



RESIDENTIAL POOL CONTRACTORS GENERAL TRADE KNOWLEDGE EXAMINATION CONTENT INFORMATION

Revised March 2009

The General Trade Knowledge examination will be administered in one session on the morning of the first day of the examination administration. 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 **7 ½%** **Pre-Installation and Site Preparation**

- 1. Drawing plans that meet job requirements**
 - knowledge of symbols
 - knowledge of abbreviations
 - knowledge of terminology
 - knowledge of site dimensions
 - knowledge of scale dimensions
 - knowledge of soil types

2. Checking code and ordinance requirements to determine appropriate equipment needed for jobs

- knowledge of site conditions
- knowledge of subsoil conditions
- knowledge of water tables
- knowledge of characteristics of gunite, tile, steel, fiberglass, vinyl, concrete piping, and wiring

Content Area B **15%** **Pool and Spa Excavation**

1. Locating underground, above ground and overhead obstructions

- knowledge of where to find information
- knowledge of site conditions
- knowledge of how to identify obstructions
- knowledge of when and how to notify appropriate authorities
- knowledge of permissible working conditions

2. Excavating or clearing sites

- knowledge of staking out excavation
- knowledge of determining location of excavation
- knowledge of invert elevations
- knowledge of basic surveying
- knowledge of layout methods
- knowledge of interpreting plans and specifications
- knowledge of surveying and leveling equipment
- knowledge of compaction equipment
- knowledge of earth moving and excavation equipment

3. Performing site grading

- knowledge of elevation requirements
- knowledge of basic surveying and leveling techniques
- knowledge of surveying and leveling equipment
- knowledge of identification of obstructions
- knowledge of removal of site debris

4. **Determining water tables**
 - knowledge of subsoil conditions
 - knowledge of augers
 - knowledge of aquifers
 - knowledge of drilling equipment and practices
5. **Determining water and soil conditions**
 - knowledge of excavation
 - knowledge of sampling
 - knowledge of soil composition
 - knowledge of soil testing
6. **Performing de-watering, de-mucking and well-pointing**
 - knowledge of dewatering equipment
 - knowledge of piping requirements
 - knowledge of soils
 - knowledge of soil permeability
 - knowledge of excavation equipment
 - knowledge of excavating techniques and requirements
 - knowledge of water table
 - knowledge of well points
 - knowledge of drawdown
 - knowledge of pump requirements and techniques
7. **Removing sod**
 - knowledge of calculating area
 - knowledge of compaction
 - knowledge of soil conditions
8. **Backfilling and compacting**
 - knowledge of different types of backfill material
 - knowledge of surveying and leveling equipment
 - knowledge of surveying and leveling techniques
 - knowledge of soil properties
 - knowledge of tamping
 - knowledge of correct moisture content
 - knowledge of percent compaction
 - knowledge of soil density testing techniques
 - knowledge of the amount of dirt to fill
9. **Removing foreign materials and debris**
 - knowledge of hand tools
 - knowledge of excavation equipment
 - knowledge of hauling equipment
 - knowledge of materials disposal requirements
 - knowledge of environmental standards protection

Content Area C
Plumbing Work

12 ½%

1. **Installing recirculating lines**
 - knowledge of piping materials and applications
 - knowledge of placement
 - knowledge of associated fittings
 - knowledge of valve requirements
 - knowledge of related components
2. **Pressure testing recirculating lines**
 - knowledge of theory
 - knowledge of psi's
 - knowledge of hook-up and placement
 - ability to understand test results
 - knowledge of dangers of pressure plugs
 - knowledge of open trench inspections
 - knowledge of pressure testing techniques
 - knowledge of the dangers of pressurized lines
3. **Installing filter equipment**
 - knowledge of filtration requirements
 - knowledge of type of filters
 - knowledge of gauges and valves
 - knowledge of placement of pumps
 - knowledge of types and capacities of motors
 - knowledge of piping requirements
 - knowledge of flow rates and piping pressures
 - knowledge of inlets and outlets
4. **Installing pumps**
 - knowledge of filtration requirements
 - knowledge of types of pumps and pump loads
 - knowledge of grounding
 - knowledge of piping techniques and requirements
 - knowledge of pressures and flow requirements
5. **Installing skimmers**
 - knowledge of filtration requirements
 - knowledge of types of skimmers
 - knowledge of skimmer housings
 - knowledge of strainer baskets
 - knowledge of weirs and valves
 - knowledge of vacuum cleaning connections
 - knowledge of flow rates, pressures, and overflow systems

- 6. Installing solar heaters**
 - knowledge of solar heating requirements and practices
 - knowledge of solar collectors
 - knowledge of piping techniques and requirements
 - knowledge of pipe fittings
 - knowledge of control requirements
 - knowledge of pump requirements
- 7. Installing conventional heaters (gas, heat pump, electric)**
 - knowledge of state and local codes
 - knowledge of location requirements
 - knowledge of fire and gas codes
 - knowledge of sizing and flow rates
 - knowledge of heat exchangers for gas heaters
 - knowledge of location of L.P. Gas tanks for gas heaters
 - knowledge of heat pumps for electric heaters
 - knowledge of immersion elements for electric heaters
- 8. Installing automatic cleaners**
 - knowledge of piping requirements
 - knowledge of pipe fitting
 - knowledge of fittings
 - knowledge of pumps
 - knowledge of filtration requirements
 - knowledge of materials
 - knowledge of processes for automatic feeders
- 9. Installing automatic feeders**
 - knowledge of piping techniques and requirements
 - knowledge of pipe fitting requirements
 - knowledge of pipe fitting
 - knowledge of pipe materials
 - knowledge of processes for automatic feeders
- 10. Sizing pipes**
 - knowledge of hydraulics

Content Area D **5%**
Electrical Work

- 1. Determining power line requirements**
 - knowledge of wire size based on amperage
 - knowledge of size of conduit
 - knowledge of wire type
 - knowledge of overhead power
 - knowledge of “call before you dig”
 - knowledge for determining line sizes
- 2. Installing electric control panels**
 - knowledge of safety requirements
 - knowledge of electrical grounding requirements
 - knowledge of sizing breakers
- 3. Bonding**
 - knowledge of safety requirements
 - knowledge of bonding requirements
- 4. Grounding**
 - knowledge of safety requirements
 - knowledge of electrical grounding requirements
- 5. Installing light niches**
 - knowledge of proper installation requirements (conduit)
 - knowledge of safety requirements
 - knowledge of types of niches
 - knowledge of location and amount of illumination
 - knowledge of bonding requirements
 - knowledge of product specifications
 - knowledge of elevation and placement of niche
- 6. Installing, replacing and repairing electrical components**
 - knowledge of local and state codes
 - knowledge of automatic timers
 - knowledge of lights
 - knowledge of electrical connections to chlorinating generators

Content Area E
Shell Placement

10%

1. Installing steel reinforcing bars

knowledge of reinforcing practices and procedures
knowledge of measurement requirements
knowledge of measuring equipment

2. Installing fiberglass walls

knowledge of material properties
knowledge of specific handling requirements
knowledge of supports and anchorage
knowledge of backfilling requirements
knowledge of surveying and leveling equipment
knowledge of surveying and leveling techniques
knowledge of soil properties and angle of repose
knowledge of excavation techniques

3. Installing wood walls

knowledge of material properties
knowledge of specific handling requirements
knowledge of supports and anchorage
knowledge of backfilling requirements
knowledge of surveying and leveling equipment
knowledge of surveying and leveling techniques
knowledge of soil properties and angle of repose
knowledge of excavation techniques

4. Installing metal walls

knowledge of material properties
knowledge of specific handling requirements
knowledge of supports and anchorage
knowledge of backfilling requirements
knowledge of surveying and leveling equipment
knowledge of surveying and leveling techniques
knowledge of soil properties and angle of repose
knowledge of excavation techniques

5. Installing plastic walls

knowledge of material properties
knowledge of specific handling requirements
knowledge of supports and anchorage
knowledge of backfilling requirements
knowledge of surveying and leveling equipment
knowledge of surveying and leveling techniques
knowledge of soil properties and angle of repose
knowledge of excavation techniques

6. Installing structural polymer walls

knowledge of material properties
knowledge of specific handling requirements
knowledge of supports and anchorage
knowledge of backfilling requirements
knowledge of surveying and leveling equipment
knowledge of surveying and leveling techniques
knowledge of soil properties and angle of repose
knowledge of excavation techniques

7. Testing for leakage in pool and spa shells

knowledge of measuring elevation differentials
knowledge of evaporation

8. Mixing pneumatically applied concrete

knowledge of concrete reinforcement requirements
knowledge of concrete properties
knowledge of concrete testing
knowledge of placement techniques
knowledge of finishing techniques
knowledge of pressurized concrete equipment

9. Installing precast support pilings

knowledge of soils
knowledge of precast piles
knowledge of pile driving methods and procedures

10. Installing concrete blocks by region and soil condition

Content Area F 5%
Deck Work

- 1. Laying out and forming decks**
knowledge of surveying and leveling equipment
knowledge of surveying and leveling techniques
knowledge of excavation and backfill
knowledge of drainage requirements
knowledge of form work
knowledge of safety requirements
- 2. Installing wood decks**
knowledge of pressure treated wood
knowledge of other wood protection
knowledge of carpentry
knowledge of carpentry tools
knowledge of foundations
- 3. Installing concrete decks**
knowledge of concrete properties
knowledge of concrete reinforcement
knowledge of concrete placement
knowledge of concrete finishing
knowledge of form work
knowledge of expansion and contraction protection
knowledge of drainage and slope
knowledge of drains and plumbing
knowledge of deck finishes
- 4. Installing masonry type decks (tile, stone, and brick)**
knowledge of sub-base materials
knowledge of work requirements
knowledge of work placement
knowledge of drainage and slope
knowledge of drains and plumbing
- 5. Tying different kinds of decks to pool shells (wood, concrete, stone)**

Content Area G 10%
Tile, Coping and Trim Work

- 1. Installing tiles**
knowledge of material properties
knowledge of specific handling requirements
knowledge of measurements
knowledge of measuring equipment
knowledge of types of grouts and requirements
knowledge of adhesive requirements
knowledge of mortar requirements
knowledge of cleaning
knowledge of leveling techniques and requirements
knowledge of architectural effects
- 2. Installing masonry trims (brick, stone, and precast coping)**
knowledge of material properties
knowledge of specific handling requirements
knowledge of measurements
knowledge of measuring equipment
knowledge of types of grouts and requirements
knowledge of adhesive requirements
knowledge of mortar requirements
knowledge of cleaning
knowledge of leveling techniques and requirements
knowledge of architectural effects
knowledge of mitering
- 3. Checking for level placement of materials**
knowledge of leveling equipment
knowledge of leveling techniques and requirements
- 4. Checking code requirements**

Content Area H 5%
Accessory Work

- 1. Installing fencing**
knowledge of state and local codes
knowledge of location requirements
knowledge of picket spacing
knowledge of safety requirements
knowledge of barrier code and insurance requirements

2. Installing diving boards and diving platforms

knowledge of materials for diving boards
knowledge of installation requirements
knowledge of safety requirements
knowledge of proper placement

3. Installing slides

knowledge of materials for slides
knowledge of installation requirements
knowledge of proper placement

4. Installing auxiliary lighting

knowledge of fiber optic lighting
knowledge of low voltage accent lighting

5. Installing alternate sanitation devices

knowledge of different types of devices

Content Area I 5%
Interior Surface Preparation and Finishing

1. Performing interior pool and spa clean-ups

knowledge of drawdown
knowledge of possible uplift
knowledge of chemicals
knowledge of cleaning solutions
knowledge of cleaning procedures
knowledge of safety requirements
knowledge of disposal requirements

2. Performing interior pool and spa plastering of pneumatically placed or poured concrete pools

knowledge of gunite materials, procedures, and requirements
knowledge of shotcrete materials and procedures
knowledge of concrete requirements
knowledge of concrete testing
knowledge of concrete properties
knowledge of form work
knowledge of finishing and brazing

3. Installing lining in vinyl-lined pools

knowledge of materials
knowledge of methods
knowledge of soils
knowledge of retaining walls
knowledge of coping
knowledge of leveling and installing
knowledge of anchoring

Content Area J 5%
Start Up

1. Pre-testing fill water

knowledge of water chemistry
knowledge of testing procedures and requirements
knowledge of reagents
knowledge of saturation
knowledge of pH
knowledge of total alkalinity
knowledge of hardness

2. Testing filters and filtration

knowledge of pressurizing procedures and requirements
knowledge of turnover rates
knowledge of pumps
knowledge testing procedures

3. Balancing pool water

knowledge of water chemistry
knowledge of testing procedures and requirements
knowledge of solutions
knowledge of reagents
knowledge of saturation
knowledge of pH
knowledge of total alkalinity
knowledge hardness
knowledge of disinfecting
knowledge of sanitizing
knowledge safety requirements
knowledge of chemical dangers

4. Starting pool and spa auxiliary equipment

knowledge of equipment specifications
knowledge of system design

5. Testing heating equipment

knowledge of wiring
knowledge of fuels
knowledge of solar input
knowledge of testing procedures
knowledge of temperature measurement
knowledge of system design

6. Testing pump sections

knowledge of testing procedures
knowledge pump requirements
knowledge of system design

- 7. Performing exterior pool and spa clean-ups**
knowledge of material procedures
knowledge of safety requirements

Content Area K **10%**
Service and Maintenance

- 1. Demonstrating pool operation to owners**
knowledge of mechanical and hydraulic systems
knowledge of chemical systems
knowledge of general pool care requirements
knowledge of communicating safety requirements
knowledge of equipment
knowledge of communication skills
knowledge of daily reports
- 2. Sanitizing pools and spas through chlorination**
knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of practices of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures
knowledge of chemical balancing techniques and requirements
knowledge of testing techniques and requirements
knowledge of reagents
knowledge of adjusting techniques and requirements

- 3. Performing shock treatments or super-chlorinations**
knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures and techniques
knowledge of chemical balancing
knowledge of testing techniques and requirements
knowledge of reagents
knowledge of adjusting techniques and requirements
- 4. Determining breakpoint chlorinations**
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of practices of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures
knowledge of chemical balancing techniques and requirements
knowledge of testing techniques and requirements
knowledge of reagents
knowledge of adjusting techniques and requirements
- 5. Sanitizing pools and spas through oxidation**
knowledge of effects of pool chemicals
knowledge of practices of pool chemicals
knowledge of safety requirements
knowledge of chemical balancing techniques and requirements
knowledge of testing techniques and requirements
knowledge of reagents
knowledge of adjusting techniques and requirements
- 6. Checking accurate turbidity**
knowledge of testing techniques and requirements
knowledge of reagents
knowledge adjusting techniques and requirements

7. Testing and adjusting pH values

knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures
knowledge of chemical balancing techniques and requirements
knowledge of testing techniques and requirements
knowledge of reagents
knowledge of adjusting techniques and requirements

8. Testing and adjusting water hardness

knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of practices of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures
knowledge of chemical balancing techniques and requirements
knowledge of testing techniques and requirements
knowledge of reagents
knowledge of adjusting techniques and requirements

9. Testing and adjusting total alkalinity

knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures
knowledge of chemical balancing techniques and requirements
knowledge of testing techniques and requirements
knowledge of reagents
knowledge of adjusting techniques and requirements

10. Testing and adjusting cyanuric acid

knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures
knowledge of chemical balancing techniques and requirements
knowledge of testing techniques and requirements
knowledge of reagents
knowledge of adjusting techniques and requirements

11. Testing and adjusting metals

knowledge of water chemistry
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating procedures
knowledge of chemical balancing techniques and requirements
knowledge of testing techniques and requirements
knowledge of reagents
knowledge of adjusting techniques and requirements

12. Cleaning D.E. filters by pressure backwashing and jet spraying

knowledge of system design
knowledge of pump requirements
knowledge of flow rates
knowledge of safety requirements
knowledge of testing procedures
knowledge of water clarity
knowledge of gauges
knowledge of drainage
knowledge of valves

13. Backwashing sand filters

knowledge of system design
knowledge of pump requirements
knowledge of flow rates
knowledge of safety requirements
knowledge of testing procedures
knowledge of water clarity
knowledge of gauges
knowledge of drainage
knowledge of valves

14. Using sodium hypochlorite for disinfecting and deck cleaning

knowledge of safety requirements
knowledge of chemical properties
knowledge of mixing procedures
knowledge of filtration requirements
knowledge of chemical effects
knowledge of chemical balancing techniques and requirements
knowledge of storage procedures and requirements

15. Using calcium hypochlorite to sanitize decks and locker rooms

knowledge of safety requirements
knowledge of chemicals
knowledge of chemical properties
knowledge of mixing procedures
knowledge of filtration requirements
knowledge of filtration media
knowledge of chemical effects
knowledge of chemical balancing techniques and requirements
knowledge of storage procedures and requirements

16. Using other pool sanitizers (e.g., bromine, iodine, ozone, ultraviolet, silver and electrolytic cells)

knowledge of safety requirements
knowledge of chemicals
knowledge of chemical properties
knowledge of mixing procedures
knowledge of filtration requirements
knowledge of filtration media
knowledge of chemical effects
knowledge of chemical balancing techniques and requirements
knowledge of storage procedures and requirements

17. Using other pool chemicals (e.g., flocculents, algicides, sequestering agents, degreasers and defoamers)

knowledge of safety requirements
knowledge of chemicals
knowledge of chemical properties
knowledge of mixing procedures
knowledge of filtration requirements
knowledge of filtration media
knowledge of chemical effects
knowledge of chemical balancing techniques and requirements
knowledge of storage procedures and requirements

18. Testing and adjusting water saturation and undersaturation

knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of safety requirements
knowledge of chlorinating techniques and procedures
knowledge of chemical balancing techniques and requirements
knowledge of testing procedures
knowledge of reagents
knowledge of adjusting procedures

19. Knowledge of the effect of chemical balances on staining

knowledge of safety requirements
knowledge of chemicals
knowledge of chemical properties
knowledge of mixing procedures
knowledge of chemical effects
knowledge of storage procedures and requirements

20. Replacing light bulbs and underwater lights

knowledge of different voltage lights
knowledge of proper safety procedures and requirements
knowledge of pressure and suction factors
knowledge of importance of GFIR
knowledge of safe wiring and sealing water out
knowledge of material specifications
knowledge of bonding and grounding requirements

21. Utilizing pool blankets and covers

knowledge of materials and types
knowledge of the properties of materials
knowledge of safety requirements
knowledge of installation
knowledge of securing installation
knowledge of chemical balance effects

22. Installing markers and signs to notify the public of safety procedures

knowledge of safety requirements
knowledge of placement
knowledge of location

23. Maintaining and repairing plumbing equipment

knowledge of safety requirements
knowledge of piping requirements
knowledge of fittings
knowledge of pipe fittings
knowledge of piping protection
knowledge of pressure requirements
knowledge of gauges
knowledge of pressure testing
knowledge of flow rates
knowledge of pumps
knowledge of leak detection

24. Maintaining and repairing decks

knowledge of bonding new material to old
knowledge of cleaning in preparation for repair
knowledge of safety requirements
knowledge of expansion joints
knowledge of codes
knowledge of maintaining strength of the deck
knowledge of soil conditions
knowledge of compaction
knowledge of concrete placement

25. Maintaining and repairing accessory fixtures

knowledge of safety requirements
knowledge of solar heating
knowledge of conventional heating
knowledge of materials
knowledge of the properties of materials
knowledge of procedures
knowledge of material handling
knowledge of system design
knowledge of system design capacity

26. Maintaining and repairing pool shells

knowledge of leak detection
knowledge of leak testing
knowledge of safety requirements
knowledge of materials
knowledge of the properties of materials
knowledge of crack repair procedures

27. Evaluating and adjusting system requirements

knowledge of system design
checking for correct turnover rate

- knowledge of testing techniques and requirements
- knowledge calculating turnover rate
- knowledge of adjusting techniques and requirements

checking for effectiveness of filtering media

- knowledge of system design
- knowledge of pump requirements
- knowledge of flow rates
- knowledge of safety requirements
- knowledge of testing procedures
- knowledge of water clarity
- knowledge of gauges
- knowledge of drainage
- knowledge of valves

testing and adjusting for water clarity

- knowledge of water chemistry
- knowledge of pH
- knowledge of pool chemicals
- knowledge of effects of pool chemicals
- knowledge of practices of pool chemicals
- knowledge of dangers of chlorinating agents
- knowledge of chlorinating requirements
- knowledge of chlorinating procedures
- knowledge of chemical balancing techniques and requirements
- knowledge of testing techniques and requirements
- knowledge of reagents
- knowledge of adjusting techniques and requirements

checking and clearing outlet strainers

- knowledge of system design
- knowledge of pump requirements
- knowledge of flow rates
- knowledge of safety requirements
- knowledge of testing procedures
- knowledge of gauges
- knowledge of drainage
- knowledge of valves

28. Cleaning cartridge filters

- knowledge of system design
- knowledge of pump requirements
- knowledge of flow rates
- knowledge of safety requirements
- knowledge of testing procedures
- knowledge of water clarity
- knowledge of gauges
- knowledge of drainage
- knowledge of valves

29. Performing heater care and maintenance

- checking heaters or heating systems for efficiency
 - knowledge of safety requirements
 - knowledge of testing procedures and requirements
 - knowledge of system design
- performing heater sizing
 - knowledge of safety requirements
 - knowledge of system design
 - knowledge of system capacity
- checking thermostats
 - knowledge of temperature measurements
 - knowledge of effects of temperature
 - knowledge of changes in temperature
- knowledge of effects of water chemistry on heater components
- knowledge of pool chemistry
- knowledge of gas and electric requirements
- knowledge of safety requirements

**Content Area L
Equipment**

10%

1. Using torches

- knowledge of safety requirements
- knowledge of OSHA requirements
- knowledge of cutting materials and techniques
- knowledge of welding materials and techniques
- knowledge of brazing materials and techniques
- knowledge of oxygen
- knowledge of acetylene

2. Using jackhammers

- knowledge of safety requirements
- knowledge of OSHA requirements
- knowledge of equipment characteristics

3. Using saw cutting machines

- knowledge of safety requirements
- knowledge of OSHA requirements
- knowledge of equipment characteristics

4. Using bobcats or backhoes

- knowledge of safety requirements
- knowledge of OSHA requirements
- knowledge of equipment characteristics
- knowledge of traffic regulations

5. Using compressors

- knowledge of safety requirements
- knowledge of OSHA requirements
- knowledge of pressure regulators
- knowledge of air tools

6. Using cement guns

- knowledge of safety requirements
- knowledge of OSHA requirements

7. Using concrete pumps

- knowledge of safety requirements
- knowledge of OSHA requirements
- knowledge of concrete properties
- knowledge of concrete procedures
- knowledge of concrete testing
- knowledge of concrete placement