



Minnesota Department of Transportation

MEMORANDUM

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Date: October 31, 2008

To: District Traffic Engineers
Resident Engineers

From: Mitch Bartelt
Pavement Marking Engineer

Subject: Guidance on Use of Late Season/Cold Weather Temporary Pavement Markings based on Winter 2007/2008 Performance

The purpose of this memo is to report the performance of late season markings during the past winter. This document is not intended to supersede the Late Season Memo dated June 7, 2007, which can be found on the MnDOT network on the following path: <http://www.dot.state.mn.us/trafficeng/pavement/LateSeasonPavementMarkings.pdf>. The Late Season/Cold Weather memo should still be referred to as the standard for the use of Late Season and Cold Weather pavement markings. This memo is for informational purposes and for emphasis of the duration for which this type of marking should be used.

In summary, Late Season markings should be treated as temporary markings. The Late Season/Cold Weather markings installed during the past winter performed well enough to last through the winter, but anyone using them should plan on replacing them with permanent markings during the next construction season.

As a reminder, all pavement markings installed after October 15 and before April 1 north of the 46th parallel or after November 1 and before March 15 south of the 46th parallel shall be defined as late season/cold weather temporary pavement markings.

Late Season markings were installed in late 2007 on state trunk highways for four projects (please see the Attachment for more details on how these markings performed):

- US 12 in Metro near Long Lake
- I-35W in Metro between the Crosstown and I-94 freeways
- US 53 in District 1 north of Virginia
- US 10 in District 3 in Staples

If you have any questions regarding the use of Late Season/Cold Weather pavement markings, please contact Mitch Bartelt at (651)234-7373 or Jon Jackels at (651)234-7377.

Attachment

Pictures and Retroreflectivity Readings for Winter 2007-08 Late Season Markings

US 12 in Metro

Cold-weather epoxy was used on this project. The retroreflective numbers were adequate, and while the enough of the markings made it through the winter intact to be visible to the driver, they were not in great shape visually.



Date Measured	District	TH	Start RP	End RP	Direction wrt RP	Line	Mat'l	Year Installed	Retro (mcd)	Std. Dev.
4/22/2008	METRO	12	153.4	152.7	D	REL	E	2007	143	46
4/22/2008	METRO	12	148.8	148	D	REL	E	2007	99	29
4/22/2008	METRO	12	148	148.8	I	REL	E	2007	118	45
4/22/2008	METRO	12	153.4	152.7	I	REL	E	2007	146	42
4/23/2008	METRO	12	153.4	152.7	D	LEL	E	2007	140	45
4/23/2008	METRO	12	148.8	148	D	CL	E	2007	107	33
4/23/2008	METRO	12	148	148.8	I	CL	E	2007	124	40
4/23/2008	METRO	12	152.7	153.4	I	LEL	E	2007	171	41

I-35W in Metro

We don't have any pictures on file for this job, but the **cold-weather epoxy** markings had adequate retroreflectivity readings.

Date Measured	District	TH	Start RP	End RP	Direction wrt RP	Line	Mat'l	Year Installed	Retro (mcd)	Std. Dev.
4/22/2008	METRO	I35W	12	13.6	I	REL	E	2007	104	30
4/22/2008	METRO	I35W	14	12	D	REL	E	2007	143	57
4/22/2008	METRO	I35W	12	13.6	I	1LL	E	2007	117	28
4/22/2008	METRO	I35W	14	12	D	1LL	E	2007	119	45
4/23/2008	METRO	I35W	12	14	I	LEL	E	2007	127	36
4/23/2008	METRO	I35W	14	12	D	LEL	E	2007	145	52
4/23/2008	METRO	I35W	12	14	I	LL	E	2007	207	66
4/23/2008	METRO	I35W	14	12	D	LL	E	2007	241	82

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Late Season Marking Performance Summary for 2007/2008

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US 53 in District 1

The retroreflectivity readings for these **cold-weather epoxy** pavement markings were substandard for the centerline, and many sections of both edge lines and centerline were either heavily worn or missing in many parts.



Date Measured	District	TH	Start RP	End RP	Direction wrt RP	Line	Mat'l	Year Installed	Retro (mcd)	Std. Dev.
4/29/2008	D1	53	72.3	74.3	I	CL	E	2007	86	23
4/29/2008	D1	53	79.1	82.4	I	CL	E	2007	88	22
4/29/2008	D1	53	82.4	79.1	D	CL	E	2007	84	24
4/29/2008	D1	53	74.3	72.3	D	CL	E	2007	81	19
4/30/2008	D1	53	72.3	74.3	I	REL	E	2007	102	30
4/30/2008	D1	53	79.1	82.4	I	REL	E	2007	143	47
4/30/2008	D1	53	82.4	79.11	D	REL	E	2007	127	50
4/30/2008	D1	53	74.3	72.3	D	REL	E	2007	103	39

US 10 in District 3

Cold-weather latex was used on this project. This product performed very well and held up well through the winter. The retroreflective readings were all over 100. However, the lane lines barely exceeded this threshold, and as the bottom-right picture shows, the lines were in need of replacement.



Date Measured	District	TH	Start RP	End RP	Direction wrt RP	Line	Mat'l	Year Installed	Retro (mcd)	Std. Dev.
5/12/2008	D3	10	108.6	107.6	D	LL	PL	2007	111	54
5/12/2008	D3	10	107.6	108.6	I	LL	PL	2007	154	70
5/12/2008	D3	10	107	105.8	D	CL	PL	2007	103	26
5/12/2008	D3	10	105.8	107	I	CL	PL	2007	85	21
5/13/2008	D3	10	105.7	107.4	I	REL	PL	2007	182	90
5/13/2008	D3	10	107	105.7	D	REL	PL	2007	137	74