

Section 2527. Pavement Marking

2527.01 DESCRIPTION.

- A. Furnish, install, maintain, and remove permanent or temporary pavement markings, temporary delineators, and raised pavement markers, such as for:
 - 1. Diversions and on site detours where the need for this work is anticipated as part of the traffic control plan to accommodate traffic during construction.
 - 2. Replacing markings obliterated during construction activities on roads open to public traffic.
 - 3. Changing markings on roads open to public traffic where the necessary changes result from staged construction.
 - 4. Replacing markings that are obsolete.
 - 5. Marking completed pavement surfaces.
- B. Permanent pavement markings are those intended to remain in place after the project is completed. Temporary markings are those that are designated for removal, those that will be obliterated during construction, or those that require changes during construction.
- C. Diversions are installations or modifications for the transfer of traffic on four lane or wider roadways to lanes which would normally carry traffic in the opposite direction. Diversions provide for continuous but restricted traffic flow from both directions for divided highways. Diversions usually include crossovers.
- D. On site detours are temporary roadways specifically constructed to accommodate traffic during construction.

2527.02 MATERIALS.

- A. Use pavement marking materials that provide markings readily visible when viewed in daylight and with vehicular headlights at night.
- B. The marking materials used for temporary pavement marking include removable marking tape, traffic paint, temporary delineators, and raised pavement markers. Unless specified otherwise, the marking materials used for permanent pavement marking include regular marking tape, traffic paint, and preformed polymer pavement marking material.
- C. Other marking materials, such as: epoxy, polyester, or thermoplastic, etc.; may be specified in the contract documents.
- D. Materials for pavement markings are described below:
 - 1. **Removable Marking Tape.**
 - a. Meet the requirements of [Article 4183.06, A.](#) and prequalified for use according to [Materials I.M. 483.06.](#)
 - b. Complying with the following:
 - 1) Nominal width of 4 inches (100 mm).
 - 2) Yellow or white, weather and traffic resistant film, precoated on one side with a pressure sensitive adhesive.
 - 3) Flexible and formable.
 - 4) Capable of remaining in place during its useful life.
 - 5) Easily removed from the pavement at any time.
 - 2. **Traffic Paint.**
 - a. **General.**
 - 1) Use painting equipment complying with the following:
 - a) Capable of placing two lines simultaneously with either line in a solid or intermittent pattern in yellow or white.
 - b) Capable of applying glass beads at the required rate.

- c) All guns in full view of the operator at all times.
 - d) Equipped with a metering device to register the accumulated length for each gun, each day.
 - e) Designed so that the pressure gages for each proportioning pump are visible to the operator at all times during operation to monitor fluctuations in pressure.
- 2) Apply reflectorizing spheres meeting requirements of [Section 4184](#) to the painted lines. Apply the paint without dilution using mechanical equipment intended for that purpose. Apply the reflectorizing spheres immediately to the wet paint with a pressurized system.
- b. Waterborne and Solvent-based Paint.**
- 1) Meet the requirements of [Section 4183](#) for fast dry paint.
 - 2) Use the nominal application paint and glass bead rates shown in Tables 2527.02-1 and 2527.02-2:

Table 2527.02-1: Waterborne Paint

| Line Width | Wet-Film Thickness | Paint | Spheres |
|--------------------|----------------------|---|-----------------------------|
| 4 1/2" (115 mm) | 14 mils (0.35 mm) | 305.5 ft. of solid line per gallon of paint. (24.60 m of solid line per liter of paint.) | 9.0 lb./gal. (1.08 kg/L) |
| 4" (100 mm) | 14 mils (0.35 mm) | 343.7 ft. of solid line per gallon of paint. (27.68 m of solid line per liter of paint.) | 9.0 lb./gal. (1.08 kg/L) |

Table 2527.02-2: Solvent-based Paint

| Line Width | Wet-Film Thickness | Paint | Spheres |
|--------------------|----------------------|---|-----------------------------|
| 4 1/2" (115 mm) | 16 mils (0.41 mm) | 267.4 ft. of solid line per gallon of paint. (21.53 m of solid line per liter of paint.) | 9.0 lb./gal. (1.08 kg/L) |
| 4" (100 mm) | 16 mils (0.41 mm) | 300.8 ft. of solid line per gallon of paint. (24.22 m of solid line per liter of paint.) | 9.0 lb./gal. (1.08 kg/L) |

- c. Durable Paint Pavement Markings.**
- 1) Meet requirements of [Article 4183.04](#).
 - 2) Provide the Engineer with a copy of the manufacturer's recommendations for applying the marking material. Install the marking material according to the product manufacturer's recommendations. Use the same binder thickness as applied on the National Transportation Product Evaluation Program (NTPEP) deck with a tolerance of 10%. The bead application rate, bead gradation, and bead coating is at the discretion of the Contractor. Use an appropriate bead package to consistently meet or exceed the minimum retroreflectivity requirements.
 - 3) Demonstrate to the Engineer at the start of the project the ability to meet the retroreflectivity requirements of these specifications when tested according to [Materials I.M. 483.04](#). The Engineer may also require the Contractor to demonstrate the ability to meet the initial retroreflectivity requirements if there is a change in equipment, materials, or a delay of more than 2 months in completing the project.
 - 4) Final acceptance will be based on compliance with these specifications. Ensure the markings meet the following retroreflectivity requirements.

Specific Luminance
(mcd/sq.ft./ft.-cdl.)
(lux•m²)

| | |
|----------------------------------|-----|
| White line, symbols, and legends | 300 |
| Yellow line | 200 |

- 3. Regular Marking Tape.**
- a. Meet the requirements of [Article 4183.06, B.](#) and prequalify regular marking tape for use according to [Materials I.M. 483.06](#).
 - b. Comply with the following:
 - 1) Nominal width of 4 inches (100 mm).

- 2) Yellow or white, weather and traffic resistant film on a conformable, metallic foil backing precoated with a pressure sensitive adhesive.
 - 3) Flexible and formable, and following application, remains conformed to the texture of the pavement surface.
4. **Temporary Delineators.**

Meet the requirements of [Article 4186.07](#). Mount on posts meeting the requirements of [Article 4186.10](#) for delineator posts.
5. **Raised Pavement Markers.**
 - a. These markers are intended for temporary use to provide retro-reflective pavement markings. Place in addition to other pavement markings, when specified. Use markers for which the reflective surface or surfaces:
 - Have a minimum area of 1/2 square inch (320 mm²),
 - Are of the color required, and
 - Provide reflectance from approaching headlights.
 - b. Ensure markers that will be continually exposed to traffic, when installed, do not extend more than 3/4 inch (20 mm) above the pavement surface. Use markers that comply with [Materials I.M. 483.07](#).
6. **Channelizer Markers.**

Use channelizer markers that comply with [Materials I.M. 483.08](#).
7. **Preformed Polymer Tape.**
 - a. Use preformed polymer tape that:
 - Consists of glass beads imbedded in a white or yellow polymer film,
 - Is precoated with a pressure sensitive adhesive, and
 - Has a nominal width of 4 inches (100 mm).
 - b. The contract documents will specify precut symbols and legends or tape to be made of preformed polymer marking material.
 - c. Use marking material that:
 - Is capable of adhering to asphalt and PCC surfaces,
 - Meets the requirements of [Article 4183.06, C.](#), and
 - Is prequalified as a preformed polymer tape according to [Materials I.M. 483.06](#).
8. **Removable, Nonreflective, Preformed Tape.**

Comply with the following:

 - a. Nominal width of 6 inches (150 mm).
 - b. Dark grey or black, weather and traffic resistant film.
 - c. Precoated on the bottom with a pressure sensitive adhesive.
 - d. The top of the tape embedded with skid resistant particles.
 - e. Flexible and conforming to the pavement surface.
 - f. Capable of remaining in place during its useful life.
 - g. Easily removed from the pavement at any time.
 - h. Does not damage or discolor the underlying pavement or pavement markings.
9. **Profiled Pavement Marking Tape.**
 - a. Use profiled pavement marking tape that:
 - Consists of reflective beads imbedded in a white or yellow polymer film, which is precoated with a pressure sensitive adhesive,
 - Is capable of adhering to asphalt and PCC surfaces,
 - Meets the requirements of [Article 4183.06, E.](#), and
 - Is prequalified as a profiled pavement marking tape according to [Materials I.M. 483.06](#).
 - b. This marking tape has raised profiles which gives the tape higher initial retroreflectivity than the preformed polymer marking in [Article 2527.02, D, 6](#).
 - c. The contract documents will specify precut symbols and legends or lane stripes to be marked with profiled pavement marking tape. Use lane stripes with a nominal width of 4 inches (100 mm).
10. **Intersection Marking Tape.**
 - a. Use intersection marking tape that:

- Consists of reflective beads and ceramic anti-skid particles embedded in a polymer film that is precoated with a pressure sensitive adhesive,
 - Is capable of adhering to asphalt and PCC surfaces,
 - Meets the requirements of [Article 4183.06, E.](#), and
 - Is prequalified as a profiled pavement marking tape according to [Materials I.M. 483.06](#).
- b. This marking tape is intended for use in high wear and high shear areas such as cross walks, gore lines, and turn symbols at intersections.
- c. The contract documents will specify precut symbols and legends or lane stripes to be marked with intersection marking tape. Use lane stripes with a nominal width of 4 inches (100 mm).

2527.03 CONSTRUCTION.

A. General.

1. The contract documents will specify the quantity, locations, and type of pavement markings required.
2. Table 2527.03-1 shows the minimum atmospheric and surface temperatures for application of pavement markings. Follow the manufacturer's written recommendations for other details of application.

Table 2527.03-1: Minimum Atmospheric and Surface Temperatures

| Type of Marking | Oct. 23 to Apr. 7 | Apr. 8 to Apr. 22 | Apr. 23 to Oct. 7 | Oct. 8 to Oct. 22 |
|--|-------------------|-------------------|-------------------|-------------------|
| Waterborne Paint | not allowed | 45°F (4°C) | 45°F (4°C) | 45°F (4°C) |
| Low Temperature Waterborne Paint with Rohm & Haas XSR Resin | 35°F (2°C) | 35°F (2°C) | 35°F (2°C) | 35°F (2°C) |
| Solvent Based Paint | no restrictions | no restrictions | (a) | no restrictions |
| (a) Solvent-based paint may be used only if temperature requirements can not be met. | | | | |

3. Follow the manufacturer's temperature restriction recommendations for tape and durable paint.
4. For all pavement markings, ensure the pavement surface is dry and free from dirt, dust, oil, curing compound, and other contaminants which may interfere with markings properly bonding to the surface. Ensure the clean surface is at least 1 inch (25 mm) wider than the anticipated marking. Shoot an air blast on the pavement surface immediately prior to placing the new marking. The air blast is not intended to remove large amounts of dust, but only a very small amount of residue that might be left from the removal and cleaning operation.
5. Ensure the following for all painted and taped pavement markings:
 - Uniform thickness,
 - Uniform distribution of glass beads throughout the line width,
 - Line widths as specified, with a tolerance of $\pm 1/4$ inch for 4 inch (± 6 mm for 100 mm) lines and $\pm 1/2$ inch (13 mm) for wider lines, **and**
 - Symbols and Legends are visually proportional to contract documents with an out-to-out tolerance of ± 6 inches (150 mm), **and**
 - Markings have sharp edges and cutoffs at the ends.
6. For tape products, follow the manufacturer's recommendations for surface dryness, primers, adhesives, and other surface preparation requirements. Unless specified otherwise by the tape manufacturer, meet the following test for determining surface dryness before applying the tape:

- a. In an area of direct sunlight where the tape will be applied, place an 18 inch x 18 inch (450 mm x 450 mm) piece of polyethylene (a green or black garbage bag may be used). There should not be any holes or tears in the polyethylene.
- b. Tape down all the edges of the polyethylene sheet to seal all the edges and not allow any air movement to get under the polyethylene.
- c. Firmly tamp the tape using the tamper cart or by foot tamping.
- d. Allow 20-25 minutes for the polyethylene to be exposed to the direct sunlight.
- e. Remove the polyethylene from the road surface. If no moisture is present on the under side of the polyethylene or on the road surface, the tape can be applied.
- f. If any moisture is present, allow another hour to pass and repeat the test until no moisture is found.

B. Traffic Control.

Apply the provisions of [Section 2528](#) to traffic control for removing and placing painted and taped pavement markings, along with the following additional requirements:

1. Place traffic control devices on the roadway before removal operations have commenced. Leave traffic control devices in place through the completed curing time of the newly applied pavement markings.
2. Do not close any longer length of lane than can be adequately removed and replace in a single working day.
3. For painted pavement markings, do not remove traffic control devices until the newly applied pavement markings are tack free.

C. Removal of Pavement Markings.

1. Promptly remove, on the same day new lines are placed, all existing pavement markings in the newly marked traffic lanes that are confusing, conflicting, or misleading to traffic. The Engineer may designate other pavement markings for removal to maximize the effectiveness of the traffic control plan.
2. Upon completion of the project, remove all new pavement markings which are applied according to this specification and would change the color or placement of existing standard pavement markings. Removal may also be required during progress of the work if lines that are no longer needed cause confusion in traffic delineation.
3. Remove existing painted pavement markings so that 90% or more of the pavement is visible. Tightly adhering markings may remain in the bottom of the tining and other depressions on the pavement surface but shall not be visible to the motorist during daytime or night time. Remove tape markings according to the manufacturer's recommendations. Ensure removal processes do not cause functional damage to the transverse or longitudinal joint sealant materials.
4. Conduct pavement marking removal operations in a manner so that the finished pavement surface is not damaged or left in a pattern that may mislead or misdirect the motorist. When the operations are completed, power broom the pavement surface. Remove all marking removal debris from the pavement surface before the pavement is open to public traffic.
5. Perform pavement marking removal to a width no less than the width of the existing or new pavement markings plus 1 inch (25 mm). When symbols or legends are removed, remove the entire area of the existing symbol or legend; in a rectangular shape so no directionality may be observed from the removed symbol or legend.
6. Removal will not be required prior to being covered by a construction process unless specified in the contract documents. Removal of pavement markings may be by vacuum blasting, vacuum dry grinding, wet grinding, shot blasting, or high pressure water blasting. Open abrasive blasting or dry grinding without containment will not be allowed.
7. In lieu of physical removal, existing pavement markings may be covered by removable, nonreflective, preformed tape that is prequalified according to [Materials I.M. 483.06](#) and meets the requirements of [Articles 2527.02, D, 7, and 4183.06, D](#).

8. Ensure pavement marking removal equipment:
 - a. Operates without the release of dust,
 - b. Recovers all removed material, and
 - c. Includes a waste collection and transfer system and for dry wastes, ensure the system incorporates HEPA methods and equipment.
9. Removal operations may be halted if the process and final result is not acceptable to the Engineer.
10. Remove collected material and dispose of according to applicable Federal and State regulations.
11. Remove temporary delineators, posts, and raised pavement markers when their need no longer exists or when directed by the Engineer.

D. Pavement Marking Requirements.

Apply the following marking material placement requirements for permanent and temporary standard pavement markings:

1. Edge Lines.

Solid white lines (solid yellow line for the inside edge line for a multi-lane divided highway, including ramps and crossovers). Place approximately 3 inches (75 mm) from the edge of the pavement.

2. Center Lines for Two Lane, Two Way Highways.

Single, dashed yellow lines 10 feet (3 m) long with 30 foot (9 m) gaps between dashes.

3. Center Lines for Multi-lane, Undivided Highways.

Solid yellow lines spaced 10 1/2 inches (270 mm) apart between the inside edges of the lines.

4. Lane Lines for Multi-lane Highways (Divided and Undivided).

Single, dashed white lines 10 feet (3 m) long with 30 foot (9 m) gaps between dashes.

5. No Passing Zone Lines.

- a. Solid yellow lines. For PCC surfaces, place 3 inches (75 mm) outside a 4 1/2 inch (115 mm) center line or 3 1/4 inches (85 mm) outside a 4 inch (100 mm) center line. For asphalt surfaces, place 10 1/2 inches (270 mm) from the adjacent center line or no passing zone line.
- b. Where there are two no passing zone lines, the center line is to be omitted, and the no passing zone lines are spaced 10 1/2 inches (270 mm) apart between the inside edges of the lines.
- c. It is intended that only the two outside paint nozzles be used for painting center lines and no passing zone lines on asphalt surfaces. Painting equipment should be equipped to change from solid line to a dashed line on the two outside paint nozzles.

6. Dotted Lines.

Dotted lines are usually single, white dotted lines 2 feet (0.6 m) long with 4 foot (1.2 m) gaps between dots.

7. Transverse Marking.

Transverse marking will be shown in the contract documents.

8. Symbols and Legends.

Symbols and legends will be shown in the contract documents. Each of the following is a complete unit:

- a. Each RxR marking for railroad and highway grade crossing.
- b. Each SCHOOL legend (one lane or two lane).
- c. Each STOP, X-ING, ONLY, BUS, LANE.
- d. Each arrow (straight, left, right, combination, or ramp).

9. Solid White Barrier Lines.

Solid white barrier lines may also be required in the contract documents.

E. Permanent Pavement Marking.

1. When permanent marking is required, place:
 - Center lines, lane lines, no passing zone lines, and edge lines,
 - Barrier lines and transverse lines,
 - Symbols and legends, and
 - Other markings required by the contract documents or by the Engineer.
2. Permanent marking will normally be required, according to this specification, for all projects on which public traffic is allowed during construction.
3. Accurately place all lines to a close tolerance using a guide extending at least 3 feet (1 m) ahead of the machine. The location of edge lines may be referenced to the pavement edge. The locations of other longitudinal lines may be referenced to accurately located longitudinal joints. Where such references do not exist or are not reliable, locate the lines as follows:
 - a. For straight or nearly straight lines, reference the locations to a stringline set between marking line points.
 - b. For curves, reference the locations to closely spaced marking line points. For sharp curves, a spacing of 10 feet (3 m) may be required.
 - c. Other equally effective systems the Engineer approves.

F. Temporary Pavement Marking.

The location of temporary pavement marking will be shown in the contract documents or as directed by the Engineer. Temporary pavement marking includes:

1. **Diversions.**

Temporarily mark roadways as follows:

 - a. Mark the traffic lane or roadway for traffic that is not diverted with a continuous yellow inside edge line in the approach taper, continuing as a no passing zone line through the diversion along the existing lane line.
 - b. For traffic that is to be diverted:
 - 1) Place a continuous yellow line as a left edge line through both crossovers, continuing as a no passing zone line through the diversion.
 - 2) Place a white edge line on the right pavement edge through the diversion and both crossovers.
2. **On Site Detours.**
 - a. Mark on site detours for two way traffic with two continuous no passing zone lines near the center of the roadway and two continuous white edge lines, one at each pavement edge.
 - b. Mark on site detours for one lane traffic with two continuous white edge lines, one at each pavement edge.
3. **Marking Changes Resulting from Stage Construction.**

On all sections of Primary Road open to traffic during construction activities, place center lines, lane lines, no passing zone lines, and edge lines necessary for the construction stage as shown in the contract documents or as directed by the Engineer.
4. **Temporary Delineators.**

Erect temporary delineators (when required) as shown in the contract documents. ~~If not shown, space them at intervals described in Section 3D-5 of the MUTCD.~~ Temporary delineators will usually be single, white reflectors which are to be placed:

 - 2 feet (0.6 m) beyond the outside edge of the shoulder, and
 - 4 feet (1.2 m) above the edge of the pavement on delineator posts.
5. **Raised Pavement Markers.**
 - a. Place raised pavement markers parallel to the line being marked at that location. Place according to the manufacturer's recommendations, subject to the Engineer's approval.

- b. For pavement crossovers, supplement the white and yellow edge line with raised pavement markers, spaced at 10 feet (3 m) on center, from the beginning of the lane reduction taper through the reverse curves of the crossover.

G. Markings Obliterated during Construction.

1. On sections of pavement open to traffic, place pavement markings where operations have obliterated existing markings.
2. Replace pavement markings before the lane or road is opened to traffic in the following situations:
 - a. **Multi-Lane Roads:**
 - 1) **Divided.**
 - a) Lane lines obliterated for 50 feet (15 m) or more.
 - b) Edge lines obliterated for 50 feet (15 m) or more.
 - 2) **Undivided (Three or More Lanes) or Road with Continuous Two-Way Left-Turn Lane.**
 - a) Lane lines obliterated for 50 feet (15 m) or more.
 - b) Edge lines obliterated for 50 feet (15 m) or more.
 - c) Center lines obliterated for 50 feet (15 m) or more.
 - b. **Two Lane Roads:**
 - 1) **Paved Shoulder More Than 2 Feet (0.6 m).**
 - a) Center lines obliterated for 50 feet (15 m) or more.
 - b) Edge lines obliterated for 50 feet (15 m) or more.
 - c) No Passing Zone lines obliterated.
 - 2) **Paved Shoulder 2 Feet (0.6 m) or Less.**
 - a) Center lines obliterated for 50 feet (15 m) or more.
 - b) Edge lines obliterated on curves with a radius of 1,000 feet (300 m) or less.
 - c) Edge lines obliterated at bridge approaches, or other obstructions within 3 feet (1 m) of the roadway, for 300 feet (90 m) or more.
 - d) No Passing Zone lines obliterated.
3. Within 3 working days from the day the pavement and shoulder work are completed for the project, place edge lines that are not required to be placed before the lane or road is opened to traffic. Place remaining pavement markings within 3 working days from the day the road work is completed for the project.
4. Place symbols and legends within 5 working days from the day the road is open to traffic.

H. Defective Pavement Markings.

1. Markings that are low on initial retroreflectivity up to 20% may, at the discretion of the Engineer, be accepted with a price adjustment.
2. Repair, at no additional cost to the Contracting Authority, all pavement markings which, after application and curing, the Engineer determines to be defective and not in conformance with these specifications. Remove the defective markings completely and clean to the underlying pavement surface according to the requirements of [Article 2527.03, C](#). Remove the defective area plus all adjacent marking material extending 1 foot (300 mm) in any direction. After surface preparation work is complete, finish the repair by reapplying new marking material over the cleaned pavement surface according to the requirements of these specifications.

I. Grooving for Pavement Markings.

1. When specified, place pavement markings in a groove cut into the pavement surface. Dry or wet cut the groove in a single pass, using stacked diamond cutting heads mounted on a floating head with controls capable of providing uniform depth and alignment. If dry cutting, use equipment that is self vacuuming. Use the equipment according to the manufacturer's recommendations.
2. Ensure the groove meets the following specifications:

- a. **Groove width.**
Tape width plus 1 inch (25 mm) minimum.
- b. **Groove depth.**
For profiled marking tape, a grooved depth of 0.080 inches + 0.010 inches (2.0 mm + 0.03 mm). For all other markings, a groove depth as recommended by the pavement marking manufacturer.
- c. **Groove length.**
Full length of tape plus 3 inches (75 mm) minimum grooving transition on either end. Do not use a continuous groove for dash markings.
- d. **Groove position.**
Minimum of 2 inches (50 mm) from edge of the longitudinal joint.
- e. **Finished surface.**
The bottom of the groove should have a fine corduroy-like texture. The maximum allowable rise between the high and low points across the width of the groove is 0.010 inch (0.25 mm).
- f. **Groove cleaning.**
Vacuum and broom dry cut grooves using a high pressure air blast for the final cleaning. If wet cutting is used, immediately flush the groove with water and recover the removed material. Allow the surface to dry to a visibly dry condition. Ensure the surface to receive the tape is free from dust, dirt, or other contaminants that may interfere with the tape properly bonding.

J. Limitations.

1. When pavement markings are required, coordinate their application with other construction work and associated traffic control changes.
2. Use removable tape for temporary pavement markings which extend diagonally across a final traffic lane.
3. When the installation of preformed polymer pavement marking material or profiled pavement marking tape is in conjunction with placement of HMA, inlay the tape by positioning it on the HMA prior to the final rolling. Perform the installation of the tape according to the manufacturer's recommendations. If grooving is specified, do not inlay the tape into hot HMA.
4. When pavement markings are placed on newly completed PCC pavements, remove the existing curing compound film from horizontal surfaces in these locations. Curing compound film need not be removed from curbs or other vertical surfaces. Remove the curing compound in a manner that does not damage the underlying PCC pavement.
5. Complete the placement of pavement markings before the lane, road, on-site detour, or diversion is open to traffic.
6. If unavoidable circumstances result in not being able to complete the pavement marking placement or removal specified for that day, provide traffic control until the pavement marking placement or removal work is completed.

K. Maintenance.

Maintain in good condition all pavement markings, symbols and legends, temporary delineators, and raised pavement markers for which the Contractor is responsible. Replace, if necessary, for the period of their intended use. Their condition is subject to review by the Engineer.

2527.04 METHOD OF MEASUREMENT.

- A. Measurement for pavement markings, symbols and legends, temporary delineators, and raised pavement markers, satisfactorily placed or approved, will be as follows:
 1. **Painted Pavement Markings.**
Stations (meters) of the type specified placed with traffic paint. This includes both permanent and temporary pavement marking.

2. **Permanent Tape Markings.**
Stations (meters) placed of the type specified in the contract documents.
 3. **Removable Tape Markings.**
Stations (meters) placed. Removing removable tape will not be measured separately for payment.
 4. **Painted Symbols and Legends.**
By count for the type specified complete as a unit placed with traffic paint.
 5. **Precut Symbols and Legends.**
By count for each complete unit placed with the marking tape specified in the contract documents.
 6. **Temporary Delineators.**
By count.
 7. **Raised Pavement Markers.**
By count.
 8. **Pavement Markings Removed.**
Stations (meters). Pavement markings obliterated during construction, that are of removable marking tape, or removed by the Contractor on the Contractor's own accord, will not be measured separately for payment.
 9. **Symbols and Legends Removed.**
By count. Symbols and legends obliterated during construction or removed by the Contractor on the Contractor's own accord, will not be measured separately for payment.
 10. **Removable, Nonreflective, Preformed Tape.**
Stations (meters) of Removable, Nonreflective, Preformed Tape placed. Removal of the tape will not be measured separately for payment.
 11. **Grooves Cut for Pavement Markings.**
Stations (meters). This quantity will be equivalent to the number of stations (meters) measured for the Pavement markings. Additional width and transition length will be incidental.
 12. **Grooves Cut for Symbols and Legends.**
By count for grooves cut for profiled marking tape. Each symbol or legend groove will be counted as a complete unit.
- B. The Engineer will measure the number of stations (meters), based on a single 4-inch (100 mm) width, of painted, taped, and/or removed line. The length of each type of markings will be determined using beginning and ending points, and adjusting for breaks at side roads, median crossings, station equations, or other locations shown in the contract documents. The measurement for dashed and dotted lines will be adjusted to exclude skips. Measurement of lines wider than 4 1/2 inches (115 100 mm) will be adjusted by the quantity factor to a 4 inch (100 mm) line.

2527.05 BASIS OF PAYMENT.

- A. Payment for pavement marking, symbols and legends, temporary delineators, and raised pavement markers, satisfactorily placed or removed, will be at the contract unit price as follows:
 1. **Painted Pavement Markings.**
Per station (meter) of the type specified, placed with traffic paint, including both temporary and permanent marking.
 2. **Permanent Tape Markings.**
Per station (meter) placed for the type of marking tape specified in the contract documents.

3. **Removable Tape Markings.**
 - a. Per station (meter) placed.
 - b. Payment includes removing the removable marking tape, when required.
 4. **Painted Symbols and Legends.**

Each.
 5. **Precut Symbols and Legends.**

Each.
 6. **Temporary Delineators.**

Each.
 7. **Raised Pavement Markers.**

Each.
 8. **Pavement Markings Removed.**

Per station (meter).
 9. **Symbols and Legends Removed.**

Each.
 10. **Removable, Nonreflective, Preformed Tape.**
 - a. Per station (meter) placed.
 - b. Payment includes removal of the tape and repairing damage to the existing pavement markings caused by the tape.
 11. **Grooves Cut for Pavement Markings.**

Per station (meter).
 12. **Grooves Cut for Symbols and Legends.**

Each.
- B.** Payment is full compensation for:
- Cleaning and surface preparation,
 - Application of temporary and permanent pavement markings, symbols and legends,
 - Maintenance of pavement markings,
 - Removal of pavement markings or symbols and legends,
 - Installing or removing temporary delineators,
 - Installing or removing raised pavement markers, and
 - Furnishing all materials, equipment and labor, and disposal of material generated from the removal operations.