

## Spring 1982

I was sharing a restored farmhouse in the fall of 81 which was for sale but was not expected to move anytime soon. I and the people I had been sharing it with were surprised that it sold so fast, and we had to move right away. They got an apartment and I moved what I had into the house. There was only solar heat, but I did ok because the spring was gradually warming.

By this time, I was a year out of school and had a job using my BS in Computer Sciences. This placed me in a neutral financial position. I had a few low college loans on a long payback and no other debts as I went back to school with no debts and a freshly restored old 1967 Saab 95.

I loved this house, and it seemed a shame to let it fall further into ruin. It took some extremely creative financing with interest rates at near 18% but it solved family problems to have it brought back to life. Let's just say that the project required creativity (lots of it).

I had enough first-hand knowledge of the house to know what it needed. I was gutsy and decided to not bring in a very expensive consultation with Taliesin (Wright's architectural foundation and school). I determined what was needed and was convinced I would get the restoration blessed when it was completed (It was). Though money was lost on the house, I did get some financial relief from getting a federal restoration tax credit. That was a very challenging prospect because one must spend at least a dollar in restoration for every dollar of purchase and rarely do non-commercial projects qualify. I had decided that the restoration had to be a complete process skipping no structural areas. Going through in a logical sequence was the only way to really fix the house. There was too much interconnection to simply do say just install the new radiant floor that the house needed so much. I hate to think what the costs would have been if someone tried to restore the property by dividing the needs into discreet projects done as time and dollars allowed.

## House Condition Spring 1982

### Radiant Floor

The floor pipes had known breaks. It was predictable that there would be further bursts from water which did not drain completely and had surely frozen over the two winters the house had sat empty and frozen. The amount of damage did not matter because the floor needed a new and better implementation and the rain down the chimney onto the broken hearth had rotted the pipes which fed the entire floor in a single loop.



There are several things to note about the original iron pipes creating the first radiant floor. The spacing of about a foot and the settling of the rocks around them led to a correctly diagnosed heat loss both due to the lack of insulation under it to keep

the heat retained and the insulating air gap caused by the air gap. And to any who might say replacing it was extreme, this was just one of the places where there were bursts in the pipes from the two years it sat empty.

## Window Wall

Two winters and all the moisture running down the windows over its life had produced dry rot in many places and there were these large single pane sections slipping into the wood frame leading to air leakage in gaps at the top of some. The house did have moisture issues. It was not uncommon to have a ¼ inch of frost form on the south window wall nightly. This was particularly true when the inside pool was a fish and water plant pool.



33 years of deep frost developing nightly and washing down the single pane of glass had cause dry rot and after two years empty the glass had slipped into the wood in some places creating air gaps at the tops of the panes.



It was not limited to the inside alone. The window wall was beyond tired.

## Roof

The roof was intact. We were lucky that two winters without heat in the house had not collected masses of snow on the roof and collapsed the house. I call the wing tips the southern most parts of the inner crescent (the east and west ends) which creates the overhang. The roof structure failed to support them and by 1982 we had several inches of sag. It is interesting to add right now that the shape of the house and the size of the overhang were extremely functional in Wright's design. The curve of the house maintained a portion of the house with direct solar contact all day allowing those areas to have maximum solar gain (angles deflect solar energy). Further, the overhang allowed full solar access to the entire

house in the winter and no solar past the window wall in the summer. Spring and fall had transition amounts of solar energy.



They say a picture says 1000 words. The roof though, technically flat, had a very slight tilt to the rear. There was never anything done to protect the roof's fascia from all the runoffs. The water came off the roof to travel over and behind the fascia. Of note in this photo is the concrete roof to the shop which has a block wall to the north and the back of the rear kitchen wall to the south. A door from the tunnel connects to this space which is open to the utility portion of the tower.



As we were cutting in the new skylights, we got a very exact picture of the lack of any real insulation. The photo shows a bonded roof of two ½ in tongue and groove layers with ½ inch of some sort of particle board. We will come back later and focus on the final structure of the roof rafters and north wall supports as we get to those parts in the story.

## Other Windows

Technically, with the storms everywhere (except the front window wall), the windows were not an energy problem though the energy audit did blame the collective windows other than the front wall as a 20% energy drain. They were a usability issue. There were three old style casement windows (Slot windows). There was a job every spring to get the west slot windows open after removing the storms. There was a 3-4 foot one where the back wall of the house hit the kitchen wall along the tunnel that was not as hard as the 6' ones in the slots.

## Slot Windows

The two tall ones were very important as they scooped air from the south and the flow then went out the kitchen slot and the back upstairs awning windows. They were at the back of covered patio on the west end which tapered back to these windows. These three windows and the six awning windows were the only air source other than small transom windows over the east and west doors.

## North Window Wall Windows

The bedroom windows were a whole other issue. There was a rod which was hinged to the window. There was a metal block attached to the inside window frame which this rod slid through. A small turn knob here let you stop the slide and hold the windows at various opening widths. The knob at the end was slightly smaller than a dime. It was very hard to close by pulling on this rod as they were always open all the way and this knob was against the slider hold hardware. To make matters worse, the windows had been hinged on the bottom having all the weight making it almost impossible to close them when they were in their normal open summer state. I cannot count the times I ran out in a storm to push them closed as the wind coming up the north berm would drive the rain up the berm and into the windows. One could not just grab that small knob at the end and pull against all that weight to close the window. The internal homemade screens were screwed on so that a quick pull of the windows from the inside was not possible.

## Light in the House

As mentioned early on, the bedrooms (all five) were dark. This was in total contrast to how light and bright and sunny it was downstairs. This was mainly due to carving a walkway along the window wall side of the balcony. This had the original three partitioned bedrooms added by Herb Jacobs to have a full south wall blocking the window wall. The end rooms had stone walls wrap around them before the window wall started leaving them with indirect light from the window wall. It is important to note that it was mostly the partitioning of the upstairs which made it dark, not the design.

## Pools

The house had reflecting pools which added another circle within the circles of the house. One of the things I did look at when I had the original plans (returned in 2019) was the pool design, as I made some changes during the restoration. Herb Jacobs operated as his own contractor as far as I know and changed things as he went. The designed furniture may be the only plywood Frank Lloyd Wright art pieces anywhere. The pools were to be a half sphere with a glass separation (as in each pool was to be a quarter sphere. A glass window to a Wisconsin winter simply made no sense. He made the inside pool about 1.5 feet deep with a pipe threaded into a  $\frac{3}{4}$  inch drain to catch overflow and allow a way to empty it for cleaning. The outside pool he made into a plunge pool about 4 feet deep. There was a concrete wall between the pools holding that portion of the window wall. **The important aspect has always been the circle of the pools intersecting the house in front as the tower intersects the house from the back.**

As design elements, they were incredible but as maintenance issues they were a pain. The pipe feeding the pools had the faucet die and eventually the only way to fill it was turn in it on in the utility room in the tower and let it leak full. When we cleaned it to get the muck and gravel from pots out, we first had to set up a syphon with a hose to get it mostly empty. Then we had to use dust pans and a pail to get the rest of the muck, stones, and water out. I won't even go into how to keep the outside pool nice with the

same kind of fill pipe and pipe drain. There was no filter for it but we as a family set up a temporary filter which was always a joy to get going (I am being facetious here as we had to try to get water fully into the inflow pipe so it would restart) as the water drained from the pipes. Pumps don't function well when all of it is on the walk above....

## The roof

This one did not really surprise me in terms of needing a permanent fix. The roof structure as built did not work and there were several inches of drop in both the east and west wing tips to the south over the covered patios and walkways. The damage, after years of water flowing off the front over the wing tips, was evidence that they had a slope contrary to the one where all the water was to drain to the north. The wing tips were the east and west ends of the south crescent formed as the roof design like the house was a segment of a donut shaped object. What did surprise me was that the house would not meet code unless the roof was strengthened. It had never had to hold a snow load (except the winters of 1980 and 1981). Then it sat empty and unheated except for the solar gain. It had always melted the snow. However, now, to meet code, the rafters had to be strengthened. This holding of snow was just one of the ways we needed to make the house more livable.

## The Plan

### Financials

#### Covering 18% Interest

The entire time I owned the house from this first major work, through unexpected major failures and things like the septic bubbling out of the ground by the studio left me feeling that I was juggling raw eggs much of the time.

Let's just say it was a family project and that helped some. My father gave up a large second mortgage in his name, my mother and my stepfather, Richard Hartshorne, loaned me funds, my siblings emotionally supported my efforts, and the banks were friendly.

I knew I could do an approved restoration with my knowledge of the house's needs without spending high architectural costs by working with Taliesin (The Frank Lloyd Wright Foundation and school). I knew what the house needed. When I was done, the restoration was quickly approved as I expected. Madison gave me an Orchid Award and Dane County gave me one of the first Historic Preservation

Awards ever. I had saved what is now a National Treasure and a very world-famous Frank Lloyd Wright design.

I bought the property and then planned the work needed. The review of the Department of the Interiors approval application, doing the needed repairs, and securing the approval of the restoration led to the initial first **round** financing costs of around \$53,000.

## 1982 Costs

Let's just say it was an expensive undertaking. Money at that time was costing 18%. I did get about \$25,000 for a restoration tax credit. ***I walked away with no financial gain. That is not to say there was no gain. As I display a few of the photos from my Wisconsin departure in 2019, you'll see the real gain was knowing I saved an incredible piece of architecture.*** It was good I had income from my recent computer science degree. All those years, 1982-1989, my entire income flowed into the property.

## Structural Dependencies (The Snake Eating Its Tail Issue)

The radiant floor provided support for the south window wall. The south window wall supported the roof. The balcony was suspended from rods which were bolted to some of the roof rafters.

## Breaking the Circle

We left about a foot of the old radiant floor under the window wall to be the footing for the new window wall. This had the footing anchored between the outside stone walkway and the new radiant floor before we moved on to start the window wall replacement. The new floor re-attached this section when it was poured.

With that decision, the phases for the project were determined.

## Plan I followed for the Restoration

My goal for the restoration work, since it would never be possible to be at the point of doing the “while we are at it why don't we”, was to do as much as possible as it was put back together. If this were a normal house, it would have been equivalent to taking the entire house down to the studs (inside and out). As I have mentioned, I had extensive experience with many variations of living within this piece of art. This was the time to enhance its potential functioning to a new level, so I did. What made the list was very enforced by the code changes needed to get the work approved and gross level problems like no heat.

- Radiant Floor (20% house heat loss): The new radiant floor is not only efficient but is also the original nice red that had always been planned.

- Windows (40% house heat loss): Except for the south solar wall, which is dual pane, all other glass in the house is modern triple pane. (Triple pane in the solar wall would have vastly reduced the solar gain by providing another reflection layer)
- Roof (20% house heat loss): Several layers of flat roof insulation sheets were added.
- Skylights: The two existing skylights (bathroom and stairs were rebuilt).
- Light: The upstairs was brightened by the additions of five new skylights and a smart reshuffling of the upstairs partitions.
- Pools: New inside pool has usable plumbing if desired to be a water pool.
- Doors and Windows: Functionality moved from difficult to pleasant.
- Electrical: Most was redone in the wiring defined by the radiant floor. Most of the downstairs wiring came out with the radiant floor. Much of the upstairs wiring was replaced west of the tower (4/5ths of the balcony) while interconnecting first-floor ceiling box lights
- Kitchen: The crude cabinets got modern replacements and moved from dark plywood doors to birch while preserving the original pine counter.
- Bathroom: The tub moved from a back dark corner to a tub/shower enclosure under the newly rebuilt skylight.
- Cooling: A high efficiency furnace/AC replaced the no longer functional fin radiators along the berm back wall of the upstairs. The new low floor temperature made the old fin system ineffective. This supplements the slower radiant floor and added AC for the increasingly warmer summers.

## Summary

As I mentioned, if this were a normal house, we would have been down to the studs internally and externally. With the stone superstructure (untouched) of this house we started with a gravel floor sub-bed, the balcony front and floor framework, and the original roof rafters and sheeting. The majority of the plumbing and electrical were replaced as well. By any definition, this was a massive project.