

The Comfort Corner

Building Science, pt. 2: Heat Flow

Last month we discussed air flow and its causes. This month, we delve into heat flow.

First, let's cover the basics. Conduction, convection and radiation are the three mechanisms by which heat moves.

Conduction occurs between objects that touch each other, such as when your warm hand touches a cold window during winter. **Convection** is the movement of hot air upwards and cold air downwards. **Radiation** is the movement of heat across open space.

So, how do we affect heat flow in a home? There are four main steps to avoid thermal related issues.

1. Framing must protect insulation
2. Insulation must be installed correctly
3. Enhanced air sealing
4. High performance windows (installed correctly)

An important note here is that the **comfort of a house is in the building envelope**. While activity, clothing, relative humidity, air velocity, temperature and radiant surface temperatures all affect comfort, the building envelope will dictate how much these factors alter the



comfort of the occupants. An inadequate envelope will result in a home that never functions quite right.

The first step to controlling heat flow is to reduce convection. An effective air barrier that separates the inside, conditioned air from the outside air begins with framing. It is extremely beneficial to explicitly label the air barrier on the house plans. Enhanced air sealing, when coupled with air barrier framing, is the second part of reducing convection. Good air sealing requires significant attention to detail.

Insulation problems generally include gaps, voids, compression or insulation/air barrier misalignment, all of which add to conduction. While the insulator can be at fault for these issues, often they are merely 'playing the hand they've been dealt' by the subcontractors before them. Certain insulation systems, such as the Blow-in-Blanket System, can reduce the occurrence of these problems.

Helping you reduce risk and increase tolerance in any given home is the driving force behind building science and part of our mission. Next month - Moisture Flow.