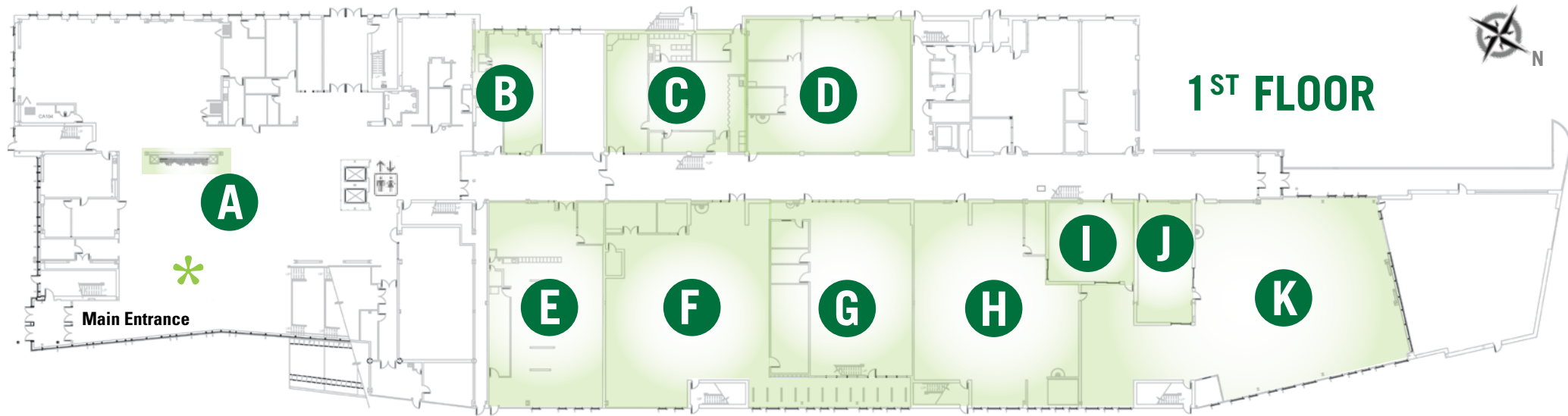




Partners: Ontario Ottawa Canada

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The Algonquin Centre for Construction Excellence (ACCE) is a \$79 million, 190,000 square foot uniquely green and architecturally iconic learning centre that offers state-of-the-art facilities for construction-related skilled trades and occupations education and training. Home to over 2,500 full-time and 5,000 part-time students, the centre uses an integrated learning approach to deliver 24 programs of study covering a wide range of disciplines including architecture, design, engineering technology, building trades, building Science, and construction industry research. The facility has been built to the exacting standards of the Leadership in Energy and Environmental Design (LEED) program. Striving to achieve LEED Platinum Certification, the centre is a showcase for sustainable construction practices and superior craftsmanship, and serves as a one-of-a-kind living laboratory that demonstrates what is possible through innovative design, construction, maintenance and operation.



FOLD

A Bio Wall: 5 storey biowall of live tropical plants drawing light from sky lights and carbon-dioxide from indoor air, reducing airborne contaminants, and producing oxygen which is drawn into the ventilation system to augment air quality.

B Applied Research Lab (CA118) Flexible space that may be sub-divided. Roughed-in services for water, compressed air, gas and ventilation allows extra-curricular construction-related applied research industry sponsored projects. Controlled climatic conditions to perform beta-testing. Innovative solutions developed by students and teaching staff assist with rapid prototype development and commercialization cycle, potentially accelerating the entry to market of new products.

C Civil Lab/Construction (CA121/122) Set up to test building materials and determine strength of construction materials and their applications in the build form. Skills taught include surveying, excavation, to the science and testing of materials and finishes.

D Welding Shop (CA124) Houses 30 ventilated stations equipped with multi-process invertch welding equipment that perform TIG, MIG and Arc welding. 24 stations are equipped with 5 pipes delivering oxygen, acetylene, argon, carbon Dioxide, and argon/CO2 mixture. Grinder and saws teach techniques for the fabrication of metal components.

E Electrical (CA119) Open concept lab with 3 areas:
1: Basic/fundamental electrical lab, designed to teach the basics running wires and connecting devices. **2:** Motor control and

programmable logic control lab to learn to wire devices in an industrial setting, use relays and program logic controllers to perform automation tasks, and demonstrate wiring of fire alarm systems; **3:** Electrical machinery to learn fundamentals of wiring a variety of motors and transformers. The lab design promotes interaction between students in multiple programs.

F HRAC/ Plumbing Shop (CA123 and CA218*) Highly integrated lab spans portions of the first and second floor of the construction wing. The combined disciplines delivered in this shop showcases the equipment/tools used, allowing collaborative learning between these interconnected skilled trades.

G Sheet Metal (CA125) Geared towards the apprenticeship curriculum allowing students to hone skills learned at their workplace in areas such as basic design concepts, functional heating, cooling/ventilation delivery systems, sheet metal interior/exterior applications on buildings, using traditional and state-of-the-art equipment such as the computerized plasma cutter.

H Cabinet Making Shop (CA127) Space for work benches and in-lab demonstrations, dedicated machining area equipped with 2 computer aided manufacturing machines programmed by the students to complete a variety of work that can be of a repetitive yet complex nature. The lab includes a spray booth used for finishing and top coating.

I Carpentry Shop (CA131) Used primarily by Apprentices, the shop features butcher block workbenches and an assortment of

power and hand tools. Adjoining this lab space is a machining area shared between students using CA131/CA133.

J Construction Lab (CA133) Used by students primarily in the Building Construction Technician program. This shop space features workbenches and an assortment of power and hand tools used for smaller scale projects. Adjoining this lab space is a machining area shared between students using CA133 and the CA131 Carpentry Shop.

K Carpentry/Framing, Formwork Shop and Outdoor Assembly Area (CA134) High ceilings allows for construction of large-scale projects while wooden flooring allows secure anchoring of projects and quick cost-efficient replacement of any damaged floor sections. Naturally lit open assembly space can be subdivided into 2 separate classes. Large glass panel doors allows access to covered outdoor assembly.

* **Living Lab** The ACCE building is used as a dynamic learning tool for academic and applied research pursuits. Architecture, structural elements, construction methods and craftsmanship, finishes, and exposed building systems form a portion of the living lab. Monitored building performance and data from thousands of networked sensors provide the occupants with real time and historic information about building system performance. Water consumption, energy savings, and building envelope performance are examples of the information provided to staff and students for educational and research purposes.

FOLD



L Study Pods (CA200/201) These space capsule shaped pods are suspended to provide easily identifiable and accessible study and social spaces. Each pod seats approximately 40 students.

M Resource Library (CA202) Includes areas for literary research, and collaborative learning spaces. Library contents include construction, architecture and design-related program areas that may not be available in electronic format.

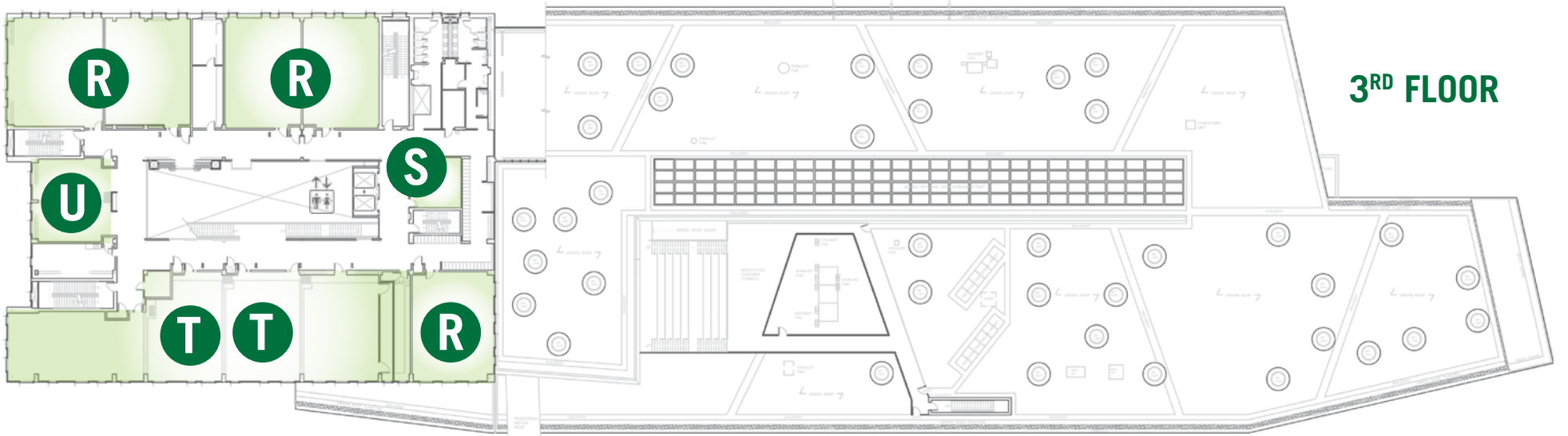
N Mobile Access Centre (CA204) This space provides individual and collaborative areas where students may use the information technology of their choice.

O Break-out Rooms (CA209-212) Students may collaborate on projects that require group work in a quiet, easily re-configurable and flexible, environment 24/7. Work spaces are equipped with large flat-screen display monitors.

P Tiered Seating (CA213) This tiered space features in-floor radiant heating and daylight from a panoramic glazed curtain wall. This wireless area allows for group work and reviewing construction drawing. A large motorized screen is available for presentations.

Q Food Court (CA214/215) The Heart and hub of the building. A link between the academic tower and the construction wing, providing access to the outdoor terraced seating and green roof areas.

* **Outdoor Terraced Seating:** Gathering point used for informal presentations surrounded by natural plants and excellent views of the building exterior.



3RD FLOOR

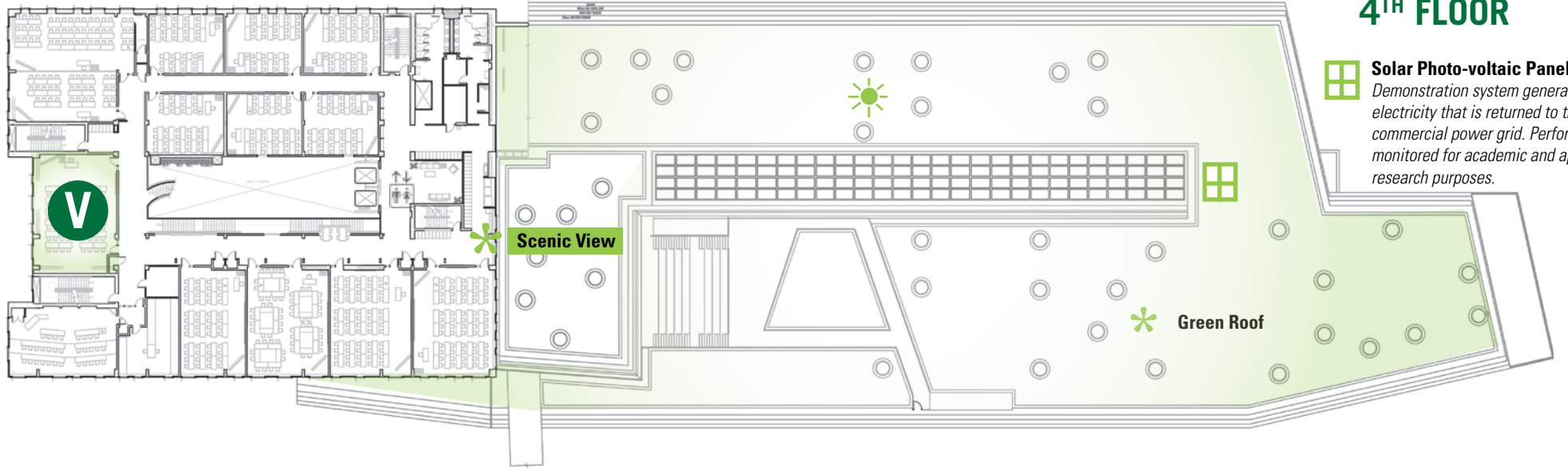
R Architecture, and Design CAD Labs (CA300/301/303/310)
In these 4 AutoCAD labs, students learn computer drafting, while in drafting labs (CA116 and CA304), students learn manual drafting skills.

S Sample Room (CA309) contains various samples of residential and commercial fabrics, tiles, surfaces, and building materials that are used by faculty to enhance the learning experience and student project work.

T Design Studios (CA312/313/314/316): Using partitions and flexible furniture, this large and versatile space can be easily re-configured into up to four separate studios to meet the needs of the design programs.

U Critique Rooms (CA318a/b): These areas are used to allow students to present their projects to an audience.

FOLD



4TH FLOOR

V Laptop Classroom (CA419) Addressing the direction of the College for digital learning and mobility, this space provides students with power and wired data access at every desk, allowing for a learning environment where more intensive use of the IT network by mobile users is facilitated.

Green Roof: At close to 4,000 m², is one of our prime visible manifestations of sustainability that sets this building apart and gives it its striking, iconic presence. It consists of sedum drought-resistant plants that grow in a sand medium, requiring little maintenance or irrigation once established, and it is part of a high performance building envelope, achieving an R-50 insulating value.

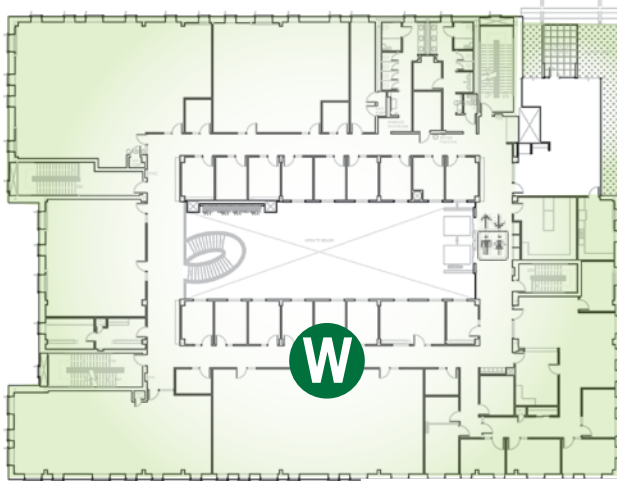
Daylight Strategy: One of the goals of the ACCE project was to ensure that 90% of the occupied spaces in the building received natural daylight. The many round skylights, atrium glazed roofs, large windows in the building walls, and internal windows and glass partitions allow for the spaces to be flooded with natural light, resulting in energy savings and a healthier learning and working environment.

Solar Photo-voltaic Panels: Demonstration system generates electricity that is returned to the commercial power grid. Performance is monitored for academic and applied research purposes.

Scenic View

Green Roof

FOLD



5TH FLOOR

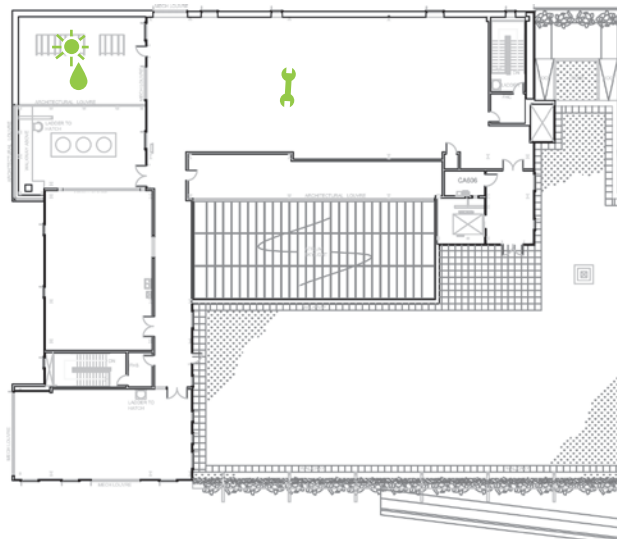
W Office Area: Design input from faculty and staff resulted in a highly efficient space configuration for offices, student interfaces, circulation, and collaborative inter-professional activities. Common collaborative areas support the academic strategy of integrated curriculum development and delivery. Group offices are on the outside perimeter of the building and the individual offices are located around the atrium to optimize daylighting opportunities in the work environment.

DID YOU KNOW?

Storm Water Capture System: A large cistern has been constructed beneath the building (located below the HRAC shop – CA123), and is comprised of three compartments that capture rainwater from the roof. This non-potable water is used to flush urinals and toilets, and to irrigate the green roof, thereby saving on the use of treated city water. It is also used to control the discharge flow back into the Pinecrest creek.

Weather Station: Located on the roof of the mechanical penthouse, the weather station provides a complete suite of climatic data parameters similar to what one would find at an airport. All of the data is collected at regular intervals and stored on a server to be used in conjunction with building performance data for the purpose of academic and applied research activities.

FOLD



6TH FLOOR

Mechanical Room: The remaining elements making up the indoor climate control system include the cooling tower, chillers and high-efficiency boilers which are connected to hybrid hydronic heat pumps distributed throughout the building.

Venmar Units: The make-up air unit (Blue) is responsible for bringing in fresh air into the building. The heat recovery unit (Green) is responsible for transferring heat from the air being exhausted from the building to the incoming fresh air to save energy and meet our LEED operating standards. The air handling unit (Red) is responsible for mixing, conditioning (cooling, heating and humidifying) and distributing the air through the building. This room has been sized, and the units have been built with viewing windows, to allow for student tours for educational purposes.

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Solar Domestic Hot Water System: Glycol passing through these two solar demonstration systems is heated by the sun, and circulated through a heat exchanger that transfers the heat to the domestic water system. The resulting hot water is used to supplement the domestic hot water needs of the building, thereby saving energy.