MEADOW PARK SPORTS CENTRE

GROUND SOURCE HEAT PUMPS REPLACE



1 SITE PLAN M0.01 SCALE: NTS

AREA OF WORK: UPPER POOL MECHANICAL ROOM

CIVIC	ADDRESS	

8625 BC-99 WHISTLER, BC V8E 1K1

MECHANICAL DRAWING LIST DRAWINGS NO. DESCRIPTION

DIVAMINGO NO.	
M0.01	COVER PAGE & EQUIPMENT SCHEDULE
M1.01	UPPER MECH RM DEMO & RENO PLANS
M2.01	MECHANICAL SCHEMATIC
M3.01	MECHANICAL SPECIFICATION

HEAT PUM	P (WATER	COOLED)												
EQUIPMENT	# OF MODULES	LOCATION	SERVICE	MANUFACTURER	MODEL	OPERATING MODE	SOURCE	SIDE					LOAD SIZE	
TAG							EWT (F)	LWT (F)	FLOW (GPM)	CAPACITY (MBH)	EER	P.D. (FT WG)	EWT (F)	LWT (F
HP-1&2	2	MECHANICAL ROOM	HEAT RECOVERY LOOP	TRANE	TPWCCMV0400 (*2 MODULES)	GEO HEAT EXTRACTION MODE	30	25	221.6	504	5.73	23.3	115	130
						DEHUM HEAT RECOVERY MODE	55	45	164.2	751	8.30	11.8	115	130
NOTES:														
1	25% ETHANOL C	IN SOURCE SIDE												
2	REFER TO SPEC	FICATION FOR DETAILS												
3	REFER TO M3.01	I CONTROL SPEC FOR CO	ONTROL SEQUENCE											

PUMP SC	HEDULE
EQUIPMENT	DESCRIPTION
TAG	
P-1	GEO-SIDE CIRCULATION PUN
P-2	GEO-SIDE CIRCULATION PUN
P-3	GEO-SIDE CIRCULATION PUN
P-4	HEATING SIDE CIRCULATION P
NOTES:	
1	PUMPS ARE SIZED FOR 2/3 CAPACITY
2	ALL CAST IRON CONSTRUCTION.
3	CONTROLLED VIA VFD, VFDs TO BE CO
4	REFER TO CONTROL SPEC FOR SEQUE
5	MOTOR TO BE TEFC ENCLOSURE

NIT NUMBER	QTY UNIT DESCRIPTION	UNIT LOCATION	ELECTRIC	CAL LOAD			VOLT	PH	E	EQUIPMEN	Ţ	STARTE	R				D	SCONNEC	СТ	CONTRO	L			EMERGENCY	NOTES
			MCA	FLA	KW	HP			S	I	с	s	I	с	TY	PE	S	I	С	s	I	с	TYPE	POWER (YES/NO)	
P-1	1 GEO-SOURCE HEAT PUMP MODULE 1	MECH RM	61				575	3	М	М	М	М	М	E		PCS	E	E	E	М	M	E	DDC	NO	1,2
P-2	1 GEO-SOURCE HEAT PUMP MODULE 2	MECH RM	61				575	3	М	М	М	М	М	E	1	PCS	Е	Е	E	М	М	E	DDC	NO	1,2
1	1 GROUND SOURCE PUMP	MECH RM				5	208	3	М	М	E	М	М	E	,	VFD	Е	E	E	М	М	E	DDC	NO	1
2	1 GROUND SOURCE PUMP	MECH RM				5	208	3	М	м	E	М	М	E	,	VFD	E	E	E	М	М	E	DDC	NO	1
3	1 HEATING WATER PUMP	MECH RM				2	208	3	М	м	E	м	м	E	, , ,	VFD	Е	E	E	м	м	E	DDC	NO	1
4	1 HEATING WATER PUMP	MECH RM				2	208	3	M	M	F	M	M	F	,	VFD	F	 F	F	M	M	F		NO	1
<u> </u>						-	200	Ŭ									_		-					110	· · ·
	S = SUPPLIED BY I = INSTALLED BY C = CONNECTED BY	ET = LINE VOLTAGE T'STAT FA = FIRE ALARM FAP = FIRE ALARM PANEL FS = FLOW SWITCH			PH = POW MCA = MIN VOLT = RE	/ER PHASE NIMUM CIR EQUIRED S	E CUIT AMI SUPPLY V	PS /OLTAGE				NOT D. CP, V TO C	ED OTHEF FD EQUIP CONTROLI	RWISE MENT RE LED EQUI	QUIRES	POWER	WIRING ⁻	TO AND FF	ROM CONT	ROL PANE	L				
	<u>STARTER CODES:</u> MAN = MANUAL STARTER HOA = MAGNETIC STARTER W/ HAND/OFF/AUTO SWITCH W/ AUX. CONTACTS	GS = GAS SENSOR H = HUMIDITY SENSOR I = INTERLOCK, SEE NOTES LIGHT = WIRED TO LIGHT SWITCH			MISCELLA FFCP = FII FRAC = FF INT = INTE	ANEOUS CO RE FIGHTE RACTIONAL EGRAL PAR	<u>DDES:</u> ERS CONT L HORSE RT OF UN	TROL PAI POWER IIT	NEL			<u>NOTES:</u> 2	1. SINGLE 2. TWO M	E POINT F IODULES	OWER (OF HEA	CONNEC ⁻ T PUMP F	TION (EXC REQUIRE	CEPT FOR ONE POW	LIGHTS). /ER SUPPL	Y (114 MCA	4)				
	MAG = MAGNETIC STARTER C/W AUX STATUS CONTACTS MRR = MOTOR RATED RELAY, 24 VAC COIL & MOTOR PROTECTION SWITCH PCS = PACKAGED CONTROL SYSTEM VFD = VARIABLE FREQUENCY DRIVE	LS = LEVEL SWITCH OS = OCCUPANT SENSOR PS = PRESSURE SWITCH R. STAT = REVERSE ACTING THERMOSTAT																							

	SYMBOL S	CHEDULE								
	PIPING					SYSTEM MON	IITORING			
	DEMOLITION	EXISTING	NEW			DEMOLITION	EXISTING	NEW		
	' ' 	· · · · · · · · · · · · · · · · · · ·		DOMESTIC COLD WATE DOMESTIC HOT WATEF	ER (DCW) R (DHW)	KO KO	T R(T)	T R(T)	ROOM TEMPERATURE	SENSOR PERATURE SENS
	++++++++++++++++++++++++++++++++++++++			SANITARY VENT			E C	E E	HUMIDITY SENSOR	ENSOR
			— — SAN — —	SANITARY SEWER ADO	OW GRADE	TAFM,	AFM FS	AFM	AIR FLOW METER	
	> 	— — ST— —	— — ST— —	STORM SEWER ABOVE	V GRADE				FLOW SWITCH	
	//// // ///@%			PIPE CLEAN-OUT PIPE CLEAN-OUT TO G	RADE	<u> </u>		<u>−−−↓</u> ₽	PIPE TEMPERATURE SE	INSOR
	′ <u>///</u> ⊀//// ′///≫¢////		——————————————————————————————————————	FIRE LINE WET SPRINKLER LINE			<u> </u>	│ <u> </u>		
	´ <u>///</u> ⊅\$₱//// ´_/K\W\$\$/_/_	DSP HWS	DSP HWS	DRY SPRINKLER LINE HYDRONIC HEATING W	ATER SUPPLY				SUPPLY OR OUTDOOR	AIR DUCT UP
	' ///K ₩VR /// ' // Q1+₩VS ///	— HWR — CHWS —	— —HWR— — ——CHWS——	HYDRONIC HEATING W CHILLED WATER SUPP	/ATER RETURN PLY	\$ <u>₹</u> ₹, \$\$,	0≅3 ↔	0 2 2 C	SUPPLY OR OUTDOOR RETURN AIR DUCT UP	AIR DUCT DOWN
		CHWR	CHWR	CHILLED WATER RETU	IRN	1, <u>7</u> , 7, 6,	€21 ⊙	E23 ©		VN
	x	HRS	—— HRS ——	HEAT RECOVERY SUPP	PLY	, , , , , , , , , , , , , , , , , , ,			EXHAUST AIR DUCT DC	WN
	<u> </u>			HEAT RECOVERY RETU CONDENSER WATER S	URN SUPPLY				ACOUSTIC INSULATION	
				CONDENSER WATER R	RETURN				BALANCING DAMPER (E BACKDRAFT DAMPER (BD) BDD)
				DIRECTION OF FLOW						MD)
_				PIPE DROP PIPE RISF			→FD		FIRE DAMPER - VERTIC	AL (FD) NTAL (FD)
_	<u>'</u> ///ø//// ' <u>///ø////</u>								DUCT OR PIPE CAP-OF	= AIR GRILLE
_	/ / / // // // // // // // // // // // 					'xc/-X-/-/			UNDER-CUT DOOR	
_	/// M ////////////////////////////////			ISOLATION VALVE (NOF	RMALLY OPEN) RMALLY CLOSED)					
_	' <u>-/-/</u> ₩ <u>√-/-/-</u> ' -/-/₩/-/-/	₹		CHECK VALVE 2-WAY CONTROL VALV	′E	987-7 1647%,		~~\$	FIRE DEPARTMENT SIA	MESE CONNECT
_	' % 	&		3-WAY CONTROL VALV BALANCING VALVE	Έ				PENDANT SPRINKLER H UPRIGHT SPRINKLER H	IEAD EAD
_	′ <mark>≠//\\$////</mark> ′ <u>///▼///</u>			PRESSURE REDUCING	VALVE (PRV)	│		<u> </u>	CONCEALED SPRINKLE SIDEWALL SPRINKLER	R HEAD HEAD
_	· → / / \ \ / / / /	► ٹی	<u>ل</u>	STRAINER		' <u>///K</u> ₽₽//, ' <u>///₩///</u>			EXT. COVERAGE SIDEV	/ALL HEAD / VALVE
_				BACKFLOW PREVENTC	DR (BFP)	······································			WET SPRINKLER SUPP	Y LINE
_	`∀, ' ///⊉///	۲ 6	ү д	AUTOMATIC AIR VENT	(AAV) FF VALVE	///DRY/// ///PRE///		DRY PRE	DRY SPRINKLER SUPPL PRE-ACTION SPRINKLE	.Y LINE R LINE
_	' <u></u>			TEMPERATURE GAUGE	Ē		F	F	FIRE LINE TO STANDPI	PE
_	· <u>·///////////////////////////////////</u>	¥	<u> </u>	PRESSURE GAUGE			AGS			
_	` <u>///Ÿ///</u> , ` ///©////			PUMP					NECK / GRILLE SIZE AIR VOLUME (L/s)	
_		EM_		ENERGY METER					EQUIPMENT / FIXTURE	TYPE
_			BTU	BTU METER					DRAWING REVISION	
_			Y.	OPEN DRAIN					DETAIL NUMBER DRAWING NUMBER	
_				HOSE-BIBB (HB)					SECTION NUMBER	
_	177. 141.	•	•	FUNNEL FLOOR DRAIN	l	//////////////////////////////////////	M-	M-	DRAWING NUMBER	
_)≥¥ ∭			AREA DRAIN						
				I OAD SIZE					POWER	MCA N
FLOW (GF 221.6	PM) CAPACITY (M	BH) EER 5.73	P.D. (FT WG)	EWT (F) LWT (F 115 130	F) FLOW (GPM 108.8	CAPACITY (MBH)	COP P.D. (F 2.7 4.3	T WG) SIZE (Lx) 35 77"X66	WxH) (IN) V/PH/HZ 6"X77" 575/3/60	60
164.2	751	8.30	11.8	115 130	142.9	1061	3.4 5.8	35		
								1		
= EL	FLUID TEMP (DEG F)	. FLUID	TYPE	FLOW (EA) (GPM)	HEAD (EA) (FT)	MOTOR MC (HP)	DTOR @ MAX FLOW (RPM)	MAX. FLO (GPM)	W POWER (V/PH/HZ)	NOTES
EL 2 2	FLUID TEMP (DEG F) 25 25	. FLUID 25% ET 25% ET	TYPE HANOL	FLOW (EA) (GPM) 90 90	HEAD (EA) (FT) 75.0 75.0	MOTOR MC (HP) 5.0 5.0	DTOR @ MAX FLOW (RPM) 3,260 3,260	MAX. FLO (GPM) 118.8 118.8	W POWER (V/PH/HZ) 208/3/60 208/3/60	ALL ALL

				SYMBOL S	CHEDULE			-			
				PIPING				SYSTEM MONIT	ORING		
				DEMOLITION	EXISTING	NEW		DEMOLITION	EXISTING	NEW	
				·/////////////////////////////////////	·		DOMESTIC COLD WATER (DCW)	, Ø	T	T	ROOM TEMPERATURE SENSOR
				` <u>+</u> +++ / ·/++++ '_ <u>+_+</u> /, / ·/ <u>-</u>	· · ·			R(T)	R(T)	R(T)	REVERSE ACTING TEMPERATURE SENSOR
				<i>───</i> /`/` <i>! ───</i> ′←/ <i>←</i> &←/ <i>←</i> ,			SANITARY VENT) Ø	(I) (II)		HUMIDITY SENSOR
					SAN	SAN	SANITARY SEWER ABOVE GRADE		0	6	CO SENSOR
					——————————————————————————————————————	— — SAN— —	SANITARY SEWER BELOW GRADE	AFM	AFM	AFM	AIR FLOW METER
				' /// \$t///	ST	ST	STORM SEWER ABOVE GRADE	ÍØ 	FS	FS	
				'≁/≁\$1≁/≁	— —ST— —	— — ST — —	STORM SEWER BELOW GRADE		<u>10</u>		FLOW SWITCH
				·////			PIPE CLEAN-OUT	·///IF///	<u>↓</u>	<u>T</u>	PIPE TEMPERATURE SENSOR
				· / / / Ø,			PIPE CLEAN-OUT TO GRADE	Ø	P		PRESSURE SENSOR
				/////////////////////////////////////				<u>'///\\////////////////////////////////</u>	<u> </u>	<u> </u>	
				<u> </u>	DSP	DSP	DRY SPRINKLER LINE	DUCTWORK			
						——HWS——	HYDRONIC HEATING WATER SUPPLY			• 🛛	SUPPLY OR OUTDOOR AIR DUCT UP
					HWR	— —HWR— —	HYDRONIC HEATING WATER RETURN	位差过, (必)	cej ()	0 E E O	SUPPLY OR OUTDOOR AIR DUCT DOWN
				~ <u>~</u>		——CHWS——	CHILLED WATER SUPPLY	(**	•		RETURN AIR DUCT UP
				´ <u></u> ∕∕¢h₩y Ŕ ∕∕		— — CHWR — —	CHILLED WATER RETURN		0 [5] O	0 EZ3	RETURN AIR DUCT DOWN
					C			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
				<u>///</u> ₩¤⁄///	—— нкр				نۍ تر چې الموني		TURNING VANES
				<pre>/// CÓNDS///</pre>			CONDENSER WATER SUPPLY	, <u>1</u>			ACOUSTIC INSULATION
				∽∕¢ón⊅r∕~	- CONDR-		CONDENSER WATER RETURN	<i></i>	-		BALANCING DAMPER (BD)
						1	1				BACKDRAFT DAMPER (BDD)
								- <i>(</i>		≠	MOTORIZED DAMPER (MD)
DESCRIPTION	NAME		EXISTING				DIRECTION OF FLOW	ŕ þ	FD	FD	FIRE DAMPER - VERTICAL (FD)
DOMESTIC COLD WATER	PDCW	·	·	/// ⊅//// /				FO	FD	● FD	FIRE DAMPER - HORIZONTAL (FD)
DOMESTIC HOT WATER	PDHW	<u> </u>	· ·	/ /// 0/////							DUCT OR PIPE CAP-OFF
DOMESTIC HOT WATER RECIRC	PDHWR	· · · ·		· · · · · · · · · · · · · · · · · · ·			PIPE TEE DOWN		\square		RETURN OR EXHAUST AIR GRILLE
DOMESTIC TEMPERED WATER	PDTW	· · · · ·		·/////////////////////////////////////		<u> </u>	PIPE UNION	´₩¢, / X, /→ /	UC — V — ►	UC- ~~	UNDER-CUT DOOR
NON POTABLE WATER	PNPW	NPW	NPW		NO	NO NO	ISOLATION VALVE (NORMALLY OPEN)	FIRE PROTECTI	ON	•	·
IRRIGATION	PIR	———IR———	———IR———	·///MC///			ISOLATION VALVE (NORMALLY CLOSED)	/ AFE			
MECHANICAL EQUIPMENT	MEQ						CHECK VALVE)©/ / (A ^A /	с К		
CONDENSATE DRAIN	MCOND	C	C	/////// /	X	₩		7 /8, 		- * 	PENDANT SPRINKLER HEAD
CONTROLS	MCONT						BALANCING VALVE	·///ø////	O		UPRIGHT SPRINKLER HEAD
TEXT	MT			· <u>►//₩///</u>	►		PRESSURE REDUCING VALVE (PRV)	· <u>///¤////</u>	ja		CONCEALED SPRINKLER HEAD
HEATING WATER SUPPLY	MHWS	HWS	HWS	·/////////////////////////////////////			POOL FLOW CONTROL VALVE	·/////////////////////////////////////	——	── ►	SIDEWALL SPRINKLER HEAD
HEATING WATER RETURN	MHWR	— — HWR— —	— — HWR — —	′ ≠//\ \{\ ////	 ار	→	STRAINER				EXT. COVERAGE SIDEWALL HEAD
CHILLED WATER SUPPLY	MCHWS	CHWS	CHWS		*	*	RELIEF VALVE				
CHILLED WATER RETURN	MCHWR	— -CHWR- —	— - CHWR - —				BACKFLOW PREVENTOR (BFP)				
HEAT PUMP SUPPLY	MHPS	HPS	——— HPS ———	×, ,,,/x,,,,	۲ ج	۲ ب					
HEAT PUMP RETURN	MHPR	— — HPR— —	— — HPR — —	7779777 /d			SEISMIC GAS SHUT-OFF VALVE		FKE	FKE	
RADIANT HEATING SUPPLY	MRHS			·///////	ĭ	ĭ	TEMPERATURE GAUGE	++++			
	MRHR			·¥	© ¥	© ¥	PRESSURE GAUGE	EQUIPMENT TAG	GS		
REFRIGERANT SUPPLY	MREGR					0	THERMOMETER	141218			
SOLAR WATER SUPPLY	MSWS								-		NECK / GRILLE SIZE
SOLAR WATER RETURN	MSWR	— — SWR— —	— — SWR — —				PUMP				
FUEL OIL SUPPLY	MFOS	FOS	—— FOS ——		EM)	- EM	ENERGY METER		<u> </u>		EQUIPMENT / FIXTURE TYPE
FUEL OIL RETURN	MFOR	— — FOR— —	— -FOR	·	-BTU-	BTU	BTU METER		<->		GENERAL NOTE
				OUTLETS AND P	RAINS	I	1		<u> </u>		DRAWING REVISION
CONDENSER WATER SUPPLY	MCWS	CWS	CWS	· · · · · · · · · · · · · · · · · · ·					-		
CONDENSER WATER RETURN	MCWR	— — CWR— —	— - CWR - —	X.k. _////.k/	کہ ا	من			M	M	DRAWING NUMBER
ETHANOL SUPPLY	METHS	ETHS	ETHS	/// //% / / \$ /	•		FLOOR DRAIN (FD)		-		SECTION NUMBER
	METHR			//. / \$ /	۲	•	FUNNEL FLOOR DRAIN	/ XM////	M-	M-	DRAWING NUMBER
				19/2	۲	٥	ROOF DRAIN (RD)				
NADIANT FLOOR HEAT KETUKN				1			AREA DRAIN				
			SOURCE SIDE				LOAD SIZE				POWER MCA NOTES
			EWT (F) LWT (F) FLOW (GP	M) CAPACITY (M	BH) EER	P.D. (FT WG)	EWT (F) LWT (F) FLOW (GPM)	CAPACITY (MBH)	COP P.D. (F	T WG) SIZE (Lx)	WxH) (IN) V/PH/HZ MOA NOTES
E TPWCCMV0400 (*2 MODU	JLES) G		30 25 221.6	504	5.73	23.3	115 130 108.8 115 100 1100	805	2.7 4.3	5 77"X6	6"X77" 575/3/60 60 ALL
	DE	TOW TEAT RECOVERY MODE	ຼີບບໍ່ 45 164.2	ı <i>(</i> 51	8.30	11.8	142.9	ו מט ו	J.4 5.8	iu	
ТҮРЕ	E	MANUFACTURER	MODEL	FLUID TEMP	. FLUID	TYPE	FLOW (EA) HEAD (EA) M	IOTOR MOTO	OR @ MAX FLOW	MAX. FLC	W POWER NOTES
				(DEG F)			(GPM) (FT)	(HP)	(RPM)	(GPM)	(V/PH/HZ)
VERTICAL	INLINE	ARMSTRONG	SG-42	25	25% ET	HANOL	90 75.0	5.0	3,260	118.8	208/3/60 ALL
VERTICAL		ARMSTRONG	SG-42	25	25% ET		90 75.0	5.0	3,260	118.8	208/3/60 ALL
		ARMSTRONG	<u>ΓΙV-4</u> FA	130	WA'		71.0 40.0	2.0	2,761	93.7	208/3/60 ALL 208/3/60 Δ11
			I [−] I V-4FA	1 130	VVA		,	2.0	2,101	J 33.1	

					SYMBOL S	CHEDULE						
					PIPING				SYSTEM MONIT	ORING		
					DEMOLITION	EXISTING	NEW		DEMOLITION	EXISTING	NEW	
					·	·	·	DOMESTIC COLD WATER (DCW)	, Ó	T	Ū	ROOM TEMPERATURE SENSOR
					' : : 	· · ·		DOMESTIC HOT WATER (DHW)	RO KO	RT	R(T)	REVERSE ACTING TEMPERATURE SENSOR
					'+/+×+/+,			SANITARY VENT	<u> </u>	H	H H	HUMIDITY SENSOR
						SAN	SAN	SANITARY SEWER ABOVE GRADE) M			CO SENSOR
					'	SAN	SAN	SANITARY SEWER BELOW GRADE	<u>AFM</u> Est	AFM FSI	AFM FS	AIR FLOW METER
					<i>+++</i> ≱1 /+++ '+/+\$t / /+	—	— — ST — —	STORM SEWER ABOVE GRADE				FLOW SWITCH
						——————————————————————————————————————		PIPE CLEAN-OUT				PIPE TEMPERATURE SENSOR
					·///Ø,			PIPE CLEAN-OUT TO GRADE	Ø	P	P	PRESSURE SENSOR
					/////////////////////////////////////		F	FIRE LINE WET SPRINKLER LINE	<u>'///\$///</u>	<u> </u>		
					·///þsp////	DSP	DSP	DRY SPRINKLER LINE	DUCTWORK	1	1	
						HWS	HWS	HYDRONIC HEATING WATER SUPPLY				SUPPLY OR OUTDOOR AIR DUCT UP
						HWR		HYDRONIC HEATING WATER RETURN				SUPPLY OR OUTDOOR AIR DUCT DOWN
					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		CHWR	CHILLED WATER RETURN	tzzzi (x)	.21 O	123 <b>C</b>	RETURN AIR DUCT DOWN
					' <u>+++</u> € <u>+++</u> +	C	C	CONDENSATE DRAIN	( <b>*</b>	•		EXHAUST AIR DUCT UP
						HRS				izi () N	0 (51 )   []	
								CONDENSER WATER SUPPLY	, , <u>, , , , , , , , , , , , , , , , , </u>			ACOUSTIC INSULATION
					<pre></pre>	CONDR	CONDR	CONDENSER WATER RETURN	( <del>4</del> ,	<b>—</b>	=	BALANCING DAMPER (BD)
1					FITTINGS AND	/ALVES						BACKDRAFT DAMPER (BDD)
	DESCRIPTION	NAME	NEW	EXISTING	′ <u>///⊭///</u>		<b>→</b>	DIRECTION OF FLOW		FD	FD	
	DOMESTIC COLD WATER	PDCW	·	·	·///⊅///,	ə	<b></b>	PIPE DROP		FD	FD	
	DOMESTIC HOT WATER	PDHW		· · ·	' <u>+++</u> ¢///, '☆///	O	□ 		/₩₩ / 			DUCT OR PIPE CAP-OFF
	DOMESTIC HOT WATER RECIRC	PDHWR		· · ·	<del>+++++++++++++++++++++++++++++++++++++</del>							RETURN OR EXHAUST AIR GRILLE
	DOMESTIC TEMPERED WATER	PDTW	· · · · ·	· · · · ·	·/////////////////////////////////////			PIPE UNION	'yc/- <del>%-/-</del> /	UC — V — >	UC — V — ►	UNDER-CUT DOOR
		PNPW		——NPW —				ISOLATION VALVE (NORMALLY OPEN)	FIRE PROTECTI	ON		
								CHECK VALVE	ØFE/	⊗ ^{FE}	⊗ ^{FE}	FIRE EXTINGUISHER
	MECHANICAL EQUIPMENT	MEQ			·///X////		×	2-WAY CONTROL VALVE	64°,	~\$¢	l ~\$	FIRE DEPARTMENT SIAMESE CONNECTION
	CONDENSATE DRAIN CONTROLS	MCOND	C	C	·///&////	&		3-WAY CONTROL VALVE	<del>///@////</del> / <u>///Ø////</u>			PENDANT SPRINKLER HEAD
	TEXT	MT						BALANCING VALVE PRESSURE REDUCING VALVE (PRV)	· · · · · · · · · · · · · · · · · · ·	æ		CONCEALED SPRINKLER HEAD
	HEATING WATER SUPPLY	MHWS		——— HWS ———	·/////////////////////////////////////			POOL FLOW CONTROL VALVE	·/////////////////////////////////////	——-KI	<b>—</b> •	SIDEWALL SPRINKLER HEAD
	HEATING WATER RETURN	MHWR	— — HWR— —	— -HWR- —	′ <mark>≠//\</mark> \////	<b>۔</b>	►	STRAINER				
	CHILLED WATER SUPPLY	MCHWS	CHWS	CHWS								WET SPRINKLER SUPPLY LINE
	CHILLED WATER RETURN	MCHWR MHPS		— - CHWR - —	X			AUTOMATIC AIR VENT (AAV)		——DRY——	DRY	DRY SPRINKLER SUPPLY LINE
	HEAT PUMP RETURN	MHPR	— — HPR— —	— — HPR — —	·///Å////			SEISMIC GAS SHUT-OFF VALVE	~~~PRE~~~~	PRE	PRE-	PRE-ACTION SPRINKLER LINE
	RADIANT HEATING SUPPLY	MRHS		RHS	· <u>·/·Å////</u>	Ţ		TEMPERATURE GAUGE	<i>′+/+₹+/+</i> ,	——F	F	FIRE LINE TO STANDPIPE
	RADIANT HEATING RETURN	MRHR	— — RHR — —	— — RHR — —		© ¥	© ¥	PRESSURE GAUGE	EQUIPMENT TA	GS		•
	REFRIGERANT SUPPLY	MRFGS MREGR		$\longrightarrow$ RFGS $\longrightarrow$				THERMOMETER	141218			
	SOLAR WATER SUPPLY	MSWS	sws					DIIMD		-		NECK / GRILLE SIZE AIR VOLUME (L/s)
	SOLAR WATER RETURN	MSWR	— — SWR— —	— — SWR — —		EM EM	EM		\$ <del></del> }			EQUIPMENT / FIXTURE TYPE
	FUEL OIL SUPPLY	MFOS	FOS	—— FOS ——	// X EN ///	BTID		BTUMETER	17-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	(-)		GENERAL NOTE
	FUEL OIL RETURN	MFOR	— — FOR— —	— — FOR — —						$\overline{\bigtriangleup}$	$\overline{\Delta}$	DRAWING REVISION
	CONDENSER WATER SUPPLY	MCWS		CWS	OUTLETS AND I	DRAINS			- 17-1			
	CONDENSER WATER RETURN	MCWR	— — CWR— —	— - CWR - —	XA	ۍل ا	من	OPEN DRAIN	- M- J	M-	M-	DRAWING NUMBER
	ETHANOL SUPPLY	METHS	ETHS	ETHS	<del>/////\?/</del> / /\$/	•		HOSE-BIBB (HB) FLOOR DRAIN (FD)				SECTION NUMBER
	ETHANOL RETURN RADIANT FLOOR HEAT SUPPLY	METHR			//. /\$/.	٠	۵	FUNNEL FLOOR DRAIN	/\//,	M-	M-	DRAWING NUMBER
	RADIANT FLOOR HEAT RETURN	MRFR	— — RFR — —	— — RFR — —	<b>Ø</b> /.	۲	٥	ROOF DRAIN (RD)				
					∕₽.			AREA DRAIN				
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SERVICE	ACTORER MODEL		OFERATING MODE	EWT (F) LWT (F) FLOW (GF	PM) CAPACITY (N	1BH) EER	P.D. (FT WG)	EWT (F) LWT (F) FLOW (GPM)	CAPACITY (MBH)	COP P.D. (F	T WG) SIZE (Lx	WxH) (IN) V/PH/HZ
OM HEAT RECOVERY LOOP T	RANE TPWCCMV0400 (*2 MODU	ILES) GEO DEHU	HEAT EXTRACTION MODE	30         25         221.6           55         45         164.2	504	5.73	23.3	<u>115</u> <u>130</u> <u>108.8</u> <u>115</u> <u>130</u> <u>142.9</u>	805	2.7 4.3 3.4 5.8	35 77"X6 85	6"X77" 575/3/60 60 ALL
					1							
OR CONTROL SEQUENCE												
LOCATION	ТҮРЕ		MANUFACTURER	MODEL	FLUID TEMF	P. FLUID	TYPE	FLOW (EA) HEAD (EA)	MOTOR MOTO	OR @ MAX FLOW	MAX. FLC	DW POWER NOTES
				SC-42	(DEG F)	250/ ET		(GPM) (FT)	(HP) 5.0	(RPM) 3 260	(GPM)	(V/PH/HZ) 208/3/60
			ARMSTRONG	SG-42	25	25% ET	HANOL	90 75.0	5.0	3,260	118.8	208/3/60 ALL
MECH RM	VERTICAL		ARMSTRONG	FTV-4FA	130	WA	TER	71.0 40.0	2.0	2,761	93.7	208/3/60 ALL
VIP   MECH RM	VERTICAL	INLINE	ARMSTRONG	FTV-4FA	130	I WA	IEK	/1.0   40.0	2.0	2,761	93.7	208/3/60 ALL

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DEMOLISH EXISTING 3" Ø GEO LOOP SUPPLY UP TO SHUT-OFF VALVE - EXISTING GEO-FIELD HEADERS TO REMAIN DEMOLISH EXISTING 3"Ø GEO LOOP RETURN UP TO SHUT-OFF VALVE

³ EX. GEO LOOP HEADER M1.01 SCALE: NTS







DETAIL NOTES DIMENSION 'A' TO BE AT LEAST 5 PIPE DIAMETERS IN LENGTH. WHERE SPACE IS LIMITED, PROVIDE SUCTION DIFFUSER ON INLET WITH INTEGRAL STRAINER.



⁵ FLOOR MOUNTED VERTICAL IN-LINE PUMP







MECHANICAL PLAN - RENO M1.01 SCALE: 1:100

### GENERAL NOTE

- 1. ALL NEW EQUIPMENT TO BE INSTALLED ON EXISTING HOUSE KEEPING PAD
- 2. REFER TO M2.01 SCHEMATIC FOR CONNECTION DETAILS

## KEY NOTE

PAD

(1) REFER TO 5/M1.01 & 2/M2.01 FOR PUMP CONNECTIONS DETAILS & SCHEMATIC. PROVIDE NEW CONCRETE

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#### COMMON WORKS

#### 1. GENERAL

1.1 GENERAL SCOPE

'PROVIDE' SHALL MEAN SUPPLY AND INSTALL 'CONSULTANT' SHALL MEAN AME GROUP CONSULTING PROFESSIONAL ENGINEERS

PROVIDE COMPLETE, FULLY TESTED AND OPERATIONAL SYSTEMS TO MEET THE REQUIREMENTS DESCRIBED HEREIN AND IN COMPLETE ACCORD WITH APPLICABLE CODES AND ORDINANCES.

ARE NOT DETAILED INSTALLATION INSTRUCTIONS. FOLLOW MANUFACTURERS' RECOMMENDED INSTALLATION INSTRUCTIONS, DETAILS AND PROCEDURES FOR EQUIPMENT,

SUPPLEMENTED BY REQUIREMENTS OF THE CONTRACT DOCUMENTS BEFORE SUBMITTING TENDER, VISIT AND EXAMINE THE SITE AND NOTE ALL CHARACTERISTICS AND FEATURES AFFECTING THE WORK. NO ALLOWANCES WILL BE MADE FOR ANY DIFFICULTIES ENCOUNTERED OR ANY EXPENSES INCURRED BECAUSE OF ANY CONDITIONS OF THE SITE OR ITEM EXISTING THEREON, WHICH IS VISIBLE OR KNOWN TO EXIST AT THE TIME OF TENDER. CLARIFICATIONS OR REQUESTS FOR ALTERNATE MATERIALS OR EQUIPMENT MUST BE SUBMITTED IN WRITING TO THE CONSULTANT AND 23 HEAT PUMPS NO LATER THAN SEVEN (7) WORKING DAYS PRIOR TO THE MECHANICAL TRADES' CLOSING TENDER DATE. APPROVAL OF REQUESTS CONFIRM OPERATION AND REVIEW CONDITION OF ALL HEAT PUMPS, AND ASSOCIATED CONTROL DEVICES IN SHALL ONLY BE GIVEN BY ADDENDUM. MAKE REFERENCE TO ELECTRICAL, MECHANICAL, STRUCTURAL AND ARCHITECTURAL DRAWINGS WHEN SETTING OUT WORK.

CONSULT WITH RESPECTIVE DIVISIONS IN SETTING OUT LOCATIONS FOR DUCTWORK, EQUIPMENT, AND PIPING, SO THAT CONFLICTS THE OWNER'S OPERATING STAFF. ARE AVOIDED AND SYMMETRICAL EVEN SPACING IS MAINTAINED. JOINTLY WORK OUT ALL CONFLICTS ON SITE BEFORE FABRICATING AT THE COMPLETION OF THE COMMISSIONING, TESTING, BALANCING AND DEMONSTRATION SUBMIT TO THE COMPLETION OF THE COMMISSIONING, TESTING, BALANCING AND DEMONSTRATION SUBMIT TO THE COMPLETION OF THE COMPLETION OF THE COMPLETION OF THE COMPLEXING AND DEMONSTRATION SUBMIT TO THE COMPLEXING AND DEMONSTRATION AND ADDITIONAL AND ADDITION 1.2 CODE COMPLIANCE, PERMITS AND FEES

ALL WORK SHALL COMPLY WITH CURRENT EDITIONS OF THE NATIONAL, PROVINCIAL AND MUNICIPAL CODES, STANDARDS, ACTS AND 1.21 FLASHING AND ROOF CURBS BYLAWS AND WILL MEET THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION. OBTAIN ALL PERMITS AND PAY ALL FEES APPLICABLE TO THE SCOPE OF WORK. CONTRACTOR SHALL ARRANGE FOR INSPECTIONS WATERPROOFED WALLS, FLOORS AND ROOFS. OF THE WORK BY THE AUTHORITIES HAVING JURISDICTION AND SHALL PROVIDE CERTIFICATES INDICATING FINAL APPROVAL.

1.3 TENDER PRICE BREAKDOWN SUBMIT A TENDER PRICE BREAKDOWN WITHIN THIRTY (30) DAYS OF TENDER CLOSING AND BEFORE FIRST PROGRESS CLAIM, IN A FORMAT AGREED TO WITH THE CONSULTANT. AS A MINIMUM INCLUDE EQUIPMENT, MATERIALS AND LABOUR FOR MECHANICAL, PLUMBING, SHEET METAL, FIRE PROTECTION AND CONTROLS.

1.4 SUBMITTALS COMPLY WITH DIVISION 1 - SUBMISSION AND CLOSEOUT PROCEDURES AND IN ADDITION THE FOLLOWING:

CONTRACTOR SHALL PROVIDE AND SUBMIT TO THE CONSULTANT ASSURANCE OF PROFESSIONAL DESIGN AND COMMITMENT FOR FIELD REVIEW SCHEDULE S-B AND ASSURANCE OF PROFESSIONAL FIELD REVIEW AND COMPLIANCE SCHEDULE S-C FOR SEISMIC ENGINEERIN SHOP DRAWINGS: PROVIDE SHOP DRAWINGS FOR ALL EQUIPMENT AS ELECTRONIC FILES (FILE FORMAT: .DWG, .DXF, PDF, OR

COMPARABLE). WHEN MANUFACTURER'S CUT SHEETS APPLY TO A PRODUCT SERIES RATHER THAN A SPECIFIC PRODUCT, THE DATA OR EXCEEDING THE SPECIFIED DEFLECTION REQUIREMENTS AND SO THAT NO ISOLATOR HAS A DEFLECTION SPECIFICALLY APPLICABLE TO THE PROJECT SHALL BE HIGHLIGHTED OR CLEARLY INDICATED BY OTHER MEANS. EACH SUBMITTED PIECE OF LITERATURE AND DRAWINGS SHALL CLEARLY REFERENCE THE SPECIFICATION AND/OR DRAWING THAT THE SUBMITTAL IS OTHERWISE. TO COVER. GENERAL CATALOGS SHALL NOT BE ACCEPTED AS CUT SHEETS TO FULFILL SUBMITTAL REQUIREMENTS

CLOSEOUT SUBMITTALS: PROVIDE A MINIMUM OF TWO (2) MECHANICAL OPERATION AND MAINTENANCE MANUALS AND ONE DIGITAL PRIOR TO REQUESTING AN INSPECTION FOR SUBSTANTIAL PERFORMANCE, PROVIDE A COMPLETE LIST OF IT OPERATION AND MAINTENANCE MANUAL APPROVED BY, AND FINAL COPIES DEPOSITED WITH THE CONSULTANT A MINIMUM OF 7-DAYS BEFORE FINAL INSPECTION.

OPERATION AND MAINTENANCE MANUAL TO INCLUDE BUT NOT LIMITED TO: LAYMAN'S DESCRIPTION OF THE SYSTEMS AND ASSOCIATED CONTROLS; OPERATIONAL INSTRUCTIONS, SERVICING, MAINTENANCE, OPERATION AND TROUBLE-SHOOTING INSTRUCTIONS FOR EACH ITEM OF FOUIPMENT: WARRANTIES: FOUIPMENT MANUFACTURER'S PERFORMANCE DATASHEETS INDICATING POINT OF OPERATION AS LEFT AFTER COMMISSIONING IS COMPLETE; TESTING, ADJUSTING AND BALANCING REPORTS. SITE RECORDS: CONTRACTOR SHALL MAINTAIN 1 SET OF WHITE PRINTS AT CONTRACTORS COST TO MARK CHANGES AS WORK PROGRESSES AND AS CHANGES OCCUR. USE DIFFERENT COLOUR WATERPROOF INK FOR EACH SERVICE. DO NOT USE PENCIL OR BLACK INK. TRANSFER INFORMATION WEEKLY TO SHOW WORK AS ACTUALLY INSTALLED. DRAWINGS SHALL BE AVAILABLE FOR REFERENCE PURPOSES AND REVIEW.

RECORD DRAWINGS: PRIOR TO START OF TESTING, ADJUSTING AND BALANCING FOR MECHANICAL FINALIZE PRODUCTION OF RECORD DRAWINGS RECORD DRAWINGS: USE FINAL SITE RECORD TO ELECTRONICALLY PRODUCE CAD AND PDF FILES THUS FORMING A "RECORD

DRAWING" SET. IDENTIFY EACH DRAWING IN LOWER RIGHT HAND CORNER IN LETTERS AT LEAST 12 MM HIGH AS FOLLOWS: -"RECORD DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (SIGNATURE OF CONTRACTOR) (DATE). PERFORM TESTING, ADJUSTING AND BALANCING FOR HVAC USING RECORD DRAWINGS, SUBMIT RECORD DRAWINGS TO CONSULTANT FOR APPROVAL AND MAKE CORRECTIONS AS DIRECTED. PERFORM TESTING, ADJUSTING, AND BALANCING FOR HVAC USING RECORD DRAWINGS. PROVIDE COMPLETED REPRODUCIBLE RECORD DRAWINGS WITH FINAL OPERATING AND MAINTENANCE MANUALS WITHIN TWO (2) WEEKS OF SUBSTANTIAL COMPLETION. FAILURE TO SUBMIT DRAWINGS WILL RESULT IN THE WORK BEING UNDERTAKEN BY THE OWNER AND DEDUCTED FROM THE CONTRACTOR'S HOLD BACK AMOUNT.

COST TO TRANSFER RECORD INFORMATION ONTO REPRODUCIBLE MEDIA & AUTO-CAD OR REVIT ARE THIS CONTRACTOR'S RESPONSIBILITY. CONSULTANT WILL RELEASE CAD DRAWINGS TO CONTRACTOR AFTER SIGNING A COPYRIGHT FORM. SHOULD THE **2.2 PIPE HANGERS AND SUPPORTS** CONTRACTOR CHOOSE TO UTILIZE THIS CONSULTANT FOR TRANSFERRING AS BUILT INFORMATION TO RECORD DRAWINGS, ALLOW PROVIDE HANGERS AND SUPPORTS TO SECURE EQUIPMENT IN PLACE, PREVENT VIBRATION, PROTECT AGAIN \$400 / SHEET FOR ALL DRAWINGS IN THE CONSTRUCTION SET. THIS WILL COVER COSTS FOR DRAFTING TIME & PRINTING COSTS. 1.5 QUALITY OF WORK

ALL WORK SHALL BE BY QUALIFIED TRADESMEN WITH VALID PROVINCIAL TRADE QUALIFICATION CERTIFICATES. SPOT CHECKS WILL PROVIDE 20MM (3/4") DIAMETER BRASS TAGS, SECURE TO VALVE STEMS WITH KEY CHAIN. PROVIDE A VALVE BE MADE BY THE CONSULTANT. WORK WHICH DOES NOT CONFORM TO STANDARDS MAY BE REJECTED BY THE CONSULTANT. THE CONTRACTOR SHALL REDO REJECTED WORK TO THE ACCEPTED STANDARD AT NO COST TO THE OWNER.

1.6 METRIC CONVERSION ALL UNITS ARE EXPRESSED IN SI UNITS. ON ALL SUBMITTALS (SHOP DRAWINGS ETC.) USE THE SAME SI UNITS AS STATED IN THE SPECIFICATION

WHERE PIPES ARE SPECIFIED WITH METRIC DIMENSIONS AND IMPERIAL SIZED PIPES ARE AVAILABLE. PROVIDE EQUIVALENT NOMINAL IMPERIAL SIZED PIPE AS INDICATED IN THE TABLE, AND PROVIDE AT NO EXTRA COST ADAPTERS TO ENSURE COMPATIBLE CONNECTIONS TO ALL METRIC SIZED FITTINGS, EQUIPMENT AND PIPING.

WHEN CSA APPROVED SI METRIC PIPES ARE PROVIDED. THE CONTRACTOR SHALL PROVIDE AT NO EXTRA COST ADAPTERS TO ENSURE COMPATIBLE CONNECTIONS BETWEEN THE SI METRIC PIPES AND ALL NEW AND EXISTING PIPES, FITTINGS, AND EQUIPMENT. EQUIVALENT NOMINAL DIAMETER OF PIPES

15MM = NPS 1/2 20MM = NPS 3/4 25MM = NPS 1 30MM = NPS 1-1/4 40MM = NPS 1-1/2 50MM = NPS 2 65MM = NPS 2-1/2 75MM = NPS 3 100MM = NPS 4

150MM = NPS 6 200MM = NPS 8

THE METRIC DUCT SIZES ARE EXPRESSED AS 25 MM = 1 INCH.

1.7 DRAWINGS AND SPECIFICATION SHOULD ANY DISCREPANCY APPEAR BETWEEN DRAWINGS AND SPECIFICATIONS OBTAIN WRITTEN CLARIFICATION FROM THE CONSULTANT DURING THE TENDER PERIOD. WITHOUT A WRITTEN CLARIFICATION THE BETTER QUALITY AND/OR GREATER QUANTITY OF WORK OR MATERIALS SHALL BE ESTIMATED, PERFORMED AND FURNISHED WITHIN THE TENDERED PRICE.

1.8 CUTTING, PATCHING AND CORING

PROVIDE HOLES AND SLEEVES, CUTTING AND FITTING REQUIRED FOR MECHANICAL WORK. RELOCATE IMPROPERLY LOCATED HOLES AND SLEEVES. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES. OBTAIN WRITTEN APPROVAL FROM THE STRUCTURAL CONSULTANT BEFORE CUTTING OR BURNING STRUCTURAL MEMBERS.

1.9 COMPLIANCE WITH ENERGY BY-LAW

ALL EQUIPMENT INSTALLED ON THIS PROJECT SHALL COMPLY WITH THE NATIONAL ENERGY CODE OF CANADA FOR BUILDINGS - 2015. ASHRAE STANDARD 90.1 - 2016 AND THE CITY OF VANCOUVER BUILDING BY-LAW ENERGY UTILIZATION REQUIREMENTS. 1.10 INSTALLATION OF EQUIPMENT

PIPE ALL EQUIPMENT DRAINS TO BUILDING DRAINS EXCEPT SYSTEMS CONTAINING GLYCOL.

UNIONS AND FLANGES SHALL BE PROVIDED IN PIPING OR DUCTWORK TO PERMIT EASY REMOVAL OF EQUIPMENT. MAINTAIN PERMANENT ACCESS TO EQUIPMENT FOR MAINTENANCE.

1.11 CONNECTIONS TO EXISTING SERVICES

MAINTAIN LIAISON WITH THE OWNER AND PROVIDE A MUTUALLY ACCEPTABLE SCHEDULE TO INTERRUPT, REROUTE, OR CONNECT TO PIPE SUPPORT SPACING AND HANGER ROD DIAMETER SHALL BE:

EXISTING BUILDING SERVICES WITH THE MINIMUM OF INTERRUPTION OF THOSE SERVICES.

1.12 SELECTIVE DEMOLITION REMOVE FROM SITE ALL EQUIPMENT, DUCTING OR PIPING WHICH IS NO LONGER REQUIRED BECAUSE OF WORK UNDER THIS

CONTRACT. EXCEPT AS OTHERWISE STATED, SALVAGEABLE MATERIALS FROM AREA OF DEMOLITION SHALL BECOME THE PROPERTY OF THE OWNER AT HIS DISCRETION THE INTENT IS FOR A HAZ-MAT CONTRACTOR TO REMOVE ALL ASBESTOS CONTAINING MATERIAL PRIOR TO THE PROPOSED PROJECT

WORK TAKING PLACE. NOTIFY THE CONSULTANT IF ASBESTOS CONTAINING MATERIAL IS SUSPECTED TO REMAIN ON SITE. 1.13 EQUIPMENT AND MATERIALS

WHERE TWO OR MORE PRODUCTS OF THE SAME TYPE ARE REQUIRED, PRODUCTS SHALL BE OF THE SAME MANUFACTURER. NOTIFY THE CONSULTANT IN WRITING TEN (10) DAYS PRIOR TO THE TENDER CLOSE, ANY MATERIALS OR EQUIPMENT SPECIFIED WHICH IS NOT CURRENTLY AVAILABLE OR WILL NOT BE AVAILABLE FOR USE AS CALLED FOR HEREIN. FAILING THIS, THE CONTRACT PRIOR TO TESTS, ISOLATE EQUIPMENT AND OTHER PARTS WHICH ARE NOT DESIGNED TO WITHSTAND TEST F WILL ASSUME THAT THE MOST EXPENSIVE ALTERNATE HAS BEEN INCLUDED IN THE TENDER PRICE.

APPROVED EQUIVALENTS AND/OR ALTERNATIVES TO SPECIFIED PRODUCTS SHALL BE EQUAL TO THE SPECIFIED PRODUCT IN EVERY RESPECT, OPERATE AS INTENDED, AND MEET THE SPACE, CAPACITY, AND NOISE REQUIREMENTS OUTLINED.

THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY ADDITIONAL LABOUR AND MATERIALS REQUIRED BY ANY TRADES OR OTHER CONTRACTORS TO ACCOMMODATE THE USE OF OTHER THAN SPECIFIED MATERIALS OR EQUIPMENT. THE CONTRACTOR

SHALL BEAR ANY AND ALL COSTS FOR DESIGN/SYSTEM MODIFICATIONS TO ACCOMMODATE THE "ALTERNATE" EQUIPMENT. EXTRAS INSULATE OR CONCEAL WORK ONLY AFTER APPROVAL AND CERTIFICATION OF TESTS BY AUTHORITIES. WILL NOT BE APPROVED TO COVER SUCH WORK.

1.14 DELIVERY, STORAGE AND HANDLING

STORE MATERIALS AND EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS IN A CLEAN, DRY, WELL-VENTILATED AREA.

REPLACE DEFECTIVE OR DAMAGED MATERIALS WITH NEW.

1.15 FIRESTOPPING AND SMOKE SEALS

PROVIDE FIRESTOPPING SYSTEM(S) TO PROVIDE AND MAINTAIN A FIRE RESISTANCE RATING, AS INDICATED ON DRAWINGS AND IN ACCORDANCE WITH UL, WH, ULC, CUL OR FM DESIGN DETAILS FOR ALL MECHANICAL WORK IN DIVISIONS 21, 22, 23 AND 25 FOR RENOVATION PROJECTS. IN ADDITION TO THE NECESSARY NEW PENETRATIONS, PROVIDE THE FIRESTOPPING FOR ALL

EXISTING MECHANICAL ASSEMBLIES WHERE FIRESTOPPING IS DAMAGED, DISCONTINUED OR ABSENT WITHIN THE CONSTRUCTION

AREA ALL FIRESTOP SYSTEM INSTALLATIONS MUST MEET THE REQUIREMENTS OF CAN4-S115-M OR ULC S-115-M TESTED ASSEMBLIES THAT PROVIDE A FIRE RATING A MANUFACTURER'S DIRECT REPRESENTATIVE (NOT DISTRIBUTOR OR AGENT) SHALL BE ON-SITE DURING THE INITIAL INSTALLATION DUCTWORK RUNS FOR A DISTANCE OF 15M (50') FROM THE CONNECTED EQUIPMENT SHALL BE ISOLATED FROM

OF FIRESTOP SYSTEMS TO TRAIN APPROPRIATE CONTRACTOR PERSONNEL IN CORRECT SELECTION AND INSTALLATION PROCEDURES. THIS WILL BE DONE PER MANUFACTURER'S WRITTEN RECOMMENDATIONS PUBLISHED IN THEIR LITERATURE AND DRAWING DETAILS.

1.16 ACCESS DOORS

PROVIDE ACCESS DOORS FOR MAINTENANCE OR ADJUSTMENT OF ALL PARTS OF THE MECHANICAL SYSTEM.

PROVIDE 300 MM X 300 MM MINIMUM SIZE FOR INSPECTION AND HAND ACCESS

600 MM X 600 MM MINIMUM SIZE, LARGER IF INDICATED ON DRAWINGS, WHERE ENTRY IS REQUIRED AND ACCESS IS DIFFICULT.

1.17 ESCUTCHEONS AND PLATES

PROVIDE ESCUTCHEONS AND PLATES ON ALL PIPING AND DUCTWORK PASSING THROUGH FINISHED WALLS, FLOORS, AND CEILINGS.

1.18 GUARANTEE / WARRANT FURNISH A WRITTEN GUARANTEE STATING THAT ALL WORK EXECUTED IN THIS CONTRACT WILL BE FREE FROM DEFECTIVE

WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL PERFORMANCE. 1.19 BALANCIN

THE APPROVED BALANCING AGENCIES ARE: WESTERN MECHANICAL; K.D. ENGINEERING, FLOTECH MECHANICAL, BLUE COLLAR THE APPROVED BALANCING AGENCIES ARE: BIG SKY BALANCING CO., ENVIRO-METRICS TECHNICAL SERVICES LTD., HYDRO-AIR TECHNICAL SERVICES. PERFECTION-AIRE LTD., AND TABTEK AIR & HYDRONICS LTD. BALANCE HEAT PUMPS INDICATED ON THE DRAWINGS AND IN THIS SPECIFICATION. WHERE OUTLET QUANTITIES ARE NOT

HYDRONIC-PUMPS AND CENTRAL EQUIPMENT ±5% CONTRACT DOCUMENTS AND DRAWINGS ARE DIAGRAMMATIC. THEY ESTABLISH SCOPE, MATERIAL AND INSTALLATION QUALITY BUT PROVIDE A DROP TEST OF ALL FIRE DAMPERS AND A LETTER/CERTIFICATE CONFIRMING THIS WORK.

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INDICATED, DIVIDE HEAT PUMP CAPACITY EQUALLY AMONG ALL OUTLETS. SUBMIT TWO (2) COPIES OF THE REPORT TO THE CONSULTANT WITHIN TWO (2) WEEKS AFTER SUBSTANTIAL COMPLETION. FAILURE	.4 DELIVERY, STORAGE, AND HANDLING .1 COMPLY WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR RIGGING, UNLOADING, AND TRANSPORTING UNITS.	2.4 PREFORMED PIPE INSULATION	consulting mechanical engineers
TO SUBMIT THE REPORT WITHIN THE SPECIFIED TIME WILL RESULT IN THE WORK BEING DONE BY THE OWNER AND THE COSTS DEDUCTED FROM FINAL PAYMENT.	.2 PROTECT UNITS ON SITE FROM PHYSICAL DAMAGE AFTER UNLOADING. .2 PRODUCTS	CHILLED WATER PIPING WITH A SERVICE TEMPERATURE OF -40°C TO 5°C (-40°F TO 41°F) SHALL BE PRE-FORMED AND PRE-SLIT FLEXIBLE FOAMED ELASTOMERIC OR CLOSED CELL INSULATION WITH SELF-ADHESIVE SELF SEAL OR LAP SEAL JOINTS, MAXIMUM "K" VALUE AT 24°C (75°F) = 0.039 W/M.°C (0.27 BTU.IN/HR.FT2.°F)	200 - 638 Smithe St Vancouver BC V/B 153
AIR-TERMINAL OUTLETS ±10%	.1 GENERAL: EACH MODULE SHALL BE ASSEMBLED ON A POWDER COATED, FORMED GALVANIZED SHEET METAL FRAME	CHILLED WATER AND HEATING WATER PIPING WITH A SERVICE TEMPERATURE OF 5°C TO 315°C (41°F TO 599°F) SHALL BE PREFORMED INSULATION, FINE FIBROUS GLASS OR FORMED MINERAL FIBRE PIPE INSULATION WITH ALL SERVICE JACKET VAPOUR	T.604-684-5995 amegroup.ca
AIR-CENTRAL EQUIPMENT ±5% HYDRONIC-PUMPS AND CENTRAL EQUIPMENT ±5% PROVIDE A DROP TEST OF ALL FIRE DAMPERS AND A LETTER/CERTIFICATE CONFIRMING THIS WORK	CHARGED WITH REFRIGERANT AND FACTORY TESTED FOR CAPACITY AND CONTROLLER FUNCTIONS PRIOR TO SHIPMENT. CHILLER SYSTEM MUST BE BUILT FOR SINGLE POINT POWER SUPPLY CONNECTION. THE POWER DISTRIBUTION PANEL SHALL INCORPORATE A CIRCUIT BREAKER FOR OVERLOAD PROTECTION FOR FACH MODILE. FLECTRICAL SUPPLY TO FACH MODILE	RETARDER (ASJ). ASJ SHALL BE RE-ENFORCED WITH GLASS FIBRE, FACTORY APPLIED WITH PRESSURE SENSITIVE LAP CLOSURE. MAXIMUM "K" VALUE AT 38°C (100°F) = 0.035 W/M.°C (0.24 BTU.IN/HR.FT2.°F)	COPYRIGHT RESERVED
COOPERATE WITH THE BALANCING AGENCY AND MAKE ANY CORRECTIONS AS REQUIRED BY BALANCING AGENCY. PROVIDE BALANCING VALVES AND DAMPERS, PULLEYS, SHEAVES ETC. AS REQUESTED BY THE BALANCING AGENCY AND/OR	SHALL CONSIST OF FLEXIBLE CONDUIT. NO ELECTRICAL CONNECTION TO A MODULE SHALL CARRY THE LOAD OF MORE THAN THAT MODULE. THE ELECTRICAL SUPPLY CONNECTIONS FOR EACH MODULE SHALL BE FACTORY ASSEMBLED AND SHIPPED WITH EACH MODULE FOR FIELD CONNECTION INTO THE POWER DISTRIBUTION PANEL.	3. EXECUTION 3.1 VALVES	This drawing and design is the property of the designer to be used only for the project named below. This page or any portion thereof shall only be reproduced with express written permission.
NECESSARY TO PROPERLY ADJUST OR CORRECT THE SYSTEMS TO DESIGN FLOWS, WITHOUT ADDITIONAL COST TO OWNER.	<ul> <li>FRAME: FRAME SHALL BE CONSTRUCTED OF WHITE POWDER COATED FORMED GALVANIZED SHEET METAL.</li> <li>CABINET: WHITE POWDER COATED FORMED GALVANIZED SHEET METAL PANELS THAT SHALL BE EASILY REMOVABLE FOR</li> </ul>	INSTALL VALVES IN ACCESSIBLE LOCATIONS WITH STEMS UPRIGHT OR ANGLED 45° ABOVE HORIZONTAL UNLESS APPROVED OTHERWISE. VALVES MUST BE ACCESSIBLE WITHOUT REMOVING ADJACENT PIPING.	THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE CONSULTANT PRIOR TO COMMENCING THE WORK.
BE RESPONSIBLE FOR THE PERFORMANCE AND COMMISSIONING OF ALL EQUIPMENT SUPPLIED AND RE-USED UNDER DIVISIONS 22 AND 23 HEAT PUMPS	SERVICING VIA STAINLESS STEEL FASTENERS AND RETAINING CLIPS. .4 COMPRESSORS: HERMETICALLY SEALED, SCROLL COMPRESSOR ON EACH REFRIGERATION CIRCUIT EACH WITH ROTALOCK CONNECTIONS, OIL LEVEL SIGHT GLASS, SUCTION GAS-COOLED MOTOR WITH SOLID-STATE SENSORS IN THE	PROVIDE STEM EXTENSIONS ON ALL INSULATED VALVES. PROVIDE BALL VALVES IN PIPING NPS 2 AND SMALLER AND BUTTERFLY VALVES OR GATE VALVES IN PIPING NPS 2-½ AND LARGER	THESE DRAWINGS ARE NOT TO BE SCALED.
CONFIRM OPERATION AND REVIEW CONDITION OF ALL HEAT PUMPS, AND ASSOCIATED CONTROL DEVICES IN THE RENOVATED AREA. SUBMIT REPORT NOTING ANY REMEDIAL WORK REQUIRED. AT THE CONCLUSION OF COMMISSIONING. DEMONSTRATE THE OPERATION OF THE SYSTEMS TO THE CONSULTANT AND THEN TO	WINDINGS FOR OVERLOAD PROTECTION, AND CIRCUIT BREAKER PROTECTION. THERE SHALL BE TWO INDEPENDENT COMPRESSORS AND REFRIGERANT CIRCUITS PER MODULE. COMPRESSORS SHALL BE MOUNTED TO THE HEAVY GAUGE STEEL FRAME WITH RUBBER-IN-SHEAR VIBRATION ISOLATORS.	FOR SHUT-OFF, EQUIPMENT ISOLATION, THROTTLING, BYPASS OR MANUAL FLOW CONTROL SERVICES. BALL VALVES USED FOR SHUT-OFF / ISOLATION SHALL BE FULL PORT.	REV.         DATE         DESCRIPTION           1.         2023 07 05         ISSUED FOR 50% REVIEW
THE OWNER'S OPERATING STAFF. AT THE COMPLETION OF THE COMMISSIONING, TESTING, BALANCING AND DEMONSTRATION SUBMIT TO THE CONSULTANT A LETTER	.5 EVAPORATORS: DUAL CIRCUIT, BRAZED PLATE EVAPORATOR ON EACH MODULE CONSTRUCTED OF 316 STAINLESS STEEL PLATES AND COPPER BRAZING. THE FLUID CONNECTIONS TO EACH EVAPORATOR SHALL USE ROLL GROOVED COUPLINGS FOR SERVICE CONVENIENCE AND EASE OF INSTALLATION. FACH EVAPORATOR SHALL BE INSULATED WITH	PROVIDE ISOLATION VALVES ARE NOT TO BE USED FOR SHOT-OFF; ADDITIONAL VALVES SHALL BE INSTALLED FOR ISOLATION PURPOSES. PROVIDE ISOLATION VALVES AT BRANCH TAKE-OFFS, TO ISOLATE EACH PIECE OF EQUIPMENT, UPSTREAM OF ALL METERS, GAUGES, AUTOMATIC AIR VENTS, AND AS INDICATED.	2. 2023.07.26 ISSUED FOR TENDER REVIEW
SPECIFICATION AND DRAWINGS.	3/4" CLOSED CELL INSULATION. THE MAXIMUM WORKING PRESSURE SHALL BE 650 PSI. EVAPORATOR PIPING FLUID VELOCITY SHALL NOT EXCEED 10 FPS AT ANY POINT IN THE SYSTEM.	PROVIDE ISOLATION VALVES IN ALL SYSTEMS SUCH THAT FLOOR BY FLOOR FOR HORIZONTAL SYSTEMS, ALL RISERS IN VERTICAL SYSTEMS AND ZONE AREAS ON A LARGE HORIZONTAL SYSTEM CAN BE ISOLATED.	3. 2023.09.07 ISSUED FOR TENDER
PROVIDE CURBS, FLASH AND COUNTER FLASH AS REQUIRED WHERE MECHANICAL EQUIPMENT PASSES THROUGH WEATHER OR WATERPROOFED WALLS, FLOORS AND ROOFS.	DISCHARGE AND EACH CONDENSER INLET AND DISCHARGE TO ISOLATE THE MODULE FOR SERVICING THE STRAINER, FLOW SWITCH, EVAPORATOR OR CONDENSER WHILE ALLOWING THE REMAINING MODULES TO CONTINUE TO OPERATE.	USE SWING OR SOFT SEATED SPRING LOADED CHECK VALVES IN HORIZONTAL AND VERTICAL UP-FLOW PIPES AND ON THE DISCHARGE OF PUMPS. SPRING LOADED WATER CHECK VALVES SHALL BE LOCATED EIGHT (8) PIPE DIAMETERS DOWNSTREAM OF	· · · · · · · · · · · · · · · · · · ·
PROVIDE FACTORY ROOF CURBS FOR ALL ROOF MOUNTED EQUIPMENT UNLESS NOTED OTHERWISE.	.7 FILTERS: A 40-MESH INDUSTRIAL GRADE FILTER STRAINER SHALL BE FACTORY INSTALLED BETWEEN THE HEADER SYSTEM AND EACH EVAPORATOR. THE STRAINER SHALL BE SERVICEABLE BY ISOLATION VALVES THAT PERMIT EACH STRAINER TO BE REMOVED AND CLEANED WITHOUT SHUTTING DOWN FLUID FLOW OR POWER TO THE ENTIRE SYSTEM	PUMPS OR ELBOWS. USE SILENT CHECK VALVES ON DISCHARGE OF PUMPS AND IN VERTICAL PIPES WITH DOWNWARD FLOW, AND AS INDICATED.	
PROVIDE NEOPRENE ISOLATORS FOR DEFLECTIONS 6MM (1/4") AND UNDER. PROVIDE EITHER NEOPRENE OR STEEL SPRING ISOLATORS FOR DEFLECTIONS BETWEEN 6MM AND 12MM (½").	AND ALLOWING THE REMAINING MODULES TO CONTINUE TO OPERATE. IN-LINE STRAINERS THAT REQUIRE COMPLETE SYSTEM SHUTDOWN FOR SERVICE AND ISOLATION ARE NOT ACCEPTABLE. 8 CONDENSERS: DUAL CIRCUIT. BRAZED PLATE CONDENSERS CONSTRUCTED OF 316 STAINLESS STEEL PLATES AND	DO NOT INSTALL BALANCING OR THROTTLING VALVE ON DISCHARGE OF PUMPS EQUIPPED WITH VFD. INSTALL PRESSURE PORTS FOR FLOW MEASUREMENT.	
PROVIDE STEEL SPRING ISOLATORS FOR DEFLECTIONS OF 12MM (½") AND OVER. PROVIDE ADJUSTABLE LIMIT STOPS FOR SPRING ISOLATION MOUNTS ON EQUIPMENT WITH OPERATING WEIGHTS SUBSTANTIALLY	COPPER BRAZING. THE FLUID CONNECTIONS TO EACH CONDENSER SHALL USE ROLL GROOVED COUPLINGS FOR SERVICE CONVENIENCE AND EASE OF INSTALLATION. THE MAXIMUM WORKING PRESSURE SHALL BE 650 PSI. CONDENSER PIPING FLUID VELOCITY SHALL NOT EXCEED 10 FPS AT ANY POINT IN THE SYSTEM.	3.2 PIPING INSULATION MINIMUM THICKNESS SCHEDULE (ASHRAE 90.1) CHILLED WATER AND REFRIGERANT PIPING IN A CONDITIONED SPACE:	
DIFFERENT FROM THE INSTALLED WEIGHTS ALL SPRING ISOLATORS SHALL BE "OPEN SPRING" UNLESS OTHERWISE STATED. SEISMICALLY RATED HOUSED SPRING ISOLATORS MAY BE USED IN LIEU PROVIDED THAT THEY MEET THIS PROJECT'S REQUIREMENTS FOR SEISMIC RESTRAINT.	.9 LIQUID PIPING: THE FLUID PIPING SHALL BE SCHEDULE 40 STEEL, AND BE INSULATED USING CLOSED CELL PIPE INSULATION TO PREVENT CONDENSATION. THE CHILLER SHALL HAVE SERVICE VALVES FOR THE INDEPENDENT ISOLATION OF EACH EVAPORATOR. WITHOUT AFEECTING THE FLUID FLOW TO THE PEMAINING EVAPORATORS. EACH	SIZES NPS 1 TO NPS 6 - 25MM THICK. SIZE NPS 8 - 40MM THICK	
SELECT ISOLATORS IN ACCORDANCE WITH EQUIPMENT WEIGHT DISTRIBUTION TO ALLOW FOR AN AVERAGE DEFLECTION MEETING OR EXCEEDING THE SPECIFIED DEFLECTION REQUIREMENTS AND SO THAT NO ISOLATOR HAS A DEFLECTION LESS THAN 80% OF THE	COUPLINGS AND NEOPRENE GASKETS. ANY TYPE OF MODULE USING VICTAULIC TYPE ROLL GROOVED STEEL COUPLINGS AND NEOPRENE GASKETS. ANY TYPE OF MODULE-TO-MODULE CONNECTION EXTERNAL TO THE MODULES IS	CHILLED WATER AND REFRIGERANT PIPING IN AN UNCONDITIONED SPACE OR EXTERIOR TO THE BUILDING: SIZES NPS 1 TO NPS 1-¼ - 25MM THICK.	
STATIC DEFLECTION SPECIFIED. A MINIMUM OF 4 ISOLATORS ARE REQUIRED FOR EACH PIECE OF EQUIPMENT, UNLESS SPECIFIED OTHERWISE.	<ul> <li>.10 REFRIGERANT PIPING: REFRIGERANT PIPING SHALL BE TYPE K SEAMLESS COPPER, INSULATED WITH CLOSED CELL PIPE INSULATION ON THE SUCTION LINES.</li> </ul>	SIZES NPS 1-½ TO 8 - 40MM THICK. LOW TEMPERATURE WATER PIPING 41-60°C (106-141°F) IN A CONDITIONED SPACE:	
PRIOR TO REQUESTING AN INSPECTION FOR SUBSTANTIAL PERFORMANCE, PROVIDE A COMPLETE LIST OF ITEMS, WHICH ARE DEFICIENT.	.11 REFRIGERANT ACCESSORIES: EACH REFRIGERANT CIRCUIT SHALL INCLUDE COMPRESSOR ROTALOCK SERVICE VALVES, SOLENOID VALVES FOR COMPRESSOR PUMPDOWN, AND SCHRADER SERVICE VALVES IN THE SUCTION, DISCHARGE, AND LIQUID LINES, LIQUID LINE SIGHT GLASS WITH MOISTURE INDICATOR AND A FILTER DRYER.	SIZES NPS 1 TO NPS 1-¼ - 25MM THICK. SIZES NPS 1-½ TO 8 - 40MM THICK.	
A CERTIFICATE OF SUBSTANTIAL PERFORMANCE WILL NOT BE GRANTED UNLESS THE FOLLOWING ITEMS ARE COMPLETED AND AVAILABLE TO THE OWNER'S CONSULTANT:	.12 HELICAL OIL SEPARATOR: THE HELICAL OIL SEPARATOR SHALL CENTRIFUGALLY REMOVE OIL FROM THE REFRIGERANT GAS AND RETURN IT TO THE CRANKCASE THEREBY PREVENTING DAMAGE TO THE COMPRESSOR (OIL SEPARATORS SHALL BE LISED FOR AIR COOLED AND WATER COOLED CHILLER MODULES WHEN THE LEAVING FLUID TEMPERATURE IS	LOW TEMPERATURE WATER PIPING 41-60°C (106-141°F) IN AN UNCONDITIONED SPACE OR EXTERIOR TO THE BUILDING: SIZES NPS 1 TO NPS 1-¼ - 40MM THICK.	
FINAL PLUMBING INSPECTION CERTIFICATE FROM THE AUTHORITY HAVING JURISDICTION. SCHEDULE S-B & FOR SEISMIC ENGINEERING.	LESS THAN 20 F AND WHEN THE REMOTE AIR COOLED CONDENSER FOR AIR COOLED SPLIT CHILLER MODULES IS GREATER THAN 125 EQUIVALENT FEET AWAY FROM THE CHILLER SYSTEM).	SIZES NPS 1-½ TO 8 - 50MM THICK. HEATING WATER PIPING 61-93°C (142-200°F) IN A CONDITIONED SPACE:	
ALL MECHANICAL SYSTEMS HAVE BEEN COMMISSIONED AND ARE CAPABLE OF OPERATION WITH ALARM CONTROLS FUNCTIONAL AND AUTOMATIC CONTROLS IN OPERATION.	COMPRESSOR SUCTION LINE ACCOMPLATORS: SUCTION LINE ACCOMPRESSOR FROM SUDDEN SURGES OF LIQUID OR OIL THAT COULD COMPRESSOR SUCTION LINE TO PROTECT THE COMPRESSOR FROM SUDDEN SURGES OF LIQUID OR OIL THAT COULD DAMAGE ITS INTERNAL COMPONENTS (SUCTION ACCUMULATORS SHALL BE USED FOR AIR COOLED AND WATER COOLED OWNER SO WILL SO WILL SO WILL SO WILL SUPPORT TO FUS TO SUPPORT OF THE SUP	SIZES NPS 1 TO NPS 1-¼ - 40MM THICK.	
WATER SYSTEMS HAVE BEEN BALANCED WITH DRAFT REPORT SUBMITTED TO THE CONSULTANT. OPERATING AND MAINTENANCE DEMONSTRATIONS HAVE BEEN PROVIDED TO THE OWNER.	<ul> <li>CONTROLS: THE MASTER CHILLER MODULE SHALL INCORPORATE THE MASTER MICROPROCESSOR CONTROLLER. THE MASTER MICROPROCESSOR SHALL COMMUNICATE WITH THE REMAINING SLAVE MICROPROCESSORS IN EACH MODULE</li> </ul>	HEATING WATER PIPING 61-93°C (142-200°F) IN AN UNCONDITIONED SPACE OR EXTERIOR TO THE BUILDING:	
RECORD DRAWINGS HAVE BEEN SUBMITTED. ALL PREVIOUSLY IDENTIFIED DEFICIENCIES HAVE BEEN CORRECTED AND ACCEPTED.	VIA A LOCAL NETWORK COMMUNICATIONS PROTOCOL. THE MASTER MICROPROCESSOR SHALL INCLUDE A PHASE MONITOR TO PROTECT AGAINST LOW VOLTAGE, PHASE UNBALANCE, PHASE LOSS, AND PHASE REVERSAL CONDITIONS. THE MASTER CONTROLLER SHALL READ ALL ANALOG AND FAULT PORT VALUES FROM ALL SLAVE MODULE CONTROLLERS	SIZES NPS 1-10 NPS 1-1/2 - 65MM THICK. SIZES NPS 1-1/2 TO 8 - 75MM THICK.	
PRIOR TO A TOTAL PERFORMANCE INSPECTION PROVIDE DECLARATION IN WRITING THAT SUBSTANTIAL PERFORMANCE DEFICIENCIES HAVE BEEN CORRECTED AND FINAL TAB REPORTS AND O&M MANUALS HAVE BEEN SUBMITTED.	AND SHALL PASS THESE VALUES TO THE BUILDING AUTOMATION SYSTEM VIA BACNET, MODBUS OR LONWORKS PROTOCOLS. EACH CHILLER CONTROL SYSTEM SHALL INCLUDE OPERATIONAL SWITCHES FOR EACH COMPRESSOR; HIGH AND LOW PRESSURE TRANSMITTERS TO PROVIDE INDICATION OF REFRIGERATION PRESSURES IN EACH CIRCUIT; HIGH	3.4 PIPING FINISH SCHEDULE INDOORS CONCEALED; FACTORY FINISH	
VISITATIONS IF REQUIRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.	AND LOW REFRIGERATION PRESSURE ALARMS INCLUDING SHUTTING SHUT DOWN THE RESPONSIBLE COMPRESSOR(S); ANTI-SHORT CYCLING COMPRESSOR TIMERS; MINIMUM COMPRESSOR RUN TIMERS; CONNECTION TO BUILDING AUTOMATION SYSTEM (IF REQUIRED).	INDOORS EXPOSED IN MECHANICAL ROOM AND ELSEWHERE; PVC JACKET OUTDOORS; ALUMINUM JACKET	
2. PRODUCTS 2.2 PIPE HANGERS AND SUPPORTS	.15 MICROPROCESSOR: THE MICROPROCESSOR SHALL PROVIDE THE FOLLOWING MINIMUM FUNCTIONS AND ALARMS: A. ADJUSTABLE FLUID TEMPERATURE SET POINT		
PROVIDE HANGERS AND SUPPORTS TO SECURE EQUIPMENT IN PLACE, PREVENT VIBRATION, PROTECT AGAINST DAMAGE FROM EARTHQUAKE, MAINTAIN GRADE, PROVIDE FOR EXPANSION AND CONTRACTION, AND ACCOMMODATE INSULATION.	<ul> <li>B. MULTIPLE STAGE COMPRESSOR CONTROL, INCLUDING COMPRESSOR ROTATION TO PROVIDE EVEN COMPRESSOR USAGE AND WEAR.</li> <li>C. HIGH AND LOW FLUID TEMPERATURE ALARM SET POINTS</li> </ul>		
2.4 IDENTIFICATION PROVIDE 20MM (3/4") DIAMETER BRASS TAGS, SECURE TO VALVE STEMS WITH KEY CHAIN. PROVIDE A VALVE DIRECTORY AT ALL MECHANICAL ROOMS, IN THE 0&M MANUALS AND A DIGITAL COPY CROSS REFERENCED WITH ANY ASSOCIATED CONTROLS	<ul><li>D. WATER INLET AND OUTLET TEMPERATURE</li><li>E. SUCTION AND DISCHARGE REFRIGERATION PRESSURES</li></ul>	DIVISION 25 INTEGRATED AUTOMATION	
NOMENCLATURE. EACH PIECE OF EQUIPMENT SHALL BE IDENTIFIED WITH ITS EQUIPMENT SCHEDULE IDENTIFICATION, E.G. SUPPLY FAN SF-1, COOLING	F. COMPRESSOR RUN STATUS G. CURRENT ALARM STATUS	1. GENERAL 1.1 SECTION SCOPE	
ACCEPTABLE MANUFACTURERS: BRADY	<ul> <li>DEMAND LOAD</li> <li>I. COMPRESSOR RUN HOURS</li> <li>J. ALARM LOGGING WITH MINIMUM OF PREVIOUSLY 100 LOGGED ALARMS WITH TIME AND DATE OF EACH OCCURRENCE</li> </ul>	PROVIDE A COMPLETE SYSTEM OF AUTOMATIC CONTROLS TO MATCH THE BASE BUILDING STANDARD WITH REGARD TO CONTROL DEVICES, COMPONENTS, WIRING AND MATERIALS. ALL CONTROL WORK ASSOCIATED WITH THE WORK OF DIVISIONS 22 AND 23.	
2.5 VIBRATION ISOLATION NEOPRENE WASHER/BUSHING: A ONE PIECE MOLDED BRIDGE BEARING NEOPRENE WASHER/BUSHING. THE BUSHING SHALL SURROUND THE ANCHOR BOLT AND HAVE A FLAT WASHER FACE TO AVOID METAL TO METAL CONTACT. USE WASHER/BUSHING ONLY	<ul> <li>K. REMOTE START STOP INPUT</li> <li>L. DRY CONTACT FOR GENERAL ALARMTHE MASTER CHILLER MODULE SHALL INCORPORATE THE MASTER</li> </ul>	1.2 RELATED REQUIREMENTS THIS SECTION OF THE SPECIFICATION FORMS PART OF THE CONTRACT DOCUMENTS AND IS TO BE READ. INTERPRETED AND	
ON LIGHT-WEIGHT EQUIPMENT. ACCEPTABLE MANUFACTURER: MASON HG HEMI GROMMET OR EQUAL	MICROPROCESSOR CONTROLLER. THE MASTER MICROPROCESSOR SHALL COMMUNICATE WITH THE REMAINING SLAVE MICROPROCESSORS IN EACH MODULE VIA A LOCAL NETWORK COMMUNICATIONS PROTOCOL. THE MASTER MICROPROCESSOR SHALL INCLUDE A PHASE MONITOR TO PROTECT AGAINST LOW VOLTAGE, PHASE UNBALANCE, PHASE	COORDINATED WITH ALL OTHER PARTS. FOR GENERAL CONDITIONS REFER TO HEATING, VENTILATION AND AIR CONDITIONING (HVAC) SECTION.	
NEOPRENE PAD ISOLATORS: NEOPRENE OR NEOPRENE / STEEL / NEOPRENE PAD ISOLATORS. MINIMUM STATIC DEFLECTION 2.5 MM (0.1") OR GREATER.	LOSS, AND PHASE REVERSAL CONDITIONS. THE MASTER CONTROLLER SHALL READ ALL ANALOG AND FAULT PORT VALUES FROM ALL SLAVE MODULE CONTROLLERS AND SHALL PASS THESE VALUES TO THE BUILDING AUTOMATION SYSTEM VIA BACNET, MODBUS OR LONWORKS PROTOCOLS.	1.3 CODE COMPLIANCE ALL WORK SHALL COMPLY WITH CURRENT EDITIONS OF THE NATIONAL, PROVINCIAL AND MUNICIPAL CODES, STANDARDS, ACTS AND	
RUBBER FLOOR MOUNTS: BRIDGE BEARING NEOPRENE MOUNTINGS. MINIMUM STATIC DEFLECTION OF 5MM (0.2") OR GREATER AND ALL DIRECTIONAL SEISMIC CAPABILITY.	.16 INTERFACE PANEL: AN OPERATOR 7" TOUCH SCREEN INTERFACE PANEL WITH GRAPHICAL DISPLAY SHALL BE INSTALLED ON THE MASTER MODULE TO ALLOW CHILLER OPERATION MONITORING, ADJUSTMENT OF USER SET POINTS, AND ALARM MONITORING.	BYLAWS AND WILL MEET THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.  1.4 ACCEPTABLE CONTRACTORS	
ACCEPTABLE MANUFACTURER: MASON RAA OR ND OR EQUAL SPRING FLOOR MOUNTS: SPRING ISOLATORS BUILT INTO A DUCTILE IRON OR STEEL HOUSING TO PROVIDE ALL DIRECTIONAL	.17 BMS INTERFACE: THE MASTER MICROPROCESSOR CONTROLLER SHALL PROVIDE COMMUNICATIONS TO THE BUILDING MANAGEMENT SYSTEM VIA RS-485 SERIAL COMMUNICATIONS CARD. THE SYSTEM SHALL INTERFACE WITH THE BMS VIA BACNET MS/TP OR BACNET IP/ETHERNET. MODBUS OR LONWORKS. ALL FUNCTIONS OF THE CONTROL SYSTEM SHALL BE	ALL CONTROLS WORK IS TO BE DONE BY THE BASE BUILDING CONTRACTOR: WEBIR.	
SEISMIC SNUBBING. THE SNUBBER SHALL BE ADJUSTABLE VERTICALLY AND ALLOW A MAXIMUM OF 6MM (1/4') TRAVEL IN ALL DIRECTIONS BEFORE CONTACTING THE RESILIENT SNUBBING COLLARS. MOLDED NEOPRENE CUP OR 1/4" (6MM) NEOPRENE ACOUSTICAL FRICTION PAD BETWEEN THE BASEPLATE AND THE SUPPORT. SPRING DIAMETERS SHALL BE NO LESS THAN 0.8 OF THE	ACCESSIBLE FROM THE BMS INCLUDING:	THIS PROJECT INVOLVES RENOVATION TO AN EXISTING CONTROL SYSTEM. THE CONTRACTOR SHALL INSPECT THE SYSTEM PRIOR TO TENDER CLOSE AND INCLUDE IN HIS BID ALL CONTROL COMPONENTS REQUIRED TO PROVIDE A FULLY OPERATIONAL SYSTEM	
COMPRESSED HEIGHT OF THE SPRING AT RATED LOAD. SPRINGS SHALL HAVE A MINIMUM ADDITIONAL TRAVEL TO SOLID EQUAL TO 50% OF THE RATED DEFLECTION. ACCEPTABLE MANUFACTURER: MASON SSLFH OR EQUAL	CHILLER ENABLE/DISABLE     COMPRESSOR RUN STATUS     SYSTEM EVADORATOR AND CONDENSER TEMPEDATURES	INCLUDING REPLACEMENT OF EXISTING DEFECTIVE COMPONENTS WHERE NOTED IN THE PROJECT DOCUMENTS.	
SPRING HANGERS: HANGERS SHALL CONSIST OF RIGID STEEL FRAMES CONTAINING MINIMUM 32MM (1 1/4") THICK NEOPRENE ELEMENTS AT THE TOP AND A STEEL SPRING SEATED IN A STEEL WASHER REINFORCED NEOPRENE CUP ON THE BOTTOM. PROVIDE A COMPLICATION PURPER AND STEEL PEROLIND WASHER AS THE SEISMIC UPPTOR FOR SUSPENDED PURPER. DURING MADE	<ol> <li>ADJUSTMENT OF ALL SYSTEM SET POINTS</li> <li>REVIEW AND RESETTING OF ALL NON-ACTIVE FAULTS</li> </ol>	DESIGN AND PROVIDE CONDUIT AND WIRING LINKING ELEMENTS OF SYSTEM TO THE EXISTING BUILDING ENERGY MONITORING AND CONTROL SYSTEM EMCS.	
EQUIPMENT. RUBBER THICKNESS SHALL BE A MINIMUM OF 6MM (1/4"). COLOUR CODED SPRINGS, RUST RESISTANT, PAINTED BOX TYPE HANGERS. TO MAINTAIN STABILITY THE BOXES SHALL NOT BE ARTICULATED AS CLEVIS HANGERS NOR THE NEOPRENE	6. INTERROGATION AND DISPLAY OF ALL SENSOR FAULTS	SUPPLY SUFFICIENT PROGRAMMABLE CONTROLLERS OF TYPES TO MEET PROJECT REQUIREMENTS. QUANTITY AND POINTS CONTENTS AS REVIEWED BY CONSULTANT PRIOR TO INSTALLATION.	CONSULTANT:
ACCEPTABLE MANUFACTURER: MASON HD, HS OR EQUAL	DIVISION 23 HVAC	PROVIDE UTILITY POWER TO EMCS AS INDICATED.	
3. EXECUTION	1. GENERAL	2.2 CONTROL COMPONENTS PROVIDE CONTROL VALVES AND DAMPER ACTUATORS AS REQUIRED TO MEET THE SEQUENCE OF OPERATION AND MEET THE	
<b>3.1 PAINTING REPAIRS AND RESTORATION</b> DO PAINTING IN ACCORDANCE WITH DIVISION 09 - INTERIOR PAINTING. PRIME AND TOUCH UP MARRED FINISHED PAINTWORK TO MATCH ORIGINAL DESTORE TO NEW CONDITION FINISHED WITHOUT UNIVERSE.	EMPLOY SERVICES OF THE EXISTING BUILDING'S WATER TREATMENT FIRM OR IF THERE IS NOT ONE, A FIRM SPECIALIZING IN HYDRONIC SYSTEM CHEMICAL TREATMENT. THIS FIRM SHALL SUBMIT A SCHEDULE OF WORK TO BE PERFORMED, CHEMICAL TYPES	DESIGN INTENT. VALVES AND ACTUATORS SHALL MATCH THE BASE BUILDING STANDARD UNLESS NOTED OTHERWISE. CONTROL VALVES FOR NEW MECHANICAL EQUIPMENT SHALL BE PROVIDED BY CONTROLS CONTRACTOR FOR INSTALLATION BY THE	
CLEAN EXPOSED BARE METAL SURFACES SUPPLIED UNDER DIVISIONS 21, 22, 23 AND 25. APPLY AT LEAST ONE COAT OF CORROSION RESISTANT PRIMER PAINT TO ALL SUPPORTS AND EQUIPMENT FABRICATED FROM FERROUS METAL.	AND QUANTITY TO BE USED. AT THE COMPLETION OF THE CHEMICAL TREATMENT A REPORT SHALL BE SUBMITTED TO OUTLINE THE WORK PERFORMED AND DETAILS OF PROCEDURES TO BE USED BY THE BUILDING OPERATOR FOR CONTINUED WATER QUALITY	MECHANICAL CONTRACTOR. WHERE EXISTING DEVICES ARE RE-USED, VERIFY OPERATION AND RE-CALIBRATE AS REQUIRED.	
3.2 DEMONSTRATION SUPPLY TOOLS, EQUIPMENT, PERSONNEL TO DEMONSTRATE AND INSTRUCT THE OPERATING, AND MAINTENANCE PERSONNEL IN	PROVIDE TEST KITS AS REQUIRED ALONG WITH ADEQUATE CHEMICALS AND REAGENTS FOR ONE YEAR OF TESTING. APPROPRIATE TEST KITS WILL BE PROVIDED TO PROPERLY TEST EACH SYSTEM INSTALLED UNDER THIS CONTRACT.	VERIFY CORRECT OPERATION OF CONTROLLED DEVICES INCLUDING EXISTING [AIR VALVE ACTUATORS], CONTROL VALVES, ETC. WITHIN THE AREA OF RENOVATION.	
OPERATING, CONTROLLING, ADJUSTING, TROUBLE-SHOOTING, AND SERVICING OF ALL SYSTEMS AND EQUIPMENT DURING REGULAR WORK HOURS, PRIOR TO ACCEPTANCE.	CLEAN AND FLUSH ALL NEW HOT AND COLD CLOSED LOOP WATER SYSTEM PIPING. PROVIDE A CERTIFICATE FOR THIS WORK.	CONTROL VALVES AND ACTUATORS TO BE COMPATIBLE WITH BASE BUILDING STANDARD UNLESS NOTED OTHERWISE. NEW CONTROL VALVE OPERATION TO BE COMPATIBLE WITH EXISTING.	
3.4 PIPE HANGERS AND SUPPORTS PIPE SUPPORT SPACING AND HANGER ROD DIAMETER SHALL BE:	2. PRODUCTS 2.1 PIPING	CHANGE ORDER, AT THE DISCRETION OF THE OWNER.	
PIPE SIZE: NPS 1/2         ROD DIAMETER 9MM (3/8"), SPACING 1.8M (6")           PIPE SIZE: NPS 3/4 TO 1½         ROD DIAMETER 9MM (3/8"), SPACING 2.4M (8")           PIPE SIZE: NPS 3/4 TO 1½         ROD DIAMETER 9MM (3/8"), SPACING 2.4M (6")	HOT WATER HEATING; GLYCOL HEATING; CHILLED WATER SHALL BE STEEL SCHEDULE 40, A53 GRADE B, TYPE "L" HARD COPPER PIPE CONNECTIONS UNLESS NOTED OTHERWISE SHALL BE: NPS 1½ AND LESS: SCREWED JOINT STEEL PIPING, NPS 2: SCREWED	3. EXECUTION 3.1 SEQUENCE OF OPERATION	
PIPE SIZE: NPS 2 TO 2/2       ROD DIAMETER 9MIM (3/8), SPACING 3M (10)         PIPE SIZE: NPS 3 TO 4       ROD DIAMETER 16MM (5/8"), SPACING 3.6M (12')         PIPE SIZE: NPS 6 TO 12       POD DIAMETER 22MM (7/8"), SPACING 4.3M (14')	JOINT FOR LIQUID SYSTEMS, WELD JOINT FOR AIR OR GAS SYSTEMS, NPS 2½ AND LARGER: WELD OR FLANGED PIPING INCLUDING BRANCH CONNECTIONS.	.1 DEHUMIDIFIER MECHANICAL HEAT RECOVERY MODE	SEAL:
3.5 PIPE PRESSURE TESTING	USE LEAD FREE SOLDER FOR SOLDERING DOMESTIC WATER COPPER PIPE.	1 IN THIS MODE, HEATING DEMAND IN THE LOW-TEMPERATURE HEATING LOOP EXISTS AT THE SAME TIME AS MECHANICAL COOLING DEMAND IN AHU-201. IN THIS CONDITION, P-1 AND P-2 WILL OPERATE IN A PRIMARY-SECONDARY PATTERN WITH P-203 TO BRING CHILED WATER TO THE RETURN AIR COOLING COIL AND EXHAUST COOLING COIL IN AHU-201. CONTROL	Association of Professional Engineers and Geoscientists of the Province of
HYDROSTATIC TEST: 150% OF WORKING PRESSURE, BUT NOT LESS THAN 860 KPA (125 PSIG). FOR PP-R PIPING, DO NOT EXCEED 1034 KPA (150 PSI). FOR PEX PIPING, DO NOT EXCEED 690 KPA (100 PSI). MAINTAIN TEST PRESSURE WITHOUT LOSS FOR 4 HOURS	2.2 VALVES WHEREVER POSSIBLE ALL VALVES SHALL BE OF ONE MANUFACTURER.	VALVE #206 WILL BE OPEN, AND P-3 AND P-4 WILL CIRCULATE HEATING WATER THROUGH THE CONDENSER SIDE OF THE HEAT PUMP PLANT. CHILLED WATER SUPPLY TEMPERATURE WILL BE SET AT AN EDITABLE CONSTANT FROM THE CONTROLLER, WITH A DEFAULT SUPPLY TEMPERATURE OF 45F. HP-1 AND HP-2 WILL INCREASE THEIR OUTPUT HEATING	M. J. T. KASUYA M. J. T. KASUYA
MINIMUM UNLESS SPECIFIED FOR LONGER PERIOD OF TIME IN RELEVANT MECHANICAL SECTIONS. PRIOR TO TESTS, ISOLATE EQUIPMENT AND OTHER PARTS WHICH ARE NOT DESIGNED TO WITHSTAND TEST PRESSURE OR MEDIA.	GROOVED VALVES SHALL BE OF THE SAME MANUFACTURER AS THE ADJOINING COUPLINGS. PROVIDE VALVES WITH MANUFACTURER'S NAME AND PRESSURE RATING CLEARLY MARKED ON OUTSIDE OF BODY. ALL VALVES	AND COOLING UNTIL EITHER THE HEATING OR COOLING DEMAND IS MET. IN THIS MODE, LOW-TO-NO-FLOW IS EXPECTED TO CIRCULATE THROUGH THE GEO-FIELD.	LICENSEE ENGINEERING Licence 58622
CONDUCT TESTS IN PRESENCE OF CONSTRUCTION MANAGER OR PROJECT MANAGER. EXAMINE ALL JOINTS FOR LEAKS AND REMAKE ALL LEAKING JOINTS WITH NEW MATERIALS. PAY COSTS FOR REPAIRS OR REPLACEMENT, RETESTING, AND MAKING GOOD. CONSULTANT TO DETERMINE WHETHER REPAIR OR REPLACEMENT IS	MUST BE SUITABLE IN ALL RESPECTS FOR SERVICE USED. ALL VALVES SHALL HAVE A PROVINCIAL CRN NUMBER WHICH IS CURRENT.	.2 GEO-FIELD HEAT EXTRACTION MODE .1 IN THIS MODE, HEATING DEMAND IN THE LOW-TEMPERATURE HEATING LOOP EXISTS AND MECHANICAL COOLING DEMAND	2023-09-07
APPROPRIATE. INSULATE OR CONCEAL WORK ONLY AFTER APPROVAL AND CERTIFICATION OF TESTS BY AUTHORITIES.	USE NON-RISING STEM VALVES ONLY WHERE THERE IS INSUFFICIENT CLEARANCE FOR STEM TO RISE. BALL VALVES 2 NPS AND UNDER SHALL BE FORGED BRASS BODY, SCREWED ENDS, THREADED CAP, CHROME PLATED BALL, PTFE	IN AHU-201 DOES NOT EXIST. REFER TO PREVIOUS CONTROL SEQUENCE FOR THIS MODE. CONTROL VALVE #206 WILL BE CLOSED. P-1 AND P-2 WILL PROVIDE A PRESCRIBED AMOUNT OF FLOW FOR THIS MODE. IN THIS MODE, LOW-TO-NO-FLOW IS EXPECTED TO CIRCULATE THROUGH THE DEHUMIDIFIER'S COOLING COILS. IT IS EXPECTED THAT CHILLED WATER	PROJECT TITLE:
PRESSURE TEST ALL GAS PIPING IN ACCORDANCE WITH CSA B149.1. PURGE ALL PIPING AFTER PRESSURE TESTS IN ACCORDANCE WITH CSA B149.1.	PORT. BALL VALVES FOR BALANCING SERVICE SHALL HAVE A REDUCED PORT AND VALVE HANDLE SHALL HAVE A MEMORY STOP, SCREWED ENDS, CLASS 4140 KPA (600 PSI) W.O.G. TOYO/RED & WHITE 5044AB OR EQUAL.	TEMPERATURES WILL DECREASE AS THE GROUND TEMPERATURE DECREASES.	MEADOW PARK
	GATE VALVES NPS 2 AND UNDER SHALL BE BRONZE BODY, RISING STEM, SOLID WEDGE DISC, UNION OR SCREWED BONNET, SCREWED ENDS, CLASS 2070 KPA (300 PSI) W.O.G. TOYO/RED & WHITE 298 OR EQUAL.	.3 DIRECT GEO-TO-DEHUM COOLING MODE .1 IN THIS MODE, HEATING DEMAND IN THE LOW-TEMPERATURE HEATING LOOP DOES NOT EXIST, MECHANICAL COOLING DEMAND IN AHU-201 DOES EXIST, AND THE GEO-FIELD'S CHILLED WATER RETURN TEMPERATURE IS BELOW A SET	SPORIS CENIRE -
ISOLATORS OR SOFT GROMMETS SUCH THAT STRUCTURE BORNE NOISE TRANSMISSION TO OCCUPIED SPACE IS LESS THAN AIRBORNE NOISE TRANSMISSION.	GATE VALVES NPS 2-½ AND OVER SHALL BE CAST IRON BODY, RISING STEM, O.S. & Y, SOLID WEDGE DISC, BRONZE TRIM, BOLTED BONNET, FLANGED ENDS, CLASS 1033 KPA (150 PSI) W.O.G. TOYO/RED & WHITE 421 OR EQUAL.	TEMPERATURE THRESHOLD. REFER TO PREVIOUS CONTROL SEQUENCE FOR THIS MODE. CONTROL VALVE #206 WILL BE CLOSED, AND P-3 AND P-4 WILL NOT BE ACTIVATED. HP-1 AND HP-2 WILL NOT BE ACTIVATED IN THIS CONDITION.	GROUND SOURCE HP
RUBBER FLOOR MOUNTS: MOUNT IN-LINE PUMPS ON TWO (2) RUBBER FLOOR MOUNT ISOLATORS UNDER EACH SUPPORT FOOT. FOR EQUIPMENT MOUNTED ON A SLAB ON GRADE MOUNT ON RUBBER FLOOR MOUNT ISOLATORS UNLESS OTHERWISE SPECIFIED. PROVIDE PROTECTION OF THE RUBBER ELEMENT FROM CONTACT WITH OIL IN THE MECHANICAL ROOM.	GLOBE VALVES NPS 2 AND UNDER SHALL BE BRONZE BODY, STAINLESS STEEL DISC, UNION BONNET, SCREWED ENDS, CLASS 2760 KPA (400 PSI) W.O.G. TOYO/RED & WHITE 214 OR EQUAL.		REPLACEMENT
SPRING FLOOR MOUNTS: ISOLATE ALL FLOOR OR PIER MOUNTED EQUIPMENT ON SPRING FLOOR MOUNT ISOLATORS, UNLESS OTHERWISE SPECIFIED.	CLASS 1380 KPA (200 PSI) W.O.G. TOYO/RED & WHITE 400 OR EQUAL. CHECK VALVES NPS 2 AND SMALLER SHALL BE BRONZE SWING CHECK WITH BRONZE DISC CAPABLE OF BEING REGROUND		PROJECT ADDRESS:
SPRING HANGERS: LOCATE ISOLATION HANGERS AS NEAR TO THE OVERHEAD SUPPORT STRUCTURE AS POSSIBLE. INSTALLATION SHALL PERMIT HANGER BOX OR ROD TO MOVE THROUGH A 30 DEGREES ARC WITHOUT METAL TO METAL CONTACT. ALL DISCHARGE DUCTWORK RUNS FOR A DISTANCE OF 15M (50') FROM THE CONNECTED EQUIPMENT SHALL BE ISOLATED FROM THE BUILDING	SCREWED ENDS, CLASS 13880 KPA (300 PSI) W.O.G. TOYO/RED & WHITE 238 OR EQUAL. CHECK VALVES NPS 2-½ AND OVER SHALL BE CAST IRON BODY, BOLTED COVER, BRONZE SEAT, CAST IRON DISC, FLANGED ENDS,		8625 BC-99 WHISTLER, BC
MODULAR CHILLERS	CLASS 1380 KPA (200 PSI) W.O.G. TOYO/RED & WHITE 435 OR EQUAL.		VƏC IKI
GENERAL .1 WORK INCLUDED: THE WATER-COOLED MODULAR CHILLER SYSTEM SHALL CONSIST OF INDIVIDUAL CHILLER MODULES. EACH	MANUAL AIR VENT: PROVIDE MANUAL AIR VENTS FROM SHORT VERTICAL SECTION OF LINE DIAMETER PIPE TO FORM AIR CHAMBER. PROVIDE 3MM (1/8") BRASS NEEDLE VALVE AT TOP OF CHAMBER.		DRAWN BY JX
CHILLER MODULE SHALL BE COMPLETELY FACTORY WIRED, AND TESTED PRIOR TO SHIPMENT. EACH MODULE SHALL INCLUDE A COMPRESSOR, EVAPORATOR, CONDENSER, AND CONTROLS. CONTROLS SHALL BE DESIGNED ON A DISTRIBUTED MASTER CONTROL SYSTEM THAT ALLOWS THE MASTER MICROPROCESSOR TO OPERATE REMAINING SLAVE MODULES IN THE EVENT OF A	AIR SEPARATOR: PROVIDE CENTRIFUGAL TYPE, CONNECTIONS TO SUIT LINE PIPE DIAMETER, 861 KPA (125 PSI) ASME RATED STEEL TANK, REMOVABLE STAINLESS STEEL 5 MM PERFORATED STRAINER, BLOW DOWN DRAIN CONNECTION. THE MANUFACTURER TO FURNISH DATA SHEFT SPECIFYING AIR COLLECTION EFFICIENCY AND PRESSURE DRAP AT PATED STORY.		CHECKED BY RA, MK
MALFUNCTION OF ANY SLAVE CONTROLLER. THE CONTROLS SHALL ALSO BE DESIGNED TO ALLOW EACH INDIVIDUAL SLAVE MICROPROCESSOR TO OPERATE ON ITS OWN TEMPERATURE SENSOR IF THERE IS A FAILURE OF THE MASTER MICROPROCESSOR. .2 QUALITY ASSURANCE	RELIEF VALVES NPS 2 AND SMALLER SHALL BE PRESSURE ONLY RELIEF VALVES, BRONZE BODY, DIRECT SPRING LOADED TYPE, ASME RATED, LEVER OPERATED NON-ADJUSTABLE FACTORY SET. THREADED CONNECTIONS, DISCHARGE PRESSURE AS		DATE SEPTEMBER 07, 2023
<ul> <li>.1 UNIT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE UL 1995 AND NEC STANDARDS AND BE UL OR ETL LISTED.</li> <li>.2 UNIT SHALL BE RATED AND TESTED IN ACCORDANCE WITH ARI 550/590 - STANDARD FOR WATER CHILLING PACKAGES.</li> </ul>	SCHEDULED. PROVIDE A DISCHARGE LINE THE SAME SIZE AS THE VALVE OUTLET AND PITCHED DOWNWARD FROM THE VALVE TO DRAIN.		DRAWING TITLE:
.3 UNIT SHALL MEET THE SAFETY STANDARDS OF ANSI/ASHRAE 15 - SAFETY STANDARD FOR REFRIGERATED SYSTEMS.     SUBMITALS     SUBMIT COMPLETE DRAWINGS INCLUDING CADINET DRUGUED DETAILS OF A SUBMIT STANDARD FOR REFRIGERATED SYSTEMS.	CIRCUIT SETTER VALVE: SCREWED ENDS, BRASS BODY REGULATING VALVE, COMBINATION P/T TEST POINTS WITH EPT INSERTS/CHECK VALVES, DRAIN PORT, MEMORY STOP HANDLE WITH GRADUATED MARKINGS, POSITIVE SHUT OFF, 1035 KPA @ 93°C (150 PSI @ 200°F) RATING.		MECHANICAL
. I SUDIVITE COMPLETE DRAWINGS INCLUDING CABINET DIMENSIONAL DE FAILS AND ANCHOR POINT LOCATIONS, REQUIRED CLEARANCES, LOCATION AND SIZES OF FIELD CONNECTIONS, PERFORMANCE DATA, ELECTRICAL WIRING DIAGRAMS, DRY AND OPERATION WEIGHTS, AND ALL REQUIRED ELECTRICAL DATA.	PRESSURE REDUCING VALVE: ½ TO ¾ NPS, SCREWED ENDS, BRASS BODY PRESSURE REDUCING VALVE WITH LOW INLET PRESSURE CHECK VALVE, REMOVABLE STRAINER. ADJUSTABLE PRESSURE OF [69 KPA TO 172 KPA (10 PSI TO 25 PSI).][172 KPA TO 414 KPA (25		SPECIFICATION
<ul> <li>.2 SUBMIT MANUFACTURER'S INSTALLATION INSTRUCTIONS, INCLUDING ANY REMOTE PANEL INSTALLATION INSTRUCTIONS.</li> <li>.3 OPERATING AND MAINTENANCE MANUALS: PROVIDE TWO COPIES OF CURRENT COMMERCIAL MANUALS.</li> </ul>	PSI TO 60 PSI)], MAXIMUM OPERATING TEMPERATURE 107°C (225°F), MAXIMUM WORKING PRESSURE 862 KPA (125 PSI). BELL AND GOSSETT A-430H OR EQUAL.		
			PROJECT NO. DRAWING NO.
			^{124в-020-23}   M2.01