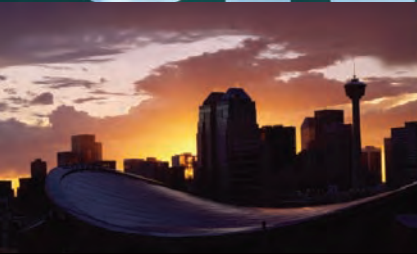




SCHULICH
School of Engineering

civil



DEPARTMENT OF CIVIL ENGINEERING

Building quality of life
through research

The Department of Civil Engineering at the Schulich School of Engineering has always attracted pioneers in research, and is now home to some of the most creative and interdisciplinary civil engineering researchers in the country.



IMPROVING QUALITY OF LIFE THROUGH RESEARCH



Making improvements to the places we live and work, our environments, our health and safety starts with high quality research.

These are the research frontiers of civil engineers at the Schulich School of Engineering.

History of the department

Founded in 1966, the department's reputation for excellent research was established through its strengths in structures and solid mechanics. A number of academics from around the globe were drawn to the opportunities presented on a new frontier. Over the years, the department grew, and experts led research advances in transportation, geotechnical, materials and water resources engineering. Always on the forefront, the department is now a leader in the emerging areas of environmental engineering, biomedical engineering, and project management.

The department's research strengths today

Today, researchers in civil engineering are focused on three primary goals: providing a sustainable built environment, securing sustainable energy and resources, and enhancing public health and safety.



Providing a sustainable
built environment that makes
up a community or city



The Urban Alliance, a research partnership between the City of Calgary and the University of Calgary, provides a framework for leading-edge researchers and front-line city planners to work together on urban issues. This application of high quality research to real-world problems has attracted the attention of municipalities around the world. It provides civil engineers at the Schulich School of Engineering with the opportunity to pioneer approaches that can be adapted for use elsewhere.



Experts in the department have created world firsts in planning, constructing and monitoring structures and systems that use innovative technologies and are more safe and efficient.

Sustainable Infrastructure

Research in the department of civil engineering includes: developing new technologies and materials for buildings, bridges, underground structures, roads, water supply and sewage treatment systems that are more economical and longer lasting than current approaches.

Transportation Engineering and Planning

Researchers in the department work to optimize the safety, efficiency and sustainability of transportation systems, with specific expertise in land use and transportation planning, travel demand management, highway engineering, bituminous material development, pavement design and management, public transportation systems, airport planning and design, and intelligent transportation systems.

The transportation research teams provide realizable solutions for municipalities, governments and companies relying on improved transportation under ever increasing pressures on the system.

Project Planning and Implementation

Current research in the civil engineering department focuses on innovative methods for the front-end planning, construction, procurement and engineering phases of projects.



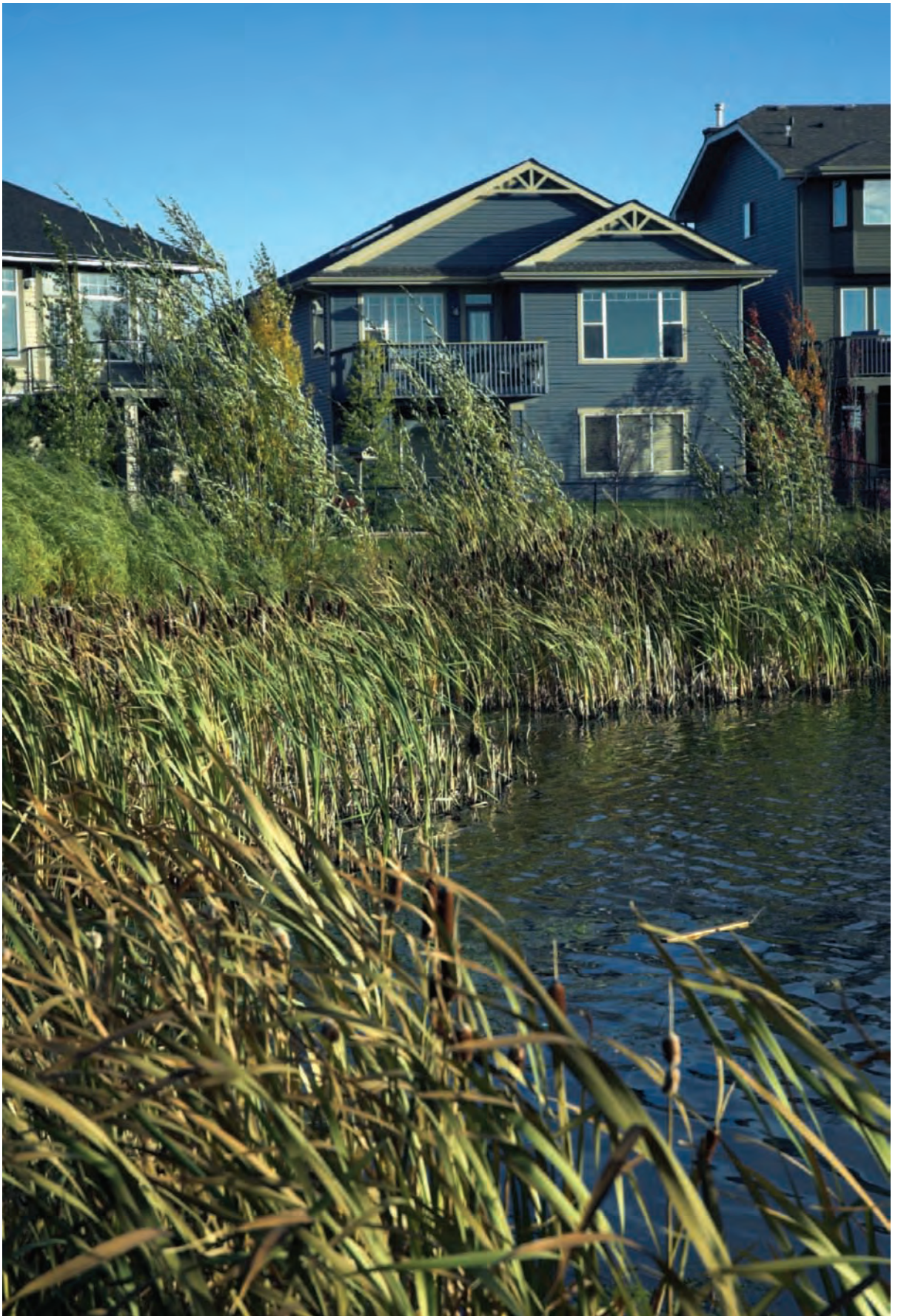
As a leader in project management research, the department develops processes aimed at minimizing resources, enhancing project performance, and improving outcome predictability of any engineering project.



Ecological Footprint

The environmental focus of civil engineering in Calgary is supported by a concentration of experts who are developing methods for building communities with the smallest ecological footprint that is economically feasible.

Researchers are studying the life cycle of development projects in a holistic way to find new steps and technologies that increase energy efficiency, reduce resources, and inject ongoing environmental stewardship into community development.





Securing energy supplies for
a sustainable environment
and a strong economy.





Resource Recovery

The Schulich School of Engineering, with its location in Calgary, Alberta, is a natural centre of energy-related research because the headquarters of many energy companies are situated in this city.

Researchers in the department of civil engineering are involved in strong research partnerships between industry and the university to enhance the safe, efficient, and economical recovery of conventional resources, such as petroleum and mining products, and unconventional resources, such as natural gas from gas hydrates, tight shale, coal beds, and landfills. Civil engineering experts specialize in the geomechanics, environmental management, and materials engineering of the recovery processes.

Climate Change Mitigation and Adaptation

Civil engineers at the Schulich School of Engineering are part of the Institute for Sustainable Energy, Environment and Economics (ISEEE), which is one of Canada's most powerful climate change research groups.



University of Calgary civil engineering researchers focus on new technologies that can control greenhouse gas production, emissions and disposal, and are developing novel predictive tools and strategies for adapting to climate change.

Waste and Containment Management

Global firsts in innovative waste management projects provide both new sources of energy and environmental solutions.

This area of research strength involves projects that are forerunners in several areas, including the development of technologies to clean contaminated sites, treat waste water, and optimize waste disposal in landfills with less environmental impact. Civil engineering research in the department also tackles technologies for the remediation of mine tailings and the transportation of contaminants.



Risk Management and Decision Analyses

As people working on any frontier understand, risk is inherent to all projects, particularly those that are novel and unique.

Developing different methods for simulating projects, analyzing risks and mitigating risks is a focus for civil engineers at the University of Calgary. This includes building and sustaining project teams that understand how the risk must be shared between all parties involved. Particular expertise is being developed for a holistic approach to decision-making systems, especially with respect to environmental issues.



Enhancing
public health
and safety





Natural Hazards and Mitigation

Increasingly severe weather, combined with social and urban influences are exacerbating the impact of natural hazards.

University of Calgary's civil engineers are among the world's experts on understanding and preparing for the impacts of floods, earthquakes, tsunamis, sea ice, and mass movements including landslides, seafloor instability, and snow avalanches. These collective strengths are resulting in the development of innovative monitoring and mitigation techniques.

Workplace and Environmental Safety

Everyone who works is affected in some way by occupational risks that can, with proper analysis and training, be reduced.

Government, industry and the public expect that occupational risks can and will be better controlled. Yet the challenges of workplace safety are diverse and complex. Experts at the Schulich School of Engineering are developing methods for creating safe organizational cultures and for analyzing and mitigating workplace hazards and the environments that create them.



Road Safety

Every year,
around the world,
1.2 million people are
killed and 50 million
people are seriously
injured in road crashes.
Something is clearly
not working.



A systems approach to traffic safety encompasses highway engineering, traffic law enforcement and public education. Our research includes both theory and evidence based approaches to reduce the incidence and severity of traffic collisions and effectively re-engineer existing road safety programs.



Biomedical Engineering

Biomedical engineering at the University of Calgary is internationally renowned.

Biomedical engineering involves a campus-wide transdisciplinary group of researchers applying engineering principles and techniques to biological systems to improve health and quality of life. These researchers provide leadership in areas of advanced modeling of human systems, tissue engineering, biomechanical testing, image analysis, mechanobiology, materials testing, and computer-assisted surgery.



Research Facilities

Environmental Research Laboratory

Environmental Information Systems Laboratory

Advanced Geomechanics Testing Laboratory

Geotechnical Gas Hydrates Research Laboratory

Gassy Soils Research Laboratory

Advanced Hydraulics Laboratory

Intelligent Transportation Laboratory

Construction Monitoring and Visualization Laboratory

Project Management and Simulation Laboratory

Rogers Pass Avalanche Research Station

M.A. Ward Structural Laboratory

Structural High Bay

Materials Preparation Laboratory

Small Specimen Testing Laboratory

Thermal Testing Laboratory

Durability Laboratory

Creep Laboratory

Bituminous Materials Research Laboratory

Biomedical Engineering Laboratory Suites

Blue River Avalanche Research Station



Areas of Expertise

- Avalanche
- Biomedical
- Environmental
- Geotechnical
- Materials
- Project Management
- Structural
- Transportation
- Water Resources



SCHULICH
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Department of Civil Engineering

University of Calgary
2500 University Drive NW
Calgary, Alberta
CANADA T2N 1N4

Phone: (403) 220-5821

www.schulich.ucalgary.ca/Civil/



UNIVERSITY OF
CALGARY

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THIS IS NOW

Department of Civil Engineering

University of Calgary
2500 University Drive NW
Calgary, Alberta
CANADA T2N 1N4

Phone: (403) 220-5821

www.schulich.ucalgary.ca/Civil/