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102 MAINTENANCE OF TRAFFIC. (REV 1-26-07) (FA 2-12-07) (7-07)

SECTION 102 (Pages 107–125) is deleted and the following substituted:

SECTION 102 MAINTENANCE OF TRAFFIC

102-1 Description.

Maintain traffic within the limits of the project for the duration of the construction period, including any temporary suspensions of the work. Construct and maintain detours. Provide facilities for access to residences, businesses, etc., along the project. Furnish, install and maintain traffic control and safety devices during construction. Furnish and install work zone pavement markings for maintenance of traffic in construction areas. Provide any other special requirements for safe and expeditious movement of traffic specified on the plans. Maintenance of Traffic includes all facilities, devices and operations as required for safety and convenience of the public within the work zone.

Do not maintain traffic over those portions of the project where no work is to be accomplished or where construction operations will not affect existing roads. Do not obstruct or create a hazard to any traffic during the performance of the work, and repair any damage to existing pavement open to traffic.

Include the cost of any work that is necessary to meet the requirements of the Contract Documents under the MOT pay item, when there is not a pay item provided.

102-2 Materials.

Meet the following requirements:

Bituminous Adhesive.....	Section 970
Work Zone Pavement Markings	971-1 and 971-3
Paint	Section 971
Glass Spheres	Section 971
Removable Tape	990-5
Raised Retro-reflective Pavement Markers	990-6

102-2.1 Temporary Traffic Control Devices: Use only the materials meeting the requirements of Section 990, Design Standards and the MUTCD.

102-2.2 Detour: Provide all materials for the construction and maintenance of all detours.

102-2.3 Commercial Materials for Driveway Maintenance: Provide materials of the type typically used for base, including recycled asphalt pavement material, and having stability and drainage properties that will provide a firm surface under wet conditions.

102-3 Specific Requirements.

102-3.1 Beginning Date of Contractor's Responsibility: Maintain traffic starting the day work begins on the project or on the first day Contract time is charged, whichever is earlier.

102-3.2 Worksite Traffic Supervisor: Provide a Worksite Traffic Supervisor in accordance with Section 105. Provide the Worksite Traffic Supervisor with all equipment and

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materials needed to set up, take down, maintain traffic control, and handle traffic-related situations.

Ensure that the Worksite Traffic Supervisor performs the following duties:

1. Performs on site direction of all traffic control on the project.
2. Is on site during all set up and take down, and performs a drive through inspection immediately after set up.
3. Is on site during all nighttime operations to ensure proper Maintenance of Traffic.
4. Immediately corrects all safety deficiencies and does not permit minor deficiencies that are not immediate safety hazards to remain uncorrected for more than 24 hours.
5. Is available on a 24-hour per day basis and present within 45 minutes after notification of an emergency situation and is prepared to positively respond to repair the work zone traffic control or to provide alternate traffic arrangements.
6. Conducts daily daytime and weekly nighttime inspections of projects with predominately daytime work activities, and daily nighttime and weekly daytime inspections of projects with predominantly nighttime work activities of all traffic control devices, traffic flow, pedestrian, bicyclist, and business accommodations.

Advise the project personnel of the schedule of these inspections and give them the opportunity to join in the inspection as is deemed necessary. Submit a comprehensive weekly report, using the Department's currently approved form, to the Engineer detailing the condition of all traffic control devices (including pavement markings) being used. Include assurances in the inspection report that pedestrians are accommodated with a safe travel path around work sites and safely separated from mainline traffic, that existing or detoured bicyclist paths are being maintained satisfactorily throughout the project limits, and that existing businesses in work areas are being provided with adequate entrances for vehicular and pedestrian traffic during business hours. Have the Worksite Traffic Supervisor sign the report and certify that all of the above issues are being handled in accordance with the Contract Documents. When deficiencies are found, the Worksite Traffic Supervisor is to note such deficiencies and include the proposed corrective actions, including the date corrected.

The Department may disqualify and remove from the project a Worksite Traffic Supervisor who fails to comply with the provisions of this Section. The Department may temporarily suspend all activities, except traffic, erosion control and such other activities that are necessary for project maintenance and safety, for failure to comply with these provisions.

102-4 Alternative Traffic Control Plan.

The Contractor may propose an alternative Traffic Control Plan (TCP) to the plan presented in the Contract Documents. Have the Contractor's Engineer of Record sign and seal the alternative plan. Prepare the TCP in conformance with and in the form outlined in the current version of the Roadway Plans Preparation Manual. Indicate in the plan a TCP for each phase of activities. Take responsibility for identifying and assessing any potential impacts to a utility that may be caused by the alternate TCP proposed by the Contractor, and notify the Department in writing of any such potential impacts to utilities.

Engineer's approval of the alternate TCP does not relieve the Contractor of sole responsibility for all utility impacts, costs, delays or damages, whether direct or indirect, resulting from Contractor initiated changes in the design or construction activities from those in the original Contract Specifications, design plans (including traffic control plans) or other

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Contract Documents and which effect a change in utility work different from that shown in the utility plans, joint project agreements or utility relocation schedules.

The Department reserves the right to reject any Alternative Traffic Control Plan. Obtain the Engineer's written approval before beginning work using an alternate TCP. The Engineer's written approval is required for all modifications to the TCP. The Engineer will only allow changes to the TCP in an emergency without the proper documentation.

102-5 Traffic Control.

102-5.1 Standards: FDOT Design Standards (DS) are the minimum standards for the use in the development of all traffic control plans. The MUTCD Part VI is the minimum national standard for traffic control for highway construction, maintenance, and utility operations. Follow the basic principles and minimum standards contained in these documents for the design, application, installation, maintenance, and removal of all traffic control devices, warning devices and barriers which are necessary to protect the public and workers from hazards within the project limits.

102-5.2 Maintenance of Roadway Surfaces: Maintain all lanes that are being used for the maintenance of traffic, including those on detours and temporary facilities, under all weather conditions. Keep the lanes reasonably free of dust, potholes and rutting. Provide the lanes with the drainage facilities necessary to maintain a smooth riding surface under all weather conditions.

102-5.3 Number of Traffic Lanes: Maintain one lane of traffic in each direction. Maintain two lanes of traffic in each direction at existing four (or more) lane cross roads, where necessary to avoid undue traffic congestion. Construct each lane used for maintenance of traffic at least as wide as the traffic lanes existing in the area before commencement of construction. Do not allow traffic control and warning devices to encroach on lanes used for maintenance of traffic.

The Engineer may allow the Contractor to restrict traffic to one-way operation for short periods of time provided that the Contractor employs adequate means of traffic control and does not unreasonably delay traffic. When a construction activity requires restricting traffic to one-way operations, locate the flaggers within view of each other when possible. When visual contact between flaggers is not possible, equip them with 2-way radios, official, or pilot vehicle(s), or use traffic signals.

102-5.4 Crossings and Intersections: Provide and maintain adequate accommodations for intersecting and crossing traffic. Do not block or unduly restrict any road or street crossing the project unless approved by the Engineer. Maintain all existing actuated or traffic responsive mode signal operations for main and side street movements for the duration of the Contract. Restore any loss of detection within 12 hours. Use only detection technology listed on the Department's Approved Products List (APL) and approved by the Engineer to restore detection capabilities.

Before beginning any construction, provide the Engineer a plan for maintaining detection devices for each intersection and the name(s) and phone numbers of persons that can be contacted when signal operation malfunctions.

102-5.5 Access for Residences and Businesses: Provide continuous access to all residences and all places of business.

102-5.6 Protection of the Work from Injury by Traffic: Where traffic would be injurious to a base, surface course, or structure constructed as a part of the work, maintain all traffic outside the limits of such areas until the potential for injury no longer exists.

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102-5.7 Flagger: Provide trained flaggers in accordance with Section 105.

102-5.8 Conflicting Pavement Markings: Where the lane use or where normal vehicle paths are altered during construction, remove all pavement markings (paint, tape, thermoplastic, raised pavement markers, etc.) that will conflict with the adjusted vehicle paths. Use of paint to cover conflicting pavement markings is prohibited. Remove conflicting pavement markings using a method that will not damage the surface texture of the pavement and which will eliminate the previous marking pattern regardless of weather and light conditions.

Remove all pavement markings that will be in conflict with “next phase of operation” vehicle paths as described above, before opening to traffic.

Cost for removing conflicting pavement markings (paint, tape, thermoplastic, raised pavement markers, etc.) to be included in Maintenance of Traffic, Lump Sum.

102-5.9 Vehicle and Equipment Visibility: Equip all pickups and automobiles used on the project with a minimum of one Class 2 amber or white warning light that meets the Society of Automotive Engineers Recommended Practice SAE J845 dated March, 1992 or SAE J1318 dated April, 1986 and incorporated herein by reference, that is unobstructed by ancillary vehicle equipment such as ladders, racks or booms. If the light is obstructed, additional lights will be required. The lights shall be operating when a vehicle is in a work area where a potential hazard exists, when operating the vehicle at less than the average speed for the facility while performing work activities, making frequent stops or called for in the plans or Design Standards.

Equip all other vehicles and equipment with a minimum of 4 ft² of reflective sheeting or flashing lights.

To avoid distraction to motorists, do not operate the lights on the vehicles or equipment when the vehicles are outside the clear zone or behind a barrier.

102-5.10 No Waiver of Liability: Conduct operations in such a manner that no undue hazard results due to the requirements of this Article. The procedures and policies described herein in no way acts as a waiver of any terms of the liability of the Contractor or his surety.

102-6 Detours.

102-6.1 General: Construct and maintain detour facilities wherever it becomes necessary to divert traffic from any existing roadway or bridge, or wherever construction operations block the flow of traffic.

102-6.2 Construction: Plan, construct, and maintain detours for the safe passage of traffic in all conditions of weather. Provide the detour with all facilities necessary to meet this requirement.

Where the plans call for the Department to furnish detour bridge components, construct the pile bents in accordance with the plans, unless otherwise authorized by the Engineer.

Submit a letter with the following: company name, phone number, office address, project contact person, project number, detour bridge type, bridge length, span length, location and usage time frames, to the Engineer at least 30 calendar days before the intended pick-up date, to obtain the storage facility location and list of components for the project. Upon receipt of letter, the Engineer will, within ten calendar days provide an approved material list to the Contractor and the appropriate Department storage yard.

Provide a letter with an original company seal, identifying the representative with authority to pick up components, to the Engineer at least ten calendar days before the proposed pick-up date. The Department is not obligated to load the bridge components without this notice. Take responsibility and sign for each item loaded at the time of issuance.

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Provide timber dunnage, and transport the bridge components from the designated storage facility to the job site. Unload, erect, and maintain the bridge, then dismantle the bridge and load and return the components to the designated storage facility.

Notify the Engineer in writing at least ten calendar days before returning the components. Include in this notice the name of the Contractor's representative authorized to sign for return of the bridge components. The yard supervisor is not obligated to unload the bridge components without this notice.

The Department will provide equipment and an operator at the Department's storage facility to assist in loading and unloading the bridge components. Furnish all other labor and equipment required for loading and unloading the components.

The Department's representative will record all bridge components issued or returned on the Detour Bridge Issue and Credit Ticket. The Tickets must be signed by a Department and Contractor representative, after loading or unloading each truck to document the quantity and type of bridging issued or returned.

Bind together all bridge components to be returned in accordance with the instructions given by the storage facility. The yard supervisor will repack components that are not packed in compliance with these instructions. Upon request, written packing instructions will be made available to the Contractor, before dismantling of the bridge for return to the Department's storage facility.

Assume responsibility for any shortage or damage to the bridge components. Monies due the Contractor will be reduced at the rate of \$35.00 per hour plus materials for repacking, repairs or replacement of bridge components.

The skid resistance of open steel grid decking on the detour bridge may decrease gradually after opening the bridge to traffic. The Department will furnish a pneumatic floor scabbler machine for roughening the roadway surface of the detour bridge decking. Provide an air compressor at the job site with 200 ft³/minute capacity, 90 psi air pressure for the power supply of the machine, and an operator. Transport the scabbler machine to and from the Department's Structures Shop. Repair any damage to the scabbler machine caused by operations at no expense to the Department. Perform scabbling when determined necessary by the Engineer. The Department will pay for the cost of scabbling as Unforeseeable Work in accordance with 4-4.

Return the bridge components to the designated storage facility beginning no later than ten calendar days after the date the detour bridge is no longer needed, the date the new bridge is placed in service, or the date Contract Time expires, whichever is earliest. Return the detour bridging at an average of not less than 200 feet per week. Upon failure to return the bridge components to the Department within the time specified, compensate the Department for the bridge components not returned at the rate of \$5.00 per 10 feet, per day, per bridge, for single lane; and \$10.00 per 10 feet, per day, per bridge, for dual lane until the bridge components are returned to the Department.

102-6.3 Construction Methods: Select and use construction methods and materials that provide a stable and safe detour facility. Construct the detour facility to have sufficient durability to remain in good condition, supplemented by maintenance, for the entire period that the detour is required.

102-6.4 Removal of Detours: Remove detours when they are no longer needed and before the Contract is completed. Take ownership of all materials from the detour and dispose of

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them, except for materials, which might be on loan from the Department with the stipulation that they are returned.

102-6.5 Detours Over Existing Roads and Streets: When the Department specifies that traffic be detoured over roads or streets outside the project area, do not maintain such roads or streets. However, maintain all signs and other devices placed for the purpose of the detour.

102-6.6 Operation of Existing Movable Bridges: The Department will maintain and operate existing moveable bridges that are to be removed by the Contractor until such time as they are closed to traffic. During this period, make immediate repairs of any damage to such structures caused by use or operations related to the work at no expense to the Department, but do not provide routine repairs or maintenance. In the event that use or operations result in damage to a bridge requiring repairs, give such repairs top priority to any equipment, material, or labor available.

102-7 Traffic Control Officer.

Provide uniformed law enforcement officers, including marked law enforcement vehicles, to assist in controlling and directing traffic in the work zone when the following types of work is necessary on projects:

1. Traffic control in a signalized intersection when signals are not in use.
2. When Standard Index No. 619 is used on Interstate at nighttime and required by the plans.
3. When pacing/rolling blockade specification is used.

102-8 Driveway Maintenance.

102-8.1 General: Ensure that each residence and or business has safe, stable, and reasonable access.

102-8.2 Construction Methods: Place, level, manipulate, compact, and maintain the material, to the extent appropriate for the intended use.

As permanent driveway construction is accomplished at a particular location, the Contractor may salvage and reuse previously placed materials that are suitable for reuse on other driveways.

102-9 Temporary Traffic Control Devices.

102-9.1 Installation and Maintenance: Install and maintain adequate traffic control devices, warning devices and barriers to protect the traveling public and workers, and to safeguard the work area. Erect the required traffic control devices, warning devices and barriers to prevent any hazardous conditions and in conjunction with any necessary traffic re-routing. Use only those devices that are included on the Qualified Products List (QPL). Specific requirements for Maintenance of Traffic devices, additional to the requirements of this Section, are contained in the 600 series of the Design Standards. Immediately remove, turn or cover any devices or barriers that do not apply to existing conditions.

All QPL approved safety devices must meet the requirements of National Cooperative Highway Research Program Report 350 (NCHRP 350) and current FHWA directives. Manufacturers seeking evaluation must furnish certified test reports showing that their product meets all test requirements set forth by NCHRP 350. Manufacturers seeking evaluation of Category I devices for inclusion on the QPL shall include the manufacturer's self-certification letter. Manufacturer's seeking evaluation of Category II and III devices shall include the FHWA WZ numbered acceptance letter with attachments and vendor drawings of the device in sufficient

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detail to enable the Engineer to distinguish between this and similar devices. Drawings shall include technical information necessary for field installation.

Notify the Engineer of any scheduled operation, which will affect traffic patterns or safety, sufficiently in advance of commencing such operation to permit his review of the plan for the proposed installation of traffic control devices, warning devices or barriers.

Ensure an employee is assigned the responsibility of maintaining the position and condition of all traffic control devices, warning devices and barriers throughout the duration of the Contract. Keep the Engineer advised at all times of the identification and means of contacting this employee on a 24-hour basis.

Keep traffic control devices, warning devices, safety devices and barriers in the correct position, properly directed, clearly visible and clean, at all times. Immediately repair, replace or clean damaged, defaced or dirty devices or barriers.

102-9.2 Work Zone Signs: Provide signs in accordance with the plans and Design Standards. Meet the requirements of 700-2.6 and 700-5.5.

102-9.3 Business Signs: Provide and place signs in accordance with the plans and Design Standards. Meet the sign background sheeting requirements of Section 700. Furnish signs having a Type III reflectorized blue background with a 4 inches series B white legend and a white border. The maximum sign size is 24 by 36 inches.

Use signs with specific business names on each sign. Install logos provided by business owners and approved by the Engineer. Standard Business entrance signs meeting the requirements of Index 17355 without specific business names may be used only with the approval of the Engineer.

102-9.4 High Intensity Flashing Lights: Furnish Type B lights in accordance with the plans and Design Standards.

102-9.5 Warning/Channelizing Devices: Furnish warning/channelizing devices in accordance with the plans and Design Standards.

102-9.5.1 Reflective Collars for Traffic Cones: Use cone collars at night designed to properly fit the taper of the cone when installed. Place the upper 6 inches collar a uniform 3 1/2 inch distance from the top of the cone and the lower 4 inch collar a uniform 2 inch distance below the bottom of the upper 6 inch collar. Ensure that the collars are capable of being removed for temporary use or attached permanently to the cone in accordance with the manufacturer's recommendations. Provide a white sheeting having a smooth outer surface and that essentially has the property of a retroreflector over its entire surface.

102-9.5.2 Barrier Wall (Temporary): Furnish, install, maintain, remove and relocate a temporary barrier wall in accordance with the plans. Temporary concrete barrier wall, for use on roadway sections, will be in accordance with Index No. 415 or 414 as specified in the plans. Temporary water filled barrier wall used on roadway sections shall conform to the requirements of the pre-approved alternatives listed on the Department's Qualified Products List (QPL), unless otherwise called for in the plans. Proprietary barrier walls for use on roadway sections must meet NCHRP Report 350 criteria and be identified on the QPL. Temporary concrete barrier wall for use on bridge and wall sections, will be in accordance with Index No. 414. Barriers meeting the requirements of Index Nos. 415 or temporary water filled barriers on the QPL will not be accepted as an alternate to barriers meeting the requirements of Index No. 414.

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102-9.5.3 Glare Screen (Temporary): Furnish, install, maintain, remove and relocate glare screen systems in conjunction with temporary barrier wall at locations identified in the plans.

Ensure the anchorage of the glare screen to the barrier is capable of safely resisting an equivalent tensile load of 600 lb/ft of glare screen, with a requirement to use a minimum of three fasteners per barrier section.

When glare screen is utilized on temporary barrier wall, warning lights will not be required.

102-9.6 Temporary Vehicle Impact Attenuator (Crash Cushion) (Redirect/Inertia): Furnish, install, maintain and subsequently remove temporary vehicular impact attenuators in accordance with the details and notes shown in the plans, the Design Standards, and requirements of the pre-approved alternatives listed on the Department's QPL. Maintain the attenuators until their authorized removal. Repair all attachment scars to permanent structures and pavements after attenuator removal. Make necessary repairs due to defective material, work, or Contractor operations at no cost to the Department. Restore attenuators damaged by the traveling public within 24 hours after notification as authorized by the Engineer.

102-9.7 Guardrail (Temporary): Furnish guardrail (temporary) in accordance with the plans and Design Standards. Meet the requirements of Section 536.

102-9.8 Advance Warning Arrow Panel: Furnish advance warning panel in accordance with the plans and Design Standards.

102-9.9 Portable Changeable (Variable) Message Sign (PCMS): Furnish changeable (variable) message sign in accordance with the plans and Design Standards.

The 7 foot by 10 foot PCMS as defined in 990-4.3 may be used as advanced warning maintenance of traffic devices and to supplement other traffic control devices used in work zones.

The 5 foot by 8 foot PCMS as defined in 990-4.3 may be used as alternates to either type A or type B arrow board on advanced warning vehicles or to supplement other traffic control devices used in a work zone.

A 5 foot by 8 foot PCMS may be used as a stand alone maintenance of traffic device only when used for accident or incident management situations as defined in the MUTCD.

102-9.10 Portable Regulatory Signs: Provide portable regulatory signs in accordance with the plans and Design Standards.

This specification establishes the physical display and operational requirements for solar powered portable regulatory signs. Ensure all portable regulatory signs meet the physical display and operational requirements as described in the Federal Highway Administration's MUTCD.

The portable regulatory sign must be activated only during active work activities and deactivated when no work is being performed. The sign must be protected by a security code.

Manufacturers seeking approval for Portable Regulatory Signs must submit an application, Material Safety Data Sheet (MSDS) and certification in accordance with 6-1.

Only use Portable Regulatory Signs listed on the QPL.

Manufacturers providing the signs must provide a certified test report to the Engineer indicating that the signs meet these specification requirements.

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102-9.11 Radar Speed Display Unit: Furnish radar speed display unit in accordance with the plans and Design Standards.

This Specification establishes the physical display and operational requirements for solar powered, Radar Speed Display Units used in active work zones to inform motorists of the posted speed and their actual speed.

Ensure the radar speed display is activated only during active work activities and deactivated when no work is being performed. The display unit must be protected by a security code.

Manufacturers seeking approval for a Radar Speed Display Unit must submit an application, MSDS and certification in accordance with 6-1.

Only use Radar Speed Display Units listed on the QPL.

Manufacturers providing the device described herein must provide a certified test report to the Engineer indicating the device meets these specification requirements.

102-9.12 Temporary Traffic Control Signals: Furnish, install and operate temporary traffic control signals as indicated in the plans. Temporary traffic control signals will consist of either portable or fixed traffic signals.

Provide certification that the portable traffic signals meet the requirements of the Design Standards and 603-2. The Engineer may approve used signal equipment if it is in acceptable condition.

102-9.13 Temporary Traffic Detection Technology: Furnish, install and operate Temporary Traffic Detection Technology listed on the Department's APL and approved by the Engineer to restore detection capabilities.

102-9.14 Trucks and Truck Mounted Impact Attenuators: Furnish, install and maintain only those attenuators that have been certified as meeting the requirements of NCHRP 350 and have been properly maintained. Include the cost of trucks and truck mounted impact attenuators in MOT.

Use Truck Mounted Attenuators (TMA), when called for in the Design Standards. Limit TMA's to those items listed on the QPL.

Use truck mounted attenuator systems designed and installed in accordance with the manufactures recommendations.

Equip the TMA cartridge with lights and reflectors in compliance with applicable Florida motor vehicle laws, including turn signals, dual tail lights, and brake lights. Ensure that lights are visible in both the raised and lowered positions if the unit is capable of being raised.

Ensure that the complete unit is painted DOT yellow (Fed. Std. 595 b, No. 13538). Stripe the rear facing of the cartridge in the operating position with the alternating 6 inch white and 6 inch safety orange 45 degree striping to form an inverted "V" at the center of the unit and slope down and toward the outside of the unit, in both directions from the center. Ensure the bottom of the cartridge has the same pattern, covering the entire bottom, with 6 inch white and 6 inch safety orange stripes. Use Type III reflectorized sheeting for striping.

The trucks and truck mounted impact attenuators will not be paid for separately, but will be included in the cost of Maintenance of Traffic. Payment includes all costs, including furnishing, maintaining and removal when no longer required, and all materials, labor, tools, equipment and incidentals required for attenuator maintenance.

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102-10 Work Zone Pavement Marking.

102-10.1 Description: Furnish and install Work Zone Pavement Markings for maintenance of traffic in construction areas and in close conformity with the lines and details shown on the plans. Meet the requirements of 710-4.3.

Use pavement marking materials that contain no lead or chromium compounds. Manufacturers seeking product approval must furnish certified test reports showing the Work Zone Pavement Marking material meets the requirements of this Section.

Centerlines, lane lines, edgelines, stop bars and turn arrows in work zones will be required in accordance with the MUTCD with the following additions:

- (a) Install edgelines on paved shoulders.
- (b) Place edgelines on all detours where vehicle paths are altered from normal operations and where a lane is narrowed from its normal width for any reason.
- (c) Apply Work Zone Pavement Markings, including arrows and messages as determined by the Engineer to be required for the safe operation of the facility, before the end of the day if the highway is open to traffic. Channelizing devices may be used to direct traffic during the day before placing the Work Zone Pavement Markings.
- (d) Work Zone Pavement Markings shall be water borne paint, unless otherwise identified in the plans or approved by the Engineer.

The most common types of Work Zone Pavement Markings are water borne paint and removable tape. Other types of Work Zone Pavement Markings may be identified in the plans.

102-10.2 Removable Tape:

102-10.2.1 General: Use removable tape listed on the Qualified Products List (QPL) and meeting the requirements of 990-5.

102-10.2.2 Application: Apply removable tape with a mechanical applicator to provide pavement lines that are neat, accurate and uniform. Equip the mechanical applicator with a film cut-off device and with measuring devices that automatically and accumulatively measure the length of each line placed within an accuracy tolerance of $\pm 2\%$. Ensure removable tape adheres to the road surface. Removable tape may be placed by hand on short sections 500 feet or less if it is done in a neat accurate manner.

102-10.2.3 Retroreflectivity: Apply white and yellow traffic stripes and markings that will attain an initial retroreflectivity of not less than 300 mcd/lx·m² for white and contrast markings and not less than 250 mcd/lx·m² for yellow markings. Black portions of contrast tapes and black masking tapes must be non-reflective and have a reflectance of less than 5 mcd/lx m². The retroreflectance of the white, yellow and contrast pavement markings at the end of the six month service life shall not be less than 150 mcd/lx·m².

102-10.2.4 Removability: Provide removable tape capable of being removed from bituminous concrete and portland cement concrete pavement intact or in substantially large strips, either manually or by a mechanical roll-up device, at temperatures above 40°F, without the use of heat, solvents, grinding or blasting. Ensure that the manufacturer shows documented reports that the removable tape meets this requirement after being in place for a minimum of 90 days and under an average daily traffic count per lane of at least 9,000 vehicles per day.

102-10.3 Work Zone Raised Pavement Markers (WZRPM's): Apply all markers in accordance with the Design Standards, Index No. 600.

102-10.4 Paint and Glass Beads: Meet the requirements of Section 710.

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102-11 Method of Measurement.

102-11.1 General: Devices installed/used on the project on any calendar day or portion thereof, within the allowable Contract Time, including time extensions which may be granted, will be paid for at the Contract unit price for the applicable pay item, except those paid for as Lump Sum.

102-11.2 Traffic Control Officers: The quantity to be paid for will be at the Contract unit price per hour (4 hour minimum) for the actual number of officers certified to be on the project site, including any law enforcement vehicle(s) and all other direct and indirect costs. Payment will be made only for those traffic control officers specified in the Plans and authorized by the Engineer.

102-11.3 Special Detours: When a detour facility is specifically detailed in the plans, or is otherwise described or detailed as a special item, and an item for separate payment is included in the proposal, the work of constructing, maintaining, and subsequently removing such detour facilities will be paid for separately. Traffic control devices, warning devices, barriers, signing, and pavement markings for Special Detours will also be paid for separately.

When the plans show more than one detour, each detour will be paid for separately, at the Contract lump sum price for each.

Where a separate item for a specific detour facility is included in the proposal, payment will be made under Special Detour.

102-11.4 Commercial Material for Driveway Maintenance: The quantity to be paid for will be the certified volume, in cubic yards, of all materials authorized by the Engineer, acceptably placed and maintained for driveway maintenance. The volume, which is authorized to be reused, and which is acceptably salvaged, placed, and maintained in other designated driveways will be included again for payment.

102-11.5 Work Zone Signs: The number of signs (Temporary Regulatory, Warning and Guide) certified as installed/used on the project will be paid for at the Contract unit price for Work Zone Signs. When multiple signs are located on single or multiple post(s), each sign panel will be paid individually. Signs >20 ft² and detailed in the plans will be paid for under Lump Sum MOT.

Portable signs (excluding Mesh signs and signs mounted with <1 foot ground clearance) and Vehicular Mounted Signs will be included for payment under work zone signs, only if used in accordance with the Design Standards.

102-11.6. Business Signs: The number of business signs certified as installed/used on the project will be paid for at the Contract unit price for Business Signs.

102-11.7 High Intensity Flashing Lights: The number of high intensity flashing lights (Type B) certified as installed/used on the project will be paid for at the Contract unit price for High Intensity Flashing Lights (Temporary - Type B).

102-11.8 Warning/Channelizing Devices: The number of Type I, Type II, Type III, Vertical Panel and Drum Warning Devices certified as installed/used on the project meeting the requirements of Design Standards, Index No. 600 and have been properly maintained will be paid for at the Contract unit prices for Barricade (Temporary).

102-11.9 Barrier Wall (Temporary): The Contract unit price for Barrier Wall (Temporary) will be full compensation for furnishing, installing, maintaining, and removing the barrier wall. When called for, the Contract unit price for Barrier Wall (Temporary/Relocate) will be full compensation for relocating the barrier. The certified quantity to be paid for will be determined by the number of sections times the nominal length of each section.

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102-11.10 Lights, Temporary, Barrier Wall Mount: The number of Type C Steady Burn lights, mounted on barrier wall, certified as installed/used on the project, meeting the requirements of the Design Standards and have been properly maintained will be paid for at the Contract unit price for Lights Temporary, Barrier Wall Mount.

102-11.11 Glare Screen (Temporary): The certified quantity to be paid for will be determined by the number of sections times the nominal length of each section.

102-11.12 Temporary Vehicular Impact Attenuator:

102-11.12.1 Redirective: The quantity to be paid for will be the number of Temporary Vehicular Impact Attenuators (Redirective) certified as installed/used and maintained on the project, including object marker.

102-11.12.2 Inertia: The quantity to be paid for will be the number of Temporary Vehicular Impact Attenuators (Inertia) complete arrays certified as installed/used and maintained in accordance with the plans and Design Standards, Index No. 417.

102-11.13 Temporary Guardrail: The quantity to be paid for will be the length, in feet, of temporary guardrail constructed and certified as installed/used on the project. The length of a run of guardrail will be determined as a multiple of the nominal panel lengths.

102-11.14 Advance Warning Arrow Panel: The quantity to be paid at the contract unit price will be for the number of advance warning arrow panels certified as installed/used on the project on any calendar day or portion thereof within the contract time.

102-11.15 Changeable (Variable) Message Sign: The quantity to be paid at the contract unit price will be for the number of changeable (variable) message signs certified as installed/used on the project on any calendar day or portion thereof within the contract time. Payment will be made for each Changeable (Variable) message sign that is used during the period beginning fourteen working days before Contract Time begins as authorized by the Engineer.

102-11.16 Portable Regulatory Signs: The quantity to be paid for will be the number of portable regulatory sign certified as installed/used on the project on any calendar day or portion thereof within the contract time, will be paid for the contract unit price for portable regulatory sign.

102-11.17 Radar Speed Display Unit: The quantity to be paid for will be the number of radar speed display units certified as installed/used on the project on any calendar day or portion thereof within the contract time, will be paid for the contract unit price for radar speed display unit.

102-11.18 Temporary Traffic Control Signals: The quantity of Temporary Traffic Control Signals to be paid for will be the number of completed installations (each signalized location) of portable traffic signals, or the number of fixed traffic signals in place and operating on the project, as authorized by the Engineer and certified as in place and in operation on the project.

102-11.19 Temporary Traffic Detection Technology: The quantity of Temporary Traffic Detection Technology to be paid for will be the number of completed and accepted intersections utilizing Temporary Traffic Detection Technology, authorized by the Engineer and certified as completed on the project. Compensation will begin the day Temporary Traffic Detection Technology is placed into operation and approved by the Engineer and will end the day the permanent detection is operational and approved by the Engineer.

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102-11.20 Work Zone Pavement Markings: The quantities, furnished and installed, to be paid for will be the length of skip and solid pavement markings, and the area of pavement markings placed as follows:

(a) The total transverse distance, in feet, of skip pavement marking authorized and acceptably applied. The length of actual applied line will depend on the skip ratio of the material used. Measurement will be the distance from the beginning of the first stripe to the end of the last stripe with proper deductions made for unpainted intervals as determined by plan dimensions or stations, subject to 9-1.3.

(b) The net length, in feet, of solid pavement marking authorized and acceptably applied.

(c) The number of directional arrows or pavement messages authorized and acceptably applied.

(d) The number of WZRPM's authorized and acceptably applied.

102-12 Submittals.

102-12.1 Submittal Instructions: Prepare a certification of quantities, using the Department's current approved form, for certified Maintenance of Traffic payment items for each project in the Contract. Submit the certification of quantities to the Engineer. The Department will not pay for any disputed items until the Engineer approves the certification of quantities.

102-12.2 Contractor's Certification of Quantities: Request payment by submitting a certification of quantities no later than Twelve O'clock noon Monday after the estimate cut-off date or as directed by the Engineer, based on the amount of work done or completed. Ensure the certification consists of the following:

(a) Contract Number, FPID Number, Certification Number, Certification Date and the period that the certification represents.

(b) The basis for arriving at the amount of the progress certification, less payments previously made and less an amount previously retained or withheld. The basis will include a detail breakdown provided on the certification of items of payment in accordance with 102-13. After the initial setup of the maintenance of traffic items and counts, the interval for recording the counts will be made weekly on the certification sheet unless there is a change. This change will be documented on the day of occurrence. Some items may necessitate a daily interval of recording the counts.

102-13 Basis of Payment.

102-13.1 Maintenance of Traffic (General Work): When an item of work is included in the proposal, price and payment will be full compensation for all work and costs specified under this Section except as may be specifically covered for payment under other items.

102-13.2 Traffic Control Officers: Price and payment will be full compensation for the services of the traffic control officers.

102-13.3 Special Detours: Price and payment will be full compensation for providing all detour facilities shown on the plans and all costs incurred in carrying out all requirements of this Section for general maintenance of traffic within the limits of the detour, as shown on the plans.

102-13.4 Commercial Materials for Driveway Maintenance: Price and payment will be full compensation for all work and materials specified for this item, including specifically all required shaping and maintaining of driveways.

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102-13.5 Work Zone Signs: Price and payment will be full compensation for all work and materials for furnishing signs, supports and necessary hardware, installation, relocating, maintaining and removing signs.

102-13.6. Business Signs: Price and payment will be full compensation for all materials and labor required for furnishing, installing, relocating, maintaining, and removing the signs as well as the cost of installing any logos provided by business owners.

102-13.7 High Intensity Warning Lights: Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing high intensity flashing lights (Type B).

102-13.8 Channelizing Devices: Prices and payment will be full compensation for furnishing, installing, relocating, maintaining and removing the warning devices, including the costs associated with attached warning lights as required.

102-13.9 Barrier Wall (Temporary): Price and payment will be full compensation for furnishing, installing, maintaining, and removing the barrier. When called for, Barrier Wall (Temporary) (Relocate) will be full compensation for relocating the barrier.

102-13.10 Lights, Temporary, Barrier Wall Mount: Price and payment will be full compensation for all work and materials for furnishing, installing and maintaining the warning lights mounted on barrier wall. Payment will not be made for lights that are improperly placed or are not working.

102-13.11 Glare Screen (Temporary): Price and payment will be full compensation for furnishing, installing, maintaining, and removing the glare screen certified as installed/used on the project. When called for, Glare Screen (Relocate) will be full compensation for relocating the glare screen.

102-13.12 Temporary Vehicular Impact Attenuator:

102-13.12.1 Redirective: Price and payment will be full compensation for furnishing, installing, maintaining and subsequently removing such attenuators. Payment for restoring damaged attenuators will be the manufacturer's/distributor's invoice price for the new materials/parts plus 20% markup. The 20% markup is compensation for all necessary work, including but not limited to labor, equipment, supplies and profit, as authorized by the Engineer. Additional MOT required for the repair of the attenuator will be paid for under the appropriate MOT pay item.

102-13.12.2 Inertia: Price and payment for the number of complete arrays will be full compensation for furnishing, installing, maintenance and removal at each specified location. In addition, payment will be made for new modules replaced due to damages, excluding damage caused by the Contractor's operations.

102-13.13 Temporary Guardrail: Price and payment will be full compensation for furnishing all materials required for a complete installation, including end anchorage assemblies and any end connections to other structures and for installing, maintaining and removing guardrail.

102-13.14 Advance Warning Arrow Panel: Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing advance warning arrow panels.

102-13.15 Changeable (Variable) Message Sign: Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing changeable message signs.

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102-13.16 Portable Regulatory Signs: Price and payment will be full compensation for furnishing, installing, relocating, maintaining and removing a completely functioning system as described in these specifications portable regulatory signs. Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing changeable message signs.

Payment will include all labor, materials, incidentals, repairs and any actions necessary to operate and maintain the unit at all times that work is being performed or traffic is being affected by construction and/or maintenance of traffic operations.

102-13.17 Radar Speed Display Unit: Price and payment will be made only for a completely functioning system as described in these specifications. Payment will include all labor, hardware, accessories, signs, and incidental items necessary for a complete system. Payment will include any measurements needed to insure that the unit conforms to all specification requirements.

Payment will include all labor, materials, incidentals, repairs and any actions necessary to operate and maintain the unit at all times that work is being performed or traffic is being affected by construction and/or maintenance of traffic operations. Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing radar speed display unit.

102-13.18 Temporary Traffic Control Signals: Price and payment will constitute full compensation for furnishing, installing, operating, maintaining and removing temporary traffic control signals including all equipment and components necessary to provide an operable traffic signal.

102-13.19 Temporary Traffic Detection Technology: Price and payment of per intersection/per day will constitute full compensation for furnishing, installing, operating, maintaining and removing temporary traffic detection technology including all equipment and components necessary to provide an acceptable signalized intersection. Take ownership of all equipment and components.

102-13.20 Work Zone Pavement Markings: Prices and payments will be full compensation for all work specified in Section 710, including, all cleaning and preparing of surfaces, furnishing of all materials, application, curing and protection of all items, protection of traffic, furnishing of all tools, machines and equipment, and all incidentals necessary to complete the work. Final payment will be withheld until all deficiencies are corrected.

Removable Tape may be substituted for work zone paint at no additional cost to the Department.

Payment for Class A or B Raised Pavement Markers used to supplement line markings will be paid for under Item No. 102-78, Reflective Pavement Marker. Install these markers as detailed in the Design Standards.

102-13.21 Payment Items: Payment will be made under:

Item No. 102- 1-	Maintenance of Traffic - lump sum.
Item No. 102- 2-	Special Detour - lump sum.
Item No. 102- 3-	Commercial Materials for Driveway Maintenance - per cubic yard.
Item No. 102- 14-	Traffic Control Officers - per hour.
Item No. 102- 60-	Work Zone Signs - per each per day.
Item No. 102- 61-	Business Signs - each.
Item No. 102- 71-	Barrier Wall - per foot.

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Item No. 102- 94-	Glare Screen - per foot.
Item No. 102- 73-	Guardrail (Temporary) - per foot.
Item No. 102- 74-	Barricade (Temporary) - per each per day.
Item No. 102- 76-	Advanced Warning Arrow Panel - per each per day.
Item No. 102- 77-	High Intensity Flashing Lights (Temporary - Type B) - per each per day.
Item No. 102- 78-	Reflective Pavement Markers - each.
Item No. 102- 79-	Lights, Temporary, Barrier Wall Mount - per each per day.
Item No. 102- 81-	Vehicular Impact Attenuator/Crash Cushion (Gating) (Temporary) -per location.
Item No. 102- 89-	Vehicular Impact Attenuator/Crash Cushion (Temporary) - per location.
Item No. 102- 99-	Changeable (Variable) Message Sign (Temporary) - per each per day.
Item No. 102-104-	Temporary Traffic Control Signals (Portable) - per each per day.
Item No. 102-104-	Temporary Traffic Control Signals (Fixed) - per each per day.
Item No. 102-107-	Temporary Traffic Detection - per day.
Item No. 102-150-	Portable Regulatory Signs - per each per day.
Item No. 102-150-	Radar Speed Display Unit - per each per day.
Item No. 102-911-	Removable Pavement Marking (White/Black) - per foot.
Item No. 102-912-	Removable Pavement Marking (Yellow) - per foot.
Item No. 710-	Reflective Paint.
Item No. 711-	Thermoplastic.