All signal heads and pedestrian signal heads must be Standard ITE black poly-carbonate signal heads. Standard ITE vehicle signal heads must utilize Light Emitting Diodes (LED) units.

The vehicle signal heads and LED indications must be listed on MnDOT’s Approved/Qualified Products List (APL) for Signals. All signal heads furnished at one intersection must be made by the same manufacturer.

The LED signal indication must operate on a nominal 120 VAC power source.

The contractor must apply a label in accordance with 2565.3L.6 showing the month and year the indication was installed.
A background shield (or backplate) must be dull non-reflective black and attached to a vehicle signal head as specified in the Contract Documents. The bottom of a background shield that is attached to a vehicle signal head mounted directly above a pedestrian signal head must not be cut.

The visors must be of the tunnel type, finished dull non-reflective black and enclose approximately 80 percent of the lens circumference.
The LED signal indication must be a MnDOT approved unit. The signal indication must be listed on MnDOT’s Approved/Qualified Products List (APL) for Signals.

A terminal block must be provided and securely fastened to the inside of one of the signal housings for connecting the conductors. The conductors from each indication must be run independently to the terminal block and must not be bound together into a cable. The conductors must not be spliced from the signal indication to the terminal block in the signal head.

For vertically mounted terminal blocks termination of the signal control cable running from the pole base into signal head shall be terminated with the spade lug mounted horizontally and a loop of wire extending up from the terminal block at least 3 inches above the block and then a loop back down to exit the signal head for termination in the pole base.
For horizontally mounted terminal blocks termination of the signal control cable running from the pole base into signal head shall be terminated with the forks of the spade lug pointing down.

After the conductors have been properly terminated the entire terminal block and the spade lugs shall be sprayed with a MnDOT approved pole base terminal block coating as listed on MnDOT’s Approved/Qualified Products List (APL).
EXISTING TRAFFIC CONTROL SIGNAL SYSTEMS

When pole mounted signal heads utilizing bracketing are mounted on the mast arm pole they must utilize a 1½ inch (38 millimeter) half coupling that is welded to the mast arm pole shaft (one on each side), 10 feet (3.5 meters) above the pole foundation. The supporting pipe may utilize a three piece coupling between the signal head and the pole shaft.

A support pipe, with an ornamental pole clamp, must be installed on the top of the pole. The clamp must be fastened to the shaft with 3/4 inch (19 mm) stainless steel banding and clip.

If a pedestrian signal head is mounted with bracketing on the bottom side of the signal head a cross fitting and another supporting pipe with tee and ornamental pole clamp must be used and the clamp banded to the shaft.
NEW TRAFFIC CONTROL SIGNAL SYSTEMS

New traffic control signal systems will require that the Contractor furnish and install angle mounts for the installation of vehicle and pedestrian signal heads on mast arm pole standards.

When installing Cluster Head Assemblies on poles the extended threaded pole adaptor must be used. Additionally the ball and socket must be adjusted with little or no gap on the back side to allow the background shield to clear the pole.
New traffic control signal systems will require the Contractor to furnish and install straight mounts for the installation of vehicle and pedestrian signal heads onto pedestal shafts.

Angle and straight mounts must be a MnDOT approved. Approved mounts are listed on MnDOT’s Approved/Qualified Products List (APL) for Signals.

The straight mount manufacturer ships threaded inserts (rivet nuts) with each bolt on hub and flange which is used to attach the straight mount to the pedestal shaft.
Chapter 18

Signal Heads

The Contractor must use a manufacturer’s specific threaded insert (rivet nut) installation tool to properly fasten the devices into the pedestal shaft.

New traffic control signal system Contract Documents will include details for installing one way mounts onto mast arm pole standards and pedestal shafts.

All wiring must be internal to the straight or angle mounts, the signal bracketing pipes, and signal heads, and the wires must terminate on the terminal block provided inside the pedestrian or signal head.
Pedestal caps must be either steel or anodized cast aluminum based on the material of the pedestal shaft. The pedestal cap must be the same color as the pedestal shaft.

When installing 4 or 5 section signal indications, Signal Head Mounting Spacers must be used.
Signal heads mounted on the mast arm must have two indications mounted below the one way mount and the rest above. For example, in a four section (FYA) head, two indications are mounted below the one way mount and two above it. The Contractor must utilize signal head mounting spacers as specified in the contract.

The signal heads are fastened to the mast arm mounting flange and the straight mount is bolted to the mast arm as indicated in the Contract Documents.

All vehicle and pedestrian signal heads must be bagged immediately after installation and must remain so until the traffic control signal system is placed into operation.
The access openings are located on the back side of the vertical mast arm pole standard, backside of the luminaire extension, under the mast arm truss near the point of attachment of the mast arm, and back side of truss at each mid-arm location to facilitate pulling the wires from the signal heads mounted on the mast arm.

All wiring must be internal to the mast arm and terminated on the terminal blocks in the signal heads.
Chapter 18

Pedestal Mounted Heads

A traffic control signal pedestal consists of the base, the shaft, slipfitter collar (bracket systems), re-enforcing collar, and appropriate signal heads.
On pedestal installations with bracketing, a slipfitter collar is mounted on top of the shaft so that bracketing pipes can be threaded into it and allows the mounting of any variety of signal heads. All signal brackets and pipe fittings must be mounted plumb and level.

Aiming signal heads must be done in the presence of the District Traffic Office representative when the signal is flashing. This requires two people; one person must stand at the location from which the indications are to be seen and direct the second person adjusting the signal heads.

Signal heads must be made plumb in all directions.
Pedestrian Signal Heads
Pedestrian signal housings must be Standard ITE black poly-carbonate. Pedestrian signal indications and housings must be furnished and installed as specified in the Contract Documents and operate on nominal 120 volts. The signal heads must be the adjustable type that can be rotated 360 degrees about its vertical axis.

Nominal 16 inch by 18 inch (406 by 457 millimeter) LED pedestrian signal indications with countdown timer must be furnished by the Contractor as specified in the Contract Documents. All pedestrian signal indications with countdown timers must be on MnDOT’s Approved/Qualified Products List (APL) for Signals as indicated in the Contract Documents.

Ramp Meters
Unless otherwise specified in the Contract Documents ramp meters must have nominal 8 inch (200 mm) LED indications. The visors must be of the cutaway type.
Flashing Yellow Arrow (FYA)

MnDOT is now installing the Flashing Yellow Arrow traffic control signal head at signalized intersections throughout the State. When operated correctly the flashing yellow arrow signal will make traffic control signals more efficient without compromising safety.

**INSTALLATION**

Flashing yellow arrow signal heads must have two sections mounted above the mast arm and two sections mounted below the mast arm.
In some FYA applications where the lane is stripped for both a thru movement and a left turn, a cluster mount (dog house) style signal head configuration is used.

An approved cluster mount adaptor is listed on MnDOT’s Approved/Qualified Products List for signals.

This signal head configuration also requires a bi-modal indication. This signal indication has both a green and yellow arrow with a clear lens. Approved bi-modal indications are listed on MnDOT’s Approved/Qualified Products List for signals. Bi-modal indications are only approved for use in this specific application only.

This signal head configuration is a 5 section 6 indication type. The bi-modal indication provides the solid green arrow and flashing yellow arrow indication.