

# Pennsylvania Housing Research Center

Pennsylvania State University/  
Penn College of Technology



## 1999 Annual Report

Since July 1988, the PHRC has served the housing industry in Pennsylvania by carrying out applied research and delivering education, training and technology transfer. The PHRC is located both at the Pennsylvania State University at University Park and at the Pennsylvania College of Technology in Williamsport, thus providing a synergistic combination of research, application and training capabilities. Through its access to faculty, staff, students and external consultants, the PHRC can address many issues related to housing.

The PHRC is set up to operate with extensive industry input and involvement. Projects are selected with input and approval from the PHRC's Advisory Council and the Operations Committee. Members include trade associations, product manufacturers and suppliers, government agencies and individual builders and remodelers. This level of industry input ensures that the PHRC's projects and services meet the needs of the housing industry.

The following is a brief discussion of the PHRC activities that received support from DCED during the 1999 calendar year. A copy of each of the reports, pamphlets, builders Briefs and other publications is included with this report.

### Training, Education and Outreach Activities:

**7<sup>th</sup> Annual Housing Conference: Innovation without Headaches** – This one-day event, co-sponsored with the PBA, was held on February 26, 1999. About 80 people attended, 34% were builders, 24% Manufacturers, and 22% were Vo-Tech Instructors. The following are some of the topics that were covered:

- Recent class action lawsuits and methods to reduce builders liability
- Housewrap in Walls: Installation, Performance, and Implications
- Steel Stud Framing- Doing it Right
- Housing Innovations and the Code Official

**Speaker Service** – As a service to the home building and remodeling industry in Pennsylvania, the PHRC is offering a speaker service to local and regional associations. This service is provided at no charge to the local HBA's. The PHRC offers short (20 to 45 minutes) technical sessions that provide an understanding of and a solution to the problems that builders and remodelers may be facing. Since the PHRC announce this service in the late spring, the following presentations have been made:

- Moisture & Crawl Space Ventilation: its not all good news! Washington County HBA
- The PHRC and what we are doing for the Housing Industry – HBA of the Alleghenies
- Innovations in Basement Systems – HBA of the Alleghenies
- Innovations in Masonry – Bucks-Mont Chapter of NARI
- Homes for Life Workshop – Self Determination Housing Project, Philadelphia, PA
- What Builders need to know About the UCC – Lebanon County HBA

**Workshops and Training** – The PHRC held a series of technical workshops for builders, remodelers, educators and code officials. These workshops were sponsored by a variety of organizations involved with the residential construction industry. They included the following subjects:

**Building with Engineered Wood Products** – This half-day workshop in Harrisburg, PA discussed common design and installation problems for engineered lumber and floor and ceiling trusses and how to avoid them.

**Homes for Life** – This full-day workshop in Warrendale, PA discussed the design and construction challenges to building homes that are more ergonomically designed to better meet the needs of people. Marketing and sales approaches were also discussed.

**Introduction to Building Codes** - This half-day workshop in Harrisburg, PA presented an overview of building codes, administrative and enforcement provisions and model residential codes.

**Code Compliance Workshop** – This half-day workshop in Harrisburg, PA discussed common code compliance violations by builders and their subs and how to avoid them.

**WWW Site** – The PHRC has developed and maintains a web page to help disseminate information ([www.engr.psu.edu/phrc](http://www.engr.psu.edu/phrc)). The executive summary of each of the reports and the builder briefs are also available from the web page.

**PHRC Newsletter** – The PHRC produces a newsletter on a regular basis that informs readers of the PHRC's projects, recent reports and other resources that are available to the housing industry in Pennsylvania.

## **Publications:**

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### **Technical Reports:**

- The Importance of the Modular Housing Industry to Pennsylvania, PHRC Report No. 56
- Design Issues with Steel-Stud-Framed Wall Systems, PHRC Report No. 58
- The Use of Housewrap in Walls, Installation, Performance and Implications, PHRC Report No. 59
- Building Code Training Needs in Pennsylvania, PHRC Report No. 61
- House Building Industry: Educational Needs Assessment, PHRC Report No. 65
- Residential Site Improvement and Subdivision Design Standards: A Review, PHRC Report No. 66

## Other Reports:

- Identifying a Vision for the PHRC, PHRC Report No. 57
- Housing Innovation – Management, Business and Marketing Practices: A session Sponsored by the Consortium of Housing Research Centers at the NAHB International Builders Show, PHRC Report No. 60
- Marketing Modular, PHRC Report No. 62
- Innovations Without Headaches, 7<sup>th</sup> Annual PHRC Workshop, PHRC Report No. 64
- PHRC Business Plan, PHRC Report No. 67<sup>1</sup>
- New and Improved Basement Wall Systems, PHRC Builder Brief, BB0199.
- Composite Action and Floor System Stiffness, PHRC Research Brief, RB0199.

## Technical Activities:

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### Applied Research Projects:

- **Membranes on Exterior Sheathings** – Conducted field investigations, laboratory testing and analysis of various housewraps and building papers to evaluate in-place performance, especially their effectiveness as an air barrier in residential wall assemblies.
- **Steel Studs Framing Systems** – Analysis (computer modeling) and some experimental simulation of wall systems to assess the performance of steel stud systems in relation to the control of heat, air and moisture.
- **Remediation and Repair of Masonry** – Laboratory testing has been performed on brick masonry wall assemblies to assess the effectiveness of various methods of repairing masonry walls.
- **Performance of Wood Floor Assemblies** – Investigation and long term creep behavior testing of floor systems constructed of engineered wood I joists and oriented strand board (OSB) sheathing.
- **Composite Action in Residential Floor Systems** – Laboratory testing and analysis of the performance enhancement that results from composite action using different nailing and gluing techniques and applications with engineered wood products.
- **Basement Performance Modeling** – Development of a computer modeling tool that will allow two and three-dimensional modeling of heat flow from basements and concrete slabs.

### Additional Housing-related Projects:

- Review and analysis of site improvement standards in Pennsylvania and surrounding states. This project seems to be gaining wide support from multiple interested parties. In 2000 the PHRC will continue this project by forming a coalition of interested parties to develop model site improvement standards for use in Pennsylvania.
- Evaluation of foundation tolerances for modular houses. This project will be completed in 2000 with the development of a Builder Brief discussing code requirements, bid specifications and construction tolerances for builders and contractors.

- Investigation into site evaluation and foundation systems for manufactured housing. This project will continue in 2000 and results will be used in the training provided through the Manufactured Housing Resource Center at Penn College. Some of the work will be done in conjunction with the Pennsylvania Manufactured Housing Association.
- The economic importance of Manufactured Housing to Pennsylvania. This report will be completed in 2000.
- Technical Assistance to the City of Philadelphia involving the initial evaluation of insulation practices for masonry walls in rehabilitation projects and potential effects on building durability.
- Provided an analysis of workforce development activities that focused on the residential construction industry. This will result in a report to be developed early in 2000.
- The PHRC initiated the Construction Code Training Consortium. The development of the Consortium was first discussed in the PHRC Report No. 61 “*Building Code Training Needs in Pennsylvania.*” Its function is to help identify the building-code-related training and educational resources and needs of various groups across the Commonwealth. The consortium’s role will be to provide a forum for members in order to coordinate what each of the members is doing; to coordinate training among the members; and to provide training where it is not provided, both geographically and by subject area.

The Consortium consists of interested organizations, associations and state agencies that either provide building code training or represent groups that need access to training. Interest in membership in the Consortium is increasing as the group comes together. The following groups have been invited to participate:

ABC, Pennsylvania Chapters	Pennsylvania Association of Code Officials
American Institute of Architects, Pennsylvania	Pennsylvania Association of Plumbing, Heating and Cooling Contractors
American Subcontractors Association, Pennsylvania Chapter	Pennsylvania Builders Association
Associated General Contractors of Pennsylvania	Pennsylvania Building Officials Conference
Associated Pennsylvania Constructors	Pennsylvania College of Technology
BOCA Pennsylvania Regional Office	Pennsylvania Department of Community and Economic Development, Governors’ Center for Local Government Services
Building Codes Assistance Project	Pennsylvania Department of Labor and Industry
California University of South Pointe	Pennsylvania Housing Research Center
Commonwealth Building Officials	Pennsylvania Manufactured Housing Association, Inc.
Constructors Association of Western Pennsylvania, AGC	Pennsylvania Society of Professional Engineers
Consulting Engineers Council of Pennsylvania	Pennsylvania State Association of Boroughs
Contractors Association of Eastern Pennsylvania	Pennsylvania State Association of Councils of Government
General Building Contractors Association	Pennsylvania State Association of Township Supervisors
Harrisburg Area Community College	Pennsylvania Vocational Association
Local Government Academy	Pocono Builders Association
Master Builders Association of Western Pennsylvania	The Pennsylvania League of Cities and Municipalities
Mid-Atlantic Building Systems Council	
National Association of the Remodeling Industry	
National Conference of States on Building Codes & Standards	

## Other Activities:

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### Committees:

NAHB: Housing Affordability Through Design Efficiency (HATDE) Committee  
Consortium of Housing Research Centers (Board Member, Vice-Chair for Research)  
US Department of Energy's (DOE) Peer Review Committees for:  
    ORNL Building Enclosure Program  
    Build America Program  
Building Environment and Thermal Envelope Council (BETEC) Board Member  
American Society for Testing and Materials (ASTM) Committee E06.5507, Weather Restive Barriers

Pennsylvania Builders Association (PBA):  
    Training and Education Committee  
    Housing Finance Committee  
    Editorial Review Board  
    Small Contractors Council  
    PHRC Committee

Advisory Council for the Modular Housing Training Institute (MHTI)  
Advisory Council for the Building Codes Assistance Program (BCAP)  
Advisory Council for the Manufactured Housing Resource Center (MHRC)

Planning Committee for Affordable Comfort Conference  
Planning Committee for Bugs Mold and Rot III Conference

### Conference Presentations:

NAHB's International Builders Show  
Energy Efficient Builders Association (EEBA) Conference  
Bugs Mold and Rot III Conference  
Thermal Envelope IIV Conference  
International Commission on Buildings (CIB) Conference  
Masonry Society Conference

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