



---

The Pennsylvania Housing Research Center

# Projects for the 2001-2002 Fiscal Year Revised

Pennsylvania Housing Research Center  
Penn State University  
219 Sackett Building  
University Park, PA 16802  
Telephone: (814) 865-2341  
Facsimile: (814) 863-7304  
E-mail: [phrc.psu.edu](mailto:phrc.psu.edu)  
Web Site: [www.engr.psu.edu/phrc](http://www.engr.psu.edu/phrc)

Updated January 16, 2003

## FY 2001/2002 Preface

Each year, the Pennsylvania Housing Research Center (PHRC) seeks to identify and prioritize a series of projects that collectively satisfy the following criteria:

- meet house builder needs and home building industry needs and the needs of the housing consumer in Pennsylvania;
- be consistent with the mission and goals of the PHRC;
- be affordable and feasible, given the resources available and the prevailing constraints on time, expertise and facilities; and
- be a balanced program of projects that address both the long and the short-term needs of all sections of the industry.

This PHRC work plan is the result of input and assistance from numerous individuals and groups. The PHRC Advisory Council and the Operations Committee, in particular, have responsibility for the final choice of topics. These housing industry-based bodies consist of manufacturers and suppliers, builders, remodelers and industry associations. Suggestions for projects and feedback have also been received from the Pennsylvania Builders Association's (PBA) Training and Education Committee, and individual builders and remodelers.

The list of projects that follows identifies only those 2001-2002 fiscal year projects that are to receive some degree of support from funds provided to the PHRC by the Commonwealth of Pennsylvania, Department of Community and Economic Development. The projects started in the beginning of June 2002 and plan on being completed on or before the end of June 2004. In most cases, we have attempted to use state funding to leverage outside support; in other cases the work is considered important enough to warrant full support. A budget by project category is presented in Attachment 1. We plan to continue with our previous initiatives in the areas of training and education, modular housing, manufactured housing, and applied research.

We have tried to build into the program some flexibility with regard to the number and nature of projects and their funding. We are required to plan projects and allocate funds at the start of each fiscal year. However, there is a real need for the PHRC to be able to take on special projects during the year. These projects typically fall into two categories: the first includes short term and limited scope projects that are time sensitive while the second requires the ability to allocate some funds to leverage additional outside funds in response to request for proposals.

**Training, Technical Assistance & Outreach:** The PHRC has a mandate to transfer knowledge by providing the necessary training and education to the wide variety of groups that make up the housing industry. The projects that are described below are in response to the recommendations that flowed out of the PHRC's industry advisory council and reflect the current needs within the housing industry.

**Workshops**

1. **Description:** Every year the PHRC provides a series of workshops for builders, remodelers, design professionals, educators and building code officials. These programs are held in partnership with local and regional building related associations and building code associations. Some of the topics that are being considered for this year's programs include the following:
  - Alternative Building Systems
  - Engineered Lumber
  - Storm Water Management & WPDES II
  - Design and construction of wood frame buildings (NDS)
  - Moisture Control, and
  - Other Building Science related issues.

**Manager/PI:** Fortney

**Deliverable:** The PHRC will develop and deliver at least two technical workshops to be held in various locations across the state.

2. **Description:** In conjunction with the Pennsylvania Department of Education, Bureau of Career and Technical Education and Workforce Education and Development, Penn State University, and Department of Education, the PHRC will be presenting a 4-day program on new technology and innovations for residential construction directed at vocational teachers.

**Manager/PI:** Sagan

**Deliverable:** The PHRC will be an active participant in the 4-day conference to vocational instructors. The instructors will gain the necessary information to incorporate the latest technology, innovations and techniques into their curriculum.

**Builder Briefs**

**Description:** Continuation of the series of short technical documents, two to four pages in length, that address specific issues that have been identified by builders or remodelers. These documents are intended to be quick to read with much information presented graphically or pictorially.

The following are topics that are being considered:

- Window Technology
- So you want to become a code official
- Basement Insulation Strategies
- Indoor Air Quality in New Homes
- Site completion of Modular Houses

- Installation of Copper Piping vs. Plastic Plex Tubing

**Manager/PI:** Fortney, Burnett, VanDerMeer, Sagan

**Deliverable:** At least three Builder Briefs will be researched, written, printed and distributed by June 30, 2003

**Manuals, Guidelines, etc.**

**Description: Moisture Control and Enclosure Design Handbook** Moisture and moisture related problems, especially mold growth, are of growing concern for both builders and homeowners. Moisture control in residential buildings is a design and performance goal for both builders and design professionals. The PHRC has developed a 1-day workshop on moisture control that has been very well received. These course notes are the foundation for the development of a design handbook for use by the building community.

**Manager/PI:** Burnett

**Deliverable:** The completion of a design handbook for building enclosures.

**Building Code Training**

**Description:** The passage of the Uniform Construction Code (Act 45 of 1999) will create, for the first time, a statewide building code for Pennsylvania. When this Act is implemented, it will cause the single biggest change for the construction industry in Pennsylvania. For areas of the state that have never had an enforced building code, now there will be one. For areas with an enforced building code, a new code will replace the existing regulations. This will change the way we build. It will also affect the way some builders operate their business.

In response, the PHRC has developed a series of building code training programs intended for builders, remodelers, building code officials, design professionals, and others involved in residential construction. These programs were developed with the support of the Pennsylvania Builders Association (PBA) and DCED, the U.S. Department of Energy. The following are the programs to be offered during this program period:

- |  |       |
|--|-------|
| 1. Comprehensive International Residential Code 2000 Program | 2 day |
| 2. CABO / BOCA Transition Program                            | 1 day |
| 3. Applying the New Energy Code in PA                        | ½ day |
| 4. UCC Plumbing Code for Contractors                         | ½ day |
| 5. UCC Mechanical Code for Contractors                       | ½ day |

**Manager/PI:** Sagan, Fortney

**Deliverable:** The PHRC will develop and deliver at least 30 workshops to be held at various locations across the state. Additional programs will be developed and/or delivered to meet training needs as they develop.

**Description: "Teach-the-Teachers" Program:** Incorporate a program to begin training vocational teachers on the code to facilitate training contractors and design professionals through their Adult Education Programs. This program will enable the possible franchising of our current code programs and curriculum by vocational schools.

**Manager/PI:** Sagan, Fortney

**Deliverable:** Incorporate a "teach-the-teachers" program to maintain the high standards that are presently maintained. Possible franchise of our programs and curriculum. This will be an on-going project for about 5-years.

**Technology Transfer  
& Outreach**

**Description:** Continuation or expansion of activities to get information and publications to builders, remodelers, design professionals, building code officials and others involved in the residential construction industry.

**Manager/PI:** Fortney

**Deliverable:** The PHRC will work with the PBA and other industry and trade organizations by means of the following activities:

1. **Annual Pennsylvania Housing Conference/Workshop:** The PHRC organizes an annual event to address one or more technical issues. This event is intended for builders, developers, vocational technical instructors, utility personnel, state policymakers, product manufacturers, and others involved in the housing industry.
2. **Speaker Service:** The PHRC will hold and/or participate in talks and seminars directed at the housing industry. This may include trade association functions and regional meetings, local association dinner or breakfast meetings, or state or national conferences.
3. **Outreach Activities:** This includes activities to let builders know about the PHRC and the services and publications it provides. These activities may include the PHRC newsletters, mailings, promotional pamphlets, advertisements in trade journals, phone calls, and the PHRC's Web site.

**Applied Research:** A very important function of the PHRC is to undertake or stimulate research and development on materials, products, procedures, etc. These efforts may have a longer-term and/or a more fundamental focus than other projects. The projects that are listed below make use of , foster partnerships and draw on the expertise and strengths of the persons, the groups and the facilities available at both the Pennsylvania State University and Pennsylvania College of Technology.

**Moisture Control  
in Enclosure Wall  
Systems**

**Description:** Wetting, storage and drying in residential wall systems is a critical and topical issue for buildings. Relevant mechanisms are to be identified and defined. Both experimental and analytical modeling of the mechanisms involved is to be conducted. This project is largely funded by ASHRAE.

**Manager/PI:** Burnett

**Deliverable:** A technical report will be generated as well as at least one short technical document for builders.

**Steel Framing in  
Residential  
Construction**

**Description:** This continuing research project addresses the thermal and moisture related consequences when light-gauge steel elements are use in place of wood in wall, floor or roofing systems in buildings. This work has significant implications for the steel industry in PA.

**Manager/PI:** Burnett

**Deliverable:** Reports and appropriate short technical publications.

**Convective Drying  
in Walls**

**Description:** This project is to investigate and quantify the contribution of convective drying to moisture control in wall systems. Significant funding is to be provided by the National Science Foundation under the PATH program.

**Manager/PI:** Burnett

**Deliverable:** A report and appropriate builder brief.

**Properties of structural  
composite lumber floor  
systems**

**Description:** Will study shear strength, diaphragm action & stiffness of floors. Possible industry and USDA funding.

**Manager/PI:** Manbeck

**Deliverable:** A technical report and builder oriented document.

**Building Enclosures:  
Science and Design**

**Description:** Based largely on material developed for two University level courses, namely:

- Residential Building: Design and Construction, and
- Building Science and Enclosure Design;

A general textbook is to be developed. This text will compliment and add value to the various specialized publications (by ASHRAE, DOE, ASTM, NAHB, PHRC, etc.) that are available.

**Manager/PI:** Burnett

**Deliverable:** A textbook.

**Properties of structural composite lumber floor systems** **Description:** Will study shear strength, diaphragm action & stiffness of floors. Possible industry and USDA funding.

**Manager/PI:** Manbeck

**Deliverable:** A technical report and builder oriented document.

**Land Development:** The following new projects have been identified by builders and approved by the PHRC Operations Committee as high-priority projects for Pennsylvania's home building industry.

**Site Improvement  
Standards –  
Phase II; Standards  
Coalition**

**Description:** The PHRC will provide the leadership and staffing to bring together a coalition of stakeholders to identify consensus needs and develop a strategic plan for the group. One goal of the group will be the development of guideline development standards and model ordinance sections addressing critical sustainable development issues.

Work will include

- Identifying and contacting all critical stakeholder groups,
- Organizing, planning, and leading for the first coalition meeting,
- Producing a follow-up document providing minutes of the first meeting, identifying Coalition structure, and outlining an initial strategic plan for the Coalition.
- Schedule for future meetings.

**Manager / PI:** Brown

**Deliverable:** The deliverable under this activity will be a report identifying a strategic plan for the Coalition.

**Land Development  
Standards Inventory**

**Description:** This project includes development of an inventory of zoning and land development practices within the state. Local ordinances will be reviewed to identify regulatory elements and standards related to sustainable development (such as stormwater management practices, zoning flexibility, road design standards, infiltration practices, etc.). Existing standards will be categorized and inventoried. Areas where ordinance improvements are necessary to promote sustainability will be identified and prioritized. The information from this inventory will be used to shape the direction and needs for the development of model standards.

**Manager / PI:** Brown

**Deliverable:** A summary inventory of current land development and subdivision practices regulatory standards in use in Pennsylvania.

**Factory Built Housing:** The PHRC has been working closely with the Modular Housing industry and the Manufactured Housing Industry. Two training centers have been established at the Pennsylvania College of Technology. A number of projects have been completed or are currently underway. The following projects build on our past experience and add value to our current commitment.

**MHTI & MHRC**

**Description:** Two programs focusing on training for the factory built housing industries have been developed. The first is the Modular Housing Training Institute (MHTI) and the second is the Manufactured Housing Resource Center (MHRC). The MHTI program currently provides a two-day training program that focuses on the on-site completion of modular houses. The program is intended for builders, installation crews, code officials as well as industry representatives. The MHRC currently provides training for the on-site completion of manufactured or HUD Code housing. The program is intended for retailers, installers, manufacturers as well as building code officials.

**Manager/PI:** Penn College of Technology

**Deliverable:**

1. Promotion of the programs by providing presentations at trade association meetings, direct marketing to manufacturers, community owners and retailers, etc.
2. Delivery and Development of Training: Provide instructors, instructional materials and training sites for the purpose of delivering training programs.
3. Field Investigations: Conduct up to 15 field investigations of both manufactured and/or modular homes. The purpose of these field investigations will be to identify and document issues of common concern and then to provide technical assistance to the factory built housing industries. Also, there is a need to evaluate the effects of educational programs. Data will be compiled for each investigation. Reporting will be on aggregate data so individuals or particular houses cannot be identified. Intent is to refine and further develop MHRC and MHTI training initiatives.

**Technical Concerns for the Modular and Manufactured Housing Industries**

**Description:** This general initiative is intended to provide resources to address specific technical issues identified by these industries and the Modular Housing Training Institute (MHTI) and the Manufactured Housing Resource Center (MHRC).

**Manager/PI:** Fortney

**Deliverable:** The deliverable for this will be brief technical documents addressing specific concerns. The documents will be written for the appropriate audiences with the potential for use by either MHTI or MHRC in their training.