

1-10 TEMPORARY TRAFFIC CONTROL

1-10.1 General

The Contractor, utilizing contractor labor and contractor-provided equipment and materials (except when such labor, equipment or materials are to be provided by the Contracting Agency as specifically identified herein), shall plan, manage, supervise and perform all temporary traffic control activities needed to support the Work of the Contract.

1-10.1(1) Materials

Materials shall meet the requirements of the following sections:

Stop/Slow Paddles	9-35.1
Construction Signs	9-35.2
Wood Sign Posts	9-35.3
Sequential Arrow Signs	9-35.4
Portable Changeable Message Signs	9-35.5
Barricades	9-35.6
Traffic Safety Drums	9-35.7
Barrier Drums	9-35.8
Traffic Cones	9-35.9
Tubular Markers	9-35.10
Warning Lights and Flashers	9-35.11
Truck-Mounted Attenuator	9-35.12
Tall Channelizing Devices	9-35.13
Portable Temporary Traffic Control Signal	9-35.14

1-10.1(2) Description

The Contractor shall provide flaggers, spotters and all other personnel required for labor for traffic control activities and not otherwise specified as being furnished by the Contracting Agency.

The Contractor shall perform all procedures necessary to support the Contract Work.

The Contractor shall provide signs and other traffic control devices not otherwise specified as being furnished by the Contracting Agency. The Contractor shall erect and maintain all construction signs, warning signs, detour signs, and other traffic control devices necessary to warn and protect the public at all times from injury or damage as a result of the Contractor's operations which may occur on or adjacent to Highways, roads, or streets. No Work shall be done on or adjacent to the Roadway until all necessary signs and traffic control devices are in place.

The traffic control resources and activities described shall be used for the safety of the public, of the Contractor's employees, and of the Contracting Agency's personnel and to facilitate the movement of the traveling public. Traffic control resources and activities may be used for the separation or merging of public and construction traffic when such use is in accordance with a specific approved traffic control plan.

Upon failure of the Contractor to immediately provide flaggers; erect, maintain, and remove signs; or provide, erect, maintain, and remove other traffic control devices when ordered to do so by the Engineer, the Contracting Agency may, without further notice to the Contractor or the Surety, perform any of the above and deduct all of the costs from the Contractor's payments.

The Contractor shall be responsible for providing adequate labor, sufficient signs, and other traffic control devices, and for performing traffic control procedures needed for the protection of the Work and the public at all times regardless of whether or not the labor, devices or procedures have been ordered by the Engineer, furnished by the Contracting Agency, or paid for by the Contracting Agency.

Wherever possible when performing Contract Work, the Contractor's equipment shall follow normal and legal traffic movements. The Contractor's ingress and egress of the Work area shall be accomplished with as little disruption to traffic as possible. Traffic control devices shall be removed by picking up the devices in a reverse sequence to that used for installation. This may require moving backwards through the workzone. When located behind barrier or at other locations shown on approved traffic control plans, equipment may operate in a direction opposite to adjacent traffic.

The Contractor is advised that the Contracting Agency may have entered into operating agreements with one or more law enforcement organizations for cooperative activities. Under such agreements, at the sole discretion of the Contracting Agency, law enforcement personnel may enter the workzone for enforcement purposes and may participate in the Contractor's traffic control activities. The responsibility under the Contract for all traffic control resides with the Contractor and any such participation by law enforcement personnel in Contractor traffic control activities will be referenced in the Special Provisions or will be preceded by an agreement and, if appropriate, a cost adjustment. Nothing in this Contract is intended to create an entitlement, on the part of the Contractor, to the services or participation of the law enforcement organization.

1-10.2 Traffic Control Management

1-10.2(1) General

It is the Contractor's responsibility to plan, conduct and safely perform the Work. The Contractor shall manage temporary traffic control with his or her own staff. Traffic control management responsibilities shall be formally assigned to one or more company supervisors who are actively involved in the planning and management of field Contract activities. The Contractor shall provide the Engineer with a copy of the formal assignment. The duties of traffic control management may not be subcontracted.

The Contractor shall designate an individual or individuals to perform the duties of the primary Traffic Control Supervisor (TCS). The designation shall also identify an alternate TCS who can assume the duties of the primary TCS in the event of that person's inability to perform. The TCS shall be responsible for safe implementation of approved Traffic Control Plans provided by the Contractor.

The primary and alternate TCS shall be certified as worksite traffic control supervisors by one of the organizations listed in the Special Provisions. Possession of a current flagging card by the TCS is mandatory. A traffic control management assignment and a TCS designation are required on all projects that will utilize traffic control.

The Contractor shall maintain 24-hour telephone numbers at which the Contractor's assigned traffic control management personnel and the TCS can be contacted and be available upon the Engineer's request at other than normal working hours. These persons shall have the resources, ability and authority to expeditiously correct any deficiency in the traffic control system.

1-10.2(1)A Traffic Control Management

The responsibilities of the Contractor's traffic control management personnel shall include:

1. Overseeing and approving the actions of the Traffic Control Supervisor (TCS) to ensure that proper safety and traffic control measures are implemented and consistent with the specific requirements created by the Contractor's workzones and the Contract. Some form of oversight shall be in place and effective even when the traffic control management personnel are not present at the jobsite.
2. Providing the Contractor's designated TCS with approved Traffic Control Plans (TCPs) which are compatible with the Work operations and traffic control for which they will be implemented. Having the latest adopted edition of the *Manual On Uniform Traffic Control Devices for Streets and Highways (MUTCD)*, including the *Washington State Modifications to the MUTCD* and applicable standards and Specifications available at all times on the project.
3. Discussing proposed traffic control measures and coordinating implementation of the Contractor-adopted traffic control plan(s) with the Engineer.
4. Coordinating all traffic control operations, including those of Subcontractors and suppliers, with each other and with any adjacent construction or maintenance operations.
5. Coordinating the project's activities (such as ramp closures, road closures, and lane closures) with appropriate police, fire control agencies, city or county engineering, medical emergency agencies, school districts, and transit companies.
6. Overseeing all requirements of the Contract that contribute to the convenience, safety, and orderly movement of vehicular and pedestrian traffic.
7. Reviewing the TCS's diaries daily and being aware of field traffic control operations.
8. Being present on-site a sufficient amount of time to adequately satisfy the above-listed responsibilities.

Failure to carry out any of the above-listed responsibilities shall be a failure to comply with the Contract and may result in a suspension of Work as described in [Section 1-08.6](#).

1-10.2(1)B Traffic Control Supervisor

A Traffic Control Supervisor (TCS) shall be present on the project whenever flagging or spotting or other traffic control labor is being utilized or less frequently, as authorized by the Engineer.

The TCS shall personally perform all the duties of the TCS. During nonwork periods, the TCS shall be available to the job site within a 45-minute time period after notification by the Engineer.

The TCS's duties shall include:

1. Having a current set of approved traffic control plans (TCPs), applicable Contract Provisions as provided by the Contractor, the latest adopted edition of the *MUTCD*, including the *Washington State Modifications to the MUTCD*, the book *Quality Guidelines for Work Zone Traffic Control Devices*, and applicable standards and Specifications.

2. Inspecting traffic control devices and nighttime lighting for proper location, installation, message, cleanliness, and effect on the traveling public. Traffic control devices shall be inspected at least once per hour during working hours except that Class A signs and nighttime lighting need to be checked only once a week. Traffic control devices left in place for 24-hours or more shall also be inspected once during the nonworking hours when they are initially set up (during daylight or darkness, whichever is opposite of the working hours). The TCS shall correct, or arrange to have corrected, any deficiencies noted during these inspections.
3. Preparing a daily traffic control diary on each day that traffic control is performed using DOT Forms 421-040A and 421-040B, and submitting them to the Engineer no later than the end of the next working day. The Contractor may use alternate forms if approved by the Engineer. Diary entries shall include, but not be limited to:
 - a. Time of day when signs and traffic control devices are installed and removed,
 - b. Location and condition of signs and traffic control devices,
 - c. Revisions to the traffic control plan,
 - d. Lighting utilized at night, and
 - e. Observations of traffic conditions.
4. Making minor revisions to the traffic control plan to accommodate site conditions provided that the original intent of the traffic control plan is maintained and the revision has the concurrence of both the Contractor and the Engineer.
5. Attending traffic control coordinating meetings or coordination activities as necessary for full understanding and effective performance.
6. Ensuring that all needed traffic control devices and equipment are available and in good working condition prior to the need to install or utilize them.

The TCS may perform the Work described in [Section 1-10.3\(1\)A](#) **Flaggers and Spotters** or in [Section 1-10.3\(1\)B](#) **Other Traffic Control Labor** and be compensated under those Bid items, provided that the duties of the TCS are accomplished.

1-10.2(2) Traffic Control Plans

The traffic control plan or plans appearing in the Contract documents show a method of handling traffic. All construction signs, flaggers, spotters and other traffic control devices are shown on the traffic control plan(s) except for emergency situations. Where mainline Contract traffic control plans are developed with the intent of operating without the use of flaggers or spotters, the plans shall contain a note that states, "NO FLAGGERS OR SPOTTERS". The use of flaggers or spotters to supplement these traffic control plans will not be allowed except in a case where no other means of traffic control can be used or in the event of an emergency. If the Contractor proposes the use of flaggers or spotters with one of these plans, this will constitute a modification requiring approval by the Engineer. The modified plans shall show locations for all the required advance warning signs and a safe, protected location for the flagging station. If flagging is to be performed during hours of darkness, the plan shall include appropriate illumination for the flagging station.

When the Contractor's chosen method of performing the Work in the Contract requires some form of temporary traffic control, the Contractor shall either: (1.) designate and adopt, in writing, the traffic control plan or plans from the Contract documents that support that method; or (2.) submit a Contractor's plan that modifies, supplements or replaces a plan from the Contract documents. Any Contractor-proposed modification, supplement or replacement shall show the necessary construction signs, flaggers, spotters and other traffic control devices required to support the Work. Any Contractor-proposed traffic control plan shall conform to the established standards for plan development as shown in the *MUTCD*, Part VI. The Contractor's submittal, either designating and adopting a traffic control plan from the Contract documents or proposing a Contractor-developed plan, shall be provided to the Engineer for approval at least 10-calendar days in advance of the time the signs and other traffic control devices are scheduled to be installed and utilized. The Contractor shall be solely responsible for submitting any proposed traffic control plan or modification, obtaining the Engineer's approval and providing copies of the approved Traffic Control Plans to the Traffic Control Supervisor.

1-10.2(3) Conformance to Established Standards

Flagging, signs, and all other traffic control devices and procedures furnished or provided shall conform to the standards established in the latest WSDOT adopted edition of the *Manual On Uniform Traffic Control Devices for Streets and Highways (MUTCD)*, published by the U.S. Department of Transportation and the *Washington State Modifications to the MUTCD*. Judgment of the quality of devices furnished will be based upon *Quality Guidelines for Temporary Traffic Control Devices*, published by the American Traffic Safety Services Association. Copies of the *MUTCD* and *Quality Guidelines for Temporary Control Devices* may be purchased from the American Traffic Safety Services Association, 15 Riverside Parkway, Suite 100, Fredericksburg, Virginia 22406-1022. The *Washington State Modifications to the MUTCD* may be obtained from the Department of Transportation, Olympia, Washington 98504.

In addition to the standards of the *MUTCD* described above, the Contracting Agency has scheduled the implementation of crashworthiness requirements for most workzone devices. The National Cooperative Highway Research Project (NCHRP) Report 350 has established requirements for crash testing. Workzone devices are divided into four categories. Each of those categories and, where applicable, the schedule for implementation is described below:

Category 1 includes those items that are small and lightweight, channelizing, and delineating devices that have been in common use for many years and are known to be crashworthy by crash testing of similar devices or years of demonstrable safe performance. These include cones, tubular markers, flexible delineator posts, and plastic drums. All Category 1 devices used on the project shall meet the requirements of NCHRP 350 as certified by the manufacturer of the device.

Category 2 includes devices that are not expected to produce significant vehicular velocity change, but may otherwise be hazardous. Examples of this class are barricades, portable sign supports and signs, intrusion alarms and vertical panels. All Category 2 devices shall meet the requirements of NCHRP 350. For the purpose of definition, a sign support and sign shall be considered a single unit. A new sign may be purchased for an existing sign support and the entire unit will be defined as "existing equipment."

Category 3 is for hardware expected to cause significant velocity changes or other potentially harmful reactions to impacting vehicles. Barriers, fixed sign supports, crash cushions, truck mounted attenuators (TMA's) and other work zone devices not meeting the definitions of Category 1 or 2 are examples from this category. Many Category 3 devices are defined in the design of the project. Where this is the case, NCHRP 350 requirements have been incorporated into the design and the Contractor complies with the requirements by constructing devices according to the Plans and Specifications. Where the device is a product chosen by the Contractor, the device chosen must be compliant with the requirements of NCHRP 350.

Category 4 includes portable or trailer-mounted devices such as arrow displays, temporary traffic signals, area lighting supports, and portable changeable message signs. Crash testing is not required for these devices.

The condition of signs and traffic control devices shall be acceptable or marginal as defined in the book *Quality Guidelines for Temporary Traffic Control Devices*, and will be accepted based on a visual inspection by the Engineer. The Engineer's decision on the condition of a sign or traffic control device shall be final. A sign or traffic control device determined to be unacceptable shall be removed from the project and replaced within 12-hours of notification.

1-10.3 Traffic Control Labor, Procedures and Devices

1-10.3(1) Traffic Control Labor

The Contractor shall furnish all personnel for flagging, spotting, for the execution of all procedures related to temporary traffic control and for the setup, maintenance and removal of all temporary traffic control devices and construction signs necessary to control traffic during construction operations.

Workers engaged as flaggers or spotters shall wear reflective vests and hard hats. During hours of darkness, white coveralls or white or yellow rain gear shall also be worn. The vests and other apparel shall be in conformance with [Section 1-07.8](#).

1-10.3(1)A Flaggers and Spotters

Flaggers and Spotters shall be posted where shown on approved Traffic Control Plans or where directed by the Engineer. All flaggers and spotters shall possess a current flagging card issued by the State of Washington, Oregon, Montana, or Idaho. The flagging card shall be immediately available and shown to the Contracting Agency upon request.

Flagging stations shall be shown on Traffic Control Plans at locations where construction operations require stopping or diverting public traffic. Flagging stations shall be staffed only when flagging is required. This staffing may be continuous or intermittent, depending on the nature of the construction activity. Whenever a flagger is not required to stop or divert traffic, the flagger shall move away from the flagging station to a safer location. During hours of darkness, flagging stations shall be illuminated in a manner that insures that flaggers can easily be seen but that does not cause glare to the traveling public. Flaggers shall be equipped with portable two-way radios, with a range suitable for the project. The radios shall be capable of having direct contact with project management (foremen, superintendents, etc.).

The Contractor shall furnish Stop/Slow paddles conforming to the requirements of [Section 9-35.1](#) for all flagging operations.

Spotting stations shall be shown on Traffic Control Plans at locations where a spotter can detect errant drivers or other hazards and provide an effective warning to other workers. Spotting stations will not be allowed at locations where the spotter will be in unnecessary danger. The Contractor shall furnish noise-makers or other effective warning devices for spotting operations. The duties of a spotter shall not include flagging.

1-10.3(1)B Other Traffic Control Labor

In addition to flagging or spotting duties, the Contractor shall provide personnel for all other traffic control procedures required by the construction operations and for the labor to install, maintain and remove any traffic control devices shown on Traffic Control Plans.

1-10.3(2) Traffic Control Procedures**1-10.3(2)A One-Way Traffic Control**

The project Work may require that traffic be maintained on a portion of the Roadway during the progress of the Work using one-way traffic control. If this is the case, the Contractor's operation shall be confined to one-half the Roadway, permitting traffic on the other half. If shown on an approved traffic control plan or directed by the Engineer, one-way traffic control, in accordance with the MUTCD, shall be provided and shall also conform to the following requirements:

In any one-way traffic control configuration, side roads and approaches will be closed or controlled by a flagger or by appropriate approved signing. A side road flagger will coordinate with end flaggers where there is line of sight and with the pilot car where the end flaggers cannot be seen.

Queues of vehicles will be allowed to take turns passing through the workzone in the single open lane. When one-way traffic control is in effect, Contractor vehicles shall not use the open traffic lane except while following the same rules and routes required of the public traffic.

As conditions permit, the Contractor shall, at the end of each day, leave the Work area in such condition that it can be traveled without damage to the Work, without danger to traffic, and without one-way traffic control. If, in the opinion of the Engineer, one-way traffic control cannot be dispensed with after working hours, then the operation will be continued throughout the non-working hours.

1-10.3(2)B Rolling Slowdown

For Work operations on multi-lane Roadways that necessitate short-term Roadway closures of 15-minutes or less, the Contractor may implement a rolling slowdown. Where included in an approved traffic control plan, a rolling slowdown shall be accomplished using one traffic control vehicle with flashing amber lights for each lane to be slowed down plus one control vehicle to serve as a chase vehicle for traffic ahead of the blockade. The traffic control vehicles shall enter the Roadway and form a moving blockade to reduce traffic speeds and create a clear area in front of the moving blockade to accomplish the Work without a total stoppage of traffic.

A portable changeable message sign shall be placed ahead of the starting point of the traffic control to warn traffic of the slowdown. The sign shall be placed far enough ahead of the Work to avoid any expected backup of vehicles.

The location where the traffic control vehicles shall begin the slowdown and the speed at which the moving blockade will be allowed to travel will be calculated to accommodate the estimated time needed for closure. The chase control vehicle shall follow the slowest vehicle ahead of the blockade. When the chase vehicle passes, the Contractor may begin the Work operation. In the event that the Work operation is not completed when the moving blockade reaches the site, all Work except that necessary to clear the Roadway shall cease immediately and the Roadway shall be cleared and reopened as soon as possible.

All ramps and entrances to the Roadway between the moving blockade and Work operation shall be temporarily closed using flaggers. Radio communications between the Work operation and the moving blockade shall be established and utilized to adjust the speed of the blockade to accommodate the closure time needed.

1-10.3(2)C Lane Closure Setup/Takedown

Where allowed by the Contract and where shown on approved traffic control plans or directed by the Engineer, the Contractor shall set up traffic control measures to close one or more lanes of a multi-lane facility. When this is to occur, the following sequence shall be followed:

1. Advance warning signs are set up on the Shoulder of the Roadway opposite the lane to be closed,
2. Advance warning signs are set up on the same Shoulder as the lane to be closed,
3. A truck-mounted attenuator, with arrow board, is moved into place at the beginning of the closure taper,
4. Channelization devices are placed to mark the taper and the length of the closure as shown on the traffic control plan.

Once the lane is closed, the TMA/arrow board combination may be replaced with an arrow board without attenuator.

If additional lanes are to be closed, this shall be done in sequence with previous lane closures using the same sequence of activities. A truck-mounted attenuator with arrow board is required during the process of closing each additional lane and may be replaced with an arrow board without attenuator after the lane is closed. Each closed lane shall be marked with a separate arrow board at all times.

Traffic control for lane closures shall be removed in the reverse order of its installation.

1-10.3(2)D Mobile Operations

Where construction operations are such that movement along the length of a Roadway is continuous or near-continuous to the extent that a stationary traffic control layout will not be effective, the Contractor shall implement a moving, or mobile, traffic control scheme. Such moving control shall always be conducted in the same direction as the adjacent traffic.

Where shown on an approved traffic control plan or where directed by the Engineer, mobile traffic control shall consist of portable equipment, moving with the operation. A portable changeable message sign shall be established in advance of the operation, far enough back to provide warning of both the operation and of any queue of traffic that has formed during the operation. The advance sign shall be continuously moved to stay near

the back of the queue at all times. A truck-mounted attenuator, with arrow board, shall be positioned and maintained at a fixed distance upstream of the Work. A shadow vehicle, with truck-mounted attenuator shall be positioned and maintained immediately upstream of the Work.

1-10.3(2)E Patrol & Maintain Traffic Control Measures

At all times, when temporary traffic control measures are in place, the Contractor shall provide for patrolling and maintaining these measures. The Work shall consist of resetting mislocated devices, assuring visibility of all devices, cleaning and repairing where necessary, providing maintenance for all equipment, including replacing batteries and light bulbs as well as keeping motorized and electronic items functioning, and adjusting the location of devices to respond to actual conditions, such as queue length, unanticipated traffic conflicts and other areas where planned traffic control has proven ineffective.

This Work shall be performed by the Contractor, either by or under the direction of the Traffic Control Supervisor. Personnel, with vehicles if necessary, shall be dispatched so that all traffic control can be reviewed at least once per hour during working hours and at least once during each non-working day.

1-10.3(3) Traffic Control Devices

1-10.3(3)A Construction Signs

All construction signs required by approved traffic control plans, as well as any other appropriate signs directed by the Engineer shall be furnished by the Contractor. The Contractor shall provide the posts or supports and erect and maintain the signs in a clean, neat, and presentable condition until the need for them has ended. Post mounted signs shall be installed as shown in Standard Plans. When the need for construction signs has ended, the Contractor, upon approval of the Engineer, shall remove all signs, posts, and supports from the project and they shall remain the property of the Contractor.

No passing zones on the existing Roadway that are marked with paint striping and which striping is to be obliterated by construction operations shall be replaced by "Do Not Pass" and "Pass With Care" signs. The Contractor shall provide and install the posts and signs. The signs shall be maintained by the Contractor until they are removed or until the Contract is Physically Completed. When the project includes striping by the Contractor, the signs and posts shall be removed by the Contractor when the no passing zones are reestablished by striping. The signs and posts will become the property of the Contractor. When the Contractor is not responsible for striping and when the striping by others is not completed when the project is Physically Completed, the posts and signs shall be left in place and shall become the property of the Contracting Agency.

All existing signs, new permanent signs installed under this Contract, and construction signs installed under this Contract that are inappropriate for the traffic configuration at a given time shall be removed or completely covered with metal, plywood, or an Engineer approved product specifically manufactured for sign covering during periods when they are not needed.

Construction signs will be divided into two classes. Class A construction signs are those signs that remain in service throughout the construction or during a major phase of the Work. They are mounted on posts, existing fixed Structures, or substantial supports of a semi-permanent nature. Class A signs will be designated as such on the approved Traffic Control Plan. "Do Not Pass" and "Pass With Care" signs are classified as Class A

construction signs. Sign and support installation for Class A signs shall be in accordance with the Contract Plans or the Standard Plans. Class B construction signs are those signs that are placed and removed daily, or are used for short durations which may extend for one or more days. They are mounted on portable or temporary mountings.

Where it is necessary to add weight to signs for stability, the only allowed method will be a bag of sand that will rupture on impact. The bag of sand shall have a maximum weight of 40-pounds, and shall be suspended no more than 1 foot from the ground.

Signs, posts, or supports that are lost, stolen, damaged, destroyed, or which the Engineer deems to be unacceptable while their use is required on the project shall be replaced by the Contractor.

1-10.3(3)B Sequential Arrow Signs

Where shown on an approved traffic control plan or where ordered by the Engineer, the Contractor shall provide, operate and maintain sequential arrow signs. In some locations, the sign will be shown as a unit with an attenuator. In other locations, the plan will indicate a stand-alone unit.

1-10.3(3)C Portable Changeable Message Sign

Where shown on an approved traffic control plan or where ordered by the Engineer, the Contractor shall provide, operate and maintain portable changeable message signs. These signs shall be available, on-site, for the entire duration of their projected use.

1-10.3(3)D Barricades

Where shown on an approved traffic control plan or where ordered by the Engineer, the Contractor shall provide, install and maintain barricades. Barricades shall be kept in good repair and shall be removed immediately when, in the opinion of the Engineer, they are no longer functioning as designed.

Where it is necessary to add weight to barricades for stability, the only allowed method will be a bag of sand that will rupture on impact. The bag of sand shall have a maximum weight of 40-pounds, and shall be suspended no more than 1 foot from the ground.

1-10.3(3)E Traffic Safety Drums

Where shown on an approved Traffic Control Plan, or where ordered by the Engineer, the Contractor shall provide, install and maintain traffic safety drums.

Used drums may be utilized, provided all drums used on the project are of essentially the same configuration.

The drums shall be designed to resist overturning by means of a weighted lower unit that will separate from the drum when impacted by a vehicle.

Drums shall be regularly maintained to ensure that they are clean and that the drum and reflective material are in good condition. If the Engineer determines that a drum has been damaged beyond usefulness, or provides inadequate reflectivity, a replacement drum shall be furnished.

When the Engineer determines that the drums are no longer required, they shall be removed from the project and shall remain the property of the Contractor.

1-10.3(3)F Barrier Drums

Where shown on approved Traffic Control Plans and as ordered by the Engineer, barrier drums shall be placed on temporary concrete barrier at the following approximate spacing:

Concrete Barrier Placement	Barrier Drum Spacing in Feet
Tangents ½-mile or less ¹	2 times posted speed limit
Tangents greater than ½-mile ¹	4 times posted speed limit
Tapers and Curves ²	posted speed limit

Note ¹ A minimum of 3 barrier drums shall be used.

Note ² A minimum of 5 barrier drums shall be used.

Temporary concrete barrier reflectors may be excluded when using barrier drums.

Both legs of the barrier drums shall be completely filled with sand. The top oval should not be filled.

Used barrier drums may be used, provided all barrier drums used on the project are of essentially the same configuration.

Barrier drums shall be regularly maintained to ensure that they are clean and that the barrier drum and reflective material are in good condition. If the Engineer determines that a barrier drum has been damaged beyond usefulness, or provides inadequate reflectivity, a replacement barrier drum shall be furnished.

When the Engineer determines that the drums are no longer required, they shall be removed from the project and shall remain the property of the Contractor.

1-10.3(3)G Traffic Cones

Where shown on an approved traffic control plan or where ordered by the Engineer, the Contractor shall provide, install and maintain traffic cones. Cones shall be kept in good repair and shall be removed immediately when directed by the Engineer. Where wind or moving traffic frequently displace cones, an effective method of stabilizing cones, such as stacking two together at each location, shall be employed.

1-10.3(3)H Tubular Markers

Where shown on an approved traffic control plan or where ordered by the Engineer, the Contractor shall provide, install and maintain tubular markers. Tubular markers shall be kept in good repair and shall be removed immediately when directed by the Engineer. Tubular markers are secondary devices and are not to be used as substitutes for cones or other delineation devices without an approved traffic control plan.

Where the Traffic Control Plan shows pavement-mounted tubular markers, the adhesive used to fasten the base to the pavement shall be suitable for the purpose, as approved by the Engineer. During the removal of pavement-mounted tubular markers, care shall be taken to avoid damage to the existing pavement. Any such damage shall be repaired by the Contractor at no cost to the Contracting Agency.

1-10.3(3)I Warning Lights and Flashers

Where shown attached to traffic control devices on an approved traffic control plan or where ordered by the Engineer, the Contractor shall provide and maintain flashing warning lights. Lights attached to advance warning signs shall be Type B, high-intensity. Lights attached to traffic safety drums, barricades or other signs shall be Type C, steady-burning low intensity or, where attention is to be directed to a specific device, Type A, flashing low-intensity units.

1-10.3(3)J Truck-Mounted Attenuator

Where shown on an approved traffic control plan or where ordered by the Engineer, the Contractor shall provide, operate and maintain truck-mounted impact attenuators (TMA). These attenuators shall be available, on-site, for the entire duration of their projected use.

The TMA shall be positioned to separate and protect construction workzone activities from normal traffic flow.

During use, the attenuator shall be in the full down-and-locked position. For stationary operations, the truck's parking brake shall be set.

1-10.3(3)K Portable Temporary Traffic Control Signal

Where shown on an approved traffic control plan, the Contractor shall provide, operate, maintain and remove a portable temporary traffic control signal to provide alternating one-lane traffic operations on a two-way facility. A portable temporary traffic control signal shall be defined as a traffic control signal that may be trailer mounted, fully self-contained unit and designed so that it can be easily transported and deployed at different locations.

The Contractor shall submit the manufacturer's specifications for the portable temporary traffic control signal to the Engineer for approval at the pre-construction meeting or a minimum of two weeks prior to installation, whichever occurs first. A manufacturer's representative is required to demonstrate the capabilities of the temporary portable signal prior to approval and provide training to contractor personnel as necessary. The Contractor shall provide a minimum of one manufacturer trained operator on-site during all hours of portable traffic control signal operation.

Remote manual control of the portable traffic control signal by the Traffic Control Supervisor (TCS) or a qualified operator may be allowed if necessitated by Work area or traffic conditions and as approved by the Engineer.

Maximum length between signal heads shall be 1500-ft unless otherwise shown on the Plans or ordered by the Project Engineer in accordance with [Section 1-04.4](#).

The Project Engineer or designee will inspect the signal system at initial installation/operation and either provide or approve the signal timing. Final approval will be based on the results of the operational inspection.

If repairs or adjustments are required the Contractor shall respond immediately and provide flagger traffic control, if the Roadway cannot be safely reopened to two-way traffic, until such time that repairs can be made. The Contractor shall either repair the signal or replace with a backup unit within 24-hours.

The Engineer will monitor the traffic, signal operation and order adjustments as needed based on traffic conditions. Timing adjustments require the approval of the Project Engineer.

As shown on the traffic control plan, temporary stop bars and "STOP HERE ON RED Signs (R10-6) shall be provided at the location traffic is expected to stop during the red display. The stop bar locations shall be illuminated at night. The illumination shall be the responsibility of the Contractor and shall be adjusted to ensure minimal glare to motorists.

When not in operation, remove signal heads from the view of traffic or cover signal heads with bags made of non-ripping material specifically designed for covering signal heads. Do not use trash bags of any type. Remove, cover, fold, or turn all inappropriate signs so that they are not readable by oncoming traffic.

The Contractor shall provide and install all field wiring to make a complete and operational portable traffic control signal and shall maintain the system throughout the life of the Contract.

Portable temporary traffic signals shall not be installed within 300-feet of at-grade railroad crossing, or if driveways or Roadway access points are located between the portable temporary traffic control signals.

1-10.4 Measurement

1-10.4(1) Lump Sum Bid for Project (No Unit Items)

When the Bid Proposal contains the item “Project Temporary Traffic Control”, there will be no measurement of unit items for Work defined by [Section 1-10](#) except as described in [Section 1-10.4\(3\)](#). Also, except as described in [Section 1-10.4\(3\)](#), all of [Sections 1-10.4\(2\)](#) and [1-10.5\(2\)](#) are deleted.

No specific unit of measurement will apply to the lump sum item of “Project Temporary Traffic Control.”

1-10.4(2) Item Bids with Lump Sum for Incidentals

When the Bid Proposal does not contain the item “Project Temporary Traffic Control”, [Sections 1-10.4\(1\)](#) and [1-10.5\(1\)](#) are deleted and the Bid Proposal will contain some or all of the following items, measured as noted.

No specific unit of measurement will apply to the lump sum item of “Traffic Control Supervisor.”

“Flaggers and Spotters” will be measured by the hour. Hours will be measured for each flagging or spotting station, shown on an approved Traffic Control Plan, when that station is staffed in accordance with [Section 1-10.3\(1\)A](#). When a flagging station is staffed on an intermittent basis, no deduction will be made in measured hours provided that the person staffing the station is in a standby mode and is not performing other duties.

“Other Traffic Control Labor” will be measured by the hour. Time spent on activities other than those described herein will not be measured under this item. The hours of one person will be measured for each patrol route that the Contractor performs the Work described under [Section 1-10.3\(2\)E](#), Patrol and Maintain Traffic Control Measures, regardless of the actual number of persons per route. Hours will be measured for each person engaged in any one of the following activities:

- Operating a pilot vehicle during one-way piloted traffic control.
- Operating a traffic control vehicle or a chase vehicle during a rolling slowdown operation.
- Operating a vehicle or placing/removing traffic control devices during the setup or takedown of a lane closure. Performing preliminary Work to prepare for placing and removing these devices.
- Operating any of the moving traffic control equipment, or adjusting signing during a mobile operation as described in [Section 1-10.3\(2\)D](#).
- Placing and removing Class B construction signs. Performing preliminary Work to prepare for placing and removing these signs.
- Relocation of Portable Changeable Message Signs within the project limits.

- Installing and removing Barricades, Traffic Safety Drums, Barrier Drums, Cones, Tubular Markers and Warning Lights and Flashers to carry out approved Traffic Control Plan(s). Performing preliminary Work to prepare for installing these devices.

“Construction Signs, Class A” will be measured by the square foot of panel area for each sign designated on an approved Traffic Control Plan as Class A or for each construction sign installed as ordered by the Engineer and designated as Class A at the time of the order. Class A signs may be used in more than one location and will be measured for each new installation. Class B construction signs will not be measured. Sign posts or supports will not be measured.

“Sequential Arrow Sign” will be measured by the hour for the time that each sign is operating as shown on an approved Traffic Control Plan.

“Portable Changeable Message Sign” will be measured per each one time only for each portable changeable message sign used on the project. The final pay quantity shall be the maximum number of such signs in place at any one time as approved by the Engineer.

“Operation of Portable Changeable Message Sign” will be measured by the hour for each hour of operation. The hours of operation will be determined by the Engineer. Hours of operation in excess of those determined by the Engineer will be at the Contractor’s expense.

“Truck Mounted Impact Attenuator” will be measured per each one time only for each truck with mounted impact attenuator used on the project. The final pay quantity shall be the maximum number of truck-mounted impact attenuators in place at any one time.

“Operation of Truck-Mounted Impact Attenuator” will be measured by the hour for each truck-mounted attenuator manned and operated. Manned and operated shall be when the truck-mounted impact attenuator has an operator and is required to move, in operating position, with the construction operation or when moving the TMA from one position to another on the project.

No specific unit of measurement will apply to the force account item of “Repair Truck-Mounted Impact Attenuator”.

No specific unit of measurement will apply to the lump sum item of “Other Temporary Traffic Control”.

“Portable Temporary Traffic Control Signal” will be measured per each one time only for each portable temporary traffic control signal device used on the project. The final pay quantity shall be the maximum number of such devices in place at any one time as approved by the Engineer.

1-10.4(3) Reinstating Unit Items with Lump Sum Traffic Control

The Contract Provisions may establish the project as lump sum, in accordance with [Section 1-10.4\(1\)](#) and also include one or more of the items included above in [Section 1-10.4\(2\)](#). When that occurs, the corresponding measurement provision in [Section 1-10.4\(2\)](#) is not deleted and the Work under that item will be measured as specified.

1-10.4(4) Owner-Provided Resources

The Contract Provisions may call for specific items of labor, materials or equipment, noted in [Section 1-10](#) as the responsibility of the Contractor, to be supplied by the Contracting Agency. When this occurs, there will be no adjustment in measurement of unit quantities.

1-10.5 Payment**1-10.5(1) Lump Sum Bid for Project (No Unit Items)**

“Project Temporary Traffic Control”, lump sum.

The lump sum Contract payment shall be full compensation for all costs incurred by the Contractor in performing the Contract Work defined in [Section 1-10.2\(1\)B](#).

1-10.5(2) Item Bids with Lump Sum for Incidentals

“Traffic Control Supervisor”, lump sum.

The lump sum contract payment shall be full compensation for all costs incurred by the Contractor in performing the contract work defined in [Section 1-10.2\(1\)B](#).

“Flaggers and Spotters”, per hour.

The unit Contract price, when applied to the number of units measured for this item in accordance with [Section 1-10.4\(2\)](#), shall be full compensation for all costs incurred by the Contractor in performing the Contract Work defined in [Section 1-10.3\(1\)A](#).

“Other Traffic Control Labor”, per hour.

The unit Contract price, when applied to the number of units measured for this item in accordance with [Section 1-10.4\(2\)](#), shall be full compensation for all labor costs incurred by the Contractor in performing the Contract Work specifically mentioned for this item in [Section 1-10.4\(2\)](#).

“Construction Signs Class A”, per square foot.

The unit Contract price, when applied to the number of units measured for this item in accordance with [Section 1-10.4\(2\)](#), shall be full compensation for all costs of labor, materials and equipment incurred by the Contractor in performing the Contract Work described in [Section 1-10.3\(3\)A](#). In the event that “Do Not Pass” and “Pass With Care” signs must be left in place, a change order, as described in [Section 1-04.4](#), will be required. When the Bid Proposal contains the item “Sign Covering”, then covering those signs indicated in the Contract will be measured and paid according to [Section 8-21](#).

“Sequential Arrow Sign”, per hour.

The unit Contract price, when applied to the number of units measured for this item in accordance with [Section 1-10.4\(2\)](#), shall be full compensation for all costs of labor, materials and equipment incurred by the Contractor in performing the Contract Work described in [Section 1-10.3\(3\)B](#).

“Portable Changeable Message Sign”, per each.

The unit Contract price, when applied to the number of units measured for this item in accordance with [Section 1-10.4\(2\)](#), shall be full compensation for all costs of labor, materials and equipment incurred by the Contractor in procuring all portable changeable message signs required for the project and for transporting these signs to and from the project.

“Operation of Portable Changeable Message Sign”, per hour.

The unit Contract price, when applied to the number of units measured for this item in accordance with [Section 1-10.4\(2\)](#), shall be full compensation for all costs of labor, materials and equipment incurred by the Contractor in performing the Contract Work described in [Section 1-10.3\(3\)C](#) except for costs compensated separately under the items “Other Traffic Control Labor” and “Portable Changeable Message Sign”.

“Truck-Mounted Impact Attenuator”, per each.

The unit Contract price, when applied to the number of units measured for this item in accordance with [Section 1-10.4\(2\)](#), shall be full compensation for all costs of labor, materials and equipment incurred by the Contractor in performing the Contract Work described in [Section 1-10.3\(3\)J](#) except for costs compensated separately under the items “Operation of Truck-Mounted Impact Attenuator” and “Repair Truck-Mounted Impact Attenuator”.

“Operation of Truck-Mounted Impact Attenuator”, per hour.

The unit Contract price, when applied to the number of units measured for this item in accordance with [Section 1-10.4\(2\)](#), shall be full compensation for all costs of labor, materials and equipment incurred by the Contractor in operating truck-mounted impact attenuators on the project.

“Repair Truck-Mounted Impact Attenuator”, by force account.

All costs of repairing or replacing truck-mounted impact attenuators that are damaged by the motoring public while in use as shown on an approved Traffic Control Plan will be paid for by force account as specified in [Section 1-09.6](#). To provide a common Proposal for all Bidders, the Contracting Agency has estimated the amount of force account for “Repair Truck-Mounted Impact Attenuator” and has entered the amount in the Proposal to become a part of the total Bid by the Contractor. Truck-mounted attenuators damaged due to the Contractor’s operation or damaged in any manner when not in use shall be repaired or replaced by the Contractor at no expense to the Contracting Agency.

“Other Temporary Traffic Control”, lump sum.

The lump sum Contract payment shall be full compensation for all costs incurred by the Contractor in performing the Contract Work defined in [Section 1-10](#), and which costs are not compensated by one of the above-listed items.

“Portable Temporary Traffic Control Signal,” per each.

The unit Contract price, when applied to the number of units measured for this item in accordance with [Section 1-10.4\(2\)](#), shall be full compensation for all costs of labor, materials and equipment incurred by the Contractor in performing the Contract Work as described in [Section 1-10.3\(3\)K](#), including all costs for traffic control during manual control, adjustment, malfunction, or failure of the portable traffic control signals and during replacement of failed or malfunctioning signals.

1-10.5(3) Reinstating Unit Items with Lump Sum Traffic Control

The Contract Provisions may establish the project as lump sum, in accordance with [Section 1-10.4\(1\)](#) and also reinstate the measurement of one or more of the items described in [Section 1-10.4\(2\)](#). When that occurs, the corresponding payment provision in [Section 1-10.5\(2\)](#) is not deleted and the Work under that item will be paid as specified.

