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ENERGY EFFICIENCY

The following is an outline of different methods of compliance to today's strict energy efficiency standards for new and existing buildings:

MEC CHECK

The Department of Energy has approved the MEC check as an approved method of compliance for the design of energy efficient buildings. You may obtain the MEC Check 3.3 release b at http://www.eren.doe.gov/buildings/codes_standards/buildings/mec_meccheck.html

INTERNATIONAL ENERGY CONSERVATION CODE

You may also obtain the complete International Energy Conservation Code at <http://www.icbo.org> in the online store.

2009 INTERNATIONAL RESIDENTIAL CODE

The City of Logan:

Climate Zone	15
HDD (Heating Degree Days)	7389

The International Residential Code is a stand-alone code regulating the construction of detached one and two family dwellings. The following is a simplified outline to the changes in energy efficiency requirements that are included in the new code.

The International Residential has broken down methods of compliance with energy efficiency requirements into 2 categories, prescriptive and performance. In each case, energy requirement provisions are based on the climate zone in which the building is located.

1. **Prescriptive based approach**—Is a building designed and constructed using table N1102.1 of the 2009 International Residential Code. This table contains minimum required thermal performance criteria for each component of the building envelope. There are no substitutions, interpolations nor trade-offs allowed in the performance based approach.
2. **Performance based approach**—Is a building constructed to meet the requirements of the 2009 International Energy Conservation Code. This method of compliance is much more detailed in its criteria. Allowable methods of compliance are based on individual components, total building envelope performance, acceptable engineering practice on individual components, prescriptive specification of individual components or by mixing and matching different methods. The performance-based approach is complex in nature and is available in the 2000 International Energy Conservation Code.

The following is a simplified breakdown of the prescriptive based approach requirements found in the 2009 International Residential Code.

- IRC 601.3 A vapor retarder is required on the warm in winter side of building envelope walls, floors and roof/ceilings.
- IRC N1101.4.1 Where blown or sprayed insulation is used, a certification of the density of material and the R-value installed shall be provided at the job site by the insulation installer. Where blown or sprayed insulation is installed in the roof/ceilings the installer shall provide certification of initial installed thickness, settled thickness, coverage area and number of bags installed. Markers shall be provided for every 300 Square feet of attic area attached to framing members and indicate in 1-inch high numbers, the thickness of the insulation.

N1102.1 MAX. WINDOW U-VALUE .35

INSULATION R-VALUE OF:	
CEILINGS	**R-49
WALLS	R-21
FLOORS	R-21
BASEMENT WALLS	R-11
CRAWL SPACE WALLS	R-20
SLAB PERIMETER	R-13
Depth	4 ft.

**Where energy trusses are used R-38 is permitted where R-49 is required

N1102.1.3 Opaque doors separating conditioned space from unconditioned space must have maximum U-value of .35. Note—1 door is exempt from this requirement.

N1102.2.7 When basement is conditioned space walls shall be insulated to R-11. When the basement is an unconditioned space the walls shall be insulated to R-11 or the floor separating the unconditioned space shall be insulated to R-21.

N1102.2.8 For Slab on grade floors where the top edge is less than 12” below grade: Min R-13 shall be installed on the inside or the outside of the foundation wall. The insulation shall extend downward from the top of the floor, or downward to the bottom of the slab and then horizontally in either direction for 4 ft. (per table above).

Where uninsulated hot water pipes, air distribution ducts or electric heating cables are installed under or within the slab, an R-15 shall be installed as outlined above.

N1102.2.9 **Crawl Spaces**
 Where the floor above a crawl space is not insulated, minimum R-20 insulation must be installed on the crawl space walls. The crawl space cannot be vented to the outside (ie: where under-floor is used as a plenum or where the ground within the under-floor is covered with an approved vapor retarder, the space is provided with conditioned air and the perimeter walls are insulated. Where the space is not vented to the outside the insulation must be installed on the crawl space wall, downward from the sill plate (of the wall above) to the exterior finished grade level then vertically or horizontally for at least an additional 24”. Exposed earth within the crawl-space shall be covered with a vapor retarder with a maximum permeance rating of 1 perm.

N1102.1.10 All joints and penetrations in the building envelope shall be caulked, gasketed or sealed. This shall include receptacle outlets in a wall, lighting outlets, A.C. line sets, plumbing pipe penetrations etc. These penetrations are required to be sealed whether penetrating the inside membrane or the outside membrane of the building envelope.

N1103.6 **Window replacements**
 When an entire window is replace (frame, sash and glazing) in an existing building, the new window Maximum U-value must meet present code requirements--U-.35.

N1103.1 **Mechanical systems**
 Ducts shall be insulated as follows:

Within a building (outside conditioned space)	R-5
Outside a building	R-8
Inside a building envelope (installed between duct and unconditioned space)	R-8

This handout is to give some helpful advice for compliance with the changes with the new Residential code. This is not an all-inclusive list of the requirements. For a more complete outline, obtain the International Residential Code at www.icbo.org.