LEGEND

dØ — ROUND DUCT, 'd' IS THE DIAMETER (IN INCHES)	TC — THERMOSTAT CONTROLER	EGRESS PATHWAY (FOR REFERENCE ONLY)	STANDARD BEVELED BRANCH - ROUND
wXh — RECTANGULAR DUCT, 'w' IS THE WIDTH & 'h' IS THE HEIGHT (IN INCHES)	TS — THERMOSTAT SENSOR	# — PLAN NOTE. SEE PLAN NOTE SCHEDULE.	BALANCING DAMPER
FLEX ROUND DUCT	SQUARE FOUR-WAY SUPPLY AIR DIFFUSER OR DUCT RISER	SD — SMOKE DETECTOR	BACKDRAFT DAMPER
TRANSITION	SQUARE RETURN AIR GRILLE OR DUCT RISER	M — MOTORIZED AIR DAMPER	FD — FIRE DAMPER
DUCT ELBOW WITH TURNING VANES - RECTANGULAR	SQUARE EXHAUST AIR GRILLE OR DUCT RISER	GOOSENECK - EXHAUST VENT	FSD — COMBINED FIRE AND SMOKE DAMPER
DUCT ELBOW - ROUND	CIRCULAR SUPPLY DIFFUSER OR ROUND DUCT RISER	GOOSENECK - INTAKE VENT	RTU-1 — MECHANICAL EQUIPMENT
STANDARD BEVELED BRANCH - RECTANGULAR	ROUND EXHAUST DUCT RISER	S2 | 200 — ACTUAL CFM AT DIFFUSER / GRILLE; DIFFUSER SERVICE TYPE (S-SUPPLY,R-RETURN,T-TRANSFER,E-EXHAUST)	UNIT HEATER/TRANSFER FAN, ARROW INDICATES THE DIRECTION OF AIR FLOW
	ACCESS PANEL		

CODE DATA

MEP SPECIFIC CODES AND STANDARDS

- 2018 VIRGINIA MECHANICAL CODE (2018 IMC WITH AMENDMENTS)
- 2018 VIRGINIA ENERGY CONSERVATION CODE (2018 IECC WITH AMENDMENTS)
- 2018 VIRGINIA PLUMBING CODE (2018 IPC WITH AMENDMENTS)
- 2018 VIRGINIA BUILDING CODE (2018 ICC WITH AMENDMENTS)
- 2018 VIRGINIA EXISTING BUILDING CODE (2018 IEBC WITH AMENDMENTS)

DESIGN CONDITION

LOCATION: CITY/STATE	WARSAW, VA
LATITUDE: DEG. N. LAT	76.883°
ELEVATION: FT. ABOVE SEA LEVEL	135
ASHRAE SUMMER DESIGN CONDITIONS: 1.0% DB/MWB	91.9°/74.7°
ASHRAE WINTER DESIGN CONDITIONS: 99% DB	19.4°
DEHUMIDIFICATION DESIGN CONDITIONS 1% MCDB/DP	81.4°/77°
BUILDING SPACE DESIGN TEMPERATURES:	
SUMMER DB	75°
WINTER DB	70°

ENVELOPE SUMMARY

ASSEMBLY	U-VALUE
CEILING/ROOF: EXISTING ATTIC CEILING WITH METAL CEILING FINISH, AND R-11 INSULATION	0.124
WALLS: 12" THICK BRICK WALL	0.303
WINDOWS: FIXED FENESTRATION	0.38
DOORS: OPAQUE FENESTRATION	0.77
FLOORS: MASS, ABOVE GRADE	0.08

CLIMATE ZONE 4A

CODE REFERENCE: IECC 2018 (VECC 2018) CHAPTER 4, SECTION C402

MECHANICAL DRAWING INDEX

TAKE NOTE BEFORE ANY WORK IS STARTED OR EQUIPMENT IS PURCHASED:

SCHEDULE OF REQUIRED SUBMITTALS

PRE-CONSTRUCTION ACTION SUBMITTALS

ANY WORK COMPLETED OR EQUIPMENT THAT IS PURCHASED PRIOR TO THE SUBMISSION AND APPROVAL OF THESE SUBMITTALS SHALL BE CORRECTED AT THE EXPENSE OF THE CONTRACTOR.

NOTE: DESIGN IS CONTINGENT ON HAVING THE FOLLOWING INFORMATION. IT IS THE RESPONSIBILITY OF THE CLIENT TO ENSURE THAT THIS INFORMATION IS GATHERED AND SUBMITTED TO THE ENGINEER IN A TIMELY MANNER. TO WAIVE ANY OF THESE REQUIREMENTS, THE CONTRACTOR AND THE OWNER SHALL REQUEST IN WRITING AND RECEIVE APPROVAL FROM THE ENGINEER OF RECORD.

EXISTING CONDITIONS DISCLAIMER: THIS DESIGN WAS COMPLETED WITH SOME ASSUMPTIONS ABOUT THE EXISTING CONDITIONS WITHIN THE SPACE. PERMITZIP DOES NOT COMPLETE COMPREHENSIVE AS-BUILTS PRIOR TO DESIGN WORK AND WILL NOT GUARANTEE THAT THE EXISTING CONDITIONS MATCH THE ASSUMPTIONS MADE IN THIS DRAWING SET.

- **COORDINATION DRAWINGS**
  1. PER THE GENERAL NOTES AND OTHER REQUIREMENTS OF THIS CONTRACT PACKAGE, THE FLOOR PLANS ARE DIAGRAMMATIC AND SHOW THE INTENT OF THE PROPOSED ENGINEERED SYSTEMS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE CONSTRUCTION COORDINATION OF THE ENGINEERED DESIGN. THE CONTRACTOR SHALL PRE-PLAN ALL WORK BY MEETING REGULARLY WITH ALL TRADES TO DISCUSS AND COORDINATE THE INSTALLATION BEFORE PURCHASING ANY MATERIALS FOR THE PROJECT. THE FINAL OUTPUT FROM THIS PRE-PLANNING EFFORT SHALL BE A SET OF COORDINATED DRAWINGS INDICATING ALL REQUIRED CLEARANCES, ACCESS PANELS, ROUTES, OFFSETS, ELEVATIONS, AND ALL OTHER DETAILS ABOUT THE SPECIFIC CLASH-FREE INSTALLATION OF THE SYSTEMS THE CONTRACTOR IS INSTALLING. THE CONTRACTOR SHALL SUBMIT THESE COORDINATION DRAWINGS FOR REVIEW TO THE ENGINEER OF RECORD. THE ENGINEERING REVIEW IS NOT TO CONFIRM THAT COORDINATION IS ACCURATE. THE ENGINEERING REVIEW IS LIMITED TO EVALUATING THE ENGINEERING IMPACT OF THE COORDINATION DRAWINGS' PROPOSED DEVIATIONS FROM THE SCHEMATICALLY DRAWN CONSTRUCTION DRAWINGS.
- **SHOP DRAWINGS**
  1. SHOP DRAWINGS SHALL BE PRODUCED FROM APPROVED COORDINATION DRAWINGS. REFER TO M4 FOR SHOP DRAWING REQUIREMENTS.
- **LOAD LETTERS, APPLICATIONS AND DPU FORMS**
  1. THE CONTRACTOR AND OWNER SHALL COMPLETE ALL REQUIRED DPU OR MECHANICAL APPLICATIONS. PERMITZIP SHALL COMPLETE THESE FORMS FOR AN ADDITIONAL PRE-PAID FEE OF $500 IF REQUIRED.
- **PRODUCT DATA**
  A. THE ENGINEER SHALL BE PROVIDED WITH CUT SHEETS OF THE FOLLOWING ITEMS FOR REVIEW:
     a. MECHANICAL EQUIPMENT
     b. AIR DISTRIBUTION DEVICES
     c. FIRE AND FIRE/SMOKE DAMPERS. DAMPERS SHALL BE UL LISTED FOR PROPOSED USE. LABELED IN A MANNER TO CLARIFY THEIR USE BASED ON SHOP DRAWING REQUIREMENT.
     d. DUCTWORK WITH INSULATION.
     e. KITCHEN HOOD AND VENTILATION EQUIPMENTS - SHOW PRODUCT'S UL CERTIFICATION AS PER NFPA REQUIREMENTS.
- **EXISTING SYSTEM CONDITIONS**
  A. CONTRACTOR SHALL FIELD VERIFY AND SUBMIT FINDINGS TO ENGINEER FOR REVIEW PRIOR DEMO OR FABRICATION. **IF SIZES OR LOCATION DIFFER FROM THE ASSUMPTION IN THIS DRAWING SET, THE DESIGN WILL BE IMPACTED. CONTRACTOR SHALL PROVIDE CONTINGENCY IN BIDDING TO COVER THE POTENTIAL OF EXPANDED SCOPE DUE TO DISCOVERY.**
  B. **THE FOLLOWING INFORMATION SHALL BE REQUIRED IN A REPORT OF FINDINGS:**
     a. EXACT LOCATION AND SIZE OF ANY EXISTING LOUVERS.
     b. LOCATION AND SIZE OF ANY BUILDING EXHAUST OR OA DUCTS.

CLOSE-OUT SUBMITTALS

THE FOLLOWING CLOSEOUT DOCUMENTATION IS REQUIRED PRIOR TO ENGAGING PERMITZIP FOR ANY CONSTRUCTION ADMINISTRATION RELATED TO THE PERFORMANCE OF INSTALLED MECHANICAL SYSTEMS WITHIN THE SCOPE OF THIS CONSTRUCTION DOCUMENT.

CLOSEOUT NOTE: PERMITZIP IS NOT RESPONSIBLE FOR REVIEWING, TROUBLESHOOTING, OR INVESTIGATING ANY PART OF THE SYSTEMS DESIGNED HEREIN. THE STARTUP AND COMMISSIONING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR INSTALLING THE SYSTEM. THE CONTRACT SHALL COMPLETE THE FOLLOWING CLOSE-OUT WORK PRIOR TO CERTIFICATE OF OCCUPANCY AND SUBMIT TO PERMITZIP FOR REVIEW NO LATER THAN FOUR WEEKS AFTER CERTIFICATE OF OCCUPANCY IS ACHIEVED. FAILURE TO SUBMIT ON TIME WILL RESULT IN OUT-OF-SCOPE SUBMITTAL REVIEW AND WILL BE BILLED TO THE SUBMITTING PARTY AT THE HOURLY RATE OF $225 PER HOUR FOR ALL REVIEWS AND PROJECT-RELATED QUESTIONS AFTER THIS PERIOD OF TIME HAS EXPIRED.

- **TESTING & COMMISSIONING**
  A. PRIOR TO WALLS AND CEILINGS BEING CLOSED, OR ANY OTHER FINISHING WORK WHICH, UPON COMPLETION, WOULD HINDER ACCESS TO ANY PART OF THE MECHANICAL SYSTEM IN THIS PLAN, COMMISSIONING SHALL BE COMPLETED FOR EACH ELEMENT OF THE DESIGNED SYSTEM.
     a. CONTRACTOR SHALL PERFORM TESTING AND COMMISSIONING OR SHALL INCLUDE IN PRICING THE FEE TO HIRE A PROFESSIONAL COMMISSIONING ENGINEER.
     b. COMMISSIONING SHALL ENCOMPASS ALL NEW WORK COMPONENTS OF THE DESIGN IN THIS CONSTRUCTION DOCUMENT.
     c. REPORT SHALL BE PROVIDED TO THE DESIGN ENGINEER OF RECORD AND OWNER SHOWING THE PERFORMANCE OF EACH DESIGN COMPONENT OF THE MECHANICAL SYSTEMS.
     d. IN THE EVENT THAT ANY PART OF THE NEW WORK DESIGN IS FOUND TO BE UNABLE TO ACHEIVE THE PERFORMANCE INTENDED IN THE DESIGN DOCUMENTS, STEPS SHALL BE TAKEN TO REMEDY THE ISSUE PRIOR TO FINISHING WORK THAT MAY HINDER ACCESS TO COMPONENTS OF THE DESIGN.
     e. THE ENGINEER OF RECORD SHALL NOT BE RESPONSIBLE FOR ANY PERFORMANCE ISSUES IN SYSTEM COMPONENTS THAT WERE NOT INSTALLED AS DESIGNED.
  B. TAB REPORT MUST BY RECEIVED BY PERMITZIP WITHIN 4 WEEKS OF CO APPROVAL.
- HANDOFF
  1. CONTRACTOR SHALL BE RESPONSIBLE FOR PACKAGING ALL OWNERS MANUALS, WARRANTIES, COMMISSIONING REPORTS AND OTHER DOCUMENTATION RELATED TO THE EQUIPMENT THAT WAS PURCHASED AND INSTALLED. THIS DOCUMENT PACKAGE SHALL BE HANDED OFF TO THE OWNER OR OWNER REPRESENTATIVE UPON COMPLETION OF TESTING AND COMMISSIONING.
  2. THE OWNER OR OWNER'S REPRESENTATIVE SHALL BE TRAINED IN THE USE OF ALL EQUIPMENT AND APPROPRIATE CONTROLS SETTINGS.

GENERAL MECHANICAL NOTES

1. ALL MECHANICAL EQUIPMENTS SHALL BE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR AND WIRED BY ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED ON THE DRAWING
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE CODES SPECIFIED.
3. DUCT DIMENSIONS SHOWN ARE INSIDE CLEAR.
4. LOCATIONS OF DUCTWORK AND FITTINGS MAY BE EXAGGERATED FOR CLARITY. COORDINATE EXACT LOCATION OF MECHANICAL WORK WITH STRUCTURE, LIGHTS AND OTHER OBSTRUCTIONS. ADJUST LOCATIONS AS REQUIRED.
5. MECHANICAL LAYOUTS ARE DIAGRAMATIC IN NATURE. PROVIDE DROPS, RISERS AND OFFSETS WHERE REQUIRED.
6. ALL DUCTWORK JOINTS SHALL BE COVERED AND SEALED WITH MASTIC.
7. ALL UNITS AND ACCESSORIES SHALL BE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR AND WIRED WIRED BY ELECTRICAL CONTRACTOR AS PER MANUFACTURER'S REQUIREMENT UNLESS NOTED.
8. ALL MECHANICAL WORK SHALL BE CONCEALED WITHIN WALLS, BELOW FLOORS OR ABOVE CEILINGS, UNLESS OTHERWISE NOTED.
9. ALL CUTTING AND PATCHING OF BUILDING CONSTRUCTION SHALL BE DONE BY THE MECHANICAL CONTRACTOR.
10. INSTALL FIRE DAMPERS AND ACCESS DOORS OR FLANGED DUCTS AT EVERY FIRE WALL PENETRATION.
11. CONTRACTOR SHALL SIZE REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS, UNLESS OTHERWISE NOTED.
12. UNDER NO CIRCUMSTANCES SHALL ANY STRUCTURAL MEMBER BE CUT OR PENETRATED WITHOUT THE WRITTEN PERMISSION OF THE ARCHITECT.
13. THE EQUIPMENT, DUCTWORK AND PIPING INSTALLED SHALL BE BLOWN OUT UNDER PRESSURE AND CLEANED OF FOREIGN MATTER, THROUGH TEMPORARY CONNECTIONS WHEN NECESSARY BEFORE THE SYSTEM IS PLACED IN SERVICE. THE SURFACES OF ALL NEW EQUIPMENT AND PIPING SHALL BE CLEAN UPON COMPLETION OF THE WORK. AIR FILTERS SHALL BE REPLACED IMMEDIATELY BEFORE BEING TURNED OVER TO THE OWNER FOR ACCEPTANCE.
14. PREPLAN ALL WORK PRIOR TO PURCHASING, ORDERING, OR FABRICATING ANY PART OF THE WORK DESCRIBED IN THESE DRAWINGS.
15. IMMEDIATELY NOTIFY THE ENGINEER OF ANY CONFLICTS WITH EXISTING FIELD CONDITIONS OR THE WORK OF OTHER TRADES.
16. RESOLVE ALL CONFLICTS PRIOR TO INCURRING ANY MATERIAL OR LABOR EXPENSES.
17. COMPLY WITH THE MANUFACTURER'S TECHNICAL INSTRUCTION WHEN INSTALLING MECHANICAL EQUIPMENT, DEVICES, DUCTWORK, GRILLES, REGISTERS, DIFFUSERS, AND OTHER MATERIALS.
18. PROVIDE ALL APPURTENANCES NECESSARY TO PROPERLY INSTALL EQUIPMENT, DEVICES, DUCTWORK, GRILLES, REGISTERS, DIFFUSERS, AND OTHER MATERIALS.
19. VERIFY EACH GRILLE, REGISTER, AND DIFFUSER TO BE INSTALLED AGAINST THE ARCHITECT'S ROOM FINISHES AND RESOLVE ALL CONFLICTS BEFORE ORDERING.
20. LOCATE MECHANICAL EQUIPMENT, DEVICES, DUCTWORK, GRILLES, REGISTERS, DIFFUSERS, AND OTHER MATERIAL GENERALLY AS SHOWN ON THE PLANS; HOWEVER, COORDINATE LOCATIONS WITH ACTUAL FIELD CONDITIONS TO PRESERVE ALL CODE-REQUIRED AND MANUFACTURER-REQUESTED SERVICE CLEARANCE.
21. COORDINATE THE ROUTING OF ALL DUCTWORK AND PIPING WITH THE BUILDING STRUCTURE AND WITH THE WORK OF OTHER TRADES.
22. BUILDING FRAMING CAVITIES SHALL NOT BE USED AS SUPPLY AIR DUCTS.
23. PROVIDE FLEXIBLE DUCTWORK OR FLEXIBLE CONNECTORS ON SUPPLY DUCTWORK AS SHOWN ON THE PLAN. FLEXIBLE DUCTWORK SHALL BE CLASS 0 OR 1 OF UNLIMITED LENGTH SIZED FOR AIRFLOW AND FRICTION LOSS. FLEXIBLE DUCTWORK IS LIMITED TO 6' MAXIMUM LENGTH.
24. RUNOUTS TO GRILLES AND DIFFUSERS SHALL MATCH THE SCHEDULED NECK SIZE UNLESS OTHERWISE TAGGED ON DRAWINGS.
25. ALL DUCTWORK NOT LOCATED WITHIN A CONDITIONED SPACE SHALL BE INSULATED. FOR DUCTWORK LOCATED OUTSIDE OF THE BUILDING ENVELOPE, PROVIDE AT LEAST R-8 INSULATION IN ADDITION TO WEATHERPROOFING. FOR DUCTWORK LOCATED IN ATTICS, CRAWLSPACES, AND OTHER UNCONDITIONED SPACES, PROVIDE AT LEAST R-6 INSULATION. FOR EXPOSED SPIRAL DUCT LOCATED IN CONDITIONED SPACE, PROVIDE AT LEAST R-6 INSULATION FOR CONDENSATION PROOFING.
26. PROVIDE AIR TURNING DEVICES AT EACH SUPPLY DUCT ELBOW AND BRANCH TAKE OFF. PROVIDE BALANCING AND SPLITTER DAMPERS AS SHOWN ON THE PLANS AND WHERE NECESSARY FOR SYSTEM BALANCING. ALL TURNING VANES SHALL BE DOUBLE-THICKNESS.
27. PROVIDE ALL LOW VOLTAGE (24V AND BELOW) MOTOR-OPERABLE DAMPERS, CONTROLS DEVICES, RELAYS, AND SENSORS NECESSARY FOR THE PROPER, EFFECTIVE, AND SAFE OPERATION OF EQUIPMENT AND SYSTEMS. LOW VOLTAGE (24V AND BELOW) CONTROLS WIRING SHALL INCLUDE, BUT NOT BE LIMITED TO, TRANSFORMERS, CABLING, WIRING, AND DISCONNECTING MEANS. COMPONENTS, WIRING, SIZING, OVERCURRENT PROTECTION, AND GROUNDING SHALL CONFORM TO THE NATIONAL ELECTRIC CODE.
28. COORDINATE GAS-FIRED EQUIPMENT CAPACITIES AND BURNER PRESSURE REQUIREMENTS WITH GAS UTILITY. PROVIDE VENT-LESS GAS REGULATORS AS NEEDED TO LIMIT PRESSURE TO THE APPLIANCE REQUIREMENT. VENT 5 PSI AND GREATER REGULATORS TO THE EXTERIOR WITH APPROVED PIPING AND WATERTIGHT PENETRATIONS.
29. ALL OUTSIDE AIR INTAKES AND EXHAUST AIR DISCHARGES SHALL HAVE AUTOMATIC OR GRAVITY DAMPERS THAT CLOSE WHEN THE VENTILATION SYSTEM IS NOT OPERATING.
30. ALL OUTSIDE AIR INTAKE OR EXHAUST AIR DISCHARGE HOODS, CAPS, ETC. SHALL BE FULLY COMPATIBLE WITH THE WALL OR ROOF INSTALLATION. PROVIDE WATERTIGHT FLASHING AND SEALING AS NECESSARY TO SEAL TIGHT THE PENETRATIONS.
31. BALANCE THE HVAC SYSTEM TO THE CFM QUANTITIES SHOWN ON THESE DRAWINGS.
32. UPON COMPLETION OF THE PROJECT AND ONCE THE BUILDING IS OCCUPIED, REBALANCE THE DIFFUSERS AS NECESSARY AND REPLACE HVAC UNIT FILTERS.
33. WHEN DIFFUSERS ARE LOCATED IN FIRE RATED CEILINGS, PROVIDE DIFFUSERS WITH INTEGRAL FIRE DAMPERS, LISTED AND IN ACCORDANCE WITH UL.
34. VIBRATION ISOLATION SHALL BE INSTALLED FOR EVERY PIECE OF MECHANICAL EQUIPMENT THAT INCLUDES A FAN OR MOTOR. ISOLATION SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

LIMITS OF ENGINEERING SUPERVISION

THE FOLLOWING LIST OF ITEMS SHALL BE EXCLUDED FROM CONSIDERATION AS UNDER THE DIRECT SUPERVISION AND CONTROL OF THE ENGINEER OF RECORD. THIS LIST IS NOT EXHAUSTIVE AND THERE MAY BE OTHER NOTES AND SPECIFICATIONS THROUGHOUT THAT LIMIT THE SUPERVISION FURTHER. NO ITEM LISTED HERE SHALL BE CONSIDERED IN ANY WAY UNDER THE DIRECT SUPERVISION AND CONTROL OF PERMITZIP OR THE ENGINEER OF RECORD, EVEN IF IT IS PART OF THE CONTRACTOR AND/OR SUBCONTRACTOR'S WORK BY WAY OF DELEGATED DESIGN NARRATIVE OR COORDINATION NOTE:

1. HOOD VENDOR: ALL COMMERCIAL KITCHEN VENTILATION SYSTEM IS SHOWN ON THIS CONTRACT DOCUMENT FOR REFERENCE ONLY. KITCHEN HOOD, EXHAUST FAN AND MAKEUP AIR FAN DESIGN ARE EXCLUDED FROM ENGINEER OF RECORD'S SUPERVISION. REFER TO THE DELEGATED DESIGN OF COMMERCIAL KITCHEN VENTILATION SYSTEM ON THIS CONTRACT DOCUMENT FOR DETAILS.
2. ROOF AND WALL PENETRATION: PERMITZIP'S DESIGN IN REGARDS TO MEANS OF FIRE/SMOKE PROTECTION FOR ANY MECHANICAL SYSTEM THAT PENETRATES THROUGH THE FIRE/SMOKE RATED ASSEMBLY IS LIMITED TO THE REQUIREMENT OF THE BUILDING CONSTRUCTION AND MECHNAICAL CODES. REFER TO ARCHITECTURAL DOCUMENT FOR THE EXACT LOCATION AND RATING OF THE FIRE/SMOKE RATED ASSEMBLY.
3. ACCESS TO HAVC EQUIPMENT: THE LOCATION AND SIZE OF ANY ACCESS MEANS TO HVAC EQUIPMENT (INCLUDING BUT NOT LIMITED TO: ROOF HATCH, CEILING/ATTIC ACCESS PANEL, CRAWL SPACE'S ACCESS DOOR, ACCESS DOOR TO FIRE DAMPER) ARE SHOWN FOR REFERENCE ONLY. REFER TO ARCHITECTURAL DOCUMENT FOR THE LOCATION OF SUCH ACCESS MEANS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING EXACT SIZE OF SUCH ACCESS MEANS WITH THE SIZE OF ACTUAL HVAC EQUIPMENT INSTALLED.
4. MANUFACTURER REQUIRED CLEARANCES: THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING EXACT REQUIREMENTS FROM EQUIPMENT MANUFACTURERS FOR A COMPLETE AND SATISFACTORY INSTALLATION.
5. EQUIPMENT'S SETUP: PERMITZIP IS NOT RESPONSIBLE OF HVAC EQUIPMENT'S SETUP PROCEDURE DURING INSTALLATION. THE CONTRACTOR SHALL FOLLOW MANUFACTURER'S RECOMMENDATION TO SET UP AND TEST/BALANCE THE HVAC EQUIPMENT WITH THE GIVEN ENGINEERING SPEC. (INCLUDING BUT NOT LIMITED TO: AIRFLOW VOLUME, PERCENTAGE OF VENTILATION AIRFLOW, TEMPERATURE SET POINT).

permitZIP
1212 Westover Hills Blvd, Richmond, VA 23225 > 833-TWO-WEEK > www.permitzip.com

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LICENSE: #0402053673.
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COMMONWEALTH OF VIRGINIA
KENNETH MICHAEL SHULTZ
Lic. No. 053673
21 JUNE 2023
PROFESSIONAL ENGINEER

NO.	DESCRIPTION	DATE

BUILDING DATA

BUILDING CONSTRUCTION: VB
USE GROUP: A-2 (RESTAURANT)
NOT IN FLOOD PLAIN.
TOTAL AREA OF PROJECT: 5,206 SF
TOTAL AREA OF BUILDING: 5,206 SF
OCCUPANCY LOAD: 197

WARSAW COMMUNITY MARKET

74 MAIN ST., WARSAW, VA 22572

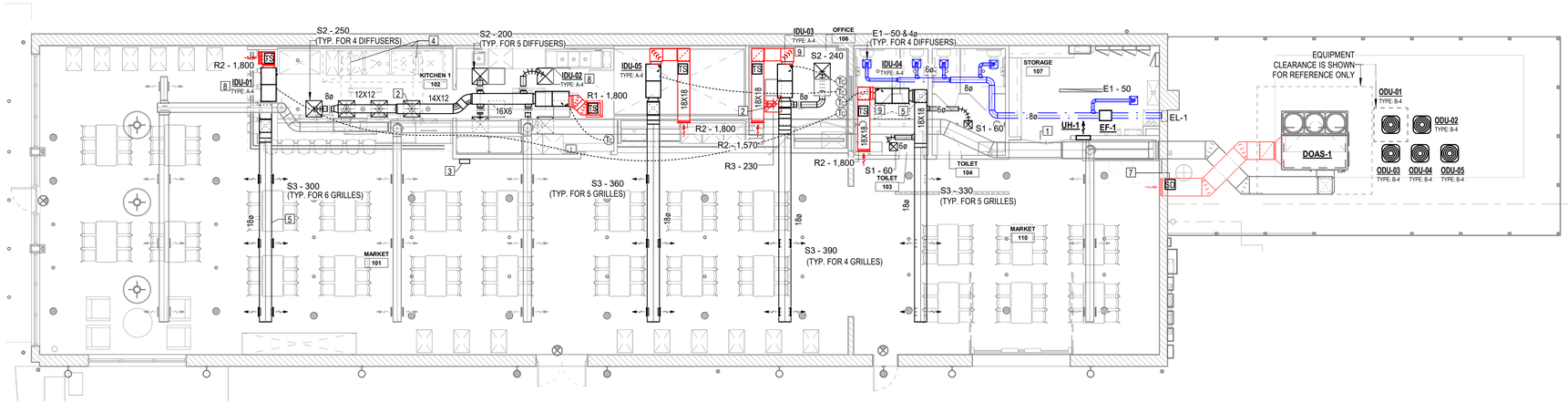
PROJECT NO: 4492 — BB No.254-232-611

21 JUNE 2023 — RVT Version 2022

GENERAL NOTES// LEGEND

M1

As indicated



1 LEVEL 1 - HVAC PLAN - NEW WORK
1/8" = 1'-0"

GENERAL NOTES

1. OUTSIDE AIR INTAKES SHALL BE KEPT AT A MINIMUM DISTANCE OF 10' AWAY FROM EXHAUST AIR OPENINGS.
2. CLEARANCE SHALL BE MAINTAINED AS FOLLOWS COMPLYING 2018 VMC SECTION 501.3.1 FOR ENVIRONMENTAL AIR EXHAUST
   - 10 FT FROM ANY OUTSIDE AIR INTAKE
   - 3 FT FROM OPERABLE BUILDING OPENINGS.
   - 3 FT FROM PROPERTY LINE
3. ALL MECHANICAL EQUIPMENT CLEARENCES ARE SHOWN FOR REFERENCE ONLY. ALL MECHANICAL EQUIPMENT SHALL BE PROVIDED WITH SERVICE CLEARANCE AS PER MANUFACTURER INSTRUCTIONS.

MECHANICAL PLAN NOTES

PLAN NOTE NUMBER	NOTE
1	PROVIDE DOOR UNDERCUT FOR TRANSFER AIR
2	PROVIDE VOLUME DAMPER ON DUCT DROP (TYP.)
3	REMOTE TEMPERATURE AND HUMIDITY SENSOR FOR DOAS. THE SENSOR SHALL BE WIRED TO DOAS. THE SENSOR'S LOCATION IS SHOWN FOR REFERENCE ONLY CONTRACTOR TO COORDINATE WITH THE HOOD DESIGNER/VENDOR.
4	THE HOOD AND EXHAUST DUCT TO THE ROOF ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR TO COORDINATE WITH HOOD DESIGNER/VENDOR
5	THE SUPPLY DUCT SHALL RUN BETWEEN JOIST. CONTRACTOR TO COORDINATE THE DUCT WITH THE JOIST AND CONFIRM DUCT LOCATION WITH THE ARCHITECT PRIOR TO INSTALLATION (TYP.).
7	DOAS SUPPLY AND RETURN DUCT SHOWN FOR REFERENCE ONLY, CONTRACTOR TO COORDINATE SUPPLY/RETURN DUCT LOCATION AND SIZE WITH HOOD DESIGNER/VENDOR.
8	HVAC CONDENSATE SHALL DRAIN TO FS-3S
9	HVAC CONDENSATE SHALL DRAIN TO MOP SINK IN STORAGE

DUCT INSULATION SCHEDULE

DUCT SYSTEM	TYPE	INSULATION MATERIAL	INSULATION THICKNESS
SUPPLY DUCTWORK	EXPOSED NON-FABRIC	DOUBLE WALL, R-6 MIN	2"
	ABOVE CEILING(CONCEALED)	BLANKET WRAP, R-6 MIN	2"
RETURN DUCTWORK	CONCEALED	BLANKET WRAP, R-6 MIN	2"
EXHAUST DUCTWORK	CONCEALED	BLANKET WRAP, R-3 MIN	1"

NOTES:
1. ALL EXPOSED DUCTWORK ABOVE 12 FEET FROM THE FINISHED FLOOR SHALL BE INSULATED WITH DOUBLE WALL INSULATION. FIBERGLASS INSULATION SURROUNDING THE INNER LINER SHALL BE R-6 MIN.
2. DUCTWORK CONCEALED ABOVE CEILING, EVEN IF IT IS HIGHER THAN 12 FEET FROM THE FINISHED FLOOR, SHALL BE INSULATED PER THE SCHEDULE.
3. THE EXPOSED DUCTS SHALL BE SPIRAL PAINT GRIP.

MECHANICAL VENTILATION SCHEDULE

ROOM NUMBER	ROOM NAME	IMC SPACE CLASSIFICATION	MINIMUM ZONE AIRFLOW	DCV CK	AREA (Az)	SF PER PERSON	# OF OCCUPANTS	CFM PER SF (Ra)	OUTDOOR AIR PER PERSON (Rp)	BREATHING ZONE OA (Vbz)	SYSTEM LEVEL VARIABLES	
											SYSTEM VENTILATION EFFICIENCY (Ev)	OUTDOOR AIR INTAKE FLOW (Vot)
101	MARKET	FOOD/BEVERAGE - DINING ROOMS	7400 CFM	Yes	2,914	21	139	0.18	8 CFM	1567 CFM	0.93	2389 CFM
102	KITCHEN 1	FOOD/BEVERAGE - KITCHEN(COOKING)	1740 CFM	No	498	50	10	0.12	8 CFM	135 CFM		
103	TOILET	PUBLIC SPACES - TOILET ROOMS - PUBLIC	80 CFM	No	117	0	0	0	0 CFM	0 CFM		
104	TOILET	PUBLIC SPACES - TOILET ROOMS - PUBLIC	80 CFM	No	118	0	0	0	0 CFM	0 CFM		
106	OFFICE	OFFICES - OFFICE SPACES	200 CFM	No	123	200	1	0.06	5 CFM	12 CFM		
110	MARKET	FOOD/BEVERAGE - DINING ROOMS	2450 CFM	Yes	944	21	45	0.18	8 CFM	507 CFM		
ZONE 1			11950 CFM				195			2222 CFM		
GRAND TOTAL			11950 CFM				195			2222 CFM		

NOTES
1. MARKET 101 & 110 EXEMPT FROM DEMAND CONTROL VENTILATION AS PER VECC C403.7.1 EXCEPTION 1.

MECHANICAL PIPING INSULATION SCHEDULE

PIPING SYSTEM	OPERATING TEMPERATURE RANGE (°F)	THERMAL CONDUCTIVITY BTU*in/(h*ft²*F)	MEAN RATING TEMPERATURE (°F)	INSULATION MATERIAL	INSULATION THICKNESS
REFRIGERANT PIPING	105 - 140	0.21-0.28	100	ARMAFLEX CLOSED-CELL OR EQUAL, R-4 MIN	1"
	40 - 60	0.21-0.27	75		

NOTES:
1. THE EXPOSED REFRIGERANT PIPE INSULATION SHALL BE PROTECTED FROM THE EFFECTS OF UV LIGHT, OZONE, MOISTURE AND WIND AS PER SECTION C403.11.3.1 OF 2018 VECC.

MECHANICAL EQUIPMENT - FAN SCHEDULE

ID	DESCRIPTION	EXHAUST CFM	ESP	FAN RPM	ELECTRICAL					UNIT CONTROLS	MAKE	MODEL
					FLA	MCA	MOCP	VOLTS	PHASE			
EF-1	INLINE EXHAUST FAN	250 CFM	0.40 in-wg	1343	1.1 A	1.4 A	15 A	120 V	1	TIMER	GREENHECK	SQ-90-VG

NOTES
1. PROVIDE INTEGRAL BACKDRAFT DAMPER.
2. COORDINATE EQUIPMENTS CONTROL AND POWER REQUIREMENT PER ELECTRICAL DRAWING WITH ELECTRICIAN.

MECHANICAL EQUIPMENT - FAN SCHEDULE - KITCHEN

ID	DESCRIPTION	ELECTRICAL					UNIT CONTROLS	MAKE	MODEL
		FLA	MCA	MOCP	VOLTS	PHASE			
KEF-1	ROOF MOUNTED DOWNBLAST EXHAUST FAN	5.0 A	6.3 A	15 A	208 V	1	HOOD CONTROLLER	SELECTED BY OTHERS	SELECTED BY OTHERS
KEF-2	ROOF MOUNTED DOWNBLAST EXHAUST FAN	5.0 A	6.3 A	15 A	208 V	1	HOOD CONTROLLER	SELECTED BY OTHERS	SELECTED BY OTHERS

NOTES
1. KITCHEN HOOD INFORMATION SHOWN FOR REFERENCE ONLY. FINAL SELECTION BY THE HOOD EQUIPMENT VENDOR AND WIRED BY ELECTRICAL CONTRACTOR. COORDINATE WITH VENDOR AND SEND FINAL SUBMITTAL TO ENGINEER OF RECORD FOR REVIEW PRIOR TO INSTALLATION.
2. THE KITCHEN EXHAUST SHALL BE DEMAND CONTROLLED AND SHALL BE INTERLOCKED WITH DOAS.

MECHANICAL EQUIPMENT - UNIT HEATER SCHEDULE

ID	DESCRIPTION	RATED HEATING CAPACITY (KW)	ELECTRICAL					UNIT CONTROLS	MAKE	MODEL
			FLA	MCA	MOCP	VOLTAGE	PHASE			
UH-1	ELECTRIC UNIT HEATER	3 kW	14.40 A	18.0 A	25 A	208 V	1	BUILT-IN THERMOSTAT	TRANE	UHAA031ATAD

NOTES
1. COORDINATE EQUIPMENTS CONTROL AND POWER REQUIREMENT PER ELECTRICAL DRAWING WITH ELECTRICIAN.

MECHANICAL EQUIPMENT - DOAS SCHEDULE

MECH UNIT TYPE	DESCRIPTION	LEAVING AIR TEMPERATURE (°F)		COOLING CAPACITIES (BTU/H)	REHEAT CAPACITY (BTU/H)	HEATING CAPACITIES		VENTILATION (HOOD ON MODE) (CFM)	MINIMUM VENTILATION (HOOD OFF MODE) (CFM)	ELECTRICAL				MAKE	MODEL
		DB (°F)	WB (°F)			GAS INPUT (BTU/h)	HEATING (BTU/H)			MCA	MOCP	VOLTS	PHASE		
DOAS-1	DEDICATED OUTDOOR AIR SYSTEM	55.3	55.3	264,000	129,600 Btu/h	308,519	249,900	3,250	2390	79.1 A	80 A	208 V	3	CAPTIVEAIRE	CASRTU3-I.400-18-20T

NOTES
1. DOAS INFORMATION SHOWN FOR REFERENCE ONLY. FINAL SELECTION BY THE HOOD EQUIPMENT VENDOR AND WIRED BY ELECTRICAL CONTRACTOR. COORDINATE WITH VENDOR AND SEND FINAL SUBMITTAL AND MECHNAICAL COMPLIANCE CERTIFICATE AS PER VECC 2018 TO ENGINEER OF RECORD FOR REVIEW PRIOR TO INSTALLATION.
2. FURNISH DEDICATED OUTDOOR AIR SYSTEM WITH SPECIFICATION BELOW:
   - RETURN AIR WITH ENERGY RECOVERY WHEEL
   - HOT GAS REHEAT COIL
   - VARIABLE SPEED OUTDOOR FANS
   - INTEGRAL SMOKE DETECTOR
   - 100% ECONOMIZER WITH BAROMETRIC RELIEF

MECHANICAL EQUIPMENT TYPE SCHEDULE - B

MECH UNIT TYPE	DESCRIPTION	COOLING CAPACITIES				HEATING CAPACITIES		RATED FAN CFM	ESP	ELECTRICAL					DESIGN BASED ON	
		NOMINAL CLG (TONS)	SENSIBLE (BTU/H)	LATENT (BTU/H)	TOTAL (BTU/H)	HEATING (BTU/H)	STRIP HEAT (KW)			FLA	MCA	MOCP	VOLTS	PHASE	MAKE	MODEL
A-4	FAN COIL UNIT	4	34,590	8,830	43,420	29,460	15	1,800	0.50 in-wg	60.32 A	75.4 A	80 A	208 V	1	CARRIER	FJ4DNBC48L15
B-4	DX HEAT PUMP	4	43,420		43,420	29,460				26.24 A	32.8 A	50 A	208 V	1	CARRIER	25SCA548A003

NOTES
1. PROVIDE INDOOR UNIT WITH 15KW STRIP HEAT.
2. PROVIDE LOW AMBIENT CONTROL FOR OUTDOOR UNITS.
3. PROVIDE WITH INDOOR UNIT WITH PROGRAMMABLE THERMOSTAT. THERMOSTAT SHALL COMPLY WITH SPECIFICATION MENTIONED ON SHEET M4.
4. TERMINATE FAN SPEED AT TAP 5 FOR MAX. FAN SPEED.

MECHANICAL LOUVER SCHEDULE

LOUVER TAG	SERVICE	SIZE (IN.)	MIN. FREE AREA (SQ.FT)
EL-1	EXHAUST AIR	16X12	0.5

NOTES
1. FURNISH WITH WATER STOP.
2. ALL EXHAUST LOUVERS SHALL BE MOUNTED ATLEAST 3' FROM EVERY BUILDING OPENINGS.
3. ALL EXHAUST LOUVERS SHALL BE MOUNTED ATLEAST 10' FROM EVERYOUTSIDE AIR INTAKE POINTS.
4. PROVIDE WITH GRAVITY DAMPER FOR EXHAUST LOUVER AS PER SECTION C403.7.7 EXCEPTION 3 OF VECC 2018. NONMOTORIZED GRAVITY DAMPERS SHALL HAVE AN AIR LEAKAGE RATE NOT GREATER THAN 40 CFM/FT2.

HVAC THERMAL LOAD SUMMARY

		Htg	Clg			Htg	Clg
Outside db	(°F)	19	93	Inside db	(°F)	70	75
Outside RH	(%)	-	42	Inside RH	(%)	-	50
Outside wb	(°F)	-	74	Inside wb	(°F)	-	62
Daily range	(°F)	-	21	Design TD	(°F)	51	18
Moisture diff.	(gr/lb)	-	33				

NAME	Area ft²	Heat Loss	Sensible Gain	Latent Gain	Htg cfm	Clg cfm	Time
UH 1	259	10423	0	0	0	0	Jul 1600 LDT
ZONE 1	5019	309889	276658	142489	9777	9777	Jul 1600 LDT
Entire House	5278	320312	276658	142489	9777	9777	Jul 1600 LDT

MECHANICAL GRILLES,REGISTERS AND DIFFUSERS SCHEDULE

ID	SERVICE	NECK SIZE(IN.)	FACE SIZE(IN.)	MOUNT					MATERIAL	FACE OPERATED DAMPER	MAX CFM	MAX NC	MAKE	MODEL
				CEILING			DUCT							
				LAY-IN	GYP.	WALL	ROUND	RECT.						
E1	EXHAUST	6	12X12		X				STEEL	Yes	137	30	PRICE	PDDR
R1	RETURN	18X18	24X24	X					STEEL	No	1,800	30	PRICE	PDDR
R2	RETURN		26X22					X	STEEL	No	1,866	30	PRICE	510Z
R3	RETURN	8	24X24	X					STEEL	No	279	30	PRICE	PDDR
R4	RETURN	28X24	30X26			X			ALUMINUM	No	3,432	30	PRICE	80
S1	SUPPLY	6	12X12		X				STEEL	Yes	137	30	PRICE	PDN
S2	SUPPLY	8	24X24	X					STEEL	No	279	30	PRICE	SPD
S3	SUPPLY		14X10				X		ALUMINUM	Yes	420	30	PRICE	SDGE

NOTES
1. THE SPIRAL DUCT-MOUNTED GRILLE SHALL MATCH THE DUCT RADIUS TO WHICH IT GETS MOUNTED.

COMcheck Software Version 4.1.5.3

Mechanical Compliance Certificate

Project Information

Energy Code: 2018 IECC
Project Title: WARSAW COMMUNITY MARKET
Location: Warsaw, Virginia
Climate Zone: 4a
Project Type: New Construction

Construction Site: 74 MAIN ST., WARSAW,, VA 22572
Owner/Agent:
Designer/Contractor:

Additional Efficiency Package(s)
Credits: 1.0 Required 1.0 Proposed
Reduced Lighting Power, 1.0 credit

Mechanical Systems List

Quantity: 5
System Type & Description: Unit Type A/B (Single Zone): Split System Heat Pump
Heating Mode: Capacity = 29 KBtu/h, Proposed Efficiency = 9.30 HSPF, Required Efficiency = 8.20 HSPF
Cooling Mode: Capacity = 43 KBtu/h, Proposed Efficiency = 14.80 SEER, Required Efficiency: 14.00 SEER
Fan System: UNIT TYPE A-4 -- Compliance (Motor nameplate HP method) : Passes

Fans:
FAN 1 Supply, Constant Volume, 1740 CFM, 0.8 motor nameplate hp, 69.0 fan efficiency grade

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2018 IECC requirements in COMcheck Version 4.1.5.3 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Kenneth Shultz — Name - Title
Signature
21 June 2023 — Date

ENGINEER: Kenneth Shultz, PE.
LICENSE: #0402053673.
EMAIL:kshultz@permitzip.com.

COMMONWEALTH OF VIRGINIA
KENNETH MICHAEL SHULTZ
Lic. No. 053673
21 JUNE 2023
PROFESSIONAL ENGINEER

NO.	DESCRIPTION	DATE

BUILDING DATA

BUILDING CONSTRUCTION: VB
USE GROUP: A-2 (RESTAURANT)
NOT IN FLOOD PLAIN.
TOTAL AREA OF PROJECT: 5,206 SF
TOTAL AREA OF BUILDING: 5,206 SF
OCCUPANCY LOAD: 197

WARSAW COMMUNITY MARKET

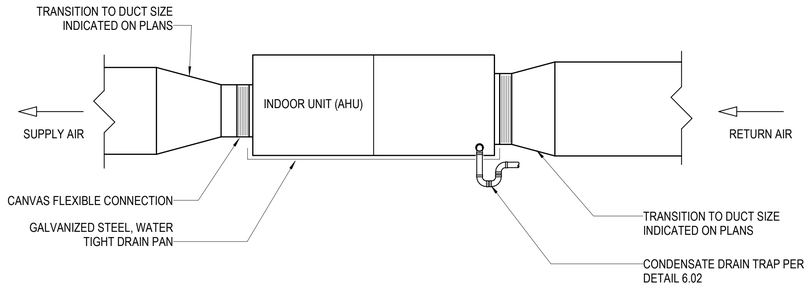
74 MAIN ST., WARSAW, VA 22572

PROJECT NO: 4492
BB No.254-232-611
21 JUNE 2023
RVT Version 2022

HVAC PLANS // SCHEDULES

M2

As indicated



NOTES
1. MOUNT INDOOR AIR HANDLING UNIT IN HORIZONTAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.
3. FIELD COORDINATE EXACT DISCHARGE LOCATION. PROVIDE CONDENSATE PUMP WHEN GRAVITY DRAIN CANNOT BE ACHIVED.

INDOOR AHU-HORIZONTAL

COMMERICAL KITCHEN VENTILATION SYSTEMS:

ACKNOWLEDGE CLAIM BELOW BEFORE START OF BIDDING:

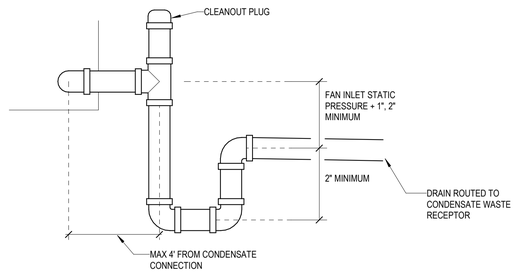
THE "COMMERCIAL KITCHEN VENTILATION SYSTEM" IS DEFINED AS THE END-TO-END COMPLETE VENTILATION SYSTEM INCLUDING THE HOOD, HOOD CONTROLS, DUCT WORK BETWEEN HOOD AND VENTILATION EQUIPMENT, EXHAUST, AND MAKEUP AIR FANS. THE COMMERCIAL KITCHEN VENTILATION SYSTEM DESIGN IS DELEGATED TO THE MECHANICAL CONTRACTOR WHO IS RESPONSIBLE FOR HIRING THE CERTIFIED HOOD SUPPLIER OR LICENSED PROFESSIONAL ENGINEER.

KITCHEN HOOD, EXHAUST FAN AND MAKEUP AIR FAN DESIGN ARE EXCLUDED FROM EOR'S SUPERVISION. COMMERCIAL KITCHEN VENTILATION SYSTEM INFORMATION FROM MECHANICAL DRAWINGS IS SHOWN FOR MEP COORDINATION ONLY. HOOD DESIGN DRAWING SHALL BE SUBMITTED BY CERTIFIED HOOD SUPPLIER OR OTHER PROFESSIONAL ENGINEER LICENSED IN JURISDICTION REVIEWING AND APPROVING DESIGN DRAWINGS.

THE DESIGNER HIRED AS PART OF THIS DELEGATED DESIGN OF COMMERCIAL KITCHEN VENTILATION SYSTEM SHALL SUPERVISE THE INSTALLATION OF HOOD, ASSOCIATED CONTROLS, GREASE DUCT WITH REQUIRED CLEANOUT AND SLOPE PER IMC, GREASE FAN, SYSTEM'S COORDINATION WITH OTHER TRADES PER REQUIRED CLEARANCE. SHOP DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR REVIEW AND APPROVAL. REVIEW OF THE SHOP DRAWINGS IS EXPLICITLY LIMITED TO CONFIRMING FINAL HOOD DESIGN AND SLECTIONS CONFORM TO THE DESIGN BASIS AND IS NOT A REVIEW OF ACCURACY OF HOOD DESIGN ITSELF.

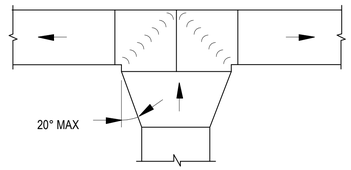
COMMERCIAL KITCHEN VENTILATION SYSTEM DESIGN SHALL COMPLY WITH CODE-REQUIRED SPECIFICATIONS LISTED BELOW. HOOD SUPPLIER OR OTHER LICENSED ENGINEER SHALL ACKNOWLEDGE, BUT NOT LIMITED TO, THE FOLLOWING REQUIREMENTS AND OTHER DESIGN STANDARDS ENFORCED BY LOCAL AHJ.

1. GREASE DUCT AND HOOD VENTILATION EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
2. GREASE DUCTS SHALL BE SIZED WITH CODE MINIMUM AIR VELOCITY.GREASE DUCTS SHALL BE FURNISHED BY HOOD SUPPLIER AND INSTALLED BY MECHANICAL CONTRACTOR.
3. THE GREASE DUCT SHALL SLOPE NOT LESS THAN ONE-FOURTH UNIT VERTICAL IN 12 UNIT HORIZONTAL (2-PERCENT SLOPE) TOWARD THE HOOD OR TOWARD A GREASE RESERVOIR DESIGNED AND INSTALLED.
4. THE DESIGN OF THE GREASE DUCT AND HOOD VENTILATION EQUIPMENT SHALL BE A DELEGATED DESIGN INCLUDED IN THE MECHANICAL CONTRACTOR PRICING AND IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:
   - AIR VELOCITIES AND AIR VOLUMES SHALL BE DESIGNED AS PER THE KITCHEN HOOD REQUIREMENTS STATED IN THE KITCHEN EQUIPMENT LIST.
   - EQUIPMENT SHALL BE CAPABLE OF INTEGRATING WITH PRESSURIZATION CONTROLS TO PROVIDE THE REQUIRED AIR BALANCE.
   - MAKEUP AIR UNITS SHALL PROVIDE GAS HEATING TO MAKEUP AIR WITH MODULATING CONTROL.
   - SECTIONS OF GREASE DUCTS THAT ARE INACCESSIBLE FROM THE HOOD OR DISCHARDE OPENINGS SHALL BE PROVIDED WITH CLEANOUT OPENINGS SPACED NOT MORE THAN 20 FEET APART AND NOT MORE THAN 10 FEET FROM CHANGES IN DIRECTION GREATER THAN 45 DEGREES.
   - CLEANOUT AND OPENINGS SHALL BE EQUIPPED WITH TIGHT-FITTING DOORS CONSTRUCTED OF STEEL HAVING A THICKNESS NOT LESS THAN THAT REQUIRED FOR THE DUCT.
   - MAKEUP AIR DUCT INSULATION INSTALLED WITHIN 18 INCHES OF THE TYPE I HOOD SHALL BE NONCOMBUSTIBLE OR SHALL BE LISTED FOR THE APPLICATION
   - HOOD VENTILATION SHALL BE DEMAND CONTROLLED VENTILATION SYSTEM DESIGNED TO PROVIDE 100% TRANSFER AIR. THE MAKE UP AIR SYSTEM SHALL BE A DEDICATED OUTDOOR AIR UNIT WITH A VFD CONTROLLED FAN.
   - DUCT WORK IN THE OCCUPIED SPACE SHALL BE DOUBLE WALL SPIRAL DUCT WITH REDISTERS MATCHING DESIGN BASIS INDICATED ON THESE DRAWINGS.
   - DESIGN SUBMITTAL SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER AND SHALL INCLUDE DUCTWORK SHOP DRAWINGS. CONFORM TO SHOP DRAWING SPECIFICATION INDICATED ON PLAN.
   - THE DOAS FAN SHALL MODULATE INTERLOCKED WITH THE EXHAUST FAN SPEED. EXHAUST SHALL MODULATE BASED ON TEMPERATURE CONDITIONS UNDER THE HOOD.
   - THE OVERALL SYSTEM SHALL BE DESIGNED TO MAINTAIN POSITIVE BUILDING PRESSURE DURING HOOD OPERATION.
   - MINIMUM AIR VOLUME SHALL BE 2390 CFM TO PROVIDE ADEQUATE CODE-REQUIRED VENTILATION DURING OCCUPIED MODE.
   - MAXIMUM AIR VOLUMED SHALL BE DETERMINED BY THE DELEGATED DESIGN ENGINEER BASED ON THE HOOD SYSTEM DESIGN.
   - SYSTEM CAPACITY SHALL BE BASED ON THE FOLLOWING:
   - OUTDOOR ENTHALPY CONDITIONS SHALL MATCH DEHUMIDIFICATION WEATHER CONDITIONS INDICATED ON THE DRAWINGS.
   - LEAVING AIR ENTHALPY:
     1. COOLING: 55°F DB AND 51°F WB
     2. HEATING: 70 °DB

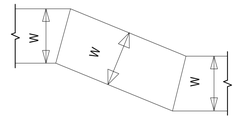


NOTES:
1. CONDENSATE DRAIN PIPING SHALL BE SLOPED AT 1/8" PER FT
2. SIZE CONDENSTAE DRAIN PIPING PER TABLE 314.2.2 OF IPC 2018

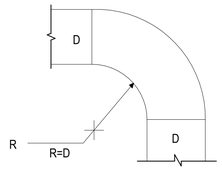
6.02 - CONDENSATE TRAP DETAIL



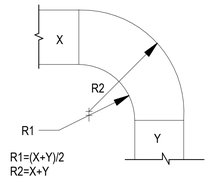
90° TEES



OFFSETS

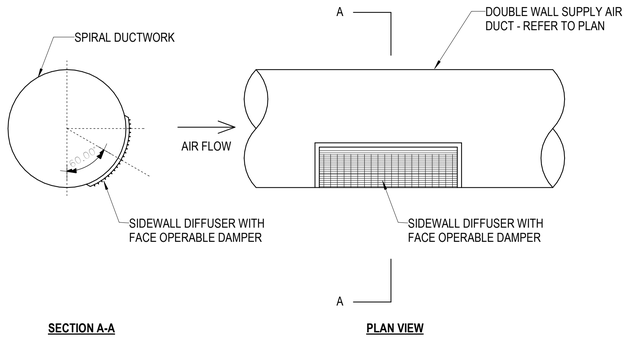


D LESS THAN 12" USE RADIUS;
FOE D OF 12" OR MORE USE
RECTANGULAR VANED ELBOW



X OR Y LESS THAN 12"

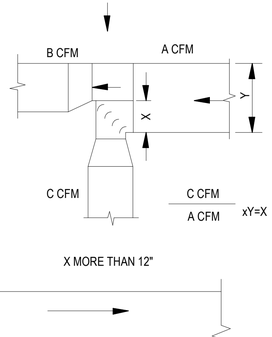
90° RADIUS ELBOW



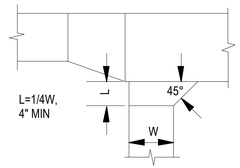
SECTION A-A **PLAN VIEW**

3.03 - EXPOSED DUCT MOUNTED DIFFUSER DETAIL

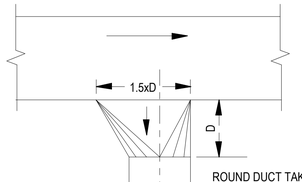
SCALE:NONE

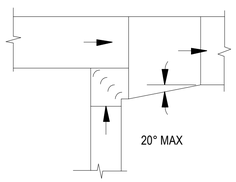


X MORE THAN 12"



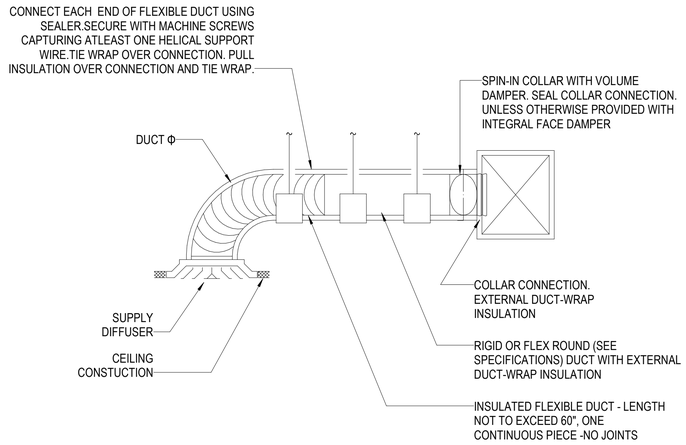
USE ONLY WHEN THERE ARE
NO OTHER TEE BRANCHS
FROM THIS BRANCH TAKEOFF





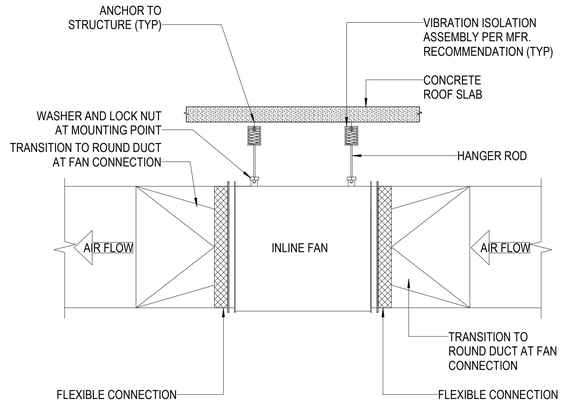
BRANCH TAKEOFFS

SCALE: NONE



3.02 TYPICAL CEILING SUPPLY DIFFUSER CONNECTION

SCALE:NONE



4.04 SUSPENDED INLINE FAN

SCALE: NONE

permitZIP
1212 Westover Hills Blvd, Richmond, VA 23225 > 833-TWO-WEEK > www.permitzip.com

COMMONWEALTH OF VIRGINIA
KENNETH MICHAEL SHULTZ
Lic. No. 053673
21 JUNE 2023
PROFESSIONAL ENGINEER

NO.	DESCRIPTION	DATE

BUILDING DATA

BUILDING CONSTRUCTION: VB
USE GROUP: A-2 (RESTAURANT)
NOT IN FLOOD PLAIN.
TOTAL AREA OF PROJECT: 5,206 SF
TOTAL AREA OF BUILDING: 5,206 SF
OCCUPANCY LOAD: 197
CHANGE OF USE? X
LEVEL OF RENOVATION: GREATER THAN XX%
ALTERATION LEVEL: X

WARSAW COMMUNITY MARKET

74 MAIN ST., WARSAW, VA 22572

PROJECT NO: 4492 BB No.254-232-611

21 JUNE 2023 RVT Version 2022

DETAILS & DIAGRAMS

M3

As indicated

23 05 53 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

1. EQUIPMENT LABELS
   A. MATERIAL AND THICKNESS: MULTILAYER, MULTICOLOR, PLASTIC LABELS FOR MECHANICAL ENGRAVING 1/8" THICK, AND HAVING PREDRILLED HOLES FOR ATTACHMENT HARDWARE.
   B. COLOR: WHITE LETTERS WITH BLACK BACKGROUND.
   C. ABLE TO WITHSTAND 160 DEG F. MINIMUM LETTER SIZE 1/2". PROVIDE WITH CONTACT-TYPE PERMANENT ADHESIVE, COMPATIBLE WITH LABEL AND WITH SUBSTRATE.
   D. EQUIPMENT LABEL CONTENT: INCLUDE EQUIPMENT'S DRAWING DESIGNATION OR UNIQUE EQUIPMENT NUMBER, DRAWING NUMBERS WHERE EQUIPMENT IS INDICATED (PLANS, DETAILS, AND SCHEDULES).
2. PIPE LABELS
   A. PREPRINTED, COLOR-CODED, WITH LETTERING INDICATING SERVICE, AND SHOWING FLOW DIRECTION ACCORDING TO ASME A13.1.
   B. PRINTED PLASTIC WITH CONTACT-TYPE, PERMANENT-ADHESIVE BACKING. MINIMUM LETTER SIZE 1/2".
   C. PIPE LABEL CONTENTS: INCLUDE IDENTIFICATION OF PIPING SERVICE; ALSO INCLUDE PIPE SIZE AND AN ARROW INDICATING FLOW DIRECTION.
3. DUCT LABELS
   A. MULTILAYER, MULTICOLOR, PLASTIC LABELS FOR MECHANICAL ENGRAVING, 1/8" THICK, AND HAVING PREDRILLED HOLES FOR ATTACHMENT HARDWARE.
   B. ABLE TO WITHSTAND 160 DEG F. MINIMUM LETTER SIZE 1/2". PROVIDE WITH CONTACT-TYPE PERMANENT ADHESIVE, COMPATIBLE WITH LABEL AND WITH SUBSTRATE.
   C. DUCT LABEL CONTENTS: INCLUDE IDENTIFICATION OF DUCT SERVICE; ALSO INCLUDE DUCT SIZE AND AN ARROW INDICATING FLOW DIRECTION.
   D. LOCATE LABELS NEAR POINTS WHERE DUCTS ENTER INTO AND EXIT FROM CONCEALED SPACES AND AT MAXIMUM INTERVALS OF 50 FEET IN EACH SPACE WHERE DUCTS ARE EXPOSED OR CONCEALED BY REMOVABLE CEILING SYSTEM.
   E. LOCATE DUCT LABEL AT EACH DUCT ACCESS DOOR AS REQUIRED BY "AIR DUCT ACCESSORIES".
   F. WHEN DUCT IS IN EXPOSED AND ARCHITECTURAL AREAS, LABELING SHALL BE LOCATED IN SUCH A WAY AS TO NOT BE EASILY RECOGNIZABLE FROM THE GENERAL PUBLIC.

SHOP DRAWINGS

1. DRAWINGS AND DOCUMENTS
   - PROVIDE ALL DRAWINGS AND DOCUMENTS NECESSARY TO CONVEY THE INFORMATION REQUIRED FOR FABRICATION, ASSEMBLY, AND INSTALLATION OF THE WORK. THIS INCLUDES DETAILED AND ACCURATE PLANS, ELEVATIONS, SECTIONS, AND DETAILS OF ALL MATERIALS, ASSEMBLIES, AND EQUIPMENT.
2. MATERIALS AND FINISHES
   - INDICATE ALL MATERIALS AND FINISHES TO BE USED, INCLUDING TYPE, GRADE, AND FINISH. WHERE SUBSTITUTIONS ARE PROPOSED, PROVIDE A DETAILED DESCRIPTION OF THE PROPOSED SUBSTITUTE MATERIAL OR FINISH.
3. FABRICATION AND INSTALLATION
   - INCLUDE DETAILED INSTRUCTIONS FOR THE FABRICATION AND INSTALLATION OF ALL COMPONENTS, AS WELL AS ANY SPECIAL INSTRUCTIONS OR REQUIREMENTS. THESE INSTRUCTIONS SHOULD BE CLEAR AND CONCISE, WITH ALL DIMENSIONS, TOLERANCES, AND CLEARANCES SPECIFIED.
4. SHOP DRAWING REVIEW/APPROVAL
   - SHOP DRAWINGS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER OF RECORD, AND ANY REQUIRED REVISIONS OR CLARIFICATIONS SHALL BE MADE PRIOR TO FABRICATION OR INSTALLATION. ANY CHANGES MADE AFTER APPROVAL MUST BE REVIEWED AND APPROVED BY THE ENGINEER OF RECORD.

23 05 93 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

1. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE PROCEDURES CONTAINED IN SMACNA'S "HVAC SYSTEMS - TESTING, ADJUSTING, AND BALANCING" AND IN THIS SECTION.
2. CUT INSULATION, DUCTS, PIPES, AND EQUIPMENT CABINETS FOR INSTALLATION OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY FOR TAB PROCEDURES.
   A. AFTER TESTING AND BALANCING, PATCH PROBE HOLES IN DUCTS WITH SAME MATERIAL AND THICKNESS AS USED TO CONSTRUCT DUCTS.
   B. INSTALL AND JOIN NEW INSULATION THAT MATCHES REMOVED MATERIALS. RESTORE INSULATION, COVERINGS, VAPOR BARRIER, AND FINISH TO ORIGINAL CONDITION.
3. MARK EQUIPMENT AND BALANCING DEVICES, INCLUDING DAMPER-CONTROL POSITIONS, VALVE POSITION INDICATORS, FAN-SPEED-CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, WITH PAINT OR OTHER SUITABLE, PERMANENT IDENTIFICATION MATERIAL TO SHOW FINAL SETTINGS.
4. TAKE AND REPORT TESTING AND BALANCING MEASUREMENTS IN INCH-POUND (IP UNITS.
5. GENERAL PROCEDURES FOR TESTING AND INSPECTION
   A. PREPARE TEST REPORTS FOR BOTH FANS AND OUTLETS. OBTAIN MANUFACTURER'S OUTLET FACTORS AND RECOMMENDED TESTING PROCEDURES. CROSS-CHECK THE SUMMATION OF REQUIRED OUTLET VOLUMES WITH REQUIRED FAN VOLUMES.
   B. PREPARE SCHEMATIC DIAGRAMS OF SYSTEMS' "AS-BUILT" DUCT LAYOUTS.
   C. FOR VARIABLE-AIR-VOLUME SYSTEMS, DEVELOP A PLAN TO SIMULATE DIVERSITY.
   D. DETERMINE THE BEST LOCATIONS IN MAIN AND BRANCH DUCTS FOR ACCURATE DUCT-AIRFLOW MEASUREMENTS.
   E. CHECK AIRFLOW PATTERNS FROM THE OUTDOOR-AIR LOUVERS AND DAMPERS AND THE RETURN- AND EXHAUST-AIR DAMPERS THROUGH THE SUPPLY-FAN DISCHARGE AND MIXING DAMPERS.
   F. LOCATE START-STOP AND DISCONNECT SWITCHES, ELECTRICAL INTERLOCKS, AND MOTOR STARTERS.
   G. VERIFY THAT MOTOR STARTERS ARE EQUIPPED WITH PROPERLY SIZED THERMAL PROTECTION.
   H. CHECK DAMPERS FOR PROPER POSITION TO ACHIEVE DESIRED AIRFLOW PATH.
   I. CHECK FOR AIRFLOW BLOCKAGES.
   J. CHECK CONDENSATE DRAINS FOR PROPER CONNECTIONS AND FUNCTIONING.
   K. CHECK FOR PROPER SEALING OF AIR-HANDLING-UNIT COMPONENTS.
   L. VERIFY THAT AIR DUCT SYSTEM IS SEALED.
6. GENERAL PROCEDURES FOR AIR BALANCING
   A. ADJUST FANS TO DELIVER TOTAL INDICATED AIRFLOWS WITHIN THE MAXIMUM ALLOWABLE FAN SPEED LISTED BY FAN MANUFACTURER.
      a. MEASURE TOTAL AIRFLOW.
         - SET OUTSIDE-AIR, RETURN-AIR, AND RELIEF-AIR DAMPERS FOR PROPER POSITION THAT SIMULATES MINIMUM OUTDOOR-AIR CONDITIONS.
         - WHERE DUCT CONDITIONS ALLOW, MEASURE AIRFLOW BY PITOT-TUBE TRAVERSE. IF NECESSARY, PERFORM MULTIPLE PITOT-TUBE TRAVERSES TO OBTAIN TOTAL AIRFLOW.
         - WHERE DUCT CONDITIONS ARE NOT SUITABLE FOR PITOT-TUBE TRAVERSE MEASUREMENTS, A COIL TRAVERSE MAY BE ACCEPTABLE.
         - IF A RELIABLE PITOT-TUBE TRAVERSE OR COIL TRAVERSE IS NOT POSSIBLE, MEASURE AIRFLOW AT TERMINALS AND CALCULATE THE TOTAL AIRFLOW.
      b. MEASURE FAN STATIC PRESSURES AS FOLLOWS:
         - MEASURE STATIC PRESSURE DIRECTLY AT THE FAN OUTLET OR THROUGH THE FLEXIBLE CONNECTION.
         - MEASURE STATIC PRESSURE DIRECTLY AT THE FAN INLET OR THROUGH THE FLEXIBLE CONNECTION.
         - MEASURE STATIC PRESSURE ACROSS EACH COMPONENT THAT MAKES UP THE AIR-HANDLING SYSTEM.
         - REPORT ARTIFICIAL LOADING OF FILTERS AT THE TIME STATIC PRESSURES ARE MEASURED.
      c. DO NOT MAKE FAN-SPEED ADJUSTMENTS THAT RESULT IN MOTOR OVERLOAD. CONSULT EQUIPMENT MANUFACTURERS ABOUT FAN-SPEED SAFETY FACTORS. MODULATE DAMPERS AND MEASURE FAN-MOTOR AMPERAGE TO ENSURE THAT NO OVERLOAD OCCURS. MEASURE AMPERAGE IN FULL-COOLING, FULL-HEATING, ECONOMIZER, AND ANY OTHER OPERATING MODE TO DETERMINE THE MAXIMUM REQUIRED BRAKE HORSEPOWER.
   B. ADJUST VOLUME DAMPERS FOR MAIN DUCT, SUBMAIN DUCTS, AND MAJOR BRANCH DUCTS TO INDICATED AIRFLOWS.
      a. MEASURE AIRFLOW OF SUBMAIN AND BRANCH DUCTS.
      b. ADJUST SUBMAIN AND BRANCH DUCT VOLUME DAMPERS FOR SPECIFIED AIRFLOW.
      c. RE-MEASURE EACH SUBMAIN AND BRANCH DUCT AFTER ALL HAVE BEEN ADJUSTED.
   C. ADJUST AIR INLETS AND OUTLETS FOR EACH SPACE TO INDICATED AIRFLOWS.
      a. SET AIRFLOW PATTERNS OF ADJUSTABLE OUTLETS FOR PROPER DISTRIBUTION WITHOUT DRAFTS.
      b. MEASURE INLETS AND OUTLETS AIRFLOW.
      c. ADJUST EACH INLET AND OUTLET FOR SPECIFIED AIRFLOW.
      d. RE-MEASURE EACH INLET AND OUTLET AFTER THEY HAVE BEEN ADJUSTED.
7. PREPARE A WRITTEN REPORT WITH RESULTS OF TESTING AS IDENTIFIED IN THIS SECTION AND CERTIFYING THE VALIDITY AND ACCURACY OF THE FIELD DATA.

23 05 48 . 13 - VIBRATION CONTROLS FOR HVAC

1. PROVIDE VIBRATION CONTROLS FOR ALL MECHANICAL EQUIPMENT. INSTALL PER MANUFACTURER RECOMMENDATIONS.
2. COORDINATE THE LOCATION OF EMBEDDED CONNECTION HARDWARE WITH SUPPORTED EQUIPMENT ATTACHMENT AND MOUNTING POINTS AND WITH CONCRETE REINFORCEMENT AND FORMWORK.
3. INSTALLATION OF VIBRATION ISOLATORS MUST NOT CAUSE ANY CHANGE OF POSITION OF EQUIPMENT, PIPING, OR DUCTWORK RESULTING IN STRESSES OR MISALIGNMENT.

CONTROLS & SPECIFICATIONS

1. AUTOMATIC TEMPERATURE CONTROL: ALL CONTROLS, CONTROL WIRING, INTERLOCKS, PROGRAMMABLE DEVICES SHALL BE IN CONFORMANCE WITH N.E.C., LOW AND LINE VOLTAGE AS APPLICABLE.
2. PROVIDE PROGRAMMABLE THERMOSTAT CONTROLS FOR PROPER AND SATISFACTORY SYSTEM OPERATION. ALL PORTIONS OF WALL-MOUNTED THERMOSTATS SHALL BE NO HIGHER THAN 46" AFF.
3. THERMOSTAT SHALL RESPOND TO ZONE TEMPERATURE.
4. OFF-HOUR CONTROLS WITH THERMOSTATIC SETBACK CAPABILITY
   - THERMOSTATIC SETBACK CONTROLS WITH THE CAPABILITY TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURE DOWN TO 55°F OR UP TO 85°F.
   - AUTOMATIC SETBACK AND SHUTDOWN CAPABILITIES AS PER SECTION C403.4.2.2 OF VECC 2018.
   - AUTOMATIC START CAPABILITIES THAT CAN ADJUST THE DAILY START TIME OF THE SYSTEM.
5. HEAT PUMPS HAVING A SUPPLEMENTAL ELECTRIC-RESISTANCE HEAT SHALL HAVE CONTROLS THAT, EXCEPT DURING DEFROST CYCLES, PREVENT SUPPLEMENTAL HEAT OPERATION WHEN THE HEAT PUMP COMPRESSOR CAN MEET THE HEATING LOAD.

23 31 13 - METAL DUCTS

1. DUCT CONSTRUCTION, INCLUDING SHEET METAL THICKNESSES, SEAM AND JOINT CONSTRUCTION, REINFORCEMENTS, AND HANGERS AND SUPPORTS, SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" AND PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED IN "DUCT SCHEDULE" ARTICLE.
2. STRUCTURAL PERFORMANCE: DUCT HANGERS AND SUPPORTS SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS DESCRIBED IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE".
3. AIRSTREAM SURFACES: SURFACES IN CONTACT WITH THE AIRSTREAM SHALL COMPLY WITH REQUIREMENTS IN ASHRAE 62.1.
4. RECTANGULAR DUCTS AND FITTINGS
   A. GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.
   B. TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-1, "RECTANGULAR DUCT/TRANSVERSE JOINTS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
   C. LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-2, "RECTANGULAR DUCT/LONGITUDINAL SEAMS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
   D. ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER DUCT CONSTRUCTION: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," CHAPTER 4, "FITTINGS AND OTHER CONSTRUCTION," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
5. ROUND DUCTS AND FITTINGS
   A. GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," CHAPTER 3, "ROUND, OVAL, AND FLEXIBLE DUCT," BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.
   B. TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-1, "ROUND DUCT TRANSVERSE JOINTS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
   C. LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-2, "ROUND DUCT LONGITUDINAL SEAMS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
   D. TEES AND LATERALS: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-5, "90 DEGREE TEES AND LATERALS," AND FIGURE 3-6, "CONICAL TEES," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
6. SHEET METAL MATERIALS
   A. GENERAL MATERIAL REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESSES, AND DUCT CONSTRUCTION METHODS UNLESS OTHERWISE INDICATED. SHEET METAL MATERIALS SHALL BE FREE OF PITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS, AND OTHER IMPERFECTIONS.
   B. GALVANIZED SHEET STEEL: COMPLY WITH ASTM A 653/A 653M.
      a. GALVANIZED COATING DESIGNATION: G90.
      b. FINISHES FOR SURFACES EXPOSED TO VIEW: MILL PHOSPHATIZED.
7. LOW PRESSURE DUCTWORK
   A. DUCTS SHALL BE SEALED IN ACCORDANCE WITH 2018 VECC.
   B. ALL RETURN DUCTWORK SHALL BE LINED WITH 1" THICK 2LB/CU-FT DENSITY FIBERGLASS DUCT LINER TREATED WITH BIOCIDE.
   C. EXHAUST DUCTWORK SHALL NOT BE INSULATED.
8. MEDIUM PRESSURE DUCTWORK
   A. ALL DUCTS SHALL BE SEALED IN ACCORDANCE WITH 2018 VECC.
   B. FIRST 20 FEET OF SUPPLY DUCTWORK SHALL BE LINED WITH 2" THICK 2LB/CU-FT DENSITY FIBERGLASS DUCT LINER TREATED WITH BIOCIDE.
   C. THE REMAINDER OF THE MEDIUM PRESSURE DUCTWORK AND LOW PRESSURE DUCTWORK SHALL BE INSULATED WITH 2" DUCTWRAP.
9. INSTALLATION
   A. INSTALL DUCT SYSTEMS AS INDICATED UNLESS DEVIATIONS TO LAYOUT ARE APPROVED ON SHOP DRAWINGS AND COORDINATION DRAWINGS.
   B. INSTALL DUCTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" UNLESS OTHERWISE INDICATED.
   C. INSTALL ROUND DUCTS IN MAXIMUM PRACTICAL LENGTHS.
   D. INSTALL DUCTS WITH FEWEST POSSIBLE JOINTS.
   E. INSTALL FACTORY- OR SHOP-FABRICATED FITTINGS FOR CHANGES IN DIRECTION, SIZE, AND SHAPE AND FOR BRANCH CONNECTIONS.
   F. UNLESS OTHERWISE INDICATED, INSTALL DUCTS VERTICALLY AND HORIZONTALLY, AND PARALLEL AND PERPENDICULAR TO BUILDING LINES.
   G. INSTALL DUCTS CLOSE TO WALLS, OVERHEAD CONSTRUCTION, COLUMNS, AND OTHER STRUCTURAL AND PERMANENT ENCLOSURE ELEMENTS OF BUILDING.
   H. INSTALL DUCTS WITH A CLEARANCE OF 1 INCH (25 MM), PLUS ALLOWANCE FOR INSULATION THICKNESS.
   I. ROUTE DUCTS TO AVOID PASSING THROUGH TRANSFORMER VAULTS AND ELECTRICAL EQUIPMENT ROOMS AND ENCLOSURES.
   J. WHERE DUCTS PASS THROUGH NON-FIRE-RATED INTERIOR PARTITIONS AND EXTERIOR WALLS AND ARE EXPOSED TO VIEW, COVER THE OPENING BETWEEN THE PARTITION AND DUCT OR DUCT INSULATION WITH SHEET METAL FLANGES OF SAME METAL THICKNESS AS THE DUCT. OVERLAP OPENINGS ON FOUR SIDES BY AT LEAST 1-1/2 INCHES (38 MM).
   K. WHERE DUCTS PASS THROUGH FIRE-RATED INTERIOR PARTITIONS AND EXTERIOR WALLS, INSTALL FIRE DAMPERS.
   L. PROTECT DUCT INTERIORS FROM MOISTURE, CONSTRUCTION DEBRIS AND DUST, AND OTHER FOREIGN MATERIALS.
   M. INSTALLATION OF EXPOSED DUCTWORK: PROTECT DUCTS EXPOSED IN FINISHED SPACES FROM BEING DENTED, SCRATCHED, OR DAMAGED. TRIM DUCT SEALANTS FLUSH WITH METAL. CREATE A SMOOTH AND UNIFORM EXPOSED BEAD. DO NOT USE TWO-PART TAPE SEALING SYSTEM. REPAIR OR REPLACE DAMAGED SECTIONS AND FINISHED WORK THAT DOES NOT COMPLY WITH THESE REQUIREMENTS.

23 33 00 - AIR DUCT ACCESSORIES

1. INSTALL DUCT ACCESSORIES ACCORDING TO APPLICABLE DETAILS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE".
2. INSTALL DUCT ACCESSORIES OF MATERIALS SUITED TO DUCT MATERIALS.
3. INSTALL VOLUME DAMPERS AT POINTS ON SUPPLY, RETURN, AND EXHAUST SYSTEMS WHERE BRANCHES EXTEND FROM LARGER DUCTS. WHERE DAMPERS ARE INSTALLED IN DUCTS HAVING DUCT LINER, INSTALL DAMPERS WITH HAT CHANNELS OF SAME DEPTH AS LINER, AND TERMINATE LINER WITH NOSING AT HAT CHANNEL.
4. INSTALL FIRE AND SMOKE DAMPERS ACCORDING TO UL LISTING.
5. INSTALL TEST HOLES AT FAN INLETS AND OUTLETS AND ELSEWHERE AS INDICATED.
6. INSTALL DUCT ACCESS DOORS ON SIDES OF DUCTS TO ALLOW FOR INSPECTING, ADJUSTING, AND MAINTAINING ACCESSORIES AND EQUIPMENT AT THE FOLLOWING LOCATIONS:
   A. ON BOTH SIDES OF DUCT COILS.
   B. UPSTREAM AND DOWNSTREAM FROM DUCT FILTERS.
   C. AT OUTDOOR-AIR INTAKES AND MIXED-AIR PLENUMS.
   D. AT DRAIN PANS AND SEALS.
   E. DOWNSTREAM FROM MANUAL VOLUME DAMPERS, CONTROL DAMPERS, BACKDRAFT DAMPERS, AND EQUIPMENT.
   F. ADJACENT TO AND CLOSE ENOUGH TO FIRE OR SMOKE DAMPERS, TO RESET OR REINSTALL FUSIBLE LINKS. ACCESS DOORS FOR ACCESS TO FIRE OR SMOKE DAMPERS HAVING FUSIBLE LINKS SHALL BE PRESSURE RELIEF ACCESS DOORS AND SHALL BE OUTWARD OPERATION FOR ACCESS DOORS INSTALLED UPSTREAM FROM DAMPERS AND INWARD OPERATION FOR ACCESS DOORS INSTALLED DOWNSTREAM FROM DAMPERS.
   G. ELSEWHERE AS INDICATED.
7. INSTALL ACCESS DOORS WITH SWING AGAINST DUCT STATIC PRESSURE.
8. ACCESS DOOR SIZES:
   A. ONE-HAND OR INSPECTION ACCESS: 8 BY 5 INCHES.
   B. TWO-HAND ACCESS: 12 BY 6 INCHES.
   C. HEAD AND HAND ACCESS: 18 BY 10 INCHES.
   D. HEAD AND SHOULDERS ACCESS: 21 BY 14 INCHES.
   E. BODY ACCESS: 25 BY 14 INCHES.
   F. BODY PLUS LADDER ACCESS: 25 BY 17 INCHES.
9. LABEL ACCESS DOORS ACCORDING TO "IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT" TO INDICATE THE PURPOSE OF ACCESS DOOR.
10. INSTALL FLEXIBLE CONNECTORS TO CONNECT DUCTS TO EQUIPMENT.
11. CONNECT TERMINAL UNITS TO SUPPLY DUCTS WITH MAXIMUM 12" LENGTHS OF FLEXIBLE DUCT. DO NOT USE FLEXIBLE DUCTS TO CHANGE DIRECTIONS OR IN EXPOSED AREAS.
12. CONNECT DIFFUSERS OR LIGHT TROFFER BOOTS TO DUCTS WITH MAXIMUM 6' LENGTHS OF FLEXIBLE DUCT CLAMPED OR STRAPPED IN PLACE. DO NOT USE FLEXIBLE DUCTS IN EXPOSED AREAS.
13. INSTALL DUCT TEST HOLES WHERE REQUIRED FOR TESTING AND BALANCING PURPOSES.
14. TESTS AND INSPECTIONS:
   A. OPERATE DAMPERS TO VERIFY FULL RANGE OF MOVEMENT.
   B. INSPECT LOCATIONS OF ACCESS DOORS AND VERIFY THAT PURPOSE OF ACCESS DOOR CAN BE PERFORMED.
   C. OPERATE FIRE AND SMOKE DAMPERS TO VERIFY FULL RANGE OF MOVEMENT AND VERIFY THAT PROPER HEAT-RESPONSE DEVICE IS INSTALLED.
   D. INSPECT TURNING VANES FOR PROPER AND SECURE INSTALLATION.

23 81 26 - SPLIT SYSTEMS

1. COMPLY WITH ASHRAE 15, 62.1, AND LATEST VERSION OF IECC 2018.
2. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
3. SPECIAL WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE COMPONENTS OF SPLIT-SYSTEM AIR-CONDITIONING UNITS THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD. WARRANTY PERIOD FOR COMPRESSOR, PARTS, AND LABOR SHALL BE A MINIMUM OF ONE YEAR FROM DATE OF SUBSTANTION COMPLETION.
4. PROVIDED WITH LOW AMBIENT CONTROL.
5. INSTALLATION
   A. INSTALL UNITS LEVEL AND PLUMB.
   B. INSTALL EVAPORATOR-FAN COMPONENTS USING MANUFACTURER'S STANDARD MOUNTING DEVICES SECURELY FASTENED TO BUILDING STRUCTURE.
   C. INSTALL ROOF-MOUNTED, COMPRESSOR-CONDENSER COMPONENTS ON EQUIPMENT SUPPORTS. ANCHOR UNITS TO SUPPORTS WITH REMOVABLE, CADMIUM-PLATED FASTENERS.
   D. EQUIPMENT MOUNTING:
      a. INSTALL GROUND-MOUNTED, COMPRESSOR-CONDENSER COMPONENTS ON CAST-IN-PLACE CONCRETE EQUIPMENT BASE(S).
      b. COMPLY WITH REQUIREMENTS FOR VIBRATION ISOLATION DEVICES SPECIFIED IN SECTION "VIBRATION CONTROLS FOR HVAC."
6. CONNECTIONS
   A. PIPING INSTALLATION REQUIREMENTS SHALL BE PROVIDED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. WHEN PIPING IS SHOWN ON DRAWINGS, IT SHALL INDICATE ONLY GENERAL ARRANGEMENT OF PIPING, FITTINGS, AND SPECIALTIES.
   B. WHERE PIPING IS INSTALLED ADJACENT TO UNIT, ALLOW SPACE FOR SERVICE AND MAINTENANCE OF UNIT.
   C. DUCT CONNECTIONS: DUCT INSTALLATION REQUIREMENTS ARE SPECIFIED IN SECTION "METAL DUCTS." DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF DUCTS. CONNECT SUPPLY AND RETURN DUCTS TO SPLIT-SYSTEM AIR-CONDITIONING UNITS WITH FLEXIBLE DUCT CONNECTORS. FLEXIBLE DUCT CONNECTORS ARE SPECIFIED IN SECTION "AIR DUCT ACCESSORIES."
7. FIELD QUALITY CONTROL
   A. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS, AND TO ASSIST IN TESTING.
   B. TESTS AND INSPECTIONS:
      a. LEAK TEST: AFTER INSTALLATION, CHARGE SYSTEM AND TEST FOR LEAKS. REPAIR LEAKS AND RETEST UNTIL NO LEAKS EXIST.
      b. OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER MOTOR ROTATION AND UNIT OPERATION.
      c. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.
      d. REMOVE AND REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED ABOVE.
      e. PREPARE TEST AND INSPECTION REPORTS.
   C. TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN UNITS.

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NO.	DESCRIPTION	DATE

BUILDING DATA

BUILDING CONSTRUCTION: VB
USE GROUP: A-2 (RESTAURANT)
NOT IN FLOOD PLAIN.
TOTAL AREA OF PROJECT: 5,206 SF
TOTAL AREA OF BUILDING: 5,206 SF
OCCUPANCY LOAD: 197
CHANGE OF USE? X
LEVEL OF RENOVATION: GREATER THAN XX%
ALTERATION LEVEL: X

WARSAW COMMUNITY MARKET

74 MAIN ST., WARSAW, VA 22572

PROJECT NO: 4492 BB No.254-232-611

21 JUNE 2023 RVT Version 2022

SHEET SPECIFICATION

M4

12" = 1'-0"