

WBS#: 5CR.10391.3, 5CR.20391.3 & 5CR.303919.3

Granville County

Date: 11-05-2004

Revised:

TRAFFIC CONTROL:

Maintain traffic in accordance with Divisions 11 and 12 of the North Carolina Department of Transportation January 2002 Standard Specifications for Roads and Structures, and the following provisions:

Use a lane closure (refer to North Carolina Department of Transportation January 2002 Highway Design Branch Roadway Standard Drawings Nos. 1101.02, 1101.11, 1110.02, Detail for 1130D01 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 Detail(s) and North Carolina Department of Transportation January 2002 Highway Design Branch Roadway Standard Drawings Nos. 1101.02, 1101.03, 1101.04, 1101.05, 1101.07, 1101.11, 1110.01, 1110.02, 1115.01, 1135.01, 1145.01, 1150.01, 1165.01 and 1170.01 when closing a lane of travel in a stationary work zone such as pavement patching resurfacing, or pavement marking removal, etc. Properly ballasted cones may be used instead of drums for lane closures during daylight hours. The stationary work zone shall be a maximum of 3 miles in length 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 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 Roadway Standard Drawing 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 10 feet of an open travel lane, close the nearest open travel lane using Roadway Standard Drawing 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.

The maximum acceptable difference in elevation between open lanes of travel is 1.5 inches. The maximum acceptable edge of pavement drop-off is 2 inches. Backfill at a 6:1 slope up to the edge and elevation of existing pavement in areas adjacent to an open travel lane if the drop-off exceeds 2 inches at no expense to the Department.

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 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.

Notify the Engineer forty-eight (48) hours before milling or resurfacing will interfere with the existing Signal Loops. Loops may need to be placed in milled surface before resurfacing occurs. Coordinate all signal loop operations with the Engineer.

Notify the Engineer fifteen (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 forty-eight (48) hours before resurfacing the areas of existing pavement that require patching. Patch these areas before resurfacing occurs. Coordinate the resurfacing operations of the patched areas with the Engineer. **Complete full depth patching and allow the asphalt to cool to the point of supporting traffic without displacement or rutting before reopening closed lane.**

During a resurfacing only operation, bring all newly resurfaced lanes to the same elevation within 72 hours **or as directed by the Engineer.**

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, the lane being milled may be left closed and paved back within 72 hours.

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

- 1) Mill a single lane and pave back by the end of each work day
- 2) Mill the entire width of roadway and pave back within 72 hours

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

- 1) Mill the entire width of pavement for all lanes to be milled in any given direction daily and pave back within 72 hours.
- 2) Mill a single lane and pave back by the end of each work day
- 3) Mill a single lane, leave a lane closure in and pave back within 72 hours.

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. Maintain all accesses where milling is conducted using suitable backfill material approved by the Engineer. Continue milling operations until the particular section of roadway being milled is complete.

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 conjunction with North Carolina Department of Transportation January 2002 Highway Design Branch 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 North Carolina Department of Transportation January 2002 Standard Specifications for Roads and Structures when electing to perform paving at night at no expense to the Department.

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 the signing and traffic control items including Truck Mounted Impact Attenuators (TMIA – see Section 1165 of the NCDOT January 2002 Standard Specifications for Roads and Structures and January 2002 Highway Design Branch Roadway Standard Drawings). This work will be considered incidental to the various other bid items in the Contract.

R-1Revised

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 Date: 11-05-2004
 Revised:

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WORK ZONE SIGNING:

1- DESCRIPTION.

Install and maintain signing in accordance with Divisions 11 and 12 of the North Carolina Department of Transportation January 2002 Standard Specifications for Roads and Structures, the North Carolina Department of Transportation January 2002 Highway Design Branch 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/or milling such as "Rough Road" (W8-8 at 48" X 48") (for milling only), "Uneven Pavement" (W8-15 at 48" X 48"), "Unmarked Pavement Ahead" (W16-10 at 48" X 48"), and "Do Not Pass"(R4-1 at 24" X 30". **Install and maintain general work zone warning signs for resurfacing and/or milling such "Low Shoulder" (W8-9 at 48" X 48"), "Low / Soft Shoulder" (W8-9B at 48" X 48"). State Forces will furnish and remove the signs, posts, and hardware for "Low Shoulder" (W8-9 at 48" x 48") and "Low / Soft Shoulder" (W8-9B at 48" X 48").** When construction is completed in any given area of the project, relocate signs to the next work site, as directed by the Engineer. Remove all signs **except "Low Shoulder and Low/Soft Shoulder"** at the completion of the project, unless otherwise directed by the Engineer.

All work zone signs may be portable.

2- 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 the work begins. Install each work zone warning sign separately and not on the same post(s) 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 Detail(s) and North Carolina Department of Transportation January 2002 Highway Design Branch Roadway Standard Drawings Nos. 1101.02 and 1110.01) 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 3

days before work resumes. 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 (see North Carolina Department of Transportation January 2002 Highway Design Branch 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/or milling such as "Rough Road" (W8-8 at 48" X 48") (for milling only), "Uneven Pavement" (W8-15 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" (W8-9B 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" (W16-10 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 these signs at the completion of the project.

3- BASIS OF PAYMENT.

No direct payment will be made for Work Zone Signing as such work will be considered incidental to the various other bid items in the Contract.

R-3Revised

WBS#: 5CR.10391.3, 5CR.20391.3 & 5CR.303919.3

Granville County

Date: 11-05-2004

Revised:

**TIME LIMITATION FOR PLACEMENT AND REPLACEMENT
OF PAVEMENT MARKINGS AND MARKERS COMPLETED BY CONTRACTORS
ON NEWLY RESURFACED AREAS**

MARKING BY CONTRACTOR: DIVIDED AND MULTI-LANE FACILITIES

For all Interstate highways and access ramps, place all markings including symbols and legends, by the end of each workday's operation.

For all divided and multi-lane facilities, place all center line and lane line markings and railroad and school symbols by the end of each workday's operation. Place all edge lines, gore lines, and other symbols within 3 calendar days after they have been obliterated by the resurfacing operation.

A Multi-lane facility is defined as any roadway having more than two lanes to include a two-lane/two-way with a center two-way left turn lane.

MARKING BY CONTRACTOR: TWO-LANE, TWO-WAY FACILITIES

For all two-lane, two-way facilities, place all center line markings, railroad and school symbols within 5 calendar days after they have been obliterated by the resurfacing operation. Place all edge lines and other symbols within 30 calendar days after they have been obliterated by the resurfacing operation.

MARKING BY CONTRACTOR: ALL FACILITIES

Place two applications of paint on newly resurfaced asphalt which will remain in place over three (3) months. Place the second application of paint upon ample drying time of the first, as determined by the Engineer.

MARKERS BY CONTRACTOR: ALL FACILITIES

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

R-4Revised

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USE IN CONJUNCTION WITH 2002 STANDARD SPECIFICATIONS

THE FOLLOWING ROADWAY STANDARDS DRAWINGS AS THEY APPEAR IN THE "HIGHWAY DESIGN BRANCH ROADWAY STANDARD DRAWINGS" - ROADWAY DESIGN UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY, 2002 AND THE LATEST REVISIONS THERETO ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

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

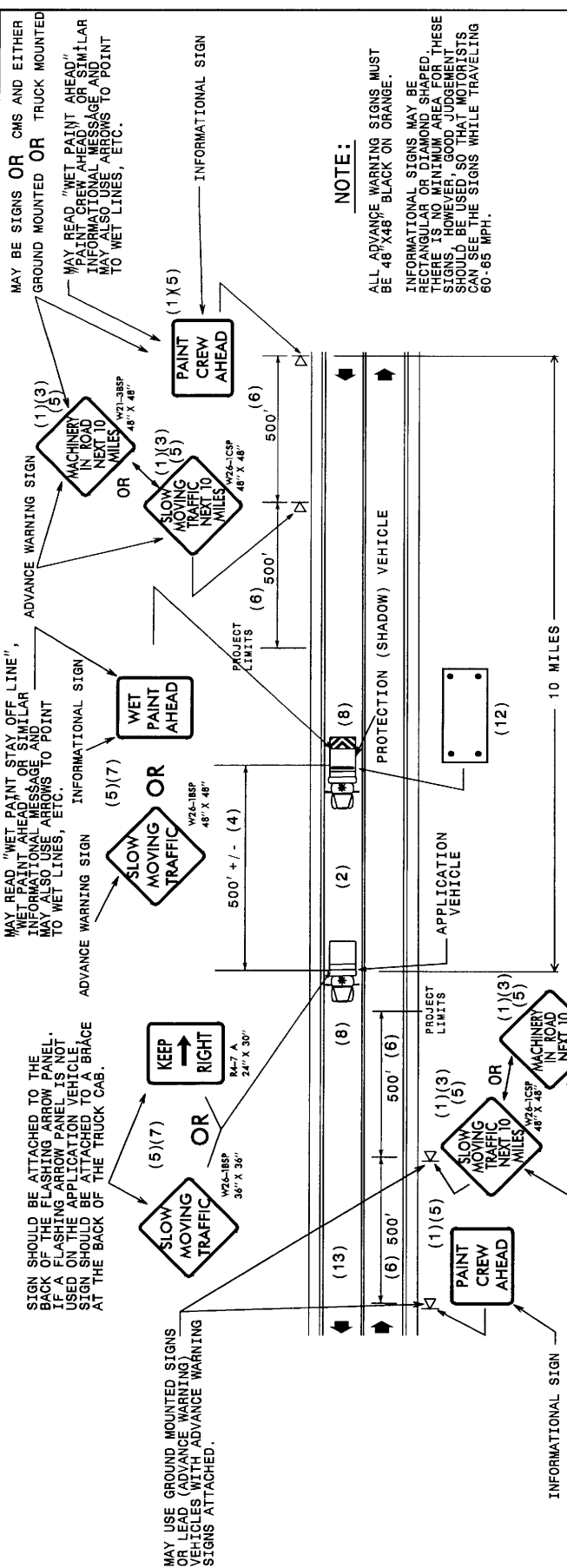
ROADWAY STANDARD DRAWINGS: 1250.01, 1251.01

GENERAL NOTES

- (1) THE FOLLOWING OPTIONS MAY BE USED AS ADVANCE WARNING SIGNS:
 - A. TRUCK MOUNTED ADVANCE WARNING SIGNS
 - B. MOVING CHANGEABLE MESSAGE SIGN (CMS)
 - C. GROUND MOUNTED ADVANCE WARNING SIGNS (MUST USE 'NEXT 10 MILES' AND MAKE CIRCLE TO PICK UP SIGNS)
 - D. STATIONARY CHANGEABLE MESSAGE SIGN (CMS) (MUST USE 'NEXT 10 MILES' AND MAKE CIRCLE TO PICK UP CMS)
- (2) ADDITIONAL VEHICLES SHOULD BE USED IN WORK CARAVAN TO FACILITATE DRYING OF PAVEMENT MARKING MATERIAL. TMA'S ARE OPTIONAL ON THESE ADDITIONAL VEHICLES. HOWEVER, THE FIRST VEHICLE MOTORISTS SEE SHOULD HAVE A TMA.
- (3) ROUND UP MILEAGE TO NEXT WHOLE MILE. WORK ZONE SHOULD NOT EXCEED TEN (10) MILES IN LENGTH.
- (4) DISTANCE BETWEEN APPLICATION VEHICLE AND PROTECTION VEHICLE WILL VARY AS DRYING TIMES VARY, HOWEVER, THE CRITICAL FACTOR IS PASSING MOTORISTS. IF THE GAP BETWEEN VEHICLES IS TOO GREAT, MOTORISTS WILL ATTEMPT TO PASS AND ULTIMATELY APPEAR IN THE MIDDLE OF THE OPERATION.
- (5) MOUNTING HEIGHT DIMENSIONS FROM ROADWAY TO SIGN SHOULD BE A MINIMUM OF FIVE (5) FEET FOR ALL PROFILES. OTHER HIGH VOLUME ROADWAYS OR ROADWAYS THAT MAY REQUIRE A MOUNTING HEIGHT OF FIVE (5) FEET FOR INCREASED VISIBILITY AND A MINIMUM OF ONE (1) FOOT FOR ALL OTHER ROADWAYS.
- (6) SIGN SPACING SHOULD BE ADJUSTED FOR HORIZONTAL AND VERTICAL CURVES, ETC. TO IMPROVE SIGHT DISTANCES.
- (7) SIGN W26-1BSP OR R4-7A SHOULD BE PLACED ON FRONT OF APPLICATION VEHICLE AND SIGN W26-1BSP OR INFORMATIONAL SIGN ON BACK OF PROTECTION VEHICLE IN TWO-LANE, TWO-WAY TRAFFIC SO VEHICLES APPROACHING FROM FRONT AND REAR ARE NOTIFIED OF OPERATION.
- (8) RADIO COMMUNICATION BETWEEN VEHICLES IS RECOMMENDED.
- (9) USE OF A LIGHT BAR ON THE ADVANCE WARNING VEHICLE IS PREFERRED, BUT A ROTATING BEACON MAY BE USED INSTEAD.
- (10) USE OF A CMS WITH ADVANCED WARNING VEHICLES IS OPTIONAL.
- (11) IF WORK IS PERFORMED AT NIGHT, THE FOLLOWING PROVISIONS MUST BE MADE:
 - A. GROUND MOUNTED SIGNS MUST HAVE TYPE B FLASHING LIGHTS ATTACHED (TRUCK MOUNTED SIGNS DO NOT REQUIRE TYPE B FLASHING LIGHTS)
 - B. OPERATION MUST BE ILLUMINATED WITH MACHINE AND/OR TOWER LIGHTS AS APPROVED BY THE ENGINEER.
- (12) USE A TYPE "B" FLASHING ARROW PANEL.
- (13) IF A LEAD VEHICLE IS ADDED TO OPERATION, IT SHOULD HAVE THE SAME ADVANCE WARNING SIGNS AS THE APPLICATION VEHICLE SHOWN BELOW.

LEGEND

- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW
- APPLICATION VEHICLE WITH ROTATING BEACON
- PROTECTION VEHICLE WITH TRUCK MOUNTED IMPACT ATTENUATOR (TMA) AND ROTATING BEACON (SEE ROADWAY STANDARD NO. 116B:01)
- FLASHING ARROW PANEL, TYPE "B"



MOVING OPERATION CARAVAN
(OPERATIONS TRAVELING 3 MPH OR FASTER)

PLACING MARKING OR MARKERS ON TWO-LANE TWO-WAY ROADWAYS

DRAWING NUMBER 6
IMPLEMENTATION DATE: 07/01/97
REVISED: 04/25/97