40 Years Later: Autonomous Homes for 2023 and Beyond

FOR THE CHALLENGES OF TODAY AND TOMORROW

Nick Nicholson,
Solar Pioneer

Described by Maclean's magazine as, "the first entrepreneur in Canada to take the socalled soft (renewable) energy of the sun and submit it to the hard laws of the marketplace."

New for 1980

HARVEST THE SUN

August 11, 2023
National Solar Conference, American Solar Energy Society
SOLAR 2023: Transforming the Energy Landscape for All

1970's Oil Embargo & Energy Crisis

- Policy; US Energy self-sufficiency by 1985.
- Attention given to solar use & energy conserving insulation designs.

The Solar Frontier, 1977. By Peter Mellen.
Watch: www.youtube.com/watch?v=oh5is71h7Ko

And now
a challenging 21st century energy transformation

- Solar/Wind mega farms and new resources.
- AND end use development.
- Advents of the 70s – 80s are at hand and affordable.

Decarbonize
Electrification
Survivability

What can be done right now?

Critically needed solutions not reliant on policy or external market development.

70s-80s pioneering becoming increasingly relevant

Autonomous House
Ayer's Cliff, Quebec, 1980's

- Economical construction
- Efficient
- DIY
- Low to no tech
- Doesn't go obsolete
- Already been invented and done!
- Affordability, social equity
- Scalable applications

Home Resilience

Becoming vital factor in systemwide power planning

Northwest Power and Conservation Council:

- Developing method that will value home resilience in whole system planning.
- Starting with weatherization. Plans to expand to other demand side resources. Eg, efficiency for ventilation, heating, cooling and conservation.

Resilience is part of an adequate, efficient, economical, and reliable power supply.

Partial Earth Shelter

BENEFITS

- Thermal resilience, for hot & cold
- Comfort and survivability
- Lower space conditioning costs

Plants need both the Sun and the Earth for completion. The same is true of homes.

Outside

North elevation with earth berming

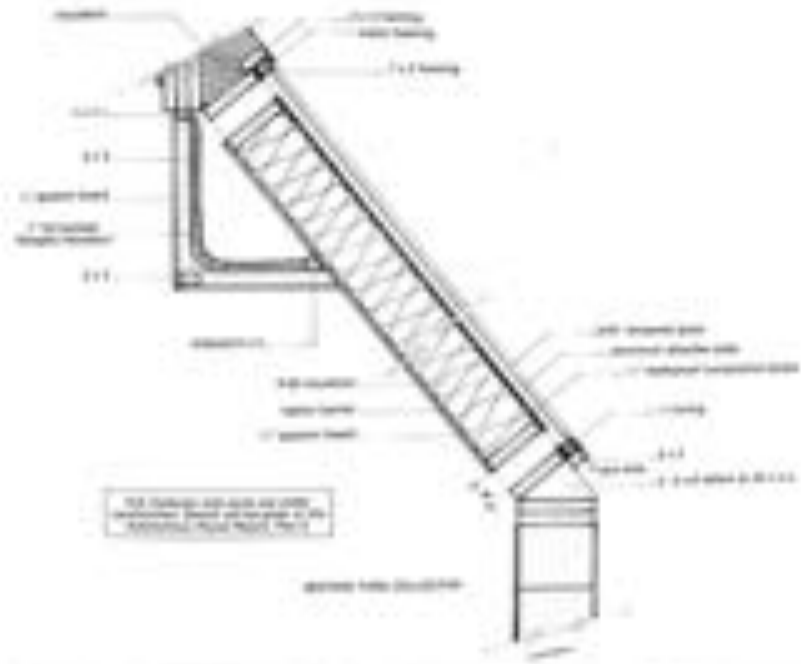
Northwest corner. The bed of rocks leads water shed from the roof away from the structure.

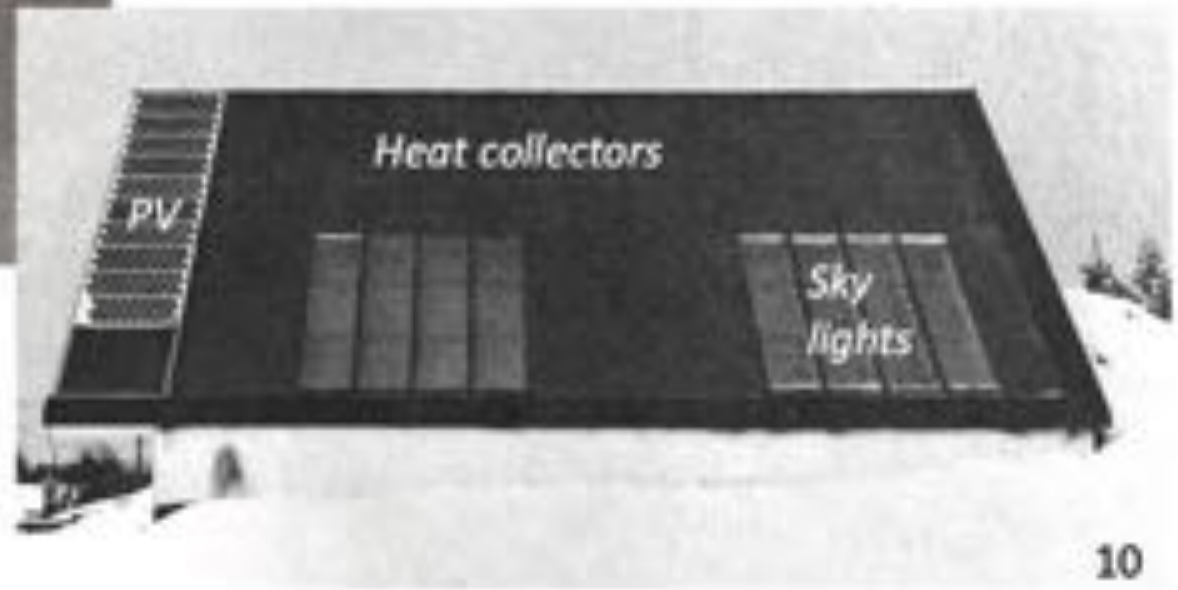
Inside

Spacious & light

Heat collection

Laying on the glazing caps.





Harvest the Sun, 1978. Nick Nicholson

Thermal storage

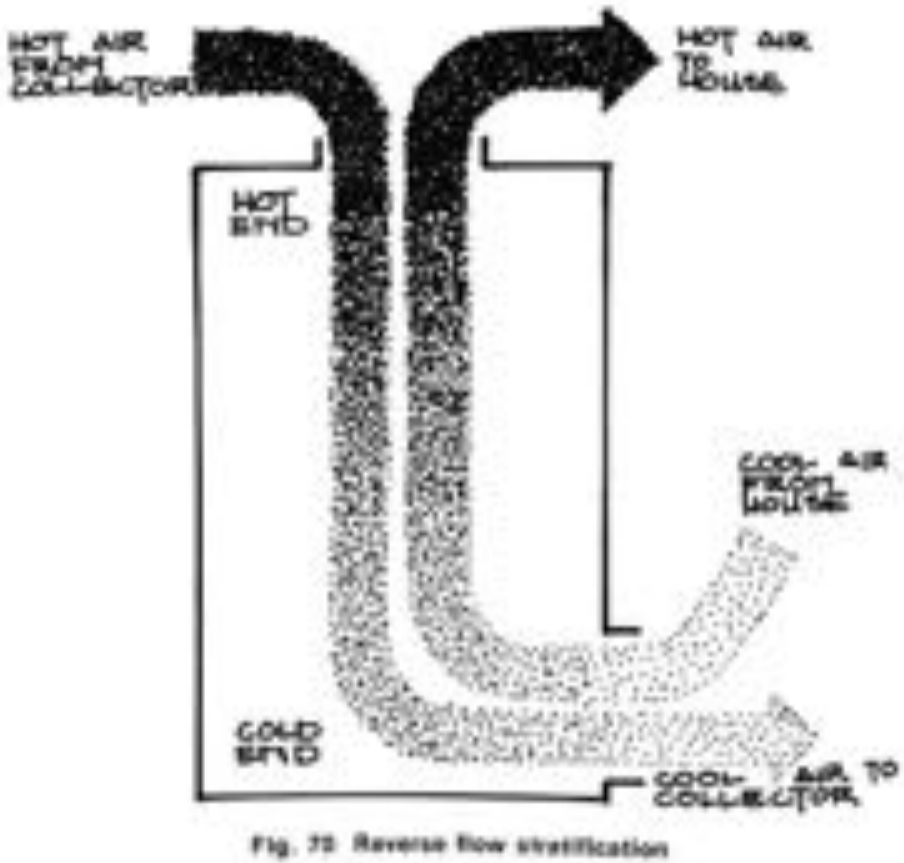
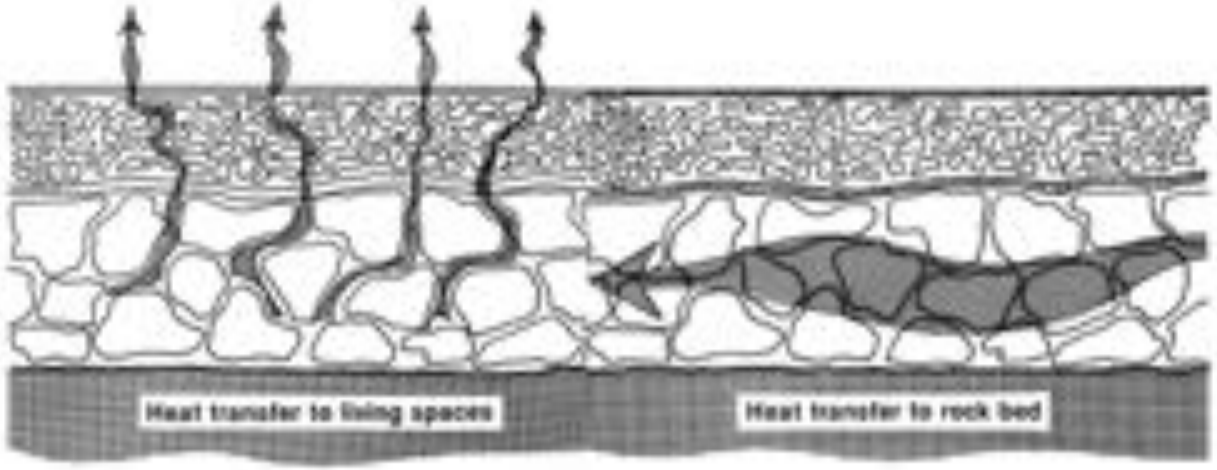
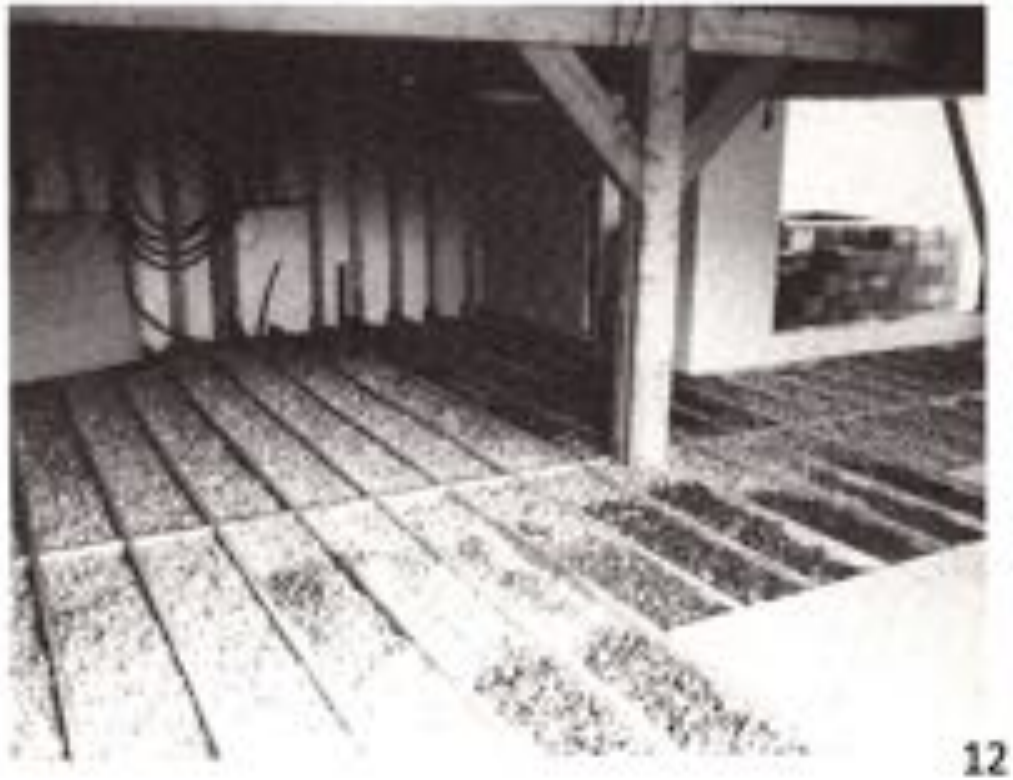


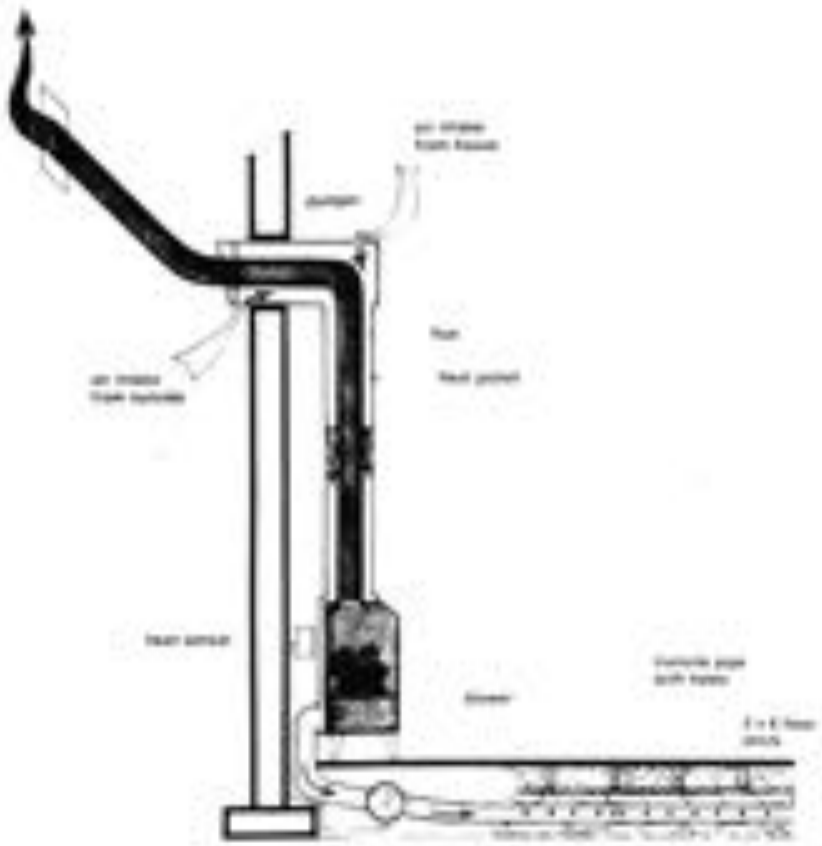
Fig. 73 Reverse flow stratification



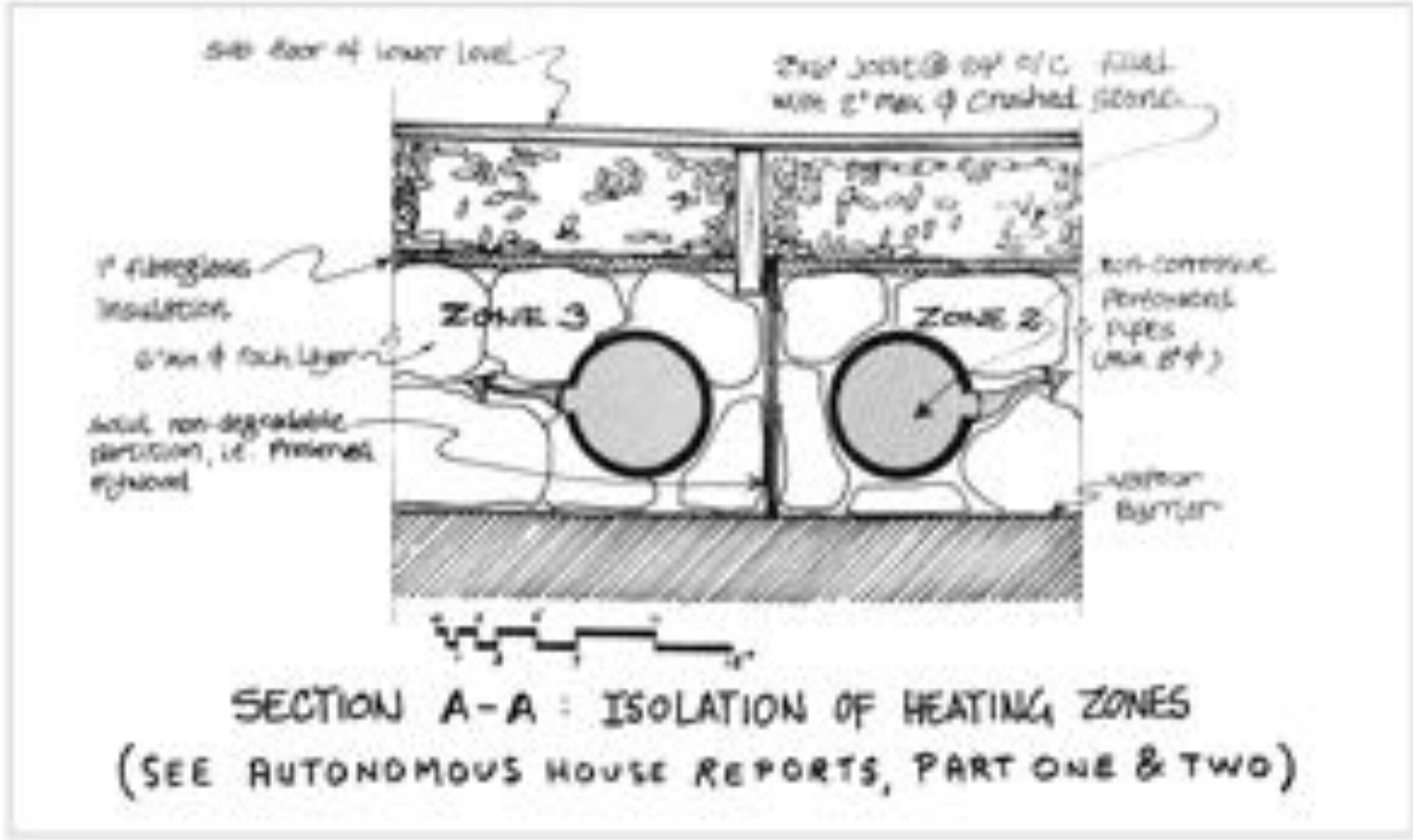


Reverse flow stratifies the heat in the store providing warmer air supply for the home and cooler air supply to the collector. Home heating and collector efficiency are increased.

Thermal storage



Woodstove heat goes into thermal storage radiant heating system



SECTION A-A : ISOLATION OF HEATING ZONES
(SEE AUTONOMOUS HOUSE REPORTS, PART ONE & TWO)

Conventional residential design

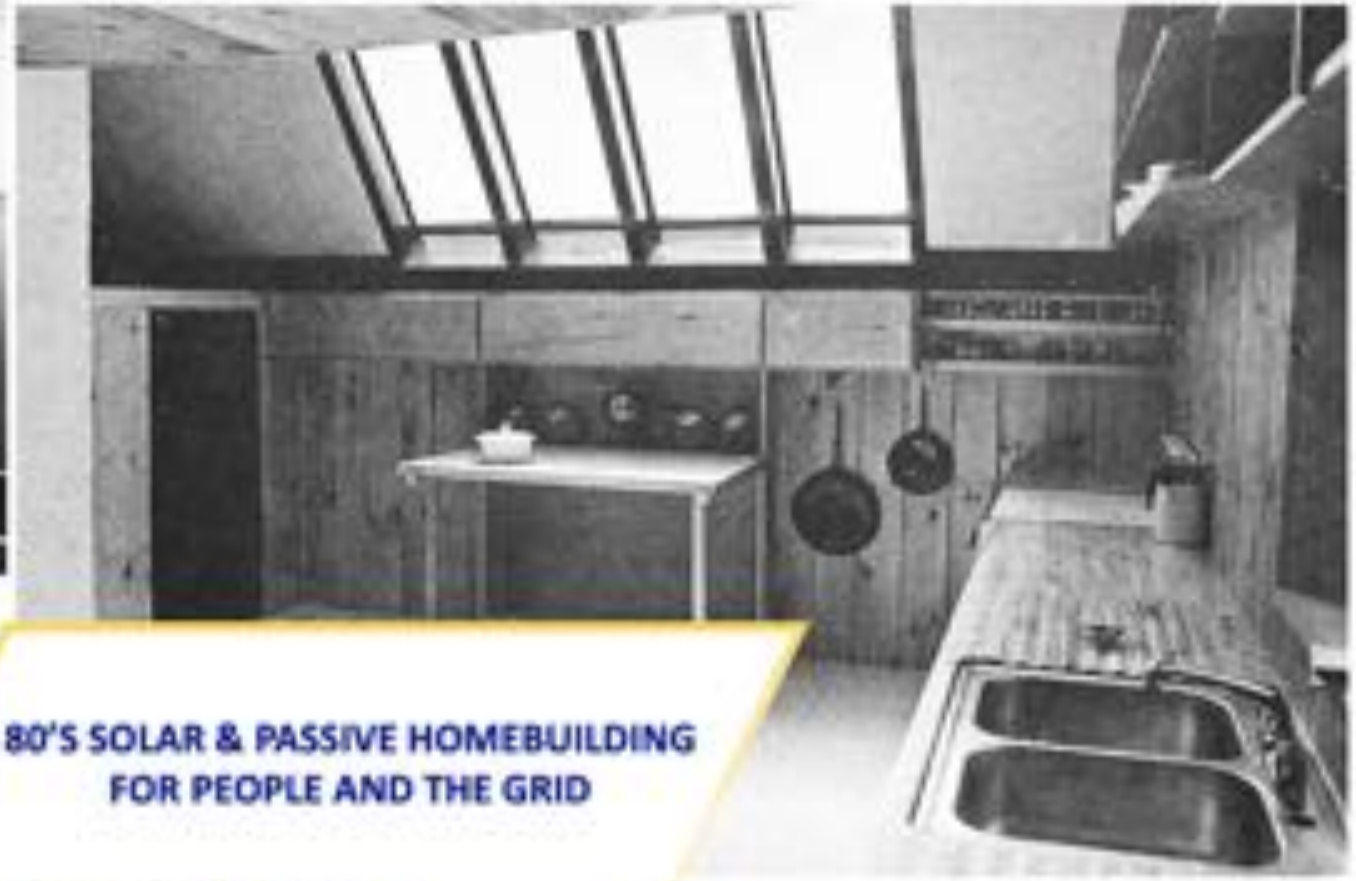
Residence circa 2020, built entirely above a south facing slope that would have been perfect partial earth application.

An earth-sheltered structure would have excluded the need for a staircase with its attendant exposure to the ice, rain, and snow of inclement weather.

Retrofit for Gain

Old two car garage turned into comfortable living space. Insulation scheme used 2" styrofoam applied to exterior and coated with stucco. This 30 year old installation is yet to show any sign of deterioration.

The concrete "skirt" protects the base. A preserved wood timber would have served as well.



80'S SOLAR & PASSIVE HOMEBUILDING FOR PEOPLE AND THE GRID

- Spacious & light filled
- Sheltered & efficient
- Economical
- Less strain on the grid
- Timeless

QUESTIONS?

Solar cat house

NICK NICHOLSON

Author:

- **The Autonomous House Reports 1-3**
- **Harvest the Sun**
- **Nicholson Solar Energy Catalogue and Building Manual**

Featured; *The Solar Frontier*, 1977. By Peter Mellen

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