



Building America

Stump the Building Chump – Joe Lstiburek

November 28, 2016

U.S. Department of Energy

Lena Burkett

Building Science Corporation

Joe Lstiburek

National Renewable Energy Laboratory

Linh Truong

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Agenda

- ✓ Welcome and Introductory Remarks
- ✓ Overview of Building America (buildingamerica.gov)
 - Linh Truong - National Renewable Energy Laboratory
- ✓ Questions and Answers
 - Lena Burkett - U.S. Department of Energy
 - Joe Lstiburek - Building Science Corporation
- ✓ Closing Remarks

Joe Lstiburek, Building Science Corporation



Dr. Joseph Lstiburek is the founding principal of Building Science Corporation. He holds a Bachelor of Applied Science in Mechanical Engineering, a Master of Engineering in Civil Engineering, and a Doctor of Philosophy (Ph.D.) in Building Science. During his Master's degree, he developed the Air Drywall Approach to air barriers. Joe is also an acclaimed educator who has taught thousands of professionals over the past three decades and written countless papers as well as the best-selling Builder Guides. Joe founded BSC in 1990.

Stump the Building Science Chump: Joe Lstiburek



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Dr. Joseph Lstiburek, Ph.D., P.Eng., ASHRAE Fellow
Principal of Building Science Corporation

Question

BSC has great articles about insulating old masonry buildings in cold climates, mostly addressing freeze-thaw. Question is: What are good practices to insulate historic masonry buildings in hot, humid, very rainy climates (like New Orleans)? Issues to tackle:

- a) historic preservationists' ruling out spray foam directly on the masonry;
- b) masonry staying wet almost year round from frequent rain (can't dry to inside) grows unsightly algae, and owner complaints.

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Question

What's the research basis for 5 ACH50 as the threshold of mechanical ventilation requirement? Fla. And La. amended their statewide codes to 3 ACH50 – partially based on great fear of causing mold in the HVAC system and high RH, and anecdotal claims that houses in hot, humid climate with ACH between 3 and 5 have no apparent IAQ problems, plus ventilation systems tend to get turned off, cause discomfort, or fail. Of course, there's also resistance to cost of adding equipment not needed before. Soooo, what is out there to disprove and overcome those assertions and objections in the hot, humid climate?

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Question

IRC seems to allow any combustion equipment with vents to supply combustion air in “unvented” conditioned attics. Isn't that super risky (safety and humidity risks) and defeating of conditioned attic purpose? Is it OK in a basement but not in an attic? Why? What should the code stipulate regarding combustion equipment in conditioned attics?

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Question

Regarding excessive humidity build-up in attic and/or living space of homes with walls and attic encapsulated with open-cell low-density spray-foam in Climate Zone 3: (Details: RH in living space is 58-60%+, 55% desired. T-stat at 78° in summer. Mechanical ventilation meeting ASHRAE 62.2. Plan to retrofit a 4" diameter supply directly from the unit plenum in the attic. Small portable dehumidifier in attic. < 1" undercut door to permanent attic walk-up stairs)

- a) If supply air is added to an unvented attic encapsulated with open-cell low-density spray-foam to try to reduce excessive humidity build-up in the attic, is this a primary solution and does an extra return pathway to living space need to be added?
- b) Are these techniques just to address excessive humidity in the attic itself, or does that humidity also move into living space and cause problems there?
- c) We know that moisture moves from more to less, but does attic moisture have enough pathways to equilibrate with living space?
- d) What role does return pathway to living space play in accomplishing air change within the attic, and does something active rather than passive need to be installed either to stir air in attic or to force better communication between attic and living space?

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Question

Dear Dr. Chump,

In climate zone 5, on clear sky evenings in shoulder seasons (i.e. – Spring and Fall when it's nice and sunny and pleasant during the day but frosty at night) is there any aesthetically pleasing way to prevent condensation on the interior of flat, walk-on skylights located in the roof of a natatorium where the dewpoint temp is maintained (on paper) at 65° F?

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Question

The never-ending debate between climate zones... to add a class I/II vapor retarder to the interior of the wall or not to? It is my understanding that in colder climates, when a wall assembly has $>R7.5$ continuous rigid insulation on the exterior (that is sealed and air-tight), a class III vapor retarder (like latex paint) can be used on the interior of the assembly. Other envelope critics claim that a class I or II vapor retarder such as polyethylene plastic should still be installed on the interior (prior to drywall). For cold climates, this would mean that the wall assembly is sandwiched between non-permeable layers which don't allow the wall to dry. Since the dew point changes depending on the season, what is the best vapor retarder approach for cold climate wall assemblies?

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