

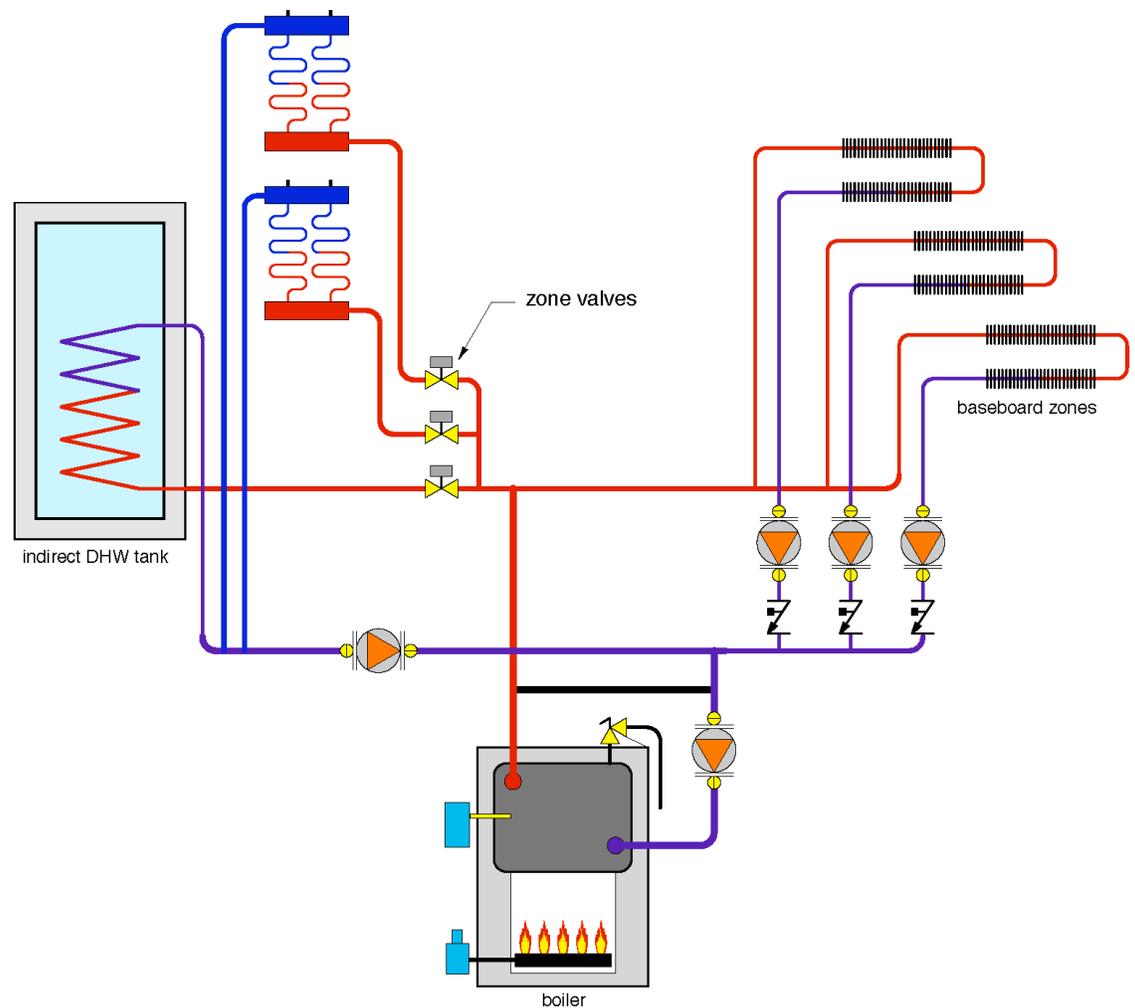
A Target-Rich Environment — For Errors

The Glitch

Here's a schematic based on a sketch that was sent to me.

After looking things over, my speculation is that this system uses higher-temperature plateless staple-up radiant floor heating along with three zones of baseboard.

Look over the schematic and make a list of at least five things you think should be changed.



The Fix

Although I can only speculate on the design intent, this system contains several piping details that should be avoided.

1. If the intent of the boiler bypass was to prevent sustained flue gas condensation, the installer will discover this doesn't work. The only assured way of preventing sustained flue gas condensation is to measure boiler inlet temperature and partially restrict hot water flow to a low-temperature load when necessary. If we assume all the loads, including the radiant panel circuits, are high-temperature loads, there really is no need for the bypass.
2. The "bullhead tee" at the top of the main boiler supply pipe is not a good detail. The turbulence it creates causes significant head loss as well as flow noise.
3. The zone circulators and flow checks should be located on the supply side of the zones to minimize heat migration. Since no expansion tank is shown, there is no way of knowing whether the circulators are attempting to "suck" rather than push flow through the zone circuits.
4. My preference would be to use a zone circulator rather than a zone valve for the indirect water heater. This will result in higher coil flow rates and higher rates of heat transfer. I would also suggest operating the indirect water heater as a priority load.
5. When zone valves are used in combination with a fixed-speed circulator, a differential-pressure bypass valve should be used.
6. Apparently the designer didn't see a need to install an air separator or purging valves. I'm not sure how he expects to get the water in or the air out at start-up. I would certainly recommend a make-up water system, central air separator and purging valves.
7. Indirect water heaters with vertical coils should be piped for counter-flow heat transfer (hot water supplied to top of coil).

