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LOUVER / DAMPER SCHEDULE

MARK	BASIS OF DESIGN	MOUNTING HEIGHT A.F.F	LOUVER W	LOUVER H	LOUVER CFM	LOUVER PRESSURE DROP (IN)	LOUVER FREE AREA (SQ. FT.)	LOUVER FRAME TYPE	LOUVER SCREEN TYPE	DAMPER W	DAMPER H	DAMPER BLADES OB/PAR	DAMPER FRAME TYPE	DAMPER ACTUATOR TYPE	VOLTAGE	CONTROL SIGNAL	MIN TORQUE (IN-LBS/SQFT)	NOTES
L1	RUSKIN ELF375DXCD50	1'-0"	72	48	8900	0.09	13.06	BOX	BIRD	-	-	-	-	-	-	-	-	
L2	RUSKIN ELF375DXCD50	6'-0"	48	72	8900	0.09	13.14	BOX	BIRD	48	72	OB	BOX	MODULATING	24	4-20mA	7.0	

NOTES:

FAN SCHEDULE

UNIT MARK	LOCATION	SERVES	TYPE	FAN DATA AIR FLOW (CFM)	TOTAL SP (IN W.G.)	RPM MAX	SONES MAX	BHP MAX	MOTOR (HP)	WHEEL TYPE	DRIVE TYPE	ELECTRICAL DATA VOLTS / PHASE	EQUAL TO MANUF	EQUAL TO MODEL	NOTES
4473-EAF001A	CHW PLANT	HEAT REMOVAL	WALL PROPELLER	15,000	0.125	425	25	1.25	1.5	BOLTED	BELT	460/3	LOREN COOK	48XMPH	6, 10, 15
4473-EAF002A	CHW PLANT	HEAT REMOVAL	WALL PROPELLER	15,000	0.125	425	25	1.25	1.5	BOLTED	BELT	460/3	LOREN COOK	48XMPH	6, 10, 15
4473-EAF003A	CHW PLANT	HEAT REMOVAL	WALL PROPELLER	15,000	0.125	425	25	1.25	1.5	BOLTED	BELT	460/3	LOREN COOK	48XMPH	6, 10, 15
4473-EAF004A	CHW PLANT	HEAT REMOVAL	WALL PROPELLER	15,000	0.125	425	25	1.25	1.5	BOLTED	BELT	460/3	LOREN COOK	48XMPH	6, 10, 15
4473-EAF005A	CHW PLANT	HEAT REMOVAL	WALL PROPELLER	15,000	0.125	425	25	1.25	1.5	BOLTED	BELT	460/3	LOREN COOK	48XMPH	6, 10, 15
4473-EAF006A	CHW PLANT	HEAT REMOVAL	WALL PROPELLER	15,000	0.125	425	25	1.25	1.5	BOLTED	BELT	460/3	LOREN COOK	48XMPH	6, 10, 15
4473-EAF007A	CHW PLANT	HEAT REMOVAL	WALL PROPELLER	15,000	0.125	425	25	1.25	1.5	BOLTED	BELT	460/3	LOREN COOK	48XMPH	6, 10, 15

NOTES:

1. BACKDRAFT DAMPER
2. INLET SCREEN
3. WALL HOUSING

PUMP SCHEDULE

UNIT MARK	LOCATION	TYPE	SERVICE	PUMP DATA FLOW RATE (GPM)	PRESSURE (FT)	% PUMP EFF.	ELECTRICAL DATA BHP	HP	VOLT	PHASE	BASIS OF DESIGN MAKE	MODEL	NOTES
4473-PRIP007A	4473	HSC	CHW	825	65	81	16.8	20	460	3	AURORA	411-5X6X11C	
4473-PRIP007B	4473	HSC	CHW	825	65	81	16.8	20	460	3	AURORA	411-5X6X11C	

NOTES:

CONTROL VALVE SCHEDULE

TAG NO.	SERVICE	GPM	PIPE SIZE	CV	BASIS OF DESIGN	REMARKS
4473-CWIV0001	CHILLER - 1 - CWS	3750	16	LINE SIZE	KEYSTONE BUTTERFLY	1, 2
4473-CWIV0002	CHILLER - 2 - CWS	3750	16	LINE SIZE	KEYSTONE BUTTERFLY	1, 2
4473-CWIV0003	CHILLER - 3 - CWS	3750	16	LINE SIZE	KEYSTONE BUTTERFLY	1, 2
4473-CWIV0004	CHILLER - 4 - CWS	3750	16	LINE SIZE	KEYSTONE BUTTERFLY	1, 2
4473-CWIV0005	CHILLER - 5 - CWS	3750	16	LINE SIZE	KEYSTONE BUTTERFLY	1, 2
4473-CWIV0006	CHILLER - 6 - CWS	3750	16	LINE SIZE	KEYSTONE BUTTERFLY	1, 2
4473-CWIV007A	CHILLER - 7A - CWS	1125	8	LINE SIZE	KEYSTONE BUTTERFLY	1, 2
4473-CWIV007B	CHILLER - 7B - CWS	1125	8	LINE SIZE	KEYSTONE BUTTERFLY	1, 2
4473-CWIV0008	CHILLER - 8 - CWS	3750	16	LINE SIZE	KEYSTONE BUTTERFLY	1, 2
4473-CWIV0009	CHILLER - 9 - CWS	3750	16	LINE SIZE	KEYSTONE BUTTERFLY	1, 2

NOTES:

1. FULL LUG BUTTERFLY VALVE (150 LB FLANGE) - 316 STAINLESS BODY, SHAFT, AND DISC; RTFE SEATS; ANSI CLASS VI SHUTOFF.
2. ELECTRIC ACTUATOR (EIM "HQ SERIES" OR APPROVED EQUAL) - 480/3/60, HANDWHEEL OVERRIDE, NEMA 4X, LOCAL/OFF/REMOTE SWITCH, 2 POSITION (OPEN/CLOSE) W/ END SWITCHES. ACTUATOR SIZE TO MATCH VALVE SHAFT TORQUE REQUIREMENTS. MINIMUM ACTUATION TIME OF 15 SECONDS (ADJ.).

CWIV - CONDENSER WATER INLET CONTROL VALVE

ELECTRIC UNIT HEATER SCHEDULE

UNIT MARK	LOCATION	SERVES	AIR FLOW RATE (CFM)	CAPACITY (KW)	ELECTRICAL DATA MOTOR (HP)	VOLTS	PHASE	BASIS OF DESIGN MANUF	MODEL	NOTES
4473-UH0001	4473	ELECT RM.	850	10	1/15	460	3	CHROMOLOX	KUH	1

NOTES:
1. WALL MOUNTING BRACKET
2. CONNECT TO UCS - LOW VOLTAGE

WATER COOLED CHILLER SCHEDULE

UNIT MARK	LOCATION	SERVES	NOM. TONS	MAX KW/TON DESIGN	REFRIG. TYPE	MIN. FULL LOAD COP	MAX. IPLV/ NPLV	COMPRESSOR INPUT (KW)	EVAPORATOR WATER TEMP EWT (deg F)	EVAPORATOR WATER TEMP LWT (deg F)	EVAPORATOR MAX WTR PD (FT)	EVAPORATOR FLOW RATE (GPM)	CONDENSER WATER TEMP EWT (deg F)	CONDENSER WATER TEMP LWT (deg F)	CONDENSER MAX WTR PD (FT)	CONDENSER FLOW RATE (GPM)	ELECTRICAL DATA RLA	MCA	LRA	VOLTS/ PHASE	BASIS OF DESIGN MANUF	MODEL	NOTES
4473-CHLR0001, 2, 4 & 5	4473	PLANT	1250	0.57	R-134A		0.49	709	53	42	15.5	2750	85	95	25.5	3750	113	143	744	4160/3	YORK	YKMSK2	2
4473-CHLR0003 & 6	4473	PLANT	1250	0.60	R-134A		0.39	750	53	42	15.5	2750	85	95	25.5	3750	110	138	742	4160/3	YORK	YKMSK2	1
4473-CHLR0008 & 9	4473	PLANT	1250	0.57	R-134A		0.49	709	53	42	15.5	2750	85	95	25.5	3750	113	143	744	4160/3	YORK	YKMSK2	2
4473-CHLR007A & 7B	4473	PLANT	375	0.60	R-134A		0.42	223	53	42	25	825	85	95	20	1125	316	395	2130	460/3	YORK	YKECETQ-ELG	3

NOTES:
1. VARIABLE FREQUENCY DRIVE (SEE ELECTRICAL)
2. UTILIZE EXISTING MOTOR STARTER
3. UNIT MOUNTED VARIABLE FREQUENCY DRIVE.

2 1

AIR HANDLING UNIT SCHEDULE

UNIT MARK	LOCATION	SERVES	MODULE 1 DISCHARGE PLENUM LENGTH	DOORS	MODULE 2 FAN DATA TOTAL FLOW RATE (CFM)	OUTSIDE AIR (CFM)	ESP (IN. W.G.)	TYPE	ELECTRICAL DATA BHP	MOTOR (HP)	VOLTS	PHASE	TOTAL (BTUH)	SENS (BTUH)	MODULE 3 VERTICAL COOLING COIL AIR TEMP EDB (deg F)	EWB (deg F)	LDB (deg F)	LWB (deg F)	MAX AIR PD (IN. W.G.)	MAX FACE VEL (FPM)	COIL ROWS	FINS/ INCH	CHILLED WATER TEMP IN/OUT (deg F)	MAX PD (FT.)	FLOW RATE (GPM)	MODULE 4 FILTER / MIXING BOX PREFILTER TYPE	MAX AIR PD (IN. W.G.)	MAX FACE VEL (FPM)	FILTER TYPE	MAX AIR PD (IN. W.G.)	MAX FACE VEL (FPM)	MODULE LENGTH	TOP INLET SIZE	BACK INLET SIZE	BASIS OF DESIGN MANUF	MODEL	NOTES
4473-AH0003	4473	ELEC.RM	48	RIGHT	10,200	100	0.5	F.C.	6.1	7.5	460	3	276,000	273,000	78.8	61.5	54.0	52.6	0.6	550	6	8	48/58	10	55	-	-	-	MERV8	0.6	350	36			YORK	SOLUTION	

NOTES:

APPROVED FOR DISTRIBUTION
QUALITY ASSURANCE AUTHORITY
DATE
SIGNED

BWS&C FILE NO. 33865-50

SIGNATURES ON INDEX SHEET INDICATE ACCEPTANCE OF THIS SHEET

REF. NO. M16 16 OF 16

REV.	BY	DATE	REVISION	CA NO.	APPROVED
2	GLR	06-25-13	CHANGE KW/TON DESIGN,MAX. IPLV/NPLV AND INPUT CHILLER SCHEDULE		
1	GLR	06-12-13	CHANGE VOLTAGE IN WATER COOLED CHILLER SCHEDULE		
0	DMS	12/21/12	ORIGINAL ISSUE		

Marshall Space Flight Center
Huntsville, Alabama 35812

REVITALIZATION/REPAIR OF CENTRAL CHILLED WATER SYSTEM (4473)

MECHANICAL EQUIPMENT SCHEDULES

AE FIRM: BARGE, WAGGONER, SUMNER, & CANNON, INC.
NASA AE CONTRACT NO. NAS8- NNM08AA15C

SUBMITTED: D. SCHUELER
AE: DATE: 12/21/12
DESIGNED P. TICHENOR
DRAWN M. AMACHER
CHECKED T. ALLEN
SCALE: AS NOTED

APPROVAL RECOMMENDED: NELSON OLINGER, AS22 PROJECT A/E
APPROVAL RECOMMENDED: NELSON OLINGER, AS22 SUPPORT A/E
APPROVAL RECOMMENDED: NELSON OLINGER, AS22 TEAM LEAD
SPEC. NO. M5050

APPROVED: J. GUARIN
AS22 GROUP LEAD DATE: 12/21/12

DRAWING NO. FAC-V-4473-M16
SHEET 31 OF 69

MSFC-FORM 232 REV. 8-21-89-RCL