SPECIAL PROVISIONS

Newburyport
Traffic Signal Design and Related Work
State Street at Parker Street HAWK Signal

SCOPE OF WORK

The work under this contract consists of the fabrication and delivery of a traffic signal pole, mast arm, and other corresponding components to be installed at a future new traffic signal to be located adjacent to the intersection of State Street at Parker Street in Newburyport, MA. All other work associated with the intersection's reconstruction and construction of other traffic signal infrastructure components will be bid and contracted under separate cover.

All work under this contract shall be done in conformance with the *Standard Specifications for Highways and Bridges* dated 2020, the *Supplemental Specifications dated April 1, 2019;* the *December 2015 Overhead Signal Structure and Foundation Standard Drawings*, and these Special Provisions.

DESIGNER / PROJECT MANAGER

DESIGNER
TEC, Inc.
Samuel W. Gregorio, PE, PTOE, RSP_1
(978) 794-1792 x1015

MEASUREMENT AND PAYMENT

All provisions pertaining to measurement and payment in the *Standard Specifications for Highways and Bridges* dated 2020, these Special Provisions, and the Plans, and the Supplemental Specifications shall defer to measurement and payment as stipulated under this Contract in the Proposal Bid Price.

ENGINEERING DIRECTIVES

Contractors can access MassDOT, Highway Division Engineering Directives at:
https://www.mass.gov/massdot-engineering-directives

ITEM 817.63 SIGNAL MAST ARM 35 FEET - STEEL EACH

The work shall include the furnishing one (1) mast arm assembly with anchor bolts, materials, and incidental costs necessary to provide a complete and fully operational High-Intensity Activated Crosswalk (HAWK) traffic control signal system, as part of a design under separate cover, as specified adjacent to the intersection of State Street / Parker Street. Work under this item shall conform to the relevant provisions of Section 800 and 900 of the *Standard Specifications for Highway and Bridges* (Standard Specifications), *2020 Edition* and the following:

Major item components of the mast arm assembly to be fabricated under this Item include:

- 35-foot smooth tapered steel mast arm;
- 22-foot vertical pole for 35'foot mast arm assembly;
- anchor bolts;
- vibration damper;
- pole cap; and
- varmint screen

It is not intended that every fitting, minor detail or feature be shown and described, as the assumption is made that the Contractor and/or their Subcontractor is an expert in the particular area of responsibility and is capable of interpreting the plans, Specifications, and Special Provisions so that the bid and/or construction shall include all items required to provide complete, fully operational traffic control signal system and that they shall be provided and installed in a neat and workmanlike manner.

Mast Arms and Poles (less than 60 feet in length)

All mast arm poles shall be Type 2 steel monolevers primed and painted gloss black, with shoe bases. Mast arms and poles shall be fabricated and constructed in conformance with the Massachusetts Department of Transportation (MassDOT's) *Overhead Signal Structure & Foundation Standard Drawings* issued December 2015. Mast arms have been designed based upon MassDOT AASHTO 2013 standards with 130 miles per hour (mph) wind speed.

Acceptance of Type 2 mast arm poles will be contingent upon review and approval of shop drawings submitted by the Contractor. Longhand design calculations shall be submitted by the Contractor with the shop drawings for the Type 2 mast arm pole. The Contractor shall provide a set of calculations, stamped by a Structural Engineer registered in the Commonwealth of Massachusetts, along with plans and specifications for review by the Engineer. Steel components for the mast arm assemblies shall be fabricated to MassDOT standard as noted in Tables 1 and 2.

ITEM 817.63 (Continued)

Galvanizing

All bolts, screws, nuts, rods and washers shall be galvanized in accordance with AASHTO M232 and the Standard Specifications. The hardened machine screws may be electroplate galvanized. Stainless steel studs, bolts, screws, nuts, straps and washers shall not be galvanized. Galvanized hardware need not be painted; however, the ends of bolts, nuts, and washers shall be painted in the field according to section "Touch-up and Repairs." Immediately prior to galvanizing, the steel shall be immersed in a bath of zinc ammonium chloride. The dry kettle galvanizing process shall be used.

All steel components, other than above, shall be galvanized after fabrication in accordance with AASHTO M111. The galvanizing bath shall contain nickel (0.05% to 0.09% by weight).

Galvanized members requiring shop assembly shall be welded and drilled prior to galvanizing.

The applicator shall ensure that all components are smooth and without sharp protrusions that would present and injury hazard to pedestrians. Also, the fabricator shall ensure that all welds shall be cleaned thoroughly in accordance with good practice and according to AWD D1.5 and ASTM A123-89a and shall have a suitable surface to accept the galvanizing.

Coating Over Galvanized Steel

In preparation for painting system over galvanized steel, the surface shall be blast cleaned in accordance with the requirements of SSPC SP7 "Brush-Off Blast Cleaning" or other method producing equivalent results and uniform profile, to achieve a 1.0 to 1.5 mils anchor profile as indicated be a Keane Tator profile comparator or similar device.

Following blast cleaning, the coating thickness shall be measured to verify that the coating thickness is in accordance with AASHTO M111.

The painting method for the coating over galvanized steel stall be stamped by a structural engineer in the Commonwealth of Massachusetts. The color over galvanized steel shall be BLACK. The fabricator shall submit to the Engineer for approval, paint chips of the intended color prior to any work being done under this heading.

All finish coat material shall be applied under conditions within the following tolerances:

Air Temperature	50°F min.,	90°F max.
Surface Temperature	50°F min.,	100°F max.

Surface temperature must be at least 5°F above the dew point. The finish coat shall be cured in a booth capable of maintaining 150°F for 2-4 hours.

ITEM 817.63 (Continued)

All paint coating over galvanized steel must be furnished with a five (5) year manufacturer warranty.

Touch-Up and Repairs

Should any damage occur to the galvanized coating during shipping or handling at the job site, the Contractor shall repair and touch-up any damaged areas to the satisfaction of the Engineer and the following:

Touch-up of galvanizing before any finish coat is applied shall be accomplished by applying galvanizing repair paint. The dry film thickness of the applied repair paint shall not be less than 4.0 mils. Applications shall be in accordance with the manufacturer's instruction.

Field touch-up procedures shall conform to the recommendations of the Galvanizer. Touch-up of the finish coat shall be by applying a coating of a two-part urethane, as supplied by the Galvanizer, to achieve a dry film thickness of at least 4.0 mils. Prior to the application of the paint, remove all damaged coatings down to a solidly adhered coating and apply galvanizing repair paint as primer. Allow the primer to dry for at least 4 hours prior to top coating.

Shop Drawings and Certificate of Compliance

The Contractor shall commence no work until approval of the shop drawings has been received in writing from the Engineer. Approval of these drawings will be general in character and shall not relieve the Contractor from the responsibility of, or the necessity of, furnishing materials and workmanship required by the plans and these specifications.

Along with the shop drawings the Contractor shall deliver to the Engineer a certificate of compliance with the manufacturer for all materials purchased from the manufacturer.

Delivery of Items

The Contractor shall exercise extreme care in the transporting traffic control signal equipment for delivery to the City of Newburyport Department of Public Works (DPW) at 16A Perry Way, Newburyport, MA 01950.

Method of Measurement and Basis of Payment

Item 817.63 shall be measured and paid for at the Contract EACH price, which price shall include all labor, material, equipment and incidental costs required to complete the work; including delivery to City of Newburyport.

ITEM 817.63 (Continued)

POLE & SIGNAL ARM DATA																				
QTY	SIGNAL ARM TUBE				POLE TUBE				POLE BASE					ANCHOR BOLT		SIGNAL ARM ATTACHMENT DATA						
	SPAN (FT)	FIXED END DIA. (IN)	FREE END DIA. (IN)	WALL THK.	BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	WALL THK.	PLATE CIRCLE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	HOLE "Z" (IN)	HOLE "X" (IN)	DIA "K" (IN)	EMBED LENGTH "J" (IN)	"A" (IN)	"B" (IN)	"C" (IN)	"D" (IN)	"E" (IN)	"F" (IN)	"G" (IN)
1	35.00	12.00	7.10	3 GA.	15.00	11.92	22.00	3 GA.	27.00	22.00	2.00	1.75	12.50	1.50	36.00	20.25	17.00	8.50	2.00	1.25	0.313	6.50

MATERIAL DATA		
COMPONENT	DESIGNATION	YIELD (KSI)
POLE TUBE	ASTM A595 GR. A	55
POLE BASE PLATE	AASHTO M270, OR ASTM A709	50
ANCHOR BOLTS	AASHTO M314, OR ASTM A307 GR. C	55
GALVANIZING	AASHTO M111 OR M232	
ARM TUBE	ASTM A595 GR. A	55
ARM CONNECTION PLATE	AASHTO M270, OR ASTM A709	50
ARM CONNECTING BOLTS	AASHTO M164, OR ASTM A325**	
** BOLTS WHICH ACCUMULATE RUST OR DIRT SHALL BE DISCARDED		