### Sustainable Northern Shelter Anaktuvuk Pass

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



CCHRC established the Sustainable Northern Communities (SNC) program in 2008 to work with willing communities to develop housing designs that are energy efficient, healthy and cost-effective to build and maintain. Community members guide the design process to ensure the design reflects the people and place, and addresses local challenges. The proto-type home in Anaktuvuk Pass was constructed during the summer of 2009 with local labor. It took approximately five weeks to build, and cost less than half (TNHA calculations, 8/10) of conventional construction costs for the area.



# Community



The community is home to approximately 300 residents, the majority of whom are Inupiat Eskimo and known as the Nunamiut.



CCHRC staff met with community members for input on a design that would provide an affordable home in this unique climate.

# **Test Module**



Researchers construct a test module made with a light steelframed floor. Testing the module will help perfect the design.



The walls and floor of the test module are covered in spray foam, chosen to reduce shipping bulk for the prototype home.



The entire module is sprayed with an coating to protect the foam insulation from moisture, sun exposure and animal infestation.



The test module in October 2008, ready for monitoring through the winter.

# Construction



In Anaktuvuk Pass, the steel floor frame was placed on a gravel surface. The cavities are filled with spray foam.



The walls of the prototype home are made of a light steel frame, making the structure substantially less expensive to ship.



The front face of the roof is built to accommodate solar panel arrays. The roof trusses are prefabricated to save on construction and shipping costs.



Students from Ilisagvik College learn about the construction trade as they build the prototype home.



The entire exterior of the home is covered in spray foam to prevent conduction of heat through framing members.



The sides of the home are bermed to further insulate the walls and reflect the traditional housing of this region.



The home is serviced by its own sewage treatment plant.

#### Facts

- Final construction cost was approximately \$250,000
- The last new home built in the community, in 1999, cost \$750,000
- Completed in four weeks
- Ilisagvik College construction students worked on the project, trained by CCHRC staff and Ilisagvik instructors
- Used 241 gallons of heating fuel in the second year
- Uses solar-and wind-generated power to provide electricity to the home
- Wall, roof, and floor insulation: R-60
- Incorporates traditional qingok stack for ventilation
- Self-contained sewage treatment plant and delivered water



The nearly completed prototype home has solar panels on the south face. In December, 2009, a family of six moved into the home.



**Anaktuvuk Pass Partners:** Tagiugmiullu Nunamiullu Housing Authority, Canada Mortgage Housing Corporation, City of Anaktuvuk Pass, U.S. Dept. of Commerce, GW Scientific, Alaska State Museum, Alaska Housing Finance Corp., Nunamiut Corp., Ilisagvik College, Denali Commission, Yukon Tiver Inter-Tribal Watershed Council, Lifewater Engineering Co., Engineering and Environmental Internet Solutions, Demilec USA.