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Air leakage condensation



Frost accumulation













Air Leaks – cathedral ceilings



Ventilated on top



























Ice dams

- Ridges of ice forming at eaves
- Also typically icicles hanging from eaves
- ice forms a "dam" that traps drained water
- Problems

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- inward leaking water
- dangerous icicles









Ice Dams: Causes & Solutions

Most common causes of ice dams are:

- insufficient insulation or thermal bridging
- air leaking into the space below the roof membrane
- a source of heat in roof such as a poorly insulated duct, hotwater piping, etc.
- a difference in snow thickness, especially when combined with solar radiation.
- Solutions available for most causes



John Straube



Cause: Poor Insulation











Sealing Leaks

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Leakage Path	Sealing Method
Attic Hatch	Weatherstrip, caulk, positive action latch, insulate
Space Cond Ducts	Avoid, insulate R20, seal boot to ceiling
Plumbing Stacks	Seal with expanding foam / caulk
Chimney Stacks	Use drywall/sheet metal + high temperature caulk
Plumbing penetrations	Seal with expanding foam / caulk
Electrical penetrations	Seal with expanding foam / caulk
Top plates	Seal with expanding foam / caulk
Light fixtures	Caulk boxes from below or add drywall box above and seal to ceiling air barrier system
Recessed lights	Build drywall box above or use special sealed units
Recessed Ceilings	Add rigid air barrier and seal: drywall, rigid foam
Knee walls/split level	Add sealed drywall or rigid foam, seal foam
Perimeter / Party walls	Drill or punch block cores /framing cavities at ceiling line, then foam



































Ventilation & Roof Temperature













Top chord

Bottom Chord