SkilledToBuild
MICHIGAN FOUNDATION

Skilled to Build
Michigan Foundation

Residential Construction Skills Certification

Study Guide

CERTIFICATION OVERVIEW

The Skilled to Build Michigan Foundation Residential Construction Skills Certification verifies an individual possesses fundamental competencies necessary to be a productive worker on a residential construction job site. Those who earn the certification are more qualified and prepared to enter high-demand roles within the construction industry. The certification exam assesses an individual's knowledge and skills of construction principles and practices.

EXAM OVERVIEW

The Skilled to Build Michigan Foundation Residential Construction Skills Certification is hosted on the iCEV testing platform. The certification exam is a 100-question, randomized assessment. Exam questions are in the format of multiple choice, sort order, diagramming, matching, labeling and other question types meant to fully evaluate an individual's competency of the industry standards. The certification exam should be proctored within a controlled environment. The proctor of the exam must review and verify all exam procedures and provide electronic documentation through the exam platform.

More information about the certification exam and testing platform, including optional preparation materials offered by iCEV, can be found at www.icevonline.com/skilledtobuild.

INDUSTRY STANDARDS

The certification exam assesses knowledge and skills from the following weighted industry standards set by Skilled to Build Michigan Foundation:

BUILDING TRADES- 25%

- Drywall
- Plumbing
- Electrical
- HVAC

SAFETY & HEALTH- 25%

- Personal & Occupational Health
- Hand Tool Safety
- Power Tool Safety
- Trenching & Excavating

BUILDING COMPONENTS- 50%

- Construction Drawings
- Codes
- Site Preparation
- Foundation/Subflooring
- Framing
- Windows & Doors
- Roofing

Industry Standard Overview

To pass the Skilled to Build Michigan Foundation Residential Construction Skills Certification exam, certification candidates must have adequate knowledge of the industry standards. The following outlines an in-depth overview of the industry standards and sub-standards:

Industry Standard: Building Trades

Drywall

- Drywall Installation Process
  - Preparing studs/joints
  - Installing ceiling panels
  - Installing wall panels
  - Installing outside corner bead
  - Installing paper joint tape
  - Spotting screw/nail holes
  - Mudding outside corner
  - Bedding and feathering
  - Sanding
  - Applying texture
- Basic Repair Techniques
  - Backer Block
  - Dutch Patch

Plumbing

- Dry Fitting
- PVC Fittings & Connections
  - Sanitary Tee
  - Tee Fitting with Threaded Connection
  - Wye Fitting
  - P-Trap
  - Cleanout Plug
  - Reducing Fitting
  - Elbow Fitting
- Water Supply System
- Toilet
- Sink & Faucet
- Soldering

Electrical

- Wiring Rough-In
  - Single-gang switch outlet
  - Two-gang switch outlet
  - Ceiling box
- Non-metallic Sheathed Cable
  - American Wire Gauge System
  - Wire Configurations
- Receptacle Terminals
  - Neutral terminal
  - Hot terminal
  - Ground terminal
- Screw Terminals
- Digital Multimeter

HVAC: The Refrigeration Cycle

- States of Matter
  - Solid
  - Liquid
  - Gas
- Temperature
  - Fahrenheit
  - Celsius
  - Rankine
  - Kelvin
- HVAC Temperature
  - British Thermal Unit
  - Ton of Refrigeration
- Types of Heat
  - Sensible Heat
  - Latent Heat
  - Superheat
  - Subcooling
- The Refrigeration Cycle
  - Compressor
  - Condenser
  - Metering Device
  - Evaporator Coil
- Refrigerant
  - Types of Refrigerants
  - Hydrochlorofluorocarbon
  - Hydrofluorocarbons
  - Hydrofluoroolefin
- HVAC Metering Devices
  - Thermostatic Expansion Valve
  - Electronic Expansion Valve
  - Capillary Tube
  - Fixed Bore Flow Rated Device

HVAC: Basic Tools

- Swaging
- Flaring
- Sealing Duct Seams
- HVAC PPE

Industry Standard: Safety & Health

Personal & Occupational Health

- Rules & Regulations
  - Occupational Safety & Health Act
  - OSHA
    - USDOL
    - Laws
    - General Duty Clause
    - Part 1926
    - Hazard Communications
  - Material Safety Data Sheets
  - Safety Data Sheets
  - Workplace Injuries & Illnesses
  - “$afety Pays” Program
  - Safety Rules & Guides
  - Safety Inspections
- Job Site Safety
  - Hazards
    - Chemical
    - Physical
    - Biological
  - Anticipation
  - Recognition
  - Evaluation
  - Control
- Hierarchy Control
  - Elimination of Hazard
  - Engineering
  - Administrative Procedures
  - PPE
- Hazards
  - Ironwork
  - Electrical
  - Chemical
  - Confided Space
  - Fire
  - Environmental
  - Aerial
  - Struck-by
  - Caught-in
- Safety Tips
  - Ironwork
  - Electrical
  - Chemical
  - Confided Space
  - Fire
  - Environmental
  - Aerial
  - Struck-by
  - Caught-in
  - Improving Job Site Safety
- Personal Protection
  - Personal Protective Equipment
    - Eye & Face
    - Foot
    - Hand
    - Head
    - Hearing
    - Fall
    - Respiratory
    - Body

Hand & Power Tool Safety

- Checklist for tools
  - Cracked or Bent
  - Loose or Missing Parts
  - Rust or Corrosion
  - Splintered Handles
  - Dull Blades
  - Mushroom Tips
  - Loose or Damaged Switches
  - Hoses and Chords
  - Self-Adjusting Guard
  - Remove tool if it is broken
  - Tag it
- Proper use of tools
- Proper Storage
- Follow given instructions
- Wear Proper PPE
- Be aware of water hazards
- Use proper grounding techniques

- Prevent Kickback
  - Clamp down material you are working on
  - Allow blade to reach full speed before cutting
  - Make sure both hands are being used
  - Use proper blades
  - Use quality materials
- Hazards
  - Use sufficient lighting
  - Remove or cover flammable materials
  - Mark unsafe areas
  - Keep a clean work area

Industry Standard: Safety & Health

Trenching & Excavating

- Cannot be wider than 15 feet
- Hazards
  - Cave-ins
  - Disturbing nearby structures
  - Disturbing natural surfaces
  - Damaging utility lines
  - Creating Hazardous Atmosphere
  - Rain
  - Standing Water
  - Falls
  - Traffic
- Soil Protective Systems
  - Sloping the wall
  - Benching the wall
  - Shoring
  - Shielding
- Access & Egress Methods
  - Ladders
  - Stairway
  - Ramps
  - Walkways
- Retaining Devices
- Trench Safety
- Excavator
  - Car body
  - Track system
  - Upper structure
  - Operator cap
  - Boom and stick
  - Attachment
- Operator Responsibilities

Industry Standard: Building Components

Construction Drawings

- Types of Construction Drawings
  - Site Plans
  - Foundation Plans
  - Floor Plans
  - Interior or Exterior Elevation Drawings
  - Section Drawings
  - Interior or Exterior Detail Drawings
  - Lighting and Electrical Floor Plans
  - Mechanical Plans
  - Plumbing Plans
  - Roof Plans
- Elements & Symbols
  - Title Blocks
  - Bold Lines
  - Medium Lines
  - Light Lines
  - Border Lines
  - Solid Lines
  - Dashed Lines
  - Movement Lines
  - Leader Lines
  - Break Lines
  - Center Lines
  - Dimension Sines
  - Architectural Symbols
  - Electrical Symbols
  - Plumbing Symbols
- Design Tools
  - Pen and Pencil
  - Drawing Board
  - Drafting Paper
  - Drafting Tape
  - Drafting Machine
  - Scales
  - Compass
  - Drafting Triangle
  - T-square
  - French Curve
  - Template
  - Lettering Guide
  - Blueprint Measuring Tool
  - Protractor
  - Caliper
  - CAD
- Project Planning & Development
  - Collecting Information
  - Schematic Design
    - Zoning Laws
    - Distribution
    - Circulation
    - Lighting
    - Ventilation
    - Sizes, Areas. And Shapes
    - Orientation
    - Height
    - Electrical Layout
    - Locations of Doors and Windows
    - Line of Sight
  - Design Development
  - Construction Documents
  - Bidding
  - Construction Administration
  - Construction

Codes

- Regulatory Agencies & Organizations
  - International Code Council
    - American Society of Civil Engineers
    - The American Institute Protection Association
    - National Fire Protection Association
    - Environmental Protection Agency
    - Occupational Safety & Health Administration
    - Federal Emergency Management Agency
- Codes and Regulations
  - Building Codes
- International Code Council
  - International Building Code
  - ICC Electrical Code
  - International Energy Conservation Code
  - International Existing Building Code
  - International Fire Code
  - International Fuel Gas Code
  - International Mechanical Code
  - International Performance Code
  - International Plumbing Code
  - International Private Sewage Disposal Code
  - International Property Maintenance Code
  - International Residential Code
  - International Zoning Code

Site Preparations

- Site Evaluation
  - Slope
  - Orientation
  - Soil Types

Industry Standard: Building Components

- −Utilities
- −Traffic
- −Vegetation

−Surveying
− Common Surveying Equipment
- −Satellites
- −Plastic and nylon tapes
- −Measuring wheel
- −Dumpy level
- −Surveyor's pole
- −Transit
- −Tripod
- −Plumb bob
- −Laser plane

−Site Development
−Zoning Codes
- −Residential zones
- −Commercial zones
- −Industrial zones

Foundation/Subflooring
−Lumber Grades
- −Select A – D
- −Common No. 1 – Common No. 5

−Span Tables
- −Span
- −E value
- −Fb value
- −Dead load
- −Live load
- −Maximum allowable deflection

− Foundation & Subflooring Installation Process
- −Construct girders
- −Attaching mudsill
- −Constructing headers
- −Attaching header to mudsill
- −Constructing joists
- −Installing joists
- −Installing outside joists and outside headers
- −Installing bridging installing subfloor

Framing
−Girders
−Mudsill
−Inside header
−Outside header
−Common joist
−Bridging member

Windows and Doors
−Parts of a Window
- −Rails
- −Stiles
- −Muntins
- −Panes
- −Sash Locks
- −Jambs
- −Flange
- −Sill
- −Casing

−Window Installation Process
−Parts of a Door
- −Top Rail
- −Intermediate Rail
- −Lock Rail
- −Bottom Rail
- −Panels
- −Mullion Lock Stile
- −Hinge Stile
- −Sweep
- −Casing
- −Jamb
- −Stop
- −Threshold
- −Hinges

−Door Installation Process

Roofing
−Roofing Installation Process
−Parts of a Roof
- −Dormer
- −Ridge Vent
- −Eaves
- −Gutter
- −Ridges
- −Valley
- −Soffit

−Roof Penetrations
−Types of Roofs