

## Lean On Me...Radiant Walls

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Our current renovation project, within a year of being completed - has over the years been featured in a number of publications including the Hydronics Marketing Groups promotional literature

The first phase of the project in 1994 was to scrap the outdated mechanical systems, which included gas fired furnaces, domestic water heater, pool boiler, incinerator, and infrared patio heaters. These were replaced with a single boiler, two fan/coils with steam humidification, domestic storage tank, the addition of radiant walls and floors, and brazed plate heat exchangers for the pools, future snow/ice melt system, and preheating and reheating of domestic water. All piping, pumps, controls, and heat exchangers were 'off the shelf' prefabricated control panels dispelling the myth that complicated customized systems can't be simplified and standardized.

Phase 2 in 1995 was a complete renovation of the kitchen, dining, and living room. The space now gets its primary heat from a radiant wall profiled on top of an existing exterior wall with one of the new fan/coils dedicated more appropriately to humidification, filtration, make up air and secondary heat.

Why a radiant wall? Our objective for the space was to create an environment, which was thermally stable with constant humidity for the woodwork including floors, guitars, antique decoys and the other furnishings. Although the room has a vaulted ceiling, we chose not to lose any height and access to the basement ceiling was not scheduled until this year so a heated vertical surface was a natural choice.



The design of a radiant wall is almost identical to any other type of site built radiant surface addressing such issues as fluid and surface temperatures, back losses, and venting. Whereas floors have a higher heat transfer coefficient for heating, ceilings a better coefficient for cooling, radiant walls are neutral in heating and cooling

performance simply because of the convection influence on radiant

surfaces. Walls are not as restricted by tube spacing or lower surface temperatures, as such can use higher fluid temperatures to deliver greater Btu/sf. Having higher output surfaces allows mechanical and interior designers greater flexibility in specifying physical dimensions and location.



Wall installations, like most other radiant systems can be correctly fabricated in a number of different ways. For our system, the radiant surface was framed out to match the profile of the wall. Once the strapping was mounted to the studs, reflective insulation was fastened to the back surface followed by the installation of plastic pipe tracking which profile provided an air space between the foil backed insulation and finished drywall. A single ½" loop of PEX was then routed to and from the prefabricated zone control panel located in the boiler room through the tracking system. A manual air vent was piped vertically from highest point on the loop and is hidden out of site at the pinnacle of the profile. Following the first pressure test the wall was then boarded, taped, and finished.



Prior to painting, a second pressure test confirmed no damaged had occurred during the drywalling stage. Once the surface was completed the system was commissioned, and room stabilized at 68°F and 40% RH. At this point, the hardwood flooring was brought in for a week of acclimation and then installed. The final concern was possible damage to the PEX tubing when the paintings were hung and potential harm to the artwork from the heated surface. To address panel damage the wall was blueprinted and photographed prior to boarding. All dimensions and details recorded in the Operation and Maintenance

Manual for the next lucky homeowner. Paintings were backed with reflective insulation before hanging preventing both radiant and conductive transfer to the backside of the canvases.

Since the radiant wall phase we have landscaped the entire project including the snow/ice melt system for a maintenance free yard (1996, 97, and 1998), repainted the exterior (1999), rebuilt the pool piping and filtration equipment (2000), renovated an outdoor covered patio and installed a hot tub (2001) renovated the upstairs (2002), and are about 60% complete in the basement redevelopment phase. Before listing this project, we still need to put on a new roof and finish the family room. At which point this ex-tradesman/general contractor/designers is going to take his tired, stressed out back, and lean it against the most therapeutic thing in a home...a heated wall.