

HOT WATER BOILER SCHEDULE

MARK	LOCATION		TYPE	CAPACITY (MBH)	EFF (%)	FUEL TYPE	COIL DATA			ELECTRICAL			WEIGHT (LBS)
	ROOM NUMBER	ROOM NAME					GPM	EWT (°F)	LWT (°F)	V	PH	V	
B-1	M02	BOILER RM.	CONDENSING	1500	95	NAT GAS	96	110	140	120	1		1410
B-2	M02	BOILER RM.	CONDENSING	1500	95	NAT GAS	96	110	140	120	1		1410

BOILER SCHEDULE (B-1, B-2)

AERCO BENCHMARK 1500 MODULATING CONDENSING BOILER 96 GPM, AT 30 DEG DELTA T, 1500.0 MBH INPUT AND 1440.0 MBH OUTPUT, MINIMUM 20:1 MODULATING FIRING INPUT, 20:1 TURNDOWN, MINIMUM OUTPUT 71.2 MBH. PROVIDE BOILER MANAGEMENT CONTROLLER FOR MULTIPLE BOILER OPERATION. PROVIDE 75 PSI RELIEF VALVE, 270V X 450V TYP, 1500 LBS. PROVIDE BOILER MANAGEMENT PANEL FOR MULTIPLE BOILER INSTALLATION. SUPPLY WATER TEMPERATURE 140°F, RETURN TEMPERATURE 110°F. COORDINATE FINAL SIZE, VOLTAGE AND PHASE OF THE ELECTRICAL REQUIREMENTS OF THE BOILER WITH THE ELECTRICIAN. PROVIDE BOILER WITH CONTROL PANEL TO INTERFACE WITH THE BMS SYSTEM. 6" FLUE AND COMBUSTION AIR CONNECTIONS. PROVIDE BACKET GATEWAY, COLOR TOUCH SCREEN, MANUAL RESET HIGH LIMIT SWITCHES, ASME CDS-1, AND CONDENSATE NEUTRALIZATION KIT.

BOILER CONTROLLER SHALL CONTROL ITS PRIMARY PUMP OPERATION AND MODULATE THE PRIMARY PUMP SPEED TO MAINTAIN THE DELTA T ACROSS THE BOILER. PROVIDE FACTORY WATER FLOW SWITCH AND LOW WATER CUTOFF.

EQUIVALENTS BY LOCHNAR, BRYAN, LAARS AND AS LISTED IN THE SPECIFICATIONS.

BOILER STACKS

6" DOUBLE WALL STACK ALL STAINLESS STEEL (AL29-4C) CONSTRUCTION, U.L. LISTED, CATEGORY IV BY HEATFAB. SUITABLE FOR USE WITH CONDENSING FORCED DRAFT BOILER SPECIFIED. PROVIDE COMPLETE EXHAUST AND INTAKE DUCTING, INCLUDING ALL DUCTS, ELBOWS, FLANGES, TRIM RING FOR WALL PENETRATION AND WALL CAPS.

AIR CONTROL

HOT WATER
AIR SEPARATOR-TACO 4800AT-125 AIR SEPARATOR WITH STRAINER
EXPANSION TANK-TACO-CASB-125-200 GALLON ASME BLADDER EXPANSION TANK WITH ACCEPTANCE VOLUME = 23 GALLONS. PRECHARGE TO 26.0 PSI. EQUIVALENTS IN THE SPECIFICATIONS.

AIR-COOLED CHILLER SCHEDULE

MARK	MANUFACTURER	MODEL	COMPRESSOR TYPE	NOMINAL TONS	EER (ARHI CONDITIONS)		EVAPORATOR		ELECTRICAL			PH		
					FULL LOAD	IPLV	LWT (°F)	GPM	ΔP	MCA	MCOOP		V	
CH-1	TRANE	CGAM 100	SCROLL	100	10.15	15.93	59	44	157	6.8	207	250	480	3
CH-2	TRANE	CGAM 100	SCROLL	100	10.15	15.93	59	44	157	6.8	207	250	480	3

TRANE AIR COOLED SCROLL CHILLER, MODEL CGAM 100 REFRIGERANT R-513-A, 100 FULL LOAD TONS, AND EER OF 10.15, AT 98°F AMBIENT PER AHR1 550/550. PROVIDE NEOPRENE VIBRATION ISOLATORS. PROVIDE ENCLOSURE PANELS AROUND COMPLETE UNIT WITH LOW SOUND FANS. PROVIDE SUPERIOR SOUND LEVEL PACKAGE, THE OVERALL A-WEIGHTED SOUND POWER LEVEL SHALL NOT EXCEED 68 DB AFTER ATTENUATION, AS MEASURED PER ASHRAE STANDARD 370. PROVIDE WIDE AMBIENT OPTION REQUIRED FOR 25 - 125°F OPERATION. PROVIDE SUCTION AND DISCHARGE SERVICE VALVE FOR EACH COMPRESSOR. PROVIDE SINGLE POINT 480 VOL. POWER CONNECTION THAT FEEDS CHILLER AND PROVIDE AN ADDITIONAL 20 KVA POWER CONNECTION FOR THE EVAPORATOR HEAT PUMP, TEAO CONDENSER FAN MOTORS. PROVIDE FACTORY MOUNTED AND WIRED CONTROL TRANSFORMER, FACTORY MOUNTED AND WIRED EVAPORATOR HEATER FOR FREEZE PROTECTION TO -20°F. PROVIDE CONTROL PANEL THAT PROVIDES CHILLED WATER SETPOINT ADJUSTMENT AND DEMAND LIMITING VIA 4-20 MA INPUT. PROVIDE HIGH SHUNT CIRCUIT CURRENT RATED CONTROL PANEL. CONTROL PANEL SCOR RATING SHALL BE MINIMUM 65 KA. PROVIDE BACKET CONTROL INTERFACE, 480/60, MCA 207, MOP = 250 PM, 0.33 FT. HD, PRESSURE DROP AT 98°F EWT AND 44°F LWT, WEIGHT = 8,800 LBS. MINIMUM EVAPORATOR FLOW = 130 GPM. EQUIVALENTS BY U.L. CARRIER AND DANAH, OR AS LISTED IN SPECIFICATIONS. TWO REFRIGERATION CIRCUITS. ALL COLD PARTS SHALL BE INSULATED WITH 1-1/2" CLOSED CELL FOAM INSULATION. IF 1-1/2" THICK INSULATION IS NOT AVAILABLE FROM FACTORY, CONTRACTOR SHALL PROVIDE ADDITIONAL INSULATION LAYERS IN THE FIELD. PROVIDE FACTORY FLOW SWITCH AND STRAINER.

THE CHILLER MANUFACTURER SHALL PROVIDE A NOISE REDUCTION SYSTEM TO LIMIT THE CHILLER NOISE AND MEET OR BE LESS THAN AN A-WEIGHTED SOUND PRESSURE LEVEL OF 45 dBA AT ALL PROPERTY LINES ADJACENT TO THE CHILLER YARD. THE NOISE REDUCTION SYSTEM SHALL BE SPECIFICALLY ENGINEERED AND INCLUDE, BUT NOT LIMITED TO, HUSH COVER™ REMOVABLE INSULATION COVERS FOR THE CHILLER COMPRESSORS, DISCHARGE/SUCTION LINES AND OIL SEPARATORS, OUTDOOR GRADE HUSH QUILT™ ACOUSTICAL INSULATION BLANKETS MANUFACTURED WITH TAMERA SORE™ THREAD AND VINYL COATED POLYESTER MATERIALS RATED FOR 20+ YEAR OUTDOOR LIFE WHEN PROPERLY ANCHORED TO A SOLID CMU/CONCRETE ARCHITECTURAL BARRIER WALL (ARCH BARRIER WALL BY OTHERS), HUSH DUCT™ ACOUSTICAL COVERS ATTACHED TO THE COMPRESSOR AND/OR CONDENSER SECTION, HUSH GUARD™ ACOUSTICAL METAL PANELS SURROUNDING THE CHILLER CONDENSER FANS AND/OR THE ENTIRE CHILLER.

THE NOISE REDUCTION SYSTEM SHALL BE MANUFACTURED BY A COMPANY SPECIALIZING IN THE MANUFACTURE OF ACOUSTICAL SYSTEMS AND RELATED ACCESSORIES WITH NOT LESS THAN 20 YEARS DOCUMENTED SUCCESSFUL EXPERIENCE WITH WORK COMPARABLE TO WORK OF THIS PROJECT. ALL NOISE CONTROL MATERIALS MANUFACTURERS SHALL DELIVER A COMPLETE SUBMITTAL INCLUDING A COPY OF AN ACOUSTICAL REPORT IN COMPLIANCE WITH THE ACOUSTICAL PERFORMANCE AS PER THIS SPECIFICATION AND THE COMPLETED SYSTEM SHALL RESULT IN A CHILLER DEGRADATION OF NO MORE THAN 2.5%. THE COMPLETE NOISE REDUCTION SYSTEM SHALL BE INSTALLED BY THE NOISE MATERIALS MANUFACTURER TO ENSURE GUARANTEED FIT AND MEET THE ACOUSTICAL PERFORMANCE AS PER THIS SPECIFICATION. CHILLER MANUFACTURER'S FACTORY ATTENUATION PACKAGES ARE NOT ACCEPTABLE. CHILLER MANUFACTURER'S LOW NOISE FANS ARE ACCEPTABLE. BRD NOISE AND VIBRATION CONTROL, INC., LITEC AND KINETICS ARE CONSIDERED AN ACCEPTABLE SUPPLIER OF THESE PRODUCTS AND SERVICES.

THE OWNER WILL RETAIN THE SERVICES OF A THIRD PARTY TO PERFORM SOUND MEASUREMENTS ON THE COMPLETE SYSTEM AT ALL ADJACENT PROPERTY LINES TO VERIFY COMPLIANCE WITH REQUIREMENTS OF THIS SPECIFICATION. IF OVERALL SOUND PRESSURE LEVEL (OASL) TEST RESULTS DO NOT MEET THE REQUIREMENTS OF THIS SPECIFICATION, THEN THE CHILLER MANUFACTURER/VENDOR SHALL SUPPLY ADDITIONAL SOUND ATTENUATION AND/OR FACILITY MODIFICATIONS TO MEET THIS REQUIREMENT AT NO ADDITIONAL COST TO THE OWNER.

AIR CONTROL

CHILLED WATER
AIR SEPARATOR-01-TACO 4800AT-125 AIR SEPARATOR WITH STRAINER
EXPANSION TANK-01-TACO-CASB-125-200 GALLON ASME BLADDER EXPANSION TANK WITH ACCEPTANCE VOLUME = 23.0 GALLONS PRECHARGE TO 26.0 PSI. EQUIVALENTS IN THE SPECIFICATIONS.

BLOWER FAN COIL UNIT SCHEDULE

MARK	MANUFACTURER	MODEL	SUPPLY FAN			COOLING COIL - 15 DEG. F. WATER TEMP RISE										REHEAT COIL			ELECTRICAL			WEIGHT (LBS)	REMARKS				
			CFM	HP	ESP IN. WG	TSP IN. WG	MOTOR RPM	FAN RPM	EDB (°F)	EWB (°F)	LWB (°F)	LWB (°F)	GPM	TOTAL COOLING (MBH)	SENSIBLE COOLING (MBH)	APD (in w.g.)	WPD (ft)	EDB (°F)	LDB (°F)	HEATING (MBH)	GPM			APD (in w.g.)	WPD (ft)	V	PH
FC-1-514	TRANE	BCVE-36	1000	1.5	1.0	1.9	1616	1616	76	65	58	57	3.65	25.47	19.85	560	1.25	57	56	39.19	2.5	141	30	277	1	250	1.2
FC-1-610	TRANE	BCVE-36	1000	1.5	1.0	1.9	1616	1616	76	65	58	57	3.65	25.47	19.85	560	1.25	57	56	39.19	2.5	141	30	277	1	250	1.2
FC-1-613	TRANE	BCVE-36	1000	1.5	1.0	1.9	1616	1616	76	65	58	57	3.65	25.47	19.85	560	1.25	57	56	39.19	2.5	141	30	277	1	250	1.2
FC-1-617	TRANE	BCVE-36	1000	1.5	1.0	1.9	1616	1616	76	65	58	57	3.65	25.47	19.85	560	1.25	57	56	39.19	2.5	141	30	277	1	250	1.2
FC-1-621	TRANE	BCVE-36	1000	1.5	1.0	1.9	1616	1616	76	65	58	57	3.65	25.47	19.85	560	1.25	57	56	39.19	2.5	141	30	277	1	250	1.2
FC-2-501	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-502	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-503	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-504	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-505	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-506	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-507	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-508	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-509	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-513	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-515	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-517	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-519	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-520	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-522	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-618	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-619	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-2-620	TRANE	BCVE-36	1200	1.5	1.0	2.26	1775	1775	76	65	58	57	4.3	29.7	23.14	79	1.69	58	93	44.87	2.8	190	38	277	1	250	1.2
FC-3-51-1	TRANE	BCVE-60	1900	1.5	.5	1.70	1183	1185	76	65	56	55	8	56.20	41	.76	3.23	60	96	74.9	4.75	176	70	277	1	375	1.2
FC-4-521	TRANE	BCVE-36	2400	3	.75	2.02	1950	1950	76	65	57	56	9.6	65.2	48.13	78	12.06	60	100	106.25	6.65	189	174	480	3	470	1.2

1. CHILLED WATER COILS ARE BASED ON 45 DEG F ENTERING WATER TEMPERATURE AT 15 DEG F. WATER TEMPERATURE RISE
2. REHEAT COIL IS BASED ON 140 DEG F ENTERING WATER TEMPERATURE AND 110 DEG F. LEAVING WATER TEMPERATURE

BLOWER FAN COIL UNIT SCHEDULE - ALTERNATE 2

MARK	MANUFACTURER	MODEL	SUPPLY FAN			COOLING COIL - 10 DEG. F. WATER TEMP RISE										REHEAT COIL			ELECTRICAL			WEIGHT (LBS)	REMARKS				
			CFM	HP	ESP IN. WG	TSP IN. WG	MOTOR RPM	FAN RPM	EDB (°F)	EWB (°F)	LWB (°F)	LWB (°F)	GPM	TOTAL COOLING (MBH)	SENSIBLE COOLING (MBH)	APD (in w.g.)	WPD (ft)	EDB (°F)	LDB (°F)	HEATING (MBH)	GPM			APD (in w.g.)	WPD (ft)	V	PH
FC-1-ALT-2	TRANE	BCH-36	1200	1.5	1.0	2.2	1805	1805	80	67	58	57	7.7	39.1	27.1	79	1.69	58	93	44.87	2.8	190	38	208	3		1.2
FC-2-ALT-2	TRANE	BCH-36	1000	1.0	.5	1.9	1638	1630	80	67	56	55	8.3	33.6	23.2	65	2.1	58	93	38.9	2.5	141	3	208	3		1.2

1. CHILLED WATER COILS ARE BASED ON 45 DEG F ENTERING WATER TEMPERATURE AT 10 DEG F. WATER TEMPERATURE RISE
2. REHEAT COIL IS BASED ON 180 DEG F ENTERING WATER TEMPERATURE AND 160 DEG F. LEAVING WATER TEMPERATURE

DEDICATED OUTSIDE AIR HANDLING UNIT SCHEDULE

MARK	MANUFACTURER	MODEL	OA (CFM)	EXH (CFM)	SUPPLY FAN			EXHAUST FAN			PREHEAT COIL			COOLING COIL										ELECTRICAL			WEIGHT (LBS)																		
					CFM	HP	ESP IN. WG	TSP IN. WG	MOTOR RPM	FAN RPM	CFM	HP	ESP IN. WG	TSP IN. WG	MOTOR RPM	FAN RPM	CFM	EDB (°F)	HEATING (°F)	GPM	APD (in w.g.)	WPD (ft)	CFM	EDB (°F)	EWB (°F)	LDB (°F)		LWB (°F)	GPM	TOTAL COOLING (MBH)	SENSIBLE COOLING (MBH)	APD (in w.g.)	WPD (ft)	REHEAT COIL AIR FLOW CFM	REHEAT COIL MBH	REHEAT COIL EAT DB DEG. F.	REHEAT COIL LAT DB DEG. F.	REHEAT COIL GPM	FACE VELOCITY FPM	WPD FT. HD	REHEAT COIL EWT (°F)	REHEAT COIL LWT (°F)	V	PH	MCA
DOAS-1	TRANE	CSAA017	8000	8555	8241	10	2.0	5.12	3600	3237	8555	10	1.5	3.47	3600	3182	8241	49	68	168.4	11.25	115	36	7790	82	67	53	52	43	340.81	262.48	879	5.11	8000	130.14	53°F	68°F	8.7	530	0.22	140	110	480	3	5100

DEDICATED OUTSIDE AIR UNIT DOAS -1 ENERGY RECOVERY WHEEL SCHEDULE

MARK	MANUFACTURER	SUPPLY AIR FLOW	SUMMER LEAVING EXH AIR DB	SUMMER LEAVING EXHAUST AIR WB	SUMMER OA ENTERING AIR DB	SUMMER OA ENTERING AIR WB	SUMMER RA ENTERING AIR DB	SUMMER RA ENTERING AIR WB	SUMMER TOTAL EFFICIENCY	SUMMER SUPPLY AIR DB	SUMMER SUPPLY AIR WB	SUPPLY AIR PD	WINTER EXHAUST LAT DB	WINTER EXHAUST LAT WB	WINTER ENTERING OAT DB	WINTER ENTERING OAT WB	WINTER ENTERING RETURN AIR DB	WINTER ENTERING RETURN AIR WB
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