## SECTION C: TRAFFIC CONTROL PLANS

moting Date: BEGIN SURFACING
Station $21+00.00=$ Station $339+72.30$ on WPGH 267-A located 916.22 feet South and 598.60 feet West of the Northeast corner
of Section 26 - Township 23 North - Range 18 East of the B.H.M. of Section 26 - Town
MRM $106.34+0.648$

Structure w/ Approach Slabs
Str. No. 16-083-011
Begin Station $48+12.2$ End Station

END SURFACING Station 83+00.00

MRM 132.64+0. 162

END COLD MILLING/RESURFACING BEGIN SURFACING Station 1303+00.00

BEGIN COLD MILLING/RESURFACING Station 1249+75.0 = Station 466+00.0 on NH 0012(185)121 MRM $130.00+0.554$

Structure w/ Approach Slabs Structure w/ Approach
Str. No. 16-328-018 Begin Station 1344+68.5 End Station 1347+22.4 MRM 132.45

## SECTION C ESTIMATE OF QUANTITIES

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
| :---: | :---: | :---: | :---: |
| 633E0010 | Cold Applied Plastic Pavement Marking, 4" | 11,921 | Ft |
| 633E0020 | Cold Applied Plastic Pavement Marking, 8" | 714 | Ft |
| 633E0030 | Cold Applied Plastic Pavement Marking, 24 " | 392 | Ft |
| 633E0040 | Cold Applied Plastic Pavement Marking, Arrow | 9 | Each |
| 633E1220 | High Build Waterborne Pavement Marking Paint, 4" White | 31,525 | Ft |
| 633E1222 | High Build Waterborne Pavement Marking Paint, 4" Yellow | 11,199 | Ft |
| $633 E 5000$ | Grooving for Cold Applied Plastic Pavement Marking, 4" | 11,921 | Ft |
| 633E5005 | Grooving for Cold Applied Plastic Pavement Marking, 8" | 714 | Ft |
| 633E5015 | Grooving for Cold Applied Plastic Pavement Marking, 24 " | 392 | Ft |
| 633E5025 | Grooving for Cold Applied Plastic Pavement Marking, Arrow | 9 | Each |
| 634E0010 | Flagging | 340.0 | Hour |
| 634E0020 | Pilot Car | 0.0 | Hour |
| 634E0110 | Trafic Control Signs | 1,044.0 | SqFt |
| 634E0120 | Traffic Contro, Miscellaneous | Lump Sum | LS |
| 634E0310 | Temporary Flexible Vertical Markers (Tabs) | 4,400 | Ft |
| 634E0600 | 4" Temporary Pavement Marking Tape Type I | 288 | Ft |
| 634E0630 | Temporary Pavement Marking | 13.6 | Mile |

## SEQUENCE OF OPERATIONS

The Contractor will submit a sequence of operations for approval two weeks prior to the preconstruction meeting. If changes to the sequence of operations are proposed during the project, these must be submitted for review a minimum of one week prior to potential implementation. Approval for changes to the sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work.

The pipe work will be completed prior to beginning the mainline paving peration on the project.
Traffic will be returned to normal driving lanes during non-working hours.
Rumble stripes and the flush seal will be completed prior to permanent pavement marking.

## COORDINATION BETWEEN CONTRACTORS

The Contractor will coordinate work with Foothills Contracting, Inc to begin work upon completion of Project NH-PS 0012(187)106 - PCN 04FL, Replace Structure \& Approach Grading for Structure 16-083-011 and Structure 16-328-018 over the BNSF Railroad.

## GENERAL TRAFFIC CONTROL

Existing guide, route, informational logo, regulatory, and warning signs will be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging, and resetting of existing traffic control devices, including be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost will be replaced by the Contractor at no cost to the State. Contractor and verified by the Engineer prior to installation.

## All construction operations will be conducted in the general direction of traffic

 movementIf there is a discrepancy between the traffic control plans, standard plates, and the MUTCD, whichever is more stringent will be used, as determined by the Engineer.

Unless otherwise stated in these plans, work will not be allowed during hours of darkness.

Fixed location signing placed more than 4 calendar days prior to the start of construction will be covered or laid down until the time of construction. The covers must be approved by the Engineer prior to installation. The cost of materials, labor, and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

All fixed location signs, sign posts, and breakaway bases will be removed within 7 calendar days following pavement marking.

All haul trucks will be equipped with an additional flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights will be incidental to the various related contract items

At no time will a vertical drop-off of greater than 3 inches be left overnigh adjacent to the traveled way. The Contractor will utilize embankment materia to ensure a 3 -inch vertical drop-off is not exceeded. The slope of the embankment material will not be steeper than a $4: 1$ within 30 feet of the traveled way.
Traffic will be maintained on the driving lanes. Use of the shoulder as a driving lane will not be permitted. Any damage to the shoulder due to rerouted traffic or Contractor's equipment will be repaired at no expense to the Department.

The Contractor will furnish, install, maintain, and remove TRUCK CROSSING (W8-6) signs daily. The TRUCK CROSSING signs will be displayed alway when haul vehicles are hauling material. When hauling conditions no longe exist, the signs will be covered or removed from view. The exact number and ocation will be determined during construction. Payment for additional signs will be based on the contract unit price per square foot for "Traffic Contro Signs".

The Contractor will notify businesses/homeowners a minimum of two weeks prior to construction to inform them of upcoming construction and again a minimum of 48 hours prior to any blocked access to make appropriate arrangements.

A mobile work operation will be allowed provided the rumble strip or rumble stripe grooving, flush sealing, and pavement marking can be completed satisfactorily by a continuously moving work operation. A mobile work operation will require approval by the Engineer.
If inappropriate or conflicting pavement markings exist, the markings will be removed and replaced with applicable temporary pavement markings when days, the channelizing devices in the area where the pavement marking conflict will be placed at one-half of the normal channelizing device spacing Pavement marking removals will be incidental to the contract unit price per
foot for "Remove Pavement Marking, 4" or equivalent". Temporary pavemen marking will be paid for at the contract unit price per mile/foot for "Temporary Pavement Marking". The additional channelizing devices will be incidental to the contract lump sum price for "Traffic Control, Miscellaneous".

## FLAGGING

Operations will be conducted so that the traveling public will not have to wait longer than 15 minutes at the flagger station.

Additional flagger warning signs and flagger hours have been included in the Estimate of Quantities for use on intersecting roads. These flaggers will be used as directed by the Engineer and will be used primarily during daytime hours. Also included in the Estimate of Quantities are WAIT FOLLOW PILO CAR signs for use on low volume intersecting roads as determined by the Engineer. WAIT FOLLOW PILOT CAR signs will not block the view of the stop sign.


It is required that the flaggers and pilot car operators be able to communicate with one another. If an emergency vehicle needs to pass through the project the Contractor will be required to expedite traffic movement. All costs associated with this will be incidental to the contract unit price per hour for "Flagging".

## TEMPORARY PAVEMENT MARKING

Temporary Pavement Marking Paint will be used on leveling surfaces for centerlines, lane lines, skips, and as directed by the Engineer. The Temporary Pavement Marking Paint will be placed at the location of the existing pavement markings except that centerline will be double yellow the entire project length and will be offset 6 -inches from centerline of the roadway. It will be the Contractor's responsibility to determine which direction to offset so that the markings do not get covered up when the first half of the roadway is paved.

Any markings that get covered by the paving operation will be reestablished as directed by the Engineer at the Contractor's expense. The Contractor will be responsible for marking out those exact locations.

Temporary Flexible Vertical Markers (Tabs) will be used on the top lift of asphalt surfacing for centerline delineation, lane lines, skips, and as directed asphalt surfacing for centerline delineation, lane lines, skips, and as direct permanent pavement markings. Centerline will be double yellow lines with tabs spaced at 5 ' the entire project length.

Temporary flexible vertical markers (tabs) will be installed on one side of the centerline rumble for the temporary pavement marking. No passing zones will be marked in accordance with Specifications. DO NOT PASS (R4-1) and

## TEMPORARY PAVEMENT MARKING (Continued)

PASS WITH CARE (R4-2) signs will also be used in addition to the temporary flexible vertical markers (tabs) placed per Specifications to mark no passing zones
The total length of no passing zone on this project is estimated to be 3.1 miles.

It is estimated that 4 DO NOT PASS and 4 PASS WITH CARE signs will be required
emporary flexible vertical markers (tabs) will be required on the top lift of asphalt concrete surfacing

Temporary pavement marking paint will not be allowed on the final lift of asphalt surfacing. Temporary pavement marking paint will not be allowed on he flush seal. Temporary flexible vertical markers (tabs) must be used on the final lift of asphalt surfacing. The Contractor may use tabs with covers, install new tabs for the flush seal.

Covers on the tabs will be sufficiently secured to prevent traffic from dislodging the cover and when removed, the covers will be properly disposed of. The Contractor will remove and properly dispose of the tabs after permanent pavement marking is applied. Method of removal will be nondestructive to the road surface and will be accomplished within one week of completion of the permanent pavement marking
Full reflectivity of all temporary flexible vertical markers (tabs) is required at all mes. The Contractor will be required to replace any missing or non-reflective tabs after each installation as detailed below at no additional cost to the State

Quantities of Temporary Pavement Markings consist of:

## One pass on top of the $1^{\text {st }}$ lift

One pas of the Engineer
One pass after the flush seal
If the Engineer determines that an additional pass prior to the flush seal is not required, this application of the temporary pavement marking will be俍 pass prior to the flush seal will be eliminated.

No adjustment in the contract unit price for "Temporary Pavement Marking" will be made because of a variation in quantities

In the absence of a signed lane closure or pilot car operation, FLAGGER W20-7) symbol signs and flaggers, or a shadow vehicle with rotating yellow ights or strobe lights will be positioned on the shoulder in advance of workers for both directions of traffic during the installation and removal of the temporary flexible vertical markers (tabs). The traffic control device used will be moved intermittently to provide proper warning of the work operation. A ROAD WORK AHEAD (W20-1) sign, a WORKER (W21-1) symbol sign or a shadow vehicle. The method of traffic control used by the Contractor for this work must be approved by the Engineer.

Prior to nightfall, tabs will be required to mark centerline on segments of roadway where existing centerline markings have been removed and new markings have not been installed

## TEMPORARY PAVEMENT MARKING TAPE, TYPE I

Temporary pavement marking for stop lines will consist of 4" Temporary Pavement Marking Tape Type I. Placement of each $24^{\prime \prime}$ white stop line will be accomplished by placing six pieces of 4 " $\times 12^{\prime}$ tape adjacent to one another Each workspace requires two stop lines which is an equivalent of approximately
144 of 4 tape ( 2 workspaces at $144=288$ ). Temporary pavement marking on centerline will consist of temporary flexible vertical markers (tabs) or emporary raised pavement markers and will be used as depicted on standard plate 634.25 when the stop condition must remain in place during nighttime hours, $9: 00 \mathrm{pm}$ to $6: 00 \mathrm{am}$ (Estimate 2 workspaces remaining during
nighttime hours $\times 2,200^{\prime}$ per workspace $=4,400^{\prime}$ ). Temporary tape will be nighttime hours $\times 2,200^{\prime}$ per workspace $=4,400^{\prime}$ ). Temporary tape will be removed upon completion of the project.

## TRAFFIC CONTROL FOR ASPHALT CONCRETE RESURFACING

The Contractor will need to install LOOSE GRAVEL (W8-7) signs with advisory speed plaques (W13-1P) in areas where loose sand is presen during the flush seal operation. LOOSE GRAVEL signs have been included in these plans for this.

## INCIDENTS

An incident is an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic such as a crash, hazardous materials spill, or other event

The Contractor will set up a meeting prior to start of work to plan and coordinate responses to an incident. The Contractor will invite the Departmen of Transportation, the South Dakota Highway Patrol, the Stanley \& Haakon County Sheriffs and local emergency response entities to the meeting.

The Contractor will assist to maintain traffic as required by these plan notes and as agreed to at that meeting

Emergency vehicle access through the project will be considered and discussed at the meeting
The Contractor may be required to modify messages on portable changeable message signs or relocate portable changeable message signs, and to to relocate advance warning signs if determined to be necessary for a majo traffic incident lasting more than two hours. Fixed location ground mounted signs may be covered and additional portable signs provided.

No additional payment will be made for the modification of portable changeable message sign messages or the relocation of portable changeable message signs. Cost for the relocation of an advance warning sign due to an incident will be $50 \%$ of the designated sign rate. Flaggers will be paid for at the contract unit price per hour for "Flagging".

## PRESS RELEASE ANNOUNCEMENTS

The SDDOT will prepare a press release to be released 5 days prior to any phase change or any other major change that affects traffic flow. The SDDO will be responsible to keep law enforcement, emergency services, and the
traveling public notified of changes in project access. The Contractor will provide the Engineer with pertinent information 7 days prior to any phase change or any other major change that affects traffic flow

## PAVEMENT MARKING PAINT

The Contractor will advise the Engineer a minimum of 3 weeks prior to the application of the permanent pavement marking to allow the State to check and mark the location of no passing zones

The application of permanent pavement marking will begin no sooner than 7 calendar days following completion of the fog or flush seal. Application permanent pavement marking will be completed within 14 calendar days following completion of the final surfacing

## COLD APPLIED PLASTIC PAVEMENT MARKING

All materials will be applied as per the manufacturer's recommendations
Cold Applied Plastic Pavement Markings will be 3M Series 380 AW or an approved equal.

## HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

Paint Quantities were calculated to include all standard lines outside of the taped intersections.

All materials will be applied as per manufacturer's recommendations. High build waterborne pavement marking paint will conform to the supplementa specifications for Section 980.1 B.

Reflective media will consist of glass beads
High Build Waterborne Pavement Marking Paint applied after October 15 must be formulated as cold-weather waterborne paint Cold weather waterborne paint will meet the requirements of Section 980.1 C.

## RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT

 MARKING PAINTSolid 4" line $=22.5$ Gals $/$ Mile
Dashed 4 " line $=6.2 \mathrm{Gal} / \mathrm{Mil}$
Glass Beads $=8 \mathrm{Lbs} / \mathrm{Gal}$.
All cost for materials, labor and equipment necessary to furnish and install the pavement markings will be incidental to the contract unit price for the respective High Build Waterborne Pavement Marking Paint items.

## RETROREFLECTIVITY FOR PAVEMENT MARKING PAINT

The Department may take retroreflectivity readings on the pavement marking lines after 2 days and within 30 days of the line application using either portable or mobile retroreflectometer that conforms to 30 -meter geometry. If the Department chooses to take retroreflectivity readings, three retroreflectivity readings will be taken on each line at each test location. Th three readings will be averaged and become the reading for that test location.

If the Department chooses to take retroreflectivity readings, three readings will be taken on the edge lines and lane lines in the direction of application. For combination solid yellow and skip yellow lines for turn lanes and for centeriine markings on two-way roadways, three readings will be taken in one direction,
the reflectometer will be turned 180 degrees and three more readings will be taken. The six readings for the centerline markings will be averaged and become the test reading for that test location
If the Department chooses to take readings, the minimum retroreflectivity values will be $275 \mathrm{mc} / \mathrm{m}^{2} / \mathrm{lux}$ for white and $170 \mathrm{mc} / \mathrm{m}^{2} / \mathrm{lux}$ for yellow.

GROOVING FOR COLD APPLIED PLASTIC PAVEMENT MARKING
The Contractor will establish a positive means for the removal of the grinding and/or grooving residue. Residue from dry grooving will be vacuumed. Solid esidue will be removed from the pavement surfaces before being blown by traffic action or wind. The Contractor will conduct this work to control and minimize airborne dust and similar debris that may become a hazard to motor vehicle operation or nuisance to property owners. Residue from wet grooving will not be permitted to flow across lanes being used by public traffic or into gutter or drainage facilities. Residue, whether in solid or slurry form, will be disposed of in a manner that will prevent it from reaching any waterway in a satisfaction of the Engineer and may require more than one pass to adequately remove material. All costs for removal of grinding and/or grooving residue will be included in the contract unit price per foot or each for "Grooving for Cold Applied Plastic Pavement Marking" contract items

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

|  |  | CONVENTIONAL ROAD |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SIGN CODE | SIGN DESCRIPTION | NUMBER | SIGN SIZE | $\begin{array}{\|c\|} \hline \text { SQFTT } \\ \text { PER SIGN } \end{array}$ | SQFT |
| R1-1 | STOP | 4 | $30^{\prime \prime}$ | 5.2 | 20.8 |
| W1-4 | REVERSE CURVE (L or R) | 2 | $48^{\prime \prime} \times 48^{\prime \prime}$ | 16.0 | 32.0 |
| W3-1 | STOP AHEAD (symbol) | 4 | $48^{\prime \prime} \times 48^{\prime \prime}$ | 16.0 | 64.0 |
| W8-1 | BUMP | 8 | $48^{\prime \prime} \times 48^{\prime \prime}$ | 16.0 | 128.0 |
| W8-6 | TRUCK CROSSING | 2 | $48^{\prime \prime} \times 48^{\prime \prime}$ | 16.0 | 32.0 |
| W8-7 | Loose gravel | 6 | $48^{\prime \prime} \times 48^{\prime \prime}$ | 16.0 | 96.0 |
| w8-11 | UNEVEN LANES | 4 | $48^{\prime \prime} \times 48^{\prime \prime}$ | 16.0 | 64.0 |
| W13-1P | ADVISORY SPEED (plaque) | 4 | 30" $\times 30^{\prime \prime}$ | 6.3 | 25.2 |
| W16-2P | FEET (supplemental distance plaque) | 4 | 30" $\times 24$ " | 5.0 | 20.0 |
| W20-1 | ROAD WORK AHEAD | 12 | $48^{\prime \prime} \times 48^{\prime \prime}$ | 16.0 | 192.0 |
| W20-4 | ONE LANE ROAD AHEAD | 4 | $48^{\prime \prime} \times 48^{\prime \prime}$ | 16.0 | 64.0 |
| W20-7 | FLAGGER (symbol) | 6 | $48^{\prime \prime} \times 48^{\prime \prime}$ | 16.0 | 96.0 |
| W21-2 | FRESH OIL | 4 | $48^{\prime \prime} \times 48^{\prime \prime}$ | 16.0 | 64.0 |
| W21-5 | SHOULDER WORK | 4 | $48^{\prime \prime} \times 48^{\prime \prime}$ | 16.0 | 64.0 |
| SPECIAL | WAIT FOLLOW PILOT CAR | 5 | 30" $\times 18^{\prime \prime}$ | 3.8 | 19.0 |
| G20-1 | ROAD WORK NEXT 2 MILES | 4 | $36^{\prime \prime} \times 18^{\prime \prime}$ | 4.5 | 18.0 |
| 620-2 | END ROAD WORK | 10 | $36^{\prime \prime} \times 18^{\prime \prime}$ | 4.5 | 45.0 |
|  |  | $\begin{array}{cc} \text { CONVENTIONAL ROAD } \\ \text { TRAFFIC CONTROL SIGNS SQFT } & \mathbf{1 0 4 4 . 0} \end{array}$ |  |  |  |

## PAVEMENT MARKING

Typical pavement marking as shown on this sheet will be applied throughout the entire length of two lane roadway

Traffic Control will be incidental to the cost of application. The striper and advance or trailing warning vehicle will be equipped with flashing amber lights and advance warning arrow board.

Application rates will be as follows:

| Two Lane Roadway <br> (Rates for one line) |
| :---: |
| Dashed Yellow Centerline |
| Rate $=6.2$ Gals./Pass-Mile |
| Solid Yellow Centerline |
| Rate $=22.5$ Gals./Pass-Mile |
| Solid White Edgeline |
| Rate $=22.5$ Gals.Pass-Mile |

4" Yellow Skip Centerline (when not adjacent to a 4" Yellow No Passing Zone) will be placed consistently to the south or east side of centerline.

| ESTIMATED QUANTITIES (BASED ON ONE APPLICATION) |  |
| :--- | :---: |
| PAINT | QUANTITY |
| WHITE | 135 GALLONS |
| YELLOW | 48 GALLONS |

two Lane roadway



PAVEMENT WARKING LAYOUT





Vehicle-mounted signs will be Vehicle-mounted signs will be
mounted in a manner such tha they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs will be covered or turned from
Shadow and Work vehicles will Shadow and Work vehicles wil display high-intensity rotating,
flashing, oscillating, or strobe ligh flags, signs, or arrow boards.
Vehicle hazard warning signals will not be used instead of the vehicle's nigh-intensity rotating, flashing, high-intensity rotating, flash
oscillating, or strobe lights.

When an arrow board is used, it will be used in the caution mode.
Marching Diamonds are acceptable.
Arrow boards will, as a minimum, be ype B, with a size of $60^{\prime \prime} \times 30^{\prime \prime}$.

All costs associated with the traffic control for mobile operation including signs, arrow boards and equipment
will be incidental to the contract lump sum price for "Traffic Control sum price for "






