

Weather Resistive Barriers

OK, it's NERD time! (And I trust that everyone receiving this has a sense of humor...if not, go borrow a colleague's before reading this email). I will apologize beforehand for any offense given...

When it comes to the codes I've found that there is some common ground. For example, the 2004 supplement to the 2003 International Building Code changed Section 1404.2 to read "A minimum of one layer of No. 15 asphalt felt, complying with ASTM D 226 for Type 1 felt, shall be attached to the studs or sheathing, with flashing as described in Section 1405.3, in such a manner as to provide a continuous water-resistive barrier behind the exterior wall veneer." in the section covering Weather Resistive Barriers. Under that provision, only #15 felt could be used (although the resource at the end of this email documents which codes permit alternate material usages...and they reference the UBC, SBC, IBC, IRC, etc.).

The *homo habilis* code: In the 1997 & 1999 Standard Building Code (the predominant "archaic" code in the Southeast, very similar to the Uniform Building Code in the West), Section 2303.3 states that surfaces exposed to the weather shall have an approved barrier to protect the structural frame and interior wall covering that is at least Type 15 felt or kraft waterproof building paper and is installed shingle style over the studs or sheathing of all exterior walls. Well, the felt paper is sort of a smart vapor retarder in that it's permeability changes depending upon how wet it is (ranges from 1 perm to 4 perms, typically). By definition, waterproof means bulk water cannot pass through the building material...so very low perm ratings are what they were looking for (apparently < 4 perms). I believe the UBC has similar provisions, but I've been wrong before.

The *homo erectus* code: In 2000 International Residential Code Section 703.2, the code states that asphalt saturated felt paper weighing not less than **14 pounds per 100 square feet** and complying with ASTM D 226 or other approved weather resistant material shall be applied shingle style over the studs or sheathing of all exterior walls, except it is not required under horizontal aluminum siding, steel siding, vinyl siding or wood siding (exemptions from Table 703.4). While this doesn't make any sense to me as a builder (all siding materials will get water behind them), at least now they referenced a standard! The down side is that #15 felt paper weighs about 8.5 to 12 pounds per 100 square feet, not 14...so now I'd have to go buy #30 felt paper (if I wanted to be compliant with what the code said).

The *homo sapiens* code: In 2003 IRC Code Section 703.2, the code states exactly the same thing as the 2000 & 2001 versions except now Table 703.4 lists fiber cement lap siding and fiber cement panel siding (both of which require this "weather-resistant material").

The *homo futuris* code: In the 2004 supplement to the International Residential Code, the ICC saw fit to change some things (woohoo, we're making progress now!). The new Section R703.1 states that exterior walls shall provide the building with a weather resistant exterior wall envelope (duh!), one that is designed and constructed in such a way that water accumulation within the wall assembly is prevented by using a **water-resistant** barrier behind the exterior veneer and a means of draining the water that enters the assembly to the exterior (sounds like a drainage plane to me). Of course, as with any code, there are exceptions: if you build a concrete or masonry wall in accordance with the Chapter 6 provisions that cover concrete and masonry construction and flash the openings according to R703.7 & R703.8, you don't have to provide this water management system. Also, if you build an exterior wall test assembly that is at least 4' x 8' (has at least one opening, one control joint, one wall/eave interface and one wall sill), create a differential pressure of 299 Pa and expose this creation for two hours to simulate wind driven rain according to ASTM E 331 and the test results indicate that water did not penetrate the control joint, joints at the perimeter of openings and penetrations or intersections of terminations with dissimilar materials, you have proven that you don't need to use the water-resistant barrier. I'll get right on that...Section 703.2 now reads "No. 15 asphalt felt" instead of "asphalt saturated felt weighing not less than 14 pounds per 100 square feet", still has to be applied over the studs or sheathing of exterior walls shingle style, now must be continuous to the tops of the walls and terminated at penetrations to meet the requirements of R703.1 and further states that you can omit this felt or other approved material under exterior wall finish materials as permitted in the now infamous Table R703.4...which now requires a weather resistant barrier under **all** siding and veneers.

So what does all this mean? Perhaps we should have defined "weather resistant" better (I think definitely!), # 15 felt paper is now the standard material listed in the codes (although one could get other materials approved through the ICC Evaluation Service), engineers can get really wacky when they want to test things, and water really does get behind all siding and veneer materials and we have to provide a way for it to get out of our walls. Some examples of "other approved weather resistant material" includes Tyvek house wrap, R Wrap house wrap, etc. If you are really interested in this, these reports are listed at www.icc-es.org. Go to the search by CSI Division (you'll want Division 7) and look under both 07270 Air Barriers and 07280 Water Resistive Barriers. It's fascinating reading, I promise.

So now that we have taken a very tiring journey through the codes, I must confess that I have never found a perm rating specifically attached to the term "weather resistant barrier". This animal might exist in a local or state code, but I haven't found it in the modern national codes (again, I work almost exclusively with houses, not commercial buildings!). The 2003 IRC does define a "vapor permeable membrane" as one with a perm rating of 5 or greater and a "vapor retarder" as a material with a perm rating less than 1. However, those terms are not used in any of the references I have found relating to an exterior weather resistant barrier.

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