



4.3 Installing Appliances and Interior Vapor Distribution Systems

Performance-Based Skills Assessment

2020



Section One

- Task 1
- Task 2
- Task 3
- Task 4
- Task 5

Design Considerations for Gas Appliances

- Identify Types of Gas Appliances
- Verify Appliance Location Requirements
- Verify Appliance Selection
- Calculate Air for Gas Appliances: Using the Standard or Kair Method
- Supply Additional Combustion Air

Section Two

- Task 1
- Task 2
- Task 3
- Task 4
- Task 5

Designing Venting Systems

- Identify Types of Venting Systems
- Identify Natural Draft System Materials and Components
- Size Natural Draft Systems for a Single Appliance
- Design Natural Draft Venting Systems
- Identify Mechanical Draft Venting Systems

Section Three

- Task 1
- Task 2
- Task 3
- Task 4

Design of Interior Vapor Distribution Systems

- Identify BTU Load and Verify Regulator Requirements in the System
- Understand Gas Pressure and Volume in the Interior Piping System
- Identify Piping Considerations in the Interior Piping System
- Size Gas Piping in the Interior Piping Systems

Section Four

- Task 1
- Task 2

Installing Appliances

- Convert Gas Appliances
- Add Gas Appliances

Section Five

- Task 1
- Task 2

Installing Venting Systems

- Install Natural Draft System
- Install Mechanical and Direct Vent Systems

Section Six

- Task 1
- Task 2
- Task 3

Installation of Interior Vapor Distribution System

- Identify General Procedures for Interior Piping Installation
- Identify General Requirements for CSST Installation
- Identify General Requirements for Pressure Testing

NOTICE: The Skills Evaluator must be the candidate's supervisor or another qualified person who has completed CETP 2014 "Installing Appliances and Interior Vapor Distribution Systems" or is familiar with the subject matter.

CETP Certification requires that the employee seeking certification cannot act as his/her own evaluator

Section One: Design Considerations for Gas Appliances

Task 1: Identify Types of Gas Appliances

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Explain how gas appliances are defined by the following groupings/categories and provide examples for each:
 - Listed and unlisted
 - Vented and unvented
 - Category I – IV vented appliances
 - Dedicated and convertible
 - Residential and commercial
 - Interior and exterior
2. Explain how the vent category of an appliance affects flue gas temperature and condensation.
3. Locate the following information on the appliance name plate:
 - Manufacturer name, model, serial number, and product information
 - Appliance category, if vented
 - Minimum installation and operating requirements
 - Fuel gas type designated for the appliance
 - Appliance input and output ratings (in Btu/hr) for installation locations from sea level to 2,000 ft elevation
 - Testing agency, if applicable

Satisfactory

Task 2: Verify Appliance Location Requirements

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Explain the requirements and considerations for the following when locating appliances:
 - Manufacturer instructions
 - Garage installations
 - Proper clearances from combustible materials
 - Accessibility for inspection, service, repair or replacement
 - Proper location of unvented room heaters: what is/is not permitted and any input rating limitations (bedroom & bathrooms)
2. Explain the following guidelines for safe access to appliance installations in an attic:
 - Attic openings and pathways to an appliance
 - Access requirements for attics less than 6' high
 - Platform dimension requirements for the appliance where work is to be performed
 - Attic lighting and electrical requirements
3. Provide examples of commercial appliances and the associated food service code requirements for the following:
 - Floor-mounted appliances
 - Countertop appliances
4. Identify the specific locations or the appliances that are strictly prohibited from installation for the following:
 - Room heaters
 - Heating furnaces, clothes dryers, and boilers (unless specifically listed for that location)
 - Mobile homes
 - Vented gas fireplaces (unless specifically listed for that use)
5. Explain code requirements for locating outdoor appliances, to include:
 - Gas-fired cooking appliances
 - Listed and Unlisted appliance requirements
 - Pool heater code and safety requirements
 - Open flame decorative appliance requirements
 - Combustible materials requirements

Satisfactory

Task 3: Verify Appliance Selection

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Identify the general considerations to determine the heat loss of a building
2. Explain the differences between a heating appliance output and input ratings, and which rating is used to select an appliance
3. Identify problems associated with an appliance that is either too small or too large for the space in which it is installed
4. Demonstrate how to use manufacturer specification sheets to correctly size the following:
 - Room heaters
 - Central heat furnace or boiler
 - Water heater

Satisfactory

Task 4: Calculate Air for Gas Appliances: Using the Standard, Alternative or Kair Methods

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Explain what the "air changes per hour" (ACH) is and why it is an important factor to know when calculating the air for gas appliances
2. Explain why direct vent appliances and clothes dryers are not included when calculating proper appliance air.
3. Describe when the following methods of calculating adequate combustion air are used:
 - Standard Method
 - Alternative Standard Method
 - Known Air Infiltration Rate (KAIR)
4. Perform the necessary steps to determine adequate air supply based on the calculation method(s) used below:

Evaluator: indicate the method(s) used below to determine adequate air supply

- Standard Method** **Known Air Infiltration Rate (KAIR)**
- Alternative Standard Method**

Standard Method

- Calculate the room volume: Room Volume Cubic ft
- List the input ratings for all appliances in the building
- Add the input rating for each appliance together, and then divide by number by 1,000: Total Input Rating (Btu/hr)
- Take the room volume and divide by the total input rating per 1,000: Room Volume cubic ft ÷ Total Input Rating
- The resulting answer is the required volume for all appliances: Answer in cubic ft
- If the number is greater than or equal to 50 cubic ft, then no additional air is required.
- If the number is less than 50 cubic ft, you will need to supply additional air

Alternative Standard Method

- Calculate the room volume: Room Volume Cubic ft
- Multiply room volume by 20: Room Volume Cubic ft x 20 = Maximum Appliance Input
- Add the input rating for each appliance together to obtain the total appliance input = Total Appliance Input
- If the Total Appliance Input is less than the Maximum Appliance Input, there is enough air to support combustion
- If the Total Appliance Input is greater than the Maximum Appliance Input, there is insufficient air to support combustion and steps must be taken to provide additional combustion air before the appliance can be placed into operation

Known Air Infiltration Rate (KAIR)

- List the total input ratings of all non-fan-assisted appliances
- Determine the air infiltration rate of the space
- Calculate required volume of non-fan-assisted appliances
- List the total input ratings of all fan-assisted appliances
- Calculate the required volume of fan-assisted appliances
- Determine total required volume for all appliances
- Determine available room volume
- Determine if additional air opening are required

Satisfactory

Task 5: Supply Additional Combustion Air

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Identify the three main sources for supplying additional combustion air.
2. Explain how the following methods supply additional air *and* identify where the source of air is obtained:
 - Two-opening method
 - Single-high method
 - Mechanical combustion air
 - Engineered air
3. Explain how the two-opening method functions to supply additional air in the following locations:
 - Direct openings
 - Wall duct air supply
 - Attic/crawl space
4. Calculate sizes for a permanent opening for use with the Single-High Method, to include:
 - Louvered openings: Net free
 - Louvered openings: Net-free/No spec sheet
5. Explain how to perform calculations when using a combination of indoor/outdoor air to supply additional air.

Satisfactory

Section Two: Designing Venting Systems

Task 1: Identify Types of Venting Systems

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Identify the three products of complete combustion.
2. Provide examples for the following venting systems:
 - Natural draft venting
 - Direct venting
 - Mechanical draft venting
3. Explain two ways that natural draft systems are vented.
4. Identify termination requirements for the following in a natural draft venting system:
 - Chimneys
 - Gas vents
 - Roof pitch
5. Identify the following for a direct venting system:
 - The two main designs for direct venting systems
 - Characteristics of a sealed combustion direct vent appliance
 - Termination requirements for a direct venting system
6. Identify the following for a mechanical draft venting system:
 - Forced draft
 - Induced draft
 - Termination requirements for a mechanical draft venting system
7. Explain how venting systems affect the appliance selection process.

Satisfactory

Task 2: Identify Natural Draft System Materials and Components

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Identify the major components of a typical natural draft venting system.
2. Describe how a natural draft venting system moves the products of combustion out of the structure.
3. Identify the proper use and code requirements for the following types of vent materials and components of a natural draft system:
 - Type B-venting
 - Type BW-venting
 - Type L-venting
 - Single-wall venting
 - Vent caps
 - Vent Wyes and Tees
 - Firestops
 - Vent supports
4. Identify the requirements and considerations for using masonry and factory-built chimneys in natural draft venting systems

Satisfactory

Task 3: Size Natural Draft Systems for a Single Appliance

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) and use manufacturer instructions and applicable code books and venting tables for the skills assessment task evaluation:

1. Explain how to use NFPA 54 tables and manufacturer sizing instructions to size a natural draft system for a single appliance
2. Use the Type B Double-Wall Vent Table in NFPA 54 to determine the correct vent diameter for the following types of Category I Appliances that are connected directly to the vent, assuming a Vent height of 20 feet and Vent lateral of 5 feet for the following:
 - Fan-assisted (FAN) appliance with input rating of 125,000 Btu/hr
 - Natural draft (NAT) appliance with input rating of 69,000 Btu/hr
3. Identify additional natural draft venting material needed for installation and their applicable location requirements.
4. Explain the requirements for obstructions and installing vent dampers in the venting system.
5. Explain how to use NFPA 54 venting tables for two-stage or modulating appliances.
6. Identify how vent connectors are used in the venting system and restrictions for their use
7. Explain requirements for the following:
 - Sizing gas vents
 - Vertical vent upsizing
 - Clay-tile-lined exterior masonry chimneys

Satisfactory

Task 4: Design Natural Draft Venting Systems

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Explain the following terms used when sizing a new multiple Category appliance venting system:
 - Total vent height
 - Connector rise
 - Common vent
2. Explain requirements and restrictions for vent connector length
3. Verify the following prior to connecting a Category I appliance to an existing venting system:
 - All appliances, including the one to be added, are designed for use with a common venting system
 - Existing venting system has adequate capacity to meet the requirements of the appliances
 - Existing venting system incorporates the proper type of venting materials specified for the appliance to be added
 - New appliance does not introduce an operating design difference that would require altering the common vent to meet the new total Btu/hr input rating
4. Explain the following requirements for multistory venting:
 - Multistory vent height
 - Multistory lowest vent and vent connector sizing
 - Required multistory B-vents
 - Multistory vent offsets and capacity

Continued

Task 4 continued

5. Explain the following NFPA 54 requirements for designing a gas appliance venting system:
- Minimum lateral runs
 - Provide proper clearances
 - Avoid existing ducting

Satisfactory

Task 5: Identify Mechanical Draft Venting Systems

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. List the major components of a mechanical draft venting system.
2. Describe how induced and forced mechanical draft systems operate to vent flue gases to the outside.
3. Explain the advantages of mechanical draft systems.
4. Identify the electrical interlock switch and explain its purpose.
5. Identify NFPA 54 requirements for direct venting terminations.
6. Identify special considerations for the following:
 - Exhaust systems
 - Excessive negative pressure
 - Gas clothes dryer
7. Identify the fundamental design features that maximize heat output in high efficiency appliance systems.
8. Explain the requirements for installing condensation drains and provide examples when condensate must be captured and disposed of.

Satisfactory

Section Three: Design of Interior Vapor Distribution Systems

Task 1: Identify BTU Load and Verify Regulator Requirements in the System

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Determine the current Btu load on the system by checking existing appliances and estimating any potential for future demands through customer consultation.
2. Explain the sizing of a system load based on established load diversity factors.
3. Calculate the Effective System Load of the system
4. Explain the purpose and function of regulators in the system.
5. Explain how the following are used to select a regulator for the system:
 - Inlet pressure
 - Outlet pressure
 - Total gas demand
 - Pipe size
6. Explain the advantages of a 2 psi regulator system.
7. Explain the use of line regulators, to include:
 - Installation location and purpose of line regulators
 - How to size a line regulator
 - Requirements for selecting a line regulator
8. Explain the purpose of using vent limiters on line regulators in the system.
9. Explain the venting of line regulators, to include:
 - Venting outdoors
 - Manifolding
 - NFPA 54 and AHJ code requirements
 - Potential problems related to diaphragm failure and consequent back pressure
 - Potential problems related to diaphragm failure due to manifold vent termination issues

Satisfactory

Task 2: Understand Gas Pressure and Volume in the Interior Piping System

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Explain how the following affect propane volume and pressure:
 - Long pipes vs short pipes
 - Added elbows and fittings
2. Explain how the following affect propane volume and pressure:
 - 1" diameter pipes vs ½" pipes
 - Selected system pressure

Satisfactory

Task 3: Identify Piping Considerations in the Interior Piping System

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Identify code requirements and manufacturer instructions-for the interior piping system, to include:
 - Approved uses for the interior piping system
 - Concealed piping
 - Piping below foundations
 - Piping supports
 - Sediment traps
 - Plastic pipe and anodeless risers
 - Connecting material restrictions
 - Alternative piping locations
 - Additional design requirements
 - Shutoff valves

Satisfactory

Task 4: Size Gas Piping in the Interior Piping Systems

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) and use NFPA 54 "Tables for Sizing Gas Piping Systems Using Propane" for the skills assessment task evaluation:

1. Identify the NFPA 54 requirements for sizing gas piping
2. Explain the "Allowable Pressure Drop Rule."
3. Explain when the following NFPA-approved methods are used for sizing gas pipes in the interior piping system:
 - Longest length
 - Branch length
 - Hybrid pressure
4. Perform the necessary steps using NFPA 54 "Tables for Sizing Gas Piping Systems Using Propane" to size a gas pipe for the interior piping system based on the calculation method(s) indicated below:

Evaluator: indicate the method(s) used below to size a gas pipe for the interior piping system:

- Longest length
- Branch length
- Hybrid Method: 2 psi Section

Longest length

- Sketch the piping system
- Calculate the system information, using Btu/hr for the piping
- Determine the system pressure and the piping material (locate appropriate NFPA 54 Pipe sizing table for future reference)
- Label sketch from first point of delivery (meter or regulator) to the first tee, then to second tee, and proceed accordingly
- Determine the longest length of piping from the point of delivery to the most remote appliance and use this length for the Pipe sizing table
- Determine the input rating for each appliance
- Use the Pipe sizing table to determine the length of pipe section, allowing for connection, elbow, and tee considerations, as appropriate

Branch length

- Sketch the piping system
- Calculate the system information, using Btu.hr for the piping
- Determine the system pressure and the piping material (locate appropriate NFPA 54 Pipe sizing table for future reference)
- Label sketch from first point of delivery (meter or regulator) to the manifold, and label accordingly
- Determine the length of branch serving each appliance and use this length for the Pipe sizing table
- Determine the input rating for each appliance, using input ratings of thousands of Btu/hr
- Use the Pipe sizing table to determine the length of pipe section, allowing for connection, elbow, and tee considerations, as appropriate

Continued

Task 4 continued

Hybrid Method: 2-psi Section

- Calculate the gas load by adding the name plate ratings from all connected appliances
- Measure the distance from the point of delivery to the line regulator from all connected appliances
- If multiple line regulators are used, measure the distance from the point of delivery to the regulator farthest removed from the 2-psi regulator
- Verify the maximum allowable pressure drop for the 2-psi section is 1-psig
- Determine the appropriate NFPA 54 Pipe sizing table based on piping material for 2-psi systems with a 1-psig pressure drop, and locate the appropriate distance and gas load on the rows in the chart
- Use the Pipe sizing table to determine the length of pipe section, as appropriate
- If multiple regulators are used in this portion of the piping system, use the longest length previously determined to size each line segment for its actual gas load

Satisfactory

Section Four: Installing Appliances

Task 1: Convert Gas Appliances

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Identify factors as they apply to appliances to be converted for propane use:
 - Information on Manufacturer name plate
 - Dedicated vs convertible appliances
 - NFPA 54 and AHJ code requirements
2. Explain how the following considerations apply to converting an appliance from natural gas to propane:
 - Volume of fuel gas input to the appliance
 - Minimum gas pressure required by the appliance
 - Primary and secondary air supply needed for complete combustion
3. Explain how heat value and density of propane differs from natural gas and affects the following:
 - Gas orifice
 - Volume of gas entering the burner
4. Identify the following for an appliance burner operating on both natural gas and propane:
 - Input pressure factors
 - Primary air supply
 - Secondary air supply
5. Explain the following for the effects of high altitude on combustion for converted gas appliances:
 - Appliance operation
 - Appliance adjustments
6. Explain when each of the following would be used during a gas appliance conversion process:
 - Conversion kit
 - Universal orifice
 - Fixed orifice
7. Identify the uses for plug-type and cap-type main burner orifices.
8. Properly verify manifold pressure:
 - In a gassed system, verify appliance gas control valve is turned off, including the pilot lights
 - Remove the plug from the pressure tap on the outlet side of the gas valve
 - Install the proper threaded fitting to connect the manometer using an approved thread sealant; attach the manometer hose to the fitting
 - Start the appliance and turn on the main burner; with thermostat-controlled burner, the thermostat must be set high enough to call for heat
 - When main burner ignites, the manometer will be pressurized
 - Access the adjustment screw cap and adjust the manifold gas pressure according to appliance name plate or manufacturer instructions
 - Turn off the appliance before disconnecting the manometer
 - Remove the fitting from the pressure tap and replace the plug in the tap using an approved thread sealant
 - Restart the appliance, turn on the main burner, and check the pressure tap for leakage
9. Identify any applicable code requirements for marking or tagging converted appliances.

Satisfactory

PERC 4.3 Installing Appliances and Interior VDS Skills Assessment (2020)

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Task 2: Add Gas Appliances

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Ensure equipment meets code requirements for adding or exchanging an appliance in the system.
2. Recalculate the combustion air for the added appliance(s) to the system using the Standard or KAIR Method.
3. Identify the proper steps for the following when adding or exchanging an appliance in the existing system:
 - Vapor distribution system can supply the new Btu/hr load
 - Air combustion and ventilation is enough to accommodate additions
 - Venting system can accommodate additions and is sized properly
4. Ensure added appliances do not render existing system or other appliances unsafe for proper operation:
 - Combustion and ventilation air
 - System pipe sizing
 - System pressure

Satisfactory

Section Five: Installing Venting Systems

Task 1: Install Natural Draft Systems

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Review the venting components for natural draft system installations.
2. Explain the purpose of a draft hood:
 - Ready escape of flue gases
 - Dilution air for flue gases
 - Prevention of back drafts
 - Neutralizing stack action of a chimney
3. Explain the requirements for draft hood locations
4. Identify vent connector requirements for natural draft systems, to include:
 - Vent connector thicknesses used in residential-type appliances
 - Vent connectors thicknesses used in non-residential low-heat appliances
 - Properly sizing vent connectors
 - Properly securing vent connectors
 - Maintaining proper clearances
5. Identify the requirements for assembling and connecting the following in a natural draft system:
 - Joint connections between piping or to the flue collars or draft hood outlets
 - Vent wyes and tees
 - Firestops
 - Vent supports
 - Roof flashing
 - Vent caps
6. Identify the following termination requirements for a natural draft system:
 - Chimneys used in residential-type or low-heat appliances
 - Chimneys used in medium-heat appliances
 - Chimneys: additional termination requirements
 - Gas Vents: Roof pitch
 - Gas Vents: Height requirements
 - Gas Vents: Type-B or Type-L
 - Gas Vents: Type-BW
 - Gas Vents: Air Inlets
7. Identify requirements for connecting to a common vent
8. Identify requirements for installing chimney liners.
9. Explain the impact temperature has on venting in colder climates
10. Identify company policies and procedures for installing multi-story venting.

Satisfactory

Task 2: Install Mechanical and Direct Vent Systems

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Review requirements and guidelines for installing mechanical draft venting systems.
2. Explain how induced and forced mechanical draft systems operate to vent flue gases to the outside.
3. Install a mechanical vent system according to manufacturer instructions, to include:

Installing PVC Pipe

- Correctly mark the wall where the vent terminal will be placed, and measure the length of pipe needed to reach the appliance from the termination point
 - Correctly cut the vent pipe and remove any burrs or defects from the outside and inside with the proper tool
 - Join the pipe and fittings per manufacturer instructions, allowing for proper curing of cement before installation
 - Properly install the vent pipe and any support components per manufacturer instructions
 - Properly seal around vent pipe at exterior wall exit
 - Install manufacturer supplied vent termination fitting, as per manufacturer instructions
4. Review requirements for adding mechanical power vents to Category I appliances.
 5. Add a mechanical power vent according to manufacturer instructions and company policies and procedures, to include:

Mechanical Power Vent, as applicable

- Assemble the power venter and other components as necessary, ensuring all power switches are in the OFF position
 - Determine the correct vent terminal location, mark as appropriate and cut the hole accordingly
 - Install the vent terminal or the entire power vent until if all one piece
 - Position and secure power venter according to manufacturer instructions
 - Install and secure the interior wall flange and decorative cover according to manufacturer instructions
 - Install the vent piping from the appliance to the power venter, and any support components, according to manufacturer instructions
 - Properly seal around vent terminal at exterior wall exit
 - Ensure power is OFF prior to power supply being connected by a qualified person
 - Incorporate the control wiring to the safety interlock system
 - Test the fan system to ensure proper operation
6. Identify the termination requirements for a mechanical draft vent system.
 7. Review requirements for installing direct vent systems.
 8. Install a direct vent system according to manufacturer instructions, to include:

Direct Vent System

- Check the finished siding on the outside wall to ensure correct termination hood installation
 - Review appliance manufacturer installation instructions and plan for installation accordingly
 - Assemble the pipe as necessary, attach, and seal to the appliance according to manufacturer instructions
 - Determine the correct vent pipe exit location, mark as appropriate, frame, and cut the hole accordingly
 - If required*, install outside half of wall thimble through the opening and secure as appropriate
 - Seal around the vent pipe where it extends through the exterior wall, as appropriate
9. Identify the termination requirements for a direct vent system.

Satisfactory

Section Six: Installation of Interior Vapor Distribution System

Task 1: Identify General Procedures for Interior Piping Installation

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Perform the following steps for basic piping installation:
 - Determine the size, length, and installation location of the pipe or tubing
 - Cut and thread the pipe, or cut tubing, and assemble fittings
 - Place and join piping or tubing
 - Install piping and tubing supports
 - Cap or plug all pipe and tubing outlets
 - Perform a pressure test on the entire piping system
2. Explain other considerations for interior vapor distribution piping to include:
 - Concealed piping and connections
 - Piping in floors
 - Shut off valves and sediment traps
 - Gas piping in partitions
 - Gas outlets
 - Appliance connectors

Satisfactory

PERC 4.3 Installing Appliances and Interior VDS Skills Assessment (2020)

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Task 2: Identify General Requirements for CSST Installation

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Identify the general requirements for installing CSST, to include:
 - Qualified technician
 - Manufacturer instructions
 - Installation requirements in construction
2. Explain the importance of and procedures for electrical bonding and grounding of CSST.

Satisfactory

Task 3: Identify the General Requirements for Pressure Testing

Preparation Guide: Wear appropriate Personal Protection Equipment (PPE) for the skills assessment task evaluation:

1. Explain the purpose for a pressure test of an interior vapor distribution system.
2. Demonstrate a clear understanding of the NFPA 54 requirements for the pressure test and devices of the interior vapor distribution system.
3. Perform a pressure test according to NFPA 54:
 - Test the piping system absent the regulators, and appliances with all lines either capped or plugged.
 - Install a test adaptor with a suitable gauge at any connection in the piping system.
 - Pressurize the piping system to at least 3 psig and isolate the source of pressure from piping system
 - Ensure the pressure on the piping system remains constant for a minimum time period of 10 minutes
 - If the piping system is not considered gas tight, locate the leak, make necessary repairs, and repeat the pressure test
 - Document the pressure test according to your company policy

Satisfactory

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CETP Certification Performance Evaluation / Candidate Record (4.3)

Completing your PERC CETP Certification:

- 1: Successfully pass the exam.
- 2: Complete and return the *CETP Performance Evaluation / Employee Record* to the testing center below within 12 months of passing the exam.
- 3: Complete any necessary prerequisites within 12 months of passing the exam.

Make a copy for your training records and then send to:

Industrial Training Services, Inc.

120 Max Hurt Drive ● Murray, KY 42071 ● PH: 270-753-2150 ext. 2 ● EMAIL: skills@its-training.com

The information requested below will be used to assist in locating your records in the CETP database. Please make sure to complete all requested information; we thank you in advance for your assistance.

Candidate Information: (print or type) Test Group Number (if known): _____

Name: _____ Last four digits of SSN (only): _____

Employer: _____

Address: _____ Daytime Phone#: _____

City, State: _____ Zip Code: _____

Affidavit

I affirm that I am the person who has performed those items checked on this checklist. I acknowledge that the performance checklists used are solely for the purpose of skills assessment for the CETP Certification requirements, and are not intended to replace or modify company operating or safety procedures, and may not be appropriate for use in all circumstances. I acknowledge that I am responsible for recognizing hazards and abnormal conditions in my workplace and must exercise care and good judgment, always using appropriate equipment, procedures and tools for the tasks I perform. The Propane Education and Research Council, the National Propane Gas Association and Industrial Training Services, Inc. assume no liability for my actions, or for my application of the skills assessment performance guides used in this evaluation checklist.

Candidate Signature _____ **Date** _____

Skills Evaluator Information: (print or type)

Name: _____

Organization/Employer: _____

Affidavit

I affirm that I am the person who has administered this checklist, and that I have conducted this Performance-Based Skills Assessment Evaluation with integrity. I also affirm that the above named Candidate is the person whose performance I evaluated, and that the above named person performed the checked tasks at the indicated level without assistance from me or any other person.

Skill Evaluator's Signature _____ **Date** _____

Registered Skills Evaluator Number (required for processing) _____

PERC 4.3 Installing Appliances and Interior VDS Skills Assessment (2020)

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Final Checklist for: 4.3 Installing Appliances and Interior VDS

Name: _____ Last four digits of SSN (only): _____

The candidate has been evaluated on the following tasks at the following level:
 (The N/A option is available only as listed in the Not Applicable column/available box(s) below. All other tasks must be completed.)

Satisfactory	Not Applicable	Section One: Design Considerations for Gas Appliances
<input type="checkbox"/>		Identify Types of Gas Appliances
<input type="checkbox"/>		Verify Appliance Location Requirements
<input type="checkbox"/>		Verify Appliance Selection
<input type="checkbox"/>		Calculate Air for Gas Appliances: Using the Standard or Kair Method
<input type="checkbox"/>		Supply Additional Combustion Air
Section Two: Designing Venting Systems		
<input type="checkbox"/>		Identify Types of Venting Systems
<input type="checkbox"/>		Identify Natural Draft System Materials and Components
<input type="checkbox"/>		Size Natural Draft Systems for a Single Appliance
<input type="checkbox"/>		Design Natural Draft Venting Systems
<input type="checkbox"/>		Identify Mechanical Draft Venting Systems
Section Three: Design of Interior Vapor Distribution Systems		
<input type="checkbox"/>		Identify BTU Load and Verify Regulator Requirements in the System
<input type="checkbox"/>		Understand Gas Pressure and Volume in the Interior Piping System
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<input type="checkbox"/>		Size Gas Piping in the Interior Piping Systems
Section Four: Installing Appliances		
<input type="checkbox"/>		Convert Gas Appliances
<input type="checkbox"/>		Add Gas Appliances
Section Five: Installing Venting Systems		
<input type="checkbox"/>		Install Natural Draft System
<input type="checkbox"/>		Install Mechanical and Direct Vent Systems
Section Six: Installation of Interior Vapor Distribution System		
<input type="checkbox"/>		Identify General Procedures for Interior Piping Installation
<input type="checkbox"/>		Perform System Flow and Lock-up Tests
<input type="checkbox"/>		Identify General Requirements for CSST Installation