

**CITY AND COUNTY OF DENVER  
DEPARTMENT OF PUBLIC WORKS  
Engineering Division**

**2011 Specifications**

The 2011 Standard Specifications for Road and Bridge Construction by the Colorado Department of Transportation controls construction of this project. The following special provisions supplement or modify the Standard Specifications and take precedence over the Standard Specifications and plans. When specifications or special provisions contain both English units and SI units, the English units apply and are the specification requirement.

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**REVISION OF SECTION 627  
PAVEMENT MARKING**

Section 627 of the Standard Specifications is revised as follows:

Subsection 627.03 is revised as follows:

All multi-lane roadways, arterial roadways and major collectors must be striped at the end of the day with full compliance pavement markings. Paint may be used for temporary markings.

All other roadways must be tabbed at minimum, at the end of each day with a minimum of 8" tabs for lane lines and center lines.

Layouts for striping should match existing conditions and roadway striping must be confirmed with Traffic Engineering Services prior to installation of final striping.

Final striping must be installed within 5 days from completion of the paving.

Subsection 627.13 is revised as follows:

The materials and installation of pavement markings shall be price reduced for failure to install within 10 days upon receipt of written request from Traffic Engineering Services or the Engineer/Project Manager or upon the task order completion deadline.

	> 10 days and < 30 days after	≥ 30 days and < 60 days after	≥ 60 days and < 90 days after	≥ 90 days
% Price Reduction	10 %	25 %	50 %	75 %

Delete the third paragraph of 627.13 and replace with the following:

Sandblasting will not be measured and paid for separately but shall be included in the work.

**REVISION OF SECTIONS 627 AND 713  
PREFORMED PLASTIC PAVEMENT MARKING (TYPE 1)**

Sections 627 and 713 of the Standard Specifications are hereby revised for this project as follows:

Subsection 627.08 shall include the following:

The preformed plastic pavement marking shall be Type I, Type II, or Type III as shown on the plans.

Prior to beginning installation operations, the Contractor shall submit to the Engineer instructions from the preformed plastic pavement manufacturer detailing surface preparation, grooving requirements and material application. The instructions shall include the following:

- (1) Equipment Requirements
- (2) Approved Work Methods and Procedures
- (3) Material Application Temperature Requirements
- (4) Ambient Air and Surface temperature Requirements
- (5) Weather Limitations
- (6) Special Precautions
- (7) Any other requirements necessary for successful installation and satisfactory performance of the material.

The Contractor shall secure from the manufacturer all warranties and guarantees with respect to materials, workmanship, performance, or combination thereof, and shall include these warranties and guarantees with the Certification of Compliance.

Materials supplied without installation instructions or with incomplete instructions will not be accepted for use.

Unless otherwise shown on the plans, typical pavement markings shall conform to the shapes and sizes as shown on Standard Plan S-627-1.

The Contractor shall make all arrangements to have a manufacturer-trained installer of the manufacturer's products on-site during the placement of preformed plastic pavement marking to ensure proper installation. A minimum of two weeks prior to the placement of the preformed plastic pavement marking, the Contractor shall submit written documentation of the installer's qualifications and training in the installation of preformed plastic pavement marking. Upon completion of the work, the Contractor shall obtain and submit to the Engineer written documentation from the manufacturer-trained installer certifying that the product was installed in full compliance with this specification and manufacturer's recommendations.

The preformed plastic pavement marking shall be inlaid or placed on new and existing pavements as shown in the Contract. The material shall be capable of use for patching worn areas of the same type according to the manufacturer's recommendations.

The preformed plastic pavement marking shall conform to pavement contours by the action of traffic, and shall be capable of application on new, dense, and open graded asphalt wearing courses during the paving operations according to the manufacturer's recommendations. After application, the markings shall be immediately ready for traffic.

- (a) *Inlaid Preformed Plastic Pavement Marking.* The grooved width for inlaid preformed plastic pavement marking is called for in the Contract, grooved width shall be the pavement marking width plus 1 inch, with a tolerance of  $\pm \frac{1}{4}$  inch. The depth of the grooves shall be 120 mils  $\pm$  10 mils. Groove position shall be a minimum of 2 inches from the edge of the pavement marking to the longitudinal pavement joint.

The bottom of the groove shall have a smooth, flat finished surface. The spacers between blade cuts shall be such that there will be less than a 10 mil rise in the finished groove between the blades.

Grooves shall be clean, dry and free of laitance, oil, dirt, grease, paint or other foreign contaminants. The Contractor shall prevent traffic from traversing the grooves, and re-clean grooves, as necessary, prior to application of the preformed plastic pavement markings.

October 13, 2005

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REVISION OF SECTIONS 627 AND 713  
PREFORMED PLASTIC PAVEMENT MARKING

Subsection 627.13 shall include the following:

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Preformed Plastic Pavement Marking (Type I) (Inlaid)	Square Foot
Preformed Plastic Pavement Marking (Type II) (Inlaid)	Square Foot

All costs associated with having the manufacturer-trained installer on-site and providing the documentation will not be measured and paid for separately, but shall be included in the work.

Delete subsection 713.13 and replace with the following:

**713.13 Preformed Plastic Material.** Preformed plastic pavement marking material shall conform to ASTM D 4505 for one of the following requirements:

- (1) Class 1 tape will not be permitted.
- (2) Class 2: for lane lines, crosswalks, stop lines and edge lines
- (3) Class 3: for legends and symbols

Preformed plastic pavement marking color shall conform to the requirements of ASTM D 6628.

Preformed plastic pavement markings shall meet the dimensional requirements of ASTM D 4505.

Skid resistance will not be considered a factor for acceptance.

The edges of the performed plastic pavement marking shall be straight and uniform, and consistently adhere to the pavement.

Unless otherwise stated in the Contract, preformed plastic pavement marking shall conform to the following material requirements for the Type shown on the plans:

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 REVISION OF SECTIONS 627 AND 713  
 PREFORMED PLASTIC PAVEMENT MARKING

Property	Type I	Type II <sup>‡</sup>	Type III
Minimum thickness (mils)	75	75	60
Minimum Width (in)	4	7	4
Initial Retroreflectivity	Retroreflectivity level I in accordance to ASTM D 4505	Retroreflectivity level I in accordance to ASTM D 4505	Retroreflectivity level II in accordance to ASTM D 4505
Adhesion (°F)*	Roadway surface temperature range of 50 °F - 115 °F** in accordance with ASTM Test Method 1000	Roadway surface temperature range of 50 °F - 115 °F** in accordance with ASTM Test Method 1000	Roadway surface temperature range of 50 °F - 115 °F in accordance with ASTM Test Method 1000
Beads	Ceramic or combination of glass and ceramic	Ceramic or combination of glass and ceramic	Glass
Minimum refractive index	1.7	1.7	1.5
Surface pattern	Minimum of 31 mils and in accordance with ASTM D 4505	Minimum of 31 mils and in accordance with ASTM D 4505	N/A

\* The adhesion temperature is identical to both the application and test temperatures.  
 \*\*Application at a lower temperature may be permitted as approved by the Engineer.  
 ‡ Contrast pavement marking to be used for skip lines, lane lines and gore markings.

## PAVEMENT MARKING WITH WATERBORNE PAINT

Sections 627 and 708 of the Standard Specifications are hereby revised for this project as follows:

Delete subsection 627.04 and replace with the following:

**627.04 Pavement Marking with Waterborne Base Paint.** Striping shall be applied when the air and pavement temperatures are no less than 52 °F for waterborne paint. The pavement surface shall be dry and clean. Surface cleaning shall be required when there is deicing material on the road. Weather conditions shall be conducive to satisfactory results.

The Contractor shall utilize equipment that meets the following requirements, as approved:

- (1) Equipment shall permit traffic to pass safely within the limits of the roadway surface and shoulder while operating.
- (2) Equipment shall be designed for placement of both solid and broken line stripes with a reasonably clean-edged stripe of the width and location as shown on the contract.
- (3) Equipment shall have a glass bead dispenser directly behind, synchronized with the paint applicator. Each applicator shall have individual control and automatic skip control that will paint a strip with a gap as shown in the contract.
- (4) The equipment may be equipped with a heat exchanger to heat the paint to reduce drying time.
- (5) The operation shall include a trailing vehicle equipped with a flashing arrow board.

The Contractor shall prevent traffic from crossing a wet stripe. Stripes which have been marred or picked up by traffic before they have dried shall be repaired at the Contractor's expense. Removal of paint from vehicles that crossed wet paint shall be at the Contractor's expense.

The water-based paint and stripes shall fall within the following minimum and maximum ranges:

	DESCRIPTION	MINIMUM	MAXIMUM
Alignment	Lateral Deviation	N/A	2.0 inch per 200 ft
Paint	Coverage rate per gallon of paint	100 sq. ft	110 sq. ft
	Thickness	20 mil	N/A
	Width of painted lines	4 inch	N/A
	Width Variance	N/A	1/4 inch
Water-Based Paint	Dry time to no tracking conditions	N/A	60 seconds
Beads	Application rate per gallon of paint	5 lbs 3 oz	6 lbs 3 oz

**REVISION OF SECTIONS 627 AND 708  
PAVEMENT MARKING WITH WATERBORNE PAINT**

*Subsection 627.13 shall include the following:*

<b>Pay Item</b>	<b>Pay Unit</b>
Pavement Marking Paint (Waterborne)	Gallon
Pavement Marking Paint (Low VOC Solvent Base)	Gallon

Delete subsection 708.01 and replace with the following:

**708.01 General.** This specification covers ready-mixed paints and coatings. Paints and coatings shall be manufactured eight weeks or less prior to delivery to the project. Each paint container shall be labeled with the name and address of the manufacturer, trade name or trademark, type of paint, number of gallons, batch number, and date of manufacture.

Paints shall be free of foreign material that is capable of clogging screens, valves, pumps, and other parts of the application equipment. Paint shall not contain the following:

- (1) Benzene
- (2) Chlorinated solvents
- (3) Ethylene glycol ethers
- (4) Ethylene glycol acetates
- (5) Lead
- (6) Mercury
- (7) Chromium
- (8) Cadmium
- (9) Petroleum products

The Contractor shall obtain certification in writing from the manufacturer showing that the product is free of the materials described above and that it meets or exceeds the requirements of 29 CFR 1910.1200.

Paints shall not form a surface skin within 48 hours in three-quarter filled, tightly closed containers. Paint and coating pigments shall be lead free, and shall not thicken, become granular, or curdle in their containers.

Delete subsection 708.05 and replace with the following:

**708.05 Pavement Marking Materials.** Pavement marking materials shall be selected from the Department's Approved Products List (APL). Prior to start of work, a Certified Test Report (CTR) for all pavement marking materials shall be submitted in accordance with subsection 106.13.

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**REVISION OF SECTIONS 627 AND 708  
PAVEMENT MARKING WITH WATERBORNE PAINT**

For white paint, the color after drying shall be a flat-white, free from tint, and shall provide the maximum amount of opacity and visibility under both daylight and artificial light. For yellow paint, the Federal Standard 595B shall be used to designate colors and the ASTM E308 shall be used to quantitatively define colors. After drying, the yellow paint shall visually match Federal Standard 595B color chip number 33538, and shall be within 6 percent of central color, PR-1 Chart, where  $x = 0.5007$  and  $y = 0.4555$  (The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 Standard Colorimetric System measured with Standard Illuminant D65.)

- (a) *Acrylic Waterborne Paint.* Acrylic waterborne paint shall be a lead-free, 100 percent Acrylic resin polymer waterborne product. The finished product shall maintain its consistency during application at temperatures compatible with conventional equipment.

Waterborne paint shall meet all of the following requirements:

**Performance Requirements:** The paint shall be water resistant and shall show no softening, blistering or loss in gloss.

**REVISION OF SECTIONS 627 AND 708  
PAVEMENT MARKING WITH WATERBORNE PAINT  
ACRYLIC WATERBORNE PAINT**

<b>Property</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Test Method</b>
Nonvolatile portion of vehicle (white and yellow), %	42.5		
<b>Pigment Composition</b>			
(white and yellow), % by weight	58.0	62.0	ASTM D 4451 ASTM D 3723
White Paint			
Titanium Dioxide		10.0%; 1.0 lb/gal	ASTM D 476, Type III
Calcium Carbonate, %		92.0	ASTM D 1199, Type GC-II
Yellow Paint			
Titanium Dioxide		5.0%; 0.2 lb/gal	ASTM D 476, Type III
Calcium Carbonate		93.0	ASTM D 1199, Type GC-II
Organic Yellow Pigments, %	5.0		
Yellow Iron Oxide		0.063%; 0.025 lb/gal	ASTM D 768
<b>Vehicle Composition, 100% acrylic polymers, (white and yellow), %</b>		43.0	FTMS 141C - Method 4031 or Method 4053.1
<b>Properties of the Finished Paint</b>			
Total Non-volatiles, (solids) % by weight			
White Paint, %	77.0		FTMS 141C - Method 4053.1,
Yellow Paint, %	76.0		ASTM D 2369, or ASTM D 4758
Density, lbs/gal <sup>1</sup>			
White and Yellow Paint	14.0		ASTM D 1475 using U.S. Standard weight per gallon cup as defined in U.S. Military Standard 4566A
Consistency (Viscosity) White and Yellow, Krebs- Stormer Units	85	95	ASTM D 562
Freeze Thaw Stability	Shall complete 5 or more test cycles successfully		ASTM D 2243
Fineness of Grind, Visual Standard Rating B	3		ASTM D 1210
Hydrogen ion content: pH	9.6		ASTM E 70
Directional Reflectance: [15 mil Wet Film]			ASTM E 1347
White, dried	85		
Yellow, dried	50		
Dry Opacity (Contrast Ratio): [15 mil Wet Film]			ASTM D 2805
White Paint	0.95		
Yellow Paint	0.88		

<sup>1</sup>Density shall not vary more than 0.3 lbs/gal between batches

## **PREFORMED THERMOPLASTIC PAVEMENT MARKING**

**SECTION 627.09** Preformed Thermoplastic Pavement Marking. The markings shall consist of a resilient white or yellow thermoplastic product with glass beads uniformly distributed throughout the entire cross sectional area. Legends and symbols shall be capable of being affixed to bituminous pavements by heating.

The markings shall conform to pavement contours, breaks and faults through the action of traffic at normal pavement temperatures. The material shall have resealing characteristics with the capability of fusing with itself and previously applied thermoplastic markings under normal use.

The preformed thermoplastic markings shall be packaged in a protective plastic film with cardboard stiffeners where necessary to prevent damage in transit. The carton in which the material is packed shall be clearly labeled for ease of identification.

- (a) Application. Application temperature shall be as recommended by the manufacturer. The pavement and air temperature shall be as recommended by the manufacturer at the time of application. The material shall be applied using a heating method recommended by the manufacturer. The contractor shall provide the Engineer a copy of the manufacturer's installation recommendations prior to beginning work. The pavement shall be clean dry and free from debris. The preformed thermoplastic markings may be installed on top of existing thermoplastic markings after all loose material has been removed. The preformed thermoplastic markings shall not be installed on top of existing preformed plastic pavement markings without first removing the existing markings to a depth that insures removal of the adhesive backing of the preformed plastic. It shall not be installed on top of pavement marking paint without first removing paint.

### **SECTION 713.14 Preformed Thermoplastic Material**

(a) General. Preformed thermoplastic markings shall be composed of aggregates, pigments, binders and Glass beads, and shall conform to AASHTO designation M 249 with the exception of the relevant differences due to the fact that the material is supplied in a preformed state. The material shall be either alkyd or hydrocarbon based. Only preformed thermoplastic pavement markings material listed on the Departments approved products list may be used.

(b) Physical Requirements.

- 1) Graded Glass Beads. The material shall contain a minimum of 30 percent graded glass beads by weight. The beads shall be clear and transparent. Twenty percent or less shall consist of irregular, fused spheroids, or silica. The refractive index shall be at least 1.50.
- 2) Pigments. White – Sufficient titanium dioxide pigment shall be used to insure a color similar to Federal Highway White, Color Number 17886, conforming to Federal Standard 595. Yellow – Sufficient yellow pigment shall be used to insure a color similar to Federal Highway Yellow, Color Number 13655, conforming to Federal Standard 595. The yellow pigment shall be organic and contain no lead chromate.
- 3) Skid Resistance. The surface of the preformed thermoplastic markings shall provide a minimum resistance value of 45 BPN when tested according to ASTM E 303. Thickness. The material shall be supplied at a minimum thickness of 90 mils.
- 4) Environmental Resistance. The preformed thermoplastic material shall be resistant to deterioration due to exposure to sunlight, water, oil, gasoline, salt and adverse weather conditions.

5) Application. The top surface material must have regularly-spaced indents which provide a visual cue during application that the material has reached a molten state indicating satisfactory adhesion and proper bead embedment has been achieved. Installation must be a no preheated of surface material.

6) Concrete surface adhesive. When Preformed Thermoplastic material is installed on concrete surfaces the use of the materials manufacturer recommended sealer for concrete application will be used by the installer to ensure the best application on concrete surfaces.

**Subsection 627.13 shall include the following:**

**Payment will be made under:**

**Pay Item**

**Pay Unit**

Preformed Thermoplastic Material (Word - Symbol)	Square
Foot	
Preformed Thermoplastic Material (X-Walk – Stop Line)	Square
Foot	
Preformed Thermoplastic Material (long-line – dashes)	Square
Foot	



REVISION OF SECTION 630  
CONSTRUCTION ZONE TRAFFIC CONTROL

Section 630 of the Standard Specifications is hereby revised as follows:

Subsection 630.01 shall be revised to include the following:

**The Contractor shall submit, in writing, the proposed Method of Handling Traffic (MHT) for review and approval of the Project Engineer. The MHT shall be developed according to this section and the construction plans.**

Subsection 630.05 TRAFFIC CONES shall include the following:

**Steel drum channelizing devices shall not be used for traffic control**

Subsection 630.06 shall be modified to include the following:

**Non-metallic drums or tubular markers may be substituted for vertical panel channelizing devices.**

Subsection 630.08 shall be modified to include the following:

**The flagger's STOP/SLOW sign paddle shall be 18 inches with letters six inches high.**

Equipment

**The Contractor shall not have construction equipment or materials in the lanes open to traffic any time, unless approved by the Project Engineer.**

**The Contractor and subcontractors shall equip their construction vehicles with flashing amber lights. Flashing amber lights on vehicles and equipment shall be visible from all directions.**

**All personal / employee vehicle and construction equipment parking is prohibited when it conflicts with safety, access, or the flow of traffic.**

REVISION OF SECTION 630  
CONSTRUCTION ZONE TRAFFIC CONTROL

Devices:

**The Contractor shall install construction traffic control devices in locations where they do not block or impede other existing traffic control devices, or sidewalks for pedestrians, disabled persons, or bicyclists.**

**Steel drum channelizing devices shall not be used for traffic control.**

Subsection 630.09, second paragraph is hereby deleted and replaced with the following:

**When a different MHT is required for a subsequent construction phase, it must be submitted at least two weeks prior to starting that phase. All proposed methods of handling traffic shall be approved, in writing, by the Project Engineer following approval of the Traffic Engineering Services Department.**

**Approval of the proposed MHT does not relieve the Contractor of liability specifically assigned to him under the contract. The Contractor shall erect and maintain warning lights, signs, barricades, and sufficient safeguards around all excavations, embankments, and obstructions.**

**The contractor shall notify the Project Engineer by Thursday at 3:00 P.M. which streets they intend to work on the following week. This notification will be made for all phases of construction.**

*Subsection 630.09 (4) shall be revised to include the following:*

Access to driveways shall be maintained at all times during construction. The Contractor shall coordinate driveway work with the property owner. Appropriate signage shall be provided alerting all motorists leaving driveways that enter a work zone as to which direction the through lane is traveling and what access restrictions exist, if any.

Subsection 630.09 (9) shall be added as follows:

**Number of hours for uniformed traffic control shall be tabulated for submittal.**

REVISION OF SECTION 630  
CONSTRUCTION ZONE TRAFFIC CONTROL

Subsection 630.09 (10) shall be added as follows:

General Work Restrictions

**The Contractor shall perform all the work on the roadway between the hours of 8:30 A.M. and 3:30 P.M. or as approved by the Project Engineer. Weekend and nighttime work will be allowed with the prior written approval of the Project Engineer.**

**Work will not be permitted that directly or indirectly interferes with the flow of traffic between the hours of 5:30 AM and 8:30 AM Monday through Friday; between the hours of 3:00 PM to 6:30 PM Monday through Thursday; and after 2:00 PM on Fridays unless otherwise authorized by the Project Engineer.**

**Work that interferes with traffic 1] on any day of a 3 or 4 day holiday weekend; or 2] after 12:00 noon on the day preceding such holiday weekend, will only be permitted following review of a Contractor submitted request and approval by the Project Engineer and the City of Denver Traffic Engineering Services Department:**

**The Contractor shall coordinate all of the work on the roadway during any special event with the City and County of Denver.**

Subsection 630.09 (10) shall be added as follows:

**Two-way traffic shall be maintained on all two-way streets, via flagging if necessary for closures of less than one day unless authorized by the Project Engineer and the Traffic Engineering Services Department. One lane, one-way traffic shall be maintained at all times on one-way streets outside of the Central Business District and two lanes, one-way traffic shall be maintained at all times within the Central Business District.**

**Contractor shall obtain all required access and construction permits from the City & County of Denver prior to initiating work along City right of way.**

REVISION OF SECTION 630  
CONSTRUCTION ZONE TRAFFIC CONTROL

**The Contractor shall maintain access to all roadways, side streets, walkways, alleyways, driveways, and hike/bike paths at all times unless otherwise approved by the Project Engineer. The sole exception to this requirement is that the City will permit full closures of access to all alleyways, walkways, driveways, and hike/bike paths DIRECTLY ADJACENT to an active work Phase for a maximum period of one (1) week. Should the Contractor wish to exercise this exception, a request for same shall be submitted to the Project Engineer for review and approval including proposed method for Public notice per Section 632. If access restrictions are approved by the Project Engineer, the Contractor shall coordinate with all tenants affected by alley and/or access closures two weeks prior to closure.**

**All proposed lane closures shall be subject to the approval of the Project Engineer and Traffic Engineering Services Department. Requests for such lane closures shall be submitted with a Method of Handling Traffic at least 24 hours in advance of the time the lane closure is to be implemented. Lane closures will not be allowed to remain unless utilized in continuum for the duration of each working period. Contractor shall make all efforts to fashion the lane closure proposal to close no more than one lane at a given time.**

**Prior to any removal or pavement marking operations directly adjacent to parking, temporary NO PARKING ANYTIME, TOW AWAY ZONES, with the date and time of the proposed work must be posted a minimum of 24 hours in advance of the work. For locations where parking meters are located adjacent to the proposed work zone all impacted parking meters must be red bagged prior to commencement of work.**

**The Contractor will be responsible to determine the meter numbers and dates for all proposed work at these locations and will need to provide this information with the street occupancy permit request for the work. This request should be submitted at least 5 days in advance of the proposed start of work. Parking may only be restricted on one side of the street at a time and the length of the restriction should not create a significant impact to the local residents or businesses in the area.**

**All lane closures require an arrow board to be installed.**

Subsection 630.14 is hereby deleted and replaced with the following:

**The Contractor shall furnish all personnel and materials necessary to perform the Construction Zone Traffic Control as required and these quantities will not be measured.**

**Temporary pavement markings for traffic control will not be measured and paid for separately, but shall be included in the work.**

Subsection 630.15 is hereby deleted and replaced with the following:

**Payment for Construction Zone Traffic Control shall be included in the cost of the work and will not be paid for separately. Construction Zone Traffic Control shall include all devices; a Traffic Control Management, Variable Message Signs as specified, arrow boards, detours, addition and/or adjustments to traffic signal heads as needed to support phased construction traffic control, temporary pavement markings, and all other personnel and resources necessary to complete the work.**

**Payment for Construction Zone Traffic Control will be made for:**

- 1. Projects that Reconfigure Roadways from current design**
- 2. Installation of Bike Lanes, where temporary parking restriction signs Will need to be placed.**

**The traffic control devices that will be paid for will be limited to the devices/Items that are on the Bid Tabulation Sheet. They are:**

- 1. Traffic Control Management ( L.S.)**
- 2. 36" Traffic Cones (each )**
- 3. Construction Zone Signs (each )**
- 4. Type I barricade ( each )**
- 5. Type III barricade (each )**
- 6. Portable Message Boards (each )**
- 7. Arrow Boards (each )**
- 8. No Parking Signs (each )**

**Payment for Uniformed Traffic Control will be made based on the number of hours, approved in advance by the Project Engineer, that Uniformed Traffic Control is utilized to control and direct traffic through the construction zone.**

