Department of Energy - Tribal Energy Program

Native Village of Unalakleet - Feasibility Study for Retrofit of 14-Plex

“Promoting and advancing the development of healthy, durable, and sustainable shelter for Alaskans and other Circumpolar people.”
CCHRC Research and Testing Facility

LEED Platinum

Runner-up
Smartest Building in America
Organization

Building Science
Design & Consulting
Public Policy
Outreach & Education
Research Programs

Building Envelopes & Materials

Energy & Mechanical Systems

Policy & Program Development
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.
Energy Efficiency – the First Step

Sustainable Housing for all Alaska
Sustainable Northern Communities

Indigenous Wisdom + 21st Century Technology
Energy and Cost Efficient

- Earth berming
- Waste water treatment
- Heating and ventilation
- Alternative energy
- Lighting
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
• 1,400 gallons/yr.
• New house is $750,000
• Last house built ten years ago
• Context appropriate housing
• Transportation costs

Construction Outcomes
• Cost significantly less than new home quotes
• 87 gallons fuel Nov.-April
• Completed in four weeks
• Local work force
• Approaches net 0
Quinhagak House Construction
Quinhagak House - Performance

- 130 gallons fuel oil first winter
- Superior indoor air
- Built in 6 weeks
- Local labor force
- Light materials
- High owner comfort
- Significantly less cost
- Durable
Atqasuk- Point Lay- Kaktovik-Wainwright

- Insulated Thermal raft foundation
- All utilities incorporated
- Light, energy efficient, lower cost

- Walls: Steel studs with plastic offsets
- R-60 spray foam insulation
- Metal siding
Crooked Creek

Flooding in May 2011

Photo by John Madden, Div. of Homeland Security
Crooked Creek

The Challenge

• TIME – need 9 replacement homes by winter
• Building above floodplain
• Design must be easy to ship, quick to build
• Single modular design for small cabin and 4-BR house
• Very low cost
A dynamic and evolving community at the University of Alaska Fairbanks, committed to the tenets of sustainability, demonstrating what can be achieved to secure an enduring future for people of the circumpolar north.
The UAF Sustainable Village

A RESEARCH PROJECT IN SUSTAINABLE LIVING
UAF Sustainable Village

Construction first phase
Spring 2012
Unalakleet

Sustainable Housing for all Alaska
Native Village of Unalakleet

14 Apartments
14 Families
Native Village of Unalakleet

Nurture the Partnership

Assess condition of building on site
• Structural
• Mechanical/electrical
• Presence of mold and contaminants
• Explore Strategies

Run Energy Models of Options
• Analyze Results
• Economics and Paybacks

Work with community on strategies to maximize benefits
• Local labor training and employment
• Energy efficiencies to lower cost and keep money in village
• Demonstrate a path forward
Unalakleet
Native Village of Unalakleet
REMOTE WALLS
Native Village of Unalakleet
The Future of Housing

What do we want? What do we need? How will we live?
SUSTAINABLE NORTHERN COMMUNITIES

COLLABORATION
Quyana, Quyanaq, Gunalcheesh, Thank You

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