SZÉKELY ENGINEERING

EXPLANATIONS & EXAMPLES

Of Websites and Browsers, or Big Doings in River City

The link in the text box at the bottom of this page is to my website, which was slapped together with Earthlink's graphic HTML editor, modified with freeware HTML text and graphic editors, and further assaulted with Windows' *Notepad* text editor. Things were sorta OK until four or five years ago or so, when a confluence of new office PC's, a spike in workload, and Microsoft's diarhea of new operating system versions resulted in my website in general, and my homepage in particular, starting to look like it was put together with a set of kindergarten blocks, what with chasms of empty space between paragraphs and font sizes varying for no apparent reason, *but* if you visit my website now, thanks to more than a few days of intensive effort, my homepage once again looks pretty normal.

I've also updated most of the text below the photo of my New York license, and added a new *Newsletter Sources* web page which I had recently cobbled on to the end of my *Newsletter Archives* page, and now that the listing of the hundreds of subjects linked to in my newsletters is on its own web page, there is no need to find a subject of interest and then go back to the archives page to get to the newsletter containing it, because you can get to the necessary newsletter right from the listings page. While I could've done this without removing the listing archives page, I might still be at it, since it was originally tacked on via one of the freeware graphic editors I'd used to maintain my site and it took forever to execute changes because of the code bloat such editors insert into the pages they generate.

Using a text editor to make changes directly, in an effort to avoid the interminable wait when using the graphic editor, was a horror because the code bloat made the text to be changed almost impossible to find (search didn't always work). So I turned the source text of the listing into its own page with a hand–coded page heading and navigation bar via the same pdf converter I use to make my newsletters.

Now as to the browsers reference in the headline, I've tested my cleaned-up site on MS Edge, and Explorer as well as Google Chrome and Mozilla Firefox, and found that while the first two display everything as intended, Chrome puts a jiggle in the underlining of the heading on my home page. Firefox, however, seems to use its own code to read pdf files with the result (?) that a new sample drawing on my site showing my all trades baseplan method of MEP coordination at first displayed hafltoning so faintly as to be almost invisible.

This last is ironic as several years ago I had to turn off the coordinating trades' layers and re-plot my drawings for a Department of Buildings filing submission when the Plans Examiner complained of the undreadability of my drawings because I had to change plotted lineweights and screen percentages when my blueprinter started using new plotters that were faster, but lacked the resolution to display my drawings as intended. This thankfully, is no longer the case, and my blueprinter's hard copies of my drawings look pretty much like the sample my website displays onscreen and during the writing of this piece, I did some troubleshooting of the Firefox display problem, discovered it was limited to the monitor on only one of my PC's, and corrected it by changing that monitor's color temperature from "Warm" to "Normal".

One last thing with regard to web browsers. Most of them cache pages in your computer so as to speed things up when revisiting pages you've been to before. Because of that, you may to use the circular arrow at the right or left side of the address box in your web browser to reload my home page and newsletter archives page to see the latest version of each.

Engineering for Dummies Redux – Part 1 – Hot Air vs. Radiant Heat

Back in late 2005 and early 2006, I wrote a 5–issue series entitled *The Shareholder/Unit Owner Board Member Survival Manual,* **or** *Engineering for Dummies*, in which I endeavored to explain those aspects of MEP engineering germane to homes and apartments, and while there was a fair amount of information on electrical and plumbing engineering, there was virtually nothing regarding mechanical (HVAC) engineering as applied to such occupancies.

What with multiple dwelling Developers and Architects apparently allergic to central air conditioning and Homebuilders apparently allergic to radiant heat, there didn't seem to be much call to include HVAC in the series, but with the gut renovation market filled with such systems, I figure explication thereof is in order. Additionally, I want to develop more clearly what I have meant in past newsletter issues when referring in passing to the difference between MEP consulting engineers and engineers/engineer-constructors specializing in heavy-industrial projects, where this "difference" is more like a yawning chasm and my references to the former have been (as you may recall from the last issue) on the derisive side.

So, let's dive right into it, shall we?

The "allergies" I referred to in the beginning of the paragraph before last have to with cost with regard to Developers, and ceiling height with regard to Architects. With Homebuilders it's purely cost, where they figure they can heat and cool a dwelling via a single forced air system fed by a hot air furnace with a central air conditioning system's cooling cool inserted into the main ductwork at the furnace for cooling.

Putting aside for the moment engineering subtleties which I'll get into later, you either have to be exceedingly dense, or uncaring to not realize that while air supply outlets at the floor are a good place from which deliver hot air, it's lousy place for the delivery of cool air, and conversely , air supply outlets at or near the ceiling are a lousy place for delivery of hot air because hot wants to stay at the ceiling and cold wants to stay at the floor.

In the old days builders and installers tried to get around this by extending cellar branch ducts from the floor to the ceiling and attic branch ducts from the ceiling to the floor, with an outlet in each branch at the floor *and* the ceiling with only the upper outlet open is summer and only the lower outlet open in winter.

Now, as to the engineering subtleties.

First, hot air is typically delivered at about 70 degrees above room temperature, while cool air is delivered at only 20-25 degrees below room temperature, with the result that all other things being equal, one needs to move three times as much cooling air through the ductwork and out of the outlets when adding an air conditioning coil to a hot air furnace in order to maintain the same level of performance.

This, however, can be got around by sizing the ductwork and outlets to carry the cooling air quantity without noise (undersized ductwork and outlets are noisy when forcing more air through them than they've been designed for) since heated air will naturally rise anyway and thus doesn't have to be forced out of outlets at high velocity in order to engender mixing with ambient room air. The same is true for cooled air delivered from near or at the ceiling, which should not, by the way, be delivered from outlets at such velocity so as to go entirely across a room, as it will be felt as a draft. Proper design allows the cooled air to gently fall to the floor and mix with ambient air at about the centerline of a room.

Having said **all** that, to quote my friend Dan Holohan as to types of systems, there is no worse way to heat a space than via "scorched air" – it's lousy as a heat transfer medium (insulation relies upon air being trapped and immobile because of its low heat transfer characteristics) when compared to more dense media such as water, and why heat air to heat you, with the attendant losses when going from medium to medium to you?

The argument I still here from time to time in favor of hot air heating is how immediately one feels its effects.

Oh yeah? Ever notice the *instant* change on a still winter's day when the sun comes out from behind a cloud? This is the very of exemplar radiant heat, which does not have to travel through a medium (or a lack thereof) to have an effect. (Notwithstanding what's written in the preceding link, radiators are called such because they do radiate heat – see part 2 in the next issue for more.)

Don't believe me? Well, at the speed of light, what we see when we look at the sun is actually what it looked like about 8 minutes ago, as it takes that long for the light from the sun to cover the 93 million miles between it and the earth, but we feel the radiant heat immediately because the sunlight had been warming the tops of the clouds, which are at most, a few miles away.

Dunno yet how many parts there'll be, but stick with me – I'll try not to put you to sleep.