



LIUNA
TRAINING & EDUCATION
FUND

Weatherization Course Descriptions



ENERGY AUDITOR TRAINING COURSE

COURSE DESCRIPTION

The LIUNA Training and Education Fund 40-hour Energy Auditor training course is designed to advance qualified individuals who have successfully completed the LIUNA Training Weatherization Technician/Installer and Weatherization Supervisor courses. This comprehensive course provides training in the energy auditing process and procedures, client communication and education, data collection and interpretation, report writing, and follow-up monitoring procedures.

TOPICS COVERED

Specific topics covered in this course include:

Overview of the Audit Process discusses the purpose of energy audits and how they are used to evaluate opportunities to create greater energy efficiencies.

Client Communication and Education covers the guidelines for professional behavior, effective communication, and ways to establish a good rapport with clients in order to conduct effective energy audits. Properly educating clients to maintain a higher level of energy efficiency upon completion of work.

Conducting an Audit provides the step-by-step procedures for gathering preliminary information through client interviews, utility bill review, and previous weatherization efforts to pinpoint areas of high-energy consumption and identify potential savings measures.

Weatherization Measures explains the different weatherization measures available for implementation, resources for weatherization standards, and identifies the different agencies and organizations establishing standards and their relationship to different weatherization measures.

Writing an Audit Report focuses on combining all of the collected data, testing results, recommendations, and cost savings measures to generate an easily understood report for client presentation.

Work Scope Development examines the recommended energy efficiency and conservation measures outlined in the audit report and provides instructions for developing a detailed and itemized list of tasks for weatherization crews to follow.

Follow-up and Monitoring identifies the items an energy auditor must review in order to determine if the recommended work was completed, and provides instruction on how to verify that work performed conforms to standards and that the client is satisfied.

COURSE OBJECTIVES

Upon successful completion of this course participants will be able to:

- Describe all of the components of an energy audit and what information to obtain from and communicate to a client prior to an audit.
- Identify what areas of a building to inspect, tests to conduct, and the information each test provides.

- Analyze utility bills and identify opportunities for energy saving.
- Interpret diagnostic test results and determine appropriate weatherization measures.
- Cite the most commonly used weatherization measures and reference applicable standards and codes.
- Select measures and materials to weatherize a structure based on codes, environmental impact, and industry practices.
- Estimate projected energy savings for the client.
- Produce an audit report, which describes the findings and recommends appropriate weatherization measures.
- Develop a work plan specifying measures to implement, order of work, and adherence to standards, codes, costs, and completion deadlines.
- Conduct follow-up and monitoring activities.

PREREQUISITES

Individuals qualified to participate in the LIUNA Training Energy Auditor course must have successfully completed the LIUNA Training 80-hour Weatherization Technician/Installer and 40-hour Weatherization Supervisor courses, or demonstrate competency by passing applicable written and performance assessments.

ASSESSMENTS

To successfully complete the Energy Auditor course participants must obtain a minimum score of 80% on a 50-question multiple-choice exam and be 100% proficient on all hands-on skill assessments.

The written examination covers the following topic areas:

- Inspection including the monitoring of weatherization projects for carbon monoxide, carbon dioxide, dust and other airborne contaminants.
- Conducting and/or interpreting diagnostic testing utilizing a number of different tools.
- Conducting and/or interpreting combustion appliance safety and efficiency tests for all fossil fuel burning appliances.
- Home Energy Audit Preparation Including:
 - Homeowner Interview
 - Exterior Inspection and Square Footage Determination
 - Documentation Collection and Review (e.g., utility bills)
 - Inspection and Measurement Determinations
- Conducting a Home Energy Audit Including:
 - Interior and Exterior Inspection
 - Tests Including Blower Door, Infrared Camera, and Combustion Safety and Efficiency
- Analyze/Interpret Information Including:
 - Test Results
 - Comparison of Test Results to Established Norms
 - Analysis of Testing Results on a Home's Energy Efficiency
 - Heat Gain or Loss Calculations

- Weatherization Measure Selection Including:
 - Recommendation of Appropriate Weatherization Measures Based upon Audit Results
 - Cost Savings Estimates Based upon Selected Weatherization Measures
- Audit Report Writing
- Work Scope Development
- Follow-Up Monitoring Including:
 - Post-Weatherization Implementation
 - Implemented Weatherization Measures Effectiveness Assessment
 - Additional Energy-Saving Measures Identification



WEATHERIZATION TECHNICIAN/INSTALLER TRAINING COURSE

COURSE DESCRIPTION

The LIUNA Training and Education Fund 80-hour Weatherization Technician/Installer training course is designed to provide qualified individuals with the skills and knowledge necessary to be a safe, competent, and productive member of a weatherization crew. This comprehensive course introduces participants to the basics of building science and the complex ways buildings and their systems interact with each other and the outside environment. The course provides instruction in the methods and materials needed to properly seal the building envelope; how to seal, repair, and insulate leaky or damaged ductwork; the specifics of various types of insulation, their properties, and where and how they are best installed; and how to interpret blower door tests and infrared images to assess the success or failure of a weatherization project.

TOPICS COVERED

Specific topics covered in this course include:

Basic Building Science provides an introduction to the basic science of weatherization, energy systems, energy conservation, the building envelope, and insulation.

Sealing the Building Envelope looks at the relationship between sealing a building's envelope and proper ventilation. Instruments and equipment used to determine building envelope leaks, methods of sealing leaking areas, and methods of applying weatherization materials and making seal related repairs are covered.

Ductwork reviews the different types of ductwork systems for heating, air conditioning, and ventilation, required components, and methods for making minor repairs, sealing, and insulating ductwork systems.

Insulation Installation provides an overview of the many different types of insulation products commercially available, installation procedures, and required personal protective equipment.

COURSE OBJECTIVES

Upon successful completion of this course participants will be able to:

- Describe how energy systems work, individually and in concert for different systems such as hot water, ventilation, air conditioning, heating, and lighting.
- Describe how energy and energy conservation principles function including air and duct leakage, the effects of weatherization methods on the home, heat loss characteristics, and reducing energy use.
- Describe materials used in new construction that help seal a home.
- Describe the importance of proper ventilation.
- Locate building envelope leaks, select and properly use products such as spray foam, caulking, weather-stripping, cement, and wood filler to seal leaking areas.

- Weatherize windows and doors including replacement methods for broken glass.
- Describe the various types of ductwork and their uses.
- Explain a home's air conditioning/heating air movement systems and identify how improvements may be made to older and/or retrofitted systems.
- Select appropriate materials and methods to properly seal ductwork, perform common ductwork repairs and insulate ductwork.
- Safely install insulation in attics, walls, ceilings, basement, and hybrid spaces such as knee walls.
- Safely install the most common types of insulation products including rolled/batt fiberglass and cellulose including loose and dense pack.
- Safely insulate specialty spaces including recessed lighting, knob & tube wiring, and water heaters.
- Properly set up and use diagnostic testing equipment including blower doors and infrared cameras.

PREREQUISITES

Individuals qualified to participate in the LIUNA Training Weatherization Technician/Installer course should possess verified core competencies in General Construction, Safety, and Environmental Hazards including:

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| • Basic Construction Skills | • Certified Lead Renovator |
| • Tool Identification and Use | • Asbestos Awareness |
| • Construction Math | • Hazard Communication |
| • OSHA 10-hour Construction Safety | • Mold/Indoor Air Quality Awareness |

Course candidates with documented prior construction, safety, and environmental experience and/or have completed training and have been evaluated through written and performance assessments are qualified to participate in the LIUNA Training Weatherization Technician/Installer course.

ASSESSMENTS

To successfully complete the LIUNA Weatherization Technician/Installer course participants must obtain a minimum score of 80% on a 50-question multiple-choice exam and be 100% proficient on all hands-on skill assessments.

The written examination covers the following topic areas:

- Building Science – air and heat flow within a building
- Sealing the Building Envelope – caulking, weather-stripping, and sealers
- Insulating and Sealing Ductwork – wrapping ductwork, sealing, and making minor modifications
- Insulation Installation – batt, blown-in, dense-pack, sprayed-on, pipe and hot water heater wrap

Hands-on skills are assessed in the following areas:

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| • Caulking Doors and Windows | • Ductwork |
| • Repairing Foundation Cracks | • Setting up a Duct Blaster Test |
| • Repairing Drywall | • Insulating Ductwork |
| • Sealing Floor Penetrations | • Sealing Duct Joint Leaks |
| • Window Replacement | • Sealing Non-Joint Duct Leaks |
| • Window Glass Replacement | • Sealing Openings Created by Ductwork |
| • Sealing the Basement Rim Joist | • Insulation Installation |
| • Weatherproofing Exterior Doors | |



WEATHERIZATION SUPERVISOR TRAINING COURSE

COURSE DESCRIPTION

The LIUNA Training and Education Fund 40-hour Weatherization Supervisor course is designed to instruct qualified individuals who have successfully completed the LIUNA Training Weatherization Technician/Installer course on the roles and responsibilities of the weatherization supervisor. This course builds on the skills of the Technician/Installer course and develops the core competencies needed by successful Weatherization Supervisors. The course covers all facets of weatherization inspection, the purpose of and procedures for conducting combustion safety testing, and procedures for conducting diagnostic blower door, duct blaster, and infrared camera tests.

TOPICS COVERED

Specific topics covered in this course include:

Inspection examines the inspection process and its relationship to the roles and responsibilities of the Weatherization Supervisor. Compliance with the scope of work documents, building codes, and safety regulations as well as communication with the homeowner, work crew, and other stakeholders are covered. Safety procedures are reinforced as are the tasks performed by Technicians/Installers including proper sealing and insulation procedures. Included is inspection and condition assessment procedures identifying building condition, thermal and pressure boundary locations, and hazardous materials such as lead, asbestos, mold, and feces.

Combustion Safety Testing focuses on one of the most critical weatherization procedures conducted by the supervisor and includes instruction to assure home combustion appliances are operating and vented properly. Information covered includes an overview of different combustion equipment, steps to conduct base pressure measurement of appliances, carbon dioxide testing, measuring spillage and draft, and steps to take if an appliance fails testing.

Diagnostic Testing provides information on using appropriate equipment and interpreting the collected data to further pinpoint air infiltration locations, accurately measure interior air flow, and evaluate the effectiveness of air sealing measures. Specific testing procedures covered include blower door testing (to identify leaks in the building envelope), thermo graphic infrared camera testing (to provide graphic evidence of air leakage sites), and duct blaster testing (to diagnose air duct leakage).

COURSE OBJECTIVES

Upon successful completion of this course participants will be able to:

- List facts regarding the scope of inspections, and the supervisor's role.
- Identify where to find regulatory information.
- Reference the Federal insulation and ventilation requirements.
- Select appropriate personal protective equipment and tools.

- Identify the procedures required and materials needed to seal the building envelope, insulate and seal duct work, and install different types of insulating products.
- Identify deficiencies and recommend solutions for thermal and pressure boundaries, ventilation, and interior zones.
- Properly handle hazardous materials or situations.
- Define terms associated with combustion and combustion safety.
- Identify different combustion safety equipment, describe its purpose and operating procedures.
- Perform all steps for measuring base pressures.
- Perform diagnostic testing including spillage measuring, carbon dioxide levels and acceptable levels, draft testing, combustion safety, and identify current action levels.

PREREQUISITES

Individuals qualified to participate in the LIUNA Training Weatherization Supervisor course must have successfully completed the LIUNA Training 80-hour Weatherization Technician/Installer course and possess proven supervisory capabilities or have demonstrated supervisor competence through a written or performance assessment.

ASSESSMENTS

To successfully complete the LIUNA Weatherization Supervisor course participants must obtain a minimum score of 80% on a 50-question multiple-choice exam and be 100% proficient on all hands-on skill assessments.

The written examination covers the following topic areas:

- Inspection of the residence including the monitoring of weatherization projects for carbon monoxide, carbon dioxide, dust and other airborne contaminants.
- Conducting and/or interpreting diagnostic testing utilizing a number of different tools.
- Conducting and/or interpreting combustion appliance safety and efficiency tests for all fossil fuel burning appliances.

Hands-on skills are assessed in the following areas:

- Duct Blaster Testing
- Blower Door Testing
- Thermographic Camera