a) PROVIDE ENERGY RECOVERY UNIT SUITABLE FOR OUTDOOR INSTALLATION AND W INDICATED WITHIN THE EQUIPMENT SCHEDULES AND THE ARRANGEMENT AS ILLUSTRATED WITHIN THE FLOOR PLANS AS WELL AS ALL FEATURES AND ACCESSORIES NOTED WITHIN THE DRAWINGS.

b) CASING SHALL BE OF DOUBLE WALLED CONSTRUCTION WITH EXTERIOR AND INTERIOR CASING BEING CONSTRUCTED OF GALVANIZED STEEL WITH WATERPROOF INSULATION.

c) INSTALLATION: THE ENERGY RECOVERY UNIT SHALL BE ROOF MOUNTED WITH FACTORY SUPPLIED 18" (MINIMUM) ROOF CURB. UNIT SHALL BE ORIENTED WITH BOTTOM RETURN/SUPPLY AIR CONNECTIONS.

10. FAN COIL UNITS

a) PROVIDE FAN COIL UNITS (4-PIPE) IN THE CAPACITIES AND QUANTITIES AS INDICATED WITHIN THE PLANS AND EQUIPMENT SCHEDULES. FAN COILS SHALL BE MANUFACTURED BY EITHER: JCI, WILLIAMS, TITUS, YORK, TRANE. PRICE OR CARRIER.

b) DRAIN PANS: ALL FAN COIL UNITS SHALL BE PROVIDED WITH MANUFACTURER PROVIDED DRAIN PANS AND CONDENSATE DRAIN CONNECTION. ALL FAN COIL UNITS LOCATED ABOVE HARD CEILINGS, IN NON-ACCESS SPACES, OR WITHIN THE VICINITY OF ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH AN AUXILIARY (SECONDARY) DRAIN PAN WHICH SHALL BE FABRICATED BY THE CONTRACTOR. THE AUXILIARY PAN SHALL NOT BE LESS THAN 3 INCHES LARGER THAN THE UNIT OR THE COIL DIMENSIONS IN WIDTH AND LENGTH AND SHALL BE CONSTRUCTED OF CORROSION-RESISTANT MATERIAL.GALVANIZED SHEET STEEL PANS SHALL HAVE A MINIMUM THICKNESS OF NOT LESS THAN 0.0236 INCH (0.6010 MM) (NO. 24 GAGE). NONMETALLIC PANS SHALL HAVE A MINIMUM THICKNESS OF NOT LESS THAN 0.0625 INCH (1.6 MM). THE AUXILIARY PAN SHALL HAVE A MINIMUM HOLDING DEPTH OF 1-1/2 INCHES. THE PAN SHALL BE EQUIPPED WITH A WATER-LEVEL DETECTION DEVICE CONFORMING TO UL 508 THAT WILL SHUT OFF THE EQUIPMENT SERVED PRIOR TO OVERFLOW OF THE PAN. WATER LEVEL DETECTOR SHALL ISSUE AN ALARM TO THE BUILDING AUTOMATION SYSTEM.

c) PROVIDE VALVING AND FITTINGS AS SHOWN ON DETAILS.

d) PROVIDE ALL FAN COIL UNITS WITH FULLY MODULATING ECM MOTORS.

e) PROVIDE UNIT MOUNTED DISCONNECT SWITCH.

- III. <u>HYDRONIC SYSTEMS:</u>
- 1. PIPING AND FITTINGS:

a) ALL EXPOSED PIPING SHALL BE WRAPPED IN PVC JACKET AND MAINTAIN REQUIRED INSULATION VALUES. COLORS BY ARCHITECT b) PIPE MATERIALS AND FITTING MATERIALS SHALL BE AS INDICATED IN SCHEDULE OF PIPE AND FITTING MATERIALS.

NOTE: THERE SHALL BE NO MECHANICAL COUPLED FITTINGS. c) PIPING 2-1/2 AND LARGER AND ALL DIRECT-BURIED PIPING SHALL BE WELDED STEEL. PIPING 2" AND SMALLER (EXCEPT DIRECT-BURIED PIPING) SHALL BE SCREWED STEEL OR COPPER, STEEL PIPING SHALL BE ASTM A53 OR A106, GRADE B, COPPER PIPING SHALL BE ASTM B88.

d) PRO-PRESS AND COPPER LOCK GLUE FITTINGS ARE NOT PERMITTED. SCHEDULE OF PIPING AND FITTING MATERIALS

SERVICE	PIPE MATERIAL WEIGHT	JOINT TYPE/ STYLE	FITTING MATERIAL	PRESSURE RATING (PSIG, SWP OR WEIGHT)
CHILLED / HOT WATER	STEEL SCHEDULE 40 or TYPE 'L' COPPER	SCREWED IRON or 95/5 SOLDERED	MALLEABLE or WROUGHT COPPER	150 PSIG
CHILLED / HOT WATER	STEEL SCHEDULE 40	WELDED	STEEL	SCHEDULE 40
CONDENSER WATER	STEEL SCHEDULE 40 or TYPE 'L' COPPER	SCREWED IRON or 95/5 SOLDERED	MALLEABLE or WROUGHT COPPER	150 PSIG
CONDENSER WATER	STEEL SCHEDULE 40	WELDED	STEEL	SCHEDULE 40
HEATING HOT WATER	STEEL SCHEDULE 40 or TYPE 'L' COPPER	SCREWED IRON or 95/5 SOLDERED	MALLEABLE or WROUGHT COPPER	150 PSIG
HEATING HOT WATER	STEEL SCHEDULE 40	WELDED	STEEL	SCHEDULE 40
CLEAR WATER CONDENSATE DRAIN	TYPE 'L' COPPER	95/5 SOLDERED	WROUGHT COPPER	125 PSIG
STEAM (LP)	STEEL SCHEDULE 40	SCREWED	MALLEABLE	150 PSIG
STEAM (LP)	STEEL SCHEDULE 40	WELDED	STEEL	SCHEDULE 40
STEAM CONDENSATE	STEEL SCHEDULE 80	WELDED	STEEL	SCHEDULE 80

2. VALVES AND STRAINERS

a) VALVES SHALL HAVE NAME OF MANUFACTURER AND GUARANTEED WORKING PRESSURE CAST OR STAMPED ON BODIES. VALVES OF SIMILAR TYPE SHALL BE BY A SINGLE MANUFACTURER. VALVES SHALL BE AS MANUFACTURED BY APOLLO, CRANE, HAMMOND, JENKINS, STOCKHOLM OR MILWAUKEE.

b) FOR WATER SERVICE, STRAINERS SHALL BE FULL SIZE OF EXTERNAL PIPE SIZE AND HAVE A MAXIMUM CLEAN PRESSURE DROP OF ONE PSI (FOR STEAM CONDENSATE 1/4 PSI). STRAINERS SHALL BE PER MANUFACTURER'S TABLE BY SARCO, WATTS, OR ARMSTRONG. INSTALL STRAINERS AT LOCATIONS THAT WILL ALLOW REMOVAL OF SCREENS FOR CLEANING.

DIVISION 23: HEATING, VENTILATING AND AIR CONDITIONING REQUIREMENTS

WITH THE CAPACITIES AS	

c) VALVE FOR WATER SERVICES SHALL BE AS SHOWN ON THE FOLLOWING TABLE(S):

GLYCOL AND HOT WATER SERVICE MAXIMUM 250°F AND 175 PSIG (1/2" THRU 12"); 125 PSIG (14" THRU 24")

<u>SPECIALTY</u>	<u>APPLICATION</u>	<u>TYPE</u>	<u>SIZEONI</u> (INCIPPES	NEBODIN/SEAT; BODY/TRIM		IMUM RATING DTES 1 & 2)
BALL VALVE	ISOLATION (WITH LOCKING HANDLE) AND MODULATION	FULL PORT, 3-PIECE	1/2" TO 2"	BRONZE / TEFLON	SWEAT (NOTE 1)	400 PSIG WOG
		FULL PORT, 3-PIECE	1/2" TO 2"	BRONZE / TEFLON	THREADED	400 PSIG WOG
GATE VALVE	NOT USED					
GLOBE VALVE	ATC MODULATION	CONTROL VALVE	1/2" TO 6"	BRONZE / METAL	THREADED	400 PSIG WOG
BUTTERFLY VALVE	ISOLATION AND MODULATION	GENERAL SERVICE	2- 1 " - 12"	DUCTILE IRON / EPDM	THREADED LUG	200 PSIG CWP; 200 PSIG BI-DIRECTIONAL SHUTOFF 200 PSIG DEAD END SERVICE
			14" - 24"	DUCTILE IRON / EPDM	THREADED LUG	150 PSIG CWP; 150 PSIG BI-DIRECTIONAL SHUTOFF 150 PSIG DEAD END SERVICE
PLUG VALVE	MANUAL BALANCING	NON - LUBRICATED	3" TO 12"	STEEL / IRON	FLANGED	CLASS 125
CHECK VALVE	PUMPS	SILENT	1" TO 2"	BRONZE / BRONZE	THREADED	200 PSIG WOG
		SILENT GLOBE	2- <u>1</u> " TO 24"	IRON / BRONZE	FLANGED	CLASS 125
	PIPING	Y-PATTERN SWING	¹ / ₂ " TO 2"	BRONZE / BRONZE	THREADED	200 PSIG WOG
			2- <u>1</u> " TO 24"	IRON / BRONZE	FLANGED	CLASS 125
STRAINER	CONTROL VALVES AND FLOW METERS	Y-TYPE	¹ / ₂ " ΤΟ 2"	BRONZE / STAINLESS (¹ ₁₆ " DIAMETER)	THREADED	200 PSIG WOG
			2- <u>1</u> " TO 4"	$\frac{1}{16} \text{IRON / STAINLESS} \\ \left(\frac{1}{16} \text{" DIAMETER}\right)$	FLANGED	CLASS 125
			5" TO 24"	IRON / STAINLESS (1/8" DIAMETER)	FLANGED	CLASS 125
	PUMP SUCTION	Y-TYPE	1/2" TO 2"	BRONZE / STAINLESS (¹ ₁₆ " DIAMETER)	THREADED	200 PSIG WOG
			2- <u>1</u> " TO 4"	IRON / STAINLESS (3/16" DIAMETER)	FLANGED	CLASS 125
			5" TO 24"	IRON / STAINLESS (1/4" DIAMETER)	FLANGED	CLASS 125
		ANGLE SUCTION DIFFUSER END SUCTION PUMPS	2" TO 12"	IRON / STAINLESS (3/16" DIAMETER)	FLANGED	CLASS 125

NOTES:

1) THESE ARE MINIMUM RATINGS FOR ASTM A126, CLASS B AND ASTM B-61 AND 62. FOR HIGHER PRESSURES AND TEMPERATURES, ADJUST THESE VALUES TO INCLUDE STATIC HEAD PLUS 1.1 TIMES PRESSURE RELIEF VALVE SETTING PLUS PUMP SHUTOFF HEAD PRESSURE. FOR ACTUAL MAXIMUM ALLOWABLE VALVE AND PRESSURE RATINGS, REFER TO "PRESSURE-TEMPEATURE RATINGS -NON SHOCK" TABLES AND "ADJUSTED PRESSURE RATINGS" FOR COPPER TUBE, SOLDERED END VALVES AND STRAINERS.

2) SWP = STEAM WORKING PRESSURE CWP = COLD WATER WORKING PRESSURE WSP = WORKING STEAM PRESSURE WOG = WATER, OIL OR GAS

3) USE 1/8" DIAMETER FOR PLATE HEAT EXCHANGER APPLICATION.

3. AUTOMATIC FLOW CONTROL VALVES

CLASS = ANSI STANDARD

a) PROVIDE AUTOMATIC PRESSURE COMPENSATING FLOW CONTROL VALVES BY GRISWOLD OR AUTOFLOW WHERE INDICATED ON THE DRAWINGS. VALVES SHALL BE FACTORY SET AND SHALL AUTOMATICALLY LIMIT THE RATE OF FLOW TO REQUIRED ENGINEERED CAPACITY WITHIN ±5% ACCURACY OVER AN OPERATING PRESSURE DIFFERENTIAL OF AT LEAST 14 TIMES THE MINIMUM REQUIRED FOR CONTROL. PROVIDE GAUGE KIT VALVE MANUFACTURER FOR USE BY BUILDING OPERATING PERSONNEL.

4. COMBINATION BALANCING AND SHUT-OFF VALVES:

a) PROVIDE CALIBRATED COMBINATION BALANCING SHUT-OFF VALVES. ACCEPTABLE MANUFACTURERS SHALL BE ARMSTRONG, BELL AND GOSSET, FLOWSET, OR TACO.

5. PIPING INSULATION

a. PIPE INSULATION SHALL BE FIBROUS GLASS INSULATION WITH FACTORY-APPLIED FIRE RETARDANT VAPOR BARRIER JACKET WITH MAXIMUM K FACTOR OF 0.23 AT 75°F MEAN TEMPERATURE: INSULATION SHALL BE BY OWNERS CORNING, CERTAIN-TEED, MANVILLE, OR KNAUF. ASTM E-84 FIRE HAZARD RATINGS SHALL BE 25 FLAME SPREAD. 50 SMOKE DEVELOPED AND 50 FUEL CONTRIBUTED. ALL OUTDOOR PIPING SHALL BE TWO (2) TIMES THE THICKNESS LISTED IN THE TABLE BELOW AND SHALL BE ADDITIONALLY COVERED WITH WEATHERPROOF ALUMINUM JACKET.

b. COOLING COIL CONDENSATE DRAIN PIPING FIBROUS GLASS INSULATION.

c. REFRIGERANT SUCTION LINES, REFRIGERANT HOT GAS BYPASS LINES, OUTDOOR COOLING TOWER DRAIN PIPING, AND OUTDOOR REFRIGERANT LIQUID LINES SHALL BE INSULATED WITH 3/4" THICK RIGID CLOSED CELL FOAM INSULATION, ARMSTRONG RIGID ARMAFLEX, MANVILLE, OWNES CORNING, OR HALSTEAD/NOMACO (INSULTUBE), EXCEPT IN COMPUTER ROOM PLENA AND RETURN AIR PLENUM PIPING SHALL BE INSULATED WITH 3/4" FIBERGLASS PIPE INSULATION. ALL OUTDOOR PIPING SHALL BE ADDITIONALLY COVERED WITH WEATHERPROOF ALUMINUM JACKET.

SCHEDULE OF PIPE INSULATION THICKNESS:

FLUID SERVICE	PIPE DIAMETER (INCHES)		
	PIPE SIZE UNDER 1-1/2 INCH	PIPE SIZE 1-1/2 INCH AND OVER	
HEATING HOT WATER	1.5 THICK	2.0 THICK	
CHILLED WATER, BRINE, OR GLYCOL	1.5 THICK	1.5 THICK	
COOLING COIL CONDENSATE	0.75 THICK	0.75 THICK	
CONDENSER WATER	N/a	N/a	
STEAM AND STEAM CONDENSATE	1.5 THICK	3.0 THICK	

- 6. EQUIPMENT INSULATION
- a) INSULATION SHALL BE CERTAIN-TEED, KNAUF, MANVILLE, OR OWENS CORNING AND SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- b) INSULATE THE FOLLOWING EQUIPMENT:
- 1) HEAT EXCHANGERS 2) EXPANSION TANKS 3) AIR SEPARATORS 4) CONDENSATE DRAIN PANS 5) DUCT-MOUNTED COILS 6) PUMPS
- IV. AUTOMATIC TEMPERATURE CONTROLS
- PROVIDE COMPLETE SYSTEM OF AUTOMATIC TEMPERATURE CONTROLS BY BUILDING CONTROL MANUFACTURER. CONTROL SYSTEM SHALL BE CAPABLE OF PERFORMING ALL SEQUENCES OF OPERATION TO CONFORM WITH BUILDING STANDARDS. INDIVIDUAL CONTROL COMPONENTS MAY NOT BE SHOWN ON CONTRACT DOCUMENTS, BUT ATC CONTRACTOR SHALL PROVIDE ALL COMPONENTS AND CONTROL WIRING NECESSARY FOR A COMPLETE OPERABLE SYSTEM. ATC CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SYSTEM COMPONENTS, WHETHER HE SUBCONTRACTS ELECTRICAL AND OTHER WORK OR NOT. ALL CONTROL VALVES SHALL BE ELECTRICALLY ACTUATED.
- 2. ALL CONTROL WIRING SHALL COMPLY WITH THE REQUIREMENTS OF THE ELECTRICAL SECTION OF THESE CONTRACT DOCUMENTS.
- 3. THERMOSTATS INSTALLED ON EXTERIOR WALLS SHALL BE PROVIDED WITH INSULATED BACK PLATES.
- 4. PNEUMATIC TUBING, IF PROVIDED, SHALL BE TYPE FR POLYETHYLENE. IF TUBING IS USED FOR OPERATING A COMPONENT OF A SMOKE CONTROL SYSTEM, IT SHALL BE ENCLOSED IN CONDUIT.
- 5. WIRING BETWEEN FIRE ALARM SYSTEM AND TEMPERATURE CONTROL SYSTEM, EXCEPT FOR DUCT MOUNTED SMOKE DETECTORS, SHALL BE BY ATC CONTRACTOR.
- 6. DDC/BUILDING AUTOMATION SYSTEM INTERFACE
- a) PROVIDE ALL NECESSARY COMPONENTS AND WIRING FOR INTERLOCK TO EXISTING DDC/BUILDING AUTOMATION SYSTEM. ALL COMPONENTS MUST BE COMPATIBLE WITH EXISTING OUTPUT DEVICES. PROVIDE HAND HELD OPERATOR'S TERMINALS FOR LOCAL OUTPUT OF SENSORS WHEN NO OUTPUT DEVICES EXIST.
- b) PROVIDE TO OWNER FULL OPERATING AND MAINTENANCE INSTRUCTIONS FOR NEW AND/OR ALTERATION OF DDC SYSTEMS.
- c) ATC SHALL UPDATE BMS EQUIPMENT GRAPHICS PER BASE BUILDING ENGINEER STANDARDS AND REQUIREMENTS.

CROCKFORDS -**RESORTS WORLD** CATSKILLS

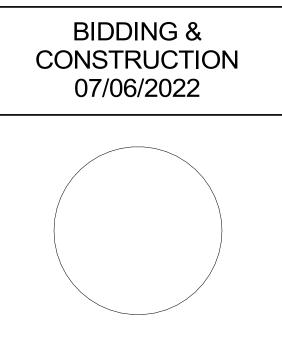
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SPECIFICATIONS

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