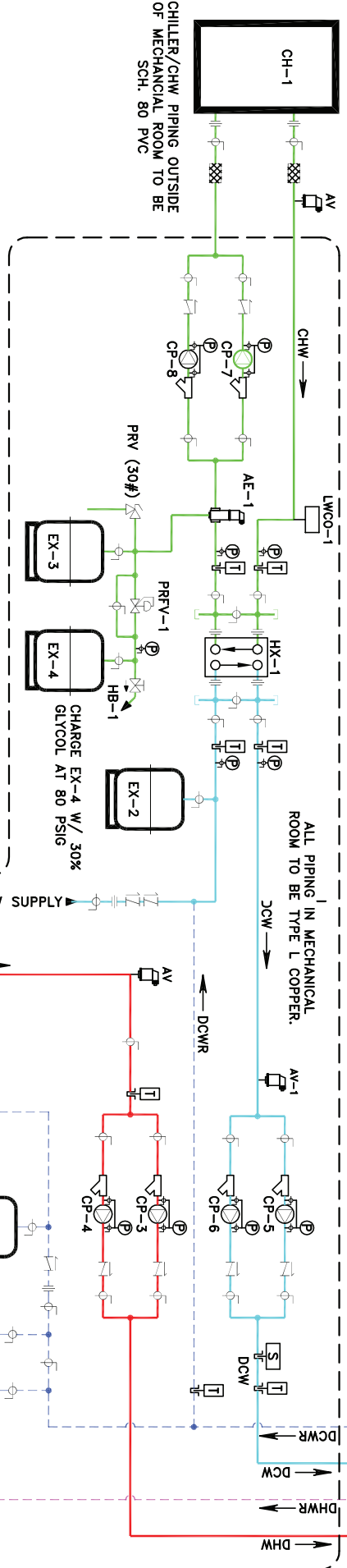


DHW/DCW PIPING OUTSIDE OF MECHANICAL ROOM TO BE CPVC FOR PIPING LARGER THAN 1" & PEX FOR PIPING 1" OR LESS



**MECHANICAL/CONTROL SEQUENCE OF OPERATION**

THE BUILDING IS HEATED & COOLED BY A FOUR-PIPE FAN COIL SYSTEM USING THE DOMESTIC HOT WATER (DHW) SYSTEM FOR HEATING/DHW REQUIREMENTS & THE DOMESTIC COLD WATER (DCW) FOR COOLING/DCW REQUIREMENTS. PATENTED EQUIPMENT BY TOTAL COMFORT SOLUTION, INC. (TCS) ALLOWS FOR COMBINING THE DHW/HEATING & DCW/COOLING SYSTEMS.

**DHW/HEATING:**  
THE DOMESTIC HOT WATER (DHW) PLANT CONSISTS OF TWO GAS FIRED BOILERS (B-1 & B-2) WITH INDIVIDUAL PUMPS (CP-1 & CP-2) PIPED REVERSE RETURN TO AN INSULATED STORAGE TANK (ST-1). EACH BOILER IS INDIVIDUALLY VENTED & HAS COMBUSTION AIR DUCTED DIRECTLY INTO THE BOILER CABINET. THE STORAGE TANK (ST-1) SUPPLIES 140°F DHW THROUGH TWO ALTERNATING, VARIABLE SPEED CIRCULATING PUMPS (CP-3 & CP-4) FOR DHW CONSUMPTION & FAN COIL/SPACE HEATING. DHW IS MIXED TO 120°F WITH A THERMOSTATIC MIXING VALVE (TMV) AT THE FAN COIL LOCATION ABOVE THE CEILING TO PREVENT SCALDING AT THE FIXTURES & STORED AT 140°F TO PREVENT LEGIONELLA PNEUMOPHILIA IN THE DHW SYSTEM.

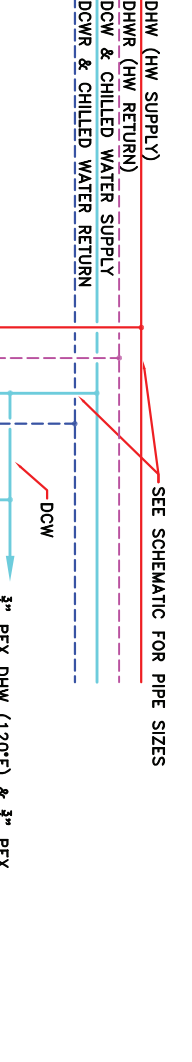
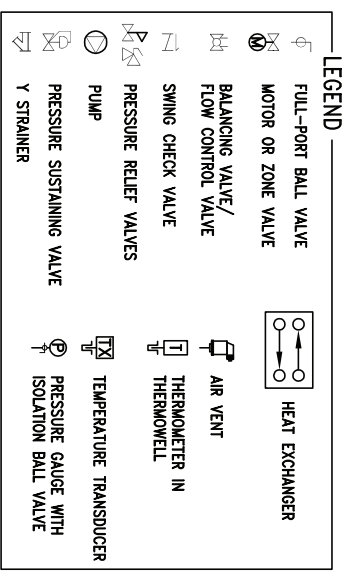
**THE BOILERS (B-1, B-2) ARE CONTROLLED BY A STAGING CONTROL TO MAINTAIN 140°F IN ST-1. A PUMP SEQUENCER ALTERNATES CP-3 & CP-4 WITH VARIABLE FREQUENCY DRIVES CONTROLLING THE PUMPS BASED ON A DIFFERENTIAL PRESSURE OF 15 PSIG BETWEEN THE DHW SUPPLY & RETURN PIPING.**

**CHILLED WATER PLANT:**  
THE DOMESTIC COLD WATER (DCW) PLANT CONSISTS OF AN AIR COOLED, PACKAGED CHILLER (CH-1) WITH STANDALONE OUTDOOR RESET CONTROLS W/ LOW AMBIENT OPERATION & AN INTERNAL FLOW SWITCH. CH-1 IS PIPED PRIMARY-SECONDARY FROM THE DCW PIPING THROUGH A HEAT EXCHANGER (HX-1). THE DCW/COOLING WATER IS CIRCULATED THROUGH TWO ALTERNATING, VARIABLE SPEED CIRCULATING PUMPS (CP-5 & CP-6) & TWO ALTERNATING, CONSTANT SPEED PUMPS (CP-7 & CP-8) CIRCULATE WATER THROUGH THE CHILLER LOOP. THE CHILLER LOOP IS TREATED WITH 30% PROPYLENE GLYCOL.

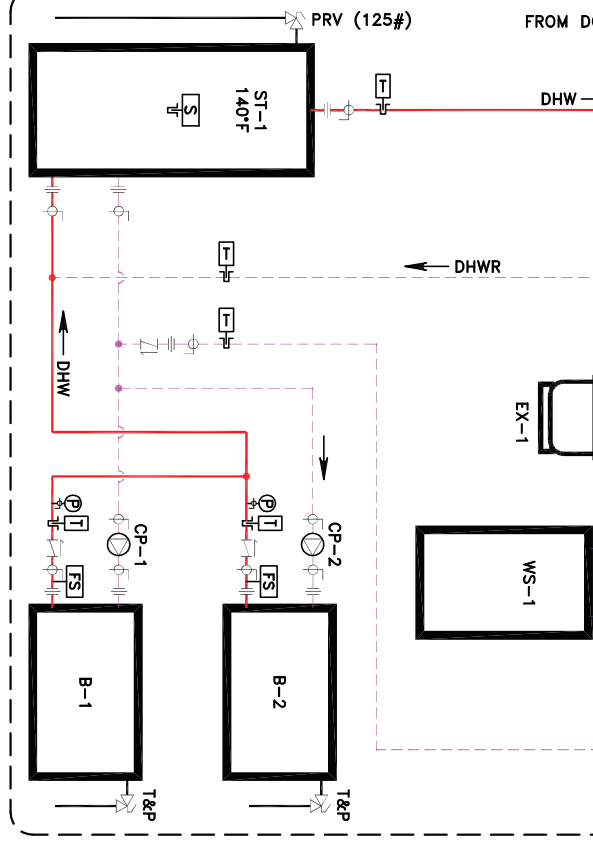
**THE CHILLER (CH-1) & CHILLER LOOP PUMP SEQUENCER ARE ENABLED TO MAINTAIN A DCW LOOP TEMPERATURE OF 50°F. A PUMP SEQUENCER ALTERNATES CP-5 & CP-6 WITH VARIABLE FREQUENCY DRIVES CONTROLLING THE PUMPS BASED ON A DIFFERENTIAL PRESSURE OF 15 PSIG BETWEEN THE DCW SUPPLY & RETURN PIPING. THE CHILLER LOOP PUMP SEQUENCER ALTERNATES CP-7 & CP-8 WHEN THE CHILLER IS ENABLED.**

**HVAC:**  
EACH ROOM IS SEPARATELY ZONED WITH A MULTI-SPEED FAN COIL UNIT IN THE CEILING. EACH ZONE IS SUPPLIED WITH FRESH AIR THROUGH A COMMON DUCT. THE FRESH AIR IS SUPPLIED & EXHAUSTED BY A HEAT RECOVERY VENTILATOR (HRV-1) THAT RUN 24 HOURS A DAY, SEVEN DAYS A WEEK TO THE RESIDENTIAL SPACES.

THE FAN COILS ARE CONTROLLED BY INDIVIDUAL THERMOSTATS THAT CONTROL THE FAN SPEED & HEATING/COOLING VALVES. A TIMER RELAY IN THE THERMOSTAT OPENS THE HOT & COLD WATER VALVES TO PURGE THE STAGNANT WATER IN THE COIL ONCE PER DAY. THE RECOMMENDED COOLING SETPOINT IS 75°F AND THE HEATING SETPOINT IS 70°F.



**Domestic Hot Water & Chilled Water Piping Schematic**



Fancoil Piping Detail (Typical)  
SCALE: NTS

SCALE: NTS