

PERFORMANCE EXAM CHECKLIST

**SAMPLING BITUMINOUS PAVING MIXTURES
FOP FOR AASHTO T 168**

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. Was sample taken with an attached sampling device correctly?	_____	_____
a. Container coated or preheated or both?	_____	_____
b. Sampling device passed through stream twice perpendicular to material?	_____	_____
c. Sampling device not over filled?	_____	_____
2. Samples from truck transports taken from four quadrants at required depth of 300 mm (12 in)?	_____	_____
3. Samples from roadway taken correctly with plate(s).		
a. When on untreated base plate placed well in front of paver?	_____	_____
b. Wire pulled to locate plate corner?	_____	_____
c. Cookie cutter placed on asphalt and pushed through to plate?	_____	_____
d. All material removed from inside the cutter?	_____	_____
4. Sample placed in appropriate container.	_____	_____
5. Sample size meets agency requirements?	_____	_____
6. Sample identified as required?	_____	_____

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

Examiner Signature _____ WAQTC #: _____

PERFORMANCE EXAM CHECKLIST (ORAL)

**SAMPLING BITUMINOUS PAVING MIXTURES
FOP FOR AASHTO T 168**

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. At the hot plant how must a sample be obtained using an attached sampling device?		
a. Coat or preheat sample container.	_____	_____
b. Sampling device passed through stream twice perpendicular to material.	_____	_____
c. The sampling device cannot be overfilled.	_____	_____
2. What must be done to sample from transport units?		
a. Divide the unit into four quadrants.	_____	_____
b. Obtain increments from each quadrant, 300 mm (12 in) below surface.	_____	_____
3. Describe how to take samples from the roadway using a plate.		
a. Place the plate well in front of the paver.	_____	_____
b. Pull the wire to locate the corner of the plate.	_____	_____
c. Place the cutter on the HMA above the plate and push it down to the plate.	_____	_____
d. Collect all the material inside the cutter.	_____	_____
4. What types of containers can be used?		
a. Cardboard boxes, stainless steel bowls, or other agency approved containers.	_____	_____
5. What dictates size of sample?		
a. Agency requirements.	_____	_____
b. Specified by test method.	_____	_____

Comments: First attempt: Pass____Fail____ Second attempt: Pass____Fail____

Examiner Signature _____ WAQTC #: _____

PERFORMANCE EXAM CHECKLIST

**REDUCING SAMPLES OF HOT MIX ASPHALT (HMA) TO TESTING SIZE
FOP FOR AASHTO R 47**

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 made soft enough to separate easily without exceeding temperature limits?	_____	_____
Mechanical Splitter Method Type A (Quartermaster)		
2. Splitter cleaned and surfaces coated with release agent?	_____	_____
3. Hopper closed and receptacles in place?	_____	_____
4. Sample placed into hopper without segregation or loss of material?	_____	_____
5. Hopper handle released allowing the HMA to uniformly flow into receptacles?	_____	_____
6. Splitter surfaces cleaned of all retained HMA, allowing it to fall into appropriate receptacles?	_____	_____
7. Further reduction with the quartermaster:		
a. Material in receptacles from opposite corners combined?	_____	_____
b. Splitting process repeated until appropriate sample size is obtained?	_____	_____
8. Remaining HMA stored in suitable container and properly labeled?	_____	_____
Mechanical Splitter Method Type B (Riffle)		
9. Splitting apparatus and tools, if preheated, not exceeding 110°C (230°F)?	_____	_____
10. Splitter cleaned and surfaces coated with release agent?	_____	_____
11. Two empty receptacles placed under splitter?	_____	_____
12. Sample placed in hopper or straight edged pan without loss of material and uniformly distributed from side to side?	_____	_____
13. Material discharged across chute assembly at controlled rate allowing free flow of HMA through chutes?	_____	_____
14. Splitter surfaces cleaned of all retained HMA allowing it to fall into appropriate receptacles?	_____	_____

OVER

Procedure Element

Trial 1 Trial 2

- 15. Further reduction with the riffle splitter:
 - a. Material from one receptacle discharged across chute assembly at controlled rate, allowing free flow of HMA through chutes? _____
 - b. Splitting process continued until appropriate sample size obtained, with splitter surfaces cleaned of all retained HMA after every split? _____
- 16. Remaining unused HMA stored in suitable container, properly labeled? _____

Quartering Method

- 17. Testing equipment preheated to a temperature not to exceed mix temperature? _____
- 18. Sample placed in a conical pile on a hard, non-stick, heat-resistant splitting surface such as metal or sheeting? _____
- 19. Sample mixed by turning the entire sample over a minimum of 4 times? _____
- 20. Conical pile formed and then flattened uniformly to diameter equal to about 4 to 8 times thickness? _____
- 21. Sample divided into 4 equal portions either with a metal quartering template or straightedges such as drywall taping knives? _____
- 22. Reduction by Full Quartering:
 - c. Two diagonally opposite quarters removed and returned to sample container? _____
 - d. Two other diagonally opposite quarters combined and process continued until appropriate sample size has been achieved? _____
- 23. Reduction by Apex:
 - e. Using two straightedges or a splitting device and one straightedge, was one of the quarters split from apex to outer edge of material? _____
 - f. Similar amount of material taken from opposite quarter? _____
 - g. Increments combined to produce appropriate sample size? _____
- 24. Remaining unused HMA stored in suitable container, properly labeled? _____

Incremental Method

- 25. Sample placed on hard, non-stick, heat-resistant splitting surface covered with sheeting? _____
- 26. Sample mixed by turning the entire sample over a minimum of 4 times? _____

OVER

Procedure Element

Trial 1 Trial 2

27. Conical pile formed?	_____	_____
28. HMA rolled into loaf and then flattened?	_____	_____
29. The first quarter of the loaf removed by slicing off or dropping off edge of counter and set aside?	_____	_____
30. Proper sample size sliced off or dropped off edge of counter into sample container?	_____	_____
31. Process continued until all samples are obtained?	_____	_____
31. All remaining unused HMA stored in suitable container, properly labeled?	_____	_____

Comments: First attempt: Pass____Fail____ Second attempt: Pass____Fail____

Examiner Signature _____

WAQTC #: _____

PERFORMANCE EXAM CHECKLIST

**MOISTURE CONTENT OF ASPHALT MIXTURES BY OVEN METHOD
FOP FOR AASHTO T 329**

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 of clean dry container including release media determined to 0.1 g?	_____	_____
2. Representative sample obtained; 1000 g minimum?	_____	_____
3. Initial temperature taken and recorded?	_____	_____
4. Mass of sample determined to 0.1 g?	_____	_____
5. Sample placed in drying oven for 90 ±5 minutes?	_____	_____
6. Sample dried at a temperature not to exceed the JMF mixing temp?	_____	_____
7. Constant mass checked at 30 ±5 minute intervals and reached?	_____	_____
8. Sample and container cooled to ±9°C (15°F) of the initial temperature before final mass determined to 0.1 g?	_____	_____
9. Calculation of moisture content performed correctly to 0.01 percent?	_____	_____

$$Moisture\ Content = \frac{M_i - M_f}{M_f} \times 100$$

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

Examiner Signature _____ WAQTC #: _____

PERFORMANCE EXAM CHECKLIST

**DETERMINING THE ASPHALT BINDER CONTENT OF HOT MIX ASPHALT (HMA) BY THE IGNITION METHOD
FOP FOR AASHTO T 308**

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. Oven at correct temperature $538 \pm 5^{\circ}\text{C}$ ($1000 \pm 9^{\circ}\text{F}$) or correction factor temperature? Or: for IR ovens, correct burn profile applied?	_____	_____
2. Sample reduced to correct size?	_____	_____
3. HMA sample or companion moisture sample taken and dried per FOP for AASHTO T 329?	_____	_____
4. Mass of sample basket assembly recorded to 0.1 g?	_____	_____
5. With pan below basket(s) sample evenly distributed in basket(s)?	_____	_____
6. Sample conforms to the required mass and mass recorded to 0.1 g?	_____	_____
7. Method A		
a. Initial mass entered into furnace controller?	_____	_____
b. Sample correctly placed into furnace?	_____	_____
c. Test continued until stable indicator signals?	_____	_____
d. Uncorrected asphalt binder content obtained on printed ticket?	_____	_____
e. Sample mass determined to nearest 0.1 g.?	_____	_____
8. Method B		
a. Sample correctly placed into furnace?	_____	_____
b. Sample burned for 45 min or time determined by correction process?	_____	_____
c. Sample cooled to room temperature?	_____	_____
d. Sample burned to constant mass?	_____	_____
e. Sample mass determined to nearest 0.1 g.?	_____	_____
f. Uncorrected asphalt binder content calculated correctly and recorded?	_____	_____

OVER

Procedure Element

Trial 1 Trial 2

- 9. Asphalt binder content corrected for Correction Factor if needed? _____
- 10. Asphalt binder content corrected for moisture per the FOP for AASHTO T 329 if needed? _____
- 11. Corrected asphalt binder content recorded? _____
- 12. Contents of the basket(s) carefully emptied into a pan? _____

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

Examiner Signature _____ WAQTC #: _____

PERFORMANCE EXAM CHECKLIST

**THEORETICAL MAXIMUM SPECIFIC GRAVITY AND DENSITY OF HOT MIX ASPHALT (HMA) PAVING MIXTURES
FOP FOR AASHTO T 209**

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 reduced to correct size?	_____	_____
2. Particles carefully separated insuring that aggregate is not fractured?	_____	_____
3. After separation, fine aggregate particles not larger than 6.3 mm (1/4 in.)?	_____	_____
4. Sample at room temperature?	_____	_____
5. Mass of container determined to 0.1 g?	_____	_____
6. Mass of sample and container determined to 0.1 g?	_____	_____
7. Mass of sample calculated and conforms to required size?	_____	_____
8. Water at approximately 25°C (77°F) added to cover sample?	_____	_____
9. Entrapped air removed using partial vacuum for 15 ±2 min?	_____	_____
10. Container and contents agitated continuously by mechanical device or manually by vigorous shaking at intervals of about 2 minutes?	_____	_____
11. Bowl determination:		
a. Water bath filled to the overflow level?	_____	_____
b. Bowl and contents suspended in water at 25 ±1°C (77 ±2°F) for 10 ±1 minutes?	_____	_____
c. Submerged weight of bowl and contents determined to 0.1 g?	_____	_____
d. Submerged weight of empty bowl determined to 0.1 g?	_____	_____
e. Net submerged weight of contents calculated?	_____	_____
12. Pycnometer / Volumetric Flask determination:		
a. Pycnometer / volumetric flask filled with water without reintroducing air into the sample?	_____	_____
b. Contents stabilized at 25 ±1°C (77 ±2°F)	_____	_____
c. Pycnometer / volumetric flask completely filled with water that is 25 ±1°C (77 ±2°F)?	_____	_____

OVER

Procedure Element

Trial 1 Trial 2

d. Mass of filled pycnometer / volumetric flask and cover determined to 0.1 g, 10 ±1 minutes after removal of entrapped air completed?

e. Mass of pycnometer / volumetric flask, cover, and water obtained from the Standardization of Pycnometer or Volumetric Flask procedure?

13. G_{mm} calculated correctly and reported to 0.001?

14. Density calculated correctly and reported to 1 kg/m³ (0.1 lb/ft³)?

Comments: First attempt: Pass____Fail____ Second attempt: Pass____Fail____

Examiner Signature _____ WAQTC #: _____

PERFORMANCE EXAM CHECKLIST

**BULK SPECIFIC GRAVITY OF COMPACTED HOT MIX ASPHALT (HMA) USING SATURATED SURFACE-DRY SPECIMENS
FOP FOR AASHTO T 166**

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
Method A:		
1. Mass of dry sample in air determined.		
a. Dried overnight at 52 ±3°C (125 ±5°F) and at successive 2-hour intervals to constant mass?	_____	_____
b. Cooled in air to 25 ±5°C (77 ±9°F)?	_____	_____
c. Dry mass determined to 0.1g?	_____	_____
2. Water at the overflow?	_____	_____
3. Balance zeroed?	_____	_____
4. Immersed weight determined.		
a. Water at 25 ±1°C (77 ±1.8°F)?	_____	_____
b. Immersed, shaken, on side, for 4 ±1 minutes?	_____	_____
c. Immersed weight determined to 0.1g?	_____	_____
5. Sample rapidly surface dried with damp towel and saturated surface dry (SSD) mass determined to 0.1 g (entire operation performed within 15 seconds)?	_____	_____
6. G_{mb} calculated to 0.001?	_____	_____
7. Absorption calculated to 0.01 percent	_____	_____
Method B:		
1. Specimen dried, cooled, and mass determined as in Method A?	_____	_____
2. Saturated surface dry (SSD) mass determined to 0.1g.		
a. Immersed at least 10 minutes at 25 ±1°C (77 ±1.8°F)?	_____	_____
b. Sample rapidly dried with damp towel?	_____	_____
c. Specimen mass determined to 0.1 g?	_____	_____
d. Any water that seeps from specimen included in mass?	_____	_____
3. Mass of volumeter filled with distilled water at 25 ±1°C (77 ±1.8°F) determined?	_____	_____
4. SSD specimen placed into volumeter and let stand for 1 minute?	_____	_____

OVER

Procedure Element	Trial 1	Trial 2
5. Temperature of water brought to 25 ±1°C (77 ±1.8°F) and volumeter covered, allowing some water to escape through the capillary bore of the tapered lid?	_____	_____
6. Volumeter wiped dry, and mass of volumeter and contents determined?	_____	_____
7. G _{mb} calculated to 0.001?	_____	_____
8. Absorption calculated to 0.01 percent?	_____	_____
Method C/A:		
1. Immersed weight determined.		
a. Water at 25 ±1°C (77 ±1.8°F)?	_____	_____
b. Immersed, shaken, on side, for 4 ±1 minutes?	_____	_____
c. Immersed weight determined to 0.1 g?	_____	_____
2. Sample rapidly surface dried with damp cloth (within 5 seconds)?	_____	_____
3. Saturated surface dry mass determined to 0.1 g?	_____	_____
4. Dry mass determined by:		
a. Heating in oven at a minimum of 105°C (221°F)?	_____	_____
b. Breaking down to 6.3 mm (¼ in.) particles?	_____	_____
c. Drying in oven to constant mass (change less than 0.05 percent in 2 hours of additional drying)?	_____	_____
d. Cooled in air to 25 ±5°C (77 ±9°F) and mass determined to 0.1 g?	_____	_____
5. G _{mb} calculated to 0.001?	_____	_____
6. Absorption calculated to 0.01?	_____	_____
Method C/B:		
1. Saturated surface dry (SSD) mass determined to 0.1g.		
a. Immersed at least 10 minutes at 25 ±1°C (77 ±1.8°F)?	_____	_____
b. Sample rapidly dried with damp towel (within 5 seconds)?	_____	_____
c. Specimen mass determined to 0.1g?	_____	_____
d. Any water that seeps from specimen included in mass?	_____	_____
2. Mass of volumeter filled with distilled water at 25 ±1°C (77 ±1.8°F) determined to 0.1 g?	_____	_____
3. SSD specimen placed into volumeter and let stand for 1 minute?	_____	_____
4. Temperature of water brought to 25 ±1°C (77 ±1.8°F) and volumeter covered, allowing some water to escape through the capillary pore of the tapered lid?	_____	_____
5. Volumeter wiped dry, and mass of volumeter and contents determined to 0.1 g?	_____	_____

OVER

Procedure Element

Trial 1 Trial 2

- 6. Dry mass determined by:
 - a. Warming in oven at a minimum of 105°C (221°F)? _____
 - b. Breaking down to 6.3 mm (¼ in.) particles? _____
 - c. Drying in oven to constant mass (change less than 0.05 percent in 2 hours of additional drying)? _____
 - d. Cooled in air to 25 ±5°C (77 ±9°F) and mass determined to 0.1 g? _____
- 7. G_{mb} calculated to 0.001? _____
- 8. Absorption calculated to 0.01 percent? _____

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

Examiner Signature _____ WAQTC #: _____

PERFORMANCE EXAM CHECKLIST

**MECHANICAL ANALYSIS OF EXTRACTED AGGREGATE
FOP FOR AASHTO T 30**

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. Total dry mass determined to 0.1 g	_____	_____
2. Dry mass agrees with sample mass after ignition (M_f) from AASHTO T 308 within 0.1 percent?	_____	_____
3. Sample placed in container and covered with water?	_____	_____
4. Wetting agent added?	_____	_____
5. Contents of container agitated vigorously?	_____	_____
6. Wash water poured through proper nest of two sieves?	_____	_____
7. Washing continued until wash water is clear and no wetting agent remaining?	_____	_____
8. Retained material returned to washed sample?	_____	_____
9. Washed material coarser than 75 μm (No. 200) dried to constant mass at $110 \pm 5^\circ\text{C}$ ($230 \pm 9^\circ\text{F}$)?	_____	_____
10. Sample cooled to room temperature?	_____	_____
11. Dry mass after washing determined to 0.1 g?	_____	_____
12. Material sieved on specified sieves?	_____	_____
13. Mass of each fraction of aggregate, including minus 75 μm (No. 200), determined and recorded to 0.1 g?	_____	_____
14. Percent passing on each sieve determined correctly to the nearest 0.1 percent?	_____	_____
15. Aggregate correction factor applied?	_____	_____
16. Percent passing on each sieve reported correctly to the nearest 1 percent and nearest 0.1 percent on the 75 μm (No. 200)?	_____	_____
17. Does summation of sieve masses check total washed dry mass to within 0.2 percent?	_____	_____

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

Examiner Signature _____ WAQTC #: _____

PERFORMANCE EXAM CHECKLIST

**GYRATORY COMPACTION OF ASPHALT MIXTURES
FOP FOR AASHTO T 312**

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. Angle, pressure and number of gyrations set?	_____	_____
2. Bearing surfaces, rotating base surface, and rollers lubricated?	_____	_____
3. Representative sample obtained according to the FOP for AASHTO T 168?	_____	_____
4. Sample reduced according to FOP AASHTO R 47?	_____	_____
5. Asphalt mixture heated to compaction temperature range?	_____	_____
6. Mold, base plate, and upper plate heated to compaction temperature range?	_____	_____
7. Mold, base plate, and upper plate (if required) removed from oven and paper disk placed on bottom of mold?	_____	_____
8. Mix placed into mold in one lift without segregation?	_____	_____
9. Paper disk placed on top of the asphalt mixture?	_____	_____
10. Mold placed into compactor and upper plate clamped into place?	_____	_____
11. Pressure applied at 600 kPa ±18 kPa?	_____	_____
12. Specified number of gyrations applied?	_____	_____
13. Proper angle confirmed from display?	_____	_____
14. Compacted specimen removed from mold, paper disc(s) removed, and allowed to cool to room temperature?	_____	_____
15. Asphalt mixture sample measured to a height of 115 ±5 mm at required gyrations?	_____	_____

Comments: First attempt: Pass____Fail____ Second attempt: Pass____Fail____

Examiner Signature _____ WAQTC #: _____

