



March 29, 2013

TO: Public Works Committee

FROM: Carl Goldsmith, Director of Public Works *cy*

SUBJECT: Pavement Markings

Per the request of the Committee, staff has analyzed the pavement marking material and installation techniques required by the Village's specifications. This report provides the findings and recommendations on the matter.

Determination of Poor Material Performance

As you are aware, the pavement markings installed last year on Main Street (between Parkside and St. Charles) did not survive the winter. To determine why, staff inspected the site, conducted meetings with the material manufacturer's (3M) representative, reviewed the contract documents, researched the material batch, and walked through the application specifications. After consideration of all of the information, it has been determined that the loss of material was not due to any material or installation defect. The loss of marking material was definitively due to abrasion or mechanical removal by snow plows.

Material Selection

Currently, the Village of Lombard specifies using 3M preformed plastic pavement markings (tape), with no alternate specification. The use of this product has been satisfactory for several years, but recently has become more difficult to maintain and achieve the design performance. The reason for the diminished performance of the product is based solely on the selected application and the additional use by the Village.

Specifically, the Village has been applying the preformed tape on hot asphalt and new concrete pavements for several years. The application of the preformed plastic pavement markings have a smooth surface commonality that permits snow plows to glide across the tape, thereby minimizing abrasive scour and demonstrating adequate performance. However, as we have been become more proactive on improving existing pavement markings, we have been applying the preformed tape to older pavement surfaces that have numerous pavement imperfections, such as cracks, differential settling, bumps, and depressions. This older pavement has varying and frequent high points that permit plows to strike the tape at the base, causing extensive shearing and abrasion to the pavement marking material. Furthermore, since the tape is monolithically designed, instead of chipping or gouging, it is pulled up until it reaches a joint or rips apart. Therefore, we have learned the application of the Village's pavement marking standard specification does not perform in all cases.

Corrective Action

The Public Works Department has begun investigating the cost and efficacy of different pavement markings to utilize. The research will likely result in a modification to our standard pavement marking specifications. It appears using the existing specification, 3M preformed plastic tape, for new road surfaces will be maintained at this time. However, paint, thermoplastic, epoxy, and polyurea materials will be considered and evaluated for all other types of applications. Once a material application hierarchy is determined, Main Street marking will be re-established with the appropriate material.

This work shall be performed in accordance with Section 780 of the Standard Specifications with the following alterations.

780.07 Preformed Plastic. Delete this entire section and replace with the following: All pavement markings shall be Stamark High Performance Tape as manufactured by the 3M Company. Series A380I ES shall be used for letters, symbols, crosswalks, stop bars, white and yellow long lines. Only currently 3M certified trained installers will be permitted to install 3M Stamark preformed plastic pavement marking tape. The list of current trained installers is available by contacting Timothy Walsh of 3M at 1-773-425-4400. At least ten business days prior to paving, the CONTRACTOR must certify in writing, on company letterhead, that the installer is currently certified by 3M Company, the required pavement marking material is on hand and all equipment is in proper working order. At least three business days prior to paving, the VILLAGE, CONTRACTOR, paver and marking tape installer shall have a meeting to outline issues (manpower, surface prep requirements, equipment, layout and placement of markings) relating to the installation of the pavement marking tape. Paving of any surface (asphalt or concrete) will not be allowed to proceed until the CONTRACTOR and VILLAGE have meet to review the placement of the pavement marking tape.

(Note to designer: To be used if markings are scheduled to be installed new asphalt pavement)

Inlaid preformed plastic pavement markings:

For new asphalt surfaces all pavement marking will be installed by the inlaid method. Series A380I ES shall be used for letters, symbols, crosswalks, stop bars, white and yellow long lines.

The inlaid process shall follow the installation procedures for the specified markings as set forth in publication "Pavement Surface Preparation and Application Techniques for 3M Stamark Tapes – Information Folder 5.7 and "Application Guidelines for 3M Stamark High Performance Tape Series 380I ES" - Information Folder 380I ES. The CONTRACTOR may request a copy of the publication directly from 3M Company by using the fax-on-demand service by calling 1-800-887-3238 and requesting the document number. Information folder files may be found online at www.3m.com/tss. In the left side column under Resources, click on Document Library. Next under Make a Selection, click on Pavement Markings. Long lines cut utility knife

(Note to designer: To be used if markings are scheduled to be installed new concrete pavement or existing asphalt pavement. Air & surface temperatures must be over 40 F)

Overlaid preformed plastic pavement markings:

For existing asphalt and concrete surfaces as well as new concrete surfaces all pavement marking will be installed by the overlaid method. Series A380I ES shall be used for letters, symbols, crosswalks, stop bars, white and yellow long lines.

The overlaid process shall follow the installation procedures for the specified markings as set forth in publication "Pavement Surface Preparation and Application Techniques for 3M Stamark Tapes – Information Folder 5.7, "Instructions for Using 3m Stamark Surface Preparation Adhesive P-50 for 3M Stamark and Scotch-Lane Pavement Marking Tape" Information Folder 5.17. The CONTRACTOR may request a copy of the publication directly from 3M Company by using the fax-on-demand service by calling 1-800-887-3238 and requesting the document number. Information folder files may be found

online at www.3m.com/tss. In the left side column under Resources, click on Document Library. Next under Make a Selection, click on Pavement Markings.

All existing markings shall be removed by grinding before applying the new pavement markings. Air and surface temperatures must be above 40 degrees Fahrenheit and rising in order to install the pavement markings. All pavements shall be dry for a minimum of 24 hours prior to tape installation. Note that 3M Company Surface Preparation Adhesive P-50 shall be applied on asphalt if applying 380I ES preformed plastic pavement marking material before May 15th or after September 15th. Between the aforementioned dates no P-50 contact cement is required. For overlay application on new concrete surfaces, the concrete curing compound shall be removed if open to traffic for less than 90 days.

(Note to designer: If the anticipated construction schedule makes the overlay process questionable (temperature requirements), a provision for installation and payment for temporary marking tape must be included)

All late season/cold weather pavement markings shall be considered temporary markings. These applications shall be either removed and replaced by the permanent markings the next construction season for final pavement surfaces or be allowed to remain until removed by subsequent construction.

Materials

All late season/cold weather pavement marking materials shall be

PAVEMENT MARKINGS - - LATE SEASON

Late Season Pavement Marking will consist of furnishing, applying, maintaining and removing late season pavement markings, both striping and messages. This work shall be performed in accordance with

All pavement marking operations after _____ or prior to _____ shall be considered Pavement Marking - - Late Season and this specification will apply.

MATERIALS

The Contractor shall use a product listed as either “Late Season/Cold Weather Epoxy” or “Late Season/Cold Weather Paint”.

MAINTENANCE

The Contractor shall be required to maintain any late season pavement markings placed.

The Contractor shall be required to reapply or freshen the pavement markings and/or messages placed when any of the following occur:

- 40% of the late season pavement markings are missing
- More than two (2) consecutive skip lines are missing
- More than a fifty (50) foot section of solid line are missing
- Any critical areas (such as, but not limited to: crossover, bypass, curve) is missing
- When the late season pavement markings are no longer effective due to a loss of reflectivity

Pavement Markings that do not conform to the requirements of the Contract shall be replaced or repaired to the satisfaction of the Engineer at the Contractors' expense. Conformance with the requirements will be determined by the Engineer. The Engineer shall notify the Contractor when maintenance is required.

All "Pavement Marking - - Late Season" shall be removed prior to placing any permanent pavement markings.

"Pavement Marking - - Late Season" will be measured by the length in meters [linear feet], the length will not include any gaps between skip stripes. All stripes will be measured as the equivalent 4" width.

PAYMENT

Payment for "Pavement Marking - - Late Season" will be made in accordance with the schedule set forth below at the appropriate Contract bid price for the specified unit of measure. Such payment, in each instance, shall be compensation in full for all costs incidental thereto including, but not limited to all costs of preparing the surface, controlling and protecting traffic, furnishing, applying, maintaining, and removing the "Pavement Marking - - Late Season".

When the Engineer determines that "Pavement Marking - - Late Season" are required, in the absence of a Contract item therefore, compensation will be made as Extra Work.

Late Season Pavement Markings shall be removed in the spring and replaced with final permanent pavement markings.

780.12 Method of Measurement. Add the following: "If the CONTRACTOR cannot inlay or overlay the pavement markings because of scheduling delays (including end of season weather considerations), the CONTRACTOR will install the required pavement markings after May 15th of the following year, per the manufacturers specifications at no extra cost to the VILLAGE.

(Note to designer: If the anticipated construction schedule makes the overlay process questionable (temperature requirements), a provision for installation and payment for temporary paint must be included and 780.11 can be removed.

780.13 Basis of Payment. Add the following sentence: "All pavement cleaning and primer will not be measured but shall be considered incidental to the cost of the various types (NOTE: ITEMS TO BE CALLED OUT AS TYPE B and specified as inlaid or overlaid, temporary tape) of PREFORMED PLASTIC PAVEMENT MARKING.

For concrete and existing asphalt pavement, grooving of the pavement will be measured for payment in place, in linear feet of GROOVING FOR RECESSED PAVEMENT MARKINGS of the width specified.