Ironworkers, sometimes referred to as The Cowboys of the Sky, erect and dismantle the metal framework of a wide range of structures, from bridges and antennas to skyscrapers and stadiums. Ironworkers also often erect the cranes and derricks that are used in the construction of these structures, and install and repair the catwalks, elevators, ladders, fire escapes, railings, and fences for commercial and industrial structures. The type of work that an Ironworker performs can usually be categorized into one of the following designations: reinforcing, structural, and ornamental.

### Education & Training

**Minimum Education**
- High school diploma or equivalent

**Recommended Education**
- Certificate in welding, metals fabrication, structural welding, etc.

**Advanced Education**
- Associate degree in welding, metals fabrication, structural welding, etc.

**Recommended Training**
- Related structural steel fabrication or steel erection work experience

**Recommended Certification**
- AWS Certified Welder

### Responsibilities

- Apply multiple welding techniques, metalworking concepts, and construction processes.
- Work at considerable heights safely and efficiently
- Analyze and interpret drawings, blueprints, and building codes
- Positioning and tying steel rods, bars or mesh as a support for concrete
- Erection and connecting of metal beams and columns to form structural skeleton

### Essential Skills

- Highly motivated and self-directed
- Flexible and able to work in a team environment
- Physically fit and good hand-eye coordination
- Comfortable working with heights
- Mechanically inclined

### Entry Level Pay

- $40,000

### National Median Pay

- $52,000

### Real Go-Getters Make

- $100,000+

### Work Environment

Many ironworkers work in the field on active construction sites. Opportunities also exist in shop environments.
Welding Technicians use their extensive knowledge of joining processes, materials, welding equipment, welding techniques, and standards to assist welding engineering personnel with the development, application, evaluation, and documentation of welding techniques, equipment, and processes used to manufacture welded products according to relevant codes. Welding technicians may also play a role in product engineering and research and development.

**Entry Level Pay**

$40,000

**National Median Pay**

$51,000

**Real Go-Getters Make**

$64,000+

**ESSENTIAL SKILLS**

- Organized and detail oriented
- Highly motivated and self-directed
- Effective written and oral communication
- Strong analytical thinking and problem-solving skills
- Proficient with hands-on and automated arc welding and cutting processes
- Able to identify weld discontinuities and read blueprints

**RESPONSIBILITIES**

- Setup and operate welding and joining processes for lab tests, and perform welding experiments
- Work in cross-functional engineering teams to develop and test new products
- Conduct training programs and field service activities for clients
- Support related manufacturing requirements
- Interpret welding-related requirements and troubleshoot welding problems

**EDUCATION & TRAINING**

Education and training that can lead to a successful career may include:

- **Minimum Education**
  - High school diploma or equivalent

- **Recommended Education**
  - Certificate in welding, metals fabrication, robotic welding, etc.

- **Preferred Education**
  - Associate degree in welding, metals fabrication, engineering technology, etc.

- **Advanced Education**
  - Bachelor’s degree in welding, material science, welding engineering, etc.

- **Recommended Training**
  - Related welding work experience

- **Advanced Training**
  - Apprenticeship program

- **Preferred Certification**
  - AWS Certified Welder

**WORK ENVIRONMENT**

Many welding technicians work in shop or lab environments. Field service on active construction sites and travel opportunities for this career are common in some industries.

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Data source: Burning Glass, 2020
Welding Inspectors employ their extensive knowledge of welding processes, test methods, discontinuities, materials, qualifications, and standards to ensure that weldments and welding-related activities comply with all applicable quality and safety criteria. The role of the Welding Inspector is critical to the safety and structural soundness of the vast number of buildings, vehicles, machinery, and consumer products that require strong, secure welds.

**Entry Level Pay**

$51,000

**National Median Pay**

$62,000

**Real Go-Getters Make**

$95,000+

**RESPONSIBILITIES**

- Review and approve welding procedures
- Verify welder and welding procedure qualification compliance
- Verify safety requirements compliance
- Develop visual inspection procedures and provide NDE inspection planning/scheduling
- Review contract requirements and vendor/contractor compliance
- Develop, implement, or oversee quality control programs and measures

**ESSENTIAL SKILLS**

- Organized and detail oriented
- Proficient computer skills
- Highly motivated, self-directed, and strong leader
- Effective written and verbal communication
- Knowledgeable of weld discontinuities, materials, weldability characteristics, and filler metals
- Interpret drawings, blueprints, and engineering documents

**EDUCATION & TRAINING**

Education and training that can lead to a successful career may include:

- **Minimum Education**
  - High school diploma or Certificate in welding, metals fabrication, or equivalent
- **Recommended Education**
  - Associate degree in welding, metals fabrication, welding technology, etc.
- **Advanced Education**
  - Bachelor’s degree in welding, material science, welding engineering, etc.
- **Recommended Training**
  - Related welding work experience
- **Advanced Training**
  - Apprenticeship program
- **Minimum Certification**
  - AWS Certified Associate Welding Inspector (CAWI)
- **Preferred Certification**
  - AWS Certified Welding Inspector (CWI)
- **Advanced Certification**
  - Senior Certified Welding Inspector (SCWI), Non-Destructive Testing (NDT) and Examination (NDE) certification

**WORK ENVIRONMENT**

Many welding inspectors work in a variety of environments both inside and outside of the office that may include; manufacturing facilities, training centers, fabrication shops, and active constructions sites. Travel may be minimal or extensive given the nature of the work.

*Data source: Burning Glass, 2020*
Welding Engineers employ their extensive knowledge of physics, engineering, metallurgy, materials, welding, and standards to design, examine, and evaluate welds as well as to plan, supervise, and document welding operations in accordance with relevant codes, contracts or drawings. The role of the Welding Engineer is critical to the integrity of the vast number of buildings, vehicles, machinery and products that require welds.

<table>
<thead>
<tr>
<th>Entry Level Pay</th>
<th>National Median Pay</th>
<th>Real Go-Getters Make</th>
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<tbody>
<tr>
<td>$67,000</td>
<td>$85,000</td>
<td>$95,000+</td>
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**RESPONSIBILITIES**

- Investigate welding-related issues to improve product performance and increase productivity
- Design welded parts, assemblies and structures such as buildings, pressure vessels, and pipelines
- Develop repair procedures and assess flaws to determine the fitness-for-service of structures
- Develop standards, materials, weld joint design, and welding processes
- Develop welding process procedure qualification, supplier qualification, and product testing
- Troubleshoot welding problems and provide corrective solutions

**ESSENTIAL SKILLS**

- Organized and detail oriented
- Highly motivated and self-directed
- Analytical thinker and problem-solver
- Excellent communication, writing, and computer skills
- Ability to create, design, and analyze blueprints and drawings

**EDUCATION & TRAINING**

Education and training that can lead to a successful career may include:

- **Recommended Education**
  - Bachelor’s degree in welding engineering, welding engineering technology, etc.

- **Recommended Training**
  - Related welding and fabrication work experience

- **Recommended Certification**
  - AWS Certified Welding Inspector, AWS Certified Welding Engineer

**WORK ENVIRONMENT**

Many welding engineers work in a mix of environments both inside and outside of the office that may include manufacturing facilities, testing labs, and active constructions sites. Frequent travel may be required.

Data source: Burning Glass, 2020
Metal fabrication is the process of creating or building a usable product out of metal. Raw materials are bent, shaped, welded or cut to complete the final product. All of the tasks during the fabrication process, from start to finish, are completed at the hands of a welder fabricator. Many welder fabricators possess the skills, knowledge, and passion to fabricate custom cars, motorcycles, metal art, and much more!

**Entry Level Pay**
$37,000

**National Median Pay**
$43,000

**Real Go-Getters Make**
$65,000+

**RESPONSIBILITIES**
A typical welder fabricator is tasked with constructing a variety of metal objects. Metal construction often requires more than just welding. Welder fabricators could be responsible for:

- Machining fabrication materials and components
- Fitting, setting, and installing fabricated structures
- Cutting and welding with a variety of processes
- Metal forming, bending, and finishing
- Repair, design, layout, and estimation
- Overseeing shop hands or helpers
- Many other industry/trade specific responsibilities

**EDUCATION & TRAINING**
There are many ways to start a career as a welder fabricator. Like every career, education and training lead to further success.

- **Minimum Education**
  High school diploma or equivalent

- **Recommended Education**
  Certificate in welding, metals fabrication, machining, etc.

- **Advanced Education**
  Associate degree in welding, metals fabrication, machining, etc.

- **Recommended Training**
  Related work experience

- **Advanced Training**
  Apprenticeship program

- **Recommended Certification**
  AWS Certified Welder

**ESSENTIAL SKILLS**
- Math
- Problem-solving
- Critical thinking
- Blueprint reading

**WORK ENVIRONMENT**
Primarily in a shop with a variety of fabrication equipment. Occasional field work and travel may be required.

*Data sources: Emsi & Burning Glass, 2020*
Robotic Welding Technicians are responsible for the set-up, maintenance, and operation of robotic welding equipment. Robotic welding technicians are critical to the fabrication of metal parts or assemblies through welding by the means of a robotic machine. Some operators are responsible for designing and programming the robot, maintaining and troubleshooting welding robots, and implementing robotic welding for manufacturing and production.

**Entry Level Pay** $36,000  
**National Median Pay** $41,000  
**Real Go-Getters Make** $65,000+

**RESPONSIBILITIES**
- Apply principles of basic welding fundamentals, symbols, and blueprints
- Identify and perform correct robotic welding parameters, welding procedures, operations and programs
- Create robotic welding programs, modify existing welding programs, and conduct welding cell cycle time calculations
- Troubleshoot and perform preventative maintenance of robotic equipment and welding equipment

**ESSENTIAL SKILLS**
- Strong analytical thinking, problem-solving, and computer skills
- Knowledgeable of automation equipment, processes, and systems
- Interpret blueprints and drawings
- Adapt to technology changes quickly and seamlessly
- Able to work independently and as part of a team

**EDUCATION & TRAINING**
Education and training that can lead to a successful career may include:

- **Minimum Education**  
  High school diploma or equivalent
- **Recommended Education**  
  Certificate in robotic arc welding, metals fabrication, automated technology, advance manufacturing, etc.
- **Advanced Education**  
  Associate degree in robotic arc welding, metals fabrication, automated technology, advanced manufacturing, etc.

**Recommended Training**
- Related work experience on robotic welding applications
- Apprenticeship program
- AWS Certified Robotic Arc Welding

**WORK ENVIRONMENT**
Many robotic welding technicians work in manufacturing or shop environments, however some field or travel opportunities are available.

*Data source: Burning Glass, 2020*
Pipeliners, also known as Pipeline Welders, join and repair tubular products and metallic pipe components and assemblies as part of the construction of buildings, vessels, structures, and stand-alone pipelines. They use a variety of welding processes and equipment, in a wide range of industrial, commercial, and construction environments. Because pipes are routinely set up in fixed positions and situated in ways that make welding difficult, pipeline welders must be well-trained and versatile. As such, they are among the most highly skilled and sought after welders.

**Entry Level Pay**
- $52,000

**National Median Pay**
- $64,000

**Real Go-Getters Make**
- $100,000+

**RESOURCES**
- Primary welding for the construction, maintenance, and repair of pipeline systems and assemblies
- Cutting, dismantling, straightening, or reshaping pipe sections and components
- Construct pipeline supports and related structures
- Perform “hot-tapping” or the welding of “live” pipelines
- Maintenance of welding equipment, tools, and field service vehicle

**ESSENTIAL SKILLS**
- Strong mechanical and mathematical aptitude
- Adapt to changes quickly and seamlessly
- Ability to work independently and as part of a team
- Ability to work efficiently in all types of weather conditions
- Knowledge of blueprints, welding symbols, piping components, and field welding techniques

**EDUCATION & TRAINING**

**Minimum Education**
- High school diploma or equivalent

**Recommended Education**
- Certificate in pipe welding, metals fabrication, welding, etc.

**Advanced Education**
- Associate degree in welding, metals fabrication, pipe welding, etc.

**Recommended Certification**
- AWS Certified Welder

**Recommended Training**
- Related pipeline work experience

**Advanced Training**
- Apprenticeship program

**WORK ENVIRONMENT**

As a pipeliner, you should expect to travel extensively, as pipeline construction can take place anywhere in the world; from heavy populated cities to remote high mountain deserts. Opportunities are also available in shop environments.

*Data source: Burning Glass, 2020*
Pipefitters are sometimes more specifically known as steamfitters or gasfitters. They fabricate, install, maintain, assemble, and repair piping systems. These systems include cooling, hydraulic, pneumatic, and high-pressure assemblies that transport water, steam, chemicals, or fuel for commercial, industrial, or marine use. In addition to welding, pipefitters often utilize a wide range of other processes throughout the course of their work, including cutting, threading, brazing, soldering, bending, and grooving.

**RESPONSIBILITIES**
- Welding, cutting, fabricating, installing, testing, and maintaining piping systems
- Layout, bend, or alter piping components for size and fit
- Use hand tools, and power tools for cutting, dismantling, straightening, or reshaping pipe
- Inspect piping systems to test for strength or leaks
- Analyze design plans and understand building codes
- Understand piping system operations of water, gas, and/or sewer lines

**EDUCATION & TRAINING**
Education and training that can lead to a successful career may include:

- **Minimum Education**
  - High school diploma or equivalent

- **Recommended Education**
  - Certificate in pipe welding, metals fabrication, welding and fitting, etc.

- **Advanced Education**
  - Associate degree in welding, metals fabrication, pipe welding and fitting, etc.

**ESSENTIAL SKILLS**
- Highly motivated and self-directed
- Flexible and able to work in a team environment
- Logical and critical thinker
- Mechanically inclined and mathematical aptitude
- Proficient in print reading and layout

**WORK ENVIRONMENT**
Many pipefitters work in the field on active construction sites. Opportunities are also available in shop environments.

Entry Level Pay: $42,000
National Median Pay: $53,000
Real Go-Getters Make: $92,000+

Data sources: Emsi & Burning Glass, 2020