

TRAFFIC STRIPING AND PAVEMENT MARKINGS

CONTROL OF MATERIALS

- 3601.1 Attention is directed to Section 6 “*Control of Materials*,” of the General Provisions regarding control of materials.
- 3601.2 The Contractor shall furnish all materials required to complete the work under the attached contract.

DESCRIPTION OF WORK

- 3602.1 The work to be done consists of supplying all labor, methods, tools, machinery, equipment and materials necessary to apply and/or remove traffic paint, perform traffic striping, apply pavement markings and markers. To be included is preliminary preparation, protection of new work, and other work not mentioned herein which, when required by the Plans and/or Special Provisions, is to be furnished and installed as specified herein or as directed by the Engineer.
- 3602.2 All striping installed shall include markers as per the Traffic Manual.
- 3602.3 Markers are not required on striping within parking lots.

CONSTRUCTION DETAILS

- 3603.1 Maintaining Traffic:
- 3603.2 Public traffic shall be permitted to pass through the work underway at all times, under the specific control of the Contractor. The Contractor shall perform traffic Control and payment for this work as such shall be considered included in the unit bid prices for the various contract items of work and no further allowances shall be made therefore. The Contractor is hereby notified that all lights, barricades, flagmen, or other devices necessary to provide for public safety and convenience, shall be furnished by and maintained at the Contractors expense. Whenever the Contractor’s operation creates a condition potentially hazardous to traffic or to the public, the contractor shall take the necessary precautions and provide adequate protection for those who must pass through the work area. If the Contractor should appear to be neglectful or negligent in providing such warning or protective measures, the Engineer may direct attention to the existence of a hazard, and any barricades, signs, lights, flagman, or other devices required to protect the public shall be installed by the Contractor and the entire cost of such protective measures will be considered as being included in the price paid for various contract items of work, and no additional allowance will be made therefore.

The Engineer may point out the inadequacy of protective devices or measures, but such action on the part of the Engineer shall not relieve the Contractor from responsi-

bility for public safety or abolish the Contractor's obligation to furnish and pay for these devices.

3603.3 Materials:

3603.4 Attention is directed to Section 8 "**Control of Materials,**" of the Standard Specifications.

3603.5 Paint

3603.6 All Paint used to perform the work specified within this contract, other than pre-mix paint, shall be low volatile organic compound (Low VOC <100) or water-base paint traffic line paint manufactured by Pervo Paint Company of Los Angeles, California, and identified by the following number codes:

CODE #PTWB-01 - WHITE, Waterborne Traffic Paint
CODE #PTWB-01 - YELLOW, L/F, Waterborne Traffic Paint
CODE #PTWB-01 - BLACK, Waterborne Traffic Paint

3603.7 Paint substitutions will be allowed if accompanied by a Certification of Compliance and the approval of the Engineer prior to the placement of striping.

3603.8 The paint shall be thinned as per manufacturer's recommendations.

3603.9 Glass Beads:

- A. Beads shall be Catophote Company Type 2 Moisture Proof safety marking spheres. The Engineer reserves the right to determine the suitability of the beads offered.
- B. Beads shall be clear, colorless and clean.
- C. Beads shall be completely lead free.
- D. Nominal sizes shall range from .033" to .007" in diameter.
- E. The spheres shall have an average index refraction not less than 1.50 or more than 1.60 when tested by the liquid immersion method at twenty-five degrees Celsius (25° C).
- F. A minimum of seventy-five percent (75%) (by weight) of the spheres shall be true spheres when tested in accordance with ASTM-0-115-53.
- G. Beads shall be stored in a dry enclosed area to prevent moisture absorption.
- H. Beads shall be applied uniformly at the rate of six pounds (6 lbs) of beads per gallon of paint, on a fifteenth hundredths of inch (0.015") wet thickness line or on every three hundred linear feet (300') of four-inch (4") line.

PAINTING EQUIPMENT:

- 3604.1 The paint striping machine used for the work shall be approved by the Engineer and shall meet or exceed following specifications:
- A. The machine shall have a minimum wheelbase of one hundred thirty inch (130”).
 - B. The air compressor shall have a minimum capacity of one hundred fifty cubic feet (150cuft) per minute, or use airless equipment.
 - C. The machine shall be capable of three (3) spray gun applications consisting of one black and two yellow spray guns operating simultaneously or individually. The machine shall also be capable of painting a channelization line on one pass.
 - D. The paint machine shall have bead dispensers capable of uniformly applying beads immediately after application of the paint. Bead system must be pressurized to provide even flow of beads under all weather conditions.
 - E. The machine shall be equipped with an automatic on-off device to produce skip lines, with adjustment to match previous painting.
 - F. The machine shall be capable of installing shoulder lines.
 - G. The machine, with crew, organization and programming, shall be capable of producing not less than fifteen miles (15 miles) of acceptable work per hour when judged on average conditions, and the Engineer shall be the sole judge of such conditions.
 - H. The machine, when deemed necessary, shall be equipped with a thermostatically controlled heating device to maintain a paint tank temperature of not less than one hundred ten degrees (110°) Fahrenheit nor more than one hundred eighty degrees (180°) Fahrenheit.
 - I. The machine, when deemed necessary, shall be equipped with agitation devices in the paint containers.
 - J. Due to traffic conditions, night striping may be required, and as such, the striper and shadow vehicle, if necessary, must have proper and acceptable safety lighting as well as lighting to illuminate the work area.
 - K. The striping vehicle and shadow vehicle, when necessary, shall both be equipped with a lighted flashing arrow board to be used when working either daytime or night-time. The arrow board shall be mounted securely and be of sufficient size to clearly display the message a distance of three hundred feet (300') to approaching motorists.

PAINT APPLICATION

- 3605.1 Paint and beads shall be applied at the following rates and in conformance with the following requirements:
- A. All striping shall be four inches (4") in width, unless otherwise required by the Engineer.
 - B. All broken stripe shall have a pattern of seven feet (7'), seventeen feet (17'), seven feet (7'), in which the seven-foot (7') sections are painted and the seventeen-foot (17') sections are unpainted.
 - C. The rate of application of paint and beads:
 - 1. Broken single stripe: seven to nine gallons per mile (7 to 9).
 - 2. Solid single stripe sixteen to eighteen gallons per mile (16 to 18).
 - 3. Six pounds (6lbs) of beads per gallon of paint.
 - 4. The Engineer reserves to right to request the highest limit where conditions so warrant.
 - D. Completed traffic stripes shall have clean and well-defined edges, shall be uniform, shall be straight on tangent alignment, and shall be on a true arc on curved alignments. The widths of completed traffic stripes shall not deviate more than one-quarter inch (1/4") on tangent nor more than two inches (2") on curves from the widths shown on the plans. Broken traffic stripes shall also conform to the following requirements:
 - 1. The lengths of the gaps and individual stripes that form broken traffic stripes shall not deviate more than two inches (2") from the lengths as specified above.
 - 2. The length of the gaps and individual stripes shall be of such uniformity throughout the entire length of each broken traffic stripe that a normal striping machine will be able to repeat the pattern and superimpose additional coats of paint upon the traffic stripe being painted.
 - a. The finished product shall have an opaque, well painted appearance with no black or other discolorations showing through.
 - b. Drips, over-spray, improper markings, and paint tracked by traffic shall be immediately removed from the pavement surface by an approved method. All such removal work shall be at the Contractors expense.

- c. The Contractor shall take all reasonable precaution to protect the paint during drying time and may be required to remove all objectionable tracking.
- d. Double yellow centerlines shall be two solid four inch (4") yellow lines separated by a solid three inch (3") black line.
- e. Traffic stripes and pavement markings shall be applied only on dry surfaces and only during periods of favorable weather. Painting shall not be performed when the atmospheric temperature is below forty degrees (40°) Fahrenheit; or when freshly painted surfaces may become damaged by rain, fog, or condensation; or when it can be anticipated that the atmospheric temperature will drop below forty degrees (40°) Fahrenheit, during the drying period. No work shall be done when fog restricts visibility to less than one mile.
- f. Surfaces, which are to receive traffic stripes and pavement markings, shall be cleaned of all dirt and loose material.

CONFLICTS

- 3606.1 Spotting and Alignment:
- 3606.2 Traffic stripes shall be painted to the lines established by the Engineer and will consist of existing stripes of control points spaced at two hundred feet (200') on tangents and fifty feet (50') on curves. All work necessary to establish satisfactory lines for stripes, when required, shall be performed by the Contractor at Contractor's expense.
- 3606.3 Correction of minor irregularities shall be accomplished by the application of cat tracks or dribble lines, the use of laser guidance devices, or by a combination of these techniques.
- 3606.4 Cat tracking shall consist of stretching a rope on a straight line between control points on tangent alignment and on a true arc through control points on curved alignment and placing spots of paint along the rope. The spots shall be not more than three inches (3") in width and not more than five feet (5') apart on curves or ten feet (10') apart on tangents.
- 3606.5 Dribble lines shall consist of making the pavement with a thin line of paint using a striping machine or other suitable device. Dribble lines shall be on a straight line between control points on tangent alignments and on a true arc through control points on curved alignments.
- 3606.6 Paint for cat tracks and dribble lines shall be the same color as the traffic stripe for which they are placed.

- 3606.7 Abrupt breaks in alignment between broken segments will not be permitted.
- 3606.8 The Engineer shall be the sole judge of the accuracy and acceptability of the alignment of work by Contractor.

TRAFFIC LINE PAINT REMOVAL

- 3607.1 Removal shall be accomplished by a grinding method acceptable to the Engineer. Wet or dry sandblasting shall not be an acceptable alternative.

CHANGE IN WORK

- 3608.1 The Engineer shall inspect completed lines as conditions may require and shall inform the Contractor of any faulty methods or unsatisfactory results.
- 3608.2 Lines considered unsatisfactory shall be repainted and reflectorized at the Contractor's expense and the Engineer shall be the sole judge as to the acceptability of the completed line work.

PAYMENT

- 3609.1 All striping shall include the installation of markers and markings as per the Traffic Manual and as directed by the Engineer. Other units for which payment is to be made shall be measured in accordance with the units designated in the request for bids.
- 3609.2 The contract unit prices for the various items of work, as provided heretofore, shall be considered as full compensation for furnishing all tools, equipment, materials, installation of markers, and labor for performing the work, as herein specified and additional compensation shall be made therefor.
- 3609.3 Any partial payments made to the Contractor by the City shall not relieve the Contractor of any of Contractor's guarantee or responsibilities under this contract.