
HRC NEWS

Vol. 1. No. 2. Summer 1992

A Publication of the Housing Research Center at The Pennsylvania State University

RESEARCH PROJECTS FOR '92-'93

The Housing Research Center has three new research projects that will begin with the new academic year. Based on the direction set by the HRC Advisory Council in May, the proposals and budgets are being completed in order to ensure a smooth transition from the completion of the existing projects and the start of new ones.

The Energy Project

The "Optimization Analysis of Total Energy Utilization in Residential Construction", is a continuation of last year's project on "Optimization Analysis of Residential Energy Systems". An update of this work appears on page 3 of this newsletter.

As background for the upcoming research we should consider the problems that the residential industry faces today. Buildings consumed approximately fifty percent of the total U.S. energy bill last year. As energy supplies become more scarce, the demand for energy efficient construction will continue. Many energy efficient materials, mechanical systems, and construction techniques are available to meet the future challenges of conservation and efficiency. However, the diverse nature of the industry and the variety of manufacturer's products prevent their direct and efficient implementation.

The new study will continue the life cycle cost optimization of heating and cooling systems, based on the geographic site location of a residence by taking into account fuel costs, materials, and construction techniques. It will also include an evaluation of the fuel cost ratios (between gas and electricity) at which the conclusions reached would change.

The final report, due next April, will consist of a matrix that builders in Pennsylvania can use to determine the most cost effective materials and types of heating and cooling systems for their clients based on the fuel costs of the site location.

continued next page

HRC FUNDRAISING SUPPORT

In this year of uncertain economic times the HRC is streamlining its operations and pinpointing its fundraising efforts to ensure effectiveness and responsiveness to the residential construction industry.

Research and Technology Transfer efforts by the HRC can be funded through external and internal funding. Externally generated funds are provided by individuals, firms, and organizations that want to sponsor projects on their own. Internally generated funds are raised under the auspices of the Pennsylvania Builders Association (PBA) sponsored fundraising plan. The Advisory Council of the HRC then allocates these funds to support projects that appear on their agenda of critical issues facing the residential building industry.

These internally generated funds are extremely important to the HRC because they reflect the "trust relationship" between the HRC and members of the homebuilding industry in Pennsylvania and surrounding states.

To kick off the fundraising effort for the '92-'93 year, Frank Corace Thompson, the President of PBA, in conjunction with the HBA of Central Pennsylvania, will host a "Fundraising Reception" at Tofrees Resort in State College from 6:00 to 7:00 p.m. on August 21, 1992. The reception coincides with the PBA Board of Directors Meeting that will be held the Toffrees Resort that weekend.

On the back page of this newsletter we have included the "Honor Role" of past contributors to the HRC at Penn State. This list dates back to July 1, 1988 when the HRC was founded and includes the Leadership, Supporting, Contributing, and Patron Member categories of contribution. These contributors have helped to provide funds and valuable professional support to the research and technology efforts here and we would like to express our appreciation to all of these friends and supporters.

Research Projects continued

CAD in Residential Construction

The low cost microcomputer systems of today have made computer-aided design (CAD) tools available to most residential builders. Nevertheless we are still faced with many problems such as:

1. Not all CAD systems are easy to use even with the addition of customized menus.
2. Architectural menus often deal with commercial design issues and are not specific to the residential building industry.
3. Customization of CAD requires programming knowledge, something many residential builders do not have in-house.

The upcoming project entitled "Development of a Customized CAD-Based Design Production System for Residential Builders" will address these problems by developing a "shell" package and macro commands that will improve the user interface, automate the installation of symbols, databases, or prototype drawings, and provide "pop down" menus and dialogue boxes in a residential builder format for AutoCAD software.

In order to benefit the largest possible number of users in the residential building industry, AutoCAD was selected because of its open architecture and widespread acceptance. A tutorial "work book" including a floppy disk containing the program enhancements will be developed for use in instructional seminars that will be a part of a technology transfer session sponsored by the HRC.

Residential Framing Systems

The residential construction industry in Pennsylvania stands at a crossroads. One path leads towards the conventional use of softwoods such as spruce, pine, and fir with balloon and platform stick framing systems while the other path leads towards an investigation and implementation of alternative systems and materials. Alternative systems can include solid sawn post and beam, glulam, stress-skin sandwich panels as well as prefabricated stick-built systems. Alternative components include engineered members such as trusses and laminated veneer lumber (LVL) made from softwoods or hardwoods.

In Pennsylvania, underutilized hardwoods such as red maple, and yellow poplar are relatively abundant at reasonable prices. The dilemma for today's builders is to position themselves so they can respond to their client's needs with state of the art materials and components, while providing the most economical

system for the project as a whole. Locally available hardwoods offer an economical and workable material alternative to conventional softwood systems.

This project will investigate the feasibility of introducing underutilized locally available hardwoods (red maple and yellow poplar) into pre-engineered residential framing systems. This proposal addresses the first phase of a three year project that will optimize components of residential framing systems.

The deliverables for year one of this project will be a report consisting of a literature review of current framing systems and materials used in residential construction, identification of appropriate systems for hardwoods and a comparison of new and existing systems. This will provide members of the residential industry with concise examples of comparisons.

NEXT TIME IN THE HRC NEWS

In November we will keep our promise to highlight the NAHB Research Center activities with a feature article. We will also focus on the Residential Construction curriculum offered here at Penn State.

HRC NEWS
Volume 1, Number 2 Summer 1992
Published three times a year in
March, July, and November by
The Designated Housing Research Center
at Penn State.

212 Sackett Building
Penn State University
University Park, PA 16802
814-863-0623 or
814-865-2341.
FAX 814-863-7304

Editor: Steven Taylor

Contributions and news items are
welcome. The deadline for fall issue
submissions is October 1, 1992.

AN UPDATE OF PRESENT RESEARCH

Our premier issue introduced three research topics that were designated as priorities by the Advisory Council for the '91-'92 year. We will continue to give you an update of current projects in each issue.

Technology Transfer Program

There are two major parts to this research effort. Each part relates to the Graduate Builders Institute/ Certified Graduate Remodelers Program presented by PBA. First, we are developing an instructional package for Computer Based Estimating using the Timberline Estimating Software and the Home Builders Database. This package will provide material for a hands-on "GBI type" computer course on residential estimating which demonstrates the use of customized estimating databases and workpackages.

Secondly, this project examines the feasibility and implementation processes of a broadened technology transfer program for Pennsylvania's residential building industry. At this point, locations have been identified around the state where we will be collecting data through builder focus groups. The result of this study will be an evaluation of existing PBA courses and a five year plan for new course implementation.

Infrastructure Update

Two research reports in storm water management area have recently been completed. The first is entitled "A Comparison of Methodologies Used to Estimate Stormwater Runoff and Detention Basin Volume on a Sample Watershed." This report compares several estimation methods and applies them to a sample case study. The findings of this report have been incorporated into the "Standard Practice" of the Model Stormwater Management Ordinance for Municipalities in Centre Region, which has been authorized and put into practice by all six municipalities in the Centre Region.

The second topic is an investigation of the "Analysis of Flow Through Porous Media as Applied to Gabion Dams Concerning the Storage and Release of Stormwater Runoff." This research indicates that gabion dams can successfully store and properly release runoff from detention basins, making them an alternative to conventional riser box systems.

Progress continues with the development of the "Evaluation of Spray Irrigation Systems for Small Flow Sewage Treatment Facilities" educational package. The seminar is on for November!

Energy Systems

<p>IMPORTANT</p> <p>Energy Symposium: Guidelines for Meeting Requirements in Housing in the '90s</p> <p>Ben Franklin Propo</p> <p>Advisory Council M and Dinner</p> <p>Matt Syal steps down</p> <p>Steve Taylor takes o</p> <p>Assistant Director of</p> <p>Advisory Council Research Symposium</p> <p>Fundraising Recepti</p> <p>On-Lot Sewer Semi</p> <p>Jack H. Willenbrock</p> <p>Sabbatical at the NA</p> <p>Research Center and</p> <p>Phyllis A. Barner</p> <p>Sabbatical at</p> <p>Harvard University</p>	<p>The research project entitled "An Optimization Analysis of Residential Energy Systems" has progressed considerably since the last issue of the HRC News. Recall that this study will optimize the heating and cooling equipment of two standard houses for a variety of Pennsylvania weather conditions and utility rates.</p> <p>First, information on a number of utility/builder programs and incentives that promote the building of energy-efficient homes has been collected. Secondly, the heating and cooling analysis for two standard case houses has been completed for nine weather conditions across the state. The residential rate schedules and coverage areas for each of the electric and gas utilities has been obtained for use in the life cycle cost optimization of the equipment. Finally, the current trends of the industry related to the choices of what heating and cooling equipment to use in the optimization analysis have been determined.</p>
--	---

**HONOR ROLL OF CONTRIBUTORS
(July 1, 1988 - June 30, 1992)**

LEADERSHIP MEMBERS (\$2500+/-year)

HBA of Central Pennsylvania	4 years
CertainTeed Corporation	3 years
Pennsylvania Builders Association	3 years
Thomas F. Songer (Penn Terra Engr. Inc.)	3 years
Carl Flohr	2 years
HBA of Metropolitan Harrisburg	2 years
Fred Betz	1 year
The Dow Chemical Company	1 year
Bernard Hankin	1 year
J. Alvin Hawbaker	1 year
Jack H. and Judy L. Mitchell	1 year
Pennsylvania Concrete Masonry Association	1 year
Philadelphia Electric Company	1 year
The Ryland Group Inc.	1 year
Elam G. Stoltzfus, Jr., Inc.	1 year
Weyerhaeuser Corporation	1 year

Cal Zimmerman (Zimmerman Homes Inc.) 1 year
 C. Kenneth Zook 1 year

SUPPORTING MEMBERS (\$1000-\$2499/year)

CONTRIBUTING MEMBERS (\$500-\$999/year)

HBA of the Alleghenies2 years
 Indiana-Armstrong Builders Association2 years
 Walter G. Freidhoff 1 year
 J. Roger Glunt 1 year
 J. Garry McShea 1 year
 John H. Miller, Jr. 1 year
 Curtis E. Schneck 1 year
 Pennsylvania Electric Association 1 year
 York County Builders Association 1 year

C. Kenneth Zook3 years
 R. T. Dooley Inc.2 years
 Builders Assn. of Met. Pittsburgh.2 years
 S & A Custom Built Homes2 years
 Richard L. Baumgardner 1 year
 Edward P. Carroll Construction, Ltd. 1 year
 David O. Clark 1 year
 Comfort Home Corporation 1 year
 Carl Flohr 1 year
 Marlin E. Gayman 1 year
 MURUS Corporation 1 year
 Pennsylvania Electric Association 1 year
 S. Murray Rust III (Montgomery Rust Inc.) 1 year
 Curtis E. Schneck 1 year
 Elam G. Stoltzfus Jr., Inc. 1 year
 Toll Brothers Inc. 1 year
 West Penn Power Company 1 year
 Weyerhaeuser Corporation 1 year

PATRON MEMBERS (\$100-\$499/year)

Compleat Restorations (Cliff Ellis)3 years
 Mack L. Smith3 years
 Blair County Builders Association2 years
 Greater Dubois Builders Association2 years
 J. Roger Glunt2 years
 Norm E. White2 years
 Clearfield County Builders Association 1 year
 Walter G. Freidhoff 1 year
 Gary E. Lenker 1 year
 John Martin and Son 1 year
 Somerset County Builders Association 1 year

The Pennsylvania State University is committed to the policy that all persons have equal access to programs, facilities, admissions, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state or federal authorities. The Pennsylvania State University does not discriminate against any person because of age, ancestry, or handicap, national origin, race, religious creed, sex, sexual orientation, or veteran status. Direct all affirmative action inquiries to the Affirmative Action Office, The Pennsylvania State University, 201 Willard Building, University Park, PA 16802-2801; 814-863-0471.

U.Ed. ENG 92-86

*The Housing Research Center at
 The Pennsylvania State University
 212 Sackett Building
 University Park, PA 16802*

Nonprofit Org.
 U.S Postage
 University Park, PA
 Permit No.1

