



# BETTER BUILDINGS BOOT CAMP 2020 REPORT

August 24 – 28, 2020

Sustainable Buildings Canada

# SUMMARY

In August, 2020, Sustainable Buildings Canada (SBC) hosted its first Better Buildings Boot Camp. Originally planned as an in-person event but later moved online due to the COVID-19 pandemic, the event was held virtually from August 24 to August 28.

The week-long virtual event featured a series of live, interactive webinar plenary sessions facilitated by a group of leading academic experts and industry professionals, and its format mirrored that of a professional integrated design workshop. Each session was designed to be interactive and focused on one or more topics relevant to sustainable building design, such as indoor environmental quality, opaque and transparent building assemblies, mechanical systems, financing, operations and maintenance, etc. Sessions with a more specialized focus were also held on topics including solar, inclusive design, GHG accounting, greywater, lighting design and urban farming. Students participated in daily online group discussions and activities and were asked to work together in groups to produce their own design recommendations. On the final day of the workshop, students had the opportunity to closely observe participating experts conduct a real-life professional design and planning workshop. At the end of the workshop, the students were asked to present their recommendations and compare them with the recommendations produced by the participating experts.

The event was planned to give students from a wide range of backgrounds an opportunity to gain practical, hands on experience with integrated design as applied to a high performance building project. Organizers chose a new building project proposed for the University of Toronto St. George Campus (the Data Sciences Centre at 215 Huron Street, Toronto, ON) and students were invited to observe and participate in the building design process.

Achieving sustainable building design requires integrated design thinking, a diversity of expertise across a wide range of disciplines, and strong multi-stakeholder, interdisciplinary collaboration. For this reason, concerted efforts were made to include and recruit students from a diversity of backgrounds and fields of study.

# WHO ATTENDED

The 2020 Boot Camp was open to students from the University of Toronto, York University, Ryerson University and OCAD University. Forty-one students from the four participating universities attended the first day of the boot camp and 31 met the participation requirements to “graduate.” Among this group were students pursuing degrees in environmental science, architecture, building science, landscape design, psychology, engineering, and economics.

Leading the Boot Camp was a diverse group of industry professionals and academic experts, including:

- Professor Alex Lukachko, U of T, Building Science
- Nicole Parsons, WSP Canada Inc., Envelope and Building Science
- Bill Lett, Lett Architecture, Integrated Project Delivery
- Michelle Xeureb, Principal., Quadrangle Architects, Green Architecture
- Dr. Jennifer Hill, U of T, Green Roofs and Storm Water Management
- Cara Sloat, Reinbold Engineering, HVAC Systems
- Professor Gerry Cornwall, Ryerson University, Lighting Design
- Dave Petersen, Outside-In Design Build, Fenestration
- Arlene Throness, Ryerson University, Urban Farming Manager
- Sebastian Carizzo and Matthew Hyder, Rowan, Williams, Davies, and Irwin Inc., Energy Modelling
- Lorene Casiez, Quadrangle Architects, Accessible Design
- Bettina Hoar, Sage Living TO, Indoor Environmental Quality
- David Sasaki, University of Toronto, Project Coordinator
- Paul Leitch, University of Toronto, Environment and Sustainability
- Jeff Ranson, Canada Green Building Council;
- Leona Savoie and Eli Miller, Hullmark Realty
- Josh Lewis, Nerva Energy, Building Automation
- Dr. Sherif Kinawy, University of Toronto
- Nils Larsson, International Initiative for the Sustainable Built Environment
- Patrick Saaverdra, York University
- Costas Catsaros, University of Toronto
- Mark Dettweiler, Ryerson University

The principal organizers of the Boot Camp included:

- Bettina Hoar, CEO of Sage Living TO;
- Professor John Robinson, University of Toronto;
- Professor Mark Gorgolewski, Ryerson University;
- Professor Arlene Gould, York University,
- Melanie Simpson, Polished Media;
- Michael Singleton, Adam Jones, Amy Pound, Samantha Hoar, Maureen Farrell and Emily Fardad, SBC.

Sustainable Buildings Canada wishes to thank all those involved who helped to make this a successful event.

# OUTCOMES

The Boot Camp<sup>1</sup> was a rich and unique learning experience for the students who took part. Through their participation in the event, students gained:

- A comprehensive and holistic understanding of integrated sustainable design and its importance
- Knowledge about how different building sector disciplines (architecture, engineering, economics, psychology, etc.) can be combined in the integrated design process;
- Practical, hands-on experience with the integrated sustainable design process and an understanding of how it's operationalized in practice through robust interdisciplinary, multi-stakeholder collaboration;
- An opportunity to learn from and network with leading academic experts, industry professionals and fellow students from several different leading institutions;
- Instruction in specific subject matter areas, such as indoor environmental quality, building science, mechanical systems, energy modelling, financing, etc.
- Working in cross-institutional, multi-disciplinary groups, students produced reports and design recommendations for the building project, which they presented at the Boot Camp.

A professional Savings by Design Workshop, delivered by SBC on behalf of Enbridge Inc., was held on the fifth day of the Boot Camp. Savings by Design is a green building initiative that was developed to encourage builders to improve energy and environmental performance in new construction projects. The program offers support and financial incentives during the design and construction stages of building and housing projects and affords builders the opportunity to market green features and energy performance goals under the Savings by Design banner.

The workshop provided a forum for a multi-disciplinary dialogue around how to optimize the design and performance of U of T's proposed Data Sciences Centre. Various stakeholders, in addition to SBD program staff and industry experts, attended the session and examined alternative designs and technologies that could achieve a projected annual energy performance that is at least 15% better than Ontario Building Code (OBC), as required by the SBD program. Real-time energy modeling was performed during the workshop and determined that energy performance for the Data Science Centre project could be 55.5% better than the OBC. The projected cumulative annual energy savings of the proposed changes are \$370k with an expected reduction in total greenhouse gas (GHG) emissions of 467 tonnes CO<sub>2</sub>Eq over the lifetime of the building.

The professional workshop produced a report containing a number of key design recommendations for the proposed new Data Sciences Building. These recommendations, together with the results of the students' work, were presented to the University of Toronto's

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<sup>1</sup> See the Appendix for the Boot Camp Schedule

governing council, the university's highest decision-making body, and will influence the design of the Data Science Centre as well as other buildings at UofT.

According to David Sasaki, Managing Director of Campus Planning at the University of Toronto:

“The value of the Better Buildings Boot Camp is that it begins to articulate the requirements for the next generation of high-performance buildings at U of T. Collaboration between sustainability experts and students from a diverse range of backgrounds has produced recommendations that will influence the design of this and other buildings at U of T.”

## FEEDBACK

After the Boot Camp, SBC asked participants to provide feedback about the event and how to improve it. The student feedback was highly positive overall and indicated high levels of satisfaction among those who participated. Here's what a few of them had to say about the event:

“I've personally benefitted a lot from [the Better Buildings Boot Camp] and I'm glad that Sustainable Buildings Canada is carrying on this program so that more people can attend and learn from it. For those who, like me, strongly believe that we desperately need good buildings to achieve positive impacts on our society -- not just economically, but environmentally, culturally and socially -- for these people I highly recommend this boot camp because you'll find similar minds. I especially recommend it to those architects and designers who are overwhelmed by the aesthetic and economic perspectives on buildings that currently dominate.”  
Jacqueline Cheung, Architectural Designer and Founder of Impact Z (University of Toronto)

The main intent of the boot camp was to provide students with an experiential, interactive learning experience in sustainability and integrative buildings design using a real building as a case study... The students had diverse backgrounds from applied science and engineering to arts and science, so that was such a great first-hand experience to collaborate with other people from other institutions and backgrounds.” – Khashayar Ebrahimi, 2<sup>nd</sup> year M.A.Sc Civil Engineering Student, University of Toronto

“Last year I took the better buildings Boot Camp. Overall, it was a wonderful experience. I remember that my thesis supervisor told me about it. I took the opportunity, applied, and I really enjoyed it. Not only are you going to learn a lot, but it's also very interactive and entertaining.” – Carolina Parra, Chemical Environmental Engineer, Chilean Energy Efficiency Agency (York University)

Student feedback also highlighted some areas where the event could be improved and streamlined. Among the key issues identified were:

- I. Technical issues with the online platform used to host the workshop

Due to health and safety concerns related to the COVID-19 pandemic, the Boot Camp was held entirely online via GoToWebinar and GoToMeeting, two popular online meeting platforms. Unfortunately, a number of students reported technical issues with the platforms that somewhat impaired their experience. For example, in some cases, meetings failed to record properly because of a glitch and presenters were not visible to all virtual attendees. The delivery team will consider other platforms for 2021.

## II. Issues with formatting and event design

One common point of feedback was that the event did not feature enough breakout sessions. Students reported that breakout sessions were particularly useful as they were a more welcoming forum in which to ask questions, participate in discussion and engage with experts. Breakout sessions also provided more advanced and detailed instruction than other sessions, which students found valuable. In the future, students recommended that breakout sessions feature more prominently throughout the event.

Students reported that the event would benefit from greater representation across a range of faculties and disciplines. They saw interdisciplinarity as a major selling point of the Boot Camp but felt certain backgrounds and areas of study were overrepresented, such as environmental studies. For this reason, student participation was somewhat limited and student-led discussions were not as productive as they could have been. During team activities, building science students tended to carry the conversation and other students were unable to offer much meaningful input. In the future, students suggested the inclusion of other topics or activities that are geared towards, or more inclusive of, other disciplines.

Students said additional background information about the building project would have been valuable for participating students and would have improved the overall quality of dialogue throughout the event. Some said it was hard to contribute meaningfully in discussions as they didn't have enough information about the project beforehand. These students suggested that students be provided with additional materials and information prior to the event that clearly outline the scope of the project, its goals, who the stakeholders are, etc. to ensure that all participants have a baseline understanding of the project at the outset.

Students expressed a desire that UofT Campus Planning personnel be more engaged throughout the event. Students were appreciative that UofT Campus Planning personnel were in attendance, however they felt these individuals could have been more actively involved in the discussions and could have provided more information about UofT's research initiatives and overarching strategic objectives vis-à-vis campus planning and sustainability. Students felt there was a "disconnect" between the planning staff and faculty.

SBC is committed to learning from the feedback and will seek to amplify the things that were done well, while considering ways to improve in other areas.

# APPENDIX – BOOT CAMP SCHEDULE

## BETTER BUILDINGS BOOT CAMP SCHEDULE 2020

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	
9:00 - 9:15	<a href="#">SESSION 1: 9-10:15 Welcome (Mike Singleton, Sustainable Buildings Canada) and Key Note Speaker on Integrated Design (Bill Lett, Lett Architects)</a>	<a href="#">SESSION 4: 9-10:00: the Human Factor (Bettina Hwar, Sage Living &amp; Lorene Casiez, Human Scale)</a>	<a href="#">SESSION 7: 9:00 - 9:30 Fenestration cont'd (Nicole Parsons)</a>	<a href="#">SESSION 10: 9:00 - 9:45: Plenary Panel Discussion: the Business of Buildings (Finance, Maintenance &amp; Operations) Jeff Ranson, CaGBC (moderator) David Sasaki &amp; Paul Leitch (U of T), Leona Savoie &amp; Eli Miller (Hullmark), and Sherif Kinawy.</a>	9-1:00 Integrated Design Charrette	
9:15 - 9:30						
9:30 - 9:45			9:30 - 10 TEAM ACTIVITY			
9:45 - 10:00				BREAK		
10:00 - 10:15		10-10:30 TEAM ACTIVITY	BREAK	10-10:45: Break out sessions* (including Q&A)	Opaque assemblies: Alex Lukachko; Fenestration: Dave Petersen; Mechanical Systems: Cara Sloat; Human Factor: Lorene Casiez; Building Automation: Josh Lewis.	
10:15 - 10:30	BREAK		<a href="#">SESSION 8: 10:15 - 11:15 Mechanical Systems (Cara Sloat, Reinboldt Engineering and Richard Lay)</a>			
10:30 - 10:45	<a href="#">SESSION 2: 10:30 - 11:15 Getting to Know The Building (David Sasaki, U of T) and Initial Energy Model (Sebastian Carrizo &amp; Matthew Hyder, RWDI)</a>	BREAK				
10:45 - 11:00		<a href="#">SESSION 5: 10:45 - 11:45 Opaque assemblies aka "walls" (Nicole Parsons and Alex Lukachko)</a>		BREAK		
11:00 - 11:15				11 - 11:45 Break Out Sessions* (including Q&A)		
11:15 - 11:30	BREAK		11:15 - 11:45 TEAM ACTIVITY			
11:30 - 11:45	<a href="#">SESSION 3: 11:30 - 12:30 High Performance Goal Setting (Michelle Xuereb, Quadrangle)</a>					
11:45 - 12:00		11:45 - 12:15 TEAM ACTIVITY	BREAK	BREAK		
12:00 - 12:15			<a href="#">SESSION 9: 12:00 - 1:00 Energy Modelling Results (RWDI)</a>	<a href="#">SESSION 11: 12-1 Plenary Panel discussion: How Covid will impact University Campus building decisions in future. Patrick Saavedra (York), Costas Catsaros (UofT), Mark Dettweiler (Ryerson); moderated by Nils Larsson (ISBY)</a>		Energy Model: RWDI
12:15 - 12:30		BREAK				
12:30 - 12:45	12:30 - 1 TEAM ACTIVITY	<a href="#">SESSION 6: 12:30 - 1:00 Fenestration aka "windows" (Dave Petersen, Outsideln)</a>			End of Boot Camp	
12:45 - 1:00						
			<a href="#">TEAM SUBMISSION OF FINAL RECOMMENDATIONS</a>			