



The Pavement Marking Quality Assurance Process

Pre-Pave/Pre-Stripe Meeting/Line Striping

- ▶ Prior to the beginning of paving on the project, the P.E. should set up a Pre-Pave / Pre-Stripe meeting and invite the **Field Quality Assurance (FQA)** team and line striping contractor.
- ▶ The line striper should bring with him the approved Quality Control plan signed by OMT.
- ▶ The line striper should have submitted his source of supplies for all materials to be used on the project.
- ▶ Prior to striping, the final layout of markings needs to be approved by the District.
- ▶ Placement of markings can begin after these steps have been followed. All testing procedures in MSMT 729 must be followed prior to striping.
- ▶ Material certifications must accompany materials to be placed on project.

Inspection Request Form

After striping has been completed the following documents are required to initiate the inspection process:

- 1) The Inspection Request Form (Form 13) - IRF
- 2) The contractor's Quality Control - QC
- 3) The manufacturer's material certifications - "Certs"

All documents must be emailed to SHA_PMMS@mdot.maryland.gov

The IRF contains required information such as:

- ❖ Roadway name and number
- ❖ Contract number
- ❖ Beginning Mile Point (BMP) and Ending Mile Point (EMP) and or closest road
- ❖ Material Type
- ❖ Application Date
- ❖ Lot and Batch numbers for the material applied and the glass beads
- ❖ Whether Management of traffic (MOT) is required

Here is an example of a correctly filled Inspection Request Form:

Inspection Request Form

Maryland State Highway Administration
Office of Materials Technology
Structural Materials and Pavement Markings Division
7450 Traffic Drive
Hanover, Maryland 21076

PAVEMENT MARKING INSPECTION AND DATA REQUEST FORM

To: Pavement Marking Team Attn: Jamal Butler /Jay Gheewala

From: Kola Fadairo Phone & Fax #: 3015137300 / 435276963

District 3 County: Montgomery County Contract #: 492D31422

Type of Inspection: Pavement Marking Inspection

Location of Inspection: Prefix MD Route # 355 From BMP 19.70, 12.62 To EMP 17.82, 10.32

Location of Field Office: District 3, 9300 Kenilworth Ave, Greenbelt, MD

(Contract Supervisor: KOLA FADAIRO)

Striping Material (Type of Material Applied): 40 Mil Thermoplastic

Installer (Striping Contractor): Midlantic marking, Inc.

Install Date (Date Material Applied): 04/20/2020

Material Manufacturer: CROWN TECHNOLOGY, LLC

Lot #(s) Origin - Material: WHITE - NT-1920W0087 / YELLOW-NT-1902Y0083

Bead (Glass Sphere Manufacturer): POTTERS INDUSTRIES LLC Type Standard

Lot Number(s) of Glass Spheres: M247TYPE 1 80% LOT PO-H-091419-211-215

Type of Roadway Surface: HMA

Is traffic control needed? Yes If yes, will traffic control be provided? Yes

Inspection Date Requested: ASAP Today's Date: 04/21/2020

QCs Submitted: Yes Prev. Install Eradicated: Yes Prev. Install Tape Exists: No

Project Engineer, please submit the striping contractor's Quality Control Results with this request to the email below. If you have any questions please call Lisa Kwiatkowski at 443-572-5289.

PMMS Email Address
sha_pmms@sha.state.md.us

Contractor Quality Control

The contractor's QC are the readings taken by the contractor after the material was applied.

This data is helpful to the Field Quality Assurance (FQA) Inspector as a basis of comparison to the readings the Inspector gets.

It is also a source of reference if the material fails or performs poorly.

Here is an example of a Contractor QC:

Contractor Quality Control

QUALITY CONTROL REPORT

Contractor

Contract # XY5155177

Location Route # : Rt 27

Contractor-Prime: FO Day

Striping-Contractor: Midlantic Marking

Date of Application: 8/4/2019 Date of Inspection: 8/5/2019

Contractor's Qualified Technician (print) Jeff Andrews

Approved By: (print) SHA Date approved: Jun-09

DATA

Station or Mile Point: Mailbox # 24501

Line Description: Edge x Center _____ Skip _____

Color: W Direction: N

Mil Thickness: 90 Width: 5 Adherence: Good

Bead Pattern: Good Bead Embedment: Good General Application: Good

Surface Moisture: None

Retro Readings

<u>482</u>	<u>491</u>	<u>519</u>	<u>508</u>	<u>484</u>	Average: <u>497</u>
------------	------------	------------	------------	------------	---------------------

DATA

Station or Mile Point: Mailbox # 24501

Line Description: Edge _____ Center x Skip _____

Color: Y Direction: N

Mil Thickness: 90 Width: 5 Adherence: Good

Bead Pattern: Good Bead Embedment: Good General Application: Good

Surface Moisture: None

Retro Readings

<u>260</u>	<u>288</u>	<u>257</u>	<u>263</u>	<u>286</u>	Average: <u>271</u>
------------	------------	------------	------------	------------	---------------------

Technician's Signature

Jeff Andrews

Date: 8/5/2019

Glass Beads Certifications

The glass beads that are applied to the Pavement Marking material are tested and identified at the plant where they were produced, to show that they met the specification requirements.

The glass bead certifications should be submitted to the P.E. prior to use on the project.

These certifications also act as a point of reference in the event the material fails or performs poorly, by tracing it back to its Batch and Lot number.

Here is an example of Glass Bead Certifications:

Glass Beads Certifications

STRAIGHT BILL OF LADING - SHORT FORM Original Not Negotiable

RECEIVED
By Lisa Kwiatkowski at 10:29 am, Dec 16, 2020

FROM: Potters Industries LLC	Loading point: Shipping Point: 507 Potsdam, NY	BT Number: 81567510 Ship Date: 12/21/2020 CUSTOMER POL NUMBER: 28938 Order #: 1443188
Consigned to: ZONE STRIPING INC DELIVER TO JACOB HARRIS DRIVE 7 - 8 JACOB HARRIS LANE GLASSBORO NJ 08028		<small>The consignor warrants that the goods are as described, packed, weighed, and delivered in accordance with the contract terms to carry to the place of delivery as indicated, free from all claims, and that the goods are not subject to any lien or other claim. It is hereby agreed that the carrier shall be released from all claims on account of loss or damage, and in such cases the carrier shall be liable for any loss or damage. The carrier shall be liable for any loss or damage to the goods in transit, and the carrier shall be liable for any loss or damage to the goods in transit, and the carrier shall be liable for any loss or damage to the goods in transit, and the carrier shall be liable for any loss or damage to the goods in transit.</small>
Routing: MERCER TRANSPORTATION CO.		Prepaid/Collect: > Prepaid Freight
Prepaid Freight bill to be submitted to:		POTTERS INDUSTRIES C/O WILLIAMS & POTT ASSOCIATES 405 EAST 70TH STREET BLOOMINGTON, MN 55424-1221

Item	Quantity or Net Weight	Units	Gross Weight	Description/Material Number
Delivery date: 12/22/2020 Tubeday				
000010	44,000.000	LB	44,440.000	1.B Glass Beads or Spheres (Ball), Highway marking / Light reflecting, NMF, 67660-2 class 55 M247 TP1 AC-110 TW 80% 2000 806262 PC-H-092570-301-322
Net Weight: 00022 Tare Weight: 00990 Loading Weight:			45,430.000	LB

DELIVERY CONTACT- TONY CELL 609-970-2515 OR TEL#856-863-3925 EXT 26. FLATBED FULLY TARPED OR VAN DOCK TO DOCK. EARLY AM DELIVERY.
 MLX DCL #XJ720h111

Lisa M. Kwiatkowski
APPROVED
 By Lisa Kwiatkowski at 10:40 am, Dec 16, 2020

Vehicle ID #: <small>THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY PACKED, WEIGHED AND DELIVERED TO THE PLACE OF DELIVERY AS INDICATED HEREIN. THE CARRIER SHALL BE RESPONSIBLE FOR THE LOSS OR DAMAGE TO THE GOODS IN TRANSIT.</small>	Seal NOS:
Signatures: Signatures of Shipper: US Potters Industries LLC 72 Reynolds Rd Potsdam NY 13676-3588 315 266 4920	<small>*If the shipment is to be carried by water, the law requires that the bill of lading shall state whether it is carried by a vessel of the United States or a foreign vessel. The carrier shall be liable for any loss or damage to the goods in transit, and the carrier shall be liable for any loss or damage to the goods in transit, and the carrier shall be liable for any loss or damage to the goods in transit.</small> Signatures of Receiver: _____ Date: _____ Signatures of Shipper: _____ Date: _____

Page 1 of 1

White and Yellow Certifications

Regardless of the material being applied, there are two colors that can be used in Pavement Marking; Yellow and White.


The plants where the material is made note the batch and lot number, along with the test results for both the yellow and white material prior to use.


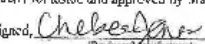
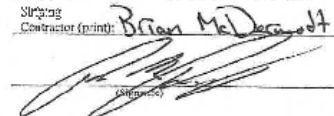
The material certifications should be submitted to the P.E. prior to use on the project.

The certifications show that the material meets specifications and standards.

An example of this type of certification is this:

White and Yellow Certifications

Date: 5/18/20		BILL OF LADING - ME 800290188		Page: 1	
SHIP FROM			Shipment Number: 800290188		
Name: ENNIS-FLINT, INC. Address: 4400 WATER AVF City/State/Zip: RICHMOND, VA 23222 Contact: Jay Wright Phone: 804-308-3208					
SHIP TO			CARRIER NAME: GLG		
Name: MARYLAND SHA Address: 14355 OCEAN GATEWAY WYE MILLS GENERAL DELIVERY City/State/Zip: QUEEN ANNE, MD 21867 Delivery Date: 05-19-2020 Contact: Unknown Phone: 555-555-1212			Trailer/Container number: Seal number(s): BLDG: GLYA Pro number:		
BILL FREIGHT CHARGES TO:			Freight Charge Terms: (Freight charges are prepaid unless otherwise noted)		
Ennis Flint C/O Transulate, PO BOX 425 Lowe, AR 72745 USA			Prepaid: <input checked="" type="checkbox"/> Prepaid Add: Collect: <input type="checkbox"/> 3rd Party: <input type="checkbox"/>		
			<input type="checkbox"/> Master Bill of Lading with attached under this Bill of Lading		
DO NOT BREAK SHIPPER SEALING TRANS-LOADING: CARGO CLAIM MAY RESULT. SPECIAL INSTRUCTIONS: *** SHIP FLATBED ONLY *** CUSTOMER REQUEST ORDER SHIP ON MAY 18TH deliver on 5/19 @ 7am *Contact person: Brian mcdermott @ 201-317-9462 Contact person: Bob, (973) 625-1010 *** SHIP FLATBED ONLY *** CUSTOMER REQUEST ORDER SHIP ON MAY 18TH Contact person: Bob, (973) 625-1010 Contact person: Bob, (973) 625-1010 *** SHIP FLATBED ONLY *** CUSTOMER REQUEST ORDER SHIP ON APRIL 27TH *Contact person: Bob, (973) 625-1010					
CARRIER INFORMATION					
HANDLING	QUANTITY	WEIGHT	H.M.	COMMODITY DESCRIPTION	LTL ONLY
QTY	TYPE	QTY	TYPE	Commodity requiring special handling or additional care or attention and if crawling must be so marked and packages are to ensure safe transportation with this marking	NMFC # CLASS
11.0	TE	3025	GL	45100 LBS	14998C-06 66
11		3025		45100 LBS	
				GRAND TOTAL	
CUSTOMER ORDER INFORMATION					
SALES ORDER NUMBER	PO NUMBER	# Pkgs	Weight	Pallet/Slip	Additional Shipper Info
00182105	VERBA - 308	3025	45100 LBS		WB WHT MD 291029/PMMC5PA029
GRAND TOTAL		3025	45100 LBS		
We warrant that the goods described in this bill of lading are as described in the bill of lading and are in the possession of the carrier at the time of receipt.			GGD Amount \$		
The carrier is not responsible for loss or damage to the goods if the shipper is not in possession of the goods at the time of receipt.			Fee Terms: Collect: <input type="checkbox"/> Prepaid: <input type="checkbox"/>		
			Customer check acceptable: <input type="checkbox"/>		
NOTE: Liability limitations for loss or damage to this shipment may be applicable. See 49 U.S.C. § 14700(a)(1)(A) and (B).					
RECEIVED, receipt is hereby presented, and the carrier is not responsible for loss or damage to the goods if the shipper is not in possession of the goods at the time of receipt.			The carrier shall not be liable for loss or damage to the goods if the shipper is not in possession of the goods at the time of receipt.		
SHIPPER SIGNATURE/DATE			SHIPPER SIGNATURE		
Trailer Locked: <input type="checkbox"/> by driver <input type="checkbox"/> by other			Freight Counted: <input type="checkbox"/> by driver <input type="checkbox"/> by other		
CARRIER SIGNATURE/PICKUP DATE (5-18-2020)			CARRIER SIGNATURE/PICKUP DATE (5-18-2020)		

08/19 0423/07		MARYLAND STATE HIGHWAY ADMINISTRATION MATERIALS INSPECTION REPORT (Preventive Marking Materials)	
Date Sampled: 04/13/2020	Approved Date: 04/16/2020		
Type of Material: White Traffic Paint	Lab Release No.: 400176		
Contract Number: 492D21421	BMS Number: 23879		
Proposal Item No(s):	Type of Construction:		
Quantity Represented: 275 GAL	Batch / Lot: VP2004W0196		
Material Produced By: Ennis traffic paint	Brand/Trade Name: PMM(2005)PA-029		
Address: Richmond, VA			
Supplier / Vendor:			
Address:			
Site of Inspection:			
This material <input checked="" type="checkbox"/> meets <input type="checkbox"/> does not meet specification requirements.			
Product Specification:	Brand/Trade Name:		
Inspected by (print): Tested By: Alvin Emlaka	Signature: 	4-16-20	
Remarks: MARYLAND SHA - # 492D21421 - 275 GALLONS			
We certify that Batch / Lot Number VP2004W0196 being sold to MARYLAND SHA the same batch / lot tested and approved by Maryland State Highway Administration under last number.			
Signed: 			
Project No(s):			
Date Received from Producer/MTI:			
Quantity Received:			
Certs. Attached? Yes / No (check)			
Shipping Contractor (print): Brian McDermodt			
			

**The Inspection Request Form,
Contractor Quality Control, and
Certifications should be submitted
to:**

SHA_PMMS@mdot.maryland.gov

Field Quality Assurance

An Inspection is conducted by the FQA team after an Inspection Request Form has been received.

FQA Inspectors will conduct tests on the roadway using a retro-reflectometer to measure the visibility/ reflectivity of the roadway's pavement marking.

Passing numbers for paint and thermoplastic are 150 for yellow and 250 for white. Passing numbers for tape are 250 for yellow and 350 for white.

The FQA Inspectors will take 5 readings at various mile points on each line striped and use the averages to determine a pass or fail for the marking.

An FQA readings sheet will look like this:

Field Quality Assurance

TRAFFIC MARKING WORKSHEET

CHARGE NO. 23879 INSPECTED BY: M. Judd / E. Thomas
 ROUTE NO. MD91 M.P. 0.00 to M.P. 1.42 DATE OF INSPECTION: 05/20/2019
 TYPE OF MATERIAL: WATERBORNE DATE OF APPLICATION: 04/12/2019 & 05/07/2019

M.P.	N E W	LINE COLOR & TYPR	MILS	WIDTH	BEAD EMBED.	READINGS					AVERAGE	REMARKS
1.42	N	WE	N/A	5"		261	263	265	242	259	258	
1.42	N/S	YC	N/A	5"		115	105	147	162	147	135	
1.42	S	WE	N/A	5"		42	37	208	215	205	141	
1.30	N	WE	N/A	5"		327	337	336	325	333	332	
1.30	N/S	YC	N/A	5"		173	181	168	155	152	164	
1.30	S	WE	N/A	5"		381	344	365	359	366	363	
1.045	N	WE	N/A	5"		340	321	300	330	338	326	
1.045	N/S	YC	N/A	5"		125	135	164	141	134	140	
1.045	S	WE	N/A	5"		293	289	291	273	294	288	
0.95	N	WE	N/A	5"		353	357	373	375	370	365	
0.95	N/S	YC	N/A	5"		118	120	120	138	143	128	
0.95	S	WE	N/A	5"		312	290	285	288	297	294	
0.00	N	WE	N/A	5"		323	316	304	310	320	315	
0.00	N/S	YC	N/A	5"		176	162	174	173	191	167	
0.00	S	WE	N/A	5"		123	145	131	125	134	132	

Clearance Letter

Once all the required documents have been submitted to OMT, and the FQA Inspection has been conducted, a Clearance Letter will be created.

The Clearance Letter will contain the necessary information gathered from the documents submitted for inspection and an Acceptance or Failure of the pavement marking will be determined from the FQA Inspection report.

The Clearance Letter is a requirement to successfully close-out an SHA roadway project.

An example of a Clearance Letter is this:

Clearance Letter



Larry Hogan
Governor
Boyd K. Rutherford
Lt. Governor
Gregory Eisher
Secretary
Tim Smith, P.E.
Administrator

MEMORANDUM

TO: James Moon
Project Engineer
District 1

FROM: Mr. David Malburg P.E., Division Chief *DM*
Structural Materials and Pavement Markings Division *F for*

DATE: August 31, 2020

SUBJECT: State Maintenance: 23492-23
Inspection of: Nontoxic Waterborne Pavement Markings
Location: US 113
Mile Points: 29.38-37.49

The Field Quality Assurance Team in-company with District 1 personnel has completed the inspection of the nontoxic waterborne pavement markings on the subject project as requested. The enclosed report details our findings and recommendations that are based on materials Quality Assurance (QA) evaluation of the in-place lines. This evaluation was performed to confirm the striping contractor's quality control results. The field testing inspection of this project shows the Nontoxic Waterborne Paint pavement markings MEET the contract specifications. Acceptance is recommended.

If additional information is required, please contact Mr. Doc Tisdale of our Pavement Markings Section at (443) 572-5296.

DM/mb
Attachment

cc:
M. Marvel
Project File

Additional Pavement Marking Information

- Line-strippers who plan to install tape are required to get trained in installation techniques from the manufacturer they purchase their material. This is free training offered by our tape manufacturers. Please be advise for tape installation of In-laid is between 130-160 up to 180 (for stiffer asphalt mixes) with 365 day observation period for installers.
- A certificate will be given and Linestrippers are required to include this document in their QC plan. If for some reason this occurs after the QC plan has been submitted, then it should be sent to the FQA team prior to installing Tape.
- The PMMT team over the last few years has been sending the district recommended roads to increase the district's durables markings by replacing paint roadway markings with a durable marking, They have also been sending recommended roads that need to be refreshed based on our Roads & highway system reports. We are asking the Districts to send us an email once the listed roads have been striped or a reason as to why the recommended road wasn't used.
- Last year the PMMT inspected over 6000 of MDSHA 27000 strip miles using a mobile retro. We do plan to continue this process as it will help us determine PM life cycles and aid us in our decision making to provide the Districts with recommended roads for replacing or refreshing as I previously mentioned. Also, we are investigating using MRU for both QC/QA inspections.

Pavement Marking Contacts

David Malburg (Division Chief)

443-572-5298

DMalburg@mdot.Maryland.gov

Dr. Doc Tisdale (Assistant Division Chief)

443-572-5296

DTisdale2@mdot.Maryland.gov

Jay Gheewala (Pavement Markings Management Team Leader)

443-572-5287

JGheewala@mdot.Maryland.gov

Mike Ball (Field Quality Assurance Sr. Technician)

410-816-8511

MBall@mdot.Maryland.gov

Jamal Buckner (Field Quality Assurance Sr. Technician)

443-221-9599

Jbuckner@mdot.Maryland.gov