Salas O'Brien
salasobrien.com 540-952-9651
Project No: 2550-00213-00

Roanoke
119 Norfolk Avenue, Suite 310
Roanoke, Virginia 24011

GENERAL DEMOLITION NOTES:

1. THESE DRAWINGS HAVE BEEN DEVELOPED FROM EXISTING DRAWINGS AND LIMITED FIELD MEASUREMENTS AND MAY NOT FULLY REFLECT ACTUAL FIELD CONDITIONS. THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS AND NOTIFY THE ARCHITECT IN WRITING OF ANY WORK DESCRIBED IN THE CONTRACT DOCUMENTS WHICH CANNOT BE PERFORMED DUE TO EXISTING CONDITIONS.
2. THE CONTRACTOR SHALL REMOVE OR ALTER AS NECESSARY ALL EXISTING PIPING, EQUIPMENT, EQUIPMENT FOUNDATIONS, AND APPURTENANCES THAT ARE NOT REQUIRED FOR THE EXISTING SYSTEMS TO REMAIN. CONTRACTOR SHALL VISIT THE SITE TO DETERMINE THE SCOPE OF THIS WORK AND VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING BIDS.
3. EXISTING EQUIPMENT SHALL BE TURNED OVER TO THE OWNER, UNLESS DIRECTED OTHERWISE AND LOCATED AS DIRECTED BY THE OWNER. ALL OTHER ITEMS TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND REMOVED FROM THE PREMISES.
4. DEMOLITION WORK INCLUDES, BUT IS NOT NECESSARILY LIMITED TO, THOSE ITEMS NOTED. OTHER ITEMS OF A MINOR NATURE MAY EXIST WHICH ARE NOT SPECIFICALLY NOTED ON THE DRAWINGS ARE TO BE REMOVED AS REQUIRED, TO PROVIDE ACCESS AND ALLOW ALTERATION OR NEW WORK TO PROCEED.
5. INSULATION ON EXISTING PIPING OR DUCTWORK THAT IS DAMAGED OR REMOVED DUE TO DEMOLITION WORK SHALL BE REPLACED AND SEALED AS REQUIRED TO PROVIDE CONTINUOUS COVERAGE.
6. FIRE-RATED ASSEMBLIES SHALL BE MAINTAINED IN ACCORDANCE WITH AN APPROVED AND TESTED UL THROUGH PENETRATION FIRESTOP SYSTEM AS SPECIFIED IN THE FIRE RESISTANCE DIRECTORY.
7. PORTIONS OF THE BUILDING MAY BE OCCUPIED DURING THIS RENOVATION. THE GENERAL CONTRACTOR SHALL TAKE ALL MEASURES NECESSARY TO PROVIDE FOR THE PROTECTION AND SAFETY OF THE BUILDING OCCUPANTS.

GENERAL NOTES:

1. INSTRUCT THE OWNER IN THE PROPER OPERATION AND MAINTENANCE OF THE MECHANICAL SYSTEMS UNTIL THE OWNER IS FULLY PREPARED TO OPERATE AND MAINTAIN THE MECHANICAL SYSTEM. HOWEVER, LENGTH OF INSTRUCTION TIME SHALL BE LIMITED TO ONE DAY.
2. EQUIPMENT, MATERIALS AND LABOR REQUIRED BY THESE CONTRACT DRAWINGS SHALL BE GUARANTEED TO BE FREE FROM DEFECTIVE MATERIALS OR WORKMANSHIP FOR ONE YEAR AFTER FINAL ACCEPTANCE OF THE PROJECT UNLESS SPECIFIED OTHERWISE. DEFECTIVE MATERIALS OR WORKMANSHIP OCCURRING DURING THIS PERIOD SHALL BE CORRECTED AT NO ADDITIONAL COST.
3. GENERAL CONTRACTOR TO VERIFY THE FINAL LOCATION OF ALL THERMOSTATS, TEMPERATURE SENSORS, PANELS AND CONTROL INSTRUMENTS WITH THE ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
4. GENERAL CONTRACTOR TO VERIFY WALL OPENINGS WITH STRUCTURE, LOCATIONS OF NEW AND EXISTING EQUIPMENT AND ROUTE OF DUCTWORK WITH EXISTING CONDITIONS PRIOR TO ROUGH-IN.
5. REFER TO ARCHITECTURAL, STRUCTURAL AND ELECTRICAL DRAWINGS TO COORDINATE THE EXACT LOCATIONS OF DIFFUSERS, REGISTERS, GRILLES, PIPING AND OTHER MECHANICAL EQUIPMENT WITH CEILING GRID, LIGHTS, BEAMS AND OTHER BUILDING COMPONENTS.
6. CEILING GRID AND OTHER ITEMS SHALL NOT BE SUPPORTED FROM OR IN CONTACT WITH MECHANICAL EQUIPMENT, CONDUIT, WIRING, PIPING AND SUPPORTS SHALL NOT BE LOCATED IN FRONT OF FAN COIL ACCESS PANELS.
7. DUCTWORK AND PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL PANELS. COORDINATE INSTALLATION OF DUCTWORK AND PIPING WITH ELECTRICAL PANELS WHEN SHOWN NEAR PANELS OR OVER ELECTRICAL ROOMS.
8. MATERIAL AND INSTALLATION SHALL COMPLY WITH LOCAL CODES, APPLICABLE PROVISIONS OF LATEST EDITION OF NATIONAL FIRE PROTECTION ASSOCIATION, LOCAL UTILITY REGULATIONS AND GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION.
9. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL SUPPORTS REQUIRED TO MOUNT MECHANICAL EQUIPMENT. PIPING AND DUCTWORK. EQUIPMENT SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
10. ALL DUCTWORK TRANSITIONS AND PIPING INCREASERS/REDUCERS SHALL BE PROVIDED AS REQUIRED FOR EQUIPMENT CONNECTIONS. SEE MANUFACTURERS DATA FOR ACTUAL DUCTWORK AND PIPING CONNECTION SIZES AND LOCATIONS.
11. PROVIDE AIR DEFLECTORS IN ALL SUPPLY AIR DUCTWORK SQUARE ELBOWS.
12. DUCTWORK AND PIPING LAYOUTS ARE FOR DIAGRAMMATICAL PURPOSES ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEASURING AND COORDINATING ALL DUCTWORK AND PIPING PRIOR TO INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY AND ALL OFFSETS AS REQUIRED TO MEET THE INTENT OF THE DESIGN DOCUMENTS AT NO ADDITIONAL COST TO THE OWNER.
13. THE GENERAL CONTRACTOR SHALL SEAL AND FLASH ALL WALL, ROOF, AND FLOOR PENETRATIONS AIRTIGHT AND WATERTIGHT AT EACH PIPE, DUCTWORK, AND CONDUIT PENETRATION. PROVIDE AIRTIGHT SEAL BETWEEN AT ALL FIRE PARTITION AND OR WALL PENETRATIONS WITH UL APPROVED FIRE-RESISTANT MATERIAL MATCHING OR EXCEEDING THE PENETRATED FIRE PARTITION AND OR WALLS RATING.
14. ALL CUTTING AND PATCHING FOR THE INSTALLATION OF NEW WORK IN EXISTING BUILDING SHALL BE DONE BY THE GENERAL CONTRACTOR.
15. PROVIDE FLEXIBLE DUCT CONNECTIONS BETWEEN THE SUPPLY AND RETURN DUCTS FROM ALL AIR UNITS AND AT BUILDING EXPANSION JOINTS. FLEXIBLE CONNECTIONS SHALL BE WEATHERTIGHT WHEN EXPOSED.

SYMBOL LEGEND

SYMBOL	DESCRIPTION (DISREGARD ITEMS NOT SHOWN ON PLANS)
GENERAL	
(#)	KEY NOTE TAG
4 / A	REVISION TAG
	NEW EQUIPMENT
DUCTWORK	
	SUPPLY AIR DUCTWORK
	RETURN AIR AND OUTSIDE AIR DUCTWORK
	EXHAUST AIR DUCTWORK
	FLEXIBLE DUCTWORK
	SUPPLY AIR DUCTWORK THROUGH HORIZONTAL PARTITION
	RETURN AIR DUCTWORK THROUGH HORIZONTAL PARTITION
	EXHAUST AIR DUCTWORK THROUGH HORIZONTAL PARTITION
	FIRE DAMPER (VERTICAL)
	FIRE DAMPER (HORIZONTAL)
	MANUAL BALANCING DAMPER (SEE DAMPER SCHEDULE)
	MOTORIZED DAMPER (SEE DAMPER SCHEDULE)
SENSORS	
T	THERMOSTAT AND TEMPERATURE SENSOR
H	HUMIDISTAT
SD	SMOKE DETECTOR
AIR DEVICES	
-	GRILLE SIZE TAG (REFER TO GRILLE SIZE LEGEND)
	SUPPLY AIR GRILLE WITH FOUR-WAY THROW
	RETURN AIR GRILLE
	SUPPLY AIR SIDEWALL GRILLE
	RETURN AIR SIDEWALL GRILLE
20X12	RETURN AIR OPENING ABOVE CEILING

SUBSCRIPTS AND ABBREVIATIONS	
AC	AIR CONDITIONING
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
APD	AIR PRESSURE DROP
ATC	AUTOMATIC TEMPERATURE CONTROL
ATM	ATMOSPHERE
BDD	BACK-DRAFT DAMPER
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
CA	COMBUSTION AIR
CFM	CUBIC FEET PER MINUTE
CO	CARBON MONOXIDE
D	DRAIN
DB	DRY BULB (TEMPERATURE)
DDC	DIRECT DIGITAL CONTROL
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
ESP	EXTERNAL STATIC PRESSURE
EUH	ELECTRICAL UNIT HEATER
EXT	EXTERNAL
EXP	EXPANSION
F	FAHRENHEIT
FA	FREE AREA
FC	FLEXIBLE CONNECTION
FD	FLOOR DRAIN
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
G	GAS
GA	GAUGE
HP	HORSEPOWER
HTG	HEATING
HZ	HERTZ (CYCLES PER SECOND)
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LVR	LOUVER
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MAU	MAKE-UP AIR UNIT
MBH	1000 BTUH
MCA	MINIMUM CIRCUIT AMPS
MOD	MOTORIZED OPERATED DAMPER
NC	NOISE CRITERIA
NOM	NOMINAL
OA	OUTSIDE AIR
PD	PRESSURE DROP
PH	PHASE
RA	RETURN AIR
RH	RELATIVE HUMIDITY
RLF	RELIEF
RPM	REVOLUTIONS PER MINUTE
RTU	ROOF-TOP UNIT
SA	SUPPLY AIR
SD	SMOKE DETECTOR OR SMOKE DAMPER
SEN	SENSIBLE
FSD	COMBINATION FIRE / SMOKE DAMPER
SP	STATIC PRESSURE
SUP	SUPPLY
TON	12,000 BTUH (COOLING CAPACITY)
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
UC	UNDERCUT (DOOR)
V	VOLTS
MD	MANUAL DAMPER
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
WB	WET BULB TEMPERATURE
WC	WATER COLUMN
WG	WATER GAUGE

ELECTRIC UNIT HEATER

MARK	CFM	KW	ELECTRICAL CONNECTION					MANUFACTURER	MODEL	REMARKS
			V	PH	F	MCA	MOCP			
EUH-1	100	3	208	1	60	14.5	20	QMARK	CWH3407F	ALL

REMARKS:
1. REFER TO FLOOR PLANS FOR UNIT QUANTITIES.
2. PROVIDE FACTORY INSTALLED THERMAL OVERLOAD PROTECTION, BUILT-IN THERMOSTAT AND DISCONNECT SWITCH.
3. PROVIDE ACCESSORIES NECESSARY FOR SURFACE MOUNTING UNIT ON FIRE RATED WALLS.
4. UNITS SHALL BE MOUNTED 12" AFF UNLESS OTHERWISE NOTED.

EXISTING ROOFTOP UNIT - GAS HEAT

MARK	CFM	ELECTRICAL CONNECTION					NOM. COOLING CAPACITY (MBH)	INPUT (MBH)	UNIT WEIGHT WITHOUT CURB
		V	PH	F	MCA	MOCP			
(EX) RTU-1	2000	208	3	60	28.6	40	60	90	510 LBS
(EX) RTU-2	800	208	1	60	15.4	20	24	60	305 LBS
(EX) RTU-3	800	208	1	60	15.4	20	24	60	305 LBS
(EX) RTU-4	2000	208	3	60	28.6	40	60	90	510 LBS

FAN

MARK	CFM	EXT. STATIC PRESSURE (IN. W.C.)	FAN RPM	HORSE POWER	ELECTRICAL CONNECTION					INTERLOCKED WITH	FAN TYPE	MANUFACTURER	MODEL	REMARKS
					V	PH	F	MCA	MOCP					
EF-1	50	0.353	750	0.036	120	1	60	5.5	15	LIGHTS	CEILING MOUNTED	COOK	GC-128	1,2,3
EF-2	50	0.353	750	0.036	120	1	60	5.5	15	LIGHTS	CEILING MOUNTED	COOK	GC-128	1,2,3
EF-3	160	0.455	1,075	0.167	120	1	60	5.5	15	DIGITAL TIMER	INLINE	COOK	SQI-D	1,2,3
REF-1	210	0.400	1,243	0.125	120	1	60	5.5	15	DIGITAL TIMER	ROOF MOUNTED	COOK	ACE-D	ALL

GENERAL NOTES:
1. EXTERNAL STATIC PRESSURE INCLUDES LOSSES DUE TO DUCTWORK, AIR DEVICES AND DAMPERS. UNIT CASING MUST BE ADDED TO EXTERNAL STATIC PRESSURE TO OBTAIN TOTAL PRESSURE LOSS. INCREASE HORSEPOWER AS REQUIRED TO MEET YOUR TOTAL PRESSURE LOSS. COORDINATE WITH ELECTRICIAN.
2. MAINTAIN MINIMUM CLEARANCE AS REQUIRED TO OPEN ACCESS AND CONTROL DOORS ON UNIT FOR SERVICE, MAINTENANCE, AND INSPECTION. MAINTAIN MINIMUM ELECTRICAL CLEARANCE AS REQUIRED BY NEC.

REMARKS:
1. COORDINATE WITH THE ELECTRICAL DRAWINGS AND ELECTRICAL CONTRACTOR FOR WIRING EXHAUST FANS TO THE ASSOCIATED LIGHT SWITCH OR DIGITAL TIMER.
2. PROVIDE WITH DISCONNECT.
3. PROVIDE WITH AUTOMATIC BACKDRAFT DAMPER.
4. PROVIDE 14" ROOF CURB TO MATCH SLOPE OF ROOF.

GRILLES, REGISTERS AND DIFFUSERS

MARK	DESCRIPTION	FACE WIDTH	FACE LENGTH	NECK SIZE	MAX AIRFLOW (CFM)	MAX AIR P.D., IN. H2O	MAX N.C.	MANUFACTURER	MODEL.	REMARKS
		30.0	18.0	30/18	650			PRICE		
A	SQUARE PLAQUE DIFFUSER	12.0	12.0	6"ø	110	0.1	25	PRICE	ASPD	1,2
B	SQUARE PLAQUE DIFFUSER	24.0	24.0	6"ø	110	0.1	25	PRICE	ASPD	1,2
C	SQUARE PLAQUE DIFFUSER	24.0	24.0	8"ø	230	0.1	25	PRICE	ASPD	1,2
D	SQUARE PLAQUE DIFFUSER	12.0	12.0	8"ø	230	0.1	25	PRICE	ASPD	1,2
E	SQUARE PLAQUE DIFFUSER	24.0	24.0	10"ø	415	0.1	25	PRICE	ASPD	1,2
F	PERFORATED DIFFUSER	24.0	24.0	10"ø	415	0.1	25	PRICE	PDF	1,2
G	45° SINGLE DEFLECTION BLADES W/ 3/4" SPACING	10.0	4.0	10/4	480	0.1	25	PRICE	SDG	3
H	45° SINGLE DEFLECTION BLADES W/ 3/4" SPACING	6.0	6.0	6/6	160	0.1	25	PRICE	620	-
I	45° SINGLE DEFLECTION BLADES W/ 3/4" SPACING	8.0	8.0	8/8	185	0.05	20	PRICE	630	3
J	EXHAUST AIR OUTLET	9.0	9.0	6"ø	75	-	-	BROAN	843BL	4
K	EXHAUST AIR OUTLET	12.0	12.0	8"ø	160	-	-	BROAN	643	4
S	STEEL TRANSFER GRILLE	30.0	18.0	30/18	350	0.05	20	PRICE	STG	6
T	EGG CRATE GRILLE WITH 0 DEGREE CORE	20.0	14.0	20/14	1520	0.1	25	PRICE	80	3
U	45° SINGLE DEFLECTION BLADES W/ 3/4" SPACING	12.0	12.0	12/12	375	0.05	20	PRICE	630	5
V	PERFORATED RETURN DIFFUSER	16.0	16.0	16/16	640	0.05	20	PRICE	630	5
W	PERFORATED RETURN DIFFUSER	24.0	24.0	10/10	350	0.05	20	PRICE	PDDR	3
X	PERFORATED RETURN DIFFUSER	24.0	24.0	12/12	500	0.05	20	PRICE	PDDR	3
Y	PERFORATED RETURN DIFFUSER	24.0	24.0	14/14	700	0.05	20	PRICE	PDDR	3
Z	PERFORATED RETURN DIFFUSER	24.0	24.0	18/18	1350	0.05	20	PRICE	PDDR	3

GENERAL NOTES:
1. COORDINATE EXACT GRILLE AND DIFFUSER LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS.
2. WHERE MULTIPLE WALL MOUNTED REGISTERS ARE INSTALLED IN A ROOM, THE REGISTERS SHALL BE ALIGNED ON THE CENTER POINT OF EACH REGISTER.
3. ALL CEILING DIFFUSERS SHALL BE 4-WAY THROW TYPE UNLESS NOTED OTHERWISE.
4. COORDINATE WITH ARCHITECT'S REFLECTED CEILING PLAN FOR MOUNTING TYPE AND PROVIDE MANUFACTURER RECOMMENDED MOUNTING HARDWARE.

REMARKS:
1. DUCT MOUNTED BALANCING DAMPERS SHALL BE FURNISHED AND INSTALLED WHERE RUNOUT IS ABOVE AN ACCESSIBLE CEILING. IN LOCATIONS ABOVE HARD CEILINGS, DIFFUSERS SHALL BE FURNISHED WITH OPPOSED BLADE DAMPER OPERABLE THRU DIFFUSER FACE.
2. THE HARD DUCT TAP FITTING AND FLEXIBLE DUCT CONNECTION SHALL BE SIZED TO EQUAL THE DIAMETER FOR THE DIFFUSER CONNECTION.
3. REGISTERS SHALL BE FURNISHED WITH OPPOSED BLADE DAMPER OPERABLE THRU REGISTER FACE.
4. COORDINATE WITH ARCHITECT FOR FINAL COLOR SELECTION PRIOR TO CONSTRUCTION.
5. AIR TERMINAL SHALL BE OPEN TO PLENUM SPACE ABOVE AND HAVE NO DUCTWORK CONNECTED TO THE NECK.
6. PAINT TO MATCH ADJACENT WALL.

BASIS OF DESIGN

THE MANUFACTURER AND MODEL NUMBER LISTED IN THE DRAWINGS OR SPECIFICATIONS ARE THE BASIS OF DESIGN. WHEN PROVIDING EQUIPMENT THAT IS NOT THE BASIS OF DESIGN, THE CONTRACTOR SHALL PROVIDE AN ITEMIZED LIST OF ALL DEVIATIONS FROM THE INFORMATION DETAILED IN BOTH THE SPECIFICATION SECTION AND SCHEDULE. ADDITIONALLY, THE EQUIPMENT MUST MEET THE PHYSICAL CONSTRAINTS OF ROOM INCLUDING COORDINATION WITH OTHER TRADES AND ALL EQUIPMENT CLEARANCES, INCLUDING OTHER TRADES. FINALLY, THE CONTRACTOR SHALL PROVIDE AT THE CONTRACTOR'S COST ANY SCOPE INCREASE AND DEDUCTIONS BASED ON THE NON-BASIS OF DESIGN EQUIPMENT FOR THE FOLLOWING MINIMUM ITEMS:

- ELECTRICAL MODIFICATIONS, INCLUDING WIRING, CONDUIT, DISCONNECTS, OVERCURRENT PROTECTION, PANELS, ETC.
- STRUCTURAL MODIFICATIONS.
- CIVIL MODIFICATIONS.
- PLUMBING MODIFICATIONS.
- DUCT AND PIPE CONNECTIONS OR ARRANGEMENTS.
- SPACE HEATING AND COOLING REQUIREMENTS.
- EXHAUST OR VENTILATION MODIFICATIONS.
- VIBRATION ISOLATION REQUIREMENTS.
- **CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE EQUIPMENT MANUFACTURER FOR ANY CHANGES TO THE REFRIGERANTS REQUIRED PER NEW EPA GUIDELINES. CONTRACTOR SHALL COORDINATE WITH OTHER DISCIPLINES FOR CHANGES IN EQUIPMENT SIZE OR ELECTRICAL REQUIREMENTS.**

HVAC EQUIPMENT SIZES ARE BASED UPON ASHRAE 2021 WEATHER DATA AS LISTED BELOW.
HEATING AND COOLING DESIGN CONDITION LOCATION: ***ROANOKE, VA***
SUMMER:
- OUTDOOR CONDITIONS: ***92.1°F DB, 72.6 WB***
- INDOOR SETPOINTS: ***75°F DB 50% RH***

WINTER:
- OUTDOOR CONDITIONS: ***12°F DB***
- INDOOR SETPOINTS: ***72°F DB 35% RH***

BALZER & ASSOCIATES
PLANNERS / ARCHITECTS
ENGINEERS / SURVEYORS
Roanoke / Richmond
Shenandoah Valley
New River Valley
www.balzer.cc

COMMONWEALTH OF VIRGINIA
02/14/2025
SAMUEL S. LOTT
Lic. No. 061900
PROFESSIONAL ENGINEER

50+ Years
RAM HOUSE
#iamramfam

LIONBERGER CONSTRUCTION

RAM HOUSE
ALTERATIONS & ADDITION
410 ELM AVE
ROANOKE CITY, VIRGINIA

MECHANICAL GENERAL NOTES, SCHEDULES, AND SYMBOLS

DRAWN BY	MDA
DESIGNED BY	MDA
CHECKED BY	SSL
DATE	02/14/2025
SCALE	NONE
REVISIONS	

M0.01
PROJECT NO 03230086.00

Salas O'Brien
salasobrien.com 540-952-9651
Project No: 2550-00213-00

Roanoke
119 Norfolk Avenue, Suite 310
Roanoke, Virginia 24011

BALZER & ASSOCIATES
PLANNERS / ARCHITECTS
ENGINEERS / SURVEYORS
Roanoke / Richmond
Shenandoah Valley
New River Valley
www.balzer.cc
1208 Corporate Circle
Roanoke, VA 24018
540.772.9580

COMMONWEALTH OF VIRGINIA
02/14/2025
SAMUEL S. LOTT
Lic. No. 061900
PROFESSIONAL ENGINEER

50+ Years RAM HOUSE #iamramfam

LIONBERGER CONSTRUCTION

MECHANICAL SPECIFICATIONS

GENERAL

1. PERFORM WORK IN ACCORDANCE WITH APPLICABLE STATUTES, ORDINANCES, CODES AND REGULATIONS OF GOVERNMENTAL AUTHORITIES HAVING JURISDICTION.
2. OBTAIN ALL PERMITS REQUIRED.
3. CONTRACT DRAWINGS ARE DIAGRAMMATIC ONLY AND DO NOT GIVE FULLY DIMENSIONED LOCATIONS OF VARIOUS ELEMENTS OF WORK. DETERMINE EXACT LOCATIONS FROM FIELD MEASUREMENTS.
4. GUARANTEE WORK FOR 1 YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION OF HE PROJECT. DURING THAT PERIOD MAKE GOOD ANY FAULTS OR IMPERFECTIONS THAT MAY ARISE DUE TO DEFECTS OR OMISSIONS IN MATERIAL, EQUIPMENT OR WORKMANSHIP. AT THE OWNER'S OPTION, REPLACEMENT OF FAILED PARTS OR EQUIPMENT SHALL BE PROVIDED.
5. IMMEDIATELY PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT, REPLACE AIR FILTERS.
6. PROVIDE EQUIPMENT HOUSEKEEPING PADS UNDER ALL FLOOR MOUNTED AND GROUND MOUNTED HVAC EQUIPMENT, AND AS SHOWN ON THE DRAWINGS. CONCRETE PADS ARE TO BE 4" THICK UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
7. PROVIDE NAMEPLATES WITH 1/2" HIGH LETTERS AND FASTENED WITH EPOXY OR SCREWS.
8. MAINTAIN QUALITY CONTROL OVER SUPERVISION, SUBCONTRACTORS, SUPPLIERS, MANUFACTURERS, PRODUCTS, SERVICES, SITE CONDITIONS AND WORKMANSHIP TO PRODUCE WORK IN ACCORDANCE WITH CONTRACT DOCUMENTS.
9. COMPLY WITH INDUSTRY STANDARDS EXCEPT WHEN MORE RESTRICTIVE TOLERANCES OR SPECIFIED REQUIREMENTS INDICATE MORE RIGID STANDARDS OR MORE PRECISE WORKMANSHIP.
10. PERFORM WORK BY PERSONS QUALIFIED TO PRODUCE WORKMANSHIP OF SPECIFIED QUALITY.
11. SECURE PRODUCTS IN PLACE WITH POSITIVE ANCHORAGE DEVICES DESIGNED AND SIZED TO WITHSTAND STRESSES, VIBRATION, AND RACKING. UNDER NO CONDITIONS SHALL MATERIAL OR EQUIPMENT BE SUSPENDED FROM STRUCTURAL BRIDGING.
12. PROVIDE FINISHES TO MATCH APPROVED SAMPLES. ALL EXPOSED FINISHES SHALL BE APPROVED BY THE ARCHITECT. SUBMIT COLOR SAMPLES AS REQUIRED.
13. COMPLY WITH INSTRUCTIONS IN FULL DETAIL, INCLUDING EACH STEP IN SEQUENCE. SHOULD INSTRUCTION CONFLICT WITH CONTRACT DOCUMENTS, REQUEST CLARIFICATION FROM ARCHITECT / ENGINEER BEFORE PROCEEDING.

MECHANICAL ALTERATIONS

1. INSPECT AND SERVICE EXISTING EQUIPMENT AND MATERIALS THAT ARE TO REMAIN OR TO BE REUSED.
2. DISPOSAL OF EQUIPMENT, MATERIALS, OR HOUSEKEEPING PADS TO BE ABANDONED. PRIOR TO DISPOSAL, THE CONTRACTOR SHALL VERIFY WITH THE OWNER WHAT IS TO BE SALVAGED BY THE OWNER AND WHAT IS TO BECOME THE PROPERTY OF THE CONTRACTOR.
3. HANDLING OF EQUIPMENT AND MATERIALS TO BE REMOVED.
4. INSPECTION: EXISTING MATERIALS AND EQUIPMENT INDICATED ON THE DRAWINGS OR IN THE SPECIFICATIONS TO BE REUSED SHALL BE INSPECTED FOR DAMAGED OR MISSING PARTS. CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER, IN WRITING, ACCORDINGLY. IF USING MATERIALS SPECIFIED OR SHOWN ON THE DRAWING VOIDS OR DIMINISHES THE WARRANTY OR OPERATION OF REMAINING EQUIPMENT OR SYSTEMS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER, IN WRITING. DEMOLITION DRAWINGS ARE BASED ON CASUAL FIELD OBSERVATION, AND WHEN AVAILABLE, EXISTING RECORD DOCUMENTS. REPORT DISCREPANCIES TO ARCHITECT BEFORE DISTURBING EXISTING INSTALLATION, AND IMMEDIATELY AFTER SUCH DISCREPANCIES ARE DISCOVERED.
5. APPLICATION: EXISTING MATERIALS AND EQUIPMENT INDICATED ON THE DRAWINGS OR IN THE SPECIFICATIONS TO BE REUSED SHALL BE CLEANED AND RECONDITIONED, INCLUDING CLEANING OF PIPING SYSTEMS AND HVAC COILS PRIOR TO INSTALLATION AND REUSE. MATERIAL AND EQUIPMENT REMOVED THAT IS NOT TO BE SALVAGED FOR OWNER'S USE OR FOR REUSE ON THE PROJECT SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND BE REMOVED FROM THE SITE. MATERIAL OR EQUIPMENT SALVAGED FOR OWNER'S USE SHALL BE CAREFULLY HANDLED AND STORED WHERE DIRECTED BY THE OWNER OR THE ARCHITECT/ENGINEER. RELOCATE MATERIAL AND / OR EQUIPMENT AS DIRECTED BY OWNER. MATERIALS AND EQUIPMENT NOT INDICATED TO BE REMOVED OR ABANDONED SHALL BE RECONNECTED TO THE NEW SYSTEM. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL WALK AREAS TO BE RENOVATED WITH OWNER TO IDENTIFY AND DOCUMENT ITEMS TO BE SALVAGED FOR OWNER'S USE.
6. SEQUENCE AND SCHEDULE: COORDINATE UTILITY SERVICE OUTAGES WITH UTILITY COMPANY, ARCHITECT AND OWNER. REMOVE CONCRETE HOUSEKEEPING PAD WHERE MATERIALS OR EQUIPMENT HAVE BEEN REMOVED.

TESTING, BALANCING, AND ADJUSTING

1. VERIFY AND RECORD THE TESTING RESULTS PERFORMED BY THE MECHANICAL CONTRACTOR.
2. THE OUTSIDE AIR, SUPPLY AIR, RETURN AIR, AND EXHAUST AIR FOR THE SYSTEM SHALL BE ADJUSTED TO WITHIN +/- 10 % OF THE VALUE SCHEDULED ON THE DRAWINGS.
3. SUPPLY FANS: TEST AND ADJUST FAN RPM TO ACHIEVE DESIGN CFM REQUIREMENTS. TEST AND RECORD MOTOR VOLTAGE AND AMPERAGES. COMPARE DATA WITH THE NAMEPLATE LIMITS TO ENSURE FAN MOTOR IS NOT IN OR ABOVE THE SERVICE FACTOR. TEST AND ADJUST THE OUTSIDE AIR ON APPLICABLE EQUIPMENT USING A PITOT-TUBE TRAVERSE.
4. EXHAUST FANS: TEST, ADJUST, AND BALANCE EACH DIFFUSER, GRILLE, AND REGISTER TO WITHIN 10 % OF DESIGN REQUIREMENTS. OBSERVE THROWS ARE IN DIRECTION AS INDICATED ON DRAWINGS. ONCE AIR FLOWS ARE SET TO ACCEPTABLE LIMITS, TAKE WET BULB AND DRY BULB AIR TEMPERATURES ON THE ENTERING AND LEAVING SIDE OF EACH COIL (COOLING ONLY).
5. DIRECT EXPANSION EQUIPMENT: WITH EACH UNIT OPERATING AT NEAR DESIGN CONDITIONS, MEASURE AND RECORD THE FOLLOWING: MANUFACTURER, MODEL NUMBER, SERIAL NUMBER AND ALL NAMEPLATE DATA. AMBIENT TEMPERATURE, CONDENSER DISCHARGE TEMPERATURE. AMPERAGE AND VOLTAGE FOR EACH PHASE. LEAVING AND ENTERING AIR TEMPERATURES. SUCTION AND DISCHARGE PRESSURES AND TEMPERATURES. TONS OF COOLING. VERIFICATION THAT MOISTURE INDICATOR SHOWS DRY REFRIGERANT.
6. TAB REPORT: THE ACTIVITIES DESCRIBED IN THIS SECTION SHALL BE RECORDED IN REPORT FORM TO BE PROVIDED IN QUADRUPLICATE (4), INDIVIDUALLY BOUND, TO THE ARCHITECT AND ENGINEER. NEATLY TYPE AND ARRANGE DATA. INCLUDE WITH THE DATA THE DATE TESTED, PERSONNEL PRESENT, WEATHER CONDITIONS, NAMEPLATE RECORD OF THE TEST INSTRUMENTS USED AND LIST ALL MEASUREMENTS TAKEN AFTER ALL CORRECTIONS ARE MADE TO THE SYSTEM. RECORD ALL FAILURES AND CORRECTIVE ACTION TAKEN TO REMEDY ANY INCORRECT SITUATION. THE INTENT OF THE FINAL REPORT IS TO PROVIDE A REFERENCE OF ACTUAL OPERATING CONDITIONS FOR THE OWNER'S OPERATIONS PERSONNEL.

REFRIGERANT PIPING

1. REFRIGERANT PIPING: TYPE K SOFT-DRAWN COPPER TUBING WITH SWEAT-TYPE, WROUGHT COPPPER FITTINGS. CAST FITTINGS ARE NOT PERMITTED.
2. PRESSURE TEST: CHARGE THE SYSTEM WITH DRY NITROGEN AND TEST TO 300 PSIG. TEST JOINTS WITH A HALIDE TORCH OR AN ELECTRONIC LEAK DETECTOR. RETEST SYSTEM UNTIL PROVEN TIGHT.
3. EVACUATION AND DRYING: AFTER REFRIGERANT SYSTEM HAS BEEN PRESSURE TESTED, CONNECT A SUITABLE VACUUM PUMP AND EVACUATE PIPING SYSTEM, INCLUDING LINES AND EQUIPMENT. MAINTAIN A VACUUM AS HIGH AS PRACTICABLE FOR LONG ENOUGH TO EVAPORATE THE MOISTURE IN THE SYSTEM (AT LEAST 48 HOURS). CHECK THE HUMIDITY WITHIN THE SYSTEM WITH A WET BULB INDICATOR, AND MAINTAIN THE VACUUM UNTIL THE WET BULB TEMPERATURE IS REDUCED TO -40°F. AFTER THE SYSTEM HAS BEEN EVACUATED AND DRIED, BREAK THE VACUUM BY CHARGING PROPER REFRIGERANT INTO THE SYSTEM.
4. INSULATION: ELASTOMERIC INSULATION WITH A MINIMUM THICKNESS OF 3/4" WITH A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS. THERMAL CONDUCTIVITY OF 0.27 AT 75°F MEAN (ASTM C177 OR C 518). INSULATION TO BE ARMSTRONG OR APPROVED EQUAL. ALL INSULATION IS TO BE COVERED BY SMOOTH FABRICATED Z-LOCK ALUMINUM JACKET 0.016" THICK WITH A FACTORY APPLIED 1 MIL POLYETHYLENE/40LB AND FAB STRAP. KRAFT MOISTURE BARRIER. CHILDER LOCK-ON OR APPROVED EQUAL.

DUCTWORK

1. DUCT MATERIAL AND CONSTRUCTION: USE LOCK FORMING QUALITY PRIME GALVANIZED STEEL SHEETS OR COILS UP TO 60" WIDE. STENCIL EACH SHEET WITH GAUGE AND MANUFACTURER'S NAME. STENCIL COILS OF SHEET STEEL THROUGHOUT ON 10' CENTERS WITH GAUGE AND MANUFACTURER'S NAME. PROVIDE CERTIFICATION OF DUCT GAUGE AND MANUFACTURER FOR EACH SIZE DUCT.
2. RECTANGULAR LOW DUCT CONSTRUCTED OF SHEET METAL IN ACCORDANCE WITH THE LATEST EDITION OF SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
3. LOW PRESSURE ROUND DUCTS SHALL BE SHOP FABRICATED WITH SNAP LOCK LONGITUDINAL SEAMS. DUCTS SHALL BE CONSTRUCTED FOR A MINIMUM OF 2" W.G. STATIC PRESSURE. MEDIUM PRESSURE ROUND DUCTWORK SHALL BE WELDED SPIRAL SEAM SUCH AS MANUFACTURED BY UNITED SHEET METAL COMPANY. KITCHEN EXHAUST DUCT: WELDED BLACK STEEL, MINIMUM 16 GAUGE. SHOWER AREA EXHAUST SYSTEMS: WELDED 304 STAINLESS STEEL.
4. FLEXIBLE DUCT LOW PRESSURE SHALL BE A CONTINUOUS GALVANIZED SPRING STEEL WIRE HELIX, WITH REINFORCED METALIZED COVER, REINFORCED VAPOR BARRIER JACKET RATED FOR USE AT SYSTEM PRESSURE (6" WC MINIMUM). THERMAL CHARACTERISTICS OF R-6 BTU/HR/SQ. FT./°F AND 2" WALL THICKNESS INSULATION WITH 1" OVERLAP. ACCEPTABLE MANUFACTURERS: FLEXMASTER, HART & COOLEY, OMNIAIR
5. ACCEPTABLE MANUFACTURERS: FLEXMASTER, THERMOFLEX, OMNIAIR.
6. FIRE DAMPERS: FIRE DAMPERS FOR REQUIRED WALL RATINGS THAT ARE 95% MINIMUM FREE AREA. PROVIDE TYPE B OR TYPE C UL DAMPERS FOR LOW, MEDIUM AND HIGH-PRESSURE RECTANGULAR, SQUARE OR ROUND DUCTS. DAMPERS SHALL BE ACTIVATED BY A FUSIBLE LINK DESIGNED TO REACT AT 165°F. INSTALL PER MANUFACTURERS RECOMMENDATIONS TO PROVIDE A UL ASSEMBLY. PROVIDE SEALED SLEEVE TO MEET DESIRED LEAKAGE PERFORMANCE.
7. WALL LOUVERS: REFER TO SCHEDULE ON DRAWINGS. COORDINATE WITH ARCHITECTURAL DRAWINGS. ALL LOUVER FRAMES SHALL BE A MINIMUM OF 0.08" EXTRUDED ALUMINUM. ALL BLADES SHALL BE A MINIMUM OF 0.081" EXTRUDED ALUMINUM. BEGINNING POINT OF WATER PENETRATION AT 0.01 OZ/SQ.FT. SHALL BE A MINIMUM OF 800 FT/MIN. PROVIDE ALL LOUVERS WITH REMOVABLE ALUMINUM BIRD SCREEN WITH 1/4" MESH.
8. VOLUME DAMPERS: MANUAL BALANCING DAMPERS THAT MEET OR EXCEED THE FOLLOWING MINIMUM CONSTRUCTION STANDARDS: FRAME 16-GAUGE, BLADES 16-GAUGE, BEARINGS CORROSION RESISTANT, OPPOSED BLADE DAMPERS.
9. INSTALLATION: USE CONSTRUCTION METHODS AND REQUIREMENTS AS OUTLINED IN SMACNA HVAC DUCT CONSTRUCTION STANDARDS AS WELL AS SMACNA BALANCING AND ADJUSTING PUBLICATIONS, UNLESS INDICATED OTHERWISE IN THE SPECIFICATIONS. REFER TO DETAILS ON THE DRAWINGS FOR ADDITIONAL INFORMATION. REINFORCE DUCTS IN ACCORDANCE WITH RECOMMENDED CONSTRUCTION PRACTICE OF SMACNA. PROVIDE ADDITIONAL REINFORCEMENT OF LARGE PLENUMS AS REQUIRED TO PREVENT EXCESSIVE FLEXING AND OR VIBRATION.

DUCTWORK INSULATION

1. FURNISH AND INSTALL EXTERNAL INSULATION ON SUPPLY, RETURN, EXHAUST AND FRESH AIR DUCTWORK.
2. ALL DUCT INSULATION USED ON THE PROJECT INSIDE THE BUILDING MUST HAVE A FLAME SPREAD RATING NOT EXCEEDING 25 AND A SMOKE DEVELOPED RATING NOT EXCEEDING 50 AS DETERMINED BY TEST PROCEDURES ASTM E84, NFPA 255 AND UL 723.
3. CONDENSATION ON ANY INSULATED SYSTEM IS NOT APPROVED.
4. WHERE EXISTING INSULATED DUCTWORK OR OTHER SERVICES ARE TAPPED, REMOVE EXISTING INSULATION BACK TO UNDAMAGED SECTIONS AND REPLACE WITH NEW INSULATION OF THE SAME TYPE AND THICKNESS AS EXISTING INSULATION.
5. INSULATION: GLASS FIBER BLANKET DUCT INSULATION. ACCEPTABLE MANUFACTURERS ARE: MANVILLE R-SERIES MICROLITE FSKL, OWENS-CORNING ED100 RKF, KNAUF 1.0 PCF FSK.
6. FIREBOARD INSULATION: TOTALLY ENCAPSULATED WITH FOIL FACING, TWO HOUR RATED FIRE PROTECTION, ZERO CLEARANCE TO COMBUSTIBLE PROTECTION. ACCEPTABLE MANUFACTURERS ARE: PARTAK INSULATION, INC., PAROC FIREBOARD, THERMAL CERAMICS FIREMASTER 3M, PREMIER REFACTORIES INTERNATIONAL, PYROSCAT.
7. REINFORCED FOIL TAPE: ACCEPTABLE MANUFACTURERS ARE: VENTURE 1525CW, 3" FSK.
8. KITCHEN GREASE EXHAUST DUCTWORK / KILN DUCTWORK / FUME HOOD DUCT: SECURE FIREBOARD INSULATION TO DUCT WITH IMPALING PINS AND 3" SQUARE SPEED CLIPS. IN ADDITION, PROVIDE A WIRE MESH SUPPORT SYSTEM AND ADDITIONAL SEALING OR SUPPORT AS REQUIRED BY THE CODE ENFORCING AUTHORITY. THE INSULATION SUPPORT SYSTEM SHALL INCLUDE FRAMED ACCESS TO ALLOW THE INSULATION TO BE REMOVED AND REPLACED WITHOUT DAMAGE AT THE ACCESS DOORS IN THE DUCT SYSTEM FOR INSPECTION AND CLEANING. COORDINATE LOCATION OF ACCESS OPENINGS TO CORRESPOND ACCURATELY. PROVIDE STAINLESS STEEL BANDING ON 12" CENTERS.
9. COORDINATE WITH PRE-FABRICATED EXTERIOR DUCTWORK MANUFACTURER FOR SPECIFICATIONS AND DETAILS.

SMOKE DETECTORS

1. ACCEPTABLE MANUFACTURERS: AUTOCALL, SIMPLEX, SIEMENS, NOTIFIER, GAMEWELL, PYROTRONICS.
2. THE UNIT SHALL CONSIST OF A CLEAR MOLDED PLASTIC ENCLOSURE (OR REMOTE MOUNTED LED STATUS INDICATOR SHALL BE PROVIDED NEXT TO THE SMOKE DETECTOR) WITH INTEGRAL CONDUIT KNOCKOUTS TO PROVIDE VISUAL VIEWING OF DETECTOR/SENSOR FOR MONITORING SENSOR OPERATION AND CHAMBER CONDITION. THE DUCT HOUSING SHALL BE PROVIDED WITH GASKET SEALS TO INSURE PROPER SEATING OF THE HOUSING TO THE ASSOCIATED DUCTWORK. EACH UNIT'S SAMPLING TUBES SHALL EXTEND THE WIDTH OF THE DUCT AND BE PROVIDED WITH POROSITY FILTERS TO REDUCE SENSOR/CHAMBER CONTAMINATION.
3. COMPLY WITH NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) SECTIONS NFPA 72, NFPA 90A, NFPA 101
4. TO MINIMIZE NUISANCE ALARMS, DETECTORS SHALL HAVE AN INSECT SCREEN AND BE DESIGN TO IGNORE INVISIBLE AIRBORNE PARTICLES OR SMOKE DENSITIES THAT ARE BELOW THE FACTORY SET ALARM POINT. NO RADIOACTIVE MATERIAL SHALL BE USED. THE DETECTOR HEAD SHALL BE DIRECTLY INTERCHANGEABLE WITH AN IONIZATION DETECTOR TYPE.
5. INSTALL AS PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE ALL NECESSARY WIRING, POWER AND OTHER DEVICES FOR INSTALLATION. INTERLOCK THE SMOKE DETECTOR WITH THE RELATED AIR HANDLING EQUIPMENT TO PROVIDE AUTOMATIC SHUT-DOWN OF THE SYSTEM WHENEVER PRODUCTS OF COMBUSTION ARE DETECTED.

KITCHEN HOOD FIRE SUPPRESSION

1. PROVIDE AN AUTOMATIC FIRE SUPPRESSION SYSTEM USING A WET CHEMICAL AGENT FOR GREASE RELATED FIRES.
2. FURNISH ALL ARTICLES OF A COMPLETED SUPPRESSION SYSTEM INCLUDING ALL MATERIALS, LABOR, TOOLS, EQUIPMENT, TRANSPORTATION SERVICES AND SUPERVISION FEES.
3. THE SYSTEM SHALL BE CAPABLE OF SUPPRESSING FIRES IN THE FOLLOWING AREAS ASSOCIATED WITH COOKING EQUIPMENT: VENTILATING EQUIPMENT INCLUDING HOODS, DUCTS, PLENUMS, AND FILTERS; FRYERS; GRIDDLES AND RANGE TOPS; UPRIGHT, NATURAL CHARCOAL, OR CHAIN-TYPE BROILERS; ELECTRIC, LAVA ROCK, MESQUITE OR GAS-RADIANT CHAR-BROILERS.
4. THE SYSTEM SHALL BE THE PRE-ENGINEERED TYPE HAVING MINIMUM AND MAXIMUM GUIDELINES ESTABLISHED BY THE MANUFACTURER, NFPA 96 AND LISTED BY UNDERWRITERS LABRATORIES, INC. (UL).
5. THE SYSTEM SHALL BE INSTALLED AND SERVICED BY PERSONNEL TRAINED BY THE MANUFACTURER.
6. THE SYSTEM SHALL BE CAPABLE OF PROTECTING COOKING APPLIANCES BY UTILITIZING EITHER DEDICATED APPLIANCE PROTECTION AND/OR OVERLAPPING APPLIANCE PROTECTION.
7. THE SYSTEM SHALL BE MANUFACTURED BY ANSUL FIRE PROTECTION.
8. THE SYSTEM SHALL CONSIST OF A REGULATED RELEASE ASSEMBLY WHICH INCLUDES A REGULATED RELEASE MECHANISM AND A WET CHEMICAL STORAGE TANK(S) HOUSED WITHIN A SINGLE ENCLOSURE. NOZZLES, BLOW-OFF CAPS, DETECTORS, CARTRIDGES, AGENT, FUSIBLE FUSIBLE LINKS, AND PULLEY ELBOWS SHALL BE SUPPLIED AS NECESSARY IN THE QUANTITIES NEEDED FOR FIRE SUPPRESSION SYSTEM ARRANGEMENTS. ADDITIONAL EQUIPMENT SHALL INCLUDE REMOTE MANUAL PULL STATION, MECHANICAL AND ELECTRICAL GAS VALVES, PRESSURE SWITCHES, AND ELECTRICAL SWITCHES FOR AUTOMATIC EQUIPMENT AND GAS LINE SHUT-OFF SHALL BE PROVIDED AS NECESSARY TO MEET THE UL & CODE REQUIREMENTS.
9. THE FIRE SUPPRESSION SYSTEM SHALL BE DESIGNED, INSTALLED, INSPECTED, MAINTAINED, AND RECHARGED IN ACCORDANCE WITH THE MANUFACTURER'S LISTED INSTRUCTION.

FANS

1. PROVIDE FAN TYPE, ARRANGEMENT, ROTATION, CAPACITY, SIZE, MOTOR HORSEPOWER, AND MOTOR VOLTAGE AS SHOWN. FAN CAPACITIES AND CHARACTERISTICS ARE SCHEDULED ON THE DRAWINGS. PROVIDE FANS CAPABLE OF ACCOMMODATING STATIC PRESSURE VARIATIONS OF +10% OF SCHEDULED DESIGN AT THE DESIGN AIR FLOW.
2. ACCEPTABLE MANUFACTURERS: COOK, GREENHECK, PENN VENTILATOR, ACME, CARNES, TWIN CITY
3. SAFETY DISCONNECT SWITCH: PROVIDE A FACTORY-WIRED TO MOTOR, SAFETY DISCONNECT SWITCH ON EACH UNIT.
4. PREFABRICATED ROOF CURBS: FURNISH PREFABRICATED ROOF CURBS AS DETAILED. THE MINIMUM HEIGHT IS 14". INCLUDE A RESILIENT PAD ON EACH ROOF CURB SO THE EQUIPMENT CAN BE MOUNTED ON THE TOP FLANGE FOR PROPER SEAL. COORDINATE ROOF SLOPE AND CURB TO ENSURE EQUIPMENT IS INSTALLED IN LEVEL POSITION. PROVIDE DOUBLE SHELL TO PROTECT INSULATION FROM DAMAGE.
5. DAMPERS. WHERE AUTOMATIC BACKDRAFT DAMPER IS SCHEDULED: MULTI-BLADED, ROLL FORMED ALUMINUM BLADES, NYLON BEARINGS, NEOPRENE WEATHER STRIP ON BLADE EDGE.
6. FURNISH KITCHEN HOOD EXHAUST FANS WITH VENTED CURB EXTENSION THAT MEETS NFPA 96, CLEANOUT PORT, GREASE TAP, CURB SEAL, DRAIN CONNECTION AND HINGE KIT.
7. ROOFTOP VENTILATION AND EXHAUST SYSTEMS: PROVIDE EACH MOTOR WITH INTERNAL OVERLOAD PROTECTION, ALUMINUM, STAINLESS STEEL OR PLASTIC COATED BIRD GUARD, SCREWS AND FASTENERS OF STAINLESS STEEL OR NONFERROUS MATERIAL, ALL ALUMINUM CONSTRUCTION UNLESS INDICATED OTHERWISE ON FAN SCHEDULE, WELDED CONSTRUCTION, CORROSION RESISTANT FASTENERS, MINIMUM 16 GAUGE MARINE ALLOY ALUMINUM, ALUMINUM BASE SHALL BE CONTINUOUSLY WELDED CURB CAP CORNERS.

SINGLE PACKAGED ROOFTOP AIR CONDITIONERS

1. PROVIDE AND INSTALL A SINGLE-PACKAGE, SINGLE-ZONE, ELECTRIC AIR CONDITIONER WITH ELECTRIC HEAT FOR ROOFTOP APPLICATION.
2. PERFORMANCE: AS SCHEDULED ON DRAWINGS, WITH HEAD PRESSURE CONTROL TO ENABLE UNIT START AND OPERATE DOWN TO 20 DEGREES F AMBIENT.
3. ACCEPTABLE MANUFACTURERS: CARRIER, YORK/JCI, TRANE.
4. COMPRESSOR: PROVIDE A THERMALLY PROTECTED, SERVICEABLE SEMI-HERMETIC COMPRESSOR OR HERMETIC COMPRESSOR WITH SERVICE VALVES, VIBRATION ISOLATION, CRANKCASE HEATERS, SLIGHT GLASS AND FILTER DRIER. PROVIDE WITH A 5-YEAR WARRANTY.
5. EVAPORATOR AND CONDENSER COILS: PROVIDE COPPER TUBES WITH MECHANICALLY BONDED ALUMINUM FINS FOR EVAPORATOR AND CONDENSER COILS. PROVIDE HAIL GUARDS FOR CONDENSER COILS.
6. ROOF CURB: INSTALL A ROOF CURB OF THE SAME MANUFACTURE AS THE AIR CONDITIONER UNIT. CURB TO SUPPORT THE UNIT AND PROVIDE A WATERTIGHT ENCLOSURE TO PROTECT DUCTWORK AND UTILITY SERVICES. USE A DESIGN COMPLYING WITH NATIONAL ROOFING CONTRACTORS ASSOCIATION REQUIREMENTS. LEVEL CURB ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. THERMOSTAT ASSEMBLY: PROVIDE STAGED 7-DAY PROGRAMMABLE HEATING AND COOLING AS REQUIRED, AUTOMATIC CHANGEOVER AND FAN CONTROL.
8. HEAD PRESSURE CONTROL: PROVIDE SOLID STATE OUTDOOR AIR FAN SPEED CONTROL TO PERMIT UNIT TO OPERATE DOWN TO -20°F.
9. SHORT CYCLE CIRCUIT: PROVIDE CIRCUIT TO PREVENT COMPRESSOR FROM SHORT CYCLING AS A RESULT OF A RAPID CHANGE IN THERMOSTAT SETTING. CIRCUIT ALSO PREVENTS COMPRESSOR RESTART AT LEAST 5 MINUTES AFTER SHUTDOWN.
10. CONVENIENCE OUTLET: PROVIDE 115V OUTLET IN UNIT CABINET.
11. CONTROL WIRING: FURNISH AND INSTALL CONTROL WIRING AS REQUIRED. INSTALL CONTROL WIRING IN CONDUIT.

SINGLE PACKAGE 100% OUTSIDE AIR ROOFTOP AIR CONDITIONERS

1. PROVIDE AND INSTALL A SINGLE-PACKAGE, MULTIPLE-ZONE, VARIABLE VOLUME, ELECTRIC AIR CONDITIONER WITH FREE COOLING & REHEAT, DEHUMIDIFICATION & INDIRECT NATURAL GAS HEATING.
2. PERFORMANCE: AS SCHEDULED ON DRAWINGS, WITH HEAD PRESSURE CONTROL TO ENABLE UNIT START AND OPERATE DOWN TO 20 DEGREES F AMBIENT.
3. ACCEPTABLE MANUFACTURERS: DES CHAMPS, AAON, ADDISON
4. COMPRESSOR: PROVIDE A THERMALLY PROTECTED, SERVICEABLE SEMI-HERMETIC COMPRESSOR OR HERMETIC COMPRESSOR WITH SERVICE VALVES, VIBRATION ISOLATION, WARRANTY. CRANKCASE HEATERS, SLIGHT GLASS AND FILTER DRIER. PROVIDE WITH A 5-YEAR
5. EVAPORATOR AND CONDENSER COILS: PROVIDE COPPER TUBES WITH MECHANICALLY BONDED ALUMINUM FINS FOR EVAPORATOR AND CONDENSER COILS. PROVIDE HAIL GUARDS FOR CONDENSER COILS.
6. GAS HEATING SECTION: UNIT SHALL BE EQUIPPED WITH STAINLESS STEEL BURNERS AND HEAT EXCHANGERS. THE GAS CONTROLS SHALL HAVE AN AUTOMATIC GAS VALVE AND PRESSURE REGULATOR, MANUAL SHUTOFF VALVE, AND AN ELECTRIC SPARK PILOT IGNITION SYSTEM WITH ELECTRONIC FLAME DETECTION AND 100% SAFETY SHUTOFF.
7. HEAD PRESSURE CONTROL: PROVIDE SOLID STATE OUTDOOR AIR FAN SPEED CONTROL TO PERMIT UNIT TO OPERATE DOWN TO -20°F.
8. CONTROLS: CONTROLS SHALL BE FACTORY MOUNTED AND TESTED, DISCHARGE AIR CONTROLLER SHALL STAGE THE COOLING CAPACITY AS REQUIRED TO MAINTAIN DISCHARGE TEMPERATURE. DUCT MOUNTED STATIC PRESSURE SENSOR SHALL MODULATED THE VARIABLE INLET DAMPERS TO MAINTAIN REQUIRED SYSTEM STATIC PRESSURE.
9. CONVENIENCE OUTLET: PROVIDE 115V OUTLET IN UNIT CABINET.

AIR DEVICES

1. FURNISH AND INSTALL AIR DISTRIBUTION DEVICES, INCLUDING GRILLES, DIFFUSERS, REGISTERS, DAMPERS, AND EXTRACTORS.
2. ACCEPTABLE MANUFACTURERS: TUTTLE AND BAILEY, TITUS, KRUEGER, METAL-AIRE, NAILOR INDUSTRIES, PRICE

AIR FILTERS

1. AIR FILTERS: FURNISH AND INSTALL A DISPOSAL MEDIA AND FRAME FILTER WITH RESISTANCE TO AIR FLOW OF A CLEAN FILTER NOT TO EXCEED 0.12" WG AT 300 FPM.
2. INSTALL THE FILTERS AND FILTER GAUGES IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

CONDENSATE PIPING

1. TYPE "L" COPPER WITH DRAINAGE PATTERN FITTINGS IN RETURN PLENUM AREAS, PVC WITH DRAINAGE PATTERN FITTINGS IN NON-PLENUM AREAS.
2. INSTALL THE SYSTEM TO FACILITATE EASY REMOVAL, USE THREADED PLUGGED TEE AT EACH CHANGE OF DIRECTION TO PERMIT CLEANING, INSTALL A CLEANOUT EVERY 50 FEET OF STRAIGHT RUN PIPING, MAINTAIN A POSITIVE SLOPE ON ALL PIPING.
3. INSTALL A WATER SEAL TRAP LEG BASED ON THE FAN PRESSURE. SIZE OTHE LENGTH OF THE TRAP LEG 1 INCH LARGER THAN THE ACTUAL SYSTEM PRESSURE.
4. DO NOT INSTALL PIPING SIZED SMALLER THAN THE UNIT DRAIN CONNECTION SIZE.
5. INSULATE PIPING WITH 3/4" ELASTOMERIC INSULATION FOR ALL PIPE BELOW ROOF.
6. INSULATION TO BE 25/50 FLAME AND SMOKE RATING.

STANDARD OPERATING PROCEDURE

GENERAL BUILDING EXHAUST FANS (EF-(1&2))

1. EXHAUST FANS SHALL OPERATE CONTINUOUSLY WHILE LIGHTS ARE ON IN SPACE THAT THE FAN SERVICES.

GENERAL BUILDING EXHAUST FAN (EF-3)

1. EXHAUST FANS SHALL OPERATE CONTINUOUSLY WHILE THE 7-DAY PROGRAMMABLE DIGITAL TIMER IS ACTIVATED. DIGITAL TIMER SHALL BE SET TO BUILDING OCCUPANCY.

GENERAL BUILDING EXHAUST FAN (REF-1)

1. EXHAUST FANS SHALL OPERATE CONTINUOUSLY WHILE THE 7-DAY PROGRAMMABLE DIGITAL TIMER IS ACTIVATED. DIGITAL TIMER SHALL BE SET TO BUILDING OCCUPANCY.

PACKAGED AIR CONDITIONING UNIT WITH GAS HEAT ((EX)-RTU-(1-4))

1. CONTROLLER: UNITS SHALL BE PROVIDED WITH STAND-ALONE FACTORY MOUNTED CONTROLS CAPABLE OF MAINTAINING THE SEQUENCES OF OPERATIONS AS LISTED BELOW. IF THE FACTORY MOUNTED CONTROLS CANNOT MAINTAIN THE SEQUENCES OF OPERATIONS AS DESCRIBED, THE CONTROLS CONTRACTOR SHALL PROVIDE A THIRD-PARTY CONTROLLER CAPABLE OF MAINTAINING THE SEQUENCES OF OPERATIONS. THE CONTROLS CONTRACTOR SHALL PROVIDE ALL THE NECESSARY SENSORS, WIRING, AND CONTROLS TO MAINTAIN THE SEQUENCE OF OPERATIONS. THE UNITS SHALL BE CONTROLLED BY SPACE MOUNTED THERMOSTAT.
2. OCCUPIED MODE: ON A SIGNAL FROM THE SPACE MOUNTED OCCUPANCY SENSOR THE SUPPLY AIR FAN SHALL OPERATE CONTINUOUSLY AND THE ASSOCIATED OUTDOOR AIR MOD SHALL MODULATE TO THE BALANCED POSITION. ON A SIGNAL FROM THE SPACE MOUNTED THERMOSTAT THE UNIT SHALL ENTERING COOLING OR HEATING MODE. DURING COOLING MODE, THE DX COOLING SHALL SEQUENCE TO MAINTAIN SPACE TEMPERATURE SETPOINT 74°F (ADJ). DURING HEATING MODE, THE GAS FURNACE SHALL STAGE TO MAINTAIN SPACE TEMPERATURE SETPOINT 72°F (ADJ).
3. UNOCCUPIED MODE: ON A SIGNAL FROM THE SPACE MOUNTED OCCUPANCY SENSOR, THE SUPPLY AIR FAN SHALL CYCLE AND THE ASSOCIATED OUTDOOR AIR MOD SHALL MODULATE FULLY CLOSED. THE DX COOLING OR GAS FURNACE SHALL MODULATE AS REQUIRED TO MAINTAIN SETBACK TEMPERATURE.
4. SAFETIES AND AUXILIARY CONTROLS:
   A. CONDENSATE OVER FLOW SWITCH.
   B. FILTER ALARM (WHEN FILTER DIFFERENTIAL IS GREATER THAN 1" WC., MANUALLY ADJUSTABLE)
   C. DUCT MOUNTED SMOKE DETECTOR. ((EX)-RTU-1 AND (EX)-RTU-4 ONLY)

PACKAGED AIR CONDITIONING UNIT WITH HOT GAS REHEAT AND GAS HEAT (RTU-(1&2)

1. REFER TO SHEET 3.10 FOR MANUFACTURER'S SEQUENCE OF OPERATIONS

RAM HOUSE
ALTERATIONS & ADDITION
MECHANICAL SPECIFICATIONS
410 ELM AVE
ROANOKE CITY, VIRGINIA

DRAWN BY	MDA
DESIGNED BY	MDA
CHECKED BY	SSL
DATE	02/14/2025
SCALE	1/4" = 1'-0"
REVISIONS	

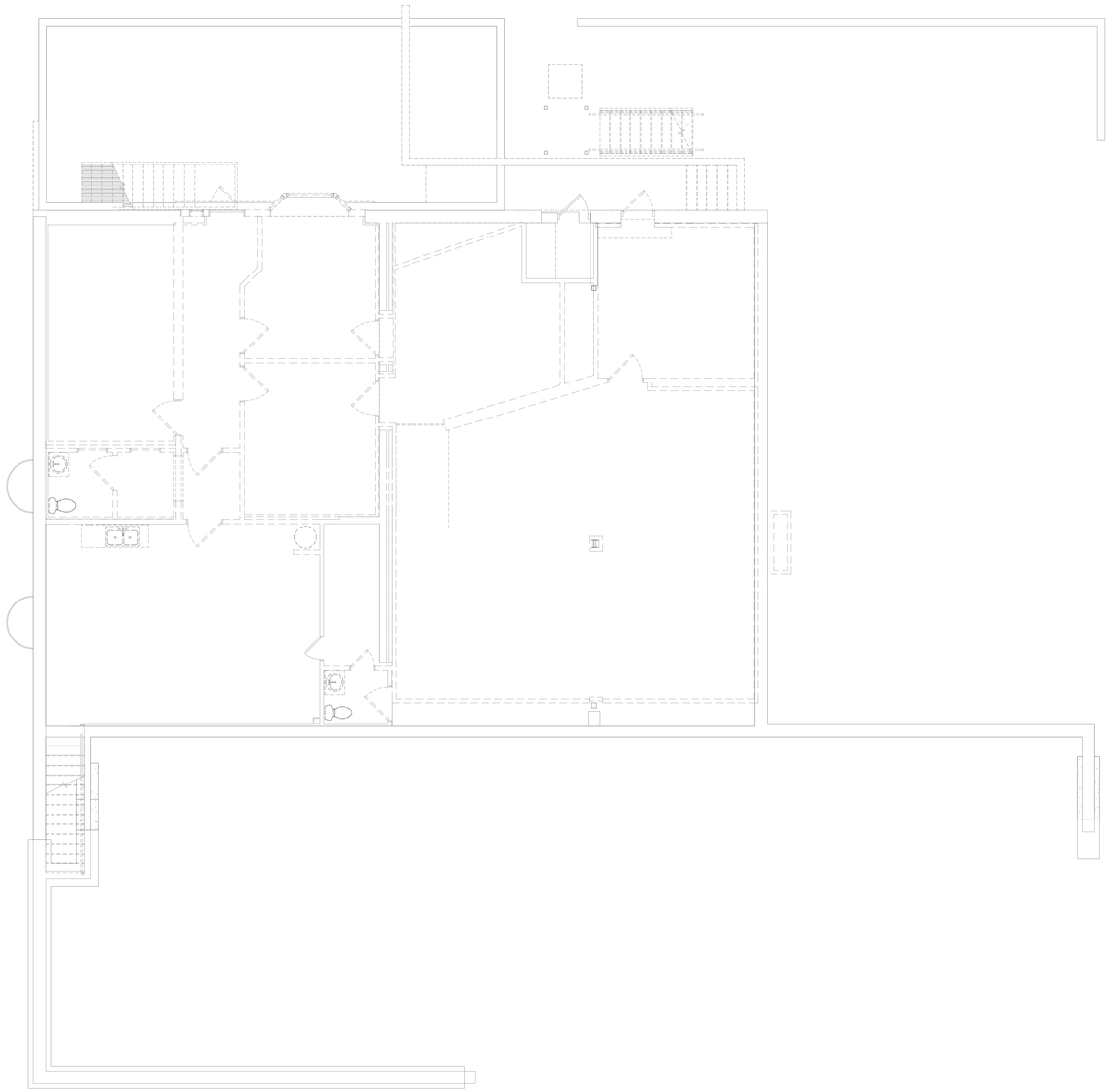
M0.02
PROJECT NO 03230086.00

Salas O'Brien
salasobrien.com 540-952-9651
Project No: 2550-00213-00

Roanoke
119 Norfolk Avenue, Suite 310
Roanoke, Virginia 24011

MECHANICAL GENERAL NOTES:

1. DEMOLISH ALL EXISTING MECHANICAL EQUIPMENT, DUCTWORK, PIPING, AND ALL RELATED APPURTENANCES ON THIS FLOOR.



1 **LOWER LEVEL MECHANICAL DEMOLITION PLAN**
Scale: 3/16" = 1'-0"

BALZER & ASSOCIATES
PLANNERS / ARCHITECTS
ENGINEERS / SURVEYORS
Roanoke / Richmond
Shenandoah Valley
New River Valley
www.balzer.cc
1208 Corporate Circle
Roanoke, VA 24018
540.772.9580

COMMONWEALTH OF VIRGINIA
02/14/2025
SAMUEL S. LOTT
Lic. No. 061900
PROFESSIONAL ENGINEER

50 Years RAM HOUSE #ramramram

LIONBERGER CONSTRUCTION

RAM HOUSE
ALTERATIONS & ADDITION
LOWER LEVEL MECHANICAL DEMOLITION PLAN
410 ELM AVE
ROANOKE CITY, VIRGINIA

DRAWN BY	MDA
DESIGNED BY	MDA
CHECKED BY	SSL
DATE	02/14/2025
SCALE	3/16" = 1'-0"
REVISIONS	

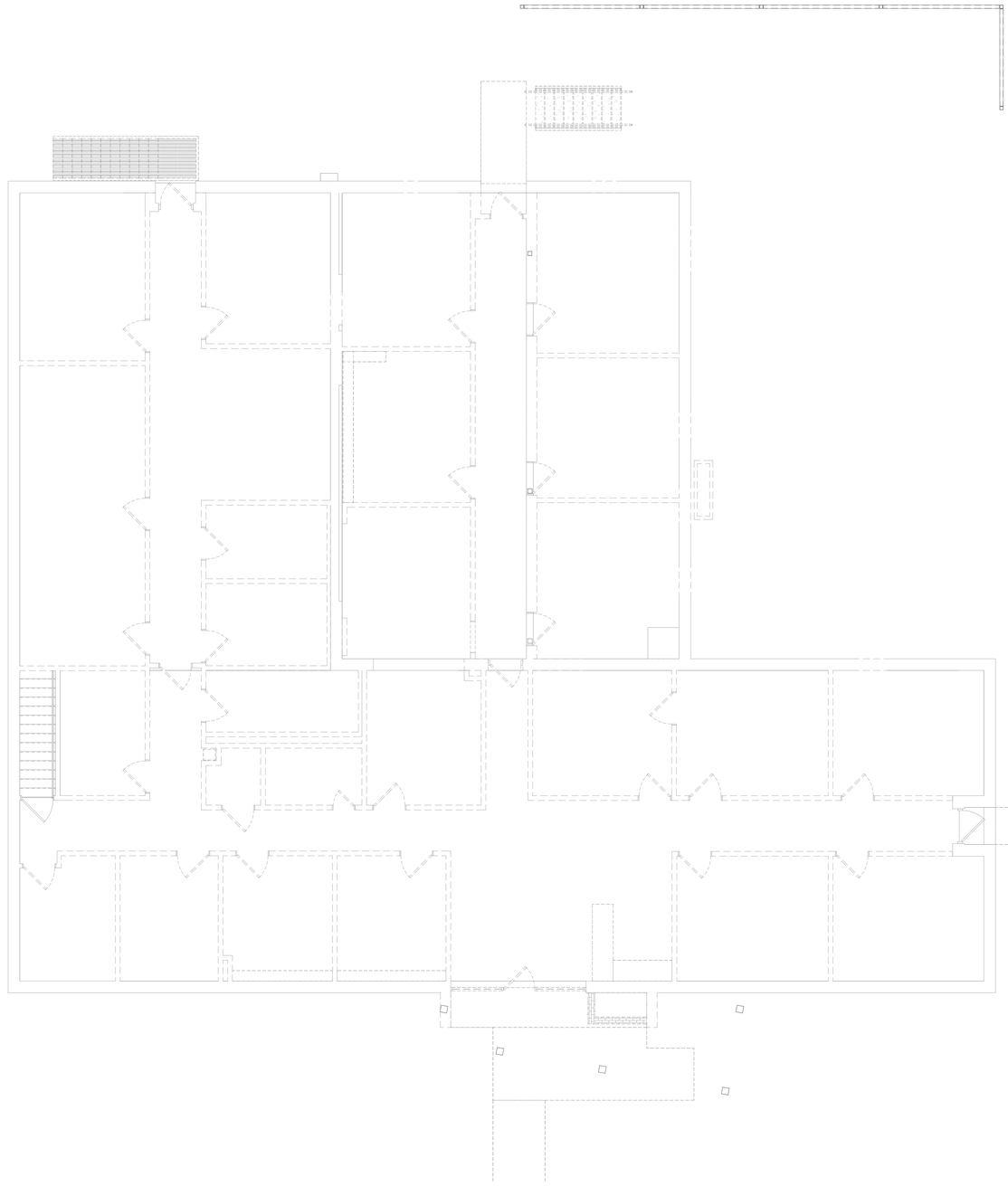
MD1.01
PROJECT NO 03230086.00

Salas O'Brien
salasobrien.com 540-952-9651
Project No: 2550-00213-00

Roanoke
119 Norfolk Avenue, Suite 310
Roanoke, Virginia 24011

MECHANICAL GENERAL NOTES:

1. DEMOLISH ALL EXISTING MECHANICAL EQUIPMENT, DUCTWORK, PIPING, AND ALL RELATED APPURTENANCES ON THIS FLOOR.



1 **MAIN LEVEL MECHANICAL DEMOLITION PLAN**
Scale: 3/16" = 1'-0"

BALZER & ASSOCIATES
PLANNERS / ARCHITECTS
ENGINEERS / SURVEYORS
Roanoke / Richmond
Shenandoah Valley
New River Valley
www.balzer.cc
1208 Corporate Circle
Roanoke, VA 24018
540.772.9580

COMMONWEALTH OF VIRGINIA
02/14/2025
SAMUEL S. LOTT
Lic. No. 061900
PROFESSIONAL ENGINEER

50+ Years RAM HOUSE #ramramram

LIONBERGER CONSTRUCTION

RAM HOUSE
ALTERATIONS & ADDITION
MAIN LEVEL MECHANICAL DEMOLITION PLAN
410 ELM AVE
ROANOKE CITY, VIRGINIA

DRAWN BY	MDA
DESIGNED BY	MDA
CHECKED BY	SSL
DATE	02/14/2025
SCALE	3/16" = 1'-0"
REVISIONS	

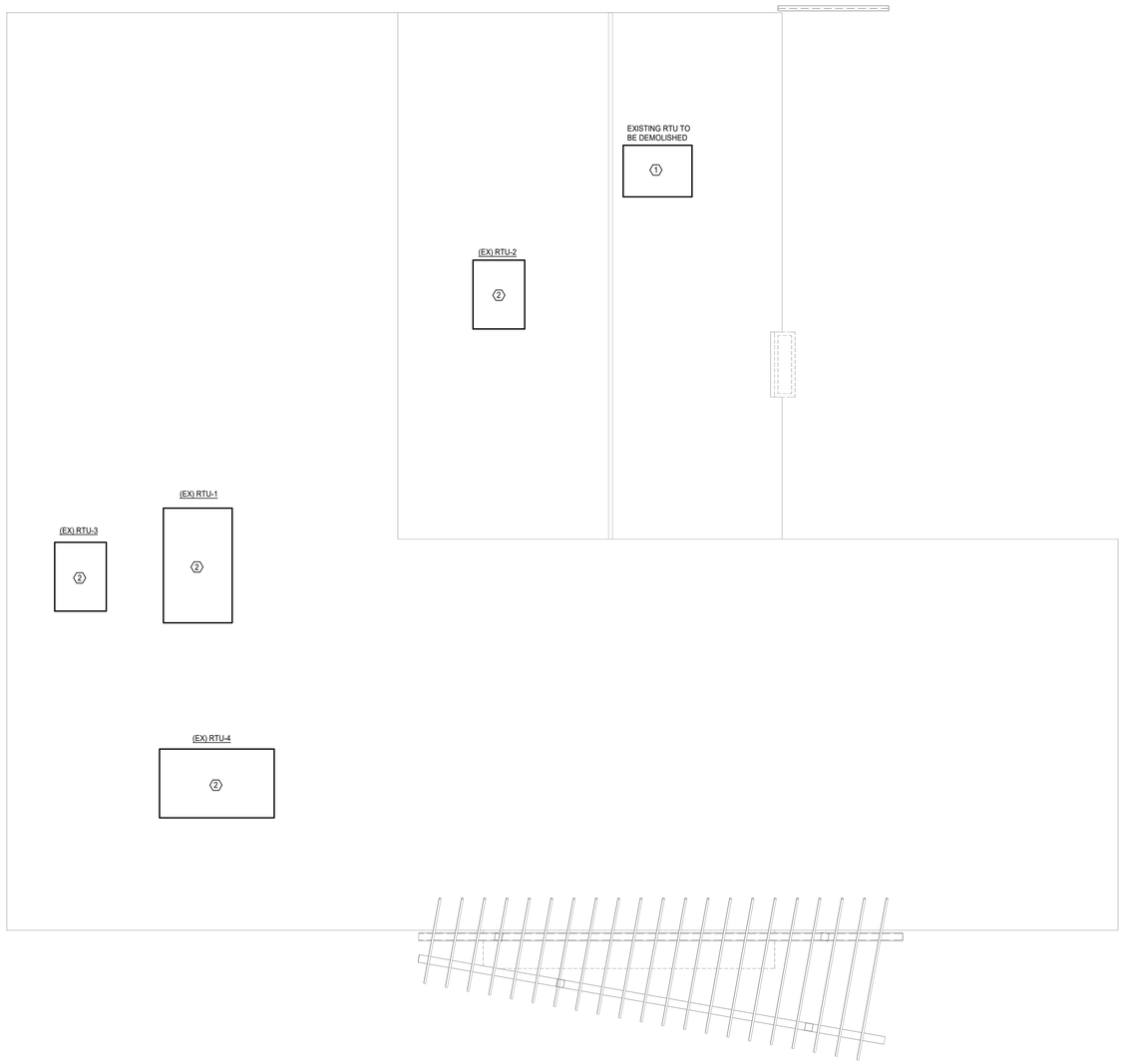
MD1.02
PROJECT NO 03230086.00

Salas O'Brien
salasobrien.com 540-952-9651
Project No: 2550-00213-00

Roanoke
119 Norfolk Avenue, Suite 310
Roanoke, Virginia 24011

MECHANICAL KEYED NOTES:

1. DEMOLISH EXISTING UNIT ALONG WITH ALL ASSOCIATED DUCTWORK, ROOF CURB, PIPING, AND APPURTENANCES.
2. REMOVE EXISTING UNIT AND DEMOLISH ASSOCIATED DUCTWORK, PIPING, AND APPURTENANCES. COORDINATE WITH GC TO CAP EXISTING ROOF PENETRATION AND RESEAL WATER AND AIR TIGHT. EXISTING UNIT AND CURB SHALL BE SALVAGED AND REUSED DURING NEW CONSTRUCTION. RE: M1.03 FOR NEW LOCATIONS.



1 **ROOF MECHANICAL DEMOLITION PLAN**
Scale: 3/16" = 1'-0"

BALZER & ASSOCIATES
PLANNERS / ARCHITECTS
ENGINEERS / SURVEYORS
Roanoke / Richmond
Shenandoah Valley
New River Valley
www.balzer.cc
1208 Corporate Circle
Roanoke, VA 24018
540.772.9580

COMMONWEALTH OF VIRGINIA
02/14/2025
SAMUEL S. LOTT
Lic. No. 061900
PROFESSIONAL ENGINEER

50 Years
RAM HOUSE
#ramramfam

LIONBERGER CONSTRUCTION

RAM HOUSE
ALTERATIONS & ADDITION
410 ELM AVE
ROANOKE CITY, VIRGINIA

ROOF MECHANICAL DEMOLITION PLAN

DRAWN BY	MDA
DESIGNED BY	MDA
CHECKED BY	SSL
DATE	02/14/2025
SCALE	3/16" = 1'-0"
REVISIONS	

MD1.03
PROJECT NO 03230086.00

Salas O'Brien
salasobrien.com 540-952-9651
Project No: 2550-00213-00

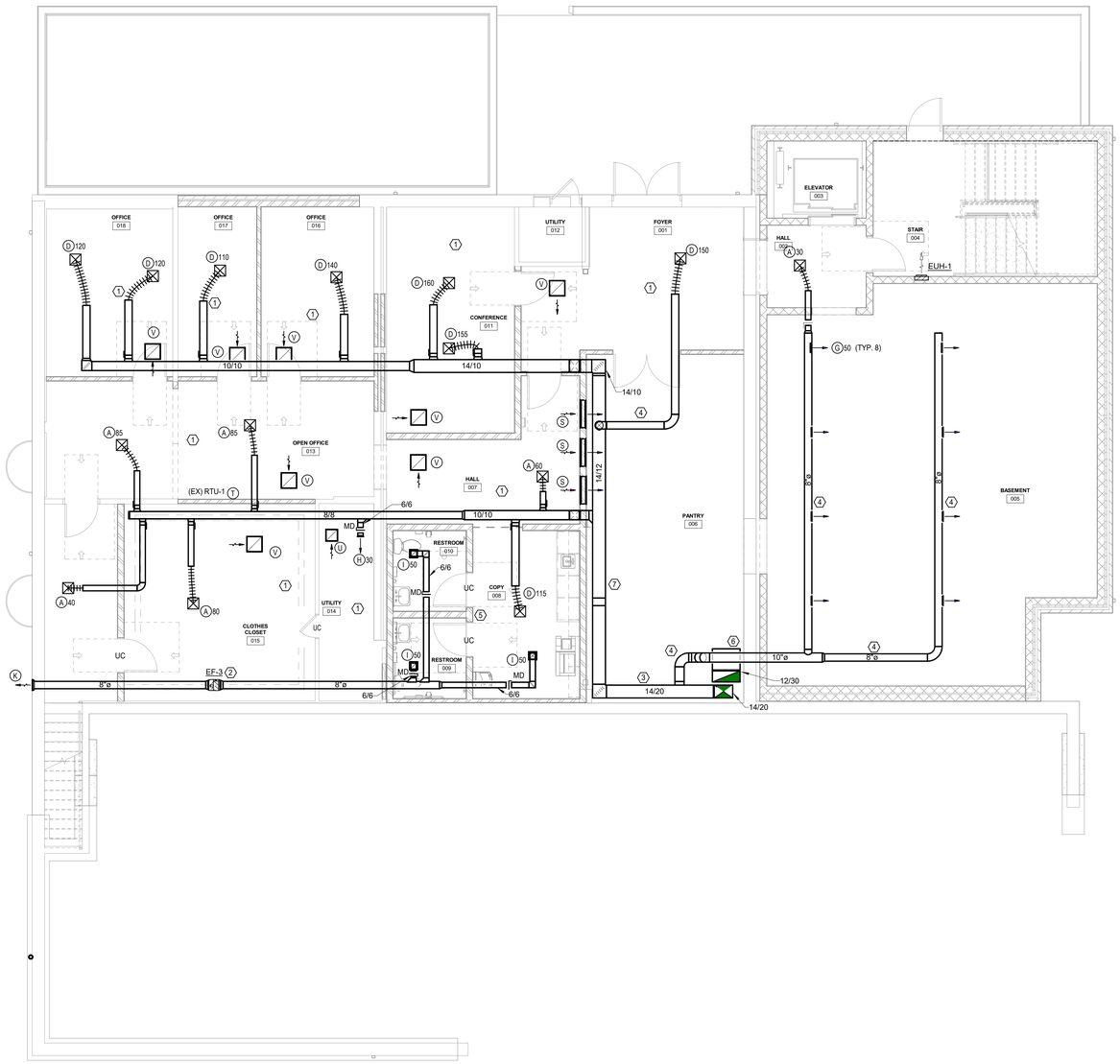
Roanoke
119 Norfolk Avenue, Suite 310
Roanoke, Virginia 24011

MECHANICAL GENERAL NOTES:

1. ROUTE DUCTWORK BETWEEN/THROUGH STRUCTURAL BEAMS AND TRUSSES WHEREVER POSSIBLE. COORDINATE IN FIELD FOR EXACT LOCATION OF STRUCTURAL MEMBERS.
2. CONTRACTOR TO PAINT ALL EXPOSED DUCTWORK WITH PAINT GRIP GALVANIZED STEEL. PAINT FLAT BLACK OR AS SPECIFIED BY ARCH.
3. FIELD COORDINATE FINAL AIR TERMINAL LOCATIONS WITH EXISTING STRUCTURAL.

MECHANICAL KEYED NOTES:

1. SPACE ABOVE CEILING SHALL BE USED AS A RETURN AIR PLENUM. ALL MATERIALS SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E 84 OR UL 723. PRIOR TO BIDDING, CONTRACTOR SHALL INFORM ALL TRADES THAT HAVE WORK IN THE RETURN AIR PLENUM AREA.
2. MOUNT FAN FROM STRUCTURE WITH UNISTRUT SUPPORT AS CLOSE TO DECK AS POSSIBLE. RE: 7/M2.01
3. INTERNALLY LINE ALL EXPOSED DUCT IN THIS AREA IN LIEU OF EXTERNAL INSULATION. ALL DUCT SIZES SHOWN REPRESENT INSIDE CLEAR SIZES.
4. ALL ROUND DUCTWORK IN THIS AREA SHALL BE DOUBLE WALLED SPIRAL ROUND.
5. APPROXIMATE LOCATION OF DIGITAL TIMER INTERLOCKED WITH EF-3. COORDINATE WITH OWNER PRIOR TO CONSTRUCTION FOR FINAL MOUNTING LOCATION AND OCCUPANCY SETTINGS. PROVIDE TIMER WITH TAMPER RESISTANT COVER.
6. DUCTWORK SHALL BE OPEN TO SPACE. PROVIDE CONSTRUCTION GRADE HARDWARE OVER DUCT OPENING.
7. ROUTE DUCT TIGHT TO STRUCTURE.
8. ROUTE DUCTWORK IN BULKHEAD.



1 **LOWER LEVEL MECHANICAL PLAN**
Scale: 3/16" = 1'-0"

BALZER & ASSOCIATES
PLANNERS / ARCHITECTS
ENGINEERS / SURVEYORS
Roanoke / Richmond
Shenandoah Valley
New River Valley
www.balzer.cc
1208 Corporate Circle
Roanoke, VA 24018
540.772.9580

COMMONWEALTH OF VIRGINIA
02/14/2025
SAMUEL S. LOTT
Lic. No. 061900
PROFESSIONAL ENGINEER

50+ Years RAM HOUSE #iamramfam

LIONBERGER CONSTRUCTION

RAM HOUSE
ALTERATIONS & ADDITION
LOWER LEVEL MECHANICAL PLAN
410 ELM AVE
ROANOKE CITY, VIRGINIA

DRAWN BY	MDA
DESIGNED BY	MDA
CHECKED BY	SSL
DATE	02/14/2025
SCALE	3/16" = 1'-0"
REVISIONS	

M1.01
PROJECT NO 03230086.00

Salas O'Brien
salasobrien.com 540-952-9651
Project No: 2550-00213-00

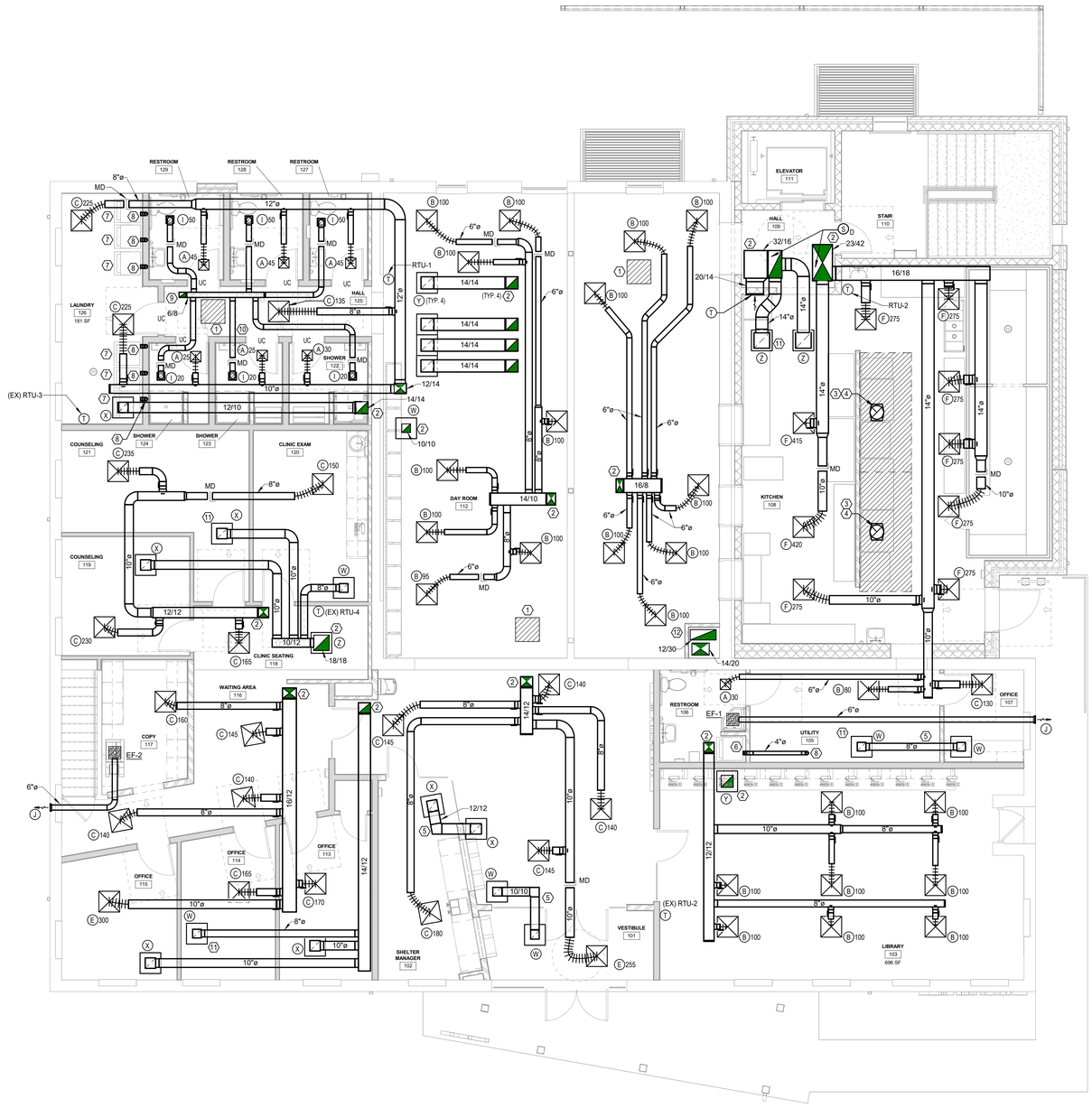
Roanoke
119 Norfolk Avenue, Suite 310
Roanoke, Virginia 24011

MECHANICAL GENERAL NOTES:

1. ROUTE DUCTWORK BETWEEN STRUCTURAL BEAMS AND TRUSSES WHEREVER POSSIBLE. COORDINATE IN FIELD FOR EXACT LOCATION OF STRUCTURAL MEMBERS.

MECHANICAL KEYED NOTES:

1. PROVIDE GPS IDF-2 ION DISTRIBUTION FAN. COORDINATE WITH ARCHITECT'S REFLECTED CEILING PLAN PRIOR TO CONSTRUCTION AND PROVIDE MANUFACTURER RECOMMENDED MOUNTING HARDWARE.
2. ROUTE DUCT THROUGH ROOF TO CORRESPONDING RTU. RE: M1.03 FOR CONTINUATION.
3. KITCHEN GREASE EXHAUST DUCT SHALL BE WELDED BLACK STEEL CONSTRUCTION. SLOPE DUCT TOWARDS HOOD. PROVIDE CLEANOUTS IN EACH CHANGE OF DIRECTION AND 12'. PROVIDE WITH FIREWRAPPING.
4. ROUTE KITCHEN GREASE EXHAUST DUCT TO KITCHEN EXHAUST FAN ON ROOF. RE: M1.03 FOR CONTINUATION.
5. TRANSITION DUCTWORK SHALL BE INTERNALLY LINED FOR SOUND ATTENUATION. PROVIDE DUCTWORK WITH EXTERIOR INSULATION AS SPACE ALLOWS.
6. PROVIDE DRYERBOX MODEL DB-350 OR APPROVED EQUAL IN WALL DIRECTLY BEHIND DRYER.
7. PROVIDE DRYERBOX MODEL 480 OR APPROVED EQUAL IN WALL DIRECTLY BEHIND DRYER.
8. ROUTE 4"Ø DRYER EXHAUST VENT TO DRYER ROOF CAP WITH BACK DRAFT DAMPER. CONTRACTOR TO VERIFY LENGTH OF DUCT ROUTE IS LESS THAN OR EQUAL TO 35 FEET WITH 5 FOOT ADDED TO TOTAL LENGTH FOR EVERY 4" 90° BEND. PROVIDE PERMANENT NAMEPLATE WITH TOTAL DUCT RUN WITHIN 6'-0" FROM EXHAUST CONNECTION. RE: M1.03 FOR CONTINUATION.
9. ROUTE DUCT THROUGH ROOF TO CORRESPONDING FAN ON ROOF. RE: M1.03 FOR CONTINUATION.
10. APPROXIMATE LOCATION OF DIGITAL TIMER INTERLOCKED WITH REF-1. COORDINATE WITH OWNER PRIOR TO CONSTRUCTION FOR FINAL MOUNTING LOCATION AND OCCUPANCY SETTINGS. PROVIDE TIMER WITH TAMPER RESISTANT COVER.
11. REFER TO DETAIL 5 ON SHEET M2.01. TYPICAL FOR ALL
12. ROUTE DUCTWORK THROUGH CHASE TO LOWER LEVEL BELOW.



1 MAIN LEVEL MECHANICAL PLAN
Scale: 3/16" = 1'-0"

BALZER & ASSOCIATES
PLANNERS / ARCHITECTS
ENGINEERS / SURVEYORS
Roanoke / Richmond
Shenandoah Valley
New River Valley
www.balzer.cc
1208 Corporate Circle
Roanoke, VA 24018
540.772.9580

COMMONWEALTH OF VIRGINIA
02/14/2025
SAMUEL S. LOTT
Lic. No. 061900
PROFESSIONAL ENGINEER

50+ Years RAM HOUSE #iamramfam

LIONBERGER CONSTRUCTION

RAM HOUSE
ALTERATIONS & ADDITION
MAIN LEVEL MECHANICAL PLAN
410 ELM AVE
ROANOKE CITY, VIRGINIA

DRAWN BY	MDA
DESIGNED BY	MDA
CHECKED BY	SSL
DATE	02/14/2025
SCALE	3/16" = 1'-0"
REVISIONS	

M1.02
PROJECT NO 03230086.00

2/14/2025 8:32:52 AM

Salas O'Brien
salasobrien.com 540-952-9651
Project No: 2550-00213-00

Roanoke
119 Norfolk Avenue, Suite 310
Roanoke, Virginia 24011

BALZER & ASSOCIATES
PLANNERS / ARCHITECTS
ENGINEERS / SURVEYORS
Roanoke / Richmond
Shenandoah Valley
New River Valley
www.balzer.cc
1208 Corporate Circle
Roanoke, VA 24018
540.772.9580

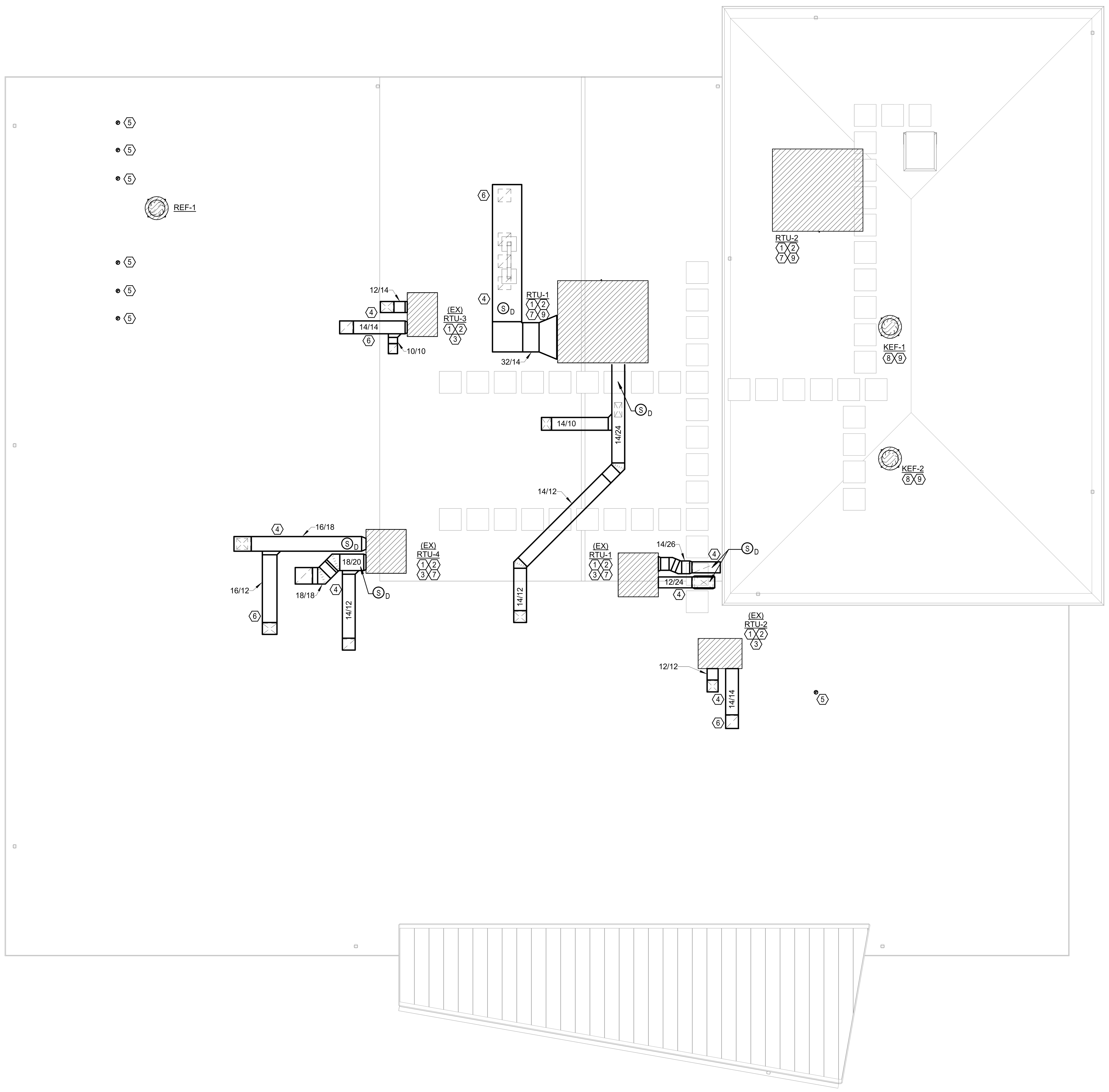
COMMONWEALTH OF VIRGINIA
02/14/2025
SAMUEL S. LOTT
Lic. No. 061900
PROFESSIONAL ENGINEER

50 Years RAM HOUSE #iamramfam

LIONBERGER CONSTRUCTION

MECHANICAL KEYED NOTES: ⬡

1. KEEP RTU A MINIMUM 10'-0" FROM ALL BUILDING INLETS. PROVIDE OUTDOOR AIR INTAKE WITH INSECT SCREEN. RTU SHALL BE LOCATED 10'-0" FROM BUILDING EDGE. OUTDOOR AIR INTAKES SHALL BE LOCATED 10'-0" FROM EXHAUST POINTS. CONTRACTOR TO FIELD VERIFY FINAL LOCATION.
2. ROUTE 1-1/4" CONDENSATE DRAIN LINE W/ AIR TRAP FROM UNIT AND DISCHARGE AT NEAREST ROOF DRAIN OR GUTTER. INSULATE CONDENSATE DRAIN LINE. PROVIDE 1/8" SLOPE FOR CONDENSATE PIPING. RE: 9/M2.01
3. RELOCATE REMOVED RTU AND ROOF CURB AS SHOWN. COORDINATE WITH GC TO PROVIDE NECESSARY ROOF PENETRATIONS.
4. ROUTE DUCTWORK ALONG ROOF AND PENETRATE ROOF AS SHOWN. PROVIDE PRO-R RECTANGULAR DUCTWORK FOR ALL EXTERIOR ROUTING. COORDINATE WITH MANUFACTURER FOR INSTALLATION GUIDELINES.
5. APPROXIMATE LOCATION OF DRYER VENT ROOF CAP. PROVIDE DRYER JACK MODEL 477 OR APPROVED EQUAL.
6. ROUTE DUCTWORK FROM EXTERNAL MAIN AND PENETRATE ROOF BEFORE ROUTING TO AIR TERMINAL. REFER TO DETAILS FOR DUCTWORK PENETRATION THROUGH ROOF. PROVIDE PREFABRICATED ROOF CURB AS REQUIRED. TYP.
7. PROVIDE DUCT MOUNTED SMOKE DETECTOR IN SUPPLY AND RETURN TRUNK DUCT. REFER TO SHEET M0.02 FOR SPECIFICATIONS.
8. PROVIDE KITCHEN EXHAUST FAN WITH MANUFACTURER RECOMMENDED HINGE KIT.
9. REFER TO SHEETS PROVIDED BY CAPTIVEAIRE FOR ALL UNIT INFORMATION AND SPECIFICATIONS.



1 ROOF MECHANICAL PLAN
Scale: 3/16" = 1'-0"

RAM HOUSE
ALTERATIONS & ADDITION
ROOF MECHANICAL PLAN
410 ELM AVE
ROANOKE CITY, VIRGINIA

DRAWN BY	MDA
DESIGNED BY	MDA
CHECKED BY	SSL
DATE	02/14/2025
SCALE	3/16" = 1'-0"
REVISIONS	

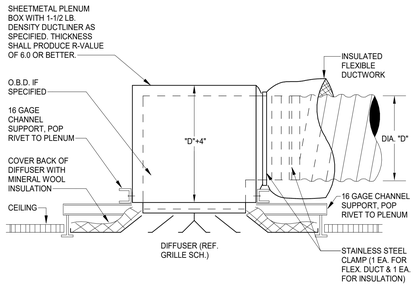
M1.03
PROJECT NO 03230086.00

Autodesk Docs://2550-00213-00 Ram House Mission - Roanoke, VA/2550-00213-00 RAM House_MEP R24.rvt

Salas O'Brien
salasobrien.com 540-952-9651
Project No: 2550-00213-00

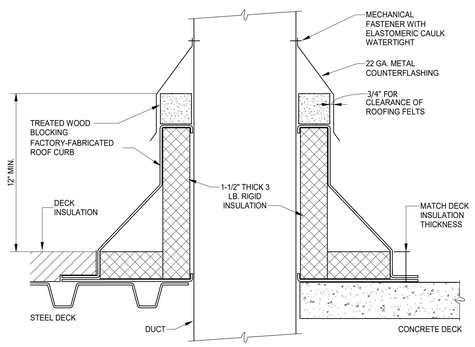
Roanoke
119 Norfolk Avenue, Suite 310
Roanoke, Virginia 24011

BALZER & ASSOCIATES
PLANNERS / ARCHITECTS
ENGINEERS / SURVEYORS
Roanoke / Richmond
Shenandoah Valley
New River Valley
www.balzer.cc
1208 Corporate Circle
Roanoke, VA 24018
540.772.9580

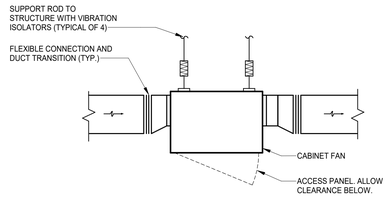


10 FLEX DUCT CONNECTION AT SUPPLY AIR DIFFUSER
Scale: NONE

9 CONDENSATE PIPE SUPPORT ON ROOF
Scale: NONE

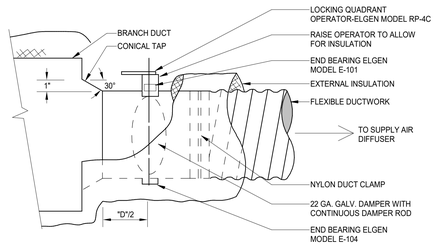


8 DUCT ROOF PENETRATION DETAIL
Scale: NONE

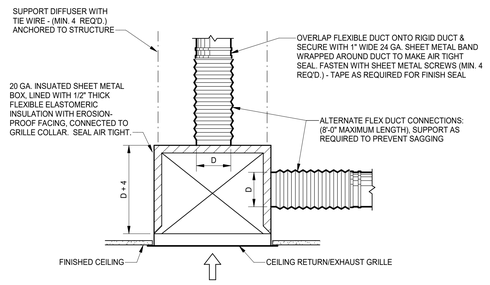


NOTE:
1. REFER TO PLANS FOR EXACT DUCT ARRANGEMENT.

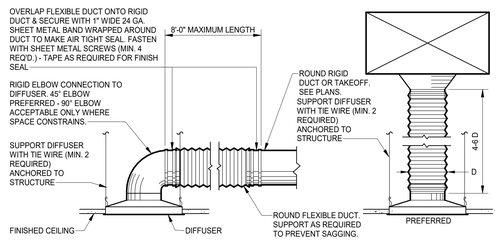
7 IN-LINE CABINET FAN DETAIL
Scale: NONE



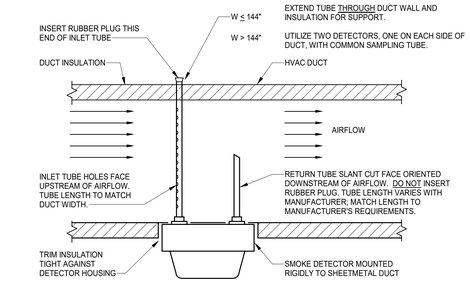
6 FLEXIBLE DUCT TAP - CONICAL
Scale: NONE



5 DUCTED RETURN/EXHAUST GRILLE INSTALLATION
Scale: 12" = 1'-0"

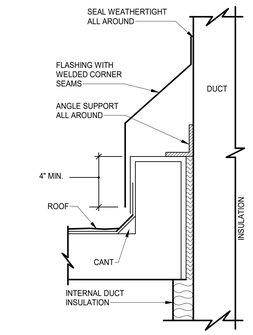


4 CEILING DIFFUSER INSTALLATION
Scale: NONE



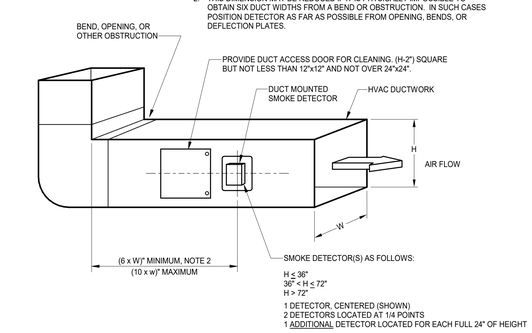
NOTE:
1. PROVIDE DUCT ACCESS TO SAMPLE/INLET TUBES VIA ACCESS DOOR.
2. COORDINATE EXACT LOCATION WITH ELECTRICAL CONTRACTOR AND FIRE ALARM SUPPLIER.
3. DUCT DETECTOR CANNOT BE INSTALLED IN RETURN AIR OPENINGS.

3 DUCT DETECTOR MOUNTING DETAIL
Scale: NONE



2 DUCT FLASHING AT ROOF CURB DETAIL
Scale: NONE

GENERAL NOTES:
1. THIS DETAIL IS INTENDED TO PROVIDE GUIDANCE IN PROPER POSITIONING OF DUCT MOUNTED SMOKE DETECTORS. FOLLOW ANY MANUFACTURER'S INSTRUCTIONS SPECIFIC TO THE DEVICE BEING INSTALLED.
2. THIS DIMENSION MAY BE REDUCED IF IT IS PHYSICALLY IMPOSSIBLE TO OBTAIN SIX DUCT WIDTHS FROM A BEND OR OBSTRUCTION. IN SUCH CASES POSITION DETECTOR AS FAR AS POSSIBLE FROM OPENING, BENDS, OR DEFLECTION PLATES.



1 DUCT DETECTOR LOCATION DETAIL
Scale: NONE

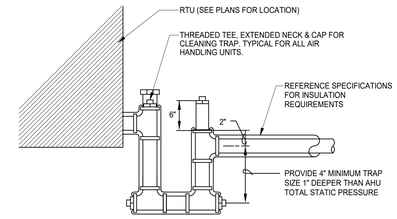
RAM HOUSE
ALTERATIONS & ADDITION
MECHANICAL DETAILS
410 ELM AVE
ROANOKE CITY, VIRGINIA

DRAWN BY	MDA
DESIGNED BY	MDA
CHECKED BY	SSL
DATE	02/14/2025
SCALE	NONE
REVISIONS	

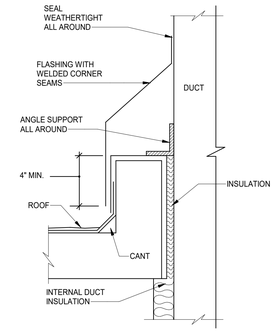
M2.01
PROJECT NO 03230086.00

Salas O'Brien
salasobrien.com 540-952-9651
Project No: 2550-00213-00

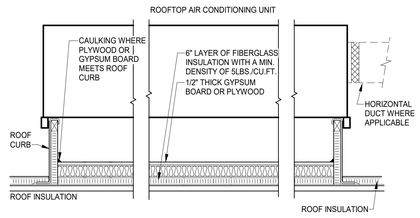
Roanoke
119 Norfolk Avenue, Suite 310
Roanoke, Virginia 24011



4 CONDENSATE DRAIN PIPING AT RTU
Scale: NONE

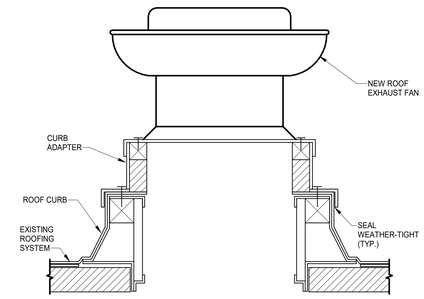


3 DUCT FLASHING AT ROOF CURB
Scale: NONE

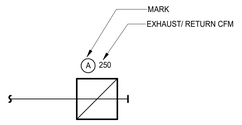


NOTES:
1. CUT ROOF OPENING JUST LARGE ENOUGH TO ACCOMMODATE SUPPLY AND RETURN DUCTWORK. CAULK AIR TIGHT THE SPACE BETWEEN DUCTWORK AND ROOF OPENINGS.
2. PROVIDE 5# DENSITY INSULATION UNDER UNIT ON TOP OF ROOF AND INSIDE ROOF CURB. COVER INSULATION WITH 1/2" THICK PLYWOOD OR GYPSUM BOARD AND CAULK BETWEEN PLYWOOD OR GYPSUM AND ROOF CURB.
3. ROOF INSULATION SHALL EXTEND UNDER UNIT.

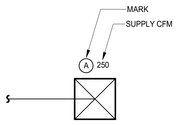
7 ROOFTOP AIR CONDITIONING UNIT MOUNTING DETAIL
Scale: NONE



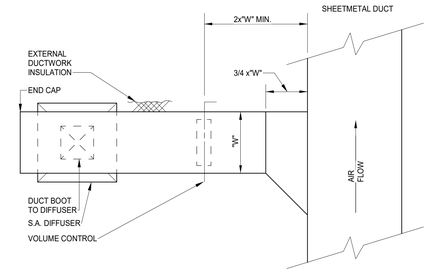
2 ROOF FAN WITH CURB ADAPTER DETAIL
Scale: NONE



6 REGISTER SIZING
Scale: NONE



5 DIFFUSER SIZING
Scale: NONE



1 RIGID DUCT TAP TO SINGLE SUPPLY AIR DIFFUSER
Scale: NONE

BALZER & ASSOCIATES
PLANNERS / ARCHITECTS
ENGINEERS / SURVEYORS
Roanoke / Richmond
Shenandoah Valley
New River Valley
www.balzer.cc
1208 Corporate Circle
Roanoke, VA 24018
540.772.9580

COMMONWEALTH OF VIRGINIA
02/14/2025
SAMUEL S. LOTT
Lic. No. 061900
PROFESSIONAL ENGINEER

50 Years
RAM HOUSE
#iamramfam

LIONBERGER CONSTRUCTION

RAM HOUSE
ALTERATIONS & ADDITION
MECHANICAL DETAILS
410 ELM AVE
ROANOKE CITY, VIRGINIA

DRAWN BY	MDA
DESIGNED BY	MDA
CHECKED BY	SSL
DATE	02/14/2025
SCALE	NONE
REVISIONS	

M2.02
PROJECT NO 03230086.00