

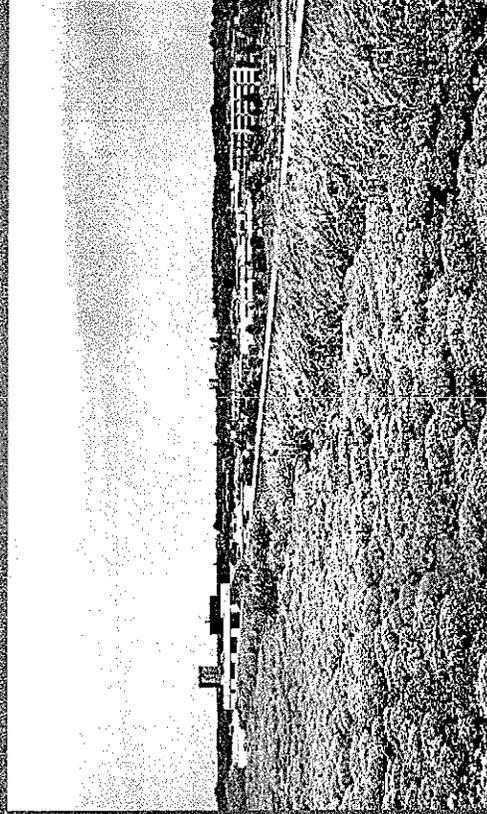
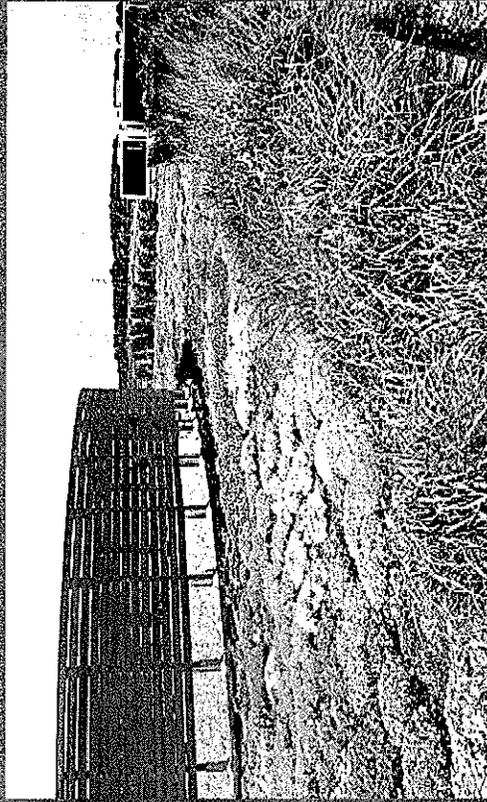
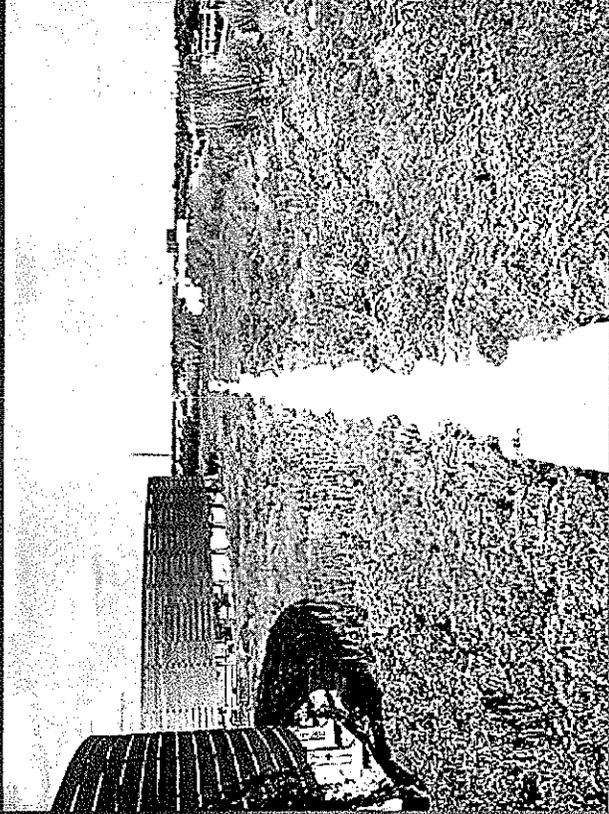
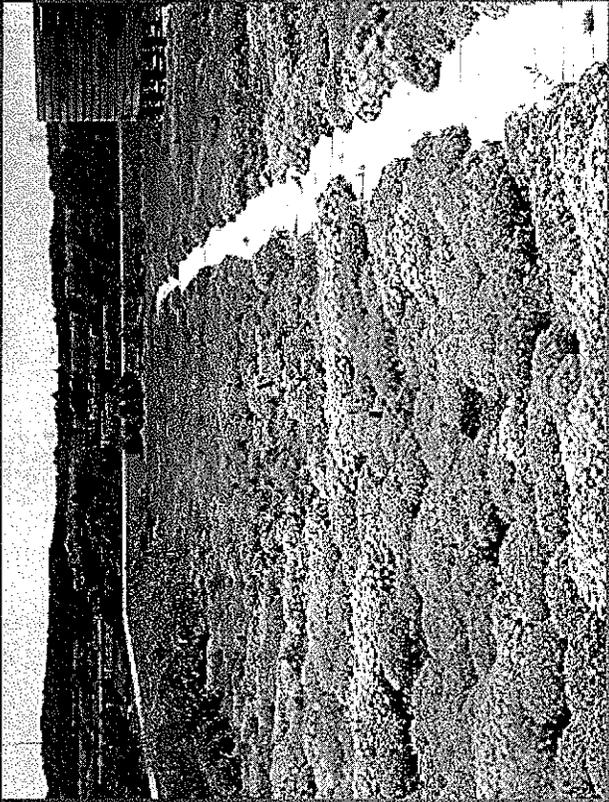
Ontario Science Centre, Toronto, ON 10,000 sq.ft.

Consultant: Halcrow Yolles
Green Roof Advisor: Wytech Building Envelope Solutions
Roof Manufacturer: Tremco Roofing Canada



Covenant House, Toronto ON

Landscape Contractor: Roth & Associates
Green Roof Advisor: Wytch Building Envelope Solutions
Roof Manufacturer: Tremco Roofing Canada



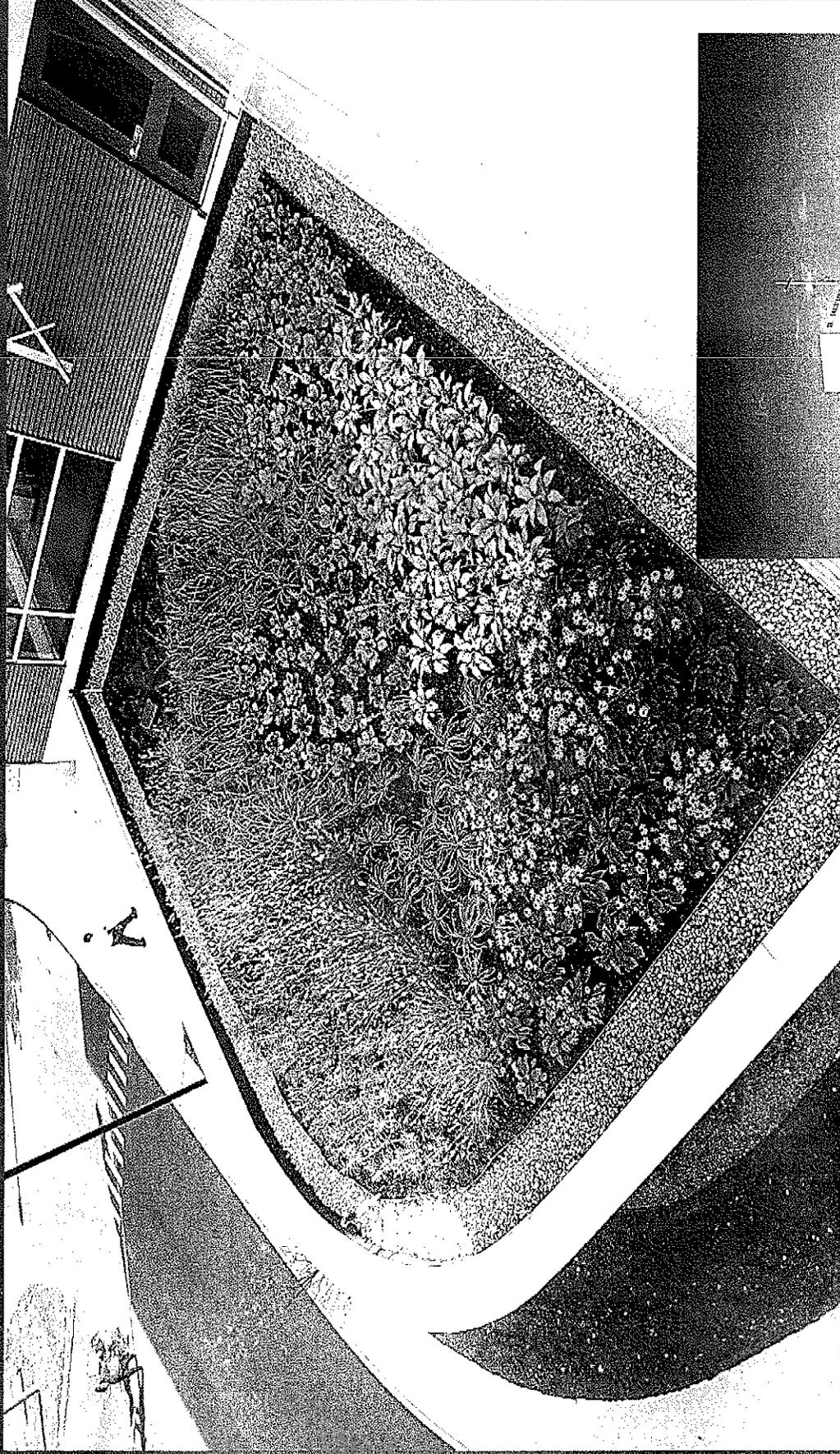
Accelerator Centre, U of Waterloo ON

30,000 sq. ft.

Architect: RHL Architects

Advisor: Wytech Building Envelope Solutions

Photo courtesy of Wytech

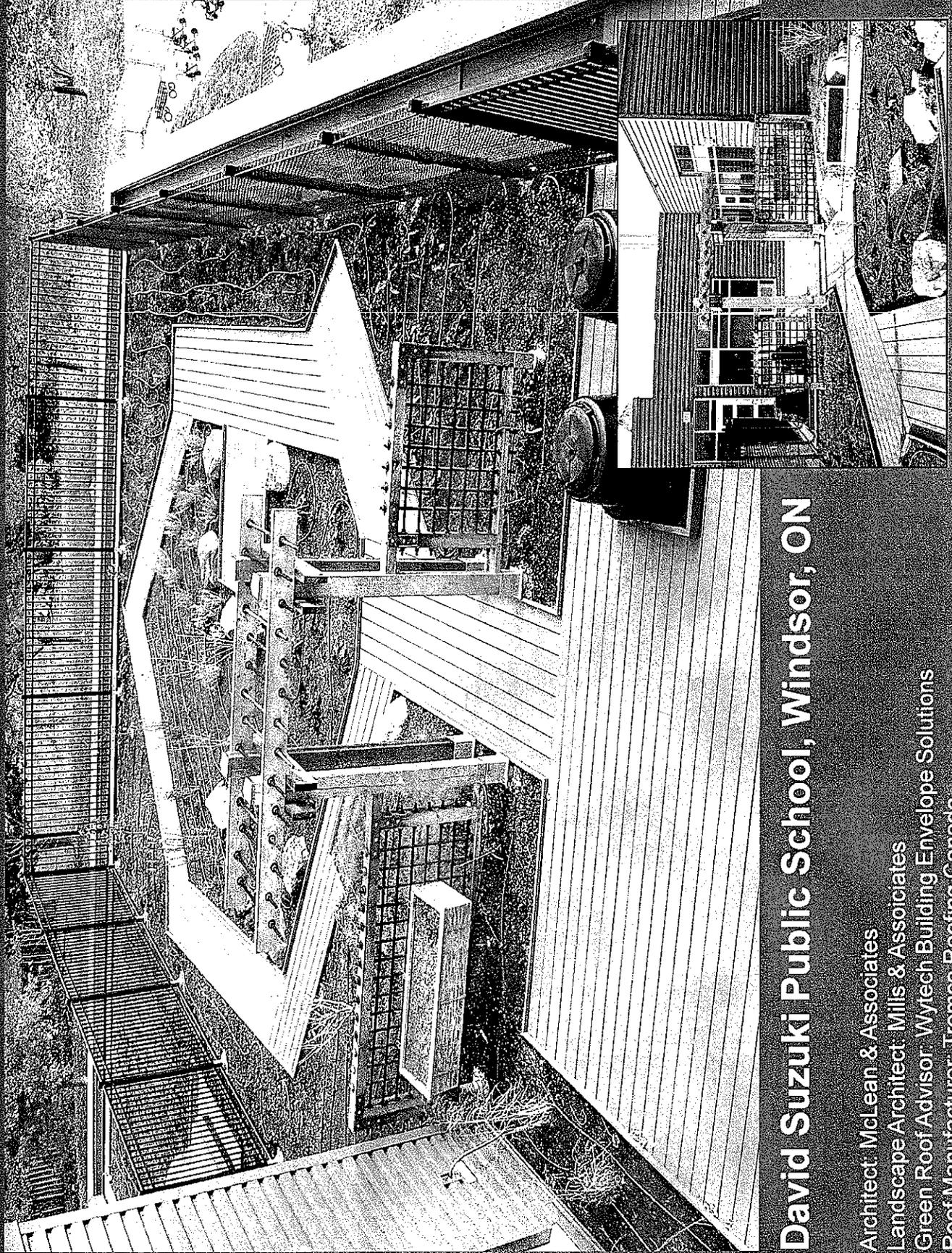


Photo's Courtesy of Passa Architect

St. Christopher RCSS, Windsor ON

5,000 sq. ft.

Architect: Passa & Associates
Advisor: Wytech Building Envelope Solutions
Roof Manufacturer: Tremco Roofing Canada



David Suzuki Public School, Windsor, ON

Architect: McLean & Associates

Landscape Architect: Mills & Associates

Green Roof Advisor: Wytech Building Envelope Solutions

Roof Manufacturer: Tremco Roofing Canada

Government Presentations:

Province of Quebec
City of Waterloo
City of Sudbury
City of Mississauga
City of Richmond Hill
Province of Ontario
City of Toronto



City of Toronto Green Roof Building Standard

Provide City Staff with the technical foundation necessary to develop a Green Roof By-law
To provide certainty and clarity for the green building industry active in Toronto
Provide recommendations for design requirements of a Toronto green roof building standard
Included analysis of how identified potential green roof standards to support the City's key policy objectives and performance criteria.

Key policy objectives of the City of Toronto include:

- Reduced urban heat island;
- Storm water management impacts (quantity and quality);
- Impacts on building energy consumption; and
- Improved air quality

City of Toronto Green Roof Building Standard

Item	Item Description	Green Roof Implication	Notes
Division B 4.1.7.1.(4)	Wind loads are to be calculated using a reference velocity pressure for "a probability of being exceeded in any one year of 1-in-50".	Specifies the basic wind pressure to which green roofs should be designed for.	Prior to the 2006 OBC, design could be limited to lower wind pressures; those for a 1 in 10 year probability.

Item	Item Description	Green Roof Implication	Notes
Division B 7.4.10.4.(1)	The hydraulic load is the maximum 15 minute rainfall (25mm for the City of Toronto) multiplied by the area of the surface drained and one half the largest adjoining vertical surface.	This design load should not change despite the green roof altering rainwater retention and run-off characteristics.	Clarify that the storm water design does not change from that mandated in the Code.

Item	Item Description	Green Roof Implication	Notes
Division B 7.4.10.(2)	Control flow roof drains may be installed provided "(b) the roof structure has been designed to carry the load of the accumulated water, (c) one or more scuppers are installed so that the maximum depth of water on the roof cannot exceed 150mm..."	Similar to control flow roof drains, green roofs similarly impede/retain rain water and reduce storm water run-off from the building.	A similar requirement to limit water depth would be prudent in the Toronto Standard

Green Roof Technical Advisory Group

Preparation of the City of Toronto Green Roof Construction Standard (TGRCS) and Supplementary Guidelines

First municipal standard in North America to establish minimum requirements for the design and construction of green roofs

The TGRCS establishes City's requirements while also meeting Ontario Building Code (OBC) requirements

The document is not a 'how to manual' on green roof design and construction

Mandatory provisions are included in the Toronto Green Roof Construction for the following areas:

- Green Roof Assembly
- Gravity Loads
- Slope Stability
- Parapet Height and /or Overflow Scupper Locations
- Wind Uplift
- Fire Safety
- Occupancy and Safety
- Waterproofing
- Drainage
- Water Retention
- Vegetation Performance
- Plant Selection
- Irrigation
- Maintenance



Vancouver Convention Centre, Vancouver BC

Toronto Green Roof Construction Standard

The Standard is to set out minimum requirements for the construction and maintenance of green roofs.

The Standard governs the design and construction of green roofs setting out minimum requirements that meet the City's objectives and the Ontario Building Code requirements.

Gross Floor Area (Size of Building)	Coverage of Available Roof Space (Size of Green Roof)
2,000 - 4,999	20%
5,000 - 9,999	30%
10,000 - 14,999	40%
15,000 - 19,999	50%
20,000 or greater	60%

Note: Residential buildings less than 6 storeys or 20m in height are exempt from a green roof



Grants for Cool and Green Roofs
on Toronto's Industrial, Commercial
and Institutional Buildings



U.S. Green
Building Council

Funding for the installation of green roofs and cool roofs on Toronto's ICI buildings through its Eco-Roof Incentive Program

Green Roof Grants

Eligible green roof projects will receive \$75 / square metre up to a maximum of \$100,000

Cool Roof Grants

Eligible cool roof projects will receive \$2 - 5 / square metre up to a maximum of \$50,000

Eco-Roof Incentive Program is a key element of the City's Climate Change Action Plan, an aggressive environmental framework aimed at reducing Toronto's greenhouse gas emissions by 80 per cent by 2050

Quantifiable & Qualitative Benefits

Rebuilds the lost ecosystem equilibrium

Reduces energy consumption

Provision of wildlife corridors

Economical/Community benefits

Aesthetic improvements

Psychological benefits

Recreation space

Employment opportunities

Storm Water Management

"Van Jones demonstrates convincingly that the best solutions for the sustainability of our planet are also the best solutions for everyday Americans."
—AL GIBBE

THE GREEN COLLAR ECONOMY

HOW ONE SOLUTION
CAN FIX OUR TWO
BIGGEST PROBLEMS

VAN JONES

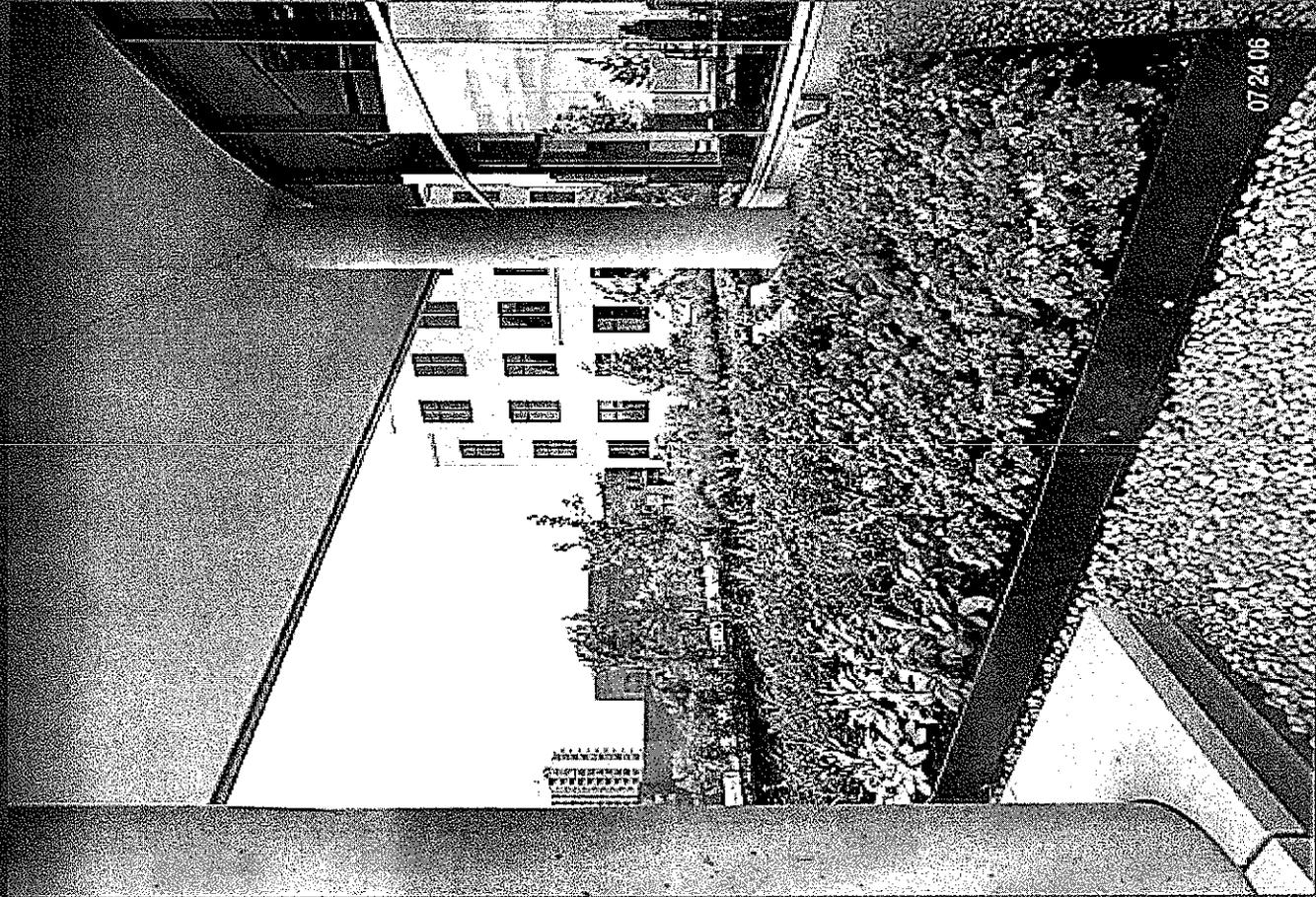
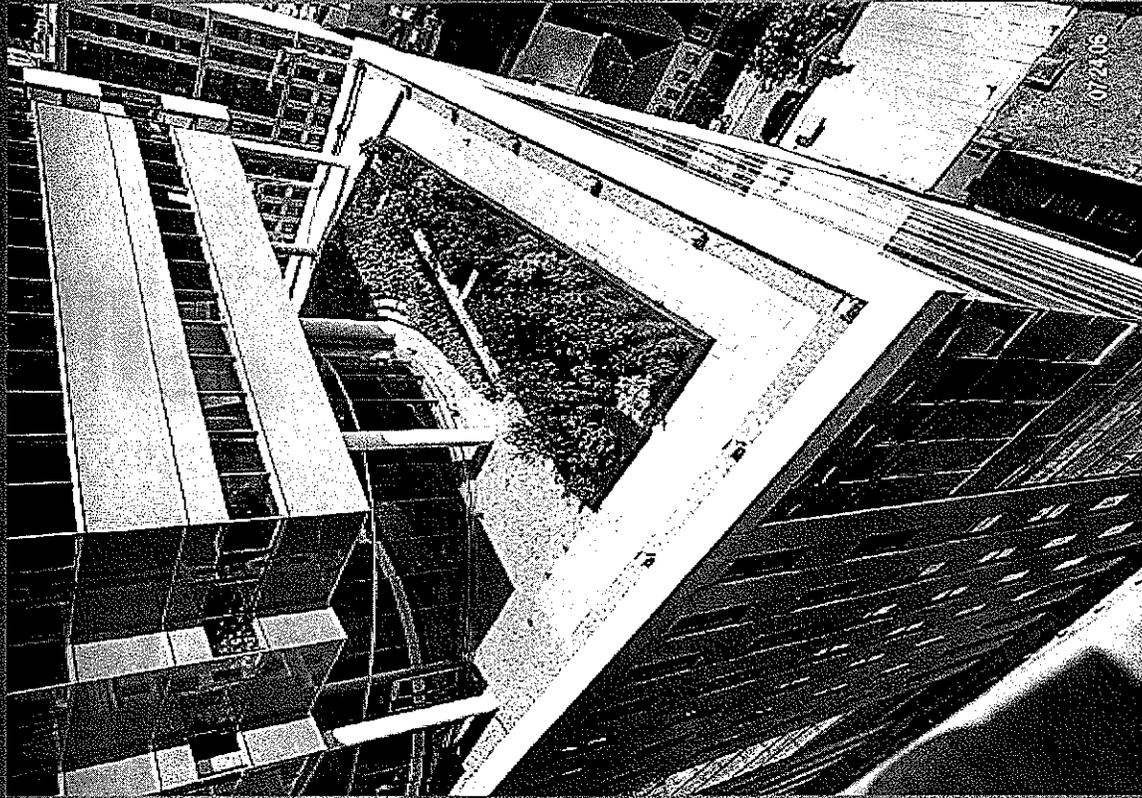
FOREWORD BY ROBERT F. KENNEDY JR.

Accelerator Centre, U of Waterloo ON - 30,000 sq.ft.
Architect: RHL Architects
Green Roof Advisor: Wytech Building Envelope Solutions



Hugh Gardiner Co-Op, Toronto, ON

Architect: Monica Kuhn
Roof Manufacturer: Tremco Roofing Canada



180 Queen St. West, Toronto ON
800 sq. ft.

Landscape Architect: Roth & Associates

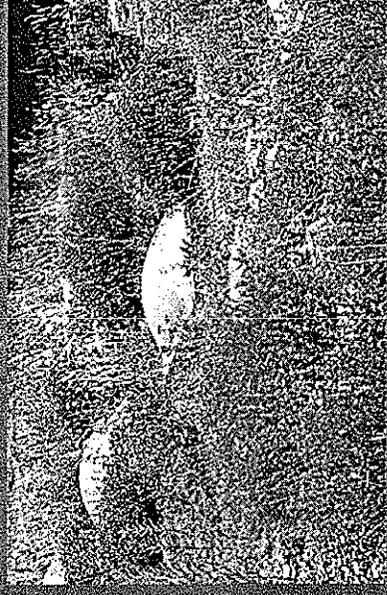


Levitt Goodman Residence, Toronto ON

Architect: Levitt Goodman Architects

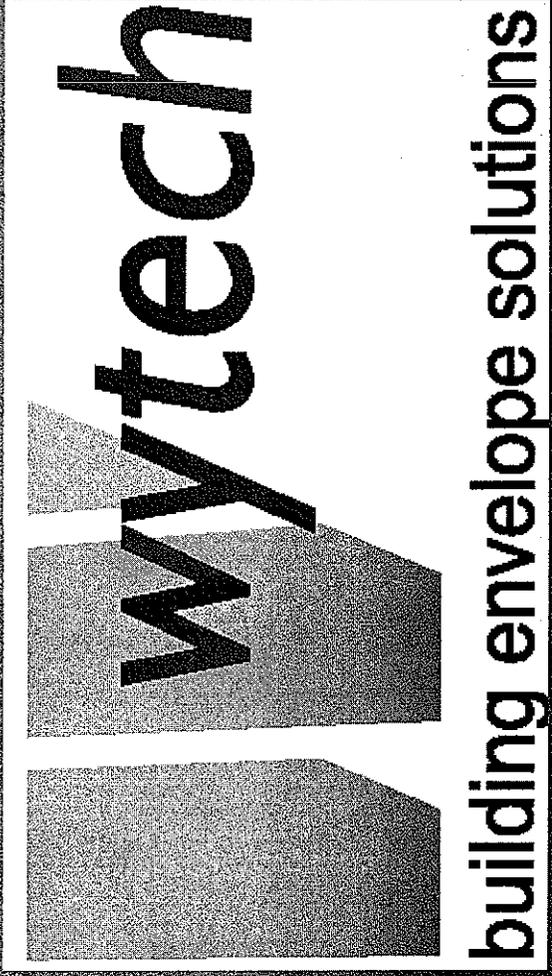
Key Concepts

- Start small and implement policies in stages. Many sustainability policies are first implemented at a small geographic scale or with a small scope. Successful pilot projects were expanded in stages over time.
- There is no silver bullet. Policies have to be coordinated and integrated across sectors and levels of government to achieve maximum effectiveness.
- Foster citizen participation and communicate policies effectively. Citizen input reduces potential legal challenges, increases public acceptance, and has the potential to improve projects and outcomes.
- Find innovative solutions and embrace bipartisanship. Successful green policies in Germany were designed to meet the needs of multiple constituents



“ He who cannot change the very fabric
of his thought will never be able to
change reality, and will never, therefore,
make any progress.”

- *Anwar Sadat*



Scott Wylie