

108-22 Pavement Marking Line Types

(This section last updated 11-16-16)

This section provides guidance for filling out the Pavement Marking Line Types tabulation for various situations encountered during design. Refer to the [PM Series](#) for layout guidance; specifically [PM-110](#) for line type information.

Line Types

Under the 'Length by Line Type (Unfactored)' heading are fifteen columns available for different line types. The first six columns are pre-selected with the most common line types. These should be left visible and in their current order to provide continuity between appearances of this tab in different projects. *Click* on an empty column header to bring up a pull-down menu to select other pavement marking types as required by the project. In the instance that a project requires more than nine additional slots and any of the first six are not used, they may be replaced as needed. If a project needs more than fifteen different line types: 1) rename filled orange and blue worksheet tabs 108-22A leaving the tab header as 108-22; 2) add an additional page of this tab (notice the box for 108-22 is now unchecked) and name the new orange and blue worksheet tabs 108-22B, again leaving the actual tab header alone; 3) replace the pre-selected line types with those needed; and 4) set any remaining pre-selected types to blank.

After selecting a line type, the factors line and the line type description will update accordingly.

Marking Types

Below are the available marking types and when to use each.



NOTE: For new or resurfaced pavements, initial pavement markings should be nondurable surface applied waterborne paint (use Waterborne/Solvent Paint bid item). More durable pavement markings, and grooving, should not be used until the construction season following the construction of the new pavement. Table 1, below, is to be used to determine pavement marking types for existing pavements.

- Waterborne/Solvent Paint – This may be used as longitudinal markings in construction zones using temporary traffic control where the marking is temporary and needs to be removed after construction. For permanent application see [Table 1](#).
- Highbuild Waterborne Paint – See [Table 1](#).
- Durable Paint – A catchall for remaining paints. Generally, either Waterborne/Solvent or Highbuild Waterborne are preferred.
- Permanent Regular Tape – Also known as foil tape. Do not use without consent from the State Traffic Engineer.
- Permanent Preformed Polymer Tape – Do not use without consent from the State Traffic Engineer.
- Permanent Profiled Tape – Preferred type of tape. Use according to [Table 1](#).
- Permanent Intersection Tape – Intended for crosswalks, gore lines, and symbols at intersections where markings are subjected to high shear from turning traffic.
- Groove Cuts for Pavement Markings – Intended for use when final pavement markings are placed. Use in conjunction with the requirements set forth in the note above. The request for grooving will come from the District.
- Wet Retroreflective Removable Tape – Intended for use as diagonal markings in construction zones using temporary traffic control where the marking is temporary and needs to be removed after construction. See Article [2527.03, 1, 2](#), of the Standard Specifications.

- Nonreflective, Preformed Removable Tape – Intended to temporarily cover up areas that have existing markings that will be re-used in the future (for example, covering existing markings during construction staging).
- Removal of Paint or Permanent Tape – To identify any markings to be removed.
- Removal of Removable Tape – To identify any markings to be removed where the removal portion is incidental to the initial placement (for example, removable tape). Mostly used as a sequencing or staging place holder.

Table 1: Longitudinal Pavement Marking Matrix

LONGITUDINAL PAVEMENT MARKINGS (June 2009)					
Remaining Pavement Service Life	Primary 2 & 3 - Lane	Primary 4+ - Lane		Interstate	
	RURAL + URBAN ≤ 55 mph	RURAL	URBAN	< 50,000 ADT	> 50,000 ADT
	7,811 centerline miles (75% of total)	1,059 centerline miles (10% of total)	556 centerline miles (5% of total)	1,000 centerline miles (9.6% of total)	45 centerline miles (0.4% of total)
≤ 2 yrs	Waterborne	Waterborne	HB Waterborne Waterborne	Waterborne	HB Waterborne Waterborne
3 - 5 yrs	HB Waterborne Waterborne	HB Waterborne Waterborne	HB Waterborne Waterborne Thermoplastic (ACC Only)	HB Waterborne	HB Waterborne Thermoplastic (ACC Only) Tape
5+ yrs	HB Waterborne <small>Recess Dashlines</small>	HB Waterborne <small>Recess Dashlines</small>	HB Waterborne <small>Recess Dashlines</small> Thermoplastic (ACC Only) Tape	HB Waterborne <small>Recess Dashlines</small> Thermoplastic (ACC Only) Tape	Tape <small>Recess Dashlines</small> HB Waterborne <small>Recess Edgelines</small> Thermoplastic (ACC Only)

NOTE: Neither Polyurea nor Epoxy are listed within the application matrix. This is not a judgement on the products efficiency, but rather a reflection on the need to field demonstrate and then determine the materials fit within the matrix.

*** Where the characteristics such as heavy volumes, weaving, high speeds, or other conditions exist markings within this category may include additional enhancements as noted below:
 Enhancements could include (Wider markings, Adding strips of Wet Reflective tape, Lighting, larger beads, paint additives, or other forms of illumination)
 Initially apply nondurable surface applied waterborne paint to new pavement surfaces. Groove in durable pavement markings during the next paint cycle

Tabulation Entry Guidelines

The proper tabulation of pavement marking line types is critical to provide the contractor a definitive location of each marking.

Pavement marking line types should be tabulated using the following guidelines:

- Tabulate markings based on staging.
- Provide station to station limits consistent with marking location.
- Each designation of 'Standard Roadway Conditions' should be tabulated in an entry which is separate from any 'Special Conditions', as described below.
 - Note the presence of interchanges and intersections will result in edge line quantities that differ from the edge line descriptions below and must be tabulated separately with appropriate station to station limits.
- Limit one 'Special Condition' per entry, unless an identical station to station range exists.
- The 'Standard Roadway Conditions' described below do not apply to the tabulation of markings for [TC Series](#) Standard Road Plans.

Standard Roadway Conditions

The Length of Marking items below were initially created with the assumption that the Station to Station values were manually entered and used to create the Length values. If values are created with the Design and Computation Manager - Compute tool (or any similar program) that generates the length values in a report, ignore the suggested lengths below and use those numbers instead.

Two-Lane Roadways

Use the following selections to tab this scenario:

1. White Edge Lines
 - a. Direction of Travel → BOTH
 - b. Side → R
 - c. Line Type → ELW4
 - d. Length of Marking → **Twice** the amount shown in Length column
2. Centerline
 - a. Direction of Travel → Either of the actual directions
 - b. Side → L
 - c. Line Type → BCY4 or DCY4 or NPY4
 - d. Length of Marking → Amount shown in Length column

Four-Lane Undivided Roadways

Use the following selections to tab this scenario:

1. White Edge Lines
 - a. Direction of Travel → BOTH
 - b. Side → R
 - c. Line Type → ELW4
 - d. Length of Marking → **Twice** the amount shown in Length column
2. Lane Lines
 - a. Direction of Travel → BOTH

- b. Side → C
 - c. Line Type → BLW4
 - d. Length of Marking → **Twice** the amount shown in Length column
3. Centerline
- a. Direction of Travel → Either of the actual directions
 - b. Side → L
 - c. Line Type → DCY4 or NPY4
 - d. Length of Marking → Amount shown in Length column

Four-Lane Divided Roadways

Use the following selections to tab this scenario:

1. White Edge Lines
- a. Direction of Travel → BOTH
 - b. Side → R
 - c. Line Type → ELW4
 - d. Length of Marking → **Twice** the amount shown in Length column
2. Lane Lines
- a. Direction of Travel → BOTH
 - b. Side → C
 - c. Line Type → BLW4
 - d. Length of Marking → **Twice** the amount shown in Length column
3. Yellow Edge Lines
- a. Direction of Travel → BOTH
 - b. Side → L
 - c. Line Type → ELY4
 - d. Length of Marking → **Twice** the amount shown in Length column

More than Four-Lane Divided Roadways

Use the following selections to tab this scenario:

1. White Edge Lines
- a. Direction of Travel → BOTH
 - b. Side → R
 - c. Line Type → ELW4
 - d. Length of Marking → **Twice** the amount shown in Length column
2. Lane Lines
- a. Direction of Travel → BOTH
 - b. Side → C
 - c. Line Type → BLW4
 - d. Length of Marking → **Four** times the amount shown in Length column for Six-Lanes or **Six** times the amount shown for Eight-Lanes
3. Yellow Edge Lines

- a. Direction of Travel → BOTH
- b. Side → L
- c. Line Type → ELY4
- d. Length of Marking → **Twice** the amount shown in Length column

Special Conditions

Turn Lanes

To indicate a Turn Lane, make a separate row from the edge line (ELW4 or ELY4) with the following:

1. Right Turn Lane
 - a. Direction of Travel → Actual direction
 - b. Side → R
 - c. Line Type → SLW4
 - d. Length of Marking → Amount shown in Length column
2. Left Turn Lane
 - a. Direction of Travel → Actual direction
 - b. Side → L
 - c. Line Type → SLW4
 - d. Length of Marking → Amount shown in Length column

Two-Way Left-Turn Lanes

To indicate a Two-Way Left-Turn Lane, use the appropriate standard roadway condition above and replace the Centerline portion with the following selections:

1. Right Side of Marking
 - a. Direction of Travel → Either of the actual directions
 - b. Side → L
 - c. Line Type → NPY4
 - d. Length of Marking → Amount shown in Length column
2. Left Side of Marking
 - a. Direction of Travel → Opposite direction of Right Side Marking
 - b. Side → L
 - c. Line Type → NPY4
 - d. Length of Marking → Amount shown in Length column

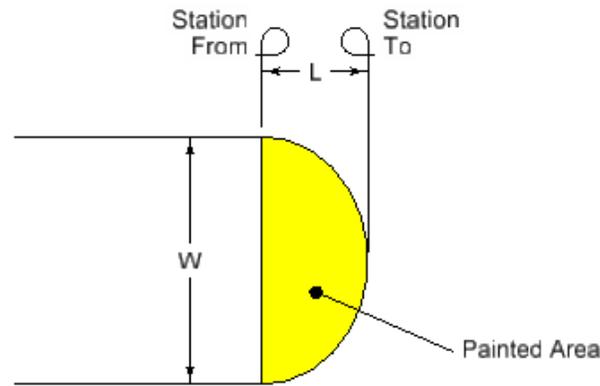
Curbs

Use the appropriate 'Standard Roadway Condition' above and replace the following with the correct type of curb:

1. Edge Lines
 - a. Line Type → Replace ELW4 or ELY4 with SPW4, SPW6, SPY4, SPY6, STW6, or STY6

Median Nose

To calculate the length of a 4-inch paint line that covers the area created by the Median Nose (MNY4), assume the area is half an ellipse and use the following:



$$\text{Painted Area} = \frac{1}{2}\pi \times \frac{1}{2}W \times L$$

If the median is 7 ft wide and 3 ft long, the Station Length to enter under MNY4 would be:

$$\frac{1}{2}\pi \times \frac{1}{2} \times 7 \text{ ft} \times 3 \text{ ft} = 16.5 \text{ ft}^2 \text{ (to determine area in ft}^2\text{)}$$

$$16.5 \text{ ft}^2 \times 144 \text{ in}^2/\text{ft}^2 = 2376 \text{ in}^2 \text{ (to convert area to in}^2\text{)}$$

$$2376 \text{ in}^2 \div 4 \text{ in wide paint line with a factor of 1.00} = 594 \text{ in} \text{ (to convert area to inches of 4 inch paint line)}$$

$$594 \text{ in} \div 12 \text{ in}/1 \text{ ft} = 49.5 \text{ ft} \text{ (to convert inches to feet)}$$

$$49.5 \text{ ft} \div 100 \text{ ft}/1 \text{ Sta} = 0.495 \text{ Sta} \approx 0.50 \text{ Sta} \text{ (Sta length is two decimal places)}$$

Channelizing Lines

For situations that do not call for separations in the roadway (traffic control, entrance/exit ramps, any others that do not have diagonal cross-hatching), use the appropriate Standard Roadway Condition above and replace the Edge Lines → Line Type with the corresponding channelizing line (CHW8 or CHY8). For those with additional diagonal cross-hatching channelizing lines, one of two methods described below will suffice:

1. Include both outer lines and the diagonals in one station to station run.
 - a. Direction of Travel → Either of the actual directions (if used in the center) or the actual direction (if used only on one side)
 - b. Side → L (if placement is center of roadway), L/C/R (if other)
 - c. Line Type → CHW8 or CHY8
 - d. Length of Marking → Amount calculated using another method (will be more than twice the amount shown in Length column)
 - e. Remarks column → “Includes lines and diagonals”
2. Separate outer lines and the diagonals into two station to station runs.
 - a. Outer Lines
 1. Direction of Travel → BOTH (if used in the center) or the actual direction (if used only on one side)
 2. Side → L (if placement is center of roadway), L/C/R (if other)
 3. Line Type → CHW8 or CHY8
 4. Length of Marking → Twice the amount shown in Length column (if lines are parallel) or split lines into two rows and use actual lengths (if lines are not parallel) or the amount shown in Length column if only one side of Diagonal Lines has Channelizing Lines.
 - b. Diagonal Lines
 1. Direction of Travel → Actual direction

2. Side → L (if center placement), L/C/R (if other)
3. Line Type → CHW8 or CHY8
4. Length of Marking → Amount calculated using another method (will be different than the amount shown in Length column)
5. Remarks column → “Diagonal lines”

Uneven Lanes

When used in conjunction with [TC-282](#) or [TC-482](#), enter the following to indicate only part of the normal line work is to be placed:

1. Edge Lines
 - a. Direction of Travel → Actual direction of lift
 - b. Side → R
 - c. Line Type → ELW4
 - d. Length of Marking → Amount shown in Length column
2. Centerlines
 - a. Direction of Travel → Actual direction of lift
 - b. Side → L
 - c. Line Type → BCY4 or DCY4 or NPY4
 - d. Length of Marking → Amount shown in Length column
 - e. Remarks column → See [TC-282](#) or [TC-482](#) for sequencing

Print Sheet Preparation

Once the marking information is filled out, click the ‘Totals’ button in the upper left corner of the Data Entry (orange) header. This button calculates the factored marking totals and provides the bid item quantities for the marking types used in this tab. If additional data is added or removed, click the ‘Totals’ button, make the necessary changes, and click again to recalculate.

If at any time the print sheet looks incorrect or data is missing (and the Update C Print Sheet(s) won’t fix it), simply delete the print sheet image of 108-22 and replace it as if it were the first time.