



State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Solicitation

NUMBER
8513C2012

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF:

ALAN CUMMINGS
304-558-2402

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From: FOX, JULIE A
3M - MAPLEWOOD, MN
3M CENTER
MAPLEWOOD MN 55144

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DIVISION OF HIGHWAYS
TRAFFIC SERVICES COMPLEX

180 DRY BRANCH ROAD
CHARLESTON, WV
25306 304-558-2908

DATE PRINTED

07/02/2013

BID OPENING DATE:

07/17/2013

BID OPENING TIME

1:30PM

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	LS		550-48	** Please see Price	Pages within bid
					REFLECTIVE SIGN SHEETING & ASSOCIATED MATERIALS documents	for unit prices.
					REQUEST FOR QUOTATION (OPEN-END CONTRACT)	
					THE WEST VIRGINIA STATE PURCHASING DIVISION FOR THE AGENCY, THE WEST VIRGINIA DIVISION OF HIGHWAYS, IS SOLICITING BIDS TO PROVIDE THE AGENCY WITH AN OPEN-END CONTRACT FOR REFLECTIVE SIGN SHEETING AND ASSOCIATED MATERIALS PER THE ATTACHED SPECIFICATIONS.	
					***** THIS IS THE END OF RFQ 8513C2012 ***** TOTAL:	\$ 257,553.42
					09/17/13 09:31:04 AM West Virginia Purchasing Division	

SIGNATURE

TELEPHONE 800-553-1380

DATE September 13, 2013

TITLE Contract Administrator FEIN 41-0417775

ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

INSTRUCTIONS TO VENDORS SUBMITTING BIDS

1. **REVIEW DOCUMENTS THOROUGHLY:** The attached documents contain a solicitation for bids. Please read these instructions and all documents attached in their entirety. These instructions provide critical information about requirements that if overlooked could lead to disqualification of a Vendor's bid. All bids must be submitted in accordance with the provisions contained in these instructions and the Solicitation. Failure to do so may result in disqualification of Vendor's bid.
2. **MANDATORY TERMS:** The Solicitation may contain mandatory provisions identified by the use of the words "must," "will," and "shall." Failure to comply with a mandatory term in the Solicitation will result in bid disqualification.
3. **PREBID MEETING:** The item identified below shall apply to this Solicitation.

☒ A pre-bid meeting will not be held prior to bid opening.

☐ A **NON-MANDATORY PRE-BID** meeting will be held at the following place and time:

☐ A **MANDATORY PRE-BID** meeting will be held at the following place and time:

All Vendors submitting a bid must attend the mandatory pre-bid meeting. Failure to attend the mandatory pre-bid meeting shall result in disqualification of the Vendor's bid. No one person attending the pre-bid meeting may represent more than one Vendor.

An attendance sheet provided at the pre-bid meeting shall serve as the official document verifying attendance. The State will not accept any other form of proof or documentation to verify attendance. Any person attending the pre-bid meeting on behalf of a Vendor must list on the attendance sheet his or her name and the name of the Vendor he or she is representing. Additionally, the person attending the pre-bid meeting should include the Vendor's E-Mail address, phone number, and Fax number on the attendance sheet. It is the Vendor's responsibility to locate the attendance sheet and provide the required

information. Failure to complete the attendance sheet as required may result in disqualification of Vendor's bid.

All Vendors should arrive prior to the starting time for the pre-bid. Vendors who arrive after the starting time but prior to the end of the pre-bid will be permitted to sign in, but are charged with knowing all matters discussed at the pre-bid.

Questions submitted at least five business days prior to a scheduled pre-bid will be discussed at the pre-bid meeting if possible. Any discussions or answers to questions at the pre-bid meeting are preliminary in nature and are non-binding. Official and binding answers to questions will be published in a written addendum to the Solicitation prior to bid opening.

4. **VENDOR QUESTION DEADLINE:** Vendors may submit questions relating to this Solicitation to the Purchasing Division. Questions must be submitted in writing. All questions must be submitted on or before the date listed below and to the address listed below in order to be considered. A written response will be published in a Solicitation addendum if a response is possible and appropriate. Non-written discussions, conversations, or questions and answers regarding this Solicitation are preliminary in nature and are non-binding.

Question Submission Deadline:	07/09/2013
Submit Questions to:	Alan Cummings 2019 Washington Street, East P.O. Box 50130 Charleston, WV 25305 Fax: 304-558-3970 Email: Alan.W.Cummings@WV.Gov

5. **VERBAL COMMUNICATION:** Any verbal communication between the Vendor and any State personnel is not binding, including that made at the mandatory pre-bid conference. Only information issued in writing and added to the Solicitation by an official written addendum by the Purchasing Division is binding.
6. **BID SUBMISSION:** All bids must be signed and delivered by the Vendor to the Purchasing Division at the address listed below on or before the date and time of the bid opening. Any bid received by the Purchasing Division staff is considered to be in the possession of the Purchasing Division and will not be returned for any reason. The bid delivery address is:

Department of Administration, Purchasing Division
 2019 Washington Street East
 P.O. Box 50130,
 Charleston, WV 25305-0130

The bid should contain the information listed below on the face of the envelope or the bid may not be considered:

SEALED BID

BUYER: _____
 SOLICITATION NO.: _____
 BID OPENING DATE: _____
 BID OPENING TIME: _____
 FAX NUMBER: _____

In the event that Vendor is responding to a request for proposal, the Vendor shall submit one original technical and one original cost proposal plus n/a convenience copies of each to the Purchasing Division at the address shown above. Additionally, the Vendor should identify the bid type as either a technical or cost proposal on the face of each bid envelope submitted in response to a request for proposal as follows:

BID TYPE: ☐ Technical
 ☐ Cost

7. **BID OPENING:** Bids submitted in response to this Solicitation will be opened at the location identified below on the date and time listed below. Delivery of a bid after the bid opening date and time will result in bid disqualification. For purposes of this Solicitation, a bid is considered delivered when time stamped by the official Purchasing Division time clock.

Bid Opening Date and Time:

07/17/2013 - 1:30 P.M.

Bid Opening Location:

Department of Administration, Purchasing Division
 2019 Washington Street East
 P.O. Box 50130,
 Charleston, WV 25305-0130

8. **ADDENDUM ACKNOWLEDGEMENT:** Changes or revisions to this Solicitation will be made by an official written addendum issued by the Purchasing Division. Vendor should acknowledge receipt of all addenda issued with this Solicitation by completing an Addendum Acknowledgment Form, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.
9. **BID FORMATTING:** Vendor should type or electronically enter the information onto its bid to prevent errors in the evaluation. Failure to type or electronically enter the information may result in bid disqualification.

GENERAL TERMS AND CONDITIONS:

1. **CONTRACTUAL AGREEMENT:** Issuance of a Purchase Order signed by the Purchasing Division Director, or his designee, and approved as to form by the Attorney General's office constitutes acceptance of this Contract made by and between the State of West Virginia and the Vendor. Vendor's signature on its bid signifies Vendor's agreement to be bound by and accept the terms and conditions contained in this Contract.

2. **DEFINITIONS:** As used in this Solicitation / Contract, the following terms shall have the meanings attributed to them below. Additional definitions may be found in the specifications included with this Solicitation / Contract.
 - 2.1 **"Agency" or "Agencies"** means the agency, board, commission, or other entity of the State of West Virginia that is identified on the first page of the Solicitation or any other public entity seeking to procure goods or services under this Contract.
 - 2.2 **"Contract"** means the binding agreement that is entered into between the State and the Vendor to provide the goods and services requested in the Solicitation.
 - 2.3 **"Director"** means the Director of the West Virginia Department of Administration, Purchasing Division.
 - 2.4 **"Purchasing Division"** means the West Virginia Department of Administration, Purchasing Division.
 - 2.5 **"Purchase Order"** means the document signed by the Agency and the Purchasing Division, and approved as to form by the Attorney General, that identifies the Vendor as the successful bidder and Contract holder.
 - 2.6 **"Solicitation"** means the official solicitation published by the Purchasing Division and identified by number on the first page thereof.
 - 2.7 **"State"** means the State of West Virginia and/or any of its agencies, commissions, boards, etc. as context requires.
 - 2.8 **"Vendor" or "Vendors"** means any entity submitting a bid in response to the Solicitation, the entity that has been selected as the lowest responsible bidder, or the entity that has been awarded the Contract as context requires.

3. **CONTRACT TERM; RENEWAL; EXTENSION:** The term of this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below:

☒ **Term Contract**

Initial Contract Term: This Contract becomes effective on award

and extends for a period of 1 year(s).

Renewal Term: This Contract may be renewed upon the mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any request for renewal must be submitted to the Purchasing Division Director thirty (30) days prior to the expiration date of the initial contract term or appropriate renewal term. A Contract renewal shall be in accordance with the terms and conditions of the original contract. Renewal of this Contract is limited to 2 successive one (1) year periods. Automatic renewal of this Contract is prohibited. Notwithstanding the foregoing, Purchasing Division approval is not required on agency delegated or exempt purchases. Attorney General approval may be required for vendor terms and conditions.

Reasonable Time Extension: At the sole discretion of the Purchasing Division Director, and with approval from the Attorney General's office (Attorney General approval is as to form only), this Contract may be extended for a reasonable time after the initial Contract term or after any renewal term as may be necessary to obtain a new contract or renew this Contract. Any reasonable time extension shall not exceed twelve (12) months. Vendor may avoid a reasonable time extension by providing the Purchasing Division Director with written notice of Vendor's desire to terminate this Contract 30 days prior to the expiration of the then current term. During any reasonable time extension period, the Vendor may terminate this Contract for any reason upon giving the Purchasing Division Director 30 days written notice. Automatic extension of this Contract is prohibited. Notwithstanding the foregoing, Purchasing Division approval is not required on agency delegated or exempt purchases, but Attorney General approval may be required.

- [] **Fixed Period Contract:** This Contract becomes effective upon Vendor's receipt of the notice to proceed and must be completed within days.
- [] **One Time Purchase:** The term of this Contract shall run from the issuance of the Purchase Order until all of the goods contracted for have been delivered, but in no event shall this Contract extend for more than one fiscal year.
- [] **Other:** See attached.

4. **NOTICE TO PROCEED:** Vendor shall begin performance of this Contract immediately upon receiving notice to proceed unless otherwise instructed by the Agency. Unless otherwise specified, the fully executed Purchase Order will be considered notice to proceed
5. **QUANTITIES:** The quantities required under this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below.
 - ☒ **Open End Contract:** Quantities listed in this Solicitation are approximations only, based on estimates supplied by the Agency. It is understood and agreed that the Contract shall cover the quantities actually ordered for delivery during the term of the Contract, whether more or less than the quantities shown.
 - ☐ **Service:** The scope of the service to be provided will be more clearly defined in the specifications included herewith.
 - ☐ **Combined Service and Goods:** The scope of the service and deliverable goods to be provided will be more clearly defined in the specifications included herewith.
 - ☐ **One Time Purchase:** This Contract is for the purchase of a set quantity of goods that are identified in the specifications included herewith. Once those items have been delivered, no additional goods may be procured under this Contract without an appropriate change order approved by the Vendor, Agency, Purchasing Division, and Attorney General's office.
6. **PRICING:** The pricing set forth herein is firm for the life of the Contract, unless specified elsewhere within this Solicitation/Contract by the State. A Vendor's inclusion of price adjustment provisions in its bid, without an express authorization from the State in the Solicitation to do so, may result in bid disqualification.
7. **EMERGENCY PURCHASES:** The Purchasing Division Director may authorize the Agency to purchase goods or services in the open market that Vendor would otherwise provide under this Contract if those goods or services are for immediate or expedited delivery in an emergency. Emergencies shall include, but are not limited to, delays in transportation or an unanticipated increase in the volume of work. An emergency purchase in the open market, approved by the Purchasing Division Director, shall not constitute of breach of this Contract and shall not entitle the Vendor to any form of compensation or damages. This provision does not excuse the State from fulfilling its obligations under a One Time Purchase contract.
8. **REQUIRED DOCUMENTS:** All of the items checked below must be provided to the Purchasing Division by the Vendor as specified below.
 - ☐ **BID BOND:** All Vendors shall furnish a bid bond in the amount of five percent (5%) of the total amount of the bid protecting the State of West Virginia. The bid bond must be submitted with the bid.

- [] **PERFORMANCE BOND:** The apparent successful Vendor shall provide a performance bond in the amount of . The performance bond must be issued and received by the Purchasing Division prior to Contract award. On construction contracts, the performance bond must be 100% of the Contract value.

- [] **LABOR/MATERIAL PAYMENT BOND:** The apparent successful Vendor shall provide a labor/material payment bond in the amount of 100% of the Contract value. The labor/material payment bond must be issued and delivered to the Purchasing Division prior to Contract award.

In lieu of the Bid Bond, Performance Bond, and Labor/Material Payment Bond, the Vendor may provide certified checks, cashier's checks, or irrevocable letters of credit. Any certified check, cashier's check, or irrevocable letter of credit provided in lieu of a bond must be of the same amount and delivered on the same schedule as the bond it replaces. A letter of credit submitted in lieu of a performance and labor/material payment bond will only be allowed for projects under \$100,000. Personal or business checks are not acceptable.

- [] **MAINTENANCE BOND:** The apparent successful Vendor shall provide a two (2) year maintenance bond covering the roofing system. The maintenance bond must be issued and delivered to the Purchasing Division prior to Contract award.

- [] **WORKERS' COMPENSATION INSURANCE:** The apparent successful Vendor shall have appropriate workers' compensation insurance and shall provide proof thereof upon request.

- [] **INSURANCE:** The apparent successful Vendor shall furnish proof of the following insurance prior to Contract award:

- [] **Commercial General Liability Insurance:**
 or more.

- [] **Builders Risk Insurance:** builders risk – all risk insurance in an amount equal to 100% of the amount of the Contract.

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The apparent successful Vendor shall also furnish proof of any additional insurance requirements contained in the specifications prior to Contract award regardless of whether or not that insurance requirement is listed above.

- ☐ **LICENSE(S) / CERTIFICATIONS / PERMITS:** In addition to anything required under the Section entitled Licensing, of the General Terms and Conditions, the apparent successful Vendor shall furnish proof of the following licenses, certifications, and/or permits prior to Contract award, in a form acceptable to the Purchasing Division.

<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

The apparent successful Vendor shall also furnish proof of any additional licenses or certifications contained in the specifications prior to Contract award regardless of whether or not that requirement is listed above.

- 9. LITIGATION BOND:** The Director reserves the right to require any Vendor that files a protest of an award to submit a litigation bond in the amount equal to one percent of the lowest bid submitted or \$5,000, whichever is greater. The entire amount of the bond shall be forfeited if the hearing officer determines that the protest was filed for frivolous or improper purpose, including but not limited to, the purpose of harassing, causing unnecessary delay, or needless expense for the Agency. All litigation bonds shall be made payable to the Purchasing Division. In lieu of a bond, the protester may submit a cashier's check or certified check payable to the Purchasing Division. Cashier's or certified checks will be deposited with and held by the State Treasurer's office. If it is determined that the protest has not been filed for frivolous or improper purpose, the bond or deposit shall be returned in its entirety.
- 10. ALTERNATES:** Any model, brand, or specification listed herein establishes the acceptable level of quality only and is not intended to reflect a preference for, or in any way favor, a particular brand or vendor. Vendors may bid alternates to a listed model or brand provided that the alternate is at least equal to the model or brand and complies with the required specifications. The equality of any alternate being bid shall be determined by the State at its sole discretion. Any Vendor bidding an alternate model or brand should clearly identify the alternate items in its bid and should include manufacturer's specifications, industry literature, and/or any other relevant documentation demonstrating the equality of the alternate items. Failure to provide information for alternate items may be grounds for rejection of a Vendor's bid.
- 11. EXCEPTIONS AND CLARIFICATIONS:** The Solicitation contains the specifications that shall form the basis of a contractual agreement. Vendor shall clearly mark any exceptions, clarifications, or

other proposed modifications in its bid. Exceptions to, clarifications of, or modifications of a requirement or term and condition of the Solicitation may result in bid disqualification.

12. LIQUIDATED DAMAGES: Vendor shall pay liquidated damages in the amount

described herein

for delivery delays

This clause shall in no way be considered exclusive and shall not limit the State or Agency's right to pursue any other available remedy.

- 13. ACCEPTANCE/REJECTION:** The State may accept or reject any bid in whole, or in part. Vendor's signature on its bid signifies acceptance of the terms and conditions contained in the Solicitation and Vendor agrees to be bound by the terms of the Contract, as reflected in the Purchase Order, upon receipt.
- 14. REGISTRATION:** Prior to Contract award, the apparent successful Vendor must be properly registered with the West Virginia Purchasing Division and must have paid the \$125 fee if applicable.
- 15. COMMUNICATION LIMITATIONS:** In accordance with West Virginia Code of State Rules §148-1-6.6, communication with the State of West Virginia or any of its employees regarding this Solicitation during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited without prior Purchasing Division approval. Purchasing Division approval for such communication is implied for all agency delegated and exempt purchases.
- 16. FUNDING:** This Contract shall continue for the term stated herein, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise made available, this Contract becomes void and of no effect beginning on July 1 of the fiscal year for which funding has not been appropriated or otherwise made available.
- 17. PAYMENT:** Payment in advance is prohibited under this Contract. Payment may only be made after the delivery and acceptance of goods or services. The Vendor shall submit invoices, in arrears, to the Agency at the address on the face of the purchase order labeled "Invoice To."
- 18. UNIT PRICE:** Unit prices shall prevail in cases of a discrepancy in the Vendor's bid.
- 19. DELIVERY:** All quotations are considered freight on board destination ("F.O.B. destination") unless alternate shipping terms are clearly identified in the bid. Vendor's listing of shipping terms that contradict the shipping terms expressly required by this Solicitation may result in bid disqualification.
- 20. INTEREST:** Interest attributable to late payment will only be permitted if authorized by the West Virginia Code. Presently, there is no provision in the law for interest on late payments.
- 21. PREFERENCE:** Vendor Preference may only be granted upon written request and only in accordance with the West Virginia Code § 5A-3-37 and the West Virginia Code of State Rules. A Resident Vendor Certification form has been attached hereto to allow Vendor to apply for the preference. Vendor's

failure to submit the Resident Vendor Certification form with its bid will result in denial of Vendor Preference. Vendor Preference does not apply to construction projects.

22. **SMALL, WOMEN-OWNED, OR MINORITY-OWNED BUSINESSES:** For any solicitations publicly advertised for bid on or after July 1, 2012, in accordance with West Virginia Code §5A-3-37(a)(7) and W. Va. CSR § 148-22-9, any non-resident vendor certified as a small, women-owned, or minority-owned business under W. Va. CSR § 148-22-9 shall be provided the same preference made available to any resident vendor. Any non-resident small, women-owned, or minority-owned business must identify itself as such in writing, must submit that writing to the Purchasing Division with its bid, and must be properly certified under W. Va. CSR § 148-22-9 prior to submission of its bid to receive the preferences made available to resident vendors. Preference for a non-resident small, women-owned, or minority owned business shall be applied in accordance with W. Va. CSR § 148-22-9.
23. **TAXES:** The Vendor shall pay any applicable sales, use, personal property or any other taxes arising out of this Contract and the transactions contemplated thereby. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.
24. **CANCELLATION:** The Purchasing Division Director reserves the right to cancel this Contract immediately upon written notice to the vendor if the materials or workmanship supplied do not conform to the specifications contained in the Contract. The Purchasing Division Director may cancel any purchase or Contract upon 30 days written notice to the Vendor in accordance with West Virginia Code of State Rules § 148-1-7.16.2.
25. **WAIVER OF MINOR IRREGULARITIES:** The Director reserves the right to waive minor irregularities in bids or specifications in accordance with West Virginia Code of State Rules § 148-1-4.6.
26. **TIME:** Time is of the essence with regard to all matters of time and performance in this Contract.
27. **APPLICABLE LAW:** This Contract is governed by and interpreted under West Virginia law without giving effect to its choice of law principles. Any information provided in specification manuals, or any other source, verbal or written, which contradicts or violates the West Virginia Constitution, West Virginia Code or West Virginia Code of State Rules is void and of no effect.
28. **COMPLIANCE:** Vendor shall comply with all applicable federal, state, and local laws, regulations and ordinances. By submitting a bid, Vendors acknowledge that they have reviewed, understand, and will comply with all applicable law.
29. **PREVAILING WAGE:** On any contract for the construction of a public improvement, Vendor and any subcontractors utilized by Vendor shall pay a rate or rates of wages which shall not be less than the fair minimum rate or rates of wages (prevailing wage), as established by the West Virginia Division of Labor under West Virginia Code §§ 21-5A-1 et seq. and available at <http://www.sos.wv.gov/administrative-law/wagerates/Pages/default.aspx>. Vendor shall be responsible for ensuring compliance with prevailing wage requirements and determining when prevailing wage

requirements are applicable. The required contract provisions contained in West Virginia Code of State Rules § 42-7-3 are specifically incorporated herein by reference.

- 30. ARBITRATION:** Any references made to arbitration contained in this Contract, Vendor's bid, or in any American Institute of Architects documents pertaining to this Contract are hereby deleted, void, and of no effect.
- 31. MODIFICATIONS:** This writing is the parties' final expression of intent. Notwithstanding anything contained in this Contract to the contrary, no modification of this Contract shall be binding without mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). **No Change shall be implemented by the Vendor until such time as the Vendor receives an approved written change order from the Purchasing Division.**
- 32. WAIVER:** The failure of either party to insist upon a strict performance of any of the terms or provision of this Contract, or to exercise any option, right, or remedy herein contained, shall not be construed as a waiver or a relinquishment for the future of such term, provision, option, right, or remedy, but the same shall continue in full force and effect. Any waiver must be expressly stated in writing and signed by the waiving party.
- 33. SUBSEQUENT FORMS:** The terms and conditions contained in this Contract shall supersede any and all subsequent terms and conditions which may appear on any form documents submitted by Vendor to the Agency or Purchasing Division such as price lists, order forms, invoices, sales agreements, or maintenance agreements, and includes internet websites or other electronic documents. Acceptance or use of Vendor's forms does not constitute acceptance of the terms and conditions contained thereon.
- 34. ASSIGNMENT:** Neither this Contract nor any monies due, or to become due hereunder, may be assigned by the Vendor without the express written consent of the Agency, the Purchasing Division, the Attorney General's office (as to form only), and any other government agency or office that may be required to approve such assignments. Notwithstanding the foregoing, Purchasing Division approval may or may not be required on certain agency delegated or exempt purchases.
- 35. WARRANTY:** The Vendor expressly warrants that the goods and/or services covered by this Contract will: (a) conform to the specifications, drawings, samples, or other description furnished or specified by the Agency; (b) be merchantable and fit for the purpose intended; and (c) be free from defect in material and workmanship.
- 36. STATE EMPLOYEES:** State employees are not permitted to utilize this Contract for personal use and the Vendor is prohibited from permitting or facilitating the same.
- 37. BANKRUPTCY:** In the event the Vendor files for bankruptcy protection, the State of West Virginia may deem this Contract null and void, and terminate this Contract without notice.

38. [RESERVED]

39. CONFIDENTIALITY: The Vendor agrees that it will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the Agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the Agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/default.html>.

40. DISCLOSURE: Vendor's response to the Solicitation and the resulting Contract are considered public documents and will be disclosed to the public in accordance with the laws, rules, and policies governing the West Virginia Purchasing Division. Those laws include, but are not limited to, the Freedom of Information Act found in West Virginia Code § 29B-1-1 et seq.

If a Vendor considers any part of its bid to be exempt from public disclosure, Vendor must so indicate by specifically identifying the exempt information, identifying the exemption that applies, providing a detailed justification for the exemption, segregating the exempt information from the general bid information, and submitting the exempt information as part of its bid but in a segregated and clearly identifiable format. Failure to comply with the foregoing requirements will result in public disclosure of the Vendor's bid without further notice. A Vendor's act of marking all or nearly all of its bid as exempt is not sufficient to avoid disclosure and WILL NOT BE HONORED. Vendor's act of marking a bid or any part thereof as "confidential" or "proprietary" is not sufficient to avoid disclosure and WILL NOT BE HONORED. In addition, a legend or other statement indicating that all or substantially all of the bid is exempt from disclosure is not sufficient to avoid disclosure and WILL NOT BE HONORED. Vendor will be required to defend any claimed exemption for nondisclosure in the event of an administrative or judicial challenge to the State's nondisclosure. Vendor must indemnify the State for any costs incurred related to any exemptions claimed by Vendor. Any questions regarding the applicability of the various public records laws should be addressed to your own legal counsel prior to bid submission.

41. LICENSING: In accordance with West Virginia Code of State Rules §148-1-6.1.7, Vendor must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agency or political subdivision. Upon request, the Vendor must provide all necessary releases to obtain information to enable the Purchasing Division Director or the Agency to verify that the Vendor is licensed and in good standing with the above entities.

42. ANTITRUST: In submitting a bid to, signing a contract with, or accepting a Purchase Order from any agency of the State of West Virginia, the Vendor agrees to convey, sell, assign, or transfer to the State of West Virginia all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the

purchasing agency tenders the initial payment to Vendor.

- 43. VENDOR CERTIFICATIONS:** By signing its bid or entering into this Contract, Vendor certifies (1) that its bid was made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, person or entity submitting a bid for the same material, supplies, equipment or services; (2) that its bid is in all respects fair and without collusion or fraud; (3) that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; and (4) that it has reviewed this RFQ in its entirety; understands the requirements, terms and conditions, and other information contained herein. Vendor's signature on its bid also affirms that neither it nor its representatives have any interest, nor shall acquire any interest, direct or indirect, which would compromise the performance of its services hereunder. Any such interests shall be promptly presented in detail to the Agency.

The individual signing this bid on behalf of Vendor certifies that he or she is authorized by the Vendor to execute this bid or any documents related thereto on Vendor's behalf; that he or she is authorized to bind the Vendor in a contractual relationship; and that, to the best of his or her knowledge, the Vendor has properly registered with any State agency that may require registration.

- 44. PURCHASING CARD ACCEPTANCE:** The State of West Virginia currently utilizes a Purchasing Card program, administered under contract by a banking institution, to process payment for goods and services. The Vendor must accept the State of West Virginia's Purchasing Card for payment of all orders under this Contract unless the box below is checked.

☐ Vendor is not required to accept the State of West Virginia's Purchasing Card as payment for all goods and services.

- 45. VENDOR RELATIONSHIP:** The relationship of the Vendor to the State shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by this Contract. The Vendor as an independent contractor is solely liable for the acts and omissions of its employees and agents. Vendor shall be responsible for selecting,

supervising, and compensating any and all individuals employed pursuant to the terms of this Solicitation and resulting contract. Neither the Vendor, nor any employees or subcontractors of the Vendor, shall be deemed to be employees of the State for any purpose whatsoever. Vendor shall be exclusively responsible for payment of employees and contractors for all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension, or other deferred compensation plans, including but not limited to, Workers' Compensation and Social Security obligations, licensing fees, *etc.* and the filing of all necessary documents, forms and returns pertinent to all of the foregoing. Vendor shall hold harmless the State, and shall provide the State and Agency with a defense against any and all claims including, but not limited to, the foregoing payments, withholdings, contributions, taxes, Social Security taxes, and employer income tax returns.

- 46. INDEMNIFICATION:** The Vendor agrees to indemnify, defend, and hold harmless the State and the Agency, their officers, and employees from and against: (1) Any claims or losses for services rendered

by any subcontractor, person, or firm performing or supplying services, materials, or supplies in connection with the performance of the Contract; (2) Any claims or losses resulting to any person or entity injured or damaged by the Vendor, its officers, employees, or subcontractors by the publication, translation, reproduction, delivery, performance, use, or disposition of any data used under the Contract in a manner not authorized by the Contract, or by Federal or State statutes or regulations; and (3) Any failure of the Vendor, its officers, employees, or subcontractors to observe State and Federal laws including, but not limited to, labor and wage and hour laws.

- 47. PURCHASING AFFIDAVIT:** In accordance with West Virginia Code § 5A-3-10a, all Vendors are required to sign, notarize, and submit the Purchasing Affidavit stating that neither the Vendor nor a related party owe a debt to the State in excess of \$1,000. The affidavit must be submitted prior to award, but should be submitted with the Vendor's bid. A copy of the Purchasing Affidavit is included herewith.
- 48. ADDITIONAL AGENCY AND LOCAL GOVERNMENT USE:** This Contract may be utilized by and extends to other agencies, spending units, and political subdivisions of the State of West Virginia; county, municipal, and other local government bodies; and school districts ("Other Government Entities"). This Contract shall be extended to the aforementioned Other Government Entities on the same prices, terms, and conditions as those offered and agreed to in this Contract. If the Vendor does not wish to extend the prices, terms, and conditions of its bid and subsequent contract to the Other Government Entities, the Vendor must clearly indicate such refusal in its bid. A refusal to extend this Contract to the Other Government Entities shall not impact or influence the award of this Contract in any manner.
- 49. CONFLICT OF INTEREST:** Vendor, its officers or members or employees, shall not presently have or acquire any interest, direct or indirect, which would conflict with or compromise the performance of its obligations hereunder. Vendor shall periodically inquire of its officers, members and employees to ensure that a conflict of interest does not arise. Any conflict of interest discovered shall be promptly presented in detail to the Agency.
- 50. REPORTS:** Vendor shall provide the Agency and/or the Purchasing Division with the following reports identified by a checked box below:
- ☒ Such reports as the Agency and/or the Purchasing Division may request. Requested reports may include, but are not limited to, quantities purchased, agencies utilizing the contract, total contract expenditures by agency, etc.
 - ☐ Quarterly reports detailing the total quantity of purchases in units and dollars, along with a listing of purchases by agency. Quarterly reports should be delivered to the Purchasing Division via email at purchasing.requisitions@wv.gov.
- 51. BACKGROUND CHECK:** In accordance with W. Va. Code § 15-2D-3, the Director of the Division of Protective Services shall require any service provider whose employees are regularly employed on the grounds or in the buildings of the Capitol complex or who have access to sensitive or critical information to submit to a fingerprint-based state and federal background inquiry through the state

repository. The service provider is responsible for any costs associated with the fingerprint-based state and federal background inquiry.

After the contract for such services has been approved, but before any such employees are permitted to be on the grounds or in the buildings of the Capitol complex or have access to sensitive or critical information, the service provider shall submit a list of all persons who will be physically present and working at the Capitol complex to the Director of the Division of Protective Services for purposes of verifying compliance with this provision.

The State reserves the right to prohibit a service provider's employees from accessing sensitive or critical information or to be present at the Capitol complex based upon results addressed from a criminal background check.

Service providers should contact the West Virginia Division of Protective Services by phone at (304) 558-9911 for more information.

52. PREFERENCE FOR USE OF DOMESTIC STEEL PRODUCTS: Except when authorized by the Director of the Purchasing Division pursuant to W. Va. Code § 5A-3-56, no contractor may use or supply steel products for a State Contract Project other than those steel products made in the United States. A contractor who uses steel products in violation of this section may be subject to civil penalties pursuant to W. Va. Code § 5A-3-56. As used in this section:

- a. "State Contract Project" means any erection or construction of, or any addition to, alteration of or other improvement to any building or structure, including, but not limited to, roads or highways, or the installation of any heating or cooling or ventilating plants or other equipment, or the supply of and materials for such projects, pursuant to a contract with the State of West Virginia for which bids were solicited on or after June 6, 2001.
- b. "Steel Products" means products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated or otherwise similarly processed, or processed by a combination of two or more or such operations, from steel made by the open hearth, basic oxygen, electric furnace, Bessemer or other steel making process.

The Purchasing Division Director may, in writing, authorize the use of foreign steel products if:

- a. The cost for each contract item used does not exceed one tenth of one percent (.1%) of the total contract cost or two thousand five hundred dollars (\$2,500.00), whichever is greater. For the purposes of this section, the cost is the value of the steel product as delivered to the project; or
- b. The Director of the Purchasing Division determines that specified steel materials are not produced in the United States in sufficient quantity or otherwise are not reasonably available to meet contract requirements.

53. PREFERENCE FOR USE OF DOMESTIC ALUMINUM, GLASS, AND STEEL: In Accordance

with W. Va. Code § 5-19-1 et seq., and W. Va. CSR § 148-10-1 et seq., for every contract or subcontract, subject to the limitations contained herein, for the construction, reconstruction, alteration, repair, improvement or maintenance of public works or for the purchase of any item of machinery or equipment to be used at sites of public works, only domestic aluminum, glass or steel products shall be supplied unless the spending officer determines, in writing, after the receipt of offers or bids, (1) that the cost of domestic aluminum, glass or steel products is unreasonable or inconsistent with the public interest of the State of West Virginia, (2) that domestic aluminum, glass or steel products are not produced in sufficient quantities to meet the contract requirements, or (3) the available domestic aluminum, glass, or steel do not meet the contract specifications. This provision only applies to public works contracts awarded in an amount more than fifty thousand dollars (\$50,000) or public works contracts that require more than ten thousand pounds of steel products.

The cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than twenty percent (20%) of the bid or offered price for foreign made aluminum, glass, or steel products. If the domestic aluminum, glass or steel products to be supplied or produced in a "substantial labor surplus area", as defined by the United States Department of Labor, the cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than thirty percent (30%) of the bid or offered price for foreign made aluminum, glass, or steel products.

This preference shall be applied to an item of machinery or equipment, as indicated above, when the item is a single unit of equipment or machinery manufactured primarily of aluminum, glass or steel, is part of a public works contract and has the sole purpose or of being a permanent part of a single public works project. This provision does not apply to equipment or machinery purchased by a spending unit for use by that spending unit and not as part of a single public works project.

All bids and offers including domestic aluminum, glass or steel products that exceed bid or offer prices including foreign aluminum, glass or steel products after application of the preferences provided in this provision may be reduced to a price equal to or lower than the lowest bid or offer price for foreign aluminum, glass or steel products plus the applicable preference. If the reduced bid or offer prices are made in writing and supersede the prior bid or offer prices, all bids or offers, including the reduced bid or offer prices, will be reevaluated in accordance with this rule.

CERTIFICATION AND SIGNATURE PAGE

By signing below, I certify that I have reviewed this Solicitation in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this bid or proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.

3M Company

(Company)



(Authorized Signature)

John N. Morris Contract Administrator

(Representative Name, Title)

800-553-1380

(Phone Number)

888-246-9793

(Fax Number)

September 13, 2013

(Date)

ADDENDUM ACKNOWLEDGEMENT FORM**SOLICITATION NO.:** 8513C2012

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

<input checked="" type="checkbox"/> Addendum No. 1	<input type="checkbox"/> Addendum No. 6
<input checked="" type="checkbox"/> Addendum No. 2	<input type="checkbox"/> Addendum No. 7
<input checked="" type="checkbox"/> Addendum No. 3	<input type="checkbox"/> Addendum No. 8
<input checked="" type="checkbox"/> Addendum No. 4	<input type="checkbox"/> Addendum No. 9
<input type="checkbox"/> Addendum No. 5	<input type="checkbox"/> Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

3M Company

Company

John N. Morris

Authorized Signature

September 13, 2013

Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.

SPECIFICATIONS

1. **PURPOSE AND SCOPE:** The West Virginia Purchasing Division is soliciting bids on behalf of the West Virginia Division of Highways (WVDOH), the West Virginia Parkways Authority (WVPA), and the West Virginia Division of Corrections (WVDOC) to establish an open-end contract for Reflective Sign Sheeting & Associated Materials.
2. **DEFINITIONS:** The terms listed below shall have the meanings assigned to them below. Additional definitions can be found in Section 2 of the General Terms and Conditions.
 - 2.1 **“Contract Item” or “Contract Items”** means the list of items identified in Section 3, Subsection 1 below.
 - 2.2 **“Pricing Pages”** means the schedule of prices, estimated order quantity, and totals attached hereto as Exhibit A and used to evaluate the RFQ.
 - 2.3 **“RFQ”** means the official RFQ published by the Purchasing Division and identified as 8513C2012.
 - 2.4 **“WVDOH”** means the West Virginia Division of Highways
 - 2.5 **“WVDOC”** means the West Virginia Division of Corrections
 - 2.6 **“WVPA”** means the West Virginia Parkways Authority
 - 2.7 **“CSS”** means the WVDOH Central Sign Shop manufacturing facility.
 - 2.8 **“Transfer Tape”** means a film (also known as “Transfer Film”) for premasking or applying prespaced legends using transparent or opaque films.
 - 2.9 **“Type ASTM-I Reflective Sheeting”** means a retroreflective sheeting referred to as “engineering grade” that is typically an enclosed lens glass-bead sheeting.
 - 2.10 **“Type ASTM-IV Reflective Sheeting”** means a retroreflective sheeting referred to as “high-intensity” that is typically an unmetalized microprismatic retroreflective element material.
 - 2.11 **“Type ASTM-XI Reflective Sheeting”** means a retroreflective sheeting typically manufactured as an unmetalized cube corner microprismatic retroreflective element material.

- 2.12 **“Opaque Film”** means an opaque, typically vinyl or acrylic pressure-sensitive film designed for permanent graphics that may be prespaced and electronically cut.
- 2.13 **“Transparent Film”** means a colored, transparent, typically acrylic, transparent pressure-sensitive film designed for permanent graphics that may be prespaced and electronically cut.
- 2.14 **“Opaque Ink”** means an opaque, weather resistant, quick drying ink designed for use in traffic sign screen printing processes.
- 2.15 **“Transparent ink”** means a transparent, weather resistant, quick drying ink designed for use in traffic sign screen printing processes.
- 2.16 **“UV”** means ultraviolet.
- 2.17 **“O.D.”** means Outside Diameter.
- 2.18 **“I.D.”** means Inside Diameter
- 2.19 **“Overage”** means the total width of excess material (beyond the specified nominal width) provided on a roll of reflective sheeting material in order to insure complete coverage of the aluminum blanks the material is applied to.
- 2.20 **“Matched Components”** means the reflective sheeting manufacturer’s recommended transparent & opaque inks & films to be used for manufacturing purposes with the manufacturer’s reflective sheeting products.
- 2.21 **“Special Provision”** means the latest special provision of the WVDOH Standard Specifications for Roads and Bridges pertaining to the materials included in this Contract. This Special Provision is attached hereto as Exhibit B.

Specific material approval requirements for the materials included in this Contract, as well as compensative requirements of the material manufacturer in the event of material failure, as defined by the material durability and warranty requirements, are included in the Special Provision. Material approval requirements include, but may not be limited to, performance, durability, testing, manufacturer certification, and general material characteristic requirements. The Special Provision also specifies additional requirements required to be met by materials in order for those materials to be qualified for use in manufacturing processes within the CSS. All materials supplied under this Contract must be qualified for use in manufacturing

processes within the CSS. The specifications and Contract Award provisions herein are reflective of this requirement.

- 2.22 “APL” means the version of the WVDOH Approved Products List for Retroreflective Sign Sheeting in effect as of the advertising date of this Contract. This APL may be found at:

<http://www.transportation.wv.gov/highways/mcst/Documents/Reflective%20Sheeting%20Approved%20List-5-31-13.pdf>

The APL is established in a manner consistent with the requirements contained in the Special Provision. All materials supplied under this Contract shall be listed on the APL. Additional requirements shall apply as specified herein. Please make reference to Note #1 associated with the APL. The Special Provision referenced in Note #1 shall be applicable to this RFQ. The referenced Special Provision is the same as the Special Provision referenced in Section 2.8 and attached to this RFQ. Per the notes included under Note #1, the second table listed under Note #1 shall be used to verify materials considered to be acceptable to be provided under this Contract. The APL establishes a list of products that meet the acceptable level of quality and is not intended to reflect a preference or favor any particular brand or vendor. Any manufacturer whose product(s) meet the established level of quality may become an approved supplier and have their product(s) added to the APL in accordance with the approval procedures described in the Special Provision.

Note that, as indicated in the Special Provision, the inclusion of the manufacturer’s reflective sheeting material on the APL is not the sole requirement for that material to be eligible to be supplied under this Contract. All requirements are specified in detail in the Special Provision. The APL notes any restrictions in place in regards to the use of a particular reflective sheeting product or its’ matched components for manufacturing purposes within the CSS. Note that this Contract is divided into Sections based on material type and is further divided into Sections based on the potential use of matched components with the reflective sheetings included within the Contract Sections. Therefore, restrictions which may apply to a material in one Section may not apply in another. For example, Section III includes Type ASTM-IV materials which the Agency will use in conjunction with manufacturer matched components. Section IV includes Type ASTM-IV materials which the Agency will not use in conjunction with manufacturer matched components. If the reflective sheeting product is approved, but there are restrictions in place regarding the use of the manufacturer recommended matched components within the CSS, this would result in the reflective material being eligible to be supplied under Section IV only.

- 2.23 “WVDOH Standards” means official standards published by the WVDOH pertaining to design, fabrication, construction, and material testing/acceptance. Examples of WVDOH Standards include the “WVDOH Standard Specifications Roads and Bridges”, the WVDOH “Standard Details Book” (Volumes I, II, and III), and the WVDOH “Materials Procedures”. Specific WVDOH Standards applicable to this RFQ are identified in the RFQ.

3. GENERAL REQUIREMENTS:

- 3.1 Contract Items and Mandatory Requirements:** Vendor shall provide the indicated Agencies with the Contract Items listed below on an open-end and continuing basis. Contract Items must meet or exceed the requirements previously noted and any additional mandatory requirements noted below.

The specifications of this RFQ and/or any WVDOH Standards referenced in and/or attached to this RFQ may include references to specific recognized "industry standard" specifications which are issued by third parties, such as the American Society for Testing and Materials (ASTM) and the American Association of State and Highway Transportation Officials (AASHTO). Such specifications are protected by strict copyright restrictions and cannot be published as part of this RFQ. The ability to access such specifications shall be considered a mandatory requirement for participation in the RFQ process as a Vendor or as a supplier to the Vendor, as applicable.

- 3.1.1 Contract Bid Items:** The following Sections and described Items are listed on the Pricing Pages.

3.1.1.1 Section I : Transfer Tape

- 3.1.1.1.1** The transfer tape supplied under this Contract shall be listed on the APL.
- 3.1.1.1.2** Note that the "Overage Preferences" column on the Pricing Pages is not applicable to the materials in this Section.

3.1.1.2 Section II: Type ASTM-I Retroreflective Sheeting & Matched Components

- 3.1.1.2.1** The reflective sheeting material supplied under this Section shall be listed on the APL. The reflective sheeting material and the manufacturer recommended matched components (transparent film & ink, opaque film & ink) for use with the supplied reflective sheeting must all be approved by the WVDOH for manufacturing purposes within the CSS.
- 3.1.1.2.2** For particular nominal roll sizes of reflective sheeting listed on the Pricing Pages, a "preferred" overage is indicated in the "Overage Preferences" column. The preferred overage indicates the agencies' preferred overages only, and are not a minimum requirement; however, these materials shall be provided with overage. If nothing is indicated in the "Overage Preferences" column, then no overage is required; however, the width specified in the "Item Description" column shall be the minimum actual width of the material. Note that

the “Overage Preferences” column is not applicable to non reflective sheeting materials listed in this Section.

3.1.1.3 Section III: Type ASTM-IV Retroreflective Sheeting & Matched Components – Matched Component Dependent

3.1.1.3.1 The reflective sheeting material supplied under this Section shall be listed on the APL. The reflective sheeting material and the manufacturer recommended matched components (transparent film & ink, opaque film & ink) for use with the supplied reflective sheeting must all be approved by the WVDOH for manufacturing purposes within the CSS.

3.1.1.3.2 For particular nominal roll sizes of reflective sheeting listed on the Pricing Pages, a “preferred” overage is indicated in the “Overage Preferences” column. The preferred overage indicates the agencies’ preferred overages only, and are not a minimum requirement; however, these materials shall be provided with overage. If nothing is indicated in the “Overage Preferences” column, then no overage is required; however, the width specified in the “Item Description” column shall be the minimum actual width of the material. Note that the “Overage Preferences” column is not applicable to non reflective sheeting materials listed in this Section.

3.1.1.4 Section IV: Type ASTM-IV Retroreflective Sheeting – Matched Component Non-Dependent

3.1.1.4.1 The reflective sheeting material supplied under this Section shall be listed on the APL and shall be approved for manufacturing purposes within the CSS. No matched component approval

requirements shall apply to materials within this Section.

3.1.1.4.2 For particular nominal roll sizes of reflective sheeting listed on the Pricing Pages, a “preferred” overage is indicated in the “Overage Preferences” column. The preferred overage indicates the agencies’ preferred overages only, and are not a minimum requirement; however, these materials shall be provided with overage. If nothing is indicated in the “Overage Preferences” column, then no overage is required; however, the width specified in the “Item Description” column shall be the minimum actual width of the material.

3.1.1.5 Section V: Type ASTM-XI Retroreflective Sheeting & Matched Components – Matched Component Dependent

3.1.1.5.1 The reflective sheeting material supplied under this Section shall be listed on the APL. The reflective sheeting material and the manufacturer recommended matched components (transparent film & ink, opaque film & ink) for use with the supplied reflective sheeting must all be approved by the WVDOT for manufacturing purposes within the CSS.

3.1.1.5.2 For particular nominal roll sizes of reflective sheeting listed on the Pricing Pages, a “preferred” overage is indicated in the “Overage Preferences” column. The preferred overage indicates the agencies’ preferred overages only, and are not a minimum requirement; however, these materials shall be provided with overage. If nothing is indicated in the “Overage Preferences” column, then no overage is required; however, the width specified in the “Item Description” column shall be the minimum actual width of the material. Note that

the “Overage Preferences” column is not applicable to non reflective sheeting materials listed in this Section.

3.1.1.6 Section VI: Type ASTM-XI Retroreflective Sheeting – Matched Component Non-Dependent

3.1.1.6.1 The reflective sheeting material supplied under this Section shall be listed on the APL and shall be approved for manufacturing purposes within the CSS. No matched component approval requirements shall apply to materials within this Section.

3.1.1.6.2 For particular nominal roll sizes of reflective sheeting listed on the Pricing Pages, a “preferred” overage is indicated in the “Overage Preferences” column. The preferred overage indicates the agencies’ preferred overages only, and are not a minimum requirement; however, these materials shall be provided with overage. If nothing is indicated in the “Overage Preferences” column, then no overage is required; however, the width specified in the “Item Description” column shall be the minimum actual width of the material.

3.1.1.7 Ancillary Items: For particular Sections of this Contract, the Vendor shall be required to supply ancillary items with the sheeting materials. These ancillary items shall be supplied at no additional cost to the Agency and shall be incidental to the pricing provided by the Vendor for the bid items in the applicable Sections of the Contract. The quantity of the items provided shall be based on the square footage of sheeting material ordered, as described below.

3.1.1.7.1 Inks: This requirement shall apply to Sections III and V of this Contract. The ink provided shall be the reflective sheeting material manufacturer

recommended matched component ink with UV inhibitor. The Vendor shall be required to supply one (1) gallon of transparent ink per 1,200 square feet of reflective sheeting ordered and/or one (1) gallon of black ink per 2,500 square feet of reflective sheeting ordered. The square footage shall be calculated based on the nominal roll size (the size listed under the line item). The square footage of transparent or opaque inks and films ordered under these Sections shall not be included in the square footage used to determine the quantity of ink to be supplied. The number of gallons of ink in each color shall be indicated by the purchasing Agency on the Release Order. The quantity of ink required to be supplied shall be calculated separately for Sections III and V.

Example: If the Agency orders 8,500 square feet of material within Section III, the organization may elect to require the Vendor to supply five (5) gallons of transparent ink and one (1) gallon of black ink $[(1 \times 2,500) + (5 \times 1,200) = 8,500]$.

The Vendor shall not be required to supply partial gallons. For example, if the Agency orders 8,000 square feet of material within Section III, and the Agency requires the Vendor to supply one (1) gallon of black ink, the Vendor shall only be required to supply as much as four (4) gallons of transparent ink.

3.1.1.7.2 Nylon Washers: This requirement shall apply to Sections III through VI of this Contract. The washers provided shall measure 5/16" (I.D.) x 7/8" (O.D.) x 1/16" thick, and shall be manufactured from commercial grade nylon. The Vendor shall be required to supply one (1) package of washers per 3,500 square feet of reflective sheeting ordered. In

order to integrate with the WVDOH's inventory system, each package of washers shall include 1,000 individual washers. The square footage shall be calculated based on the nominal roll size (the size listed under the line item). The total square footage of reflective sheeting ordered under Sections III through VI shall be combined in order to determine the quantity of washers required to be supplied. The square footage of transparent or opaque inks and films ordered under Sections III and V shall not be included in the square footage used to determine the quantity of washers to be supplied. The number of washers required to be supplied shall be indicated by the purchasing Agency on the Release Order.

Example: If 17,500 total square feet of reflective sheeting material is ordered from the indicated Sections, the Vendor shall be required to supply 5,000 washers (five packages) ($5 \times 3,500 = 17,500$).

The Vendor shall not be required to supply partial packages. For example, if 18,500 total square feet of reflective sheeting is ordered, then the Vendor shall only be required to supply five (5) packages (5,000 washers).

3.1.1.8 Slip Sheeting: This requirement shall apply to Sections III through VI of this Contract. With the exception of 12-3/4" reflective sheeting, the Vendor shall supply slip sheeting equal in width to each different width (nominal) reflective sheeting material ordered under these Sections. The total length of each width supplied shall be at least equal to the total length of each width of reflective sheeting ordered under these Sections. All slip sheeting shall be supplied in roll form. The Vendor shall not be required to supply slip sheeting for 12-3/4" wide sheeting material. The slip sheeting shall be compatible with the sheeting manufacturer's reflective sheeting material and matched

components. The minimum total length of each width of slip sheeting required to be supplied shall be indicated by the purchasing Agency on the Release Order.

4. CONTRACT AWARD:

- 4.1 Contract Award:** The Contract is intended to provide Agencies with a purchase price on all Contract Items. Contract Sections shall be awarded to the Vendor that provides the Contract Items meeting the required specifications for the lowest overall total cost within each Section, as shown on the Pricing Pages. Each Section shall be evaluated independently and award shall be made to multiple Vendors if needed.
- 4.2 Matched Component Film Line Items:** Sections II, III, and V of this Contract include line items for transparent and opaque films, rather than there being a separately defined Section for films. This is necessary to insure that the manufacturer recommended films are available on the Contract in the event that the Contract is split among two or more Vendors, or if the manufacturer recommended films for the reflective sheeting to be supplied under one Section differs from those for the reflective material to be supplied under another Section. It is understood that the manufacturer recommended films for use with the reflective sheeting materials included within one or more Sections may be identical. The Vendor shall provide unit pricing within each Section regardless of this. If the same Vendor is awarded two or more Sections in which the manufacturer recommended films are identical, only the film related line items associated with one of the Sections will be awarded. If an identical Series film is bid in multiple Sections awarded to a Vendor, but the pricing of the film differs for one or more rolls of the same width and length, the line item(s) with the lower price(s) shall be the one(s) awarded.
- 4.3 Pricing Pages:** The Vendor shall complete the Pricing Pages by providing a unit price for each item listed. In order for the Vendor's bid in a particular Section to be considered for award, the Vendor must indicate a unit price for each item listed. Failure to do so will result in Vendor's bid for that Section being disqualified.

The Vendor should also specify the material to be supplied (manufacturer product code) in the location provided for each line item. This Contract shall not be awarded to any Vendor prior to receipt of this information from the Vendor.

The Vendor should also enter a calculated value [estimated quantity x unit price (except as noted below for 50 yard length 12-3/4" roll widths)] in the "Extended Total Amount" column.

The Pricing Pages contain a list of the Contract Items and estimated purchase volume. The estimated purchase volume for each item represents the approximate volume of anticipated purchases only. No future use of the Contract or any individual item is guaranteed or implied. Note, in Section I & Sections III through VI, not all line items include a value in the estimated quantity column. For line items that do not include an estimated quantity, the Vendor shall enter a unit price but should not enter a value in the "Extended Total Amount" column. The "Extended Total Amount" column is greyed out for these line items out for this reason. Although the Vendor is required to provide a unit bid price for line items which do not include an estimated quantity, only the "Extended Total Amount" values associated with line items which do include an estimated quantity shall be totaled in order to determine the Vendor's total bid price for each Section.

Note that Sections IV and VI include 12-3/4" x 100 yard roll sizes in various colors. The preference of the Agencies is to procure these materials in 100 yard lengths. However, it is understood that some manufacturers only manufacture particular 12-3/4" wide sheeting material grade / color combinations in 50 yard lengths. If this is the case, the Vendor shall indicate this for each applicable line item in the location provided. Otherwise, if the Vendor is awarded that Section of the Contract, they shall be required to provide 100 yards of material for each unit ordered under those line items. If the Vendor indicates that the material is to be supplied in 50 yard length rolls and an estimated quantity is provided, the value entered in the "Extended Total Amount" column should be equal to double the value calculated by multiplying the unit price by the estimated quantity (2 x estimated quantity x unit price). This is to insure that the value entered in the "Extended Total Amount" column is based on the same overall quantity of material as the Vendor's who provide a unit price based on 100 yd. length rolls.

Notwithstanding the foregoing, the Purchasing Division may correct errors at its discretion. If there is a discrepancy between the correct calculated "Extended Total Amount" [estimated quantity x unit price (except as noted above for 50 yard length 12-3/4" roll widths)] and the value entered in the "Extended Total Amount" column by the Vendor, the correct calculated "Extended Total Amount" shall take precedence in total bid amount calculations. The specified unit prices shall not be modified for any reason. The Vendor should type or electronically enter the information into the Pricing Pages to prevent errors in the evaluation. The Pricing Pages were

REQUEST FOR QUOTATION
8513C2012 – Reflective Sign Sheeting & Associated Materials

31

created as a Microsoft Excel document and Vendor can request an electronic copy for bid purposes by sending an email request to the following address: Alan.W.Cummings@wv.gov.

5. ORDERING AND PAYMENT:

- 5.1 Ordering:** Vendor shall accept orders by regular mail, facsimile, e-mail, or any other written forms of communication. Vendor may, but is not required to, accept on-line orders through a secure internet ordering portal/website. If Vendor has the ability to accept on-line orders, it should include in its response a brief description of how Agencies may utilize the on-line ordering system. Any on-line ordering system must have the capability to restrict prices and available items to conform to the items included in this RFQ and the prices provided by the Vendor in response to this RFQ. Vendor shall ensure that its on-line ordering system is properly secured prior to processing Agency orders on-line.
- 5.2 Payment:** Vendor shall accept payment in accordance with the payment procedures of the State of West Virginia.
- 5.3 Minimum Order Size:** There shall be no minimum order size associated with this Contract.

6. DELIVERY AND RETURN:

- 6.1 Delivery Time:** Vendor shall deliver standard orders within twenty-five (25) Working Days after orders are received. Vendor shall ship all orders in accordance with the above schedule and shall not hold orders until a minimum delivery quantity is met.
- 6.2 Late Delivery:** The Agency placing the order under this Contract must be notified in writing if orders will be delayed for any reason. Any delay in delivery that could cause harm to an Agency will be grounds for cancellation of the delayed order, and/or obtaining the items ordered from a third party.

Any Agency seeking to obtain items from a third party under this provision must first obtain approval of the Purchasing Division.

Regardless of whether or not the vendor provides written notification of an order delay, if the Vendor is unable to deliver in full within twenty-five (25) Working Days after receipt of the order, the Vendor shall be subject to a daily (per Calendar Day) penalty at the purchasing Agency's discretion for each Calendar Day beyond the delivery deadline date until the order is received in full. This penalty shall be

assessed by subtracting the penalty from the original total value of the Release Order. The penalty shall not exceed the original total amount of the Release Order. The penalty shall be calculated based on the Table shown at the following address:

<http://www.transportation.wv.gov/highways/contractadmin/specifications/Pages/LiquidDatedDamages.aspx>

A hard copy of this Table is attached to this RFQ as Exhibit C.

The original total amount of the Release Order shall be substituted for the "Original Contract Amount" when using this Table.

- 6.3 **Delivery Payment/Risk of Loss:** Standard order delivery shall be F.O.B. destination to the Agency's specified location. Vendor shall include the cost of standard order delivery charges in its bid pricing/discount and is not permitted to charge the Agency separately for such delivery.
- 6.4 **Packaging & Material Condition:** Upon delivery, all materials shall be of good appearance free from ragged edges, cracks, and extraneous materials, and shall be supplied in roll form. The materials shall be evenly wound on a core of sufficient rigidity to prevent distortion of the roll. For sheeting materials, the maximum number of splices shall be four (4) per 50-yd roll. Each splice shall be visible at the edge of the roll. Rolls shall be packaged snugly in corrugated fiberboard boxes such that no damage or defacement may occur during shipment or storage.
- 6.5 **Return of Unacceptable Items:** If the Agency deems the Contract Items to be unacceptable, the Contract Items shall be returned to Vendor at Vendor's expense and with no restocking charge. Vendor shall make arrangements for pickup of the items to be returned within five (5) days of being notified that items are unacceptable. If the original packaging cannot be utilized for the return, Vendor will supply the Agency with appropriate return packaging upon request. All returns of unacceptable items shall be F.O.B. the Agency's location. The returned product shall either be replaced, or the Agency shall receive a full credit or refund for the purchase price, at the Agency's discretion. If the Agency elects to have the returned items replaced, the provisions of Sections 6.1 and 6.2 shall remain in effect until the order is completed in full with material accepted by the Agency.
- 6.6 **Return Due to Agency Error:** Items ordered in error by the Agency will be returned for credit within 30 days of receipt, F.O.B. Vendor's location. Vendor shall not charge a restocking fee if returned products are in a resalable condition. Items shall be deemed to be in a resalable condition if they are unused and in the original packaging. Any restocking fee for items not in a resalable condition shall be the lower of the Vendor's customary restocking fee or 5% of the total invoiced value of the returned items.

REQUEST FOR QUOTATION
8513C2012 – Reflective Sign Sheeting & Associated Materials

33

7. MISCELLANEOUS:

- 7.1 No Substitutions:** Vendor shall supply only Contract Items submitted in response to the RFQ. Vendor shall not supply substitute items without Purchasing Division approval.
- 7.2 Vendor Supply:** Vendor must carry sufficient inventory of the Contract Items being offered to fulfill its obligations under this Contract. By signing its bid, Vendor certifies that it can supply the Contract Items contained in its bid response.
- 7.3 Reports:** Vendor shall provide quarterly reports and annual summaries to the Agency showing the Agency's items purchased, quantities of items purchased, and total dollar value of the items purchased. Vendor shall also provide reports, upon request, showing the items purchased during the term of this Contract, the quantity purchased for each of those items, and the total value of purchases for each of those items. Failure to supply such reports may be grounds for cancellation of this Contract.
- 7.4 Technical Assistance:** If awarded any Section of this Contract, the successful Vendor shall upon request provide technical assistance for the service of application equipment and instruction and training of Agency personnel in the proper application of the materials supplied. This may include, but shall not be limited to, calibration and trouble shooting of application equipment, training films, material application, screen printing, packaging, storage, and the proper use & handling of inks.
- 7.5 Certification Submittal:** Certifications shall be required for all sheeting material supplied as part of this Contract. Certifications are to be received within ten (10) Calendar Days after receipt of the material.
- 7.6 Contract Manager:** During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract manager and his or her contact information below.

Contract Manager: John N. Morris
Telephone Number: 800-553-1380 Option 2
Fax Number: 888-246-9793
Email Address: tbidgroup@mmm.com

EXHIBIT A - PRICING PAGES

Quantities listed in this RFQ are approximations only. It is understood and agreed that the contract shall cover the quantities actually ordered for delivery during the term of the contract, whether more or less than the quantities shown. Award will be based on lowest total cost.

SECTION I: Transfer Films								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
1	-	Transfer Tape, Low Tack, 2 inch x 100 yds.	NA	3M# TPM-5	NA	\$12.50		-
2	-	Transfer Tape, Low Tack, 3 inch x 100 yds.	NA	3M# TPM-5	NA	\$18.75		-
3	-	Transfer Tape, Low Tack, 12 inch x 100 yds.	NA	3M# TPM-5	NA	\$75.00		-
4	-	Transfer Tape, Low Tack, 15 inch x 100 yds.	NA	3M# TPM-5	NA	\$93.75		-
5	6	Transfer Tape, Low Tack, 18 inch x 100 yds.	NA	3M# TPM-5	NA	\$112.50	\$675.00	-
6	5	Transfer Tape, Low Tack, 24 inch x 100 yds.	NA	3M# TPM-5	NA	\$150.00	\$750.00	-
7	19	Transfer Tape, Low Tack, 30 inch x 100 yds.	NA	3M# TPM-5	NA	\$187.50	\$3,562.50	-
8	6	Transfer Tape, Low Tack, 36 inch x 100 yds.	NA	3M# TPM-5	NA	\$225.00	\$1,350.00	-
9	-	Transfer Tape, Low Tack, 42 inch x 100 yds.	NA	3M# TPM-5	NA	\$262.50		-
10	7	Transfer Tape, Low Tack, 48 inch x 100 yds.	NA	3M# TPM-5	NA	\$300.00	\$2,100.00	-

SECTION II: Type ASTM-I Retroreflective Sheeting & Matched Components								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
11	1	Type ASTM-I Sheeting, 15 inch x 50 yds., White	1/16" min. overage preferred	3M# 3430	NA	\$ 121.87	\$ 121.87	111015
12	1	Type ASTM-I Sheeting, 15 inch x 50 yds., Yellow	1/16" min. overage preferred	3M# 3431	NA	\$ 121.87	\$ 121.87	112015
13	1	Type ASTM-I Sheeting, 18-1/2 inch x 50 yds., White	-	3M# 3430	NA	\$ 150.31	\$ 150.31	-
14	1	Type ASTM-I Sheeting, 18-1/2 inch x 50 yds., Yellow	-	3M# 3431	NA	\$ 150.31	\$ 150.31	112018
15	1	Type ASTM-I Sheeting, 21 inch x 50 yds., White	1/16" min. overage preferred	3M# 3430	NA	\$ 170.63	\$ 170.63	111021
16	1	Type ASTM-I Sheeting, 21 inch x 50 yds., Yellow	1/16" min. overage preferred	3M# 3431	NA	\$ 170.63	\$ 170.63	-
17	1	Type ASTM-I Sheeting, 24-1/2 inch x 50 yds., White	-	3M# 3430	NA	\$ 199.06	\$ 199.06	111024
18	1	Type ASTM-I Sheeting, 24-1/2 inch x 50 yds., Yellow	-	3M# 3431	NA	\$ 199.06	\$ 199.06	112024
19	1	Type ASTM-I Sheeting, 30-1/2 inch x 50 yds., White	-	3M# 3430	NA	\$ 247.81	\$ 247.81	111030
20	1	Type ASTM-I Sheeting, 30-1/2 inch x 50 yds., Yellow	-	3M# 3431	NA	\$ 247.81	\$ 247.81	112030
21	1	Type ASTM-I Sheeting, 36 inch x 50 yds., White	5/16" min. overage preferred	3M# 3430	NA	\$ 292.50	\$ 292.50	111036
22	1	Type ASTM-I Sheeting, 36 inch x 50 yds., Yellow	5/16" min. overage preferred	3M# 3431	NA	\$ 292.50	\$ 292.50	112036
23	1	Type ASTM-I Sheeting, 42 inch x 50 yds., White	5/16" min. overage preferred	3M# 3430	NA	\$ 341.25	\$ 341.25	-
24	1	Type ASTM-I Sheeting, 42 inch x 50 yds., Yellow	5/16" min. overage preferred	3M# 3431	NA	\$ 341.25	\$ 341.25	-
25	1	Type ASTM-I Sheeting, 48 inch x 50 yds., White	7/16" min. overage preferred	3M# 3430	NA	\$ 390.00	\$ 390.00	111048
26	1	Type ASTM-I Sheeting, 48 inch x 50 yds., Yellow	7/16" min. overage preferred	3M# 3431	NA	\$ 390.00	\$ 390.00	112048
27	1	Type ASTM-I Sheeting, 1/2 inch x 50 yds., White	-	3M# 3430	NA	\$ 4.06	\$ 4.06	111050
28	1	Type ASTM-I Sheeting, 1/2 inch x 50 yds., Yellow	-	3M# 3431	NA	\$ 4.06	\$ 4.06	112050

SECTION II: Type ASTM-I Retroreflective Sheeting & Matched Components (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
29	1	Type ASTM-I Sheeting, 1 inch x 50 yds., White	-	3M# 3430	NA	\$ 8.13	\$ 8.13	111100
30	1	Type ASTM-I Sheeting, 1 inch x 50 yds., Yellow	-	3M# 3431	NA	\$ 8.13	\$ 8.13	112100
31	1	Type ASTM-I Sheeting, 15 inch x 50 yds., Blue	1/16" min. overage preferred	3M# 3435	NA	\$ 121.87	\$ 121.87	115015
32	1	Type ASTM-I Sheeting, 18-1/2 inch x 50 yds., Blue	-	3M# 3435	NA	\$ 150.31	\$ 150.31	-
33	1	Type ASTM-I Sheeting, 21 inch x 50 yds., Blue	1/16" min. overage preferred	3M# 3435	NA	\$ 170.63	\$ 170.63	-
34	1	Type ASTM-I Sheeting, 24-1/2 inch x 50 yds., Blue	-	3M# 3435	NA	\$ 199.06	\$ 199.06	115024
35	1	Type ASTM-I Sheeting, 30-1/2 inch x 50 yds., Blue	-	3M# 3435	NA	\$ 247.81	\$ 247.81	115030
36	1	Type ASTM-I Sheeting, 36 inch x 50 yds., Blue	3/16" min. overage preferred	3M# 3435	NA	\$ 292.50	\$ 292.50	115036
37	1	Type ASTM-I Sheeting, 42 inch x 50 yds., Blue	5/16" min. overage preferred	3M# 3435	NA	\$ 341.25	\$ 341.25	-
38	1	Type ASTM-I Sheeting, 48 inch x 50 yds., Blue	7/16" min. overage preferred	3M# 3435	NA	\$ 390.00	\$ 390.00	115048
39	1	Transparent film, Acrylic, 12 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 109.50	\$ 109.50	-
40	1	Transparent film, Acrylic, 12 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 109.50	\$ 109.50	-
41	1	Transparent film, Acrylic, 12 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 109.50	\$ 109.50	-
42	1	Transparent film, Acrylic, 12 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 109.50	\$ 109.50	-
43	1	Transparent film, Acrylic, 12 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 109.50	\$ 109.50	-
44	1	Transparent film, Acrylic, 15 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 136.88	\$ 136.88	-
45	1	Transparent film, Acrylic, 15 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 136.88	\$ 136.88	-
46	1	Transparent film, Acrylic, 15 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 136.88	\$ 136.88	-

SECTION II: Type ASTM-I Retroreflective Sheeting & Matched Components (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
47	1	Transparent film, Acrylic, 15 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 136.88	\$ 136.88	-
48	1	Transparent film, Acrylic, 15 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 136.88	\$ 136.88	-
49	1	Transparent film, Acrylic, 18 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 164.25	\$ 164.25	-
50	1	Transparent film, Acrylic, 18 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 164.25	\$ 164.25	-
51	1	Transparent film, Acrylic, 18 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 164.25	\$ 164.25	-
52	1	Transparent film, Acrylic, 18 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 164.25	\$ 164.25	904018
53	1	Transparent film, Acrylic, 18 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 164.25	\$ 164.25	906018
54	1	Transparent film, Acrylic, 24 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 219.00	\$ 219.00	902024
55	1	Transparent film, Acrylic, 24 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 219.00	\$ 219.00	907024
56	1	Transparent film, Acrylic, 24 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 219.00	\$ 219.00	905024
57	1	Transparent film, Acrylic, 24 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 219.00	\$ 219.00	904024
58	1	Transparent film, Acrylic, 24 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 219.00	\$ 219.00	906024
59	1	Transparent film, Acrylic, 30 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 273.75	\$ 273.75	-
60	1	Transparent film, Acrylic, 30 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 273.75	\$ 273.75	907030
61	1	Transparent film, Acrylic, 30 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 273.75	\$ 273.75	905030
62	1	Transparent film, Acrylic, 30 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 273.75	\$ 273.75	904030
63	1	Transparent film, Acrylic, 30 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 273.75	\$ 273.75	906030
64	1	Transparent film, Acrylic, 36 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 328.50	\$ 328.50	902036

SECTION II: Type ASTM-I Retroreflective Sheeting & Matched Components (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
65	1	Transparent film, Acrylic, 36 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 328.50	\$ 328.50	-
66	1	Transparent film, Acrylic, 36 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 328.50	\$ 328.50	905036
67	1	Transparent film, Acrylic, 36 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 328.50	\$ 328.50	904036
68	1	Transparent film, Acrylic, 36 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 328.50	\$ 328.50	906036
69	1	Transparent film, Acrylic, 42 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 383.25	\$ 383.25	-
70	1	Transparent film, Acrylic, 42 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 383.25	\$ 383.25	-
71	1	Transparent film, Acrylic, 42 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 383.25	\$ 383.25	-
72	1	Transparent film, Acrylic, 42 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 383.25	\$ 383.25	904042
73	1	Transparent film, Acrylic, 42 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 383.25	\$ 383.25	-
74	1	Transparent film, Acrylic, 48 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 438.00	\$ 438.00	-
75	1	Transparent film, Acrylic, 48 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 438.00	\$ 438.00	-
76	1	Transparent film, Acrylic, 48 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 438.00	\$ 438.00	905048
77	1	Transparent film, Acrylic, 48 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 438.00	\$ 438.00	904048
78	1	Transparent film, Acrylic, 48 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 438.00	\$ 438.00	906048
79	1	Opaque film, Vinyl, 3/8 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 2.25	\$ 2.25	518038
80	1	Opaque film, Vinyl, 5/8 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 3.38	\$ 3.38	518062
81	1	Opaque film, Vinyl, 3/4 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 4.50	\$ 4.50	518075
82	1	Opaque film, Vinyl, 7/8 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 5.25	\$ 5.25	518088

SECTION II: Type ASTM-I Retroreflective Sheeting & Matched Components (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
83	1	Opaque film, Vinyl, 1-1/4 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 7.50	\$ 7.50	518125
84	1	Opaque film, Vinyl, 18 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 108.00	\$ 108.00	-
85	1	Opaque film, Vinyl, 18 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 108.00	\$ 108.00	-
86	1	Opaque film, Vinyl, 18 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 108.00	\$ 108.00	-
87	1	Opaque film, Vinyl, 18 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 108.00	\$ 108.00	-
88	1	Opaque film, Vinyl, 24 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 144.00	\$ 144.00	-
89	1	Opaque film, Vinyl, 24 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 144.00	\$ 144.00	518024
90	1	Opaque film, Vinyl, 24 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 144.00	\$ 144.00	-
91	1	Opaque film, Vinyl, 24 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 144.00	\$ 144.00	-
92	1	Opaque film, Vinyl, 30 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 180.00	\$ 180.00	-
93	1	Opaque film, Vinyl, 30 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 180.00	\$ 180.00	518030
94	1	Opaque film, Vinyl, 30 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 180.00	\$ 180.00	512030
95	1	Opaque film, Vinyl, 30 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 180.00	\$ 180.00	-
96	1	Opaque film, Vinyl, 36 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 216.00	\$ 216.00	-
97	1	Opaque film, Vinyl, 36 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 216.00	\$ 216.00	518036
98	1	Opaque film, Vinyl, 36 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 216.00	\$ 216.00	512036
99	1	Opaque film, Vinyl, 36 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 216.00	\$ 216.00	-
100	1	Opaque film, Vinyl, 48 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 288.00	\$ 288.00	-

SECTION II: Type ASTM-I Retroreflective Sheeting & Matched Components (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
101	1	Opaque film, Vinyl, 48 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 288.00	\$ 288.00	518048
102	1	Opaque film, Vinyl, 48 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 288.00	\$ 288.00	-
103	1	Opaque film, Vinyl, 48 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 288.00	\$ 288.00	-
104	1	Opaque film, Vinyl, 60 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 360.00	\$ 360.00	-
105	1	Opaque film, Vinyl, 60 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 360.00	\$ 360.00	-
106	1	Opaque film, Vinyl, 60 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 360.00	\$ 360.00	-
107	1	Opaque film, Vinyl, 60 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 360.00	\$ 360.00	-

SECTION III: Type ASTM-IV Retroreflective Sheeting & Matched Components – Matched Component Dependent								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
108	-	Type ASTM-IV Sheeting, 15 inch x 50 yds., White	1/16" min. overage preferred	3M# 3930	NA	\$ 181.88		211015
109	-	Type ASTM-IV Sheeting, 15 inch x 50 yds., Yellow	1/16" min. overage preferred	3M# 3931	NA	\$ 181.88		-
110	9	Type ASTM-IV Sheeting, 18-1/2 inch x 50 yds., White	-	3M# 3930	NA	\$ 224.31	\$ 2,018.79	211018
111	5	Type ASTM-IV Sheeting, 18-1/2 inch x 50 yds., Yellow	-	3M# 3931	NA	\$ 224.31	\$ 1,121.55	212018
112	5	Type ASTM-IV Sheeting, 21 inch x 50 yds., White	1/16" min. overage preferred	3M# 3930	NA	\$ 254.63	\$ 1,273.15	211021
113	-	Type ASTM-IV Sheeting, 21 inch x 50 yds., Yellow	1/16" min. overage preferred	3M# 3931	NA	\$ 254.63		-
114	28	Type ASTM-IV Sheeting, 24-1/2 inch x 50 yds., White	-	3M# 3930	NA	\$ 297.06	\$ 8,317.68	211024
115	20	Type ASTM-IV Sheeting, 24-1/2 inch x 50 yds., Yellow	-	3M# 3931	NA	\$ 297.06	\$ 5,941.20	212024
116	76	Type ASTM-IV Sheeting, 30-1/2 inch x 50 yds., White	-	3M# 3930	NA	\$ 369.81	\$28,105.56	211030
117	54	Type ASTM-IV Sheeting, 30-1/2 inch x 50 yds., Yellow	-	3M# 3931	NA	\$ 369.81	\$19,969.74	212030
118	21	Type ASTM-IV Sheeting, 36 inch x 50 yds., White	3/16" min. overage preferred	3M# 3930	NA	\$ 436.50	\$ 9,166.50	211036
119	16	Type ASTM-IV Sheeting, 36 inch x 50 yds., Yellow	3/16" min. overage preferred	3M# 3931	NA	\$ 436.50	\$ 6,984.00	212036
120	16	Type ASTM-IV Sheeting, 42 inch x 50 yds., White	5/16" min. overage preferred	3M# 3930	NA	\$ 509.25	\$ 8,148.00	211042
121	-	Type ASTM-IV Sheeting, 42 inch x 50 yds., Yellow	5/16" min. overage preferred	3M# 3931	NA	\$ 509.25		212042
122	22	Type ASTM-IV Sheeting, 48 inch x 50 yds., White	7/16" min. overage preferred	3M# 3930	NA	\$ 582.00	\$12,804.00	211048
123	10	Type ASTM-IV Sheeting, 48 inch x 50 yds., Yellow	7/16" min. overage preferred	3M# 3931	NA	\$ 582.00	\$ 5,820.00	212048
124	-	Transparent film, Acrylic, 12 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 109.50		-
125	-	Transparent film, Acrylic, 12 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 109.50		-

SECTION III: Type ASTM-IV Retroreflective Sheeting & Matched Components – Matched Component Dependent (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
126	-	Transparent film, Acrylic, 12 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 109.50		-
127	-	Transparent film, Acrylic, 12 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 109.50		-
128	-	Transparent film, Acrylic, 12 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 109.50		-
129	-	Transparent film, Acrylic, 15 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 136.88		-
130	-	Transparent film, Acrylic, 15 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 136.88		-
131	-	Transparent film, Acrylic, 15 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 136.88		-
132	-	Transparent film, Acrylic, 15 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 136.88		-
133	-	Transparent film, Acrylic, 15 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 136.88		-
134	-	Transparent film, Acrylic, 18 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 164.25		-
135	-	Transparent film, Acrylic, 18 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 164.25		-
136	-	Transparent film, Acrylic, 18 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 164.25		-
137	8	Transparent film, Acrylic, 18 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 164.25	\$ 1,314.00	904018
138	-	Transparent film, Acrylic, 18 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 164.25		906018
139	-	Transparent film, Acrylic, 24 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 219.00		902024
140	-	Transparent film, Acrylic, 24 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 219.00		907024
141	-	Transparent film, Acrylic, 24 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 219.00		905024
142	7	Transparent film, Acrylic, 24 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 219.00	\$ 1,533.00	904024
143	1	Transparent film, Acrylic, 24 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 219.00	\$ 219.00	906024

SECTION III: Type ASTM-IV Retroreflective Sheeting & Matched Components – Matched Component Dependent (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
144	-	Transparent film, Acrylic, 30 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 273.75		-
145	-	Transparent film, Acrylic, 30 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 273.75		907030
146	2	Transparent film, Acrylic, 30 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 273.75	\$ 547.50	905030
147	34	Transparent film, Acrylic, 30 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 273.75	\$ 9,307.50	904030
148	-	Transparent film, Acrylic, 30 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 273.75		906030
149	-	Transparent film, Acrylic, 36 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 328.50		902036
150	-	Transparent film, Acrylic, 36 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 328.50		-
151	2	Transparent film, Acrylic, 36 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 328.50	\$ 657.00	905036
152	7	Transparent film, Acrylic, 36 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 328.50	\$ 2,299.50	904036
153	1	Transparent film, Acrylic, 36 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 328.50	\$ 328.50	906036
154	-	Transparent film, Acrylic, 42 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 383.25		-
155	-	Transparent film, Acrylic, 42 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 383.25		-
156	-	Transparent film, Acrylic, 42 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 383.25		-
157	1	Transparent film, Acrylic, 42 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 383.25	\$ 383.25	904042
158	-	Transparent film, Acrylic, 42 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 383.25		-
159	-	Transparent film, Acrylic, 48 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 438.00		-
160	-	Transparent film, Acrylic, 48 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 438.00		-
161	4	Transparent film, Acrylic, 48 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 438.00	\$ 1,752.00	905048

SECTION III: Type ASTM-IV Retroreflective Sheeting & Matched Components – Matched Component Dependent (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
162	2	Transparent film, Acrylic, 48 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 438.00	\$ 876.00	904048
163	-	Transparent film, Acrylic, 48 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 438.00		906048
164	1	Opaque film, Vinyl, 3/8 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 2.25	\$ 2.25	518038
165	-	Opaque film, Vinyl, 5/8 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 3.75		518062
166	-	Opaque film, Vinyl, 3/4 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 4.50		518075
167	-	Opaque film, Vinyl, 7/8 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 5.25		518088
168	1	Opaque film, Vinyl, 1-1/4 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 7.50	\$ 7.50	518125
169	-	Opaque film, Vinyl, 18 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 108.00		-
170	-	Opaque film, Vinyl, 18 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 108.00		-
171	-	Opaque film, Vinyl, 18 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 108.00		-
172	-	Opaque film, Vinyl, 18 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 108.00		-
173	-	Opaque film, Vinyl, 24 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 144.00		-
174	4	Opaque film, Vinyl, 24 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 144.00	\$ 576.00	518024
175	-	Opaque film, Vinyl, 24 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 144.00		-
176	-	Opaque film, Vinyl, 24 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 144.00		-
177	-	Opaque film, Vinyl, 30 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 180.00		-
178	2	Opaque film, Vinyl, 30 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 180.00	\$ 360.00	518030
179	-	Opaque film, Vinyl, 30 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 180.00		512030

SECTION III: Type ASTM-IV Retroreflective Sheeting & Matched Components – Matched Component Dependent (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
180	-	Opaque film, Vinyl, 30 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 180.00		-
181	-	Opaque film, Vinyl, 36 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 216.00		-
182	2	Opaque film, Vinyl, 36 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 216.00	\$ 432.00	518036
183	-	Opaque film, Vinyl, 36 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 216.00		512036
184	-	Opaque film, Vinyl, 36 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 216.00		-
185	-	Opaque film, Vinyl, 48 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 288.00		-
186	2	Opaque film, Vinyl, 48 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 288.00	\$ 576.00	518048
187	-	Opaque film, Vinyl, 48 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 288.00		-
188	-	Opaque film, Vinyl, 48 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 288.00		-
189	-	Opaque film, Vinyl, 60 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 360.00		-
190	-	Opaque film, Vinyl, 60 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 360.00		-
191	-	Opaque film, Vinyl, 60 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 360.00		-
192	-	Opaque film, Vinyl, 60 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 360.00		-

SECTION IV: Type ASTM-IV Retroreflective Sheeting – Matched Component Non-Dependent								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
193	-	Type ASTM-IV Sheeting, 1/2 inch x 50 yds., White	-	3M# 3930	NA	\$ 6.06		211050
194	-	Type ASTM-IV Sheeting, 1/2 inch x 50 yds., Yellow	-	3M# 3931	NA	\$ 6.06		-
195	-	Type ASTM-IV Sheeting, 1 inch x 50 yds., White	-	3M# 3930	NA	\$ 12.13		211100
196	-	Type ASTM-IV Sheeting, 1 inch x 50 yds., Yellow	-	3M# 3931	NA	\$ 12.13		-
197	4	Type ASTM-IV Sheeting, 12-3/4 inch x 100 yds., White	-	3M# 3930	☐	\$ 309.19	\$ 1,236.76	211012
198	-	Type ASTM-IV Sheeting, 12-3/4 inch x 100 yds., Yellow	-	3M# 3931	☐	\$ 309.19		212012
199	20	Type ASTM-IV Sheeting, 12-3/4 inch x 100 yds., Blue	-	3M# 3935	☐	\$ 309.19	\$ 6,183.80	215012
200	27	Type ASTM-IV Sheeting, 12-3/4 inch x 100 yds., Green	-	3M# 3937	☐	\$ 309.19	\$ 8,348.13	214012
201	3	Type ASTM-IV Sheeting, 12-3/4 inch x 100 yds., Brown	-	3M# 3939	☐	\$ 309.19	\$ 927.57	2016012
202	-	Type ASTM-IV Sheeting, 15 inch x 50 yds., Blue	1/16" min. overage preferred	3M# 3935	NA	\$ 181.88		215015
203	-	Type ASTM-IV Sheeting, 15 inch x 50 yds., Green	1/16" min. overage preferred	3M# 3937	NA	\$ 181.88		-
204	-	Type ASTM-IV Sheeting, 15 inch x 50 yds., Brown	1/16" min. overage preferred	3M# 3939	NA	\$ 181.88		-
205	-	Type ASTM-IV Sheeting, 18-1/2 inch x 50 yds., Blue	-	3M# 3935	NA	\$ 224.31		-
206	-	Type ASTM-IV Sheeting, 18-1/2 inch x 50 yds., Green	-	3M# 3937	NA	\$ 224.31		-
207	-	Type ASTM-IV Sheeting, 18-1/2 inch x 50 yds., Brown	-	3M# 3939	NA	\$ 224.31		-
208	-	Type ASTM-IV Sheeting, 21 inch x 50 yds., Blue	1/16" min. overage preferred	3M# 3935	NA	\$ 254.63		-
209	-	Type ASTM-IV Sheeting, 21 inch x 50 yds., Green	1/16" min. overage preferred	3M# 3937	NA	\$ 254.63		-
210	-	Type ASTM-IV Sheeting, 21 inch x 50 yds., Brown	1/16" min. overage preferred	3M# 3939	NA	\$ 254.63		-

SECTION IV: Type ASTM-IV Retroreflective Sheeting -- Matched Component Non-Dependent (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
211	-	Type ASTM-IV Sheeting, 24-1/2 inch x 50 yds., Blue	-	3M# 3935	NA	\$ 297.06		-
212	-	Type ASTM-IV Sheeting, 24-1/2 Inch x 50 yds., Green	-	3M# 3937	NA	\$ 297.06		-
213	-	Type ASTM-IV Sheeting, 24-1/2 inch x 50 yds., Brown	-	3M# 3939	NA	\$ 297.06		216024
214	-	Type ASTM-IV Sheeting, 30-1/2 inch x 50 yds., Blue	-	3M# 3935	NA	\$ 369.81		215030
215	-	Type ASTM-IV Sheeting, 30-1/2 inch x 50 yds., Green	-	3M# 3937	NA	\$ 369.81		214030
216	-	Type ASTM-IV Sheeting, 30-1/2 inch x 50 yds., Brown	-	3M# 3939	NA	\$ 369.81		216030
217	-	Type ASTM-IV Sheeting, 36 inch x 50 yds., Blue	3/16" min. overage preferred	3M# 3935	NA	\$ 436.50		215036
218	-	Type ASTM-IV Sheeting, 36 inch x 50 yds., Green	3/16" min. overage preferred	3M# 3937	NA	\$ 436.50		214036
219	-	Type ASTM-IV Sheeting, 36 inch x 50 yds., Brown	3/16" min. overage preferred	3M# 3939	NA	\$ 436.50		-
220	-	Type ASTM-IV Sheeting, 42 inch x 50 yds., Blue	5/16" min. overage preferred	3M# 3935	NA	\$ 509.25		215042
221	-	Type ASTM-IV Sheeting, 42 inch x 50 yds., Green	5/16" min. overage preferred	3M# 3937	NA	\$ 509.25		214042
222	-	Type ASTM-IV Sheeting, 42 inch x 50 yds., Brown	5/16" min. overage preferred	3M# 3939	NA	\$ 509.25		-
223	-	Type ASTM-IV Sheeting, 48 inch x 50 yds., Blue	7/16" min. overage preferred	3M# 3935	NA	\$ 582.00		215048
224	-	Type ASTM-IV Sheeting, 48 Inch x 50 yds., Green	7/16" min. overage preferred	3M# 3937	NA	\$ 582.00		214048
225	-	Type ASTM-IV Sheeting, 48 Inch x 50 yds., Brown	7/16" min. overage preferred	3M# 3939	NA	\$ 582.00		216048

SECTION V: Type ASTM-XI Retroreflective Sheeting & Matched Components – Matched Component Dependent								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
226	1	Type ASTM-XI Sheeting, 12 inch x 100 yds., White	-	3M# 4090	NA	\$ 804.00	\$ 804.00	611012
227	-	Type ASTM-XI Sheeting, 15 inch x 50 yds., White	1/16" min. overage preferred	3M# 4090	NA	\$ 502.50		-
228	-	Type ASTM-XI Sheeting, 15 inch x 50 yds., Fluorescent Orange	1/16" min. overage preferred	3M# 4084	NA	\$ 468.75		-
229	1	Type ASTM-XI Sheeting, 18-1/2 inch x 50 yds., White	-	3M# 4090	NA	\$ 619.75	\$ 619.75	611018
230	4	Type ASTM-XI Sheeting, 18-1/2 inch x 50 yds., Fluorescent Orange	-	3M# 4084	NA	\$ 578.13	\$ 2,312.52	-
231	-	Type ASTM-XI Sheeting, 21 inch x 50 yds., White	1/16" min. overage preferred	3M# 4090	NA	\$ 703.50		-
232	-	Type ASTM-XI Sheeting, 21 inch x 50 yds., Fluorescent Orange	1/16" min. overage preferred	3M# 4084	NA	\$ 656.25		-
233	-	Type ASTM-XI Sheeting, 24-1/2 inch x 50 yds., White	-	3M# 4090	NA	\$ 820.75		611024
234	4	Type ASTM-XI Sheeting, 24-1/2 inch x 50 yds., Fluorescent Orange	-	3M# 4084	NA	\$ 765.63	\$ 3,062.52	613024
235	-	Type ASTM-XI Sheeting, 30-1/2 inch x 50 yds., White	-	3M# 4090	NA	\$ 1,021.75		-
236	-	Type ASTM-XI Sheeting, 30-1/2 inch x 50 yds., Fluorescent Orange	-	3M# 4084	NA	\$ 953.13		613030
237	-	Type ASTM-XI Sheeting, 36 inch x 50 yds., White	3/16" min. overage preferred	3M# 4090	NA	\$ 1,206.00		611036

SECTION V: Type ASTM-XI Retroreflective Sheeting & Matched Components – Matched Component Dependent (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
238	5	Type ASTM-XI Sheeting, 36 inch x 50 yds., Fluorescent Orange	3/16" min. overage preferred	3M# 4084	NA	\$ 1,125.00	\$ 5,625.00	613036
239	-	Type ASTM-XI Sheeting, 42 inch x 50 yds., White	5/16" min. overage preferred	3M# 4090	NA	\$ 1,407.00		-
240	-	Type ASTM-XI Sheeting, 42 inch x 50 yds., Fluorescent Orange	5/16" min. overage preferred	3M# 4084	NA	\$ 1,312.50		-
241	2	Type ASTM-XI Sheeting, 48 inch x 50 yds., White	7/16" min. overage preferred	3M# 4090	NA	\$ 1,608.00	\$ 3,216.00	611048
242	3	Type ASTM-XI Sheeting, 48 inch x 50 yds., Fluorescent Orange	7/16" min. overage preferred	3M# 4084	NA	\$ 1,500.00	\$ 4,500.00	613048
243	6	Type ASTM-XI Sheeting, 9 inch x 100 yds., Fluorescent Yellow Green	-	3M# 4083	NA	\$ 603.00	\$ 3,618.00	-
244	-	Type ASTM-XI Sheeting, 12 inch x 100 yds., Fluorescent Yellow	-	3M# 4081	NA	\$ 804.00		612012
245	2	Type ASTM-XI Sheeting, 12-3/4 inch x 100 yds., Fluorescent Yellow Green	-	3M# 4083	□	\$ 854.25	\$ 1,708.50	612412
246	-	Type ASTM-XI Sheeting, 15 inch x 50 yds., Fluorescent Yellow	1/16" min. overage preferred	3M# 4081	NA	\$ 502.50		-
247	-	Type ASTM-XI Sheeting, 15 inch x 50 yds., Fluorescent Yellow Green	1/16" min. overage preferred	3M# 4083	NA	\$ 502.50		-
248	-	Type ASTM-XI Sheeting, 18-1/2 inch x 50 yds., Fluorescent Yellow	-	3M# 4081	NA	\$ 619.75		612018
249	-	Type ASTM-XI Sheeting, 18-1/2 inch x 50 yds., Fluorescent Yellow Green	-	3M# 4083	NA	\$ 619.75		612418

SECTION V: Type ASTM-XI Retroreflective Sheeting & Matched Components – Matched Component Dependent (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50' yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
250	-	Type ASTM-XI Sheeting, 21 inch x 50 yds., Fluorescent Yellow	1/16" min. overage preferred	3M# 4081	NA	\$ 703.50		-
251	-	Type ASTM-XI Sheeting, 21 inch x 50 yds., Fluorescent Yellow Green	1/16" min. overage preferred	3M# 4083	NA	\$ 703.50		-
252	12	Type ASTM-XI Sheeting, 24-1/2 inch x 50 yds., Fluorescent Yellow	-	3M# 4081	NA	\$ 820.75	\$ 9,849.00	612024
253	-	Type ASTM-XI Sheeting, 24-1/2 inch x 50 yds., Fluorescent Yellow Green	-	3M# 4083	NA	\$ 820.75		612424
254	6	Type ASTM-XI Sheeting, 30-1/2 inch x 50 yds., Fluorescent Yellow	-	3M# 4081	NA	\$ 1,021.75	\$ 6,130.50	612030
255	2	Type ASTM-XI Sheeting, 30-1/2 inch x 50 yds., Fluorescent Yellow Green	-	3M# 4083	NA	\$ 1,021.75	\$ 2,043.50	612430
256	12	Type ASTM-XI Sheeting, 36 inch x 50 yds., Fluorescent Yellow	5/16" min. overage preferred	3M# 4081	NA	\$ 1,206.00	\$14,472.00	612036
257	-	Type ASTM-XI Sheeting, 36 inch x 50 yds., Fluorescent Yellow Green	5/16" min. overage preferred	3M# 4083	NA	\$ 1,206.00		612436
258	-	Type ASTM-XI Sheeting, 42 inch x 50 yds., Fluorescent Yellow	5/16" min. overage preferred	3M# 4081	NA	\$ 1,407.00		-
259	-	Type ASTM-XI Sheeting, 42 inch x 50 yds., Fluorescent Yellow Green	5/16" min. overage preferred	3M# 4083	NA	\$ 1,407.00		-
260	12	Type ASTM-XI Sheeting, 48 inch x 50 yds., Fluorescent Yellow	7/16" min. overage preferred	3M# 4081	NA	\$ 1,608.00	\$19,296.00	612048

SECTION V: Type ASTM-XI Retroreflective Sheeting & Matched Components – Matched Component Dependent (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
261	-	Type ASTM-XI Sheeting, 48 inch x 50 yds., Fluorescent Yellow Green	7/16" min. overage preferred	3M# 4083	NA	\$ 1,608.00		612448
262	-	Transparent film, Acrylic, 12 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 109.50		-
263	-	Transparent film, Acrylic, 12 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 109.50		-
264	-	Transparent film, Acrylic, 12 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 109.50		-
265	-	Transparent film, Acrylic, 12 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 109.50		-
266	-	Transparent film, Acrylic, 12 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 109.50		-
267	-	Transparent film, Acrylic, 15 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 136.88		-
268	-	Transparent film, Acrylic, 15 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 136.88		-
269	-	Transparent film, Acrylic, 15 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 136.88		-
270	-	Transparent film, Acrylic, 15 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 136.88		-
271	-	Transparent film, Acrylic, 15 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 136.88		-
272	-	Transparent film, Acrylic, 18 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 164.25		-
273	-	Transparent film, Acrylic, 18 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 164.25		-
274	-	Transparent film, Acrylic, 18 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 164.25		-
275	-	Transparent film, Acrylic, 18 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 164.25		904018
276	-	Transparent film, Acrylic, 18 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 164.25		906018
277	-	Transparent film, Acrylic, 24 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 219.00		902024

SECTION V: Type ASTM-XI Retroreflective Sheeting & Matched Components – Matched Component Dependent (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
278	-	Transparent film, Acrylic, 24 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 219.00		907024
279	-	Transparent film, Acrylic, 24 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 219.00		905024
280	-	Transparent film, Acrylic, 24 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 219.00		904024
281	-	Transparent film, Acrylic, 24 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 219.00		906024
282	-	Transparent film, Acrylic, 30 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 273.75		-
283	-	Transparent film, Acrylic, 30 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 273.75		907030
284	-	Transparent film, Acrylic, 30 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 273.75		905030
285	-	Transparent film, Acrylic, 30 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 273.75		904030
286	-	Transparent film, Acrylic, 30 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 273.75		906030
287	-	Transparent film, Acrylic, 36 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 328.50		902036
288	-	Transparent film, Acrylic, 36 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 328.50		-
289	-	Transparent film, Acrylic, 36 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 328.50		905036
290	-	Transparent film, Acrylic, 36 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 328.50		904036
291	-	Transparent film, Acrylic, 36 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 328.50		906036
292	-	Transparent film, Acrylic, 42 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 383.25		-
293	-	Transparent film, Acrylic, 42 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 383.25		-
294	-	Transparent film, Acrylic, 42 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 383.25		-
295	-	Transparent film, Acrylic, 42 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 383.25		904042

SECTION V: Type ASTM-XI Retroreflective Sheeting & Matched Components – Matched Component Dependent (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
296	-	Transparent film, Acrylic, 42 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 383.25		-
297	-	Transparent film, Acrylic, 48 inch x 50 yds., Yellow	NA	3M# 1171	NA	\$ 438.00		-
298	-	Transparent film, Acrylic, 48 inch x 50 yds., Red	NA	3M# 1172	NA	\$ 438.00		-
299	-	Transparent film, Acrylic, 48 inch x 50 yds., Blue	NA	3M# 1175	NA	\$ 438.00		905048
300	-	Transparent film, Acrylic, 48 inch x 50 yds., Green	NA	3M# 1177	NA	\$ 438.00		904048
301	-	Transparent film, Acrylic, 48 inch x 50 yds., Brown	NA	3M# 1179	NA	\$ 438.00		906048
302	-	Opaque film, Vinyl, 3/8 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 2.25		518038
303	-	Opaque film, Vinyl, 5/8 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 3.75		518062
304	-	Opaque film, Vinyl, 3/4 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 4.50		518075
305	-	Opaque film, Vinyl, 7/8 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 5.25		518088
306	1	Opaque film, Vinyl, 1-1/4 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 7.50	\$ 7.50	518125
307	-	Opaque film, Vinyl, 18 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 108.00		-
308	-	Opaque film, Vinyl, 18 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 108.00		-
309	-	Opaque film, Vinyl, 18 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 108.00		-
310	-	Opaque film, Vinyl, 18 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 108.00		-
311	-	Opaque film, Vinyl, 24 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 144.00		-
312	2	Opaque film, Vinyl, 24 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 144.00	\$ 288.00	518024
313	-	Opaque film, Vinyl, 24 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 144.00		-

SECTION V: Type ASTM-XI Retroreflective Sheeting & Matched Components – Matched Component Dependent (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
314	-	Opaque film, Vinyl, 24 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 144.00		-
315	-	Opaque film, Vinyl, 30 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 180.00		-
316	2	Opaque film, Vinyl, 30 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 180.00	\$ 360.00	518030
317	-	Opaque film, Vinyl, 30 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 180.00		512030
318	-	Opaque film, Vinyl, 30 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 180.00		-
319	-	Opaque film, Vinyl, 36 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 216.00		-
320	2	Opaque film, Vinyl, 36 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 216.00	\$ 432.00	518036
321	-	Opaque film, Vinyl, 36 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 216.00		512036
322	-	Opaque film, Vinyl, 36 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 216.00		-
323	-	Opaque film, Vinyl, 48 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 288.00		-
324	1	Opaque film, Vinyl, 48 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 288.00	\$ 288.00	518048
325	-	Opaque film, Vinyl, 48 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 288.00		-
326	-	Opaque film, Vinyl, 48 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 288.00		-
327	-	Opaque film, Vinyl, 60 inch x 50 yds., Matte White	NA	3M# 7725-20	NA	\$ 360.00		-
328	-	Opaque film, Vinyl, 60 inch x 50 yds., Black	NA	3M# 3650-12	NA	\$ 360.00		-
329	-	Opaque film, Vinyl, 60 inch x 50 yds., Yellow	NA	3M# 7725	NA	\$ 360.00		-
330	-	Opaque film, Vinyl, 60 inch x 50 yds., Blue	NA	3M# 7725	NA	\$ 360.00		-

SECTION VI: Type ASTM-XI Retroreflective Sheeting – Matched Component Non-Dependent								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
331	-	Type ASTM-XI Sheeting, 12-3/4 inch x 100 yds., White	-	3M# 4090	<input type="checkbox"/>	\$ 854.25		611012
332	-	Type ASTM-XI Sheeting, 12-3/4 inch x 100 yds., Blue	-	3M# 4095	<input type="checkbox"/>	\$ 854.25		-
333	-	Type ASTM-XI Sheeting, 12-3/4 inch x 100 yds., Green	-	3M# 4097	<input type="checkbox"/>	\$ 854.25		614012
334	-	Type ASTM-XI Sheeting, 12-3/4 inch x 100 yds., Fluorescent Orange	-	3M# 4084	<input type="checkbox"/>	\$ 796.88		613012
335	2	Type ASTM-XI Sheeting, 12-3/4 inch x 100 yds., Fluorescent Yellow	-	3M# 4081	<input type="checkbox"/>	\$ 854.25	\$ 1,708.50	612012
336	-	Type ASTM-XI Sheeting, 15 inch x 50 yds., Blue	1/16" min. overage preferred	3M# 4095	NA	\$ 502.50		-
337	-	Type ASTM-XI Sheeting, 15 inch x 50 yds., Green	1/16" min. overage preferred	3M# 4097	NA	\$ 502.50		-
338	-	Type ASTM-XI Sheeting, 18-1/2 inch x 50 yds., Blue	-	3M# 4095	NA	\$ 619.75		-
339	-	Type ASTM-XI Sheeting, 18-1/2 inch x 50 yds., Green	-	3M# 4097	NA	\$ 619.75		-
340	-	Type ASTM-XI Sheeting, 21 inch x 50 yds., Blue	1/16" min. overage preferred	3M# 4095	NA	\$ 703.50		-
341	-	Type ASTM-XI Sheeting, 21 inch x 50 yds., Green	1/16" min. overage preferred	3M# 4097	NA	\$ 703.50		-
342	-	Type ASTM-XI Sheeting, 24-1/2 inch x 50 yds., Blue	-	3M# 4095	NA	\$ 820.75		-
343	-	Type ASTM-XI Sheeting, 24-1/2 inch x 50 yds., Green	-	3M# 4097	NA	\$ 820.75		-

SECTION VI: Type ASTM-XI Retroreflective Sheeting – Matched Component Non-Dependent (Continued)								
Contract Item Number	Estimated Quantity	Item Description	Overage Preferences	Manufacturer Product Code	Item To Be Supplied In 50 yd. Length	Unit Cost	Extended Total Amount (Qty x Unit Cost)	DOH Inventory Subcode
344	-	Type ASTM-XI Sheeting, 30-1/2 inch x 50 yds., Blue	-	3M# 4095	NA	\$ 1,021.75		-
345	-	Type ASTM-XI Sheeting, 30-1/2 inch x 50 yds., Green	-	3M# 4097	NA	\$ 1,021.75		-
346	-	Type ASTM-XI Sheeting, 36 inch x 50 yds., Blue	5/16" min. overage preferred	3M# 4095	NA	\$ 1,206.00		-
347	-	Type ASTM-XI Sheeting, 36 inch x 50 yds., Green	5/16" min. overage preferred	3M# 4097	NA	\$ 1,206.00		-
348	-	Type ASTM-XI Sheeting, 42 inch x 50 yds., Blue	5/16" min. overage preferred	3M# 4095	NA	\$ 1,407.00		-
349	-	Type ASTM-XI Sheeting, 42 inch x 50 yds., Green	5/16" min. overage preferred	3M# 4097	NA	\$ 1,407.00		-
350	-	Type ASTM-XI Sheeting, 48 inch x 50 yds., Blue	7/16" min. overage preferred	3M# 4095	NA	\$ 1,608.00		-
351	-	Type ASTM-XI Sheeting, 48 inch x 50 yds., Green	7/16" min. overage preferred	3M# 4097	NA	\$ 1,608.00		-

EXHIBIT B**WEST VIRGINIA DEPARTMENT OF TRANSPORTATION****DIVISION OF HIGHWAYS****SPECIAL PROVISION****FOR****SECTION 715****MISCELLANEOUS MATERIALS****715.9-WARNING DEVICES:****715.9.1 – General:****DELETE THIS SECTION AND REPLACE WITH THE FOLLOWING:**

715.9.1-General: Warning devices shall include, but shall not be limited to, signs, barricades, auxiliary barriers, channelizing devices, hazard warning lights, flares, and reflectors. Unless otherwise indicated such devices shall conform to the standard, "Manual On Temporary Traffic Control for Streets and Highways ", published by the Division. The Contractor shall exhibit evidence that the warning devices furnished meet the requirements detailed.

715.9.2-Signs:**DELETE THIS SECTION AND REPLACE WITH THE FOLLOWING:**

715.9.2-Signs: Sign blank material shall be either 0.080 in. flat sheet aluminum, 0.040 in. flat sheet aluminum (guide sign demountable shields, legend, & border only), or extruded panel as specified in Section 661. Retroreflection shall be required and shall be accomplished by using approved retroreflective sheeting as specified in Section 661 and meeting the requirements specified herein.

All references herein to ASTM specification D4956 shall be interpreted as referencing version D4956 – 11a. Any portion of this specification which is in contradiction to ASTM D4956 shall supersede ASTM D4956. All references herein to AASHTO (American Association of State Highway and Transportation Officials) specification M268 shall be interpreted as referencing version M 268-10. Any portion of this specification which is in contradiction to AASHTO M268 shall supersede AASHTO M268. All AASHTO-NTPEP references herein shall be interpreted as referring to the AASHTO National Transportation Product Evaluation Program (NTPEP). All retroreflectivity values referenced herein shall be in units of $\text{cd}/\text{fc}/\text{ft}^2(\text{cd}\cdot\text{lx}^{-1}\cdot\text{m}^{-2})$. All "matched component" references herein shall be

interpreted as referencing the retroreflective sheeting manufacturer's recommended inks and overlay films to be used for manufacturing purposes with the manufacturer's sheeting. All APL references herein shall be interpreted as referring to the Division's Approved Products List (APL) for Retroreflective Sheeting. All CSS references herein shall be interpreted as referring to the Division's Central Sign Shop (CSS) internal sign manufacturing facility in Charleston, WV.

715.9.2.1-Retroreflective Sheeting, Type ASTM-I: A retroreflective sheeting referred to as "engineering grade" that is typically an enclosed lens glass-bead sheeting.

715.9.2.1.1- Type ASTM-I Sheeting Requirements:

715.9.2.1.1.1- Coefficient of Retroreflection: New sheeting shall meet the Minimum Coefficient of Retroreflection requirements in ASTM specification D4956 for Type I material, as defined in ASTM D4956.

For transparent ink printed or transparent film covered areas over white sheeting, the Minimum Coefficient of Retroreflection requirements shall be seventy (70) % of the values specified in ASTM D4956 for sheeting of the same color as the ink or film.

All testing shall be conducted in accordance with ASTM D4956.

715.9.2.1.1.2- Color: New sheeting shall meet the Daytime Color & Nighttime Color requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956. These requirements shall also apply to transparent ink and transparent film covered areas over white sheeting.

715.9.2.1.1.3- Daytime Luminance Factor: New sheeting shall meet the Daytime Luminance Factor requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956. These requirements shall also apply to transparent ink and transparent film covered areas over white sheeting.

715.9.2.1.1.4- Adhesion: New sheeting with a pressure sensitive backing shall meet the adhesion requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956.

715.9.2.1.1.5- Shrinkage: New sheeting shall meet the shrinkage requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956.

715.9.2.1.1.6- Flexibility: New sheeting shall meet the flexibility requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956.

715.9.2.1.1.7- Liner Removal: New sheeting shall meet the liner removability requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956.

715.9.2.1.1.8- Impact Resistance: New sheeting shall meet the impact resistance requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956.

715.9.2.1.1.9-Rotational Sensitivity: New sheeting shall meet the applicable requirements of AASHTO M268 in order for the sheeting to be considered rotationally insensitive. Testing shall be conducted at the viewing geometry of 0.5/-4 as recommended in AASHTO M268, and the results of retroreflectivity readings at rotation angles of 0, 45, 90, and 120 degrees shall be compared as recommended in AASHTO M268. If the sheeting does not meet these requirements, it shall be noted on the APL that the material is rotationally sensitive.

715.9.2.1.1.10- Shelf Life: Any Type ASTM-I material to be considered for listing on the Division's APL shall have a minimum one (1) year shelf life. The same provisions shall apply to the manufacturer recommended matched components. Reasonable conditional requirements pertaining to storage, such as temperature and relative humidity, shall be permitted.

715.9.2.1.1.11- Backing Class: Type ASTM-I sheeting shall have a Class 1 adhesive backing, as defined in ASTM D4956.

715.9.2.1.1.12- Durability: The durability requirements of finished products manufactured using Type ASTM-I sheeting are specified within Section 715.9.2.7.

715.9.2.1.2- Approval Process: The WVDOH approval process for Type ASTM-I sheeting products is specified within Section 715.9.2.9.

715.9.2.2- Retroreflective Sheeting, Type ASTM-IV: A retroreflective sheeting referred to as "high-intensity" that is typically an unmetalized micropismatic retroreflective element material.

715.9.2.2.1- Type ASTM-IV Sheeting Requirements:

715.9.2.2.1.1- Coefficient of Retroreflection: New material shall meet the Minimum Coefficient of Retroreflection requirements in ASTM D4956 for Type IV material, as defined in ASTM D4956.

For transparent ink printed or transparent film covered areas over white sheeting, the Minimum Coefficient of Retroreflection requirements shall be seventy (70) % of the values specified in ASTM D4956 for sheeting of the same color as the ink or film.

All testing shall be conducted in accordance with ASTM D4956.

715.9.2.2.1.2- Color: New sheeting shall meet the Daytime Color & Nighttime Color requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956. These requirements shall also apply to transparent ink and transparent film covered areas over white sheeting.

715.9.2.2.1.3- Daytime Luminance Factor: New sheeting shall meet the Daytime Luminance Factor requirements in specification D4956 when tested in accordance with ASTM specification D4956. These requirements shall also apply to transparent ink and transparent film covered areas over white sheeting.

715.9.2.2.1.4- Adhesion: New sheeting shall meet the adhesion requirements in specification D4956 when tested in accordance with ASTM specification D4956. If the material is marketed as a reboundable material, the supplementary adhesion requirements in ASTM D4956 for reboundable materials shall apply.

715.9.2.2.1.5- Shrinkage: New sheeting shall meet the shrinkage requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956.

715.9.2.2.1.6- Flexibility: New sheeting shall meet the flexibility requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956. If the material is marketed as a reboundable material, the supplementary flexibility requirements in ASTM D4956 for reboundable materials shall apply.

715.9.2.2.1.7- Liner Removal: New sheeting shall meet the liner removability requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956.

715.9.2.2.1.8- Impact Resistance: New sheeting shall meet the impact resistance requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956. If the material is marketed as a reboundable material, the supplementary impact resistance requirements in ASTM D4956 for reboundable materials shall apply.

715.9.2.2.1.9- Rotational Sensitivity: New sheeting materials, with exceptions noted herein, shall meet the applicable requirements of AASHTO M268 in order for the sheeting to be considered rotationally insensitive. Testing shall be conducted at the viewing geometry of 0.5/-4 as recommended in AASHTO M268, and the results of retroreflectivity readings at rotation angles of 0, 45, 90, and 120 degrees shall be compared as recommended in AASHTO M268. If the sheeting does not meet these requirements, it shall be noted on the APL that the material is rotationally sensitive. With the exception of fluorescent-orange materials intended for application to rigid substrate signs, "work zone" materials as defined herein shall not be subject to rotational sensitivity testing.

715.9.2.2.1.10- Shelf Life: A minimum shelf life shall not be required for the sheeting to be listed on the APL. However, in order for the sheeting to be approved for manufacturing purposes within the Division's CSS, a minimum (1) year shelf life shall be required. The same provisions shall apply to the manufacturer recommended matched components. Reasonable conditional requirements pertaining to storage, such as temperature and relative humidity, shall be permitted.

715.9.2.2.1.11- Backing Class: All Type ASTM-IV material supplied to the Division for manufacturing purposes within the CSS shall have a Class 1 adhesive backing, as defined in ASTM D4956. The adhesive backing on all Type ASTM-IV material supplied to manufacturers providing finished products to the Division or to Contractors performing work on Division Contracts shall have the most appropriate ASTM D4956 defined adhesive backing for the materials intended purpose, as determined by the manufacturer.

715.9.2.2.1.12- Durability: Durability requirements of finished products manufactured using Type ASTM-IV to be warranted by the sheeting manufacturer are specified within Section 715.9.2.7.

715.9.2.2.2- Approval Process: The WVDOH approval process for Type ASTM-IV sheeting products is specified within Section 715.9.2.9.

715.9.2.3- Retroreflective Sheeting, Type ASTM-VI: An elastomeric retroreflective sheeting without adhesive. This sheeting is typically a vinyl microprismatic retroreflective material.

715.9.2.3.1- Type ASTM-VI Sheeting Requirements:

715.9.2.3.1.1- Coefficient of Retroreflection: New sheeting shall meet the Minimum Coefficient of Retroreflection requirements as specified in Table 715.9.2.3.1.1-I below.

Table 715.9.2.3.1.1-I

Observation Angle	Entrance Angle	Color	
		White	Fluorescent-Orange
0.2	-4	300	200
0.2	+30	180	120
0.2	+45	100	60
0.5	-4	200	120
0.5	+30	75	50
0.5	+45	60	30

For transparent ink printed areas over white sheeting, the Minimum Coefficient of Retroreflection requirements shall be as shown in Table 715.9.2.3.1.1-II below.

Table 715.9.2.3.1.1-II

Observation Angle	Entrance Angle	Color				
		Green	Blue	Red	Yellow	Brown
0.2	-4	21	9.5	29	147	6.1

All testing shall be conducted in accordance with ASTM D4956.

715.9.2.3.1.2- Color: New sheeting shall meet the Daytime Color & Nighttime Color requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956. These same requirements shall apply to transparent ink covered areas over white sheeting.

715.9.2.3.1.3- Daytime Luminance Factor: New sheeting shall meet the Daytime Luminance Factor requirements of ASTM specification D4956 when tested in accordance with ASTM specification D4956. These requirements shall also apply to transparent ink covered areas over white sheeting.

715.9.2.3.1.4- Shrinkage: New sheeting shall meet the shrinkage requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956.

715.9.2.3.1.5- Flexibility: New sheeting shall meet the flexibility requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956.

715.9.2.3.1.6- Impact Resistance: New sheeting shall meet the impact resistance requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956.

715.9.2.3.1.7- BLANK

715.9.2.3.1.8- Backing Class: All Type ASTM-VI material shall have a Class 5 backing, as defined in ASTM D4956.

715.9.2.3.1.9- Durability: Durability requirements of finished products manufactured using Type ASTM-VI material to be warranted by the sheeting manufacturer are specified within Section 715.9.2.7.

715.9.2.3.2- Approval Process: The WVDOH approval process for Type ASTM-VI sheeting products is specified within Section 715.9.2.9.

715.9.2.4- Retroreflective Sheeting, Type ASTM-XI: A retroreflective sheeting typically manufactured as an unmetalized cube corner microprismatic retroreflective element material.

715.9.2.4.1- Type ASTM-XI Sheeting Requirements:

715.9.2.4.1.1- Coefficient of Retroreflection: New sheeting shall meet the Minimum Coefficient of Retroreflection requirements in ASTM specification D4956 for Type XI material, as defined in ASTM D4956.

For transparent ink printed or transparent film covered areas over white sheeting, the Minimum Coefficient of Retroreflection requirements shall be seventy (70) % of the values specified in ASTM D4956 for sheeting of the same color as the ink or film.

All testing shall be conducted in accordance with ASTM D4956.

715.9.2.4.1.2- Color: New sheeting shall meet the Daytime Color & Nighttime Color requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956. These same requirements shall apply to transparent ink and transparent film covered areas over white sheeting.

715.9.2.4.1.3- Daytime Luminance Factor: New sheeting shall meet the Daytime Luminance Factor requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956. These same requirements shall apply to transparent ink and transparent film covered areas over white sheeting.

715.9.2.4.1.4- Adhesion: New sheeting shall meet the adhesion requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956. If the material is marketed as a reboundable material, the supplementary adhesion requirements in ASTM D4956 for reboundable materials shall apply.

715.9.2.4.1.5- Shrinkage: New sheeting shall meet the shrinkage requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956.

715.9.2.4.1.6- Flexibility: New sheeting shall meet the flexibility requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956. If the material is marketed as a reboundable material, the supplementary flexibility requirements in ASTM D4956 for reboundable materials shall apply.

715.9.2.4.1.7- Liner Removal: New sheeting shall meet the liner removability requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956.

715.9.2.4.1.8- Impact Resistance: New sheeting shall meet the impact resistance requirements in ASTM specification D4956 when tested in accordance with ASTM specification D4956. If the material is marketed as a reboundable material, the supplementary impact resistance requirements in ASTM D4956 for reboundable materials shall apply.

715.9.2.4.1.9-Rotational Sensitivity: New sheeting materials, with exceptions noted herein, shall meet the applicable requirements of AASHTO M268 in order for the sheeting to be considered rotationally insensitive. Testing shall be conducted at the viewing geometry of 0.5/-4 as recommended in AASHTO M268, and the results of retroreflectivity readings at rotation angles of 0, 45, 90, and 120 degrees shall be compared as recommended in AASHTO M268. If the sheeting does not meet these requirements, it shall be noted on the APL that the material is rotationally sensitive. With the exception of fluorescent-orange materials intended for application to rigid substrate signs, "work zone" materials as defined herein shall not be subject to rotational sensitivity testing.

715.9.2.4.1.10- Shelf Life: A minimum shelf life shall not be required for the sheeting to be listed on the APL. However, in order for the sheeting to be approved for manufacturing purposes within the Division's CSS, a minimum (1) year shelf life shall be required. The same provisions shall apply to the manufacturer recommended matched components. Reasonable conditional requirements pertaining to storage, such as temperature and relative humidity, shall be permitted.

715.9.2.4.1.11- Backing Class: All Type ASTM-XI material supplied to the Division for manufacturing purposes within the CSS shall have a Class 1 adhesive backing, as defined in ASTM D4956. The adhesive backing on all Type ASTM-XI material supplied to manufacturers providing finished products to the Division or to Contractors performing work on Division Contracts shall have the most appropriate ASTM D4956 adhesive backing for the materials intended purpose.

715.9.2.4.1.12- Durability: Durability requirements of finished products manufactured using Type ASTM-XI material to be warranted by the sheeting manufacturer are specified within Section 715.9.2.7.

715.9.2.4.2- Approval Process: The WVDOH approval process for Type ASTM-XI sheeting products is specified within Section 715.9.2.9.

715.9.2.5-Transfer Film: Transfer film for premasking or applying prespaced legends using transparent or opaque films.

715.9.2.5.1 – Transfer Film Requirements:

715.9.2.5.1.1 – Transparency: Transfer films shall be transparent.

715.9.2.5.2 – Approval Process: The WVDOH approval process for Transfer Film is specified within Section 715.9.2.9.

715.9.2.6-Matched Components:

715.9.2.6.1-Black Opaque Overlay Film: A black, opaque, typically vinyl or acrylic pressure-sensitive film designed for permanent graphics that may be prespaced and electronically cut. These films have a synthetic liner that resists moisture absorption and static buildup.

715.9.2.6.1.1-Black Opaque Overlay Film Requirements:

715.9.2.6.1.1.1- Adhesive: This material shall utilize a pressure sensitive adhesive.

715.9.2.6.1.1.2- Chemical Resistance: This material shall resist mild alkalis, mild acids, and salt. The material shall exhibit excellent resistance to water, with exception to cases of submersion.

715.9.2.6.1.1.3- Shrinkage: After application, this material shall not exhibit shrinkage in excess of 0.010 inches.

715.9.2.6.1.1.4- Durability: Durability requirements of black opaque overlay films, depending on the Type sheeting the material is to be utilized with and the intended application, are specified in Sections 715.9.2.1 through 715.9.2.4.

715.9.2.6.1.1.5 – Shelf Life: A minimum shelf life shall not be required for the film to be approved for use with the manufacturer's sheeting products. However, in order for the film to be approved for manufacturing purposes within the Division's CSS, a minimum (1) year shelf life shall be required. Reasonable conditional requirements pertaining to storage, such as temperature and relative humidity, shall be permitted.

715.9.2.6.1.1.6- CSS Requirements: In addition to, but not limited to, any other requirements stated herein, all black opaque overlay film to be approved for manufacturing purposes within the CSS shall be a vinyl material. In addition, this material shall have sufficient strength so that it can be handled, processed, and applied according to the recommendations of the manufacturer without appreciable stretching, tearing, or other damage. The material shall permit cutting and application at temperatures of 40 to 100°F (4 to 38°C).

715.9.2.6.1.2-Approval Process: The WVDOT approval process for Black Opaque Overlay Film is specified within Section 715.9.2.9.

715.9.2.6.2- Transparent Overlay Films: A colored, transparent, typically acrylic, transparent pressure-sensitive film designed for permanent graphics that may be prespaced and electronically cut. These films have a synthetic liner that resists moisture absorption and static buildup.

715.9.2.6.2.1- Transparent Overlay Film Requirements:

715.9.2.6.2.1.1- Adhesive: This material shall utilize a transparent pressure sensitive adhesive.

715.9.2.6.2.1.2- Chemical Resistance: This material shall resist mild alkalis, mild acids, and salt. The material shall exhibit excellent resistance to water, with exception to cases of submersion.

715.9.2.6.2.1.3- Color Standards: Transparent overlay films applied to the manufacturer's approved white sheeting shall produce colors meeting the daytime and nighttime color requirements of ASTM D4956 for like colored sheeting. Testing shall be conducted in accordance with ASTM D4956.

715.9.2.6.2.1.4- Transparency: After application over the manufacturer's white sheeting, the film's level of transparency shall result in a minimum retroreflectivity level of seventy (70) % of the minimum required retroreflectivity level, as specified

herein, of the like colored sheeting of the same grade as the white sheeting. Testing shall be conducted in accordance with ASTM D4956.

715.9.2.6.2.1.5- Durability: Durability requirements of transparent overlay films, depending on the Type sheeting the material is to be utilized with and the intended application, are specified in Sections 715.9.2.1 through 715.9.2.4.

715.9.2.6.2.1.6 – Shelf Life: A minimum shelf life shall not be required for the film to be approved for use with the manufacturer's sheeting products. However, in order for the film to be approved for manufacturing purposes within the Division's CSS, a minimum (1) year shelf life shall be required. Reasonable conditional requirements pertaining to storage, such as temperature and relative humidity, shall be permitted.

715.9.2.6.2.1.7- CSS Requirements: In addition to, but not limited to, any other requirements stated herein, all transparent overlay film to be approved for manufacturing purposes within the CSS shall be an acrylic material and shall be supplied on a clear liner. In addition, this material shall have sufficient strength so that it can be handled, processed, and applied according to the recommendations of the manufacturer without appreciable stretching, tearing, or other damage. The material shall permit cutting and application at temperatures of 40 to 100°F (4 to 38°C).

715.9.2.6.2.2-Approval Process: The WVDOH approval process for Transparent Overlay Film is specified within Section 715.9.2.9.

715.9.2.6.3- Opaque and Transparent Inks: Weather resistant, quick drying inks designed for use in traffic sign screen printing processes.

715.9.2.6.3.1- Opaque and Transparent Ink Requirements:

715.9.2.6.3.1.1- Chemical Resistance: This material shall resist mild alkalis, mild acids, and salt. The material shall exhibit excellent resistance to water, with exception to cases of submersion.

715.9.2.6.3.1.2- Color Standards: Transparent inks applied to the manufacturer's approved white sheeting shall produce colors meeting the daytime and nighttime color requirements of ASTM D4956 for like colored sheeting. Testing shall be conducted in accordance with ASTM D4956.

715.9.2.6.3.1.3- Transparency: After application over the manufacturer's white sheeting, the level of transparency of the transparent ink shall result in a minimum retroreflectivity level of seventy (70) % of the minimum required retroreflectivity level, as specified herein, of the like colored sheeting of the same grade as the white sheeting. Testing shall be conducted in accordance with ASTM D4956.

715.9.2.6.3.1.4- Durability: Durability requirements of opaque & transparent inks, depending on the Type sheeting the material is to be utilized with and the intended application, are specified in Sections 715.9.2.1 through 715.9.2.4.

715.9.2.6.3.1.5– Shelf Life: A minimum shelf life shall not be required for the ink to be approved for use with the manufacturer’s sheeting products. However, in order for the ink to be approved for manufacturing purposes within the Division’s CSS, a minimum (1) year shelf life shall be required. Reasonable conditional requirements pertaining to storage, such as temperature and relative humidity, shall be permitted.

715.9.2.6.3.2-Approval Process: The WVDOT approval process for Opaque and Transparent Ink is specified within Section 715.9.2.9.

715.9.2.7 – Durability Requirements: The durability requirements of the various type sheeting materials described herein and their matched components are specified in this Section. The sheeting manufacturer’s obligations in the event that the manufacturer’s material(s) fails to meet the durability requirements specified herein, as applicable, are specified within Section 715.9.2.8.

715.9.2.7.1-Non Work Zone Applications:

715.9.2.7.1.1-Type ASTM-I Sheeting: Finished signs manufactured using Type ASTM-I sheeting shall exhibit the minimum level of performance described herein for a period of seven (7) years after field installation.

The retroreflectivity levels maintained by the sheeting placed on the signs shall be a minimum of fifty (50) % of the required values for new sheeting of the same color, per 715.9.2.1.1.1. For transparent ink and film covered areas over white sheeting, the retroreflectivity levels maintained by these areas of the signs shall be a minimum of thirty-five (35) % [seventy (70) % of the fifty (50) % value specified above] of the required values for new sheeting of the same color as the ink or film, per 715.9.2.1.1.1.

The colors and luminance factors of all areas of finished signs shall be such that the sign remains effective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions by drivers with normal vision.

All retroreflectivity testing shall be done in accordance with ASTM D4956. All retroreflectivity testing shall be done at the set observation angle / entrance angle geometry of 0.2/-4.

715.9.2.7.1.2-Type ASTM-IV Sheeting: Finished signs manufactured using Type ASTM-IV sheeting shall exhibit the minimum level of performance described herein for a period of ten (10) years after field installation.

The retroreflectivity levels maintained by the sheeting placed on the signs shall be a minimum of eighty (80) % of the required values for new sheeting of the same color, per 715.9.2.2.1.1. For transparent ink and transparent film covered areas over white sheeting, the retroreflectivity levels maintained by these areas of the signs shall be a minimum of fifty-six (56) % [seventy (70) % of the eighty (80) % value specified above] of the required values for new sheeting of the same color as the ink or film, per 715.9.2.2.1.1.

The colors and luminance factors of all areas of finished signs shall be such that the sign remains effective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions by drivers with normal vision.

All retroreflectivity testing shall be done in accordance with ASTM D4956. All retroreflectivity testing shall be done at the set observation angle / entrance angle geometry of 0.2/-4.

715.9.2.7.1.3-Type ASTM-XI Sheeting:

715.9.2.7.1.3.1-Non Fluorescent Materials: Finished signs manufactured using Type ASTM-XI non-fluorescent sheeting shall exhibit the minimum level of performance described herein for a period of twelve (12) years after field installation.

The retroreflectivity levels maintained by the sheeting placed on the signs shall be a minimum of eighty (80) % of the required values for new sheeting of the same color, per 715.9.2.4.1.1. For transparent ink and film covered areas over white sheeting, the retroreflectivity levels maintained by these areas of the signs shall be a minimum of fifty-six (56) % [seventy (70) % of the eighty (80) % value specified above] of the required values for new sheeting of the same color as the ink or film, per 715.9.2.4.1.1.

The colors and luminance factors of all areas of finished signs shall be such that the sign remains effective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions by drivers with normal vision.

All retroreflectivity testing shall be done in accordance with ASTM D4956. All retroreflectivity testing shall be done at the set observation angle / entrance angle geometry of 0.2/-4.

715.9.2.7.1.3.2-Fluorescent Materials: Finished signs manufactured using Type ASTM-XI fluorescent sheeting shall exhibit the minimum level of performance described herein for a period of ten (10) years after installation.

The retroreflectivity levels maintained by the sheeting placed on the signs shall be a minimum of eighty (80) % of the required values for new sheeting of the same color, per 715.9.2.4.1.1.

The colors of all areas of finished signs shall be such that the sign remains effective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions by drivers with normal vision.

The daytime luminance factor of all areas of finished signs shall be in conformance with the daytime luminance factor requirements referenced in Section 715.9.2.4.1.3.

All testing shall be done in accordance with ASTM D4956. All retroreflectivity testing shall be done at the set observation angle / entrance angle geometry of 0.2/-4.

715.9.2.7.2-Work Zone Applications:

715.9.2.7.2.1-Type ASTM-IV Sheeting:

715.9.2.7.2.1.1-Channelization & Delineation Devices: Products in this category include but may not be limited to plastic posts, tubes, barricades, drums, cones, and channelizer cones, including “permanently” installed plastic posts and tubes.

Applicable colors are orange, white, yellow, blue, and red. The sheeting placed on finished products of this type shall have its' performance warranted for a period of three (3) years after application on the finished product.

The Minimum Coefficient of Retroreflection shall be fifty (50) % of the values specified in Section 715.9.2.2.1.1 for sheeting of the same color.

The colors and luminance factors of the applied sheeting shall be such that the sheeting remains effective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions by drivers with normal vision.

All retroreflectivity testing shall be done in accordance with ASTM D4956. All retroreflectivity testing shall be done at the set observation angle / entrance angle geometry of 0.2/-4.

715.9.2.7.2.2-Type ASTM-VI Sheeting:

715.9.2.7.2.2.1-Roll-Up Signs: Finished roll-up signs manufactured using Type ASTM-VI sheeting shall have their performance warranted for a period of three (3) years after manufacturing.

The retroreflectivity levels maintained by the white or fluorescent-orange areas of the finished signs shall be a minimum of fifty (50) % of the required values for new sheeting of the same color, per Table 715.9.2.3.1.1-I. For transparent ink covered areas over white sheeting, the retroreflectivity levels maintained by these areas of the signs shall be a minimum of fifty (50) % of the required values for like colored screen printed areas over new sheeting (50% of the values in Table 715.9.2.3.1.1-II).

The colors and luminance factors of all areas of finished signs shall be such that the sign remains effective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions by drivers with normal vision.

The daytime luminance factor of fluorescent-orange finished signs shall be in conformance with the daytime luminance factor requirements referenced in Section 715.9.2.3.1.3.

All testing shall be done in accordance with ASTM D4956. All retroreflectivity testing shall be done at the set observation angle / entrance angle geometry of 0.2/-4.

715.9.2.7.2.3-Type ASTM-XI Sheeting:

715.9.2.7.2.3.1-Signs: Finished work zone signs manufactured using fluorescent-orange Type ASTM-XI material shall have their performance warranted for a period of three (3) years after manufacturing.

The retroreflectivity levels maintained by the sheeting placed on the signs shall be a minimum of fifty (50) % of the required values for new fluorescent-orange sheeting, per 715.9.2.4.1.1.

The colors of all areas of finished signs shall be such that the sign remains effective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions by drivers with normal vision.

The daytime luminance factor of all areas of finished signs shall be in conformance with the daytime luminance factor requirements referenced in Section 715.9.2.4.1.3 for fluorescent-orange.

All testing shall be done in accordance with ASTM D4956. All retroreflectivity testing shall be done at the set observation angle / entrance angle geometry of 0.2/-4.

715.9.2.7.2.3.2--Channelization & Delineation Devices: Products in this category include but may not be limited to plastic posts, tubes, barricades, drums, cones, and channelizer cones, including “permanently” installed plastic posts and tubes. Applicable colors are orange, white, yellow, blue, and red. The sheeting placed on finished products of this type shall have its’ performance warranted for a period of three (3) years after application on the finished product.

The Minimum Coefficient of Retroreflection shall be fifty (50) % of the values specified in Section 715.9.2.4.1.1 for sheeting of the same color.

The colors and luminance factors of the applied sheeting shall be such that the sheeting remains effective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions by drivers with normal vision.

The daytime luminance factor of fluorescent-yellow sheeting shall be in conformance with the daytime luminance factor requirements referenced in Section 715.9.2.4.1.3.

All testing shall be done in accordance with ASTM D4956. All retroreflectivity testing shall be done at the set observation angle / entrance angle geometry of 0.2/-4.

715.9.2.8- Warranty Claims: The sheeting manufacturer’s obligations in the event that the manufacturer’s material(s) fails to meet the warranty requirements specified herein are specified within this Section. The retroreflective sheeting and/or matched components used to manufacture finished signs, channelization devices, & delineation devices shall be considered to be in non-compliance with these specifications where it can be shown that during the specified warranty period the finished product has deteriorated due to natural causes to the extent that is in non-compliance with the quantitative requirements contained herein related to retroreflectivity or luminance factor, as applicable, or is otherwise determined to be ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions by drivers with normal vision. Under such circumstances, the sheeting manufacturer’s warranty obligations shall be as outlined as described herein. The retroreflectivity, color, & luminance factor durability requirements of the various type sheeting materials described herein and their matched components, as well as the required warranty periods, are specified within Section 715.9.2.7.

Warranty claims shall be based on failures which occur as a result of design or manufacturing defects in the manufacturer's sheeting and/or matched components and not of outside causes such as improper fabrication, handling, maintenance, or installation; use of non manufacturer recommended inks, thinners, coatings, or overlay films for the sheeting being used; use of application equipment not recommended by the manufacturer; failure of sign substrate; exposure to chemicals, abrasion, or damage from fasteners used to mount the sign; snow burial; collisions, vandalism, or malicious mischief. It shall be the sheeting manufacturer's responsibility to investigate and demonstrate that the recommendations contained in their product bulletins, information folders, and technical memos have not been followed in cases where the manufacturer chooses to contest the warranty claim.

Replacement sheeting shall carry the unexpired warranty of the sheeting it replaces.

715.9.2.8.1-Non Work Zone Applications:

715.9.2.8.1.1-Signs:

715.9.2.8.1.1.1-Non Fluorescent Type ASTM-IV and Type ASTM-XI Sheeting: If the failure occurs within the first seven (7) years from the date of field installation, the sheeting manufacturer shall, at its expense, restore the sign surface to its original effectiveness. The Division will be responsible for no labor, equipment, or material costs in this case.

If the failure occurs after seven (7) years from the date of field installation, but less than ten (10) years from the date of field installation for Type ASTM-IV material or less than twelve (12) years from the date of field installation for Type ASTM-XI material, the manufacturer shall furnish the necessary amount of sheeting to restore the sign surface to its original effectiveness.

715.9.2.8.1.1.2-Fluorescent Type ASTM-XI Sheeting: If the failure occurs within the first seven (7) years from the date of field installation, the sheeting manufacturer shall, at its expense, restore the sign surface to its original effectiveness. The Division will be responsible for no labor, equipment, or material costs in this case.

If the failure occurs after seven (7) years from the date of field installation, but less than ten (10) years from the date of field installation, the manufacturer shall furnish the necessary amount of sheeting to restore the sign surface to its original effectiveness.

715.9.2.8.2-Work Zone Applications:

715.9.2.8.2.1-Signs:

715.9.2.8.2.1.1-Type ASTM-VI and Type ASTM-XI Sheeting: If the failure occurs within one (1) year from the date of manufacturing, the sheeting manufacturer will, at its expense, provide all required sheeting to restore the effected sign(s) to their original effectiveness.

If failure occurs after one (1) year from the date of manufacturing, but less than two (2) years from the date of manufacturing, the sheeting manufacturer will, at its

expense, provide two-thirds (2/3) of the required sheeting to restore the effected sign(s) to their original effectiveness.

If failure occurs after two (2) years from the date of manufacturing, but less than three (3) years from the date of manufacturing, the sheeting manufacturer will, at its expense, provide one-third (1/3) of the required sheeting to restore the effected sign(s) to their original effectiveness.

715.9.2.8.2.2-Channelization & Delineation Devices:

715.9.2.8.2.2.1-Type ASTM-IV and Type ASTM-XI Sheeting: If the failure occurs within one (1) year from the date of manufacturing, the sheeting manufacturer will, at its expense, provide all required sheeting to restore the effected device(s) to their original effectiveness.

If failure occurs after one (1) year from the date of manufacturing, but less than two (2) years from the date of manufacturing, the sheeting manufacturer will, at its expense, provide two-thirds (2/3) of the required sheeting to restore the effected device(s) to their original effectiveness.

If failure occurs after two (2) years from the date of manufacturing, but less than three (3) years from the date of manufacturing, the sheeting manufacturer will, at its expense, provide one-third (1/3) of the required sheeting to restore the effected device(s) to their original effectiveness.

715.9.2.9-Approval Processes: The WVDOH processes for review and approval of the various material types described in Sections 715.9.2.1 through 715.9.2.6 are described within this Section.

Retroreflective sheeting materials of the Types described herein, manufacturer recommended matched components for use with the sheeting materials, and transfer films to be considered for inclusion on the WVDOH APL shall be submitted to the Materials Division following the current procedures specified by the Materials Division. The manufacturer may contact the Traffic Engineering Division for verification. The manufacturer should include all relevant documentation and information with their submittal, including but not limited to Product Data Sheets, Product Flyers, Manufacturer Product Specifications, Product Bulletins, and any required independent test results described herein.

In addition to the above described documentation and information, the manufacturer shall submit a letter of certification prior to approval. This letter shall include the following:

1. Certification that the material(s) submitted for approval will meet all applicable requirements contained within Section 715 of the WVDOH Standard Specifications. The applicable material Type designation, as defined in this specification, should also

be referenced. If the material is a Type ASTM-I, IV, or XI material and not intended solely for application to work zone devices as defined herein, or is a fluorescent-orange material intended for application to rigid substrate signs, and does not meet the requirements of this specification to be considered rotationally insensitive, the manufacturer should note this exception in the certification letter. Classification of the material as being rotationally sensitive will not prevent approval of the material.

2. Certification that the manufacturer agrees to warranty the performance of the material(s) in accordance with Section 715 of the WVDOT Standard Specifications.
3. Certification that the material(s) have a minimum one (1) year shelf life, when stored as recommended by the manufacturer, if the manufacturer is seeking approval of the material(s) for manufacturing purposes within the CSS.

All submitted information will be forwarded to the WVDOT Traffic Engineering Division, which will in turn contact and work directly with the manufacturer during the evaluation process. The Traffic Engineering Division will evaluate all submitted literature and documentation for compliance with the specified requirements as well as satisfactory independent testing results, as applicable. The Traffic Engineering Division will also arrange for the manufacturer to furnish test samples for evaluation of the materials suitability for use within the CSS, as applicable. After the evaluation is complete, the Traffic Engineering Division will inform the Materials Division in writing of the outcome of its evaluation.

The WVDOT reserves the right to conduct testing, whether internally or through an independent testing agency of its choice, on any material submitted for approval in order to verify that the material meets any of the material specifications herein. This testing may be conducted prior to or any time after approval is issued. Any such testing shall be conducted in accordance with the testing requirements of the applicable standardization body, such as ASTM or AASHTO.

715.9.2.9.1-Retroreflective Sheeting Materials & Matched Components:

715.9.2.9.1.1-Independent Test Results: In order for the material to be evaluated and considered for approval, independent test results must be supplied by the manufacturer demonstrating the sheeting material's conformance with the requirements specified within the applicable Section 715.9.2.1, 715.9.2.2, 715.9.2.3, or 715.9.2.4, with the exception of the requirements specified in the "Shelf Life", "Backing Class", and "Durability" subsections. The independent test results shall include accelerated outdoor weathering test results conducted in conformance with ASTM D4956. Artificial accelerated lab weathering shall not be accepted except for materials intended for work zone applications. Materials intended for work zone applications shall include all Type ASTM-VI materials and shall include, but may not be limited to, other "Type" materials

intended for use on plastic posts, tubes, barricades, drums, cones, and channelizer cones, including “permanently” installed plastic posts and tubes. However, any approval granted based on the results of artificial accelerated lab weathering shall be provisional in nature and noted as such on the APL. As a condition of the acceptance of artificial accelerated lab weathering results in lieu of accelerated outdoor weathering results, the accelerated outdoor weathering process shall be ongoing at the time of issuance of the provisional approval. In addition, the material manufacturer shall submit the standard outdoor weathering test results to the WVDOH within nine (9) months after the effective date of the provisional approval for Type ASTM-VI materials, and within fifteen (15) months after the effective date of the provisional approval for all other material “Types”. AASHTO-NTPEP results shall be considered acceptable for meeting the accelerated outdoor weathering test results requirement.

Rotational sensitivity testing is not required for sheeting materials intended solely for application to work zone devices, as defined herein, with the exception of fluorescent-orange materials intended for application to rigid substrate signs. Otherwise, if a material submitted for approval does not meet the rotational sensitivity requirements herein, rotational sensitivity testing may be omitted from the independent test results provided that the manufacturer notes that the material does not meet the rotational sensitivity requirement in their required certification letter described in Section 715.9.2.9.

715.9.2.9.1.1.1-Accelerated Weathering Test Results: The duration of testing required shall be based on the sheeting material Type, as defined by this specification, and the intended application of the material. All Type ASTM-I sheeting materials shall be subjected to two (2) years of accelerated outdoor weathering. Type ASTM-IV and Type ASTM-XI materials intended for non work zone applications shall be subjected to three (3) years of accelerated outdoor weathering. Type ASTM-IV and Type ASTM-XI materials intended for work zone applications shall be subjected to one (1) year of accelerated outdoor weathering. Type ASTM-VI materials shall be subjected to six (6) months of accelerated outdoor weathering.

After completion of the accelerated outdoor weathering, all materials shall be in conformance with the general durability requirements related to cracking, scaling, pitting, blistering, edge lifting, curling, shrinkage, and expansion specified in ASTM D4956.

The retroreflectivity level of the sheeting material after completion of the accelerated outdoor weathering, when tested in accordance with ASTM D4956, shall be in conformance with the requirements of ASTM D4956. ASTM D4956 specifies the level of retroreflectivity to be maintained by the material as a percentage of the initial required retroreflectivity level specified in ASTM D4956. An exception to this shall apply to Type ASTM-VI materials. In this case, the percentage specified in ASTM

D4956 shall be applied to the applicable initial required retroreflectivity levels specified in Section 715.9.2.3.1.1 rather than the initial values specified in ASTM D4956.

After completion of the accelerated weathering, the sheeting material shall be in conformance with the requirements specified in the "Color" (daytime) and "Luminance Factor" subsections within the applicable Section 715.9.2.1, 715.9.2.2, 715.9.2.3, or 715.9.2.4 when tested in accordance with ASTM D4956.

The manufacturer recommended matched components for use with the sheeting material must also be subjected to accelerated outdoor weathering in order for approval to be given for the manufacturing of signs requiring the use of these matched components. The duration of accelerated outdoor weathering required for the matched components shall be the same as the applicable duration required for the sheeting.

The retroreflectivity level of the areas of all signs processed with transparent inks or transparent films after completion of the accelerated outdoor weathering, when tested in accordance with ASTM D4956, shall be a minimum of seventy (70) % of the retroreflectivity values required for like colored sheeting of the same material Type upon completion of the accelerated outdoor weathering.

After completion of the accelerated outdoor weathering, the areas of all signs processed with transparent inks or transparent films shall be in conformance with the requirements specified in the "Color" (daytime) and "Luminance Factor" subsections within the applicable Section 715.9.2.1, 715.9.2.2, 715.9.2.3, or 715.9.2.4 when tested in accordance with ASTM D4956.

If artificial accelerated lab weathering is conducted in order to obtain provisional approval for a material intended for work zone applications, per Section 715.9.2.9.1.1, the weathering process shall be done in accordance with the ASTM D4956 specifications. The performance requirements for the results of the testing shall be the same as described herein for accelerated outdoor weathering.

715.9.2.9.1.2--CSS Evaluation: Material Types and their matched components that are typically used in manufacturing processes within the CSS are subject to evaluation by WVDOH personnel for their suitability for use within the Division's CSS. This evaluation is primarily focused on the compatibility, workability, and general "user friendliness" of the materials when used for production purposes within the CSS using the equipment in place at the CSS, as well as the characteristics of the materials in these regards relative to other materials which have already been approved. The suitability of the materials in these regards shall be based solely on the judgment of the Division. The un-acceptance of the manufacturer's sheeting material and/or matched components based

on this evaluation shall not prevent the listing of these materials on the APL and the use of these materials by private fabricators supplying finished products to the WVDOH or to Contractors performing Contracts for the WVDOH.

In order for a sheeting material to be eligible for bidding on any Division raw material supply Contract, particular Section(s) of the Contract may require that only the sheeting material be determined to be suitable for use within the CSS. Other Section(s) may require that one or more of the matched components also be determined to be suitable for use within the CSS. These requirements shall be indicated in the raw material supply Contract.

In addition to any other requirements specified herein, in order to be accepted for manufacturing purposes within the CSS all sheeting materials shall permit application to aluminum blanks and shall permit processing with compatible matched components at temperatures between 60 to 100°F (16 to 38°C) and relative humidity at 20% to 80 % when performed in accordance with the manufacturer's recommendations. In addition, the sheeting and the matched component inks shall allow oven accelerated curing, providing that the manufacturer's recommendations are followed.

Any restrictions on the use of the material or any of the matched components within the CSS shall be noted on the APL.

In addition to the information provided above, note the following:

1. Type ASTM-I material is not specified for any applications on WVDOH advertised construction projects. The specifications and approval process described herein for Type ASTM-I material are in place solely for the purpose of establishing requirements for the placement of Type ASTM-I materials on the Division's APL. A listing of approved Type ASTM-I materials is maintained in order to establish a list of materials approved for bidding on Division raw material supply Contracts. Therefore, no Type ASTM-I material that is not accepted by the Division for manufacturing purposes within the CSS shall be placed on the APL.
2. Type ASTM-IV sheeting materials and their matched components intended for work zone (as described herein) applications only are not required to be evaluated for use within the CSS.
3. Type ASTM-VI sheeting materials and their matched components are not required to be evaluated for use within the CSS.
4. With the exception of fluorescent-orange material and its' applicable matched components intended for use in manufacturing temporary work zone signs, Type ASTM-XI sheeting materials and their matched components intended for work zone (as described herein) applications only are not required to be evaluated for use within the CSS.

715.9.2.9.2-Transfer Films: The transfer film section of the APL is solely for the purpose of establishing an approved list of transfer tapes for bidding on Division raw material supply Contracts. Private fabricators are not required to utilize transfer tapes listed on the APL. This shall be noted on the APL. Therefore, no transfer film that is not accepted by the Division for manufacturing purposes within the CSS shall be placed on the APL.

All transfer films submitted for approval shall be transparent. No other specific requirements are listed herein. However, transfer films shall be thoroughly evaluated by personnel within the Division's CSS. The CSS evaluation is primarily focused on the compatibility, workability, and general "user friendliness" of the material when used for production purposes within the CSS using the equipment in place at the CSS, as well as the characteristics of the material in these regards relative to other transfer films which have already been approved. The suitability of the material in this regard shall be based solely on the judgment of the Division.

ORIGINAL CONTRACT AMOUNT		DAILY CHARGE
From More Than	To And Including	Per Calendar Day
\$ 0	\$ 25,000	\$ 40
\$ 25,000	\$ 100,000	\$ 70
\$ 100,000	\$ 500,000	\$ 150
\$ 500,000	\$ 1,000,000	\$ 310
\$ 1,000,000	\$ 2,000,000	\$ 570
\$ 2,000,000	\$ 5,000,000	\$ 910
\$ 5,000,000	\$ 10,000,000	\$ 1410
\$ 10,000,000	-----	\$ 3280

Vendor comments/inquiries which have been submitted for this RFQ and responses/answers are as follows:

Comment/Inquiry #1: Page 23, 3.1.1.1.1 says, "The transfer tape supplied under this Contract shall be listed on the APL."

- We checked the APL (July 25, 2012), but could not find the products approved. Transfer tape is typically not a APL/QPL material due to the short life of usage.
APL/QPL requirement on this item might cause sole source situation.

Response/answer #1: The APL referenced is not the most current APL, and is not the APL that is applicable to this RFQ. The current APL is dated 6/14/13, and lists approved Transfer Films. The purpose of listing Transfer Films on the APL is explained in Section 715.9.2.9.2 of Exhibit B. A direct link to the 6/14/13 APL is as follows:

<http://www.transportation.wv.gov/highways/mcst/Documents/Reflective%20Sheeting%20Approved%20List-5-31-13.pdf>

A hard copy of the above referenced APL is also attached.

The 6/14/13 APL went into effect prior to the advertising date of this RFQ, therefore it is the APL applicable to this RFQ. However, this APL went into effect after the RFQ specifications were drafted. The direct link to the applicable APL changed when the 6/14/13 version went into effect (the direct link listed in the RFQ specs still points to the 7/25/12 version). All potential Vendors should consult the 6/14/13 version referenced above.

Comment/Inquiry #2: Page 64, 715.9.2.6.1 - Black Opaque Overlay Film

- It seems that DOT allows Black vinyl here, but does not allow Black vinyl with paper liner. The requirement for synthetic liner for non-reflective sheeting significantly restrict competition. We respectfully request DOT to accept Black vinyl with paper liner.
There are only three manufacturers, who can potentially participate in the Solicitation. Avery Dennison, 3M and Nippon Carbide Industries (NCI). NCI does not have Type IV nor Type XI. They can bid Type IV with beaded Type III, but it is not viable against prismatic Type IV. So, practically we (Avery Dennison) are the only one who can bid against 3M, if the spec allows.

Response/answer #2: The WVDOH does not allow vinyl black opaque film as an *option* under this RFQ. Per Section 715.9.2.6.1.1.6 of Exhibit B, any black opaque film supplied under this Contract is *required* to be a vinyl material. Generally speaking, as explained in Exhibit B the primary requirements for a matched component film material to be accepted for bidding under this RFQ (under the RFQ Sections that are applicable) are that a) the reflective sheeting material be listed on the APL, and b) the manufacturer's recommended matched components (this would include matched component films such as black vinyl material) be noted on the APL as being accepted by the WVDOH for manufacturing purposes within the Central Sign Shop. The liners associated with the matched component films provided by any potential Vendor for this Contract are a characteristic that may only potentially affect the WVDOH's acceptance of the material for use in the Central Sign Shop, since the type of liner will not affect the field performance of the material. In regards to reflective sheeting materials that may potentially be supplied under this RFQ, the footnote on the

APL associated with each applicable Avery Dennison reflective sheeting material states "All manufacturer matched components are approved for manufacturing within the WVDOH Central Sign Shop." Furthermore, it is noted that when testing was performed with the Avery Dennison black vinyl material in the Central Sign Shop, it was noted that this material is supplied on a paper liner. The language contained within Section 715.9.2.6.1 of Exhibit B is intended to be a very general description of the material and interpretation of the term "synthetic" as used here is an exercise in semantics. The Avery Dennison black vinyl matched component material with paper liner is acceptable under this RFQ.

Comment/Inquiry #3: White and Colored Vinyl:

- Sections II, III and V include White and Colored non-reflective vinyl. We respectfully request DOT to accept our (Avery Dennison) SC 900-xxx-O with paper liner.

Response/answer #3: See Response/answer #2 above. In regards to reflective sheeting materials that may potentially be supplied under this RFQ, the footnote on the APL associated with each applicable Avery Dennison reflective sheeting material states "All manufacturer matched components are approved for manufacturing within the WVDOH Central Sign Shop." The matched component materials referenced are acceptable.

Comment/Inquiry #4: Even though DOT created Sections IV and VI (non-dependent), the Solicitation is not "Full and Open". It is restrictive. We (Avery Dennison) respectfully request DOT to adopt the Generally Accepted Competitive Bid Procedures for Governments.

Response/answer #4: We respectfully disagree with this observation. The RFQ is open to any manufacturer which can demonstrate and provide materials which meet the requirements explained in detail in Exhibit B. Furthermore, no portions of the requirements in Exhibit B are in place as a result of any preference to any particular brand(s) or vendor(s). We are not familiar with the referenced "Generally Accepted Competitive Bid Procedures for Governments".

Approved Products List
Retroreflective Sign Sheet (715.9.2)
Effective Date: June 14, 2013 (see notes 1, 2, and 22)

81

<u>TRANSFER FILMS</u>		
<u>MANUFACTURER</u>	<u>PRODUCT</u>	<u>LAB APPROVAL NUMBER</u>
3M	TPM5 clear transfer tape (see note 11)	1433733
Avery Dennison	Z1XXX clear application tape (see note 11)	1433734

<u>TYPE ASTM-I</u>		
<u>MANUFACTURER</u>	<u>PRODUCT</u>	<u>LAB APPROVAL NUMBER</u>
3M	34XX Series (See note 21)	1433735
Avery Dennison	T-15XX Series (See note 3)	1394149

<u>TYPE ASTM-III</u>		
<u>MANUFACTURER</u>	<u>PRODUCT</u>	<u>LAB APPROVAL NUMBER</u>
Nippon Carbide	ULG-II N8XX Series (See note 15)	1394159

<u>TYPE ASTM-IV</u>		
<u>MANUFACTURER</u>	<u>PRODUCT</u>	<u>LAB APPROVAL NUMBER</u>
3M	Series 393X (See note 3)	1392883
3M	Series 331X (See note 4)	1433736
3M	Series 333X (See note 5)	1433737
3M	Series 33X (See note 5)	1394157
3M	Series 3340 (See note 17)	1433738
Avery Dennison	T-6XXX Series (See note 3)	1394161
Avery Dennison	W-6XXX Series (See note 4)	1394160

<u>TYPE ASTM-VI</u>		
<u>MANUFACTURER</u>	<u>PRODUCT</u>	<u>LAB APPROVAL NUMBER</u>
3M	RS-2X Series (See note 6)	1394162
Orafol of Americas	High Performance Series (See note 20)	1394163

<u>TYPE ASTM-IX</u>		
<u>MANUFACTURER</u>	<u>PRODUCT</u>	<u>LAB APPROVAL NUMBER</u>
3M	399X Series (See note 7)	1394171
3M	3981 Series (NOTICE: See note 19)	1394169
3M	3983 Series (See note 13)	1394170
Avery Dennison	T-950X (See note 7)	1394166
Avery Dennison	T-9511 (See note 12)	1394167
Avery Dennison	T-9513 (See note 13)	1394168
Avery Dennison	W-9514 (See note 10)	1394165
Nippon Carbide	Nikkalite CRG 95847 (See note 16)	1424104

<u>TYPE ASTM-XI</u>		
<u>MANUFACTURER</u>	<u>PRODUCT</u>	<u>LAB APPROVAL NUMBER</u>
3M	409X Series (See note 14)	1395497
3M	4081 Series (See note 8)	1395498
3M	4083 Series (See note 9)	1395499
3M	4084 Series (See note 18)	1394172
Avery Dennison	T-1150X (See note 7)	1424106
Avery Dennison	T-11511 (See note 12)	1424107
Avery Dennison	T-11513 (See note 13)	1424108
Avery Dennison	W-11514 (See note 10)	1424105

- purposes within the WVDOH Central Sign Shop. All manufacturer matched components are approved for manufacturing within the WVDOH Central Sign Shop.
- 14 - Various colored pressure sensitive sheetings for use with aluminum substrate signs and delineators, as specified and as recommended by the sheeting manufacturer. This approval does not include fluorescent materials. This material is classified as being rotationally sensitive. The reflective sheeting material is approved for manufacturing purposes within the WVDOH Central Sign Shop. All manufacturer matched components are approved for manufacturing within the WVDOH Central Sign Shop.
 - 15 - Various colored pressure sensitive sheetings for use with aluminum substrate signs. The reflective sheeting material is approved for manufacturing purposes within the WVDOH Central Sign Shop. The manufacturer matched components are not approved for manufacturing purposes within the WVDOH Central Sign Shop.
 - 16 - Fluorescent orange pressure sensitive sheetings for use with aluminum substrate signs. The reflective sheeting material is approved for manufacturing purposes within the WVDOH Central Sign Shop. The manufacturer matched components are not approved for manufacturing purposes within the WVDOH Central Sign Shop.
 - 17 - Pressure sensitive sheeting for use with traffic cones, as specified and as recommended by the sheeting manufacturer.
 - 18 - Fluorescent orange pressure sensitive sheeting for use with aluminum substrate signs. This material is classified as being rotationally sensitive. The reflective sheeting material is approved for manufacturing purposes within the WVDOH Central Sign Shop. All manufacturer matched components are approved for manufacturing within the WVDOH Central Sign Shop.
 - 19 - Fluorescent yellow pressure sensitive sheeting for use with aluminum substrate signs and delineators, as specified and as recommended by the sheeting manufacturer. The reflective sheeting material is approved for manufacturing purposes within the WVDOH Central Sign Shop. All manufacturer matched components are approved for manufacturing within the WVDOH Central Sign Shop. **NOTE: Approval of this material has been placed on "hold". No finished products utilizing this material are to be supplied on any projects advertised on or after 7/25/12.**
 - 20 - Sheeting for use in manufacturing work zone roll-up signs. This material shall not be considered approved on projects for which the 5/2/13 Special Provision referenced under Note #1 applies to.
 - 21 - Various colored pressure sensitive sheetings for use with aluminum substrate signs, as specified. This material is classified as being rotationally sensitive. The reflective sheeting material and all manufacturer matched components are approved for manufacturing within the WVDOH Central Sign Shop.
 - 22 - The value(s) "X" in material designations are place holders which indicate variable numerical values. These values vary based on different colors and/or widths (cut widths or stripe widths) configurations of the material and/or intended substrates for the material.



State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Solicitation

NUMBER
8513C2012

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
ALAN CUMMINGS 304-558-2402

RFQ COPY

TYPE NAME/ADDRESS HERE

3M Company
3M Center Bldg 235-3A-09
St. Paul, MN. 55144-1000

DIVISION OF HIGHWAYS
TRAFFIC SERVICES COMPLEX

180 DRY BRANCH ROAD
CHARLESTON, WV
25306 304-558-2908

DATE PRINTED
08/27/2013

BID OPENING DATE: 09/18/2013

BID OPENING TIME 1:30PM

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
ADDENDUM NO. 04						
CREATED TO REISSUE SPECIFICATIONS IN THEIR ENTIRETY, ADDRESS VENDOR QUESTIONS AND AGENCY RESPONSES, AND TO EXTEND THE BID OPENING TO 09/18/13 AT 1:30 P.M.						
0001	1	LS		550-48	** Please see Price	Pages within bid
REFLECTIVE SIGN SHEETING & ASSOCIATED MATERIALS documents						for unit prices.
***** THIS IS THE END OF RFQ 8513C2012 ***** TOTAL:						\$ 257,553.42

SIGNATURE	TELEPHONE 800-553-1380	DATE September 13, 2013
TITLE Contract Administrator	FEIN 41-0417775	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

SOLICITATION NUMBER: 8513C2012

Addendum Number: 4

The purpose of this addendum is to modify the solicitation identified as ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

- ☒ | Modify bid opening date and time
- ☒ | Modify specifications of product or service being sought
- ☒ | Attachment of vendor questions and responses
- ☐ | Attachment of pre-bid sign-in sheet
- ☒ | Correction of error
- ☐ | Other

Description of Modification to Solicitation:

CREATED TO REISSUE SPECIFICATIONS IN THEIR ENTIRETY,
ADDRESS VENDOR QUESTIONS AND AGENCY RESPONSES, AND TO
EXTEND THE BID OPENING TO 09/18/13 AT 1:30 P.M.

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

ATTACHMENT A



State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Solicitation

NUMBER
8513C2012

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
ALAN CUMMINGS 304-558-2402

VENDOR	RFQ COPY
	TYPE NAME/ADDRESS HERE
	3M Company
	3M Center Bldg 235-3A-09 St. Paul, MN 55144-1000

SHIP TO	DIVISION OF HIGHWAYS
	TRAFFIC SERVICES COMPLEX
	180 DRY BRANCH ROAD
	CHARLESTON, WV 25306 304-558-2908

DATE PRINTED
08/08/2013

BID OPENING DATE: 08/28/2013 BID OPENING TIME 1:30PM

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
ADDENDUM NO. 03						
ISSUED TO CHANGE THE BID OPENING DATE AND TIME FROM: 08/14/2013 AT 1:30 P.M. TO 08/28/2013 AT 1:30 P.M.						
0001	1	LS		550-48	** Please see price	pages within Bid Documents.
REFLECTIVE SIGN SHEETING & ASSOCIATED MATERIALS						
***** THIS IS THE END OF RFQ 8513C2012 ***** TOTAL:						** Please see price pages within Bid Documents.
SIGNATURE <i>[Signature]</i> TELEPHONE 800-553-1380 DATE September 13, 2013						
TITLE Contract Administrator			FEIN 41-0417775		ADDRESS CHANGES TO BE NOTED ABOVE	

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

SOLICITATION NUMBER: 8513C2012

Addendum Number: 3

The purpose of this addendum is to modify the solicitation identified as ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

- ☒ Modify bid opening date and time
- ☐ Modify specifications of product or service being sought
- ☐ Attachment of vendor questions and responses
- ☐ Attachment of pre-bid sign-in sheet
- ☐ Correction of error
- ☐ Other

Description of Modification to Solicitation:

ISSUED TO CHANGE THE BID OPENING DATE AND TIME FROM:
08/14/2013 AT 1:30 P.M. TO 08/28/2013 AT 1:30 P.M.

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

ATTACHMENT A

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: 8513C2012

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

<input checked="" type="checkbox"/> Addendum No. 1	<input type="checkbox"/> Addendum No. 6
<input checked="" type="checkbox"/> Addendum No. 2	<input type="checkbox"/> Addendum No. 7
<input checked="" type="checkbox"/> Addendum No. 3	<input type="checkbox"/> Addendum No. 8
<input type="checkbox"/> Addendum No. 4	<input type="checkbox"/> Addendum No. 9
<input type="checkbox"/> Addendum No. 5	<input type="checkbox"/> Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

3M Company

Company

John N. Morris

Authorized Signature

September 13, 2013

Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.
 Revised 6/8/2012



State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Solicitation

NUMBER
8513C2012

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF.
ALAN CUMMINGS 304-558-2402

RFQ COPY

TYPE NAME/ADDRESS HERE

3M Company

3M Center Bldg 235-3A-09

St. Paul, MN 55144-1000

DIVISION OF HIGHWAYS TRAFFIC SERVICES COMPLEX

180 DRY BRANCH ROAD
CHARLESTON, WV

25306

304-558-2908

DATE PRINTED
07/30/2013

BID OPENING DATE:

08/14/2013

BID OPENING TIME 1:30PM

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
ADDENDUM NO. 02 ISSUED TO CHANGE THE BID OPENING DATE AND TIME FROM: 07/31/2013 AT 1:30 P.M. TO 08/14/2013 AT 1:30 P.M.						
0001	1	LS		550-48	** Please see price	pages within Bid Documents.
REFLECTIVE SIGN SHEETING & ASSOCIATED MATERIALS						
***** THIS IS THE END OF RFQ 8513C2012 ***** TOTAL:						** Please see price pages within Bid Documents

SIGNATURE

TELEPHONE 800-553-1380

DATE September 13, 2013

TITLE	Contract Administrator	FEIN	41-0417775
-------	------------------------	------	------------

ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

SOLICITATION NUMBER: 8513C2012

Addendum Number: 2

The purpose of this addendum is to modify the solicitation identified as ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

- ☒ | Modify bid opening date and time
- ☐ | Modify specifications of product or service being sought
- ☐ | Attachment of vendor questions and responses
- ☐ | Attachment of pre-bid sign-in sheet
- ☐ | Correction of error
- ☐ | Other

Description of Modification to Solicitation:

ISSUED TO CHANGE THE BID OPENING DATE AND TIME FROM:
07/31/2013 AT 1:30 P.M. TO 08/14/2013 AT 1:30 P.M.

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

ATTACHMENT A

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: 8513C2012

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

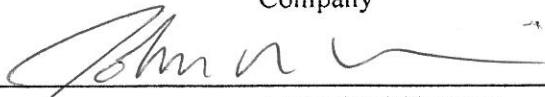
(Check the box next to each addendum received)

<input checked="" type="checkbox"/> Addendum No. 1	<input type="checkbox"/> Addendum No. 6
<input checked="" type="checkbox"/> Addendum No. 2	<input type="checkbox"/> Addendum No. 7
<input type="checkbox"/> Addendum No. 3	<input type="checkbox"/> Addendum No. 8
<input type="checkbox"/> Addendum No. 4	<input type="checkbox"/> Addendum No. 9
<input type="checkbox"/> Addendum No. 5	<input type="checkbox"/> Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

3M Company

Company



John N. Morris

Authorized Signature

September 13, 2013

Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.

Revised 6/8/2012



State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Solicitation

NUMBER	PAGE
8513C2012	1
ADDRESS CORRESPONDENCE TO ATTENTION OF	
ALAN CUMMINGS 304-558-2402	

RFQ COPY

TYPE NAME/ADDRESS HERE

3M Company
3M Center Bldg 235-3A-09
St. Paul, MN 55144-1000

DIVISION OF HIGHWAYS
TRAFFIC SERVICES COMPLEX

180 DRY BRANCH ROAD
CHARLESTON, WV
25306 304-558-2908

DATE PRINTED
07/12/2013

BID OPENING DATE: 07/31/2013

BID OPENING TIME 1:30PM

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
ADDENDUM NO. 01						
ISSUED TO CHANGE THE BID OPENING DATE AND TIME FROM: 07/17/2013 AT 1:30 P.M. TO 07/31/2013 AT 1:30 P.M.						
C001	1	LS		550-48	** Please see price pages within in	Bid Documents.
REFLECTIVE SIGN SHEETING & ASSOCIATED MATERIALS						
***** THIS IS THE END OF RFQ 8513C2012 ***** TOTAL:						** Please see Price Pages within the Bid Documents.
SIGNATURE				TELEPHONE 800-553-1380		DATE September 13, 2013
TITLE Contract Administrator		FEIN 41-0417775		ADDRESS CHANGES TO BE NOTED ABOVE		

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

SOLICITATION NUMBER: 8513C2012

Addendum Number: 1

The purpose of this addendum is to modify the solicitation identified as ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

- ☒ | Modify bid opening date and time
- ☐ | Modify specifications of product or service being sought
- ☐ | Attachment of vendor questions and responses
- ☐ | Attachment of pre-bid sign-in sheet
- ☐ | Correction of error
- ☒ | Other

Description of Modification to Solicitation:

Issued to change bid opening date and time from: 07/17/2013 at 1:30 P.M. to 07/31/2013 at 1:30 P.M.

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

ATTACHMENT A

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: 8513C2012

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

<input checked="" type="checkbox"/> Addendum No. 1	<input type="checkbox"/> Addendum No. 6
<input type="checkbox"/> Addendum No. 2	<input type="checkbox"/> Addendum No. 7
<input type="checkbox"/> Addendum No. 3	<input type="checkbox"/> Addendum No. 8
<input type="checkbox"/> Addendum No. 4	<input type="checkbox"/> Addendum No. 9
<input type="checkbox"/> Addendum No. 5	<input type="checkbox"/> Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

3M Company

 Company


 John N. Morris Authorized Signature

 September 13, 2013

 Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.
 Revised 6/8/2012

POWER OF ATTORNEY

By the authority granted the undersigned by the Deputy General Counsel and Secretary, the individuals listed below are appointed as 3M's, or its designated subsidiaries', true and lawful attorneys-in-fact for it, and in its name, for commercially-available products and services and government-unique products and services (except research and development services¹) for which 3M or its designated subsidiaries will be a prime contractor or subcontractor to any federal, state or municipal governmental agency in the United States, or to a federal, state or municipal prime contractor or higher tier subcontractor in the United States, to do acts specified on behalf of this Corporation.

- (a) To submit or execute proposals, bids, binding purchase orders, contracts and subcontracts, and documents related thereto, excluding certifications, representations and warranties to comply with certain laws or regulations² (hereafter referred to as "certifications"), the following attorneys-in-fact are hereby appointed. Authority may not be sub-delegated.

Authority for the below individuals applies to the specific Business Unit or staff function indicated, subject to the limitations imposed by their respective General Manager/Vice President or equivalent.

- | | | | |
|---|--|---|---|
| • <u>3M Purification Inc.</u>
Richard P. Couture | • <u>Electronics Markets Materials Division</u>
Joseph F. Koch | • <u>Industrial Adhesive and Tapes Division</u>
<i>Authority for the below individual(s) applies to Federal Supply Schedule contracts only:</i>
Perry M. Canniff | • <u>Traffic Safety and Security Division</u>
Catherine J. LeClair
Chad Reed
Dan J. McGurran
Daniel F. Moran
David A. Pointon
Ella M. Schiralli
John N. Morris
John P. Benz
John W. Lehman
Linda M. Gondringer
Mary K. Zilles
Matthew J. Bignell
Matthew R. Leibel
Nicole A. Christopherson
Richard J. LaClair
Robert L. Storeygard
Tim O'Leary |
| • <u>3M ESPE Division</u>
Todd M. Scott | • <u>Electrical Markets Division</u>
Timothy A. Koenig | • <u>Infection Prevention Division</u>
Melanie J. Zahler
-Health Care Service Support
Bill J. Biebesheimer | • <u>Venture Tape Corporation</u>
Perry M. Canniff |
| • <u>3M Unitek Corporation</u>
Vincent Martinez | • <u>Food Safety Department</u>
Melissa A. Mallak | • <u>Optical Systems Division</u>
Mick A. Summers | |
| • <u>Aero Technologies LLC</u>
Perry M. Canniff | • <u>Government R&D Contracts Department</u>
Steven L. Kays
Ruth P. Charles
Vivien L. Smith | • <u>Personal Safety Division</u>
Thomas L. Kettelman | |
| • <u>Aerospace and Aircraft Maintenance Division</u>
Perry M. Canniff | • <u>GTA-NHT, Inc.</u>
Perry M. Canniff | • <u>Quest Technologies</u>
James D. Banach | |
| • <u>Abrasive Systems Division</u>
Perry M. Canniff | • <u>Health Information Systems Division</u>
Andee S. Andriole
Deborah A. Mason
Garri L. Garrison
Gayl W. Kirkpatrick
Gerald R. Jennings
James R. McDonough
Jan C. Cline
John C. Mathison
Lisa M. Black
Myung H. Kim
Paulette Brimley
Ray J. Terrill Jr.
Terri G. McCubbin | • <u>Stationery and Office Supplies Division</u>
Malcolm P. West | |
| • <u>Advanced Materials Division</u>
Scott R. Hanson | | | |
| • <u>Critical and Chronic Care Solutions Division</u>
Melanie J. Zahler | | | |

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|---|--|
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Paul H. Sander
Derrick E. Hiller | • <u>Government Markets</u>
Karen A. Kindem
Laurie A. Patrick |
| • <u>Government Contract Compliance</u>
Elizabeth A. Grimes
Karin Stein O'Boyle
Richard J. Bordas | • <u>Office of General Counsel</u>
Richard N. Kuyath |

¹ Authority to submit proposals and sign contracts for research and development services is managed by the Executive Vice President & Chief Technology Officer for Research & Development.

² Product or performance warranties are to be reviewed and accepted by any 3M individual granted authority or responsibility to do so by the applicable business unit or staff group.

(b) To make certifications, except Country of Origin certifications, the following attorneys-in-fact are hereby appointed. Authority may not be sub-delegated, except certifications made by other attorneys-in-fact listed in paragraph (a) may be authorized in writing by one of the individuals listed in paragraph (b) after a determination by one of the individuals in paragraph (b) that such certification is valid. Unfamiliar certifications must be cleared with the Government Contract Compliance department prior to execution.

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- 3M ESPE Division
Todd M. Scott
- 3M Unitek Corporation
Vincent Martinez
- Aero Technologies LLC
Perry M. Canniff
- Abrasive Systems Division
Perry M. Canniff
- Aerospace and Aircraft Maintenance Division
Perry M. Canniff
- Advanced Materials Division
Scott R. Hanson
- Critical and Chronic Care Solutions Division
Melanie J. Zahler
- Electronics Markets Materials Division
Joseph F. Koch
- Food Safety Department
Melissa A. Mallak
- Government R&D Contracts Department
Steven L. Kays
Ruth P. Charles
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Andee S. Andriole
Deborah A. Mason
Garri L. Garrison
Gayl W. Kirkpatrick
Gerald R. Jennings
James R. McDonough
Jan C. Cline
John C. Mathison
Lisa M. Black
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- Quest Technologies
James D. Banach
- Traffic Safety and Security Division
Chad Reed
Dan J. McGurran
Daniel F. Moran
John N. Morris
John P. Benz
Linda M. Gondringer
Mary K. Zilles
Matthew J. Bignell
Matthew R. Leibel
Richard J. LaClair
Robert L. Storevaard
Tim O'Leary
- Venture Tape Corporation
Perry M. Canniff

Authority for the below individuals applies to the specific Business Unit or staff function.

- Global Channel Services
Derrick E. Hiller
- Government Contract Compliance
Elizabeth A. Grimes
Karin Stein O'Boyle
Richard J. Bords
- Government Markets
Karen A. Kindem
Laurie A. Patrick
- Office of General Counsel
Richard N. Kuyath

(c) To make Country of Origin certifications, the following attorney(s)-in-fact are hereby appointed:

- Office of General Counsel
Richard N. Kuyath
- Trade Compliance Department
Authority may be sub-delegated in writing:
Doug G. Whitman

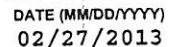
For all appointments, authority ceases or may be subsequently modified upon the individual's change in business unit, staff group or responsibilities, or when employment is terminated. Authority may be withdrawn or modified at any time.

This Power of Attorney revokes all prior Powers of Attorney with respect to the same matters and shall remain in effect until terminated by the undersigned or any other person authorized to grant powers of attorney on behalf of 3M. The undersigned has signed this Power of Attorney on this

18th day of July, 2013.

3M Company

By 
James S. Anderson
Director, Government Contract Compliance



IMPORTANT: If the certificate holder is an **ADDITIONAL INSURED**, the policy(ies) must be endorsed. If **SUBROGATION IS WAIVED**, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

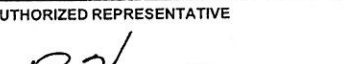
PRODUCER	Willis of Minnesota, Inc. c/o 26 Century Blvd. P. O. Box 305191 Nashville, TN 37230-5191	CONTACT NAME:	
		PHONE (A/C NO. EXT): 877-945-7378	FAX (A/C NO.): 888-467-2378
INSURED	3M Company 3M Insurance Department Bldg 224-5S-29 St. Paul, MN 55144	E-MAIL ADDRESS: certificates@willis.com	
		INSURER(S) AFFORDING COVERAGE	
		INSURER A: Old Republic Insurance Company	
		INSURER B:	
		INSURER C:	
		INSURER D:	
		INSURER E:	
		INSURER F:	

REVISION NUMBER:

INSR LTR	TYPE OF INSURANCE	ADD'L INSRD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC			MWZY 59131	3/1/2011	3/1/2014	EACH OCCURRENCE \$ 5,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 1,000,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 5,000,000 GENERAL AGGREGATE \$ 5,000,000 PRODUCTS - COMP/OP AGG \$ 5,000,000 \$
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS <input type="checkbox"/>			MWTB 21146	3/1/2011	3/1/2014	COMBINED SINGLE LIMIT (Ea accident) \$ 2,000,000 BODILY INJURY(Per person) \$ BODILY INJURY(Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
	<input type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input type="checkbox"/> RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$ \$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N N	N/A	MWC116992 02	3/1/2013	3/1/2014	<input checked="" type="checkbox"/> WC STATU-TORY LIMITS <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 2,000,000 E.L. DISEASE - EA EMPLOYEE \$ 2,000,000 E.L. DISEASE - POLICY LIMIT \$ 2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach Acord 101, Additional Remarks Schedule, if more space is required)												
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CANCELLATION

<p>CERTIFICATE HOLDER</p>	<p>SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.</p>
<p>Evidence of Coverage</p> <p>.</p> <p>.</p> <p>.</p>	<p>AUTHORIZED REPRESENTATIVE</p> 



Engineer Grade Prismatic Reflective Sheeting

Series 3430 with Pressure Sensitive Adhesive

Meets ASTM Type I

Product Bulletin 3430-U.S.

July 2009

Description

3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430 meets ASTM D4956 Type I and is a non-metalized micro-prismatic lens retroreflective sheeting designed for production of reflective commercial signs and non-critical traffic control signs that are exposed vertically in service. Series 3430 sheeting can easily be identified by the visible integral “EGP” marking. When applied to properly prepared sign substrates, 3430 sheeting provides long-term reflectivity and durability. Series 3430 sheeting is available in the following colors.

<u>Color</u>	<u>Product Code</u>
White	3430
Yellow	3431
Red	3432
Blue	3435
Green	3437
Brown	3439

Sign Fabrication Methods

Application

Series 3430 sheeting comes with pressure sensitive adhesive and should be applied to the sign substrate at room temperature 65°F (18°C) or higher by any of the following methods:

Mechanical squeeze roll applicator - Reference 3M Information Folder 1.4 (Room temperature application)

Application to extruded guide sign panels that require edge wrapping requires heat directed at the next-to-last edge roller. Cracking or edge lifting may occur if the sheeting is not sufficiently heated during the edge wrapping process.

Hand squeeze roll applicator - Reference 3M Information Folder 1.6

Hand Application

Hand application is recommended for legend and copy only. Application of sheeting for complete signs or backgrounds must be performed with a roll laminator, either mechanical or hand. See 3M Information Folder 1.5 for more details.

Hand applications may result in visual irregularities that may be aesthetically objectionable to some customers. Such irregularities are more noticeable on darker colors. To obtain a close-up uniform appearance, a roll laminator must be used.

All direct applied copy and border **MUST** be cut at all metal joints and squeegeed at the joint.

Splices

Series 3430 sheeting should be butt spliced when more than one piece of sheeting is used on one piece of substrate. The sheeting pieces should not touch each other at the splice, where a gap of up to 1/16 inch is acceptable. This is to prevent buckling as the sheeting expands in extreme temperature/humidity exposure. If the visual appearance of the splice is important or a slight gap is undesirable, the following procedures must be followed:

1. Overlap the sheeting at least one inch, with or without the liner attached.
2. Using a straight edge and a sharp utility knife, cut through both layers of reflective sheeting.
3. Peel back and remove cut remnants. If liner was left on, remove and roll down remaining sheeting.
4. Seal edge with thinned 3M™ Process Color 880I Clear using a fine artist paintbrush.

Double Faced Signs - Series 3430 sheeting can be damaged by direct exposure to steel laminating rolls. When fabricating double-faced sided signs, a piece of cardboard must be placed between the sheeting and steel laminating roll. The Highway Handyman 12" HSRA is equipped with rubber top and bottom rolls that will prevent any damage the sheeting.

Substrates

For traffic sign use properly prepared sheet or extruded aluminum is recommended. While most clean, smooth, relatively non-porous, flat, rigid, weather resistant surfaces can be prepared for application of retroreflective sheeting, the user must evaluate any substrate other than aluminum for adhesion and sign durability. 3M is not liable for sign failures caused by the substrate (deformation, outgassing, cracking, warping, etc. leading to cosmetic or functional failure of the sign sheeting) or improper surface preparation. (See 3M Information Folder 1.7). Extrusions can be wrapped or trimmed, and flat panel signs are to be carefully trimmed so that sheeting from adjacent panels are not in contact with each other. Series 3430 sheeting is designed primarily for application to flat substrates. Any use that requires a radius of curvature of less than five inches should also be supported by rivets or bolts. Plastic substrates are not recommended where cold shock performance is essential.

Screen Processing

Series 3430 sheeting may be screen processed into traffic signs before or after mounting on a sign substrate, using 3M Process Colors Series 880I (see Product Bulletin 880I) or Series 880N (see Product Bulletin 880N). Series 880I or 880N process colors can be screened at 60-100°F (16-38°C) at relative humidity of 20-50%. A PE 157 screen mesh with a fill pass is recommended. See Information Folder 1.8 for details. Use of other process colors series is not recommended. 3M assumes no responsibility for failure of sign face legends or backgrounds that have been processed with non-3M process colors or 3M process colors other than those listed above.

For white sheeting screen printed with 3M transparent inks or covered with 3M™ Electrocut™ Film Series 1170, the R_A for the colored areas should be no less than 70% of the minimum R_A as specified in Table A for the corresponding integral colored sheeting.

Care should be taken to avoid flexing Series 3430 sheeting before and especially after screening to eliminate the possibility of cracking from improper handling techniques.

Cutting and Matching

The sheeting may be hand cut or die cut one sheet at a time, and band sawed or guillotined in stacks. Series 3430 sheeting can be hand cut from either side with a razor blade or other sharp hand tool. Like all reflective sheetings, when two or more pieces are used side by side on a sign, they must be matched to assure uniform daytime and nighttime appearance.

Cutting equipment such as guillotines and metal shears, that have pressure plates on the sheeting when cutting, may damage the optics. Padding the pressure plate and easing it down onto the sheets will significantly reduce damage.

Maximum stack height for cutting Series 3430 sheeting is 1-1/2 inches or 50 sheets. Details on cutting can be found in 3M Information Folder 1.10. **Note:** If direct copy is cut with a friction fed plotter, a minimum 550 gm downforce is required.

When used as background, sheeting should be oriented identically across all panels or pieces of the sign for uniform appearance of sign background (the seal pattern or tiles in the same direction).

Edge sealing Series 3430 sheeting is generally not required. Following extended exposure, airborne dust particles may become trapped within the row of cut cells along the sheeting edge. This should have no adverse effect on sign performance. If the user chooses to edge seal, series 880I process color should be used.

Cleaning

Signs that require cleaning should be flushed with water, then washed with a detergent solution and bristle brush or sponge. Avoid pressure that may damage the sign face. Flush with water following washing. Do not use solvents to clean signs. See 3M Information Folder 1.10.

Storage and Packaging

Series 3430 sheeting should be stored in a cool, dry area, preferably at 65-75°F (18-24°C) and 30-50% relative humidity and should be applied within one year of purchase. Rolls should be stored horizontally in the shipping carton. Partially used rolls should be returned to the shipping carton or suspended horizontally from a rod or pipe through the core. Unprocessed sheets should be stored flat. Finished signs and applied blanks should be stored on edge. Screen processed signs must be protected with the adhesive liner or SCW 568 slipsheet paper. Place the glossy side of the slipsheeting against the sign face and pad the face with closed cell packaging foam. Double-faced signs must have the glossy side of the slipsheet against each face of the sign.

Unmounted screened faces must be stored flat and interleaved with SCW 568 slipsheet, glossy side facing the sign face. Packages of finished sign faces must be supplemented with nylon washers for mounting. Avoid banding, crating, or stacking signs. Package for shipment in accordance with commercially accepted standards to prevent movement and chafing. Store sign packages indoors on edge.

Panels or finished signs must remain dry during shipment and storage. If packaged signs become wet, unpack immediately and allow signs to dry. See Information Folder 1.11 for instructions on packing for storage and shipment.

Installation

Nylon washers are recommended between the heads of all twist fasteners (such as screw heads, bolts, or nuts) and the sheeting to protect the sheeting from the twisting action of the bolt heads.

Health and Safety Information

Read all health hazard, precautionary and first aid statements found in the Material Safety Data Sheet, and/or product label of chemicals prior to handling or use.

General Performance Considerations

The durability of 3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430 will depend upon substrate selection and preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance.

Engineer grade prismatic reflective sheeting can be expected to provide satisfactory performance for 5-7 years when processed with 3M matched component inks and films, depending upon climatic conditions of the installation.

Maximum durability of Series 3430 sheeting can be expected in applications subject to vertical exposure on stationary objects when processed and applied to properly prepared aluminum according to 3M recommendations provided in 3M Information Folder 1.7 on Sign Substrate Surface Preparation.

The user must determine the suitability of any nonmetallic sign backing for its intended use.

Applications to unprimed, excessively rough or non-weather-resistant surfaces, or exposure to severe or unusual conditions can shorten the performance of such applications. Signs in mountainous areas that are covered by snow for prolonged periods may also have reduced durability.

3M process colors, when used according to 3M recommendations, are generally expected to provide performance comparable to colored reflective sheeting.

Dilution of color and atmospheric conditions in certain geographic areas may result in reduced durability.

3M™ ElectroCut™ Film Series 1170 can be expected to perform satisfactorily for the life of the sign when direct applied to series 3430 sheeting.

Minimum coefficient of retroreflection, chromaticity limits, and daytime luminance factor (Y%) for the Engineer Grade Prismatic Sheeting Series 3430 are given in Table A and Table B, respectively.

Table A - Minimum Coefficient of Retroreflection
Candelas/Foot Candle/Square Foot
Candelas/Lux/Square Meter

Obs. ¹ Angle	Ent. Angle ²	White	Yellow	Red	Green	Blue	Brown
0.2	-4	70	50	14.5	9.0	4.0	2.0
0.2	+30	30	22	6.0	3.5	1.7	1.0
0.5	-4	30	25	7.5	4.5	2.0	1.0
0.5	+30	15	13	3.0	2.2	0.8	0.5
Reflectivity conforms to ASTM D 4956.							
¹ Observation Angle - The angle between the illumination axis and the observation axis.							
² Entrance Angle - The angle from the illumination axis to the retroreflector axis. The retroreflector axis is an axis perpendicular to the retroreflective surface.							

Table B - CIE Chromaticity Coordinate Limits

									Reflectance Limit (Y)	
Color	x	y	x	y	x	y	x	y	Min	Max
White	.303	.300	.368	.366	.340	.393	.274	.329	27.0	
Yellow	.498	.412	.557	.442	.479	.520	.438	.472	15.0	45.0
Red	.648	.351	.735	.265	.629	.281	.565	.346	2.5	12.0
Blue	.140	.035	.244	.210	.190	.255	.065	.216	1.0	10.0
Green	.026	.399	.166	.364	.286	.446	.207	.771	3.5	9.0
Brown	.430	.340	.610	.390	.550	.450	.430	.390	4.0	9.0

Limitation of Liability and Remedies

3M's liability under this warranty is limited to replacement or allowance as stated herein, and 3M assumes no liability for incidental or consequential damages such as lost profits, business or revenue in any way related to the product regardless of the legal theory on which the claim is based.

Literature Reference

IF 1.4 Instructions for Squeeze Roll Applicator
 PB880I 3M™ Process Color Series 880I
 PB880N 3M™ Process Color Series 880N
 IF 1.5 Hand Application Instructions
 IF 1.6 Instructions for Hand Squeeze Roll Applicator
 IF 1.7 Sign Base Materials
 IF 1.8 Color Application Instructions
 IF 1.10 Cutting, Matching, Premasking, and Prespacing Instructions
 IF 1.11 Storage Maintenance, and Removal Instructions
 "Standard Highway Signs, As Specified in the Manual on Uniform Traffic Control Devices", U.S. Department of Transportation, Federal Highway Administration, 1979.

FOR INFORMATION OR ASSISTANCE

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1-800-553-1380

IN CANADA CALL:

1-800-265-1840

Internet:

www.3M.com/tss

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All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of all warranties, or conditions express or implied. Seller's and manufacturer's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct, special or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his/her intended use, and user assumes all risk and liability whatsoever in connection therewith. Statements or recommendations not contained herein shall have no force or effect unless in an agreement signed by officers of seller and manufacturer.

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Boiger 9070764
Electronic Only



High Intensity Prismatic Reflective Sheeting Series 3930

Product Bulletin 3930

January 2013

Replaces PB 3930 dated January 2012

Description

3M™ High Intensity Prismatic Reflective Sheeting Series 3930 is a non-metalized microprismatic lens reflective sheeting designed for production of reflective durable traffic control signs, work zone devices and delineators that are exposed vertically in service. Applied to properly prepared sign substrates, 3M high intensity prismatic sheeting provides long-term reflectivity and durability. Series 3930 sheeting is available in the following colors.

Color	Product Code
White	3930
Yellow	3931
Red	3932
Orange	3934
Blue	3935
Green	3937
Brown	3939
Color – TT Series	
White – thermal transfer (TT) printable	3930TT
Yellow – TT printable	3931TT

Photometrics

Daytime Color (x,y,Y)

The chromaticity coordinates and total luminance factor of the retroreflective sheeting conform to Table A.

Color Test – Ordinary Colored Sheeting

Conformance to standard chromaticity (x, y) and luminance factor (Y %) requirements shall be determined by instrumental method in accordance with ASTM E 1164 on sheeting applied to smooth aluminum test panels cut from Alloy 6061-T6 or 5052-H38. The values shall be determined on a HunterLab ColorFlex 45/0 spectrophotometer. Computations shall be done for CIE Illuminant D65 and the 2° standard observer.²

²The instrumentally determined color values of retroreflective sheeting can vary significantly depending on the make and model of colorimetric spectrophotometer as well as the color and retroreflective optics of the sheeting (David M. Burns and Timothy J. Donahue, Measurement Issues in the Color Specification of Fluorescent Retroreflective Materials for High Visibility Traffic Signing and Personal Safety Applications, Proceedings of SPIE: Fourth Oxford Conference on Spectroscopy, 4826, pp. 39-49, 2003). For the purposes of this document, the HunterLab ColorFlex 45/0 spectrophotometer shall be the referee instrument.

Coefficients of Retroreflection (R_A)

The values in Table B are minimum coefficients of retroreflection expressed in candelas per lux per squaremeter (cd/lux/m²).

Table A Daytime color specification limits¹

Color	x	y	x	y	x	y	x	y	Daytime Luminance Limit	
									Min.	Max.
White	0.303	0.300	0.368	0.366	0.340	0.393	0.274	0.329	27	
Yellow	0.498	0.412	0.557	0.422	0.479	0.520	0.438	0.472	15	45
Red	0.648	0.351	0.735	0.265	0.629	0.281	0.565	0.346	2.5	15
Orange	0.558	0.352	0.636	0.364	0.570	0.429	0.506	0.404	10	30
Blue	0.140	0.035	0.244	0.210	0.190	0.255	0.065	0.216	1	10
Green	0.026	0.399	0.166	0.364	0.286	0.446	0.207	0.771	3	12
Brown	0.430	0.340	0.610	0.390	0.550	0.450	0.430	0.390	1	9

¹The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 Standard Colorimetric System.

Test for Coefficients of Retroreflection

Conformance to coefficient of retroreflection requirements shall be determined by instrumental method in accordance with ASTM E-810 "Test Method for Coefficient of Retroreflection of Retroreflective Sheeting", and per E-810 the values of 0° and 90° rotation are averaged to determine the R_A in Table B.

Table B

Minimum Coefficient of Retroreflection R_A for new fluorescent sheeting (cd/lux/m²)

-4° Entrance Angle ³	Observation Angle ⁴	
	0.2°	0.5°
White	560	200
Yellow	420	150
Red	84	30
Orange	210	75
Green	56	21
Blue	30	13
Brown	18	7.5
30° Entrance Angle ³		
White	280	100
Yellow	210	75
Red	42	15
Orange	105	37
Green	28	10
Blue	14	6
Brown	8.5	3.5

³Entrance Angle – The angle from the illumination axis to the retroreflector axis. The retroreflector axis is an axis perpendicular to the retroreflective surface.

⁴Observation Angle – The angle between the illumination axis and the observation axis.

Printed Colors and Overlay Films

For screenprinted or thermally transfer printed transparent color areas on white sheeting when processed according to 3M recommendations, the coefficients of retroreflection shall not be less than 70% of the value for the corresponding color in Table B. For white sheeting covered with 3M™ ElectroCut™ Film Series 1170 when processed according to 3M recommendations, the coefficients of retroreflection shall not be less than 100% of the value for the corresponding color in Table B. The color chromaticity and luminance shall conform to Table A on page 1.

Entrance Angularity Performance in Regard to Orientation

High intensity prismatic reflective sheeting is designed to be an effective wide angle reflective sheeting regardless of its orientation on the substrate or ultimate orientation of the sign after installation. Signs and applied copy (letters, arrows, borders and shields) can be fabricated and installed using the application orientation that most efficiently utilizes the reflective sheeting.

Note: For multi-panel signs it is recommended that all background panels be sheeted such that the sheeting direction is the same for all panels.

Fabrication Lines

The manufacture of prismatic sheeting results in lines being present in the product. In high intensity prismatic sheeting these lines are slightly thicker than the seal pattern legs. Fabrication lines are noticeable in shop light but are not observable on the road either in daylight or at night under typical use conditions (Figure 1).

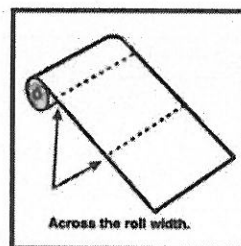


Figure 1 – Fabrication Lines

Adhesive

Series 3930 sheeting has a pressure-sensitive adhesive that is recommended for application at temperatures of 65°F (18°C) or higher.

Adhesive and Film Properties

Standard Test Panels

Unless otherwise specified herein, sheeting shall be applied to test panels and conditioned in accordance with ASTM D4956 and test methods and conditions shall conform to ASTM D4956.

Properties

The following properties shall conform to the requirements in ASTM D4956.

1. Adhesion
2. Outdoor weathering
 - retained coefficient of retroreflection
 - colorfastness

3. Shrinkage
4. Flexibility
5. Liner removal
6. Impact resistance
7. Night time color

In addition, Series 3930 sheeting will conform to the following properties.

1. Gloss

Test Method – Test in accordance with ASTM D523 using a 60° glossmeter.

Requirement – Rating not less than 50.

2. Optical Stability

Test Method – Apply a 3 inch x 6 inch sample to a test panel. Measure R_A then place it in an oven at $71^\circ\text{C} \pm 3^\circ\text{C}$ ($160^\circ\text{F} \pm 5^\circ\text{F}$) for 24 hours followed by conditioning at standard conditions for 2 hours. Remeasure R_A .

Requirement – The sheeting shall retain a minimum of 85% and a maximum of 115% of the original coefficient of retroreflection.

Sign Fabrication Methods

Application

Series 3930 sheeting incorporates a pressure sensitive adhesive and should be applied to the sign substrate at temperature of $65^\circ\text{F}/18^\circ\text{C}$ or higher by any of the following methods:

Mechanical squeeze roll applicator – refer to 3M Information Folder (IF) 1.4. Application to extrusions that are edge wrapped requires sufficient softening of the sheeting. This can be accomplished by directing additional heat to the “next to last” edge roller. This practice will increase productivity and minimize cracking.

Hand squeeze roll applicator – refer to 3M IF 1.6.

Application of Series 3930 sheeting for complete signs or backgrounds must be done with a roll laminator, either mechanical or hand driven.

Hand Application

Hand application is recommended for legend and copy only. Refer to 3M Information Folder 1.5 for more details.

Hand applications will show some visual irregularities, which are objectionable to aesthetically critical customers. These are more noticeable on darker colors. To obtain a close-up uniform appearance, a roll laminator must be used.

All direct applied copy and border **MUST** be cut at all metal joints and squeegeed at the joints.

Splices

Series 3930 sheeting must be butt spliced when more than one piece of sheeting is used on one piece of substrate. The sheeting pieces should not touch each other. This is to prevent buckling as the sheeting expands in extreme temperature and humidity exposure.

Double Faced Signs

The sheeting on the bottom side of a double faced sign can be damaged if rolled through a squeeze roll applicator with an unprotected steel bottom roller. The use of a semi-soft flat sheet between the steel roller and the applied sign face will provide protection from damage. A material such as a rubber mat, tag board or cardboard is recommended.

Substrates

For traffic sign use, substrates found to be most reliable and durable are properly prepared aluminum sheets and extrusions. **Users are urged to carefully evaluate all other substrates for adhesion and sign durability.** Other substrates that may be satisfactory for proper application of sheeting will have the following characteristics:

- Clean
- Smooth
- Flat
- Rigid
- Dimensionally stable
- Weather resistant
- Non-porous
- High surface energy (passes water break test)

Refer to Information Folder 1.7 for surface preparation recommendations. Substrates with low surface energy may require additional preparation such as flame treatment, mechanical abrasion or use of adhesion promoters prior to sheeting application. Guide sign extrusions may be edge wrapped. Flat panels or unwrapped extrusions are to be carefully trimmed so that sheeting from adjacent panels does not touch on assembled signs.

High intensity prismatic sheeting is designed primarily for applications to flat substrates. Any use that requires a radius of curvature of less than five inches should also be supported by rivets or bolts. Plastic substrates are not recommended where cold shock performance is required. **Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M.**

Imaging

High intensity prismatic sheeting may be processed into traffic signs by any of the imaging methods described below. 3M assumes no responsibility for failure of sign face legends or backgrounds that have been processed with non-3M process colors or matched component imaging materials other than those listed below.

Screen Processing

Series 3930 sheeting may be screen processed into traffic signs before or after mounting on a sign substrate, using 3M Process Colors Series 880I or Series 880N. Series 880I or 880N process colors can be screened at 60-100°F (16-38°C) at relative humidity of 20-50%. A PE 157 screen mesh with a fill pass is recommended. Refer to Information Folder 1.8 for details. No clear coating is required and is not recommended. Use of other process colors series is not recommended. **Care should be taken to avoid flexing high intensity prismatic sheeting before and especially after screening to eliminate the possibility of cracking from improper handling techniques.**

Thermal Transfer Printing

High intensity prismatic TT series sheeting may be imaged with 3M™ Thermal Transfer Ribbon Series TTR2300 in conjunction with the Matan SprinG3 or Matan Spot4 thermal transfer printers. For regulated traffic signs, Series TTR2300 Spot Traffic Colors are to be applied using these printers and must be covered with 3M™ ElectroCut™ Film 1170. Refer to Product Bulletin TTR2300 for more information.

3M™ ElectroCut™ Film

3M™ ElectroCut™ Film Series 1170 may be used to provide transparent colored background copy for traffic control signs on high intensity prismatic sheeting. Refer to Product Bulletin 1170 for fabrication procedures.

Applied Cut-Out Copy

High intensity prismatic cut letters may be applied to series 3930 sheeting background to create a sign legend. Such cut-out copy may be directly applied to the background sheeting, or may be applied in a demountable form. Direct applied copy must be cut at all panel seams and carefully trimmed back so that sheeting from adjacent panels does not touch on assembled signs. Refer to Information Folder 1.10 for more information.

Note: *It is recommended to fabricate all but the largest signs using 1170 electronic cuttable overlay film (ECOF) instead of direct applied copy.*

Additional Imaging Options for Work Zone Signs

Vinyl Graphic Films

Scotchcal™ Vinyl Series 3650, Series 7720 and Series 7725 may be used to provide copy for traffic control signs on high intensity prismatic sheeting (typically orange, white or yellow sheeting) for use in construction work zones. Refer to Scotchcal™ product literature for more information.

Latex Ink Jet Printing

Series 3930 sheeting to be used in work zone signs may be imaged with HP 789 series black latex ink in conjunction with the HP Designjet L25500 Printer, or with 792 series black latex ink in conjunction with the HP Designjet L26500 Printer. Refer to Information Folder 3.4 for more information.

Note: *With the exception of 3M branded products, 3M does not represent that any printer or printer accessory recommended in 3M literature will meet customer requirements, any federal, state or local regulations or any applicable safety standards. Such determination is the responsibility of the printer owner.*

Cutting

Series 3930 sheeting may be cut into letters and shapes of at least 3 inches in height and stroke widths of at least 1/2 inch. Smaller sizes are not recommended. Sealing cut edges of Series 3930 sheeting is not required.

Plotter Cutting

Programmable knife cut (electronic cutting)

1. Flat bed plotters can either die cut or kiss cut and offer the most consistent reliable performance.
2. Friction Fed plotter. Kiss cut only. Success has been achieved using plotters that have 600 grams of down force and a 60° cutting blade. Additional drive wheels may need to be added to improve tracking. An alternative procedure is to cut sheeting from the liner side. Blade force and knife depth must be set to score but not cut through the topfilm. Break apart individual copy or apply premask to retain spacing.

Other Cutting Methods

Series 3930 sheeting may be hand cut or die cut one sheet at a time, and band sawed or guillotined in stacks. Cutting equipment such as guillotines and metal shears, which have pressure plates on the sheeting when cutting, may damage the optics. Padding the pressure plate and easing it down onto the sheets being cut will significantly reduce damage. Maximum stack height for cutting Series 3930 sheeting is 1 ½ inch or 50 sheets. Details on cutting can be found in Information Folder 1.10.

Storage and Packaging

Series 3930 sheeting should be stored in a cool, dry area, preferably at 65-75°F (18-24°C) and 30-50% relative humidity and should be applied within one year of purchase. Rolls should be stored horizontally in the shipping carton. Partially used rolls should be returned to the shipping carton or suspended horizontally from a rod or pipe through the core. Unprocessed sheets should be stored flat. Finished signs and applied blanks should be stored on edge.

Screen processed signs must be protected with SCW 568 slipsheet paper. Place the glossy side of the slipsheet against the sign face and pad the face with closed cell packaging foam. Double faced signs must have the glossy side of the slipsheet against each face of the sign.

Unmounted screened faces must be stored flat and interleaved with SCW 568 slipsheet, glossy side against the sign face.

Avoid banding, crating, or stacking signs. Package for shipment in accordance with commercially accepted standards to prevent movement and chafing. Store sign packages indoors on edges.

Panels or finished signs must remain dry during shipment and storage. If packaged signs become wet, unpack immediately and allow signs to dry. Refer to Information Folder 1.11 for instructions on packing for storage and shipment.

Installation

Nylon washers are required when twist style fasteners are used to mount the sign.

Cleaning

Signs that require cleaning should be flushed with water, then washed with a detergent solution and soft bristle brush or sponge. Avoid pressure that may damage the sign face. Flush with water following washing. Do not use solvents to clean signs. Refer to 3M Information Folder 1.10.

Health and Safety Information

Read all health hazard, precautionary and first aid statements found in the Material Safety Data Sheet and/ or product label of any materials prior to handling or use.

General Performance Considerations

The durability of high intensity prismatic Series 3930 sheeting and finished signs using 3M Matched Component materials will depend upon substrate selection and preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance. Maximum durability of Series 3930 sheeting can be expected in applications subject to vertical exposure on stationary objects when processed and applied to properly prepared aluminum according to 3M recommendations provided in Information Folder 1.7. The user must determine the suitability of any nonmetallic sign backing for its intended use. **Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M.** Applications to unprimed, excessively rough or non-weather resistant surfaces or exposure to severe or unusual conditions can shorten the performance of such applications. Signs in mountainous areas that are covered by snow for prolonged periods may also have reduced durability. 3M process colors and ElectroCut™ Film, when used according to 3M recommendations, are generally expected to provide performance comparable to colored reflective sheeting. Custom colors, certain lighter colors, heavily toned colors or blends containing yellow or gold may have reduced durability. Atmospheric conditions in certain geographic areas may result in reduced durability.

Periodic sign inspection and regular sign replacement are strongly recommended in order for sign owners to establish their own effective service life expectation, beyond the warranty period.

3M has tested HP Designjet Printers and black latex inks: L25500 printer/series 789 black ink, and L26500 printer/series 792 black ink; and when applied within parameters defined in IF 3.4 the resulting sign performance is considered to be commensurate with typically expected sign life. However, this imaging system is not covered as part of the 3M Matched Component system noted in the General Warranty Terms.

3M Basic Product Warranty and Limited Remedy

3M™ High Intensity Prismatic Reflective Sheeting Series 3930 ("Product") is warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. If Series 3930 Sheeting is proven not to have met the Basic Warranty on its shipment date, then a buyer's exclusive remedy, and 3M's sole obligation, at 3M's option, will be refund or replacement of the sheeting.

General Warranty Terms:

1. 3M makes the Additional Warranty (as defined below) as to any traffic control and guidance sign in the United States and Canada ("Sign") made with 3M™ High Intensity Prismatic Reflective Sheeting Series 3930 ("Product") and the Matched Component materials listed in Table E. Any Additional Warranty is contingent on all components involved in that Additional Warranty being stored, applied, installed, and used only as 3M recommends in its Product Bulletins and Other Product Information.
2. The Basic Warranty and any applicable Additional Warranty are collectively referred to as the "3M Warranty." EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, THE 3M WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, RIGHTS OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND THOSE ARISING FROM A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. A BUYER IS RESPONSIBLE FOR DETERMINING IF A PRODUCT IS SUITABLE FOR ITS PARTICULAR PURPOSE AND APPLICATION METHODS.
3. A Sign's failure to meet the 3M Warranty must be solely the result of the Product or the matched component materials' design or manufacturing defects. 3M has no obligation under the 3M Warranty if a sign failure is caused by: improper fabrication, handling, maintenance or installation; non-vertical applications where the Sign face is more than +/- 10% from vertical; use of any material or product not made by 3M or not included in Table E; use of application equipment not recommended by 3M; failure of sign substrate; loss of adhesion due to incompatible or improperly prepared substrate; exposure to chemicals, abrasion and other mechanical damage; snow burial or any other sign burial; collisions, vandalism or malicious mischief.

4. 3M reserves the right to determine the method of replacement, and any replacement Product will have the remainder of the original Product's unexpired 3M Warranty. Claims made under this warranty will be honored only if

- The Sign was dated upon completion of fabrication ("Fabrication Date") using a permanent method (sticker, permanent marker or crayon, metal stamp, etc.)
- 3M is notified of a 3M Warranty claim during any applicable Warranty Period and the owner or fabricator provides the information reasonably required by 3M to verify if a 3M Warranty is applicable.

Additional Warranty and Limited Remedy

1. The Additional Warranty for a Sign made with the Product is that the Sign will: (a) remain effective for its intended use when viewed from **a moving vehicle under normal day and night driving conditions by a driver with normal vision**, and (b) after cleaning, will meet the **minimum values for coefficient of retroreflection stated in Table C** for Table C's applicable Warranty Period measured from the Sign's Fabrication Date.

Table C

Minimum Percent Retained of Table B

Initial R_A for applicable Warranty Period for white, yellow, red, green, blue and brown

Warranty Period	Minimum Percentage R_A Retained
1-7 Years	80%
8-10 Years	70%

2. If any Sign made with the Product is proven not to have met the Additional Warranty, then a buyer's **exclusive remedy**, and 3M's sole obligation, at 3M's option:
 - a. if this occurs within seven years after the Fabrication Date, then 3M will, at its expense, restore the Sign's surface to its **original effectiveness**; or
 - b. if this occurs during the remainder of the Additional Warranty Period, then 3M will furnish only the necessary 3M sheeting Product and matched component materials quantity to restore the Sign's surface to its original effectiveness.

Additional Warranty & Limited Remedy for 3934 Orange Product

- The Additional Warranty for a Sign made with 3934 orange sheeting (Orange Product) is that the Sign will: (a) **remain effective for its intended use when viewed from a moving vehicle under normal day and night driving conditions by a driver with normal vision;** (b) after cleaning, will retain the coefficient of retroreflection stated in Table D for three years measured from Fabrication Date; and (c) after cleaning, the Product will **maintain daytime luminance equal to or greater than the minimums specified in Table A.**

Table D

Minimum Coefficient of Retroreflection
for 3934 Orange sheeting Product (cd/lux/m²)
(0.2° observation and -4° entrance)

Warranty Period	Minimum R _A
Orange	80

If any Sign made with the Product is proven not to have met the Additional Warranty, then a buyer's **exclusive remedy**, and 3M's sole obligation, at 3M's option, is that 3M will provide pro-rated replacement of the 3M materials.

Table E

Matched Component Materials.

Matched Components	
Process Colors	Series 880I
Process Colors	Series 880N
Thermal Transfer Ribbons – Spot Traffic Colors only*	Series TTR2300
ElectroCut™ Film	Series 1170
Premium Protective Overlay Film	Series 1160
Slipsheet	SCW 568
Prespacing Tape	SCPS-2
Premasking Tape	SCPM-3
Transfer Tape	TPM-5

*must be covered with 3M™ ElectroCut™ Film 1170

Refer to 3M Information Folders and Product Bulletins for detailed information about recommended application procedures and equipment.

Other Product Information

Always confirm that you have the most current version of the applicable Product Bulletin, Information Folder or Other Product Information.

IF 1.4	Instructions for Interstate Squeeze Roll Applicator
IF 1.5	Hand Application Instructions
IF 1.6	Hand Squeeze Roll Applicator
IF 1.7	Sign Base Surface Preparation
IF 1.8	Process Color Application Instructions
IF 1.10	Cutting, Premasking, and Prespacing
IF 1.11	Sign Maintenance Management
PB 880I	Process Color 880I
PB 880N	Process Color 880N
PB 1170	ElectroCut™ Film
PB TTR2300	Thermal Transfer Ribbons Series TTR2300
PB 1160	Protective Overlay Film 1160 Ink Jet Imaging with HP Designjet L25500
IF 3.4	Printer and HP 789 Series latex Inks

Limitation of Liability

3M WILL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO A BUYER FOR DIRECT (other than the applicable Limited Remedy stated above), SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS) IN ANY WAY RELATED TO A PRODUCT OR THIS PRODUCT BULLETIN, REGARDLESS OF THE LEGAL OR EQUITABLE THEORY ON WHICH SUCH DAMAGES ARE SOUGHT.

ASTM Test Methods are available from ASTM International, West Conshohocken, PA.

3M assumes no responsibility for any injury, loss or damage arising out of the use of a product that is not of our manufacture. Where reference is made in literature to a commercially available product, made by another manufacturer, it shall be the user's responsibility to ascertain the precautionary measures for its use outlined by the manufacturer.

Important Notice

All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of all warranties, or conditions express or implied. Seller's and manufacturer's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct, special or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his/her intended use, and user assumes all risk and liability whatsoever in connection therewith. Statements or recommendations not contained herein shall have no force or effect unless in an agreement signed by officers of seller and manufacturer.

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Diamond Grade™

DG³ Reflective Sheeting Series 4000

Product Bulletin 4000

January 2012

Description

3M™ Diamond Grade™ DG³ Reflective Sheeting Series 4000 is a super-high efficiency, full cube retroreflective sheeting designed for the production of traffic control signs and delineators that are exposed vertically in service. DG³ sheeting is designed to have the highest retroreflective characteristics at medium and short road distances as determined by the R_A values at 0.5° and 1.0° observation angles in Table B. Performance at these observation angles represents the most common nighttime viewing geometries encountered by the driving public. During the daytime, Diamond Grade DG³ fluorescent reflective sheeting provides higher visibility than ordinary (non-fluorescent) colored sheetings.

Applied to properly prepared sign substrates Diamond Grade DG³ reflective sheeting provides long-term retroreflectivity and durability. Series 4000 sheeting is available in the following colors.

Color	Product Code
White.....	4090
Yellow.....	4091
Red	4092
Blue.....	4095
Green.....	4097
Brown	4099
Fluorescent Yellow - FY	4081
Fluorescent Yellow Green- FYG	4083
Fluorescent Orange - FO	4084

Color

Product Code

White - thermal transfer printable 4090TT
Yellow - thermal transfer printable 4091TT
Fluorescent Yellow - TT printable4081TT
Fluorescent Yellow - Green - TT printable ..4083TT

Photometrics

Daytime Color (x, y, Y)

The chromaticity coordinates and total luminance factor of the retroreflective sheeting conform to Table A.

Color Test – Fluorescent Sheetings

Conformance to standard chromaticity (x, y) and luminance factor (Y %) requirements shall be determined by instrumental method in accordance with ASTM E 991 on sheeting applied to smooth aluminum test panels cut from Alloy 6061-T6 or 5052-H38. The values shall be determined on a HunterLab ColorFlex 45/0 spectrophotometer. Computations shall be done for CIE Illuminant D65 and the 2° standard observer.²

Color Test – Ordinary Colored Sheeting

Conformance to standard chromaticity (x, y) and luminance factor (Y %) requirements shall be determined by instrumental method in accordance with ASTM E 1164 on sheeting applied to smooth aluminum test panels cut from Alloy 6061-T6 or 5052-H38. The values shall be determined on a HunterLab ColorFlex 45/0 spectrophotometer. Computations shall be done for CIE Illuminant D65 and the 2° standard observer.²

Table A - Daytime Color Specification Limits¹

Color	x		y		x		y		x		y		Daytime Luminance Limit (Y %)	
	x	y	x	y	x	y	x	y	x	y	x	y	Min.	Max.
White	0.303	0.300	0.368	0.366	0.340	0.393	0.274	0.329					27	
Yellow	0.498	0.412	0.557	0.442	0.479	0.520	0.438	0.472					15	45
Red	0.648	0.351	0.735	0.265	0.629	0.281	0.565	0.346					2.5	15
Blue	0.140	0.035	0.244	0.210	0.190	0.255	0.065	0.216					1	10
Green	0.026	0.399	0.166	0.364	0.286	0.446	0.207	0.771					3	12
Brown	0.430	0.340	0.610	0.390	0.550	0.450	0.430	0.390					1	9
FY	0.479	0.520	0.446	0.483	0.512	0.421	0.557	0.442					40	
FYG	0.387	0.610	0.369	0.546	0.428	0.496	0.460	0.540					60	
FO	0.583	0.416	0.535	0.400	0.595	0.351	0.645	0.355					20	

¹The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 Colorimetric System.

²The instrumentally determined color values of retroreflective sheeting can vary significantly depending on the make and model of colorimetric spectrophotometer as well as the color and retroreflective optics of the sheeting (David M. Burns and Timothy J. Donahue, Measurement Issues in the Color Specification of Fluorescent Retroreflective Materials for High Visibility Traffic Signing and Personal Safety Applications, Proceedings of SPIE: Fourth Oxford Conference on Spectroscopy, 4826, pp. 39-49, 2003). For the purposes of this document, the HunterLab ColorFlex 45/0 spectrophotometer shall be the referee instrument.

Coefficients of Retroreflection (R_A)

The values in Table B are minimum coefficients of retroreflection expressed in candelas per lux per square meter (cd/lux/m^2).

Test for Coefficients of Retroreflection

Conformance to coefficient of retroreflection requirements shall be determined by instrumental method in accordance with ASTM E-810 "Test Method for Coefficient of Retroreflection of Retroreflective Sheeting", and per E-810 the values of 0° and 90° rotation are averaged to determine the R_A in Table B.

Table B - Minimum Coefficient of Retroreflection R_A for new sheeting (cd/lux/m^2)

	Observation Angle ⁴		
	0.2°	0.5°	1.0°
-4° Entrance Angle³			
White	580	420	120
Yellow	435	315	90
Red	87	63	18
Green	58	42	12
Blue	26	19	5
Brown	17	13	4
Fluorescent Yellow	350	250	72
Fluorescent Yellow Green	460	340	96
Fluorescent Orange	175	125	36
30° Entrance Angle³			
	0.2°	0.5°	1.0°
White	220	150	45
Yellow	165	110	34
Red	33	23	7
Green	22	15	5
Blue	10	7	2
Brown	7	5	1
Fluorescent Yellow	130	90	27
Fluorescent Yellow Green	180	120	36
Fluorescent Orange	66	45	14

³ Entrance Angle – The angle from the illumination axis to the retroreflector axis. The retroreflector axis is an axis perpendicular to the retroreflective surface.

⁴ Observation Angle – The angle between the illumination axis and the observation axis.

Printed Colors and Overlay Films

For screenprinted or thermally transfer printed transparent color areas on white sheeting when processed according to 3M recommendations, the coefficients of retroreflection shall not be less than 70% of the value for the corresponding color in Table B. For white sheeting covered with 3M™ ElectroCut™ Film Series 1170 when processed according to 3M recommendations, the coefficients of retroreflection shall not be less than 100% of the value for the corresponding color in Table B. The color chromaticity and luminance shall conform to Table A on page 1.

Entrance Angularity Performance in Regard to Orientation

Diamond Grade DG³ Reflective Sheeting is designed to be an effective wide angle reflective sheeting regardless of its orientation on the substrate or ultimate orientation of the sign after installation. However, because the efficiency of light return from cube corner reflectors is not equal at all application orientations, especially with increasing entrance angles, it is possible to get the widest entrance angle light return when the sheeting is oriented in a particular manner. When high entrance angle ($>50^\circ$) performance is required for given signs (e.g. Keep Right Symbols), it can be obtained easily by specifying the application orientation of the completed signs. In these situations the completed sign should have the sheeting positioned at the 0° orientation (downweb direction perpendicular to the road).

When the "primary groove line" (or, flat side of the diamond shape) is vertical in the completed sign, sheeting is said to be at a 0° orientation. When the "primary groove line" (or, flat side of the diamond shape) is horizontal in the completed sign, the sheeting is said to be at a 90° orientation. (Figure 1)

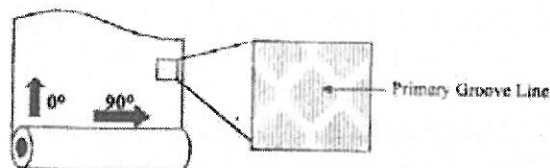


Figure 1

Unless the sign location and/or position calls for extra-wide entrance angularity performance, signs and applied copy (letters, arrows, borders and shields) can be fabricated and installed using the application orientation that most efficiently utilizes the reflective sheeting.

Note: For multi-panel signs it is recommended that all background panels be sheeted such that the sheeting direction is the same for all panels.

Fabrication Lines

The manufacture of prismatic sheeting results in lines being present in the product. In Diamond Grade DG³ sheeting these lines are slightly thicker than the seal pattern legs. Fabrication lines are noticeable in shop light but are not observable on the road either in daylight or at night under typical use conditions (Figure 2).

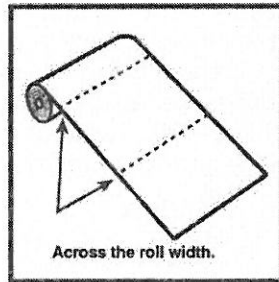


Figure 2 - Fabrication Lines

Adhesive

Diamond Grade DG³ sheeting has a pressure-sensitive adhesive that is recommended for application at temperatures of 65°F (18°C) or higher.

Adhesive and Film Properties

Standard Test Panels

Unless otherwise specified herein, sheeting shall be applied to test panels and conditioned in accordance with ASTM D4956 and test methods and conditions shall conform to ASTM D4956.

Properties

The following properties shall conform to the requirements in ASTM D4956.

1. Adhesion
2. Outdoor weathering
 - retained coefficient of retroreflection
 - colorfastness
3. Shrinkage
4. Flexibility
5. Liner removal
6. Impact resistance
7. Night time color

In addition, DG³ sheeting will conform to the following properties.

1. Gloss

Test Method – Test in accordance with ASTM D523 using a 60° glossmeter.

Requirement – Rating not less than 50.

2. Optical Stability

Test Method – Apply a 3-inch x 6-inch sample to a test panel. Measure R_A , then place it in an oven at $71^\circ\text{C} \pm 3^\circ\text{C}$ ($160^\circ\text{F} \pm 5^\circ\text{F}$) for 24 hours followed by conditioning at standard conditions for two hours.

Remeasure R_A .

Requirement – The sheeting shall retain a minimum of 85% and a maximum of 115% of the original coefficient of retroreflection.

Sign Fabrication Methods

Application

Diamond Grade DG³ sheeting incorporates a pressure sensitive adhesive and should be applied to the sign substrate at temperature of 65°F/18°C or higher by any of the following methods:

Mechanical squeeze roll applicator – refer to 3M Information Folder (IF) 1.4. Application to extrusions that are edge wrapped requires sufficient softening of the sheeting. This can be accomplished by directing additional heat to the “next to last” edge roller. This practice will increase productivity and minimize cracking.

Hand squeeze roll applicator – refer to 3M IF 1.6.

Application of Diamond Grade DG³ sheeting for complete signs or backgrounds must be done with a roll laminator, either mechanical or hand driven.

Hand Application

Hand application is recommended for legend and copy only. Refer to 3M Information Folder 1.5 for more details.

Hand applications will show some visual irregularities, which are objectionable to aesthetically critical customers. These are more noticeable on darker colors. To obtain a close-up uniform appearance, a roll laminator must be used.

All direct applied copy and border MUST be cut at all metal joints and squeegeed at the joints.

Splices

Series 4000 sheeting must be butt spliced when more than one piece of sheeting is used on one piece of substrate. The sheeting pieces should not touch each other. This is to prevent buckling as the sheeting expands in extreme temperature and humidity exposure.

Double Faced Signs

The sheeting on the bottom side of a double faced sign can be damaged if rolled through a squeeze roll applicator with an unprotected steel bottom roller. The use of a semi-soft flat sheet between the steel roller and the applied sign face will provide protection from damage. A material such as a rubber mat, tag board or cardboard is recommended.

Substrates

For traffic sign use, substrates found to be most reliable and durable are properly prepared aluminum sheets and extrusions. **Users are urged to carefully evaluate all other substrates for adhesion and sign durability.** Other substrates that may be satisfactory for proper application of sheeting will have the following characteristics:

- Clean
- Smooth
- Flat
- Rigid
- Dimensionally stable
- Weather resistant
- Non-porous
- High surface energy (passes water break test)

Refer to Information Folder 1.7 for surface preparation recommendations. Substrates with low surface energy may require additional preparation such as flame treatment, mechanical abrasion or use of adhesion promoters prior to sheeting application. Guide sign extrusions may be edge wrapped. Flat panels or unwrapped extrusions are to be carefully trimmed so that sheeting from adjacent panels does not touch on assembled signs.

Diamond Grade DG³ sheeting is designed primarily for applications to flat substrates. Any use that requires a radius of curvature of less than five inches should also be supported by rivets or bolts. Plastic substrates are not recommended where cold shock performance is required. **Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M.**

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Diamond Grade DG³ sheeting may be processed into traffic signs by any of the imaging methods described below. 3M assumes no responsibility for failure of sign face legends or backgrounds that have been processed with non-3M process colors or matched component imaging materials other than those listed below.

Screen Processing

Diamond Grade DG³ sheeting may be screen processed into traffic signs before or after mounting on a sign substrate, using 3M Process Colors Series 880I or Series 880N. Series 880I or 880N process colors can be screened at 60-100°F (16-38°C) at relative humidity of 20-50%. A PE 157 screen mesh with a fill pass is recommended. Refer to Information Folder 1.8 for details. No clear coating is required or recommended. Use of other process colors series is not recommended.

Care should be taken to avoid flexing DG³ sheeting before and especially after screening to eliminate the possibility of cracking from improper handling techniques.

Thermal Transfer Printing

Diamond Grade DG³ TT sheeting may be imaged with 3M™ Thermal Transfer Ribbon Series TTR2300 in conjunction with the Matan SprinG3 or Matan Spot4 thermal transfer printers. For regulated traffic signs, Series TTR2300 Spot Traffic Colors are to be applied using these printers and must be covered with 3M™ ElectroCut™ Film 1170. Refer to Product Bulletin TTR2300 for more information.

3M™ ElectroCut™ Film

3M™ ElectroCut™ Film Series 1170 may be used to provide transparent colored background copy for traffic control signs on Diamond Grade DG³ sheeting. Refer to Product Bulletin 1170 for fabrication procedures.

Applied Cut-Out Copy

Diamond Grade DG³ cut letters may be applied to a DG³ sheeting background to create a sign legend. Such cut-out copy may be directly applied to the background sheeting, or may be applied in a demountable form. Direct applied copy must be cut at all panel seams and carefully trimmed back so that sheeting from adjacent panels does not touch on assembled signs. Refer to Information Folder 1.10 for more information.

Note: It is recommended to fabricate all but the largest signs using 1170 electronic cuttable overlay film instead of direct applied copy.

Cutting

Diamond Grade DG³ sheeting may be cut into letters and shapes of at least three inches in height and stroke widths of at least one half inch. Smaller sizes are not recommended. Sealing cut edges of DG³ sheeting is not required.

Plotter Cutting

Programmable knife cut (electronic cutting)

1. Flat bed plotters can either die cut or kiss cut and offer the most consistent and reliable performance.
2. Friction Fed plotter. Kiss cut only. Success has been achieved using plotters that have 600 grams of down force and a 60° cutting blade. Additional drive wheels may need to be added to improve tracking. An alternative procedure is to cut sheeting from the liner side. Blade force and knife depth must be set to score but not cut through the topfilm. Break apart individual copy or apply premask to retain spacing.

Other Cutting Methods

Diamond Grade DG³ sheeting may be hand cut or die cut one sheet at a time, and band sawed or guillotined in stacks. Cutting equipment such as guillotines and metal shears, which have pressure plates on the sheeting when cutting, may damage the optics. Padding the pressure plate and easing it down onto the sheets being cut will significantly reduce damage. Maximum stack height for cutting Series 4000 sheeting is 1½ inch or 50 sheets. Details on cutting can be found in Information Folder 1.10.

Storage and Packaging

3M Diamond Grade DG³ Sheeting should be stored in a cool, dry area, preferably at 65-75°F (18-24°C) and 30-50% relative humidity and should be applied within one year of purchase. Rolls should be stored horizontally in the shipping carton. Partially used rolls should be returned to the shipping carton or suspended horizontally from a rod or pipe through the core. Unprocessed sheets should be stored flat. Finished signs and applied blanks should be stored on edge.

Screen processed signs must be protected with SCW 568 slipsheet paper. Place the glossy side of the slipsheet against the sign face and pad the face with closed cell packaging foam. Double faced signs must have the glossy side of the slipsheet against each face of the sign.

Unmounted screened faces must be stored flat and interleaved with SCW 568 slipsheet, glossy side against the sign face.

Avoid banding, crating, or stacking signs. Package for shipment in accordance with commercially accepted standards to prevent movement and chafing. Store sign packages indoors on edges.

Panels or finished signs must remain dry during shipment and storage. If packaged signs become wet, unpack immediately and allow signs to dry. Refer to Information Folder 1.11 for instructions on packing for storage and shipment.

Installation

Nylon washers are required when twist style fasteners are used to mount the sign.

Cleaning

Signs that require cleaning should be flushed with water, then washed with a detergent solution and soft bristle brush or sponge. Avoid pressure that may damage the sign face. Flush with water following washing. Do not use solvents to clean signs. Refer to 3M Information Folder 1.10.

Health and Safety Information

Read all health hazard, precautionary and first aid statements found in the Material Safety Data Sheet and/or product label of any materials prior to handling or use.

General Performance Considerations

The durability of Diamond Grade DG³ sheeting and finished signs using 3M Matched Component materials will depend upon substrate selection and preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance. Maximum durability of Diamond Grade DG³ sheeting can be expected in applications subject to vertical exposure on stationary objects when processed and applied to properly prepared aluminum according to 3M recommendations provided in Information Folder 1.7. The user must determine the suitability of any nonmetallic sign backing for its intended use. **Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M.** Applications to unprimed, excessively rough or non-weather resistant surfaces or exposure to severe or unusual conditions can shorten the performance of such applications. Signs in mountainous areas that are covered by snow for prolonged periods may also have reduced durability. 3M process colors and ElectroCut™ Film, when used according to 3M recommendations, are generally expected to provide performance comparable to colored reflective sheeting. Custom colors, certain lighter colors, heavily toned colors or blends containing yellow or gold may have reduced durability. Atmospheric conditions in certain geographic areas may result in reduced durability.

Periodic sign inspection and regular sign replacement are strongly recommended in order for sign owners to establish their own effective service life expectation, beyond the warranty period.

3M Basic Product Warranty and Limited Remedy

3M™ Diamond Grade™ DG³ Reflective Sheeting Series 4000 ("Product") is warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. If DG³ Sheeting is proven not to have met the Basic Warranty on its shipment date, then a buyer's exclusive remedy, and 3M's sole obligation, at 3M's option, will be refund or replacement of the sheeting.

General Warranty Terms:

1. 3M makes the Additional Warranty (as defined below) as to any traffic control and guidance sign in the United States and Canada ("Sign") made with 3M™ Diamond Grade™ DG³ Reflective Sheeting Series 4000 ("Product") and the Matched Component materials listed in Table E. Any Additional Warranty is contingent on all components involved in that Additional Warranty being stored, applied, installed, and used only as 3M recommends in its Product Bulletins and Other Product Information.

2. The Basic Warranty and any applicable Additional Warranty are collectively referred to as the "3M Warranty." EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, THE 3M WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, RIGHTS OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND THOSE ARISING FROM A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. A BUYER IS RESPONSIBLE FOR DETERMINING IF A PRODUCT IS SUITABLE FOR ITS PARTICULAR PURPOSE AND APPLICATION METHODS.

3. A Sign's failure to meet the 3M Warranty must be solely the result of the Product or the matched component materials' design or manufacturing defects. 3M has no obligation under the 3M Warranty if a sign failure is caused by:

improper fabrication, handling, maintenance or installation; non-vertical applications where the Sign face is more than +/- 10% from vertical; use of any material or product not made by 3M or not included in Table E; use of application equipment not recommended by 3M; failure of sign substrate; loss of adhesion due to incompatible or improperly prepared substrate; exposure to chemicals, abrasion and other mechanical damage; snow burial or any other sign burial; collisions, vandalism or malicious mischief.

4. 3M reserves the right to determine the method of replacement, and any replacement Product will have the remainder of the original Product's unexpired 3M Warranty. Claims made under this warranty will be honored only if

–The Sign was dated upon completion of fabrication ("Fabrication Date") using a permanent method (sticker, permanent marker or crayon, metal stamp, etc.)

–3M is notified of a 3M Warranty claim during any applicable Warranty Period and the owner or fabricator provides the information reasonably required by 3M to verify if a 3M Warranty is applicable.

Additional Warranty & Limited Remedy for Ordinary colored Product

1. The Additional Warranty for a Sign made with ordinary colored Product is that the Sign will: (a) **remain effective for its intended use when viewed from a moving vehicle under normal day and night driving conditions by a driver with normal vision**, and (b) after cleaning, will meet the **minimum values for coefficient of retroreflection stated in Table C** for Table C's applicable Warranty Period measured from the Sign's Fabrication Date.

Table C – Minimum Percent Retained of Table B Initial R_A for applicable Warranty Period for Ordinary Colors (white, yellow, red, green, blue and brown)

Warranty Period	Minimum Percentage R_A Retained
1-7 Years	80%
8-12 Years	70%

2. If any Sign made with Ordinary Product is proven not to have met the Additional Warranty, then a buyer's **exclusive remedy**, and 3M's sole obligation, at 3M's option:

(a) if this occurs within seven years after the Fabrication Date, then 3M will, at its expense, restore the Sign's surface to its **original effectiveness**; or

(b) if this occurs during the remainder of the Additional Warranty Period, then 3M will furnish only the necessary 3M sheeting Product and matched component materials quantity to restore the Sign's surface to its original effectiveness.

Additional Warranty & Limited Remedy for Fluorescent Product

1. The Additional Warranty for a Sign made with Fluorescent Product is that the Sign will: (a) **remain effective for its intended use when viewed from a moving vehicle under normal day and night driving conditions by a driver with normal vision**; (b) after cleaning, will **retain 70% of the minimum values for coefficient of retroreflection stated in Table B** for the applicable Warranty Period stated in Table D, measured from Fabrication Date; and (c) after cleaning, the fluorescent Product will **maintain daytime luminance equal to or greater than the minimums specified in Table A**.

Table D – Warranty Period for Fluorescent Colors.

Color	Warranty Period
Fluorescent Yellow	10/7 Years ⁵
Fluorescent Yellow Green	10/7 Years ⁵
Fluorescent Orange	3 Years

⁵ Due to climatic conditions, Signs in Alabama, Arizona, Florida, Georgia, Hawaii, Louisiana, Mississippi, New Mexico, South Carolina and Texas have the 7-year Additional Warranty Period.

2. If a Sign made with Fluorescent Product is proven not to have met the Additional Warranty, then a buyer's exclusive remedy, and 3M's sole obligation, at 3M's option:

(a) for those Fluorescent Products with a 10-year Additional Warranty Period, 3M will, at its expense: (a) restore the Sign's surface to its **original effectiveness** if this occurs within seven years after the Fabrication Date; or (b) furnish only the necessary 3M Fluorescent Product and matched component materials quantity to restore the Sign's surface to its original effectiveness if this occurs during the remainder of the Warranty Period.

(b) for those Fluorescent Products with a 7-year Additional Warranty Period, 3M will, at its expense: (a) restore the Sign's surface to its **original effectiveness** if this occurs within five years after the Fabrication Date; or (b) furnish only the necessary 3M Fluorescent Product and matched component materials quantity to restore the Sign's surface to its original effectiveness if this occurs during the remainder of the Warranty Period.

(c) for those Fluorescent Products with a 3-year Additional Warranty Period, 3M will furnish only the necessary Fluorescent Product and matched component materials quantity to restore the Sign's surface to its original effectiveness.

Table E. Matched Component Materials.

Matched Components	
Process Colors	Series 880I
Process Colors	Series 880N
Thermal Transfer Ribbons – Spot Traffic Colors only*	Series TTR2300
ElectroCut™ Film	Series 1170
Premium Protective Overlay Film	Series 1160
Slipsheet	SCW 568
Prespacing Tape	SCPS-2
Premasking Tape	SCPM-3
Transfer Tape	TPM-5

* Must be covered with 3M™ ElectroCut™ Film 1170

Refer to 3M Information Folders and Product Bulletins for detailed information about recommended application procedures and equipment.

Other Product Information

Always confirm that you have the most current version of the applicable Product Bulletin, Information Folder or Other Product Information.

IF 1.4	Instructions for Interstate Squeeze Roll Applicator
IF 1.5	Hand Application Instructions
IF 1.6	Hand Squeeze Roll Applicator
IF 1.7	Sign Base Surface Preparation
IF 1.8	Process Color Application Instructions
IF 1.10	Cutting, Premasking, and Prespacing
IF 1.11	Sign Maintenance Management
PB 880I	Process Color 880I
PB 880N	Process Color 880N
PB 1170	ElectroCut™ Film
PB TTR2300	Thermal Transfer Ribbons Series TTR2300
PB 1160	Protective Overlay Film 1160

Limitation of Liability

3M WILL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO A BUYER FOR DIRECT (other than the applicable Limited Remedy stated above), SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS) IN ANY WAY RELATED TO A PRODUCT OR THIS PRODUCT BULLETIN, REGARDLESS OF THE LEGAL OR EQUITABLE THEORY ON WHICH SUCH DAMAGES ARE SOUGHT.

ASTM Test Methods are available from ASTM International, West Conshohocken, PA.

3M assumes no responsibility for any injury, loss or damage arising out of the use of a product that is not of our manufacture. Where reference is made in literature to a commercially available product, made by another manufacturer, it shall be the user's responsibility to ascertain the precautionary measures for its use outlined by the manufacturer.

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All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of all warranties, or conditions express or implied. Seller's and manufacturer's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct, special or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his/her intended use, and user assumes all risk and liability whatsoever in connection therewith. Statements or recommendations not contained herein shall have no force or effect unless in an agreement signed by officers of seller and manufacturer.

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ElectroCut™ Film

Series 1170

Product Bulletin 1170

July 2007

Replaces PB 1170 dated January 2004

Description

3M™ ElectroCut™ Film Series 1170 is a durable, transparent, acrylic colored film coated with a transparent, pressure-sensitive adhesive that is protected by a removable liner available in the following colors.

<u>Color</u>	<u>Product Code</u>
Yellow	1171
Red	1172
Orange	1174
Blue	1175
Standard Green (Worboy)	1176
Green	1177
Black (Opaque)	1178
Brown	1179

Series 1170 is intended for use on 3M Reflective Sheeting as part of 3M's Matched Component System™ for signing. Series 1170 E.C. Film has a clear pressure-sensitive adhesive compatible with all the following 3M reflective sheetings used in permanent signing:

3M™ Reflective Sheeting

Engineer Grade Series 3290
High Intensity Grade Series 3870
High Intensity Prismatic Series 3930
Diamond Grade™ Series 3990 VIP
Diamond Grade™ Series 3970 LDP
Diamond Grade™ Series 3990T Translucent
Diamond Grade™ DG³ Series 4000

E.C. Film is designed with a special film liner for kiss-cutting on electronic cutting machines. Rolls are available prepunched for sprocket fed cutters or unpunched for flatbed or friction fed cutters. Colored E.C. Film is often used instead of silk

screened inks to provide transparent colored background copy for retroreflective street name signs and other traffic control signs. Various film widths are available to fabricate single sign panels up to 48" wide. For single panel signs requiring more than a single piece of sheeting or for multipanel signs such as guide signs, be sure to follow 3M color matching procedures in Information Folder 1.10 to achieve satisfactory results. **(For best color uniformity on a colored multipanel sign, make all panels from the same lot of E.C. Film.)**

Properties

Standard colors of series 1170 E.C. Films conform to appropriate retroreflective sheeting specifications – Federal Specification FP-96, Section 178.01 (a) and ASTM D4956 when applied over 3M™ Diamond Grade™ Reflective Sheeting Series 3970, 3990, 3990T or 4000, 3M™ High Intensity Grade Sheeting Series 3870 or 3930, or 3M™ Engineer Grade Sheeting Series 3290.

Due to the high transparency of 3M acrylic E.C. Films, retroreflective signs made with these E.C. Films give equal or better retroreflective performance than sheetings screened with transparent inks. Transparent blue, green, red, and yellow E.C. Films applied to white 3M™ Reflective Sheeting can be expected to give performance comparable to integrally colored reflective sheetings. The coefficient of retroreflection of the colored areas of E.C. Film signs will depend on both the overlay film transparency and the brightness of the white reflective substrate.

Table 1 gives the minimum and maximum coefficient of retroreflection (R_A values) for each transparent 1170 Series film as a percentage of the R_A of the white reflective background on which it is applied.

Table 1

Coefficient of retroreflection R_A^* for colored E.C. Films applied over white retroreflective sheeting (expressed as % of white retroreflective sheeting background)

Transparent (R_A color/ R_A white background) x 100%		
Color	Minimum	Maximum
Green	13.0	20
Blue	6.5	20
Red	14.0	24
Yellow	60.0	80
Orange	30.0	-
Brown	5.0	-
Standard Green (Worboy)**	8.0	14

* R_A (cd/lux/m²) measurements shall be made at 0.2° observation angle, -4° entrance angle, and 0° rotation, per ASTM E-810.

**Standard green color for U.K., Australia, and New Zealand

Film Liner

Series 1170 films have a transparent film release liner designed to aid the cutting process and the removal of the film weed after cutting. The rolls of film come edge weeded on punched rolls to prevent adhesive build-up on sprocket fed cutters.

Storage

Store in a cool, dry area 65-75°F (18-24°C), 30-50% relative humidity, and use within one year from date of receipt.

Fabrication – Cutting and Application Procedures

Important Note: It is recommended that inside radius corner fonts be used when cutting series 1170 film. Read and follow the manufacturer's operating manual carefully for proper use of cutting equipment.

1. Adjust knife pressure to cut cleanly through the film without cutting into the liner. A 30 degree blade works best. Spacing between letters or numbers should be adjusted to the aesthetic preference of the user. Consult the operating manual for instructions on how to regulate spacing. **Note:** Do not cut at high speed on variable speed machines.

2. Avoid sharp bends when cutting and handling film as this may cause film to release from the liner.
3. After cutting is complete, lay sheets flat, face to face, back to back. Always store sheets in this manner until the sheeting has been weeded and transfer tape has been applied to sheeting.
4. Use a stripping tool designed for weeding films that has a blunt (not a sharp) edge.
5. After weeding is completed, store sheets flat, face to face and back to back, until transfer tape is applied.
6. TPM-5 Clear Transfer Tape is recommended for best results. SCPM-3 Application Tape is also satisfactory for use on small signs. Other transfer tapes are not recommended.
7. Transfer tape can be applied either by hand using a plastic squeegee or through a hand squeeze roll laminator. If applying the transfer tape by hand, care must be taken to **always** squeegee from the center to the outside in both directions. If applying the transfer tape through the HSRA, the "lead" edge must be cut square and fed into the nip very carefully to avoid wrinkles in the E.C. Film.
8. Series 1170 film may be applied to the sheeting either before or after the sheeting has been applied to the substrate. Series 1170 film can be applied to Engineer Grade sheeting series 3290, High Intensity Grade sheeting series 3870 and 3930, Diamond Grade™ sheeting series 3970, 3990, 3990T and 4000. Use of a hand squeeze roll laminator is recommended to ensure satisfactory results. Use the "split liner method" – start in the middle of the sheet and remove half the liner to ensure proper alignment.
9. After series 1170 film and sheeting have been applied, remove the transfer tape by carefully removing the tape at as low an angle as possible.
10. **IMPORTANT!** When the transfer tape has been removed, reroll the sign through the laminator to ensure good adhesion.
11. A clean cutting blade is required. To remove adhesive build-up use a soft cloth dampened with mineral spirits, isopropyl alcohol or 3M Natural Cleaner.

Health and Safety Information

Read all health hazard, precautionary and first aid statements found in the Material Safety Data Sheet and/or product label of chemicals prior to handling or use.

General Performance Considerations

All existing field performance warranties for the reflective sheetings remain in effect when series 1170 film is applied over recommended Reflective Sheetings.

FOR INFORMATION OR ASSISTANCE

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Product Bulletin 7725

Release M, Effective December 2006
Release L and M changes are highlighted
See Bulletin Change Summary on last page

Scotchcal™ ElectroCut™

Graphic Film

Series 7725

For Electronic Cutting, Thermal Transfer Printing and Screen Printing

Description

Film series 7725 are 2 mil, pressure-sensitive films designed for permanent graphics that may be prespaced and electronically cut, screen printed or used in narrow width thermal transfer printing systems. These films, which are the same color on both sides, have a transparent synthetic liner that resists moisture absorption and static buildup, lays flat for easier assembly of multicolor graphics, and allows superior cutting and weeding. This film series is available in 62 colors.

Recommended Types of Graphics and End Uses

These end uses are recommended for this film and may be covered by the 3M™ MCS™ Warranty. Certain restrictions may apply; please read the entire bulletin for details.

- Prespaced and electronically-cut graphics
- Commercial and industrial graphic applications, including emblems, vehicle graphics, labels, striping, general signage, two-way window markings
- Thermal transfer printed graphics
- Screen printed graphics

Limitations of End Uses

We do not normally warrant other end uses, but please contact us to discuss your needs or let us suggest other 3M products.

Unsuitable End Uses for This Film

- Application to stainless steel for fleet applications
- Application to corrugated surfaces or surfaces with compound curves
- Graphics subjected to gasoline vapors or spills
- Thermoforming
- Backlit signage (Use 3M™ Scotchcal™ Translucent Graphic Film Series instead)
- Use in Summa's SummaChrome™ or DuraChrome® printers or similar printers
- Graphics made for automotive Original Equipment Manufacturers (OEM); contact 3M Automotive Division at 1-800-328-1684 for alternatives.

Compatible Products

Refer to the durability tables for 3M™ MCS™ Warranty for the proper combination of materials and imaging options.

Inks

- 3M™ Screen Printing Ink Series 1900
line color only
- 3M™ Screen Printing UV Ink Series 9800
line color only

Graphic Protection Options

- 3M™ Screen Printing Gloss Clear 1920DR
- 3M™ Screen Printing Matte Clear 1930
- 3M™ Screen Printing Gloss Clear 9720UV
- 3M™ Screen Printing Matte Clear 9730UV
- 3M™ Screen Printing Gloss Clear 9800CL

3M Substrates

- 3M™ Panaflex™ Awning and Sign Facing Series 945GPS

Other Products

- 3M™ Prespacing Tape SCPS-2
- 3M™ Prespacing Tape SCPS-3 with HVA
- 3M™ Prespacing Tape SCPS-53X
- 3M™ Premasking Tape SCPM-3
- 3M™ Premasking Tape SCPM-44X

Characteristics

Physical Characteristics

Characteristic	Description
Film	Cast vinyl
Thickness	Without adhesive: 2 mil (0.05 mm) With adhesive: 2.5 to 3.5 mils (0.063 to 0.09 mm)
Colors	See Color Chart
Adhesive type	Pressure sensitive
Adhesive color	Clear
Liner	Transparent synthetic

Tensile strength <i>minimum</i>	5 pound/inch at 73°F (0.9 kg/cm at 23°C)
Adhesion 24 hours after application	ABS, Acrylic, Acrylic enamel, Fruehauf painted panels, Polycarbonate, Urethane paints: 4 pounds/inch (0.7 kg/cm) Aluminum, alodine: 8 pounds/inch (1.4 kg/cm) Chrome: 5 pounds/inch (0.9 kg/cm) Polypropylene: 3 pounds/inch (0.5 kg/cm)
Chemical resistance	Resists mild alkalis, mild acids, and salt Excellent resistance to water (<i>this does not include immersion</i>)
Flammability	Film 7725 has been tested for flame spread per ASTM E84, "Surface Burning Characteristics of Building Materials," and meets the requirements of National Fire Protection Association Class A (1) (most fire-resistant class) as defined in NFPA 101, "Life Safety Code." Contact 3M at 1-800-328-3098 for more information.

Application Characteristics

Characteristic	Description
Finished graphic application recommendation	Graphic orientation: Vertical, non-vertical and horizontal Surface type: Flat with and without rivets; Simple curves
Finished graphic application recommendation <i>continued</i>	Substrate type: Panaflex substrate 945GPS, metal, glass, acrylic, polycarbonate, fiberglass, painted surfaces Application temperature: 40° to 100°F (4° to 38°C) <i>air and substrate</i>
Applied film shrinkage	0.010 inch (0.3 mm) <i>maximum</i>
Finished graphic exposure temperature	-40° to +225°F (-40° to +107°C)
Graphic removal	None, permanent

Color Chart

No.	Color	No.	Color
7725-10	White	7725-66	Forest green
7725-11	Pearl grey	7725-77	Peacock blue
7725-12	Black	7725-85	Vista yellow
7725-13	Tomato red	7725-86	Robin egg blue
7725-14	Bright orange	7725-88	Violet
7725-15	Bright yellow	7725-89	Sandstone
7725-17	Vivid blue	7725-90	Antique white
7725-19	Deep mahogany brown	7725-96	Teal
7725-20	Matte white	7725-98	Dark violet
7725-22	Matte black	7725-99	Fawn
7725-23	Deep red	7725-103	Magenta
7725-24	Terra cotta	7725-105	Harvest gold
7725-25	Sunflower	7725-120	Satin aluminum
7725-27	Indigo	7725-130	Eggshell
7725-29	Russet brown	7725-131	Satin gold
7725-31	Medium grey	7725-139	Saddle brown
7725-37	Sapphire blue	7725-173	Salmon pink
7725-38	Royal purple	7725-176	Aqua
7725-39	Tan	7725-177	Shadow blue
7725-41	Dark grey	7725-186	Bright green
7725-46	Kelly green	7725-187	Wedgewood blue
7725-47	Intense blue	7725-193	Mauve
7725-48	Purple	7725-196	Apple green
7725-49	Beige	7725-197	Light navy
7725-53	Cardinal red	7725-263	Perfect match red
7725-54	Light orange	7725-273	Process magenta
7725-56	Dark green	7725-276	Bottle green
7725-57	Olympic blue	7725-307	Dark aqua
7725-58	Burgundy	7725-357	Bermuda blue
7725-59	Putty		
7725-63	Geranium		
7725-64	Apricot		

Transparent

7725-114 Clear Enamel Receptive

Warranty Information

See the 3M Graphics Center Warranty Brochure for the complete warranty and remedy details. The warranty given in the Product Bulletin that is current at the time you purchased the film is the one that 3M will honor.

3M™ MCS™ Warranty for Finished Graphics

Warranted Durabilities for Graphic Constructions in a Vertical Exposure												
warranties shown in years	No Printing			Ink Series 1900			Ink Series 9800			Ink Series 9800 Metallic		
Warranty shown in years	Vehicle	Out-door	Indoor	Vehicle	Out-door	Indoor	Vehicle	Out-door	Indoor	Vehicle	Out-door	Indoor
Graphic Protection	Film Colors : 7725-10, 12, 20, 22											
1920DR, air dry	—	—	—	5	5	5	—	—	—	—	—	—
1920DR, oven dry	—	—	—	6 ■	6 ■	6 ■	—	—	—	—	—	—
1930	—	—	—	2	2	2	—	—	—	—	—	—
9720UV	—	—	—	6	6	6	6	6	6	5	5	5
9730UV	—	—	—	3	3	3	3	3	3	—	—	—
9800CL	—	—	—	—	—	—	5	5	5	5	5	5
None	8	7	7	—	—	—	—	—	—	—	—	—
	Film Colors : 7725-114, 120, 131											
1920DR, air dry	—	—	—	5	5	5	—	—	—	—	—	—
1920DR, oven dry	—	—	—	5 ■	5 ■	5 ■	—	—	—	—	—	—
1930	—	—	—	2	2	2	—	—	—	—	—	—
9720UV	—	—	—	5	5	5	5	5	5	5	5	5
9730UV	—	—	—	3	3	3	3	3	3	—	—	—
9800CL	—	—	—	—	—	—	5	5	5	5	5	5
None	5	5	5	—	—	—	—	—	—	—	—	—
	Film Colors: All other colors of film series 7725											
1920DR, air dry	—	—	—	5	5	5	—	—	—	—	—	—
1920DR, oven dry	—	—	—	6 ■	6 ■	6 ■	—	—	—	—	—	—
1930	—	—	—	2	2	2	—	—	—	—	—	—
9720UV	—	—	—	6	6	6	6	6	6	5	5	5
9730UV	—	—	—	3	3	3	3	3	3	—	—	—
9800CL	—	—	—	—	—	—	5	5	5	5	5	5
None	6	6	6	—	—	—	—	—	—	—	—	—

- Warranty requires oven drying the last color of ink series 1900 and screen print 1920DR for 2 hours at 150°F (65°C).

Formulas for Other U.S. Warranted Durabilities

Use the following formulas to determine other durabilities, based on a percentage of the U.S. Warranted Durability for vertical exposure

Exposure	Percentage of U.S. Vertical Exposure	Example
U.S. Non-vertical	50% (0.5)	0.5 x 5 years = 2.5 years
Desert Southwest, Vertical	70% (0.7)	0.7 x 5 years = 3.5 years
Desert Southwest, Non-vertical	35% (0.35)	0.35 x 5 years = 1.75 years

Legibility Warranty for Horizontal Exposure of Vehicle Graphics Requiring Legibility Only, in years

Refer to the definition of Horizontal Exposure. This orientation exposes graphics to the maximum sunlight and environmental conditions and is intended for use only on rooftops of commercially owned vehicles where identification from the air is needed.

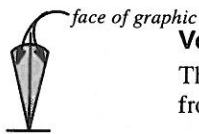
This warranty covers legibility only. Color change, lose of gloss, and chalking will occur and are not covered by warranty.

Film Colors 10, 11, 12, 13, 14, 15, 20, 22, 53

U.S.	5 years
U.S. Desert Southwest:	3 years

Warranty Notes

Terms



Vertical Exposure

The face of the graphic is $\pm 10^\circ$ from vertical.



Non-Vertical Exposure

The face of the graphic is greater than 10° from vertical and greater than 5° from horizontal.



Horizontal Exposure

The face of the graphic is $\pm 5^\circ$ from horizontal.

Desert southwest exposure. Graphics exposed to solar energy more than half of the time in Arizona, New Mexico and the desert areas of California, Nevada, Utah and Texas. A detailed map is available upon request.

Signs. Graphics applied outdoors and exposed to the elements.

Fleet vehicle. Straight trucks and trailers used in commercial fleets.

Standard vehicle. Buses, vans, automobiles, recreational vehicles.

Graphic Performance Life

The actual performance depends on the:

- Correct combination of 3M-recommended graphics products
- Ink formulation (screen printing)
- Adequate ink drying and UV curing (screen printing)
- Imaging (thermal mass transfer)
- Selection and preparation of the substrate
- Surface texture
- Application methods
- Angle and direction of sun exposure
- Environmental conditions
- Cleaning or maintenance methods

Application Outside the U.S.

Contact the 3M organization for that country.

Opacity

This film can be used on opaque surfaces but has less hiding power than a film with a colored adhesive. Consider this characteristic when selecting and preparing the substrate.

Graphic Protection

Clears 1930 and 9730UV may haze, which is not covered by the warranty.

Chalking

Chalking for unprinted film colors 20, 263 and 273 as they age is considered normal and acceptable wear. Chalking can be removed by normal graphic cleaning methods.

Application to Glass

3M accepts no liability for glass breakage when using this film for window graphics. See Instruction Bulletin 5.1 for details.

Graphics that Require Protection to be Warranted

- Screen printed vehicle graphics require a clear to have a warranty against abrasion damage and loss of gloss.
- Graphics exposed to abrasive washing conditions, harsh cleaners or chemicals are not warranted.

Graphics Made with Components Not Sold or Recommended by 3M

The 3M MCS warranty does not cover finished graphics made with other manufacturers' inks, film, graphic protection and/or application tapes, except as noted in this Bulletin. The user is solely responsible for the graphic appearance, performance and durability of graphic constructions that include non-3M graphic products.

Warranty and Limited Remedy

The following is made in lieu of all other express or implied warranties, including any implied warranty of **merchantability** or fitness for a particular purpose or implied warranty arising out of a course of dealing, custom or usage of trade: all 3M products are warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. 3M will replace or refund the price of any 3M materials that do not meet this warranty within the specified time periods. These remedies are exclusive. **In no case shall 3M be liable for any direct, indirect, or consequential damages, including any labor or non-3M materials charges.**

See the Graphics Market Center Warranty Brochure, which gives the terms, additional limitations of the warranty, if any, and limitations of liability.

Thermal Transfer Printing

Formulations and processing conditions can affect ink durability. Refer to the Product and Instruction Bulletins for your ink for limitations and proper usage.

This film can be imaged with narrow width thermal transfer printing systems. Refer to the equipment manufacturers literature for details.

Fabrication

This Bulletin does not contain detailed processing or application procedures. Refer to the 3M Related Literature for further information.

Cutting

Minimum Cutting Heights

Based on cutting and weeding evaluations that used Helvetica medium upper case, the recommended minimum cutting height for text is 0.25 inch (0.64 cm). Because of the differences in electronically-controlled cutting equipment and font characteristics, users should determine their own cutting and weeding capability.

These factors can affect cutting quality and ability:

- **Sharpness of the knife blade.** Dull blades create a serrated look to the cut edge of the film.
- **Weight on the knife blade.** The ideal weight slightly scores the liner. Too little weight does not cut completely through the film and the adhesive. Excessive weight cuts the liner. It also causes the blade to drag, accelerating wear and eventually creating a serrated cut edge on the film.
- Temperature and relative humidity are minor considerations, but avoid extreme or rapidly fluctuating conditions.

- Store the film in the same environment as the cutting equipment.
- Consider the stroke width of characters, style of serifs or extensions, and small details of scanned or digitized artwork.
- The minimum recommended stroke width is 0.040 inch (1.0 mm) when film is exposed to cleaning or other physical stress.

Weeding

The excess film should be weeded (removed) as soon after cutting as practical. This is to minimize the effect of possible adhesive flow 24 or more hours after cutting.

Application Tapes

The application tape to use depends on the type of graphic produced. See Instruction Bulletin 4.3 for more details.

Film 7725	Graphic Protection						
	Refer to the Warranty tables on page 3 to determine whether the Graphic Protection option listed is approved for the ink series you are using with these films.						
	1920DR	1930	9720UV	9730UV	9800CL	Ink 9800, no clear	Unprinted film
Premasking Tape SCPM-3 with HVA use for prespacing	■	■					■
Prespacing Tape SCPS-2	■	■					■
Prespacing Tape SCPS-53X			■	■	■	■	
Premasking tape SCPM-3	■	■					■
Premasking Tape SCPM-44X			■	■	■	■	

Shelf Life, Storage and Shipping

Activity	Recommendation
Shelf life	Total shelf life: 2 years Up to 2 years unprocessed, OR process within 1 year and apply within 1 year of processing
Storage conditions	<ul style="list-style-type: none"> • 100°F (38°C) maximum • Out of sunlight • Clean dry area • Original container • Bring the film to print room temperature before using
Shipping finished graphics	Flat, or rolled printed side out on 5 inch (13 cm) or larger core. These methods help to prevent the liner from wrinkling or popping off the liner.

Health and Safety



Caution

When handling any chemical products, read the manufacturers' container labels and the Material Safety Data Sheets (MSDS) for important health, safety and environmental information.

To obtain MSDS sheets for 3M products:

- By fax, call 1-800-364-0768 in the US and Canada or 1-650-556-8417 for all other locations.
- Electronically, visit us at www.3M.com/MSDS.
- By mail, or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501.

When using any equipment, always follow the manufacturers' instructions for safe operation.

Attention:
Authorized Graphics Manufacturers

Visit our password-protected website for exclusive product information and services. Certain restrictions apply.

1. Go to www.scotchprint.com.
2. Select a country.
3. Click *Login* on upper left side of screen.
4. Click Register.
5. Enter authorization code: **CGD_SGN**.
6. Complete the information and submit.
An e-mail will be sent when your authorization is completed.

3M Related Literature

Before starting any job, be sure you have the most current Product and Instruction Bulletins.

The information in 3M Product and Instruction Bulletins is subject to change. Current Bulletins, as well as a list of all Bulletins updated within the last three months, are available at www.scotchprint.com or through our Fax-on-Demand system. Any warranty, if offered, is based on information in the appropriate Bulletin(s) that was current at the time you purchased the 3M products. The following Product and/or Instruction Bulletins provide the information and processes you need to properly make the graphics described in this Bulletin.

Fax-on-Demand phone numbers:
United States or Canada: 1-800-364-0768
International: 1-651-732-6506

Subject	Bulletin No.	FOD No.
Product Bulletins		
3M™ Scotchcal™ Translucent Graphic Film Series 3630	3630	3009
3M™ Panaflex™ Awning and Sign Facing Series 945GPS	945	4006
3M™ Screen Printing Ink Series 1900 and Overprint Clear VI0402	1900	2501
3M™ Screen Printing UV Ink Series 9800	9800	2513
3M™ Screen Printing Ink Series 9700UV	9700	2507
Instruction Bulletins		
Design of markings	2.1	5501
Screen printing with ink series 1900	3.12	6012
Screen printing with UV ink series 9800	3.20	6020
Screen printing with ink 9700UV	3.4	6004
Using 3M application tapes; premasking and prespacing for films	4.3	6503
Application, substrate selection, preparation and substrate-specific application techniques	5.1	7001
Application, general procedures for interior and exterior dry applications	5.5	7005
Storage, handling, maintenance, removal	6.5	8505
Warranties		
3M Graphics Market Center Warranty Brochure		9503

3M, ElectroCut, MCS, Panaflex and Scotchcal are trademarks of 3M Company.

Bulletin Change Summary

Added requirements about graphic protection on selected graphics.

This bulletin was updated to better organize the warranty information. Additional text changes are indicated by a black bar in the margin.

Release M now includes the Shelflife, Shipping and Storage section.



Commercial Graphics Division

3M Center, Building 220-12E-04
PO Box 33220
St. Paul, MN 55144-3220 USA
General Info. 1-800-374-6772
Technical Info. 1-800-328-3908
Fax 1-651-736-4233

Fax-on-Demand ordering: 1-800-364-0768 US/Canada; 1-651-732-6506 International
Fax-on-Demand document: 3013
www.3m.com/graphics

3M Canada

P.O. Box 5757
London, Ontario
Canada N6A 4T1
1-800-265-1840
Fax 519-452-6245

3M México, S.A. de C.V.

Av. Santa Fe No. 55
Col. Santa Fe, Del. Alvaro Obregón
México, D.F. 01210
52-55-52-70-04-00
Fax 52-55-52-70-22-77

3M Puerto Rico, Inc.

Puerto Rico Industrial Park
P.O. Box 100
Carolina, PR 00986-0100
787-620-3000
Fax 787-750-3035



Product Bulletin 3650

Release I, October 2006

See Bulletin Change Summary on last page

Scotchcal™ Graphic Film Series 3650

Description

3M™ Scotchcal™ Graphic Film Series 3650 is an excellent choice for screen printing permanent graphics for signs and commercial vehicle, fleet graphics and OEM graphics. These films are long term durable. They resist gasoline vapors and occasional petroleum spills when used for fleet and vehicle graphics.

Recommended Types of Graphics and End Uses

When constructed and used as described in this Bulletin, these types of graphics and end uses may be warranted by the 3M™ MCS™ Warranty. Please read the entire Bulletin for details.

- Clear, window or 2-way graphics
- Outdoor and indoor graphics and signs
- Information labels
- Commercial vehicle and fleet graphics and emblems
- Small format original equipment manufacturer's decorative and identification graphics, cautionary, safety and vandal-resistant labeling

Limitations of End Uses

We do not normally warrant other end uses, but please contact us to discuss your needs or let us suggest other 3M products.

Unsuitable End Uses for this Film

- Graphics applied to:
 - corrugated surfaces.
 - stainless steel vehicles.
- Film without graphic protection under these conditions:
 - vehicle graphics.
 - exposure to abrasive conditions, harsh cleaners or chemicals.
- 3M Commercial Graphics Division policy is not to support applications of clear graphic film when a driver's view is obstructed and/or where local laws prohibit its use.

Caution

Some states have laws or regulations requiring minimum light passage that may limit or preclude the use of this product on vehicle windows. The user is responsible for determining and complying with all applicable standards.

- Graphics made for automotive Original Equipment Manufacturers (OEM); contact 3M Automotive Division at 1-800-328-1684 for alternatives.

Compatible Products for 3M™ MCS™ Warranted Graphics

3M Screen Printing Inks

- 3M™ Screen Printing Ink Series 1900
line color and four-color
- 3M™ Screen Printing UV Ink Series 9800
line color and four-color

3M Graphic Protection Options

- 3M™ Screen Print Gloss Clear 1920DR
- 3M™ Screen Print Low Gloss Clear 1930
- 3M™ Screen Print Gloss Clear 9720UV
- 3M™ Screen Print Low Gloss Clear 9730UV
- 3M™ Screen Print UV Gloss Clear 9800CL
- 3M™ Screen Printing Clear VI0402

OEM Ink and Clear

- Sericol™ Duracal™ UV Screen Print Ink
- Sericol™ Duracal™ Screen Print Clear
(approved for OEM applications only)

Note: See page 4 for how to obtain Duracal inks.

Other 3M Products

- 3M™ Edge Sealer 3950
- 3M™ Prespacing Tape SCPS-2
- 3M™ Prespacing Tape SCPS-53X
- 3M™ Premasking Tape SCPM-3
- 3M™ Premasking Tape SCPM-44X

Characteristics

All values given are typical for unprocessed film unless noted otherwise and are not for use in specifications. Processing film may change certain values. Please contact the Technical Service helpline at 1-800-328-3908 if you need more detailed information.

Physical Characteristics

Characteristic	Description
Material	Vinyl
Color	3650-10 white 3650-12 black 3650-114 clear
Thickness	Without adhesive: 2 mils (0.05 mm) With adhesive: 3 to 4 mils (0.08 to 0.10 mm)
Adhesive type	Pressure sensitive
Adhesive color	3650-10 gray-pigmented 3650-12 gray-pigmented 3650-114 clear
Liner	Polyethylene-coated layflat
Tensile strength (<i>minimum</i>)	5.5 pounds/inch at 73°F (0.9 kg/cm at 23°C)
Adhesion 24 hours after application	ABS: 5 pounds/inch (0.9 kg/cm) Acrylic enamel: 5 pounds/inch (0.9 kg/cm) Aluminum, anodized: 6 pounds/inch (0.1 kg/cm) Chrome: 5 pounds/inch (0.9 kg/cm) Fruehauf prepainted panels: 4 pounds/inch (0.7 kg/cm)
Chemical resistance	Resists mild acids, mild alkalis, and salts. Excellent resistance to water (<i>this does not include immersion</i>)

Application Characteristics

Characteristic	Description
Finished graphic application recommendation	Surface type: Flat, with and without rivets Substrate type: Glass, metal, paint, fiberglass reinforced plastic, rigid plastic Application temperature: 50° to 100°F (10° to 38° C) <i>air and substrate</i>
Applied film shrinkage	0.015 inch (0.4 mm)
Finished graphic exposure temperature	-65° to +160°F (-54° to +70°C)
Graphic removal	Permanent

Warranty Information

See the 3M Graphics Center Warranty Brochure for the complete warranty and remedy details. The warranty given in the Product Bulletin that is current at the time you purchased the film is the one that 3M will honor.

3M™ MCS™ Warranty for Finished Graphics

Warranted Durability for Graphic Constructions in a Vertical Exposure												
Warranties shown in years	Unprinted			Ink Series 1900			Ink Series 9800			Ink Series 9800 Metallic		
	Fleet Vehicle	OEM	Signs	Fleet Vehicle	OEM	Signs	Fleet Vehicle	OEM	Signs	Fleet Vehicle	OEM	Signs
Graphic Protection	Film Colors 3650-10 and 12											
1920DR	-	-	-	5	5	5	-	-	-	-	-	-
1930	-	-	-	2	2	2	-	-	-	-	-	-
V10402	-	-	-	6	5	6	-	-	-	-	-	-
9720UV	-	-	-	6	5	6	7	5	7	7	5	7
9730UV	-	-	-	3	3	3	3	3	3	-	-	-
9800CL	-	-	-	-	-	-	5	5	5	5	5	5
None												
3650-10	8	5	7	-	-	-	0	0	2	-	-	-
3650-12	7	5	7				0	0	2			
	Film Colors 3650-114											
1920DR	-	-	-	5	5	5	-	-	-	-	-	-
1930	-	-	-	2	2	2	-	-	-	-	-	-
V10402	-	-	-	5	5	5	-	-	-	-	-	-
9720UV	-	-	-	5	5	5	5	5	5	5	5	5
9730UV	-	-	-	3	3	3	3	3	3	-	-	-
9800CL	-	-	-	-	-	-	5	5	5	5	5	5
None	5	5	5	-	-	-	0	0	2	-	-	-

Warranted Durability for OEM Applications

OEM applications using Duracal UV Screen Print Ink (line colors) and Duracal Clear are warranted for 5 years.

Formulas for Other U.S. Warranted Durabilities

Use the warranted durability for your construction if exposed in a U.S. vertical orientation and use the following formulas to determine other durabilities.

Exposure	Percentage of U.S. Vertical Exposure	Example
U.S. Non-vertical	50% (0.5)	0.5 x 8 years = 4.0 years
Desert Southwest Vertical	70% (0.7)	0.7 x 8 years = 5.6 years
Desert Southwest Non-vertical	35% (0.35)	0.35 x 8 years = 2.8 years
Horizontal, Vehicle only	Warranted for legibility only for the stated durability.	

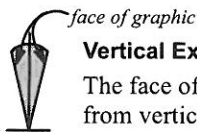
Legibility Warranty for Horizontal Exposure of Vehicle Graphics

Applications subjected to maximum sunlight and environmental conditions used on rooftops of commercially-owned fleet vehicles where identification from the air is needed. The graphic will change color, lose gloss, and chalk.

Film Colors 3650-10 and 12		Exposure in years	
Ink series	Clear	U.S.	U.S. Desert Southwest
Unprinted	None	5	3
9800	9720UV	5	3
	9800CL	5	3

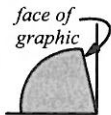
Warranty Notes

Terms



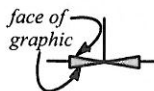
Vertical Exposure

The face of the graphic is $\pm 10^\circ$ from vertical.



Non-Vertical Exposure

The face of the graphic is greater than 10° from vertical.



Horizontal Exposure for Vehicle Graphics Requiring Legibility Only

The face of the graphic is $\pm 5^\circ$ from horizontal.

Desert Southwest Exposure. Graphics exposed to solar energy more than half of the time in Arizona, New Mexico and the desert areas of California, Nevada, Utah and Texas. A detailed map is available upon request.

Fleet Vehicle. Straight trucks and trailers used in commercial fleets.

OEM. Labels and decorative graphics produced for original equipment manufacturers.

Signs. Graphics applied outdoors and exposed to the elements.

Graphic Performance Life

The actual performance life of a graphic depends on all of the following.

- Correct combination of 3M-recommended graphics products
- Ink formulation
- Ink drying and UV curing
- Selection and preparation of the substrate
- Surface texture
- Application methods
- Angle and direction of sun exposure
- Environmental conditions
- Cleaning or maintenance methods

Graphic Protection

Any graphic exposed to abrasive conditions (including vehicle graphics), harsh cleaners or chemicals must include graphic protection in order to be warranted.

Graphics Subjected to Gasoline Vapors or Spills

For the best protection against staining for screen printed graphics subjected to gasoline vapors or occasional spills, use ink series 1900 with clear V10402.

Application Outside the U.S.

Contact the 3M organization for that country.

Graphics Made with Components Not Sold or Recommended by 3M

The user is solely responsible for the graphic appearance, performance and durability when this film is used with any other manufacturers' inks, graphic protection and/or application tapes.

Warranty and Limited Remedy

The following is made in lieu of all other express or implied warranties, including any implied warranty of **merchantability** or fitness for a particular purpose or implied warranty arising out of a course of dealing, custom or usage of trade: all 3M products are warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. 3M will replace or refund the price of any 3M materials that do not meet this warranty within the specified time periods. These remedies are exclusive. **In no case shall 3M be liable for any direct, indirect, or consequential damages, including any labor or non-3M materials charges.**

See the Graphics Market Center Warranty Brochure, which gives the terms, additional limitations of the warranty, if any, and limitations of liability.

Screen Printing

Formulations and processing conditions can affect ink durability. Refer to the Product and Instruction Bulletins for your ink for limitations and proper usage.

- The liner on film series 3650 is not printable. If you need a printable liner, contact Technical Service at 800-328-3908.
- Graphic protection can improve the appearance, performance and durability of your graphic. A clear coat also prevents chalking on unprinted colored films. Use standard screen printing methods to apply clear coats.

Sericol Inks

Sericol's Duracal inks can be obtained through their distribution network. Please refer this web site for details: <http://www.sericol.com/Distributors/distribFR.htm>. You can also contact Sericol at: Sericol Inc. Corporate Office, 1101 W. Cambridge Drive, Kansas City, KS 66103
Tel: 913-342-4060, Fax: 913-342-4752

Cutting

The following are common cutting methods for this film. See Instruction Bulletin 4.1 for details.

- Bandsawing
- Hot kiss cutting
- Drum-type electronic cutting
- Flat-bed electronic cutting
- Guillotine
- Hand cut
- Cold and hot steel-rule die cutting

The following minimum values for cutting text from film series 3650 are based on upper case Helvetica medium type. Weeding is much more difficult with smaller text.

Minimum stroke width: 0.25 inch (6.35 mm)
Minimum height: 3.0 inch (76.2 mm)
Minimum radius of end of stripe: 0.024 inch (0.6 mm)

Application Tapes

The type of 3M application tape to use depends on the type of graphic produced and the ink or screen print clear coat that was applied last. See Instruction Bulletin 4.3 for details.

- Use a prespacing application tape if the graphic has large amounts of the liner exposed.
- Use a premasking application tape if very little of the liner is exposed.

Last Coating	Prespacing Tape	Premasking Tape
Unprinted	SCPS-2	SCPM-3
1920DR	SCPS-2	SCPM-3
1930	SCPS-2	SCPM-3
9720UV	SCPS-53X	SCPM-44X
9730UV	SCPS-53X	SCPM-44X
Ink series 9800, no clear	SCPS-53X	SCPM-44X
9800CL	SCPS-53X	SCPM-44X

Application

Refer to the 3M Related Literature section for a list of available application Bulletins. The following are application details specific to film series 3650.

Positioning

This film has a pressure sensitive adhesive. On vehicles, do not use detergent and water or a commercial application liquid to position the graphic on vehicles.

Finishing

If an application requires edge sealing, use edge sealer 3950.

Removal

Film series 3650 is not a removable film. Removal requires a solvent-based or mechanical remover system. It may be very time consuming and may damage the substrate.

Maintenance

Use a cleaner designed for high-quality painted surfaces. The cleaner must be wet, non-abrasive, without strong solvents, and have a pH value between 3 and 11 (neither strongly acidic nor strongly alkaline.) See Instruction Bulletin 6.5.

Chalking on unprinted colored film can be washed off with normal graphic cleaning methods.

Shelf Life, Storage, and Shipping

Activity	Recommendation
Shelf life	Total shelf life: 2 years Up to 2 years unprocessed, OR process within 1 year and apply within 1 year of processing
Storage conditions	<ul style="list-style-type: none">• 80°F (27°C) maximum• Out of sunlight• Clean dry area• Original container• Bring the film to room temperature before printing
Shipping finished graphics	Flat, or rolled printed side out on 5 inch (13 cm) or larger core; this helps prevent the liner and premasking tape from wrinkling or popping off

Health and Safety

Caution

When handling any chemical products, read the manufacturers' container labels and the Material Safety Data Sheets (MSDS) for important health, safety and environmental information.

To obtain MSDS sheets for 3M products:

- By fax, call 1-800-364-0768 in the US and Canada or 1-650-556-8417 for all other locations.
- Electronically, visit us at <http://www.3M.com/MSDS>.
- By mail, or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501.

When using any equipment, always follow the manufacturers' instructions for safe operation.

**Attention:
Authorized Graphics Manufacturers**

Visit our password-protected website for exclusive product information, profiles and services. Certain restrictions apply.

1. Go to www.scotchprint.com.
 2. Select a country.
 3. Click *Login* on upper left side of screen.
 4. Click Register.
 5. Enter authorization code: **CGD_SGN**.
 6. Complete the information and submit.
- An e-mail will be sent when your authorization is completed.

3M Related Literature

Before starting any job, be sure you have the most current Product and Instruction Bulletins.

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Fax-on-Demand phone numbers:
United States or Canada: 1-800-364-0768
International: 1-651-732-6506

Subject	Bulletin No.	FOD No.
Product Bulletins		
3M™ Screen Printing Ink Series 1900 and Screen Print Clear VI0402	1900	2501
3M™ Screen Printing Ink Series 9700UV	9700	2507
3M™ Screen Printing UV Ink Series 9800	9800	2513
Instruction Bulletins		
Screen printing with UV ink series 9800 - line color - 4-color	3.20 3.21	6020 6021
Screen printing with ink series 9700UV	3.4	6004
Screen printing with ink series 1900 - line color - 4-color	3.12 3.11	6012 6011
Design of graphics	2.1	5501
Scoring and cutting	4.1	6501
Using 3M application tapes; premasking and prespacing for films	4.3	6503
Application, substrate selection, preparation and substrate-specific application techniques	5.1	7001
Application, special applications and vehicles	5.4	7004
Application, general procedures for interior and exterior dry applications	5.5	7005
Storage, handling, maintenance, removal	6.5	8505
Warranties		
3M Graphics Market Center Warranty Brochure		9503

3M, Controltac, MCS and Scotchcal are trademarks of 3M.

Bulletin Change Summary

Added warranties for OEM graphic constructions and reorganized the warranty information. Removed warranty exception about chalking. Deleted references to clear 1902DR and 9780UV, which were typographical errors. Other changes and additions are marked by black bars in the margins.



Graphics Market Center

3M Center, Building 220-12E-04
PO Box 33220
St. Paul, MN 55144-3220 USA
General Info. 1-800-374-6772
Technical Info. 1-800-328-3908
Fax 1-651-736-4233

Fax-on-Demand 1-800-364-0768 US/Canada or 1-651-732-6506 International
Fax-on-Demand document: 1509
www.3M.com/graphics

3M Canada

P.O. Box 5757
London, Ontario
Canada N6A 4T1
1-800-265-1840
Fax 519-452-6245

3M México, S.A. de C.V.

Av. Santa Fe No. 55
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México, D.F. 01210
52-55-52-70-04-00
Fax 52-55-52-70-22-77

3M Puerto Rico, Inc.

Puerto Rico Industrial Park
P.O. Box 100
Carolina, PR 00986-0100
787-620-3000
Fax 787-750-3035

Rev. 07/12

State of West Virginia

83

VENDOR PREFERENCE CERTIFICATE

Certification and application* is hereby made for Preference in accordance with *West Virginia Code*, §5A-3-37. (Does not apply to construction contracts). *West Virginia Code*, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the *West Virginia Code*. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

1. **Application is made for 2.5% resident vendor preference for the reason checked:**

____ Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,

____ Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,

____ Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; or,

2. **Application is made for 2.5% resident vendor preference for the reason checked:**

____ Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,

3. **Application is made for 2.5% resident vendor preference for the reason checked:**

____ Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,

4. **Application is made for 5% resident vendor preference for the reason checked:**

____ Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; or,

5. **Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:**

____ Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; or,

6. **Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:**

____ Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

7. **Application is made for preference as a non-resident small, women- and minority-owned business, in accordance with *West Virginia Code* §5A-3-59 and *West Virginia Code of State Rules*.**

____ Bidder has been or expects to be approved prior to contract award by the Purchasing Division as a certified small, women- and minority-owned business.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (*West Virginia Code*, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: 3M Company

Signed: _____

John N. Morris

Date: September 13, 2013

Title: Contract Administrator

RFQ No. 8513C2012STATE OF WEST VIRGINIA
Purchasing Division**PURCHASING AFFIDAVIT**

MANDATE: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

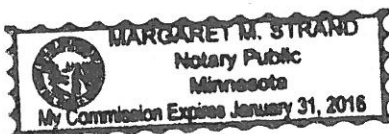
"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

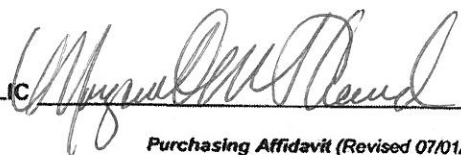
AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:Vendor's Name: 3M CompanyAuthorized Signature:  Date: September 13, 2013
John N. Morris Contract AdministratorState of MinnesotaCounty of Ramsey, to-wit:Taken, subscribed, and sworn to before me this 13th day of September, 2013.My Commission expires 1-31, 2016.

AFFIX SEAL HERE



NOTARY PUBLIC



Purchasing Affidavit (Revised 07/01/2012)

NOTE:

Vendor and Notary's date must be the same.

Notary required to AFFIX SEAL on Purchasing Affidavit.