

PHRC NEWS



The Pennsylvania Housing Resource/Research Center (PHRC) serves the home building and remodeling industries and the citizens of Pennsylvania by improving the quality and affordability of housing. The PHRC conducts applied research, fosters the development and commercialization of innovative technologies, and transfers appropriate technologies to the housing community.

Inside this Issue

Page 2

- PHRC Update
- Personnel Changes

Page 3

- New Training Programs
- Academy Programs

Page 4

- Residential Sprinklers
- Wall Bracing
- Advanced Framing
- Webinars

Page 5

- Building Permit Fees and UCC Enforcement
- Land Development

Page 6

- Research Update

Page 7

- Upcoming PHRC/PCCA Training Programs

Page 8

- PHRC Membership

Page 10

- Upcoming Meetings

Register Now!
February 23-24, 2011

On February 23 & 24, the PHRC will hold its 19th annual conference in York County, PA. The conference strives to be the premier technical conference for housing and land development issues in Pennsylvania. This 2-day conference provides the latest information on emerging technologies and how to resolve problems facing the housing industry.

February 23th is intended for all sectors of the housing industry including builders, remodelers, code officials, educators, design professionals and modular and HUD-code builders.

February 24th — Land Development — will offer multiple training events:

- Residential Fire Sprinklers
- Advanced Framing
- Energy Incentives for New Homes
- Solar Electric Systems, Installation, & Inspection

Please visit www.engr.psu.edu/phrc for more information and to register.

PHRC UPDATE

PERSONNEL CHANGES

Mark Fortney resigned his position with the PHRC effective July 23, 2010. He has spent the last five months traveling around North America with his wife Marianne. Mark plans to stay involved in related fields including applied building science, energy efficiency, green buildings, building codes, energy codes, and technology transfer.

Mike Turns was hired internally as the Associate Director of the PHRC to replace Mark. Mike began working at the PHRC as a Housing Program Development Specialist in 2005. His previous work has included assessing the impact of the Uniform Construction Code in rural Pennsylvania (funded by The Center for Rural Pennsylvania, a Legislative Agency of the Pennsylvania General Assembly); the development of a residential mechanical training program focused on common code violations; estimating the potential impacts of residential energy efficiency programs in Pennsylvania (funded by the West Penn Power Sustainable Energy Fund); and implementing an energy code technical assistance program and compliance assessment (funded by the U.S. Department of Energy). Mike is an NAHB Certified Green Professional and was certified as a Home Energy Rating System (HERS) Rater in 2006. He has been an invited speaker at numerous state and national conferences, as well as a variety of professional association meetings. Mike holds a B.S. from the College of William & Mary and an M.S. from Penn State.

Bo Kasal was named Director of Fraunhofer Institute: Bo Kasal, the former Bernard and Henrietta Hankin Chair of Residential Building Construction and Director of Research at the Pennsylvania Housing Research Center, resigned from his position effective October 2, 2010. He has accepted a position in Germany. He will hold a Professorship at the Carolo-Wilhelmina University of Braunschweig, and was appointed Director of the Fraunhofer Wilhelm-Klauditz Institute.

Andy Scanlon has been appointed as the Hankin Chair, beginning October 3, 2010, for a one-year term. An international search for a new Hankin Chair will be conducted this fall to fill the chair beginning in the fall of 2011, or as soon as possible thereafter.

Brian Wolfgang graduated in May 2010 with a Master of Science degree in Architectural Engineering and is working for former Glunt Fellow, Brennan Glantz as a Staff Engineer for Engineering Projects, Inc. in State College, PA. Using the results from his research, Brian produced three PHRC Builder Briefs, Basement Wall Insulation Strategies: Parts 1, 2, and 3.

Katie Blansett, a former Glunt Fellow has begun working part time on land development-related activities for the PHRC. Currently, Katie is finishing her Ph.D. in Ag & Bio Engineering (research topic: data analysis and modeling of storm water flow and quality in karst watersheds) and teaching the undergraduate course, Sustainable Residential Subdivision Design for the PHRC. She has both an academic and professional background, having worked as a consulting engineer, and is a registered professional civil engineer in PA. Katie is currently working part-time for the PHRC as she develops a strategic plan for PHRC land development activities, and assembles a Land Development Subcommittee of the PHRC Industry Advisory Council. Katie plans to begin working full-time in the spring.

NEW TRAINING PROGRAMS

ACADEMY PROGRAMS

The PHRC updated and expanded several of its existing training programs to create four-day, academy-style programs delivered through the Pennsylvania Construction Codes Academy (PCCA). These programs provide a comprehensive overview of the 2009 International Residential Code (IRC) with separate programs for each building trade, including building, mechanical, plumbing, and electrical. Programs include examples, exercises and case studies designed to illustrate how to achieve code compliance along with best practices for inspectors and plans examiners. The intent is to initiate those with limited or no experience into the realm of the UCC, and specifically the IRC. The following programs are offered twice per year.

Basic Blueprint Reading – This introduction to understanding house plans is offered in conjunction with the IRC Building Essentials program described below. The ability to read construction blueprints is a foundational skill in the code enforcement and construction industries. This one-day program is designed to provide an introduction to the fundamentals of blueprint reading. Participants will gain an elementary knowledge of blueprint reading as it relates to residential construction projects; be able to find trade information using blueprints; be able to answer basic construction questions relating to the layout and installation of materials at the job site; be exposed to different types of blueprints from construction, floor framing, roof framing, elevations, HVAC layouts, and electrical; and various construction details.

Building Essentials – This program, launched in February 2010, provides a comprehensive overview of Chapters 1-10 of the International Residential Code (IRC). Topics include: administration; building planning; townhouses and two family dwellings; emergency escape and egress; foundation systems; floor systems; deck requirements; wall systems and coverings; wall bracing; roof and ceiling systems; and chimneys and fireplaces.

Plumbing Essentials – First taught in May 2010, this program covers chapters 25-33 of the IRC. Topics include: general plumbing requirements; protection, testing, trenching and workmanship, plumbing fixtures; water supply systems; backflow prevention; water and waste drainage systems; traps and vents; sumps and sub-soil drains; on-lot septic systems and water/sewer laterals; and fire sprinkler systems.

Mechanical Essentials– This program had its initial offering in June 2010. It provides a comprehensive overview of chapters 12-24 of the IRC. Topics include: general requirements; heating and cooling systems; dryer and kitchen exhaust systems; duct sealing and insulation; combustion air; vents and chimney connectors; water heaters and boilers; oil storage; solar systems; radiant floor heating; fuel gas appliances; and fuel gas piping.

Electrical Essentials – Debuting in September 2010, this program marked the PHRC's first major undertaking in the electrical trade. The program covers chapters 34-43 of the IRC with topics including: general electrical requirements; residential services; branch circuits and feeders; wiring methods; bonding and grounding; power and lighting distribution; devices and luminaires, appliance installation; swimming pools, spas and hot tubs; and power-limited circuits.

For more information or to schedule a program—please contact PCCA at www.paconstructioncodesacademy.org.

RESIDENTIAL SPRINKLERS

Residential fire sprinkler requirements contained in the IRC went into effect in Pennsylvania for townhouses on January 1, 2010, and for one-and two-family dwellings on January 1, 2011. This PHRC training program will be offered either as a one-day or a two-day program. The two-day program is intended more for residential plan reviewers and inspectors, while the one-day program is geared more toward contractors or other interested parties. Both sessions will help participants to: understand the scope of installation standards NFPA 13R, NFPA 13D and IRC P2904; identify and evaluate residential sprinkler system water supply components; identify and evaluate residential sprinkler system pipe, valves and trim components; identify residential sprinkler system overhead pipe and sprinklers and evaluate the components and design for compliance with either IRC or NFPA 13D; perform hydraulic calculations for compliance with NFPA 13D

For more information or to schedule a program—please contact Tracy Dorman at tsd5@psu.edu.

WALL BRACING

The interest in this program continues to grow as builders and code officials struggle to implement the new requirement of the 2009 IRC. So far, four programs have been delivered with over 100 people trained. This workshop is designed to provide an overview of the 2009 IRC wall bracing requirements. The program provides a general understanding of structural principals of wood frame buildings as well as wind and seismic loading. The program also provides an emphasis on prescriptive design using the IRC versus when a building is exceeding the limits of this approach requiring a design professional. Determining whether plans are in compliance with IRC wall bracing provisions is also emphasized.

A second day has been added to this program with several exercises that put into practice the lessons learned during the first day of the program. The PHRC will be offering the program as either a one- or two-day program.

For more information or to schedule a program—please contact Tracy Dorman at tsd5@psu.edu.

ADVANCED FRAMING

With increased competition between builders and a green building movement that is here to stay, advanced framing provides a means to cut costs while improving energy efficiency and reducing waste. The full title of this program will be, *Advanced Framing: Increasing Performance While Reducing costs*. This half-day program will provide an overview of advanced framing techniques, including, framing 24 inches on center, stacked framing with single top plates, two-stud corners, ladder framing at partition wall intersections, let-in bracing and more. The program will discuss potential benefits to builders and homeowners, as well as potential pitfalls to be avoided. Code acceptance of these techniques will also be covered.

WEBINARS

The PHRC is continuing the popular webinar series. These web-based training programs meet participants' demand for free interactive training that is available both live and archived for future viewing.

The following are some of the topics that are offered as web-based training:

December 14, 2010 - Understanding Barriers - *vapor, air, water resistive, etc.*

January 11, 2011 - Wall Bracing Overview (2009 IRC)

March 8, 2011 - Performing inspections using the IECC insulation and air sealing checklist

April 12, 2011- Sprinkler head selection

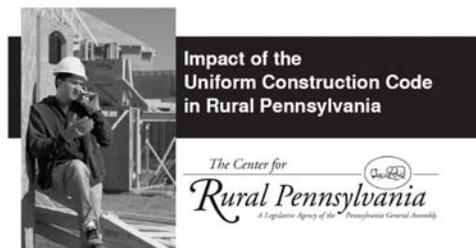
May 10, 2011 - Bringing the ducts inside: *unvented attics, conditioned basements and crawl spaces, and avoiding exterior walls*

BUILDING PERMIT FEES AND UCC ENFORCEMENT

This project, partially funded by the Center for Rural Pennsylvania, provides a clearer picture of the UCC's impact on Pennsylvania municipalities, builders and developers. The report includes an assessment of which municipalities are enforcing the UCC and how they are enforcing it, as well as an estimate of the average and range of building permit fees. Average fees in rural and urban municipalities were also compared.

The final report entitled, *Impact of the Uniform Construction Code in Rural Pennsylvania*, was approved by the Center for Rural Pennsylvania on April 15, 2010, and the report was delivered to the legislature September 20, 2010. It is now available on the PHRC website at: <http://www.engr.psu.edu/phrc>.

For more information contact Mike Turns at 814-863-2366 or mat289@psu.edu.



LAND DEVELOPMENT

Land development activities are returning to the PHRC! This fall we wrote a strategic plan that addresses emerging issues in field of land development. The plan outlines both technical and educational approaches in which the PHRC can assist the design and development communities in tackling these issues. A draft of the Strategic Plan was presented to the Operations Committee and the Industry Advisory Council at the October 2010 meetings. We are in the process of forming a Land Development-specific subcommittee of Industrial Advisory Council to review the plan and help guide the direction and set priorities for future projects. The PHRC will begin to implement the plan in the Spring of 2011 with the first meeting of the Land Development subcommittee in March to finalize the draft version of the plan and make project priority recommendations for the April 2011 Industry Advisory Council meeting. Be sure to check the next newsletter for details on the new land development projects!

As part of the implementation of the Land Development Strategic Plan we are bringing back the Land Development Day to the 2011 Conference. Topics to be addressed in this exciting return to the conference include the Chesapeake Bay TMDL and impact of the TMDL on the development community, Chapter 102 updates, operation and maintenance and legal issues related to post construction storm water management, and performance data from actual BMPs. See the newsletter insert or website for more information about the conference.

For information about Land Development at the PHRC or to join the Land Development subcommittee, contact Katie Blansett at 814-863-2990 or kblansett@engr.psu.edu.

RESEARCH UPDATE

Within the past year, eight graduate students were involved in various research projects. A few of these projects are highlighted in the section below.

Experimental investigation of beam-to-column connections of laminated wood frames under cyclic loadings (Kyle Karschner, Student; Bo Kasal, Advisor)

This project involves laboratory experiments and research investigating the effectiveness of new beam-to-column moment connections in laminated wood frames. Different connections were tested under cyclic loading because the connections will be used in a three-dimensional space frame subject to seismic loadings. Under seismic loadings these types of frames are subject to cyclic loads in the connection zones and have a cyclic response to the loading. Currently the data is being analyzed to determine maximum moments, rotations, and energy dissipation in the connections. The results will be evaluated to justify the use of laminated wood frame moment connections in medium-rise buildings in seismic areas.

Experimental and analytical investigation of crack development in composite reinforced laminated arches (Robert Blass, Student; Bo Kasal, Advisor)

This project is currently investigating the use of glass-fiber composites in arresting crack growth in wood. The objective is to test reinforced and unreinforced laminated arches in a laboratory setting, and compare the effects of the composite reinforcement. An analytical model will serve as a deterministic means of comparison as well. This research is practical as wood is very weak in tension perpendicular to the grain, and reinforcement may provide additional strength where perpendicular stresses cannot be avoided (connections, arches, notched sections). This is exploratory, cutting-edge research that may result in significant improvement in application of laminated wood in medium-rise buildings.

Reliability Assessment of Roof Sheathing Performance in Light Wood Frame Structures Subjected to Wind Pressure (Maral Amini, Student; Bo Kasal, Advisor)

Low-rise buildings encompass the majority of the residential structures in the United States. Predominantly, this category of structures is constructed with dimension lumber. Investigations after natural disasters report that during high intensity wind pressures, low-rise buildings with wood-frame construction are at immense risks of damage with the first sign of damage initiated from the roofs. More particularly, surveys have shown that typical roof damages include roof sheathing nail withdrawal and loss of roof sheathing panels due to failure to comply with the required nail spacing. The developed methodology can be used as a tool to evaluate roof-sheathing performance subjected to wind load for a given inventory of low-rise structures or a single structure. The research has applications in risk assessment of residential structures and/or in the insurance industry.

Fiber Reinforcement of Wood Moment Connections (Emma Leitner, Student; Bo Kasal, Advisor)

Under seismic loading, wood connections are subjected to moments which are not typically designed for within the constraints of the current standards. The addition of reinforcement to these connections allows for higher strength and better performance of the connections under seismic loading. Following laboratory tests upon small-scale connections, the results are compared to those of a numerical model, developed using the finite element method. The completed numerical model should allow for the prediction of the behavior of connections of differing configurations, eliminating the need for expensive and time-consuming laboratory tests. The optimum connection configuration may also be studied.

TRAINING SCHEDULE

Upcoming PHRC/PCCA Training Programs		
Date	Course Title	Location
December 13-16, 2010	Mechanical Academy	PSATS Educational Ctr., Enola, PA
December 14-15, 2010	Wall Bracing	Southeast PA
January 12-13, 2011	Wall Bracing	South Central PA
January 19, 2011	Mechanical Compliance	Northeast PA
February 1, 2011	Mechanical Compliance	South Central PA
February 14, 2011	Blueprint Reading	PSATS Educational Ctr., Enola, PA
February 15-18, 2011	Residential Building Academy	PSATS Educational Ctr., Enola, PA
March 1-2, 2011	Wall Bracing Program	Lehigh Valley
March 15, 2011	Decks	Northeast PA
March 22-25, 2011	Electrical Academy	PSATS Educational Ctr., Enola, PA
April 5-6, 2011	Residential Energy Academy	PSATS Educational Ctr., Enola, PA
April 6-7, 2011	Commercial Energy Provisions (IECC)	York
April 28 2011	Multi-Family	Southeast PA
May 4, 2011	Residential Decks	South Central PA
May 17-20, 2011	Plumbing Academy	PSATS Educational Ctr., Enola, PA
May 24, 2011	Multi-Family	South Central PA
June 7-10, 2011	Mechanical Academy	PSATS Educational Ctr., Enola, PA

For more information visit: www.paconstructioncodesacademy.org

Additional PHRC Training Programs		
Date	Course Title	Location
February 24, 2011	Residential Fire Sprinklers	York, PA
February 24, 2011	Solar Electric System Installation and Inspection	York, PA
February 24, 2011	Building Energy Efficient New Homes (and Getting Paid To Do It)	York, PA
February 24, 2011	Advanced Framing: Reducing Costs and Improving Energy Performance	York, PA

To register visit: www.engr.psu.edu/phrc

PHRC Members

Leadership

BIA of Lancaster
 Builders Association of Northwestern PA
 Cannon Simply Beautiful
 CertainTeed Corporation
 City of Philadelphia
 CMX
 Curtis E. Schneck, Inc.
 Department of Community and Economic Development
 Dow Chemical Company
 DuPont Building Innovations
 Electra-Save, Inc.
 Glunt Development Co., Inc.
 Governor's Center for Local Government Service
 Hankin Group
 Harmony Home Builders
 iLevel by Weyerhaeuser
 J.E. Greishober Plumbing Hydronics
 JHW C/M Consultant
 JRG Advisors
 Kreitzer Construction
 Laskey Properties
 Lebanon County Builders Association
 Liberty Homes Custom Builders
 Modular Building Systems Association
 PA Department of Community & Economic Development
 PA Manufactured Housing Association
 PennBOC
 Pennsylvania Association of Bldg. Code Officials
 Pennsylvania Association of Code Officials
 Pennsylvania Builders Association
 Pennsylvania College of Technology
 Pennsylvania Construction Codes Academy
 Pennsylvania State University
 Sota Construction Services, Inc.
 Start-Living Homes
 Target Homes
 Tepes Construction Company, Inc.
 The Housing Alliance of Pennsylvania
 Tri-County COG-IBC Inspector
 Upper Darby Township

Supporting

BA of Central PA
 Central Susquehanna Builders Assoc.
 City of Uniontown
 Comfort Home Corporation
 Commonwealth Code Inspection Service
 Indiana-Armstrong Builders Association
 Lackawanna HBA
 Muncy Homes, Inc.
 Pennsylvania Concrete Masonry Association
 Pennsylvania Housing Finance Agency
 Pulte Homes Corporation
 S&A Homes
 West Penn Power Sustainable Energy
 York County Builders Association

Patron

Gutters Insulation & More
 Independent Quality Alliance
 Jack Gaughon ERA
 James Wentling/Architect
 Jenkintown Associates
 Joy Beck Custom Builders, Inc.
 Kuhns Bros. Log Homes, Inc.
 Lancaster County Code Association
 Lobar Properties
 Local 95 Training Fund
 Lower Swatara Township
 LTS Builders, LLC
 MaGrann Associates
 Mesa Wood, Ltd.
 Morrissey Holdings, L.P.
 NHR Real Estate Services
 Nittany Homes
 Old Lycoming Township
 Paul Kearney Inspections
 Paul Macht Architects, LLC
 Penn Terra Engineering, Inc.
 Perry L. Cisney Custom Builder
 Peter Joseph Brown
 Peters Township
 Projects in Progress
 Pure Energy
 Queen Engineering
 Redevelopment Authority of Washington Co.
 Residential Technology Services
 Rettew Associates, Inc.
 Richmond Township
 River Rock Creative Group
 Riverview Homes, Inc.
 Schumacher Homes Greensburg
 Sleighter Engineering, Inc.
 Somerset County Builders Association
 Sparkle Construction-SPP, Inc.
 Sweetland Engineering & Assoc., Inc.
 T&T Realty Acquisition Associates
 Thomas Comitta Associates, Inc.
 Thomas J. Wasilowski A. L.A. Architects
 Tim Myers Contracting
 UpStreet Architects, Inc.
 Vertex Mechanical Inc.
 Wagner Construction
 Watkins Architect, Ltd.
 Wayne County Builders Association
 Weaver Precast, Inc.
 Whitehall Township
 Woodloch Builders, Inc.

Patron

Adams Township
 Alan Hawman Architect
 Avignon Homes, Inc.
 Benchmark Civil Engineering
 Benjamin Obdyke Inc.
 BIA of Northeastern PA
 Borough of Fox Chapel
 Borough of Frackville
 Bozzuto Development Co..
 Bursich Associates, Inc.
 Cedar Knoll Builders
 Cocalico Properties Inc.
 Columbus Property Management & Dev., Inc.
 CZOP/Specter, Inc.
 DeLuca Homes
 Design Build by Robert P. Baney, LLC
 E&M Engineers and Surveyors, P.C.
 East Petersburg Borough
 Engineering Projects Incorporated
 Fine Line Homes, Inc.
 Franklin County Builders Association
 GAI Consultants
 Gluszko Architects, P.C.
 Greater Dubois Area Builders Association

**Not a member?
 Join the PHRC today!**

Name _____
 Address _____

 Phone _____

Method of Payment:

Check

Total: _____

Membership Levels:

Corporate or Trade Associations:

- Leadership \$2,500
- Supporting \$1,000
- Patron \$500

Local Associations:

- Leadership \$1,000
- Supporting \$500
- Patron \$250

Individuals:

- Leadership \$500
- Supporting \$250
- Patron \$100



www.engr.psu.edu/phrc

PHRC

Pennsylvania Housing Research/
Resource Center
Penn State University
219 Sackett Building
University Park, PA 16802
Tel: (814) 865-2341
Fax: (814) 863-7304

Associate Director: Mike Turns
Director of Research: Andrew Scanlon
Housing Program Development
Specialist: Vacant
Land Use and Development Specialist:
Vacant
Admin. Assistant: Rhonda Decker
Staff Assistant: Tracy Dorman

PHRC at Penn College

Pennsylvania Housing Resource Center
Pennsylvania College of Technology
One College Avenue
Williamsport, PA 17701
Tel: (570) 327-4768
Fax: (570) 320-5239

Upcoming Meetings

February 23, 2011	PA Housing and Land Development Conference Day 1– York	8:30 – 4:30 p.m.
February 23, 2011	PHRC Leadership Reception - York	6:00 – 9:00 p.m.
February 24, 2011	PA Housing and Land Development Conference Day 2– York	8:30 – 4:30 p.m.
April 13, 2011	Operations Committee Meeting – State College	6:00 – 9:00 p.m.
April 14, 2011	Industry Advisory Council Meeting – State College	9:30 – 2:00 p.m.
October 5, 2011	Operations Committee Meeting – Harrisburg	6:00 – 9:00 p.m.
October 6, 2011	Industry Advisory Council – Harrisburg	9:30 – 2:00 p.m.

For additional details on training programs, visit www.engr.psu.edu/phrc