

# Case Study:

## York University Computer Science Building

Toronto, Ontario



### Credits

Owner:  
York University, Toronto

Architect:  
Busby + Associates Architects,  
Vancouver

Van Nostrand di Castri Architects,  
Toronto

Environmental Consultants:  
RWDI, Toronto

Structural Engineer:  
Yolles Partnership, Toronto

Materials Engineer:  
Davroc & Associates, Brampton

Contractor:  
Ellis Don Construction, Toronto

Concrete Supplier:  
Ontario Ready-Mix, Etobicoke

Concrete Placer:  
Forma-Con Construction, Toronto

Cement Supplier:  
Essroc Italcementi Group, Picton

Fly Ash Supplier:  
Lafarge Canada, Toronto

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## ECOSMART™ CONCRETE

### A Concrete Contribution to the Environment™

*EcoSmart™ concrete is field tested through a series of case studies including the Computer Science Building at York University*

### Case Study Overview

York University's commitment to environmental sustainability led to the development of the first "green" university building in Ontario. Building materials were carefully selected for low embodied energy and reduced construction waste, which included the specification of high volume fly ash for the majority of the building's concrete elements. The 9,500 m<sup>2</sup> building includes two large lecture theatres, offices, classrooms, common areas and labs.

### EcoSmart™ Concrete Usage

EcoSmart™ concrete using recycled fly ash was used for all cast-in-place concrete components of the building. Concrete thermal mass to offset peak heating and cooling loads required all interior floor slabs, ceilings, stairs and 95% of interior walls and columns to be exposed concrete. **Approximately 5000 m<sup>3</sup> of concrete was used during construction.** Fly ash was obtained from Lafarge Canada Great Lakes in Atikokan, Thunder Bay. Approximately 385 m<sup>3</sup> of Type C fly ash was supplied in bulk quantities to avoid the intensive labor associated with the use of fly ash delivered in bags.



*The concrete manufactured for the York University Computer Science building resulted in approximately 37% less CO<sub>2</sub> emissions than a conventional concrete mix with 15% fly ash replacement.*

### Results

Incorporating fly ash in the concrete mix produced a high quality, warm color, smoother and denser finish concrete satisfying the architect's aesthetic expectations at no extra cost. The use of EcoSmart concrete provided a **higher strength concrete, excellent workability and did not disrupt the project schedule.**

The contractors concluded that in another project similar to York University, they would feel confident setting a goal of at least 50% fly ash replacement for the EcoSmart™ concrete mix. The project team encourages the future use of EcoSmart™ concrete for the **simplicity of the technology, low initial cost, high durability and high environmental friendliness of the product.**



### EcoSmart™ Concrete

EcoSmart™ concrete is produced by replacing cement in the concrete mix with an optimum amount of supplementary cementing material while maintaining or improving the cost, physical performance and constructability.

### EcoSmart™ Objective

The EcoSmart™ Concrete Project is an innovative government-industry partnership that aims to minimize the greenhouse gas signature of concrete by developing EcoSmart™ concrete technology to the point where it becomes common practice. The Project aims to increase awareness of the benefits and challenges of EcoSmart™ concrete through case studies, applied research and communication.

### EcoSmart™ Foundation Inc.

The EcoSmart™ Foundation Inc. is a not-for-profit organization that delivers the Project. The Project is supported by the Government of Canada Action Plan 2000 on Climate Change and various project partners. The EcoSmart™ National Advisory Committee, made up of representatives of the cement and concrete industry, members of the engineering and architectural communities, and Federal Government Agencies, provides support and guidance to the Project.



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