VOLUME 56, NUMBER 5 **JANUARY 2015** EDITOR: EUGENE MITCHELL

Denver Meeting Information

DATE: Wednesday, January 7th, 2015
TIME: 5:30 PM – 8:00 PM

LOCATION: Jackson's Sports Rock
2nd Floor Private Room
1520 20th Street
Denver, CO 80524

RSVP: **www.RockyMTNASHRAE.COM**

COST: $25 Rocky Mtn Chapter Members
*Reservation made by 5:00 PM on Monday
$35 Non-members and late reservations
$20 Students

Ft. Collins Lunch Meeting

DATE: Wednesday, January 7th, 2015
TIME: 5:30 PM – 8:00 PM

LOCATION: First Bank Old Town
1000 South College Ave.
Fort Collins, CO. 80524

Table of Contents

"ASHRAE Building Energy Quotient Rating System Updates"

The ASHRAE Building Energy Quotient rating system comprises a pair of building energy ratings – the As Designed rating applies to new building design and the In Operation rating applies to existing buildings. Like ASHRAE Standard 189.1 and LEED, the As Designed rating system allows building owners, designers, and occupants to evaluate and compare expected building performance and assess the impact of building design variables on energy performance. Like ASHRAE Standard 100 and EPA ENERGY STAR, the In Operation rating allows building owners and occupants to benchmark their building against similar existing buildings. Unlike others, the ASHRAE Building Energy Quotient rating system also provides a consistent system for comparing both design expectations and operating performance. This presentation will give an overview of building energy rating systems, describe the As Designed and In Operation rating systems, highlight their technical foundations and their submission requirements, and identify resources to support the submission process.

Michael J. Brandemuehl is Professor of Civil, Environmental, and Architectural Engineering at the University of Colorado Boulder. He performs teaching and research related to the design, operation, and analysis of building energy systems, with emphasis on the modeling and simulation of HVAC&R systems and their controls, smart building systems, and application of renewable energy technologies. He is a licensed Professional Engineer and a Fellow of ASHRAE. He has served on the ASHRAE Board of Directors and is currently the vice-chair of the ASHRAE Building Energy Quotient Committee.

Upcoming Events:

- January 24th-28th – Ashrae Winter Conference, Palmer House Hilton, Chicago IL.
- January 26th-28th – AHR Expo, McCormick Place, Chicago IL.
- February 27th – DU Hockey Night
- April 24th – Annual TECH Conference
- June 15th – Annual Golf Tournament

PRESIDENT'S MESSAGE

Rocky Mountain ASHRAE Patrons,

Rocky Mountain ASHRAE Patrons,

Welcome back for another exciting month of ASHRAE in the Rocky Mountains! I'd like to extend a thank you to Sean Beilman for a great presentation on ASHRAE Standard 90.1 and the changes to the Standard. Thank you to everyone who was able to attend the President's Luncheon! It was great to see so many people and to have so many President's in attendance.

The January 7 presentation will be both a lunch and dinner presentation. The lunch meeting will be held in Fort Collins at the First Bank Old Town. The dinner meeting will be held in Denver at Jackson's Bar and Grille in LoDo. Michael Brandemuehl will be presenting on the ASHRAE Building Energy Quotient (BEQ) rating system for both presentations. This presentation will give an overview of building energy rating systems, describe the As Designed and In Operation rating systems, highlight their technical foundations and their submission requirements, and identify resources to support the submission process. Our Director and Regional Chair (DRC) Blake Ellis will be visiting the chapter during this meeting, so we are honored to have him in attendance and hope you can make it out to say hello! You can register to attend the presentation on the www.rockymtnashrae.com website.

Our YEA committee is going to be putting together a PE study group for the spring exam, so let them know if you are interested in attending the sessions or if you are interested in instructing one of the sessions. Contact Bryce Buchanan bbuchanan@mkkeng.com or Rachel Romero Rachel.romero@nrel.gov for more information and to RSVP.

In addition to our monthly meetings this year, we are hosting quite a few social events that you won't want to miss. The DU Hockey Game is coming up on February 27 against the University of Miami (OH) , so make sure to reserve a spot today (contact Mike Day at mike.day@me-engineers.com)! Space is limited and the event will fill up fast.

Our annual Technical Conference is going to be here before you know it. Our Tech Conference Committee has been hard at work for the past few months putting the seminars together, so make sure you put April 24 on your calendar. As in past years, there will be five educational tracks, a vendor tradeshow, and open bar at the end of the day. You won't want to miss it!

If you have any recommendations, comments, and/or suggestions, please don't hesitate to let me know your thoughts on how to improve our chapter. We are always looking for enthusiastic volunteers to add diversity to our Board of Governors, so if you are interested in working on a committee be sure to let me know.

Thank you and look forward to seeing you all on January 7th!

Jessie Jones Fleming

ASHRAE Rocky Mountain Chapter

Rocky Mountain ASHRAE

@ASHRAERkyMtn

ROCKY MOUNTAIN BOARD OF GOVERNORS ROSTER

Rocky Mountain Chapter 2014 - 2015

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YEA Chairs	Bryce Buchanan Rachel Romero	YEA@RockyMtnASHRAE.com	719-330-7971 303-886-8254

Don't Wait, Please Donate for the 2014 -2015 ASHRAE Year

Mail Check To:
ASHRAE RESEARCH
c/o Mike Harrington, Beabout Brock Easley
621 Southpark Drive, Suite 300
Littleton, CO 80120

Your contribution puts us closer to achieving our goal. Please send what you can today!

* Individual contributions of $100 or more and Corporate contributions of $150 or more receive this year's Commemorative Coin And Honor Roll Contribution status.

Name: _____

Company: _____

Address: _____

Telephone: _____

INDIVIDUAL	$25.00	$50.00	$75.00	$100.00	Other: _____
CORPORATE	$75.00	$100.00	$175.00	$250.00	Other: _____

Or Contact Mike Harrington at: 303-795-1000

THANK YOU Recent 2014-2015 Donors!

- Brent Cunningham
- Gershon Gendler
- Long Building Technologies
- Kyle Manske
- Dave Olson
- Victaulic
- McNevin Company
- Air Purification Company
- Adam Bishop
- Scott Lohr
- Jock Griffith

Our goal for this year is to raise over $90,000

ASHRAE RESEARCH DONOR LEVELS AND RECOGNITION

	Honor Roll Donor** *$150-$249*	Major Donor – Antique *$250-$499*	Major Donor – Bronze *$500-$999*	Major Donor – Silver *$1000-$2499*	ASHRAE Associate *$2500-$4999*	ASHRAE Partner *$5000-$9999*	Golden Circle Donor *$10,000 - $19,999*	Platinum Circle Donor $20,000+
Receives 1 day Meeting Registration*							-------	ASHRAE
Receives 2 tickets to *Members Night Out* and *Welcome Party**							ASHRAE	ASHRAE
Presented Commemorative Sculpture							ASHRAE	ASHRAE
Individually recognized at President's Luncheon*							ASHRAE	ASHRAE
Invited to President's Luncheon*							ASHRAE	ASHRAE
Invited to Board of Directors Luncheon*							ASHRAE	ASHRAE
Listed on special Display at President's Luncheon*							ASHRAE	ASHRAE
Group photo published in spring issue of ASHRAE Insights							ASHRAE	ASHRAE
Receives personalized shadowbox plaque						ASHRAE	-------	-------
Listed on RP Display in Registration						------	ASHRAE	ASHRAE
Receives Gold ASHRAE Commemorative Coin & Plaque					ASHRAE	-----	ASHRAE	ASHRAE
Receives Silver ASHRAE Commemorative Coin & Plaque				ASHRAE	-------	-------	-------	-------
Receives Bronze ASHRAE Commemorative Coin & Plaque			ASHRAE	-------	-------	-------	-------	-------
Receives Antique ASHRAE Commemorative Coin & Plaque		ASHRAE	-------	-------	-------	-------	-------	-------
Receives blue desktop coin holder	ASHRAE	-------	-------	-------	-------	-------	-------	-------
Listed in annual *Investor Honor Roll*	ASHRAE	ASHRAE	ASHRAE	ASHRAE	ASHRAE	ASHRAE	ASHRAE	ASHRAE

* ASHRAE Winter Meeting ** Individual Honor Roll Donor begins at $100

ARE YOU READY TO RUMBLE?

ASHRAE HOCKEY NIGHT AT DU

It's time once again for the Annual ASHRAE/DU Hockey Night. This year's event will have the Mighty DU Pioneers battling the Miami of Ohio Snapperheads on Friday February 27th, 2015 at 7:30 p.m. The game will be played at Magness Arena in the Ritchie Center at DU. Tickets are Available now for $24.00 each. As always, door prizes will be given out at the intermissions. So please come and join us for another fun filled night of DU Hockey.

Name:_____

Company:_____

Address:_____

_____

Tickets: _____ X $24 = _____

Total = _____

Preferably Pay On-line at http://www.rockymtnashrae.com
OR make checks payable to **Rocky Mountain Chapter ASHRAE** and send to:

Mike Day
C/O M-E Engineers, Inc.
10055 W. 43rd Ave
Wheat Ridge, CO 80033
Ph. 303-421-6655, Fx. 303-421-0331
mike.day@me-engineers.com

Heja Sverige!

SUSTAINABLE ENGINEERING COMMITTEE

Next Committee Meeting

DATE: Thursday, January 8th 2014

TIME: 4:30 – 5:30 pm

LOCATION: Happy Hour @ The Hornet
76 Broadway (corner of 1st & Broadway)
Denver, CO

RSVP: Sara Frame, 303-951-0650
sustainable@rockymtnashrae.com

The Sustainable Engineering Committee is committed to advocate sustainable design, construction and operation to our members, the industry and our community through advocacy group meetings and educational seminars. We strive to promote sustainable practices at all ASHRAE events and sponsored activities.

This committee meets once a month for planning and coordination. If you have questions about the committee, please contact Sara Frame at sustainable@rockymtnashrae.com.

ILLINOIS ASHRAE CHAPTER SUSTAINABILITY PROJECT AT THE 2015 ASHRAE WINTER CONFERENCE

ASHRAE's Sustainable Footprint Project was launched in 2008 by the Utah Chapter and continued by other chapters including the Rocky Mountain Chapter in 2012 with the extensive and very successful Sustainability Project at the Denver Rescue Mission.

The goals of the program are to leave a legacy representing ASHRAE's commitment to sustainability and to offset the environmental impact from holding the Annual Conference. It is now customary for the Annual Conference host city to select a project with some funding provided by ASHRAE as seed money.

2015 Winter Conference
Jan. 24-28
Palmer House Hilton
Chicago, IL

AHR Expo
Jan. 26-28
McCormick Place
Chicago, IL

The Illinois Chapter has a deep history of education and community outreach. Through the Footprint Project, the chapter plans to expand its mission to foster stronger communities through fundamental education and building a foundation for sustainable business and professional growth.

One of the biggest issues facing the industry is the lack of professionals coming into the science, technology, engineering and mathematics (STEM) fields. With a theme Sustaining Community, the project is more about creating an environment than a project.

Two local community college projects have been identified as catalyst:

- A solar domestic hot water heating retrofit at Harold Washington College;
- A new solar photovoltaic installation at Pembroke Community School in conjunction with Kankakee Community College.

Illinois Chapter volunteers will help with the design, installation and ongoing operation of the identified renewable energy projects. They will also work with the schools to establish a recurring educational series where chapter volunteers will present at a class each spring and fall on HVAC&R and renewable technology and ASHRAE's role.

http://illinoisashrae.org

GREENING OUR MEETINGS

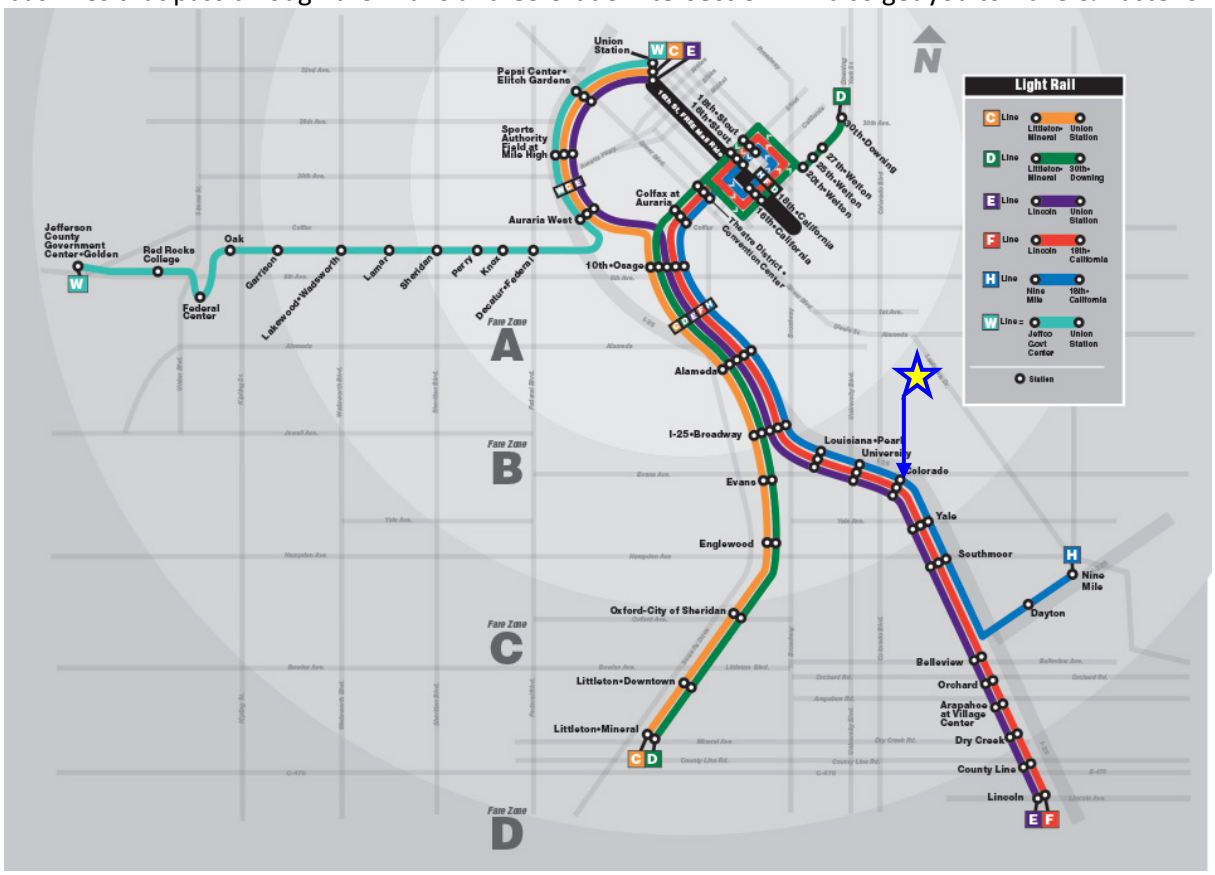
The Rocky Mountain Chapter of ASHRAE will present a free raffle ticket to anyone taking public transportation to the monthly ASHRAE meeting.

One raffle ticket will be given to each participant for each meeting. Visit www.rtd-denver.com for system maps and times or contact ridegreen@rockymtnashrae.com for further assistance.

Acceptable modes of alternative transportation:

- ✓ Walking
- ✓ Bicycling
- ✓ Bus
- ✓ Light Rail
- ✓ Alternative Fuel Vehicle
- ✓ High Efficiency Vehicle (35+ mpg)
- ✓ Carpooling (2 or more persons)

The ASHRAE meeting (Denver) at Dave & Buster's is located at the **Colorado Light Rail Station** for lines **E**, **F** and **H**. Any bus lines that pass through the **Evans and Colorado intersection** will also get you to Dave & Buster's.



YOUNG ENGINEERS IN ASHRAE (YEA) & STUDENTS

ASHRAE Winter Conference YEA Scholarship

Thank you to the applicants for this year's Winter Conference Scholarship, and congratulations to the winner, Amir Bazkiei!

YEA in 2015

The YEA committee is working on a lot of events for 2015 so keep an eye out for future events. Some upcoming events include:

- PE prep classes for the April Exam
- More awesome HVAC on Tap dinners and presentations
- Annual kickball tournament!

YEA Mailing List

Do you want to hear about YEA events directly? YEA has their own mailing list (separate from the chapter), so please email YEA@RockyMtnASHRAE.com to get added today!

ASHRAE Rocky Mountain Chapter | Rocky Mountain ASHRAE | @ASHRAERkyMtn

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ICC 700, LEED, Green Globes Referenced in House-Senate NDAA FY 2015 Agreement

The U.S. House and Senate are in the midst of agreeing to the conference report for the National Defense Authorization Act (NDAA) for Fiscal Year 2015. The NDAA paves the way for funding the United States' defense programs, including military construction. The conference report includes a reference to reference to ICC 700 National Green Building Standard, as well as LEED, and Green Globes.

ASHRAE supportive of this reference, and earlier this year agreed to jointly develop the 2015 version of ICC 700.

ASHRAE worked with several groups, including the National Association of Home Builders and U.S. Green Building Council, and all House and Senate members of the Armed Services Committees over a number a number of months to help achieve this goal. Below is the specific language included in the conference report:

"If a residential building project (including repair or remodeling project) is authorized by this Act or will be carried out using amounts appropriated pursuant to an authorization of appropriations in this Act and the project will be designed and constructed to meet an above code green building standard or rating system, the Secretary of Defense or the Secretary of the military department concerned may use the ICC 700 National Green Building Standard, the LEED Green Building Standard System, the Green Globes Green Building Certification System, or an equivalent protocol developed using a voluntary consensus standard, as defined in Office of Management and Budget Circular Number A–119."

The NDAA has been enacted into law for over 50 consecutive years, and is expected to be approved by the House and Senate, and then signed by the President sometime next week.

ASHRAE Seeks Applicants for WISE Paid Summer Internship Program in Washington, DC

Do you know a college engineering student who is interested in exploring the relationship between engineering and public policy through a paid summer internship in Washington, DC? If so, please make sure they apply to the Washington Internships for Students of Engineering (WISE) Program.

The Program runs from May 31 to August 1, 2015. **Applications are due to Mark Ames (mames@ashrae.org) by December 31, 2014.**

The application and additional information about the WISE Program are available here.

Please note that applicants must be a citizen or legal permanent resident of the United States, and a junior or senior engineering or computer science/engineering student or a recent engineering graduate beginning study in a graduate-level program.

ASHRAE Submits Comments on EPA 111(d) Rulemaking and USAID Request for Information on Climate Data, Tools, and Training for Developing Countries

The federal government has been active in issuing rulemakings and requests for information, and ASHRAE has responded, providing in-depth technical information to inform the policymaking process.

On November 24, ASHRAE submitted comments to the U.S. Environmental Protection Agency (EPA) on their proposed rulemaking for electric generating units, commonly referred to as 111(d). The Society's comments focus on energy efficiency, building energy codes, green building codes and standards, workforce training and professional certification, and building energy labeling and disclosure.

On December 4, ASHRAE submitted comments to the U.S. Agency for International Development (USAID) on their request for information seeking advice knowledge, and best practices for developing and launching a new public-private partnership focused on connecting actionable climate science, data, tools, and training to decision-makers in developing countries.

ASHRAE's comments to EPA and USAID are available here.

In 1954, ground breaking took place at Shippingport, Pennsylvania, for the first U.S. full-scale atomic electricity generating station devoted exclusively to peaceful uses. Televised from Denver, Colorado, President Eisenhower remotely signalled a radio-controlled bulldozer. On 2 Dec 1957, the reactor reached critical power. It produced its full rated net capacity of 60 megawatts about 3 weeks later on 23 Dec. This would be sufficient to supply a city of 250,000 homes. The plant consisted of a single pressurized water-type reactor which heated steam to drive an electrical turbine-generator. The plant was formally dedicated by the same president on 25 May 1958, by remote control from Washington, D.C. It operated until 1982.

MEMBERSHIP PROMOTION

Welcome to the "The Membership Promotion Page." We would like time to welcome the following new ASHRAE members for the month of December:

- Miss Judy Rigg
- Mr Samuel Heilbronner
- Mr Ted Ehrlich
- Mr Bret Roberts
- Mr Russ Chitwood

We would also like to welcome the following new student members:

- Mr Conor Doyle
- Mr Matthew Brandt
- Miss Claire Strebinger
- Mr Steven Staszak
- Mr Logan Nissenson
- Mr Masud Karim
- Mr Ali Moradi
- Mrs Kathleen Menyhart
- Mr Seth Farmer
- Mr Michael Szostak
- Mr Michael Burkhardt
- Miss Victoria Eagen
- Mr Ali Khavari
- Mr Alexander Fornoff
- Mr Jared Stewart

If you have questions or need membership assistance please send an email to membership@rockymtnashrae.com or call Laura Dyas at 720-221-1078.

Also, please look around your company and through your contacts to let people know about the benefits of joining ASHRAE. We continue to bring in new young members of the industry to keep them involved with technology and standard advancements.

 ASHRAE Rocky Mountain Chapter  Rocky Mountain ASHRAE  @ASHRAERkyMtn

In 1882, the first central electric station to supply light and power was the Edison Electric Illuminating Company at 257 Pearl Street in New York City. Thomas Edison inaugurated its operation by operating a switch in the Wall Street office of his primary financial backer. The station's "Jumbo No.1" generator was a direct-current steam-powered dynamo. The armature alone was 6 tons of its total 27 ton weight, and used air cooling. It was built at the Edison Machine Works in 1881, and had its first test on 5 Jul 1882. It could power about 700 sixteen candlepower lamps. Within 14 months, Edison's first power station served 508 subscribers and powered 12,732 bulbs.

MEMBERSHIP APPLICATION

Name: _____

New Member ☐ Renewal☐ National Member ID _____

**National membership is required to join chapter.*

Address: _____

_____

Email: _____

Name Tag: _____ ($10) Yes☐

***Name as it is to appear on the tag.*

I would like to be contacted about participating in the following events.

Mentor	Trade Show	Meeting Volunteer	Sustainability Project
Meeting Presenter	Raffle item for meeting	Committee Participation	

Please make check payable to **Rocky Mountain Chapter ASHRAE**.

Annual Membership	$50
Name Tag	$10
Total	_____

Please mail to:

Scott McQuoid

1756 Clarkson St. #316 Denver, CO 80218

membership@rockymtnashrae.com

ROCKY MOUNTAIN ASHRAE HISTORY

In January of 1978 the guest speaker was Katherine Fletcher who served on President Carter's Domestic Policy & Planning Staff. Her specialty was energy and environmental affairs. Her presentation topic was the present status of federal energy legislation. They billed it as "interesting, controversial and informative". Glad to see things haven't changed! They asked people to register early as they anticipated having roughly 400 members in attendance. Back then they held a theme for programs for the entire year and as you can guess, the theme in 1978 was energy conservation and alternative energy sources.

In the January newsletter, the February Valentine's dinner and dance was promoted. They also referred to it as "Ladies Night". There were also many pictures in the newsletter that showed some really nice plaid sport coats!

In 1881, in a Presidential Address to the British Association, at York, Sir William Thomson (Lord Kelvin) spoke On the Sources of Energy in Nature Available to Man for the Production of Mechanical Effect. He summarized the natural sources of energy as Tides, Food, Fuel, Wind, and Rain. All except the tides derive energy from the sun. "Heat radiated from the sun ... is the principal source of mechanical effect available to man." He referred to tide mills, and the possibility of storing energy in batteries between tides, but nevertheless considered the economics impractical for wide application. Windpower he considered "decadent," but acknowledged coal would become an exhausted resource, thus windmills should generate electrical power. Kelvin also outlined the economics of hydroelectricity.

In 1752, today was the last day of the Julian calendar in Great Britain, Ireland and the British colonies, including those on the East coast of America. Eleven days were skipped to adopt the Gregorian calendar, designed to realign the calendar with equinoxes. Hence the following day was 14 Sep. For more than a century and a half before, following the decree by Pope Gregory XIII, Italy, and three other Catholic countries (Spain, Portugal and Poland) used the Julian calendar for the last time on 4 Oct 1582. France followed, ending Julian calendar use on 9 Dec 1582. Russia did not change until the early 20th century: 31 Jan 1918 was the last Julian date, followed the next day by 14 Feb 1918. Parts of China changed in 1912, but the Communist revolution, 1949, established Gregorian calendar use in all China.

ASHRAE/IES Proposes Expansion of Climate Zones for Energy Standard

ATLANTA – New proposed climate data could make the ASHRAE/IES energy standard more applicable for global use.

Addendum *w* is one of 10 proposed addenda to ANSI/ASHRAE/IES Standard 90.1-2013, *Energy Standard for Buildings Except Low-Rise Residential Buildings,* open for public comment starting Dec. 5, 2014. The proposed addendum closes for review Jan. 19, 2015. To comment or learn more, visit www.ashrae.org/publicreviews.

The addendum was developed in response to an update of ASHRAE Standard 169-2013, *Climatic Data for Building Design Standards*, which now contains updated climate data and additional Climate Zone 0 with humid (0A) and dry (0B) zones. Addendum *w* adds this climate zone to 90.1, This has global implications for the standard as Climate Zone 0 does not exist in the United States and is primarily used in the equatorial regions of South America, Africa, Middle East, southern Asia and the south Pacific.

"It gives the standard more of an international view with maps and data never before available to users," Dru Crawley, chair of the Standard 169 committee, said. "Previously there was the single U.S. map. Now there are high-level (1 deg latitude/longitude) maps of the world, covering each continent and major countries."

Other addenda open for public review from Dec. 5, 2014, until Jan. 4, 2015 are:

- *v* revises fenestration orientation requirements
- *y* adds a new approach to simplified building lighting
- *z* clarifies and modifies the modeling of a baseline HVAC system with air source heat pumps and electric auxiliary heat
- *aa* clarifies an exception in a table in the design model section
- *ad* revises the preheat coil requirement for the baseline building model in Appendix G
- *ae* updates a section related to definitions used with motors
- *af* restores the specification of the rating conditioners for measuring efficiency of heat pump pool heaters
- *ag* limits mechanical cooling for vestibules
- *ah* clarifies lighting requirements

ASHRAE Drives Home Residential Guidance in 2015 Winter Conference Technical Program

ATLANTA – Guidance to help ensure that homes are energy efficient and have good indoor environmental quality will be featured in several Technical Program sessions at the 2015 ASHRAE Winter Conference, Jan. 24-28, Chicago.

"More time and energy is spent in residential environments than any other environment," Max Sherman, who chaired a Presidential Ad Hoc Committee on the Residential Construction Market that developed a report on "ASHRAE and the Residential Construction Market," said. "The ASHRAE Board of Directors recently acknowledged that by creating a Residential Committee and by making residential an initiative in the Society's newly adopted Strategic Plan. Similarly ASHRAE's mission of providing technical information cannot be achieved without consideration of residential information and guidance. Starting in Chicago, we will see an increase in the number of residential programs available for the professional. This residential guidance is not just for the consulting engineer but is intended for broader residential stakeholders as well."

Sherman noted that in the past, ASHRAE used to be heavily focused on residential. In 1895, President Edward Bates, first president of the American Society of Heating and Ventilating Engineers, an ASHRAE predecessor society, spent much of his Presidential address talking about the living conditions of the poor and the Society's duty to improve it. For the last several generations ASHRAE's emphasis has shifted more to commercial and institutional occupancies and away from where people spend most of their time.

In the last year, given the amount of energy used in residential buildings and issues related to the indoor environmental quality, ASHRAE took a look at how it can contribute most effectively to the improvement of the performance of residential buildings. The Society released a report, "ASHRAE and the Residential Construction Market," which contains a series of recommendations to the Board of Directors.

The ASHRAE 2015 Winter Conference takes place at the Palmer House Hilton, while the ASHRAE co-sponsored AHR Expo is held Jan. 26-28, McCormick Place. Complete Conference information and registration can be found at www.ashrae.org/chicago, and Expo information at www.ahrexpo.com.

The Technical Program begins Sunday, Jan. 25, and offers over 200 Professional Development Hours, as well as Continuing Education Units, which can be applied toward a Professional Engineering license. The Conference features papers and programs for eight tracks, which address trends in the industry and also are relevant to the design community in the area.

Sessions related to residential include:

- Modeling and Simulation of Occupant Behavior in Buildings, Sunday, Jan. 25
- Variable System Field Results and Why Load Based Testing Is Needed for Residential Equipment Applications, Sunday, Jan. 25
- Alternative Refrigerants for Residential Refrigerator-Freezers, Sunday, Jan. 25
- ASHRAE and the Residential Construction Market: Status and Strategic Opportunities, Monday, Jan. 26
- Analysis of Variable Capacity Heat Pumps, Ground Source Heat Pumps Hydronics and Rainwater, Gray Water and AC Condensate Collection, Monday, Jan. 26
- New 2015 Regional Standards and the Effects on Different Areas of the HVAC Industry, Monday, Jan. 27
- A Paradigm Shift for HVAC Design, Tuesday, Jan. 27
- Building Energy Prediction and Measurement: Avoiding Fantasy and Heading toward Fact, Tuesday, Jan. 27
- Using Solar to Improve Efficiency, Tuesday, Jan. 27
- Who Needs a Residential IAQ Guide?, Tuesday, Jan. 27
- International Codes and Standards Issues Impacting Use of A2L Refrigerants in Unitary Heat Pump and Air-Conditioning Equipment, Tuesday, Jan. 27
- Advances in Cooling Heat Exchangers and Refrigerants, Wednesday, Jan. 28
- Modeling Radiant Heating and Cooling Systems: Tools and Analysis , Wednesday, Jan. 28
- The Future is Now: Small, Simple, Efficient and Comfortable Residential HVAC Systems, Wednesday, Jan. 28
- Data Center Cooling for Increased Performance, Wednesday, Jan. 28
- Efficiency of Residential Domestic Water Heating, Wednesday, Jan. 28
- Lies, Damn Lies, and…EUIs?, Wednesday, Jan. 28

Recipients of Technology Awards Announced by ASHRAE

ATLANTA – Buildings designed for a range of occupant types and uses – including penguins, patients, skaters, students, government employees and water testers – are being recognized for innovative design with ASHRAE Technology Awards.

The awards recognize outstanding achievements by ASHRAE members and building owners who have successfully applied innovative building design. Their designs incorporate ASHRAE standards for effective energy management

and indoor air quality and serve to communicate innovative systems design. Winning projects are selected from entries earning regional awards.

First place awards are presented at the ASHRAE 2015 Winter Conference, Jan. 24-28, Chicago, Ill.

Following are summaries of the nine projects receiving first place.

Antarctica: Empire of the Penguin

William C. Weinaug Jr., P.E., vice president, exp U.S. Services Inc., Maitland, Fla., receives first place in the existing industry facilities or processes category for the Antarctica Empire of the Penguin animal exhibit and ride attraction, Orlando, Fla. The facility is owned by Sea World Parks and Entertainment Inc.

The building includes a 6,000 square foot immersive dark ride and penguin exhibit in a 30,000 square foot space, including spaces for bird holding, brooding and life support systems. The project included a major expansion and renovation to an existing penguin encounter, with a portion of the original space, animal pools and life support spaces reused to save costs.

When creating a 32°F space in hot and humid Orlando, the efficiency of the systems and envelope is crucial. The facility is designed to minimize energy use while providing a habitat for penguins to thrive.

Another important factor in design is indoor air quality for both penguins and guests. In regard to thermal comfort, the criteria were driven by birds' comfort instead of humans. Human comfort was measured by how well odors were controlled, particularly guest perception of the natural odor of penguin guano. Designers also had to protect the birds from mold and fungi not common to their native environment.

The facility contains many innovative systems, such as use of condenser water for heating and defrosting of iced coils. To ensure proper envelope was maintained while allowing thousands of people to flow through the building, sally ports and quick acting doors were added to keep cold in and moisture out. For the queue, ride and exhibit spaces; control and concern focused on dew point. Self-contained liquid desiccant air conditioning units were used to control the space dew point by creating cold and dry air as efficiently as possible.

Centre Civique de Dollard-des-Ormeaux

Kateri Héon, Ing., project manager; and Pietro Guerra, Ing., mechanical-electrical director; exp, Montreal, Quebec, receive first place in the existing other institutional buildings category for Centre Civique de Dollard-des-Ormeaux, Quebec. The building is owned by the Ville de Dollard-des-Ormeaux.

The 225,000 square foot building features three National Hockey League regulation-size skating rinks, swimming pools, the town's city hall and library and a cultural center.

An energy efficiency program was developed to increase the performance of the refrigeration system for the three indoor rinks and then to recover the energy rejected from the center compressors to heat the building. The design team chose a system that featured a direct carbon dioxide heating and regeneration of a dehumidifier desiccant wheel, which is the first time this system has been used in a rink in North America. The system also is the first to use carbon dioxide in a multi-rink complex and the first to use carbon dioxide to cool the brine, thereby avoiding having to re-do the slabs in the rinks.

Other efficiency measures included:

- Four-pass brine distribution reduces by more than 50 percent the brine pump power compared to the old two-pass distribution.
- Low-e ceiling above the skating rinks to limit the radiative heat exchange between the hot ice rinks ceiling and the cold ice sheets.
- Expanded water storage by the use of an existing 600-L tank to accumulate preheated domestic hot water.
- New dehumidifiers for the pool using heat pipes to preheat entering air and energy recovery system.
- Sensitive energy recuperators on the exhaust vents for the arena and pool changing rooms to preheat fresh air.

The annual electricity savings for the project totaled $247,000 or a 31 percent cost reduction from the previous baseline. Achieving a return on investment will take approximately 8.3 years. The implementation of recovery and energy saving measures decreases overall consumption by 4.7 million kWh.

Federal Center South – Building 12021

Benjamin Frank Gozart, engineer; Tom Marseille, P.E., managing director; WSP; Charles Chaloeicheep, P.E., WSP Built Ecology; Seattle, Wash.; Tom Boysen Jr., P.E., senior project manager, Sellen Construction, Seattle, Wash.; receive first place in the new commercial buildings category for Federal Center South, Building 12021, Seattle, Wash. The building is owned by the U.S. General Services Administration.

Federal Center South is a three-story, 209,000 square foot facility with the U.S. Army Corps of Engineers Seattle District as the exclusive tenant.

The project used an integrated design approach that focused on energy conservation measures vs. expensive on-site energy generation strategies. Floor depth, façade design and daylighting are optimized to reduce heating and cooling requirements and the amount of artificial lighting. Several innovative technologies are included: passive chilled sails; thermal storage using phase change material; a 100 percent outside air ventilation system with heat recovery of exhaust serving a raised floor ventilation air distribution system; and heat recovery chillers tied to a high efficiency low temperature heating/high temperature cooling hydronic system.

The project includes use of ground loop heat exchange piping in almost 50 percent of the building's grout-filled steel pipe piles that provide needed structural support for the building. These 100 tons of "energy piles" efficiently reject waste heat and extract heat from the ground. In the summer, waste heat is rejected into the ground as a priority over an evaporative fluid cooler to save both energy and water. In the winter, heat is

extracted from the ground and elevated to useful temperatures for heating the building through the use of the heat recovery chillers. The ground loop heat exchanger improves the building's energy use intensity substantially, reduces the building's carbon footprint and saves water.

The total building energy cost usage was shown to be 40.5 percent less than the ASHRAE baseline. The yearly total building energy cost was modeled at $80,740 compared to baseline of $135,791.

Janesville Ice Arena Addition and Renovation

Jason Troy LaRosh, P.E., mechanical engineer, Angus-Young Associates, Janesville, Wis., receives first place in the existing public assembly category for the Janesville Ice Arena addition and renovation. The building is owned by the City of Janesville.

The project included renovation of the existing 26,000 square foot arena with the addition of 2,000 square feet that included new locker rooms, an ice resurfacing melt pit and resurfacing equipment storage area.

The original ice refrigeration system, installed in 1964, was a direct refrigeration system that used R-22 refrigerant circulated in piping embedded in the floor. The new system incorporates a pond loop geothermal system to handle the high refrigeration needs of the arena. The system uses a city owned pond as thermal storage to pull and reject heat to the ice refrigeration system which is made up of three water source heat pumps. The use of a pond loop geothermal system as it relates to an ice sheet refrigeration system is unique as the system takes advantage of the pond's ability to maintain relatively constant temperatures.

The water source heat pumps use R-410A refrigerant, which does not contain bromine or chlorine and is considered a non-ozone depleting refrigerant. The geothermal system transfers energy to and from the pond without burning fossil fuels.

The updates to the building energy systems resulted in an annual natural gas energy savings of 33.5 percent from 2010 to 2013. The overall facility energy usage intensity was reduced by 24.1 percent: from 234.6 kbtu/square foot per year in 2010 to 178 kbtu/square foot per year in 2013.

Peace Island Medical Center

Mark Stavig, P.E., principal, CDi+Mazzetti, Lynnwood, Wash., receives first place in the new health care facilities category for Peace Island Medical Center, San Juan Island, Wash. The building is owned by PeaceHealth.

The building, a 40,000 square foot high performance, critical access hospital and clinic, contains 10 inpatient beds, emergency and imaging areas, surgery departments and an ambulatory outpatient clinic with a cancer care center.

Island resources are limited, which made sustainable choices vital and simple design necessary. The mechanical system was designed to use only electricity, the only available energy source on the island. The project employs numerous energy efficiency measures and achieves an average EUI of 87.7 kBtu/square foot per year.

Passive design strategies provide for load reductions and facilitate natural ventilation. A conscious effort was made to reduce cooling demand resulting from building envelope and plug loads. The orientation allows for controlled penetration of sun for passive solar heat in exam and waiting areas. Unwanted heat gain is minimized on the east and west exposures. Heat gain from solar is further controlled with the use of appropriate overhangs. Roofs are sloped to the south allowing for future installations of solar collectors. A major contributor to energy reduction was the use of decentralized systems sized to specific loads. This approach allows for systems to be tailored to the individual needs of each program area.

Other measures include operable windows, a ground source heat pump, a variable air volume system and heat recovery ventilators.

Tacoma Center for Urban Waters

Matthew William Longsine, P.E., associate, and Henry Di Gregorio, senior vice president, WSP, Seattle, Wash., receive first place in the new other institutional buildings category for the Tacoma Center for Urban Waters, Tacoma, Wash. The building is owned by the National Development Council, HEDC Public-Private Partnerships on behalf of the City of Tacoma.

The 51,000 square foot lab facility functions as a shared research facility for the City of Tacoma, the University of Washington and Puget Sound Partnership. It focuses on receiving and analyzing water samples from the waterways of Tacoma and surrounding areas.

Design features include heat recovery, energy efficient lighting, daylighting, natural ventilation, radiant floors, low-e glass and exterior operable shading, variable air volume low flow fume hoods, low flow plumbing fixtures, rainwater harvesting, green roof and energy efficiency HVAC&R components.

One of most innovative features is a geoexchange system. At depths below 12 feet, the earth is typically at a relatively constant temperature compared with the surrounding air (approximately 55°F in the Puget Sound Region). When feasible, this makes it an ideal medium to either reject heat from the building in the cooling cycle, or draw energy from the earth for heating the building. The geoexchange ground loop will last the life of the building without requiring replacement.

Another innovative component is rainwater harvesting. Two 36,000 gallon water storage tanks sit outside the building and collect both rainwater and rejected purified lab water which are used for toilet flushing and irrigation. Combined with low flow plumbing fixtures, this project provides a 46 percent reduction in water use.

Valley Middle School

Brian Haugk, P.E., mechanical principal, and Brian Cannon, mechanical senior associate, Hargis Engineers Inc., Seattle, Wash., receive first place in the new educational facilities category for Valley View Middle School, Snohomish, Wash. The school is owned by Snohomish School District No. 201.

The directive from the school district was to build on experience gained from two previous highly sustainable school projects and to make the building as energy efficient and maintenance-friendly as possible.

A ground source system sized for 100 percent of the central plant heating and cooling capacity was selected. A water-to-water heat pump (WWHP) allowed the design team to utilize displacement ventilation, which requires very tight discharge air temperature control to maintain occupant comfort, only achievable with a WWHP system. This project was one of the first to use this technology in the region and fully integrate the factory controls with the building energy management system (EMS).

An EMS based energy dashboard system with touch screen monitors at multiple locations allows staff and students to learn about the sustainable features of the building. To further spark the interest of the student population, the EMS metering design of the lighting, plug and HVAC systems allowed for competition zones to be created in two classroom pods. This allows students to interact with the building systems to see what kind of impact they have on the overall energy usage.

The project saw a reduction in greenhouse gas emissions of 530 metric ton carbon dioxide equivalent reduction based on northwest region utility average emissions and 1,079 metric ton carbon dioxide equivalent reduction based on national utility average emissions.

Wayne N. Aspinall Federal Building and U.S Courthouse

Roger (Jui-Chen) Chang, P.E., BEMP, principal and director of engineering and sustainability, Westlake Reed Leskosky, Washington, D.C., receives first place in the existing commercial buildings category for the Wayne N. Aspinall Federal Building and U.S. Courthouse, Grand Junction, Colo. The building is owned by the U.S. General Services Administration, Rocky Mountain Region and was completed by WRL with The Beck Group.

The project converted a 1918 landmark into one of the most energy efficient, sustainable historic buildings in the country. To meet aggressive performance goals, including energy independence and energy efficiency, design included:

- a roof canopy-mounted 123 kW photovoltaic array (generating electricity on-site to power 15 average homes)
- addition of spray foam and rigid insulation to building shell
- storm windows with solar control film to reduce demand on HVAC
- variable-refrigerant flow heating and cooling systems tied to a 32-well geoexchange loop;
- a dedicated outdoor air system with evaporative cooling and heat recover, wireless controls, and fluorescent and LED lighting upgrades

The project not only preserved a piece of cultural heritage and an anchor in the Grand Junction community, but also converted this 96-year-old property into one of the most sustainable and energy efficient buildings in the General Service Administration's portfolio, showcasing how innovative technology and building preservation work hand-in-hand to create sustainable design.

Westhills Recreation Center

Art Sutherland, president, Accent Refrigeration Systems, Victoria, British Columbia, receives first place in the new public assembly category for the Westhills Recreation Center, Langford, British Columbia. The building is owned by the City of Langford.

The 75,000 square foot recreation facility includes a National Hockey League size indoor ice rink, an outdoor ice rink, a skating trail joining the two together, a bowling alley, offices and a restaurant.

The mechanical system for the three ice surfaces are integrated into the building HVAC system to the extent that no fossil fuels are used for the facility other than in the kitchen. The outdoor rink offers an interesting energy balance opportunity in winter by providing additional rejected energy during the heating season. Even with the extensive use of energy, only 40 percent of the waste energy is required within the complex. The

remaining 60 percent is pumped 400 yards to the growing Westhills housing development as an energy source for their household heat pumps.

The project turned a typical arena sub-floor heating system into an enhanced geothermal field. It is the first in North America to use new ultra high efficient reciprocating compressors and the first total integration between an ice facility and an entire community. The center also is the first in North America to utilize ammonia heat pumps to heat a housing community and is one of only a few ammonia based air conditioning systems.

ASHRAE, founded in 1894, is a global society advancing human well-being through sustainable technology for the built environment. The Society and its more than 50,000 members worldwide focus on building systems, energy efficiency, indoor air quality, refrigeration and sustainability. Through research, standards writing, publishing, certification and continuing education, ASHRAE shapes tomorrow's built environment today. More information can be found at www.ashrae.org/news.

EMPLOYMENT OPPORTUNITIES

Position	Company	Date Posted
Junior Mechanical Engineer	**MKK**	**October 19th, 2014**

Junior Mechanical Engineer, Greenwood Village, CO.

Building Energy Modeler	**Group 14 Engineering**	**December 1st, 2014**

Group14 Engineering is an engineering consulting firm specializing in the built environment. Our services include building commissioning and energy audits, energy modeling and consulting on LEED/ sustainability. Our office culture is one that promotes great work while maintaining a work-life balance. Our LEED Platinum office is located just outside of downtown Denver in the historic Uptown neighborhood.
http://rockymtnashrae.com/classifieds.php?record_number=62

Building Official	**City & County of Denver**	**Decemb er 1st, 2014**

Engineer/Architect/Director

Go to our website to open these links: http://rockymtnashrae.com/classifieds.php

ASHRAE Jobs Website Tool:

ASHRAE has now partnered with the job board service Bird Dog to promote employment opportunities for the ASHRAE community. This effort is called ASHRAE Jobs and can be linked to from the ASHRAE home page or www.ashraejobs.com.

Would you like to show your ASHRAE Rocky Mountain Chapter pride? How about a polo with the chapter logo?

You can order polos through Michelle Swanson by emailing her at mswanson@rmhgroup.com. Polos available include a light knit weight polo in mens and womens styles for $27, you choose the color. An enduring favorite, our comfortable classic polo is anything but ordinary. With superior wrinkle and shrink resistance, a silky soft hand and an incredible range of styles, sizes and colors, it's a first-rate choice for uniforming just about any group. 5-ounce, 65/35 poly/cotton pique, Flat knit collar and cuffs, Metal buttons with dyed-to-match plastic rims, Double-needle armhole seams and hem, Side vents, Adult Sizes: XS-6XL

Banana	Bark	Black	Bright Lavender	Burgundy
Clover Green	Coffee Bean	Cool Grey	Court Green	Dark Green
Deep Berry	Eggplant	Gold	Hibiscus	Kelly Green
Light Blue	Light Pink	Light Stone	Lime	Maroon
Maui Blue	Mediterranean Blue	Mint Green	Navy	Orange
Purple	Red	Royal	Steel Grey	Stone
Strong Blue	Teal Green	Texas Orange	Tropical Pink	Ultramarine Blue
White				

Or a Nike dry fit performance polo for $57, you choose the color. Nike Golf is known for classic polos engineered to take comfort to the next level. The Dri-FIT fabric technology delivers superior moisture management, while the stitch-trimmed shoulder panels and gussets make a distinctive difference. Flat knit collar, three-button placket and open hem sleeves. Pearlized buttons are selected to complement the shirt color. The contrast Swoosh design trademark is embroidered on the left sleeve. Made of 4.7-ounce, 100% polyester Dri-FIT fabric. Adult Sizes: XS-4XL

Black	French Blue	Midnight Navy	Skyline Blue	Varsity Red
Vivid Green	White			

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