

Efficient, Healthy Housing for our People

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COLD CLIMATE HOUSING RESEARCH CENTER

CCHRC

Cold Climate Housing Research Center Joined NREL to Expand Mission Impact



Promoting and advancing the development of healthy, affordable, sustainable shelter for Alaskans and other circumpolar people

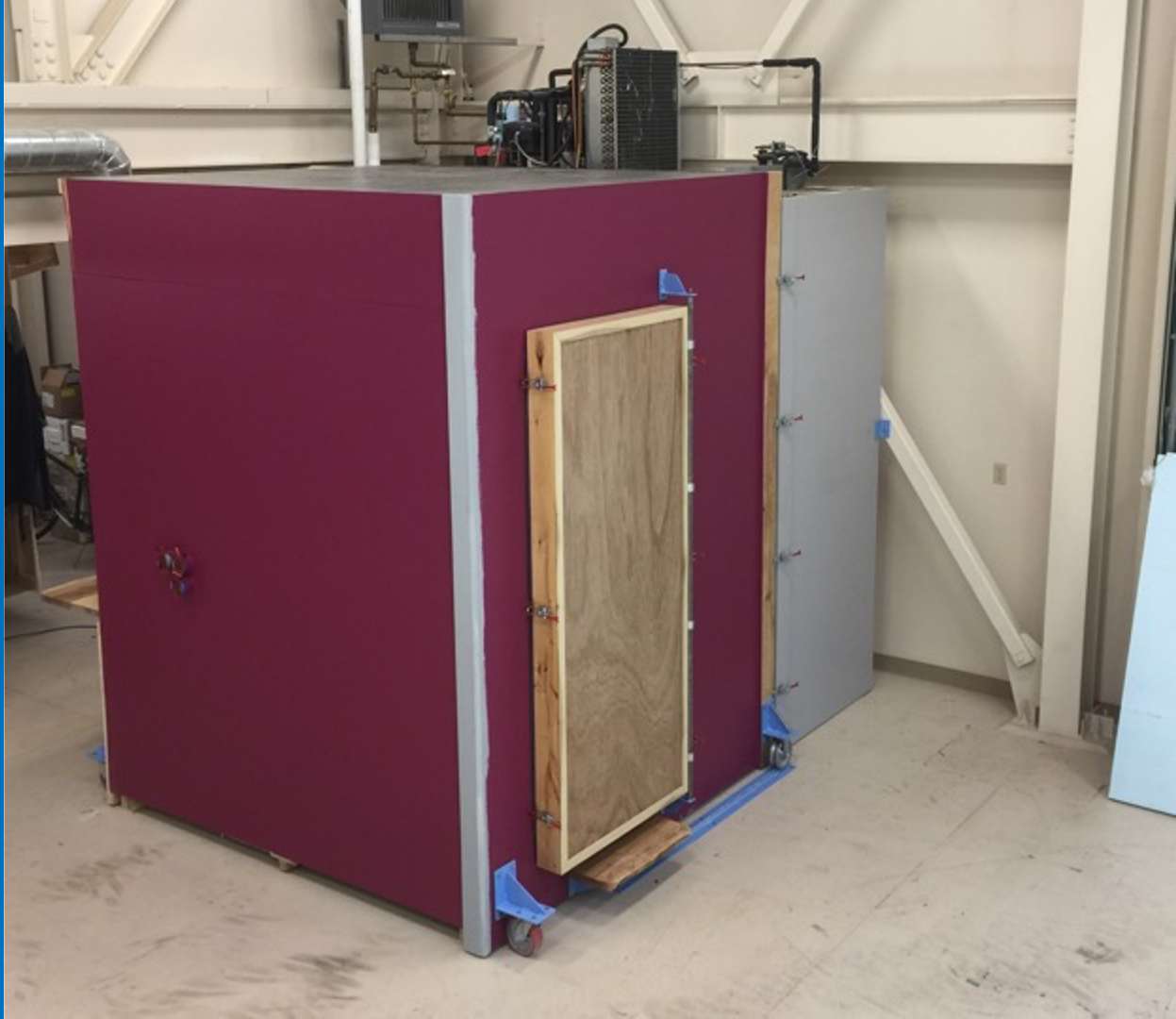
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Research Areas

Building Envelopes &
Materials

Energy & Mechanical
Systems

Social & Economic
Analysis



Demonstration & Deployment



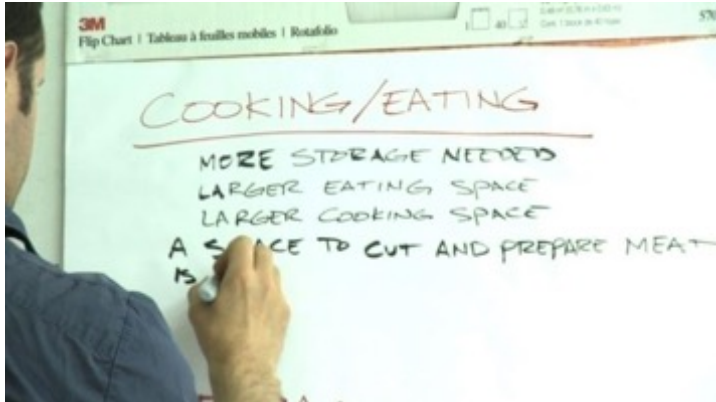
Sustainable Demonstration Homes
Designed for the north, by the north



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Indigenous Wisdom



21st Century Technology



Sustainable Northern Communities





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 70° 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/gallon.

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

Arctic is changing, 184 Alaskan communities threatened by erosion

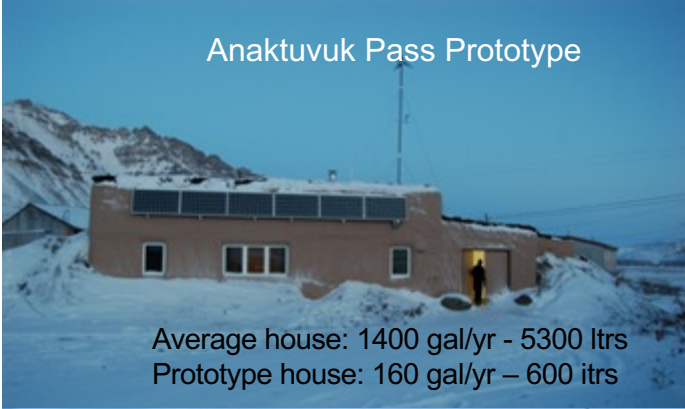
Natural disasters are becoming more frequent



Sustainable Northern Communities


INNOVATIVE COLABORATIVE HOUSING DESIGN

Anaktuvuk Pass Prototype

A single-story house with a flat roof and solar panels, situated in a snowy, mountainous area.


Average house: 1400 gal/yr - 5300 ltrs
Prototype house: 160 gal/yr - 600 ltrs

Atmautluak Prototype

A two-story house with a red roof and a wooden deck, situated in a grassy field.


Average house: 1200 gal/yr - 4600 ltrs
Prototype house: 120 gal/yr - 450 ltrs

Quinhagak Prototype

A single-story house with a dark roof and a small porch, situated in a snowy area.

Average house: 1000 gal/yr - 3800 ltrs
Prototype house: 150 gal/yr - 600 ltrs

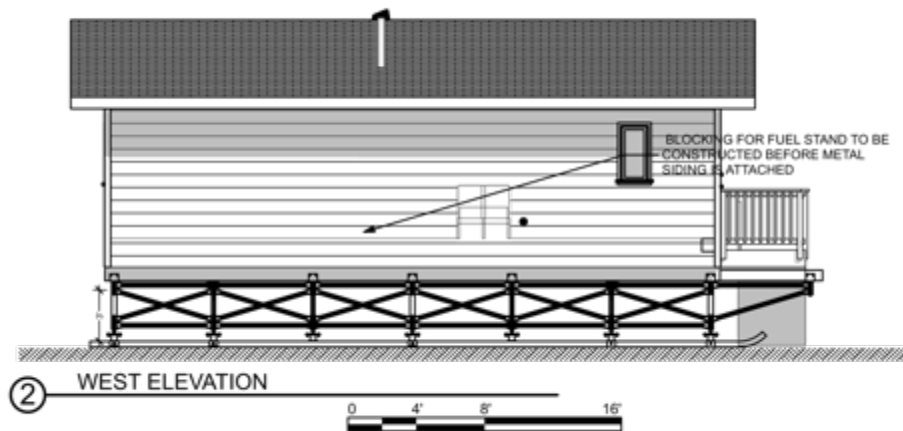
North Slope

A single-story house with a dark roof and a small porch, situated in a snowy area.

Average house: 900 gal/yr - 3400 ltrs
Prototype house: 132 gal/yr - 500 ltrs

Newtok





Newtok

Mertarvik





PASS- Portable Alternative Sanitation System



PASS- Portable Alternative Sanitation System

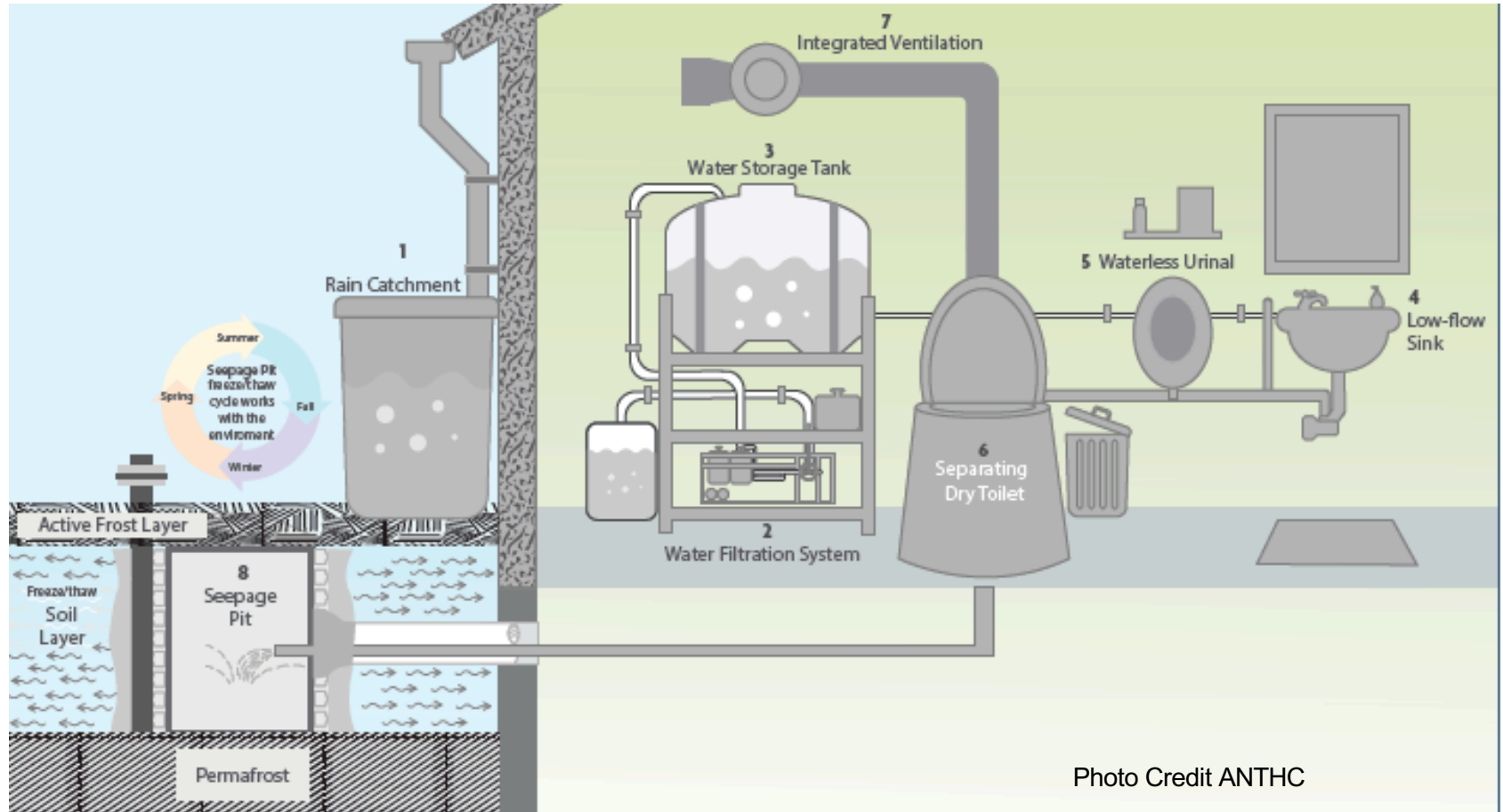


Photo Credit ANTHC

PASS- Portable Alternative Sanitation System



Mini-PASS Handwashing Cabinet

PORTABLE ALTERNATIVE SANITATION SYSTEM (PASS)



Photo Credit ANTHC

BrHEAThe- Warm and healthy air





Merktarvik

Sustainable Village “Willow House”



On Site water and wastewater



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



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Questions?



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