

# 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.*

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**Save the Date -  
February 11-12, 2009**

## PA Housing and Land Development Conference

On February 11 & 12, the PHRC will hold its 17<sup>th</sup> annual conference in Scranton, 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.

The first day of the conference is intended for all sectors of the housing industry including builders, remodelers, code officials, educators, design professionals and modular and HUD-code builders.

The second day of the conference serves as a forum that addresses emerging planning, design, and regulatory issues affecting the land development industry in Pennsylvania. This day is intended for anyone involved in land development activities including builders, developers, design professionals, planners and regulatory officials.

Please visit [www.engr.psu.edu/phrc](http://www.engr.psu.edu/phrc) for more information and to register.

PENNSTATE





**RESIDENTIAL DECKS:  
DESIGN, CONSTRUCTION, AND INSPECTION**

Decks are considered simple structures. Yet deck related failures are responsible for a substantial number of injuries and deaths each year. This program will discuss the root causes of these problems and offer real world solutions.

This one-day program provides an overview of IRC code requirements for residential decks and a detailed review of the proper installation of commonly used connectors, fasteners and some commonly used proprietary products. The afternoon will focus on hands-on examples including designing a simple residential deck, performing a deck plan review to check for code compliance, and a virtual inspection of a residential deck.

This course is designed for builders, remodelers, deck contractors, building code officials (plan reviewers and inspectors), design professionals, home inspectors, and manufacturers and suppliers of deck-related construction materials.

This program will be held:

- September 17, 2008** — Cabela’s - Hamburg, PA
- October 29, 2008** — Poconos Area
- February 18, 2009** — Lancaster County
- March 24, 2009** — Pittsburgh/Monroeville/Butler

For additional information: [www.engr.psu.edu/phrc](http://www.engr.psu.edu/phrc)



**WEBINARS**

**2<sup>ND</sup> TUESDAY OF THE MONTH – 1:00 TO 2:00 P.M.**

The PHRC’s Industry Advisory Council has requested the development and deployment of web-based training that would deliver low cost technical training programs. This initiative will make available free, live, interactive, web-based training. These programs are not designed to replace the classroom training, professional workshops or annual conference for which the PHRC has become so well known. They are intended to supplement the learning opportunities that we already provide in a new, modern format that promotes the dissemination of timely, topic-specific information to large numbers of people in a cost-effective manner. These programs will be archived so anyone can view them at their convenience in the future.

Webinars will give us the ability to interact in an educational setting with significantly larger numbers of participants representing diverse professions and trades, but who share common interests and concerns.

In the age of \$4.00 a gallon gasoline, and increasingly hectic schedules, webinars provide you an opportunity to learn about a very focused topic in a **one hour time period without leaving your office** or wherever you may be that has internet connection capabilities.

- Sept. 9, 2008** — Ducts I - Inspecting Residential Duct Systems: Making the Connections
- Oct. 14, 2008** — Ducts II - Inspecting Residential Duct Systems: Obtaining Adequate Air Flow
- Nov. 11, 2008** — Inspecting Attached Decks: Ledger Board Flashing Details
- Dec. 9, 2008** — Relocated Manufactured Housing: Alternative Installation Standards
- Jan. 13, 2009** — Intro to Residential Solar Technologies: Resources and Solutions
- March 10, 2009** — Alternatives to Traditional Foundations: Shallow Frost-Protected Foundations
- April 14, 2009** — Sneak Peek: Critical Changes in the 2009 IRC

**For more information:** [www.engr.psu.edu/phrc](http://www.engr.psu.edu/phrc)

## NEW TRAINING PROGRAMS UNDER DEVELOPMENT

The PHRC is always seeking to develop new training programs to meet the needs of the construction industry. The PHRC currently maintains around 12 programs for builders, remodelers, building code officials, materials suppliers, etc. During the next few months the following programs will be developed:

**Residential Mechanical Inspections** – The need for this program is two-fold. The first is the need of new building code officials to have more in-depth knowledge of mechanical systems since many of them come into code enforcement from other areas of the construction industry and are not familiar with mechanical requirements, systems, and proper installation. Additionally, a recent DOE-funded study conducted by the PHRC (see Energy Code Enforcement Study Completed) found generally poorly performing HVAC systems across the commonwealth. This was generally attributed to poorly constructed ducts and highlighted the need for improved training for contractors, as well as code officials. This program will provide new and experienced building code officials the background they need to effectively administer and enforce the mechanical requirements in the IRC.

**Multi-Family IRC Program** – There are specific requirements for multi-family structures built under the IRC that require special attention by the building code official. The program will highlight such issues as fire separation requirements, energy efficiency, and accessibility. This program will focus on effective plan review and inspection practices and provide an understanding of fire rated assemblies.

**Residential Green Building** – The interest in green building has increased at an impressive rate. However, the industry is finding it challenging to find a good source of unbiased information on innovative construction technologies and methodologies. This program, or series of programs, will help builders understand how to build green and how to have their development and homes certified by major voluntary green building programs.

For more information on these programs contact Mark Fortney at [mrf106@psu.edu](mailto:mrf106@psu.edu).

## JOB OPENING — LAND DEVELOPMENT SPECIALIST

This position will serve as the focus for land development activities within the PHRC. The following is a list of general responsibilities and duties for the position:

- Provide leadership, technical assistance, and other support for the PHRC's ongoing effort on Residential Subdivision Design guidelines for Pennsylvania.
- Coordinate the PA Land Development Conference, which serves as an annual forum to address emerging planning, design, and regulatory issues affecting the residential development industry.
- Develop and deliver training to industry stakeholders: Develop focused training programs for design professionals and regulators covering scientific and regulatory issues facing the land development industry. Recent training courses have included stormwater management, site hydrology, and site development standards.
- Identify and secure funding from various state and federal agencies, industry groups and foundations.
- Teach CE-410W "*Residential Subdivision Design*" within the Department of Civil and Environmental Engineering at Penn State.

For a full job description visit our website at: [www.engr.psu.edu/phrc](http://www.engr.psu.edu/phrc)

## SPEAKER SERVICE

The PHRC offers an informal speaker service for local home builders associations and other organizations. Some of the topics include: Understanding Pennsylvania's Alternative Energy Provisions; Energy Code Enforcement in Pennsylvania: Lessons from the Field; Foundation Systems for Relocated Manufactured Housing; Overview of Current Research at the PHRC; Pennsylvania Standards for Residential Site Development; and An Introduction to Green Building. In the first six months the PHRC has provided eight service programs throughout Pennsylvania. To schedule a program, call Tracy at 814-865-2341, or e-mail her at [tsd5@psu.edu](mailto:tsd5@psu.edu).

## DOE ENERGY CODE ENFORCEMENT STUDY COMPLETED

The PHRC recently completed a report summarizing the findings of a study on energy code enforcement in Pennsylvania funded by the U.S. Department of Energy. The report is titled, *Energy Code Enforcement and Compliance in Pennsylvania: Lessons from the Field*. It contains 27 recommendations to municipal and third-party code offices, as well as an analysis of home energy performance of the homes visited during the study.

The report summarizes findings from twelve PHRC visits to municipalities and third party agencies. During these visits energy code enforcement processes were reviewed, and the PHRC performed its own plan reviews and inspections, looking for indicators of code compliance. Finally, the report describes better than expected blower door test results with all but two homes estimated to have fewer than 0.35 air changes per hour. The duct testing results described in the report reveal a wide range of airtightness with a few at or near the ENERGY STAR Homes maximum duct leakage requirement, and a few that were so leaky that significant pressure could not be achieved. Software simulations project that most of the homes in the study will perform near the energy code baseline set by the 2003 IECC Standard Design.

This report is available for free download at our website at: [www.engr.psu.edu/phrc](http://www.engr.psu.edu/phrc). For additional information on the study, contact Mike Turns at [mat289@psu.edu](mailto:mat289@psu.edu).

## THREE-PART WALL BRACING BUILDER BRIEFS COMPLETED

The PHRC recently completed a series of briefs addressing the wall bracing issues.

**Part 1: Basic Components for Code Compliant Bracing** discusses the fundamental principles of bracing, as well as, loads and mechanisms that control the lateral stability of a low-rise building.

**Part 2: IRC Wall Bracing Requirements** discusses bracing provisions of the 2006 International Residential Code and provides a simple table that can be used to calculate required amounts of bracing.

**Part 3: Beyond Code Wall Bracing Solutions** of the series discussed, the bracing technologies that can be applied if the code requirements cannot be met. References to pertinent literature are provided in each brief.

The briefs are available, free of charge, from the PHRC web site [www.engr.psu.edu/phrc/Publications](http://www.engr.psu.edu/phrc/Publications)

Introduction

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Builder Brief: BB0107

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## RESEARCH UPDATE

### Wall Bracing Standards for Pennsylvania —

The lowest wind speed for which the bracing in the current International Residential Code (IRC 2006) is listed is 100 mph. This means that in all areas with the speeds lower than 100 mph, the bracing requirements can be conservative unless earthquake lateral load governs the bracing design. Since Pennsylvania does not experience winds above 100 mph over most of its territory and is not located in seismic-prone region of the US it may be possible to establish bracing criteria for PA based on more realistic wind speed estimates. To do this, historic wind speed data from weather stations across PA must be collected and analyzed. The methodology must be consistent with the ASCE 7-08 (ASCE Standard ASCE/SEI 7-05. Minimum Design Loads for Buildings and Other Structures).

The study has three phases: in the phase one, anemometer data was gathered and analyzed to determine if, indeed, the wind speeds in PA can be expected to be below the 100 mph. During the second phase the wind speed data was analyzed to determine if several wind zones should be used for PA. It appears that a single wind speed zone is sufficient (statistical data analysis was used to prove this). During the phase three, the bracing recommendations specific to PA will be developed. These bracing recommendations will be compared with the current IRC requirements.

### Research in Residential Structures Gears Up —

Currently, eight graduate students and visiting scientists are working on various research projects that are either directly or indirectly related to residential construction and housing. The projects range from applied research (such as the one on wall bracing above or insulation study on below-grade construction) to a fundamental research, results of which might be seen in years to come (such real-time radioscopy in wood structures or using Computational Fluid Dynamics-CFD to calculate wind pressures on building envelope). The research group (see [www.engr.psu.edu/ce/divisions/residential/research.html](http://www.engr.psu.edu/ce/divisions/residential/research.html)) includes talented individuals dedicated to excellence.

## WOOD FRAME DESIGN FOR BUILDINGS (NDS-2005 BASED) MARCH 10-11, 2009

**Overview** – This 2-day hands on program will provide an overview of the basic principals of wood frame design as well as an opportunity for problem solving activities—so bring your calculators!

**The Need for this program** – Most model building codes contain limited applicability for wood frame construction. Any deviation, such as cantilevers, from a simple box design goes beyond the scope of the code and references the ANSI/AF&PA National Design Specification ASD Provisions (NDS)© 2005 for Wood Construction published by the American Forest and Paper Association (AF&PA). This has special application as the Commonwealth of Pennsylvania implements a statewide building code. The Commonwealth has adopted the 2006 International Code Council family of codes, which references the 2005 edition of ANSI/AF&PA NDS. Additionally, these specifications are widely used in both the manufactured and modular housing industry.

### Program Day 1

- Allowable strength and stiffness of engineered solid sawn lumber and glulam
- Wood column analysis and design procedures
- Wood beam analysis and design procedures
- Wood beam-column analysis and design procedures

### Program Day 2

- General provisions for wood connections
- Nailed connection analysis and design
- Bolted connection analysis and design
- Lag screw connection analysis and design
- Design check examples (IRC/NDS)
- Introduction to Structural Composite Lumber-LVL, PSL, LSL and I-Joists
- Informal Question and Answer

### PHRC Workshops

Date	Course Title	Location
Sept. 17, 2008	Residential Decks: Design, Inspection	Hamburg, PA
Oct. 29, 2008	Residential Decks: Design, Inspection	Poconos, PA
Nov. 12, 2008	Pennsylvania Manufactured Installer Update Training 2009	State College, PA
Dec. 17, 2008	Pennsylvania Manufactured Installer Update Training 2009	Clarion, PA
Feb. 18, 2009	Residential Decks: Design, Inspection	Lancaster/Berks, PA
March 10-11, 2009	National Design Specification (NDS) Workshop	Lancaster/Berks, PA
March 24, 2009	Residential Decks: Design, Inspection	Pittsburgh/Monroeville, PA

For more information visit: [www.engr.psu.edu/phrc](http://www.engr.psu.edu/phrc)

### PHRC Workshops Held by Industry Partners

Date	Course Title	County
October 1, 2008	Residential Decks	Butler
October 14 - 15, 2008	International Energy Conservation Code Essentials	Butler
October 22, 2008	Residential Decks	Blair/Bedford
December 16 - 17, 2008	International Energy Conservation Code Essentials	Cumberland
December 17 - 18, 2008	Residential Energy Essentials	Westmoreland
January 7 - 8, 2009	International Residential Code (IRC) Building Essentials	Montgomery
February 4 - 5, 2009	Residential Inspections	Westmoreland
March 3 - 4, 2009	International Energy Conservation Code Essentials	Bucks
March 24 - 25, 2009	Residential Energy Essentials	Berks
March 31 - April 1, 2009	Residential Plumbing Essentials	Berks
April 7 - 8, 2009	International Residential Code (IRC) Building Essentials	Cumberland
April 9, 2009	Residential Decks	Lackawanna
April 14 - 15, 2009	Residential Mechanical Essentials	Butler
April 29 - 30, 2009	Residential Inspections	Chester
May 19, 2009	Residential Decks	Cumberland

For more information visit: [www.paconstructioncodesacademy.org](http://www.paconstructioncodesacademy.org)

# PHRC Members

## Leadership

BA of Metro Pittsburgh  
 BIA of Lancaster  
 Blair County Builders Association  
 Borough of Carlisle  
 Builders Association of Northwestern PA  
 Cannon Custom Homes  
 CertainTeed Corporation  
 City of Philadelphia  
 CMX  
 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  
 HBA Metropolitan Harrisburg  
 HBA of Chester and Delaware Counties  
 Indiana-Armstrong Builders Association  
 JHW C/M Consultant  
 JRG Advisors  
 Lebanon County Builders Association  
 Lehigh Valley Builders Association  
 Liberty Homes Custom Builders  
 Mercer County Builders Association  
 Modular Building Systems Association  
 PA Association of Township Supervisors  
 PA Department of Community & Economic Development  
 PA Manufactured Housing Association  
 PennBOC  
 Pennsylvania Association of Bldg. Code Officials  
 Pennsylvania Builders Association  
 Pennsylvania College of Technology  
 Pennsylvania State University  
 The Housing Alliance of Pennsylvania  
 Upper Dublin Township

## Supporting

ACCA- Western Pennsylvania  
 BA of Central PA  
 Benjamin Obdyke Incorporated  
 Cedar Knoll Builders  
 Central Susquehanna Builders Assoc.  
 Clanton County Career Center  
 Comfort Home Corporation  
 Commonwealth Code Inspection Service  
 Fine Line Homes  
 Irwin Contracting Custom Homes, LLC  
 Lackawanna HBA  
 Muncy Homes, Inc.  
 PA Association of Professional Soil Scientists  
 PA Petroleum Marketers & Convenience Store Association  
 Pennsylvania Concrete Masonry Association  
 Pennsylvania Housing Finance Agency  
 Pulte Homes Corporation  
 S&A Homes  
 Sota Construction Services, Inc.  
 Superior Walls of America, Ltd.  
 T.H. Properties  
 Weyerhaeuser Company  
 York Corrugating Co.  
 York County Builders Association

## Patron

Adams Township  
 Alan Hawman Architect  
 Avignon Homes, Inc.  
 Benchmark Civil Engineering  
 BIA of Northeastern PA  
 Borough of Fox Chapel  
 Borough of Frackville  
 Bozzuto Development Co.  
 Britton Construction Services, Inc.  
 Building Inspection Underwriters, Inc.  
 Bursich Associates, Inc.  
 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  
 ECI Corp.  
 Engineering Projects Incorporated  
 Franklin County Builders Association  
 GAI Consultants  
 Gluszko Architects, P.C.  
 Gutters Insulation & More  
 HDR Engineering  
 Independent Quality Alliance  
 Jack Gaughen ERA  
 James Wentling/Architect  
 Jenkintown Associates  
 Joy Beck Custom Builders, Inc.  
 Kuhns Bros. Log Homes, Inc.  
 Lobar Properties  
 Lower Swatara Township  
 LTS Builders, LLC  
 MaGrann Associates  
 Manheim Township  
 Mesa Wood, Ltd.  
 Morrissey Holdings, L.P.  
 NHR Real Estate Services  
 Nittany Homes  
 Old Lycoming Township  
 Paul Macht Architects, LLC  
 Penn Terra Engineering, Inc.  
 Perry L. Cisney Custom Builder  
 Peters Township  
 Preferred Solutions, Inc.  
 Pure Energy  
 Queen Engineering  
 Redevelopment Authority of Washington Co.  
 Redevelopment Authority Uniontown  
 Rettew Associates, Inc.  
 Richmond Township  
 River Rock Creative Group  
 Riverview Homes, Inc.  
 Schumacher Homes Greensburg  
 Sleighter Engineering, Inc.  
 Somerset County Builders Association  
 Sweetland Engineering & Assoc., Inc.  
 T&T Realty Acquisition Associates  
 Thomas Comitta Associates, Inc.  
 Thomas J. Wasilowski A. L.A. Architects  
 Tim Myers Contracting  
 Upper Darby Township  
 UpStreet Architects, Inc.  
 Vertex Mechanical Inc.  
 Wagner Construction  
 Watkins Architect, Ltd.  
 Wayne County Builders Association  
 Weaver Precast, Inc.  
 Whitehall Township  
 Woodloch Builders, Inc.

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

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  - Patron \$250
- Individuals:**
- Leadership \$500
  - Supporting \$250
  - Patron \$100



[www.engr.psu.edu/phrc](http://www.engr.psu.edu/phrc)

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**Upcoming Meetings**

Oct. 15 - 6:00 p.m.	Operations Committee Meeting	Harrisburg
Oct. 16 - 9:30-2:00 p.m.	Industry Advisory Council Meeting	Harrisburg
Nov. 19 - 4:00 p.m.	Hankin Distinguished Lecture—Nicholas Retsinas	Nittany Lion Inn, Ballroom A/B/C
Nov. 20 - 5:30-9:00 p.m.	Penn State NAHB Student Awards Banquet	Nittany Lion Inn, Fireside Lounge
Feb. 11-12	PA Housing and Land Development Conference	Hilton, Scranton, PA

For additional details on training programs, visit [www.engr.psu.edu/phrc](http://www.engr.psu.edu/phrc)