

TRAFFIC CONTROL:

(10-21-08)

RWZ-1Revised

Maintain traffic in accordance with Divisions 10, 11 and 12 of the *Standard Specifications* and the following provisions:

Use a lane closure (refer to the *Roadway Standard Drawings* Nos. 1101.02, 1101.11, 1110.02, 1130.01 and details for the Advance Work Zone signing in contract) or a slow-moving operation as shown in details of this contract. Use a moving operation only if the minimum speed maintained at all times is 3 mph with no stops that narrow or close a lane of travel. If the moving operation is progressing slower than 3 mph at any time, install a lane closure. Maintain the existing traffic pattern at all times, except in the immediate work zone where lane closures are allowed as determined by the Engineer.

Refer to Attached Details and the *Roadway Standard Drawings* Nos. 1101.02, 1101.03, 1101.04, 1101.05, 1101.11, 1110.01, 1110.02, 1115.01, 1130.01, 1135.01, 1145.01, 1150.01, 1165.01, 1170.01 and 1180.01 when closing a lane of travel in a stationary work zone such as pavement patching resurfacing, or pavement marking removal. Properly ballasted cones may be used instead of drums for lane closures during daylight hours. However, drums are required for the upstream taper portion of lane closures in all applications. The stationary work zone shall be a maximum of **3 miles in length, including tapers**, at any given time unless otherwise directed by the Engineer. A pilot vehicle operation may be used in conjunction with flaggers and the appropriate pilot vehicle warning signing as directed by the Engineer. During periods of construction inactivity, return the traffic pattern to the existing alignment and remove or cover any work zone signs. When covering work zone signs, use an opaque material that prevents reading of the sign at night by a driver using high beam headlights. Use material, which does not damage the sign sheeting. Replace any obliterated markings as required by other sections of the *Standard Specifications* and the Engineer.

When personnel and/or equipment are working on the shoulder adjacent to an undivided facility and within 5 feet of an open travel lane, close the nearest open travel lane using the *Roadway Standard Drawings* No. 1101.02 unless the work area is protected by barrier or guardrail. When personnel and/or equipment are working on the shoulder, adjacent to a divided facility and within 20 feet of an open travel lane, close the nearest open travel lane using the *Roadway Standard Drawings* No. 1101.02 unless the work area is protected by barrier or guardrail. When personnel and/or equipment are working within a lane of travel of an undivided or divided facility, close the lane according to the traffic control plans, *Roadway Standard Drawings* or as directed by the Engineer. Conduct the work so that all personnel and/or equipment remain within the closed travel lane. Do not work simultaneously, on both sides of an open travel way, within the same location, on a two-lane, two-way road. Do not perform work involving heavy equipment within 15 feet of the edge of travel way when work is being performed behind a lane closure on the opposite side of the travel way. Perform work only when weather and visibility conditions allow safe operations as directed by the Engineer.

Do not exceed a difference of 2 inches in elevation between open lanes of traffic for nominal lifts of 1.5 inches. Install advance warning UNEVEN LANES signs (W8-11 at 48" X 48") 500 feet in advance and a minimum of once every half mile throughout the uneven area.

For drop-offs of 2" or greater and less than or equal to 3" in elevation between open lanes of traffic for nominal lifts of 2 inches, the following measures shall be taken, as per Traffic Control Plan Drawings, while the drop-off is present (See Traffic Control Plan Sheet Drawings TCP-1, TCP-2, TCP-3, and TCP-4):

- 1.) Install "UNEVEN LANES" signs (W8-11) 500' in advance and once every half mile.**
- 2.) Use Changeable Message Signs (CMS's) to warn drivers of the uneven lanes and/ or direct drivers to stay in their lanes.**
- 3.) Use Temporary Pavement Marking solid lane lines to delineate traffic lanes and discourage motorist from changing lanes.**
- 4.) Do not exceed a Drop-Off area of greater than 2 miles in length.**
- 5.) Install "STAY IN LANE" signs (R4-9) along with solid white lane line between the uneven lanes.**
- 6.) Use advisory speed limit signs.**
- 7.) Drop-Off shall not be present longer than 24 hours.**

Backfill at a 6:1 slope up to the edge and elevation of existing pavement in areas adjacent to an open travel lane that has an edge of pavement drop-off as follows:

- (A) Drop-off that exceeds 2 inches on roadways with posted speed limits of 45 mph or greater
- (B) Drop-off that exceeds 3 inches on roadways with posted speed limit less than 45 mph.

Backfill the unacceptable drop-off with suitable compacted material, as approved by the Engineer, at no expense to the Department. This work is not considered part of shoulder reconstruction.

When utilizing a slow-moving operation for such items as pavement marking placement, pavement marker installation and pesticide spraying, the slow moving operation caravan shall consist, as a minimum, of the vehicles and devices shown on the Moving Operation Caravan Detail(s) herein. Traffic cones may be used when necessary to provide additional protection of wet pavement markings. Ballast all traffic cones so they will not be blown over by traffic.

Submit a written sequence of operation for all maps to the Engineer at the first pre-construction meeting for approval by the Engineer. Approved sequence can not be altered without written permission of the Engineer.

Failure to comply with the following requirements will result in a suspension of all other operations:

- 1. Coordinate the installation of items on Summary of Quantity spreadsheet, the milling, and resurfacing operations such that these operations are completed in the order as agreed upon with the Engineer at the first pre-construction meeting. Refer to the Typical and Details unless otherwise directed by the Engineer.**
- 2. Before working on I-40 and Ramps, the Contractor shall submit a written construction sequence to the Engineer at the first pre-construction meeting and the sequence must be approved before closing a lane of traffic. The Contractor and Engineer will coordinate with the Traffic Management Unit at 919-250-4159 for additional traffic control guidance.**
- 3. Once the Contractor has started work at a location, the Contractor should prosecute the work in a continuous and uninterrupted manner from the time he begins the work until completion and final acceptance unless determined otherwise by the Engineer.**
- 4. Obtain written approval of the Engineer before working in more than one location.**

5. **Do not install more than 3 miles of lane closure on I-40 measured from the beginning of the *merge taper* to the end of the *lane closure*.**
6. **When performing the work at interchanges, the Contractor shall be allowed to close its Off-Ramp and its corresponding same directional On-Ramp and detour traffic to the Exit as agreed upon with the Engineer at the first pre-construction meeting. No ramp shall be closed more than six (6) consecutive hours. The Contractor shall not be allowed to close more than one pair of On & Off Ramps at a time. The Contractor shall notify the Engineer 48 hours before closing the interchange.**
7. **Detours will be required for ramp closures. The Contractor shall provide the Traffic Control items, including signing, for these detours. All associated costs will be considered incidental to the work being paid for under the various items in the contract.**
8. **Mainline pavement shall not be left milled or uneven for more than 24 hours.**
9. **Mainline pavement shall not be left unmarked at the end of the work day.**
10. **Contractor shall mill and pave lanes in an order such that water shall not accumulate.**

A "Work Zone Variable Speed Limit" Reduction and \$250 Speeding Penalty are only in effect for I-40 Eastbound and Westbound for the following two (2) conditions: 1) when workers are present while a lane closure is in place or 2) a 2" or greater drop-off between open lanes of traffic exists. Changeable Message Signs (CMSs) and portable signs will be used to notify motorists of the speed reduction. The reduced speed shall be 55 MPH and the Contractor shall cover any existing speed limits signs located within the active work area that conflict with the "Work Zone Variable Speed Limit" Reduction. When the two (2) conditions no longer exist, the "Work Zone Variable Speed Limit" and \$250 Speed Penalty messages are to be removed, the signs are to be turned off and the existing 65 MPH speed limit signs shall be uncovered. Other pertinent messaging may be displayed at the direction of the Engineer in coordination with the Work Zone Traffic Control Unit (919-250-4159). Refer to the attached Traffic Control Plan Drawings TCP-1, TCP-2, TCP-3, and TCP-4 for additional information. At the completion of the project, the Resident Engineer shall notify the Regional Traffic Engineer to rescind the ordinance.

Notify the Engineer and the Traffic Engineer seven (7) consecutive calendar days before milling or resurfacing will interfere with the existing Signal Loops. Loops may need to be placed in milled surface before resurfacing occurs. State Forces will place all necessary loops prior to the time that the Contractor places the proposed resurfacing. Coordinate all signal loop operations with the Engineer and the Traffic Engineer. Signal Loops may be encountered on the ramps.

Notify the Engineer 15 consecutive calendar days before resurfacing a bridge or its approaches. Patch and make repairs to bridge surface and its approaches before resurfacing occurs. Coordinate all operations on the bridge and its approaches with the Engineer.

Notify the Engineer 48 hours before resurfacing the areas of existing pavement that require patching. Patch these areas before resurfacing occurs. Allow full depth asphalt patching to cool to the point of supporting traffic without displacement or rutting before reopening closed lane. Coordinate the resurfacing operations of the patched areas with the Engineer.

During a resurfacing only operation, bring all newly resurfaced lanes to the same elevation within 72 hours for nominal lifts of 1.5 inches or less of asphalt course and by the end of each work day for nominal lifts of greater than 1.5 inches of asphalt course.

For partial or wheel track milling operations on two-way, two-lane facilities, mill and pave back by the end of each work day. For partial or wheel track milling operations on multi-lane facilities, **mill and pave back by the end of each work day.**

The following option is acceptable during Resurfacing and milling operations on two-way, two-lane facilities when the entire roadway or entire lane is to be milled:

Mill and pave back by the end of each work day.

The following option is available during Resurfacing and milling operations on multi-lane facilities when all lanes or a single lane in one direction are to be milled:

Mill and pave back by the end of each work day.

When resurfacing facilities with ramps, resurface the ramp and gore area of the ramp as directed by the Engineer. A transverse joint shall be placed on the ramp at the terminal point of the gore except when resurfacing up to the Stop Bar at the top of the ramp. Newly resurfaced lanes on the main roadway and the ramp shall be at the same elevation where traffic merges.

Slope the pavement at the beginning and ending of the daily milling operation as directed by the Engineer. Sweep and remove all milled material from the roadway as soon as the daily milling operation is completed. Continue milling operations until the particular section of roadway being milled is complete. Remove any existing pavement adjacent to the milled area that has been damaged, and replace with patch material as directed by the Engineer.

Maintain vehicular access in accordance with Section 1101-13 of the *Standard Specifications* using suitable backfill material approved by the Engineer.

Operate equipment and conduct operations in the same direction as the flow of traffic. Do not cross medians with equipment, except at properly designated interchanges.

Review and record the existing pavement markings and markers prior to resurfacing. Use the record of existing pavement markings and markers in accordance with the *Roadway Standard Drawings* to re-establish the proposed pavement markings and markers unless otherwise directed by the Engineer.

Provide appropriate lighting in accordance with Section 1413 of the *Standard Specifications*.

Remove existing pavement markers in preparation for paving. Repair any pavement damage due to existing pavement marker removal prior to the end of the work day. Dispose of existing pavement markers as directed by the Engineer. No direct payment will be made for this work, as it will be incidental to the paving operation.

Payment will be made for the traffic control items that have been included in the contract. No direct payment will be made for providing other traffic control as required herein, as the cost of same will be considered incidental to the work being paid for under those various traffic control items that have been included. Where the Contractor maintains traffic as required herein but no specific pay items have been included in the contract, all associated costs will be considered incidental to the work being paid for under the various items in the contract.

WORK ZONE SIGNING:

(10-21-08)

RWZ-3Revised

Description

Install and maintain signing in accordance with Divisions 11 and 12 of the *Standard Specifications*, the *Roadway Standard Drawings* and the following provisions:

Furnish, install, maintain, and remove advance warning work zone signs and any required lane closure signing.

Furnish, install, and maintain general work zone warning signs for resurfacing and milling such as ROUGH ROAD (W8-8 at 48" X 48") (for milling only), UNEVEN LANES (W8-11 at 48" X 48"), LOW SHOULDER (W8-9 at 48" X 48"), LOW / SOFT SHOULDER (DOT No. 16-79860 at 48" X 48"), UNMARKED PAVEMENT AHEAD (DOT No. 116087130 at 48" X 48") and DO NOT PASS (R4-1 at 24" X 30"). **Remove signs when no longer applicable.** When construction is completed in any area of the project, relocate signs to the next work site, as directed by the Engineer. Remove these signs at the completion of the project.

All work zone signs may be portable.

Construction Methods

(A) General

Install all warning work zone signs before beginning work on a particular map. If signs are installed three days prior to the beginning of work on a particular map, cover the signs until **forty-eight (48) hours before resurfacing operations begin.** Install each work zone warning sign separately and not on the same post or stand with any other sign except where an advisory speed plate or directional arrow is used.

(B) Advance Warning Work Zone Signs

Install advance warning work zone signs (see attached Details and the *Roadway Standard Drawings* Nos. 1101.02 and 1110.01 and advance signing details) prior to beginning of work and remove upon final completion of the project. If there is a period of construction inactivity longer than two weeks, remove or cover advance warning work zone signs. Uncover advance warning work zone signs no more than **forty-eight (48) hours before resurfacing operations begin/resume**. All other operations could be suspended upon failure to comply with the above requirements. Such suspended operations would not be resumed until the above requirements are fulfilled.

(C) Lane Closure Work Zone Signs

Install any required lane closure signing needed during the life of the project in accordance with the *Roadway Standard Drawings* Nos. 1101.02, 1101.11 and 1110.02.

(D) General Work Zone Warning Signs

Install general work zone warning signs for resurfacing and milling such as ROUGH ROAD (W8-8 at 48" X 48") (for milling only), UNEVEN LANES (W8-11 at 48" X 48"), LOW SHOULDER (W8-9 at 48" X 48") and LOW / SOFT SHOULDER (W8-9B at 48" X 48") at 1 mile intervals starting at a minimum of 500 feet in advance of the condition for both directions of travel (undivided roadways only) and at any other points determined by the Engineer.

Install the LOW SHOULDER (W8-9 at 48" X 48") or LOW / SOFT SHOULDER (DOT No. 16-79860 at 48" X 48") signs prior to any resurfacing in an area where shoulder construction will be performed.

Install general work zone warning signs such as UNMARKED PAVEMENT AHEAD (DOT No. 116087130 at 48" X 48") and DO NOT PASS (R4-1 at 24" X 30") alternately at 1/2 mile intervals starting at a minimum of 500 feet in advance of the condition for both directions of travel (undivided roadways only) and at any other points determined by the Engineer. Install signs prior to the obliteration of any pavement markings. **Remove signs when no longer applicable.**

Failure to provide Work Zone Signing shall result in suspension of work on the improperly signed map until the proper signs are installed. Failure to remove or cover signs not in use for more than two weeks shall result in the assessment of Liquidated Damages equal to the Contract Time Liquidated Damages Amount in the Contract. These Liquidated Damages shall be in addition to any other assessment of Liquidated Damages.

Measurement and Payment

Payment will be made for the work zone signing items that have been included in the contract. No direct payment will be made for providing other work zone signing as required herein, as the cost of same will be considered incidental to the work being paid for under those various work zone signing items that have been included. Where the Contractor provides work zone signing as required herein but no specific pay items have been included in the contract, all associated costs will be considered incidental to the work being paid for under the various items in the contract.

TIME LIMITATION FOR PAVEMENT MARKINGS AND MARKERS ON NEWLY RESURFACED AREAS:

12-18-07)

RWZ-4Revised

Markings: Two-Lane, Two-Way Facilities

For all two-lane, two-way facilities, place all edge lines and other symbols within 30 calendar days after they have been obliterated by the resurfacing operation.

Markings: All Facilities

The pavement markings on a specific map are subject to a 180-day observation period that begins with the satisfactory completion of all pavement markings required on a specific map and shall meet all requirements as specified in Subarticle 1205-3(H) Observation Period of the *Standard Specifications*.

Any portion of stop bars that are obliterated at intersections of a multilane roadway and all its approaches shall be replaced by the end of each work day prior to opening the lane to traffic. Any portion of stop bars that are obliterated at 2-lane 2-way roadway intersections shall be replaced by the end of 5th calendar day.

Prior to opening the lane(s) to traffic, all pavement markings that are obliterated by milling should be replaced as specified in Subarticle 1205-3(D) Time Limitations for Replacement of the *Standard Specifications* or as stated herein.

Final pavement marking applications of paint shall be placed in 2 applications of 15 mils wet each. Each application of paint pavement marking lines will be measured and paid for as the actual number of linear feet of pavement marking lines that have been satisfactorily placed and accepted by the Engineer.

Failure to follow the time limitations as previously established in this Special Provision shall result in the assessment of Liquidated Damages equal to the Contract Time Liquidated Damages Amount in the Contract and suspension of all other work activities until all the pavement markings are up to date. These Liquidated Damages shall be in addition to any other assessment of Liquidated Damages.

Markers: All Facilities

Install permanent pavement markers within 60 calendar days after completing the resurfacing on each map.

ROADWAY STANDARD DRAWINGS FOR PAVEMENT MARKINGS AND MARKERS:

(7-18-06)

RWZ-5Revised

Use the following in conjunction with the *Standard Specifications*:

Standard Pavement Markings*Roadway Standard Drawings:*1205.01, 1205.02, 1205.03, 1205.04, 1205.05, 1205.06,
1205.07, 1205.08, 1205.09, 1205.10, 1205.11, 1205.12**Raised Pavement Markers***Roadway Standard Drawings:*

1205.12, 1250.01, 1251.01

Snowplowable Pavement Markers*Roadway Standard Drawings:*

1250.01, 1253.01

Milled Rumble Strips*Roadway Standard Drawings:*

665.01

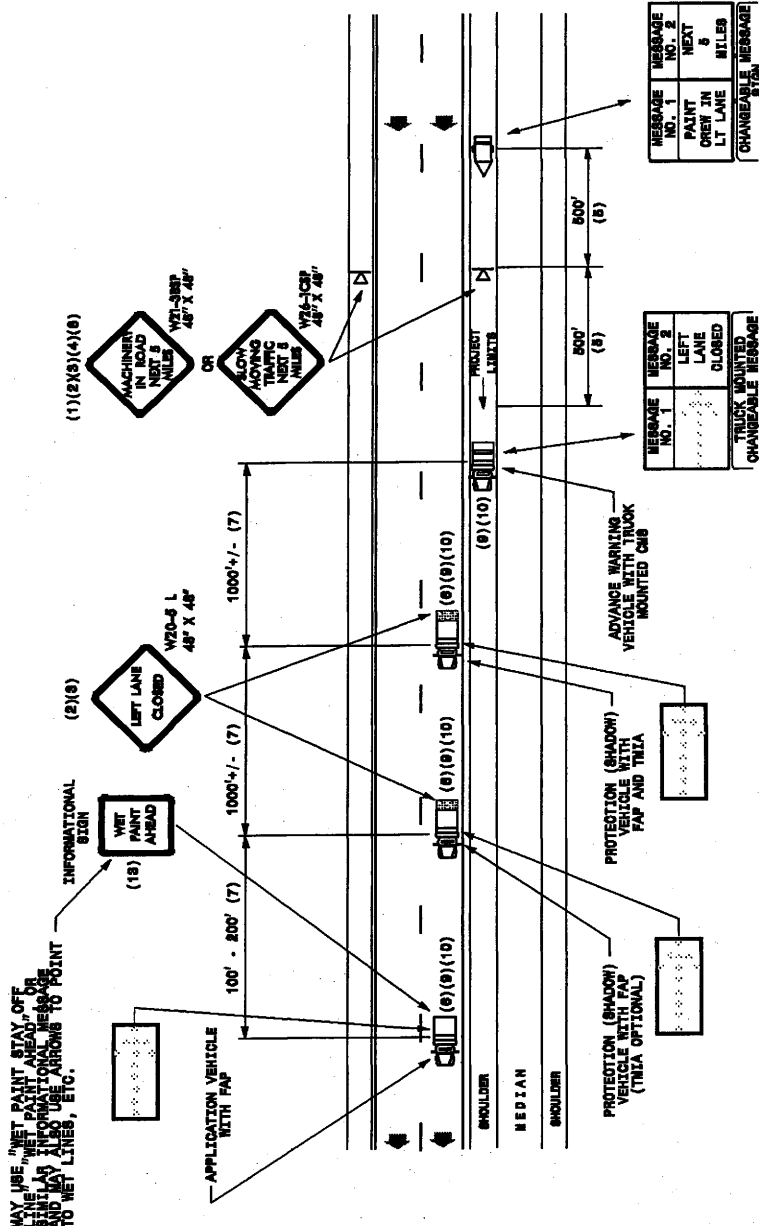
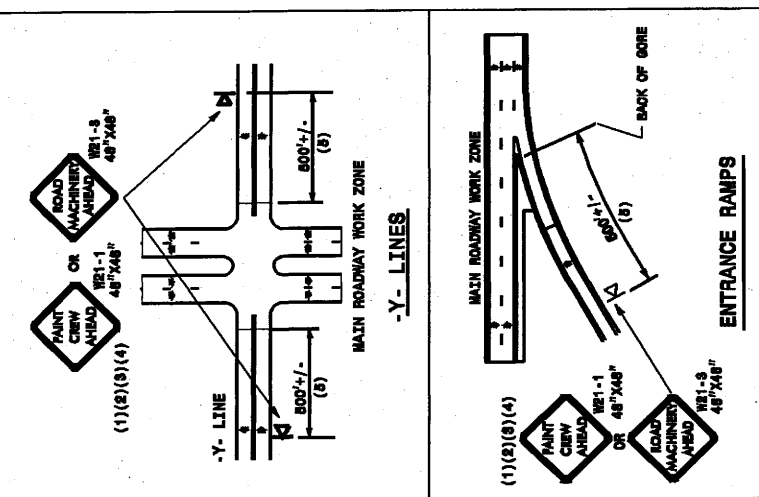
Date: 04-29-2009

GENERAL NOTES

- (1) THE FOLLOWING OPTIONS MAY BE USED FOR ADVANCE WARNING SIGNS:
 - A. TRUCK MOUNTED SIGNS
 - B. TRUCK MOUNTED CHANGEABLE MESSAGE SIGN (CMS)
 - C. GROUND MOUNTED ADVANCE WARNING SIGNS (MUST BE CIRCLE TO PICK UP SIGNS)
 - D. GROUND MOUNTED CHANGEABLE MESSAGE SIGN (CMS) (MUST USE CIRCLE TO PICK UP SIGNS)
- (2) ALL ADVANCE WARNING SIGNS MUST BE 48" X 48" WITH FLUORESCENT ORANGE TYPE VII, VIII OR IX SHEETING. IF SPACE LIMITATIONS ON SHOULDER PROHIBIT A 48" X 48" SIGN, A SMALLER SIGN CAN BE USED WITH APPROVAL FROM ENGINEER.
- (3) SIGNS ON VEHICLES SHOULD BE MOUNTED A MINIMUM OF ONE (1) FOOT FROM THE GROUND AND SHOULD NOT BLOCK THE MOTORIST'S SIGHT OF THE FLASHING ARROW PANEL AND/OR LIGHTBAR.
- (4) GROUND MOUNTED ADVANCE WARNING SIGNS SHOULD BE MOUNTED A MINIMUM OF FIVE (5) FEET FROM THE GROUND TO BOTTOM OF SIGN.
- (5) SIGN SPACING SHOULD BE ADJUSTED FOR HORIZONTAL AND VERTICAL CURVES, ETC. TO IMPROVE SIGHT DISTANCES.
- (6) ADDITIONAL VEHICLES SHOULD BE USED IN WORK CARAVAN TO FACILITATE DRIVING OF PAVEMENT MARKING MACHINES (TRIA'S ARE OPTIONAL ON THESE ADDITIONAL VEHICLES). THESE VEHICLES SHOULD BE IN THE TRAVEL LANE SHALL HAVE A TRIA.
- (7) ADJUST DISTANCE AS NEEDED TO PREVENT MOTORISTS FROM ENTERING SPACE BETWEEN THE APPLICATION AND PROTECTION VEHICLE. DISTANCE CAN BE LENGTHENED TO ACCOMMODATE SIGHT DISTANCE NEEDS.
- (8) ROUND UP MILEAGE TO NEXT WHOLE MILE. WORK ZONE SHOULD NOT EXCEED FIVE (5) MILES IN LENGTH.
- (9) RADIO COMMUNICATION BETWEEN VEHICLES IS REQUIRED.
- (10) USE OF A LIGHT BAR ON ALL VEHICLES IS REQUIRED, BUT A ROTATING BEACON MAY BE USED INSTEAD.
- (11) IF WORK IS PERFORMED AT NIGHT, THE WORK AREA MUST BE ILLUMINATED WITH MACHINE AND/OR TOWER LIGHTS AS APPROVED BY THE ENGINEER.
- (12) ALL TRAFFIC CONTROL DEVICES WILL BE CONSIDERED INCIDENTAL TO THE PAY ITEMS FOR PAVEMENT MARKING AND MARKERS.
- (13) INFORMATIONAL SIGNS SHOULD BE ACTIVITY SPECIFIC. 1. INFORMATIONAL SIGNS MAY BE RECTANGULAR OR DIAMOND SHAPE. SIGN SIZE SHOULD BE BASED ON THE MOTORIST ABILITY TO RECOGNIZE SIGN WHEN TRAVELING FIVE (5) MILES ABOVE POSTED SPEED LIMIT.

LEGEND

- PORTABLE SIGN. SIGNS MUST BE NCHRP-380 AND NCHRP APPROVED.
- DIRECTION OF TRAFFIC FLOW
- APPLICATION VEHICLE WITH LIGHT BAR
- PROTECTION VEHICLE WITH TRUCK AND LIGHT BAR (SEE ROADWAY AND TRUCK) (TRIA) STANDARD NO. 1168-011. TRIA MUST BE NCHRP-380 TEST LEVEL 3 (60-MPH) APPROVED.
- ADVANCE WARNING VEHICLE WITH TRUCK AND LIGHT BAR (SEE ROADWAY AND TRUCK) (TRIA) STANDARD NO. 1168-011. TRIA MUST BE NCHRP-380 TEST LEVEL 3 (60-MPH) APPROVED.
- FLASHING ARROW PANEL. TYPE 'B' (60"X80" MIN.). APPROPRIATE DIRECTION INDICATED
- CHANGEABLE MESSAGE SIGN



MOVING OPERATION CARAVAN
 (OPERATIONS TRAVELING 3 MPH OR FASTER)
 PLACING PAVEMENT MARKING OR MARKERS
 ON INTERSTATE ROADWAYS

DRAWING NUMBER 8
 IMPLEMENTATION DATE: 11/09/04
 REVISED:

April 30, 2009



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Forsyth County

45087.3.ST1 (I-5132)

Date: 04-23-2009

Revised:

LUMP SUM PAYMENT FOR TRAFFIC CONTROL:

(06-16-09)

LS-TC

The Contractor shall maintain traffic on 45087.3.ST1 (I-5132) during construction and shall provide, install and maintain all traffic control devices as shown in the *Roadway Standard Drawings* or as directed by the Engineer.

The lump sum price bid for traffic control shall include but not be limited to providing **Signs (portable, stationary, barricade or detour), Truck Mounted Impact Attenuators (TMIA), Changeable Message Signs (CMS), Flashing Arrow Panel (FAP), Pilot Vehicle, Flaggers, Cones and Drums** and all labor, tools, equipment and incidentals necessary to furnish, install, maintain and remove traffic control devices when no longer required.

Partial payments will be made on each payment estimate based on the following: Fifty percent of the contract lump sum price bid will be paid on the first monthly estimate and the remaining 50% of the contract lump sum price bid will be paid on each subsequent estimate based on the percent of the project completed.

Payment will be made under:

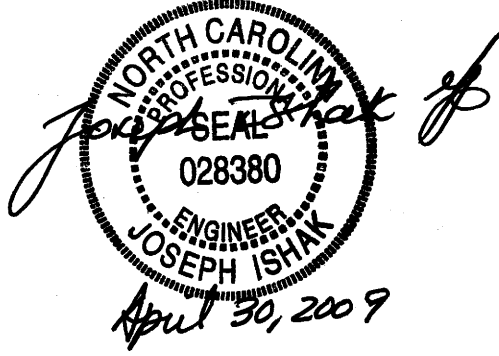
Pay Item

Traffic Control

Pay Unit

Lump Sum

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Forsyth County

45087.3.ST1 (I-5132)
 Date: 04-23-2009
 Revised:

Law Enforcement:
 2-19-09

SPI

Description

Furnish Law Enforcement Officers and marked Law Enforcement vehicles to direct traffic in accordance with the contract.

Construction Methods

Use uniformed Law Enforcement Officers and marked Law Enforcement vehicles equipped with blue lights mounted on top of the vehicle, and Law Enforcement vehicle emblems to direct or control traffic as required by the plans or by the Engineer.

Measurement and Payment

Law Enforcement will be measured and paid for in the actual number of hours that each Law Enforcement Officer is provided during the life of the project as approved by the Engineer. There will be no direct payment for marked Law Enforcement vehicles as they are considered incidental to the pay item.

Payment will be made under:

Pay Item

Law Enforcement

Pay Unit

Hour