Illinois Department of Transportation

Memorandum

To:	Studies and Plans Squad Leaders	PPM 70-07
From:	James M. Sullivan	Revised: Tim Brandenburg
Subject:	Pavement Marking Materials, RRPM's and Delineation	
Date:	November 8, 2001	Revision Date: April 12, 2007

PLAN PREPARATION MEMORANDUM 70-07

BACKGROUND

This memorandum revises Plan Preparation Memorandum 01-118.P, Pavement Marking Materials and Application; Delineators dated November 8, 2001 and supplements the Bureau of Operations' Traffic Policies and Procedures (TPP) Manual; Departmental Policy TRA-14 dated December 23, 1987 (Appendix 5.C) for uniformity of District preference concerning application of Pavement Marking Materials, Raised Reflective pavement markers and Delineation

For bituminous surfaces:

Type of Facility	Edge Lines	Skip Dash Lines	Letters and Symbols
Full Access Control	Thermoplastic	Preformed Plastic*	Thermoplastic
Rural Multilane; Partial Access Control	Thermoplastic	Preformed Plastic*	Thermoplastic
Urban	Thermoplastic	Thermoplastic	Thermoplastic
Interchange Crossroad	Thermoplastic	Thermoplastic	Thermoplastic
Rural Two Lane	Paint	Paint	Thermoplastic

*Preformed Plastic Pavement Marking, Type B shall be installed in accordance with Article 780.07(a) of the Standard Specifications. District Special Provision "PREFORMED PLASTIC PAVEMENT MARKING, TYPE B" should be included in the contract Special Provisions when applicable.

For pc concrete surfaces:

Type of Facility	Edge Lines	Skip Dash Lines	Letters and Symbols
Full Access Control	Polyurea, Type II	Polyurea, Type II	Polyurea, Type II
Rural Multilane; Partial Access Control	Polyurea, Type II	Polyurea, Type II	Polyurea, Type II
Urban	Polyurea, Type II	Polyurea, Type II	Polyurea, Type II
Interchange Crossroad	Polyurea, Type II	Polyurea, Type II	Polyurea, Type II
Rural Two Lane	Polyurea, Type II	Polyurea, Type II	Polyurea, Type II

Bridge Decks should normally match the above for roadway surfaces (bituminous or pcc as the case may be) if they are included in a larger roadway segment. For bridge-only jobs, the pavement markings for the decks should be selected on a case-by-base basis. Considerations for this decision include age and type of markings on the adjacent roadway, anticipated time until the next roadway project adjacent to the bridge, and whether or not the need for high type markings on the bridge is critical, such as near a major intersection.

When we have job omissions of one-half mile or less, include quantities for striping the centerline and edge lines. Include a note on the plans that "QUANTITIES OUTSIDE THE LIMITS OF THE SECTION ARE INCLUDED IN THE QUANTITIES LISTED."

Pavement striping and raised reflective pavement markers shall be placed according to:

- District Detail 7800AAAA "Pavement Marking and Markers (Rural & Urban Typical Applications)"
- District Detail 7800BBBB "Pavement Marking (Interstate & Multi-Lane Applications)"
- District Detail 7800CCCC "Pavement Marking (McLean County "Spot" Improvements Only)"
- Highway Standards 780001 "Typical Pavement Markings" and 781001 "Typical Applications Raised Reflective Pavement Markers"

When the striping to be placed is not fully defined by District details and Highway Standards, the plans should include job-specific striping details. The legend to show the markings shall be the same as shown on the District Details.

The spacing of turn arrows is not exactly defined in the MUTCD. The District has adopted the following practice, which is reflected in the District Details: (See 7800AAAA)

> "The base of the last arrow should be 18' in advance of the stop line. Additional arrows should be spaced at a maximum of 10 times the 8' arrow height (80' maximum spacing base to base). If the distance from the first arrow to the beginning of the full width of the auxiliary lane is more than half of the maximum spacing or 40', one additional arrow should be added (base at the beginning of the full width), and the spaces between all arrows adjusted for uniformity."

RAISED REFLECTIVE PAVEMENT MARKERS

(TPP Manual 5-105.3; TRA-14, Appendix 5.D) RRPM's shall be placed according to District Detail 7800AAAA and Highway Standard 781001. The following information will give guidance on when to include a pay item for markers in our contracts. Also, it will give District exception(s) to Standard 781001.

For All Sections Built to Interstate Standards

Raised reflective pavement markers shall be included in the contract.

Ralph Wehner's memo of March, 1991, tells use that "dual markers can be installed on freeways having an ADT generally exceeding 20,000." For application in District 5, we will apply this to install dual markers, according to Standard 781001, on all locations of Interstate 57, Interstate 70, and Interstate 74. Other Interstate or Freeway locations will be evaluated on a case-by-case basis under the guidance of Mr. Wehner's March, 1991 memo.

For Routes not built to Interstate Standards

- Include reflective pavement markers when markers are in place on adjacent sections of the route and the job will require a minimum of 250 units.

- When existing markers were originally installed because the section was a high accident location (actual or potential) correctable by better nighttime delineation include markers in the contract.

- Establish a pay item for markers when the section includes uncurbed left turn lanes; lane-reduction transitions or two-way left turn lanes and will require a minimum of 250 units.

- Include a pay item for markers when the quantity exceeds 1000.

Placement of marker should be in accordance with Standard 781001.

For any job including roadway work, electronically submit a copy of the CA/PS sheet in Adobe Acrobat format to the Planning & Design Engineer in Operations. Include a statement in the remarks telling whether or not raised reflective markers are to be placed.

DELINEATORS (TPP Manual 7-500 & 7-600)

Highway Standard 635001 indicates typical placement of delineators on curves of two-way roadways and on mainline and ramps of dual highways. District Detail 63500105 shows typical placement of delineators for roadside hazards on two-way roadways and placement of delineators at crossovers for dual highways.

The MUTCD says that delineators are optional and it was the consensus of the Operation Field Engineer's that they were not needed on tangent sections and many times were being removed by the team sections. Our current standard shows delineators on tangent sections of two and four lane highways.

On freeways:

- Include removal of existing delineators and replacement with new delineators when the roadway work will disturb the existing delineators, or when the existing delineators are in such poor condition that the scoping meeting determines they should be replaced.

- If no continuous lighting exists or no RRPMs are on the lane lines – delineators shall be provided. This case does not typically occur because we have RRPMs on all freeways.

- If continuous lighting without RRPMs on the lane lines – delineators shall not be placed.

- If no continuous lighting and there are RRPMs – Delineators shall be omitted on tangent sections. Delineators shall be placed on curved sections. Delineators shall be placed on ramps and acceleration/deceleration lanes regardless of whether or not lighting or RRPMs are in place according to Highway Standard 635001.

On non-freeways and two lane roads:

- Our Operations forces will generally install and maintain delineators. When the scope of work is basically resurfacing (3P & SMART), quantities for delineators will not be included in our project. Contracts that involve extensive earthwork and culvert replacements (3R) will require pay items for delineators.

- Delineators may be used as necessary on tangents or curved sections. Generally, delineators are not installed on tangents unless there is an unusual case, such as a ditch with a steep foreslope or an object that is not protected by guardrail. Operations' forces will install and maintain these delineators. Contracts that are 3R project will remove and replace existing delineators.

- If delineators are placed on curves and at other roadside hazards, placement shall be according to Highway Standard 635001 and District Detail 63500105.

GUARDRAIL AND BARRIER WALL DELINEATION (TPP 7-605)

Design

R.W. Jones' memo of August 18, 1983 transmitted policy for guardrail markers and terminal markers as a change in the Traffic (Operations) Policy and Procedures Manual. That policy, giving design criteria for the markers, is attached for reference.

In Mr. Jones' memo, references to Highway Standard 2421 should be understood to refer to current Highway Standard 631006, and references to Figure 7S should be understood to refer to Highway Standard 635006.

Application

- For Interstate and Freeway resurfacing, 3R, or higher level jobs, all guardrail, barrier wall, and terminal markers shall be installed or upgraded.

- For all other State-let 3R or higher type improvements, all guardrail, barrier wall, and terminal markers shall be installed or upgraded.

- For 3P or SMART type jobs, the guardrail, barrier wall, and terminal markers shall be replaced or installed when guardrail, barrier wall, or terminals are included as work items. Generally, if these markers are included in a contract, all markers within the limits of the contract should be addressed.

Any exceptions to the above should be coordinated, beginning with the Project Engineer.

7-504 Objects Adjacent to the Roadway

Type 3 object markers should be placed on the right side of a two-lane roadway or on either side of a multilane roadway whenever the object is located within the usable shoulder area. At a bridge where the shoulder is not carried across the bridge, an object marker should be placed with the inside edge of the marker in line with the inner edge of the obstruction.

Type 3 object markers should be placed on both sides of a two-lane bridge with a roadway that is not 2-feet wider than the pavement approaching the bridge.

Type 3 object markers may be omitted at bridges where the approach guardrail or barrier wall has terminal markers and reflectors installed in accordance with Section 7-605 of this manual.

For objects adjacent to the roadway that may interfere with district mowing operations, the district may install a post or post mounted nonreflectorized marker. Similarly, these types of posts should be used to delineate limits of mowing in areas that are to be protected; i.e., native grasses or new plantings.

7-605 Guardrail/Barrier Wall/Bridge Rail Delineation

On roadways with posted speeds above 45 mph and without continuous lighting, all guardrail, barrier wall, and bridge rail shall be marked in accordance with the following requirements and in accordance with Figure 7.S. Guardrail, barrier wall, and bridge rail on other roadways may also be marked, especially where there is evidence of nighttime run-off-the-road problems.

1. Except for buried terminals (see Highway Standard 2421), all guardrail or attenuator terminals within 10 feet of the edge of pavement shoulder (or break point of unpaved shoulder) shall be marked as shown in the Terminal marker Details on Figure 7.S.

2. All guardrail/barrier/bridge rail within 2 feet of the edge of paved shoulder (or break point of unpaved shoulder) shall be marked with guardrail/barrier wall/ bridge rail reflectors at 80-foot spacing (or the curve spacing shown in Highway Standard 2149, whichever is less) for the first 400 feet and transitioned to standard delineator spacing thereafter. Where the overall length of rail is less than 400 feet, the spacing shall be adjusted to provide a minimum of four reflectors. The spacing may also be adjusted to match guardrail bolt hole spacing where bolt-on reflectors are used.

3. All reflectors on two-way roadways shall be monodirectional silver except that bidirectional silver/silver reflectors shall be used on two-lane bridges with roadways that are less than 2-feet wider than the pavement approaching the bridge.

4. Reflector mountings used with brown colored guardrail may be brown in color.