



COLD CLIMATE HOUSING RESEARCH CENTER

CCHRC

Promoting the development and advancement of healthy, durable and economically sound shelter for Alaskans and circumpolar people.

CCHRC QUARTERLY REPORT

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CCHRC

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CCHRC: This Quarter in Review

CCHRC has been actively working on projects for almost two years now and it is rewarding and exciting to have the results of several finished projects under our belts and out to the public. The latest completed project, Evaluating Residential Heating Systems is available at our office, at local Home Builders offices and at our Web Site.

During this quarter, we received notification that our application for additional Building America funds from the Department of Energy was successful. We also received additional funding from AHFC to work with the Interior Regional Housing Authority on foundation and ventilation designs.

CCHRC staff completed a Business Plan for constructing and operating a Research Facility in cooperative agreement with the University of Alaska to

be located on the Fairbanks campus. The Plan is currently in review before being submitted to the University as the next step in establishing a state of the art Cold Climate Housing Research Facility in interior Alaska

The Annual General Membership Meeting will be held in conjunction with the Alaska State Homebuilders Convention November 2nd at 5:00 pm in the Baranof Hotel in Juneau. If your membership has expired or expires before that date, you will find a membership form enclosed. Current members will receive a Notice of Meeting with agendas and a candidate slate. Only current members are allowed to vote in the Board Elections. Our membership is important to us, so please renew and join us at the annual meeting.

Message from the President/CEO

Dear CCHRC members & supporters:

As Interior Alaska's days shorten and temperatures fall the research center is preparing for a very full agenda of projects. Please take some time to review our activities described briefly in this most current quarterly report. Further details and complete final reports can of course be accessed on the www.cchrc.org website. Of particular interest in the next few weeks will be the published final report of the "Evaluating Ventilation Systems with Regard to Indoor air Quality" that

ABSN has completed for CCHRC (AHFC financial support). Ginny Moore, the PI on this project, and her strong team have done a very professional examination of a good sample of homes (particularly in the Anchorage area) for IAQ and its relationship to ventilation systems, garages and building characteristics. It is our hope that much of the data collected in this effort will be of immediate interest to Northern builders. We anticipate that this study will be a catalyst for future work related to this most critical issue.

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CURRENT CCHRC RESEARCH PROJECTS

Health House VOC Monitoring:

CCHRC will compare VOCs in 3 homes of different construction in both Fairbanks and Juneau, pre- and post-occupancy. Dwellings tested in both communities include a Health House, a 5 Star Plus house with an HRV, and a non-mechanically ventilated house. Testing is expected to be completed early in 2003.

Combustion Air/CO Study:

The purpose of this study is to assess the sufficiency of current practices in combustion air supply for atmospherically vented heating appliances and the performance of power vented appliances. CCHRC will begin testing homes in Fairbanks this winter. Scheduled completion date is August 2003.

Infrared Thermography Study:

CCHRC will conduct infrared thermography on housing of various construction types in the Fairbanks area. The purpose of this study is 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. Project is scheduled for completion in August 2003.

Strawbale House Monitoring Project:

CCHRC is conducting in-house monitoring of a strawbale house in Fairbanks. Temperature and moisture gradients will be measured throughout the strawbale insulation of exterior walls. Weather conditions which could affect results will be measured on sight. Finished house will be monitored for one year.

Evaluating Ventilation Systems with Regard to Indoor Air Quality:

CCHRC contracted ABSN to monitor one hundred relatively new homes for relative humidity, particulates, benzene, and VOCs in Anchorage, Juneau, and Fairbanks. The goal of the study is to provide an evaluation of the extent to which various factors, including ventilation strategies, house characteristics and location, and occupant usage affect indoor air quality. A draft report of this study has been delivered and is currently under review.

Improving the AK Warm Design Heat Loss Calculation:

This project is a follow-up of the completed Evaluation of Residential Heating Systems study and will develop new computer software to calculate the design heating load of a home so that home heating systems can be sized more accurately. The software will be operated via the user's Internet web browser and will be freely accessible to all users across the Internet.

PERSIST/EIFS Study:

CCHRC is conducting a study to determine the efficacy of a modified PERSIST (Pressure equalized Rain Screen Insulation Structure Technique) building envelope. The modification relates to the roof structure. Whereas the PERSIST homes in Alberta, Canada have incorporated the roof into the same type of design as the walls, the Alaskan models will use a conventional energy truss and tie the wall membrane to the interior ceiling air/vapor barrier. The PERSIST type design is an attempt to eliminate moisture intrusion or condensation from degrading the structural components of a building. Pictures and videos are recording the construction process on three PERSIST homes. Construction is complete and an AK-Warm analysis has been run on one home. EIFS walls from previously constructed homes will also be tested as a comparison.

PERSIST house under construction in Fairbanks

Above projects received funding through Alaska Housing Finance Corporation

CURRENT CCHRC RESEARCH PROJECTS (continued)

Healthy Homes in Alaska:

AHFC is working with CCHRC on this HUD sponsored project to address children's health concerns related to their housing. Families from Fairbanks and a rural community will be selected to participate based on child health records and family income. Participant homes will be assessed and tested and appropriate remediation will be completed. Health assessments and testing will be repeated to determine if the intervention was successful in improving the child's health. Currently, village selection and medical protocols are being finalized. Assessments are scheduled to begin in November.

Building America in Alaska:

CCHRC is waiting for grant paperwork to begin this follow-up to the Building America (BA) work done last year. This project will:

1. Develop builder's education courses on BA approaches to residential construction and promote these techniques to the building industry.
2. Monitor completed Building America homes and do a cost comparison with standard construction.
3. Build a mobile testing module to test various wall panels for moisture, durability, and energy efficiency to arrive at a BA strategy for Southeast Alaska.

Other Projects—Proposed or Under Consideration

Egress Window:

The Northerm window, designed to address emergency egress problems in rural Alaska, underwent AAMA structural and NFRC thermal tests in August and passed analysis. Northerm hopes to get these windows on the market this season. Northerm will make a donation to CCHRC for each window sold.

Rain Catchment Systems in Alaska:

CCHRC submitted a proposal to AHFC to fund a study that will research rain catchment systems to be used for domestic water collection, storage, and distribution. The study was suggested by Charles Dearden, CCHRC board member from Ketchikan. Dan White at the Institute of Northern Engineering at UAF will be the principal investigator.

Design & Development of Cold Climate Housing Research and Infrastructure Facility:

CCHRC is continuing to work with the University of Alaska toward establishing this Research Facility next to the UAF campus. A business plan is being reviewed, input on building needs is being collected from interested parties, and funding is being sought for both design and construction phases.

Development of Product Testing Lab:

CCHRC is also working with the University of Alaska and the Institute of Northern Engineering on developing a Product Testing Lab in conjunction with the Research Facility. This lab may incorporate cold chamber testing, structural loading, and seismic testing capabilities

Foundation Behavior:

AHFC has provided funding for CCHRC to work on viable foundation designs with the Interior Regional Housing Authority (IRHA). CCHRC will meet with representatives of IRHA to determine needs and to formulate a study.

Affordable Ventilation Strategies:

CCHRC hopes to collaborate with AHFC, industry, and the Alaska Science and Technology Foundation (ASTF) on developing designs for more passive and lower cost ventilation systems for Alaska in both rural and urban communities.

Modular Housing in Alaska:

A Department of Energy project examining modular housing for Alaska is a possibility. This would be 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 will meet in October 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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Message from the President/CEO (cont.)

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All builders and building scientists should as well take some time to read the results of Phil Kaluza's fine work for CCHRC on the sizing of residential heating systems. As suspected, many new homes are being built with furnaces that exceed the BTU requirements for today's more energy efficient buildings, wasting money and resources. With the development of software later this winter that calculates design heat load requirements from AHFC's Akwarm program (sizes heating systems accordingly), designers, architects and builders will have a valuable new tool.

The efforts made by your Cold Climate Housing Research Center will only be worthwhile if the building industry and the people of Alaska apply what we learn to the homes we build and live in. I hope to see many of you at the CCHRC annual membership meeting and board of director elections in Juneau November 2nd. We have a lot to do to improve the quality and affordability of housing in the North. I need your help and input.

Best to all of you,

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

The Research Advisory Committee is appointed by the Board of Directors to advise CCHRC on research projects. Approaching a Committee member in your area is the best way to steer CCHRC research in the direction that would be most helpful for you and others in your field.

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