

SECTION 422 -- TEMPORARY TRAFFIC CONTROL DEVICES

422.01 -- Description

1. This work consists of furnishing, installing at the locations shown in the plans, operating, maintaining, and when work is complete, removing the temporary traffic control devices described in this Section.

2. General Requirements:

a. All traffic control devices shall be located according to and meet all requirements prescribed in the MUTCD. Failure of the Contractor to erect and maintain traffic protective devices shall be reason to temporarily suspend the work in accordance with Subsection 108.06.

b. (1) All barricades and signs shall be constructed and erected in accordance with the plans. Type A, B, and C barricade lights shall be on the NDR approved Products List.

(2) Temporary signs and temporary (portable) sign supports shall meet National Cooperative Highway Research Program (NCHRP) Report 350 test level 3 requirements.

(i) The Contractor shall furnish "Temporary Signs". The Contractor shall install "Temporary Signs" at the locations shown in the plans, maintain "Temporary Signs", and, when no longer needed, remove the "Temporary Signs".

(ii) Any project let prior to January 1, 2002 with a scheduled start date after January 1, 2002 or with a substantial amount of work remaining after January 1, 2002 will require that all "Temporary Sign" supports (bases) are NCHRP 350 (TL-3) approved.

(iii) "Temporary Signs" are all temporarily mounted work zone signs that are not post-mounted in the ground at the typical 7' mounting height. Temporary signs are considered NCHRP 350 category 2 devices and are mounted on temporary sign stands. Temporary signs are generally mounted a minimum of 1' above the ground, unless otherwise required to be mounted at a higher height.

c. The initial placement, replacement, and removal of the lane dividers and other traffic control devices shall be done with extreme care and consideration for the traveling public.

d. Traffic control devices shall not be removed without the Engineer's approval.

e. The barricades and other traffic control devices, except materials furnished by the Department, shall remain the property of the Contractor.

f. (1) The Contractor shall provide hard covers for signs left in place and currently not in use.

(2) The covers shall be the same size as the sign and completely cover the sign when installed.

(3) Bolting the cover to the sign by drilling holes through the sign will not be allowed.

(4) The cover shall be constructed so there will be at least a 1/8 inch space between the sign and the cover when installed.

(5) The cover will be fastened so that it will not come loose or damage the sign during normal or windy conditions.

(6) Spacer blocks are allowed in the border area of the sign.

g. The Contractor shall maintain a stock of spare lights, signs, devices, and repair parts at the project site for immediate emergency replacement or repairs.

h. The Contractor shall mow or trim vegetation to insure that the complete visibility of signs, barricades, and other warning devices is maintained at all times.

i. The Contractor shall, at the preconstruction conference, provide the Engineer with the names and telephone numbers of personnel who will be available on a 24-hour-per-day, 7-days-per-week basis. These people shall be responsible for repair, correction, replacement, and maintenance of the traffic control devices.

j. (1) The Contractor shall take all necessary precautions for the protection of the work and the safety of the public.

(2) (i) The Contractor shall be alert at all times to any and all deficiencies in the placement and maintenance of any traffic control devices and shall take immediate action to correct any deficiencies.

(ii) The Contractor shall inspect traffic control devices at least once every day the devices are in use, but shall provide more frequent inspections during or following periods of inclement weather or at other times when more frequent inspections are warranted.

(3) Type A, B, and C barricade warning lights shall comply with the requirements for warning lights in the MUTCD.

k. (1) The Contractor may be given notice, either written or verbal, of failure to install, replace, remove, or maintain a traffic control device.

(2) Upon notification by the Engineer, the Contractor shall respond to any site within 4 hours and take immediate steps to correct the deficiency.

(3) If corrective action is not taken by the Contractor within 4 hours of the initial notice, the Engineer shall make no payment for any traffic control devices for that day.

(4) If corrective action is not taken within 4 hours, a written notice of action to be taken shall be given to the Contractor or person designated for work zone traffic control.

(5) Failure to install, replace, remove, or maintain a device within 8-hours of the initial notice may result in no payment being made for any traffic protective devices on the project for that day and on subsequent days until the requested installation, replacement, removal, or maintenance is performed. The Engineer may also suspend all other work until the problem is corrected.

l. The Department may elect at any time to correct a traffic control deficiency and bill the Contractor for all costs necessary to correct the problem.

m. The Contractor shall immediately notify the Engineer of any hazard or changed roadway condition that is not identified in the plans.

n. When more than one Contractor is working on the project or when consecutive projects require protection and control of traffic, the Engineer shall determine and notify in writing the Contractor whose responsibility it shall be to provide the protection and control of traffic.

o. When a pilot vehicle is required by the contract, it shall be used to lead the traffic through the restricted section. The work shall be so coordinated that the pilot vehicle shall make a round trip in 15 minutes or less.

3. Asphalt Pavement:

a. The Contractor shall control the traffic to protect any new bituminous surface work including patches, prime coat and track coat as described in Division 500 and the plans.

b. Public traffic will not be allowed on new asphalt surfaces until compaction rolling is complete and the surface has cooled to less than 165°F (74°C).

c. When a detour is not shown in the plans, the Contractor may restrict the traveling public to one-way traffic. This restriction shall be limited to the minimum time and distance required to properly compact the mixture and allow sufficient reduction in temperature to prevent displacement of the surface or damage to the surface treatment and/or edges of the newly placed surface. Two-way traffic shall be allowed on the remainder of the project unless there are other traffic restrictions.

d. When traffic is restricted to one lane, the Contractor shall place at least one flagger at each end of the restricted section.

4. Temporary Pavement Markings:

a. (1) The pay item "Temporary Pavement Marking, Type _____" has 4 options and is used on major construction such as phased PCC pavement, bridges, and shooflys.

- Temporary Pavement Marking, Type I (Tape)
- Temporary Pavement Marking, Type II (Tape)
- Temporary Pavement Marking, Type Paint.
- Temporary Pavement Marking, Type RPM

(2) The pay item "Temporary Pavement Marking" has 4 optional materials unless otherwise restricted by the plans or other contract documents. The options are:

- Temporary Pavement Marking, Type I (Tape)
- Temporary Pavement Marking, Type II (Tape)
- Temporary Pavement Marking, Type Paint.
- Temporary Pavement Marking, Type RPM

(3) The application and type of pavement marking to be used shall be as specified in the project plans or as directed by the Engineer.

(4) All temporary pavement marking shall conform to the requirements in this Section for materials, equipment used, application, measurement and payment.

b. (1) The pay items "Overlay Broken Lines" and "Overlay Solid Lines" are used to provide and apply lines on asphalt pavement where the marking is renewed at the end of each day as in overlay work.

(2) Both pay items have four optional materials:

- (i) Paint (see Paragraph 4.d. below for requirements)
- (ii) Tape – Type I (see Paragraph 4.d. below for requirements)
- (iii) Tape – Type II (see Paragraph 4.d. below for requirements)
- (iv) Raised pavement markers (see Paragraph 4.g. below for requirements)

(3) Plans will indicate the appropriate marking material to be used. If the plans or other contract documents do not indicate the type of material, then the Contractor may select any of the four options.

c. Temporary Pavement Marking, Type Paint:

(1) This work shall consist of the placement of white or yellow paint stripes with embedded glass beads for retroreflectivity. The paint stripes shall be the color, size, and type specified. They will be placed in the locations specified in the project plans or as directed by the Engineer.

(2) Temporary Traffic Paint that fails to provide a uniform appearance, or which fails to be clearly visible during the day or night shall be corrected or replaced by the Contractor in a manner acceptable to the Engineer and at no additional cost to the Nebraska Department of Roads.

(3) The paint machine shall be capable of applying an even, clean-cut line without excessive drifting of paint. The cutoff mechanism on the paint machine shall be capable of making a clean-cut end section without dripping or stringing fine lines of paint.

(4) The bead dispenser shall be equipped with an automatic cutoff control synchronized with the cutoff on the striping material.

d. Temporary Pavement Marking, Type I and II (tape):

(1) This work shall consist of the application of preformed temporary pavement marking tape meeting the materials requirements of section 1069.02 paragraphs 1 and 2 of the current Nebraska Department of Roads, Standard Specifications for Highway Construction.

(2) Type I tape will generally be used for asphalt projects.

(3) Preformed pavement line markings consisting of Type I and II tape shall be installed with a mechanical applicator, which shall be capable of placing pavement lines in a neat, accurate and uniform manner. The mechanical applicator shall be equipped with a film cut off device.

e. " _____ Temporary Pavement Marking Type _____" is the pay item for temporary arrows, words, and symbols on all asphalt and PCC pavement.

These markings can be either painted with beads or tape as indicated in the pay item.

f. Temporary pavement marking (“Temporary Pavement Marking, Type _____” and “Temporary Pavement Marking”, and “_____ Temporary Pavement Marking, Type ___”) includes removal of the markings when they are no longer needed at no additional cost to the Department.

g. The Engineer may approve the use of raised pavement markers for yellow solid lane lines with a maximum spacing of 5 feet (1.5 m). They may also be used as right edge lines, but **only** when shown in the plans.

h. Any broken or solid lines that fail to meet dimensions or spacing in Tables 422.01 and 422.02 shall not be accepted and no payment will be made for **all** pavement marking applied that day, until correct installation (to the satisfaction of the Engineer) resumes.

i. Raised pavement markers and paint or tape shall not be interspersed or used with each other to simulate the same line. However, they may be used together to supplement a line when required by the plans or the Engineer.

j. The plans and the Specifications will indicate where each type of temporary pavement marking will be applied. The Engineer may direct the Contractor to apply any of the four optional temporary pavement marking line materials as are necessary for safe traffic flow.

5. National Cooperative Highway Research Program (NCHRP) Report 350 Requirements.

a. Contractor furnished traffic control devices shall be crashworthy and qualify as such according to the testing and acceptance guidelines of the National Cooperative Highway Research Program (NCHRP) Report 350. Traffic control devices have been classified into four (4) categories. The following is a list of categories and compliance requirements.

(1) **Category 1:** Includes traffic cones, tubular posts, vertical panels, flexible delineator posts, and reflectorized plastic drums with no attachments. The Contractor shall provide the Engineer a copy of the developer’s self-certification of the devices used.

(2) **Category 2:** Includes Type II and III barricades, portable sign supports, intrusion alarms and cones, vertical panels and plastic drums with a light or sign attached. The following compliance requirement for Category 2 devices shall be used:

(i) By January 1, 2002, all Category 2 devices shall be NCHRP 350 (Test Level-3) compliant.

(ii) All new Category 2 devices purchased or built after October 1, 2000 shall be NCHRP 350 (TL-3) compliant; and Contractors shall certify that all devices purchased or built after October 1, 2000 are NCHRP 350 compliant.

(iii) Projects let prior to October 1, 1999 will not be subject to this provision.

(iv) Projects let after January 1, 2002 will require that all Category 2 devices are NCHRP 350 (TL-3) compliant.

(v) For projects let after October 1, 1999 but prior to January 1, 2002, the Category 2 devices used may be either compliant devices or non-compliant devices purchased prior to October 1, 2000 completing their normal service life. For projects let during this period with a starting date after January 1, 2002, all Category 2 devices shall be NCHRP 350 (TL-3) compliant. For projects let during this period but not completed by January 1, 2002, the Department of Roads --- at its discretion --- will determine whether non-compliant devices may remain in service. If the Department directs that non-compliant devices be replaced with compliant devices, the Contractor will be compensated for the replacement as extra work. Compensation will be based upon the actual cost of the replacement less any residual value of the new devices upon completion of the contract.

(vi) The Contractor shall provide the Engineer a copy of the FHWA acceptance letter for all NCHRP 350 (TL-3) compliant Category 2 devices when used.

(3) **Category 3:** Includes concrete protection barriers, fixed sign supports, truck mounted attenuators (TMA), and work zone crash cushions (WZCC) and other work zone devices not meeting Category 1 or 2.

(i) TMA's and WZCC purchased after October 1, 1998 must comply with NCHRP 350 TL-3. Existing TMA's and WZCC may be phased out as they complete their service life. Concrete protection barriers purchased after October 1, 2002 shall meet NCHRP 350 TL-3.

(ii) The Contractor shall provide the Engineer a copy of the FHWA acceptance letter for all NCHRP 350 (TL-3) Category 3 devices when supplied by the Contractor.

(iii) Fixed breakaway sign supports for work zones shall be tested under the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, and accepted by the FHWA.

(4) **Category 4:** Includes portable or trailer-mounted devices, such as flashing arrow panels, temporary traffic signals, area lighting supports and portable changeable message signs. The compliance date for Category 4 devices has not been determined.

422.02 -- Material Requirements

1. a. Warning Signs – The Department will furnish the permanent sign messages on an appropriately sized panel at one of the permanent maintenance headquarters located throughout the State. These are as follows:

Maintenance Headquarters			
Ainsworth	Geneva	Mullen	Scottsbluff
Alliance	Grand Island	Neligh	Sidney
Bridgeport	Hastings	Norfolk	South Sioux City
Broken Bow	Holdrege	North Platte	Tecumseh
Chadron	Imperial	Omaha	Valentine
Columbus	Kearney	O’Neill	Wayne
Fairbury	Lincoln	St. Paul	York
Fremont	McCook		

b. Temporary Signs

(1) Contractor-furnished “Temporary Signs” shall consist of approved retroreflective fluorescent orange or white roll-up signs mounted on temporary sign stands. The sign with stand shall be NCHRP-350, Test Level 3, approved. The roll-up signs shall be of the size and shape required by the plans. The color and design of the roll-up signs shall be as required by the MUTCD and the NDR Traffic Engineering Division. Sign legends and symbols shall be of professional quality workmanship and in uniformity with the Standard Highway Signs design guide. Temporary signs shall meet the requirements of the American Traffic Safety Services Association (ATSSA). "Quality Standard for Work Zone Traffic Control Devices", hand printing or poor workmanship shall not be allowed. The Contractor shall provide the Engineer a copy of the FHWA acceptance letter for all Category 2 “Temporary Signs” before they are used.

(2) Rigid plastic sign substrates that have been approved to NCHRP 350 (TL-3) may be used for roll-up signs. When used, the plastic sign substrate with sign sheeting and temporary sign support shall, all together as a single, testing unit, be NCHRP 350 (TL-3) approved. Aluminum sign substrates shall not be used.

(3) The temporary sign stands have enough vertical rigidity to support the roll-up signs in an upright position and provide continuous legibility of the sign legend in gusty conditions (wind or vehicle gusts). The Engineer shall determine the adequacy of visibility, and temporary sign stands that fail to provide adequate visibility of the sign shall not be allowed.

(4) Retroreflective, orange fluorescent sheeting used for temporary, roll-up signs shall be 3M diamond grade roll-up sheeting or Reflexite Marathon fluorescent sheeting or other approved equal material. Retroeffective white sheeting shall be 3M diamond grade roll-up sheeting or Reflexite Marathon white sheeting or other approved equal material.

(5) Signs required for flagging shall meet the "Temporary Sign" requirements of this Section (422).

2. The following items shall meet the requirements prescribed in the *Manual on Uniform Traffic Control Devices*:

- a. Barricades (Type II & III)
- b. Temporary Traffic Signals
- c. Concrete Protection Barriers
- d. Vertical Panels
- e. Type B High Intensity Warning Lights

3. The following items must be on the NDR Approved Products List to be used on a Department project:

- a. (1) Temporary Pavement Marking, Type I, II, & RPM.
(2) Overlay Broken Lines and Overlay Solid Lines (Type I, II, & RPM).
- b. Inertial Barrier Systems
- c. Flashing Arrow Panels
- d. Tubular Posts
- e. Opposing Lane Dividers
- f. Temporary Glare Screen
- g. Changeable Message Signs
- h. 42" (1070 mm) Reflective Cones

4. Temporary Pavement Marking, Type Paint and "Overlay Broken/Solid Lines (Paint)" shall meet the following requirements:

a. **Paint.** The paint shall be commercially available traffic paint capable of receiving and holding glass beads for producing reflectorized traffic markings. The paint shall be furnished ready mixed and shall not be diluted or thinned. The paint shall be compatible with drop-on floating conventional beads. The color for white paint after drying shall be a flat white, free from tint, furnishing good opacity and visibility. For yellow, the color shall closely match Color Chip 33538 of Federal Standard 595.

b. **Beads.** The glass beads shall be AASHTO M-247 Type 1, Floating. The beads shall be free from clumps and suitable for application to the type of paint selected by the Contractor. The glass beads shall show good adherence to the paint binders and provide good night visibility throughout the manufacturer's predicted useful life of the reflectorized binders. The beads shall allow sufficient capillary action to form a firm embedment in typical traffic paint when dropped on a freshly applied paint film. The beads shall be accepted based on certified test results indicating that the beads meet the specifications for AASHTO M-247 Type 1, Floating beads and the above requirements.

5. The reflective sheeting on 42-inch (1067 mm) cones shall be 3M scotchlite diamond grade fluorescent orange flexible sheeting or an approved equal quality sheeting.

422.03 -- Construction Methods

1. a. The Contractor shall install, maintain, and remove all signs in accordance with the details of and at the locations shown in the plans.

b. The Contractor shall furnish all necessary posts, support standards, bolts, or other fasteners for signs.

c. For the purpose of protecting and controlling traffic through or around a construction project, permanent signs are defined as those signs which provide protection and control on a 24-hour-per-day basis. All other signs shall be considered as temporary signs, including signs designated in the plans as "Temporary Signs", which must remain in place for variable periods of time. Construction speed zone signing shall be considered temporary signing and shall only be installed during those periods when the speed zone is required.

d. Permanent signs, complete with posts, bolts, or other fasteners, shall be placed at the time construction work begins in compliance with the applicable conditions of the standard and/or special plan(s) and shall be used until permission is granted, in writing, by the Engineer that the work is complete and that they may be removed.

e. Posts used to erect permanent signs shall be installed and maintained plumb, and the sign faces shall be positioned and maintained so that they face approaching traffic.

f. Signs shall be disassembled and returned to the maintenance headquarters from which they were obtained, or to a location designated by the Engineer, during normal working hours.

g. (1) Signs returned to the Department shall be in reusable condition.

(2) Wood signs shall not be marred or damaged to the extent that they will be unsightly.

(3) Aluminum signs shall not be marred, damaged, bent, or contain holes other than necessary bolt holes.

(4) If signs are damaged while issued to the Contractor, then the Contractor will be charged the replacement cost.

h. Steel drums shall not be used as sign holders.

i. (1) "Temporary Signs" shall be installed as shown in the "plans", "Standard Plans", or "Special Plans".

(2) "Temporary Signs" shall be installed as prescribed in the MUTCD.

2. Barricades:

a. This work consists of providing, installing, maintaining, and when no longer required, removing barricades and reflectorized drums at the locations shown in the plans or designated by the Engineer.

b. The *Manual on Uniform Traffic Control Devices* defines 2 types of barricades authorized for use in Nebraska:

(1) Type II

(2) Type III

c. In applications other than on a freeway, expressway, or an interstate roadway, reflectorized drums may be used in lieu of Type II Barricades. Reflectorized drums shall be used in lieu of Type II Barricades in applications on a freeway, expressway, or an interstate roadway.

d. When approved by the Engineer or shown in the plans, 42" (1070 mm) reflective cones may be used in lieu of Type II Barricades or Reflectorized Drums. 42" (1070 mm) reflective cones shall include a 30-pound (14 kg) rubber base and display four 6-inch (150 mm) wide bands of 3M Scotchlite diamond grade fluorescent orange flexible sheeting or an approved equal quality sheeting. The bands shall alternate orange-white-orange-white. 42" (1070 mm) reflective cones shall not be used for lane-closure tapers or shifts, or the dropoff at the edge between the pavement and the shoulder.

3. Flagging:

a. (1) It shall be the responsibility of the Contractor to furnish flagger(s) to direct traffic when construction activity occurs on or adjacent to a surface being used by the traveling public.

(2) Except when necessitated by an emergency situation or for situations not reasonably expected to last for more than 15 minutes, flagging shall not be performed by other than certified flaggers. Flaggers must always carry a valid Flagger Certification Card. Flagger Certification Cards shall be valid for a period of 2 years from date of issue.

b. (1) The flagger(s) shall be properly attired with vest and head gear. They shall be provided properly installed advance warning signs, and they shall be otherwise equipped in accordance with the requirements of the plans and specifications.

(2) Flaggers shall position themselves appropriately and according to accepted flagging procedures.

c. (1) The Contractor shall be responsible for the training and certification of the flaggers employed on the project. Certification shall be according to the standards established herein and the "Guidelines for Flagger Training and Certification of Flaggers" available from the Department. Certification cards issued according to these rules by other Contractors, provided they have not expired, shall be considered valid.

(2) Flaggers shall be familiar with the contents of the Department's "Flagger's Handbook" and shall carry a copy of such publication on their person while performing the flagger duties. This publication is available from the Engineer.

d. In order to be certified, the prospective flagger must:

(1) Be in good health with normal abilities or hearing and sight.

(2) Be able to read and speak English.

(3) View the 45-minute video "The Flagger."

(4) Correctly answer 80 percent of the questions on an examination that accompanies the video.

e. Upon satisfactory completion of the training and examination procedure, the prospective flagger shall be issued a Flagger Certification Card by the examining Contractor. The flagger's name, social security number, and test score shall be reported to the Construction Engineer on DR Form 90, "Flagger Certification Report".

f. The video, examination forms, Flagger Certification Cards, Flagger Certification Reports, and "Guidelines for Flagger Training and Certification of Flaggers" shall be furnished by the Department.

4. Temporary Traffic Signal:

a. Temporary traffic signal systems shall be furnished, installed, operated, and maintained by the Contractor at the locations shown in the plans.

b. "Temporary Traffic Signal" shall include signal heads for all approaches to the signal. A temporary traffic signal for a single lane roadway section or bridge shall include signal heads for both ends of the single lane section.

c. (1) The Contractor shall make arrangements with the local utility for power service for temporary signals in a timely manner.

(2) The Contractor is required to comply with the local utility's policy for temporary power service.

(3) The Contractor shall cooperate with the local utility in scheduling the installation.

(4) Any delay resulting from a Contractor's untimely request to the local utility for temporary power service shall not be justification for the suspension or adjustment of the working days or calendar days on a project.

d. When work is complete, the Contractor shall remove the traffic signal.

5. Concrete Protection Barriers:

a. (1) Concrete protection barriers shall be furnished by the Department and installed by the Contractor at the locations shown in the plans or designated by the Engineer for the pay item "Install Concrete Protection Barrier".

(2) The Contractor shall furnish and install concrete protection barriers at the locations shown in the plans or designated by the Engineer for the pay item "Concrete Protection Barrier".

(3) The repositioning of concrete protection barriers to locations directed by the Project Manager or as shown in the plans after the initial installation is included in and defines when the pay item "Relocate Concrete Protection Barrier" is used.

b. The Contractor shall obtain and return the concrete barriers to the location(s) indicated in the plans. These units, which are 2 feet wide by 10 feet long by 32 inches high and with weigh approximately 4,900 pounds, shall be installed as shown in the plans.

c. The barrier unit ends shall be placed as close together as possible and in close alignment.

d. Adjacent ends of the barrier units shall be fastened together as directed by the Engineer.

e. The Contractor shall shim the barrier units as necessary to compensate for surfaces that are not level.

6. Temporary Pavement Marking/Overlay Solid Lines/Overlay Broken Lines:

a. (1) The Contractor shall install reflectorized temporary pavement markings of the color, width, line configuration, and dimensions shown in the

plans or designated by the Engineer. Work includes arrows, words and symbols marked on the pavement.

(2) When markings are no longer needed, the Contractor shall remove them at no additional cost. **If removing markings from the final wearing surface, the removal process shall not mar or damage the surface. Removed marking shall no longer be visible on the final wearing surface.**

(3) When “over” painting existing lines, the pattern shall match the existing pattern.

b. Temporary Pavement Marking, Type I and Type II (tape) and Overlay Solid Line (tape) shall be placed to form a continuous line when used as a solid line, breaking only at intersections

c. Raised pavement markers shall not be used for right edge lines unless shown in the plans.

d. (1) When temporary pavement markings (including “Overlay Broken Line”) are used to delineate lanes with broken lines in rural areas, the following **minimum dimensions shall** be used:

**Table 422.01
Rural Area**

Marking	Minimum Dimension
Temporary Traffic Paint	Minimum 4 inches (100 mm) wide by 10 feet (3 m) long with 30 foot (9 m) max. gaps.
Temporary Pavement Marking Tape	Minimum 4 inches (100 mm) wide by 4 feet (1.2 m) long placed every 40 feet (12 m).
Raised Pavement Markers	3 markers, each a maximum of 5 feet (1.5 m) apart with 30 foot (9 m) gaps.

(2) When temporary pavement markings (including “Overlay Broken Line”) are used for lane delineation with broken lines in urban areas, the following **minimum dimensions shall** be used:

**Table 422.02
Urban Area**

Marking	Minimum Dimension
Temporary Traffic Paint	Minimum 4 inches (100 mm) wide by 6 feet (2 m) long with 18 foot (5.5 m) max. gaps.
Temporary Pavement Marking Tape	Minimum 4 inches (100 mm) wide by 2 feet long (600 mm) placed every 20 feet (6 m)
Raised Pavement Markers	3 markers, each a maximum of 3 feet (900 mm) apart with 18 foot (5.5 m) gaps.

e. In order to insure maximum adhesion, the Contractor shall clean all dirt, glaze and grease, road film, and all other foreign materials from the pavement area to be marked. The pavement shall be clean and dry prior to the application of the temporary pavement marking.

f. Pavement markings which fail to provide a uniform appearance, fail to be clearly visible during the day or night, or which fail to remain firmly in place on the roadway shall be replaced or corrected by the Contractor in a manner acceptable to the Engineer and at no additional cost to the Department of Roads.

g. To insure the satisfactory performance of pavement mark-ings, new portland cement concrete pavement shall be sandblasted to remove the curing compound from the surface on which pavement markings are to be applied. Sandblasting may be done seven days after the placement of the concrete surface unless otherwise directed by the Engineer.

h. Temporary Pavement Marking, Type Paint and Overlay Solid/Broken Lines (Paint):

(1) The material shall be applied to the pavement at a minimum wet film thickness of 0.015 in. (.38 mm).

(2) The beads shall be distributed evenly over the wet paint at a reasonably accurate rate of 5 pounds per gallon (0.60 kg/l) of paint, unless the Engineer specifies a different rate. Beads applied to the surface of the completed stripe shall be applied by an automatic bead dispenser attached to the striping machine in such a manner that the beads are dispensed immediately upon the completed line.

(3) The paint shall be applied in such a manner as to follow the existing lines on the roadway or as directed by the Engineer. When deemed necessary by the Engineer to achieve the correct alignment, the Contractor shall, at no additional cost to the Department of Roads, place additional markings to guide the placement of the lines. The guide markings shall be temporary in nature and the material and equipment used to place these guidelines shall be approved by the Engineer.

(4) The completed line shall be a uniform cross section. The traffic paint stripe shall not be applied when there is moisture on the pavement that would cause a poor bond between the paint and the pavement.

(5) Application shall not be permitted when atmospheric temperature is below 40° F (4° C) and falling.

(6) The Contractor shall follow all manufacturer recommendations for application of traffic paint so as to obtain the best results.

(7) The paint shall be applied $4 \pm 1/2$ inches (100 mm \pm 12 mm) in width with a dry thickness of at least 10 mils (0.25 mm) (approximately 10.7 gallons of paint per mile (25.2 l/km) of solid line).

(8) The equipment used to paint the line shall be designed to apply painted traffic lane markings of the type, width, and thickness required.

(9) The machine shall be equipped with an adjustable guide to assure the line's proper placement. Hand application or towing of the equipment will not be allowed, except in emergency situations.

(10) The Contractor shall remove all temporary lines when they are no longer needed. If removing markings from the final wearing surface, the removal process shall not mar or damage the surface. Removed markings shall no longer be visible on the final wearing surface.

i. Projects without Detour:

(1) Not more than 1/2 mile (0.8 Km) of roadway behind the finish rolling operation, completed asphaltic surface treatment, or the milling operation shall be unmarked. At the end of each day, the temporary lines shall be placed so that, when combined with existing or previously placed lines, the entire project is marked. The Contractor shall clean or replace all temporary marking and reflective surfaces at no additional cost to the Department.

(2) When raised pavement markers, paint or tape is applied and the adjacent layer of asphaltic concrete has not been placed, the markings shall be placed on the higher layer approximately 6 inches (150 mm) from the longitudinal joint. The Contractor shall be required to remove the raised pavement markers and the overlay markers on all lifts.

(3) The top layer shall be marked with three raised pavement markers placed at 5 foot (1.5 m) spacing approximately 6 inches (150 mm) off centerline at 40 foot (12 m) intervals or 4 inch (100 mm) by 48 inch (1.2 m) reflectorized tape every 40 feet (12 m).

(4) When possible, the location of the temporary edge line should coincide with the permanent line in its final position.

j. Projects with Detour:

(1) A temporary centerline will be required for all layers of asphaltic concrete placed. Lower layers shall be marked with reflectorized tape or paint applied in sections 4 inches (100 mm) by 24 inches (600 mm) at 40-foot (12 m) intervals, 4 inch (100 mm) by 10 foot (3 m) painted line with 30-foot (9 m) gap, or three raised pavement markers at 5 foot (1.5 m) spacing placed

approximately 6 inches (150 mm) off centerline at 40-foot (12 m) intervals. The Contractor shall remove raised pavement markers before successive resurfacing operations.

(2) The top layer shall be marked with three raised pavement markers placed approximately 6 inches (150 mm) off centerline at 40-foot (12 m) intervals or 4 inch (100 mm) by 48 inch (600 mm) reflectorized tape every 40 feet (12 m).

k. The Engineer may direct that raised pavement markers are left in place. The Engineer shall consider the RPM's location and color.

7. Temporary Rumble Strips:

a. The Contractor shall furnish, install, and maintain temporary rumble strips at the locations shown in the plans or directed by the Engineer.

b. The material shall be given adequate time to harden before the rumble strips are opened to traffic.

c. Upon completion of that particular phase of the work requiring rumble strips, the Contractor shall remove the rumble strips. The Contractor shall exercise the same care and consideration for traffic control during removal operations as that required for the initial installation or replacement.

8. Vertical Panels:

The Contractor shall furnish, install, and maintain vertical panels at the locations and spacing shown in the plans or designated by the Engineer. The vertical panels shall comply with the requirements shown in the MUTCD and any pertinent modifications shown in the plans. A vertical panel unit may be single- or double-sided (back-to-back) as required by the plans, and the supporting post shall not cover any of the reflective area of the panel(s).

9. Inertial Barrier System:

a. This work shall include the furnishing and installation required for project phasing, and removal of sand-filled type inertial barrier systems, including filler material and object markers, in accordance with the plans or as required by the Engineer.

b. (1) The Contractor shall furnish an FHWA approved inertial barrier system that is on the NDR Approved Products List.

(2) The system shall be installed in the field as required by the manufacturer.

(3) The sand or filler material for the inertial barrier system shall meet one of the material and gradation requirements of fine aggregate for concrete.

(4) A complete set of replacement modules shall be available near the project site in the event of damage to the installed system. Damaged modules shall be replaced within 24 hours.

(5) For inertial barriers which are required to remain in place during the winter, 5 to 15 percent (by volume) rock salt shall be mixed with the filler material.

(6) Upon completion of the work requiring the inertial barrier system, the Contractor shall remove the system and clean the site of any debris and filler material remaining from the system.

c. Inertial barrier modules shall be available in 200, 400, 700, 1,400, and 2,100 pound sizes and shall consist of the following components:

(1) An outer container molded in one or two pieces. The material shall be durable, weatherproof, and formulated to resist deterioration from ultraviolet rays. The outer container shall have a minimum width of 27 inches at the base, 36 inches at the top, and a minimum height of 36 inches. The standard color shall be yellow.

(2) A lid which locks securely to the top lip of the outer container. The material shall be durable, weatherproof, and formulated to resist deterioration from ultraviolet rays. The lid shall be capable of withstanding a 200 pound vertical load.

(3) A supporting insert which is varied to allow for different sizes of modules to support 200, 400, 700, and 1,400 pound sand weight. Care shall be taken to fill each module with the proper amount of sand as called for in the array design. The height and diameter of the inserts shall be such to ensure that the center of gravity of each module is at the proper elevation to control the attitude of impacting vehicles. The insert container interface shall allow free drainage of excess water contained in the sand mass.

d. A MUTCD Type I object marker shall be placed on the first inertial barrier module facing approaching traffic. The Type I object marker shall consist of nine yellow prismatic reflectors, each with a minimum dimension of 3 inches, mounted symmetrically on a 18 inch black or yellow diamond panel; or a 18 inch yellow diamond panel of Type III reflective sheeting without buttons. The object marker shall be placed approximately 2 inches below the top of the first module.

10. Flashing Arrow Panel:

a. The Contractor shall furnish, install, and operate mounted flashing arrow panels for use in traffic control at the locations shown in the plans. The Contractor shall remove the panels when work is complete and the Engineer has approved their removal.

b. (1) The minimum panel size shall be 8 feet by 4 feet and shall contain 22 lamps. The lamps shall be arranged to form 3 connected diamonds with the short axis of the diamonds lying on the horizontal centerline of the sign. Each side of the diamonds will form an arrowhead of 5 lamps per head. Each arrowhead shall have a minimum angle of 100 degrees.

(2) The panel shall be constructed in a rigid manner such that the panel face does not flex in the vertical dimension.

(3) For use on multi-lane roadways where at least one traffic lane is maintained for each direction of travel, the arrow panel shall have the capability of the following mode selections:

- (i) Left or right flashing arrow.
- (ii) Left or right sequential chevrons.
- (iii) Double flashing arrows.

(4) For use as a hazard identification marker on 2-lane highways with 1 lane closed, the flashing arrow panel shall be wired to alternately flash the two outside diamonds or flash the 4 outside corners.

(5) Minimum "on time" shall be 50 percent for the flashing arrow and flashing diamonds and equal intervals of 25 percent for each sequential phase.

c. (1) Lamps for generator powered arrow panels shall maintain visibility out to a horizontal angle of 20 degrees.

(2) Solar powered arrow panels shall maintain visibility out to a horizontal angle of 13 degrees.

(3) Vertical maintained visibility shall be greater than 3 degrees.

(4) The lamp intensity shall be adjusted to prevent an unnecessary blinding effect and to compensate for daytime and nighttime light conditions so that the arrow panel message is legible for a distance of 1 mile. The intensity shall be controlled by an automatic dimmer capable of a 50 percent reduction in intensity when ambient light falls below 5 foot candles.

d. (1) The arrow panel shall be aimed to provide for recognition throughout the range from 1,600 feet to 300 feet upstream of the panel.

(2) For use on 2-lane highways as a hazard identification marker, the mounted arrow panel shall be located immediately in front of the hazard and behind a Type III barricade.

(3) The arrow panel shall be mounted at a minimum height of 7 feet from the road surface to the bottom of the panel.

(4) The arrow panel shall be mounted such that it will remain stationary and rigid in high or gusty winds while the panel is in use.

e. (1) The arrow panel shall be maintained so as to operate continuously. The Contractor shall advise the Engineer of the person to contact in case of needed repairs or maintenance.

(2) The Contractor shall always have an extra unit on the project for use as a standby unit. In the event of equipment failure resulting in an arrow panel becoming inoperative, regardless of the time of day, the Contractor shall immediately substitute the standby unit for the inoperative arrow panel. The Contractor shall then either immediately repair or replace the defective unit.

11. Type B High Intensity Warning Lights:

a. Type B High Intensity Warning Lights shall be furnished, placed, operated, and maintained as shown in the plans.

b. When work is complete and their removal has been approved by the Engineer, the warning lights shall be removed by the Contractor.

12. Pilot Vehicle:

a. This work shall consist of providing a vehicle and driver to serve as a pilot vehicle to lead the traveling public and the Contractor's vehicles through the construction work area where 2-way traffic is restricted to only one lane.

b. (1) The pilot vehicle shall be properly equipped and licensed for operation on public roadways in accordance with the applicable State laws.

(2) The vehicle shall carry the Contractor's monogram or company insignia and shall be equipped with a rear facing, rigidly mounted sign having a fluorescent orange background with black lettering bearing the message:

"PILOT CAR--FOLLOW ME"

(3) The sign shall be a MUTCD sign No. G20-4, sized at 36 x 18 inches.

(4) The bottom of the sign shall be mounted a minimum of 1 foot above the vehicle's roof.

(5) The sign shall be securely covered or removed when not in use.

(6) The vehicle, while in use, shall be used exclusively to lead and assist traffic movement.

(7) During construction, a pilot vehicle shall be kept in continuous operation. Delays to traffic movement will not be allowed for refueling, driver relief, or any other foreseeable reason.

(8) The work shall be so coordinated that the pilot vehicle shall make a roundtrip in 15 minutes or less.

c. Pilot vehicle drivers shall be properly licensed and shall be familiar with and always observe the "Rules of the Road" for proper, safe, and courteous driving. Drivers will be subject to prosecution for all violations.

d. Pilot vehicle drivers shall be certified flaggers and must have their Flagger Certification Card in their possession at all times.

13. Tubular Post:

a. The Contractor shall furnish, install, maintain, and remove reflectorized tubular posts at the locations shown in the plans or as directed by the Engineer.

b. (1) The height of a tubular post shall be 28 inches. The material from which the post is fabricated shall be rubber, plastic, or any other material which meets the physical test requirements and results in little or not damage to impacting vehicles. The minimum width of the post shall be 2 inches. The predominant color of the post shall be orange.

(2) Each complete tubular post and each replacement post must have a minimum of two 3-inch wide reflective white bands placed a maximum of 2 inches from the top with a maximum of 6 inches between the bands. The reflective white bands must be 3M flexible high intensity grade reflective sheeting or approved equivalent.

(3) Tubular posts that are approved for use are shown in the NDR Approved Products List. Tubular posts which have not been previously approved by the Department will not be permitted on the project until approved by the Engineer.

c. (1) The tubular posts shall be spaced at the intervals shown in the plans or as directed by the Engineer and shall be attached to the existing surface by epoxy or other suitable adhesive. The adhesive shall be given adequate time to harden before the post can be attached and the area opened to traffic. The initial placement and/or replacement of the tubular posts shall be performed with extreme care and consideration for the traveling public.

(2) Reflective sheeting which is no longer effective shall be replaced.

(3) Tubular posts which have become dislodged due to traffic or other action shall be properly repositioned and reattached within 24 hours. Tubular posts which cannot be cleaned or which are broken shall be replaced.

d. Upon completion of that particular phase of the work requiring tubular post delineation, the Contractor shall remove the posts as directed by the Engineer. The Contractor shall exercise care and consideration for traffic control during removal, initial installation, and replacement. The Contractor must explain this phase of traffic control to the Engineer before installation, replacement, and removal.

14. Opposing Lane Dividers:

a. (1) The Contractor shall furnish, install, and maintain reflectorized opposing lane dividers at the locations shown in the plans.

(2) When work is complete and the Engineer has approved their removal, the Contractor shall remove the reflectorized opposing lane dividers.

b. (1) The height of the opposing lane divider shall be 36 inches.

(2) The divider shall be fabricated from rubber or plastic.

(3) The predominant color of the divider shall be orange.

c. Each opposing lane divider and each replacement divider must have back-to-back, upright, orange, reflective panels approximately 12 inches wide by 18 inches high. The symbol on the divider shall be 2 opposing black arrows. The reflective panel must be AASHTO M 268 Type III reflective sheeting or approved equivalent.

d. (1) The opposing lane dividers shall be attached to the existing surface by an epoxy or other approved adhesive.

(2) The adhesive shall be given adequate time to harden before the divider can be attached and the road opened to traffic.

e. (1) Reflective panels which are no longer effective shall be replaced.

(2) Lane dividers which cannot be cleaned or which are broken shall be replaced.

15. Pavement Marking Removal:

The Contractor shall remove conflicting permanent (not "temporary") pavement markings as shown in the plans or as required by the Engineer.

16. Temporary Glare Screen:

a. The Contractor shall furnish, install, maintain, and remove temporary glare screens (TGS) on Department-furnished concrete protection barriers at the locations shown in the plans.

b. The TGSs shall be installed as required by the manufacturer. The anchors shall be flush mounted. The TGSs shall consist of a white base rail (10 feet length) and green blades (2 foot height) angled at 0.384 radians. Every 10 feet, a 2 x 12 inch vertical, yellow, high intensity AASHTO M 268 Type III reflective sheet shall be placed at the midpoint on the right side of the vertical blade, one for each direction of travel.

c. Before installing the TGS, the Contractor shall furnish and install the internally threaded sleeve into the protection barrier. The top of the sleeve shall be flush with the top of the barrier.

d. Damaged sheeting, blades, base rails, and blades which no longer provide glare protection (such as bent blades or blades which move significantly in the wind) shall be immediately repaired or replaced by the Contractor at no additional cost to the Department.

e. Upon completion of the project, the Contractor shall remove the temporary glare screens (base rail and blades). The anchor sleeves in the concrete barriers shall be plugged with weatherproof plugs provided by the manufacturer. The plugs become the property of the State.

17. Changeable Message Signs:

The Contractor shall furnish, install, operate, and maintain changeable message signs as prescribed in the plans. When their removal is approved by the Engineer, the Contractor shall remove the changeable message signs.

18. Install Impact Attenuator:

a. (1) The Contractor shall pick up the impact attenuator from the location designated by the Engineer and assemble the attenuator in accordance with the details shown in the plans. The Contractor shall transport, maintain, and install the units at the location shown in the plans or designated by the Engineer.

(2) A second unit shall be stored with replacement cartridge sets in the Lincoln Maintenance Yard. It will be available in the event of damage to the installed system or if a second system is required while the original system is still in operation.

b. The Contractor shall perform all earthwork and provide the reinforced concrete pad (required for off-the-road installations) needed to place the unit. The Contractor shall immediately repair or replace any damaged units.

c. Upon completion of the pavement work on an initial construction phase, the Contractor will be required to relocate the attenuator to the position required for the traffic protection for pavement work on the subsequent phases.

d. Upon completion of the work, the Contractor shall disassemble the system and return it to the location designated by the Engineer.

422.04 -- Method of Measurement

1. a. (1) "Sign Days" is the pay item for permanent signs and permanent signs and permanent sign days shall be measured by the each. Signs must be installed in accordance with the plans or as directed by the Engineer.

(2) "Temporary Sign Days" is the pay item for "Temporary Signs" and "Temporary Sign Days" shall be measured by the each. Signs must be installed in accordance with the plans or as directed by the Engineer.

b. The quantity of sign days shall be the number of signs multiplied by the number of calendar days that the respective signs are in place.

c. A calendar day for signs shall be defined as the 24-hour period from midnight to midnight, or any portion of it, within which the sign is installed and maintained.

d. Each sign shall be paid for separately, even if more than one sign is installed on the same post or device.

2. a. Type III barricades shall be measured for payment by the number of calendar days each Type III barricade is in place and positioned as shown in the plans or as directed by the Engineer. The unit is barricade-day (BDay).

b. (i) "Type II Barricades, Reflectorized Drums, 42" (1070 mm) Reflective Cones, and Vertical Panels shall be measured for payment by the number of calendar days each is in place and positioned as shown in the plans or as directed by the Engineer. Payment shall be made at the established contract unit price.

(ii) Vertical panels will be paid at ½ the contract unit price for "Barricade Type II".

(iii) Reflectorized Drums and 42" (1070 mm) reflective cones are paid at the unit price for "Barricade Type II":

c. Payment for "Barricades, Type II", "Barricades, Type III", 42" (1070 mm) Reflective Cones and Vertical Panels will not be made for any devices which are not kept clean and properly positioned.

d. Payment for any traffic control device paid for by the day (excluding "Flagging") will not extend beyond the last working day or calendar day allowed by the contract. Payment will be made for any approved extension of the contract time allowance. The traffic control devices paid by the day that are required as determined by the Project Manager, shall remain in service at no cost to the Department.

3. a. "Flagging" will be measured for payment for each flagger location on a daily basis.

b. Operation of one flagger for 4 hours or less will be considered as one-half day and operation for more than 4 hours will be considered as one full day.

c. This price shall be full compensation for furnishing properly trained, attired, and equipped flaggers, for furnishing, installing, maintaining, and removing up to eight temporary signs per flagger situation as directed by the Engineer, and for all labor, tools, equipment, material, and incidentals necessary to complete the work. Temporary signs and stands for flaggers shall comply with the requirements of Temporary Sign.

4. a. "Temporary Traffic Signal" is measured by the each for every complete installation.

b. When a traffic signal is required at a bridge or other obstruction, all signals required to clear traffic through the obstruction are counted as a single unit.

5. a. "Concrete Protection Barrier" is measured by the length in feet (meters) based on the 10 foot (3 m) nominal length of the individual units.

b. The pay item "Relocate Concrete Protection Barrier" applies to those repositionings directed by the Engineer or shown in the plans, and these relocations shall be measured by the length of the concrete barriers so relocated based on the 10 foot (3 m) nominal length of the individual units.

6. a. (1) "Temporary Pavement Markings _____" and "Temporary Pavement Marking" shall be measured by the linear feet (meter) of each line applied.

(2) All gaps are not measured.

b. (1) "Overlay Solid Lines" and "Overlay Broken Lines" are measured by the station.

(2) Measurements can be made from the estimated length of each segment.

(3) When necessary, measurements shall be along the centerline or edgeline, as appropriate, between the beginning and ending points of the project and between the beginning and ending points of any intersecting roadway, shoofly, detour, or ramp.

(4) Breaks or gaps that are not part of a standard pattern (such as identified in Tables 422.01 and 422.02.) and which are more than 100 feet (30 m) in length are not measured for payment.

(5) Breaks or gaps that are part of a standard pattern in "Overlay Broken Lines" are measured.

c. Arrows, words, and symbols shall be measured by the each. Arrows shall be counted by each head.

d. Excluded from payment are any applications for maintenance of previously applied lines, replacement of previously applied lines that have worn or were covered by asphalt or any other substance and applications that are necessary to accommodate the Contractors schedule; as prescribed in Paragraph 9. of Subsection 422.05 of these applications are subsidiary.

e. Replacement of all temporary lines necessary because of required daily maintenance or the Contractor's work quality or schedule of operation shall not be measured for payment and is subsidiary to the relevant pay item.

f. When traffic must be routed over a new application of asphalt and the traffic is directed over payment markings, then the Department will pay to replace the markings that have been removed by traffic.

7. a. Raised pavement markers are measured by the linear foot.

b. When the spacing between the raised pavement markers is 10 feet or less, the length to be paid for shall be the distance between the first and last markers measured along the path represented by the markers.

c. When the spacing between raised pavement markers is greater than 10 feet, the distance shall be considered a gap and shall not be measured for payment.

d. All other marking materials shall be measured by the actual length of line installed, excluding gaps.

8. Temporary rumble strips will be measured for payment by the each for the entire section of temporary rumble strips initially installed at a specific location. No direct payment will be made for rumble strips replaced.

9. a. The inertial barrier system shall be measured by the each.

b. The replacement modules for the inertial barrier system shall be measured for payment by the each for each module installed on the project.

10. a. Flashing arrow panels are measured by the each per each calendar day in use.

b. A double-faced flashing arrow panel will be counted as two units when a double-faced panel is prescribed in the plans.

11. Type B High Intensity Warning Lights shall be measured by the each per day for the number of calendar days each Type B light is in place and operating. The unit is light-day (LDay).

12. "Pavement Marking Removal" shall be measured by the linear foot along the centerline of the traveled roadway for each permanent (not "temporary") line removed.

13. The pilot vehicle will be measured for payment on a daily basis when actually in use. Operation for 4 hours or less shall be considered as one-half day and operation for more than 4 hours shall be considered as a full day.

14. Tubular posts are measured by the each.

15. Opposing lane dividers are measured by the each.

16. Temporary Glare Screen is measured by the length in linear feet of base rail initially installed, complete with blades.

17. Changeable message signs are measured by the each per day for the number of calendar days each sign is in place and operating.

18. "Install Impact Attenuator" is measured by the each.

19. a. "Replacement Module" is the pay item for inertial barrier system replacement modules and the unit of measurement is each (EA).

b. "Relocate Inertial Barrier" is the pay item for moving the inertial barrier to a new location after initial installation and operation.

20. a. "Remove Pavement Marking" is paid by the linear feet (meter) of temporary or permanent pavement marking removed.

b. Gaps are excluded from measurement. This includes gaps in standard patterns of "Broken Lines."

c. Removal of pavement markings is only paid when the marking alignment is different from an existing permanent marking or if an alignment is changed after a temporary marking is placed and the new alignment does not cover the temporary alignment.

422.05 -- Basis of Payment

1. Pay Item	Pay Unit
Sign Day	Each (ea)
Barricade, Type II	Barricade-Day (BDay)
Barricade, Type III	Barricade-Day (BDay)
Flagging	Day (d)
Temporary Traffic Signal	Each (ea)
Install Concrete Construction Barrier	Linear Foot (LF)
Concrete Protection Barrier	Linear Foot (LF)
Temporary Pavement Marking, Type ____	Linear Foot (LF)
Raised Pavement Marker	Linear Foot (LF)
Temporary Rumble Strip	Each (ea)
Inertial Barrier System	Each (ea)
Flashing Arrow Panel	Day (d)
Type B High Intensity Warning Light	Light-Day (LDay)
Pavement Marking Removal	Linear Foot (LF)
Furnishing & Operating Pilot Vehicle	Day (d)
Opposing Lane Divider	Each (ea)

Temporary Glare Screen	Linear Foot (LF)
Changeable Message Sign	Day (d)
Tubular Post	Each (ea)
Install Impact Attenuator	Each (ea)
Temporary Sign Day	Each (ea)
Overlay Broken Lines	Station (Sta)
	[Station (StaM)]
Overlay Solid Lines	Station (Sta)
	[Station (StaM)]
Remove Pavement Marking	Linear Feet (LF)
	[Meter (m)]
Relocate Inertial Barrier	Each
Replacement Module	Each
Relocate Concrete Protection Barrier	Linear Feet (LF)
	[Meter (m)]
Temporary Pavement Marking	Linear Feet (LF)
	[Meter (m)]
____ Temporary Pavement Marking	
Type ____	Each (ea)

2. a. If signs are not returned, the Contractor shall be charged the value of the missing items. These charges shall be deducted from monies due the Contractor upon final payment.

b. Payment will not be made for those calendar days when signs are not in use, such as for folded signs, temporarily covered signs, or signs temporarily positioned so that the message is not readable by the travelling public.

c. (1) Temporary Signs which are required for "Flagging" are subsidiary to "Flagging".

(2) The "Temporary Sign" pay item shall be full compensation for furnishing the "Temporary Sign" and for "Temporary Sign" support, transportation, original installation, any required relocation and maintenance of any and all "Temporary Signs", for removal of all "Temporary Signs", and for all equipment, tools, labor, and incidentals necessary to complete the work.

3. a. The pay item "Barricades, Type II" is used to pay for four (4) items (Vertical Panels, 42 inch (1070 mm) Reflectorized Cones, Reflectorized Drums, & Barricades, Type II).

b. Vertical Panels shall be paid for at 1/2 the contract unit price established for the item, "Barricades, Type II".

c. "42 inch (1070 mm) Reflectorized Cones", "Reflectorized Drums" and "Barricades, Type II" shall be paid for at the contract unit price established for the item, "Barricades, Type II".

4. Barricades, Type II are paid for as an "established" contract unit price item, which is shown in the bid proposal "Schedule of Items".

5. a. The Contractor shall be responsible for the utility costs to install or relocate the power service for temporary traffic signals.

b. The Contractor shall also pay for power to operate the temporary signals. However, costs for power to operate a temporary signal that replaces an existing operating signal shall be paid by the jurisdiction responsible for the power costs of the permanent signal.

c. Direct payment will not be made for power costs. Power costs shall be considered subsidiary to the temporary traffic signal.

6. Except for Type B High Intensity Warning Lights, all warning lights shall not be measured for payment but shall be considered subsidiary to the items for which direct payments are provided.

7. No direct payment will be made for opposing lane dividers repositioned, reattached, or replaced or for their removal.

8. The repositioning and/or reattachment, removal, and/or replacement of a tubular post is subsidiary to the pay item "Tubular Post."

9. a. Maintenance of temporary pavement markings is subsidiary to the appropriate pay item. Maintenance includes replacement of lines worn by traffic or covered by asphalt or any other substance. The Engineer will determine when the lines are no longer effective and direct the Contractor to replace the lines at no additional cost to the Department.

b. Replacement of, temporary markings which is necessary because of the Contractors schedule of operation or the Contractor's work quality is subsidiary to the relevant pay item.

c. Temporary marking removal (broken and solid lines; raised pavement markers; and arrows, words, symbols) is subsidiary to the relevant pay item.

d. Overlay markers shall be subsidiary to the relevant temporary pavement marking pay item.

e. Sandblasting to remove the curing compound from the pavement surface before placing pavement markings shall be considered subsidiary to the relevant temporary pavement marking pay item.

10. a. Payment for inertial barrier systems and replacement modules shall include all modules required to build and maintain the required array of barrels, sand filler material, salt, object markers, installation, maintenance, earthwork required for placing the system on flat ground, removal of the system, and cleaning of the site.

b. "Relocation Inertial Barrier" is paid for each relocation.

11. The pay item "Temporary Pavement Marking" includes the following material options:

- Temporary Pavement Marking, Type I (Tape)
- Temporary Pavement Marking, Type II (Tape)
- Temporary Pavement Marking, Type Paint
- Temporary Pavement Marking, Type RPM

12. “_____Temporary Pavement Marking Type_____” is the pay item for arrows, words, and symbols.

13. Removal of markings is subsidiary to all temporary pavement marking and overlay marking except:

a. If the Department denies the Contractor the opportunity to apply his own temporary paint and then applies its own paint (the Department), then the Contractor is entitled to reimbursement for removing the Department's paint.

b. The Contractor shall match the existing pattern when an area must be restriped.

c. If the markings must be placed at a new alignment, then existing pavement markings shall be removed. The removal will be a separate pay item, “Remove Pavement Marking.”

14. Marking material specified in the plans or other contract documents should not be changed to a less expensive material (usually paint) without a change order.

15. Payment is full compensation for all work prescribed in this Section.