

**PIGGYBACK AGREEMENT
PURSUANT TO NASSAU COUNTY PURCHASING POLICY, SECTION 4.3**

Piggyback Contract Information

Contract Name/Description: **Street Sign Sheeting Materials**

Lead Contracting Agency: **Osceola County**

Contract No.: **AR-11-1950-DW**

Vendor/Awardee: **3M Traffic Safety Systems Division**

Award/Contract Date: **March 14, 2011**

Term: **March 14, 2011 through March 6, 2014**

THIS AGREEMENT, made and entered into by and between **NASSAU COUNTY BOARD OF COUNTY COMMISSIONERS**, hereinafter called the "County" and the Vendor, referenced above.

WHEREAS, upon completion of a formal competitive solicitation and selection process, the Lead Contracting Agency entered into an agreement, hereinafter referred to as "Piggyback Agreement", with Vendor to provide goods and services; and


WHEREAS, the Nassau County Purchasing Policy, Ordinance 2009-09, allows piggybacking for the same commodity or service; and

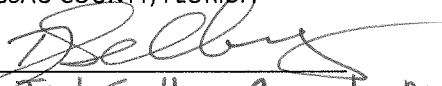
WHEREAS, the parties desire to contract with Vendor under the terms of the Piggyback Agreement;

NOW, THEREFORE, the parties agree as follows:

1. The Vendor shall honor for Nassau County the same prices under the same terms and conditions as indicated in the Piggyback Agreement, attached hereto as Attachment "A" and incorporated by reference as if fully set forth herein. Additional terms or conditions whether submitted purposely or inadvertently, shall have no force or effect.
2. Notwithstanding any other provision of the piggyback contract to the contrary:
 - a. The term of this agreement shall be three (3) years beginning March 7, 2011 and ending March 6, 2014, during which term total purchases may/shall not exceed \$50,000.00 unless approved by the Nassau County Board of County Commissioners.


BOARD OF COUNTY COMMISSIONERS
NASSAU COUNTY, FLORIDA


 By: Daniel B. Loeper Date 5-15-13
 Its: Chair

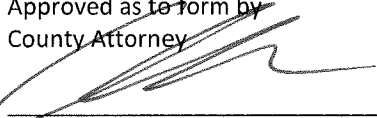

 By: Ted Selby, County Manager
 Its: Chair (or designee)

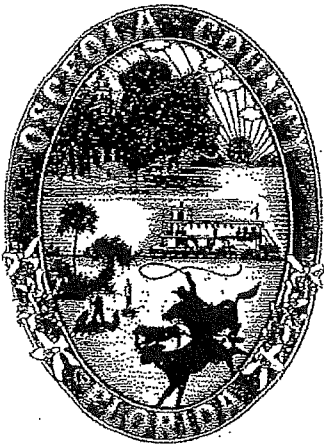
ATTEST TO CHAIR'S SIGNATURE (if applicable)

3M TRAFFIC SAFETY SYSTEMS DIVISION


 John A. Crawford, Ex-Officio Clerk
 by Eileen Straebel
 MES 05-15-13


 By: Matthew Leibel
 Its: Contract Administrator
 Address: P. O. Box 33225
 St. Paul, MN 55133-3225

Approved as to form by
 County Attorney

 David A. Hallman



March 18, 2011

Grier Kirkpatrick
Traffic Safety Systems Division
2562 Twain Drive
Tallahassee, FL 32311

RE: AR-11-1950-DW Street Sign Sheeting Materials

*Osceola County
Government*

Procurement Services

*Barbara Lawrence
Manager*

1 Courthouse Square
Suite 2300
Kissimmee FL 34741
407-742-0900

Congratulations! The Osceola Board of County Commissioners approved the award of the above referenced agreement on March 14, 2011. This contract term will be in effect through March 6, 2014.

A representative from Traffic Engineering Department will contact you directly regarding information and documentation needed prior to commencement. Also be advised that no service shall be authorized prior to receipt of an official Purchase Order as issued by the County.

Osceola County looks forward to working with you on this and future projects. Please feel free to contact me if you should have any questions or require any further assistance.

Sincerely,

David P. Weston
Procurement Analyst
Osceola County
1 Courthouse Square, Suite 2300
Kissimmee, FL 34741
Phone: (407) 742-0940
Fax: (407) 742-0901
email: dwes@osceola.org

**Osceola
County**

AGREEMENT

THIS AGREEMENT is made by and between OSCEOLA COUNTY, a political subdivision of the State of Florida, 1 Courthouse Square, Kissimmee, Florida 34741, hereinafter referred to as the "COUNTY", and 3M Company, Tax, Building 224-5N-40, Saint Paul, Minnesota 55144-1000, hereinafter referred to as the "CONTRACTOR".

WITNESSETH:

WHEREAS, the COUNTY has competitively solicited for reflective and non-reflective street sign sheeting materials pursuant to AR-11-1950-DW, and,

WHEREAS, the CONTRACTOR has exhibited by its response to the solicitation that it is capable of providing the required services; and,

WHEREAS, the parties hereto have agreed to the terms and conditions cited herein based on said solicitation;

NOW, THEREFORE, in consideration of the mutual covenants, terms, and provisions contained herein, the parties agree as follows:

SECTION 1. **TERM.**

The term of this Agreement shall begin upon execution by the COUNTY and continue through March 6, 2014.

SECTION 2. **SCOPE OF SERVICES.**

The CONTRACTOR will furnish and install all necessary labor, materials, and equipment to complete the services set forth in Exhibit "A" which is attached hereto and incorporated herein.

SECTION 3. **OBLIGATIONS OF THE CONTRACTOR.**

Obligations of the CONTRACTOR shall include, but not be limited to, the following:

- A. It is understood that the CONTRACTOR shall provide and pay for all labor, tools, materials, permits, equipment, transportation, supervision, and any and all other items or services, of any type whatsoever, which are necessary to fully complete and deliver the services requested by the COUNTY, and shall not have the authority to create, or cause to be filed, any liens for labor and/or materials on, or

against, the COUNTY, or any property owned by the COUNTY. Such lien, attachment, or encumbrance, until it is removed, shall preclude any and all claims or demands for any payment expected by virtue of this Agreement.

- B. The CONTRACTOR shall ensure that all of its employees, agents, sub-contractors, representatives, volunteers, and the like, fully comply with all of the terms and conditions set herein, when providing services for the COUNTY in accordance herewith.
- C. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, safety programs, and procedures necessary to properly and fully complete the work set forth in the Scope of Services.
- D. The CONTRACTOR shall maintain an adequate and competent staff, and remain authorized to do business within the State of Florida. The CONTRACTOR may subcontract the services requested by the COUNTY; however, the CONTRACTOR is fully responsible for the satisfactory completion of all subcontracted work.

SECTION 4. DELIVERY.

Time is of the essence in the performance of this Agreement. It is necessary that the COUNTY fabricate and install signs as soon as possible. The CONTRACTOR shall communicate to the COUNTY any delays in the delivery of reflective and non-reflective street sign sheeting materials and sign faces. If the CONTRACTOR cannot deliver the sign materials in a reasonable length of time the COUNTY reserves the right to select another CONTRACTOR to perform the services.

SECTION 5. WARRANTY.

The CONTRACTOR shall submit sheeting warranty and any extended manufacturer's warranty and technical details for all Group 1 products listed in Exhibit "B". For Groups 2 through 9 products listed in Exhibit "B" the CONTRACTOR shall warrant that the reflective sheeting and any components applied to the reflective sheeting used to fabricate traffic control and guidance signs will remain effective for its intended use and meet the stated minimum for coefficient of retro-reflective values.

In the event of a material failure during the full warranty period, as described below, the CONTRACTOR shall provide all labor and materials to rectify the failure at no cost to the COUNTY (including return transportation costs). In addition, if the failure occurs during any extended warranty period, the manufacturer shall provide all materials to rectify the failure.

- a. If the erected roadway signage fails to meet its intended purpose as viewed from moving vehicles under normal day and night driving conditions; and,
- b. the coefficient of retro-reflection is less than the minimum specified.

The failure shall be solely from defects in the reflective sheeting or components and not due to outside causes such as improper fabrication, handling, maintenance, installation, failure of sign substrate, and vandalism or malicious mischief.

The CONTRACTOR has the right to determine the method of replacement and shall rectify condition within sixty (60) days after receipt of notice from the COUNTY. The COUNTY shall date all signs at the time of sheeting application and this date shall become the commencement start of the warranty period. Failure to comply with the requirements of the warranty may be cause for cancellation of this Agreement.

In addition, the CONTRACTOR agrees to provide a full warranty to the COUNTY for all services which it provides hereunder for one full year following the date of final completion of said services. In the event that the CONTRACTOR is called to perform warranty work, the CONTRACTOR will be responsible for all costs incurred in repairing the areas under warranty. If it is determined that new problem areas have appeared, which were not areas repaired by the CONTRACTOR under the Scope of Services set forth herein, the COUNTY will be responsible for the costs incurred in repairing the new areas. Any manufacturer's guarantee related to the materials installed by the CONTRACTOR shall extend for the full warranty period.

SECTION 6. STANDARD OF CARE.

- A. The CONTRACTOR has represented to the COUNTY that it possesses a level of knowledge, experience, and expertise that is commensurate with firms in the areas of practice required for the services to be provided. By executing this Agreement, the CONTRACTOR agrees that the CONTRACTOR will exercise that degree of care, knowledge, skill, and ability as any other similarly situated contractor possessing the degree of skill, knowledge, experience, and expertise within the local area, working on similar activities. The CONTRACTOR shall perform the services requested in an efficient manner, consistent with the COUNTY's stated scope of services and industry standards.
- B. The CONTRACTOR covenants and agrees that it and its employees, agents, sub-contractors, representatives, volunteers, and the like, shall be bound by the same standards of conduct as stated above.

SECTION 7. COMPENSATION.

- A. The amount to be paid under this Agreement for services rendered will not exceed Fifty Thousand and 00/100 Dollars (\$50,000.00) annually, for a total not to exceed amount of One Hundred Fifty Thousand and 00/100 Dollars (\$150,000.00) for the term of this Agreement, in accordance with the pricing schedule set forth in Exhibit "B" which is attached hereto and made a binding part hereof.

- B. Compensation for services completed by the CONTRACTOR will be paid in accordance with section 218.70, Florida Statutes, Florida's Prompt Payment Act.

- C. Services to be performed in accordance with this Agreement are subject to the annual appropriation of funds by the COUNTY. In its sole discretion, the COUNTY reserves the right to forego use of the CONTRACTOR for any project which may fall within the Scope of Services listed herein. In the event the COUNTY is not satisfied with the services provided by the CONTRACTOR, the COUNTY will hold any amounts due until such time as the CONTRACTOR has appropriately addressed the problem.

SECTION 8. TERMINATION.

Either party may terminate this Agreement, with or without cause, given thirty (30) days written notice to the other party.

SECTION 9. PAYMENT WHEN SERVICES ARE TERMINATED.

- A. In the event of termination of this Agreement by the COUNTY, and not due to the fault of the CONTRACTOR, the COUNTY shall compensate the CONTRACTOR for all services performed prior to the effective date of termination.

- B. In the event of termination of this Agreement due to the fault of the CONTRACTOR, or at the written request of the CONTRACTOR, the COUNTY shall compensate the CONTRACTOR for all services completed, prior to the effective date of termination, which have resulted in a usable product, or otherwise tangible benefit to the COUNTY. All such payments shall be subject to an off-set for any damages incurred by the COUNTY resulting from any delay occasioned by early termination. This provision shall in no way be construed as the sole remedy available to the COUNTY in the event of breach by the CONTRACTOR.

SECTION 10.

INSURANCE.

- A. The CONTRACTOR shall maintain the following types of insurance, with the respective limits, and shall provide proof of same to the COUNTY, in the form of a Certificate of Insurance prior to the start of any work hereunder:
1. AUTOMOBILE COMBINED SINGLE LIMIT: \$2,000,000.00 per accident,
 2. GENERAL LIABILITY: \$5,000,000.00 each occurrence;
 3. GENERAL LIABILITY AGGREGATE: \$5,000,000.00 each occurrence;
 4. PRODUCTS AND COMPLETED OPERATIONS: \$5,000,000.00; and,
 5. WORKERS' COMPENSATION: Employers' liability insurance which covers the statutory obligation for all persons engaged in the performance of the work required hereunder with limits not less than \$2,000,000.00 per occurrence. Evidence of qualified self-insurance status will suffice for this subsection. The CONTRACTOR understands and acknowledges that it shall be solely responsible for any and all medical and liability costs associated with an injury to itself and/or to its employees, sub-contractors, volunteers, and the like, including the costs to defend the COUNTY in the event of litigation against same.
- B. The CONTRACTOR shall name the "Osceola County Board of County Commissioners" as a certificate holder and/or as additional insured, to the extent of the services to be provided hereunder, on all required insurance policies, and provide the COUNTY with proof of same.
- C. The CONTRACTOR shall provide the COUNTY's Procurement Services with a Certificate of Insurance evidencing such coverage for the duration of this Agreement. Said Certificate of Insurance shall be dated and show:
1. The name of the insured CONTRACTOR,
 2. The specified job by name and job number,
 3. The name of the insurer,
 4. The number of the policy,
 5. The effective date,
 6. The termination date,
 7. A statement that the insurer will mail notice to the COUNTY at least thirty (30) days prior to any material changes in the provisions or cancellation of the policy.
- D. Receipt of certificates or other documentation of insurance or policies or copies of policies by the COUNTY, or by any of its representatives, which indicates less

coverage than is required, does not constitute a waiver of the CONTRACTOR's obligation to fulfill the insurance requirements specified herein.

- E. The CONTRACTOR shall ensure that any sub-contractor(s), hired to perform any of the duties contained in the Scope of Services of this Agreement, maintain the same insurance requirements set forth herein. In addition, the CONTRACTOR shall maintain proof of same on file and made readily available upon request by the COUNTY.

SECTION 11. COUNTY OBLIGATIONS.

At the CONTRACTOR's request, the COUNTY agrees to provide, at no cost, all pertinent information known to be available to the COUNTY to assist the CONTRACTOR in providing and performing the required services.

SECTION 12. ENTIRE AGREEMENT.

This Agreement, including referenced exhibits and attachments hereto, constitutes the entire agreement between the parties and shall supersede, replace and nullify any and all prior agreements or understandings, written or oral, relating to the matters set forth herein, and any such prior agreements or understandings shall have no force or effect whatsoever on this Agreement.

SECTION 13. APPLICABLE LAW, VENUE, JURY TRIAL.

The laws of the State of Florida shall govern all aspects of this Agreement. In the event it is necessary for either party to initiate legal action regarding this Agreement, venue shall lie in Osceola County, Florida. The parties hereby waive their right to trial by jury in any action, proceeding or claim, arising out of this Agreement, which may be brought by either of the parties hereto.

SECTION 14. PUBLIC RECORDS.

The CONTRACTOR understands that by virtue of this Agreement all of its documents, records and materials of any kind, relating to the relationship created hereby, shall be open to the public for inspection in accordance with Florida law.

SECTION 15. INDEPENDENT CONTRACTOR.

This Agreement does not create an employee/employer relationship between the parties. It is the parties' intention that the CONTRACTOR, its employees, sub-contractors, representatives, volunteers, and the like, will be an independent contractor and not an employee

of the COUNTY for all purposes, including, but not limited to, the application of the following, as amended: the Fair Labor Standards Act minimum wage and overtime payments, the Federal Insurance Contribution Act, the Social Security Act, the Federal Unemployment Tax Act, the provisions of the Internal Revenue Code, the State of Florida revenue and taxation laws, the State of Florida workers' compensation laws, the State of Florida unemployment insurance laws, and the Florida Retirement System benefits. The CONTRACTOR will retain sole and absolute discretion in the judgment of the manner and means of carrying out the CONTRACTOR's activities and responsibilities hereunder.

SECTION 16. **APPLICABLE LICENSING.**

The CONTRACTOR, at its sole expense, shall obtain all required federal, state, and local licenses, occupational and otherwise, required to successfully provide the services set forth herein.

SECTION 17. **COMPLIANCE WITH ALL LAWS.**

The CONTRACTOR, at its sole expense, shall comply with all laws, ordinances, judicial decisions, orders, and regulations of federal, state, county, and municipal governments, as well as their respective departments, commissions, boards, and officers, which are in effect at the time of execution of this Agreement or are adopted at any time following the execution of this Agreement.

SECTION 18. **INDEMNIFICATION.**

The CONTRACTOR agrees to be liable for any and all damages, losses, and expenses incurred, by the COUNTY, caused by the acts and/or omissions of the CONTRACTOR, or any of its employees, agents, sub-contractors, representatives, volunteers, or the like. The CONTRACTOR agrees to indemnify, defend and hold the COUNTY harmless for any and all claims, suits, judgments or damages, losses and expenses, including but not limited to, court costs, expert witnesses, consultation services and attorney's fees, arising from any and all acts and/or omissions of the CONTRACTOR, or any of its employees, agents, sub-contractors, representatives, volunteers, or the like. Said indemnification, defense, and hold harmless actions shall not be limited by any insurance amounts required hereunder.

SECTION 19. **BANKRUPTCY OR INSOLVENCY.**

If the CONTRACTOR files a Petition in Bankruptcy, or if the same shall be adjudged bankrupt or insolvent by any Court, or if a receiver of the property of the CONTRACTOR shall be appointed in any proceeding brought by or against the CONTRACTOR, or if the CONTRACTOR shall make an assignment for the benefit of creditors, or proceedings shall be

commenced on or against the CONTRACTOR's operations of the premises, the COUNTY may terminate this Agreement immediately, notwithstanding the notice requirements stated herein.

SECTION 20. **BINDING EFFECT.**

This Agreement shall be binding upon and enure to the benefit of the parties hereto, their heirs, personal representatives, successors, and/or assigns.

SECTION 21. **ASSIGNMENT.**

This Agreement shall only be assignable by the CONTRACTOR upon the express written consent of the COUNTY.

SECTION 22. **SEVERABILITY.**

All clauses found herein shall act independently of each other. If a clause is found to be illegal or unenforceable, it shall have no effect on any other provision of this Agreement. It is understood by the parties hereto that if any part, term, or provision of this Agreement is by the courts held to be illegal or in conflict with any law of the State of Florida or the United States, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular part, term, or provision held to be invalid.

SECTION 23. **WAIVER.**

Failure of the parties to insist upon strict performance of any of the covenants, terms, provisions, or conditions of this Agreement or to exercise any right or option herein contained, shall not be construed as a waiver or a relinquishment for the future of any such covenant, term, provision, or condition, or right of election, but same shall remain in full force and effect.

SECTION 24. **NOTICE.**

The parties hereto agree and understand that written notice, mailed or delivered to the last known mailing address, shall constitute sufficient notice to the COUNTY and the CONTRACTOR. All notices required and/or made pursuant to this Agreement to be given to the COUNTY and the CONTRACTOR shall be in writing and given by way of the United States Postal Service, first class mail, postage prepaid, addressed to the following addresses of record:

COUNTY: Osceola County
Attention: Procurement Services
1 Courthouse Square, Suite 2300
Kissimmee, Florida 34741

CONTRACTOR: 3M Company
Tax, Building 224-5N-40
Saint Paul, Minnesota 55144-1000

SECTION 25. MODIFICATION.

The covenants, terms, and provisions of this Agreement may be modified by way of a written instrument, mutually accepted by the parties hereto. In the event of a conflict between the covenants, terms, and/or provisions of this Agreement and any written Amendment(s) hereto, the provisions of the latest executed instrument shall take precedence.

SECTION 26. HEADINGS.

All headings of the sections, exhibits, and attachments contained in this Agreement are for the purpose of convenience only and shall not be deemed to expand, limit, or change the provisions contained in such sections, exhibits, and attachments.

SECTION 27. ADMINISTRATIVE PROVISIONS.

In the event the COUNTY issues a purchase order, memorandum, letter, or any other instrument addressing the services, work, and materials to be provided and performed pursuant to this Agreement, it is hereby specifically agreed and understood that any such purchase order, memorandum, letter, or other instrument is for the COUNTY's internal purposes only, and any and all terms, provisions, and conditions contained therein, whether printed or written, shall in no way modify the covenants, terms, and provisions of this Agreement and shall have no force or effect thereon.

SECTION 28. CONFLICT OF INTEREST.

The CONTRACTOR warrants that the CONTRACTOR has not employed or retained any company or person, other than a bona fide employee working solely for the CONTRACTOR, to solicit or secure this Agreement, and that the CONTRACTOR has not paid or agreed to pay any person, company, corporation, individual, or firm any fee, commission, percentage, gift, or any other consideration, contingent upon or resulting from the award or making of this Agreement. For the breach or violation of this Paragraph, the COUNTY shall have the right to terminate this Agreement immediately, without liability and without regard to the notice requirements stated hereinabove.

SECTION 29. PUBLIC ENTITY CRIMES.

As required by section 287.133, Florida Statutes, the CONTRACTOR warrants that it is not on the convicted contractor list for a public entity crime committed within the past thirty six (36) months. The CONTRACTOR further warrants that it will neither utilize the services of, nor contract with, any supplier, sub-contractor, or consultant in connection with this Agreement for a period of thirty six (36) months from the date of being placed on the convicted contractor list.

SECTION 30. JOINT AUTHORSHIP.

This Agreement shall be construed as resulting from joint negotiation and authorship. No part of this Agreement shall be construed as the product of any one of the parties hereto.

SECTION 31. EQUAL OPPORTUNITY EMPLOYER.

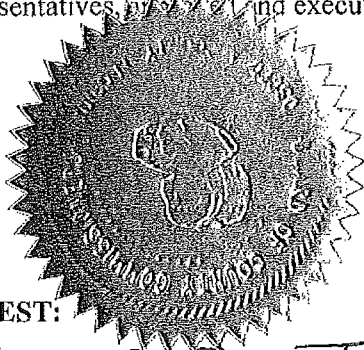
The CONTRACTOR is an Equal Opportunity Employer and will comply with all equal opportunity employment laws. The CONTRACTOR will further ensure that all sub-contractors it utilizes in providing the services required hereunder will comply with all equal opportunity employment laws.

SECTION 32. AUDITING, RECORDS, AND INSPECTION.

In the performance of this Agreement, the CONTRACTOR shall keep books, records, and accounts of all activities, related to the Agreement, in compliance with generally accepted accounting procedures. Throughout the term of this Agreement, books, records, and accounts related to the performance of this Agreement shall be open to inspection during regular business hours by an authorized representative of the COUNTY and shall be retained by the CONTRACTOR, for a period of three years after termination or completion of the Agreement or until the full COUNTY audit is complete, whichever comes first. The COUNTY shall retain the right to audit the books during the three-year retention period. All books, records, and accounts related to the performance of this Agreement shall be subject to the applicable provisions of the Florida Public Records Act, chapter 119, Florida Statutes. The COUNTY also has the right to conduct an audit within sixty (60) days from the effective date of this Agreement to determine whether the CONTRACTOR has the ability to fulfill its contractual obligations to the satisfaction of the COUNTY. The COUNTY has the right to terminate this Agreement, based upon the findings in this audit, without regard to any notice requirement for termination.

(Signatures on the following page)

IN WITNESS WHEREOF, the parties hereto have, though their duly authorized representatives, signed and executed this Agreement as of the date set forth below.



**BOARD OF COUNTY COMMISSIONERS
OSCEOLA COUNTY, FLORIDA**

By: [Signature]
Chairman/Vice Chairman

ATTEST:

Paula J. Carpenter
Clerk/Deputy Clerk of the Board

DATE: BCC approved 03/14/11

3M COMPANY
By: [Signature]
Robert J. Schouveller

Title: Sr. Contract Administrator

Date: March 4, 2011

STATE OF MINNESOTA
COUNTY OF RAMSEY

The foregoing instrument was executed before me this 4th day of March, 2011, by Robert J. Schouveller, as Sr. Contract Admin. of 3M Company, who personally swore or affirmed that he is authorized to execute this Agreement and thereby bind the Corporation, and who is personally known to me. ~~OR--has--produced~~ _____ as identification.

Commission Expires:
1-31-2014

Jeanne Lou Kubicka
NOTARY PUBLIC, State of Minnesota

(stamp)

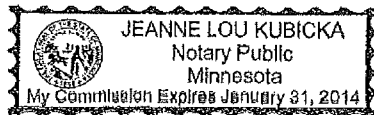


Exhibit "A"
Scope of Services

1. DESCRIPTION:

This project supports the COUNTY's street sign fabrication program. The COUNTY's Traffic Engineering Department provides fabrication, installation, and maintenance of traffic signs, signals, school walks, and pavement markers which enhance the visibility of day and night traffic travel within Osceola County. The CONTRACTOR will supply and deliver reflective and non-reflective street sign sheeting materials and sign faces as may be constituted by an order from the COUNTY.

2. PROJECT MANAGER:

The COUNTY's Project Manager shall be Rick Cole, who shall have the responsibility for managing the purchases performed under this Agreement. The COUNTY's Contact Information is as follows:

Osceola County Traffic Engineering Department
3850 Old Canoe Creek Road
St. Cloud, Florida 34769
(407) 343-7143

3. DESIGN STANDARDS:

All the materials provided by the CONTRACTOR shall conform to the following requirements and standards:

- a. The Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction (latest edition), Specification Section 700 - Highway Signing and Section 994 - Retro-Reflective and Non-Reflective Sign Sheeting. All the materials being offered must be approved by the FDOT and be listed on their Qualified Product List (QPL) website, for use on roadway unless specifically specified and approved before acceptance
- b. The American Society for Testing and Materials (ASTM) Standard D4956-09 for Reflective Sheeting Type I and Type XI as further described under Section 6 Sheeting Material unless specifically specified and approved before acceptance.
- c. The 3M Specifications as described and set forth in **Exhibit "D"** which is attached hereto and made a binding part hereof.

4. MATCHED COMPONENT SYSTEM PRODUCTS:

Group 2, Group 3, and Group 5 include: Flexible, prismatic, wide angle, colored reflective sign sheeting, sign faces, border materials, film overlay materials with self adhesive backs, and protective liners. The CONTRACTOR shall supply and deliver at no additional cost to the COUNTY the following items which are compatible with the CONTRACTOR's sheeting products:

- a. Inks;

- b. Clears;
- c. Thinners;
- d. Nylon Washers; and,
- e. Slip Sheeting Liners for sign faces.

The COUNTY shall process requests for a. Inks, b. Clears, c. Thinners, d. Nylon Washers, and e. Slip Sheeting Liners for sign faces on **Exhibit "C" Order Form**, which is attached hereto and made a binding part hereof.

Exhibit "B"
Pricing Schedule

GROUP 1

Group 1 shall include: Electronic Cuttable Overlay Film, Acrylic, un-punched, pressure sensitive adhesive back with liner. Product is 3M ElectroCut Transparent Overlay Film Series 1170, at minimum. Product shall be approved by the FDOT and listed on their QPL website under Specification 700, Sheeting Ink and Overlay Material. Includes all colors. This material shall perform to meet the warranty period of the product adhered to.

Group 1 Description	Size	Quantity	Unit Price
All Colors Available	48"X 50 yards	30 Rolls	\$570.00
Size	Custom Sizes (Standard other than listed)	Per square foot	\$0.95

GROUP 2

Group 2 shall include: Retro-Reflective Sheeting Micro-Prismatic, with pressure sensitive adhesive back. The CONTRACTOR's product specification shall meet or exceed current product(s) in use by the COUNTY: 3M DG3 Series 4000 at minimum (including fluorescent yellow/green and yellow (Series 4081 and 4083). The CONTRACTOR's product shall meet ASTM 04956-09 Standards for Reflective Sheeting Type XI and be approved by the FDOT and listed on their QPL website under Specification 700, Reflective Sheeting Type VII.

Group 2 Description	Size	Quantity	Unit Price
Fluorescent Yellow/Green And Yellow	30"X 50 yards	2 Rolls	\$1,462.50
	36"X 50 yards	4 Rolls	\$1,755.00
	48"X 50 yards	2 Rolls	\$2,340.00
All Colors	Custom Sizes (Standard other than listed)	Per square foot	\$3.90

Group 2 Continued Description	Size	Quantity	Unit Price
All Colors Available (Excludes Yellow/Green And Yellow)	12"X 50 yards	2 Rolls	\$585.00
	24"X 50 yards	2 Rolls	\$1,170.00
	30"X 50 yards	4 Rolls	\$1,462.50
	36"X 50 yards	2 Rolls	\$1,755.00
	48"X 50 yards	2 Rolls	\$2,340.00
	30"X 100 yards	6 Rolls	\$2,925.00
	Custom Sizes (Standard other than listed)	Per square foot	\$3.90

GROUP 3

Group 3 shall include: High Performance Prismatic Retroreflective with pressure-sensitive adhesive back. The CONTRACTOR's product specification shall meet or exceed current product(s) in use by the COUNTY: 3M HIP Reflective Series 3930. The CONTRACTOR's product shall meet ASTM 04956-09 Standards for Reflective Sheeting (Type III, IV and X) and be approved by the FDOT and listed on their QPL website under Specification 700, Reflective Sheeting Type VII.

Group 3 Description	Size	Quantity	Unit Price
All Colors Available (Excludes Fluorescent Colors)	9" X 50 yards	2 Rolls	\$136.13
	12"X 50 yards	2 Rolls	\$181.50
	18"X 50 yards	10 Rolls	\$272.25
	24"X 50 yards	2 Rolls	\$363.00
	30"X 50 yards	10 Rolls	\$453.75
	36"X 50 yards	2 Rolls	\$544.50
	48"X 50 yards	2 Rolls	\$726.00
	9" X 100 yards	20 Rolls	\$272.25
	Custom Sizes (Standard other than listed)	Per square foot	\$1.21

GROUP 4

Group 4 shall include: Fluorescent Orange Prismatic Retroreflective Sheeting with pressure sensitive adhesive back. The CONTRACTOR's product specification must meet or exceed current product(s) in use by the COUNTY: 3M Engineering Grade Prismatic Series 3924s. The CONTRACTOR's product shall meet ASTM 04956-09 Standards for Reflective Sheeting Type XI and be approved by the FDOT and listed on their QPL website under Specification 700, Reflective Sheeting Type VII.

Group 4 Description	Size	Quantity	Unit Price
Fluorescent Orange	36"X 50 yards	2 Rolls	\$1,147.50
	48"X 50 yards	2 Rolls	\$1,530.00
	Custom Sizes (Standard other than listed)	Per square foot	\$2.55

GROUP 5

Group 5 shall include: Engineer Grade Reflective Sheeting with pressure sensitive adhesive back. The CONTRACTOR's product specification must meet or exceed current product(s) in use by the COUNTY: 3M Series 3200. The CONTRACTOR's product shall meet ASTM 04956-09 Standards for Reflective Sheeting Type I. The CONTRACTOR's product is not required to be on FDOT QPL.

Group 5 Description	Size	Quantity	Unit Price
All Colors Available	24"X 50 yards	6 Rolls	\$195.00
	48"X 50 yards	4 Rolls	\$390.00
	Custom (Standard other than listed)	Per square foot	\$0.65

GROUP 6

Group 6 shall include: Matte Electrocut Cast Vinyl with pressure sensitive adhesive back. The CONTRACTOR's product specification must meet or exceed current product(s) in use by the COUNTY: 3M Scotchcal Electrocut Graphics Film Series 7725. The CONTRACTOR's products are not required to be on the FDOT QPL and no match component warranty is required. The CONTRACTOR's product shall include all Colors, including: Matte White, Matte Black and Matte Dark Green**. The **Matte Dark Green must color match 3M Scotchcal Electrocut Film 7725-56 (Sheriff's Vehicle Roof Graphic Designated Color).

Group 6 Description	Size	Quantity	Unit Price
All Colors Available	24"X 50 yards	2 Rolls	\$180.00
	48"X 50 yards	2 Rolls	\$360.00
	Custom Sizes (Standard other than listed)	Per square foot	\$0.60

GROUP 7

Group 7 shall include: Protective Overlay Films with pressure sensitive adhesive back: to provide clear, non-chlorinated, colorless films to be used in lieu of clear coating. Product A shall have a pre-mask installed on film. The CONTRACTOR's product specification must meet or exceed current product(s) in use by Osceola COUNTY: 3M 1160 Overlamine. Product B is for printed graphics no pre-mask. The CONTRACTOR's product specification must meet or exceed current product(s) in use by the COUNTY: 3M Scotchlite 8519 Luster Overlamine. The CONTRACTOR's product is not required to be on FDOT QPL and no match component warranty is required on Product B.

Group 7 Description	Size	Quantity	Unit Price
Product A Clear Graffiti Protective Overlay With Premask For HIP/DG3	48"X 50 yards	6 Rolls	\$1,326.00
	Custom Sizes (Standard other than listed)	Per square foot	\$2.21
Product B Luster Overlamine For Printed Graphics	48"X 50 yards	2 Rolls	\$399.28
	Custom Sizes (Standard other than listed)	Per square foot	\$0.6586

GROUP 8

Group 8 shall include: Removable Flexible Reflective Graphic Film with Air Release Channels in the pressure activated adhesive back. The CONTRACTOR's product specification must meet or exceed current product(s) in use by the COUNTY: 3M 680CR and 680CR-10 (white) film. The CONTRACTOR's product is not required to be on FDOT QPL.

Colors: White, All Other Colors

Group 8 Description	Size	Quantity	Unit Price
White	24"X 50 yards	2 Rolls	\$903.87
	48"X 50 yards	4 Rolls	\$1,807.74
	Custom (Standard other than listed)	Per square foot	\$3.0129
All Available Colors (Excludes White)	24"X 50 yards	2 Rolls	\$971.37
	48"X 50 yards	2 Rolls	\$1,942.74
	Custom (Standard other than listed)	Per square foot	\$3.237

GROUP 9

Prismatic, Retroreflective Markings for Vehicle Conspicuity: Highly reflective prismatic lens sheeting with pressure-sensitive adhesive designed for truck and trailer markings Bid Product specification must meet or exceed current product(s) in use by the COUNTY: 3M Series 983. The CONTRACTOR's product is not required to be on FDOT QPL.

Group 9 Description	Size	Quantity	Unit Price
All Colors Available	2"X 50 yards	2 Rolls	\$95.75
	3"X 50 yards	2 Rolls	\$143.63
	4"X 50 yards	2 Rolls	\$191.50
	Custom Sizes (Standard other than listed)	Per square foot	\$3.83

**Exhibit "C"
ORDER FORM**

3M 2009 Match Component System Order Form

3M Traffic Safety Systems Division
3M Center, Building, 225-65-08
St. Paul, MN 55144-1000

Please print, have customer fill out, then fax to Customer Service (1-800-591-9293)

700 Series		\$ Gallons
705	Black (Opaque)	
707	Toner	
708	Green	
710	Blue	
711	Thinner	
712	Traffic Sign Red	
714	Yellow	
716	Construction Orange	
717	Brown	

8801 Series		\$ Gallons
882I	Traffic Sign Red	
883I	Blue	
884I	Yellow	
885I	Black (Opaque)	
886I	Orange	
887I	Brown	
888I	Green	
891I	Thinner	
892I	Flow Additive	

990 Series for 3290		\$ Gallons
990-03	Blue	
990-04	Yellow	
990-05	Black	
990-06	Orange	
990-07	Brown	
990-08	Green	
990-12	Traffic Sign Red	
991	Thinner	
T11A	Thinner	

1800 Series		\$ Gallons
1805	Black	
CGS-50	Thinner	
CGS-80	Thinner	

800-00 Series		\$ Gallons
883N	Blue	
884N	Yellow	
885N	Black	
886N	Orange	
888N	Green	
882N	Traffic Sign Red	

Slip Shtg	SCW568 For packaging of finished signs made of 3M™ Diamond Grade & High Intensity Grade Sheeting Only.
	150 yds
24" Rolls	NC
30" Rolls	NC
36" Rolls	NC
48" Rolls	NC

NOTE: See TSS Price Catalog for all other premix special formulas.
Contact TSS Customer Service for more information at 1-800-563-1380

By my signature (below) I accept that these items are provided to me for purposes of application to use with 3M™ Reflective Sheatings only. They may not be used with other sheatings and may not be resold.

Company/Agency Name: _____ Date: _____

Address: _____

Telephone: _____

Authorized Customer (Please Print): _____

Signature: _____

EXHIBIT "D"
3M SPECIFICATION

Osceola County Specification for
ELECTRONICALLY CUTTABLE FILMS
FOR USE ON RETROREFLECTIVE SHEETING

Item bid must, at minimum, meet the specification of current product used by
Osceola County:

3M ElectroCut™ Film Series 1170

EXHIBIT "D"
3M SPECIFICATION

1.0 Scope

This document covers highly durable, transparent, acrylic, pressure sensitive colored film designed to be applied to retroreflective materials for the creation of traffic control signs and devices.

2.0 Performance History

- 2.1 The sheeting manufacturer shall provide test data showing that representative production material of the type to be supplied has met the requirements for 36 months of accelerated outdoor weathering described in Section 6.6.
- 2.2 This data shall be gathered by an independent agency, such as AASHTO's National Transportation Product Evaluation Program (NTPEP).
- 2.3 The data submitted shall cover the films manufactured by the sheeting manufacturer in standard traffic colors and the data collection shall have been completed no more than 5 years prior to the offer.
- 2.4 To be considered an equal alternate to an existing, qualified product, a candidate product must be used or weathered along side the control or benchmark material to eliminate any bias in the exposure procedures.

3.0 Applicable Documents

The following documents, of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

3.1 ASTM Standards

- 3.1.1 B 209 Specification for Aluminum and Aluminum Alloy Sheet and Plate.
- 3.1.2 D 523 Standard Method for Test for Specular Gloss.
- 3.1.3 D 4956 Standard Specification for Retroreflective Sheeting for Traffic Control
- 3.1.4 E 284 Standard Definition of Terms Relating to Appearance of Materials.
- 3.1.5 E 308 Computing the Colors of Objects by Using the CIE System.
- 3.1.6 E 810 Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting.

EXHIBIT "D"
3M SPECIFICATION

3.1.7 E 1164 Standard Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation.

3.2 CIE Publication Number 39-2, Recommendation for Surface Colors for Visual Signaling.

3.3 FP-92 Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects.

4.0 Description

Electronic cuttable films shall consist of highly durable, transparent, acrylic colored films coated with a transparent pressure sensitive adhesive protected by a removable translucent, synthetic, release liner. The films are designed to be cut on knife over roll (sprocket fed or friction fed) and flat bed electronic cutting machines. The films shall be available in standard traffic colors, be dimensionally stable, and be designed to optimally cut, weed, lift, and transfer. Use of electronic cuttable films will not require the using agency to release any volatile organic compounds.

5.0 Test Methods

5.1 Test Conditions. Unless otherwise specified herein, all applied and unapplied test samples and specimens shall be conditioned at the standard conditions of $73 \pm 3^{\circ} \text{F}$ ($23 \pm 1.5^{\circ} \text{C}$) and $50 \pm 5\%$ relative humidity for 24 hours prior to testing.

5.2 Test Panels. Unless otherwise specified herein, when tests are to be performed using test panels, the specimens of retroreflective and/or overlay film(s) shall be applied to smooth aluminum cut from ASTM B-209 Alloy 5052-H36, 5052-H38, 5154-H38, or 6061-T6 sheets on 0.020 inch (0.051 cm), 0.040 inch (0.102 cm), or 0.063 inch (0.160 cm) thickness. The aluminum shall be degreased and lightly acid etched before the specimens are applied. The specimens shall be applied in accordance with the recommendations of the reflective sheeting and electronic cuttable film manufacturer(s).

6.0 Physical Requirements

6.1 Color Requirements. When electronic cuttable film is applied to retroreflective sheeting, the resulting color of the composite sheeting will conform to Federal Specification FP-92, Section 718.01 and ASTM D 4956 or to the using agency specification for the appropriate retroreflective sheeting to which it is applied.

6.1.1 Color Test. Conformance to color requirements shall be determined by instrumental method in accordance with ASTM E 1164 on sheeting applied to aluminum test panels. The values shall be determined on a HunterLab Labscan 6000 0/45 Spectrocolorimeter with option CMR 559 [or approved equal 0/45 (45/0) instrument with circumferential viewing (illumination)]. Computations shall be done in accordance with ASTM E 308 for the 2° observer.

EXHIBIT "D"
3M SPECIFICATION

- 6.2 Coefficient of Retroreflection, R_A . When transparent colored electronic cuttable film is applied per the manufacturer's recommendations over white retroreflective sheeting, the colored composite will conform to the percentage specified in Table 1. The coefficient of retroreflection shall be determined in accordance with ASTM E 810.

Table 1		
Coefficient of Retroreflection R_A * for Applied E.C. Films (expressed as % of white retroreflective sheeting background)		
Transparent 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	-
Blue-Violet	1.4	-
Dark Green**	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.

- 6.2.1 Units. Coefficients of retroreflection R_A shall be specified in units of candelas per foot candle per square foot (candelas per lux per square meter).
- 6.2.2 R_A measurements at 0.2° observation angle and -4° entrance angle (0° rotation) shall be made on the same area of sheeting before and after application of the colored overlay film.
- 6.2.3 The ratio of the R_A (color) to R_A (White) shall be calculated and converted to a percentage to determine the film transmission values.
- 6.3 Specular Gloss. The electronic cuttable film shall have an 85° specular gloss of not less than 50 when tested in accordance with ASTM D 523.
- 6.4 Processing and Cuttability. The electronic cuttable film shall permit cutting, weeding, masking with transfer tape, lifting, and application to retroreflective sheeting when used in accordance with manufacturer's recommendations at temperatures between 65° and 95° (18.3° and 35.0° C) and relative humidities between 30% and 70%. The film shall lay flat with minimal edge curl and be dimensionally stable.

EXHIBIT "D"
3M SPECIFICATION

- 6.5 Adhesive Liner. The protective lay flat liner shall be a synthetic film liner resistant to moisture absorption and curl and shall be removable by peeling, without breaking, tearing, or removing any adhesive from the electronic cuttable film. The liner shall have a controlled release from the adhesive coated film sufficient to allow cutting and weeding without the film popping off from the liner, while still allowing the liner to easily be peeled from the film during application. The liner shall be printed with an indelible mark indicating the name of the film manufacturer.
- 6.5.1 Film with punched edges for use on sprocket fed knife over roll cutters shall be edge scored and weeded to remove film in the punched area as a means of eliminating adhesive build up on the sprockets.
- 6.6 Resistance to Accelerated Outdoor Weathering. When electronic cuttable film is applied to retroreflective sheeting, the surface of the film shall be weather resistant and show no appreciable cracking, blistering, crazing, or dimensional change after 3 years unprotected outdoor exposure, facing the equator and inclined 45° from the vertical (one year for orange EC film.) Following weather exposure, panels shall be washed in a 5% HCl solution for 45 seconds, rinsed thoroughly with clean water, blotted dry with a soft clean cloth and brought to equilibrium at standard conditions. After cleaning, the coefficient of retroreflection shall not be less than the value specified by the using agency for colored retroreflective sheeting.
- 6.6.1 Show no appreciable evidence of cracking, scaling, pitting, blistering, edge lifting or curling or more than 1/32 inch (0.08 cm) shrinkage or expansion.
- 6.6.2 Show "good" color fastness or better when tested as in 5.7.
- 6.6.3 Retained reflectivity shall be the same as the using agency specification for colored retroreflective sheeting of the type being tested.
- 6.6.4 The electronic cuttable film shall not be removable from the retroreflective sheeting without damage.

Retroreflective performance measurements made after weather exposure shall be made only at angles of 0.2° observation and -4° entrance. Where more than one panel of a color is measured, the coefficient of retroreflection shall be the average of all determinations.

- 6.7 Colorfastness. One specimen, exposed and prepared as specified in 5.6 shall be wet out with a mild detergent and water solution and compared with a similarly treated unexposed specimen under natural (North sky) daylight or artificial daylight having a color temperature of 7600° K. The colorfastness shall be evaluated as follows:

Excellent - no perceptible change in color.
Good - perceptible but no appreciable change in color.
Fair - appreciable change in color.

EXHIBIT "D" 3M SPECIFICATION

Appreciable change in color means a change that is immediately noticeable in comparing the exposed specimen with the original comparison specimen. If closer inspection or a change of angle of light is required to make apparent a slight change in color, the change is not appreciable.

6.8 General Characteristics and Packaging.

6.8.1 Roll Goods. When supplied as roll goods, the electronic cuttable film shall be of good appearance, free from ragged edges, cracks and extraneous materials. The maximum number of splices in each roll shall be three per 50 yards of material. Splices shall be butted. The sheeting shall be packed snugly in corrugated fiberboard cartons, in accordance with commercially accepted standards. Each carton shall clearly stipulate the brand, quantity, size, lot or run number, and color. Stored under normal conditions the electronic cuttable film as furnished shall be suitable for use for a minimum period of one year.

6.8.2 Sign Faces. When supplied as a finished sign face or mounted sign, the sign face, made of electronic cuttable film and retroreflective sheeting, shall comply with the appearance, specification, and good workmanship designated by the using agency for sign faces constructed of colored retroreflective sheeting of the same type.

7.0 Performance Requirements and Obligations.

- 7.1 Certification. The film manufacturer shall, upon request, submit with each lot or shipment, a certification which states that the material supplied will meet all of the requirements listed herein.
- 7.2 Field Performance Requirements. The electronic cuttable film applied to retroreflective sheeting, both materials applied in accordance with the manufacturer's recommendations, shall as a composite perform with the same effective performance life as the using agency specifies for that type of colored retroreflective sheeting. The composite sign will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that: (1) the sign is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions; or (2) the coefficient of retroreflection is less than the minimums specified by the using agency for colored retroreflective sheeting.
- 7.3 Electronic Film Manufacturer's Replacement Obligation. Where it can be shown that retroreflective traffic signs with electronic cuttable film supplied and used according to the film manufacturer's recommendations have not met the performance requirements of Section 7.2, the film manufacturer shall cover restoration costs as provided in the using agency specification for colored retroreflective sheeting.
- 7.4 Government Using Agency Obligation. The using agency shall be responsible for requiring dating of all signs at the time of application. That date constitutes the start of the field performance obligation period.

EXHIBIT "D"
3M SPECIFICATION

8.0 Technical Assistance Requirements

8.1 Instruction and Training. The manufacturer supplying the electronic cuttable film shall provide the services of a qualified technician for instruction and training at the primary sign manufacturing facility designated by the agency. This instruction shall be available upon request at no additional cost, and shall include but not be limited to, training films, material application, equipment operation, packaging, storage and other proven sign shop practices as they apply to the electronic cuttable film supplied by the manufacturer, and to assure that the resulting signs can comply with the applicable specifications. Additional on-site technical assistance by the manufacturer supplying the electronic cuttable film shall be provided at each of the sign shops designated in the bid invitation. This assistance will be provided upon request of sign production, if required.

8.2 Compliance. Failure to comply with the requirements and schedules of 8.1 shall be cause for cancellation of contract.

9.0 Patented Devices, Materials, and Processes.

Seller will pay any damages, costs or fines resulting from any claims against Osceola County for infringement of third party patents by product supplied by Seller under this specification. The costs paid by Seller shall include legal and court costs deemed reasonably necessary by counsel for Osceola County (government unit) in defending against such claims.

EXHIBIT "D"
3M SPECIFICATION

Osceola County Specification For
Super-High Efficiency, Full Cube
Retroreflective Sheeting

EXHIBIT "D"
3M SPECIFICATION

Specification for a Super-High Efficiency Full Cube Retroreflective Sheeting for Optimal Performance

NOTICE: This specification contains a sheeting manufacturer's field performance obligation paragraph 7.2 which shall apply only when included and made part of a bid request, proposal, and/or purchase agreement of Osceola County.

1.0 Scope

This specification covers flexible white or colored, Super-High Efficiency Full Cube Retroreflective Sheeting (hereinafter called sheeting), tape and related processing materials designed to enhance nighttime visibility of traffic control signs and objects. The sheeting shall consist of full cube prismatic lens elements with a distinctive interlocking diamond seal pattern visible from the face of a smooth surface. The sheeting shall have a precoated adhesive protected by an easily removable liner.

The sheeting shall be part of a family of matched component products required for the manufacture and imaging of traffic control signs as described in section 4. Only section 2.0, section 6.2.5, section 6.4, and section 7.2 cover printed colored areas of signs.

2.0 Prequalification

Materials (sheeting, process colors, overlay films) shall be considered for use only when, in the opinion of Osceola County, sufficient evidence exists to ensure that the materials and services offered can reliably conform to this specification.

3.0 Classification and Conformance

3.1 The sheeting shall conform to ASTM D 4956 as modified by this specification.

EXHIBIT "D"
3M SPECIFICATION

4.0 Items to be included in Bids

4.1 Process Colors

4.1.1 The manufacturer of the sheeting shall manufacture and offer process colors in standard traffic colors, clears and thinners recommended for the sheeting to meet the performance requirements of this specification.

4.1.2 The process colors shall be a single line of traffic colors which may be applied before and after sheeting is applied to a substrate, require no component premixing, and will air dry for packing with proper ventilation in 3 hours or less and require no clear coating.

4.2 Overlay Films

The sheeting manufacturer shall also manufacture colored acrylic imaging films and clear protective overlays, which are compatible with the sheetings, and when used in accordance with the sheeting manufacturer's instructions, shall not lessen the warranty term as described in section 7.2.

5.0 Test Panels and Test Conditions

Unless otherwise specified herein, sheeting shall be applied to test panels in accordance with ASTM D 4956-09, section 7.2 and test conditions shall conform to ASTM D 4956-09 section 7.1.

EXHIBIT "D"
3M SPECIFICATION

6.0 Requirements

6.1 Color Requirements

6.1.1 Colors

Color shall be as specified and shall conform to the Daytime and Nighttime Color Specification Limits of ASTM D 4956. Daytime luminance factors shall conform to ASTM D 4956-09 Table 2.

6.1.1.1 Ordinary Colors

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.*

6.1.1.2 Fluorescent Colors

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.*

* The instrumentally determined color values of ordinary and fluorescent colored 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.

EXHIBIT "D"
3M SPECIFICATION

6.2 Coefficient of Retroreflection

6.2.1 Conformance to minimum requirements for Retroreflectance is determined as follows:

6.2.2 Three 8 in. x 8 in. samples spaced evenly across and down a representative piece of sheeting shall be taken. The Coefficient of Retroreflection (R_A) shall be determined for each of the three samples per ASTM E810. The average of the three values shall comply with the stated minimum table value and no single sample shall be less than 80% of the table value.

6.2.3 The observation angles shall be 0.2°, 0.5°, 1.0°.

6.2.4 The entrance angles shall be -4° and 30°.

6.2.5 For screen printed transparent colored areas or transparent colored overlay films on white sheeting, the coefficients of retroreflection shall not be less than 70% of the values for corresponding color in Table I of this specification.

6.3 Fractional Retroreflectance

The optical design of the sheeting shall be such that when measured at an entrance angle of -4° the fractional retroreflectance within a 2° observation angle cone, as defined in ASTM E808 as R_T with $\alpha_{max} = 2^\circ$, is at least 55%.

EXHIBIT "D"
3M SPECIFICATION

Table 1
Minimum Coefficient of Retroreflection
(cd/lux/m²)

White	4	30
0.2	580	220
0.5	420	150
1.0	120	45

Blue	4	30
0.2	26	10
0.5	19	7.0
1.0	5.0	2.0

Yellow	4	30
0.2	435	165
0.5	315	110
1.0	90	34

FYG	4	30
0.2	460	180
0.5	340	120
1.0	96	36

Red	4	30
0.2	87	33
0.5	63	23
1.0	18	7

FY	4	30
0.2	350	130
0.5	250	90
1.0	72	27

Green	4	30
0.2	58	22
0.5	42	15
1.0	12	5.0

FO	4	30
0.2	175	66
0.5	125	45
1.0	36	14

Brown	4	30
0.2	17	7.0
0.5	13	5.0
1.0	4.0	1.0

6.4 Color Processing

The retroreflective sheeting shall be designed to work in concert with recommended imaging systems. Color processing with compatible transparent and opaque process colors shall be possible in accordance with the sheeting manufacturer's recommendation at temperatures of 60° to 100°F (16° to 38°C) and relative humidity of 20% to 80%. The sheeting shall be heat resistant and permit force curing without staining of applied or unapplied sheeting at temperatures recommended by the sheeting manufacturer.

EXHIBIT "D" 3M SPECIFICATION

6.5 Shrinkage

The retroreflective sheeting shall comply with the shrinkage requirements contained in ASTM D 4956-09 section 6.6.

6.6 Adhesive

The retroreflective sheeting shall comply with the liner removal and adhesion requirements contained in ASTM D 4956-09 sections 6.8 and 6.9 respectively.

6.7 Optical Stability

Three samples of retroreflective sheeting applied to test panels and conditioned as in Section 5.0 shall each first have their photometric properties characterized by measuring the coefficients of retroreflection in accordance with ASTM E 810 at all test geometries shown in Table I. These panels shall then be exposed in an air circulating oven at $160 \pm 5^\circ\text{F}$ ($71 \pm 3^\circ\text{C}$) for a period of 24 hours. After exposure the panels shall be allowed to condition according to the provisions of Section 5.0. These panels will again be characterized for photometric properties by measuring the coefficients of retroreflection at all test geometries measured before exposure.

The coefficients of retroreflection measured after exposure shall be between 85% and 115% of the values measured before exposure for each of the three samples.

6.8 Fungus resistance

The retroreflective sheeting shall comply with the supplementary requirements contained in section S1 of ASTM D 4956-09.

6.9 General Characteristics and Packaging

The retroreflective sheeting as supplied shall be of good appearance, free from ragged edges, cracks and extraneous materials and shall be furnished in either rolls or sheets.

When furnished in continuous rolls, the number of splices shall not be more than two per 50 yards (45.7 m) of material, with a maximum of three pieces in any 50-yard (45.7 m) length. Splices shall be butted and shall be suitable for continuous application as furnished.

The sheeting shall be packaged in accordance with commercially accepted standards. Each carton shall clearly stipulate the brand, quantity, size, lot or run number, and color. Stored under normal conditions the retroreflective sheeting as furnished shall be suitable for use for a minimum period of one year.

EXHIBIT "D"
3M SPECIFICATION

7.0 Performance Requirements and Obligations

7.1 Certification

The sheeting manufacturer shall submit with each lot or shipment, a certification that states the material supplied will meet all the requirements listed herein.

7.2 Field Performance Requirements

7.2.1 For Permanent Signing - Ordinary Colors:

Sheeting manufactured of ordinary colors and processed and applied to sign blank materials in accordance with sheeting manufacturer's recommendations, shall perform effectively for at least 12 years. The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that: (1) the sign is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions; or (2) the coefficient of retroreflection is less than the minimum specified for that sheeting during that period listed.

80% of values listed in Table I up to 7 years and
70% of values listed in Table I up to 12 years

Failure of process colors or overlay films provided and/or sold for use on recommended sheeting shall constitute a failure of the sign and shall be replaced under the manufacturer's replacement obligations (7.3).

For screen printed transparent colored areas or transparent colored overlay films on white sheeting, the coefficients of retroreflection shall not be less than 70% of the values for the corresponding integral color.

All measurements shall be made after sign cleaning according to the sheeting manufacturer's recommendations.

EXHIBIT "D"
3M SPECIFICATION

7.2.2 For Permanent Signing – Fluorescent Colors:

Sheeting manufactured of fluorescent colors and processed and applied to sign blank materials in accordance with sheeting manufacturer's recommendations shall perform effectively for the number of years stated in this specification. The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that: (1) the sign is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions; or (2) the coefficient of retroreflection is less than the minimum specified for that sheeting during that period listed.

80% of values listed in Table I up to 7 years* and
70% of values listed in Table I up to 10* years

Failure of process colors or overlay films provided and/or sold for use on recommended sheeting shall constitute a failure of the entire sign and shall be replaced under the manufacturer's replacement obligations (7.3).

All measurements shall be made after sign cleaning according to sheeting the manufacturer's recommendations.

*Due to climatic conditions, the warranty in the following states will be a seven year warranty: Alabama, Arizona, Florida, Georgia, Hawaii, Louisiana, Mississippi, New Mexico, South Carolina, Texas

- 80% of values listed in Table I up to 5 years in states listed above
- 70% of values listed in Table I up to 7 years in states listed above

EXHIBIT "D"
3M SPECIFICATION

7.2.3 For Temporary Signing – Fluorescent Orange Colors

Sheeting manufactured of fluorescent orange and applied to sign blank material in accordance with the sheeting manufacturer's recommendations, is expected to perform effectively for a minimum of three years. The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that: (1) the sign is ineffective for its intended purpose or (2) retains less than 50% of the coefficient of retroreflection values listed in Table I at 0.2 degrees observation, -4 degrees entrance (measured in accordance with ASTM E810).

All measurements shall be made after sign cleaning according to the sheeting manufacturer's recommendations.

Natural causes include effects of exposure to weather. Natural causes exclude (without limitation) damage from exposure to chemicals, abrasion and other mechanical damage (such as from fasteners used to mount the sign, collisions or mishandling), vandalism, or malicious mischief.

7.3 Sheeting Manufacturer's Replacement Obligation

7.3.1 For ordinary colors where it can be shown that retroreflective signs, supplied and used according to the sheeting manufacturer's recommendations, have not met the performance requirements of Section 7.2, the sheeting manufacturer shall cover restoration costs as follows for sheetings shown to be unsatisfactory during:

7.3.1.1 For the entire 12 years, the sheeting manufacturer will replace the sheeting required to restore the sign surface to its original effectiveness.

7.3.1.2 In addition, during the first seven years the sheeting manufacturer will cover the cost of restoration of the sign surface to its original effectiveness at no cost to Osceola County for materials and labor.

7.3.2 For fluorescent colors where it can be shown that retroreflective signs, supplied and used according to the sheeting manufacturer's recommendations, have not met the performance requirements of Section 7.2, the sheeting manufacturer shall cover restoration costs as follows for sheetings shown to be unsatisfactory:

7.3.2.1 For those states with a 10 year warranty, if the failure

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occurs within the first 7 years from the date of fabrication, the sheeting manufacturer shall, at its expense, restore the sign surface to its original effectiveness.

7.3.2.2 If the failure occurs in the 8th through the 10th year from the date of fabrication, the sheeting manufacturer will furnish the necessary amount of sheeting to restore the sign surface to its original effectiveness.

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

7.3.2.4 For those states with a 7 year warranty, if the failure occurs within the first 5 years from the date of fabrication, the manufacturer will, at its expense, restore the sign surface to its original effectiveness.

7.3.2.5 If the failure occurs within the 6th or 7th year from the date of fabrication, the manufacturer will furnish the necessary amount of sheeting necessary to restore the sign surface to its original effectiveness.

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

7.3.3 For temporary signing, fluorescent orange, where it can be shown that the retroreflective sheeting fails to conform to the performance requirements of Section 7.2, the sheeting manufacturer's sole responsibility and purchaser's and user's exclusive remedy shall be:

7.3.3.1 Provide replacement sheeting. This sheeting shall carry the unexpired warranty of the sheeting it replaces

7.4 Osceola County Obligation

Osceola County shall be responsible for requiring the dating of all signs at the time of application. That date constitutes the start of the field performance obligation period.

8.0 Applicable Documents

The following documents, of the issues in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

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8.1 ASTM Standards

8.1.1 D 4956 Standard Specification for Retroreflective Sheeting for Traffic Control.

8.1.2 E 810 Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting.

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Osceola County Specification for
High Performance Prismatic Retroreflective
for Sign Sheeting

Item bid must, at minimum, meet the specification of current product used by
Osceola County:
3M™ High Intensity Grade Prismatic
Reflective Sheeting Series 3930

Specification for High Performance Prismatic

EXHIBIT "D"
3M SPECIFICATION

Retroreflective for Sign Sheeting

1.0 Scope

This specification covers flexible white or colored, prismatic retroreflective sheeting (hereinafter called sheeting), and related processing materials designed to enhance nighttime visibility of traffic control signs and objects. The sheeting shall consist of cube corner prismatic optics encapsulated by a flexible transparent plastic film that has a smooth outer surface. The sheeting shall have a pre-coated adhesive protected by an easily removable liner.

The sheeting shall be part of a family of products required for the manufacture and imaging of traffic control signs as described in section 4. Imaged (printed or overlain) areas of signs are covered only by section 2.0, section 6.2, Table 1, section 6.3 and Table 2.

2.0 Prequalification and Performance History

Materials shall be considered for use only when, in the opinion of the agency, sufficient evidence exists to ensure that the materials and services offered can reliably conform to this specification. The sheeting manufacturer shall provide evidence of performance and suitability for use in accordance with the Agency's Qualified Products Procedures

3.0 Classification and Conformance

The sheeting shall meet the performance requirements contained in *all* of the standards and specifications listed below, as modified herein. The sheeting need not conform to any construction or composition limitations included in the reference specifications; and the retroreflectance measurements shall be limited to observation angles less than 2.0°.

ASTM D 4956 (Type III, Type IV, Type X)	BS 873 Class 1
AASHTO M 288 (Type III, Type IV, Type X)	AS/NZ 1906.1 Class 1
CGSB 62-GP-11 Type 1	DIN 67520 Type 2
EN 12899-1 Class 2	JT/T 279 Class 3
GB/T 18833 Class 2	NTC 4739 Type III and IV
NBR 14644 Type II	SABS 1519.1 Class III

3.1 The adhesive shall be a pressure-sensitive adhesive of the aggressive tack type requiring no heat, solvent or other preparation for adhesion to smooth, clean surfaces when properly applied at temperatures above 65°F. For application to rough surfaces, a surface primer may be required.

4.0 Imaging Systems

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4.1 Process Inks

4.1.1 The process colors shall be a single line of traffic colors which may be applied before and after the sheeting is applied to a substrate; require no component premixing; and will air dry for packing in 4 hours or less and requires no clear coating.

4.2 Overlay Films: The sheeting manufacturer shall also manufacture colored imaging films and clear protective overlays, which are compatible with the sheetings, and when used in accordance with the sheeting manufacturer's instructions shall not lessen the warranty term as described in section 7.2.

5.0 Test Panels and Test Conditions

Unless otherwise specified herein, when tests are to be performed using test panels, the specimens shall be applied to smooth aluminum 0.020 in. (0.508 mm), 0.040 in. (1.016 mm) or 0.063 in. (1.600 mm) in thickness cut from Alloy 6061-T6 or 5052-H38. The aluminum shall be degreased and lightly acid etched before the specimens are applied. Unless otherwise specified, all test samples shall be conditioned for 24 hours prior to testing and all tests shall be conducted at a temperature of $73 \pm 3^{\circ}\text{F}$ ($23 \pm 2^{\circ}\text{C}$) and $50 \pm 5\%$ relative humidity.

6.0 Material Requirements

6.1 Color Requirements: Color shall be as specified and shall conform to the requirements for standard highway colors as defined all the standards and specifications listed in section 3.0 above.

6.2 Coefficient of Retroreflection: The coefficients of retroreflection shall be determined in accordance with ASTM E-810, for the minimum requirements of Table 1, as specified.

6.2.1.1 Units: Coefficients of retroreflection shall be specified in units of candelas per lux per square meter. The observation angles shall range from 0.2° to 1.0° . The entrance angles shall range from -4° to 40° .

6.2.1.2 For screen printed transparent colored areas on white sheeting, the coefficients of retroreflection shall not be less than 70% of the values for corresponding color in the above table. Standard traffic colors not available in integrally colored sheeting may be produced using acrylic overlay films.

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- 6.3 Color Processing: The retroreflective sheeting shall be designed to work in concert with recommended imaging systems. Color processing with compatible transparent and opaque process colors shall be possible in accordance with the sheeting manufacturer's recommendation at temperatures of 66 to 100°F (16 to 38°C) and relative humidity of 20 to 80%. The sheeting shall be heat resistant and permit force curling without staining of applied or unapplied sheeting at temperatures recommended by the sheeting manufacturer.
- 6.4 Flexibility: The reflective sheeting shall be sufficiently flexible to show no cracking during application to substrates in accordance with the manufacturer's instructions.
- 6.5 Adhesion: The retroreflective sheeting shall comply with the liner removal and adhesion requirements contained in the standards and specifications listed in section 3.0.
- 6.6 Impact Resistance: The retroreflective sheeting shall comply with the impact resistance requirements contained in the standards and specifications listed in section 3.0.
- 6.7 Resistance to Accelerated Weathering: The retroreflective sheeting shall comply with the weathering resistance requirements contained in the standards and specifications listed in section 3.0.
- 6.8 Resistance to Heat, Cold and Humidity: Three samples of retroreflective sheeting, 3 x 6 inch, applied to test panels in accordance with section 5.0 above, shall be exposed as follows:
- 6.8.1 Heat: One specimen shall be placed in an oven at 160°F ± 5°F (71° C ± 3° C) for 24 hours, then conditioned as in section 5.0 for 2 hours.
- 6.8.2 Cold: The second specimen shall be exposed to an air temperature of -70°F ± 5°F (-57°C ± 3°C) for 72 hours, then conditioned as in section 5.0 for 2 hours.
- 6.8.3 Humidity: The final specimen shall be subjected to 100% relative humidity at a temperature of 75° - 78°F (23°- 27°C) in accordance with US Federal Test Method Standard 141, method 6201, for 24 hours, then conditioned as in section 5.0 for 24 hours.

Examination of each of the three samples following the exposures shall show no evidence of cracking, peeling, chipping or delamination from the test panel. After heat exposure the sheeting shall retain a minimum of 85% and a maximum of 115% of the original coefficient of retroreflection when measured at room temperature.

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Table 1
Minimum Coefficient of Retroreflection
(Candelas per Lux per Square Meter)

White

	4/5	30	40
0.2	580	280	90
0.5	200	100	45
1.0	20	10	9.0

Green

	4/5	30	40
0.2	56	30	8
0.5	21	12	3.0
1.0	2.0	2.0	0.8

Yellow

	4/5	30	40
0.2	420	210	66
0.5	150	75	32
1.0	14	8.5	7.0

Blue

	4/5	30	40
0.2	30	14	6.0
0.5	13	6.0	2.0
1.0	1.0	0.8	0.5

Red

	4/5	30	40
0.2	84	42	16
0.5	30	15	7
1.0	3.0	2.0	1.0

Brown

	4/5	30	40
0.2	18	8.5	2.0
0.5	7.5	3.5	1.0
1.0	1.0	0.2	0.1

Orange

	4/5	30	40
0.2	210	105	29
0.5	75	37	14
1.0	6.0	3.0	1.0

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7.0 Performance Requirements and Obligations

7.1 Certification. The sheeting manufacturer shall submit with each lot or shipment, certification that states that the material supplied will meet all the requirements listed herein.

7.2 Field Performance Requirements

Sheeting processed and applied to sign blank materials in accordance with sheeting manufacturer's recommendations, shall perform effectively for the number of years stated in Table 2 of this specification. The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that: (1) the sign is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions; or (2) the coefficient of retroreflection is less than the minimum specified for that sheeting during that period listed in Table 2. All measurements shall be made after sign cleaning according to sheeting manufacturer's recommendations.

Table 2
Minimum Coefficient of Retroreflection
Candelas per Lux per Sq-Meter
(.2° obs, and -4° entrance)

Sheeting Color	Minimum Coefficient of Retro. (7 years) ¹	Minimum Coefficient of Retro. (10 years)
White	450	390
Yellow	336	294
Green	45	39
Red	67	59
Blue	24	20
Brown	14	12
Orange	165	147

For screen printed transparent colored areas on white sheeting, the coefficients of retroreflection shall not be less than 70% of the values for the corresponding color in the above table.

¹ When sheeting is used in temporary work zone applications the warranty period shall be limited to 3 years

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7.3 Sheeting Manufacturer's Replacement Obligation

Where it can be shown that retroreflective traffic signs manufactured with sheeting supplied and used according to the sheeting manufacturer's recommendations have not met the performance requirements of Section 7.2 due to internal defects, the sheeting manufacturer shall cover restoration costs as follows for sheetings shown to be unsatisfactory during:

7.3.1 The entire ten years (three years for work zone materials): the sheeting manufacturer will replace the sheeting required to restore the sign surface to its original effectiveness.

7.3.2 In addition, during the first seven years (excluding work zone materials): the sheeting manufacturer will cover the cost of restoring the sign surface to its original effectiveness at no cost to the using Agency for materials and labor.

7.4 Osceola County shall be responsible for requiring the dating of all signs at the time of application. That date constitutes the start of the field performance obligation period.

EXHIBIT "D"
3M SPECIFICATION

Osceola County Specification for
Fluorescent Orange
Prismatic Retroreflective Sheeting for The Work Zone

Item bid must, at minimum, meet the specification of current product used by
Osceola County:
3M™ Fluorescent Prismatic
Work Zone Sheeting Series 3924S

EXHIBIT "D"
3M SPECIFICATION

1.0 Scope

This specification covers premium transparent protective overlay film designed for application to sign faces reflectorized with retroreflective sheeting to provide a superior barrier to staining by graffiti and other markings.

2.0 Description

The protective overlay film shall be a clear, non-chlorinated, colorless film which may be used in lieu of clear coating. It shall be durable, solvent resistant and shall be coated with a transparent, UV stabilized pressure sensitive adhesive protected by an easily removable paper liner.

3.0 Compatibility

The protective overlay film shall be compatible with reflective sheeting and inks used for signing. This compatibility shall be clearly designated by the manufacturers of each component or, alternately, each component shall be produced by a single manufacturer.

4.0 Performance Requirements

4.1 Tensile Strength. A 1" (25mm) wide sample of protective overlay film, with the liner removed shall have a minimum tensile strength of 4500 psi when tested at 72°F (23°C) using a jaw speed of 5 inches per minute.

4.2 Dimensional Stability. The protective overlay film, without adhesive, shall have a minimum melt point of 520°F (270°C).

4.3 Color. When protective overlay film is applied in accordance with the manufacturer's recommendation over retroreflective sheeting, the color of the film/sheeting composite shall conform to the color requirements of the screen processed colors for the type of sheeting material used.

4.4 Transparency. The overlay film, without adhesive, shall provide a minimum of 95% transmittance of light in the visible range (400 - 700 nanometers.) The overlay film shall remain transparent through the expected life of the sheeting to which it is applied.

4.5 Solvent Resistance. The protective overlay film, without adhesive shall show no swelling or crazing after immersion in any of the following solvents for 7 days:

1. Methylene Chloride
2. Toluene
3. Ethyl Acetate
4. Gasoline
5. Mineral Spirits
6. Naphtha

4.6 Cleanability. The overlay film manufacturer shall identify acceptable cleaning systems sufficient to clean paint and other surface contaminants without damaging the sign face.

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3M SPECIFICATION

Osceola County Specification
For Premium Grade Transparent Overlay Film
Group 7 Product A

Item bid must, at minimum, meet the specification of current product used by
Osceola County:

3M Premium Protective Overlay Film Series 1160

EXHIBIT "D"
3M SPECIFICATION

Table I
CIE 1931 Daytime Chromaticity Coordinates Limits and Total Luminance Factor Minimum

Color	Chromaticity Coordinate 1		Chromaticity Coordinate 2		Chromaticity Coordinate 3		Chromaticity Coordinate 4		Total Luminance Factor Limit, Y_T	
	X	y	x	y	X	y	X	y	min.	max.
Fluorescent	.583	.416	.535	.400	.595	.351	.645	.355	25	----
Orange										

5.2 Fluorescence Requirements

5.2.1 Fluorescence Test. Conformance to fluorescence luminance factor requirements in Table II, shall be determined instrumentally, on sheeting applied to aluminum test panels, using a 2-monochromator spectrophotometer employing annular 45/0 illuminating and viewing geometry. The fluorescence luminance factor shall be calculated from bispectral fluorescence radiance factor matrix (the fluorescent component of the Donaldson matrix) in accordance with ASTM E2162 "Practice for Computing the Colors of Fluorescent Objects from Bispectral Data" for CIE illuminant D65 and the CIE 1931 (2°) standard colorimetric observer. The measurements shall be made on a Labsphere BFC-450 Bispectral Fluorescence Colorimeter or equivalent.

Table II Fluorescence Luminance Factor Minimum Y_F (%)		
Fluorescent	New Sheeting	In-service
Orange	20	15

5.3 Coefficient of Retroreflection, R_A . The coefficients of retroreflection shall not be less than the minimum values specified in Tables III. Testing shall be in accordance with ASTM E-810 and the values of 0° rotation and 90° rotation will be averaged to determine the R_A .

5.3.1 Units. Coefficients of retroreflection R_A shall be specified in units of candelas per lux per square meter.

5.3.2 The sheeting is positioned at the 90° rotation angle when the flat sides of the diamond seal pattern are running vertically. The sheeting is positioned at the 0° rotation angle when the flat sides of the diamond seal pattern are running horizontally (parallel to the entrance plane).

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Table III Minimum Coefficient of Retroreflection R_A For New Sheeting (Candelas per lux per square meter)		
Observation Angle	Entrance Angle	
	-4°	30°
0.2°	230	130
0.5°	72	41

5.4 Resistance to Accelerated Weathering

The retroreflective surface of the sheeting shall be weather resistant and show no appreciable cracking, blistering, crazing, or dimensional change after 1 year's unprotected outdoor exposure facing the equator, and inclined 45° from the vertical. Following exposure, panels shall be washed in a 5% HCL solution for 45 seconds, rinsed thoroughly with clean water, blotted with a soft clean cloth and brought to equilibrium at standard conditions. After cleaning the sample shall:

5.4.1 Show no appreciable evidence of cracking, scaling, pitting, blistering, edge lifting or curling or more than 1/32 inch (0.08 cm) shrinkage or expansion.

5.4.2 Retain not less than 50% of the coefficient of retroreflection values listed in Table III at 0.2 degrees observation, -4 degrees entrance (measured in accordance with ASTM E810).

5.4.3 Be within the values listed in Table I and in-service values in Table II.

5.5 Optical Stability

The retroreflective sheeting, applied to a test panel as in 4.2, and conditioned for 24 hours, at 73° F ±3° F and 50% ±5% relative humidity shall be measured at 0.2° observation and -4° entrance angles, and exposed to 160 ± 5° F (71 ± 3° C) for 24 hours in an air circulating oven. After heat exposure the sheeting shall retain between 80% and 120% of the original tested value at 0.2 degrees observation and -4 degrees entrance angles.

5.6 Gloss. The retroreflective sheeting shall have an 85° specular gloss of not less than 50 when tested in accordance with ASTM D-523.

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3M SPECIFICATION

- 5.7 Color Processing. The retroreflective sheeting shall permit color processing with compatible process colors in accordance with the sheeting manufacturer's recommendations at temperatures of 15° to 38°C (59 to 100°F) and relative humidity of 20% to 80%. The sheeting shall be heat resistant and permit force curing without staining of applied or unapplied sheeting at temperatures recommended by the sheeting manufacturer.
- 5.8 Shrinkage. A 9 inch by 9 inch specimen shall be conditioned a minimum of one hour at 72° F and 50% relative humidity. Remove liner and place specimen on a flat surface with adhesive side up. Ten minutes later and again after 24 hours, the specimen shall be measured to determine the amount of dimensional change. The reflective sheeting shall not shrink in dimension more than 1/32 inch in 10 minutes or more than 1/8 inch in 24 hours.
- 6.0 Sheeting Manufacturer's Warranty
- 6.1 Certification. The sheeting manufacturer shall, upon request, submit with each lot or shipment, a certification which states that the material supplied will meet all of the requirements listed herein.
- 6.2 Field Performance
- Retroreflective sheeting processed and applied in accordance with the sheeting manufacturer's recommendations, is expected to perform effectively for a minimum of 3 years. The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that: (1) the sign is ineffective for its intended purpose or (2) does not meet the requirements as stated in Section 5.5.
- 6.2.1 All measurements shall be made after sign cleaning according to the sheeting manufacturer's recommendations.
- 6.2.2 Natural causes include effects of exposure to weather. Natural causes exclude (without limitation) damage from exposure to chemicals, abrasion and other mechanical damage (such as from fasteners used to mount the sign, collisions or mishandling), vandalism, or malicious mischief.

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6.3 Sheeting Manufacturer's Replacement Obligation

6.3.1 Where it can be shown that the retroreflective sheeting fails to conform to the performance requirements of Section 6.2, the sheeting manufacturer's sole responsibility and purchaser's and user's exclusive remedy shall be:

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

7.0 Oscola County shall be responsible for requiring the dating of all signs at the time of fabrication with the fabrication date so that the start of the warranty period can be determined. In the event of claims made under the warranty the agency shall notify the sheeting manufacturer of the failure within a reasonable time of the failure, provide reasonable information requested by the sheeting manufacturer and permit the manufacturer to verify the cause of the failure.

EXHIBIT "D"
3M SPECIFICATION

Specification for Fluorescent Orange Prismatic Retroreflective Sheeting for the Work Zone

- 1.0 Scope. This specification covers flexible, colored, fluorescent wide angle prismatic retroreflective sheeting (hereinafter called sheeting), tape and related processing materials designed to enhance the visibility of traffic control signs and objects under all driving conditions, day and night.
- 2.0 Classification. The sheeting shall be a visible-activated fluorescent retroreflector providing higher daytime brightness than ordinary colored sheetings of similar chromaticity. The sheeting shall be of the following retroreflective types as specified in the plans or in the invitation to bid.
 - 2.1 Description

The fluorescent orange prismatic retroreflective sheeting is specifically designed for use on rigid substrate work zone signs to provide high visual impact under nighttime and daytime driving conditions, including low visibility periods such as dawn, dusk, and overcast days. The sheeting shall consist of prismatic lenses formed in a transparent fluorescent orange synthetic resin, sealed, and backed with an aggressive pressure sensitive adhesive protected by a removable liner.
- 3.0 Applicable Documents. The following documents, of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:
 - 3.1 ASTM Standards.
 - 3.1.1 B-117 Method of salt spray (fog) testing.
 - 3.1.2 B-209 Specification for Aluminum and Aluminum Alloy Sheet and Plate.
 - 3.1.3 D-523 Standard Method for Test for Specular Gloss.
 - 3.1.4 E-284 Standard Definition of Terms Relating to Appearance of Materials.
 - 3.1.5 E-308 Computing the Colors of Objects by Using the CIE System.
 - 3.1.6 E-810 Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting.

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3M SPECIFICATION

3.1.7 E2153 Practice for Obtaining Bispectral Photometric Data for Evaluation of Fluorescent Color.

3.1.8 E2152 Practice for Computing the Colors of Fluorescent Objects from Bispectral Data.

4.0 Test Methods.

4.1 Test Conditions. Unless otherwise specified herein, all applied and unapplied test samples and specimens shall be conditioned at the standard conditions of $23 \pm 1^\circ\text{C}$ ($73^\circ \pm 3^\circ\text{F}$) and $50 \pm 5\%$ relative humidity for 24 hours prior to testing.

4.2 Test Panels. Unless otherwise specified herein, when tests are to be performed using test panels, the specimens of retroreflective material shall be applied to smooth aluminum cut from ASTM B-209 Alloy 5052-H36, 5052-H38, 5154-H38 or 6061-T6 sheets in 0.05 cm (0.020 in.), 0.10 cm (0.040 in.) or 0.16 cm (0.063 in.) thickness. The aluminum shall be degreased and lightly acid etched before the specimens are applied. The specimens shall be applied to the panels in accordance with the recommendations of the retroreflective sheeting manufacturer.

5.0 Physical Requirements.

5.1 Daytime Color Requirements.

5.1.1 Daytime Color Test. Conformance to daytime color requirements of Table I shall be determined instrumentally on sheeting applied to aluminum test panels, using a 2-monochromator spectrophotometer employing annular 45/0 illuminating and viewing geometry. The bispectral radiance factor matrix (Donaldson matrix) shall be obtained in accordance with ASTM E2153 "Practice for Obtaining Bispectral Photometric Data for Evaluation of Fluorescent Color. The total chromaticity coordinates and total luminance factor shall be computed from the Donaldson matrix in accordance with ASTM E2152 "Practice for Computing the Colors of Fluorescent Objects from Bispectral Data" for CIE illuminant D65 and the CIE 1931 (2°) standard colorimetric observer. The measurements shall be made on a Labsphere BFC-450 Bispectral Fluorescence Colorimeter or equivalent.

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3M SPECIFICATION

- 4.7 Field Performance. The expected performance life of a sign face constructed of overlay film and reflective sheeting shall be equivalent to the expected performance life of the retroreflective material used.
- 4.8 Storage. The overlay film, when stored in accordance with the manufacturer's recommendations shall be suitable for use up to 1 year from date of purchase.

