

AIR COOLED CHILLER SCHEDULE																																		
MARK	LOCATION	AREA	AUDIOR BLDG	TYPE	EVAPORATOR												CONDENSER										ELECTRICAL							REMARKS
					CAPACITY	# OF COMP	MAX KW/TON	MIN COP	MAX PLV (EER)	FLOW GPM	EWT [US]	LMT			MAX WPD [HP/ea]	FOULING FACTOR	AMBIENT DB TEMP	# COMP	COMPRESSOR MOTOR		CONDENSER FAN MOTORS													
												TONS	[KW]	°F					°C	°F	°C	FT	HP/ea	HP [KW]	PHASE	VOLT	# FANS	NOMINAL POWER HP (EA)	[W/EA]	PHASE	VOLT			
TSACH1	THERMAL STORAGE	CHILLER PLANT	ROTARY	350	3	1283	2.19	14.3	853	[54]	28	[+2]	21.5	[+6]	16.3	[56]	0.0031	95	[35]	3	100	[75]	3	460	20	3	[2200]	3	460	30% ETHYLENE GLYCOL				
TSACH2	THERMAL STORAGE	CHILLER PLANT	ROTARY	350	3	1283	2.19	14.3	853	[54]	28	[+2]	21.5	[+6]	16.3	[56]	0.0031	95	[35]	3	100	[75]	3	460	20	3	[2200]	3	460	30% ETHYLENE GLYCOL				
TSACH3	THERMAL STORAGE	CHILLER PLANT	ROTARY	350	3	1283	2.19	14.3	853	[54]	28	[+2]	21.5	[+6]	16.3	[56]	0.0031	95	[35]	3	100	[75]	3	460	20	3	[2200]	3	460	30% ETHYLENE GLYCOL				

GENERAL SHEET NOTES:

1. REFER TO DRAWING MH-001 FOR SYMBOLS AND ABBREVIATIONS.
2. VERIFY LOCATION AND DIMENSIONS OF EXISTING EQUIPMENT AND COORDINATE ALL WORK PRIOR TO THE START OF CONSTRUCTION.
3. PROVIDE ALL MOTORS WITH PHASE MONITORING.


AIR COOLED CHILLER SCHEDULE

LIQUID TO LIQUID HEAT EXCHANGER SCHEDULE																		
MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM TYPE	HOT SIDE								COLD SIDE				REMARKS		
				FLOW	EWT	LWT	WPD	FLOW	EWT	LWT	WPD							
1334.1	CEILING	ICE STORAGE	PLATE	200	180	48	121	42	101	150	200	130	141	44.67	77	123.3	170	PROVIDE AS PART OF PACKAGED SINK DRAINING SYSTEM
DO NOT PROVIDE PLATE AND FRAME HEAT EXCHANGER WITH ASME CERTIFIED STAMP FOR CONSTRUCTION TESTING																		

LIQUID TO LIQUID HEAT EXCHANGER SCHEDULE



GLYCOL CHEMICAL FEED SYSTEMS, PUMP TYPE SCHEDULE													
MARK	SYSTEM LOCATION	SYSTEM ANJIOR SERVICE	QUANTITY	TANK		FLOW RATE		DISCHARGE PRESSURE		PUMP POWER		REMARKS	
				SIZE	[GAL]	GPM	[US]	PSIG	[KPA]	PHASE	VOLTS		
THERMAL STORAGE	ICE STORAGE	SYSTEM LOOP	1	66	3	3	[]	80	[560]	16	1	115	PROVIDE AS PART OF PACKAGED AND PUMPING SYSTEM
A													

AIR SEPARATOR SCHEDULE

AIR SEPARATOR SCHEDULE											
MARK	LOCATION	SYSTEM AND/OR SERVICE	TYPE	AIR SEPARATOR						REMARKS	
				SIZE IN	FLOW	WPD	BUILT-IN STRAINER	RECORD			
THSAS 1	THERMAL STORAGE	SYSTEM COOL	VORTEX	12	1300	346	1203	3.5	191	NO	PROVIDE AS PART OF PACKAGED AND PULPING SYSTEM 

PUMP SCHEDULE																						
MARK	LOCATION	AREA AND/OR SLOPE SERVED	SYSTEM AND/OR SERVICE	TYPE	CIRCULATING FLUID							ELECTRICAL MOTOR					REMARKS					
					FLUID	FLOW		HEAD		NPSH AVAILABLE	TEMPERATURE		N/A % EFF	NOMINAL POWER	PHASE	VOLT		MAX RPM	SPEED CONTROL			
						GPM	US/G	FT	KG/2		FT	KG/2								° F	° C	HP
TSP 1	THERMAL STORAGE	ACC-1	ICE STORAGE SYSTEM LOOP	SPUT CASE	30% ETHYLENE GLYCOL IN WATER	1155	[73]	123	[200]	8.17	[1.39]	23	[-5]	1.047	82.9	60	[45]	3	460	1800	VFD	PROVIDE AS PART OF PACKAGED SKID PUMPING SYSTEM
TSP 2	THERMAL STORAGE	ACC-2	ICE STORAGE SYSTEM LOOP	SPUT CASE	30% ETHYLENE GLYCOL IN WATER	1155	[73]	123	[200]	8.17	N/A	23	[-5]	1.047	82.9	60	[45]	3	460	1800	VFD	PROVIDE AS PART OF PACKAGED SKID PUMPING SYSTEM
TSP 3	THERMAL STORAGE	ACC-3	ICE STORAGE SYSTEM LOOP	SPUT CASE	30% ETHYLENE GLYCOL IN WATER	1155	[73]	123	[200]	8.17	N/A	23	[-5]	1.047	82.9	60	[45]	3	460	1800	VFD	PROVIDE AS PART OF PACKAGED SKID PUMPING SYSTEM
TSP 4	THERMAL STORAGE	SPARE	ICE STORAGE SYSTEM LOOP	SPUT CASE	30% ETHYLENE GLYCOL IN WATER	1155	[73]	123	[200]	8.17	N/A	23	[-5]	1.047	82.9	60	[45]	3	460	1800	VFD	PROVIDE AS PART OF PACKAGED SKID PUMPING SYSTEM
TSP 5	THERMAL STORAGE	CHW SYSTEM	CHILLED WATER SYSTEM LOOP	SPUT CASE	CHILLED WATER	2800	[180]	150	[2400]	34	N/A	45	[7.7]	1	84.6	150	[110]	3	460	1800	VFD	PROVIDE AS PART OF PACKAGED SKID PUMPING SYSTEM
TSP 6	THERMAL STORAGE	SPARE	CHILLED WATER SPUT CASE	CHILLED WATER	2800	[180]	150	[2400]	34	N/A	45	[7.7]	1	84.6	150	[110]	3	460	1800	VFD	PROVIDE AS PART OF PACKAGED SKID PUMPING SYSTEM	

PUMP SCHEDULE

EXPANSION TANK SCHEDULE 																									
MARK	LOCATION	SYSTEM AND/OR SERVICE	APPROX. SYSTEM VOLUME		SYSTEM TEMPERATURE RANGE		INITIAL PRESSURE IN TANK		MAX. OPERATING PRESSURE		FILL PRESSURE AT TANK		MIN. VOLUME TANK		MIN. BLADDER VOLUME		PIPE SIZE TO TANK		COLD WATER FILL SIZE		REMARKS				
			GAL	[L]	°F	[°C]	°F	[°C]	PSIG	[kPa]	PSIG	[kPa]	PSIG	[kPa]	AT TANK	GAL	[L]	GAL	[L]	IN		[mm]	IN	[mm]	
TOEFT 1	TERMINAL STORAGE	DAMPENING ICE STORAGE LOOP	10000	[38800]	23	[-5]	240	[115]	12	[53]	105	[480]	320	[130]	7	[46]	215	[500]	115	[440]	1.25	[31]	2	[50]	PROVIDE AS PART OF PACKAGED AND PIPING SYSTEM 

EXPANSION TANK SCHEDULE

DESIGN DAY SYSTEM ANALYSIS				
CHILLER DOWNSTREAM	-	SERIES FLOW	NOMINAL CHILLER TONS	= 1050
SYSTEM SUPPLY TEMPERATURE (°F)	=	39	NUMBER OF PERCENT ETHYLENE GLYCOL	MODEL 1500CSF
SYSTEM RETURN TEMPERATURE (°F)	=	45		
FLOW (GPM) :	DISCHARGE	2,800		
FLOW (GPM) :	CHARGE	2,440		



DESIGN DAY SYSTEM ANALYSIS

THERMAL STORAGE TANK SCHEDULE																			
MARK	LOCATION	SYSTEM SERVICE	WARRANTY & CONDITIONS LISTED (Max 4)	ICE TANKING NOTE										DISCHARGE NOTE					
				AVERAGE		PERCENTAGE		ICE MAKING		TOTAL FLOW		MAXIMUM		RETURN		Model			
				TEMP	TEMP	LEAKING	LEAKING	TEMP	TEMP	FLOW	PRESSURE	FLOW	TEMP	TEMP	TEMP	TEMP	PSI	PSI	PSI
TS17-01	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-02	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-03	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-04	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-05	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-06	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-07	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-08	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-09	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-10	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-11	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-12	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-13	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-14	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-15	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						
TS17-16	ICE PARM	GLYCOL	7880	218	30.6	21.1	2440	8.6	12	45	39	6.000	472						

THERMAL STORAGE TANK SCHEDULE

DESIGN DAY SYSTEM ANALYSIS																
CHILLER DOWNSTREAM		-	SERIES FLOW		NOMINAL CHILLER TONS		=	1000								
SYSTEM SUPPLY TEMPERATURE (°F)		=	39		NUMBER OF											
SYSTEM RETURN TEMPERATURE (°F)		=	45		PERCENT ETHYLENE GLYCOL											
FLOW (GPM) = DISCHARGE		=	2,440													
HOOR																
Δ TYPE	LOAD TONS	CHLR TONS	STRG TONS	TANK TOTAL	TONS PER TANK	CHLR TEMP	REGD TEMP	AVG MIN	PTN TEMP	GPM	PSI					
1	1	0	660	660	137	660	138	247	316	316	247	506	8.4			
2	1	0	660	660	137	1200	27.5	247	316	316	247	506	8.4			
3	1	0	660	660	137	1980	41.3	246	317	317	246	503	8.4			
4	1	0	660	660	137	2640	60.8	246	317	317	246	506	8.4			
5	1	0	660	660	137	3000	68.5	246	316	316	246	506	8.4			
6	1	0	660	660	137	3960	82.3	244	315	315	245	503	8.4			
7	1	0	660	660	137	4620	96.3	243	314	314	243	506	8.4			
8	1	0	660	660	137	5280	110.2	240	311	311	240	506	8.5			
9	1	0	660	660	137	5940	123.8	235	306	306	235	503	8.5			
10	1	0	660	660	137	6600	137.5	229	300	300	229	506	8.6			
11	1	0	660	660	137	7260	151.3	221	293	293	221	503	8.6			
12	1	0	660	660	137	7920	165.0	211	282	282	211	506	3.2			
13	F	506	0	-506	-110	1987	1940	300	300	300	333	439	246	3.6		
14	F	573	0	-573	-119	1782	1421	300	300	333	444	267	37			
15	F	664	0	-664	-126	1661	1295	300	300	333	447	282	3.6			
16	F	616	0	-616	-126	1336	1063	300	300	333	446	292	4.1			
17	F	640	0	-640	-126	1120	703	300	300	333	450	307	3.8			
18	F	566	0	-566	-116	920	516	300	300	333	443	292	4.0			

CONSTRUCTION DOCUMENTS

CONSULTANTS:		Mechanical/Electrical/Plumbing/Structure		Project Number 595-11-131		 Department of Veterans Affairs
		ANTHONY R. BUCKER, JR., P.E. LEAD DESIGN ENGINEER PROFESSIONAL LICENSE NO. 15522/779		Drawing Title THERMAL STORAGE FOR CHILLER PLANT		
		 Miller-Remick LLC M.E.P. & Structural Engineering 1015 KINGS HIGHWAY SOUTH BUILDING ONE 1st FLOOR SUITE 1000 PHOENIX, ARIZONA 85034 PHONE: (602)429-4000 FAX: (602)429-5002		Project Number M/A		
		Drawing Title EQUIPMENT SCHEDULES		Building Number M/A		
PROVIDER: 06-11-12 Date		SIGNATURE: _____		SCALE: NONE Approved Project Director		Location VA MED. CENTER, LEBANON, PA
				Date 6/1/2012		Checked KD
				Drawn CAJ		Date 20 of 34