

MECHANICAL SYMBOLS	
SYMBOL	DESCRIPTION
	CONTROL VALVE (3-WAY)
	CONTROL VALVE (2-WAY)
	GATE VALVE
	BALANCING VALVE
	GLOBE VALVE
	BALL VALVE
	CHECK VALVE
	BUTTERFLY VALVE
	PRESSURE REGULATING VALVE
	VENTURI FLOW METER
	BACKFLOW PREVENTER
	PIPE REDUCER OR INCREASER
	Y-STRAINER
	UNION
	PIPE CAP OR PLUG
	PIPE CONTINUES
	ELBOW UP
	ELBOW DOWN
	TOP TAKE-OFF
	BOTTOM TAKE-OFF
	DIRECTION OF FLOW
	DIRECTION OF AIR FLOW
	PIPE SLOPE AS NOTED
	CONNECT TO EXISTING

MECHANICAL SYMBOLS	
SYMBOL	DESCRIPTION
	MANUAL DAMPER
	FIRE DAMPER
	SMOKE DAMPER
	MOTOR OPERATED DAMPER
	CARBON DIOXIDE SENSOR
	CARBON MONOXIDE SENSOR
	THERMOSTAT/TEMPERATURE SENSOR
	HUMIDISTAT
	DUCT MOUNTED SMOKE DETECTOR
	TEMPERATURE SENSOR
	HOSE END DRAIN VALVE
	PRESSURE GAUGE
	FLOW SWITCH
	GAS PRESSURE REGULATING VALVE
	GAS COCK

PIPING DESCRIPTION	
	CHILLED WATER RETURN
	CHILLED WATER SUPPLY
	HEATING WATER RETURN
	HEATING WATER SUPPLY
	REFRIGERANT PIPES (SUCTION/LIQUID)
	NATURAL GAS
	CONDENSATE DRAIN

GENERAL	
	X = SECTION DETAIL NUMBER XX = SHEET REFERENCE
	X = CALLOUT DETAIL NUMBER XX = SHEET REFERENCE

MECHANICAL SUMMARY (BASE BID)

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT		
METHOD OF COMPLIANCE		
⊗	PERSCRPTIVE	ENERGY COST BUDGET
THERMAL ZONE - 3A		
WINTER DRY BULB	28°F	
SUMMER DRY BULB	92.3°F	
INTERIOR DESIGN CONDITIONS		
WINTER DRY BULB	70°F	
SUMMER DRY BULB	75°F	
RELATIVE HUMIDITY	50% - SUMMER	
BUILDING HEATING LOAD 638.5 MBTUH		
BUILDING COOLING LOAD 59.3 TONS		
MECHANICAL SPACING CONDITIONING SYSTEM		
UNITARY	DESCRIPTION OF UNIT:	REFER TO SCHEDULES
	HEATING EFFICIENCY:	REFER TO SCHEDULES
	COOLING EFFICIENCY:	REFER TO SCHEDULES
	HEAT OUTPUT OF UNIT:	REFER TO SCHEDULES
	COOLING OUTPUT OF UNIT:	REFER TO SCHEDULES
BOILER	TOTAL BOILER OUTPUT, IF OVERSIZED, STATE REASON:	N/A
CHILLER	TOTAL CHILLER CAPACITY, IF OVERSIZED, STATE REASON:	N/A
LIST EQUIPMENT EFFICIENCIES - REFER TO SCHEDULES		
EQUIPMENT SCHEDULES WITH MOTORS (MECHANICAL SYSTEMS)		
MOTOR HORSEPOWER:	REFER TO SCHEDULES	
NUMBER OF PHASES:	REFER TO SCHEDULES	
MINIMUM EFFICIENCY:	REFER TO SPECIFICATIONS	
MOTOR TYPE:	REFER TO SPECIFICATIONS	
# OF POLES:	REFER TO SPECIFICATIONS	

DUCTWORK SYMBOLS	
	SQUARE ELBOW (WITH TURNING VANES)
	RADIUS ELBOW (1.5 DIA. UNLESS NOTED)
	SQUARE TO SQUARE/ROUND DUCT 90 DEGREE TAKEOFF
	ROUND TO ROUND DUCT 90 DEGREE TAKEOFF
	TRANSITION
	RECTANGULAR ELBOW UP (SUPPLY)
	RECTANGULAR ELBOW DN (SUPPLY)
	ROUND ELBOW UP (SUPPLY)
	ROUND ELBOW DN (SUPPLY)
	VAV BOX (SIZE MAY VARY)
	45 DEGREE DUCT TRANSITION UP/DN
	FLEX DUCT

AIR DEVICE SYMBOLS	
	SUPPLY AIR DEVICE
	EXHAUST AIR DEVICE
	RETURN AIR DEVICE
	WALL AIR DEVICE (SUPPLY/RETURN)
	LINEAR SLOT WALL AIR DEVICE
	LINEAR SLOT CEILING AIR DEVICE
	EQUIPMENT TAG XXX = TYPE X = NUMBER (SEE SCHEDULE)
	AIR DEVICE TAG X = TAG XX = CFM (SEE SCHEDULE)

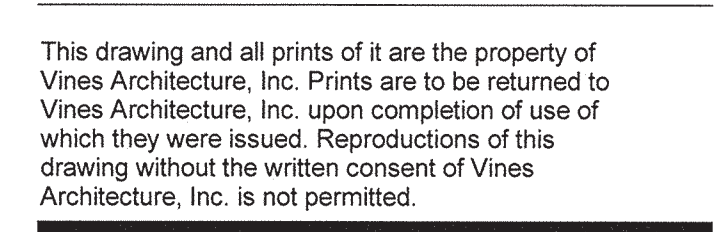
ABBREVIATIONS - MECHANICAL	
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAU	MAKEUP AIR UNIT
MBH	1,000 BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MFRG	MANUFACTURER
MOCP	MAXIMUM OVERCURRENT PROTECTION
N	NEW OR NORTH
NC	NORMALLY CLOSED OR NOISE CRITERIA
NG	NATURAL GAS
NO	NORMALLY OPEN OR NUMBER
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTDOOR AIR
OAT	OUTDOOR AIR TEMPERATURE
OD	OUTSIDE DIAMETER
OS	OCCUPANCY SENSOR
P	PRESSURE OR PRESSURE SENSOR
PI	PROVIDE AND INSTALL
PA	PIPE ANCHOR
PD	PRESSURE DROP
PH	PHASE
PHC	PREHEAT COIL
PPM	PARTS PER MILLION
PTAC	PACKAGED TERMINAL AIR CONDITIONER
QTY	QUANTITY
R	RADIUS, RISE, OR REMOVE
RA	RETURN AIR
RAD	RADIATOR
RAT	RETURN AIR TEMPERATURE
RCP	REFLECTED CEILING PLAN
RD	REFRIGERANT DISCHARGE
RF	REFRIGERANT PIPING
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SAT	SUPPLY AIR TEMPERATURE
SCH	SCHEDULE
SD	SLOT DIFFUSER
SEC	SECONDS
SF	SUPPLY FAN OR SQUARE FOOT
SS	STATIC PRESSURE
SP	SPLIT SYSTEM OR STAINLESS STEEL
SVAV	SERIES FLOW FAN POWERED BOX
SWR	SIDEWALL REGISTER
T OR TEMP	TEMPERATURE
T&P	TEMPERATURE AND PRESSURE
T-STAT	THERMOSTAT
TOP	TEMPERATURE CONTROL PANEL
TEF	TOILET EXHAUST FAN
TON	12,000 BRITISH THERMAL UNITS PER HOUR COOLING
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UH	UNIT HEATER
V OR VOLT	VOLTAGE
VAV	VARIABLE AIR VOLUME BOX
VEL	VELOCITY
VF	VENTILATION FAN
VFD	VARIABLE FREQUENCY DRIVE
Voc	OUTDOOR AIRFLOW (SPACE)
W	WIDTH OR WATTS
WI	WITH
WB	WET BULB
WC	WATER COLUMN
WCU	WATER CHILLING UNIT
WG	WATER GAUGE
WH	WALL HYDRANT
WHP	WATER HEATER PUMP
WL	WALL LOUVER
WPD	WATER PRESSURE DROP
X	UNCORRECTED FRACTION OF OUTDOOR AIR (SYSTEM)
Y	CORRECTED FRACTION OF OUTDOOR AIR (SYSTEM)
Z	FRACTION OF OUTDOOR AIR (CRITICAL SPACE)

GENERAL NOTES - MECHANICAL	
1	ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES AND REGULATIONS. MECHANICAL EQUIPMENT SHALL BE SELECTED TO MEET OR EXCEED THE REQUIREMENTS OF THE ENERGY CONSERVATION CODE.
2	ALL STRUCTURAL OPENINGS SHALL BE COORDINATED WITH STRUCTURAL TRADES. COORDINATE ANY STRUCTURAL SUPPORTS FOR OPENINGS WITH STRUCTURAL TRADES.
3	THESE DRAWINGS ARE DIAGRAMMATIC. EXACT EQUIPMENT LOCATIONS AND DUCT AND PIPING ROUTING SHALL BE COORDINATED WITH THE BUILDING AND SITE CONDITIONS. THE ACTUAL EQUIPMENT AND MINIMUM CLEARANCE DIMENSIONS SHALL BE VERIFIED WITH THE SUPPLIERS. FITTINGS NOT SHOWN ON THE DRAWINGS MIGHT BE REQUIRED.
4	CUT, FIT, AND PLACE MISCELLANEOUS METAL MECHANICAL SUPPORTS ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION TO SUPPORT AND ANCHOR MECHANICAL MATERIALS AND EQUIPMENT. REFER TO STRUCTURAL TRADE FOR STEEL FRAMING AND SUPPORT MATERIAL REQUIREMENTS.
5	FURNISH AND INSTALL ALL INCIDENTAL ACCESSORIES REQUIRED TO MAKE THE MECHANICAL WORK COMPLETE AND OPERATIONAL.
6	COORDINATE THE INSTALLATION OF EQUIPMENT WITH OTHER TRADES PRIOR TO PURCHASE AND INSTALLATION. MAINTAIN MINIMUM EQUIPMENT AND DEVICE MAINTENANCE CLEARANCES. INSTALLED MATERIALS NOT COORDINATED SHALL BE REMOVED AND REINSTALLED AT NO ADDITIONAL COST.
7	COORDINATE THE LAYOUT OF EQUIPMENT, DUCTWORK, PIPING AND CONDUIT WITH BUILDING COMPONENTS AND OTHER TRADES PRIOR TO INSTALLATION. THE SYSTEMS SHALL BE NEATLY ARRANGED TO MAXIMIZE SPACE ABOVE CEILINGS AND WITHIN CHASES. DEVICES SHALL BE READILY MAINTAINABLE. METERS AND GAGES SHALL BE ORIENTED FOR BEST VIEW.
8	VOLUME DAMPERS SHALL BE INSTALLED IN ALL BRANCH DUCTS AS REQUIRED TO FACILITATE SYSTEM BALANCING. A BRANCH IS WHERE ONE DUCT CONNECTS TO ANOTHER. BRANCH DUCT MANUAL VOLUME DAMPERS LOCATED OVER INACCESSIBLE CEILINGS SHALL BE ADJUSTABLE BY A REMOTE CABLE CONTROL EQUAL TO YOUNG REGULATOR MODEL 270-301.
9	COORDINATE EXACT LOCATIONS OF CEILING MOUNTED EQUIPMENT WITH THE REFLECTED CEILING PLANS AND THE EXISTING CONDITIONS. AIR OUTLETS AND SMOKE DETECTORS SHALL BE COORDINATED TO BE NO LESS THAN 36-INCHES APART.
10	WALL MOUNTED CONTROL SENSORS SHALL BE INSTALLED AT 48-INCHES ABOVE THE FLOOR TO THE TOP OF THE BACK-BOX. COORDINATE EXACT LOCATIONS WITH LIGHT SWITCHES. WHEN BOTH ARE INDICATED ADJACENT TO A DOOR, LOCATE THE SWITCH CLOSEST TO THE DOOR AND THE SENSOR WITHIN 12-INCHES OF THE SWITCH.
11	MAXIMUM LENGTH OF FLEX DUCT SHALL BE 5'-0".
12	ELBOWS FOR RECTANGULAR DUCTWORK SHALL BE RADIAL UNLESS SHOWN TO BE MITERED. PROVIDE TURNING VANES IN ALL MITERED ELBOWS.
13	ALL DUCTWORK SHALL CONFORM TO "SMACNA" AND ASHRAE DUCT CONSTRUCTION STANDARDS.
14	PROVIDE A DUCT ACCESS DOOR FOR EACH DUCT-MOUNTED DEVICE REQUIRING MAINTENANCE OR INSPECTION. REFER TO SECTION 233300 FOR DOOR SIZING REQUIREMENTS. COORDINATE CEILING AND WALL ACCESS DOORS WITH DUCT ACCESS DOORS.
15	HVAC PIPING SHALL BE NO LESS THAN 3/4-INCH, EXCEPT FOR REFRIGERANT PIPING.
16	EXPOSED DUCT, PIPING AND CONDUIT SHALL BE PRIMED AND PAINTED TO MATCH ADJACENT SURFACES.
17	EXPOSED DUCT, PIPING AND CONDUIT SHALL BE PRIMED FOR OTHERS TO PAINT.
18	ALL HANGER SYSTEMS FOR PIPING AND EQUIPMENT SHALL BE SECURED TO BUILDING STRUCTURAL SYSTEM.
19	EXTEND POWER CONDUIT AND WIRING FROM DEDICATED POWER SOURCES TO CONTROL'S EQUIPMENT.
20	ALL MOTORIZED EQUIPMENT SHALL BE CONNECTED TO DUCTWORK WITH FLEXIBLE CONNECTIONS.
21	INSTALL PENETRATIONS OF LIFE-SAFETY RATED ASSEMBLIES PER APPROVED UL DETAIL IN ACCORDANCE WITH THE BUILDING CODE.
22	INSTALL LIFE-SAFETY (FIRE, SMOKE AND COMBINATION FIRE AND SMOKE) DAMPERS IN RATED ASSEMBLIES PER UL DETAIL IN ACCORDANCE WITH THE BUILDING CODE AND MANUFACTURERS LISTING REQUIREMENTS.
23	CONTROL AND ALARM DEVICES SHALL BE INSTALLED IN BACK-BOXES WITHIN NEW WALLS. SURFACED MOUNTED CONDUIT AND RACEWAY WILL NOT BE ACCEPTED. DEVICE BACK-BOXES IN FIRE-RATED WALLS SHALL HAVE FIRESTOP PUTTY PADS OR EQUIVALENT UL LISTED INSTALLATION.
24	ALL EQUIPMENT AND DEVICES LISTED IN THE EQUIPMENT SCHEDULES OR NOTED ON THE DRAWINGS SHALL BE CONSIDERED THE BASIS OF DESIGN. THE CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF ALL EQUIPMENT OR DEVICES WHICH DEVIATE FROM THE BASIS OF DESIGN. THE CONTRACTOR SHALL SUBMIT A DESCRIPTION AND LIST OF ANY AND ALL CHANGES REQUIRED, INCLUDING BUT NOT LIMITED TO, ELECTRICAL, MECHANICAL, AND PLUMBING CONNECTIONS, VOLTAGE REQUIREMENTS, FLOW REQUIREMENTS, SIZES, WEIGHTS, REQUIRED CLEARANCES, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL COSTS ASSOCIATED WITH PROVIDING EQUIPMENT OR DEVICES WHICH DIFFER FROM THE BASIS OF DESIGN.

DRAWING LIST - MECHANICAL	
M001	MECHANICAL SYMBOLS, ABBREVIATIONS & NOTES
M101	FIRST FLOOR PLAN - DUCTWORK
M101A	FIRST FLOOR PLAN - DUCTWORK (ALTERNATE #1)
M101B	FIRST FLOOR PLAN - DUCTWORK (ALTERNATE #2)
M201	ROOF PLAN - DUCTWORK
M201A	ROOF PLAN - DUCTWORK (ALTERNATE #1)
M201B	ROOF PLAN - DUCTWORK (ALTERNATE #2)
M301	MECHANICAL SECTIONS
M302	MECHANICAL SECTIONS
M303	MECHANICAL SECTIONS ALTERNATES
M401	MECHANICAL DETAILS I
M402	MECHANICAL DETAILS II
M501	MECHANICAL CONTROLS
M502	MECHANICAL CONTROLS
M503	MECHANICAL CONTROLS
M601	MECHANICAL SCHEDULES
Grand total: 16	



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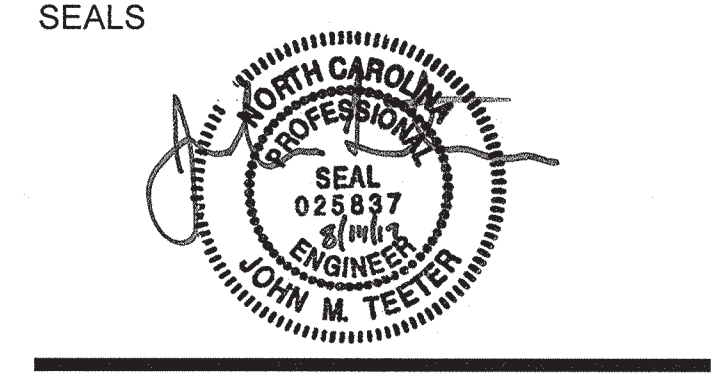
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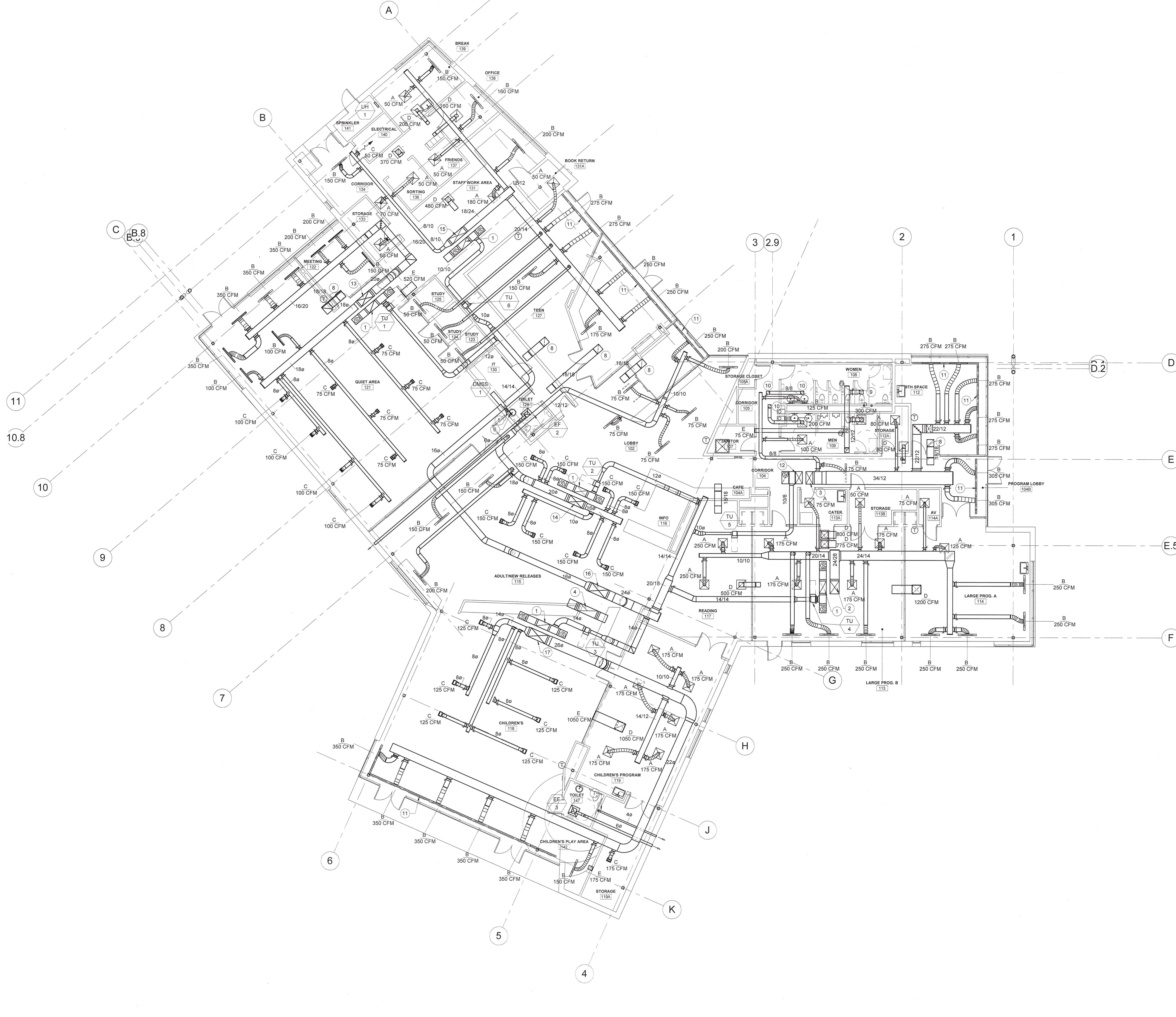
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PHASE CONSTRUCTION DOCUMENTS	
DATE	AUGUST 14, 2017
PROJECT	PINE VALLEY BRANCH
DEI PROJECT #	50090277
SCO ID #	

DRAWING TITLE
MECHANICAL SYMBOLS, ABBREVIATIONS & NOTES

DRAWING NUMBER
M001



GENERAL NOTES:

1. PROVIDE CABLE ACTUATED DAMPERS IN AREAS WITH HARD CEILINGS. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.
2. WHERE EXPOSED, INSTALL ALL DUCTWORK AND EQUIPMENT ABOVE BOTTOM FLANGE OF STRUCTURAL TRUSSES AND AS CLOSE TO DECK AS POSSIBLE.
3. ALL EXPOSED DUCTWORK SHALL BE DOUBLE WALL. REFER TO ARCHITECTURAL DRAWINGS AND SEE SPECIFICATION SECTION 233113 - METAL DUCTS FOR REQUIREMENTS.
4. ALL EXPOSED DUCTWORK IN OPEN PUBLIC AREAS SHALL BE PAINTED. COORDINATE WITH ARCHITECT.
5. RETURN AIR TRANSFER DUCTS ABOVE WOOD SLAT CEILINGS WILL UTILIZE AIR GAP BETWEEN SLATS TO TRANSFER AIR FROM ROOM TO ABOVE CEILING.

KEYED NOTES:

- 1 32X18 RA DOWN FROM RTU INLET. SPLIT INTO TWO 18X16 DUCTS AND PROVIDE DUCT MOUNTED SMOKE DETECTORS. DIVISION 23
- 2 34X24 SA DUCT UP TO RTU-4.
- 3 FULL SIZE SA DUCT UP TO RTU OUTLET.
- 4 FULL SIZE EA DUCT DOWN FROM DOAS INLET. SPLIT INTO TWO 21X21 DUCTS.
- 5 REFRIGERANT LINES UP TO CU-1 ON ROOF. ROUTE AND SIZE PER THE MANUFACTURER'S RECOMMENDATIONS.
- 6 TIE 3/4" COPPER CONDENSATE LINE INTO SINK WASTE LINE PER DETAIL 8/M5.02.
- 7 ROUTE 4" DRYER VENT FROM DRYER TO BUILDING EXTERIOR. PROVIDE DRYER MANUFACTURER DISCHARGE CAP.
- 8 TURN DOWN OPEN 18X18 RA DUCT ABOVE WOOD SLAT CEILING.
- 9 TURN DOWN OPEN 10X10 EA DUCT ABOVE WOOD SLAT CEILING. BALANCE TO 375CFM.
- 10 TURN DOWN OPEN 8X8 TRANSFER DUCT ABOVE WOOD SLAT CEILING. DIVISION 23
- 11 LINEAR SLOTS SHALL RUN CONTINUOUSLY ALONG PERIMETER WALL. PROVIDE BLANK-OFFS AS REQUIRED.
- 12 32X18 RA DOWN FROM RTU INLET. PROVIDE DUCT MOUNTED SMOKE DETECTOR.
- 13 40X20 SA DUCT DOWN FROM RTU-1. SPLIT INTO TWO 20X20 DUCTS.
- 14 40X20 SA DUCT DOWN FROM RTU-2. SPLIT INTO TWO 20X20 DUCTS.
- 15 48X18 SA DUCT DOWN FROM RTU-6. SPLIT INTO TWO 18X24 DUCTS.
- 16 48X24 SA DUCT DOWN FROM DOAS OUTLET. SPLIT INTO TWO 24X24 DUCTS.
- 17 48X24 SA DUCT DOWN FROM RTU-3. SPLIT INTO TWO 24X24 DUCTS.



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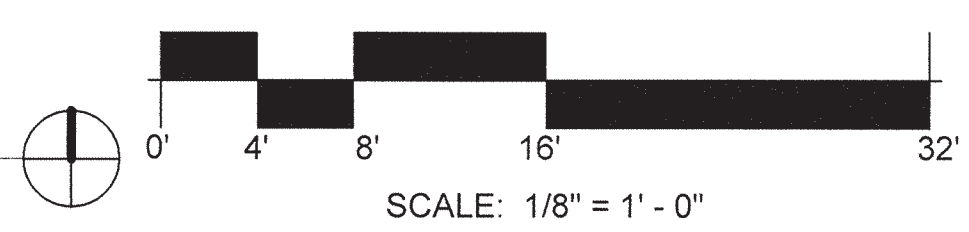
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PHASE CONSTRUCTION DOCUMENTS
 DATE AUGUST 14, 2017
 PROJECT PINE VALLEY BRANCH
 DEI PROJECT # 50090277
 SCO ID #

DRAWING TITLE
FIRST FLOOR PLAN - DUCTWORK

DRAWING NUMBER
M101

MECHANICAL DUCTWORK PLAN
 Scale: 1/8" = 1'-0"





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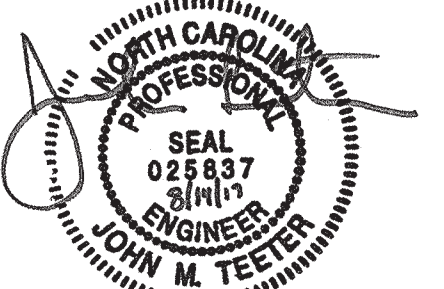
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DRAWING TITLE
**FIRST FLOOR PLAN
- DUCTWORK
(ALTERNATE #1)**

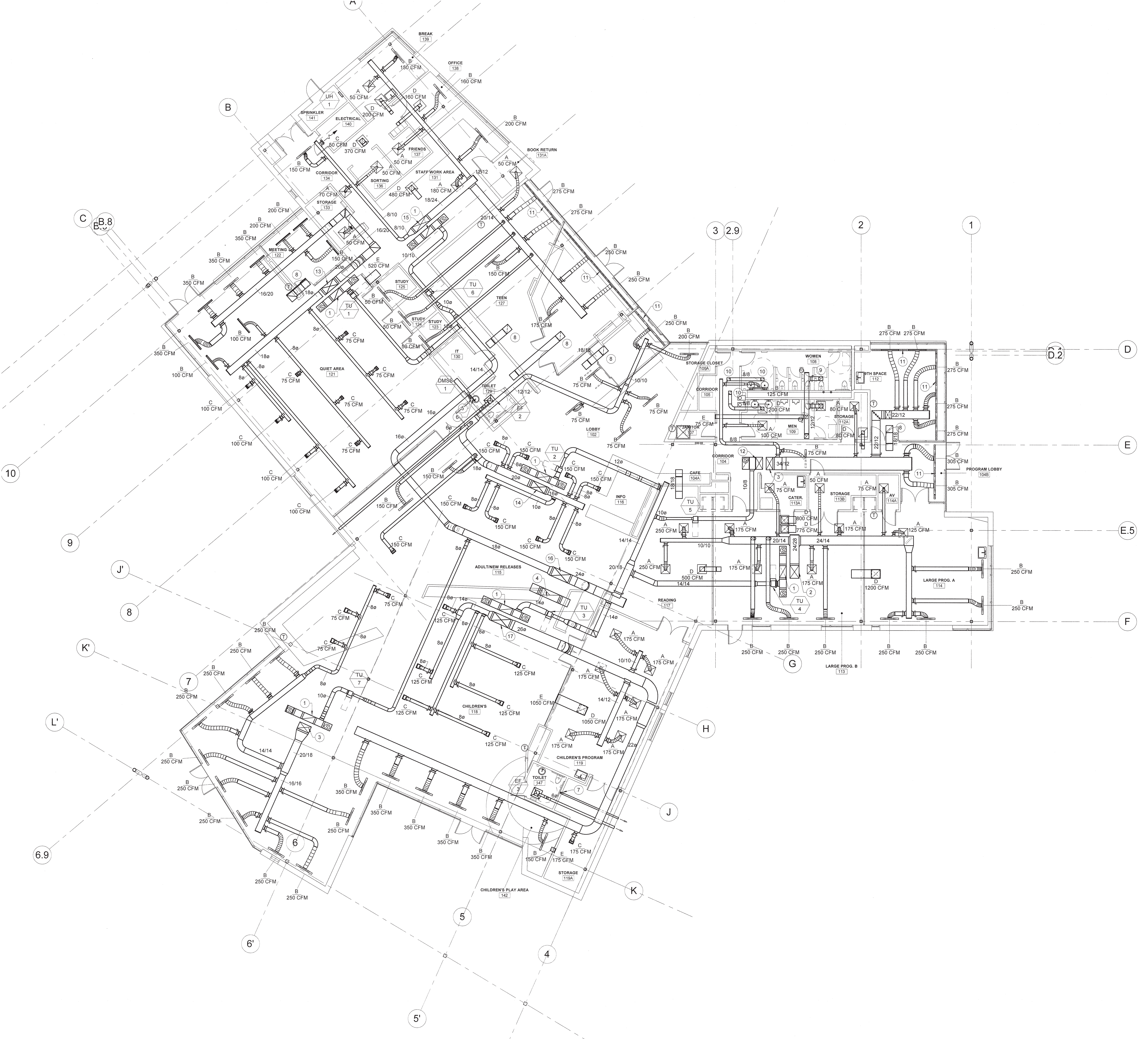
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GENERAL NOTES:

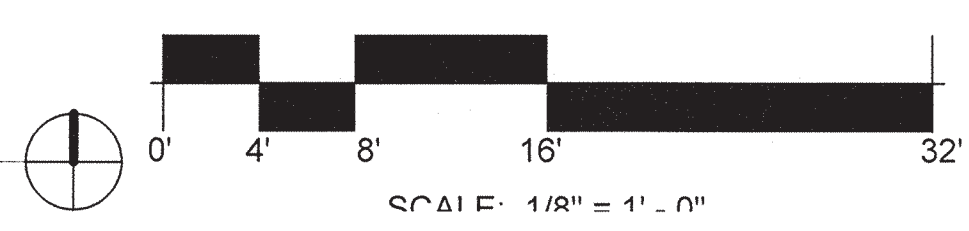
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2. WHERE EXPOSED, INSTALL ALL DUCTWORK AND EQUIPMENT ABOVE BOTTOM FLANGE OF STRUCTURAL TRUSSES AND AS CLOSE TO DECK AS POSSIBLE.
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KEYED NOTES:

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- 2 34X24 SA DUCT UP TO RTU-4.
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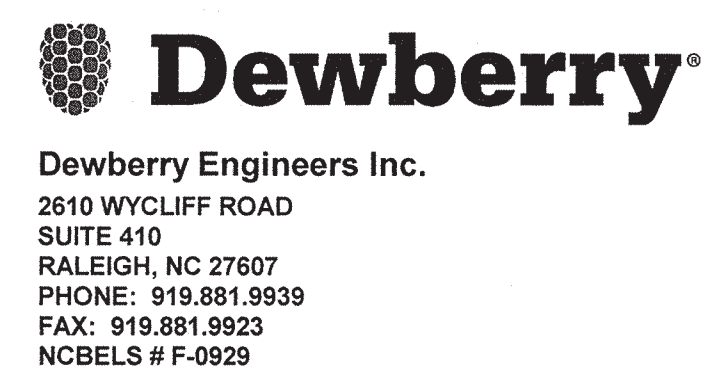


MECHANICAL DUCTWORK PLAN (ALTERNATE #1)
Scale: 1/8" = 1'-0"





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 DEI PROJECT # 50090277
 SCO ID #

DRAWING TITLE
FIRST FLOOR PLAN - DUCTWORK (ALTERNATE #2)

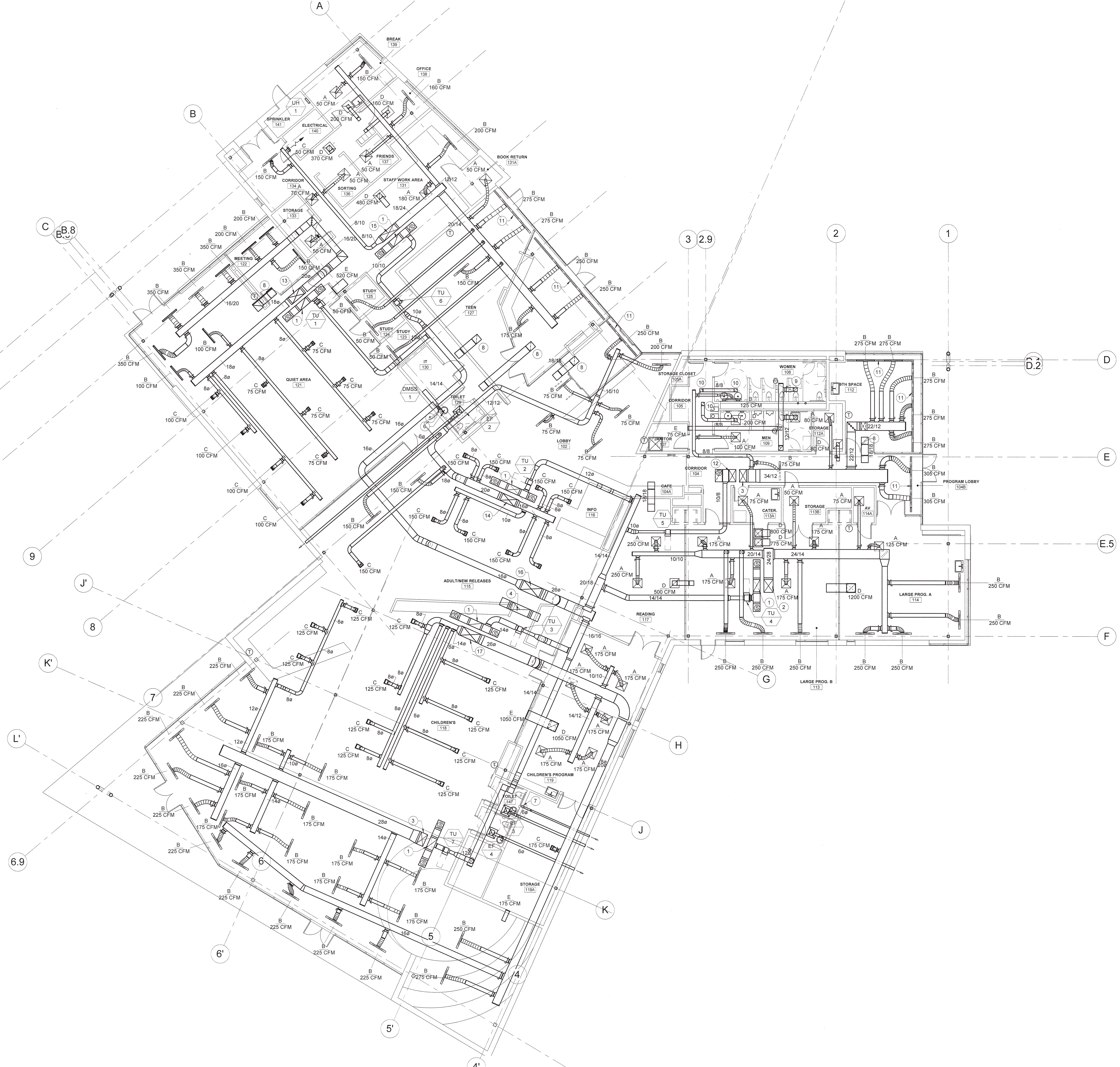
DRAWING NUMBER
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GENERAL NOTES:

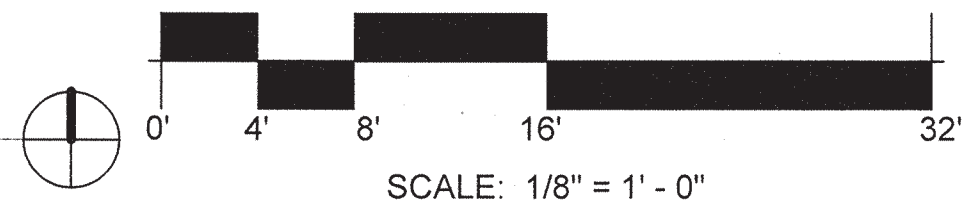
1. PROVIDE CABLE ACTUATED DAMPERS IN AREAS WITH HARD CEILINGS. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.
2. WHERE EXPOSED, INSTALL ALL DUCTWORK AND EQUIPMENT ABOVE BOTTOM FLANGE OF STRUCTURAL TRUSSES AND AS CLOSE TO DECK AS POSSIBLE.
3. ALL EXPOSED DUCTWORK SHALL BE DOUBLE WALL. REFER TO ARCHITECTURAL DRAWINGS AND SEE SPECIFICATION SECTION 233113 - METAL DUCTS FOR REQUIREMENTS.
4. ALL EXPOSED DUCTWORK IN OPEN PUBLIC AREAS SHALL BE PAINTED. COORDINATE WITH ARCHITECT.
5. RETURN AIR TRANSFER DUCTS ABOVE WOOD SLAT CEILINGS WILL UTILIZE AIR GAP BETWEEN SLATS TO TRANSFER AIR FROM ROOM TO ABOVE CEILING.

KEYED NOTES:

- 1 32x18 RA DOWN FROM RTU INLET. SPLIT INTO TWO 18x18 DUCTS AND PROVIDE DUCT MOUNTED SMOKE DETECTORS. DIVISION 23
- 2 34x24 SA DUCT UP TO RTU-4.
- 3 FULL SIZE SA DUCT UP TO RTU OUTLET.
- 4 FULL SIZE EA DUCT DOWN FROM DOAS INLET. SPLIT INTO TWO 21x21 DUCTS.
- 5 REFRIGERANT LINES UP TO CU-1 ON ROOF. ROUTE AND SIZE PER THE MANUFACTURER'S RECOMMENDATIONS.
- 6 TIE 3/4" COPPER CONDENSATE LINE INTO SINK WASTE LINE PER DETAIL 8/M5.02.
- 7 ROUTE 4" DRYER VENT FROM DRYER TO BUILDING EXTERIOR. PROVIDE DRYER MANUFACTURER DISCHARGE CAP.
- 8 TURN DOWN OPEN 18x18 RA DUCT ABOVE WOOD SLAT CEILING.
- 9 TURN DOWN OPEN 10x10 EA DUCT ABOVE WOOD SLAT CEILING. BALANCE TO 375CFM.
- 10 TURN DOWN OPEN 8x8 TRANSFER DUCT ABOVE WOOD SLAT CEILING. DIVISION 23
- 11 LINEAR SLOTS SHALL RUN CONTINUOUSLY ALONG PERIMETER WALL. PROVIDE BLANK-OFFS AS REQUIRED.
- 12 32x18 RA DOWN FROM RTU INLET. PROVIDE DUCT MOUNTED SMOKE DETECTOR.
- 13 40x20 SA DUCT DOWN FROM RTU-1. SPLIT INTO TWO 20x20 DUCTS.
- 14 40x20 SA DUCT DOWN FROM RTU-2. SPLIT INTO TWO 20x20 DUCTS.
- 15 48x18 SA DUCT DOWN FROM RTU-6. SPLIT INTO TWO 18x24 DUCTS.
- 16 52x26 SA DUCT DOWN FROM DOAS OUTLET. SPLIT INTO TWO 28x26 DUCTS.
- 17 48x24 SA DUCT DOWN FROM RTU-3. SPLIT INTO TWO 24x24 DUCTS.



MECHANICAL DUCTWORK PLAN (ALTERNATE #2)
 Scale: 1/8" = 1'-0"



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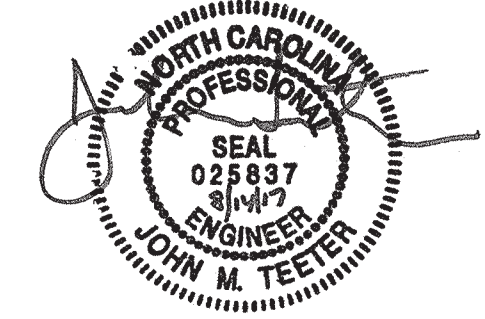
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DRAWING TITLE

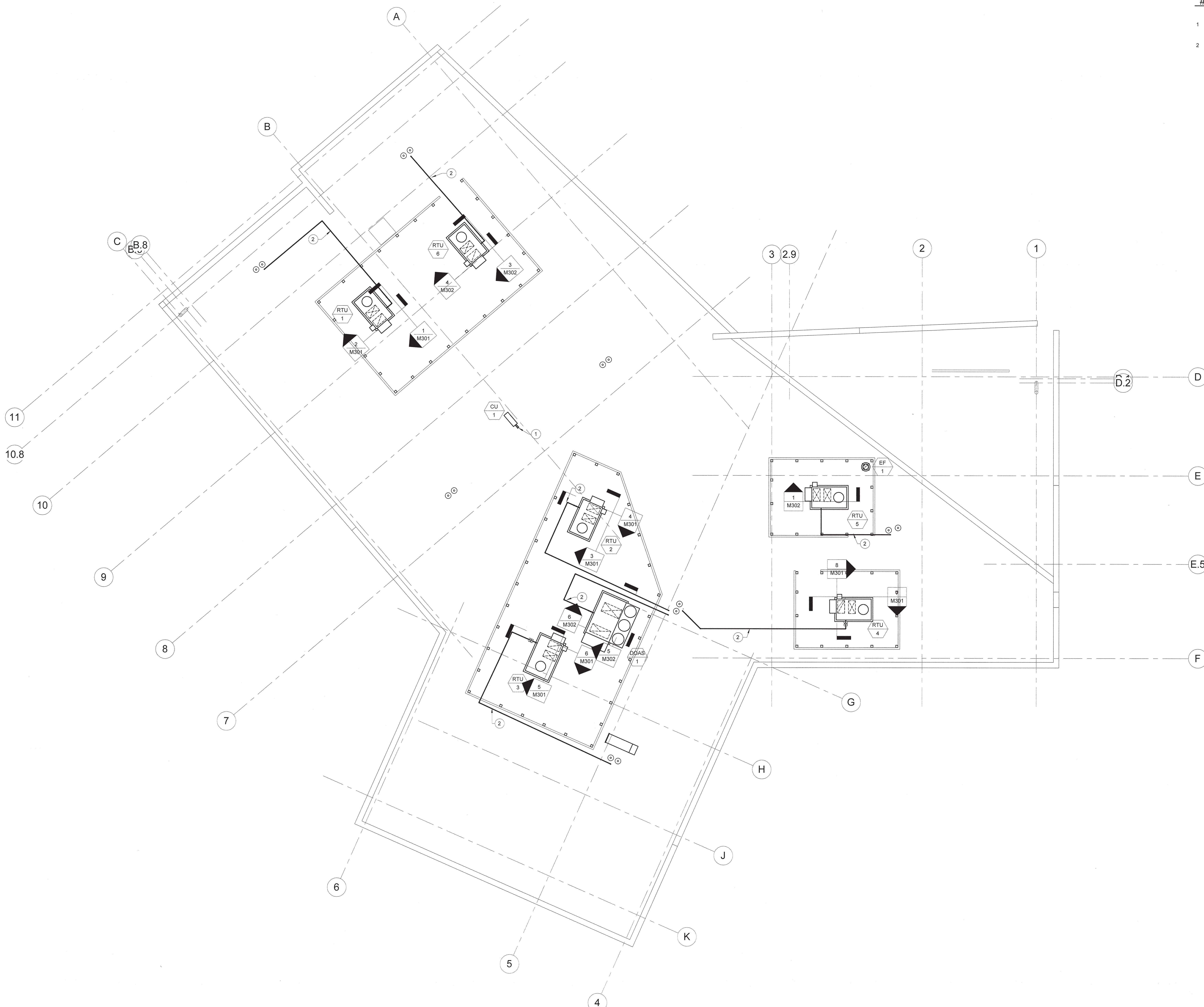
ROOF PLAN - DUCTWORK

DRAWING NUMBER

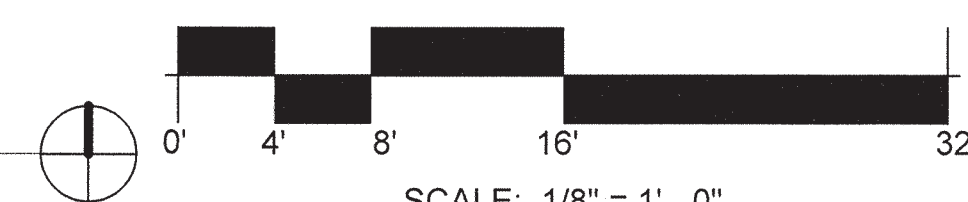
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KEYED NOTES:

- REFRIGERANT LINES DOWN TO DMSS-1. ROUTE AND SIZE PER THE MANUFACTURER'S RECOMMENDATIONS.
- ROUTE 3/4" COPPER CONDENSATE LINE FROM RTU TO NEAREST ROOF DRAIN.



1 MECHANICAL ROOF PLAN
Scale: 1/8" = 1'-0"



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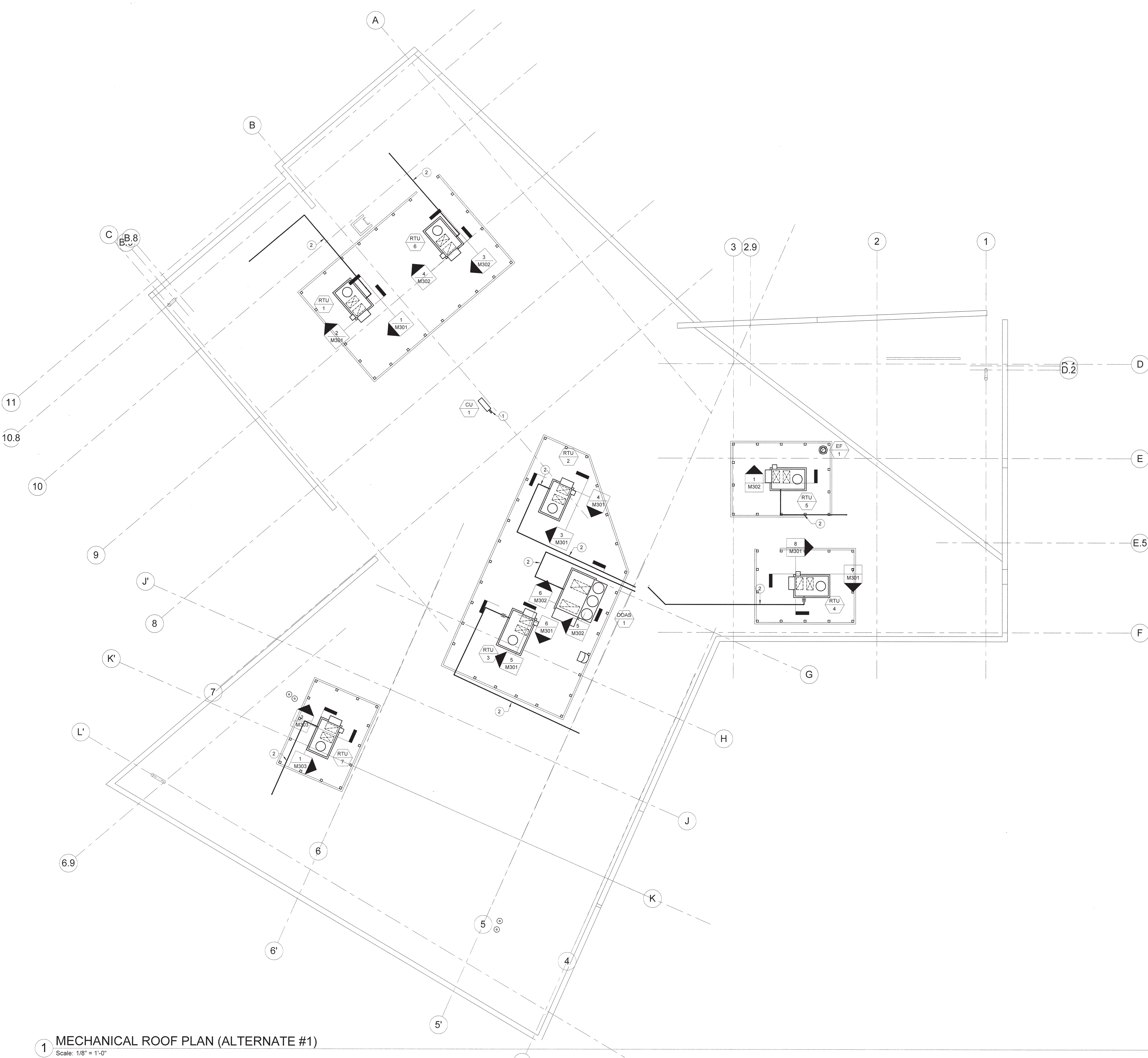
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ROOF PLAN - DUCTWORK (ALTERNATE #1)

DRAWING NUMBER

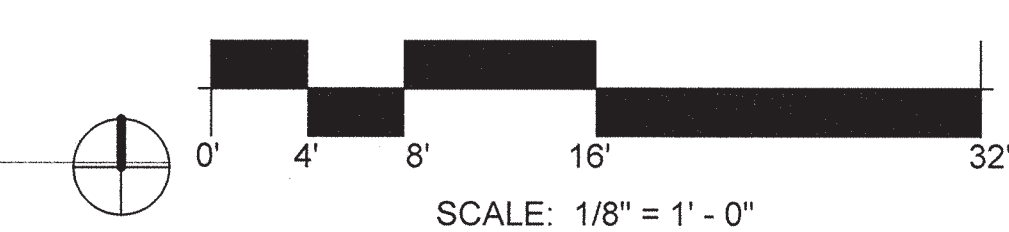
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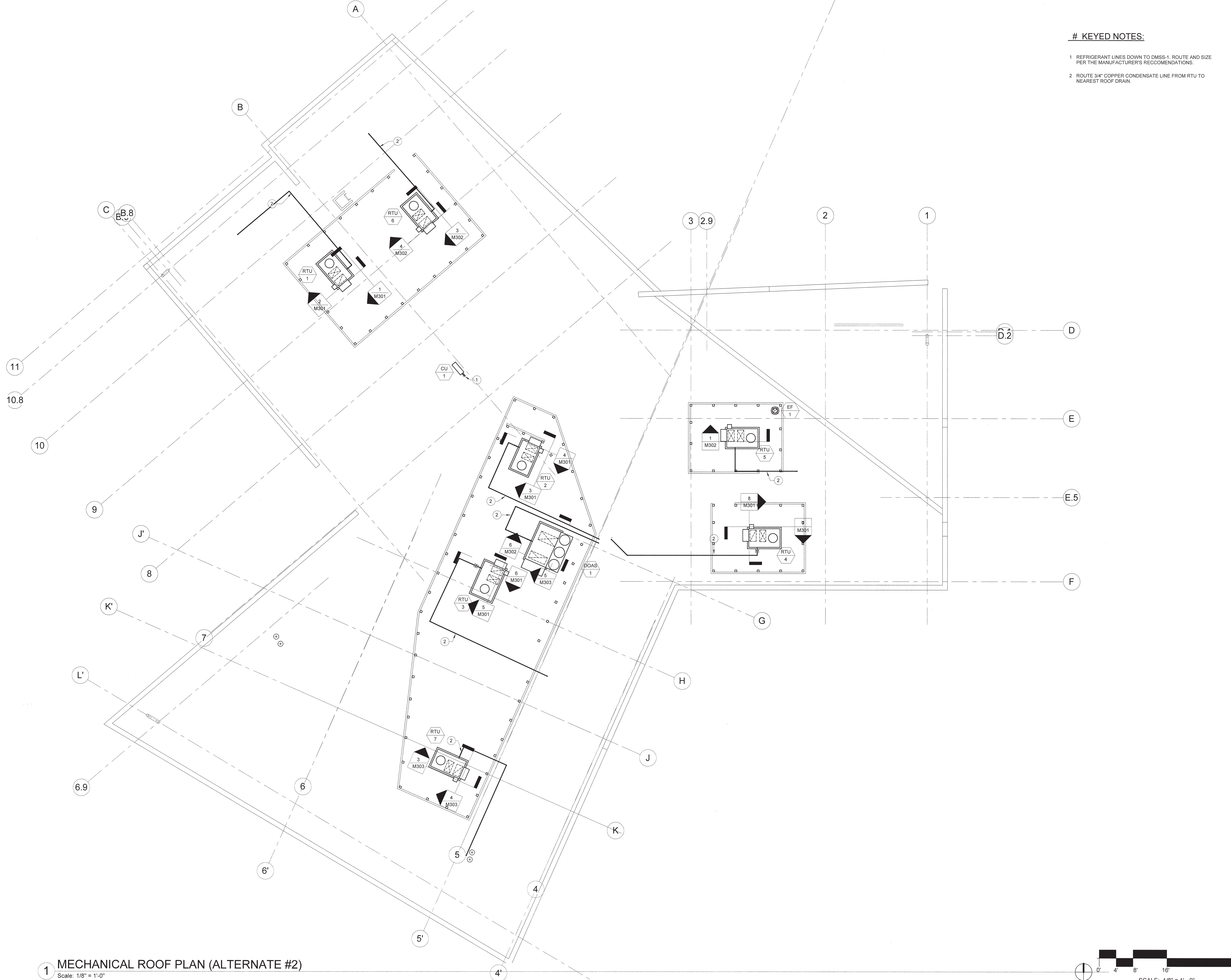
KEYED NOTES:

- REFRIGERANT LINES DOWN TO DMSS-1. ROUTE AND SIZE PER THE MANUFACTURER'S RECOMMENDATIONS.
- ROUTE 3/4" COPPER CONDENSATE LINE FROM RTU TO NEAREST ROOF DRAIN.



1 MECHANICAL ROOF PLAN (ALTERNATE #1)
Scale: 1/8" = 1'-0"

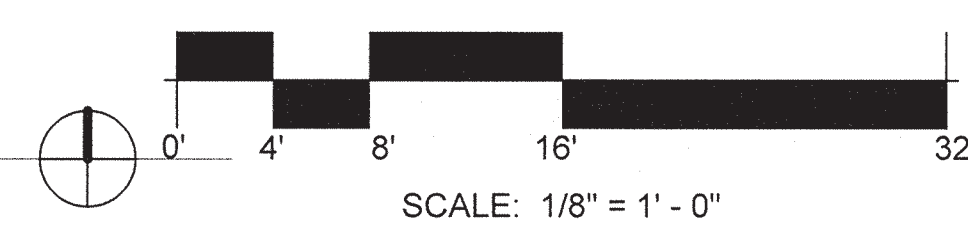




KEYED NOTES:

- 1 REFRIGERANT LINES DOWN TO DMSS-1. ROUTE AND SIZE PER THE MANUFACTURER'S RECOMMENDATIONS.
- 2 ROUTE 3/4" COPPER CONDENSATE LINE FROM RTU TO NEAREST ROOF DRAIN.

1 MECHANICAL ROOF PLAN (ALTERNATE #2)
Scale: 1/8" = 1'-0"



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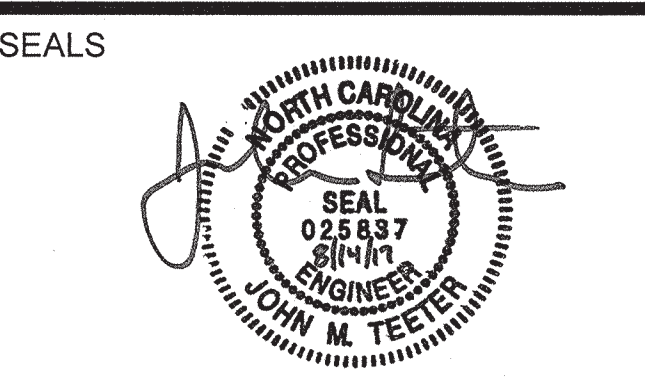
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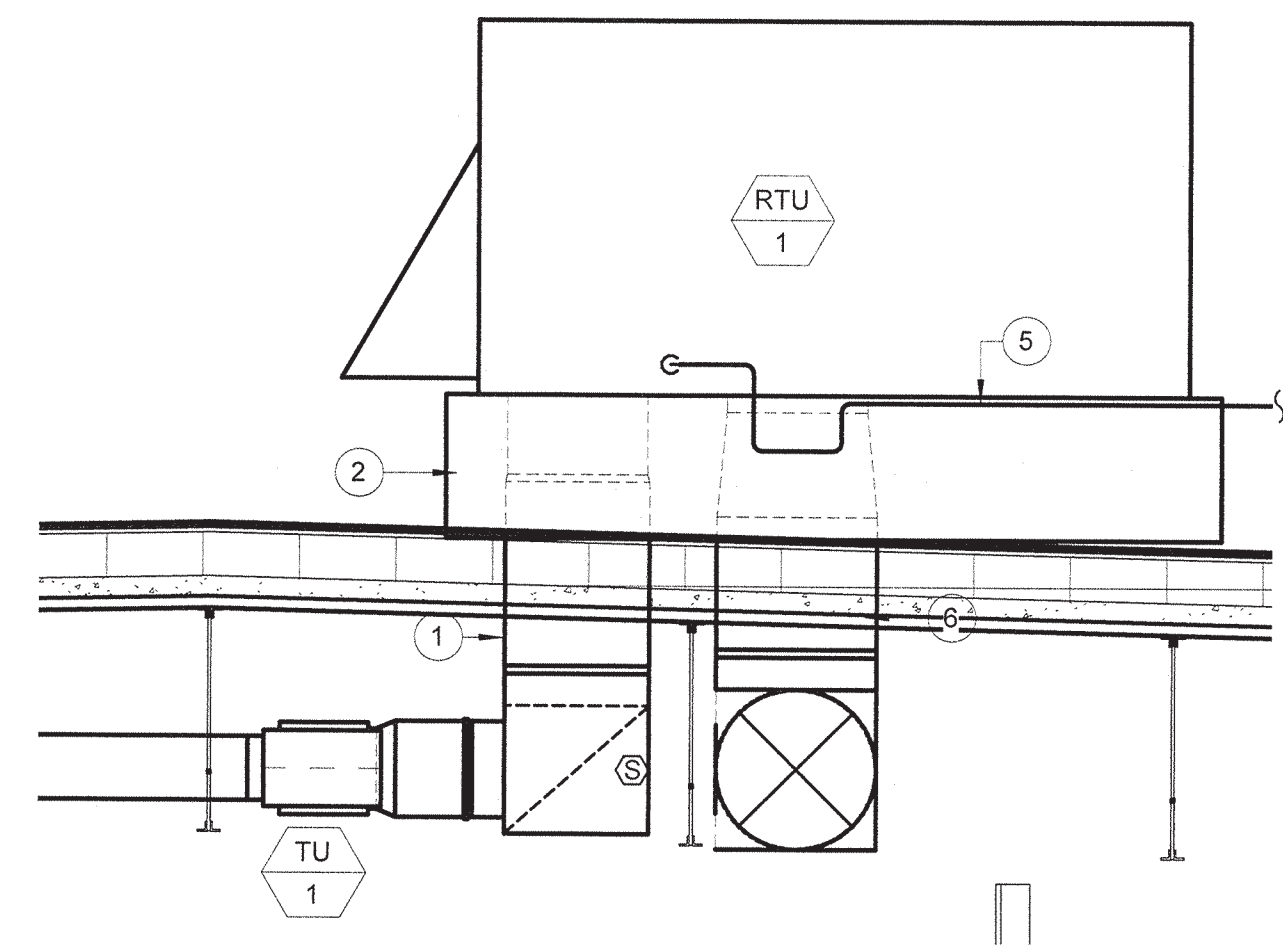
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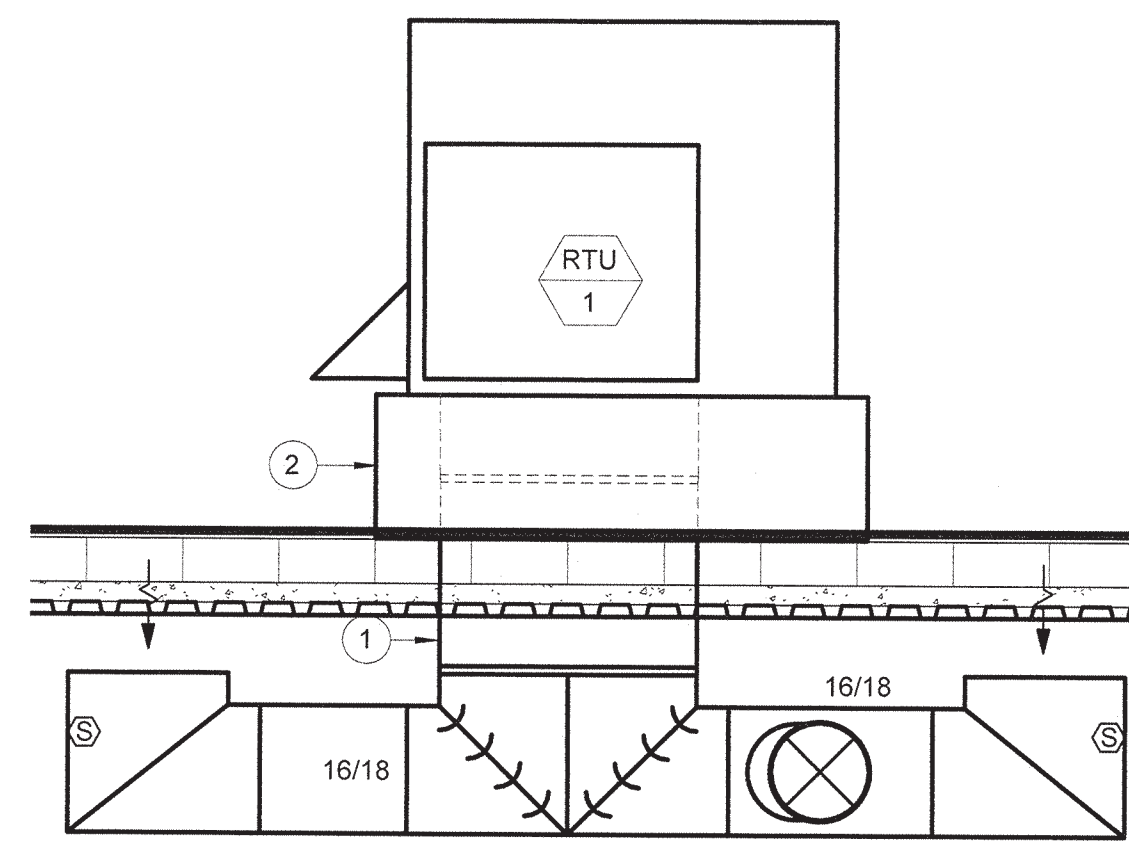
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 DATE AUGUST 14, 2017
 PROJECT PINE VALLEY BRANCH
 DEI PROJECT # 50090277
 SCO ID #

DRAWING TITLE
**ROOF PLAN -
 DUCTWORK
 (ALTERNATE #2)**

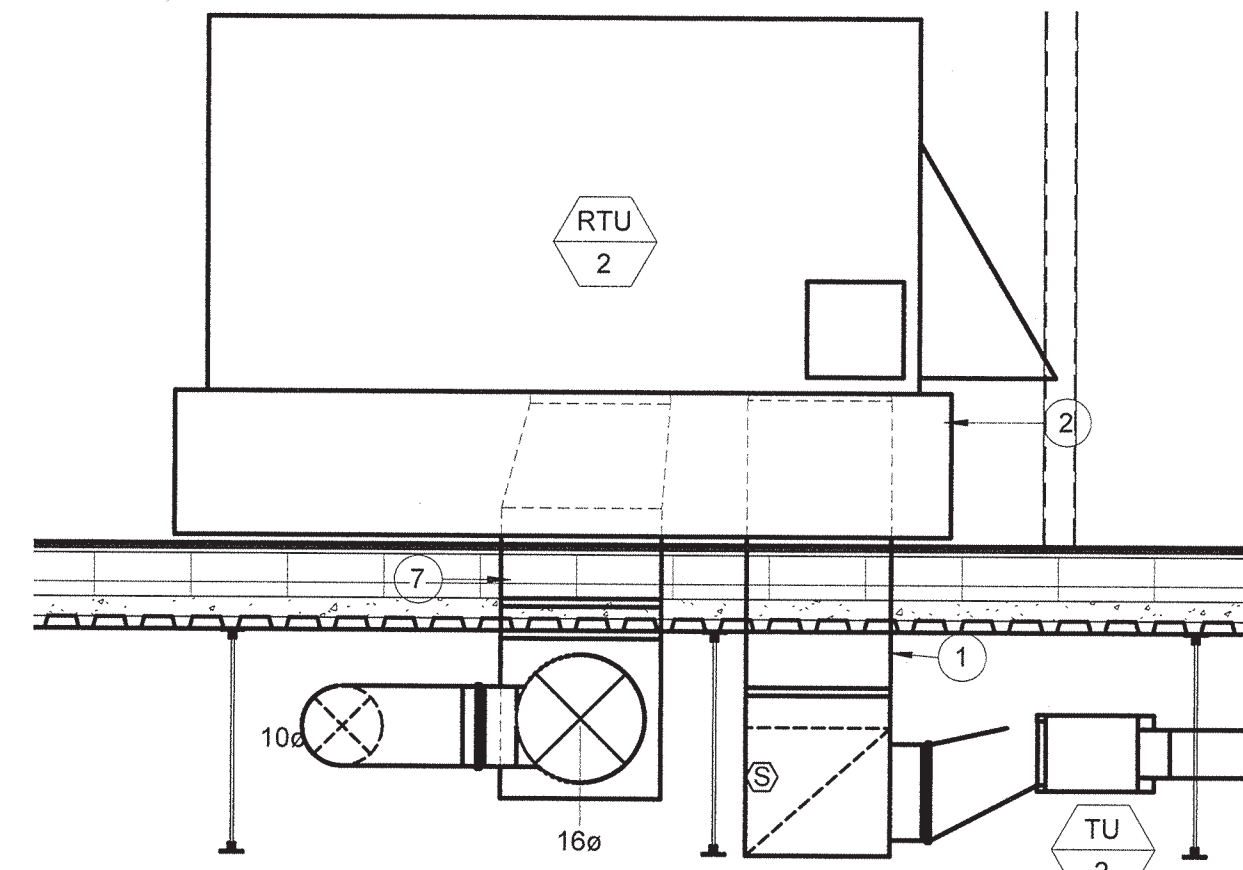
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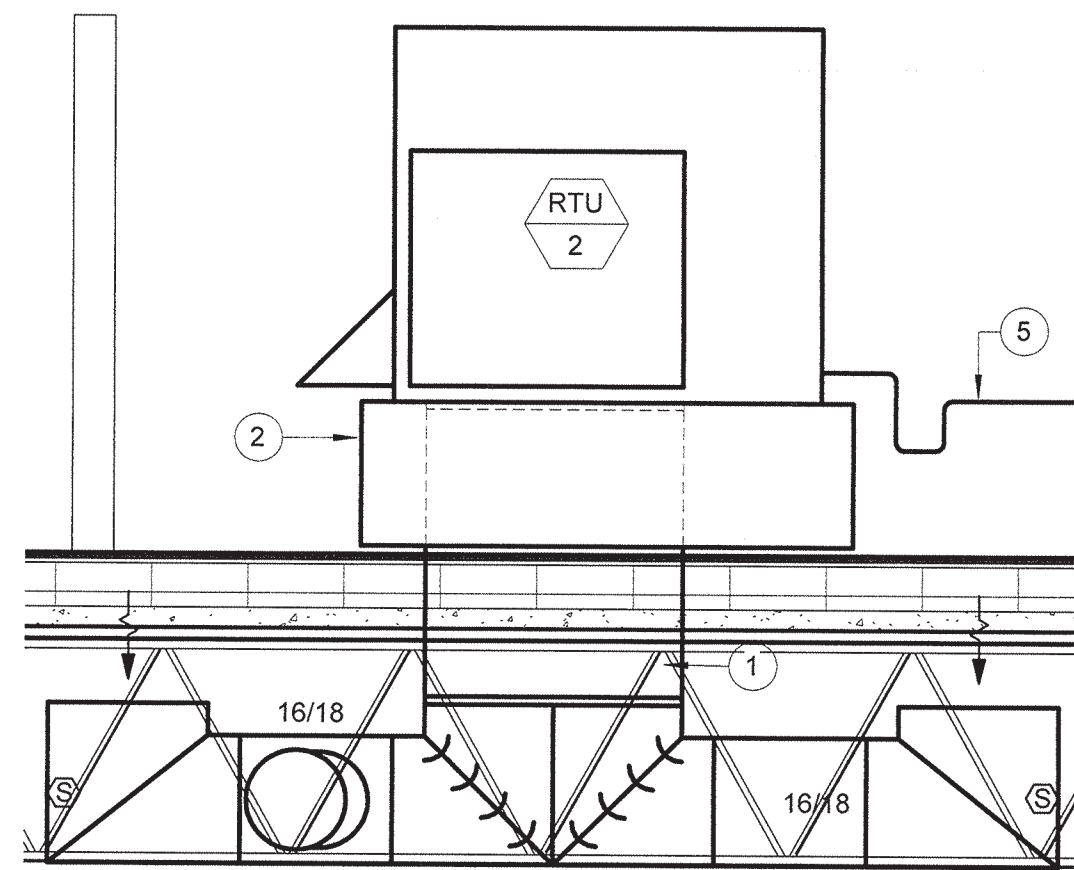
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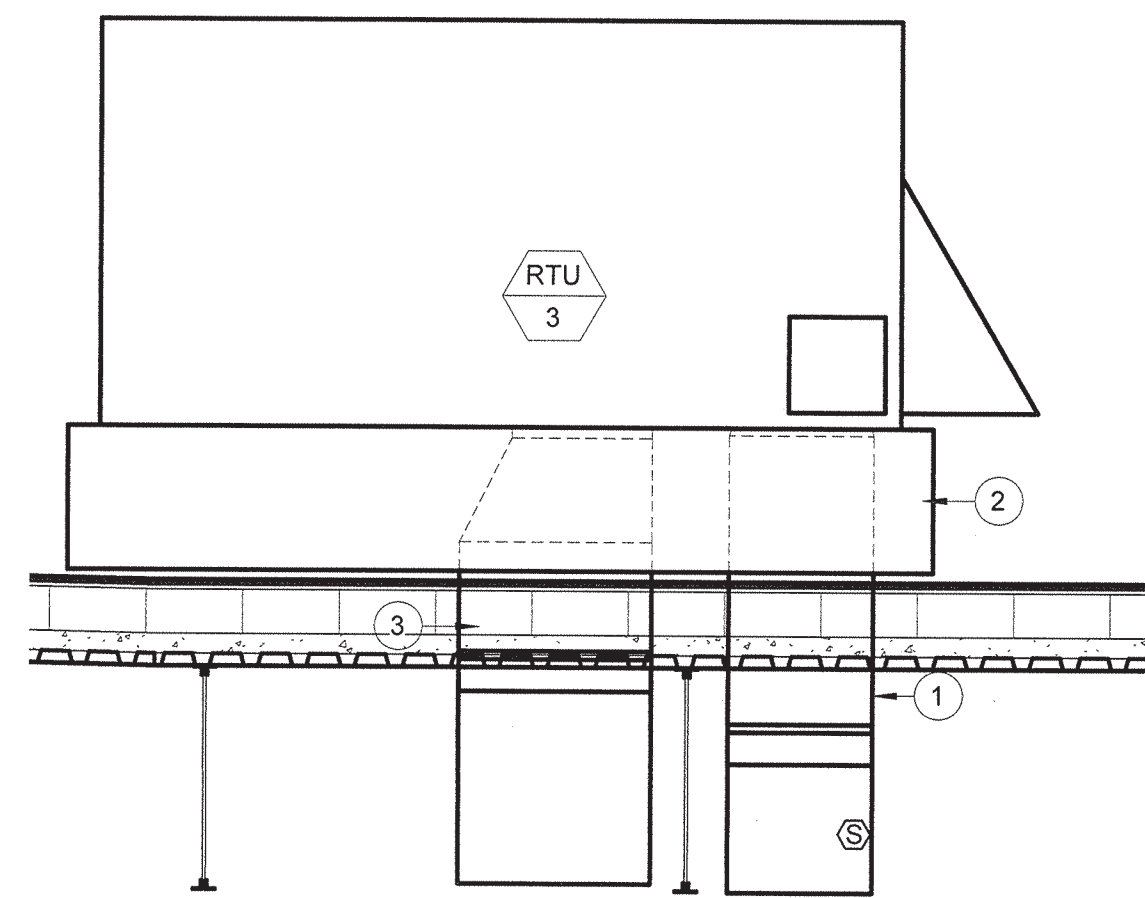
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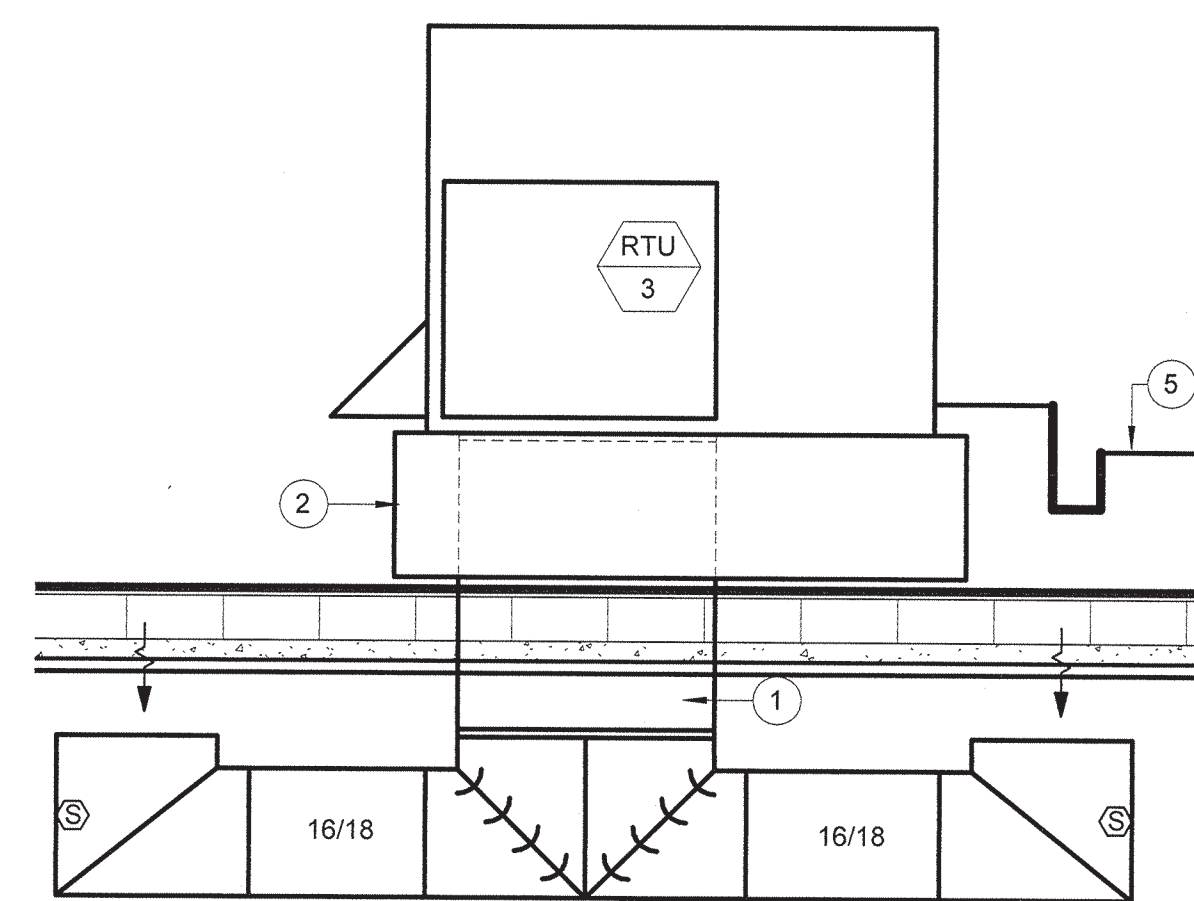
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Scale: 1/2" = 1'-0"



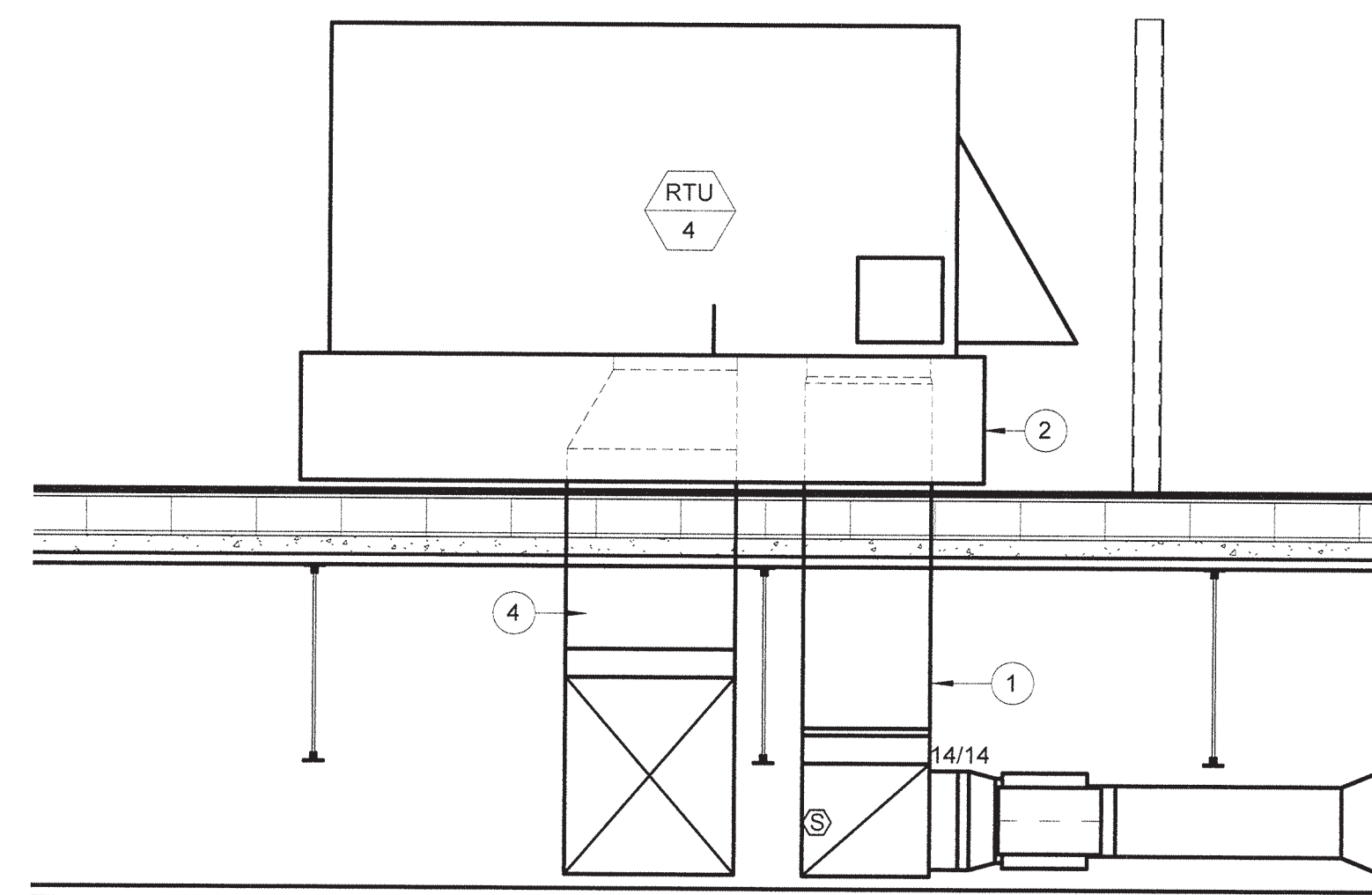
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Scale: 1/2" = 1'-0"



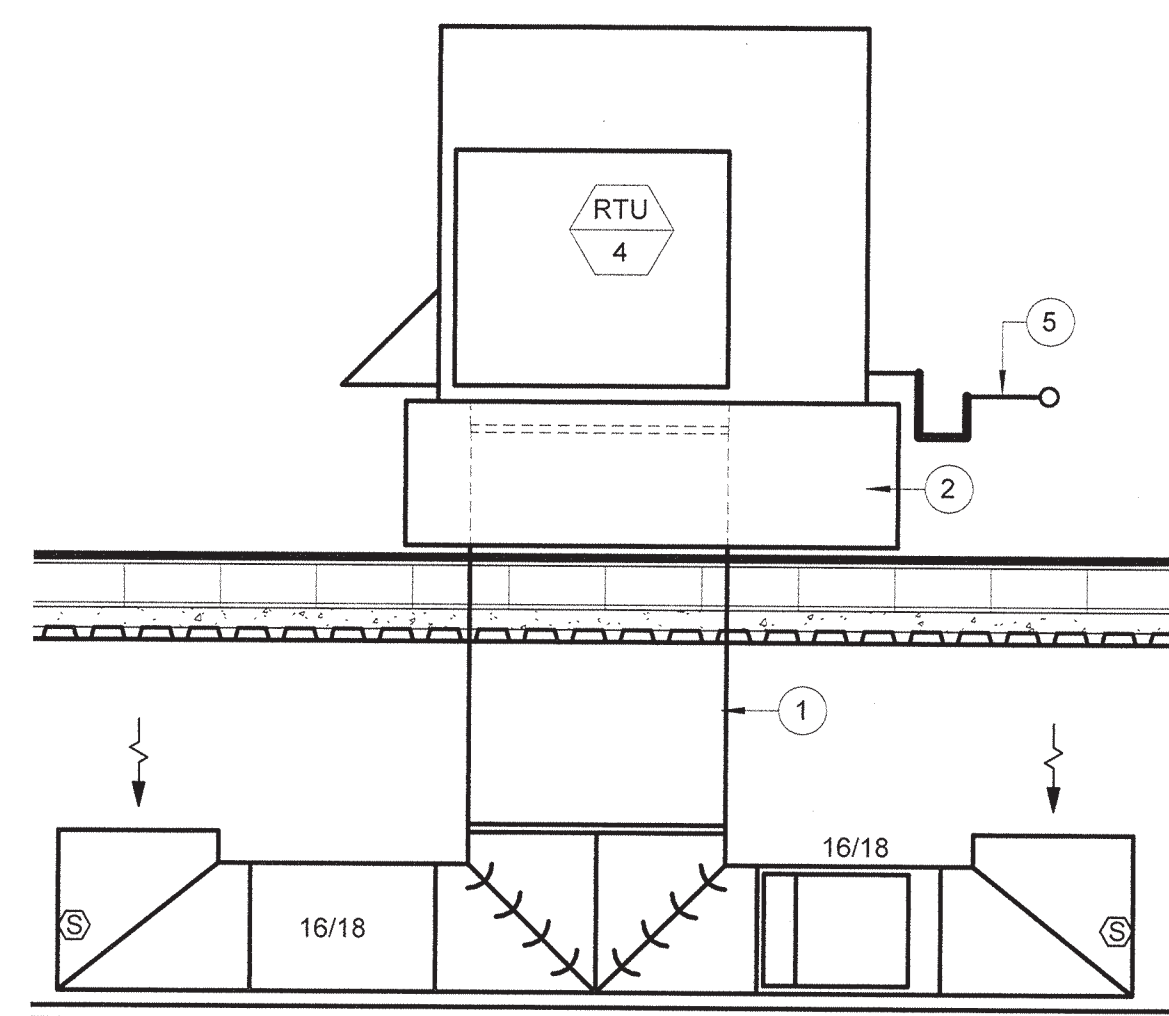
5 RTU-3
Scale: 1/2" = 1'-0"



6 RTU-3 RA
Scale: 1/2" = 1'-0"



7 RTU-4
Scale: 1/2" = 1'-0"



8 RTU-4 RA
Scale: 1/2" = 1'-0"

KEYED NOTES:

- 1 32X18 RA DOWN FROM RTU INLET. SPLIT INTO TWO 18X16 DUCTS AND PROVIDE DUCT MOUNTED SMOKE DETECTORS. DIVISION 23
- 2 FACTORY FABRICATED ACOUSTICAL ROOF CURB.
- 3 48X24 SA DUCT DOWN FROM RTU-3. SPLIT INTO TWO 24X24 DUCTS.
- 4 34X24 SA DUCT UP TO RTU-4.
- 5 ROUTE 3/4" COPPER CONDENSATE LINE FROM RTU TO NEAREST ROOF DRAIN.
- 6 40X20 SA DUCT DOWN FROM RTU-1. SPLIT INTO TWO 20X20 DUCTS.
- 7 40X20 SA DUCT DOWN FROM RTU-2. SPLIT INTO TWO 20X20 DUCTS.



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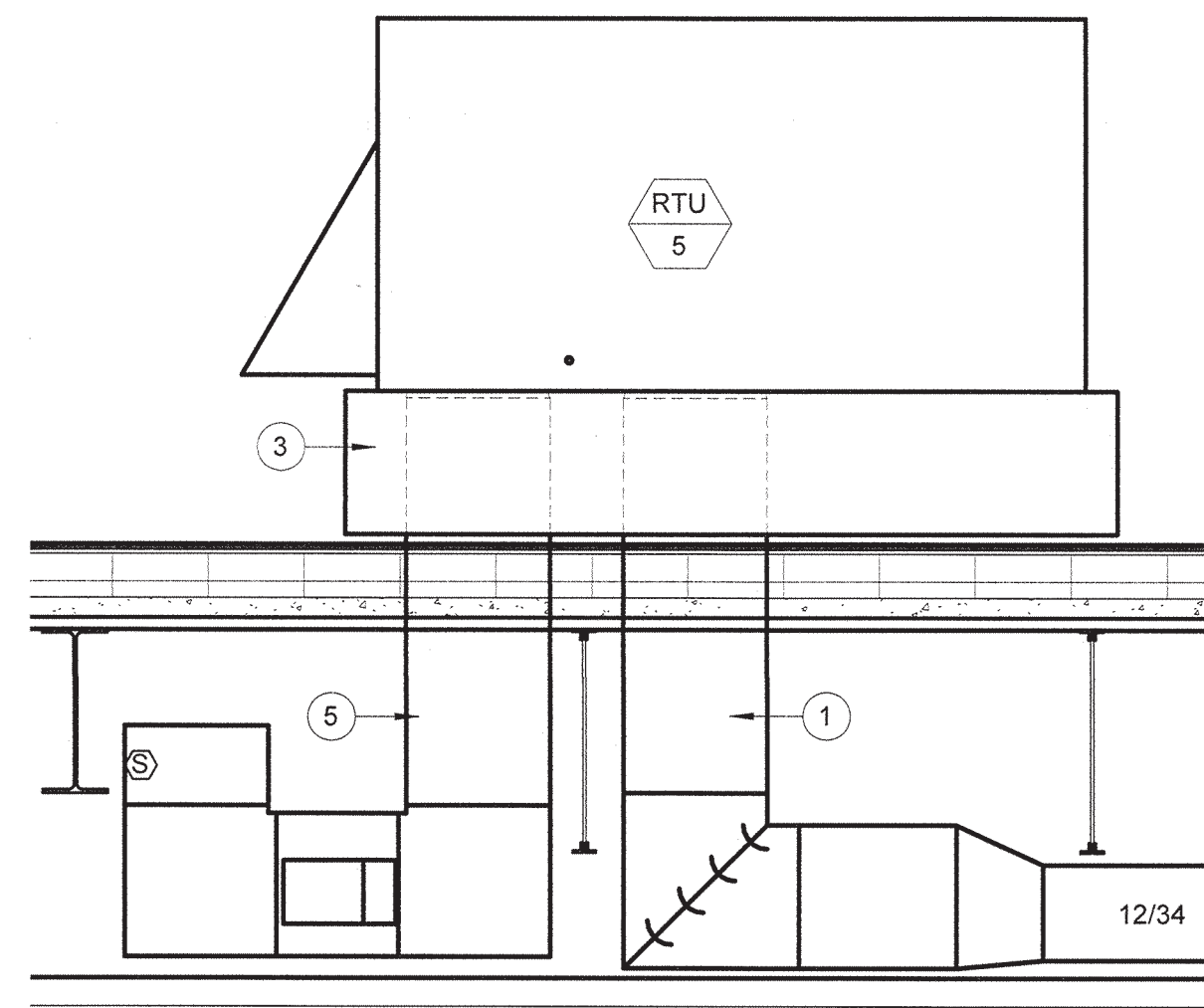
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MECHANICAL
SECTIONS

DRAWING NUMBER

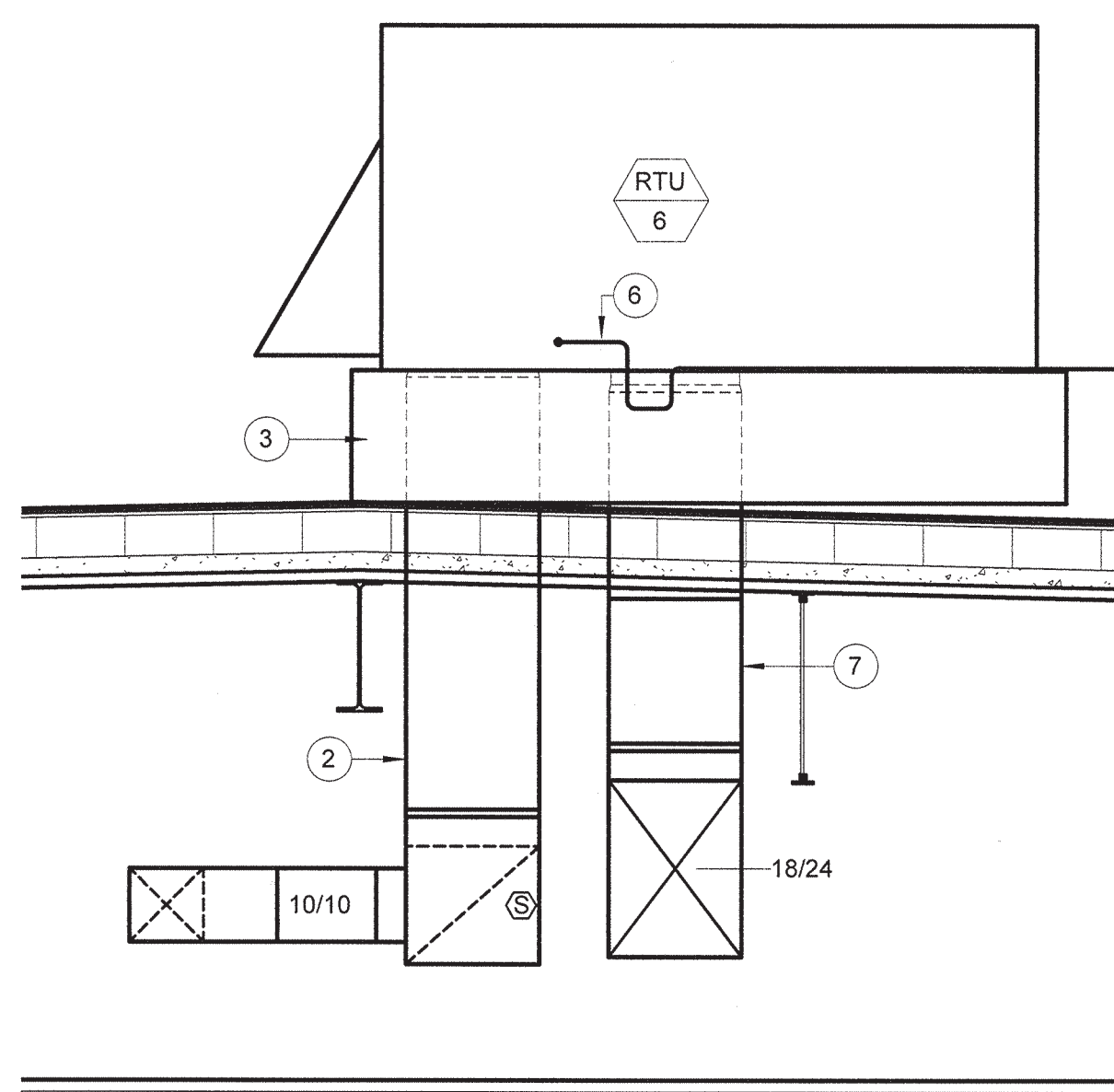
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KEYED NOTES:

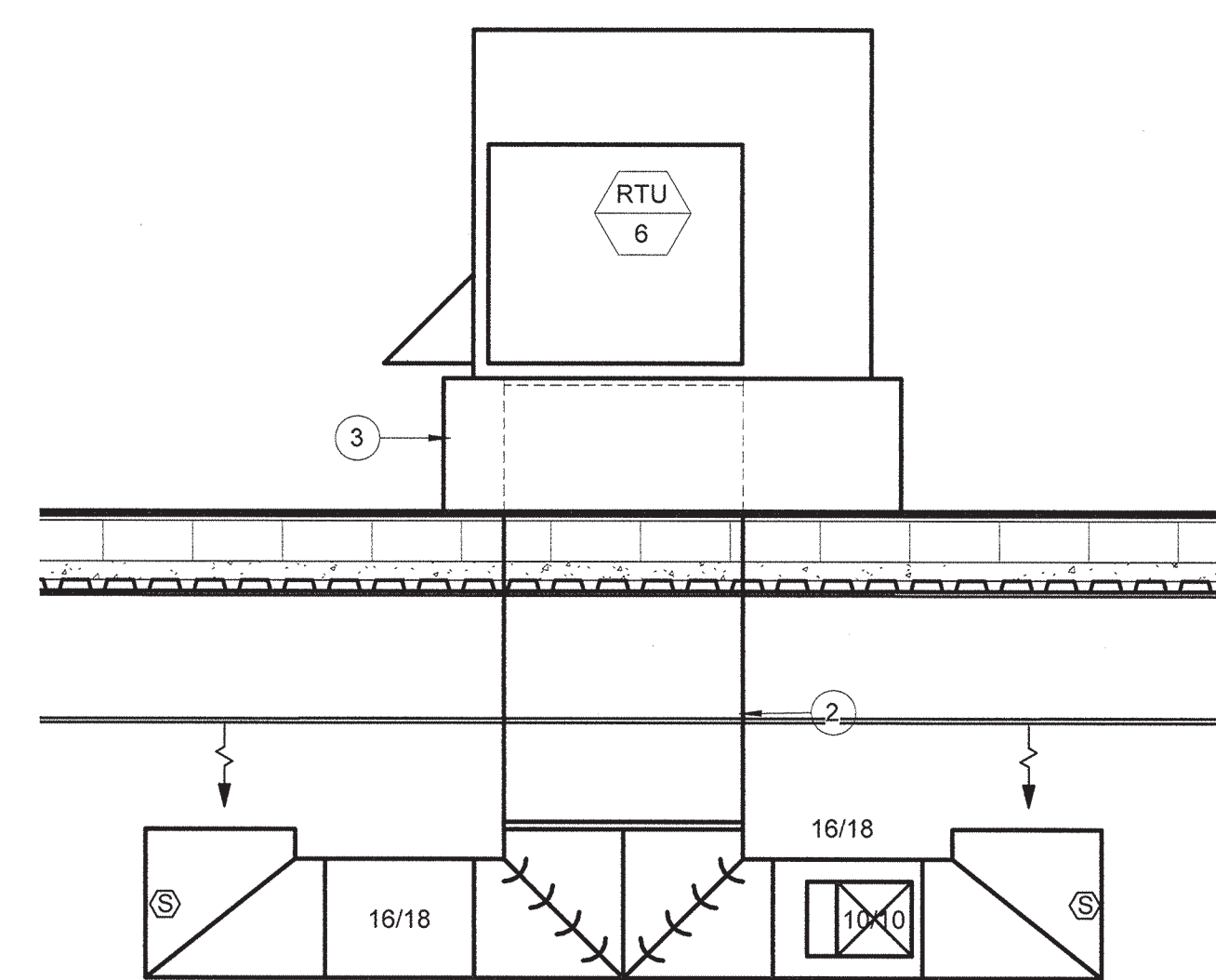
- 1 FULL SIZE SA DUCT UP TO RTU OUTLET.
- 2 32X18 RA DOWN FROM RTU INLET. SPLIT INTO TWO 18X18 DUCTS AND PROVIDE DUCT MOUNTED SMOKE DETECTORS. DIVISION 23
- 3 FACTORY FABRICATED ACOUSTICAL ROOF CURB.
- 4 FULL SIZE EA DUCT DOWN FROM DOAS INLET. SPLIT INTO TWO 21X21 DUCTS.
- 5 32X18 RA DOWN FROM RTU INLET. PROVIDE DUCT MOUNTED SMOKE DETECTOR.
- 6 ROUTE 3/4" COPPER CONDENSATE LINE FROM RTU TO NEAREST ROOF DRAIN.
- 7 40X20 SA DUCT DOWN FROM RTU-1. SPLIT INTO TWO 20X20 DUCTS.
- 8 48X24 SA DUCT DOWN FROM DOAS OUTLET. SPLIT INTO TWO 24X24 DUCTS.



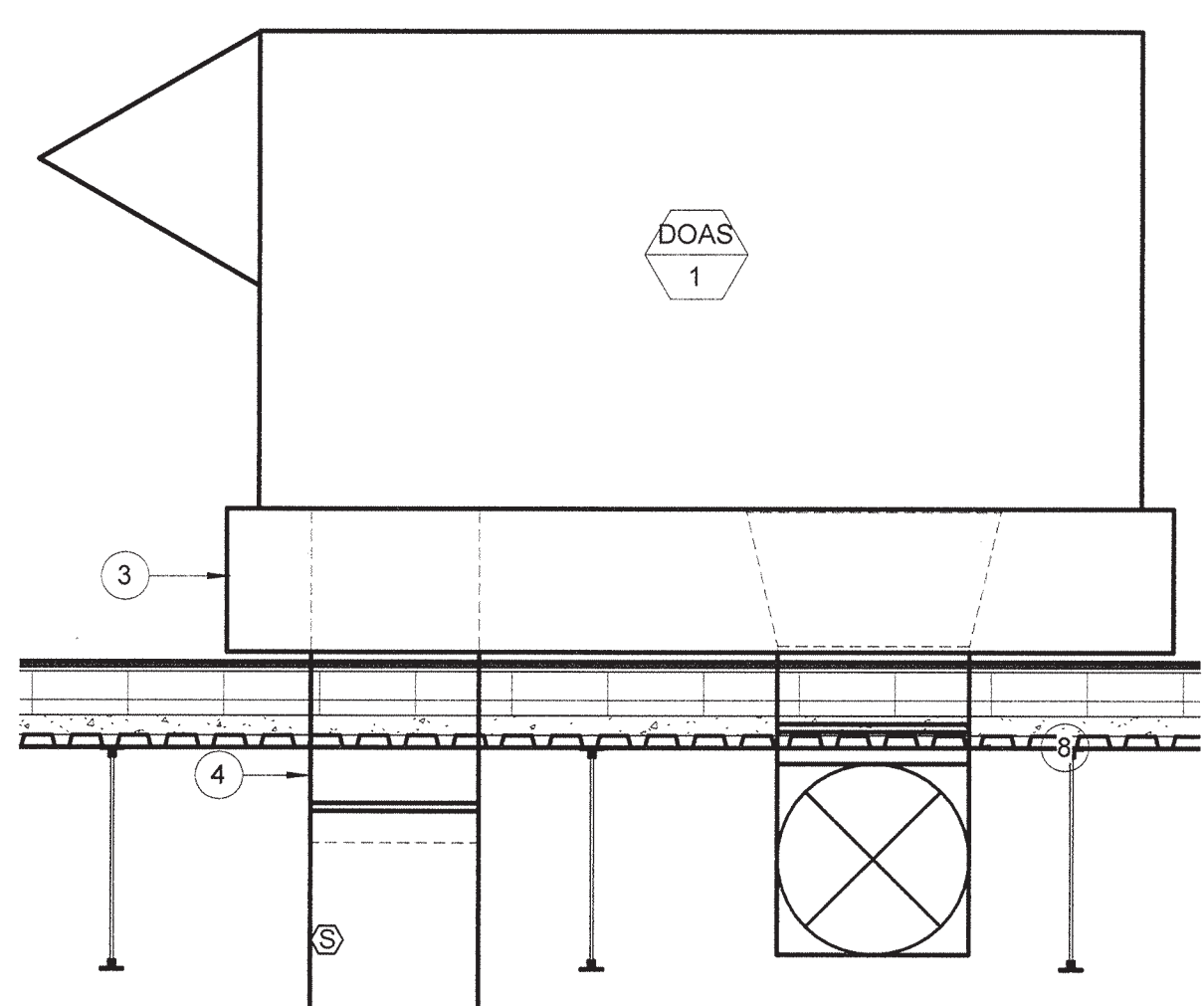
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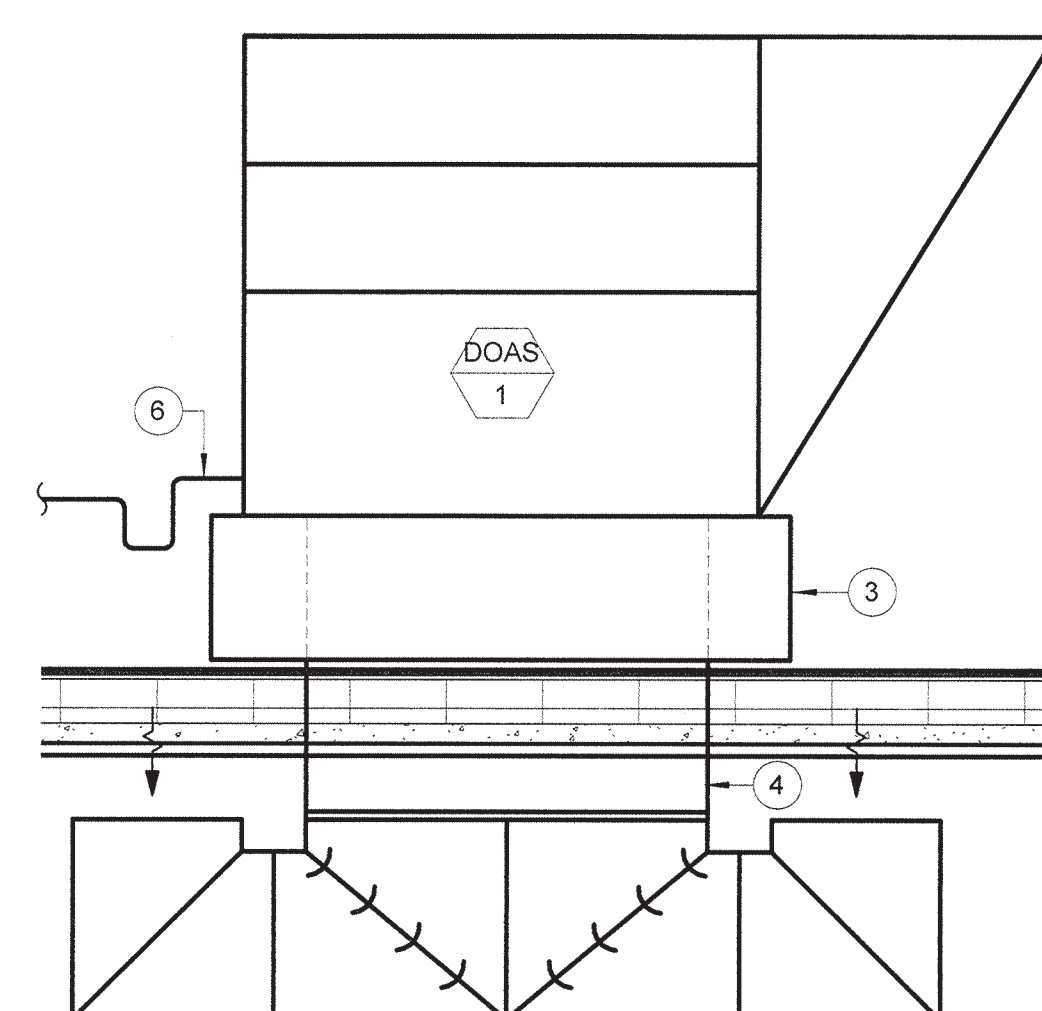
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Scale: 1/2" = 1'-0"



4 RTU-6 RA
Scale: 1/2" = 1'-0"



5 DOAS-1
Scale: 1/2" = 1'-0"



6 DOAS-1 EA
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MECHANICAL SECTIONS

DRAWING NUMBER

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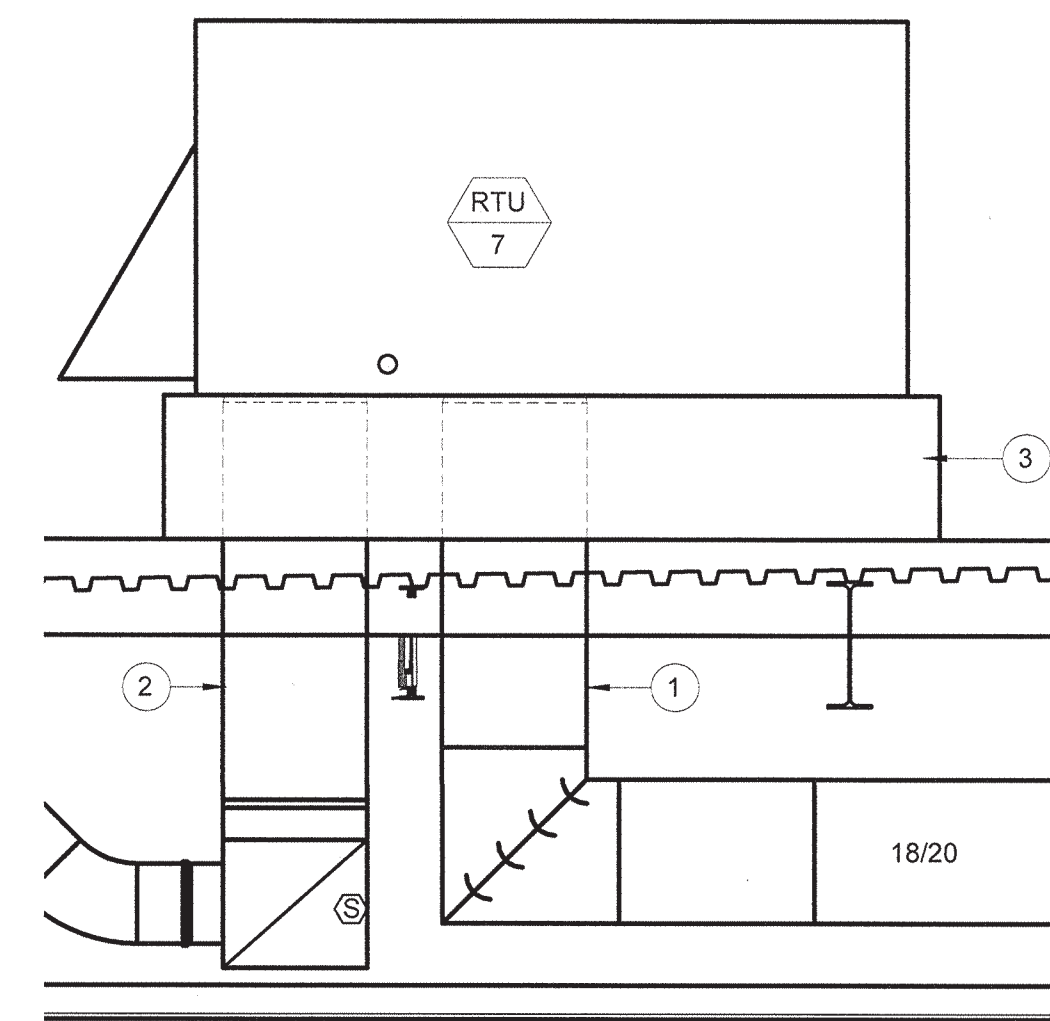
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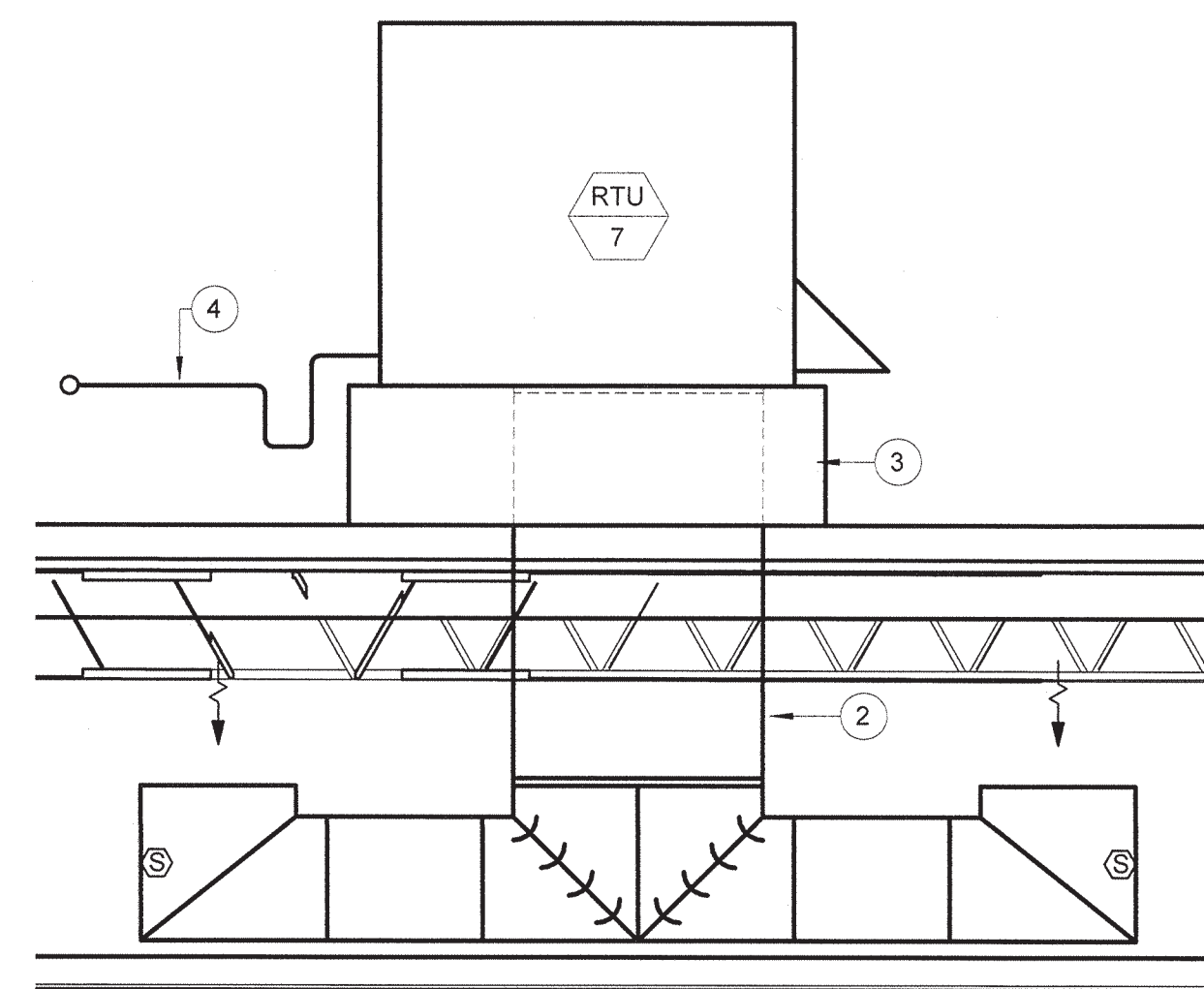
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KEYED NOTES:

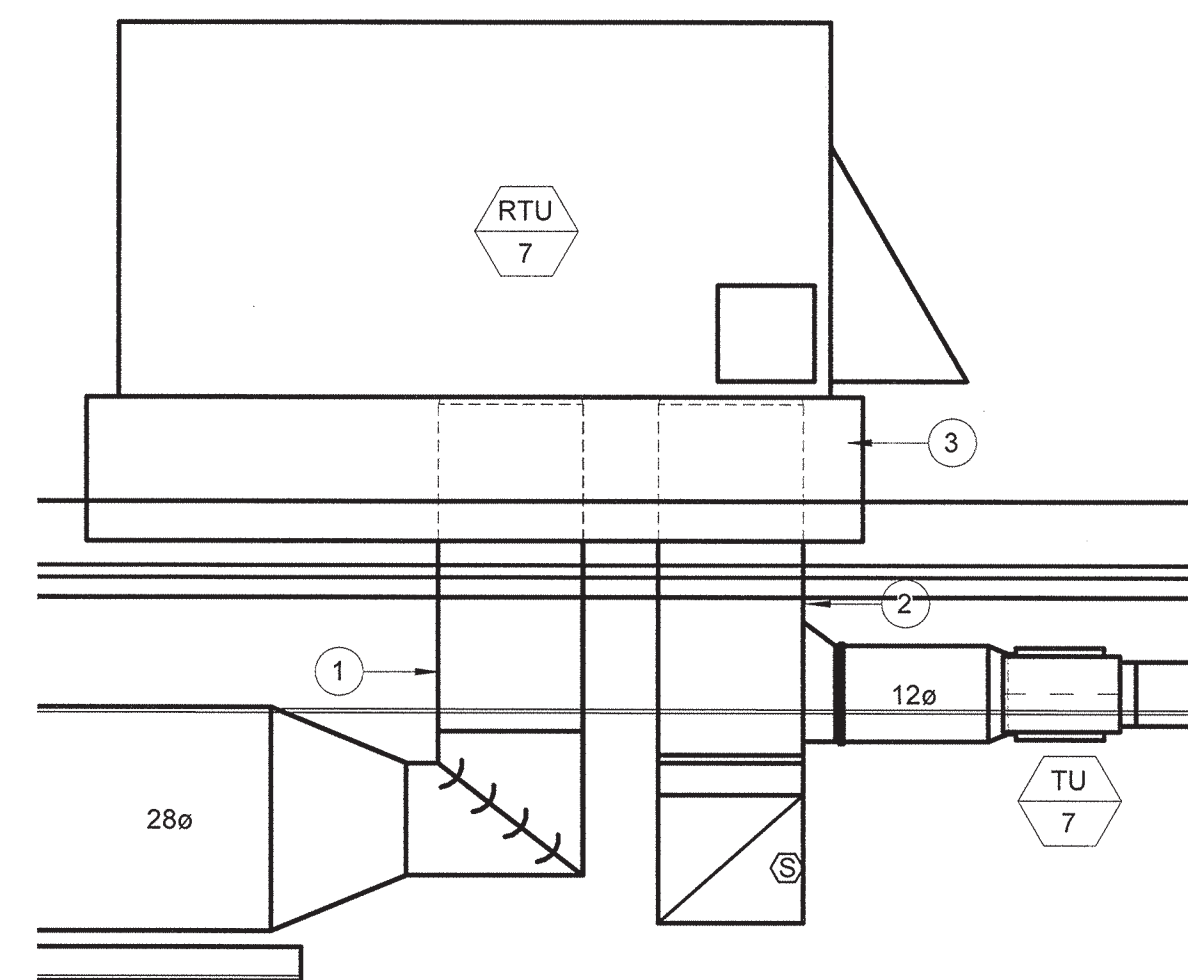
- FULL SIZE SA DUCT UP TO RTU OUTLET.
- 32x18 RA DOWN FROM RTU INLET. SPLIT INTO TWO 18x16 DUCTS AND PROVIDE DUCT MOUNTED SMOKE DETECTORS. DIVISION 23
- FACTORY FABRICATED ACOUSTICAL ROOF CURB.
- ROUTE 3/4" COPPER CONDENSATE LINE FROM RTU TO NEAREST ROOF DRAIN.
- FULL SIZE EA DUCT DOWN FROM DOAS INLET. SPLIT INTO TWO 21x21 DUCTS.
- 52x26 SA DUCT DOWN FROM DOAS OUTLET. SPLIT INTO TWO 26x26 DUCTS.



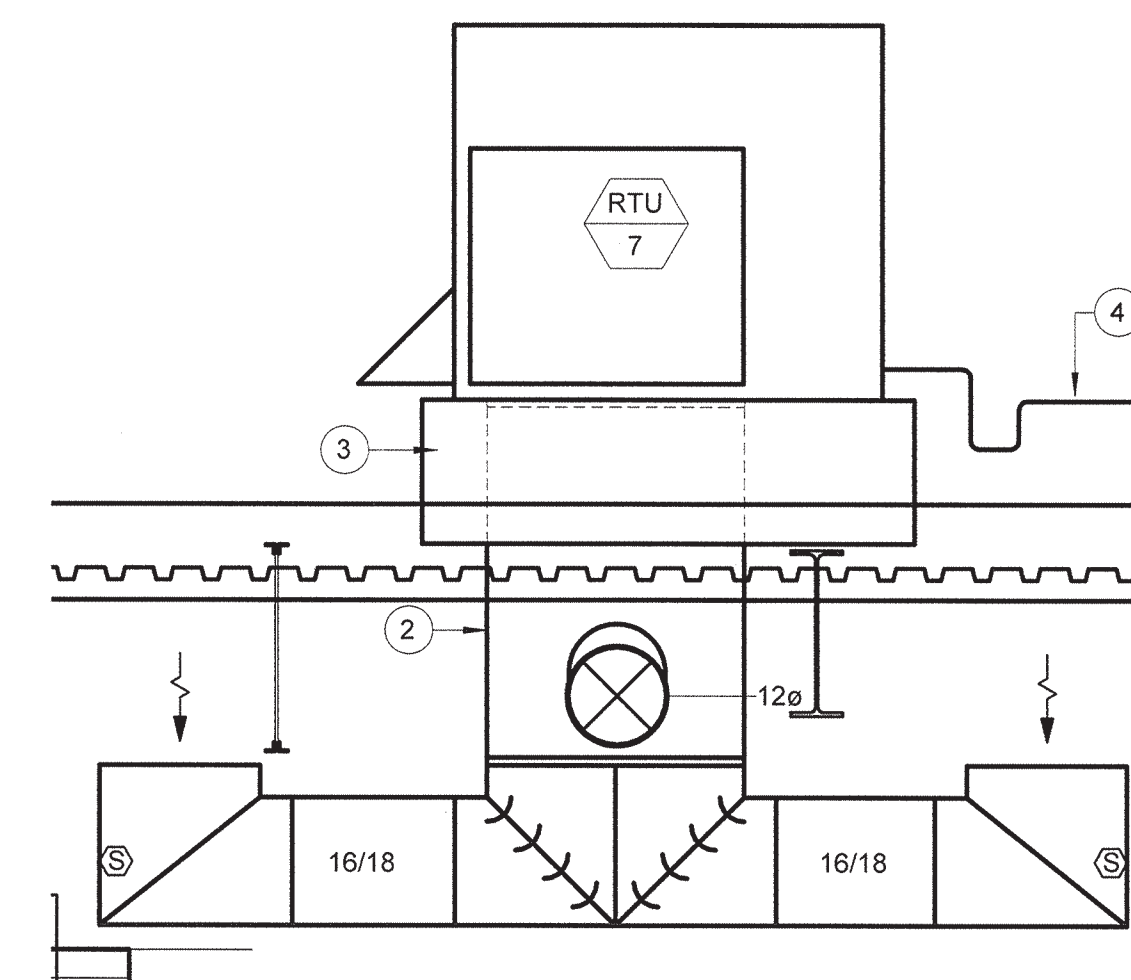
1 AHU-7 (ALTERNATE #1)
Scale: 1/2" = 1'-0"



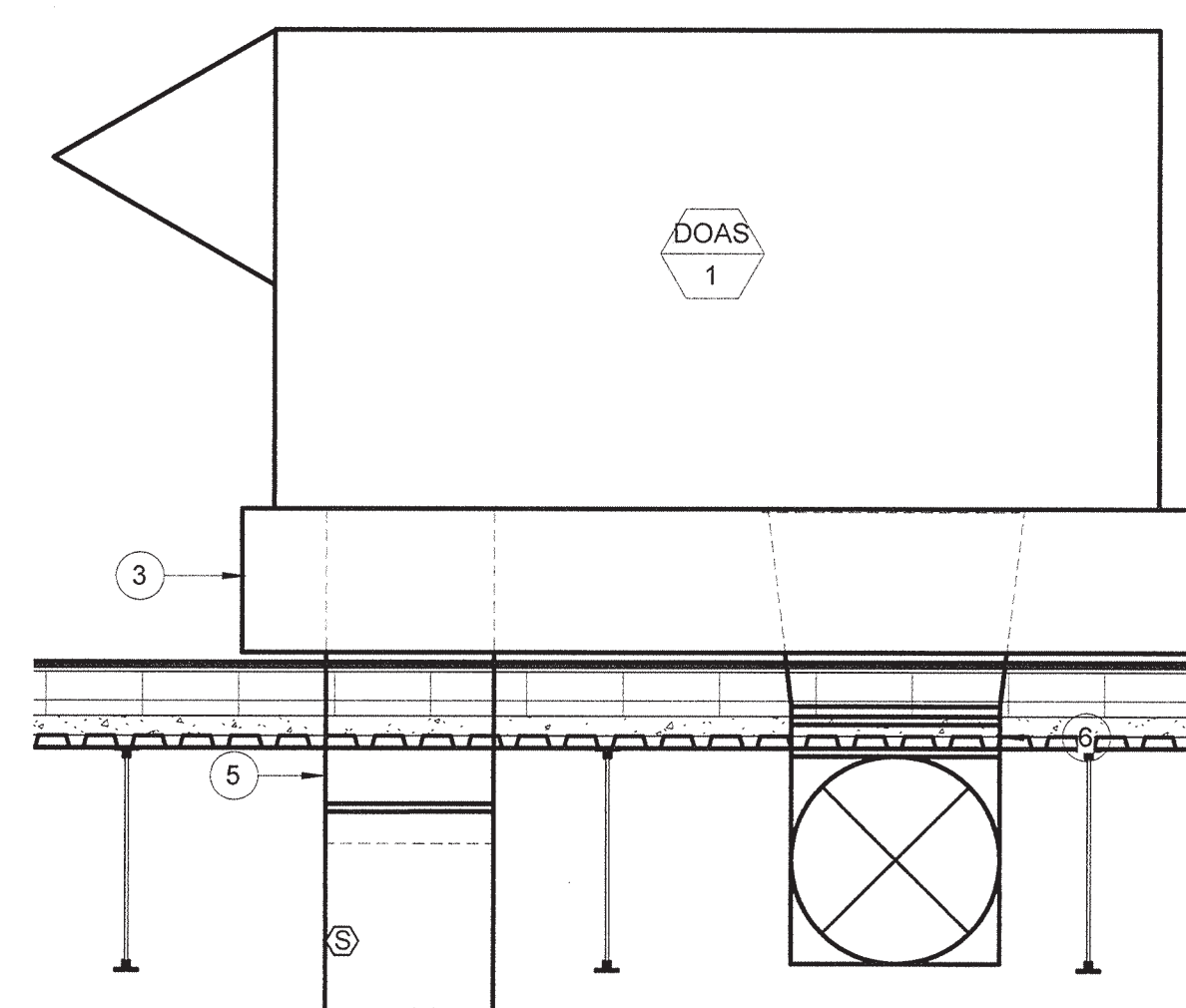
2 AHU-7 RA (ALTERNATE #1)
Scale: 1/2" = 1'-0"



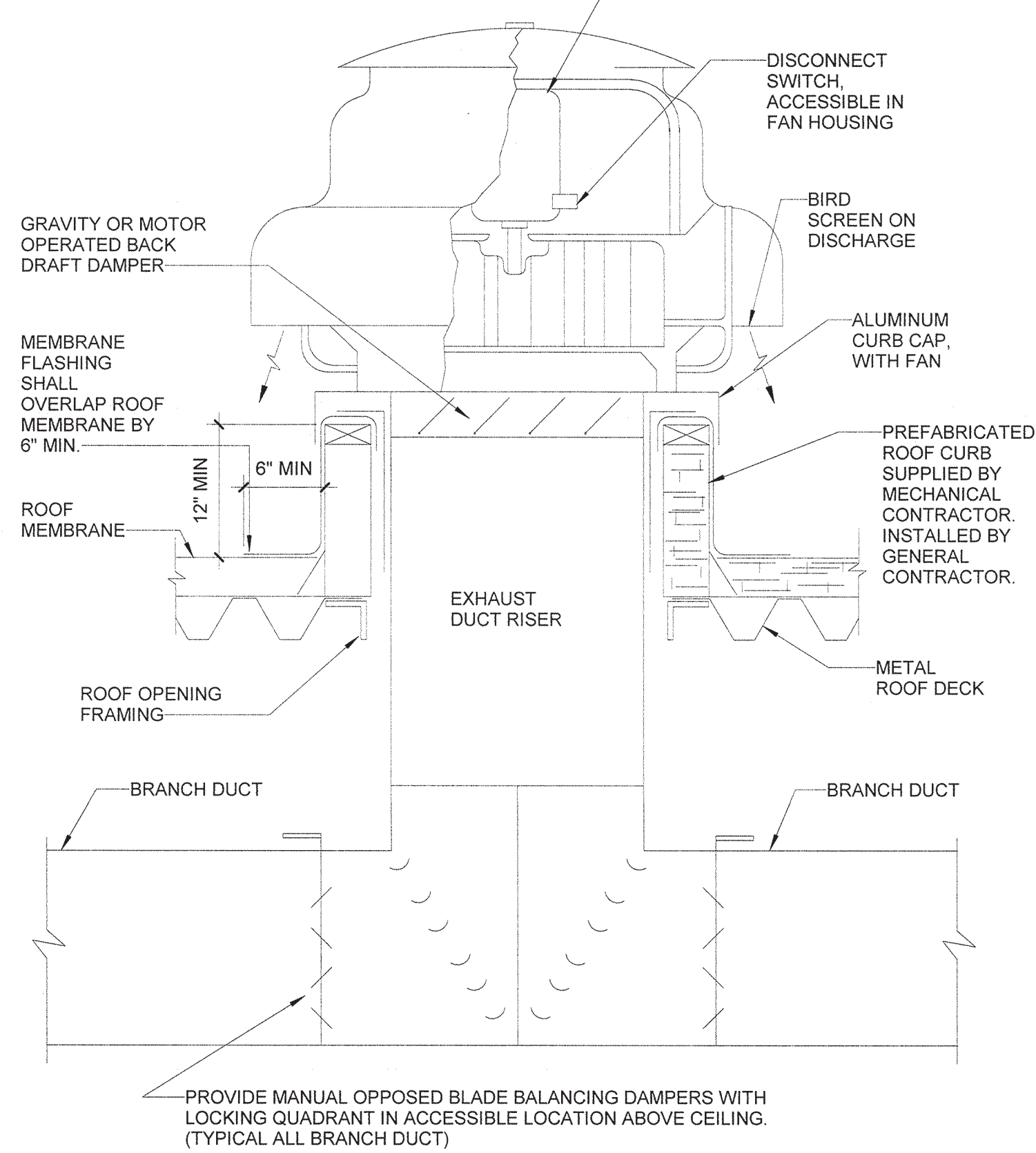
3 RTU-7 (ALTERNATE #2)
Scale: 1/2" = 1'-0"



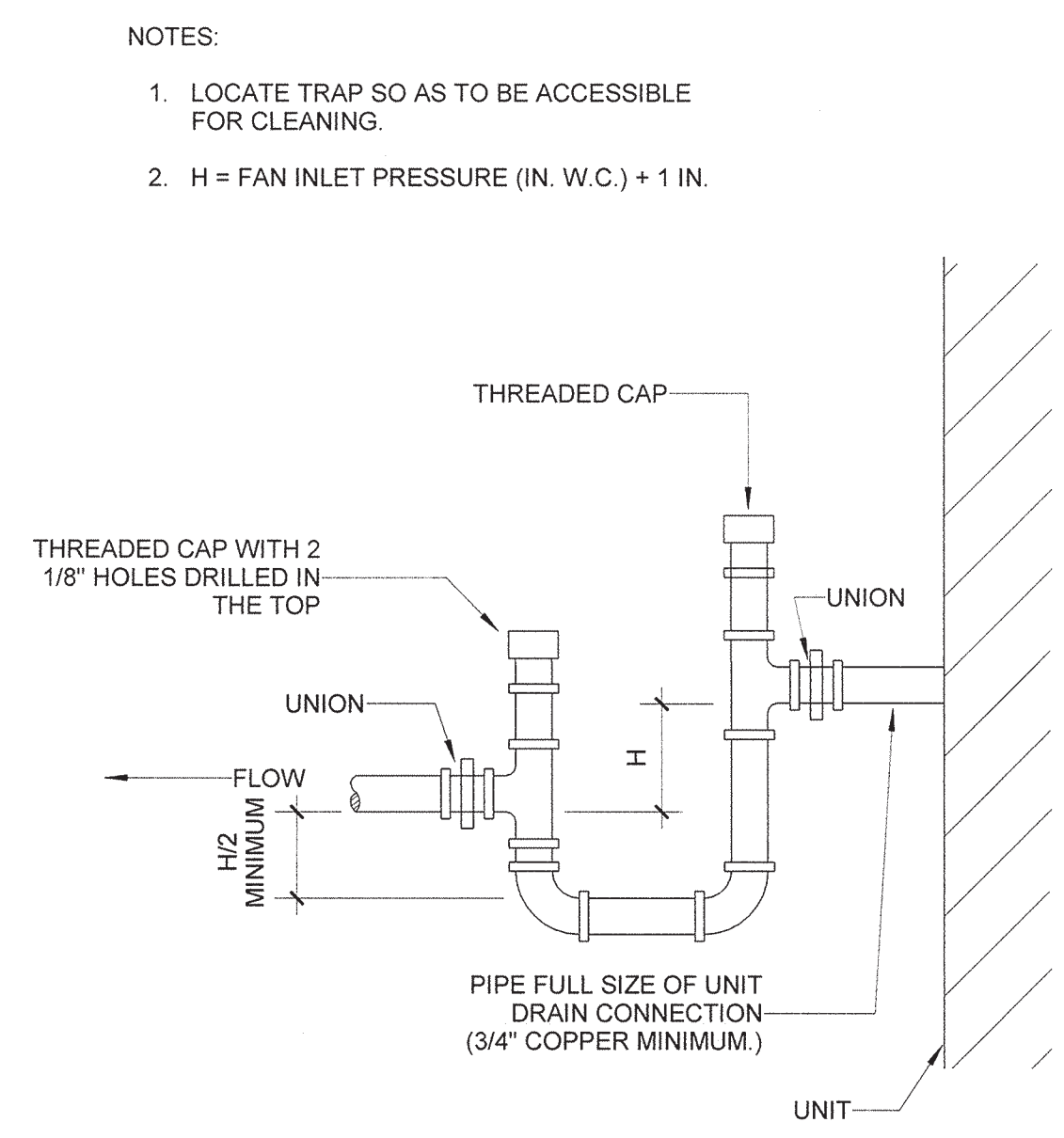
4 RTU-7 RA (ALTERNATE #2)
Scale: 1/2" = 1'-0"



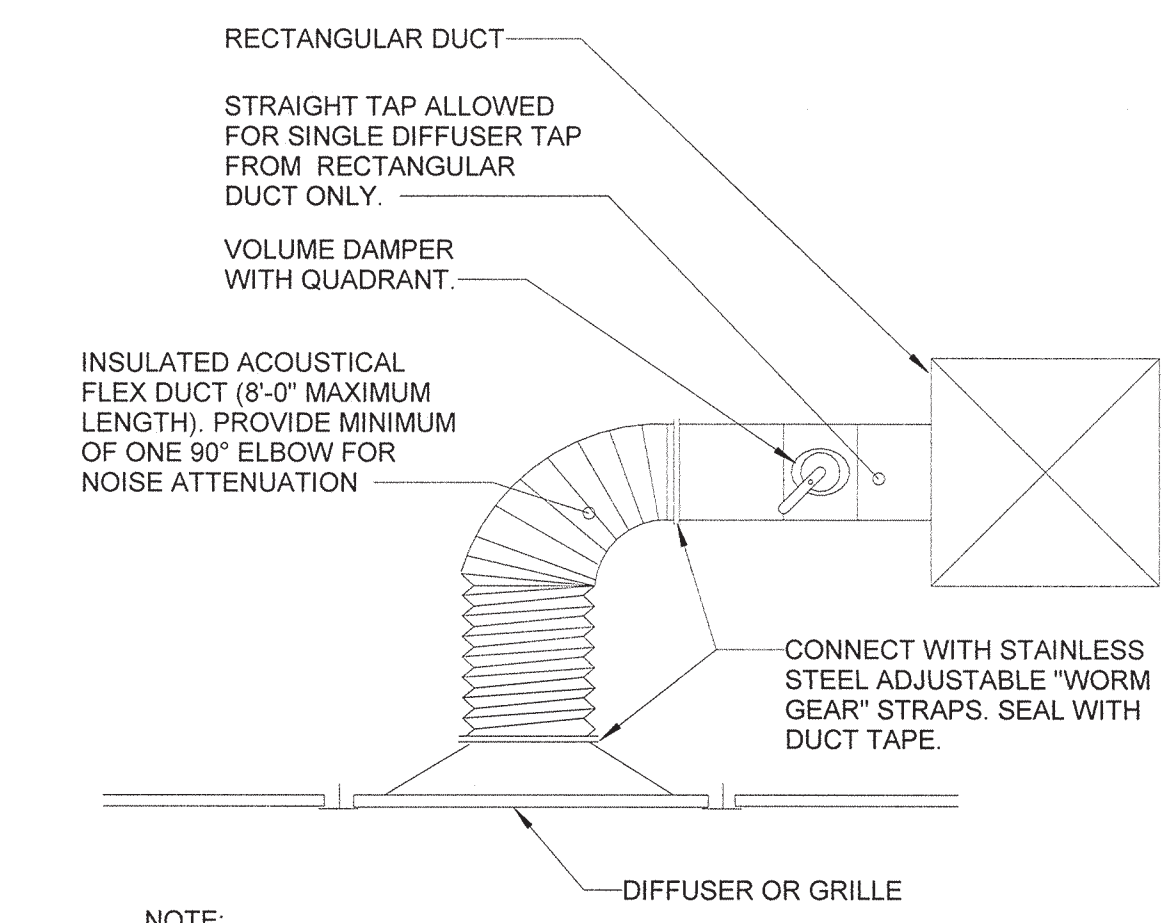
5 DOAS-1 (ALTERNATE #2)
Scale: 1/2" = 1'-0"



1 MECH - ROOF MOUNTED EXHAUST FAN DETAIL
Scale: 1" = 1'-0"

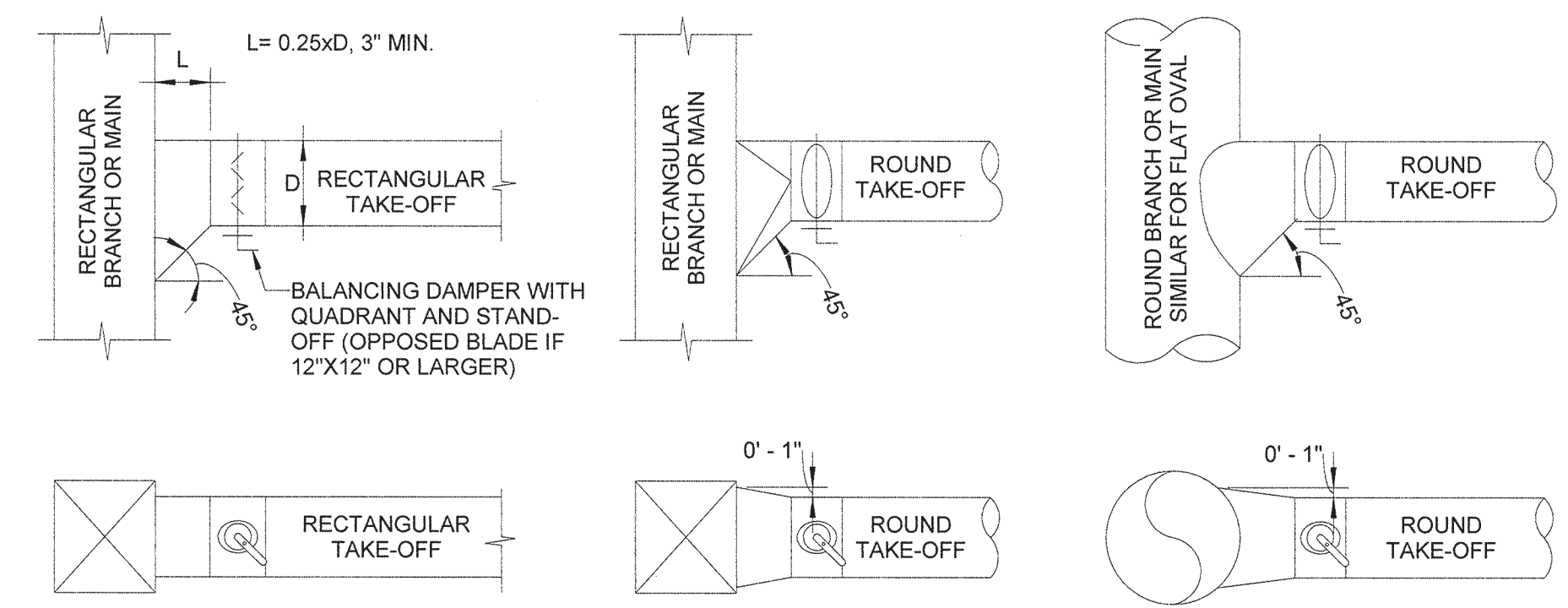


2 CONDENSATE TRAP - DRAIN & BLOW THRU
Scale: N.T.S.



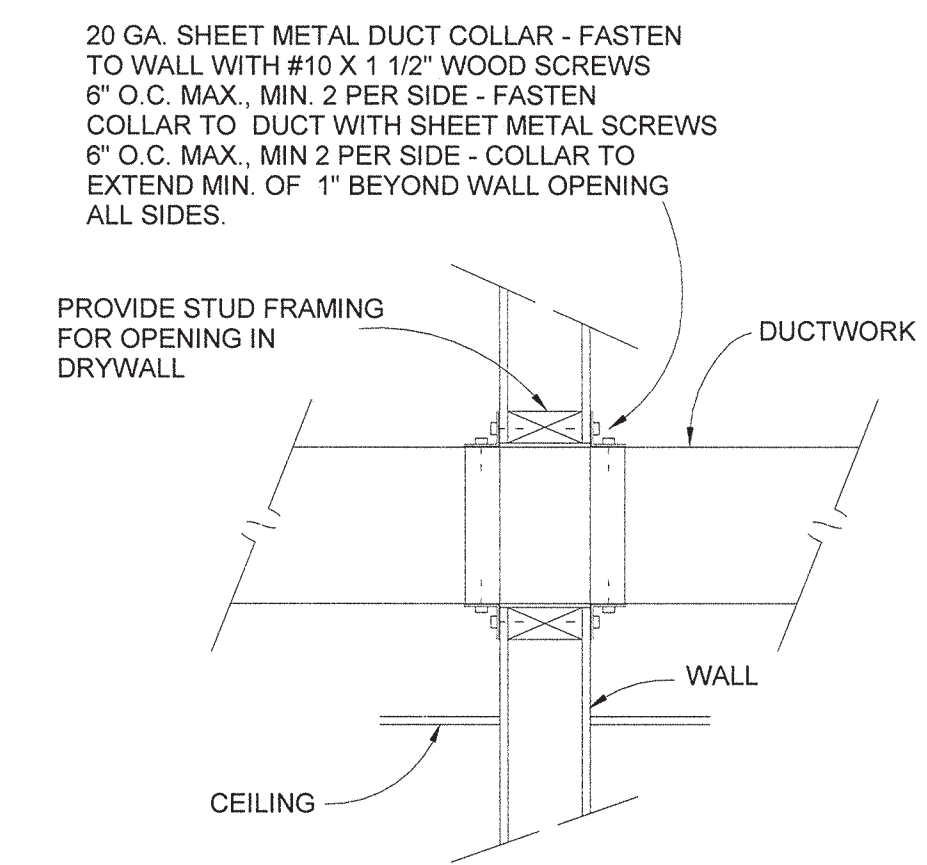
- NOTE:**
1. PROVIDE VOLUME DAMPERS ON RUNOUTS TO ALL DIFFUSERS AND GRILLES EXCEPT DO NOT INSTALL A VOLUME DAMPER ON A SUPPLY WHEN THERE IS ONLY ONE SUPPLY OUTLET ON TERMINAL BOX.
 2. LOCATE DAMPER WHERE ACCESSIBLE.
 3. STANDOFF REQUIRED FOR DAMPER HANDLE ON ALL INSULATED DUCT.
 4. PROVIDE CABLE ACTUATED DAMPERS IN AREAS WITH HARD CEILINGS. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.

3 DIFFUSER ASSEMBLY DETAIL
Scale: N.T.S.

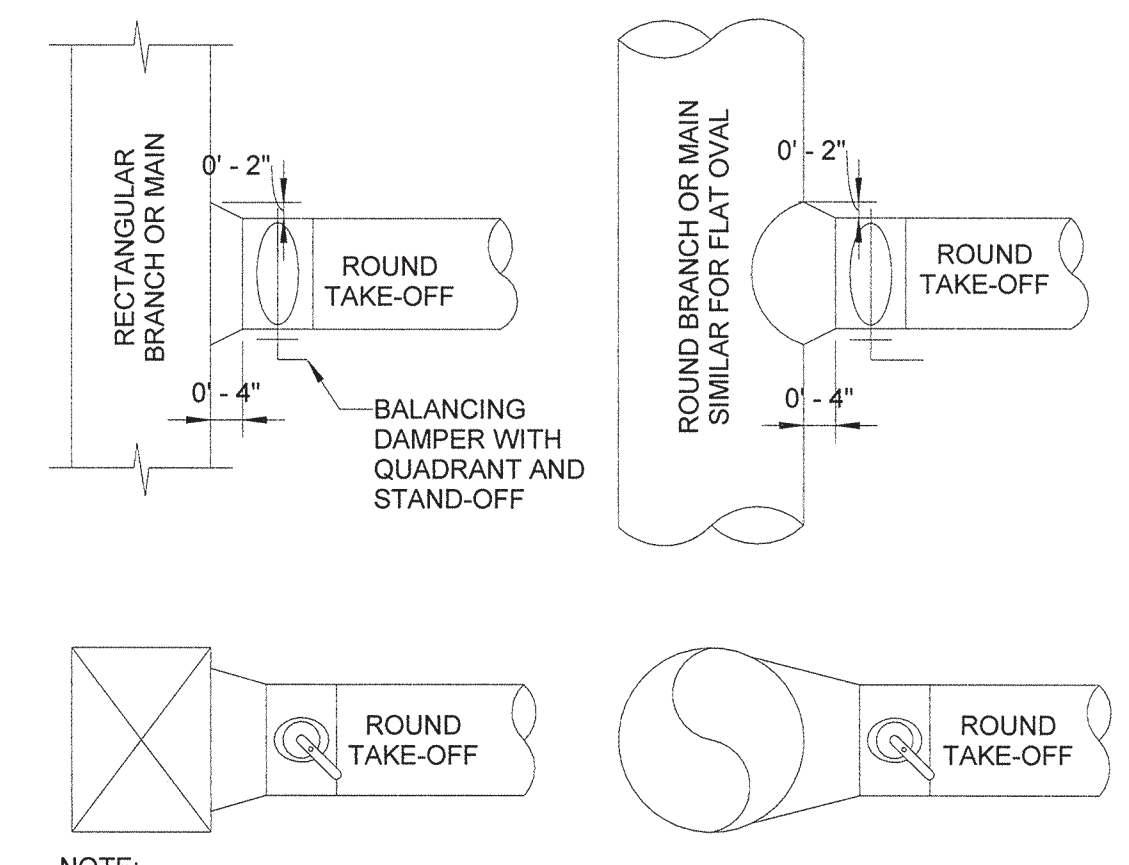


- NOTE:**
1. PROVIDE 45° LATERAL WYE TAKE-OFFS.
 2. WHEN SPACE DOES NOT ALLOW 45° LATERAL WYE TAKE-OFF, USE 90° CONICAL TEE CONNECTIONS.
 3. STRAIGHT IN FACTORY BUILT CONNECTIONS ARE PERMITTED FOR:
 - A. SINGLE DIFFUSER, GRILLE OR REGISTER RUNOUTS FOR EXHAUST OR RETURN AIR APPLICATIONS.
 - B. SINGLE DIFFUSER, GRILLE OR REGISTER RUNOUTS ON THE LOW PRESSURE SIDE OF TERMINAL BOXES.
 4. STANDOFF REQUIRED FOR DAMPER HANDLE ON ALL INSULATED DUCT.
 5. PROVIDE CABLE ACTUATED DAMPERS IN AREAS WITH HARD CEILINGS. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.

4 DUCT 45° LATERAL TAKE-OFF DETAIL
Scale: N.T.S.

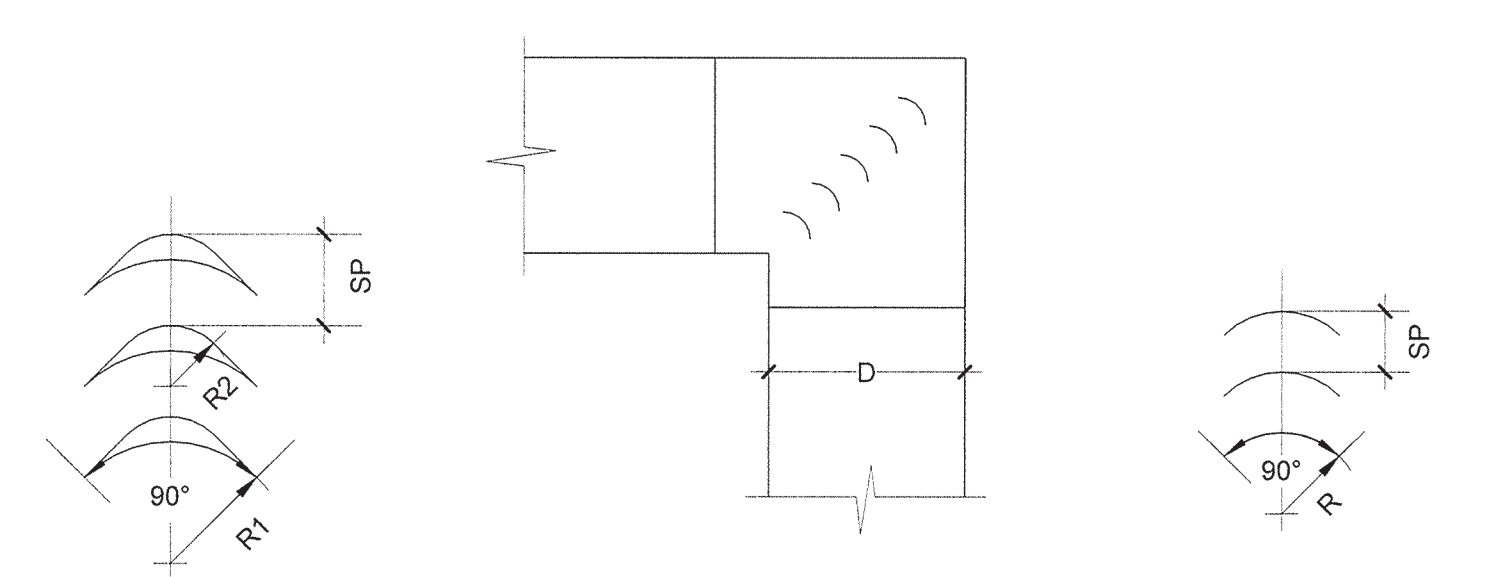


5 DUCT COLLAR - DRYWALL
Scale: N.T.S.



- NOTE:**
1. PROVIDE 45° LATERAL WYE TAKE-OFFS.
 2. WHEN SPACE DOES NOT ALLOW 45° LATERAL WYE TAKE-OFF, USE 90° CONICAL TEE CONNECTIONS.
 3. STRAIGHT IN FACTORY BUILT CONNECTIONS ARE PERMITTED FOR:
 - A. SINGLE DIFFUSER, GRILLE OR REGISTER RUNOUTS FOR EXHAUST OR RETURN AIR APPLICATIONS.
 - B. SINGLE DIFFUSER, GRILLE OR REGISTER RUNOUTS ON THE LOW PRESSURE SIDE OF TERMINAL BOXES.
 4. STANDOFF REQUIRED FOR DAMPER HANDLE ON ALL INSULATED DUCT.
 5. PROVIDE CABLE ACTUATED DAMPERS IN AREAS WITH HARD CEILINGS. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.

6 DUCT CONICAL TAKE-OFF DETAIL
Scale: N.T.S.



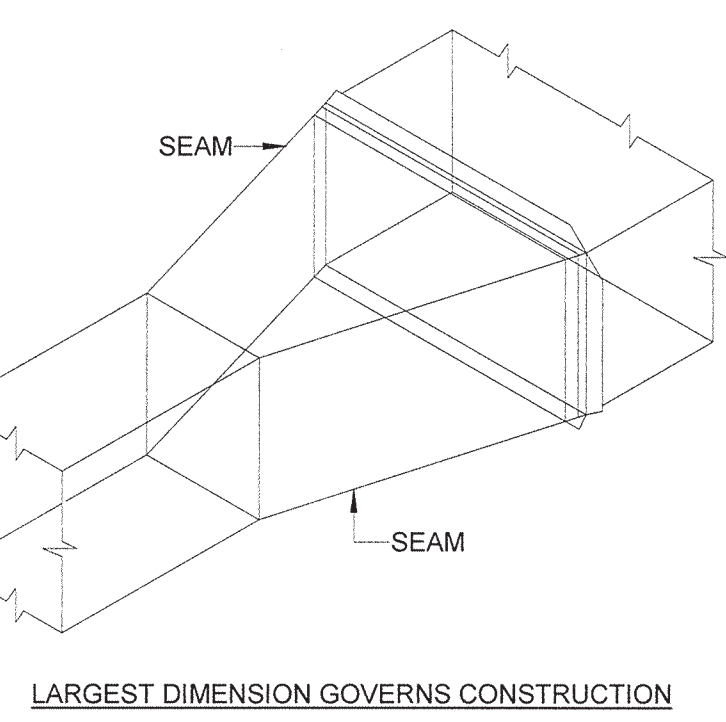
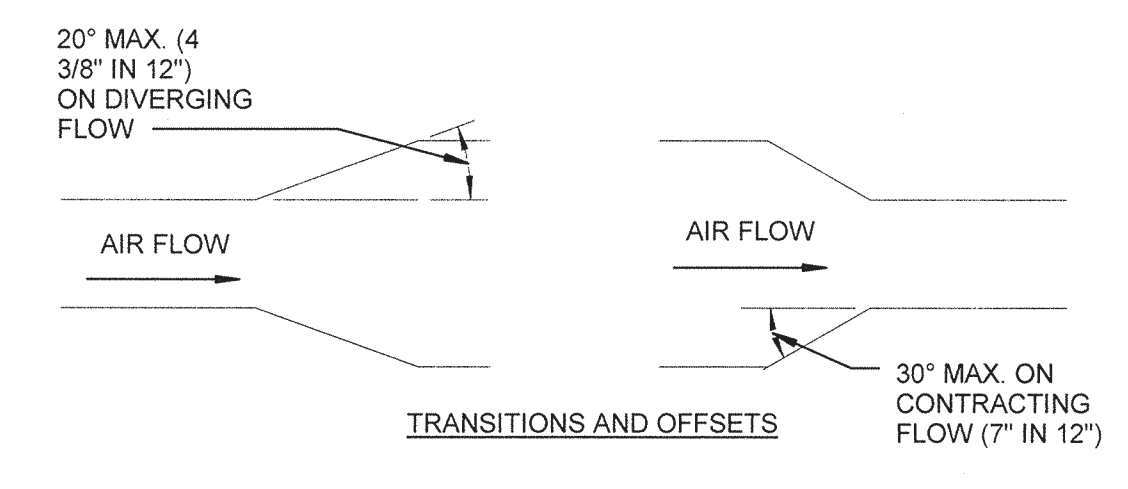
DOUBLE VANE SCHEDULE						
D	H	R1	R2	SP	GA	
LARGE	>18"	>18"	4-1/2"	2-1/4"	3-1/4"	24

D	H	R	SP	GA	
SMALL	<18"	<18"	2"	1-1/2"	24

MAXIMUM UNSUPPORTED VANE LENGTH
LARGE DOUBLE VANE 72"

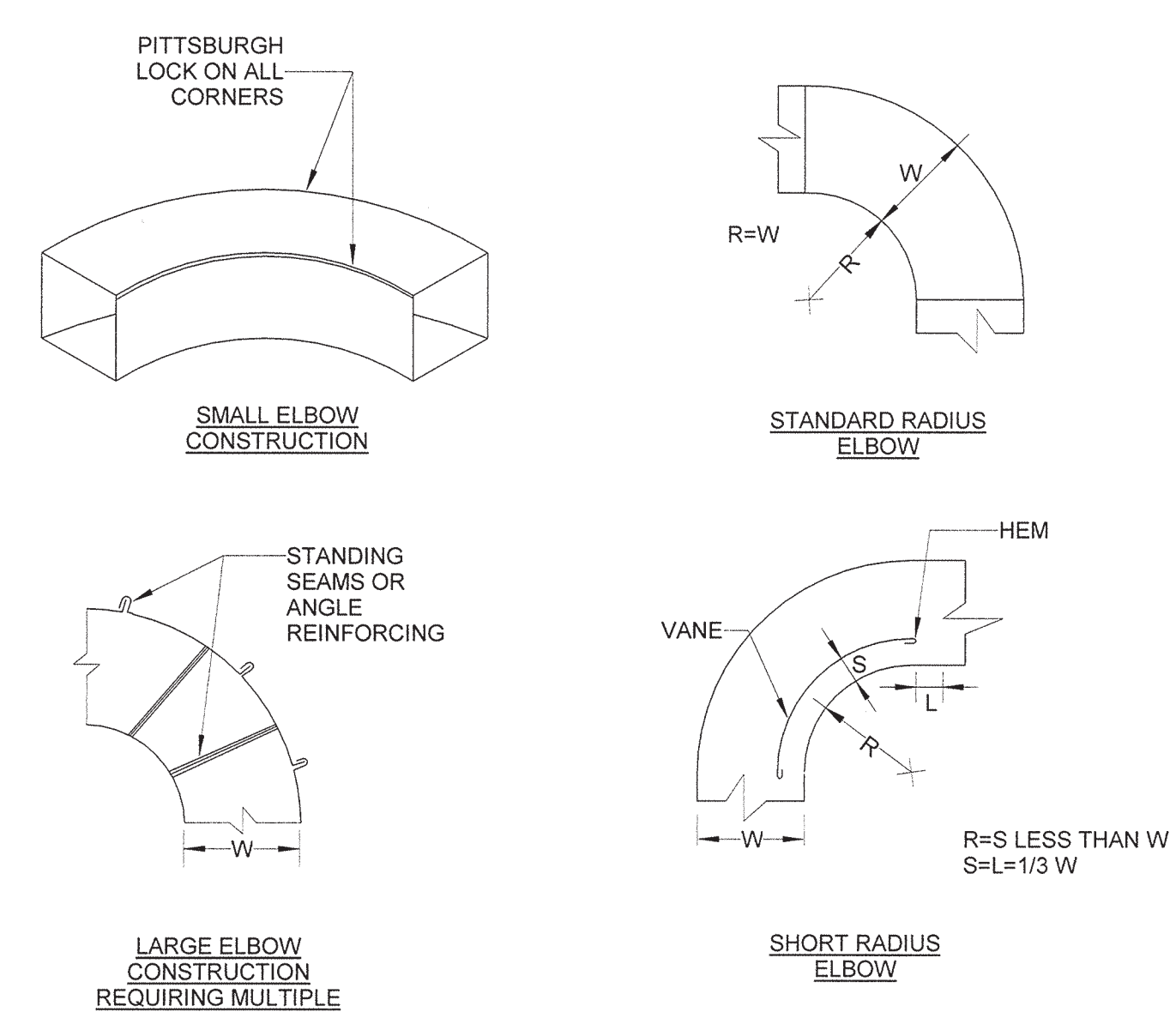
- NOTE:**
1. SINGLE VANES ALLOWED IN ELBOWS LESS THAN OR EQUAL TO 18" x 18".
 2. TURNING VANES NOT REQUIRED IN ELBOWS SMALLER THAN 12" x 12".

7 DUCT MITERED 90 ELBOW
Scale: N.T.S.



CROSS BREAK OR BEAD FOR DUCT PAGE 1-36 (SMACNA LOW PRESSURE STAND, 5th ED.)

8 DUCT TRANSITION DETAIL
Scale: N.T.S.



9 DUCTWORK ELBOWS
Scale: N.T.S.

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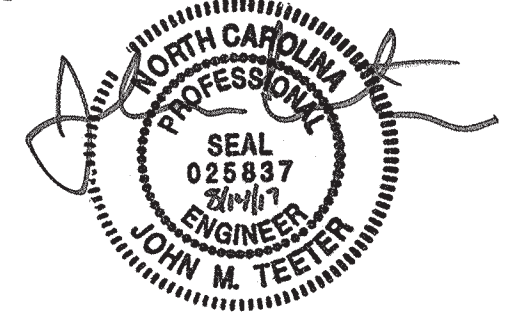
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PROJECT PINE VALLEY BRANCH
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SCO ID #

DRAWING TITLE
MECHANICAL DETAILS I

DRAWING NUMBER

M401

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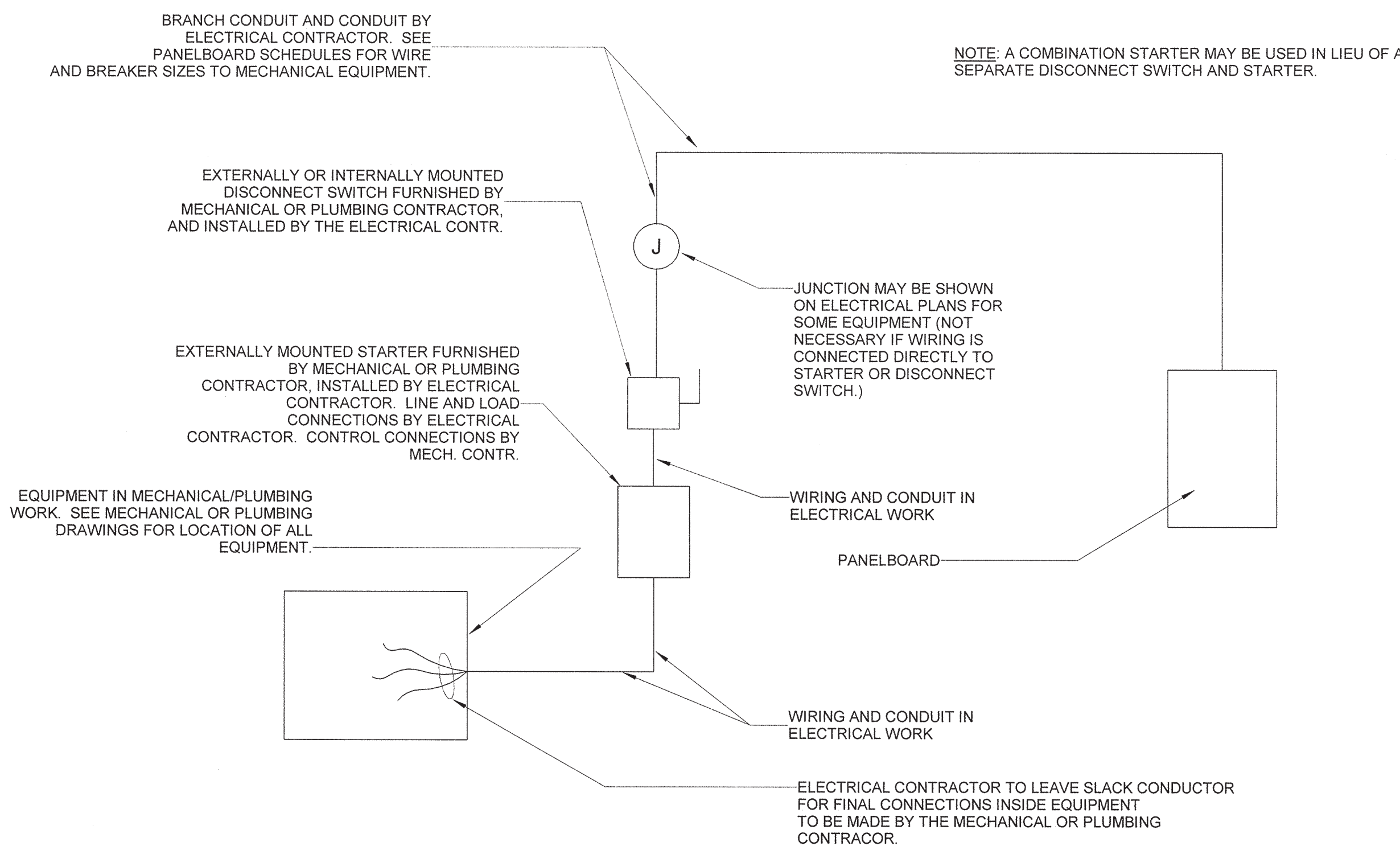
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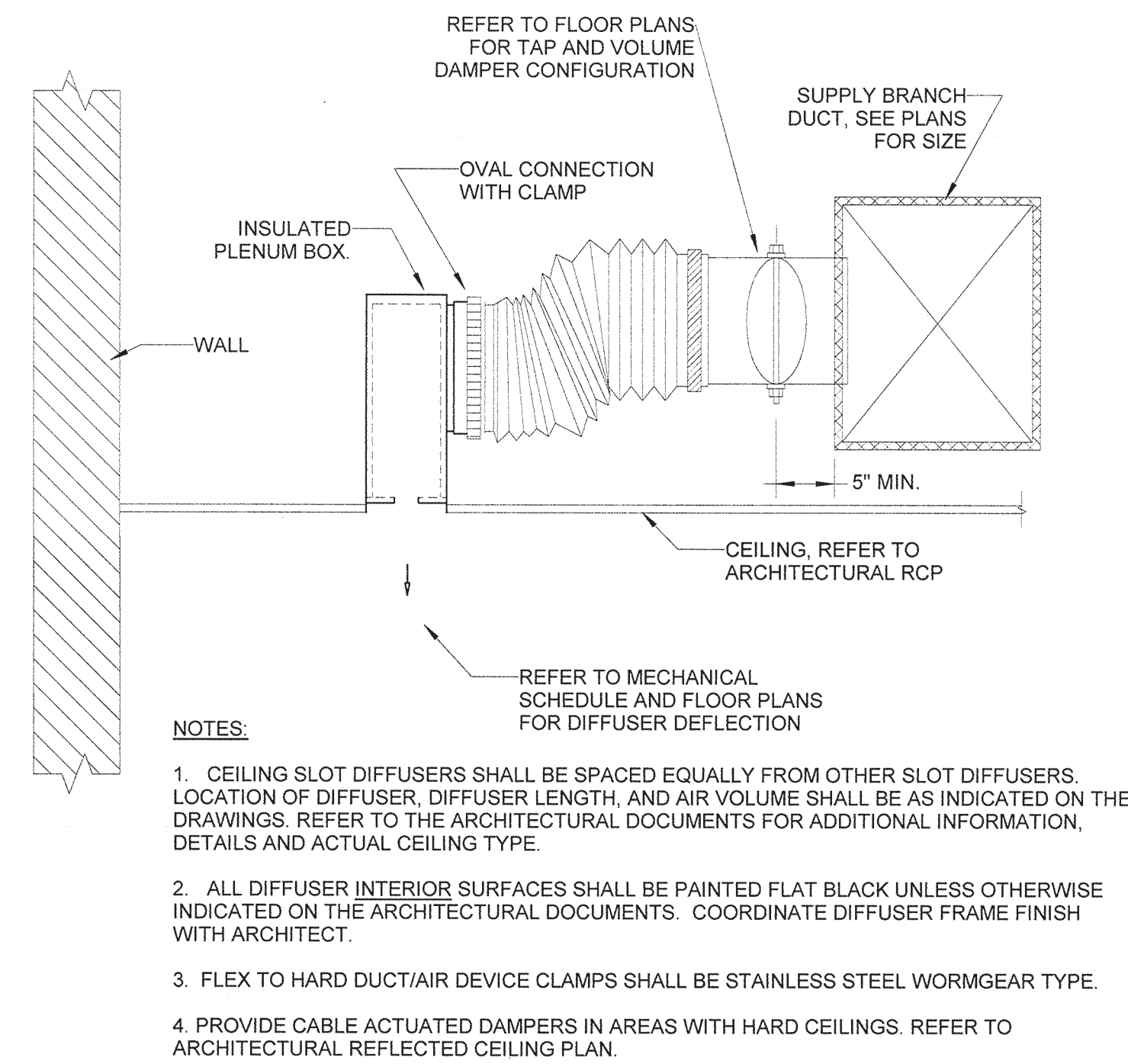
MECHANICAL DETAILS II

DRAWING NUMBER

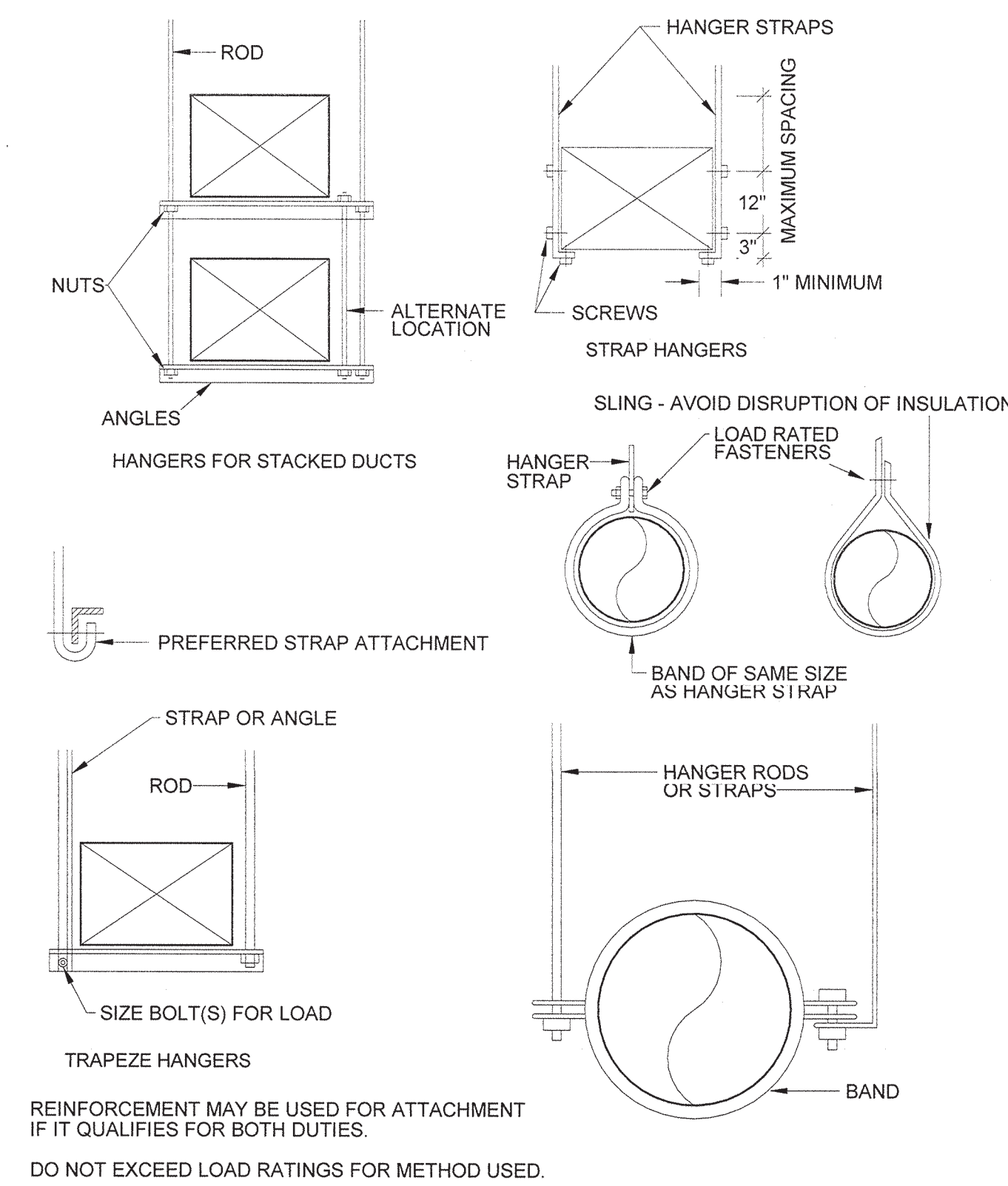
M402



1 ELEC. CONNECTION
Scale: N.T.S.

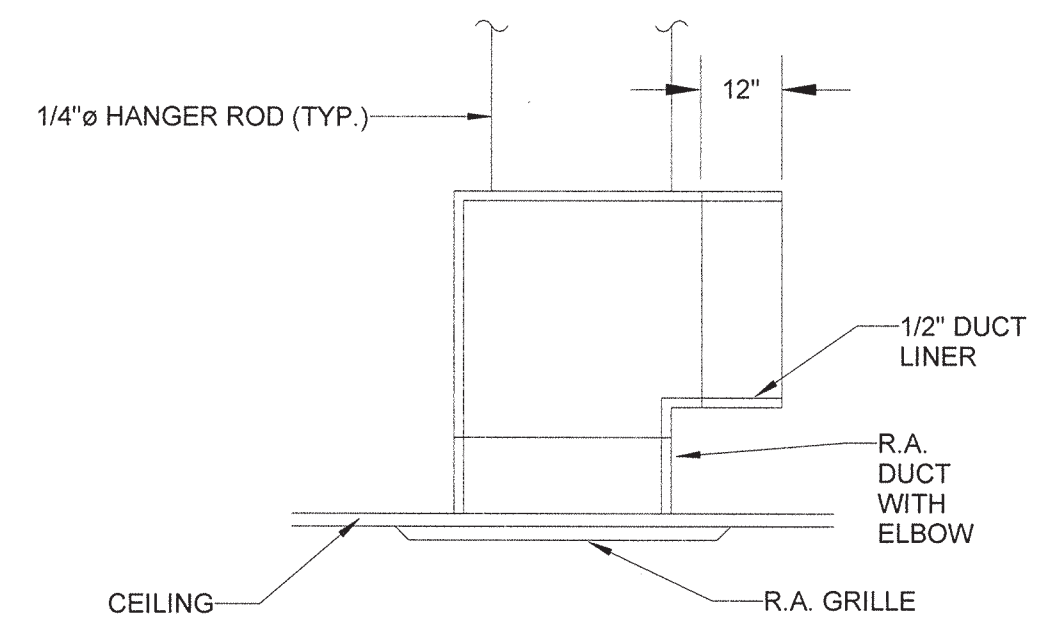


2 SLOT DIFFUSER DETAIL - CEILING
Scale: N.T.S.

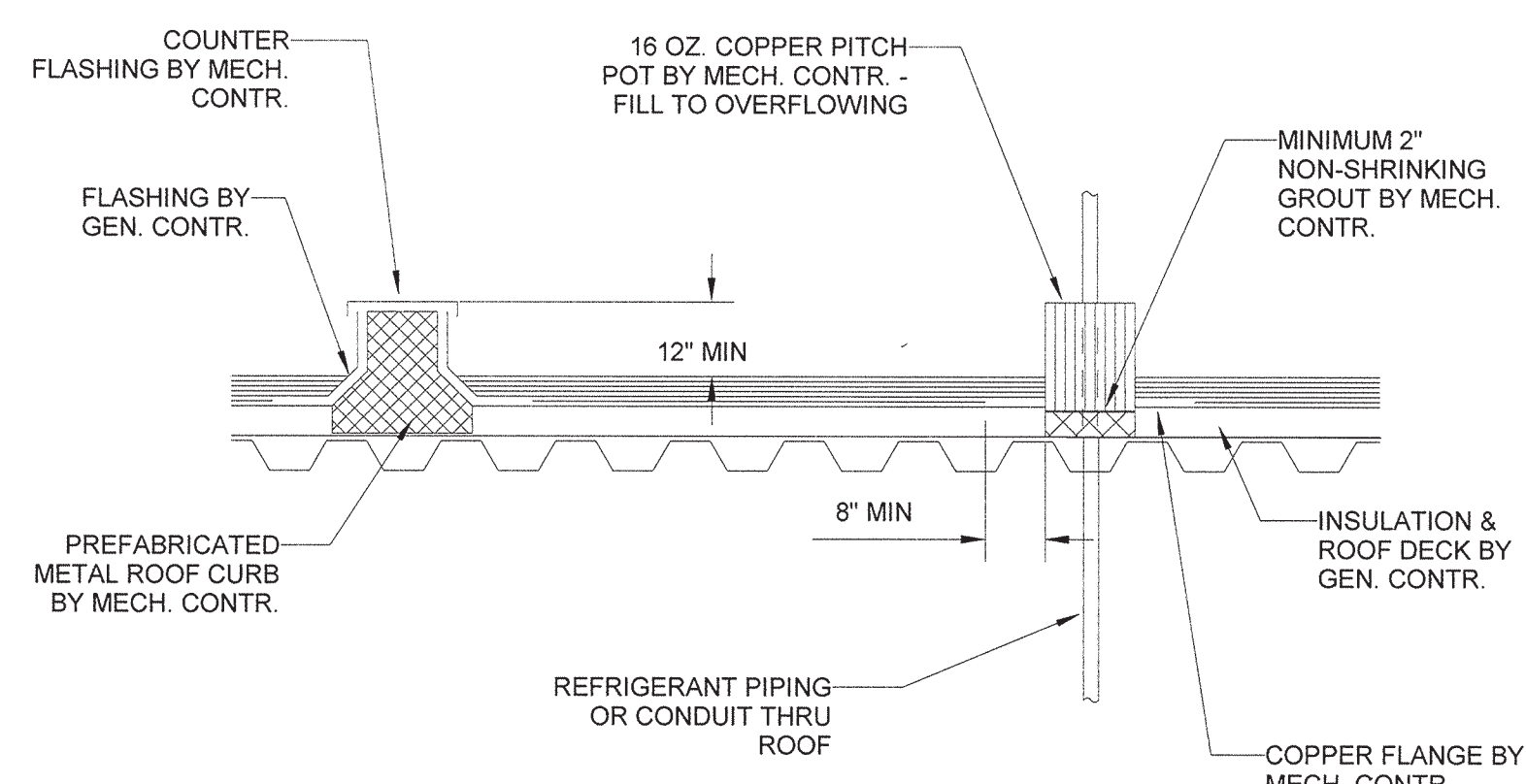


TYPICAL DUCT HANGERS

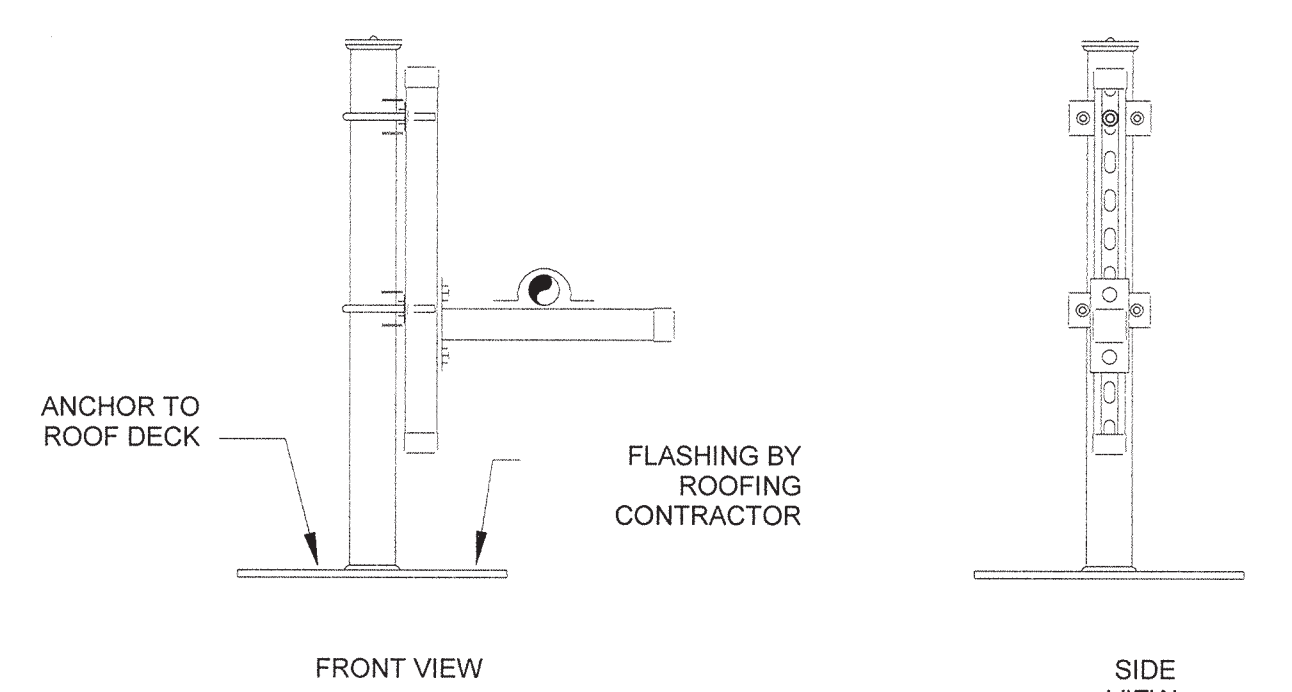
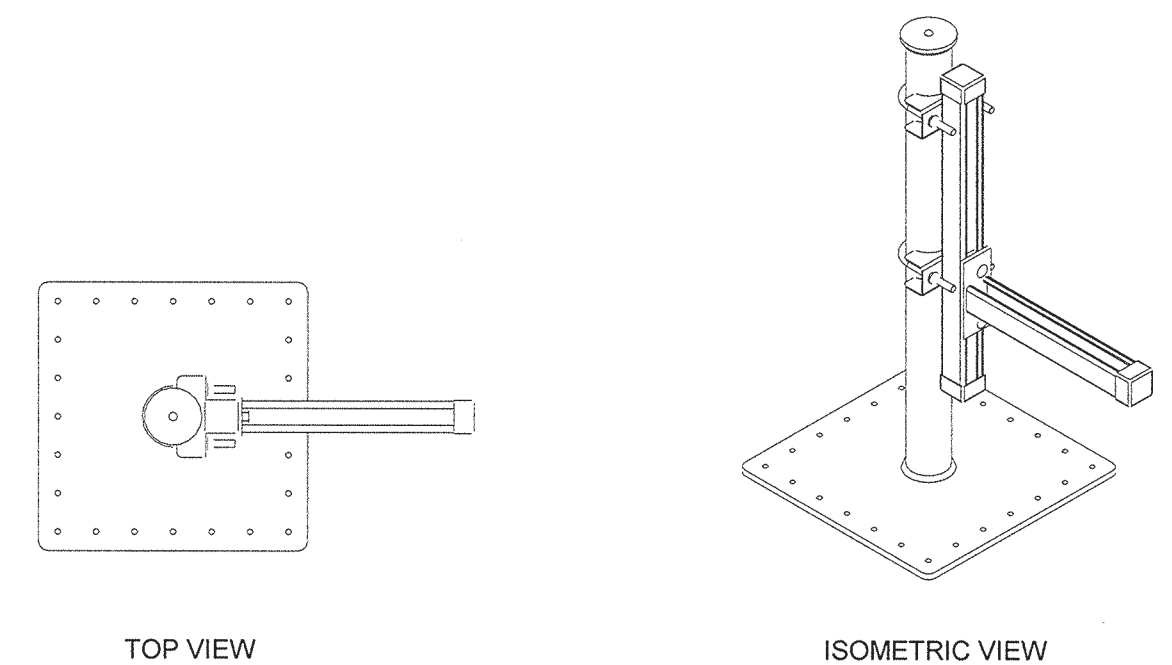
3 TYPICAL DUCT HANGERS
Scale: 12" = 1'-0"



4 RETURN DUCT ELBOW
Scale: N.T.S.

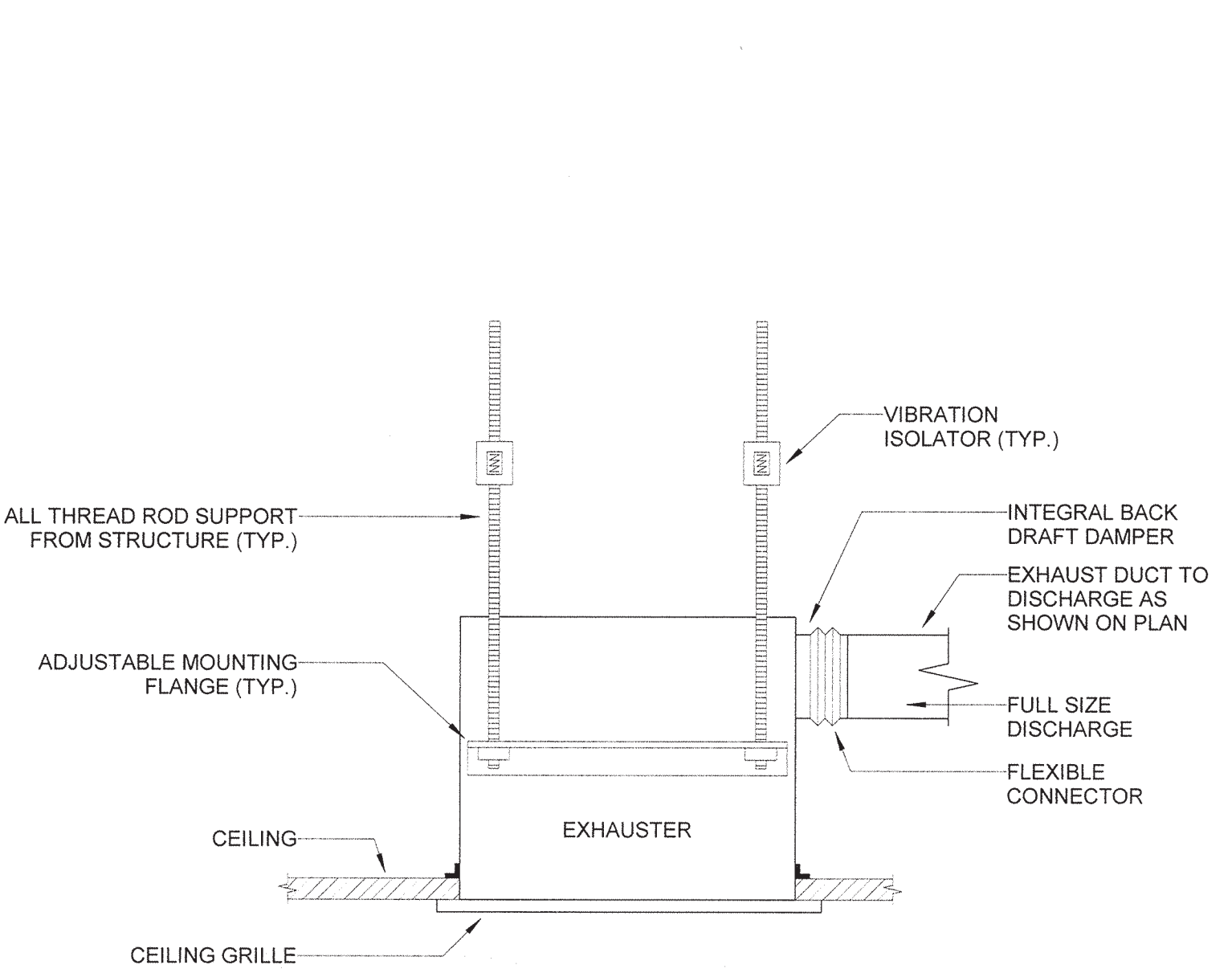


5 ROOF RAIL
Scale: N.T.S.

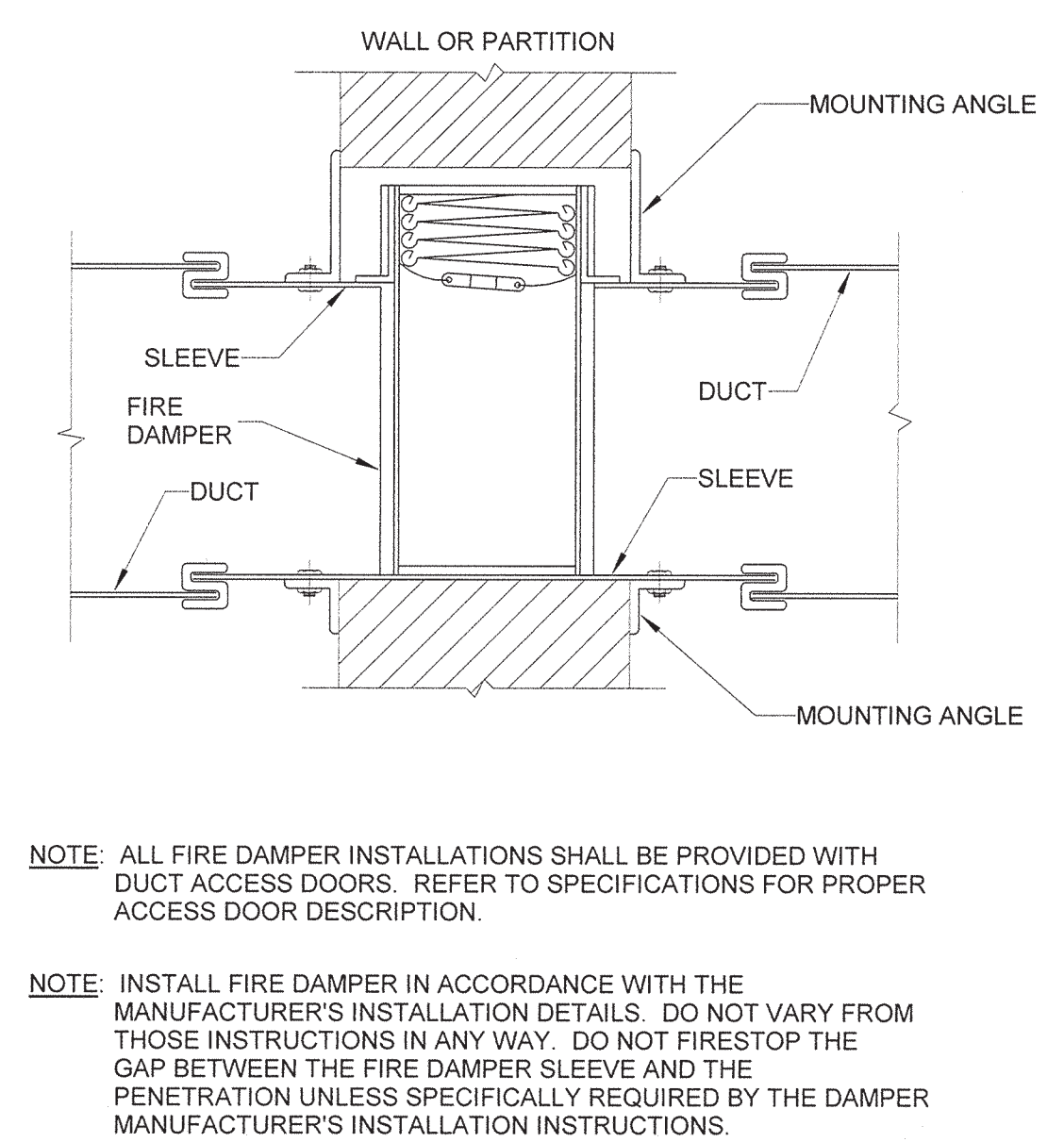


- NOTES:
1. PIPING SHALL BE SUPPORTED AT ALL ELBOWS AND TEES AND AT SPACING SPECIFIED IN THE TABLE BELOW. PIPING SHALL BE SLOPED AND ROUTED TO PREVENT TRAPPING CONDENSATE (EXCEPT AT DIRT LEGS) AND TO FACILITATE CONDENSATE DRAINAGE.
 2. GAS PIPING AND PENETRATIONS THRU ROOF SHALL BE CALLED FOR IN SPEC. SECTIONS 22 & 23 OR AS REQUIRED BY LOCAL CODES.
 3. PIPE STAND SHALL BE MIRO, INC. OR EQUAL STANCHIONED SINGLE PIPE SUPPORT.
 4. STANCHIONED PIPE SUPPORTS SHALL BE ENGINEERED TO ENSURE MEMBER/COMPONENT CAPACITIES AND DEFLECTION CRITERIA ARE NOT EXCEEDED. DEFLECTION IN THE HORIZONTAL HEADER BAR IS NOT TO EXCEED THE SPAN LENGTH BY 3/80 OR 1/8.
 5. STANCHIONED PIPE SUPPORTS ALLOW ADJUSTABLE HEIGHT AS DESIRED OR REQUIRED BY THE CODE OR ROOF SYSTEM.
 6. ALL METAL PARTS SHALL BE HOT DIP GALVANIZED.
 7. STANCHIONED SUPPORTS SHALL MEET PROJECT WIND AND SEISMIC REQUIREMENTS.
 8. ANCHOR SUPPORTS TO ROOF DECK.

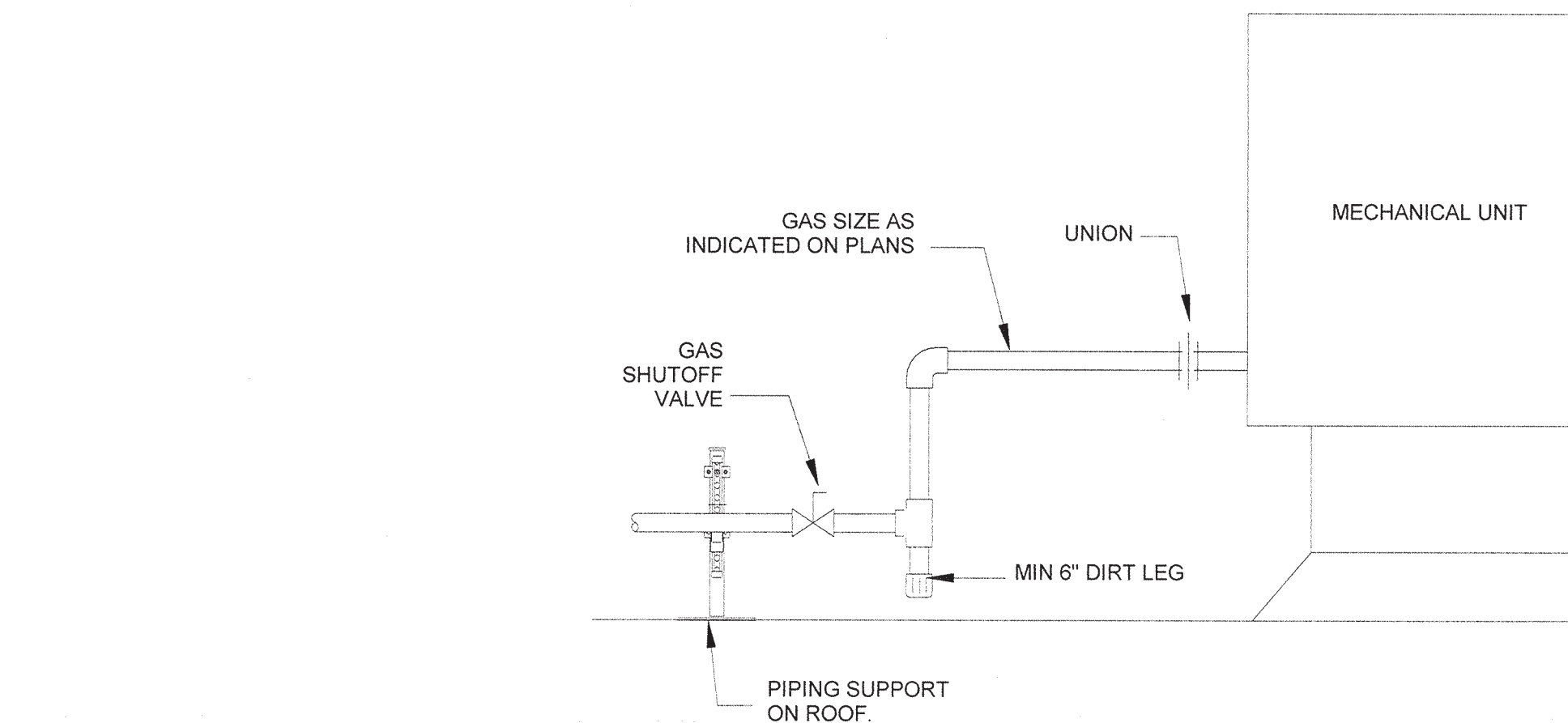
PIPE SIZE	MAX. SPACING
3/4"	5'
1"	6'
1-1/4"	7'
1-1/2"	9'
2"	10'
2-1/2"	10'
3"	10'



6 EXHAUST FAN - CEILING CABINET
Scale: N.T.S.



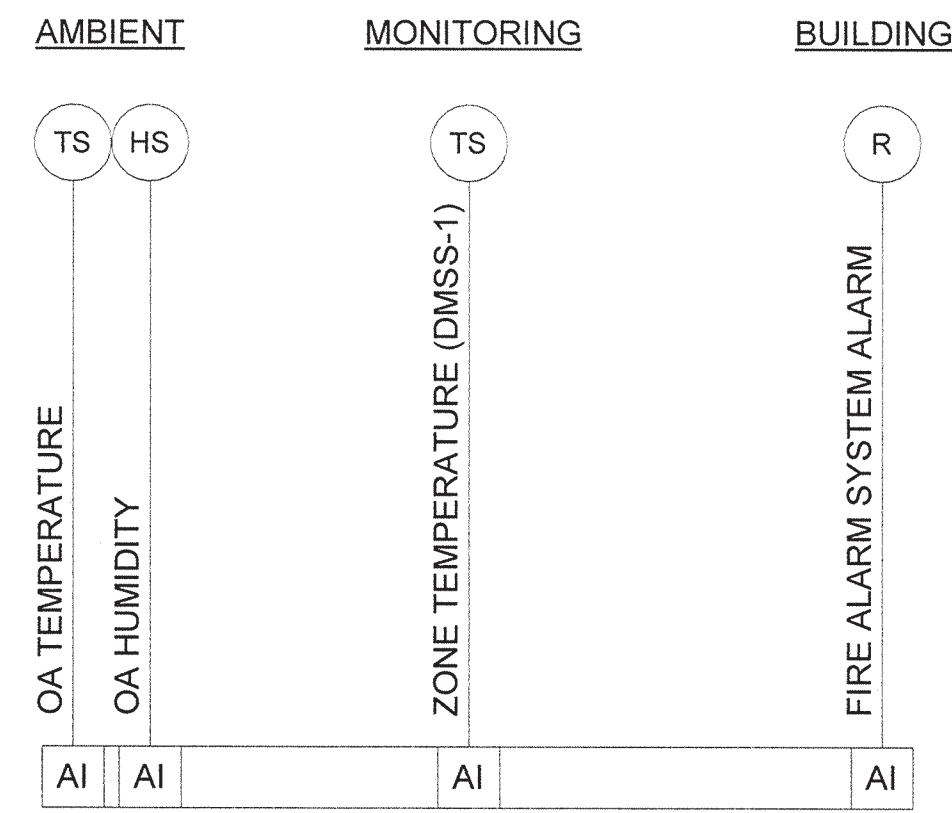
7 FIRE DAMPER (TYPE B)
Scale: N.T.S.



8 GAS & CONDENSATE ROOF SUPPORT DETAIL
Scale: 12" = 1'-0"

CONTROLS LEGEND

- = ANALOG INPUT
- = ANALOG OUTPUT
- = DIGITAL INPUT
- = DIGITAL OUTPUT
- = NETWORK CONNECTION
- = ACTUATOR CONTROL
- = AIR FLOW SWITCH
- = CONSTANT FLOW VALVE OR DAMPER
- = CO2 SENSOR
- = CURRENT SENSING RELAY
- = DIFFERENTIAL PRESSURE SENSOR
- = ENERGY METER
- = FLOW METER
- = HUMIDITY HIGH LIMIT SWITCH
- = HUMIDITY SENSOR
- = OCCUPANCY SENSOR
- = PRESSURE SENSOR
- = RELAY
- = END SWITCH
- = STARTER
- = THERMOSTAT
- = TEMPERATURE SENSOR
- = VARIABLE FLOW VALVE OR DAMPER
- = VELOCITY SENSOR
- = VARIABLE SPEED DRIVE
- = WATER FLOW SWITCH
- = OVERRIDE SWITCH
- = ELECTRIC / PNEUMATIC TRANSDUCER
- = FIRE ALARM CONTACT
- = FAIL OPEN
- = FAIL CLOSED
- = THREE WAY CONTROL VALVE
- = TWO WAY MOTOR
- = MOTOR
- = AIR FLOW MONITORING STATION
- = DAMPER
- = COOLING OR HEATING COIL
- = FREEZE STAT
- = FILTER
- = FAN
- = FAN



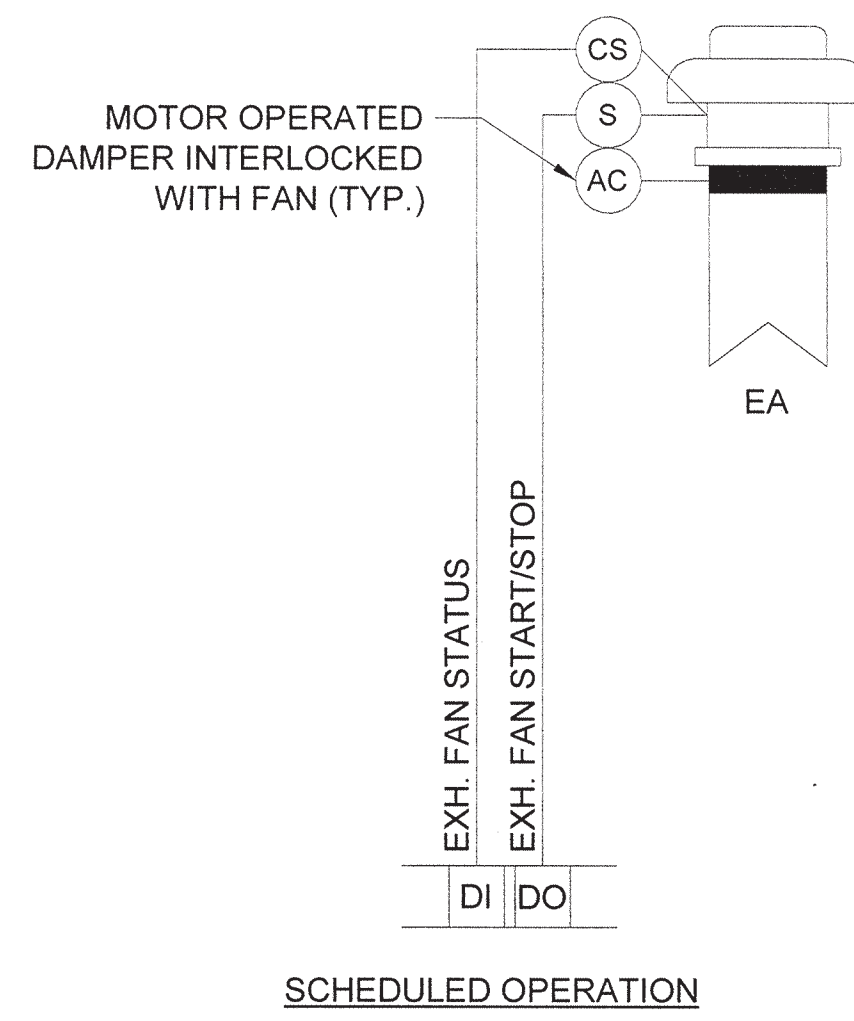
1 CONTROL - BUILDING MONITOR CONTROL DIAGRAM
Scale: 12" = 1'-0"

BUILDING MONITORING AND CONTROL

REGAIN POWER CONTROL: AFTER RESUMPTION OF POWER FROM AN OUTAGE, AUTOMATICALLY RESTART ALL EQUIPMENT BASED ON THE OCCUPIED SCHEDULE. POWER TO THE BAS SYSTEM SHALL BE MAINTAINED BY UPS FOR A POWER LOSS DURATION OF UP TO 4 HOURS.

MONITOR, TREND, & REPORT:
 OA TEMPERATURES (15 MINUTE INTERVALS)
 OA HUMIDITY (15 MINUTE INTERVALS)
 OA DRY BULB AND WET BULB EXCEEDS DESIGN CONDITIONS FOR MORE THAN 60 MIN.
 FIRE ALARM SYSTEM PANEL STATUS

ALARMS:
 FIRE ALARM SYSTEM PANEL GENERAL ALARM SIGNAL



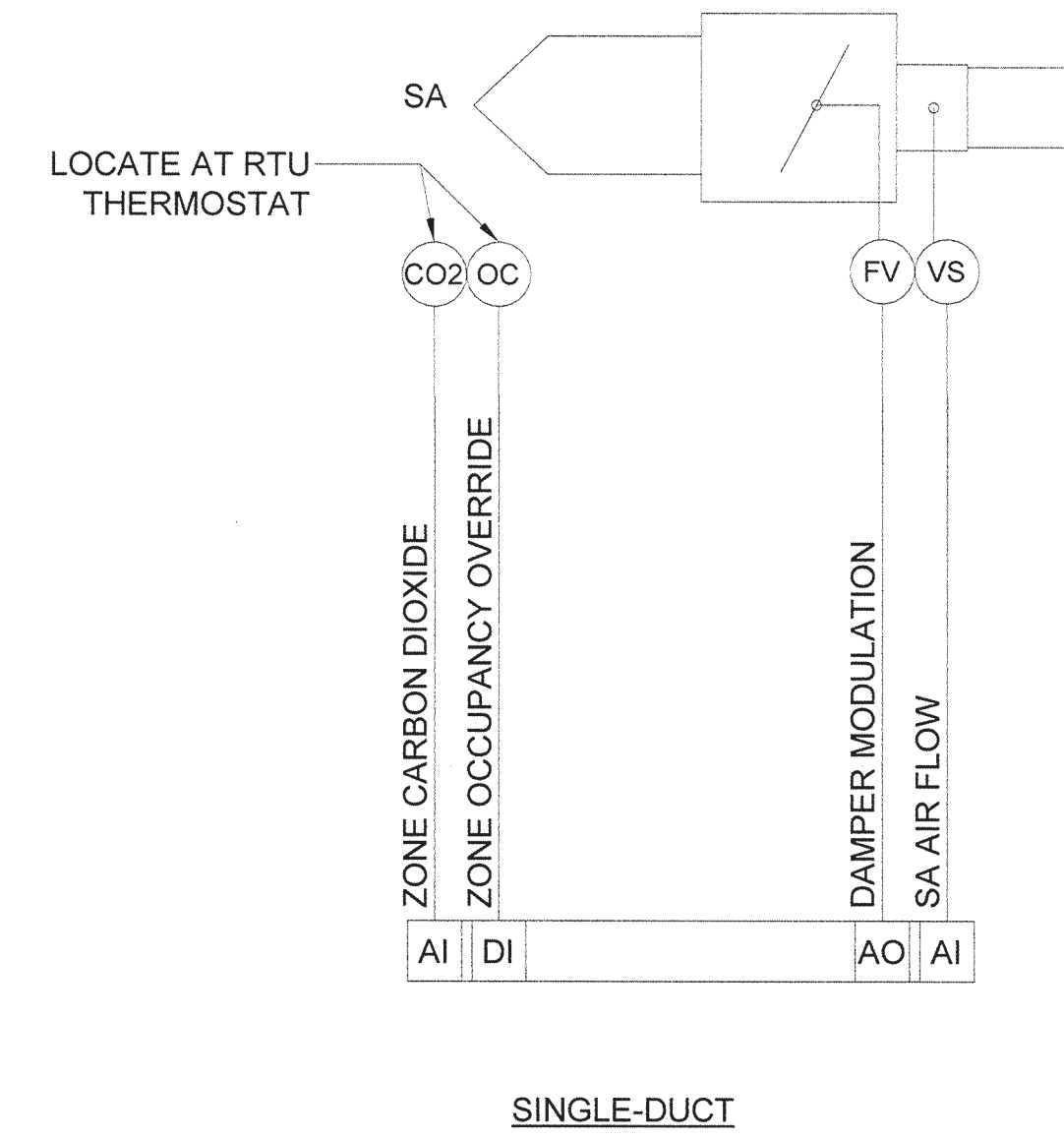
2 CONTROL - EXHAUST FAN CONTROL DIAGRAM
Scale: 12" = 1'-0"

GENERAL EXHAUST FAN CONTROL

FAN CONTROL: OPEN MOTOR-OPERATED BACKDRAFT DAMPER AND START FAN (TIME DELAY) BASED ON OCCUPIED SCHEDULE. STOP FAN AND CLOSE MOTOR-OPERATED BACKDRAFT DAMPER (TIME DELAY) BASED ON UNOCCUPIED SCHEDULE.

MONITOR AND TREND:
 FAN STATUS CHANGES (BY AIR FLOW SENSOR)
 FAN RUN TIMES

ALARMS:
 FAN FAILURES



3 CONTROL - TERMINAL UNIT CONTROL DIAGRAM
Scale: 12" = 1'-0"

TERMINAL UNIT CONTROL

BUILDING OCCUPANCY CONTROL

OCCUPIED MODE: MAINTAIN OCCUPIED MODE BASED ON SIGNAL TOD SCHEDULE.

UNOCCUPIED MODE: SWITCH ALL TERMINAL UNITS ASSOCIATED WITH DOAS TO UNOCCUPIED MODE BASED ON SIGNAL FROM CONTROLLER.

WARM-UP/COOL-DOWN MODE: TERMINAL UNITS SHALL BE CLOSED DURING WARM-UP/COOL-DOWN MODE.

UNIT CONTROL

PRIMARY AIR DAMPER CONTROL: PRIMARY AIR DAMPER SHALL MODULATE IN A PI LOOP TO MAINTAIN ZONE AIR FLOW SET POINT. MONITOR CO2 LEVELS IN ZONE AND MODULATE DAMPER TO DELIVER OA BETWEEN MINIMUM AND FULL OCCUPANCY AIR FLOW RATE TO MAINTAIN THE SPACE CO2 BELOW 1,100 PPM.

MONITOR AND TREND:
 PRIMARY AIR FLOW RATES (5 MINUTE INTERVALS)
 PRIMARY AIR DAMPER POSITIONS (5 MINUTE INTERVALS)
 ZONE HUMIDITY (15 MINUTE INTERVALS)

ALARMS:
 AIR FLOW IS 30% (ADJUSTABLE) MORE OR LESS THAN AIR FLOW SET POINT CONTINUOUSLY FOR 15 MINUTES (ADJUSTABLE).



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 DEI PROJECT # 50090277
 SCO ID # -

DRAWING TITLE

MECHANICAL CONTROLS

DRAWING NUMBER

M501

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DRAWING NUMBER

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SINGLE-ZONE RTU CONTROL

OCCUPIED MODE: THE RTU UNIT SHALL BE STARTED AND STOPPED BY THE BAS UNDER A TOD SCHEDULE. THIS SCHEDULE SHALL BE MODIFIED BY A START TIME OPTIMIZATION PROGRAM.

OA DAMPER: UPON PROOF OF AIR FLOW THRU THE SUPPLY FAN, THE NORMALLY CLOSED OUTSIDE AIR DAMPER SHALL SHUT OPEN. IN ECONOMIZER MODE, OA DAMPER SHALL CLOSE.

RA DAMPER: OPEN AT START UP. UPON PROOF OF AIR FLOW THRU THE SUPPLY FAN, THE RETURN AIR DAMPER SHALL MODULATE CLOSED OPPOSITE OF OA DAMPER. IN ECONOMIZER MODE, RA DAMPER SHALL BE OPEN.

EA DAMPER: OPEN TO POSITION TO MAINTAIN BUILDING AT IN A POSITIVE PRESSURE CONDITION. IN ECONOMIZER MODE, EA DAMPER SHALL BE CLOSED.

SA FAN: START (TIME DELAY), STOP WHEN BUILDING IS IN ECONOMIZER MODE.
EA FAN: START (TIME DELAY), STOP WHEN BUILDING IS IN ECONOMIZER MODE.

UNOCCUPIED MODE: THE RTU SHALL NORMALLY REMAIN OFF DURING THE UNOCCUPIED PERIOD. THE NORMALLY CLOSED OUTSIDE AND RELIEF AIR DAMPERS SHALL REMAIN CLOSED THROUGHOUT THE UNOCCUPIED PERIOD. RETURN AIR DAMPER SHALL BE OPEN.

RTU MAY BE STARTED THRU THE BAS OR BY A MANUAL OVERRIDE COMMAND FROM OVERRIDE PUSHBUTTON, OR THRU UNOCCUPIED HIGH LIMIT OR LOW LIMIT ROUTINES.

UNOCCUPIED HIGH LIMIT: UNIT TO REMAIN OFF, ZONE LEVEL RTU SHALL CYCLE AS REQUIRED TO MEET UNOCCUPIED LOADS.

UNOCCUPIED LOW LIMIT: UNIT TO REMAIN OFF, ZONE LEVEL RTU SHALL CYCLE AS REQUIRED TO MEET UNOCCUPIED LOADS.

SMOKE DETECTION AND AHU SHUTDOWN SHALL BE THE SAME AS FOR OCCUPIED PERIODS.

WARM-UP/COOL-DOWN MODE: DOAS SHALL REMAIN OFF DURING WARM-UP/COOL-DOWN MODE.

OA DAMPER: REMAIN CLOSED.
RA DAMPER: REMAIN OPEN.
EA DAMPER: REMAIN CLOSED.

SA FAN: STOP.
EA FAN: STOP.

MANUAL OVERRIDE MODE: SWITCH TO OCCUPIED MODE BASED ON MANUAL ACTIVATION OF THE OCCUPANT OVERRIDE SWITCH. SWITCH BACK TO OCCUPIED, UNOCCUPIED OR WARM-UP / COOL-DOWN MODE BASED ON OCCUPANCY SCHEDULE WHEN OVERRIDE TIME EXPIRES AFTER 60 MINUTES.

REMOTE OVERRIDE MODE: SWITCH TO OCCUPIED, UNOCCUPIED OR WARM-UP/COOL-DOWN MODE BASED ON BAS OPERATOR COMMAND. SWITCH BACK TO OCCUPIED, UNOCCUPIED OR WARM-UP/COOL-DOWN MODE BASED ON OCCUPANCY SCHEDULE WHEN OVERRIDE IS REMOVED.

SAFETY SHUTDOWN MODE: UPON UNIT SHUTDOWN DUE TO AUTOMATIC SAFETY FUNCTION, REMOTE, OR MANUAL CONTROL, EACH COMPONENT SHALL CONTROL SIMILAR TO UNOCCUPIED MODE.

COOLING MODE: PACKAGED CONTROLS SHALL OPERATE THE ROOFTOP UNIT TO MAINTAIN COOLING SUPPLY AIR SET POINT OF 52° F (ADJ). THE SUPPLY AIR FAN SHALL MODULATE TO MAINTAIN STATIC PRESSURE SET POINT (ADJ). SET POINT TO BE ESTABLISHED DURING TEST AND BALANCE BASED ON TERMINAL BOX MAXIMUM AIR FLOW SETTING.

HEATING MODE: PACKAGED CONTROLS SHALL OPERATE THE ROOFTOP UNIT TO MAINTAIN A SUPPLY AIR TEMPERATURE SET POINT OF 50° F (ADJ). SUPPLY FAN SHALL BE A MINIMUM SPEED AS NECESSARY TO ALLOW FOR PROPER GAS HEAT OPERATION.

DEHUMIDIFICATION: WHEN A RISING HUMIDITY SIGNAL IS RECEIVED, 55%, THE UNIT SHALL OPERATE COMPRESSORS AS REQUIRED TO MEET A COOLING COIL LEAVING AIR TEMPERATURE OF 52° F (ADJ) AND THE MODULATING HOT GAS REHEAT COIL SHALL REHEAT SUPPLY AIR TO 65° F (ADJ).

WET BULB ECONOMIZER CONTROL: DURING ECONOMIZER MODE, DOAS UNIT WILL BE OFF. ZONE LEVEL UNITS WILL OPERATE IN ECONOMIZER MODE.

ECONOMIZER MODE:

OA DAMPER: CLOSED.
RA DAMPER: OPEN.
EA DAMPER: CLOSED.
SA FAN: STOP.
EA FAN: STOP.
DX REFRIGERANT COIL: DISABLE PACKAGED CONTROLS.

SMOKE DETECTION CONTROL: UPON DETECTION OF SMOKE IN THE AIR HANDLING SYSTEM BY THE DUCT-MOUNTED RETURN AIR SMOKE DETECTOR, AN ALARM CONDITION SHALL BE SENT TO THE BUILDING FIRE ALARM SYSTEM, AND THE RTU SHALL BE SHUT DOWN BY THE BUILDING FIRE ALARM SYSTEM. THE BUILDING FIRE ALARM SYSTEM SHALL PROVIDE ONE DIGITAL OUTPUT TO THE BAS TO INDICATE AN ALARM CONDITION. WIRING FOR THIS ALARM POINT SHALL BE PROVIDED BY THE BAS SUBCONTRACTOR.

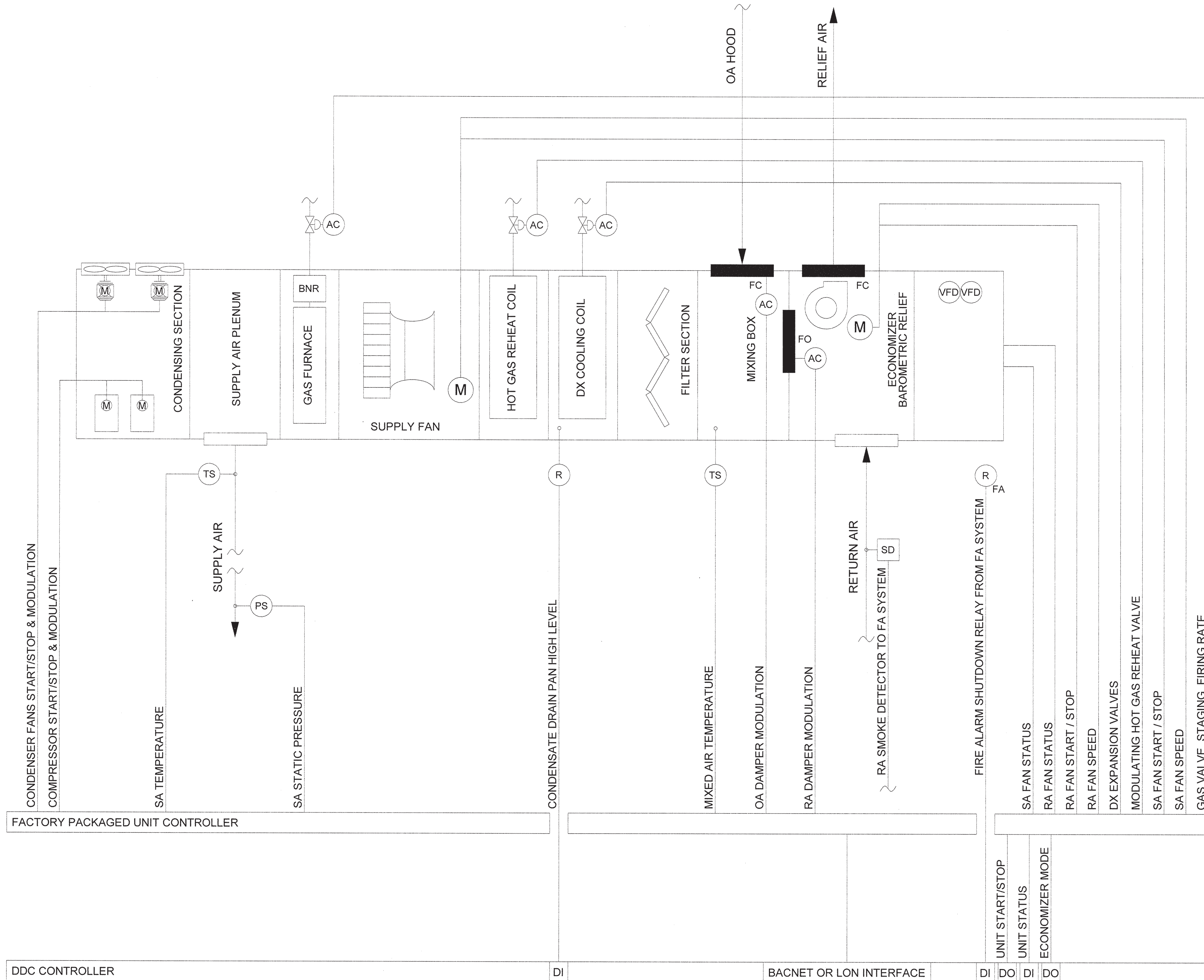
CONDENSATE LEVEL SHUTDOWN CONTROL: DISABLE COOLING OPERATION AND ALARM BAS WHEN CONDENSATE DRAIN PAN HIGH-LEVEL SWITCH INDICATES HIGH-LEVEL.

MONITOR AND TREND FROM DDC SYSTEM OR THROUGH PACKAGE CONTROL BACNET OR LON INTERFACE:

UNIT STATUS (TIME AND VALUE)
FAN STATUS CHANGES BY AIR FLOW SENSOR
FAN SPEED
FAN RUN TIMES
SA, RA, OA AND MA TEMPERATURES (15 MINUTE INTERVALS)
RISING HUMIDITY CONDITION (15 MINUTE INTERVALS)
OVERRIDE MODE INITIATIONS AND DURATIONS (TIME AND VALUE)
COMPRESSOR STATUS, TYPICAL ALL COMPRESSORS (TIME AND VALUE)
COMPRESSOR SPEED, TYPICAL ALL COMPRESSORS (15 MINUTE INTERVALS)
CONDENSER FAN STATUS, TYPICAL ALL COMPRESSORS (TIME AND VALUE)
CONDENSER FAN SPEED, TYPICAL ALL COMPRESSORS (15 MINUTE INTERVALS)
HOT GAS REHEAT STATUS (TIME AND VALUE)
HOT GAS REHEAT MODULATION (TIME AND VALUE)
GAS HEAT STATUS (TIME AND VALUE)
GAS HEAT STAGES (TIME AND VALUE)

ALARMS FROM DDC SYSTEM OR THROUGH PACKAGE CONTROL BACNET OR LON INTERFACE:

RTU PACKAGED CONTROL ALARMS
SA FAN FAILURES
EA FAN FAILURES
SA TEMPERATURE FAILURES TO MEET SET POINT WITHIN 15 MINUTES
COMPRESSOR FAILURE (TYPICAL ALL COMPRESSORS)
CONDENSER FAN FAILURE (TYPICAL ALL CONDENSER FANS)



- NOTES:**
1. RTU SHALL OPERATE WITH THE FACTORY PACKAGED UNIT CONTROLLER. DDC SYSTEM SHALL PROVIDE START / STOP, AND ECONOMIZER MODE SIGNALS AND MONITOR UNIT STATUS.
 2. COORDINATE NUMBER AND LOCATION OF DUCT DETECTORS IN RA DUCT. DUCT DETECTORS TO INPUT INTO FIRE ALARM SYSTEM.
 3. FIRE ALARM RELAY SHALL SEND A SIGNAL TO SHUT DOWN UNIT UPON ACTIVATION.

1 CONTROL - DOAS RTU CONTROL DIAGRAM

Scale: 12" = 1'-0"



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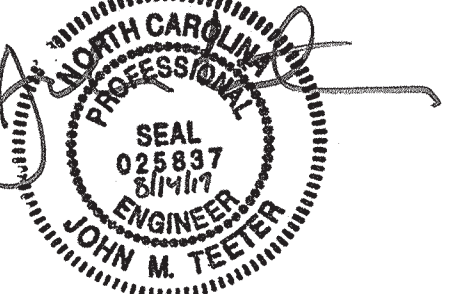
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REVISIONS

Table with 2 columns: Description, Date/Author. Contains multiple empty rows for revisions.

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MECHANICAL CONTROLS

DRAWING NUMBER

M503

SINGLE-ZONE RTU CONTROL

OCCUPIED MODE: THE RTU UNIT SHALL BE STARTED AND STOPPED BY THE BAS UNDER A TOD SCHEDULE. THIS SCHEDULE SHALL BE MODIFIED BY A START TIME OPTIMIZATION PROGRAM.
OA DAMPER: UPON PROOF OF AIR FLOW THRU THE SUPPLY FAN, THE NORMALLY CLOSED OUTSIDE AIR DAMPER SHALL BE REMAIN CLOSED, VENTILATION AIR IS INTRODUCED INTO THE RETURN AIR DUCT FROM A DEDICATED OUTSIDE AIR SYSTEM (DOAS), OPEN AND MODULATE PER ECONOMIZER CONTROL WHEN CONDITIONS ARE FAVORABLE.
RA DAMPER: REMAIN OPEN. MODULATE OPPOSITE OF OA DAMPER PER ECONOMIZER CONTROL WHEN CONDITIONS ARE FAVORABLE.
EA DAMPER: REMAIN CLOSED AND OPEN/CLOSE PER ECONOMIZER CONTROL.
SA FAN: START (TIME DELAY)

UNOCCUPIED MODE: THE RTU SHALL NORMALLY REMAIN OFF DURING THE UNOCCUPIED PERIOD. THE NORMALLY CLOSED OUTSIDE AND RELIEF AIR DAMPERS SHALL REMAIN CLOSED THROUGHOUT THE UNOCCUPIED PERIOD. RETURN AIR DAMPER SHALL BE OPEN.

RTU MAY BE STARTED THRU THE BAS OR BY A MANUAL OVERRIDE COMMAND FROM OVERRIDE PUSHBUTTON, OR THRU UNOCCUPIED HIGH LIMIT OR LOW LIMIT ROUTINES.

UNOCCUPIED HIGH LIMIT: WHEN THE SPACE TEMPERATURE OR HUMIDITY RISES ABOVE THE UNOCCUPIED HIGH LIMIT SET POINT OF 85 DEGREES F. (ADJ.) OR 60% RH (ADJ.), THE SUPPLY AIR FAN SHALL START, THE RTU SYSTEM SHALL GO INTO A COOLING MODE AND OPERATE THE COMPRESSORS TO MAINTAIN THE CALCULATED TEMPERATURE SET POINT. UNIT OPERATES 100% RETURN AIR UNLESS ECONOMIZER OPERATION IS FAVORABLE.

UNOCCUPIED LOW LIMIT: WHEN THE SPACE TEMPERATURE DROPS BELOW THE UNOCCUPIED LOW LIMIT SET POINT OF 60 DEGREES F. (ADJ.), THE SUPPLY AIR FAN SHALL START, THE RTU SHALL GO INTO A HEATING MODE AND THE GAS HEATER SHALL MODULATE TO MAINTAIN THE CALCULATED TEMPERATURE SET POINT. UNIT OPERATES 100% RETURN AIR.

SMOKE DETECTION AND AHU SHUTDOWN SHALL BE THE SAME AS FOR OCCUPIED PERIODS.

WARM-UP/COOL-DOWN MODE: SWITCH TO WARM-UP/COOL-DOWN MODE BASED ON THE OCCUPANCY SCHEDULE AND AN INTERVAL DERIVED FROM BAS OPTIMIZATION LOGIC THAT USES THE SYSTEM'S HISTORY OF OUTSIDE AIR TEMPERATURES VERSUS TIME NEEDED TO SATISFY THE ZONE TEMPERATURE SET POINTS. BEGIN OPTIMIZATION LOGIC WITH 2 HOUR INTERVAL.

OA DAMPER: REMAIN CLOSED, WHEN FAVORABLE MODULATE PER ECONOMIZER CONTROL.
RA DAMPER: REMAIN OPEN, WHEN FAVORABLE MODULATE PER ECONOMIZER CONTROL.
EA DAMPER: REMAIN CLOSED AND OPEN/CLOSE PER ECONOMIZER CONTROL.
SA FAN: START (TIME DELAY) AND CYCLE ON/OFF TO MAINTAIN SPACE TEMPERATURE SET POINTS

MANUAL OVERRIDE MODE: SWITCH TO OCCUPIED MODE BASED ON MANUAL ACTIVATION OF THE OCCUPANT OVERRIDE SWITCH ON THE SPACE TEMPERATURE SENSOR. SWITCH BACK TO OCCUPIED, UNOCCUPIED OR WARM-UP / COOL-DOWN MODE BASED ON OCCUPANCY SCHEDULE WHEN OVERRIDE TIME EXPIRES AFTER 60 MINUTES.

REMOTE OVERRIDE MODE: SWITCH TO OCCUPIED, UNOCCUPIED OR WARM-UP/COOL-DOWN MODE BASED ON BAS OPERATOR COMMAND. SWITCH BACK TO OCCUPIED, UNOCCUPIED OR WARM-UP/COOL-DOWN MODE BASED ON OCCUPANCY SCHEDULE WHEN OVERRIDE IS REMOVED.

SAFETY SHUTDOWN MODE: UPON UNIT SHUTDOWN DUE TO AUTOMATIC SAFETY FUNCTION, REMOTE, OR MANUAL CONTROL, EACH COMPONENT SHALL CONTROL SIMILAR TO UNOCCUPIED MODE.

SPACE SET POINTS: RESET SPACE TEMPERATURE AND DEHUMIDIFICATION SET POINTS

OCCUPIED MODE:
COOLING SET POINT = 75F +/- 2F OCCUPANT ADJUSTMENT
HEATING SET POINT = 70F +/- 2F OCCUPANT ADJUSTMENT
DEHUMIDIFICATION SET POINT = 60%

COOLING MODE: PACKAGED CONTROLS SHALL OPERATE THE ROOFTOP UNIT TO MAINTAIN COOLING SPACE TEMPERATURE SET POINT. WHEN SPACE TEMPERATURE IS ABOVE SET POINT, THE SUPPLY AIR FAN SHALL BE AT FULL SPEED AND SUPPLY AIR TEMPERATURE SHALL BE 55° F (ADJ.). AS SPACE TEMPERATURE REACHES SET POINT, THE SUPPLY FAN SHALL REDUCE SPEED IN A LINEAR ADJUSTMENT TO MINIMUM SPEED WHILE IN THE DEAD BAND. SUPPLY AIR TEMPERATURE SHALL BE 55° F (ADJ.). AS SPACE TEMPERATURE REMAINS SATISFIED AND SPACE HUMIDITY REMAINS BELOW 60% RH (ADJ.), THE SUPPLY AIR DISCHARGE TEMPERATURE SHALL BE ALLOWED TO RESET UPWARDS TO 65° F (ADJ.).

HEATING MODE: PACKAGED CONTROLS SHALL OPERATE THE ROOFTOP UNIT TO MAINTAIN HEATING SPACE TEMPERATURE SET POINT. SUPPLY FAN SHALL BE A MINIMUM SPEED AS NECESSARY TO ALLOW FOR PROPER GAS HEAT OPERATION. IF SPACE TEMPERATURE REMAINS BELOW SET POINT, THE SUPPLY FAN SPEED SHALL INCREASE IN A LINEAR ADJUSTMENT TO FULL SPEED.

SA TEMPERATURE SET POINT RESET CONTROL: THE SUPPLY AIR TEMPERATURE SHALL BE RESET FROM 55° F TO 70° F AS THE OUTDOOR TEMPERATURE CHANGES FROM 55° F TO 30° F (ADJ.). THE DX COOLING, ECONOMIZER DAMPERS AND GAS SHALL BE SEQUENCED TO ACHIEVE SET POINT.

DEHUMIDIFICATION: WHEN THE SPACE HUMIDITY IS ABOVE 55% (ADJ.), THE UNIT SHALL TRANSMIT A RISING HUMIDITY CONDITION SIGNAL TO THE DOAS. WHEN THE RETURN AIR HUMIDITY IS ABOVE 60% (ADJ.), OPERATE COMPRESSORS AS REQUIRED TO MEET A SUPPLY AIR TEMPERATURE OF 55° F (ADJ.).

WET BULB ECONOMIZER CONTROL: ECONOMIZER AND VENTILATION CYCLES. (PROVIDE PROGRAMMING FOR ENTHALPY, OA HUMIDITY WILL BE A NETWORK OBTAINED VALUE). DURING THE OCCUPIED PERIOD WHEN THE OUTSIDE AIR ENTHALPY IS BELOW 23 BTU/LB (ADJ.) AND THE OUTDOOR TEMPERATURE IS BELOW 70°F (ADJ.) AND ABOVE 45°F (ADJ.), THE ECONOMIZER CYCLE SHALL BE ENABLED. DURING ECONOMIZER MODE, DOAS UNIT WILL BE OFF.

ECONOMIZER MODE:
OA DAMPER: MODULATE TO MAINTAIN ZONE TEMPERATURE SET POINT
RA DAMPER: MODULATE OPPOSITE OF OA DAMPERS
EA DAMPER: MODULATE DAMPER OPEN/CLOSE TO RELIEVE EXCESS AIR.
SA FAN: MODULATE FAN BETWEEN MINIMUM AND MAXIMUM SPEED TO MAINTAIN SPACE TEMPERATURE SET POINT.
DX REFRIGERANT COIL: DISABLE PACKAGED CONTROLS WHEN MAX. OA DAMPER IS LESS THAN 90% OPEN. ENABLE AND INITIATE PACKAGED CONTROLS WHEN MAX. OA DAMPER IS MORE THAN 95% OPEN. UNIT SHALL SWITCH OUT OF ECONOMIZER MODE WHEN ADDITIONAL COOLING IS REQUIRED AS NECESSARY TO ESTABLISH A MINIMUM LOAD ON THE COMPRESSOR.

SMOKE DETECTION CONTROL: UPON DETECTION OF SMOKE IN THE AIR HANDLING SYSTEM BY THE DUCT-MOUNTED RETURN AIR SMOKE DETECTOR, AN ALARM CONDITION SHALL BE SENT TO THE BUILDING FIRE ALARM SYSTEM, AND THE RTU SHALL BE SHUT DOWN BY THE BUILDING FIRE ALARM SYSTEM. THE BUILDING FIRE ALARM SYSTEM SHALL PROVIDE ONE DIGITAL OUTPUT TO THE BAS TO INDICATE AN ALARM CONDITION. WIRING FOR THIS ALARM POINT SHALL BE PROVIDED BY THE BAS SUBCONTRACTOR.

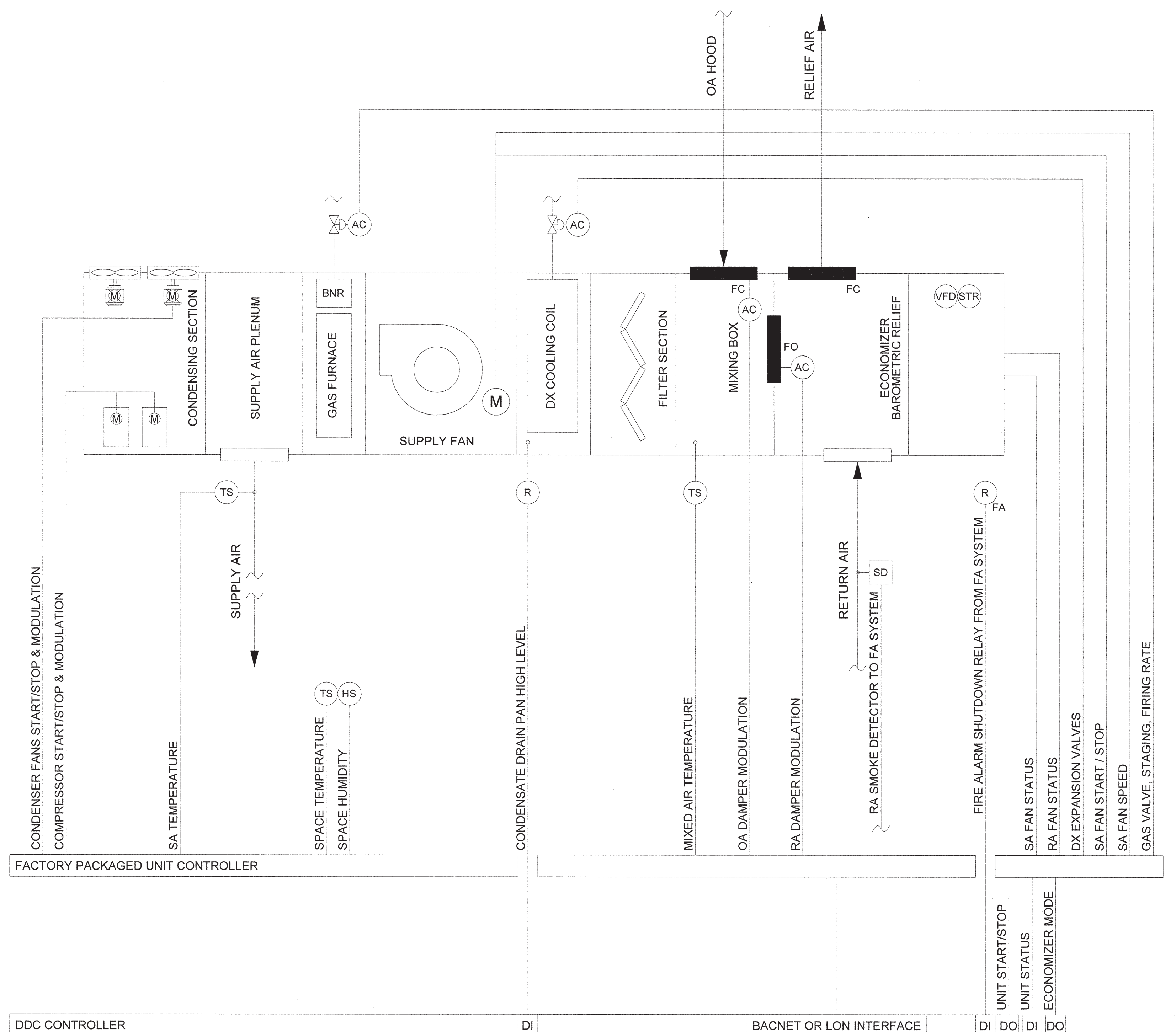
CONDENSATE LEVEL SHUTDOWN CONTROL: DISABLE COOLING OPERATION AND ALARM BAS WHEN CONDENSATE DRAIN PAN HIGH-LEVEL SWITCH INDICATES HIGH-LEVEL.

MONITOR AND TREND FROM DDC SYSTEM OR THROUGH PACKAGE CONTROL BACNET OR LON INTERFACE:

- UNIT STATUS (TIME AND VALUE)
FAN STATUS CHANGES BY AIR FLOW SENSOR
FAN SPEED
FAN RUN TIMES
SA, RA, OA AND MA TEMPERATURES (15 MINUTE INTERVALS)
SPACE TEMPERATURE SET POINT CHANGES
SPACE HUMIDITY (15 MINUTE INTERVALS)
WARM-UP/COOL-DOWN SEQUENCE INITIATIONS
OVERRIDE MODE INITIATIONS AND DURATIONS (TIME AND VALUE)
COMPRESSOR STATUS, TYPICAL ALL COMPRESSORS (TIME AND VALUE)
COMPRESSOR SPEED, TYPICAL ALL COMPRESSORS (15 MINUTE INTERVALS)
CONDENSER FAN STATUS, TYPICAL ALL COMPRESSORS (TIME AND VALUE)
CONDENSER FAN SPEED, TYPICAL ALL COMPRESSORS (15 MINUTE INTERVALS)
GAS HEAT STATUS (TIME AND VALUE)
GAS HEAT STAGES (TIME AND VALUE)

ALARMS FROM DDC SYSTEM OR THROUGH PACKAGE CONTROL BACNET OR LON INTERFACE:

- RTU PACKAGED CONTROL ALARMS
SA FAN FAILURES
SA TEMPERATURE FAILURES TO MEET SET POINT WITHIN 15 MINUTES
COMPRESSOR FAILURE (TYPICAL ALL COMPRESSORS)
CONDENSER FAN FAILURE (TYPICAL ALL CONDENSER FANS)



- NOTES:
1. RTU SHALL OPERATE WITH THE FACTORY PACKAGED UNIT CONTROLLER. DDC SYSTEM SHALL PROVIDE START / STOP, AND ECONOMIZER MODE SIGNALS AND MONITOR UNIT STATUS.
2. COORDINATE NUMBER AND LOCATION OF DUCT DETECTORS IN RA DUCT. DUCT DETECTORS TO INPUT INTO FIRE ALARM SYSTEM.
3. FIRE ALARM RELAY SHALL SEND A SIGNAL TO SHUT DOWN UNIT UPON ACTIVATION.

1 CONTROL - RTU CONTROL DIAGRAM

Scale: 12" = 1'-0"

UNIT HEATER SCHEDULE

Table with 12 columns: MARK, SERVICE, TYPE, MANUFACTURER / MODEL, FAN (AIR FLOW, MOTOR, VOLTAGE, BEAT, LAT), AIR (MI, CAP, DESIGN), ELECTRIC (VOLTAGE, PHASE), NOTES.

- NOTES
1. REFER TO SECTION 238239 FOR ADDITIONAL REQUIREMENTS.
2. PROVIDE MOTOR-RATED DISCONNECT SWITCH.
3. PROVIDE FACTORY-FABRICATED WALL/CEILING SUPPORT MOUNT AT XX" AFF TO TOP OF HEATER UNLESS OTHERWISE NOTED ON PLANS.
4. PROVIDE WITH INTEGRAL THERMOSTAT.
5. PROVIDE SINGLE-STEP CONTROLLER FOR ELECTRIC COILS. COIL CAPACITIES SHALL BE NO LESS THAN MINIMUM AND NO MORE THAN THE ELECTRICAL DESIGN BASIS SCHEDULED.

TERMINAL UNIT SCHEDULE

Table with 12 columns: MARK, OA SERVICE, TYPE, MAX DISC SOUND (IN), MAX RADIATED SOUND (IN), PRIMARY AIR VALVE (INLET, MAX VENT, MIN VENT), AIR FLOW (CFM), NOTES.

- NOTES
1. REFER TO SECTION 233500 FOR ADDITIONAL REQUIREMENTS.
2. SOUND LEVELS SHALL BE BASED ON ASHRAE 130, ARI 880 AND AHRI 885 AND ON 1.5 INCH PRESSURE DIFFERENCE.
3. COORDINATE CONTROL POWER TRANSFORMER INPUT VOLTAGE WITH THE LINE VOLTAGE PROVISIONS.
4. SOUND LEVELS FOR SINGLE-DUCT UNITS ARE BASED ON 0.5 INCHES WG ACROSS UNIT INLET AND OUTLET.
5. ALTERNATE #1.
6. ALTERNATE #2.

AIR DISTRIBUTION SCHEDULE

Table with 12 columns: MARK, SERVICE, TYPE, MANUFACTURER / MODEL, MATERIAL, COLOR, PATTERN, AIR FLOW (CFM), FACE SIZE (IN x IN), TRICK SIZE (IN WG), APD, MAX SOUND (IN), NOTES.

- NOTES
1. REFER TO SECTION 233713 FOR ADDITIONAL REQUIREMENTS.
2. VERIFY MOUNTING FRAME STYLE WITH ARCHITECTURAL REFLECTED CEILING PLANS. FINISH SCHEDULES AND CEILING TYPES.
3. PROVIDE PRIME-D FOR PAINT FINISH FOR DIFFUSERS AND GRILLES IN SPACES WITH EXPOSED STRUCTURE CEILINGS AND/OR MOUNTED TO EXPOSED DUCT.

DUCTLESS MINI-SPLIT UNIT SCHEDULE

Table with 11 columns: MARK (INDOOR/OUTDOOR UNIT), SERVICE, TYPE, MANUFACTURER / MODEL, SUPPLY AIR FLOW (CFM), COOLING (TOT CAP, BENS CAP, BTUH/WH), ELECTRICAL (Amps, MCA, MOCP, VOLTAGE/PHASE), NOTES.

- NOTES
1. REFER TO SECTION 238116 FOR ADDITIONAL REQUIREMENTS.
2. ALL UNITS SHALL MEET OR EXCEED ENERGY EFFICIENCY RATIO (EER).
3. PROVIDE WIRED THERMOSTAT / TEMPERATURE SENSOR AS INDICATED. WIRELESS REMOTE CONTROLS ARE NOT ACCEPTABLE.
4. SIZE REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS.
5. PROVIDE SINGLE-POINT POWER CONNECTION. PROVIDE FUSED-DISCONNECT SWITCH FOR OUTDOOR UNIT. PROVIDE MOTOR-RATED DISCONNECT SWITCH FOR INDOOR UNIT.
6. PROVIDE LOW AMBIENT TEMPERATURE OPTION.
7. PROVIDE CONDENSATE DRAIN PUMP.
8. DUCTLESS MINI-SPLIT SYSTEM SHALL HAVE SEA-COAST CONSTRUCTION.
9. PROVIDE ROOF RAILS FOR OUTDOOR CONDENSING UNIT.

FAN SCHEDULE

Table with 17 columns: MARK, SERVICE, TYPE, MANUFACTURER / MODEL, AIR FLOW (CFM), TSP (IN WG), DRIVE TYPE, SPEED (RPM), BRAKE MOTOR (HP), NOMINAL MOTOR (HP), MAX SOUND (SONES), DAMPER TYPE, VOLTAGE/PHASE, STARTER/MEANS, NOTES.

- NOTES
1. REFER TO SECTION 233423 FOR ADDITIONAL REQUIREMENTS.
2. PROVIDE STARTING AND DISCONNECTING MEANS AS SCHEDULED. (MRS = MOTOR RATED SWITCH, MSD = COMBINATION MOTOR-STARTER AND DISCONNECT)
3. PROVIDE VARIABLE SPEED CONTROLLER AND BALANCE FAN TO SCHEDULED AIR FLOW.
4. PROVIDE BRICKVENT.
5. PROVIDE FACTORY-FABRICATED ROOF CURB. COORDINATE EXACT LOCATION OF ROOF OPENINGS AND STRUCTURAL SUPPORT.
6. PROVIDE FAN WITH ECM MOTOR AND BALANCE TO SCHEDULED AIR FLOW.
7. FAN SHALL HAVE SEA COAST CONSTRUCTION.
8. ALTERNATE #2.

DEDICATED OUTDOOR AIR UNIT SCHEDULE

Table with 19 columns: MARK, MANUFACTURER / MODEL, TYPE, SUPPLY AIR FAN (AIR FLOW, ESP, MOTOR, NOMINAL), EXHAUST AIR FAN (AIR FLOW, ESP, MOTOR, NOMINAL), COOLING CAPACITY (TOTAL CAPACITY, SENSIBLE AIR COOLED, NUMBER), HEATING CAPACITY (NATURAL GAS, SUPPLY AIR), FILTRATION, ELECTRICAL, MAX SOUND LEVEL, WEIGHT, NOTES.

- NOTES
1. REFER TO SECTION 237433 FOR ADDITIONAL REQUIREMENTS. REFER TO UNIT DETAILS AND DIAGRAMS FOR COMPLETE CONFIGURATION AND DIMENSIONAL DETAILS.
2. MAX. COOLING COIL FACE VELOCITY = 600 FPM.
3. PROVIDE SINGLE-POINT ELECTRICAL CONNECTION AND FUSED-DISCONNECT.
4. COILS APDS ARE BASED ON THE MAX. SUPPLY FAN AIRFLOW. UNIT INTERNAL STATIC PRESSURE TO INCLUDE 0.5 INCH WG FOR FILTER PRESSURE DROP.
5. PROVIDE FACTORY-FABRICATED, SOLID BOTTOM, ACUSTICAL ROOF CURB. UNIT WEIGHT INCLUDES 300 LBS CURB ALLOWANCE. COORDINATE EXACT LOCATION OF ROOF OPENINGS AND STRUCTURAL SUPPORT.
6. DGAS UNIT SHALL HAVE SEA COAST CONSTRUCTION. ENTIRE UNIT EXPOSED TO ELEMENTS. INCLUDE HAIL GUARDS FOR CONDENSER SECTIONS.
7. PROVIDE RTU WITH VARIABLE SPEED SCROLL COMPRESSOR, SUPPLY FAN, CONDENSER FAN, AND POWERED EXHAUST.

PACKAGED ROOFTOP UNIT SCHEDULE

Table with 24 columns: MARK, MANUFACTURER / MODEL, TYPE, SUPPLY AIR FAN (AIR FLOW, ESP, MOTOR, NOMINAL), RETURN AIR FAN (AIR FLOW, ESP, MOTOR, NOMINAL), OUTSIDE AIR INTAKE (ECONO, MAX VENT, MIN VENT), COOLING SECTION (AIR FLOW, EAT, FODS/FWB, FODS/FYWB, LAT, TOTAL CAPACITY, SENSIBLE CAPACITY, EER/EER, AMB, OF, COMP), HEATING SECTION (EAT, LAT, CAPACITY, GAS: INPUT, OUTPUT, EFF), FILTRATION (TYPE & THICKNESS, EFF), ELECTRICAL (FLA, MCA, MOCP, VOLTAGE/PHASE), MAX SOUND LEVEL, WEIGHT, NOTES.

- NOTES
1. REFER TO SECTION 238213 FOR ADDITIONAL REQUIREMENTS. REFER TO UNIT DETAILS AND DIAGRAMS FOR COMPLETE CONFIGURATION AND DIMENSIONAL DETAILS.
2. MAX. COOLING COIL FACE VELOCITY = 600 FPM.
3. PROVIDE SINGLE-POINT ELECTRICAL CONNECTION AND FUSED-DISCONNECT SWITCH.
4. COILS APDS ARE BASED ON THE MAX. SUPPLY FAN AIRFLOW. UNIT INTERNAL STATIC PRESSURE TO INCLUDE CLEAN FILTER PRESSURE DROP.
5. PROVIDE FACTORY-FABRICATED, SOLID BOTTOM, ACUSTICAL ROOF CURB. UNIT WEIGHT INCLUDES 250 LBS CURB ALLOWANCE. COORDINATE EXACT LOCATION OF ROOF OPENINGS AND STRUCTURAL SUPPORT.
6. PROVIDE RTU WITH VARIABLE SPEED SCROLL COMPRESSOR, SUPPLY FAN AND CONDENSER FAN.
7. RTU SHALL HAVE SEA COAST CONSTRUCTION. ENTIRE UNIT EXPOSED TO ELEMENTS. INCLUDE HAIL GUARDS FOR CONDENSER SECTIONS.
8. PROVIDE DUCT MOUNTED SMOKE DETECTOR IN RETURN AIR DUCT.
9. ALTERNATE #1.
10. ALTERNATE #2.



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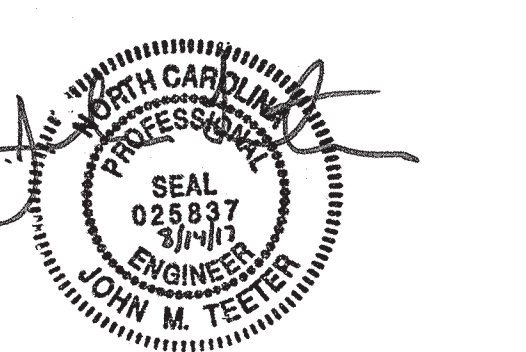
LIGHT DEFINES FORM

610 PEMROKE ROAD
SUITE 4465
GREENSBORO, NC 27408
T: 336 230 1990
WWW.LIGHTDEFINESFORM.COM

REVISIONS

Table with 2 columns: Revision number and description.

SEALS



PINE VALLEY BRANCH LIBRARY

OWNER
NEW HANOVER COUNTY

PHASE CONSTRUCTION DOCUMENTS

DATE AUGUST 14, 2017
PROJECT PINE VALLEY BRANCH
DEI PROJECT # 50090277
SCO ID #

DRAWING TITLE
MECHANICAL SCHEDULES

DRAWING NUMBER

M601