

**LATEST IN
RESIDENTIAL
ENERGY AUDIT
CERTIFICATION**

**NOW WITH
WEATHERIZATION
CAPABILITIES**

Green High Efficiency Training House



**NEW
DESIGN!**



Hampden®
ENGINEERING CORPORATION



GREEN PLANET HOME AUDIT

—Hampden Engineering Corporation

HAMPDEN GREEN EFFICIENCY TESTING HOUSE

With today's limited supply and rising costs of producing and delivering energy, there is an increased demand for building **GREEN** buildings and retro-fitting existing buildings to be more environmentally friendly. By using recycled building materials, air tight construction, energy star rated appliances, modern refrigerants and HVAC controls along with multiple uses for resources, we can greatly reduce the amount of energy being used by the home owner. To this end there is now a great need for highly trained auditors that have the capability to perform detailed inspections and make cost effective recommendations on improving a homes efficiency. The house is manufactured for indoor or outdoor use.



Compatible with all
Major Energy Audit
Certification Programs:

ESCO/Green Mechanical Council

USGBC.

HERS/RESNET

B.P.I.



Go To HAMPDEN FOR THE LATEST IN TECHNOLOGY

The Hampden **MODEL H-HEAT-1A Home Efficiency Auditor TESTING Facility** will allow potential auditors to learn the proper techniques in performing a complete energy audit. Some of the areas covered are consistent data collection, insulation inspection, HVAC analysis, base load consumption, air leakage, energy usage, along with many more vital areas. Along with helping develop these skills the Hampden **MODEL H-HEAT-1A** is provided with an intricate fault package. This fault package will create a realistic situation that will require the auditor to diagnose the problem and specify maintenance or repair.

The Hampden **MODEL H-HEAT-1A** is a small scale **GREEN** building that is built on a movable skid with mobile wheels and outfitted with modern components such as:

- ▶ 410A Air Conditioning System
- ▶ Programmable Digital Thermostat
- ▶ Full Electrical System
- ▶ Fault Package
- ▶ Switchable/Removable Wall Insulation Panel
- ▶ Switchable/Removable Ceiling Insulation Panel
- ▶ Thermal Insulation Imaging
- ▶ TYVEK® House Wrap
- ▶ Variable Speed, Forced Air Heating System
- ▶ Variable Speed, Forced Air Cooling System
- ▶ Fully Insulated Duct Work
- ▶ Triple Pane Windows
- ▶ Finished Walls and Ceiling
- ▶ Locking Storage Cabinet
- ▶ Roof Mounted Solar Collectors for Electricity
- ▶ Interior/Exterior Intercom System

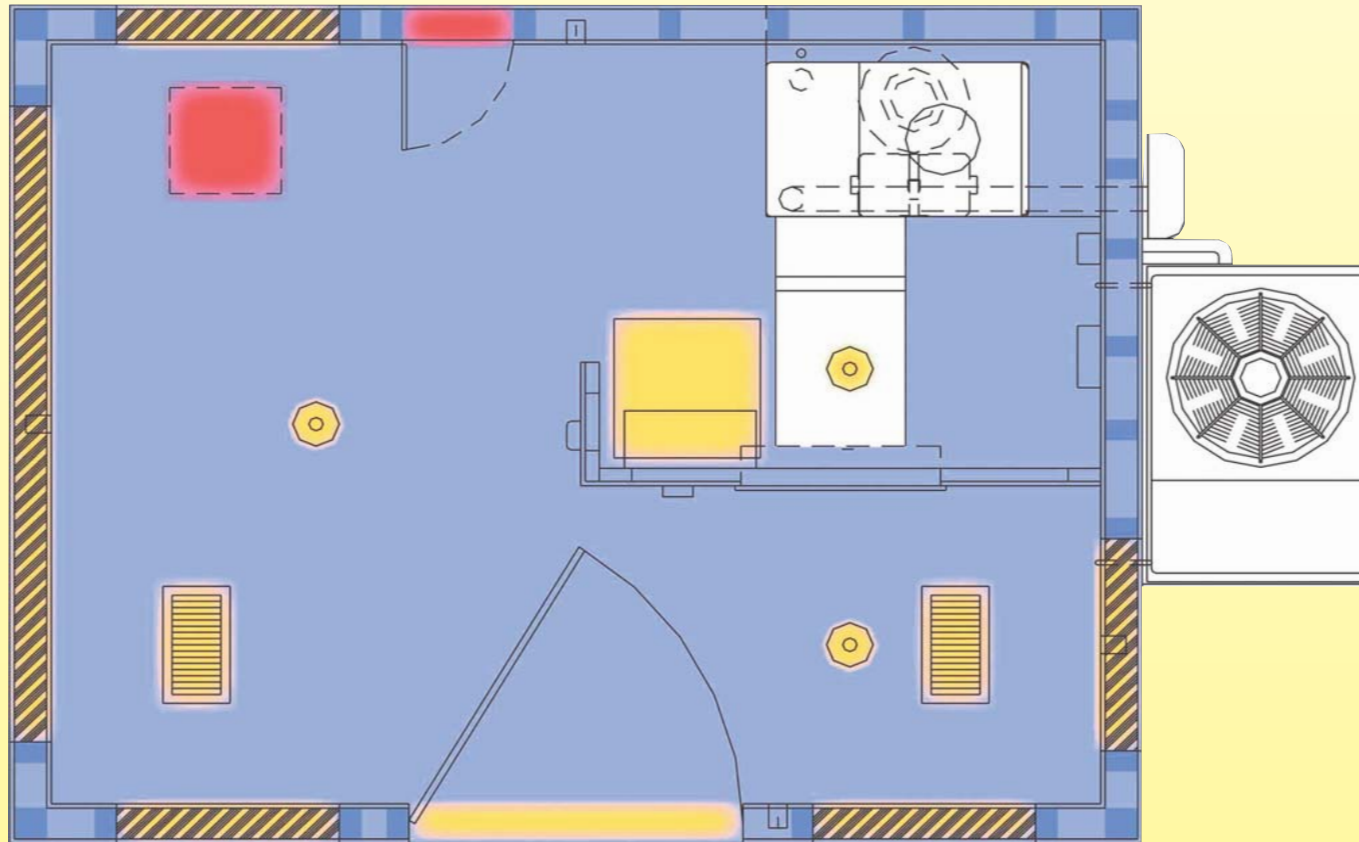
Optional Test Equipment

The Hampden **MODEL H-HEAT-TEP Test Equipment Package** Consists of the following:

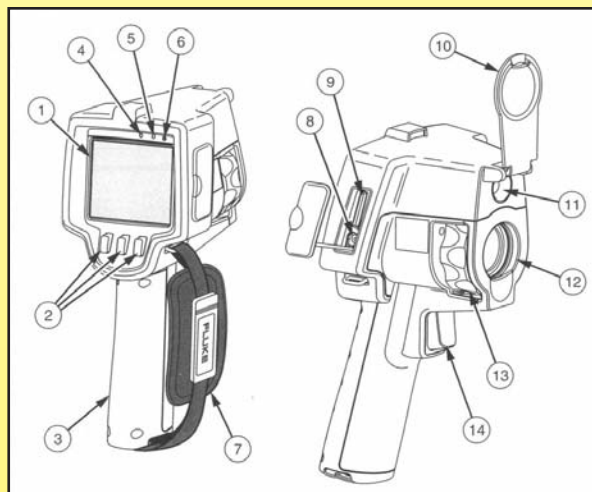
- ❖ Gas Leak Detector Kit
- ❖ Digital Combustion Analyzer
- ❖ Digital Temperature Meter
- ❖ Digital Multimeter
- ❖ Blower Door with Duct Leakage Tester & with Digital manometer
- ❖ Power Analyzer
- ❖ Thermal Imaging Camera
- ❖ Duct Blaster
- ❖ Pressure Pan w/ Handle
- ❖ Manifold Gauge Set w/ Hoses
- ❖ Sling Psychrometer
- ❖ Clamp-on Power Meter
- ❖ Pocket Air Flow Tracker (2)
- ❖ Glass Thermometer -40 to 160°F
- ❖ Glass Thermometer 0 to 220°F



TEST HOUSE LAYOUT



House Dimensions: 10'L x 8'W x 114"H



THERMAL IMAGER

- 1. LCD Display
- 2. Function Softkeys (F1, F2, and F3)
- 3. Battery Cover
- 4. Speaker
- 5. Microphone
- 6. Auto Backlight Sensor
- 7. Hand Strap
- 8. AC Adapter/Charger Input Terminal
- 9. SD Memory Card Compartment
- 10. Retractable Lens Cover
- 11. Visual Camera (Ti10, Ti25, TiR, TiR1 only)
- 12. Thermal (IR) Camera
- 13. Focus Control
- 14. Trigger

1: Orientation

- Energy Audit Overview
- The Energy Auditor
- Diagnostic Equipment
- Green Awareness / Terminology (Certification)

2: Safety

- Safety
- OSHA 10 Certification

3: General Competencies

- Computer Literacy

4: Customer Relations

- Customer Relations

5: Mechanical Training

- Principles of AC&R
- EPA Section 608
- R-410A Training
- Basics of Heating Systems
- Combustion Analysis
- Basic Electricity

6: Mechanical & Envelope Evaluation

- Introduction to Heat Transfer
- Building Envelope Analysis
- Window and Doors
- Heat Gain and Heat Loss Calculations
- Mechanical Data Collections
- Exterior Insulation, Siding, Windows

7: Airflow

- Airflow Properties and Measurements



CD Module Sections



© ESCO PRESS



Book Module Sections

8: Building Pressure Analysis

- Blower Door
- Duct Blaster Lab

9: Infrared Imaging

- Introduction to Infrared Imaging

10: Indoor Environmental Quality

- Health and Safety
- Mold, Lead, and Asbestos

11: Baseload Measures

- Baseload Measures

12: Domestic Water

- Water Heating Systems
- Water Auditing



CURRICULUM

- Sustainable Construction and Design w/ CD (25 Sets each included)
- Hampden Engineering Corporation H-HEAT-1A Binder

The H-HEAT-CC Curriculum includes the following informational literature and Textbooks:

- Answerman Principles of Air Conditioning
- Answerman Electricity for HVAC&R

- Green Awareness
- Combustion Analysis & Fuel Efficiency
- Universal R-410A Safety & Training
- Carbon Monoxide – A Clear and Present Danger 3rd Ed.
- HVAC/R Terminology 2nd Ed.

Standard Products...Designed to Meet Your Growing Needs!

Energy Auditor Training Program

Delivery Methodology

This energy auditor curriculum consists of 23 individual classes or modules, totaling 800 contact hours. Each module may be taught as a standalone class.

Each “Turn-key” module contains:

- An instructor guide
- Lesson plan(s)
- Certification exams where applicable
- CD containing
 - PowerPoint with instructor notes printable:
 - Student handouts
 - Student work assignments
 - Laboratory performance assignments (designed for use with Hampden trainers / when applicable)
 - Assessment(s)
 - Recommended References

Most modules do not require student textbooks, thus minimizing student cost.

Due to the nature of our ever changing knowledge of energy efficiency, construction materials, mechanical equipment and water conservation, continual update of the instructional materials is necessary.

Updates are issued each year upon license renewal.

Instructional Support

The ESCO Professional Development Team (EPDT) will be available to train instructors in the proper use of related specialized tools, software and the effective instructional delivery of each module.

The EPDT will provide a customized onsite hands-on “train the trainer” session in the use of the blower door, duct blaster and infrared camera (thermography).

Additional fees for this service to be determined by needs of the individual program.

Energy Auditor Course Class List

1. Green Terminology
2. Diagnostic Equipment
3. Safety
4. Energy Audit Overview
5. Green Awareness
6. Inspecting the Building Shell
7. Diagnosing Shell Air Leakage
8. Windows, Doors, and Exterior Insulation
9. Principles of Air Conditioning and Refrigeration
10. Basics of Heating Systems
11. Heat Gain and Heat Loss Calculations
12. Evaluating Heating and Cooling Systems
13. Airflow Properties and Measurements
14. Blower Door and Duct Blaster Lab
15. Thermography
16. Baseload Measures
17. Health and Safety
18. Analyzing Mobile Homes
19. Water Auditing
20. Software training using the National Energy Audit Tool (N.E.A.T.)

Energy Audit Certifications

Upon completing the “ESCO HVAC Excellence” Energy Audit Program, Students are Eligible for:

1. **“Certified Energy Auditor” issued by The Green Mechanical Council**
2. **Green Awareness Certification**
3. **EPA-608 Federal Clean Air Act Training Certification**
4. **R-410A Safety and Handling Certification**
5. **Carbon Monoxide Safety Certification**
6. **Combustion Analysis Certification**
7. **Heat Gain / Heat Loss Certification**
8. **OSHA 10 Materials**

Graduates will have
conferred upon them the title of CEA
“Certified Energy Auditor”
issued by



ENERGY AUDITOR TRAINING PROGRAM CURRICULUM OUTLINE

Green Program Funding

The Green Jobs Act of 2007 authorizes funding up to 125 million dollars annually for job training in the energy efficiency and renewable energy industries.

Billions of dollars in the American Recovery and Re-Investment Act are tied to the projects that use renewable and sustainable technologies.

Programs become eligible to apply for grants after they have incorporated green training into their curriculum.

Learn how to transition your program to green.

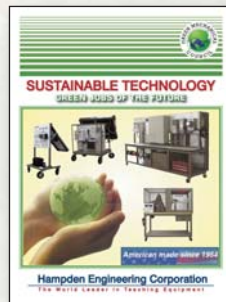
Contact us about our energy auditing curriculum developed for the U.S. Department of Interior. This 53 credit hour program is available in modules to be partially integrated into your training programs or offered as a standalone curriculum in energy auditing.

This program recognizes that the current workforce does not contain enough experienced professionals to take under their wings the numbers of new Energy Auditors that the marketplace is demanding.

With this Program you receive an abundance of information on **SUSTAINABLE TECHNOLOGY**.

Included in the program are equipment and pricing lists for:

- **Alternative Energy**
- **Sustainable Building**
- **Sustainable Resources**
- **Green Trailer**



GREEN AWARENESS was a joint effort of Ferris State University and HVAC Excellence

This course offers a nationally recognized certification. Also included are the table of contents from Green Building Fundamentals and with a sample curriculum.

Data Sheets for all of the equipment along with brochures.

GREEN TECHNOLOGY AWARENESS PROGRAM is a must for your school.

Therefore, the 800-contact hour curriculum has been designed to produce a professional that is able to stand on their own upon graduation.

Energy Auditor Training Program

Curriculum Outline

is Approved By



**Green Is On The Move
Don't Be Left Behind**



The **GREEN AWARENESS CERTIFICATION** gives a breakdown of the following:

- Section I — Core
- Section II — HVAC/R
- Section III — Electrical
- Section IV — Plumbing

Green plumbing system relevance to LEED

The table of contents for the certification was taken from the Going Green Book Series, Green Awareness, published by ESCO Press, 2008



H-HEAT-MTP MOBILE TRAILER PACKAGE

.....



**7.5kw Generator
to power the complete training facility**

Hampden **Model H-HEAT-MTP** Mobile Trailer Package will allow the user to bring the testing facility to multiple testing sites. One facility can now be tracked to any location looking to perform the Auditor Certification Program.



Removable stairs allow for front door access



Fully ADA compliant access

**Undercarriage
storage ramp**



Hampden is committed to providing industry-leading technology.

For the latest from Hampden, visit our home page at <http://www.hampden.com> or e-mail us at sales@hampden.com

Hampden[®]
ENGINEERING CORPORATION

99 Shaker Road P.O. Box 563, East Longmeadow, MA 01028-0563 • TEL. (413) 525-3981 • (888) HEC-CORP • FAX (413) 525-4741