



Manor House Project – IPSgeo Piping Schematic.

Sequence of Operation

The Building heating & cooling including DHW & DCW will be provided by a three pipe IPS fan coil system.

Central Plant for Building Heating & Cooling:
 Central plant will consist of geothermal field, water to water heat pumps (WWHP), chilled water loop, hot water loop, domestic cold water loop, domestic hot water loop, double wall heat exchangers, expansion tanks, main circulating pumps with piping, valves & accessories. The geothermal field will only provide space heating and cooling.

Space Cooling: When system is in cooling mode, fan coil circulator will supply 45°F water to coil which then return back at 55°F to same riser to mix it with 45°F water. WWHP's maintain DCW loop temperature of 45°F with CP-5, CP-6, CP-7 & CP-8 running to circulate thermal fluid through HX-2, WWHP's & geothermal field. DCW will be circulated throughout the building via two circulating pumps (CP-1 & CP-2).

Space Heating: When system is in heating mode, fan coil TRAC valve will vary the flow to match the heating demand & supply 120°F water to coil which then return back at 100°F in separate riser to central plant. WWHP's maintain DHW return loop temperature to 120°F with CP-5, CP-6, CP-7 & CP-8 running to circulate thermal fluid through HX-1, WWHP's & geothermal field. The DHW will be supplied via two circulating pumps (CP-3 & CP-4) to DHW storage tanks where it can pick up the 120°F make up water which then finally circulates throughout the building. During shoulder seasons space heating will be provided by DHW boiler system, if needed.

DHW Heating: Two gas fired condensing boilers B-1 & B-2 sized for 100% DHW heating and 50% space heating with pumps (BP-1 & BP-2) piped reverse return to an insulated storage tanks to maintain DHW tank at 140°F to prevent legionella pneumophila. DHW will mix to 120°F with a thermostatic mixing valve at central plant level to prevent scalding at the plumbing fixtures. Heating economizer occurs at no additional cost when water returned from DCW system directly used as make-up to DHW system.

Pumps: will be equipped with integral VFD's, sensor & controller to control the speed of the pump in the event of changes in fluid pressure across the pump. DHW & DCW pumps are LEAD & LAG pumps to maintain system head & demand flow requirements. When any pump fails alternator shall start the other pump automatically & give an alarm indication.

