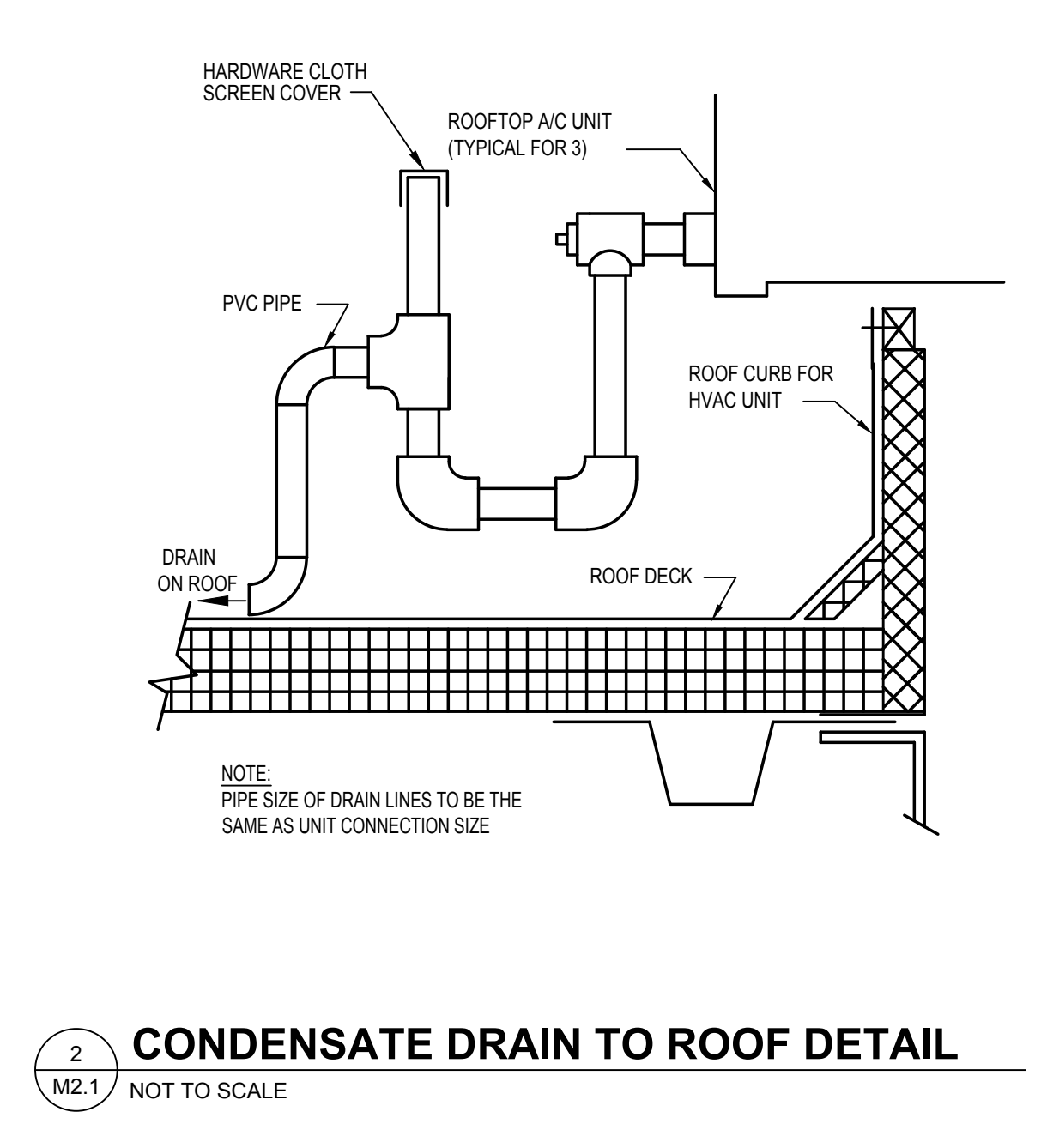
2 MECHANICAL SECOND FLOOR PLAN
 M1.1 SCALE: 3/16" = 1'-0"

PRELIMINARY
 NOT FOR CONSTRUCTION
 OR PRICING

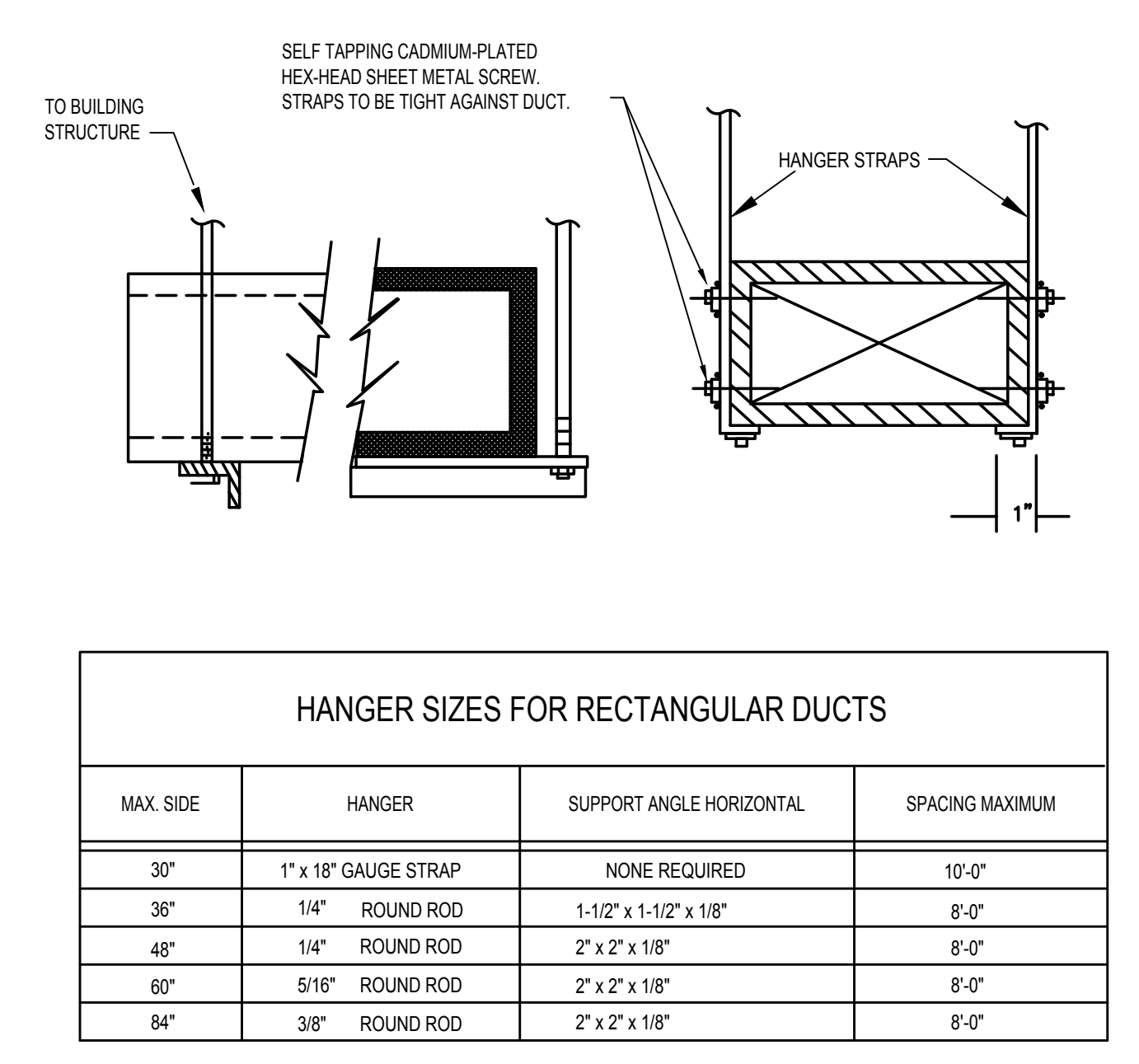
10/08/2021



1 WALL MOUNTED AIR DEVICE DETAIL
 M2.1 NOT TO SCALE

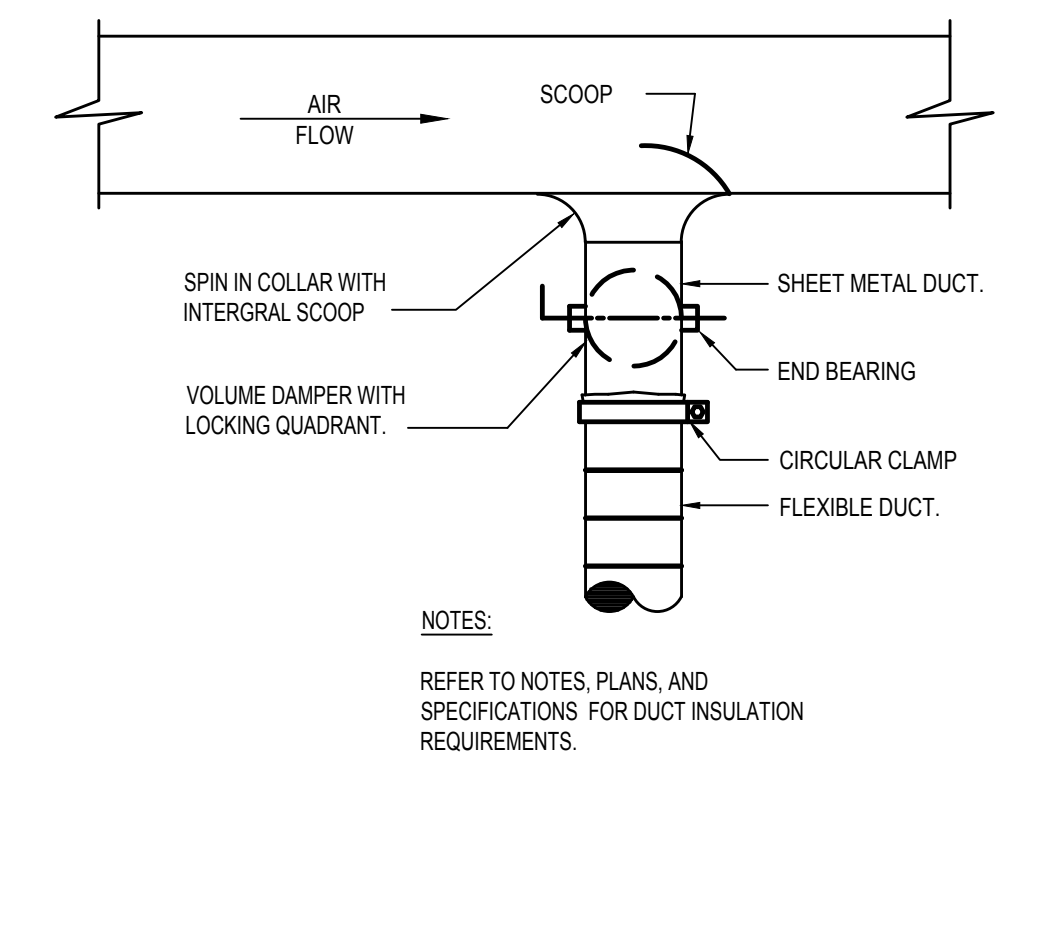


2 CONDENSATE DRAIN TO ROOF DETAIL
 M2.1 NOT TO SCALE

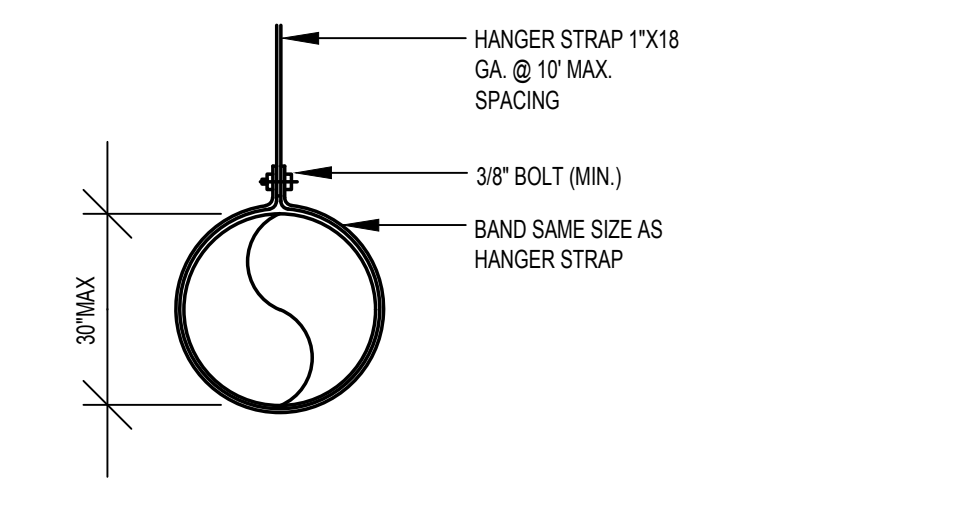


3 RECTANGULAR DUCT HANGER DETAIL
 M2.1 NOT TO SCALE

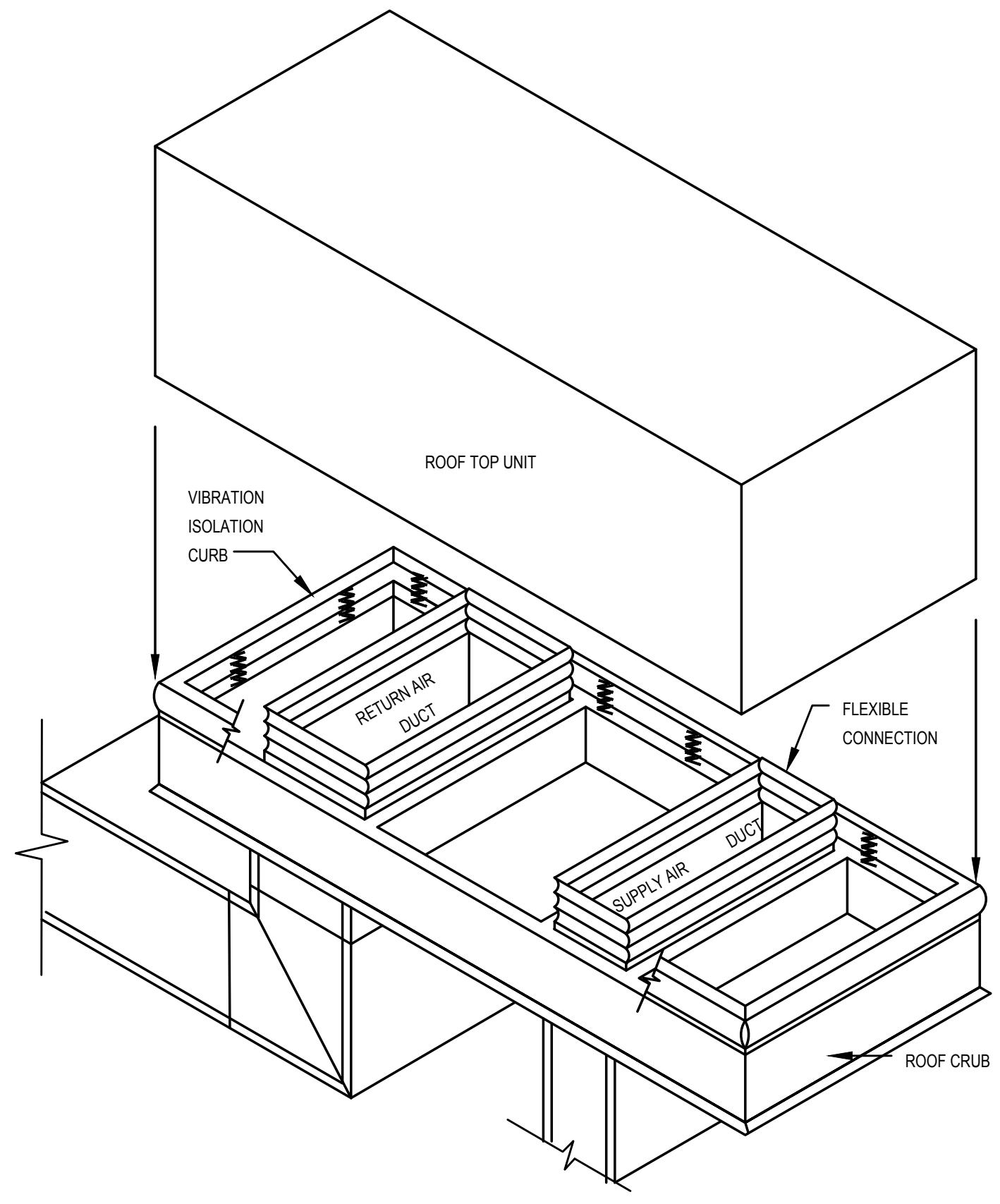
HANGER SIZES FOR RECTANGULAR DUCTS			
MAX. SIDE	HANGER	SUPPORT ANGLE HORIZONTAL	SPACING MAXIMUM
30"	1" x 18" GAUGE STRAP	NONE REQUIRED	10'-0"
36"	1/4" ROUND ROD	1-1/2" x 1-1/2" x 1/8"	8'-0"
48"	1/4" ROUND ROD	2" x 2" x 1/8"	8'-0"
60"	5/16" ROUND ROD	2" x 2" x 1/8"	8'-0"
84"	3/8" ROUND ROD	2" x 2" x 1/8"	8'-0"



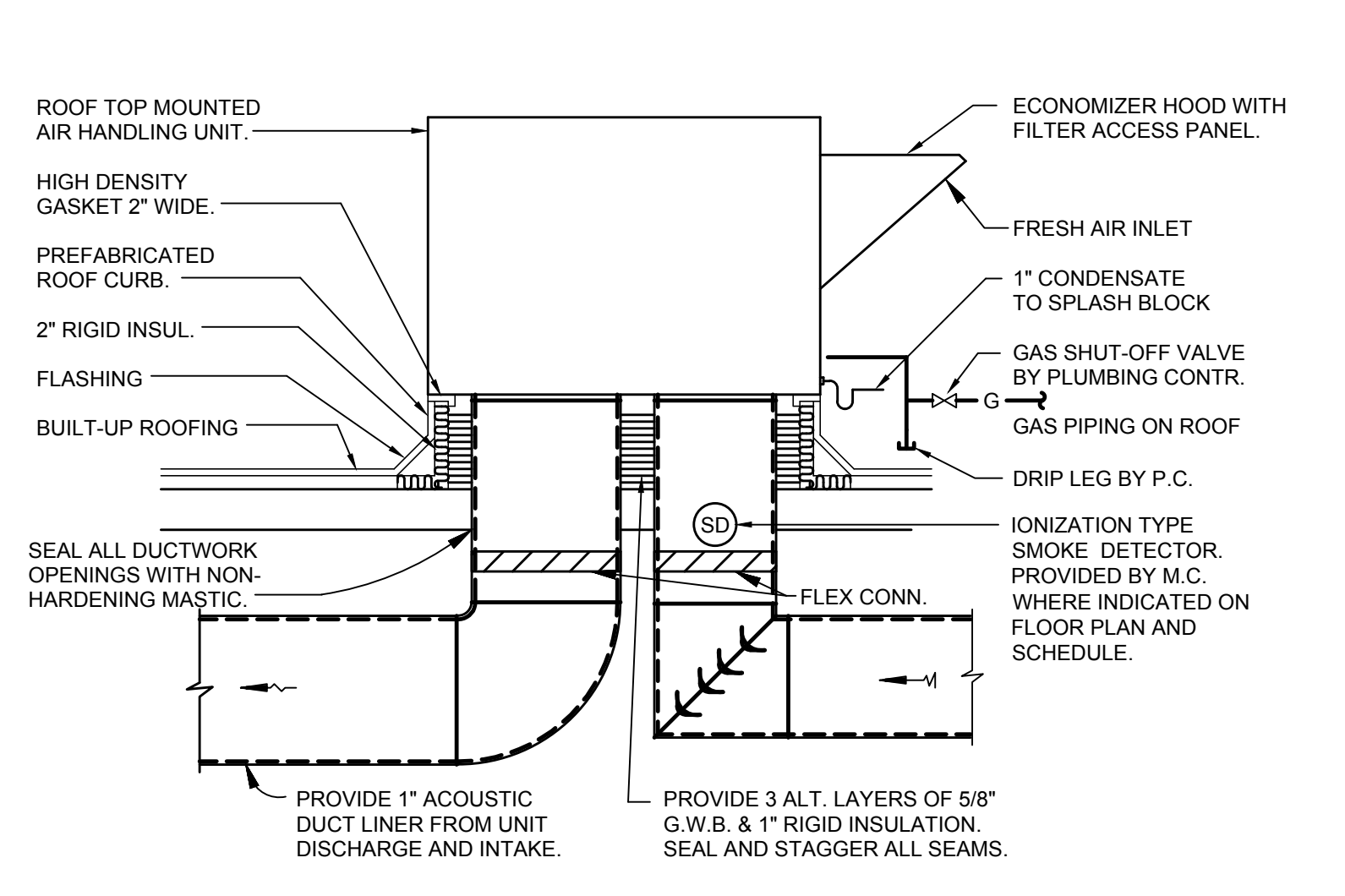
4 TYPICAL BRANCH TAKE-OFF DETAIL
 M2.1 NOT TO SCALE



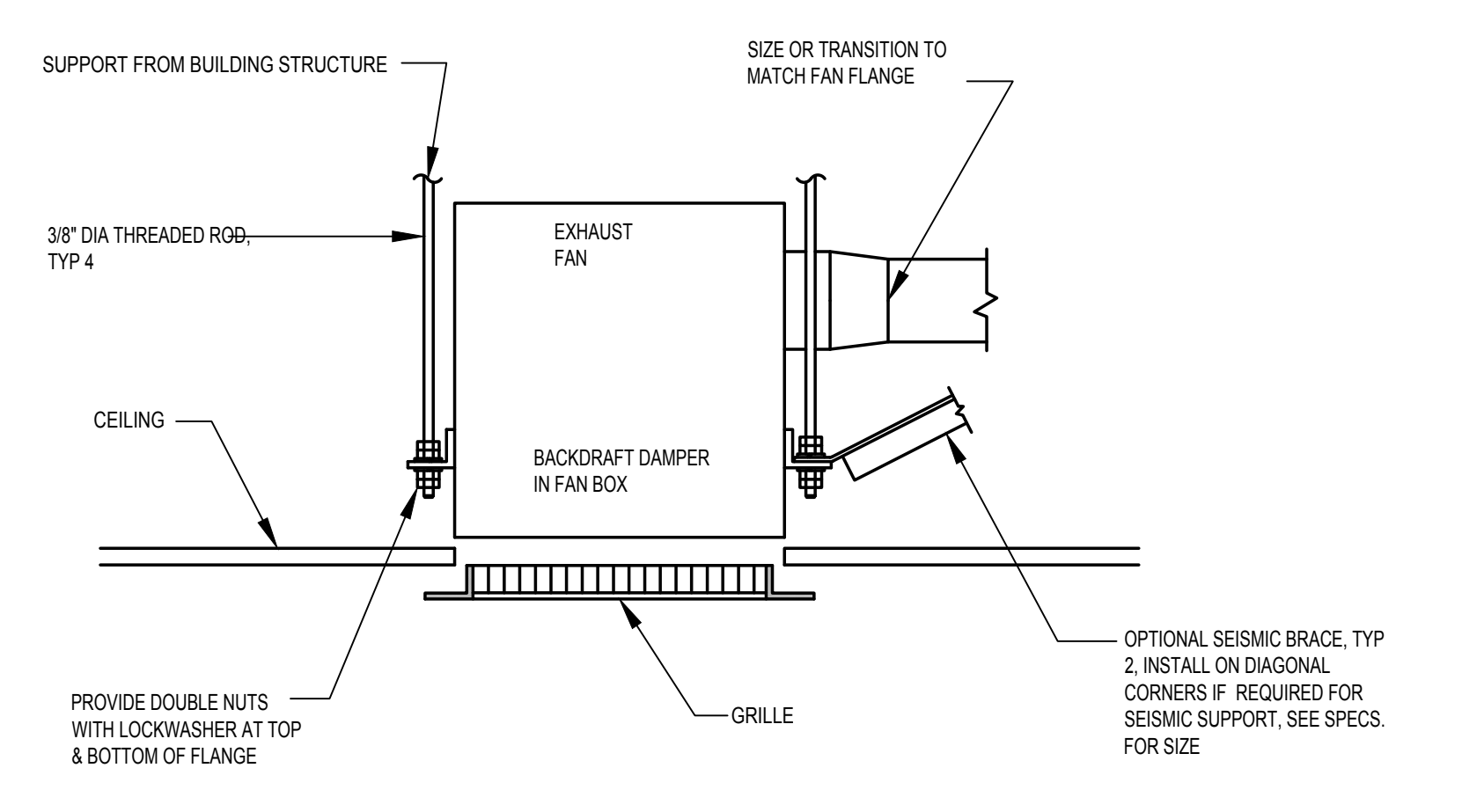
5 ROUND DUCT HANGER DETAIL
 M2.1 NOT TO SCALE



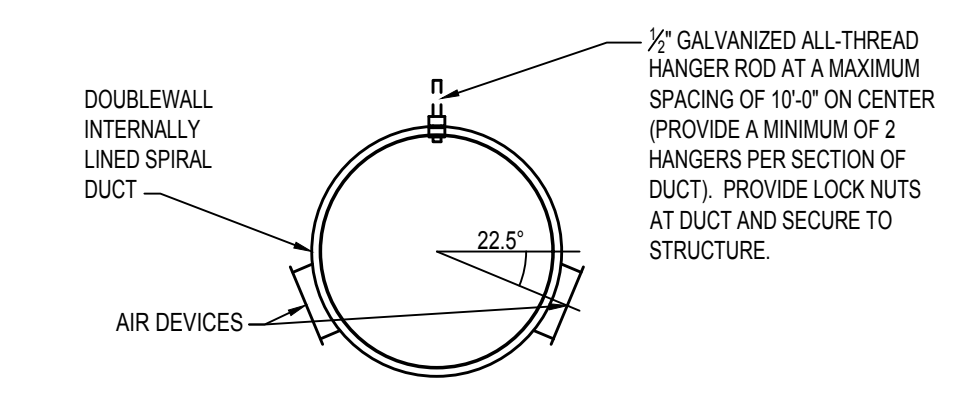
6 ROOF TOP UNIT CURB DETAIL
 M2.1 NOT TO SCALE



7 ROOF TOP UNIT DETAIL
 M2.1 NOT TO SCALE



8 CEILING EXHAUST FAN
 M2.1 NOT TO SCALE



9 DUCT MOUNTED DIFFUSER DETAIL
 M2.1 NOT TO SCALE

SPIRITED CYCLIST
 16601 OLD STATESVILLE ROAD
 HUNTERSVILLE, NC 28078
 SHEET TITLE: **MECHANICAL DETAILS**

PROJECT NO: 21167
 DRAWN BY: MRM
 SCALE: AS NOTED
 ISSUE DATE: 10/01/2021

REVISIONS:

SHEET NUMBER:
M2.1