

Professional CONSULTING Services: Net Zero Energy Healthy Housing & Sustainable Communities

- helping proponents to make their projects more "sustainable"
- an integrated & holistic approach to IAQ, water, energy, transit, lifestyle, GHG & self-sufficiency
- Jorg Ostrowski, M. Arch. (MIT), B. Arch. (Toronto), 30 years in "real world" sustainable development
- designer/builder, (prime) consultant to developers, builders, NZE proponents, designers, architects, property owners, municipalities, government, colleges, First Nations, individuals and owner-builders

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INDEX

01) Summary	08) Sustainable Community Work
02) Introduction	09) Mission Statement
03) Consulting Services	10) Current Projects
04) <i>Curriculum Vitae</i>	11) Highlights of Past Work
05) Benefits for Clients	12) AEEC (energy plus Eco office)
06) Qualifications	13) ASH/O (NZ water/gas/sewer)
07) Corporate Profile	

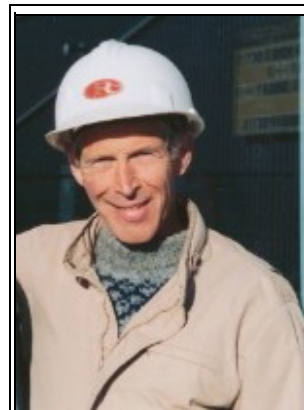


Fig. 1: Jorg Ostrowski



Fig. 2: conference talk

01.0) SUMMARY:

[1.1] Our sustainable projects have received public recognition through 6 awards, 135 articles (journals/newspapers), 20 TV /radio interviews, 60 (conference) presentations, 22 reports, 20 workshops and seminars, 5 leading-edge demonstration projects, 300 industry/government partnerships and about 200,000 real-time visitors. Consulting have been provided for 30 years.

02.0) INTRODUCTION:

[2.1] This firm has already provided consulting services to 2 Phase 1 CMHC NZEH Housing Competition winners. A 3rd winner has also contacted this office for consulting services. Due to the demand, we would like to make ourselves available to any other firms designing or building NZE housing projects.

[2.2] ACE-Alternative & Conservation Energies Inc. and ASH-Autonomous & Sustainable Housing Inc., are prime consultants on several sustainable communities in western Canada including a multi-family mixed use project in the inner city and a larger 41 ha development, in Calgary. ASH will project manage the design team and all consultants on behalf of the developer. ACE will project manage construction with the builders.

[2.3] Our most useful benefit to clients is our daily experience with the healthy materials, green products, innovative design, appropriate technology, alternative energies, resource conservation and energy efficiency of our own sustainable home and office. Most of our projects are in British Columbia, Alberta and Saskatchewan. "Hands-on" experience, including project management and site inspections, can compliment your design team to improve the integrated and pragmatic approach to the ecological planning of green communities and the environmental design of housing.



Fig. 3: PV/Wind NZEH home, Alberta 1995

03.0 Consulting SERVICES offered (per hr/diem basis):

We offer the following expertise, based on work with sustainable housing and green communities over the last 30 years:

- [3.1] design/construction of 5 demonstration projects
- [3.2] company goodwill, including: long track record, many contacts, a national reputation, many articles on our work
- [3.3] second opinion based on our experience and knowledge
- [3.4] personal and professional feedback on the strengths, weaknesses and reality of various sustainable features
- [3.5] strategies: how to make the project award winning and go beyond any competition, as a future investment
- [3.6] assistance with partnerships: we have a track record of working with 300 partners for mutual benefit
- [3.7] assistance with funding applications: we have received funding grants from Federal and Provincial governments
- [3.8] how to go beyond the targets of "net zero energy healthy housing" in several major ways, far beyond LEEDS
- [3.9] 2 possible revenue generation opportunities for the land owners in the short and long term

Consulting may include: a tour of our Calgary demonstration project (Fig. 4), design charrettes, round table discussion with staff, a review (or purchase) of y(our) drawings/specs, access to our mechanical/structural engineers, in person or by internet.

04.0 short Curriculum Vitae of Jorg Ostrowski (Fig.1):

- director, partner, president of ASH-Autonomous & Sustainable Housing Inc. & ACE-Alternative & Conservation Energies Inc.
- education: M. Arch. A.S. (M.I.T.), B. Arch. (U. of Toronto)
- specialization: green buildings and sustainable communities
- 30 years of full-time "real world" professional practice
- environmental/architectural design, ecological planning and consulting on green buildings and sustainable communities
- lectures (Fig. 2) and "hands-on" construction workshops
- urban design of downtown Toronto Waterfront (now called "Harbourfront"): 1972-1973 (Fig. 6)
- 5 demonstration projects completed, ~ 200,000 visitors (4 are shown here in Figs. 4, 7, 13, 21-25, and 26-33)
- recipient of 5 national and international awards and citations
- 930 m² urban strawbale commercial project (Fig. 9)
- sustainable strawbale office building (2 awards, Figs. 21-25)
- college retrofit (73% energy reduction, Figs. 18 and 19)
- 50 story office tower retrofit
- many RecoFit (ecological RetroFit) homes and projects
- worked on various small self-sufficient EcoVillages & sustainable communities since 1976 (see 08.00 below)
- residential, commercial, institutional, both new and retrofit, using "EcoStuds", straw bales, SIPs, ICFs, double wall/log, stackwall, rammed earth, Blackie Block, modified stick frame
- many low-energy passive solar homes completed
- design/built 1 Energy Plus (Credit) building (Figs. 21 to 25)
- designed several NZEH homes (off-grid) (i.e. Figs. 3 and 17)
- live + work daily in a sustainable Home/Office not using city gas, water or sewer lines, total grid energy = 10.5 kWh/m²/a
- trying to lead a conserver lifestyle both at home and work
- a longer older **resume** can be found at:
http://ecodeveloper.com/resume_jorg.htm



Fig. 4: Japanese energy corporations on Tour



Fig. 5: R-2000 Certificate, 1983



Fig. 6: 1973 plans ⇒ Toronto Harbourfront 2005



Fig. 7: demonstration with PV/wind, 1979

05.0) BENEFITS of consulting work for clients:

The benefits of our consulting work for clients may include:

- [5.1] saving money (hard, soft, capital, operating and maintenance costs) through design simplification, and avoiding untenable, impractical, questionable or costly systems
- [5.2] avoiding or reducing liabilities from unnecessarily high operating costs, missed energy or income generation, building obsolescence, or potential litigation from poor IAQ
- [5.3] generating revenue in some cases, depending on site, assets, mandate, interest, opportunities and constraints
- [5.4] defining leadership & benchmark opportunities
- [5.5] increasing real estate value of property
- [5.6] cultivating opportunities for awards and citations
- [5.7] promotional/marketing opportunities that money cannot buy (see 07.00, ¶ 2, below) based on previous experience
- [5.8] secrets, short cuts, refinements and lessons learned
- [5.9] trouble shooting and proposed remedies
- [5.10] cost avoidance, and risk reduction and management

06.0) QUALIFICATIONS compared to others:

The main **difference** between our firms and other consultants in Canada is a unique professional combination of:

- [6.1] long track record: 30 years specialization in green buildings and sustainable communities
 - [6.2] creative and innovative solutions based on an integrated, holistic, visionary and pragmatic approach to sustainability
 - [6.3] real world experience: most design projects are built
 - [6.4] diversified portfolio: small scale (single family homes) to large scale (waterfront, office tower and college retrofit)
 - [6.5] wide scope of work: design/built, project management, consulting, R&D experience, not just theoretical design
 - [6.6] our own sustainable building, designed and built by one of our firms (not using city water, sewer or gas lines, a boiler or furnace), allows us daily experience and constant evaluation of the strengths and weaknesses of design innovations and features, healthy materials, green products, appropriate technology, IAQ and DSM, etc. Demonstration projects allows us to see the effects of durability, time, children, UV and wear and tear, and to gage public and client interest and response to specific features.
 - [6.7] 5 demonstration buildings have been designed and built
- We are sometimes brought in to provide creative solutions, after standard consultants have given their best effort.

07.0) Corporate Profile & further information:

- the best **slide presentation** on our work can be found at: <http://www.ecobuildings.net/pdfs/Portfolio.Slide.showF.pdf>
- **media coverage** of work can be found at: http://www.ecobuildings.net/pdfs/Public_Interest_1.pdf, and http://www.ecobuildings.net/pdfs/Public_Interest_2.pdf
- **partners** for 3 of our demonstration projects can be found at: <http://www.ecobuildings.net/partners.php>
- **10 Main Principles** for Sustainable Buildings are listed at: <http://www.ecobuildings.net/other.php>



Fig. 8: Health Food Store, Calgary 1995



Fig. 9: commercial Strawbale project, Calgary 1997



Fig. 10: Fortier Strawbale Residence, SK, 2005

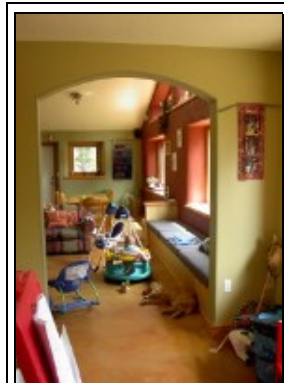


Fig. 11: Kubian Strawbale

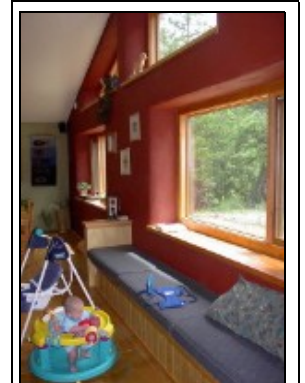


Fig. 12: ...Home, BC, 2003



Fig. 13: home for Engineered Homes, builder 1981

08.0) Sustainable Community Work:

- proposals, conferences, consulting, design, construction:
http://www.ecodeveloper.com/ecovillage_work.htm and
http://ecodeveloper.com/ecovillage_work.htm
- **media coverage** and **talks** on our EcoVillage work can be found in 4.00) COMMUNITIES, A & B at:
http://www.ecobuildings.net/pdfs/Public_Interest_2.pdf
- 4 talks given at the **World's Fair** in 2000 can be found at:
http://www.ecobuildings.net/pdfs/ace_hannover_expo_2000.pdf
http://ecodeveloper.com/resources/ace_hannover_expo_2000.pdf
- **slide show** on our EcoVillage 1 in **Rockyridge**:
<http://www.ecodeveloper.com/ecovillage/index.htm>
- **EcolInventory** Map for our Rockyridge project can be found at: http://ecodeveloper.com/ecovillage_inventory.htm
- plans for EcoVillage 1 in **Bearspaw** (1999):
http://ecodeveloper.com/ecovillage_concept_poster.htm and
http://ecodeveloper.com/ecovillage_site_plan.htm
- 2 **plans** for EcoVillage 1 at **Rockyridge** (2000):
<http://ecodeveloper.com/ecovillage2.html>
- **Abstract** of EcoVillage 1 in **Rockyridge** can be found at:
http://ecodeveloper.com/ecovillage_summary.htm
- a Regulatory Reform Summary **Report** for EcoVillage 1, can be found at http://ecodeveloper.com/Ecovillage_Report_1.html
- 2 partners have traveled to several sustainable communities: 2 in the US including, Civano AZ, 1 in Denmark, 2 in Germany
- we have an extensive library on reports and articles on other sustainable communities around the world

09.0) MISSION/VISION Statement/Corporate Mandate:

- see: http://www.ecobuildings.net/mission_statement.php

10.0) CURRENT (& PAST) Energy plus & NZE WORK:

- 10.1) **Energy Plus** projects 5 examples):
 - a) SunAlta EcoSolarium (Calgary): Mixed-use, medium density energy-plus prototype community (2006)
 - b) CV Sustainable Community (Calgary): 41 ha self-sufficient community (2006)
 - c) IDEAL Quest Ranch (Jaffray, BC): ongoing consulting since 1995 on the design and planning of green buildings, university, EcoVillage and renewable energy
 - d) Byran/Griebel single family home (Saskatchewan)
 - e) Packard single family retirement home (Quebec)
- 10.2) **NZE Healthy Home** Projects:
 - a) Griffiths Off-Grid, BC (under Construction, Fig. 17)
 - b) Wickhorst Strawbale home, Off-Grid, AB (1995, Fig. 3)
- 10.3) other low energy passive solar projects :
 - a) Ferguson Project
 - b) Taylor Duplex, Calgary (2004, Fig. 15)
- 10.4) other possible Sustainable Community projects:
 - a) Bearspaw (Calgary)
 - b) Ashcroft (BC)



Fig. 14: solar Sustainable Community, AB 1989



Fig. 15: Taylor Solar Duplex, Calgary, 2005



Fig. 16: Pattinson Solar Residence, BC, 1995



Fig. 17: Griffiths solar NZE Home, BC, 2006

11.0) Highlights of **PAST WORK** (1972 to 2006):

Highlights of professional design, planning and consulting work over the last 34 years include the following projects:

- [11.1] 1972-3: **Toronto Waterfront**: transformation of a 39 ha brownfield into greenfield ("Harbourfront", Fig. 6)
- [11.2] 1979: **Stampede SunSeed** demonstration building for the Calgary Stampede & Exhibition Board, with ~ 65,000 visitors (design/built, Fig. 7)
- [11.3] 1981: ValleyView (private) **School** (Alberta, Fig. 20)
- [11.4] 1981: Engineered Homes (builder, 3 awards, Fig. 13)
- [11.5] 1989: small mixed-use multifamily residential for a sustainable community (Alberta, Fig. 14)
- [11.6] 1996: \$2.4 M college retrofit reducing GHG emissions and fossil fuel consumption 73% with a 2.7 year payback (Calgary, Fig. 18 and 19)
- [11.7] 1997: retrofit strategies to make a 50 story, 2,000 person office tower more sustainable (Calgary)
- [11.8] 1997: factory addition built from reused materials, solar hot water collectors, SIPs & strawbales (Calgary, Fig. 9)
- [11.9] 1999: evaluation report on new Recreation Centre & Dormitory just completed for workers of SunCor Energy
- [11.10] 1976-2000: 5 leading-edge demonstration buildings for public viewing, student education and private tours with 200,000 visitors & 300 industry/government partners from around the world (Figs. 7, 13, 21-25 and 26-33)
- [11.11] 1999-2001: design of EcoVillage 1, 2.4 ha leading-edge sustainable community in Rockyridge aborted by others
- [11.12] 2002: small energy plus Eco Office demonstration building for municipality with PV intertie (Airdrie, Figs. 21-25)

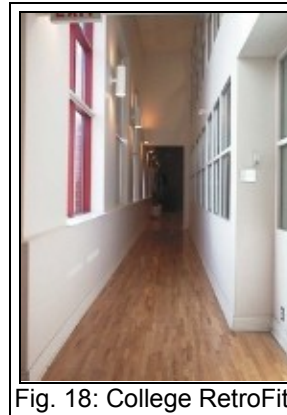


Fig. 18: College RetroFit



Fig. 19: Library over pool



Fig. 20: low cost passive solar School, 1981

12.0) The **Airdrie Environmental Education Centre**:

[12.1] This small 102 m² (1100 SF) energy plus demonstration project for public viewing of alternative energy and environmental technologies, was completed in 2002. It can be used as a sustainable home or office, or both. It is designed and built by ASH-Inc. to demonstrate the use of sustainable design and construction, and to promote healthy materials, environmental stewardship, green products, appropriate technology, the many "R"s, resource conservation, and renewable energy for government, industry and general public, far beyond net zero energy.

[12.2] This project is believed to be the first municipal EcoOffice Building of its type in Canada. Some of the unique features of this small but integrated, energy plus project include:

- airtight strawbale wall construction ("Nebraska style")
- shallow foundation (rubble trench)
- "SolarWall" preheat panels (seen in Fig. 21)
- surplus solar heat storage in the earth under the building
- a high efficiency heat recovery ventilator (HRV, Fig. 22)
- passive solar heating (Fig. 21)
- hinged active solar hot water collectors (Fig. 21)
- solar preheated radiant floor heating system
- high performance [i.e. RSI 2.46 (R-14)] fiberglass windows
- rainwater harvesting (cistern seen at left in Fig. 22)
- a photovoltaic grid-intertie system (Fig. 21)
- the reuse of left-over materials (i.e. tiles, glass, bench)
- Nikken Pi Mag "living water" filter (0.1 micron)



Fig. 21: Energy Plus Eco Office Building, 2002



Fig. 22: cistern, HWT, HRV



Fig. 23: presentation room

[12.3] The strawbale Eco Office is seen by about 1,000-1,500 visitors a week as local people visit their recycling depot. The building also has about 20-30 visitors a week throughout the year, and about 20 students per week during the school year.

[12.4] A future alternative treatment system for greywater and blackwater ("Watson Wick") was planned, but not implemented.

[12.5] It has won 2 awards. The design and construction of this innovative project was made possible through the generous participation of the Alberta Government. It demonstrates the products and services from 64 partners in industry, including: ASH-Autonomous & Sustainable Housing Inc., Home Depot, LaFarge Canada, Plasti-Fab, Pedersen Engineering, Dow Chemical Canada Inc., LePage/Henkel Canada Corporation, Conserv Engineering, NuTech Energy Systems, Chacare Inc., Can-Cell Industries, National Concrete, and Wirsbo Canada. Website: http://www.ecobuildings.net/old_website/airdrie.shtml



Fig.24: AEEC, N entry



Fig. 25: N & S airlocks

13.0) The Alberta Sustainable Home/Office (Abstract):
(construction: September 1993 - March 1994, Figs. 26 to 33)

[13.1] This 170 m² (1625 SF) demonstration home/office in suburban Calgary Alberta, was the first sustainable, autonomous and energy-credit home built in Canada. It has been visited by about 100,000 visitors, many foreign delegations and thousands of students. It is the 4th ecobuilding demonstration project for the public, design/built by the partners of ASH-Inc.



Fig. 26: Calgary NZ water/gas EcoHome, 1994

[13.2] Annual utility savings in January of 2001 were about \$4,000 (based on \$13/GJ for natural gas (NG) and \$0.11/kWh for electricity), since it does not use the city gas line, water line or sewer line, and due to the very efficient use of electricity at home and in the office. It has no furnace or boiler.



Fig. 27: waterless toilet



Fig. 28: multi-task fireplace

[13.3] This sustainable home/office houses an inventory of innovative concepts, healthy materials, green products, alternative construction methods and renewable energies, for the everyday Canadian, in both new and retrofit applications.

[13.4] It does not need Government subsidies to pay for operating costs. It did not benefit from the Alberta government's energy rebate program, since it does not use natural gas and electrical use is so low. It relies on conservation energy, internal heat gain (body/appliance heat), solar energy (passive and active) and a masonry heater for backup heating during cold weather (average 5,040 hDD, 1994-2004). It is integrated into the electrical grid, to export clean green energy in the future.

[13.5] Its construction in 1993-1994, saved about 225 Alberta trees and an estimated 70% of all construction waste. Today, after 13 years of continuous use, it uses **1.05 wh/hDD/m³** of purchased (wind) energy annually. Total electrical consumption is about 87 kWh/person/month for both home and office, (28% of average residential use, Calgary). Annually, it saves 210 GJ of NG (100% reduction), 349,850 L drinking water (100% reduction), 216,910 L of sewage (100% reduction), 6,135 kwh of coal-generated electricity (82% reduction) and 49 kg of household garbage (92% reduction) through the prudent use of resources, renewable energy and a conserver lifestyle.

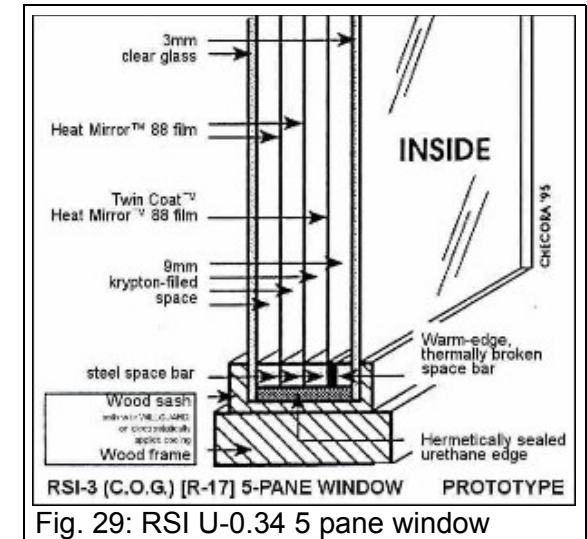


Fig. 29: RSI U-0.34 5 pane window

[13.6] Its total purchased energy compares with the following:

- 1) standard home: 217 kWh/m²
- 2) R-2000 home: 104 kWh/m²
- 3) Advanced Home: 52 kWh/m²
- 4) Calgary **Eco-Home**: 10 kWh/m²

[13.7] Internal heat gains from appliances, people and lighting is estimated at 15% of space heating requirements. Passive and active solar contributes another estimated 65%. The remaining 20% (backup heating) comes from a multi-purpose masonry heater, using less than 0.75 chord of wood per year.

[13.8] This house addresses the Kyoto protocol in a very realistic manner. **CO₂ reductions** from eliminated natural gas and reduced electrical demand, amount to 16,739 kgs each year, with a market value of about \$1,700-\$2,920/yr, as **carbon credits** (a reduction of about 92% of CO₂ emissions compared to a standard neighbourhood house). Over the last 13 years, a total of 79,755 kWh of electricity, 143,560 L of **water** and 39,880 m³ of oxygen has been saved only due to low electrical consumption. NG savings have resulted in a saving of 2,730 GJ and 163,800 m³ of oxygen. Total **oxygen** saved from using no NG and an 82% reduction in coal generated electricity, is 203,680 m³ over the last 13 years. Approximate reductions in GHG emissions from reduced fossil fuel use are as follows: 217,607 kg of CO₂, > 1.69 kg of N₂O, 278.98 kg of NO_x, 257.66 Kg of SO₂, 53.30 kg of CH₄, 91.65 kg of CO, 4.68 kg of VOCs, and 17.94 kg particulates. Water and oxygen are far more important than "energy" and NZE projects must consider oxygen and water before they can be considered "sustainable". NZE does NOT necessarily imply sustainability.

[13.9] One technical highlight is an 5-pane prototype window (Fig. 29) with a RSI U-Value of 0.34 (believed to the highest insulated window in the world at this time). The project also includes our favourite wall construction method, the EcoStud; a waterless toilet (Fig. 27); a greywater recycling system (Fig. 32); slab-on-grade construction; shallow foundation; the "Airtight Drywall Approach" to airtight construction and vapour retardation; cellulose insulation for airtightness, firestops and recycled content; a translucent solar hot water collector for both space and water heating; healthy materials including "Meditate II" and "Phoenix Biocomposite"; and several forms of lighting technology including LEDs, CFLs and electroluminescence.

[13.10] This project has received 5 national/international awards and citations (1 is shown in Fig. 30). It has been discussed on several national TV and radio programs and presented at many conferences with about 75 articles written internationally. About 220 partners from industry, government and NGOs were involved in the application of healthy materials and green products, as listed at: <http://www.ecobuildings.net/partners.php>

[13.11] This project has been open to the public for 13 years. Regular "EcoTours" are still held on the last Saturday of each month (except for holiday weekends). For further information, please see our web site: <http://www.ecobuildings.net>

THANK YOU for having read this resume. Comments welcomed.

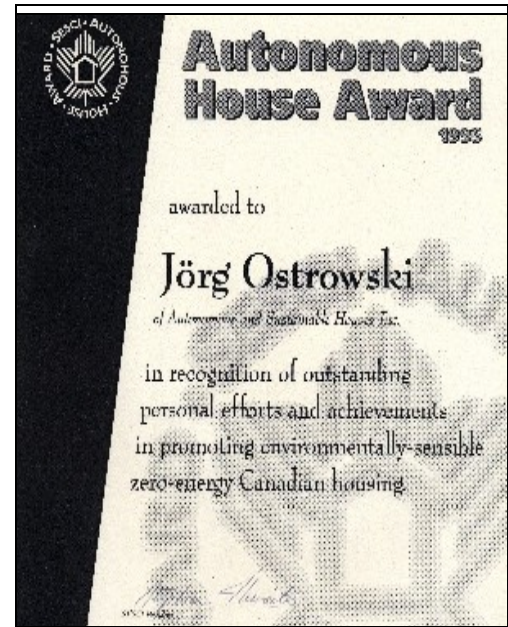


Fig. 30: Zero Energy Housing Award, 1995



Fig. 31: Home Office/reception/garage/display center



Fig. 32: GW hydroponics



Fig. 33: wide window sills

	<input type="checkbox"/> A.C.E.-ALTERNATIVE & CONSERVATION ENERGIES INC.
	<input type="checkbox"/> A.C.T.-ALTERNATIVE CONSTRUCTION & TECHNOLOGY INC.
<input type="checkbox"/> A.R.E.-ALTERNATIVE & RETROFIT ENERGIES INC.	
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<input type="checkbox"/> HELEN OSTROWSKI, B.S. Arch.	<input type="checkbox"/> AL PATTERSON, P.Eng
<input type="checkbox"/> TONY ARGENTO, B.A., B.E.D.S., M.Arch.	<input type="checkbox"/>
<input type="checkbox"/> ORIAN LOW, B.A., B.E.S., B.Arch. (Waterloo)	<input type="checkbox"/>
<input type="checkbox"/> DESIGN: environmental, architectural, urban	
<input type="checkbox"/> PLANNING: master, ecological, community, subdivision	
<input type="checkbox"/> CONSULTING: preliminary design, blueprint review	
<input type="checkbox"/> R.D. & D.: research, development, demonstration	
<input type="checkbox"/> EDUCATIONAL: seminars, workshops, presentations, publications	
<input type="checkbox"/> CONSTRUCTION: project management	
<input type="checkbox"/> SUSTAINABLE HOUSE PLANS: working drawings, specifications	