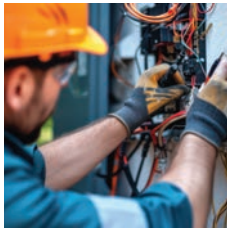
VETERANS GUIDEBOOK TO

RESIDENTIAL BUILDING

Open the Door to Your Future and Build Something Great






DAWN CRANDALL

SkilledToBuild
MICHIGAN FOUNDATION

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

ACKNOWLEDGMENTS

A need created a vision which led to the creation of this book. Several groups and individuals need to be recognized for their support—without them, this idea would not have become the reality it is today.

The organizations listed below were generous in their financial support:

Home Builders Association Foundation

HBA Charitable & Educational Foundation

Michigan Propane Gas Association

I would be remiss if I didn't recognize the Department of Military and Veterans Affairs for their technical guidance and support to make sure the information we included was accurate.

And finally, many thanks go to Ariana Dawes and Elizabeth Yassick at the HBA of Michigan for their time in assisting with editing and graphic design. Their time in the conceptual stage laid the foundation for this book to go to the next level of working with the Jenkins Group to complete the vision.

As the data provided is a snapshot in time, we invite you to visit www.skilledtobuildmichigan.com for updates.

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HOME BUILDERS WANT YOU TO JOIN THE RESIDENTIAL CONSTRUCTION INDUSTRY

Dear Friend,

You served honorably in the military, and your sacrifice for our country is noticed and appreciated. You defended the American Dream, and now we invite you to join another honorable profession as a builder.

Your skills obtained in the military can easily transfer from defending the American Dream to building it.

Skilled to Build Michigan Foundation created this guidebook with you in mind. It looks at jobs in each branch of the military that complement the trades, and then refers you to the specific trade in the back of the book you might want to explore.

It is our mission to cultivate future employees and educate them about the opportunities in the residential construction industry. Not only do we cultivate and educate, but we also recruit. We have more than 300 employers who want to connect with a veteran and provide them with a career in the residential construction industry.

Skilled trades in the residential building industry aren't the jobs 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 and growing.

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 (HBAM) are feeling the direct impact of the labor shortage. As the number of 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. According to the Bureau of Labor Market Information and Strategic Initiatives, nearly 75% of military employment is concentrated in five military occupational categories:

- Transportation, Engineering, Science, and Technical
- Combat Specialty
- Vehicle and Machinery Mechanic
- Electronic and Electrical Equipment and Repair
- Health Care

The skills learned in combat specialty transfer to the construction industry as a Construction Laborer. Those trained as a Vehicle and Machinery Mechanic have skills that are a natural fit for 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, the ability to learn new skills, professionalism, character, respect for procedures and accountability, resiliency, first-class image, global perspective, and dependability.

The Need for Skilled Labor

To solve the housing crisis, we first need to take a hard look at the workforce in residential construction. The industry lost a

generation in the trades during the housing downturn. From workers in the trades leaving the state and relocating to where building was taking place, to construction trades programs being eliminated, it all added up to a labor shortage.

They say a picture is worth a thousand words. It is our hope that the graphic below shows you the opportunities, and need, available to you TODAY in residential construction. With a majority of licensed builders at, or near, retirement age, it is imperative that we build the next generation of skilled laborers to keep the American Dream alive and attainable.

LICENSED BUILDER AGE DATA

TOTAL MICHIGAN BUILDERS

AGE RANGE	NUMBER OF BUILDERS IN RANGE
18-25	469
26-34	1,920
35-45	6,841
46-55	9,390
56-65	12,394
66+	11,192

AVERAGE AGE: 56.42 MEDIAN AGE: 58

According to the U.S. Department of Veterans Affairs, there will be roughly 48,492 veterans under the age of 40 who will be residing in the state of Michigan by September 2025. They are also projecting for the same timeframe, 151,342 veterans ages 40-64 will be residing in the state of Michigan. When you compare those numbers to the age of licensed builders in the state of Michigan, you can see the immediate demand needed for individuals in skilled trades.

Barriers Removed for Returning Veterans

The Michigan Legislature has made great strides in removing barriers for you to enter the skilled trades as a returning veteran. From 2012 through 2015, nine bills were signed into law to assist our veterans who want to enter the trades.

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

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

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

P.A. 167 of 2013 allows for 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 for 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.

Not only do these public acts remove barriers for veterans to enter the trades, but they create the perfect opportunity for veterans to thrive in the building industry.

Build Something Great Guide

Skilled to Build Michigan Foundation is the nonprofit arm of the Home Builders Association of Michigan. This guidebook has been developed to create awareness among the veteran community of the careers waiting for you. Information on this program can be found by going to the Veterans section at **www.skilledtobuildmichigan.com**.

We have designed this guidebook in a way for you, as a veteran, to connect to your world. This guidebook is arranged in order by Military Occupational Code (MOC), and it refers you to the specific trade in the appendix. The branches of the 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. Even if you cannot find a particular trade you're interested in, we still highly encourage you to look at the other professional trades in this guidebook. Chances are you have the skills we are looking for. Currently, we have more than 300 employers from around the state of Michigan who would hire a veteran.

If after taking a look at this guidebook you decide to enter the residential construction industry, please send your resume with a cover letter to Dawn Crandall at **skilledtobuildmichigan@gmail.com** and you will receive a list of employers interested in hiring a veteran, along with our monthly "I'm Hiring" guide.

Training Alternatives

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 and 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 HBA of Michigan's website at **www.hbaofmichigan.com/licensing**.

The 60 hours of approved pre-licensure courses must include at least six (6) hours in each subject below:

- Business Management, Estimating, and Job Costing
- Design and Building Science
- Contracts, Liability, and Risk Management
- Marketing and Sales
- Project Management and Scheduling
- The Michigan Residential Code
- MIOSHA Construction Safety Standards

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

Skilled Trade Occupation Job Profiles

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. It also shows the most recent wage data available as well as the projected employment growth through 2030. In each profile, education and training requirements are identified. Statistical data in this guide has been provided by the State of Michigan.

In today's changing economy, employers are looking for an employee who has the education, knowledge, skills, and ability to excel at their job. Those who possess educational AND technical skills will have a competitive advantage.

The HBA of Michigan released a report in 2017 titled "Where Will Ten Million Michiganders Live?" The report provides three possible solutions to encourage homebuilding in Michigan. One of those cornerstones is building the workforce of tomorrow, today.

Where the Data Comes From

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 as well as to the Department of Military and Veteran Affairs. This project would not have been accomplished without 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 HVAC Mechanics and Installers on p. 67

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 HVAC Mechanics and Installers on p. 67

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 HVAC Mechanics and Installers on p. 67

3E191 Heating, Ventilation, Air Conditioning, and 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 HVAC Mechanics and Installers on p. 67

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 HVAC Mechanics and Installers on p. 67

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 HVAC Mechanics and Installers on p. 67

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 HVAC Mechanics and Installers on p. 67

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 HVAC Mechanics and Installers on p. 67

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 HVAC Mechanics and Installers on p. 67

65W3 Cost Analysis – (Commissioned Officer)

Provides 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 Estimators on p. 64

65W4 Cost Analysis – (Commissioned Officer)

Provides 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 Estimators on p. 64

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 its 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 Architects on p. 58

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 its 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 Estimators on p. 64
See Construction Managers on p. 70

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 its 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 Architects on p. 58
See Cost Estimators on p. 64
See Construction Managers on p. 70

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 its 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 Estimators on p. 64
See Construction Managers on p. 70

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 Estimators on p. 64

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 Estimators on p. 64

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 Estimators on p. 64

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 Estimators on p. 64

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 Estimators on p. 64

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 Estimators on p. 64

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 Estimators on p. 64

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 Estimators on p. 64

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, and fire alarms and intrusion detection systems. Complies with environmental and safety regulations and practices.

See Electricians on p. 62

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, and fire alarms and intrusion detection systems. Complies with environmental and safety regulations and practices.

See Electricians on p. 62

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, and fire alarms and intrusion detection systems. Complies with environmental and safety regulations and practices.

See Electricians on p. 62

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, and fire alarms and intrusion detection systems. Complies with environmental and safety regulations and practices.

See Electricians on p. 62

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 and Loading Machine and Dragline Operators on p. 75
See Cement Masons and Concrete Finishers on p. 60

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 and Loading Machine and Dragline Operators on p. 75
See Cement Masons and Concrete Finishers on p. 60

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 and Loading Machine and Dragline Operators on p. 75
See Cement Masons and Concrete Finishers on p. 60

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 and Loading Machine and Dragline Operators on p. 75
See Cement Masons and Concrete Finishers on p. 60

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 Estimators on p. 64

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 Estimators on p. 64

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 Estimators on p. 64

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 Estimators on p. 64

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 Electricians on p. 62

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 Electricians on p. 62

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 Electricians on p. 62

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 Electricians on p. 62

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, back-hoes, and dump trucks. Operates tractor-trailer combinations, transporting construction equipment, and materials. Ensures compliance with all safety and environmental regulations.

See Cement Masons and Concrete Finishers on p. 60
See Excavating and Loading Machine and Dragline Operators on p. 75

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 Masons and Concrete Finishers on p. 60
See Excavating and Loading Machine and Dragline Operators on p. 75

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 Masons and Concrete Finishers on p. 60
See Excavating and Loading Machine and Dragline Operators on p. 75

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 Masons and Concrete Finishers on p. 60
See Excavating and Loading Machine and Dragline Operators on p. 75

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. 73

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. 73

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. 73

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. 73

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 Managers on p. 70

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 Managers on p. 70

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 Estimators on p. 64

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 Estimators on p. 64

56631 Utilities Systems Specialist (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. 73

56651 Utilities Systems Specialist (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. 73

56671 Utilities Systems Specialist (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. 73

56691 Utilities Systems Specialist (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. 73

ARMY

12 A Engineer Officer (Army – Enlisted)
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. 68

12 T Technical Engineer (Army – Enlisted)
Supervises or participates in construction site development in areas such as technical investigation, surveys, drafts, and construction plans/specifications. Conducts land surveys, makes maps, and prepares detailed plans for construction projects.

See Cost Estimators on p. 64

12 Y Geospatial Engineer (Army – Enlisted)
Responsible for using geographic data that supports military/civilian operations for Disaster Relief and Homeland Security. Collects, analyzes, and distributes geospatial information to represent the terrain and its potential effects.

See Cost Estimators on p. 64

12 W Carpentry and Masonry Specialist (Army – Enlisted)
Responsible for general heavy carpentry and masonry duties.

See Cement Masons and Concrete Finishers on p. 60
See Carpenters on p. 54
See Drywall and Ceiling Installers on p. 61
See Construction Laborers on p. 68
See Glaziers on p. 66
See Insulation Workers on p. 79
See Roofers on p. 77
See Painters and Construction and Maintenance Workers on p. 71

12 V Concrete and Asphalt Equipment Operator (Army – Enlisted)

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 and Loading Machine and Dragline Operators on p. 75
See Cement Masons and Concrete Finishers on p. 60

12 N Horizontal Construction Engineer (Army – Enlisted)

Uses bulldozers, cranes, graders, and other heavy equipment to move tons of earth and material to complete construction projects for the Army. Also responsible for operating tractors with dozer attachments, scoop loaders, backhoe loaders, hydraulic excavators, motorized graders, and scrapers.

See Excavating and Loading Machine and Dragline Operators on p. 75

12 G Quarry Specialist (Army – Enlisted)

Helps construct airfields, roads, dams, and buildings by moving tons of earth/materials with heavy types of machinery. Operates powered machines that are used in cleaning, crushing, drilling, grading, and detonating rock at construction sites.

See Excavating and Loading Machine and Dragline Operators on p. 75

12 Q Power Distribution Specialist (Army – Enlisted)

Primarily responsible for the electrical distribution system in the Army.

See Electricians on p. 62

12 R Interior Electrician (Army – Enlisted)

Primarily responsible for installation and maintenance of the Army's interior electrical systems.

See Electricians on p. 62

91 C Utilities Equipment Repairer (Army – Enlisted)

Responsible for supervising and performing maintenance on utilities equipment and special purpose support systems.

See Electricians on p. 62

12 K Army Plumber and Pipefitter (Army – Enlisted)

Responsible for installing and repairing plumbing and pipe systems.

See Plumbers, Pipefitters, and Steamfitters on p. 73

92W Water Treatment Specialist (Army – Enlisted)

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. Also inspects 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. 73

51B Carpenter (Army – Enlisted)

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

See Cement Masons and Concrete Finishers on p. 60
See Drywall and Ceiling Installers on p. 61
See Construction Laborers on p. 68
See Glaziers on p. 66
See Insulation Workers on p. 79
See Roofers on p. 77
See Painters and Construction and Maintenance Workers on p. 71

COAST GUARD

AE Aviation Electrician's 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; 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 Electricians on p. 62

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 Electricians on p. 62

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 Laborers on p. 68

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. 70

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 to this MOS are taught carpentry skills and how to employ demolitions and military explosives.

See Construction Laborers on p. 68
See Carpenters on p. 54

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 Estimators on p. 64

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 the authority to enter into, administer, or terminate contracts and make related determinations and findings. 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 an FMOS.

See Cost Estimators on p. 64
See Construction Managers on p. 70

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 earth moving, grading, excavation, logging, clearing, and landing operations.

See Excavating and Loading Machine and Dragline Operators on p. 75

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; recovery and recycling of specified gases or fluids into systems; dismantling and testing malfunctioning systems; and repairing systems. 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 Mechanics and Installers on p. 67

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. 62

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. 62

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 and load banks. On humanitarian assistance and civil military operations, they install and repair interior wiring in buildings.

See Electricians on p. 62

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. 62
See HVAC Mechanics and Installers on p. 67

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 Occupational Field 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. 70
See Electricians on p. 62
See HVAC Mechanics and Installers on p. 67
See Plumbers, Pipefitters, and Steamfitters on p. 73

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 are also planned, coordinated, and supervised.

See Construction Managers on p. 70
See Electricians on p. 62
See HVAC Mechanics and Installers on p. 67
See Plumbers, Pipefitters, and Steamfitters on p. 73

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. 73

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 and Loading Machine and Dragline Operators on p. 75

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. 70
See Electricians on p. 62

EA Engineering Aid (Navy – Enlisted)

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

See Cost Estimators on p. 64

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. 58

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. 58

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. 58

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 Full-Time Support (FTS) Program (includes officers of the FTS Program rotated to other than FTS billets).

See Architects on p. 58

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. 70

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. 70

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. 70

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. Help plan, coordinate, and direct the technical, operational, training, and administrative responsibilities of Naval Construction Force units, along with assisting 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 Full-Time Support (FTS) Program (includes officers of the FTS Program rotated to other than FTS billets).

See Construction Managers on p. 70

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 repairing 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. 62
See HVAC Mechanics and Installers on p. 67

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 repairing 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. 62
See HVAC Mechanics and Installers on p. 67

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 repairing 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. 62
See HVAC Mechanics and Installers on p. 67

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 repairing 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. 62
See HVAC Mechanics and Installers on p. 67

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 repairing 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 (Full-Time Support) Program (includes officers of the FTS Program rotated to other than FTS billets).

See Electricians on p. 62
See HVAC Mechanics and Installers on p. 67

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 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 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. 62
See HVAC Mechanics and Installers on p. 67

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. 62

EM Electrician's Mate (Navy – Enlisted)

An electrician's mate (EM) stands watch on generators, switchboards, control equipment, and electrical equipment; operates and performs organizational and intermediate maintenance on power and lighting circuits, electrical fixtures, motors, generators, voltage and frequency regulators, controllers, distribution switchboards, and other electrical equipment; tests for short circuits and grounds; and rebuilds electrical equipment, including solid state circuitry elements.

See Electricians on p. 62

EMN Electrician's Mate (Nuclear) (Navy – Enlisted)

An electrician's mates (nuclear) – EM(NUC) – stands watch on generators, switchboards, control equipment, electrical equipment, and shutdown reactor plants; operates and performs organizational and intermediate maintenance on power and lighting circuits, electrical fixtures, motors, generators, voltage and frequency regulators, controllers, distribution switchboards, and other electrical equipment; tests for short circuits, grounds, or other casualties; and rebuilds electrical equipment, including solid state circuitry elements in an electrical shop.

See Electricians on p. 62

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. 73

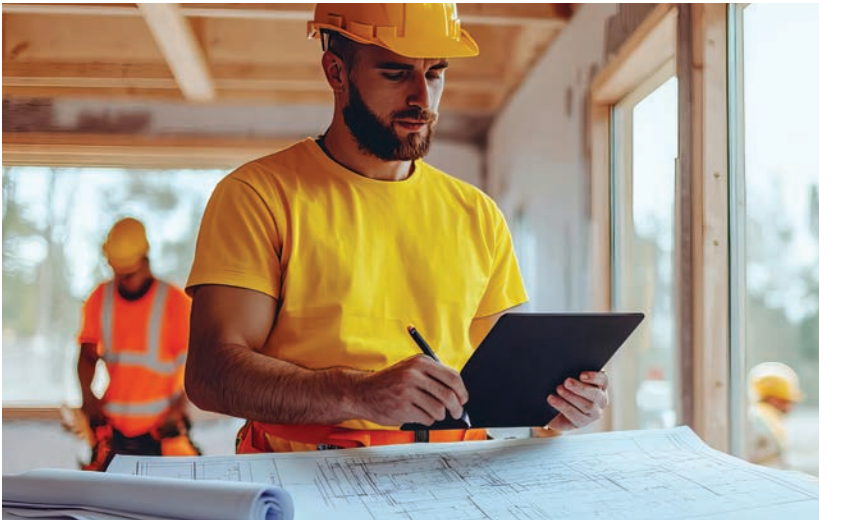
SKILLED TRADE OCCUPATION APPENDIX

CARPENTERS

2023 Average Wage	**$27.79 Per Hour**
Entry-Level Education	High School Diploma or Equivalent
Typical On-the-Job Training Needed	Apprenticeship
Number of Jobs in Michigan, 2023	21,400
Job Growth (2020-2030)	440
Forecasted Employment Growth Through 2030	1.9%

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 for new jobs, tracking inventory, and planning work assignments.

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

MANUAL DEXTERITY is needed for coordination when using tools 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.

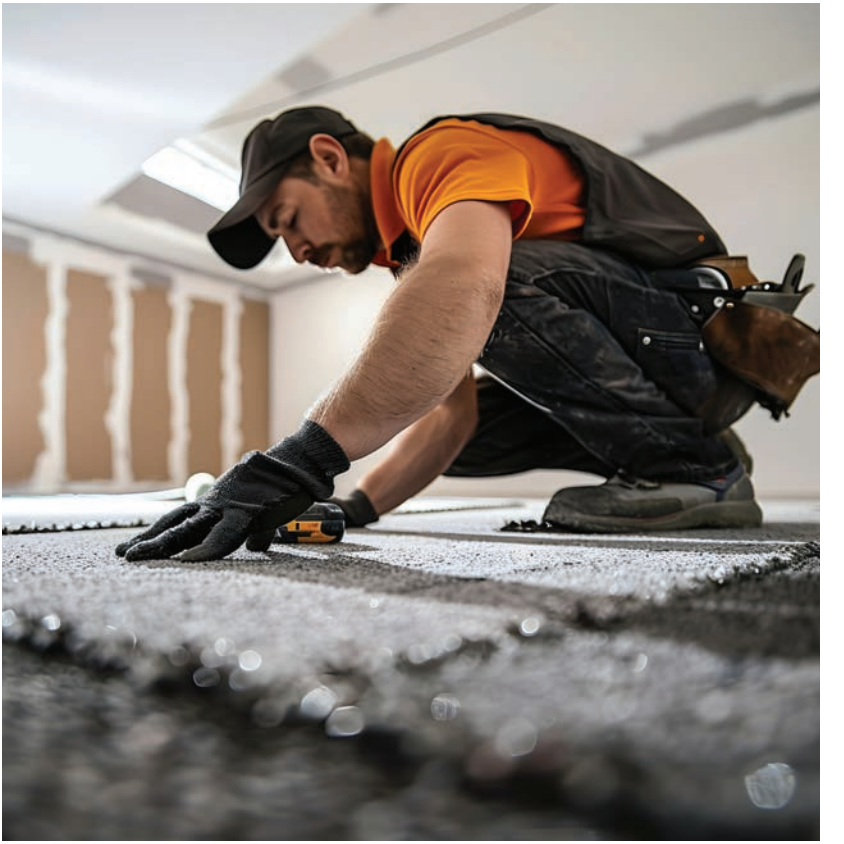
PROBLEM-SOLVING SKILLS come in handy as every construction job is different, so carpenters must adjust project plans accordingly.

CARPET INSTALLERS

2023 Average Wage	**$25.06 Per Hour**
Entry-Level Education	Less than High School
Typical On-the-Job Training Needed	Short-Term On-the-Job Training
Number of Jobs in Michigan, 2023	290
Job Growth (2020-2030)	-70
Forecasted Employment Growth Through 2030	-6.1%

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 covering installer spends a great deal of time kneeling and bending. Depending on what materials they are installing, different tools will be used.

Knowledge, Skills, and Abilities

ATTENTION TO DETAIL is critical for reading and interpreting drawings, preparing subfloors, and ensuring precise placement of seams and joints.

MEASUREMENT AND MATH SKILLS are required to calculate material quantities, measure and cut floor coverings, and ensure accurate installations.

MANUAL DEXTERITY is essential for sewing carpet seams, joining pieces with heat tape, and handling tools safely and effectively.

PHYSICAL STAMINA is necessary for prolonged periods of bending, kneeling, and lifting heavy materials during installations.

TECHNICAL SKILLS include laying and securing padding, stretching and fastening carpets, and installing vinyl, tile, and ceramic flooring.

PROBLEM-SOLVING SKILLS are useful for adapting to different installation challenges, removing old flooring, and resolving on-site issues.

You will need to be in good physical health and have 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

2023 Average Wage	**$43.21 Per Hour**
Entry-Level Education	Bachelor's Degree
Typical On-the-Job Training Needed	Internship/Residency
Number of Jobs in Michigan, 2023	3,060
Job Growth (2020-2030)	190
Forecasted Employment Growth Through 2030	6.8%

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.

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

2023 Average Wage	**$26.17 Per Hour**
Entry-Level Education	Less than High School
Typical On-the-Job Training Needed	Moderate-Term On-the-Job Training
Number of Jobs in Michigan, 2023	5,360
Job Growth (2020-2030)	130
Forecasted Employment Growth Through 2030	2.9%

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 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

2023 Average Wage	**$23.61 Per Hour**
Entry-Level Education	Less than High School
Typical On-the-Job Training Needed	Moderate-Term On-the-Job Training
Number of Jobs in Michigan, 2023	870
Job Growth (2020-2030)	130
Forecasted Employment Growth Through 2030	8%

What Drywall and Ceiling Tile Installers and Tapers 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 the 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 50 to 100 pounds. Drywall and ceiling tile installers often must lift heavy panels over their heads to secure into the ceiling.

ELECTRICIANS

2023 Average Wage	**$31.67 Per Hour**
Entry-Level Education	High School Diploma or Equivalent
Typical On-the-Job Training Needed	Apprenticeship
Number of Jobs in Michigan, 2023	24,240
Job Growth (2020-2030)	2,840
Forecasted Employment Growth Through 2030	13.1%

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 people's 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

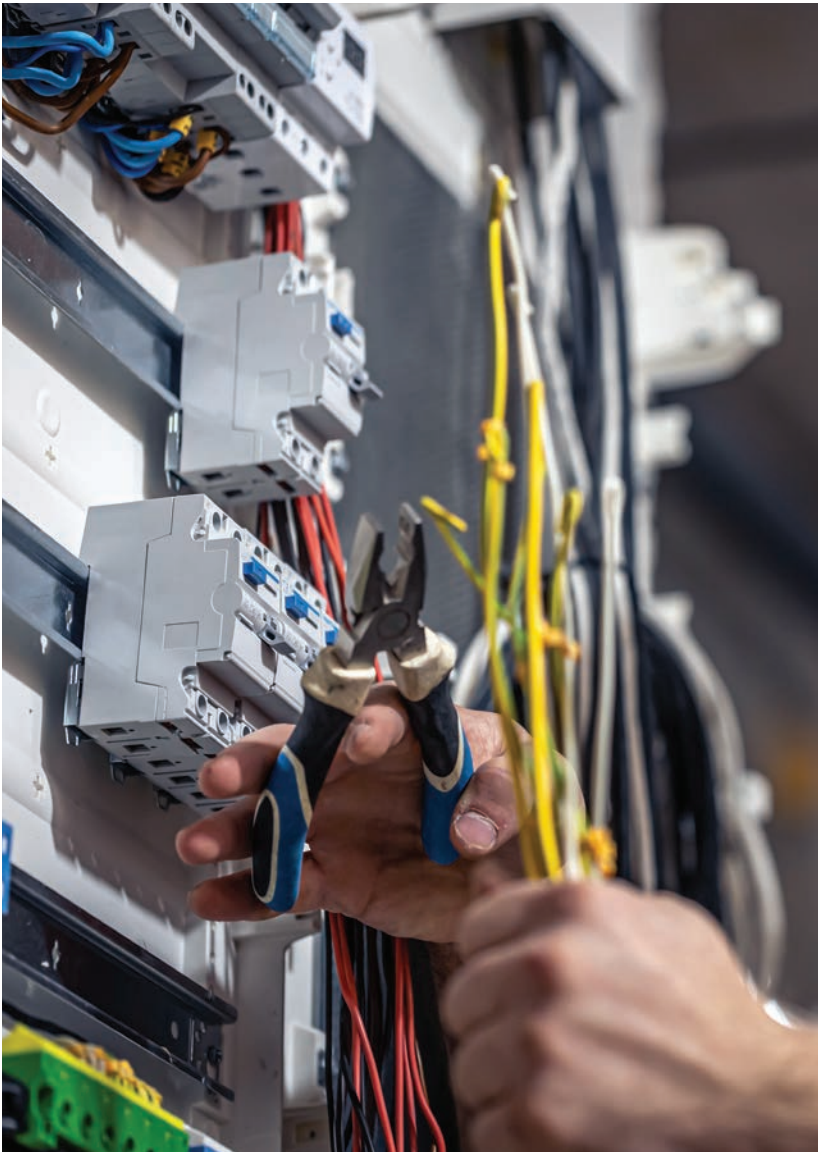
BUSINESS SKILLS are needed by self-employed electricians so they can bid on new jobs, track inventory, and plan payroll and work assignments.

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 electricians deal with people on a regular basis. As a result, electricians should be friendly and 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 ESTIMATORS

2023 Average Wage	**$36.52 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, 2023	6,090
Job Growth (2020-2030)	220
Forecasted Employment Growth Through 2030	3.7%

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 their time reading and interpreting working drawings for new home construction. They prepare, update, and maintain job specifications. They calculate

the 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

ANALYTICAL SKILLS are essential for understanding working drawings, calculating material quantities, and evaluating project costs accurately.

TECHNICAL SKILLS are needed to use computers, spreadsheets, and drafting software for preparing and maintaining cost estimates and job specifications.

ORGANIZATIONAL SKILLS are critical for managing project details, tracking costs, and maintaining accurate records for monitoring and reporting systems.

COMMUNICATION SKILLS are used to negotiate with suppliers and contractors, share project details with stakeholders, and present cost analyses effectively.

GLAZIERS

2023 Average Wage	**$25.95 Per Hour**
Entry-Level Education	**High School Diploma or Equivalent**
Typical On-the-Job Training Needed	**Apprenticeship**
Number of Jobs in Michigan, 2023	**1,520**
Job Growth (2020-2030)	**120**
Forecasted Employment Growth Through 2030	**8.8%**

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.

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

HVAC MECHANICS AND INSTALLERS

2023 Average Wage	**$27.54 Per Hour**
Entry-Level Education	Postsecondary Non-degree Award
Typical On-the-Job Training Needed	Long-Term On-the-Job Training
Number of Jobs in Michigan, 2023	10,580
Job Growth (2020-2030)	830
Forecasted Employment Growth Through 2030	9.2%

What HVAC Mechanics and Installers Do

Heating, ventilation, 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

TECHNICAL SKILLS are essential for working with complex heating, cooling, ventilation, and refrigeration systems, including computer-controlled components.

TROUBLESHOOTING SKILLS are critical for diagnosing and repairing issues in advanced and often intricate HVACR systems.

KNOWLEDGE OF COMPUTERS AND ELECTRONICS is required to operate, maintain, and repair modern systems with integrated technology.

PHYSICAL STAMINA AND FLEXIBILITY are needed for working in cramped spaces, enduring extreme temperatures, and handling irregular hours.

CONSTRUCTION LABORERS

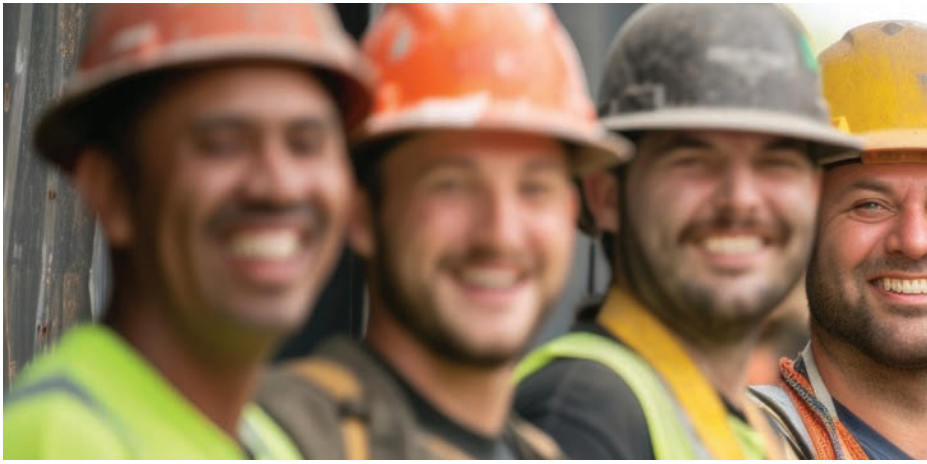
2023 Average Wage	**$23.92 Per Hour**
Entry-Level Education	Less than High School
Typical On-the-Job Training Needed	Short-Term On-the-Job Training
Number of Jobs in Michigan, 2023	26,150
Job Growth (2020-2030)	2,950
Forecasted Employment Growth Through 2030	9.2%

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 job sites 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 perform strenuous tasks throughout the day.

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

CONSTRUCTION MANAGERS

2023 Average Wage	**$55.07 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, 2023	6,340
Job Growth (2020-2030)	840
Forecasted Employment Growth Through 2030	9.2%

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.

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

KNOWLEDGE OF HOME BUILDING TRADES is essential for understanding and overseeing all aspects of residential construction projects.

PLANNING AND ORGANIZATIONAL SKILLS are needed to schedule tasks, manage resources, and ensure projects are completed on time and within budget.

LEADERSHIP AND MOTIVATIONAL SKILLS are important for guiding employees, subcontractors, and suppliers toward successful project completion.

COMMUNICATION SKILLS are critical for collaborating with clients, suppliers, and team members, as well as preparing and presenting progress reports.

PROBLEM-SOLVING SKILLS are required to address challenges and make decisions that keep projects on track.

PAINTERS AND CONSTRUCTION AND MAINTENANCE WORKERS

2023 Average Wage	**$23.60 Per Hour**
Entry-Level Education	Less than High School
Typical On-the-Job Training Needed	Moderate-Term On-the-Job Training
Number of Jobs in Michigan, 2023	4,690
Job Growth (2020-2030)	390
Forecasted Employment Growth Through 2030	5.5%

What Painters and Construction and Maintenance Workers Do

Painters do more than paint. Before they even pick up a paintbrush 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

2023 Average Wage	$33.44 Per Hour
Entry-Level Education	High School Diploma or Equivalent
Typical On-the-Job Training Needed	Apprenticeship
Number of Jobs in Michigan, 2023	12,860
Job Growth (2020-2030)	1000
Forecasted Employment Growth Through 2030	8%

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, follow state 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 pipes.

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 AND LOADING MACHINE AND DRAGLINE OPERATORS

2023 Average Wage	**$26.82 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, 2023	680
Job Growth (2020-2030)	90
Forecasted Employment Growth Through 2030	6%

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

2023 Average Wage	**$26.64 Per Hour**
Entry-Level Education	**Less than High School**
Typical On-the-Job Training Needed	**Moderate-Term On-the-Job-Training**
Number of Jobs in Michigan, 2023	**2,990**
Job Growth (2020-2030)	**270**
Forecasted Employment Growth Through 2030	**7.8%**

What Roofers Do

Roofers typically do the following:

- Inspect problem roofs to determine the best way to repair them
- Measure the 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

2023 Average Wage	**$22.89 Per Hour**
Entry-Level Education	Less than High School
Typical On-the-Job Training Needed	Apprenticeship
Number of Jobs in Michigan, 2023	950
Job Growth (2020-2030)	50
Forecasted Employment Growth Through 2030	11.1%

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. Workers often reach above their 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 because workers spend most of the day standing, stretching, and bending. Workers should be able to stay physically active without getting tired.

CONSTRUCTION AND BUILDING INSPECTORS

2023 Average Wage	**$32.70 Per Hour**
Entry-Level Education	Less than High School
Typical On-the-Job Training Needed	Apprenticeship
Number of Jobs in Michigan, 2023	2,870
Job Growth (2020-2030)	170
Forecasted Employment Growth Through 2030	3.9%

What Construction and Building Inspectors Do

Construction and building inspectors ensure that construction meets 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 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 DETAIL 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.

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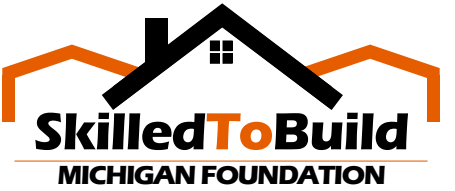

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