

LLC Building Science: Your Home and How It Works (and Doesn't)

Spring 2019

Information Sources and References

There is information available on Building Science topics on the web. Here's some good examples of general Building Science references.

<https://buildingscience.com>

<https://www.greenbuildingadvisor.com/blog/building-science>

Paul, Jens, *Building Science - concepts and application*. West Sussex, UK: Wiley-Blackwell, 2011, \$61. <https://www.amazon.com/Building-Science-Application-Jens-Pohl/dp/0470655739>

Racusin, Jacob, *Essential Building Science: Understanding Energy and Moisture in High Performance House Design*. https://www.amazon.com/Essential-Building-Science-Understanding-Performance/dp/0865718342/ref=sr_1_1?ie=UTF8&qid=1542929671&sr=8-1&keywords=building+science

Gifford, Henry, *Buildings Don't Lie*, \$75.

https://smile.amazon.com/Buildings-Dont-Lie-Henry-Gifford/dp/0999011006/ref=pd_rhf_ee_s_vtp_ses_clicks_0_1?encoding=UTF8&pd_rd_i=0999011006&pd_rd_r=5948b8f1-bf88-4362-9723-166841051c80&pd_rd_w=jKkGN&pd_rd_wg=ApcGs&pf_rd_i=desktop-rhf&pf_rd_m=ATVPDKIKX0DE

"A simple, clear, thorough and complete explanation of basic building science applicable to any building..."

National Institute of Building Sciences

<https://www.nibs.org>

Climate zones (not plant hardiness zones):

<https://www.greenbuildingadvisor.com/article/all-about-climate-zones>

Resilient Design (overview on buildings weathering storms and outages)

<https://www.finehomebuilding.com/2012/04/26/a-case-for-resilient-design>

Winterizing Tips

<https://www.greenbuildingadvisor.com/article/winterizing-tips-that-work>

Energy-efficient dehumidification:

<https://www.greenbuildingadvisor.com/article/high-performance-dehumidification>

mold, humidity levels:

<https://www.greenbuildingadvisor.com/article/coping-high-humidity-mold>

<https://www.greenbuildingadvisor.com/article/moisture-sources-relative-humidity-and-mold>

<https://www.greenbuildingadvisor.com/article/common-sense-mold>

Poisonous Home Cleaning Chemicals and Food-Medication Interactions:

<https://missouripoisoncenter.org/some-things-just-dont-mix/>

Ventilation:

<https://www.greenbuildingadvisor.com/article/two-main-flaws-kitchen-ventilation>

Lead Poisoning

<https://www.youtube.com/watch?v=GUizvEjR-OU>

John Oliver covers data and costs of lead poisoning in children

<https://www.greenbuildingadvisor.com/article/managing-lead-paint-hazards>

Lead paint hazards and abatement procedures

Lstiburek video

<https://www.youtube.com/watch?v=9Hm9ALhyTHo>

1:45 of 10 mins done

Building science summer camp

<https://www.energyvanguard.com/blog/76438/Matt-Risinger-s-Building-Science-Summer-Camp-Interviews>

<https://www.wbdg.org/resources/building-science-concepts>

<https://www.wbdg.org/resources/building-enclosure-design-principles-and-strategies>

<https://www.amazon.com/Building-Science-Application-Jens-Pohl/dp/0470655739>

<https://www.energyvanguard.com/blog/44254/The-Best-Books-I-ve-Ever-Read-On-Building-Science-and-Beyond>

<https://www.wiley.com/en-us/Water+in+Buildings%3A+An+Architect%27s+Guide+to+Moisture+and+Mold-p-9780471468509>

<https://www.newsociety.com/Books/E/Essential-Building-Science>

Pressure diagnostics, air movement tied to air temp within building envelope

<https://www.greenbuildingadvisor.com/article/an-introduction-to-pressure-diagnostics>

holes in partitions and walls can lead to air flow up and down the structure, and may cause condensation or humidity problems as well as heat loss or heat gain.

Architects Need Training in Building Science

<https://s3.amazonaws.com/greenbuildingadvisor.s3.tauntoncloud.com/app/uploads/2019/01/04073550/EDU-June-2005-final.pdf>

Fortified Home Program

<https://disastersafety.org/fortified/fortified-home/>

Budget-Friendly Energy Efficient Construction

<https://www.greenbuildingadvisor.com/article/efficient-walls-budget>

Poor Indoor Air Quality and Health

<https://www.greenbuildingadvisor.com/article/the-trouble-with-homes-asthma-and-poor-indoor-air-quality>

NY Times article on “How Your Gas Stove is Bad for You and the Planet”

<https://www.nytimes.com/2019/05/01/opinion/climate-change-gas-electricity.html>

Asbestos

<https://www.greenbuildingadvisor.com/article/how-worried-should-you-be-about-asbestos-in-older-homes>

Ventilation Requirements and HRVs for Bathrooms

<https://www.greenbuildingadvisor.com/article/does-a-home-with-an-hrv-also-need-bath-fans>

Ontario Canada Imposes Tougher Ventilation Requirements

<https://www.greenbuildingadvisor.com/article/ontario-imposes-tougher-ventilation-requirements>

Air Leakage and Air Sealing

<https://www.greenbuildingadvisor.com/article/an-introduction-to-pressure-diagnostics>

Holes in partitions and walls can lead to air flow up and down the structure, and may cause condensation or humidity problems as well as heat loss or heat gain.

FEMA Building Code Resources for Natural Hazards (Quake, Wind, Flood, Wildfires)

<https://www.fema.gov/building-code-resources>

Interesting article about affordable Panama City Habitat homes that survived the hurricane

<https://www.jlconline.com/projects/disaster-resistant-building/surviving-hurricane-habitat-houses-offer->

[lessons_o?utm_source=newsletter&utm_content=Brief&utm_medium=email&utm_campaign=JLC_120218%20\(1\)&he=56c8cc46cd5d14365291bacef5cb6b3966b22d3e](https://www.greenbuildingadvisor.com/article/lessons_o?utm_source=newsletter&utm_content=Brief&utm_medium=email&utm_campaign=JLC_120218%20(1)&he=56c8cc46cd5d14365291bacef5cb6b3966b22d3e)

Summer interior humidity control, nighttime cooling, dehumidifiers, ERVs, AC:
<https://www.greenbuildingadvisor.com/article/coping-high-humidity-mold>

Air Filters

<https://www.greenbuildingadvisor.com/article/seven-reasons-filter-isnt-cleaning-air>

Floods

<http://www.bbc.com/future/story/20181129-the-underground-cathedral-protecting-tokyo-from-floods>

Climate Zones

<https://www.greenbuildingadvisor.com/article/all-about-climate-zones>

Energy-efficient “Pretty Good” House Concept

<https://www.greenbuildingadvisor.com/article/ten-essential-steps-to-a-pretty-good-house>

Radiation

<https://io9.gizmodo.com/how-does-radiation-travel-and-what-kinds-of-damage-can-5782367>

Wintertime Solar Heat Gain, Passive Solar Heating, and Climate

<https://www.greenbuildingadvisor.com/article/a-quantitative-look-at-solar-heat-gain>

This article is loaded with data, and may be difficult to read in some sections, but gives a lot of useful information about solar heat gain.

<https://www.greenbuildingadvisor.com/green-homes/a-passive-solar-home-from-the-1980s>

This article describes how passive solar works, and describes the house I built in Colorado.

<https://www.greenbuildingadvisor.com/article/resilient-design-passive-solar-heat>

Excellent description of passive solar design and resilience. Alex Wilson is a good person to follow for well thought out and well written descriptions of high performance building design concepts and sustainable materials.

"Passive Solar Architecture: Heating, Cooling, Ventilation, Daylighting, and more Using Natural Flows"

<https://buildingscience.com/documents/insights/bsi-021-thermodynamics-its-not-rocket-science?searchterm=space%2520shuttle>

Drying Green Lumber, Solar Kiln for Drying Wood, Moisture Meters

<https://www.wagnermeters.com/forest-products/industry-info/kiln-drying-your-own-wood/>

Hiring a Contractor

<https://www.homeadvisor.com/r/guide-to-hiring-a-contractor/>

Older Adults Trained How to Fall Safely

<https://www.nytimes.com/2018/01/02/world/europe/netherlands-falling-elderly.html>

Amazon Alexa intelligent assistant device sends voice recordings of its user to random stranger by mistake:

<https://www.theverge.com/2018/12/20/18150531/amazon-alexa-voice-recordings-wrong-user-gdpr-privacy-ai>

Nostalgia for buildings and places:

<https://www.npr.org/sections/thesalt/2019/03/31/702530169/closing-time-the-science-behind-nostalgia-for-our-favorite-bars>

partially read

<https://www.greenbuildingadvisor.com/article/how-to-become-a-building-enclosure-control-freak>

<https://www.greenbuildingadvisor.com/article/what-is-the-ideal-relative-humidity-in-winter>

<http://www.greenbuildercoalition.org>

<https://www.greenbuildingadvisor.com/article/is-cold-sheathing-in-double-wall-construction-at-risk>

<https://www.greenbuildingadvisor.com/article/winterizing-tips-that-work>

<https://www.greenbuildingadvisor.com/article/ten-essential-steps-to-a-pretty-good-house>

<https://www.greenbuildingadvisor.com/article/a-brief-introduction-to-wufi-in-5-easy-pieces>

<https://www.greenbuildingadvisor.com/article/does-a-composting-toilet-stink-up-your-house>

<https://www.greenbuildingadvisor.com/article/all-about-climate-zones>

<https://www.greenbuildingadvisor.com/article/the-trouble-with-homes-asthma-and-poor-indoor-air-quality>

<https://www.greenbuildingadvisor.com/article/is-the-pretty-good-house-the-next-big-thing-part-2>

<https://www.resnet.us/hers-index-score-card>

Videos:

Matt Risinger is a high-end builder in Austin, and has a big presence on social media, often touting specific products (endorsements). Google Risinger and a high performance homebuilding topic to see other videos.

Matt Risinger building timber frame luxury home with Bensonwood components (2 min):
<https://www.youtube.com/watch?v=Ab51ZkNY1R8>

Ted Benson started out building timber frame homes, moving to high end clients. Benson saw the promise of manufacturing walls and other building assemblies in controlled factory conditions. The following videos show Benson's state of the art factory.

Ted Benson, Bensonwood and Unity Homes, custom manufactured, energy efficient homes (4 min):

https://www.youtube.com/watch?v=GICs5i_MvJ4

Factory tour (22 min) uses construction vocabulary (lots more detail):

<https://www.youtube.com/watch?v=JpznB7uiZrw>

Norman Foster, "My Green Agenda for Architecture", computers in architecture and factory-based construction, green architecture history, homes imbedded in car-centric cities (32 min):

https://www.ted.com/talks/norman_foster_s_green_agenda#t-1096317

Focuses architecture and on larger buildings

Four 26 minute "Aging in Place" TV show videos from 2012. Overview of Universal Design ideas, home design and construction upgrades, and specific equipment available in hardware stores. Includes interviews with elderly and disabled users of homes that are upgraded with Universal Design features.

<https://video.wcny.org/search/?q=design+for+a+lifetime>

This Old House "How to Retrofit Home Accessibility"

Twelve minute video shows upgrades to a typical home to improve the home's accessibility for someone with Parkinson's, who is using a small wheelchair. Upgrades are done without making the home appear too "institutional." Short ramps, stair chair lift to access the second floor, replacing a typical tub with a no-threshold shower, and cutting away underneath (and one corner of) a bath vanity improve the accessibility for the wheelchair user. Bathroom upgrades include attractive grab bar accessories: Towel rack, shower soap dish, and toilet paper holder, all with integrated grab bars.