

PERFORMANCE EXAM CHECKLIST

**TOTAL EVAPORABLE MOISTURE CONTENT OF AGGREGATE BY DRYING
FOP FOR AASHTO T 255**

**LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOILS
FOP FOR AASHTO T 265**

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 g? | _____ | _____ |
| 3. Sample placed in container and mass determined to 0.1 g? | _____ | _____ |
| 4. Test sample mass conforms to the required mass? | _____ | _____ |
| 5. Wet sample mass determined to 0.1 g? | _____ | _____ |
| 6. Loss of moisture avoided prior to mass determination? | _____ | _____ |
| 7. Sample dried by a suitable heat source? | _____ | _____ |
| a. Describe suitable heat sources for aggregate? | _____ | _____ |
| b. Describe suitable heat sources for soils? | _____ | _____ |
| 8. If aggregate heated by means other than a controlled oven, is sample stirred to avoid localized overheating? | _____ | _____ |
| 9. For microwave, aggregate heaped and covered with a ventilated lid? | _____ | _____ |
| 10. For aggregate, heated for the additional, specified time? | _____ | _____ |
| a. Forced draft, ventilated, convection ovens – 30 minutes | | |
| b. Microwave – 2 minutes | | |
| c. Other – 10 minutes | | |
| 11. For soil: | | |
| a. Heated for at least 1 hour additional drying time using a controlled heat source? | _____ | _____ |
| 12. Mass determined and compared to previous mass - showing less than 0.10 percent loss? | _____ | _____ |
| 13. Sample cooled, dry mass determined and recorded to the nearest 0.1 percent? | _____ | _____ |
| 14. Moisture content calculated correctly and recorded to the nearest 0.1 percent? | _____ | _____ |

OVER

EMBANKMENT AND BASE
IN-PLACE DENSITY

WAQTC

FOP AASHTO T 255/T 265 (18)

Comments: First attempt: Pass____Fail____ Second attempt: Pass____Fail____

Examiner Signature _____ WAQTC #: _____

PERFORMANCE EXAM CHECKLIST

**ONE-POINT METHOD
FOP FOR AASHTO T 272 (T 99)**

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. One-point determination of dry density and corresponding moisture content made in accordance with the FOP for AASHTO T 99? | _____ | _____ |
| a. Correct size (4.75 mm / No. 4 or 19.0 mm / 3/4 in.) material used? | _____ | _____ |
| 2. If necessary, sample dried until friable in air or drying apparatus, not exceeding 60°C (140°F)? | _____ | _____ |
| 3. Sample broken up and an adequate amount sieved over the appropriate sieve (4.75 mm / No. 4 or 19.0 mm / 3/4 in.) to determine oversize (coarse particle) percentage? | _____ | _____ |
| 4. Sample passing the sieve has appropriate mass? | _____ | _____ |
| 5. Moisture content adjusted if needed? | _____ | _____ |
| 6. Determine mass of clean, dry mold without collar to nearest 1 g (0.005 lb.)? | _____ | _____ |
| 7. Mold placed on rigid and stable foundation? | _____ | _____ |
| 8. Layer of soil (approximately one third compacted depth) placed in mold with collar attached, loose material lightly tamped? | _____ | _____ |
| 9. Soil compacted with appropriate number of blows (25 or 56)? | _____ | _____ |
| 10. Material adhering to the inside of the mold trimmed? | _____ | _____ |
| 11. Layer of soil (approximately two thirds compacted depth) placed in mold with collar attached, loose material lightly tamped? | _____ | _____ |
| 12. Soil compacted with appropriate number of blows (25 or 56)? | _____ | _____ |
| 13. Material adhering to the inside of the mold trimmed? | _____ | _____ |
| 14. Mold filled with soil such that compacted soil will be above the mold, loose material lightly tamped? | _____ | _____ |
| 15. Soil compacted with appropriate number of blows (25 or 56)? | _____ | _____ |
| 16. Collar removed without shearing off sample? | _____ | _____ |
| 17. Approximately 6 mm (1/4 in.) of compacted material above the top of the mold (without the collar)? | _____ | _____ |
| 18. Soil trimmed to top of mold with the beveled side of the straightedge? | _____ | _____ |
| 19. Remove soil from exterior surface of mold and base plate? | _____ | _____ |
| 20. Mass of mold and contents determined to appropriate precision? | _____ | _____ |

OVER

| Procedure Element | Trial 1 | Trial 2 |
|---|---------|---------|
| 21. Wet density calculated from the wet mass? | _____ | _____ |
| 22. Soil removed from mold using a sample extruder if needed? | _____ | _____ |
| 23. Soil sliced vertically through center (non-granular material)? | _____ | _____ |
| 24. Moisture sample removed ensuring all layers are represented? | _____ | _____ |
| 25. Moist mass determined immediately to 0.1 g? | _____ | _____ |
| 26. Moisture sample mass of correct size? | _____ | _____ |
| 27. Sample dried and water content determined according to the FOP for T 255/T 265? | _____ | _____ |
| 28. One-point plotted on family of curves supplied? | _____ | _____ |
| a. One-point falls within 80 to 100 percent of optimum moisture content in order to be valid? | _____ | _____ |
| b. If one-point does not fall within 80 to 100 percent of optimum moisture content, another one-point determination with an adjusted water content is made? | _____ | _____ |
| c. Maximum dry density and corresponding optimum moisture content correctly estimated? | _____ | _____ |
| 29. One-point plotted on a single reference curve? | _____ | _____ |
| a. Does one-point plot within 2 lb/ft ³ in order to be valid? | _____ | _____ |
| b. Does one-point fall within 80 to 100 percent of optimum moisture content in order to be valid? | _____ | _____ |
| c. Maximum dry density and corresponding optimum moisture content determined from single reference curve? | _____ | _____ |

Comments: First attempt: Pass____Fail____ Second attempt: Pass____Fail____

Examiner Signature _____ WAQTC #: _____

PERFORMANCE EXAM CHECKLIST

**ONE-POINT METHOD
FOP FOR AASHTO T 272 (T 180)**

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. One-point determination of dry density and corresponding moisture content made in accordance with the FOP for AASHTO T 180? | _____ | _____ |
| a. Correct size (4.75 mm / No. 4 or 19.0 mm / 3/4 in.) material used? | _____ | _____ |
| 2. If necessary, sample dried until friable in air or drying apparatus, not exceeding 60°C (140°F)? | _____ | _____ |
| 3. Sample broken up and an adequate amount sieved over the appropriate sieve (4.75 mm / No. 4 or 19.0 mm / 3/4 in.) to determine oversize (coarse particle) percentage? | _____ | _____ |
| 4. Sample passing the sieve has appropriate mass? | _____ | _____ |
| 5. Moisture content adjusted if needed? | _____ | _____ |
| 6. Determine mass of clean, dry mold without collar to nearest 1 g (0.005 lb.)? | _____ | _____ |
| 7. Mold placed on rigid and stable foundation? | _____ | _____ |
| 8. Layer of soil (approximately one fifth compacted depth) placed in mold with collar attached, loose material lightly tamped? | _____ | _____ |
| 9. Soil compacted with appropriate number of blows (25 or 56)? | _____ | _____ |
| 10. Material adhering to the inside of the mold trimmed? | _____ | _____ |
| 11. Layer of soil (approximately two fifths compacted depth) placed in mold with collar attached, loose material lightly tamped? | _____ | _____ |
| 12. Soil compacted with appropriate number of blows (25 or 56)? | _____ | _____ |
| 13. Material adhering to the inside of the mold trimmed? | _____ | _____ |
| 14. Layer of soil (approximately three fifths compacted depth) placed in mold with collar attached, loose material lightly tamped? | _____ | _____ |
| 15. Soil compacted with appropriate number of blows (25 or 56)? | _____ | _____ |
| 16. Material adhering to the inside of the mold trimmed? | _____ | _____ |
| 17. Layer of soil (approximately four fifths compacted depth) placed in mold with collar attached, loose material lightly tamped? | _____ | _____ |
| 18. Soil compacted with appropriate number of blows (25 or 56)? | _____ | _____ |
| 19. Material adhering to the inside of the mold trimmed? | _____ | _____ |

OVER

| Procedure Element | Trial 1 | Trial 2 |
|---|----------------|----------------|
| 20. Mold filled with soil such that compacted soil will be above the mold, loose material lightly tamped? | _____ | _____ |
| 21. Soil compacted with appropriate number of blows (25 or 56)? | _____ | _____ |
| 22. Collar removed without shearing off sample? | _____ | _____ |
| 23. Approximately 6 mm (1/4 in.) of compacted material above the top of the mold (without the collar)? | _____ | _____ |
| 24. Soil trimmed to top of mold with the beveled side of the straightedge? | _____ | _____ |
| 25. Remove soil from exterior surface of mold and base plate? | _____ | _____ |
| 26. Mass of mold and contents determined to appropriate precision? | _____ | _____ |
| 27. Wet density calculated from the wet mass? | _____ | _____ |
| 28. Soil removed from mold using a sample extruder if needed? | _____ | _____ |
| 29. Soil sliced vertically through center (non-granular material)? | _____ | _____ |
| 30. Moisture sample removed ensuring all layers are represented? | _____ | _____ |
| 31. Moist mass determined immediately to 0.1 g? | _____ | _____ |
| 32. Moisture sample mass of correct size? | _____ | _____ |
| 33. Sample dried and water content determined according to the FOP for T 255/T 265? | _____ | _____ |
| 34. One-point plotted on family of curves supplied? | _____ | _____ |
| a. One-point falls within 80 to 100 percent of optimum moisture content in order to be valid? | _____ | _____ |
| b. If one-point does not fall within 80 to 100 percent of optimum moisture content, another one-point determination with an adjusted water content is made? | _____ | _____ |
| c. Maximum dry density and corresponding optimum moisture content correctly estimated? | _____ | _____ |
| 35. One-point plotted on a single reference curve? | _____ | _____ |
| a. Does one-point plot within 2 lb/ft ³ in order to be valid? | _____ | _____ |
| b. Does one-point fall within 80 to 100 percent of optimum moisture content in order to be valid? | _____ | _____ |
| c. Maximum dry density and corresponding optimum moisture content determined from single reference curve? | _____ | _____ |

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

Examiner Signature _____ WAQTC #: _____

PERFORMANCE EXAM CHECKLIST

**IN-PLACE DENSITY AND MOISTURE CONTENT OF SOIL AND SOIL-AGGREGATE BY NUCLEAR METHODS (SHALLOW DEPTH)
FOP FOR AASHTO T 310**

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. Gauge turned on 10 to 20 minutes before use? | _____ | _____ |
| 2. Calibration verified? | _____ | _____ |
| 3. Standard count taken and recorded in accordance with manufacturer’s instructions? | _____ | _____ |
| 4. Test location selected appropriately 10 m (30 ft.) from other radioactive sources, 3 m (10 ft.) from large objects, 150 mm (6 in.) away from vertical projections? | _____ | _____ |
| 5. Loose, disturbed material removed? | _____ | _____ |
| 6. Flat, smooth area prepared? | _____ | _____ |
| 7. Surface voids filled with native fines (-No. 4) to 3 mm (1/8 in.) maximum thickness? | _____ | _____ |
| 8. Hole driven 50 mm (2 in.) deeper than source rod depth? | _____ | _____ |
| 9. Gauge placed and source rod lowered without disturbing loose material? | _____ | _____ |
| 10. Method A: | | |
| a. Gauge firmly seated, and gently pulled back so that the source rod is against the side of the hole toward the scaler / detectors? | _____ | _____ |
| b. Two, one-minute reading taken; wet density within 32 kg/m ³ (2.0 lb/ft ³)? | _____ | _____ |
| c. Density and moisture data averaged? | _____ | _____ |
| 11. Method B: | | |
| a. Gauge firmly seated, and gently pulled back so that the source rod is against the side of the hole toward the scaler / detectors? | _____ | _____ |
| b. A minimum of a one-minute reading taken; density and moisture data recorded? | _____ | _____ |
| c. Gauge turned 90° or 180° (180° in trench)? | _____ | _____ |

OVER

| Procedure Element | Trial 1 | Trial 2 |
|--|---------|---------|
| d. Gauge firmly seated, and gently pulled back so that the source rod is against the side of the hole toward the scaler / detectors? | _____ | _____ |
| e. A minimum of a one-minute reading taken; density and moisture data recorded? | _____ | _____ |
| f. Wet densities within 50 kg/m ³ (3.0 lb/ft ³)? | _____ | _____ |
| g. Density and moisture data averaged? | _____ | _____ |
| 12. Representative sample (4 kg or 9 lb) obtained from test location? | _____ | _____ |
| 13. Sample sealed immediately to prevent moisture loss? | _____ | _____ |
| 14. Moisture content correctly determined using other means than the nuclear density gauge reading? | _____ | _____ |
| 15. Dry Density calculated using proper moisture content? | _____ | _____ |
| 16. Percent compaction calculated correctly? | _____ | _____ |

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

Examiner Signature _____ WAQTC #: _____

PERFORMANCE EXAM CHECKLIST

**IN-PLACE DENSITY OF ASPHALT MIXTURES BY NUCLEAR METHODS
FOP FOR AASHTO T 355**

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. Gauge turned on approximately 10 to 20 minutes before use? | _____ | _____ |
| 2. Gauge calibrated, and standard count recorded? | _____ | _____ |
| 3. Test location selected appropriately [600 mm (24 in.) from vertical projections or 10 m (30 ft.) from any other radioactive sources]? | _____ | _____ |
| 4. Filler spread evenly over test site? | _____ | _____ |
| 5. Excess filler material removed by striking off the surface? | _____ | _____ |
| 6. Gauge placed on pavement surface and footprint of gauge marked? | _____ | _____ |
| 7. Source rod extended to backscatter position? | _____ | _____ |
| 8. Method A: | | |
| a. One-minute count taken; gauge rotated 90°, reseated, and another one-minute count taken? | _____ | _____ |
| b. Densities averaged? | _____ | _____ |
| c. If difference of the wet densities is greater than 40 kg/m ³ (2.5 lb/ft ³), retest conducted in both directions? | _____ | _____ |
| 9. Method B: | | |
| a. One four-minute count taken? | _____ | _____ |
| 10. Core correlation applied if required? | _____ | _____ |
| 11. Percent compaction calculated correctly? | _____ | _____ |

Comments: First attempt: Pass____Fail____ Second attempt: Pass____Fail____

Examiner Signature _____ WAQTC #: _____

