

PENNSYLVANIA HOUSING RESEARCH CENTER NEWSLETTER

FALL 2014



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Join us!

2015 PHRC HOUSING AND LAND DEVELOPMENT CONFERENCE

MARCH 4-5, 2015

Join us for our 23rd Annual PA Housing and Land Development Conference! This two-day event provides information and updates on issues of interest to the residential construction industry. The intended audience is builders, remodelers, code officials, design professionals, and home performance contractors.



Register and learn more at phrc.psu.edu under Conferences

NEW WEBSITE! PHRC.PSU.EDU

Over the past year the PHRC has been working to revise and update our website. The new and improved website provides extensive information about the PHRC organization, upcoming workshops and conferences, ongoing research projects, easier access to PHRC publications, and a user-friendly workshop calendar. Please check it out!

SIGN UP FOR OUR MAILING LIST!

Sign up for our mailing list to receive emails regarding webinars, training programs, conferences, new publications, and other announcements.



WWW.FACEBOOK.COM/PHRC.PSU



Proper versus improper way to install insulation

Throughout the history of the Pennsylvania Housing Research Center, instructors and program developers have used many creative educational techniques to make building code-related workshops more engaging.

Recently the PHRC has taken this approach one step further through the introduction of table-top scale mockups of various building assemblies. These portable building envelope mockups have allowed for direct hands-on learning for the PHRC audience and have created a more active learning experience. To date, the PHRC staff has developed three separate building envelope mockups, with another in the design phase. These mockups address the following issues:

1. **Building envelope air sealing in light-frame walls**
2. **Proper installation of fiberglass batt insulation**
3. **Proper window flashing sequence and assembly**
4. **Roof to wall intersection flashing, including kickout flashing (*in progress*)**

Each of these mockups have allowed for visual demonstration of “best practice” techniques, as well as trouble spots in the building envelope. As the residential

industry continues to approach the construction of the building envelope as a series of systems, the interaction of each of these systems or assemblies is becoming increasingly critical. This also puts an emphasis on the compatibility of products such as tapes, sealants, and films. The PHRC mockup demonstrations take into account each of these issues and includes overall code compliance, as well. The next mockup, roof to wall intersection flashing, including kickout flashing, is currently in the design phase. This model will take visual demonstration to the next level. A table-top scaled roof to wall assembly will be constructed in order to demonstrate the sequence of construction which involves roof underlayment, step flashing, shingles, and house wrap.

All of the current and future PHRC mockups are used in existing programs and are featured in various one hour workshops being offered around the state. If you are interested in scheduling a workshop that includes these visual demonstrations, contact Tracy Dorman at 814-865-2341 or by email at phrc@psu.edu.

A NEW FACE AT PHRC!



Sarah Klinetob Lowe joined the PHRC team as the Budgets and Publications Coordinator in July 2014.

Sarah received her M.S. in Architectural Engineering in 2009, has experience as an energy auditor and sustainability researcher, and participated and held leadership roles in the 2007 and 2009 Solar Decathlon competitions.

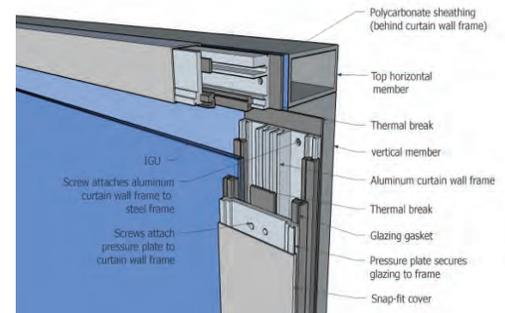
NEW APPOINTMENT!



On September 19, 2014, Dr. Katie Blansett, PE (*far right*) was installed as the Vice President of the Central Region of the Pennsylvania Society of Professional Engineers (PSPE) during the annual conference.

Dr. Blansett is also serving as chairperson of the PSPE education committee.

NEW PATENT!



Dr. Ali Memari, professor and Hankin Chair in Residential Building Construction, and his co-inventor, Joseph Standley, have been issued a patent entitled “Transparent Sustainable Wall System”. This story-high, transparent, panelized wall system features a gravity load-bearing steel tube structure and transparent polycarbonate sheathing that resists the wall shear forces. This results in reusable residential window walls systems for maximum daylighting.



Dr. Ali Memari, Hankin Chair

Last year was a successful year for PHRC in seeing good progress in various initiatives.

The most important accomplishment is the great interest we see in students toward residential construction as evident by high enrollment in courses related to residential construction and increasing participation in student competitions such as the NAHB Residential Construction Management Competition and DOE Challenge Home Student Design Competition.

These competitions have also brought about opportunities for students to benefit from the knowledge and experience of our highly qualified and dedicated advisors. Without the support of these faculty and practitioner advisors, our students would not be able to shine so successfully at these national competitions. The residential construction program at Penn State continues to attract and recruit some of the brightest graduate students who work on various research topics with applications to the engineering and technology of residential building systems. The results of the work of graduate students supervised by faculty, and in some cases supported by PHRC technical staff, are reflected in PHRC research reports, Builder Briefs, conference presentation/proceedings, and journal papers. We continue to promote and support residential building construction at the national level through various activities and programs such as:

- Organization of the Residential Building Design and Construction conference filling national need and void for such a conference. With its third conference planned for 2016, the PHRC continues to play a leading role in providing a forum for exchange of ideas on the latest research and innovations related to housing and residential construction.
- Initiation of the Special Section on Housing and Residential Building Construction as part of the ASCE Journal of Architectural Engineering, with the first issue scheduled for December 2014, creating a focal point for attracting scholarly manuscripts documenting the latest research and innovation accomplishments in the field.
- Leadership to the National Consortium of Housing Research Centers through involvement at the Executive Committee.
- Involvement in organization of other conferences such as the Architectural Engineering Conference 2015 and national committees such as Building Science Education further supports the promotion of engineering and technology innovation aspects of residential construction.
- Healthy Homes and Aging-In-Place, Sustainable Residential Buildings, Modular and Panelized Construction, Building Science and Building Enclosures, and Multi-hazard Resistant Residential Buildings.

Overall, our activities in the areas of teaching, research, outreach and technology transfer continue to be successful as evidenced by the variety of our products available on the PHRC website, which has recently been redesigned. The PHRC invites university and practitioner colleagues to be involved and contribute to the knowledge exchange forums and platforms such as the Housing and Land Development Conference, Residential Building Design and Construction Conference, Journal of Architectural Engineering Special Section on Housing and Residential Building Construction. Besides Pennsylvania-based builders, remodelers, code officials, architects, and engineers, we invite companies and organizations from other states to benefit from the wealth of our products to improve and enhance housing and residential construction industry in their regions.

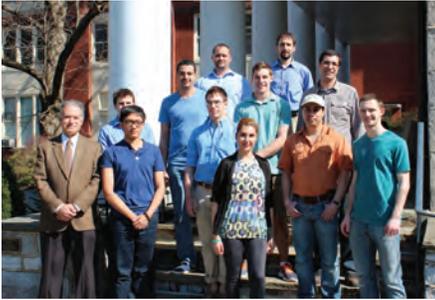
Our building testing laboratories are among the best equipped laboratories in the country to test various types of building components, including envelope/enclosure, foundation, walls, floors, and roof systems. We continue to enhance our facilities to offer unique capabilities in performing standard and custom testing on products and systems, developing engineering analysis and evaluation of component/system performance, and developing guidelines. We continue to be a resource and offer expertise to manufacturers in developing and advancing their new product lines and help them through commercialization of new products. We continue to pursue national grants for research through teams of faculty researchers and industry collaborators. In particular, we are actively developing five PHRC research tracks and are building faculty research teams under each track, which includes:



Students visiting local land development project

STUDENT DESIGN COMPETITIONS

DOE CHALLENGE HOME COMPETITION



DOE Challenge Home Team with Dr. Memari

A team of Penn State students received the Best Technical Integration Award at the U.S. Department of Energy's (DOE) inaugural Challenge Home Student Design Competition held April 26-27 at the National Renewable Energy Laboratory in Golden, Colorado.

The DOE charged teams with developing cost-effective zero energy ready homes for mainstream builders. Teams were evaluated based on design/construction strategies, clear project plans, required analyses, and overall competency applying best practice solutions and principles of building science from the DOE's Building America program. Twenty-eight teams from U.S. and Canadian universities competed.

Penn State's team designed a two-story, single family gas-powered residence in Berwick, Pennsylvania, dubbed "Nittany Lions E-den."



Nittany Lions E-den Home Design

Entries were judged by national leading high-performance builders, building science professionals and researchers. The Penn State team won the award for Best Technical Integration handed to them by DOE Chief Architect Sam Rashkin, who champions the cause for net-zero energy home construction, and also received high scores on indoor air quality.

Student participants included:

- Architecture undergraduate Emily Stein;
- Architecture graduate students Alireza Arabshahi, Shahrzad Fadaei, Sohrab Rahimi and Bobak Soleimani;
- Architectural Engineering undergraduates Sam Bridwell, Chang Deng, Drew Nicholas, and Justin Rotella;
- Architectural Engineering graduate students Mona Hatami and Issa Ramaji;
- Civil Engineering graduate students Tony Jellen and Ehsan Kamel; and
- Energy Engineering undergraduate Aiden Gilrain-McKenna.

The team was advised by:

- Steve Ayer, postdoctoral researcher in Architectural Engineering

- Katie Blansett, Associate Director of the PHRC;
- Rich Kisner, Executive Director at the Columbia County Housing and Redevelopment Authorities;
- Andy Lau, Associate Professor of Engineering Design;
- Ali Memari, Bernard and Henrietta Hankin Chair of Residential Construction and Director of the PHRC;
- Chad Owens, Manager and Project Engineer at RARE Building Consultants;
- Peter Vargo, CEO of Nu-Tech Energy Solutions Co., LLC;
- Scott Wing, Associate Professor of Architecture; and
- Brian Wolfgang, Project Manager at the PHRC.



Team members with DOE Chief Architect Sam Rashkin



Students outside NREL's Education Center in Golden, CO

NAHB RESIDENTIAL CONSTRUCTION MANAGEMENT COMPETITION



NAHB Residential Construction Management Competition team members with Dr. Ali Memari

The Penn State NAHB student chapter sent a team to the Residential Construction Management Competition hosted in Las Vegas on February 4-6, 2014. The team consisted of students in the fields of finance, architectural engineering, civil engineering, and marketing. With a strong interdisciplinary background, the team placed seventh out of 35 teams in the national competition.

This year's project was located in Aurora, Colorado, and the team designed a four-phase project with

223 homes built over the course of five years. In four months a team of nine students designed a 60-acre neighborhood situated on the eastern boundaries of the ever-expanding Aurora metro area. From sidewalks to siding to schedules, no detail was too small for the team to design as a final project portfolio and presentation were created and delivered to the judges.

The goal of the project is to give students the opportunity to apply academic knowledge to a real business

problem in a team setting. Working with a wide breadth of skills, students were responsible for the street and drainage layout, home design, marketing plan, and financial analysis. The overarching themes of family-centered design, community activity, and natural resource management influenced all aspects of the project.

This year's team was composed of Alayna Auerbach, Alec Galanti, Chris Guyan, Dana Lindt, Hannah Noss, Josh Jaskowiak, Paige Donnell, Victoria Brinemugha, and Victoria Riedinger.

SUPPORT THE NEXT GENERATION!



NAHB Student Chapter on a Tour of Winchester Homes' Poplar Run Development

From site visits to guest speakers to traveling for national competitions, Penn State students are leading the way as the next generation of professionals to serve the housing and residential construction industry by pursuing careers as builders, remodelers, land developers, engineers, architects, planners, code officials, and local government officials.

Please consider investing in their success this year through scholarships, travel grants, and annual giving opportunities.

Contact Sarah Klinetob Lowe at 814-865-7915 or slowe@engr.psu.edu to find out more.



Proper fiberglass batt insulation installation in wall cavities



General Land Development Process



Properly installed housewrap on walls and roof

1. Insulation: Is This “Stuff” Right?

This one hour workshop demonstrates the correct ways to insulate wall and floor cavities with fiberglass batt insulation. A few key issues for wall cavity insulation that are addressed include the installation of insulation in a standard wall cavity, a wall cavity with horizontal electrical wires, and wall cavity with plumbing and HVAC runs. Along with wall cavity insulation, maintaining insulation alignment in floor assemblies over unconditioned spaces is also presented. This includes proper installation techniques for both joist bays and rim board applications. This is an approximately 1-hour program and includes a mock-up to help demonstrate key installation issues.

2. Stormwater 101

Recent regulatory and policy changes have now made stormwater management an issue for some single-family homebuilders. Regulatory and permit updates and increased public awareness of flooding and water quality are bringing the issues of stormwater management to others professions, such as municipal officials and code officials who may not be well versed in the topic. This session will teach builders, code and municipal officials, and other non-stormwater professionals on the basic issues of stormwater, the management of runoff, and the new rules that affect a larger percentage of the development community.

3. The Land Development Process

The land development process is a long and complicated process. Many of the entities involved in the process do not know what other steps are involved in getting a project from conceptual idea to construction. The PHRC published a Land Development Brief, Summary of the Typical Residential Land Development Process in Pennsylvania, in 2012 to help educate those involved with the process about the many steps. This current project expands upon that Brief to provide municipal officials, code officials, and sewage enforcement officers (SEOs) with an overview of the land development process through a focused training program. Content in the workshop focuses on the land development flow chart included in the Brief, and highlights the various approvals needed and where additional information on steps in the process can be found.

4. Achieving Compliance with the International Energy Conservation Code in Commercial Occupancies

This new online class covers the commercial energy efficiency portions of the 2009 International Energy Conservation Code. The self-paced online program format consists of a series of videos and quiz questions covering the main topics of the IECC for commercial applications. These videos and quizzes can be completed in one sitting, or you can complete portions of it and then return at a later time to complete the course.

5. Building Envelope Design and IECC Code Compliance

Residential structures are being built in vastly different ways today than in past decades, incorporating new materials, techniques, and assemblies. These changes have dramatically altered the way buildings interact with their surrounding environment. Understanding that interaction requires a working knowledge of building science and building envelope design. This full day workshop is designed to provide builders, designers, and code officials with an introduction to building science principles and practices as they relate to the building envelope and current IECC regulations.

6. Residential Plan Review and Inspection

This one-day program begins with a brief overview of the residential provisions of the 2009 International Energy Conservation Code (IECC), followed by an outline of a process for performing a detailed plan review for energy code compliance. The rest of the morning consists of a hands-on plan review exercise to give attendees experience with performing plan reviews for energy code compliance. The second half of the program will involve an on-site insulation/air sealing (if logistically feasible), or a series of video clips with class discussion. Note that this program assumes that attendees have a working knowledge of the IECC.



Measurements in Morningstar Solar Home at Penn State

1. Resuspension and Transport of Allergen Carrier Particles in Residential HVAC Systems

HVAC systems play an important role in transporting allergen carrier particles that trigger asthma episodes in residential indoor environments. Unfiltered particles deposited on interior duct surfaces resuspend and transport when disturbed under mechanical vibration and varying air flow conditions in the system. However, experimental data is needed to characterize the behaviors of individual allergen-carrier particles in response to HVAC system disturbances and to inform modeling work that will lead to better design and performance guidance for builders seeking to improve indoor air quality in residential settings. The results of this research investigation are expected to provide a better understanding of the behavior of allergen sources in residential homes and to influence HVAC component and system designs, which in turn aid in the development of improved methods of mitigating dust-borne allergens for Pennsylvania builders and homeowners.

2. Performance Optimization and Development of a Home Modular Delivery System

The objective of this research is to expand affordable home energy performance by developing an optimized modular delivery system – a Kit-of-Parts (KoP) – applicable for infill development of new homes and for retrofitting existing homes. This innovative system of components will result in homes that surpass ENERGY STAR performance for energy efficiency, have improved indoor air quality, and provide realistic options for aging-in-place. Most notably it will provide a way to deliver high quality, well-designed, small affordable housing projects on a broad scale. The project team investigated precedents for

the project, identifying successful strategies for further investigation. Repetitive building components that contribute to a home's energy performance were identified and designed using design criteria that included (but was not limited to) energy performance, accessibility and flexibility for aging-in-place, comfort and indoor environmental quality, and modular construction methods. Repetitive and replicable individual components, core elements, and housing typologies were developed.

During the first phase of proof-of-concept, the modular KoP homes were applied to an actual development site identified by our partner organization, the Union County Housing Authority. Based on a LIHTC analysis for the site, a master plan with a variety of housing unit types was designed for an under-utilized (formerly industrial) site in the heart of Lewisburg, PA. This master plan along with architectural drawings for the KoP housing was used to seek input from building professionals, developers, and other specialists. Concurrently, a series of existing building conditions representative of those found in small towns throughout Pennsylvania were identified. Schematic designs for the retrofit and adaptation of these structures for single-floor living (aging-in-place), conversion to multifamily, and the addition of ancillary dwellings were developed using the KoP. A peer-reviewed paper was written and presented at PHRC's annual Residential Building Design and Construction Conference in February 2014.



Repetitive core components, designed for modular prefabrication and enhanced energy performance, can be used in multiple configurations for the design of new infill housing and the retrofit of existing homes.



Architectural Light Therapy System demonstration

3. Prototype of an Architectural Light Therapy System to Promote Successful Aging in Place

The goal of this project is to develop a working prototype of a residential living environment outfitted with a novel architectural lighting system that is designed to promote health by stimulating the human circadian system while maintaining standards for visual quality. Full physical realization of the Architectural Light Therapy System has been achieved, which comprises a customizable 5-channel (i.e., red, green, blue, cool white, warm white) color changing architectural lighting system and a custom lighting control interface. The lighting hardware includes thirty-seven individual color-changing lighting fixtures from Philips Lighting. Five are employed for accent lighting. The other 32 were grouped and enclosed in five custom-built luminaires created with aluminum housings and acrylic diffusing panels. Lighting control is achieved via a touch-panel controller from Pharos Architectural Controls. A custom interface was designed with the following defining goals:

1. To be user-friendly
2. To provide high customizability in an intuitive manner
3. To present the user with simple architectural presets—typical of a residential system—that can be edited via the interface
4. To offer a simple interface for an intelligent system that is photobiologically enhanced

In addition to the lighting, the space is furnished as a typical residential living room (e.g., couch and chair, coffee and end tables, bookshelf/TV stand). Photometric measurements were performed at a

RECENTLY COMPLETED PROJECTS

position in the room corresponding to where an occupant would sit on the couch and look forward. These measurements are representative of the luminous conditions in the space as experienced by an occupant. Separate measurements were taken for each of the five channels at a sufficient number of dimming levels to permit reconstruction of all possible combinations via simulation. A tool was developed in Microsoft Excel to analyze and quantify the photometric and photobiological conditions that can be delivered by the lighting system. A manuscript document that will outline the design and construction of the prototype system and its photometric and photobiological potential is under development.

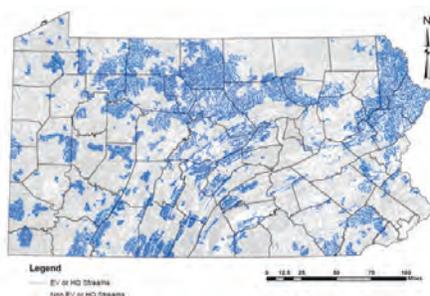
4. Update of Manufactured Housing Briefs

The manufactured housing industry provides installation manuals with every house it produces. Those manuals provide instructions for the on-site completion of the home, including acceptable foundation design and construction practices. Two previously published PHRC Technical Briefs (TB0101 and TB0201) were developed to provide supplementary guidance to the manufactured housing industry regarding various site design considerations relevant to PA. The PHRC reviewed current manufactured housing industry practices and technology in order to update the previously published briefs to current state of the art. The PHRC has developed updated versions of the Soil Freeze Guide and Site Design Considerations briefs related to manufactured housing and used a new and updated format. The update was requested by DCED, and the updated content took into consideration feedback from DCED. Updated briefs are published on the PHRC website and are available in print per request.

5. Location and Land Areas for Buffers on High Quality and Exceptional Value Streams

Recent and proposed regulation and policy updates are relying heavily on stream buffers as a major tool in protecting water quality, particularly in High Quality (HQ) and Exceptional Value (EV) watersheds. Some areas of

the Commonwealth have a much higher density of HQ and EV streams than other areas. In addition to affecting many traditional land development projects, the new regulations and policies can affect single-lot home builders. Single-lot builders have not traditionally needed to be concerned with knowing in which watershed they are building, obtaining stormwater permits, or designating and planting stream buffers. A technical report entitled "Summary of Stream Buffer Requirement and Geographic Distribution of Buffers for Exceptional Value and High Quality Streams in Pennsylvania" was published in August 2014. This report includes a short summary of the regulations and policies that require a stream buffer, as well as tables that highlight the length of EV/HQ stream miles and area of land in an EV/HQ stream buffer in each county. The report also includes county by county maps of the EV/HQ designated streams in the Commonwealth. The report is available for download from the PHRC website.



Exceptional Value and High Quality Streams in PA

6. OSHA Residential Construction Compliance Recommendations

Various levels of government oversight have taken a more predominant role in the current residential construction industry with differing levels of compliance on the part of builders and contractors across the state. A webinar highlighting the OSHA fall protection regulations was given on November 12, 2013 and a one page graphic laminated handout was created for distribution to field workers. This graphic shows major fall protection areas and how

to comply with OSHA's requirements. The fall protection handout has been distributed at several PHRC events including the Annual Conference and the Spring PBA Board meetings. A PDF version of the handout is available on the PHRC website. A recording of the "OSHA Residential Construction Fall Protection" webinar is archived on the PHRC webpage and is available for free, on-demand viewing.



Portion of PHRC's OSHA Fall Protection Tips Handout

7. Support of Standards

The PHRC has developed three standards to respond to industry demand. These include Pennsylvania's Alternative Residential Energy Provisions, Subdivision and Land Development Guidelines for Pennsylvania, and Foundation Systems for Relocated Manufactured Housing. Each of these standards requires training and timely technical assistance for local governments, builders/developers, design professionals, and contractors. The PHRC frequently fields phone calls from building code officials and builders regarding these standards. Also, these standards, specifically the PA Alternative Residential Energy Provisions, were included in other training programs such as Introduction to Building Science and various building science related speaker services. Katie Blansett was a guest speaker on the Subdivision and Land Development Guidelines for Pennsylvania in May as part of the Penn State Ag Extension Land Use webinar series. All of these standards are available electronically for free, and hard copies are available for a fee.

UPCOMING EDUCATIONAL OPPORTUNITIES

HANKIN DISTINGUISHED LECTURES



Hankin Distinguished Lecturers (left to right): Peter Yost, Kent Colton, Liza Bowles, Frank Anton, Henry Cisneros, Ron Jones, Nicolas Retsinas, David Seiders, and Peer Haller

The Hankin Distinguished Lecture Series invites world-class speakers to the Pennsylvania State University to address students, faculty, staff, and industry professionals.

The lecture series was established in 2006 in honor of the late Bernard Hankin and his family for their continuous and dedicated support of the residential building construction program at Penn State.

Over the next few months the PHRC will have all videotaped lectures (from 2007-present) available for streaming on our website under "Outreach". All lectures will be closed captioned and free to view. Please check them out!

2014 HANKIN DISTINGUISHED LECTURE

THE ART, THE SCIENCE, AND THE BUSINESS OF SUSTAINABLE RESIDENTIAL CONSTRUCTION

Peter Yost, VP of Technical Services, BuildingGreen, Inc.

The demand for sustainable homes to use less energy, use less water, last longer, be safer, and use fewer materials creates a unique challenge. In order to be truly sustainable, homes must be: 1) **beautiful**, 2) **high performance and last a really long time**, and 3) **skillfully marketed**. This lecture is driven by examples of homes and builders that get all three right, including the details that deliver.

[View each Hankin Lecture at phrc.psu.edu](http://phrc.psu.edu) under **Outreach**

UPCOMING WORKSHOPS

Stay up to date on all of our workshop offerings at our website under "Outreach".

NOVEMBER

MECHANICAL CODE REFRESHER
11/13/2014 | Greensburg |
Ramada Inn

PLUMBING CODE REFRESHER
11/19/2014 | Enola |
PSATS Educational Center

DECEMBER

ELECTRICAL CODE REFRESHER
12/16/2014 | Monroeville |
Doubletree by Hilton, Monroeville
Convention Center

MECHANICAL CODE REFRESHER
12/16/2014 | Bethlehem |
Best Western Plus, Lehigh Valley
Hotel & Conference Center

JANUARY

RESIDENTIAL PLUMBING ACADEMY
1/12-1/15/2015 | Enola |
PSATS Educational Center

PLUMBING CODE REFRESHER
1/29/2015 | Greensburg |
Ramada Inn

FEBRUARY

ELECTRICAL CODE REFRESHER
2/10/2015 | Concordville |
Best Western Plus Hotel &
Concordville Inn

MECHANICAL CODE REFRESHER
2/18/2015 | Lansdale | Holiday Inn

RESIDENTIAL MECHANICAL ACADEMY
2/23-2/26/2015 | Enola |
PSATS Educational Center

MARCH

RESIDENTIAL ENERGY ACADEMY
3/17-3/18/2015 | Enola |
PSATS Educational Center

PCCA SYMPOSIA EAST
3/25-3/26/2015 | Montgomery County

APRIL

PCCA SYMPOSIA WEST
4/8-4/9/2015 | Allegheny County

BUILDING SCIENCE TRAINING
4/30/2015 | Mars | Four Points by
Sheraton, Pittsburgh North

2014-2015 WEBINAR SCHEDULE

Join us every **second Tuesday of the month** from **1pm to 2pm** for our monthly webinars! In case you miss one, or if you would like to hear one again, recordings of all of our webinars (since 2011) are available on our website under "Webinars".

SEPTEMBER (9/9)

Requirements for Fire Protection of Light Weight Floor Systems

Act 1 of 2011 eliminated sprinkler requirements, but required a protective floor membrane, the installation of which comes with its own set of challenges. This webinar provides an overview of criteria that can be used to demonstrate the equivalence of alternatives to the ½-inch gypsum or 5/8-inch wood structural panel membrane that is required by the Act.

OCTOBER (10/14)

Insulating with Exterior Rigid Foam

Rigid foam can currently be used as an option in the prescriptive insulation design path for the 2009 IECC and 2009 IRC chapter 11. This webinar focuses on the benefits and obstacles of an exterior wall assembly constructed with rigid foam, from increased wall assembly R-values to how rigid foam affects the dew point in wall assemblies.

NOVEMBER (11/11)

The Appraisal Process

This webinar provides a brief description of how the current appraisal process works, some projections of where it might be going, the key items that are looked at during the process, and tips that both the builder and consumer should know during the design phase to reduce the risk of any surprises during the appraisal. Examples of both low-cost, high-return features and high-cost, low-return features in regards to an appraisal are provided, as well as how above code

programs such as "National Green Building Standard" or "Energy Star" can affect the appraised value.

DECEMBER (12/9)

Fundamentals of Exterior Plaster & Manufactured Stone Veneer

Exterior plaster systems such as stucco and manufactured stone veneer have been a part of the residential and commercial construction industries for decades regionally, building codes that address these systems do not vary significantly between regions. This webinar takes a look at the impact that exterior plaster and adhered masonry veneer systems have on the current residential construction market as well as the changes that took place in order to get to that point. This analysis takes into consideration material properties of each system, the building physics that determines the performance of each system, as well as building code provisions that dictate the installation of each system.

JANUARY (1/13)

Aging in Place - Business Strategies for Residential Construction

This webinar will provide participants with methods for performing needs assessments to identify the requests and requirements of the aging in place client. The webinar will also identify contractual and legal considerations that the building professional must consider, as well as considerations for executing the job while the client is in the residence. Specific design solutions and strategies will also be discussed.

FEBRUARY (2/10)

Aging in Place - The Final Step

This third and final webinar in the series will further explore the design concepts associated with aging in place. Topics such as universal design, accessibility, and visitability will be addressed, and their relationship to aging in place will be considered. This webinar will also discuss case studies associated with the aging in place theme.

APRIL (4/14)

The Do's and Don'ts of Design & Construction of Crawlspaces

Crawlspaces can be both a cost saver during construction and sometimes a necessity due to site conditions, but if done poorly or not designed and constructed with sustainability in mind, it can cost much more in the long run. In this webinar we will take a look at design and construction of crawlspaces, starting with the compliance paths listed in Section 408 of the 2009 IRC and also include some above code options for the design and construction of a crawlspace.

MAY (5/12)

Thermal Bridging in Residential Construction

In order to optimize the energy efficiency of standard platform light frame construction, builders and designers have been forced to address thermal bridging's role in the energy performance of residential structures. This webinar will take a look at how much of an effect thermal bridging has on energy efficiency, as well as the effectiveness of current strategies for reducing heat loss through these bridges.



2012 Hankin Lecture with Liza Bowles

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Housing Program Development Specialist **Bryan Heitzmann**
Housing and Land Development Specialist **Chris Hine**
Housing Systems Specialist **Brian Wolfgang**
Training and Events Coordinator **Tracy Dorman**
Budgets and Publications Coordinator **Sarah Klinetob Lowe**

www.phrc.psu.edu

PENNSYLVANIA HOUSING RESEARCH CENTER NEWSLETTER

FALL 2014



The PHRC Team (left to right): Brian Wolfgang, Chris Hine, Sarah K. Lowe, Dr. Ali Memari, Dr. Katie Blansett, Bryan Heitzmann, & Tracy Dorman

