

## Construction and Extraction

### Plumbers, Pipefitters, and Steamfitters

**Plumbers, Pipefitters, and Steamfitters** perform a wide range of tasks, although many people are only familiar with plumbers, who come into their homes in order to unclog a drain or fix a leaking toilet. Plumbers, pipefitters, and steamfitters install, maintain, and repair many different types of pipe systems. Some of these systems move water from reservoirs to municipal water treatment plants and then to residential, commercial, and public buildings. Other systems dispose of waste, supply gas to stoves and furnaces, or provide for heating and cooling needs. Pipe systems in power plants carry the steam that powers huge turbines. Pipes also are used in manufacturing plants to move material through the production process. Specialized piping systems are very important in both pharmaceutical and computer-chip manufacturing. Although plumbing, pipefitting, and steamfitting are sometimes considered a single trade, workers generally specialize in one of five areas.

- **Plumbers** install and repair the water, waste disposal, drainage, and gas systems in homes and commercial and industrial buildings. In addition plumbers install plumbing fixtures - bathtubs, showers, sinks, and toilets - and appliances such as dishwashers, waste disposers, and water heaters.
- **Pipelayers** lay clay, concrete, plastic, or cast-iron pipe for drains, sewers, water mains, and oil or gas lines.
- Pipefitters install and repair both high-pressure and low-pressure pipe systems used in manufacturing, in the generation of electricity, and in the heating and cooling of buildings. They also install automatic controls that are increasingly being used to regulate these systems. Pipefitters and steamfitters most often work in industrial and power plants.
- **Steamfitters** install pipe systems that move liquids or gases under high pressure.
- **Sprinklerfitters** install automatic fire sprinkler systems in buildings.

Plumbers, pipelayers, pipefitters, and steamfitters use many different materials and construction techniques, depending on the type of project. Residential water systems, for example, incorporate copper, steel, and plastic pipe that can be handled and installed by one or two plumbers. Municipal sewerage systems, by contrast, are made of large cast-iron pipes; installation normally requires crews of pipefitters. Despite these differences, all plumbers, pipelayers, pipefitters, and steamfitters must be able to follow building plans or blueprints and instructions from supervisors, lay out the job, and work efficiently with the materials and tools of their trade.

Plumbers work in commercial and residential settings where water and septic systems need to be installed and maintained. Pipelayers work outdoors, sometimes in remote areas, laying pipes that connect sources of oil, gas, and chemicals with the users of these resources. Sprinklerfitters work in all buildings that require the use of fire sprinkler systems.

As they frequently must lift heavy pipes, stand for long periods, and sometimes work in uncomfortable or cramped positions, plumbers, pipefitters, and steamfitters need physical strength and stamina. They may have to work outdoors in inclement weather. In addition, they are subject to possible falls from ladders, cuts from sharp tools, and burns from hot pipes or soldering equipment. Consequently, this occupation experiences rates of nonfatal injuries and illnesses that are much higher than average. Their work week is often more than 40 hours per week and they can be on call for emergencies nights and weekends.

## **Education/Training**

### *How to Obtain:*

Most plumbers, pipefitters, and steamfitters get their training in jointly administered apprenticeships or in technical schools and community colleges. Pipelayers typically receive their training on the job.

Apprenticeship programs generally provide the most comprehensive training available for these jobs. Such programs are, for the most part, administered jointly by union locals and their affiliated companies or by non-union contractor organizations. Organizations that sponsor apprenticeships include the United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada; local employers of either the Mechanical Contractors Association of America or the National Association of Plumbing-Heating-Cooling Contractors.

Apprenticeships - both union and nonunion - consist of 4 or 5 years of paid on-the-job training and at least 144 hours of related classroom instruction per year. Classroom subjects include:

- Drafting and blueprint reading
- Mathematics
- Applied physics and chemistry
- Safety
- And local plumbing codes and regulations

Although most plumbers, pipefitters, and steamfitters are trained through apprenticeships, some still learn their skills informally on the job or by taking classes on their own.

Most states require a license in plumbing, in New York licensure is done by cities rather than a state wide licensing process. Journeyman plumbers must register with their city's Department of Buildings or Department of Public Works. In some cities to register an applicant must have:

- Minimum of 5 years experience under direct supervision of a master plumber
- Having satisfactorily completed a state registered training program

Additionally, in order to become a Licensed Master Plumber cities often require that the applicant, aside from passing the Master Plumber Examination, have at least one of the following:

- 7 years total experience under the supervision of a licensed master plumber
- Have received a bachelor's degree in an appropriate area and 5 years experience
- Be a registered and licensed architect or professional engineer with 3 years experience.

After the examination the applicant must submit documentation to prove claimed experience. Often the requirements are the listings of previous jobs and statements from previous employers about job duties. Licensing requirements for different cities can often be found through the Department of Buildings, Public Works or the city's building code.

*More Information on Licensing, Certification, and Apprenticeship Programs:*

New York State Registration and Licensing for plumbers-

- New York City:  
[http://www.nyc.gov/html/dob/downloads/pdf/journeyman\\_guide.pdf](http://www.nyc.gov/html/dob/downloads/pdf/journeyman_guide.pdf)
- Rochester:  
<http://www.cityofrochester.gov/article.aspx?id=8589939642>

Check with your local Department of Buildings or Public Works for other areas in New York

- State by State information on licensing requirements:  
[http://www.clsi.com/state\\_contractor\\_license\\_board.htm](http://www.clsi.com/state_contractor_license_board.htm)
- How to Become a New York City Licensed Master Plumber;  
[http://www.nyc.gov/html/dob/downloads/pdf/master\\_plumbers\\_license\\_exam.pdf](http://www.nyc.gov/html/dob/downloads/pdf/master_plumbers_license_exam.pdf)
- **The Plumbing-Heating-Cooling Contractors Educational Foundation:**  
<http://www.phccweb.org/AboutUs/content.cfm?ItemNumber=2581&navItemNumber=5216>

*Average Costs:*

Apprenticeship programs generally do not charge the apprentice for classroom instruction, provided the apprentice maintains employment with a contractor affiliated with the apprenticeship program, throughout the apprenticeship period of 4 to 5 years.

The cost of licensing varies by state and locality, and generally ranges from around \$40\* to a few hundred dollars.

The Master Plumber application or examination fee varies by state. For example the NY examination fee is \$210 while the NJ application fee is \$100.

\*Note: Costs of license renewal vary.