Research • Innovation • Education

COLD CLIMATE HOUSING RESEARCH CENTER

CCHRC

CCHRC Research and Testing Facility

LEED Platinum

SIEMENS

Runner-up
Smartest Building in America

Organization

Research

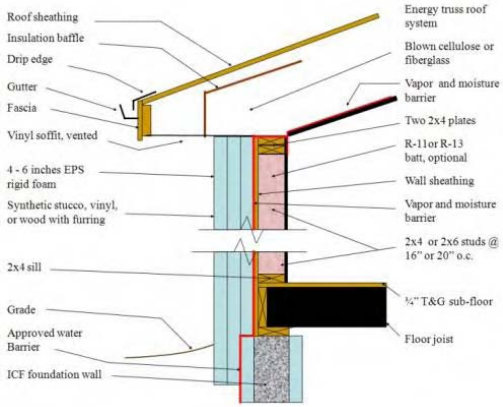
Product Testing

Design & Consultin

each & Education

Research Programs

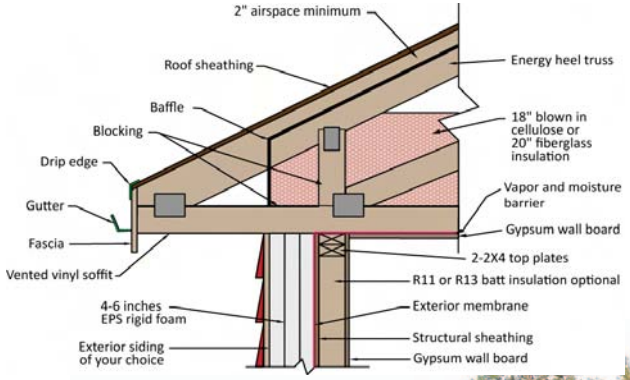
Building Envelopes & Materials



Energy & Mechanical System

Policy & Program Development

?Lsc?snR ?nE?cdT?F??n? ? ?i?gs?cF?



??????g sn &? g??n??Lsc?snR ?i ?n??g?Fv?

??E?n?snR??Lsc?snR ??s?n??

Net Zero-
Passive House

Alaska is part of the
Global Arctic Community

The Changing Arctic

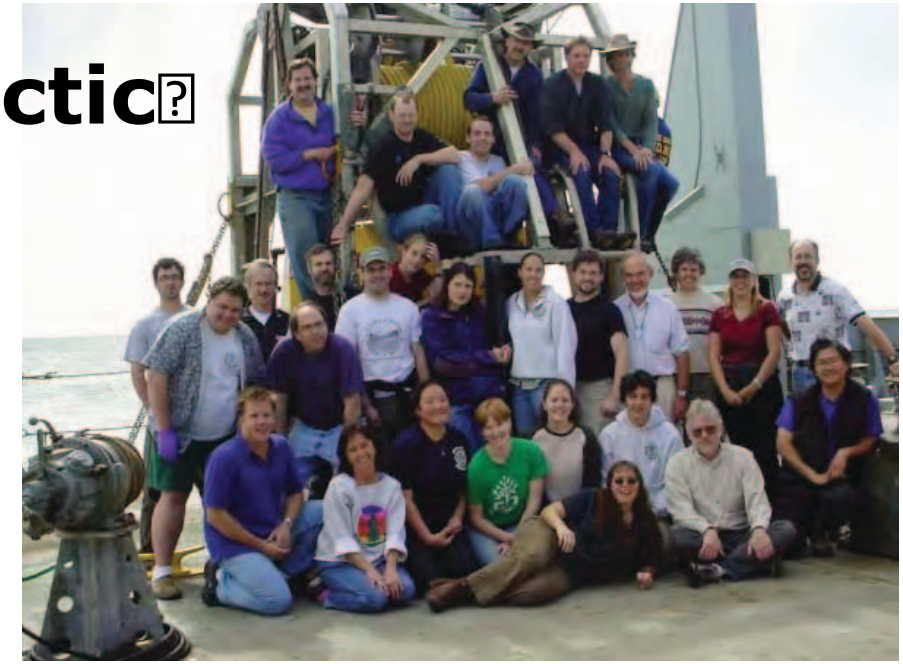
The Polar Regions are experiencing climate change at a speed and scale unmatched in the inhabited world. Currently, 184 Alaskan communities are classified as ‘threatened’ by erosion due to changing weather patterns, and five are classified as ‘imminently threatened.’

The Changing Arctic

- euFs c
nEsgdnh ni

- dndh s
nEsgdnh ni

The Changing Arctic



- LdiLg
nEsgdnh ni

- dcsl
nEsgdnh ni

[illegible]

[illegible]

[illegible]

Archives, University of Alaska, Fairbanks

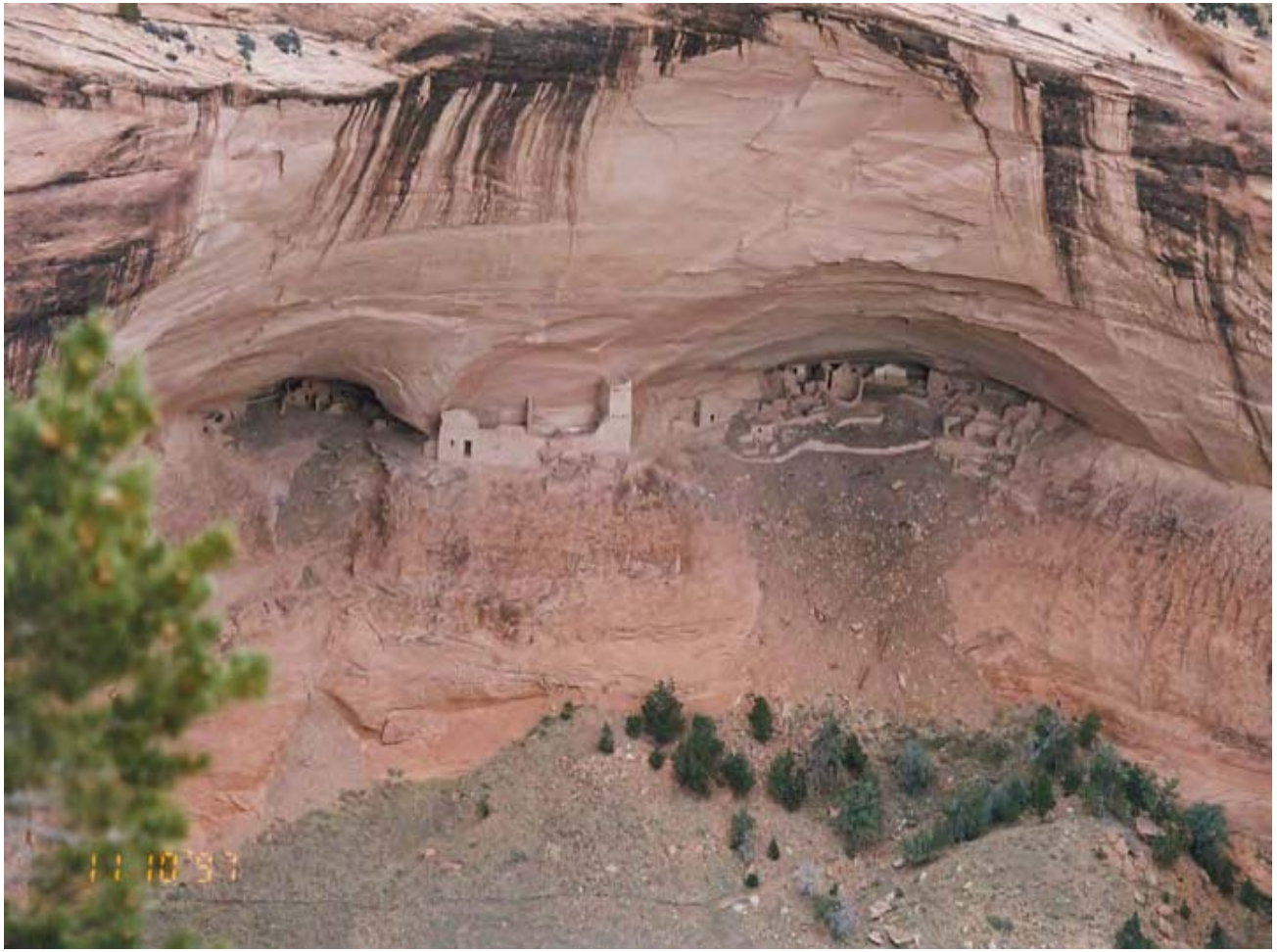
N[illegible]

N[illegible]

N[illegible]

[illegible]

[illegible]



N80fi1[illegible]8[illegible]sccsdn[illegible]

N83’1[illegible]sccsdn[illegible]

N411tt[illegible]0[illegible]sccsdn[illegible]

[illegible]

[illegible]iLg[illegible]Dscc[illegible]Tg[illegible]E[illegible]sc[illegible]

Sustainable Design Communities

[illegible]

fi4‘ O Wd[illegible]edLFsnRFid[illegible]rs[illegible]dnFs[illegible]g[illegible]sn[illegible]
n[illegible]dh [illegible]adgg[illegible]Tsgdg[illegible]csnR[illegible]Tgi[illegible]

2‘ O [illegible]Wd[illegible]edLF[illegible]edc[illegible]F[illegible]g[illegible]dnFs[illegible]g[illegible]g[illegible]HuO

48O Wd[illegible]edLF[illegible]edc[illegible]F[illegible]g[illegible]Ln[illegible]c[illegible]dh [illegible]sni[illegible]sn[illegible]
21d[illegible]dn[illegible]dc[illegible]uF[illegible]sn[illegible]e[illegible]Dsni[illegible]gO

fi2‘ O Wd[illegible]edLF[illegible]edc[illegible]F[illegible]g[illegible]Tdgi[illegible]e[illegible]EsnR[illegible]h dc[illegible]dg[illegible]
h sc[illegible]D[illegible]sn[illegible]e[illegible]edh [illegible]O[illegible]

[illegible]L[illegible]dsc[illegible]Tgs[illegible]F[illegible]g[illegible]e[illegible]F[illegible]
esRe[illegible]F[illegible]w81N[illegible]R[illegible]ccdnO[illegible]

’’ O3 Wd[illegible]edLF[illegible]edc[illegible]F[illegible]e[illegible]E[illegible]
sn[illegible]dh [illegible]c[illegible]FFi[illegible]e[illegible]n[illegible]w41B111O[illegible]

[illegible]g[illegible]l [illegible]sF[illegible]e[illegible]nRsnRB[illegible]80‘ [illegible]
[illegible]c[illegible]Fr[illegible]n[illegible]dh h Lnsl [illegible]F[illegible]
ieg[illegible]i[illegible]n[illegible]u[illegible]gdFsdn[illegible]

[illegible]iLg[illegible]c[illegible]sF[illegible]Fi[illegible]gF[illegible]g[illegible]
[illegible]dh snR[illegible]h dg[illegible]g[illegible]tiL[illegible]ni[illegible]

?L Fi ?sn??c?? dgi e?gn??dh h Lnsl ?F?

?h?sR?ndL F?
? sF?dh ?
9?
48Fi?
??ni Lgu?
???endcdRu?

Concept

Learn From Nature

The most successful Arctic animals don't have to eat more fuel to keep warm in the winter. Instead, they put their energy into high-quality fur and fat to maintain their body temperature.

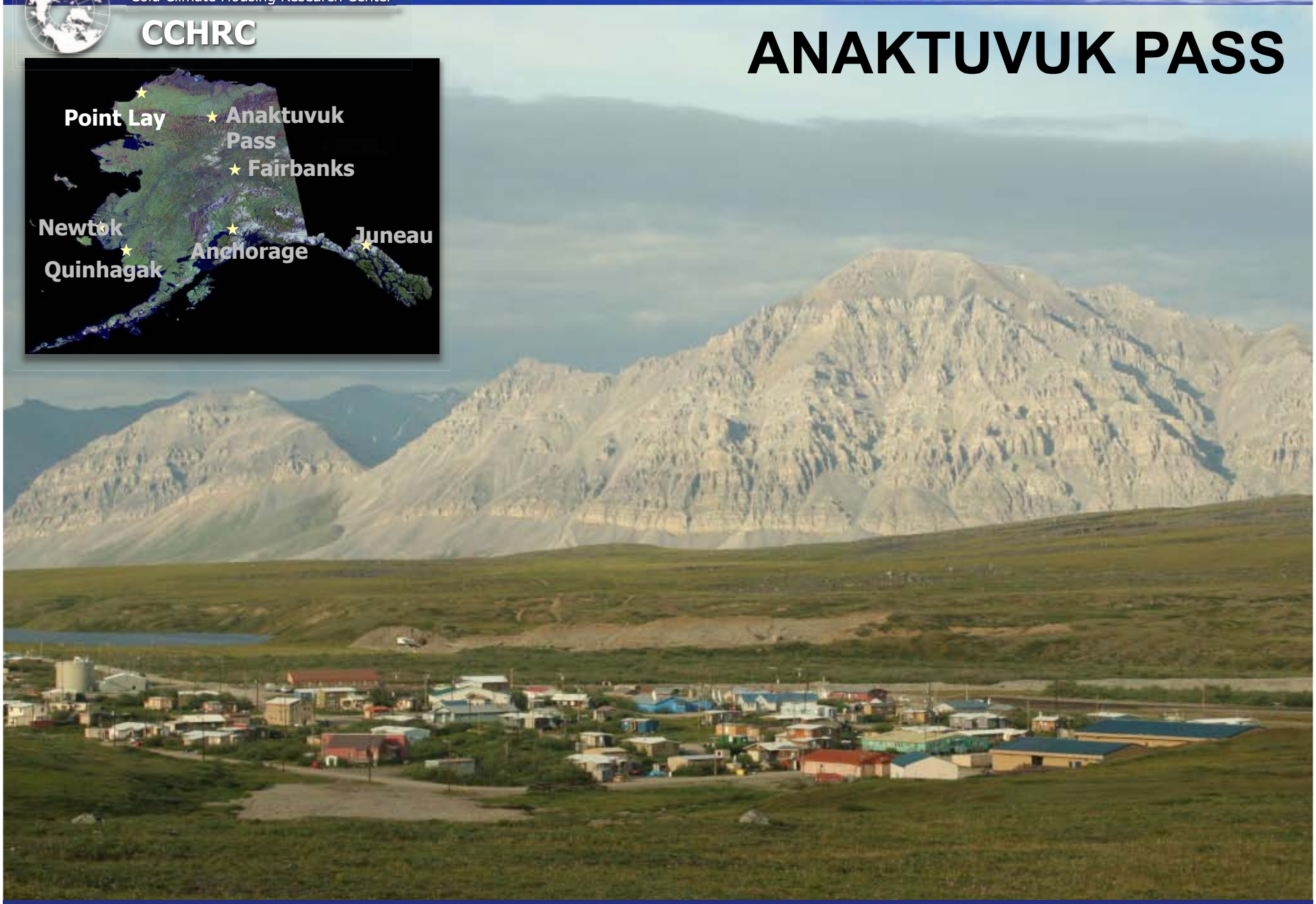
RETAINING heat, not PRODUCING heat, is the most important part of an animal's survival.

Traditional Housing In Alaska

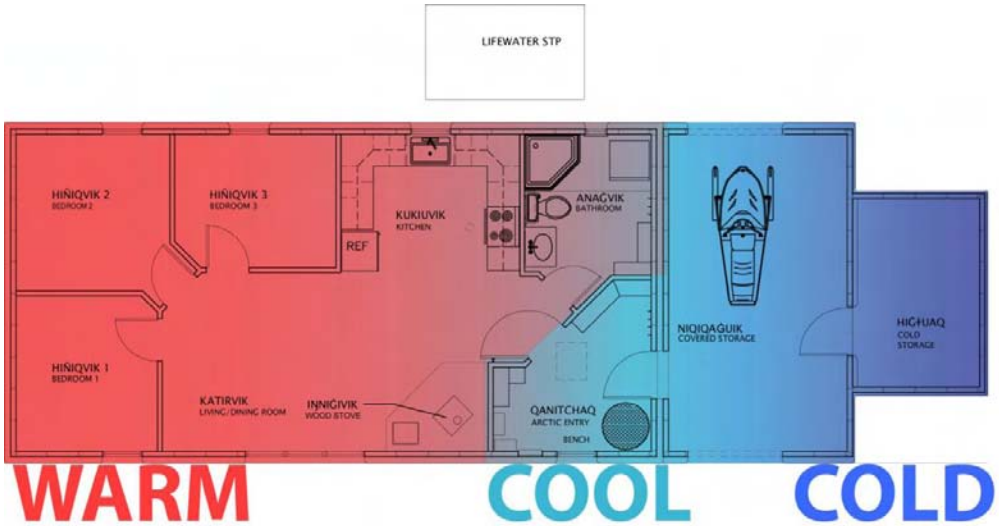
Cold Climate Housing Research Center

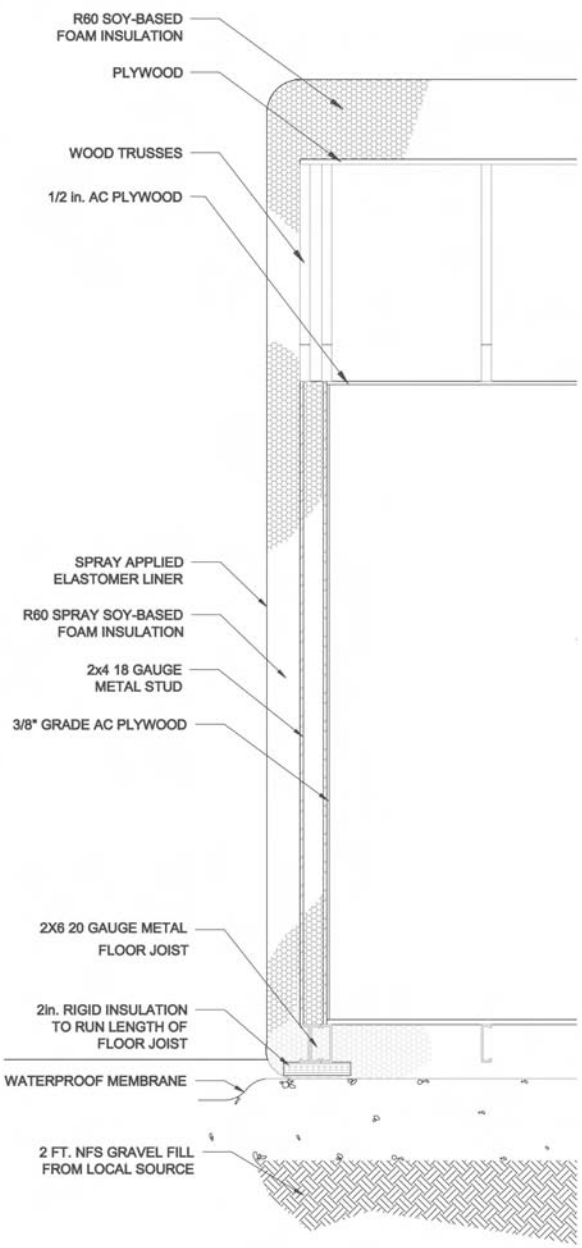
CCHRC

ANAKTUVUK PASS



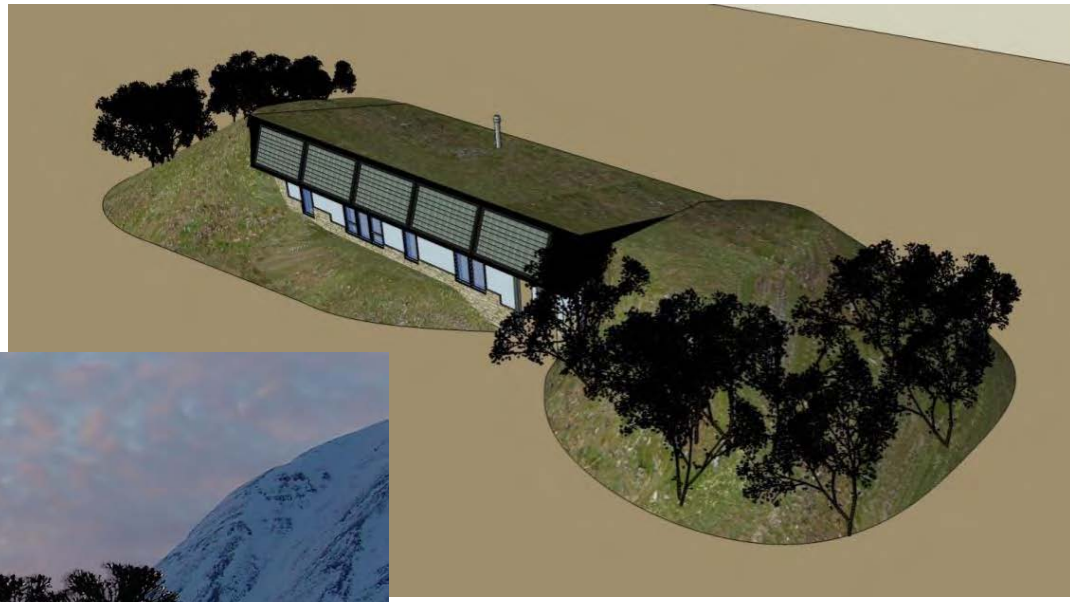
Anaktuvuk Pass Prototype Home

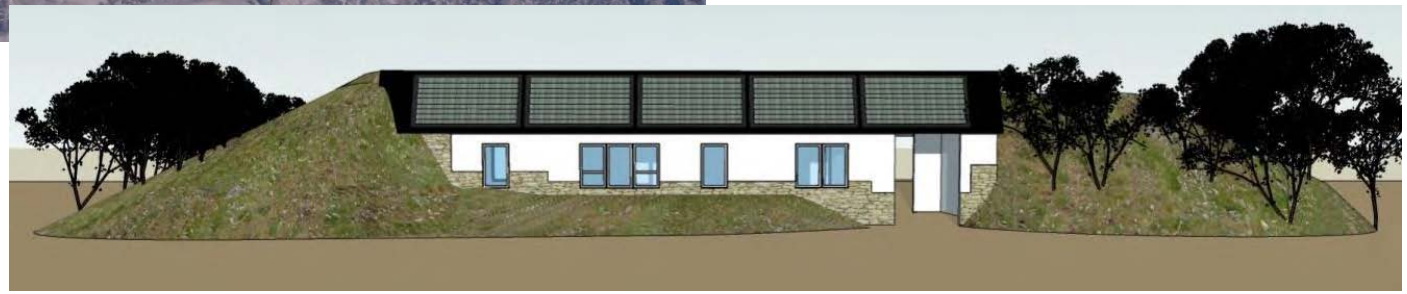




Design:

Rendering of Initial Design





Anaktuvuk Pass Prototype Home

Energy and Cost Efficient

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

[illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

G?gdidiuT?id?Tgd?L?l dn?

?iti?FLr?

?dsni???u?"???cs?

Point Lay
Anaktuvuk Pass
Fairbanks
Newtok
Anchorage
Juneau
Quinhagak

QUINHAGAK

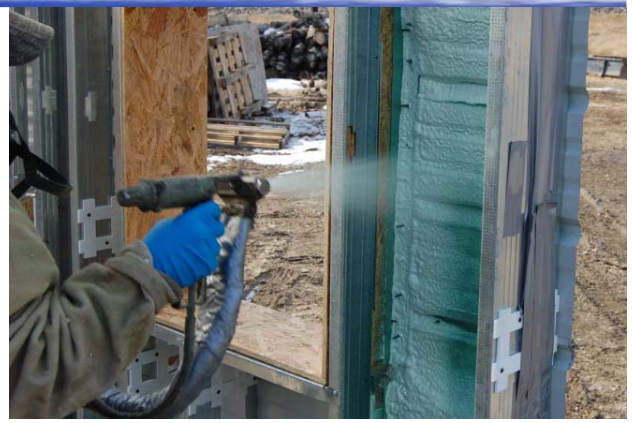
65
BEWARE OF THE DOG
POLARIS

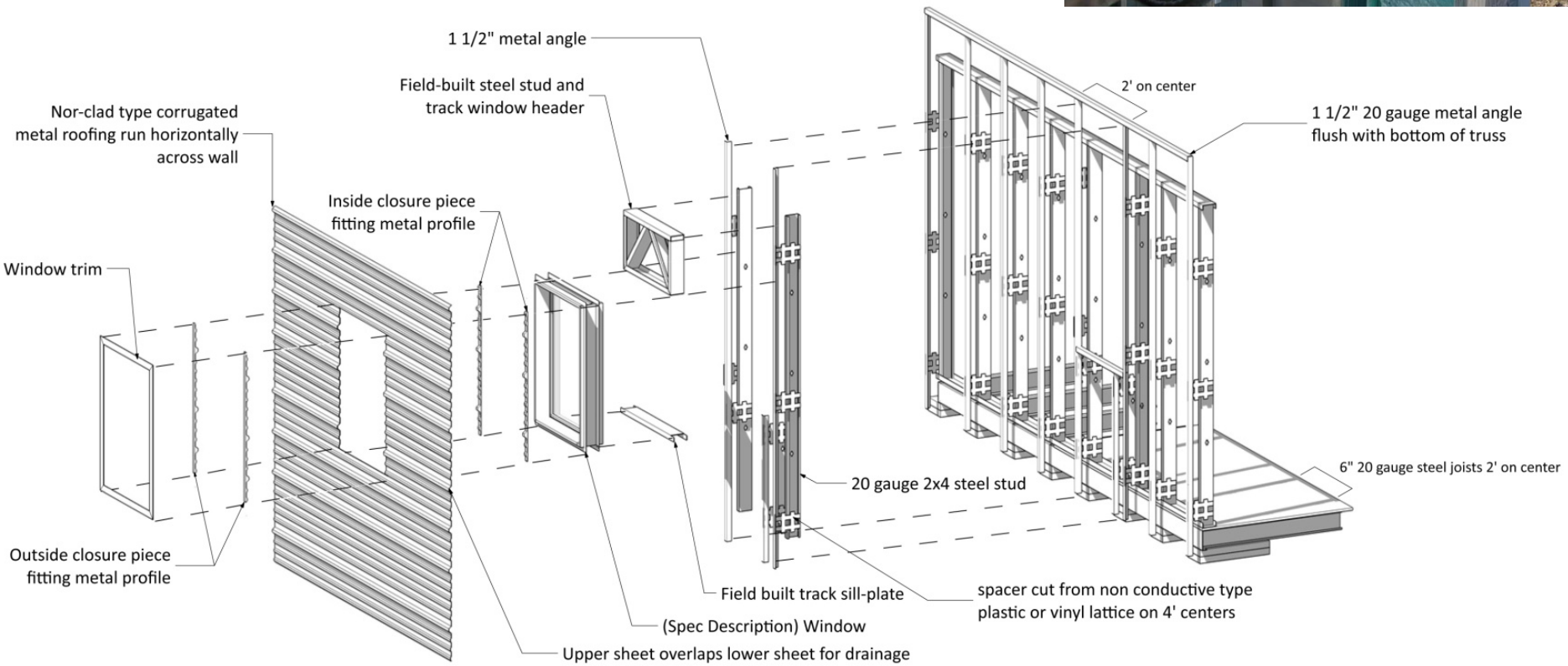
Lsne R r

FsRn e g y

? Lsne?R?r?? dLF??

??FsRn??hndE?l dn?





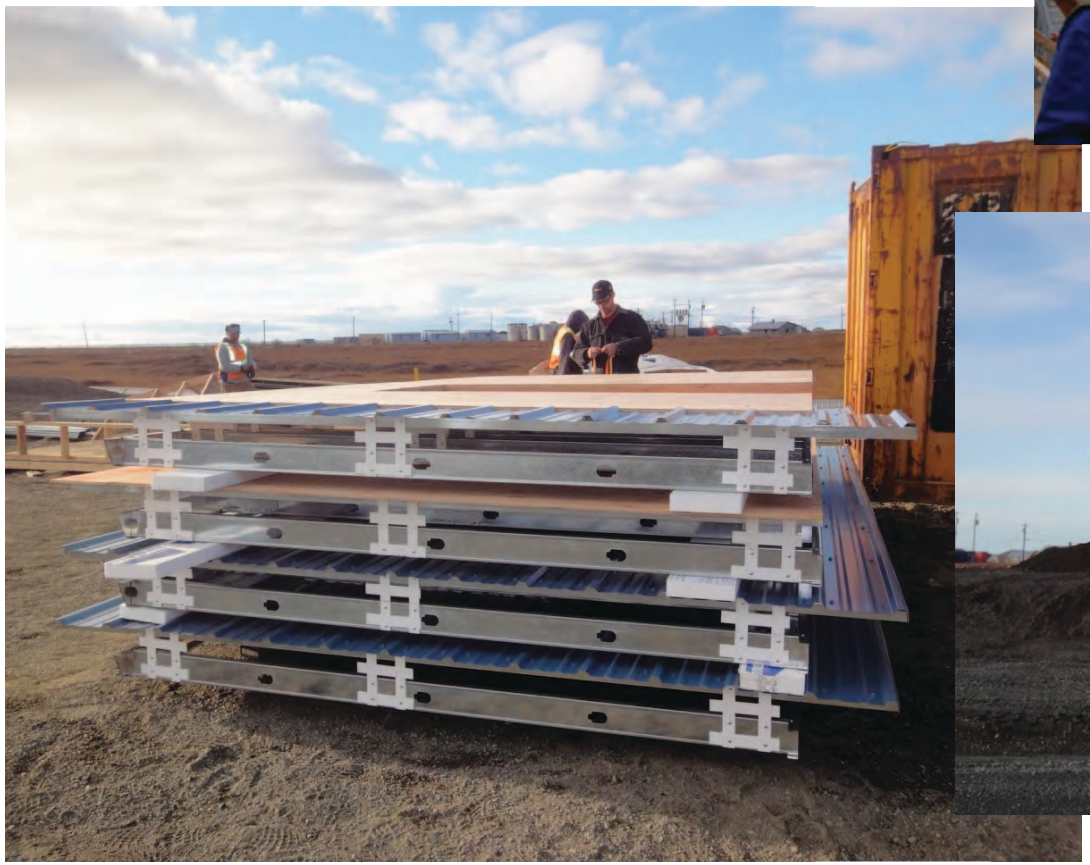
Exploded Axonometric of Wall Assembly

Quinhagak House Construction

Lsne R r dLF g dgh n

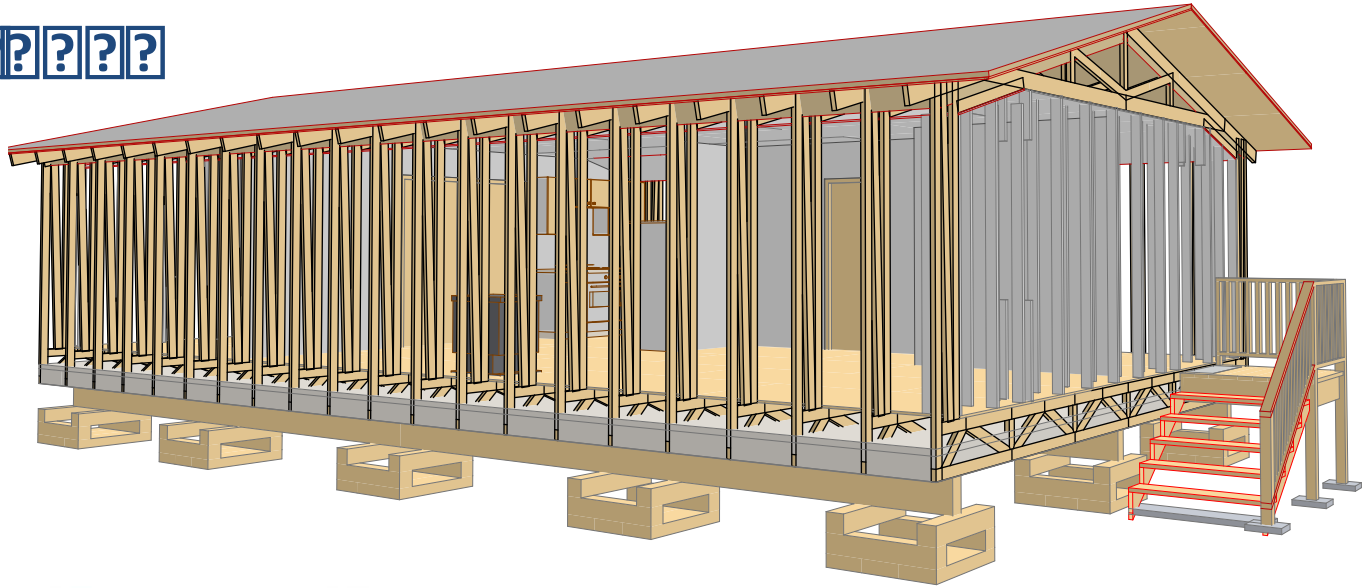
- 8fi1 R ccdnF L cdsc gFi u g
- LT gsdg sn ddg sg
- Lsci sn tt D r F
- d cc dg dg
- sRei h i gs cF
- sRe dD n g dh dgi
- sRns ni cu cFF dFi
- Lg c

Lsne R r dL F G
gdidiuT id Tgd L l dn

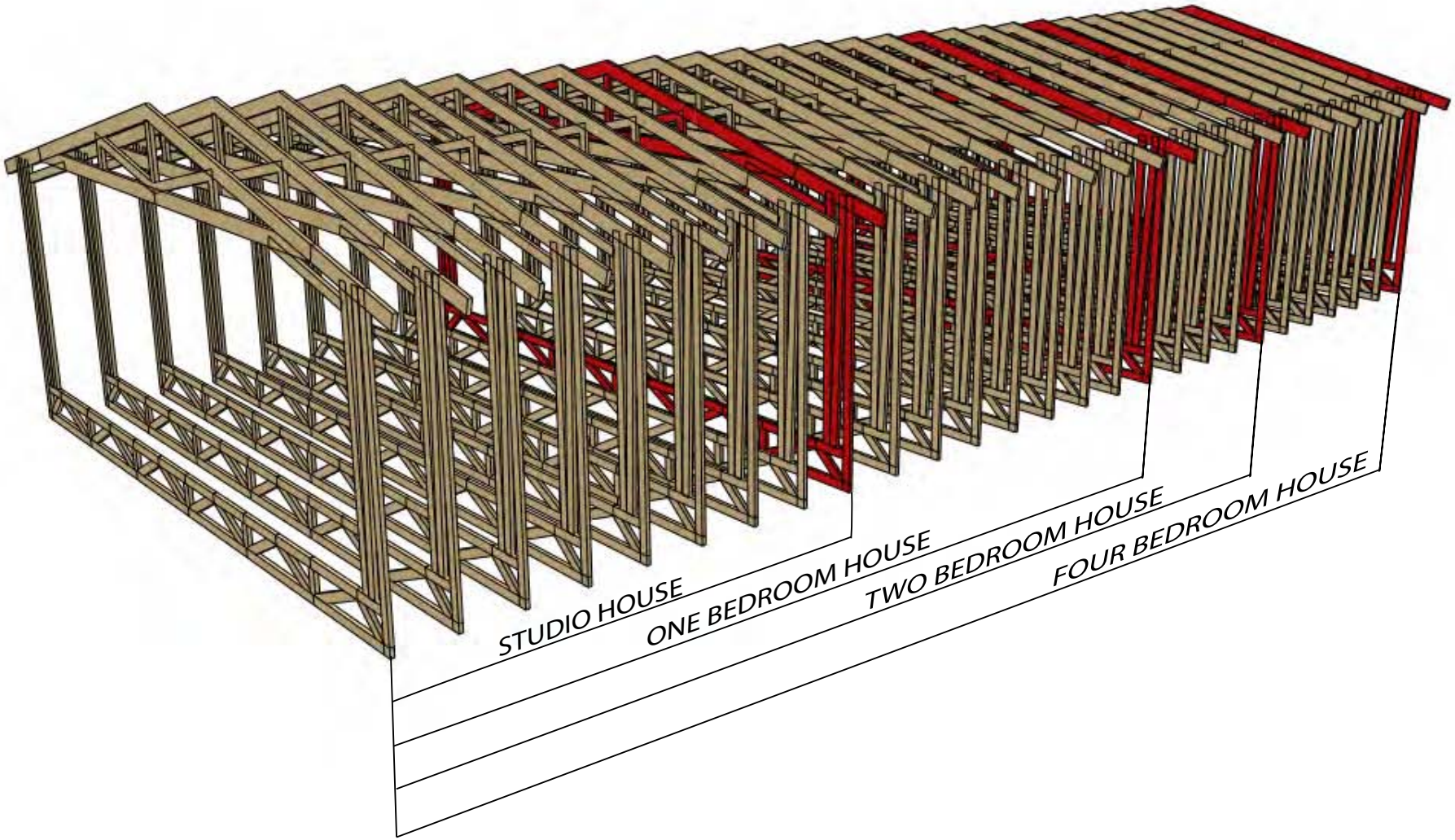


Lsne R r dL F G
gdidiuT id Tgd L l dn

gddr g r“ e i g h h s i c u



- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

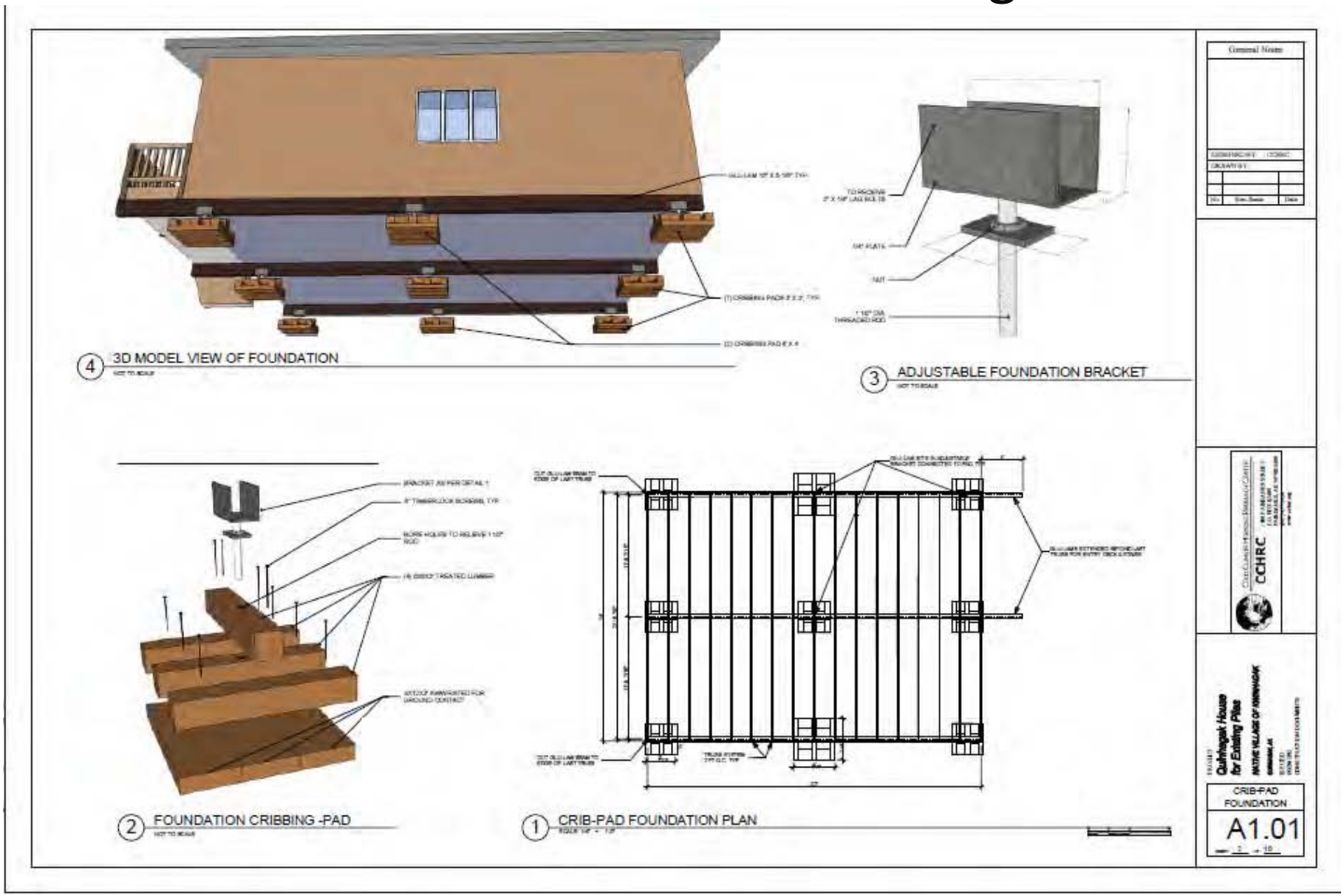

STUDIO HOUSE
ONE BEDROOM HOUSE
TWO BEDROOM HOUSE
FOUR BEDROOM HOUSE

gddr g r

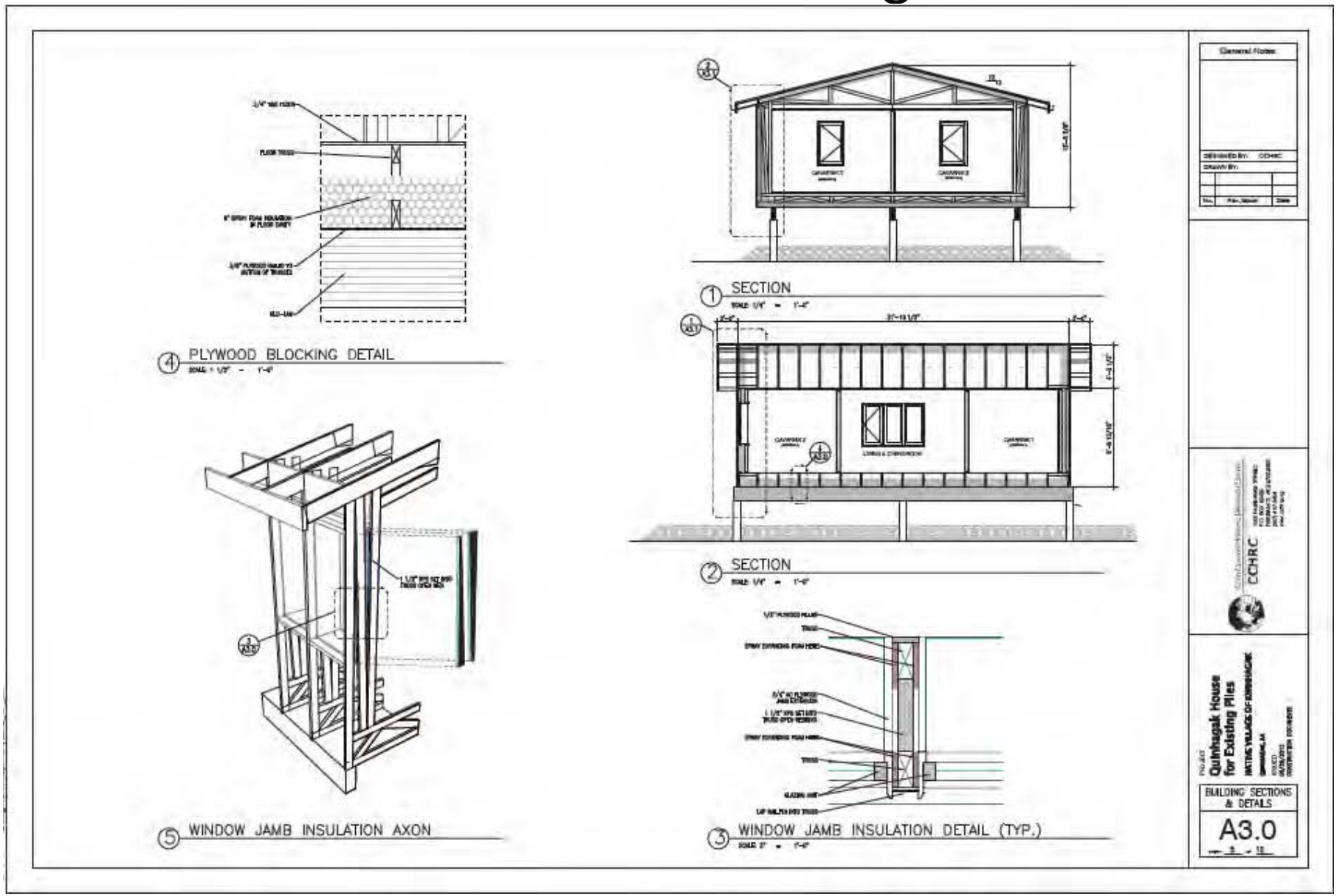
n dc s n

n D edh

Lsne R r dL F G i nRL g T l dn



Lsne R r dL F G i nRL g Tl dn



? Ls ne ? R ? r ?? d L F ? ? G ?? ? ? i ? n R L c ? g ?? T l d n ?

Lsne R r dL F G i nRLc g Tl dn

?e ??? ? ???L Fi ?sn ??c ??? scc ?R ??

? ?? ????? ?A? ??? ? ??A???? ??B ??? ?? ? ????C ?? ?

?e??? ? ???L Fi ?sn??c??? scc?R??

4188?

- ?iL??ni??? ?FsRn? ?dh T?l l dn?
- ?si???E?cdTh ?ni?
- ? ?FsRn? gFi?cdD??dFi? n?i“m?gd“?n?gRu? edh ?F?
- ?iL??niF??F?csE?“sn? g?F??g?e?gF?
- ?dh h Lnsiu??? ?FsRn?

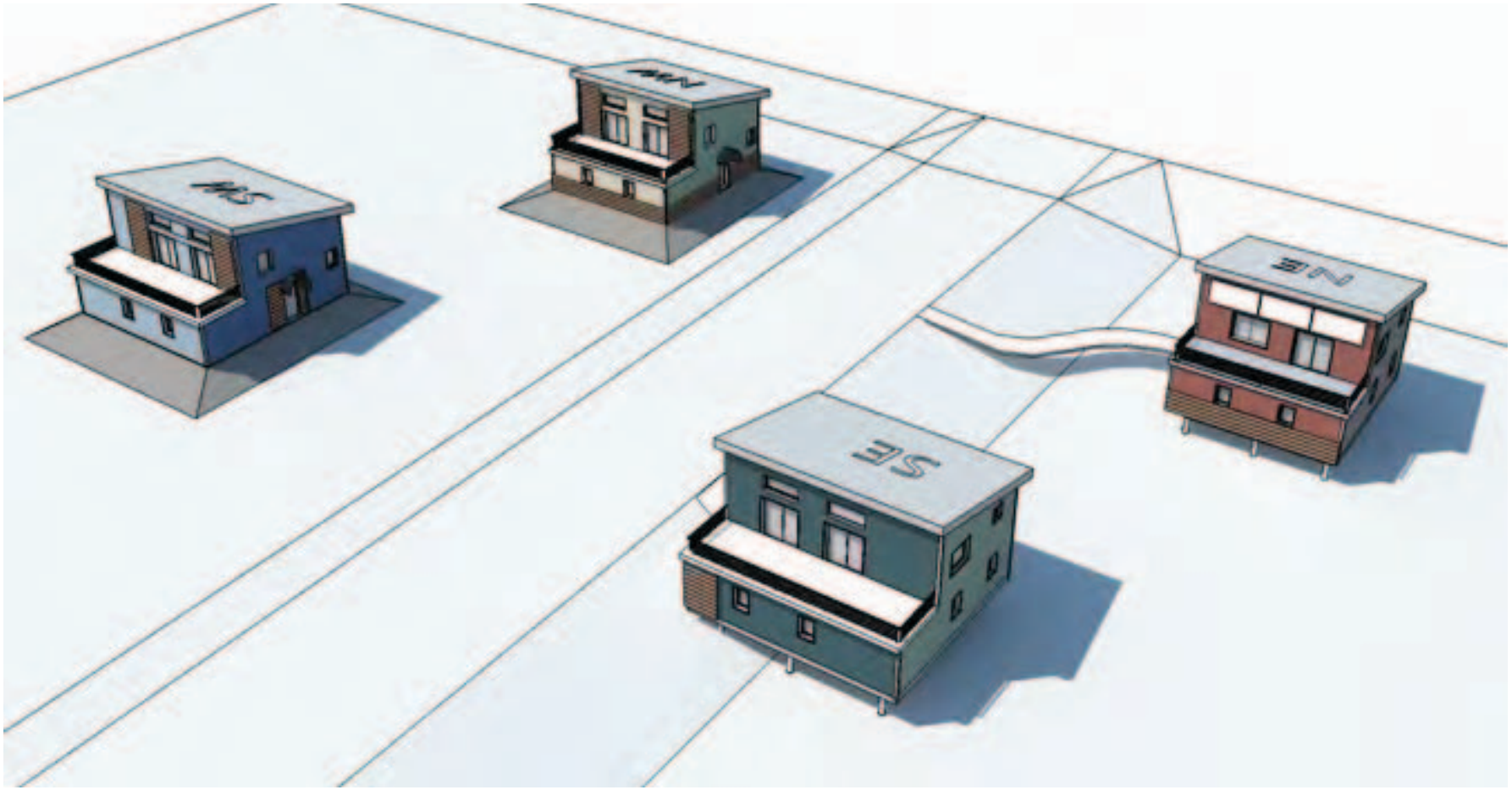
L Fi sn c sc R

dnFigL l dn gFi Te F

TgsnR 4184

warmth + shade thermal shutters rated to R-10 prevent heat loss at night in the winter. in the summer, they fold up to create awnings and shade from unwanted solar gain.
garden rooftop or ground level gardens provide personal plots for each resident and a relaxing place to read or study in the summer months. the balcony garden cantilevers over the lower level for sun shading.

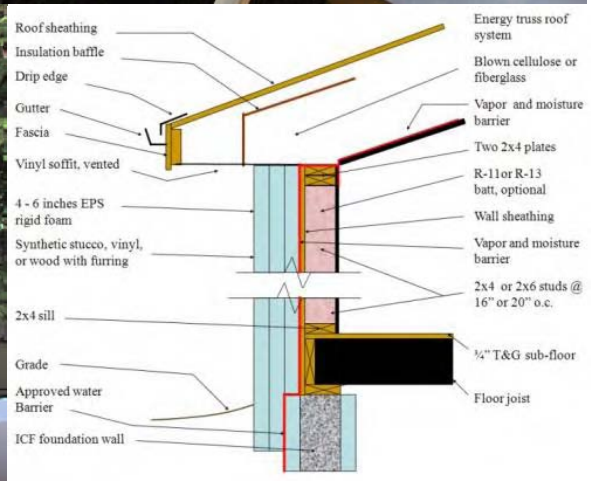
?g?F?g?e??d Fi?g?



??? ? ???????uFi?h ?

Dsie?????

DANGER

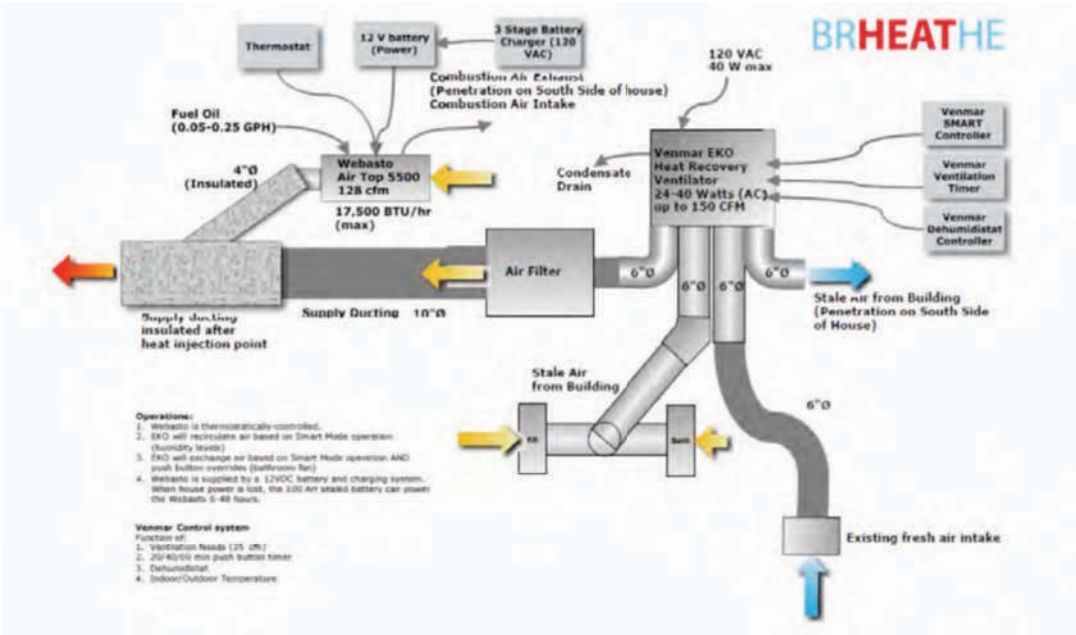

Roof sheathing
Insulation baffle
Drip edge
Gutter
Fascia
Vinyl soffit, vented
4 - 6 inches EPS rigid foam
Synthetic stucco, vinyl, or wood with furring
2x4 sill
Grade
Approved water Barrier
ICF foundation wall
Energy truss roof system
Blown cellulose or fiberglass
Vapor and moisture barrier
Two 2x4 plates
R-11or R-13 batt, optional
Wall sheathing
Vapor and moisture barrier
2x4 or 2x6 studs @ 16" or 20" o.c.
¾" T&G sub-floor
Floor joist

FuFi h

Dsie cLcdF

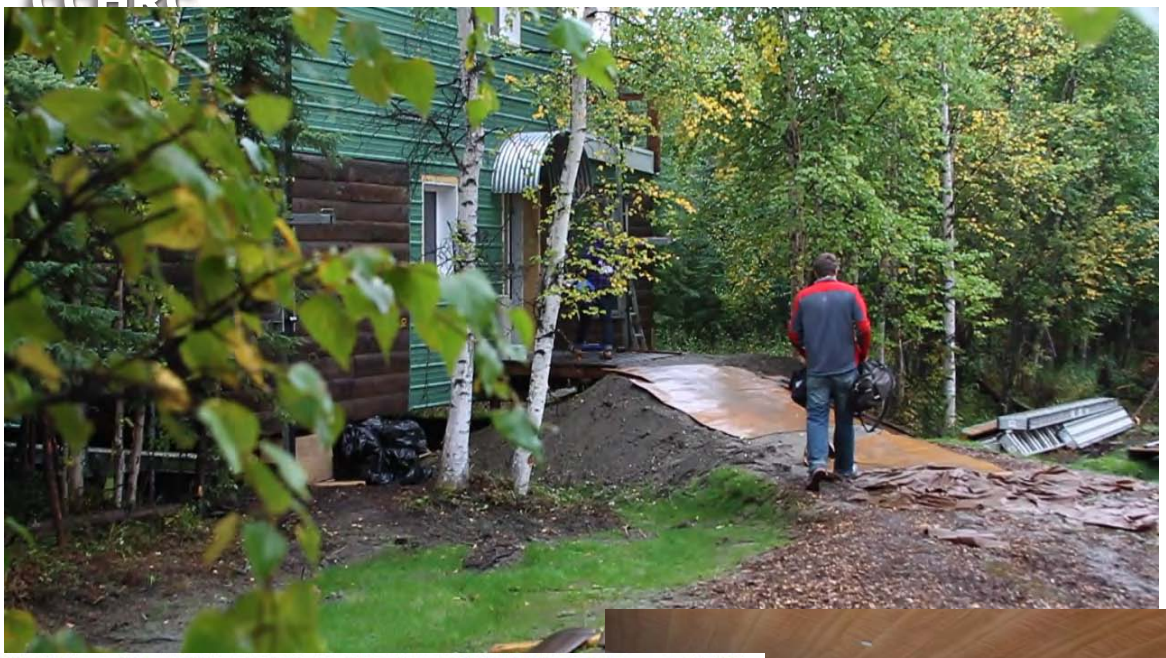
Insi Dig n
D Fi Dig

sRecu?C s?ni sni?Rgi???e??l nRM? E?nl c?l dnM?TdD?g?

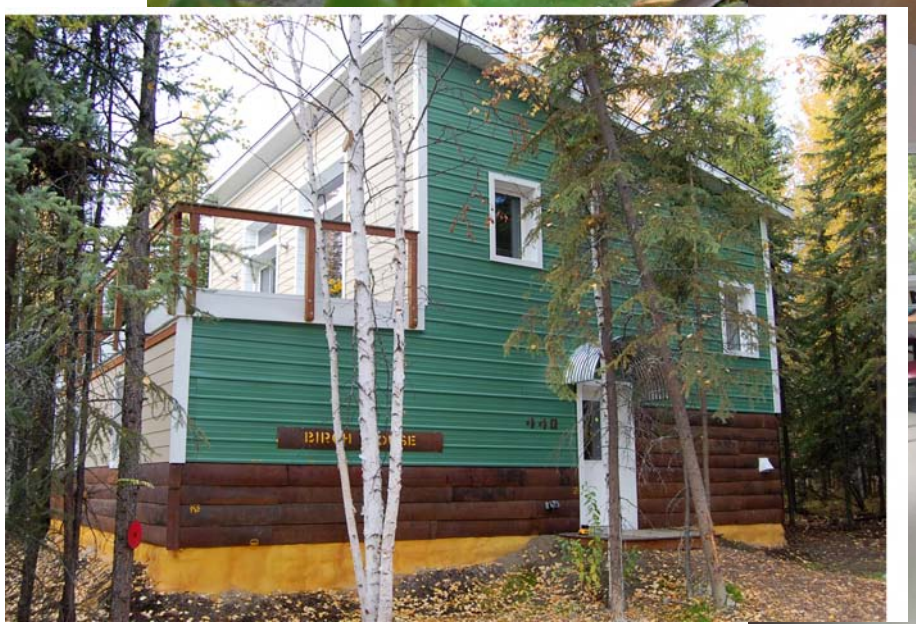


?L Fi ?sn ??c? ?? scc?R??

&? sccd D ?? d L F?v?

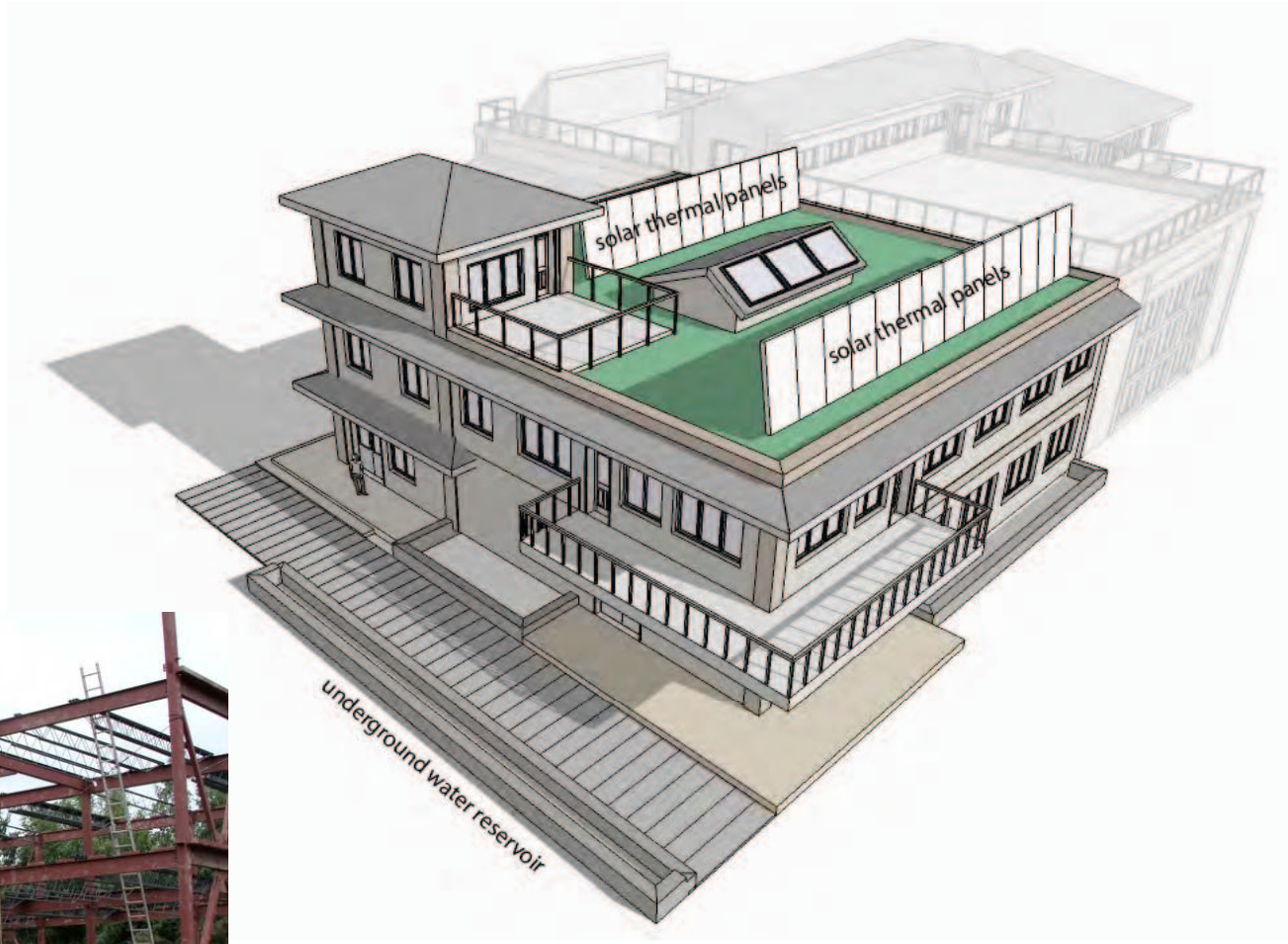


? dE??sn?



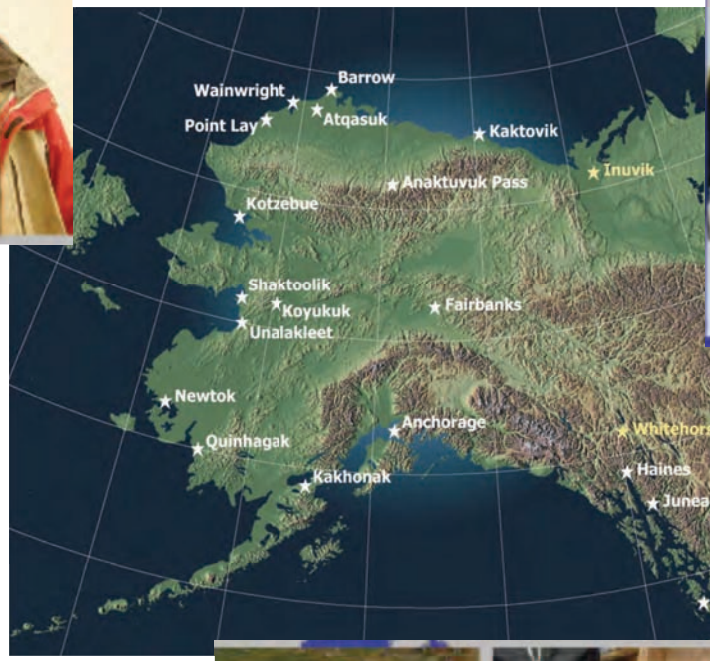
[illegible]

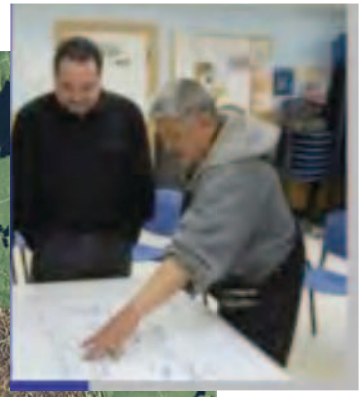
[illegible]


solar thermal panels
solar thermal panels
underground water reservoir

The Future of Housing

Quyana, Quyanaq, Gunalcheesh, Thank You





dnn i Dsie LFp

blog

“

gFs niM a rb eg Odg R

dl dn 8111 sg nrF ig i

nie D b eyTAW eg Odg R

n ddr b dc sh i dLFsnR F ge ni g

n Dsy g b ” c Fr

e r dLi dLg cdR b h rsnRedLF FDdgrO eg Odg R