PERMANENT PAVEMENT MARKING PLAN

NOTES & GUIDELINES

GENERAL INFORMATION:
1. SEE 2582 IN THE SPECIAL PROVISIONS FOR PAVEMENT MARKING SPOTTING RESPONSIBILITIES.
2. EDGE LINES AND LANE LINES ARE TO BE USED ONLY AT INTERSECTIONS WITH PUBLIC ROADS, AND AT PRIVATE ENTRANCES IF THEY ARE Controlled BY AN AGENCY PlACED "YIELD" SIGN STOP SIGN OR TRAFFIC SIGNAL, THE BREAK POINT IS TO BE AT THE START OF THE MAINLINE RADIUS.
3. DO NOT APPLY THE PAVEMENT MARKINGS WHEN WEATHER AND OTHER CONDITIONS CAUSE A FILL OF DUST OR DEBRIS TO BE DEPOSITED ON THE PAVEMENT SURFACE AFTER CLEANING AND BEFORE THE MARKING MATERIAL IS APPLIED.
4. APPLY THE PAVEMENT MARKING IMMEDIATELY FOLLOWING THE PAVEMENT CLEANING.
5. APPLY THE RETROREFLECTIVE MEDIA IMMEDIATELY AFTER APPLICATION OF THE LIQUID PAVEMENT MARKINGS.
6. THE FILLING OF TANKS, POURING OF MATERIALS OR CLEANING OF EQUIPMENT SHALL NOT BE PERFORMED ON UNPROTECTED PAVEMENT SURFACES UNLESS ADEQUATE PROVISIONS ARE MADE TO PREVENT SPILLAGE OF MATERIAL.

CONTRAST MARKINGS
1. CONTRAST MARKINGS ARE DEFINED AS STANDARD LINEAR PAVEMENT MARKINGS, CROSSWALK MARKINGS AND PAVEMENT MESSAGES WITH 1.5 INCH NON-REFLECTIVE BLACK BORDERS.

PREFORM TAPE INLAY APPLICATION
1. VERIFY MAT TEMPERATURE WITH A THERMOMETER TO MAKE SURE THE INLAY IS BEING DONE IN THE PROPER TEMPERATURE RANGE, THE TEMPERATURE SHOULD MEASURE BETWEEN 160° F ASPHALT FIRM ENOUGH TO WALK ON AND 120° F. APPLICATION BELOW 120° F MAY NOT GET A PROPER INLAY. INLAYS ARE NOT RECOMMENDED AFTER SEPTEMBER 29TH AS THE ASPHALT COOLS TOO FAST AT THIS TIME OF THE YEAR.
2. NO PRIMERS ARE USED FOR INLAY APPLICATION, DO NOT PLACE LANE LINES ON AN ASPHALT SEAM, ROLLING OF ALL THE MARKINGS SHOULD BE LENGTHWISE IN THE DIRECTION THEY WERE LAID. FOR CROSSWALKS AND STOP BARS, INITIAL TAMING WITH THE TAMING CART IS RECOMMENDED USING ONLY 100 LBS. OF WEIGHT.
3. USE A COMPACTION ROLLER TO EMBED INLAY MARKINGS INTO PAVEMENT SURFACE, USE MEDIUM SPEED AND WATER ON ROLLER, DO NOT USE VIBRATOR, IF MARKING BUCKLES OR DISTORTS SEVERELY IN FRONT OF ROLLER, MAT TEMPERATURE OR ROLLER SPEED MAY BE TOO HIGH.
4. IF INLAY IS NOT SUCCESSFUL INTO THE APPROPRIATELY HEATED MAT, RECESS THE PAVEMENT MARKINGS PER MnDOT 2582.3.B.7.

DESIGNER'S NOTES:
REMOVE ALL UNNECESSARY MATERIAL NOTES FROM TITLE SHEET.
THIS SPACE MAY BE USED FOR PERMANENT PAVEMENT MARKING TABULATIONS SHEET.

STATE PROJ. NO. 0000-000 (TH 000) SHEET NO. PMAAA OF PMAAA SHEETS
GENERAL INFORMATION:
The engineer's involvement in the application of the material shall be limited to:

- Field consultation and inspection. The contract will include necessary spotting at appropriate points to provide horizontal control for striping and to determine necessary starting and cutoff points, longitudinal joints, pavement edges and existing markings. This shall serve as horizontal control when so designated.

- Edge lines and lane lines are to be broken only at intersections with public roads and at private entrance if they are controlled by an agent placed yield signs, stop signs or traffic signals. The break point is to be at the start of the radius for the intersection or at marked stop lines or crosswalks.

- A tolerance of 1/4 inch under or 1/4 inch over the specified width will be allowed for striping provided the variation is gradual and does not detract from the general appearance. Broken line segments may vary up to 3 inches from the specified length provided the over and under variations are reasonably compensatory. Alignment deviations from the control guide shall not exceed 1 inch. Material shall not be applied over longitudinal joints. Establishment of application tolerances shall not relieve the contractor of their responsibility to comply as closely as practicable with the planned dimensions.

JUST PRIOR TO THE PLACEMENT OF MARKING MATERIALS THE ROAD SURFACE SHALL BE CLEANED AND FREE OF CONTAMINATION AS RECOMMENDED BY THE MATERIAL MANUFACTURER AND ACCEPTABLE TO THE ENGINEER. PORTLAND CEMENT CONCRETE SURFACES SHALL BE SANDBLAST CLEANED TO REMOVE ANY SURFACE TREATMENTS AND/OR LAITANCE.

APPLY ALL PAINTING MATERIALS AS RECOMMENDED BY THE MATERIAL MANUFACTURER. PERMANENT PAINT MARKING MATERIALS SHALL NOT BE PLACED OVER TEMPORARY TAPE MARKINGS.

THE FILLING OF TANKS, POURING OF MATERIALS OR CLEANING OF EQUIPMENT SHALL NOT BE PERFORMED ON UNPROTECTED PAINTED SURFACES UNLESS ADEQUATE PROVISIONS ARE MADE TO PREVENT SPILLAGE OF MATERIAL.

REFER TO SPECIAL PROVISIONS OR SPEC BOOK FOR GROUND IN/RECESSED PAINTING PERFORMED ON UNPROTECTED PAINTED SURFACES UNLESS ADEQUATE PROVISIONS ARE MADE TO PREVENT SPILLAGE OF MATERIAL.

MULTI-COMPONENT LIQUID:

- The road surface shall be cleaned at the direction of the engineer just prior to application. Pavement cleaning shall consist of at least brushing with a rotary broom (non-metallic) as recommended by the material manufacturer and acceptable to the engineer. New Portland cement concrete surfaces shall be sandblasted cleaned to remove any surface treatments and/or laitance.

- The multi-component liquid application shall immediately follow the pavement cleaning. Glass beads shall be applied immediately after application of the multi-component liquid pavement marking.

- Apply multi-component liquid using a minimum thickness of 2.5 mils. Glass beads shall be applied at a rate of at least 25 lb/gal. The no-fading condition shall be determined on an application of specified thickness on the pavement covered with glass beads at the rate of at least 25 lb/gal.

- Pavement markings shall only be applied in seasonable weather when the air and pavement surface temperatures are soft and regular and shall not be applied when the wind or other conditions cause a film of dust to be deposited on the pavement surface. Before cleaning and before the marking material can be applied.

PREFORMED MARKINGS:

- Manufacturer certifications are required for installers, and written certification shall be presented at any time upon request of the engineer or other state personnel.

- Do not use line material to piece together individual letters, symbols, or crosswalks. Utilize pre-cut kits made by the manufacturer. Two strips of 10' line material may be used to form crosswalk blocks of 20' width.

- Do not use narrower line material to piece together wider lines.

- If there is a crack or joint in road surface, for tape lay over crack or joint then but tape 1" on each side of crack or joint. For thermo make a deep score in material. Once it has set up but not entirely cooled down.

- Prefrom tape inlay application:

  - Mat temperature shall be checked using a thermometer to make sure the inlay is being done in proper temperature range. The temperature should measure between 550°F asphalt firm enough to walk on and 120°F. Application below 120°F may not get a proper inlay. Inlays are not recommended after September 15th as the asphalt cools too fast at this time of the year.

  - No primers are used for inlay application. Do not place line lines on an asphalt seam. Rolling of all the markings should be lengthwise in the direction they were laid, for crosswalks and stop bars. Initial tamping with the tamping cart is recommended using only 100 lb of weight.

  - Use compaction roller to embed inlay markings into pavement surface. Use minimum speed and water on rollers. Do not use vibration. If marking buckle or develop severe in front of roller, mat temperature or roller speed may be too high.

- Ruminous pavement surfaces where pavement markings cannot be inlaid in the mat. Mat shall have a prepared ground for the placement of durable retroreflective pavement markings. See construction specifications.
PERMANENT PAVEMENT MARKING PLAN

NOTES & GUIDELINES

GENERAL INFORMATION
The contractor shall be responsible for pavement marking related activities such as, but not exclusive to, collecting data from 36 IN PLACE LINES AND PERMANENT MARKING ALIGNMENTS. THIS SHALL ALSO INCLUDE ANY LAKE CLOUSURES OR TRAFFIC CONTROL NEEDED TO COMPLETE THESE PROJECTS. SAIF, WROTH PERSONNEL WILL ASSIST IN THE LOCATION OF MARKER MESSAGES AND TAPERS FOR PERMANENT PAVEMENT MARKING. MOST PERSONNEL WILL BE GIVEN A MINIMUM OF 24 HOURS NOTICE TO PROVIDE THIS ASSISTANCE.

The contractor shall be responsible for the location and placement of temporary pavement markings, most personnel will be available to assist in the spotting of temporary marker messages and tapers for permanent pavement markings. Most personnel shall be given a minimum of 24 hours notice to provide this assistance.

The road surface shall be cleaned at the direction of the engineer just prior to application. Pavement cleaning shall consist of at least brushing with a rotary broom, non-installed or as recommended by the material manufacturer and acceptable to the engineer. Portland cement concrete surfaces shall be sandblasted cleaned to remove any surface treatments and/or laitance.

Paint:
Standard paint line, crosswalk markings, and pavement messages with 1.5 INCH NON-REFLECTIVE BLACK BORDERS.

Contextual Markings:
Standard linear pavement markings, crosswalk markings, and pavement messages with 1.5 INCH NON-REFLECTIVE BLACK BORDERS.

Paint:
Class Beads shall be applied at a rate of at least B (LoC/ Gal) immediately after application of the Paint line.

PAINT:
Paint lines shall only be applied in reasonable weather when air and pavement surface temperatures are 55° F or higher and shall not be applied when the wind or other conditions cause a film of dust to be deposited on the pavement surface after cleaning and before the marking material can be applied.

Applications:
Apply multi-component liquid markings with a width thickness of 20 MIL GLASS BEADS shall be applied at a rate of at least 25 LB/GAL. The "NO-TRACKING" condition shall be determined on an application of specified thickness to the pavement and covered with glass beads at the rate of at least 1 INCH.

Pavement markings shall only be applied in reasonable weather, when air and pavement surface temperatures are 55° F or higher and shall not be applied when the wind or other conditions cause a film of dust to be deposited on the pavement surface after cleaning and before the marking material can be applied.

Preformed Markings:
Manufacturer certifications are required for installers and written certification shall be presented at any time upon request of the engineer or other state personnel.

Do not use line material to piece together individual letters, symbols, or crosswalks. Use pre-cut kits provided by the manufacturer. No strips of line material may be used to form crosswalk breaks of 30° or more.

Do not use narrower line material to piece together wider lines.

If there is a crack or joint in the road surface, for tape lay over crack or joint then cut tape off on each side of crack or joint. For thermo make a deep score in the material. Once it is set but not entirely cooled down.

Prefrom Tape Inlay Application:
Mat temperature shall be checked using a thermometer to make sure the inlay is being done in the proper temperature range. The temperature should measure between 150°F (asphalt firm enough to walk on) and 120°F. Application below 120°F may not get a proper bond. Inlays are not recommended after September 15th as the asphalt cools too fast at this time of the year.

No primers are used for Inlay application. Do not place lane lines on an asphalt seam. Rolling of all the markings should be longitudinal in the direction they were laid. For crosswalks and stop bars. Initial taping with the taping cart is recommended using only 100 lbs of weight.

Use Compaction roller to ensure Inlay markings into pavement surface. Use minimum speed and water on roller. Do not use vibration. If marking buckles up during compaction, roll lightly in front of roller, mat temperature or roller speed may be too high.

Rhythmic pavement surfaces where pavement markings cannot be imprinted in the hot mat shall have a recess ground in for the placement of durable reflectorized pavement markings. See construction specifications.

Designer's Notes:
Remove all unnecessary material notes from title sheet.

This space may be used for permanent pavement marking tabulations sheet.