

**Reducing Air Leakage Through  
The Building Envelope  
Cuts Energy Demand  
and Consumption**

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**BUILDING ENVELOPE SPECIALISTS INC.**

# Late 1970s: How it all started

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## Three Toronto schools air sealed:

- ▲ **Brimwood Snr. Public School**  
Electricity cost savings 9.4%
- ▲ **Chester Blvd. Public School**  
Electricity cost savings 17%
- ▲ **Brookmill Blvd. Public School**  
Electricity cost savings 35.5%

# National Research Council of Canada Report

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## Effects of air infiltration on energy consumption:

- ▲ School buildings 29%
- ▲ Houses 40%
- ▲ Tall buildings (commercial) 22-46%
- ▲ Supermarkets 2-4 times higher than schools or tall buildings
- ▲ High-rise residential 40%

# Donald Street, Ottawa

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- ▲ Peak demand before air sealing  
772kW
- ▲ Peak demand after air sealing  
687kW
- ▲ Consumption reduction after air sealing  
12%

# Bridletown, Toronto

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- ▲ Peak demand before air sealing  
496kW
- ▲ Peak demand after air sealing  
454kW
- ▲ Consumption reduction after air sealing  
6.5%

# Donald Street and Bridletown

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Share of demand reduction by air sealing measure:

- ▲ Weatherstripping windows 42%
- ▲ Weatherstripping exterior doors 28%
- ▲ Sealing shafts 14%
- ▲ Miscellaneous 14%

# St. Hilda's Senior Citizens' High Rise, Toronto

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- ▲ Weatherstripping windows and doors
  - ▲ Sealing behind baseboards, mechanical room, shafts
  - ▲ Result: Reduced electrical demand and consumption
- Provincial Government Energy Program*

# Baycrest Geriatric Centre (Toronto)

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- ▲ Weatherstripping windows and doors
- ▲ Sealing behind baseboards, mechanical room, shafts
- ▲ Result: Energy savings, reduced fly infestation

*Provincial Government Energy Program*

# Trinity College, University of Toronto

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## ▲ Weatherstripping windows

# Muskoka School Board, Ontario

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- ▲ Sealing roof/wall joints
- ▲ Weatherstripping doors and windows

*Energy Service Company Performance Contracting*

# Gravenhurst High School, Ontario

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- ▲ Cost of air leakage control \$6,740
- ▲ Energy savings in January/February \$4,893

*Energy Service Company Performance Contracting*

# Testing

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- ▲ Large-scale depressurization
- ▲ Individual residential blower door
- ▲ Windows
- ▲ Smoke pencils

# Fixable problems

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## ▲ Roof top exhaust

# Other roof top penetrations

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# Mechanical penthouses

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# Electrical penetrations

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# Mechanical stacks in high-rises

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# Soffits

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# Double doors

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# Fire doors

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# Party walls

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# Results

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- ▲ Energy savings
- ▲ Improved comfort
- ▲ Increased durability

# In

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- ▲ More than 1,000 schools in Canada and the U.S.
- ▲ More than 100 commercial and residential high rises in Toronto, Ottawa, Windsor and Chicago
- ▲ Several thousand new + existing single-family homes

# The future

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- ▲ Performance contracting
- ▲ Building renewal
- ▲ Utility post-deregulation services