Well I'll Be Darn!

George Porter

Oh my, this could be soooo good! You know how there are some things you just know about our homes but can't prove it. You may have known these things all your life but figured there must be some reason that you have to do something that doesn't' really make sense to you. Don't get too excited yet, but I may have by just sheer luck come across the "Holy Grail" of HUD code housing.

A little background first: In February of this year Tony Widowski, owner of the Mobile Home Stuff Store in Wisconsin, asked me to give a seminar on shallow frost protected foundations. When I got to the meeting Tony had a document called Revised Builders Guide to Frost Protected Shallow Foundations. (You can find it on the web) I had not seen this revised guide and he gave it to me on a disc. It is put out by the National Association of Home Builders and on the front cover it has logos and seals from HUD, Path, PD&R, and NAHB. The thing certainly had plenty of credentials. Inside were plans for various types of insulated foundations; the theory behind them and the engineering to determine what would work in various areas of the nation.

This was interesting but not really new; the technology has existed for 60 years elsewhere in the world and it is just "new" around here. I have a pretty good "layman's knowledge" of how this stuff works but I have always found that there is always a little something somewhere that can be useful. At the end of the publication in Appendix 2 there are some answers to some common questions about the principles involved. The first question was, "How does insulation stop frost heave from occurring?" Here is the answer to that question; at least the part that stopped me in my tracks.

"Frost heave can only occur when all of the following three conditions are present: 1) the soil is frost susceptible (large silt fraction), 2) sufficient moisture is available (soil is above approximately 80 percent saturation), and 3) sub-freezing temperatures are penetrating the soil"

Did you just see what I saw when I read this? Item 1 says the dirt can't be like gravel or coarse sand because it will drain all the water out. It needs to be something that holds water at least a little bit. Item 3 says the temperature of the soil needs to be below freezing to freeze. (DUH) But look closely at item 2! This is the first time in my life that I have ever seen freezing associated with a percentage of water! Of course you need water to make ice and of course nearly all soil has some sort of water in it but where did that 80% come from?

In case you don't understand the implications of this sentence yet let me 'splain it. How many installers crawl under homes in the northern states all winter long and are really puzzled by the need for deep footings under the beams when they can clearly see under their hands and knees that the dirt is not frozen. This doesn't mean all homes don't have ice underneath them, but lots and lots of them don't. And yet the rule is; all the footings for the piers need to be way down in the ground so the frost heave will not mess with them. Lots of trouble and treasure involved here.

What if this is true? What if we had a way to make sure that all the soil under a home was less than 80% saturated? Get the picture now? Why do you think there are millions of older homes (pre 1980 would be my guess) located in the north without frost- free footings and no real problems? Yes of course there are some with problems, but maybe there is a reason for that? It's probably over 80% moisture under them!

Before anyone out there gets the wrong idea here I am absolutely, positively, without any question **NOT** telling you "forget digging footings!" Although I am pretty sure someone will say I did. Do not tell your local building inspector that you don't need to do that any more and he can get in his car and leave. "Sound bite science" is stupid! What I am saying here is that nearly all the "VIPs" of the housing world endorsed this publication and we need to look into this, big- time.

Here is what I have done so far: I have called the NAHB Research Center in MD and spoken with a Ms. Del Bianco, one of the staff members. She has given me some leads to track down the source of this info about 80%. I have contacted the offices of Manufactured Housing Research Alliance in NY and spoken with Jordan Dentz. My good friend Bill Farish, chief engineer at Fleetwood is one of the first I called about this. I have also been looking on the internet until my eyeballs were sore and came up with at least one little tidbit. I am not done yet though, there are over 3,070,000 hits when you look for "water percentage in frozen ground" on Google. (This could take a while)

Here is what I have found so far: Nearly all info on water % in dirt is found under an agricultural heading. It has to do with plants growing also. Washington State University has a Pacific Norwest Publication called Soil Water Monitoring and Measurement. This paper is published by some notable scientists for people who grow stuff out there. Near the end of the paper they have a chart of how to tell soil water % by feeling the dirt. (I am not making this up) If you grab a handful of dirt and squeeze it into a ball with one hand and your hand gets a wet outline of the dirt on it then the dirt has more than 80% moisture content. If you do the same thing and your hand looks just slightly damp then it is less than 80%. You can also get a moisture meter for under $100 that will tell you everything you need to know. (You can also get one for $5 at Lowes, don't bother)

So here is the deal. We need to get all over this as an industry and we need to do it now. We cannot use this one little sentence to do this. We will always have to have perimeter foundations frost protected, but under the home, when it is done right, it is dry. We can save ourselves and our customers millions and millions of dollars and maybe even our industry in the process.

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