



Q&A FEATURE GRAHAM CONSTRUCTION

Unlocking the Value of Mass Timber:

Graham Construction and the Impact of Mass Timber at The Lawson Centre for Sustainability

Mass timber's importance in Canada lies in its role as a sustainable, low-carbon alternative to concrete and steel.

Produced By: Build Canada | Photos provided by Graham Construction

As a North American industry leader, Graham Construction's experience in state-of-the-art educational facilities is evident in their extensive portfolio of completed projects. In the pursuit of building better, the company's involvement in mass timber building further supports their commitment to staying at the forefront of the industry.

Currently pursuing LEED Platinum and Zero Carbon Building certification, The Lawson Centre for Sustainability at Trinity

College emphasizes the integration of advanced ecological design principles and cutting-edge technologies to reduce the building's carbon footprint and optimize energy efficiency.

In the second in a two-part series, Sustainability Manager for Graham Construction Radek Pilarski discusses the significance of mass timber and technology in building The Lawson Centre for Sustainability.



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~Radek Pilarski

Build Canada: With Graham Construction expanding its portfolio in the mass timber construction market - how has the perception and application of mass timber construction evolved in Canada, and what factors are contributing to its increasing popularity?

Radek Pilarski: Mass timber is not a new product; it has already existed for a long time and has been used in various buildings for years and years. Some countries have used mass timber for a very long time; Canada has this natural resource of timber and it makes sense to use it. Mass timber is

made of natural and renewable material, and its manufacturing process has lower CO2 emissions than steel and concrete. Wood absorbs CO2 from the atmosphere when it grows, representing a natural CO2 sink. It is part of a natural CO2 circulation. In addition to that, the manufacturing of mass timber uses less energy and emits less carbon than steel and concrete production. This results in a lower embodied carbon footprint for mass timber buildings.

I think there is a big shift on how we understand mass timber. In the past it was

predominantly used as a feature element for long span structures, canopies, and additional elements to a building that would otherwise be built out of concrete or steel. We now have transferred to using it as a whole building structure, not just using parts of the building. There have been some advances in technology that have allowed for that and there has been growth in production capabilities. There are also cultural, political and regulatory drivers for us to use it more.

For example, not long-ago mass timber was only used in low-rise buildings, but recently

the regulations opened up the possibility of using it for twelve and even eighteen story high buildings in certain jurisdictions. But obviously, there is still a lot of work to do, and there are still many regulations that need to catch up to help us use it more effectively. We also have a lot to learn about the best ways of producing and building it in an efficient and standardized way.

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BC: During a time that is progressively focused on sustainability, the concepts of ESG (Environmental, Social, Governance) and ESG reporting have become essential. What were the environmental, academic and social targets for the Lawson Centre project as part of Graham Construction's sustainability strategy?

RP: It's a rather complex question. The Lawson Centre isn't just a place for students to learn about sustainability. It offers a combination of hands-on learning about the natural environment, natural resources, particularly about food production, understanding the students and faculty's sense of place, with spaces for social activities and well-being that is a focal point of the campus. At the same time, they have now a good looking and pleasant place to come together and spend time with each other.

The rooftop farm is designed for local food production and research that is integrated with a teaching and community kitchen that provides students with a chance to support campus food programs and sustainable food practices.

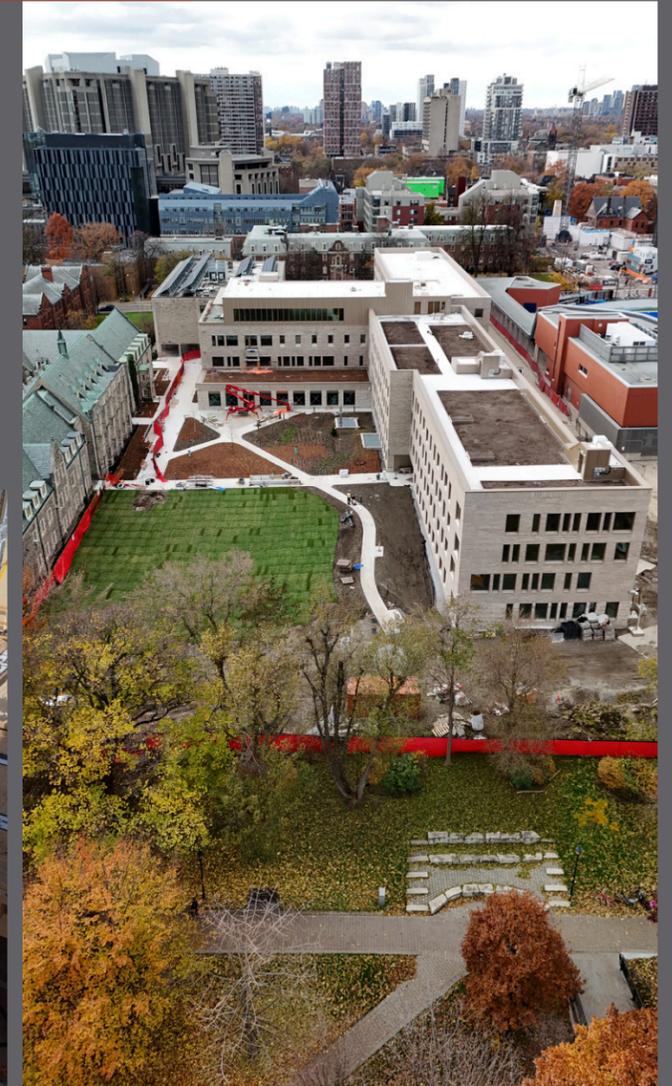
From our perspective, even though Graham is a business, and we have commercial needs to think about, our sustainability strategy is aligned with the Lawson Centre.

We understand that our focus includes all aspects of the ESG focus areas and our people are at the center of our success. Graham is owned by the employees. Not only are the employees stakeholders, but they are also investing in working for a sustainable business that focuses on integrity, reliability and commitment.

BC: How do you define high performance, and in what ways does the Lawson Centre build to higher energy and durability standards that help in future-proofing the property against changing regulations?

RP: It's typically about picking a reasonable target and making it work for the project. It is usually about trying to produce a building that uses as little energy, and as few nonrenewable resources as possible. After you have a target that makes sense for the owner and the project, we work together throughout the design and later the execution phase of the project to produce a reasonable balance between the various systems that make up the whole building. In green construction and high-performing buildings, the most important question is about how much energy is being added in to make the building run and how much energy we're losing through the envelope or through ventilation. You need to achieve a balance between those two and make

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The Lawson Centre for Sustainability

Trinity College, University of Toronto

WE ARE BUILDING BETTER TOGETHER

From transformative infrastructure to advanced industrial facilities and world-class commercial developments, Graham is invested in shaping the skyline, streets, and communities across Canada and beyond.

As one of North America's leading construction solutions providers, Graham combines local expertise with national resources and a strong record of collaboration. Our team is trusted to deliver across most vital sectors—including transportation, water, healthcare, energy and power, education, recreation, and mixed-use development.

Guided by our core values of *Commitment, Integrity, and Reliability*, every project is built to endure.

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The **Lawson Centre for Sustainability** will serve as the heart of Trinity College, connecting people and uniting existing buildings. This four-storey hybrid mass timber facility places sustainability at its core, featuring rooftop community gardens that support a sustainable food program along with numerous other environmentally conscious design and construction elements.



Lawson Centre



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sure you use and lose as little energy as possible to operate the building. By doing that and using environmentally friendly materials, we are limiting the amounts of CO2 that we are adding to the atmosphere. We are also reducing the operating costs for the client.

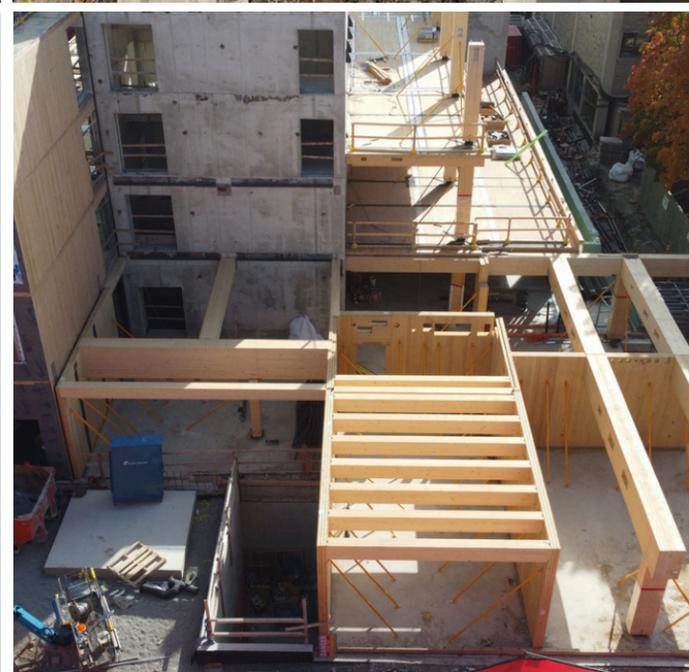
Sustainability is about thinking about the future. We don't have a crystal ball, but we can make some informed assumptions. We know how the industry operates and how it affects the world. We are figuring out how we need to change to achieve better outcomes, and both the public and the private hand play a role in this. An important assumption that I would make today, for example, is that the environmental regulations that we have achieved in Canada so far are not going to go backwards. It is unclear how fast they're going to develop further, but what we have now already presents challenges that the industry must find a way to deal with. So we have plenty of work to do as it is. However fast or slow, the drive towards improvement and environmentally friendly construction and technology is not going away, and it will profoundly affect the way we build.

BC: What are the environmental and business drivers with mass timber buildings and carbon-conscious design? Is mass timber the solution to the massive carbon footprint of buildings?

RP: I can give you my understanding from my perspective, which does not necessarily need

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to reflect everybody else's. I think in terms of mass timber — and building out of timber in general — this is an approach that is in line with Canada's construction culture and experience. We have a lot of valuable craft and knowledge here, and we have access to incredible natural resources. Mass timber allows for prefabrication of many building elements in a controlled environment and installing them quickly on site rather than having expensive workforce putting them together on site by hand. On top of that, you get the pleasant look of the wood in your finished building and the knowledge that you used less CO2 than on a conventional building. Canada has been known for the use of these renewable resources, and we need to continue using them wisely and effectively.

Having said that, there is still a long way to go. There are still challenges with sustainable forestry that need to be resolved — monocultures, forest fires and wood bug infestations are just some manifestations of these issues. We must continue learning how the materials are grown and extracted responsibly, how the mass timber is produced efficiently, and how to deliver it and put it together on site without damaging it or trapping moisture inside.

Also, what I think most don't understand is that this technology is not refined or standardized yet as much as people think it is. We have made great improvements in recent years, and we have learned a lot of lessons as

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as an industry. There is also a lot of will to use this material, but it still requires quite a lot of standardization of regulations and technical solutions across the board. As an example, we already discussed that we are now allowed to build much taller mass timber buildings, yet there are some codes like the fire code that still need to catch up. The fire code still treats mass timber like any normal lightweight timber structure despite the fact mass timber behaves very differently during fire. Instead of simply

burning and collapsing like your normal lightweight timber frame, mass timber produces a layer of char on the outside that protects the core of the material from burning. Its heavy and massive, and nature helps it to perform surprisingly well — a mass timber structure will withstand fires for 1 or 2 hours, just like a concrete structure would. But because there is still a lot of testing and standardization to do, mass timber is often treated like any other timber building.



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Another important aspect is that the methods of producing and installing these buildings vary across Canada. For instance, the Lawson Centre was installed in Toronto. A similar building in Vancouver will face different challenges due to significantly higher moisture levels. Conversely, in Regina, the primary concern is dryness, presenting a completely different set of issues.

As far as technology, I would say, if handled correctly, mass timber lends itself well for modular and volumetric production. But technology and supply chains still must really evolve to produce the volume and the versatile output that you would like to have. The ability to reasonably control the

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the material supply from the tree in the forest to the finished mass timber building still needs to evolve much further, even in Canada. The thing about construction is that you can't really make it as modular and volumetric as you would like to because there is always an amount of individuality in every building and every product. You must allow for some versatility and potential shifts in the market which makes this business quite tricky and quite risky for the industry.

BC: Biophilic design and materials are becoming a groundbreaking solution by incorporating natural elements into building designs and material selections. What was your strategy for implementing biophilic design, and can you share some successful integrations of biophilic materials that were utilized in The Lawson Centre?

RP: For reasons of current fire safety regulations, which I explained above, a lot of the mass timber surfaces inside of the buildings are often covered up with drywall. To see and experience more of the natural wooden surfaces you must find and agree on alternative solutions with the local authorities. There are ways of exposing big parts of mass timber while keeping the building safe. The architects and the code consultants on the Lawson Centre project did an exceptional job in that regard. The Lawson Centre students will be able to experience almost half of the mass timber



structure on the walls and ceilings. Since mass timber is not as standardized and well-regulated as other materials, it depends a lot on the municipality and their willingness to explore alternative options.

Our job at Graham is to make it work and look as beautifully as the designers envisioned it. Sometimes, we have to contribute solutions that the client teams haven't thought of because there isn't yet enough experience in the industry. In addition to the large components, we will also work on various details with the

designers and the suppliers, like structural connections or electrical conduit integration, to round up that picture. On every project there will also be unexpected challenges that we will have to resolve to make sure that the building looks good by the time we are done. Many of the solutions to issues like site damage, staining or sun-tanning of the timber come from our trusted installers.

Finally, we must ensure that we deal correctly with moisture and with tolerances — this is a reoccurring theme on all mass

timber projects that greatly affects the speed of installation. The building is not put together in a lab; we are building it outside in the rain, in the wind, in the dust, using heavy machines and with the hard hands-on work of real people. ■

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