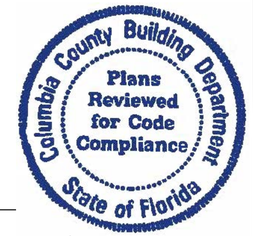

HVAC GENERAL NOTES

1. CONNECTION TO EQUIPMENT SHALL BE VERIFIED WITH MANUFACTURER'S CERTIFIED DRAWINGS. TRANSITIONS TO ALL EQUIPMENT SHALL BE VERIFIED AND PROVIDED FOR EQUIPMENT FURNISHED.
2. DIMENSIONS SHALL BE FIELD-VERIFIED AND COORDINATED PRIOR TO PROCUREMENT OR FABRICATION. COORDINATE ALL WORK WITH OTHER TRADES INVOLVED. FIELD MODIFICATIONS SUCH AS OFFSETS IN PIPING OR DUCTWORK (INCLUDING DIVIDED DUCTWORK) NEEDED DUE TO OBSTRUCTIONS OR INTERFERENCES SHALL BE PROVIDED AT NO ADDITIONAL COST. FOR RENOVATION PROJECTS, COORDINATE NEW WORK WITH EXISTING ELEMENTS SUCH AS THE BUILDING STRUCTURE, ARCHITECTURAL FEATURES, SPRINKLER PIPING, LIGHTS, PLUMBING, AND ELECTRICAL CONDUIT.
3. DUCTWORK CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE SMACNA HVAC DUCTWORK CONSTRUCTION STANDARD.
4. INSTALL ALL FIRE DAMPERS, SMOKE DAMPERS, AND COMBINATION FIRE/SMOKE DAMPERS IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE ACCESS DOORS TO ALLOW COMPLETE INSPECTION AND MAINTENANCE OF ALL DEVICES.
5. PROVIDE 1.5R ELBOWS IN DUCTWORK AS INDICATED ON DRAWING. IF 1.5R ELBOWS DO NOT FIT, PROVIDE 1.0R ELBOWS. IF 1.0R ELBOWS DO NOT FIT, PROVIDE 90 DEGREE RECTANGULAR DUCT ELBOWS WITH TURNING VANES.
6. COORDINATE DIFFUSER, GRILLE, AND REGISTER LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS AND EQUIPMENT OF ALL TRADES.
7. LOCATE THERMOSTATS, TEMPERATURE SENSORS, HUMIDISTATS, AND HUMIDITY SENSORS AT 48" ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE. COORDINATE LOCATIONS WITH OTHER EQUIPMENT, FURNITURE, AND DOOR SWINGS.
8. ALL EQUIPMENT, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED AND/OR SPECIFIED. PROVIDE ADDITIONAL SUPPORTS AS REQUIRED TO PROVIDE A VIBRATION-FREE, RIGID INSTALLATION.
9. ALL DUCTWORK SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS.
10. DAMPERS AND INSIDES OF DUCTWORK VISIBLE THROUGH GRILLES, REGISTERS, AND DIFFUSERS SHALL BE PAINTED FLAT BLACK.
11. REFER TO TYPICAL DETAILS FOR PIPING AND INSTALLATION OF EQUIPMENT.
12. PROPER DRAINAGE SHALL BE PROVIDED TO SUIT EQUIPMENT FURNISHED.
13. ACCESS PANELS IN DUCTWORK AND CEILINGS SHALL BE PROVIDED WHERE REQUIRED FOR OPERATION, BALANCING, OR MAINTENANCE OF ALL MECHANICAL EQUIPMENT.
14. ALL DUCTWORK AND PIPING IS SHOWN SCHEMATICALLY. PROVIDE ALL TRANSITIONS, TURNING VANES, ELBOWS, FITTINGS, ETC., TO ALLOW SMOOTH FLOW. ALL SPLIT DUCTWORK FITTINGS SHALL TRANSITION TO FULL SIZE OF THE SUM OF BOTH BRANCHES, UPSTREAM OF SPLIT.
15. COORDINATE SIZE REQUIREMENTS OF ALL CONCRETE HOUSEKEEPING PADS UNDER ALL FLOOR MOUNTED EQUIPMENT. REFER TO DETAILS AND SPECIFICATIONS FOR PAD REQUIREMENTS.
16. VERIFY FINISH WITH ARCHITECT PRIOR TO PURCHASE GRILLES, REGISTERS, DIFFUSERS, LOUVERS AND OTHER AIR DISTRIBUTION DEVICES.
17. PROVIDE FLEXIBLE DUCTWORK CONNECTIONS ON ALL DUCTWORK CONNECTING TO FANS, AIR HANDLING UNITS, AND FAN COIL UNITS.
18. PROVIDE TRANSITIONS AT DIFFUSER NECKS AS REQUIRED TO MATCH SIZES OF FLEX DUCTWORK TO BE CONNECTED.
19. SLEEVE AND SEAL ALL PIPING PENETRATIONS THROUGH BUILDING PARTITIONS.
20. MAINTAIN CLEARANCE OF A MINIMUM OF 6" BETWEEN DUCTWORK, PIPING, EQUIPMENT, ETC., AND ALL FIRE RATED AND FIRE/SMOKE RATED PARTITIONS, TO ALLOW FOR INSPECTIONS OF RATED WALLS.
21. LOCATE ALL OUTSIDE AIR INTAKES A MINIMUM OF 10'-0" CLEAR FROM ALL PLUMBING VENTS AND EXHAUST AIR DISCHARGE LOCATIONS. LOWEST POINTS OF EACH OUTSIDE AIR ON ROOF SHALL BE A MINIMUM OF 24" ABOVE ROOF.
22. DUCTWORK RUNOUTS TO DIFFUSERS SHALL MATCH THE SIZE OF THE DIFFUSER NECK.
23. UNLESS OTHERWISE NOTED, ALL EQUIPMENT AND VALVE DRAINS SHALL BE INDEPENDENTLY PIPED FULL SIZE TO THE NEAREST PLUMBING DRAIN.
24. INTERRUPTIONS TO EXISTING SERVICES SHALL BE SCHEDULED FOR TIMES OTHER THAN NORMAL OPERATING HOURS (SUCH AS NIGHTS AND WEEKENDS). SUCH INTERRUPTIONS TO SERVICES SHALL NOT BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF THE OWNER'S REPRESENTATIVE AND PROPER COORDINATION WITH OTHER TRADES. PRE-WORK SHALL BE PERFORMED TO MAKE THE SHUTDOWN PERIOD AS BRIEF AS POSSIBLE.
25. ALL EQUIPMENT, DUCTWORK, ETC., TO BE REMOVED SHALL REMAIN PROPERTY OF THE OWNER OR DISPOSED OF LEGALLY, AS DIRECTED BY THE OWNER.
26. WATER PRESSURE DROP THROUGH COIL CONTROL VALVES SHALL NOT EXCEED 5 PSI.
27. PROVIDE MANUAL AIR VENTS AT ALL HIGH POINTS IN CHILLED WATER AND HOT WATER PIPING.
28. PIPING, DUCTWORK, LEAK PROTECTION APPARATUS, OR OTHER EQUIPMENT FOREIGN TO ELECTRICAL SWITCHBOARDS, PANELBOARDS, DISTRIBUTION BOARDS, OR MOTOR CONTROL CENTERS SHALL NOT BE INSTALLED WITHIN THE REQUIRED SPACE FOR WORKING CLEARANCES OR DEDICATED SPACES OF THE ELECTRICAL EQUIPMENT, EXTENDING IN FRONT OF AND FROM FLOOR TO STRUCTURAL CEILING WITH A WIDTH AND DEPTH OF THE ELECTRICAL EQUIPMENT IN ACCORDANCE WITH NEC-110.26.
29. ALL ROOFTOP MECHANICAL EQUIPMENT SHALL MAINTAIN A MINIMUM DISTANCE OF 10'-0" FROM ROOF EDGE. WHERE REQUIRED, A 42" GUARDRAIL OR STRUCTURALLY DESIGN TIE-OFF POINT FOR FALL PROTECTION CAN BE PROVIDED IN ACCORDANCE WITH FLORIDA MECHANICAL CODE SECTION 304.11.

APPLICABLE CODES & STANDARDS

FLORIDA BUILDING CODE – MECHANICAL 2020 EDITION
FLORIDA BUILDING CODE – PLUMBING 2020 EDITION
FLORIDA BUILDING CODE – ENERGY CONSERVATION 2020 EDITION
FLORIDA ADMINISTRATIVE CODE – 69A-3.012
NFPA-13, STANDARD FOR INSTALLATION OF SPRINKLER SYSTEMS – 2016 EDITION
NFPA-70, NATIONAL ELECTRICAL CODE – 2017 EDITION
NFPA-72, NATION AL FIRE ALARM CODE – 2016 EDITION
NFPA-90A, STANDARD FOR THE INSTALLATION OF AIR CONDITIONING AND VENTILATION SYSTEMS – 2018 EDITION
NFPA-90B, STANDARD FOR THE INSTALLATION OF WARM AIR HEATING AND AIR CONDITIONING SYSTEMS – 2018 EDITION

HVAC SYMBOL LEGEND

SYMBOL	DESCRIPTION
	-CEILING DIFFUSER, ROUND NECK (CEILING DIFFUSERS ARE 4-WAY THROW UNO)
	-CEILING RETURN
	-CEILING EXHAUST
	-CEILING DIFFUSER, RECT. OR SQUARE NECK (DIFFUSERS ARE 4-WAY THROW UNO)
	-SUPPLY REGISTER OR GRILLE (VERTICAL MOUNT, SIDEWALL)
	-RETURN/EXHAUST REGISTER OR GRILLE (VERTICAL MOUNT, SIDEWALL)
XX	-REVISION REFERENCE
1 / M-1	-DETAIL REFERENCE: TOP – DETAIL#, BOTTOM – DRAWING# SHOWN ON
T	-THERMOSTAT/TEMPERATURE SENSOR
H	-HUMIDISTAT/HUMIDITY SENSOR
	-DUCT SMOKE DETECTOR
M	-MOTORIZED CONTROL DAMPER
T	-TEMPERATURE SENSOR
SP	-STATIC PRESSURE SENSOR
BD	-BACKDRAFT DAMPER
XX	-SHEET NOTE CALLOUT
	-CEILING MOUNTED ACCESS DOOR
	-DEMO TO
	-CONNECT TO
CWS	-CONDENSER WATER SUPPLY
CWR	-CONDENSER WATER RETURN
CHWS	-CHILLED WATER SUPPLY
CHWR	-CHILLED WATER RETURN
CD	-CONDENSATE
HWS	-HOT WATER SUPPLY
HWR	-HOT WATER RETURN
RL	-REFRIGERANT LIQUID
RS	-REFRIGERANT SUCTION

SYMBOL	DESCRIPTION
M	-MOTOR OPERATED CONTROL DAMPER (MOD)
	-MANUAL BALANCING DAMPER
	-DOOR GRILLE
UC	-UNDERCUT DOOR
	-ACCESS DOORS, VERTICAL OR HORIZONTAL
	-FLEXIBLE CONNECTION
	-NEW DUCTWORK, FIRST DIMENSION IS SIDE SHOWN
DOWN / UP W/IN FLOOR	-DUCT ELBOW, POSITIVE PRESSURE (SUPPLY)
	-DUCT ELBOW, EXHAUST
	-DUCT ELBOW, NEGATIVE PRESSURE, RETURN
	-DUCT ELBOW UP THROUGH ROOF OR SLAB ABOVE
	-RECTANGULAR DUCT SECTION UP, POSITIVE PRESSURE, SUPPLY OR OUTSIDE AIR
	-RECT DUCT SECTION UP, NEGATIVE PRESSURE, RETURN
	-RECTANGULAR DUCT SECTION UP, EXHAUST
	-ROUND DUCT SECTION UP
	-FLOW DIRECTION
	-ISOLATION VALVE
	-UNION
	-STRAINER
	-CONTROL VALVE
S	-SOLENOID VALVE
	-CHECK VALVE
	-SLOPE DIRECTION (DOWN)
	-FLEX CONNECTION
	-O.S.&Y. GATE VALVE
	-THREE-WAY CONTROL VALVE
	-THERMOMETER

SYMBOL	DESCRIPTION
	-ELECTRIC DUCT HEATER (W/PANEL CLEARANCE)
UP / DN	-CHANGE OF ELEVATION
	-FLEXIBLE DUCT
	-TRANSITION, CONCENTRIC
	-TRANSITION, ECCENTRIC
	-TRANSITION, SQUARE TO ROUND
	-SQUARE THROAT ELBOW W/TURNING VANES
	-RADIUS ELBOW
	-RECTANGULAR/ROUND BRANCH TAKE-OFF OR ROUND/ROUND BRANCH TAKE-OFF
	-SQUARE THROAT TEE
	-RADIUS TEE
	-RECTANGLE-TO-ROUND TAKE-OFF
	-STANDARD BRANCH TAKE-OFF
	-SPIN-IN TAKE-OFF
	-ELBOW, TURNED DOWN
	-ELBOW, TURNED UP
	-TEE, OUTLET DOWN
	-TEE, OUTLET UP
D / D	-45° PIPE RISE (R) / DROP (D)
	-CONCENTRIC REDUCER

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

HVAC ABBREVIATIONS

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

MECHANICAL EQUIPMENT TAGS

DIFFUSER/GRILLE TAG: A / 300 CFM — A = DIFFUSER/GRILLE TAG, 300 CFM = CFM

AHU-1-1 — AHU FLOOR LOCATION, AHU NUMBER, AIR HANDLING UNIT

VTU-1-1-1 — TERMINAL UNIT TYPE (VAV – VARIABLE VOLUME, CAV – CONSTANT VOLUME), AHU NUMBER, TERMINAL UNIT NUMBER

SHEET INDEX

COBURN AND ASSOCIATES, INC
MECHANICAL • ELECTRICAL • CONSULTING ENGINEERS
P.O. BOX 577 HIGH SPRINGS, FLORIDA
PH 386-454-3748 CELL 352-538-0163
CERTIFICATE OF AUTHORIZATION 3687

KYLE J. DAVIS LICENSE No. 84275 STATE OF FLORIDA PROFESSIONAL ENGINEER

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Kyle Davis

Digitally signed by Kyle Davis
DN: cn=Kyle Davis, c=US, o=FLORIDA PROFESSIONAL ENGINEER, ou=84275, 0.9.2342.19200300.100.1.1=F063000000005, 0.9.2342.19200300.100.1.25=Coburn, 2.5.4.5=4F6F
Date: 2023.10.02 14:54:54-04'00'

CA JOB NO.	2363
DRAWN	KJD
APPROVED	KJD
DATE OF ISSUE	10/02/2023
REVISIONS	

PROJECT TITLE AND LOCATION

MCM CHURCH
INTERIOR RENOVATION PROJECT
155 SE AUSUST GLEN
LAKE CITY, FL
2023 RENOVATION PROJECT

SHEET TITLE

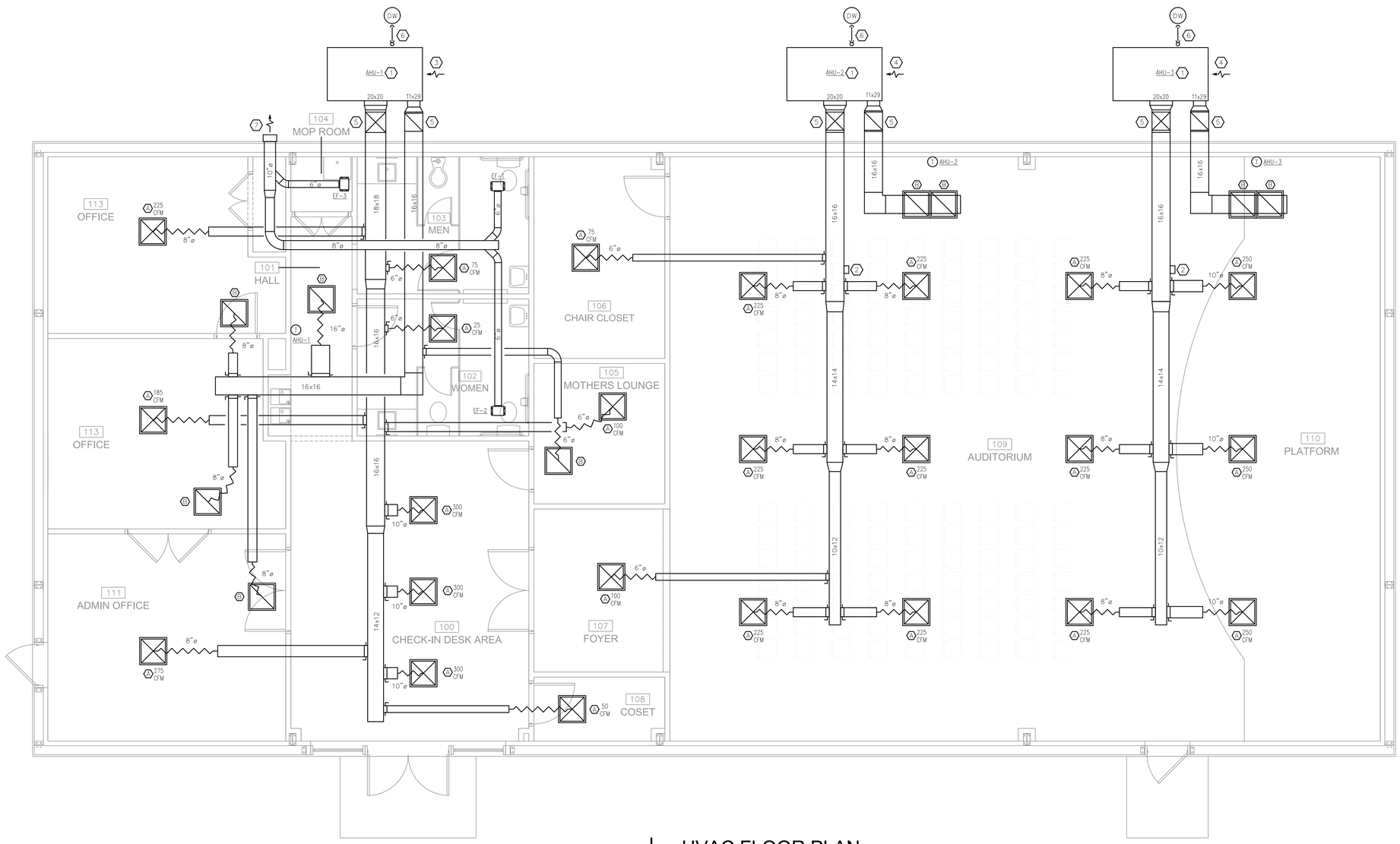
GENERAL NOTES, LEGEND, & SHEET INDEX - HVAC

M001

CA PROJ NO: 2363 PLOTTED: 10/2/2023 2:13 PM

KEY NOTES:

1. INSTALL NEW PACKAGED DX UNIT ON NEW EQUIPMENT PAD. PAD SHALL EXTEND 6" BEYOND EACH SIDE OF UNIT.
2. PROVIDE A CPS WAVE-R AIR IONIZATION UNIT MOUNTED IN DUCTWORK. IONIZATION UNIT SHALL BE POWERED VIA 120V POWER.
3. BALANCE OUTDOOR AIR DAMPER TO 200 CFM. DAMPER SHALL OPEN TO SETPOINT UPON UNIT STARTUP AND SHALL CLOSE UPON UNIT SHUTDOWN.
4. BALANCE OUTDOOR AIR DAMPER TO 250 CFM. DAMPER SHALL OPEN TO SETPOINT UPON UNIT STARTUP AND SHALL CLOSE UPON UNIT SHUTDOWN.
5. DUCTWORK ROUTED UP SIDE OF EXTERIOR WALL AND INTO CEILING PLENUM.
6. 3/4" CONDENSATE PIPING ROUTED TO NEW DRYWELL.
7. NEW EXHAUST DISCHARGE CAP. EXHAUST AIR DISCHARGE SHALL BE LOCATED A MINIMUM OF 10'-0" FROM NEW OUTDOOR AIR INTAKES.



HVAC FLOOR PLAN

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

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2363	KJD	KJD
DATE OF ISSUE		
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REVISIONS		

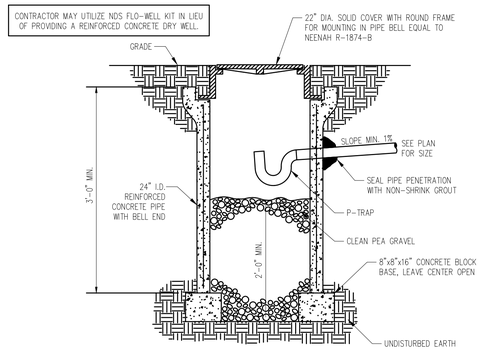
PROJECT TITLE AND LOCATION

MCM CHURCH
INTERIOR RENOVATION PROJECT
155 SE AUSUST GLEN
LAKE CITY, FL
2023 RENOVATION PROJECT

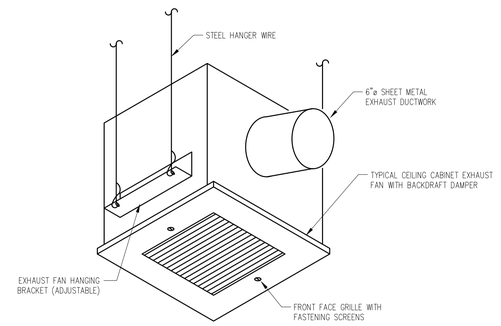
SHEET TITLE

HVAC FLOOR PLAN

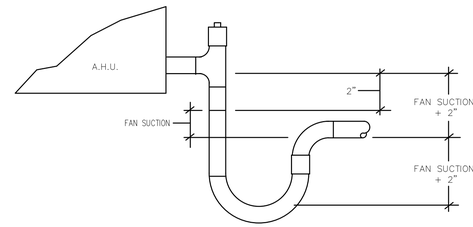
M111



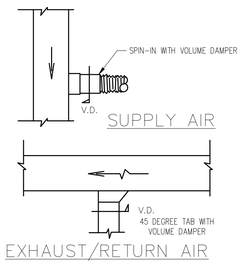
DRYWELL DETAIL NTS 5



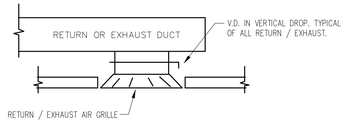
CEILING MOUNTED EXHAUST FAN NTS 3



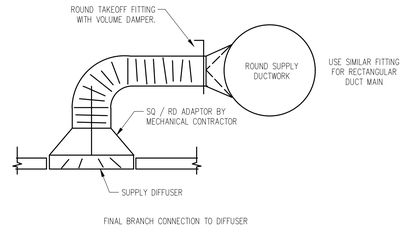
AHU CONDENSATE DRAIN DETAIL NTS 1



AIR DUCT DETAILS NTS 6



RET./ EXH. DROP DETAIL NTS 4



FINAL BRANCH CONNECTION TO DIFFUSER

CONNECTION TO DIFFUSER NTS 2

FMC TABLE 403.3.1.1 - OUTSIDE AIR REQUIREMENTS

AIR HANDLER NUMBER – AHU-1

ROOM NAME	AREA (SQ. FT.)	SPACE REQUIREMENTS		OCCUPANCY REQUIREMENTS				TOTAL O/A CFM
		CFM/SQFT	CFM	PEOPLE/SQFT	PEOPLE	CFM/PERSON	CFM	
100 – CHECK-IN DESK	386	0.06	23	30/1000	12	5	60	83
101 – HALL	80	0.06	5	--/1000	--	--	--	5
102 – WOMEN	127	50E/T	100E	--/1000	--	--	--	100E
103 – MEN	127	50E/T	100E	--/1000	--	--	--	100E
104 – MOP ROOM	18	50E	50E	--/1000	--	--	--	50E
105 – MOTHERS LOUNGE	100	0.06	6	5/1000	1	5	5	11
108 – CLOSET	44	0.12	5	--/1000	--	--	--	5
111 – ADMIN OFFICE	267	0.06	16	5/1000	2	5	10	26
112 – OFFICE	232	0.06	14	5/1000	2	5	10	24
113 – OFFICE	227	0.06	14	5/1000	2	5	10	24
TOTAL								178 / 250E

AIR HANDLER NUMBER – AHU-2 / 3

ROOM NAME	AREA (SQ. FT.)	SPACE REQUIREMENTS		OCCUPANCY REQUIREMENTS				TOTAL O/A CFM
		CFM/SQFT	CFM	PEOPLE/SQFT	PEOPLE	CFM/PERSON	CFM	
109 – AUDITORIUM	1671	0.06	100	120/1000	126*	5	630	730
110 – PLATFORM	576	0.06	35	35/1000	20	10	200	235
106 – CHAIR CLOSET	142	0.12	17	--/1000	--	--	--	17
107 – FOYER	114	0.06	7	--/1000	--	--	--	7
TOTAL								989*

*IONIZATION UNIT PROVIDED TO REDUCE OUTDOOR AIR REQUIREMENT

PACKAGED UNIT SCHEDULE - ELECTRIC COOLING/ELECTRIC HEAT PUMP

MARK	SYSTEM TYPE	MANUFACTURER	MODEL	LxWxH/WT	NOMINAL TONNAGE	COOLING CAPACITY				RATING CONDITIONS		AIR FLOW	INDOOR FAN					ELECTRIC HEATER				ELECTRICAL			COMMENTS
						TOTAL	SENSIBLE	SEER2	IEER	AMB	EAT-DB/WB	CONFIG	CFM	EXT. SP.	DRIVE	HP	VOLTS/ø	KW	STAGE	VOLTS/ø	AMPS	MCA	BRKR	VOLTS/ø	
AHU-1	HEAT PUMP	LENNOX	KHB060S4B	84x47x44 / 760	5.0	59,100	45,100	13.4	--	95	80/67	HORIZONTAL	1850	0.8	D	1.5	240/1	15	1	240/1	(8)	120	125	240/1	1,2,3,4,5,6,7,8
AHU-2	HEAT PUMP	LENNOX	KHB048S4B	84x47x44 / 720	4.0	46,500	35,400	14.0	--	95	80/67	HORIZONTAL	1500	0.8	D	3/4	240/1	7.5	1	240/1	(8)	74	80	240/1	1,2,3,4,5,6,7,8
AHU-3	HEAT PUMP	LENNOX	KHB048S4B	84x47x44 / 720	4.0	46,500	35,400	14.0	--	95	80/67	HORIZONTAL	1500	0.8	D	3/4	240/1	7.5	1	240/1	(8)	74	80	240/1	1,2,3,4,5,6,7,8

REMARKS: 1. INSTALL ON EQUIPMENT PAD 2. COMP TIME DELAY KIT 3. LOW AMBIENT CONTROL 4. MOTORIZED FRESH AIR DAMP 5. ELECTRIC HEAT STRIP 6. OUTDOOR AIR HOOD WITH INSECT SCREEN 7. INTEGRAL CONVENIENCE OUTLET 8. SINGLE POINT ELECTRICAL CONNECTION.

AIR DISTRIBUTION SCHEDULE

MARK	TYPE	NECK	FACE SIZE	DESCRIPTION
Ⓐ	000-60 61-110 111-240 241-420 421-550	6Ø 6Ø 8Ø 10Ø 12Ø	12x12 24x24 24x24 24x24 24x24	SUPPLY DIFFUSER BASIS OF DESIGN: TITUS TMS COLOR: WHITE / PAINT TO MATCH MATERIAL: ALUMINUM MOUNTING: 24x24 LAY-IN OPPOSED BLADE DAMPERS: NO
Ⓑ	000-90 91-110 111-220 221-350 351-530 531-730 731-1600	6Ø 6Ø 8Ø 10Ø 12Ø 14Ø 18Ø	12x12 24x24 24x24 24x24 24x24 24x24 24x24	RETURN/EXHAUST GRILLE BASIS OF DESIGN: TITUS 50F COLOR: PAINT TO MATCH MATERIAL: ALUMINUM MOUNTING: CEILING MOUNTED OPPOSED BLADE DAMPERS: YES

EXHAUST FAN SCHEDULE

MARK	MFGR.	MODEL	TYPE	WATTS	HP	RPM	CFM	EXT. SP.	VOLT/ø	COMMENTS
EF-1	GREENHECK	SP-A110	CEILING MOUNTED	18	--	950	100	0.2	120/1	INTERLOCK WITH AHU-1
EF-2	GREENHECK	SP-A110	CEILING MOUNTED	18	--	950	100	0.2	120/1	INTERLOCK WITH AHU-1
EF-3	GREENHECK	SP-A70	CEILING MOUNTED	14	--	850	50	0.2	120/1	INTERLOCK WITH AHU-1

FURNISH ALL FANS WITH INTEGRAL DISCONNECT, THERMALLY PROTECTED MOTOR, BACKDRAFT DAMPER, AND ROOF CURB

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155 SE AUSUST GLEN
LAKE CITY, FL
2023 RENOVATION PROJECT

SHEET TITLE

HVAC DETAULS AND SCHEDULES

M201

HVAC SPECIFICATIONS

A. It is the intent of these specifications to define the work and materials typically installed by a Mechanical Contractor. However, it is not intended to define a subcontract between the Mechanical Contractor and the General Contractor. The General Contractor is responsible for the entire project and any questions regarding scope of work shall be directed to the General Contractor.

B. Work shall include all labor, materials, fixtures, equipment, tools and service necessary for installation, testing and adjusting of all mechanical systems shall be furnished and installed in compliance with the Drawings, Specifications, and any Addenda thereto.

C. Drawings and Specifications shall be understood to cover, according to their intent and meaning, complete mechanical systems. Work shown and not specified, or work specified and not shown shall be performed as though mentioned in both.

D. Minor items and accessories reasonably inferred as necessary for the complete and proper operation of any system shall be provided by contractor or subcontractor for such system whether or not they are specifically called for.

E. Before submitting a bid, the Mechanical Contractor is to coordinate with the General Contractor to ascertain, in detail, the division of work, and the extent of performance other subs and the General Contractor.

F. All work shall be performed or installed in strict accordance with Florida Building Code 2020 – Mechanical, NFPA 101, NFPA 90A and local ordinances.

G. Fees for permits, inspections, patent use, royalties, etc. shall be paid by the contractor.

H. All systems shall be tested for proper operation, rotation air supply, water supply, pressures, flows, balance, vibration, and appropriate interlocks as required by these specifications or manufacturers' recommendations.

I. All work shall be installed in accordance with the appropriate codes and satisfy the local inspector having jurisdiction.

J. Upon completion of each part of the mechanical system, the contractor shall demonstrate to the Engineer that each item on that system is installed with proper covers, safeties, controls, etc., and that all are in proper working order.

K. A set of "red-lined" mechanical drawings shall be carefully maintained at the job site. Actual conditions are to be put on the drawings in red on a daily basis so the drawings will continuously show locations and routings of piping, ducts, grilles, equipment, valves, and any equipment specified on the drawings or in these specifications.

L. Equipment and materials shall be new and meet or exceed specification / schedule requirements.
1. All products shall be current model for which replacement parts are available.

M. Acceptable manufacturers are listed, additional manufacturers may request approval for their products up to 10 days in advance of bid. Engineer may require supplemental information prior to accepting or rejecting the alternate.

N. All work shall be performed in compliance with OSHA regulations.

O. Shop drawings and product data shall be submitted on all equipment, fixtures, etc
1. Submittals shall include all equipment to be installed by the subcontractor and all submittals must be made at same time.
2. Each package must have the General Contractors review stamp prior to submittal.
3. The Engineer will review one submittal and one resubmittal; subsequent resubmittals may require a review charge to be paid by subcontractor.
4. Shop drawings shall be labeled in the same designation as the drawings

P. Job conditions shall be determined prior to bidding in the following manner:
1. Site visit to determine:
a. Existing conditions.
b. How and where materials will be delivered and stored.
c. Special problems encountered during construction.
2. Examine all Contract Drawings and Specifications to determine:
a. Type of construction to be used.
b. How construction or work will affect the work of this Section.
c. Nature and extent of work of other trades.

Q. Failure to determine existing conditions or nature of construction will not be considered as a basis for granting additional compensation.

R. Installation:
1. Contract Drawings show the arrangements and sizes of principal apparatus and devices to be provided under this Contract and connection thereto. These shall be followed as closely as actual building construction will permit.
2. Dimensions of work as indicated on Plans are not guaranteed to be as-built d dimensions.
3. No measurements shall be scaled from Drawings and used as definite dimensions for layout or fitting work in place.
4. Layout of equipment, as shown on the plans, shall be checked and exact location determined by dimension if equipment approved by the Architect.
5. Consult the Drawings for all dimensions, locations of partitions, sizes of structural member, foundations, etc.
6. Do not make final layouts until shop or equipment drawings are approved and job conditions verified.
7. Mechanical reference symbols are given on the mechanical legend on the drawings.

S. Rough-in:
1. Work included:
a. Contractor shall rough-in for all equipment, fixtures, etc., in building whether or not such equipment is furnished by this Contractor or by Owner.
2. Method:
a. Determine in advance the location and size of all openings and chases necessary for proper installation of all work and have openings and chases provided during construction.
b. Install all inserts for hangers and supports of mechanical work and equipment work as general construction progresses.
c. Rough-in openings in masonry or stud walls shall be cut, not broken or chiseled.
d. Sleeves shall be required at all points where piping passes through concrete walls, slabs or masonry walls; sleeves installed below grade or where subject to high water conditions shall be installed watertight.

T. Coordination:
1. Work shall be coordinated between all Contractors, Subcontractors, Installers, Suppliers, Trades, etc., to:
a. Insure a neatly fitted installation.
b. Determine the nature and extent of the work of others.
c. Eliminate interferences.
d. Maintain maximum headroom and clearances.
2. Any interference which develops or is foreseen and cannot be resolved by the affected trades, etc. shall be handled as follows:
a. Cease installation of that portion of the work which is in conflict as no additional compensation will be allowed for any relocation, etc.
b. Continue work only on other portions of the work which are not in conflict.
c. Notify the Architect immediately.
d. Architect's decision shall be final as to any relocation, rerouting, removal, etc.
e. No additional compensation will be allowed for removal, relocation, repairs or changes required by interferences.

U. Clear away all debris, surplus materials, etc., resulting from work on operations, leaving job and equipment in clean first-class condition.

V. Clean all rotating equipment, ducts, piping, etc., and leave them in a ready-to-use condition.

W. Where factory finish is provided on equipment, all marred or damaged surfaces shall be touched-up or refinished hereunder as approved.

X. Thoroughly clean all items of equipment, leaving them in first-class condition.

Y. Wipe clean or wash if necessary air surfaces of all coils, fan housings, fan wheels, fan motors, air unit plenums, and all air filters.

Z. All pumps, motors, fans and other rotating equiment shall be stored at Site with openings, bearing, etc., covered to exclude dust and moisture; all stockpiled conduit shall be placed on dunnage, and protected from weather, from entry of foreign materials.

BALANCING OF AIR SYSTEMS

A. Balance and adjust each air distribution system shown on the Drawings.

B. Perform work in accordance with procedures and standards described in SMACNA Balancing and Adjustment Manual."

C. Fuse sizes and thermal overload heaters shall be checked against each motor nameplate.

D. The amperage shall be read at each electrical motor to determine the load imposed on it.

E. Adjustment and Balance:
1. Adjust variable type pulleys, volume dampers, control dampers, etc. to provide correct volumes to main trunk lines.
2. Check and adjust outside air quantities as required.
3. Adjust air extractors and manual balancing dampers to supply correct air volume to each main branch duct from main trunk lines.
4. Adjust manual balancing dampers to supply correct volume to each individual branch duct.
5. Use terminal registers only for minimal adjustment of air flows, i.e. less than 5% of air volume.
6. Adjust grilles and diffusers for proper air flow patterns.
7. Air conditioning units shall be placed in operation and both wet and dry bulb temperature taken at one-hour intervals to determine the amount of cooling being accomplished and to indicate adjustments needed.
8. After spaces have been brought down to design temperatures and equipment is functioning properly, air shall be rebalanced if necessary by means of calibrated thermometers placed in each room and in open spaces,not over 20' apart. There shall be no deviation in temperature of more than 3 F throughout the space cooled.
9. A thorough check shall be made, with an anemometer, of air motion in the occupied space. Any air motion exceeding 50 fpm shall be remedied.

HVAC SYSTEMS

A. Split System or packaged heating and cooling units with reverse cycle and heat strip where specified.

B. Acceptable Manufacturers
1. Trane
2. Carrier
3. Lennox

C. BLOWER COIL SECTION
1. Airflow as indicated on drawings.
2. Fan shall be direct – drive, forward-curved, double inlet, statically and dynamically balanced.
3. Fan motor shall be resiliently mounted and shall be easily removable for service.
4. Fan motor shall be permanent –split–capacitor type with integal overload protection, high – efficency, Florida Energy Code Minimum.
5. Cooling coil shall have aluminum fins mechanically bonded to copper tubing. Coil shall have factory installed refrigerant metering devices.

D. CONDENSING SECTION
1. Outdoor unit shall be designed for use with Refrigerant 134a and contain sufficient charges (R134a) for complete system. Brass service valves with refrigerant line fittings and service ports shall be located on exterior of unit.
2. Outdoor coil shall be constructed with aluminum fins mechanically bonded to non–ferrous tubing. Factory installed coil refrigerant metering device shall be mounted on unit liquid service valve. Metering device internal components shall be removable for cleaning or replacement.
3. Outdoor unit fan shall be propeller type, direct driven, and arranged for vertical air discharge. Fan motor shall be factory lubricated, inherently protected and resiliently mounted.
4. Compressor shall be of the welded–hermetic type with internal vibration isolation and shall be covered with a shield to muffle operating sound. Compressor motor shall have both thermal and current –sensitive overload device. Compressor shall be equipped with a crank–case heater and have internal high–pressure protection.
5. Controls shall be factory wired and located in a readily accessible location. Controls and protective devices shall include a liquid line low pressure switch, suction line accumulator and pressure relief device. Control wiring terminal board shall be designed to match indoor unit terminal board and accessory thermostat terminals for standardized point–to–point connection.

E. Refer to Mechanical Equipment Schedule for Model Numbers.

EXHAUST FANS

A. All exhaust fans mounted in the ceiling inside the building and ducted to the outside.

B. Meet the specification for air delivery at static pressure as specified on the Equipment schedule.

C. Meet the noise criteria (if specified on Schedule).

D. Be of the manufacture and model number specified in the Equipment Schedule or equal.

E. Shall be UL listed.

F. Acceptable Manufacturers
1. Breidert
2. Cames
3. Greenheck

G. General
1. Acoustically insulated steel housing
2. Baked enamel finish on housing
3. Adjustable mounting brackets
4. Automatic backdraft damper at the discharge duct
5. Lifetime lubricated motor
6. Terminal box on housing with cord, plug and receptacle inside the housing.
7. Fan motor and wheel shall be removable without removing entire fan housing.

DUCTWORK

A. RECTANGULAR SUPPLY DUCTWORK SHALL INSULATED LOW PRESSURE SHEET METAL

B. EXPOSED ROUND DUCT SHALL BE GALVANIZED DOUBLE WALL WITH 1" INSULATION BETWEEN THE WALLS.

C. GENERAL EXHAUST DUCTWORK SHALL BE GALVANIZED SHEETMETAL WITH NO INSULATION.

D. RETURN DUCTWORK SHALL BE INSULATED LOW PRESSURE GALVANIZED SHEET METAL.

E. FLEXIBLE DUCTWORK IS ALLOWED ONLY WHERE SHOWN AND SHALL NOT EXCEED 12' FEET IN LENGTH. FLEXIBLE DUCT SHALL MEET UL 181 CLASS 1.

J. FLEXIBLE DUCTWORK WHERE INSTALLED SHALL BE ATTACHED USING SPIN–IN TAKE–OFFS WITH LOCKING QUADRANT DAMPERS.

F. LOW – PRESSURE SHEETMETAL DUCTWORK
1. Except as otherwise specified or detailed on the drawings, all ductwork shall be constructed in accordance with the Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)
2. Duct systems shall be complete, including all duct fittings, turning vanes, transverse reinforcing hangers, supports, etc., as detailed on the Drawings or in the standards.
3. Provide and install balancing dampers or adjustable splitters at all branch ducts, and where required for balancing the system.
4. Each damper shall be adjustable with an approved quadrant or regulator. Dampers to be opposed blade type for ducts over 12" in any dimension, for ducts 12" single blade is acceptable except for outdoor air intakes which shall be low–leakage opposed blade.
5. Dimensions shown are net inside dimensions (including insulation).
6. Galvanized sheetmetal duct shall conform to the following thicknesses

a. Largest dimension	Gauge
0–30 inches	24
30–54 inches	22
55–84 inches	20
over 84 inches	18

7. All joints shall be sealed with tape and coated with mastic.
8. Ductwork shall be seal class – 2" w.c. unless otherwise noted.

G. Plenums shall be constructed and tested in accordance with SMACNA STANDARDS.

H. FLEXIBLE CONNECTIONS
1. Provide between duct system and air moving equipment
2. Connection shall be made with not less than 4" wide flexible collar using "Ventglas" 30–ounce neoprene coated glass fabric.

I. Where construction methods for various items are not indicated on the Drawings or specified herein, all such work shall be fabricated and installed in strict accordance with the recommended methods, metal gauges, hanging procedures, access door and accessory installation, etc., as outlined, the latest edition of SMACNA'S Duct Manual and Sheet Metal Construction for Ventilating and Air Conditioning System.

J. Leakage:
1. Contractor shall make necessary repair and shall make duct system ready for a leakage test.
2. Test shall be performed by Test and Balance Contractor.
3. Leakage shall not exceed 1% leakage for high pressure duct and 5% for low pressure duct construction.

DUCT INSULATION

A. Acceptable Manufacturers
1. Johns–Manville
2. Certainteed
3. Knauf

B. Duct Wrap:
1. 2" inch thick fiberglass – R6 INSTALLED
2. Flamespread 25 per ASTM E–84
3. Smoke developed 50 per ASTM E–84
4. Factory applied vapor barrier – heavy duty 4 mil vinyl film, class 1, meeting NFPA 90A and 90B, UL rated
5. Product:
a. Johns–Manville "Microlite"

C. Accessories:
1. Insulation tape, mastic, adhesives, etc., shall have the same flamespread and smoke rating as the insulation to which they are applied and meet manufacturer's recommendations.

D. Ductwrap
1. Overlap seams of ductwrap, secure with 4" wide open weave glass fabric and two coats of vapor retarder mastic.
2. Underside of ductwork greater than 24" wide shall also be secured with mechanical fasteners with tape.
3. Pressure tape is not acceptable.

E. Provide rigid insulation on supply and return ducts inside mechanical rooms or on any exposed ductwork.

DUCT HANGERS AND SUPPORTS

A. All ductwork for air supply, return, fresh air or exhaust shall be supported by duct hangers, clamps, clips or supports.

B. Acceptable Manufacturers
Duct hangers may be a manufactured item or field fabricated as required.

C. Galvanized steel straps
1. Minimum 16 gauge and one inch wide

D. Trapeze hangers
1. Ducts 20 inches to 40 inches largest dimension.
a. Minimum 1 inch x 1 inch x 1/4 inch steel angles.
b. Minimum 1/4 inch threaded rod
2. Ducts above 40 inches largest dimension and plenums
a. Minimum 1–1/2 inch x 1–1/2 inch x 1/4 inch steel angles.
b. Minimum 3/8 inch threaded rod.

E. Supports
1. All ductwork shall be supported from structural building members, i.e. block, beams,columns, purlins, joists, etc.
2. Ductwork shall not be supported from ceiling tile or grids, conduit, mechanical equipment, piping or non–structural steel.
3. Ductwork hangers shall be attached to building steel by bolts, screws, clamps or welding.

F. Hanger Bands
1. Horizontal concealed ductwork up to 20 inches largest dimension shall be supported by one (1) inch x 16 gauge galvanized steel straps at a maximum spacing of 10 ft. and at each elbow or branch takeoff.
2. Bands and spacing shall be at a maximum spacing of 10 feet on horizontal runs and at each elbow or branch takeoff.
a. No nails shall be driven through any ductwork and into floor joists, trusses, etc.
3. Vertical ductwork, all sizes, shall be supported by bands bolted or screwed to walls, studs, etc.
4. Hanger bands shall be bent over one (1) inch from end and turned under corners of rectangular duct.
5. Duct hanger bands shall be fastened with sheet metal screws at six (6) inch intervals up sides and into bottom.
a. Sheet metal screws shall be 3/4 inch so as not to penetrate duct liner completely.

G. Trapeze Hangers
1. Horizontal ductwork larger than 20 inches largest dimension and all exposed ductwork shall be supported by trapeze type hangers.
2. Trapeze hangers shall be at a maximum spacing of 10 feet and at each elbow or branch takeoff.
3. Hanger rods shall be secured to bottom bracing angles with nuts and locknuts.

DUCT ACCESSORIES

A. Air distribution system shall be furnished complete with duct accessories necessary to allow complete air balancing and adjusting of flow and volume.

B. All square duct corners and "T" connections shall be fitted with turning vanes.

C. All branch duct takeoffs shall be fitted with nonadjustable air turning vanes AND manual volume control dampers, OR adjustable volume extractors which are adjustable from outside the duct.

D. Each grille and diffuser shall be fitted with a manual volume control register at the face of the grille and adjustable from the face of the grille without requiring removal of the grille.

E. Acceptable Manufacturers
1. Barber Colman
2. Titus
3. Price
4. MetalAire

F. Air turning vanes:
1. Multiple radius vanes
2. Steel construction
3. Electrocoated white finish
4. Maximum pressure loss = 2% of velocity head
5. Model number – equal to Barber Colman Models AOOA and AOOF

G. Volume Extractors:
1. Gang operated parallel blade
2. Fully adjustable from wide open to full closed
3. Supply with supporting foot as required for branch takeoffs not in the same plane as trunk lines.

VOLUME DAMPERS

A. All return air and fresh air dampers shall be parallel blade pivot dampers with motorized control where noted.

B. All balancing dampers shall have manual control dampers with positive position locking.

C. Acceptable Manufacturers
1. Prefco Manufacturing Co.
2. Titus
3. Ruskin

D. Parallel Blade Pivot Dampers:
1. Low leakage non–degradable
2. Friction free metal to metal seals incorporated into the blade and frame shapes
3. Galvanized steel frame, 16 gauge
4. Galvanized steel blades, 22 gauge with double–wrapped center and edge forming
5. Maximum leakage – 11 CFM per sq. ft. @ 1 inch S.P.
6. The static pressure loss shall not exceed 0.7" W.G. @ 2000 FPM and 50% modulation
7. Model Number
a. Equal to Prefco Model 5150
8. Classified 1–1/2 hour rating, UL Listed.
9. Fire dampers shall have thermal link.
10. Model:
a. Dampers shall be equal to a Prefco "Low Profile B" or approved equal.

D. Dampers – mounted horizontally in ceiling:
1. UL Listed ceiling damper
2. Round or square as required
3. 2 hour rated
4. Single or dual blade depending on duct size
5. Model Number
a. Prefco Model 5650, 5600, or 5660
1. Fusible link rated at 165 Degrees F. release temperature.

DUCT ACCESS PANELS AND TEST HOLES

A. Provide an access panel at each return air and/or fresh air damper which will allow for inspection and cleaning of dampers.
1. Where return and fresh air dampers are located adjacent, one access door is sufficient, providing each damper is accessible.

B. Provide an access panel at each fire damper for resetting and maintenance of each fire and smoke damper.

C. Provide test holes for measurement of air flow, on each branch duct and main trunk line or plenum.

D. Acceptable Manufacturers
1. Penn Ventilator Co.
2. Ruskin

E. Access Doors:
1. Insulated hinged duct access door
2. Standard gauge galvanized steel
3. Continuous piano hinge
4. Gasketed at door frame surface and at frame to duct surface
5. Positive acting cam latch handle
6. Doors shall be of sufficient size to allow access to both sides of dampers
7. If duct width is greater than 36 inches, provide access doors on each side of duct for access to entire dampers.
8. Exception:
a. Where access door must be installed in such a position that hinged opening is not possible, provide door that is completely removable.
b. Removable door shall have cam–locks on both sides
c. Where noted on drawings fire damper may be accessed through return air grille.
9. Model Numbers:
a. Hinged doors shall be equal to Penn Ventilator Model DAD
b. Non–hinged removable door shall be equal to Penn Ventilator Model DAD–RP.

F. Test Holes
1. Provide a capped access hole in each trunk line or branch duct for insertion of air–flow line or branch duct pitot for flow measurement.

GRILLES & DIFFUSERS

A. Aluminum fixed blade with air pattern and neck sizes as shown on grille and diffuser schedule.
1. Provide all supply diffusers with opposed blade dampers.

DISPOSABLE FILTERS

A. Provide 1" pleated with perforated metal back, unless otherwise noted.

B. MERV–8

CONTROL SYSTEM

PART 1 – GENERAL

DESCRIPTION

A. GENERAL
1. Furnish and install all electrical controls and components for all mechanical systems as listed below.

B. SPLIT SYSTEM / PACKAGED ROOFTOP
1. Provide Heat – Cool – Off, Fan–On–Auto, thermostat, electronic, fully programmable with 4 functions per day, seven day/week programmable, t'stat shall have auxiliary contacts for O.A damper control.
2. Thermostat shall have internal CO2 sensor and dedicated contacts to control O.A. damper.
3. Thermostat shall have wireless capability.

PART 2 – SEQUENCE OF OPERATION

A. SPLIT SYSTEM / PACKAGED ROOFTOP
1. Occupied Mode–
a. Air Handler shall run continuously
b. Compressor shall cycle to maintain space temperature (heating or cooling)
c. Outside air damper shall open to minimum set point cfm as noted on dwgs.
2. Unoccupied Mode–
a. Air Handler shall cycle with compressor
b. Compressor shall cycle to maintain space temperature (heating or cooling)

FIRE STATS

A. Provide fire stats on each unit as required by code.
1. Firestat shall shut down all unit components including fans, compressors.

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KYLE J. DAVIS LICENSE No. 84275 STATE OF FLORIDA PROFESSIONAL ENGINEER

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KYLE J. DAVIS, PE ON THE INDICATED DATE. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC DOCUMENTS.

APPROVED	KJD
DRAWN	KJD
CA JOB NO.	2363
DATE OF ISSUE	10/02/2023
REVISIONS	

PROJECT TITLE AND LOCATION

MCM CHURCH
INTERIOR RENOVATION PROJECT
155 SE AUSUST GLEN
LAKE CITY, FL
2023 RENOVATION PROJECT

SHEET TITLE

HVAC SPECIFICATIONS

M301