

CSG WATER TREATMENT

EQUIPMENT MEETING OR EXCEEDING THE BASIS OF DESIGN LISTED BELOW MAY BE SUBMITTED. BASIS OF DESIGN MANUFACTURER ASHBERRY. EQUIPMENT MODELS LISTED BELOW

ACA-10G-1 SINGLE CARBON FILTER SYSTEM

Qty (1) 10" Diameter x 54" FRP Pressure Vessels
Non-Code Pressure Vessel, 150 psig Rating
1 ft Carbon Filtration Media
Washed Gravel Sub-Fill for Media Support
1" Fleck Model 2750 Top-Mounted Control Valves for Automatic Operation
Automatic Backwash Flow Controller (6 gpm)
Pentair 3200 12-day Calendar Clock Controller
RO Lockout switch
120V/1Ph/60Hz Electrical Power Rating
Estimated Shipping Weight, lbs: 165

MAT-45M-1 TWIN ALTERNATING SOFTENER SYSTEM

Qty (2) 10" Diameter x 54" FRP Pressure Vessels
Non-Code Pressure Vessels, 150 psig Rating
1.5 ft Softening Resin Per Vessel (45,000 grains Capacity Per Vessel)
1" Fleck Model 9100 Top-Mounted Control Valves for Automatic Operation
Pentair "SXT" digital display electronic timer
120/24 VAC, 60 Hz Electrical Power Rating
Alternating Flow Control Configuration for Continuous Treated Water Supply
Qty (1) Fleck Noryl Inline Paddlewheel-Type Flow Sensor(s) for Volume Initiated Regeneration Cycle
Qty (1) 18" x 40" Polyethylene Brine Storage Tank Assembly with Salt Shift and Safety Overflow Valve
Water Hardness Testing Kit
Estimated Shipping Weight, lbs: 265

MRO-2500-2.5 SINGLE REVERSE OSMOSIS SYSTEM

2,500 gpd Nominal Product Output from the RO Machine (1.75 gpm @ 77° F)
Powder-coated steel wall-mount bracket
Pump, 0.75 HP, brass, 120 VAC, 1-Ph, 60 Hz
Polypropylene Cartridge Type Sediment Prefilter Housing (5-micron)
Polypropylene Cartridge Type Carbon Prefilter Housing
Qty (3) FRP Membrane Housings
Qty (3) Thin-Film Composite Low Pressure Membrane Elements (2.5" x 40")
Polyethylene interconnecting tubing
Panel Mounted RO Permeate, Concentrate and Recycle Flow Meters
Panel Mounted Pressure Gauges
Concentrate and Recycle Flow Control Valves
Automatic Inlet Feed Valve
Low Inlet Pressure Switch with Shut-Down
Estimated Shipping Weight, lbs: 115

TANK ASSY RO 160 GAL TITAN 3/4HP

160 gals of RO Storage
26" x 68" Flat Bottomed Polyethylene tank
Tank Comes Complete w/inlet and Outlet Bulkhead Fittings Installed
Qty (1) 304SS Single Stage Centrifugal Pump (5 gpm @ 40 psi)
120 VAC, 1 Phase, 60 Hz, 3/4 HP TEFC Motor
Integral Bladder on Pump
Qty (2) Single Pull Double Throw Level Switches to Control RO Pump & Transfer Pump
Approximate Shipping Weight, lbs: 96

PLENUM SUPPLY FAN DATA										PREHEAT COIL DATA																											
MARK	MODEL	EXPANSION AIRFLOW	QTY	DESIGN AIRFLOW	DESIGN OA AIRFLOW	ESP	TSP	HP (EACH)	VOLTAGE	SYSTEM TYPE	FACE AREA	FACE VELOCITY	ROWS	EAT DB	LAT DB	GPM	TOTAL CAPACITY	EWT	LWT	SYSTEM TYPE	FACE AREA	FACE VELOCITY	ROWS	EAT DB	EAT WB	LAT DB	LAT WB	TOTAL CAPACITY	SENSIBLE CAPACITY	EWT	LWT	STEAM PRESSURE	STEAM FLOW RATE	EAT DB	ENTERING RH	LEAVING RH	CONDENSATE FLOW RATE
2-AH01	CSAA025	12290 CFM	1	12290 CFM	4450 CFM	3.00 in-wg	6.23 in-wg	25 hp	208 V	Hot water	24.74 SF	500 FPM	1	40 °F	70 °F	44 GPM	401,670 Btu/h	180 °F	160 °F	Chilled water	24.74 SF	500 FPM	6	81 °F	66 °F	52 °F	52 °F	518,580 Btu/h	392,201 Btu/h	44 °F	56 °F	15 psig	129.98 lb/hr	60	15%	35%	17.95 lb/hr
2-AH02	CSAA025	12605 CFM	1	12605 CFM	4180 CFM	3.00 in-wg	6.24 in-wg	25 hp	208 V	Hot water	24.74 SF	500 FPM	1	40 °F	70 °F	44 GPM	402,026 Btu/h	180 °F	160 °F	Chilled water	24.74 SF	500 FPM	6	81 °F	66 °F	52 °F	52 °F	519,420 Btu/h	392,839 Btu/h	44 °F	56 °F	15 psig	225.35 lb/hr	60	15%	50%	17.97 lb/hr

NOTES:

- PROVIDE MODULAR, HORIZONTAL DRAW-THROUGH UNIT WITH VERTICAL DISCHARGE. PROVIDE UNIT WITH HINGED ACCESS DOORS. PROVIDE ACCESS SECTION AFTER COOLING COIL FOR COIL CLEANING.
- PROVIDE MODULATING ELECTRONIC CONTROL VALVE ON RETURN LINE FOR EACH HYDRONIC COIL.
- PROVIDE UNIT WITH 6" BASE RAIL FACTORY CONNECTED (LEGS NOT ACCEPTABLE) AND EXTENDING THE ENTIRE LENGTH OF UNIT. ENSURE THAT PROPER RISE IS PROVIDED FOR CONDENSATE P-TRAP.
- PROVIDE WITH 2 SETS OF FILTERS. AT PROJECT COMPLETION, INSTALL NEW FILTERS IN UNIT AND PROVIDE ONE EXTRA SET OF FILTERS FOR OWNER. UNITS SHALL NOT BE RUN WITHOUT SCHEDULED FILTERS IN PLACE.
- PROVIDE UNIT-MOUNTED VFD, WITH SOFT START, MANUAL BYPASS SWITCH, SURGE PROTECTION, AND FUSED DISCONNECT.
- ALL MOTORS SHALL BE PREMIUM EFFICIENCY, COMPATIBLE WITH VARIABLE FREQUENCY DRIVE OPERATION.
- COORDINATE INSTALLATION OF EQUIPMENT TO PROVIDE ACCESS FOR MAINTENANCE AND FILTER REPLACEMENT.
- CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF FIELD CONDITIONS AND COORDINATING EQUIPMENT DIMENSIONS AND INSTALLATION WITH FIELD CONDITIONS.
- FOR ALL SYSTEMS WITH DESIGN SUPPLY AIR GREATER THAN 2000 CFM, PROVIDE A DUCT SMOKE DETECTOR IN THE SUPPLY AIR DUCT, DOWNSTREAM OF THE AIR FILTERS AND AHEAD OF ANY BRANCH CONNECTIONS.

PACKAGED AIR COOLED CHILLER SCHEDULE																			
MARK	ELECTRICAL				FULL LOAD CAP	IPLV	EWT	LWT	PUMPING PACKAGE		OPER. WEIGHT	BASIS OF DESIGN		SHIP WEIGHT					
	FREQ.	VOLT.	PHASE	EER					PD	FLOW RATE		PD	FLOW RATE		MANUFACTURER	MODEL			
CH-1	60 Hz	208 V	3	10.302	1169640.0 Btu/h	15.192	54 °F	44 °F	5.26 psi	233 GPM	6 lb		Trane	CGAM100	6 lb				
CH-2	60 Hz	208 V	3	10.302	1169640.0 Btu/h	15.192	54 °F	44 °F	5.26 psi	233 GPM	6 lb		Trane	CGAM100	6 lb				
NOTES:																			
1. PROVIDE WITH 136 GALLON CHILLED WATER BAFFLED STORAGE TANK ACCESSORY WITH ELECTRIC TANK HEATERS AND THERMOSTAT CONTROL.																			
2. PROVIDE WITH FACTORY INSTALLED EVAPORATOR HEATER FREEZE PROTECTION.																			
3. PROVIDE HEAT TAPE INSULATION ON ALL EXPOSED PIPING.																			
4. PROVIDE WITH SINGLE POINT POWER CONNECTION AND UNIT MOUNTED NON-FUSED DISCONNECT.																			
5. PROVIDE WITH DIGITAL COMPRESSOR																			
6. PROVIDE WITH ALL NOISE REDUCTION PACKAGES.																			
7. PROVIDE WITH FACTORY VIBRATION ISOLATION PACKAGE.																			
8. PROVIDE WITH CONTROLS CAPABLE OF STAND ALONE OPERATION AND INTERFACE WITH NIAGARA SYSTEM.																			

CHILLED WATER AIR HANDLER SCHEDULE

AL CITY		EWT		LWT		COOLING COIL DATA															HUMIDIFIER										AIR FILTER DATA	SHIPPING WEIGHT	OPERATING WEIGHT		
						SYSTEM TYPE		FACE AREA		FACE VELOCITY		ROWS		EAT DB		EAT WB		LAT DB		LAT WB		TOTAL CAPACITY		SENSIBLE CAPACITY		EWT		LWT		STEAM PRESSURE				STEAM FLOW RATE	
Btu/h	180 °F	160 °F	Chilled water				24.74 SF	500 FPM	6	81 °F	66 °F	52 °F	52 °F	518,580 Btu/h	392,201 Btu/h	44 °F	56 °F	15 psig	129.98 lb/hr	60	15%	35%	17.95 lb/hr	4" high eff. - 95% eff. - MERV 14	3,822 lb	3,961 lb									
Btu/h	180 °F	160 °F	Chilled water				24.74 SF	500 FPM	6	81 °F	66 °F	52 °F	52 °F	519,420 Btu/h	392,839 Btu/h	44 °F	56 °F	15 psig	225.35 lb/hr	60	15%	50%	17.97 lb/hr	4" high eff. - 95% eff. - MERV 14	3,822 lb	3,961 lb									

COIL CLEANING.

TE P-TRAP.

SCHEDULED FILTERS IN PLACE.

Y BRANCH CONNECTIONS.

HYDRONIC WATER PUMP SCHEDULE

MARK	LOCATION	AREA SERVED	TYPE	CIRCULATING FLUID					ELECTRICAL DATA					BASIS OF DESIGN		NOTES
				FLUID	GPM	TOTAL HEAD	NPSH AVAILABLE	TEMPERATURE	MOTOR POWER	VOLTAGE	PHASE	RPM	SPEED CONTROL	MANUFACTURE	MODEL NUMBER	
CWP-1	MECHANICAL PENTHOUSE	CLC - BLDG XX	END SUCTION	CHILLED WATER	235 GPM	50 ftH2O	5 ftH2O	56 °F	7.500 hp	208 V	1	1800	VFD	BELL & GOSSETT	2.5 BB	1-5
CWP-2	MECHANICAL PENTHOUSE	CLC - BLDG XX	END SUCTION	CHILLED WATER	235 GPM	50 ftH2O	5 ftH2O	56 °F	7.500 hp	208 V	1	1800	VFD	BELL & GOSSETT	2.5 BB	1-5
HWP-1	MECHANICAL ROOM	CLC - BLDG XX	END SUCTION	HEATING HOT WATER	150 GPM	50 ftH2O	5 ftH2O	160 °F	5.000 hp	208 V	1	1800	VFD	BELL & GOSSETT	2 BD	1-5
HWP-2	MECHANICAL ROOM	CLC - BLDG XX	END SUCTION	HEATING HOT WATER	150 GPM	50 ftH2O	5 ftH2O	160 °F	5.000 hp	208 V	1	1800	VFD	BELL & GOSSETT	2 BD	1-5
NOTES:																
1. DISCONNECT PROVIDED AND INSTALLED BY MECHANICAL. WIRED BY ELECTRICAL.																
2. PROVIDE WITH VFD CONTROL FOR EACH PUMP.																
3. PROVIDE EQUIPMENT PAD WITH VIBRATION ISOLATION.																
4. REFER TO DETAILS FOR MORE INFORMATION.																
5. INSTALL VIBRATION ISOLATION BASE PER TO DETAIL 7 ON SHEET M-501.																

LOUVER SCHEDULE

vv	TYPE	AIR FLOW	VELOCITY	MAX AIR PRESSURE DROP	SIZE	FREE AREA	BASIS OF DESIGN		NOTES
							MANUFACTURER	MODEL NUMBER	
OAL-1	INTAKE	24895 CFM	990 FPM	0.17 in-wg	138x48	26.00 SF	GREENHECK	EVH-501D	1.2
RL-1	EXHAUST	24895 CFM	830 FPM	0.11 in-wg	102x72	30.10 SF	GREENHECK	EVH-501D	1.2

NOTES:

- PROVIDE WITH BAKED ENAMEL FINISH. COORDINATE WITH ARCHITECT FOR FINAL PAINT COLOR.
- PROVIDE WITH BIRDSCREEN, INSECT SCREEN AND ALL OTHER ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION.

STEAM-TO-HOT WATER HEAT EXCHANGER SCHEDULE

MARK	LOCATION	SYSTEM	TYPE	WATER CONDITIONS			STEAM PRESSURE		CONTROL VALVE			STEAM TRAP		ELECTRICAL INFO			BASIS OF DESIGN		REMARKS				
				GPM	EWT	LWT	MAX PD (PSI)	ENT CONTROL VALVE	ENT HX	FOULING FACTOR	SIZE	LBS/HR	TRAP #	SIZE	CAPACITY	QTY CONNECTIONS	VOLTAGE	PHASE		MCA	MOCP	MANUFACTURER	MODEL
HX-01	144 - MECHANICAL	HYDRONIC WATER	SHELL AND TUBE	150 GPM	160 °F	180 °F	0.2	30 psi	30 psi	0	2 1/2"	1508	ST-B-3	0" - 0 9/16"	3016	2	120 V	1	4 A	15 A	CEMLINE	HTP848EX-S-D-SKID	1,2,3,5,6,7
HX-02	144 - MECHANICAL	DOMESTIC HOT WATER	SHELL AND TUBE	50 GPM	47 °F	180 °F	15	30 psi	30 psi	0	2"	3581	ST-B-4	0" - 1 5/8"	7162	2	120 V	1	4 A	15 A	CEMLINE	10SEH1030-D-W	1-8

NOTES:

- PROVIDE SKID MOUNTED, PRE-WIRED, DUPLEX PACKAGE SYSTEM COMPLETE WITH ASME 150 PSIG DUAL CARBON STEEL SHELL AND COPPER TUBE HEAT EXCHANGERS, DUPLEX CONTROL PANEL WITH DISCONNECTS.
- PROVIDE WITH SKID MOUNTED ACCESSORIES INCLUDING EXPANSION TANK, AIR VENT.
- INCLUDE ALL INTERCONNECTING PIPING AND ACCESSORIES INCLUDING TRAP, SERVICE AND STOP VALVES, CHECK VALVES, FLEXIBLE CONNECTORS, PRESSURE GAUGES, INLET AND OUTLET THERMOMETERS, AND ALL OTHER RELATED AND REQUIRED COMPONENTS FOR A COMPLETE WORKING SYSTEM.
- PROVIDE MIXING VALVE TO DISCHARGE 140F HOT WATER.
- REFER TO DETAILS AND CONTROL DIAGRAMS.
- SYSTEM IS TO BE DESIGNED FOR 100% REDUNDANCY.
- PROVIDE WITH INTEGRAL STEAM TRAPS.
- LWT SHOWN IS NORMAL OPERATING TEMPERATURE. UNIT SHALL BE CAPABLE OF PROVIDING 180 DEG F LWT FOR THERMAL ERADICATION PURPOSES.

DEDUCTIVE ALTERNATE NOTES

(DEDUCTIVE ALTERNATES ARE CASCADING AND MUST BE EXERCISED IN THE ORDER PRESENTED) FOR A DETAILED DESCRIPTION OF EACH DEDUCTIVE ALTERNATE REFER TO COVER SHEET ON G1000

DEDUCTIVE ALTERNATE #2 : ELIMINATE TUNNEL (EAST LEG).

DEDUCTIVE ALTERNATE #6 : REDUCE PLATFORM AT CHILLER

FLASH TANK SPECIFICATION

FT-B:
PROVIDE 12" DIAMTER BY 24" LONG HORIZONTAL FLASH TANK.
PROVIDE A 3" VENT OUT, A 2-1/2" PIPE IN, AND 1-1/2" PIPE OUT. REFER TO DETAIL FOR MORE INFORMATION.

AIR DEVICE SCHEDULE								
MARK	BASIS OF DESIGN		TYPE	AIRFLOW		PANEL SIZE (IN.)	NECK SIZE (IN.)	NOTES
	MANUFACTURER	MODEL		MIN.	MAX.			
CD-11	PRICE	ASPD	PLAQUE FACE	40 CFM	85 CFM	12x12	6a	
CD-12	PRICE	ASPD	PLAQUE FACE	90 CFM	185 CFM	12x12	8a	
CD-21	PRICE	ASPD	PLAQUE FACE	40 CFM	85 CFM	24x24	6a	
CD-22	PRICE	ASPD	PLAQUE FACE	90 CFM	185 CFM	24x24	8a	
CD-23	PRICE	ASPD	PLAQUE FACE	190 CFM	345 CFM	24x24	10a	
CD-24	PRICE	ASPD	PLAQUE FACE	350 CFM	475 CFM	24x24	12a	
EG-11	PRICE	630	LOUVERED, FIXED FACE EXHAUST GRILLE	40 CFM	95 CFM	12x12	6x6	
EG-12	PRICE	630	LOUVERED, FIXED FACE EXHAUST GRILLE	100 CFM	195 CFM	12x12	8x8	
EG-22	PRICE	630	LOUVERED, FIXED FACE EXHAUST GRILLE	100 CFM	195 CFM	24x24	8x8	
RG-11	PRICE	630	LOUVERED, FIXED FACE RETURN GRILLE	40 CFM	95 CFM	12x12	6x6	
RG-21	PRICE	630	LOUVERED, FIXED FACE RETURN GRILLE	40 CFM	95 CFM	24x24	6x6	
RG-22	PRICE	630	LOUVERED, FIXED FACE RETURN GRILLE	100 CFM	195 CFM	24x24	8x8	
RG-23	PRICE	630	LOUVERED, FIXED FACE RETURN GRILLE	200 CFM	295 CFM	24x24	10x10	
RG-24	PRICE	630	LOUVERED, FIXED FACE RETURN GRILLE	300 CFM	500 CFM	24x24	12x12	
SD-1	PRICE	620	SURFACE	0 CFM	0 CFM	N/A	10x6	
SD-2	PRICE	620	SURFACE	0 CFM	0 CFM	N/A	20x6	
SD-3	PRICE	630	SURFACE	0 CFM	0 CFM	N/A	14x8	
SD-4	PRICE	630	SURFACE	0 CFM	0 CFM	N/A	20x10	
SD-5	PRICE	620	SURFACE	0 CFM	0 CFM	N/A	10x8	
SG-1	PRICE	630	SURFACE	0 CFM	0 CFM	NA	16x8	
SG-2	PRICE	630	SURFACE	0 CFM	0 CFM	NA	40x24	
SG-3	PRICE	630	SURFACE	0 CFM	0 CFM	NA	20x14	
SGE-1	PRICE	630	SURFACE	0 CFM	0 CFM	NA	10x6	

NOTES:

- BASIS OF DESIGN EQUIPMENT WITH REQUIRED PERFORMANCE CHARACTERISTICS IS SCHEDULED. OTHER MANUFACTURERS ARE ACCEPTABLE; HOWEVER EQUIPMENT NOT MEETING EQUIVALENT CRITERIA CANNOT BE CONSIDERED.
- NECK SIZE AS INDICATED. RUNOUT BRANCH DUCTS SHALL BE THE SAME SIZE AS INDICATED NECK SIZE. PROVIDE TRANSITION IF NECESSARY.
- PROVIDE VOLUME DAMPER INSTALLED IN BRANCH DUCT SERVING EACH DIFFUSER.
- PROVIDE ALL REQUIRED ACCESSORIES FOR A COMPLETE INSTALLATION.
- PROVIDE EXHAUST GRILLES LOCATED IN HARD CEILINGS WITH BALANCING DAMPER ADJUSTABLE AT FACE OF GRILLE.

CONSULTANT



NORRIS DESIGN
Design | Construction | Construction Management



HINMAN



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