

## CHAPTER 19 – EMERGENCY VEHICLE PREEMPTION “PRIORITY”/ENFORCEMENT LIGHT

### EMERGENCY VEHICLE PREEMPTION “PRIORITY”

Emergency vehicle preemption “priority” (EVP) allows the normal operation of traffic control signals to be preempted for emergency purposes halting conflicting traffic and allowing for emergency vehicle right-of-way to help reduce response times and enhance traffic safety. All EVP systems must be fully operational at the time of traffic control signal turn on.

#### 19.1 Optical Emitter-Activated EVP System

The optical emitter activated type EVP system consists of four main components:

1. Optical detector
2. Confirmation light
3. Emitter
4. Phase selector

The optical detector mounted on the traffic control signal mast arm receives the optical communication and transmits the message to the phase selector in the cabinet.

At this time, a confirmation light mounted on the mast arm will be activated as a solid light. The other three directions will also activate to a flashing condition.

When EVP is installed, MnDOT requires LED confirmation indications be used on traffic control signal systems. Approved LED EVP confirmation indications are listed on MnDOT’s Approved/Qualified List (APL) for signals.

The emitter on the emergency vehicle establishes direct one-way communication with the detector via an optically-coded, high intensity strobe light.

The phase selector mounted inside the traffic control signal cabinet checks the condition of the signal coming from the emergency vehicle, and then it either holds the green light for the approaching emergency vehicle, or accelerates the normal cycle to provide a green light by the time the emergency vehicle reaches the intersection.

After the emergency vehicle has cleared the intersection, the traffic control signal will return to its normal operation.



Figure 19-1: Two Way Optical Detector



Figure 19-2: Optical Detector



Figure 19-3: Confirmation Light

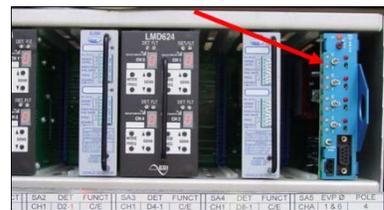


Figure 19-4: Phase Selector



Figure 19-5: Optical Emitter

For optical emitter activated systems, MnDOT now requires specific EVP mounting equipment for mast arm and pedestal mounting as specified in the contract documents (see Figure 19-6).

EVP systems (both emitter activated and siren activated) and EVP verify lamp holders must be MnDOT approved and are listed on MnDOT's APL for signals.

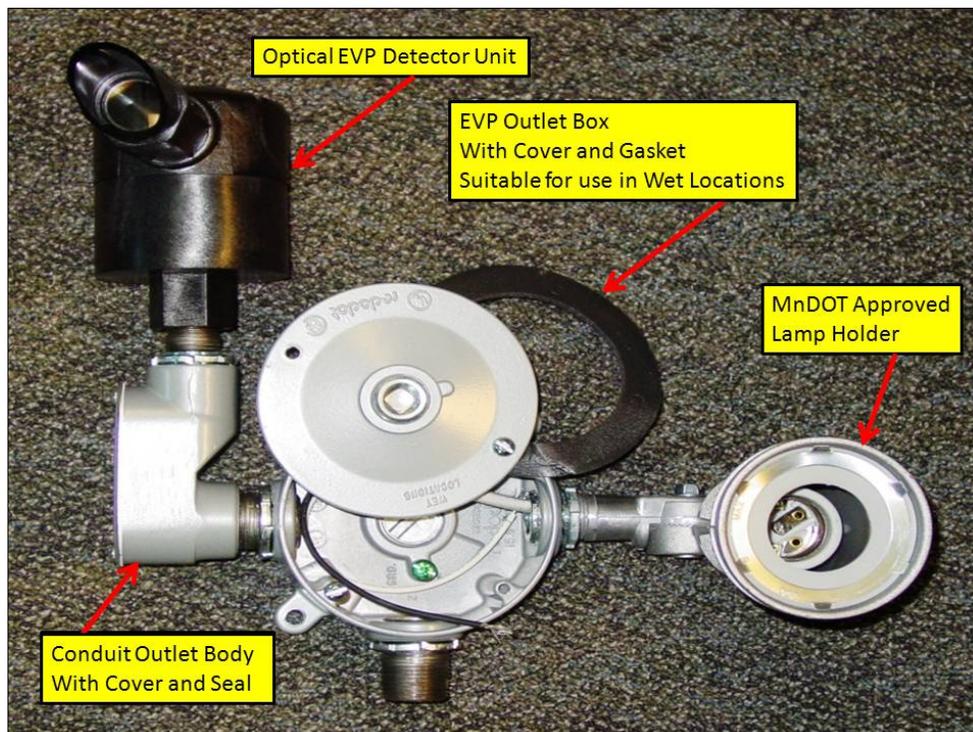


Figure 19-6: EVP Equipment

### 19.1.1 EVP SYSTEM CABLE TYPES

Confirmation Indication:

A 3 conductor, 14 AWG (3/C #14) signal control cable from the signal cabinet to the pole transformer base (pole base connector or terminal block) to the verify light.

Detector Unit:

A 3 conductor, 20 AWG (3/C #20) continuous (without splices) from the EVP detector mounted on the mast arm or top of a pedestal pole to the terminals in the signal cabinet.

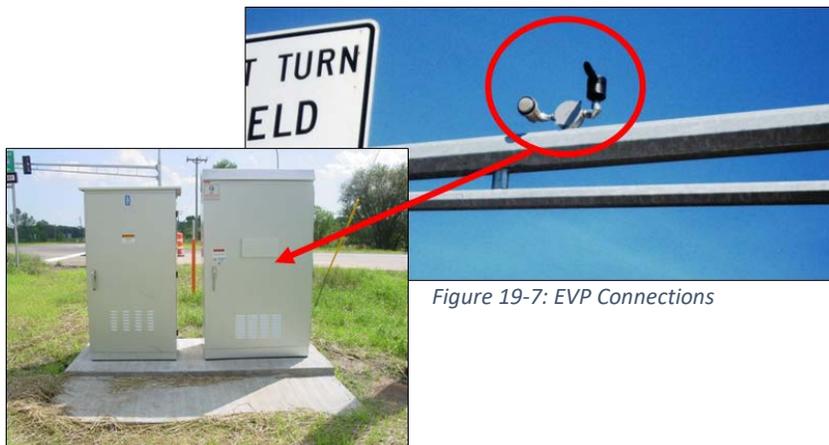


Figure 19-7: EVP Connections

When the traffic control signal system is placed in operation by the district traffic office, the timing and ranges of the EVP system will be adjusted and made operational.

At signal turn on in accordance with MnDOT Standard Specifications for Construction 2565.3W paragraph (13), ensure approaching emergency vehicles can be detected at a minimum distance of 1800 feet.

It is the contractor's responsibility to adjust the EVP detectors and ensure the approaching emergency vehicles are detected at least 1800 feet from the intersection.

## 19.2 Siren-Activated EVP System

A siren activated system consists of three main components:

1. Microphone type detector
2. Verify light
3. Controller card in the traffic control signal cabinet

The siren activated system does not require the use of a separate operator initiated emitter to obtain a green light at the signal. The emergency vehicle's siren activates the EVP system.

All specifications for a siren activated EVP system are contained in the contract documents. MnDOT only allows the use of the siren activated EVP system outside of the eight county Metro area.

The contract documents will specify which type of EVP system (optical or siren activated) is required on the project.



Figure 19-8: Siren Activated EVP



Figure 19-9: Siren Activated EVP

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### 19.3 EVP Indication Lamp Holder Modification (2565.3W.2)

The lamp holder requires a slight modification before the LED confirmation indication is installed. The fiber washer that is behind the stainless-steel retaining clip and the rubber washer must be removed. The rubber washer and stainless-steel retaining clip must be reinstalled.

Ensure that the dielectric grease supplied with each LED confirmation indication is applied to the threads and point of the indication prior to securing the indication in the lamp holder. The dielectric grease reduces or eliminates long term corrosion issues that develop in lamp holders.



Figure 19-10: Lamp Holder

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### 19.4 Enforcement Light

MnDOT may have enforcement lights installed by the contractor at signalized intersection upon Department request.

The intent of the enforcement light is to aid law enforcement in safely pursuing red light runners to reduce the incidence of crashes at signalized intersections.



Figure 19-11: Blue Enforcement Light

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### 19.5 Chapter 19 Resources

- MnDOT Optical Emitter Procurement Guide  
<http://www.dot.state.mn.us/trafficeng/signals/manual.html>