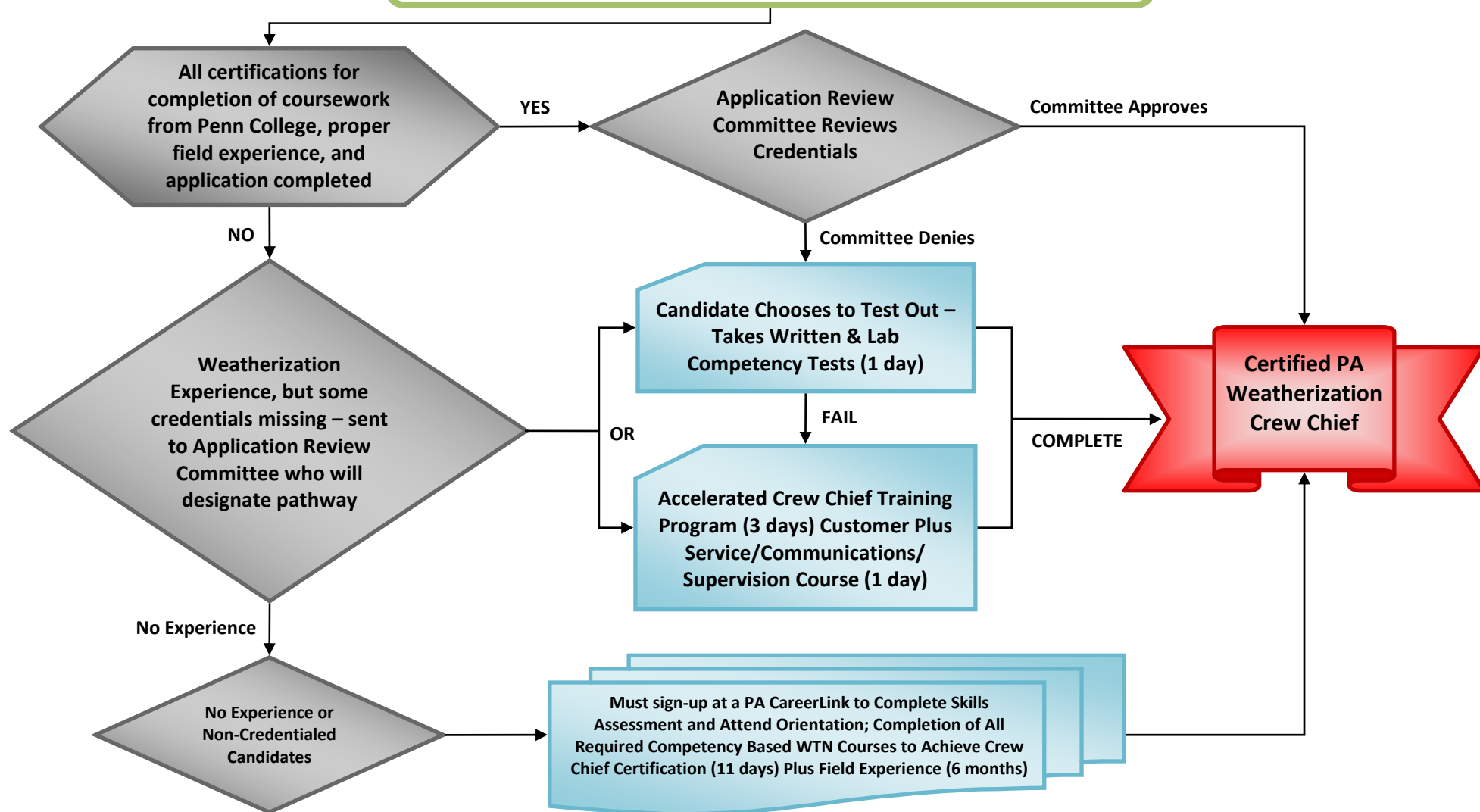


The Pennsylvania Department of Labor & Industry, in cooperation with the Pennsylvania Department of Community and Economic Development and Penn College, has developed this process for providing Weatherization Certifications to individuals interested in become certified Weatherization Crew Chiefs. In the future, this certification may be applicable for certification in other programs and/or initiatives.

In order to become certified as a Weatherization Crew Chief, you must fulfill certain qualifications (please see the attached application form, as well as Labor and Industry Training Forms D and F). As the outline below indicated, applicants may be approved as Weatherization Crew Chiefs by following one of three pathways.

Weatherization Crew Chief Certification



Pennsylvania Labor & Industry Weatherization Training Form F

Coursework for Weatherization Workers: Crew Chiefs

Applicant Name _____

Completion of the following courses is required to become a Weatherization Crew Chief. Please check the following courses for which you hold a certificate of completion from Penn College Weatherization Training Center. If possible, proof of completion should be attached to your completed application:

Coursework:	Date Taken	WTC Verified
<input type="checkbox"/> WTC Tactics	_____	_____
<input type="checkbox"/> Lead Safe Practices	_____	_____
<input type="checkbox"/> Crew Safety	_____	_____
<input type="checkbox"/> Diagnostic Approaches To Weatherization	_____	_____
<input type="checkbox"/> Advanced Diagnostics	_____	_____

Field experience is necessary to receive a certification immediately. Please have your employer verify and of the below work that you have done.

Field Work Experience/Verification:	Years of Experience	Agency Verified
<input type="checkbox"/> Air Sealing	_____	_____
<input type="checkbox"/> Duct Sealing	_____	_____
<input type="checkbox"/> Insulation	_____	_____
<input type="checkbox"/> Base Load Measure	_____	_____
<input type="checkbox"/> Blower Door/Zone Pressure Diagnostics	_____	_____
<input type="checkbox"/> Combustion Safety	_____	_____
<input type="checkbox"/> Code Requirements	_____	_____
<input type="checkbox"/> Inspection And Measurements	_____	_____
<input type="checkbox"/> 6 Months Crew Chief Field Experience	_____	_____

Applicant Name _____

If agency verifying field work experience is different than the employer listed on page one of the Weatherization Worker Certification Application, please list the verifying agency's information below, and include the name of a contact person:

Please list any other relevant Weatherization courses completed at Penn College or other institutions. Please specify who provided the training and the dates taken. If possible, proof of completion should be attached to your completed application:



Test Out Option

Weatherization Crew Chief

What it is:

Prospective candidates may qualify to “test out” of their appropriate certification requirements through a combination of both written and hands-on testing.

Crew Chief Level Testing:

1. Written Exam (2 hours maximum): consisting of 100 questions from Weatherization Crew Chief courses (see Labor & Industry Weatherization Training Form F)
2. Hands-on Test (2.5 hours maximum):
 - a. Demonstration of tool and safe workplace practices
 - b. Construct access door from provided plans
 - c. Glass replacement
 - d. Dense pack cellulose
 - e. Volume of house
 - f. CFM₅₀ test
 - g. Blower door set up
 - h. Can't reach 50 factor

Where:

- Weatherization Training Center at Pennsylvania College of Technology (WTC/PCT), Williamsport, PA
- Department of Labor and Industry approved training providers – list to be available after August 25, 2009

When:

- Weatherization Training Center: beginning the week of September 21, 2009
- Department of Labor and Industry approved training providers: to be announced



Accelerated Crew Chief Certification Course Content Outline

Course Goal

A Crew Chief is a weatherization worker that supervises a crew of installers and directs their efforts to weatherize eligible dwellings. Reference for Crew Chiefs will be the *Weatherization Standards and Field Guide for Pennsylvania* by the PA Department of Community and Economic Development (DCED) and the Pennsylvania Weatherization Assistance Program (PAWAP).

This course will prepare current PAWAP contractors, private contractors and tradespersons to gain Commonwealth certification as a Weatherization Crew Chief thus enabling them to participate with the Weatherization workforce in their region. Pre-qualified candidates for this course will be required to demonstrate, through written and hands-on assessments during the training, the knowledge, understanding, and physical application of the minimum core competencies of the Crew Chief certification standards as determined by the Commonwealth.

Course Objectives

Upon successful completion of this course, Crew Chief candidates will be able to:

- Present and/or demonstrate proficiency in Weatherization Basic Competencies
- Understand and maintain Safe Work Practices
- Integrate into the Weatherization workforce with an understanding of PA Weatherization program standards as Certified Weatherization Chiefs
- Meet PA Weatherization Crew Chief Certification Requirements

Course Areas of Concentration

The following areas of concentration are presented in this course:

- Weatherization Tactics
- Lead Safe Work Practices
- Crew Safety
- Advanced Diagnostics
- PA WAP Standards

Primary Audience

Potential Candidates include:

- Weatherization Training Center & Weatherization Assistance Program Agency Personnel who have not completed all the necessary course requirements for Crew Chief Certification
- Private Contractors Pre-qualified by the Weatherization Application Process who wish to enter the Weatherization Workforce or Participate in the WAP Program in PA
- Any other Crew Chief Candidates identified by the Commonwealth

Course Materials The following reference materials are provided to candidates during this course:

- *Weatherization Standards and Field Guide for Pennsylvania* by the PA DCED and the PAWAP
 - *Residential Energy* by John Krigger and Chris Dorsi
-

Format Using a combination of classroom lecture and discussion, audio-visual presentations, and practical hands-on lab exercises, candidates will be introduced to the weatherization side of construction, building science and building assessment. Each module of instruction will include part or all of these methods of technology transfer to acclimate the candidates to the demands and expectations of the weatherization programs.

In addition to the familiarization process, the Crew Chief course structure also serves as a stepping off platform into the weatherization industry. For example, trade contractors not used to working in the weatherization program may have experience installing insulation, air sealing buildings, and/or addressing moisture problems, but weatherization focuses on assessment and permanent remediation of such challenges so the end user will benefit from a more energy efficient, safer, and healthier home.

Day 1: (8) hour combination of lecture, discussion, and hands on training in Weatherization Tactics (emphasis on building science through lecture & discussion)

Day 2: (8) hour combination of lecture, discussion, and hands on training in Advanced Diagnostics (emphasis moves to more hands on assessments and remediation)

Day 3: (4) hour combination of lecture, discussion, and hands on training to complete Advanced Diagnostics and (4) hour Lead Safe Work Practices and Crew Safety (emphasis on safety through lecture and discussion with some hands on)

Day 4: (4) hour review of PAWAP standards and Crew Chief competencies referencing the Field Guide; (4) hours allotted for written and practical test for certification

Crew Chief Certification Accelerated Course Content Outline

Day 1 Weatherization Tactics (8 hours)

Overview The first module of this program focuses on addressing basic weatherization and building science knowledge and application. The information moves from a classroom based delivery to the hands-on lab focused application so that participants can be assessed in their comfort level of weatherization tactics from the weatherization versus traditional construction trades point of view. PA WAP standards are emphasized through all Weatherization courses where they apply; tactics begins that process and is geared towards developing a comfort level in the participants so that they can work in their respective programs under a common standard, and established competencies.

DAY 1

Objectives Upon completion of the module, participants will be able to:

- Demonstrate a basic knowledge of Weatherization Principles and Building Science Theory
- Identify the different types of basic construction, potential air leakage, and areas requiring new or additional insulation required for effective energy retrofits
- Assess and remediate issues pertaining to HVAC Ducting, Ventilation, Moisture, and Building Cavities
- Demonstrate the ability to replace glass in windows and doors according to PA WAP standards
- Work with attic spaces to determine proper ventilation and installation requirements
- Work with accessing building cavities to include drywall patching, building and installing access doors
- Comply with PA WAP standards through demonstration of ability to effectively air seal and insulate buildings

Agenda Day 1

8:30 am	INTRODUCTION
8:45 am	WEATHERIZATION PRINCIPLES AND THEORY: <ul style="list-style-type: none">1) Goals of Weatherization program2) Priorities3) Heat movement
9:15 am	BUILDING COMPONENTS <ul style="list-style-type: none">1) Balloon2) Platform3) Brick4) Knee wall
10:00 am	IDENTIFYING AIR LOSS <ul style="list-style-type: none">1) Blower door components

- 2) What causes air leakage
- 3) Air Barrier/Thermal Barrier

10:45 am **AIR SEALING/WEATHERSTRIPPING MATERIALS & TECHNIQUES**

- 1) Video
- 2) Lab/Hands On
 - a. Knee wall
 - b. Basement Band Joist
 - c. Thresholds
 - d. Door Sweeps
 - e. Caulking

11:15 am **INSULATION MATERIALS & TECHNIQUES**

- 1) Materials
 - a. R-Values
 - b. Types
 - c. Uses
- 2) Attics
 - a. Baffles
 - b. Dams
 - c. Electrical
- 3) Floors
 - a. Fiberglass batt
 - b. Loose blown
 - c. Dense pack
 - d. Loose fill coverage chart
- 4) Lab/Hands On
 - a. Insulate hot water tanks & pipes
 - b. Demo different types of insulation techniques/materials
- 5) Review PA WAP Priority List for Air Seal and Insulation

12 Noon **BREAK FOR LUNCH**

12:30 pm **HVAC DUCTS**

- 1) Supply and Return Ducts
- 2) Vented crawl spaces
- 3) Attics
- 4) Basements
- 5) Video – DEMO

LAB / DEMO

- 1) Duct sealing supply and returns
- 2) Proper use of insulation machine
 - a) wall cavity
 - b) dense pack floored attic

1:45 pm **VENTILATION & MOISTURE CONTROL**

- 1) Moisture Movement
- 2) Identifying moisture problems

- 3) Vapor Barriers
 - 4) Crawl Spaces & Attics
- CALCULATING MINIMUM VENTILATION GUIDELINES

- 2:15 pm** **ATTICS**
- 1) How vents work
 - 2) Types
 - 3) Sizes
 - 4) Calculating attic ventilation needs
 - 5) Calculating net free vent areas
 - 6) Lab/Hands On
 - a) Installing a gable window vent
 - b) Installing roof vents

- 3:15 pm** **ACCESSING BUILDING CAVITIES (LAB)**
- 1) Construct & Install Access Door
 - 2) Install & patch dry wall

- 4:00 pm** **WORKMANSHIP**
- 1) Video – “Who Filled the Dishwasher?”
 - 2) Glass replacement
 - 3) Lab/Hands On - Glazing Exercise

- 5:00 pm** **Q&A – WRAP UP DAY 1**

DAY 2 **ADVANCED DIAGNOSTICS (8 hours)**

Overview The second day addresses the topic of Weatherization Diagnostics. A heavy emphasis is placed on building science and the use of diagnostics to determine priority selection for materials and actions according to PA WAP standards.

Objectives Upon completion of this module, participants will be able to:

- Identify and demonstrate proficiency in air sealing and insulation
- Perform blower door testing, and zonal pressure diagnostics
- Understand basic building science as it relates to heat loss, moisture, indoor air quality, ventilation, and defining the thermal envelope
- Set-up and perform blower door testing of a building without assistance
- Identify and describe driving forces of pressure, air infiltration, air exfiltration, and ventilation
- Identify and accurately measure pressure and air flow; demonstrate knowledge of various instruments used to measure pressure
- Explain and perform zonal pressure testing in both primary and secondary zones

- Demonstrate knowledge of and perform HVAC ductwork testing, including but not limited to Pressure Pan Testing and duct blaster equipment
 - Identify and accurately measure draft and building pressures
-

Agenda
Day 2

- 8:30 am** BASIC BUILDING SCIENCE CONCEPTS
- HOUSE AS A SYSTEM
- 1) Health, Safety, Building Integrity, Comfort
 - 2) Energy efficiency
- 9:00 am** INTRODUCTION TO THE BLOWER DOOR
- BLOWER DOOR TEST PROCEDURES (CLASSROOM & LAB)
- 1) Preparing the House
 - 2) Components
 - 3) Equipment Set Up
 - 4) Gauge Use
 - 5) Conducting an Air Leakage Test
- 10:30 am** MEASURING AIR LEAKAGE
- 1) Blower door values and what they mean
 - 2) Taking the House Measurements
 - 3) Determining the Volume
 - 4) One Point Blower Door Testing
 - 5) Can't Reach 50 Factor
- 11:30 am** PRINCIPLES OF AIR LEAKAGE
- 1) Intentional leaks and unintentional leaks
 - 2) Types and relative importance of leaks
- DEFINING THE THERMAL ENVELOPE
- 12 Noon** BREAK FOR LUNCH
- 12:30 pm** DEFINING THE THERMAL ENVELOPE
- 1:30 pm** BLOWER DOOR EXERCISE (LAB)
- 3:00 pm** INTRODUCTION TO AIR QUALITY & MOISTURE ISSUES
- 1) Pollution Sources
 - 2) Moisture Problems
 - 3) Moisture Movement
 - 4) Building Tightness Limits

- 4:00 pm** **AIR LEAKAGE BASICS**
- 1) Infiltration
 - 2) Exfiltration
 - 3) Ventilation

5:00 pm **Q & A – Wrap Up Day 2**

DAY 3 ADVANCED DIAGNOSTICS, LEAD SAFE WORK PRACTICES & CREW SAFETY (8 hours)

Overview The third module finishes the unit on Advanced Diagnostics and concludes with the unit on Lead Safe Work Practices and Crew Safety according to PA WAP standards and competencies.

Objectives Upon completion of this module, participants will be able to:

- Identify materials in existing buildings that could become potential lead hazards
- Be familiar with ventilation and indoor air quality issues and how they apply to safety on the job
- Indicate potential hazards and recommended remediation through action and materials in documentation
- Incorporate proper safety practices into everyday processes and tasks
- Recognize potential safety hazards to self and fellow crew members and take proactive action to remediate
- Recognize, measure and monitor for proper Carbon Monoxide (CO) levels
- Identify different types of insulation and demonstrate proficiency in operation of insulation blowing machinery

Agenda **Day 3**

- 8:30 am** **PRESSURE**
- 1) Driving forces of pressure
 - 2) Units for measuring pressure
 - 3) Units for measuring air flow
 - 4) Measuring pressure
 - a) Types of gauges
 - b) Magnahelic gauge
 - c) Digital manometer
 - d) DG-700 dual channel manometer
 - e) Lab/classroom Demonstration of Gauges

- 9:30 am** **ZONAL PRESSURE TESTING**
- 1) Zonal Pressure Basics
 - a) Outside zones/Inside zones(*examples*)
 - b) Pressure and Thermal Boundaries
 - c) Zone and ZPD definitions
 - 2) Zone Types
 - a) Primary zones
 - b) Secondary zones
- 10:15 am** **TYPES OF PRESSURE DIAGNOSTICS**
- 1) Blower door
 - 2) Air handler/ exhaust fans
 - 3) Attached garage zonal testing (*House of Pressure demonstration*)
 - 4) Manometer setup for zonal testing (*House of Pressure demonstration*)
- 10:45 am** **HVAC DUCTWORK & PRESSURE**
- 1) Duct leakage with the pressure pan
 - 2) Manometer setup for pressure pan testing. (*House of Pressure demonstration*)
 - 3) Pressure Pan Testing/ Duct-induced pressures
- MEASURING DRAFT & HOUSE PRESSURE**
- 1) Types of (CAZ) pressure diagnostics
 - 2) Worst case chimney safety test
 - 3) Worst case pressure balancing CAZ test
- 12 Noon** **BREAK FOR LUNCH**
- 12:30 pm** **LEAD SAFE WORK PRACTICES**
- 1) Video: “Moving Toward A Lead-Safe America”
 - 2) Why should I be concerned about Lead-Contaminated Dust?
 - 3) Talking to Clients & Planning Work
 - 4) Set-up Your Work Space to Contain Lead-Dust
 - 5) Clean-up and Check Your Work
- 1:30 pm** **CREW SAFETY**
- 1) OSHA Construction Regulations
 - 2) Common Construction Hazards
 - 3) Common OSHA Violations
 - 4) Training Requirements
 - 5) Maintenance and Cleaning
- 2:00 pm** **PPE (Personal Protective Equipment)**
- 1) Eye and Hearing Protection
 - 2) Tool and Electrical Safety
- 2:30 pm** **LADDER SAFETY**
- 1) Classification

2) Inspection

- 3:00 pm** FALL PROTECTION
- 1) What is Fall Protection?
 - 2) Types and applications

- 4:00 pm** RESPIRATORS
- 1) Types & uses
 - 2) Medical evaluation
 - 3) Replacement cartridges
 - 4) Fit testing
 - 5) Cleaning & maintenance

- 5:00 pm** Q & A – WRAP UP DAY 3

DAY 4 **PA WAP STANDARDS and PRIORITIZATION LIST (4 hours);
CREW CHIEF CERTIFICATION REVIEW & EXAM (4 hours)**

Overview The fourth module focuses on review and understanding of the PA WAP standards. Complete familiarity of the *Weatherization Standards and Field Guide for Pennsylvania* by the PA DCED and the PAWAP will be emphasized. Participants will spend time in the lab reviewing correct application of tactics and assessment according to the Measure Selection Priority List for the PA Weatherization standard. Review for and the actual written exam for Crew Chief Certification will conclude the day and overall training.

- Objectives** Upon completion of this module, participants will be able to:
- Identify and demonstrate proficiency in the core competencies of the Crew Chief Certification program
 - Demonstrate proper employment of Weatherization tactics as defined in the PA WAP standards and Field Guide
 - Display ability to use and reference the *Weatherization Standards and Field Guide for Pennsylvania* in an assessment and remediation scenario
 - Take the written and practical certification exams for Weatherization Crew Chief
-

Agenda
Day 4

-
- 8:30 am** REVIEW OF PA WAP STANDARDS & CORE COMPETENCIES
- 1) Using the Field Guide
 - 2) Understanding the PA Measure Selection Priority List
 - 3) Review of core competencies for Crew Chief Certification
 - 5) LAB / HANDS ON – Competency Review
- 12Noon** BREAK FOR LUNCH
- 12:30 pm** CREW CHIEF CERTIFICATION WRITTEN EXAM*

3:00 pm CREW CHIEF CERTIFICATION PRACTICAL EXAM (LAB)*

5:30 pm WRAP-UP

***Depending on size of class, some candidates may take written exam first while others take practical concurrently and vice versa.**