



NYSERDA ENERGY CODE TRAINING

ENERGY CONSERVATION in Historic Buildings



REQUEST FOR PROPOSALS: MONITORING AND SELECTIVE IMPLEMENTATION OF INSULATION STRATEGIES IN HISTORIC BUILDINGS TO MEET THE ENERGY CONSERVATION CONSTRUCTION CODE OF NYS – 2010

Background

The Preservation League of New York State (PLNYS), with funding from the New York State Energy Research and Development Authority's (NYSERDA) Energy Code Training Program and the National Center for Preservation Technology and Training, seeks proposals from consultants to use readily available software to generate information on insulation options in two historic buildings in Eastern New York.

The goals of the project are to identify insulation strategies appropriate to historic buildings that adhere to the Secretary of the Interior's Standards for Rehabilitation, minimize impact on historic materials through the installation process, are reversible, and represent a conservative but studied understanding of condensation potential in the specific buildings studied. As a result of this study, PLNYS hopes to provide specific guidance to building owners and contribute to NYS policy associated with energy upgrades at existing buildings.

This project includes analysis of a spectrum of insulation choices, varying by material/density, thickness, and installation location, totaling approximately 30 scenarios. Selected scenarios will include insulation installed at varying combinations of the following locations:

- Entire building envelope;
- Attic/roof alone; and
- Wall alone.

The impact of application techniques shall be considered. Variables such as windows, doors, and mechanical systems will remain static, in order to measure solely the insulation impacts. It will be assumed that mechanical ventilation is not present in these scenario buildings.

Additionally, each scenario will be assessed in the context of:

- 3 Climate Zones of NYS
- 4 levels of compliance with Energy Conservation Construction Code of NYS -2010 (ECCCNYS), i.e., meeting 50%, 75%, 100% and 125% of the insulation requirements (for new construction).





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The study buildings are the Cambridge Food Coop in Cambridge, Washington County and the Zadock Pratt Museum in Prattsville, Greene County. Photos of the subject buildings are below. We do not anticipate a site visit as necessary to respond to this Request for Proposals.



Cambridge Food Coop, Cambridge, NY (Washington County)



Zadock Pratt Museum, Prattsville, NY (Greene County)



NCPTT: Technology serving the future of America's heritage.



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The study will be undertaken in three parts:

Task 1. This task will serve as the basis for the installation and moisture monitoring done in Tasks 2 and 3. The establishment of insulation recommendations based on computer analysis will inform the type of insulation chosen for the demonstration project. The monitoring plan will build upon the computer-generated data on potential condensation locations to pinpoint the most important monitoring locations. The final narrative and tables will synthesize this work and provide guidance for future research.

1. Establish Study methodology, including materials and choices to be evaluated for scenarios.
2. Provide data for insulation materials (including ingredients, compatibilities, options for installation, life expectancy, etc.) .
3. Analysis of Scenarios using software/methodologies
 - a. Overall Energy performance
 - b. Potential Condensation Locations
4. Assess impact on Historic Fabric based on
 - a. Options/Mode of installation
 - b. Compatibility issues
 - c. Life expectancy
5. Provide specific recommendations for insulation choices
 - a. (Specific) Two buildings included in Study
 - b. (General) NYS historic and existing buildings
 - c. Identify post-installation testing to confirm thoroughness and adequacy of installation.
6. Develop monitoring plan
 - a. Plan to document the sensors and data logging equipment that will be installed at each site.
 - b. Describe the data analysis approach and details of the web site.
 - c. Provide preliminary scope of monitoring points for the two building sites.
7. Develop methodology and specific recommendations for monitoring equipment and placement.
8. Develop list of recommended future study.
9. Prepare Final Report incorporating above.

Assume: 3 meetings with PLNYS and NYSERDA and a field visit to each site.





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Deliverable: Summary Report (narrative and tabular):

- a. Methodology
- b. Data and findings analysis (items 2-5)
- c. Spreadsheet of data
- d. Monitoring plan
- e. Monitoring methodology and recommendations
- f. Conclusions and recommendations for future study

Budget: \$32,000

Due Date: April 30, 2012

Task 2. Insulation implementation.

1. Install insulation as recommended by Task 1.
 - a. Include post-installation testing.
2. Install monitoring equipment.
3. Provide direction for 12-month assessment.
4. Confirm proper access to monitoring equipment from Task 1.
5. Conduct testing at conclusion of Task 1 to confirm

Assume: Coordination with Project Sponsor required for documentation of installation.

Deliverable: Documentation of installation installation, including post-insulation test reports.

Due Date: June 30, 2012

Task 3. Manage and report on 12 month monitoring cycle.

Contractor or designee shall orchestrate the installation of monitoring hardware to quantify the performance of the subject buildings. The monitoring system will continuously sample the installed sensors and record averaged and totalized data at 15-minute intervals. The data will be downloaded at least once per day and loaded into a data system. The data will be posted to a web site designed to present and summarize the daily, weekly, and monthly performance of the homes. This data also needs to be provided in a format that the Preservation League of New York State can post on its own website.

The contractor shall also complete several other tests and one-time measurements at each site, including:

- I. Blower door testing to determine building air tightness (ACH50, ELA, exponent, etc.)
 - A. Measurements of airflow in the main return trunk and supply registers with TSI hot wire probe, flowhood, etc





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- II. Onetime measurements of fan power (that can be correlated to continuously-measured runtime)
- III. Tracer gas tests by adding CO₂ to the space and recording the decay rate with the installed CO₂ sensors.

Contractor shall document the key characteristics of the buildings in order to complete the analysis.

The final analysis will use the measured data to develop a “trued up” building simulation model (such as EnergyGauge, Energy-10, Therm, or other applicable software packages). The model will be used to predict the energy use of a similar sized, traditionally constructed baseline house for comparison.

Assume: Several visits to the site(s) to oversee monitoring installation and check on progress.

Deliverable: Summary Report (narrative and tabular)

- a. Methodology
- b. Monitoring results
 - i. Tabular
 - ii. Narrative summary
- c. Results of one-time measurements listed above
- d. Moisture analysis based on monitoring results
- e. Recommendations for “trued up” building simulation model
- f. Conclusion on moisture-related impact of insulation

Budget: \$18,500

Due Date: June 30, 2013





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Contractor Selection

The Preservation League must receive all responses to Task One, at a minimum, by February 17, 2012.

Contractors must demonstrate experience with readily available software appropriate to this project, and work on existing and historic buildings. Responses must include at least three representative projects demonstrating the contractor's experience with this project type.

Proposals to identify software anticipated for use, and may include alternate approaches (with cost) to achieving PLNYS goals.

Funding dictates Task One project completion by April 30, 2012.

Respond by February 17, 2012 to:

Erin M. Tobin
Regional Director, Technical and Grant Programs
Preservation League of New York State
44 Central Avenue
Albany, New York 12206

Please direct questions to Erin at 518-462-5658 x12 or etobin@preservenys.org.

