

1 KEY PLAN  
M-100 1:200

**GENERAL NOTES**

1. PROVIDE INSULATION ON NEW PIPING WORK TO MATCH EXISTING INSULATION.
2. UPON COMPLETION OF INSTALLATION, REBALANCE WATER FLOW TO INDICATED WATER FLOW AND SUBMIT WATER BALANCING REPORT.
3. ALL FAULTY OR NON-COMPLYING PIPING CONNECTIONS ON EXISTING PIPING LAYOUT TO BE UPGRADED TO MEET INSTALLATION STANDARDS.
4. CONTRACTOR TO ENSURE ALL SENSORS & COVERS ARE PROTECTED FROM DAMAGE. REPORT ANY DAMAGED SENSORS TO ENGINEER PRIOR TO START OF WORK. ALLOW TO REPLACE IN PRICING.
5. LOCATION OF EXISTING EQUIPMENT SHOWN ON THIS DRAWING IS FOR INFORMATION ONLY. CONTRACTOR SHOULD REVIEW AND CHECK THE EXACT LOCATION, SIZE, ELEVATION AND INVERT OF ALL EXISTING EQUIPMENT AND PIPING ON SITE PRIOR TO COMMENCING WITH WORK.
6. MODIFY THE SIZE AND ROUTING OF NEW PIPING AS REQUIRED TO SUIT THE SITE CONDITION WITHOUT EXTRA COST TO THE OWNER. PROVIDE ADEQUATE OFFSETS, AND TRANSITIONS ON NEW PIPES AS REQUIRED TO SUIT SITE CONDITIONS. CAPTURE ALL VARIATIONS ON RECORD DRAWINGS. SUBMIT RECORD DRAWINGS ON COMPLETION OF PROJECT.
7. PATCH AND MAKE GOOD DAMAGED PIPING INSULATION DURING CONSTRUCTION FOR NEW & EXISTING PIPES.
8. SEISMICALLY RESTRAIN ALL REPLACED EQUIPMENT
9. CONTACT THE DEPARTMENTAL REPRESENTATIVE FOR ALL WORK AFFECTING BASE BUILDING HVAC, PLUMBING OR LIFE SAFETY SYSTEMS.
10. COORDINATE WITH OTHER TRADES TO ENSURE THAT ALL BALANCING DEVICES, COMPONENTS, AND CONTROL VALVES, ETC. ARE ACCESSIBLE FOR SERVICING.
11. MAINTAIN FACILITY OPERATION AT ALL TIMES. REFER TO SPECIFICATIONS FOR INSTRUCTIONS ON OPERATION DURING CONSTRUCTION PERIOD, INTERRUPTIONS TO SERVICES AND PHASING REQUIREMENTS.
12. NOTE RESTRICTIVE DIMENSIONS IN EXISTING MECHANICAL ROOM, ANY DEVIATIONS FROM DESIGN SHALL BE MADE WITHIN ALLOWABLE SPACE AND AT NO EXTRA COST TO THE CLIENT.

**MECHANICAL DRAWING LIST**

NO.	DESCRIPTION	SCALE
M100	MECHANICAL KEY PLAN, NOTES, LEGEND & DRAWING LIST	N.T.S.
M101	MECHANICAL DEMO & NEW PLAN-PIPING & EQUIPMENT	1:50
M102	MECHANICAL DEMO & NEW-HEATING & COOLING SCHEMATIC	N.T.S.
M103	MECHANICAL SCHEDULES	N.T.S.

**MECHANICAL LEGEND:**

**HVAC EQUIPMENT AND SYMBOLS**

MECHANICAL EQUIPMENT TAG CP --

**PIPING IDENTIFICATION AND SYMBOLS**

ATMOSPHERIC VENT -----ATV-----  
 CHILLED WATER SUPPLY -----CHWS-----  
 CHILLED WATER RETURN -----CHWR-----  
 HOT WATER HEATING SUPPLY -----HWS-----  
 HOT WATER HEATING RETURN -----HWR-----

MANUAL AIR VENT [Symbol]  
 AUTOMATIC AIR VENT [Symbol]  
 THERMOMETER [Symbol]  
 PIPE CAP [Symbol]  
 PIPE BREAK [Symbol]  
 FLOW ARROW [Symbol]  
 PIPING ELBOW DOWN [Symbol]  
 PIPING ELBOW UP [Symbol]  
 PIPING TEE UP [Symbol]  
 PIPING TEE DOWN [Symbol]  
 PIPING TEE [Symbol]  
 GATE VALVE [Symbol]  
 GLOBE VALVE [Symbol]  
 PRESSURE REDUCING VALVE [Symbol]  
 SWING GATE CHECK VALVE [Symbol]  
 BALL VALVE [Symbol]  
 FLOW MEASURING & BALANCING VALVE [Symbol]  
 BUTTERFLY CHECK VALVE [Symbol]  
 CONCENTRIC REDUCER [Symbol]  
 ECCENTRIC REDUCER [Symbol]  
 Y STRAINER [Symbol]  
 BLOW OFF Y STRAINER [Symbol]  
 THERMOMETER WELL [Symbol]  
 PRESSURE GAUGE AND COCK [Symbol]  
 UNION CONNECTION [Symbol]  
 FLANGED CONNECTION [Symbol]



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1	ISSUED FOR REVIEW	2019/03/19

Client/client  
**CANADA BORDER SERVICE AGENCY**

Project title/Titre du projet  
**SURREY , BRITISH COLUMBIA**  
**220 99 HIGHWAY**  
**CBSA DOUGLAS BORDER CROSSING**  
**COOLING SYSTEM**  
**HEAT PUMPS**

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**PREETIPAL PAUL**  
 Drawing title/Titre du dessin

**MECHANICAL KEY PLAN , NOTES, LEGEND & DRAWING LIST**

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<b>R.103695.001</b>	<b>M100</b>	<b>2</b>





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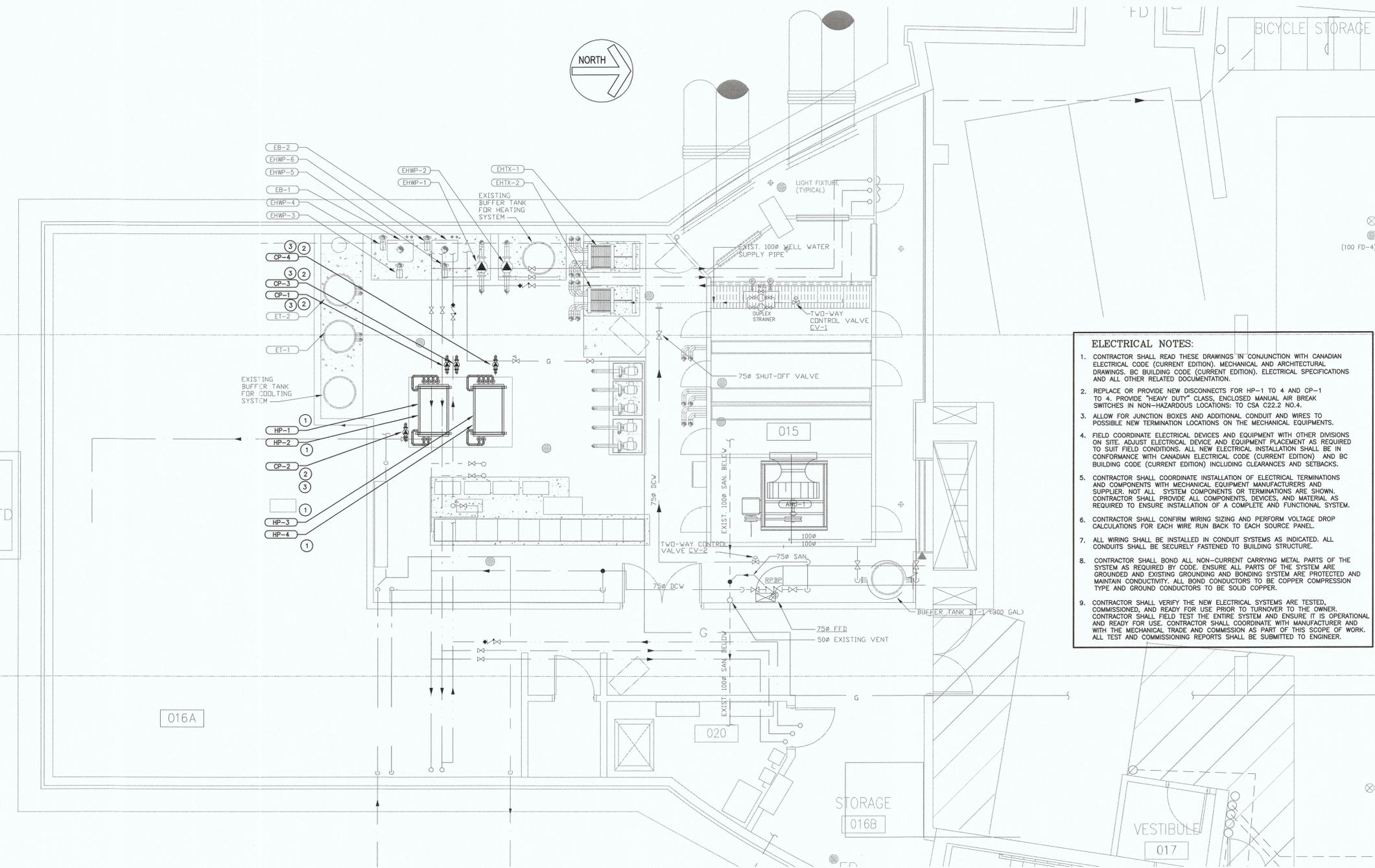
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Drawing title/Titre du dessin  
**MECHANICAL DEMO & NEW PLAN -  
 PIPING & EQUIPMENT**

Project No./No. du projet	Sheet/Feuille	Revision no./La Révision no.
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**ELECTRICAL NOTES:**

- CONTRACTOR SHALL READ THESE DRAWINGS IN CONJUNCTION WITH CANADIAN ELECTRICAL CODE (CURRENT EDITION), MECHANICAL AND ARCHITECTURAL DRAWINGS, BC BUILDING CODE (CURRENT EDITION), ELECTRICAL SPECIFICATIONS AND ALL OTHER RELATED DOCUMENTATION.
- REPLACE OR PROVIDE NEW DISCONNECTS FOR HP-1 TO 4 AND CP-1 TO 4. PROVIDE "HEAVY DUTY" CLASS, ENCLOSED MANUAL AIR BREAK SWITCHES IN NON-HAZARDOUS LOCATIONS: TO CSA C22.2 NO.4.
- ALLOW FOR JUNCTION BOXES AND ADDITIONAL CONDUIT AND WIRES TO POSSIBLE NEW TERMINATION LOCATIONS ON THE MECHANICAL EQUIPMENTS.
- FIELD COORDINATE ELECTRICAL DEVICES AND EQUIPMENT WITH OTHER DIVISIONS ON SITE. ADJUST ELECTRICAL DEVICE AND EQUIPMENT PLACEMENT AS REQUIRED TO SUIT FIELD CONDITIONS. ALL NEW ELECTRICAL INSTALLATION SHALL BE IN CONFORMANCE WITH CANADIAN ELECTRICAL CODE (CURRENT EDITION) AND BC BUILDING CODE (CURRENT EDITION) INCLUDING CLEARANCES AND SETBACKS.
- CONTRACTOR SHALL COORDINATE INSTALLATION OF ELECTRICAL TERMINATIONS AND COMPONENTS WITH MECHANICAL EQUIPMENT MANUFACTURERS AND SUPPLIER. NOT ALL SYSTEM COMPONENTS OR TERMINATIONS ARE SHOWN. CONTRACTOR SHALL PROVIDE ALL COMPONENTS, DEVICES, AND MATERIAL AS REQUIRED TO ENSURE INSTALLATION OF A COMPLETE AND FUNCTIONAL SYSTEM.
- CONTRACTOR SHALL CONFIRM WIRING SIZING AND PERFORM VOLTAGE DROP CALCULATIONS FOR EACH WIRE RUN BACK TO EACH SOURCE PANEL.
- ALL WIRING SHALL BE INSTALLED IN CONDUIT SYSTEMS AS INDICATED. ALL CONDUITS SHALL BE SECURELY FASTENED TO BUILDING STRUCTURE.
- CONTRACTOR SHALL BOND ALL NON-CURRENT CARRYING METAL PARTS OF THE SYSTEM AS REQUIRED BY CODE. ENSURE ALL PARTS OF THE SYSTEM ARE GROUNDED AND EXISTING GROUNDING AND BONDING SYSTEM ARE PROTECTED AND MAINTAIN CONDUCTIVITY. ALL BOND CONDUCTORS TO BE COPPER COMPRESSION TYPE AND GROUND CONDUCTORS TO BE SOLID COPPER.
- CONTRACTOR SHALL VERIFY THE NEW ELECTRICAL SYSTEMS ARE TESTED, COMMISSIONED, AND READY FOR USE PRIOR TO TURNOVER TO THE OWNER. CONTRACTOR SHALL FIELD TEST THE ENTIRE SYSTEM AND ENSURE IT IS OPERATIONAL AND READY FOR USE. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER AND WITH THE MECHANICAL TRADE AND COMMISSION AS PART OF THIS SCOPE OF WORK. ALL TEST AND COMMISSIONING REPORTS SHALL BE SUBMITTED TO ENGINEER.

**KEY NOTES:**

- EXISTING WATER SOURCE HEAT PUMP UNITS TO BE REMOVED AND REPLACED WITH NEW ONE (REPLACEMENT BASED ON THE "SAME FOR SAME", C/W SAME CAPACITY, PHYSICAL DIM., AND ELECTRIC DATA ETC.), ONE AT A TIME. INTEGRATE OPERATION BEFORE REPLACING THE NEXT ONE.
- EXISTING HYDRONIC CIRCULATION PUMPS TO BE REMOVED AND REPLACED WITH NEW ONE (REPLACEMENT BASED ON THE "SAME FOR SAME", C/W SAME WATER FLOW, HEAD, PHYSICAL DIM., AND ELECTRIC DATA ETC.), TOGETHER WITH RESPECTIVE HEAT PUMP.
- REPLACE WITH SUCTION STRAINER; ADJUST PIPE CONNECTIONS.

**1 MECHANICAL DEMO & NEW PLAN**  
 SCALE: 1:50





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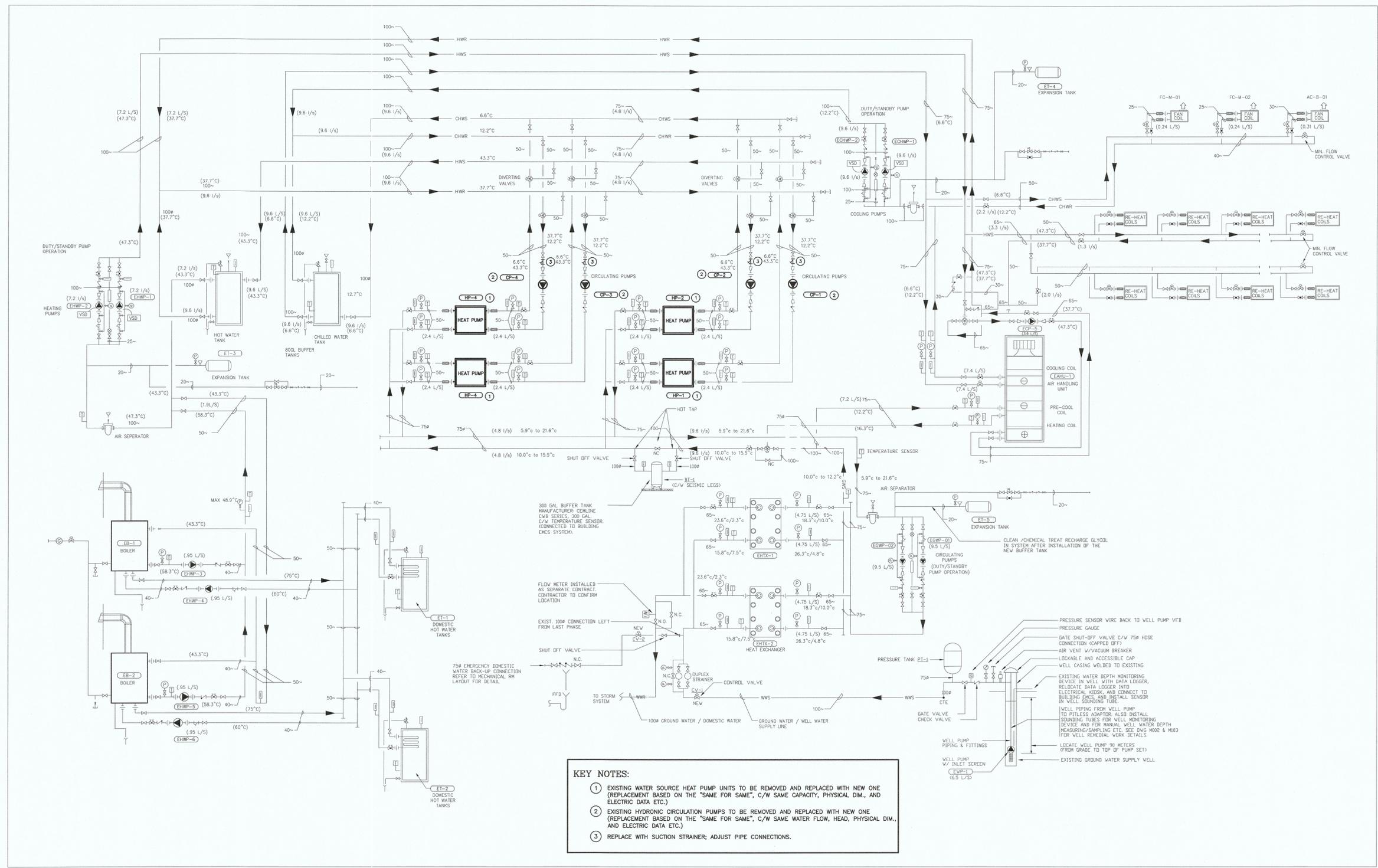
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**MECHANICAL DEMO & NEW - HEATING & COOLING SCHEMATICS**

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<b>R.103695.001</b>	<b>M102</b>	<b>2</b>



**1** MECHANICAL DEMO/NEW - HEATING & COOLING SCHEMATICS  
 SCALE: N.T.S.



HEAT PUMP SCHEDULE																					
UNIT NO.	MAKE	MODEL	COOLING @ 50°F (WT)					HEATING @ 50°F (WT)					COP	ELEC. MCA	POWER REQ.	PHYSICAL DIMENSIONS			WEIGHT (KG)	REFRIGERANT	NOTES
			L/S	EW (°C)	LWT (°C)	kPa	CLG. CAP. (KW)	L/S	EW (°C)	LWT (°C)	kPa	CLG. CAP. (KW)				HEIGHT (mm)	WIDTH (mm)	LENGTH (mm)			
HP-1	BOSCH/FHP	WW210-3CSC	2.8	10	5.4	52	55	2.8	38	43	42.7	57	4.1	69.8	208/3/60	950	710	1168	403	R410a	1, 2, 3, 4
HP-2	BOSCH/FHP	WW210-3CSC	2.8	10	5.4	52	55	2.8	38	43	42.7	57	4.1	69.8	208/3/60	950	710	1168	403	R410a	1, 2, 3, 4
HP-3	BOSCH/FHP	WW210-3CSC	2.8	10	5.4	52	55	2.8	38	43	42.7	57	4.1	69.8	208/3/60	950	710	1168	403	R410a	1, 2, 3, 4
HP-4	BOSCH/FHP	WW210-3CSC	2.8	10	5.4	52	55	2.8	38	43	42.7	57	4.1	69.8	208/3/60	950	710	1168	403	R410a	1, 2, 3, 4

NOTES:  
 1. EQUAL MANUFACTURE: CARRIER  
 2. SINGLE-STAGE SCROLL COMPRESSOR  
 3. HEAVY-DUTY GALVANIZED STEEL CABINET  
 4. REFER TO MECHANICAL SPECIFICATIONS

PUMP SCHEDULE										
UNIT NO.	SERVICE	MAKE	MODEL	TYPE	FLOW RATE (L/S)	HEAD PRESSURE (Kpa)	ELECTRICAL (V/PH/Hz)	POWER (HP)	SPEED (RPM)	NOTES
CP-1	CIRCULATION PUMP FOR HP	ARMSTRONG	SERIES 4360-1.5B	VERTICAL INLINE PUMP	2.4	65	575/3/60	0.5	1800	2, 3
CP-2	CIRCULATION PUMP FOR HP	ARMSTRONG	SERIES 4360-1.5B	VERTICAL INLINE PUMP	2.4	65	575/3/60	0.5	1800	2, 3
CP-3	CIRCULATION PUMP FOR HP	ARMSTRONG	SERIES 4360-1.5B	VERTICAL INLINE PUMP	2.4	65	575/3/60	0.5	1800	2, 3
CP-4	CIRCULATION PUMP FOR HP	ARMSTRONG	SERIES 4360-1.5B	VERTICAL INLINE PUMP	2.4	65	575/3/60	0.5	1800	2, 3

NOTES:  
 1. W/ VFD CONTROL PANEL.  
 2. REFER TO MECHANICAL SPEC.. FOR DETAIL INFORMATION.  
 3. PROVIDE SUCTION GUIDE TO MATCH.



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