

For L&I Staff Use Only

Received 09/03/2024 EA
 L&I Apprenticeship Consultant

Teri Gardner 9-3-24
 L&I Admin

Department of Labor and Industries
 Apprenticeship Section
 PO Box 44530
 Olympia WA 98504-4530



**Request for Revision
 of Standards**

TO: Washington State Apprenticeship & Training Council
 FROM: IAM/Boeing Joint Apprenticeship Committee #154

Please update our Standards of Apprenticeship to reflect the following changes:

- Additions shall be underlined (underlined).
- Deletions shall be struck through (~~struck through~~).
- See attached.

Form must be signed by Committee Chair and Secretary or Program's Authorized Signer

<input type="checkbox"/> Chair	Date	<input type="checkbox"/> Secretary	Date
<input checked="" type="checkbox"/> Authorized Signer	8/30/2024		
Print Name: Raymond Miller	Print Name:		
Signature: <i>Raymond Miller</i>	Signature:		

Approved By: Washington State Apprenticeship & Training Council
Signature of Secretary of the WSATC:
Date:

Attach additional sheets if necessary

Teri Gardner 9-3-24

Occupational Objective(s): SOC# Term [WAC 296-05-015] *Teri Gardner 9-4-24*
PLUMBER MAINTENANCE 47-2152.00 10000 HOURS

IV. TERM OF APPRENTICESHIP:

The term of apprenticeship will be 10,000 hours of reasonably continuous employment and experience in the principal operations of the trade for the following occupations:

Plumber Maintenance

V. INITIAL PROBATIONARY PERIOD:

For the 10,000 hours apprenticeship programs, the 20% probationary period is 2,000 hours. These programs are:

Plumber Maintenance

VII: APPRENTICE WAGES AND WAGE PROGRESSION:

C. Wage Progression Schedules

For Blue Streak Mechanic; Composite Manufacturing Technician; Jig & Fixture Tool Maker; Machinist; Metal Structures Technician; NC Spar Mill Operator; **Plumber Maintenance**; Tool & Cutter Grinder; and Quality Assurance Inspector programs.

VIII. WORK PROCESSES:

<u>R. Plumber Maintenance</u>	<u>Approximate Hours</u>
<u>1. Maintenance, Repair and Installation of High & Low Pressure</u>	
i. <u>Steam Piping</u>	<u>500</u>
<u>2. Installation, Maintenance and Repair of Hot Water Piping for</u>	
i. <u>Comfort Heating.....</u>	<u>500</u>
<u>3. Installation, Maintenance and Repair of Industrial Process Piping.....</u>	<u>1500</u>
<u>4. Installation, Maintenance and Repair of Sanitary Waste and Vent Piping</u>	<u>1000</u>
<u>5. Installation, Maintenance and Repair of Instrumentation & Control Piping</u>	<u>200</u>
<u>6. Installation, Maintenance and Repair of Natural Gas Piping</u>	<u>500</u>
<u>7. Maintenance, Repair and Replace of Waste Treatment Plant</u>	<u>500</u>
<u>8. Installation, Maintenance and Repair of Potable Water Piping.....</u>	<u>1500</u>
<u>9. Installation, Maintenance and Repair of Plumbing Fixtures, Appurtenances and Appliance</u>	
.....	<u>600</u>
<u>10. Installation, Maintenance and Repair of Oil/Water Separator</u>	<u>500</u>

11. <u>Installation, Maintenance and Repair of Backflow Prevention Devices</u>	500
12. <u>Replace, Repair and Maintenance of Autoclave</u>	500
13. <u>Replace, Repair and Maintenance of Hot Water Heaters/Instant Hot</u>	200
14. <u>Repair, Replace and Maintenance of Pumps</u>	300
15. <u>Repair, Replace and Maintenance of Pump Motors and Controls</u>	300
16. <u>Maintenance, Repair and Replace of Fuel Farm</u>	500
17. <u>Repair, Replace and Maintenance of Valves and Controls</u>	400
	<u>Total Hours: 10,000</u>

IX. RELATED/SUPPLEMENTAL INSTRUCTION:

C. Additional Information

Apprentices will be provided with a minimum of 216 hours of RSI per year, up to a total of 1,080 hours over the course of their apprenticeship, unless otherwise directed by the committee, in the following occupations:

Plumber Maintenance (RSI Per Year Variance Approved 01/15/2015)

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<input type="checkbox"/> Chair	Date	<input type="checkbox"/> Secretary	Date
<input checked="" type="checkbox"/> Authorized Signer	8/29/2024		
Print Name: Raymond Miller		Print Name:	
Signature: <i>Raymond Miller</i>		Signature:	

Approved By: Washington State Apprenticeship & Training Council
Signature of Secretary of the WSATC:
Date:

Attach additional sheets if necessary

VIII. WORK PROCESSES:

O. Tool & Die Maker:

	<u>Code</u>	<u>Hours</u>
1. Tool & Cutter Grind	A	240
2. Lathe	B	240
3. Mill Conventional	C	800
4. NC/CNC Lather	D	600
5. NC/CNC Milling	E	840
6. Heat Treat	F	160
7. Surface Grind Conventional	G	120
8. Cylindrical Grind Conventional	H	120
9. Jig Grind Conventional	I	80
10. Surface Grind CNC	J	160
11. Cylindrical Grind CNC	K	120
12. Jig Grind CNC	L	80
13. EDM Conventional/CNC	M	360
14. Jig Bore	N	520
15. Layout	O	160
16. Horizontal Boring	P	320
17. Spring Bench	Q	120
18. Breakdown/CATIA	R	240
19. CAD/CAM (Shop)	S	320
20. Bench Work	T1	920
21. Bench Work	T1	1880
22. Tool Engineering, Programming, Planning	U	160
23. Tool Inspection	V	120
24. Optical Tool Fabrication	W	320
25. Hydraulic/Pneumatic	X	200
	TOTAL HOURS:	9200

VIII. WORK PROCESSES:

O. Tool & Die Maker:

	<u>Code</u>	<u>Hours</u>
<u>1. Tool & Cutter Grind</u>	<u>A</u>	<u>200</u>
<u>2. Lathe</u>	<u>B</u>	<u>500</u>
<u>3. Mill Conventional</u>	<u>C</u>	<u>600</u>
<u>4. NC/CNC Lathe</u>	<u>D</u>	<u>240</u>
<u>5. NC/CNC Milling</u>	<u>E</u>	<u>800</u>
<u>6. ATS Core (17-10)</u>	<u>F1</u>	<u>600</u>
<u>7. AMS (17-68) Shipline T&D/Crane</u>	<u>F2</u>	<u>800</u>
<u>8. S&S (17-06) Shipline T&D</u>	<u>F3</u>	<u>800</u>
<u>9. IAS (17-45) Shipline T&D</u>	<u>F4</u>	<u>800</u>
<u>10. TDRC (17-62) Shipline T&D</u>	<u>F5</u>	<u>180</u>
<u>11. Fredrickson (24-60) Shipline T&D</u>	<u>F6</u>	<u>500</u>
<u>12. Grind</u>	<u>G</u>	<u>500</u>
<u>13. EDM Conventional/CNC</u>	<u>H</u>	<u>240</u>
<u>14. Jig Bore</u>	<u>I</u>	<u>600</u>
<u>15. Layout</u>	<u>J</u>	<u>160</u>
<u>16. Hydraulic/Pneumatic</u>	<u>K</u>	<u>400</u>
<u>17. Mastercam/CATIA</u>	<u>L</u>	<u>560</u>
<u>18. Tool programming (CATIA)</u>	<u>M</u>	<u>80</u>
<u>19. Tool Inspection</u>	<u>N</u>	<u>200</u>
<u>20. Tool Engineering/Design</u>	<u>O</u>	<u>200</u>
<u>21. Tool Planning</u>	<u>P</u>	<u>80</u>
<u>22. Heat Treat</u>	<u>Q</u>	<u>80</u>
<u>23. Weld</u>	<u>R</u>	<u>80</u>
<u>TOTAL HOURS:</u>		<u>9200</u>

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- Additions shall be underlined (underlined).
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- See attached.

Form must be signed by Committee Chair and Secretary or Program's Authorized Signer

<input type="checkbox"/> Chair	Date	<input type="checkbox"/> Secretary	Date
<input checked="" type="checkbox"/> Authorized Signer	8/30/2024		
Print Name: Raymond Miller		Print Name:	
Signature: <i>Raymond Miller</i>		Signature:	

Approved By: Washington State Apprenticeship & Training Council
Signature of Secretary of the WSATC:
Date:

Attach additional sheets if necessary

Sponsor Introductory Statement (Required):

The IAM/Boeing Joint Programs Apprenticeship Committee is committed to recruiting and developing future ~~journeymen and women~~ Journey person to provide our industry with a continual flow of highly talented and qualified team members to build the best airplanes in the world.

VII. APPRENTICE WAGES AND WAGE PROGRESSION:

C. Wage Progression Schedules

***Above wages are base only as of September 11, 2020. The IAM/Boeing Joint Apprenticeship Wage rates are defined in the District 751 IAM & AW/Boeing Company Collective Bargaining Agreement.**

X. ADMINISTRATIVE/DISCIPLINARY PROCEDURES:

Disciplinary actions:

e. Definitions

1) **Unacceptable Conduct:** Conduct deemed unacceptable and/or not compatible with the Apprenticeship Program, by the ~~IAM~~ IAM/Boeing Apprenticeship Committee. This may include non-authorized possession or use of IAM/Boeing Apprenticeship RSI tests or answer sheets or dishonesty, including cheating on, forgery and/or falsification of apprenticeship documents, tests, lessons, and log sheets.

3) **Unsatisfactory Progress – OJT:** Two consecutive monthly grades of less than three (3) or a monthly grade of (1). OJT ~~logs hours~~ more than ~~60~~ 7 days delinquent or turned in after the due date 3 times within a 12-month period. OJT ~~logs hours~~ are required to be turned in ~~by the 10th of the month~~ weekly.



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Journey Level Wage Rate

From which apprentices' wage rates are computed

TO: Washington State Apprenticeship & Training Council
 FROM: IAM/Boeing Joint Apprenticeship Committee #154

Occupation:	County(ies):	Journey Level Wage Rate:	Effective Date:
Plumber Maintenance	Snohomish, King and Pierce	\$ 46.04	9/8/2023
		\$	
		\$	
		\$	

Sponsors must submit the journey-level wage at least annually or whenever changed to the Department.

Form must be signed by Committee Chair and Secretary or Program's Authorized Signer

<input type="checkbox"/> Chair	Date	<input type="checkbox"/> Secretary	Date
<input checked="" type="checkbox"/> Authorized Signer	9/17/2024		
Print Name: Roxane Jonson	Print Name:		
Signature: <i>Roxane Jonson</i>	Signature:		

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Apprenticeship Related/Supplemental Instruction (RSI) Plan Review

Program Name IAM/Boeing Joint Apprenticeship Committee	
Occupation Plumber Maintenance	
Term/OJT Hours 10000 hours	Total RSI Hours 1081 hours
Training Provider Boeing	

By the signature placed below, the **program sponsor** agrees to provide the prescribed RSI for each registered apprentice and assures that:

1. The RSI content and delivery method is and remains reasonably consistent with the latest occupational practices, improvements, and technical advances.
2. The RSI is coordinated with the on-the-job work experience.
3. The RSI is provided in safe and healthful work practices in compliances with WISHA and applicable federal and state regulations.
4. The RSI Plan is maintained, updated and submitted to the Department a minimum of once every 5 years (WSATC Policy 2015-01; rev, 10-21-21).
5. The RSI will be conducted by instructors who meet the qualification of the “competent instructor” as described in WAC 296-05-003:
 - a. Has demonstrated a satisfactory employment performance in her/her occupation for a minimum of three years beyond the customary learning period for that occupation; and
 - b. Meets the State Board for Community and Technical Colleges requirements for a professional technical instructor (see WAC 131-16-080 through -094), or be a subject matter expert, which is an individual, such as a journey worker, who is recognized within the industry as having expertise in a specific occupation; and
 - c. Has training in teaching techniques and adult learning styles, which may occur before or within one year after the apprenticeship instructor has started to provide the related technical instruction.
6. If using alternative forms of instruction, such as correspondence, electronic media, or other self-study, instruction shall be clearly defined.

Signatures on next page

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<input type="checkbox"/> Chair	Date	<input type="checkbox"/> Secretary	Date
<input checked="" type="checkbox"/> Authorized Signer	8/30/2024		
Print Name: Raymond Miller		Print Name:	
Signature: <i>Raymond Miller</i>		Signature:	

Training Provider Signature

Approved By (Print Name): Shelley Wilson	Title: BPS Senior Laeder
Signature of the Training Provider: <i>Shelley Wilson</i>	
Date: 8/30/2024	

If additional training providers are needed, go to page 4.

SBCTC

Print Name:	Title:
Signature of the Program Administrator:	
Date:	
<input type="checkbox"/> SBCTC recommends approval	<input type="checkbox"/> SBCTC recommends return to sponsor

Program Name IAM/Boeing Joint Apprenticeship Committee	Occupational Objective Plumber Maintenance
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Note: The description of each element must be in sufficient detail to provide adequate information for review by the SBCTC and Review Committee. To add more elements, click on the plus sign that appears below the "Description of Element/Course" field.

Describe minimum hours of study per year in terms of (check one):

- 12-month period from date of registration.
- Defined 12-month school year.
- 2,000 hours of on-the-job training.

Element/Course: Introduction to Hand Tools – year 1	Planned Hours: 8
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Apprentices will learn to read and interpret several varieties of blueprints used in industrial plant. They will have the opportunity to examine hydraulic, pneumatic, piping, plumbing, electrical, air-conditioning, and refrigeration drawings. Apprentices will identify details, and markings from an assembly drawing. Apprentices will learn to name and identify from an exhibit several types of threaded fasteners and they will recognize and name building materials given their standard symbols.	

Element/Course: Introduction to Power & Plumbing Tools - year 1	Planned Hours: 12
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Provides detailed descriptions of commonly used power tools such as drills, saws, grinders, and sanders. Reviews applications, proper use, safety, and maintenance. Many illustrations show power tools used in on-the-job settings. Instructs trainees in the care and use of the different types of hand and power tools they will use on the job. Gives trainees the information they need to select the appropriate tools for different tasks, and reviews tool maintenance and safety issues.	

Element/Course: Introduction to Blueprints and Plumbing Drawings - year 1	Planned Hours: 28
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Introduces apprentices to the different types of plumbing drawings they will encounter on the job and discusses how to interpret and apply them when laying out and installing plumbing systems. Discusses the symbols used in plumbing and mechanical drawings and reviews isometric, oblique, orthographic, as well as schematic drawings. Requires students to render plumbing drawings and to recognize how code requirements apply to plumbing drawings. Apprentices will learn to locate and apply requirements for sprinkler system valves including water control valves, hose valves, and backflow prevention devices. After gaining an understanding of the purpose of NFPA 13, apprentices will learn how to achieve life safety, property protection, and environmental safety objectives. Apprentices will also learn the purpose and scope of NFPA 25. They will define and identify impairments and both critical and non-critical deficiencies. Apprentices will identify inspection, testing, and maintenance activities to be conducted on a scheduled basis and for unscheduled events.	

Element/Course: Business Communication Skills – year 1	Planned Hours: 50
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Boeing	
Description of element/course: This instructor-led course focuses on developing job-ready skills for Apprentices in today’s complex mobile and social workplace. This course will help Apprentices develop and strengthen vital communication skills that are critical in the manufacturing industry. These skills include effective verbal and written communication, critical thinking, and teamwork skills. Special emphasis is placed on professionalism and emotional intelligence. Students will also learn basic computer skills by utilizing the Microsoft Office Suite: Outlook, word, Excel, and PowerPoint (all 365). Proprietary applications and tasks like inSite and tie-ins will be covered in this course.	

Element/Course: Intro to Plumbing Math – year 1	Planned Hours: 12
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Reviews basic math concepts, such as whole numbers, fractions, decimals, and squares, and demonstrates how they apply to on-the-job situations. Teaches students how to measure pipe using fitting tables and framing squares and how to calculate 45-degree offsets.	

Element/Course: Pipe Fittings (Plastic & Copper) – year 1	Planned Hours: 30
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Introduces students to the different types of plastic pipe and fittings used in plumbing applications, including ABS, PVC, CPVC, PE, PEX, and PB. Describes how to measure, cut, join, and support plastic pipe according to manufacturer’s instructions and applicable codes. Also discusses pressure testing of plastic pipe once installed. Discusses sizing, labeling, and applications of copper pipe and fittings and reviews the types of valves that can be used on copper pipe systems. Explains proper methods for cutting, joining, and installing copper pipe. Also addresses insulation, pressure testing, seismic codes, and handling and storage requirements.	

Element/Course: Cast Iron & Carbon Pipe Fittings – year 1	Planned Hours: 30
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Introduces students to hub-and-spigot and no-hub cast-iron pipe and fittings and their applications in DWV systems. Reviews material properties, storage and handling requirements, and fittings and valves. Covers joining methods, installation, and testing. Discusses threading, labeling, and sizing of steel pipe and reviews the differences between domestic and imported pipe. Covers the proper techniques for measuring, cutting, threading, joining, and hanging steel pipe. Also reviews corrugated stainless-steel tubing.	

Element/Course: Plumbing Math 2 – year 1 or year 2	Planned Hours: 15
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Explains the Pythagorean theorem and reviews methods for laying out square corners. Discusses the techniques used to calculate simple and rolling offsets, as well as offsets on parallel runs of pipe.	

Element/Course: Intro to Fixture, Water, DWV – year 1	Planned Hours: 28
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Discusses the proper applications of code-approved fixtures in plumbing installations. Reviews the different types of fixtures and the materials used in them. Also covers storage, handling, and code requirements. Explains how DWV systems remove waste safely and effectively. Discusses how system components, such as pipe, drains, traps, and vents work. Reviews drain and vent sizing, grade, and waste treatment. Also discusses how building sewers and sewer drains connect the DWV system to the public sewer system. Identifies the major components of water distribution systems and describes their functions. Reviews water sources and treatment methods and covers supply and distribution for the different types of systems that trainees will install on the job.	

Element/Course: Math 1 – year 1 or year 2	Planned Hours: 50
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Boeing	
Description of element/course: This course focuses on the fundamentals and applications of geometry and trigonometry. Topics include perimeters, area and volume, trigonometric ratios and function, right angles, and non-right angles. Apprentices learn relationships of lines, planes, angles, congruent and similar triangles, polygons, and circles. Additional topics include special triangles and the Pythagorean Theorem.	

Element/Course: Basic Rigging – year 2	Planned Hours: 20
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Explains how ropes, chains, hoists, loaders, and cranes are used to move material and equipment from one location to another on a job site. Describes inspection techniques and load-handling safety practices. Also reviews American National Standards Institute (ANSI) hand signals.	

Element/Course: Installing & Testing DWV & Water Supply Piping – year 2	Planned Hours: 60
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Explains how to locate, install, connect, and test a complete drain, waste, and vent (DWV) system. Discusses how to develop material takeoffs, set up and use levels, locate building sewers and building drains, locate fixtures, and test a DWV system. Explores the proper techniques for locating, installing, and testing complete water service and distribution systems, including meters, water heaters, water softeners, and hose bibbs. Introduces trainees to basic backflow prevention and water hammer prevention, and discusses the installation of shower and tub valves, ice maker and washing machine boxes, and pipe stub outs and supports.	

Element/Course: Fixtures & Valves – year 2	Planned Hours: 28
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Reviews types of valves, their components, and applications. Also covers valve servicing. Covers the installation of basic plumbing fixtures, including bathtubs, shower stalls, lavatories, sinks, water closets, and urinals. Reviews the installation of associated valves, faucets, and components. Also discusses how to connect appliances such as dishwashers, food-waste disposers, refrigerators and ice makers, and washing machines.	

Element/Course: Installing Water Heaters – year 2	Planned Hours: 15
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Discusses gas-fired, electric, tankless, heat pump, and indirect water heaters, components, and applications. Reviews proper installation and testing techniques and covers the latest code requirements for water heaters.	

Element/Course: Boilers/Steam Theory Fundamentals – year 2	Planned Hours: 32
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Boeing	
Description of element/course: Install, service, troubleshoot, & repair steam systems. Explain how steam is created in a boiler. Describe how steam can be used to transfer heat. List safety hazards and safe work practices associated with steam generation and distributions systems. Describe the relationship between steam pressure and saturated steam temperature. Describe the relationship between steam pressure and saturated steam temperature.	

Element/Course: Basic Electricity – year 2	Planned Hours: 25
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Introduces electrical safety and the principles of electricity including voltage, current, resistance, and power. Includes important electrical formulas, circuitry, and common plumbing-related electrical applications.	

Element/Course: Sizing & Protecting the Water Supply System – year 3	Planned Hours: 40
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Teaches techniques for sizing water supply systems, including calculating system requirements and demand, developed lengths, and pressure drops. Reviews the factors that can reduce efficiency of water supply piping. Introduces different backflow prevention devices and explains how they work, where they are used, and how they are installed in water supply systems.	

Element/Course: Types of Venting – year 3	Planned Hours: 25
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Reviews the different types of vents that can be installed in a DWV system and explains how they work. Also teaches design and installation techniques.	

Element/Course: Sizing DWV & Storm Systems – year 3	Planned Hours: 20
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Explains how to calculate drainage fixture units for waste systems. Reviews how to size drain, waste, and vent (DWV) systems; storm drainage systems; and roof storage and drainage systems.	

Element/Course: Sewage Pumps & Sump Pumps – year 3	Planned Hours: 15
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Discusses the installation, diagnosis, and repair of pumps, controls, and sumps in sewage and storm water removal systems.	

Element/Course: Corrosive-Resistant Waste Piping – year 3	Planned Hours: 10
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Discusses the installation, diagnosis, and repair of pumps, controls, and sumps in sewage and storm water removal systems.	

Element/Course: Compressed Air – year 3	Planned Hours: 10
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Explains the principles of compressed air systems and describes their components and accessories. Reviews installation and periodic servicing of air compressor systems.	

Element/Course: Service Plumbing – year 3	Planned Hours: 35
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Covers the troubleshooting and repair of fixtures, valves, and faucets in accordance with code and safety guidelines. Explains how to diagnose and repair water supply and drainage piping, water heaters, and other appliances and fixtures. Describes the effects of corrosion, freezing, and hard water on plumbing systems.	

Element/Course: Autoclave – year 2 or year 3	Planned Hours: 12
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Boeing	
Description of element/course: Introduces cooling towers, vacuum lines & pressure testing. Understanding safety & preventative maintenance. Apprentices will explain the purpose of an autoclave. They will understand which chemicals are used with an autoclave and the levels of hazard of each. Finally, apprentices will be able to explain safety measure and precautions that should be taken with an autoclave.	

Element/Course: Oil/Water Separators – year 3	Planned Hours: 16
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Boeing	
Description of element/course: Understand & maintain storm water systems. Understand maintaining oil/water separators & dams. Preventative maintenance (e.g., catch basins, pump houses, ponds, bioswells, and dams).	

Element/Course: De-icing Process Equipment – year 3	Planned Hours: 12
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Boeing	
Description of element/course: Provide training on the process of the de-icing/anti-icing systems and equipment. Understand the environmental requirements for de-icing / anti-icing locations and spill reporting. Familiarization of the de-icing/anti-icing procedures, safety requirements and emergency operations.	
Element/Course: Fuel Farms – year 3	Planned Hours: 24
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Boeing	
Description of element/course: Accept and transfer fuel; inspect tanks, flow, and grounds; perform sampling on fuel farms. Introduces electrical safety and the principles of electricity including voltage, current, resistance, and power. Includes important electrical formulas, circuitry, and common plumbing-related electrical applications.	
Element/Course: Service Piping Fixtures & Appliances – year 4	Planned Hours: 25
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Explains how to diagnose and repair water supply and drainage piping, water heaters, and other appliances and fixtures. Describes the effects of corrosion, freezing, and hard water on plumbing systems.	
Element/Course: Water Pressure Booster & Recirculation – year 4	Planned Hours: 25
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Builds on trainees' previous experience with pumps, storage tanks, controls, and pipes and fittings by explaining how to assemble those components into systems that boost water pressure and provide hot water.	
Element/Course: Indirect & Special Waste – year 4	Planned Hours: 20
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Explains the code requirements and installation procedures for systems that protect against contamination from indirect and special wastes.	
Element/Course: Codes – year 4	Planned Hours: 35
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Discusses the different codes used by plumbers across the country and explains how those codes are written, adopted, modified, and implemented.	

Element/Course: Facility Management Programs – year 4	Planned Hours: 60
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Boeing	
Description of element/course: This course will teach apprentices how to navigate and execute project management programs utilized by facility maintenance on various platforms. These platforms include; inventory management programs using data to optimize min/max levels of parts and materials, work order and asset management on a large scale and learn how to access information in real-time, on the job. Included systems; Corrigo, SDI and Pro-Core.	

Element/Course: Seattle Gas Piping & Basic Electricity & Code Req – year 4 or year 5	Planned Hours: 8
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Reviews the City of Seattle Gas Piping regulations, coded standards and definitions. Prepares students for the Gas Piping Exam. Course is also designed to provide a general understanding of electrical theory, the NEC and safety requirements.	

Element/Course: Backflow Assembly Tester (Trainee Cert) – year 4 or year 5	Planned Hours: 32
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: In this course apprentices learn to identify the different types of backflow preventers, components, and functions. Apprentices learn to inspect and test backflow prevention assembly installations. Apprentices will also learn and demonstrate the proper methods to record and report assembly test results. This course follows the regulations, policies, and procedures established by the Washington State Department of Health (DOH) in cooperation with the Waterworks Operator Certification Advisory Committee. This course meets Washington State Department of Ecology Criteria for Wastewater Treatment Plant Operators and Washington State DOH Relevancy Criteria for Waterworks Operator Professional Growth.	

Element/Course: Generating & Using Steam in a Power Plant - year 5	Planned Hours: 50
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Boeing	
Description of element/course: Apprentices will learn energy principles and boiler maintenance. They will gain an understanding of coal, oil, and natural gas combustion, as well as how to conserve energy through combustion control. Apprentices will also learn various methods of conserving energy in turbines, auxiliaries, and air conditioning systems.	

Element/Course: Basic Chemistry – year 5	Planned Hours: 50
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Boeing	
Description of element/course: Beginning course for the non-science student interested in chemistry with less mathematical rigor. Students will learn the theory and how it relates to working within a tank line.	

Element/Course: OSHA 10 – year 5	Planned Hours: 32
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Boeing	
Description of element/course: OSHA 10 Course. Students will receive their OSHA 10 card upon completion of the class.	

Element/Course: Power Plant Fundamentals– year 5	Planned Hours: 50
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Boeing	
Description of element/course: In this introductory course apprentices will learn the basic steam generation system, how thermal energy is converted into electrical energy, components of the system, and design features for gaining thermal efficiency. Topics covered include: handling of water, fuel, and wastes, and the operating features and maintenance of a power plant.	

Element/Course: Journey level Preparatory Course for Licensing Exam – year 5	Planned Hours: 32
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input type="checkbox"/> Lab <input type="checkbox"/> Online <input checked="" type="checkbox"/> Self-Study Provided by: CITC	
Description of element/course: Reviews the City of Seattle Gas Piping regulations, coded standards and definitions. Prepares students for the Gas Piping Exam. Course is also designed to provide a general understanding of electrical theory, the NEC and safety requirements.	

Additional Training Providers (if necessary)

Halene Sigmund, CITC

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Title of Training Provider

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