UNIVERSITY OF TORONTO

OFFICE OF THE GOVERNING COUNCIL

FOR RECOMMENDATION **PUBLIC** **OPEN SESSION**

TO: Planning & Budget Committee

SPONSOR: Scott Mabury, Vice President, Operations and Real Estate Partnerships

PRESENTER: Mayo Moran, Provost and Vice Chancellor, Trinity College

CONTACT INFO: 416-978-2689, provost@trinity.utoronto.ca

DATE: April 30, 2020 for May 7, 2020

AGENDA ITEM: 3

ITEM IDENTIFICATION:

Capital Project: *Report of the Project Planning Committee for Trinity College in the University of Toronto New Student Residence & Academic Building - The Lawson Centre for Sustainability*

JURISDICTIONAL INFORMATION:

Pursuant to section 4.2.3. of the Committee's terms of Reference, "…the Committee considers reports of project planning committees and recommends to the Academic Board approval in principle of projects (i.e. space plan, site, overall cost and sources of funds)."

Under the Policy on Capital Planning and Capital Projects, "…proposals for capital projects exceeding $20 million must be considered by the appropriate Boards and Committees of Governing Council on the joint recommendation of the Vice-President and Provost and the Vice-President, University Operations. Normally, they will require approval of the Governing Council. Execution of such projects is approved by the Business Board. If the project will require financing as part of the funding, the project proposal must be considered by the Business Board."

Trinity College is governed separately from the University of Toronto and subject to its own approvals processes. As per Trinity College Statutes, there is a tricameral governance model in place: Senate (academic and policy matters), Board of Trustees ("Board" - business and financial matters) and Corporation (broad oversight).

Major decisions (e.g., hiring architects, hiring construction management, final design approval, approval of funding and expenditures, business model and financing plan, etc.) are subject to oversight by these bodies and their committees, under the guidance of the above-named senior staff and governance leaders. Substantive oversight is proceeding primarily via two strategically populated working Board of Trustees (Board) subcommittees, the Finance and Building Committees, which contain alumni members with expertise

in Legal, Construction, Liability, Finance and other core areas, and are supported by senior staff, independent legal counsel and other subject matter experts and consultants. Terms of reference and reporting responsibilities for these committees were approved by the Board of Trustees at the onset of work. The Board is kept regularly apprised (updates at all meetings) and major decisions are brought to the Board for approval, with Corporation kept regularly informed at each of its biannual meetings.

Importantly, and in accordance with its independent governance, Trinity College is a separate financial entity and takes full responsibility, independent from the University for all financial matters pertaining to this project. As such, Trinity is responsible for the full capital and any associated long-term costs. This will include raising initial capital (substantial funds already raised), financing and development of the business model and program to ensure financial viability and net financial contribution to the College over time.

As per the 1910 agreement between the University of Toronto and Trinity College, Trinity has perpetual rights to the use of the land upon which the new building will sit, though the deed is held by the University.

Extensive student and community consultation has taken place throughout all stages of planning, from initial discussion of the need for a new building, to site visits, including a trip with student representatives to visit representative example buildings in the Netherlands, and honing of design. Student representatives on Trinity governance bodies have been enthusiastically positive about Trinity's plans for a new building and the evolving design.

GOVERNANCE PATH:

A. Project Planning Report

1. **Planning and Budget [for recommendation] (May 7, 2020)**
2. University Affairs Board [for concurrence with the prospective recommendation of the Academic Board] (May 21, 2020)
3. Academic Board [for recommendation] (May 28, 2020)
4. Executive Committee [for endorsement and forwarding] (June 16, 2020)
5. Governing Council [for approval] (June 25, 2020)

B. Execution of the Project:

1. Business Board [for approval] (June 18, 2020)

PREVIOUS ACTION TAKEN:

- Research and Community consultations throughout
- Hired Architects (spring 2019)
- Completed Schematic Design (fall 2019)
- Design Develop (90% complete)
- Submitted Rezoning Application (March 2019) and subsequent update (Dec 2019)
- Open community meeting hosted by City (Feb 2020)
- Construction Management Hiring (March 2020)

- Community Liaison Meetings (several, mostly 2019)
- Presented at Design Review Committee Meetings (2)
- Presented to CaPS Executive (2), most recently April 8, 2020
- Site Plan Approval (targeting April 2020 application)
- Board and working subcommittee approvals throughout

HIGHLIGHTS:

Trinity College is embarking on an ambitious building project which will provide much needed downtown student housing, as well as academic and meeting spaces for its world-renowned faculty and student community. Our level of ambition for this project is high, and our goal involves working with our world class design and project team to deliver an excellent design which solves the unique spatial, technical, and programmatic challenges of our campus both for this moment and for years to come. The quality of our renowned neo-Gothic quadrangle building at 6 Hoskin Avenue is compelling evidence of the power of enduring architecture. Our goal is to achieve a fine balance between history and contemporary expression through dexterity, creativity, and collaboration.

The Lawson Centre for Sustainability creates a place to celebrate community, reflects a shift in how students wish to both live and learn on campus, inspires students to engage and re-think their relationship with the environment and reflects the aspirations of Trinity College to provide a cutting-edge education while celebrating its historic setting.

This vision has evolved from a fourteen storey mid-rise tower, restricted to the existing Larkin surface parking lot, to a four-storey 'T' shaped volume which frames the north edge of the campus, embraces the North Field and respects the scale of the College. This human-scaled intervention creates a built edge along the northern perimeter of the campus, in turn facilitating two key campus transformations: reimagining the North Field and Trinity Lane, two new key public realm features on the campus.

The traditional college typology is built on the idea of community, framing introverted clusters of buildings around semi-permeable courtyards. The resulting sequencing of indoor and outdoor spaces, moves between a variety of characters, from formal entrance landscapes to quiet contemplative corners, the intimate Quad courtyard to the expansive view over the North Field.

By maintaining the scale and language of the traditional campus typology, embraced with a contemporary program and design language, the Lawson Centre for Sustainability becomes an emblem of past, present and future for Trinity College, A rich new landscape palette in the reclaimed courtyards and laneways helps to both enliven and bring cohesion to the new Trinity Campus.

The 'T' shaped volume is broken into segments which shift to frame the newly formed courtyards around the GIT and the re-imagined North Field. The projecting volumes to the south also provide additional sun protection on the ground floor. A covered pergola extends the central axis from the main Quad to the New Building, with the possibility to create a secondary access from Philosopher's walk.
The academic and common programs wrap around the new GIT courtyard to extend into the southern axis of the 'T', creating a new communal hub at the end of Trinity Lane. Residences frame the North Field spaces

parallel to the Quad spaces, extending on the upper floors to Devonshire Place.

The extended rooftop becomes a prime display of Trinity's sustainability and urban farming initiatives, with PV panels along the west wing, urban farming to the east and the Trinity Lane Pavilion at the centre, with stunning views of the campus, the city and the newly landscaped Trinity Lane.

The total area for the project is 9,229 net assignable square metres (NASM) and 14,068 gross square metres (GSM), organized into 1 level below grade accommodating kitchen, facilities management, and logistics connections to existing College buildings, and 4 levels above grade with a ground-level connection to the George Ignatieff Theatre and the Gerald Larkin Building. The functional program in the Lawson Centre for Sustainability includes:

- Industrial kitchen facilities, servicing new and existing dining operations
- New dining facility to serve residents in the new development and other community members
- Community Kitchen facility modelled on a teaching kitchen/multipurpose event space
- Rooftop urban farming and greenhouse operation
- Academic seminar and classroom spaces, and Trinity faculty/staff office spaces
- Multi-functional event spaces and uses
- 280 residence units totaling 352 beds, arranged in single, double, and studio (en-suite washroom + kitchenette) typologies

Like the University of Toronto, Trinity College has set lofty ambitions with regard to sustainability and through this project aspires to exceed, where possible, environmental standards, regulations and guidelines. Serving as a leading example on sustainability is integral to the Lawson Centre for Sustainability as part of a larger program of reimagining both campus life and curriculum renewal. In keeping with the naming of the Lawson Centre for Sustainability, the building will feature several large-scale building systems and will also put a particular emphasis on passive systems design. The design will meet LEED "Platinum" and Canadian Green Building Council "Zero Carbon Building Framework" criteria and Trinity intends to commission as well as officially certify to these standards.

Schedule

The proposed project schedule is as follows:

• Trinity College Strategic Plan released	2016-2017
• Trinity master planning and site massing studies	2017-2018
• Trinity College begin development discussions with U of T (Scott Mabury) City Planning, etc.	2017-2018
• Trinity College Governance subcommittees struck	Winter 2018
• Initial re-zoning application submitted to the City of Toronto	March 2019
• Board of Trustees approves Architect team selection	May 2019
• Schematic Design completed	November 2019
• Re-zoning application amended with updated SD design	December 9, 2019
• 50% Design Development completed	February 2020
• Early Works Agreement with Construction Manager begins	April 2020

• Site Plan Application submitted to the City of Toronto	April 2020
• 100% Design Development completed	Early Summer 2020
• Contract Award to Construction Manager	June 2020
• Construction Documents Phase	Summer 2020 – Fall 2021
• Early Site Works	September 2020
• Tenders, Negotiation, and Building Permits	Winter 2020 – Spring 2022
• Mobilization and Construction begins	February 2021
• Substantial Completion	Winter 2022/2023
• Operational Occupancy	Spring 2023

*** Note that construction and completion/occupancy dates are subject to municipal approvals. Dates may also shift based on recent market uncertainty due to the ongoing COVID-19 pandemic.*

FINANCIAL AND PLANNING IMPLICATIONS:

Discussion of overall costs and sources of funds can be found in the *in camera* document for this project.

RECOMMENDATIONS:

Be It Recommended:

THAT the *Report of the Project Planning Committee for Trinity College in the University of Toronto New Student Residence & Academic Building - The Lawson Centre for Sustainability,* dated April 16, 2020, be approved in principle; and,

THAT the project totaling 9,229 net assignable square metres (nasm) and 14,068 gross square metres (gsm), be approved in principle, to be funded by Trinity College by means of a combination of institutional investments, fundraising, and external loans.

DOCUMENTATION PROVIDED:

- *Report of the Project Planning Committee for Trinity College in the University of Toronto New Student Residence & Academic Building - The Lawson Centre for Sustainability*, updated April 16, 2020

Report for the University of Toronto Project Planning Committee for

Trinity College in the University of Toronto
New Student Residence & Academic Building

The Lawson Centre for Sustainability

Updated April 16, 2020

I.Executive Summary

Trinity College operates under Royal Charter in Federation with the University of Toronto and is governed separately from the University of Toronto.

Following extensive study Trinity College has determined it necessary to add additional space to its campus: first and foremost to house students, second to expand and modernize teaching facilities and third to ensure adequate community meeting and gathering space for all members of the Trinity community, especially commuting students. This follows several decades of limited investment in built form, and in particular, new facilities.

As approved by Trinity's Board of Trustees, the new building will be named the "Lawson Centre for Sustainability" in recognition of the great generosity of Joannah and Brian Lawson, who have committed $10 million dollars to the new building and corresponding Sustainability Initiative. The Lawson Centre for Sustainability will serve as a world-class example of sustainability both in its operational functioning and the study and understanding of sustainability that it will directly facilitate. The building will have various high-sustainability building systems, including solar panels and geothermal heating/cooling. For example, it will have a generous rooftop agriculture operation and community kitchen, and greenhouses to allow year-round growing, and the building will serve as a "living lab" for internships and study directly integrated with Trinity's core academic programming.

Trinity has worked closely with both the University and the City over the past several years to ensure consistency with planning underway, such as the Secondary Plan in development and the University's Low-Carbon Action Plan.

To date, Trinity has secured substantial funds to support the construction of the Lawson Centre, has internal resources available for allocation, and is aligning financing; the allotment of 350 residence beds and food operation are significant revenue streams, contributing to a strong overall business model.

Following Rezoning Applications and consultations to date with City Planning, Trinity will submit an application for Site Plan Approval in April 2020 and is in the process of hiring Construction Management. Site work is anticipated to start as early as fall 2020, with the goal of substantial completion in spring 2023.

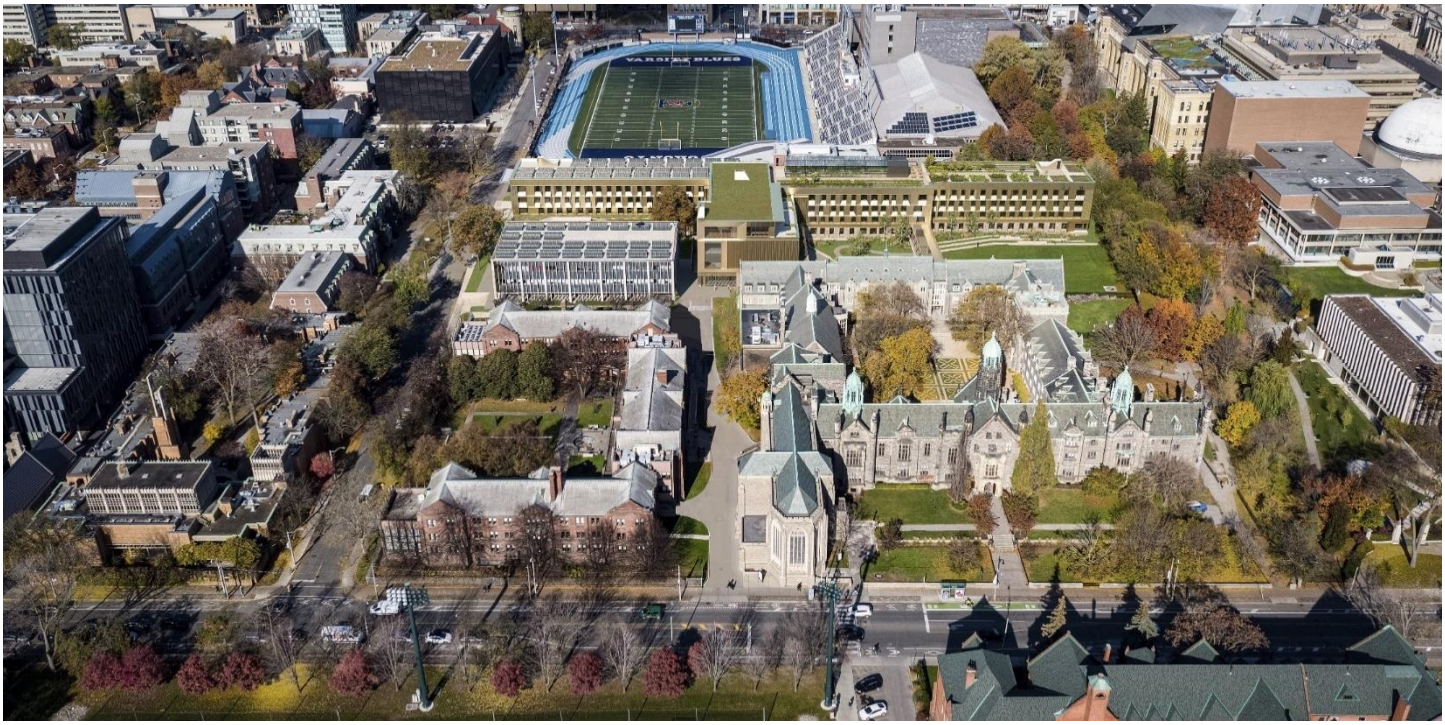

Figure 1: Aerial view of Trinity College campus superimposed with low-resolution rendering of the new Lawson Centre for Sustainability

Figure 2: Standing at the centre of Trinity campus, between 6 Hoskin and the Graham Library/Munk Centre, looking North. Pictured (L to R) are North wing of Munk Centre, the South-East corner of the Gerald Larkin Building, the West academic and residence wing of the new Lawson Centre for Sustainability and the south face of its central pavilion, and the North-East corner of 6 Hoskin Avenue

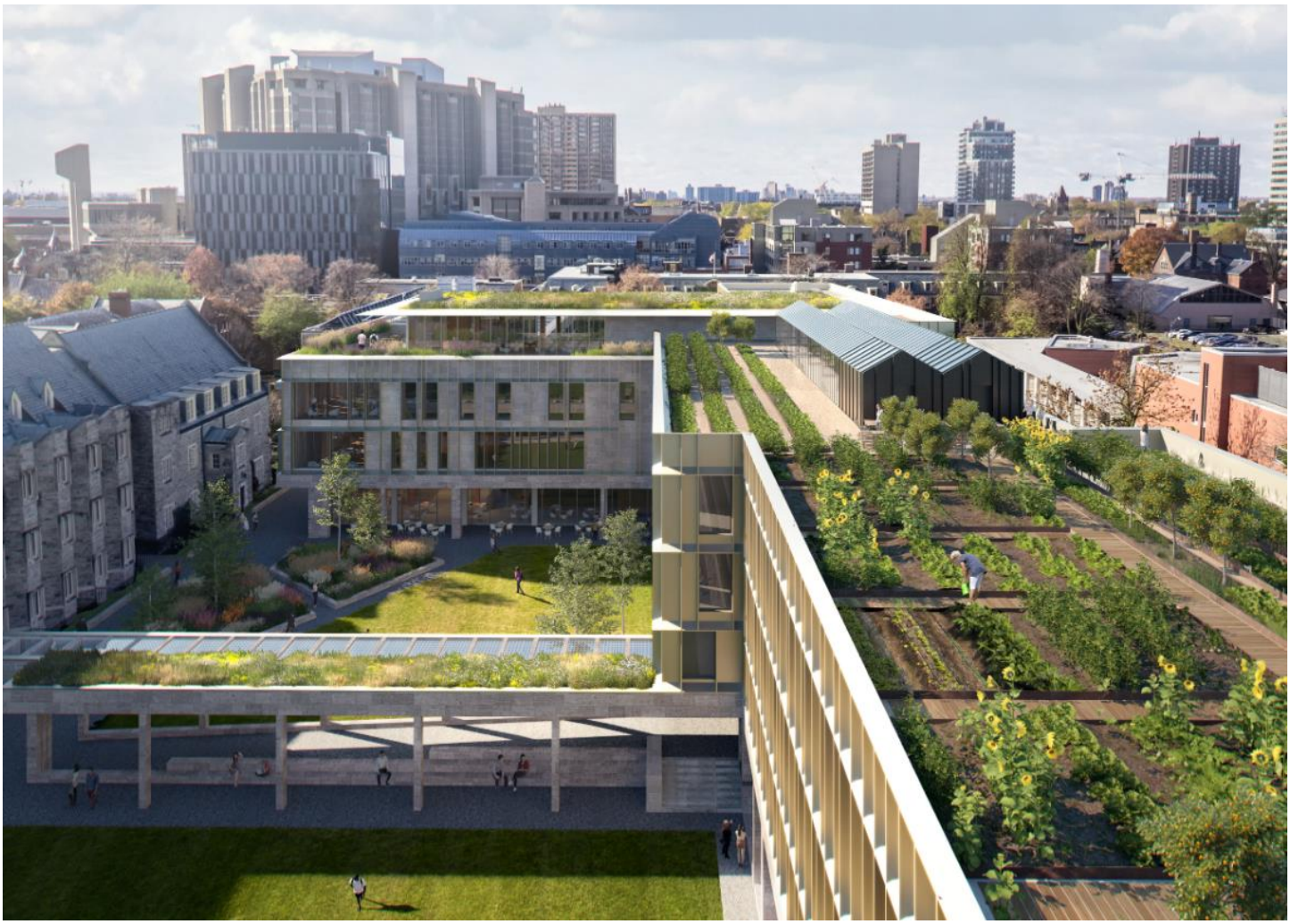

Figure 3: Aerial view of Trinity College campus superimposed with the new Lawson Centre for Sustainability. Pictured (L to R): central pavilion signature rooftop event space and urban agriculture operation on the East wing. New courtyard spaces are framed below by the pergola-covered walkway, new and existing buildings.

Figure 4: View of the Devonshire Place streetscape and façade of the new Lawson Centre for Sustainability, from the viewpoint of St. Hilda's College lawn.

Trinity College
UNIVERSITY OF TORONTO

Table of Contents

II. Project Background

a) Membership

Trinity College Project & Leadership Team:

Mayo Moran	Provost (Staff – Institution Head)
Jonathan Steels	Assistant Provost (Staff - Senior Project Lead)
Jason MacIntyre	Chief Administrative Officer & Bursar (Staff)
David DeMarco	Special Projects Officer (Staff)
Gerry Noble	Alumnus, Chair of Building Committee, Chair of Finance Committee (volunteer) Experienced businessman
Andrew McFarlane	Alumnus, Chair of Board of Trustees (volunteer) PPP Lawyer

b) Terms of Reference

Trinity College is governed separately from the University of Toronto and subject to its own approvals processes. As per Trinity College Statutes, there is a tricameral governance model in place: Senate (academic and policy matters), Board of Trustees ("Board" - business and financial matters) and Corporation (broad oversight).

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c) Background Information

Trinity College has a very rich, 168-year history as an institution of academic excellence. It is located in the heart of the University of Toronto's St. George Campus, and enjoys a mutually beneficial relationship with the University, with which it operates in federation. The Trinity College campus comprises four buildings: historic Trinity College (6 Hoskin Avenue), the Munk School of Global Affairs & Public Policy and John W. Graham Library (1 Devonshire Place), the Gerald Larkin Building and George Ignatieff Theatre ("the GIT") (15 Devonshire Place), and St. Hilda's College (44 Devonshire Place).

Trinity College has a total of some 2000 registered students, including the undergraduate student body and a graduate Faculty of Divinity with approximately 150 graduate students. It operates as an independent institution with its own Royal Charter and governance structure but also in federation with the University of Toronto.

Through the extensive consultation that informed Provost Mayo Moran's 2016 Trinity College Strategic Plan, three core pillars emerged: people, program and place. The acute need for additional residence, academic and community space at Trinity to support the needs of the College, and the students in particular became a major focus following from the strategic plan. With Board support, the leadership team engaged planning consultants later the same year to assess existing space and explore the possibility of adding to the Trinity

campus.

The student body at Trinity College grew significantly over the 1980s and 1990s (by approximately 50%), and there has been recent corresponding expansion of academic programming yet with no significant addition of built facilities since the construction of the Gerald Larkin building in the early 1960s and a small addition to St. Hilda's College in the 1980s (approx. 50 residence rooms). For several decades, the current space on Trinity's campus has been inadequate to support the needs of the College. For the commuting students who currently make up 75% of the student population, there are few places to gather, study, eat, and interact. Accessible and sufficient teaching and learning space is also in short supply relative to the core academic needs of the College, following introduction and expansion of the Trinity One program among other areas. And perhaps most pressing, the fact that Trinity College can house only 25% of its students means that many travel for well over an hour to get to campus because of the lack of affordable housing in the vicinity of the College. While pressure for additional housing has been building for many years, need has become acute and highly exacerbated in recent years with lack of available affordable downtown housing and growing numbers of out of province and international students. The first-year housing guarantee continues to face mounting pressure as we observe growing numbers of upper year students requesting housing.

Historically, some 40% of registered students were able to live at the College while studying. Despite optimization of our current space, we have only been able to house up to 470 students. The New Student Residence and Academic Building project will move the College back in the direction of the historical housing ratio, reinforcing Trinity's values related to collegiate living and learning and helping to alleviate the demand for housing that is faced by Trinity and the University as a whole.

Trinity College is committed to ensuring provision of the highest quality living and learning experience for its students. Space limitations are preventing this from happening. The program of the proposed development is meant to address these space limitations, while enhancing the Trinity experience - student services and academic programming – and supporting the overall mission of the University.

Project Timeline:

2016-17	Trinity College Strategic Plan released Engaged Master Planner Mark Sterling
2017-18	Site massing studies, surveying; determination of site Initiation of discussion with UofT (Scott Mabury) Initiation of discussion with City Planning Introduction of new building to Trinity College community

2018-19	Establishment of Governance working subcommittees Consultation, development of RFP for Architectural Services International competition, Board approves hiring Architects Financial modeling Initial application for Rezoning submitted to City First meetings of CLC, DRC, CaPS Executive with preliminary massing Site studies initiated
Summer 2019	Architects complete initial design; presented to key constituents, including UofT and City Planning
Fall 2019	Schematic design completed; design development initiated Initial costing completed Financing discussions initiated New design presented at CLC (2) meetings Rezoning is resubmitted along with updated site studies Construction Management competition initiated (2-stage), RFP & Contract finalized
Winter 2020	Public meeting held at Trinity by City Board approves negotiating with selected Construction Management and "early works" agreement Design Development near-complete City provides written comments in response to application
Spring 2020	Response to City comments Site plan application Completion of design development & final design Initiation of Construction management Development of construction documents Finalized budget, financing plan, business model
Late-fall 2020/early 2021	Initiation of construction
Spring 2023	Desired substantial completion

d) Existing Space

Trinity Campus comprises 4 buildings and the grounds between:

- Trinity College (6 Hoskin Ave.)
- Gerald Larkin Building (15 Devonshire Place)
- St. Hilda's College (44 Devonshire Place)
- Graham Library & Munk Centre for Global Affairs and Public Policy (6 Hoskin Ave.)

Trinity College (6 Hoskin)

- 25-30 administrative and service staff offices and Welcome Desk ranging from 8 m^2 to 45 m^2
- Archive facilities (basement level): 175 m^2 including office spaces and controlled archive
- Chapel (ground level) of approximately 330 m^2
- 3 Formal Faculty, Staff and Student common rooms (Divinity Common Room, Junior Common Room, Senior Common Room): 86 m^2, 53 m^2, and 45 m^2
- Large Dining Hall (Strachan Hall) and associated food service facility (ground and basement levels): 307 m^2 dining hall + 250 m^2 food service facilities
- Large Event Hall (Seeley Hall, second level): 248 m^2
- 1 Medium and 2 Small multi-purpose event rooms (Combination Room, Private Dining Room, and Boardroom): 112 m^2, 46 m^2, and 45 m^2
- Existing logistics and waste management facility (to be replaced by new integrated facility in new building): 78 m^2
- Residence Laundry facilities (basement level): 13 m^2
- 187 single residence rooms
- 23 double residence rooms
- 7 triple residence rooms

Gerald Larkin Building

- Ground floor common facility with retail food operation (The Buttery): 112 m^2 seating area + 65 m^2 common lounge + 62 m^2 retail food servery
- George Ignatieff Theatre facility, including a 280 m^2 theatre + 100 m^2 theatre back-of-house (ground and basement floors)
- 8 medium-sized classrooms (located on the second and third levels of the building) ranging from 32 m^2 to 75 m^2
- 40 faculty, staff, and graduate student offices (located on the second and third levels) ranging from 7.5 m^2 to 22 m^2

St. Hilda's College

- 6 administrative staff offices (ground floor) and Welcome Desk, ranging in size from 10 m^2 to 19 m^2
- Large ground-floor student common lounge (Melinda Seaman hall) of 168 m^2

- Medium common event and meetings rooms (Rigby Room and Adams room) of 82 m^2 and 55 m^2
- Medium student event and activity room (The Abbott Room/Wellness Space): 32.5 m^2
- Medium ground-floor classroom (Cartwright Hall): 128.5 m^2 + a 55 m^2 raised stage area
- Residence Laundry facilities (basement level): 28 m^2
- 157 single residence rooms
- 28 double residence rooms
- 4 triple residence rooms

Graham Library & Munk Centre for Global Affairs and Public Policy (6 Hoskin Ave.)

- Graham Library: houses library collection with some limited space for staff offices
- Munk Centre: most of this space is leased to the University on a 99-year lease; Trinity retains a handful of offices on the 2nd and 3rd floors of the North wing.

Occupant profile

As indicated in the description above, the project will provide housing for an additional 350 individuals: dorm-style, in a mixture of suites (self-contained washroom), single and double rooms. Generous common rooms and amenities are included to encourage community building and minimize isolation. This will alleviate housing pressure from primarily the Trinity undergraduate population, across all years.

Modern, accessible teaching facilities will alleviate the pressure felt across the teaching portfolio, supporting Trinity's teaching faculty and core academic programs across all years of study – from Trinity One to specialized senior courses, while contributing to the overall inventory of teaching spaces on campus. Final building design includes 5 seminar teaching spaces, two large classrooms and additional meeting and breakout spaces, as well as a community kitchen associated with a teaching space. All grounds, common areas and parts of the building will be fully accessible, as well as approximately 15% of student rooms.

A new dining facility will provide food service for an additional 350 residents while also providing additional variation in food programming for residents and the extended community.

The urban agriculture program will be leading-edge year-round facility designed for intensified urban food production and will serve as a food source for various facets of the food operation but also a place of study and part-time work for students through academic and other programming. This will be coordinated with the Community Kitchen, which will also serve the community broadly through extensive programming.

Extensive internal and external community space is programmed for the benefit of the entire Trinity and extended community, and includes interventions to existing infrastructure, to make the campus fully accessible. The project also allows for creation of dedicated breakout space for the existing theatre operation.

III. Project Description

a) Vision Statement

Since its founding in 1851, Trinity College has been a place of deep academic and architectural integrity imbued with a strong sense of purpose and values, an environment that encourages growth, development, and change. Trinity's mission statement reflects an on-going ambition for excellence and contribution to the world:

> *"A small, distinctive college at the heart of a great university, Trinity offers an exceptional academic experience and fosters community, responsibility and leadership."*

Trinity's recent strategic plan emphasizes the idea that the College is "first and foremost a community... built on a set of values that stress the importance of an outstanding education in a setting that values creativity and believes in contribution." Trinity has a long history in international engagement, innovation in undergraduate education and Divinity programs. Attracting and cultivating the leaders of tomorrow remains a core strength of the College, and thoughtful, high-functioning architecture will play an important role in evolving the outstanding collegiate living-learning model for which Trinity is renowned.

Trinity College is embarking on an ambitious building project which will provide much needed downtown student housing, as well as academic and meeting spaces for its world-renowned faculty and student community. Our level of ambition for this project is high, and our goal is work with our design and project team to deliver an excellent design, through a highly collaborative approach, which solves the unique spatial, technical, and programmatic challenges of our campus both for our time and the years to come. The quality of our renowned neo-Gothic quadrangle building at 6 Hoskin Avenue is compelling evidence of building to last "forever." Enduring and timeless building is fundamental to our thinking, and our goal is to achieve a fine balance between history and contemporary expression through dexterity, creativity, and collaboration.

We strongly believe in the power of architecture to bring our values to life, to create a high quality of everyday living for our students, to inspire convivial exchange, to honour history and contemporary innovation in equal measure, and to promote timeless quality and meaningful sustainability. Trinity is a diverse, multi-faith college with Anglican origins that prides itself in being an important place on the path of people capable of changing the world. Trinity remains committed to the collegiate living-learning model, with the strong mentorship, social, and academic benefits this affords our community.

Within the collegiate living-learning model, Trinity is unique in the sense of home it creates. This strong sense of being home is crucial to the character of the expansion. Due to the high demand for residence spaces, students at the broader University of Toronto can typically only live in residence for their first year, but at Trinity an unusually high percentage remain in residence for second year and beyond. Trinity's total student

enrolment is approximately 2000, consisting of the undergraduate student body and the graduate Faculty of Divinity made up of approximately 150 graduate students. Of the 470 who live in residence, about 50% are first year students, with the remaining portion made up of a declining split of upper year students. Through the addition of new residence spaces, Trinity's aim is to increase the proportion of enrolled students who live in residence to 40%.

Our enrolment will not increase: our vision is to enhance the experience for our students and staff, characterized by the kind of connection and rootedness that emerges from the multiple facets of deep community. We see this building as playing a role in creating a sense of responsibility for sustainable behaviour, and for engendering an appreciation of the way timeless and thoughtful design can improve everyday life.

Similar to the New Building, the Trinity Campus vision embraces a new era for Trinity College, building upon the strong foundation of Trinity's historic campus setting. The Campus vision acknowledges the spatial value of the campus in contributing to a quality educational experience as well as a strong sense of community. This is strengthened by implementing much needed improvements for campus accessibility, permeability and quality of public spaces. These improvements help to further Trinity's mandate of inclusiveness by creating universal access to its facilities.

The gradual evolution of Trinity's programs and uses has created a rich spatial variety in its facilities, as well as a collection of under-utilized spaces in its wake. Accessibility and day lit workspaces are two areas for improvement in the campus, as well as embracing the public realm outside the buildings as well as inside. The fenced North Field and under-valued yet heavily used loading laneway (also providing the accessible entrances to the Munk and Quad buildings) have the potential to unlock a new dimension of spatial sequencing on the campus.

In this sense the campus can also contribute to the living lab initiatives of the Butterfield Sustainability stream of Trinity One, by comparing existing spaces, uses, sun exposure, pedestrian flows etc. and seeing how future campus improvements impact the spaces and users.

The traditional college typology is built on the idea of community, framing introverted clusters of buildings around semi-permeable courtyards. The resulting sequencing of indoor and outdoor spaces, moves between a variety of characters, from formal entrance landscapes to quiet contemplative corners, the intimate Quad courtyard to the expansive view over the North Field.

By maintaining the scale and language of the traditional campus typology, embraced with a contemporary program and design language, the Lawson Centre for Sustainability becomes an emblem of past, present and

future for Trinity College, A rich new landscape palette in the reclaimed courtyards and laneways helps to both enliven and bring cohesion to the new Trinity Campus.

b) Statement of Academic Plan

Trinity's Senate is responsible for the approval of any changes to academic programs, in coordination with the University's approvals process. General principles pertaining to Trinity's academic plans are outlined in the aforementioned strategic plan and include continued investment in Trinity's signature and supported programs, Trinity One, Immunology, International Relations and Ethics, Society & Law, as well as robust academic supports and programming for all students.

No significant changes to Trinity's academic programs or units are planned in association with the Lawson Centre for Sustainability. However, of particular note and relevance, this building will fundamentally support the College's new Sustainability Initiative through embedded sustainability features and programming such as the urban agriculture operation and community kitchen. There will be addition of minimal staffing to support this, such as an urban farm manager and academic oversight. With the support of the Faculty of Arts and Science, and consistent with their recent academic plan, Trinity will supplement existing course requirements for its programs with core sustainability material to increase sustainability fluency across the College.

c) Space Requirements, Program and Functional Plan

Space Requirements

Space requirements have been determined through extensive internal consultation and master planning exercises and reflect a combination of unmet need and conservative anticipated need, ensuring financial viability. Details are provided below.

Space Program and Functional Plan

The space program for the Lawson Centre is composed of the following elements:

- **Residence** – 350 beds arranged in single, double, and ensuite studio room types
- **Food Services** – large-scale kitchen to service both new cafeteria and existing Strachan Hall dining facilities,

- **Academic and Event Spaces** – seminar and classrooms, academic office spaces, and rooftop event and conference space
- **Common & Community Spaces** – Study areas and student lounges, Community Kitchen, rooftop Urban Farm, three new exterior courtyard spaces
- **Facilities Management**, including integrated loading/waste management facility for entire Trinity College campus

The sizes of the limited number of existing classrooms at Trinity are quite variable but most are within the range of 50-70 m^2. Likewise, student rooms are also highly variable but residence rooms are generally between 9-15 m^2 (single) or 19-22 m^2 (double). As such the size of the new classroom and living space is to scale with existing facilities.

An overview of the functional program elements is shown below in Table 1. The total area for the project is 9,229 NASM and 14,068 GSM, with a gross factor of 1.5 GSM per NASM. These numbers do not include existing buildings, though the project scope includes a below-ground tunnel connection to existing Trinity College tunnels, and a ground floor connection to the George Ignatieff Theatre (GIT), and thereby, the Gerald Larkin Building (Larkin).

Functional Program	Amount	Average sqm per room (sqm)	Total Assignable Area (sqm)	Total Non-Assignable Area (sqm)	Notes
Common, Academic, and Event Facilities			1,779.50	406.70	
Main entrance foyer, Welcome Desk, and co-working space	1	104.10	104.10	196.60	
Flexible common spaces	5	427.70	427.70	210.10	Open lounge and workspaces combined with general circulation; Potential to act as breakout space for adjacent facilities
Seminar Rooms	5	70.40	352.00	-	
Second Floor Lounge	1	269.20	269.20	-	
Third Floor Class and Event Rooms	2	104.65	209.30	-	
Fourth Floor Conferencing and Event Room	1	417.20	417.20	-	
Food Service Facilities			1,243.70	-	
Trinity Café Seating area	1	319.80	319.80	-	
Trinity Café Food Service area	1	307.00	307.00	-	
Kitchen Prep, Cooking, and Storage area	1	357.40	357.40	-	Kitchen facilities for Trinity Café and existing Strachan Hall
Kitchen Office and Staff area	1	40.00	40.00	-	
Catering Prep areas	3	6.37	19.11	-	Prep areas throughout building
Community Kitchen	1	178.40	178.40	-	
Community Kitchen Dishwashing & Storage	1	15.40	15.40	-	
Community Kitchen Office	1	6.60	6.60	-	
Office Facilities			315.90	-	
Offices spaces	13	12.92	168.00	-	
Meeting Rooms	3	13.27	39.80	-	
Coffee and breakout space	3	28.73	86.20	-	
Storage and Office Support	4	8.58	34.30	-	
Residence Facilities			5,654.20	-	
Residence Common Rooms	7	85.90	601.30	-	Common lounge and full kitchen for approx. every 50 residents
Activity Rooms	3	31.40	94.20	-	Residence acitivity rooms (music, games, reading)
Laundry Room	1	26.60	26.60	-	
Flexible common space	15	13.99	209.90	-	Common lounge and study space combined with residence circulation
Mail services	1	13.00	13.00	-	
Resident Cleaning Storage Rooms	7	10.57	74.00	-	
Common Private Washrooms	48	3.59	172.10	-	
Common Private Washrooms - Accessible	7	7.96	55.70	-	
Single Units	78	9.61	749.40	-	
Single Units - Accessible	14	10.27	143.80	-	
Double Units	61	18.09	1,103.40	-	
Double Units - Accessible	11	21.75	239.20	-	
Studio Units	97	14.02	1,359.50	-	
Ensuite Washroom	97	2.80	271.60	-	
Studio Units - Accessible	17	18.84	320.30	-	
Ensuite Washroom - Accessible	17	6.51	110.60	-	
Staff/Faculty Apartment Units	2	54.80	109.60	-	
Facilities Management			235.80	1,034.60	
Building Operations Office spaces			52.40	-	
Technical systems			-	761.10	
Building maintenance			209.60	47.50	
Loading & logistics			-	226.00	
Bicycle Parking and Changerooms			68.80	-	
Circulation		-	-	3,397.60	Includes staircases and elevators
TOTALS					
Total Net Assignable Square Metres (NASM)			9,229.10		
Total Non-Assignable			4,838.90		
Total Gross Square Metres			14,068.00		
Gross Factor			1.52		

Table 1: Space and functional program, Lawson Centre for Sustainability

Non-Assignable Space

The project includes a number of non-assignable elements, which have been detailed in aggregate in Table 1. The non-assignable spaces include the following:

- Entrance vestibules
- Public Washrooms: 36 private washroom units situated throughout the building common spaces in order to accommodate OBC requirements based on occupancy studies
- Technical systems, including:
    - Mechanical and Electrical rooms located primarily in the basement level
    - Data and Communications rooms located throughout the building on each level
- Staff change rooms for kitchen facility staff
- Basement bicycle storage facility, changerooms and showers (2)
- Elevators: 3 passenger elevators (1 public and 2 residence), service elevator to accommodate food services and loading/logistics, and dumb-waiter for food service distribution
- Building maintenance facilities, including:
    - Janitorial closets located throughout the building on each level
    - Garbage rooms located on each level in the residence communities
- Loading and logistics/waste management facilities, including a new integrated loading and waste dock for the entire Trinity College campus, and tunnel connections to existing Trinity buildings

Functional Plan

The Lawson Centre for Sustainability consists of a four-level T-shaped structure along a central east-west axis bordering the north boundary of the Trinity campus, with a central pavilion that faces south down the central north-south axis of the Trinity campus.

On Level 01, the academic program elements are clustered on the west side of the building, enclosing a courtyard bounded to the south by the Larkin Building, to the west by the GIT, and to the north and east by new constructions. The Lawson Centre for Sustainability wraps around the existing GIT on the west and connects with the existing GIT lobby to provide a direct connection to the GIT and the Larkin Building. The new dining facility is located in the centre of the building. All loading and logistics for the entire Trinity College campus will be handled through a new loading dock in the north side of the Lawson Centre for Sustainability, to be accessed via the existing service lane, and connected on Level (-01) to an existing tunnel network joining Trinity's Quadrangle Building to the Larkin Building. Student residences are arranged on the east wing of the building at Level 01, and across the entire east-west axis on the upper levels.

Figure 5: Lawson Centre for Sustainability Basement (-1) program, showing mechanical and electrical, geothermal, waste storage (light grey), industrial kitchen for dining facility (dark grey), bicycle storage (tan), showers and lockers (orange), as well as underground tie-in to existing tunnel network.

Figure 6: Lawson Centre for Sustainability ground floor program, showing (L to R) main entry and theatre break-out space (pink), common meeting and study space (orange), seminar classrooms (yellow) and washroom (orange), loading and back of house (grey), central dining facility (red), east residence wing (blue), pergola (white) and proposed grounds and interconnectivity with existing campus.

Figure 7: Lawson Centre for Sustainability level 2 program, showing residences (L to R, across top in blue), common meeting and study space and washrooms (orange/yellow) and community kitchen with breakout space (pink, centre).

Figure 8: Lawson Centre for Sustainability level 3 program, showing residences (L to R, across top in blue), faculty offices and meeting spaces (yellow) and large teaching spaces (orange).

Figure 9: Lawson Centre for Sustainability level 4 program, showing residences (L to R, across top in blue). Note, split level due to differing floor-to-floor heights between residential and non-residential components of building.

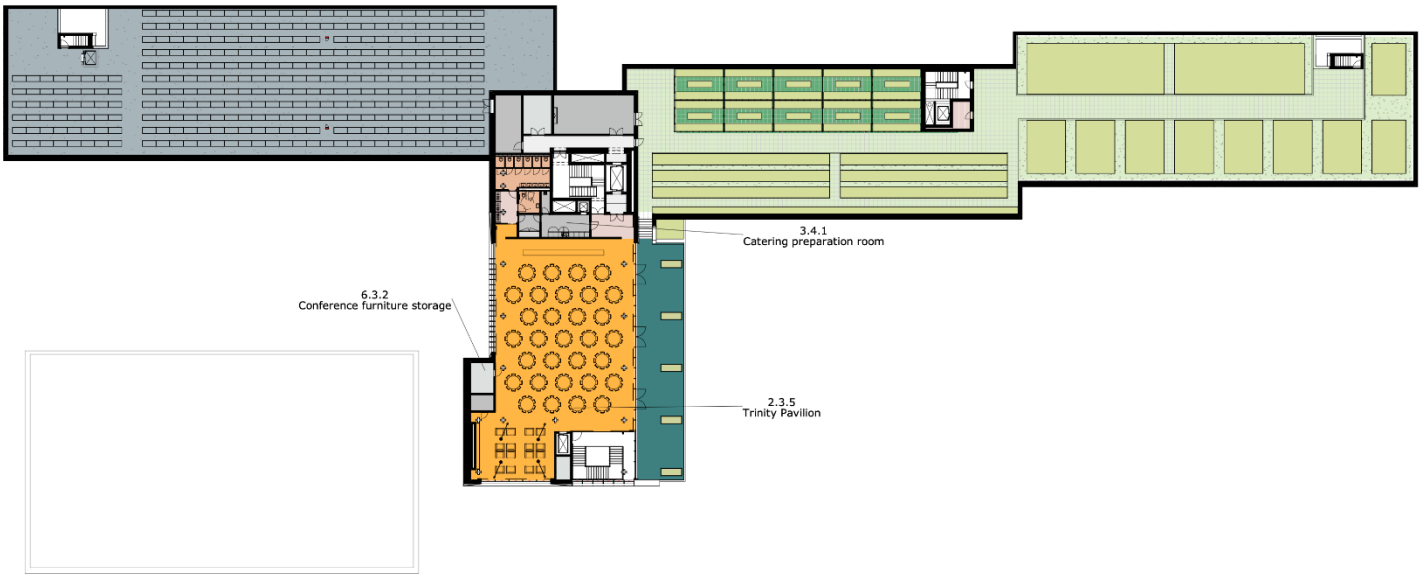

Figure 10: Lawson Centre for Sustainability level 5 program, showing (L to R) solar array for electricity generation (grey), back-of-house facilities for urban agriculture (grey) and urban agriculture operation (green) with greenhouses (dark green), large rooftop event space (orange) and adjoining outdoor terrace (teal).

Residence

Residence facilities in the Lawson Centre include:

- 280 residence units (352 beds) arranged in a modular design to allow for rational integration of different room typologies throughout the residence wings – unit typologies include:
    - Single occupancy units (w. access to common private washroom facilities located in hall)
    - Double occupancy units (w. access to common private washroom facilities in hall)
    - Studio units with private ensuite washroom and kitchenette facilities
    - Two-bedroom apartment style units (2 units) for staff/faculty

As can be seen in Table 1, as per Ontario Building Code, 15% of each unit typology are dedicated barrier-free accessible units, a proportion anticipated to greatly exceed needs by those with mobility restrictions. Trinity has taken great care to ensure a mix of possible residence configurations and to accommodate a range of socioeconomic backgrounds and needs, and discussions are underway about a bursary program to ensure those in need of residence will have access.

In the interest of building strong communities at Trinity, we have devoted much space in the Lawson Centre for common facilities and amenities. In the residences, these include:

- Study and common lounge spaces integrated within the circulation space in every hallway
- Dedicated activity rooms throughout the residence for various uses such as music practice, games, or group study
- A large residence common room with lounge space and full kitchen, located within each residence hall wing (7 Common Rooms in total)

Trinity has taken great care throughout the design process, building on established contemporary need and student feedback, to ensure robust means of community building and the fostering of wellness through built form through creation of generous common rooms and common areas within residential hallways, common kitchens, natural light, proximity to nature, walkability, and other measures.

Food Services and Urban Farm

Food is an important feature of the Lawson Centre for Sustainability, featuring significantly in various ways, including:

- Industrial kitchen facilities, servicing new and existing dining operations
- New dining facility to serve residents in the new development and other community members
- Community Kitchen facility modelled on a teaching kitchen/multipurpose event space

- Rooftop urban farming and greenhouse operation

The rooftop urban agriculture program will produce significant volumes of produce, including year-round production from the greenhouses. The significant new dining facility and industrial kitchen in the heart of the building will roughly double Trinity's current food production, providing a new facility for made on site meals available to all Trinity community members. The Community Kitchen on Level 02 becomes a multi-functional event and teaching space, creating a teaching kitchen for urban farming events, hosting cooking and other classes, larger student meals and broader community initiatives. These facilities are complemented by residence kitchens within lounges on each residential floor, creating both variety and flexibility in how students live and study in the Lawson Centre for Sustainability.

Academic and Event Space

- Seminar and classroom spaces
- Trinity office space
- Event uses and pavilion

Common Space

- Lounge spaces
- Community Kitchen
- Campus integration

Facilities Management

- Loading and waste management for entire campus

d) Building Considerations & Sustainability

Standards of construction

- High level of sustainability – seeking LEED Platinum and Zero-Carbon certifications through CaGBC
- Materials built to last with minimal maintenance – durable
- Aesthetics and materials relating to and complimenting the existing heritage aspects of adjacent College buildings
- Optimize features such as natural light/shading for wellness and sustainability goals

Building Characteristics and Massing

Floor-to-floor heights and Elevation

Floor-to-floor heights differ in general between the primarily residential east-west wings of the building, and the academic/common use south wing.

In the residence (east and west wings), the levels above grade include:

- Ground level – entrance foyer and academic use in the west wing, residence in the east wing
  - 4.5 m floor to floor
- Second level – residence in both wings
  - 3.2 m floor to floor
- Third level – residence in both wings
  - 3.2 m floor to floor
- Fourth level – residence in both wings
  - 3.2 m floor to floor

The south wing, which includes most of the mixed-use spaces, includes:

- Ground level – Trinity Café food service facility
  - 4.5 m floor to floor
- Second level – Community kitchen and common lounge facilities
  - 4.5 m floor to floor
- Third level – academic spaces and offices
  - 4.5 m floor to floor
- Fourth level – conference and event space
  - 4.0 m floor to floor

The total maximum building height is approximately 17.5 m. Sections of the various building wings have been included for reference as appendices.

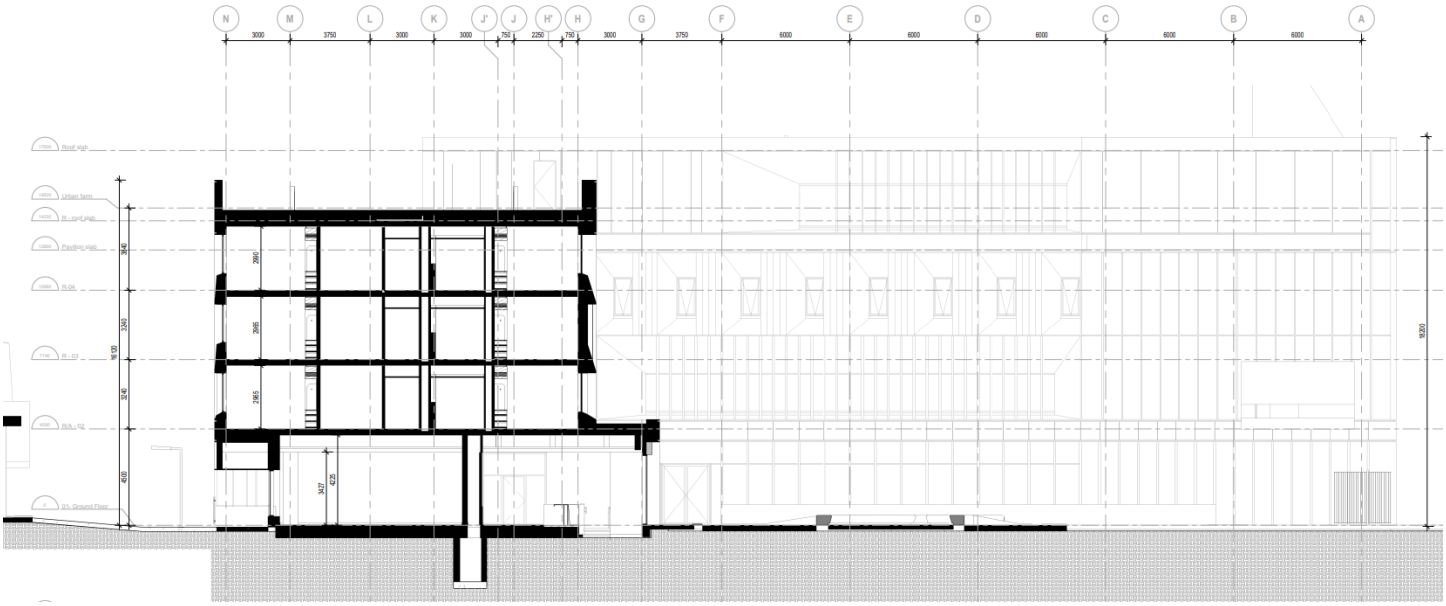

Figure 11: Profile section, West Wing, facing East

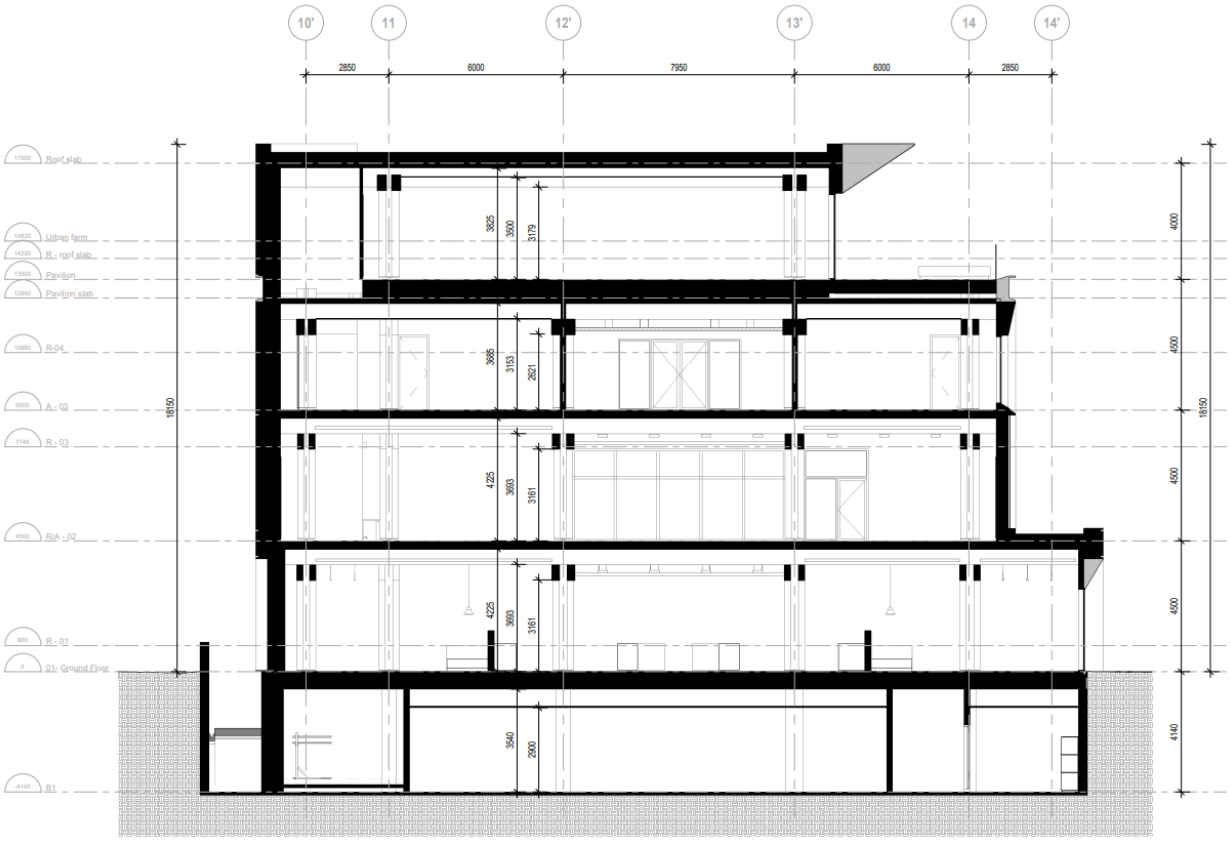

Figure 12: Profile section, centre Pavillion structure

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Basement Facilities

Mechanical systems are housed almost exclusively in the basement level of the building, in order to facilitate multiple core sustainability program elements on the rooftop level (solar panels, urban agriculture, green roof). Along with facilities management, the basement level also includes:

- Industrial kitchen facility which services both the next ground level dining operation in the new building, as well as the existing Strachan Hall dining facility in the existing 6 Hoskin Trinity College building; ground floor food services will also include retail service ultimately replacing the Buttery
- Tunnel connection into an existing tunnel which connects the 6 Hoskin Trinity College building, the Larkin Building, and the new building – to be used for back-of-house coordination, particularly food service and logistics/waste management
- New, integrated loading, logistics, and waste management facilities coordinated with ground level loading dock
- Indoor bicycle parking facilities, showers (2) and locker room area for commuting cyclists

Elevators

While a key design goal of the Lawson Centre is to build a highly walkable building, all aspects of the building will provide a high level of accessibility which complies with all applicable regulations. Three passenger elevators are included in the design – one public elevator at the south wing of the building, and two elevators to serve the residence areas. There is also a service elevator located in the centre of the T-shape of the building, which accesses every level in the building with doors from either side.

Built Form

- T-shape structure
- Responding to scale of campus
- Balanced, proportional volume to frame the context, courtyards and campus
- Optimizes urban farm potential
- Maintains a walkable scale
- Materials, articulation of façade responding to adjacent heritage context
- Masonry base (limestone), aluminum above
- Shadows – no net new relative to as-of-rights

The Lawson Centre for Sustainability creates a place to celebrate community, reflects a shift in how students wish to both live and learn on campus, inspires students to engage and re-think their relationship with the environment and reflects the aspirations of Trinity College to provide a cutting-edge education while celebrating its historic setting.

This vision evolved from a fourteen storey mid-rise tower, restricted to the existing Larkin surface parking lot, to a four-storey 'T' volume which frames and embraces the scale of the College. This human-scaled intervention creates a built edge along the northern perimeter of the campus, in turn facilitating two key campus transformations: unlocking the North Field and Trinity Lane, two new key public realm features on the campus.

The traditional college typology is built on the idea of community, framing introverted clusters of buildings around semi-permeable courtyards. The resulting sequencing of indoor and outdoor spaces, moves between a variety of characters, from formal entrance landscapes to quiet contemplative corners, the intimate Quad courtyard to the expansive view over the North Field.

By maintaining the scale and language of the traditional campus typology, embraced with a contemporary program and design language, the Lawson Centre for Sustainability becomes an emblem of past, present and future for Trinity College. A rich new landscape palette in the reclaimed courtyards and laneways helps to both enliven and bring cohesion to the new Trinity Campus.

By extending across the North Field, the Lawson Centre for Sustainability embraces the scale of the campus and frames the end of the new Trinity Lane, while along Devonshire Place a new entrance wraps around the GIT to connect to Larkin.

The 'T' shape volume is broken into segments which shift to frame the newly formed courtyards around the GIT and in the newly imagined North Field. The projecting volumes to the south also provide additional sun protection on the ground floor. A covered pergola extends the central axis from the main Quad to the New Building, with the possibility to create a secondary access from Philosopher's walk.

The academic and common programs wrap around the new GIT courtyard to extend into the southern axe of the 'T', creating a new communal hub at the end of Trinity Lane. Residences frame the North Field spaces parallel to the Quad spaces, extending on the upper floors to Devonshire Place.

The extended rooftop becomes a prime display of Trinity's sustainability and urban farming initiatives, with PV panels along the west wing, urban farming to the east and the Trinity Lane Pavilion at the centre, with stunning views of the campus, the city and the newly landscaped Trinity Lane.

Sustainability design and energy conservation

Like the University of Toronto, Trinity College has very high ambitions with regard to sustainability and through this project intends to exceed, where possible, environmental standards, regulations and guidelines. Serving as a leading example on sustainability is integral to the Lawson Centre for Sustainability and that this is interfaced

with campus life and curriculum renewal. In keeping with the naming of the Lawson Centre for Sustainability, the building will feature several large-scale building systems and the building design puts a particular emphasis on passive systems design. The design will meet LEED "Platinum" and Canadian Green Building Council "Zero Carbon Building Framework" criteria and Trinity intends to commission as well as officially certify to these standards.

Trinity is working closely with the University's Chief Operating Officer, Ron Saporta, and Presidential Advisor on Sustainability, John Robinson to ensure consistency with the University's broader planning and carbon-reduction strategies, and to ensure the Lawson Centre for Sustainability serves as a leading example which continues to advance the University's leading work on sustainability in relation to built form and societal impact. In addition, U of T has joined the University Climate Change Coalition (UC3); a group of 13 leading research universities in North America committed in reducing greenhouse gas (GHG) emissions on their own campuses and in their communities. In doing so, the University of Toronto is committed to reducing its scope 1 and 2 greenhouse gas (GHG) emissions by at least 37% below its 1990 level of 116,959 tonnes eCO2 by 2030, working towards becoming a net-zero GHG institution, and this building will support these goals.

The Lawson Centre for Sustainability is committed to meeting, at a minimum, the energy standards set out by the University of Toronto's Energy Performance and Modelling Standard (April 1, 2019) which stipulated that Energy Efficiency for New Construction Capital projects must be 40% better than ASHRAE 90.1-2013 at a minimum, with components which have payback of less than 15 years. Since the issuance of these standards, the University has also introduced the Tri-Campus Energy Modelling & Utility Performances Standard. This new standard provides project-specific energy and water efficiency targets, which are believed to be necessary to achieve the 2030 goal, while also introducing a streamlined modelling and documentation submission approach. While the residence project was initiated under the April 1, 2019 standard, the current planning and design of the project aspires to a higher degree of sustainability and energy conservation in keeping with and potentially surpassing the current Performance Standard. Trinity will continue its close collaboration with the University of Toronto in order to comply with, at a minimum, the project-specific efficiency targets set out by this modelling.

More broadly, the Lawson Centre for Sustainability is designed to meet Toronto Green Standard V3 Tier 2 requirements at a minimum, and is adopting features from various sustainable rating systems, including Living Building Challenge®, WELL®, and others, as a guideline to establish a sustainability strategy that is unique for this building and responsive to the Trinity community and academic mandate of the University. The College is also working to retain commissioning consultant services to integrate into the project team imminently, and prior to completion of Design Development.

Framework	Original Target	Current Achievement	Areas for Enhancement	Potential Achievement
LEED	Gold	Platinum	- Confirm costing on platinum measures - Contract a commissioning agent - Review and assess pending items	Platinum
TGS	Tier 2	Tier 1 + Tier 4 Energy Requirement	- Water savings - District energy connection - Optional Tier 2 measures	Registration in Tier 4
Net Zero Carbon	Energy Requirement	Energy Requirement	- LCA for embodied carbon	ZCB Certification

Table 2: Potential (intended) targets for Lawson Centre for Sustainability relative to established Sustainability Frameworks (source: Footprint Consulting)

Major design features of the Lawson Centre for Sustainability included in the design are depicted below (Figure 13) and include:

- Hybrid mass timber/concrete structural design
- Geothermal-source heating and cooling with distributed chilled beams/radiant heating and cooling
- Enhanced building envelope design to achieve highly efficient thermal and airtightness operating targets
- No use of natural gas in the building with exception of emergency back-up generator
- High-efficiency and highly effective ventilation system for maximum IAQ
- Rainwater collection and reuse system with below-grade cistern
- Rooftop photovoltaic array for energy generation
- Rooftop agriculture program, including an outdoor farmed area and rooftop greenhouses
- Addition of planted green roofs where possible, in combination with setbacks and other building design features
- Advanced measurement and verification
- Ample bicycle parking, including an indoor facility with showers and lockers

Additional features will include:

- Energy efficient lighting and controls, coordinated with natural light where appropriate
- Energy efficient equipment and fixtures
- Flexible building automation systems (with occupancy/occupant load sensors to moderate HVAC and lighting levels)
- Zoned HVAC control wherever beneficial and desirable
- Durable, local materials with renewable and/or recycled content
  Provision of recycling depots for source-separation of waste throughout the building to meet the needs of the University's recycling and waste reduction programs and vehicular access to these sites
- Low-use systems for flushing toilets and urinals
- Water-efficient fixtures and combined water fountains/bottle-filling stations

Along with these design features, the College wishes to pursue a holistic sustainability vision throughout the process of building the Lawson Centre for Sustainability, to include exploration and possible incorporation of the following:

Material & Resources:

- Consideration and preference for materials with environmentally, economically, and socially preferable life-cycle impacts: more efficient water use; waste diversion; efficiencies to reduce greenhouse gas emissions; articulated as a key principle for construction in oversight of Construction Management.

Environment & Ecology:

- Healthy soils, water, trees, and wildlife habitat; accessible nature; vegetated roof spaces; mitigation of heat island effect; natural processes integrated into build environment.

Wellbeing & Community:

- Strong student, faculty and staff engagement in sustainability vision
- Preservation and celebration of the campus's culture and history
- Potential for education and leadership through connection within and outside campus
- Encouragement of active living based on walkability and recreation

Finally, Trinity has set very aggressive energy modeling targets and continues to hone and improve modeling through design iteration, and will be conducting extensive life-cycle analysis. A comparison of modeled values from the energy modeling for the Lawson Centre for Sustainability is shown below in Table 3, as compared to various standards.

	TEUI (kWh/m^2)	TEDI (kWh/m^2)	GHGI ($eCO2/m^2$)
Industry Targets			
TGS Tier 1 Residential	165	65	20
TGS Tier 2 Residential	130	40	15
TGS Tier 3 Residential	100	25	10
TGS Tier 4 Residential	70	15	5
U of T Energy Targets	74	32	4.8
Our Performance - Commercial Kitchen Included			
50% DD Design	71	47	2.8
With Zero Carbon upgrades	53	31	2.2
Our Performance - Commercial Kitchen Excluded			
50% DD Design	68	37	2.7
With Zero Carbon upgrades	49	21	2.1

Table 3: Current energy modeling for the Lawson Centre for Sustainability, as compared to standard target

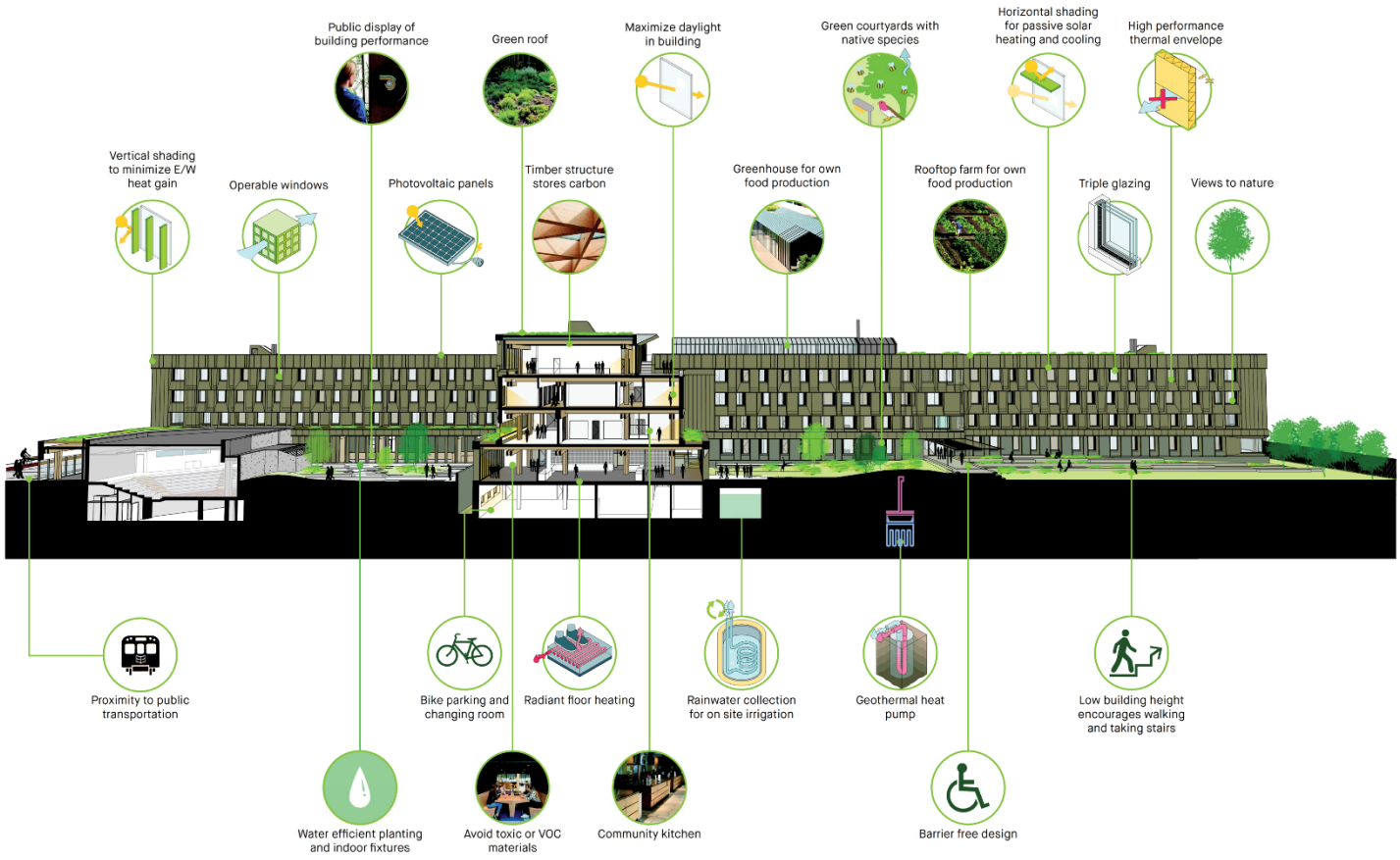

Figure 13: Lawson Centre for Sustainability in profile, highlighting major sustainability features. Top (L to R): vertical shading to minimize E/W heat gain, operable windows, public display of building performance, photovoltaic panels, green roof, timber structure, greenhouse for food production, green courtyards with native species, rooftop farm for food production, horizontal shading for passive solar heating and cooling, triple glazing, high performance thermal envelope, views to nature. Bottom (L to R): proximity to public transit, water efficient planting and indoor textures, bike parking and change room, avoid toxic VOC materials, community kitchen, rainwater collection for onsite irrigation, geothermal heat pump, barrier free design, low building height to encourage walking and taking stairs.

Accessibility

Trinity shares the University's commitment to equitable access to all of the building's facilities by the whole campus community. A fundamental aspect of the vision for the Lawson Centre for Sustainability is provision of a facility which can be used and enjoyed by all users, regardless of mobility restrictions. As such ensuring

universal barrier free access is not only a building code requirement, but a fundamental design principle to achieve project success.

Accessibility features of the Lawson Centre for Sustainability will include:

- Barrier-free arrival and access to the building at all entrances and exits
- Accessible drop-off zone at main entrance, accessed from Devonshire and/or loading lane
- Way-finding (including accommodation of visual impairment)
- Universal washroom facilities with change tables included in close proximity to all common-use areas, including on the main ground floor thoroughfare, located mid-way between main classroom space and dining facility
- All washrooms, including public and residence washrooms, will be designed for use by all genders
- All required facilities for the needs of wheelchair or mobility device users, visually impaired people and people with hearing impairments
    - All publicly-accessible spaces, teaching & learning spaces, common spaces, grounds, and residence facilities will be designed in accordance with accessibility requirements
    - Good physical conditions: light, sound, visual cues
    - Vertical and horizontal barrier free access
- 15% of residence units designed barrier free, with a 2.5m turning radius

Personal safety and security

Functional zoning is an integral part of the spatial design and functional arrangement, enabling different parts of the building to open at different times of the day, and year, while maintaining necessary security and access controls to parts that are closed, or only accessible to certain users (i.e. student residences). This creates a logical spatial organization which minimizes control points and security barriers. Security access can be categorized into 3 levels:

- Public (open access during operating hours)
- Group (authorized user groups i.e. residents or staff)
- Individual (resident rooms or staff offices)

The general principle applied is the requirement of sufficient security without it being too visible or influencing the building's appearance to users. Key principles include:

- Security is to be unobtrusive but effective
- 'Natural ways' of security:
    - 1] social control by users, enabled by creating overview and sight lines

    - 2] demarcation of areas by layout of areas or furnishing, rather than creating barriers
- Requirement for highest industry standards where needed
- The security system should be very flexible and adaptable, to accommodate any future building changes
- Exterior and interior lighting design to ensure entrances and circulation areas are well lit, safe and secure
- Residents quarters on ground floor to be secured with perimeter fencing or security landscaping.
- Panic/exit hardware on secured doors for emergency egress

Building Access

Access to the building will be controlled at three primary points: the Devonshire (main) entrance, the entrance to the central south pavilion (food services) and the entrance to the East residence wing.

There will be an adjoining welcome desk at the main entrance that is staffed at all times. The entrance into the pavilion will correspond with standard building and meal hours and be locked after hours.

All entry-points into the residence components of the building will be secured and fob-controlled, and monitored regularly by College staff.

Grounds

Similar to the existing campus management, the grounds on which the Lawson Centre for Sustainability sit will have perimeter fencing but be open to the public during business hours. The entrance to new courtyard and playing field that is generated will be gated and secured after hours for the protection of residents and campus safety.

Residence Security

Ensuring that students living in the Lawson Centre for Sustainability feel safe, but also at home, is a key design consideration. Residence areas will be secured through key/fob controlled entrances accessibleto authorized individuals (and their guests, as determined by Trinity College policies) at all times. Entrance points will be located at every junction between common academic areas and resident areas, including vertical connections. Residence quarters on the ground floor should be secured with perimeter fencing or security landscaping features. Each residence floor is configured with the same amenities to enable flexibility in programming and access controls based on seasonal needs or Trinity College policies:

- Gender preferences (or no preference)
- Trinity students staying over summer
- Hotel users or summer student program participants

- Access control by floor or open access to residents

Campus Oversight

This new addition to the Trinity campus and the grounds upon which it sits will be overseen in a manner consistent with the current Trinity campus operation. Onsite security personnel will staff welcome desks, and complete regular building rounds and lock schedules. Onsite staff such as dons and summer supervisors will oversee the day-to-day operations under the supervision of senior College staff, the Dean of Students and Building Manager primarily, with the support of additional building management and student life staff.

Campus Police and other centralized University services will provide additional support as required.

Signage, donor recognition

The naming of the Lawson Centre for Sustainability was approved by the Trinity College Board of Trustees in January 2020. To date, Trinity has discussed the naming of the building as a whole with Joannah and Brian Lawson, and the naming of an additional wing of the building with another donor.

At Trinity, naming rights are guided by Trinity's Board-approved naming policy, which is generally consistent with that of the University, and discussed with donors with the intent of ensuring satisfaction of donors, as well as recognition.

Efforts will be made to ensure consistency with the design principles in place at the University, and Trinity will consult with the University as necessary; Trinity welcomes the advice of the Design Review Committee.

Non-assignable space

Consists primarily of loading, building-related facilities and back-of-house utilities, as listed in Table 1.

Mechanical/Electrical and Data

Please see later sections for technical details.

Mechanical:

- Geothermal heating and cooling with chilled beams/radiant floors throughout because:
    - Sustainability
    - Occupant comfort and wellness
- No connection with central U of T steam/heating cooling

Electrical:

- on-site generation with PV array, complementing our existing facility
- All-electric appliances
- U of T HV loop connection

Data

- Continuation of existing Trinity set up
- U of T fibre connection

Environmental Health and Safety

Emergency lighting will be required both in the building to allow safe egress from the building and for safety of residents in the courtyards and public gathering areas heavily populated by the community at night. Camera monitoring of these areas outside the building will also be incorporated. Environmental emissions will primarily be from the kitchen/servery and from the back-up generator, if in use (vented to roof).

Food preparation areas will be a safety focus with eye wash stations, fire suppression and extinguishers, and management of grease and other containments necessary. Use of induction and electrical appliances in the kitchen facilities will mitigate some risk associated with personal injury.

Care will be taken to ensure appropriate enclosure of the rooftop agriculture operation in accordance with Code and other safety requirements. Mechanical, caretaking, electrical rooms and other pertinent rooms will need to be provided with eyewash, emergency shower and the safety provisions as required by both University and Authorities having jurisdiction standards. Safety design requirements for receiving areas and loading docks will include engineering controls such as vehicle restraints, dock plates dock barriers and bumpers and dock doors and seals, CO monitors and all other safety features required. Ergonomic design of mechanical rooms will be paramount to allow ongoing operation of the facility and protection of maintenance staff performing both routine and specialized maintenance. Standby power to allow egress and keep occupants safe and warm during a prolonged power failure will be required.

Dormitory rooms and residence common rooms and halls will be outfitted with standard life safety equipment.

Any common area fireplaces – currently 2 to 3 are proposed for central common areas – will be sealed and/or accessed only by staff and equipped with appropriate signage.

e) Site Considerations

Site context

The proposed development site is located at 15 Devonshire Place and is directly adjacent to Devonshire Place to the west, University of Toronto's Varsity Stadium to the north, Philosopher's Walk to the east and the GIT,

Larkin Building, and Trinity Main Quadrangle to the south. This portion of the Trinity College lands currently includes the Gerald Larkin Building and the GIT, a surface parking lot, and the Trinity College North Field (development site shown below, Figure 14).

On the northern edge of the property boundary is an existing 6m service and emergency lane which currently serves the Varsity Stadium and must be maintained as a clear access route, but which will also become the access point for loading to the Lawson Centre for Sustainability.

The Main Quadrangle Building (6 Hoskin) and the Munk School of Global Affairs are listed by the City as heritage buildings; the city has also indicated that the Gerald Larkin Building will soon be designated heritage status (as indicated in written communication from City planning), but that the GIT will not be designated heritage status. According to the University of Toronto Secondary Plan in section 3.2 Heritage, *Development will conserve the attributes of significant heritage resources in accordance with the policies of the Official Plan.*

The Heritage Impact Assessment for the Lawson Centre for Sustainability prepared by ERA Architects in March 2019 identified mitigation measures including minimizing connections between itself and the Larkin Building, as well as maintaining setbacks to preserve the visibility of the Larkin elevations. Further consideration has been identified to integrate with the existing campus landscape through semi-enclosed green spaces and permeable pedestrian and circulation routes.

Master Plan

Throughout planning and design, Trinity has worked closely with the University and the City, endeavouring to follow core principles of the University's proposed secondary plan in alignment with City feedback:

- ensuring campus porosity while fostering public accessibility
- thoughtful integration with surrounding city elements and character
- suitability to neighbourhood and unique character of surrounding campus
- honouring neighbouring heritage structures through appropriate setbacks and design
- preservation of important campus and City sight lines (i.e., views north from King's College Circle)
- appropriate scale and beauty in design
- maximizing overall potential of site while minimizing use for surface parking
- furthering the University as a leader in sustainability both by City and University standards
- balancing density with retention of open unprogrammed outdoor space
- design fosters safety and security of eventual inhabitants
- making a lasting and positive contribution to the City and the University campus

Trinity has also taken great care to conduct an internal campus master planning exercise with the expertise of Mecanoo and Acronym Urban Design and Planning, informing longer-range planning for the campus. These studies have been complemented by Trinity's own strategic planning exercise and report, and countless reports

and projections from the University, the City and beyond (eg, enrolment, housing projections), providing strong rationale and support for the need for additional space in the form of a new structure of this scale and scope.

Zoning regulations

The development site is currently zoned Institutional in the former City of Toronto Zoning By-Law 438-86. The envelope for the site has a maximum height limit of 20 m, with a requirement for a minimum landscaped courtyard area of 1,000 m^2 within the envelope boundaries (see below, Figure 14, showing proposed building envelope overlaid with existing zoning per above By-Law). The development site is not subject to City of Toronto Zoning By-law 569-2013. On March 12, 2019, the College submitted a Zoning Amendment Application to the City to modify the permitted building envelope from 20 m to 48 m. This application is ongoing and has been recently amended to reflect the current proposed building volume based on the Schematic Design, and resubmitted to the City (December 9, 2019), with a maximum height of 17.5m.

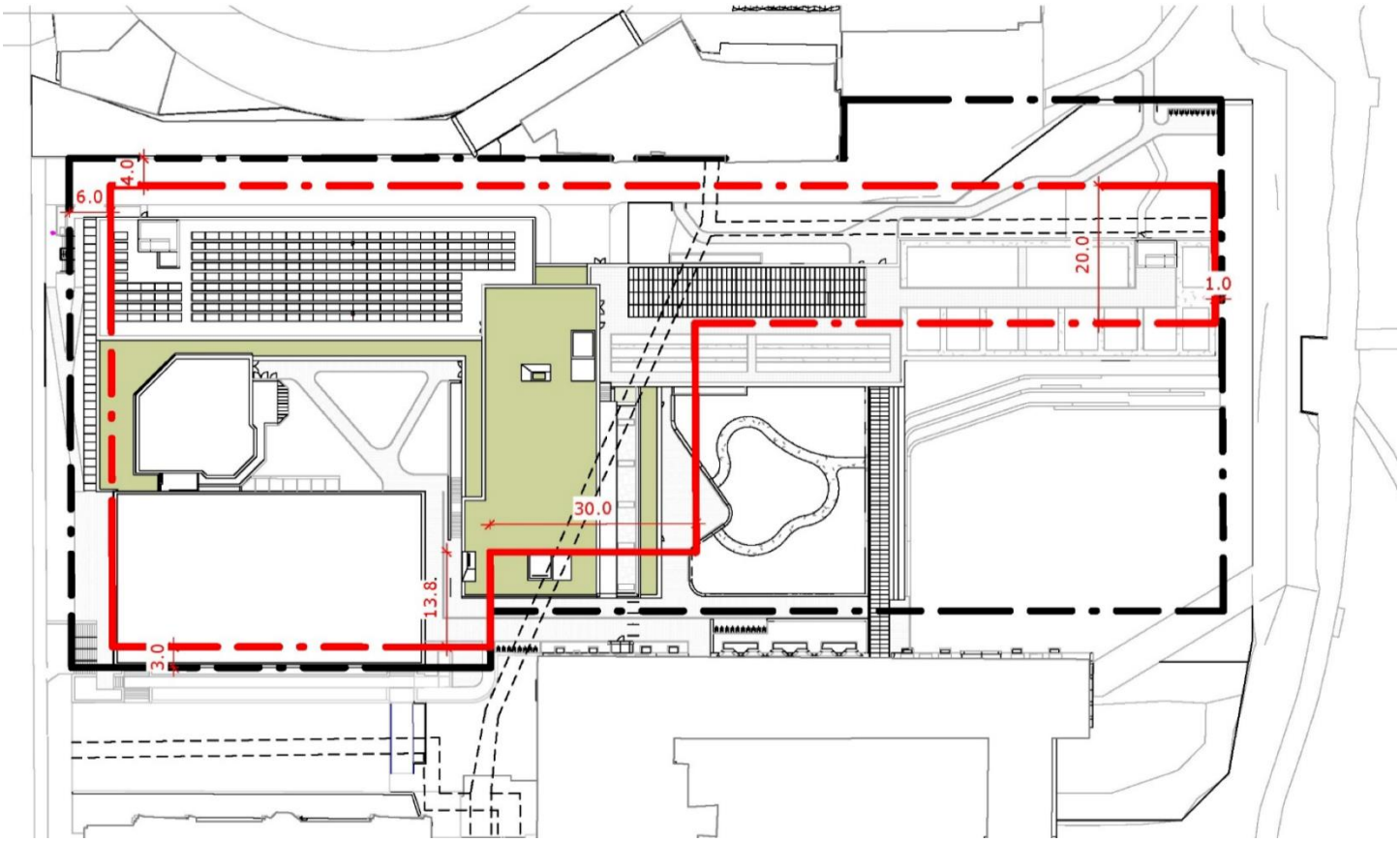

Figure 14: Footprint of Lawson Centre for Sustainability is overlaid onto Trinity College grounds. Full site bound by black hatched lines, existing zoning in red (up to 20m)

Trinity College
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Environmental issues, regional conservation, Ministry of the Environment

Trinity has taken a considerate approach to the proximity of the site and proposed building to Philosopher's Walk and Taddle Creek, as outlined below under Landscape. Slab-on-grade will be the method of construction of the most easterly wing abutting Philosopher's Walk, as such there will not be extensive excavation. The site has been an open play field since Trinity's early days and has not been built upon prior. Geotechnical studies have been completed and do not indicate any areas of concern. Principles of sustainability, biodiversity and indigenous planting will be applied in landscaping the site. Between the urban agriculture operation, green roofs, landscaping and buried rainwater cisterns the site will facilitate extensive stormwater management.

Landscape and open space requirements

While Trinity College operates independently from the University of Toronto, in landscape they become linked through a rich public realm network existing out of parks, open spaces, sidewalks, plazas and courtyards. The urban design guidelines illustrate a network of potential shared streets to strengthen the public realm and open space network. Our strategy is to emphasize these connections and to make a continuation in the sequence of open spaces and courtyards, and the finer grain of spaces which make Trinity College unique.

Open spaces should promote comfort, safety and accessibility. The configuration of open spaces varies across the campus, but open spaces should collectively contribute to an overall network with diverse functions in combination with campus buildings.

The Courtyards and forecourts of Trinity College have a rational formal design. The Philosopher's walk is the opposite; the meandering landscape with level differences where the path resembles the original stream of the Taddle Creek. The existing delivery lane between Trinity College and the Munk Centre/Graham Library is programmatically anchored as "the" central spine of the campus with (barrier free) access to key common facilities including the Graham Library, the Chapel and Strahan Hall, as well as the Gerald Larkin Building and Buttery. Aesthetically, however, it reads primarily as a delivery lane, its secondary function. By relocating deliveries to the North side of the Lawson Centre for Sustainability, this central corridor becomes Trinity's campus equivalent of Philosopher's Walk: a meandering path surrounded by planting and multi-stem trees, connecting to all buildings.

The North Lane then becomes the new shared connection for deliveries and pedestrians, with drastic reduction in overall traffic along this lane, following the removal of the parking lot. This new landscape will prioritize pedestrian traffic while accommodating logistical needs. The shifting volume of the new building frames existing trees while a planted green edge along the building gradually increases in width and density, blending seamlessly into Philosopher's Walk. Planting will be balanced with lighting design to ensure the connection is both safe and welcoming.

The streetscape along Devonshire Place highlights the new connection between the Lawson Centre for Sustainability and the Gerald Larkin Building, with a forking sloping path providing barrier free access to both buildings. The raised walkway along the building, protected by a canopy above, widens at Larkin to create a new outdoor seating area for the Buttery and George Ignatieff Theatre.

The Lawson Centre for Sustainability's T shape, combined with a new pergola connection, frames three new courtyards. These courtyards create an extension of the existing public realm of forecourts and courtyards in the College, however the language of these new landscapes is intended to add new variety to the existing formal landscapes. By combining hard and soft landscapes in different combinations, each courtyard has a different yet complimentary character. The Academic courtyard between the GIT and new café is intended as a quieter space for contemplation, however can also serve as a breakout space for events in the GIT. The central Café courtyard is intended to be a social garden, where users can eat outside, or sit amongst nature in the central garden. The easternmost courtyard is the most informal, with a large open field for recreational sports framed by the pergola to the west, a terraced planting to the north with integrated seating, and the natural edge of Philosopher's Walk to the East.

The planting of the courtyards, open spaces and rooftop farm combine seasonal planting which change in character throughout the year as different plants come into season. Spring is welcomed with flowering bulbs and blossoms. The landscape experiences great trans- formations when the temperature rises into summer. Perennials and grasses grow back and some give a spectacular display of extravagant flowering. During the summer season flowers alternate, some will keep their silhouette when autumn arrives. During autumn grasses turn yellow and trees can have spectacular red, purple or yellow leaves. As the temperature drops, evergreens and silhouettes of dried grasses and perennials are gradually covered by snow, the white landscape contrasting the vivid colours of summertime.

Indigenous plantings will honour early inhabitants and be matched with seasonality and typical precipitation. A large rainwater collection cistern will be located beneath the central café courtyard and used for irrigation purposes. Where possible, fruit trees and other suitable and food-bearing plantings will be incorporated.

Site access

The image below depicts the various means of site access as outlined in the embedded legend. Notably, all access and grounds surrounding the Lawson Centre for Sustainability will be barrier free and fully accessible, as depicted with solid red and hatched blue lines in Figure 15.

Vehicular drop-off zones are located at the North-West corner of the site, at the main entrance and will be accessed primarily via Devonshire Place, but the North Lane is also available for busy periods, including move-in. This general area shifts from entry and egress of the existing parking lot to a loading zone for both Trinity and the Varsity Centre. Further East along the North Lane, the North entrance to the East wing becomes another barrier-free entry-point that can also be used day-to-day or for busy periods such as move-in.

Bicycles may enter the site from any of the various barrier-free locations and parking has been designated for approximately 50 bicycles indoors, via ramp below the central pavilion and dining facilities, as well as outdoors at the south end of the pergola.

Consistent with University of Toronto campus redevelopment and centralized planning for campus parking, surface parking lots are discouraged and Trinity campus will no longer provide vehicular parking on this site.

The North Lane will remain an unobstructed fire lane (access to Varsity Arena and Varsity Centre Field House) and will function similarly to a w*oonerf*, a living shared streetscape with continued pedestrian flow from Philosopher's Walk and deliveries and waste removal from the Trinity campus consolidated to the loading dock of the Lawson Centre for Sustainability.

Trinity has had extensive discussion with the Dean and senior leadership of Kinesiology and Physical Education about the impacts of shifting loading to the North Lane and the impacts this might have on pedestrian traffic and servicing to the Varsity complex. Overall, conversations have been positive and are ongoing.

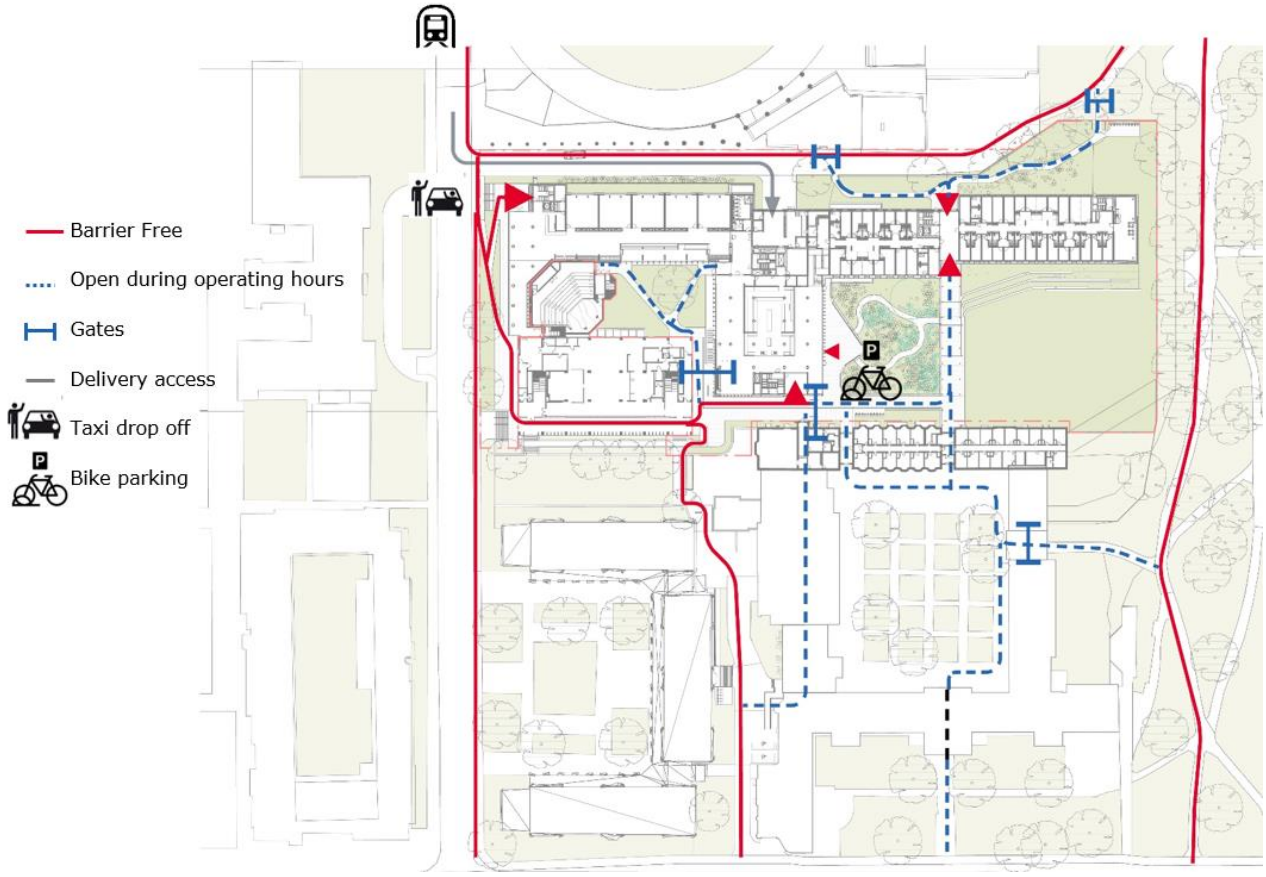


Figure 15: Barrier-free access to Trinity Campus following construction of the Lawson Centre for Sustainability.

Heritage status

The Lawson Centre for Sustainability will be located within the historic core of the University of Toronto campus, and will be central to the Trinity Campus; its erection will be transformative to the completion of the campus. Historic Trinity College (6 Hoskin Avenue) was assigned heritage designation by the City, and Trinity has recently been notified that the same designation will soon apply to the Gerald Larkin Building (but not the GIT). In their most recent communication to Trinity, city planning and heritage staff encouraged the creation of architectural bridging between the Lawson Centre for Sustainability and the Gerald Larkin Building in a manner that will create architectural cohesiveness and enhance the functionality of the GIT. With the exception of the Gerald Larkin Building, the Lawson Centre for Sustainability will have no other connections to existing buildings on the Trinity campus (with exception of underground tie-in to the existing tunnel between 6 Hoskin and Larkin) and its design has been careful to accommodate and contribute to the surrounding context.

Trinity College
UNIVERSITY OF TORONTO

Soil conditions

Boreholes were drilled across the full proposed footprint of the building: the Larkin parking lot and back field, and the soil was analyzed; water flow and other factors were also assessed.

The parking lot of the Gerald Larkin Building, below the topsoil and earth fill layers is predominantly underlain by still to hard silty clay to the depths from 9-11 m below grade, followed by the stratum of the dense to a very dense silt/silt to the end of the investigation dept.

The earth fill layer in almost all of the boreholes was encountered below the topsoil veneer, extending to depths ranging from 1.4 to 2.5m below grade. Excessive earth fill was contacted at two boreholes in particular, extending to depths of 3.6m and 4.8m, respectively: these two boreholes are located at the northeast corner of the site, nearby the buried creek, and this area may need to be replaced with inorganic engineered fill if sorting-free of the deleterious materials is impossible.

At this point, the recommended Soil Bearing Pressures are 150kPa (SLS) and 240kPa (ULS) for the conventional footings founded on sound native soils. The total and differential settlements of the footings are estimated to be 25mm and 15mm, respectively.

Groundwater levels were recorded at varying depths in the boreholes within the clay stratum. But generally speaking, the yield of groundwater in the silty clay will be slow in rate and limited in quality. During excavation, any water seepage can be drained into sump and removed by conventional pumping. Couple silt samples at lower stratum are really wet and may be saturated.

Generally speaking, the site has been deemed suitable for building with no major concerns, though some replacement of sub-soil may be required in the North-East corner of the site prior to building. A full, detailed report is forthcoming.

Site servicing; existing and proposed

An essential intervention for improving overall accessibility on campus is the relocation and optimization of the loading and waste management facilities in the Lawson Centre for Sustainability. These facilities will serve the entire campus and enable the current delivery lane between Munk and the Quadrangle to transform into the main accessible pedestrian axis on campus, following completion of building.

The loading area will facilitate delivery trucks unloading goods without obstructing the North Lane itself or any adjacent roadways. It will enable deliveries to be easily brought into the building, with appropriate security controls to prevent unauthorized access.

As part of a logical functional organization, a clear routing of deliveries and waste management from the loading bay to a dedicated 'back of house' area is required and has been designed into the building. This area will not be accessible to visitors, academic staff or students. This connection is facilitated through a dedicated service elevator to enable the movement of deliveries and the removal of waste from the New Building, Larkin and the Main Quadrangle. These services are connected through a new tunnel which connects to the existing tunnel infrastructure on level B1. The service elevator will connect to every floor to facilitate easy distribution of goods and furniture, and the removal of waste as needed throughout the building.

	Vehicle Type					
	Type C1	Type C2	Type B	Type A	Type G	Total
Quantity (average day)	5	6	2	0	1	14
	Passenger car, van	Cube van, step van	Single unit truck	Tractor Trailor	Refuse truck	
	5.5m	4.9m	7.3m		7.7m	

Table 4: Approximate current daily loading following transportation studies, anticipated to increase but not double once Lawson Centre for Sustainability opens

Moreover, loading relocation is anticipated to vastly decrease the congestion and increase the safety in the central part of the Trinity campus through the relocation of loading from the extremely busy Hoskin Avenue (buses, cyclists, Hart House proximity, cross walk, etc.), which is necessarily a central pedestrian zone as well as a loading zone requiring almost all truck traffic to back into the site off of Hoskin Ave. Further, analysis of parking sales in the Larkin surface parking lot indicates that removal of this lot will result in a decrease in traffic by upwards of 150 cars which currently enter and exit the site on a given day.

The new North Lane will be slightly wider (by approx. 0.5 m) and service both the Trinity Campus and Varsity Complex. It will be maintained as an essential fire route and is expected also to function as a pedestrian thoroughfare; this shared function is to be addressed with landscape and paving, not unlike the entrance to King's College Circle, from College St.

Roughly once a year during new student move-in, it is anticipated that students will also be dropped off at the East end of the North Lane for more direct access to that residence wing.

Similar to the existing drop-off zone used to access the Varsity Pavilion (and marked no-parking on Devonshire), a similar zone will be located immediately south of the entry to the North Lane, effectively buffering against any ability to park in proximity to the entry to the North Lane, such that these area are reserved for short-term drop-off/pick-up.

Just interior to the building inside the loading dock, significant space has been allocated for materials and waste storage, including in the basement, to be accessed by immediately adjacent freight elevator. Refrigerated storage has also been designed in to the basement space for organics. As such, no waste or other external storage will occur within or proximal to the loading dock area.

Site Access

Modeling for the various sizes of delivery vehicles is shown below in Figure 16, including modeling of Greyhound-sized buses frequently used to transport varsity athletes.

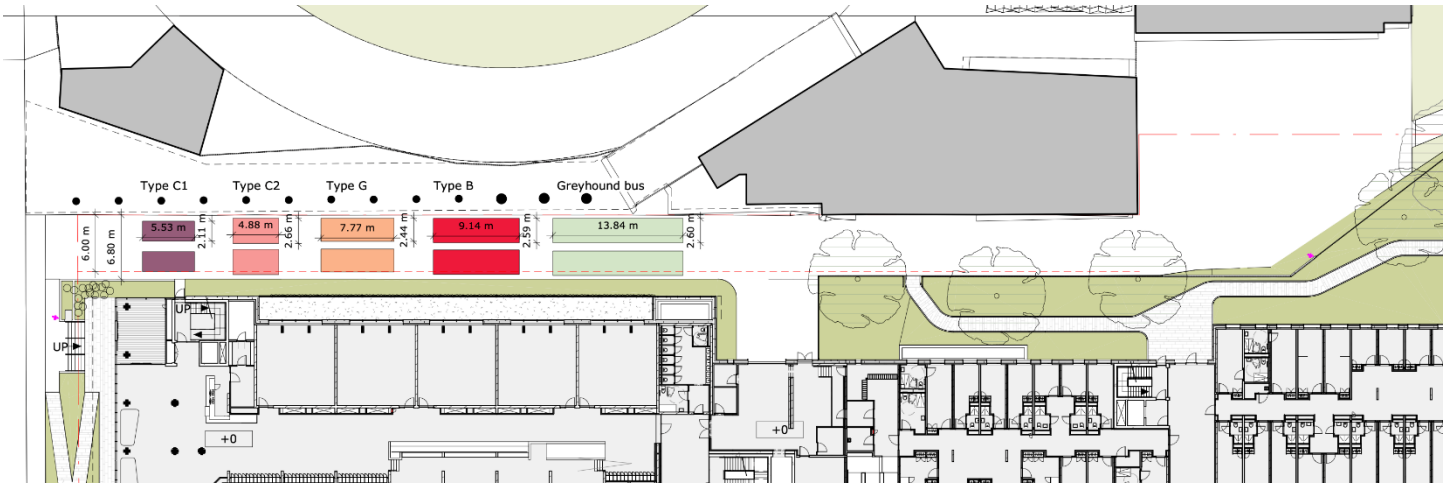
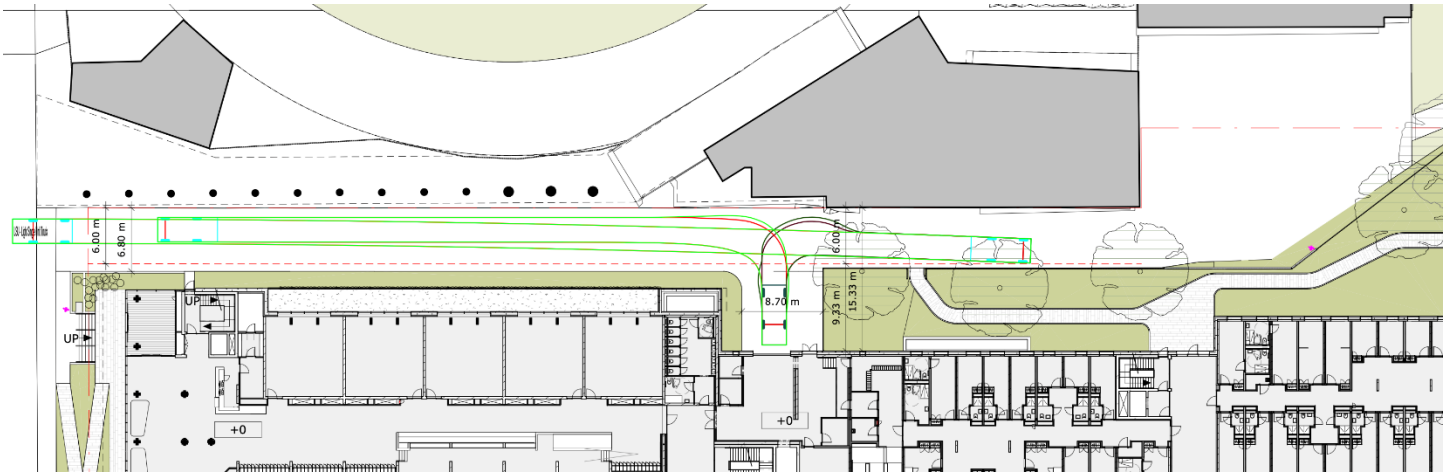


Figure 16: Typical and anticipated delivery vehicles (see Table 4, above) are modeled onto the North Lane, to scale. Types C1 (purple) an C2 (pink) will do the bulk of deliveries. Type G (orange) is expected daily for waste removal, and Type B (red) is expected with a very low frequency. Greyhound buses are modeled (green; 13.8m x 2.6m) for reference.

A



B

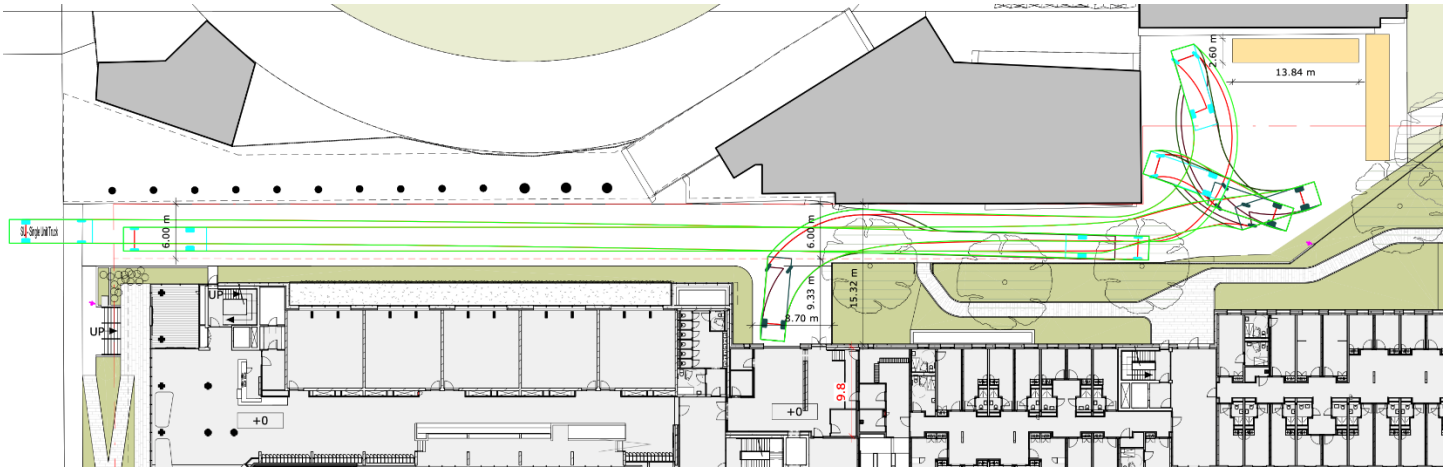


Figure 17 A,B: Turning radii of typical delivery trucks is modeled. The bulk of deliveries will occur as per panel A; infrequently, larger deliveries will require turnaround in the easternmost turning area.

Designated Substances

Designated substances and other site-specific hazardous materials present within the project area will be investigated and identified as per appropriate regulations and the Ontario Occupational Health and Safety Act.

f) Campus Infrastructure Considerations

Utilities (electrical capacity, water, gas, steam lines)

Geothermal Heating & Cooling

Space heating and cooling shall be generated by distributed chilled beams and/or radiant heating and cooling. Geothermal field heat sink and source shall consist of a vertical borehole distribution of heat exchange piping. The field will be sized for approximately1300kW (370tons). The approximate area of the field is 2,320SM (25,000SF). The field size is an estimate and should be validated by a geothermal consultant or provider. The above-mentioned size was based on the following metrics:

- 3 tons per hole; assuming 600-foot-deep holes
- One hole per 200 square feet

The field balance (net annualized heating and cooling load) is a significant concern and should be validated by geothermal consultant or provider. This is particularly critical when the domestic hot water loads are also put onto the field which tends to make it heating dominant and unbalanced.

A conductivity testing procedure shall be employed by the owner to refine the field size. Geothermal systems are regulated by Authorities having Jurisdiction (e.g. in Ontario under the Ministry of the Environment). The owner/installer shall be required to apply for the appropriate approval. In Ontario, for example, such approvals include "Environmental Compliance Approval (ECA)" under Ontario regulation 98/12.3.2.7.

The heating load shall be sized to serve:

- Perimeter envelope losses though chilled beams and radiant floors
- Building air handling unit heating coils
- Reheat, if required
- Snow melting, if required
- Entrance heating
- Domestic hot water

The cooling load shall be sized to serve:

- Solar loads through chilled beams and radiant floors
- Internal Gains (People, Lights, Equipment) through chilled beams and radiant floors
- Building air handling unit cooling coils
- Process loads from food service equipment

Radiant floor heating and cooling system shall consist of high density cross-linked polyethylene tubing embedded into the flooring structure/system. System shall be complete with distribution manifolds, circuit isolation and balancing valves, and controls. Tubing shall be rated for not less than 82.2 deg. C. (180 deg. F.) working temperature and 100 psig working pressure.

Chilled slabs will be used in common areas supplemented by an overhead VAV system and chilled beams. These areas are as follows:

- Ground floor lobby
- Ground floor cafeteria
- Student lounges
- Event spaces
- Seminar rooms
- Level 3 academic space

The use of operable windows in the academic office space is in discussion with the ownership group and will affect the decision to use chilled slabs in these areas.

Entrances and service spaces shall be heated by force flow heating water cabinets or unit heaters. Loading dock and similar type doors shall be equipped with overhead glycol heating water air curtains that shall be switched to start when the door is opened.

Snow melting systems shall consist of high density cross-linked polyethylene tubing embedded into the structure/system. System shall be complete with distribution manifolds, circuit isolation and balancing valves, and controls. Tubing shall be rated for not less than 82.2 deg. C. (180 deg. F.) working temperature and 100 psig working pressure. Glycol shall be 50% propylene glycol by volume.

Gas

Natural gas will be provided to the building to service only the emergency generator facility located in the basement. Otherwise, no natural gas is used in the building.

Electricity

Precise detail is not yet resolved but Trinity is working closely with the University's Facilities and Services department as it relates to the infrastructure upgrade project underway at the University. The high voltage duct running diagonally across the Trinity playing field which serves the Varsity Centre will require relocation. Trinity intends to tie in to the central U of T high voltage loop.

Data and Communications

This is yet to be resolved and Trinity is coordinating with the necessary U of T departments for determination of feasibility.

Sewer and storm water management

Water services (water, sanitary and storm) and stormwater management measures to be provided to the proposed site are as follows:

Water

- There is an existing 150 mm watermain on Devonshire Place. A 150 mm fireline and a 100 mm domestic water service will connect to the existing Devonshire Place watermain.
- The four existing fire hydrants will provide most of the required coverage for the proposed building. One additional private site fire hydrant may be required.

Wastewater

- There is an existing 300 mm diameter combined sewer on Devonshire Place. The internal storm and sanitary drainage systems will be separated within the building. A new sanitary sewer connection will be required at the northwest corner of the building connecting to the existing combined sewer on Devonshire Place.

Storm and Stormwater Management

- There is an existing 525 mm diameter storm sewer on Devonshire Place. The internal storm and sanitary drainage systems will be separated within the building. A new storm sewer connection will be required at the northwest corner of the building connecting to the existing storm sewer on Devonshire Place.
- The revitalized building will have a partial basement floor and possibly a weeping tile system. Any groundwater discharging from the weeping tile system would necessitate a discharge application.
- Roof drains are to drain to the internal storm system. Control roof drains and rooftop detention are not required.
- The minor system building drainage will be conveyed by the internal storm drain system. A storm connection will be provided for the proposed building. The building connection and the catchbasin connections in the courtyard areas will drain towards the quantity control cistern.
- Quantity control measures will be required on-site to control peak discharge rates from all storms up to the 100-year storm to below the pre-development discharge rate for the 2-year storm.
- Quantity control for the subject site is to be provided by an orifice control device and detention within a box culvert onsite.
- Quality control will be provided by a JellyfishTM model by Imbrium Systems Corporation to provide the required TSS removal rate of 80.0%.
- The WWFM Policy water balance requirement for the retention of 5mm of rainfall and the TGS water balance requirement for the retention of 25mm of rainfall will be met through an on-site infiltration trench.

- To satisfy a LEED requirement, a cistern will be provided in the basement level of the building to re-use rainwater for irrigation.

Bicycle parking

Bicycle parking will serve the entire Trinity community and include:

- 50 indoor bicycle parking spots, located in the basement level and accessed by a dedicated outdoor staircase – facilities include adjacent locker and washroom/shower facilities, and access to central public staircase and elevator core
- Outdoor bicycle parking located adjacent to the three primary entrances to the Lawson Centre for Sustainability

g) Secondary Effects

Staging will be necessary for incorporating connection to Larkin Building and GIT. Careful timing will also be required to accommodate busy periods in the school year, such as new student move-in, or any known major events and nearby Varsity Complex. Coordination has been initiated between Trinity and the University with the various anticipated neighbouring construction projects, particularly with regard to a possible closure of Devonshire during construction. The Trinity community will be provided advance notice of termination of parking.

At present, the Varsity Centre to the north of the development site is serviced by a University of Toronto high-voltage hydro line which runs through the Trinity campus, north from Hoskin in the existing laneway between 6 Hoskin and the Graham Library, and diagonally through the existing playing field to the Varsity. This hydro duct bank will require re-routing prior to the construction of the Lawson Centre, to ensure minimal disruption to the serviced University of Toronto facilities. This scope of work is included in Trinity's ongoing budget analysis for this project, and Trinity will ensure proper collaboration with the University of Toronto's Facilities and Services department on this and all associated utility considerations.

h) Schedule

Projected Timeline – Construction (possibly subject to COVID delay)

Task	Duration	Start Date	End Date

Pre-Design & Schematic Design	27 weeks	June 2019	Nov. 29, 2019
Design Development Phase	21 weeks	Dec. 2, 2019	Apr. 24, 2020
Site Plan Application	6-9 months	Feb. 2020	Nov. 2020
Construction Documents Phase	72 weeks	Apr. 27, 2020	Sept. 10, 2021
Package #1: *Demolition, Foundations, and Site Works*	37 weeks	Apr. 27, 2020	Jan. 8, 2021
Package #2: *Structure and Building Envelope*	45 weeks	May 18, 2020	Mar. 26, 2021
Package #3: *Building Interior and Mechanical & Electrical*	40 weeks	Aug. 3, 2020	May 7, 2021
Package #4: *Millwork and Furniture, Fixtures & Equipment*	18 weeks	May 10, 2021	Sept 10, 2021
Building Permit Application	**57 weeks**	**Nov. 9, 2020**	**Dec. 10, 2021**
Package #1: *Demolition, Foundations, and Site Works*	12 weeks	Nov. 9, 2020	Jan. 29, 2021
Package #2: *Structure and Building Envelope*	14 weeks	Mar. 1, 2021	June 4, 2021
Package #3: *Building Interior and Mechanical & Electrical*	14 weeks	Sept. 6, 2021	Dec. 10, 2021
Construction & Contract Administration Phase	**82 weeks**	**Feb. 1, 2021**	**Aug. 26, 2022**

Package #1: *Demolition, Foundations, and Site Works*	8 months	Feb. 1, 2021	Sept. 10, 2021
Package #2: *Structure and Building Envelope*	10 months	July 19, 2021	Apr. 22, 2022
Package #3: *Building Interior and Mechanical & Electrical*	6 months	Jan. 10, 2022	June 24, 2022
Package #4: *Millwork and Furniture, Fixtures & Equipment*	14 weeks	May 9, 2022	Aug. 12, 2022
Substantial Completion	**8 weeks**	**May 30, 2022**	**July 22, 2022**
Commissioning	**16 weeks**	**Apr. 4, 2022**	**July 22, 2022**
Project Close-Out	**8 weeks**	**June 27, 2022**	**Aug. 26, 2022**
Client Move-In	**7 weeks**	**July 11, 2022**	**Aug. 26, 2022**
Performance of Warranties Phase	**52 weeks**	**July 25, 2022**	**July 21, 2023**
Warranty Review	2 weeks	July 3, 2023	July 14, 2023

IV.Resource Implications

a) Total Project Cost Estimate

Total estimated cost for the project includes estimates or allowances for:

- construction costs contingencies
- taxes
- site service relocates (electrical bank)
- secondary effects

- landscaping
- permits and insurance
- Professional fees, architect, engineer, misc. consultants (i.e. LEED etc.), project management, construction management
- computer and telephone terminations
- furniture and equipment
- miscellaneous costs [signage, security, other]
- commissioning
- donor recognition
- escalation
- Financing costs during design & construction.

b) Operating Costs

Operating costs are estimated based on recent modeling, subject to refinement.

Operating Expenses (Year 1)	
Operating Expenses[1]	$4M
Annual Building Maintenance Reserve	$0.6M
Residence Life Programming Costs[2]	$0.3M
Total Operating Expenses	$4.9M

Annual Growth Rate for Operating Expenses[3] 2-4%

[1] Operating Expenses include Mealplan, Food Service & Events expenses, Staff Salaries & Benefits, Supplies & Services, Repairs & Maintenance, Utilities, and Insurance
[2] Residence Life Programming Costs reflect costs incurred for programming in the new building, and does not include Residence Life Staff salaries or benefits
[3] Annual Growth Rate modelled between 2% and 4% on an item-by-item basis

c) Other Related Costs

Not aware of any additional costs.

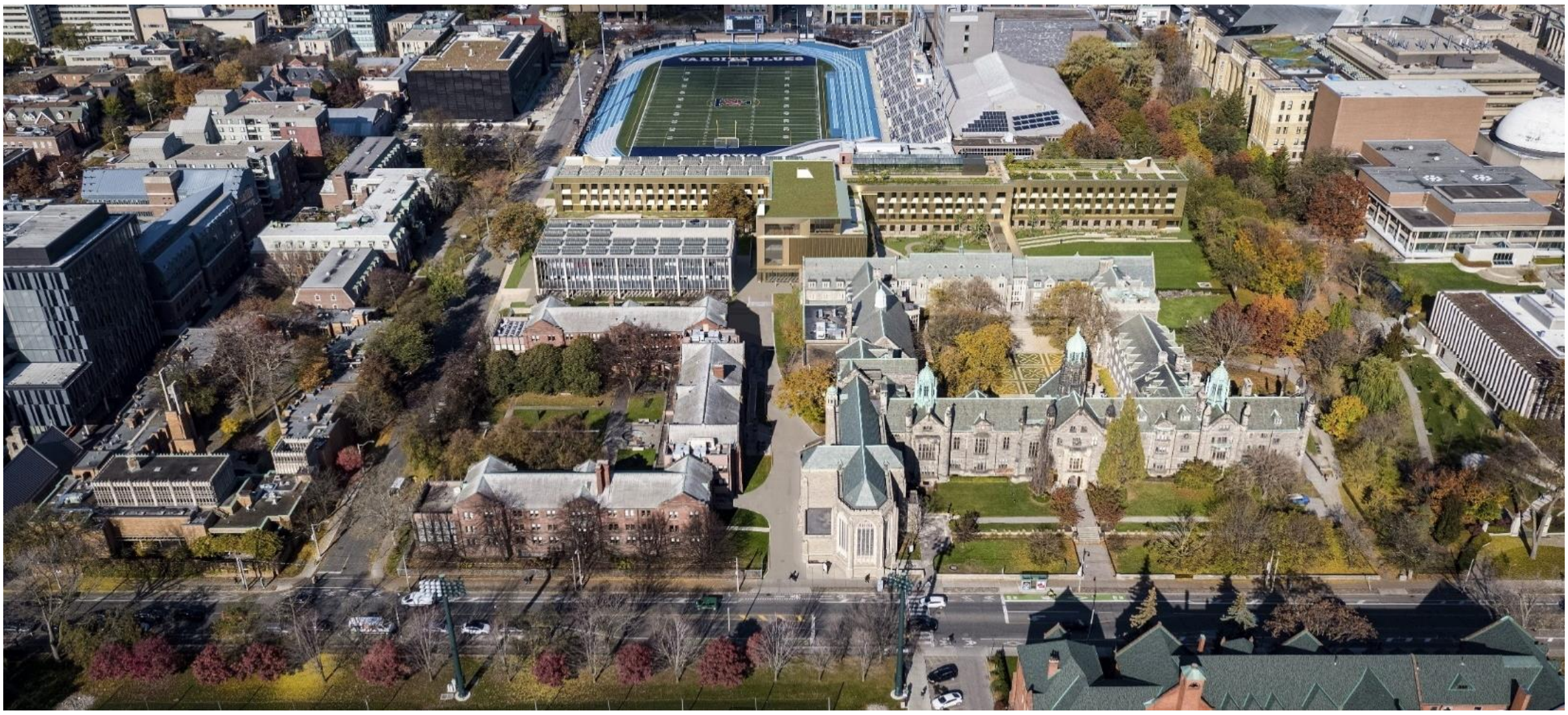
d) Funding Sources

The project will be funded through a combination of College investment, financing and donations.

Trinity College in the University of Toronto
New Student Residence & Academic Building

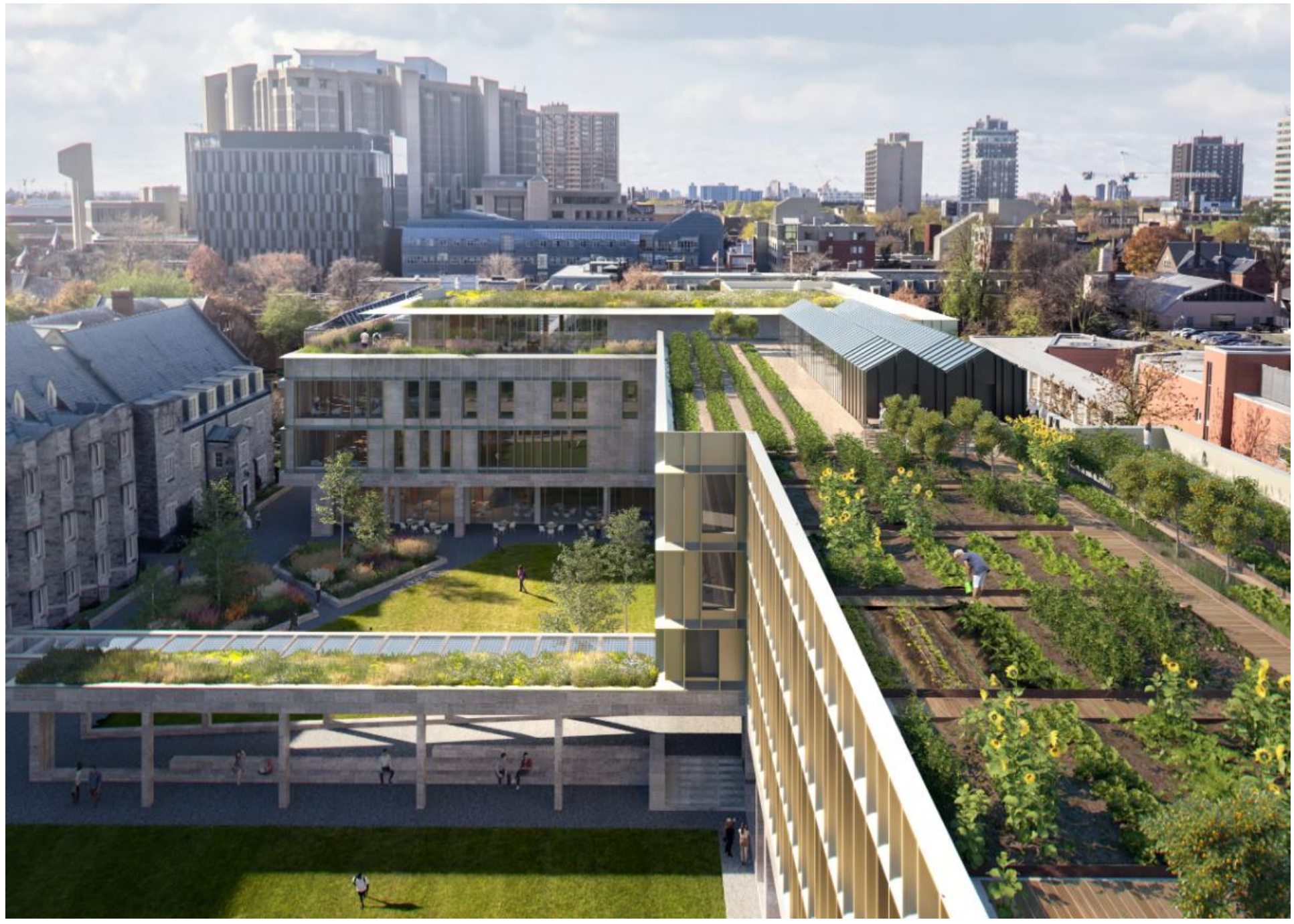
The Lawson Centre for Sustainability

Presented by Provost Mayo Moran, Trinity College

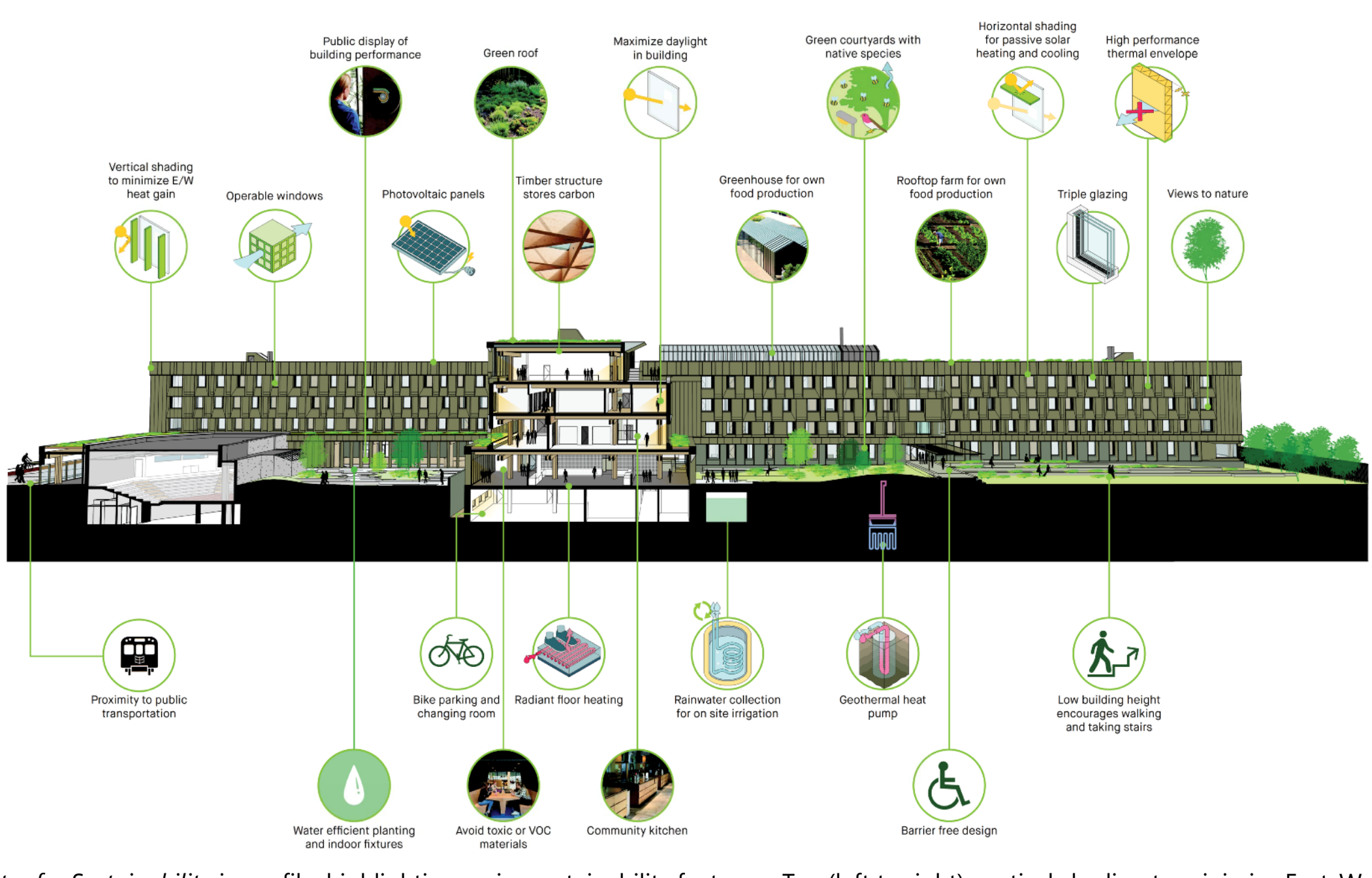


Aerial view of Trinity College campus superimposed with low-resolution rendering of the new *Lawson Centre for Sustainability*: completion of the Trinity campus.

- Mixed-use: residence, academic and community space, responding to long-term needs
- 352 residence beds: suites, single & double rooms, responding to range of student and community needs
- Full service dining facility for all community members and neighbors
- State-of-the-art rooftop Urban Agriculture operation and centrally-located Community Kitchen providing locally produced food, applied learning, food and nutrition literacy, community building and partnership and more
- Leader in sustainability: LEED Platinum and CaGBC Zero Carbon certification; integrated platform for academic and community programming and broad, public-facing education and partnership
- Flagship teaching and event space: intimate seminar rooms, large teaching spaces and signature rooftop teaching and conference facility space
- Faculty offices, administration and meeting spaces
- Fully accessible building and grounds; redesign of Devonshire streetscape and central axis of Trinity campus
- Generous common facilities to promote community building and well-being
- Thoughtful, seamless integration with surrounding campus and reactivation of public realm through framing of several new outdoor character spaces, space for open play, and relocation of site loading



Aerial view from North-East corner of Trinity College campus superimposed with the new *Lawson Centre for Sustainability*. Pictured (clockwise, bottom left to bottom right): north face of existing Trinity College 6 Hoskin Avenue building, new central pavilion signature rooftop event space and urban agriculture operation atop the East residence wing. New courtyard spaces are framed below by the pergola-covered walkway, new and existing buildings.



Lawson Centre for Sustainability in profile, highlighting major sustainability features. Top (left to right): vertical shading to minimize East-West solar heat gain, operable windows, public display of building performance, photovoltaic panels, green roof, timber structure, greenhouse for food production, green courtyards with native species, rooftop farm for food production, horizontal shading for passive solar heating and cooling, triple glazing of windows, high performance thermal envelope, views to nature. Bottom (left to right): proximity to public transit, water-efficient planting and indoor fixtures, bike parking and change room, avoidance of toxic VOC materials, community kitchen, rainwater collection for onsite irrigation, geothermal heat pump, barrier free design, low building height to encourage walking and taking stairs.