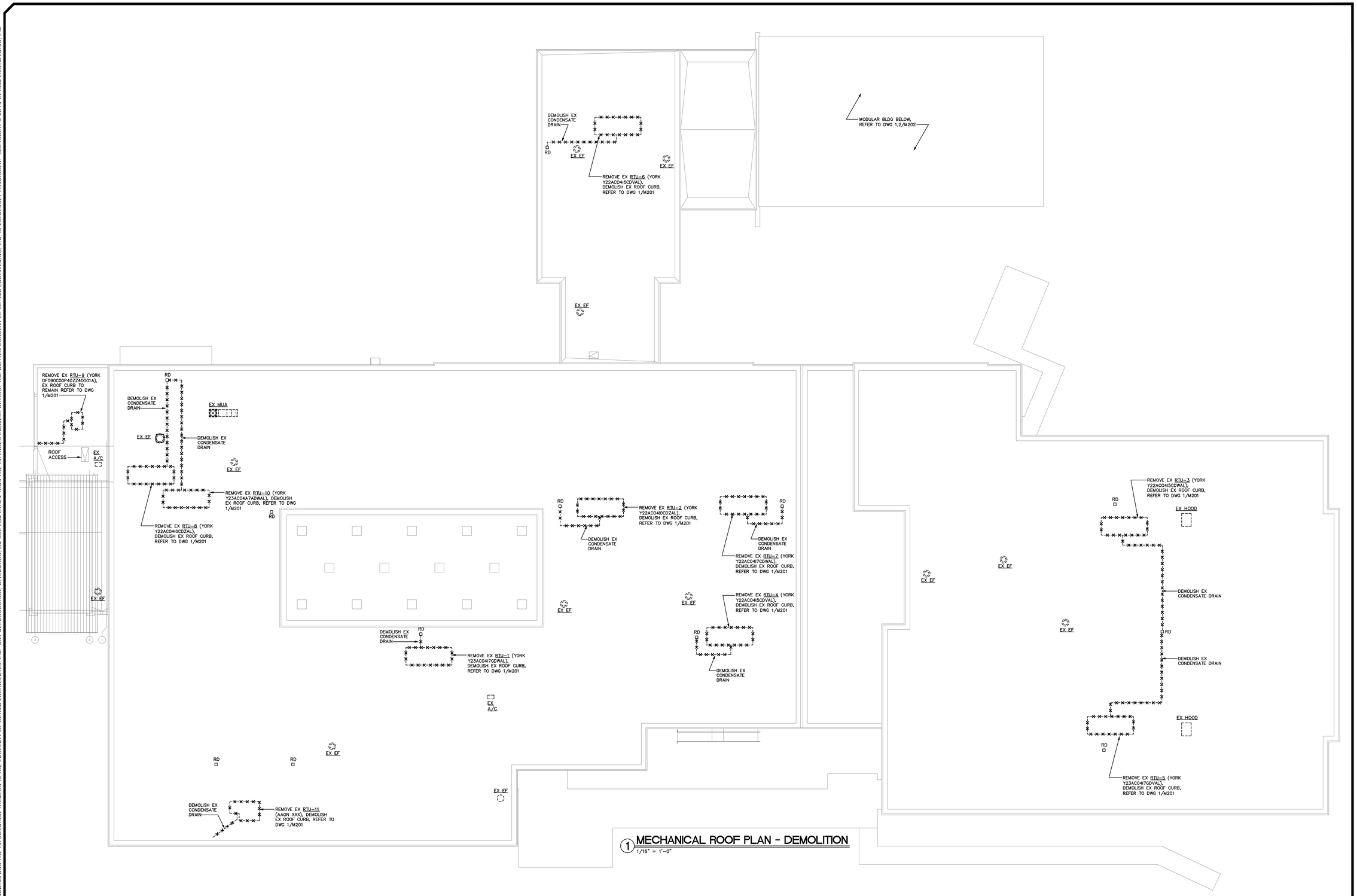


1 MECHANICAL ROOF PLAN - DEMOLITION

1/16" = 1'-0"

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MECHANICAL • ELECTRICAL • PLUMBING
FIRE PROTECTION • TECHOLOGY DESIGN

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10-23-26

RANDOLF MIDDLE SCHOOL
ROOFTOP UNIT REPLACEMENT

4400 WATER OAK RD, CHARLOTTE, NC 28211

REV #	DATE	DESCRIPTION

DATE:	10-23-26
PROJECT #:	22-0254
DRAWN BY:	JMF
DESIGNED BY:	JMF
CHECKED BY:	SRD

SHEET TITLE:

MECHANICAL ROOF PLAN - DEMOLITION

DWG #:

M001

SHEET NO: 1 OF 5

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EQUIVALENT MANUFACTURERS LISTING

LISTING OF MANUFACTURER'S NAME DOES NOT GUARANTEE APPROVAL. ALL EQUIPMENT MUST MEET OR EXCEED QUALITY AND CAPACITIES OF SPECIFIED EQUIPMENT. FINAL APPROVAL WILL BE BASED ON EQUIPMENT SUBMITTALS. ANY MANUFACTURER NOT LISTED BUT WISHING TO BID THIS PROJECT SHALL SUBMIT A WRITTEN REQUEST A MINIMUM OF 7 DAYS PRIOR TO BID DATE OR AS INDICATED IN THE SPECIFICATIONS. ALL EQUIPMENT LISTED IN THE PROJECT SCHEDULE IS TO BE CONSIDERED DESIGN BASIS EQUIPMENT. PRIOR APPROVAL IS REQUIRED FOR ALL MANUFACTURERS NOT LISTED.

(ALPHABETICAL ORDER)

DDC CONTROLS: ALC (EXISTING CAMPUS BAS), INTEGRATE NEW RTUS INTO EX BAS

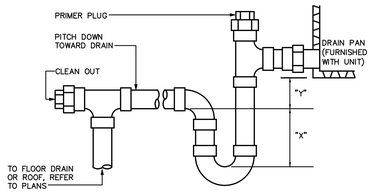
ROOFTOP UNITS (RTU-1 THRU 10): TRANE, AAON

DOAS UNITS (RTU-11): AAON, DESERT-AIRE, KCC

ROOFTOP UNIT CURBS: CDI, ALLADIN, CURBS PLUS

PACKAGED TERMINAL HEAT PUMP: BARD

NOTE:
ALL COST ASSOCIATED WITH SUBSTITUTED/NON-DESIGN BASIS EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED/NON-DESIGN BASIS EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.



DIMENSIONS

P = PRESSURE INSIDE AHU CASING (INCHES W.G.)
Y = P + 2"
X = Y

MINIMUM PIPE SIZE	MAXIMUM COIL LOAD (TONS)
3/4"	2
1"	5
1 1/4"	30
1 1/2"	50
2"	160
3"	300
4"	430
5"	1000

1 P-TRAP PIPING DETAIL
NO SCALE

MECHANICAL LEGEND

SYMBOL	DESCRIPTION	ABBR.
D	CONDENSATE DRAIN	D
	DOUBLE LINE DUCTWORK	
	EXISTING MECHANICAL	
	EXISTING MECHANICAL TO BE REMOVED	
20x14	20"x14" RECTANGULAR DUCT	
DD	DUCT MOUNTED SMOKE DETECTOR W/ ACCESS DOOR	
SP	STATIC PRESSURE SENSOR	
CO2	CARBON DIOXIDE SENSOR	
M	MOTORIZED DAMPER	
	POINT OF EXISTING TO NEW CONNECTION	
M.C.	MECHANICAL CONTRACTOR	
E.C.	ELECTRICAL CONTRACTOR	
P.C.	PLUMBING CONTRACTOR	
N.I.C.	NOT IN CONTRACT	
EX	EXISTING	
AFF	ABOVE FINISHED FLOOR	
DN	DOWN	
UP	UP	
RD	ROOF DRAIN	

MECHANICAL DEMOLITION NOTES

1. THE MECHANICAL CONTRACTOR SHALL VISIT SITE PRIOR TO BEGINNING WORK TO DETERMINE THE LEVEL OF DEMOLITION REQUIRED AND INCLUDE ALL NECESSARY PRICING IN THEIR BID.
2. IT IS THE MECHANICAL CONTRACTORS RESPONSIBILITY TO FIELD VERIFY ALL EXISTING DUCTWORK AND PIPING. ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND MECHANICAL PLANS SHOULD BE BROUGHT TO THE ATTENTION OF THE MECHANICAL ENGINEER.
3. M.C. SHALL VERIFY ALL EXISTING SUPPLY AND RETURN AIR DUCT TO REMAIN IS INSULATED WITH VAPOR BARRIER INTACT. IF EXISTING DUCT IS NOT INSULATED WITH EITHER DUCT LINER OR WRAP, M.C. SHALL PROVIDE 2" THICK DUCT WRAP WITH VAPOR BARRIER (MIN. R-VALUE OF 5.0).

MECHANICAL DRAWING INDEX

DRAWING NUMBER	DRAWING NAME
M001	MECHANICAL ROOF PLAN – DEMOLITION
M101	MECHANICAL DETAILS, NOTES, SYMBOLS AND LEGEND
M102	MECHANICAL SCHEDULES AND DETAILS
M201	MECHANICAL ROOF PLAN – NEW WORK
M202	MECHANICAL FLOOR PLAN – NEW WORK AND DEMOLITION

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

VENTILATION REQUIREMENTS DO NOT APPLY FOR THIS APPLICATION. PROJECT CONSISTS OF REPLACEMENT OF EXISTING BAS AND ROOFTOP AIR HANDLING UNITS. MECHANICAL LOAD REQUIREMENTS, EQUIPMENT AND ROOM IDENTIFICATIONS DO NOT CHANGE WITHIN THIS SCOPE OF WORK.

TESTING, ADJUSTING, AND BALANCING

1. NEW ROOFTOP UNITS AND PTHP'S SCHEDULED PER THESE DRAWINGS ARE TO BE BALANCED AS PER THEIR SCHEDULED AIRFLOWS. ASSOCIATED DOWNSTREAM VAV BOXES, AIR DEVICES OR HOT WATER COIL ZONES SHALL HAVE THEIR EXISTING AIRFLOW BALANCE REMAIN.
2. REFER TO SPECIFICATION SECTION 230593 FOR TEST AND BALANCE REQUIREMENTS FOR ROOFTOP AIR HANDLING UNITS.

WORK SCHEDULING NOTE

ALL WORK INVOLVING EXISTING EQUIPMENT SHUTDOWN, EXISTING SYSTEM CONNECTION, AND/OR MODIFICATION TO EXISTING EQUIPMENT SHALL BE COORDINATED WITH THE OWNER 1 WEEK PRIOR TO COMMENCING WORK.

NO SHUTDOWN OF ANY EXISTING SYSTEM WILL BE ALLOW WITH OUT AUTHORIZATION FROM THE OWNER.

COORDINATE WITH OWNER AND PROVIDE DETAILED WORK SEQUENCE PLAN PRIOR TO START OF DEMOLITION

FIRE ALARM COORDINATION

THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION WITH THE FIRE ALARM VENDOR AND SHALL BE RESPONSIBLE FOR ALL ASSOCIATED COSTS AND SCHEDULING FOR DIS-ARMING, RE-ARMING, WATCH, ETC. COORDINATE ALL REQUIREMENTS WITH CHARLOTTE MECKLENBURG COUNTY SCHOOLS

COMMISSIONING NOTE

THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR SYSTEM COMMISSIONING. MC SHALL HIRE A CERTIFIED COMMISSIONING PROVIDER. TO PERFORM THE COMMISSIONING DUTIES AS PER SPECIFICATIONS, AND PROVIDE THE OWNER WITH A STATEMENT OF COMPLETION. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH COMMISSIONING AGENT AND PROVIDE ALL NECESSARY TIME, MATERIALS, AND PROCEDURES REQUIRED FOR A FULLY COMMISSIONED PROJECT.

COMMISSIONING AGENT: TIM MCELROY (OPTIMA ENGINEERING)
P: 704-941-3751

PROJECT PHASING NOTE

INSTALLATION OF RTU-1 AND RTU-5 SHALL BE SUBSTANTIALLY COMPLETED PRIOR TO APRIL 5, 2027. THE REMAINDER OF RTU AND PTHP SCOPE OF WORK SHALL BE COMPLETED IN ITS ENTIRETY PRIOR TO AUGUST 15, 2027. THIS INCLUDES ALL BAS AND COMMISSIONING WORK.

2018 NORTH CAROLINA ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY – MECHANICAL SUMMARY

C401 METHOD OF COMPLIANCE

- ■ 2018 NCECC CHAPTER 4
- ☐ ASHRAE 90.1-2013 PRESCRIPTIVE
- ☐ ASHRAE 90.1-2013 PERFORMANCE
- ☐ N/A (EXISTING LIGHTING, HVAC, AND DOM. WATER HEATING SYSTEMS TO REMAIN)
- ☐ COMCHECK PROVIDED (2018 NCECC)
- ☐ COMCHECK PROVIDED (90.1-2013)
- ☐ ENERGY MODELING DATA PROVIDED

C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS

- ☐ C406.2 EFFICIENT MECH EQUIPMENT
- ☐ C406.3 REDUCED LTG DENSITY
- ☐ C406.4 ENHANCED LTG CONTROLS
- ■ N/A EQUIPMENT REPLACEMENT ONLY
- ☐ C406.5 ON-SITE RENEWABLE ENERGY
- ☐ C406.6 DEDICATED OA SYSTEM
- ☐ C406.7 SERVICE WATER HEATING

C301 CLIMATE ZONE

3A -MECKLENBURG COUNTY, NORTH CAROLINA

DESIGN CONDITIONS

EXTERIOR (ASHRAE 90.1-2013 TABLE D-1)

winter dry bulb	18° F.
summer dry bulb	91° F.
summer wet bulb	74° F.

INTERIOR (2018 NCECC SECTION C302.1)

winter dry bulb	72° F.
summer dry bulb	75° F.

C403.2 HEATING & COOLING LOADS AND EQUIPMENT & SYSTEM SIZING

BUILDING HEATING LOAD	EXISTING
BUILDING COOLING LOAD	EXISTING
INSTALLED HEATING CAPACITY	N/A
INSTALLED COOLING CAPACITY	RTU REPLACEMENT (11 UNITS) REFER TO SCHEDULES

C403.2.3 & C406.2 – REQUIRED & INCREASED HVAC EQUIPMENT PERFORMANCE

SYSTEM DESCRIPTION – DX ROOFTOP UNIT REPLACEMENT

- ■ MINIMUM HVAC EQUIP EFFICIENCY COMPLIANCE – TABLE C403.2.3
- ☐ INCREASED HVAC EQUIP EFFICIENCY COMPLIANCE – 10% OVER TABLE C403.2.3

EQUIP TYPE	SIZE CATEGORY (BTUH)	SUBCATEGORY	C403.2.3 MINIMUM EFFICIENCY (a)	10% INCREASED EFF. (a)	DESIGN EFFIC.
TABLE C403.2.3(1) – UNITARY AIR CONDITIONERS AND CONDENSING UNITS					
AIR COND, AIR COOLED	>= 65,000 & < 135,000	SPLIT SYSTEM & SINGLE PACKAGE	11.2 EER 12.8 IEER	12.3 EER 14.1 IEER	SEE SCHEDULE
AIR COND, AIR COOLED	>= 135,000 & < 240,000	SPLIT SYSTEM & SINGLE PACKAGE	11.0 EER 12.4 IEER	12.1 EER 13.6 IEER	SEE SCHEDULE
AIR COND, AIR COOLED	>= 240,000 & < 760,000	SPLIT SYSTEM & SINGLE PACKAGE	10.0 EER 11.6 IEER	11.0 EER 12.8 IEER	SEE SCHEDULE

a. DEDUCT 0.2 FROM THE REQUIRED EERS AND IEERS FOR UNITS WITH A HEATING SECTION OTHER THAN ELECTRIC RESISTANCE HEAT OR NO HEAT.

C403.2.4 THRU C403.2.11

☐ HVAC SYSTEMS ARE FULLY COMPLIANT WITH THE REQUIREMENTS FOR HVAC SYSTEM CONTROL, VENTILATION, ENERGY RECOVERY, DUCT AND PLENUM INSULATION AND SEALING, PIPING INSULATION, AND SYSTEM COMPLETION.

C403.2.12 – AIR SYSTEM DESIGN AND CONTROL

☐ ALL FANS INSTALLED ON THE PROJECT ARE 5 HP OR LESS AND ARE EXEMPT FROM THESE REQUIREMENTS.

■ FANS ABOVE 5 HP MEET THE CFM LIMITATIONS SHOWN BELOW:

OPTION 1 – FAN SYSTEM MOTOR NAMEPLATE HP – TABLE C403.2.12.1(1)

ALLOWABLE NAMEPLATE MOTOR HP	CONSTANT VOLUME MINIMUM CFM	VARIABLE VOLUME MINIMUM CFM	DESIGN CFM
7.5	6,818 CFM	5,000 CFM	SEE SCHEDULE
10	9,091 CFM	6,667 CFM	SEE SCHEDULE
15	13,636 CFM	10,000 CFM	SEE SCHEDULE
20	18,182 CFM	13,333 CFM	SEE SCHEDULE
25	22,727 CFM	16,667 CFM	SEE SCHEDULE
30	27,272 CFM	20,000 CFM	SEE SCHEDULE
40	36,364 CFM	26,667 CFM	SEE SCHEDULE
50	45,455 CFM	33,333 CFM	SEE SCHEDULE

C403.3 – ECONOMIZERS (PRESCRIPTIVE)

- ■ PROJECT INCLUDES AN AIR OR WATER ECONOMIZER COMPLIANT WITH C403.3
- ☐ PROJECT MEETS AN ECONOMIZER EXCEPTION LISTED IN C403.3

C403.4 – HYDRONIC AND MULTIPLE-ZONE HVAC SYSTEMS CONTROL AND EQUIPMENT (PRESCRIPTIVE)

- ☐ PROJECT CONSISTS OF ONLY SINGLE ZONE DX SYSTEMS, EXEMPT FROM THE PRESCRIPTIVE REQUIREMENTS OF C403.4.
- ■ PROJECT CONSISTS OF HVAC SYSTEMS FULLY COMPLIANT WITH THE PRESCRIPTIVE REQUIREMENTS OF C403.4.

C405.8 – ELECTRICAL MOTORS (MANDATORY REQUIREMENTS).

- ■ ELECTRICAL MOTORS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMNTS PER C405.8, EXCEPT WHERE EXEMPT.
- ☐ NOT APPLICABLE.

C408 – SYSTEM COMMISSIONING

- ☐ BUILDING IS LESS THAN 10,000 SQUARE FEET AND IS EXEMPT FROM THE SYSTEM COMMISSIONING REQUIREMENTS OF SECTION C408.
- ■ BUILDING IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.
- ☐ N/A EQUIPMENT REPLACEMENT

MECHANICAL GENERAL NOTES

SEE SPECIFICATIONS FOR ADDITIONAL PROJECT REQUIREMENTS. THESE GENERAL NOTES ARE INTENDED TO SUPPLEMENT THE SPECIFICATIONS. IN THE EVENT THAT THE VERBIAGE IS IN CONFLICT OR CONTRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED PRIOR TO BIDDING OR THE MORE STRINGENT SHALL APPLY AT THE ENGINEER'S DISCRETION.

1. DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.
2. ALL EQUIPMENT LISTED IN THE PROJECT SCHEDULES IS TO BE CONSIDERED DESIGN BASIS EQUIPMENT. ALL COST ASSOCIATED WITH SUBSTITUTED/NON-DESIGN BASIS EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED/NON-DESIGN BASIS EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. THIS INCLUDES ANY MODIFICATIONS TO ANY ASSOCIATED MECHANICAL, PLUMBING, OR ELECTRICAL SYSTEMS REQUIRED BY THIS SPECIFIC MANUFACTURER'S INSTALLATION INSTRUCTIONS.
3. ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. ALL SUPPLY, RETURN AND OUTSIDE AIR DUCTWORK SHALL BE WRAPPED WITH 2" THICK DUCT WRAP WITH VAPOR BARRIER. INSULATION (INCLUDING FLEXIBLE DUCT INSULATION) SHALL HAVE A MINIMUM INSTALLED R-VALUE OF 6.0. DUCT DIMENSIONS ON PLANS ARE FREE AREA SIZE.
4. ALL DUCTWORK SHALL BE SEALED PER THE REQUIREMENTS OF THE **NORTH CAROLINA** MECHANICAL CODE. SEAL LOW PRESSURE SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK FOR POSITIVE/NEGATIVE 2" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 4.
5. THE MECHANICAL CONTRACTOR SHALL BALANCE ALL MECHANICAL SYSTEMS TO THE PERFORMANCE SPECIFICATIONS INDICATED ON PLANS AND PROVIDE THE ENGINEER WITH THREE COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT IS TO BE ISSUED A MINIMUM OF TWO WEEKS PRIOR TO PROJECT COMPLETION. THE TEST AND BALANCE REPORT WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. ANY ADDITIONAL TESTING, ADJUSTING AND BALANCING REQUIRED (AT ENGINEER'S REQUEST) AFTER REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST. TESTING AND BALANCING CONTRACTOR TO CONFIRM FILTERS ARE CLEAN, AND FREE OF DEBRIS PRIOR TO BEGINNING WORK. THE MECHANICAL CONTRACTOR SHALL REPLACE ANY DIRTY FILTERS, AS NEEDED. .
6. UPON PROJECT COMPLETION, THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE OWNER INSTALLATION INFORMATION INCLUDING RECORD SUBMITTALS (WITH ANY SUBMITTAL REVIEW COMMENTS ADDRESSED) AND O&M MANUALS FOR EACH PIECE OF EQUIPMENT INCLUDING ALL SELECTED OPTIONS, THE NAME AND ADDRESS OF AT LEAST ONE SERVICE AGENCY, FULL CONTROL SYSTEM O&M AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, SCHEMATICS,.
7. PROVIDE A ONE YEAR WARRANTY FOR ALL WORK PERFORMED BEGINNING ON THE DAY THE SYSTEM IS COMPLETELY OPERATIONAL AND ACCEPTABLE BY THE OWNER.
8. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE AND FILTER REMOVAL.
9. CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 PVC PIPE AND FITTINGS. DRAINS FROM AIR HANDLING UNITS SHALL BE TRAPPED. CONDENSATE DRAINS SHALL BE INSULATED WITH ½" THICK ARMAFLEX INSULATION. MINIMUM DRAIN SIZE SHALL BE ¾". TERMINATE ROOFTOP
10. ANY DEVICE REQUIRING A THERMOSTAT FOR CONTROL SHALL BE FURNISHED WITH A THERMOSTAT WHETHER INDICATED ON THE DRAWINGS OR NOT.
11. INSTALL THE TOP OF ALL THERMOSTATS, SENSORS, AND SWITCHES AT 4'-0" (MAXIMUM) ABOVE FINISH FLOOR. COORDINATE EXACT THERMOSTAT LOCATION WITH OWNER PRIOR TO INSTALLATION..
12. ROOF CURBS SHALL ALLOW A MINIMUM OF 8" ABOVE ROOF INSULATION FOR FLASHING, OR AS INDICATED ON THE DRAWINGS, WHICHEVER IS GREATER. IN ADDITION, ALL ROOF CURBS OR EQUIPMENT SUPPORT RAILS THAT SUPPORT EQUIPMENT, PIPING, CONDUIT, ETC. EXPOSED ON THE ROOF SHALL HAVE SUFFICIENT HEIGHT TO MAINTAIN A MINIMUM OF 18" CLEARANCE BELOW SUPPORTED EQUIPMENT FOR ROOF MAINTENANCE. CONTRACTOR TO FIELD VERIFY LOCATION AND SIZE OF ALL EXISTING TO BE DEMOLISHED ROOF CURBS AND FIELD VERIFY MEASUREMENTS PRIOR TO ORDERING NEW RTU ROOF CURBS.
13. DUCTWORK AND PIPING PASSING THROUGH/ABOVE ELECTRICAL ROOMS SHALL BE CLOSELY COORDINATED WITH THE ELECTRICAL CONTRACTOR. DUCTWORK OR PIPING SHALL NOT BE LOCATED ABOVE ELECTRICAL PANELS.
14. EQUIPMENT OPERATED DURING CONSTRUCTION SHALL USE FILTERED MEDIA TO PREVENT CONSTRUCTION DEBRIS FROM ENTERING COILS, DUCTWORK SYSTEMS, AIR TERMINALS ETC. AT COMPLETION OF CONSTRUCTION, MECHANICAL CONTRACTOR SHALL CLEAN ALL SYSTEMS WITH ALL CONTROL DEVICES WIDE OPEN AND REMOVE ANY REMAINING DEBRIS PRIOR TO TEST AND BALANCING. MECHANICAL CONTRACTOR SHALL REPLACE ALL FILTRATION WITH NEW FILTERS AT COMPLETION OF CONSTRUCTION. ANY DUCTWORK, AIR TERMINALS, AND/OR OTHER EQUIPMENT UPSTREAM OF FILTRATION SHALL BE CLEANED THOROUGHLY OF CONSTRUCTION DEBRIS BEFORE HANDING OVER TO OWNER.
15. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING RESTRAINTS TO RESIST THE EARTHQUAKE EFFECTS ON THE MECHANICAL SYSTEMS. THE REQUIREMENTS FOR THOSE RESTRAINTS ARE FOUND IN THE LOCAL BUILDING CODE AND ASCE 7. THE ANCHORAGE OF THE MECHANICAL SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE LOCAL BUILDING CODE AND ASCE 7.
16. ALL MECHANICAL EQUIPMENT SHALL BE U.L. LISTED AND LABELED AS A COMPLETE PACKAGE, NOT THROUGH INDIVIDUAL COMPONENTS OR PARTS. PROVIDE REQUIRED 3RD PARTY FIELD UL LISTING SERVICES AS REQUIRED TO COMPLY.

MECHANICAL • ELECTRICAL • PLUMBING
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SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 27396 ENGINEER STEVEN R. DALEY
10-23-26

RANDOLF MIDDLE SCHOOL
ROOFTOP UNIT REPLACEMENT
4400 WATER OAK RD, CHARLOTTE, NC 28211

REV #	DATE	DESCRIPTION

DATE: 10-23-26
PROJECT #: 22-0254
DRAWN BY: JMF
DESIGNED BY: JMF
CHECKED BY: SRD

SHEET TITLE:
MECHANICAL DETAILS, GENERAL NOTES, SYMBOLS AND LEGEND

DWG #:
M101

SHEET NO: 2 OF 5

100% DIRECT OUTDOOR AIR ROOFTOP UNIT SCHEDULE (DX COOLING - R454B, ENERGY RECOVERY WHEEL)

SYMBOL	AREA SERVED	SUPPLY CFM	O.A. CFM	SUPPLY E.S.P.	EXH. CFM	EXH. E.S.P.	SUMMER POST-WHEEL AIR CONDITIONS DRY BULB	WET BULB	HUM. RATIO	WINTER POST-WHEEL AIR CONDITIONS DRY BULB	WET BULB	HUM. RATIO	UNIT LEAVING AIR TEMPERATURE SUMMER DB	SUMMER WB	WINTER DB	COMPRESSOR COOLING CAPACITY QTY	NET TC (BTUH)	NET SHC (BTUH)	EER	SUPPLY FAN HP	FLA	ENERGY WHEEL HP	FLA	EXHAUST FAN HP	FLA	COMPRESSORS #1 RLA	#2 RLA	CONDENSER FANS QTY.	HP	FLA	NORMAL POWER SUPPLY MCA	MOCP	VOLTAGE	OPERATING WEIGHT	MANUFACTURER AAON	ACCESSORIES	UNIT NUMBER
RTU-11	LOCKER/SHOWERS	4,500	4,500	1.25"	4,500	1.25"	80.0 °F	65.9 °F	72.8 gr/lb	53.8 °F	44.2 °F	27.4 gr/lb	51.6 °F	51.5 °F	**53.8 °F**	2	187,000	131,000	11.7	5	7.6	.017	0.60	3	4.8	12.8	11.0	2	0.75	1.8	44	50	460V-3Φ	3,407 LBS	RNA-016-C-A-3-GABOA	SEE BELOW	RTU-11

NOTES:

1. ALL UNITS SHALL BE AGA CERTIFIED, U.L. LABELED, AND ASHRAE 90.1 COMPLIANT.
2. ALL AIR HANDLING UNITS UNITS SHALL BE PROVIDED WITH A PHOTOELECTRIC TYPE SMOKE DETECTOR MOUNTED IN THE RETURN DUCT. THE SMOKE DETECTOR SHALL BE FURNISHED AND WIRED FOR UNIT SHUT DOWN AND FIRE ALARM INTERFACE BY THE ELECTRICAL CONTRACTOR AND SHALL BE INSTALLED IN THE DUCT BY THE MECHANICAL CONTRACTOR.
3. ALL TEMPERATURES ARE MEASURED IN DEGREES FAHRENHEIT, AND HUMIDITY RATIO IS MEASURED IN GRAINS PER POUND DRY AIR.
4. OUTDOOR DESIGN CONDITIONS: SUMMER: 93° F. D.B., 74° F. W.B., WINTER: 15° F. D.B.
5. REPLACE ALL FILTERS WITH COMPLETE SET OF NEW FILTERS AT PROJECT COMPLETION. PROVIDE ONE COMPLETE ADDITIONAL SET OF FILTERS FOR OWNER STORAGE. COORDINATE WITH OWNER ON STOCK STORAGE LOCATION. PERMANENT METAL FILTER FRAMES WITH MERV-10 ROLL FILTER MEDIA.
6. PROVIDE 5-YEAR WARRANTY FOR LABOR, PARTS AND REFRIGERANT ON ALL ROOFTOP UNITS.

RTU-11 HAS A EX DUCT MOUNTED HOT WATER REHEAT COIL

ACCESSORIES:

1. - PERMANENT METAL FILTER FRAMES WITH REPLACEABLE FILTERS
2. - CONSTANT VOLUME SPEED SUPPLY/EXHAUST FANS
3. - DIRECT DRIVE PLENUM SUPPLY FAN
4. - COMPRESSORS - (1)VARIABLE SPEED SCROLL (1)FIXED SPEED SCROLL
5. - HORIZONTAL DRAW THROUGH W/DOWNFLOW DISCHARGE
6. - MERV-8 MINIMUM FILTER MEDIA
7. - DEMOLISH EX CURB INSTALL NEW CURB RE-ROOF AS NECESSARY
8. - 2" DOUBLE WALL EXTERIOR CABINET CONSTRUCTION
9. - INTERNAL VIBRATION ISOLATION
10. - EXHAUST AIR/SUPPLY AIR DAMPER/DIVIDING SECTION
11. - POLYMER ENERGY RECOVERY WHEEL
12. - STAINLESS STEEL COOLING COIL DRAIN PAN
13. - CONDENSER COIL HAIL GUARDS
14. - SINGLE POINT ELECTRICAL CONNECTION WITH CONVENIENCE OUTLET.

ROOFTOP UNIT SCHEDULE - (DX COOLING ONLY - R454B)

SYMBOL	CFM	NOMINAL TONNAGE	OUTSIDE AIR MINIMUM (CFM)	E.S.P.	COOLING CAPACITY TC (BTUH)	SHC (BTUH)	EFFICIENCY EER	IEER	COMPRESSOR (EA) NO.	BELOW	OFM QTY.	FLA	IFM QTY	MHP	EXHAUST FAN. (EA) QTY.	HP	FLA	POWER SUPPLY MCA	MOCP	VOLTAGE	OPERATING WEIGHT	ACCESSORIES	SYSTEM TYPE	MANUFACTURER TRANE MODEL
RTU-1	14,000	35	2,750-/750+*	2.5"	418,000	337,000	10.5	15.4	3	SEE NOTE "B"	3	2.2	1	20	2	-	2.2	101	125	460V-3Φ	4,695 LBS	A,B,C,D,E,F2,G,H,I,J,K,L,M,N,O,P,R	VAV (DUCT PRESSURE CONTROL)	TCD420040
RTU-2	9,000	27.5	1,750-/450+*	2.5"	338,000	242,000	11.0	15.4	3	SEE NOTE "A"	3	2.2	1	15	2	-	2.2	88	100	460V-3Φ	4,615 LBS	A,B,C,D,E,F2,G,H,I,J,K,L,M,N,O,P,R	VAV (DUCT PRESSURE CONTROL)	TCD330040
RTU-3	11,000	27.5	2,250+/550+*	2.5"	350,000	271,000	12.3	15.4	3	SEE NOTE "A"	3	2.2	1	15	2	-	2.2	88	100	460V-3Φ	4,615 LBS	A,B,C,D,E,F2,G,H,I,J,K,L,M,N,O,P,R	VAV (DUCT PRESSURE CONTROL)	TCD330040
RTU-4	8,000	25	1,500+/400+*	1.6"	275,000	196,000	11.0	16.3	2	SEE NOTE "C"	2	2.5	1	4.6	1	-	5.5	64	80	460V-3Φ	2,496 LBS	A,B,C,D,E,F2,G,H,I,J,K,L,M,N,O,P,R	VAV (DUCT PRESSURE CONTROL)	THK300A4S
RTU-5	14,000	35	2,750+/750+*	2.5"	418,000	337,000	10.5	15.4	3	SEE NOTE "B"	3	2.2	1	20	2	-	2.2	101	125	460V-3Φ	4,695 LBS	A,B,C,D,E,F2,G,H,I,J,K,L,M,N,O,P,R	VAV (DUCT PRESSURE CONTROL)	TCD420040
RTU-6	9,000	27.5	1,750+/450+*	2.5"	338,000	242,000	11.0	15.4	3	SEE NOTE "A"	3	2.2	1	15	2	-	2.2	88	100	460V-3Φ	4,615 LBS	A,B,C,D,E,F2,G,H,I,J,K,L,M,N,O,P,R	VAV (DUCT PRESSURE CONTROL)	TCD330040
RTU-7	12,000	30	2,500+/600+*	2.5"	379,000	294,000	10.8	15.6	3	SEE NOTE "D"	3	2.2	2	15	2	-	2.2	90	100	460V-3Φ	4,603 LBS	A,B,C,D,E,F2,G,H,I,J,K,L,M,N,O,P,R	VAV (DUCT PRESSURE CONTROL)	TCD360040
RTU-8	7,000	20	1,500+/350+*	1.7"	243,000	175,000	11.2	16.5	2	SEE NOTE "E"	2	2.5	1	4.3	1	-	5.5	58	80	460V-3Φ	2,446 LBS	A,B,C,D,E,F2,G,H,I,J,K,L,M,N,O,P,R	VAV (DUCT PRESSURE CONTROL)	THK240A4S
RTU-9	3,500	7.5	750	1.5"	96,000	77,000	12.5	17.3	2	SEE NOTE "F"	1	1.5	1	3	N/A	N/A	N/A	22	25	460V-3Φ	1,118 LBS	A,B,C,D,E,F1,G,J,K,L,O,P,Q	CONSTANT VOLUME (SPACE TEMP CONTROL)	THK090A4S
RTU-10	12,000	30	2,500+/600+*	1.5"	379,000	294,000	10.8	15.6	3	SEE NOTE "D"	3	2.2	2	10	2	-	2.2	84	100	460V-3Φ	4,603 LBS	A,B,C,D,E,F2,G,H,I,J,K,L,M,N,O,P	SINGLE ZONE VAV (SPACE TEMP CONTROL)	TCD360040

COMPRESSOR NOTES:

A. COMPRESSOR #1: 14.5 RLA; COMPRESSOR #2: 19.1 RLA; COMPRESSOR #3: 19.1 RLA
B. COMPRESSOR #1: 14.5 RLA; COMPRESSOR #2: 21.8 RLA; COMPRESSOR #3: 21.8 RLA
C. COMPRESSOR #1: 23.8 RLA; COMPRESSOR #2: 14.4 RLA
D. COMPRESSOR #1: 14.5 RLA; COMPRESSOR #2: 19.8 RLA; COMPRESSOR #3: 19.8 RLA
E. COMPRESSOR #1: 22.4 RLA; COMPRESSOR #2: 12.2 RLA
F. COMPRESSOR #1: 8.1 RLA; COMPRESSOR #2: 5.2 RLA

NOTES:

1. COOLING CAPACITIES BASED ON 95° AMBIENT, 80/67 ENTERING AIR.
2. ALL UNITS SHALL BE AGA CERTIFIED, U.L. LABELED, AND ASHRAE 90.1 COMPLIANT.
3. REPLACE EXISTING DUCT SMOKE DETECTOR WITH A NEW PHOTOELECTRIC TYPE SMOKE DETECTOR, INSTALLED IN THE RETURN DUCT WIRED TO SHUT DOWN THE UNIT UPON ACTIVATION. SMOKE DETECTOR SHALL BE SUPPLIED, WIRED FOR INTERFACE WITH FIRE ALARM SYSTEM AND UNIT SHUTDOWN BY THE ELECTRICAL CONTRACTOR. SMOKE DETECTOR SHALL BE INSTALLED IN THE RETURN DUCT BY THE MECHANICAL CONTRACTOR.
4. PRIMARY COOLING COIL DRAIN PAN SHALL BE PROVIDED WITH A FLOAT SWITCH BY UNIT MFR; ACTIVATION OF THE FLOAT SWITCH SHALL SHUT DOWN UNIT AND SEND AN ALARM TO THE CENTRAL BAS.
5. PROVIDE 5-YEAR WARRANTY FOR LABOR, PARTS AND REFRIGERANT ON ALL ROOFTOP UNITS.
6. ALL UNITS MUST BE PROVIDED WITH 65K SCCR.

* DESIGN OUTSIDE AIRFLOW (CFM)
** OCCUPIED MINIMUM OUTSIDE AIRFLOW (CFM), REFER TO CO2 CONTROL ON SEQUENCE OF OPERATIONS IN SPECIFICAITONS.

ION GENERATOR REQUIREMENTS:

PROVIDE RTU'S WITH AN NEEDLE POINT ION GENERATOR AS MANUFACTURED BY GLOBAL PLASMA SOLUTIONS INDICATED BELOW
MODEL # GPS-FC48-AC 120V COMPATIBLE
INSTALL (1) PER 4,000 CFM

ION FILTER NOTES:

1. UL-2998 AND UL 867 COMPLIANCE.
2. PROVIDE WITH INTEGRAL BAS ALARM CONTACTS.
3. AUTO CLEANING
4. INSTALL AT SUPPLY FAN INLET
5. MAGNETIC BASE MOUNTED TO FAN INLET

SUBSTITUTED EQUIPMENT (NON-SPECIFIED) THAT EXCEEDS THE WEIGHT SHOWN IN THE RTU SCHEDULE SHALL BE REQUIRED TO OBTAIN A STRUCTURAL EVALUATION AND APPROVAL LETTER FROM THE BELOW STRUCTURAL ENGINEER.

BENNETT AND PLESS STRUCTURAL ENGINEERING
P: 704-710-6721

ACCESSORIES:

A - PERMANENT METAL FILTER FRAMES WITH REPLACEABLE FILTERS
B - VARIABLE SPEED SUPPLY FAN(S)
C - HORIZONTAL DRAW THRU
D - FLAT FILTER SECTION
E - 2" MERV-10 FILTERS
F1 - INSTALL ROOF CURB ADAPTOR ATOP EX YORK CURB (FIELD VERIFY)
F2 - DEMOLISH EX YORK CURB INSTALL NEW CURB RE-ROOF AS NECESSARY
G - SINGLE WALL EXTERIOR CABINET CONSTRUCTION
H - REPLACE EX CO2 SENSOR WITH NEW FOR DEMAND LIMITING CONTROL (BY BAS)
I - INTERNAL VIBRATION ISOLATION
J - STAINLESS STEEL COOLING COIL DRAIN PAN
K - CONDENSER COIL HAIL GUARDS
L - SINGLE POINT ELECTRICAL CONNECTION WITH NON FUSED DISCONNECT AND POWERED CONVENIENCE OUTLET
M - POWER EXHAUST
N - COMPARATIVE ENTHALPY ECONOMIZER
O - LOW AMBIENT CONTROLS
P - GPS NEEDLE POINT ION GENERATOR (SEE NOTE THIS PAGE)
Q - PROVIDE NEW TEMPERATURE SPACE SENSOR (WITH PROTECTIVE CAGE) LOCATE IN SAME LOCATION AS EXISTING, FIELD VERIFY (BY BAS)
R - REPLACE EX DUCT STATIC PRESSURE SENSOR WITH NEW (BY BAS)

PACKAGED TERMINAL HEAT PUMP (W/ AUX ELEC HEAT)

THIS PTHP REQUIRES A ENLARGED EXTERIOR WALL OPENING FOR NEW 42"x46" WALL SLEEVE.

SYMBOL	NOMINAL TONNAGE	CFM	OA CFM	COOLING CAPACITY TC (BTUH)	SHC (BTUH)	EFFICIENCY EER	IEER	AUXILARY ELEC HEATING CAPACITY BTUH	KW	VOLTAGE/PH	HP HEATING CAPACITY BTUH (47°F)	BTUH (10°F)	EFFICIENCY COP	HSPF	FAN HP	ELECTRICAL DATA MCA	FUSE	VOLTAGE	MANUFACTURER BARD MODEL	WEIGHT	REFRIG. TYPE	UNIT TYPE
PTHP-1	3.0	1,200	170	35,000	26,000	11.0	--	26,000	10	280V/1Φ	32,000	17,000	3.4	-	1/2	81	90	208V-1Φ	Q36HFDA10VP4XXR	687 LBS.	R-454B	TOP DUCTED
PTHP-2	3.0	1,200	170	35,000	26,000	11.0	--	26,000	10	280V/1Φ	32,000	17,000	3.4	-	1/2	81	90	208V-1Φ	Q36HFDA10VP4XXR	687 LBS.	R-454B	TOP DUCTED
PTHP-3	3.0	1,200	170	35,000	26,000	11.0	--	26,000	10	280V/1Φ	32,000	17,000	3.4	-	1/2	81	90	208V-1Φ	Q36HFDA10VP4XXR	687 LBS.	R-454B	TOP DUCTED
PTHP-4	3.0	1,200	170	35,000	26,000	11.0	--	26,000	10	280V/1Φ	32,000	17,000	3.4	-	1/2	81	90	208V-1Φ	Q36HFDA10VP4XXR	687 LBS.	R-454B	TOP DUCTED
PTHP-5	3.0	1,200	170	35,000	26,000	11.0	--	26,000	10	280V/1Φ	32,000	17,000	3.4	-	1/2	81	90	208V-1Φ	Q36HFDA10VP4XXR	687 LBS.	R-454B	TOP DUCTED
PTHP-6	3.5	1,300	200	43,000	31,000	11.3	--	26,000	10	280V/1Φ	38,000	21,000	3.5	-	1/2	83	90	208V-1Φ	Q43HFDA10VP4XXR	747 LBS.	R-454B	TOP DUCTED
PTHP-7	3.0	1,200	170	35,000	26,000	11.0	--	26,000	10	280V/1Φ	32,000	17,000	3.4	-	1/2	81	90	208V-1Φ	Q36HFDA10VP4XXR	687 LBS.	R-454B	TOP DUCTED
PTHP-8	3.0	1,200	170	35,000	26,000	11.0	--	26,000	10	280V/1Φ	32,000	17,000	3.4	-	1/2	81	90	208V-1Φ	Q36HFDA10VP4XXR	687 LBS.	R-454B	TOP DUCTED
PTHP-9	3.0	1,200	170	35,000	26,000	11.0	--	26,000	10	280V/1Φ	32,000	17,000	3.4	-	1/2	81	90	208V-1Φ	Q36HFDA10VP4XXR	687 LBS.	R-454B	TOP DUCTED

NOTES:

1. COOLING CAPACITY @ 95° AMBIENT, 80/67 ENTERING AIR
2. ALL UNITS SHALL BE UL LISTED AND ASHRAE 90.1 COMPLIANT.
3. PROVIDE UNITS WITH METAL FILTER RACKS W/REPLACEABLE FILTER MEDIA (MERV-8), FACTORY INSTALLED HEATER, UL LABEL, SINGLE POINT ELEC CONNECTION, DEHUMIDIFICATION (HGRH), ECM SUPPLY FAN MOTOR, CONDENSATE DRAIN KIT, GRAY FINISH 10" HEIGHT TRIM KIT, GRAY SIDE TRIM EXTENSION KIT, WALL SLEEVE, BAKED ENAMEL FINISH EXTERIOR LOUVER, DOOR MOUNTED THERMOSTAT SUPPLIED BY UNIT MANUFACTURER INTEGRATED INTO EXISTING BAS VIA ALC. REFER TO POINTS LIST BELOW
4. MANUFACTURER SHALL PROVIDE FACTORY START UP FOR ALL UNITS. START UP TECHNICIAN SHALL BE AN EMPLOYEE OF THE MANUFACTURER OR A FACTORY CERTIFIED TECHNICIAN.
5. PROVIDE EACH UNIT WITH AN AIR CLEANING SYSTEM EQUAL TO NEEDLE POINT BI-POLAR IONIZATION SYSTEM MOUNTED ON THE ENTERING SIDE OF THE COOLING COIL. EQUAL TO GLOBAL PLASMA SOLUTIONS GPS-FC36-AC.
6. UNIT SHALL HAVE AN INDOOR OPERATING SOUND LEVEL THAT WILL NOT EXCEED 42.7 DBA MEASURED FROM 10' FROM THE UNIT IN ACCORDANCE WITH ANSI S12.60 MIXED AIR SOUND RATING.
7. PROVIDE UNITS WITH 5 YEAR PARTS AND LABOR WARRANTY.

ION GENERATOR REQUIREMENTS:

PROVIDE RTU'S WITH AN NEEDLE POINT ION GENERATOR AS MANUFACTURED BY GLOBAL PLASMA SOLUTIONS INDICATED BELOW
MODEL # GPS-FC48-AC 120V COMPATIBLE
INSTALL (1) PER 4,000 CFM

ION FILTER NOTES:

1. UL-2998 AND UL 867 COMPLIANCE
2. PROVIDE WITH INTEGRAL BAS ALARM CONTACTS.
3. AUTO CLEANING
4. INSTALL AT SUPPLY FAN INLET
5. MAGNETIC BASE MOUNTED TO FAN INLET

INPUT/OUTPUT SUMMARY (PTHP ONLY)

SYSTEM, APPARATUS, OR AREA POINT DESCRIPTION	INPUTS: ANALOG MEASURED: TEMPERATURE	PRESSURE	KW	AIR FLOW	WATER FLOW	CO2	FRTZ	PWM	VOLTS	AMPS	INPUTS: ANALOG CALC.: SETPOINT ADJ.	ENTHALPY	RUN TIME	EFFICIENCY	INPUTS: BINARY: STATUS	FILTER	SMOKE	AIR FLOW	METER	OVER-RIDE	OUTPUTS: DIGITAL: OFF-ON	OFF-AUTO-ON	OFF-HI-LO	DEFROST/CLOSE	OUTPUTS: ANALOG: DAMPR. POS.	VALVE POS.	STEP CONTROL	SYSTEM FEATURES: ALARMS: HI ANALOG	LO ANALOG	HI BINARY	LO BINARY	FROST	PROGRAMS: TIME SCHEDULING	DEMAND LIMITING	FIRE / SMOKE OPT.	START/STOP OPT.	SMOKE CNT.	TREND	ALARM INSTRUCT	MAIN. WK. ORD.	GENERAL: COLOR GRAPHIC	OVERRIDE	SUPPLMENT. NOTES
PACKAGED HEAT PUMP																																						X		X		
Supply Fan																					X																						
Status															X														X														
Discharge Temp	X																																										
Setpoint Adjust											X																																
Space Temp	X																												X														

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NORTH CAROLINA PROFESSIONAL SEAL 027956 ENGINEER STEVEN R. DALEY
10-23-26

RANDOLF MIDDLE SCHOOL
ROOFTOP UNIT REPLACEMENT
4400 WATER OAK RD, CHARLOTTE, NC
28211

REV #	DATE	DESCRIPTION

DATE: 10-23-26
PROJECT #: 22-0254
DRAWN BY: JMF
DESIGNED BY: JMF
CHECKED BY: SRD

SHEET TITLE:
MECHANICAL SCHEDULES, AND DETAILS

DWG #:
M102
SHEET NO: 3 OF 5

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1 MECHANICAL ROOF PLAN - NEW WORK
1/16" = 1'-0"

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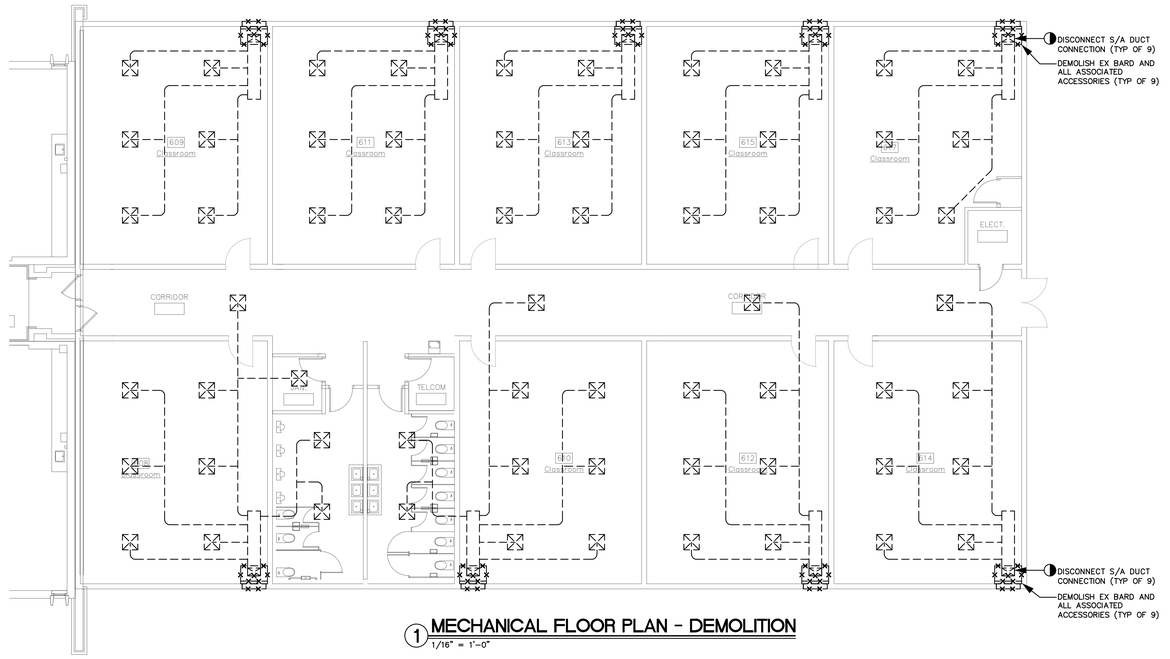
DATE:	10-23-26
PROJECT #:	22-0254
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DESIGNED BY:	JMF
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SHEET TITLE:
MECHANICAL ROOF PLAN - NEW WORK

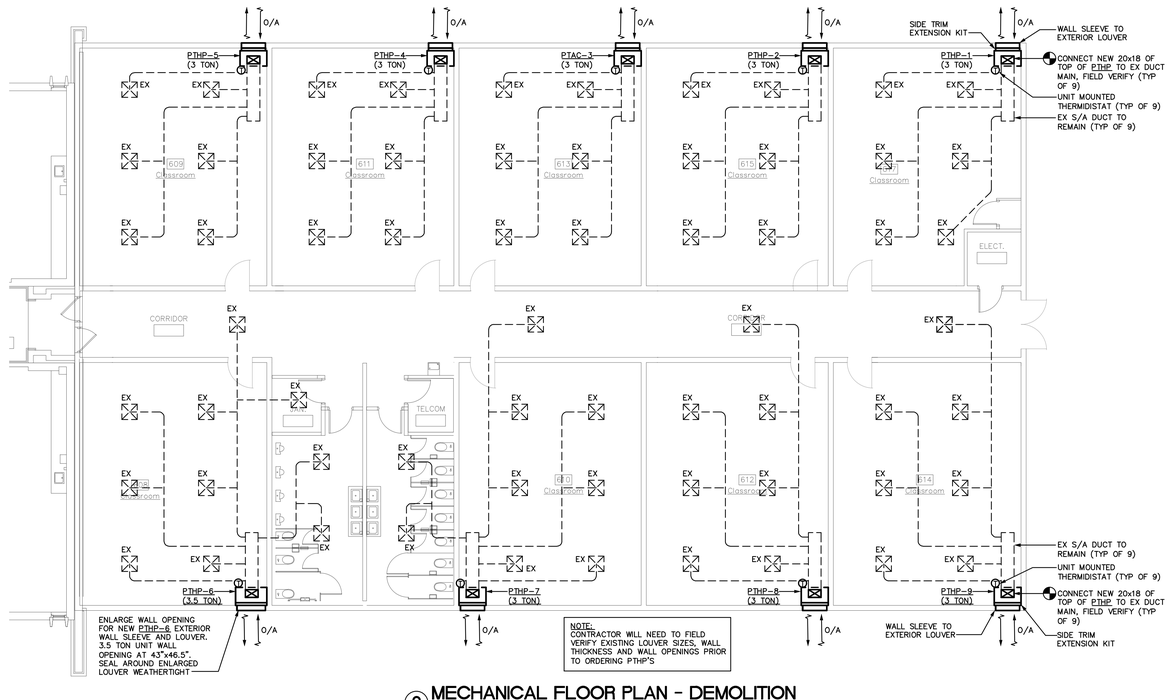
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1 MECHANICAL FLOOR PLAN - DEMOLITION
1/16" = 1'-0"



2 MECHANICAL FLOOR PLAN - DEMOLITION
1/16" = 1'-0"

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10-23-26

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ROOFTOP UNIT REPLACEMENT
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REV #	DATE	DESCRIPTION

DATE:	10-23-26
PROJECT #:	22-0254
DRAWN BY:	JMF
DESIGNED BY:	JMF
CHECKED BY:	BJN

SHEET TITLE:
MECHANICAL FLOOR PLAN - NEW WORK AND DEMOLITION

DWG #:
M202

SHEET NO: 5 OF 5