The General Trade Knowledge portion of the examination is administered daily in Computer Based Testing (CBT) format. It will consist of 80 equally weighted questions.

The examination will have questions relating to the following content areas and necessary knowledge for each area includes:

- reading and interpreting plans and specifications
- reading and interpreting codes
- basic mathematics (addition, subtraction, multiplication, division, calculations of area and volume, fractions, decimals, percentages, calculating the sides of triangles, square roots, powers of numbers, and solving simple algebraic equations for unknown variables)

You should be prepared to respond to examination questions on any of the content areas listed. Questions asked and content areas tested on previous examinations should not be assumed to be the only possible questions to be asked or content areas to be tested on this examination.

The percentage of questions shown for each content area may vary by as much as plus or minus three (3) percent. Please refer to the Candidate Information Brochure and the Reference List for additional information.

Content Area A  15%
Pre-Installation and Site Work

1. **Recommendating changes to plans and specifications**
   - knowledge of symbols
   - knowledge of abbreviations
   - knowledge of terminology
   - knowledge of dimensioning
   - knowledge of material costing
   - knowledge of equipment costing
   - knowledge of labor costing

2. **Designing duct systems**
   - knowledge of design requirements
   - knowledge of symbols
   - knowledge of abbreviations
   - knowledge of air velocity’s static pressures
   - knowledge of final test and balance of completed air distribution system
   - knowledge of drafting
   - knowledge of local, state, and national codes
   - knowledge of SMACNA requirements
   - knowledge of sealants and mastics

3. **Designing roof drainage systems**
   (sheet metal)
   - knowledge of flashing requirements
   - knowledge of roofing materials
   - knowledge of gutter installation requirements
   - knowledge of downspout installation requirements

4. **Designing sheet metal specialties**
   - knowledge of louver requirements
   - knowledge of screen requirements
   - knowledge of gravity ventilator requirements
   - knowledge of power roof exhauster requirements
   - knowledge of smoke hatch requirements
   - knowledge of linen and trash shoot requirements
   - knowledge of stack requirements
   - knowledge of types of locks and seams
   - knowledge of design requirements

5. **Designing grease handling duct systems**
   - knowledge of design requirements
   - knowledge of fire codes

6. **Determining proper gauge of metals used**
   - knowledge of gauge tables
   - knowledge of reinforcement requirements
   - knowledge of proper gauges
   - knowledge of types of metal and bracing
   - knowledge of local, state, and national codes
   - knowledge of SMACNA requirements
### Content Area B  
**Industrial Duct Fabrication**

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
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<tbody>
<tr>
<td>1. Fabricating rectangular ducts under 2 ft.</td>
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</table>
- knowledge of sheet metal duct requirements  
- knowledge of fiberglass duct requirements  
- knowledge of flex duct requirements  
- knowledge of duct fitting requirements  
- knowledge of duct outlets and grilles  
- knowledge of joining requirements  
- knowledge of double seam corner  
- knowledge of elbow longitudinal seams  
- knowledge of butt welding techniques and requirements  
- knowledge of using a pattern  
- knowledge of double angles  
- knowledge of mitering  
- knowledge of plug weld or spot weld techniques and requirements  
- knowledge of irregular angles  
- knowledge of how to operate light gauge welding units  
- knowledge of safety requirements |

| 2. Fabricating rectangular ducts over 2 ft. |  
- knowledge of sheet metal duct requirements  
- knowledge of fiberglass duct requirements  
- knowledge of flex duct requirements  
- knowledge of duct fitting requirements  
- knowledge of duct outlets and grilles  
- knowledge of joining requirements  
- knowledge of double seam corner  
- knowledge of elbow longitudinal seams  
- knowledge of butt welding techniques and requirements  
- knowledge of using a pattern  
- knowledge of double angles  
- knowledge of mitering  
- knowledge of plug weld or spot weld techniques and requirements  
- knowledge of irregular angles  
- knowledge of how to operate light gauge welding units  
- knowledge of safety requirements |

| 3. Fabricating round sheet metal ducts |  
- knowledge of sheet metal duct requirements  
- knowledge of fiberglass duct requirements  
- knowledge of flex duct requirements  
- knowledge of duct fitting requirements  
- knowledge of duct outlets and grilles  
- knowledge of joining requirements  
- knowledge of double seam corner  
- knowledge of elbow longitudinal seams  
- knowledge of butt welding techniques and requirements  
- knowledge of using a pattern  
- knowledge of mitering  
- knowledge of plug weld or spot weld techniques and requirements  
- knowledge of how to operate light gauge welding units  
- knowledge of safety requirements |

| 4. Fabricating oval sheet metal ducts |  
- knowledge of triangulation  
- knowledge of measuring lines  
- knowledge of mitering  
- knowledge of how to operate light gauge welding units  
- knowledge of safety requirements |

| 5. Fabricating fittings for rectangular ducts |  
- knowledge of layout requirements and techniques  
- knowledge of mitering  
- knowledge of how to operate light gauge welding units  
- knowledge of safety requirements |

| 6. Fabricating fittings for round ducts |  
- knowledge of layout requirements and techniques  
- knowledge of radial line layout  
- knowledge of mitering  
- knowledge of how to operate light gauge welding units  
- knowledge of safety requirements |

| 7. Fabricating fittings for oval ducts |  
- knowledge of layout requirements and techniques  
- knowledge of mitering  
- knowledge of how to operate light gauge welding units  
- knowledge of safety requirements |
8. **Fabricating snaplock seams**  
   knowledge of allowances

9. **Fabricating standing seams**  
   knowledge of layout requirements and techniques

10. **Fabricating other types of locks and seams**  
    knowledge of other types of seam techniques and requirements  
    knowledge of welding requirements and techniques  
    knowledge of mechanical seam requirements

11. **Fabricating interior lined sheet metal ducts**  
    knowledge of layout and design techniques and requirements  
    knowledge of seam requirements and techniques  
    knowledge of pin spacing (well pins, etc.)  
    knowledge of adhesives and coverage

12. **Fabricating kitchen hoods**  
    knowledge of exhaust out vs. fresh air intake requirements  
    knowledge of design requirements and materials  
    knowledge of state and national codes  
    knowledge of layout and design  
    knowledge of welding requirements  
    knowledge of fire codes  
    knowledge of SMACNA requirements

13. **Fabricating kitchen hood exhaust systems**  
    knowledge of exhaust out vs. fresh air intake requirements  
    knowledge of design requirements and materials  
    knowledge of state and national codes  
    knowledge of layout and design  
    knowledge of welding requirements  
    knowledge of fire codes  
    knowledge of SMACNA requirements  
    knowledge of how to operate light gauge welding units  
    knowledge of safety requirements

14. **Fabricating drain pans**  
    knowledge of layout and design requirements and techniques  
    knowledge of seam requirements and techniques  
    knowledge of soldering

15. **Fabricating air handling systems**  
    (ducts and fans)  
    knowledge of seam requirements and techniques  
    knowledge of fittings

16. **Fabricating turning vanes**  
    knowledge of different types (single blade, air foil)  
    knowledge of spacing requirements  
    knowledge of required numbers of elbows

**Content Area C**  
**Architectural Sheet Metal**

1. **Fabricating formed gravel stop fascia systems**  
    knowledge of pitch drippage  
    knowledge of lips  
    knowledge of soffits  
    knowledge of drip edge  
    knowledge of gauge requirements  
    knowledge of flange  
    knowledge of crimped metal requirements and techniques  
    knowledge of longitudinal break

2. **Fabricating through-wall flashings**  
    knowledge of materials requirements  
    knowledge of dowels  
    knowledge of extension length  
    knowledge of wall cavity protection

3. **Fabricating gravel stops**  
    knowledge of minimum gauge requirements  
    knowledge of cleat requirements  
    knowledge of edge strips  
    knowledge of types of gravel stops  
    knowledge of fascia  
    knowledge of mastic  
    knowledge of back-up plate  
    knowledge of top cover plate  
    knowledge of fastener requirements  
    knowledge of watertight washers  
    knowledge of soffits  
    knowledge of joint requirements  
    knowledge of corner requirements
4. Fabricating base and counter flashing systems
   - knowledge of receivers
   - knowledge of masonry walls
   - knowledge of effects of drippage
   - knowledge of notching and lapping
   - knowledge of drip edge requirements
   - knowledge of raggle
   - knowledge of wedges
   - knowledge of gauge requirements

5. Fabricating valley flashings
   - knowledge of gauge requirements
   - knowledge of hook edges
   - knowledge of cleat requirements
   - knowledge of properties of zinc alloy and painted terne metal
   - knowledge of crimping techniques and requirements

6. Fabricating hip and ridge flashings
   - knowledge of length requirements
   - knowledge of shingle roof requirements

7. Fabricating flashing around roof penetrations
   - knowledge of bonnet flashing requirements
   - knowledge of collar requirements
   - knowledge of fastener requirements
   - knowledge of flanges
   - knowledge of sealing requirements
   - knowledge of cap flashing requirements

8. Fabricating flashing for equipment supports
   - knowledge of counter flashing requirements
   - knowledge of insulation requirements
   - knowledge of cants
   - knowledge of seaming techniques and requirements
   - knowledge of inverted V and hemming

9. Fabricating formed metal coping
   - knowledge of gauge requirements
   - knowledge of types of materials
   - knowledge of fastener requirements and techniques
   - knowledge of sealing requirements
   - knowledge of mitering

10. Fabricating extruded coping
    - knowledge of mitering
    - knowledge of gauge requirements

11. Fabricating expansion joint intersections
    - knowledge of expansion and contraction sizing requirements
    - knowledge of curb requirements

12. Fabricating roof and separation joint intersections
    - knowledge of minimum wood curb requirements
    - knowledge of maximum allowance for expansion
    - knowledge of continuous flange
    - knowledge of expansion cap
    - knowledge of counter flashing requirements
    - knowledge of standing seam requirements
    - knowledge of cleat requirements

13. Fabricating expansion joints designed to allow independent roof movement
    - knowledge of face plate requirements
    - knowledge of hook seam requirements
    - knowledge of curbs
    - knowledge of neoprene and weather resistant materials requirements
    - knowledge of receiver requirements
    - knowledge of links
    - knowledge of adhesives
    - knowledge of minimum gauge requirements
    - knowledge of length requirements
    - knowledge of horizontal working width
    - knowledge of mitering
    - knowledge of sealing

14. Fabricating water stops
    - knowledge of mitering

15. Fabricating expansion joints for floor slabs
    - knowledge of minimum gauge requirements

16. Fabricating seams for flat metal roofs
    - knowledge of types of seams
    - knowledge of sealing
    - knowledge of fastening requirements
    - knowledge of joint requirements

17. Determining gauge and pan width for standing seam roofs
    - knowledge of materials
    - knowledge of gauge requirements
    - knowledge of pan width requirements
18. Fabricating batten seams for metal roofs
   knowledge of types of seams
   knowledge of sealing
   knowledge of fastening requirements
   knowledge of joint requirements

19. Fabricating chevron batten seams for metal roofs
   knowledge of gauge requirements
   knowledge of lock and seam requirements

20. Fabricating mansard roofs and screens
   knowledge of cap flashing requirements
   knowledge of sill flashing requirements
   knowledge of batten requirements
   knowledge of standing seam requirements and techniques
   knowledge of snaplock seam requirements and techniques
   knowledge of double S seam requirements and techniques

21. Fabricating parts of an ornamental roof
   knowledge of standing seam requirements and techniques
   knowledge of batten requirements
   knowledge of canopy requirements

22. Fabricating parts of a bermuda type roof
   knowledge of wood framing requirements and techniques
   knowledge of pans
   knowledge of continuous cleat requirements
   knowledge of minimum gauge requirements
   knowledge of pan widths

23. Manufacturing parts of a skylight
   knowledge of single and double pitch requirements
   knowledge of condensate gutters
   knowledge of skylight bars
   knowledge of weep holes
   knowledge of bar joints
   knowledge of mitering
   knowledge of soldering requirements and techniques
   knowledge of material requirements
   knowledge of gauge requirements

24. Fabricating roof scuttles
   knowledge of forming a curb
   knowledge of scuttle requirements
   knowledge of metal skirt requirements

25. Manufacturing formed louvers
   knowledge of stiffener bars
   knowledge of mullion connected sections
   knowledge of sealing requirements
   knowledge of metal sill flashing
   knowledge of screening

26. Fabricating louvered enclosures
   knowledge of gauge requirements
   knowledge of material requirements

27. Fabricating louvered sunshades
   knowledge of gauge requirements
   knowledge of material requirements

28. Fabricating sunshade canopies
   knowledge of support requirements
   knowledge of sunshade frame requirements

29. Fabricating rectangular gutters
   knowledge of sizing gutters
   knowledge of design requirements

30. Fabricating half round gutters
   knowledge of sizing
   knowledge of design requirements

31. Fabricating built-in gutters
   knowledge of corrosion resistant materials
   knowledge of soldering techniques and requirements
   knowledge of riveting techniques and requirements
   knowledge of seaming techniques and requirements
   knowledge of wood box frame requirements
   knowledge of expansion joints
   knowledge of continuous cleat techniques and requirements
   knowledge of outlet requirements
32. Fabricating water diverters  
   knowledge of sizing  
   knowledge of pitch requirements  
   knowledge of gauge requirements  
   knowledge of cleat requirements  
   knowledge of bracing requirements  
   knowledge of allowances for expansion  
   knowledge of flanges and effects of temperature

33. Placing expansion joints in gutters  
   knowledge of materials  
   knowledge of width of joints  
   knowledge of expansion rates

34. Fabricating lap type gutter expansion joints  
   knowledge of riveting techniques and requirements  
   knowledge of sizing

35. Fabricating butt type gutter expansion joints  
   knowledge of materials  
   knowledge of width of joints  
   knowledge of expansion rates

36. Fabricating built-in gutter expansion joints  
   knowledge of materials  
   knowledge of width of joints  
   knowledge of expansion rates

37. Fabricating expansion joints in welded gutters  
   knowledge of riveting techniques and requirements  
   knowledge of sizing

38. Fabricating combination scuppers and gutters  
   knowledge of soldering techniques and requirements  
   knowledge of intervals  
   knowledge of rims

39. Fabricating hanging gutters  
   knowledge of sizing  
   knowledge of gutter brackets and straps  
   knowledge of material requirements  
   knowledge of spaces  
   knowledge of spike and ferrule

40. Fabricating gutter accessories  
   (e.g., baffle, screen, strainers)  
   knowledge of sizing  
   knowledge of material compatibility

41. Fabricating conductor heads  
   knowledge of sizing  
   knowledge of minimum length for outlet tube  
   knowledge of gauges

42. Fabricating formed roof sumps  
   knowledge of flanges  
   knowledge of gravel stop requirements  
   knowledge of welding requirements and techniques  
   knowledge of gauges  
   knowledge of sizing

43. Fabricating scuppers  
   knowledge of material compatibility  
   knowledge of gauges  
   knowledge of welding requirements and techniques

44. Fabricating overflow scuppers  
   knowledge of material compatibility  
   knowledge of gauges  
   knowledge of welding requirements and techniques

45. Fabricating downspouts  
   knowledge of dimensioning  
   knowledge of minimum gauges for standard downspouts  
   knowledge of material compatibility  
   knowledge of elbow requirements  
   knowledge of hanger requirements

46. Determining types of downspout hangers  
   knowledge of types of hangers  
   knowledge of material compatibility

47. Fabricating downspout hangers  
   knowledge of material compatibility  
   knowledge of support requirements

48. Constructing and installing splash pans  
   knowledge of placement requirements  
   knowledge of dimensioning
<table>
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<tr>
<th>Content Area D</th>
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<tbody>
<tr>
<td>Fabricating Other Sheet Metal Structures</td>
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1. **Fabricating gravity ventilators**  
   - knowledge of seaming techniques and requirements  
   - knowledge of material requirements  
   - knowledge of curbs  
   - knowledge of weep hole requirements  
   - knowledge of cants  
   - knowledge of flashing requirements  
   - knowledge of riveting techniques and requirements  
   - knowledge of dampers  
   - knowledge of screening techniques and requirements

2. **Fabricating power roof ventilators (exhauster)**  
   - knowledge of sizing  
   - knowledge of material requirements

3. **Fabricating smoke hatches**  
   - knowledge of spring requirements  
   - knowledge of material requirements  
   - knowledge of riveting techniques and requirements  
   - knowledge of sizing

4. **Fabricating draft and fire curtains**  
   - knowledge of seaming techniques and requirements  
   - knowledge of gauge requirements  
   - knowledge of bracing requirements

5. **Fabricating cornices**  
   - knowledge of sheathing techniques and requirements  
   - knowledge of blocking techniques and requirements  
   - knowledge of fastening techniques and requirements  
   - knowledge of soldering and welding techniques and requirements  
   - knowledge of mitering

6. **Fabricating spires**  
   - knowledge of material requirements  
   - knowledge of welding techniques and requirements  
   - knowledge of fastening techniques and requirements

7. **Fabricating cornerstone boxes**  
   - knowledge of soldering techniques and requirements  
   - knowledge of insulation requirements  
   - knowledge of riveting

8. **Fabricating column covers**  
   - knowledge of gauge requirements  
   - knowledge of material compatibility  
   - knowledge of soldering and welding techniques and requirements

9. **Fabricating corner guards**  
   - knowledge of fastening techniques and requirements

10. **Fabricating wall panels**  
    - knowledge of fastening techniques and requirements

11. **Fabricating metal siding and roofing**  
    - knowledge of welding and soldering techniques and requirements  
    - knowledge of fastening techniques and requirements

12. **Fabricating exhausts**  
    - knowledge of welding and soldering techniques and requirements  
    - knowledge of riveting techniques and requirements

13. **Fabricating partition and column closures**  
    - knowledge of sizing

14. **Fabricating ornamental hoods**  
    - knowledge of welding and soldering techniques and requirements

15. **Fabricating linen and trash chutes**  
    - knowledge of welding and soldering techniques and requirements

16. **Fabricating stacks**  
    - knowledge of welding and soldering techniques and requirements
Content Area E                                           25%
Installation of Sheet Metal Systems

1. Installing rectangular sheet metal ducts and fittings
   knowledge of hanger types
   knowledge of hanging techniques and requirements
   knowledge of fittings
   knowledge of sealants and mastics

2. Installing round sheet metal ducts and fittings
   knowledge of hanger types
   knowledge of hanging techniques and requirements
   knowledge of fittings
   knowledge of sealants and mastics

3. Installing oval sheet metal ducts
   knowledge of hanger types
   knowledge of hanging techniques and requirements
   knowledge of fittings
   knowledge of sealants and mastics

4. Installing spiral sheet metal ducts and fittings
   knowledge of hanger types
   knowledge of hanging techniques and requirements
   knowledge of fittings
   knowledge of sealants and mastics

5. Installing coping
   knowledge of sealing techniques and requirements
   knowledge of blocking techniques and requirements
   knowledge of anchoring techniques and requirements
   knowledge of cleat requirements

6. Installing gravel stops
   knowledge of stop fascia
   knowledge of cleat requirements
   knowledge of fastening techniques and requirements
   knowledge of soffit requirements

7. Installing fascia
   knowledge of fastening techniques and requirements
   knowledge of nailing techniques and requirements
   knowledge of joints
   knowledge of overlapping and corrosion protection

8. Installing flashing
   knowledge of underlayment requirements
   knowledge of fastening techniques and requirements
   knowledge of nailing techniques and requirements
   knowledge of joints
   knowledge of overlapping and corrosion protection

9. Installing metal roofs
   knowledge of dead loads
   knowledge of joining requirements
   knowledge of riveting techniques and requirements
   knowledge of sealing techniques and requirements
   knowledge of seam requirements

10. Installing metal roof components
    knowledge of joining requirements
    knowledge of sealing techniques and requirements
    knowledge of seam requirements

11. Installing gutters and downspouts
    knowledge of sizing
    knowledge of hanger techniques and requirements
    knowledge of sheet requirements
    knowledge of water diverter requirements
    knowledge of allowance for gutter expansion and joints

12. Installing other sheet metal structures
    knowledge of joining requirements
    knowledge of fastening techniques and requirements

13. Performing fire department required smoke tests
    knowledge of requirements
14. **Installing air handling systems**
   - Knowledge of fastening techniques and requirements
   - Knowledge of installation techniques and requirements

15. **Balancing air handling systems**
   - Knowledge of balancing to CFM required in different areas
   - Knowledge of air balance meter operation

16. **Installing kitchen exhaust systems**
   - Knowledge of fastening techniques and requirements
   - Knowledge of installation techniques and requirements
   - Knowledge of design and codes

17. **Installing fiberglass duct systems**
   - Knowledge of hanging techniques and requirements
   - Knowledge of joining techniques and requirements

18. **Installing fire dampers, smoke dampers and fire and smoke combination dampers**
   - Knowledge of break-away techniques
   - Knowledge of local and national codes
   - Knowledge of NFPA requirements
   - Knowledge of SMACNA requirements

Content Area F 15%

**Safety and Equipment**

1. **Wearing hearing protection**
   - Knowledge of safety requirements

2. **Wearing head protection**
   - Knowledge of safety requirements
   - Knowledge of types given job conditions

3. **Wearing eye and face protection**
   - Knowledge of safety requirements
   - Knowledge of types given job conditions

4. **Using respiratory protection**
   - Knowledge of material safety data sheets (M.S.D.S.)
   - Knowledge of types given job conditions

5. **Using ventilation devices**
   - Knowledge of material safety data sheets (M.S.D.S.)
   - Knowledge of types given job conditions

6. **Using overhead hoists or cranes**
   - Knowledge of proper rigging techniques

7. **Using mobile equipment**
   - (e.g., forklifts, hi-lifts, cranes)
   - Knowledge of weight capacities of equipment
   - Knowledge of outriggers

8. **Using ladders, scaffolds, and rolling platforms**
   - Knowledge of how to assemble
   - Knowledge of safety requirements

9. **Using brakes**
   - Knowledge of how to operate
   - Knowledge of safety requirements

10. **Using shears**
   - Knowledge of safety requirements

11. **Using drill presses**
    - Knowledge of safety requirements

12. **Using cutting equipment**
    - Knowledge of safety requirements

13. **Using various hand and power tools**
    - (e.g., power shears, wrenches, and snips)
    - Knowledge of safety requirements

14. **Using air compressors and air tools**
    - Knowledge of safety requirements
    - Knowledge of safe operating pressures