CCO Certification

CANDIDATE HANDBOOK

- CONCRETE PUMP OPERATOR

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Certification Policies
CONCRETE PUMP OPERATOR

ELIGIBILITY

To be eligible for certification, candidates must:

- Be at least 18 years of age
- Pass written examination
- Pass practical examination
- Comply with CCO's Substance Abuse Policy
- Comply with CCO's Code of Ethics

CERTIFICATION EXAM OPTIONS

The following Concrete Pump Operator designations are available.

If you are seeing certification for:	Take the corresponding exams:	
	Written	Practical
Concrete Pump Operator (CPO)	Concrete Pump Operator	Concrete Pump Class 1
		Concrete Pump Class 2

EXAMINATION FEES

For all exam and related fees, visit www.nccco.org/fees.

CCO CERTIFICATION EXAM REQUIREMENTS

Certification is valid for five years. Candidates must pass the Concrete Pump Operator written and practical exams to earn certification.

Candidates have 12 months from the time they pass their first exam in which to pass the corresponding exam. Any tests passed within a 12-month period count towards certification. For example, a candidate who fails the Concrete Pump Operator Written Exam in December 2024 but passes the Concrete Pump Operator Practical Exam in January 2025 has until the end of January 2026 to retake (and pass) the Concrete Pump Operator Written Exam.

RECERTIFICATION REQUIREMENTS

CCO Concrete Pump Operator certification is valid for five years. Certificants must recertify during the 12 months prior to their certification's expiration date.

Candidate who were certified prior to July 15, 2024, must take and pass the practical exam at the time of recertification.

Additional requirements remain to be determined.

Recertification candidates must complete all recertification requirements during the 12 months prior to their certification's expiration date. There is no grace period after their certification expires. Regardless of the date of the exams within that one-year period, the new five-year certification period begins from the date of expiration of the candidate's initial certification.

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Written Examination Outline

CONCRETE PUMP OPERATOR

80 QUESTIONS/90 MINUTES (CALCULATOR PERMITTED)

The Concrete Pump Operator Written Examination tests the following knowledge areas relating to concrete pump operations:

Domain 1: Conduct Pre-Trip Planning

- Approximately 15% of test

Domain 2: Driving the Truck

- Approximately 9% of test

Domain 3: Set Up Pump

- Approximately 34% of test

Domain 4: Conduct Placement Operations

- Approximately 25% of test

Domain 5: Prepare Pump for Travel

- Approximately 10% of test

Domain 6: End-of-Day Procedures

- Approximately 7% of test

DOMAIN 1: CONDUCT PRE-TRIP PLANNING

1. Select appropriate materials for job site that day:
   a. Emergency spill kits, system clamps, outrigger pads and/or dunnage, tools, spare parts, necessary paperwork, safety pins, operators' manual, tarps, boom strap, spare gaskets
2. Select necessary PPE required by the job:
   a. Knowledge of PPE required by the job
3. Gather personal needs per environmental conditions (e.g., food, water, clothing):
   a. Knowledge of weather conditions
   b. Knowledge of how many jobs that day or the length of job
4. Perform precheck inspection on truck (DVIR):
   a. Knowledge of FMCSA (Federal Motor Carrier Safety Administration) requirements
   b. Observational skills
5. Perform precheck inspection on pump:
   a. Knowledge of how to inspect the boom safety pins, boom straps, grease levels, water levels, hydraulic levels, visible leaks, everything stowed and away for travel, outriggers pinned, outriggers retracted and in the fully up position
   b. Pre-operational function check
   c. Observational skills

DOMAIN 2: DRIVING THE TRUCK

1. Plan route to the job:
   a. Take into consideration dimensions and weight of pump
   b. Verify permit limitations
   c. Check for traffic
   d. What roads you can be on
   e. Time management
2. Drive the concrete pump to the job:
   a. Avoiding distractions
   b. Defensive driving skills
3. Follow laws and regulations:
   a. Knowledge of driving laws for area driving in such as: federal, state, county, city
4. Follow FMCSA guidelines:
   a. Maintain CDL logbook (HOS - hours of service)
   b. Maintain CDL requirements
   c. Clearing house rules
   d. Med card
   e. Intrastate vs. interstate

DOMAIN 3: SET UP PUMP

1. Consult with pour supervisor for any known hazards and setup location:
   a. Knowledge of where underground utilities and power lines are located
   b. Obvious obstacles
   c. Job site traffic
   d. Communication skills
2. Verify and observe the information from pour supervisor:
   a. Knowledge of cleanout location, soil conditions for outrigger placement, surrounding hazards, overhead obstructions (powerlines)
   b. Knowledge of primeout (where to prime)
   c. Other equipment and/or personnel that could enter work area
   d. Job site traffic
   e. Underground utilities/ground disturbance
   f. Observational skills
3. Unfold the boom:
   a. Be aware of changes to surrounding hazards

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4. Visually inspect necessary components pre-pour:
    a. Awareness of necessary components
5. Install attachments to boom:
    a. Knowledge of installation process
    b. Knowledge of where to find weight limitations for attachments
    c. Knowledge of concrete weight
6. Test outrigger support:
    a. Understand proper ground bearing conditions
    b. How to use pocket penetrometer (if needed)
7. Consult with pour supervisor/controlling entity if improvements need to be made:
    a. ASME B30.27
8. Complete pre-pour paperwork
9. Review plan of action for the day with crew:
    a. PTP, JHA, JSA, discussion of any safety measures
10. Position pump in designated location
11. Position outrigger pads:
    a. Knowledge of procedures regarding outrigger pads and dunnage
12. Extend and lower outriggers:
    a. Know how to conduct short rigging
    b. Knowledge of company and manufacturer procedures regarding short rigging
13. Level the pump:
    a. Knowledge of 1-to-1 rule and 3 degrees standard

DOMAIN 4: CONDUCT PLACEMENT OPERATIONS

1. Guide concrete trucks:
    a. Knowledge of backing procedures, staging area, safety procedures
    b. Communication skills
    c. Directional skills
2. Review concrete mix design and batch time prior to pour for pumpability:
    a. Communicate with pour supervisor regarding pump ability of mix (flow ability)
    b. Take ambient temperature into consideration
3. Maintain communication with placement crew:
    a. Know how to use hand signals, verbal signals, radio, air horn, sticker on outrigger
    b. Communication skills
4. Control and monitor boom/hose placement:
    a. Knowledge of system pours (if having to run the hose)
    b. Not kinking the hose
    c. Inspect piping and joints along the boom during pour
5. Prime out pump:
    a. Identify style of prime out
    b. Identify safe location to prime out
    c. Clear area of all personnel
6. Monitor conditions that affect the pump:
    a. Control amount of material being pumped
    b. Monitor concrete throughout the pour (i.e., drum spinning full hopper)
    c. Monitor wind conditions
    d. Monitor outrigger support (ground conditions)
7. Manage blockages:
    a. Know how to recognize blockages
    b. Methods to rectify
    c. Troubleshooting skills
8. Conduct a restart procedure:
    a. Know to clear area of all personnel
    b. Hazard recognition
9. Monitor maintenance needs during pour:
    a. Knowledge of safety procedures for spill containment, greasing, water box level, monitor elbows

DOMAIN 5: PREPARE PUMP FOR TRAVEL

1. Conduct a cleanout:
    a. Knowledge of types of cleanouts (different types and when to use)
    b. Use proper cleanout tools/PPE
    c. Local environmental regulations
2. Conduct a shutdown procedure:
    a. The order of process is important
3. Verify that all of the system is clean
4. Plan route:
    a. Take into consideration dimensions and weight of pump
    b. Verify permit limitations
    c. Check for traffic
    d. Knowing what roads you can be on
    e. Directional skills
    f. Time management

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5. Prepare for offsite cleanout:
    a. Knowledge of containment of hopper, additives that may be needed
6. Conduct pre-trip inspection:
    a. As needed, 360 degree walk around

DOMAIN 6: END-OF-DAY PROCEDURES

1. Conduct offsite cleanout:
    a. Knowledge of types of cleanouts (different types and when to use)
    b. Use proper cleanout tools/PPE
2. Document post-trip inspection (DVIR):
    a. Knowledge of DOT regulations
3. Document needed maintenance or repairs
4. Pressure wash truck
5. Prepare for the next day:
    a. Top off fuel and water
    b. Charge remote control batteries
6. Perform preventative maintenance on truck:
    a. Knowledge of manufacturer and company specifications
    b. Basic mechanical skills
7. Perform preventative maintenance on boom:
    a. Knowledge of manufacturer and company specifications
    b. Basic mechanical skills.
8. Complete paperwork:
    a. Knowledge of what paperwork is needed to be completed, such as logbook, timecard, inspection forms, company forms, complete PTP

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Practical Examination

CONCRETE PUMP OPERATOR

SKILLS TESTED

The CCO Concrete Pump Operator Practical Exam may be taken on either of the following class pumps:

- Class 1: 28m–36m boom length
- Class 2: 37m–49m boom length

The practical exam comprises eight main tasks that increase progressively in the skill level tested. Skills tested are: set-up, attachment use, depth perception, combination (multifunction) operations, and stowing.

The following is an outline of the practical testing procedure, as provided to candidates at the time of testing.

CANDIDATE INFORMATION AND INSTRUCTIONS

The following sections describe the specific tasks that you will be performing when taking the practical examination. It is important that you understand these instructions. If there is anything you do not understand, please request clarification from the Practical Exam Proctor.

TASKS

The practical exam tasks are:

- Task 1: Pre-Operational (Shift) Inspection
- Task 2: Set Up & Unfold the Boom
- Task 3: Add Attachments
- Task 4: Hose in Designated Area (DA-1)
- Task 5: Zigzag Corridor
- Task 6: A-Frame Wash Out
- Task 7: Remove Attachments
- Task 8: Stow Boom/Shutdown

You will be required to complete all phases of the test in sequence.

During the practical examination, you are under the direction of the Proctor and must follow the Proctor's directions at all times.

Once you have completed all the tests you are taking, you must leave the testing area. Only personnel involved in the administration of the test are allowed in the test area.

Task	Optimum Time	Points deducted for:
1	n/a	– Incorrectly describing how you would conduct the inspection – Incorrectly describing what deficiencies you would look for – Incorrectly identifying the quickest method for shutting off the machine in an emergency situation
2	n/a	– Outriggers not fully engaged on pads – Equipment not leveled within 3 degrees
3	10:30	– Gaskets not set – Pins not set – Clamps not set – Slings/cable not secured – Exceeding optimum time
4	Class 1: 2:00 Class 2: 2:30	– Hose/chain touching the ground outside of the DA – Hose/chain touching any part of the zigzag course – Dragging hose on the ground – Knocking off balls – Exceeding the optimum time
5	Class 1: 5:30 Class 2: 6:00	– Chain leaving the ground before/after denotation – line(s) – Each progressive pole passed with chain off the – ground – Hoset touching the ground – Each progressive pole passed with hose dragging on the ground – Chain outside of corridor – Hurdle knocked over – Circumventing the course – Knocking over poles – Moving poles off string line – Knocking balls off poles – Exceeding the optimum time
6	2:30	– Hose/chain touching the ground outside of the DA – Hose/chain touching any part of the zigzag course – Dragging hose on the ground – Knocking off balls – Not in A-frame configuration – Exceeding the optimum time
7	3:00	– Contacting the barrel assembly after leaving the barrel – All attachments not removed – Balls knocked off – Exceeding optimum time
8	n/a	– Boom not stowed in cradle – Outriggers not secured – Outrigger pads not stowed and secured

OPTIMUM TIMES

For some tasks ***optimum time limits*** have been set. If the task is completed within this time period, you receive no time penalty. Other tasks are untimed, as noted below.

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Once you exceed this time limit, however, you will lose points on a gradual basis. The optimum time for each task is stated as part of the task descriptions. At one-and-a-half times the optimum time the Proctor may end the task and move on to the next task.

If Task 3 cannot be completed within twice the optimum time, the Proctor is required to end the test.

PRE-TEST BRIEFING

While you are waiting to take your test, you will have sufficient time to read this description of the tasks to be performed and review the operator's manual for the equipment you will operate. In addition, you will be informed of the make/model of the equipment, and the boom length. You will also watch a short video showing all the tasks you will be required to perform during the examination.

Note that none of the target points have been placed at a radius that exceeds the equipment's rated capacity.

CIRCUMVENTING THE COURSE

Circumventing the course on CCO Concrete Pump Operator practical exams is defined as when:

1. Chain leaves the corridor while on or off the ground and passes more than one pole left still standing on the original string line before re-entering the corridor; you must enter the circles from inside the corridor to avoid this being marked as a deficiency
2. Chain leapfrogs from one leg of corridor to another with the chain off the ground, outside the corridor
3. Chain passes four or more poles consecutively with the chain off the ground, inside the corridor
4. Hose and chain enters or exits the corridor without vertically clearing the hurdle (i.e., by going around the hurdle)

UNSAFE ACT

If, at any time during the test, you commit an unsafe act, you will be disqualified from continuing with the test. An "unsafe act" is defined as an action by a candidate that is uncontrolled or reckless, and is sufficient to cause safety concern for persons or property damage.

The Proctor has the authority to stop the test at any time for reasons of safety. Please ask the Proctor if you have any questions. If you are disqualified due to an unsafe act, you will not be permitted to take any additional practical exams that day.

WEATHER CONDITIONS AND EQUIPMENT PROBLEMS

The Proctor will use an anemometer to check the wind speed and then will record the weather conditions on the score sheet.

The Proctor has the responsibility to determine if weather conditions or equipment problems are such that a test needs to be suspended. If the test is interrupted due to weather conditions or equipment problems, the procedure for restarting is as follows:

- You will resume the test at the beginning of the task you were performing at the time of the interruption, except for Task 5, when you will go back to the beginning.
- If testing resumes on a different machine, you must start the test over from the beginning. The first score sheet will be marked as "VOID" with an explanation and returned to CCO.
- If the testing is delayed to a different day, the test must be restarted from the beginning.

TASK 1: PRE-OPERATIONAL (SHIFT) INSPECTION

Not timed

- The Proctor will identify five items regarding the equipment that are part of the pre-operational inspection. One at a time, you will describe how you would conduct the inspection and what deficiencies you would look for.
- You have approximately one minute per item.
- You will also be asked to physically identify by pointing to the quickest method for shutting off the machine in an emergency situation.
- Points will be deducted for each incorrectly identified inspection item.

TASK 2: SET UP & UNFOLD THE BOOM

Not timed

- At the Proctor's indication to start, you will proceed to set up the pump and unfold the boom. Unfold the boom so that the boom is working over the corridor side.
- Bring the boom over to the assembly area designated by the circle.
- Once complete you will indicate this to the Proctor by stating "done."

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- Points will be deducted for the following:
  - — Outriggers not fully engaged on pads
  - — Equipment not leveled within 3 degrees

TASK 3: ADD ATTACHMENTS

Maximum time: 10:30

- At the Proctor's indication to start, at which point timing will begin, attach the materials provided in preparation for a pump operation.
- Once complete, raise the hose and chain until only the chain is touching the ground at the assembly/disassembly circle.
- Timing will end once the chain is touching the circle and the Proctor has given you a stop signal.
- **If your time exceeds the maximum time, the Proctor will stop you and your test will end.**
- Points will be deducted for the following:
  - — Gaskets not set
  - — Pins not set
  - — Clamps not set
  - — Slings/cable not secured
  - — Exceeding maximum time

TASK 4: HOSE IN DESIGNATED AREA (DA-1)

Optimum time:

- — ***Class 1 pumps: 2:00***
- — ***Class 2 pumps: 2:30***

- At the Proctor's indication to start, at which point timing will begin, raise the hose and chain off the ground to clear all obstacles and personnel and land the chain on the ground inside the barrel at Designated Area 1.
- Avoid contacting anything but the ground within the Designated Area.
- Once the chain is under control in the Designated Area, the Proctor will give you a stop signal.
- If your time exceeds one-and-a-half times the optimum time, the Proctor may stop you and move on to the next task.
- Points will be deducted for the following:
  - — Hose/chain touching the ground outside of the DA
  - — Hose/chain touching any part of the zigzag course
  - — Dragging hose on the ground
  - — Knocking off balls
  - — Exceeding the optimum time

TASK 5: ZIGZAG CORRIDOR

Optimum time:

- — ***Class 1 pumps: 5:30***
- — ***Class 2 pumps: 6:00***

- At the Proctor's indication to start, at which point timing will begin, raise the hose and chain out of the Designated Area until it clears the barrel.
- Land the chain on the ground outside of the barrel and before the first denotation line located at the start of the corridor.
- Once the chain makes contact with the ground, guide the hose and chain through the corridor. Avoid contacting anything but keep the chain on the ground until any part of the chain has touched or crossed the denotation line located before the hurdle.
- Once the chain touches or crosses the denotation line, raise the chain over the horizontal hurdle without knocking over the hurdle. Once clear, lower the chain until the chain makes contact with ground before reaching the last denotation line.
- Once the chain makes contact with the ground, continue to guide the hose and chain through the corridor until you have reached Designated Area 2.
- Place the chain inside Designated Area 2. Once in the circle, the Proctor will give you a stop signal. If the hose and chain is not fully within the outside perimeter of the circle, timing continues.
- If your time exceeds one-and-a-half times the optimum time, the Proctor may stop you and move on to the next task.
- Points will be deducted for the following:
  - — Chain leaving the ground before/after denotation line(s)
  - — Each progressive pole passed with chain off the ground
  - — Hoset touching the ground
  - — Each progressive pole passed with hose dragging on the ground
  - — Chain outside of corridor
  - — Hurdle knocked over
  - — Circumventing the course
  - — Knocking over poles
  - — Moving poles off string line
  - — Knocking balls off poles
  - — Exceeding the optimum time

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TASK 6: A-FRAME WASH OUT

Optimum time: 2:30

- At the Proctor's indication to start, at which point timing will begin, raise the hose and chain off the ground to clear all obstacles and personnel, and land the chain inside the barrel at Designated Area 3.
- The boom must be within an A-frame configuration, minimum 2 up and 1 down.
- Avoid contacting anything but the ground within the Designated Area.
- Once the chain is under control in the Designated Area, the Proctor will give you a stop signal.
- If your time exceeds one-and-a-half times the optimum time, the Proctor may stop you and move on to the next task.
- Points will be deducted for the following:
  - — Hose/chain touching the ground outside of the DA
  - — Hose/chain touching any part of the zigzag course
  - — Dragging hose on the ground
  - — Knocking off balls
  - — Not in A-frame configuration
  - — Exceeding the optimum time

TASK 7: REMOVE ATTACHMENTS

Optimum time: 3:00

- At the Proctor's indication to start, at which point timing will begin, lift the hose and chain out of the barrel and move the boom to the Assembly/ Disassembly area. The elbow must be located at the assembly/disassembly area with the hose facing away from the barrel assembly.
- Avoid making contact with the barrel assembly after the hose and chain have left the barrel.
- Lay the hose down and remove all attachments.
- Once complete, indicate this to the Proctor by saying "done."
- Timing will end when you have stated "done."
- Points will be deducted for the following:
  - — Contacting the barrel assembly after leaving the barrel
  - — All attachments not removed
  - — Balls knocked off
  - — Exceeding optimum time

TASK 8: STOW BOOM/SHUT DOWN

Not timed

- At the Proctor's indication to start, stow the boom and prepare the equipment for travel.
- Please apply safe shutdown procedures to the equipment in preparation for the next candidate.
- Once complete you will indicate this to the Proctor by stating "done."
- Points will be deducted for the following:
  - — Boom not stowed in cradle
  - — Outriggers not secured
  - — Outrigger pads not stowed and secured

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Reference List
CONCRETE PUMP OPERATOR

The latest versions of the following reference materials are used by CCO to verify the accuracy of CCO test questions:

Primary Reference Materials

1. ASME B30.27: Material Placement Systems Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings (2019)

   webstore.ansi.org

2. ACPA Safety Manual 7: A Guide for the Prevention of Accidents When Driving, Operating, Cleaning, and Maintaining Concrete Pumps, Placing Booms, and Related Equipment

   www.concretepumpers.com

3. Federal Motor Carrier Safety Administration Regulations: Title 49, Parts 383, 392, 395, 396

   www.fmcsa.dot.gov

4. Putzmeister Safety Manual: Concrete Delivery and Placing Machines (2020)

   www.putzmeister.com

Supplemental Reference Materials

1. OSHA Job Hazard Analysis (2002)

   www.osha.gov

2. OSHA Safety and Health Topics: Heat

   www.osha.gov

3. ACPA Certified Operator Study Guide version 3: Guidelines for the Safe Operation of Concrete Pumps

   www.concretepumpers.com

4. ACPA Safety Bulletins: Hose Whipping Parts I and II

   www.concretepumpers.com

5. ACI PRC 304-00: Guide for Measuring, Mixing, Transporting, and Placing Concrete (2009)

   www.concrete.org

6. Schwing Operations Manual version 3.0.8 Original Instructions for Concrete Line Pumps

   schwingpartsstore.com

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Sample Exam Questions
CONCRETE PUMP OPERATOR

The following questions serve ONLY as examples of the question types and structures that are found on the Concrete Pump Operator certification exam. Your performance on these items is not intended to be a predictor of your exam performance, nor should it be interpreted as such.

1. Operation of the boom pump in excess of 3 degrees of level is MOST likely to have which result?
   A. Excessive fuel usage by the truck
   B. Failure of the hydraulic systems
   C. Greater wear on the delivery system
   D. Uncontrolled boom movement when slewing

2. The placement crew is ready to restart pumping after a lengthy delay, and one of the crew grabs the tip hose and points to where the material should be placed. Once the operator is signaled to start pumping, which step should the operator take FIRST?
   A. Have the placing crew move a safe distance from the tip hose
   B. Inspect the system to ensure there is no blockages
   C. Listen for any potential hose whip
   D. Start the pump with an increased volume

3. After the system has been cleaned out following a completed pour, which step in preparing the boom for travel should the operator take NEXT?
   A. Conduct a final walk around
   B. Raise, stow, and properly lock the outriggers
   C. Stow the boom with a safety strap
   D. Wash out the hopper

4. Prior to travel, what is the best practice to verify a separately laid system is clean?
   A. Push a cleaning ball through the system
   B. Shake out the system
   C. Spray the system with water
   D. Visually inspect the system

5. When cleaning the hopper during the clean-out process of a pump, the hopper grate should only be lifted or removed under which circumstance?
   A. The agitator has been disengaged
   B. The machine has been de-energized
   C. The mix is stiff
   D. There is concrete build up in the hopper

Question #	Answer
1	D
2	A
3	C
4	D
5	B

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CCO Policies
CONCRETE PUMP OPERATOR

Code of Ethics

www.nccco.org/coe

Disciplinary Policy

www.nccco.org/discipline

Substance Abuse Policy

www.nccco.org/abuse

Testing Accommodations

www.nccco.org/accommodations

Test Security

www.nccco.org/security

Information Release Policy

www.nccco.org/inforelease

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