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?	_____	_____
8. If aggregate heated by means other than a controlled oven, is sample stirred to avoid localized overheating?	_____	_____
9. For aggregate: Is aggregate heated for the additional, specified time (forced draft, ventilated, convection – 30 minutes; microwave – 2 minutes; other 10 minutes) and then mass determined and compared to previous mass showing less than 0.10 percent loss?	_____	_____
10. For soil: Is soil heated for at least 1hour additional drying time and then mass determined and compared to previous mass - showing less than 0.10 percent loss?	_____	_____
11. Sample cooled, dry mass determined and recorded to the nearest 0.1 percent?	_____	_____
12. Moisture content calculated correctly and recorded to the nearest 0.1 percent?	_____	_____

Comments: First attempt: Pass_____Fail_____ Second attempt: Pass_____Fail_____

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Examiner Signature _____WAQTC #:_____

PERFORMANCE EXAM CHECKLIST

MOISTURE-DENSITY RELATION OF SOILS FOP FOR AASHTO 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. If damp, sample dried in air or drying apparatus, not exceeding 60°C (140°F)?	_____	_____
2. 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?	_____	_____
3. Sample passing the sieve has appropriate mass?	_____	_____
4. If soil is plastic (clay types):		
a. Multiple samples mixed with water varying moisture content by 1 to 2 percent, bracketing the optimum moisture content?	_____	_____
b. Samples placed in covered containers and allowed to stand for at least 12 hours?	_____	_____
5. Sample determined to be 4 to 8 percent below expected optimum moisture content?	_____	_____
6. Mold placed on rigid and stable foundation?	_____	_____
7. Layer of soil (approximately one third compacted depth) placed in mold with collar attached, loose material lightly tamped?	_____	_____
8. Soil compacted with appropriate number of blows (25 or 56)?	_____	_____
9. Material adhering to the inside of the mold trimmed?	_____	_____
10. Layer of soil (approximately two thirds compacted depth) placed in mold with collar attached, loose material lightly tamped?	_____	_____
11. Soil compacted with appropriate number of blows (25 or 56)?	_____	_____
12. Material adhering to the inside of the mold trimmed?	_____	_____
13. Mold filled with soil such that compacted soil will be above the mold, loose material lightly tamped?	_____	_____
14. Soil compacted with appropriate number of blows (25 or 56)?	_____	_____
15. Collar removed without shearing off sample?	_____	_____

OVER

Procedure Element	**Trial 1**	**Trial 2**
16. Approximately 6 mm (1/4 in.) of compacted material above the top of the mold (without the collar)?	_____	_____
17. Soil trimmed to top of mold with the beveled side of the straightedge?	_____	_____
18. Mass of mold and contents determined to appropriate precision?	_____	_____
19. Wet density calculated from the wet mass?	_____	_____
20. Soil removed from mold using a sample extruder if needed?	_____	_____
21. Soil sliced vertically through center (non-granular material)?	_____	_____
22. Moisture sample removed ensuring all layers are represented?	_____	_____
23. Moist mass determined immediately to 0.1 g?	_____	_____
24. Moisture sample mass of correct size?	_____	_____
25. Sample dried and water content determined according to the FOP for T 255/T 265?	_____	_____
26. Remainder of material from mold broken up until it will pass through the sieve, as judged by eye, and added to remainder of original test sample?	_____	_____
27. Water added to increase moisture content of the remaining sample in 1 to 2 percent increments?	_____	_____
28. Steps 2 through 26 repeated for each increment of water added?	_____	_____
29. If material is degradable: Multiple samples mixed with water varying moisture content by 1 to 2 percent, bracketing the optimum moisture content?	_____	_____
30. Process continued until wet density either decreases or stabilizes?	_____	_____
31. Moisture content and dry density calculated for each sample?	_____	_____
32. Dry density plotted on vertical axis, moisture content plotted on horizontal axis, and points connected with a smooth curve?	_____	_____
33. Moisture content at peak of curve recorded as optimum water content and recorded to nearest 0.1 percent?	_____	_____
34. Dry density at optimum moisture content reported as maximum density to nearest 1 kg/m^3 (0.1 lb/ft^3)?	_____	_____
35. Corrected for coarse particles if applicable?	_____	_____

Comments: First attempt: Pass_____Fail_____ Second attempt: Pass_____Fail_____

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Examiner Signature _____WAQTC #:_____

PERFORMANCE EXAM CHECKLIST

MOISTURE-DENSITY RELATION OF SOILS FOP FOR AASHTO 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. If damp, sample dried in air or drying apparatus, not exceeding 60°C (140°F)?	_____	_____
2. 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?	_____	_____
3. Sample passing the sieve has appropriate mass?	_____	_____
4. If soil is plastic (clay types):		
a. Multiple samples mixed with water varying moisture content by 1 to 2 percent, bracketing the optimum moisture content?	_____	_____
b. Samples placed in covered containers and allowed to stand for at least 12 hours?	_____	_____
5. Sample determined to be 4 to 8 percent below expected optimum moisture content?	_____	_____
6. Mold placed on rigid and stable foundation?	_____	_____
7. Layer of soil (approximately one fifth compacted depth) placed in mold with collar attached, loose material lightly tamped?	_____	_____
8. Soil compacted with appropriate number of blows (25 or 56)?	_____	_____
9. Material adhering to the inside of the mold trimmed?	_____	_____
10. Layer of soil (approximately two fifths compacted depth) placed in mold with collar attached, loose material lightly tamped?	_____	_____
11. Soil compacted with appropriate number of blows (25 or 56)?	_____	_____
12. Material adhering to the inside of the mold trimmed?	_____	_____
13. Layer of soil (approximately three fifths compacted depth) placed in mold with collar attached, loose material lightly tamped?	_____	_____
14. Soil compacted with appropriate number of blows (25 or 56)?	_____	_____
15. Material adhering to the inside of the mold trimmed?	_____	_____

OVER

Procedure Element	**Trial 1**	**Trial 2**
16. Layer of soil (approximately four fifths compacted depth) placed in mold with collar attached, loose material lightly tamped?	_____	_____
17. Soil compacted with appropriate number of blows (25 or 56)?	_____	_____
18. Material adhering to the inside of the mold trimmed?	_____	_____
19. Mold filled with soil such that compacted soil will be above the mold, loose material lightly tamped?	_____	_____
20. Soil compacted with appropriate number of blows (25 or 56)?	_____	_____
21. Collar removed without shearing off sample?	_____	_____
22. Approximately 6 mm (1/4 in.) of compacted material above the top of the mold (without the collar)?	_____	_____
23. Soil trimmed to top of mold with the beveled side of the straightedge?	_____	_____
24. Mass of mold and contents determined to appropriate precision?	_____	_____
25. Wet density calculated from the wet mass?	_____	_____
26. Soil removed from mold using a sample extruder if needed?	_____	_____
27. Soil sliced vertically through center (non-granular material)?	_____	_____
28. Moisture sample removed ensuring all layers are represented?	_____	_____
29. Moist mass determined immediately to 0.1 g?	_____	_____
30. Moisture sample mass of correct size?	_____	_____
31. Sample dried and water content determined according to the FOP for T 255/T 265?	_____	_____
32. Remainder of material from mold broken up until it will pass through the sieve, as judged by eye, and added to remainder of original test sample?	_____	_____
33. Water added to increase moisture content of the remaining sample in 1 to 2 percent increments?	_____	_____
34. Steps 2 through 20 repeated for each increment of water added?	_____	_____
35. If soil is plastic (clay types):		
a. Samples mixed with water varying moisture content by 1 to 2 percent, bracketing the optimum moisture content?	_____	_____
b. Samples placed in covered containers and allowed to stand for at least 12 hours?	_____	_____
36. If material is degradable:		
Multiple samples mixed with water varying moisture content by 1 to 2 percent, bracketing the optimum moisture content?	_____	_____

OVER

Procedure Element	**Trial 1**	**Trial 2**
37. Process continued until wet density either decreases or stabilizes?	_____	_____
38. Moisture content and dry density calculated for each sample?	_____	_____
39. Dry density plotted on vertical axis, moisture content plotted on horizontal axis, and points connected with a smooth curve?	_____	_____
40. Moisture content at peak of curve recorded as optimum water content and recorded to nearest 0.1 percent?	_____	_____
41. Dry density at optimum moisture content reported as maximum density to nearest 1 kg/m^3 (0.1 lb/ft^3)?	_____	_____
42. Corrected for coarse particles if applicable?	_____	_____

Comments: First attempt: Pass_____Fail_____ Second attempt: Pass_____Fail_____

Examiner Signature _____WAQTC #:_____

PERFORMANCE EXAM CHECKLIST

DEVELOPING A FAMILY OF CURVES
FOP FOR AASHTO R 75

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. Curves sorted by method and procedure (A, B, C, or D of the FOP for T 99/T 180)?	_____	_____
a. At least three curves per family?	_____	_____
2. Maximum density and optimum moisture points plotted on the graph?	_____	_____
3. Spine drawn correctly?	_____	_____
4. Maximum density and optimum moisture points removed that were not used for the spine?	_____	_____
5. Moisture/density curves added?	_____	_____
6. Optimum moisture range desired?	_____	_____
a. 80 percent of optimum moisture calculated for each curve?	_____	_____
b. Curved line through 80 percent of optimum moisture drawn correctly?	_____	_____

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. Mold placed on rigid and stable foundation?	_____	_____
6. Layer of soil (approximately one fifth compacted depth) placed in mold with collar attached, loose material lightly tamped?	_____	_____
7. Soil compacted with appropriate number of blows (25 or 56)?	_____	_____
8. Material adhering to the inside of the mold trimmed?	_____	_____
9. Layer of soil (approximately two fifths compacted depth) placed in mold with collar attached, loose material lightly tamped?	_____	_____
10. Soil compacted with appropriate number of blows (25 or 56)?	_____	_____
12. Material adhering to the inside of the mold trimmed?	_____	_____
13. Layer of soil (approximately three fifths compacted depth) placed in mold with collar attached, loose material lightly tamped?	_____	_____
14. Soil compacted with appropriate number of blows (25 or 56)?	_____	_____
15. Material adhering to the inside of the mold trimmed?	_____	_____
16. Layer of soil (approximately four fifths compacted depth) placed in mold with collar attached, loose material lightly tamped?	_____	_____
17. Soil compacted with appropriate number of blows (25 or 56)?	_____	_____
18. Material adhering to the inside of the mold trimmed?	_____	_____

OVER

Procedure Element	**Trial 1**	**Trial 2**
19. Mold filled with soil such that compacted soil will be above the mold, loose material lightly tamped?	_____	_____
20. Soil compacted with appropriate number of blows (25 or 56)?	_____	_____
21. Collar removed without shearing off sample?	_____	_____
22. Approximately 6 mm (1/4 in.) of compacted material above the top of the mold (without the collar)?	_____	_____
23. Soil trimmed to top of mold with the beveled side of the straightedge?	_____	_____
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?	_____	_____
35. One-point falls within 80 to 100 percent of optimum moisture content in order to be valid?	_____	_____
36. 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?	_____	_____
37. Maximum dry density and corresponding optimum moisture content correctly estimated?	_____	_____

Comments: First attempt: Pass_____Fail_____ Second attempt: Pass_____Fail_____

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Examiner Signature _____WAQTC #:_____

PERFORMANCE EXAM CHECKLIST

SPECIFIC GRAVITY AND ABSORPTION OF COARSE AGGREGATE FOP FOR AASHTO T 85

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 obtained by FOP for AASHTO T 2 and reduced by FOP for AASHTO R 76 or from FOP for AASHTO T 99 / T 180?	_____	_____
2. Screened on the appropriate size sieve?	_____	_____
3. Sample mass appropriate?	_____	_____
4. Particle surfaces clean?	_____	_____
5. Dried to constant mass 110 ±5°C (230 ±9°F) and cooled to room temperature?	_____	_____
6. Covered with water for 15 to 19 hours?	_____	_____
7. Basket placed into immersion tank and attached to balance?	_____	_____
8. Immersion tank inspected for proper water height?	_____	_____
9. Balance tared with basket in tank and temperature checked 23.0 ±1.7°C (73.4 ±3°F)?	_____	_____
10. Sample removed from water and rolled in cloth to remove visible films of water?	_____	_____
11. Larger particles wiped individually?	_____	_____
12. Evaporation avoided?	_____	_____
13. Sample mass determined to 0.1 g?	_____	_____
14. Sample immediately placed in basket, in immersion tank?	_____	_____
15. Entrapped air removed before weighing by shaking basket while immersed?	_____	_____
16. Immersion tank inspected for proper water height?	_____	_____
17. Immersed sample weight determined to 0.1 g?	_____	_____
18. All the sample removed from basket?	_____	_____
19. Sample dried to constant mass and cooled to room temperature?	_____	_____

OVER

Procedure Element	**Trial 1**	**Trial 2**
20. Sample mass determined to 0.1 g?	_____	_____
21. Proper formulas used in calculations?	_____	_____

Comments: First attempt: Pass____Fail____ Second attempt: Pass____Fail____

Examiner Signature _____WAQTC #:_____