UNIVERSITY OF ALBERTA
FACILITIES AND OPERATIONS

Green Building Design Summary

Introduction

The University of Alberta's commitment to sustainability is expressed throughout its institutional plans and guiding documents, building on the *Sustainability Commitment and Guiding Principles* adopted by the Board of Governors in 2008. Below are some key references relevant to green building design and related sustainability work.

Plan or Strategy	Alignment with Sustainability
Institutional Strategic Plan, *For the Public Good*	***Goal 5:*** *Sustain our people, our work, and the environment by attracting and stewarding the resources we need to deliver excellence to benefit all.* ***Objective 20:*** *Continue to build and support an integrated approach to social, economic, and environmental sustainability that incorporates teaching and learning, research, outreach, capacity building, and the operations that support them.*
Facilities and Operations Mission, Vision, Values and Behaviours	***Mission:*** *Facilities and Operations supports the University of Alberta's mission through safe, well-maintained, sustainable and inviting spaces, and by providing crucial services for the university community.*
Energy Management and Sustainable Operations Purpose Statement	*Purpose: EMSO works to minimize the University of Alberta's impact on the environment on behalf of all members of the university community.*
Sustainability Plan (2016-2020)	***Goal 3.1:*** *Embed social, economic and environmental sustainability into the development and care of the university's indoor and outdoor spaces.*
Long Range Development Plan (2002-2032)	***Campus Planning Principles:*** *Smart Growth, Healthy Communities, Sustainability*
Integrated Asset Management Strategy (2019-2035), *Taking Care of our Campuses*	***Principle 7.*** *Social, economic and environmental sustainability is achieved by:* *a. Incorporating inclusive design principles into campus infrastructure (e.g., all-gender, barrier-free).* *b. Reducing our ecological footprint.* *c. Reducing operational costs.* *d. Continually advancing the three pillars of sustainability: social, economic and environmental.* ***Action 1. b.*** *Demonstrate consistency in direction and decisions for campus planning that exemplifies best practices in smart growth, healthy community and sustainable design.*

The design of campus buildings has a large impact on the sustainability of overall campus operations. This document compiles the core set of green building design standards, practices and guidelines adopted by the University of Alberta. Information on current green building ratings can be found through our interactive dashboards on our website: uab.ca/emso.

Green Building Design Guidelines

It is the intention of the university to embody the principles of sustainable design in all its planning, design and construction projects, whether new construction or renovations.

In general, the university's principles and goals are to promote multi-purpose space use, flexibility and adaptability as well as better utilization of space to minimize needs for new construction. Newly constructed and renovated facilities are designed to be:

- Functional and meet the needs of users.
- Safe and reliable.
- Consistent with a highly satisfactory indoor environment.
- Institutional quality and provide a long building systems service life.
- Efficient and cost effective for operation and maintenance.
- Designed to provide low operating and maintenance costs for the life of the facility.
- Composed of environmentally friendly and recyclable materials.

As quoted from the Integrated Asset Management Strategy, reducing operational costs is a priority for the university. Since the majority of a building's life cycle cost is incurred after its design and construction are complete, it is important to design buildings to minimize future operation costs for maintenance, renovation, renewal and/or disposal.

LEED and Green Globes. Since 2008, the Government of Alberta has required all new buildings and major renovations that receive substantial provincial government funding to achieve at minimum LEED® Silver certification. The Green Globes® rating system and guidelines are used on projects that do not require LEED certification to rate and guide sustainable designs. Although not all projects at the university will be formally certified, all projects should endeavour to incorporate sustainable measures as identified by the LEED and/or Green Globes Rating Systems. Information on current green building ratings can be found through our interactive dashboards on our website: uab.ca/emso.

Each project will undergo a thorough review by the university and the design team before arriving at a final decision. The project must be evaluated to ensure that design and construction practices being implemented are sustainable and responsive to the environment.

More detailed design guidelines and construction documents can be found at https://www.ualberta.ca/vice-president-facilities-operations/planning/index.html.

Surrounding Environment

Reduced Impact

- Site planning should consider the incorporation of xeriscaping principles and stormwater management systems.
- Site planning should consider the incorporation of native plant species wherever feasible.
- Site selection should favour the use of infill development techniques when feasible.

Accessibility

- Universal design should be used to provide features to enhance accessibility for all.
- Site planning must accommodate persons with mobility and sight impairment without the need of assistance on primary routes.
- Site planning must allow access universally regardless of ability, from the moment of entry to the university campus, into and through its buildings and lands.

Energy Use and Efficiency

- Building design should use best practices for energy management; design should consider passive systems, heat recovery, high efficiency lighting, and harmonic correction.
- Facilities should be designed with energy conservation and occupant comfort in mind.
- Where possible, new construction and major renovations will incorporate energy efficiency measures and renewable or alternative energy supply technologies.
- For sealed glazing units, consult with a certified (IGMA) sealed unit manufacturer regarding the configuration and components for glare and heat reduction requirements, i.e.: low E coatings, tinted lites, double/triple glazing, gas infill, etc., as required to provide project HVAC and energy efficiency requirements.
- All buildings have meters installed to measure energy usage.

HVAC Systems

- Where significant upgrades to HVAC systems are undertaken, systems must meet or exceed the latest edition of ASHRAE 90.1 Guidelines on Energy and the edition of National Energy Code of Canada for Buildings (NECB) that is currently in force.
- In general mechanical system designs are to incorporate heat recovery systems for both air and water side designs.
- Lab environments are to incorporate the latest control systems for lab design, including air quality sensing, fume hood sash position sensors and occupancy zone sensors.
- Plug load heat capture systems are to be installed for all applicable research

applications on North Campus. These systems capture waste heat from research equipment and recycle it back into the district energy system's chilled water loop.

Lighting

- Lighting choices must adhere to the University of Alberta *Lighting Design Guidelines and Standards*, which communicate recommended energy efficient lighting design practices and university expectations.
- In general, lighting choices should be efficient, meet designated luminary requirements, and be easy to operate and maintain.
- In most instances common area lighting should be on motion detectors, with select fixtures on normal/back-up power at all times.
- Intelligent programmable lighting controls or connection to the building automation system for lighting should be considered for all new buildings.

Equipment

- Energy efficient equipment is a minimum standard to be procured and installed.

Materials, Resources, and Waste

- Design should exercise a preference for materials that demonstrate a greater degree of responsibility to the environment.
- Life cycle costs should be optimized while ensuring long life for building components and elements.
- Green demolition techniques are specified as a standard for all construction projects for removal, recycling, and reuse of building materials.
- Contractors are required to provide their construction waste diversion data to the university for tracking purposes.
- Laboratory design should facilitate long term maintenance and retain flexibility of reuse of casework; modular casework designed in accordance with university cabinet and millwork standards will be used.
- Classroom finishes should be easy to repair and replace; resilient flooring is preferred.

Indoor Environment

Ventilation

- Ventilation design must follow the latest ASHRAE 62-Standards, “Ventilation for Acceptable Indoor Air Quality”, and should allow for easily accessible equipment for inspection, cleaning and testing.
- In classrooms, consideration should be given to both adequate ventilation and noise of the ventilation system; quiet systems are preferred (preference for low velocity, large duct systems).
- Smoking is restricted in all buildings, around buildings entrances and air intakes.

Laboratory Air Quality

- Fume hoods in research laboratories must comply with ANSI/AIHA Z9.5 Class A performance standards. Capture efficiency as installed and used must be at least 4AU0.1. (reference: Design Standards - Function and Use - 5.2.2 Laboratory Design)

Volatile Organic Compounds (VOCs)

- Only latex paints containing zero volatile organic compounds (VOCs) are allowed to be used. Other coatings must not exceed the VOC and chemical component limits of Green Seal Standards GS-03 and GS-11 and South Coast Air Quality Management District (SCAQMD) Rule #1113. (reference: Design Guidelines – Architectural – Painting Standards, section 1.3 (DSGN-GUIDE-DIV09-ARCH-09 90 00)).
- Carpet adhesive must also be “zero VOC” (reference: Design Guidelines – Architectural – Carpet Tile, section 6.7 (DSGN-GUIDE-DIV09-ARCH-09 68 18)).

Water Use and Efficiency

- Water and plumbing design should adhere to the University of Alberta *Mechanical Guidelines.*
- In brief, low flow fixtures should be used and motion sensors installed wherever feasible; lab facilities should have a dual riser system to allow for proper separation of potable water (drinking fountains and washrooms) and lab services water.
- Equipment requiring water as a cooling medium will be connected to closed plug loop recirculation systems to prevent wasting of water.
- All buildings have meters installed to measure water usage.