

HEAT EXCHANGER SCHEDULE														
UNIT ID	DESCRIPTION	LOCATION	MANUFACTURER	MODEL	CAPACITY (BTU/HR)	SHELL SIDE			TUBE SIDE					NOTES
						FLUID TYPE	PRESSURE (PSIG)	FLOW RATE (LB/HR)	FLUID TYPE	FLOW RATE (GPM)	EWT (F)	LWT (F)	PRESSURE DROP (FT)	
HTX-1	HEAT EXCHANGER ON HW-SKD-1	209 - MECH/ELEC	ARMSTRONG	WS-0804-200-1-CSSSSNN-20	2,301,573	STEAM	15	2417.14	30% PROPYLENE GLYCOL	160	150	180	2.3	
HTX-2	HEAT EXCHANGER ON HW-SKD-1	210 - MECH/ELEC	ARMSTRONG	WS-0804-200-1-CSSSSNN-20	2,301,573	STEAM	15	2417.14	30% PROPYLENE GLYCOL	160	150	180	2.3	

GLYCOL MAKEUP UNIT SCHEDULE											
UNIT ID	DESCRIPTION	SYSTEM	LOCATION	MANUFACTURER	MODEL	TANK CAPACITY	PUMP CAPACITY	NO. OF PUMPS	ELECTRICAL		
									V	PH	HZ
GMU-1	GLYCOL MAKEUP UNIT	CHILLED GLYCOL AND HEAT RECOVERY	112 - MECHANICAL	NEPTUNE	G-50-2A	50	1.5 GPM @ 100 PSI	2	115	1	60
GMU-2	GLYCOL MAKEUP UNIT ON HW-SKD-1	HOT GLYCOL	209 - MECH/ELEC	ARMSTRONG	GLA-U-HP-1	53	1.5 GPM @ 100 PSI	1	120	1	60

EXPANSION TANK SCHEDULE															
UNIT ID	DESCRIPTION	LOCATION	SERVICE	MANUFACTURER	MODEL	TANK TYPE	SYSTEM VOLUME (GAL)	TANK VOLUME (GAL)	ACCEPTANCE VOLUME (GAL)	FILL PRESSURE (PSI)	RELIEF PRESSURE (PSI)	TEMP COLD (F)	TEMP HOT (F)	TEMP DIFFERENCE (F)	NOTES
ET-2	EXPANSION TANK ON HW-SKD-1	209 - MECH/ELEC	HEATING HOT GLYCOL	ARMSTRONG	130-L	BLADDER	400	35	35	15	75	50	180	130	
ET-3	EXPANSION TANK	112 - MECHANICAL ROOM	HEAT RECOVERY	ARMSTRONG	85-L	BLADDER	60	23	23	15	75	30	85	55	

NOTES:  
1. FILL PRESSURE IS THE SYSTEM STATIC HEAD PRESSURE PLUS 5 PSIG.

DEAERATOR SCHEDULE																	
UNIT ID	MANUFACTURER	MODEL	LOCATION	SERVICE	NUMBER OF STAGES	OUTLET CAPACITY (LB/HR)	STORAGE CAPACITY		STEAM		SIZE (L X DIA)	NO. OF PUMPS	HP	ELECTRICAL			NOTES
							VOLUME (GAL)	TIME (MIN)	FLOW (LB/HR)	PRESSURE (PSIG)				V	HZ	PH	
DA-1	BFS INDUSTRIES	SMS-135	112 - MECHANICAL ROOM	B-1 & B-2	15	5000	155	16	1000	5	78" X 36"	3	2	460	60	3	1

NOTES:  
1. PUMPS SUPPLIED WITH THE DA SHALL BE 15-STAGE, STAINLESS FITTED, LOW NPSH INDUCED CENTRIFUGAL PUMPS EQUIPPED WITH HIGH TEMP MECHANICAL SEALS. EACH PUMP WILL HAVE A CAPACITY OF 11 GPM @ 328 TDH. PUMPS WILL BE MOUNTED ON FORMED STEEL UNIT BASE.

FLASH TANK SCHEDULE								
UNIT ID	DESCRIPTION	LOCATION	SERVICE	MANUFACTURER	MODEL	CONNECTION SIZE (IN)	MAX OPERATING PRESSURE (PSIG)	MAX OPERATING TEMP (F)
FT-1	FLASH RECOVERY VESSEL	112 - MECHANICAL	STEAM BOILER	SPIRAX SARCO	PMO	8	150	500

CONDENSATE PUMP SCHEDULE									
UNIT ID	DESCRIPTION	LOCATION	MANUFACTURER	UNIT MODEL NO.	PUMP MODEL NO.	TANK CAPACITY (GAL)	CONDENSATE FLOW (GPM)	MOTOR HP	NOTES
CPU-1	DUPLEX CONDENSATE RETURN PUMP	112 - MECHANICAL ROOM	FEDERAL PUMP CORP	CCV-1530	1.25CCF	25	15	0.5	1

NOTES:  
1. PROVIDE WITH 2" OVERFLOW CONNECTION.  
2. PROVIDE WITH HIGH LEVEL ALARM TO BAS.

STEAM BOILER SCHEDULE																
UNIT ID	LOCATION	MANUFACTURER	MODEL	BOILER HP	ENERGY INPUT (MBTU)	OUTPUT CAPACITY (LB/HR)	GAS FUEL INLET PRESSURE (PSIG)	OPERATING PRESSURE (PSIG)	SAFETY VALVE SETTING (PSIG)	STEAM PRODUCED (LB/HR)	TUBE TYPE	BLOWER MOTOR HP	ELECTRICAL			NOTES
													V	PH	HZ	
B-1	112 - MECHANICAL ROOM	CLEAVER BROOKS	CB-700-1505T	80	3348	2760	2	100	150	2760	FIRE TUBE	2	460	3	60	
B-2	112 - MECHANICAL ROOM	CLEAVER BROOKS	CB-700-1505T	80	3348	2760	2	100	150	2760	FIRE TUBE	2	460	3	60	

NOTES:  
1. BOILER SUPPLIED WITH CSD-1 GAS TRAIN.

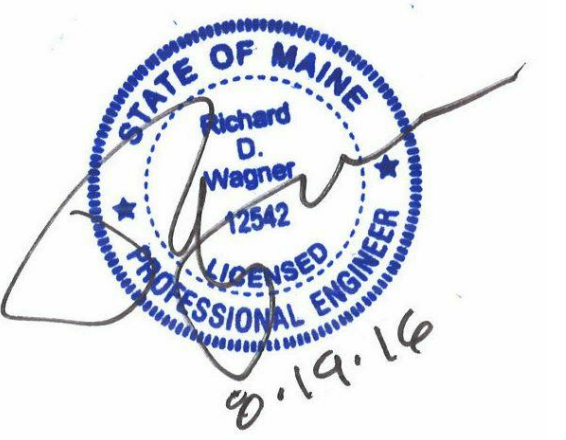
AIR SEPARATOR SCHEDULE							
UNIT ID	DESCRIPTION	LOCATION	SERVICE	MANUFACTURER	MODEL	CONNECTION SIZE (IN)	CAPACITY (GPM)
AS-1	AIR SEPARATOR	112 - MECHANICAL	CHILLED GLYCOL	SPIRO THERM	VDN-800	8	900
AS-2	AIR SEPARATOR ON HW-SKD-1	209 - MECH/ELEC	HOT GLYCOL	ARMSTRONG	DAS-3-R	3	160
AS-3	AIR SEPARATOR	112 - MECHANICAL	HEAT RECOVERY	SPIRO THERM	VDN-250	2.5	40

PUMP SCHEDULE																
UNIT ID	DESCRIPTION	SERVICE	MANUFACTURER	SERIES	MODEL	PUMP TYPE	GPM	PUMP HEAD (FT)	PUMP EFF. (%)	ELECTRICAL						NOTES
										MOTOR HP	MOTOR BHP	RPM	VOLTAGE	PHASE	HZ	
HGP-1	PUMP ON HW-SKD-1	30% PROPYLENE GLYCOL	ARMSTRONG	4302	0306-005.0	INLINE	160	50	51.4	5	4.03	3178	460	3	60	1
HGP-2	PUMP ON HW-SKD-1	30% PROPYLENE GLYCOL	ARMSTRONG	4302	0306-005.0	INLINE	160	50	51.4	5	4.03	3178	460	3	60	1
CGP-1	CHILLED GLYCOL PUMP	30% PROPYLENE GLYCOL	ARMSTRONG	4300	5XSX13	INLINE	900	130	78.7	50	38.47	1790	460	3	60	
CGP-2	CHILLED GLYCOL PUMP	30% PROPYLENE GLYCOL	ARMSTRONG	4300	5XSX14	INLINE	900	130	78.7	50	38.47	1790	460	3	60	
HRP-1	HEAT RECOVERY PUMP	30% PROPYLENE GLYCOL	BELL & GOSSETT	E-90	1.5AB	INLINE	40	40	39.74	1.5	0.66	1725	460	3	60	
HRP-2	HEAT RECOVERY PUMP	30% PROPYLENE GLYCOL	BELL & GOSSETT	E-90	1.5AB	INLINE	40	40	39.74	1.5	0.66	1725	460	3	60	

NOTES:  
1. DUAL ARM PUMP PROVIDED WITH SENSORLESS CONTROL OPTION.

AIR COOLED CHILLER SCHEDULE																			
UNIT ID	LOCATION	MANUFACTURER	MODEL	CAPACITY (TONS)	EFFICIENCY (EER)	REFRIGERANT			EVAPORATOR				CONDENSER AMBIENT AIR TEMP. (F)	ELECTRICAL				NOTES	
						REF TYPE	NO. OF CIRCUITS	NO. OF STAGES	FLUID TYPE	FLOW (GPM)	EWT (F)	LWT (F)		WPD (FTHD)	VOLTAGE	PHASE	MCA		MOP
CH-1	ROOF	TRANE	RTAE-250	212.3	10.9	HFC-134A	2	VFD OPERATION	30% PROPYLENE GLYCOL	449.5	50	38	24.9	92	460	3	455	600	1.2
CH-2	ROOF	TRANE	RTAE-250	212.3	10.9	HFC-134A	2	VFD OPERATION	30% PROPYLENE GLYCOL	449.5	50	38	24.9	92	460	3	455	600	2

NOTES:  
1. PROVIDE ECONOMIZER FOR CH-1.  
2. INTERNAL CHILLER PIPING AND EVAPORATOR SHALL BE HEAT TRACED FROM THE FACTORY. FIELD INSTALLED INSULATION AND JACKETS REQUIRED.



Revision	By	App'd	DD.MM.YYYY
0	INTERIOR FIT-OUT - ISSUED FOR CONSTRUCTION		08/19/2016
	PACKAGE C - INTERIOR FIT-OUT		08.19.2016
	PACKAGE B - SUPERSTRUCTURE & SHELL		08.05.2016
	PACKAGE A - FOUNDATIONS & BELOW SLAB		07.22.2016
	Issued		DD.MM.YYYY

Permit-Seal

Client/Project  
IMMUCELL

Lot 11 - Second Tee Business Park  
1039 Riverside Street  
Portland, Maine 04103

Title  
MECHANICAL PIPING SCHEDULES

Project No.  
191504176

Scale  
12" = 1'-0"

Revision  
0

Drawing No.  
MP-800-C

**MP-800-C**