



CCHRC REPORT

Volume 7 Issue 1

A publication of the Cold Climate Housing Research Center

April 2007

CCHRC

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Cold Weather Concrete Demonstration Project



Finishing work on cold weather concrete poured at the west end of the CCHRC Research & Testing Facility.

Photo provided from SpringBoard
www.springboard.org

GeoWatersheds Scientific installed sensors at different locations both in and under the concrete to monitor the temperatures before, during and after the pour. Temperature profiles are available at: <http://www.cchrc.org/new.html>.

Photo provided by Mike Musick



On March 28, 2007 CCHRC hosted a new cold-weather concrete mixture demonstration. Researchers working at the Army Cold Regions Research and Engineering Laboratory (CRREL) developed a technique for combining commercially available admixtures to concrete batches so that pours can be made at or below freezing temperatures. SpringBoard, a program of the Juneau Economic Development Council, teamed with CRREL to help transfer knowledge of this process via a demonstration concrete pour at the CCHRC Research and Testing Facility.

Concrete can be poured anytime, but because concrete loses strength if it freezes during the curing process, contractors are forced to tent and heat the pour area. It is estimated that \$800 million is spent in America each year to protect concrete sites from the cold. This new process, created by Charles Korhonen, uses a layer of gravel to insulate against the frozen ground and allows a four-inch slab of cold-weather concrete to be poured at temperatures

down to 20° F below zero without tenting and heating the area and without losing strength.

University Ready Mix and Yukon Equipment provided additional support. CCHRC prepared the test pads and GW Scientific installed monitoring equipment at different levels and different locations at the sites.

A 10" thick, 14 foot by 20 foot test slab with 2" of underlying insulation on the west side of the RTF will be foundation to a small addition to house a bio-mass fueled combined heat and power (CHP) co-generator.

A smaller 5-6" patio slab with no underlying insulation on the south side of the building will serve as walkway and handicapped entrance.

A web cam provided a view of the pours live on the CCHRC website and results of the monitoring were available by the next day. See [Cold-Pour Concrete Monitoring](#) under "Whats New" at www.cchrc.org.

Research Update

John Davies

BEES Revision

The AHFC Board of Directors adopted changes proposed by CCHRC to the Alaska Building Energy Efficiency Standard (BEES) last November. Meeting the BEES standard allows a residential building to qualify for a low-interest loan from AHFC and so is of great interest to the housing industry. The adopted changes to BEES are available on our web site in two documents: (1) *AHFC BEES Regulations* and (2) *Alaska Amendments to IECC 2006 and ASHRAE 62.2-2004*. CCHRC made presentations around the state to builders and other interested parties and continues to collect comments on the new standards for possible amendment. Based on these comments, CCHRC has recommended 3 changes to the Alaska Amendments section for the AHFC board to consider. The old BEES standards were in place for over a decade, so it is to be expected that several groups are taking a detailed

look at the changes. CCHRC continues to solicit and listen to all comments and will recommend additional changes to the AHFC board as the need arises throughout the next several months.

Research Snapshots

CCHRC has recently begun putting out short, easily accessible publications with information we want to get out to the public quickly. These 'Snapshots' cover our Research Projects or other information we think may be of interest and are available on our website under Research Reports at: <http://www.cchrc.org/reports.html>. The hope is that they will give readers a quick review of the research, which may be all that is needed. If their interest is piqued, then they can usually take the next step to a full Research Report.

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

Message from the President/CEO

Jack Hébert

CCHRC Members and Supporters: I hope by now many of you have been able to visit the new facility (RTF) and understand the contribution it is making to the organization. This building is a world class structure in the demonstration of current building technologies for cold climates. We look forward to introducing the RTF and ourselves at the *Forum on Sustainable Northern Shelter in a World of Diminishing Resources* next fall (see details at <http://www.cchrc.org/forum.html>). Remarkably, over six hundred data points are recording building and ground behavior from frozen subsoils through roof assembly. Some of this data can be viewed live on our website with more to come in the future. Current and archived data will be available to scientists for a

number of purposes including building modeling, material behavior and climate change analysis. As importantly, industry partners will be able to go online and see in real time how their products are performing. The RTF may be the most extensively instrumented structure on Earth. The majority of the monitoring system and its design is the work of Michael Lilly of GW Scientific. He has donated countless hours to the project and deserves CCHRC's thanks. I personally owe many of you a sincere thank you for the part you have played in CCHRC's success. Make a habit of looking at the CCHRC website. It's a great way to keep up on your Cold Climate Housing Research Center.

CCHRC President/CEO Testifies at Senate Committee

Jack Hébert testified before the United States Senate Committee on Energy and Natural Resources Subcommittee on Energy: Energy Efficiency Programs in February. Senator Murkowski invited him to speak before the committee to make recommendations on policies and programs to improve the energy efficiency of buildings and on expanding the role of electric and gas utilities in energy efficiency programs.

Jack's report to the committee is titled "Research, Product Testing and Development, and Incentives to Reduce Energy Use in Residential Buildings and Community Infrastructure." It is available, along with the papers of the other five presenters, under 'What's New' on the CCHRC website:

<http://www.cchrc.org/new.html>.

The Conclusion from Jack's report is included below:

Conclusion

A directed national effort must be initiated immediately to address the global issue of unsustainable energy consumption and its many effects. Buildings, land development and

related infrastructure, including electrical generation, transportation, water and wastewater systems are major factors to consider. Applied research and demonstration projects are very necessary components for identifying and developing technologies and strategies that will move toward effective solutions. The direction the nation takes is dependent on the quality and application of that research. Through a collaborative approach involving industry and the marketplace, financial incentives, federal and state regulatory agencies, and most importantly each individual's commitment, we can make a positive change. The United States must lead this effort by example to the rest of the world. This is an opportunity for the nation to come together. For the first time there is general agreement about the impacts of unrestrained energy use and a real concern for the future. This issue can galvanize us as a nation around a common goal for the common good. CCHRC and the building and research communities of Alaska are prepared to embrace that movement. It is our hope that we can be a valuable part of that solution.

CCHRC Update

Gail Koepf

The Research and Testing Facility (RTF) is beginning to realize its potential. The Institute of Northern Engineering at UAF has moved into the South Lab. Too many tours, workshops and meetings held here to list, but it seems the Facility is becoming a focal point for energy and building interest locally and across the state. CCHRC has recently hired two new staff to help with the growing work load.

Dave Misiuk has been hired with funding received from the Fairbanks North Star Borough to work in researching, developing and testing a variety of wood-burning technologies and products. Dave is a registered professional engineer who has worked in the construction industry here in Fairbanks for over ten years during which time he developed an interest in wood burning technology.

Judy Dellinger is filling a much needed position for our research team in writing grant proposals. Judy was previously Executive Director of the local Habitat for Humanity. One application she has completed is for funding for the **CCHRC Library** to make our collection and research publications more visible to the public. We hope to catalog our collection of books, journals and research documents and become networked to the UAF Rasmussen Library and to the Online Computer Library Center and the InterLibrary Loan systems. To help get the library organized this summer, CCHRC is hiring a student intern starting in May.

Mara Bacsujlaky joined the Cooperative Extension Service office in the RTF as the Sustainable Communities Agent on April 2. Her first project will be a small-scale agriculture project conducting trials on cold-hardy crops in six Interior Alaska villages. She is also developing a sustainable commu-

Upcoming Classes:

Installing Solar Hot Water Systems

May 4-6 at the RTF

The Cooperative Extension Service, Office of Energy and Housing is working with Golden Valley Electric and CCHRC to bring this contractor-focused class to Fairbanks. In addition to instruction on issues and mechanics involved with installing roof-based solar thermal systems, participants will get hands-on instruction while installing four different types of thermal systems on the RTF. A half-day class on solar thermal theory will also be offered May 4 for homeowners. Cost is \$50 for half day, \$400 three days, or \$350 for IABA members. Contact Garrison at 474-2402 or GS.collette@uaf.edu for more info.

Log Building Workshop

May 19-20 at the RTF

This 2-day course will provide contractors 16 hours of Continuing Education Units. Contact Mike Musick at 388-2000 for more information.

nities program that will form collaborations with various organizations, agencies and departments within the University system. She will be working closely with CCHRC to bring its innovative building and energy technologies to rural Alaska communities.

W. Cecil Steward, FAIA, head of the North/North Network, gave a presentation at the RTF to the Alaska Chapter of the US Green Building Council on March 22nd. His presentation on *The Five Domains of Sustainability: Tools for Building Design, Urban Design, Urban Development, Regional Planning and Urban Administration* is available on the CCHRC website.

Membership: New levels, new rights, and new members:

Go to the membership levels page on the CCHRC web site to see the changes.

Circumpolar Housing Conference—October 28-30, 2007

Jennifer Jolis

The agenda for the Forum on Sustainable Northern Shelter in a World of Diminishing Resources is taking shape. Opening Key Note speakers are Swedish eco-municipal planner **Torbjörn Lahti** and **Sarah James**, community planner from Boston. **Torbjörn** has been working professionally with sustainable development for the last 20 years. Believing that sustainable municipal development concerns everything and everybody, projects work simultaneously with many target groups to start and maintain a democratic, participatory processes that lead to local ideas, local development and sustainability. **Sarah** has worked with municipalities for over twenty years in the areas of urban and town planning, growth management, and community development. She specializes in participatory approaches to city and town planning, and integration of sustainability principles in community planning.

Closing Key Note speaker is familiar to many in the building community. **Oliver Drerup** is the head of the Canadian Mortgage and Housing Corporation's (CMHC) International Training Team. He is recognized as one of Canada's leading

authorities on house construction. A builder for twenty-seven years before joining CMHC, he continues to apply his combination of hands-on experience and expertise in innovative housing in his training sessions. Mr. Drerup has been involved with the Canadian R2000 Project since its inception and held the position of Co-coordinator of Technology for the Canadian Homebuilders Association from 1987-1990. He played a pivotal role in establishing the Energy and Environmental Building Association and the Alaska Craftsman Home Program and consults with a variety of national and international clients as a curriculum designer and trainer. He has also served on the CCHRC Board of Directors since 2000.

This two and a half day event is filled with great speakers, panelists and moderators from around the circumpolar north, and the free flow of ideas and vision. Registration will be limited to 150. To stay up-to-date, check CCHRC's web site or email Jennifer Jolis at: jennifer@cchrc.org to be put on the list serve and receive email updates.



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Research Advisory Committee Meetings

The Research Advisory Committee (RAC) consists of the four volunteer Chairs (listed to the right) of regional subcommittees. The regional subcommittees are building industry representatives in the area who have volunteered their time to insure CCHRC is addressing issues important to their region. The RAC meets at the CCHRC Annual General Membership meeting held each year in conjunction with the Alaska State Home Building Association convention.

This committee will be of growing importance to CCHRC as we grow and adjust our goals to include the possibilities the Research and Testing Facility provides the Alaskan building industry.

The **Southeast RAC sub-committee** met with Jack Hébert in February and listed the following prioritized concerns for CCHRC to address:

1. How effective /important is attic ventilation in a cold marine climate?
2. Wind-driven rain against windows.
3. The effect of pressure washers on siding.
4. Re-examine AKWarm

The **Interior RAC sub-committee** met here at the CCHRC RTF in March and their prioritized list of concerns are:

1. Best Practices on Retrofits; cost effectiveness
2. Solar thermal, Photovoltaic and Combined Heat & Power
3. Addressing ventilation concerns around the garage/house interface
4. Cement Alternatives

It is obvious why we need regional committees!

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.

Research Advisory Committee **Regional Chairs**

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