# WALL THERMOGRAPHY

Thermographic inspection of building exterior walls is a powerful tool to evaluate and assess exterior wall performance. The outcome of the thermal inspection will determine the location of wall deficiencies and potential problems that contribute to:

❏   Heat loss from building during heating season
❏   Heat gain to the building during cooling season
❏   Interior air ex-filtration
❏   Exterior air infiltration

Variety of building concerns are directly or indirectly related to air leakage, insufficient and poor placement of wall insulation. This will result in the following:

❏   Premature failure of building elements
❏   Precious energy loss
❏   Exhaustion of building mechanical systems
❏   Reduction in occupants' comfort level
❏   Interference with intended building usage

Thermal inspection of building exterior walls are conducted base on two fundamental thermodynamic principles, Conductive & Convective heat transfer.
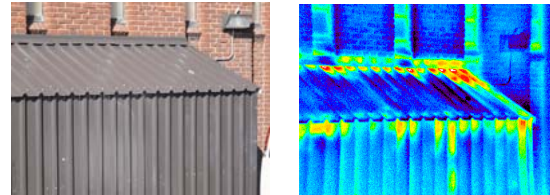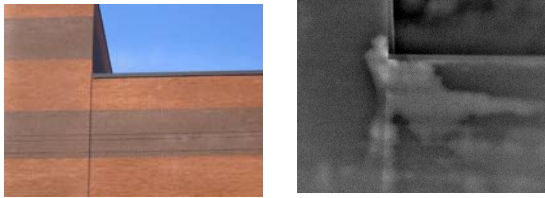

Figure 1: Conductive heat loss from exterior walls and roof due to poor placement of insulation.

1.   Conduction Losses:

Conduction heat transfer is the exchange of kinetic energy between molecules. In this process the less energetic molecules gain energy by colliding into more energetic particles. This results in transfer of heat energy from higher state to a lower state. The rate of transfer through a medium depends on substance's thermal conductivity properties. Heat energy moves faster through materials with high thermal conductivity and slower through materials with low thermal conductivity. Building insulation materials have low thermal conductivity and are used in building assemblies to reduce the transfer of heat energy, thus keeping our building warm in winter and cold in summer.

Conduction losses from building wall assemblies are a direct result of heat transfer through building materials. This could be caused by insufficient and poor placement of insulation materials and thermal bridging of different assemblies due to poor construction details.

Figure 2: Convection heat loss from exterior wall/flat roof perimeter detail, due to lack of continuous wall/roof air barrier.

Figure 3: Convection heat loss at wall corner/flat roof perimeter detail. Masonry brick wall appears to be wet, due to moist warm interior air ex-filtrating through exterior wall system.

2.   Convection Losses:

Convection heat transfer is the process of heat energy transfer by the movement of heated substances. Heat transfer due to convection can occur in two different forms:

❏   Natural Convection
❏   Forced Convection

Natural convection is the result of differential substances densities, such as rising of warmer air mass due to its molecular expansion and lower density.

Forced convection occurs when heated substance is forced to move by mechanical means, such as fans blowing hot air.

Convection losses from building wall assemblies are related to air tightness of different wall elements and their performances. Improperly applied caulking, poor detailing of wall air barriers, windows

and wall/roof junctions are a few examples related to air leakage from exterior building walls.

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OUR SERVICES

Mould: What should we do?

The primary goal for any remediation effort should be to identify and resolve the source of moisture. Identify the level and size of the contaminated area in order to determine method of remediation. Investigation may include destructive testing, infrared imaging, examination of ventilation systems and sampling of mould.

Be certain of your professional's technical competence in this particular discipline.