



CCHRC QUARTERLY REPORT

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CCHRC

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CCHRC: This Quarter in Review

CCHRC has missed publishing a newsletter for two quarters, which we regret. It has been a very busy time here trying to get the new Cold Climate Building and Infrastructure Research and Test Facility (RTF) off the drawing board. The complexity of development, design, permitting, contracting, preliminary construction and initiating a capital campaign for the RTF on top of our ongoing research has required everyone's full time effort.

Part of this effort has resulted in a grant from the Economic Development Administration and teaming up with the National Northern Test Center Consortium to develop a world-class cold weather research technology park adjacent to the University of Alaska, Fairbanks. Phase one of the research technology park will be CCHRC's RTF. Based upon the knowledge that healthy houses and healthy workplaces create healthier communities, the RTF will be the premier center for research and development related to cold climate construction and infrastructure.

Kimberly Williams joined the CCHRC Board of Directors last October. She currently

works at the University of Alaska Bristol Bay Campus in Dillingham to increase science education opportunities for students in the Bristol Bay region. She previously worked for the Bristol Bay Housing Authority as a Housing Manager, Deputy Director and Executive Director. She resides in rural Alaska and provides a unique perspective to the board regarding the research needs of Southwest Alaska.

The Board also named three ex-officio members: Dr. Ted DeLaca, Vice Provost for Research at the University of Alaska, Fairbanks (UAF), Mike Buller, Deputy Executive Officer of the Alaska Housing Finance Corporation (AHFC), and Dr. Theresa Weston, a building science technology leader at Dupont in Richmond, Virginia. Dr. DeLaca's presence at CCHRC Board Meetings will be very helpful as the CCHRC/UAF collaboration grows. Mr. Buller's presence will improve our great working relationship with AHFC and Dr. Weston promises insight into industry housing research.

A renewal form will be sent to you when your membership has lapsed. Membership information is also available at our website.

Message from the President/CEO

Dear homebuilders, building scientists, supporters and Alaskans;

Your Cold Climate Housing Research Center continues to have a very full and expanding plate of activities. There are a number of new studies being initiated that should have significant impact on how we build and live in these Northern latitudes. See inside for details of these new projects.

There are more ideas and potential studies than time and financial resources can sup-

port, but we are very committed to following the recommendations of our Research Advisory Committees (RACs). CCHRC staff and Board know it is essential that our research priorities reflect RAC concerns.

One of our biggest challenges is to make information gained through CCHRC research easily accessible and understandable. The DVD (with audio) on the REMOTE building envelope is one example of meeting

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What's New in Research at CCHRC?

by John Davies, Research Director

As you are likely aware, Fairbanks has recently experienced the worst smoke event since the first European settlers founded the city over a hundred years ago. The Borough's air quality data indicated particulates over 1000 ppm (an air quality alert begins at 18 ppm). We know that IAQ can be improved significantly through filtration and ventilation strategies. Not only does an anomaly like the recent fires generate components that effect IAQ but dust, ice fog and seasonal allergens create (on a much more frequent basis) stress on the respiratory systems of buildings occupants. In response to and in the midst of the heavy smoke, CCHRC in partnership with Bill Reynolds of Solutions and Cathy Cahill of the University of Alaska initiated a comprehensive study to improve indoor air quality and address filtration strategies that are simple and affordable. A number of add on systems are now being installed in Fairbanks homes and being monitored for performance. It is our expectation that a simple filtration module will be available soon to adapt to forced air or whole house ventilation systems that will dramatically improve occupant air quality.

Frost protected shallow foundations (FPSF) have generated a great deal of interest in the last decade for application in Alaska. The NAHBRC and the International Residential Code include FPSFs in their recommended practices. However, current research has not been done in Alaska on how well FPSFs have performed. Paul Perrault, a longtime carpenter, PE and now doctoral candidate in engineering at UAF, with CCHRC support, is working to develop a best practice manual for FPSFs in Alaska. The study will thoroughly examine the behavior of these foundations in the variable soil types of Interior Alaska. Thermistor strings placed in the ground at specific points in and around components of the foundation system will measure temperature and behavior. The results of Paul's efforts over the next two years will satisfy his doctorate requirements and measurably benefit builders who can then feel confident in using this cost saving foundation technique in their home construction.

CCHRC, AHFC and the Association of Alaska Housing Authorities are working together to update the 1991 Housing Needs Assessment Study. This study will be conducted in two phases. In Phase I, the 2000 Census Data and other data sources will be assembled. In Phase II, any needed surveys will be conducted, collected data sets will be analyzed, and a report assessing the status of housing in the State of Alaska will be written. CCHRC received a separate grant from AAHA in the amount of \$25,000.00 to be used for the state-wide Housing Needs Assessment. John and Rose attended a meeting with the Housing Infrastructure Committee in Anchorage where John presented the Scope of Work for the study. A project team was formed to develop protocols to allow all agencies to access the data collected.

Marquam George, at the University of Alaska Southeast, recently submitted his draft final report for the Building America in Alaska project. The report summarizes the results

from comparing the REMOTE wall to common wall systems in use in SE Alaska and reports on the experiences of the Tlingit-Haida Regional Housing Authority (THRHA) in using the REMOTE wall in one of their houses in Juneau. Both the test results from the mobile test lab and the experience in the first application in Juneau have lead THRHA to plan to build four, four-plex apartment houses this fall using the REMOTE wall system. We are hoping to monitor the moisture and energy performance of these houses to get some more data from real houses using this promising technique.

We have also received the draft final report from Bob Maxwell of Alaska Energy Associates on the Health House VOC study. In this study we wanted to compare the indoor air quality in new Health Houses, which utilize low-VOC materials, paints and caulks to that in some standard high quality homes. While the sample is small, an early conclusion is that materials brought into the homes by occupants are as important, if not more important, than the choice of building materials used in a well-ventilated house. We still recommend the use of low-VOC materials, but find that it is important to educate homeowners on the appropriate use and storage of certain materials within the home, including the garage.

CCHRC should have project results in a published report format on our web page and available through the local Housing Associations offices soon. We will also be at the Alaska State Home Builders annual meeting in October and present an update on our research at that time.

Current Project List

Building America II
Healthy House Initiative
Regional Housing Authority Consultation
REMOTE Study
Combustion Air/CO Study
Infrared Thermography Study
Strawbale House Monitoring Project
Housing Authority Consultation
Health House VOC Monitoring
Kenai Indoor Air Quality Study
South Central Ventilation Study
Frost Protected Shallow Foundation Study
Smoke Study

Proposed or Under Consideration

Housing Needs Survey
Development of Product Testing Lab
Modular Housing in Alaska
IAQ at Military Facilities in Alaska

Information on all projects available at: www.cchrc.org



RTF Renderings

Research & Test Facility

As the RTF project moves from the design phase to the construction phase, Mike Musick has assumed the role as RTF Project Director and Don Cott will continue part time with CCHRC as Staff Mechanical Engineer/Project Director.

Locating \$3.5 million in construction funding is probably our biggest challenge yet, and we are approaching it from all possible directions. Bill Allen, head of Rural Development Alaska for the U.S. Department of Agriculture, is leading the effort to secure these funds from both private foundations and public agencies. Our national legislative representatives are also being updated on our progress.

Current developments in the RTF construction follow:

A recent round-table discussion with geotechnical engineer Ed Clark of Soils Alaska, John Zarlino, PE, and CCHRC staff resulted in a recommendation to pre-consolidate the thawed silt soils beneath the proposed facility by stockpiling material equal to 1.5 times the weight of the RTF building. This amounts to around 10 million pounds of material piled over 15 feet high over the footprint of the structure and left in place until the spring of '05. This material will be used next spring to raise the site and landscape. CCHRC has concluded that the RTF can cost effectively obtain a Gold level on the current Leadership in Energy and Environmental Design (LEED) 2.1 green rating system. The first LEED prerequisite is to create a storm water plan. Rockwell Engineering helped us file a Notice of Intent to comply with the US Environmental Protection Agency Clean Water Act and to develop a Storm Water Pollution Prevention Plan. The RTF building project is now registered with the US Green Building Council LEED program and both Mike Musick and Don Cott are now LEED Accredited Professionals.

A pioneer access road leading to the RTF is complete and a Requests for Quotes (RFQ's) for finishing the road and for

constructing a pre-consolidation stockpile over the building footprint is out. The plan is to excavate a storm water retention pond on the east side of the property to provide material for the stockpile. We have also issued an RFQ to survey the property corners, the building corners, and the new road centerline.

Structural engineering for the RTF is about 75% complete. The foundation is being re-designed to reflect new geotechnical engineering recommendations regarding the bearing capacity of the soil on the building site. Some questions remain regarding the roof trusses and floor trusses. How much does a roof garden weigh?

We have submitted a proposal to AHFC to monitor deep soil temperatures and water levels this fall. We will also measure settlement under the stockpile. Weather data is being monitored by an onsite met station which provides hourly reports of temperature, relative humidity, wind speed and direction on the Mesonet Network web site: URL: <http://www.tanana-watershed.org/mesonet/stations/cchrc/cchrc.shtml>

The EPA Storm Water Pollution Prevention Plan and the Corps of Engineer Wetlands Permit are being updated as the site plan evolves. The storm water retention pond has migrated to the east. The new south property line is due east-west parallel to the berm created when the field was cleared about 50 years ago. The Golden Valley Electric easement remains the north property line. These changes will allow CCHRC to use 100% of the 2.5 acres leased from the University. We anticipate recreating some wetlands that were affected by the original clearing for the UA Experimental Farm.

CCHRC continues to refine the design and construction schedule. With funding in place, construction of the RTF will begin next spring.



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this challenge. Actual construction and research in the past three years has proved that the REMOTE system can be affordable and superior to other wall building techniques, yet, few Alaskan builders have requested the DVD. Recently I gave a presentation to builders and architects from the Rocky Mountains where a great deal of interest in the REMOTE envelope was expressed and over thirty DVDs were purchased. We all get used to building in the manner to which we are accustomed, but I know that Alaskans are innovative and given the time to investigate new techniques are not timid about trying them. It is my hope that CCHRC, ABSN and others will help get the results of our grassroots research out to the industry. The internet and easy access to our website (www.cchrc.org) is an immediate way to catch up on our activities.

I would not be honest if I didn't express my disappointment in the delay in securing necessary funding for the Cold Climate Housing and Infrastructure Research and Test Facility (RTF). It is important to current and potential funders that all capital needed for the RTF be committed before breaking ground, so construction has been delayed until spring 2005. However, all involved in this process are our friends and supporters and they are unwavering in sharing our vision for CCHRC. Public projects involve many players, regulations and procedures - a very different atmosphere from the housing industry most of us are accustomed to. This delay does allow us time to design, schedule and re-examine the project to insure the result is the best facility for the money.

It has been a beautiful summer in our great state. Global warming or just an anomaly I hope you have enjoyed the sunshine and pleasant days.

The very best to all of you,

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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Regional Chairs

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