ARTICLE 8

PAVEMENT

8.1 ASPHALT PAVEMENT

8.1.1 DESCRIPTION

Asphalt concrete pavement shall consist of asphalt cement uniformly mixed with well-graded aggregate and laid upon a prepared surface, along the lines and to the thickness as shown on the approved plans.

8.1.2 SUBMITTALS

Asphalt suppliers furnishing asphalt for placement within any City right-of-way shall provide to the City, once every two years, asphalt mix designs for asphalt intended for use within the City right-of-way.

8.1.3 MATERIALS

8.1.3.1 Asphalt Cement

Asphalt cement for the pavement mixture shall be PG 58-28 (residential streets) or PG 64-22 (arterial, collector, and industrial streets) unless otherwise specified in Article 2 - Special Provisions and shall conform to the requirements of Table 2 of AASHTO M-226 (latest revision). The asphalt cement shall be homogeneous, free from water, and show no tendency to foam when heated to 347°F. The spot test shall be negative for all grades when conducted with a napthaxylene solvent containing not more than 10% xylene by volume.

Asphalt cement shall not be heated during the process of its manufacture, storage or during construction, to a temperature so as to cause the formation of carbonized particles. At no time shall the temperature of the asphalt cement be raised above 375°F after loading in a tank for transportation from the refinery to the purchaser.

Written Certification of Compliance with these specifications shall be provided to the City Engineer. The City Engineer may, in the absence of written certification, require that samples of the asphalt cement be delivered to an approved testing laboratory to ensure compliance with these specifications. Costs for testing shall be paid for by the Contractor/Developer.

8.1.3.2 Aggregate

The coarse and fine aggregates for hot bituminous pavement mixtures shall be graded and combined in such proportions that the resulting composite blend meets the grading requirements of the job mix formula. The job mix formula, with the aggregate tolerances, shall be within the master range set forth in the following table:

Table 8.1. Percent by weight passing square mesh sieves

Sieve Size	Grading SF	Grading ST	Grading SX	Grading S
1 1/2″				
1″				100
3/4″			100	90-100
1/2″		100	90-100	*
3/8″	100	90-100	*	*
No. 4	90-100	*	*	*
No. 8	*	28-58	28-58	23-49
No. 16	30-54			
No. 30	*	*	*	*
No. 200	2-12	2-10	2-10	2-8

Grading of the aggregate shall be Grading SX unless otherwise approved by the City Engineer.

Coarse aggregate (material retained on the No. 8 sieve) shall have a "Los Angeles Abrasion Test" (AASHTO T-96) percentage of wear not exceeding 45%. Fine aggregate (material passing the No. 8 sieve) shall have a maximum of 12% at five cycles in the sodium sulfate solution by the “Soundness Aggregate Test (AASHTO T-104). The aggregate shall be free from clay balls, organic matter, or other deleterious substances. At least 60% of the aggregate retained on the No. 4 sieve, and larger, shall have at least two fractured faces.

8.1.3.3 Asphalt-Aggregate Mixture (Job Mix Formula)

The Contractor/Developer shall furnish to the City Engineer, a mix design from an approved independent testing laboratory, of the hot bituminous pavement proposed for use. This job mix formula shall establish a single percentage of aggregate passing each required sieve size, a single percentage of bituminous material to be added to the aggregate, and a single temperature for the mixture at the discharge point at the plant. The job mix formula shall also give recommended temperatures for delivery and compaction. The job mix formula shall be determined a minimum of once per year, or when the asphalt supplier or aggregate characteristics change. **After the job mix formula has been established, all mixtures furnished for respective projects shall conform thereto within the following range of tolerances:**

Table 8.2. Percent by weight passing square mesh sieves

Maximum Size	± 0%
Passing No. 8 and larger sieves	± 8%
No. 8 to No. 200	± 6%
Passing No. 200	± 2%
Asphalt Content	± 0.5%
Discharge Mix Temperature	± 20°F

The job-mix formula may be changed by the City Engineer for either of the following reasons:

(a) Change in the job-mix formula will produce material of equal or better quality and will provide for more efficient pit operations.

(b) Change in the job-mix formula will produce material of equal or better quality and will result in a cost savings to the City through an adjustment in unit price.

Asphalt mix designs containing reclaimed asphalt pavement (RAP) materials greater than 20% will only be allowed with written approval from the City Engineer.

8.1.3.4 Quality Control

All samples and tests described herein shall be made in accordance with approved ASTM/AASHTO procedures. The Contractor/Developer shall provide for all testing laboratory services in connection with tests verifying conformance of proposed materials with project requirements. The City may also provide for testing laboratory services in connection with tests on materials after incorporation into the project.

Additional tests may be required at the direction of the Engineer. If additional tests are required, the financial burden will be borne by the contractor/developer if the testing results fail to meet minimum city specifications. If the testing results meet or exceed the city specifications the additional testing costs will be paid for by the requesting entity.

Table 8.3. Minimum Project Testing

Gradation	1/1,000 Tons or 1/project site
Asphalt Content	1/1,000 Tons or 1/project site
In-Place Density (including cores & comparative lab densities)	1/1,000 Tons or min. 1/500 L.F. of paving

8.1.4 MIXING PLANT

The requirements of this section shall be the same as Section 401.08 “Asphalt Mixing Plant” of the Standard Specifications for the Road and Bridge Construction, by the Colorado Department of Transportation, 1991 edition, or as amended. For plant inspection, the Engineer or approved laboratory shall have full right to enter at any time and conduct necessary tests to ensure compliance with these specifications.

8.1.5 CONSTRUCTION METHODS

8.1.5.1 Hauling Equipment

Trucks used for hauling the asphalt concrete mixture shall be equipped with tight, clean, smooth metal beds. When directed by the Engineer, the beds shall be coated with an oil or other approved material to prevent the mixture from adhering to the beds, also each load shall be covered with canvas or other suitable material of sufficient size to protect it from inclement weather conditions.

8.1.5.2 Paving Machines

Unless otherwise permitted by the Engineer, the mixture shall be spread by means of a self-propelled laydown machine equipped with a screed or strike-off assembly and capable of spreading and finishing the asphalt concrete mixture to the line, grade, and crown as shown on the plans.

The paver shall be equipped with a receiving hopper having sufficient capacity for a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed. The mixture shall be dumped in the center of the hoppers, and care exercised to avoid overloading and spilling over of the mixture onto the base.

The screed or strike-off assembly shall effectively produce finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture.

When laying mixtures, the paver shall be capable of being operated at the necessary forward speeds for satisfactory placement. The operation of the paver shall be such to attain continuous paving.

8.1.5.3 Rollers

Rollers shall be steel wheeled and/or pneumatic tire type and be in good condition, capable of reversing without backlash. They shall weigh not less than 8 tons. All rollers shall have a water system capable of keeping the wheels properly moistened to prevent adhesion of the mixture to the wheels.

8.1.5.4 Paving Surface

After the pavement base has been prepared, it shall be made ready for paving by clearing any loose material off as directed by the Engineer. Edges of all contact surfaces such as curb and gutter, manholes, cross pans and other structures shall be coated with the tack coat material as described herein before paving. When more than one lift is required, a tack coat shall be used between courses of pavement in accordance with Section 8.2 of these specifications at the rate, or as directed by the Engineer.

Asphalt pavement shall be a minimum of 2″ compacted thickness and shall be laid in one lift. If a thickness greater than 3″ is specified, separate courses shall be laid; each course shall be not less than 1-1/2″ compacted thickness, nor greater than 3″ compacted thickness or three times the nominal aggregate size.

For overlays the material shall be placed in a maximum compacted thickness of 3” and a minimum compacted thickness of twice the diameter of the aggregate unless otherwise directed by the Engineer.

8.1.5.5 Spreading, Finishing, and Compaction

The mixture shall be laid upon the approved base surface, spread, and struck off to the grade and elevation required. Pavers shall be used to distribute the mixture over the entire surface except where hand placing is necessary.

The longitudinal and transverse joints shall be made in a careful manner, well bonded and sealed. If directed, the joints shall be coated with tack coat material.

On the areas where the use of mechanical pavers cannot be used, the mixture shall be spread,

raked and luted by hand tools. When material is shoveled, it shall be deposited by turning the shovel over above the desired area. No "slinging" of the shovel will be permitted. The hand placed material shall be smoothed and left higher than the machine laid material by about 1/4″ per inch of depth prior to rolling. If the machine laid mixture has been rolled, then the hand laid mixture shall be smoothed and left higher than the rolled pavement by about 1/4″ per inch depth. The majority of the raker's work shall be done with a lute rather than a tined rake.

Segregation of materials shall not be permitted. If segregation occurs, the spreading operation shall be immediately suspended until the cause is determined and corrected.

Placing the mixture shall be as continuous as possible. All surface irregularities shall be adjusted by the addition or removal of mixture prior to rolling. After the mixture has been spread, struck off and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling.

The surface shall be rolled at a specified breakdown temperature which shall be determined by the Contractor's foreman and the Engineer at the beginning of the job. The breakdown temperature shall be such that the required density is obtained without displacement, cracking, or shoving of the mixture. The rollers shall operate at a speed slow enough to avoid displacements or "crawl" of the mixture. Any displacement shall be immediately corrected by means suitable to the Engineer.

The number, weight, and type of rollers furnished shall be sufficient to obtain the required compaction while the mixture is in a workable condition. The minimum number of rollers shall be two. Heavy equipment or rollers shall not be allowed to stand on freshly placed pavement.

Unless otherwise directed, rolling shall begin at the sides and proceed longitudinally parallel to the street centerline, each pass overlapping one-half the roller width, gradually progressing to the crown of the street. When paving adjacent to a previously placed lane, the longitudinal joint shall be rolled first followed by the regular rolling procedure.

Rolling shall be continued until all roller marks are eliminated and no further compression is possible. The minimum density of the compacted mixture shall be 95% of the maximum density required to provide laboratory compacted specimen made in the same proportions as the job mix formula (AASHTO T-209). However, if in the opinion of the Engineer a 95% density would prove to be detrimental to the asphalt cement pavement, then a density of 93% will be allowed. Along forms, curbs, manholes, and other places not accessible to rollers, the mixture shall be thoroughly compacted with hand tampers or with mechanical tampers. The joints between these structures shall be effectively sealed.

Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective shall be removed and replaced with fresh hot mixture, which shall be compacted to conform with the surrounding area.

8.1.5.6 Asphalt Temperature

The minimum and maximum delivery and discharge temperatures of the asphalt to the jobsite shall comply with CDOT Section 401.15 “Mixing”.

8.1.5.7 Joints

Transverse joints shall be formed by cutting through the previously laid course to expose the full depth of the course. A coat of tack coat material shall be used on contact surfaces of all joints just before additional mixture is placed.

8.1.5.8 Weather Limitations

The placing and compacting of asphalt surfacing shall be performed only when weather conditions are suitable. Asphalt surfacing shall not be placed on surfaces which are damp or wet or when the temperature of the surface on which the asphalt pavement is to be placed is less than 40°F and the atmospheric temperature is less than 40°F. The temperature of the mixture delivered to the jobsite shall not be less than 235°F. When the atmospheric temperature is less than 50°F, all loads shall be delivered continuously in covered vehicles.

Table 8.4. Minimum Surface and Air Temperature

Compacted Layer Thickness	Minimum Surface and Air Temperature	
	Top Layer	Layers Below Top Layer
1-1/2″	60°F	50°F
2″ - <3″	50°F	40°F

8.1.5.9 Surface and Thickness Tolerances

The surface of the finished pavement shall be free from depressions exceeding 3/16″ in 10′, when tested with a straight-edge. All depressions exceeding the specified tolerances shall be corrected by removing defective work and replacing it with new material as directed. The surface shall be smooth and true to the established crown and grade. The required compacted thickness shall be as specified on the construction drawings.

8.1.6 RESTRICTION OF TRAFFIC

The Contractor shall arrange the work in such a manner as to cause a minimum of inconvenience to the traveling public and the abutting property owners. The Contractor shall submit to the Engineer a plan of this operation. In general, the Contractor shall be allowed to proceed as he proposes. However, the Engineer retains the authority to order the Contractor to schedule the proposed operation in another manner if such a change in schedule is to the benefit of the owner and beneficial to the interests of a good project. The Contractor shall arrange to have the haul vehicles operate over roads which will not be damaged by such vehicles. The Contractor shall provide all necessary Traffic Control in conformity with these provisions and specifications and with the ordinances and regulations of the City of Pueblo, MUTCD and ARTICLE 9 –Traffic Control; shall be paid for as specified in the contract documents.

8.1.7 PATCHING

For warranty work or patching repairs, the requirement is for the patching to be equal to the existing pavement thickness or Table 3-1 from the design criteria whichever is greater.

Remove the backfill material to the depth and extent required in accordance with drawings. Prepare the subsurface with the required base course, Flowfill, and/or Portland Cement concrete subsurface in accordance with the drawings. Depths and/or thickness of base course, Portland Cement concrete and/or asphalt pavement shall be as indicated on the drawings. The asphalt pavement shall conform to the *Pavement Design Criteria for the City of Pueblo* or equal to the existing pavement thickness, whichever is greater. The backfill and base coarse material shall be thoroughly compacted to the densities specified in ARTICLE 6 – Aggregate Base Course with a roller for large areas and smaller hand operated compactor for small patches.

Existing pavement may be rough cut initially in conjunction with trenching; however, a square even vertical saw cut shall be made in the existing asphalt pavement after placement of backfill and prior to pavement replacement. The square vertical saw cut shall be made at a minimum of 1′ back from the trench line into good pavement (not required if using CLSM). Before placement of the new pavement, the cut edges shall be thoroughly cleaned, and a tack coat shall be uniformly and evenly applied to vertical faces in accordance with Section 8.2. The patch shall be made with placement of a hot asphalt cement and aggregate mixture as described in this Article. If asphalt cut is within 2′ of lip of curb & gutter, new asphalt patch shall extend to the lip of the curb & gutter in a continuous patch.

In large patches or whenever possible, a self-propelled paving machine shall be used to place the mixture. In small patches, the material shall be hand placed or placed with a spreader box without separation of the mixture. The material shall be placed to the grade and thickness required to allow for compaction after rolling. The hot mix material shall be compacted using the number, weight and type of rollers required to provide 95% of the maximum density of a laboratory compacted specimen made in the same proportions as the job mix formula (AASHTO T-209). Rolling shall continue until all roller marks are eliminated and no further compression is possible in the pavement. After rolling the surface, a straight-edge or a stringline shall be used to check grade and riding quality of the patch.

8.1.8 RECYCLED PLANT MIX BITUMINOUS PAVEMENTS

Plant mixed bituminous pavements shall not contain more than 20% reclaimed asphalt pavement. The reclaimed asphalt pavement shall meet all the requirements for hot bituminous pavement, as contained herein.

8.1.8.1 Reclaimed Asphalt Pavement (RAP) Material

The Engineer may require the contractor to maintain separate stockpiles for each type of RAP material. All processed material shall be free of foreign materials and segregation shall be minimized. The RAP material shall be processed, if needed, so that at least 95% passes through a 5/8″ sieve. Any RAP material that cannot be readily broken down in the mixing process and/or affects the paving operation, shall be processed prior to mixing with the virgin material.

8.1.8.2 Composition of Mixtures

Tests for cleanliness, abrasion loss, and percent of fractured faces will be made on

representative samples of aggregate taken during production or from the stockpiles. Proportions of the reclaimed and virgin material shall be determined and proposed by the Contractor/Developer to meet the mix composition requirements of CDOT Standard Specifications for Road and Bridge Construction - Section 400. The maximum aggregate size contained in the combination of reclaimed asphalt pavement and new aggregate shall not exceed the maximum specified in the gradations presented in these specifications.

(a) **Job-Mix Formula.** See Section 8.1 of these specifications for approval of mix design. Cost for this testing shall be the responsibility of the Contractor.

(b) **Uniformity.** After the job-mix formula has been approved, the owner shall implement an acceptable quality control plan as detailed in Section 8.1.3.4 of these specifications. Deviations from the final approved design for bitumen content and gradation of aggregates shall not be greater than the tolerances listed in Section 8.1.3.3 of these specifications and shall be based on the extraction test.

(c) **Bituminous Mixing Plant**

(1) **Batch Plant.** The batch plant shall be modified to allow weighing the reclaimed asphalt pavement (RAP) material prior to incorporation into the pugmill. The cold feed bin, conveyor system and the special bin adjacent to the weigh box, if used, shall be designed to avoid segregation and stocking of the RAP material. The virgin aggregates shall be dried and heated to a suitable temperature so that on combining with the RAP material at ambient temperature the resulting mix temperature of successive loads may be a cause for a rejection of the mix by the Engineer. The virgin aggregates shall be free of unburned fuel oil when delivered to the pugmill.

(2) **Drum Mixer Plant.** The drum mixer plant shall be modified to prevent direct contact of the RAP material with the burner flame and/or overheating of the RAP material in the process.

8.1.9 MEASUREMENT AND PAYMENT

Asphalt concrete pavement courses measured by the square yard, will be paid for at the contract unit price per square yard. This payment shall be full compensation for all materials, tools, equipment, and labor necessary to complete the work under this section in accordance with the plans and these specifications. The payment shall be full compensation for all coats applied in accordance with these specifications.

If there is no pay item for asphalt concrete pavement of the type specified it will not be measured and paid for separately but shall be included in the pay item most closely associated with the work. Payment will be made under:

Table 8.5. Payment Units

Pay Item	Pay Unit
Asphalt Pavement (Asphalt)	Ton
Asphalt Pavement (RAP) (Asphalt)	Ton
Asphalt Pavement (Patching) (Asphalt)	S.F.

8.2 ASPHALTIC TACK COAT

8.2.1 TACK COAT

8.2.1.1 Description

Existing asphalt surfaces receiving an asphalt overlay, existing vertical concrete surfaces such as curb and gutter, crosspans and manholes, or between layers of multi-course asphaltic pavement structure, shall receive a tack coat consisting of an emulsified asphalt in accordance with these specifications at the locations shown on the plans, or as directed by the Engineer. Tack coat may be eliminated between successive lifts if the Contractor protects the surface from contamination.

8.2.1.2 Surface Preparation

Before applying the tack coat, surfaces shall be thoroughly cleaned of all dirt and other debris to ensure adequate bond between tack surface and asphaltic mat. The surface of the existing asphalt must be completely dry before placing tack coat.

8.2.1.3 Liquid Asphalt

The liquid asphalt used for tack coat shall be an emulsified asphalt grade conforming to CDOT Specifications Section 407 and shall satisfy the requirements of AASHTO M-140 or M-208. Other emulsified asphalts may be used upon written permission of the Engineer.

8.2.1.4 Placing

The rate of application shall be 0.05 to 2.0 gallons per square yard and shall provide a uniform and even coating of the surface. The surface shall be allowed to cure to permit drying and setting of the tack coat prior to the paving operation.

8.2.2 MEASUREMENT AND PAYMENT

Payment for tack coat shall be included in the unit price bid for asphalt pavement, and shall include all materials, tools, equipment, and labor necessary to complete the work in accordance with the plans and specifications, and as directed by the Engineer.

8.3 CONCRETE PAVEMENT

8.3.1 DESCRIPTION

The work performed under this section shall consist of the construction of a pavement composed of Portland cement concrete, with or without reinforcement as specified, on a prepared subgrade or base course in accordance with these specifications and in reasonably close conformity with the lines, grades, thicknesses, and typical cross sections shown on the plans or established.

8.3.2 MATERIAL

8.3.2.1 General

The specifications presented in this section are performance oriented. The City's objective in setting forth these specifications is to achieve an acceptable quality of streets. All sources for the mined or manufactured materials must be annually approved by the City as having met the appropriate materials performance specifications. This approval is a condition of using those material sources for public improvement construction.

8.3.2.2 Procedure for Material Source Approval

On or before April 1st of each year, a material supplier for any City improvement shall supply written documentation and material test results from a qualified, independent materials testing laboratory that describes:

(a) Material(s) being tested to meet City specifications.

(b) The test procedures employed.

(c) The supplier(s) manufacturing, mining, or treating process by which the tested materials were created.

(d) The material test results.

(e) A signed statement by the material supplier that the materials produced and tested for this certification are truly representative of the materials to be provided for public improvements in the City during the coming 365-day period.

8.3.2.3 Portland Cement Concrete

This material shall consist of a mixture of fine and coarse aggregates, Portland cement, water and other materials or admixtures as required. Comply with ARTICLE 4 – Concrete and ARTICLE 5 – Structural Concrete.

8.3.3 CONSTRUCTION REQUIREMENTS

Materials shall be proportioned, handled, measured, batched, placed, finished and cured in accordance with Section 412 of the CDOT and ASTM C-94 (whichever is more stringent).

8.3.4 QUALITY CONTROL

All samples and tests described herein shall be made in accordance with approved ASTM/AASHTO procedures. The Contractor/Developer shall provide for all testing laboratory services in connection with tests verifying conformance of proposed materials with project requirements. The Contractor/Developer shall also provide for testing laboratory services in connection with tests on materials after incorporation into the project, on a first-time basis only. Additional tests may be required at the direction of the Engineer. If additional tests are required,

the financial burden will be borne by the contractor/developer if the testing results fail to meet minimum city specifications. If the testing results meet or exceed the city specifications the additional testing costs will be paid for by the requesting entity.

During placement of Portland cement concrete pavement, observation and testing shall be on a full-time basis. For each day of production, aggregate samples shall be obtained for gradation of both the coarse and fine aggregates.

Testing shall be done per ARTICLE 4 – Concrete.

Thickness of fresh concrete must be checked a minimum of every 300 lineal feet each traffic lane according to the CDOT Section 412.24. Any noted deficiency areas shall be corrected at that time. Surface deficiency areas shall also be corrected at that time. Surface smoothness shall be tested and corrected as necessary according to CDOT Section 412.16. The Engineer will decide when the pavement shall be opened to traffic; otherwise, the pavement shall not be opened to traffic until 14 days after the concrete was placed, or until the compressive strength of laboratory cured 6 x 12 cylinders (ASTM C-39) averages 3000 psi. Prior to opening to traffic, the pavement shall also be cleaned, and all joints sealed.

8.3.5 FINAL ACCEPTANCE

All test results shall be submitted and reviewed by the City. Provided all tests are acceptable, the pavement will be accepted. Should testing indicate unsatisfactory work, removal, replacement, grinding or reduced payment will be required.

8.3.6 MEASUREMENT AND PAYMENT

The accepted quantities of concrete pavement will be paid for at the contract unit price per square yard which price and payment shall be full compensation for furnishing and placing all materials, including any dowels, tie bars and joint material.

No additional payment over the unit contract bid price will be made for any pavement which has an average thickness in excess of that shown on the plans. Reinforcing steel, other than as mentioned above, will be measured and paid for in accordance with ARTICLE 5 – Structural Concrete.

8.4 PAVEMENT MARKING

8.4.1 DESCRIPTION

This work consists of furnishing and applying pavement marking, and furnishing and installing, and removing temporary marking in accordance with these specifications, the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), the Colorado supplement thereto, and in conformity to the lines, dimensions, patters, locations, and details shown on the plans or established.

8.4.2 SUBMITTALS

Contractor shall submit product details and MSD Sheets for all paint, pavement marking tape, thermoplastic pavement marking, glass beds, and epoxy pavement marking materials.

8.4.3 MATERIALS

8.4.3.1 Paint

Comply will all provisions of CDOT specifications subsection 708.05.

8.4.3.2 Glass Beads

Comply will all provisions of CDOT specifications subsection 713.08.

8.4.3.3 Modified Epoxy Pavement Marking

Comply will all provisions of CDOT specifications subsection 713.17.

8.4.3.4 Thermoplastic Marking

Comply will all provisions of CDOT specifications subsection 713.12.

8.4.3.5 Pavement Primer

Comply will all provisions of CDOT specifications subsection 708.07.

8.4.3.6 Preformed Plastic Pavement Marking

Comply will all provisions of CDOT specifications subsection 713.13.

8.4.3.7 Pavement Marking Tape

Comply will all provisions of CDOT specifications subsection 713.15.

8.4.3.8 Pavement Marking Tape (Removable)

Comply will all provisions of CDOT specifications subsection 713.16.

8.4.3.9 Raised Pavement Marker

Comply will all provisions of CDOT specifications subsection 713.18.

8.4.3.10 Preformed Thermoplastic Pavement Marking

Comply will all provisions of CDOT specifications subsection 713.14.

8.4.4 CONSTRUCTION REQUIREMENTS

8.4.4.1 General. All pavement markings shall be placed in accordance with the following requirements.

(a) **Pavement Marking Plan.** When pavement marking location details are not provided in the Contract, the Contractor shall submit a layout of existing conditions to the City of Pueblo Traffic Engineer for approval or modification.

(b) **Roadways Closed to Traffic During Construction.** Final markings shall be in place prior to opening the roadway to traffic. Pavement markings on detour routes shall meet all requirements of the MUTCD.

(c) **Roadway Constructed Under Traffic.** Final pavement markings shall be placed within two weeks after final surfacing is completed. Pavement markings shall also be placed on any roadways opened to traffic when the project pavement work is discontinued for more than two weeks.

(d) **Temporary Pavement Markings.** Temporary pavement markings and control points for the installation of those pavement markings for roadways that are being constructed under traffic shall be installed as follows:

(1) Temporary paved roadways shall have a center line, lane line, and edge line markings before they are open for traffic.
(2) Upon removal, markings applied to a final surface shall not leave a scar that conflicts with permanent markings.
(3) Center line, lane line, and edge line temporary markings shall be in pace at the end of each workday.
(4) Temporary pavement stencils (SCHOOL, RR Xing, etc.) are not required unless specified in the plans.
(5) Control Points consisting of 4″ by 1′ marks at 40′ interval may be placed as guide markers for the installation of temporary or final pavement markings. Raised flexible markers may be substituted for these marks. Control points shall not be used as a substitute for any required marking.

(e) All other provisions and specifications of construction shall conform to the latest version of the CDOT specifications with the following exceptions:

(1) Subsection 627.08 (a) Inlaid Preformed Plastic Pavement Marking. Delete this section.
(2) Subsection 627.06 (c) Thermoplastic Pavement Marking – Application. Revise sentence to read: “The minimum thickness of thermoplastic lines as viewed from a lateral cross section **shall not be less than 1/8″**. Measurements shall be taken as an average throughout any 36″ section of the line. The material, when formed into traffic stripes, must be readily renewable by placing an overlay of new material direction over the old line of compatible material. Such new material shall bond itself to the old line in such a manner that no splitting or separation takes place.”

8.4.5 MEASUREMENT AND PAYMENT

The accepted quantities will be paid for at the contract price per unit of measurement for each the pay items listed below that appear in the bid schedule. Payment will be made under:

Table 8.6. Payment Units

Pay Item	Pay Unit
Pavement Marking Paint	Gallon
Modified Epoxy Pavement Marking	Gallon
Pavement Marking Tape	LF
Pavement Marking Paint (Word-Symbol)	SF
Pavement Marking Paint (Xwalk-Stop Line)	SF
Thermoplastic Pavement Marking	SF
Thermoplastic Pavement Marking (Word-Symbol)	SF
Thermoplastic Pavement Marking (Xwalk-Stop Line)	SF
Preformed Thermoplastic Pavement Marking	SF
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF
Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line)	SF

Waterblasting will not be measured or paid for separately but shall be included in the work. Glass beads and cleaning with high pressure water blast or air blast shall be included in the cost of the work. Each authorized application of temporary pavement marking will be measured and paid for at the contract unit price for each type of material used. Control points and Contractor pavement marking plans will not be measured and paid for separately but shall be included in the work. All costs associated with having the Preformed Plastic Pavement Marking manufacturer-trained installer on-site and providing documentation will not be measured and paid separately but shall be included in the work.