

Notes

This Qualitative Core Competency document applies to all three subsections of the plumbing inspection section:

Plumbing Inspector

Cross Connection Inspector

Plumbing – Water Department Inspector

Separate Quantitative Core Competencies will apply to each subsection. Advancement in the Plumbing Inspector career ladder will be contingent upon successful completion of the qualitative and quantitative requirements for the pay step being requested.

Plumbing Inspector, Step 1

New hires are placed at step one until they meet the minimum requirements and qualifications to move to step two.

To move to step two, an inspector at step one must obtain the following inspection credentials as mandated by the State of Wisconsin:

- 1. State of Wisconsin Commercial Plumbing Inspector Certification**
- 2. State of Wisconsin Journeyman Plumbing License**

An inspector holding these credentials upon entering the City of Milwaukee Plumbing Inspection section, with supervisor and DNS administrative approval, may be eligible for appointment to a higher career ladder step (based on certifications held at the time of appointment) with the one year probationary period waived for the sole purposes of this Career Ladder. Separate probationary period requirements mandated by the Department of Employee Relations still apply.

An inspector must demonstrate a thorough knowledge pertaining to the fundamentals of performing basic plumbing inspections as they relate to good communication, construction methodologies, code knowledge, problem solving and code interpretation and its enforcement. Listed below is a representation of the core competencies an inspector must have a thorough knowledge of:

General Competencies

- Knowledge of plumbing construction practices and techniques
- Knowledge of codes, methods, materials and tests used in construction of Plumbing
- Knowledge of the inspection methods for plumbing and ability to perform inspections to ensure code compliance
- Knowledge of safe working practices
- Skill in reading and recognizing violations of all applicable plumbing codes
- Skill in preparing analytical reports on compliance with standards and codes
- Ability to make sound technical decisions independently
- Ability to communicate diplomatically with the public, public officials, and other skilled trades people
- Ability to maintain detailed records
- Management and Control of Assigned District
- Ability to coordinate with other DNS and City Entities
- Ability to Evaluate and Interpret Construction Plans
- Thorough knowledge of the Milwaukee Code of Ordinances
- Code Administration and Definitions of 1&2 Family and commercial Codes

- *Familiarity of DNS processes and skill set with regards to computer programs.*

Commercial Plumbing Code Competencies

Design, Construction, Installation Supervision, Maintenance, and Inspection of Plumbing

- *Design Criteria*
- *Loads & Materials*
- *Intent and basic requirements*
- *Basic plumbing principals*
- *Administration and enforcement*
- *Plan review and cross connection control assembly registration*
- *Testing and inspection*
- *Maintenance and repairs*
- *Drain and Vent Systems*
- *Sanitary drain systems*
- *Vents and venting systems*
- *Traps and direct fixture connections*
- *Indirect and local waste piping*
- *Wastewater treatment and holding devices*
- *Waste cleanouts*
- *Storm water and clear water plumbing systems*
- *Sanitation Facilities and campgrounds*
- *Discharge points*
- *Water supply systems*
- *Cross connection control of water supply systems*
- *Health Care and related facilities*
- *Special plumbing installations*
- *Manufactured homes and manufactured home communities*
- *Pipe hangers and supports*
- *Plumbing treatment and standards*

Private Onsite Wastewater Treatment Systems

- *Sanitary permits*
- *Installation and inspection training*
- *Plan review and approval*
- *Petitions for variance*
- *Governmental programs*
- *Governmental inventory maintenance programs*
- *Experiments*
- *Penalties*
- *Range of responses from testing*
- *Prohibitions and limitations*
- *Design and installation*
- *General requirements*
- *Parameters for POWTS components consisting of in situ soil*
- *Reporting Requirements*
- *Recognized methods and technologies*
- *Parameters for using acceptable methods and technologies*
- *Performance monitoring*

Plumbing Products

- *Identification*
- *Department approval*
- *Device listing*
- *Penetrations of fire-resistive assemblies*
- *Chemical treatments for private sewage systems*
- *Biochemical treatments for private sewage systems*
- *Healthcare plumbing appliances*
- *Plumbing fixtures, appliances and equipment*
- *POWTS holding components or treatment components*

- *Plumbing materials*
- *Joints and connections*
- *Alternate approvals and experimental approvals*

Soil and Site Evaluations

- *Identification*
- *Department approval*
- *Device listing*
- *Penetrations of fire-resistive assemblies*
- *Chemical treatments for private sewage systems*
- *Biochemical treatments for private sewage systems*
- *Healthcare plumbing appliances*
- *Plumbing fixtures, appliances and equipment*
- *POWTS holding components or treatment components*
- *Plumbing materials*
- *Joints and connections*
- *Alternate approvals and experimental approvals*

Boat and On-Shore Sewage Facilities

- *Petition for Variance*
- *Applicability*
- *Required Approvals*
- *Holding tank, toilet and apertures*
- *Overboard discharge inactivation*
- *On-shore disposal facilities*
- *Alternate facilities*
- *Operation and maintenance*
- *Prohibited Facilities*

Private Onsite Wastewater Treatment System Replacement

- *Applicability*
- *Grant applicability participating governmental units*
- *Categories of POWTS*
- *Eligibility of owners*
- *Ineligibility of owners*
- *Maximum allowable financial assistance amount*
- *Maximum allowable financial assistance amount for experimental POWTS*
- *Ineligible rehabilitation or replacement work*
- *Application by owners*
- *Alternate evidence of income*
- *Allocation of funds*
- *Financial assistance awards*
- *Program enforcement*
- *Petition for variance*

Additionally, an inspector must meet or exceed the thresholds for advancement established in the **QUANTITATIVE CORE COMPETENCIES**.

Additional Steps

After attainment of job required certifications and licensure as required in the job description along with supervisor and DER approval the inspector may begin advancing in the career ladder. The below listed steps may be achieved in any order.

In order to advance to pay step 2 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for one of the below listed Qualitative Steps.

In order to advance to pay step 3 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for two of the below listed Qualitative Steps.

In order to advance to pay step 4 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for three of the below listed Qualitative Steps.

In order to advance to pay step 5 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for four of the below listed Qualitative Steps.

In order to advance to pay step 6 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for five of the below listed Qualitative Steps.

In each case above, for advancement to a higher pay step, the inspector shall obtain the required Qualitative and Quantitative measures associated with the step they are requesting. The quantitative core competencies must be achieved in the sequential order as outlined in the Quantitative Core Competencies document. In addition, inspector's performance, customer service, job skill and knowledge is subject to review by the supervisor for applicability for the step being requested and the time frame to be analyzed taking into consideration training, specialty projects, inspector workload, district composition, and other factors that may have an impact on performance.

Plumbing Inspector, Step Option 2

To advance a step using step option two, an inspector at step one must hold the job required credentials required at step one and obtain the following inspection credentials or certification issued by the State of Wisconsin, American Society of Sanitary Engineers (ASSE), Plumbers Local 75 or certification from other approved equivalent certification training facilities:

- 1. Cross-Connection Control Tester**
AND
- 2. Gas Systems Certification**
OR
2 lb. Gas Certification

An inspector using step two option must demonstrate a thorough knowledge pertaining to the fundamentals of performing basic plumbing inspections as they relate to gas systems and protecting the City of Milwaukee's water supply from cross contaminants as well as maintaining qualitative core competencies of the requested pay step.

These certifications requirements are intended to give the inspector a thorough understanding in a particular subject that will continue to be built upon in the coming career ladder steps. Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of to advance using this step option:

Cross Connection

1. **Back Flow Prevention History**

- *Legal Precedent*
- *Federal Laws and Regulations*
- *Safe drinking water act*
- *Incidents*

2. **Backflow Prevention Hydraulics**

- *Water characteristics and Pressure*
- *Backflow*
- *Fluid Flow Fundamentals*
- *Cross-Connection Types*
- *Cross-Connection Control Isolation*
- *Cross-Connection Control Containment*
- *Thermal Expansion*

3. **Code and Installation Criteria**

- *Identification of potable and non-potable water systems*
- *Unlawful connections*
- *Cross-connection control*
- *Protection from backflow in underground piping*
- *Dangerous connections*
- *Enclosures*
- *Air gap separation*
- *Barometric loop*
- *Anti-siphon fill valves for gravity water closet flush tanks*
- *Hose Bibb devices*
- *Hose connection vacuum breakers*
- *Vacuum breaker wall hydrants, freeze-resistant, automatic draining type*

- *Hose connection back flow preventers*
- *Beverage equipment devices*
- *Beverage dispensing equipment*
- *Trap seal primer valves*
- *Laboratory faucet vacuum breakers*
- *Check valves*
- *Reduced pressure principle assembly*
- *Gauges*
- *Differential pressure gauge*
- *Water column*
- *ASSE standard 1064*

4. **Backflow preventer testing**

- *Field test*
- *Equipment*
- *Test results*
- *Pre-test*
- *Assembly test preparation*
- *Testing the DC/RP detector assembly*
- *Equipment maintenance*

5. **Fire-sprinkler system backflow prevention**

- *Fire-sprinkler installations*
- *Water based suppression systems*
- *Dry pipe pressurized and pre-action systems*
- *NFPA 13*
- *NFPA 20*
- *NFPA 25*

Gas Systems Certification / 2 Lb Gas Certification

Gas Piping System Design, Materials and Components

- *Piping plans*
- *Provisions for locations for point of delivery*
- *Interconnections between gas piping systems*
- *Sizing of gas piping systems*
- *Piping system operating pressure limitations*

- *Acceptable piping materials and joining methods*
- *Gas meters*
- *Gas pressure regulators*
- *Overpressure protection devices*
- *Back pressure protection*
- *Low-pressure protection*
- *Shut off valves*
- *Excess flow valves*
- *Expansion and flexibility of gas pipes*

Gas Piping installation

- Piping underground
- Installation of piping
- Concealed piping in buildings
- Piping in vertical chases
- Gas pipe turns
- Drips and sediment traps
- Outlets
- Branch pipe connection
- Manual gas shutoff valves
- Prohibited devices
- Systems containing gas-air mixtures outside the flammable range
- Systems containing flammable gas-air mixtures

- Electrical bonding and grounding
- Electrical circuits
- Electrical connections

Appliance equipment and accessory installation

- Accessibility and clearance
- Air for combustion and ventilation
- Appliances on roofs
- Appliances in attics
- Appliance and equipment connections to building piping
- Electrical
- Room temperature thermostat

These Skills and certifications build on important priorities of the building code that the inspector should already be familiar with and encounter on a regular basis in public buildings.

Additionally, an inspector advancing from step one to step two must meet or exceed the thresholds for advancement established in the QUANTITATIVE CORE COMPETENCIES.

Plumbing Inspector, Step Option 3

To advance a step using step option three, an inspector shall have obtained the job required certifications/licensure as outlined in step one. Step option three requires the inspector to obtain the following inspection credentials or certification issued by the State of Wisconsin:

1. **Wisconsin Automatic Fire Sprinkler System Tester**
2. **Wisconsin Private Onsite Wastewater Treatment System (POWTS) Inspector Certification**

An inspector using this step option three must demonstrate a thorough knowledge pertaining to the fundamentals of performing basic plumbing inspections as they relate to Sprinkler Systems and the POWTS while maintaining qualitative core competencies of an inspector using step option three.

Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of to advance using this step option:

Wisconsin Automatic Fire Sprinkler System Tester

NFPA 13

- Level of protection
- Classification of occupancies
- Hazardous occupancies
- Special occupancy
- Limited area systems
- Additives
- Sprinklers
- Aboveground pipe and tube
- Fittings
- Joining of pipe and fittings
- Hangers
- Valves
- Fire department connections

Department Of Neighborhood Services
Plumbing Inspection Qualitative Core Competencies - 2017

- *Water flow alarm devices*
 - *Wet pipe systems*
 - *Dry pipe systems*
 - *Pre-action system*
 - *Deluge systems*
 - *Multi-cycle systems*
 - *Antifreeze systems*
 - *Automatic systems with non-fire protection connections*
 - *System protection area limitations*
 - *Residential sprinklers*
 - *Large drop sprinklers*
 - *Early suppression fast response sprinklers*
 - *In-rack sprinklers*
 - *Pilot line detectors*
 - *special situations*
 - *Piping installation*
 - *System attachments*
 - *Hanging, bracing and restraint of system piping*
 - *Underground piping*
 - *Design approaches*
 - *Adjacent hazards or design methods*
 - *Protection of commodities*
 - *System testing and acceptance.*
- NFPA 14**
- *Installation of standpipe and hose systems*
 - *System components and hardware*
 - *Piping and tubing*
 - *Fittings*
 - *Joining of pipe and fittings*
 - *Valves*
 - *Hose connections*
 - *Hose stations*
 - *Fire department connections*
 - *Pressure-regulating devices*
 - *Signs*
 - *Automatic dry systems*
 - *Classes of standpipe systems*
 - *Required type of system*
 - *Gauges*
 - *Water flow and supervisory alarms*
- *Location and protection of piping*
 - *Underground piping gate valves and check valves*
 - *Fire department connections*
 - *Support of piping*
 - *Installation of signs*
 - *Signs for water supply pumps*
 - *Hydraulic design*
 - *Pressure limitation*
 - *Locations of hose connections*
 - *Number of standpipes*
 - *Interconnection of standpipes*
 - *Minimum sizes for standpipes and branch lines*
 - *System design and sizing of pipe for delivery of system demand*
 - *Minimum and maximum pressure limits*
 - *Standpipe system zones*
 - *Flow rates*
 - *Drains and test riser*
 - *Fire department connections*
 - *Plans and specifications*
 - *Required water supply*
 - *Minimum supply for Class I and Class III systems*
 - *Minimum supply for Class II systems*
 - *Water supply evaluation*
 - *Flushing of piping*
 - *System acceptance*
 - *Hose threads*
 - *Hydrostatic tests*
 - *Flow tests*
 - *Manual valve test*
 - *Alarm and supervision tests*
 - *Other system features*
 - *Fire department connections for buildings under construction*
 - *Temporary installations*
- NFPA 25**
- *Deluge foam-water sprinkler and foam-water spray systems*
 - *Water-based fire protection system definitions*

- *Responsibility of the property owner or designated representative*
- *Corrective action*
- *Records*
- *Inspection*
- *Testing*
- *Performance based programs*
- *Maintenance*
- *Safety*
- *Inspection of sprinkler systems*
- *Testing of sprinkler systems*
- *Maintenance of sprinkler systems*
- *Component action requirements*
- *Inspection of standpipe and hose systems*
- *Testing of standpipe and hose systems*
- *Maintenance of standpipe and hose systems*
- *Inspection of private fire service mains*
- *Testing of private fire service mains*
- *Maintenance of private fire service mains*
- *Inspection of fire pumps*
- *Testing of fire pumps*
- *Maintenance of fire pumps*
- *Inspection of water storage tanks*
- *Testing of water storage tanks*
- *Maintenance of water storage tanks*
- *Water spray fixed systems*
- *Ultra-high speed water spray system operational tests*
- *Component action requirements for ultra-high-speed water spray systems*
- *Inspection of foam-water sprinkler systems*
- *Testing of foam-water sprinkler systems*
- *Maintenance of foam-water sprinkler systems*
- *Inspection of water mist systems*
- *Testing of water mist systems*
- *Maintenance of water mist systems*
- *Control valves in water-based fire protection systems*
- *System valves*
- *Pressure reducing valves*
- *Relief valves*
- *Backflow prevention assemblies*
- *Fire department connection valves*
- *Obstruction investigation*
- *Internal inspection of piping*
- *Obstruction prevention*
- *Ice obstruction*
- *System impairments*
- *Impairment coordinator*
- *Tag impairment system*
- *Impaired equipment*
- *Preplanned impairment programs*
- *Emergency impairments*
- *Restoring systems to service.*

Private Onsite Wastewater Treatment System (POWTS)

- *Soil and site evaluation*
 - *Basic soils*
 - *Interpreting soils characteristics for treatment of domestic wastewater*
 - *Use of Soil Survey Information*
 - *Legal land descriptions of Wisconsin Real Estate*
 - *Site investigation procedures*
 - *Knowledge of setback and minimum requirements*
- *Component Manuals*
 - *In-ground soil absorption manual*
 - *Definitions and specifications*
 - *Principles of operation*
 - *Soil and site requirements*
 - *Cover material*
 - *Design*
 - *Site preparation and Construction*

- Operation, maintenance and performance monitoring
- Plan submittal and installation inspection
- Pressure Distribution manual
 - Definitions and specifications
 - Principles of operation
 - Soil and site requirements
 - Design
 - Site preparation and Construction
 - Operation, maintenance and performance monitoring
 - Plan submittal and installation inspection
- At-grade manual
 - Definitions and specifications
 - Principles of operation
 - Soil and site requirements
 - Cover material
 - Design
 - Site preparation and Construction
 - Operation, maintenance and performance monitoring
 - Plan submittal and installation inspection
- Mound manual
 - Definitions and specifications
 - Principles of operation
 - Soil and site requirements
 - Cover and fill material
 - Design
 - Site preparation and Construction
 - Operation, maintenance and performance monitoring
 - Plan submittal and installation inspection
- Holding tank
 - Definitions and specifications
 - Principles of operation
 - Design
 - Site preparation and Construction
 - Operation, maintenance and performance monitoring
 - Plan submittal and installation inspection
- Single pass sand filter manual
 - Definitions and specifications
 - Principles of operation
 - Design
 - Construction
 - Operation, maintenance and performance monitoring
 - Plan submittal and installation inspection
- Recirculating sand filter manual
 - Definitions and specifications
 - Principles of operation
 - Design
 - Construction
 - Operation, maintenance and performance monitoring
 - Plan submittal and installation inspection
- Split bed Recirculating sand filter manual
 - Definitions and specifications
 - Principles of operation
 - Design
 - Construction
 - Operation, maintenance and performance monitoring
 - Plan submittal and installation inspection
- Drip-line effluent dispersal manual
 - Definitions and specifications
 - Principles of operation
 - Design
 - Site preparation and Construction
 - Operation, maintenance and performance monitoring
 - Plan submittal and installation inspection

- Definitions and specifications
- Principles of operation
- Soil and site requirements
- Cover material
- Design
- Site preparation and Construction
- Operation, maintenance and performance monitoring
- Plan submittal installation inspection
- Understanding of SPS 383 and SPS 385

An inspector at this level expands on aspects of life safety and onsite wastewater treatment. At this level the inspector has the ability to greatly expand their knowledge on requirements for safety, health, and safe environment. It is intended that at this level, an inspector will become more specialized in the commercial building codes and various regulations intended to keep our community safe and our drinking water pure.

*Additionally, an inspector advancing in the career ladder must meet or exceed the thresholds for advancement established in the **Quantitative Competencies**.*

Plumbing Inspector, Step 4

To advance a step using step option four, an inspector shall have obtained the job required certifications/licensure as outlined in step one. Step option four requires the inspector to obtain the following inspection credentials or certification issued by the State of Wisconsin, American Society of Sanitary Engineers (ASSE), Plumbers Local 75 or certification from other approved equivalent certification training facilities:

1. **ASSE Cross Connection Surveyor**
AND
2. **Master Plumbing License**

An inspector using step option four must demonstrate a thorough knowledge pertaining to the performance of cross connection surveys and their impact on the health of the community and a mastery of the construction of plumbing systems. Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of to advance using this step option:

Cross Connection

Back Flow Prevention History

- Legal Precedent
- Federal Laws and Regulations
- Safe drinking water act
- Incidents

Backflow Prevention Hydraulics

- Water characteristics and Pressure
- Backflow
- Fluid Flow Fundamentals
- Cross-Connection Types
- Cross-Connection Control Isolation

- Cross-Connection Control Containment
- Thermal Expansion

Code and Installation Criteria

- Identification of potable and non-potable water systems
- Unlawful connections
- Cross-connection control
- Protection from backflow in underground piping
- Dangerous connections
- Enclosures
- Air gap separation

- *Barometric loop*
- *Anti-siphon fill valves for gravity water closet flush tanks*
- *Hose Bibb devices*
- *Hose connection vacuum breakers*
- *Vacuum breaker wall hydrants, freeze-resistant, automatic draining type*
- *Hose connection back flow preventers*
- *Beverage equipment devices*
- *Beverage dispensing equipment*
- *Trap seal primer valves*
- *Laboratory faucet vacuum breakers*
- *Check valves*
- *Reduced pressure principle assembly*
- *Gauges*
- *Differential pressure gauge*
- *Water column*
- *ASSE standard 1064*

Backflow preventer testing

- *Field test*
- *Equipment*
- *Test results*
- *Pre-test*
- *Assembly test preparation*
- *Testing the DC/RP detector assembly*
- *Equipment maintenance*

Fire-sprinkler system backflow prevention

- *Fire-sprinkler installations*
- *Water based suppression systems*
- *Dry pipe pressurized and pre-action systems*
- *NFPA 13*
- *NFPA 20*
- *NFPA 25*

Plumbing Code Competencies

Design, Construction, Installation Supervision, Maintenance, and Inspection of Plumbing

- *Design Criteria*
- *Loads & Materials*
- *Intent and basic requirements*
- *Basic plumbing principals*
- *Administration and enforcement*
- *Plan review and cross connection control assembly registration*
- *Testing and inspection*
- *Maintenance and repairs*
- *Drain and Vent Systems*
- *Sanitary drain systems*
- *Vents and venting systems*
- *Traps and direct fixture connections*
- *Indirect and local waste piping*
- *Wastewater treatment and holding devices*
- *Waste cleanouts*
- *Storm water and clear water plumbing systems*
- *Sanitation Facilities and campgrounds*
- *Discharge points*
- *Water supply systems*
- *Cross connection control of water supply systems*
- *Health Care and related facilities*
- *Special plumbing installations*
- *Manufactured homes and manufactured home communities*
- *Pipe hangers and supports*
- *Plumbing treatment and standards*

Private Onsite Wastewater Treatment Systems

- *Sanitary permits*
- *Installation and inspection training*
- *Governmental programs*
- *Plan review and approval*
- *Petitions for variance*

Department Of Neighborhood Services
Plumbing Inspection Qualitative Core Competencies - 2017

- *Governmental inventory maintenance programs*
- *Experiments*
- *Penalties*
- *Range of responses from testing*
- *Prohibitions and limitations*
- *Design and installation*
- *General requirements*
- *Parameters for POWTS components consisting of in situ soil*
- *Reporting Requirements*
- *Recognized methods and technologies*
- *Parameters for using acceptable methods and technologies*
- *Performance monitoring*

Plumbing Products

- *Identification*
- *Department approval*
- *Device listing*
- *Penetrations of fire-resistive assemblies*
- *Chemical treatments for private sewage systems*
- *Biochemical treatments for private sewage systems*
- *Healthcare plumbing appliances*
- *Plumbing fixtures, appliances and equipment*
- *POWTS holding components or treatment components*
- *Plumbing materials*
- *Joints and connections*
- *Alternate approvals and experimental approvals*

Soil and Site Evaluations

- *Identification*
- *Department approval*
- *Device listing*
- *Penetrations of fire-resistive assemblies*
- *Chemical treatments for private sewage systems*
- *Biochemical treatments for private sewage systems*
- *Healthcare plumbing appliances*
- *Plumbing fixtures, appliances and equipment*
- *POWTS holding components or treatment components*
- *Plumbing materials*
- *Joints and connections*
- *Alternate approvals and experimental approvals*

Boat and On-Shore Sewage Facilities

- *Petition for Variance*
- *Applicability*
- *Required Approvals*
- *Holding tank, toilet and apertures*
- *Overboard discharge inactivation*
- *On-shore disposal facilities*
- *Alternate facilities*
- *Operation and maintenance*
- *Prohibited Facilities*

Private Onsite Wastewater Treatment System Replacement

- *Applicability*
- *Grant applicability participating governmental units*
- *Categories of POWTS*
- *Eligibility of owners*
- *Ineligibility of owners*
- *Maximum allowable financial assistance amount*
- *Maximum allowable financial assistance amount for experimental POWTS*

Upon the completion of this step, the inspector should be highly specialized in performing cross connection surveys and be familiar with the requirements of one and two family construction.

*Additionally, an inspector advancing in the career ladder must meet or exceed the thresholds for advancement established in the **Quantitative Core Competencies**.*

Plumbing Inspector, Step Option 5

To advance a step using step option five, an inspector shall have obtained the job required certifications/licensure as outlined in step one. Step option five requires the inspector to obtain the following inspection credentials or certification issued by the State of Wisconsin:

- 1. State of Wisconsin Commercial Building Inspectors License**
- 2. State of Wisconsin Uniform Dwelling Code Construction Inspector**

An inspector using step option five must demonstrate a thorough knowledge and the ability to review and perform construction inspections on buildings. These components are found in some of the Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of to advance to using this step option:

Commercial Code Competencies

- *Use and Occupancy Classifications*
- *Special Use Occupancies and Elements*
- *Height and Area Limitations Based on Type of Construction*
- *Fire Resistance and Protection Requirements*
- *Interior Finishes*
- *Use and Application of Glass, Glazing, Safety Glazing & Plastics*
- *Means of Egress*
- *Accessibility*
- *Building Systems Such as Lighting, HVAC, Plumbing Fixtures, Elevators, Generators*
- *Structural Components Such as Masonry, Wood, Steel and their Performance and Stability*
- *Safeguards During Construction*
- *Erosion Control and Storm Water Management Regulations*
- *Special Construction Such as Membrane Structures, Tents & Awnings*
- *Hazardous Occupancies*
- *Use & Application of the International Existing Building Code*
- *Use & Application of the International Fuel Gas Code*
- *Use & Application of the International Mechanical Code*
- *Use & Application of the International Energy Conservation Code*
- *Use & Application of ANSI A117.1 Standard for Accessible and Usable Buildings and Facilities*
- *Competency of Code Referenced Standards*
- *General Knowledge of the Milwaukee Code of Ordinances*

- Familiarity and Application of the *International Fire Code*

1 & 2 Family Uniform Dwelling Code (UDC) Competencies

Construction

- Design Criteria
- Loads & Materials
- Exits
- Interior Circulation
- Stairways & Elevated Areas
- Ladders
- Ramps
- Natural Light & Ventilation
- Ceiling Height
- Attic & Crawl Spaces
- Fire Separation & Dwelling Unit Separation
- Fire blocking
- Smoke Detectors
- Automatic Fire Sprinklers
- Protection Against Decay & Termites
- Foam Plastic
- Installation of Elevators or Dumbwaiters
- Excavations
- Erosion Control & Sediment Control
- Storm Water Management
- Excavations Adjacent To Adjoining Property
- Excavations For Footings & Foundations
- Footings
- Frost Protection
- Drain Tiles
- Foundations
- Floor Design
- Concrete Floors
- Garage Floors
- Wood Floors in Contact With The Ground
- Precast Concrete Floors
- Wood Frame Floors
- Decks
- Wall Design
- Exterior Covering
- Wood Frame Walls
- Masonry Walls
- Roof Design
- Roof & Ceiling Wood Framing
- Masonry Fireplaces
- Masonry Chimneys
- Factory-Built Fireplaces
- Construction in Floodplains
- Installation Standards of Manufactured Homes

Energy Conservation

Energy Conservation Scope and Application

- *Insulation Materials & Installation Basic Requirements and Protection*
- *Thermal Envelope Design & Requirements*
- *Prescriptive Insulation and Fenestration Criteria*
- *Specific Insulation Requirements*
- *Slab Floors*
- *Crawl Spaces*
- *Thermally Isolated Sunrooms*
- *Fenestration*
- *Air Leakage*
- *Vapor Retarders*
- *Ventilation & Moisture Control*
- *Indoor Temperatures & Equipment Sizing*
- *Temperature Control*
- *Duct Systems*
- *Duct & Plenum Sealing*
- *Pipe Insulation*
- *Air-Conditioner & Heat Pump Efficiencies*
- *Replacement Furnace & Boiler Efficiencies*
- *Simulated Performance Alternative Energy Conservation*

Heating, Ventilating & Air-Conditioning Design

- *Selection of Heating Equipment*
- *Types & Location of Equipment*
- *Solid-Fuel Burning Equipment*
- *Safety Controls*
- *Combustion Air*
- *Mechanical Draft Systems*
- *Equipment Maintenance Information*
- *Air Distribution Systems*
- *Ductwork*
- *Damper, Registers & Grills*
- *Piping*
- *Factory-Built Chimneys or Vents*
- *Gas Vents*
- *Chimney Connectors, Smoke Pipes & Stovepipes*
- *Multiple Appliance Venting*
- *Condensate Drains*
- *Fuel Storage & Supply Systems*
- *Equipment Location and Operation*

It is at this stage, the inspector masters the field of plumbing on sites and within buildings as well as gains critical knowledge to the construction of these buildings and the interaction of the plumbing elements to the occupancies of the building.

Additionally, an inspector advancing in the career ladder must meet or exceed the thresholds for advancement established in the Quantitative Competencies.

Plumbing Inspector, Step 6

To advance a step using step option six, an inspector must successfully complete one the following inspection credentials issued by the International Code Council (ICC), or through other means described below:

- 1. ICC Certified Building Code Official (CBO)**
 - a. Management Module**
 - b. Legal Module**
 - c. Building Codes and Standards Module****OR**
- 2. Have obtained an associate's degree in engineering, architecture, construction management, construction technology or a field closely related to construction.**
OR
- 3. Have successfully completed 60 college credits of which a minimum of 39 credits are job-related or engineering-related, architectural design-related or construction management related.**
OR
- 4. Have obtained a Bachelor's degree in engineering, architecture, architectural engineering, construction management, construction technology, mechanical engineering, or a field closely related to construction.**
OR
- 5. Registered as a Designer of Plumbing Systems, Designer of Sprinkler Systems, Professional Engineer or Registered as an Architect by the State of Wisconsin.**

An inspector using step option six must demonstrate a thorough knowledge pertaining to the fundamentals of hazardous liquid, chemical, combustible, radioactive, health hazard occupancies, system and the equipment associated with them. These components are found in some of the list below which is a representation of the core competencies that an inspector must have a thorough knowledge of to advance using this step option:

ICC –Certified Building Official

Legal Module

Financial Management

- Budgets And Financing
- Implementation Of Financial Checks
- Verification Of Revenue Generation And Expenditures

Records Management

- Maintenance Of Employment Records
- Code Enforcement Records

Personnel Management

- Job Descriptions And Personnel Equipment
- Personnel Supervision
- Time-Management Efficiency

- Anti-Discrimination
- Employee Working Conditions
- Employee Discipline And Grievance
- Employee Professional Development
- Interagency, Legislative, and Public Communication
- Code Adoption And Amendments
- Alternative Methods Through Appeals
- Interagency Cooperation
- Public Service And Information
- Code Enforcement
- Permits, Notices And Orders
- Right Of Entry
- Hazard Abatement

- Tort Liability
- Legal Due Process
- Court Prosecution

Technology Module

- Architectural Plan Review
 - Use And Occupancy Classification
 - Construction Classification
 - Means Of Egress Provisions
 - Light, Ventilation And Sanitation Provisions
 - Fire Resistance And Fire Protection Provisions
 - Accessibility Provisions
 - Environmental And Natural Hazard Provisions
 - Special Use/Occupancy Provisions
- Structural Plan Review

- Structural Provisions
- Material Standards And Construction Methods

Building System Plan Review

- Mechanical Provisions
- Plumbing Provisions
- Electrical Provisions

Field Inspection

- Site Inspection
- Foundation Inspection
- Structural Frame Inspection
- Building Envelope Inspection
- Electrical Inspections
- Plumbing Inspection
- Mechanical Inspection
- Fire Protection Inspection
- Final Building Inspection

An inspector using step option six must demonstrate a thorough knowledge of performing complex construction inspections and plan reviews involving all applicable codes, standards and construction methodology. An inspector must demonstrate innate public communication skills and actively participate in mentoring less experienced inspectors. The inspector will possess both core competencies as well as specialized competencies in a wide variety of construction regulations.

*Additionally, an inspector advancing in the career ladder must meet or exceed the thresholds for advancement established in the **Quantitative Competencies**.*