801-T-236 PROTECT THE QUEUE TRUCKS

(Revised 05-01-25)

Description

This work shall consist of strategic and ongoing placement, operation, and repositioning of designated Protect the Queue, PTQ, trucks for advanced queue protection of the work zones in accordance with 105.03, to provide advance warning of the traffic queue where stopped or slowed traffic presents risks to motorists and workers.

This work shall include PTQ trucks and operators who are actively assessing the queue, providing a designated graphic and message, and repositioning the vehicle to provide awareness of the traffic queue resulting from construction operations.

Materials

Materials shall be in accordance with 801.02, 919, and as described herein.

Quality Control

(a) Traffic Quality Control Means and Methods Coordination Submittal, TQCMMCS

The TQCMMCS is a plan that describes how PTQ trucks will be implemented for a given phase of the work zone. For each phase and direction of work, the Contractor shall submit a TQCMMCS to the Engineer. A template TQCMMCS form is available at the Department's Queue Awareness Program website.

For each phase of construction, the Contractor shall meet with the Engineer to review their plan to deploy PTQ trucks prior to preparing the TQCMMCS. Each TQCMMCS shall be prepared in accordance with the Temporary Traffic Control Plan, TTCP, and Department Standards. The TQCMMCS shall consider the predicted lengths and durations of the queues listed in the Contract Information Book. If queue predictions are not available, the Engineer will provide initial placement locations upon request.

The TQCMMCS shall incorporate the configuration of the work zone, including detour routes and interchange ramp control, and provide proposed initial locations for deployment and the staging of PTQ trucks in standby for each day of work. Details shall include start times, initial truck placements, anticipated durations of daily PTQ truck deployments, the planned schedule of deployment, in either calendar days or workdays, and any other specific details discussed between the Engineer and the Contractor prior to submittal.

The Contractor shall submit a TQCMMCS and obtain concurrence from the Engineer with the submittal before beginning each phase of work. The Engineer may request revision and provide detailed guidance. The Engineer may also request a resubmission as conditions change. A copy of each TQCMMCS document shall be retained by the Contractor, kept in Department project files, and delivered via E-mail to the Department's Traffic Management Center at INDYTMC@indot.in.gov.

(b) Operator Training

PTQ truck operators shall view the Department's Training Video for Queue Awareness available on the Department's Queue Awareness Program website. Upon completion of the training, PTQ truck operators shall fill out, sign, date and submit the Statement of Affirmation form as

confirmation that they have completed the training and to affirm their agreement to adhere with the practices discussed in the training and herein. A copy of the signed affirmation form shall be provided to the Engineer. The form is available at the Department's Queue Awareness Program website.

Equipment

PTQ trucks shall consist of a commercial chassis truck with at least 16,000 LB GVWR and shall comply with length requirements designated in IC 9-20-3-4. All PTQ trucks shall be as approved in advance by the Engineer prior to initial deployment on the Project.

(a) Queue Warning Features

In accordance with the PTQ Truck Detail, all PTQ trucks shall include queue warning features consisting of the following equipment:

1. "BE PREPARED TO STOP" Sign

A "BE PREPARED TO STOP" sign, 96 in. wide and 48 in. tall, shall be secured to the vehicle in a manner that ensures the safe operation of the vehicle at highway speeds. The sign shall be in accordance with 919 for traffic sign materials, and shall meet the following additional requirements:

Alternating red and yellow stripes, 6 in. wide, 3M™ Diamond Grade™ Emergency Vehicle Markings 983-71NL and 983-72NL or equivalent. The stripes shall be installed in an upside down "V" fashion in accordance with emergency vehicle marking schemes, as shown on the PTQ Truck Detail. To ensure a robust color, printed sign material shall not be used.

A 30 in. W3-4 "BE PREPARED TO STOP" sign shall be mounted in the center of the alternating red and yellow stripes described above. The sign shall be in accordance with 919 for traffic sign materials. The color shall be FLUORESCENT PINK in accordance with Chapter 6I of the MUTCD.

These signs shall be configured in a manner that does not interfere with brake and reverse lighting ensuring safe operation.

2. Lighting Package on the "BE PREPARED TO STOP" Metal Sign

A lighting package on the "BE PREPARED TO STOP" metal sign shall be distinct from the standard construction lighting package on the PTQ truck and shall meet the following requirements:

Four, Whelen Strip-Lite Plus Series SmartLED® WARNING DUO Model: PSD02FCR 12V RED/WHT flasher lights, or equivalent, shall be installed in accordance with the PTQ Truck Detail.

The operation of the flasher lights shall be managed by a Whelen ULF44, 4 Channel LED Flasher device. The lights shall be placed in solid mode to allow the flasher to operate properly using the ULF44 device. The ULF44 flasher shall be set to operate the ActionFlash 41 pattern.

The flasher lights shall be operable from inside the vehicle using conventional wiring or wireless devices. Lighting packages shall include a dawn-to-dusk dimmer operation, managed from the Whelen Flasher, to avoid excessive lighting during nighttime operations.

3. HAAS Transmitter

A HAAS Transmitter shall be included to report activity to the WAZE TRAFFIC APPLICATIONS. The HAAS transmitter shall be configured to report

activity only when the PTQ truck is actively warning motorists of the presence of queue and while the "BE PREPARED TO STOP" sign is visible to motorists with the Whelen lighting package active.

When queue warning features are inactive, the lighting package shall be off, the HAAS system deactivated, and the metal sign stowed or covered so it is not visible to traffic.

(b) Other features

Other features that shall be equipped on all PTQ trucks include:

1. Retractable Truck-mounted Attenuator

The retractable truck-mounted attenuator shall be suitable for a commercial chassis, in accordance with the applicable attenuator manufacturer specifications. Trailer attenuators are prohibited.

2. Truck-mounted Changeable Message Sign

The truck-mounted changeable message sign shall be a WANCO Model WVMB Large Display, or equivalent. The changeable message sign shall be positioned so that it does not cover the "BE PREPARED TO STOP" sign and shall be in accordance with the MUTCD.

3. Rear Camera with Monitor

A rear camera with monitor capable of continuous operation allowing the PTQ truck operator to continuously monitor approaching traffic.

Each truck mounted attenuator shall meet MASH or NCHRP 350 Test Level 3 or higher requirements. A copy of the FHWA eligibility letter for each truck mounted attenuator model shall be provided to the Engineer prior to use.

Construction Requirements

Unless defined otherwise in the contract, two PTQ trucks in each direction shall be provided where PTQ trucks are protecting the queue.

PTQ trucks shall be deployed in accordance with the TQCMMCS for each phase of construction. Start times and initial truck placement shall be confirmed either daily with the Engineer, as agreed at the pre-construction conference, or as agreed during the execution of the contract.

The Contractor shall provide notice to the Department and the Indiana State Police, ISP, three business days prior to commencing work which may develop a queue, necessitating a need for PTQ trucks. The Contractor's notice shall include: the work location, work start and end times, work date, the anticipated queue locations, and the anticipated queue start and end times.

A queue is a congested line of vehicles, stopped or traveling at a significantly lower speed than the posted speed, due to a construction zone, road hazard, or other atypical event. A queue is visually confirmed by significant deceleration or speed delta in the normal flow of traffic as supported by the presence of widespread brake lights. A PTQ truck's queue warning features shall only be visible to motorists when a queue exists or is beginning to form. Deployed PTQ truck operators shall not activate the queue warning features until a queue begins to form, as supported by the presence of a significant deceleration in the normal flow of traffic and widespread brake lights. Once a queue forms, all queue warning features shall be activated. When a queue is no longer present

during a scheduled deployment, PTQ trucks shall remain in standby for the remainder of the approved period or until the queue returns.

(a) When Queue is Present

When a queue is present, PTQ truck operators shall activate all queue warning features and activate the appropriate message on the PTQ truck changeable message sign in accordance with the "Changeable Message Sign Messaging" guidance herein.

The initial placement of the primary PTQ truck, the one closest to the work zone, shall be approximately 1/4 mile to 1/2 mile in advance of where queuing is anticipated to form, or as directed by the Engineer. Whenever possible, the primary PTQ truck shall be located within the shoulder that is on the same side of the road where work is being performed. When the PTQ truck cannot be positioned on the same side of the road where work is being performed, unique messaging shall be provided, as approved by the Engineer. Often the initial location where the queue will form is the point of restriction, for example at the start of a lane merge.

The initial placement of the secondary PTQ truck shall be approximately two miles in advance of the primary PTQ truck with its Queue Warning Features deactivated. When near live traffic, construction lighting and appropriate messaging shall be activated. The Contractor shall confirm the locations of initial deployments with the Engineer.

Once in place, PTQ truck operators shall actively monitor traffic flow and prepare to reposition the PTQ trucks as necessary to continuously maintain an optimal position relative to the queue as it grows and shrinks. As a queue develops, the primary PTQ truck shall maintain a distance of approximately 1/4 mile to 1/2 mile in advance of observed braking before the back of queue. Note that once a queue develops and braking begins, the placement of the primary PTQ truck is now determined relative to the location of the braking rather than the back of queue. The secondary PTQ truck shall maintain a position approximately two miles in advance of the primary PTQ truck.

If the queue rapidly expands to where the point that braking is observed to occur within a few seconds of passing the primary PTQ truck, the primary PTQ truck shall signal the secondary PTQ truck to move into an appropriate position, approximately 1/4 to 1/2 mile in advance of the primary PTQ truck, and activate queue warning features and messaging thereby becoming the primary PTQ truck. The overtaken PTQ truck shall then deactivate all queue warning features and be repositioned into the secondary PTQ truck position. Once in the secondary PTQ truck position, the overtaken PTQ truck shall then function as the secondary PTQ truck maintaining a distance of approximately two miles in advance of the primary PTQ truck.

(b) When Queue is Not Present

When no queue is present, PTQ trucks shall deactivate all queue warning features and be repositioned to a location designated in the TQCMMCS. Queue truck operators shall notify the Engineer and be available by phone to receive instructions.

While deactivated, the PTQ truck operators shall monitor traffic conditions and the location of the back of queue from their PTQ truck by using the Department's DeltaSpeed tool or Google Maps, google.com/maps, with the Traffic Layer activated. When queue is observed, PTQ truck operators shall notify the Engineer and resume active queue protection as

described herein. A link to the Department's DeltaSpeed tool and other resources are available at the Department's Protect the Queue program website.

(c) Changeable Message Sign Messaging

The default message displayed on the changeable message sign during active queue awareness deployment shall be "SLOW TRAFFIC AHEAD".

Other unique messages or graphics, such as an arrow, shall be pre-programmed as options and may be used when directed by the Engineer, as approved in the TQCMMCS, or as directed by the Department's Traffic Management personnel. This shall include cases of use where messaging may be appropriate, but Queue Warning Features are disabled. Unique messages, such as "SHIFT RIGHT" for the case where there is insufficient room to place a PTQ truck on the left shoulder in advance of work that would be performed in the left lane, may be used when deemed appropriate by the Engineer.

Method of Measurement

PTQ trucks will be measured by the number of days that each unit is deployed. A day for the purpose of payment will be a 12 hour continuous period. Additional time will be measured in 1/12 day, one hour, increments. Each deployment shall be at a minimum duration of 4 hours for each truck in use.

Basis of Payment

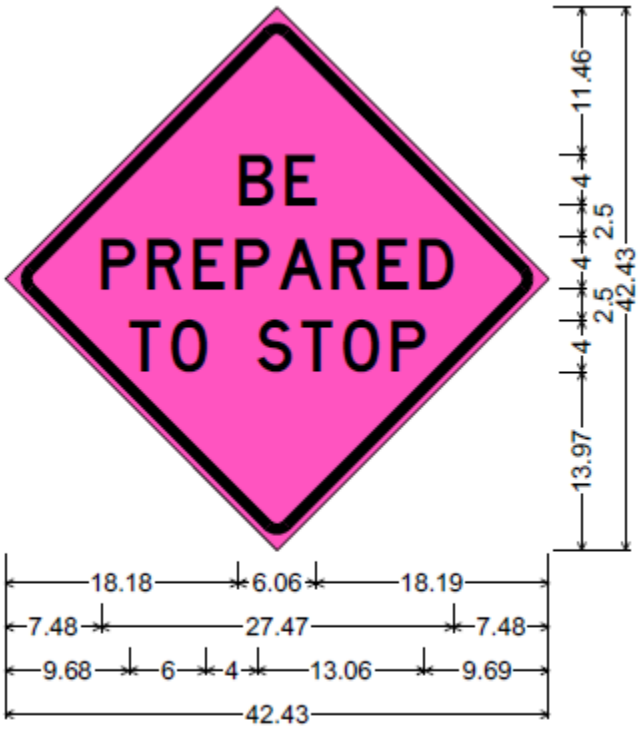
The accepted quantities of PTQ trucks will be paid for at the contract unit price for each truck per day. Payment will be made only once for each day of use, regardless of the number of times the PTQ truck is moved to accommodate different phases of traffic maintenance or construction operations as shown in the contract.

Payment will be made under:

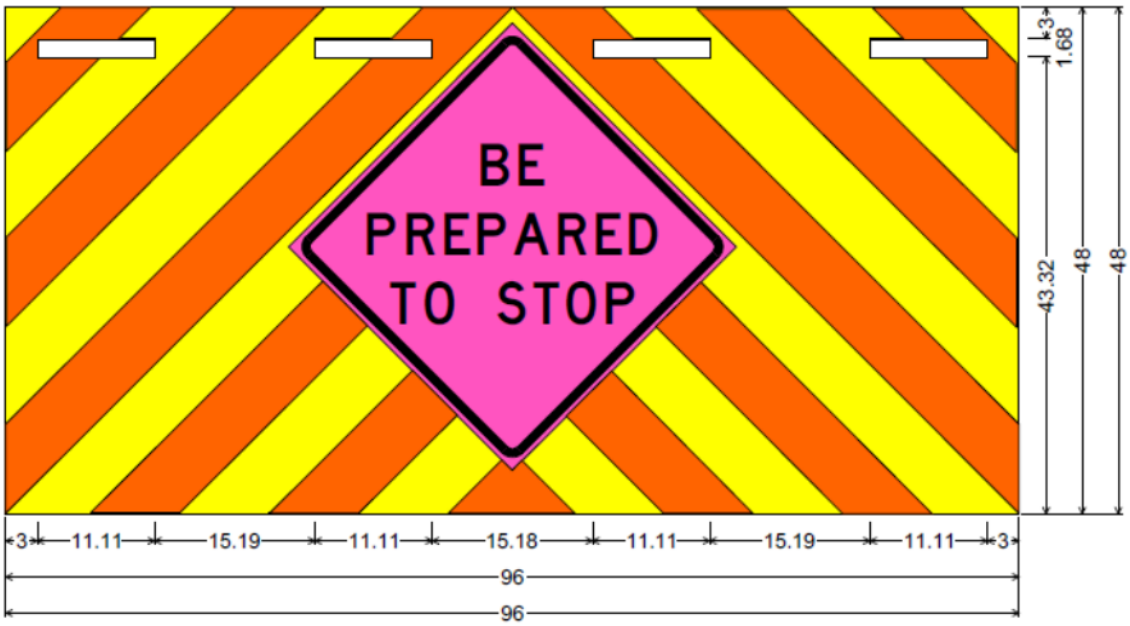
Pay Item	**Pay Unit Symbol**
Queue Truck	DAY

The cost of all labor, equipment, and all incidental work shall be included in the cost of the pay item. The cost of furnishing the PTQ truck, the "BE PREPARED TO STOP" sign, the lighting package on the "BE PREPARED TO STOP" sign, the transmitter reporting activity to WAZE TRAFFIC APPLICATIONS, the retractable truck-mounted attenuator, the truck-mounted changeable message sign, and the rear camera with a monitor shall be included in the cost of the pay item. No additional payment will be made for maintenance, repairs, or replacement of PTQ trucks that are damaged or become inoperable.

PTQ Truck Detail



Identifier : W3-4_30x30
30.00" across sides 0.75" Border, 0.50" Indent, Black on Pink;
"BE" D; "PREPARED" D; "TO STOP" D;



Identifier : 6" Chevrons
No border, Yellow;
Rectangle White; Rectangle White; Rectangle White; Rectangle White; W3-4_30x30;