

# TRAFFIC SIGNAL GENERAL NOTES AND TABULATION OF SIGNAL QUANTITIES

- Traffic Signal Materials and Installation shall comply with the "State of Colorado - Standard Specifications for Road and Bridge Construction", The "State of Colorado - Standard Plans, M and S Standards (Latest Edition), the "Manual of Uniform Traffic Control Devices", the "National Electric Code", and all local ordinances and regulations that apply, except as noted on the plans or special provisions.
- The Contractor shall adhere to the following requirements regarding Traffic Signal construction and maintenance personnel. Current Certificates showing qualifications shall be submitted at the pre-construction meeting.
  - For any work inside the traffic signal cabinet, Signal and Signal Bench Technicians shall be minimum IMSA Level II certified. This includes the completion of training in construction, corrective maintenance and signal turn-on.
  - For all work external to the signal cabinet, a- minimum IMSA Level I Traffic Signal Field Technician/Electrician - or Traffic Signal Bench Technician/Signal Technician - is required. An IMSA Level II Traffic Signal Electrician - shall be on the job site at all times that signalization work is taking place to ensure proper construction. A maximum ratio of four IMSA Level-I to one IMSA Level-II will be allowed for work external to the signal cabinet.
  - The United States Department of Labor - Bureau of Apprenticeship and Training may be substituted for the IMSA Level I Traffic Signal Electrician requirement.
- All vehicle and pedestrian indications shall be approved solid state LED type. Luminaires shall be LED (8500 Lumens) at 40-foot mounting height.
- Traffic signals that are mounted on mast arms shall be furnished with mounting brackets and black louvered backing plates. All signal heads to be centered over outbound lanes as per plans. Signal backplates shall include yellow retroreflective border.
- Installation shall include ADA pedestrian push buttons. Pedestrian push button signs shall conform to MUTCD or r103b.
- The signal shall not be put in flash mode or made fully operational until CDOT has inspected and approved the installation, and all pavement markings are in place. The existing or temporary traffic signal shall remain operational until the new signal is tested and approved by the Engineer for operational service. Contact Tony Kerr, Region 2 (719) 251-4201
- All used or excess signal equipment, to include signal pole but not signal heads or wiring, shall remain the property of CDOT and delivered to the Region 2 signal shop; contact Tony Kerr, Region 2 (719) 251-4201.
- Measurement and payment of traffic signal construction items shall conform to the project specifications.
- All items not shown in the traffic signal quantities shall be considered incidental to the construction of the traffic signals and will not be paid & measured separately. All quantities are approximate. The Contractor shall be responsible for all work necessary to complete the construction shown on the plans to build a complete and functioning system.
- Pole finishes shall match existing poles.
- The Contractor shall field verify mast arm length with Tony Kerr (719) 251-4201, prior to ordering the mast arms.
- Should Contractor incur water in the caisson excavation, any de-watering methods & necessary permits shall be included in the cost of the caisson. Contractor shall provide method statement to accomplish de-watering.
- All conduits shall have a pull rope left in them when construction is completed. All conduit under the roadway shall be directionally bored a minimum of 3' below existing pavement. Directionally bored conduit and fittings and tracer wire shall be HDPE 3408.
- All signal cable shall be continuous from connections made in the hand-hole compartment of signal pole base to the terminal compartment in the controller cabinet. Splicing shall not be permitted.
- Signal heads shall be bagged with a heavy black plastic until ready for operation.
- All removed luminaires and poles shall remain property of CDOT.
- All camera detector lead-in cables are continuous from the controller to the camera detectors. No splices will be permitted. Camera detectors shall be mounted in accordance with the manufacturer recommendations and approved by CDOT. All cameras shall be mounted on signal mast arms with a 5' extension arm (to be included in the cost).
- Contractor shall complete all work necessary for the operation of the system, and shall contact CDOT traffic operations, Contact Tony Kerr, Region 2 (719) 251-4201, to schedule a compliance inspection prior to flash operation. Contractor shall add Cienna fiber switch/laterals in existing controller cabinet for re-splice. Upon completion of the inspection, the field operation testing shall begin. The complete traffic system shall be fully operational and fully tested at the completion of the project.
- Contractor to ensure proper signal operation during removal and replacement, and reset of traffic signal controller.

- Traffic signal will need to run for a minimum of 15 days without any issues, as identified by Region 2 Traffic Operations (Contact Jason Nelson, at 719-546-5734), before the project will be accepted.
- Pull box locations are approximate. Actual locations shall be verified in the field by the Engineer. All pull boxes shall be flush with finished ground surface. Pull boxes shall not be spaced farther than 200' apart.
- Prior to all milling or planing operation at signalized intersections, all video detection equipment called out in the plans and adaptive radar markings shall be in place and shall be operational. All video detection changes during milling or planing operations and striping reconfiguration will not be measured and paid for separately but shall be included in the work. Upon acceptance, all shall be operational as well.
- No excavation shall be permitted until underground utilities have been located to the satisfaction of all parties. The Contractor shall be responsible for protecting all utilities above and below ground during construction. Contact the Utility Notification Center of Colorado (UNCC) to have locations of UNCC registered lines marked by member companies. Call 811 for all locations. For location of CDOT utilities, contact Tony Kerr, Region 2 (719) 251-4201. All other utilities shall be located by contacting the respective company.
- Two or more weeks prior to the start of construction, the Contractor shall submit temporary phasing and timing signal plans to the Engineer for approval.
- Contractor's signal electrician is required to be on site, at a minimum, during AM & PM peak hours following the next day a signal is turned on to observe operation and make adjustments as needed. Signal electrician's additional hours may be required by the Engineer. This applies to both permanent and temporary installations.
- The Contractor shall provide CDOT with at least four (4) sets of equipment specifications/descriptions, COC's and obtain approvals prior to ordering the equipment.
- The Contractor shall adjust the existing traffic signal interconnects in the project area, as necessary
- All manuals, installation guides and associated equipment shall be provided to the Engineer at time of inspection.
- Signal shall be re-spliced to US 50 fiber backbone via Cienna 3930 equipment and shall be tested from 29<sup>th</sup> Street node for operation.

TABULATION OF SIGNAL QUANTITIES (FOR INFO ONLY)					
ITEM NO.	DESCRIPTION	UNIT	PUEBLO BLVD		TOTAL
			US 50	WB RAMP	
202-00821	Removal of Sign Panel	EACH	2	1	3
202-00827	Removal of Pull Box	EACH	2	2	4
202-00831	Removal of Traffic Signal Head	EACH	1		1
202-00840	Removal of Traffic Signal Pole	EACH	1	1	2
202-00848	Removal of Traffic Signal Controller and Cabinet	EACH		1	1
202-00858	Removal of Pedestal Pole	EACH	1		1
210-00476	Reset Microwave Vehicle Radar Detector (MVRD)	EACH	1	1	2
210-00831	Reset Traffic Signal Head	EACH		4	4
210-00848	Reset Traffic Signal Controller and Cabinet	EACH	1		1
210-00865	Reset Pedestrian Signal Head	EACH	2		2
210-00890	Reset Intersection Detection System (Camera)	EACH	3	2	5
503-00036	Drilled Caisson (36 inch)	LF	30	15	45
613-00200	2 Inch Electrical Conduit*	LF	1,128	278	1,406
613-00206	2 Inch Electrical Conduit (Bored)	LF	265	25	290
613-00306	3 Inch Electrical Conduit (Bored)	LF	530	50	580
613-07023	Pull Box (24"X36"X24") *	EACH	2		2
613-07039	Pull Box (30"X48"X18")	EACH	2	2	4
613-10000	Wiring**	LS	0.5	0.5	1
613-13006	Luminare (Led) (8500 Lumens)	EACH	2	1	3
614-00011	Sign Panel (Class I)	SF	57	39	96
614-70150	Pedestrian Signal Face (16) (Countdown)	EACH	2		2
614-70336	Traffic Signal Face (12-12-12)	EACH	8	2	10
614-70448	Traffic Signal Face (12-12-12-12)	EACH	2	2	4
614-72855	Traffic Signal Controller Cabinet	EACH		1	1
614-72860	Pedestrian Push Button	EACH	2		2
614-72886	Intersection Detection System (Camera)	EACH	1		1
614-81145	Traffic Signal-Light Pole Steel (1-45 Foot Mast Arm)	EACH	1		1
614-81155	Traffic Signal-Light Pole Steel (1-55 Foot Mast Arm)	EACH	1	1	2
614-87350	Test Fiber Optic Cable	LS	0.5	0.5	1
614-87424	Fiber Optic Cable (Single Mode) (24 Strands)	LF	345	345	690
614-87524	Splice Fiber Optic Cable (24 Strand)	EACH	1	1	2
614-87624	Terminate Fiber Optic Cable (24 Strand)	EACH	1	1	2

\* INCLUDES QTY FOR FLASHING BEACONS (SEE SIGNING AND STRIPING PLAN FOR LOCATION).

\*\* QTY ALSO INCLUDES WIRING FOR ITEMS SUCH AS TRAFFIC SIGNAL, PUSH BUTTON POST ASSEMBLY, DETECTION SYS. (CAMERA) AND FLASHING BEACON

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