

**SECTION 32 17 23
PAVEMENT MARKINGS**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Paint on pavement surfaces, in form of traffic lanes, parking bays, areas restricted to handicapped persons, crosswalks, curb warnings, and other detail pavement markings.
- B. Contractor shall replace all pavement markings disturbed by work for the project. Color, width, pattern, and location shall match existing pavement marking disturbed. Disturbed parking lines, stop lines, pavement symbols, and cross walks shall be completely removed and replaced.
- C. Contractor shall paint top and face of curb safety yellow where indicated on the drawings.

1.2 APPLICABLE PUBLICATIONS

- A. Comply with references to extent specified in this section.
- B. Federal Specifications (Fed. Spec.):
 - 1. TT-P-1952F - Paint, Traffic and Airfield Marking, Waterborne.
- C. Master Painters Institute (MPI):
 - 1. No. 97 - Traffic Marking Paint, Latex.

1.3 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Submittal Drawings:
 - 1. Show pavement marking configuration and dimensions.
 - 2. Show international symbol of accessibility at designated parking spaces.
- C. Manufacturer's Literature and Data:
 - 1. Description of each product.
 - 2. Application instructions.
- D. Samples:
 - 1. Paint: 200 mm (8 inches) square, each type and color.
- E. Certificates: Certify products comply with specifications.
- F. Qualifications: Substantiate qualifications comply with specifications.
 - 1. Installer with project experience list.

1.4 QUALITY ASSURANCE**A. Installer Qualifications:**

1. Regularly installs specified products.
2. Installed specified products with satisfactory service on five similar installations for minimum five years.
 - a. Project Experience List: Provide contact names and addresses for completed projects.

1.5 DELIVERY

- A. Deliver products in manufacturer's original sealed packaging.
- B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, production run number, and manufacture date.
- C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.6 STORAGE AND HANDLING

- A. Store products indoors in dry, weathertight conditioned facility.
- B. Protect products from damage during handling and construction operations.

1.7 FIELD CONDITIONS**A. Environment:**

1. Product Temperature: Minimum 13 degrees C (55 degrees F) for minimum 48 hours before installation.
 - a. Surface to be painted and ambient temperature: Minimum 10 degrees C (50 degrees F) and maximum 35 degrees C (95 degrees F).

- B. Field Measurements: Verify field conditions affecting traffic marking installation. Show field measurements on Submittal Drawings.

1.8 WARRANTY

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS**2.1 SYSTEM PERFORMANCE**

- A. Design paint complying with specified performance:
 1. Application: Fed. Spec. TT-P-1952.

2.2 PRODUCTS - GENERAL

- A. Provide each product from one manufacturer and from one production run.

2.3 SANDBLASTING EQUIPMENT

- A. Air compressor, hoses, and nozzles of proper size and capacity as required for cleaning painted surfaces. Compressor to provide minimum 0.08 cu. m/s (150 cfm) of air at pressure of minimum 625 kPa (90 psi) at each nozzle used.

2.4 PAINT APPLICATOR

- A. Apply marking paint with approved mechanical equipment. Provide equipment with constant agitation of paint and travel at controlled speeds. Synchronize one or more paint "guns" to automatically begin and cut off paint flow in case of skip lines. Equipment to have manual control to apply continuous lines of varying length and marking widths as indicated on Drawings. Provide pneumatic spray guns for hand application of paint in areas where mobile paint applicator cannot be used.

2.5 PAINT

- A. Paint: MPI No. 97. For obliterating existing markings comply with Fed. Spec. TT-P-1952. Provide minimum 18 L (5 gallons) containers.

PART 3 - EXECUTION**3.1 PREPARATION**

- A. Examine and verify substrate suitability for product installation.
 - 1. Allow new pavement surfaces to cure for period of minimum 14 days before application of marking materials.
- B. Protect existing construction and completed work from damage.
- C. Clean substrates. Remove contaminants capable of affecting subsequently installed product's performance.
 - 1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or combination of these methods.
 - 2. Completely remove rubber deposits, existing paint markings, and other coatings adhering to pavement with scrapers, wire brushings, sandblasting, mechanical abrasion, or approved chemicals as directed by Contracting Officer's Representative (COR).
 - 3. As an option, comply with Fed. Spec. TT-P-1952 for removal of existing paint markings on asphalt pavement. Apply black paint in as many coats as necessary to completely obliterate existing markings.

4. Scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application, Where oil or grease are present on old pavements to be marked.
 - a. After cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through new paint.
5. Clean and dry surface before pavement marking are installed. Do not begin any marking until Contracting Officer's Representative inspected surface and gives permission to proceed.

3.2 TEMPORARY PAVEMENT MARKING

- A. Apply Temporary Pavement Markings of colors, widths and lengths directed by Contracting Officer's Representative. After temporary marking has served its purpose and when so ordered by Contracting Officer's Representative, remove temporary marking by carefully controlled sandblasting, approved grinding equipment, or other approved method to prevent damage on applied surface.
- B. As an option, provide approved preformed pressure sensitive, adhesive tape type of temporary pavement marking of required colors, widths and lengths in lieu of temporary painted marking. Continuous durability and effectiveness of such marking is required during period for which its use is required. Remove any unsatisfactory tape type marking and replace with painted markings.

3.3 INSTALLATION - GENERAL

- A. Install products according to manufacturer's instructions and approved submittal drawings.
 1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.

3.4 PAINT APPLICATION

- A. Apply uniformly painted pavement marking of required colors, length, and width with true, sharp edges and ends on properly cured, prepared, and dried surfaces.
- B. Comply with details as indicated on drawings and established control points.
- C. Apply paint at wet film thickness of 0.4 mm (0.015 inch). Apply paint in one coat. When directed by Contracting Officer's Representative, apply additional coats at markings showing light spots. Comply with

paint manufacturer's maximum drying time requirements to prevent undue softening of asphalt, and pick-up, displacement, or discoloration by tires of traffic.

- D. When deficiency in marking drying occurs, discontinue paint operations until cause of slow drying is determined and corrected.
- E. Remove and replace marking applied less than minimum material rates, deviates from true alignment, exceeds stipulated length and width tolerances, or shows light spots, smears, or other deficiencies or irregularities.
- F. Remove marking by carefully controlled sandblasting, approved grinding equipment, or other approve method to prevent damage on applied surface.

3.5 DETAIL PAVEMENT MARKING APPLICATION

- A. Apply Detail Pavement Markings, exclusive of actual traffic lane marking as follows:
 - 1. At exit and entrance islands and turnouts.
 - 2. On curbs.
 - 3. At crosswalks.
 - 4. At parking bays.
 - 5. Other locations as required to replace existing.
- B. Apply International Handicapped Symbol at applicable parking spaces. Apply paint for symbol using suitable template that will provide pavement marking with true, sharp edges and ends.
- C. Install detail pavement markings of colors, widths and lengths, and design pattern to match existing on campus.

3.6 TOLERANCES

- A. Length and Width of Lines: Plus or minus 75 mm (3 inches) and plus or minus 3 mm (1/8 inch), respectively, in case of skip markings.
- B. Length of intervals exceeding line length tolerance are not acceptable.

3.7 CLEANING

- A. Remove excess paint before paint sets.

3.8 PROTECTION

- A. Protect pavement markings from traffic and construction operations.
 - 1. Protect newly painted markings from vehicular traffic until paint is dry and track free.

2. Place warning signs at beginning of wet line, and at points well in advance of marking equipment for alerting approaching traffic from both directions.
 3. Place small flags or other similarly effective small objects near freshly applied markings at frequent intervals to reduce crossing by traffic.
- B. Repair damage.

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