

PERFORMANCE EXAM CHECKLIST

**SAMPLING AGGREGATE PRODUCTS
FOP FOR AASHTO R 90**

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
Conveyor Belts – Method A (From the Belt)		
1. Belt stopped?	_____	_____
2. Sampling template set on belt, avoiding intrusion of adjacent material?	_____	_____
3. Sample, including all fines, scooped off?	_____	_____
4. Samples taken in at least three approximately equal increments?	_____	_____
Conveyor Belts – Method B (From the Belt Discharge)		
5. Sampling device passed through full stream of material twice (once in each direction) as it runs off end of belt?	_____	_____
Transport Units		
6. Unit divided into four quadrants?	_____	_____
7. Increment obtained from each quadrant, 0.3 m (1ft.) below surface?	_____	_____
8. Increments combined to make up the sample?	_____	_____
Roadways Method A (Berm or Windrow)		
9. Sample taken before spreading?	_____	_____
10. Full depth of material taken?	_____	_____
11. Underlying material excluded?	_____	_____
12. Samples taken in at least three approximately equal increments?	_____	_____
Roadways Method B (In-place)		
13. Sample taken after spreading?	_____	_____
14. Full depth of material taken?	_____	_____
15. Underlying material excluded?	_____	_____
16. Samples taken in at least three approximately equal increments?	_____	_____

OVER

Stockpile Method A– (Loader sampling)

- 17. Loader operator directed to enter the stockpile with the bucket at least 150 mm (6 in.) above ground level without contaminating the stockpile? _____
- 18. First bucketful discarded? _____
- 19. The loader re-entered the stockpile and obtained a full loader bucket of the material with the bucket tilted back and up? _____
- 20. A small sampling pile formed at the base of the stockpile by gently rolling the material out of the bucket with the bucket just high enough to permit free-flow of the material? _____
- 21. A flat surface created by the loader back dragging the small pile? _____
- 22. Increment sampled from each quadrant by fully inserting the shovel into the flat pile as vertically as possible, care taken to exclude the underlying material? _____

Stockpile Method B (Stockpile Face)

- 23. Created horizontal surfaces with vertical faces? _____
- 24. At least one increment taken from each of the top, middle, and bottom thirds of the stockpile. _____

Stockpile Method C – Alternate Tube Method (Fine Aggregate)

- 25. Outer layer removed? _____
- 26. Increments taken from at least five locations with a sampling tube? _____

General

- 27. Increments mixed thoroughly to form sample? _____

Comments: First attempt: Pass____ Fail____ Second attempt: Pass____ Fail _____

Examiner Signature _____ WAQTC #: _____

PERFORMANCE EXAM CHECKLIST (ORAL)

**SAMPLING AGGREGATE PRODUCTS
FOP FOR AASHTO R 90**

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. How is a sample obtained from a conveyor belt using Method A?		
a. Stop the belt.	_____	_____
b. Set the sampling template on belt, avoiding intrusion of adjacent material.	_____	_____
c. All the material is removed from belt including all fines.	_____	_____
d. Take at least three approximately equal increments.	_____	_____
2. How is a sample obtained from a conveyor belt using Method B?		
a. Pass the sampling device through a full stream of material as it runs off the end of the belt.	_____	_____
b. The device must be passed through at least twice (once in each direction).	_____	_____
3. How is a sample obtained from a Transport Unit?		
a. Divide the unit into four quadrants.	_____	_____
b. Dig 0.3 m (1 ft.) below surface.	_____	_____
c. Obtain an increment from each quadrant.	_____	_____
4. Describe the procedure for sampling from roadways Method A (Berm or Windrow).		
a. Sample before spreading	_____	_____
b. Sample the material full depth without obtaining underlying material.	_____	_____
c. Take at least three approximately equal increments.	_____	_____

OVER

Procedure Element	Trial 1	Trial 2
5. Describe the procedure for sampling from roadway Method B (In-place).		
a. Sample after spreading, before compaction.	_____	_____
b. Sample the material full depth without obtaining underlying material.	_____	_____
c. Take at least three approximately equal increments.	_____	_____
6. Describe the procedure for sampling a stockpile Method A (Loader Sampling).		
a. Loader removes contaminates and creates sampling pile.	_____	_____
b. Loader back drags pile to create a flat surface.	_____	_____
c. Divide the flat surface into four quadrants.	_____	_____
d. Take an approximately equal increment from each quadrant, excluding the underlying material.	_____	_____
7. Describe the procedure for sampling a stockpile Method B (Stockpile Face Sampling).		
a. Create horizontal surfaces with vertical faces with a shovel.	_____	_____
b. At least one increment taken from each of the top, middle, and bottom thirds of the stockpile.	_____	_____
8. Describe the procedure for sampling a stockpile Method C – Alternate Tube Method (Fine Aggregate).		
a. Remove the outer layer of segregated material.	_____	_____
b. Obtain increments from at least five locations.	_____	_____
9. After obtaining the increments what should you do before performing R 76?		
a. Increments mixed thoroughly to form sample.	_____	_____

Comments: First attempt: Pass_____Fail_____ Second attempt: Pass_____Fail_____

Examiner Signature _____ WAQTC #: _____

PERFORMANCE EXAM CHECKLIST

**REDUCING FIELD SAMPLES OF AGGREGATE TO TESTING SIZE
FOP FOR AASHTO R 76**

Participant Name _____ Exam Date _____

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

Trial 1 Trial 2

Method A - Splitting

- 1. Chutes appropriate size and number? _____
- 2. Material spread uniformly on feeder? _____
- 3. Rate of feed slow enough so that sample flows freely through chutes? _____
- 4. Material in one pan re-split until desired mass is obtained? _____
- 5. Mechanical splitter checked or alternative used? _____

Method B - Quartering

- 1. Sample placed on clean, hard, and level surface? _____
- 2. Mixed by turning over 4 times with shovel or by pulling sheet horizontally over pile? _____
- 3. Conical pile formed without loss of material? _____
- 4. Pile flattened to uniform thickness and diameter? _____
- 5. Diameter equal to about 4 to 8 times thickness? _____
- 6. Divided into 4 equal portions with shovel or trowel without loss of material? _____
- 7. Two diagonally opposite quarters, including all fine material, removed? _____
- 8. Process continued until desired sample size is obtained when two opposite quarters combined? _____

The sample may be placed upon a sheet and a stick or pipe may be placed under the sheet to divide the pile into quarters.

Comments: First attempt: Pass____Fail____ Second attempt: Pass____Fail____

Examiner Signature _____ **WAQTC #:** _____

**PERFORMANCE EXAM CHECKLIST
TOTAL MOISTURE CONTENT OF AGGREGATE BY DRYING
FOP FOR AASHTO T 255**

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 of appropriate mass obtained?	_____	_____
2. Mass of container determined to 0.1 percent or 0.1 g?	_____	_____
3. Sample placed in container and wet mass determined to 0.1 percent or 0.1 g?	_____	_____
4. Test sample mass conforms to the required mass?	_____	_____
5. Loss of moisture avoided prior to mass determination?	_____	_____
6. Sample dried by a suitable heat source?	_____	_____
7. If aggregate heated by means other than a controlled oven, is sample stirred to avoid localized overheating?	_____	_____
8. If heated in a microwave, heaped and covered with a ventilated lid	_____	_____
9. Is aggregate heated for the additional, specified time?	_____	_____
a. Forced draft, ventilated, convection ovens – 30 minutes		
b. Microwave – 2 minutes		
c. Other – 10 minutes		
10. Mass determined and compared to previous mass – showing less than 0.10 percent loss?	_____	_____
11. Sample cooled before dry mass determination to 0.1 percent or 0.1 g?	_____	_____
12. Calculations performed properly, and results reported to the nearest 0.1 percent?	_____	_____

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

Examiner Signature _____ **WAQTC #:** _____

PERFORMANCE EXAM CHECKLIST

**METHOD A
SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES
FOP FOR AASHTO T 27
MATERIALS FINER THAN 75 µm (No. 200) SIEVE IN MINERAL AGGREGATE
BY WASHING
FOP FOR AASHTO T 11**

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. Minimum sample mass meets requirement of Table 1?	_____	_____
2. Sample dried to a constant mass by FOP for AASHTO T 255?	_____	_____
3. Sample cooled, and original dry mass of the sample recorded to the nearest 0.1 percent or 0.1 g?	_____	_____
4. Sample placed in container and covered with water?	_____	_____
5. Contents of the container vigorously agitated?	_____	_____
6. Suspension of minus 75 µm (No. 200) achieved?	_____	_____
7. Wash water poured through nested sieves such as 2 mm (No. 10) and 75 µm (No. 200)?	_____	_____
8. Operation continued until wash water is reasonably clear?	_____	_____
9. Material retained on sieves returned to washed sample?	_____	_____
10. Washed sample dried to a constant mass by FOP for AASHTO T 255?	_____	_____
11. Washed sample cooled, and dry mass recorded to the nearest 0.1 percent or 0.1 g?	_____	_____
12. Sample placed in nest of sieves specified? (Additional sieves may be used to prevent overloading as allowed in FOP.)	_____	_____
13. Material sieved in verified mechanical shaker for proper time?	_____	_____
14. Mass of material on each sieve and pan recorded to 0.1 g?	_____	_____
15. Total mass of material after sieving agrees with mass before sieving to within 0.3 percent (check sum)?	_____	_____

OVER

Procedure Element

Trial 1 Trial 2

16. Percentages calculated to the nearest 0.1 percent and reported to the nearest whole number, except 75 μm (No. 200) which is reported to the nearest 0.1 percent?

17. Percentage calculations based on original dry mass of the sample?

18. Calculations performed properly?

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

Examiner Signature _____ **WAQTC #:** _____

PERFORMANCE EXAM CHECKLIST

**METHOD B
SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES
FOP FOR AASHTO T 27
MATERIALS FINER THAN 75 µm (No. 200) SIEVE IN MINERAL AGGREGATE
BY WASHING
FOP FOR AASHTO T 11**

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. Minimum sample mass meets requirement of Table 1?	_____	_____
2. Sample dried to a constant mass by FOP for AASHTO T 255?	_____	_____
3. Sample cooled, and original dry mass of the sample recorded to the nearest 0.1 percent or 0.1 g?	_____	_____
4. Sample placed in container and covered with water?	_____	_____
5. Contents of the container vigorously agitated?	_____	_____
6. Suspension of minus 75 µm (No. 200) achieved?	_____	_____
7. Wash water poured through nested sieves such as 2 mm (No. 10) and 75 µm (No. 200)?	_____	_____
8. Operation continued until wash water is reasonably clear?	_____	_____
9. Material retained on sieves returned to washed sample?	_____	_____
10. Washed sample dried to a constant mass by FOP for AASHTO T 255?	_____	_____
11. Washed sample cooled, and dry mass recorded to nearest 0.1 percent or 0.1 g?	_____	_____
12. Sample placed in nest of sieves specified? (Additional sieves may be used to prevent overloading as allowed in FOP.)	_____	_____
13. Material sieved in verified mechanical shaker for proper time?	_____	_____
14. Mass of material on each sieve and pan determined to the nearest 0.1 percent or 0.1 g?	_____	_____
15. Total mass of material after sieving agrees with mass before sieving to within 0.3 percent (coarse check sum)?	_____	_____

OVER

Procedure Element	Trial 1	Trial 2
16. Material in pan reduced in accordance with FOP for AASHTO R 76 to at least 500 g?	_____	_____
17. Mass of minus 4.75 mm (No. 4) split recorded to the nearest 0.1 g?	_____	_____
18. Sample placed in nest of sieves specified? (Additional sieves may be used to prevent overloading as allowed in FOP.)	_____	_____
19. Material sieved in verified mechanical shaker for proper time?	_____	_____
20. Mass of material on each sieve and pan recorded to the nearest percent or 0.1 g?	_____	_____
21. Total mass of material after sieving agrees with mass before sieving to within 0.3 percent (fine check sum)?	_____	_____
22. Percentages calculated to the nearest 0.1 percent and reported to the nearest whole number, except 75 μm (No.200) which is reported to the nearest 0.1 percent?	_____	_____
23. Percentage calculations based on original dry mass of the sample?	_____	_____
24. Calculations performed properly?	_____	_____

Comments: First attempt: Pass_____Fail_____ Second attempt: Pass_____Fail_____

Examiner Signature _____ **WAQTC #:** _____

PERFORMANCE EXAM CHECKLIST

**METHOD C
SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES
FOP FOR AASHTO T 27
MATERIALS FINER THAN 75 µm (No. 200) SIEVE IN MINERAL AGGREGATE
BY WASHING
FOP FOR AASHTO T 11**

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. Minimum sample mass meets requirement of Table 1?	_____	_____
2. Sample dried to a constant mass by FOP for AASHTO T 255?	_____	_____
3. Sample cooled, and original dry mass of the sample recorded to the nearest 0.1 percent or 0.1 g?	_____	_____
4. Material aggregations and clay lumps, silt, or adhering fines broken up?	_____	_____
5. Sample placed in nest of sieves specified? (Additional sieves may be used to prevent overloading as allowed in FOP.)	_____	_____
6. Material sieved in verified mechanical shaker for proper time?	_____	_____
7. Mass of material on each sieve and in pan determined to the nearest 0.1 percent or 0.1 g?	_____	_____
8. Complete separation of coarse and fine particles achieved?	_____	_____
9. Total mass of material after sieving agrees with original dry mass of sample to within 0.3 percent (coarse check sum)?	_____	_____
10. Material in pan reduced to test size for washing in accordance with FOP for AASHTO R 76?	_____	_____
11. Mass of the minus 4.75 mm (No. 4) split sample recorded to the nearest 0.1 g?	_____	_____
12. Test sample placed in container and covered with water?	_____	_____
13. Contents of the container vigorously agitated?	_____	_____
14. Suspension of minus 75 µm (No. 200) achieved?	_____	_____

OVER

PERFORMANCE EXAM CHECKLIST

DETERMINING THE PERCENTAGE OF FRACTURE IN COARSE AGGREGATE FOP FOR AASHTO T 335

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. Sample properly sieved through specified sieve(s)?	_____	_____
2. Sample reduced to correct size?	_____	_____
3. Sample dried and cooled, if necessary?	_____	_____
4. Particles separated into fractured, unfractured, and questionable categories?	_____	_____
5. Dry mass of each category determined to nearest 0.1 g?	_____	_____
6. Questionable category resorted if more than 15 percent of total mass falls in that category?	_____	_____
7. Fracture calculation performed correctly?	_____	_____

Comments: First attempt: Pass____Fail____ Second attempt: Pass____Fail____

Examiner Signature _____ **WAQTC #:** _____

PERFORMANCE EXAM CHECKLIST

**PLASTIC FINES IN GRADED AGGREGATES AND SOILS BY THE USE OF THE SAND EQUIVALENT TEST
FOP FOR AASHTO T 176**

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
Sample Preparation		
1. Sample passed through 4.75 mm (No. 4) sieve?	_____	_____
2. Material in clods broken up and re-screened?	_____	_____
3. Split or quarter 1,000 to 1,500 g of material passing the 4.75 mm (No. 4) sieve? NOTE: If necessary, the material may be dampened before splitting to avoid segregation or loss of fines.	_____	_____
4. No fines lost?	_____	_____
5. Working solution dated?	_____	_____
6. Temperature of working solution 22 ±3°C (72 ±5°F)?	_____	_____
7. Working calcium chloride solution 915 ±25 mm (36 ±1in) above the work surface?	_____	_____
8. 101.6 ±2.5 mm (4 ±0.1in) working calcium chloride solution siphoned into cylinder?	_____	_____
9. Material checked for moisture condition by tightly squeezing small portion in palm of hand and forming a cast?	_____	_____
10. Sample at proper water content?		
a. If too dry (cast crumbles easily) water added, re-mixed, covered, and allowed to stand for at least 15 minutes?	_____	_____
b. If too wet (shows free water) sample drained, air dried and mixed frequently?	_____	_____
11. Sample placed on splitting cloth and mixed by alternately lifting each corner of the cloth and pulling it over the sample toward diagonally opposite corner, causing material to be rolled?	_____	_____
12. Is material thoroughly mixed?	_____	_____
13. When material appears to be homogeneous, mixing finished with sample in a pile near center of cloth?	_____	_____
14. Fill the 85 mL (3 oz) tin by pushing through base of pile with other hand on opposite side of pile?	_____	_____

OVER

Procedure Element	Trial 1	Trial 2
15. Material fills tin to overflowing?	_____	_____
16. Material compacted into tin with palm of hand?	_____	_____
17. Tin struck off level using spatula or straightedge?	_____	_____
18. Prepared sample funneled into cylinder with no loss of fines?	_____	_____
19. Bottom of cylinder tapped sharply on heel of hand several times to release air bubbles?	_____	_____
20. Wetted sample allowed to stand undisturbed for 10 min. ±1 min.?	_____	_____
21. Cylinder stoppered and material loosened from bottom by shaking?	_____	_____
22. Stoppered cylinder placed properly in mechanical shaker and cylinder shaken 45 ±1 seconds?	_____	_____
23. Following shaking, cylinder set vertical on work surface and stopper removed?	_____	_____
24. Irrigator tube inserted in cylinder and material rinsed from cylinder walls as irrigator is lowered?	_____	_____
25. Irrigator tube forced through material to bottom of cylinder by gentle stabbing and twisting action?	_____	_____
26. Stabbing and twisting motion applied until cylinder filled to 381 mm (15 in.) mark?	_____	_____
27. Liquid raised and maintained at 381 mm (15 in.) mark while irrigator is being withdrawn?	_____	_____
28. Liquid at the 381 mm (15 in.) mark?	_____	_____
29. Contents let stand 20 minutes ±15 seconds?	_____	_____
30. Timing started immediately after withdrawal of irrigator?	_____	_____
31. No vibration or disturbance of the sample?	_____	_____
32. Readings taken at 20 minutes or up to 30 minutes, when a definite line appears?	_____	_____
33. Clay level correctly read, rounded, and recorded?	_____	_____
34. Weighted foot assembly lowered into cylinder without hitting mouth of cylinder?	_____	_____
35. Sand level correctly read, rounded, and recorded?	_____	_____
36. Calculations performed correctly?	_____	_____

Comments: First attempt: Pass_____Fail_____ Second attempt: Pass_____Fail_____

Examiner Signature _____ **WAQTC #:** _____