



# CCHRC QUARTERLY REPORT

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April 2003

## CCHRC

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## CCHRC: This Quarter in Review

CCHRC welcomes two new staff members this first quarter of 2003. John Davies is our new Research Director and Don Cott is our project manager for the Cold Climate Housing and Infrastructure Research and Testing Facility (RTF). Both bring a wealth of information and experience to CCHRC and we are grateful to have them working with us. (*see pg. 3*)

We received the last installment of FannieMae's three-year commitment of financial support. Their generosity supported us through the first crucial years of development. CCHRC is now a viable research center and is capable of attracting other operational funding.

The Alaska State Home Building Association (ASHBA) now contributes \$10 to CCHRC for each ASHBA member. The local Homebuilding Associations

will receive the CCHRC Quarterly Report at their office. ASHBA members can access the reports there or from the CCHRC website. If an ASHBA member would like full CCHRC membership privileges, he or she may credit the \$10 toward another CCHRC membership level. Membership information is also available at our website.

Northern has the egress window that CCHRC helped develop ready to market. The price of the window is \$500. The window is currently available for viewing at the CCHRC office & was at the Interior Home Building Association's booth in the Fairbanks Home Show in March where it drew a lot of interest. The Interior Regional Housing Authority is about to place a first order for the window. Northern/Capital Glass can be contacted at: (907) 272-4433 or (800) 478-1820.

## Message from the President/CEO

Dear CCHRC members and supporters:

Over the last couple of months I have met with all Research Advisory Committees (RACs) throughout the state, except the Bush RAC. The top concern among the RAC members continues to be ventilation strategies.

It is common knowledge to most of you that, as we tightened building envelopes in the last two decades for improved energy efficiency, it has become important that fresh air be introduced to the living and mechanical spaces. Without that fresh air, moisture levels

were elevated, healthy indoor air quality was compromised, conditions favorable for mold growth occurred, and a variety of problems developed with appliances and heating systems. There are no simple solutions when affordability, maintenance, total energy consumption and simplicity are considered. What might appear to be a logical solution, for instance, requiring whole house ventilation with an HRV, on closer examination generates many questions. Was the initial cost of installing an HRV and related ducting

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## CCHRC RESEARCH PROJECTS (More projects & further details at [cchrc.org](http://cchrc.org))

### **Health House VOC Monitoring:**

CCHRC is examining VOCs in 3 homes of different construction in both Fairbanks and Juneau, pre- and post-occupancy. Testing is expected to be substantially completed early in 2003.

### **Combustion Air/CO Study:**

This study assesses current practices in combustion air supply for atmospherically vented heating appliances and the performance of power vented appliances, and will recommend safe building practices. Testing homes in Fairbanks began this winter and completion is expected in August 2003. An interim report was submitted to the City of Fairbanks Code Review Board on combustion air requirements for oil-fired boilers. We hope this information will be incorporated in new code requirements that will be adopted by the City in time for the upcoming construction season.

### **Infrared Thermography Study:**

Infrared thermography is being conducted in Fairbanks on housing of various construction types to create a database of temperature maps for a range of building components and assemblies in a severe cold climate. Imaging will be used to evaluate the performance of building materials. This project is just beginning & is scheduled for completion in August 2003.

### **Strawbale House Monitoring Project:**

CCHRC is conducting in-house monitoring of 3 strawbale houses in Fairbanks. Temperature and moisture gradients are being measured throughout the strawbale insulation of exterior walls. Weather conditions that could affect results are being measured on site. Monitoring will continue for one year. We also have contracted for a literature search/best practice report.

### **REMOTE (formerly PERSIST) Study:**

This CCHRC study will determine the efficacy of a REMOTE (Residential Exterior Membrane Outside-insulation TEchnique) building envelope for Alaska. The PERSIST type design is an attempt to eliminate moisture intrusion or condensation from degrading the structural components of a building. Bob Maxwell is making a power point presentation on REMOTE at the Affordable Comfort Conference in Kansas City this month. Several REMOTE homes in Fairbanks, Anchorage and Juneau are scheduled for this building season.

### **Rain Catchment Systems in Alaska:**

The Institute of Northern Engineering at UAF completed research on rain catchment systems in Alaska and a brochure and materials list is available on the CCHRC website.

### **Housing Authority Consultation**

AHFC has provided funding for CCHRC to work on ventilation and viable foundation designs with the Regional Housing Authorities. CCHRC has met with representatives of Interior Regional Housing Authority (IRHA) to determine needs and to formulate a study. CCHRC will help design and monitor a new prototype house that will incorporate alternative heating and ventilation strategies. We have provided a modified Build America floor plan to the Ninilchik Housing Authority and may do some consulting with the Native Village of Tanacross on mold problems. Under a separate contract with HUD (through Magna Systems) we have completed a rapid survey of mold problems in Alaska Native Housing. We made phone contact with 73 of 88 Alaska Native Housing Authorities and identified over 1,700 apartments or houses that have some form of mold problems. This survey in the form of an Excel Spreadsheet is available upon request. Contact: [john@cchrc](mailto:john@cchrc).

### **Building America in Alaska:**

A Mobile Test Lab was constructed in North Pole and was delivered to the University of Alaska Southeast (UAS). Students of Construction Technology at the UAS will construct and test various wall systems in the test module. After a year or two in Juneau, the lab can be moved to other locations in SE Alaska to address other building performance and durability concerns. This project will also monitor Building America in Alaska (BAA) homes constructed in Alaska, conduct a cost analysis of BAA techniques, and work to promote the BAA technologies. BAA homes are being built in Fairbanks, Wasilla, Kenai, and Juneau.

### **Healthy Homes in Alaska**

HUD and AHFC have sponsored this project to address children's health concerns related to housing. Indoor air quality will be assessed before and after remediation in participant housing to determine if any corresponding health changes in children with respiratory ailments can be identified. Currently study participants are being identified in Fairbanks and Hooper Bay.

*Above projects received funding through AHFC*

## John Davies and Don Cott bring valuable experience to CCHRC

John Davies received a Ph.D. in geophysics from the University of Alaska Fairbanks in 1975. He served as the State Seismologist for the Alaska Division of Geological and Geophysical Surveys from and for the Geophysical Institute at the University of Alaska, Fairbanks from 1981-1992 where he was a principal in creating the Alaska Earthquake Information Center and the Alaska Volcano Observatory.

John was an elected Representative to the State Legislature from 1992-2002 where he served on the Resources, Legislative Budget and Audit, and Finance Committees. Along the way, John designed, built, and resided in two energy efficient homes.

John is responsible for overseeing current projects and developing and implementing a long-term strategy for projects taken on by CCHRC, including financial management and grant development.

Don's education includes a B.S. and M.S. in Mechanical Engineering, and a Ph.D. in Aerospace Engineering. His background includes design, construction, operation, and maintenance of aerospace, power, and defense facilities. These range from supersonic and hypersonic propulsion test facilities, through magnetohydrodynamic test facilities and associated power plants, to the new Clear Air Force Station Solid State Phased Array Radar Facility.

Don has served on the Mechanical Engineering Faculties of North Carolina State University, Clemson University, and the University of Alaska Fairbanks. He is a registered Professional Engineer (mechanical) in Alaska, and consults from his home office in Anderson.

Don manages the design, construction, and eventually the operation of the new Cold Climate Housing and Infrastructure Research and Testing Facility (*see below*).

## Design of Cold Climate Housing and Infrastructure Research and Testing Facility

The Cold Climate Housing and Infrastructure Research and Testing Facility (RTF) will help builders provide safer, more cost efficient homes for Alaska and other cold regions in the future. The facility will be shared by the Cold Climate Housing Research Center and Institute of Northern Engineering at UAF. The agreements between CCHRC and the University for this cooperative effort are being completed and reviewed. Geotechnical Analysis of the proposed building site is underway.

The preliminary design of the RTF includes a two-story office building of about 3000 sq. ft., with a long

utilidor/hallway extending away from the offices. Test Cells and Shops will be attached to this main stem as the facility grows.

A Design Charette is being planned for the end of April 2003 to assemble a group of top building specialists from across North America to review, critique and improve on the preliminary design of the RTF. Future users of the RTF, including the UAF Institute of Northern Engineering, Department of Transportation and Public Facilities (DOT/PF), UAF students, and staff and board members of CCHRC, will be represented at this meeting as well.

### Projects—Proposed or Under Consideration

#### Development of Product Testing Lab:

CCHRC is working with the University of Alaska and the Institute of Northern Engineering to develop a Product Testing Lab in conjunction with the RTF. This lab may incorporate cold chamber testing, structural loading, and seismic testing capabilities.

#### Affordable Ventilation Strategies:

CCHRC is in the design phase for studies in Anchorage, Kenai and Fairbanks that will address different aspects of the ventilation issue. In Anchorage, we will examine low cost methods to meet the BEES requirements in homes with forced-air furnaces. In Kenai, a study is planned with Steve Wisdom and Associates to document affordable strategies to remediate moisture problems in homes with a variety of HVAC systems.

In Fairbanks, we will work with William Reynolds to develop low-cost air filtration systems to clean air introduced into a house.

#### Modular Housing in Alaska:

A possible DOE project will examine modular housing for Alaska. This is planned as a cooperative study with the Idaho National Engineering & Environmental Laboratory (INEEL) and the University of Alaska. Improvements in energy efficiency, affordability and durability will be target objectives.

#### Examination of IAQ at Military Facilities in Alaska:

CCHRC has met with military personnel from Alaska and IAQ experts from the University of Alaska to develop a study for the Department of Defense. This study proposes to analyze IAQ in military housing and office buildings and develop remediation strategies to address problems.



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acceptable in the affordable housing market? Were the systems being maintained so they performed as expected? Did it make any sense in the Anchorage Bowl to put in a forced air/ducted heating system and then install a separate ducted system for fresh air distribution? Were the energy efficiency claims of the HRV units really performing as expected? Etc.

Builders want to know what works, what is affordable, and what is required by the public and lenders to meet acceptable standards. Ventilation just isn't straightforward at this point. It is CCHRC's intention to work with some of the higher volume builders in our state's most populated region (Anchorage/ MatSu) to address some of these questions and propose a best practice approach for home ventilation in that region. Obviously, this will be no small task. More than half of our state's population and new home construction activity occurs in the Anchorage Bowl and the Matanuska and Susitna Valleys. We're looking forward to putting together a study that will be responsive to the

housing needs of these Alaskans.

Have an enjoyable spring wherever in this great land you make your home.



MTL in Juneau

*The CCHRC Quarterly Report is sent to members, funding agencies and to those requesting information about CCHRC. Response to this report is welcome.*

*The RAC is appointed by the Board of Directors to advise CCHRC on research projects. Contact a committee member in your area with your input and concerns.*

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