


Unit/Standard Number	 <p style="text-align: center;">Plumbing and Heating Technology/Plumber CIP 46.0503 High School Graduation Years 2023, 2024, 2025</p>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
Secondary Competency Task List		
100	SAFETY	
101	RESERVED	
102	RESERVED	
103	RESERVED	
104	RESERVED	
105	RESERVED	
106	RESERVED	
107	RESERVED	
108	RESERVED	
109	RESERVED	
110	RESERVED	
111	RESERVED	
112	RESERVED	
113	Practice Occupational Safety and Health Administration (OSHA) safety standards as they relate to the industry.	
160	Demonstrate and follow rules for fire safety.	
161	Demonstrate and follow rules for housekeeping safety.	
162	Demonstrate and follow shop rules.	
163	Demonstrate and follow rules for material handling safety.	
164	Demonstrate and follow rules for eye protection.	
165	Demonstrate and follow rules for hearing protection.	
166	Demonstrate and follow rules for respiratory protection.	
167	Demonstrate and follow rules for hand tool safety.	
168	Demonstrate and follow rules for power equipment safety.	
169	Demonstrate and follow rules for portable electric hand tool safety.	
170	Demonstrate and follow rules for SDS Safety.	
171	Demonstrate and follow safety rules as they relate to E.C.P. (Exposure Control Procedures: blood borne pathogens, etc.).	
172	Demonstrate knowledge of the Occupational Safety Health Act (OSHA) and Earn 10 Hour OSHA certification	

200	DEMONSTRATE JOB SITE SAFETY PRACTICES (RESERVED)	
201	RESERVED	
202	RESERVED	
203	RESERVED	
260	Identify and use hand held MAPP gas torch for soldering	
261	Identify and use B- tank acetylene gas torch for soldering and brazing	
263	Identify and use Oxyacetylene gas torch for brazing	
300	BLUEPRINTS AND SKETCHING OF PIPE SYSTEMS	
301	Interpret types of drawings.	
302	Interpret various lines used on drawings.	
303	Interpret specifications and dimensions.	
304	RESERVED	
305	Interpret piping systems according to color-coding.	
360	Identify the three basic views of a drawing.	
400	PIPE SPECIFICATIONS AND SYSTEMS	
401	Install pipe and connections according to manufacturer specifications.	
402	Follow plumbing standards, codes, and specifications.	
403	RESERVED	
404	RESERVED	
405	Explain the effects and corrective measures for thermal expansion in a piping system.	
406	Install various types of pipe insulation.	
407	RESERVED	
460	Identify pipe and connections according to specification.	
461	Demonstrate knowledge of plumbing standards, codes and specifications.	
462	Read and interpret plumbing specifications.	
463	Identify schedules and types of pipe in PVC, Black iron steel, cast iron, PEX, copper	
464	Explain types and applications of pipe insulation.	
465	Identify various metals and specification process used in the plumbing and heating industry.	
500	HAND AND POWER TOOLS	
501	Use and maintain hand tools.	
502	Use and maintain power tools and equipment.	
503	Operate laser or transit level for sitework.	
560	Identify basic hand tools, state their uses, and use them in the trade.	
561	Identify, safely use, and maintain power tools.	

600	VALVES	
601	Use backflow prevention devices	
602	Use types of valves that start and stop flow.	
603	Use valves that regulate flow.	
604	Use valves that relieve pressure.	
605	RESERVED	
606	Disassemble and assemble various types of valves, e.g., gate valve, globe valve, flushometer.	
660	Identify usage and installation of backflow prevention devices	
661	Identify and install types of valves that start and stop flow.	
662	Identify and install types of valves that regulate flow.	
663	Identify valves that relieve pressure.	
664	Explain the factors that influence valve selection.	
700	COPPER PIPING OPERATIONS	
701	Join, cut, and bend various types of copper pipe tube, e.g., solder, compression, flare, swage, press fit, brazing.	
702	RESERVED	
703	RESERVED	
704	RESERVED	
760	Demonstrate skills in joining, cutting and bending various types of copper pipe tubing: solder, compression, flare, swage, press fit.	
761	Demonstrate skills in compression flaring, swaging and Pro- press fitting copper pipe.	
762	Prepare and braze a copper joint.	
763	Perform air and water leak tests on joints according to plumbing code.	
800	PLASTIC PIPE AND TUBING	
801	Measure, cut and assemble Polyvinyl Chloride (PVC), Chlorinated Polyvinyl Chloride (CPVC), and Acrylonitrile-Butadiene-Styrene (ABS).	
802	Measure, cut and assemble cross-linked Polyethylene (PEX) plastic tubing and Polyethylene (PE).	
803	RESERVED	
804	RESERVED	
860	Fabricate a crimp joint and expansion joint connection on PEX piping	
861	Install push connect fittings on piping	
900	PIPE HANGERS AND SUPPORTS	
901	Use hangers to secure horizontal and vertical pipe to masonry, metal, and wood.	
902	Layout and explain various fixture carriers.	
1000	WATER DISTRIBUTION LINES	
1001	RESERVED	
1002	Rough-in water supply lines for residential and commercial fixtures according to manufacturer spec sheet.	
1003	RESERVED	
1060	Perform a tests on water distribution lines that meets plumbing code.	

1100	STEEL PIPE OPERATIONS	
1101	Thread steel pipe with an adjustable die, power threading machine, and hand threader.	
1102	Measure, cut, ream, and assemble various types of steel piping.	
1103	Adapt steel pipe to other piping materials.	
1104	Assemble black steel pipe with mega press fittings.	
1105	Assemble Corrugated Stainless-Steel Tubing (CSST) pipe and fittings.	
1160	Manual Thread steel pipe with a Ridgid die head and oiler.	
1161	Power thread steel pipe with a Ridgid #300 Stationary die head and oiler.	
1162	Power thread steel pipe with a Ridgid #600 Portable die head and oiler.	
1200	CAST IRON PIPE OPERATIONS	
1201	Use tools for working with cast iron pipe.	
1202	Measure and cut cast iron soil pipe with various cutting methods.	
1203	Assemble cast iron with No Hub, Fernco, and rubber gasketed joints.	
1204	Research lead joints.	
1260	Identify and use tools for working with cast iron pipe.	
1261	Measure and cut cast iron soil pipe with a chain cutter.	
1262	Assemble cast iron to various pipe types with no hub, Fernco, rubber gasket joints	
1300	DEMONSTRATE KNOWLEDGE OF A BUILDER LEVELER (RESERVED)	
1301	RESERVED	
1302	RESERVED	
1360	Identify and set up a builder's level.	
1361	Set up the level shoot elevations and grade pipe.	
1362	Slope drainage pipe for sewer laterals to septic or street main using transit	
1400	DRAINS, STACKS AND SEWERS	
1401	Lay out and establish grade/slope for drain lines.	
1402	Explain backwater prevention.	
1403	RESERVED	
1404	RESERVED	
1405	Rough-in drain lines for residential and commercial fixtures according to manufacturer specification sheet.	
1460	Install backwater prevention valves.	
1461	Test a drain and sewer according to plumbing code.	
1462	Install air admittance valves.	
1463	Rough-in waste lines and vents for bathtubs, lavatories, dishwashers, water closets, showers, bidets and urinals according to manufacturers specification.	

1500	FIXTURES	
1501	Install gravity, pressure assist, and flush valve type water closets.	
1502	Install bathtubs.	
1503	Install wall mounted fixtures.	
1504	RESERVED	
1505	Install kitchen sinks.	
1506	Install prefabricated shower base drains.	
1507	Install lavatories.	
1508	RESERVED	
1509	Install fixture traps.	
1600	APPLIANCES	
1601	Install a dishwasher.	
1602	Install electric and gas water heater.	
1603	RESERVED	
1604	Install a clothes washing machine.	
1605	Install specialty water heaters (oil, tankless, indirect, or heat pump).	
1606	Install a water re-circulating pump.	
1607	Install a garbage disposal unit.	
1608	Install a sump pump.	
1609	Research a sewage ejector pump.	
1660	Describe and install a clothes washing machine outlet box	
1700	VENTS	
1701	Explain principles and purposes of venting, e.g., common, individual, wet vent.	
1702	RESERVED	
1703	Explain vent termination.	
1704	Explain air admittance valves.	
1760	Install soil or waste stack vents	
1761	Install soil or waste individual vents.	
1763	Install common vent	
1764	Demonstrate knowledge for installation of a vent terminals (roof-flashing).	
1765	Install Air Admittance Valve	
1766	Install circuit vent	

1800	PLUMBING SYSTEMS MAINTENANCE	
1801	Clear obstructions from lavatory drains.	
1802	Clear obstructions from main drain lines.	
1803	Clear obstructions from water closets.	
1804	Repair/replace leaking water faucets or valves.	
1805	RESERVED	
1806	RESERVED	
1807	RESERVED	
1808	Perform methods to thaw frozen pipes.	
1809	RESERVED	
1810	RESERVED	
1811	Replace all components in a gravity and/or pressure assist toilet tank.	
1812	Research sewer camera(s) for pipe inspection.	
1860	Remove obstructions from main drain lines using drain cleaner snake	
1861	Remove obstructions from water closets using closet snake	
1862	Repair/replace lavatory trap drains, and leaking water faucets or valves.	
1863	Repair leaking shower valves.	
1864	Repair water flush valves on water closets.	
1865	Explain how to thaw frozen pipes with heat gun and torch	
1866	Disassemble "P" traps to clear lavatory drains.	
1867	Repair/replace any type of water closets.	
1868	Replace all components in a tank style toilet.	
1900	TESTS ON SYSTEMS	
1901	RESERVED	
1902	RESERVED	
1903	RESERVED	
1904	Perform tests according to local plumbing and mechanical codes (air, hydrostatic, head pressure, etc.)	
1960	Perform head pressure tests 10ft standing pipe.	
1961	Perform hydrostatic water tests.	
1962	Perform leak tests on gas supply lines.	
1963	Perform air pressure tests.	
2000	ADVANCED PIPE FABRICATION	
2001	Calculate simple piping offsets.	
2002	Calculate three-line, 45° equal-spread offsets around a vessel.	
2003	Calculate three-line, 45° unequal-spread offsets.	
2004	Convert center, back throat, and/or face measurement to an end measurement.	

2100	PRESSURE BOILERS	
2101	Explain various near boiler fittings, controls, and accessories.	
2102	Explain various types of boilers and fuel sources.	
2103	RESERVED	
2104	RESERVED	
2105	RESERVED	
2106	Explain the operation of water and steam boilers and their various controls.	
2107	RESERVED	
2108	RESERVED	
2160	Identify and explain various boiler fittings and accessories, including thermal expansion devices.	
2161	Discuss the various types of boilers.	
2162	Identify and explain various boiler, steam, and hot water fittings and piping.	
2163	Identify and explain feed water accessories.	
2164	Identify and explain steam and hot water accessories.	
2165	Explain the operation of a boiler and its various controls.	
2166	Explain the operation of the draft controls.	
2167	Identify and explain boiler safety.	
2200	HYDRONIC HEATING SYSTEM	
2201	Identify piping for a hydronic heating system.	
2202	Identify a primary and secondary piping system.	
2203	Identify a radiant system.	
2260	Describe and design a hydronic heating systems.	
2261	Describe and design a primary and secondary loops.	
2300	LADDERS AND SCAFFOLDS	
2301	Use different types of ladders and scaffolds.	
2302	Set up and inspect stepladders, extension ladders, and scaffolding.	
2360	Earn industry Certifications from Ladder Safety Institute, online training	
2400	EPA 608 CERTIFICATION	
2401	Perform the five steps of Refrigeration, Recover, Pressure test with Nitrogen, Evacuation, Charge System, Check operation	
2402	Review EPA laws and regulations for safe handling of refrigerants	
2403	Earn EPA 608 Refrigerant Certification to work on Hybrid Hot Water heating systems,	

3000	CONSTRUCTION MATH	
3060	Apply Math skills for addition and subtraction of whole numbers	
3061	Apply Math skills for multiplication and division of whole numbers	
3062	Apply Math skills for fractions and percentages	
3063	Determine square area and volume of rooms and buildings	
3064	Determine GPM and Btuh Load calculations from applied formulas	
3065	Apply Math skills for piping work layout and design	
3066	Apply Math skills for floor plans	
3067	Apply Math skills for determining slope and pitch of piping.	
3068	Apply Math skills to determine weight of water and column PSI	
3069	Apply Math skills to determine offset travel of piping using pythagorean theorem	
3100	BASIC EMPLOYABILITY	
3160	Assemble an employment portfolio	
3161	Create a resumé and cover letter	
3162	Complete a job application	
3163	Develop and practice job interview skills	
3164	Demonstrate social etiquette in the workplace	
3165	Select characteristics of a positive image in the workplace	
3200	PROFESSIONAL DEVELOPMENT- NCCER- TOOLS FOR SUCCESS	
3261	First Impression: Getting a Job	
3261	Professionalism: Keeping Your Job	
3262	Building a Strong Relationship with Your Supervisor	
3263	Teamwork: Getting Along with Your Co-Workers	
3264	Diversity in the Workplace	
3265	Communication Skills; Listening and Speaking in the workplace	
3266	Communication Skills; Reading and Writing in the workplace	
3267	Managing Stress on the job	
3268	Thinking Critically and Solving Problems on the job	
3269	Resolving Conflict in the workplace	
3270	Giving and Receiving Criticism on the job	