cttp

Asphalt Study Guide

Terminology

1) Pb is the _____ _____ of the asphalt mixture.
2) Gmb is the _____ specific gravity of the _____.
3) Gmm is the _____ theoretical specific gravity of the _____.
4) Gse is the _____ specific gravity of the _____.
5) VMA stands for the _____ in the _____ aggregate.

Mix Design and Verification

6) The values calculated for VMA_{eff} are used when determining compliance with field specifications on an ARDOT project. True False
7) The optimum binder content shown on the mix design is used in all calculations during production. True False
8) Two temperatures needed for field quality control which can be found on the ARDOT mix design are the _____ temperature and the _____ temperature.
9) The VMA correction factor is found on the ARDOT mix design. True False
10) PG 76-22 and PG 70-22 binders can be used interchangeably. True False
11) For quality control/quality assurance testing, asphalt specimens are compacted in the gyratory compactor to _____ gyrations.
12) The Asphalt Pavement Analyzer (APA) is used to test for _____.
13) The Ideal-CT test is used for testing a mixture's resistance to _____.
14) Mixes designed by the balanced mix design method may have different field compliance limits than traditional mixes. True False
15) A mix design verification is required at the start of mix production or after an interruption of more than _____ days.
16) If the first mix verification is unsuccessful, the binder content may be adjusted. True False

Applications

17) Application rate is the _____ of asphalt needed to cover a square yard in order to produce the required _____ of pavement.
18) Application rates are generally found on the job _____.
19) One inch of asphalt thickness is roughly equivalent to a rate of _____ lb/sy

Specifications

20) Standard specifications always supersede supplemental specifications and special provisions. True False
21) Special provisions apply to _____ _____.
22) In the ARDOT quality system for most mixes, a "lot" of asphalt mix is _____ tons and a "sublot" of asphalt mix is _____ tons.
23) For typical mixes, field compliance limits for binder content are ± _____ percent.
24) Pay items for an ARDOT asphalt paving project are % binder, % _____ _____, % _____, and % _____ _____.
25) The standard ARDOT specification for % compaction is _____ % to _____ % for normal travel surfaces and widths.

Sampling Asphalt Mixtures

26) When sampling from a truck, you must gather your field sample from a minimum of _____ different locations within the truck.
27) When transporting asphalt samples, avoid contamination, _____ of material, and _____ loss.

Reduction of HMA Samples to Testing Size

28) The equipment used in reducing samples may be heated up to the maximum _____ temperature to help reduce temperature loss.
29) WD-40 or diesel oil may be used as a release agent to coat reduction equipment. True False
30) Reduction of samples to testing size may be accomplished using a mechanical _____, the quartering method, or the incremental method.

Gyratory Compaction

31) The gyratory compactor must be able to exert _____ ± _____ kPa of force to a specimen after the first five gyrations.
32) The internal angle required by AASHTO T 312 for a gyratory compactor is _____ ± 0.02 degrees.
33) The speed of gyration during compaction is required to be _____ ± 0.5 gyrations per minute.
34) To properly compact a specimen for ARDOT quality control/acceptance testing, the gyratory must be set to compact to the _____ number of gyrations shown on the mix design for the mixture.
35) Molds and plates must be preheated to the compaction temperature for a minimum of _____ minutes before use and at least _____ minutes between uses.
36) The required height of a gyratory specimen is _____ ± 5 mm.
37) Asphalt mixtures are placed into a gyratory mold in _____ lift(s).

Bulk Specific Gravity (Gmb)

38) The water bath used in AASHTO T 166 is required to have an overflow device to control the water level in the tank and to maintain a temperature of _____ ± _____ ° F during testing.
39) When drying back a specimen prior to testing under AASHTO T 166, the maximum allowable temperature is _____ ± 5° F to prevent destroying the specimen.
40) Specimens should be cooled to approximately room temperature before testing.
    True False
41) When weighing under water, specimens should be immersed for _____ ± _____ minute(s) prior to recording the submerged weight.
42) Report Gmb to the nearest _____ and absorption to the nearest _____ %.
43) AASHTO T 166 may only be used for specimens which have _____ % or less absorption.
44) For specimens which have more than 2 % absorption, the _____ sealing method or the _____ coating must be used to report the bulk specific gravity of the specimen.

Max. Theoretical SpG (Gmm)

45) Samples must be separated during cooling so that there are no fine clumps greater than _____ inch in size so that air is not trapped between particles.
46) After weighing the dry sample in air, cover the sample with water and apply a vacuum of _____ ± 5 mm Hg for _____ ± _____ minute(s).
47) During vacuuming, the specimen must be agitated at least every _____ minute(s).
48) After vacuuming is complete, the vacuum must be released _____.
49) After vacuum is released, the vacuum bowl with sample is submerged in the water bath for _____ ± 1 minute(s) and the _____ mass is recorded.
50) To obtain the standardized submerged weight of a vacuum bowl, the three submerged weight determinations must not vary by more than _____ g.

Paraffin Coating & Vacuum Sealing Gmb

51) When coating a specimen with paraffin, it is important to ensure that the entire surface of the specimen is sealed with paraffin. True False
52) When vacuum sealing a specimen, the specimen is placed with the _____ side of the specimen down inside the sealing bag to prevent punctures.
53) After weighing the sealed specimen in water, the bag must be cut open and the specimen _____ in air to obtain the final weight of the specimen.

Moisture Content of HMA

54) The temperature required for drying asphalt for a moisture content determination is the _____ range shown on an ARDOT mix design.
55) After weighing, the asphalt mixture is dried for an initial period of _____ minutes.
56) Checks are made every _____ minutes until constant mass is achieved.
57) Adjust the sample to the _____ temperature before obtaining the final weight.
58) Report moisture content of asphalt mixtures to the nearest _____ %.

AC Gauge Field Testing

59) Prior to testing, a daily background count must be taken (either _____ or _____ minute count) and the proper _____ activated in the gauge.

60) The test times allowed for field testing are _____, _____, or _____ minutes.

61) To conduct a field test for binder content using an asphalt content gauge, the sample pans should be filled to within ± _____ grams of the calibration weight.

62) Field samples should be tested within ± _____ °F of the calibration temperature.

63) The reported % binder is computed by subtracting the moisture content from the gauge reading and then rounding to the nearest _____ %.

Ignition Oven Field Testing

64) The standard field operating temperature of the ignition oven is either _____°C or _____ °C based on the _____ temperature.

65) The _____ mass of the sample is obtained and entered into the ignition oven for computation of the binder content.

66) Prior to placing the loaded basket into the ignition oven, the internal scale should be _____.

67) The total mass of the basket assembly and sample is used to check the ignition oven scale and must be within ± _____ grams of an outside scale.

68) The reported binder content using an ignition oven is obtained by taking the calibrated asphalt content shown on the ticket and subtracting the _____ _____, then rounding the result to the nearest _____%.

69) A sample mass may not exceed the required minimum mass by more than _____ grams.

Ignition Oven – Mechanical Analysis (Gradation)

70) When washing a sieve analysis sample after an ignition oven burn, a _____ agent is used to assure separation of the finer materials.

71) Required aggregate correction factors are applied _____to rounding for the reported sieve analysis results.

Solvent Wash

72) When performing an ARDOT solvent wash, you must know the _____ content and _____ of asphalt mixture prior to washing with solvent in order to calculate the weight of the _____.

73) After solvent washing, the solvent residue must be rinsed from the remaining aggregate with _____ and liquid detergent as needed prior to drying the sample.

74) Report the % passing the # 200 sieve to the nearest _____ %.

Batching & Mixing

75) When batching for calibration samples, all aggregates should be _____ dried.

76) Binder may be heated overnight in an oven prior to mixing samples. True False

77) The mixing container should be _____ prior to mixing calibration samples to prevent low binder contents in the samples.

78) Mix samples at least _____ minutes or until _____ coated.

79) After mixing an asphalt specimen, the bucket must be scraped clean until the empty bucket weight is within ± _____ g of the initial weight of the bucket.

80) RAP should be added to the aggregate _____ hour before mixing.

AC Gauge Calibration

81) ARDOT 449A requires a minimum of _____ wet points during calibration; a _____ % point, an optimum % binder point, and a _____ % point for all calibrations.

82) Sample pans of an AC Gauge are loaded in _____ layers (lifts).

83) The dry point is used for determining the _____ weight.

84) All calibration times, including the background count, should be _____ minutes.

85) When completed, a calibration must achieve a fit coefficient of at least _____ to be considered a valid calibration.

Ignition Oven Correction Factors

86) Ignition oven binder correction factors are obtained by testing two samples at the _____ binder content found on the _____ _____.

87) If two calibration samples differ by more than _____ %, then two more samples must be burned at the same temperature for the calibration.

88) If the calibration factor determined is greater than _____ % at 538 °C, then the calibration temperature is lowered to _____ ° C and the procedure is repeated.

89) Aggregate correction factors are always applied to all sieves. True False

Compaction and Rolling Patterns

90) The purpose of a rolling pattern is to determine the _____ of passes required to achieve _____ with the onsite _____.
91) When establishing a rolling pattern, _____ second tests are conducted and each _____ density reading is recorded.
92) The breakdown roller typically operates in _____ mode, while the finish roller operates in _____ mode.

Sampling Cores / Density

93) When transporting cores, the cores should be _____ and protected from _____ temperatures.
94) After cutting a core, the core hole should be filled with _____ mix.
95) Report % density to the nearest _____ %.
96) According to ARDOT specifications, tests for mat density of an asphalt pavement should not be taken within _____ feet of the pavement edge.

Joint Densities

97) Joint density cores shall be _____ inches in diameter.
98) Joint density cores for a butt joint should be cut centered over the _____ joint line.
99) Joint density cores for wedge joints should be cut centered over the _____ width.
100) The longitudinal joint between a shoulder and travel lane is subject to joint density testing. True False