

A NEW CODE PROVIDES NEW OPTIONS

It is the calm before the storm for Alberta builders. In spite of some significant construction in and around Edmonton's ICE District, the last year has generally been regarded as slower for business than in years past. But with oil trending upwards and the number of announced construction projects currently in the design phase, the next year is promising to be tremendously positive for both restorative work on existing building stock and for new construction across Alberta.

Interestingly, the large number of residential projects currently under construction, along with some major large-scale residential projects in the works, appear to be completely independent of the cyclical nature of Alberta oil. In many ways it seems as though perhaps speculation is driving this new wave of construction, leaning on either the diversification in Alberta's economy, a continuing improvement in oil prices, or recent population projects which will see Alberta's population increasing by 2.1 million over the next three decades, creating a greater growth in demand for additional living space.

A major influence on construction within Alberta over the last few years has been the adoption of the *National Energy Code for Buildings* (NECB) in the *Alberta Building Code*. Our updated code sets out to greatly improve energy efficiency standards for Alberta's buildings. This impacts design and construction in regard to the building enclosure, mechanical and electrical systems. Improving the performance of glazing, lighting, heating and cooling systems, insulation and the overall building exterior helps us be more in line with the rest of Canada, as it relates to the reduction of greenhouse gas emissions and reduced energy consumption by buildings.

But, in this pursuit of improving energy efficiency, we have also put a greater demand on the building envelopes themselves, which in turn has had a profound effect on a building's overall design. In order to ensure that all building systems are able to work together, Alberta designers and builders are typically traveling down three avenues when it comes to meeting building code requirements; a prescriptive method, the trade-off method or through the creation of an adaptive energy model.

With the prescriptive-type of approach, the *Alberta Building Code* and the *National Energy Code*

for Buildings (NECB), dictate design. If the code calls for a wall to have a certain R-value, the wall has to meet or exceed that R-value. If the code says that a wall can only be a certain percentage of vision glass, then that wall cannot exceed that prescribed percentage. With the trade-off method, enhanced energy efficiency of one component can be used to compensate for the reduced energy efficiency of another component within the same part of the Code. For example, higher roof insulation efficiency values can be traded off against lower wall insulation values, but not against mechanical or electrical components. And while this kind of approach is well-suited for small building projects, for larger building designs we generally need to go another route.

For more complex projects, a computer-generated energy model is used to check if the proposed overall design meets or exceeds the performance standards of the Code. This method allows the designers to use individual components that do not meet the energy requirements in one area and compensate by using higher performing components in others. By looking at the whole building as a complex organism of many parts, builders and designers have the opportunity to become increasingly creative in their designs, while still meeting the requirements of the *Alberta Building Code*.

The adoption of NECB and the pursuit of higher energy efficiency has also led to a wave of new innovative building materials entering the Alberta building marketplace. On the building envelope front, there has been an incredible push to improve the thermal properties of wall and roof assemblies and reduce thermal bridging through the use of various higher performing materials, products and processes being made available to Alberta builders.

The learning curve in adopting NECB and in using these innovations has—at times—caused the design and construction communities to revisit how they would build but, now that we are a few years out, people are more aware of the new code requirements. We may not be 100 per cent there yet, but our industry has come forward by leaps and bounds and has most certainly changed for the better, both in regard to reducing our environmental footprint and in creating more comfortable building environments for Albertans.



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As Managing Principal of RJC Edmonton's Building Science and Restoration team, Nick has a solid background in building science both in the design of new buildings and in the evaluation and restoration of existing. To each project, Nick brings a strong understanding of the performance of the building structure and the building exterior for the many types of cladding systems used in Edmonton's northern environment. His attention to detail and eye for constructability is a great asset to any project. Currently, Nick is RJC's Practice Director for the Building Science and Restoration group.

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