

Texas Housing Research Program

Texas A&M University

2004 Annual Report

A. Overview of 2004

Housing research at Texas A&M University includes interdisciplinary activities between faculty researchers in laboratories in the Colleges of Architecture and Engineering. The Department of Construction Science competitively awarded eleven O.N. Mitchell Graduate Fellowships in housing research during 2004. The Center for Housing and Urban Development has continued its work in the community resource centers along the Texas-Mexico border and requested funding for completion of more. The compressed soil block machine has facilitated new research activities involving low-cost housing along the Texas-Mexico border. Studies in soils mix designs for earth construction, energy efficiency, moisture control and indoor air quality are making an impact on building design and mechanical design techniques.

B. Projects

Energy Services

Texas Energy Codes- The Energy Systems Lab has State of Texas funding to assist municipalities throughout Texas on understanding, adopting and implementing the International Energy Conservation Code (IECC) and the International Residential Code (IRC – energy efficiency chapter). The ESL staff also determine municipality code compliance.

HVAC/Mechanical/Electrical Research

1. Residential Duct Efficiency Study

PI name: Dr. Charles Culp, P.E.

Title of project: Residential Duct Efficiency Study

Objective: Measure the current duct efficiency and create an “as-built” test protocol which more realistically depicts actual duct installations.

Status of project, or time frame: In process of doing study

Sponsoring agency: Consortium of Duct Manufacturers, Utility

Budget: \$250K+

2. Emissions Reductions from Energy Efficiency

PI name: Dr. Jeff Haberl, P.E., Dr. Charles Culp, P.E., Bahman Yazdani, P.E.

Title of project: Emissions Reductions from Energy Efficiency

Objective: Quantify emissions reductions due to energy efficiency code adoptions and energy efficiency measures.

Status of project, or time frame: In process. Texas has now adopted the IECC Energy Efficiency Codes and we conduct training to make this process easier. We also have a major effort going on an Emissions Calculator (eCalc) which takes residential (and other energy efficiency measures) and then translates these into EPA creditable emissions reductions.

Sponsoring agency: State of Texas, Texas Commission on Environmental Quality, USEPA

Budget: \$1M+

3. Residential A/C Impact on Utility Peak Demand

PI name: Dr Charles Culp, P.E.

Title of project: Residential A/C Impact on Utility Peak Demand

Objective: Determine the cumulative impact of improving A/C SEER ratings in urban topographical areas.

Status of project, or time frame: Initial phase.

Sponsoring agency: Utility

Budget: \$100K+

4. Waste Transport in Piping Systems Served by Ultra-Low Flush Water Closets

P.I. Name: Dr. John A. Bryant, P.E.

This research is being conducted at the Energy Systems Laboratory facility at the Riverside Campus of Texas A&M University.

Sponsors: American Society of Plumbing Engineers (\$200,000), Department of Energy administered through Lawrence Berkeley National Laboratory (\$100,000)

Approximate start and finish dates: Started July, 2002, ended July, 2004

Key terms, words, or findings: Though the emphasis of this research is commercial use of gravity, tank-type water closets, the same fundamental problems exist in both residential and commercial applications of the 1.6 gallon per flush water closet. This research is an investigation into waste (solid) transport in both PVC and cast iron waste pipes at varying slopes and through a 100 foot flow length. WC manufacturer's units were evaluated to determine flush curve characteristics and if there is a link between WC flush curve and transport in the piping system. Another objective of the research is to develop a "human waste substitute" suitable for use in these type of WC tests. Initial tests have shown that the high velocity, short flush duration type WC discharge has the best waste transport results. Results from this research could have significant impact on residential and commercial plumbing codes.

1. Stockpile Sampling, Characterization and Benefication of Twin Oaks Power Station Coal Combustion By-Products (Phase One Study)
P.I.- Dr. Don Saylak, P.E.
Co-P.I. - Dr. Shondeep Sarkar, P.E.
Earth Materials Consultant – Dr. Charles W. Graham, AIA, FRICS
2. Compressed Earth Blocks – Thermal, structural performance; field quality control; building design
P.I. – Dr. Charles W. Graham, AIA, FRICS
Co-P.I. – Dr. Richard Burt
Research in coordination with Prof. John Moroney, Southwest Texas Community College, Del Rio, Texas; includes test modules

Residential Construction Standards Development

1. Home Construction Standards for Texas Residential Construction Standards Commission
P.I. – Joe Horlen, J.D.
Co-P.I. – Debra Ellis, J.D.
Structural Consultant – M.L. (Skip Coody, P.E.)
Mold Task Force Committee – Dr. Charles W. Graham, AIA, FRICS

C. Other Accomplishments

The Department of Construction Science conducted two Home Inspectors Workshops in 2004. These are for the Southern Association of Residential Inspectors. Attendance has averaged 75 inspectors each time the course has been offered. Dr. John Bryan, P.E. is the workshop coordinator.

New Housing Courses

Sustainable and Earth Construction Courses

Both the Sustainable Construction and Earth Construction Courses have been approved by the University and taught by Dr. Richard Burt, the instructor, who is LEED certified.

O.N. Mitchell Jr. Graduate Student Fellowships

During 2004, eleven fellowships were awarded to graduate students studying residential construction and visualization.

Advisory Council

The Housing Research Program reports to the Dean of the College of Architecture through the Department of Construction Science and the Center for Housing and Urban Development. The Construction Industry Advisory Council (CIAC) for the Department of Construction Science provides administrative support.

NAHB Student Chapter

Texas A&M University continues to have an active NAHB Student Chapter. Community service projects are a major activity for the Chapter.

Primary Contact

Dr. Charles W. Graham, A.I.A., FRICS
Bryan N. and Sandra K. Mitchell Endowed Professor of
Housing Research
Department of Construction Science
Texas A&M University
College Station, Texas 77843-3137
979-845-0216
cwgraham@archone.tamu.edu

Alternate Contact

Dr. Lou Tassinary
Associate Dean for Research
College of Architecture
Texas A&M University
College Station, Texas 77843
979-845-1221
lou@archone.tamu.edu