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Challenging Framing Details

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Energy Design Conference & Expo - February 26-27, 2013 - Duluth, MN

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What does Framing Provide?









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Framing provides the ...





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Framing provides the Foundation for. . .

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... Air-Sealing and Thermal Performance

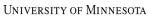
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... Durable, Comfortable, and Energy Efficient











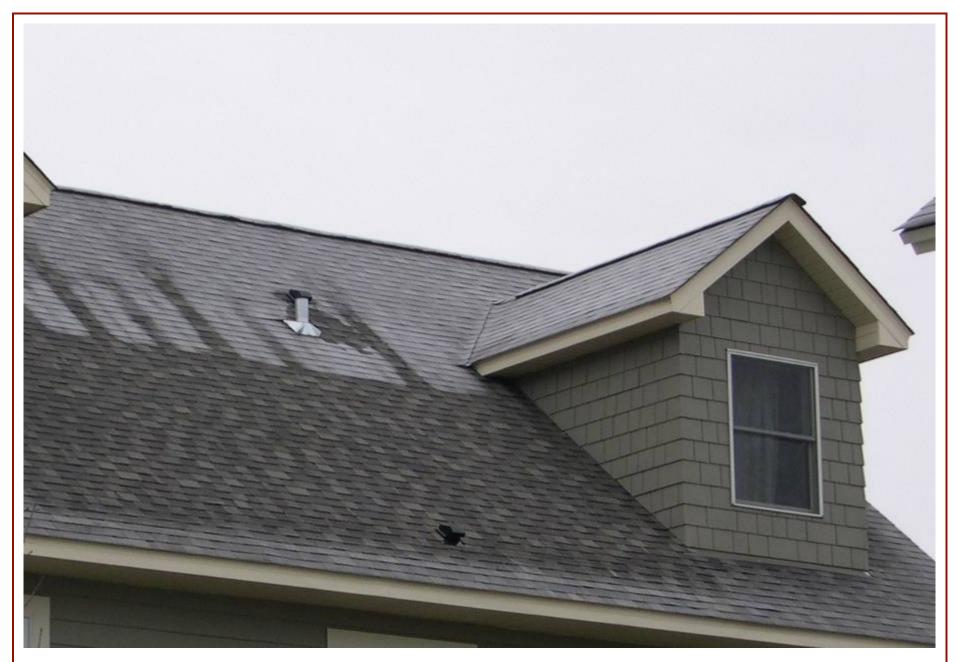


Was this Durable?



EXTENSION

Was this Comfortable?









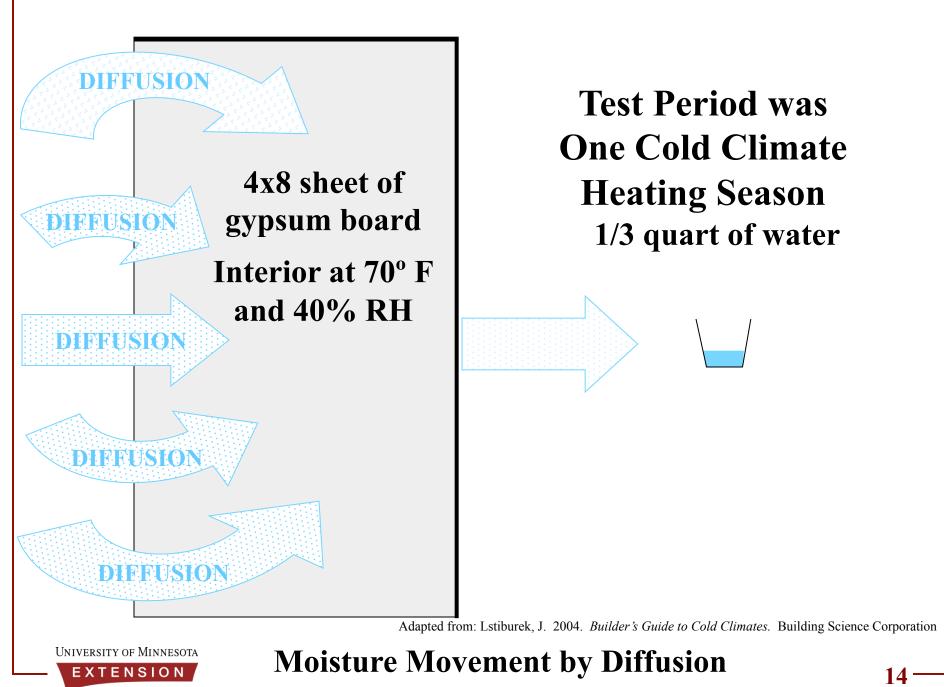


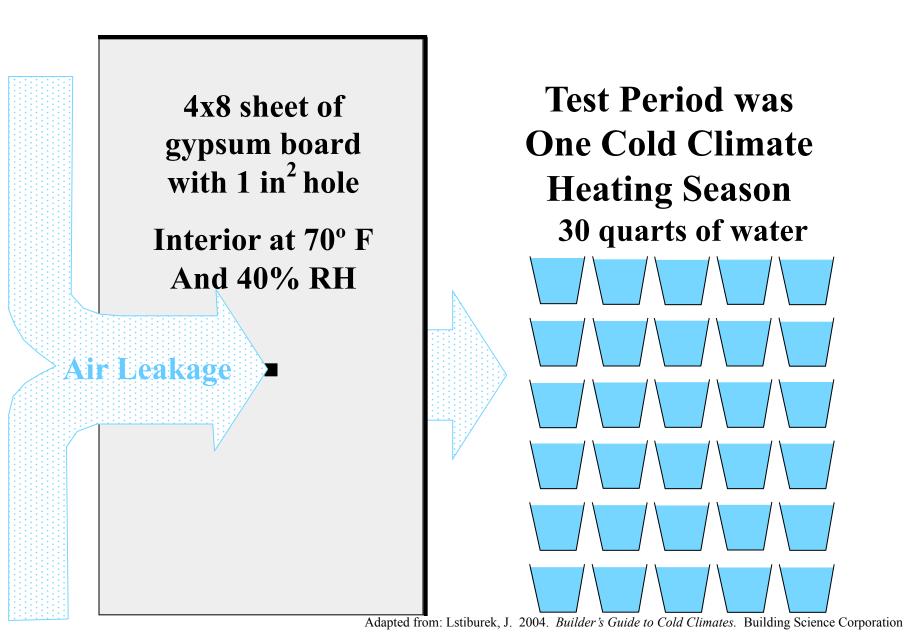
Was this Energy Efficient or Durable?





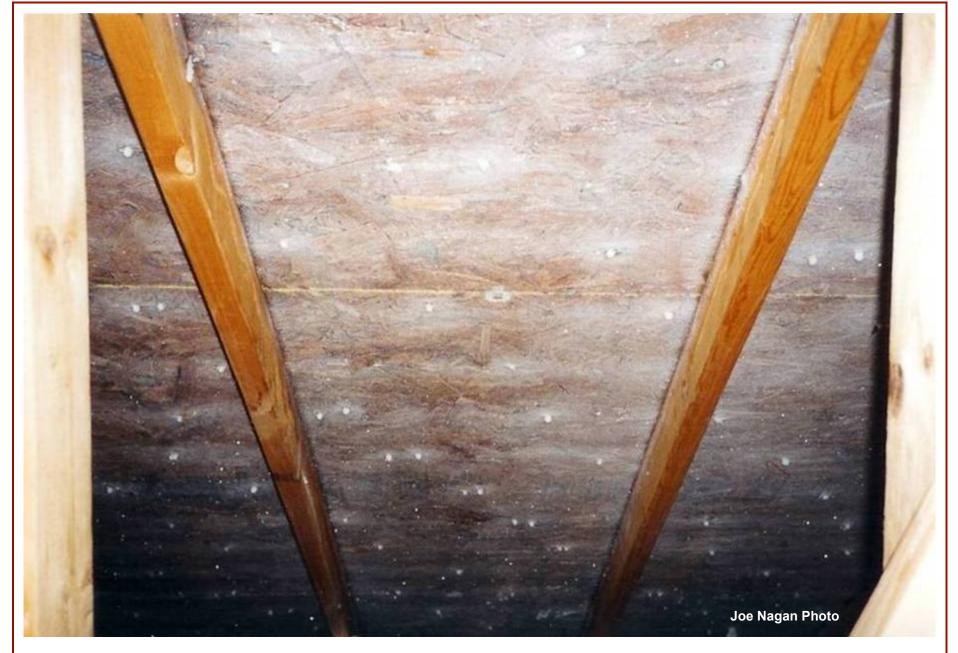
Stack Effect in Winter





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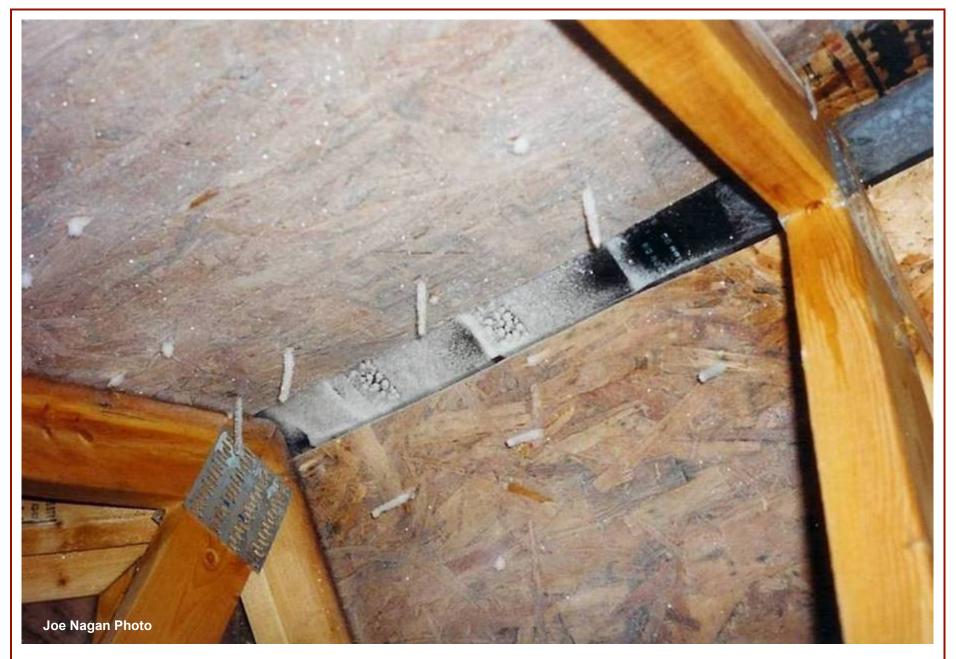
Air Transported Moisture





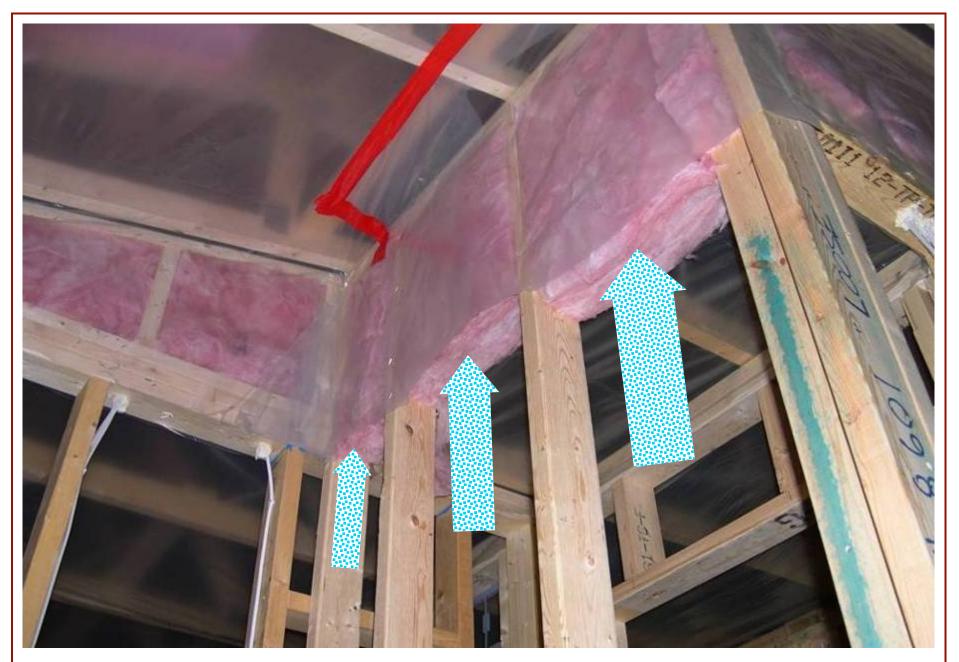
First Condensing Surface in the Attic

16





Is this Condition Sustainable?





Moist Air is NOT Filtered Out





What is missing from this Attic Kneewall?





Ceiling Height changes Elevation





Blocking needed at Bottom of Kneewall



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Add Sheathing at "Exterior" Side of Kneewall 22



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Insulation should Fill the Cavities Completely

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Remove Strapping to Avoid a Bypass



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Walls need Top Plates – Roofs need Insulation





Where do the Top Plates go?





Add Blocking to Complete the Assembly



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A Good Way to do a Story and a Half





Where are the Boundaries Here?





Add the Bottom Plate and "Exterior" Sheathing 30











What is Floor and What is Attic?











Looks like a Rim – Treat it like a Rim



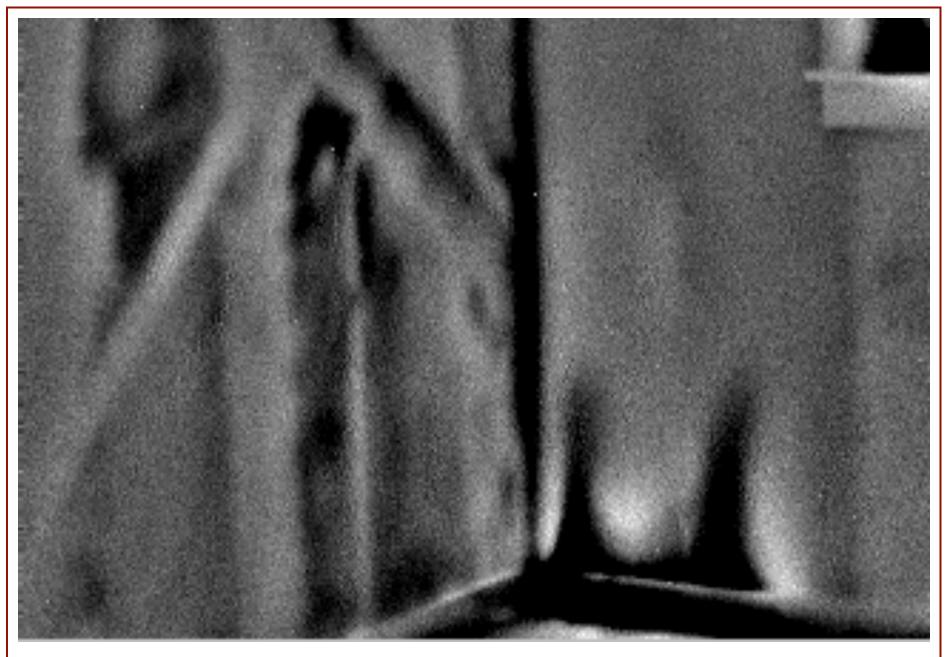


Bonus Room Framing Challenge





Foamed against a Housewrap Backer





Seal Framing Connections when Using Foam





Another Way to Finish the Wall





Can You See the Garage Down There?





Can You Find the Gaps? The Electrician did.





Interior Gable Challenge

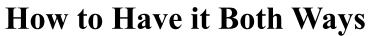




Enclosed on All Six Sides?









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Less Framing – More R-Value





Exterior Wall – Attic Space – Interior Wall





This is How the Insulator Finished the Job



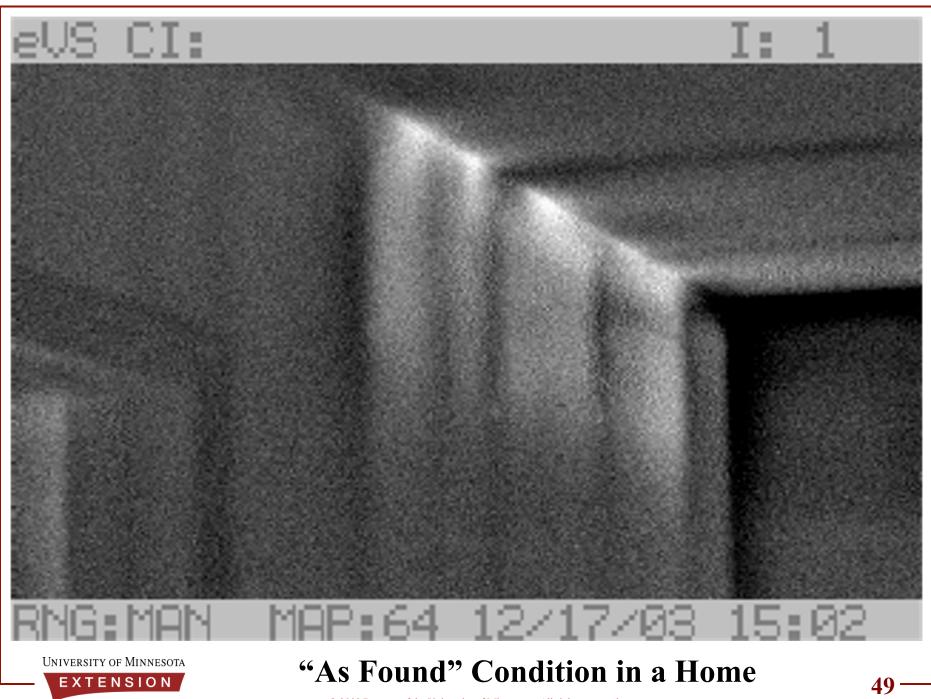
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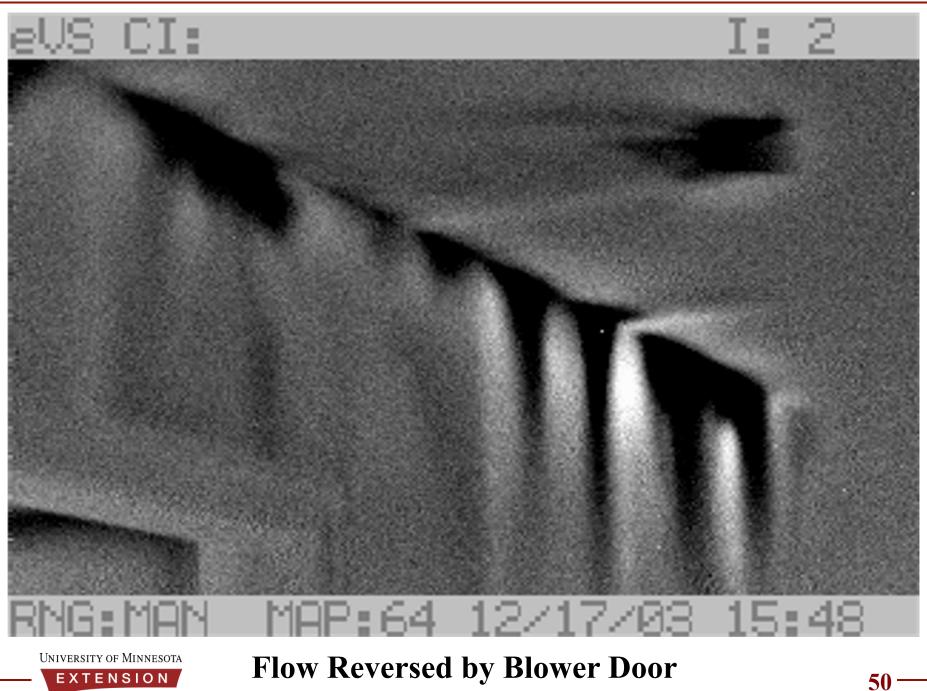
Exterior Wall above a Vaulted Ceiling

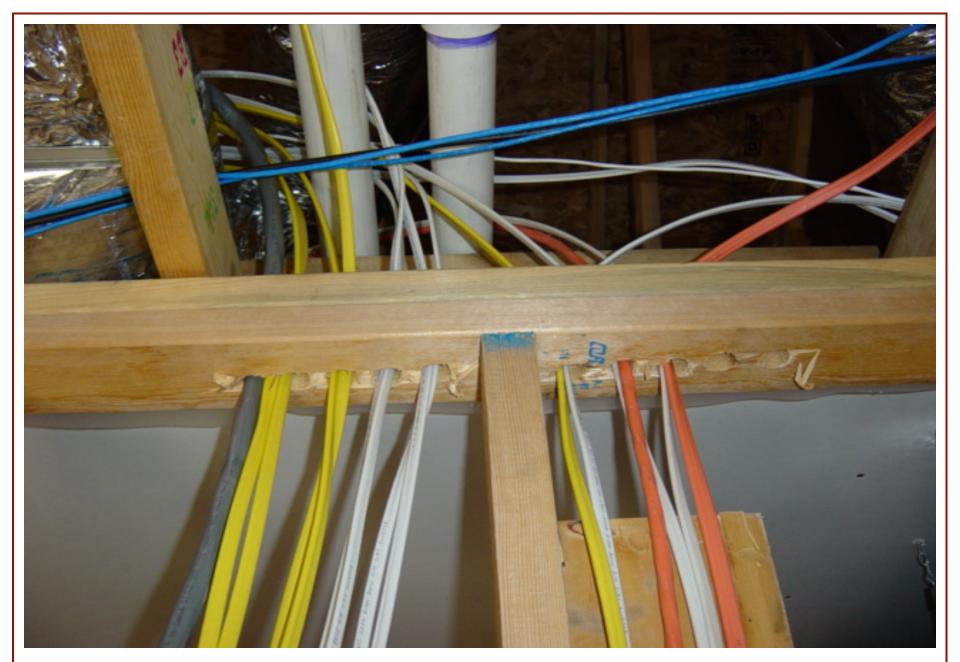




Attic – Archway Connection is Open







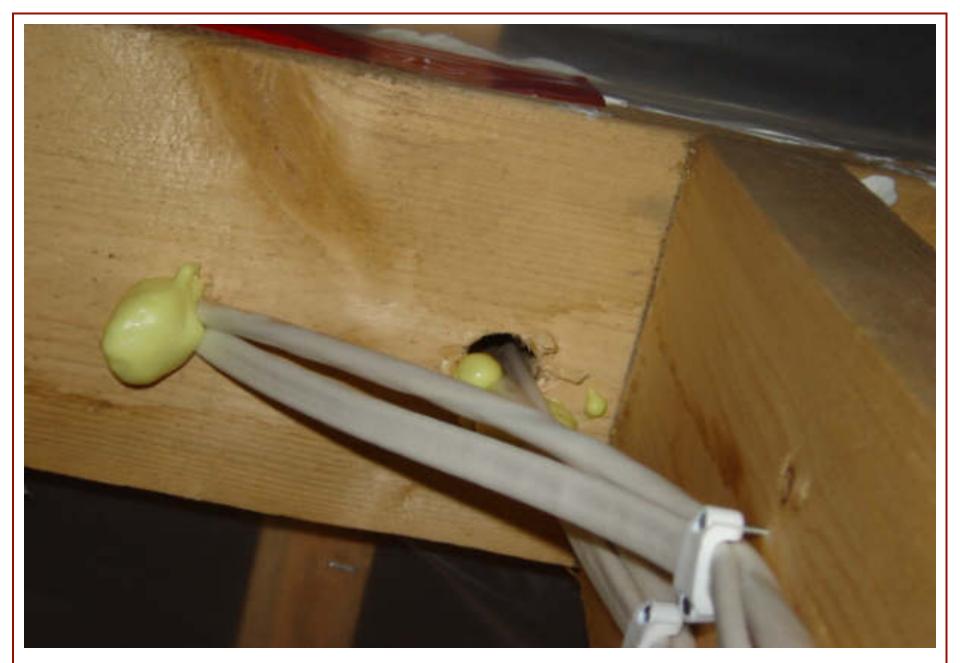


The Cause Looked like This





What Size Drill Bit was Used Here?





How are these two holes different?









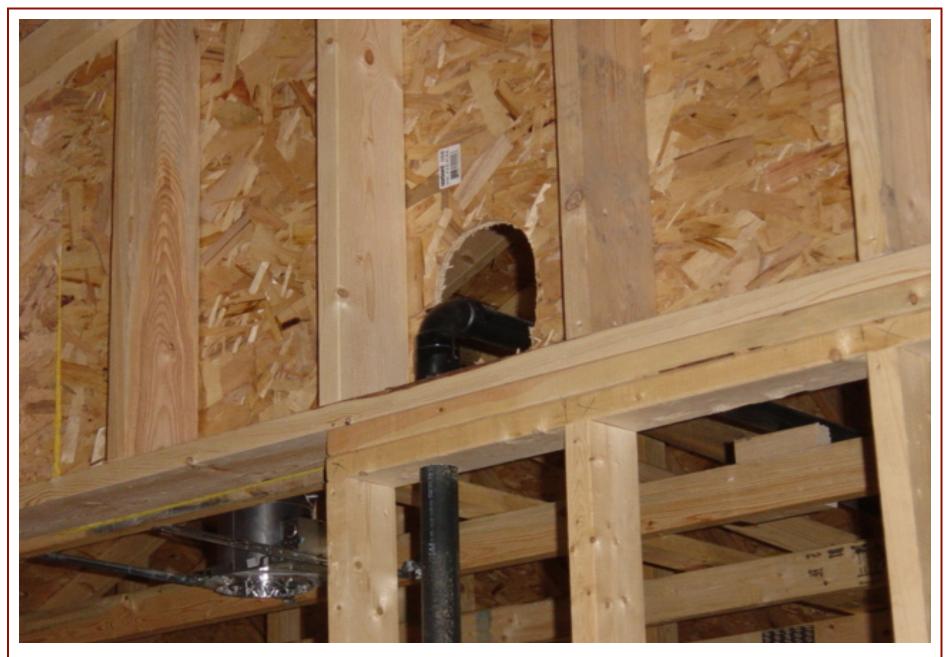








Who Put That in the Way?











Structural Modification





Existing Chase Lid was Removed





Chase is now Open to the Attic





Gap below plenum filled and chase lid sealed





Solid Lids should be Sealed in Place



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Multi-level Tray Ceiling Trusses





Kitchen Soffits Open to Attic



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Arch Open to Attic and Wall Cavities





Archway Open to Attic and Chase





Flat Lid Sealed to All Irregularities





How many Leaks in this Panned Return?





How Many Cavities are Connected?

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What is this Supply Duct Connected To?





Thermal Boundary? Pressure Boundary?





Air Barrier in Contact with Warm Side?



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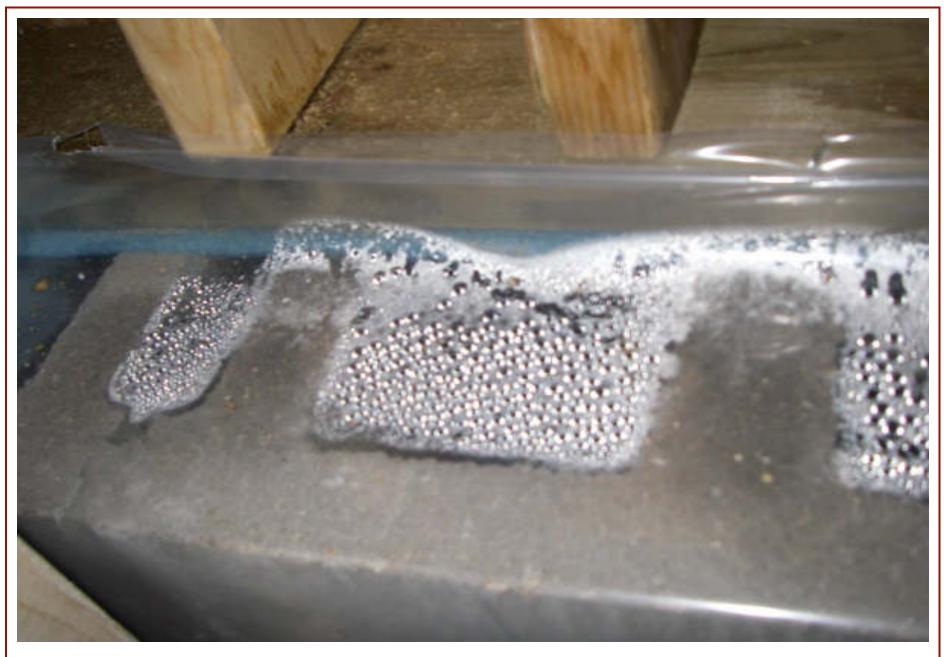
Thermal and Pressure Boundaries not Aligned

73





What is This Opening Bringing into the Wall?





How Durable will This Wall Assembly be?





Double Wall with Boundaries in Alignment





Filling Both Cavities Also Works Well





Complex Boundary Definition Challenge





How the Challenge was Successfully met























































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Thank You

References and Acknowledgements

Marilou Cheple photo: slide number 12 Dave Hepfler photo: slide number 8 Terry Lenhart photo: slide number 44 Joe Lstiburek diagrams: slides number 14 and 15 Joe Nagan photos: slides number 16 and 17

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Challenging Framing Details

Framing provides more than just the structure of a building and something to hang the exterior and interior finishes from. It also creates enclosures for insulation and provides the basis for effective air-sealing. Getting the framing details right makes all the difference when it comes to delivering a finished home that is safe, healthy, durable, comfortable, and energy efficient. This session addresses the little details that all builders should know, but are often missing from blueprints and detail pages.

- Framing Overview
- Air transported moisture
- Incomplete framing assemblies
- Mechanical Framing penetrations
- Framing cavities used as ducts
- Thermal and pressure boundary misalignment

