14.0 SIGNING, PAVEMENT MARKING, SIGNALIZATION, AND LIGHTING INFRASTRUCTURE

The Contractor shall provide permanent signing, pavement marking, traffic signalization, and lighting for the Project.

The Contractor shall be responsible for the design and installation of the Project permanent signing, pavement marking, traffic signalization, and lighting elements within the limits of the Project and comply with the requirements of this Section 14.

14.1 Design Requirements

The Contractor shall prepare signing, pavement marking, and traffic signal designs and plans for all areas on the Project in accordance with the requirements of the following sections. These plans shall be a component of all Released for Construction Documents where any signing, pavement marking, traffic signal, or lighting element is required for the Work. No material, part, or attachment of any equipment shall be substituted or applied contrary to the manufacturer's recommendations and standard practices.

The Contractor shall provide permanent signing, pavement marking, delineation, and other traffic control devices that facilitate safe flow of traffic through the completed Project elements and that accommodates future phases of the Project (subsequent phases and any Additional Requested Elements [AREs] not included in the Basic Configuration).

The electrical designs shall include the electrical and power requirements for the Intelligent Transportation Systems (ITS) as described in Book 2, Section 19, ITS. The Contractor shall coordinate with Colorado Springs Utilities to determine electric power requirements for the Project and to develop the Project lighting design and construction requirements.

The Contractor shall obtain approval of the power service design from the power service provider and coordinate and meet all requirements as specified by the power service provider for the complete and operational power service to all required locations. All power connections to devices shall include a quick-disconnect.

The Contractor shall be responsible for the coordination of power source work to be performed by Colorado Springs Utilities. The Contractor shall contact Colorado Springs Utilities Ms. Mary Hoaglund at 719-688-4083 to request, and process to completion, the required coordination to establish the power sources for traffic signals, traffic signal pole mounted lighting and all roadway and street lighting. The Contractor shall perform all work necessary to maintain existing or establish new power sources for traffic signals and lighting. All cost charges from the power service provider, and all necessary materials, including meter(s) (if required), labor, and coordination required to maintain existing or establish new power sources shall be included in the Work.

The Contractor shall design and construct signing, pavement marking, traffic signal, and lighting elements in accordance with the requirements of the standards listed in Table 14.1-1 as appropriate for the jurisdictional ownership, oversight and approval of the Work.

Table 14.1-1
LIGHTING STANDARDS

	Author	Title
1	CDOT	Special Provisions included in Section 14
2	CDOT	*Standard Specifications for Road and Bridge Construction Section 613*
3	Colorado Springs Utilities	*Colorado Springs Utilities Standards*
4	CDOT	*Sign Design Manual* – May 21, 2010
5	CDOT	*M&S Standards (Latest Edition)*
5	FHWA	*Manual on Uniform Traffic Control Devices* (Latest Edition)
6	FHWA	*Standard Highway Signs – 2004 Edition*
7	FHWA	*Standard Highway Signs – 2012 Supplement*
8	AASHTO	*A Policy on Geometric Design of Highways and Streets*
9	AASHTO	*Roadside Design Guide*
10	AASHTO	*Standard Specifications for Highway Bridges*, 16th Edition
11	Local Jurisdiction	*Design Standards, Details, and Specifications*
12	CDOT	*CDOT Lighting Design Guide-2009*

14.1.1 Permanent Signing

14.1.1.1 Signing Design

The Contractor shall prepare signing designs and plans for the Project area. These plans shall include all necessary guide, warning, supplemental, and regulatory signs, and additions, removals, or modifications to existing signs and appurtenances. Plans shall also include a preliminary layout of signs, which will be required for future phases of the Project and that may affect placement and configuration of signs placed as a part of the Basic Configuration.

Signing design shall comply with the requirements of the most current publications of the CDOT *Standard Specifications for Road and Bridge Construction*, *M & S Standard Plans*, and *Sign Design Manual*; and the FHWA *Manual for Uniform Traffic Control Devices* (MUTCD). The requirements of the MUTCD shall include both the standard requirements and the guidance recommendations of the manual. The design and plans shall address modifications to permanent signing inside and outside the Project that is rendered inaccurate, ineffective, confusing or unnecessary by the Project. Signing plans shall provide layouts showing the locations of ground-mounted and overhead signs, special sign details, and structural and foundation requirements.

Signing design for the intersections and local streets shall comply with the City of Colorado Springs Signage and Pavement Markings Guidelines. City of Colorado Springs (COS) Traffic Engineering requires submittal of signing and striping design plans for review and approval.

Signing shall be provided on all Bikeway elements or connections in accordance with MUTCD and the AASHTO Guide for the Development of Bicycle Facilities, and shall be subject to review and approval of the COS Parks, Recreation, and Cultural Services Department.

The Contractor shall submit plans for all Class III, major overhead signs, and regulatory and guide signs to CDOT for approval. These plans shall identify the location and legend for each sign. The Contractor shall submit sign layouts for all special signs of any size to CDOT for approval. All existing non-monotube overhead sign structures shall be replaced with new structures.

Where CDOT sign structure standards cannot be met, provide custom-designed monotube sign structures and foundations for approval from CDOT Staff Bridge. Permanent signage on bridges shall not be hung from or be attached to the face of bridge superstructures. Existing signs attached to bridge superstructures shall be removed and replaced with monotube sign bridges or cantilever structures if signs are to remain.

The Contractor shall mount all overhead signs with a vertical clearance consistent with current CDOT Standard S-614-50 measured from the high point on the roadway surface under the sign panels to the bottom of the VMS, VTMS, or guide sign (whichever is lowest.

Sign lighting and walkways shall not be used on overhead guide signs.

Sign structures shall be designed in accordance with CDOT Standard S-614-50.

All ground mounted signage, delineators, etc., shall be installed within a full depth PVC sleeve at locations where the device is installed within concrete sidewalk, median cover material, concrete pavement, slope paving, etc.

14.1.1.2 Materials

The Contractor shall use schedule 80 tubular steel posts per CDOT *S-Standard Plans* for all Class I and Class II ground signs. Wood posts for mounting ground signs shall not be used. All delineators shall have metal posts.

All ground signs shall include breakaway devices per CDOT *S-Standard Plans*.

All sign panel backs, zee bars, poles, new overhead sign structures, on I-25 and the interchange ramps, shall be painted in conformance to the I-25 Architectural Requirements. Reset monotube sign structures will no need to be repainted.

Sign panel materials shall conform to CDOT *Standard Specifications* Section 713. Sheeting shall be Type IV and Type XI as defined in the CDOT Retroreflective Sheeting Materials Guide, and shall conform to Subsections 713.04 and 713.06 when applicable. For all permanent signs, the legend, borders, and background shall be Type XI.

The Contractor may reuse any existing sign structures, ground signs and their components if they meet all current CDOT and MUTCD standards. Any existing signs not meeting MUTCD retro-reflectivity requirements shall be replaced as part of the Project.

City of Colorado Springs Signage and Markings Guidelines shall be utilized for all COS signs.

14.1.2 Permanent Pavement Marking

14.1.2.1 Pavement Marking Design

The Contractor shall prepare pavement marking designs and plans for roads affected by the construction of the Project. These plans shall include, all striping required for center lines, edge lines, lane lines, gore areas, lane drops, merging lanes, transition lanes, bike lanes, arrows, legends, symbols, object markings, delineation, and other striping, as well as any modifications required for transitions to existing pavement markings.

Pavement marking design for CDOT facilities shall comply with the requirements of the most current publications of the CDOT *Standard Specifications for Road and Bridge Construction* and *M & S Standard Plans*; and the FHWA MUTCD. The requirements of the MUTCD shall include both the standard requirements and the guidance recommendations of the manual.

Striping design for the local streets and intersections shall comply with City of Colorado Springs Signage and Markings Guidelines.

The conceptual mainline and other roadway striping as shown in the Reference Documents is for information and reference only.

14.1.2.2 Materials

The Contractor shall use the pavement-marking materials on US 24 and I25 for the locations specified in Table 14.1-2.

Table 14.1-2
PAVEMENT MARKING MATERIALS

Location	Pavement Marking Type
Edge lines	Epoxy Pavement Marking
Skip lines, channelizing lines, and lane drop lines on Portland concrete cement pavement (PCCP)	Preformed Plastic Pavement Marking Type II (contrast)(Inlaid)
Skip lines, channelizing lines, and lane drop lines on Hot Mix Asphalt (HMA)	Preformed Plastic Pavement Marking Type I
Words/symbols/cross walks/stop lines	Preformed Plastic Pavement Marking Type I

The City of Colorado Springs requires the use of Thermoplastic for all Xwalks, stop bars, and symbols and Epoxy for all skip lines, edges lines and channelizing lines.

The Contractor shall refer to CDOT's Material Striping Chart as shown below for pavement marking materials for US24 and I-25.

Freeway / Expressway Striping Materials

Surface	Line	Material
New Asphalt*	4" White Edge Line	Epoxy
	4" Yellow Edge Line	Epoxy
	4" Double-Yellow Centerline	Epoxy
	4" White Lane Line	Preformed Plastic Type I (Inlaid)
	4" White Extension Line	Preformed Plastic Type I (Surface Applied)
	8" White Gore Area	Preformed Plastic Type I (Surface Applied)
	8" White Channelizer	Preformed Plastic Type I (Surface Applied)
	8" White Lane Drop	Preformed Plastic Type I (Inlaid)
	8" White Double-Left Guide	Preformed Plastic Type I (Surface Applied)
	Stop Bar / Crosswalk	Preformed Plastic Type I (Surface Applied)
	Word Message	Preformed Plastic Type I (Surface Applied)
Old Asphalt	4" White Edge Line	Epoxy
	4" Yellow Edge Line	Epoxy
	4" Double-Yellow Centerline	Epoxy
	4" White Lane Line	Preformed Plastic Type II (Inlaid)
	4" White Extension Line	Preformed Plastic Type II (Inlaid)
	8" White Gore Area	Preformed Plastic Type II (Surface Applied)
	8" White Channelizer	Preformed Plastic Type II (Surface Applied)
	8" White Lane Drop	Preformed Plastic Type II (Inlaid)
	8" White Double-Left Guide	Preformed Plastic Type II (Inlaid)
	Stop Bar / Crosswalk	Preformed Thermoplastic**
	Word Message	Preformed Thermoplastic**
New Concrete*	4" White Edge Line	Epoxy
	4" Yellow Edge Line	Epoxy
	4" Double-Yellow Centerline	Epoxy
	4" White Lane Line	Preformed Plastic Type II (Inlaid)
	4" White Extension Line	Preformed Plastic Type II (Inlaid)
	8" White Gore Area	Preformed Plastic Type II (Surface Applied)
	8" White Channelizer	Preformed Plastic Type II (Surface Applied)
	8" White Lane Drop	Preformed Plastic Type II (Inlaid)
	8" White Double-Left Guide	Preformed Plastic Type II (Inlaid)
	Stop Bar / Crosswalk	Preformed Plastic Type I (Surface Applied)
	Word Message	Preformed Plastic Type I (Surface Applied)
Old Concrete	4" White Edge Line	Epoxy
	4" Yellow Edge Line	Epoxy
	4" Double-Yellow Centerline	Epoxy
	4" White Lane Line	Preformed Plastic Type II (Inlaid)
	4" White Extension Line	Preformed Plastic Type II (Inlaid)
	8" White Gore Area	Preformed Plastic Type II (Inlaid)
	8" White Channelizer	Preformed Plastic Type II (Inlaid)
	8" White Lane Drop	Preformed Plastic Type II (Inlaid)
	8" White Double-Left Guide	Preformed Plastic Type II (Inlaid)
	Stop Bar / Crosswalk	Preformed Plastic Type I (Surface Applied)
	Word Message	Preformed Plastic Type I (Surface Applied)

* Inlaid markings are preferred on new construction but not required.
**Preformed Plastic Type I markings may be acceptable depending on pavement condition.
-Typical first application of Preformed Plastic markings is surface-applied; consecutive applications are inlaid.

14.1.3 Temporary and Permanent Traffic Signalization

14.1.3.1 Traffic Signal Design

The Contractor shall prepare traffic signal plans that include, existing and proposed intersection plan details, traffic signal pole locations, mast arm and signal head locations, signal pole mounted overhead lighting (luminaires), pedestrian button and signal locations, approach striping and marking locations and types, cabinet and power source locations, conduit and pull boxes, detection systems and locations, and all other plan and component details for complete traffic signal installation in accordance with the City of Colorado Springs Traffic Signal Specifications, and shall include Colorado Springs Utilities Standards for all non-signal lighting placed on the poles.

Refer to Book 2, Section 19 – ITS for fiber optics along and within I-25 and US24.

The Contractor shall coordinate all traffic signal design and installations with the COS Traffic Engineering Division. Permanent traffic signal equipment shall ~~match the~~comply with the Project ~~Architectural Requirements~~ Aesthetic Plans and Details in Book 4.

~~Permanent traffic signalization appurtenances shall not be allowed to hang from, or be attached to the face of bridge superstructures.~~

14.1.3.3 Materials

The Contractor shall use traffic signal equipment, including traffic signal poles, for all temporary and permanent installations as specified in the COS *Standard Specifications*

14.1.4 Lighting

14.1.4.1 Permanent Lighting Design

The Contractor shall prepare lighting designs and plans for US 24, I-25, and all existing permanent lighting conditions on roadways impacted by the Project. All permanent lighting within the Project shall be LED luminaries and shall be designed and constructed to be consistent with current Colorado Springs Utilities (SU) Electric Line Extension and Service Requirements, including standards for required lighting values. Lighting designs and Plans shall be subject to the review and approval of CDOT and SU.

Lighting plans shall address both temporary and permanent Work and shall include existing topography, right of way, utilities, drainage facilities, structures, and all other existing and proposed facilities. The plans shall include location and orientation of standards and fixtures, wiring, conduits, pedestals, power sources, and all other lighting components required to construct the lighting on the Project.

Roadway lighting for US 24 & I-25 shall be provided for the entire length of highway, including ramps, being constructed by the Project and from the outside edges of the roadways, unless otherwise approved by CDOT. High-mast lighting will not be allowed.

Full interchange lighting shall be provided for at the US 24/I-25 interchange including all ramps.

The Contractor shall submit to SU for Acceptance lighting calculations, including voltage-drop calculations for each circuit, showing that the design meets the performance criteria for roadway design to include average, maximum, minimum foot-candles; and average to minimum, and maximum to minimum luminance on the horizontal roadway plane. The lighting design shall include iso-foot-candle curve plots showing foot-candle levels at 1.0, 0.5, 0.2, and 0.1 foot candles. The design and plans shall also include circuit layouts showing underground circuits alongside and under the roadway and through retaining wall and bridge structures.

Lighting on and underneath all bridge structures and within structures for public use facilities, such as sidewalks, bikeways, and trails, within the Project boundaries shall comply with the design criteria for average and minimum luminance for the roadway or pedestrian/bicycle facility. Roadway and pedestrian lighting on bridge structures shall comply with the requirements of the Project Aesthetic Plans and Details~~Architectural Requirements~~ in Book 4.

14.1.4.2 Permanent Lighting Materials

The Contractor shall use lighting equipment for all permanent installations as specified in the SU Line Extension and Service Standards.

SU is responsible for lighting maintenance for the entire project. The Contractor shall submit the materials lists for the proposed lighting, including under deck lighting for review and approval by SU prior to ordering material. The Contractor shall contact Colorado Springs Utilities, Ms. Mary Hoaglund at 719-688-4083 to request, and process to completion, the required coordination to review and approve the lighting equipment. All cost charges from SU for review and approval shall be included in the Work.

14.1.4.3 Temporary Lighting

The Contractor shall provide installation, maintenance, and removal of all temporary lighting devices. The Contractor shall maintain temporary lighting at a level equivalent to existing lighting provided within the Project limits.

14.2 Construction Requirements

14.2.1 Permanent Signing

The Contractor shall remove and dispose of all existing sign structures, ground-mounted signs, and delineators within the Project area that conflict with project modifications or do not meet the specifications contained herein, and they shall become the property of the Contractor.

14.2.2 Permanent Pavement Marking

New PCCP shall be sandblasted prior to placement of any primer or pavement-marking material.

14.2.3 Permanent Traffic Signalization

14.2.3.1 Contractor Requirements

The Contractor shall purchase cabinets, controllers, CCTV's and associated traffic signal equipment, and shall deliver the equipment to the City of Colorado Springs, Traffic Engineering Division a minimum of 6 weeks prior to the scheduled installation date and delivered to the City of Colorado Springs for initial setup. The Contractor shall transport the devices to the project site for the Contractor's installation after the City of Colorado Springs staff have completed the setup and tasks as identified below.

All existing signalization equipment removed by the Contractor is the property of the City of Colorado Springs. The Contractor shall deliver in good condition all equipment removed to the City of Colorado Springs Traffic Engineering Division.

14.2.3.2 Operational

The City of Colorado Springs shall provide the Contractor any available traffic signal timing plans for each traffic signal installation to include these six timing plans: AM, PM, and Off-peak for both weekday and weekend periods. Timing plans shall be prepared using Synchro 6 and include signal coordination with adjacent signals, cycle length, splits, optimal phasing, and sequence.

The City of Colorado Springs will equip the controller cabinets with all the necessary software to operate the permanent traffic signals. The City of Colorado Springs will provide timing plans for the permanent traffic signals for the Contractor to initiate and install with the initial startup.

The Contractor shall coordinate with the City of Colorado Springs to ensure timing plans function properly, and to ensure they minimize intersection approach delays and accommodate pedestrians.

All signal timing plan modification requests shall be approved and completed by the City of Colorado Springs. The Contractor shall allow 28 Days prior to implementation of any signal timing plan modification for review and approval by the City of Colorado Springs.

14.2.4 Permanent Lighting

The Contractor shall be responsible for the coordination of lighting removal and lighting relocation work to be performed by Colorado Springs Utilities and/or the contractor. The Contractor shall contact the Colorado Springs Utilities, Ms. Mary Hoaglund at 719-688-4083 to request, and process to completion, the required coordination for lighting removal or lighting relocation Work. The Contractor shall remove the existing lighting as required within the Project area, and shall become the property of the Contractor.

14.3 Project Special Provisions

The following specifications modify and take precedence over the Standard Specifications.

14.3.1 REVISION OF SECTION 627 - EPOXY PAVEMENT MARKING (SPECIAL) -

Section 627 of the Standard Specifications is hereby revised for this project to include the following:

Delete subsection 627.05 and replace with the following:

Epoxy Pavement Marking (Special). Epoxy Pavement Marking (Special) shall be applied to the road surface according to the epoxy manufacturer's recommendations at 20 mils minimum thickness. Beads shall be applied into the epoxy pavement marking by means of a pressurized bead applicator at the manufacturer's recommended application rate.

The surface area receiving marking shall be ground prior to placement of the Epoxy Pavement Marking (Special). This applies to new or existing concrete or asphalt pavements. The ground surface shall then be cleaned with a high pressure air blast to remove loose material prior to placement of the Epoxy Pavement Marking (Special). The grooved width for inlaid pavement marking shall be between 4 and 4-1/4 inches in width The depth of the inlaid grooves shall be 80 mils ± 5 mils below the surface of the existing pavement.

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 shall re-clean grooves, as necessary, prior to application of the Epoxy Pavement Markings (Special).

The Contractor shall grind only those locations on which pavement marking shall be applied on a daily basis.

If a rain event occurs during grinding and marking application, a temporary lane line marking tab shall be placed while the pavement is drying prior to the marking application. Marking application can proceed when pavement is dry and has had no moisture for a minimum of 24 hours. The placement of tabs shall be every other lane line/ skip or approximately 80 feet.

The primary and secondary beads shall be applied in a two drop operation in accordance with the manufacturer's recommendations. If manufacturer recommendations do not address this operation, then the rate of primary beads shall be 10 to 11 pounds per gallon of epoxy. The primary composite cluster shall be applied first from the bead dispenser directly behind the Epoxy binder application gun followed immediately by the application of the secondary beads from a second bead dispenser. The application rates of the primary and secondary beads shall be adjusted from these starting values until the minimum retroreflectivity values have been consistently achieved. The beads shall be applied in such a manner that the beads shall adhere and be embedded within the epoxy binder to produce a high reflective all weather pavement marking.

There shall be two types of glass and/or ceramic beads used for the Epoxy Pavement Marking (Special) reflective elements, a Primary bead which is a high performance, high reflective all weather bead and a Secondary standard glass bead. Beads will be accepted on the project by certificates of compliance (COC). The COC shall be in conformance with subsection 106.02 in addition to the following requirements:

1) The primary bead shall be a composite cluster comprised of a core element and shall contain an outer shell containing elements surrounding it. The shell elements shall be permanently attached to the core element. The core and shell elements shall be manufactured from glass, ceramic, or silica. The primary element shall be coated by manufacturer's recommendations for application within Epoxy binder.

2) The secondary bead shall conform to the following specifications: Gradation:

U.S. Mesh	Microns	% Retained	%Passing
18	1000	20 – 35	65 – 80
30	600	50 – 70	30 – 50
50	300	95 – 100	0 – 5

Roundness: Shall be a minimum of 85 % true spheres above the sieve 20 by visual inspection using test method FLH-520. All beads below the 20 sieve, must meet a minimum of 80% true spheres by ASTM Method D 1155.

Color / Clarity: Beads shall be colorless / clear and free of carbon residues.

Refractive Index: Minimum 1.50 by oil immersion method.

Air Inclusions: < 5% by visual count.

Hardness: All beads above the 20 sieve shall exhibit an average hardness of C70.5 when measured using the Rockwell C scale method and with a minimum sampling of 100 glass beads.

Crushing Strength: Beads above the 20 sieve shall exhibit an average crushing strength of not less than 60,000 psi when measured with the L/D^2 method and with a minimum sampling of 100 glass beads.

Coatings: Shall use manufacturer's recommended adhesion coating for optimum adhesion and embedment.

Chemical Resistance: Both the primary and secondary beads shall be resistant to hydrochloric acid, water, calcium chloride, sodium sulfide, acid, and magnesium chloride, and shall not develop any haze, dulling or darkening of the bead as tested per methods outlined in sections 4.3.6 to 4.3.9 of the TT-B Federal Spec. 1325C.

3) Primary and secondary glass beads shall be furnished in fully identified, separate containers and shall be free of extraneous materials or clumps. If the use of recycled post consumer glass is used in manufacturing of beads those recycled glass beads shall be manufactured from North American glass waste streams. The bead manufacturer shall submit a notarized certification to the department stating that North

American glass waste streams were used in the manufacture of this specification.

Products will be accepted on the project by certificates of compliance (COC). The COC shall be in conformance with subsection 106.02, and shall include that the materials conform to the following:

1) Retroreflectivity. The applied finish system shall have an initial minimum dry retroreflectivity reading of 700 mcd·m-2·1x-1 for white and 500 mcd·m-2·1x-1for yellow. The Contractor shall use an industry accepted and available Retro-meter for retroreflectivity readings and it shall be calibrated each day testing occurs. For information: (CDOT will be using a Delta LTL-X Retro-meter for retroreflectivity readings). CDOT will obtain retroreflectivity readings from the Contractor for each 1 mile of line placed or fraction thereof. CDOT will determine a random testing location for each 1 mile section of line placed or fraction thereof. Each test location shall represent that 1 mile of line placed or fraction thereof. At each random testing location two reflectivity readings will be taken on 11 different skip lines or 22 readings will be taken with a 440 foot section of the continuous line. Of those 22 readings the highest and lowest will be disregarded and the remaining 20 readings will be averaged and that average value will represent the reflectivity of that 1 mile section or fraction thereof. The contractor shall remove and replace at their expense each 1 mile of line placed or fraction thereof where the test result from that random location fails the minimum retro reflectivity reading.

   The retroreflectivity readings shall be taken between two and three days after the marking is tack free. Prior to taking reflectivity readings, the Contractor shall remove at the retroreflectivity reading locations any excess beads placed during marking application.

Applied markings shall have uniform mil thickness and bead distribution across the entire width of the line. 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 will be required to submit to CDOT certification from the manufacturer that the installed epoxy binder and both the primary and secondary beads have been installed in accordance with this specification and with their recommendations and has achieved the minimal retroreflectance values stated herein. If the pavement marking system is comprised of multiple manufacturers, then all manufacturers will be required to affirm to the certification. A manufacturer's representative shall be onsite at the installation of the epoxy binder, primary bead, and secondary bead materials to identify areas of the installation falling below the minimum manufacturer's recommendations and these specifications to assist in the calibration of equipment, set up of equipment and the proper adjustment of equipment during installation to achieve the minimums outlined herein. The cost of the manufacturer(s) representation will not be measured and paid for separately but shall be included in the cost of the work.

Subsection 627.13 shall include the following:

Pay Item	Pay Unit
Epoxy Pavement Marking (Special)	Gallon

The work to groove the asphalt or concrete and clean the grooving residual or debris will not be measured and paid for separately but shall be included in the work.

The primary and secondary beads will not be measured and paid for separately but shall be included in the cost of the Epoxy Pavement Marking (Special).

Temporary markings will not be measured and paid for separately, but shall be included in the cost of work.

14.4 Deliverables

At a minimum, the Contractor shall submit the following to CDOT, City of Colorado Springs, and or Springs Utilities for review, Approval, and/or Acceptance:

Deliverable	Review, Acceptance, or Approval	Schedule
Pavement Marking Plans	Acceptance	Prior to issuance of Released for Construction Documents
Class III, major overhead signs, and regulatory and guide signs plan	Approval	Submitted with Preliminary Design and Plans.
Sign layouts for all special signs of any size	Acceptance	Prior to issuance of Released for Construction Documents
Custom-designed monotube sign structure and foundation plans	Acceptance	Prior to issuance of Released for Construction Documents
Median butterfly sign structure and foundation plans	Acceptance	Prior to issuance of Released for Construction Documents
All temporary and permanent traffic signal plans	Acceptance	Prior to issuance of Released for Construction Documents
All permanent lighting plans	Acceptance	Prior to issuance of Released for Construction Documents
Traffic Signal Timing Plans and associated electronic timing plan software files.	Approval	28 Days prior to implementation
Lighting and electrical design calculations	Acceptance	Prior to issuance of Released for Construction Documents