| DESIGN DATA (RP 7.671 to RP 9.436) | | | | |
|---|---|---|---|---|
| Traffic | Average Daily | | | |
| Current 2013 | Pass: 1,890 | Trucks: 115 | Total: 2,005 | |
| | | | | |
| Preventative Maintenance | | | | |

| DESIGN DATA (RP 9.436 to RP 10.09) | | | | |
|---|---|---|---|---|
| Traffic | Average Daily | | | |
| Current 2013 | Pass: 3,040 | Trucks: 145 | Total: 3,185 | |
| | | | | |
| Preventative Maintenance | | | | |

# JOB # 10
# NORTH DAKOTA
# DEPARTMENT OF TRANSPORTATION

SS-1-024(021)008

Sioux County
Highway 24 Near Fort Yates
Chip Seal

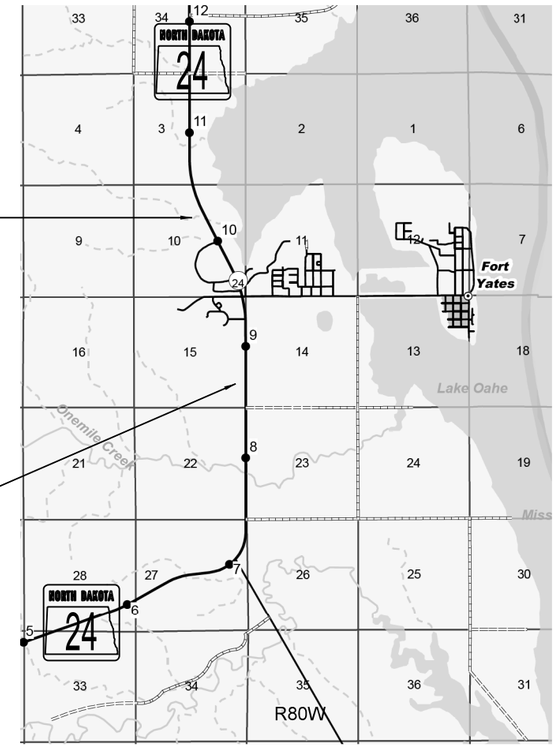
| STATE | PROJECT NO. | PCN | SECTION NO. | SHEET NO. |
|---|---|---|---|---|
| ND | SS-1-024(021)008 | 21352 | 1 | 1 |

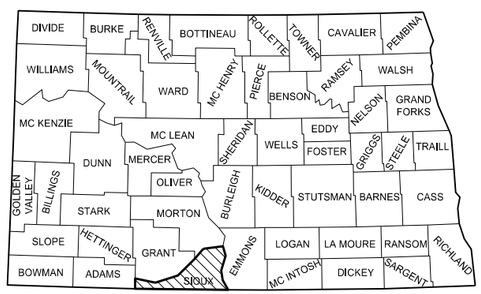
GOVERNING SPECIFICATIONS:
Standard Specifications adopted by the North Dakota Department of Transportation October 2008; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

| PROJECT NUMBER \ DESCRIPTION | NET MILES | GROSS MILES |
|---|---|---|
| SS-1-024(021)008 | 1.306 | 1.306 |

End Project SS-1-024(021)008
RP 10.132
Sta 535+00

Begin Project SS-1-024(021)008
RP 8.826
Sta 466+00




STATE COUNTY MAP

DESIGNERS

Emily Gustafson /s/

APPROVED DATE 1/4/2016

Kevin J. Levi /s/
BISMARCK DISTRICT ENGINEER
ND DEPARTMENT OF TRANSPORTATION

I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.

APPROVED DATE 1/4/16

Kirk J. Hoff /s/
BISMARCK DISTRICT

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1/4/2016 10:52:30 AM ekgustafson G:\PROJECT\Emily\Designs\SS-1-024(021)008\SHEETS\001TS_001_TITLE.dgn

| STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|
| ND | SS-1-024(021)008 | 2 | 1 |

## TABLE OF CONTENTS



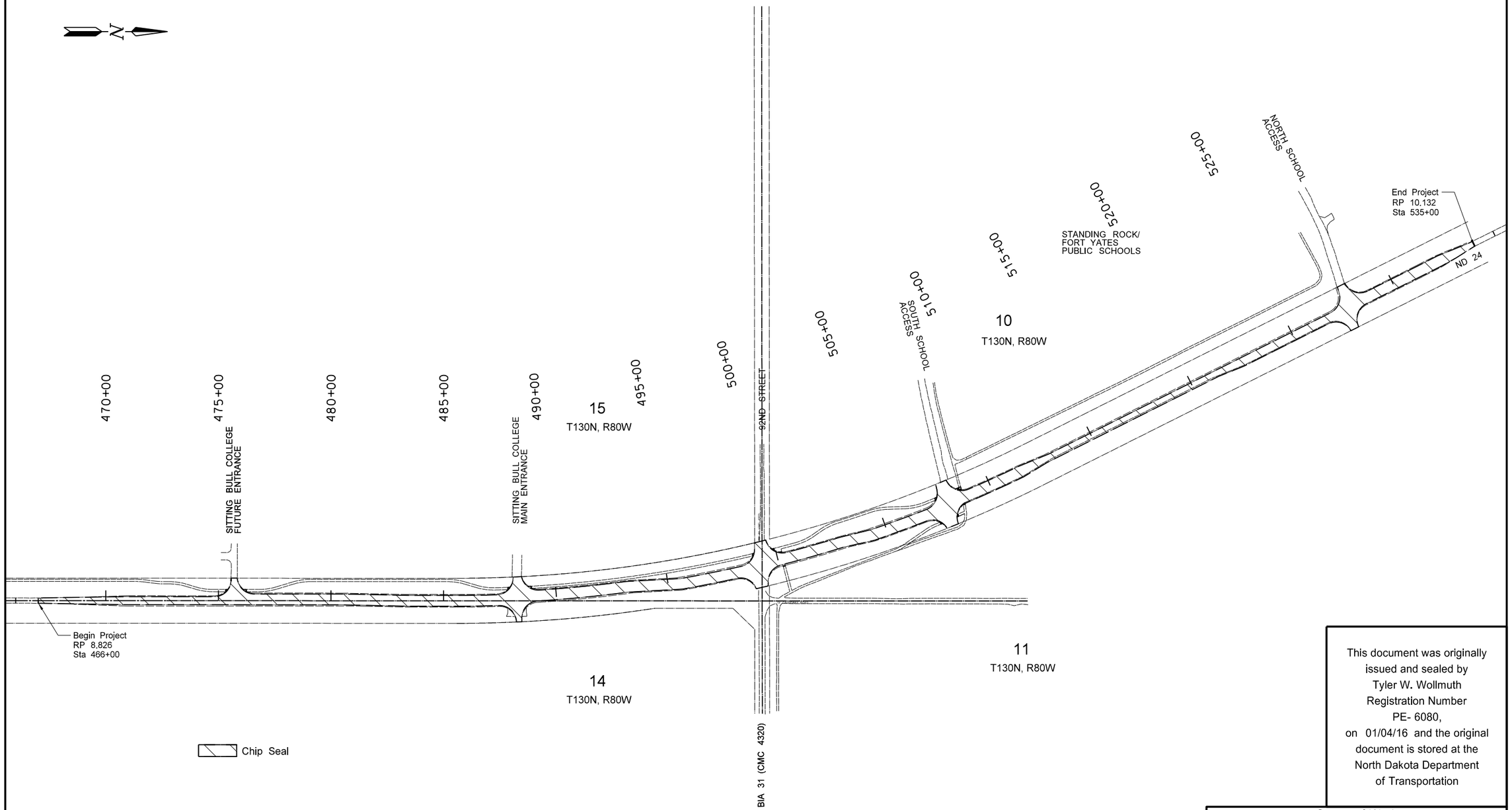
## LIST OF SPECIAL PROVISIONS (SP)

| SP # | Description |
|---|---|
| SP 270(14) | TERO |

## LIST OF STANDARD DRAWINGS

| Standard No. | Description |
|---|---|
| D-101-1 | NDDOT Abbreviations |
| D-101-2 | NDDOT Abbreviations |
| D-101-3 | NDDOT Abbreviations |
| D-101-10 | NDDOT Utility Abbreviations |
| D-101-20 | Line Styles |
| D-101-21 | Line Styles |
| D-101-30 | Symbols |
| D-101-31 | Symbols |
| D-101-32 | Symbols |
| D-704-7 | Breakaway Systems for Construction Zone Signs Perforated Tube |
| D-704-8 | Breakaway Systems for Construction Zone Signs |
| D-704-9 | Construction Sign Details |
| D-704-10 | Construction Sign Details |
| D-704-11 | Construction Sign Details |
| D-704-14 | Construction Sign and Barricade Assembly Details |
| D-704-15 | Construction Sign and Barricade Location Details |
| D-704-20 | Construction Sign and Barricade Location Details |
| D-704-22 | Construction Sign and Barricade Location Details |
| D-704-26 | Miscellaneous Sign Layouts |
| D-704-27 | Traffic Control Plan - Moving Operations (Pavement Marking) |
| D-704-50 | Portable Sign Support Assembly |
| D-762-1 | Pavement Marking Message Details |
| D-762-4 | Pavement Marking |
| D-762-6 | Short-Term Pavement Marking |

| | STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|---|
| | ND | SS-1-024(021)008 | 4 | 1 |

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Scope of Work

Chip Seal

Highway 24 Near Fort Yates

# NOTES

| STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|
| ND | SS-1-024(021)008 | 6 | 1 |

401-P01 FOG SEAL: The fog seal shall be applied with the following requirements:

1. The fog seal shall be applied after the chip seal is applied.
2. The roadway shall be broomed prior to the fog seal application. The Dilution rate of the fog seal is 50% water and 50% CSS-1H. Dilution at the supplier is required.
3. The maintenance period will end 5 days after the fog seal is applied.

420-P01 COVER COAT MATERIAL CL 41: Class 41 cover coat will be paid at actual quantity used up to plan quantity unless otherwise directed by the Engineer.

704-P01 TRAFFIC CONTROL FOR SEAL COATS: Traffic control device quantities are based on the following list:

1. Standard D-704-15, layout A, for flagging and pilot car operations
2. Standard D-704-20 Type H
3. The pilot car operation will be limited to 5 miles maximum.

762-P01 EPOXY PAVEMENT MARKING: The Epoxy Pavement Marking will not be applied this construction season. It shall be applied by July 1 of the following construction season. Removal of Short Term Pavement Marking or Permanent Pavement Marking will not be required prior to placing the Epoxy Pavement Marking.

# ESTIMATE OF QUANTITIES

| STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|
| ND | SS-1-024(021)008 | 8 | 1 |

| SPEC | CODE | ITEM DESCRIPTION | UNIT | MAINLINE | TOTAL |
|---|---|---|---|---|---|
| 103 | 0100 | CONTRACT BOND | L SUM | 0.26 | 0.26 |
| 401 | 0070 | FOG SEAL | GAL | 2,190 | 2,190 |
| 420 | 0111 | CRS2P EMULSIFIED ASPHALT | GAL | 15,222 | 15,222 |
| 420 | 0125 | COVER COAT MATERIAL CL 41 | TON | 438 | 438 |
| 702 | 0100 | MOBILIZATION | L SUM | 0.26 | 0.26 |
| 704 | 1000 | TRAFFIC CONTROL SIGNS | UNIT | 923 | 923 |
| 762 | 0103 | PVMT MK PAINTED-MESSAGE | SF | 528 | 528 |
| 762 | 0110 | EPOXY PVMT MK 4IN LINE-GROOVED | LF | 18,772 | 18,772 |
| 762 | 0113 | EPOXY PVMT MK 4IN LINE | LF | 14,555 | 14,555 |
| 762 | 0114 | EPOXY PVMT MK 6IN LINE | LF | 845 | 845 |
| 762 | 0115 | EPOXY PVMT MK 8IN LINE | LF | 249 | 249 |
| 762 | 0117 | EPOXY PVMT MK 24IN LINE | LF | 210 | 210 |
| 762 | 0132 | EPOXY PVMT MK 8IN LINE-GROOVED | LF | 4,595 | 4,595 |
| 762 | 0136 | EPOXY PVMT MK MESSAGE-GROOVED | SF | 528 | 528 |
| 762 | 0434 | SHORT TERM 8IN LINE-TYPE NR | LF | 9,190 | 9,190 |
| 762 | 0442 | SHORT TERM MESSAGE-TYPE NR | SF | 528 | 528 |
| 762 | 0460 | SHORT TERM PAINTED LINE-SEAL JOBS | LF | 37,544 | 37,544 |
| 762 | 1104 | PVMT MK PAINTED 4IN LINE | LF | 33,327 | 33,327 |
| 762 | 1106 | PVMT MK PAINTED 6IN LINE | LF | 845 | 845 |
| 762 | 1108 | PVMT MK PAINTED 8IN LINE | LF | 4,844 | 4,844 |
| 762 | 1124 | PVMT MK PAINTED 24IN LINE | LF | 210 | 210 |
| 762 | 1363 | PAVEMENT MARKING 24IN LINE-MASKING | LF | 300 | 300 |

| STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|
| ND | SS-1-024(021)008 | 10 | 1 |

# BASIS OF ESTIMATE

| | | | Mainline | | Approaches (9 locations) | | | |
|---|---|---|---|---|---|---|---|---|
| **Material** | **Basis** | **Unit** | Width(ft) | Qty | Approx. SY per approach | Unit/ approach | Total Approach Qty | **TOTAL** |
| CRS2P Emulsified Asphalt | 0.40 Gal/ SY | GAL | varies | 13,422 | 500 | 200 | 1800 | 15,222 |
| Cover Coat Material Class 41 | 23 LB/ SY | Ton | varies | 386 | 500 | 5.75 | 52 | 438 |
| Fog Seal (prior to dilution) | 0.05 Gal / SY | GAL | varies | 1,965 | 500 | 25 | 225 | 2,190 |

**Short Term Pavement Marking (taken from overlay plans)**

Short Term Painted Line -Seal Jobs (4”) 18,772 LF x 2 = 37,544 LF

Pavement Mk Painted 8" Line - Type NR 4,595 LF x 2 = 9,190 LF

Message - Type NR 528 LF (apply once after fog seal)

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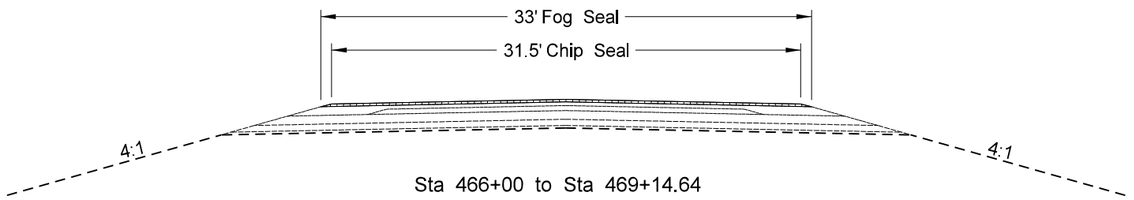
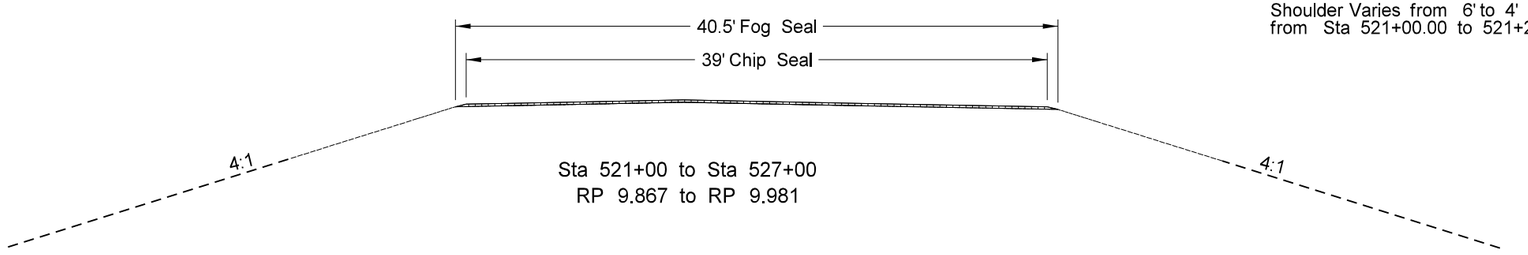
| | STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|---|
| | ND | SS-1-024(021)008 | 30 | 1 |




Sta 466+00 to Sta 469+14.64
RP 8.826 to RP 8.885

Sta 534+00 to Sta 535+00
RP 10.114 to RP 10.132

RT Shoulder
Shoulder Varies from 6' to 4'
from Sta 521+00.00 to 521+23.60




Sta 521+00 to Sta 527+00
RP 9.867 to RP 9.981

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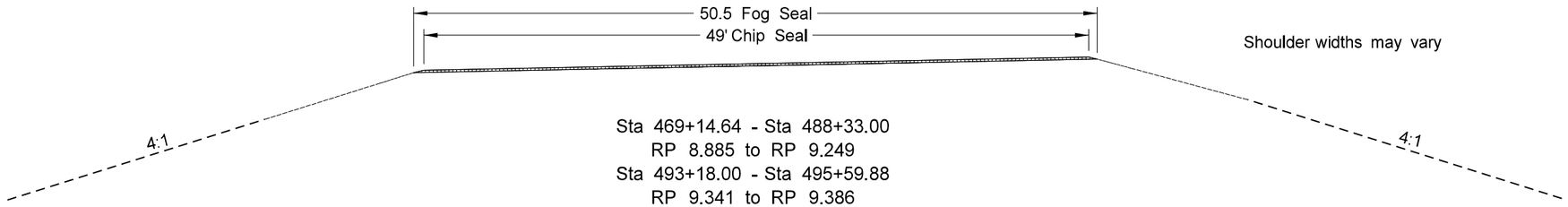
Proposed Typical Section

Chip Seal

Highway 24 Near Fort Yates

| STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|
| ND | SS-1-024(021)008 | 30 | 2 |




Sta 469+14.64 - Sta 488+33.00
RP 8.885 to RP 9.249
Sta 493+18.00 - Sta 495+59.88
RP 9.341 to RP 9.386
Sta 502+91.94 - Sta 504+34.39
RP 9.525 to RP 9.552
Sta 508+33.00 - Sta 512+94.89
RP 9.628 to RP 9.715
Sta 527+00.00 - Sta 534+00
RP 9.981 to RP 10.114

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Proposed Typical Sections

Chip Seal

ND 24 near Fort Yates

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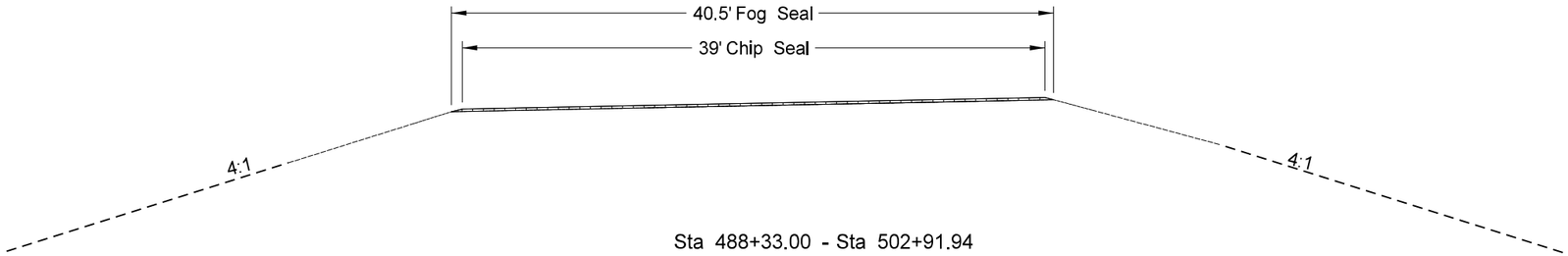
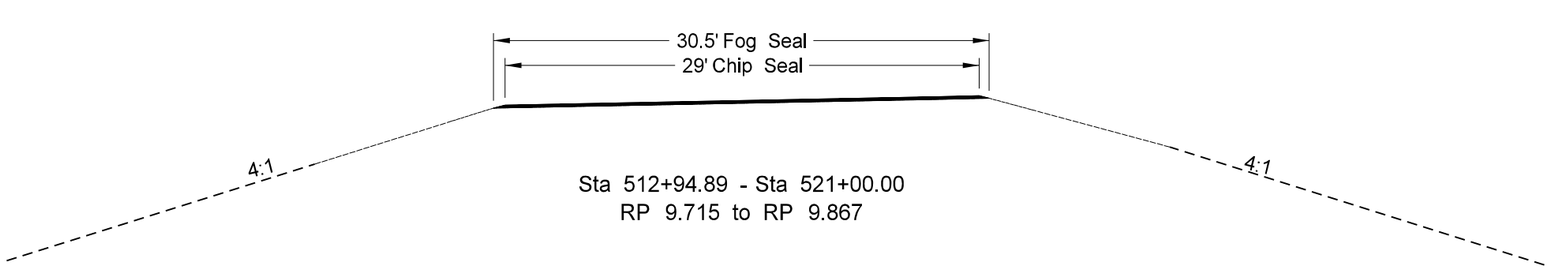
| | STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|---|
| | ND | SS-1-024(021)008 | 30 | 3 |




Sta 488+33.00 - Sta 502+91.94
RP 9.249 to RP 9.525
Sta 504+34.39 - Sta 508+33.00
RP 9.552 to RP 9.628




Sta 512+94.89 - Sta 521+00.00
RP 9.715 to RP 9.867

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Proposed Typical Sections

Chip Seal

Highway 24 Near Fort Yates

| STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|
| ND | SS-1-024(021)008 | 100 | 1 |

| SIGN NUMBER | SIGN SIZE | DESCRIPTION | AMOUNT REQUIRED | UNITS PER AMOUNT | UNITS SUB TOTAL |
|---|---|---|---|---|---|
| D3-36 | 36"x6" | STREET NAME SIGN (Sign and installation only) | | 6 | |
| G20-1-60 | 60"x24" | ROAD WORK NEXT __ MILES | | 34 | |
| G20-1b-60 | 60"x24" | WORK IN PROGRESS/ NO WORK IN PROGRESS (Sign and installation only) | | 26 | |
| **G20-2-48** | **48"x24"** | **END ROAD WORK** | **2** | **19** | **38** |
| G20-4-36 | 36"x18" | PILOT CAR FOLLOW ME (Mounted to back of pilot car) | | 18 | |
| G20-10-108 | 108"x48" | CONTRACTOR SIGN | | 64 | |
| G20-50a-72 | 72"x36" | ROAD WORK NEXT __ MILES RT & LT ARROWS | | 37 | |
| G20-52a-72 | 72"x24" | ROAD WORK NEXT __ MILES RT or LT ARROW | | 30 | |
| G20-55-96 | 96"x48" | SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT | | 59 | |
| M1-1-36 | 36"x36" | INTERSTATE ROUTE MARKER (Post and installation only) | | 10 | |
| M1-4-24 | 24"x24" | U.S. ROUTE MARKER (Post and installation only) | | 10 | |
| M1-5-24 | 24"x24" | STATE ROUTE MARKER (Post and installation only) | | 10 | |
| M3-1-24 | 24"x12" | NORTH (Mounted on route marker post) | | 7 | |
| M3-2-24 | 24"x12" | EAST (Mounted on route marker post) | | 7 | |
| M3-3-24 | 24"x12" | SOUTH (Mounted on route marker post) | | 7 | |
| M3-4-24 | 24"x12" | WEST (Mounted on route marker post) | | 7 | |
| M4-8-24 | 24"x12" | DETOUR (Mounted on route marker post) | | 7 | |
| M4-9-30 | 30"x24" | DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT | | 15 | |
| M4-10-48 | 48"x18" | DETOUR ARROW RIGHT or LEFT | | 23 | |
| M5-1-21 | 21"x15" | ARROW AHD AND RT or LT(Mounted on route marker post) | | 7 | |
| M5-2-21 | 21"x15" | ARROW AHD UP & RT or LT (Mounted on route marker post) | | 7 | |
| M6-1-21 | 21"x15" | ARROW RT or LT (Mounted on route marker post) | | 7 | |
| M6-2-21 | 21"x15" | ARROW UP & RT or LT (Mounted on route marker post) | | 7 | |
| M6-3-21 | 21"x15" | ARROW AHD (Mounted on route marker post) | | 7 | |
| R1-1-48 | 48"x48" | STOP | | 32 | |
| R1-1a-18 | 18"x18" | STOP and SLOW PADDLE Back to Back | | 5 | |
| R1-2-60 | 60"x60" | YIELD | | 29 | |
| **R2-1-48** | **48"x60"** | **SPEED LIMIT __** | **5** | **39** | **195** |
| **R2-1a-24** | **24"x18"** | **MINIMUM FEE $80 (Mounted on Speed Limit post)** | **5** | **10** | **50** |
| R3-7-48 | 48"x48" | LEFT or RIGHT LANE MUST TURN LEFT or RIGHT | | 35 | |
| **R4-1-48** | **48"x60"** | **DO NOT PASS** | **5** | **39** | **195** |
| R4-7-48 | 48"x60" | KEEP RIGHT SYMBOL | | 39 | |
| R5-1-48 | 48"x48" | DO NOT ENTER | | 35 | |
| R6-1-36 | 36"x12" | ONE WAY RIGHT or LEFT | | 13 | |
| R7-1-12 | 12"x18" | NO PARKING | | 11 | |
| R10-6-24 | 24"x36" | STOP HERE ON RED | | 16 | |
| R11-2-48 | 48"x30" | ROAD CLOSED | | 28 | |
| R11-2a-48 | 48"x30" | STREET CLOSED | | 28 | |
| R11-3a-60 | 60"x30" | ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY | | 31 | |
| R11-3c-60 | 60"x30" | STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY | | 31 | |
| R11-4a-60 | 60"x30" | STREET CLOSED TO THRU TRAFFIC | | 31 | |
| W1-3-48 | 48"x48" | RIGHT or LEFT SHARP REVERSE CURVE ARROW | | 35 | |
| W1-4-48 | 48"x48" | RIGHT or LEFT REVERSE CURVE ARROW | | 35 | |
| W1-4b-48 | 48"x48" | DOUBLE RIGHT or LEFT REVERSE CURVE ARROW | | 35 | |
| W1-6-48 | 48"x24" | LARGE ARROW | | 26 | |
| W3-1-48 | 48"x48" | STOP AHEAD SYMBOL | | 35 | |
| W3-3-48 | 48"x48" | SIGNAL AHEAD SYMBOL | | 35 | |
| **W3-4-48** | **48"x48"** | **BE PREPARED TO STOP** | **2** | **35** | **70** |
| **W3-5-48** | **48"x48"** | **SPEED REDUCTION AHEAD** | **2** | **35** | **70** |
| W4-2-48 | 48"x48" | RIGHT or LEFT LANE TRANSITION SYMBOL | | 35 | |
| W5-1-48 | 48"x48" | ROAD NARROWS | | 35 | |
| W5-8-48 | 48"x48" | THRU TRAFFIC RIGHT LANE | | 35 | |
| W5-9-48 | 48"x48" | ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW | | 35 | |
| W6-3-48 | 48"x48" | TWO WAY TRAFFIC SYMBOL | | 35 | |
| W8-1-48 | 48"x48" | BUMP | | 35 | |
| W8-3-48 | 48"x48" | PAVEMENT ENDS | | 35 | |
| W8-7-48 | 48"x48" | LOOSE GRAVEL | | 35 | |
| W8-9a-48 | 48"x48" | SHOULDER DROP-OFF | | 35 | |
| W8-11-48 | 48"x48" | UNEVEN LANES | | 35 | |
| W8-12-48 | 48"x48" | NO CENTER STRIPE | | 35 | |
| W8-53-48 | 48"x48" | TRUCKS ENTERING HIGHWAY | | 35 | |
| W8-54-48 | 48"x48" | TRUCKS ENTERING AHEAD or __FT. | | 35 | |
| W8-55-48 | 48"x48" | TRUCKS CROSSING AHEAD or __ FT. | | 35 | |
| W8-56-48 | 48"x48" | TRUCKS EXITING HIGHWAY | | 35 | |
| W9-3a-48 | 48"x48" | CENTER LANE CLOSED SYMBOL | | 35 | |
| W12-2-48 | 48"x48" | LOW CLEARANCE SYMBOL | | 35 | |
| W13-1-24 | 24"x24" | __ MPH ADVISORY SPEED PLATE (Mounted on warning sign post) | | 11 | |
| W13-4-48 | 48"x60" | RAMP ARROW | | 39 | |
| W14-3-48 | 48"x36" | NO PASSING ZONE | | 23 | |
| **W20-1-48** | **48"x48"** | **ROAD WORK AHEAD or _FT or _ MILE** | **2** | **35** | **70** |
| W20-2-48 | 48"x48" | DETOUR AHEAD or __ FT | | 35 | |
| W20-3-48 | 48"x48" | ROAD or STREET CLOSED AHEAD or __ FT. | | 35 | |
| W20-4-48 | 48"x48" | ONE LANE ROAD AHEAD or __ FT. | | 35 | |
| W20-5-48 | 48"x48" | RIGHT or LEFT LANE CLOSED AHEAD or __FT. | | 35 | |
| W20-7a-48 | 48"x48" | FLAGGING SYMBOL | | 35 | |
| W20-7k-24 | 24"x18" | __ FEET (Mounted on warning sign post) | | 10 | |
| W20-8-48 | 48"x48" | STREET CLOSED | | 35 | |
| W20-51-48 | 48"x48" | EQUIPMENT WORKING | | 35 | |
| **W20-52-54** | **54"x12"** | **NEXT __ MILES (Mounted on warning sign post)** | **5** | **12** | **60** |
| W21-1a-48 | 48"x48" | WORKERS SYMBOL | | 35 | |
| W21-2-48 | 48"x48" | FRESH OIL | | 35 | |
| W21-3-48 | 48"x48" | ROAD MACHINERY AHEAD or __FT | | 35 | |

| SIGN NUMBER | SIGN SIZE | DESCRIPTION | AMOUNT REQUIRED | UNITS PER AMOUNT | UNITS SUB TOTAL |
|---|---|---|---|---|---|
| W21-5-48 | 48"x48" | SHOULDER WORK | | 35 | |
| W21-5a-48 | 48"x48" | RIGHT or LEFT SHOULDER CLOSED | | 35 | |
| W21-5b-48 | 48"x48" | RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT. | | 35 | |
| W21-6a-48 | 48"x48" | SURVEY CREW AHEAD | | 35 | |
| W21-50-48 | 48"x48" | BRIDGE PAINTING AHEAD or __ FT. | | 35 | |
| W21-51-48 | 48"x48" | MATERIAL ON ROADWAY | | 35 | |
| **W22-8-48** | **48"x48"** | **FRESH OIL LOOSE ROCK** | **5** | **35** | **175** |
| | 24"x24" | TAKE TURNS (6" D letters) (Mounted on stop sign post) | | 11 | |

**SPECIAL SIGNS**

**SPEC & CODE**

| | | | |
|---|---|---|---|
| **704-1000** | **TRAFFIC CONTROL SIGNS** | **TOTAL UNITS** | **923** |

| SPEC & CODE | DESCRIPTION | UNIT | QUANTITY |
|---|---|---|---|
| 704-0100 | FLAGGING | MHR | |
| 704-1041 | ATTENUATION DEVICE-TYPE B-55 | EACH | |
| 704-1043 | ATTENUATION DEVICE-TYPE B-65 | EACH | |
| 704-1044 | ATTENUATION DEVICE-TYPE B-70 | EACH | |
| 704-1050 | TYPE I BARRICADES | EACH | |
| 704-1051 | TYPE II BARRICADES | EACH | |
| 704-1052 | TYPE III BARRICADES | EACH | |
| 704-1060 | DELINEATOR DRUMS | EACH | |
| 704-1065 | TRAFFIC CONES | EACH | |
| 704-1067 | TUBULAR MARKERS | EACH | |
| 704-1070 | DELINEATOR | EACH | |
| 704-1072 | FLEXIBLE DELINEATORS | EACH | |
| 704-1081 | VERTICAL PANELS - BACK TO BACK | EACH | |
| 704-1085 | SEQUENCING ARROW PANEL - TYPE A | EACH | |
| 704-1086 | SEQUENCING ARROW PANEL - TYPE B | EACH | |
| 704-1087 | SEQUENCING ARROW PANEL - TYPE C | EACH | |
| 704-1088 | SEQUENCING ARROW PANEL - TYPE C - CROSSOVER | EACH | |
| 704-1095 | TYPE B FLASHERS | EACH | |
| 704-1500 | OBLITERATION OF PVMT MK | SF | |
| 704-3501 | PORTABLE PRECAST CONCRETE MED BARRIER | LF | |
| 704-3510 | PRECAST CONCRETE MED BARRIER - STATE FURNISHED | EACH | |
| 762-0200 | RAISED PAVEMENT MARKERS | EACH | |
| 762-0420 | SHORT TERM 4IN LINE - TYPE R | LF | |
| 762-0430 | SHORT TERM 4IN LINE - TYPE NR | LF | |
| 772-2110 | FLASHING BEACON - POST MOUNTED | EACH | |

NOTE:
If additional signs are required, units will be calculated using the formula from Section III-19.06 of the Design Manual.
http://www.dot.nd.gov/

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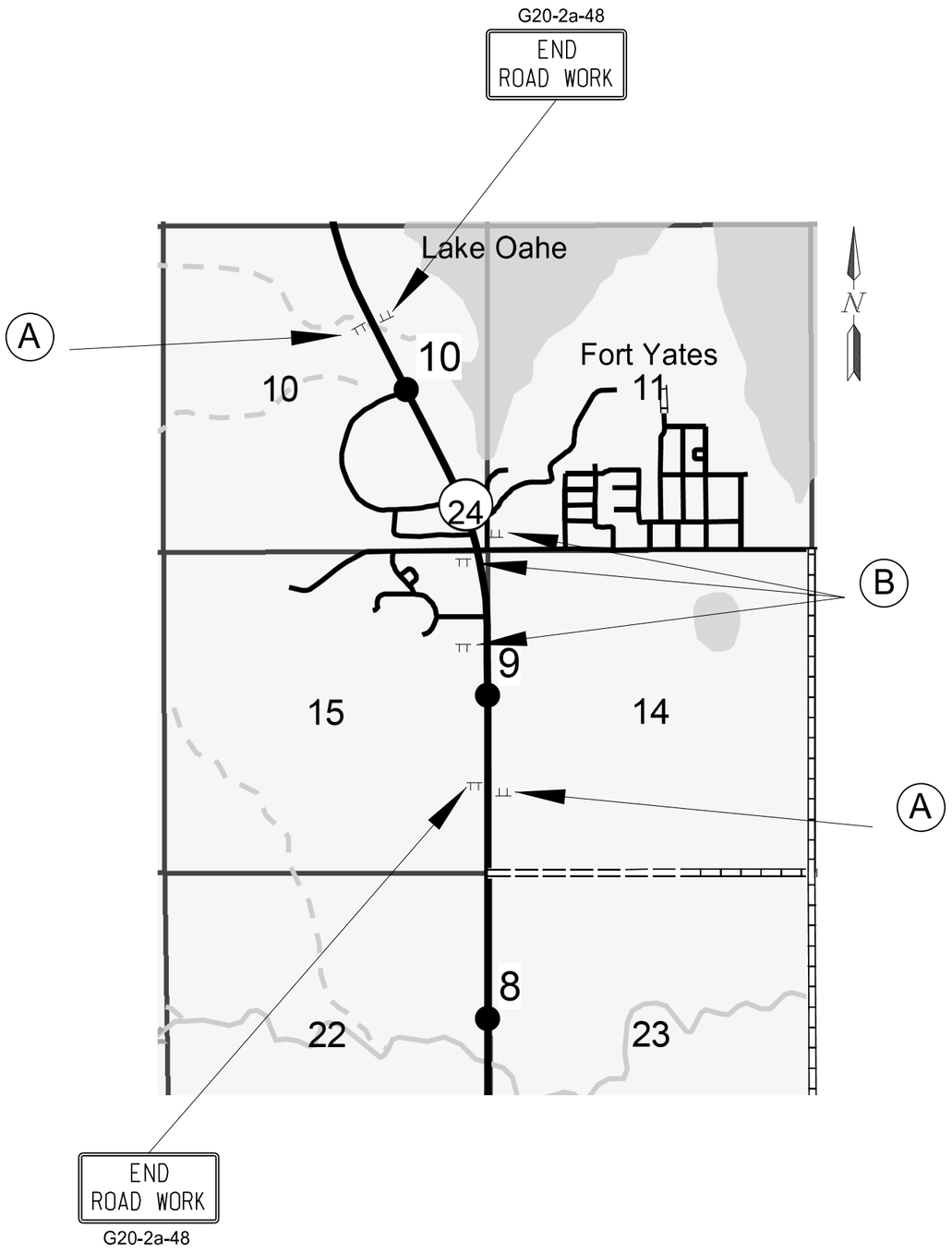
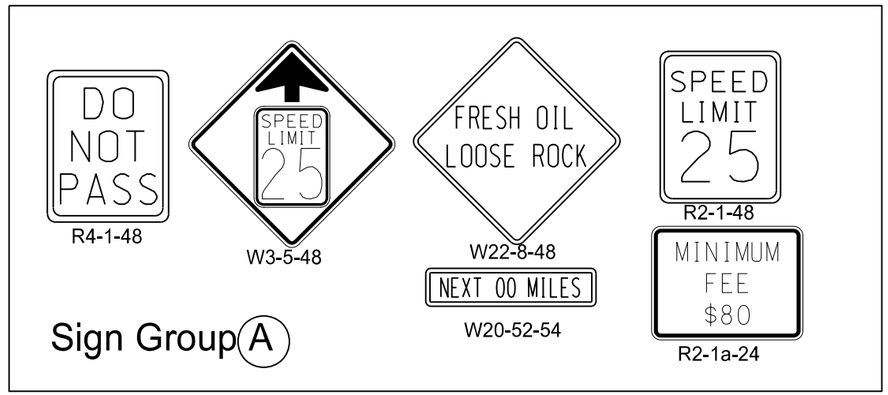
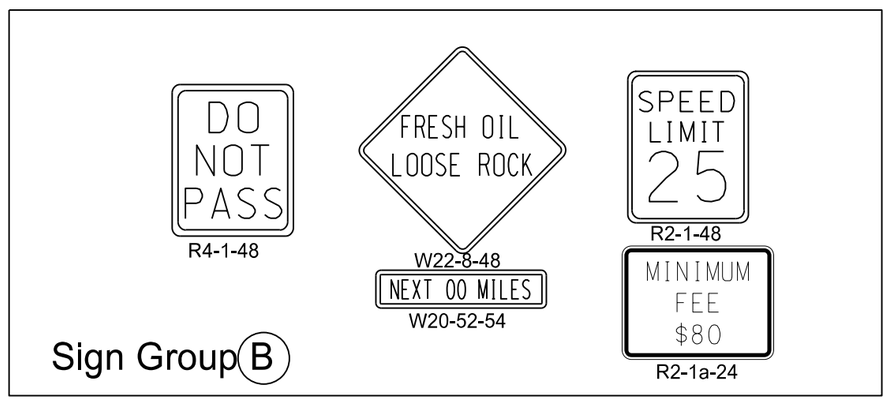
Traffic Control Devices List

| | STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|---|
| | ND | SS-1-024(021)008 | 100 | 2 |

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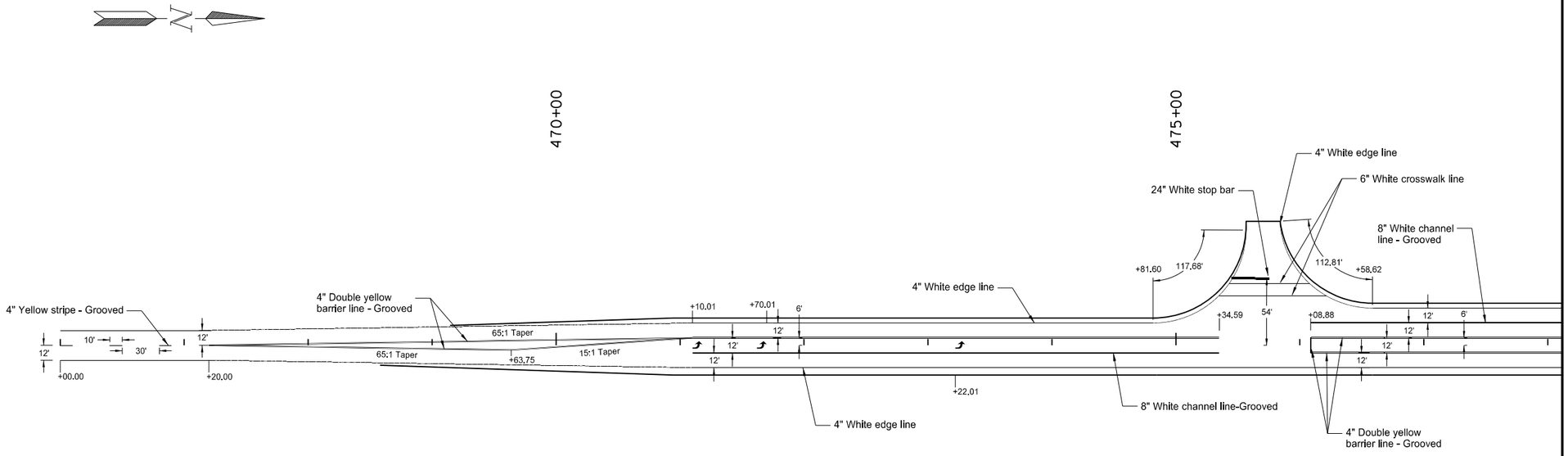
Construction Sign Layout

Chip Seal

ND 24 near Fort Yates

| | STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|---|
| | ND | SS-1-024(021)008 | 120 | 1 |




| Pvmt Mk Painted Message | |
|---|---|
| Left Arrow (3) | 48 SF |

| Pvmt Mk Painted 4In Line | |
|---|---|
| 4" White edge line | 2411 LF |
| 4" Yellow stripe | 30 LF |
| 4" Double yellow barrier line | 3032 LF |
| Total | 5473 LF |

| Pvmt Mk Painted 6In Line | |
|---|---|
| 6" White crosswalk line | 151 LF |

| Pvmt Mk Painted 8In Line | |
|---|---|
| 8" White channel line | 597 LF |

| Pvmt Mk Painted 24In Line | |
|---|---|
| 24" White stop bar | 31 LF |

| Epoxy Pvmt Mk Message - Grooved | |
|---|---|
| Left Arrow (3) | 48 SF |

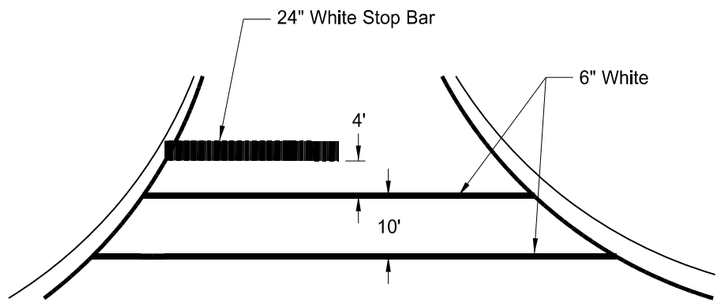
| Epoxy Pvmt Mk 4In Line | |
|---|---|
| 4" White edge line | 2411 LF |

| Epoxy Pvmt Mk 4In Line - Grooved | |
|---|---|
| 4" Yellow stripe | 30 LF |
| 4" Double yellow barrier line | 3032 LF |
| Total | 3062 LF |

| Epoxy Pvmt Mk 6In Line | |
|---|---|
| 6" White crosswalk line | 151 LF |

| Epoxy Pvmt Mk 8In Line - Grooved | |
|---|---|
| 8" White channel line | 597 LF |

| Epoxy Pvmt Mk 24In Line | |
|---|---|
| 24" White stop bar | 31 LF |



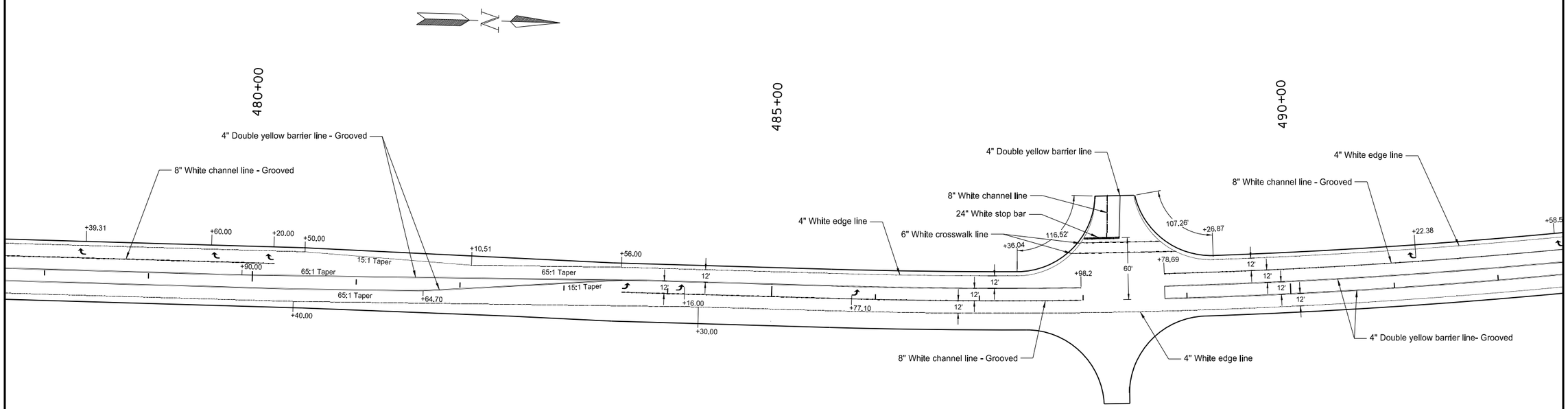

Stop Bar Location Detail



Pavement Marking Layout

ND 24
Fort Yates

| | STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|---|
| | ND | SS-1-024(021)008 | 120 | 2 |




**Pvmt Mk Painted Message**

| | |
|---|---|
| Right Arrow (4) | 64 SF |
| Left Arrow (3) | 48 SF |
| Total | 112 SF |

**Pvmt Mk Painted 4In Line**

| | |
|---|---|
| 4" White edge line | 2908 LF |
| 4" Double yellow barrier line | 4674 LF |
| Total | 7582 LF |

**Pvmt Mk Painted 6In Line**

| | |
|---|---|
| 6" White crosswalk line | 177 LF |

**Pvmt Mk Painted 8In Line**

| | |
|---|---|
| 8" White channel line | 1065 LF |

**Pvmt Mk Painted 24In Line**

| | |
|---|---|
| 24" White stop bar | 34 LF |

**Epoxy Pvmt Mk Message - Grooved**

| | |
|---|---|
| Right Arrow (4) | 64 SF |
| Left Arrow (3) | 48 SF |
| Total | 112 SF |

**Epoxy Pvmt Mk 4In Line**

| | |
|---|---|
| 4" White edge line | 2908 LF |
| 4" Double yellow barrier line | 80 LF |
| Total | 2988 LF |

**Epoxy Pvmt Mk 4In Line - Grooved**

| | |
|---|---|
| 4" Double yellow barrier line | 4594 LF |

**Epoxy Pvmt Mk 6In Line**

| | |
|---|---|
| 6" White crosswalk line | 177 LF |

**Epoxy Pvmt Mk 8In Line**

| | |
|---|---|
| 8" White channel line | 40 LF |

**Epoxy Pvmt Mk 8In Line - Grooved**

| | |
|---|---|
| 8" White channel line | 1025 LF |

**Epoxy Pvmt Mk 24In Line**

| | |
|---|---|
| 24" White stop bar | 34 LF |

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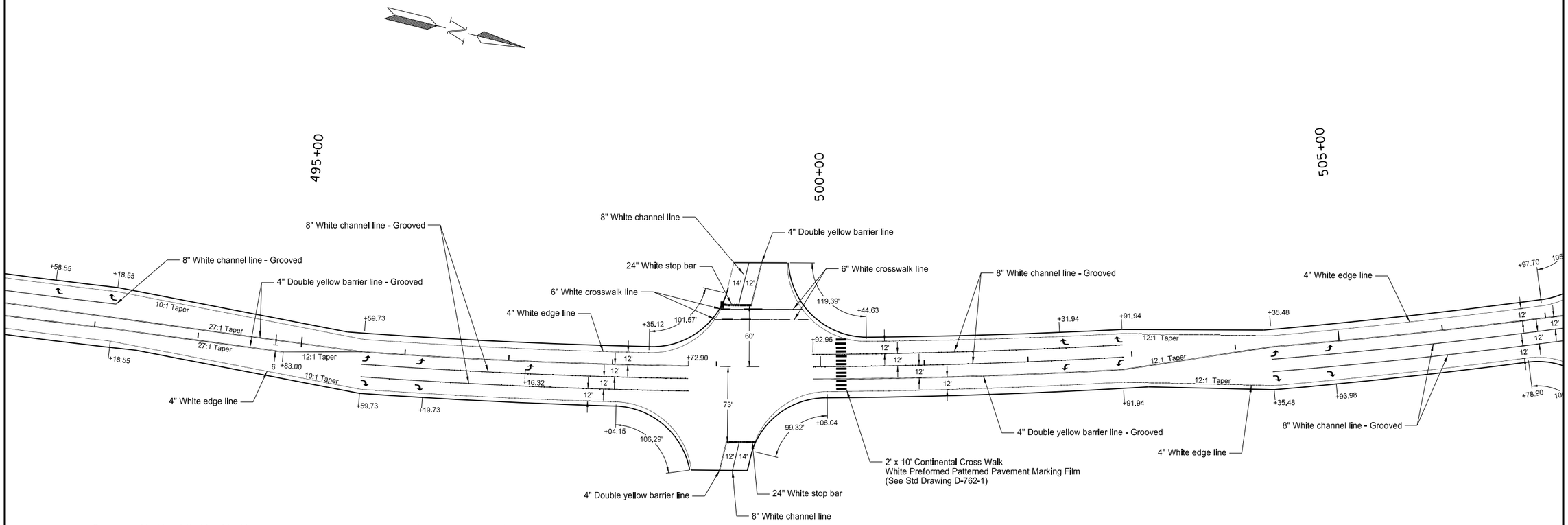
Pavement Marking Layout

ND 24
Fort Yates

| | STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|---|
| | ND | SS-1-024(021)008 | 120 | 3 |




**Pavement Marking 24In Line Masking**

| | |
|---|---|
| 24" White continental crosswalk line | 150 LF |

**Pvmt Mk Painted Message**

| | |
|---|---|
| Right Arrow (8) | 128 SF |
| Left Arrow (7) | 112 SF |
| Total | 240 SF |

**Pvmt Mk Painted 4In Line**

| | |
|---|---|
| 4" White edge line | 2936 LF |
| 4" Double yellow barrier line | 3796 LF |
| Total | 6732 LF |

**Pvmt Mk Painted 6In Line**

| | |
|---|---|
| 6" White crosswalk line | 172 LF |

**Pvmt Mk Painted 8In Line**

| | |
|---|---|
| 8" White channel line | 1883 LF |

**Pvmt Mk Painted 24In Line**

| | |
|---|---|
| 24" White stop bar | 55 LF |

**Epoxy Pvmt Mk Message - Grooved**

| | |
|---|---|
| Right Arrow (8) | 128 SF |
| Left Arrow (7) | 112 SF |
| Total | 240 SF |

**Epoxy Pvmt Mk 4In Line**

| | |
|---|---|
| 4" White edge line | 2936 LF |
| 4" Double yellow barrier line | 138 LF |
| Total | 3074 LF |

**Epoxy Pvmt Mk 4In Line - Grooved**

| | |
|---|---|
| 4" Double yellow barrier line | 3658 LF |

**Epoxy Pvmt Mk 6In Line**

| | |
|---|---|
| 6" White crosswalk line | 172 LF |

**Epoxy Pvmt Mk 8In Line**

| | |
|---|---|
| 8" White channel line | 69 LF |

**Epoxy Pvmt Mk 8In Line - Grooved**

| | |
|---|---|
| 8" White channel line | 1814 LF |

**Epoxy Pvmt Mk 24In Line**

| | |
|---|---|
| 24" White stop bar | 55 LF |

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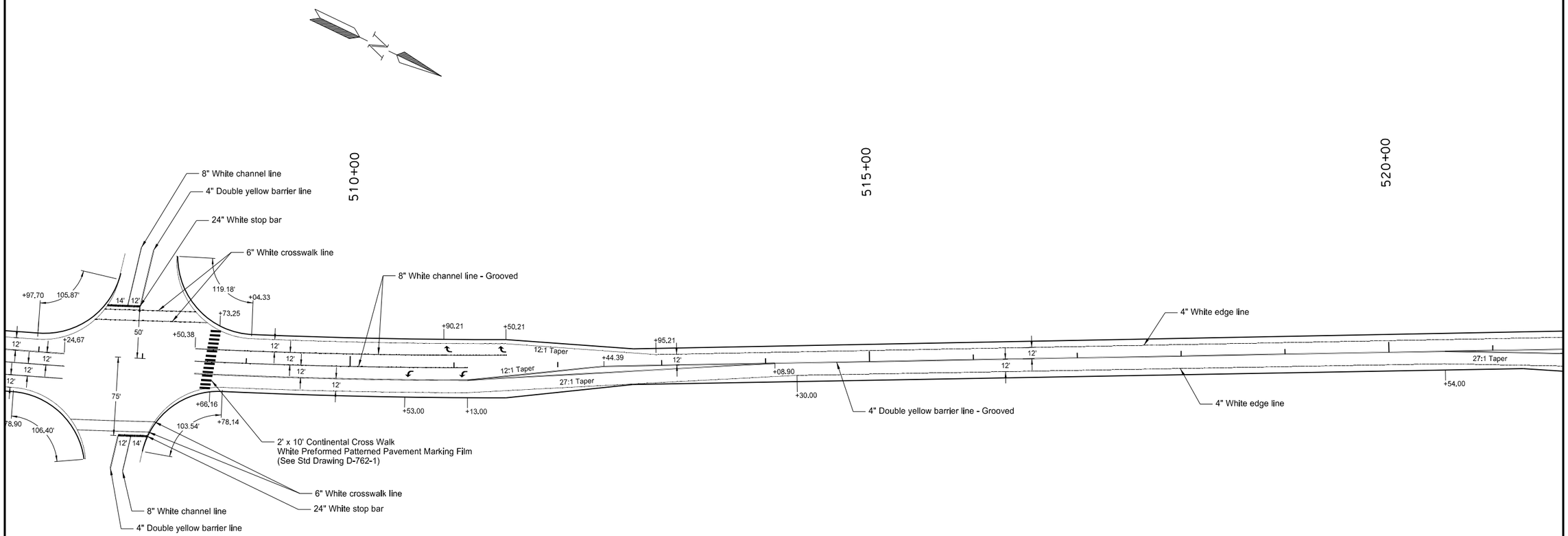
Pavement Marking Layout

ND 24
Fort Yates

| | STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|---|
| | ND | SS-1-024(021)008 | 120 | 4 |




| Pvmt Mk 24In Line Masking | |
|---|---|
| 24" White continental crosswalk line | 150 LF |

| Pvmt Mk Painted Message | |
|---|---|
| Right Arrow (2) | 32 SF |
| Left Arrow (2) | 32 SF |
| Total | 64 SF |

| Pvmt Mk Painted 4In Line | |
|---|---|
| 4" White edge line | 3043 LF |
| 4" Double yellow barrier line | 3514 LF |
| Total | 6557 LF |

| Pvmt Mk Painted 6In Line | |
|---|---|
| 6" White crosswalk line | 345 LF |

| Pvmt Mk Painted 8In Line | |
|---|---|
| 8" White channel line | 661 LF |

| Pvmt Mk Painted 24In Line | |
|---|---|
| 24" White stop bar | 60 LF |

| Epoxy Pvmt Mk Message - Grooved | |
|---|---|
| Right Arrow (2) | 32 SF |
| Left Arrow (2) | 32 SF |
| Total | 64 SF |

| Epoxy Pvmt Mk 4In Line | |
|---|---|
| 4" White edge line | 3043 LF |
| 4" Double yellow barrier line | 176 LF |
| Total | 3219 LF |

| Epoxy Pvmt Mk 4In Line - Grooved | |
|---|---|
| 4" Double yellow barrier line | 3338 LF |

| Epoxy Pvmt Mk 6In Line | |
|---|---|
| 6" White crosswalk line | 345 LF |

| Epoxy Pvmt Mk 8In Line | |
|---|---|
| 8" White channel line | 88 LF |

| Epoxy Pvmt Mk 8In Line - Grooved | |
|---|---|
| 8" White channel line | 573 LF |

| Epoxy Pvmt Mk 24In Line | |
|---|---|
| 24" White stop bar | 60 LF |

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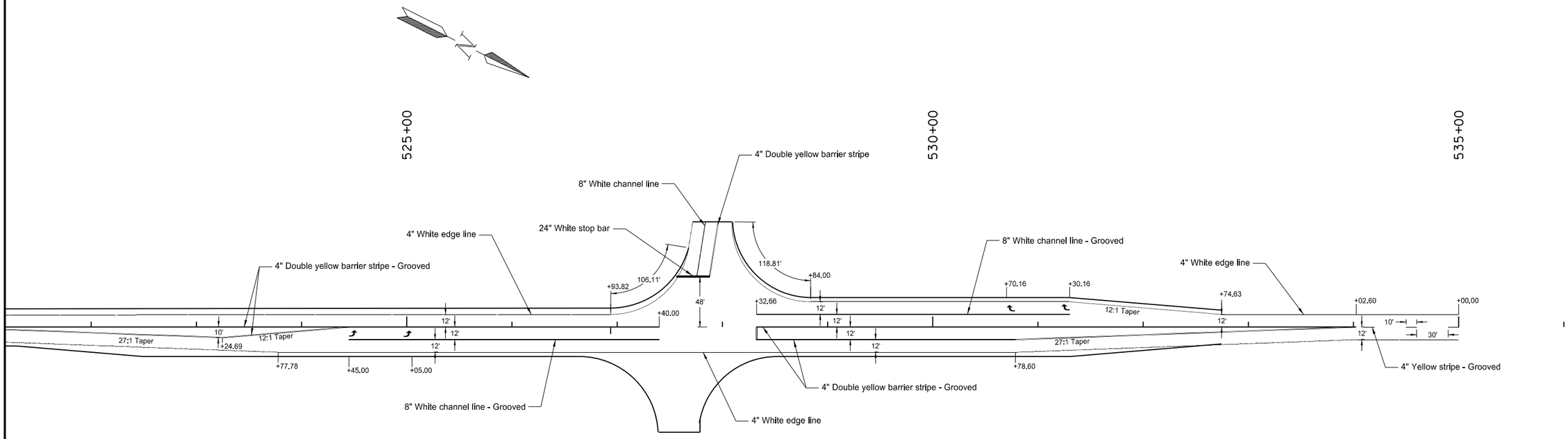
Pavement Marking Layout

ND 24
Fort Yates

| | STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
|---|---|---|---|---|
| | ND | SS-1-024(021)008 | 120 | 5 |




**Pvmt Mk Painted Message**

| | |
|---|---|
| Right Arrow (2) | 32 SF |
| Left Arrow (2) | 32 SF |
| Total | 64 SF |

**Pvmt Mk Painted 4In Line**

| | |
|---|---|
| 4" White edge line | 2759 LF |
| 4" Double yellow barrier line | 4194 LF |
| 4" Yellow stripe | 30 LF |
| Total | 6983 LF |

**Pvmt Mk Painted 8In Line**

| | |
|---|---|
| 8" White channel line | 638 LF |

**Pvmt Mk Painted 24In Line**

| | |
|---|---|
| 24" White stop bar | 30 LF |

**Epoxy Pvmt Mk Message - Grooved**

| | |
|---|---|
| Right Arrow (2) | 32 SF |
| Left Arrow (2) | 32 SF |
| Total | 64 SF |

**Epoxy Pvmt Mk 4In Line**

| | |
|---|---|
| 4" White edge line | 2759 LF |
| 4" Double yellow barrier line | 104 LF |
| Total | 2863 LF |

**Epoxy Pvmt Mk 4In Line - Grooved**

| | |
|---|---|
| 4" Yellow stripe | 30 LF |
| 4" Double yellow barrier line | 4090 LF |
| Total | 4120 LF |

**Epoxy Pvmt Mk 8In Line**

| | |
|---|---|
| 8" White channel line | 52 LF |

**Epoxy Pvmt Mk 8In Line - Grooved**

| | |
|---|---|
| 8" White channel line | 586 LF |

**Epoxy Pvmt Mk 24In Line**

| | |
|---|---|
| 24" White stop bar | 30 LF |

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Pavement Marking Layout

ND 24
Fort Yates

# NDDOT ABBREVIATIONS

D-101-1

| | |
|---|---|
| ? | This is a special text character used in the labeling of existing features. It indicates a feature that has an unknown characteristic, potentially based on: lack of description, location accuracy or purpose. |
| Abn | abandoned |
| Abut | abutment |
| Ac | acres |
| Adj | adjusted |
| Aggr | aggregate |
| Ahd | ahead |
| ARV | air release valve |
| Align | alignment |
| Al | alley |
| Alt | alternate |
| Alum | aluminum |
| ADA | Americans with Disabilities Act |
| A | ampere |
| & | and |
| Appr | approach |
| Approx | approximate |
| ACP | asbestos cement pipe |
| Asph | asphalt |
| AC | asphalt cement |
| Assmd | assumed |
| @ | at |
| Atten | attenuation |
| ATR | automatic traffic recorder |
| Ave | Avenue |
| Avg | average |
| ADT | average daily traffic |
| Az | azimuth |
| Bk | back |
| BF | back face |
| Bs | backsight |
| Balc | balcony |
| B Wire | barbed wire |
| Barr | barricade |
| Btry | battery |
| Brg | bearing |
| BI | beehive inlet |
| Beg | begin |
| BM | bench mark |
| Bkwy | bikeway |
| Bit | bituminous |
| Blk | block |
| Bd Ft | board feet |
| BH | bore hole |
| BS | both sides |
| Bot | bottom |
| Blvd | Boulevard |
| Bndry | boundary |
| BC | brass cap |
| Brkwy | breakaway |
| Br | bridge |
| Bldg | building |
| BV | butterfly valve |
| Byp | bypass |
| C Gdrl | cable guardrail |
| Calc | calculate |
| Cd | candela |
| CIP | cast iron pipe |
| CB | catch basin |
| CRS | cationic rapid setting |
| C Gd | cattle guard |
| C To C | center to center |
| Cl or ℄ | centerline |
| Cm | centimeter |
| Ch | chain |
| Chnlk | chain-link |
| Ch Blk | channel block |
| Ch Ch | channel change |
| Chk | check |
| Chsld | chiseled |
| Cir | circle |
| Cl | class |
| Cl | clay |
| Cl F | clay fill |
| Cl Hvy | clay heavy |
| Cl Lm | clay loam |
| Clnt | clean-out |
| Clr | clear |
| Cl&gr | clearing & grubbing |
| Co S | coal slack |
| Comb. | combination |
| Coml | commercial |
| Compr | compression |
| CADD | computer aided drafting & design |
| Conc | concrete |
| Cond | conductor |
| Const | construction |
| Cont | continuous |
| CSB | continuous split barrel sample |
| Contr | contraction |
| Contr | contractor |
| CP | control point |
| Coord | coordinate |
| Cor | corner |
| Corr | corrected |
| CAES | corrugated aluminum end section |
| CAP | corrugated aluminum pipe |
| CMES | corrugated metal end section |
| CMP | corrugated metal pipe |
| CPVCP | corrugated poly-vinyl chloride pipe |
| CSES | corrugated steel end section |
| CSP | corrugated steel pipe |
| C | coulomb |
| Co | County |
| Crse | course |
| C Gr | course gravel |
| CS | course sand |
| Ct | Court |
| Xarm | cross arm |
| Xbuck | cross buck |
| Xsec | cross sections |
| Xing | crossing |
| Xrd | Crossroad |
| Crn | crown |
| CF | cubic feet |
| M3 | cubic meter |
| M3/s | cubic meters per second |
| CY | cubic yard |
| Cy/mi | cubic yards per mile |
| Culv | culvert |
| C&G | curb & gutter |
| CI | curb inlet |
| CR | curb ramp |
| CS | curve to spiral |
| C | cut |
| Dd Ld | dead load |
| Defl | deflection |
| Defm | deformed |
| Deg or D | degree |
| Dlnt | delineate |
| Dlntr | delineator |
| Depr | depression |
| Desc | description |
| Det | detail |
| DWP | detectable warning panel |
| Dtr | detour |
| Dia | diameter |
| Dir | direction |
| Dist | distance |
| DM | disturbed material |
| DB | ditch block |
| DG | ditch grade |
| Dbl | double |
| Dn | down |
| Dwg | drawing |
| Dr | drive |
| Drwy | driveway |
| DI | drop inlet |
| D | dry density |
| Ea | each |
| Esmt | easement |
| E | East |
| EB | Eastbound |
| Elast | elastomeric |
| EL | electric locker |
| E Mtr | electric meter |
| Elec | electric/al |
| EDM | electronic distance meter |
| Elev or El | elevation |
| Ellipt | elliptical |
| Emb | embankment |
| Emuls | emulsion/emulsified |
| ES | end section |
| Engr | engineer |
| ESS | environmental sensor station |
| Eq | equal |
| Eq | equation |
| Evgr | evergreen |
| Exc | excavation |
| Exst | existing |
| Exp | expansion |
| Expy | Expressway |
| E | external of curve |
| Extru | extruded |
| FOS | factor of safety |
| F | Fahrenheit |
| FS | far side |
| F | farad |
| Fed | Federal |
| FP | feed point |
| Ft | feet/foot |
| Fn | fence |
| Fn P | fence post |
| FO | fiber optic |
| FB | field book |
| FD | field drive |
| F | fill |
| FAA | fine aggregate angularity |
| FS | fine sand |
| FH | fire hydrant |
| Fl | flange |
| Flrd | flared |
| FES | flared end section |
| F Bcn | flashing beacon |
| FA | flight auger sample |
| FL | flow line |
| Ftg | footing |
| FM | force main |
| Fs | foresight |
| Fnd | found |
| Fdn | foundation |
| Frac | fractional |
| Frwy | freeway |
| Frt | front |
| FF | front face |
| F Disp | fuel dispenser |

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|---|
| 07-01-14 | |
| REVISIONS | |
| DATE | CHANGE |
| | |

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# NDDOT ABBREVIATIONS

D-101-2

| | |
|---|---|
| FFP | fuel filler pipes |
| FLS | fuel leak sensor |
| Furn | furnish/ed |
| Gal | gallon |
| Galv | galvanized |
| Gar | garage |
| Gs L | gas line |
| G Reg | gas line regulator |
| GMV | gas main valve |
| G Mtr | gas meter |
| GSV | gas service valve |
| GVP | gas vent pipe |
| GV | gate valve |
| Ga | gauge |
| Geod | geodetic |
| GIS | Geographical Information System |
| G | giga |
| GPS | Global Positioning System |
| Gov | government |
| Grd | graded/grade |
| Gr | gravel |
| Grnd | ground |
| GWM | ground water monitor |
| Gdrl | guardrail |
| Gtr | gutter |
| H Plg | H piling |
| Hdwl | headwall |
| Ha | hectare |
| Ht | height |
| HI | height of instrument |
| Hel | helical |
| H | henry |
| Hz | hertz |
| HDPE | high density polyethylene |
| HM | high mast |
| HP | high pressure |
| HPS | high pressure sodium |
| Hwy | highway |
| Hor | horizontal |
| HBP | hot bituminous pavement |
| HMA | hot mix asphalt |
| Hr | hour(s) |
| Hyd | hydrant |
| Ph | hydrogen ion content |
| Id | identification |
| In or " | inch |
| Incl | inclinometer tube |
| IMH | inlet manhole |
| ID | inside diameter |
| Inst | instrument |
| Intchg | interchange |
| Intmdt | intermediate |
| Intscn | intersection |
| Inv | invert |
| IM | iron monument |
| I Pn | Iron Pin |
| IP | iron Pipe |
| Jt | joint |
| J | joule |
| Jct | junction |
| K | kelvin |
| Kn | kilo newton |
| Kpa | kilo pascal |
| Kg | kilogram |
| Kg/m3 | kilogram per cubic meter |
| Km | kilometer |
| K | Kip(s) |
| LS | Land Surveyor (licensed) |
| LSIT | Land Surveyor In Training |
| Ln | lane |
| Lg | large |
| Lat | latitude |
| Lt | left |
| L | length of curve |
| Lens | lenses |
| Lvl | level |
| LB | level book |
| Lvlng | leveling |
| Lht | light |
| LP | light pole |
| Ltg | lighting |
| Lig Co | lignite coal |
| Lig Sl | lignite slack |
| LF | linear foot |
| Liq | liquid |
| LL | liquid limit |
| L | litre |
| Lm | loam |
| Loc | location |
| LC | long chord |
| Long. | longitude |
| Lp | loop |
| LD | loop detector |
| Lm | lumen |
| Lum | luminaire |
| L Sum | lump sum |
| Lx | lux |
| ML | main line |
| M Hr | man hour |
| MH | manhole |
| Mkd | marked |
| Mkr | marker |
| Mkg | marking |
| MA | mast arm |
| Matl | material |
| Max | maximum |
| MC | meander corner |
| Meas | measure |
| Mdn | median |
| MD | median drain |
| MC | medium curing |
| M | mega |
| Mer | meridian |
| M | meter |
| M/s | meters per second |
| M | mid ordinate of curve |
| Mi | mile |
| MM | mile marker |
| MP | mile post |
| Ml | milliliter |
| Mm | millimeter |
| Mm/hr | millimeters per hour |
| Min | minimum |
| Misc | miscellaneous |
| Mon | monument |
| Mnd | mound |
| Mtbl | mountable |
| Mtd | mounted |
| Mtg | mounting |
| Mk | muck |
| Mun | municipal |
| N | nano |
| NGS | National Geodetic Survey |
| NS | near side |
| Neop | neoprene |
| Ntwk | network |
| N | newton |
| N | North |
| NE | North East |
| NW | North West |
| NB | Northbound |
| No. or # | number |
| Obsc | obscure(d) |
| Obsn | observation |
| Ocpd | occupied |
| Ocpy | occupy |
| Off Loc | office location |
| O/s | offset |
| OC | on center |
| C | one dimensional consolidation |
| OC | organic content |
| Orig | original |
| O To O | out to out |
| OD | outside diameter |
| OH | overhead |
| PMT | pad mounted transformer |
| Pg | pages |
| Pntd | painted |
| Pr | pair |
| Pnl | panel |
| Pk | park |
| PK | Parker-Kalon nail |
| Pa | pascal |
| PSD | passing sight distance |
| Pvmt | pavement |
| Ped | pedestal |
| Ped | pedestrian |
| PPP | pedestrian pushbutton post |
| Pen. | penetration |
| Perf | perforated |
| Per. | perimeter |
| PL | pipeline |
| Pl | place |
| P&P | plan & profile |
| PL | plastic limit |
| Pl | plate |
| Pt | point |
| PCC | point of compound curve |
| PC | point of curve |
| PI | point of intersection |
| PRC | point of reverse curvature |
| PT | point of tangent |
| POC | point on curve |
| POT | point on tangent |
| PE | polyethylene |
| PVC | polyvinyl chloride |
| PCC | Portland Cement concrete |
| Lb or # | pounds |
| PP | power pole |
| Preempt | preemption |
| Prefab | prefabricated |
| Prfmd | preformed |
| Prep | preperation |
| Press. | pressure |
| PRV | pressure relief valve |
| Prestr | prestressed |
| Pvt | private |
| PD | private drive |
| Prod. | production/produce |
| Prog | programmed |
| Prop. | property |
| Prop Ln | property line |
| Ppsd | proposed |
| PB | pull box |

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|---|
| 07-01-14 | |
| REVISIONS | |
| DATE | CHANGE |
| 08-03-15 | General Revisions |

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# NDDOT ABBREVIATIONS

D-101-3

| | |
|---|---|
| Qty | quantity |
| Qtr | quarter |
| Rad or R | radius |
| RR | railroad |
| Rlwy | railway |
| Rsd | raised |
| RTP | random traverse point |
| Rge or R | range |
| RC | rapid curing |
| Rec | record |
| Rcy | recycle |
| RAP | recycled asphalt pavement |
| RPCC | recycled portland cement concrete |
| Ref | reference |
| R Mkr | reference marker |
| RM | reference monument |
| Refl | reflectorized |
| RCB | reinforced concrete box |
| RCES | reinforced concrete end section |
| RCP | reinforced concrete pipe |
| RCPS | reinforced concrete pipe sewer |
| Reinf | reinforcement |
| Res | reservation |
| Ret | retaining |
| Rev | reverse |
| Rt | right |
| R/W | right of way |
| Riv | river |
| Rd | road |
| Rdbd | road bed |
| Rdwy | roadway |
| RWIS | roadway weather information system |
| Rk | rock |
| Rt | route |
| Salv | salvage(d) |
| Sd | sand |
| Sdy Cl | sandy clay |
| Sdy Cl Lm | sandy clay loam |
| Sdy Fl | sandy fill |
| Sdy Lm | sandy loam |
| San | sanitary sewer line |
| Sc | scoria |
| Sec | seconds |
| Sec | section |
| SL | section line |
| Sep | separation |
| Seq | sequence |
| Serv | service |
| Sh | shale |
| Sht | sheet |
| Shtng | sheeting |
| Shldr | shoulder |
| Sw | sidewalk |
| S | siemens |
| SD | sight distance |
| SN | sign number |
| Sig | signal |
| Si Cl | silt clay |
| Si Cl Lm | silty clay loam |
| Si Lm | silty loam |
| Sgl | single |
| SC | slow curing |
| SS | slow setting |
| Sm | small |
| S | South |
| SE | South East |
| SW | South West |
| SB | Southbound |
| Sp | spaces |
| Spcl | special |
| SA | special assembly |
| SP | special provisions |
| G | specific gravity |
| Spk | spike |
| SC | spiral to curve |
| ST | spiral to tangent |
| SB | split barrel sample |
| SH | sprinkler head |
| SV | sprinkler valve |
| Sq | square |
| SF | square feet |
| Km2 | square kilometer |
| M2 | square meter |
| SY | square yard |
| Stk | stake |
| Std | standard |
| N | standard penetration test |
| Std Specs | standard specifications |
| Sta | station |
| Sta Yd | station yards |
| Stm L | steam line |
| SEC | steel encased concrete |
| SMA | stone matrix asphalt |
| SSD | stopping sight distance |
| SD | storm drain |
| St | street |
| SPP | structural plate pipe |
| SPPA | structural plate pipe arch |
| Str | structure |
| Subd | subdivision |
| Sub | subgrade |
| Sub Prep | subgrade preperation |
| Ss | subsoil |
| SE | superelevation |
| SS | supplement specification |
| Supp | supplemental |
| Surf | surfacing |
| Surv | survey |
| Sym | symmetrical |
| SI | systems international |
| Tan | tangent |
| T | tangent (semi) |
| TS | tangent to spiral |
| Tel | telephone |
| Tel B | Telephone Booth |
| Tel P | telephone pole |
| Tv | television |
| Temp | temperature |
| Temp | temporary |
| TBM | temporary bench mark |
| T | tesla |
| T | thinwall tube sample |
| T/mi | tons per mile |
| Ts | topsoil |
| Twp or T | township |
| Traf | traffic |
| TSCB | traffic signal control box |
| Tr | trail |
| Transf | transformer |
| TB | transit book |
| Trans | transition |
| TT | transmission tower |
| Trans | transverse |
| Trav | traverse |
| TP | traverse point |
| Trtd | treated |
| Trmt | treatment |
| Qc | triaxial compression |
| TERO | tribal employment rights ordinance |
| Tpl | triple |
| TP | turning point |
| Typ | typical |
| Qu | unconfined compressive strength |
| Ugrnd | underground |
| USC&G | US Coast & Geodetic Survey |
| USGS | US Geologic Survey |
| Util | utility |
| VG | valley gutter |
| Vap | vapor |
| Vert | vertical |
| VC | vertical curve |
| VCP | vitrified clay pipe |
| V | volt |
| Vol | volume |
| Wkwy | walkway |
| W | water content |
| WGV | water gate valve |
| WL | water line |
| WM | water main |
| WMV | water main valve |
| W Mtr | water meter |
| WSV | water service valve |
| WW | water well |
| W | watt |
| Wrng | wearing |
| Wb | weber |
| WIM | weigh in motion |
| W | west |
| WB | westbound |
| Wrng | wiring |
| W/ | with |
| W/o | without |
| WC | witness corner |
| WGS | world geodetic system |
| Z | zenith |

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# NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

| | |
|---|---|
| 702COM | 702 Communications |
| ACCENT | Accent Communications |
| AGASSIZ WU | Agassiz Water Users Incorporated |
| AGC | Assiociated General Contractors of America |
| All PI | Alliance Pipeline |
| ALL SEAS WU | All Seasons Water Users Association |
| AMOCO PI | Amoco Pipeline Company |
| AMRDA HESS | Amerada Hess Corporation |
| AT&T | AT&T Corporation |
| B PAW | Bear Paw Energy Incorporated |
| BAKER ELEC | Baker Electric |
| BASIN ELEC | Basin Electric Cooperative Incorporated |
| BEK TEL | Bek Communications Cooperative |
| BELLE PL | Belle Fourche Pipeline Company |
| BLM | Bureau of Land Management |
| BNSF | Burlington Northern Santa Fe Railway |
| BOEING | Boeing |
| BRNS RWD | Barnes Rural Water District |
| BURK-DIV ELEC | Burke-Divide Electric Cooperative |
| BURL WU | Burleigh Water Users |
| Cable One | Cable One |
| CABLE SERV | Cable Services |
| CAP ELEC | Capital Electric Cooperative Incorporat |
| CASS CO ELEC | Cass County Electric Cooperative |
| CASS RWU | Cass Rural Water Users Incorporated |
| CAV ELEC | Cavalier Rural Electric Cooperative |
| CBLCOM | Cablecom Of Fargo |
| CENEX PL | Cenex Pipeline |
| CENT PL WATER DIST | Central Pipe Line Water District |
| CENT PWR ELEC | Central Power Electric Cooperative |
| COE | Corps of Engineers |
| CONS TEL | Consolidated Telephone |
| CONT RES | Continental Resource Inc |
| CPR | Canadian Pacific Railway |
| D O E | Department Of Energy |
| DAK CARR | Dakota Carrier Network |
| DAK CENT TEL | Dakota Central Telephone |
| DAK RWD | Dakota Rural Water District |
| DGC | Dakota Gasification Company |
| DICKEY R NET | Dickey Rural Networks |
| DICKEY RWU | Dickey Rural Water Users Association |
| DICKEY TEL | Dickey Telephone |
| DNRR | Dakota Northern Railroad |
| DOME PL | Dome Pipeline Company |
| DVELEC | Dakota Valley Electric Cooperative |
| DVMW | Dakota, Missouri Valley & Western |
| ENBRDG | Enbridge Pipelines Incorporated |
| ENVENTIS | Enventis Telephone |
| FALK MNG | Falkirk Mining Company |
| FHWA | Federal Highway Administration |
| G FKS-TRL WD | Grand Forks-traill Water District |
| GETTY TRD & TRAN | Getty Trading & Transportation |
| GLDN W ELEC | Golden West Electric Cooperative |
| GRGS CO TEL | Griggs County Telephone |
| GT PLNS NAT GAS | Great Plains Natural Gas Company |
| HALS TEL | Halstad Telephone Company |
| IDEA1 | Idea1 |
| INT-COMM TEL | Inter-Community Telephone Company |
| KANEB PL | Kaneb Pipeline Company |
| KEM ELEC | Kem Electric Cooperative Incorporated |
| KOCH GATH SYS | Koch Gathering Systems Incorporated |
| LKHD PL | Lakehead Pipeline Company |
| LNGDN RWU | Langdon Rural Water Users Incorporated |
| LWR YELL R ELEC | Lower Yellowstone Rural Electric |
| MCKNZ CON | McKenzie Consolidated Telcom |
| MCKNZ ELEC | McKenzie Electric Cooperative |
| MCKNZ WRD | McKenzie County Water Resource District |
| MCLEOD | McLeod USA |
| MCLN ELEC | McLean Electric Cooperative |
| MCLN-SHRDN R WAT | McLean-Sheridan Rural Water |
| MDU | Montana-dakota Utilities |
| MID-CONT CABLE | Mid-Continent Cable |
| MIDSTATE TEL | Midstate Telephone Company |
| MINOT CABLE | Minot Cable Television |
| MINOT TEL | Minot Telephone Company |
| MISS W W S | Missouri West Water System |
| MNKOTA PWR | Minnkota Power |
| MOR-GRAN-SOU ELEC | Mor-gran-sou Electric Cooperative |
| MOUNT-WILLI ELEC | Mountrail-williams Electric Cooperative |
| MRE LBTY TEL | Moore & Liberty Telephone |
| MUNICIPAL | City Water And Sewer |
| MUNICIPAL | City Of '.....' |
| N CENT ELEC | North Central Electric Cooperative |
| N VALL W DIST | North Valley Water District |
| ND PKS & REC | North Dakota Parks And Recreation |
| ND TEL | North Dakota Telephone Company |
| NDDOT | North Dakota Department of Transportation |
| NDSU SOIL SCI DEPT | NDSU Soil Science Department |
| NEMONT TEL | Nemont Telephone |
| NODAK R ELEC | Nodak Rural Electric Cooperative |
| NOON FRMS TEL | Noonan Farmers Telephone Company |
| NPR | Northern Plains Railroad |
| NSP | Northern States Power |
| NTH PRAIR RW | Northern Prairie Rural Water Association |
| NTHN BRDR PL | Northern Border Pipeline |
| NTHN PLNS ELEC | Northern Plains Electric Cooperative Incorporated |
| NTHWSTRN REF | Northwestern Refinery Company |
| NW COMM | Northwest Communication Cooperation |
| ONEOK | Oneok gas |
| OSHA | Occupational Safety and Health Administration |
| OTTR TL PWR | Otter Tail Power Company |
| P L E M | Prairielands Energy Marketing |
| POLAR COM | Polar Communications |
| PVT ELEC | Private Electric |
| QWEST | Qwest Communications |
| R&T W SUPPLY | R & T Water Supply Association |
| RAMSEY R SEW | Ramsey Rural Sewer Association |
| RAMSEY RW | Ramsey Rural Water Association |
| RAMSEY UTIL | Ramsey County Rural Utilities |
| RED RIV TEL | Red River Rural Telephone |
| RESVTN TEL | Reservation Telephone |
| ROBRTS TEL | Roberts Company Telephone |
| R-RIDER ELEC | Roughrider Electric Coop |
| RRVW | Red River Valley & Western Railroad |
| RSR ELEC | R.S.R. Electric Cooperative |
| S E W U | South East Water Users Incorporated |
| SCOTT CABLE | Scott Cable Television Dickinson |
| SHERDN ELEC | Sheridan Electric Cooperative |
| SHEYN VLY ELEC | Sheyenne Valley Electric Cooperative |
| SKYTECH | Skyland Technologies Incorporated |
| SLOPE ELEC | Slope Electric Cooperative Incorporated |
| SOURIS RIV TELCOM | Souris River Telecommunications |
| ST WAT COMM | State Water Commission |
| STATE LN WATER | State Line Water Cooperative |
| STER ENG | Sterling Energy |
| STUT RWU | Stutsman Rural Water Users |
| SW PL PRJ | Southwest Pipeline Project |
| T M C | Turtle Mountain Communications |
| TCI | TCI of North Dakota |
| TESORO HGH PLNS PL | Tesoro High Plains Pipeline |
| TRI-CNTY WU | Tri-County Water Users Incorporated |
| TRL CO RWU | Traill County Rural Water Users |
| UNTD TEL | United Telephone |
| UPPR SOUR WUA | Upper Souris Water Users Association |
| US SPRINT | U.S. Sprint |
| USAF MSL CABLE | U.S.A.F. Missile Cable |
| USFWS | US Fish and Wildlife Service |
| USW COMM | U.S. West Communications |
| VRNDRY ELEC | Verendrye Electric Cooperative |
| W RIV TEL | West River Telephone Incorporated |
| WEB | W. E. B. Water Development Association |
| WILLI RWA | Williams Rural Water Association |
| WILSTN BAS PL | Williston Basin Interstate Pipeline Company |
| WLSH RWD | Walsh Water Rural Water District |
| WOLVRTN TEL | Wolverton Telephone |
| XLENER | Xcel Energy |
| YSVR | Yellowstone Valley Railroad |

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# Line Styles

D-101-20

- Limits of Const Transition Line
- Bale Check
- Rock Check
- Sight Distance Triangle Line
- Small Hidden Object
- Dimension Leader
- Existing Ground
- Existing Topsoil (Cross Section View)
- Large Hidden Object
- Edge Drain
- Geotextile Fabric Type D
- Existing Electrical
- Existing Fiber Optic Line
- Existing TV Fiber Optic
- Existing Gas Pipe
- Geogrid
- Existing Overhead Utility Line
- Existing Power
- Existing Fuel Pipeline
- Existing Undefined Above Ground Pipe Line
- Geotextile Fabric Type R
- Geotextile Fabric Type R1
- Remove Line
- Geotextile Fabric Type RR
- Geotextile Fabric Type S
- Floating Silt Curtain
- Existing Telephone Line
- Existing TV Line
- Existing Assumed Ground (Not Surveyed)
- Tentative Ground Line
- Existing Water or Steam Line
- Existing Under Drain
- Under Drain
- Wall
- Existing Slotted Drain
- Existing Cemetary Boundary
- Centerline Pavement Marking
- Barrier with Centerline Pavement Marking
- Barrier Pavement Marking
- Stripe 4 IN Dotted Extension White
- Stripe 8 IN Dotted Extension White
- Stripe 8 IN Lane Drop
- Wetland Mitigation
- Existing Box Culvert Bridge
- Existing Concrete Surface
- Existing Drainage Structure
- Easement
- Existing Concrete
- Existing Easement
- Existing Gravel Surface
- Existing Aggregate (Cross Section View)
- Existing Curb and Gutter (Cross Section View)
- Existing Riprap
- Existing Underground Vault or Lift Station
- Tangent Line
- Hidden Object
- Existing Dirt Surface
- Existing Conduit
- Topsoil Profile
- Existing Conductor
- Conductor
- Fiber Optic
- Existing Loop Detector
- Subgrade, Subcut or Ditch Grade
- Existing Asphalt Surface
- Existing Asphalt (Cross Section View)
- Existing Reinforcement Rebar
- Existing Tie Point Line
- Existing State or International Line
- Existing Quarter Section Line
- Existing County
- Existing Section Line
- Existing Township
- Existing Railroad Centerline
- Centerline
- Existing Centerline
- Supplemental Contour
- Right of Way
- Existing Right of Way
- Existing Right of Way Railroad
- Failure Line
- Existing Conditions
- Existing Ground (Details)
- Existing Sixteenth Section Line
- Existing Right of Way Not State Owned
- Phantom Object
- Centerline Main
- Existing Guardrail Cable
- Existing Guardrail Metal
- Existing Edge of Water
- Excavation Limits
- Existing Government Lot Line
- Existing Adjacent Block Lines
- Existing Adjacent Lot Lines
- Existing Adjacent Property Line
- Existing Adjacent Subdivision Lines

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# Line Styles

- Subgrade Reinforcement
- Existing Down Guy Wire Down Guy
- Existing Fence
- Existing Railroad
- Existing Sanitary Sewer
- Existing Sanitary Force Main
- Existing Storm Drain
- Existing Storm Drain Force Main
- Fence
- Silt Fence
- Existing Field Line
- Exst Flow
- Flow
- Existing Culvert
- Existing Curb
- Existing Valley Gutter
- Existing Driveway Gutter
- Existing Curb and Gutter
- Existing Mountable Curb and Gutter
- Existing Double Micro Loop Detector
- Micro Loop Detector Double
- Existing Overhead Sign Structure
- Existing Micro Loop Detector
- Micro Loop Detector
- Existing Overhead Sign Structure Cantilever
- Existing Railroad Switch
- Overhead Sign Structure Cantilever
- 24 Inch Pipe
- Reinforced Concrete Pipe
- Signal Head with Mast Arm
- Existing Signal Head with Mast Arm
- Tie Bar at Random Spacing
- 3-Cable w Posts
- Existing 3-Cable w Posts
- Site Boundary
- Fiber Rolls
- Doweled Joint
- Tie Bar 30 Inch 4 Foot Center to Center
- Tie Bar 18 Inch 3 Foot Center to Center
- Existing Berm, Dike, Pit, or Earth Dam
- Existing Ditch Block
- Depression Contours
- Existing City Corporate Limits or Reservation Boundary
- Gravel Pit - Borrow Area
- Existing Tree Boundary
- Tree Row
- Existing Brush or Shrub Boundary
- Existing Retaining Wall
- Existing Planter or Wall
- Retaining Wall (Plan View)
- Sheet Piling
- W-Beam w Posts
- Existing W-Beam Guardrail with Posts
- Exst Wet Area-Vegetation Break
- Existing Wetland Delineated

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|---|---|
| 07-01-14 | |
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# Symbols

D-101-30

North Arrow (Half Scale)

Truck Mounted Attenuator

Type I Barricade

Type II Barricade

Type III Barricade

Catch Basin

Cairn or Stone Circle

Video Detection Camera

Storm Drain Cap or Stub

Corrugated Metal End Section 18 Inch

Corrugated Metal End Section 24 Inch

Corrugated Metal End Section 30 Inch

Corrugated Metal End Section 36 Inch

Corrugated Metal End Section 42 Inch

Corrugated Metal End Section 48 Inch

Concrete Foundation

Ground Connection Conductor

Neutral Connection Conductor

Phase 1 Connection Conductor

Phase 2 Connection Conductor

Traffic Cone

Signal Controller

Pad Mounted Signal Controller

Alignment Data Point

Emergency Vehicle Detector

Attenuation Device

Diamond Grade Delineator Type A

Diamond Grade Delineator Type B

Diamond Grade Delineator Type C

Diamond Grade Delineator Type D

Diamond Grade Delineator Type E

Flexible Delineator

Flexible Delineator Type A

Flexible Delineator Type B

Flexible Delineator Type C

Flexible Delineator Type D

Flexible Delineator Type E

Delineator Type A

Delineator Type A Reset

Delineator Type B

Delineator Type B Reset

Delineator Type C

Delineator Type D

Delineator Type E

Delineator Drums

Spot Elevation

Existing Access Control Arrow

Existing Artifact

Existing Flashing Beacon

Existing Benchmark

Existing Railroad Battery Box

Existing Bush or Shrub

Existing Gas Cap or Stub

Existing Sanitary Cap or Stub

Existing Storm Drain Cap or Stub

Existing Water Cap or Stub

Existing Sanitary Cleanout

Existing Concrete Foundation

Existing Traffic Signal Controller

Existing Pad Mounted Signal Controller

Existing Sixteenth Section Corner

Existing Quarter Section Corner

Existing Section Corner

Existing Railroad Crossbuck

Existing Satellite Dish

Existing Fuel Dispensers

Existing Flexible Delineator Type A

Existing Flexible Delineator Type B

Existing Flexible Delineator Type C

Existing Flexible Delineator Type D

Existing Flexible Delineator Type E

Existing Delineator Type A

Existing Delineator Type B

Existing Delineator Type C

Existing Delineator Type D

Existing Delineator Type E

Existing EFB Misc

Existing Flashing Beacon

Existing Pipe Mounted Flasher

Existing Pad Mounted Feed Point

Existing Pipe Mounted Feed Point with Pad

Existing Pole Mounted Feed Point

Existing Railroad Frog

Existing Snow Gate 18

Existing Snow Gate 28

Existing Snow Gate 40

Existing Headwall

Existing Pedestrian Head with Number

Existing Signal Head

Existing Sprinkler Head

Existing Fire Hydrant

Existing Catch Basin Drop Inlet

Existing Curb Inlet

Existing Manhole Inlet

Existing Junction Box

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# Symbols

D-101-31

- Existing Light Standard
- Existing High Mast Light Standard 10 Luminaire
- Existing High Mast Light Standard 3 Luminaire
- Existing High Mast Light Standard 4 Luminaire
- Existing High Mast Light Standard 5 Luminaire
- Existing High Mast Light Standard 6 Luminaire
- Existing High Mast Light Standard 7 Luminaire
- Existing High Mast Light Standard 8 Luminaire
- Existing High Mast Light Standard 9 Luminaire
- Existing Overhead Sign Structure Load Center
- Existing Luminaire
- Existing Light Standard Luminaire
- Existing Federal Mailbox
- Existing Private Mailbox
- Existing Meander Section Corner
- Existing Meter
- Existing Electrical Manhole
- Existing Gas Manhole
- Existing Sanitary Manhole
- Existing Sanitary Force Main Manhole
- Existing Sanitary Manhole with Valve
- Existing Storm Drain Manhole
- Existing Force Main Storm Drain Manhole
- Existing Force Main Storm Drain Manhole with Valve
- Existing Telephone Manhole
- Existing Manhole with Valve Water
- Existing Water Manhole
- Existing Mile Post Type A
- Existing Mile Post Type B
- Existing Mile Post Type C
- Existing Reference Marker
- Existing RW Marker
- Existing Utility Marker
- Iron Monument Found
- Iron Pin R/W Monument
- Existing Object Marker Type I
- Existing Object Marker Type II
- Existing Object Marker Type III
- Existing Electrical Pedestal
- Existing Telephone Pedestal
- Existing Fiber Optic Telephone Pedestal
- Existing TV Pedestal
- Existing Fiber Optic TV Pedestal
- Existing Fuel Filler Pipes
- Existing Traverse PI Aerial Panel
- Existing Pole
- Existing Power Pole
- Existing Power Pole with Transformer
- Existing Telephone Pole
- Existing Wood Pole
- Existing Post
- Existing Pedestrian Push Button Post
- Existing Control Point CP
- Existing Control Point GPS-RTK
- Existing Control Point TRI
- Existing Reference Marker Point NGS
- Existing Pull Box
- Existing Intelligent Transportation Pull Box
- Existing Water Pump
- Existing Slotted Reinforced Concrete Pipe
- Existing RR Profile Spot
- Existing Fuel Leak Sensors
- Existing Highway Sign
- Existing Miscellaneous Spot
- Existing Lighting Standard Pole
- Existing Traffic Signal Standard
- Existing Transformer
- Existing Large Evergreen Tree
- Existing Small Evergreen Tree
- Existing Large Tree
- Existing Small Tree
- Existing Tree Trunk
- Existing Pad Mounted Traffic Signal Control Box
- Existing Undefined Manhole
- Existing Undefined Pull Box
- Existing Undefined Pedestal
- Existing Undefined Valve
- Existing Undefined Pipe Vent
- Existing Gas Valve
- Existing Water Valve
- Existing Fuel Pipe Vent
- Existing Gas Pipe Vent
- Existing Sanitary Pipe Vent
- Existing Storm Drain Pipe Vent
- Existing Water Pipe Vent
- Existing Weather Station
- Existing Ground Water Well Bore Hole
- Existing Windmill or Tower
- Existing Witness Corner
- Flashing Beacon
- Flagger
- Pipe Mounted Flasher
- Sanitary Force Main with Valve

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| 07-01-14 | |
| REVISIONS | |
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# Symbols

D-101-32

- Pad Mounted Feed Point
- Pipe Mounted Feed Point with Pad
- Pole Mounted Feed Point
- Headwall
- Double Headwall with Vegitation Barrier
- Single Headwall with Vegitation Barrier
- Pole Mounted Head
- Sprinkler Head
- Fire Hydrant
- Inlet Type 1
- Inlet Type 2
- Double Inlet Type 2
- Inlet Grate Type 2
- Junction Box
- High Mast Light Standard 10 Luminaire
- High Mast Light Standard 3 Luminaire
- High Mast Light Standard 4 Luminaire
- High Mast Light Standard 5 Luminaire
- High Mast Light Standard 6 Luminaire
- High Mast Light Standard 7 Luminaire
- High Mast Light Standard 8 Luminaire
- High Mast Light Standard 9 Luminaire
- Relocate Light Standard
- Overhead Sign Structure Load Center
- Light Standard 100 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 150 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 175 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 200 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 250 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 310 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 35 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 400 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 50 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 70 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 700 Watt High Pressure Sodium Vapor Luminaire
- Manhole
- Manhole 48 Inch
- Sanitary Force Main Manhole
- Sanitary Sewer Manhole
- Storm Drain Manhole
- Storm Drain Manhole with Inlet
- Reset Mile Post
- Mile Post Type A
- Mile Post Type B
- Mile Post Type C
- Right of Way Marker
- Tubular Marker
- Alignment Monument
- Iron Pin Reference Monument
- Object Marker Type I
- Object Marker Type II
- Object Marker Type III
- Caution Mode Arrow Panel
- Back to Back Vertical Panel Sign
- Double Direction Arrow Panel
- Left Directional Arrow Panel
- Right Directional Arrow Panel
- Sequencing Arrow Panel
- Truck Mounted Arrow Panel
- Power Pole
- Wood Pole
- Pedestrian Push Button Post
- Property Corner
- Pull Box
- Intelligent Transportation Pull Box
- Sanitary Pump
- Storm Drain Pump
- Reinforced Pavement
- Reinforced Concrete End Section 15 Inch
- Reinforced Concrete End Section 18 Inch
- Reinforced Concrete End Section 24 Inch
- Reinforced Concrete End Section 30 Inch
- Reinforced Concrete End Section 36 Inch
- Reinforced Concrete End Section 42 Inch
- Reinforced Concrete End Section 48 Inch
- Reinforced Concrete End Section 54 Inch
- Reset Right of Way Marker
- Reset USGS Marker
- Right of Way Markers
- Riser 30 Inch
- Continuous Split Barrel Sample (CSB)
- Flight Auger Sample (FA)
- Split Barrel Sample (SB)
- Thinwall Tube Sample
- Highway Sign
- SNOW GATE 18 FT
- SNOW GATE 28 FT
- SNOW GATE 40 FT
- Standard Penetration Test (N)
- Transformer
- Inclinometer Tube (Incl)
- Underdrain Cleanout
- Excavation Unit
- Water Valve

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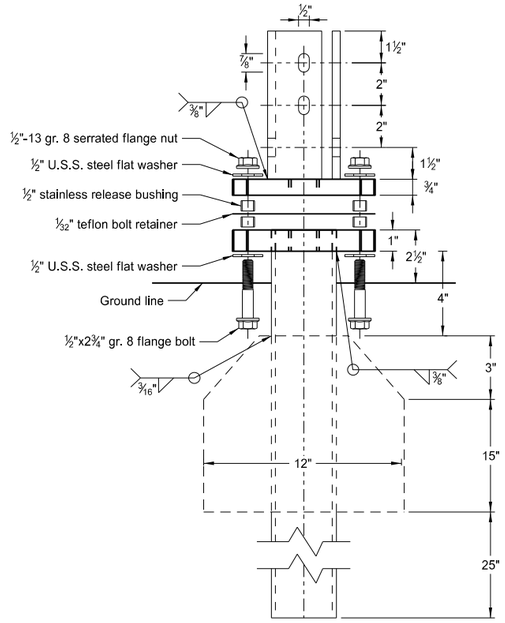
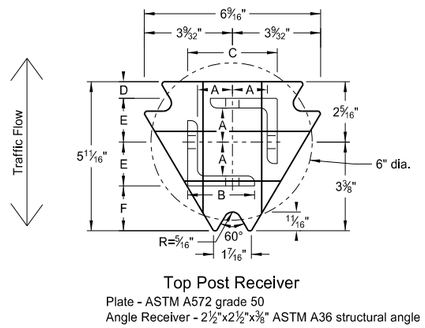
# BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-7

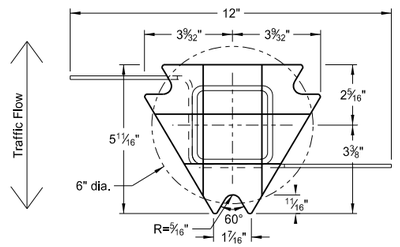



Multi-Directional
Slip Base Assembly

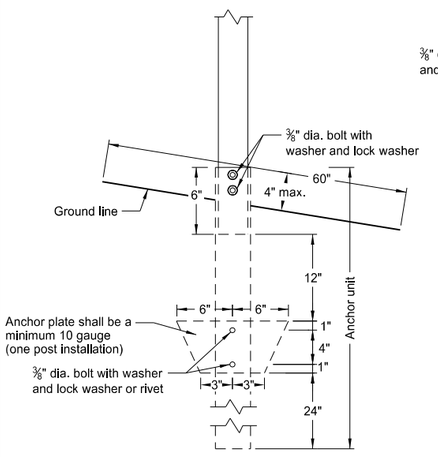
## Perforated Tube



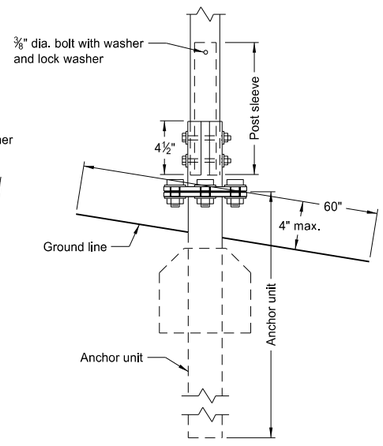

Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2½"x2½"x⅜" ASTM A36 structural angle



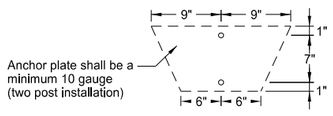

Bottom Soil Stub
Tube - 3"x3"x7 gauge ASTM A500 grade B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A1011
Plate - ASTM A572 grade 50

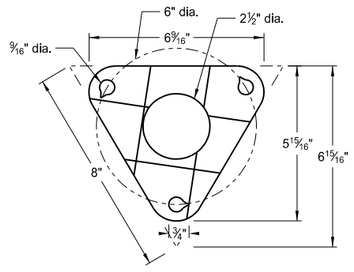



Anchor Unit and Post Assembly




Multi-Directional
Slip Base Anchor Unit
and Post Sleeve Assembly




Bolt Retainer for Base Connection
Bolt Retainer- 1/32" Reprocessed Teflon

Notes:

1. Slip base bolts shall be torqued as specified by the manufacturer.
2. Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI.
3. The 4" vertical clearance is required for the anchor or breakaway base. The 4"x60" measurement shall be made above and below post location and also back and ahead of the post.
4. When used in concrete sidewalk, anchor shall be same except without the wings.
5. Four post signs shall have over 7' between the first and the fourth posts.

| Telescoping Perforated Tube | | | | | | |
|---|---|---|---|---|---|---|
| Number of Posts | Post Size in. | Wall Thick-ness Gauge | Sleeve Size in. | Wall Thick-ness Gauge | Slip Base | Anchor Size without Slip Base in. |
| 1 | 2 | 12 | | | No | 2¼ |
| 1 | 2¼ | 12 | | | No | 2½ |
| 1 | 2½ | 12 | | | (A) | 3 |
| 1 | 2½ | 10 | | | Yes | |
| 1 | 2¼ | 12 | 2 | 12 | Yes | |
| 1 | 2½ | 12 | 2¼ | 12 | Yes | |
| 2 | 2 | 12 | | | No | 2¼ |
| 2 | 2¼ | 12 | | | No | 2½ |
| 2 | 2½ | 12 | | | Yes | |
| 2 | 2½ | 12 | | | Yes | |
| 2 | 2¼ | 10 | 2 | 12 | Yes | |
| 2 | 2½ | 12 | 2¼ | 12 | Yes | |
| 3 & 4 | 2½ | 12 | | | Yes | |
| 3 & 4 | 2½ | 10 | | | Yes | |
| 3 & 4 | 2½ | 12 | 2¼ | 12 | Yes | |
| 3 & 4 | 2¼ | 12 | 2 | 12 | Yes | |
| 3 & 4 | 2½ | 10 | 2 3/16 | 10 | Yes | |

| Properties of Telescoping Perforated Tube | | | | | | |
|---|---|---|---|---|---|---|
| Tube Size in. | Wall Thickness in. | U.S. Standard Gauge | Weight per Foot lbs. | Moment of Inertia $in.^4$ | Cross Sec. Area $in.^2$ | Section Modulus $in.^3$ |
| 1½ x 1½ | 0.105 | 12 | 1.702 | 0.129 | 0.380 | 0.172 |
| 2 x 2 | 0.105 | 12 | 2.416 | 0.372 | 0.590 | 0.372 |
| 2¼ x 2¼ | 0.105 | 12 | 2.773 | 0.561 | 0.695 | 0.499 |
| 2 3/16 x 2 3/16 | 0.135 | 10 | 3.432 | 0.605 | 0.841 | 0.590 |
| 2½ x 2½ | 0.105 | 12 | 3.141 | 0.804 | 0.803 | 0.643 |
| 2½ x 2½ | 0.135 | 10 | 4.006 | 0.979 | 1.010 | 0.785 |

| Top Post Receiver Data Table | | | | | | |
|---|---|---|---|---|---|---|
| Square Post Sizes (B) | A | B | C | D | E | F |
| 2 3/16"x10 ga. | 1 9/64" | 2½" | 3 1/32" | 25/32" | 1 33/64" | 1⅞" |
| 2½"x10 ga. | 1 9/32" | 2½" | 3 5/16" | ⅝" | 1 21/32" | 1¾" |

(A) The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak.

(B) The 2 3/16"x10 ga. may be inserted into 2½"x10 ga. for additional wind load.

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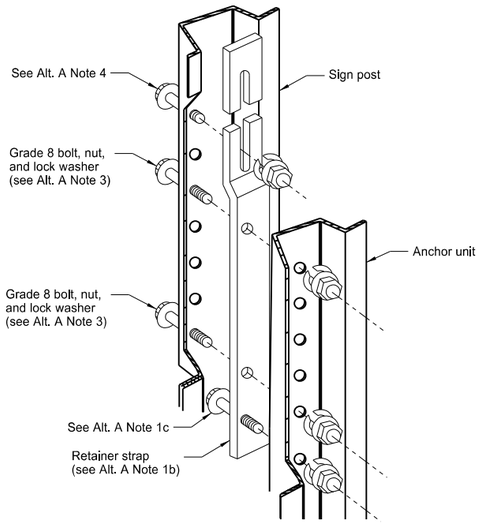
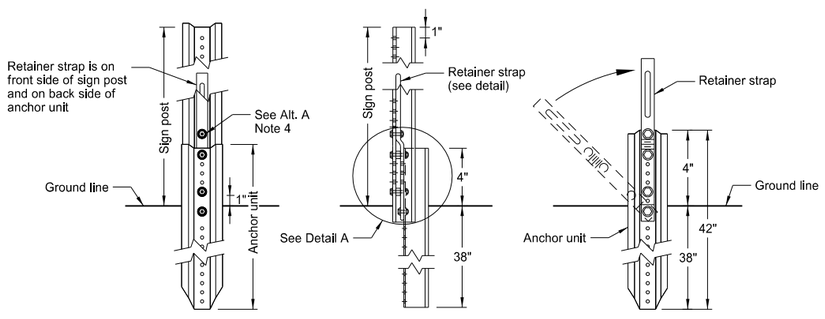
# BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

## U-Channel Post



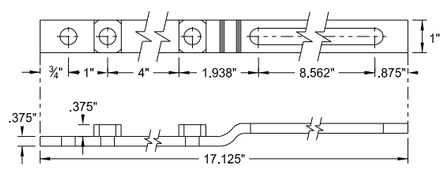

Detail A



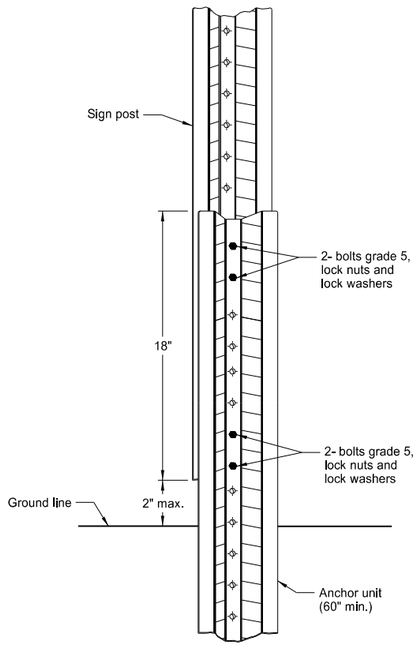

Front View Side View Back View

Breakaway U-Channel Detail
Alternate A

A maximum of 2 posts shall be installed within 7'.

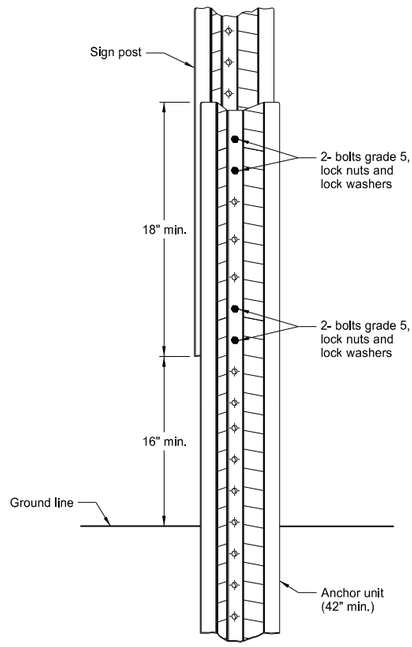



Retainer Strap Detail




Breakaway U-Channel Splice Detail
Alternate B
(2.5 and 3 lb/ft)

A maximum of 3 posts shall be installed within 7'.




Breakaway U-Channel Splice Detail
Alternate C
(2.5 and 3 lb/ft)

A maximum of 3 posts shall be installed within 7'.

Alternate A Steps of Installation:

1. a) Drive anchor unit to within 12" of ground level.
   b) Proper assembly established by lining up the bottom hole of retainer strap with the 6th hole from the top of the anchor unit.
   c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
   d) Rotate strap 90° to left.
2. a) Drive anchor unit to 4" above ground.
   b) Rotate strap to vertical position.
3. a) Place 5/16"x2" bolt, lock washer and nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit.
   b) Alternately tighten two connector bolts.
4. Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
5. The base post, strap and sign post shall be properly nested. Proper nesting occurs when all flat surfaces of the base post, strap, and sign post at the bolts have full contact across the entire width.

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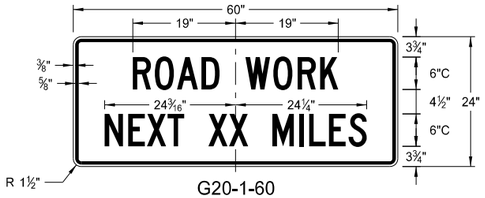
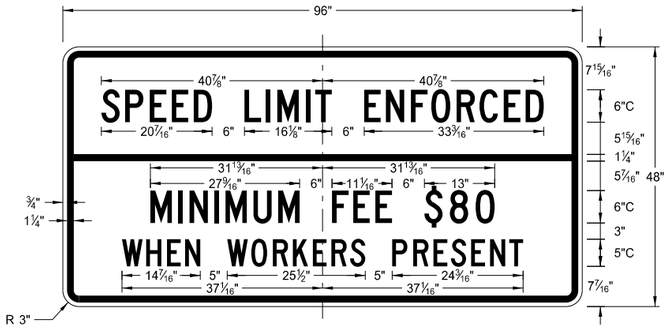
# CONSTRUCTION SIGN DETAILS
# TERMINAL AND GUIDE SIGNS




G20-1-60
Legend: black (non-refl)
Background: orange


G20-4b-36
Legend: black (non-refl)
Background; orange




G20-55-96
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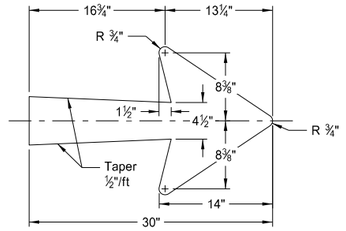
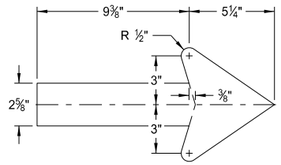
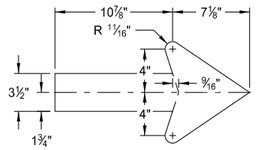
Background: orange



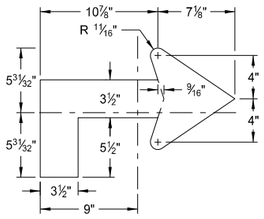

E5-1-48



G20-50a-72
G20-52a-72



M4-9(L or R)-30
Right or Left



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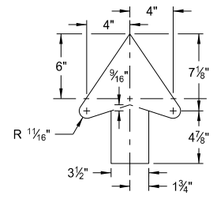
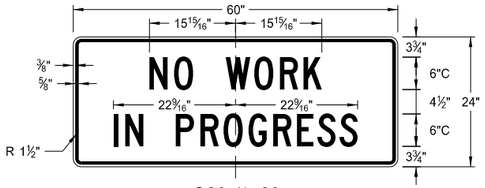
Advanced Right or Left



M4-9-30
Straight

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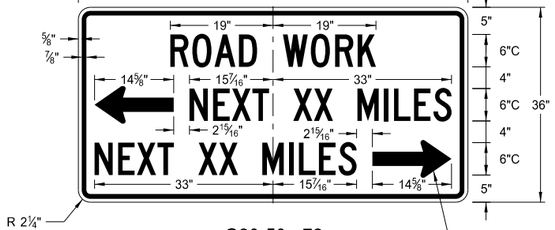
Background: orange

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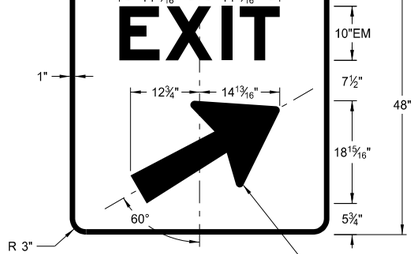
Background: orange




E5-1(L or R)-48
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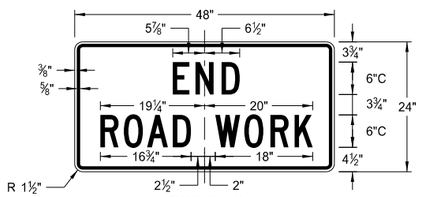
Background: green




G20-2-48
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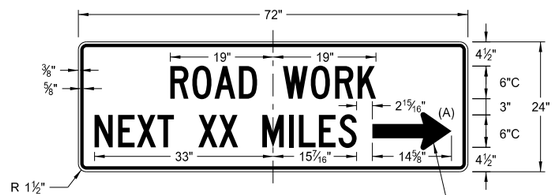
Background: orange

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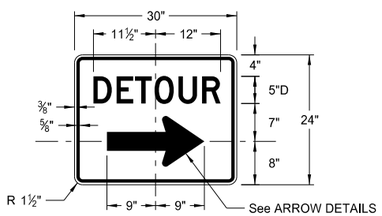
Background: orange




M4-9(L or R)-30 &
M4-9-30
Legend: black (non-refl)
Background: orange

## ARROW DETAILS

NOTES:

(A) Arrow may be right or left of the legend to indicate construction to the right or left.

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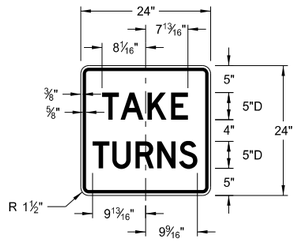
# CONSTRUCTION SIGN DETAILS
## REGULATORY SIGNS

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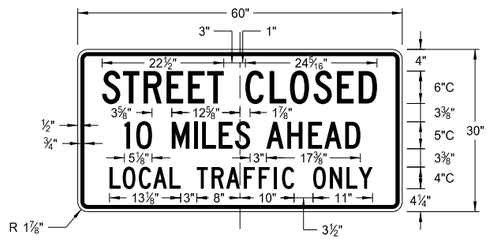


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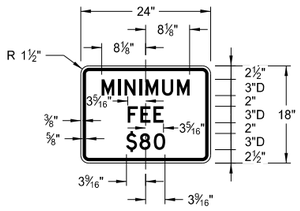


R2-1a-24
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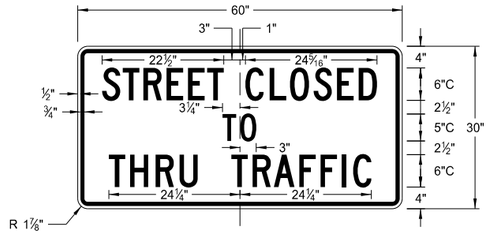


R11-4a-60
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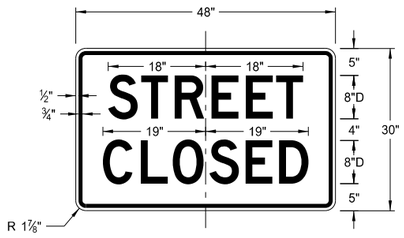


R11-2a-48
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Background: white

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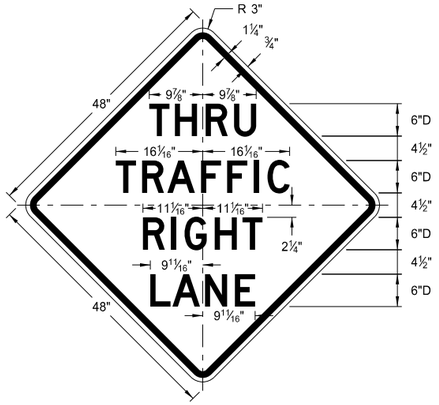
# CONSTRUCTION SIGN DETAILS
## WARNING SIGNS




W5-8-48
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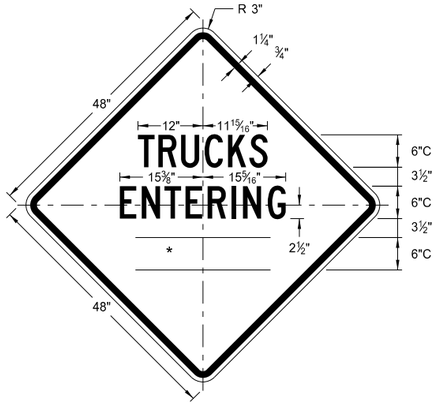
Background: orange

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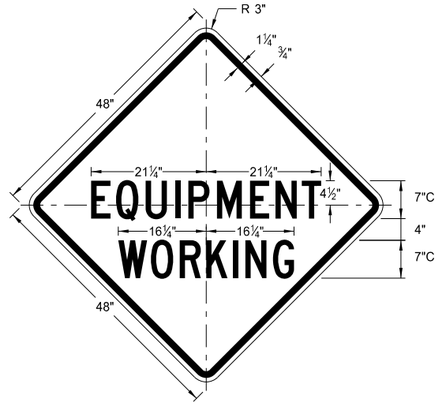


W20-51-48
Legend: black (non-refl)
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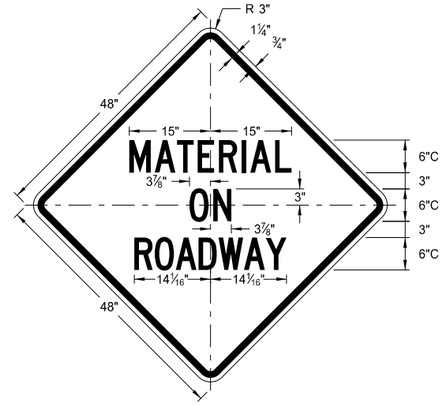
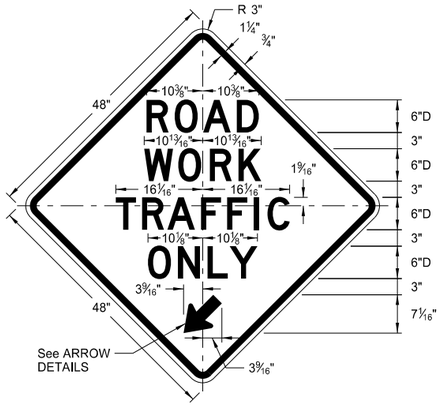



W21-51-48
Legend: black (non-refl)
Background: orange

| WORD | LETTER SPACING |
|---|---|
| AHEAD | Standard |
| 200 FT | Standard |
| 350 FT | Standard |
| 500 FT | Standard |
| 1000 FT | Reduce 40% |
| 1500 FT | Reduce 40% |
| ½ MILE | Reduce 50% |
| 1 MILE | Standard |

* DISTANCE MESSAGES

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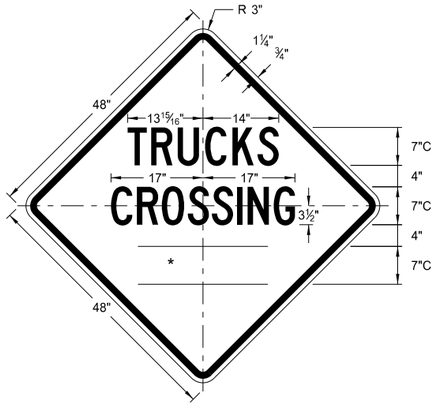
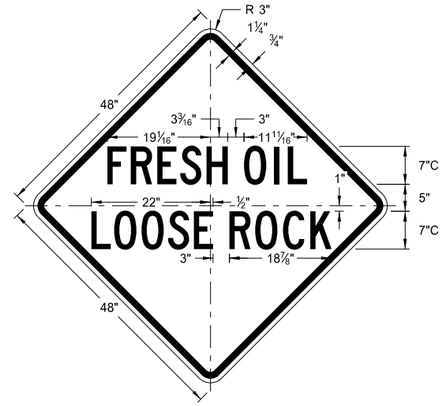
Background: orange




W8-55-48
Legend: black (non-refl)
Background: orange




W20-52-54
Legend: black (non-refl)
Background: orange

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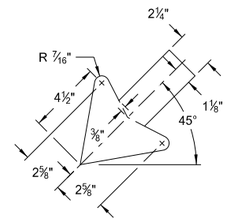
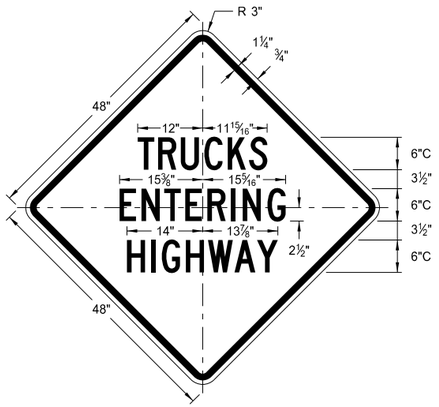



W5-9-48

ARROW DETAILS

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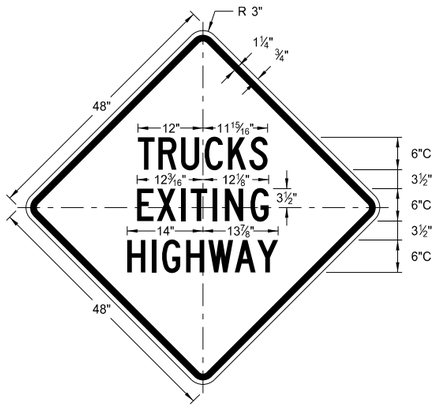


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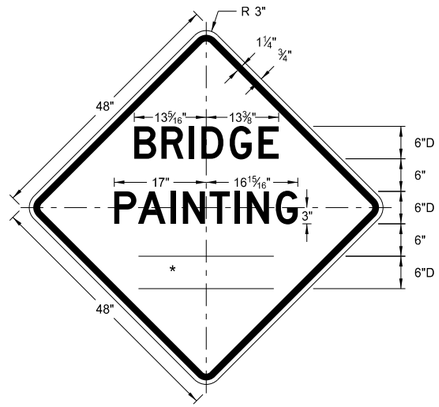
Legend: black (non-refl)
Background: orange




W21-50-48
Legend: black (non-refl)
Background: orange

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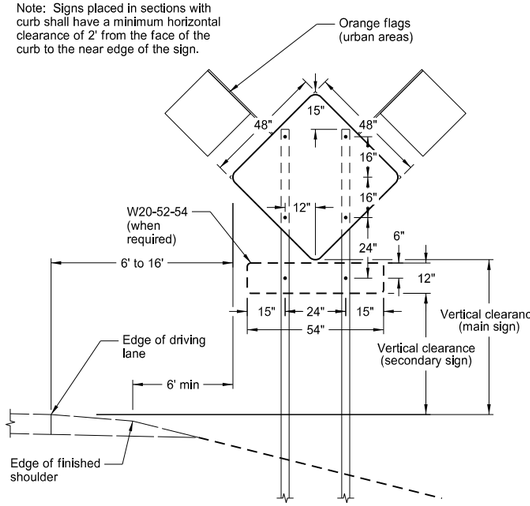
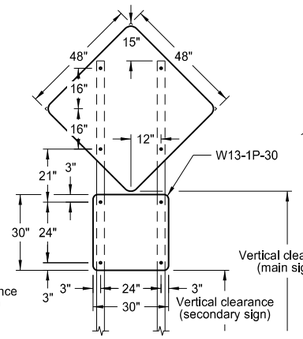
# CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

D-704-14

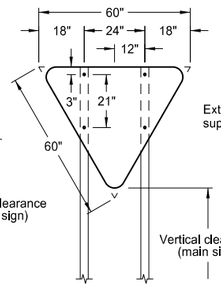
Note: Signs placed in sections with curb shall have a minimum horizontal clearance of 2' from the face of the curb to the near edge of the sign.



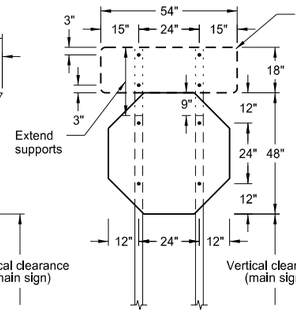

TYPICAL SECTION
(48" x 48" diamond warning sign shown)



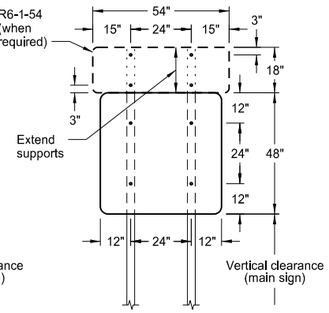

48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



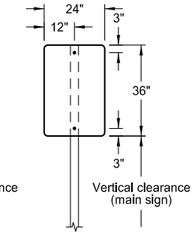

R1-2-60 - YIELD SIGN



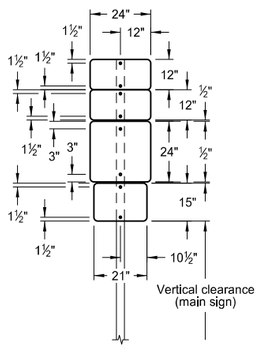

R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



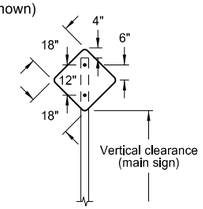

48" x 48" SIGN
(with R6-1-54 sign as required)



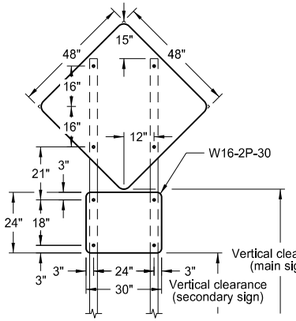

24" x 36" SIGN



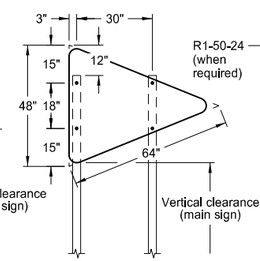

24" x 24"
ROUTE MARKER
ASSEMBLY



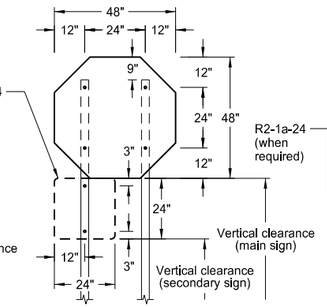

18" x 18"
DIAMOND SIGN



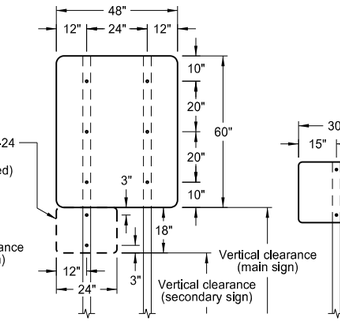

48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



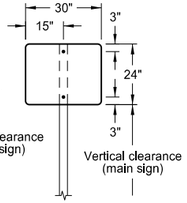

W14-3-64 - PENNANT SIGN



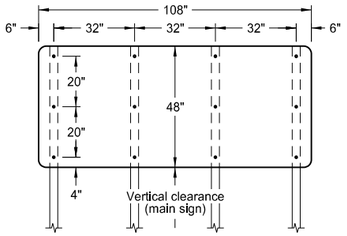

R1-1-48 - STOP SIGN
(with R1-50-24 sign as required)



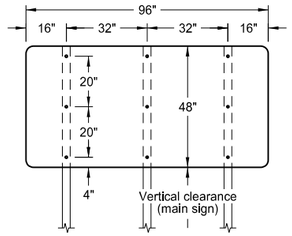

48" x 48" SIGN
(with R2-1a-24 sign as required)



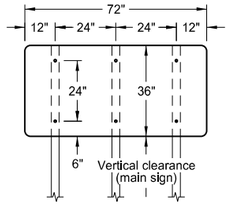

30" x 24" SIGN



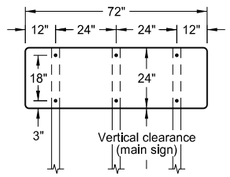

108" x 48" SIGN



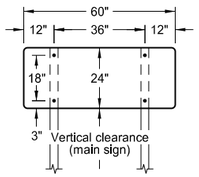

96" x 48" SIGN



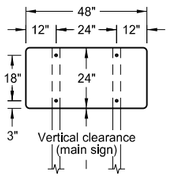

72" x 36" SIGN



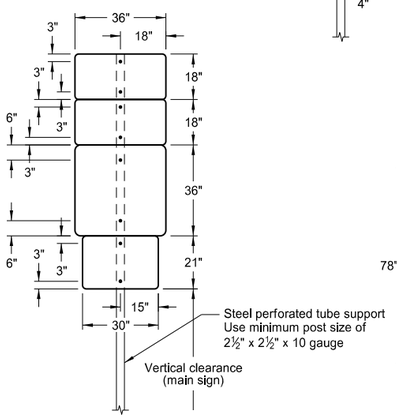

72" x 24" SIGN



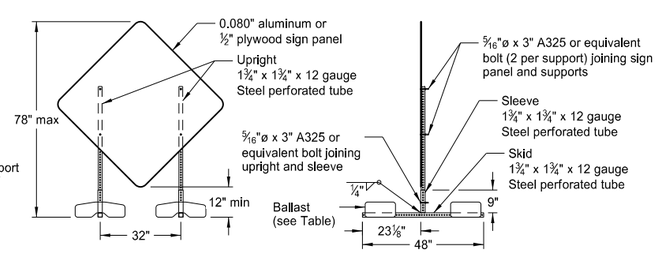

60" x 24" SIGN



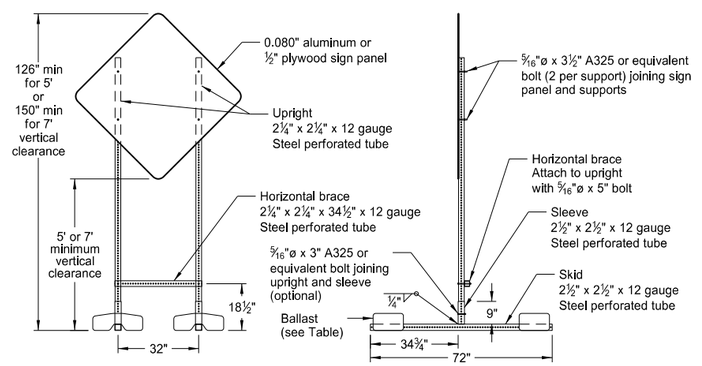

48" x 24" SIGN




36" x 36"
ROUTE MARKER
ASSEMBLY




PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT




PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

1. Sign Supports: Supports shall be galvanized or painted. Minimum post sizes are 2.5 lb/ft u-channel or 2" x 2" x 12 gauge steel perforated tube, except where noted. When installing signs on u-channel, the minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes are based on a wind speed of 55 MPH.

   Signs over 50 square feet should be installed on 2½" x 2½" perforated tube supports as a minimum.

   Guy wires shall not be attached to sign supports. Wind beams may be attached to u-posts behind the sign panels.

2. Sign Panels: Provide sign panels made of 0.100" aluminum, ½" plywood, or other approved material, except where noted. All holes to be punched round for ⅜" bolts.

3. Alternate Messages: The signs that have alternate messages may have these alternate messages placed on a reflectorized plate (without a border) and installed and removed as required. (i.e. "Left" and "Right" message on a lane closure sign)

4. Route Marker Auxiliary Signs: Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:

   Interstate - white legend on blue background
   Interstate Business Loop - white legend on green background
   US and State - black legend on white background
   County - yellow legend on blue background

5. Vertical Clearance: Install signs with a vertical clearance of 5'-0" (see TYPICAL SECTION.) In areas where parking or pedestrian movements are likely or the view of the sign may be obstructed, install signs with a vertical clearance of 7'-0" from the top of the curb or from the near edge of the driving lane in absence of a curb.

   The vertical clearance to secondary signs is 1'-0" less than the vertical clearance as stated above.

   Large signs having an area exceeding 50 square feet shall have a minimum clearance of 7'-0" from the ground at the post.

6. Portable Signs: Provide portable signs that meet the vertical clearance as stated above. Use portable signs when it is necessary to place signs within the pavement surface.

   When portable signs are used for 5 days or less, low-mounting height (minimum 12" vertical clearance) sign supports may be used as long as the view of the sign is not obstructed. Time delays caused by unforseen circumstances, such as equipment breakdown, rain, subgrade failures, etc., will not accrue towards the 5 day period. The R9-8 through R9-11a series, W1-6 through W1-8 series, M4-10, and E5-1 may be used for longer than 5 days.

   Signs mounted to the portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT Details shall have a maximum surface area of 16 square feet.

MINIMUM BALLAST
(For each side of sign support base)

| Sign Panel Mounting Height (ft) | Number of 25 lb sandbags for 4' x 4' sign panel |
|---|---|
| 1' | 6 |
| 5' | 8 |
| 7' | 10 |

Note: The number of sandbags are based on a wind speed of 55 MPH. The sandbags are assumed to be placed at or near the ends of the skids.

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| 11-14-13 | Revised Note 6. |

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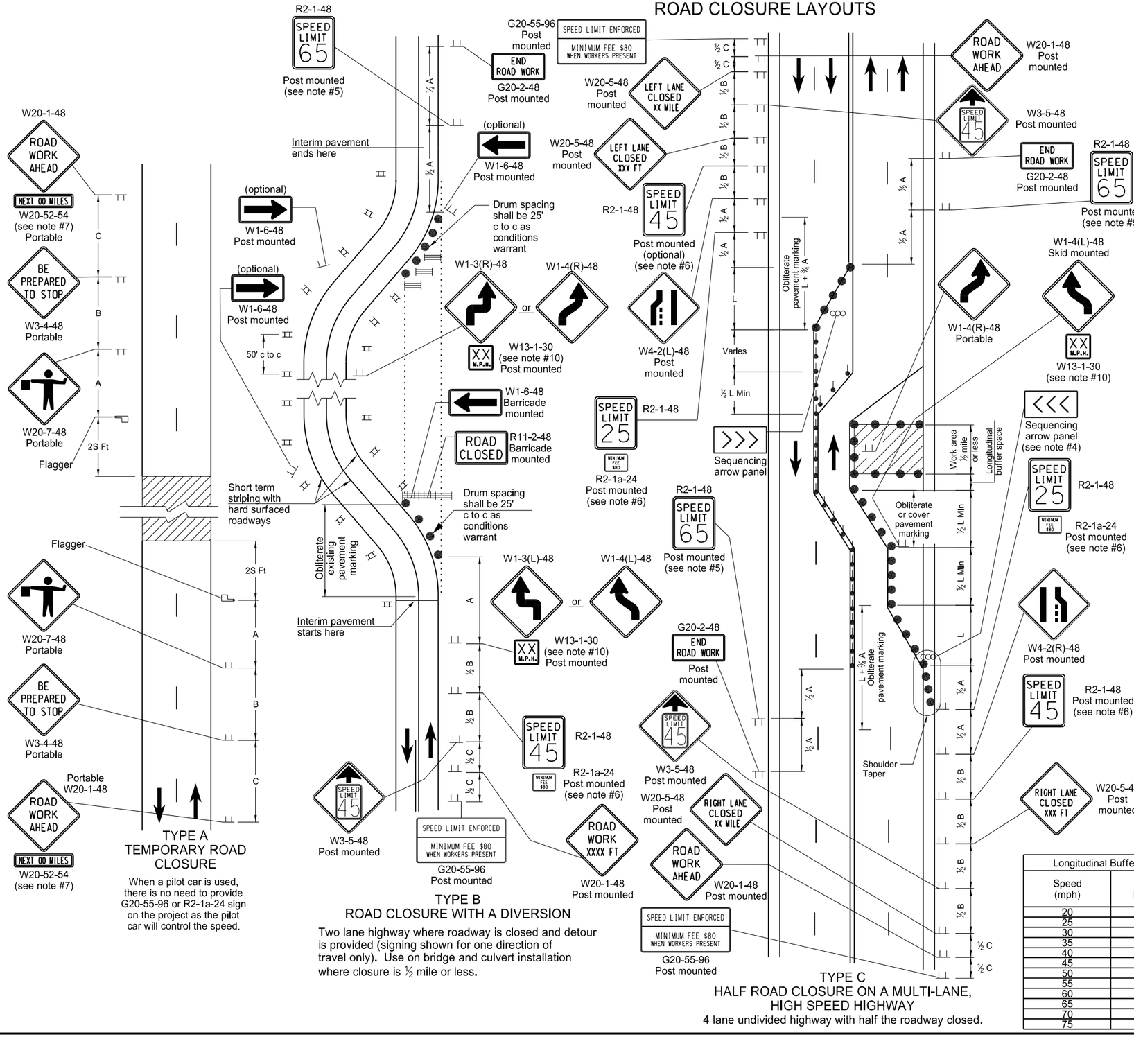
# ROAD CLOSURE LAYOUTS

D-704-15




Notes

1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of taper.
   L = Minimum length of taper, or S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater, or W x $S^2/60$ for urban, residential, and other streets with speeds of 40 mph or less.
2. Barricades placed on roadway shall be on a moveable assembly. Signs placed on roadway shall be placed on skid mounted assemblies.
3. Delineator drums, barricades or cones used for tapering traffic shall be spaced at the dimension "S". Delineator drums or cones used for tangents shall be spaced at 2 times dimension "S".
4. Sequencing Arrow Panels
   Panels should normally be placed at the beginning of the taper. Where shoulder width does not provide sufficient room, the panel should be moved closer to the work area so that it can be placed on the roadway surface. See Shoulder Closure Standard Drawing.
   Type A shall be used on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
   Type B shall be used on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
   Type C shall be used on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
5. The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
6. The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at ½ B.
7. Use when work area is 1 mile or longer.
8. When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
9. Existing speed limit signs within a reduced speed zone shall be covered.
10. Where necessary, safe speed to be determined by the Engineer.
11. The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
12. G20-55-96 sign is not required if this standard is part of other traffic control layouts, or the work is less than 15 days.

| ADVANCE WARNING SIGN SPACING | | | |
|---|---|---|---|
| Road Type | Distance Between Signs Min. (ft) | | |
| | A | B | C |
| Urban - Low Speed (30 mph or less) | 150 | 150 | 150 |
| Urban - Low Speed (over 30 to 40 mph) | 280 | 280 | 280 |
| Urban - High Speed (over 40 mph to 50 mph) | 360 | 360 | 360 |
| Rural - High Speed (over 50 mph to 65 mph) | 720 | 720 | 720 |
| Urban Expressway and Freeway (55 mph to 60 mph) | 850 | 1350 | 2200 |
| Rural Expressway and Freeway (70 mph to 75 mph) | 1000 | 1500 | 2640 |
| Interstate/4-Lane Divided (Maintenance and Surveying) | 750 | 1000 | 1500 |

KEY

- Type III barricade
- Sign
- Delineator drum
- Tubular markers
- Work area
- Flagger
- Sequencing arrow panel
- Vertical panels back to back

| Longitudinal Buffer Space | |
|---|---|
| Speed (mph) | Length Min (feet) |
| 20 | 115 |
| 25 | 155 |
| 30 | 200 |
| 35 | 250 |
| 40 | 305 |
| 45 | 360 |
| 50 | 425 |
| 55 | 495 |
| 60 | 570 |
| 65 | 645 |
| 70 | 730 |
| 75 | 820 |

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

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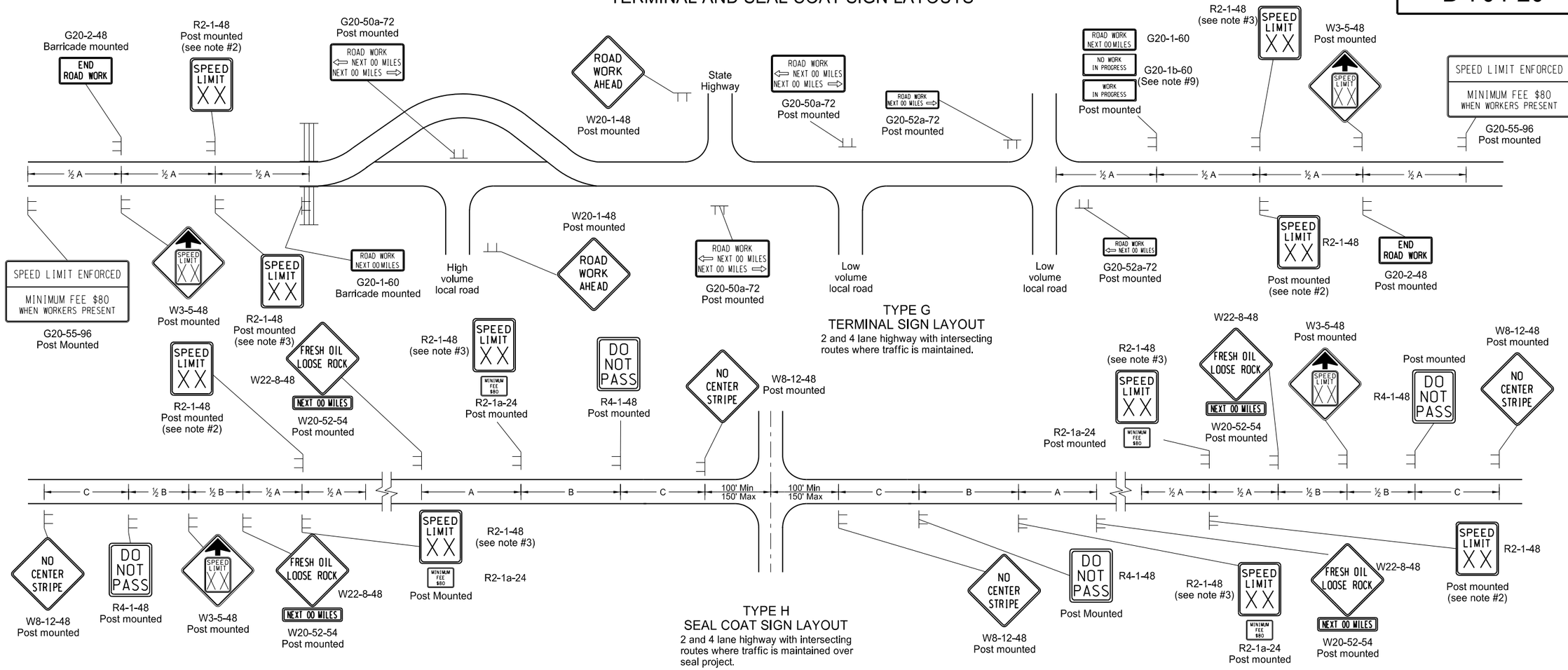
# TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20




1. Barricades placed on roadway shall be on a moveable assembly. Signs placed on the roadway shall be placed on skid mounted assemblies.
2. The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
3. The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 MPH below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 MPH. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at ½ B.
4. When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
5. Existing speed limit signs within a reduced speed zone shall be covered.
6. On seal projects, signs R2-1-48, R2-1a-24, R4-1-48, W22-8-48 and W20-52-54 shall be placed just after all important intersections and at five mile intervals thereafter. Sign W8-12-48 shall be placed just after all important intersections and at 2 mile intervals thereafter until the short term center line pavement marking is in place. No short term pavement markings are placed when traffic volumes are 750 ADT or less.
7. The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
8. Type H construction sign traffic control shall have the speed limit signs covered or removed once the loose aggregate has been removed.
9. The contractor shall install the G20-1b-60 sign when work is suspended for winter.
10. Other traffic control layouts will be required in the immediate work areas. If the speed limit is reduced in the work area, speed limit signs shall have the R2-1a-24 sign placed below.
11. G20-55-96 sign is not required if work is less than 15 days.

| ADVANCE WARNING SIGN SPACING | | | |
|---|---|---|---|
| Road Type | Distance Between Signs Min. (ft) | | |
| | A | B | C |
| Urban - Low Speed (30 mph or less) | 150 | 150 | 150 |
| Urban - Low Speed (over 30 to 40 mph) | 280 | 280 | 280 |
| Urban - High Speed (over 40 mph to 50 mph) | 360 | 360 | 360 |
| Rural - High Speed (over 50 mph to 65 mph) | 720 | 720 | 720 |
| Urban Expressway and Freeway (55 mph to 60 mph) | 850 | 1350 | 2200 |
| Rural Expressway and Freeway (70 mph to 75 mph) | 1000 | 1500 | 2640 |
| Interstate/4-Lane Divided (Maintenance and Surveying) | 750 | 1000 | 1500 |

KEY

Type III barricade

Sign

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|---|
| 9-27-13 | |
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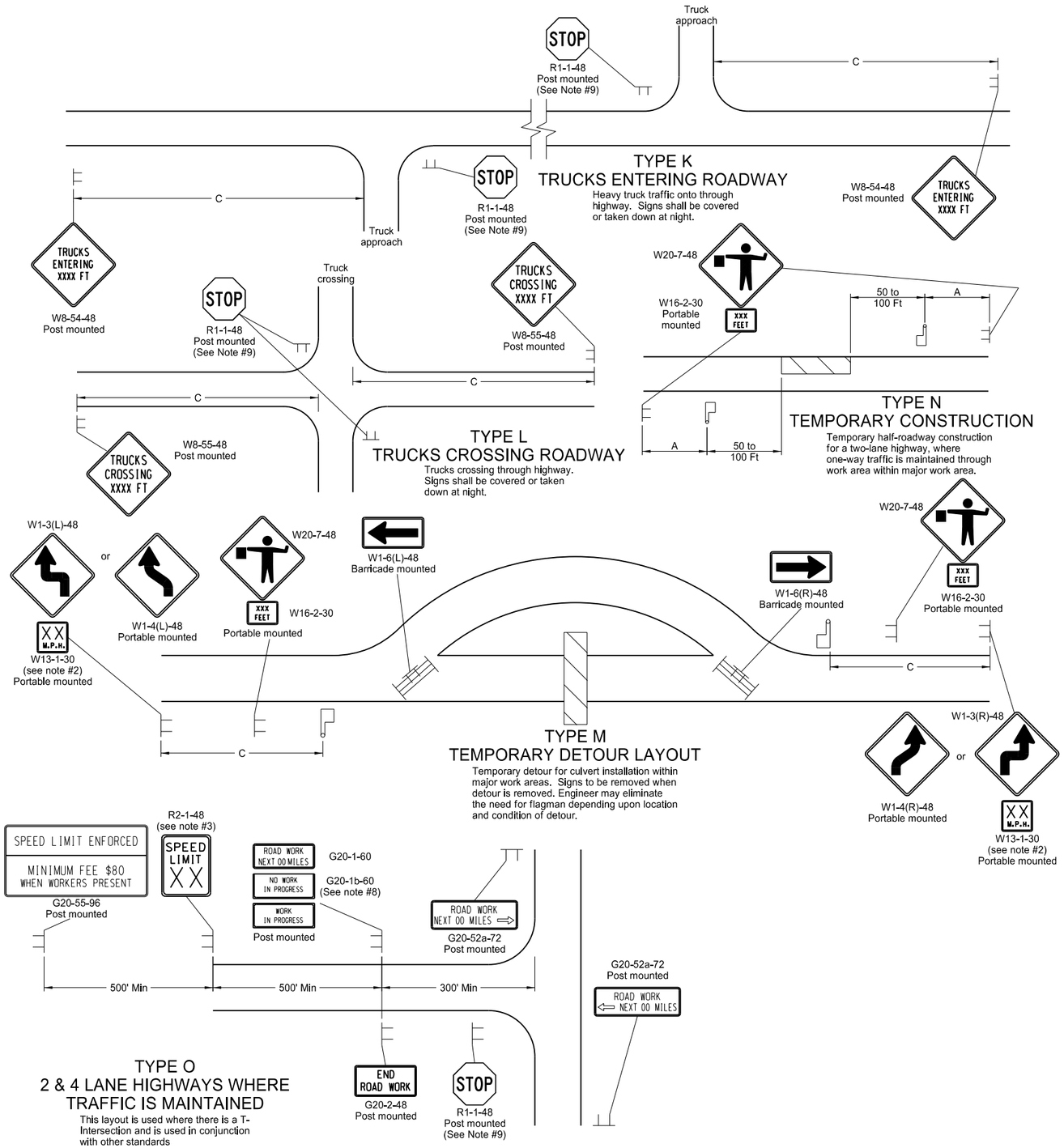
# CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

D-704-22




Notes

1. Barricades placed on roadway shall be on a moveable assembly. Signs placed on the roadway shall be placed on skid mounted assemblies.
2. Where necessary, safe speed to be determined by the Engineer.
3. The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at ½ B.
4. When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
5. Existing speed limit signs within a reduced speed zone shall be covered.
6. Obliterated or covered pavement marking shall be paid for as Obliteration of Pavement Marking. The covering shall be approved by the engineer.
7. The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
8. The contractor shall install the G20-1b-60 sign when work is suspended for winter.
9. If existing stop sign is in place, a 48" stop sign is not required.
10. G20-55-96 sign is not required if this standard is part of other traffic control layouts with this sign or the work is less than 15 days.

KEY

Type III barricade — Work area

Sign — Flagger

| ADVANCE WARNING SIGN SPACING | | | |
|---|---|---|---|
| Road Type | Distance Between Signs Min. (ft) | | |
| | A | B | C |
| Urban - Low Speed (30 mph or less) | 150 | 150 | 150 |
| Urban - Low Speed (over 30 to 40mph) | 280 | 280 | 280 |
| Urban - High Speed (over 40 mph to 50 mph) | 360 | 360 | 360 |
| Rural - High Speed (over 50 mph to 65 mph) | 720 | 720 | 720 |
| Urban Expressway and Freeway (55 mph to 60 mph) | 850 | 1350 | 2200 |
| Rural Expressway and Freeway (70 mph to 75 mph) | 1000 | 1500 | 2640 |
| Interstate/4-Lane Divided (Maintenance and Surveying) | 750 | 1000 | 1500 |

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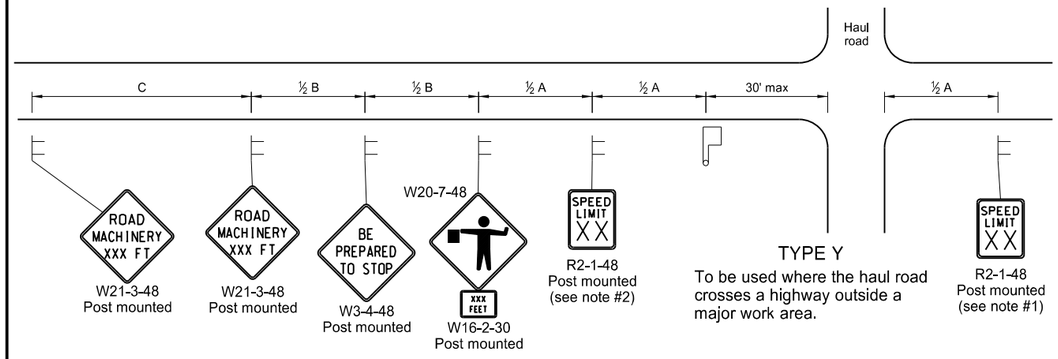
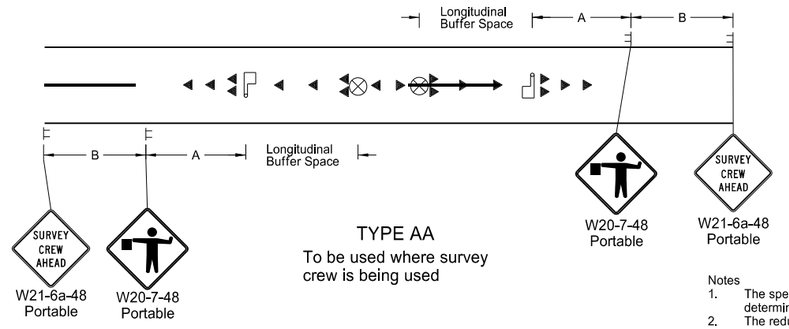
# MISCELLANEOUS SIGN LAYOUTS

D-704-26



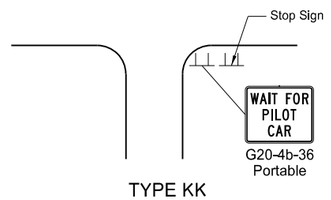

## TYPE Y

To be used where the haul road crosses a highway outside a major work area.




## TYPE AA

To be used where survey crew is being used

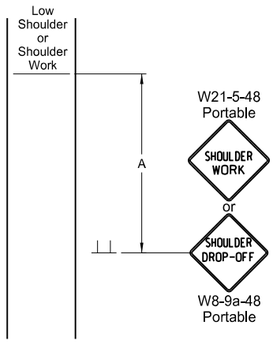



## TYPE KK

To be used at major intersections within pilot car control area

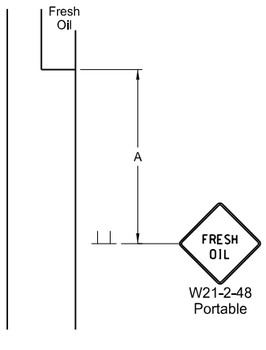
Notes

1. The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
2. The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at ½ B.
3. When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
4. Existing speed limit signs within a reduced speed zone shall be covered.
5. The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
6. G20-55-96 signs are not required if this standard is part of other traffic control layouts, or the work is less than 15 days.
7. When a pilot car operation is used, place a G20-4b-36 "Wait For Pilot Car" sign at major intersections within pilot car control area.



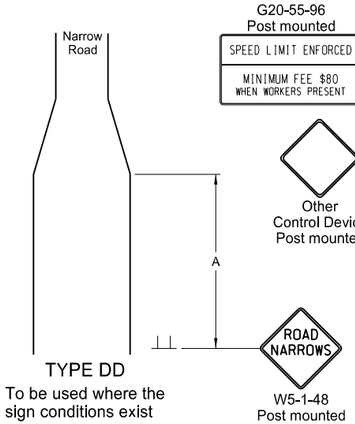

## TYPE BB

To be used within a major work area where the sign conditions exist



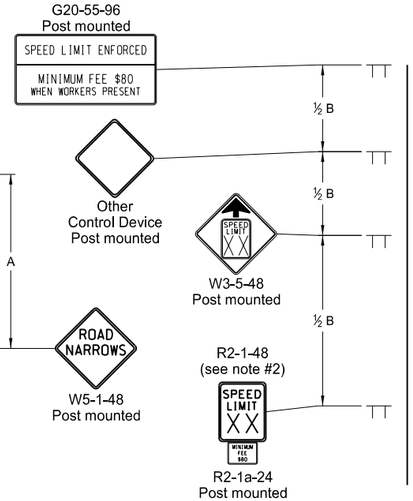

## TYPE CC

To be used where the sign conditions exist



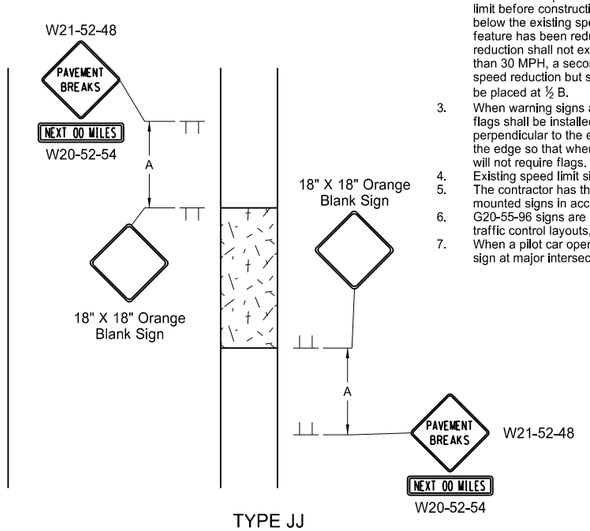

## TYPE DD

To be used where the sign conditions exist




## TYPE Z

To be used where speed zone is needed

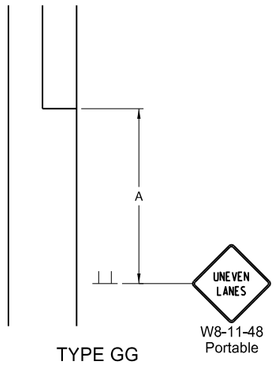



## TYPE JJ

To be used where there is a break in the pavement. These signs may be skid mounted or post mounted and shall be installed when conditions exist and removed when not applicable.

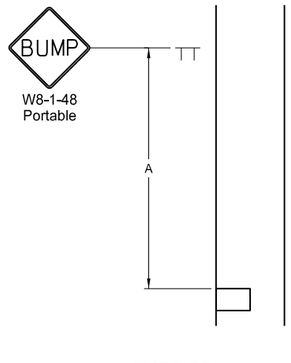
| Longitudinal Buffer Space | |
|---|---|
| *Speed (mph) | Length Min (feet) |
| 20 | 115 |
| 25 | 155 |
| 30 | 200 |
| 35 | 250 |
| 40 | 305 |
| 45 | 360 |
| 50 | 425 |
| 55 | 495 |
| 60 | 570 |
| 65 | 645 |
| 70 | 730 |
| 75 | 820 |

* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.



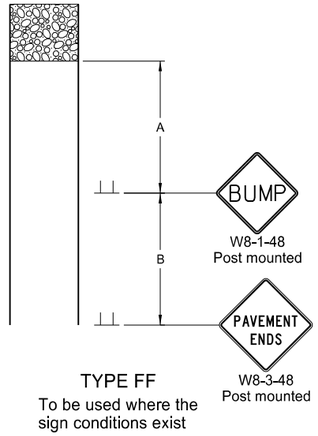

## TYPE GG

To be used where a difference of elevation between lanes exist




## TYPE EE

To be used where the sign conditions exist




## TYPE FF

To be used where the sign conditions exist

| ADVANCE WARNING SIGN SPACING | | | |
|---|---|---|---|
| Road Type | Distance Between Signs Min. (ft) | | |
| | A | B | C |
| Urban - Low Speed (30 mph or less) | 150 | 150 | 150 |
| Urban - Low Speed (over 30 to 40 mph) | 280 | 280 | 280 |
| Urban - High Speed (over 40 mph to 50 mph) | 360 | 360 | 360 |
| Rural - High Speed (over 50 mph to 65 mph) | 720 | 720 | 720 |
| Urban Expressway and Freeway (55 mph to 60 mph) | 850 | 1350 | 2200 |
| Rural Expressway and Freeway (70 mph to 75 mph) | 1000 | 1500 | 2640 |
| Interstate/4-Lane Divided (Maintenance and Surveying) | 750 | 1000 | 1500 |

KEY

Sign — Flagger

Cones

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|---|
| 9-27-13 | |
| REVISIONS | |
| DATE | CHANGE |
| | |

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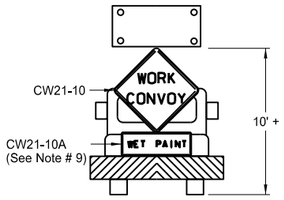
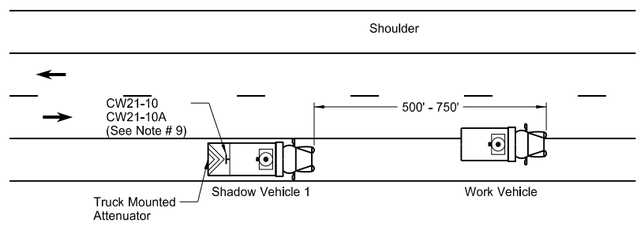
# TRAFFIC CONTROL PLAN FOR MOVING OPERATIONS

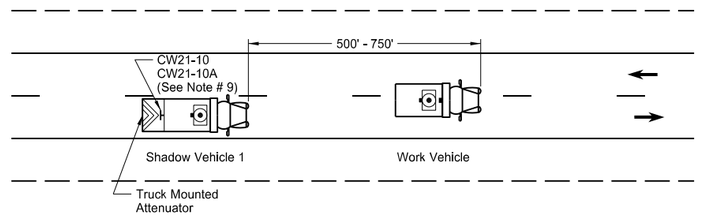
D-704-27




Typical Shadow Vehicle 1
Two-Way Roaday

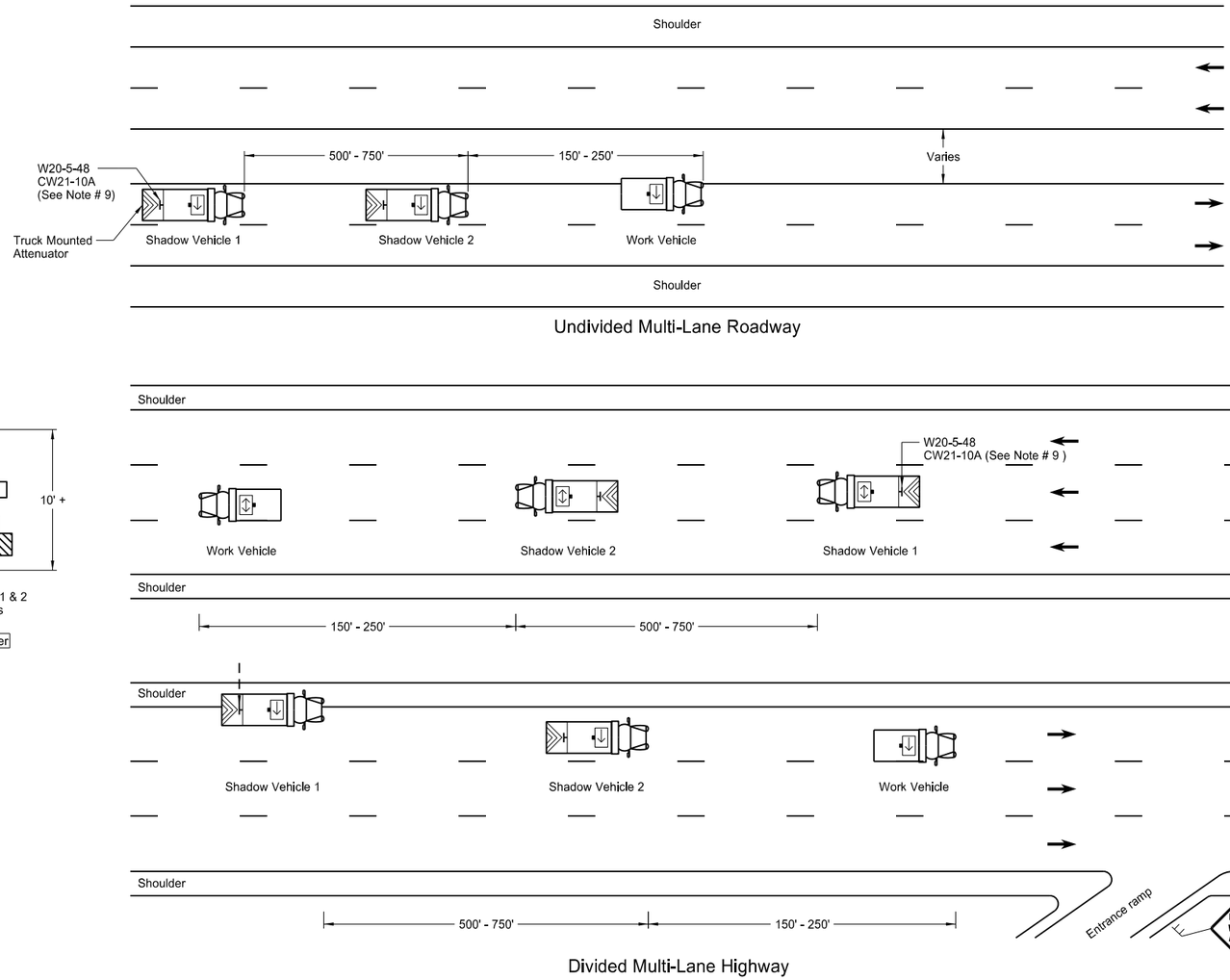



Two-Way Roadway with Paved Shoulders



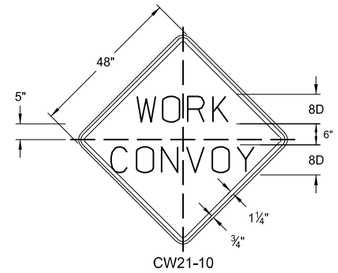

Two-Way Roadway without Paved Shoulders

Notes
1. If the contractor chooses to place more vehicles in the convoy than are shown, these vehicles shall have the truck mounted attenuator and shall be at the contractor's expense.
2. Shadow and work vehicles shall display yellow rotating beacons or strobe lights unless otherwise stated elsewhere in the plans.
3. Flashing arrow panels shall be Type B or Type C. The panel operation shall be controlled from inside the vehicle.
4. Each vehicle shall have two-way electronic communication capability.
5. When work convoys must change lanes, shadow vehicle 1 should change lanes first to shadow other convoy vehicles.
6. Vehicle spacing between the shadow vehicle 1 and shadow vehicle 2 will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the trail vehicle in time to slow down and/or change lanes as they approach the shadow vehicle.
7. Sign Colors
   Letters = Black
   Border = Black
   Background = Orange
8. Shadow vehicle 2 may be used as the paint tender vehicle.
9. Sign CW21-10A shall only be used during a painting operation.
10. On two lane - two way roadways, the work and shadow vehicles should pull over periodically to allow motor vehicle traffic to pass.

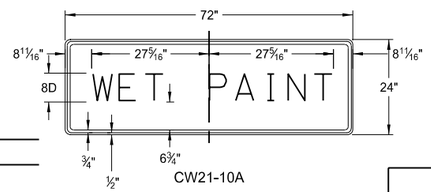



Undivided Multi-Lane Roadway

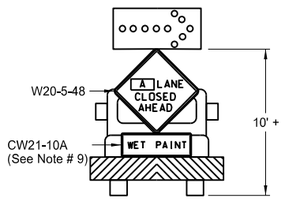
Sign Details




CW21-10




CW21-10A




Typical Shadow Vehicle 1 & 2
Multi-Lane Highways

A = Left Right Center




Divided Multi-Lane Highway

KEY

- Sign
- Truck mounted attenuator
- Flashing arrow panels:
  - Right directional
  - Left directional
  - Double arrow directional
  - Caution Mode

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|---|
| 9-27-13 | |
| REVISIONS | |
| DATE | CHANGE |
| 6-18-14 | Removed shadow vehicle 2 on two lane roadways |

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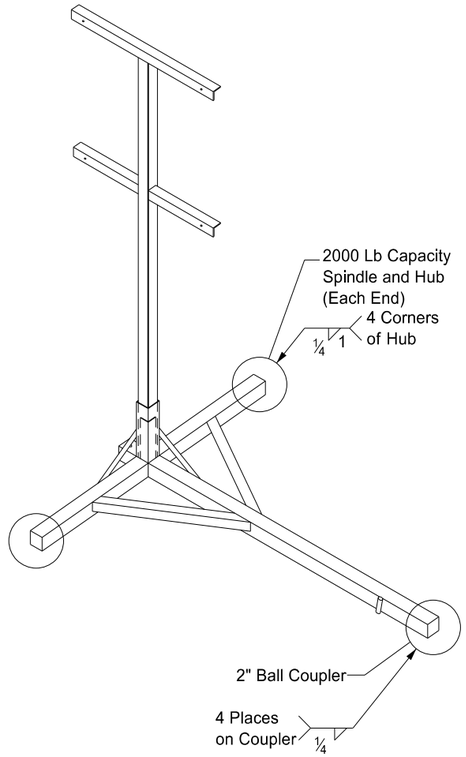
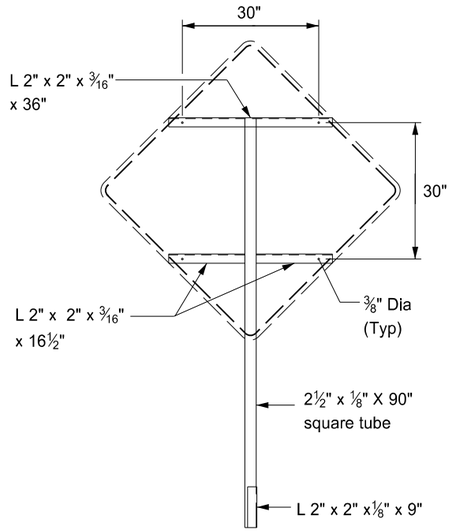
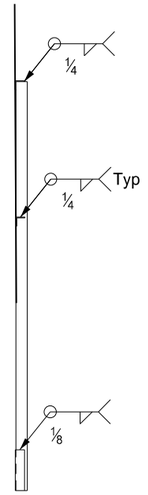
# PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



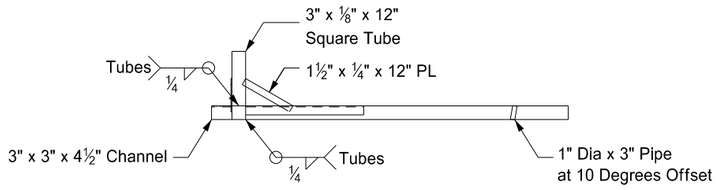




FRONT

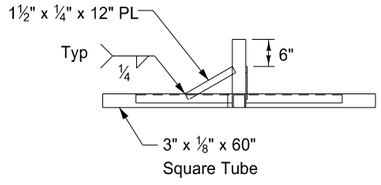



RIGHT

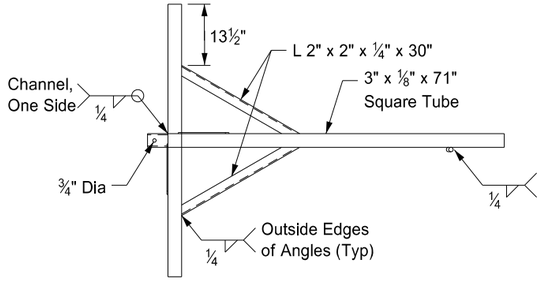
SIGN SUPPORT




FRONT




RIGHT




TOP

TRAILER

Notes:

1. The maximum weight of the assembly is 250 pounds.
2. Use a 14" wheel and tire.
3. Automotive and equipment axle assemblies may not be used for trailer-mounted sign supports.
4. Other NCHRP 350 crash tested assemblies are acceptable.

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|---|
| 11-23-10 | |
| REVISIONS | |
| DATE | CHANGE |
| | |

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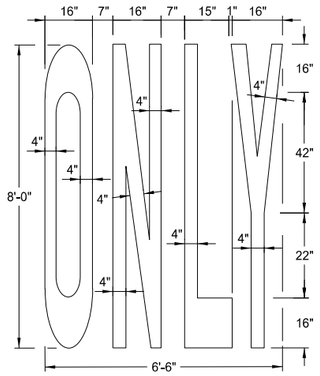
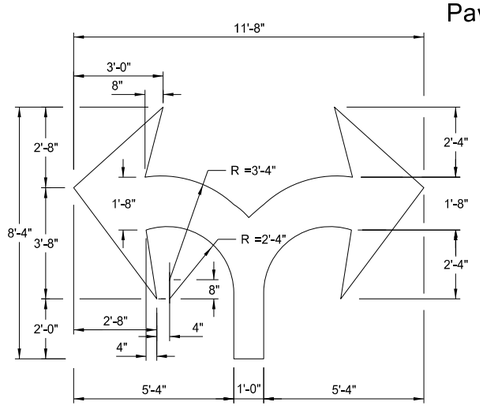
# Pavement Marking Message Details

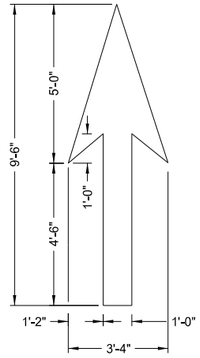
D-762-1



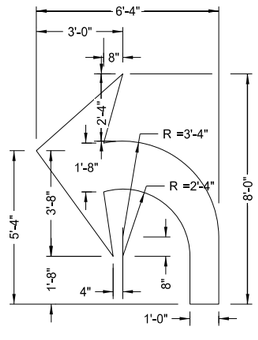

22 S. F.



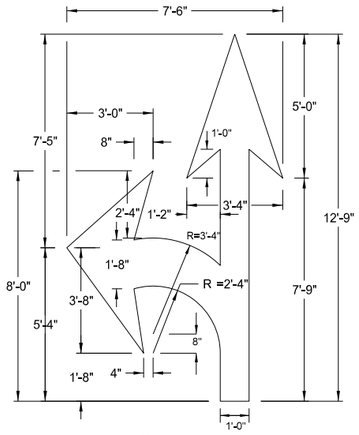

29 S. F.



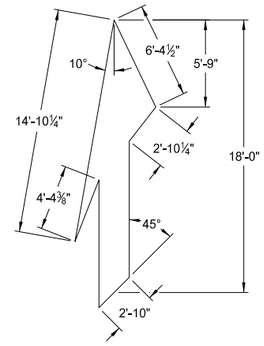

12 S. F.




16 S. F.

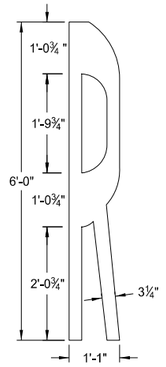



27 S. F.

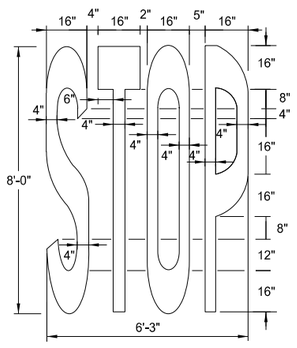



41 S. F.

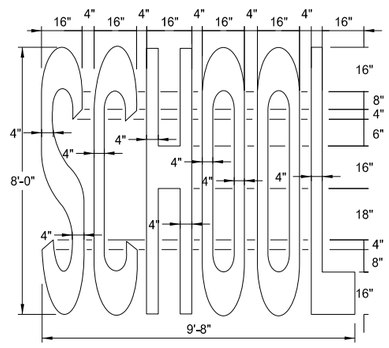
Note:
The merge arrow shall be rotated 20° from the edge of the roadway.



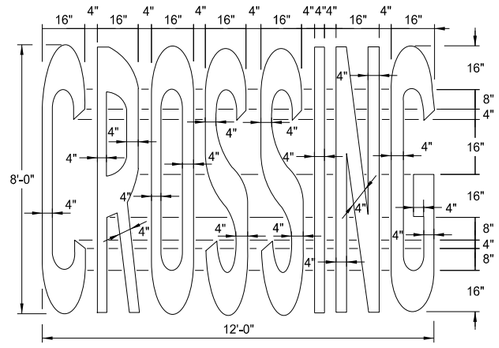

4 S. F.




22 S. F.



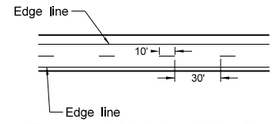

34.5 S. F.




46 S. F.

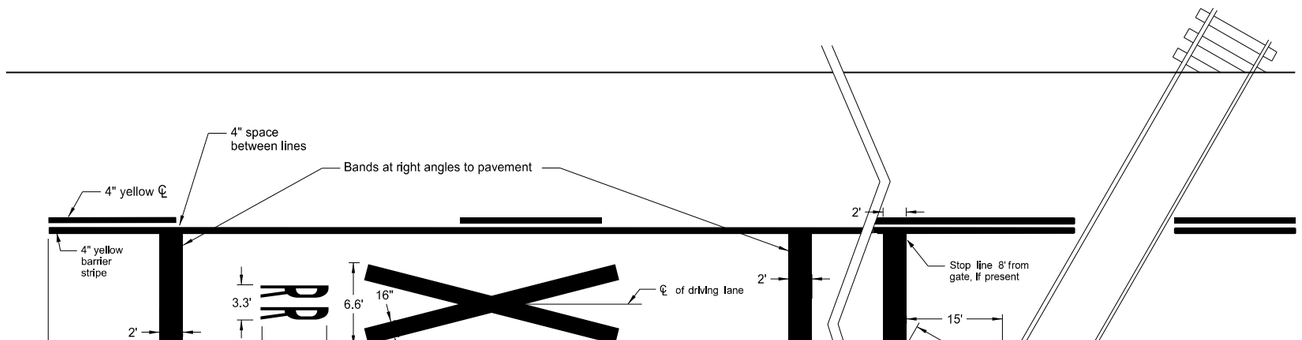
| Speed Limit | Chevron Width | Chevron Spacing 45° to Traffic |
|---|---|---|
| 0-25 mph | 8" | 5' |
| 30-40 mph | 8" | 15' |
| 45 mph and above | 12" | 25' |

Chevron Crosshatching Table




Centerline Pavement Marking Skip Spacing Detail

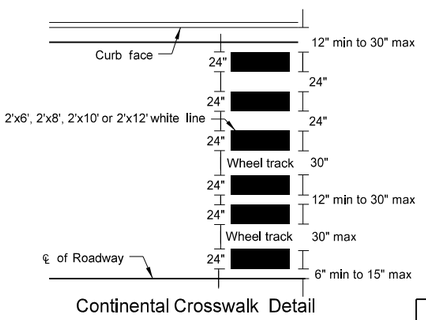
| Advance Placement Distance for Railroad Warning Signs | |
|---|---|
| Posted or 85th Percentile Speed | Advance Distance |
| 20 mph | min. 100 ft |
| 25 mph | min. 100 ft |
| 30 mph | min. 100 ft |
| 35 mph | min. 100 ft |
| 40 mph | 125 ft |
| 45 mph | 175 ft |
| 50 mph | 250 ft |
| 55 mph | 325 ft |
| 60 mph | 400 ft |
| 65 mph | 475 ft |
| 70 mph | 550 ft |




Railroad cross & 2 R's 60.5 S.F.
3 Bands (12' lane) 72 S.F.

Notes:
A three lane roadway should be marked with a centerline for two-lane approach operation on the approach to a crossing. On multi-lane roads, the transverse bands should extend across all approach lanes, and individual R X R symbols should be used in each approach lane.

See plans for correct message. All pavement markings shall be white unless noted otherwise.




Continental Crosswalk Detail

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|---|
| 12-6-11 | |
| REVISIONS | |
| DATE | CHANGE |
| | |

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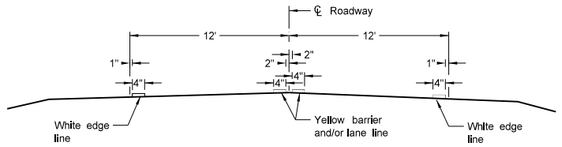
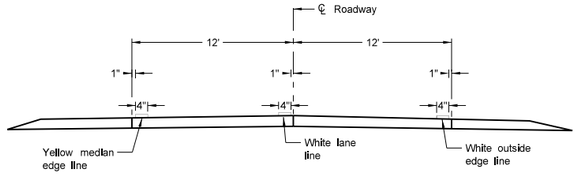
# PAVEMENT MARKING

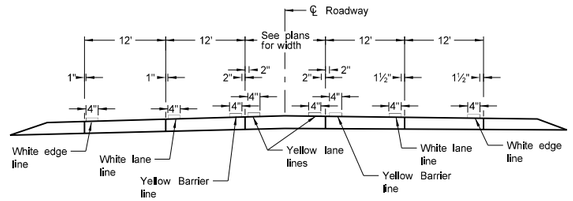
D-762-4




Two Lane Two Way
RURAL ROADWAY



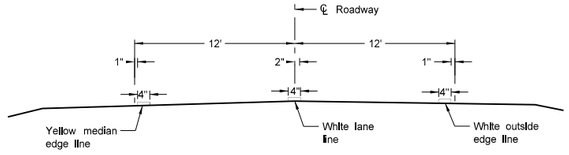

Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



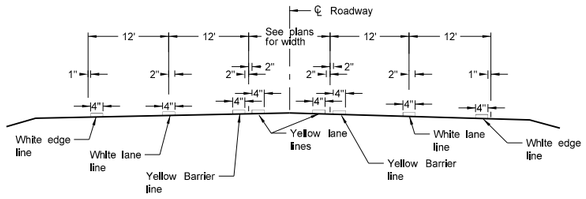

RURAL FIVE LANE ROADWAY
Concrete Section

NOTES:

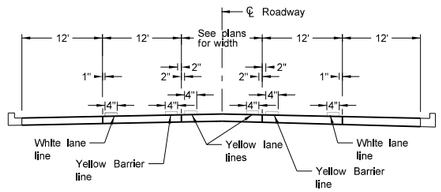
1. Edge lines shall be continued through private drives and field drives and broken for intersections.



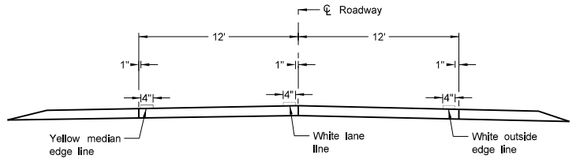

Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



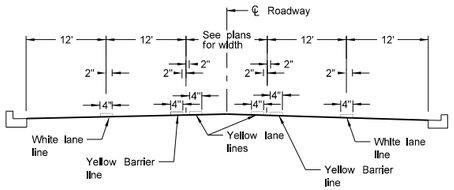

RURAL FIVE LANE ROADWAY
Asphalt Section



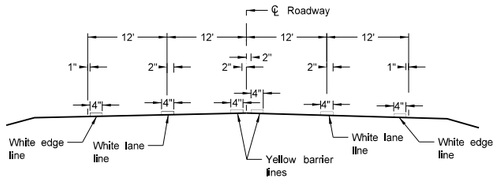

URBAN FIVE LANE SECTION
Concrete Section



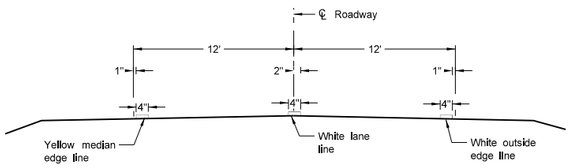

Two Lane Roadway
PRIMARY HIGHWAY
Concrete Section



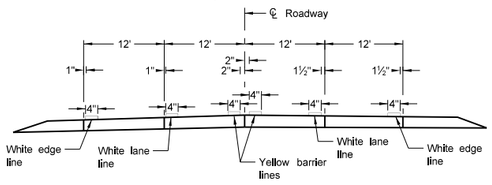

URBAN FIVE LANE SECTION
Asphalt Section



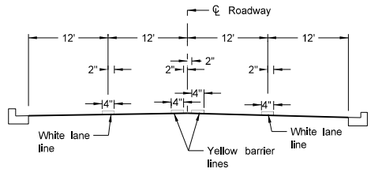

RURAL FOUR LANE ROADWAY
Asphalt Section



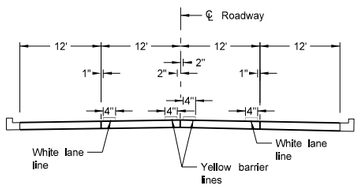

Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



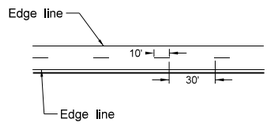

RURAL FOUR LANE ROADWAY
Concrete Section




URBAN FOUR LANE SECTION
Asphalt Section




URBAN FOUR LANE SECTION
Concrete Section




CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

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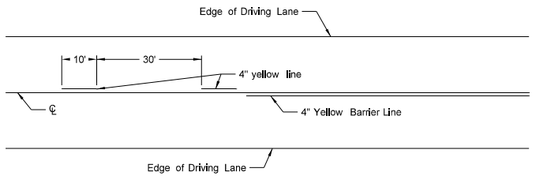
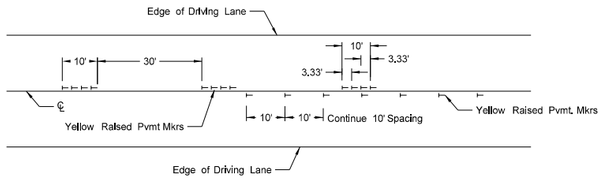
# SHORT-TERM PAVEMENT MARKING

D-762-6

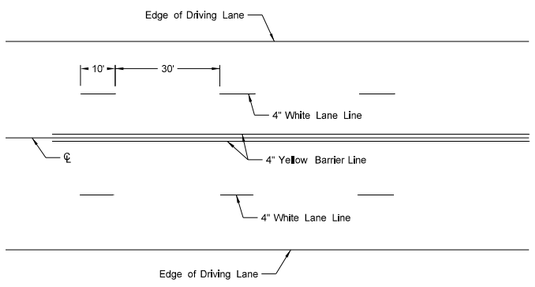



Painted or Tape Lines




Raised Pavement Markers

TWO-LANE TWO-WAY ROADWAY

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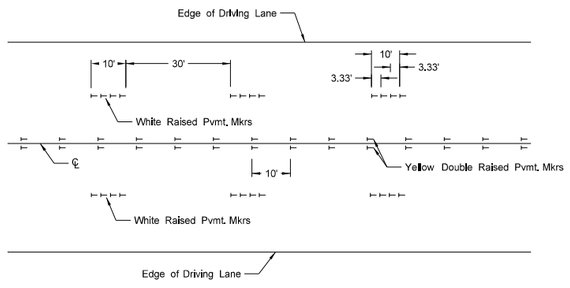
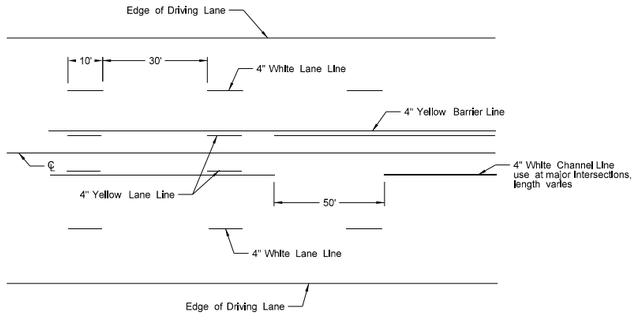



Raised Pavement Markers

FOUR LANE ROADWAY

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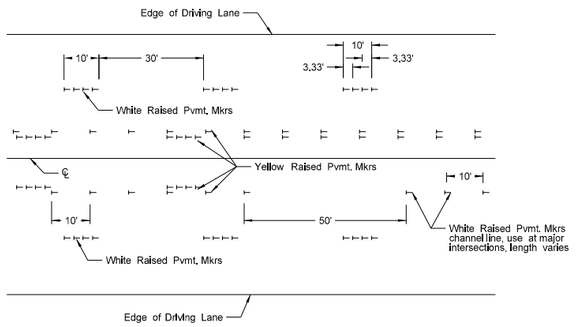
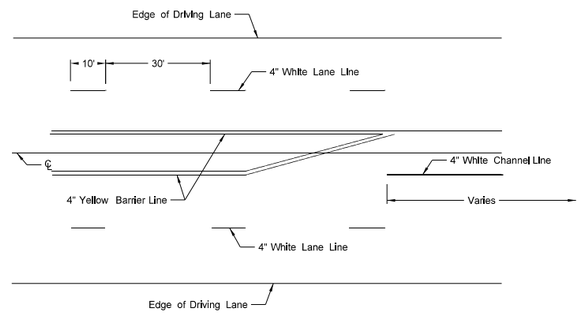



Raised Pavement Markers

FIVE LANE ROADWAY TWO WAY LEFT TURN

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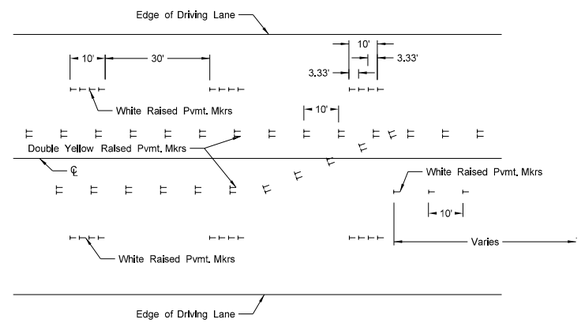


Raised Pavement Markers

FIVE LANE ROADWAY WITH MARKED ISLANDS

NOTES:

1. Two-lane two-way roadways shall have no passing zones placed as shown. No passing zone signs may be placed in lieu of short term no passing zone pavement markings. These signs will be allowed to remain in place for three days, at which time the short term no passing zone pavement marking shall be placed.

2. Short term center line stripe (paint) on top lift shall be carefully placed with exact spacing so that the permanent stripe will match when applied.

3. Raised markers and tape markings shall be removed after permanent pavement marking has been installed. Removed markings shall become the property of the contractor.

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