

PERFORMANCE EXAM CHECKLIST

**SAMPLING FRESHLY MIXED CONCRETE
FOP FOR WAQTC TM 2**

Participant Name _____ **Exam Date** _____

Record the symbols “P” for passing or “F” for failing on each step of the checklist.

Procedure Element	Trial 1	Trial 2
1. Receptacle dampened and excess water removed?	_____	_____
2. Obtain a representative sample from drum mixer:		
a) Concrete sampled after 1/2 m ³ (1/2 yd ³) discharged?	_____	_____
b) Receptacle passed through entire discharge stream or discharge stream completely diverted into sampling container?	_____	_____
3. Obtain a representative sample from a paving mixer:		
a) Concrete sampled after all the concrete has been discharged?	_____	_____
b) Material obtained from at least 5 different locations in the pile?	_____	_____
c) Avoid contaminating the sample with sub-grade materials.	_____	_____
4. Obtain a representative sample from a pump:		
a) Concrete sampled after 1/2 m ³ (1/2 yd ³) has been discharged?	_____	_____
b) All the pump slurry is out of the lines?	_____	_____
c) Receptacle passed through entire discharge stream or discharge stream completely diverted into sampling container?	_____	_____
d) Do not lower the pump arm from the placement position.	_____	_____
5. Samples transported to place of testing?	_____	_____
6. Sample(s) combined, or remixed, or both?	_____	_____
7. Sample protected?	_____	_____
8. Minimum size of sample used for strength tests 0.03 m ³ (1ft ³)?	_____	_____
9. Completed temperature test within 5 minutes of obtaining sample?	_____	_____
10. Start tests for slump and air within 5 minutes of obtaining sample?	_____	_____
11. Start molding cylinders within 15 minutes of obtaining sample?	_____	_____
12. Protect sample against rapid evaporation and contamination?	_____	_____
13. Wet Sieving:		
a) Required sieve size determined for test method to be performed?	_____	_____
b) Concrete placed on sieve and doesn't overload the sieve.	_____	_____
c) Sieve shaken until no more material passes the sieve.	_____	_____
d) Sieving continued until required testing size obtained.	_____	_____

OVER

Procedure Element

Trial 1 Trial 2

- e) Oversized aggregate discarded.
- f) Sample remixed.

_____	_____
_____	_____

Comments: First attempt: Pass_____Fail_____ Second attempt: Pass_____Fail_____

Examiner Signature _____ WAQTC #: _____

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PERFORMANCE EXAM CHECKLIST (ORAL)

**SAMPLING FRESHLY MIXED CONCRETE
FOP FOR WAQTC TM 2**

Participant Name _____ **Exam Date** _____

Record the symbols “P” for passing or “F” for failing on each step of the checklist.

Procedure Element	Trial 1	Trial 2
1. What is the minimum sample size? a) 0.03 m ³ or 1 ft ³	_____	_____
2. Describe how to obtain a representative sample from a drum mixer. a) Dampen receptacle and empty excess water. b) Sample the concrete after 1/2 m ³ (1/2 yd ³) has been discharged. c) Pass receptacle through entire discharge stream or completely divert discharge stream into sampling container.	_____ _____ _____	_____ _____ _____
3. Describe how to obtain a representative sample from a paving mixer. a) Dampen receptacle and empty excess water. b) Sample the concrete after all the concrete has been discharged. c) Obtain the material from at least 5 different locations in the pile. d) Avoid contaminating the sample with sub-grade materials.	_____ _____ _____ _____	_____ _____ _____ _____
4. Describe how to obtain a representative sample from a pump: a) Dampen receptacle and empty excess water. b) Sample the concrete after 1/2 m ³ (1/2 yd ³) has been discharged. c) Make sure all the pump slurry is out of the lines. d) Pass receptacle through entire discharge stream or completely divert discharge stream into sampling container. e) Do not lower the pump arm from the placement position.	_____ _____ _____ _____ _____	_____ _____ _____ _____ _____
5. After obtaining the sample or samples what must you do? a) Transport samples to place of testing.	_____	_____
6. What must be done with the sample or samples once you have transported them to the place of testing? a) Combine and remix the sample. b) Protect sample against rapid evaporation and contamination.	_____ _____	_____ _____
7. What are the two time parameters associated with this test? a) Complete temperature test and start tests for slump and air within 5 minutes of sample being obtained? b) Start molding cylinders within 15 minutes of sample being obtained?	_____ _____	_____ _____
8. What test methods may require wet sieving? a) Slump, air content, and strength specimens?	_____	_____

OVER

Procedure Element

Trial 1 Trial 2

- 9. The sieve size used for wet sieving is based on?
 - a) The test method to be performed. _____
- 10. How long must you continue wet sieving?
 - a) Until a sample of sufficient size for the test being performed is obtained. _____
- 11. What is done with the oversized aggregate?
 - a) Discard it. _____
- 12. What must be done to the sieved sample before testing?
 - a) Remix. _____

Comments: First attempt: Pass____Fail_____ Second attempt: Pass____Fail_____

Examiner Signature _____ WAQTC #: _____

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PERFORMANCE EXAM CHECKLIST

**TEMPERATURE OF FRESHLY MIXED CONCRETE
FOP FOR AASHTO T 309**

Participant Name _____ **Exam Date** _____

Record the symbols "P" for passing or "F" for failing on each step of the checklist.

Procedure Element	Trial 1	Trial 2
1. Obtain sample of concrete large enough to provide a minimum of 75 mm (3 in.) of concrete cover around sensor in all directions?	_____	_____
2. Place temperature measuring device in sample with a minimum of 75 mm (3 in.) cover around sensor?	_____	_____
3. Gently press concrete around thermometer?	_____	_____
4. Read temperature after a minimum of 2 minutes or when temperature reading stabilizes?	_____	_____
5. Complete temperature measurement within 5 minutes of obtaining sample?	_____	_____
6. Record temperature to nearest 0.5°C (1°F)?	_____	_____

Comments: First attempt: Pass _____ Fail _____ Second attempt: Pass _____ Fail _____

Examiner Signature _____ **WAQTC #:** _____

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PERFORMANCE EXAM CHECKLIST

**SLUMP OF HYDRAULIC CEMENT CONCRETE
FOP FOR AASHTO T 119**

Participant Name _____ Exam Date _____

Record the symbols “P” for passing or “F” for failing on each step of the checklist.

Procedure Element	Trial 1	Trial 2
First layer		
1. Mold and floor or base plate dampened?	_____	_____
2. Mold held firmly against the base by standing on the two foot pieces? Mold not allowed to move in any way during filling?	_____	_____
3. Representative sample scooped into the mold, moving a scoop around the perimeter of the mold to evenly distribute the concrete as discharged?	_____	_____
4. Mold approximately one third (by volume), 67 mm (2 5/8 in.) deep?	_____	_____
5. Layer rodded throughout its depth 25 times with hemispherical end of rod, uniformly distributing strokes?	_____	_____
Second layer		
6. Representative samples scooped into the mold, moving a scoop around the perimeter of the mold to evenly distribute the concrete as discharged?	_____	_____
7. Mold filled approximately two thirds (by volume), 155 mm (6 1/8 in.), deep?	_____	_____
8. Layer rodded throughout its depth 25 times with hemispherical end of rod, uniformly distributing strokes, penetrate approximately 25 mm (1 in.) into the bottom layer?	_____	_____
Third layer		
9. Representative sample scooped into the mold, moving a scoop around the perimeter of the mold to evenly distribute the concrete as discharged??	_____	_____
10. Mold filled to just over the top of the mold?	_____	_____
11. Layer rodded throughout its depth 25 times with hemispherical end of rod, uniformly distributing strokes, penetrate approximately 25 mm (1 in.) into the second layer?	_____	_____
12. Excess concrete kept above the mold at all times while rodding?	_____	_____
13. Concrete struck off level with top of mold using tamping rod?	_____	_____

OVER

Procedure Element	Trial 1	Trial 2
14. Concrete removed from around the outside bottom of the mold?	_____	_____
15. Mold lifted upward 300 mm (12 in.) in one smooth motion, without a lateral or twisting motion of the mold, in 5 ±2 seconds?	_____	_____
16. Test performed from start of filling through removal of the mold within 2 1/2 minutes?	_____	_____
17. Slump immediately measured to the nearest 5 mm (1/4 in.) from the top of the mold to the displaced original center of the top surface of the specimen?	_____	_____

Comments: First attempt: Pass_____Fail_____ Second attempt: Pass_____Fail_____

Examiner Signature _____ WAQTC #: _____

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PERFORMANCE EXAM CHECKLIST

**DENSITY (UNIT WEIGHT), YIELD, AND AIR CONTENT (GRAVIMETRIC) OF CONCRETE
FOP FOR AASHTO T 121**

Participant Name _____ Exam Date _____

Record the symbols “P” for passing or “F” for failing on each step of the checklist.

Procedure Element	Trial 1	Trial 2
1. Mass and volume of empty measure determined?	_____	_____
First Layer		
2. Dampened measure filled approximately one third full, moving a scoop around the perimeter of the measure to evenly distribute the concrete as discharged?	_____	_____
3. Layer rodded throughout its depth 25 times, without forcibly striking the bottom of the measure, with hemispherical end of rod, uniformly distributing strokes?	_____	_____
4. Perimeter of the measure tapped 10 to 15 times with the mallet after rodding?	_____	_____
Second layer		
5. Measure filled approximately two thirds full, moving a scoop around the perimeter of the measure to evenly distribute the concrete as discharged?	_____	_____
6. Layer rodded throughout its depth, just penetrating the previous layer (approximately 25 mm (1 in.) 25 times with hemispherical end of rod, uniformly distributing strokes?	_____	_____
7. Perimeter of the measure tapped 10 to 15 times with the mallet after rodding?	_____	_____
Third layer		
8. Measure slightly overfilled, moving a scoop around the perimeter of the measure to evenly distribute the concrete as discharged?	_____	_____
9. Layer rodded throughout its depth, just penetrating the previous layer (approximately 25 mm (1 in.) 25 times with hemispherical end of rod, uniformly distributing strokes?	_____	_____
10. Perimeter of the measure tapped 10 to 15 times with the mallet after rodding each layer?	_____	_____
11. Any excess concrete removed using a trowel or a scoop, or small quantity of concrete added to correct a deficiency, after consolidation of final layer?	_____	_____

OVER

Procedure Element

Trial 1 Trial 2

- 12. Strike-off plate placed flat on the measure covering approximately 2/3 of the surface, then sawing action used to withdraw the strike-off plate across the previously covered surface? _____
- 13. Strike-off plate placed flat on the measure covering approximately 2/3 of the surface, then sawing action used to advance the plate across the entire measure surface? _____
- 14. Strike off completed using the inclined edge of the plate creating a smooth surface? _____
- 15. All excess concrete cleaned off and mass of full measure determined? _____
- 16. Net mass calculated? _____
- 17. Density calculated correctly? _____

Comments: First attempt: Pass _____ Fail _____ Second attempt: Pass _____ Fail _____

Examiner Signature _____ WAQTC #: _____

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PERFORMANCE EXAM CHECKLIST

**AIR CONTENT OF FRESHLY MIXED CONCRETE BY THE PRESSURE METHOD
FOP FOR AASHTO T 152**

Participant Name _____ Exam Date _____

Record the symbols “P” for passing or “F” for failing on each step of the checklist.

Procedure Element	Trial 1	Trial 2
1. Representative sample selected?	_____	_____
First Layer		
2. Dampened measure filled approximately one third full, moving a scoop around the perimeter of the measure to evenly distribute the concrete as discharged?	_____	_____
3. Layer rodded throughout its depth 25 times, without forcibly striking the bottom of the measure, with hemispherical end of rod, uniformly distributing strokes?	_____	_____
4. Perimeter of the measure tapped 10 to 15 times with the mallet after rodding?	_____	_____
Second layer		
5. Measure filled approximately two thirds full, moving a scoop around the perimeter of the measure to evenly distribute the concrete as discharged?	_____	_____
6. Layer rodded throughout its depth, just penetrating the previous layer (approximately 25 mm (1 in.)) 25 times with hemispherical end of rod, uniformly distributing strokes?	_____	_____
7. Perimeter of the measure tapped 10 to 15 times with the mallet after rodding?	_____	_____
Third layer		
8. Measure slightly overfilled, moving a scoop around the perimeter of the measure to evenly distribute the concrete as discharged?	_____	_____
9. Layer rodded throughout its depth, just penetrating the previous layer (approximately 25 mm (1 in.)) 25 times with hemispherical end of rod, uniformly distributing strokes?	_____	_____
10. Perimeter of the measure tapped 10 to 15 times with the mallet after rodding each layer?	_____	_____
11. Concrete struck off level with top of the measure using the bar or strike-off plate and rim cleaned off?	_____	_____
12. Top flange of base cleaned?	_____	_____

OVER

Procedure Element

Trial 1 Trial 2

Using a Type B Meter:

- 13. Both petcocks open? _____
- 14. Air valve closed between air chamber and the measure? _____
- 15. Inside of cover cleaned and moistened before clamping to base? _____
- 16. Water injected through petcock until it flows out the other petcock? _____
- 17. Water injection into the petcock continued while jarring and or rocking the meter to insure all air is expelled? _____
- 18. Air pumped up to just past initial pressure line? _____
- 19. A few seconds allowed for the compressed air to stabilize? _____
- 20. Gauge adjusted to the initial pressure? _____
- 21. Both petcocks closed? _____
- 22. Air valve opened between chamber and measure? _____
- 23. The outside of measure tapped smartly with the mallet? _____
- 24. With the main air valve open, gauge lightly tapped and air percentage read to the nearest 0.1 percent? _____
- 25. Air valve released or closed and then petcocks opened to release pressure before removing the cover? _____
- 26. Aggregate correction factor applied if required? _____
- 27. Air content recorded to 0.1 percent? _____

Comments: First attempt: Pass _____ Fail _____ Second attempt: Pass _____ Fail _____

Examiner Signature _____ WAQTC #: _____

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PERFORMANCE EXAM CHECKLIST

**MAKING AND CURING CONCRETE TEST SPECIMENS IN THE FIELD
FOP FOR AASHTO T 23 (4 X 8)**

Participant Name _____ Exam Date _____

Record the symbols “P” for passing or “F” for failing on each step of the checklist.

Procedure Element	Trial 1	Trial 2
1. Molds placed on a level, rigid, horizontal surface free of vibration?	_____	_____
2. Representative sample selected?	_____	_____
3. Making of specimens begun within 15 minutes of sampling?	_____	_____
First layer		
4. Concrete placed in the mold, moving a scoop or trowel around the perimeter of the mold to evenly distribute the concrete as discharged?	_____	_____
5. Mold filled approximately half full?	_____	_____
6. Layer rodded throughout its depth 25 times with hemispherical end of rod, uniformly distributing strokes?	_____	_____
7. Sides of the mold tapped 10-15 times after rodding?		
a. With mallet for reusable steel molds	_____	_____
b. With the open hand for flexible light-gauge molds	_____	_____
Second layer		
8. Concrete placed in the mold, moving a scoop or trowel around the perimeter of the mold to evenly distribute the concrete as discharged?	_____	_____
9. Mold slightly overfilled on the last layer?	_____	_____
10. Layer rodded 25 times with hemispherical end of rod, uniformly distributing strokes and penetrating 25 mm (1 in.) into the underlying layer?	_____	_____
11. Sides of the mold tapped 10-15 times after rodding each layer?		
a. With mallet for reusable steel molds	_____	_____
b. With the open hand for flexible light-gauge molds	_____	_____
12. Concrete struck off with tamping rod, float or trowel?	_____	_____
13. Specimens covered with non-absorptive, non-reactive cap or plate?	_____	_____
14. Initial curing addressed?	_____	_____

OVER

Comments: First attempt: Pass ____ Fail ____ Second attempt: Pass ____ Fail ____

Examiner Signature _____ WAQTC #: _____

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PERFORMANCE EXAM CHECKLIST

**MAKING AND CURING CONCRETE TEST SPECIMENS IN THE FIELD
FOP FOR AASHTO T 23 (6 X 12)**

Participant Name _____ Exam Date _____

Record the symbols “P” for passing or “F” for failing on each step of the checklist.

Procedure Element	Trial 1	Trial 2
1. Molds placed on a level, rigid, horizontal surface free of vibration?	_____	_____
2. Representative sample selected?	_____	_____
3. Making of specimens begun within 15 minutes of sampling?	_____	_____
First layer		
4. Concrete placed in the mold, moving a scoop or trowel around the perimeter of the mold to evenly distribute the concrete as discharged?	_____	_____
5. Mold filled approximately one third full?	_____	_____
6. Layer rodded throughout its depth 25 times with hemispherical end of rod, uniformly distributing strokes?	_____	_____
7. Sides of the mold tapped 10-15 times after rodding each layer?		
a. With mallet for reusable steel molds	_____	_____
b. With the open hand for flexible light-gauge molds	_____	_____
Second layer		
8. Concrete placed in the mold, moving a scoop or trowel around the perimeter of the mold to evenly distribute the concrete as discharged?	_____	_____
9. Mold filled approximately two thirds full?	_____	_____
10. Layer rodded 25 times with hemispherical end of rod, uniformly distributing strokes and penetrating 25 mm (1 in.) into the underlying layer?	_____	_____
11. Sides of the mold tapped 10-15 times after rodding?		
a. With mallet for reusable steel molds	_____	_____
b. With the open hand for flexible light-gauge molds	_____	_____
Third layer		
12. Concrete placed in the mold, moving a scoop or trowel around the perimeter of the mold to evenly distribute the concrete as discharged?	_____	_____

OVER

Procedure Element	Trial 1	Trial 2
13. Mold slightly overfilled on the last layer?	_____	_____
14. Layer rodded 25 times with hemispherical end of rod, uniformly distributing strokes and penetrating 25 mm (1 in.) into the underlying layer?	_____	_____
15. Sides of the mold tapped 10-15 times after rodding?		
a. With mallet for reusable steel molds	_____	_____
b. With the open hand for flexible light-gauge molds	_____	_____
16. Concrete struck off with tamping rod, straightedge, float, or trowel?	_____	_____
17. Specimens covered with non-absorptive, non-reactive cap or plate?	_____	_____
18. Initial curing addressed?	_____	_____

Comments: First attempt: Pass_____Fail_____ Second attempt: Pass_____Fail_____

Examiner Signature _____ WAQTC #: _____

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