

**SECTION 32 17 23  
PAVEMENT MARKINGS**

SPEC WRITER NOTE: Use this section only  
for NCA projects. Delete text between  
// \_\_\_\_\_ // not applicable to project.  
Edit remaining text to suit project.

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
- B. Paint // and reflective glass beads // on pavement surfaces, in form of traffic lanes, parking bays, areas restricted to handicapped persons, crosswalks, and other detail pavement markings.

**1.2 RELATED REQUIREMENTS**

SPEC WRITER NOTE: Update and retain  
references only when specified elsewhere  
in this section.

- A. Paint VOC Limits: Section 01 81 11, SUSTAINABLE DESIGN REQUIREMENTS.
- B. Paint Color: Section 09 06 00, SCHEDULE FOR FINISHES.

**1.3 APPLICABLE PUBLICATIONS**

- A. Comply with references to extent specified in this section.
- B. Federal Specifications (Fed. Spec.):
  - 1. TT-B-1325D - Beads (Glass Spheres) Retro-Reflective.
  - 2. TT-P-1952F - Paint, Traffic and Airfield Marking, Waterborne.
- C. Master Painters Institute (MPI):
  - 1. No. 97 - Traffic Marking Paint, Latex.

**1.4 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.

**1.5 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.

**1.6 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.

**1.7 STORAGE AND HANDLING**

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

**1.8 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.

**1.9 WARRANTY**

SPEC WRITER NOTE: Always retain construction warranty. FAR includes Contractor's one year labor and material 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-1952F.

**2.2 PRODUCTS - GENERAL**

- A. Basis of Design: Section 09 06 00, SCHEDULE FOR FINISHES.
- B. Provide each product from one manufacturer and from one production run.

## SPEC WRITER NOTE:

- 1. Section 01 81 11, SUSTAINABLE DESIGN REQUIREMENTS includes comprehensive product list setting VOC limits for low-emitting materials.
- 2. Retain subparagraphs applicable to products specified in this section.

- 1. Low Pollutant-Emitting Materials: Comply with VOC limits specified in Section 01 81 11, SUSTAINABLE DESIGN REQUIREMENTS for the following products:
  - a. Paints and coatings.

**2.3 SANDBLASTING EQUIPMENT**

- A. Air compressor, hoses, and nozzles of proper size and capacity as required for cleaning surfaces to be painted. 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 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. Provide pneumatic spray guns for hand application of paint in areas where mobile paint applicator cannot be used. // If equipment does not have glass bead dispenser, use separate piece of equipment. Adjust and synchronize equipment with paint applicator for reflective beads uniform distribution on paint lines within ten seconds without waste. //

**2.5 PAINT**

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

SPEC WRITER NOTE: Delete reference to reflective glass beads if not required by drawings.

## 2.6 REFLECTIVE GLASS BEADS

- A. Beads: Comply with Fed. Spec. TT-B-1325D, Type I, Gradation A. In regions of high humidity, coat beads with silicone or other suitable waterproofing material. Provide glass beads in containers suitable for handling and prevent loss during shipment.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Examine and verify substrate suitability for product installation.
  - 1. Allow new pavement surfaces to cure for 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. Application of paint conforming to Fed. Spec. TT-P-1952F is an option to removal of existing paint markings on asphalt pavement. Apply black paint in as many coats as necessary to completely obliterate existing markings.
  - 4. Where oil or grease are present on old pavements to be marked, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application.
    - a. After cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through new paint.
  - 5. Pavement marking to follow as closely as practicable after surface has been cleaned and dried, but do not begin any marking until COR has inspected surface and gives permission to proceed.

**3.2 TEMPORARY PAVEMENT MARKING**

- A. Apply Temporary Pavement Markings of colors, widths and lengths shown on drawings or directed by COR. Upon COR's direction, remove temporary marking by carefully controlled sandblasting, approved grinding equipment, or other approved method to avoid damaged. As an option, provide approved preformed pressure sensitive, // reflective, // adhesive tape type of temporary pavement marking of required colors, widths and lengths in lieu of temporary painted // and reflective // marking. Remove any unsatisfactory tape type marking and replace with painted // and reflective // markings at no additional cost to Government.

**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 COR consideration.

**3.4 PAINT APPLICATION**

- A. Apply uniformly painted // and reflective // pavement marking of required colors, length, and width with true, sharp edges and ends on properly cured, prepared, and dried surfaces in conformance with details shown on drawings and established control points.
1. Skip Markings Line Tolerances:
    - a. Length: Plus or minus 75 mm (3 inches).
    - b. Width: Plus or minus 3 mm (1/8 inch).
    - c. Length of intervals exceeding line length tolerance are not acceptable.
  2. Apply paint at wet film thickness of 0.4 mm (0.015 inch).  
// Disperse reflective glass beads evenly on wet paint at rate of 720 g/l (6 lbs./gal.) of paint. // Apply paint in one coat.
  3. At the direction of COR, apply additional coats at markings showing light spots.
  4. 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.
  5. If any deficiency in marking drying occurs, discontinue paint operations until cause of slow drying is determined and corrected.

6. Remove and replace marking applied at less than minimum material rates, deviates from true alignment, exceeds stipulated length and width tolerances, or shows light spots, // faulty distribution of beads //, smears, or other deficiencies or irregularities. Remove marking so that surface to which marking was applied will not be damaged by carefully controlled sand blasting, approved grinding equipment, or other approved method.

SPEC WRITER NOTE: Delete following paragraphs not required.

**3.5 DETAIL PAVEMENT MARKING**

- A. Apply Detail Pavement Markings in locations indicated on drawings.  
// Apply International Handicapped Symbol where indicated in parking spaces. Color as shown on drawings. Apply paint for symbol using suitable template that will provide pavement marking with true, sharp edges and ends. // Place detail pavement markings of colors, widths and lengths, and design pattern at locations shown on drawings.

**3.6 CLEANING**

- A. Remove excess paint before paint sets.
- B. Remove all debris, rubbish and excess material from project site.

**3.7 PROTECTION**

- A. Protect pavement markings from traffic and construction operations.
  1. Protect newly painted markings track free.
  2. Place warning signs to alert traffic from both directions.
  3. Place small flags or other similarly small objects near freshly applied markings at frequent intervals to reduce crossing by traffic.
- B. Repair damage.

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