

# Annual Report 1998-1999



## Background:

---

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 listing of some PHRC activities during the 1998/99 fiscal year.

## Training, Education and Outreach:

---

**7<sup>th</sup> Annual Housing Workshop** – 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 or other Instructors. The following are some of the topics that were covered:

- Recent class action lawsuits and methods to reduce builders liability
- The House Under Pressure
- Housewrap in Walls: Installation, Performance, and Implications
- Exterior Insulated Finish Systems
- Steel Stud Framing- Doing it Right
- Energy and Comfort
- Housing Innovations and the Code Official

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

- Washington County HBA – Moisture & Crawl Space Ventilation: its not all good news!
- HBA of the Alleghenies – The PHRC and What its Doing for the Housing Industry

- HBA of the Alleghenies – Innovations in Basement Systems
- Bucks-Mont Chapter of NARI – Innovations in Masonry

**What Builders need to know About Building Codes** – This workshop provided an overview of building codes and code compliance issues. It was held in conjunction with PBA’s Fall board meeting in Warrendale PA. About 35 people attended the three-hour workshop.

**Other Outreach Activities:**

- Web 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)).
- 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:**

---

**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

**Technical Papers:**

Straube, J.F., and E.F.P. Burnett, “Drainage, Ventilation Drying, and Enclosure Performance,” *Presented at Thermal Performance of Building Envelopes VII*, Clearwater Beach, Florida, December 4-7, 1998.

Taylor, S.B., H. B. Manbeck, and J.J. Janowiak, “Structural Insulated Panel (SIP) Fractional Creep Deflection,” *Proceedings of the 1998 World Congress on Timber Engineering*. Lausanne, Switzerland. August 17-20, 1998.

Straube, J.F., and E.F. P. Burnett, “Field Measurements of Masonry Veneer Exposure Conditions,” *Proceedings of the Eighth Canadian Masonry Symposium*, Jasper, Alta., Canada, May 31 – June 3, 1998, pp. 208-221.

Straube, J.F., and E.F.P. Burnett, “Vents, Ventilation and Masonry Veneer Wall Systems”, *Proceedings of the Eighth Canadian Masonry Symposium*, Jasper, Alta., Canada, May 31 – June 3, 1998, pp.194-207.

Bosak, E. J., and E.F.P. Burnett, “Durability of Wall Systems Containing Housewrap”, *Proceedings of the Conference on the Durability of Building Materials and Components*, Vancouver, Canada, May, 1999, pp. 959-969.

### 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
- PHRC Business Plan, PHRC Report No. 67\*

\*Intended for internal use; not for distribution

### Current Projects:

---

#### 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 framing 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, especially the use of helical stainless steel ties and reinforcement.
- **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.
- **Air Leakage Paths in Houses** – Initial development of computer models of the air flows through basements and ducts.

#### Additional Housing-related Projects:

- Review and analysis of site improvement standards in Pennsylvania and surrounding states.
- Evaluation of foundation tolerances for modular houses.
- Investigation into site evaluation and foundation systems for manufactured housing.
- The economic importance of Manufactured Housing to Pennsylvania.
- 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.

- The development of multimedia software that can be used for training and marketing by the modular housing industry.

## **Other Activities:**

---

### **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, Moisture Committee

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

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 (Dallas)

Energy Efficient Builders Association (EEBA) Conference (Washington, D.C.)

Bugs Mold and Rot III Conference (Washington, D.C.)

Thermal Envelope IIV Conference (Clearwater Beach)

International Commission on Buildings (CIB) Conference (Vancouver)

Masonry Society Conference (Austin)

## **Contacts:**

---

Dr. Eric F. P. Burnett

Director

PHRC

Phone: (814) 865-2341

FAX: (814) 863-7304

Email: efb6@psu.edu

Mr. Mark Fortney

Assistant Director

PHRC

Phone: (814) 863-2366

FAX: (814) 863-7304

Email: mfortney@psu.edu

Mr. Bill VanderMeer

Director

PHRC at Penn College

Phone: (717) 327-4768

Fax: (717) 327-4515

Email: bvanderm@pct.edu