# The In-Slab Radiant Heat System Installation At Otter's Run Ludlow, VT.

Our interior back fill was done with 10 inches of 3" stone on top of virgin soil and then a layer of several inches of 2" stone. Floor drain pipes and vented Radon pipes were installed in these stone layers. This was then covered with a minimum of 6 inches of clean sand compacted and leveled, as a base for our IPS foam board insulation, and for the installation of our in-slab septic waste lines.

Our foam board work was most likely more intense due to the nature of the Superior Walls. Since they have stud cavities I had to measure and hand cut notches in the foam board to fit around the studs to slip the perimeter boards in, to get a tight fit to the walls.

1st, I laid the 4 mil vapor barrier over the sand and notched it around the studs up the walls by 3 inches. Then I cut a tight fitting piece of 2" R10 foam board to fit on the wall inside the stud cavities and used foam board glue to hold the board against the wall and against the 3"s of 4 mil plastic (the Superior Walls already have R5 foam board built in the walls, so the glue was foam to foam contact, and it will give us an R15 value at the edge of the concrete, which should also help the Radiant Heat system response time). All seams on the vapor barrier were sealed with 2" Tyvek tape and reinforced with Scotch's clear plastic duct tape. Then I notched the 2'x 8' 2" R10 floor foam boards to slide into the stud cavities at the perimeter, up against the previously installed wall boards for a tight fit where the floor boards meets the wall boards. I would then build out the floor field with the foam board, staggering the joints as I went, an 8 foot piece then a 4 foot piece then an 8 foot piece at the heads and ends of the floor field, then all 8 foot pieces down the field. This made the joints stagger in the middle of every other 8-foot board. I also used foam board glue on the 4 edges of each foam board to hold them together and seal them as I worked the field. When I got to the opposite walls from where I started I cut the foam board slightly over sized and wedged it to make the whole field tight against the walls. At the ends of the boards where there was no wall to hold them against (at the 14" deep, center load bearing hunch, and garage door openings)I spiked the boards down in the sand with 10" galvanized spikes. This kept the whole foam board field/system from wanting to float in the concrete and made for a tight insulation under the concrete. It was like putting together a jigsaw puzzle, and I'll admit I most likely did an over kill job on the foam. But I'm known to be anal about the little details on such things.

Then with the help of our Motley Crew, Kevin and Ryan we unrolled the wire mesh and flipped the 12-foot sections we cut off over, and laid them on top of the foam board. Naturally, it wanted to go back to it's rolled state so it bows up in an arch off the foam. This is why the

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concrete guys like the roll mesh, they'd rather step on it to push in down in the concrete mix then reach in the wet concrete and pull up flat wire mesh into the mix. With a 4 inch plus floor pour, we actually had to spike down a few sections of mesh to get the PEX tubes in the center of the floor pour.

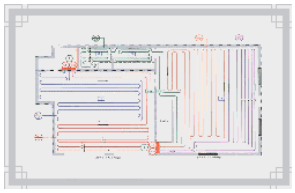
I used 6 foot galvanized all thread rods to build the manifold supports instead of re-bar. With 2 x 4s 16" long, drilled through the 2" edge, I slipped them over the rods, and with nuts and washers on the rods, I was able to adjust the height of the 2 x 4s that the manifold brackets were attached to, to get the proper 36” manifold heights from the finished floor level. I set the height for the first manifold in the garage and used a laser level to shoot across to the second one in the hunch footing. I had to extend the PEX PVC bend supports by 14 inches up the 14" hunch. I used 3/4" schedule 40 electric conduit and couplers held together with duct tape (PVC glue could not be used as it might be reactive to the PEX Tubes passing through the conduits). To keep the bend supports and tubing in line up to the manifolds I took two pieces of zinc plated perforated plate/bar and bolted it around the all thread rods to sandwich the tubes in the center of the rods. This should make a nice neat tight straight package coming up out of the concrete inside the stud walls.

The system was then air pressure tested at 60 Lbs PSI, and remained under pressure throughout the slab pour.

Man! was this a lot of work! The entire project took 5-1/2 days, over the course of two 3-day weekends. Actually the tubing went fairly quickly (approximately 1500 feet of PEX). Started

laying it at 1 PM Sunday afternoon and completed it by 11 PM Sunday night, by myself. Back breaking work, 10 hours spent bent over wire tying the tubes to the wire mesh. The most time consuming part was the Foam board work (3 days work from 6 AM to 10 PM each day with no breaks, working by myself). The wire mesh took only 1 day from 10 AM to 9 PM thanks to the great help from Ryan, my 16 year old Son, and my adopted son, Kevin (my Daughter's boyfriend). I'd guess with a standard poured or block foundation it would not have taken 3 days @ 16 hours a day (48 hours) to do the foam board insulation, since there would be no notching around the studs and all that fine detailed hand cutting work on all those perimeter foam boards. Just lay the boards up flat against the walls, stagger the joints, fill in the field and your done. Oh well, live and learn I guess. Hopefully the advantages of the Superior Walls will make all my efforts worth while in the end.

All and all the project went smoothly and without a hitch, thanks to



the great design work from Northeast Radiant Technology, LLC.

Thanks Rob & Dave, I did appreciate it!

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*The Experts in Radiant heating & cooling!*