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Knowledge Check Answers

Chapter 1 Standard Practices Answers

1. The purpose of pavement markings is to communicate information about the traveled roadway so motorists can safely reach their destination.
 - a) True
2. Standard markings shall only be used to convey the meaning prescribed for them in the Manual on Uniform Traffic Control Devices (MUTCD).
 - a) True
3. In Virginia, the normal specified width of a longitudinal line is:
 - b) 4 – 6 inches
4. The standard for a broken line separating traffic in the same direction at the same speed limit is:
 - c) 10 ft. segments with 30 ft. gaps.
5. Solid yellow lines are used to delineate the separation of traffic flows in:
 - a) opposing directions.
6. The left edge of divided highways and one way roads is delineated by:
 - d) a single solid yellow line.
7. White lines are used to delineate the separation of traffic flows in:
 - b) the same direction.
8. Broken lines are restrictive in nature.
 - b) False

Knowledge Check Answers

9. The right edge of divided highways and one way roads is delineated by:
c) a single solid white line.
10. Solid lines are restrictive in nature.
a) True
11. A double line consists of two normal width lines separated by a 3 inch space.
b) False
12. A pavement marking plan or sketch may not be required before a road is marked, but is strongly encouraged.
a) True
13. A chalk line is the only approved way of pre-marking a road.
b) False
14. Traffic control is not required when pre-marking on low volume roads.
b) False
15. Which document takes precedence over all others:
c) Special Provision Copied Notes
16. In the Road and Bridge Specifications Book, which section specifies that the publication, "Quality Standards for Work Zone Traffic Control Devices" be used?
c) Section 512

Chapter 2 Reflective Glass Beads

Answers

1. Reflective beads are used with pavement markings:
 - c) to enhance nighttime visibility
2. The phenomenon where light is reflected directly back to the light source is called:
 - b) retroreflectivity
3. For glass beads, the light bending phenomenon is known as:
 - a) the refractive index
4. The optimum embedment depth for reflective beads is
 - b) 50 to 60%
5. When inspecting pavement markings with regard to glass beads, which of the following criteria should be met?
 - c) Both a & b
6. In order for glass beads to reflect light as intended, they must be:
 - d) round
7. Proper bead distribution and depth are critical in ensuring a _____ line.
 - a) durable and retroreflective
8. Correct glass bead application and embedment will result in the line feeling like:
 - c) sandpaper

Chapter 3 Traffic Paint Answers

1. VDOT designated "Type A" traffic paint should dry "track-free" within:
c) 60 seconds
2. Reflective beads are normally:
b) spray applied to the wet paint immediately following application of the marking material.
3. The minimum surface temperature at which Virginia designated Type A traffic paint may be applied is:
c) 50 °F +
4. Before marking materials of any kind may be applied, the surface of the roadway must be:
c) both a & b
5. The specified application thickness for Virginia designated Type A traffic paint is:
c) 15 ±1 mil when wet
6. The minimum amount of glass beads applied to Type A paint is:
a) 6 pounds per gallon

Chapter 4 Liquid Thermoplastic Answers

1. Liquid thermoplastic pavement marking material:
 - a) is a blend of solid materials that becomes liquid when heated.
2. Markings constructed with liquid thermoplastic pavement marking materials are considered:
 - a) durable markings.
3. Liquid thermoplastic comes from the manufacturer with reflective beads already intermixed.
 - a) True
4. Reflective beads have to be applied to liquid thermoplastic pavement markings.
 - a) True
5. Granular thermoplastic may be heated three (3) times.
 - a) True
6. Block thermoplastic may be heated three (3) times.
 - b) False
7. It is permissible to intermix alkyd and hydrocarbon thermoplastic materials in the same heating kettle.
 - b) False
8. Which of the following methods are acceptable for applying thermoplastic?
 - d) all of the above
9. Virginia Road & Bridge Specifications requires the thickness of thermoplastic markings to be:
 - b) 90 ± 5 mils when set
10. Virginia specifies that glass beads be applied to liquid thermoplastic immediately and uniformly across the entire line at the rate of:
 - a) 7 lb/100 ft²

Chapter 5 Preformed Thermoplastic Answers

1. There is no need to add glass beads to newly applied preformed thermoplastic since they are intermixed with the material at the factory.
c) False
2. When stored inside at a temperature between 35°F and 95°F, preformed thermoplastic has a shelf life of _____.
c) 1 year
3. Preformed thermoplastic is considered to be a:
a) durable pavement marking
4. When preformed thermoplastic has been positioned on the pavement, it is necessary to heat only the edges of the material to achieve a good bond with the pavement.
b) False
5. When a small portion of freshly applied preformed thermoplastic has been chiseled up to inspect for bonding with the pavement, it should _____ on the underside.
b) have some asphalt stuck to it

Chapter 6 Epoxy Resins

Answers

1. Epoxy pavement marking material:
 - a) is a two component system.
2. Epoxy pavement marking material does not contain solvent.
 - a) True
3. For epoxy pavement markings, the ratio of resin to hardener is:
 - d) all of the above
4. The Virginia specified thickness for epoxy pavement markings is:
 - c) 20 ± 1 mil when wet
5. The equipment used to apply epoxy resin pavement markings cannot be used to apply any other liquid binder material.
 - a) True
6. The minimum surface temperature for applying epoxy markings in Virginia is:
 - c) $50^{\circ}\text{F} +$
7. Glass beads should be applied to the surface of epoxy resin at the rate of:
 - b) 25 pounds per gallon

Chapter 7 Polyurea Answers

1. What is one advantage for using Polyurea pavement marking material?
 - a) Good abrasion resistance.
2. Polyurea pavement marking material is normally applied at the following thickness:
 - b) 20 mils
3. Polyurea pavement marking material cure time is less than one minute.
 - b) False
4. What is the sheet called where manufacturer's product information is found for polyurea application requirements?
 - c) Product Data Sheet (PDS)
5. Polyurea is typically applied at a 20 mil wet film thickness and will yield a 20 mil dry film thickness after curing.
 - a) True

Chapter 8 Preformed Tape Answers

1. Preformed tapes do not contain pigments.
b) False
2. Preformed pavement marking tapes can be used for:
c) both a & b
3. When patterned tape is inlaid, no primer is used.
c) Follow the manufacturer's installation instructions
4. Glass beads are applied to pavement marking tapes:
c) by the manufacturer
5. The minimum surface temperature at which pavement marking tapes may be applied is:
d) as recommended by the manufacturer
6. Virginia specifications allow pavement marking tapes to be tamped with vehicle tires.
b) False
7. Virginia Road & Bridge specifications state that the contractor is responsible for supplying a copy of the manufacturer's installation recommendations to the project inspector.
a) True
8. Virginia designated Type E tape is:
c) black

Chapter 9 Pavement Markers Answers

1. Pavement markers may be used in lieu of pavement markings. b)
False
2. The most common types of pavement markers are:
d) all of the above
3. Raised temporary pavement markers are glued to the roadway with a bitumen or epoxy adhesive.
a) True
4. Raised temporary pavement markers are normally used with:
b) construction zone markings.
5. Raised snow plowable marker castings are installed using bitumen adhesive.
b) False

Chapter 10 Installation & Quality Control Answers

1. VDOT requires that by the end of each workday, form C-85, "Contractor's Daily Log and Quality Control Report", shall be signed by the Contractor and delivered to the:
c) Engineer or VDOT Inspector
2. VDOT specs. state that before proceeding with work, surface temperature and weather conditions must be checked for compliance with the specifications by the:
b) contractor's certified Q.C. technician
3. Layouts for pavement markings must be in conformance with:
b) The Manual on Uniform Traffic Control Devices(MUTCD).
4. VDOT requires that quality control tests be conducted in accordance with:
d) VTM-94.
5. What topics should be discussed at the pre-construction conference held prior to beginning pavement marking operations?
d) all of the above
6. A copy of the manufacturer's recommended installation instructions for pavement marking tapes does not have to be supplied by the contractor.
b) False
7. A Material Safety Data Sheet (MSDS) must be obtained by the contractor for each material required for a particular type of pavement marking.
a) True
8. In Virginia, traffic control must be constantly monitored to minimize disruption and to ensure compliance with:
e) a and c
9. The contractor is required to measure the application thickness and bead application rate:
b) at the beginning of each workday and every three hours thereafter.
10. Both the contractor and the inspector should constantly monitor the installation and quality of the material being placed.
a) True

11. In addition to application rates and glass bead distribution, markings should be inspected with regard to:
d) all of the above
12. VDOT requires in order that corrective action be taken, the inspector should immediately report unacceptable work to:
c) the contractor.
13. When should pay quantities be compared and confirmed by the contractor and inspector?
b) at the end of each operation or the end of each workday
14. Before beginning work, the Source of Materials Document is required to insure that:
d) all of the above
15. VDOT specifications require the Materials Inventory Tracking system to be maintained by the:
a) contractor
16. The contractor's inventory is monitored by the:
a) Central Office Materials Quality Assurance Section
17. Copies of materials certifications are to be retained by the contractor as part of the Materials Inventory Tracking documentation.
a) True
18. When materials are delivered directly from the manufacturer to a VDOT project, the project inspector will contact:
b) Central Office Materials Quality Assurance Section
19. Contractor's Daily Log and Quality Control Report is required on Federal Projects only.
b) False

Chapter 11 Equipment Answers

1. A long-line paint truck manufactured by one company should look exactly the same as that of a different manufacturer.
b) False
2. Which item mentioned below is a component for a long-line truck?
d) all of the above
3. The inspector should be knowledgeable with the pavement marking equipment to help identify problems.
a) True
4. Clear communication and cooperation between the inspector and contractor helps ensure quality.
a) True
5. One must inspect pavement marking “close up” to ensure quality.
a) True

Chapter 12 Eradication Answers

1. Failure to remove existing markings when there are shifts in the traffic pattern can:
d) all of the above
2. Which of the following methods is not acceptable for long term eradication?
e) both b and c
3. All residue created when eradicating pavement markings must be:
b) contained.
4. Eradication methods, other than those specified, must be submitted to the project engineer for approval prior to beginning work.
a) True
5. Eradicated lines should be inspected for:
c) both a & b
6. Virginia designated Type E black tape may only be used on hydraulic cement concrete roadways.
b) False
7. One of the criteria in Virginia for using Type E black tape in lieu of eradication is that the traffic pattern will shift back to the original pattern within:
c) 120 days.