

VETERAN'S GUIDEBOOK



# RESIDENTIAL BUILDING:

OPEN THE DOOR TO YOUR FUTURE  
AND BUILD SOMETHING GREAT



[www.SkilledToBuildMichigan.com](http://www.SkilledToBuildMichigan.com)



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# HOME BUILDERS WANT YOU TO JOIN THE RESIDENTIAL CONSTRUCTION INDUSTRY

We owe a debt of gratitude to you, our returning veterans. You have dedicated your life, taken time away from your family and friends, all in the name of serving our country and keeping us safe.

You, along with approximately 50,000 service members will come home to Michigan in the next five years. You will be transitioning into a civilian life, and more importantly, you will be looking for your next career. You are highly trained, creative, focused on the mission at hand, and you know how to identify and solve problems. You can deliver outcomes that will contribute positively to the residential construction industry.

Skilled trades in the residential building industry aren't the skilled trades of yesterday. Veterans entering the Michigan job market have numerous opportunities available that don't require the time and financial investment of a four-year college degree program. In fact, there are roughly 132 career choices in the home building industry. The opportunities are endless.

No other industry took a hit like the residential building industry during the last decade. The home building industry saw a job loss of 20% between 2000 and 2007. Those are employees that are not coming back into the industry. As if that hit wasn't hard, from December 2007 and lasting through June 2009, construction dropped 39,000 additional payroll jobs. The total was a loss of 82,000 jobs, or an overall drop of 40%.

As of December 2020, there were 2,457 openings in the trades outlined in the following pages. We are projecting a total of just over 16,000 single family building permits that were pulled in 2020.

Former Governor Snyder said, "Key priorities I have, for one, is focused on one huge national problem that we have, which is we don't have enough people going into the skilled trades, and we need to improve career tech education in our country. My commitment to you is we're going to be focused on being number one in developing and bringing back the skilled trades as an honorable career path with great opportunity." We were fortunate to have a governor who was committed to making skilled trades and career technical education his key priority in his second term. We are working to make sure Governor Whitmer has the same goal.

Skilled trades are vital to our state's recovering economy. They play an instrumental role in producing some of our state's most important products – homes being one of them. The members of the Home Builders Association of Michigan (HBA of MI) are feeling the direct impact of the labor shortage. As building permits and home values continue to rise, the immediate demand for skilled workers is increasing as well.

You are trained in skills that can be put to use in the residential construction industry upon your return. According to the Bureau of Labor Market Information and Strategic Initiatives, nearly 75 percent of military employment is concentrated in six military occupational categories: Transportation, Engineering, Science, and Technical; Combat Specialty; Vehicle and Machinery Mechanic; Electronic and Electrical Equipment and Repair; and Health Care.

Those skills learned in combat specialty transfer to the construction industry as a construction laborer. While those trained in Vehicle and Machinery Mechanic have skills that are a natural fit to become HVAC Installers and Repairers.

In addition to the hard skills, you bring soft skills builders are looking for. As a veteran, you bring leadership and teamwork skills, organizational commitment, exposure to technology, ability to learn new skills, professionalism, character, respect for procedures and accountability, resiliency, first class image, global perspective and dependability.

## **BARRIERS REMOVED FOR RETURNING VETERANS**

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The Michigan Legislature has made great strides in removing barriers for you, as a returning veteran, to enter the skilled trades. From 2011 through 2015 there were 9 bills signed into law to assist our veterans who want to enter the trades.

**P.A. 379** of 2012 allows the use of certain military experience as the basis for licensure as an electrician.

**P.A. 380** of 2012 allows the use of certain military experience as the basis for licensure as a plumber.

**P.A. 419** of 2012 allows the use of certain military experience as the basis for licensure as a security guard.

**P.A. 167** of 2013 allows the use of certain military experience as the basis for registration, and authorizes for stationary steam engineers and boiler operators to waive the initial license and registration fees for certain veterans.

**P.A. 168** of 2013 allows the use of certain military experience as the basis for licensure to become a mechanical contractor.

**P.A. 169** of 2013 allows for the use of certain military experience as the basis for licensure as a residential builder or residential maintenance and alteration contractor.

**P.A. 127** of 2014 waives the initial application and initial registration and license fees for certain veterans.

**P.A. 128** of 2014 waives the initial fees for security business and alarm licenses for certain veterans.

**P.A. 191** of 2015 amends the Boiler Act to revise provisions recognizing military training and experience as the basis for licensure or registration for certain classifications.

While these public acts remove barriers for veterans to enter the trades, it creates the perfect opportunity to market and promote the residential building industry to veterans.

## BUILD SOMETHING GREAT GUIDE

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Skilled to Build Michigan Foundation is the non-profit arm of the Home Builders Association of Michigan.

This guidebook has been created to create awareness among the veteran community of the careers waiting for you upon your return. Information on this program can be found by going to the veterans section at [www.skilledtobuildmichigan.org](http://www.skilledtobuildmichigan.org).

We have designed this guidebook in terms that you, as a veteran, will connect to your world. This guidebook is put in order by Military Occupational Code (MOC), and then we refer you to the specific trade in the appendix. The branches of military are listed in alphabetical order.

This is by no means a complete listing of every MOC that may have the transferable skills to the trades. If there isn't a trade listed under the MOC, we encourage you to look at the professional trades found in this guidebook. Chances are you have the skills we are looking for. Currently we have over 279 employers from around the state of Michigan who would hire a veteran. We encourage you to send your resume to Dawn Crandall at [skilledtobuildmichigan@gmail.com](mailto:skilledtobuildmichigan@gmail.com). Dawn will get your resume in the hands of those employers who have a desire to hire a veteran.

## TRAINING ALTERNATIVES

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While many skilled trade occupations do not require a four-year degree, they do require some training. Currently, an applicant for a Residential Builder or Maintenance & Alteration Contractor license must complete 60 hours of approved pre-licensure education prior to taking the examination or submitting a license application to the department.

All pre-licensure education courses must be approved by the Department of Licensing and Regulatory Affairs (LARA). A list of approved pre-licensure education courses is available on the Builders website at [www.michigan.gov/builders](http://www.michigan.gov/builders) under the Licensing Information section.

### **THE 60 HOURS OF APPROVED PRE-LICENSE COURSES MUST INCLUDE AT LEAST SIX (6) HOURS IN EACH SUBJECT BELOW:**

Business Management, Estimating, and Job Costing (6 hours)

Design and Building Science (6 hours)

Contracts, Liability, and Risk Management (6 hours)

Marketing and Sales (6 hours) Project

Management and Scheduling (6 hours)

The Michigan Residential Code (6 hours)

MIOSHA Construction Safety Standards (6 hours); and

The rest of the 18 hours may come from other topics on the approved course list.

## **SKILLED TRADE OCCUPATION JOB PROFILES**

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In this guide you will find 17 occupations we are shining a light on in the residential building industry.

Each occupation description in this guide provides a job summary, shows the current wage range and projected employment growth through 2028. In each profile, education and training requirements are identified along with the demand needed as of December 2020. Statistical data in this guide has been provided from the state of Michigan.

In today's changing economy, employers are looking for an employee that has not only an education, but knowledge, skills and ability. Those who will have a competitive advantage will have a blend of education AND technical skills.

The HBA of Michigan released a report in 2017, "Where Will Ten Million Michiganders Live?" In the report they listed three cornerstones to help continue the return of homes being built. One of those cornerstones is building the workforce of tomorrow, today.

## **WHERE THE DATA COMES FROM**

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There is a wealth of information available for someone interested in any of these careers; unfortunately it isn't in one place. We have taken the time to research those websites and compile the information in one location. Many thanks go to the Bureau of Labor Market Information and Strategic Initiatives, and the Department of Military and Veteran Affairs. This project would not have been accomplished with their quick response, guidance and advice.

# AIR FORCE

## MILITARY OCCUPATIONAL CODE (MOC)

### **3E131 – HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION APPRENTICE**

Installs, operates, maintains, and repairs heating, ventilation, air conditioning and refrigeration (HVAC/R) systems, combustion equipment, and industrial air compressors. Maintains and repairs non- electric kitchen equipment. Manages HVAC and R functions and activities.

See Heating, Air Conditioning, and Refrigeration Mechanics and Installers on p. 40 in the appendix

### **3E151 - HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION JOURNEYMAN**

Installs, operates, maintains, and repairs heating, ventilation, air conditioning and refrigeration (HVAC/R) systems, combustion equipment, and industrial air compressors. Maintains and repairs non- electric kitchen equipment. Manages HVAC and R functions and activities.

See Heating, Air Conditioning, and Refrigeration Mechanics and Installers on p. 40 in the appendix

### **3E171 - HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION CRAFTSMAN**

Installs, operates, maintains, and repairs heating, ventilation, air conditioning and refrigeration (HVAC/R) systems, combustion equipment, and industrial air compressors. Maintains and repairs non- electric kitchen equipment. Manages HVAC and R functions and activities.

See Heating, Air Conditioning, and Refrigeration Mechanics and Installers on p. 40 in the appendix

### **3E191 - HEATING, VENTILATION, AIR CONDITIONING & REFRIGERATION SUPERINTENDENT**

Installs, operates, maintains, and repairs heating, ventilation, air conditioning and refrigeration (HVAC/R) systems, combustion equipment, and industrial air compressors. Maintains and repairs non- electric kitchen equipment. Manages HVAC and R functions and activities.

See Heating, Air Conditioning, and Refrigeration Mechanics and Installers on p. 40 in the appendix

### **54500 - HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION MANAGER**

Installs, operates, maintains, and repairs heating, ventilation, air conditioning and refrigeration (HVAC/R) systems, combustion equipment, and industrial air compressors. Maintains and repairs non- electric kitchen equipment. Manages HVAC and R functions and activities.

See Heating, Air Conditioning, and Refrigeration Mechanics and Installers on p. 40 in the appendix



**54530 - HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION SPECIALIST**

Installs, operates, maintains, and repairs heating, ventilation, air conditioning and refrigeration (HVAC/R) systems, combustion equipment, and industrial air compressors. Maintains and repairs non- electric kitchen equipment. Manages HVAC and R functions and activities.

See Heating, Air Conditioning, and Refrigeration Mechanics and Installers on p. 40 in the appendix

**54550 - HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION SPECIALIST**

Installs, operates, maintains, and repairs heating, ventilation, air conditioning and refrigeration (HVAC/R) systems, combustion equipment, and industrial air compressors. Maintains and repairs non- electric kitchen equipment. Manages HVAC and R functions and activities.

See Heating, Air Conditioning, and Refrigeration Mechanics and Installers on p. 40 in the appendix

**54570 - HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION SPECIALIST**

Installs, operates, maintains, and repairs heating, ventilation, air conditioning and refrigeration (HVAC/R) systems, combustion equipment, and industrial air compressors. Maintains and repairs non- electric kitchen equipment. Manages HVAC and R functions and activities.

See Heating, Air Conditioning, and Refrigeration Mechanics and Installers on p. 40 in the appendix

**54590 - HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION SPECIALIST**

Installs, operates, maintains, and repairs heating, ventilation, air conditioning and refrigeration (HVAC/R) systems, combustion equipment, and industrial air compressors. Maintains and repairs non- electric kitchen equipment. Manages HVAC and R functions and activities.

See Heating, Air Conditioning, and Refrigeration Mechanics and Installers on p. 40 in the appendix

**65W3 – COST ANALYSIS, COMMISSIONED OFFICER**

Provide commanders/leadership with sound, technical and quantitative information as a basis for making financial and programmatic decisions. Leads and conducts analysis and studies to estimate cost and evaluate performance against standards, operational systems, acquisition programs, and support activities in support of daily operations and the war-fighting mission. Performs cost, economic, and business case analyses and conducts research essential to operational mission and involving major defense acquisition programs.

See Cost Estimator on p. 38 in the appendix

**65W4 - COST ANALYSIS, COMMISSIONED OFFICER**

Provide commanders/leadership with sound, technical and quantitative information as a basis for making financial and programmatic decisions. Leads and conducts analysis and studies to estimate cost and evaluate performance against standards, operational systems, acquisition programs, and support activities in support of daily operations and the war-fighting mission. Performs cost, economic, and business case analyses and conducts research essential to operational mission and involving major defense acquisition programs.

See Cost Estimator on p. 38 in the appendix

### **32E1A – CIVIL ENGINEER, ARCHITECT/ARCHITECTURAL ENGINEER – COMMISSIONED OFFICER**

Develops and implements civil engineer (CE) force employment, and provides staff supervision and technical advice. Performs and manages CE functions and activities to provide facilities and infrastructure supporting the United States and allies. Activities include programming, budgeting, project management, drafting, surveying, planning, feasibility studies, construction management, utilities operations, energy and environmental programs, land management, real property accounting, fire protection, explosive ordnance disposal (EOD), disaster preparedness (DP) programs, family housing and dorm management, and mobilization programs at base level. Serves on response teams and related installation support services. Advises commanders and government officials on effective use of CE resources.

See Architect on p. 34 in the appendix

### **32E2 CIVIL ENGINEER (AIR FORCE - OFFICER)**

Develops and implements civil engineer (CE) force employment, and provides staff supervision and technical advice. Performs and manages CE functions and activities to provide facilities and infrastructure supporting the United States and allies. Activities include programming, budgeting, project management, drafting, surveying, planning, feasibility studies, construction management, utilities operations, energy and environmental programs, land management, real property accounting, fire protection, explosive ordnance disposal (EOD), disaster preparedness (DP) programs, family housing and dorm management, and mobilization programs at base level. Serves on response teams and related installation support services. Advises commanders and government officials on effective use of CE resources.

See Cost Estimator on p. 38 in the appendix

See Construction Manager on p. 42 in the appendix

### **32E3A - CIVIL ENGINEER, ARCHITECT/ARCHITECTURAL ENGINEER – COMMISSIONED OFFICER**

Develops and implements civil engineer (CE) force employment, and provides staff supervision and technical advice. Performs and manages CE functions and activities to provide facilities and infrastructure supporting the United States and allies. Activities include programming, budgeting, project management, drafting, surveying, planning, feasibility studies, construction management, utilities operations, energy and environmental programs, land management, real property accounting, fire protection, explosive ordnance disposal (EOD), disaster preparedness (DP) programs, family housing and dorm management, and mobilization programs at base level. Serves on response teams and related installation support services. Advises commanders and government officials on effective use of CE resources.

See Architect on p. 34 in the appendix

See Cost Estimator on p. 38 in the appendix

See Construction Manager on p. 42 in the appendix

### **32E4 CIVIL ENGINEER (AIR FORCE - OFFICER)**

Develops and implements civil engineer (CE) force employment, and provides staff supervision and technical advice. Performs and manages CE functions and activities to provide facilities and infrastructure supporting the United States and allies. Activities include programming, budgeting, project management, drafting, surveying, planning, feasibility studies, construction management, utilities operations, energy and environmental programs, land management, real property accounting, fire protection, explosive ordnance disposal (EOD), disaster preparedness (DP) programs, family housing and dorm management, and mobilization programs at base level. Serves on response teams and related installation support services. Advises commanders and government officials on effective use of CE resources.

See Cost Estimator on p. 38 in the appendix

See Construction Manager on p. 42 in the appendix

### **3E531 ENGINEERING (AIR FORCE - ENLISTED)**

Directs and performs civil engineering design, drafting, surveying, and contract surveillance to support Air Force facility construction and maintenance programs. Prepares Computer Aided Design (CAD) drawings, specifications, and cost estimates. Operates, and maintains Geographic Information Systems (GIS). Utilizes surveying technology to include Global Positioning System (GPS). Evaluates potential construction sites and performs field tests on soils, asphalt, and concrete.

See Cost Estimator on p. 38 in the appendix

### **3E551 ENGINEERING (AIR FORCE - ENLISTED)**

Directs and performs civil engineering design, drafting, surveying, and contract surveillance to support Air Force facility construction and maintenance programs. Prepares Computer Aided Design (CAD) drawings, specifications, and cost estimates. Operates, and maintains Geographic Information Systems (GIS). Utilizes surveying technology to include Global Positioning System (GPS). Evaluates potential construction sites and performs field tests on soils, asphalt, and concrete.

See Cost Estimator on p. 38 in the appendix

### **3E571 ENGINEERING (AIR FORCE - ENLISTED)**

Directs and performs civil engineering design, drafting, surveying, and contract surveillance to support Air Force facility construction and maintenance programs. Prepares Computer Aided Design (CAD) drawings, specifications, and cost estimates. Operates, and maintains Geographic Information Systems (GIS). Utilizes surveying technology to include Global Positioning System (GPS). Evaluates potential construction sites and performs field tests on soils, asphalt, and concrete.

See Cost Estimator on p. 38 in the appendix

### **3E591 ENGINEERING (AIR FORCE - ENLISTED)**

Directs and performs civil engineering design, drafting, surveying, and contract surveillance to support Air Force facility construction and maintenance programs. Prepares Computer Aided Design (CAD) drawings, specifications, and cost estimates. Operates, and maintains Geographic Information Systems (GIS). Utilizes surveying technology to include Global Positioning System (GPS). Evaluates potential construction sites and performs field tests on soils, asphalt, and concrete.

See Cost Estimator on p. 38 in the appendix

### **55330 ENGINEERING SPECIALIST (AIR FORCE - ENLISTED)**

Directs and performs civil engineering design, drafting, surveying, and contract surveillance to support Air Force facility construction and maintenance programs. Prepares Computer Aided Design (CAD) drawings, specifications, and cost estimates. Operates, and maintains Geographic Information Systems (GIS). Utilizes surveying technology to include Global Positioning System (GPS). Evaluates potential construction sites and performs field tests on soils, asphalt, and concrete.

See Cost Estimator on p. 38 in the appendix

### **55350 ENGINEERING SPECIALIST (AIR FORCE - ENLISTED)**

Directs and performs civil engineering design, drafting, surveying, and contract surveillance to support Air Force facility construction and maintenance programs. Prepares Computer Aided Design (CAD) drawings, specifications, and cost estimates. Operates, and maintains Geographic Information Systems (GIS). Utilizes surveying technology to include Global Positioning System (GPS). Evaluates potential construction sites and performs field tests on soils, asphalt, and concrete.

See Cost Estimator on p. 38 in the appendix

### **55370 ENGINEERING SPECIALIST (AIR FORCE - ENLISTED)**

Directs and performs civil engineering design, drafting, surveying, and contract surveillance to support Air Force facility construction and maintenance programs. Prepares Computer Aided Design (CAD) drawings, specifications, and cost estimates. Operates, and maintains Geographic Information Systems (GIS). Utilizes surveying technology to include Global Positioning System (GPS). Evaluates potential construction sites and performs field tests on soils, asphalt, and concrete.

See Cost Estimator on p. 38 in the appendix

### **55390 ENGINEERING SPECIALIST (AIR FORCE - ENLISTED)**

Directs and performs civil engineering design, drafting, surveying, and contract surveillance to support Air Force facility construction and maintenance programs. Prepares Computer Aided Design (CAD) drawings, specifications, and cost estimates. Operates, and maintains Geographic Information Systems (GIS). Utilizes surveying technology to include Global Positioning System (GPS). Evaluates potential construction sites and performs field tests on soils, asphalt, and concrete.

See Cost Estimator on p. 38 in the appendix

**54230 ELECTRICAL SYSTEMS SPECIALIST (AIR FORCE - ENLISTED)**

Installs, inspects, maintains, troubleshoots, repairs, and modifies electrical distribution systems and components above and below 600 volts; airfield lighting systems; fire alarms and intrusion detection systems, and complies with environmental and safety regulations and practices.

See Electrician on p. 37 in the appendix

**54250 ELECTRICAL SYSTEMS SPECIALIST (AIR FORCE - ENLISTED)**

Installs, inspects, maintains, troubleshoots, repairs, and modifies electrical distribution systems and components above and below 600 volts; airfield lighting systems; fire alarms and intrusion detection systems, and complies with environmental and safety regulations and practices.

See Electrician on p. 37 in the appendix

**54270 ELECTRICAL SYSTEMS SPECIALIST (AIR FORCE - ENLISTED)**

Installs, inspects, maintains, troubleshoots, repairs, and modifies electrical distribution systems and components above and below 600 volts; airfield lighting systems; fire alarms and intrusion detection systems, and complies with environmental and safety regulations and practices.

See Electrician on p. 37 in the appendix

**54290 ELECTRICAL SYSTEMS SPECIALIST (AIR FORCE - ENLISTED)**

Installs, inspects, maintains, troubleshoots, repairs, and modifies electrical distribution systems and components above and below 600 volts; airfield lighting systems; fire alarms and intrusion detection systems, and complies with environmental and safety regulations and practices.

See Electrician on p. 37 in the appendix

**55131 PAVEMENTS AND CONSTRUCTION EQUIPMENT SPECIALIST (AIR FORCE - ENLISTED)**

Constructs and maintains concrete and asphalt runways, aircraft parking aprons, and roads. Operates and maintains heavy construction equipment, such as loaders, graders, dozers, backhoes, and dump trucks. Operates tractor-trailer combinations, transporting construction equipment, and materials. Ensures compliance with all safety and environmental regulations.

See Excavating, Loading Machine and Dragline Operators on p. 45 in the appendix

See Cement Mason and Concrete Finisher on p. 35 in the appendix

**55151 PAVEMENTS AND CONSTRUCTION EQUIPMENT SPECIALIST (AIR FORCE - ENLISTED)**

Constructs and maintains concrete and asphalt runways, aircraft parking aprons, and roads. Operates and maintains heavy construction equipment, such as loaders, graders, dozers, backhoes, and dump trucks. Operates tractor-trailer combinations, transporting construction equipment, and materials. Ensures compliance with all safety and environmental regulations.

See Excavating, Loading Machine and Dragline Operators on p. 45 in the appendix

See Cement Mason and Concrete Finisher on p. 35 in the appendix

**55171 PAVEMENTS AND CONSTRUCTION EQUIPMENT SPECIALIST (AIR FORCE - ENLISTED)**

Constructs and maintains concrete and asphalt runways, aircraft parking aprons, and roads. Operates and maintains heavy construction equipment, such as loaders, graders, dozers, backhoes, and dump trucks. Operates tractor-trailer combinations, transporting construction equipment, and materials. Ensures compliance with all safety and environmental regulations.

See Excavating, Loading Machine and Dragline Operators on p. 45 in the appendix

See Cement Mason and Concrete Finisher on p. 35 in the appendix

**55191 PAVEMENTS AND CONSTRUCTION EQUIPMENT SPECIALIST (AIR FORCE - ENLISTED)**

Constructs and maintains concrete and asphalt runways, aircraft parking aprons, and roads. Operates and maintains heavy construction equipment, such as loaders, graders, dozers, backhoes, and dump trucks. Operates tractor-trailer combinations, transporting construction equipment, and materials. Ensures compliance with all safety and environmental regulations

See Excavating, Loading Machine and Dragline Operators on p. 45 in the appendix

See Cement Mason and Concrete Finisher on p. 35 in the appendix

**6F030 FINANCIAL MANAGEMENT AND SERVICES CRAFTSMAN (AIR FORCE - ENLISTED)**

Provides financial decision support, services, and resources to support the Air Force's war-fighting mission. Performs, supervises, manages and directs financial management activities both at home station and deployed locations. Provides customer service. Maintains financial records for pay and travel transactions. Maintains accounting records and prepares reports. Determines fund availability and propriety of claims. Accounts for and safeguards cash, checks, and other negotiable instruments. Processes commitments and obligations, payments, and collections. Serves as financial advisor to commanders and resource managers. Compiles, analyzes, and summarizes data. Prepares and executes budget execution plans. Performs audits and implements fraud prevention measures.

See Cost Estimator on p. 38 in the appendix

**6F050 FINANCIAL MANAGEMENT AND SERVICES CRAFTSMAN (AIR FORCE - ENLISTED)**

Provides financial decision support, services, and resources to support the Air Force's war-fighting mission. Performs, supervises, manages and directs financial management activities both at home station and deployed locations. Provides customer service. Maintains financial records for pay and travel transactions. Maintains accounting records and prepares reports. Determines fund availability and propriety of claims. Accounts for and safeguards cash, checks, and other negotiable instruments. Processes commitments and obligations, payments, and collections. Serves as financial advisor to commanders and resource managers. Compiles, analyzes, and summarizes data. Prepares and executes budget execution plans. Performs audits and implements fraud prevention measures.

See Cost Estimator on p. 38 in the appendix

**6F070 FINANCIAL MANAGEMENT AND SERVICES CRAFTSMAN (AIR FORCE - ENLISTED)**

Provides financial decision support, services, and resources to support the Air Force's war-fighting mission. Performs, supervises, manages and directs financial management activities both at home station and deployed locations. Provides customer service. Maintains financial records for pay and travel transactions. Maintains accounting records and prepares reports. Determines fund availability and propriety of claims. Accounts for and safeguards cash, checks, and other negotiable instruments. Processes commitments and obligations, payments, and collections. Serves as financial advisor to commanders and resource managers. Compiles, analyzes, and summarizes data. Prepares and executes budget execution plans. Performs audits and implements fraud prevention measures.

See Cost Estimator on p. 38 in the appendix

**6F090 FINANCIAL MANAGEMENT AND SERVICES CRAFTSMAN (AIR FORCE - ENLISTED)**

Provides financial decision support, services, and resources to support the Air Force's war-fighting mission. Performs, supervises, manages and directs financial management activities both at home station and deployed locations. Provides customer service. Maintains financial records for pay and travel transactions. Maintains accounting records and prepares reports. Determines fund availability and propriety of claims. Accounts for and safeguards cash, checks, and other negotiable instruments. Processes commitments and obligations, payments, and collections. Serves as financial advisor to commanders and resource managers. Compiles, analyzes, and summarizes data. Prepares and executes budget execution plans. Performs audits and implements fraud prevention measures.

See Cost Estimator on p. 38 in the appendix

**3E032 ELECTRICAL POWER PRODUCTION (AIR FORCE - ENLISTED)**

Installs, removes, operates, maintains, and repairs electrical power generating and control systems, aircraft arresting systems, and associated equipment.

See Electrician on p. 37 in the appendix

**3E052 ELECTRICAL POWER PRODUCTION (AIR FORCE - ENLISTED)**

Installs, removes, operates, maintains, and repairs electrical power generating and control systems, aircraft arresting systems, and associated equipment.

See Electrician on p. 37 in the appendix

**3E072 ELECTRICAL POWER PRODUCTION (AIR FORCE - ENLISTED)**

Installs, removes, operates, maintains, and repairs electrical power generating and control systems, aircraft arresting systems, and associated equipment.

See Electrician on p. 37 in the appendix

### **3E092 ELECTRICAL POWER PRODUCTION (AIR FORCE - ENLISTED)**

Installs, removes, operates, maintains, and repairs electrical power generating and control systems, aircraft arresting systems, and associated equipment.

See Electrician on p. 37 in the appendix

### **3E231 PAVEMENTS AND CONSTRUCTION EQUIPMENT (AIR FORCE - ENLISTED)**

Constructs and maintains concrete and asphalt runways, aircraft parking aprons, and roads. Operates and maintains heavy construction equipment, such as loaders, graders, dozers, backhoes, and dump trucks. Operates tractor-trailer combinations, transporting construction equipment, and materials. Ensures compliance with all safety and environmental regulations.

See Cement Mason and Concrete Finisher on p. 35 in the appendix

See Excavating, Loading Machine and Dragline Operators on p. 45 in the appendix

### **3E251 PAVEMENTS AND CONSTRUCTION EQUIPMENT (AIR FORCE - ENLISTED)**

Constructs and maintains concrete and asphalt runways, aircraft parking aprons, and roads. Operates and maintains heavy construction equipment, such as loaders, graders, dozers, backhoes, and dump trucks. Operates tractor-trailer combinations, transporting construction equipment, and materials. Ensures compliance with all safety and environmental regulations.

See Cement Mason and Concrete Finisher on p. 35 in the appendix

See Excavating, Loading Machine and Dragline Operators on p. 45 in the appendix

### **3E271 PAVEMENTS AND CONSTRUCTION EQUIPMENT (AIR FORCE - ENLISTED)**

Constructs and maintains concrete and asphalt runways, aircraft parking aprons, and roads. Operates and maintains heavy construction equipment, such as loaders, graders, dozers, backhoes, and dump trucks. Operates tractor-trailer combinations, transporting construction equipment, and materials. Ensures compliance with all safety and environmental regulations.

See Cement Mason and Concrete Finisher on p. 35 in the appendix

See Excavating, Loading Machine and Dragline Operators on p. 45 in the appendix

### **3E291 PAVEMENTS AND CONSTRUCTION EQUIPMENT (AIR FORCE - ENLISTED)**

Constructs and maintains concrete and asphalt runways, aircraft parking aprons, and roads. Operates and maintains heavy construction equipment, such as loaders, graders, dozers, backhoes, and dump trucks. Operates tractor-trailer combinations, transporting construction equipment, and materials. Ensures compliance with all safety and environmental regulations.

See Cement Mason and Concrete Finisher on p. 35 in the appendix

See Excavating, Loading Machine and Dragline Operators on p. 45 in the appendix



### **3E431 WATER AND FUEL SYSTEMS MAINTENANCE (AIR FORCE - ENLISTED)**

Installs, inspects, maintains, troubleshoots, modifies, repairs, and manages plumbing, water distribution, wastewater collection systems, water and wastewater treatment systems, fire suppression, backflow prevention systems, natural gas distribution systems, liquid fuel storage, distribution, and dispensing systems. Complies with environmental and safety regulations.

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

### **3E451 WATER AND FUEL SYSTEMS MAINTENANCE (AIR FORCE - ENLISTED)**

Installs, inspects, maintains, troubleshoots, modifies, repairs, and manages plumbing, water distribution, wastewater collection systems, water and wastewater treatment systems, fire suppression, backflow prevention systems, natural gas distribution systems, liquid fuel storage, distribution, and dispensing systems. Complies with environmental and safety regulations.

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

### **3E471 WATER AND FUEL SYSTEMS MAINTENANCE (AIR FORCE - ENLISTED)**

Installs, inspects, maintains, troubleshoots, modifies, repairs, and manages plumbing, water distribution, wastewater collection systems, water and wastewater treatment systems, fire suppression, backflow prevention systems, natural gas distribution systems, liquid fuel storage, distribution, and dispensing systems. Complies with environmental and safety regulations.

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

### **3E491 WATER AND FUEL SYSTEMS MAINTENANCE (AIR FORCE - ENLISTED)**

Installs, inspects, maintains, troubleshoots, modifies, repairs, and manages plumbing, water distribution, wastewater collection systems, water and wastewater treatment systems, fire suppression, backflow prevention systems, natural gas distribution systems, liquid fuel storage, distribution, and dispensing systems. Complies with environmental and safety regulations.

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

### **3S331 MANPOWER (AIR FORCE - ENLISTED)**

Performs core competencies in organization structure, manpower requirements determination, program allocation and control, and performance management. Manages manpower and organization (MO) functions including Air Force organization structure; organizational and manpower standards; manpower resources, military grades, manpower data systems, and peacetime and wartime manpower requirements and utilization; A-76 commercial activities and competitive sourcing and privatization studies. Manages process reengineering, continuous improvement initiatives, and management consulting services. Supports operational planning and execution.

See Construction Manager on p. 42 in the appendix

### **3S351 MANPOWER (AIR FORCE - ENLISTED)**

Performs core competencies in organization structure, manpower requirements determination, program allocation and control, and performance management. Manages manpower and organization (MO) functions including Air Force organization structure; organizational and manpower standards; manpower resources, military grades, manpower data systems, and peacetime and wartime manpower requirements and utilization; A-76 commercial activities and competitive sourcing and privatization studies. Manages process reengineering, continuous improvement initiatives, and management consulting services. Supports operational planning and execution.

See Construction Manager on p. 42 in the appendix

### **55330 ENGINEERING SPECIALIST (AIR FORCE - ENLISTED)**

Directs and performs civil engineering design, drafting, surveying, and contract surveillance to support Air Force facility construction and maintenance programs. Prepares Computer Aided Design (CAD) drawings, specifications, and cost estimates. Operates, and maintains Geographic Information Systems (GIS). Utilizes surveying technology to include Global Positioning System (GPS). Evaluates potential construction sites and performs field tests on soils, asphalt, and concrete.

See Cost Estimator on p. 38 in the appendix

### **55390 ENGINEERING SPECIALIST (AIR FORCE - ENLISTED)**

Directs and performs civil engineering design, drafting, surveying, and contract surveillance to support Air Force facility construction and maintenance programs. Prepares Computer Aided Design (CAD) drawings, specifications, and cost estimates. Operates, and maintains Geographic Information Systems (GIS). Utilizes surveying technology to include Global Positioning System (GPS). Evaluates potential construction sites and performs field tests on soils, asphalt, and concrete.

See Cost Estimator on p. 38 in the appendix

### **56631 UTILITIES SYSTEMS SPECIALIST (AIR FORCE - ENLISTED)**

Installs, inspects, maintains, troubleshoots, modifies, repairs, and manages plumbing, water distribution, waste water collection systems, water and waste water treatment systems, fire suppression, back-flow prevention systems, natural gas distribution systems, liquid fuel storage, distribution, and dispensing systems. Complies with environmental and safety regulations.

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

### **56651 UTILITIES SYSTEMS SPECIALIST (AIR FORCE - ENLISTED)**

Installs, inspects, maintains, troubleshoots, modifies, repairs, and manages plumbing, water distribution, waste water collection systems, water and waste water treatment systems, fire suppression, back-flow prevention systems, natural gas distribution systems, liquid fuel storage, distribution, and dispensing systems. Complies with environmental and safety regulations.

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

**56671 UTILITIES SYSTEMS SPECIALIST (AIR FORCE - ENLISTED)**

Installs, inspects, maintains, troubleshoots, modifies, repairs, and manages plumbing, water distribution, waste water collection systems, water and waste water treatment systems, fire suppression, back-flow prevention systems, natural gas distribution systems, liquid fuel storage, distribution, and dispensing systems. Complies with environmental and safety regulations.

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

**56691 UTILITIES SYSTEMS SPECIALIST (AIR FORCE - ENLISTED)**

Installs, inspects, maintains, troubleshoots, modifies, repairs, and manages plumbing, water distribution, waste water collection systems, water and waste water treatment systems, fire suppression, back-flow prevention systems, natural gas distribution systems, liquid fuel storage, distribution, and dispensing systems. Complies with environmental and safety regulations.

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

# ARMY

## MILITARY OCCUPATIONAL SPECIALTIES (MOS)

**(12 A) ENGINEER OFFICER** is responsible for providing full support to the wide range of engineering duties in the Army. They can build structures, develop civil works programs and even provide combat support.

See Construction Laborers on p. 41 in appendix

**(12 T) TECHNICAL ENGINEER** supervises or participates in construction site development in areas such as technical investigation, surveys, drafts and construction plans/specifications. They conduct land surveys, make maps and prepare detailed plans for construction projects.

**(12 Y) GEOSPATIAL ENGINEERS** are responsible for using geographic data that supports military/civilian operations for Disaster Relief and Homeland Security. They collect, analyze and distribute geospatial information to represent the terrain and its potential effects.

**(12 W) A CARPENTRY AND MASONRY SPECIALIST** is responsible for general heavy carpentry and masonry duties.

See Cement Mason and Concrete Finisher on p. 35 in the appendix

See Carpenter on p. 32 in the appendix

See Drywall and Ceiling Installer on p. 36 in the appendix

See Construction Laborer on p. 41 in the appendix

See Glazier on p. 39 in the appendix

See Insulation Installer on p. 47 in the appendix

See Roofer on p. 46 in the appendix

See Painter, Construction and Maintenance on p. 43 in the appendix

**(12 V) A CONCRETE AND ASPHALT EQUIPMENT OPERATOR** is responsible for supervising or operating all equipment used in concrete asphalt production, which is integral to the construction of airfields, roads, dams and buildings.

See Excavating, Loading Machine and Dragline Operators on p. 45 in appendix

See Cement Mason and Concrete Finisher on p. 35 in the appendix

**(12 N) A HORIZONTAL CONSTRUCTION ENGINEER** uses bulldozers, cranes, graders and other heavy equipment to move tons of earth and material to complete construction projects for the Army. They are also responsible for operating tractors with dozer attachments, scoop loaders, backhoe loaders, hydraulic excavators, motorized graders and scrapers.

See Excavating, Loading Machine and Dragline Operators on p. 45 in appendix

**(12 G) QUARRY SPECIALIST** helps construct airfields, roads, dams and buildings by moving tons of earth/materials with heavy types of machinery. They operate powered machines that are used in cleaning, crushing, drilling, grading, and detonating rock at construction sites.

See Excavating, Loading Machine and Dragline Operators on p. 45 in appendix

**(12 Q) A POWER DISTRIBUTION SPECIALIST** is primarily responsible for the electrical distribution system in the Army.

See Electrician on p. 37 in appendix

**(12 R) AN INTERIOR ELECTRICIAN** is primarily responsible for the installation and maintenance for all of the Army's interior electrical systems.

See Electrician on p. 37 in appendix

**(91 C) UTILITIES EQUIPMENT REPAIRER** is responsible for supervising and performing maintenance on utilities equipment and special purpose support systems.

See Electrician on p. 37 in appendix

**(12 K) ARMY PLUMBER AND PIPE FITTERS** are responsible for installing and repairing plumbing and pipe systems.

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

**(92W) WATER TREATMENT SPECIALISTS** are primarily responsible for supervising or performing the installation and operation of water purification equipment, as well as dealing with water storage and distribution operations and activities. They also inspect facilities and food supplies for the presence of disease, germs or other conditions hazardous to health and the environment.

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

### **51B CARPENTER (ARMY - ENLISTED)**

Performs general heavy carpentry, structural steel, and masonry duties.

See Cement Mason and Concrete Finisher on p. 35 in the appendix

See Drywall and Ceiling Installer on p. 36 in the appendix

See Construction Laborer on p. 41 in the appendix

See Glazier on p. 39 in the appendix

See Insulation Installer on p. 47 in the appendix

See Roofer on p. 46 in the appendix

See Painter, Construction and Maintenance on p. 43 in the appendix

# COAST GUARD

## **AE AVIATION ELECTRICIANS MATE (COAST GUARD - ENLISTED)**

Handles and services aircraft; inspects and maintains aircraft electrical and instrument systems, including power generation, conversion and distribution systems; interior and exterior lighting; electrical components of aircraft controls, including airframe, engine, propeller, and utility control systems; aircraft electrical starting systems, including starters, starting controls and ignition system components; aircraft engine, flight, and flight control instruments; instrument systems; and non-instrument type indicating warning systems; aircraft automatic flight control system, including automatic pilots, flight director systems, aircraft compasses, and altitude reference systems; aircraft batteries and related electrical components.

See Electrician on p. 37 in the appendix

## **EM ELECTRICIAN'S MATE (COAST GUARD - ENLISTED)**

Operates, installs, maintains, and repairs motors, generators, switchboards, and solid-state control equipment; installs, maintains, and repairs power and lighting circuits and electrical fixtures; performs tests for short circuits, grounds, and other casualties; and repairs or rebuilds electrical equipment in an electric shop.

See Electrician on p. 37 in the appendix

# MARINE CORPS

## **1302 COMBAT ENGINEER OFFICER (MARINE CORPS - OFFICER)**

Engineer officers command or assist in commanding engineer units consisting of Marines in various MOSs whose duties include repair, maintenance, and operation of engineer heavy equipment; construction, operation, and repair of structures and facilities; clearing and emplacing obstacles such as minefields; construction of bridges; using explosives for construction and demolition projects; using specialized demolitions for urban breaching; storage and distribution of bulk fuel products; installation, operation, and maintenance of utility systems.

See Construction Laborer on p. 41 in the appendix

## **1361 ENGINEER ASSISTANT (MARINE CORPS - ENLISTED)**

Engineer assistants perform various duties incidental to construction design, planning, estimating, and management. Personnel assigned this MOS are trained to use optical reading/electronic total station survey instruments to establish the horizontal and vertical alignment/layout for construction projects. In addition, they are trained to use manual/Computer Aided Drafting (CAD) methods of preparing architectural/mechanical/civil drawings, to include computations for bills of material/earthwork volumes.

See Construction Managers on p. 42 in the appendix

## **1371 COMBAT ENGINEER (MARINE CORPS - ENLISTED)**

Combat engineers construct, alter, repair, and maintain buildings and structures; lift and move heavy objects and equipment by setting up, bracing, and utilizing rigging devices and equipment; and perform various duties incidental to the use of demolitions in construction projects and destruction of objects; Personnel assigned this MOS are taught carpentry and other construction skills as well as demolitions, specialized demolitions for urban breaching and land mine.

See Construction Laborers on p. 41 in the appendix

See Carpenters on p. 32 in the appendix

## **3401 BASIC FINANCIAL MANAGEMENT OFFICER (MARINE CORPS - OFFICER)**

Financial Management Officers are in charge of financial issues, such as managing budgets and disbursing operations.

See Cost Estimator on p. 38 in the appendix

### **8856 CONTRACTING OFFICER (MARINE CORPS - OFFICER)**

Contracting officers evaluate contract requirements, specifications, bids, proposals, and subsequent contractor performance. When appointed in accordance with the Federal Acquisition Regulation, contracting officers have authority to enter into, administer, or terminate contracts and make related determinations and findings. Contracting officers may bind the Government only to the extent of the authority delegated to them. This MOS is also an Acquisition Workforce Career Field as defined by the Defense Acquisition Workforce Improvement Act and Title 10, Section 1701. Officers serving in MOS 3006 are eligible for the MOS 8057, Acquisition Professional Candidate, and MOS 8058, Acquisition Management Officer, acquisition workforce programs. This MOS will be assigned only as a FMOS.

See Cost Estimator on p. 38 in the appendix

See Construction Managers on p. 42 in the appendix

### **1345 ENGINEER EQUIPMENT OPERATOR (MARINE CORPS - ENLISTED)**

Engineer equipment operators operate gasoline or diesel engine powered, self-propelled, skid-mounted, and towed engineer construction equipment including accessories and allied equipment used in earthmoving, grading, excavation, logging, clearing, and landing operations.

See Excavating, Loading Machine and Dragline Operators on p. 45 in the appendix

### **1161 REFRIGERATION AND AIR CONDITIONING TECHNICIAN (MARINE CORPS - ENLISTED)**

Refrigeration and Air Conditioning technicians must be certified by the Environmental Protection Agency (EPA) to handle Chlorofluorocarbons (CFCs). They install, operate, and make organizational and intermediate level repairs on heating, refrigeration, and air conditioning systems, to include automotive, for all ground operations and equipment. These duties include installing refrigerating systems according to engineering specifications; recovery and recycling specified gases or fluids into systems; dismantling and testing malfunctioning systems using electrical, mechanical, and pneumatic testing equipment; and repairing systems by replacing or adjusting defective and worn parts. An apprenticeship program, leading to U.S. Department of Labor certification as a Journey Worker, is available to refrigeration and air conditioning technicians under the United Services Military Apprenticeship Program (USMAP).

See HVAC on p. 40 in the appendix

### **1142 ENGINEER EQUIPMENT ELECTRICAL SYSTEMS TECHNICIAN (MARINE CORPS - ENLISTED)**

Using knowledge of electrical theory and concepts, and electronic fundamentals, equipment electrical systems technicians repair electric motors, electronic modules, motor control circuits, and electric power generation equipment. These technicians also troubleshoot digital/logic components/circuits and make organizational and intermediate level repairs on the electrical systems of engineer and general supply equipment.

See Electricians on p. 37 in the appendix

### **9624 ELECTRONICS ENGINEER (MARINE CORPS - OFFICER)**



Electronics engineers supervise and coordinate design, development, testing, procurement, modification, improvement, and repair of electronics equipment.

See Electricians on p. 37 in the appendix

#### **1141 ELECTRICIAN (MARINE CORPS - ENLISTED)**

Using knowledge of electrical theory and concepts, Electricians install, operate, maintain, and repair underground, and overhead electrical power distribution systems. Electricians operate and perform organizational level electrical power generation equipment, load banks, and on Humanitarian Assistance and Civil Military Operations they install and repair interior wiring in buildings.

See Electricians on p. 37 in the appendix

#### **6073 AIRCRAFT MAINTENANCE SUPPORT EQUIPMENT ELECTRICIAN/ REFRIGERATION (MARINE CORPS - ENLISTED)**

Aircraft maintenance support equipment electricians/refrigeration mechanics install, inspect, test, maintain and repair aircraft support equipment (SE), electrical/instrument and refrigeration and air conditioning equipment, systems and accessories.

See Electricians on p. 37 in the appendix

See HVAC on p. 40 in the appendix

#### **1120 UTILITIES OFFICER (III) (MARINE CORPS - WARRANT OFFICER)**

The utilities occupation includes technical warrant officers who plan, supervise, and coordinate activities of Marines in various MOSs who install, operate, and maintain water supply, heating, mobile electrical power generating sources, electrical distribution systems, air conditioning, refrigeration, and hygiene utility systems. There are a wide variety of challenging and interesting billets available to Warrant Officers in occupation 11, ranging from duty in battalions and squadrons of the division, air wing, and force service support groups, to instructor duty at the Marine Corps Engineer School and acquisition billets at the Marine Corps Systems Command.

See Construction Managers on p. 42 in the appendix

See Electricians on p. 37 in the appendix

See HVAC on p. 40 in the appendix

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

### **1169 UTILITIES CHIEF (MARINE CORPS - ENLISTED)**

Utilities chiefs are technical advisers to the commander at all levels of all elements of the various MAGTFs on the employment of utilities support. These staff noncommissioned officers analyze, translate, and execute commanders' operational requirements into a utilities support reality that enhances mission accomplishment. They plan and supervise the establishment, operation, and maintenance of water filtration/purification, storage, and distribution sites; electric power generating sites along with the inherent underground, above ground, and overhead electric power distribution systems; and shower and laundry services. They coordinate and supervise the installation, maintenance and repair of heating, air conditioning (to include automotive), and refrigeration equipment; and the maintenance and repair of the electrical systems on engineer and general supply equipment. Water quality assurance, field sanitation, sewage, and waste disposal is also planned, coordinated, and supervised.

See Construction Managers on p. 42 in the appendix

See Electricians on p. 37 in the appendix

See HVAC on p. 40 in the appendix

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

### **1171 WATER SUPPORT TECHNICIAN (MARINE CORPS - ENLISTED)**

Water support technicians install, operate, inspect, and perform preventive and corrective maintenance on pumps, water filtration/purification equipment, water storage/distribution systems, and laundry and shower facilities. They conduct and evaluate water surveys, water reconnaissance, and water quality analysis as well as establish, maintain, and close sanitation systems. When on Humanitarian Assistance and Civil Military Operations these technicians also plan, install, and repair the plumbing systems of structures. These duties include cutting, bending, and threading pipes; joining pipes using screws, bolts, fittings, solder, and plastic solvent; cleaning tanks and filter beds using backwashing; testing water to determine acidity, impurities, turbidity, and conductivity; and regulating the flow of raw water for treatment while mixing it with specified amounts of chemicals (i.e. alum, coagulate, chlorine, ammonia, and lime) in the filtration/purification process. Noncommissioned officers are afforded the opportunity to attend the Advanced Water Support Technician course that provides in-depth instruction on the requirements of the Uniform Plumbing Code and the planning of water support. An apprenticeship program, leading to U.S. Department of Labor certification as a Journey Worker, is available to water support technicians under the United Services Military Apprenticeship Program (USMAP).

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

# NAVY

## **EO EQUIPMENT OPERATOR (NAVY - ENLISTED)**

Operates automotive, material handling, weight lifting and construction equipment involved in earth moving, road building, quarrying, asphalt batching and paving, concrete paving and construction work.

See Excavating, Loading Machine and Dragline Operators on p. 45 in the appendix

## **CE CONSTRUCTION ELECTRICIAN (NAVY - ENLISTED)**

Plans, supervises and performs tasks required to install, operate, service and overhaul electric generating and distribution systems, wire communications systems and associated equipment.

See Construction Managers on p. 42 in the appendix

See Electricians on p. 37 in the appendix

## **EA ENGINEERING AID (NAVY - ENLISTED)**

Plans, supervises and performs tasks required in construction surveying, drafting, planning, estimating and quality control.

See Cost Estimator on p. 38 in the appendix

## **5100 SC - CIVIL ENGINEER CORPS (NAVY - OFFICER)**

CEC officers are professional engineers and architects, acquisitions specialists and Seabee Combat Warfare Officers. They are responsible for executing and managing the planning, design, acquisition, construction, operation, and maintenance of the Navy's shore facilities. An officer of the Regular Navy whose permanent status is Ensign or above.

See Architects on p. 34 in the appendix

## **5103 SC - CIVIL ENGINEER CORPS (NAVY - OFFICER)**

CEC officers are professional engineers and architects, acquisitions specialists and Seabee Combat Warfare Officers. They are responsible for executing and managing the planning, design, acquisition, construction, operation, and maintenance of the Navy's shore facilities. An Officer of the Regular Navy who is on the retired list.

See Architects on p. 34 in the appendix

## **5105 SC - CIVIL ENGINEER CORPS (NAVY - OFFICER)**

CEC officers are professional engineers and architects, acquisitions specialists and Seabee Combat Warfare Officers. They are responsible for executing and managing the planning, design, acquisition, construction, operation, and maintenance of the Navy's shore facilities. An officer of the Naval Reserve.

See Architects on p. 34 in the appendix

**5107 SC - CIVIL ENGINEER CORPS (NAVY - OFFICER)**

CEC officers are professional engineers and architects, acquisitions specialists and Seabee Combat Warfare Officers. They are responsible for executing and managing the planning, design, acquisition, construction, operation, and maintenance of the Navy's shore facilities. An officer of the Naval Reserve on active duty in the FTS Program (Full Time Support) [Includes officers of the FTS Program rotated to other than FTS billets].

See Architects on p. 34 in the appendix

**6530 LDO - CIVIL ENGINEER CORPS (NAVY - OFFICER)**

Officer technical managers in the operational fields of horizontal and vertical construction, facilities maintenance, utilities, and automotive and construction equipment; Help plan, coordinate, and direct the technical, operational, training, and administrative responsibilities of Naval Construction Force units, assist in planning, scheduling, and operations of public works departments within the Navy shore establishment; Supervise personnel engaged in horizontal and vertical construction, maintenance and repair including buildings, airfields, waterfront structures, and utilities systems, and in the operation, testing, maintenance, and repair of automotive and construction equipment; An officer of the Regular Navy whose permanent status is Ensign or above.

See Construction Managers on p. 42 in the appendix

**6533 LDO - CIVIL ENGINEER CORPS (NAVY - OFFICER)**

Officer technical managers in the operational fields of horizontal and vertical construction, facilities maintenance, utilities, and automotive and construction equipment; Help plan, coordinate, and direct the technical, operational, training, and administrative responsibilities of Naval Construction Force units, assist in planning, scheduling, and operations of public works departments within the Navy shore establishment; Supervise personnel engaged in horizontal and vertical construction, maintenance and repair including buildings, airfields, waterfront structures, and utilities systems, and in the operation, testing, maintenance, and repair of automotive and construction equipment; An Officer of the Regular Navy who is on the retired list.

See Construction Managers on p. 42 in the appendix

**6535 LDO - CIVIL ENGINEER CORPS (NAVY - OFFICER)**

Officer technical managers in the operational fields of horizontal and vertical construction, facilities maintenance, utilities, and automotive and construction equipment; Help plan, coordinate, and direct the technical, operational, training, and administrative responsibilities of Naval Construction Force units, assist in planning, scheduling, and operations of public works departments within the Navy shore establishment; Supervise personnel engaged in horizontal and vertical construction, maintenance and repair including buildings, airfields, waterfront structures, and utilities systems, and in the operation, testing, maintenance, and repair of automotive and construction equipment; An officer of the Naval Reserve.

See Construction Managers on p. 42 in the appendix

**6537 LDO - CIVIL ENGINEER CORPS (NAVY - OFFICER)**

Officer technical managers in the operational fields of horizontal and vertical construction, facilities maintenance, utilities, and automotive and construction equipment. They help plan, coordinate, and direct the technical, operational, training, and administrative responsibilities of Naval Construction Force units, assist in planning, scheduling, and operations of public works departments within the Navy shore establishment. They supervise personnel engaged in horizontal and vertical construction, maintenance and repair (including buildings, airfields, waterfront structures, and utilities systems), and in the operation, testing, maintenance, and repair of automotive and construction equipment. An officer of the Naval Reserve on active duty in the FTS Program (Full Time Support) [Includes officers of the FTS Program rotated to other than FTS billets].

See Construction Managers on p. 42 in the appendix

**7131 CWO - ENGINEERING TECHNICIAN (SURFACE) (NAVY - WARRANT OFFICER)**

Officer technical specialists in ship machinery, electrical power, lighting, and interior communications systems. They supervise and instruct personnel whose duties involve operation and maintenance of main propulsion (gas turbine, diesel, or steam) and auxiliary machinery and systems, engineering and repair department equipment, and refrigeration systems; handling, stowing, and regulating expenditure of fuel oil and boiler feed water; installation, adjustment, testing maintenance, modification, and repair of shipboard electrical systems pertaining to power distribution, propulsion, steering, lighting, degaussing, interior communications, gyrocompass, and associated equipment, and instrument repair, adjustment, and calibration. An officer of the Regular Navy whose permanent status is Warrant Officer.

See Electricians on p. 37 in the appendix

See HVAC on p. 40 in the appendix

**7132 CWO - ENGINEERING TECHNICIAN (SURFACE) (NAVY - WARRANT OFFICER)**

Officer technical specialists in ship machinery, electrical power, lighting, and interior communications systems. They supervise and instruct personnel whose duties involve operation and maintenance of main propulsion (gas turbine, diesel, or steam) and auxiliary machinery and systems, engineering and repair department equipment, and refrigeration systems; handling, stowing, and regulating expenditure of fuel oil and boiler feed water; installation, adjustment, testing maintenance, modification, and repair of shipboard electrical systems pertaining to power distribution, propulsion, steering, lighting, degaussing, interior communications, gyrocompass, and associated equipment, and instrument repair, adjustment, and calibration. A temporary officer of the Regular Navy whose permanent status is enlisted.

See Electricians on p. 37 in the appendix

See HVAC on p. 40 in the appendix

**7133 CWO - ENGINEERING TECHNICIAN (SURFACE) (NAVY - WARRANT OFFICER)**

Officer technical specialists in ship machinery, electrical power, lighting, and interior communications systems. They supervise and instruct personnel whose duties involve operation and maintenance of main propulsion (gas turbine, diesel, or steam) and auxiliary machinery and systems, engineering and repair department equipment, and refrigeration systems; handling, stowing, and regulating expenditure of fuel oil and boiler feed water; installation, adjustment, testing maintenance, modification, and repair of shipboard electrical systems pertaining to power distribution, propulsion, steering, lighting, degaussing, interior communications, gyrocompass, and associated equipment, and instrument repair, adjustment, and calibration. An Officer of the Regular Navy who is on the retired list.

See Electricians on p. 37 in the appendix

See HVAC on p. 40 in the appendix

**7135 CWO - ENGINEERING TECHNICIAN (SURFACE) (NAVY - WARRANT OFFICER)**

Officer technical specialists in ship machinery, electrical power, lighting, and interior communications systems. They supervise and instruct personnel whose duties involve operation and maintenance of main propulsion (gas turbine, diesel, or steam) and auxiliary machinery and systems, engineering and repair department equipment, and refrigeration systems; handling, stowing, and regulating expenditure of fuel oil and boiler feed water; installation, adjustment, testing maintenance, modification, and repair of shipboard electrical systems pertaining to power distribution, propulsion, steering, lighting, degaussing, interior communications, gyrocompass, and associated equipment, and instrument repair, adjustment, and calibration. An officer of the Naval Reserve.

See Electricians on p. 37 in the appendix

See HVAC on p. 40 in the appendix

**7137 CWO - ENGINEERING TECHNICIAN (SURFACE) (NAVY - WARRANT OFFICER)**

Officer technical specialists in ship machinery, electrical power, lighting, and interior communications systems. They supervise and instruct personnel whose duties involve operation and maintenance of main propulsion (gas turbine, diesel, or steam) and auxiliary machinery and systems, engineering and repair department equipment, and refrigeration systems; handling, stowing, and regulating expenditure of fuel oil and boiler feed water; installation, adjustment, testing maintenance, modification, and repair of shipboard electrical systems pertaining to power distribution, propulsion, steering, lighting, degaussing, interior communications, gyrocompass, and associated equipment, and instrument repair, adjustment, and calibration. An officer of the Naval Reserve on active duty in the FTS Program (Full Time Support) [Includes officers of the FTS Program rotated to other than FTS billets].

See Electricians on p. 37 in the appendix

See HVAC on p. 40 in the appendix

### **7138 CWO - ENGINEERING TECHNICIAN (SURFACE) (NAVY - WARRANT OFFICER)**

Officer technical specialists in ship machinery, electrical power, lighting, and interior communications systems. They supervise and instruct personnel whose duties involve operation and maintenance of main propulsion (gas turbine, diesel, or steam) and auxiliary machinery and systems, engineering and repair department equipment, and refrigeration systems; handling, stowing, and regulating expenditure of fuel oil and boiler feed water; installation, adjustment, testing maintenance, modification, and repair of shipboard electrical systems pertaining to power distribution, propulsion, steering, lighting, degaussing, interior communications, gyrocompass, and associated equipment, and instrument repair, adjustment, and calibration. An officer of the Naval Reserve who was appointed in the Naval Reserve Integration Program from enlisted status or whose permanent status is Warrant Officer or enlisted.

See Electricians on p. 37 in the appendix

See HVAC on p. 40 in the appendix

### **AE AVIATION ELECTRICIAN'S MATE (NAVY - ENLISTED)**

Maintains and repairs electrical, instrument and power systems on various aircraft; Duty assignments are designated as either O Level troubleshooting and replacing modular systems on aircraft or I Level disassembling, repairing and bench testing modules.

See Electricians on p. 37 in the appendix

### **EM ELECTRICIAN'S MATE (NAVY - ENLISTED)**

Electrician's Mates (EM) stand watch on generators, switchboards, control equipment, and electrical equipment; operate and perform organizational and intermediate maintenance on power and lighting circuits, electrical fixtures, motors, generators, voltage and frequency regulators, controllers, distribution switchboards and other electrical equipment; test for short circuits and grounds; and rebuild electrical equipment, including solid state circuitry elements.

See Electricians on p. 37 in the appendix

### **EMN ELECTRICIAN'S MATE (NUCLEAR) (NAVY - ENLISTED)**

Electrician's Mates (Nuclear) EM(NUC) stand watch on generators, switchboards, control equipment, electrical equipment and shutdown reactor plants; operate and perform organizational and intermediate maintenance on power and lighting circuits, electrical fixtures, motors, generators, voltage and frequency regulators, controllers, distribution switchboards, and other electrical equipment; test for short circuits, grounds or other casualties; and rebuild electrical equipment, including solid state circuitry elements in an electrical shop.

See Electricians on p. 37 in the appendix

### **UT UTILITIESMAN (NAVY - ENLISTED)**

Plans, supervises, and performs tasks involved in the installation, maintenance, and repair of plumbing, heating, steam, compressed air, fuel storage, and distribution systems, water treatment and distribution systems, air conditioning and refrigeration equipment, and sewage collection and disposal facilities.

See Plumbers, Pipefitters, and Steamfitters on p. 44 in the appendix

# CARPENTERS

## 2019 MEDIAN WAGE

**\$22.41 PER HOUR**

Entry-Level Education

High School Diploma or Equivalent

Typical On the Job Training Needed

Apprenticeship

Number of Jobs in Michigan, 2019

20,480

Real Time Job Growth Demand, Dec 2020

261

Forecasted Employment Growth through 2028

2.8%

## WHAT CARPENTERS DO

Carpenters are one of the most versatile construction occupations, with workers usually doing many different tasks. Residential carpenters typically specialize in new-home, townhome, and condominium building and remodeling. As part of a single job, they might build and set forms for footings, walls, and slabs, and frame and finish exterior walls, roofs, and decks. They also frame interior walls, build stairs, and install drywall, crown molding, doors, and cabinets. In addition, residential carpenters may tile floors and lay wood floors and carpet. Fully trained construction carpenters can easily switch from new home building to remodeling.

## WORK ENVIRONMENT

Because carpenters are involved in many types of construction, from building highways and bridges to installing kitchen cabinets, they work both indoors and outdoors. Carpenters may work in cramped spaces, with frequent lifting, standing, and kneeling. Those who work outdoors are subject to various weather conditions.

## KNOWLEDGE, SKILLS AND ABILITIES

**BUSINESS SKILLS** are needed by self-employed carpenters that will be used in bidding new jobs, tracking inventory, and planning work assignments.

**DETAIL ORIENTED** qualities are needed when making precise measurements, for example, reducing gaps between windows and frames, limiting any leaks around the window.

**MANUAL DEXTERITY** is needed for hand-eye coordination when using tools in order to avoid injury.

**MATH SKILLS** are used daily to calculate volume and measure materials to be cut.

**PHYSICAL STAMINA** is needed to lift heavy tools and materials while standing, climbing, or bending for long periods.

**PHYSICAL STRENGTH** is needed for lifting and holding heavy tools and materials.

**PROBLEM SOLVING SKILLS** come in handy as every construction job is different, so carpenters must adjust project plans accordingly.



# CARPET INSTALLERS

<b>2019 MEDIAN WAGE</b>	<b>\$18.30 PER HOUR</b>
Entry-Level Education	Less than High School
Typical On the Job Training Needed	Short-term on-the-job Training
Number of Jobs in Michigan, 2019	1,050
Real Time Job Growth Demand, Dec 2020	10
Forecasted Employment Growth through 2028	-2.1%

## WHAT CARPET INSTALLERS DO

This occupation is also referred to as floor covering installers. They mainly install, repair and replace floor-covering materials such as underlayment, carpet, vinyl, resilient tile and ceramic tile.

## WORK ENVIRONMENT

As one would guess, a floor cover installer spends a great deal of time bent over and on their knees. Depending on what materials they are installing, different tools will be used.

## KNOWLEDGE, SKILLS AND ABILITIES

A floor covering installer will need to be able to:

- Read and interpret drawings and specifications
- Inspect and prepare subfloors for covering
- Determine where to place any necessary seams or joints, and estimate the quantity of material required
- Measure and cut floor covering materials to fit around permanent obstructions
- Lay and tack down or glue a foam or rubber pad over floors to be carpeted
- Sew carpet seams together or use special heat tape to join carpet pieces
- Stretch carpet and fasten it with a tackless strip around perimeter of the room, or by gluing it to the floor
- Install vinyl flooring and resilient tiles by applying adhesive to the subfloor, laying the covering, and rolling it with a roller
- Install ceramic tiles
- Remove existing floor coverings and contaminants if necessary

You will need to be in good physical health, including good vision and spatial awareness. You will also need manual dexterity and motor coordination. Mathematical ability is a must, as are communication skills and interpersonal skills.

# ARCHITECTS

<b>2019 MEDIAN WAGE</b>	<b>\$36.80 PER HOUR</b>
Entry-Level Education	Bachelor's degree
Typical On the Job Training Needed	Internship/residency
Number of Jobs in Michigan, 2019	2,300
Real-time Job Growth Demand, Dec 2020	49
Forecasted Employment Growth through 2028	2.2%

## WHAT ARCHITECTS DO

Architects plan and design houses, office buildings and other structures.

## WORK ENVIRONMENT

Architects spend much of their time in offices, where they meet with clients, and consult with engineers and other architects. They also visit construction sites to review the progress of projects.

## KNOWLEDGE, SKILLS AND ABILITIES

**ANALYTICAL SKILLS** are a must to understand the content of designs and the context in which they were created. For example, architects must understand the locations of mechanical systems and how those systems affect building operations.

**COMMUNICATION SKILLS** are used by architects to share their ideas, both in oral presentations and in writing, with clients, other architects, and workers who help prepare drawings. Many also give presentations to explain their designs.

**CREATIVITY** is used by architects when designing houses, buildings, and other structures. Therefore, the final product should be attractive and functional.

**ORGANIZATIONAL SKILLS** are used by architects when managing contracts. Therefore, they must keep records related to the details of a project, including total cost, materials used, and progress.

**TECHNICAL SKILLS** are needed when using computer-aided design and drafting (CADD) technology to create plans as part of integrated building information modeling (BIM).

**VISUALIZATION SKILLS** are used by architects to see how the parts of a structure relate to each other. They also must be able to visualize how the overall building will look once completed.

# CEMENT MASONS AND CONCRETE FINISHERS

<b>2019 MEDIAN WAGE</b>	<b>\$23.11 PER HOUR</b>
Entry-Level Education	Less than High School
Typical On the Job Training Needed	Moderate-term on-the-job training
Number of Jobs in Michigan, 2019	5,270
Real-time Job Growth Demand, Dec 2020	32
Forecasted Employment Growth through 2028	6.2%

## WHAT CEMENT MASONS AND CONCRETE FINISHERS DO

Cement masons pour, smooth, and finish concrete floors, sidewalks, roads, and curbs. Using a cement mixture, terrazzo workers create durable and decorative surfaces for floors and stairways.

## WORK ENVIRONMENT

Concrete and terrazzo work is fast paced and strenuous and often involves kneeling, bending, and reaching. Because many jobs are outdoors, work generally stops in wet weather. Most work is full time.

## KNOWLEDGE, SKILLS AND ABILITIES

**COLOR VISION** is needed by terrazzo workers to determine small color variances when setting terrazzo patterns. Because these patterns often include many different colors, terrazzo workers must be able to distinguish between colors for the best looking finish.

**PHYSICAL STAMINA** is needed by cement masons and terrazzo workers. They must be able to spend a lot of time kneeling, bending and reaching.

**PHYSICAL STRENGTH** is needed by cement masons and terrazzo workers. They often must lift heavy materials. For example, many jobs require workers to be able to lift and carry 50 pound bags of gravel and sand.



# DRYWALL AND CEILING TILE INSTALLERS, AND TAPERS

<b>2019 MEDIAN WAGE</b>	<b>\$20.63 PER HOUR</b>
Entry-Level Education	Less than High School
Typical On the Job Training Needed	Moderate-Term on-the-job training
Number of Jobs in Michigan, 2019	1,250
Real Time Job Growth Demand, Dec 2020	39
Forecasted Employment Growth through 2028	-2.5%

## WHAT DRYWALL AND CEILING TILE INSTALLERS DO

Drywall and ceiling tile installers hang wallboards to walls and ceilings and install ceiling tile inside buildings. Tapers prepare the wallboards for painting, using tape and other materials. Many workers do both installing and taping.

## WORK ENVIRONMENT

Drywall and ceiling tile installers and tapers spend most of the day standing, bending, or stretching.

## KNOWLEDGE, SKILLS AND ABILITIES

**MATH SKILLS** are used by drywall and ceiling tile installers and tapers on every job. They must be able to estimate quantity of materials needed and measure accurately when cutting panels.

**PHYSICAL STAMINA** is needed as installers and tapers constantly lift and move heavy materials into place. Workers should be in good physical shape.

### PHYSICAL STRENGTH

is required since standard drywall sheets can weigh up to 50 to 100 pounds. Drywall and ceiling tile installers often must lift heavy panels over their heads to secure into the ceiling.



# ELECTRICIANS

<b>2019 MEDIAN WAGE</b>	<b>\$29.54 PER HOUR</b>
Entry-Level Education	High School Diploma or equivalent
Typical On the Job Training Needed	Apprenticeship
Number of Jobs in Michigan, 2019	22,380
Real Time Job Growth Demand, Dec 2020	260
Forecasted Employment Growth through 2028	5.5%

## WHAT ELECTRICIANS DO

Electricians install and maintain electrical power, communications, lighting, and control systems in homes, businesses, and factories.

Residential electricians install wiring and troubleshoot electrical problems in peoples' homes. Those who work in new-home construction install outlets and provide access to power where needed. Those who work in maintenance and remodeling typically repair and replace faulty equipment.

## WORK ENVIRONMENT

Electricians work indoors and outdoors, in nearly every type of facility. Almost all electricians work full time, which may include evenings and weekends.

## KNOWLEDGE, SKILLS AND ABILITIES

**BUSINESS SKILLS** are needed by self-employed electricians so they can bid on new jobs, track inventory, and plan payroll and work assignments.

**COLOR VISION** is a must as electricians identify wires by color.

**CRITICAL THINKING SKILLS** are used when electricians perform tests and use the results to diagnose problems. For example, if an outlet isn't working, they must use a multimeter to check the voltage, amperage, or resistance to determine the best course of action.

**CUSTOMER-SERVICE SKILLS** are needed as you deal with people on a regular basis. As a result, electricians should be friendly and be able to address the customers' questions.

**TROUBLESHOOTING SKILLS** are used by electricians daily. They find, diagnose, and repair problems. For example, if a motor stops working, they perform tests to determine the cause and failure and then, depending on the results, fix or replace the motor.

# COST ESTIMATOR

## 2019 MEDIAN WAGE

**\$29.53 PER HOUR**

Entry-Level Education

Bachelor's Degree

Typical On the Job Training Needed

Moderate-term on-the-job training

Number of Jobs in Michigan, 2019

6,910

Real Time Job Growth Demand, Dec 2020

150

Forecasted Employment Growth through 2028

3.6%

## WHAT COST ESTIMATORS DO

Estimators analyze costs and prepare estimates on residential construction projects. They are typically employed by homebuilders, suppliers and contractors. Possible career path options include senior management, supervisory positions and inspectors.

## WORK ENVIRONMENT

An estimator spends most of his/her time reading and interpreting working drawings for new home construction. They prepare, update and maintain job specifications. They calculate quantities of building materials required to complete the job. They set up cost monitoring and reporting systems and procedures. They need to be able to prepare cost statements at regular intervals.

## KNOWLEDGE, SKILLS AND ABILITIES

- Numerical and analytical ability
- Knowledge of computers/spreadsheets
- Knowledge of drafting
- Complete understanding of construction procedures
- Organizational skills
- Negotiation skills
- Communication skills
- Interpersonal skills

# GLAZIERS

<b>2019 MEDIAN WAGE</b>	<b>\$21.36 PER HOUR</b>
Entry-Level Education	High School Diploma or equivalent
Typical On the Job Training Needed	Apprenticeship
Number of Jobs in Michigan, 2019	1,520
Real Time Job Growth Demand, Dec 2020	37
Forecasted Employment Growth through 2028	6.0%

## WHAT GLAZIERS DO

Glaziers install windows, skylights, and other glass products in storefronts and buildings. In homes, glaziers install or replace windows, mirrors, shower doors, and bathtub enclosures. They fit glass for tabletops and display cases.

## WORK ENVIRONMENT

As in many other construction trades, the work is physically demanding.

## KNOWLEDGE, SKILLS AND ABILITIES

**BALANCE** is needed to minimize the risk of falling, glaziers need a good sense of balance while working on ladders and scaffolding.

**HAND-EYE COORDINATION** is a must. Glass must be precisely cut. As a result, a steady hand is needed to achieve a cut of the correct size and shape.

**PHYSICAL STAMINA** is needed as glaziers must be on their feet and move heavy pieces of glass most of the day. They need to be able to hold glass in place until it can be fully secured.

**PHYSICAL STRENGTH** helps when glaziers have to lift heavy pieces of glass for hanging.

# HEATING, AIR CONDITIONING, AND REFRIGERATION MECHANICS AND INSTALLERS

<b>2019 MEDIAN WAGE</b>	<b>\$22.85 PER HOUR</b>
Entry-Level Education	Postsecondary non-degree award
Typical On the Job Training Needed	Long-term on-the-job training
Number of Jobs in Michigan, 2019	9,010
Real Time Job Growth Demand, Dec 2020	284
Forecasted Employment Growth through 2028	8.0%

## WHAT HVAC INSTALLERS DO

Heating, air conditioning, and refrigeration mechanics and installers – often called HVACR technicians – work on heating, ventilation, cooling and refrigeration systems that control the temperature and air quality in buildings.

## WORK ENVIRONMENT

HVACR technicians work in residential homes, schools, hospitals, office buildings, or factories. Their worksite may be very hot or cold because the heating and cooling systems they must repair may not be working, and because some parts of these systems are located outdoors. Irregular hours and working in cramped spaces are common.

## KNOWLEDGE, SKILLS AND ABILITIES

Candidates familiar with computers and electronics and those with good troubleshooting skills will have the best job opportunities as employers continue to have difficulty finding qualified technicians to work on complex new systems.





# CONSTRUCTION LABORERS

<b>2019 MEDIAN WAGE</b>	<b>\$18.53 PER HOUR</b>
Entry-Level Education	Less than High School
Typical On the Job Training Needed	Short-term on-the-job training
Number of Jobs in Michigan, 2019	24,730
Real Time Job Growth Demand, Dec 2020	510
Forecasted Employment Growth through 2028	4.8%

## WHAT CONSTRUCTION LABORERS DO

Construction laborers and helpers perform many basic tasks that require physical labor on construction sites.

Construction laborers perform a variety of construction related activities during all phases of construction. However, the main task laborers perform is preparing and cleaning up construction sites. Although most laborers are generalists – such as those who install barricades, cones, and markers to control traffic patterns – many others specialize. Construction laborers use a variety of tools and equipment.

Helpers assist construction craft workers, such as electricians and carpenters, with a variety of tasks. They may carry tools and materials or help set up equipment.

## WORK ENVIRONMENT

Most construction laborers and helpers do physically demanding work. Some work at great heights or outdoors in all weather conditions. They must use earplugs around load equipment and wear gloves, safety glasses, and other protective gear.

## KNOWLEDGE, SKILLS AND ABILITIES

**COLOR VISION** is needed as laborers and helpers may need to be able to distinguish colors to do the job.

**MATH SKILLS** are used by laborers and some helpers to perform basic math calculations to do their job. They often help with measuring on jobsites or they may be part of a surveying crew.

**MECHANICAL SKILLS** are needed as laborers frequently are required to operate and maintain equipment, such as jackhammers.

**PHYSICAL STAMINA** helps when laborers and helpers perform strenuous tasks throughout the day.

**PHYSICAL STRENGTH** is needed when laborers and helpers lift heavy materials or equipment.

# CONSTRUCTION MANAGERS

## 2019 MEDIAN WAGE

**\$46.48 PER HOUR**

Entry-Level Education

Bachelor's Degree

Typical On the Job Training Needed

Moderate-term on-the job training

Number of Jobs in Michigan, 2019

5,090

Real Time Job Growth Demand, Dec 2020

299

Forecasted Employment Growth through 2028

2.7%

## WHAT CONSTRUCTION MANAGERS DO

Construction managers manage the activities or residential construction projects from start to finish. They are usually employed by medium to large homebuilders.

### THEIR RESPONSIBILITIES COULD INCLUDE:

- Providing advice to senior management
- Making sure the home is built within budget and on schedule
- Encouraging and motivating employees, subcontractors and suppliers
- Cultivating good customer service relations
- Complying with all government regulations related to home building
- Managing relationships with other builders operating in the same subdivision
- Regularly comparing actual costs to projected costs
- Establishing working relationships with suppliers
- Preparing progress reports and issuing progress schedules to clients

## WORK ENVIRONMENT

Many construction managers work from a main office, but most work out of a field office at the construction site, where they monitor the project and make daily decisions about construction activities. For those managing multiple projects, frequent travel between sites is required.

## KNOWLEDGE, SKILLS AND ABILITIES

- Familiar with all home building trades
- Ability to plan, schedule and organize
- Ability to motivate and lead staff
- Ability to work within timelines
- Problem solving skills
- Communication skills

# PAINTERS, CONSTRUCTION, AND MAINTENANCE

<b>2019 MEDIAN WAGE</b>	<b>\$18.25 PER HOUR</b>
Entry-Level Education	Less than High School
Typical On the Job Training Needed	Moderate-term on-the-job training
Number of Jobs in Michigan, 2019	4,560
Real Time Job Growth Demand, Dec 2020	140
Forecasted Employment Growth through 2028	-0.7%

## WHAT PAINTERS, CONSTRUCTION, & MAINTENANCE WORKERS DO

Painters do more than paint. Before they even pick up a paint brush they have to typically do the following:

- Cover floors and furniture with drop cloths and tarps to protect surfaces
- Remove fixtures such as pictures, doorknobs, or electrical switch covers
- Put up scaffolding and set up ladders
- Fill holes and cracks with putty, plaster, or other compounds
- Calculate the area to be painted and determine the amount of paint needed
- Apply primers or sealers for desired color and appearance
- Apply paint or other finishes, using hand brushes, rollers or sprayers

## WORK ENVIRONMENT

Painting requires a lot of climbing, bending, kneeling, and stretching.

## KNOWLEDGE, SKILLS AND ABILITIES

**COLOR VISION** is needed so painters can identify and differentiate between subtle differences in color of paints.

**CUSTOMER-SERVICE SKILLS** are an important skill for workers who paint the inside and outside of residential homes. In those situations they often interact with clients. They must communicate with the client, listen to what the client wants, and select colors and application techniques that satisfy the client.

**ATTENTION TO DETAIL** is needed by painters when creating or painting edges, because minor flaws can be noticeable.

**PHYSICAL STAMINA** allows painters to stay physically active for many hours, because they spend most of the day standing with their arms extended.

# PLUMBERS, PIPEFITTERS AND STEAMFITTERS

<b>2019 MEDIAN WAGE</b>	<b>\$31.61 PER HOUR</b>
Entry-Level Education	High School Diploma or equivalent
Typical On the Job Training Needed	Apprenticeship
Number of Jobs in Michigan, 2019	12,180
Real Time Job Growth Demand, Dec 2020	141
Forecasted Employment Growth through 2028	7.4%

## WHAT PLUMBERS, PIPEFITTERS, AND STEAMFITTERS DO

Plumbers, pipefitters, and steamfitters install and repair pipes that carry liquids or gases into and out of businesses, homes and factories. They install pipes and fixtures, study blueprints and follow state and local building codes, determine the amount of material and type of equipment needed, inspect and test installed pipe systems and pipelines, troubleshoot systems that are not working and replace worn parts.

## WORK ENVIRONMENT

Plumbers, pipefitters, and steamfitters work where there are pipes or septic systems. They often must lift heavy materials, climb ladders, and work in tight spaces. Some plumbers travel to a variety of worksites every day. A few work outdoors, even in bad weather.

## KNOWLEDGE, SKILLS AND ABILITIES

Business skills are used by plumbers who own their own business. They must be able to direct workers, bid on jobs, and plan work schedules.

Customer-service skills are needed when working with customers on a regular basis, so they should be polite and courteous.

Mechanical skills are used by plumbers, pipefitters, and steamfitters. They use a variety of tools to assemble and repair pipe systems. Choosing the right tool and successfully installing, repairing, or maintaining a system is crucial to their work.

Physical strength is needed by plumbers, pipefitters, and steamfitters. They need to be strong enough to lift and move heavy pipe.

Troubleshooting skills are needed by plumbers, pipefitters, and steamfitters to find, diagnose, and repair problems. For example, pipefitters must be able to perform pressure tests to pinpoint the location of a leak.

# EXCAVATING & LOADING MACHINE & DRAGLINE OPERATORS

## 2019 MEDIAN WAGE

\$20.38 PER HOUR

Entry-Level Education

High School Diploma or equivalent

Typical On the Job Training Needed

Moderate-term on-the-job training

Number of Jobs in Michigan, 2019

1,350

Real Time Job Growth Demand, Dec 2020

8

Forecasted Employment Growth through 2028

3.5%

## WHAT MACHINE OPERATORS DO

Construction equipment operators drive, maneuver, or control the heavy machinery used to construct roads, bridges, buildings and other structures.

## WORK ENVIRONMENT

Construction equipment operators work in nearly every weather condition. Some operators work in remote locations on large construction projects, such as highways and dams, or in factories or mines.

## KNOWLEDGE, SKILLS AND ABILITIES

**HAND-EYE-FOOT COORDINATION** is needed. Workers should have steady hands and feet to guide and control heavy machinery precisely, sometimes in tight spaces.

**MECHANICAL SKILLS** will be used by construction equipment operators to perform basic maintenance on the equipment they operate. As a result, they should be familiar with hand and power tools and standard equipment care.



# ROOFERS

<b>2019 MEDIAN WAGE</b>	<b>\$20.35 PER HOUR</b>
Entry-Level Education	Less than High School
Typical On the Job Training Needed	Moderate-term on-the-job training
Number of Jobs in Michigan, 2019	2,790
Real Time Job Growth Demand, Dec 2020	84
Forecasted Employment Growth through 2028	6.0%

## WHAT ROOFERS DO

Roofers typically do the following:

- Inspect problem roofs to determine the best way to repair them
- Measure roof to calculate the quantities of materials needed
- Replace damaged or rotting joists or plywood
- Install vapor barriers or layers of insulation
- Install shingles, asphalt, metal, or other materials to make the roof watertight
- Align roofing materials to fit around walls or vents
- Cover exposed nail or screw heads with roofing cement or caulk to prevent leakage

## WORK ENVIRONMENT

Roofing work can be hot and physically demanding. It involves heavy lifting, as well as climbing, bending, and kneeling. Roofers work outdoors in all types of weather, particularly when making repairs. However, they rarely install roofs when it rains or when it is very cold.

## KNOWLEDGE, SKILLS AND ABILITIES

**BALANCE** is required as roofing is often done on steep slopes at significant heights. Good balance is required to avoid falling.

**PHYSICAL STAMINA** allows roofers to have the endurance to perform strenuous duties throughout the day. They may spend hours on their feet, bending and stooping, often in hot temperatures, with few breaks.

**PHYSICAL STRENGTH** is needed to lift and carry heavy materials. Bundles of shingles can weigh 60 pounds or more.

# INSULATION WORKERS - FLOOR, CEILING AND WALL

<b>2019 MEDIAN WAGE</b>	<b>\$24.50 PER HOUR</b>
Entry-Level Education	Less than High School
Typical On the Job Training Needed	Apprenticeship
Number of Jobs in Michigan, 2019	570
Real Time Job Growth Demand, Dec 2020	15
Forecasted Employment Growth through 2028	4.0%

## WHAT INSULATION WORKERS DO

Insulation workers install and replace the materials used to insulate buildings to help control and maintain the temperatures in the building.

## WORK ENVIRONMENT

Insulation workers generally work indoors in residential and industrial settings. They spend most of their workday standing, bending, or kneeling, often in confined spaces.

## KNOWLEDGE, SKILLS AND ABILITIES

**DEXTERITY** is needed so you can work in confined spaces while maintaining coordination and control of tools and materials. You often reach above your head to fit and fasten insulation in place.

**MECHANICAL SKILLS** are needed while using a variety of hand and power tools to install insulation. Those who apply foam insulation, for example, must be able to operate a compressor and sprayer to spread the foam onto walls or across attics.

**PHYSICAL STAMINA** is needed while you are spending most of the day standing, stretching, and bending. Workers should be able to stay physically active without getting tired.

# CONSTRUCTION AND BUILDING INSPECTOR

## 2019 MEDIAN WAGE

**\$26.53 PER HOUR**

Entry-Level Education

High School Diploma or equivalent

Typical On the Job Training Needed

Moderate-term on-the-job training

Number of Jobs in Michigan, 2019

2,980

Real Time Job Growth Demand, Dec 2020

71

Forecasted Employment Growth through 2028

-1.1%

## WHAT CONSTRUCTION AND BUILDING INSPECTORS DO

Construction and building inspectors ensure that construction meets local and state building codes and ordinances, zoning regulations, and contract specifications.

## WORK ENVIRONMENT

Construction and building inspectors spend considerable time inspecting worksites, alone or as part of a team. Some inspectors may have to climb ladders or crawl in tight spaces. Most work full time during regular business hours.

## KNOWLEDGE, SKILLS AND ABILITIES

**COMMUNICATION SKILLS** are needed in order to explain any problems they find and to help the people understand what is needed to fix the problems.

**CRAFT EXPERIENCE**, although not required, is helpful to have in a related construction occupation. It provides inspectors with the necessary background that may help them to become certified to work in the field.

**ATTENTION TO DETAILS** is needed as inspectors must thoroughly examine many different construction activities, often at the same time. Therefore, inspectors must pay close attention to detail so as to not overlook any items that need to be checked.

**MECHANICAL KNOWLEDGE** is needed when inspectors are using a variety of testing equipment as they check complex systems.

**PHYSICAL STAMINA** is needed as inspectors are constantly on their feet and often must crawl through attics and other tight spaces.