

***“Promoting and advancing the development of
healthy, durable, and sustainable shelter for
Alaskans and other Circumpolar People ”***



COLD CLIMATE HOUSING RESEARCH CENTER

CCHRC



CCHRC Research and Testing Facility



LEED Platinum



SIEMENS

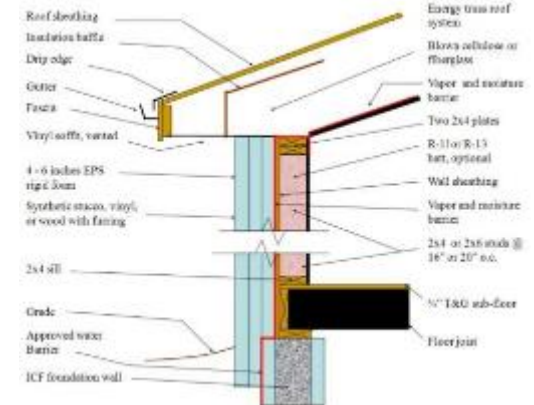
Runner-up
Smartest Building in America





Research Programs

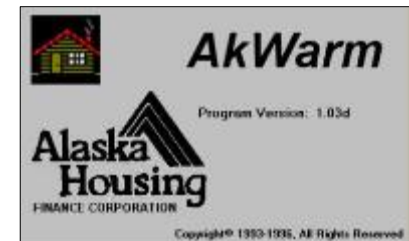
Building
Envelopes
& Materials



Energy &
Mechanical
Systems



Policy & Program
Development





Net Zero- Passive House



Alaska is part of the
Global Arctic Community



Indigenous Wisdom for our dilemma in time

FIRST NEEDS



Archives, University of Alaska, Fairbanks

- Water
- Food
- Shelter



Indigenous Wisdom for our dilemma in time

RESPONSIBILITY

- Sustainability
- Respect
- Community





Indigenous Wisdom for our dilemma in time

15,000 years of success should guide the process

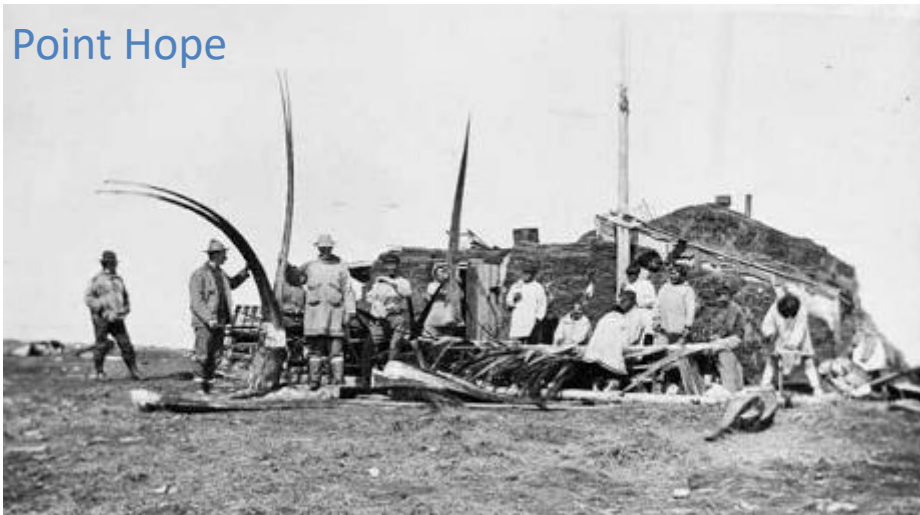
Aleutian Islands



Anaktuvuk Pass



Point Hope



Barrow





Indigenous Wisdom for our dilemma in time

LEARN FROM NATURE

RETAINING heat, not PRODUCING heat, is the most important part of an animal's survival.





The Need

32.5% of the housing stock is considered in need of major repair or falling apart.

74.4 % of households are considered drafty.

21.8% of households are unable to maintain 68° F on cold days in the winter.

37.4% of households reported having mold or mildew in the home.

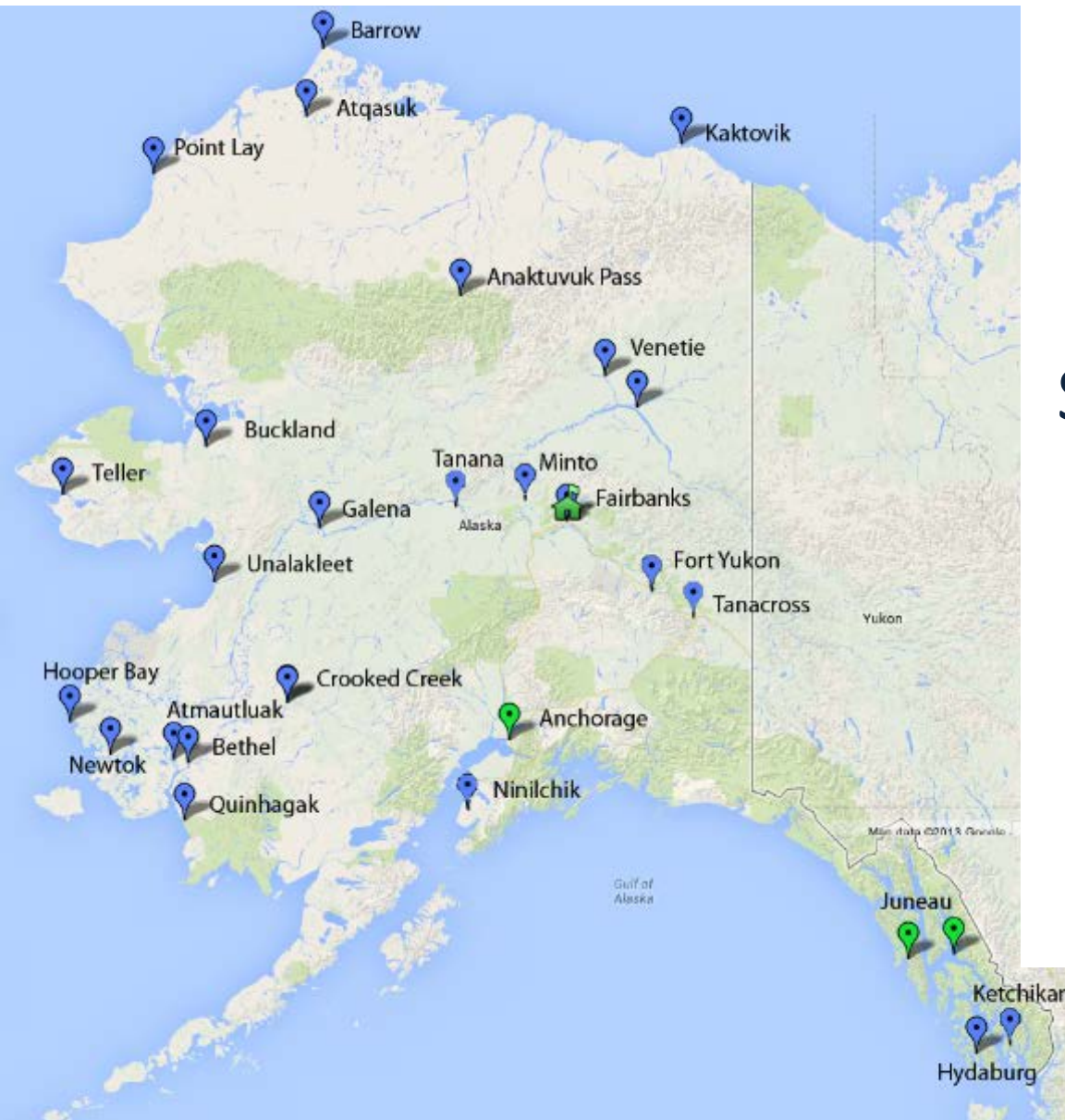
Fuel oil prices reach as high as \$10.00 per gallon

55.9% of households have income less than \$20,000.

Arctic is changing, 184 Alaskan communities threatened by erosion

Natural disasters are becoming more frequent





Sustainable Northern Communities

Building Alaska's
Future Together



Indigenous wisdom



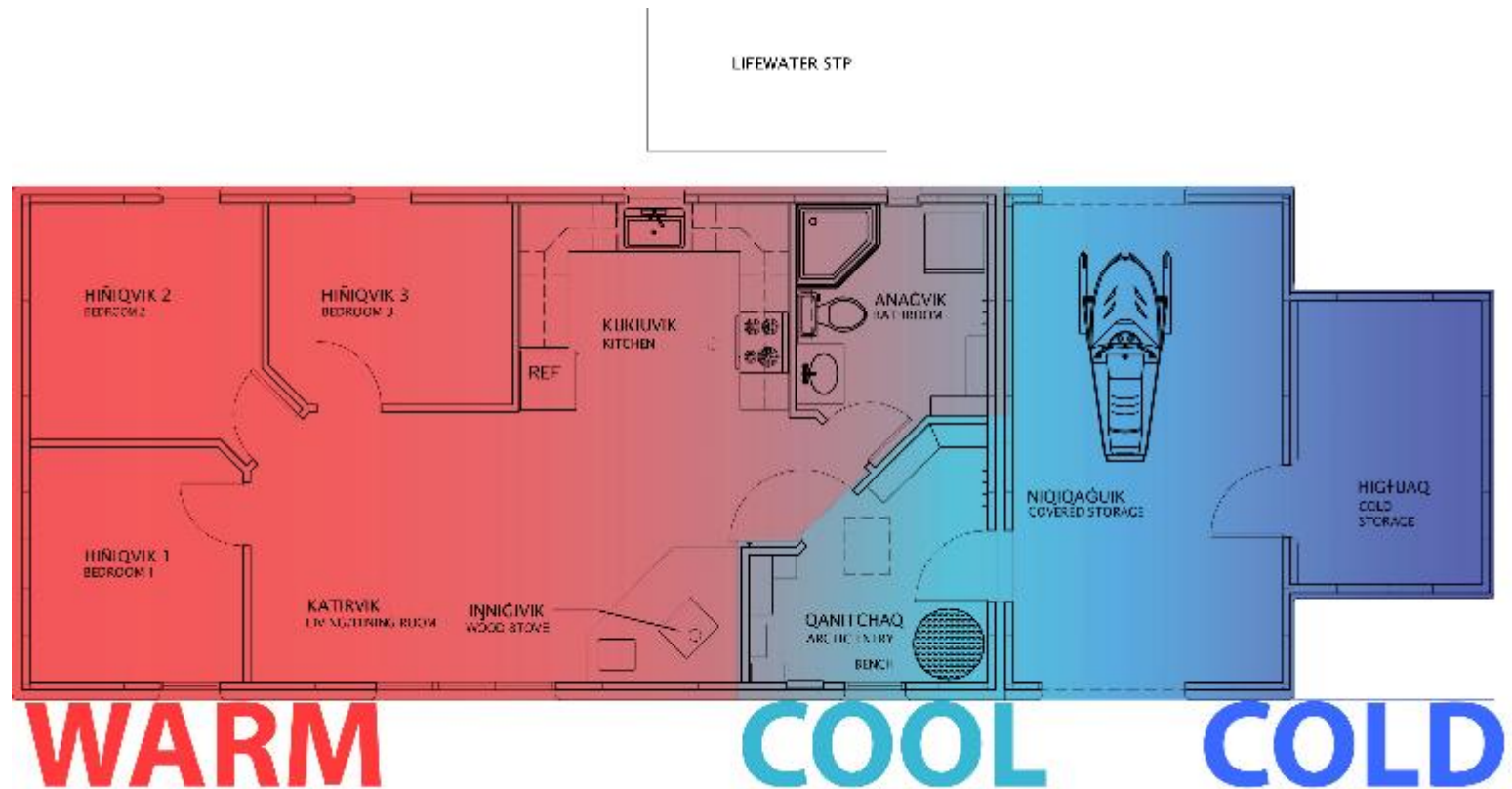


21st century technology



Design

SNS Prototype Floor Plan





Energy and Cost Efficient



Earth berming



Sod



Waste water treatment



Heating and ventilation



Lighting



Alternative energy



Sustainable Northern Communities

"We need housing. Our young people have no place to live."

George Paneak (1950-2009) Former Mayor of Anaktuvuk Pass

Design Challenges

- 16,000 HDD
- Electricity \$.60/kWh
- Heating Oil \$8/gallon
- 1400 gallons/yr.
- New house is \$650,000
- Last house built ten years ago
- Context appropriate housing
- Transportation costs

Construction Outcomes

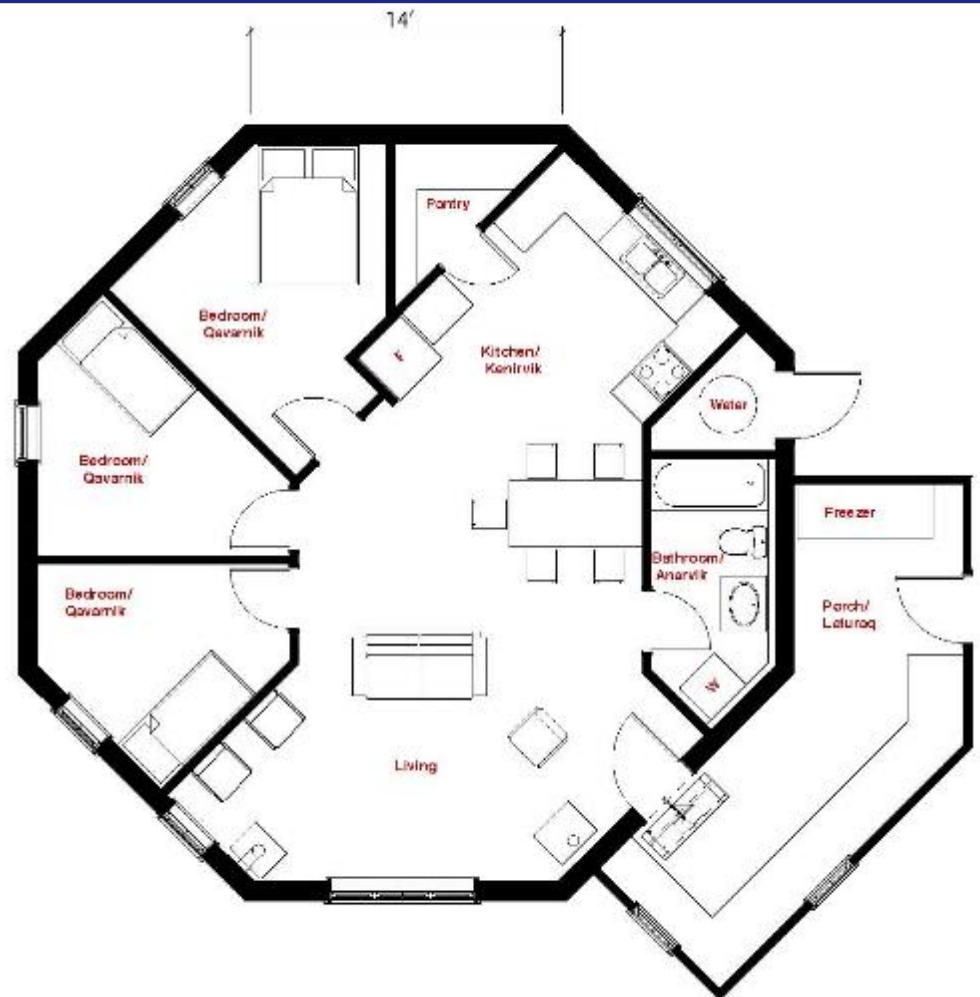
- Cost significantly less than new home quotes
- 160 gallons fuel annually
- Completed in four weeks
- Local work force
- Approaches net 0





Quinhagak

Design Charette (share it)





Building Envelope Thermal Raft Foundation



Quinhagak

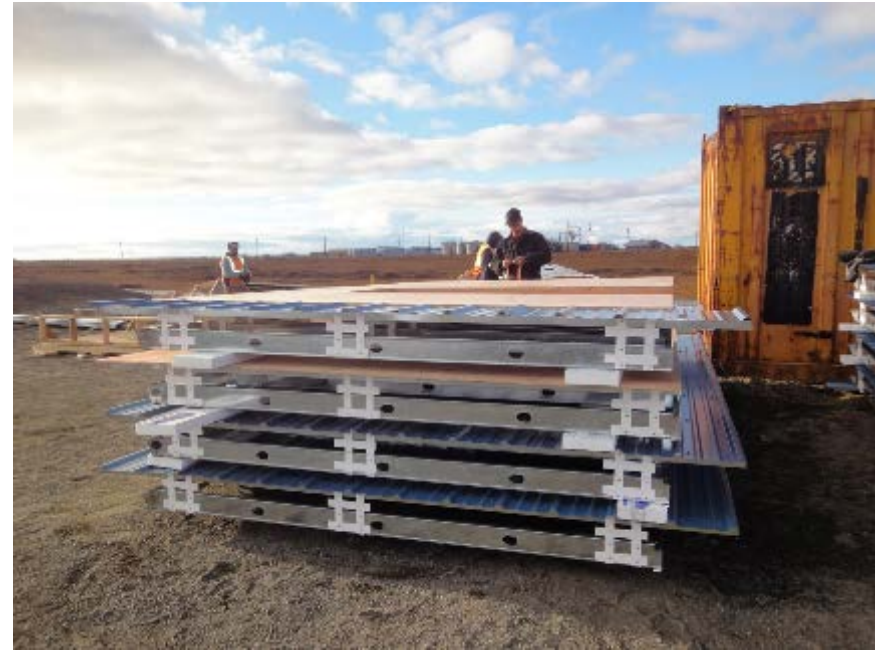


Constructability

Prefab sections for speed of assembly



Instruction & Local Labor





Quinhagak House Construction





Quinhagak House - Performance

- 132 gallons fuel oil first winter
- Superior indoor air
- Built in 6 weeks
- Local labor force
- Light materials
- High owner comfort
- Significantly less cost
- Durable





Prototype to Production





Quinhagak House
becomes the people's





Quinhagak
House
becomes the
people's

120 gallons oil annually
Warm, healthy, affordable

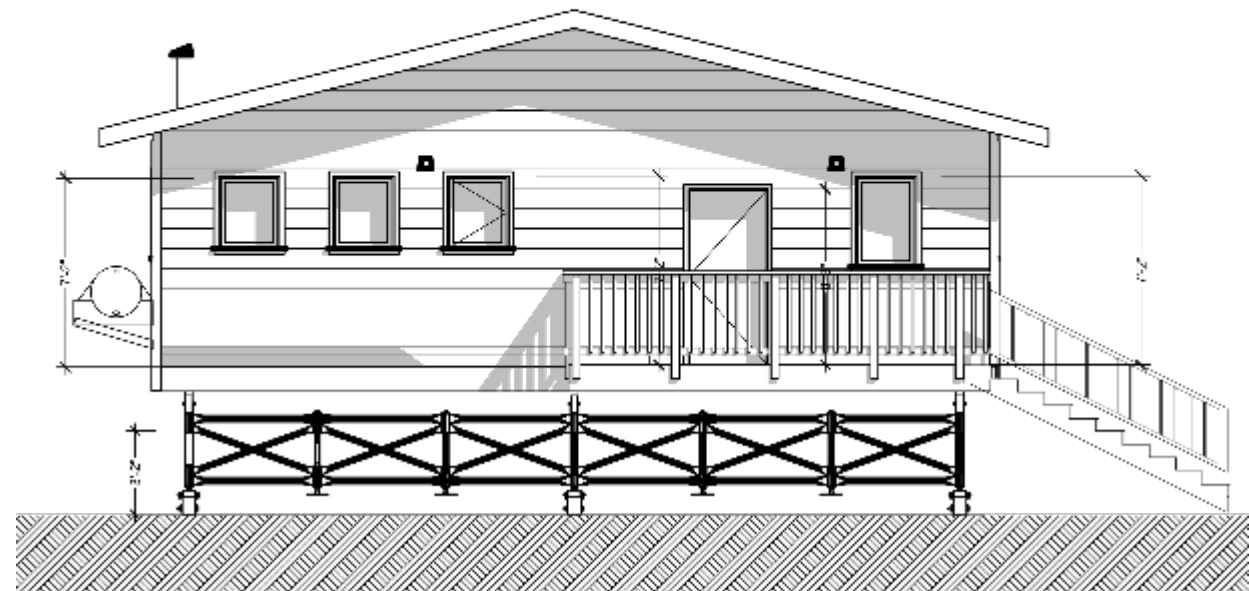
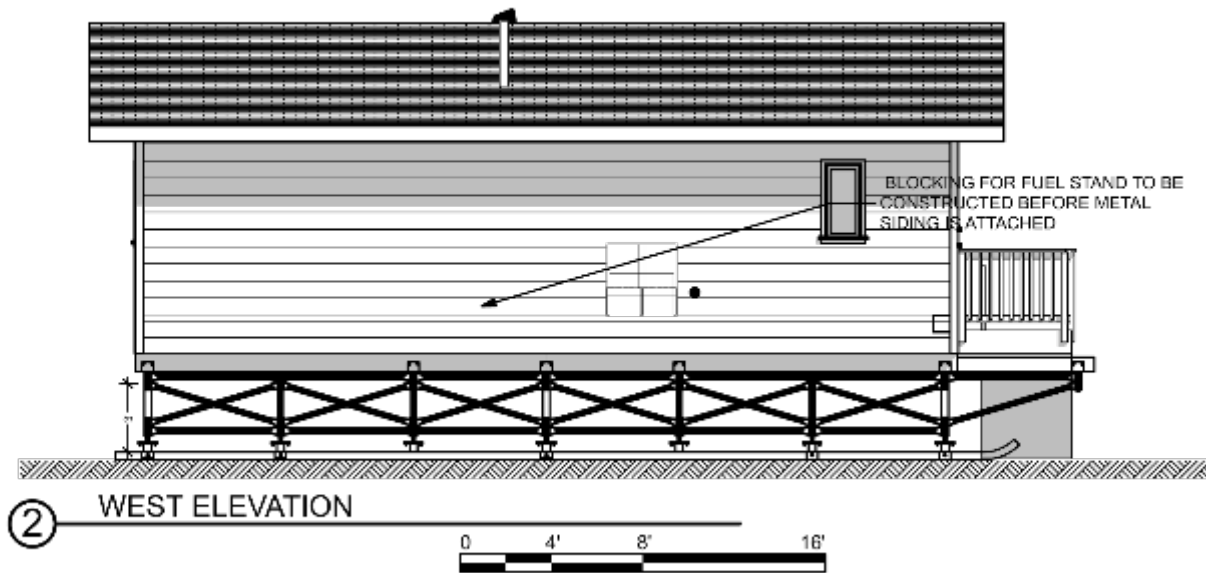


Newtok



Newtok







Newtok/ Merktarvik







Newtok/ Merktarvik





So many challenges
we face together





Sustainable Northern Communities

A HOLISTIC APPROACH

Only through a holistic approach can we create healthy, thriving, sustainable communities.





Sustainable Northern Communities

A HOLISTIC APPROACH

SECURITY, RESILIENCY, SUSTAINABILITY

Community Engagement – Multi-agency Approach – Economic Development – Phased Prioritized Projects



Shishmaref, Alaska
Photo Credit: Arctic Photo



Kivalina, Alaska
Photo Credit: Flickr



Newtok, Alaska
Photo Credit: NYTimes



Our Past



Their Future

Qagaasakung, Quyanaq, Quyana, Mahsi', Gunalcheesh, Haw'aa, Merci!



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