

STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

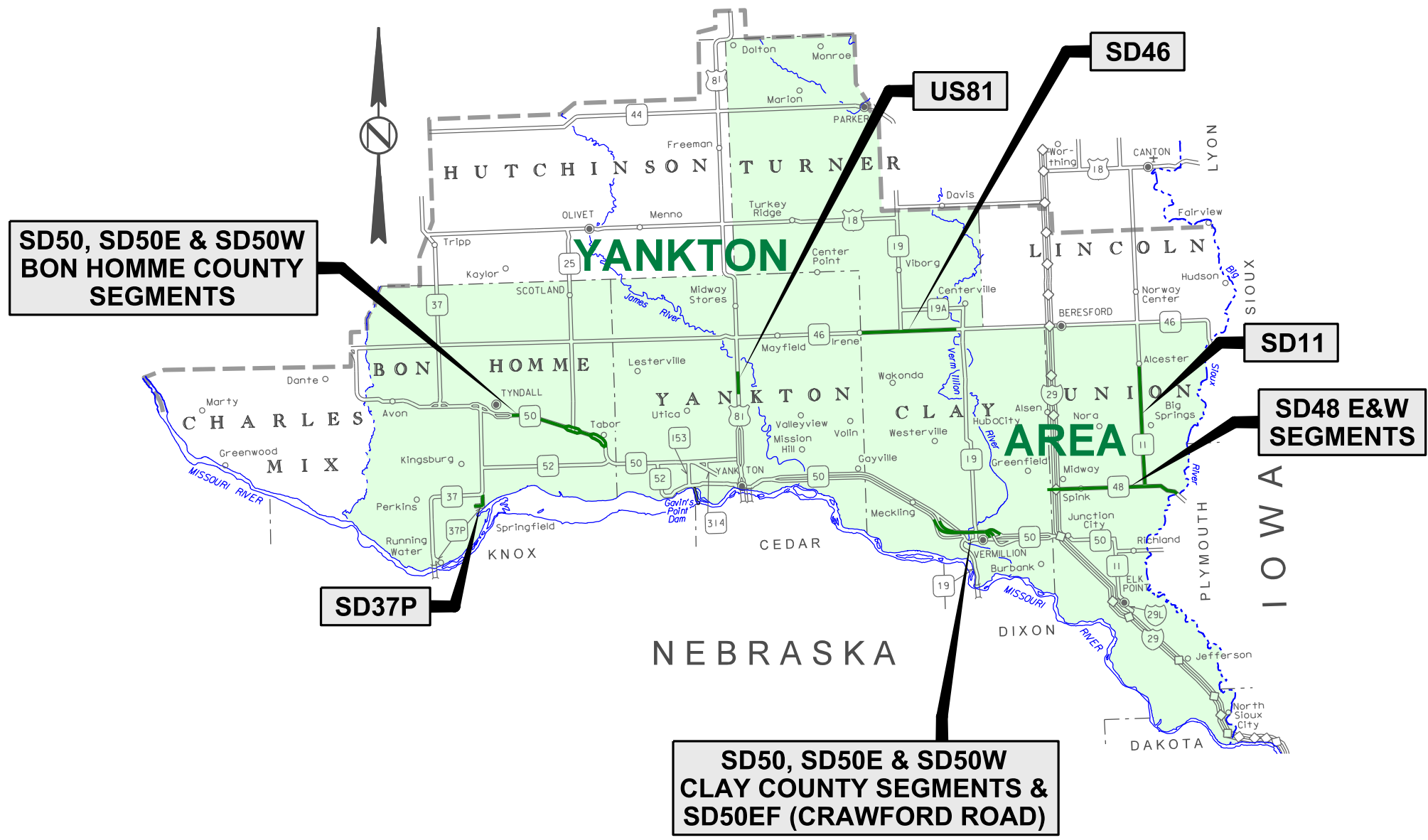
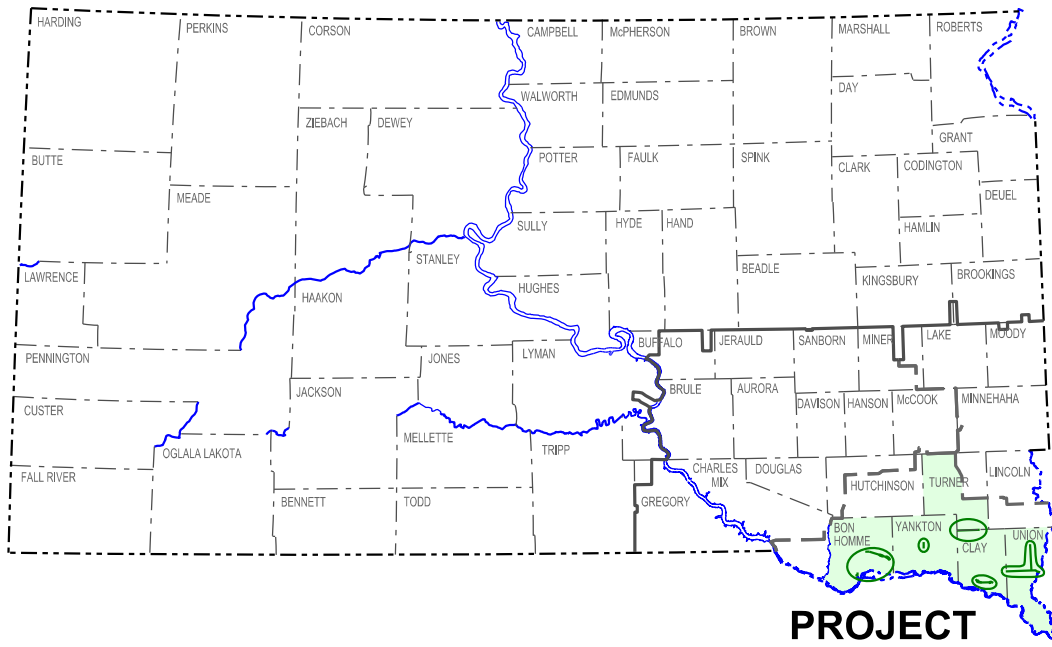
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-P 0023(65)	1	18

PLANS FOR PROPOSED  
**PROJECT NH-P 0023(65)**

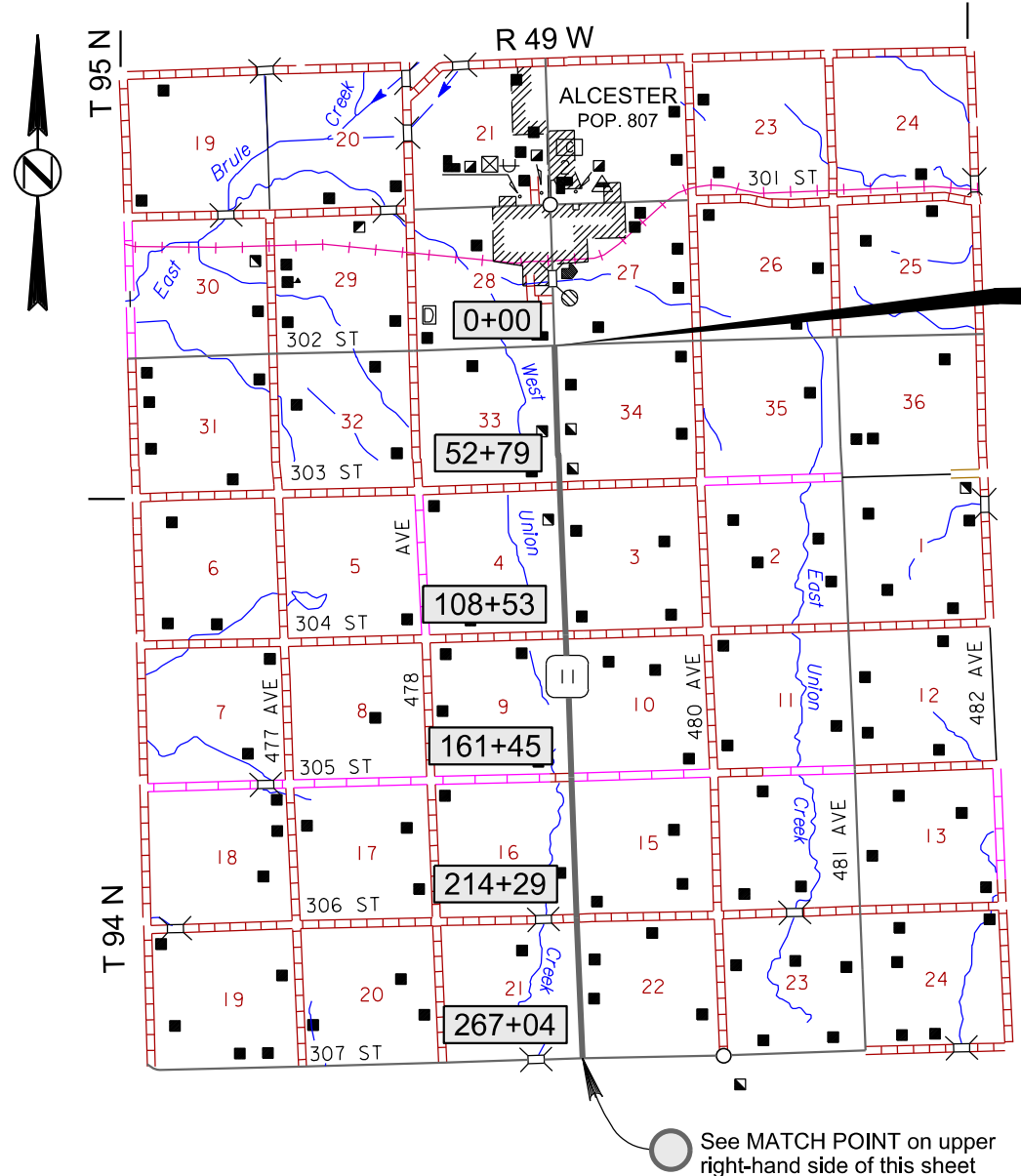
US HIGHWAY 81,  
SD HIGHWAYS 11, 37P, 46, 48, 50, 50W, 50E &  
SD50EF (CRAWFORD ROAD) IN VERMILLION  
BON HOMME, CLAY, TURNER,  
UNION & YANKTON COUNTIES  
ASPHALT CONCRETE CRACK SEALING &  
ASPHALT CONCRETE CRACK SEALING OF SHOULDERS  
PCN 08R3

INDEX OF SHEETS

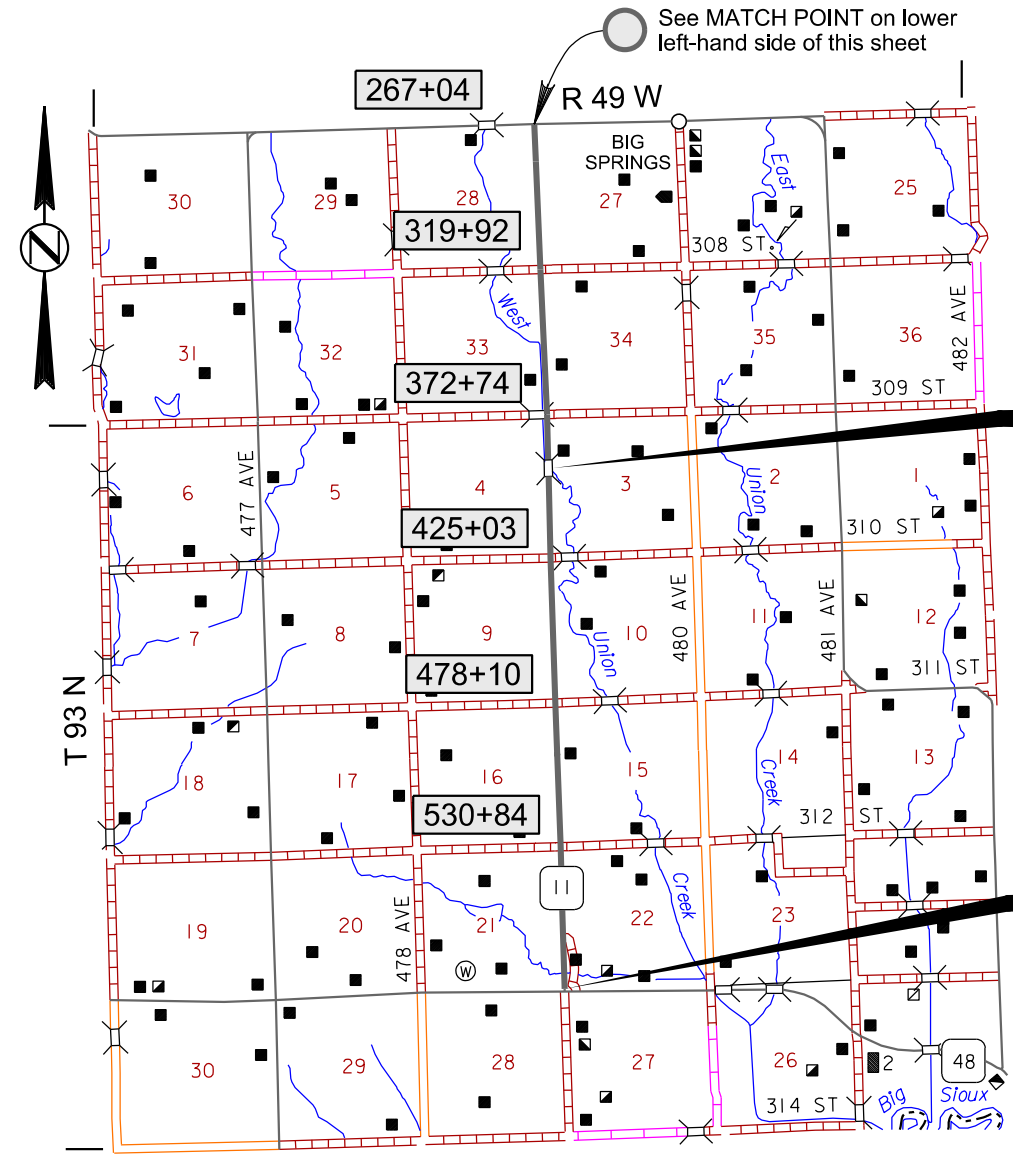
Sheet 1	Title Sheet
Sheets 2 - 8	Layout Maps
Sheet 9	Estimate of Quantities
Sheet 10	Environmental Commitments
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Sheet 14	Pavement Marking
Sheet 15	Typical Reservoir Section
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**SD HIGHWAY 11  
UNION COUNTY  
ASPHALT CONCRETE CRACK SEALING  
GROSS LENGTH: 11.055 MILES  
BRIDGE LENGTH: 0.023 MILE  
NET LENGTH: 11.032 MILES**



**BEGIN SD11**  
STA. 0+00 -50'  
MRM 34.00 +0.487  
MILEAGE 16.110  
50' N of Jct 302 St

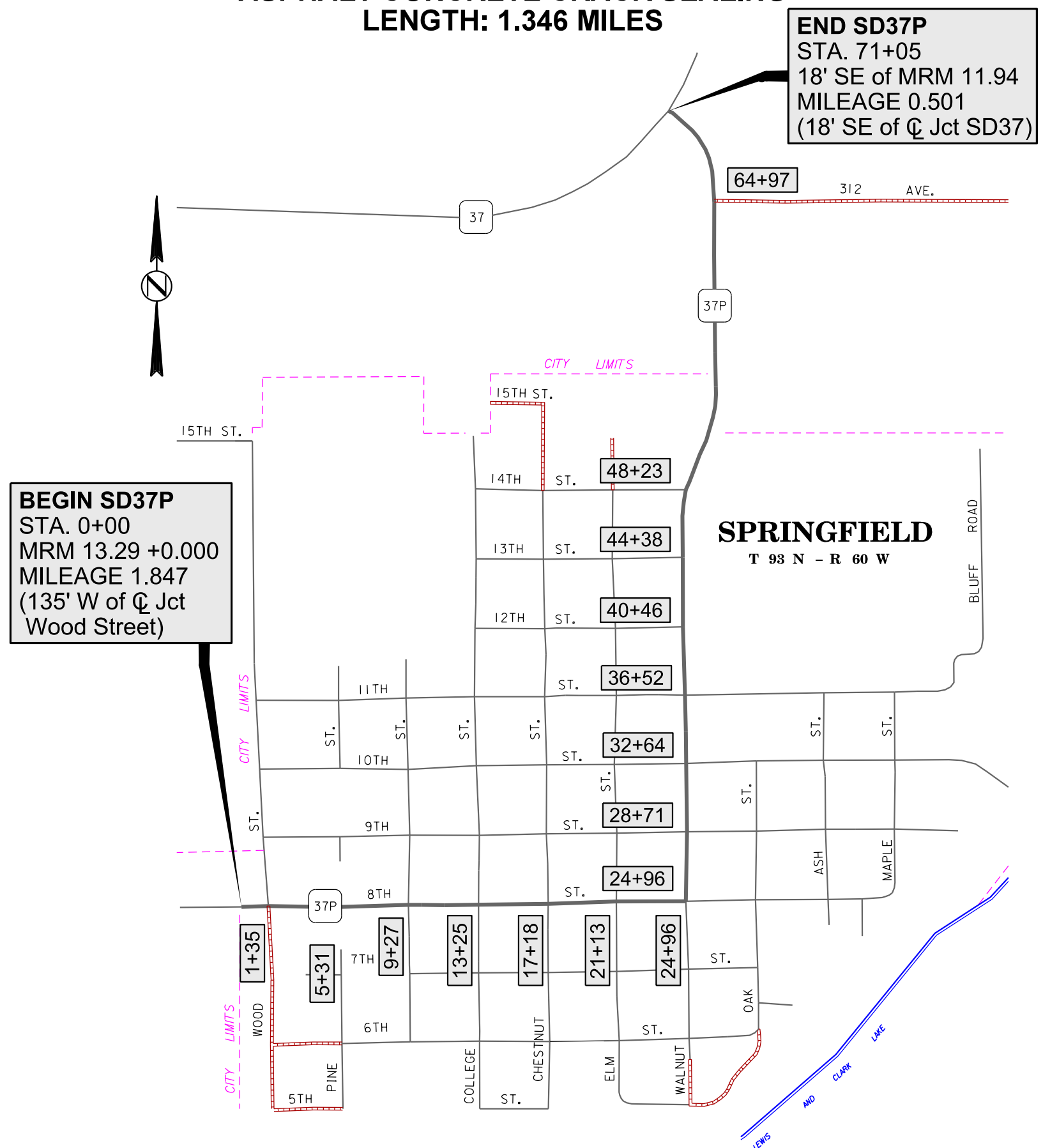


**STR. NO. 64-090-124**  
Sta. 392+06.08 to Sta. 393+25.91  
Continuous Concrete Bridge  
119'-10"=0.023 Mile  
MRM 27.04

**END SD11**  
STA. 583+20  
MRM 23.46 +0.007  
MILEAGE 5.053  
36' N of Jct Q SD48

**SD HIGHWAY 37P  
BON HOMME COUNTY  
ASPHALT CONCRETE CRACK SEALING  
LENGTH: 1.346 MILES**

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-P 0023(65)	3	18



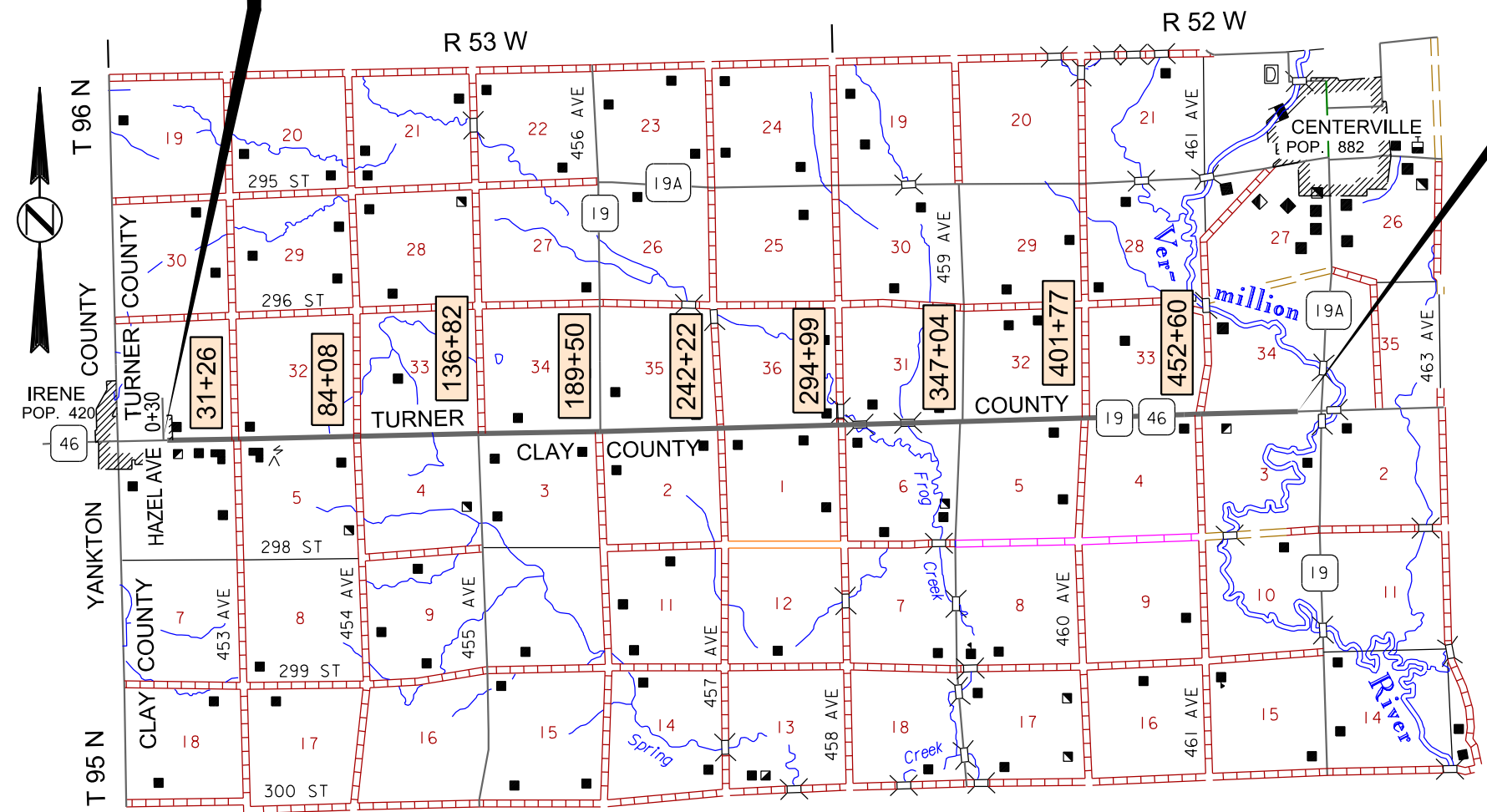
**ADT (2022) 1,253**

# SD HIGHWAY 46 CLAY & TURNER COUNTIES ASPHALT CONCRETE CRACK SEALING LENGTH: 9.357 MILES

STATE OF SOUTH DAKOTA	PROJECT NH-P 0023(65)	SHEET 4	TOTAL SHEETS 18
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**BEGIN SD46**  
STA. 1+10  
MRM 347.60 +0.015  
MILEAGE 69.955  
(80' E of  $\bar{C}$  Hazel Ave)

**END SD46**  
STA. 495+17  
MRM 356.00 +0.395  
MILEAGE 79.312  
(1,022' W of  $\bar{C}$  Jct SD19)



**SD HIGHWAY 48  
WEST SEGMENT  
UNION COUNTY**  
**ASPHALT CONCRETE CRACK SEALING**  
**GROSS LENGTH: 6.845 MILES**  
**BRIDGES LENGTH: 0.104 MILE**  
**NET LENGTH: 6.741 MILES**

**SD HIGHWAY 48  
EAST SEGMENT  
UNION COUNTY**  
**ASPHALT CONCRETE CRACK SEALING**  
**GROSS LENGTH: 5.630 MILES**  
**CONCRETE EXCEPTION LENGTH: 0.288 MILE**  
**BRIDGE & APPROACH / SLEEPER SLAB LENGTH: 0.155 MILE**  
**NET LENGTH: 5.187 MILES**



**STR. NO. 64-039-159**  
 Sta. 151+62 to Sta. 153+48  
 Continuous Concrete Bridge  
 186'-0"=0.035 Mile  
 MRM 375.38

**STR. NO. 64-043-159**  
 Sta. 165+50 to Sta. 166+53  
 Continuous Concrete Bridge  
 106'-0"=0.020 Mile  
 MRM 375.64

**STR. NO. 64-101-160**  
 Sta. 159+17 to Sta. 160+34  
 Continuous Concrete Bridge  
 117'-0"=0.022 Mile  
 MRM 381.63

**STR. NO. 64-105-161**  
 Sta. 181+73 to Sta. 182+90  
 Continuous Concrete Bridge  
 117'-0"=0.022 Mile  
 MRM 382.07

**STR. NO. 64-115-166**  
 Sta. 244+73 to Sta. 245+33.5  
 Continuous Concrete Bridge  
 60'-6"=0.011 Mile  
 MRM 383.27

**EQUATION**  
 Sta. 36+06 Back=  
 Sta. 0+00 Ahead

**STR. NO. 64-006-160**  
 Sta. 8+31 to Sta. 10+85  
 Cont. Comp. Girder Bridge  
 254'-0"=0.048 Mile  
 MRM 371.92

**BEGIN SD48  
WEST SEGMENT**  
 STA. 0+00 -80'  
 1180' W of MRM 371.92  
 MILEAGE 0.000 -0.104

**CONCRETE EXCEPTION**  
 Sta. 274+48 to Sta. 289+68

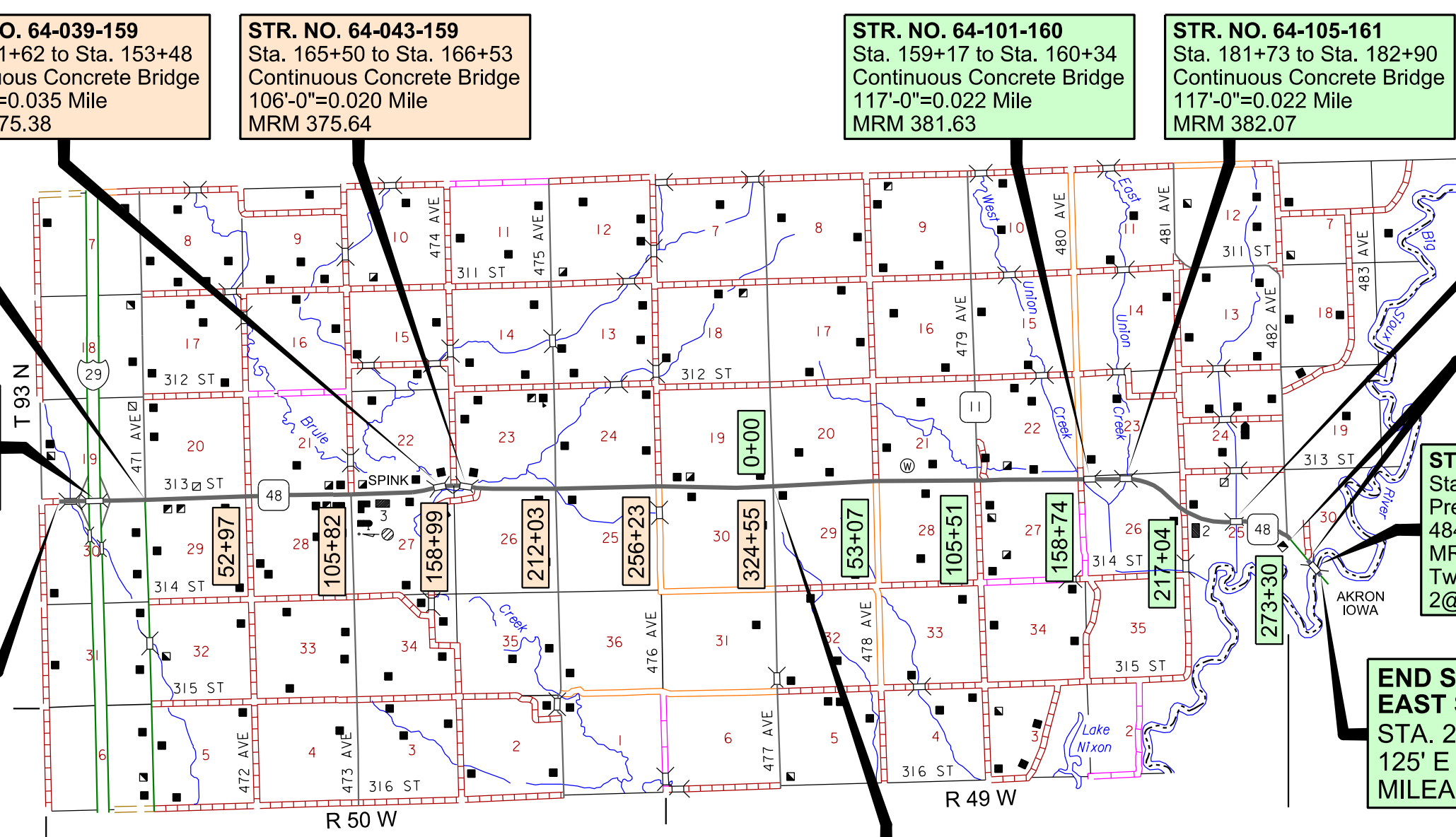
**STR. NO. 64-122-170**  
 Sta. 291+15.25 to Sta. 296+00.25  
 Prestressed Concrete Girder Bridge  
 484'-6"=0.092 Mile  
 MRM 384.24  
 Two Approach/Sleeper Slabs  
 2@22'=44' = 0.008 Mile

**END SD48  
EAST SEGMENT**  
 STA. 297+28  
 125' E of MRM 384.24  
 MILEAGE 12.354 +0.024

**END SD48  
WEST SEGMENT**  
 STA. 324+55  
 MRM 378.63 +0.000  
 MILEAGE 6.743  
 (At Jct Q 477th Ave)

**BEGIN SD48  
EAST SEGMENT**  
 STA. 0+00  
 MRM 378.63 +0.000  
 MILEAGE 6.743  
 (At Jct Q 477th Ave)

**SD48 WEST SEGMENT ADT (2022) 756**  
**SD48 EAST SEGMENT ADT (2022) 961**



**SD HIGHWAY 50  
BON HOMME COUNTY SEGMENTS  
ASPHALT CONCRETE CRACK SEALING  
GROSS LENGTH: 9.236 MILES  
BRIDGE LENGTH: 0.027 MILE  
NET LENGTH: 9.209 MILES**

**SD HIGHWAY 50W & 50E  
BON HOMME COUNTY SEGMENTS  
ASPHALT CONCRETE CRACK SEALING  
SD50W LENGTH: 1.697 MILES  
SD50E LENGTH: 1.697 MILES**

**STR. NO. 05-199-135**  
349+38.25 to 350+81.75  
Composite I Beam Bridge  
143'-6"=0.027 Mile  
MRM 361.16

**BEGIN SD50W**  
STA. 509+53  
MRM 364.18 +0.000  
MILEAGE 2.890  
(At Begin Divided)

**BEGIN SD50E**  
STA. 509+53  
MRM 364.18 +0.000  
MILEAGE 2.890  
(At Begin Divided)

**SUSPEND SD50W**  
STA. 535+98  
MRM 364.68 +0.000  
MILEAGE 3.391  
(At End Divided)

**SUSPEND SD50E**  
STA. 535+98  
MRM 364.68 +0.000  
MILEAGE 3.391  
(At End Divided)

**END SD50**  
STA. 652+09  
MRM 366.87 +0.000  
MILEAGE 108.669  
(At Begin Divided)

**CONTINUE SD50W**  
STA. 652+09  
MRM 366.87 +0.000  
MILEAGE 3.391  
(At Begin Divided)

**CONTINUE SD50E**  
STA. 652+09  
MRM 366.87 +0.000  
MILEAGE 3.391  
(At Begin Divided)

**END SD50W**  
STA. 715+26  
MRM 368.00 +0.043  
MILEAGE 4.587  
(Near End Divided)

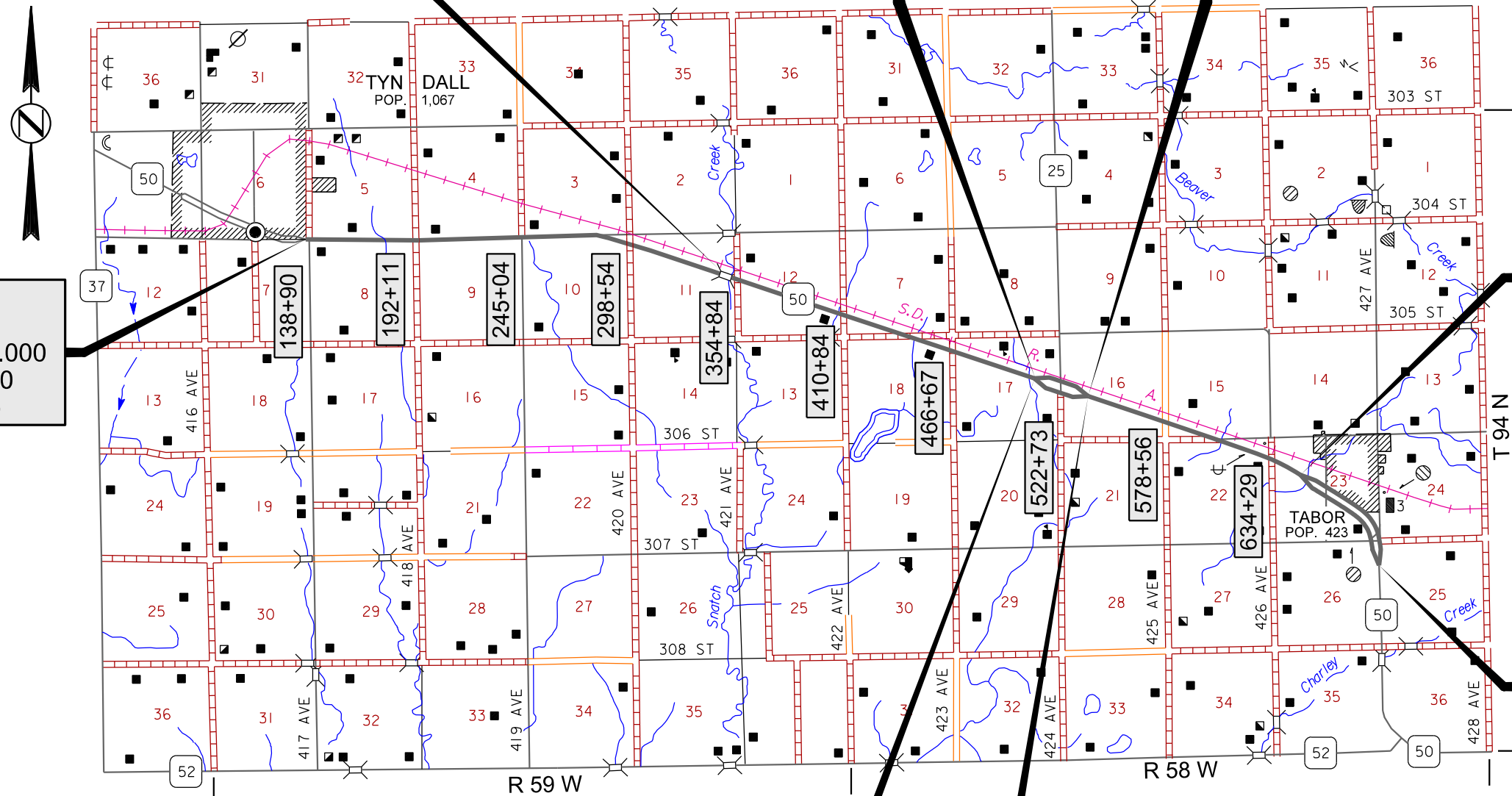
**END SD50E**  
STA. 715+26  
MRM 368.00 +0.045  
MILEAGE 4.587  
(Near End Divided)

**BEGIN SD50**  
STA. 137+99  
MRM 357.14 +0.000  
MILEAGE 99.410  
(At End Divided)

**SUSPEND SD50**  
STA. 509+53  
MRM 364.18 +0.000  
MILEAGE 106.470  
(At Begin Divided)

**CONTINUE SD50**  
STA. 535+98  
MRM 364.68 +0.000  
MILEAGE 106.470  
(At End Divided)

**SD50W ADT (2022) 1,520**  
**SD50E ADT (2022) 1,520**  
**SD50 ADT (2022) 2,258**



**SD HIGHWAY 50  
CLAY COUNTY SEGMENT  
ASPHALT CONCRETE CRACK SEALING  
GROSS LENGTH: 3.712 MILES  
BRIDGE & APPROACH / SLEEPER  
SLAB LENGTH: 0.176 MILE  
NET LENGTH: 3.536 MILES**

**SD HIGHWAY 50W & 50E  
CLAY COUNTY SEGMENTS  
ASPHALT CONCRETE CRACK SEALING &  
ASPHALT CONCRETE CRACK SEALING OF SHOULDERS  
SD50W LENGTH: 1.073 MILES    SD50E LENGTH: 0.918 MILE**

**SD50EF (CRAWFORD ROAD)  
ASPHALT CONCRETE  
CRACK SEALING  
LENGTH: 0.205 MILE**

**BEGIN SD50W**  
STA. 0+00  
MRM 406.17 +0.248  
MILEAGE 22.552  
(At End Concrete)

**SUSPEND SD50W**  
STA. 30+51  
MRM 407.10 +0.000  
MILEAGE 23.130

**STR. NO. 14-092-199**  
Sta. 2+35 to Sta. 6+28  
Cont. Comp. Girder Bridge  
393'-4 1/4" = 0.075 Mile  
SD50 MRM 407.18  
Two Approach/Sleeper Slabs  
2@61'=122' = 0.023 Mile

**STR. NO. 14-100-200**  
Sta. 43+85 to Sta. 47+57  
Cont. Comp. Girder Bridge  
372'-0" = 0.070 Mile  
SD50 MRM 407.97  
Two Approach/Sleeper Slabs  
2@20'=40' = 0.008 Mile

**END SD50**  
STA. 196+00  
MRM 410.81 +0.000  
MILEAGE 131.686  
(At Begin Divided)

**CONTINUE SD50E**  
STA. 196+00  
MRM 410.81 +0.000  
MILEAGE 23.139

**CONTINUE SD50W**  
STA. 196+00  
MRM 410.81 +0.000  
MILEAGE 23.130

**BEGIN SD50E**  
STA. 0+00  
MRM 406.00 +0.482  
MILEAGE 22.533

**SUSPEND SD50E**  
STA. 32+01  
MRM 407.10 +0.000  
MILEAGE 23.139

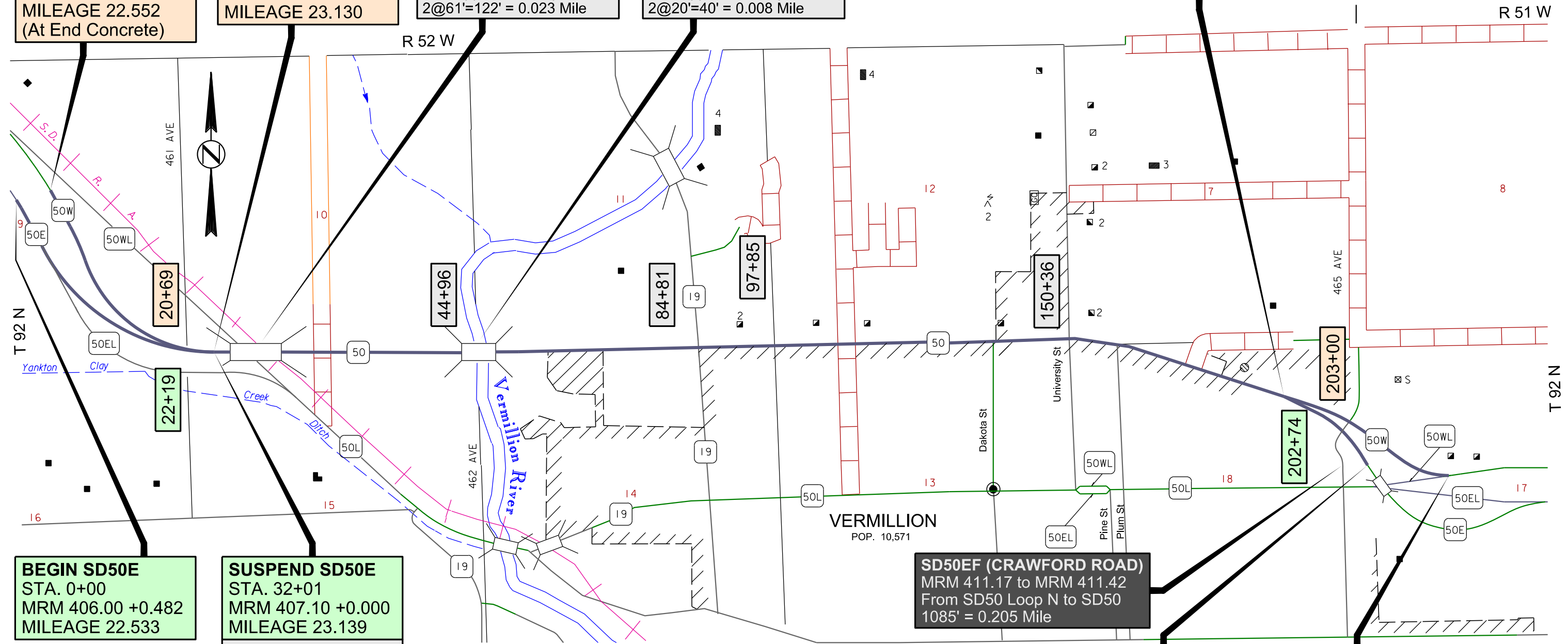
**BEGIN SD50**  
STA. 0+00  
MRM 407.10 +0.000  
MILEAGE 127.987  
(At End Divided)

**SD50W ADT (2022) 2,600  
SD50E ADT (2022) 2,596  
SD50 ADT (2022) 5,742**

**SD50EF (CRAWFORD ROAD)**  
MRM 411.17 to MRM 411.42  
From SD50 Loop N to SD50  
1085' = 0.205 Mile

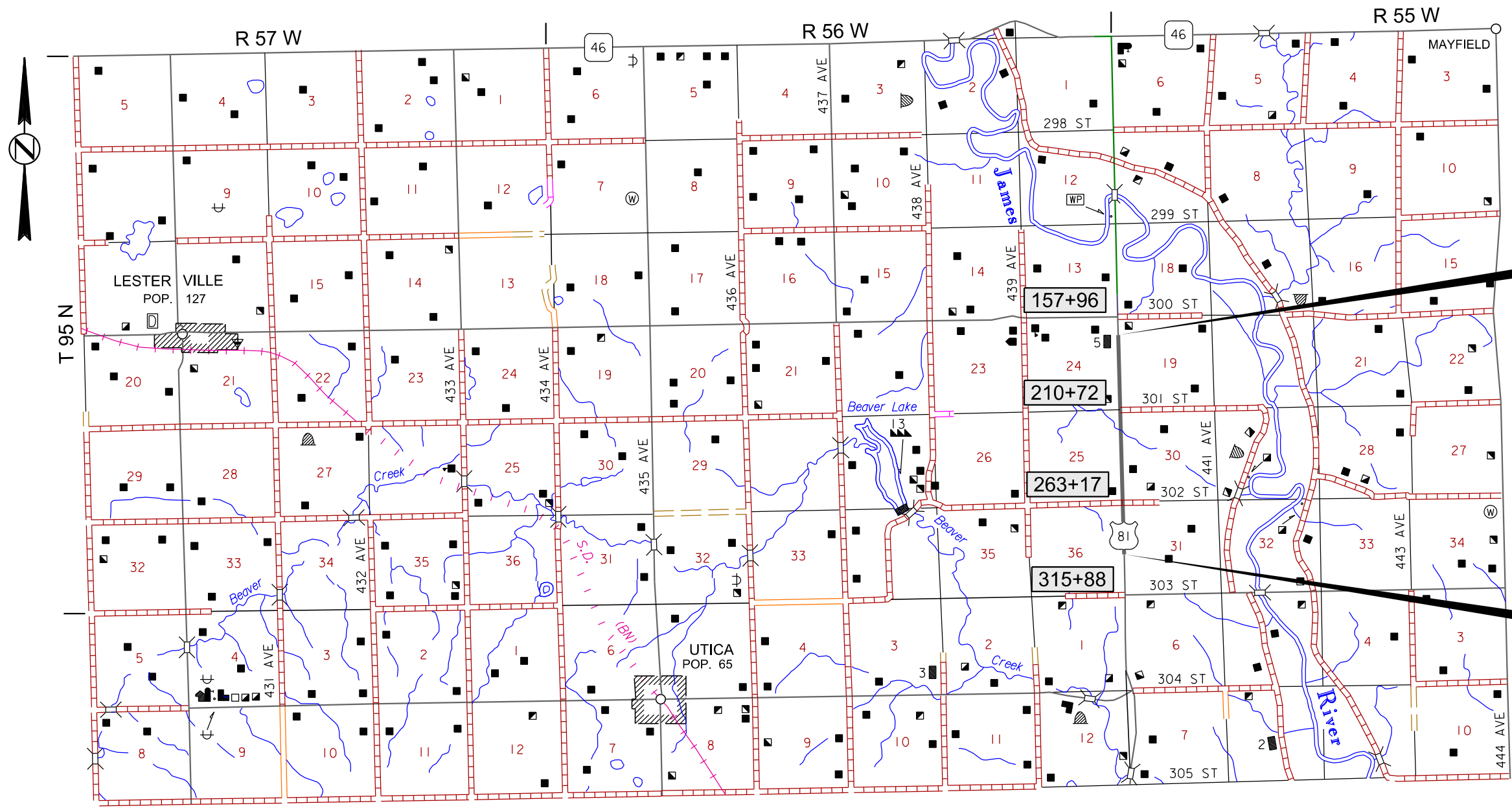
**END SD50E**  
STA. 212+48  
MRM 411.00 +0.138  
MILEAGE 23.463  
(At Begin Concrete)

**END SD50W**  
STA. 222+16  
MRM 411.00 +0.308  
MILEAGE 23.640  
(At Begin Concrete)



**US HIGHWAY 81  
YANKTON COUNTY  
ASPHALT CONCRETE CRACK SEALING  
LENGTH: 2.365 MILES**

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH-P 0023(65)	8	18



**BEGIN US81**  
 STA. 168+16  
 MRM 12.00 +0.152  
 MILEAGE 7.623  
 (At Begin Widening)

**END US81**  
 STA. 293+03  
 MRM 9.37 +0.433  
 MILEAGE 5.258  
 (At End Proposed  
 Grading on 04G5  
 2285' N of 303 St)

ADT (2022) 3,664



## ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
350E0010	Asphalt Concrete Crack Sealing	68,743	Lb
633E1200	High Build Waterborne Pavement Marking Paint, White	2,987	Gal
633E1205	High Build Waterborne Pavement Marking Paint, Yellow	1,641	Gal
634E0010	Flagging	292.0	Hour
634E0020	Pilot Car	147.0	Hour
634E0110	Traffic Control Signs	1,557.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Board	3	Each

## ESTIMATE OF QUANTITIES (FOR INFORMATION ONLY)

BID ITEM NUMBER	ITEM	SD HWY 11	SD HWY 37P	SD HWY 46	SD HWY 48W	SD HWY 48E	SD HWY 50 BON HOMME COUNTY	SD HWY 50W BON HOMME COUNTY	SD HWY 50E BON HOMME COUNTY	SD HWY 50 CLAY COUNTY	SD HWY 50W CLAY COUNTY	SD HWY 50E CLAY COUNTY	SD HWY 50EF CRAWFORD ROAD	US HWY 81	TOTAL QUANTITY
009E0010	Mobilization	----- Lump Sum ----->													Lump Sum
350E0010	Asphalt Concrete Crack Sealing	9939	2267	2908	12443	9813	12740	2207	2290	7436	775	778	159	4988	68743 Lb
633E1200	High Build Waterborne Pavement Marking Paint, White	608	58	521	378	316	513	54	56	267	34	40	12	130	2987 Gal
633E1205	High Build Waterborne Pavement Marking Paint, Yellow	296	62	207	181	167	214	62	63	259	29	33	12	56	1641 Gal
634E0010	Flagging	42	10	12	53	42	54	9	10	32	3	3	1	21	292 Hour
634E0020	Pilot Car	21	5	6	26	21	27	5	5	16	2	2	0	11	147 Hour
634E0110	Traffic Control Signs	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	169.0	169.0	169.0	105.0	105.0	1557.0 SqFt
634E0120	Traffic Control, Miscellaneous	----- Lump Sum ----->													Lump Sum
634E0420	Type C Advance Arrow Board	-	-	-	-	-	-	-	-	1	1	1	-	-	3 Each

### SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

# ENVIRONMENTAL COMMITMENTS

## ENVIRONMENTAL COMMITMENTS

The SDDOT is committed to protecting the environment and uses Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office.

Additional guidance on SDDOT's Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <https://dot.sd.gov/media/documents/EnvironmentalProceduresManual.pdf>

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.

## COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

### COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

#### Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pits, or staging areas associated with the project, cease construction activities in the affected area until the Whooping Crane departs and immediately contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

### COMMITMENT B4: BALD EAGLE

Bald eagles are known to occur in this area.

#### Action Taken/Required:

If a nest is observed within one mile of the project site, notify the Project Engineer immediately so that he/she can consult with the Environmental Office for an appropriate course of action.

## COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

#### Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

## COMMITMENT H: WASTE DISPOSAL SITE

Construction and/or demolition debris may be disposed of within the Public ROW

The waste disposal site(s) will be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

The waste disposal site(s) will not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Environmental Office and the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements will apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will control the access to waste disposal sites not within the Public ROW with fences, gates, and placement of a sign or signs at the entrance to the site stating, No Dumping Allowed.
2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period not to exceed the duration of the project. Prior to project completion, the waste will be removed from view of the ROW or buried, and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

Cost associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates and signs), and reclamation of the waste disposal site(s) will be incidental to the various contract items.

## COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historic Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

#### Action Taken/Required:

All earth disturbing activities not designated within the plans require a cultural resource review prior to scheduling the pre-construction meeting. This work includes but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor will arrange and pay for a record search and when necessary, a cultural resource survey. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view in which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities within 100 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

**ASPHALT CONCRETE CRACK SEALING**

Only the top of the road and shoulders will be routed and sealed. No routing and sealing will be done on the Asphalt Concrete bevel/sluff.

The width of crack sealing will vary but the typical roadway widths for information only are as follows:

- On SD11, the average top width is 31 feet wide.
- On SD37P, the average top width is 40 feet wide.
- On SD46, the average top width is 40 feet wide.
- On SD48W, the average top width is 31 feet wide.
- On SD48E, the average top width is 31 feet wide.
- On SD50 Bon Homme, the average top width is 40 feet wide.
- On SD50W Bon Homme, the average top width is 40 feet wide.
- On SD50E Bon Homme, the average top width is 40 feet wide.
- On SD50 Clay, the average top width is 61 feet wide.
- On SD50W Clay, the average top width is 32 feet wide.
- On SD50E Clay, the average top width is 32 feet wide.
- On SD50EF Crawford Rd, the average top width is 36 feet wide.
- On US81, the average top width is 31 feet wide.

**ASPHALT CONCRETE CRACK SEALING (CONTINUED)**

All other requirements stated in Section 350 will apply, except the crack sealant material will be from one of those listed below:

<u>Product</u>	<u>Manufacturer</u>
Deery 101 ELT Hot Poured Elastic Joint Sealer ASTM D-6690 Type IV (Modified)	Crafco, Inc. Chandler, AZ 602-276-0406 <a href="http://www.crafco.com">http://www.crafco.com</a>
W.R. Meadows 3405-M Hot Poured Elastic Joint Sealer ASTM D-6690 Type IV	W.R. Meadows Hampshire, IL 800-342-5976 <a href="http://www.wrmeadows.com">http://www.wrmeadows.com</a>

**TABLE OF LONGITUDINAL AND TRANSVERSE CRACKS**

<b>ROUTE</b>	<b>LONGITUDINAL</b>	<b>TRANSVERSE</b>
SD11	7.5%	92.5%
SD37P	1.4%	98.6%
SD46	15%	85%
SD48W	7.2%	92.8%
SD48E	8.8%	91.2%
SD50 Bon Homme	20%	80%
SD50W Bon Homme	20%	80%
SD50E Bon Homme	20%	80%
SD50 Clay	17.7%	82.3%
SD50W Clay	9.4%	90.6%
SD50E Clay	18.9%	81.1%
SD50EF	62.5%	37.5%
US81	18.2%	81.8%

**HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT**

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

**RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT**

- Solid 4" line = 27.8 Gals/Mile
- Dashed 4" line = 7.6 Gal/Mile
- Glass Beads = 5.3 Lbs/Gal.

Cost for material, labor and equipment necessary to furnish and install the pavement marking will be incidental to the contract unit price for the respective High Build Waterborne Pavement Marking Paint items.

**PERMANENT PAVEMENT MARKING**

The application of permanent pavement marking may not begin until 7 calendar days following completion of the crack seal and will be completed within 14 calendar days following completion of the crack seal.

Marking eight-inch edgelines and gore areas will require the use of two spray nozzles to achieve the required width. Marking twelve-inch gore lines will require the use of three spray nozzles to achieve the required width.

The Contractor will be required to repaint existing pavement marking including centerline, edgeline, dashed edgelines, dashed lane lines, lane lines, turn lanes, gore areas, etc.

Flush sealing will not be allowed as an option for correction of markings that are not within tolerance due to the occurrence of shadow through.

Routing and sealing operations shall not disturb existing thermoplastic pavement marking.

The following table contains locations of existing pavement marking to be painted by hand.

**TABLE OF HAND WORK FOR PAVEMENT MARKING**

ROUTE	LOCATION
SD37P	24" Stop Bar at SD37
SD37P	Pedestrian Crossings in Springfield
SD37P	Handicap Parking Symbols in Springfield
SD46	24" Hashes in Turn Bays at 455 <sup>th</sup> Ave & SD19
SD48 E Segment	24" Hashes in Turn Bay as SD11
SD50 Bon Homme County	24" Hashes in Turn Bays at 419 <sup>th</sup> Ave & 306 <sup>th</sup> St.
SD50 Bon Homme County	Arrows in Turn Bays at 419 <sup>th</sup> Ave & 306 <sup>th</sup> St
SD50 Bon Homme County	24" Hashes for Gore Areas at SD25 & Tabor divides
SD50 Clay County	24" Hashes in Turn Bay at Over Drive
SD50 Clay County	Solid Area in Turn Bay at Over Drive
SD50 Clay County	24" Stop Bar & Arrow at SD19 North
SD50E Clay County	24" Hashes in Turn Bay at Crawford Road

**PERMANENT PAVEMENT MARKING (CONTINUED)**

**TABLES OF PERMANENT PAVEMENT MARKING**

SD11	White	Yellow
Yellow Centerline Dashes = 9.827 miles @ 7.6 Gal/Mile		74.7
Solid Yellow Centerline = 7.973 miles @ 27.8 Gal/Mile		221.6
4" Solid White Edgeline = 21.881 miles @ 27.8 Gal/Mile	608.3	
<b>TOTAL GALLONS</b>	<b>608</b>	<b>296</b>

SD37P	White	Yellow
Yellow Centerline Dashes = 0.121 miles @ 7.6 Gal/Mile		0.9
Solid Yellow Centerline = 2.182 miles @ 27.8 Gal/Mile		60.7
4" Solid White Edgeline = 1.822 miles @ 27.8 Gal/Mile	50.7	
24" White Pedestrian Crossings = 0.015 miles @ 166.8 Gal/Mile	2.5	
4" Solid White Parking Lines = 0.052 miles @ 27.8 Gal/Mile	1.4	
Solid White Handicap Symbol = 0.036 miles @ 27.8 Gal/Mile	1.0	
24" White Stop Line = 0.014 miles @ 166.8 Gal/Mile	2.3	
<b>TOTAL GALLONS</b>	<b>58</b>	<b>62</b>

SD46	White	Yellow
Yellow Centerline Dashes = 8.604 miles @ 7.6 Gal/Mile		65.4
Solid Yellow Centerline = 2.417 miles @ 27.8 Gal/Mile		67.2
Double Yellow for Turn Bays = 2 (4" line) x 1.070 miles @ 27.8 Gal/Mile		59.5
24" Yellow Hatches for Turn Bays= 0.091 miles @ 166.8 Gal/Mile		15.2
4" Solid White Edgeline = 18.587 miles @ 27.8 Gal/Mile	516.7	
Solid White Lane Lines = 0.145 miles @ 27.8 Gal/Mile	4.0	
<b>TOTAL GALLONS</b>	<b>521</b>	<b>207</b>

SD48 West Segment	White	Yellow
Yellow Centerline Dashes = 5.780 miles @ 7.6 Gal/Mile		43.9
Solid Yellow Centerline = 4.932 miles @ 27.8 Gal/Mile		137.1
4" Solid White Edgeline = 13.588 miles @ 27.8 Gal/Mile	377.7	
<b>TOTAL GALLONS</b>	<b>378</b>	<b>181</b>

SD48 East Segment	White	Yellow
Yellow Centerline Dashes = 4.503 miles @ 7.6 Gal/Mile		34.2
Solid Yellow Centerline = 3.238 miles @ 27.8 Gal/Mile		90.0
Double Yellow for Turn Bays = 2 (4" line) x 0.535 miles @ 27.8 Gal/Mile		29.7
24" Yellow Hatches for Turn Bays= 0.076 miles @ 166.8 Gal/Mile		12.7
4" Solid White Edgeline = 11.148 miles @ 27.8 Gal/Mile	309.9	
Solid White Lane Lines = 0.225 miles @ 27.8 Gal/Mile	6.3	
<b>TOTAL GALLONS</b>	<b>316</b>	<b>167</b>

**PERMANENT PAVEMENT MARKING (CONTINUED)**

**TABLES OF PERMANENT PAVEMENT MARKING (CONTINUED)**

SD50 Bon Homme County	White	Yellow
Yellow Centerline Dashes = 8.291 miles @ 7.6 Gal/Mile		63.0
Solid Yellow Centerline = 2.209 miles @ 27.8 Gal/Mile		61.4
Solid Yellow Areas for Turn Bays = 634 SqFt = 0.360 miles @ 27.8 Gal/Mile		10.0
Double Yellow for Turn Bays = 2 (4" line) x 1.236 miles @ 27.8 Gal/Mile		68.7
24" Yellow Hatches for Turn Bays= 0.066 miles @ 166.8 Gal/Mile		11.0
4" Solid White Edgeline = 18.104 miles @ 27.8 Gal/Mile	503.3	
Solid White Lane Lines = 0.136 miles @ 27.8 Gal/Mile	3.8	
Arrows = 7 each @ 0.8 Gal/Each	5.6	
<b>TOTAL GALLONS</b>	<b>513</b>	<b>214</b>

SD50W Bon Homme County	White	Yellow
White Centerline Dashes = 1.107 miles @ 7.6 Gal/Mile	8.4	
4" Solid Yellow Edgeline = 1.035 miles @ 27.8 Gal/Mile		28.8
4" Solid White Edgeline = 1.654 miles @ 27.8 Gal/Mile	46.0	
8" Solid Yellow Edgeline = 0.599 miles @ 55.6 Gal/Mile		33.3
<b>TOTAL GALLONS</b>	<b>54</b>	<b>62</b>

SD50E Bon Homme County	White	Yellow
White Centerline Dashes = 1.107 miles @ 7.6 Gal/Mile	8.4	
4" Solid Yellow Edgeline = 1.047 miles @ 27.8 Gal/Mile		29.1
4" Solid White Edgeline = 1.695 miles @ 27.8 Gal/Mile	47.1	
8" Solid Yellow Edgeline = 0.617 miles @ 55.6 Gal/Mile		34.3
<b>TOTAL GALLONS</b>	<b>56</b>	<b>63</b>

SD50 Clay County	White	Yellow
Solid Yellow Centerline = 2.959 miles @ 27.8 Gal/Mile		72.1
Yellow Center Turn Lane Dashes = 3.596 miles @ 7.6 Gal/Mile		27.3
Solid Yellow Center Turn Lane = 3.596 miles @ 27.8 Gal/Mile		100.0
Solid Yellow Areas for Turn Bays = 56.549 SqFt = 0.032 miles @ 27.8 Gal/Mile		1.0
Double Yellow for Turn Bays = 2 (4" line) x 0.986 miles @ 27.8 Gal/Mile		54.8
24" Yellow Hatches for Turn Bays= 0.022 miles @ 166.8 Gal/Mile		3.7
White Centerline Dashes 7.497 miles @ 7.6 Gal/Mile	57.0	
4" Solid White Edgeline = 7.197 miles @ 27.8 Gal/Mile	200.1	
Solid White Lane Lines = 0.341 miles @ 27.8 Gal/Mile	9.5	
<b>TOTAL GALLONS</b>	<b>267</b>	<b>259</b>

**PERMANENT PAVEMENT MARKING (CONTINUED)**

**TABLES OF PERMANENT PAVEMENT MARKING (CONTINUED)**

<b>SD50W Clay County</b>	<b>White</b>	<b>Yellow</b>
White Centerline Dashes = 0.659 miles @ 7.6 Gal/Mile	5.0	
4" Solid Yellow Edgelines Ramps = 1.039 miles @ 27.8 Gal/Mile		28.9
4" Solid White Edgelines Ramps = 1.025 miles @ 27.8 Gal/Mile	28.5	
<b>TOTAL GALLONS</b>	<b>34</b>	<b>29</b>

<b>SD50E Clay County</b>	<b>White</b>	<b>Yellow</b>
White Centerline Dashes = 0.579 miles @ 7.6 Gal/Mile	4.4	
Solid Yellow Centerline = . miles @ 27.8 Gal/Mile		
4" Solid Yellow Edgelines Ramps = 0. miles @ 27.8 Gal/Mile		27.4
24" Yellow Hatches for Turn Bays= 0.320 miles @ 166.8 Gal/Mile		5.3
4" Solid White Edgelines Ramps = 1.025 miles @ 27.8 Gal/Mile	28.5	
12" Solid White Edgelines Ramps = 0.087 miles @ 83.4 Gal/Mile	7.3	
<b>TOTAL GALLONS</b>	<b>40</b>	<b>33</b>

<b>SD50EF Crawford Road</b>	<b>White</b>	<b>Yellow</b>
Solid Yellow Centerline = 0.415 miles @ 27.8 Gal/Mile		11.5
4" Solid White Edgelines = 0.441 miles @ 27.8 Gal/Mile	12.3	
<b>TOTAL GALLONS</b>	<b>12</b>	<b>12</b>

<b>US81</b>	<b>White</b>	<b>Yellow</b>
Yellow Centerline Dashes = 2.355 miles @ 7.6 Gal/Mile		17.9
Solid Yellow Centerline = 1.386 miles @ 27.8 Gal/Mile		38.5
4" Solid White Edgelines = 4.692 miles @ 27.8 Gal/Mile	130.4	
<b>TOTAL GALLONS</b>	<b>130</b>	<b>56</b>

**RETROREFLECTIVITY FOR PAVEMENT MARKING PAINT**

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

If the Department chooses to take retroreflectivity readings, three readings will be taken on the edge lines and lane lines in the direction of application. For combination solid yellow and skip yellow lines for turn lanes and for centerline markings on two-way roadways, three readings will be taken in one direction, the reflectometer will be turned 180 degrees and three more readings will be taken. The six readings for the centerline markings will be averaged and become the test reading for that test location.

If the Department chooses to take readings, the minimum retroreflectivity values will be 275 mc/m2/lux for white and 170 mc/m2/lux for yellow.

**GENERAL MAINTENANCE OF TRAFFIC**

Flaggers and a pilot car will be used when traffic must be routed out of its normal lane for a distance greater than the two flaggers are able to communicate with each other.

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

Routing traffic onto gravel or asphalt shoulders during any phase of the construction will not be allowed. Damage to the shoulders due to the Contractor's operation will be repaired by the Contractor, to the satisfaction of the Engineer, at no expense to the State.

Overnight lane closures will not be allowed.

Regulatory signs will have a mounting height of five feet above the pavement even if mounted on portable supports.

Traffic control signs have been included in a table for each route. Payment will only be for those signs used on each route.

All construction operations will be conducted in the general direction of traffic movement. If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD, whichever is more stringent will be used, as determined by the Engineer.

A mobile work operation will be allowed provided the rumble strip or rumble stripe grooving, flush sealing, and pavement marking can be completed satisfactorily by a continuously moving work operation. A mobile work operation will require approval by the Engineer.

**TRAFFIC CONTROL SIGNS**

Traffic control signs have been included in a table for each route.

# FURNISHING AND APPLYING PAVEMENT MARKING PAINT

## PAVEMENT MARKING

Application rates shall be as follows:

DIVIDED ROADWAY	UNDIVIDED ROADWAY		
	Four Lane Roadway	Two Lane Roadway	
(Rates for one line)	(Rates for one line)	(Rate for one line)	
Solid Yellow Edgeline Rate = 22.5 Gals./Pass-Mile	Solid Yellow Centerline Rate = 22.5 Gals./Pass-Mile	Dashed Yellow Centerline Rate = 6.2 Gals./Pass-Mile	
Dashed White Centerline Rate = 6.2 Gals./Pass-Mile	Dashed White Laneline Rate = 6.2 Gals./Pass-Mile	Solid Yellow Centerline Rate = 22.5 Gals./Pass-Mile	
Solid White Edgeline (Not applicable in curb and gutter) Rate = 22.5 Gals./Pass-Mile	Solid White Edgeline (Not applicable in curb and gutter) Rate = 22.5 Gals./Pass-Mile	Solid White Edgeline - 4" Rate = 22.5 Gals./Pass-Mile	Solid White Edgeline - 8" Rate = 45 Gals./Pass-Mile
Glass Beads = 8 Lbs./Gal.	Glass Beads = 8 Lbs./Gal.	Glass Beads = 8 Lbs./Gal.	Glass Beads = 8 Lbs./Gal.

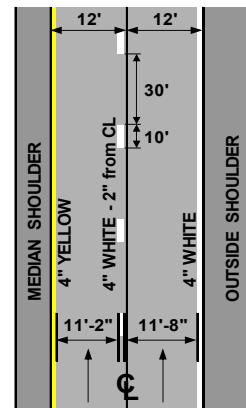
Typical pavement marking shall be applied throughout the applicable sections of roadway.

vehicle shall be equipped with flashing amber lights or advance

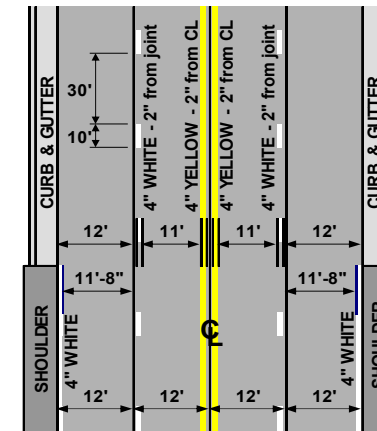
PROJECTS	ESTIMATED QUANTITIES	
	WHITE	YELLOW
SD11	608	296
SD37P	58	62
SD46W	521	207
SD48W	378	181
SD48E	316	167
SD50 BH	513	214
SD50W BH	54	62
SD50E BH	56	63
SD50 Clay	267	259
SD50W Clay	34	29
SD50E Clay	40	33
SD50 EF Crawford	12	12
US81	130	56
<b>TOTALS:</b>	<b>2987 GALLONS</b>	<b>1641 GALLONS</b>

## PAVEMENT MARKING

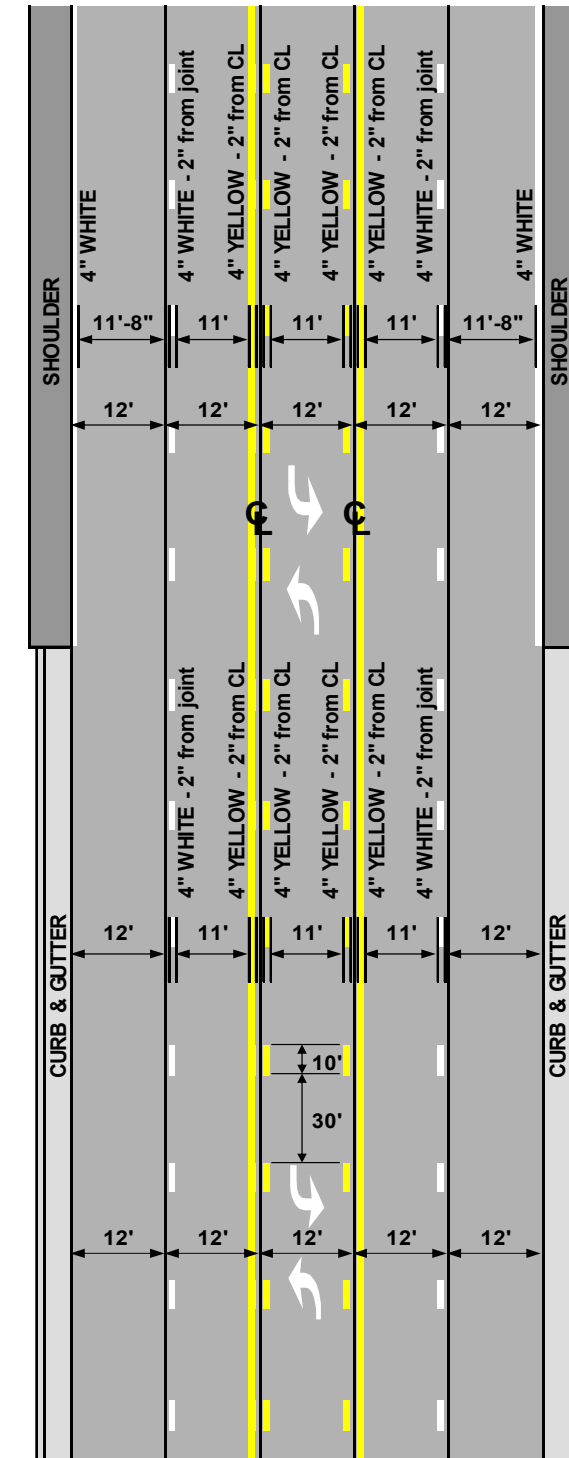
DIVIDED ROADWAY  
(ONE DIRECTION SHOWN)



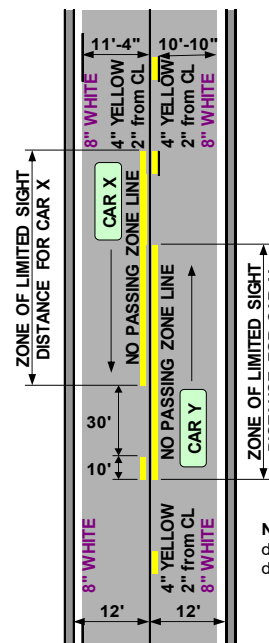
UNDIVIDED ROADWAY



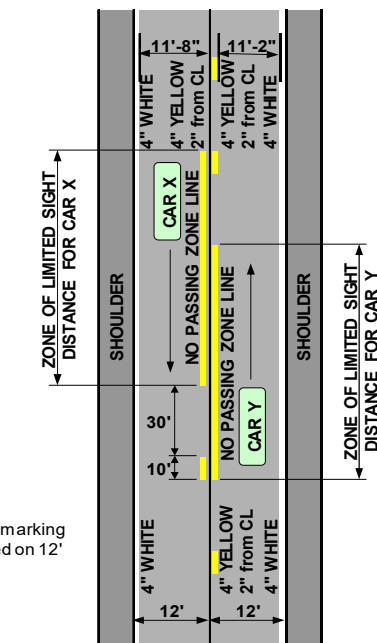
FOUR LANE ROADWAY  
WITH CENTER TURN LANE



UNDIVIDED ROADWAY

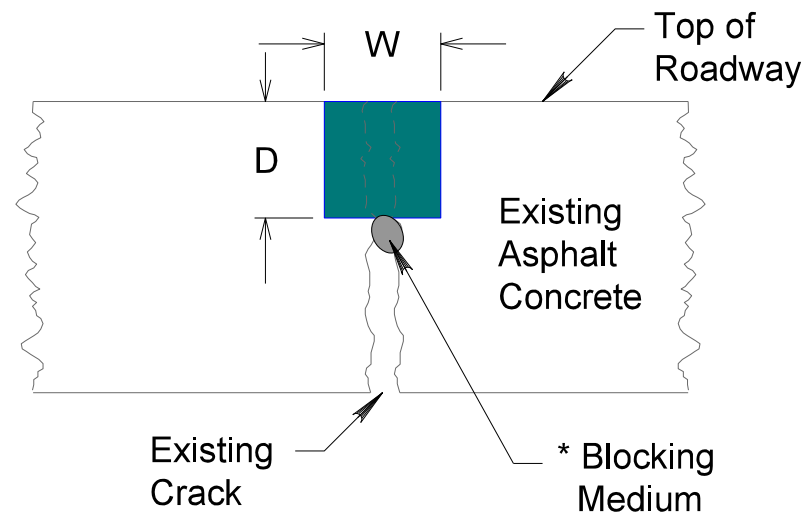


UNDIVIDED ROADWAY



NOTE: All pavement marking dimensions are based on 12' driving lanes.

## TYPICAL RESERVOIR SECTION



\* Inert compressible material required for cracks 3/8" or more in width. The backer rod will be a nonmoisture absorbing, resilient material approximately 25 percent larger in diameter than the width of the joint to be sealed. The backer rod will be compatible with the sealant and no bond or reaction will occur between the rod and the sealant.

D & W = 3/4"

Recommended Backer Rod Diameter for Joint Width	
Joint Width	Rod Diameter
3/16" - 1/4"	3/8"
1/4" - 3/8"	1/2"
3/8" - 1/2"	5/8"
5/8" - 3/4"	7/8"
3/4" - 7/8"	1"
7/8" - 1"	1 1/4"
1" - 1 1/4"	1 1/2"
1 1/4" - 1 1/2"	2"

# ITEMIZED LISTS FOR TRAFFIC CONTROL

**SD50 Clay County, SD50W Clay County and SD50E Clay County routes:**

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
<b>CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT</b>					<b>169.0</b>

**All remaining routes:**

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
<b>CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT</b>					<b>105.0</b>



Plotting Date: 02/27/2024

PLOT SCALE - 1:200

PLOT NAME - 1

\* Messages on signs will vary depending on the operation being conducted.

Vehicle-mounted signs will be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs will be covered or turned from view when work is not in progress.

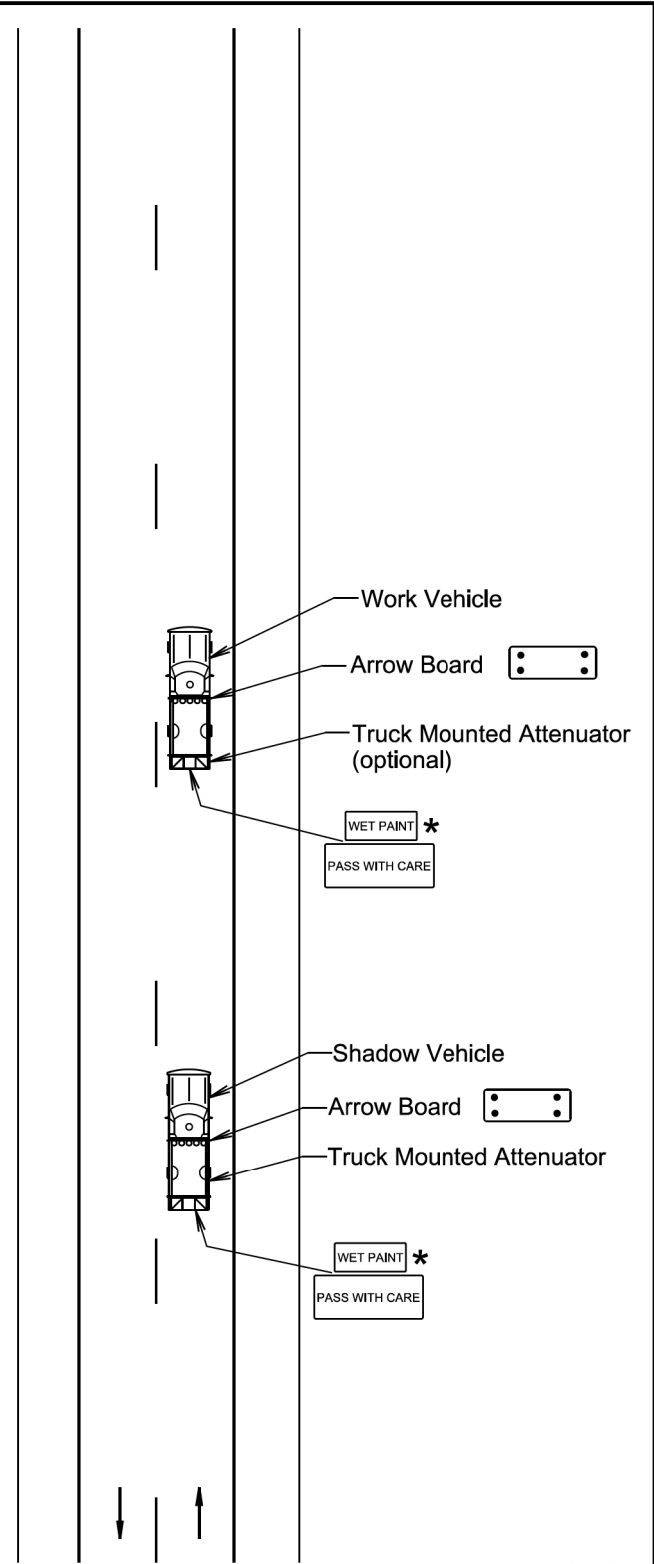
Shadow and Work vehicles will display high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow boards.

Vehicle hazard warning signals will not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

When an arrow board is used, it will be used in the caution mode. Marching Diamonds are acceptable.

Arrow boards will, as a minimum, be Type B, with a size of 60" x 30".

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



January 22, 2021

<b>S D D O T</b>	<b>MOBILE OPERATIONS ON 2-LANE ROAD</b>	PLATE NUMBER <b>634.06</b>
		Sheet 1 of 1

Published Date: 2024

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	25
35 - 40	350	25
45	500	25
50	500	50
55	750	50
60 - 65	1000	50

Flagger  
 Channelizing Device

For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used.

The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) will be displayed in advance of the liquid asphalt areas.

Flashing warning lights and/or flags may be used to call attention to the advance warning signs.

The channelizing devices will be drums or 42" cones.

Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.

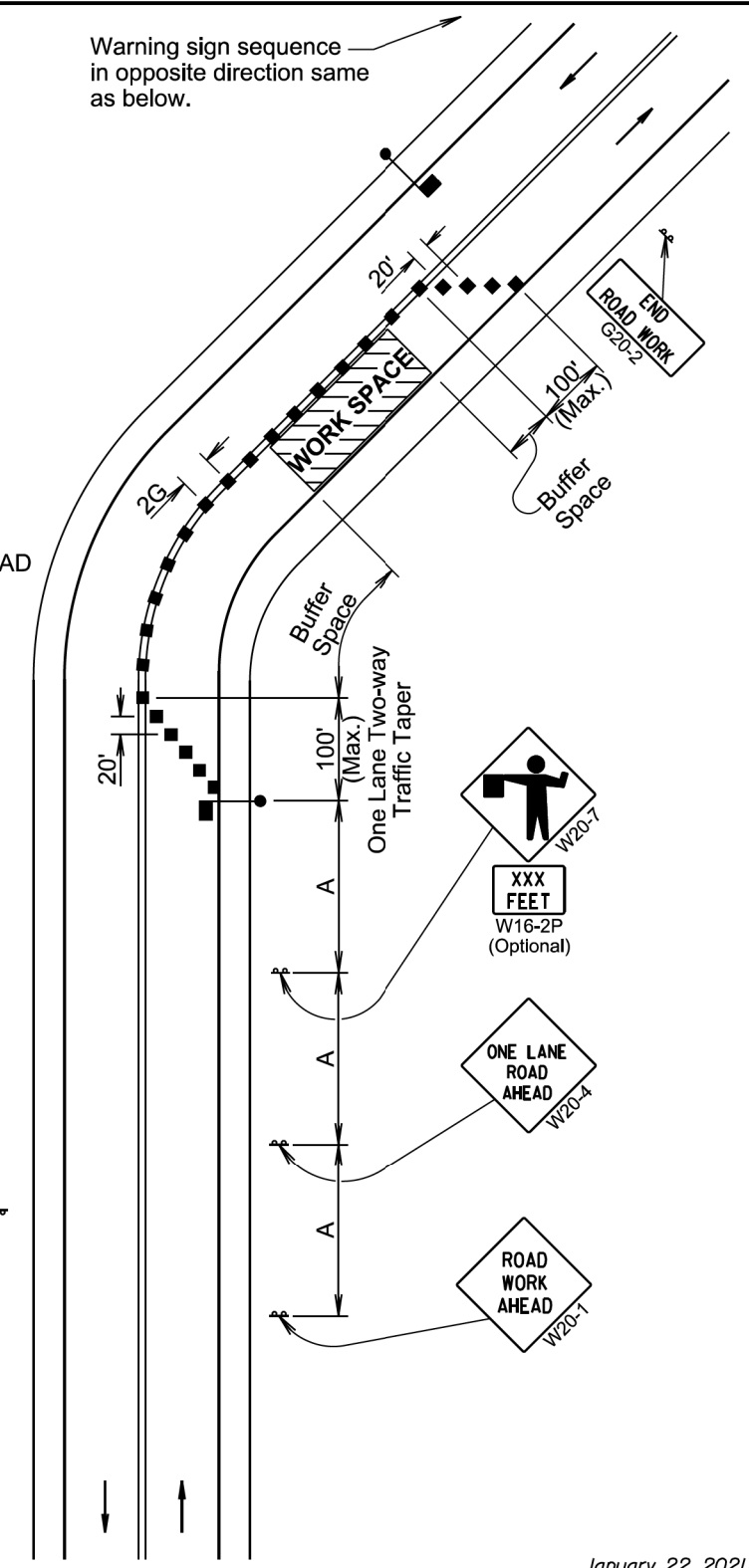
Channelizing devices and flaggers will be used at intersecting roads to control intersecting road traffic as required.

The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

The length of A may be adjusted to fit field conditions.

<b>S D D O T</b>	<b>LANE CLOSURE WITH FLAGGER PROVIDED</b>	PLATE NUMBER <b>634.23</b>
		Sheet 1 of 1

Published Date: 2024



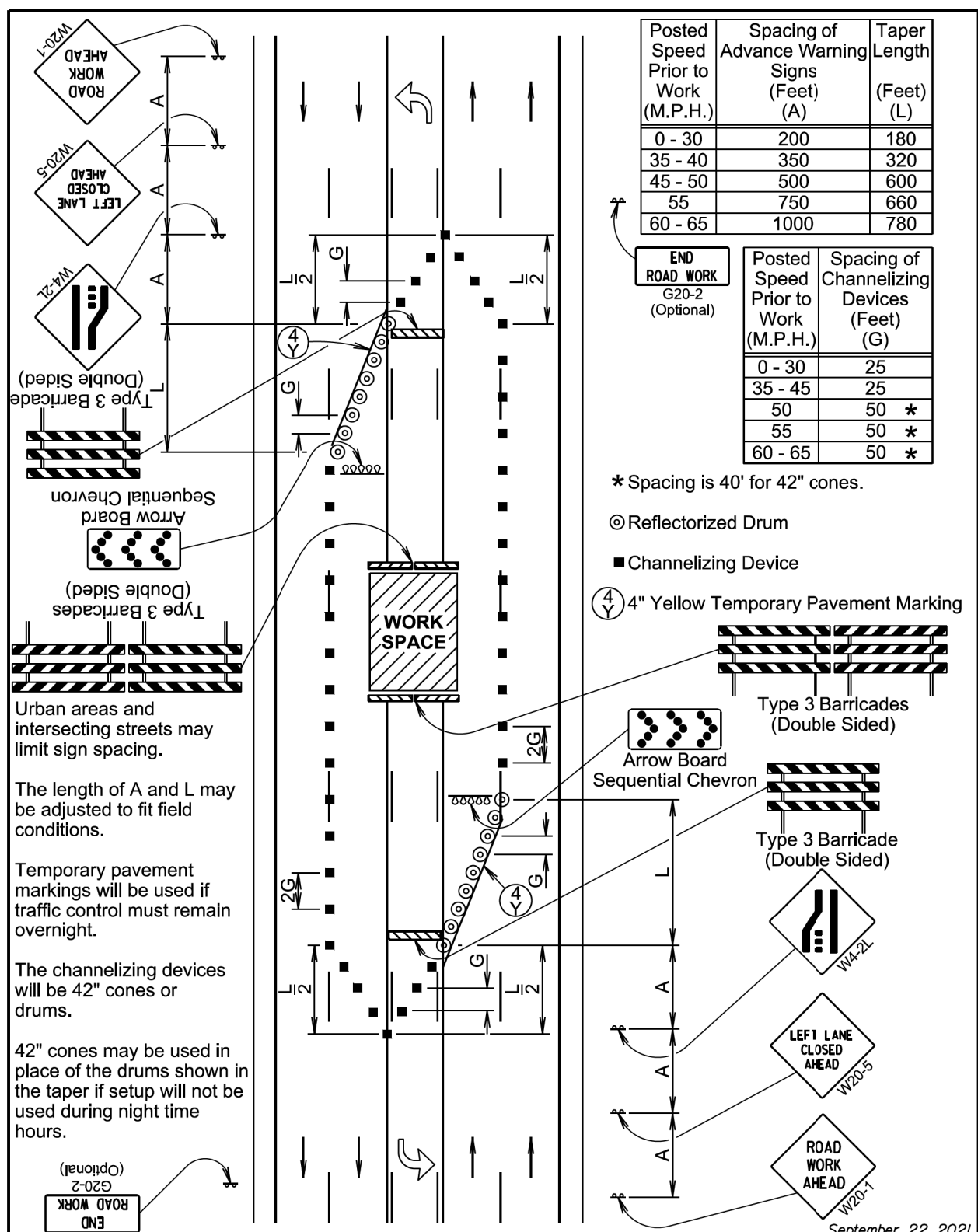
January 22, 2021

PLOTTED FROM - TRMLINT15

FILE - ... \CRACK SEALS\STD 634 PLATES.DGN

Plotting Date: 02/27/2024

PLOT SCALE - 1:200



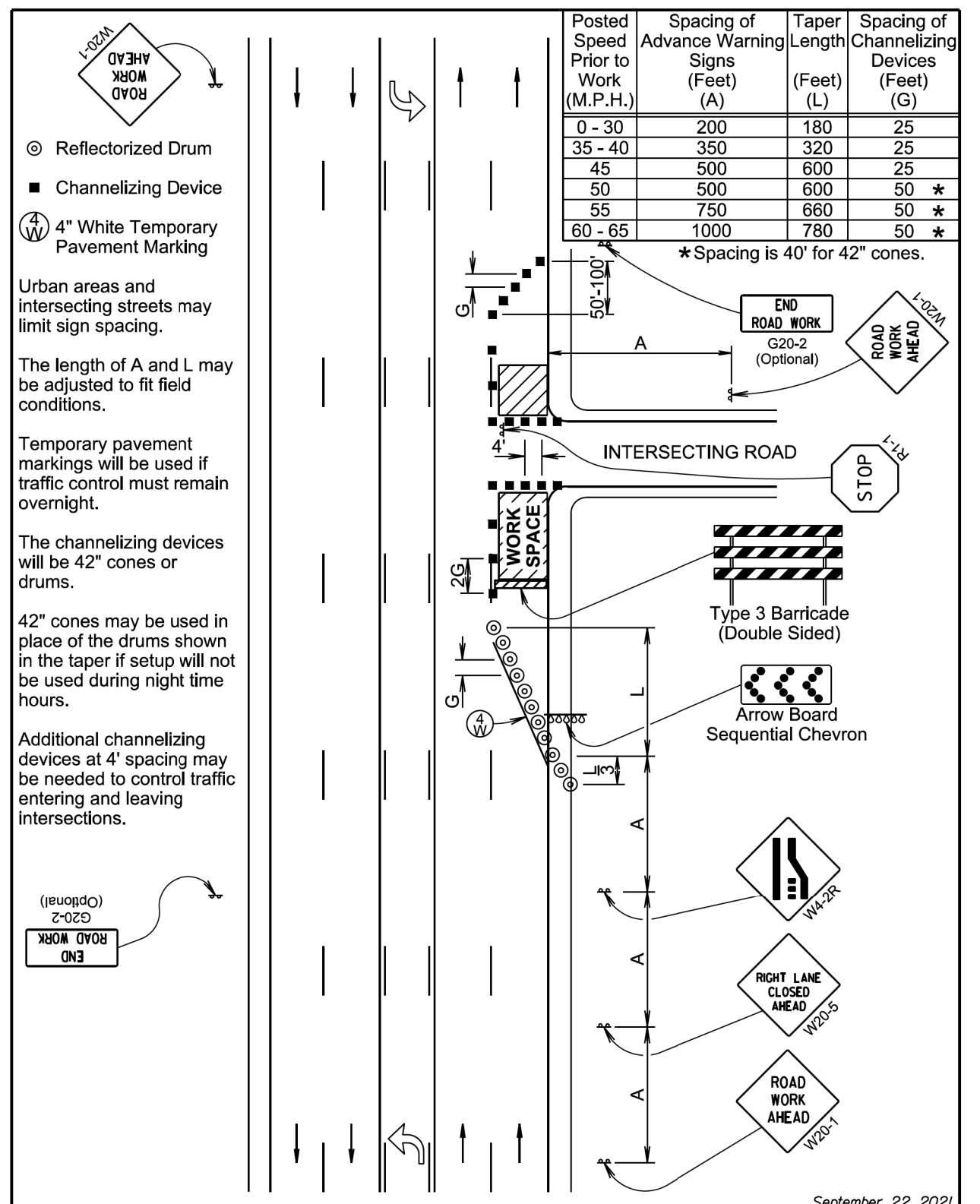
September 22, 2021

<b>S D D O T</b>	<b>5-LANE, CENTER 3 LANES CLOSED</b>	PLATE NUMBER <b>634.57</b>
	Published Date: 2024	Sheet 1 of 1

PLOT NAME - 2

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PLOTTED FROM - TRMLINT15



September 22, 2021

<b>S D D O T</b>	<b>5-LANE, OUTSIDE LANE CLOSED</b>	PLATE NUMBER <b>634.60</b>
	Published Date: 2024	Sheet 1 of 1