

House Resources Committee

HB 173-Testimony

Effects and Adaptation
To Climate Changes in Alaska



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Impacts on the People and Communities

Climate change is occurring, is very likely caused by human activities, and poses significant risks for a broad range of human and natural systems.

-America's Climate Choices: Final Report

The National Academies, 2011



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What Is ANTHC Doing?

Established a Center for Climate and Health

- Observe
- Respond
 - New ways of doing things
 - Innovate
 - Advocate

- Assist Communities in Planning for the Future
- Adaptation of Our Infrastructure Designs
 - Borrow from the principles of Native survival
 - Flexible, light, moveable when possible



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Awareness





Center for Climate and Health



Disease



Behavioral Health



Food Security



Injury



Water Security

In 2009 ANTHC established the first center in the nation with a focus on understanding the connections between climate change, environmental impacts and health effects. We focus on five major topic areas.



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Identifying health effects of climate change in Alaska

Allergic Reactions



Travel Safety

Food Spoilage



Mental Health



Waterborne Disease



Respiratory Health

Food Confidence



Injury

Vessel Safety



Harvest Failures



Allergies



Infrastructure Damage



Food Safety

The Center has described a wide variety of health effects as climate change priorities for the tribal health system.



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Local Environmental Observer (LEO) Network

Through these three activities:

- Scanning for events in the press,
- performing local assessments,
- and working with the LEO Network

we are beginning to describe some of the climate and health relationships.



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Selawik River

Photo by Yuri Gorokhovich

Climate Change Effects on Healthy Homes

- Air Quality
 - Tightly constructed homes without cooling as temperatures rise
 - Wildfire smoke infiltrating homes
- Melting Permafrost
 - Shifting ground causes injury hazards and degrading home conditions



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Failed Arctic Boxes

Box Pulled from Building



Insulation Wet/Removed



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Structural Health

Massive ice formation exist in permafrost soil beneath many communities and structures.

When ice melts, the soils subside and the structures above the ice experience settlement that can be up to several feet, damaging foundations and pipelines.



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In Kotlik, coastal flooding has damaged community infrastructure.



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Adapting Infrastructure to Climate Change

- Water and Sewer along with Transportation Infrastructure is estimated to be most vulnerable to climate change.
- Cost of not adapting infrastructure has been estimated to shorten the useful life of water and sewer infrastructure by 3.5 years (20 year normal design life assumed).
- Compounding this shortened life over decades adds Billions of dollars to preserving the sanitation utility. Estimated to add \$3-6 B (rebuilding) by 2030 for Alaskan villages.

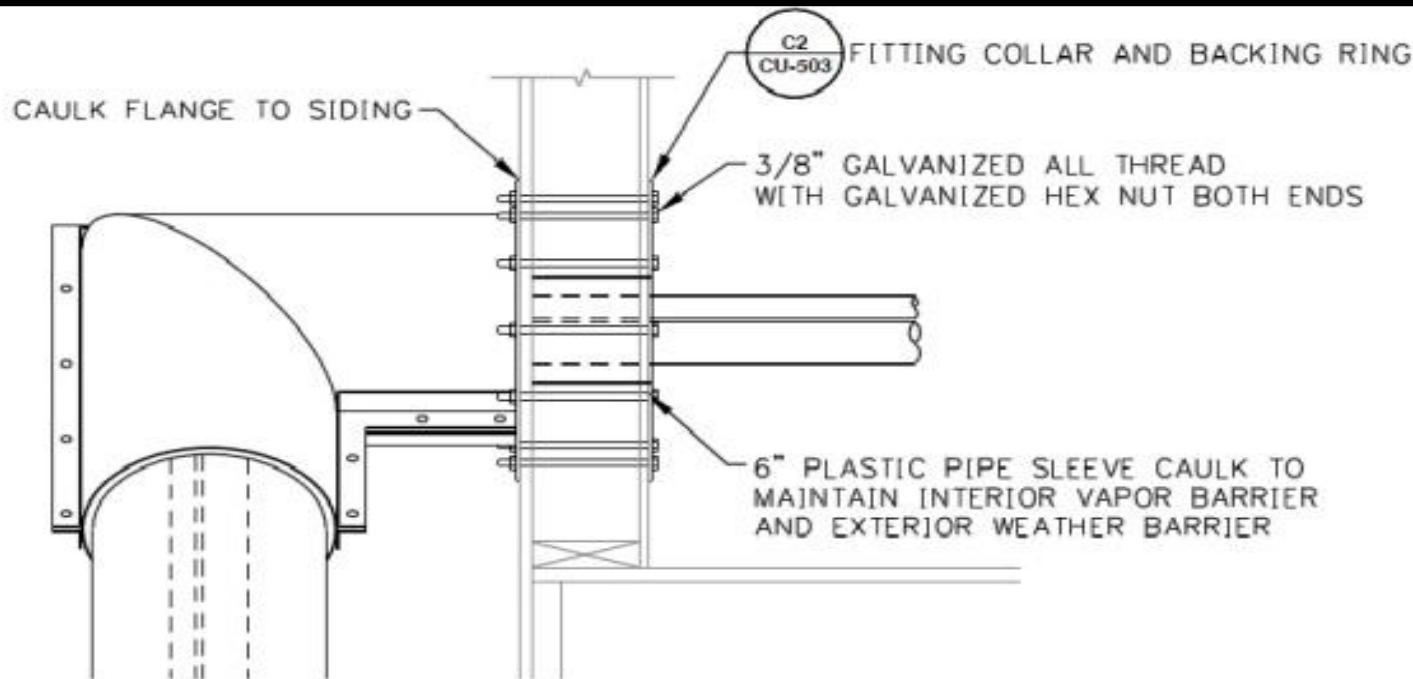
(Larsen, Goldsmith, Smith, et al (2007) Estimating Future Costs for Alaska Public Infrastructure At Risk from Climate Change.



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Adaptation

make pipe flexible not rigid



A3

SERVICE LINE HOUSE CONNECTION

1 1/2" = 1'-0"



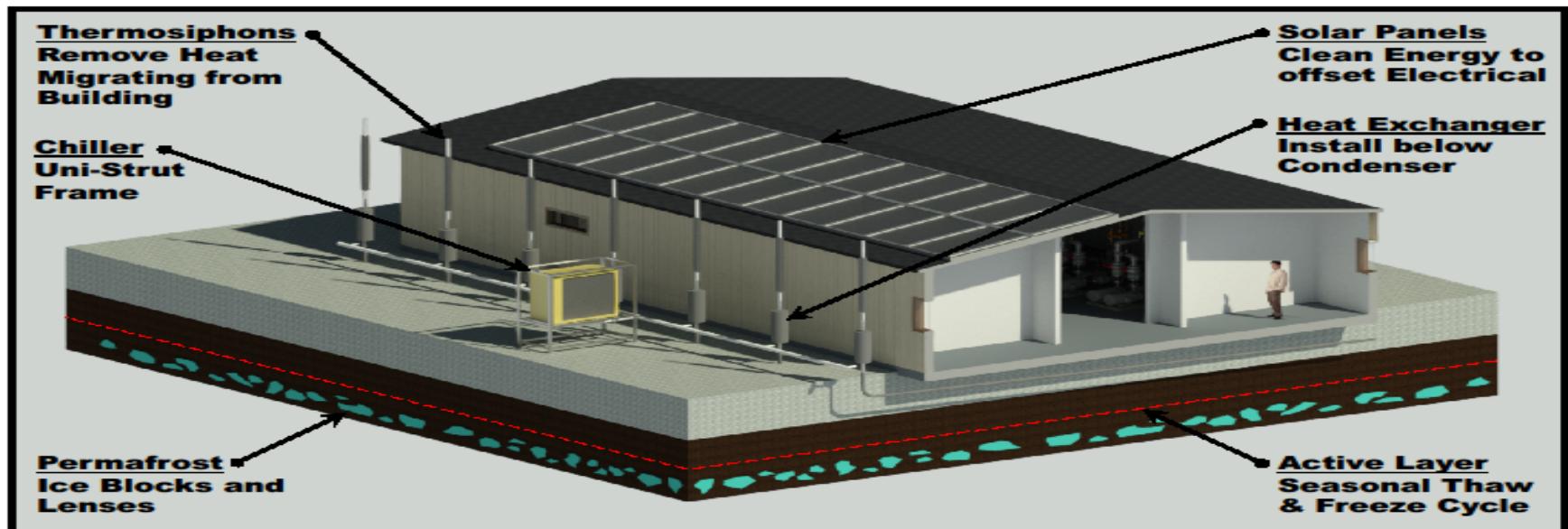
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Arctic Box Adaption pipe flex's to accommodate differential settling



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Adaptation: Using Solar Energy to Keep the Ice Rich Soil Chilled



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Adaptation: Modular Water Treatment Plant

ANTHC has implemented a new approach to water treatment by constructing water treatment plants off-site. The buildings have one or more modules that are built in Anchorage and shipped to the community. The structures can be moved to the community and with the community if threatened by eroding shorelines or flooding



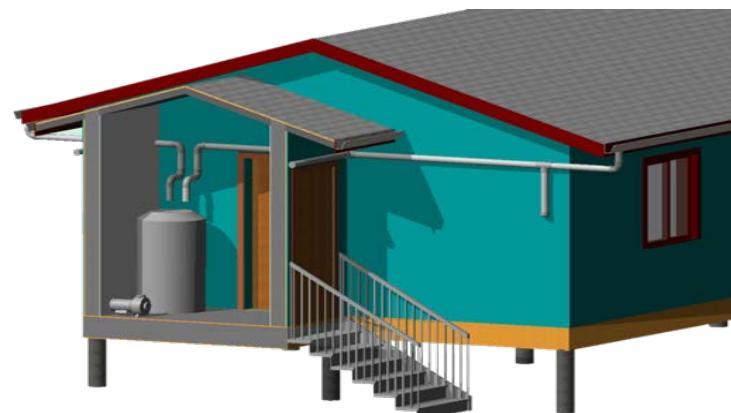
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Portable Alternative Sanitation System (PASS) in Kivalina

ANTHC has developed a small demonstration project in Kivalina that will allow the community to adapt to climate change. This system is entirely homeowner-based, designed to address the most basic sanitation needs and is portable.



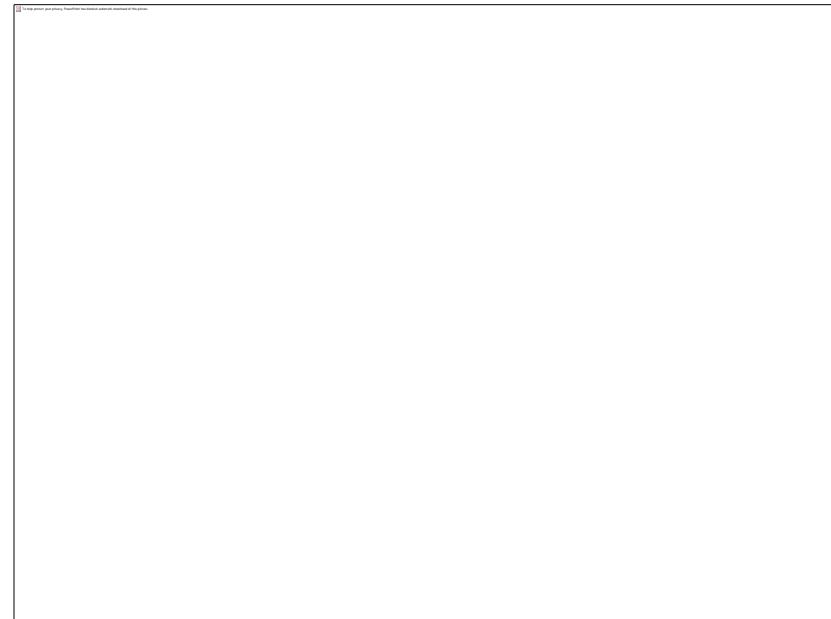
Typical system layout



Rain catchment system

Relocation Support for Environmentally Threatened Communities

- Empower and engage the Community to drive community design
- Utilize institutional knowledge to inform planning process
- Implement holistic approach to ensure synergy in infrastructure development



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