

Right Here, Right Now

Exciting developments are happening in the green building design sector

by NATALIE BRUCKNER

Green building design today is seen as a way to tackle our climate crisis. As a result, leaders in the sector are implementing strategies and standards to help us deal with mitigating the impacts today, and in the future. “The time has come to address the elephant in the room: climate change and how we will respond to the impending changes that are coming,” says Lindsay Austrom, team lead, sustainability at Williams Engineering. “With buildings this means looking at both mitigation, in terms of how we can reduce the carbon impact of our buildings, as well as adaptation. Knowing that changes are coming, with more severe storms and temperature extremes, we need to figure out how to respond to it and adjust our approach to buildings accordingly.”

Austrom is seeing change largely driven by municipalities. “They are taking the lead as they look to not only reduce the operating costs of their building portfolio, but, from a holistic perspective, to extend the life of their assets.”

The City of Edmonton, for example, has been aggressive in this area and is looking at the energy and water consumption of their building portfolio and undertaking benchmarking so they can identify opportunities for improvements. “They are looking at it from a carbon accounting perspective and seeing what they can do to achieve the municipalities overall carbon goals and how to meet the 2030 target to reduce the carbon impacts of buildings.”

Mike Williams, VP buildings at RWDI, agrees that the most recent change of late is a refocus on the idea of building resiliency. “We’ve reached a point where we know climate change is happening and while we still need to mitigate greenhouse gas emissions [GHG], we also have to deal with the consequences of our actions. This means considering how we can make existing and new buildings resilient to these new climate change realities,” explains Williams.

Understanding what the current climate is and having a better handle on the future climate is of course essential. Two years ago RWDI conducted a study to create a future weather file for the City of Toronto that can be plugged into building energy simulation models to provide a quantified summary of a building’s ability to perform in a future climate scenario. RWDI has made the file and report explaining their work available for free to download on its website.

RWDI has been working on an extremely impressive project of late with BentallGreenOak, as Williams explains: “BentallGreenOak was aware that climate change was creating new risks to their building assets and came to us to ask what they should do. We worked together to develop a methodology to assess the resiliency across their North American wide portfolio, which consists of 187 buildings. We assessed each building and created a database of resiliency best practices and came up with adaptation plans for each of the buildings,” explains Williams.

One challenge ahead of us will be quantifying the value of resiliency. “To do this successfully will require us in the engineering space to collaborate with different circles, in particular those who quantify risk, such as insurance providers. This will result in more integrated conversations early on.”

One company that is taking the leadership reigns when it comes to green building design is WSP, which now ranks 16th in the Engineering News-Record (ENR) rankings of the Top 200 Environmental Firms and Top Firms by Market Segment for 2019.

As part of WSP’s Future Ready initiative and commitment to sustainability, WSP helps to ensure its clients can reduce environmental impacts over the life-cycle of their assets. One example of this is WSP’s very own Calgary office, which was Alberta’s first project to certify under the LEED v4 rating system, receiving



Offices of Prairie Architects Inc., Winnipeg, MB.

ID+C Silver certification in April 2018. WSP’s Calgary office fit-out showcases the company’s commitment to supporting the growth of a healthier and more sustainable society.

Through green building design, WSP was able to offset 100 percent of anticipated energy use, divert 87 percent of construction waste from the landfill, and save 31 percent calculated water versus the LEED baseline. “At WSP, our Future Ready approach to sustainability is understanding how changing climate, access to resources, emerging technologies, and urbanization of society all intersect. This allows us to design and think differently,” says Greg Northcott, chief operating officer, at WSP in Canada.

RJC Engineers is also busy working on a number of impressive green building projects across the country. Terry Bergen, managing principal at RJC Engineers, says a reason for the recent uptick in activity is as a direct result of performance-based energy codes and standards such as the implementation of the BC Energy Step Code. “Energy modelling went from being a somewhat niche service primarily provided on institutional and select commercial projects to now almost every building in B.C. requiring energy modelling at both design and completion stages.”

Energy modelling as a design assist tool is now recognized as one of the most powerful methods to cost-effectively develop the design of higher performing buildings. It provides a clearer understanding of how various design approaches affect energy use intensity (EUI) requirements for a project and is now legislated through the Step Code in B.C., as well as in other regional jurisdictions including the City of Vancouver and the City of Toronto.

Bergen is enthusiastic about the Step Code and its methodical approach, and says it, and other performance-based codes, are essential in helping take Canada where it needs to go in terms of meeting its GHG reduction target under the Paris Agreement.

He adds that while there will always be talk about the “latest and greatest” technologies on the market, it simply comes down to efficient design with selective, as opposed to wholesale, assembly improvements and “taking a little more time during construction to assure, with testing and commissioning, that critical elements like continuity of the air barrier and thermal insulation are achieved to meet target requirements.”

It has often been said that the future of green building design lies in the hands of those architects who are willing to take the lead. One firm that has a firm grip on this notion is Prairie Architects, which has been working with and certifying under a new version of LEED (v4). This has brought issues such as building product disclosures (addressing transparency in material ingredients and supply chain), lifecycle assessments, VOC emissions (not just content), and acoustics into Prairie's sustainable discussions.

Its very own new office space in the Exchange District of downtown Winnipeg recently received LEEDv4 Commercial Interiors Platinum certification, and is Manitoba's first and Canada's second LEEDv4 CI Platinum space.

"For us, this showcases how existing building retrofits can significantly contribute to combating climate change and allows us to advocate by example. Further to this, Prairie Architects Inc. became a founding signatory of the Canadian Architects Declare pledge, which is the Royal Architectural Institute of Canada's Committee on Regenerative Environment's call to Canadian architectural and design firms to commit to combating climate crisis with urgent and sustained action," says Lindsay Oster, principal architect.

Prairie has seen a noticeable shift lately toward discussions of climate change and the role that buildings play in striking a balance between carbon reduction, health, and resilience. However, Oster says there is still some pushback.

"Unfortunately, in some jurisdictions across Canada, sustainability is still viewed as an additive approach as opposed to an integral part of the way we live and the lens with which we view success."

Over in Penticton, B.C., HDR Architecture Associates, Inc. is seeing the greater use of wood in construction projects as a positive step toward greener infrastructure.

Robert Cesnik, architect at HDR, welcomes the recent news that B.C. is changing its building code to increase the height limit of wood buildings from six to 12 storeys, and says it is "an economic and environmental alternative to concrete apartments."

He adds that mass timber, CLT, and glulam, while not new, will help toward the goal of zero carbon. HDR recently completed the six-storey, mass timber West Wing at the Penticton Lakeside Resort. It is believed to feature the most extensive use of CLT panels in any building in the Okanagan. It is widely known that wood



West Wing, Penticton Lakeside Resort, Penticton, B.C.

acts as a "carbon sink," absorbing carbon dioxide from the atmosphere, but wood also has a lighter environmental footprint than concrete or steel.

After completing West Wing, HDR created a lifecycle analysis on the building using an outside firm. With this information HDR created a carbon balancing toolkit that analysed all the materials that went into the project and highlighted areas for improvement, such as using wood fibre insulation as opposed to spray insulation, which is considered carbon intense. "This toolkit will help with our decision making on future projects."

Another great benefit of mass timber, according to Cesnik, is the ability to disassemble and reuse. "We have the responsibility to look at what happens in 50 years if a building runs past its use. Can the CLT be reused? It's about longevity and keeping it out of the landfill."

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Support to implement green design is of course essential, and BC Hydro continues to assist with resources, technical assistance to building owners, developers, and the design industry to create high-performance, and energy-efficient buildings.

Bojan Andjelkovic, technical lead at BC Hydro, says one of the significant changes of late is CSA Group's approval and development of the Building Envelope Thermal Bridging Heat Loss Calculation Methodology standard, adding that CSA has now established a Technical Subcommittee (TSC) for this standard.

The BC Energy Step Code is also having a great impact on the development of green buildings, with 30 local governments having adopted the Code into their building bylaws, which accounts for more than 70 percent of all new building permits in B.C. "Builders and developers in these communities will be getting a head start on requirements that will be coming into the BC Building Code in 2022, 2027, and 2032. BC Hydro has been working with builders, developers, professional associations, and government to support training and capacity development to smooth transition of code implementation," says Robyn Wark, team lead, sustainable communities at BC Hydro.

BC Hydro is also implementing the Provincial Government's CleanBC Commercial New Construction Program. The program provides funding for the design and construction of new high-performance buildings that use high-efficiency electricity in place of fossil fuels, in order to reduce GHG emissions. Available incentives include up to \$15,000 for Energy Study support and Capital Incentives up to \$500,000 based on the amount of GHGs reduced relative to an established baseline building per program rules.

As part of its efforts to drive adoption of lower-carbon technologies for green buildings, FortisBC has a dedicated team conducting pilots on promising new energy-efficiency technology.

"Our team lives and breathes innovation every day," says Jim Kobiialko, program manager, innovative technology and projects, FortisBC. "By evaluating both the energy-saving potential and customer acceptance, these pilots provide certainty to building professions that the technologies we recommend deliver on the expected results."

Evaluating gas-fired heat pumps is one of the pilots now underway. By transferring heat energy from the air, these units have efficiencies greater than 100 percent

and the potential to reduce natural gas use by 25 to 33 percent. FortisBC is testing 14 units in seven commercial buildings – these are the first of their kind in B.C.

Another technology showing promise is on-demand recirculation controls for central domestic hot water systems. These controls save energy by operating the pump only when there is demand. FortisBC's recently completed test on 19 multi-family buildings showed energy savings of up to 22 percent.

Of the 230 technologies FortisBC has evaluated, close to 20 have become full incentive offerings. With ambitious plans to help customer's lower natural gas use by 30 percent by 2030, FortisBC will be launching many more pilots and encourages manufactures with promising technology to get in touch. **A**

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