



NEVADA LABOR COMMISSIONER
NEVADA STATE APPRENTICESHIP COUNCIL
2023 Non-Joint Standards of Apprenticeship

Appendix A

WORK PROCESS SCHEDULES AND RELATED INSTRUCTION OUTLINE

Veterans Stand Together

**Heating & Air-Conditioner
Install/Service**

O*NET-SOC CODE: 49-9021.00 RAPIDS CODE: 0637HY

**APPROVED BY
THE NEVADA LABOR COMMISSIONER AND THE NEVADA STATE APPRENTICESHIP COUNCIL**

Toni Giddens, Nevada State Apprenticeship Director

REGISTRATION DATE: _____

RAPIDS PROGRAM ID NUMBER: 0637HY

**DEVELOPED IN COOPERATION WITH THE
THE NEVADA LABOR COMMISSIONER, THE NEVADA STATE APPRENTICESHIP COUNCIL AND
THE U.S. DEPARTMENT OF LABOR**

Appendix A

WORK PROCESS SCHEDULE

This schedule is attached to and a part of these Standards for the above identified occupation.

1. TYPE OF OCCUPATION

☐ Time-based ☐ Competency-based ☒ Hybrid

2. TERM OF APPRENTICESHIP

The term of the occupation shall be defined by the attainment of all competencies of the position. 1) If the program uses a time-based approach, requires the completion of not less than 2,000 hours of [work experience,] on-the-job learning, consistent with training requirements as established by practice in the trade; (2) If the program uses a competency-based approach, specify the skills that must be demonstrated by an apprentice and address how on-the-job learning will be integrated into the program; or (3) If the program uses a hybrid approach, specify the skills that must be acquired and the minimum number of hours of on-the-job learning that must be completed by an apprentice.

This would be expected to occur within 7920-9380 hours approximately hours (must be at least 2,000 hours) of OJL, supplemented by the minimum of 144 hours of related instruction per year of the apprenticeship.

3. RATIO OF APPRENTICES TO JOURNEYWORKERS

The apprentice to journey worker/fully trained worker ratio is 1 apprentice(s) to 1 journey worker/fully trained worker(s).

4. APPRENTICE WAGE SCHEDULE

An apprentice's minimum starting wage will be at least \$15.48 per hour. Apprentices shall be paid a progressively increasing schedule of wages based on either a percentage or a dollar amount of the current hourly journey worker/fully trained worker wage. A journey worker/fully trained worker minimum wage will be at least \$28.00.

Period	% of journeyworker wage	Competencies	Wage (Hourly)
First	55%	0-1000 Hours	\$15.40
Second	60%	1000-2000 Hours	\$16.80
Third	65%	2000-3000 Hours	\$18.20
Fourth	70%	3000-4000 Hours	\$19.60
Fifth	75%	4000-5000 Hours	\$21.00
Sixth	80%	5000-6000 Hours	\$22.40
Seventh	85%	6000-7000 Hours	\$23.80
Eighth	90%	7000-8000 Hours	\$25.20
Ninth	95%	8000-8500 Hours	\$26.60
End Wage	100%	8500 Hours	\$28.00

Periodic review and evaluation of the apprentice's on-the-job learning and related technical instruction will be conducted in alignment with the wage schedule established.

5. WORK PROCESS SCHEDULE (See attached Work Process Schedule)

The sponsor may modify the work processes to meet local needs prior to submitting these Standards to the appropriate Registration Agency for approval.

6. RELATED INSTRUCTION OUTLINE (See attached Related Instruction Outline)

The sponsor may modify the related instruction to meet local needs prior to submitting these Standards to the appropriate Registration Agency for approval.

Appendix A

WORK PROCESS SCHEDULE

The term of the occupation shall be defined by the attainment of all competencies, both technical and behavioral, of the position, which would be expected and approximated to occur within 648 hours of OJL, supplemented by a minimum of 144 hours of related instruction per year of apprenticeship.

Apprenticeship Competencies – Technical

	Minimum Hours	Maximum Hours
A. Test electrical circuits or components for proper functioning. <ul style="list-style-type: none"> Test electrical circuits or components for continuity, using electrical test equipment. 	300	350
B. Determine operational compliance with regulations or standards. <ul style="list-style-type: none"> Comply with all applicable standards, policies, or procedures, such as safety procedures or the maintenance of a clean work area. 	200	240
C. Interpret blueprints, specifications, or diagrams to inform installation, development or operation activities. <ul style="list-style-type: none"> Study blueprints, design specifications, or manufacturers' recommendations to ascertain the configuration of heating or cooling equipment components and to ensure the proper installation of components. 	200	240
D. Confer with customers or users to assess problems. <ul style="list-style-type: none"> Discuss heating or cooling system malfunctions with users to isolate problems or to verify that repairs corrected malfunctions. Customer Service / Soft Skills 	200	240
E. Install heating, ventilation, or air conditioning (HVAC) equipment.	800	900

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<ul style="list-style-type: none"> • Connect heating or air conditioning equipment to fuel, water, or refrigerant source to form complete circuit. • Install, connect, or adjust thermostats, humidistats, or timers. • Install auxiliary components to heating or cooling equipment, such as expansion or discharge valves, air ducts, pipes, blowers, dampers, flues, or stokers. • Mount compressor, condenser, and other components in specified locations on frames, using hand tools and acetylene welding equipment. 		
<p>F. Adjust equipment to ensure optimal performance.</p> <ul style="list-style-type: none"> • Install, connect, or adjust thermostats, humidistats, or timers. • Adjust system controls to settings recommended by manufacturer to balance system. 	300	350
<p>G. Service heating, ventilation or air-conditioning (HVAC) systems or components.</p> <ul style="list-style-type: none"> • Repair or replace defective equipment, components, or wiring. • Install or repair air purification systems, such as specialized filters or ultraviolet (UV) light purification systems. • Install or repair self-contained ground source heat pumps or hybrid ground or air source heat pumps to minimize carbon-based energy consumption and reduce carbon emissions. • Repair or service heating, ventilating, and air conditioning (HVAC) systems to improve efficiency, such as by changing filters, cleaning ducts, and refilling non-toxic refrigerants. 	800	900
<p>H. Repair worn, damaged, or defective mechanical parts.</p> <ul style="list-style-type: none"> • Repair or replace defective equipment, components, or wiring. • Perform mechanical overhauls and refrigerant reclaiming. • Repair or service heating, ventilating, and air conditioning (HVAC) systems to improve efficiency, such as by 	500	600

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changing filters, cleaning ducts, and refilling non-toxic refrigerants.		
<p>I. Advise others on issues related to repairs, installation, or equipment design.</p> <ul style="list-style-type: none"> Recommend, develop, or perform preventive or general maintenance procedures, such as cleaning, power-washing, or vacuuming equipment, oiling parts, or changing filters. 	150	180
<p>J. Inspect systems to determine if they are operating properly.</p> <ul style="list-style-type: none"> Inspect and test systems to verify system compliance with plans and specifications or to detect and locate malfunctions. 	200	250
<p>K. Replace worn, damaged, or defective mechanical parts.</p> <ul style="list-style-type: none"> Repair or replace defective equipment, components, or wiring. 	500	600
<p>L. Install energy-efficient heating, ventilation, or air conditioning (HVAC) equipment.</p> <ul style="list-style-type: none"> Install dehumidifiers or related equipment for spaces that require cool, dry air to operate efficiently, such as computer rooms. Install or repair air purification systems, such as specialized filters or ultraviolet (UV) light purification systems. Install or repair self-contained ground source heat pumps or hybrid ground or air source heat pumps to minimize carbon-based energy consumption and reduce carbon emissions. 	300	350
<p>M. Braze metal parts or components.</p> <ul style="list-style-type: none"> Braze or solder parts to repair defective joints and leaks. 	300	340
<p>N. Connect electrical components or equipment.</p> <ul style="list-style-type: none"> Lay out and connect electrical wiring between controls and equipment, according to wiring diagrams, using electrician's hand tools. 	400	450
<p>O. Install machine or equipment replacement parts.</p> <ul style="list-style-type: none"> Install expansion and control valves, using acetylene torches and wrenches. 	300	350
P. Cut materials according to specifications or needs.	300	350

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<ul style="list-style-type: none"> Measure, cut, thread, or bend pipe or tubing, using pipe fitter's tools. 		
Q. Measure distances or dimensions. <ul style="list-style-type: none"> Measure, cut, thread, or bend pipe or tubing, using pipe fitter's tools. 	300	350
R. Document operational activities. <ul style="list-style-type: none"> Record and report time, materials, faults, deficiencies, or other unusual occurrences on work orders. 	200	240
S. Maintain repair or maintenance records. <ul style="list-style-type: none"> Keep records of repairs and replacements made and causes of malfunctions. 	200	240
T. Drill holes in parts, equipment, or materials. <ul style="list-style-type: none"> Cut or drill holes in floors, walls, or roof to install equipment, using power saws or drills. 	250	300
U. Install home appliances. <ul style="list-style-type: none"> Estimate, order, pick up, deliver, and install materials and supplies needed to maintain equipment in good working condition. 	200	240
V. Order materials, supplies, or equipment. <ul style="list-style-type: none"> Estimate, order, pick up, deliver, and install materials and supplies needed to maintain equipment in good working condition. 	80	120
W. Travel to work sites to perform installation, repair or maintenance work. <ul style="list-style-type: none"> Estimate, order, pick up, deliver, and install materials and supplies needed to maintain equipment in good working condition. 	80	120
X. Schedule repair, installation or maintenance activities. <ul style="list-style-type: none"> Schedule work with customers and initiate work orders, house requisitions, and orders from stock. 	80	120
Y. Supervise employees. <ul style="list-style-type: none"> Supervise and instruct assistants. 	140	180
Z. Train others in operational procedures. <ul style="list-style-type: none"> Supervise and instruct assistants. 	140	180
. Lay out work according to specifications. <ul style="list-style-type: none"> Lay out reference points for installation of structural and functional components, using measuring instruments. 	200	250

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• Test mechanical systems to ensure proper functioning. <ul style="list-style-type: none">• Test pipes, lines, components, and connections for leaks.	300	350
Total Hours	7920	9380

The above on-the-job-learning (OJL) work process competencies are intended as a guide. It need not be followed in any sequence, and it is understood that some adjustments may be necessary in the hours allotted for different work experience. In all cases, the apprentice is to receive sufficient experience to make them fully competent and use good workmanship in all work processes, which are a part of the industry. In addition, the apprentice shall be fully instructed in safety and OSHA requirements.

Apprenticeship Competencies – Behavioral

In addition to mastering all the essential technical competencies, an apprentice must consistently demonstrate at an acceptable level the following behavioral competencies, to complete the apprenticeship.

Item #	Behavioral Competencies
1.	Participation in team discussions/meetings
2.	Focus in team discussions/meetings
3.	Focus during independent work
4.	Openness to new ideas and change
5.	Ability to deal with ambiguity by exploring, asking questions, etc.
6.	Knows when to ask for help
7.	Able to demonstrate effective group presentation skills
8.	Able to demonstrate effective one-on-one communication skills
9.	Maintains an acceptable attendance record
10.	Reports to work on time
11.	Completes assigned tasks on time
12.	Uses appropriate language
13.	Demonstrates respect for patients, co-workers, and supervisors
14.	Demonstrates trust, honesty, and integrity
15.	Requests and performs work assignments without prompting
16.	Appropriately cares for personal dress, grooming and hygiene
17.	Maintains a positive attitude
18.	Cooperates with and assists co-workers
19.	Follows instructions/directions
20.	Able to work under supervision
21.	Able to accept constructive feedback and criticism
22.	Able to follow safety rules
23.	Able to take care of equipment and workplace
24.	Able to keep work area neat and clean
25.	Able to meet supervisor's work standards
26.	Able to not let personal life interfere with work
27.	Adheres to work policies/rules/regulations

RELATED INSTRUCTION OUTLINE

The related instruction has been developed in cooperation with employer-partners as part of the apprenticeship. The following is a set of courses to be delivered by subject matter experts.

Related Technical Instruction (RTI) - This instruction shall include, but not be limited to, at least 144 hours per year for each year of the apprenticeship. The related theoretical education listed below is tightly integrated with real work product. The curriculum is defined as a variety of classes, around which the exams and projects are based. By defining the RTI this way, all competencies required of the students are met, through project work.

Course Number	Course Title	Learning Objectives	Contact Hours
O*NET-SOC Code: 49-9021.00 RAPIDS Code: 0637HY	Heating & Air-Conditioner Install/Service	1. SAFETY <ul style="list-style-type: none"> a. Job Site Safety b. Local and National Codes c. Heavy Equipment Safety d. Other/Regional Needs 	45
		2. INSTALLATION <ul style="list-style-type: none"> a. Heat Basics b. Refrigeration Process c. Unit Location d. Air Distribution Systems e. System Connections f. Other/Regional Needs 	123
		3. STARTUP AND SERVICE <ul style="list-style-type: none"> a. System Evacuation b. System Startup c. System Charging d. Electrical Motors and Starting Components 	210

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		<ul style="list-style-type: none"> e. Automatic Controls and Devices f. Other/Regional Needs 	
		4. MECHANICAL AND ELECTRICAL TROUBLESHOOTING <ul style="list-style-type: none"> a. Common Mechanical Problems b. Metering Device c. Common Control-Circuit Problems d. Common Power-Circuit Problems e. Other/Regional Needs 	96
		5. REFRIGERANT MANAGEMENT <ul style="list-style-type: none"> a. Terms and Types b. Oils c. Handling and Transporting d. Refrigerant Recovery, Recycling and Reclaiming e. Other/Regional Needs 	78
		6. HEATING <ul style="list-style-type: none"> a. Electric Heating b. Gas Furnaces c. Oil Furnaces d. Hydronic Heat e. Heat Pumps f. Other/Regional Needs 	96
Total Hours			648

SECTION 27 - OFFICIAL ADOPTION OF APPRENTICESHIP STANDARDS

Veterans Stand Together hereby adopts these standards of apprenticeship.

Sponsor(s) designate the appropriate person(s) to sign the standards on their behalf.


Signature of Sponsor (designee)

Date: 1/18/2024

Claudia Dzul, Director of Outreach/Director of Charitable Contributions
Type Name/Title