



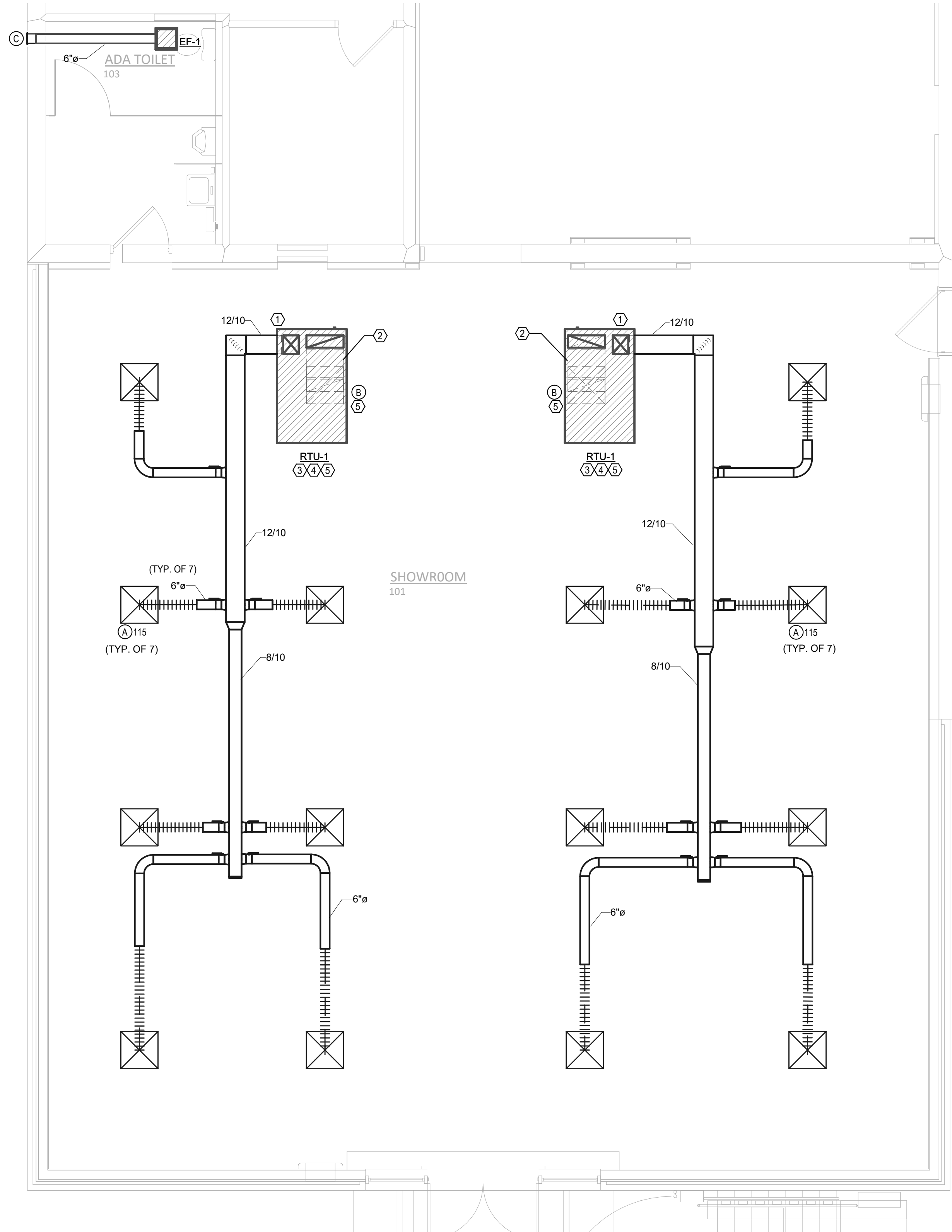
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DATE: 04/04/2023

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#### MECHANICAL KEYED NOTES: ①

- ROUTE SUPPLY DUCT DOWN FROM RTU CONNECTIN AND TRANSATION DUCTWORK AS REQUIRED TO 12"/10" SUPPLY DUCT WORK.
- ROUTE RETURN DUCT UP FROM RTU CONNECTIN AND TRANSATION DUCTWORK AS REQUIRED TO 24"/8" RETURN DUCT WORK.
- ROUTE RTU-1 CONDENSATE TO ROOF SCUPPER. CONTRACTOR TO FIELD VERIFY EXACT ROUTING IN THE FIELD.
- PROVIDE 14" ROOF CURB. ROOF CURB TO MATCH SLOPE OF ROOF. REFER TO DETAIL 3M2-0 FOR ROOF CURB DETAIL.
- ROUTE 24"/8" RETURN DUCT UP FROM RETURN GRILLE CONNECTIN AND TRANSATION DUCTWORK AS REQUIRED TO 24"/8" RETURN DUCT WORK.

#### GENERAL KEYED NOTES

- 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.
- THE GENERAL CONTRACTOR SHALL SEAL AND FLASH ALL WALL, ROOF, AND FLOOR PENETRATIONS AIRTIGHT AND WATERTIGHT AT EACH PIPE DUCTWORK AND CONDUIT PENETRATION. ALL PENETRATION THRU FIRE RATED WALLS ARE TO BE SEALED PER UL DETAILS.
- DUCT WORK INSTALLATION, CONNECTIONS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST APPLICABLE SMACNA STANDARDS.
- EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. COPY OF INSTRUCTIONS SHALL BE ON JOB SITE AT TIME OF BUILDING INSPECTIONS.
- DUCT DIMENSIONS INDICATED ARE ACTUAL SHEET METAL SIZES. WHERE ACOUSTIC LINING IS INDICATED (IF SHOWN), THE DUCT SIZES WERE ADJUSTED TO COMPENSATE FOR THE LINING.
- DUCTWORK LAYOUTS ARE SCHEMATIC. ALL DROPS, RISES, OR OFFSETS REQUIRED BUT NOT SHOWN SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
- DUCT CONNECTIONS TO SIDE WALL OR DUCT MOUNTED REGISTERS AND GRILLES SHALL BE MADE WITH RIGID DUCT. DUCT CONNECTIONS TO CEILING-MOUNTED DIFFUSERS, REGISTERS, AND GRILLES MAY BE WITH RIGID OR FLEXIBLE DUCT (CONTRACTOR OPTION). PROVIDE SMOOTH BENDS IN FLEXIBLE DUCT SECTIONS.
- ALL TEMPERATURE AND HUMIDITY SENSORS IN PUBLIC AREAS SHALL BE MOUNTED AT 5'-0" AFF.
- DUCT CONNECTIONS TO ALL AIR HANDLING UNITS, INCLUDING FAN COIL UNITS, INLINE FANS, ETC. SHALL BE MADE USING FLEXIBLE DUCT CONNECTION. ALSO, PROVIDE FLEXIBLE DUCT CONNECTIONS WHERE DUCTWORK CROSSES BUILDING EXPANSION JOINTS.
- LOCATE CEILING AIR DIFFUSERS, REGISTERS AND GRILLES IN THE CENTER OF 2x2' AND AT THE QUARTER POINT OF 2x4' ACOUSTICAL TILE CEILING MODULES UNLESS SPECIFICALLY INDICTED OTHERWISE ON THE ARCHITECTURAL REFLECTED CEILING PLANS.
- EQUIPMENT HANGERS SHALL BE SPACED IN A SYSTEMATIC RANDOM PATTERN AS REQUIRED TO ELIMINATE OVERLOADING INDIVIDUAL STRUCTURAL MEMBERS. THE ESTIMATED WEIGHT ASSIGNED TO EQUIPMENT HANGERS SHALL BE DETERMINED BY THE MECHANICAL CONTRACTOR AND SUBMITTED TO THE GENERAL CONTRACTOR FOR REVIEW, COORDINATION AND APPROVAL PRIOR TO INSTALLATION. THIS REQUIREMENT APPLIES TO ALL MECHANICAL WORK, INCLUDING PLUMBING AND FIRE PROTECTION.
- WHERE MORE THAN ONE TOP REGISTER IS INSTALLED IN A ROOM, THE CENTERLINE ELEVATION OF EACH REGISTER SHALL BE THE SAME DISTANCE FROM AND LEVEL TO THE PLANE OF THE CEILING.
- MANY OF THE CEILING SPACES ARE EXTREMELY CONGESTED AND WILL REQUIRE SIGNIFICANT ON-SITE FIELD COORDINATION BETWEEN THE CONSTRUCTION TRADES. CONTRACTOR GENERATED COORDINATION DRAWINGS ARE REQUIRED FOR ALL SUCH AREAS AND SHOULD INDICATE STRUCTURE, CEILING FEATURES, LIGHT FIXTURES, PLUMBING AND FIRE SERVICE PIPING AND ALL MECHANICAL EQUIPMENT, PIPING AND DUCTWORK.
- ALL DUCT PENETRATIONS THRU FIRE-RATED WALLS OR FLOOR ASSEMBLIES SHALL BE IN ACCORDANCE WITH AN APPROVED UL AND FIRESTOP SYSTEM FOR THE CONDITIONS ENCOUNTERED AS DEFINED IN THE UL BUILDING MATERIAL DIRECTORY.
- THE ROUTING OF LARGER SIZE SUPPLY AIR DUCTS SHALL TAKE PRECEDENCE OVER SMALLER DUCTS, AND OVER RETURN AND EXHAUST AIR DUCTS. PROVIDE DUCT OFFSETS, RISES AND DROPS AS REQUIRED TO INSTALL DUCTWORK AS CLOSELY TO THE LAYOUT SHOWN ON THESE DOCUMENTS AS POSSIBLE.
- SEE ARCHITECTURAL FIRE PROTECTION DRAWINGS FOR DETAILS OF FIRE AND SMOKE SEALING REQUIREMENTS AT PENETRATIONS OF ALL UL LISTED FIRE AND SMOKE RATED WALL, FLOOR AND ROOF/CEILING ASSEMBLIES.



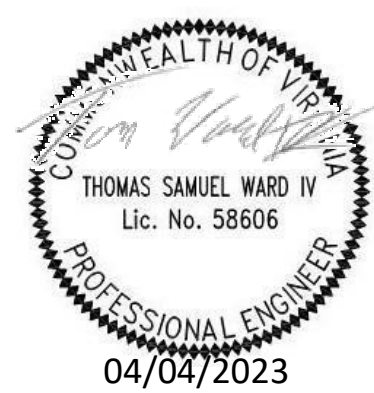
#### 1 LEVEL 1 - MECHANICAL ENLARGEMENT

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

ADDITION & RENOVATIONS  
FOR  
F & S COMMONWEALTH  
BUILDING MATERIALS  
1735 PLANTATION ROAD NE, ROANOKE, VIRGINIA

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MECHANICAL  
ENLARGEMENT



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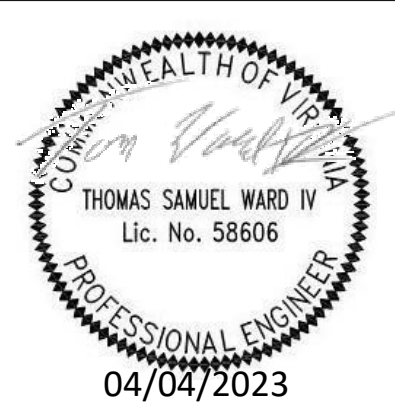
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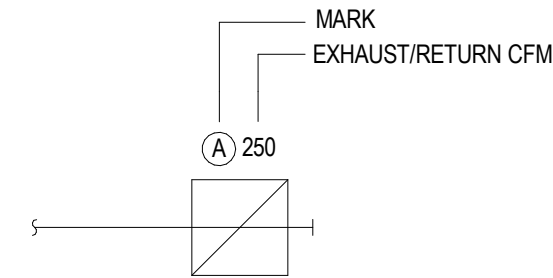
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MECHANICAL DETAILS

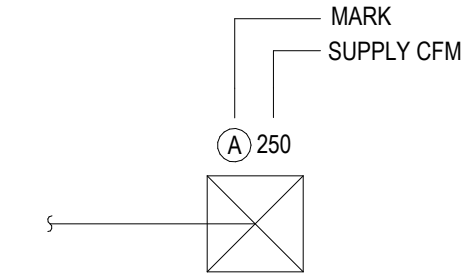


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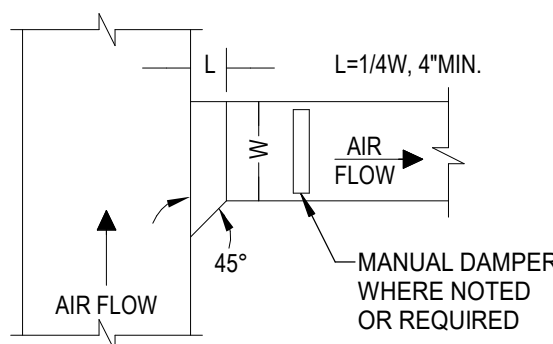
### REGISTER SIZING

NO SCALE



### DIFFUSER SIZING

NO SCALE

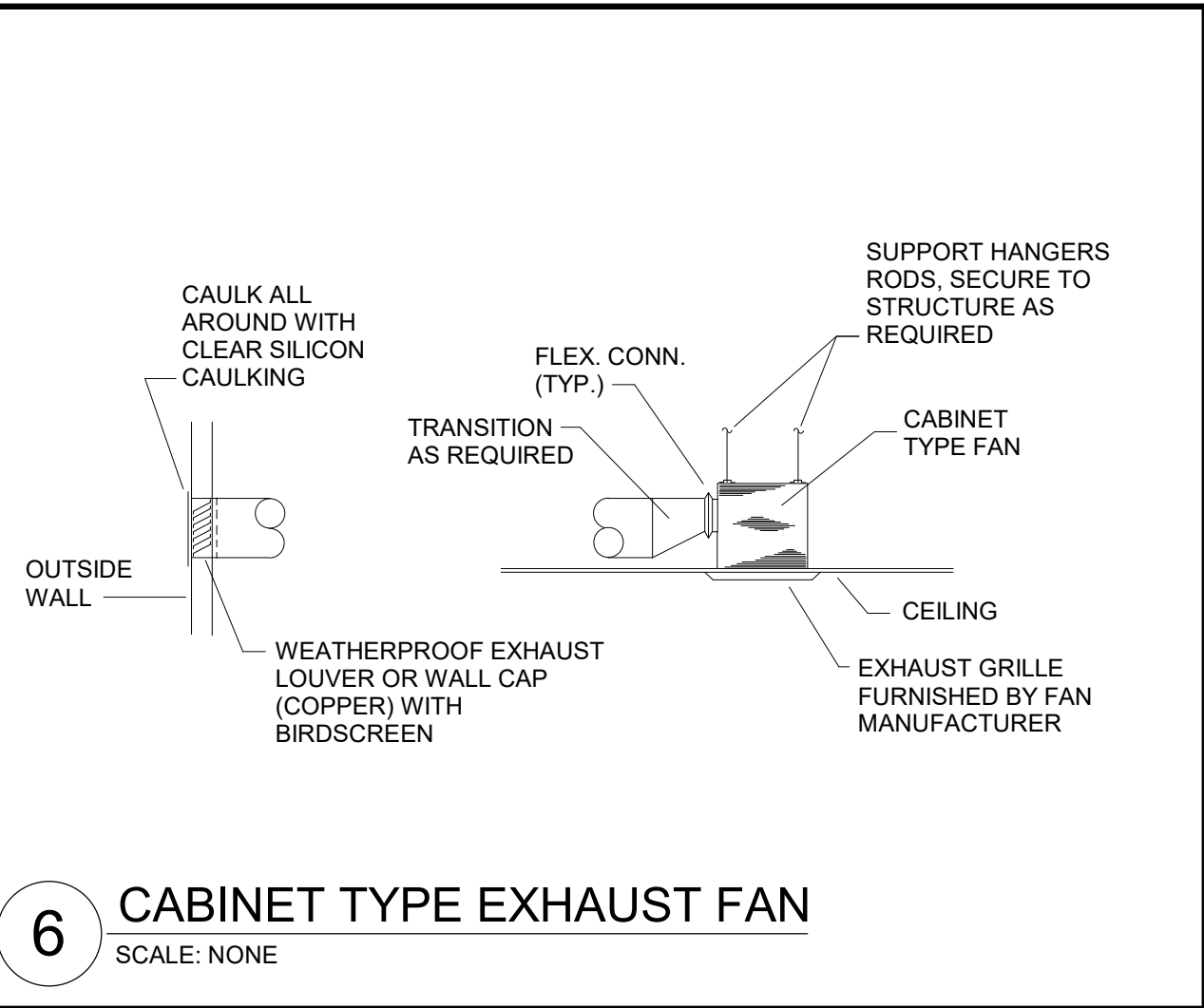


### BRANCH DUCT CONNECTION DETAIL

SCHEMATIC

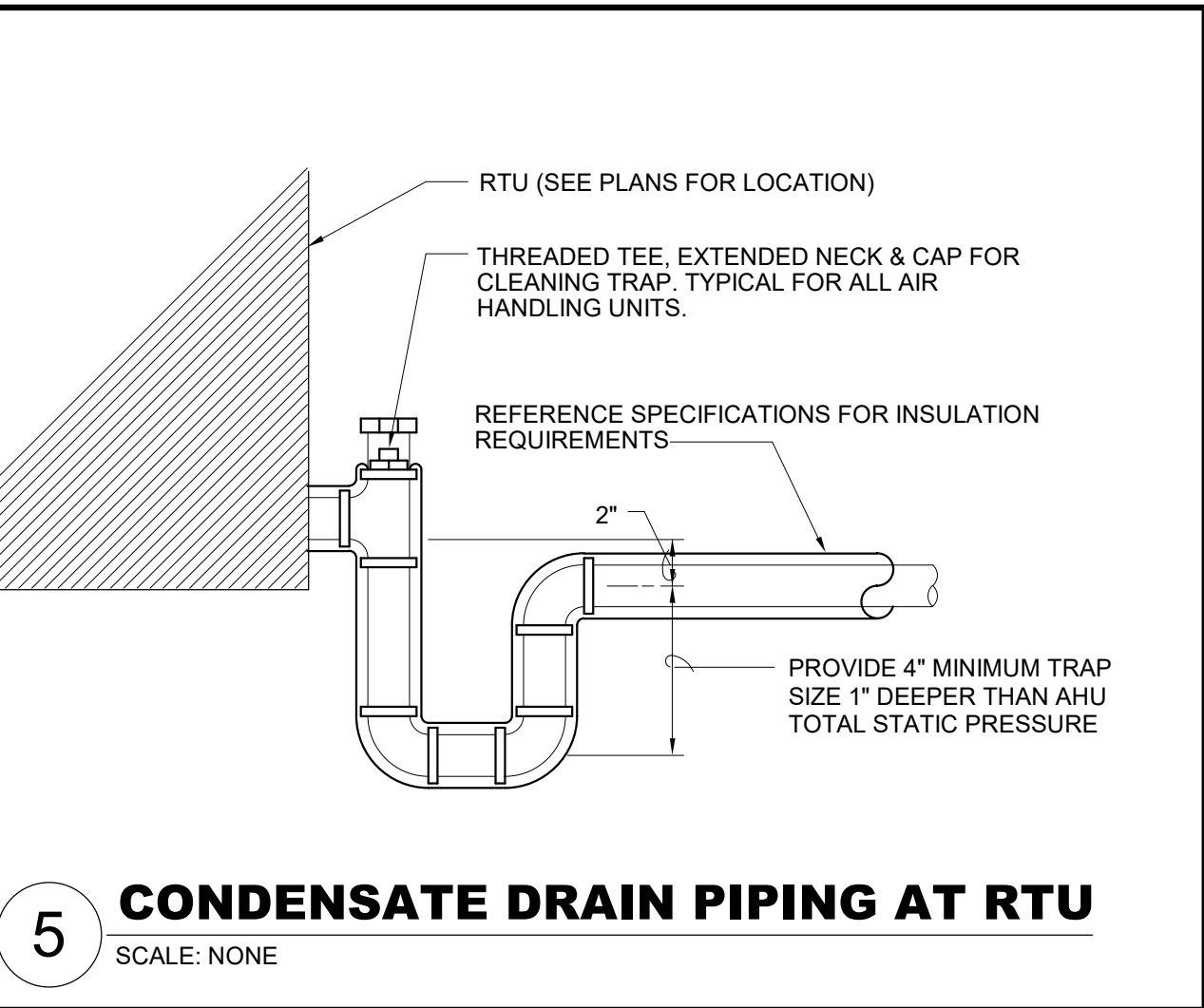
## SYMBOL LEGEND

SYMBOL	DESCRIPTION (DISREGARD ITEMS NOT SHOWN ON PLANS)
<b>GENERAL</b>	
⊕	KEY NOTE TAG
⊙	NOTE SPECIFIC TO DETAIL TAG
⚠	REVISION TAG
<b>DUCTWORK</b>	
▢	SUPPLY AIR DUCTWORK
▤	RETURN AIR AND OUTSIDE AIR DUCTWORK
▥	EXHAUST AIR DUCTWORK
▧	FLEXIBLE DUCTWORK
▨	SUPPLY AIR DUCTWORK THROUGH HORIZONTAL PARTITION
▩	RETURN AIR AND OUTSIDE AIR DUCTWORK THROUGH HORIZONTAL PARTITION
<b>SENSORS</b>	
⊖	THERMOSTAT AND TEMPERATURE SENSOR
⊕	HUMIDISTAT
<b>AIR DEVICES</b>	
⊠	SUPPLY AIR GRILLE WITH FOUR-WAY THROW
▢	RETURN AIR GRILLE
<b>PIPING</b>	
—RLR—	REFRIGERANT LIQUID & GAS RECIRCULATION LINE (TOTAL OF TWO PIPES, ONLY ONE PIPE SHOWN FOR DRAWING CLARITY)
—RL—	REFRIGERANT LIQUID LINE
—HG—	REFRIGERANT HOT GAS LINE
—RS—	REFRIGERANT SUCTION LINE
<b>SUBSCRIPTS AND ABBREVIATIONS</b>	
AFF	ABOVE FINISHED FLOOR
BBS	BELOW BOTTOM OF STRUCTURE
BOD	BOTTOM OF DUCT
CFM	CUBIC FEET PER MINUTE
EA	EXHAUST AIR
FPM	FEET PER MINUTE
OA	OUTSIDE AIR
RA	RETURN AIR
SA	SUPPLY AIR



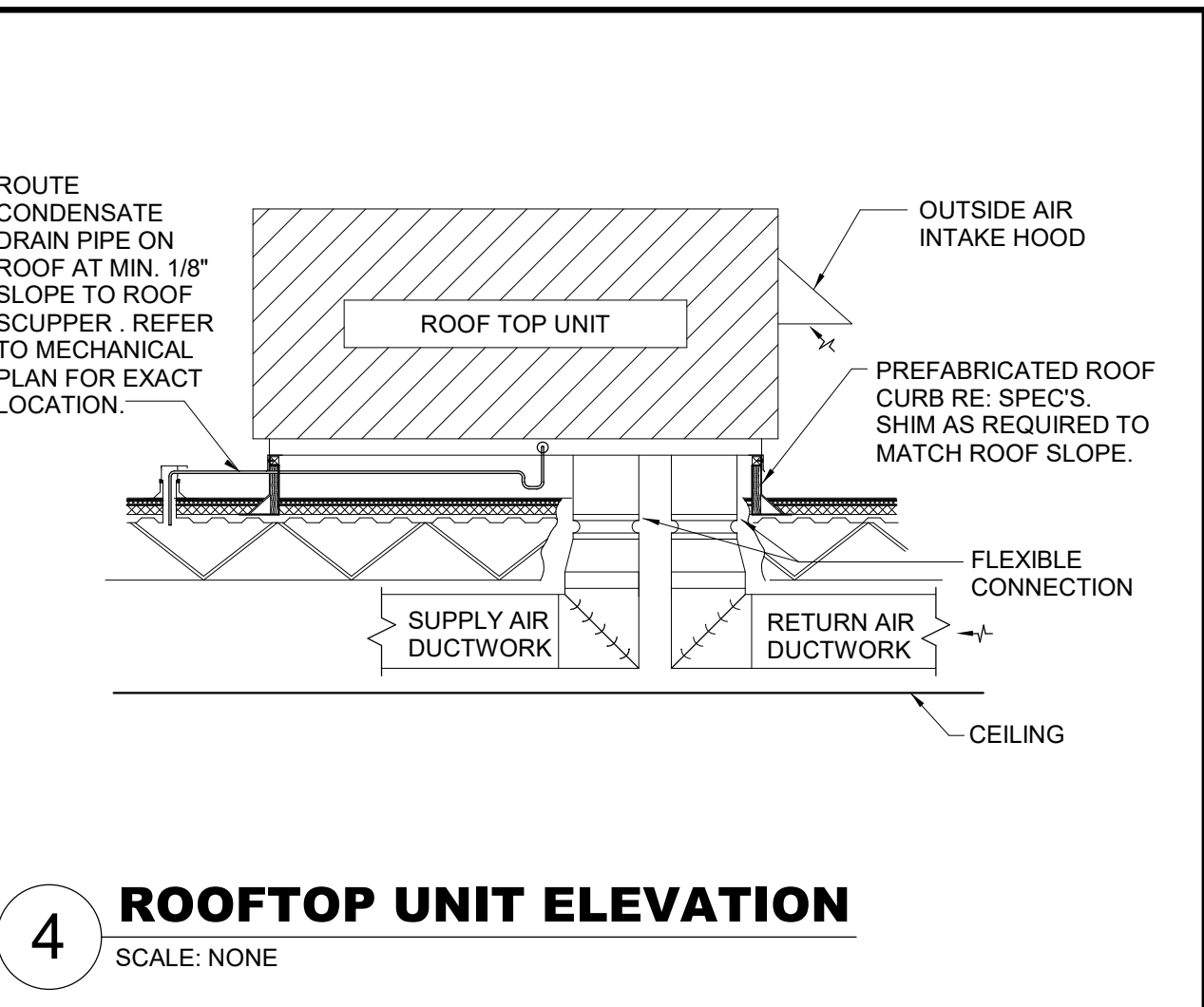
### 6 CABINET TYPE EXHAUST FAN

SCALE: NONE



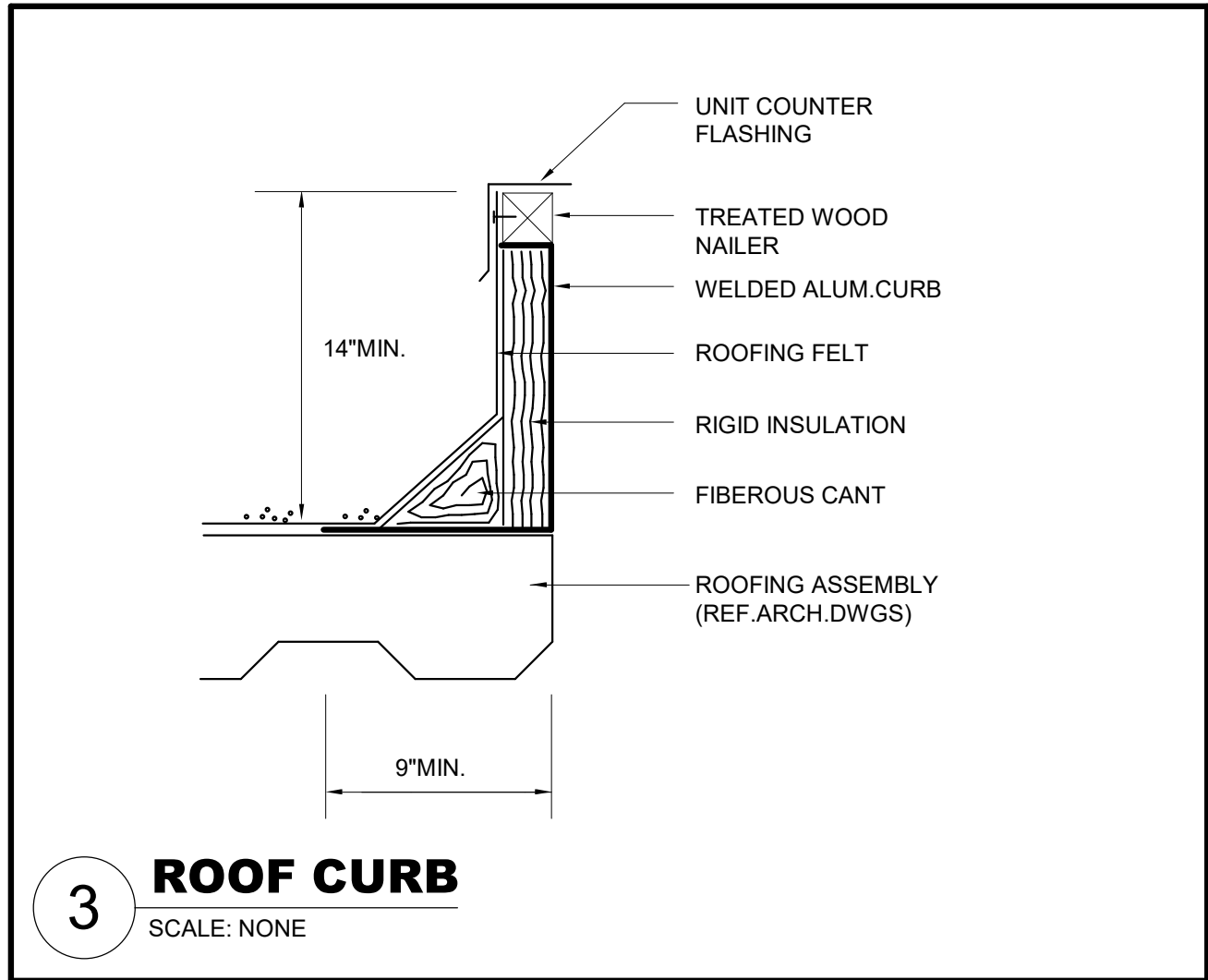
### 5 CONDENSATE DRAIN PIPING AT RTU

SCALE: NONE



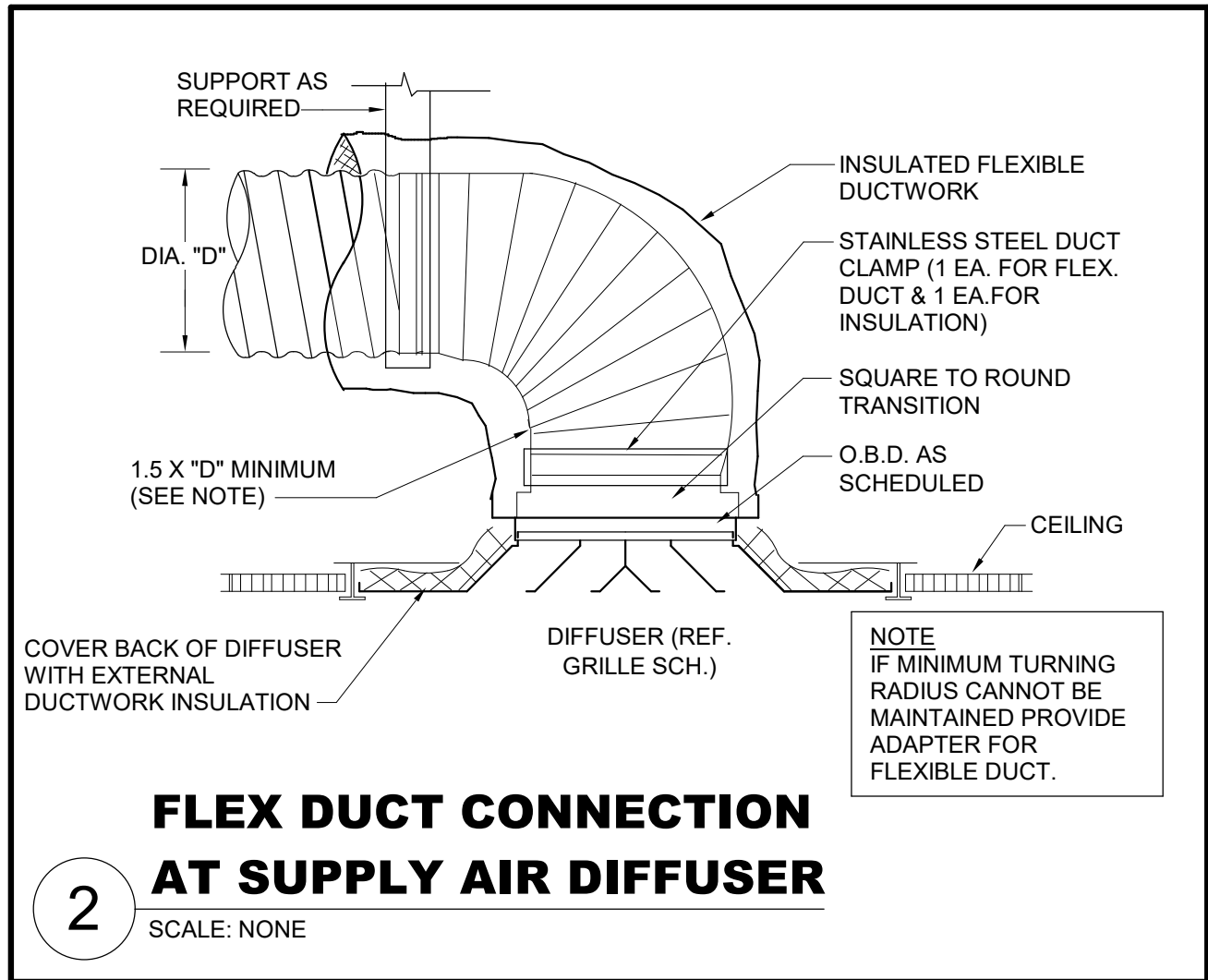
### 4 ROOFTOP UNIT ELEVATION

SCALE: NONE



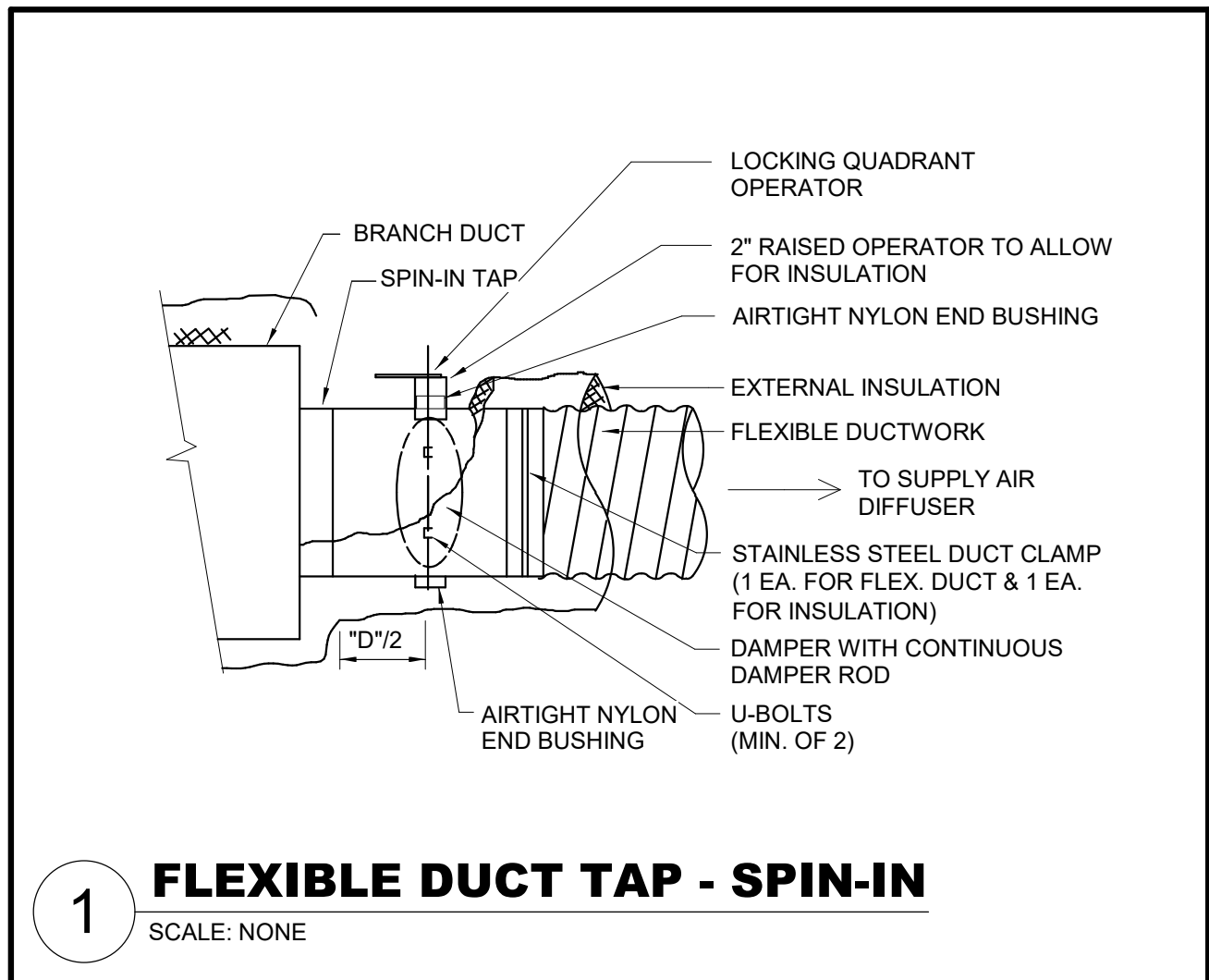
### 3 ROOF CURB

SCALE: NONE



### 2 FLEX DUCT CONNECTION AT SUPPLY AIR DIFFUSER

SCALE: NONE



### 1 FLEXIBLE DUCT TAP - SPIN-IN

SCALE: NONE



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## MECHANICAL SCHEDULES



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## PACKAGED ROOFTOP UNIT - ELECTRIC HEAT

MARK	FAN							COOLING					HEATING					REMARKS				
	SUPPLY AIR CFM	OUTSIDE AIR CFM	EXT.STATIC PRESSURE (IN. W.C.)	HORSE POWER	CURRENT CHARAC.			AIR TEMPERATURE (°F)			MIN. TOTAL CAPACITY (BTUH)	MIN. SENS. CAPACITY (BTUH)	MINIMUM EER/ SEER	ENTERING AIR TEMP.(°F)	MINIMUM CAPACITY (BTUH)	KW	CURRENT CHARAC.					
					V	P	F	ENTERING DRY BULB	ENTERING WET BULB	AMBIENT TEMP							V		P	F		
																					Manufacturer	Model Number
RTU-1	805	270	1.0	0.3	208	1	60	80.0	67.0	95.0	30.00	22.50	12.7/15	80	25.600	7.5	208	1	60	LENNOX	KCB030S4D	1, 2, 3, 4, 5, 6, 7, 8, 9

### GENERAL NOTES

1. EXTERNAL STATIC PRESSURE INCLUDES LOSSES DUE TO DUCTWORK, AIR DEVICES, DAMPERS, AND DUCT MOUNTED HOT WATER COILS WHERE APPLICABLE. DIRTY FILTER AND 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.

## REMARKS:

1. PROVIDE UNIT WITH ROOF CURB.
2. PROVIDE 7 DAY PROGRAMMABLE THERMOSTAT.
3. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR ALL ELECTRICAL COSTS IF ALTERNATE UNIT IS PROVIDED WITH GREATER ELECTRICAL CHARACTERISTICS THEN SHOWN.
4. PROVIDE SINGLE-POINT ELECTRICAL POWER CONNECTION.
5. PROVIDE PRE-WIRED INTEGRAL ELECTRICAL DISCONNECT SWITCH.
6. PROVIDE PRE-WIRED INTEGRAL ELECTRICAL CONVENIENCE RECEPTACLE.
7. PROVIDE UNIT WITH MODULATING HOT GAS RE-HEAT.
8. PROVIDE UNIT WITH SCR CONTROLS.

## GRILLES, REGISTERS AND DIFFUSERS

MARK	DESCRIPTION	MOUNTING TYPE	FACE LENGTH	FACE WIDTH	NECK SIZE	MIN AIRFLOW (CFM)	MAX AIRFLOW (CFM)	MAX AIR P.D., IN. H2O	MAX N.C.	MANUFACTURER	MODEL #	NOTES
A	SQUARE PLAQUE DIFFUSER	SURFACE MOUNTED DIFFUSER	24.0	24.0	6"ø	0	175	0.1	25	PRICE	ASPD	1,2
B	SINGLE DEFLECTION BLADES W/3/4"SPACING	SURFACE MOUNTED REGISTER	24.0	24.0	24/24	280	500	0.05	20	PRICE	630	1,3
C	AIR INTAKE / EXHAUST OUTLET	SURFACE MOUNTED	6.9	6.9	6"ø	0	100	0.1	25	BROAN	641FA	1,3

1. COORDINATE EXACT GRILL/DIFFUSER LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS.
2. DUCT MOUNTED BALANCING DAMPERS SHALL BE FURNISHED AND INSTALLED WHERE ROUNOT IS ABOVE AN ACCESSIBLE CEILING. IN LOCATIONS ABOVE HARD CEILINGS, DIFFUSERS SHALL BE FURNISHED WITH OPPOSED BLADE DAMPER OPERABLE THRU DIFFUSER FACE. FLEX DUCT CONNECTION SHALL EQUAL THE DIAMETER OF DIFFUSER CONNECTION.
3. REGISTERS SHALL BE FURNISHED WITH OPPOSED BLADE DAMPER OPERABLE THRU REGISTER FACE.

**FAN**

MARK	LOCATION	CFM	EXT. STATIC PRESSURE (IN. W.C.)	MAX. FAN RPM	HORSE POWER	CURRENT CHARAC.			INTERLOCKED WITH	FAN TYPE	DRIVE TYPE	MANUFACTURER	MODEL NUMBER	REMARKS
						V	P	F						
EF-1	BATHROOM	70	0.13	640	0.2	120	1	60	LIGHTS	CEILING	DIRECT	GREENHECK	SP-870	1, 2, 3

## GENERAL NOTES:

1. EXTERNAL STATIC PRESSURE INCLUDES LOSSES DUE TO DUCTWORK, AIR DEVICES, DAMPERS, AND DUCT. MOUNTED HOT WATER COILS WHERE APPLICABLE. DIRTY FILTER AND 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. MINIMUM RECOMMENDED CLEARANCE AROUND UNIT IS 12 INCHES ON NON-SERVICE SIDES AND 30 INCHES ON SERVICE SIDES. 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

REMARKS:

1. PROVIDE WITH DISCONNECT.
2. PROVIDE WITH BIRD SCREEN.
3. PROVIDE WITH MOTORIZED DAMPER.



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## MECHANICAL SPECIFICATIONS

### GENERAL

- PERFORM WORK IN ACCORDANCE WITH APPLICABLE STATUTES, ORDINANCES, CODES AND REGULATIONS OF GOVERNMENTAL AUTHORITIES HAVING JURISDICTION.
- OBTAIN ALL PERMITS REQUIRED.
- CONTRACT DRAWINGS ARE DIAGRAMMATIC ONLY AND DO NOT GIVE FULLY DIMENSIONED LOCATIONS OF VARIOUS ELEMENTS OF WORK. DETERMINE EXACT LOCATIONS FROM FIELD MEASUREMENTS.
- 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.
- IMMEDIATELY PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT, REPLACE AIR FILTERS.
- 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.
- PROVIDE NAMEPLATES WITH 1/2" HIGH LETTERS AND FASTENED WITH EPOXY OR SCREWS.
- MAINTAIN QUALITY CONTROL OVER SUPERVISION, SUBCONTRACTORS, SUPPLIERS, MANUFACTURERS, PRODUCTS, SERVICES, SITE CONDITIONS AND WORKMANSHIP TO PRODUCE WORK IN ACCORDANCE WITH CONTRACT DOCUMENTS.
- COMPLY WITH INDUSTRY STANDARDS EXCEPT WHEN MORE RESTRICTIVE TOLERANCES OR SPECIFIED REQUIREMENTS INDICATE MORE RIGID STANDARDS OR MORE PRECISE WORKMANSHIP.
- PERFORM WORK BY PERSONS QUALIFIED TO PRODUCE WORKMANSHIP OF SPECIFIED QUALITY.
- 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.
- PROVIDE FINISHES TO MATCH APPROVED SAMPLES. ALL EXPOSED FINISHES SHALL BE APPROVED BY THE ARCHITECT. SUBMIT COLOR SAMPLES AS REQUIRED.
- COMPLY WITH INSTRUCTIONS IN FULL DETAIL, INCLUDING EACH STEP IN SEQUENCE. SHOULD INSTRUCTION CONFLICT WITH CONTRACT DOCUMENTS, REQUEST CLARIFICATION FROM ARCHITECT / ENGINEER BEFORE PROCEEDING.

### EARTHWORK

- REMOVE EXCESS EXCAVATION MATERIAL OR MATERIAL UNSUITABLE FOR BACKFILL. EXCESS MATERIAL CAN BE SPREAD ON GRADE, OR SHALL BE REMOVED FROM SITE AS DIRECTED BY THE OWNER/ARCHITECT.

### TESTING, BALANCING, AND ADJUSTING

- VERIFY AND RECORD THE TESTING RESULTS PERFORMED BY THE MECHANICAL CONTRACTOR.
- 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.
- 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.
- 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).
- 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.
- 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.

### DUCTWORK

- 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.
- RECTANGULAR LOW DUCT CONSTRUCTED OF SHEET METAL IN ACCORDANCE WITH THE LATEST EDITION OF SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
- 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. SEAMS AND JOINTS OF ALL MEDIUM PRESSURE DUCTWORK SHALL BE CONTINUOUSLY WELDED.
- 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/IN/50, FT./F AND 2" WALL THICKNESS INSULATION WITH 1" OVERLAP. ACCEPTABLE MANUFACTURERS: FLEXMASTER, HART & COOLEY, OMNIAIR.
- ACCEPTABLE MANUFACTURERS: FLEXMASTER, THERMOFLEX, OMNIAIR.
- 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.
- 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

- FURNISH AND INSTALL EXTERNAL INSULATION ON SUPPLY, RETURN, EXHAUST AND FRESH AIR DUCTWORK.
- 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.
- CONDENSATION ON ANY INSULATED SYSTEM IS NOT APPROVED.
- INSULATION: GLASS FIBER BLANKET DUCT INSULATION. ACCEPTABLE MANUFACTURERS ARE: MANVILLE R-SERIES MICROUTE FSKL, OWENS-CORNING ED100 RKF, KNAUF 1.0 PCF FSK.
- 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.
- REINFORCED FOIL TAPE: ACCEPTABLE MANUFACTURERS ARE: VENTURE 1525CW, 3" FSK.

### CONDENSATE PIPING

- TYPE "L" COPPER WITH DRAINAGE PATTERN FITTINGS IN RETURN PLENUM AREAS, PVC WITH DRAINAGE PATTERN FITTINGS IN NON-PLENUM AREAS.
- 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.
- 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.
- DO NOT INSTALL PIPING SIZED SMALLER THAN THE UNIT DRAIN CONNECTION SIZE.
- INSULATE PIPING WITH 3/4" ELASTOMERIC INSULATION FOR ALL PIPE BELOW ROOF.
- INSULATION TO BE 25/50 FLAME AND SMOKE RATING.

### SINGLE PACKAGED ROOFTOP AIR CONDITIONERS

- PROVIDE AND INSTALL A SINGLE-PACKAGE, SINGLE-ZONE, ELECTRIC AIR CONDITIONER WITH ELECTRIC HEAT FOR ROOFTOP APPLICATION.
- PERFORMANCE: AS SCHEDULED ON DRAWINGS, WITH HEAD PRESSURE CONTROL TO ENABLE UNIT START AND OPERATE DOWN TO 20 DEGREES F AMBIENT.
- ACCEPTABLE MANUFACTURERS: CARRIER, YORK/JCI, TRANE.
- 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.
- EVAPORATOR AND CONDENSER COILS: PROVIDE COPPER TUBES WITH MECHANICALLY BONDED ALUMINUM FINS FOR EVAPORATOR AND CONDENSER COILS. PROVIDE HAIL GUARDS FOR CONDENSER COILS.
- 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.
- THERMOSTAT ASSEMBLY: PROVIDE STAGED 7-DAY PROGRAMMABLE HEATING AND COOLING AS REQUIRED, AUTOMATIC CHANGEOVER AND FAN CONTROL.
- HEAD PRESSURE CONTROL: PROVIDE SOLID STATE OUTDOOR AIR FAN SPEED CONTROL TO PERMIT UNIT TO OPERATE DOWN TO -20°F.
- 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.
- CONVENIENCE OUTLET: PROVIDE 115V OUTLET IN UNIT CABINET.
- CONTROL WIRING: FURNISH AND INSTALL CONTROL WIRING AS REQUIRED. INSTALL CONTROL WIRING IN CONDUIT.

### FANS

- 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.
- ACCEPTABLE MANUFACTURERS: COOK, GREENHECK, PENN VENTILATOR, ACME, CARNES, TWIN CITY.
- SAFETY DISCONNECT SWITCH: PROVIDE A FACTORY-WIRED TO MOTOR, SAFETY DISCONNECT SWITCH ON EACH UNIT.
- DAMPERS, WHERE AUTOMATIC BACKDRAFT DAMPER IS SCHEDULED: MULTI-BLADED, ROLL FORMED ALUMINUM BLADES, NYLON BEARINGS, NEOPRENE WEATHER STRIP ON BLADE EDGE.

### AIR DEVICES

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

### AIR FILTERS

- 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.
- INSTALL THE FILTERS AND FILTER GAUGES IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

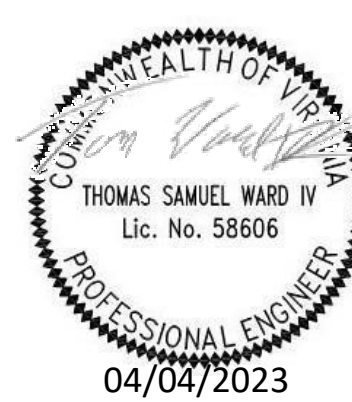
### SYSTEM CONTROL

- GENERAL EXHAUST FANS SHALL BE INTERLOCKED WITH LIGHTS IN ROOM UNLESS OTHERWISE NOTED.
- PACKAGED ROOF TOP UNIT SHALL GO INTO OCCUPIED/UNOCCUPIED MODE AT TIME SET THROUGH PROGRAMMED THERMOSTAT (CONSULT WITH OWNER FOR TIMES). A SPACE TEMPERATURE AND HUMIDITY SENSOR SHALL MAINTAIN DESIRED SET POINT TEMPERATURE. IF UNIT HAS (2) COMPRESSORS, FAN COIL SHALL RUN AT HALF SPEED WHEN ONLY ONE COMPRESSOR IS ENERGIZED TO MAINTAIN COLDEST AIR POSSIBLE. UNIT SHALL BE SET TO RUN IN "AUTO" MODE ONLY. THE OUTSIDE AIR DAMPER SHALL BE INTERLOCKED TO ONLY OPEN WHEN THE UNIT IS OPERATING.

ADDITION & RENOVATIONS  
FOR  
F & S COMMONWEALTH  
BUILDING MATERIALS  
1735 PLANTATION ROAD NE, ROANOKE, VIRGINIA

DRAWN BY: JS  
CHECKED BY: SL

MECHANICAL  
SPECIFICATIONS



COMMISSION No.  
21064

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