

CHAPTER 10 INSTALLATION, ACCEPTANCE AND INVENTORY OF MATERIALS

OBJECTIVES

- 1) Quality and Workmanship
- 2) Pre-Installation Considerations/Responsibilities
- 3) Installation
- 4) Acceptance of Materials
- 5) Materials Inventory Tracking Program

QUALITY AND WORKMANSHIP

The successful installation of pavement markings depends upon a logical sequence of events that involves planning, installation, and acceptance. These steps are necessary to ensure that:

- All materials have been tested in accordance with the specifications. Quality Control/Quality Assurance (QC/QA) or acceptance testing shall be performed as set forth in each agency's material testing specifications.
- Proper markings are installed at the intended locations.
- The completed installation meets the criteria established in the specifications for quality and workmanship.
- The finished product is aesthetically pleasing and provides clear direction to motorists.

PRE-INSTALLATION CONSIDERATIONS

To ensure quality, there are some important steps that must be taken before the pavement marking material is installed.

The three primary objectives of project management that must be met before any markings are applied are Material Verification, Review of pavement marking layout details, and Pre-construction discussion.

Material Verification

To verify that the correct materials are supplied and used on the job, the contract material specifications must first be reviewed. Material test results and/or products must then be compared against specifications to ensure that they are correct. Project inspectors and contractors must be familiar with the application requirements for all the specified material. Materials may be specified or required in several areas of the contract. Specifications may be modified or changed through addendums or special provisions. All additions to the published specifications, as well as the effective date of the specifications and standards, are listed in the job proposal.

Review of Pavement Marking Layout Details

The layout of all markings shall be reviewed in detail. Additionally, all drawings and measurements shall be reviewed for accuracy. The layout is either included in the plans or referenced in the standard plans and drawings.

Pre-construction Discussion

Agencies typically require that only materials approved by the engineer shall be used on the project. At the pre-construction meeting, the project engineer, inspector and contractor will review and discuss the acceptance procedures and specifications in general. The type of materials, methods of application, and other installation considerations should be discussed.

PRE-INSTALLATION RESPONSIBILITIES

Agency (VDOT) Responsibilities:

- Review the MUTCD and established specifications to determine the correct location and type of pavement marking to be installed.
- Project Inspectors ensure:
 - That weather and surface conditions comply with specifications
 - Periodic monitoring is performed at the start of the day and every 3 hours thereafter.
 - Any unsatisfactory work is reported to the contractor immediately.
- Project personnel shall ensure that an approved source of materials has been furnished for the types of materials used.
- The project inspector shall ensure that weather and surface conditions comply with the specification requirements prior to allowing pavement marking operations to begin.
- The project personnel shall ensure that the pavement marking field layout (pre-marking) conforms to plans and MUTCD requirements.
- The project personnel shall ensure, through random inspection, that materials are applied in accordance with contract documents.

Contractor's Responsibilities:

- The contractor's QC Technician should ensure the Inventory Tracking Documents are on hand for all pavement marking materials used.
- The plans, contract, specifications, and MUTCD shall be reviewed to determine the location and type of pavement markings to be installed. Also, review the plans and the contract to ensure that the type of material specified conforms to the contract documents.
- A copy of the manufacturer's installation recommendations must be obtained and supplied by the contractor for the type of materials used. Specific recommendations shall be followed in conjunction with the specifications.
- A copy of the Material Safety Data Sheet (MSDS) must be obtained, as required by Occupational Safety and Health Administration (OSHA) for each type of material to be used or work is not to proceed.
- The contractor must obtain and complete all required documents from the governing agency.

requirements prior to allowing pavement marking operations to begin.

- The QC technician shall ensure that the pavement marking field layout (pre-marking) conforms to plans and MUTCD requirements.
- The QC technician shall ensure, through random inspection, that materials are applied in accordance with contract documents.
- Striping equipment shall be checked for proper calibration and obvious mechanical deficiencies. The contractor is required to demonstrate that all equipment is capable of performing the intended work prior to beginning actual application.

INSTALLATION

Safety Considerations: Traffic control must be constantly monitored to minimize disruption and to ensure compliance with the government agency's traffic control manual and the MUTCD. Workers shall wear hard hats, safety vests and steel-toed shoes/boots.

The contractor shall measure the application thickness, color, and the bead application rate at the beginning of each workday and a minimum of every three hours thereafter, for paint, thermoplastic, and epoxy. State agency specifications designate required procedures. Once application of the pavement markings begins, the following items should be closely monitored:

- Material temperatures shall be randomly checked during application.
- In order to prevent tracking, the applied material must be cured sufficiently to ensure tracking does not occur.
- The temporary pavement markers should be installed according to the contract documents, specifications, and manufacturer recommendations.
- The contractor's quality control technician must constantly monitor the quality and workmanship of the material being applied. Line width, length, thickness, and color shall be checked frequently to ensure compliance with the contract documents, and a written report (quality control report) shall be submitted to the agency's inspector.
- Unacceptable work must be identified, reported to the contractor, and corrected prior to further application and final payment.
- Pay quantities for materials being applied shall be measured and documented after each operation or at the end of the day's operation.
- Payment for completed work shall be dependent on compliance to contract requirements and the quality of the work.

ACCEPTANCE OF MATERIALS

The Source of Materials Document:

This document is commonly called the "Source of Materials". A source of materials is required to be submitted by the contractor no later than seven (7) days prior to start of work so that testing, sampling and acceptance can be pre-assigned.

This document details to the Department where and from whom the contractor will obtain the material. Upon assignment of the method of acceptance or inspection, the document is returned to

the project and Contractor. This is done so that untested material does not arrive on the job site and cause delays while the material is being sampled and tested. Sometimes it is necessary to assign “on the job sampling”.

NOTE: The Source of Materials Document (C-25) can be submitted electronically via the VDOT website. Each district will process the Source of Materials document for each project specific to that district.

Section 106.01(b): The details of how pavement markings are to be accepted and the documentation necessary for the project records are detailed in the Materials Division Manual of Instructions. Also detailed is how a sample is to be taken and how much that sample can represent. An attempt is made to either sample or pre-approve at the source of supply to facilitate ease of acceptance.

Material is accepted by one of following methods:

- 1) Certification I - Batch tested
- 2) Certification II - Approved List and requires manufacturers certification letter
- 3) Special Product Evaluation List (SPEL)
- 4) Visual Acceptance

Certification I

Materials that are required to be tested as a batch or lot before use on a project. Each new batch or lot produced, must be tested and accepted before use. Examples of materials requiring Certification I are paint, thermoplastic, epoxy, polyester and glass beads.

The Certification I statement should read: We certify that our product (batch or lot number) _____ on invoice number _____ or shipping ticket number _____ has been sampled, tested, and approved by VDOT Materials Division as indicated by Laboratory Test Number, MS _____, or by an approved Quality Control Plan as indicated by its unique test number_____.

Note: Some materials that require a Certification I may be included on an Approved List. (Refer to Certification II for an explanation of the Approved List or QPL). However, every batch or lot produced must still be tested and approved before use.

Certification II

Materials that are tested and approved for use far in advance of their need on a project. Once these materials are approved, they are placed on an Approved List (or Qualified Products List - QPL) in the Manual of Instructions.

Some materials (pavement marking tape, pavement markers) don't have to be tested before use on each project. The Contractor simply selects these materials from the Approved List and begins using them.

These materials should arrive on the project with the following Certification II statement: We certify that our product has been tested, approved, and placed on a qualified products list. We certify that our (batch or lot number) _____ on invoice number _____ is the same product that was tested and approved. Indicated on the shipping document will be the test number from the approved list.

Special Product Evaluation List (S.P.E.L.)

Some selected materials may be used on projects under a trial basis. These materials are normally used along side approved materials and are monitored for performance. The S.P.E.L. Committee oversees these trials and makes recommendations for possible future use.

Visual Acceptance

The visual evaluation of pavement marking materials finished products on the road.

Materials Inventory Tracking Program

State agencies (DOT's), cities and towns will specify their requirements for acceptance of pavement marking materials.

Section 704 of the Road and Bridge Specifications and the Manual of Instructions require the Contractor to use an approved inventory tracking system for all materials received from the Manufacturer.

The program consists of three (3) primary components:

The Source of Materials Document

- 1) **Inventory Ledger** - The striping Contractor maintains a running inventory of all materials received and shipped. When the records associated with the inventory are examined, a given load or batch of material received by the striping Contractor can be tracked to all projects where it was used. Thus it is readily apparent when a given batch has been exhausted. Furthermore, shipments of all materials can be tracked over a period of time. (Refer to Page B-10 for Inventory Ledger)
- 2) **Contractors Daily Log and Quality Control Report (C-85)** - The Contractor's Certified Pavement Marking Technician shall fill out this report completely (in accordance with Section 704.03(a) of the Road & Bridge Specifications) by hand in ink on a daily basis or at the end of each operation to track materials used, quantities installed or eradicated, certification information, material test numbers (MS No.), work completed (with locations), and recorded Quality Control test results.

C-85 forms submitted for project records shall not be modified to incorporate any other information such as contractor personnel, equipment used, etc. The following data must be included on the C-85 form:

1. General Information - Contractors name, project number, date, start time, finish time weather conditions, air temperatures and surface temperatures.
2. Materials Documentation - Type of material, quantity, unit of measure, certification type, MS number and expiration date of material.
3. Work Completed - Type of material, contract item number, quantity, location installed, width and color of marking.
4. Quality Control Measurements - Type of material, quality control measurement used, location of test, time of test and inspector's initials.
5. Signatures and dates by both the contractor's certified Pavement marking Technician and the Engineer (VDOT Inspector)

The Contractor's Certified Pavement marking Technician shall review this report with the Engineer (VDOT Inspector) on a daily basis. The Engineer (VDOT Inspector) shall sign the report after reviewing and confirming quantities. Pay quantities are confirmed from this report.

PAVEMENT MARKING CONTRACTOR'S DAILY LOG AND QUALITY CONTROL REPORT

Contractor: <i>STRAPE KINGS INC.</i>		Date: <i>7/8/11</i>	Start Time: <i>8:15 AM</i>	Finish Time: <i>6:30 PM</i>
Job/Project No: <i>0095-074-726, N501</i>			Sheet	<i>1</i> of <i>1</i>
Weather: <i>PARTLY CLOUDY</i>				
Air Temp. (Start): <i>82°F</i>	Air Temp. (Finish): <i>96°F</i>	Surface Temp. (Start): <i>86°F</i>		

*** MATERIALS DOCUMENTATION:**

Type of Material	Quantity	Units	Certification Letter (Type/Date)	MS Number	Exp. Date
<i>TYPE F CLASS 1</i>	<i>39</i>	<i>GAL.</i>	<i>CERT. 1</i>	<i>21742</i>	<i>6/2012</i>
<i>SNOW BLOWABLE MARKERS</i>	<i>78</i>	<i>EACH.</i>	<i>CERT. 11 LETTER DATED</i>	<i>5/21/11</i>	

WORK COMPLETED:

Type of Marking	Contract Item No.	Quantity	Units	Location/Description	Width	Color
<i>ERADICATION</i>	<i>54105</i>	<i>875</i>	<i>L.F.</i>	<i>M.P. 34.7 TO 34.9</i>	<i>6 INCHES</i>	
<i>TYPE F CLASS 1</i>	<i>54554</i>	<i>6,300</i>	<i>L.F.</i>	<i>M.P. 38 TO 39.2</i>	<i>8 INCHES</i>	<i>WHITE</i>
<i>MARKERS</i>	<i>54217</i>	<i>625</i>	<i>EACH</i>	<i>M.P. 37.4 TO 47.4</i>	<i>4"</i>	<i>W/RED</i>

Quality Control Measurements:

Material Type	Q.C. Measurement (Units)	Location	Time	Inspector (Initial)
<i>MOISTURE TEST (PLASTIC)</i>	<i>PASS</i>	<i>M.P. 38</i>	<i>8:30 AM</i>	<i>W.L.S.</i>
<i>TYPE F PAINT PLATE TEST</i>	<i>16 mils</i>	<i>M.P. 38</i>	<i>8:45 AM</i>	<i>W.L.S.</i>

* Material shipped under this certification has been tested and approved by VDOT as indicated by laboratory test numbers listed hereon.

Contractor Q. C. Technician	<i>William L. Smith</i>	Date	<i>7/8/11</i>
VDOT Representative	<i>Robert T. Walker</i>	Date	<i>7/8/11</i>

**PAVEMENT MARKING
CONTRACTOR'S DAILY LOG AND QUALITY CONTROL REPORT**

Contractor:	Date:	Start Time:	Finish Time:
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Job/Project No:	Sheet	of	
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Weather:

Air Temp. (Start)	Air Temp. (Finish)	Surface Temp. (Start):
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*** MATERIALS DOCUMENTATION:**

Type of Material	Quantity	Units	Certification Letter (Type/Date)	MS Number	Exp. Date

WORK COMPLETED:

Type of Marking	Contract Item No.	Quantity	Units	Location/Description	Width	Color

Quality Control Measurements:

Material Type	Q.C. Measurement (Units)	Location	Time	Inspector (Initial)

*** Material shipped under this certification has been tested and approved by VDOT as indicated by laboratory test numbers listed hereon.**

Contractor Q. C. Technician		Date	
VDOT Representative		Date	

Copy District Traffic Engineer
 District Materials Engineer

Pay Quantity to be based on actual field measurement verified by the Engineer.

ORDER NO.: G83
CONTRACT ID. NO.: CM010PM6P96327

Form C-6a
Rev. 3-22-05
CNSP (F) 1-9-06

**COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
BID PROPOSAL AND CONTRACT**

ROUTE NUMBER: VARIOUS
FHWA NUMBER: STP-PM06(321)
PROJECT NUMBER: (NFO) PM6P-059-F10, N501
COUNTY: ESSEX, KING & QUEEN, AND MIDDLESEX
DISTRICT: FREDERICKSBURG



DESCRIPTION: ASPHALT RESURFACING (VOLUME 1 OF 2)
LOCATION: VARIOUS
DATE BID SUBMITTED: 10:00 A.M., WEDNESDAY, NOVEMBER 17, 2010

PM6P-059-F10, N501

PM6P-059-F10, N501

E22-LASGCSCP

VIRGINIA DEPARTMENT OF TRANSPORTATION

PAGE: 2

CONTRACT ID : CM010PM6P96327

STATE PROJ NUM:PM6P-059-F10,P101,N501

FEDERAL PROJ NUM:STP-EM06(321)

ORDER NO. G83

DATE 12/08/10

SCHEDULE OF ITEMS

REVISED

CONTRACTOR :

LINE	ITEM	ITEM DESCRIPTION	APP QTY.	UNIT PRICE	BID AMOUNT
SPEC NUMBER			UNITS	DOLLARS CTS	DOLLARS CTS
COMMON ITEMS					
0010	16242	AGGR. BASE MATL. TY. I OR II NO. 21A OR 21B	2361.00		
	AT7D		TON	21 9100	51729 51
0020	16350	ASPHALT CONCRETE TY. SM-12.5A	19820.00		
	315		TON	65 0700	1289687 40
0030	16355	ASPHALT CONCRETE TY. SM-12.5D	11909.00		
	315		TON	65 0700	774918 63
0040	16516	FLEXIBLE PAVE. TIE-IN PLANING 0" - 2"	1074.00		
	515		SY	7 5000	8055 00
0050	24265	MAINTENANCE OF TRAFFIC	1		
	512		LS	19149 0000	19149 00
0060	54032	TYPE B CLASS I PAVE. LINE MARKING 4"	225337.00		
	704		LF	0 4100	92388 17
0070	54042	TYPE B CLASS I PAVE. LINE MARKING 24"	182.00		
	704		LF	11 0000	2002 00
0080	54106	ERADICATION OF EXIST. NONLINEAR PAVE.MARKING	604.00		
	512		SF	8 0000	4832 00
0090	54217	SNOW FLOW. RAISED PAVE. MARKER ASPH.CONC	1452.00		
	704		EA	22 0000	31944 00
0100	54300	PAVEMENT MESSAGE MARK. ELONGATED ARROW SINGLE	11.00		
	704		EA	260 0000	2860 00
TOTAL ITEMS IN SECTION 0001					2277565 71
TOTAL BID					2277565 71

ORDER NO.: G83
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VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
SECTION 512—MAINTAINING TRAFFIC – NON-SCHEDULES (LUMP SUM)

June 25, 2010C

SECTION 512 of the Specifications is amended as follows:

Section 512.03—Procedures is amended to add the following:

The Contractor shall submit a plan, sequenced with his plan of operations, to the Engineer for maintenance of traffic for his review prior to commencement of work. The plan shall be designed and implemented in accordance with the *Virginia Work Area Protection Manual*, the *MUTCD* and the Department generated project-specific temporary traffic control plan or requirements provided in the Contract Documents. When the Department provides a sequence of construction in the Contract documents the plans or estimated quantities for maintenance of traffic items are for estimating purposes only.

Section 512.04—Measurement and Payment is replaced with the following:

Maintenance of traffic including flagger service, pilot vehicles, electronic arrows, warning lights, channelizing devices, traffic barrier service, traffic barrier service guardrail terminals, impact attenuator service, construction pavement markings, construction pavement message markings, temporary pavement markers, eradication of existing pavement markings, temporary detours, aggregate material, Type III barricades, construction signs, and truck mounted attenuators will be paid for on a lump sum basis as follows:

- (a) **Per structure** wherein, the lump sum price bid shall be for providing maintenance of traffic for a single structure identified in the Contract by its structure number. No measurement will be made.
- (b) **Per route and location(s)** wherein, the lump sum price bid shall be for providing maintenance of traffic for work at a specified location on a single specified route or, specified locations grouped together on a single specified route as one lump sum item. No measurement will be made as detailed in the Contract.

The Contractor's price bid shall include, but not be limited to; providing a person to meet the basic work zone traffic control and intermediate work zone traffic control requirements of Section 105.14 of the Specifications; furnishing, placing, maintaining, replacing, relocating, adjusting, aligning, removing, flagger service, pilot vehicles, warning lights, electronic arrow, channelizing devices, traffic barrier service, traffic barrier service guardrail terminals, impact attenuator service, construction pavement markings, construction pavement message markings, temporary pavement markers, eradication of existing pavement markings, temporary detours, aggregate material, Type III barricades, construction signs, truck mounted attenuators, and all labor, material and equipment incidental to completing this work in accordance with the *Virginia Work Area Protection Manual* and traffic engineering guidelines and principles. Site specific adjustments to maintenance of traffic operations specified by the *Virginia Work Area Protection Manual* and the *MUTCD* such as quantity, location, or spacing of traffic control devices within construction limits or on any approaches to the project, required by the Engineer to improve traffic operation or safety shall be considered an alteration to the character of work in accordance with the provisions of Section 104.02 of the Specifications.

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The Contractor will be paid 30 percent of the lump sum bid price upon satisfactory installation of the required maintenance of traffic items to commence construction operations and active prosecution of the work. Contingent upon active pursuit of the work, the Contractor will receive monthly payments for maintenance of traffic based on the daily dollar amount of the bid price for maintenance of traffic until 90 percent of the unit bid price is paid. The remaining 10 percent will be paid for after all maintenance of traffic items are removed at final acceptance of the Contract.

Additional traffic control layout detail items that are determined and authorized by the Engineer to be necessary to ensure the safety of the traveling public and are in addition to the number required by the traffic control layout details in the VWAPM, the drawings in herein, and the Contract, will be measured and paid for as follows, therefore, the provisions of Section 104.02 will not apply:

- **Flagger service** shall include furnishing certified flagger, paddles and safety equipment. Where additional flagger service is required, as determined and authorized by the Engineer, flagger service will be measured in hours and paid for at the rate of **\$15** per hour of use.

When flagger service is used for the Contractor's convenience, such as for ingress and egress of construction equipment or materials, payment will not be made. **Note:** The required flaggers described in the two flagging conditions in Section 512.03(b)2. herein will not be measured as a separate pay item but will be considered incidental to the traffic control operations described.

- **Pilot vehicles** shall include furnishing vehicles, necessary warning devices, drivers, fuel and maintenance. Where additional pilot vehicles are required as determined and authorized by the Engineer, such vehicles will be measured in hours of actual use and will be paid for at the rate of **\$23** per hour of employed use.
- **Electronic arrows** shall include furnishing arrow panels, fuel, maintenance, and a truck or trailer having flashing amber warning lights for mobility of the electronic arrow. Where additional electronic arrows are required as determined and authorized by the Engineer, electronic arrows will be measured in hours of actual use and will be paid for at the rate of **\$5** per hour for each hour of employed use.
- **Warning lights** for use on sign panels or installed on traffic barrier service will not be measured for separate payment. The cost thereof shall be included in the price for other appropriate pay items. This shall include maintaining, relocating, and removing.
- **Group 1 channelizing devices** will not be measured for separate payment. The cost thereof shall be included in the price for other appropriate pay items.
- **Group 2 channelizing devices**, not designated in the Contract as a separate pay item but where additional Group 2 channelizing devices are required as determined and authorized by the Engineer, these will be measured in days and paid for at the rate of **\$1** per day per device. This price shall include furnishing and maintaining devices, removing devices when no longer required and signs. When group 2 channelizing devices are moved to a new location or are removed and re-installed at the same location, they will be measured for separate payment. However, when group 2 channelizing devices are moved within the lane or from one lane to another by simply moving the devices across the lane edge line without removal from the roadway, no additional payment will be made.

ORDER NO.: G83
CONTRACT ID. NO.: CM010PM6P96327

The Contractor will be paid 30 percent of the lump sum bid price upon satisfactory installation of the required maintenance of traffic items to commence construction operations and active prosecution of the work. Contingent upon active pursuit of the work, the Contractor will receive monthly payments for maintenance of traffic based on the daily dollar amount of the bid price for maintenance of traffic until 90 percent of the unit bid price is paid. The remaining 10 percent will be paid for after all maintenance of traffic items are removed at final acceptance of the Contract.

Additional traffic control layout detail items that are determined and authorized by the Engineer to be necessary to ensure the safety of the traveling public and are in addition to the number required by the traffic control layout details in the *VWAPM*, the drawings in herein, and the Contract, will be measured and paid for as follows, therefore, the provisions of Section 104.02 will not apply:

- **Flagger service** shall include furnishing certified flagger, paddles and safety equipment. Where additional flagger service is required, as determined and authorized by the Engineer, flagger service will be measured in hours and paid for at the rate of **\$15** per hour of use.

When flagger service is used for the Contractor's convenience, such as for ingress and egress of construction equipment or materials, payment will not be made. **Note:** The required flaggers described in the two flagging conditions in Section 512.03(b)2. herein will not be measured as a separate pay item but will be considered incidental to the traffic control operations described.

- **Pilot vehicles** shall include furnishing vehicles, necessary warning devices, drivers, fuel and maintenance. Where additional pilot vehicles are required as determined and authorized by the Engineer, such vehicles will be measured in hours of actual use and will be paid for at the rate of **\$23** per hour of employed use.
- **Electronic arrows** shall include furnishing arrow panels, fuel, maintenance, and a truck or trailer having flashing amber warning lights for mobility of the electronic arrow. Where additional electronic arrows are required as determined and authorized by the Engineer, electronic arrows will be measured in hours of actual use and will be paid for at the rate of **\$5** per hour for each hour of employed use.
- **Warning lights** for use on sign panels or installed on traffic barrier service will not be measured for separate payment. The cost thereof shall be included in the price for other appropriate pay items. This shall include maintaining, relocating, and removing.
- **Group 1 channelizing devices** will not be measured for separate payment. The cost thereof shall be included in the price for other appropriate pay items.
- **Group 2 channelizing devices**, not designated in the Contract as a separate pay item but where additional Group 2 channelizing devices are required as determined and authorized by the Engineer, these will be measured in days and paid for at the rate of **\$1** per day per device. This price shall include furnishing and maintaining devices, removing devices when no longer required and signs. When group 2 channelizing devices are moved to a new location or are removed and re-installed at the same location, they will be measured for separate payment. However, when group 2 channelizing devices are moved within the lane or from one lane to another by simply moving the devices across the lane edge line without removal from the roadway, no additional payment will be made.

ORDER NO.: G83
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- **Truck mounted attenuators**, not designated in the Contract as a separate pay item but where additional Truck Mounted Attenuators are required as determined and authorized by the Engineer, these will be measured in hours of actual use required, and will be paid for at the rate of **\$22** per employed hour. This price shall include furnishing the truck mounted attenuator, mounting vehicle, lights, electronic arrows, if allowed but not required, and maintenance. When electronic arrows are used at the option of the Contractor in lieu of the rotating or high intensity amber strobe light, the cost of the electronic arrow shall be included in the price for truck mounted attenuators. When electronic arrows are required and authorized as determined by the Engineer and not incidentally mounted (and permitted) on such truck mounted attenuator support vehicles, they will be paid for separately as specified herein.
- **Portable traffic control signal** will not be measured for separate payment. The cost thereof shall be included in the price for other appropriate pay items. This shall include portable traffic control signal equipment, installation, energy source, maintaining, adjusting, aligning, removing and relocating equipment.
- **Portable Changeable Message Signs (PCMS)**, not designated in the Contract as a separate pay item but where additional Portable Changeable Message Signs are required as determined and authorized by the Engineer, these will be measured in hours of actual use and paid for at the rate of **\$15** per hour for each hour of employed use. This price shall be full compensation for furnishing or mobilizing the unit(s) to the project, maintenance, operation, and repositioning the unit(s).

Payment will be made under:

Pay Item	Pay Unit
Maintenance of traffic (Structure No.)	Lump sum
Maintenance of traffic (Route and Location[s])	Lump sum

Schedule ID: PM-6P-10
 District: Fredericksburg

Commonwealth of Virginia — Department of Transportation
 Asset Management Division
 Plant Mix

Date: 2/18/2010

County Of: Essex Co.

Route:	17	Milepost From:	26.00	0.28 Miles North Of Route 724
Subdivision:	NBL	Milepost To:	27.70	South End Of Occupada Creek Bridge
Lane:	XIII			
Traf Grp:	XIII			

Notes:
 Rideability Pay Factor is in effect for this item.

Item Code & Description	Detail	Len(mi)	Wid(ft)	Dep(in)	Gal/SqYd	Lbs/SqYd	Quantity	UOM
16242 - AGR.BASE MAT.TY.I OR II NO. 21A OR 21B	Shldr 2' L & 1' R	1.70	3.00	1.50			247	TON
16355 - ASPHALT CONCRETE TY. SM-12.5D	Shldr 8' R	1.70	8.00	1.50			658	TON
16355 - ASPHALT CONCRETE TY. SM-12.5D	Mainline	1.70	22.00			180.00	1,975	TON
16355 - ASPHALT CONCRETE TY. SM-12.5D	4 Xovers; 2 Conn; 4 TL						300	TON
16516 - Flexible Pavement Tie-In 0'-2"	Mill 150' Before Bridge	0.03	30.00	1.50			528	SY
54032 - TY.B CL.I PAVE. LINE MARK. 4"	White						12,420	LF
54032 - TY.B CL.I PAVE. LINE MARK. 4"	Yellow						8,976	LF
54217 - SNOW FLOW,RAISED PAVE.MARK.ASPH.CONC	White						136	EA

Route:	17	Milepost From:	27.72	North End Of Occupada Creek Bridge
Subdivision:	NBL	Milepost To:	29.62	0.57 Miles North Of Route 637
Lane:	XIII			
Traf Grp:	XIII			

Notes:
 Rideability Pay Factor is in effect for this item.

Item Code & Description	Detail	Len(mi)	Wid(ft)	Dep(in)	Gal/SqYd	Lbs/SqYd	Quantity	UOM
16242 - AGR.BASE MAT.TY.I OR II NO. 21A OR 21B	Shldr 2' L & 1' R	1.90	3.00	1.50			276	TON
16355 - ASPHALT CONCRETE TY. SM-12.5D	Mainline	1.90	23.00			180.00	2,307	TON
16355 - ASPHALT CONCRETE TY. SM-12.5D	6 Xovers; 1 Conn; 6 TL						414	TON
16355 - ASPHALT CONCRETE TY. SM-12.5D	Shldr 8' R	1.90	8.00	1.50			736	TON
16516 - Flexible Pavement Tie-In 0'-2"	Mill 150' After Bridge	0.03	31.00	1.50			546	SY
54032 - TY.B CL.I PAVE. LINE MARK. 4"	Yellow						10,032	LF
54032 - TY.B CL.I PAVE. LINE MARK. 4"	White						14,340	LF

54217 - SNOW PLOW, RAISED PAVE.MARK.ASPH.COMC WHITE

162 EA

Route:	17	Milepost From:	22.71	0.07 Miles North Of Route 624
Subdivision:	NBL	Milepost To:	26.00	0.28 Miles North Of Route 724
Lane:	NBL			
Traf Grp:	XIII			

Notes:
Rideability Pay Factor is in effect for this item.

Item Code & Description	Detail	Len(m)	Wid(ft)	Dep(m)	Gal/SqYd	Lbs/SqYd	Quantity	UOM
16242 - AGR.BASE MAT.TY.I OR II NO. 21A OR 21B	Shldr 2' L & 1' R	3.29	3.00	1.50			478	TON
16355 - ASPHALT CONCRETE TY. SM-12.5D	Shldr 6' R	3.29	8.00	1.50			1,274	TON
16355 - ASPHALT CONCRETE TY. SM-12.5D	9 Xovers; 2 Conn; 10 TL						423	TON
16355 - ASPHALT CONCRETE TY. SM-12.5D	Mainline	3.29	22.00			180.00	3,822	TON
54032 - TY.B CLI.PAVE. LINE MARK. 4"	Yellow						17,371	LF
54032 - TY.B CLI.PAVE. LINE MARK. 4"	White						24,419	LF
54042 - TY.B CLI.PAVE. LINE MARK. 24"	White						77	LF
54106 - Eradication of existing nonlinear pavement marking	White						154	SF
54217 - SNOW PLOW, RAISED PAVE.MARK.ASPH.COMC	White						274	EA

County Of: King and Queen Co.

Route:	360	Milepost From:	4.77	0.07 Miles East Of Route 631
Subdivision:	EBL	Milepost To:	9.20	Essex - KING Co. Line
Lane:	EBL			
Traf Grp:	XIV			

Notes:
Rideability Pay Factor is in effect for this item.

Item Code & Description	Detail	Len(m)	Wid(ft)	Dep(m)	Gal/SqYd	Lbs/SqYd	Quantity	UOM
16242 - AGR.BASE MAT.TY.I OR II NO. 21A OR 21B	Shldr 1' L & 1' R	4.43	2.00	1.50			429	TON
16350 - ASPHALT CONCRETE TY. SM-12.5A	11 Xovers; 3 Conn; 11 TL						957	TON
16350 - ASPHALT CONCRETE TY. SM-12.5A	Mainline	4.43	22.00			180.00	5,146	TON
16350 - ASPHALT CONCRETE TY. SM-12.5A	Shldr 2' L & 4' R	4.43	6.00	1.50			1,286	TON
54032 - TY.B CLI.PAVE. LINE MARK. 4"	Yellow						23,390	LF
54032 - TY.B CLI.PAVE. LINE MARK. 4"	White						33,137	LF
54042 - TY.B CLI.PAVE. LINE MARK. 24"	White						45	LF
54106 - Eradication of existing nonlinear pavement marking	White						150	SF

358 EA
4 EA

54217 - SNOW FLOW-RAISED PAVE.MARK.ASPH.COMC White
54300 - PAVE.MESS.MARK.ELONG.ARROW SIN White

County Of: Middlesex Co.

Route:	17	Milepost From:	8.05	0.11 Miles North Of Route 602
Subdivision:				
Lane:	NBL	Milepost To:	14.46	Essex Middlesex Co. Line
Traf Grp:	XIII			

Notes:
Rideability Pay Factor is in effect for this item.

Item Code & Description	Detail	Len(mi)	Wid(ft)	Dep(in)	Gal/SqYd	Lbs/SqYd	Quantity	UOM
16242 - AGR.BASE MAT.TY.I OR II NO. 21A OR 21B	Shldr 1' L & 2' R	6.41	3.00	1.50			931	TON
16350 - ASPHALT CONCRETE TY. SM-12.5A	Mainline	6.41	24.00			180.00	8,123	TON
16350 - ASPHALT CONCRETE TY. SM-12.5A	Shldr 2' L & 0' R	6.41	10.00	1.50			3,102	TON
16350 - ASPHALT CONCRETE TY. SM-12.5A	15 Xovers, 6 Corn, 18 TL						1,206	TON
54032 - TY.B CL.I PAVE. LINE MARK. 4"	White						47,407	LF
54032 - TY.B CL.I PAVE. LINE MARK. 4"	Yellow						33,645	LF
54042 - TY.B CL.I PAVE. LINE MARK. 24"	White						60	LF
54106 - Eradication of existing nonlinear pavement marking	White						300	SF
54217 - SNOW FLOW-RAISED PAVE.MARK.ASPH.COMC	White						522	EA
54300 - PAVE.MESS.MARK.ELONG.ARROW SIN	White						7	EA

Schedule Totals

Item	Quantity	UOM
16242 - AGR.BASE MAT.TY.I OR II NO. 21A OR 21B	2,361	TON
16350 - ASPHALT CONCRETE TY. SM-12.5A	19,820	TON
16355 - ASPHALT CONCRETE TY. SM-12.5D	11,909	TON
16516 - Flexible Pavement Tie-in 0"-2"	1,074	SY
54032 - TY.B CL.I PAVE. LINE MARK. 4"	225,337	LF
54042 - TY.B CL.I PAVE. LINE MARK. 24"	182	LF
54106 - Eradication of existing nonlinear pavement marking	604	SF
54217 - SNOW FLOW-RAISED PAVE.MARK.ASPH.COMC	1,452	EA
54300 - PAVE.MESS.MARK.ELONG.ARROW SIN	11	EA
24265 - MAINTENANCE OF TRAFFIC	1	LS

ORDER NO.: G83
 CONTRACT ID. NO.: CM010PM6P96327

SUMMARY OF ESTIMATED QUANTITIES FOR PM-6P-10

Summary of Estimated Quantities (Contract)					
Item	Unit	Quantity	Item	Unit	Quantity
AGR. BASE MATERIAL TYPE I OR II NO. 21A OR 21B	TON	2361	ASPHALT CONCRETE TY. SM-12.5A	TON	19,820
ASPHALT CONCRETE TY. SM-12.5D	TON	11,909	FLEXIBLE PAVEMENT PLANING TIE-IN 0'-2"	SY	1,074
TY. B CL I PAVE. LINE MARK 24"	LF	182	TY. B CL I PAVE. LINE MARK 4"	LF	225,337
SNOW PLOW RAISED MARKER ASPH. CONC.	EA	1,452	ERADICATION OF EXIST. NONLINEAR PAVE. MARKING	SF	604
MAINTENANCE OF TRAFFIC	LUMP SUM	1	PAVE. MESS MARK. ELONG. ARROW SIGN	EA	11

STATE FORCES WORK PARTICIPATING NON-PARTICIPATING

These items and quantities provided for estimating purposes only.

Chapter 10
Installation & Quality Control
Review Questions

1. VDOT requires that by the end of each workday, form C-85, “Contractor’s Daily Log and Quality Control Report”, must be signed by the Contractor and submitted to the:
 - a) Materials Division
 - b) contractor’s certified Q.C. technician
 - c) Engineer or VDOT Inspector
 - d) State Police

2. VDOT specs. state that before proceeding with work, surface temperature and weather conditions must be checked for compliance with the specifications by the:
 - a) project inspector
 - b) contractor’s certified Q.C. technician
 - c) paint truck operator
 - d) traffic engineer

3. Layouts for pavement markings must be in conformance with:
 - a) Special Product Evaluation List.
 - b) The Manual on Uniform Traffic Control Devices(MUTCD).
 - c) Virginia Test Method Manual (VTM).
 - d) Materials Division Manual of Instructions.

4. VDOT requires that quality control tests be conducted in accordance with:
 - a) The 1994 Road and Bridge Standards.
 - b) The MUTCD.
 - c) The manufacturer’s recommendations.
 - d) VTM-94.

5. What topics should be discussed at the pre-construction conference held prior to beginning pavement marking operations?
 - a) specifications
 - b) type of materials
 - c) method of application
 - 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.
 - a) True
 - 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
 - b) False

8. In Virginia, traffic control must be constantly monitored to minimize disruption and to ensure compliance with:
 - a) The Virginia Work Area Protection Manual
 - b) The Materials Division Manual of Instructions
 - c) the MUTCD
 - d) all of the above
 - e) a and c

9. The contractor is required to measure the application thickness and bead application rate:
 - a) before completing the work.
 - b) at the beginning of each workday and every three hours thereafter.
 - c) once.
 - d) twice daily.

10. Both the contractor and the inspector should constantly monitor the installation and quality of the material being placed.
 - a) True
 - b) False

11. In addition to application rates and glass bead distribution, markings should be inspected with regard to:
 - a) width
 - b) length
 - c) color
 - d) all of the above

12. VDOT requires in order that corrective action be taken, the inspector should immediately report unacceptable work to:
 - a) the manufacturer.
 - b) the resident engineer.
 - c) the contractor.
 - d) none of the above

13. When should pay quantities be compared and confirmed by the contractor and inspector?
- a) before proceeding with the work
 - b) at the end of each operation or the end of each workday
 - c) before the end of the project
 - d) only at estimate time
14. Before beginning work, the Source of Materials Document is required to insure that:
- a) only approved materials are used
 - b) appropriate test coverage is obtained
 - c) only tested material arrives at the project
 - d) all of the above
15. VDOT specifications require the Materials Inventory Tracking system to be maintained by the:
- a) Contractor
 - b) Project Engineer
 - c) Materials Section
 - d) District Administrator
16. The contractor's inventory is monitored by the:
- a) Central Office Materials Quality Assurance Section
 - b) District Materials Engineer
 - c) Resident Engineer
17. Copies of materials certifications are to be retained by the contractor as part of the Materials Inventory Tracking documentation.
- a) True
 - b) False
18. When materials are delivered directly from the manufacturer to a VDOT project, the project inspector will contact:
- a) The Traffic Engineer
 - b) Central Office Materials Quality Assurance Section
 - c) The manufacturer
 - d) The Resident Engineer

19. When materials are delivered directly from the manufacturer to a VDOT project, the contractor will be required to maintain an Inventory Tracking Program.
- a) True
 - b) False
20. Contractor's Daily Log and Quality Control Report (C-85) is required on Federal Projects only.
- a) True
 - b) False