

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



*Research • Innovation • Education*



COLD CLIMATE HOUSING RESEARCH CENTER

**CCHRC**



# CCHRC Research and Testing Facility



LEED Platinum



# SIEMENS

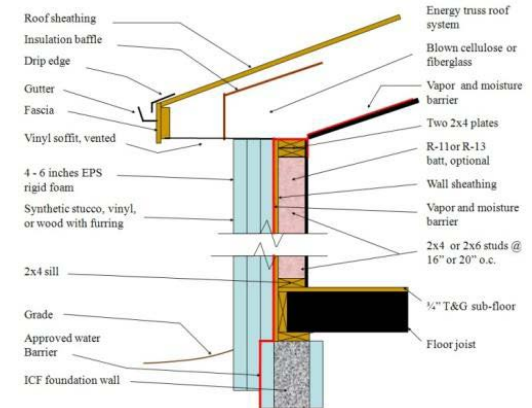
Runner-up  
Smartest Building in America





# Research Programs

## Building Envelopes & Materials



## Energy & Mechanical Systems



## Policy & Program Development



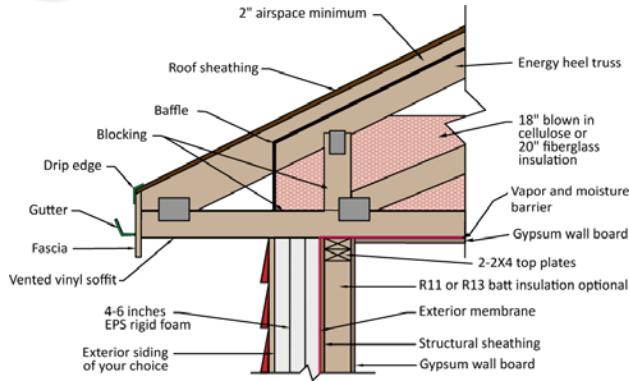
**AkWarm**  
Program Version: 1.03d  
**Alaska Housing**  
FINANCE CORPORATION  
Copyright © 1993-1996, All Rights Reserved





# Building Envelopes and Materials

Leader in “Green Building Standards”  
Advancing Building Science







# Net Zero- Passive House



Alaska can lead



# Indigenous Wisdom for our dilemma in time

## FIRST NEEDS

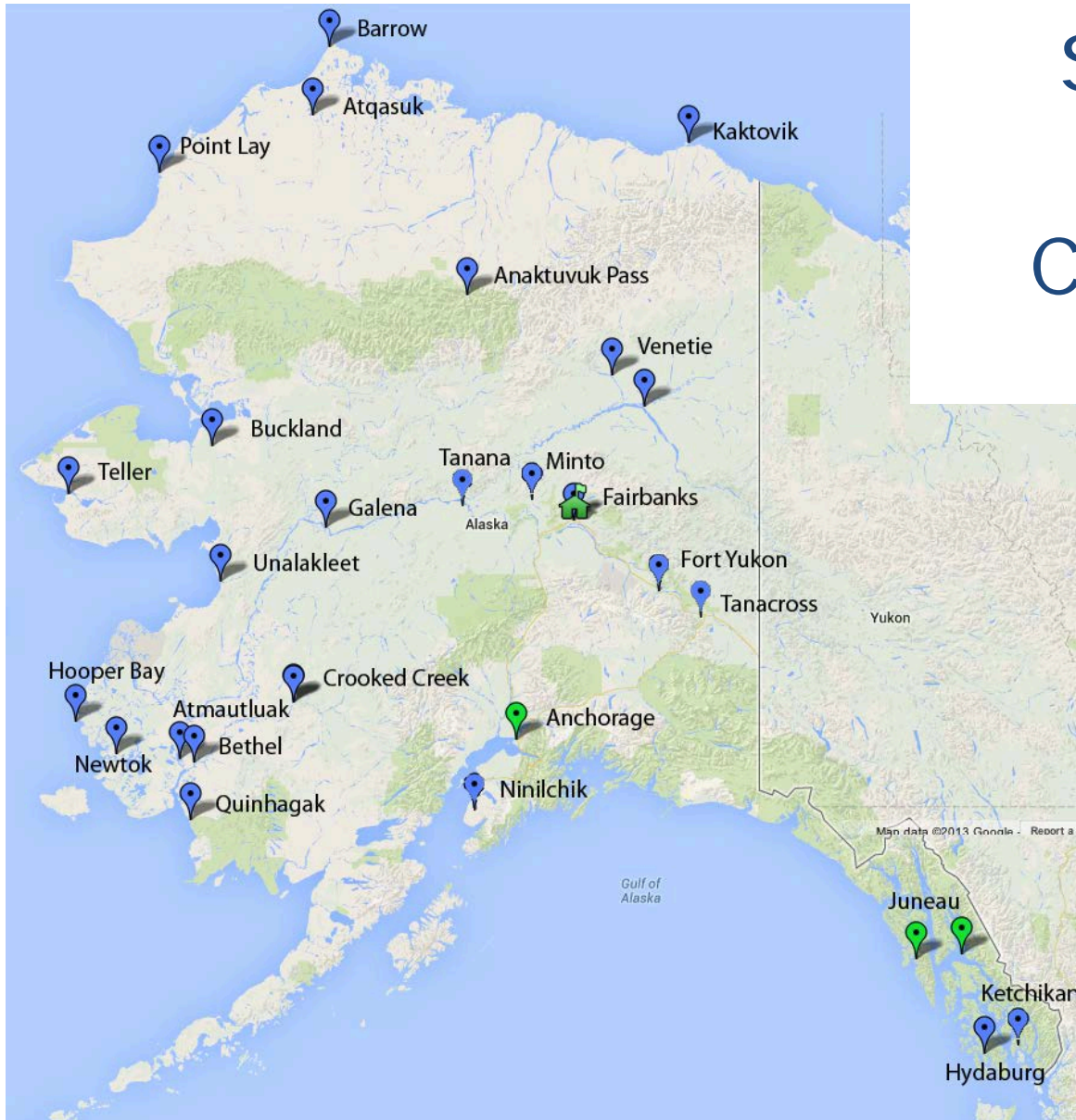
- Water
- Food
- Shelter



Archives, University of Alaska, Fairbanks







# Sustainable Northern Communities

## Building Alaska's Future Together



# 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.

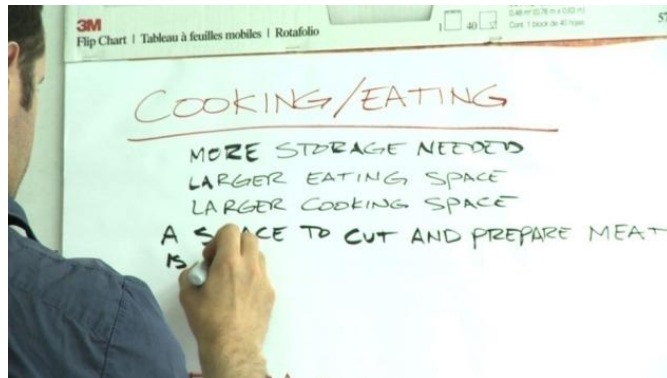
Arctic is changing, 184 Alaskan communities threatened by erosion

Natural disasters are becoming more frequent

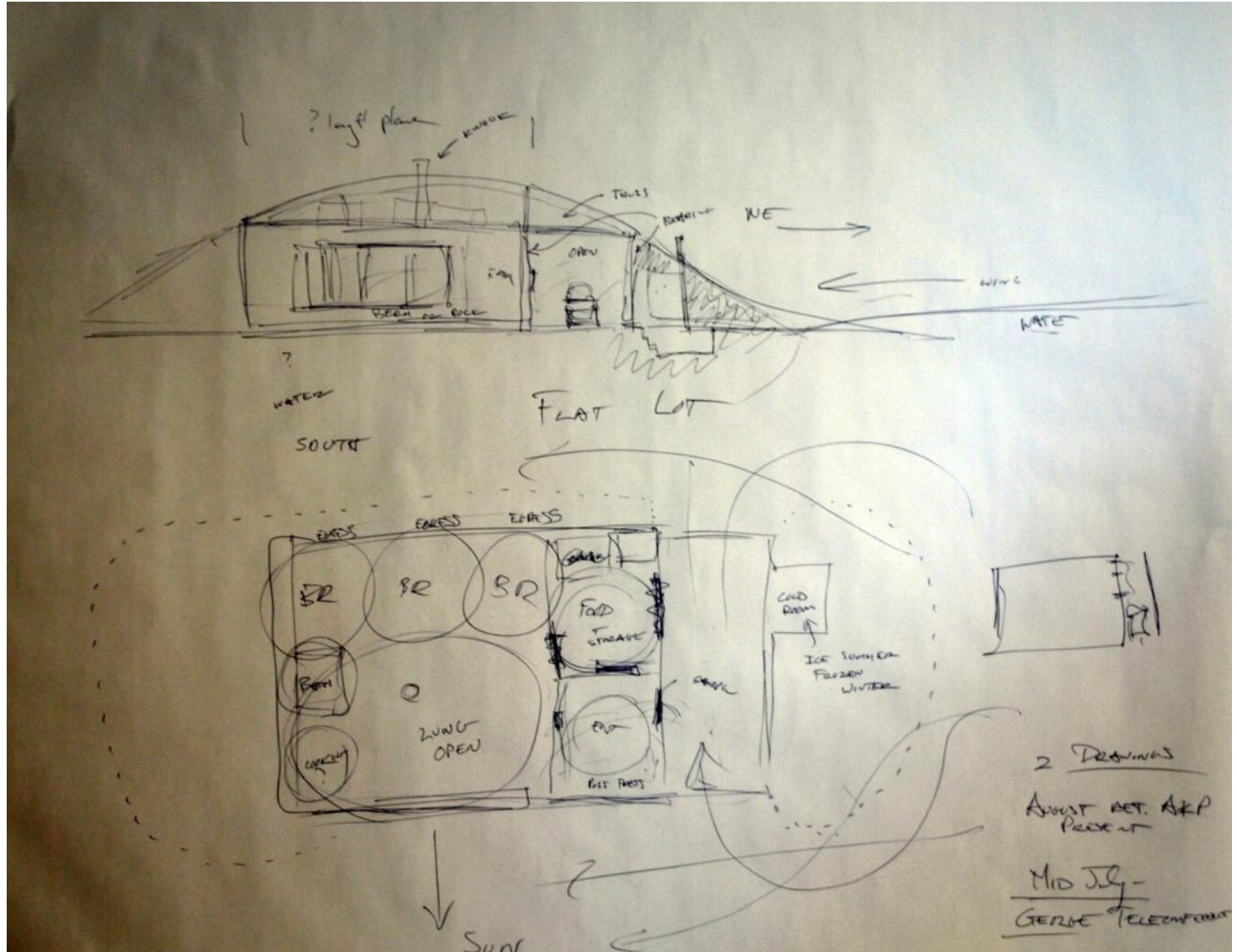




# Charette = Listen



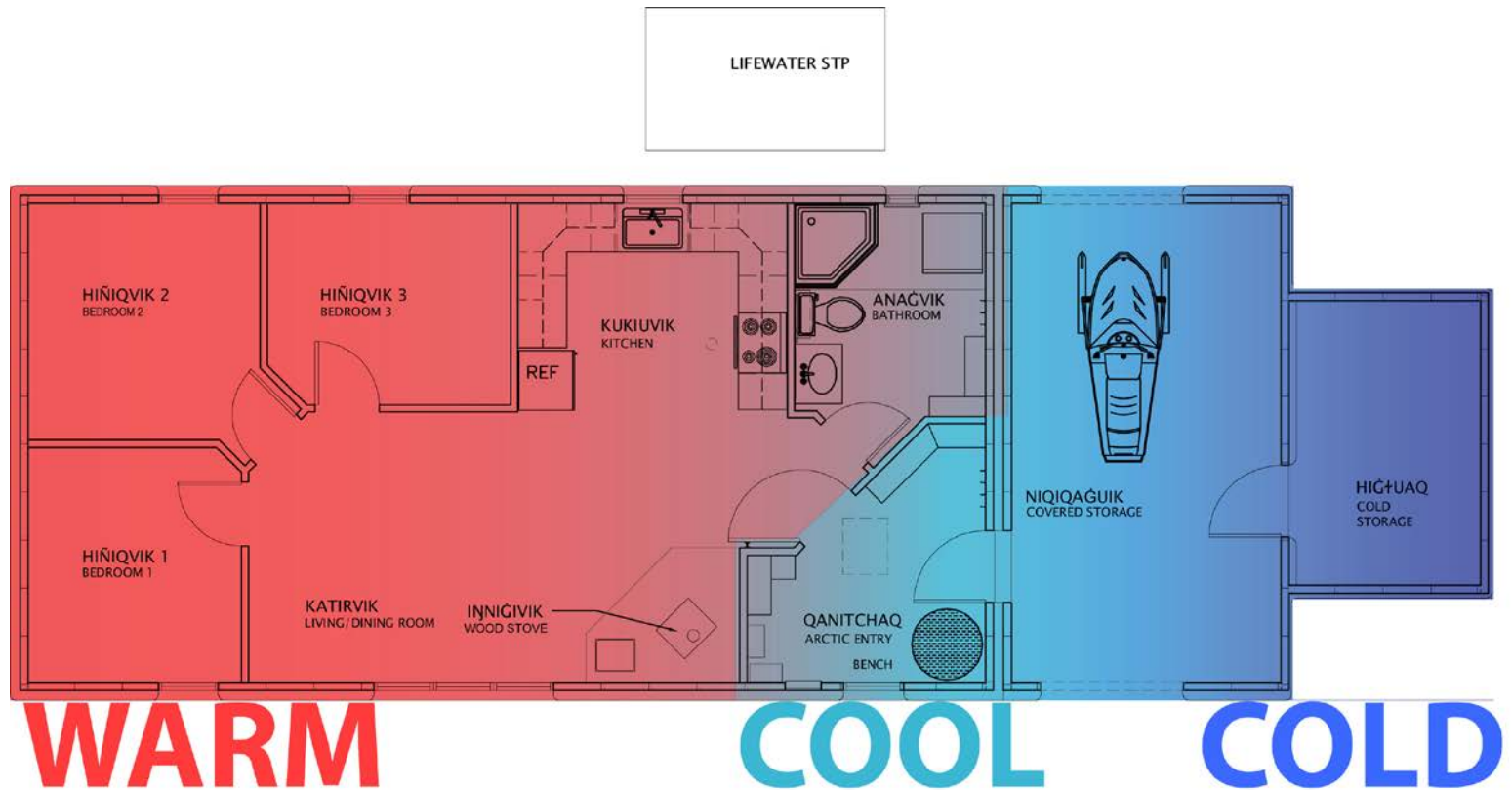
# Charette - Creating





# Design

## *SNS Prototype Floor Plan*





# Energy and Cost Efficient







# 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

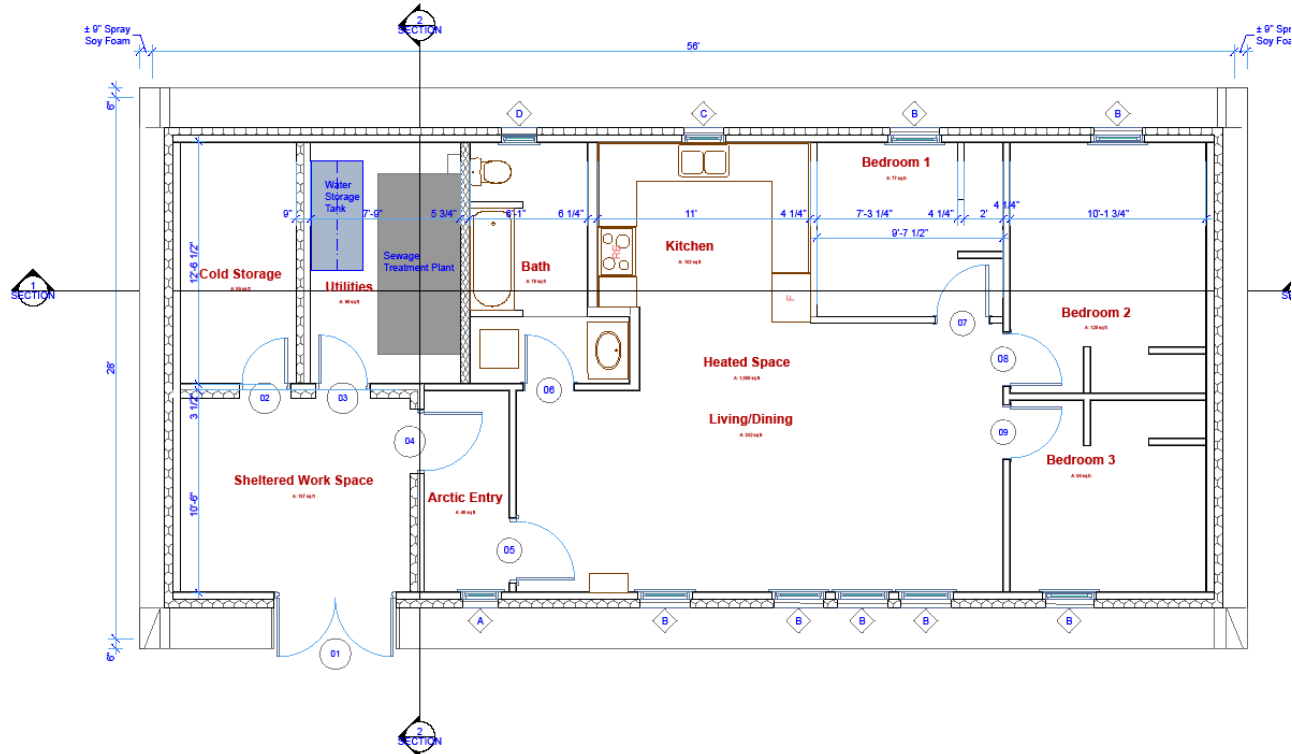
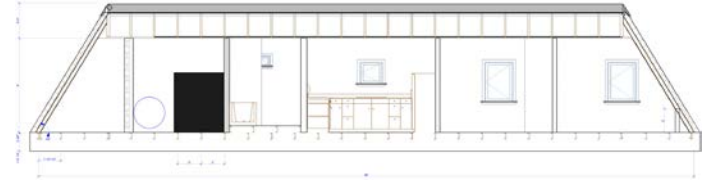
- Cost significantly less than new home quotes
- 130 gallons fuel annually
- Completed in four weeks
- Local work force
- Approaches net 0





CCHRC

# Tagiugmiullu Nunamiullu Design Charettes







## *Tagiugmiullu Nunamiullu Housing Authority*



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

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





# *Tagiugmiullu Nunamiullu Housing Authority*







# Quinhagak Design Charette





# 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





Quinhagak House  
becomes the people's







Quinhagak  
House  
becomes the  
people's



120 gallons to heat  
Warm, healthy, affordable



# Crooked Creek- SNS Immediately

Flooding in May 2010



Photo by John Madden







# Crooked Creek

It takes a Village  
To rebuild a village

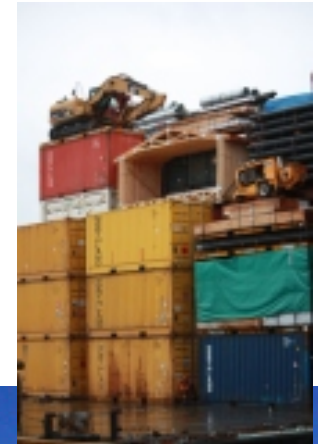




# Crooked Creek

## The Challenge

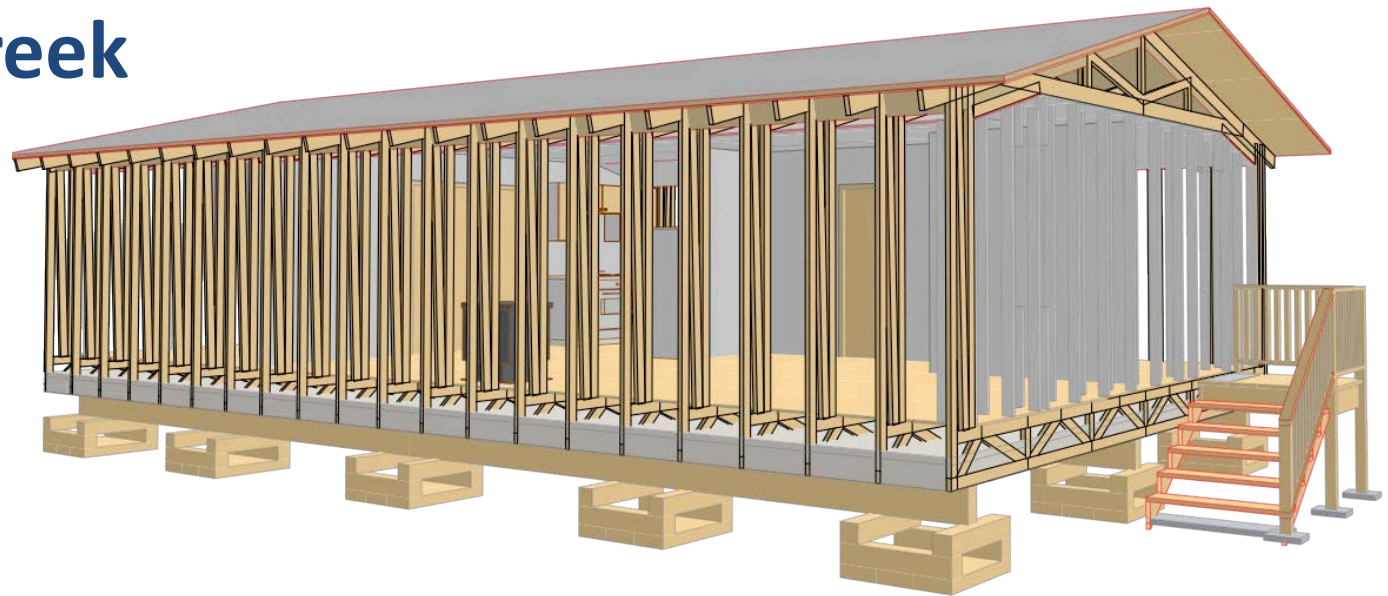
- TIME – need 9 replacement homes by winter
- Building above floodplain
- Design must be easy to ship, quick to build
- Single modular design for small cabin and 4-BR house
- Very low cost



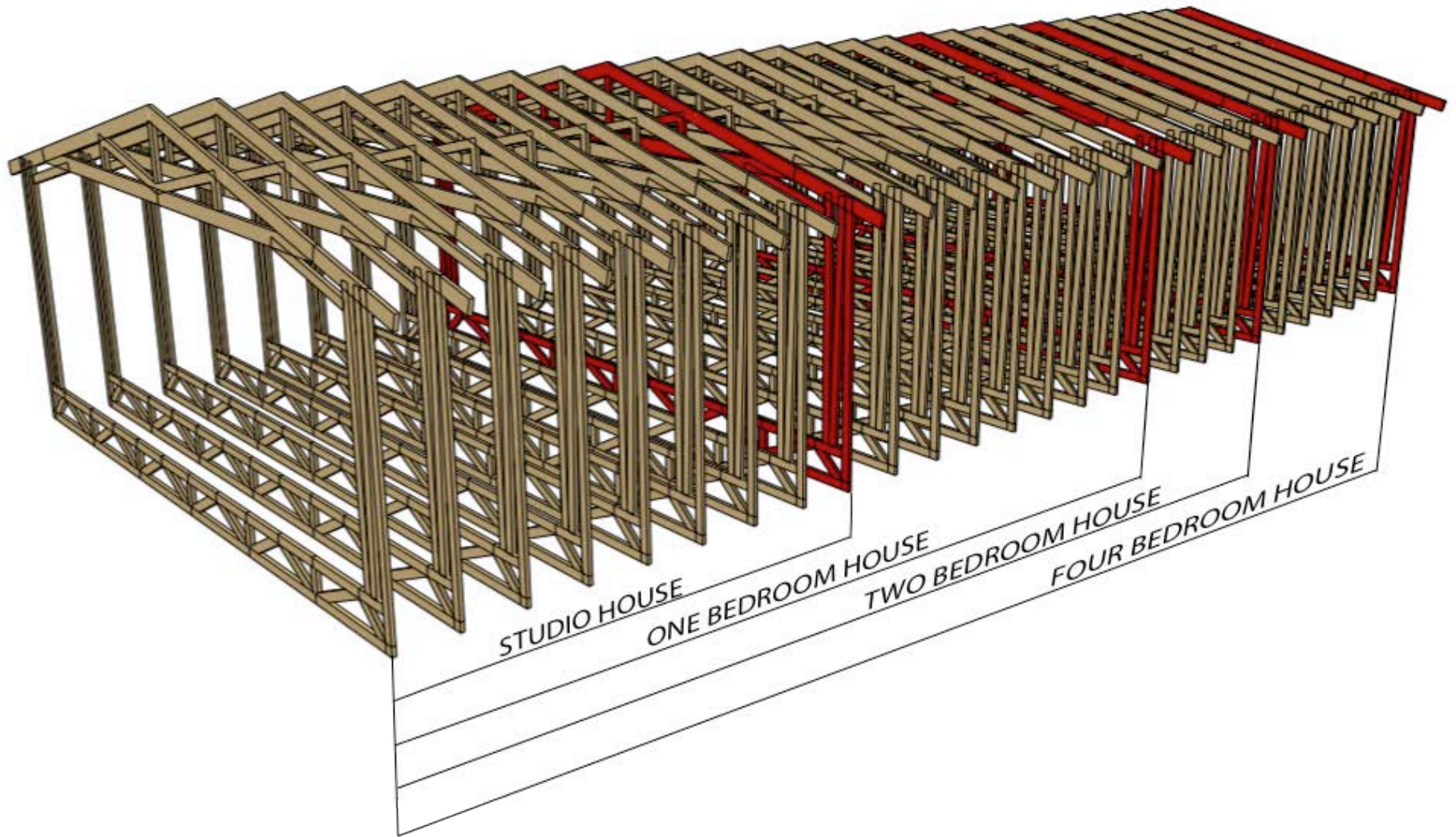




# Crooked Creek



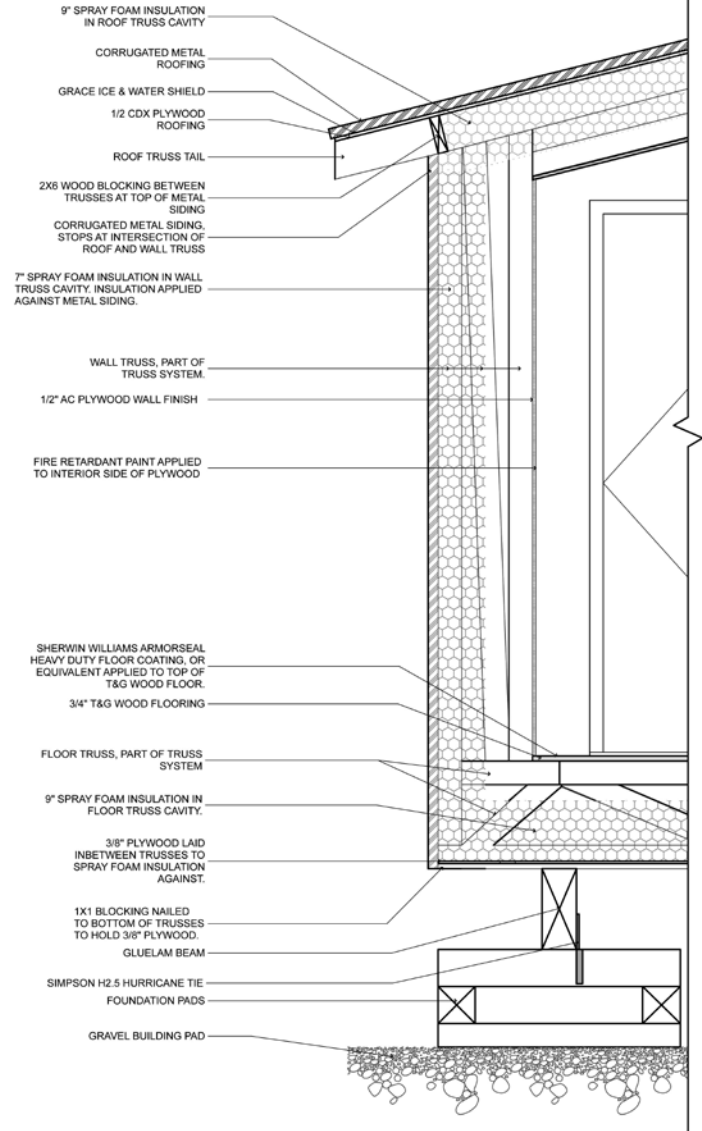
- Partner Co-ordination
- Materials arriving
- Volunteers Building
- Knowledge being shared
- Finished by Oct. 1
- Follow-up for future







# Crooked Creek



2 TRUSS WALL SECTION

SCALE: 1" = 1'-0"





# Crooked Creek

Quick Assembly  
No thermal bridge  
Structural



Tight assembly must be ventilated  
Annual fuel usage very low





# Crooked Creek

An old life in a new home







# Atmautluak







# Atmautluak







# Atmautluak







# Atmautluak





# Atmautluak







Atmautluak



# Atmautluak







# GALENA



So many  
challenges  
we face  
together





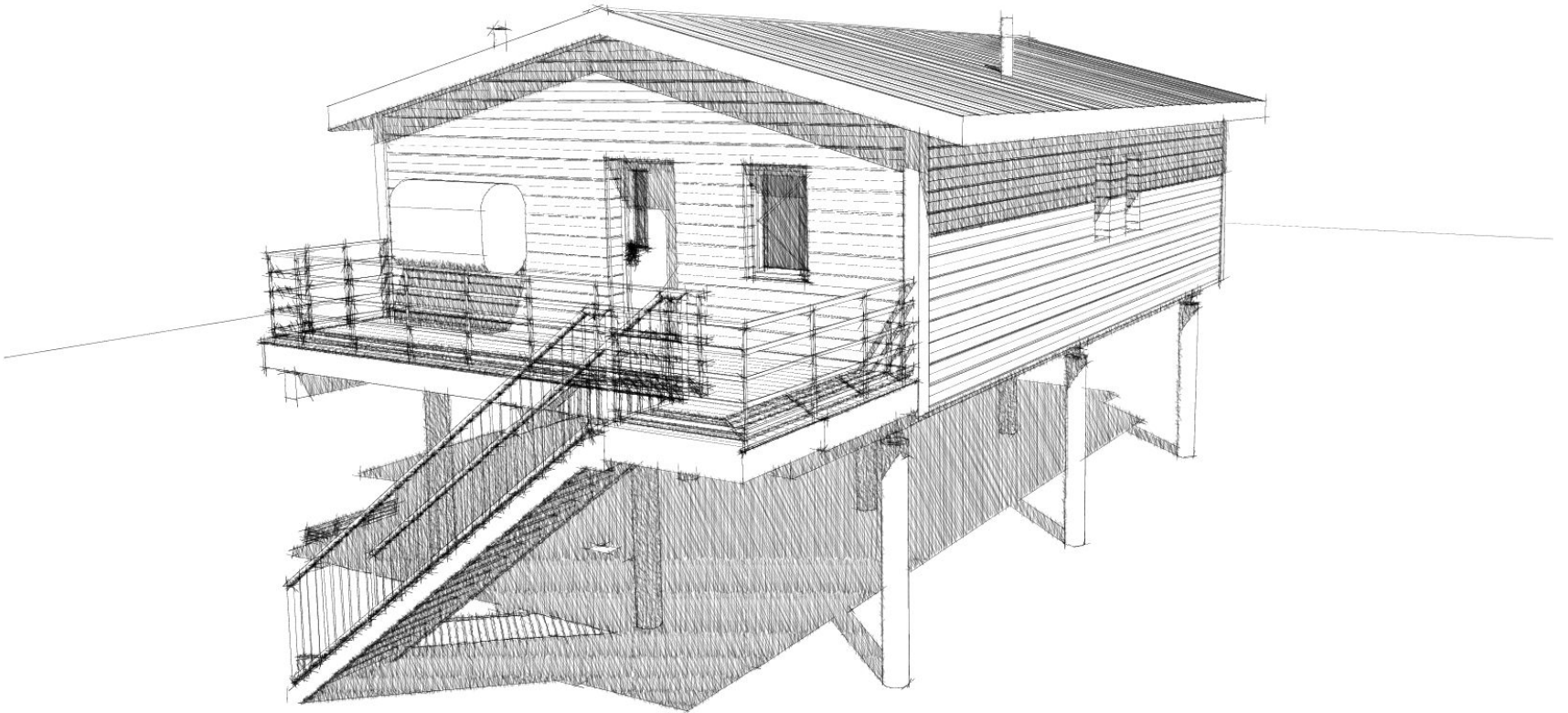
# GALENA





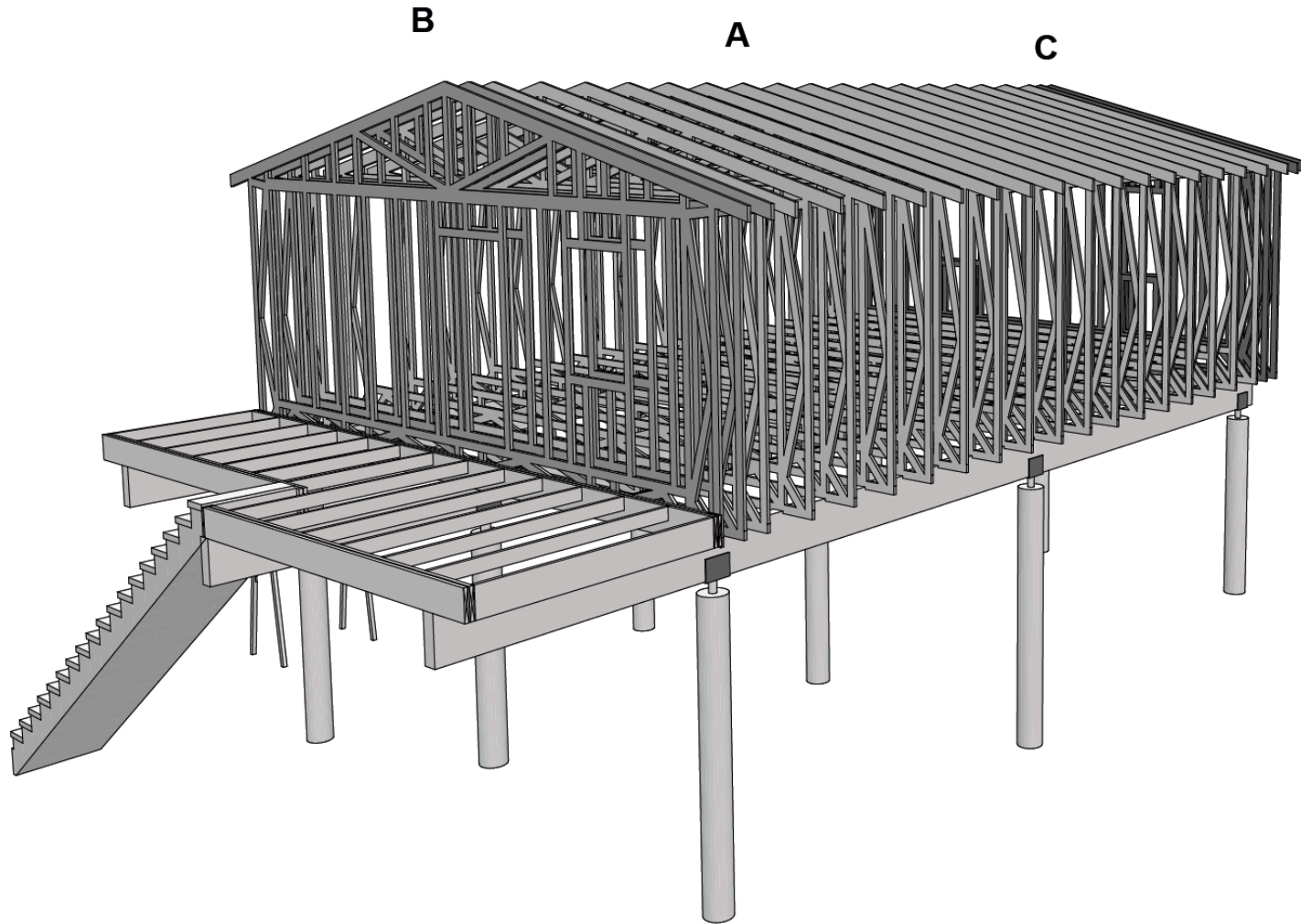


# GALENA





# GALENA







# GALENA- Jen's Home





# GALENA- Jen's Home







# GALENA- Jen's Home





# GALENA- Jen's Home







# The University of Alaska's Sustainable Village

**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.**



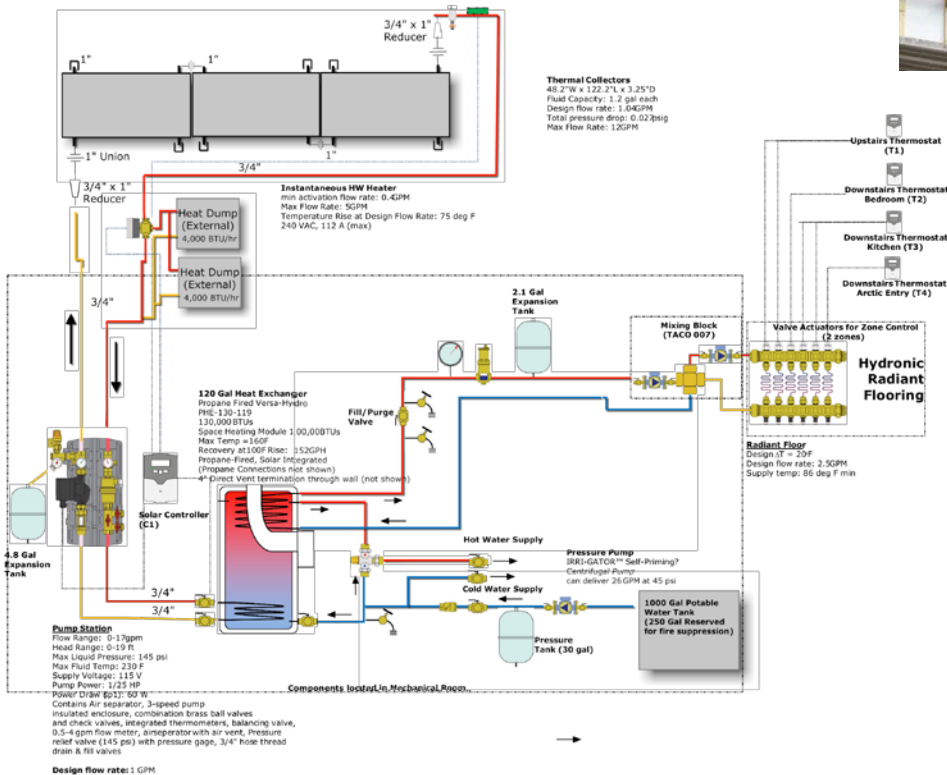
# Sustainable Village “Willow House”







# Solar Hydronic Heating





# The Future of Housing

What do we *want*? What do we *need*? How will we live?









## Connect with us!



### Jack Hébert

President/CEO [jack@cchrc.org](mailto:jack@cchrc.org)

Location [1000 Fairbanks Street](#)

On the web @ <http://cchrc.org>

On [Facebook](#) @ Cold Climate Housing Research Center

On [Twitter](#) @CCHRC\_Alaska

Check out our [blog](#) @ [makinghouseswork.cchrc.org](http://makinghouseswork.cchrc.org)