

ROOF TOP UNIT SCHEDULE

UNIT ID	MFRG	MODEL	AREA SERVED	NOMINAL TONS	SUPPLY FAN					HEATING										COOLING					ELECTRICAL									
					TOTAL CFM	OUTSIDE AIR	EXT. AP	TOT. AP	RPM	HP	INPUT MBH	OUTPUT MBH	TOTAL MBH	SEER	AMBIENT DB	ENT. DB	ENT. WB	PHASE	FLA	MCA	MOCP	EER	IEER	SEER	OPERATING WEIGHT	VOLTS	FLA	MCA	MOCP					
RTU-1	TRANE	YHC090	SALES	5	2100	550	0.41	0.72	953	1.00	130.0	104.0	60.2	43.3	92.2	78.8	66.8	208	3	26	30	45	-	-	-	14.2	1052							
RTU-2	TRANE	YHC036	STOCK ROOM	3	960	229	0.41	0.72	953	1.00	60.0	48.0	35.3	24.5	92.2	81.3	68.2	208	3	15.3	18	25	-	-	-	14.4	847							

REQUIRED AC UNIT ACCESSORIES

MARK	ROOF CURB	SUPPLY FAN	ECONOMIZER	MOTORIZED DAMPER	MANUAL DAMPER	GRAVITY EXH. (BAROMETRIC)	POWER EXHAUST	THERMOSTAT	TIME OVERRIDE BUTTON	HUMIDITY SENSOR	FACTORY INST. W/PHGR REC.	FACTORY INST. W/ELC. & GAS	THR.U-THE-BASE FRESH AIR TEMP. KIT	LOW AMBIENT COOLING	FACTORY INST. REHEAT COIL	SMOKE DETECTOR IN RETURN	FLUE EXTENSION KIT	COND. DRAIN PAN OVERFLOW SWITCH
RTU-1	14"	BELT	YES	YES	NO	YES, NOTE 4	NO	NOTE 6	PROVIDE W/ T-STAT	YES	YES	YES	YES	YES	YES	NO	NO	YES, NOTE 8
RTU-2	14"	BELT	NO	YES	NO	NO	NO	NOTE 6	PROVIDE W/ T-STAT	YES	YES	YES	YES	YES	NO	NO	NO	YES, NOTE 8

NOTES:

- 1. RTU-1 AND ALL ASSOCIATED ACCESSORIES SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
- 2. RTUS SHALL BE PROVIDED WITH TWO SETS OF 2" DISPOSABLE FILTERS. ONE SET SHALL BE INSTALLED DURING CONSTRUCTION AND ONE SET SHALL BE INSTALLED BEFORE FINAL AIR BALANCE.
- 3. EXTERNAL STATIC PRESSURE INCLUDES SUPPLY AND RETURN AIR DUCTWORK. TOTAL STATIC PRESSURE INCLUDES EXTERNAL STATIC PRESSURE, VELOCITY COIL, ECONOMIZER, AND GAS HEAT EXCHANGER.
- 4. AN INTEGRATED ECONOMIZER IS REQUIRED FOR RTU-1 IN THIS PARTICULAR LOCATION. PROVIDE ECONOMIZER WITH DUAL ENTHALPY CONTROL AND BAROMETRIC REF-F.
- 5. ANY SUBSTITUTION MUST BE APPROVED BY OWNER PRIOR TO INSTALLATION. PLEASE CONTACT J.D. HOWARD AT TRANE NATIONAL ACCOUNTS FOR ALL PRICING ON EQUIPMENT AT 919-232-5729 OR JHOWARD@TRANE.COM.
- 6. PROVIDE WITH HOOPER/TRE TRANE PROGRAMMABLE NON-SETBACK TOUCH SCREEN THERMOSTAT.
- 7. RTU-1 SHALL BE PROVIDED WITH FACTORY INSTALLED SMOKE DETECTORS IN THE RETURN SIDE OF THE UNIT.
- 8. PROVIDE RTUS WITH FACTORY OPTION CONDENSATE DRAIN PAN OVERFLOW SWITCH.
- 9. PROVIDE RTUS WITH CONDENSER COIL HAIL GUARD.

FAN SCHEDULE

UNIT ID	MANUFACTURER	MODEL	CFM	TYPE	DRIVE	FAN RPM	S.P.				H.P.	FLA	VOLTS	PHASE	SERVICE	CONTROLLED BY	NOTES/ACCESSORIES
							(IN W.G.)	1/2"	1"	1 1/2"							
EP-1 & 2	GREENHECK	SP-800	75	CABINET	DIRECT	900	0.125	-	0.16	1.15	1			RESTROOMS	LIGHT SWITCH	1,2	

NOTES / ACCESSORIES:

- 1. EQUIVALENT SUBSTITUTES ARE ACCEPTABLE.
- 2. VENT TO ROOF TOP AND PROVIDE SCREENED CAP.

DIFFUSER, GRILLE, AND REGISTER SCHEDULE

UNIT ID	MANUFACTURER	MODEL	MODULE	NECK	TYPE	STYLE	FRAME TYPE	MATERIAL	OB DAMPER	FINISH	NOTES
A	PRICE	SCDA	24"x24"	30"x24"	SUPPLY	LOWVEGED	LAY-IN	STEEL	YES	WHITE	1,2,3,4
B	PRICE	10	32"x28"	30"x24"	RETURN	PERFORATED	SURFACE	STEEL	YES	WHITE	1,3,4
C	PRICE	SDGE	14"x10"	12"x8"	SUPPLY	DEFLECTION	DUCT	STEEL	YES	WHITE	1,2,3,4
D	PRICE	10	24"x24"	10"x10"	TRANSFER	PERFORATED	LAY-IN	STEEL	NO	WHITE	1,2,4
E	PRICE	620	10"x7"	8"x5"	SUPPLY	DEFLECTION	SURFACE	STEEL	YES	WHITE	1,3,4
F	PRICE	510Z	24"x14"	22"x12"	RETURN	DEFLECTION	SURFACE	STEEL	YES	WHITE	1,3,4

NOTES:

- 1. EQUIVALENT SUBSTITUTES ARE ACCEPTABLE.
- 2. CONTRACTOR SHALL PROVIDE SQUARE TO ROUND TRANSITION FROM DUCT SHOWN ON PLAN TO DIFFUSER AS REQUIRED.
- 3. PROVIDE OB DAMPER IF BRANCH DUCT IS NOT EQUIPPED WITH BALANCING DAMPER.
- 4. MOUNTING FRAME TYPE SHALL BE COORDINATED WITH CEILING/WALL/DUCT CONSTRUCTION TYPE.

HVAC SEQUENCE OF OPERATION

BUILDING AIRFLOW:

M.C. SHALL SET THERMOSTAT "OCCUPIED" AND "UNOCCUPIED" MODES TO OWNER'S OPERATION SCHEDULE. M.C. SHALL SET ALL THERMOSTATS IN "AUTO" POSITION AND FANS ON.

NORMAL OPERATION (OCCUPIED):

EVAPORATOR FANS AND ECONOMIZERS (IF INSTALLED) SHALL OPERATE WHEN ENERGIZED BY THE THERMOSTAT DURING "OCCUPIED" PERIODS DETERMINED BY OWNER. OUTSIDE AIR INTAKE ON ECONOMIZERS OR DAMPERS SHALL BE SET TO VALUE SHOWN IN AIR BALANCE SCHEDULE ON SHEET M601 OR SHALL FOLLOW ECONOMIZER OPERATION DESCRIBED BELOW.

THE TEMPERATURE SCHEDULE SET POINTS SHALL BE SPECIFIC FOR EACH RTU AND SHALL BE FIELD ADJUSTABLE.

SPACE TEMPERATURE SET POINTS:
RTU-1 = 74°F COOLING, 70°F HEATING
RTU-2 = 78°F COOLING, 68°F HEATING

SPACE HUMIDITY SET POINTS:
RTU-1, RTU-2: 55% RH

RTU-1 AND RTU-2 COOLING/HEATING SWITCHOVER SHALL BE AUTOMATIC BASED ON SPACE DEMAND. OUTSIDE AIR INTAKE ON ECONOMIZERS OR DAMPERS SHALL BE IN MINIMUM OPEN POSITION TO DELIVER CFM'S INDICATED IN AIR BALANCE SCHEDULE ON SHEET M601.

ECONOMIZER OPERATION (IF APPLICABLE)

THE RTU'S EQUIPPED WITH ECONOMIZERS (SEE PLANS) SHALL UTILIZE "FREE COOLING" AS THE FIRST STAGE OF COOLING. WHEN OUTSIDE AIR ENTHALPY IS LOWER THAN THE MIXED AIR ENTHALPY, OUTSIDE AIR INTAKE DAMPERS SHALL MODULATE FROM MIN. TO MAX. OPEN POSITION AND SPACE RETURN AIR DAMPERS SHALL MODULATE FROM MAX. TO MIN. TO MIN. RELIEF DAMPERS SHALL BE CONTROLLED EXCLUSIVELY VIA INTEGRAL RTU CONTROL. IF THE OUTSIDE AIR ALONE CANNOT MEET THE SPACE COOLING DEMAND, THE COMPRESSORS SHALL BE ENERGIZED. WHEN OUTSIDE AIR ENTHALPY IS HIGHER THAN MIXED AIR ENTHALPY, OR WHEN THE LOW LIMIT SENSOR LOCATED IN DISCHARGE AIR REACHES ITS SET POINT (55°F -ADJ.), THEN OUTDOOR AIR AND RETURN AIR DAMPERS SHALL BE SET TO DELIVER MINIMUM O.A. CFM'S INDICATED IN THE AIR BALANCE SCHEDULE.

NIGHT SETBACK OPERATION (UNOCCUPIED)

ALL RTU'S SPACE TEMPERATURE SET POINTS: 85°F COOLING, 55°F HEATING

ALL RTU'S EVAPORATOR FAN, COMPRESSORS AND HEATER SHALL RUN ON DEMAND ONLY. ANY MOTORIZED OUTSIDE AIR DAMPERS SHALL BE IN CLOSED POSITION. M.C. SHALL VERIFY REQUIREMENT FOR AUTOMATIC SETBACK CONTROL WITH LOCAL AUTHORITIES AND COORDINATE WITH EQUIPMENT SUPPLIER.

EMERGENCY OPERATION:

EVAPORATOR FAN ON EACH RTU UNIT SHALL ALSO BE SHUT DOWN BY ITS SMOKE DETECTOR (IF APPLICABLE) UPON DETECTING SMOKE.

AIR BALANCE SCHEDULE

UNIT	AREA SERVED	SUPPLY AIR	RETURN AIR	OUTSIDE AIR	EXHAUST AIR
RTU-1	SALES	2100 CFM	1550 CFM	550 CFM	-
RTU-2	STOCK ROOM	960 CFM	735 CFM	225 CFM	-
EP-1	RESTROOMS	-	-	-	75 CFM
EP-2	RESTROOMS	-	-	-	75 CFM
TOTAL:		3060 CFM	2285 CFM	775 CFM	150 CFM
BUILDING PRESSURE:				625 CFM	POSITIVE

VENTILATION SCHEDULE

SYSTEMS	AREA	VENT/EXHAUST REQ'D	MIN. REQUIRED VENT. (CFM)	TOTAL MIN. REQUIRED VENT. (CFM)	PROVIDED VENT. (CFM)	MIN. REQUIRED EXHAUST (CFM)	PROVIDED EXHAUST (CFM)
RTU-1	OFFICE	SEE 2018 NCM CALCS	54	630	650	-	-
	RESTROOMS	SEE 2018 NCM CALCS	-			-	140
RTU-2	SALES	SEE 2018 NCM CALCS	517	751	775	-	-
	STORAGE	SEE 2018 NCM CALCS	220			225	-
TOTALS			751	751	775	140	150

NOTES:

- 1. VENTILATION RATES PER 2018 NORTH CAROLINA MECHANICAL CODE.
- 2. OUTSIDE AIR QUANTITIES ARE SHOWN IN AIR BALANCE SCHEDULE.

GENERAL NOTES

GENERAL CONSTRUCTION:

1. ALL WORK SHALL BE PERFORMED BY A LICENSED CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL INSTALL SYSTEMS, EQUIPMENT AND COMPONENTS IN ACCORDANCE WITH MINIMUM REQUIREMENTS SHOWN IN THESE PLANS. ANY DEVIATION FROM THE DESIGN PLANS SHALL ONLY BE PERFORMED IF APPROVED BY THE OWNER REPRESENTATIVE OR DESIGN ENGINEER. ALL WORK SHALL MEET OR EXCEED THE MINIMUM REQUIREMENTS OF ALL APPLICABLE CODES AND STANDARDS. HOWEVER, ANY DEVIATION FROM THE DESIGN PLANS IMPLIED BY LOCAL CODES THAT SUGGESTS INSTALLATION OF LESS THAN THE REQUIREMENTS SPECIFIED IN THESE DESIGN PLANS SHALL NOT BE ALLOWED WITHOUT APPROVAL BY THE OWNER REPRESENTATIVE OR THE DESIGN ENGINEER.

2. THE GENERAL CONTRACTOR SHALL PROVIDE ALL ROOF OPENINGS. THE G.C. SHALL VERIFY SIZES AND LOCATIONS IN THE FIELD BEFORE ROOFING IS INSTALLED.

HVAC SYSTEMS & UNITS

3. THE RTU, ACCESSORIES, FILTERS, ALL DUCT, SUPPLY FANS, REGISTERS, RETURN GRILLES, AND FANS, ARE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR UNLESS OTHERWISE NOTED ON PLANS. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR AS REQUIRED ON PLAN.
4. THE MECHANICAL CONTRACTOR SHALL PROVIDE AN OPERATION AND MAINTENANCE MANUAL AND COMPLETE AS-BUILT DRAWINGS TO THE BUILDING OWNER UPON COMPLETION OF THE JOB. THE MANUAL SHALL INCLUDE BASIC DATA RELATING TO THE OPERATION AND MAINTENANCE OF NEW HVAC SYSTEMS. EQUIPMENT AS WELL AS NAMES AND ADDRESSES OF QUALIFIED SERVICE AGENCIES. REQUIRED ROUTING AND MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED. HVAC CONTROL DIAGRAMS, SEQUENCING CONTROL SEQUENCE DESCRIPTIONS, AND CALIBRATION INFORMATION SHALL BE INCLUDED DESIRED OR FIELD DETERMINED SET POINTS MUST BE PERMANENTLY MARKED ON CONTROL DRAWINGS, AT CONTROL DEVICES, OR FOR DIGITAL CONTROL SYSTEMS. PROGRAMMING COMMENTS, THE MANUAL SHALL INCLUDE A COPY OF THE CONTROL SYSTEMS TESTING REPORT AND A COPY OF THE AIR BALANCE REPORT.

THE MECHANICAL CONTRACTOR SHALL INSTALL EQUIPMENT AND ALL ACCESSORIES IN ACCORDANCE WITH INSTALLATION INSTRUCTIONS FURNISHED WITH THE EQUIPMENT, INCLUDING BUT NOT LIMITED TO:

- ALL EXTERNAL DUCT WORK.
- REMOVE ALL SHIPPING TE-DOWN AND SHIPPING BLOCKS.
- INSTALL ALL BLOWER BELTS AND ACCESSORIES.
- INSTALL ALL EXTERNAL CONTROLLING DEVICES, SUCH AS THERMOSTATS AND DUCT SENSORS.
- POWER, CONTROL WIRING AND FUEL PIPING TO BE PERMANENTLY INSTALLED AND CONNECTED TO THE EQUIPMENT.
- ALL SPLIT SYSTEMS MUST BE PIPED AND CHARGED COMPLETELY (WHERE APPLICABLE).
- ALL COMPRESSORS WHICH UTILIZE CRANKCASE HEATERS MUST HAVE HEATER ENERGIZED FOR 24 HOURS BEFORE STARTING EQUIPMENT.
- COMPLETE START-UP, TEST AND RUN OF ALL UNITS AT LEAST 24 HOURS PRIOR TO THE E.O.C.
- ALL FILTERS MUST BE INSTALLED AND CLEAN.
- CHECK THAT ALL NEW RTU'S HAVE BEEN NUMBERED IN THE FIELD AS SHOWN ON PLANS (I.E. RTU#1, RTU#2 ETC.).
- 6. THE MECHANICAL CONTRACTOR SHALL NOT SCALE THE DRAWINGS FOR RTU AND FAN SIZES. THE MECHANICAL CONTRACTOR SHALL OBTAIN THE LATEST SHOP DRAWINGS FROM THE MANUFACTURER FOR EACH PIECE OF EQUIPMENT AND USE IT FOR ACTUAL DIMENSIONS.

DUCT INSTALLATION, GRILLES/DIFFUSERS AND AIR BALANCE

7. DUCTWORK LAYOUTS ARE ACTUAL. ALL RISES, DROPS, AND OFFSETS REQUIRED (EVEN IF NOT SHOWN) SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER. DUCTWORK DIMENSIONS ARE INSIDE "CLEAR" DIMENSIONS AND DO NOT INCLUDE INSULATION WHERE STRUCTURAL OBSTRUCTIONS ARE ENCOUNTERED, DUCT DIMENSIONS MAY BE CHANGED TO PROVIDE DUCTS OF EQUAL AREAS WITH ASPECT RATIOS NO GREATER THAN 4 TO 1. IF THE ABOVE CRITERIA CAN NOT BE MET, THE CONTRACTOR OR OWNER'S REPRESENTATIVE SHOULD CONTACT THE ENGINEER TO WORK OUT AN ACCEPTABLE SOLUTION.

8. DUCTWORK SHALL HAVE RIGHT-OF-WAY OVER ALL PLUMBING PIPES AND ELECTRICAL CONDUIT ETC. DO NOT RELOCATE DUCTWORK BY BUILDING OFFSETS UNLESS APPROVED BY THE OWNER'S REPRESENTATIVE AND THE ENGINEER. MECHANICAL CONTRACTOR SHALL FIELD MEASURE ALL CONDITIONS AND BE RESPONSIBLE FOR COORDINATION AND FIT. DO NOT SCALE DUCTWORK SIZES ON DRAWINGS.

9. THE MECHANICAL CONTRACTOR SHALL INSTALL G.C. PROVIDED RTU DUCTWORK SYSTEM MADE OF GALVANIZED SHEET METAL (RECTANGULAR AND/OR ROUND). ALL SHEET METAL DUCTWORK SHALL BE PER "SMACNA" STANDARDS. ALL FLEX DUCT SHALL BE INSULATED AND UL 181 LISTED CLASS I, METAL GAUGES, FITTINGS AND INSTALLATION SHALL BE PER "SMACNA" LATEST EDITION OF "HVAC METAL DUCT STANDARDS". KEEP A COPY OF THE "SMACNA" STANDARDS ON THE JOBSITE. ESPECIALLY REFER TO THE "SMACNA" STANDARDS FOR ELBOWS AND FITTINGS. SUPPORT DUCTS FROM THE STRUCTURE WITH STRAPS AT EACH JOINT PER "SMACNA" STANDARDS. ALSO REFER TO DETAILS AND SECTIONS IN THIS SET OF DRAWINGS WHICH TAKE PRECEDENCE.

10. INSTALL TURNING VANES IN SUPPLY DUCTWORK AT ALL SQUARE ELBOWS. PROVIDE BALANCING DAMPERS IN ALL DUCTS WHERE REQUIRED FOR SYSTEM BALANCING AND AT EACH AIR OUTLET OR DIFFUSER. DIFFUSERS SHALL BE INSTALLED WITH CONTRACTOR SUPPLIED SQUARE TO ROUND TRANSITION WHERE REQUIRED.

11. ALL JOINTS, LONGITUDINAL AND TRANSVERSE SEAMS AND CONNECTIONS IN DUCTWORK SHALL BE SECURELY SEALED USING WELDMENTS, MECHANICAL FASTENERS WITH SEALS, GASKETS OR MASTICS OR PRESSURE SENSITIVE TAPES. DUCTS SHALL BE CONNECTED TO FANS AND AIR DEVICES USING MECHANICAL FASTENERS WITH SEALS, MASTICS OR GASKETS. TAPES AND MASTICS MUST BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A OR UL 181B.

12. ALL RTU'S METAL SUPPLY AND RETURN AIR DUCTS SHALL BE THERMALLY INSULATED WITH R-6.0 (MIN.) EXTERNAL DUCTWRAP WITH VAPOR BARRIER (EXCEPT IF OTHERWISE NOTED ON DRAWINGS). NO THERMAL INSULATION IS REQUIRED ON EXHAUST DUCTS.
13. APPLY INSULATION ON RIGID METAL DUCTWORK PER MANUFACTURER SPECIFICATIONS WITH 2" (MIN.) OVERLAPPING FASTENED 6" O.C. WITH 1/2" (MIN.) STAPLES. SEAL ALL JOINTS WITH PRESSURE SENSITIVE FOIL TAPE. INSULATION ON DUCTS OVER 24" WIDE, SHALL BE SECURED TO THE BOTTOM OF DUCT TO PREVENT SAGGING. EXTERNAL INSULATION IS REQUIRED ON ALL CONCEALED DUCT, INTERNAL INSULATION IS NOT ACCEPTABLE.

14. THE MECHANICAL CONTRACTOR SHALL BALANCE BUILDING HVAC AIR FLOW AS SHOWN ON PLANS. THE MECHANICAL CONTRACTOR SHALL ADJUST AIR CFM AND FLOW PATTERNS AS INDICATED ON PLAN, SCHEDULES AND NOTES. HVAC SYSTEM COMMISSIONING SHALL BE PERFORMED BY N.E.B.C. CERTIFIED BALANCING AGENCY SERVING AS A BALANCING CONTRACTOR (B.C.). B.C. SHALL BE RESPONSIBLE FOR FINAL ADJUSTMENTS AND ENSURING AN OVERALL POSITIVE BUILDING PRESSURE WITH ALL EXHAUST, M.U. AIR FANS AND RTU EVAPORATOR FANS OPERATING. THE POSITIVE BUILDING AIR FLOW REQUIREMENT MUST NOT BE REDUCED. ADJUST EXISTING RTU OUTSIDE AIR QUANTITIES AS REQUIRED TO PROVIDE MIN. POSITIVE PRESSURE AS INDICATED.

15. ALL DIFFUSERS SHALL BE INSULATED WITH FIBERGLASS INSULATION WITH VAPOR BARRIER PERMANENTLY ATTACHED TO THE DIFFUSER. DIFFUSERS SHALL BE INSTALLED WITH CONTRACTOR SUPPLIED SQUARE TO ROUND TRANSITIONS WHERE REQUIRED.

POWER & WIRING

16. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL REQUIRED (POWER) FIELD WIRING FOR PROPER OPERATION OF ALL MECHANICAL SYSTEMS.

WILLIAMS ASSOCIATES
MECHANICAL ENGINEERS ARCHITECTS
1505 COUNTRY CLUB ROAD, SUITE 103
WINSTON-SALEM, NC 27104
PHONE: 919.234.0057 FAX: 919.234.9316



PROJECT: SHERWIN - WILLIAMS
4809 COUNTRY CLUB ROAD
SUITE 103
WINSTON-SALEM, NC 27104

DRAWING: MECHANICAL SCHEDULES AND NOTES

Revisions

NO.	REVISION DATE

PROJECT DATE
6/24/2019

Drawn By
RJB

Checked By
MJM

Sheet No.

M601