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% Built-Up Roofs

1. Installation of metal gravel stops
   - knowledge of placement
   - knowledge of fastening requirements and techniques
   - knowledge of adhesives requirements and techniques

2. Performing test cuts
   - knowledge of test cut requirements and techniques
   - knowledge of when required
   - knowledge of sizes and best method of testing

3. Built-up roof surfaces
   - knowledge of liquid applied coatings
   - knowledge of spray polyurethanic foam
   - knowledge of aggregates
   - knowledge of cap sheets

4. Tie-ins for built-up roofs
   - following a roofing layout
   - measuring for tie-ins
   - using cold adhesives or sprayed materials

5. Insulating and ventilating for built-up roofs
   - mechanically fastening insulation
   - installing multiple layer insulation
   - installing factory-tapered board roof insulation systems
   - installing field-sloped roof fill, cricketed roof fill and insulation systems
   - installing adhered in-place insulation (e.g., foam, epoxy)
   - determining thermal values of roofing materials
   - knowledge of ventilation requirements for built-up roofs

6. Roof assembly installed over steel decks
   - knowledge of underlayment
   - knowledge of fastening requirements and techniques
   - knowledge of weight and dead loads
   - knowledge of flute span capabilities of insulation

7. Roof assembly installed over concrete decks
   - knowledge of weights and deadloads
   - knowledge of underlayment requirements
   - knowledge of adhesives requirements and techniques
knowledge of fastening requirements and techniques
knowledge of deck preparation

8. **Roof assembly installed over insulating concrete**
   knowledge of weights and deadloads
   knowledge of fastening requirements and techniques

9. **Roof assembly installed over wood deck**
   installing rosin-sized sheathing paper
   knowledge of weights and deadloads
   knowledge of underlayment requirements
   knowledge of adhesives requirements and techniques
   knowledge of fastening requirements and techniques
   knowledge of deck preparation

10. **Installing coal tar pitch built-up roofing**
    knowledge of determining roof slope
    knowledge of what materials can be used with coal tar
    knowledge of ponding
    knowledge of roof penetrations
    knowledge of sloped or tapered insulation requirements

11. **Installing roofing felts**
    knowledge of surface preparation and techniques
    knowledge of temperature requirements
    knowledge of fastening requirements

12. **Installing flashing and counter-flashing for built-up roofs**
    knowledge of metal flashings
    knowledge of reinforced membrane flashings
    knowledge of flashing around penetrations
    knowledge of crickets and saddle flashings

13. **Maintenance and repair of built-up roofs**
    determine roof type

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Content Area B 15%
Shingles and Shakes

1. **Selecting appropriate type of shingles**
   knowledge of types available,
   knowledge of different types and compatibility
   knowledge of number of bundles per square
   knowledge of exposure requirements

2. **Cutting shingles individually when using a pattern**
   knowledge of cutting tools
   knowledge of measuring for cutting

3. **Using the straight-up method**
   knowledge of marking and following bond lines
   knowledge of shingling around obstructions

4. **Using the stair stepping method**
   knowledge of applying strips of underlayment
   knowledge of overlapping measurements

5. **Straightening bond lines**
   knowledge of marking and following bond lines
   knowledge of even and uneven lines
   knowledge of shingling around penetrations or obstructions

6. **Installing wood shakes**
   knowledge of doubling at all eaves
   knowledge of starter course placement
   knowledge of gutter requirements
   knowledge of trough requirements
   knowledge of shingle extension
   knowledge of spacing between adjacent shingles
   knowledge of nailing and fastening
   knowledge of attaching hip and ridge shingles
   knowledge of pre-manufactured hip and ridge unit application
   knowledge of preparing areas to be shingled
   knowledge of handling shingles
   knowledge of roofing underlayments

7. **Determining fastener types, placement and length for wood shakes and shingles**
   knowledge of types of fasteners and their application
   knowledge of spacing for different types of shingles
   knowledge of types of nails
   knowledge of size of nails needed and required

8. **Determining width and grade for wood shakes**
   knowledge of types of grades and when applicable
9. Determining shingle and shake exposure
   - knowledge of slope calculations
   - knowledge of coverage of one square of shingles based on following weather exposures
   - knowledge of types of shingles and shakes and their properties
   - knowledge of spacing requirements

10. Installing composite shingles
    - knowledge of adhesive requirements
    - knowledge of live loads
    - knowledge of cutting
    - knowledge of placement
    - knowledge of roof recover requirements
    - knowledge of surface preparation requirements

11. Tie-ins for shingles and shakes
    - following a roofing layout
    - methods and materials for tie-ins

12. Installing valleys
    - knowledge of methods of installation
    - knowledge of placing shingles appropriately
    - knowledge of plastic cement
    - knowledge of valley underlayments
    - knowledge of adhesive requirements
    - knowledge of fastening requirements and techniques
    - knowledge of underlayment trimming or dub corners
    - verifying and selecting proper materials
    - waterproofing blind/dead valleys
    - connecting valleys

13. Installing and repairing ridges
    - knowledge of alignment
    - knowledge of determining size of nails/attachments
    - knowledge of adhesives
    - knowledge of temperature requirements
    - knowledge of tabs

14. Installing drip edges
    - knowledge of appropriate types of fasteners
    - knowledge of placement
    - knowledge of sealants
    - knowledge of flashing requirements

15. Insulating and ventilating for shingle and shake roofs
    - mechanically fastening insulation
    - installing insulation
    - determining thermal values of roofing materials

16. Installing flashing and counter-flashing for shingle and shake roofs
    - knowledge of metal flashings/compatibility
    - knowledge of reinforced membrane flashings
    - knowledge of flashing around penetrations
    - knowledge of crickets and saddle flashings

17. Maintenance and repair of shingle and shake roofs
    - determine roof assembly and condition
    - knowledge of leak detection

Content Area C 10%
Architectural Metal Roofs

1. Installing architectural metal roofs
    - knowledge of fasteners
    - knowledge of caulk
    - knowledge of adhesives
    - knowledge of soldering
    - knowledge of flashing
    - knowledge of underlayment
    - knowledge of wind loads
    - use of dissimilar materials

2. Tie-ins for architectural metal roofs
    - following a roofing layout
    - measuring for tie-ins
    - using metal flashings

3. Installing metal shingles
    - knowledge of placement
    - knowledge of fastening requirements and techniques
    - knowledge of adhesive requirements
    - knowledge of sealants

4. Insulating and ventilating for architectural metal roofs
    - mechanically fastening insulation
    - determining thermal values of roofing materials
    - knowledge of ventilation requirements for architectural metal roofs

5. Installing flashing and counter-flashing for architectural metal roofs
    - knowledge of metal flashings
    - knowledge of reinforced membrane flashings
    - knowledge of flashing around penetrations
    - knowledge of crickets and saddle flashings
6. Maintenance and repair of architectural metal roofs
determine roof assembly and condition
knowledge of leak detection

Content Area D  15%
Single Ply Systems

1. Installing adhesive-applied systems
   knowledge of adhesives and their properties
   knowledge of effects of sun

2. Installing heat applied systems
   knowledge of heat application equipment
   knowledge of application temperatures

3. Installing mechanically fastened systems
   knowledge of fastening requirements and techniques
   knowledge of sealant requirements and techniques

4. Tie-ins for single-ply roofs
   following a roofing layout
   methods and materials for Tie-ins

5. Determining seaming needs
   knowledge of types of seaming adhesive and their properties
   knowledge of application requirements and techniques
   knowledge of seaming tapes
   knowledge of heat seaming methods

6. Insulating and ventilating
   installing insulation
   installing factory-tapered board roof insulation systems
   installing field-sloped and cricketed roof fill and insulation systems
   determining thermal values of roofing materials
   knowledge of ventilation requirements for single ply roofs

7. Installing flashing and counter-flashing
   knowledge of metal flashings
   knowledge of supported and unsupported membrane flashings
   knowledge of flashing around penetrations
   knowledge of crickets and saddle flashings

8. Maintenance and repair
   determine roof assembly and condition
   knowledge of leak detection

Content Area E  15%
Modified Roofing Systems

1. Installing modified systems
   knowledge of asphalt properties
   knowledge of sealants and caulks
   knowledge of APP modified
   knowledge of SBS modified
   knowledge of SA modified

2. Installing adhesive-applied systems
   knowledge of adhesives and their properties
   knowledge of effects of sun
   knowledge of application methods

3. Installing heat applied systems
   knowledge of heat application equipment
   knowledge of application temperatures

4. Insulating and ventilating
   installing insulation
   installing factory-tapered board roof insulation systems
   installing field-sloped and cricketed roof fill and insulation systems
   determining thermal values of roofing materials
   knowledge of ventilation requirements for modified roofing systems

5. Installing flashing and counter-flashing
   knowledge of metal flashings
   knowledge of reinforced membrane flashings
   knowledge of flashing around penetrations
   knowledge of crickets and saddle flashings

Content Area F  10%
Concrete and Clay Tile Roofs

1. Loads

2. Roof Layout Bond lines

3. Adhesive requirements
4. Installing flashing and counter-flashing for concrete and tile roofs
   knowledge of metal flashings
   knowledge of reinforced membrane flashings
   knowledge of flashing around penetrations
   knowledge of crickets and saddle flashings

5. Under tile drainage requirements

6. Plastic cement application requirements

7. Mortar applications

8. Battens

9. Fastening requirements

10. Ridge and hip tiles

11. Gables and perimeters

12. Foam

13. Underlayment

14. Insulating and ventilating for concrete and clay tile roofs
   mechanically fastening insulation
   determining thermal values of roofing materials
   knowledge of ventilation requirements for concrete and clay tile roofs

15. Tie-ins for concrete and tile roofs
   following a roofing layout
   measuring for tie-ins
   using metal flashings

16. Maintenance and repair of concrete and tile roofs
   determine roof assembly and condition
   knowledge of leak detection

Content Area G
Membrane Waterproofing

1. Installation of walls below grade
   knowledge of materials
   knowledge of primers
   different membrane types
   hydrostatic pressure
   knowledge of hot and cold application methods
   knowledge of when membrane waterproofing is required

2. Installation of floor slabs
   knowledge of materials
   knowledge of primers
   different membrane types
   hydrostatic pressure
   knowledge of hot and cold application methods
   knowledge of when membrane waterproofing is required

Content Area H
Drain and Gutters

1. Verifying scupper overflow requirements
   knowledge of water flow rates

2. Determining gutter and downspout requirements
   knowledge of water flow rates

3. Installing gutters and downspouts
   knowledge of strapping
   knowledge of fastening requirements and techniques
   knowledge of size requirements

4. Installing leader and conductor heads
   knowledge of fastening requirements and techniques
   knowledge of caulking and sealants
   knowledge of size requirements

Content Area I
Equipment and Safety

1. Using ladders
   knowledge of safety requirements
   knowledge of OSHA requirements

2. Using scaffolds
   knowledge of safety requirements
   knowledge of OSHA requirements

3. Using hoists (manual and automatic)
   knowledge of safety requirements
   knowledge of OSHA requirements
   knowledge of load capabilities

4. Using lift trucks
   knowledge of safety requirements
   knowledge of OSHA requirements
   knowledge of load capabilities
5. **Using kettles**
   knowledge of safety requirements
   knowledge of OSHA requirements
   knowledge of tar temperature
   knowledge of temperature gauges and automatic controls
   knowledge of starting procedures

6. **Using heat welding equipment**
   knowledge of safety requirements
   knowledge of OSHA requirements
   knowledge of torches
   knowledge of hot air

7. **Using manual lifts**
   knowledge of safety requirements
   knowledge of OSHA requirements
   knowledge of load capabilities

8. **Using pump lifts**
   knowledge of safety requirements
   knowledge of OSHA requirements
   knowledge of dynamic heads
   knowledge of mechanical joints

9. **Using roof jacks for steep pitch**
   knowledge of safety requirements
   knowledge of OSHA requirements
   knowledge of proper anchoring procedures

10. **Using spudding machines**
    knowledge of safety requirements
    knowledge of OSHA requirements
    knowledge of aggregate disposal

11. **Using compressors**
    knowledge of safety requirements
    knowledge of OSHA requirements

12. **Using pneumatic equipment**
    knowledge of safety requirements
    knowledge of OSHA requirements
    knowledge of pressure requirements
    knowledge of fastening requirements and techniques

13. **Fall Protection**
    Knowledge of safety requirements
    Knowledge of OSHA requirements