

Home Performance Laborer (Residential)
O*NET-SOC Code: 47-4099.03
RAPIDS Code: 2004
Term: 2,000+ (Core plus two competencies)
Type of Training: Time

WORK PROCESSES AND RELATED INSTRUCTION OUTLINE

The following list of core and concentrations areas represents skills and knowledge required by a Home Performance Laborer (HPL) in the energy efficiency and residential industry. The skills required of a HPL are diverse and many. They work on protecting a residential building and its interior from the elements, new housing construction, housing retro-fit, remodel and perform services that improve the energy efficiency and performance of the home. Home Performance Laborers also perform green landscaping and environmental remediation.

The following skill areas need to be satisfied by the Home Performance Laborer (HPL) apprentice to develop the competencies and knowledge needed to obtain the expertise in the Core components. All Home Performance Laborer apprentices must complete the Related Instruction hours and On-the-Job Learning hours for the following Core Skills. (The Related Instruction descriptions follow the skills descriptions.) To complete the apprenticeship program, HPL apprentices must also complete the Related Instruction and On-the-Job Learning in 2 of the concentration areas that follow the Core Skills.

Core Skills for the Home Performance Laborer:

Industry Orientation

Industry Orientation introduces participants to the construction industry and prepares those seeking a career as a Home Performance Laborer for a successful career. Emphases is placed on developing good work habits, being productive on the job, working under a collective bargaining agreement, being aware of growth areas in construction employment, and background information.

RELATED INSTRUCTION: 8 hours

ON-THE-JOB LEARNING: 10 hours

Communications with the Building Owner/Occupants

First impressions; presenting one's self in a professional manner

Construction Math

Construction Math introduces students to the basic math skills needed to perform calculations related to distance, area, volume, angles, weight and measurement on construction projects. Participants are provided instruction and an ample opportunity to measure objects, calculate and perform basic math functions including addition, subtraction, multiplication, and division of whole and fractional numbers; measure and estimate volumes, convert fractions to decimals, (and decimals to fractions). In addition participants learn practical applications of the Pythagorean theorem, formulas for

RELATED INSTRUCTION: 40 hours

ON-THE-JOB LEARNING: 20 hours

calculating perimeters, area, volume, and the use and function of square roots.

RELATED INSTRUCTION: 80 hours

ON-THE-JOB LEARNING: 200 hours

Safety

Confined Space Awareness is designed to train workers to identify confined spaces and provide instruction regarding the types of hazards associated with confined space entry.

First Aid/CPR instruction provides the basic knowledge for non-medical personnel to provide assistance to an injured person prior to the arrival of professional medical assistance.

Hearing Protection training instructs HPLs on the noises associated with building construction, their sources, harmful effects, and methods to reduce exposure. Participants obtain an understanding of OSHA's occupational noise exposure, its debilitating effects, and control options.

Lockout/Tagout training introduces trainees to the control of hazardous energy and procedures and requirements of locking out and tagging out of electrical and mechanical equipment.

The OSHA Construction Safety and Health program is designed to meet the requirements for OSHA's 10-hour and 30-hour training programs. The program provides safety and health information as it relates to the many hazards found on construction projects and offers insight into their mitigation.

RELATED INSTRUCTION: 8 hours

ON-THE-JOB LEARNING: 20 hours

Hazard Communication

Hazard Communication introduces HPLs to the Occupational Safety and Health Hazard Communication Standard, as it applies to the construction industry. Training focuses on the guidelines for recognizing and protecting oneself from exposure to hazardous substances, including identifying chemical hazards and the proper use of container labels, placards, and material safety data sheets.

Personal Protective Equipment

Fire Protection

Electrical Safety

Ladder Safety

Tool Identification, Inspection, Safety and Use

Material Handling

RELATED INSTRUCTION: 80 hours

ON-THE-JOB LEARNING: 100 hours

General Construction training introduces participants to a wide variety of concepts, tools, and skills that are important to successfully begin a career as a HPL. Participants receive instruction on the work and role of a HPL, commonly encountered safety issues, measurement in residential construction, safe hand and power tool operation, and materials frequently used in construction. Each topic is presented in a separate module, several of which require students to perform tasks or demonstrate skills being taught. Special emphasis is placed on following proper procedures and developing safe work

habits.

The OSHA Construction Safety and Health program is designed to meet the requirements for OSHA's 10-hour and 30-hour training programs. The program provides safety and health information as it relates to the many hazards found on construction projects and offers insight into their mitigation.

Fall Protection

Fall Protection Awareness provides an overview of applicable OSHA standards, types of protective devices and their uses, and fall protection program requirements.

RELATED INSTRUCTION: 8 hours

ON-THE-JOB LEARNING: 10 hours

Scaffold User

Scaffold User training is designed to address the needs of workers required to perform job tasks from scaffolding. Participants receive instruction in identifying the hazards associated with scaffold use, regulations pertaining to scaffolds, and proper work methods. The course includes the use of a specialized pre-built scaffold system designed for student inspection, participant discussion, and interactive exercises to enhance training.

RELATED INSTRUCTION: 8 hours

ON-THE-JOB LEARNING: 10 hours

Introduction to Green for Residential

This training introduces participants to the techniques and processes and procedures associated with green construction projects. Topics covered include:

- Definitions of Green
- Green Rating Systems
- Green Construction Procedures
- Overview of Alternate Energy Sources

RELATED INSTRUCTION: 8 hours

ON-THE-JOB LEARNING: 30 hours

RELATED INSTRUCTION HOURS: 240

ON-THE-JOB LEARNING HOURS: 400

HOME PERFORMANCE LABORER CONCENTRATIONS

Below are the five concentration areas (Weatherization, Sustainable Building, Deconstruction/Retrofit, Green Landscaping and Green Remediation) of the Home Performance Laborer (HPL) and the corresponding skills, knowledge and Related Instruction descriptions. To complete the HPL Apprenticeship Program, an HPL Apprentice must satisfy the Related Instruction and On-the-Job Learning hours in **two** of the specific concentration areas.

WEATHERIZATION

RELATED INSTRUCTION: 80 hours
ON-THE-JOB LEARNING: 715 hours

Weatherization Technician/Installer Heating and Domestic Hot Water Systems Appliances and Lighting

Weatherization Technician/Installer training is designed to provide qualified individuals with the skills and knowledge necessary to be a safe, competent, and productive member of a weatherization crew. Participants are introduced to the basics of building science and the complex ways buildings and their systems interact with each other and the outside environment. Instruction includes 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.

Heating and Domestic Hot Water Systems

1. Testing for combustion safety and steady state efficiency
2. Inspect and test draft, venting and combustion air
3. Test for worst-case depressurization conditions
4. Insulate space heating and domestic hot water piping
5. Ensure clearance to combustibles of heating appliances and flues
6. Air sealing of forced air handler cabinets and duct work
7. Measure and adjust domestic hot water delivery temperature
8. Install water heater insulation blanket
9. Measure bathroom fixture flow rates; install low-flow shower heads

Appliances and Lighting

1. Measuring refrigerator and freezer energy consumption
2. Inventory plug loads and energy usage
3. Replace incandescent lighting with fluorescent, CFL, or LED lighting

Commissioning

1. Removal of all construction scraps and debris
2. Change air filters in furnaces and air handling equipment

Installing Exterior Doors and Windows

Installing Insulation and Vapor Barriers

Patching and Repairing Drywall

This training introduces participants to the process and procedures for installing insulation, vapor barriers, exterior doors, windows and repairing drywall.

RELATED INSTRUCTION: 40 hours

ON-THE-JOB LEARNING: 40 hours

Lead Renovation, Repair and Painting (RRP)

Lead Renovator training prepares participants to perform renovation work using lead safe work practices. The course meets all Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) training requirements under 29 CFR Part 1926.1101 and 40 CFR Part 745.225 respectively. The course is mandatory for all workers conducting renovation activities where lead-based paint is present in target housing and child occupied facilities.

RELATED INSTRUCTION: 16 hours

ON-THE-JOB LEARNING: 40 hours

Asbestos Awareness

Asbestos Awareness trains HPLs to recognize and identify components and areas of a structure, which may consist of asbestos containing materials. Participants receive instruction on the history of asbestos, health effects associated with exposure, and procedures to avoid disturbing asbestos containing materials.

RELATED INSTRUCTION: 8 hours

ON-THE-JOB LEARNING: 10 hours

Mold Awareness

Mold Awareness instructs HPLs on the identification and health hazards, associated with the exposure to mold as well as other microbial contamination.

RELATED INSTRUCTION: 8 hours

ON-THE-JOB LEARNING: 10 hours

RELATED INSTRUCTION HOURS: 152

ON-THE-JOB LEARNING HOURS: 815

SUSTAINABLE BUILDING

Materials, Plans, Specifications, and Codes

This training presents basic elements of print reading and provides experience in print reading for residential construction, light commercial and heavy commercial construction. Course content includes coverage in the areas of green building technology and construction, sustainable energy systems, the latest print production technology, and expanded building trade roles, materials, and methods. The course also introduces participants to the challenge of interpreting information from various locations in a set of prints in heavy commercial construction.

RELATED INSTRUCTION: 40 hours

ON-THE-JOB LEARNING: 50 hours

Flooring Systems

Wall and Roof Framing

Exterior Finishing – Walls and Roof
Installing Exterior Doors and Windows
Installing Insulation and Vapor Barriers
Installing Drywall

RELATED INSTRUCTION: 60 hours
ON-THE-JOB LEARNING: 650 hours

Sustainable Construction introduces apprentices to the many facets of the residential construction process and provides the core skills, knowledge, and aptitude necessary to construct homes safely and efficiently through a series of six (6) one-week courses. This program is designed to start with an introduction to residential construction that will focus on Hand and Power Tools, Performing Basic Carpentry, and the importance of Building Materials, Plans, Specifications, and Codes in the residential construction industry.

1. Introduction to Sustainable Construction: This training introduces apprentices to the many facets of the sustainable residential construction process and provides the core skills, knowledge, and aptitude necessary to construct homes safely and efficiently.
2. Concrete Forming and Flooring Systems: This training introduces apprentices to the concrete forming procedure for residential foundations and slabs on grade as well as the construction of flooring systems.
3. Installing Exterior Finishing Walls and Roofs: This training introduces apprentices to the process and procedures for installing exterior wall and roof finishing.
4. Installing Insulation, Vapor Barriers, Drywall, and Installing Exterior Doors and Windows: This training introduces apprentices to the process and procedures for installing insulation, vapor barriers, drywall, exterior doors and windows.
5. Roof Framing: This training introduces apprentices to the process and procedures for framing roofs on sustainable construction projects.
6. Wall Framing: This training introduces apprentices to the process and procedures for framing interior and exterior walls on sustainable construction projects.

RELATED INSTRUCTION: 8 hours
ON-THE-JOB LEARNING: 40 hours

Trench Protection

Trench and Excavation Safety focuses on standards for building protective systems in trenches and excavations. Participants will also discuss how to install different kinds of protective systems to protect themselves and others in the event that trenches or excavations cave in.

Scaffold Builder – Tools and PPE
Frame, Pump Jack and Baker Rolling

RELATED INSTRUCTION: 40 hours
ON-THE-JOB LEARNING: 60 hours

Scaffold Builder training is designed to address the needs of HPLs that are responsible for building scaffolding on the job site or are required to perform job tasks while using scaffolding. Designed to meet the training requirements of 29 CFR Part 1926.454, the comprehensive program also includes use of a specialized pre-built scaffold system. The program also includes participant discussion, interactive exercises, and extensive hands-on training.

RELATED INSTRUCTION HOURS: 148
ON-THE-JOB LEARNING HOURS: 800

DECONSTRUCTION/RETROFIT

Lead Renovation, Repair and Painting (RRP) RELATED INSTRUCTION: 16 hours
ON-THE-JOB LEARNING: 40 hours
Lead Renovator training prepares participants to perform renovation work using lead safe work practices. The course meets all Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) training requirements under 29 CFR Part 1926.1101 and 40 CFR Part 745.225 respectively. The course is mandatory for all workers conducting renovation activities where lead-based paint is present in target housing and child occupied facilities.

Asbestos Awareness RELATED INSTRUCTION: 8 hours
ON-THE-JOB LEARNING: 10 hours
Asbestos Awareness trains HPLs to recognize and identify components and areas of a structure, which may consist of asbestos containing materials. Participants receive instruction on the history of asbestos, health effects associated with exposure, and procedures to avoid disturbing asbestos containing materials.

Mold Awareness RELATED INSTRUCTION: 8 hours
ON-THE-JOB LEARNING: 10 hours
Mold Awareness instructs HPLs on the identification and health hazards, associated with the exposure to mold as well as other microbial contamination.

Materials, Plans, Specifications, and Codes RELATED INSTRUCTION: 40 hours
ON-THE-JOB LEARNING: 30 hours
This training presents basic elements of print reading and provides experience in print reading for residential construction, light commercial and heavy commercial construction. Course content includes coverage in the areas of green building technology and construction, sustainable energy systems, the latest print production technology, and expanded building trade roles, materials, and methods. The course also introduces participants to the challenge of interpreting information from various locations in a set of prints in heavy commercial construction.

Installing Interior and Exterior Doors
Installing Replacement Windows
Installing Insulation and Vapor Barriers
Installing Drywall
Wood Building Materials, Fasteners, and Adhesives
Hand and Power Tools for Carpentry RELATED INSTRUCTION: 60 hours
Interior Finishing and Interior Stair Finishing ON-THE-JOB LEARNING: 160 hours
Retro-fit/remodel introduces apprentices to the many facets of the residential remodel and reconstruction process and provides the core skills, knowledge, and aptitude necessary to remodel/retro-fit homes safely and efficiently through a series of six (6) one-week

courses. This program is designed to start with an introduction to residential construction that will focus on Hand and Power Tools, Performing Basic Carpentry, and the importance of Building Materials, Plans, Specifications, and Codes in the residential construction industry.

1. Introduction to Sustainable Construction: This training introduces apprentices to the many facets of the sustainable residential construction process and provides the core skills, knowledge, and aptitude necessary to construct homes safely and efficiently.
2. Installing Exterior Finishing Walls and Roofs: This training introduces apprentices to the process and procedures for installing exterior wall and roof finishing.
3. Installing Insulation, Vapor Barriers, Drywall, and Installing Exterior Doors and Windows: This training introduces apprentices to the process and procedures for installing insulation, vapor barriers, drywall, exterior doors and windows.
4. Roof Framing: This training introduces apprentices to the process and procedures for framing roofs on sustainable construction projects.
5. Wall Framing: This training introduces apprentices to the process and procedures for framing interior and exterior walls on sustainable construction projects.
6. Installing Interior Finishes: This training introduces apprentices to the process and procedures for installing interior finishing including stair finishing.

RELATED INSTRUCTION: 40 hours

ON-THE-JOB LEARNING: 40 hours

Concrete Repair

Concrete training prepares apprentices to work safely and productively in this potentially hazardous field. Safety issues associated with the mixing, forming, placement, and curing of concrete materials as well as the associated skills are covered in depth. Through instructor facilitated and extensive hands-on training, the Home Performance Laborer becomes familiar with construction math and measurements, project planning, and site preparation. Other topics important to a concrete worker, such as forming, placing, finishing, and sawing are covered in detail. Appropriate cleanup procedures and concrete repair are also covered in the program.

RELATED INSTRUCTION: 40 hours

ON-THE-JOB LEARNING: 505 hours

Deconstruction

Deconstruction training teaches apprentices to systematically disassemble a structure in a manner where the building's materials are efficiently reused and recycled. Participants completing training will be aware of the safety precautions to take to control deconstruction hazards. Additional topics include the overall planning of the deconstruction job, including the methods to be used to bring the structure down, the equipment necessary to do the job, and the measures to be taken to perform the work safely.

Scaffold Builder – Tools and PPE,
Frame, Pump Jack and Baker Rolling

RELATED INSTRUCTION: 40 hours
ON-THE-JOB LEARNING: 40 hours

Scaffold Builder training is designed to address the needs of HPLs that are responsible for building scaffolding on the job site or are required to perform job tasks while using scaffolding. Designed to meet the training requirements of 29 CFR Part 1926.454, the comprehensive program also includes use of a specialized pre-built scaffold system. The program also includes participant discussion, interactive exercises, and extensive hands-on training.

Carpet Installation
Wood and Tile Floor Installation

RELATED INSTRUCTION: 40 hours
ON-THE-JOB LEARNING: 40 hours

The training covers beginner through advanced terms and technologies. Apprentices will learn all of the step-by-step installation procedures for installing carpet, wood and tile floors. Training will include: measuring for carpet, stretch-in carpet procedures, hand sewing, glue down carpet, steps, non-stretchable carpets, carpeting around posts and over ledges. Wood and tile floor installation will include flooring material types and grades; preparing the underlayment; planning the layout; wood floor sanding; and applying various finishes.

RELATED INSTRUCTION HOURS: 292
ON-THE-JOB LEARNING HOURS: 875

GREEN LANDSCAPING

Materials, Plans, Specifications, and Codes

RELATED INSTRUCTION: 40 hours
ON-THE-JOB LEARNING: 50 hours

This training presents basic elements of print reading and provides experience in print reading for residential construction, light commercial and heavy commercial construction. Course content includes coverage in the areas of green building technology and construction, sustainable energy systems, the latest print production technology, and expanded building trade roles, materials, and methods. The course also introduces participants to the challenge of interpreting information from various locations in a set of prints in heavy commercial construction.

Planting and Lawn Installation

RELATED INSTRUCTION: 40 hours
ON-THE-JOB LEARNING: 250 hours

Training presents the proper methods of installing a lawn and a wide array of turf grasses, groundcovers, and lawn treatments. The program offers detailed procedures for lawn installation including lawn repair methods such as reseeding, installing sod, and plugging a lawn. Lawn maintenance is also discussed, including mowing, watering, aerating, de-thatching, and prevention and control of weeds and diseases.

Pruning

RELATED INSTRUCTION: 40 hours
ON-THE-JOB LEARNING: 100 hours

The training introduces the process of pruning everything from ornamental trees and bushes to common shrubs and discusses the timing and techniques that results in successful pruning for healthy growth. Pruning training also gives specific methods for pruning hundreds of species from the cold climates to the tropics and covers plant types from ornamental bushes, evergreens, ornamental vines, and edible fruit and nut trees to houseplants. Upon completion of the training, apprentices will know about pruning: why you need to prune, when to do it and what tools are required.

Installing an Irrigation System

RELATED INSTRUCTION: 40 hours
ON-THE-JOB LEARNING: 200 hours

Training includes information on how to select, install, and maintain the right system(s) for the landscaping needs and discusses how to plan watering zones appropriate to the climate and landscape varieties. Through instructor facilitated and extensive hands-on training, the Home Performance Laborer becomes familiar with the processes needed to assemble and install a new drip, trickle, or sprinkler system for lawns, shrubs or gardens.

Installing a Retaining Wall Brick Pavers Walk or Patio Installation

RELATED INSTRUCTION: 40 hours
ON-THE-JOB LEARNING: 200 hours

This training provides the apprentice with all the information needed to integrate popular hardscape design into the overall home landscape. Included are processes for building retaining walls, flagstone and tile patios, and brick, mortar, and concrete walks and patios.

RELATED INSTRUCTION HOURS: 200
ON-THE-JOB LEARNING HOURS: 800

GREEN REMEDIATION

Asbestos Abatement

RELATED INSTRUCTION: 40 hours
ON-THE-JOB LEARNING: 100 hours

Asbestos Abatement Worker training prepares HPLs to work safely and productively on asbestos abatement projects. The program is designed to exceed Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) training requirements under 29 CFR Part 1926.1101 and 40 CFR Part 763 respectively. Apprentices receive extensive instruction and hands-on training on work area preparation, decontamination facility construction and use, abatement techniques, and

cleanup procedures. Special emphasis is placed on following proper procedures and developing safe work habits.

Lead Abatement

Lead Abatement Worker training prepares HPLs to work safely and productively on lead abatement projects. The course meets all Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) training requirements under 29 CFR Part 1926.62 and 40 CFR Part 745.225 respectively. The course is mandatory for all workers conducting lead-based paint activities in target housing and child occupied facilities.

RELATED INSTRUCTION: 40 hours
ON-THE-JOB LEARNING: 50 hours

Lead Renovation, Repair and Painting (RRP)

Lead Renovator training prepares apprentices to perform renovation work using lead safe work practices. The course meets all Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) training requirements under 29 CFR Part 1926.1101 and 40 CFR Part 745.225 respectively. The course is mandatory for all workers conducting renovation activities where lead-based paint is present in target housing and child occupied facilities.

RELATED INSTRUCTION: 16 hours
ON-THE-JOB LEARNING: 250 hours

Microbial

Microbial Remediation training instructs HPLs on the health hazards, personal protective equipment requirements, and remediation processes and techniques associated with the removal of mold as well as other microbial contamination.

RELATED INSTRUCTION: 16 hours
ON-THE-JOB LEARNING: 250 hours

Hazardous Waste

Hazardous Waste Worker training prepares HPL to work safely and productively on hazardous waste remediation projects. The program meets all Occupational Safety and Health Administration (OSHA) training requirements under 29 CFR Part 1910.120 – Hazardous Waste Operations and Emergency Response. Training is mandatory for all workers conducting hazardous waste remediation activities on all Environmental Protection Agency (EPA) National Priorities Listed (NPL) hazardous waste sites as well as all state, local, county, city, public, and private hazardous waste sites.

RELATED INSTRUCTION: 80 hours
ON-THE-JOB LEARNING: 60 hours

Water Damage /Fire Restoration

Training prepares apprentices to properly evaluate the loss, test damaged materials, select the optimum restoration alternative, coordinate with insurance professionals, and ultimately, to restore property and contents to a pre-loss condition. Training will also increase the apprentice's ability to remove excess water efficiently, to promote efficient evaporation and to establish the dehumidification conditions necessary to stop on-going damage.

RELATED INSTRUCTION: 40 hours
ON-THE-JOB LEARNING: 90 hours

RELATED INSTRUCTION HOURS: 232
ON-THE-JOB LEARNING HOURS: 800

Totals

Core – 400 hours

Weatherization – 815 hours

Sustainable Building – 800 hours

Deconstruction/Retrofit – 875 hours

Green Landscaping – 800 hours

Green Remediation – 800 hours

Alternative Related Instruction Outline

| SUBJECT AREAS | APPROXIMATE HOURS |
|--|--------------------------|
| UNDERSTANDING THE BUILDING | |
| Energy Flow and Physics | 4 |
| Energy and Building Durability | 4 |
| Retrofitting a Building | 3 |
| Building Construction - Foundations | 3 |
| Building Construction - Walls | 3 |
| Building Construction - Roofs and Attics | 3 |
| Insulating Materials | 3 |
| Cladding, Flashings, and Weather Barriers | 3 |
| Windows and Doors | 3 |
| Ventilation and Indoor Air Quality | 3 |
| Heating and Domestic Hot Water | 3 |
| Commissioning | 3 |
| BUILDING DIAGNOSTICS | |
| Communications with the Building Owner/Occupant | 2 |
| Visually Inspecting the Building's Exterior | 4 |
| Visually Inspecting the Building's Interior | 6 |
| Tools and Techniques used in Determining Building Air Tightness and Energy Usage | 2 |
| Testing a Building | 8 |
| Testing Building Systems | 8 |
| Developing Strategies to Fix the Building | 8 |
| Safety | 14 |
| RETROFITTING THE BUILDING | |
| Prepping the Building | 4 |
| Foundation Retrofit and Repair | 8 |
| Roof Retrofit and Repair | 8 |
| Wall Retrofit and Repair | 8 |
| Window and Door Retrofit and Repair | 8 |
| Heating and Domestic Hot Water Systems Improvements | 8 |
| Ventilation System Improvements | 8 |
| Appliances and Lighting | 4 |
| Commissioning | 4 |
| TOTAL HOURS OF RELATED INSTRUCTION | 150 |