(N) Temporary Traffic Signal Installations

When a traffic signal is installed for control of traffic during construction of the project and scheduled for removal during or upon completion of the project, install and remove the temporary traffic signal as required. Upon removal of the temporary traffic signal, restore surface to like-new condition. Rake smooth unpaved areas, repave paved areas and seed grassed areas that were damaged by Contractor activities.

Prepare intersection for sign control before removing the temporary traffic signal. Install required regulatory signs in accordance with Sections 900, 901 and 903. Cover signs with burlap bags until traffic signal is placed into flashing operation.

Place traffic signal into flashing operation and uncover signs simultaneously. Operate the flashing operation for a period of time as directed by the Engineer.

Signal cabinets, controllers, detector units, signal heads and accessories and microwave detectors are property of the Department. Return Department owned equipment between 8:00 a.m. and 12:00 p.m., Monday through Thursday, to the Traffic Services Office within the Division responsible for administration of the project. Assume ownership of removed poles, messenger cable, interconnect cable, communications cable, supporting hardware and loop emulator detection equipment, unless otherwise specified.

1700-4 MEASUREMENT AND PAYMENT

There will be no direct payment for work covered in this section. Payment at the contract unit prices for the various items in the contract will be full compensation for all work covered by this section.

Repair, removal and replacement of damaged or unacceptable equipment or work under this section will be at no additional cost to the Department. The Department will deduct the cost of Department-owned equipment damaged by the Contractor from money due to the Contractor.

If the Department performs maintenance and emergency service necessary to ensure continuous traffic signal operation, all expenses incurred by the Department in implementing this option will be deducted from payment due the Contractor, plus $2,500 liquidated damage per occasion, per day or any portion thereof, until corrected.

SECTION 1705
SIGNAL HEADS

1705-1 DESCRIPTION

Furnish and install vehicle and pedestrian LED signal heads, visors, interconnecting brackets, wire entrance fittings, mounting assemblies, signal cable, lashing wire, pedestrian pushbuttons (and associated lead-in cable), pedestrian signal signs, grounding systems and all necessary hardware.

1705-2 MATERIAL

Furnish material, equipment and hardware under this section that is pre-approved on the ITS and Signals QPL.

1705-3 CONSTRUCTION METHODS

(A) General

Bag new pedestrian and vehicle signal heads with burlap bags or bags made of non-ripping material specifically designed for covering signal heads until signal heads are placed in operation. Do not use trash bags of any type.

When new signal heads are placed into operation, immediately bag and remove signals heads that are not to be reused.

Adjust each signal head vertically and horizontally so that light output will be of maximum effectiveness for traffic and pedestrians. Do not tilt signal heads forward.

Reposition signal heads as required for various construction phases.

(B) Vehicle Signal Heads

Install vehicle signal heads such that the top of the signal housing located over any portion of a highway that can be used by motor vehicles is no more than 25.6 ft above the pavement.

Install vehicle signal heads such that the maximum mounting height to the top of the signal housing is as shown in Figure 1705-1 if the location is between 40 ft and 53 ft from the stop line.

Maximum Mounting Height of Signal Heads
Located Between 40 Feet and 53 Feet from Stop Line

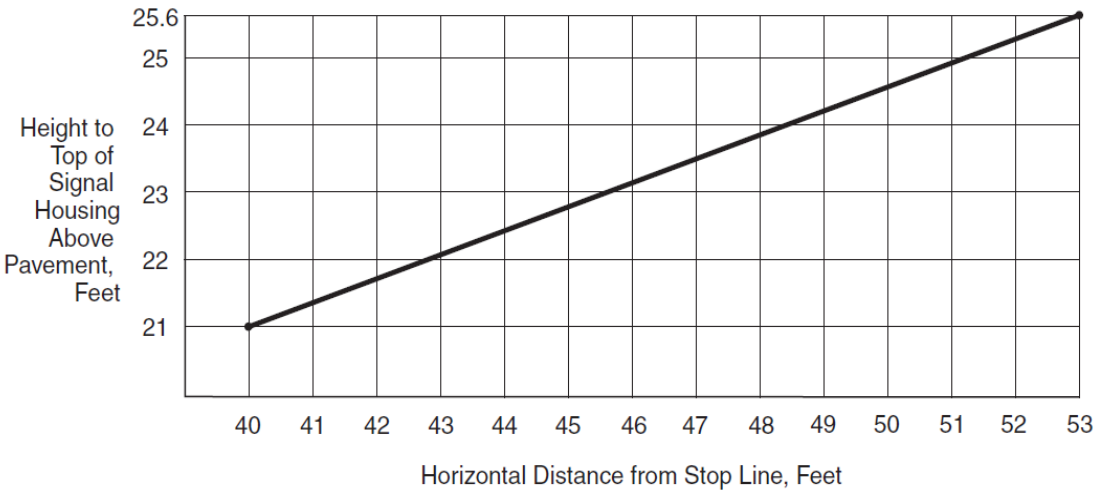

Figure 1705-1. Graph of maximum mounting height of signal heads.

Install vehicle signal heads such that the bottom of the signal housing and any related attachments to the signal head located over any portion of a highway that can be used by motor vehicles is at least 16.5 ft above the pavement directly below the signal head.

(1) Install vehicle signal heads such that the bottom of the signal housing (including brackets) of a signal head that is vertically arranged and not located over a roadway is as follows:

(a) A minimum of 8 ft and a maximum of 19 ft above the sidewalk or, if there is no sidewalk, above the pavement grade at the center of the roadway.

(b) A minimum of 8 ft and a maximum of 19 ft above the median island grade of a center median island if located on the near side of the intersection.

(2) Install vehicle signal heads such that the bottom of the signal housing (including brackets) of a signal head that is horizontally arranged and not located over a roadway is as follows:

(a) A minimum of 8 ft and a maximum of 22 ft above the sidewalk or, if there is no sidewalk, above the pavement grade at the center of the roadway.

(b) A minimum of 8 ft and a maximum of 22 ft above the median island grade of a center median island if located on the near side of the intersection.

Where vehicle signal heads are installed on messenger cable, install mounting hardware consisting of messenger cable hanger, balance adjuster, bottom cap, wire entrance fitting bracket and insulating bushings.

Where vehicle signal heads are installed on mast arms, install mounting hardware consisting of rigid vehicle signal head mounting brackets.

Install signal cable in continuous lengths between signal controller cabinets and signal heads. Route signal cable to minimize the length of cable installed and the number of cables and conductors in each run. Pull 36" of additional signal cable into controller cabinets.

Wrap signal cable to messenger cable with at least 4 turns of wrapping tape spaced at intervals less than 15" or lash signal cable to messenger cable with one 360° spiral of lashing wire per 12".

Make electrical connections inside each signal head, signal controller cabinet and termination compartment in metal poles. Do not splice cable at any other point between signal heads and controller cabinet.

Coil sufficient signal cable beside each vehicle signal head to accommodate head shifts during various construction phases. For final signal head locations, coil 36"on each side of signal head if signal cable comes from both directions. If signal cable terminates at the signal head, coil 36"of signal cable on the same side as the cable run.

(C) Pedestrian Signal Heads

Install signs with mounting hardware immediately above pedestrian pushbuttons.

Mount the pushbutton or accessible pedestrian signal (APS) at a minimum height of 3.5 ft but no higher than 4.0 ft above the adjacent pedestrian travelway.

Connect each pushbutton with a separate run of lead-in cable between the pushbutton and the termination panel in the controller cabinet. Bond pushbutton housing and all metal components to cabinet ground using lead-in cable ground.

Mount pedestrian signal heads so the bottom of the signal housing, including brackets, is not less than 7 ft or more than 10 ft above sidewalk level. Position and adjust the heads to provide maximum visibility at the beginning of the controlled crosswalk. Ensure pedestrian signal heads and vehicular signal heads mounted on the same support are physically separated from each other.

(D) Optically-Programmed Vehicle Signal Sections

Install vehicle signal heads with optically-programmed vehicle signal sections so that movement of the vehicle signals head is restricted. Tightly tether vehicle signal heads at the top and bottom when installed on messenger cable. Attach vehicle signal heads using a mounting-bracket assembly that locks the vehicle signal head into position from the back and restricts movement when installed on mast arms.

(E) Louvers

Attach the louvers to the visors using stainless steel hardware. Position the signal head to give the viewing angle as shown in the plans.

(F) Modify Existing Vehicle Signal Heads

Modify existing vehicle signal heads as shown in the plans.

1705-4 MEASUREMENT AND PAYMENT

Vehicle Signal Head (____) and *Pedestrian Signal Head* (____) will be measured and paid as the actual number of signal heads of each type of material (aluminum or polycarbonate), size and number of sections furnished, installed and accepted.

Vehicle Signal Head with Single Optically-Programmed Sections will be measured and paid as the actual number of signal heads containing a single optically-programmed section furnished, installed and accepted.

Vehicle Signal Head with Multiple Optically-Programmed Sections will be measured and paid as the actual number of signal heads containing multiple optically-programmed sections furnished, installed and accepted.

Louver will be measured and paid as the actual number of signal sections for which louvers have been furnished, installed and accepted.

Modify Existing Vehicle Signal Head will be measured and paid as the actual number of existing vehicle heads modified and accepted.

Signal Cable will be measured and paid as actual linear feet of signal cable furnished, installed and accepted. Measurement will be point to point with no allowance for sag. Twenty-five feet will be allowed for vertical segments up or down poles.

Lead-in Cable will be measured and paid in accordance with Section 1726.

No measurement will be made of visors, wire entrance fittings, interconnecting brackets, mounting assemblies, pedestrian pushbuttons, pedestrian signal signs and signal head shifts as these are incidental to furnishing and installing signal heads. No measurement will be made for drip loops, coiled sections or lashing wire as these are incidental to furnishing and installing signal cable.

Payment will be made under:

Pay Item	Pay Unit
Vehicle Signal Head (____)	Each
Pedestrian Signal Head (____)	Each
Vehicle Signal Head With Single Optically-Programmed Sections	Each
Vehicle Signal Head With Multiple Optically-Programmed Sections	Each
Louver	Each
Modify Existing Vehicle Signal Head	Each
Signal Cable	Linear Foot

SECTION 1706
BACKPLATES

1706-1 DESCRIPTION

Furnish and install backplates for vehicle signal heads with all necessary hardware.

1706-2 MATERIAL

Refer to Division 10.

Item	Section
Backplates	1098-2

Furnish material, equipment and hardware under this section that is pre-approved on the ITS and Signals QPL.