

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-PH-EM 0046(60)347	1	32

Plotting Date: 04/12/2021

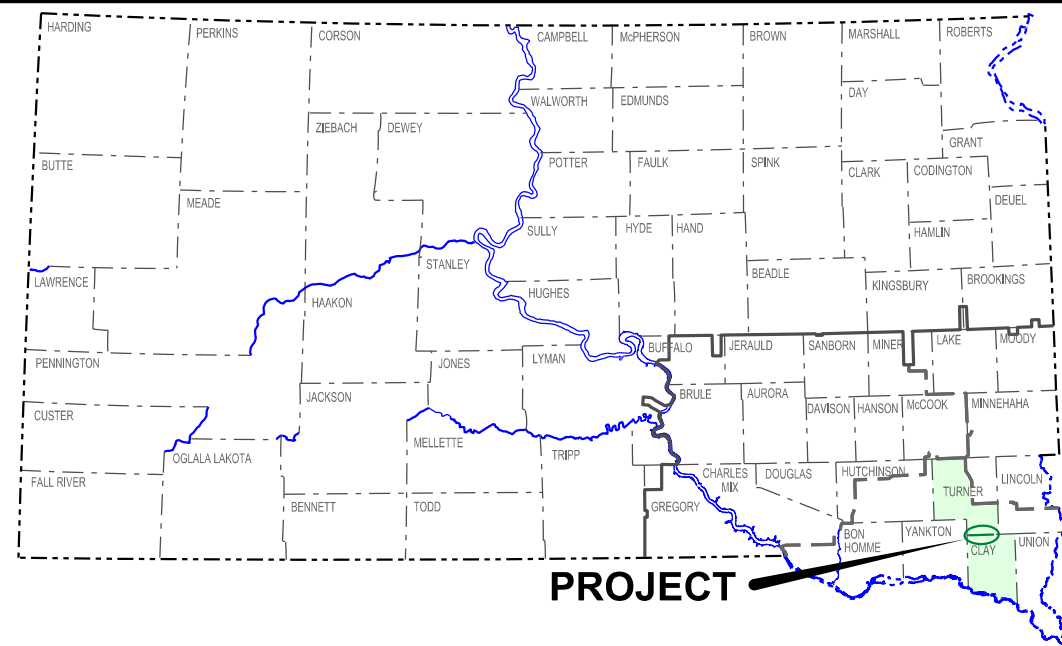
PLANS FOR PROPOSED
PROJECT
P-PH-EM 0046(60)347
SD HIGHWAY 46
TURNER & CLAY COUNTIES

COLD MILLING ASPHALT CONCRETE,
ASPHALT CONCRETE RESURFACING &
PAVEMENT MARKING
PCN 07L2

INDEX OF SHEETS

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PLOT SCALE - 1"=7000'



PROJECT

DESIGN DESIGNATION

ADT(2019)	3,261
ADT(2039)	4,301
DHV	496
D	51%
T DHV	4.5%
T ADT	9.9%
V (Rural)	65 MPH
V (Irene)	25/40 MPH

COLD MILLING & ASPHALT CONCRETE RESURFACING EXCEPTIONS

Sta. 51+46 to Sta. 94+12
Sta. 112+36 to Sta. 134+68
Sta. 206+45 to Sta. 251+90
Sta. 281+00 to Sta. 328+00

STORM WATER PERMIT (NON REQUIRED)

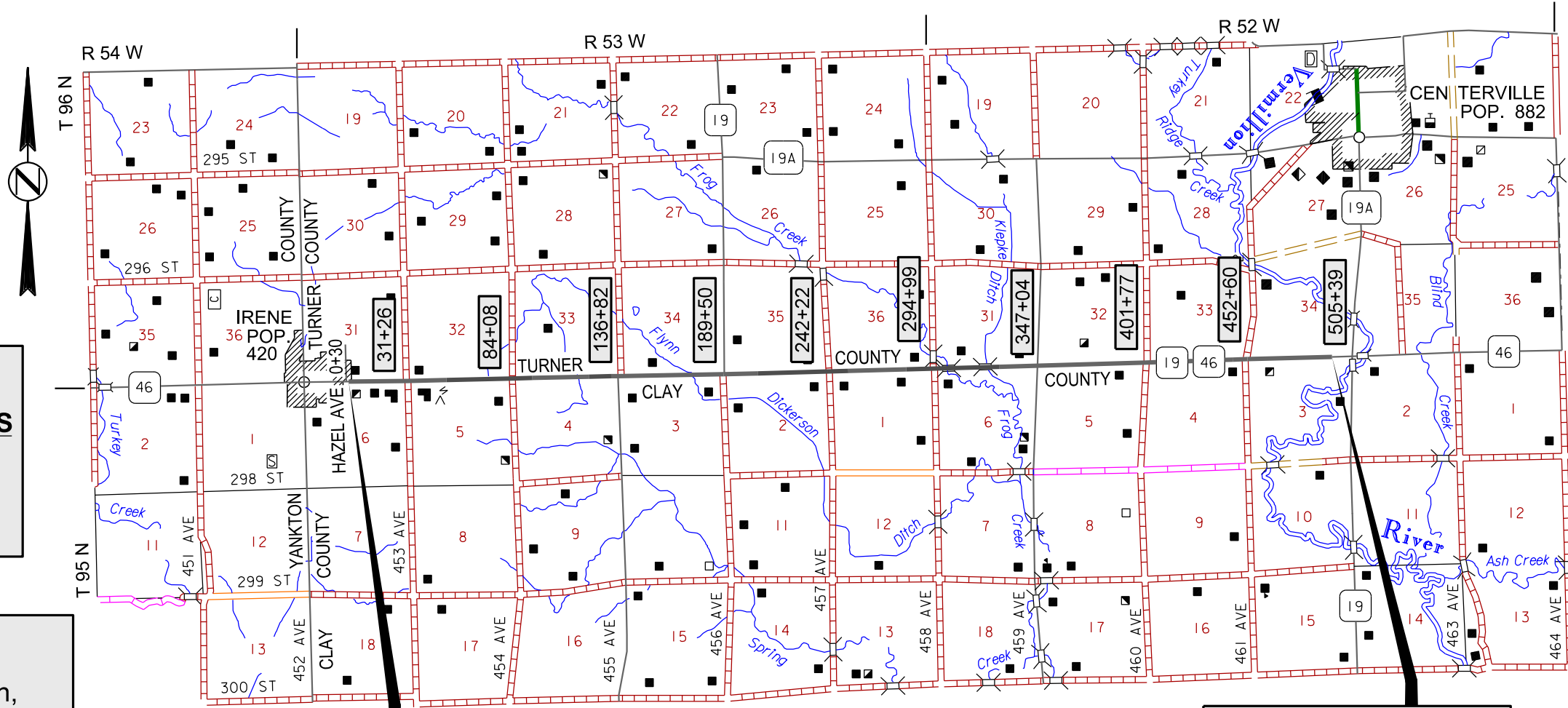
Receiving Waters: Klepke Ditch, Flynn Dickerson Ditch, Frog Creek & Vermillion River

Area Disturbed: 0 Acres

Total Project Area: 170 Acres

Latitude: 43.0832 (Google Maps)

Longitude: -97.1522 (Google Maps)



BEGIN PROJECT

STA. 1+10
MRM 347.60 +0.015
MILEAGE 69.955
(80' E of Q Hazel Ave)

PROJECT LENGTH

Gross Length:	49,407'	9.357 Miles
Milling & Resurfacing		
Exception Length:	15,743'	2.981 Miles
Net Length:	33,664'	6.376 Miles

END PROJECT

STA. 495+17
MRM 356.00 +0.395
MILEAGE 79.312
(1022' W of Q Jct SD19)

3

September 15, 2021

PLOTTED FROM - TRMLINT15

FILE - ... \PRJ2022\CLAY07L2\T1T107L2.DGN

ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT P-PH-EM 0046(60)347	SHEET 2	TOTAL SHEETS 32
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Rev 4-23-21 MR

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E1010	Remove Asphalt Concrete Pavement	478.0	SqYd
120E0100	Unclassified Excavation, Digouts	318	CuYd
260E1010	Base Course	1,327.0	Ton
320E0005	PG 58-34 Asphalt Binder	857.4	Ton
320E1200	Asphalt Concrete Composite	160.0	Ton
320E1203	Class Q3R Hot Mixed Asphalt Concrete	16,844.0	Ton
320E1800	Asphalt Concrete Blade Laid	982.0	Ton
320E4000	Hydrated Lime	176.3	Ton
320E7012	Grind 12" Rumble Strip or Stripe in Asphalt Concrete	12.8	Mile
320E7030	Grind Sinusoidal Centerline Rumble Stripe in Asphalt Concrete	9.4	Mile
330E0100	SS-1h or CSS-1h Asphalt for Tack	76.6	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	35.5	Ton
330E2000	Sand for Flush Seal	379.0	Ton
332E0010	Cold Milling Asphalt Concrete	157,244	SqYd
600E0300	Type III Field Laboratory	1	Each
633E0235	Preformed Thermoplastic Pavement Marking, Arrow	9	Each
633E1200	High Build Waterborne Pavement Marking Paint, White	425	Gal
633E1205	High Build Waterborne Pavement Marking Paint, Yellow	166	Gal
633E5025	Grooving for Cold Applied Plastic Pavement Marking, Arrow	9	Each
634E0010	Flagging	320.0	Hour
634E0020	Pilot Car	160.0	Hour
634E0110	Traffic Control Signs	527.6	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0630	Temporary Pavement Marking	25.4	Mile
900E0022	Remove and Reset Mailbox	13	Each
900E1980	Storage Unit	1	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

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. 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 C: WATER SOURCE

The Contractor will not withdraw water with equipment previously used outside the State of South Dakota or previously used in aquatic invasive species waters within South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment to prevent and control the introduction and spread of invasive species into the project vicinity.

The Contractor will not withdraw water directly from streams of the James, Big Sioux, and Vermillion watersheds without prior approval from the SDDOT Environmental Office.

Action Taken/Required:

The Contractor will obtain the necessary permits from the regulatory agencies such as the South Dakota Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (USACE) prior to water extraction activities.

Additional information and mapping of water sources impacted by Aquatic Invasive Species in South Dakota can be accessed at:

< <http://sdleastwanted.com/maps/default.aspx> >

< [South Dakota Administrative Rule 41:10:04 Aquatic Invasive Species: https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04](https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04) >

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

The Contractor will furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not 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 of time not to exceed the duration of the project. Prior to project completion, the waste must 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: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical 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 of 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.

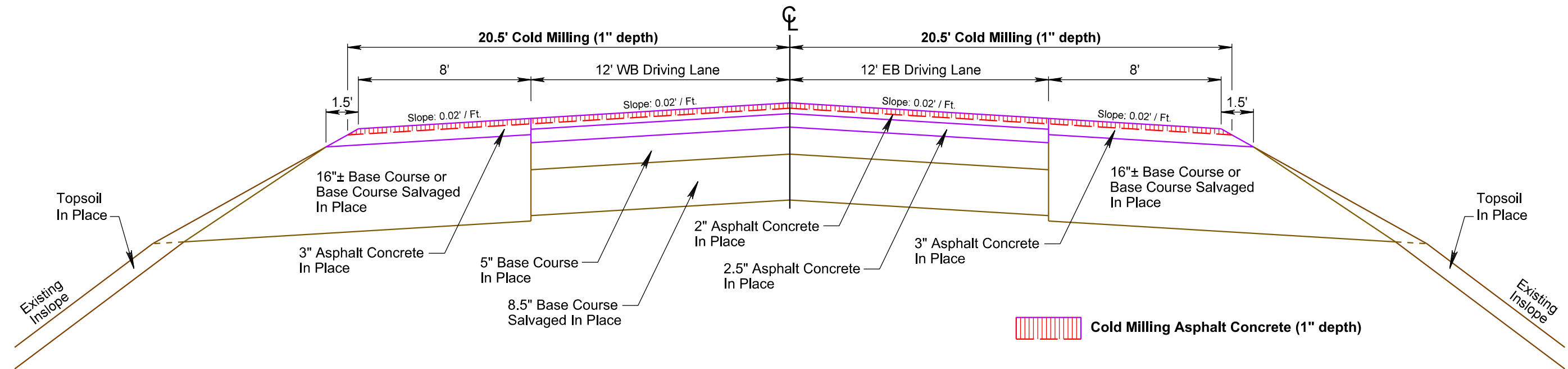
In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities within 100 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately 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.

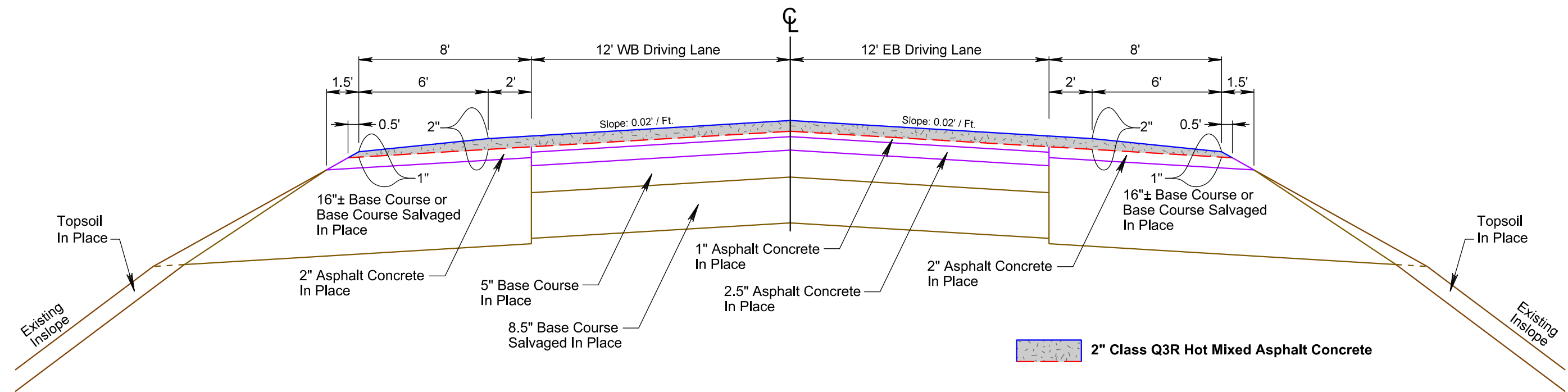
TYPICAL COLD MILLING SECTION

SECTION 1

RURAL TWO LANE
 1+10 to 51+46
 94+12 to 112+36
 144+26 to 179+74
 197+31 to 206+45
 251+90 to 281+00
 328+00 to 495+17



TYPICAL RESURFACING SECTION



PLOT SCALE - 1:5

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PLOT NAME - 2

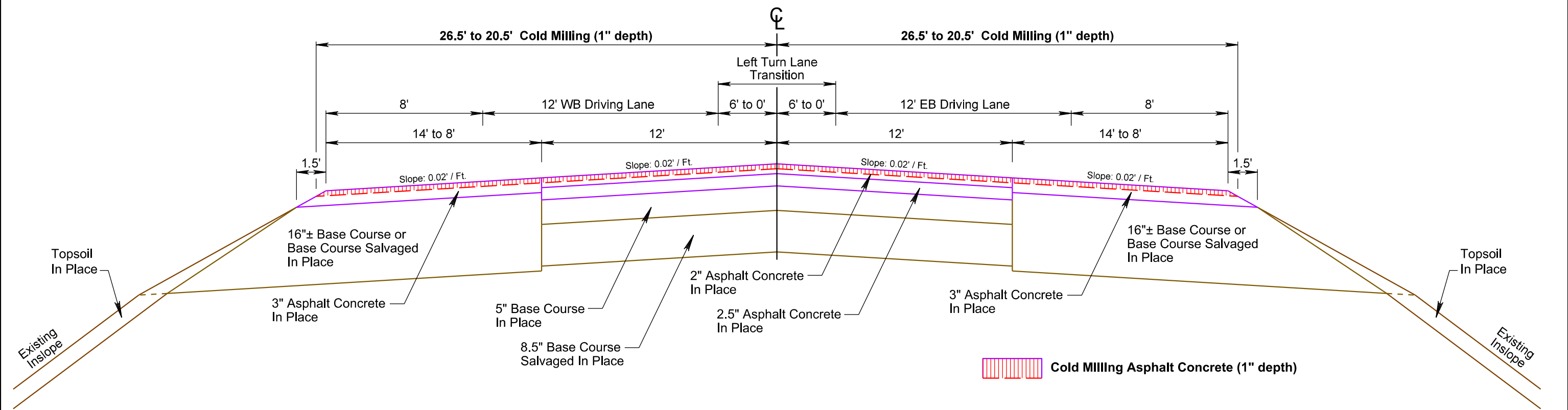
TYPICAL COLD MILLING SECTION

SECTION 1

RURAL TWO LANE AT LEFT TURN LANE TRANSITION
140+36 to 144+26

PLOT SCALE - 1:5

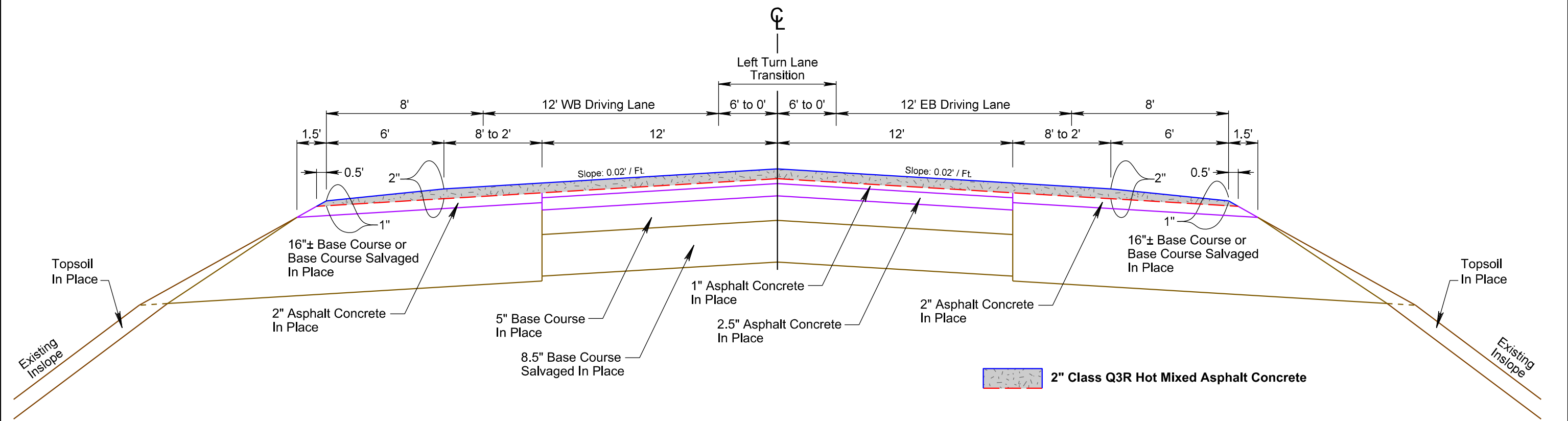
PLOT NAME - 3



TYPICAL RESURFACING SECTION

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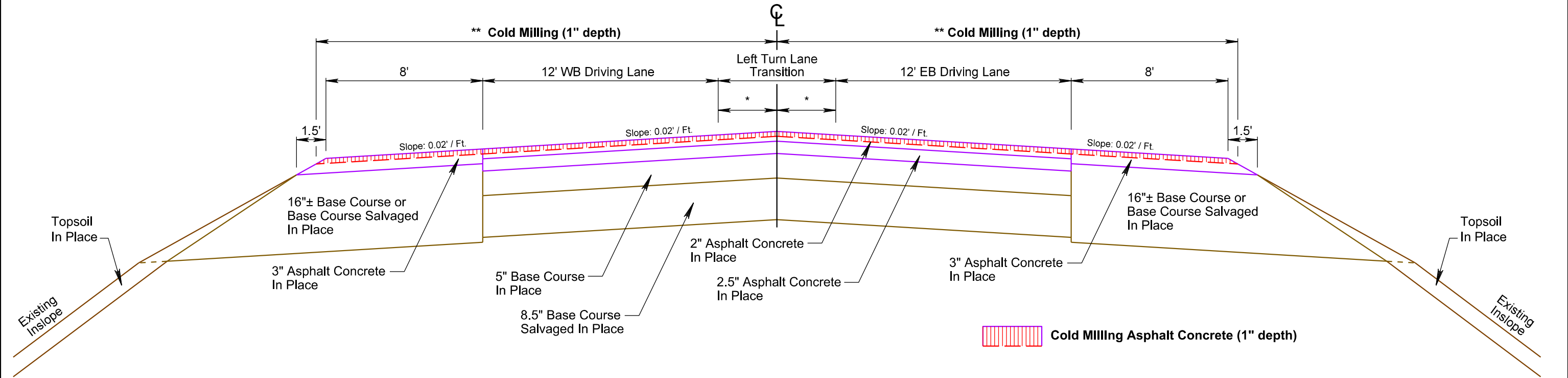
TYPICAL COLD MILLING SECTION

SECTION 1

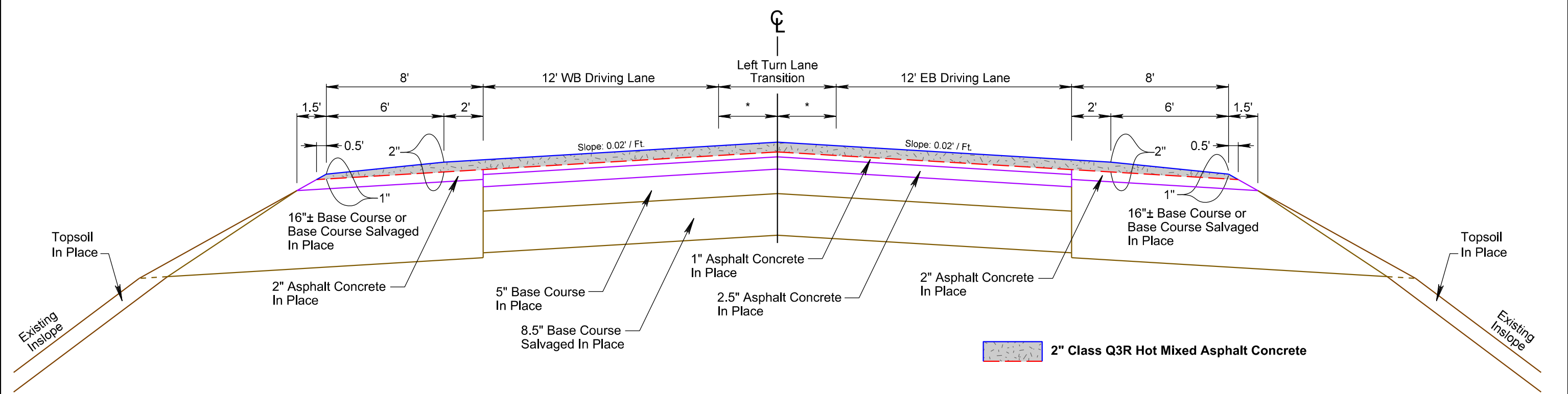
RURAL TWO LANE AT LEFT TURN LANE TRANSITIONS
 179+74 to 183+64 (*0 to 6', **20.5' to 26.5')
 193+41 to 197+31 (*6' to 0', **26.5' to 20.5')

PLOT SCALE - 1:5

PLOT NAME - 4



TYPICAL RESURFACING SECTION



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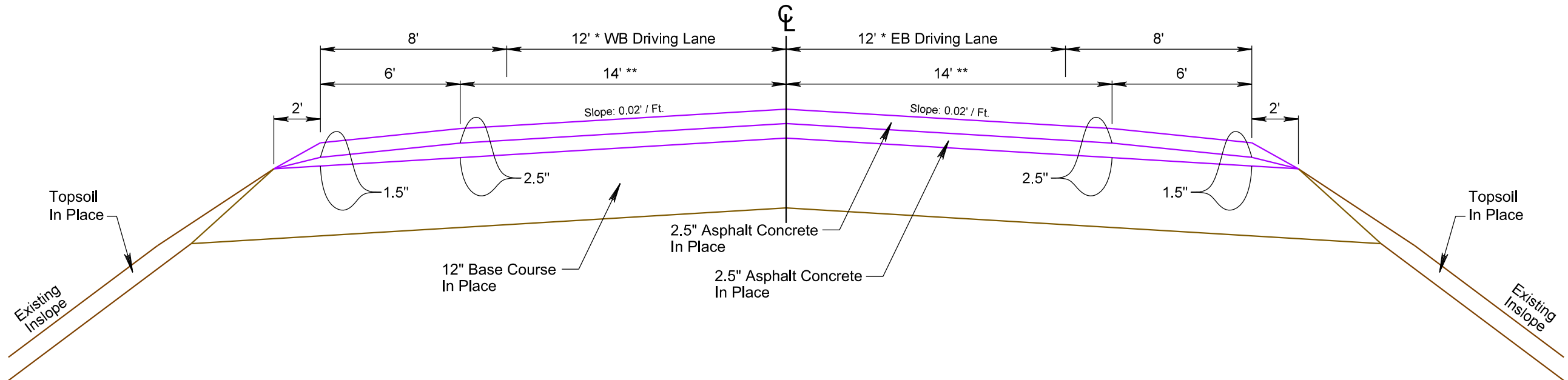
TYPICAL EXISTING SECTION (RESURFACING EXCEPTION)

SECTION 2

RURAL TWO LANE
 51+46 to 94+12
 112+36 to 133+90
 206+45 to 251+90
 281+00 to 328+00

Transitions:

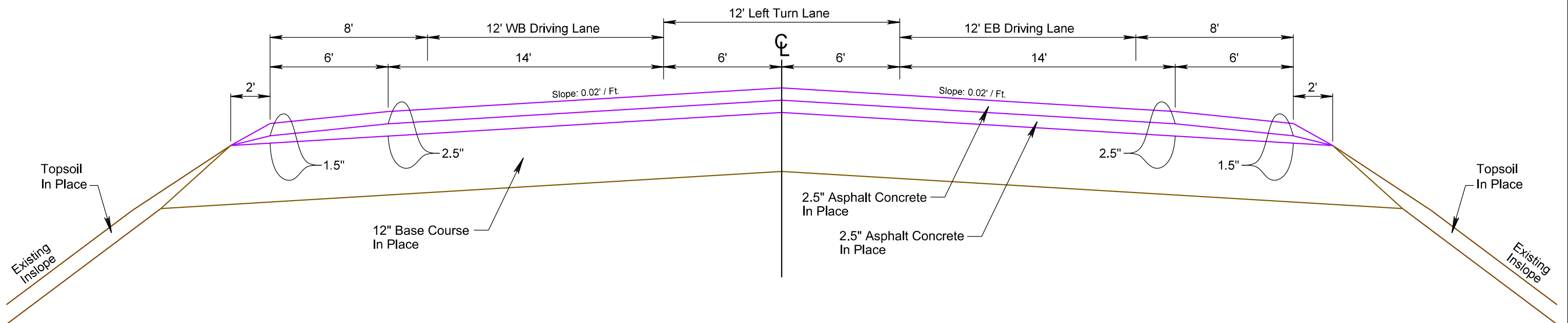
Just West of Jct 455th Ave (136+82) * 12' to 18' ** 14' to 20'



TYPICAL EXISTING SECTION (RESURFACING EXCEPTION)

SECTION 3

RURAL TWO LANE WITH LEFT TURN LANE
 133+90 to 134+68



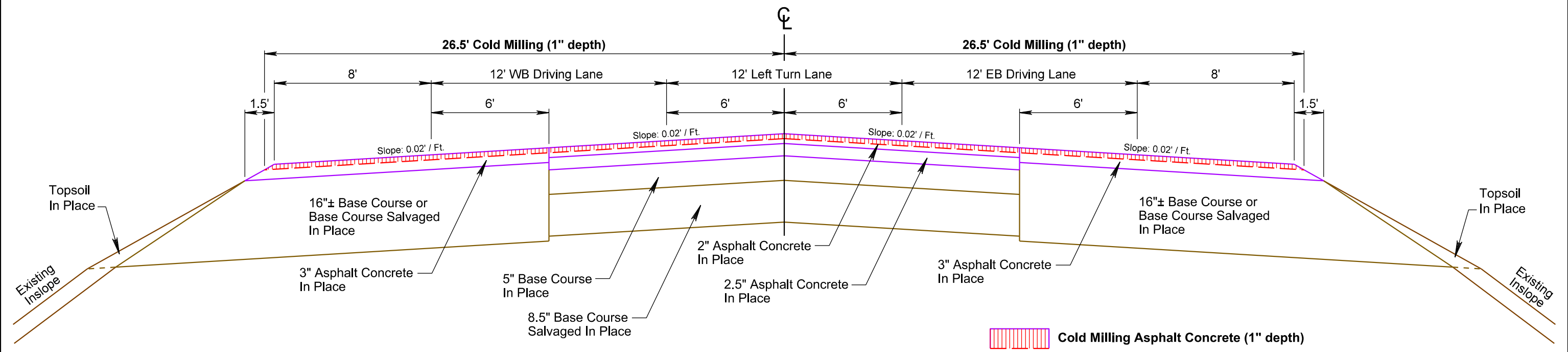
TYPICAL COLD MILLING SECTION

SECTION 4

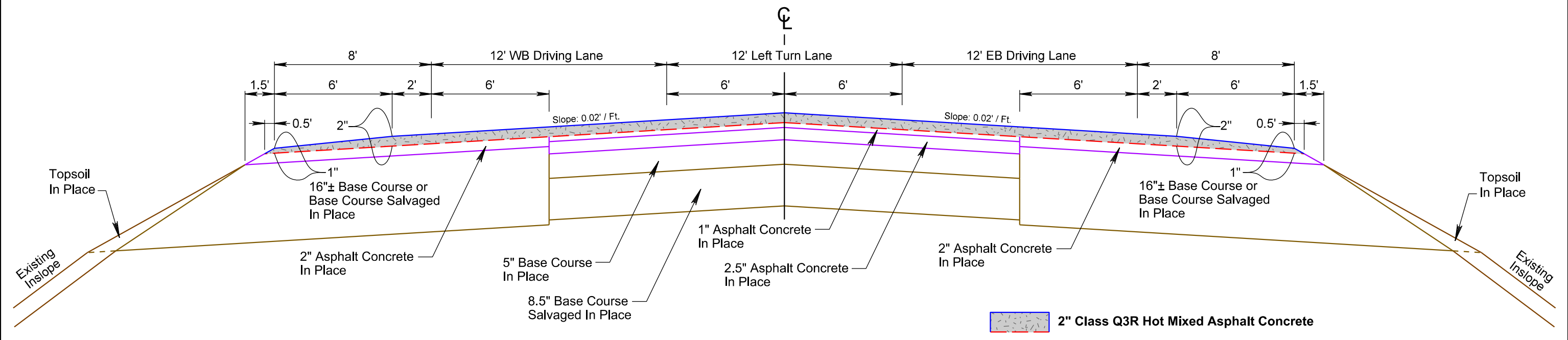
RURAL TWO LANE WITH LEFT TURN LANE
134+68 to 140+36

PLOT SCALE - 1+5

PLOT NAME - 6



TYPICAL RESURFACING SECTION



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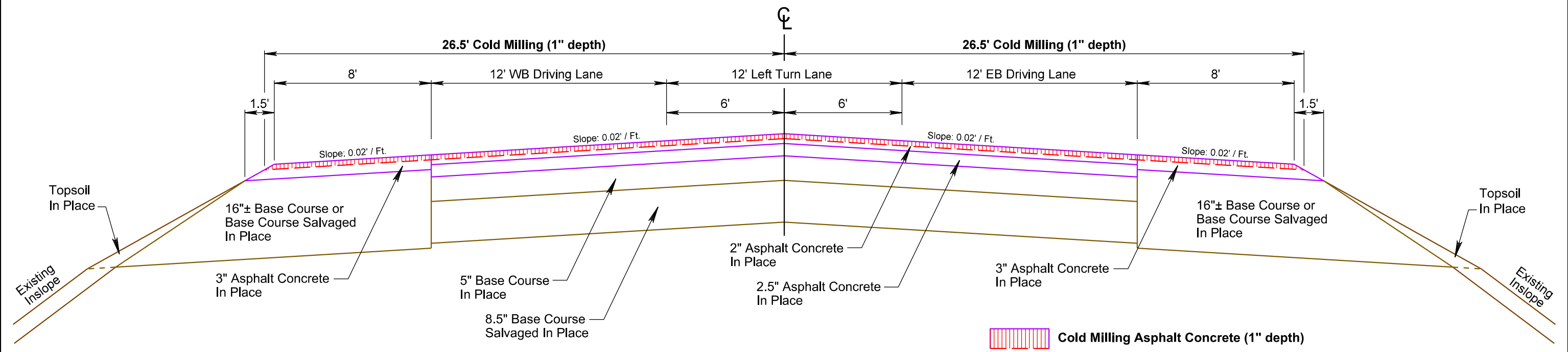
TYPICAL COLD MILLING SECTION

SECTION 5

RURAL TWO LANE WITH LEFT TURN LANE
183+64 to 193+41

PLOT SCALE - 1:5

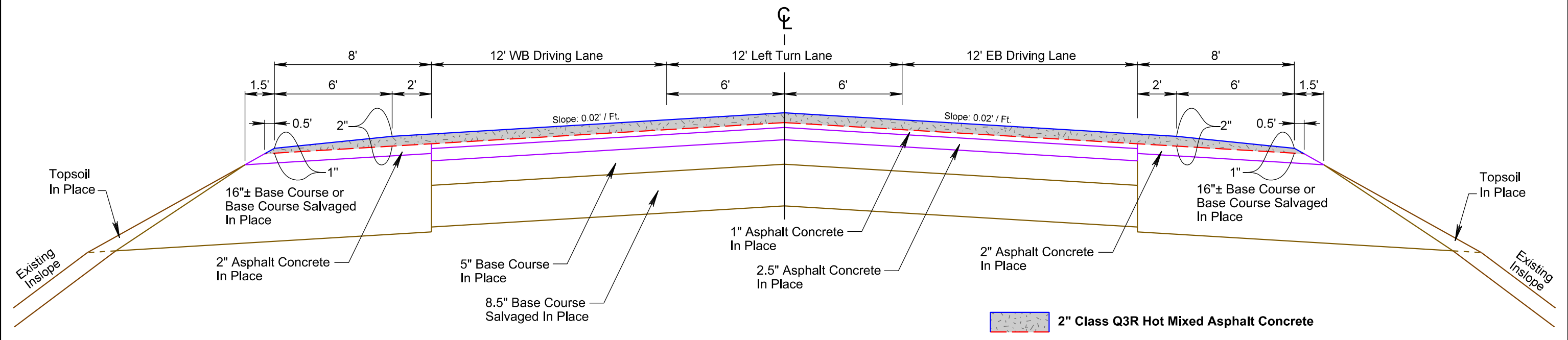
PLOT NAME - 7



TYPICAL RESURFACING SECTION

PLOTTED FROM - TRMLINT15

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RATES OF MATERIALS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-PH-EM 0046(60)347	10	32

Section 1

Rural Two Lane

1+10.00 to 51+46.00
 94+12.00 to 112+36.00
 140+36.00 to 183+64.00
 193+41.00 to 206+45.00
 251+90.00 to 281+00.00
 328+00.00 to 495+17.00

The Estimate of quantities is based on the following quantities of materials per mile.

SS-1h or CSS-1h Asphalt for Tack at the rate of 3.7 tons applied 25 feet wide (Rate = 0.06 gallon per square yard).

SS-1h or CSS-1h Asphalt for Tack at the rate of 4 tons applied 18 feet wide (9 feet wide each shoulder) (Rate = 0.09 gallon per square yard).

2" CLASS Q3R HOT MIXED ASPHALT CONCRETE

Salvaged Asphalt Concrete	463 Tons
Crushed Aggregate	1849 Tons
PG 58-34 Asphalt Binder	114 Tons
	TOTAL: 2426 Tons
Hydrated Lime	24 Tons
	TOTAL: 2450 Tons

The exact proportions of these materials will be determined on construction.

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 5.4 tons applied 43 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 56 tons applied 24 feet wide (Rate = 8 pounds per square yard).

Section 2

Rural Two Lane (Exception Area)

51+46.00 to 94+12.00
 112+36.00 to 133+90.00
 206+45.00 to 251+90.00
 281+00.00 to 328+00.00

Section 3

Rural Two Lane with Left Turn Lane (Exception Area)

133+90.00 to 134+68.00

Section 4

Rural Two Lane with Left Turn Lane

134+68.00 to 140+36.00

The Estimate of quantities is based on the following quantities of materials per station.

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.07 ton applied 25 feet wide (Rate = 0.06 gallon per square yard).

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.12 ton applied 30 feet wide (15 feet wide each shoulder) (Rate = 0.09 gallon per square yard).

2" CLASS Q3R HOT MIXED ASPHALT CONCRETE

Salvaged Asphalt Concrete	11.58 Tons
Crushed Aggregate	46.31 Tons
PG 58-34 Asphalt Binder	2.85 Tons
	TOTAL: 60.74 Tons
Hydrated Lime	0.61 Ton
	TOTAL: 61.35 Tons

The exact proportions of these materials will be determined on construction.

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 0.13 ton applied 55 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 1.6 tons applied 36 feet wide (Rate = 8 pounds per square yard).

Section 5

Rural Two Lane with Left Turn Lane

183+64.00 to 193+41.00

The Estimate of quantities is based on the following quantities of materials per station.

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.1 ton applied 37 feet wide (Rate = 0.06 gallon per square yard).

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.08 ton applied 18 feet wide (9 feet wide each shoulder) (Rate = 0.09 gallon per square yard).

2" CLASS Q3R HOT MIXED ASPHALT CONCRETE

Salvaged Asphalt Concrete	11.58 Tons
Crushed Aggregate	46.31 Tons
PG 58-34 Asphalt Binder	2.85 Tons
	TOTAL: 60.74 Tons
Hydrated Lime	0.61 Ton
	TOTAL: 61.35 Tons

The exact proportions of these materials will be determined on construction.

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 0.13 ton applied 55 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 1.6 tons applied 36 feet wide (Rate = 8 pounds per square yard).

SUMMARY OF ASPHALT CONCRETE

	ASPHALT CONCRETE COMPOSITE	ASPHALT CONCRETE BLADE LAID	CLASS Q3R HOT MIXED ASPHALT CONCRETE	CLASS Q3R HOT MIXED ASPHALT CONCRETE
	COMPACTION WITHOUT SPECIFIED DENSITY TONS	COMPACTION WITHOUT SPECIFIED DENSITY TONS	COMPACTION WITH SPECIFIED DENSITY TONS	COMPACTION WITHOUT SPECIFIED DENSITY TONS
Section 1				
24' Finished Roadway Surface	-	-	9602	-
Shoulders	-	-	-	5301
Backfilling Digouts	152	-	-	-
Add Quans for spot leveling and tight blading	-	912	-	608
Section 4				
36' Finished Roadway Surface	-	-	254	-
Shoulders	-	-	-	94
Backfilling Digouts	3	-	-	-
Add Quans for spot leveling and tight blading	-	24	-	11
Section 5				
36' Finished Roadway Surface	-	-	438	-
Shoulders	-	-	-	161
Backfilling Digouts	5	-	-	-
Add Quans for spot leveling and tight blading	-	42	-	18
Table of Additional Quantities				
Mainline Transitions	-	4	90	-
Intersecting Roads & Entrances	-	-	-	267
Additional Totals:	-	4	90	267
Totals:	160	982	10384	6460

10384 TONS ASPHALT CONCRETE COMPACTION WITH SPECIFIED DENSITY 7602 TONS ASPHALT CONCRETE COMPACTION WITHOUT SPECIFIED DENSITY 17986 TONS TOTAL

TABLES OF PROJECT STATIONING

SECTION	STATION TO	STATION	DESCRIPTION	LENGTH	GROSS SECTION LENGTHS	EXCEPTION LENGTHS	NET SECTION LENGTHS			
1	1+10.00 to	51+46.00	Rural Two Lane	5036.00'	32119.00'		32119.00' 6.083 mi.			
	94+12.00 to	112+36.00		1824.00'						
	140+36.00 to	183+64.00		4328.00'						
	193+41.00 to	206+45.00		1304.00'						
	251+90.00 to	281+00.00		2910.00'						
	328+00.00 to	495+17.00		16717.00'						
2	51+46.00 to	94+12.00	Rural Two Lane (Exception Area)	4266.00'	15665.00'	4266.00'	0.00' 0.000 mi.			
	112+36.00 to	133+90.00		2154.00'		2154.00'				
	206+45.00 to	251+90.00		4545.00'		4545.00'				
	281+00.00 to	328+00.00		4700.00'		4700.00'				
3	133+90.00 to	134+68.00	Rural Two Lane with Left Turn Lane (Exception Area)	78.00'	78.00'	78.00'	0.00' 0.000 mi.			
4	134+68.00 to	140+36.00	Rural Two Lane with Left Turn Lane	568.00'	568.00'		568.00' 0.108 mi.			
5	183+64.00 to	193+41.00	Rural Two Lane with Left Turn Lane	977.00'	977.00'		977.00' 0.185 mi.			
Totals					49407.00'	9.357 mi.	15743.00'	2.982 mi.	33664.00'	6.376 mi.

TABLE OF MATERIALS QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-PH-EM 0046(60)347	12	32

UNCL. EXC. DIG- OUTS	REMOVE ASPHALT CONCRETE PAVEMENT	BASE COURSE	COLD MILLING ASPHALT CONCRETE	ASPHALT CONCRETE COMPOSITE	ASPHALT CONCRETE BLADE LAID	PG 58-34 ASPHALT BINDER	HYDRATED LIME	CLASS Q3R HOT MIXED ASPHALT CONCRETE	PG 58-34 ASPHALT BINDER	HYDRATED LIME	VIRG. AGGR.	SALV. MAT'L.	SS-1h/ CSS-1h FOR TACK	SS-1h/ CSS-1h FOR FLUSH SEAL	SAND FOR FLUSH SEAL	
N.A.B.I. = Not A Bid Item																
<--- BLADE LAID --->																
SECTION	CuYd	SqYd	Ton	SqYd	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	
1	304	456	608	146320	152	-	-	-	14903	693.5	147.6	11250	2812	46.8	32.8	341
4	5	8	11	3345	3	-	-	-	348	16.2	3.4	262	66	1.1	0.7	9
5	9	14	18	5753	5	-	-	-	599	27.9	5.9	452	113	1.8	1.3	16
Subtotals:	318	478	637	155418	160	-	-	-	15850	737.6	156.9	11964	2991	49.7	34.8	366
Add Quans for spot leveling and tight blading in Section 1	-	-	-	-	-	912	68.0	9.0	608	28.0	6.0	459	115	24.3	-	-
Add Quans for spot leveling and tight blading in Section 4	-	-	-	-	-	24	2.0	0.2	11	1.0	0.1	8	2	0.4	-	-
Add Quans for spot leveling and tight blading in Section 5	-	-	-	-	-	42	3.0	0.4	18	1.0	0.2	14	3	1.0	-	-
Add Quans for spot leveling and tight blading:	-	-	-	-	-	978	73.0	9.6	637	30.0	6.3	481	120	25.7	-	-
Table of Additional Quantities:	-	-	690	1826	-	4	0.2	-	357	16.6	3.5	270	66	1.2	0.7	13
Totals:	318	478	1327	157244	160	982	73.2	9.6	16844	784.2	166.7	12715	3177	76.6	35.5	379

TABLE OF ADDITIONAL QUANTITIES

LOCATION	Width	Mill Depth	BASE COURSE	COLD MILLING ASPHALT CONCRETE	ASPHALT CONCRETE BLADE LAID	PG 58-34 ASPHALT BINDER	CLASS Q3R HOT MIXED ASPHALT CONCRETE	PG 58-34 ASPHALT BINDER	HYDRATED LIME	VIRG. AGGR.	SALV. MAT'L.	SS-1h/ CSS-1h FOR FLUSH SEAL	SAND FOR FLUSH SEAL
N.A.B.I. = Not A Bid Item													
			Ton	SqYd	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
Mainline Transitions													
Sec. 1	140+36 L to 144+26 L	6' to 0'	-	130	-	-	15	0.7	0.15	11.5	2.5	0.03	0.5
Sec. 1	140+36 R to 144+26 R	6' to 0'	-	130	-	-	15	0.7	0.15	11.5	2.5	0.03	0.5
Sec. 1	179+74 L to 183+64 L	0' to 6'	-	130	1	0.1	15	0.7	0.15	11.5	2.5	0.03	0.5
Sec. 1	179+74 R to 183+64 R	0' to 6'	-	130	1	0.1	15	0.7	0.15	11.5	2.5	0.03	0.5
Sec. 1	193+41 L to 197+31 L	6' to 0'	-	130	1	0.1	15	0.7	0.15	11.5	2.5	0.03	0.5
Sec. 1	193+41 R to 197+31 R	6' to 0'	-	130	1	0.1	15	0.7	0.15	11.5	2.5	0.03	0.5
Resurface to ROW													
4	Intersecting Roads		-	478	-	-	116	5.4	1.10	87.0	22.0	0.23	4.4
Resurface to End of Radius													
8	Intersecting Roads		120	568	-	-	151	7.0	1.50	114.0	29.0	0.29	5.6
Pads													
27	Entrances		270	-	-	-	-	-	-	-	-	-	-
15	Double Entrances		300	-	-	-	-	-	-	-	-	-	-
TOTALS:			690	1826	4	0.2	357	16.6	3.5	270	66	0.70	13.0

NOTES: 1.2 tons of SS-1h or CSS-1h Asphalt for Tack are included in the Estimate of Quantities and will be applied at the rate shown on the plans as directed by the Engineer.

The above quantities are included in the Estimate of Quantities.

UTILITIES

The Contractor will contact the involved utility companies through South Dakota One Call (1-800-781-7474) prior to starting work. It will be the responsibility of the Contractor to coordinate work with the utility owners to avoid damage to existing facilities.

Utilities are not planned to be affected on this project. If utilities are identified near the improvement area through the SD One Call process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25; the Contractor will contact the Project Engineer to determine if project changes are necessary to avoid utility impacts.

SURFACING THICKNESS DIMENSIONS

The plans shown spread rates will be applied even though the thickness may vary from that shown on the plans.

At those locations where material must be placed to achieve a required elevation, the depth/quantity may be varied to achieve the required elevation.

FLEXIBLE PAVEMENT SMOOTHNESS SPECIAL PROVISION

Sections 1, 4 and 5, if not excluded by the Special Provision for Flexible Pavement Smoothness, will be evaluated as two opportunities.

COORDINATION BETWEEN CONTRACTORS

A separate contract for Project P-PH-EM 0046(60)347 - PCN 04J5 has been awarded to Central Specialties Inc. (Phone 320-762-7289) for spot grading and shoulder widening on SD46 from Irene east to just W of Jct SD19A (SD46 MRM 347.60 +0.015 to MRM 356.00 +0.395).

If the work for PCN 04J5 remains ongoing in 2022, the Contractor will schedule work so as not to interfere with or hinder the progress of the work performed by other Contractors on the spot grading and shoulder widening project.

TYPE III FIELD LABORATORY

The lab will be equipped with an internet connection such as DSL, cable modem, or other approved service. The internet connection will be provided with a multi-port wireless router. The internet connection will be a minimum speed of 5 Mbps unless limited by job location and approved by the DOT. Prior to installing the wireless router, the Contractor will submit the wireless router's technical data to the Area Office to check for compatibility with the State's computer equipment. The internet connection is intended for State personnel usage only. The Contractor's personnel are prohibited from using the internet connection unless pre-approved by the Project Engineer.

Reimbursement will not be made for fees associated with the purchase, installation, maintenance, monthly line charges, and incidentals involved with the internet connection (including attachments). These items will be incidental to the contract unit price per each for Type III Field Laboratory.

INTERSECTING ROADS AND ENTRANCES

Intersecting roads and entrances will be satisfactorily cleared of vegetation, shaped and compacted prior to placement of mainline surfacing. This work will be considered incidental to other contract items. Separate measurement and payment will not be made.

STORAGE UNIT

The Contractor will provide a storage unit such as a portable storage container or a semi-trailer meeting the minimum size requirements from the table below:

Project Total Asphalt Concrete Tonnage	Minimum Internal Size (Cu Ft)	Minimum External Size (L x W x H)
Less than 50,000 ton	1,166	20' x 8' x 8.6' std
More than 50,000 ton	2,360	40' x 8' x 8.6' std
All Gyrotory Controlled QC/QA Projects	2,360	40' x 8' x 8.6' std

The storage unit is intended for use only by the Engineer for the duration of the project. The QC lab personnel or the Contractor will not be allowed to use the storage container while it is on the project, without permission of the Engineer.

The storage unit will be on site and operational prior to asphalt concrete production. Upon completion of asphalt concrete production, the Engineer will notify the Contractor when the storage unit can be removed from the project. The storage unit use will not exceed 30 calendar days from the completion of asphalt concrete production. The storage unit will remain the property of the Contractor.

The storage unit will be weather proof and will be set in a level position. The storage unit will be able to be locked with a padlock.

The storage unit will be placed adjacent to the QA lab, as approved by the Engineer.

The following will apply when the storage unit provided on the project is a portable storage container:

1. The portable storage container will be constructed of steel.
2. The portable storage container will be set such that it is raised above the surrounding ground level to keep water from ponding under or around the storage container.

The following will apply when the storage unit provided on the project is a semi-trailer:

1. A set of steps and hand railings will be provided at the exterior door.
2. If the floor of the semi-trailer is 18 inches or more above the ground, a landing will be constructed at the exterior door. The minimum dimensions for the landing will be 4 feet by 5 feet. The top of the landing will be level with the threshold or opening of the doorway.
3. The semi-trailer may be connected to the QA lab by a stable elevated walkway. The walkway will be a minimum of 48 inches wide and contain handrails installed at 32 inches above the deck of the walkway. The walkway will be constructed such that it is stable and the deck does not deform during use and allows for proper door operation. Walkway construction will be approved by the Engineer.

Cost for furnishing, maintaining, and removing the storage unit including labor, equipment, and material including any necessary walkways, landings, stairways, and handrails will be included in the contract unit price per each for Storage Unit.

SHOULDER WORK

Prior to construction, Department of Transportation maintenance forces will spray the shoulders to kill existing vegetation. It is the Contractor's responsibility to notify the State a minimum of thirty days prior to starting work on the surface of the highway. The State assumes no responsibility for the effectiveness of the herbicide applied.

Vegetation and accumulated material on or adjacent to the existing roadway edge will be removed by the Contractor, to the satisfaction of the Engineer, prior to cold milling and asphalt concrete resurfacing. Any remaining windrow of accumulated material will be spread evenly on the inslope adjacent to the asphalt shoulder, to the satisfaction of the Engineer, following application of the flush seal.

Cost for shoulder work including removal and replacement of topsoil will be incidental to the contract unit prices for the various items. Separate measurement and payment will not be made.

UNCLASSIFIED EXCAVATION, DIGOUTS

The locations and extent of digout areas will be determined in the field by the Engineer. The backfilling material for the digouts will be Asphalt Concrete Composite and Base Course. The depth of asphalt will match the in-place thickness.

Included in the Estimate of Quantities are 50 cubic yards of Unclassified Excavation, Digouts and 75 square yards of Remove Asphalt Concrete Pavement per mile for the removal of asphalt and unstable material throughout the project.

Included in the Estimate of Quantities are 100 tons of Base Course and 25 tons of Asphalt Concrete Composite per mile for backfill of Unclassified Excavation, Digouts.

The digouts will be extended to the shoulder and backfilled with granular material that will daylight to the inslope to allow water to escape the subsurface.

WATER FOR COMPACTION

Cost for water for compaction of the Base Course will be incidental to the contract unit prices for the various contract items. The moisture required at the time of compaction will be 6%± unless otherwise directed by the Engineer.

COLD MILLING ASPHALT CONCRETE

The Los Angeles Abrasion Loss value of the aggregate used for the in place asphalt concrete was 24 percent. This value was obtained from testing during construction of the in place asphalt concrete.

Cold milling asphalt will be done according to the typical section. In areas where maintenance patches have raised the road, additional asphalt concrete will be milled to provide a uniform typical section from centerline to the edge of the finished shoulder.

Cold milling is estimated to produce 8,159 tons of cold milled asphalt concrete material. An estimated 3,177 tons of cold milled asphalt concrete material will be used on this project as Reclaimed Asphalt Pavement (RAP) in the Class Q3R Hot Mixed Asphalt Concrete mixture. The Contractor is responsible to assure that enough cold milled asphalt concrete material is available for use as RAP in the Class Q3R Hot Mixed Asphalt Concrete.

The remainder of the cold milled asphalt concrete material (estimated at 4981 tons) will become the property of the Contractor for disposal.

Estimated quantities are for information purposes only and the exact quantity will be determined upon construction. No allowance will be made for loss of expected reimbursement or loss of anticipated profit.

Cold Milling Asphalt Concrete operations ahead of asphalt concrete laydown will be limited by particular job conditions and will be subject to approval of the Engineer. In no case will cold milling operations ahead of asphalt concrete laydown operations exceed seven calendar days.

RAP achieved for project use and/or other uses is based on the dimensions given in the typical section. Field conditions will vary from that given in the typical section. Therefore, the Contractor will be required to adjust the mill depth, as necessary, to provide the quantity of RAP specified by the plans.

If resurfacing as per the typical section cannot be placed immediately after cold milling at project ends and section ends, then temporary asphalt mix ramps will be placed as directed by the Engineer. Cost for placing and removing the temporary ramps will be incidental to the contract unit prices for the various items.

Intersecting roads and entrances will be milled back for approximately ten feet from the shoulder edge so that additional surfacing may be placed at these locations.

Asphalt concrete intersecting roads and entrances will be milled in for approximately ten feet at the ROW line so that additional surfacing may be placed at these locations.

COLD MILLING TAPERS

In order to construct the new surfacing flush with the asphalt concrete, it will be necessary to taper the depth of milling according to the details for Cold Milling Tapers.

The surface will be milled full roadway width.

Cost for this work will be incidental to the contract unit price per square yard for Cold Milling Asphalt Concrete.

Taper depth of Cold Milling at locations shown in the Cold Milling Asphalt Concrete Tapers details.

ASPHALT CONCRETE BLADE LAID

Included in the Estimate of Quantities are 150 tons of Asphalt Concrete Blade Laid, 11.1 tons of PG 58-34 Asphalt Binder, 1.5 tons of Hydrated Lime and 5.6 tons of SS-1h or CSS-1h Emulsified Asphalt for Tack (Rate = 0.09 gallon per square yard) per mile and will be tight bladed on the existing surface 24' wide prior to the overlay in Sections 1 and 4.

Included in the Estimate of Quantities are 225 tons of Asphalt Concrete Blade Laid, 16.7 tons of PG 58-34 Asphalt Binder, 2.3 tons of Hydrated Lime and 8.3 tons of SS-1h or CSS-1h Emulsified Asphalt for Tack (Rate = 0.09 gallon per square yard) per mile and will be tight bladed on the existing surface 36' wide prior to the overlay in Section 5.

A sufficient amount of material will be kept in front of the blade to fill and level all joints, cracks and other surface irregularities.

Mineral Aggregate for tight bladed material will use only the fine aggregate components combined in the same proportions as the Class Q3R Hot Mixed Asphalt Concrete mix. Quality testing is not required on the coarse aggregate (+No. 4 sieve) in this mixture.

The Asphalt Concrete Blade Laid Lift will be designed using an N_{design} Gyratory Compactive Effort of 65. The asphalt binder content will be determined so that the air voids of Asphalt Concrete Blade Laid Lift are between 3.0% and 5.0%.

Included in the Estimate of Quantities are 24.1 tons of SS-1h or CSS-1h Asphalt for Tack for use prior to the application of the Blade Laid lift (Rate = 0.09 Gal/SqYd).

CLASS Q3R HOT MIXED ASPHALT CONCRETE

Mineral Aggregate:
Asphalt concrete aggregate will consist of RAP and virgin aggregate.

Virgin mineral aggregate for Class Q3R Hot Mixed Asphalt Concrete will conform to the requirements of Class Q3.

The Class Q3R Hot Mixed Asphalt Concrete will include 20% percent RAP in the mixture. RAP will be obtained from the material produced by cold milling.

Mix Design Criteria:
Gyratory Controlled QC/QA Mix Design requirements for the Class Q3R Hot Mixed Asphalt concrete will conform to the requirements of Class Q3 except as modified by the following:

Gyratory Compactive Effort:

	N _{initial}	N _{design}	N _{maximum}
Class Q3R	6	50	75

All remaining requirements for Class Q3 will apply.

ADDITIONAL QUANTITIES

Included in the Estimate of Quantities are 100 tons of Class Q3R Hot Mixed Asphalt Concrete, 4.7 tons of PG 58-34 Asphalt Binder and 1 ton of Hydrated Lime per mile for spot leveling, strengthening and repair of the existing surface throughout the project.

Included in the Estimate of Quantities are 1.6 tons of SS-1h or CSS-1h Asphalt for Tack for surface repair and leveling areas throughout the project. (Rate = 0.09 gallon per square yard).

FLUSH SEAL

Application of the flush seal will be completed within 10 working days following completion of the asphalt concrete resurfacing.

Immediately prior to the application of the flush seal over the centerline rumble stripes, the Contractor will be required to broom the entire width of the roadway. An SS-1h or CSS-1h emulsion will be used for the centerline rumble stripe flush seal application. An emulsion-to-water rate of 3:1 should be used for binder application over the centerline rumble stripes.

CENTERLINE RUMBLE STRIPES – FLUSH SEAL

Asphalt for Flush Seal will be applied after the centerline rumble stripes have been installed. The application width should extend 1 ft beyond the centerline of the roadway in each direction to create a total application rate of 0.10 Gal/SqYd on the centerline rumble stripes.

ASPHALT CONCRETE COMPOSITE

Class Q3R Hot Mixed Asphalt Concrete as specified elsewhere in the plans may be used as Asphalt Concrete Composite.

Asphalt for tack SS-1h or CSS-1h will be applied prior to each lift of Asphalt Concrete Composite. Asphalt for tack will be applied at a rate of 0.09 gallons per square yard on existing pavement or milled asphalt concrete surfaces and at a rate of 0.06 gallons per square yard on new asphalt concrete pavement. The Asphalt for tack will be applied for the full width of the bottom layer of Asphalt Concrete Composite plus one-half foot additional on the outside shoulder.

RUMBLE STRIPS

INSTALLATION:

Rumble strips will be constructed according to the details of Standard Plate 320.24.

Rumble strips will be installed in rural areas with posted speeds greater than 50 mph and are not required in urban areas. The rumble strips will begin at the location of the Speed Limit 65 sign as traffic is departing the built up area of a community, unless otherwise specified in the plans. The Engineer will provide the exact start and stop locations.

Gaps for rumble strip installation as detailed on the standard plate are included with the measurement and payment.

Cost for asphalt concrete rumble strips will be included in the contract unit price per mile for Grind 12" Rumble Strip or Stripe in Asphalt Concrete.

ROADWAY CLEANING:

The Contractor will be required to remove loose material from the driving surface and/or asphalt shoulders of the roadway. Loose material may be broomed to the edge of shoulders. It will be the Contractor's responsibility to ensure the loose material does not enter any vegetated areas or waterways.

Cost for this work will be incidental to the contract unit price per mile for Grind 12" Rumble Strip or Stripe in Asphalt Concrete.

SINUSOIDAL CENTERLINE RUMBLE STRIPES

INSTALLATION:

Sinusoidal centerline rumble stripes will be constructed according to the details of Standard Plate 320.40.

Sinusoidal centerline rumble stripes will be installed in rural areas with posted speeds greater than 50 mph and are not required in urban areas. The rumble stripes will begin at the location of the Speed Limit 65 sign as traffic is departing the built up area of a community, unless otherwise specified in the plans. The Engineer will provide the exact start and stop locations.

Gaps for rumble stripes installation as detailed on the standard plates are included with the measurement and payment.

Cost for sinusoidal centerline rumble stripes will be included in the contract unit price per mile for Grind Sinusoidal Centerline Rumble Stripe in Asphalt Concrete.

ROADWAY CLEANING:

After brooming, cleaning will be accomplished with an air compressor producing a minimum of 125 cubic feet per minute output and equipped with a maximum 3/4 inch nozzle. The air compressors will be equipped with traps capable of removing free water and oil from the compressed air.

Rumble stripes will be thoroughly cleaned of dust, dirt, and loose material so the rumble stripes are clean and dry at the time the flush seal is applied. If rumble stripes are left overnight, the area will be re-cleaned immediately before the flush seal.

The asphalt concrete and foreign material resulting from the sinusoidal centerline rumble stripe flush seal preparation will be removed from the roadway surface before an area is opened to traffic.

Cost for this work will be incidental to the contract unit price per mile for Grind Sinusoidal Centerline Rumble Stripe in Asphalt Concrete.

REMOVE AND RESET MAILBOXES

Existing mailboxes will be removed, turnouts constructed, and mailboxes reset using existing posts and hardware. The local Postmaster will determine the recommended mounting height of the mailboxes. The Contractor will coordinate with the Engineer on the proper postal representative to contact.

The Contractor will be responsible for maintaining a temporary mailbox assembly until the reset mailbox assembly is complete in place.

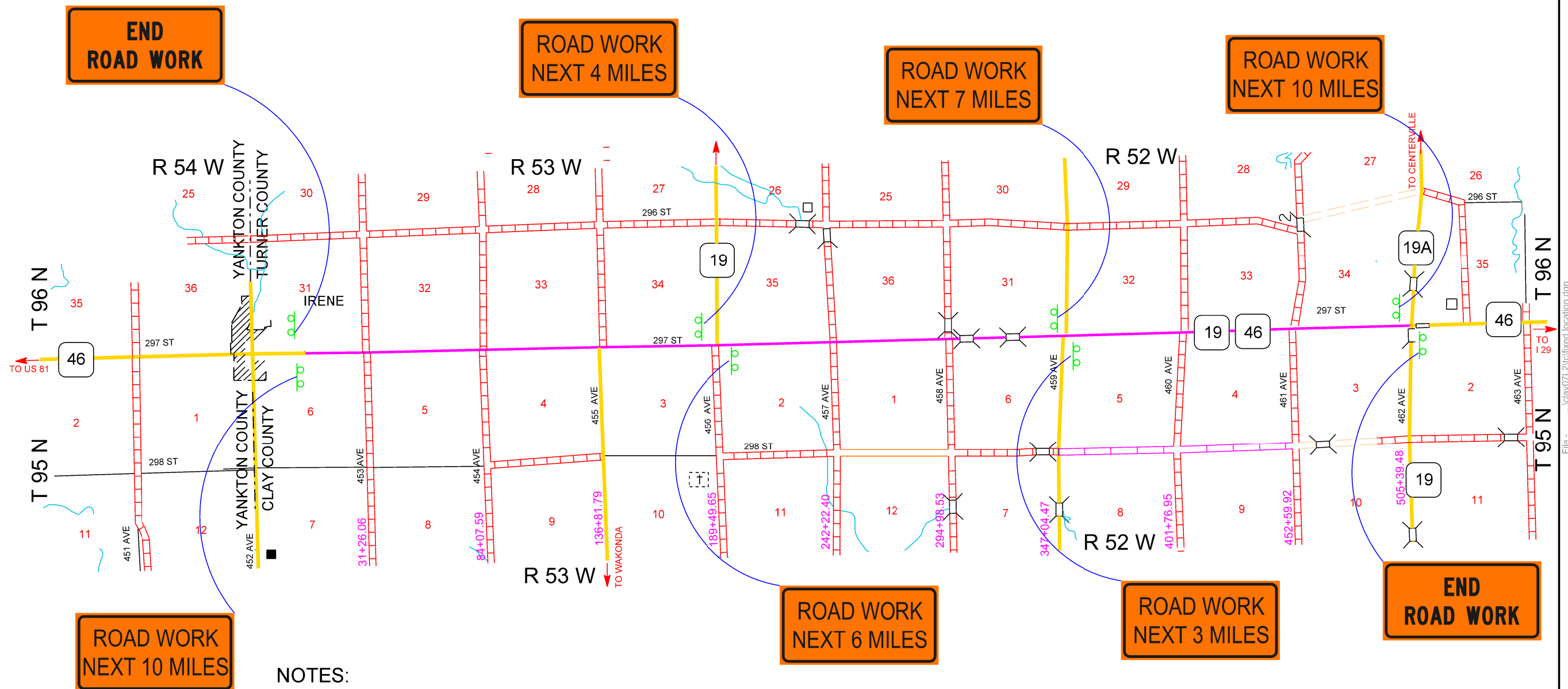
Cost for removing existing mailboxes, providing temporary mailbox assemblies, and resetting mailboxes with existing posts and hardware will be included in the contract unit price for Remove and Reset Mailbox.

TABLE OF REMOVE AND RESET MAILBOX

Station	L/R	Single (Each)
4+98	R	1
5+01	R	1
63+85	L	1
99+39	L	1
150+15	L	1
231+77	L	1
272+52	R	1
289+72	L	1
303+95	R	1
339+23	L	1
371+78	L	1
389+87	R	1
443+43	L	1
Total:		13

TRAFFIC CONTROL

Fixed Location Signs (Ground Mounted Support)



NOTES:

All fixed location signs will remain in place until permanent pavement marking is complete.

Signs will be placed 200' to 300' from intersections. Exact location to be determined by the Engineer.

Construction signs cannot obscure existing signs and must be installed a minimum of 200' from existing sign.

Construction signs will not be installed on the same post as an existing highway sign or light pole.

Plot Scale - 1:200

Plotted From - TRM113318

File - ...:\cley0712\trcfixed location.dgn

SEQUENCE OF OPERATIONS

The Contractor will submit a sequence of operations for approval two weeks prior to the preconstruction meeting.

GENERAL TRAFFIC CONTROL

Unless otherwise stated in these plans, no work will be allowed during hours of darkness.

A mobile work operation will be allowed provided the rumble strip 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.

Cost for a mobile workspace will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

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.

W8-15 Grooved Pavement signs are required in advance of areas that have been cold milled and are not resurfaced the same day. The Grooved Pavement sign assemblies will be installed a minimum 1000 ft. in advance of cold milled sections and remain in place until the sections have been resurfaced.

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

The distance between the closest points of any two construction workspaces, including channeling devices, will not be less than 3 miles.

At no time will a vertical drop-off of greater than 3 inches be left overnight adjacent to the traveled way. The Contractor will utilize embankment material to ensure a 3-inch vertical drop-off is not exceeded. The slope of the embankment material will not be steeper than a 4:1 within 30 feet of the traveled way.

Install fixed location signing no more than 4 calendar days prior to the start of work. Cost for material, labor and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

All temporary traffic control sign locations will be set in the field by the Contractor and verified by the Engineer prior to installation.

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.

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

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

Traffic will be maintained on the driving lanes. Use of the shoulder as a driving lane will not be permitted. Any damage to the shoulder due to rerouted traffic or Contractor's equipment will be repaired at no expense to the Department.

The Contractor will furnish, install, maintain, and remove TRUCK CROSSING (W8-6) signs daily. The TRUCK CROSSING signs will be displayed always when haul vehicles are hauling material. When hauling conditions no longer exist, the signs will be covered or removed from view. The exact number and location will be determined during construction.

FLAGGING

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

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



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

TEMPORARY PAVEMENT MARKING

Temporary flexible vertical markers (tabs) will be installed on one side of the centerline rumble for the temporary pavement marking. No passing zones will be marked in accordance with Specifications. DO NOT PASS (R4-1) and PASS WITH CARE (R4-2) signs will also be used in addition to the temporary flexible vertical markers (tabs) placed per Specifications to mark no passing zones.

The total length of no passing zone on SD highway 46 is estimated to be 1.89 miles.

It is estimated that 6 DO NOT PASS and 6 PASS WITH CARE signs will be required.

Temporary pavement marking paint will be required on the milled surface and first lift of asphalt concrete surfacing.

Temporary flexible vertical markers (tabs) will be used to mark centerline, turn lane transitions and other applicable lane lines on the top lift of asphalt concrete surfacing.

Paint will not be allowed for temporary pavement marking on the asphalt concrete wear course or after application of the flush seal.

Four applications of temporary pavement marking are included in the estimate of quantities for completion of the milling, the blade laid, the asphalt concrete lift, and uncovering the temporary flexible vertical markers (tabs) after application of the flush seal.

If the flush seal is eliminated, the application of the temporary pavement marking on top of the flush seal will be eliminated. No adjustment in the contract unit price for "Temporary Pavement Marking" will be made because of a variation in quantities.

Covers on the tabs will be sufficiently secured to prevent traffic from dislodging the cover and when removed, the covers will be properly disposed of. The Contractor will remove and properly dispose of the tabs after permanent pavement marking is applied. Method of removal will be nondestructive to the road surface and will be accomplished within one week of completion of the permanent pavement marking.

Any temporary flexible vertical markers (tabs) with covers removed before the flush seal will be replaced prior to application of the flush seal. Full reflectivity of all temporary flexible vertical markers (tabs) is required at all times. The Contractor will be required to replace any missing or non-reflective tabs at no additional cost to the State.

In the absence of a signed lane closure or pilot car operation, Flagger symbol signs (W20-7) and flaggers, or a shadow vehicle with rotating yellow lights or strobe lights will be positioned on the shoulder in advance of workers for both directions of traffic during the installation and removal of temporary flexible vertical markers (tabs). The traffic control device used will be moved intermittently to provide proper warning of the work operation. A ROAD WORK AHEAD (W20-1), a Workers symbol sign (W21-1) or a BE PREPARED TO STOP (W3-4) warning sign will be mounted on the rear of the shadow vehicle. The method of traffic control used by the Contractor for this work will be approved by the Engineer.

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

PERMANENT PAVEMENT MARKING

The Contractor will be required to repaint all existing pavement markings including centerline, edge line, lane lines, and turn arrows. This list is approximate. The Contractor will be required to document and be able to relocate for replacement of the existing turn arrows, stop bars, etc. before the markings are obliterated. The cost to duplicate the existing marking locations will be incidental to the contract unit prices for the various contract items.

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

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

HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

No further testing of this material will be required. Reflective media consisting of glass beads as well as bonded core reflective elements will be adhered to the paint.

The bonded core reflective elements will contain either clear or yellow tinted microcrystalline ceramic beads bonded to the outer surface. The bonded core reflective elements will provide a 50/50 blend of dry to wet ratio of reflective element. All microcrystalline ceramic beads bonded to reflective elements will have a minimum index of refraction of 1.8 for dry retro-reflectivity and 2.4 for wet retro-reflectivity when tested using the liquid oil immersion method.

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

RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

Yellow Solid 4" line = 27.8 Gals/Mile
 Yellow Dashed 4" line = 7.6 Gal/Mile
 Glass Beads = 5.3 Lbs/Gal.
 Composite Reflective Elements = 2.1 Lbs/Gal

White Solid 4" line = 22.5 Gals/Mile
 Glass Beads = 8 Lbs/Gal

All cost for materials, labor and equipment necessary to furnish and install the pavement markings will be incidental to the contract unit price for the respective High Build Waterborne Pavement Marking Paint items.

RETROREFLECTIVITY FOR PAVEMENT MARKING PAINT

The Department may take retro-reflectivity readings on the pavement marking lines after 2 days and within 30 days of the line application using either a portable or mobile retro-reflectometer that conforms to 30-meter geometry. If the Department chooses to take retro-reflectivity readings, three retro-reflectivity 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 retro-reflectivity 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 retro-reflectivity values will be 275 mc/m²/lux for white and 170 mc/m²/lux for yellow.

MARKINGS WITHIN SINUSOIDAL CENTERLINE RUMBLE STRIPES

Sinusoidal rumble stripes exist on SD 46.

The sinusoidal centerline rumble stripes are recessed below the pavement surface, so pavement marking grooving will not be required at these locations.

Sinusoidal rumble stripes will receive an asphalt surface treatment to seal the centerline joint and minimize the depth of water held on centerline.

Retro-reflectivity readings will not be taken for pavement markings within the sinusoidal rumble stripe. Restriping of pavement markings to meet the specified application rate requirements and to provide a quality retroreflective line will be at the expense of the Contractor with no additional cost to the Department. Sections to be restriped will be determined by the Engineer.

GROOVING FOR PERFORMED THERMOPLASTIC PAVEMENT MARKING

Grooving for the thermoplastic pavement markings will be done according to Grooving for Cold Applied Plastic Pavement Marking in the specifications.

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

Immediately prior to application of the markings the groove must be cleaned by using high pressure air (90psi minimum).

If application of the markings does not immediately follow dry pavement grooving, then within 24 hours prior to placing the thermoplastic pavement markings the groove must be sandblasted and cleaned as noted above. If the thermoplastic pavement markings are not placed within 24 hours of sandblasting, the groove will be re-sandblasted and re-cleaned.

All costs associated with sandblasting and cleaning will be incidental to the contract unit price per foot for "Grooving for Cold Applied Plastic Pavement Marking, Arrow."

PERFORMED THERMOPLASTIC PAVEMENT MARKING

General

- Made of prefabricated retroreflective, resilient thermoplastic material;
- Contains glass beads uniformly distributed through the entire cross-sectional area;
- Capable of being affixed to bituminous or concrete pavement by heating;
- Resistant to deterioration due to exposure to sunlight, water, salt, and adverse weather conditions;
- Under traffic wear, shows no appreciable fading in accordance with the color requirements, lifting, or shrinkage throughout the life of the marking;

- Capable of conforming to pavement contours, breaks, and faults through the action of traffic at normal pavement temperatures;
- Possesses resealing characteristics, such that it is capable of fusing with itself and previous thermoplastic markings when heated; and
- Protected during shipment and in storage.

Apply the preformed thermoplastic pavement marking as recommended by the manufacturer to provide a neat, durable marking that will not flow, distort, or crack due to temperature if the pavement surface remains stable. Use equipment and application methods specified by the manufacturer. Primer as required by the manufacturer will be provided with the material.

Application of the markings will include the use of any manufacturer recommended sealers. Sealers may be required on concrete pavements, inside grooves, or on older asphalt pavements. Prior to placing any markings on new concrete, the Contractor will remove any curing compounds. Removal will be by sandblasting or other standard industry methods.

Any required primers or sealers will be included in the contract unit price for the various preformed thermoplastic pavement marking items.

Provide precut messages and symbols meeting the requirements of the MUTCD and the Standard Signs Manual in custom kits. Use separate pieces or segments to form individual letters or symbols only to the extent supplied by the manufacturer. Provide shapes, sizes, and colors as required by the contract.

Color

- Will meet the color specification limits and luminance factors for Cold Applied Plastic Pavement Marking and Legends (Section 983.2 D, Tables 1 and 2).

Glass Beads

- Ensure the preformed thermoplastic pavement marking contains a minimum 30% intermixed glass beads by weight and a minimum 80% true spheres.
- Ensure preformed thermoplastic pavement markings contain only clear beads.

Skid Resistance

- Ensure the surface of the preformed thermoplastic pavement marking provides a skid resistance value of at least 45 British Pendulum Number (BPN) when tested in accordance with ASTM E303.

Retro-reflectivity

- Provide preformed thermoplastic pavement marking meeting the minimum initial pavement marking retro-reflectivity values using 30 m geometry and meeting the testing procedures of ASTM E1710:

Minimum Initial Pavement Marking Retro-reflectivity		
	White	Yellow
Thermoplastic	400 mcd/sq. ft./ft.	250 mcd/sq. ft./ft.
Thermoplastic, enhanced skid resistance (ESR)	250 d/sq. ft./ft.	150 d/sq. ft./ft.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-PH-EM 0046(60)347	19	32

PREFORMED THERMOPLASTIC PAVEMENT MARKING (CONTINUED)

Thickness

- A longitudinal marking is a minimum 90 mils thick at the edges, and a maximum 125 mils thick at the center of the stripe.
- Transverse markings and symbols are a minimum 125 mils thick at the edges, and a maximum 160 mils thick at the center.

Sample

- Prior to application, the Contractor will provide a sample of the preformed thermoplastic pavement marking to be used on the project to the Region Traffic Engineer for inspection and approval.
- Do not begin application of the preformed thermoplastic pavement marking prior to obtaining the Region Traffic Engineer's approval of the preformed thermoplastic pavement marking material. The Region Traffic Engineer's approval of the preformed thermoplastic pavement marking does not void other preformed thermoplastic pavement marking requirements specified.

PAVEMENT MARKING

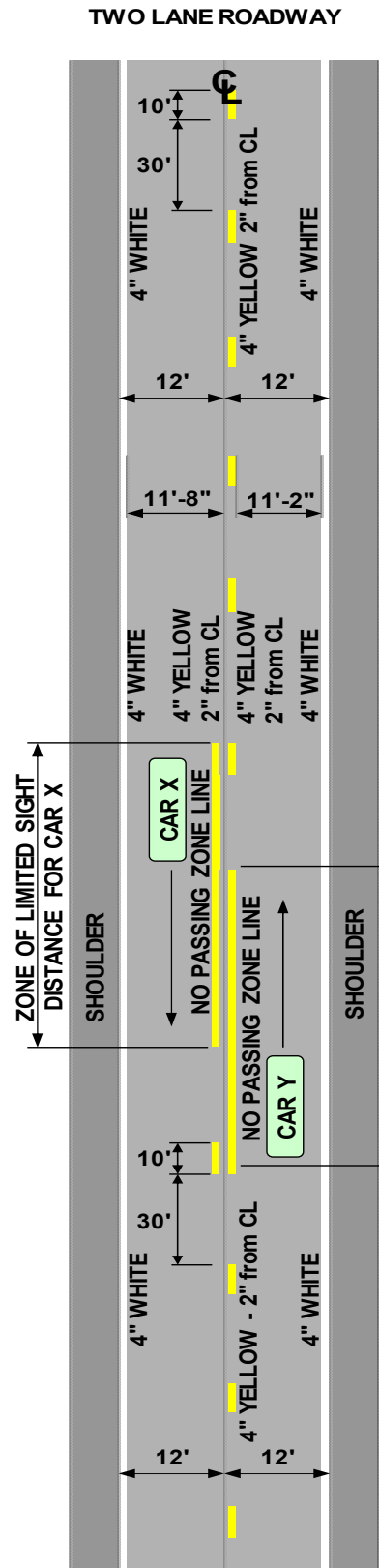
Typical pavement marking as shown on this sheet will be applied throughout the entire length of two lane roadway.

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

Application rates will be as follows:

Two Lane Roadway (Rates for one line)	
Dashed Yellow Centerline	Rate = 7.6 Gals./Pass-Mile
Solid Yellow Centerline	Rate = 27.8 Gals./Pass-Mile
Solid White Edgeline	Rate = 22.5 Gals./Pass-Mile

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



ESTIMATED QUANTITIES (BASED ON ONE APPLICATION)	
HIGH BUILD	QUANTITY
WHITE	425 GALLONS
YELLOW	166 GALLONS

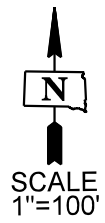
Included in the above quantities are:			
Additional White (1 Application)		Additional Yellow (1 Application)	
Description	Gallons	Description	Gallons
4" Lines	782' 4	Transitions 4 Ea	4080' 24
8" Lines	-	4" Skip Lines	-
12" Gore Lines	-	8" Lines	-
Crosswalks	-	12" Lines	-
24" Stop Lines	-	24" Hatches	480' 24
24" Hatches	-	Solid Areas	-
Solid Areas	-	Additional Yellow:	48
<u>Arrows</u>			
Left Arrows	-	Additional Quantities	
Right Arrows	-	<u>Rates of Coverage:</u> SqFt/Gal	
Straight Arrows	-	4", 8" and 12" Lines	60
Combo Arrows	-	24" Lines and Bars	40
Lane Drop Arrows	-	Arrows, Messages and Solid Areas	25
<u>Messages</u>			
STOP	-	All pavement marking dimensions are based on 12' driving lanes.	
STOP AHEAD	-		
R X R with Bars	-		
SCHOOL X-ING	-		
Additional White:	4		

THERMOPLASTIC	
Left Arrows	9 Ea

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W8-15	GROOVED PAVEMENT	4	48" x 48"	16.0	64.0
W20-1	ROAD WORK AHEAD	10	48" x 48"	16.0	160.0
W20-4	ONE LANE ROAD AHEAD	4	48" x 48"	16.0	64.0
W20-7	FLAGGER (symbol)	6	48" x 48"	16.0	96.0
W21-5	SHOULDER WORK	4	48" x 48"	16.0	64.0
G20-1	ROAD WORK NEXT 3 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 6 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 4 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 10 MILES	2	36" x 18"	4.5	9.0
G20-1	ROAD WORK NEXT 7 MILES	1	36" x 18"	4.5	4.5
G20-2	END ROAD WORK	10	36" x 18"	4.5	45.0
SPECIAL	WAIT FOLLOW PILOT CAR	2	30" x 18"	3.8	7.6
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					527.6

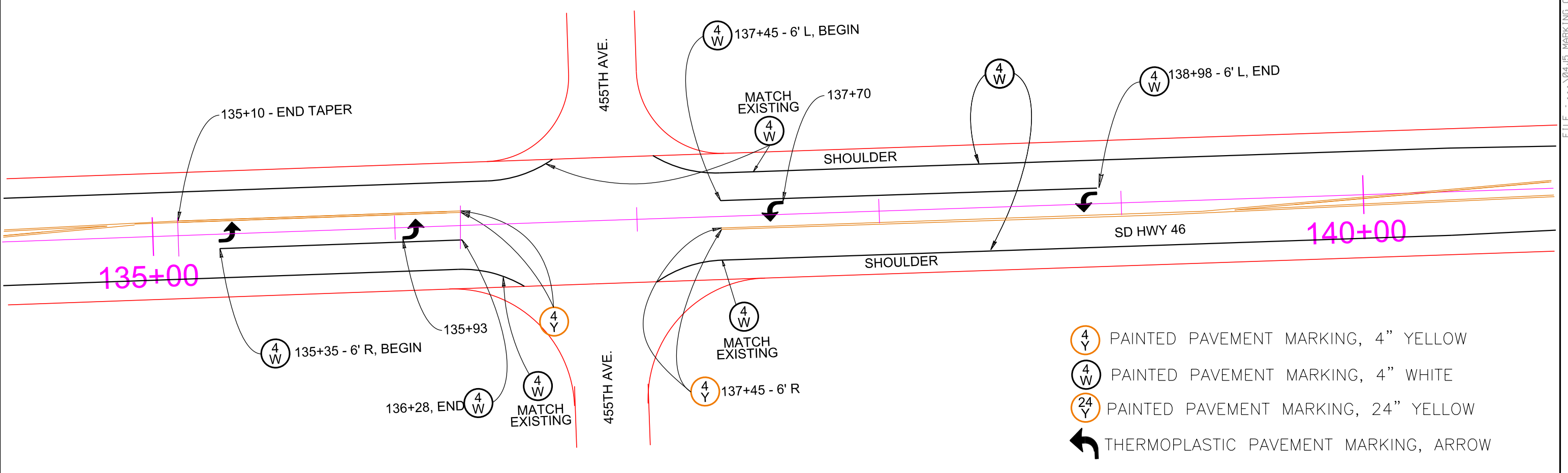
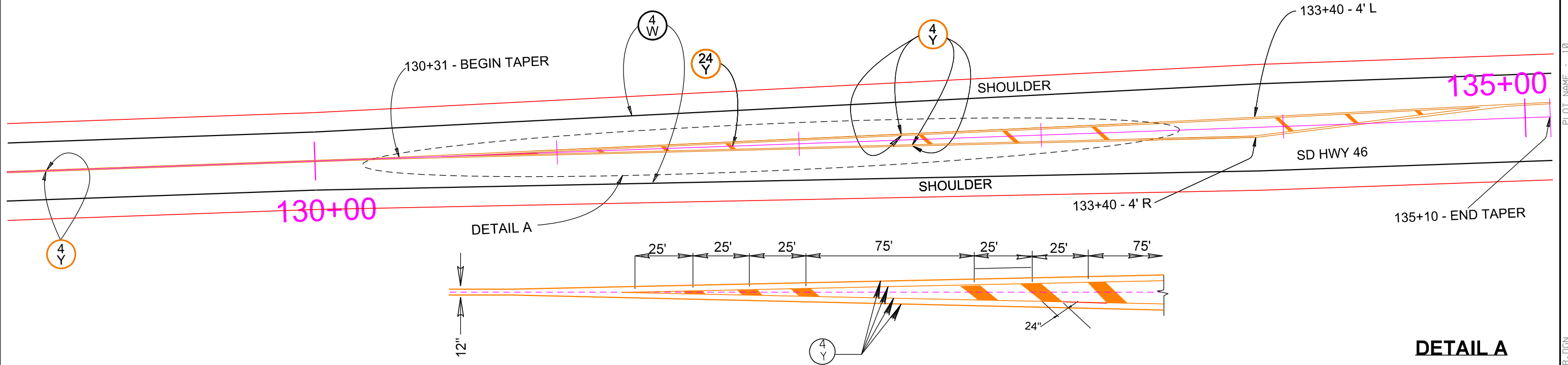
PAVEMENT MARKING



PLOT SCALE - 1:40,2597

PLOTTED FROM - TRM113318

PLOT NAME - 10
FILE - ... \04J5 MARKING CONTAINER.DGN



- PAINTED PAVEMENT MARKING, 4" YELLOW
- PAINTED PAVEMENT MARKING, 4" WHITE
- PAINTED PAVEMENT MARKING, 24" YELLOW
- THERMOPLASTIC PAVEMENT MARKING, ARROW

PAVEMENT MARKING

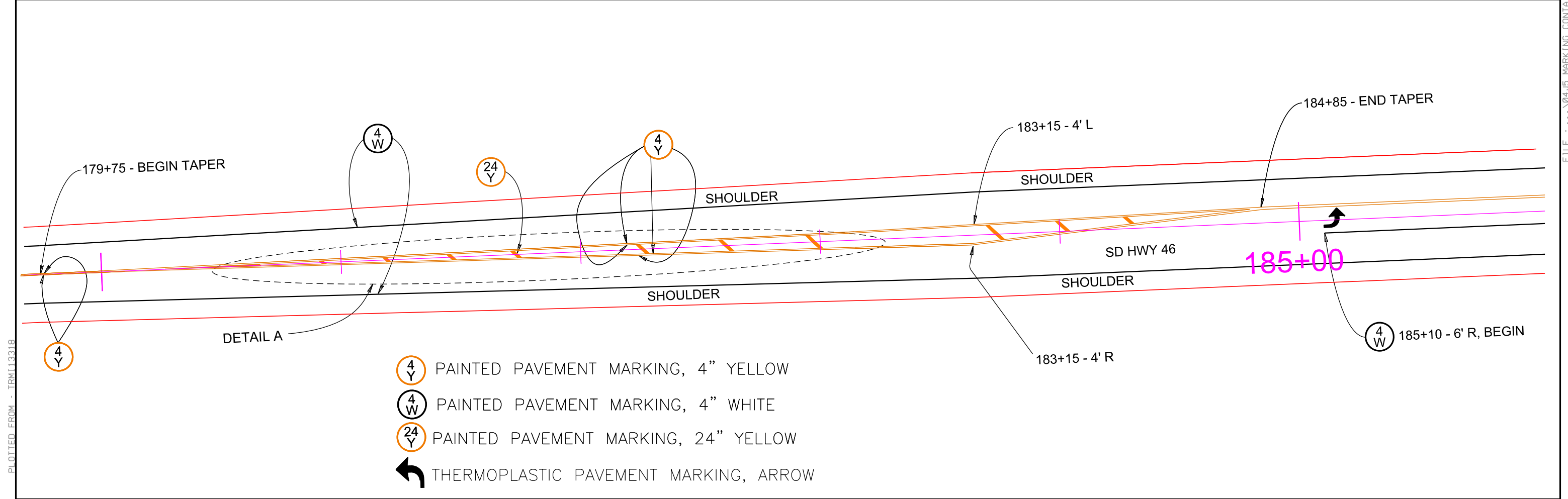
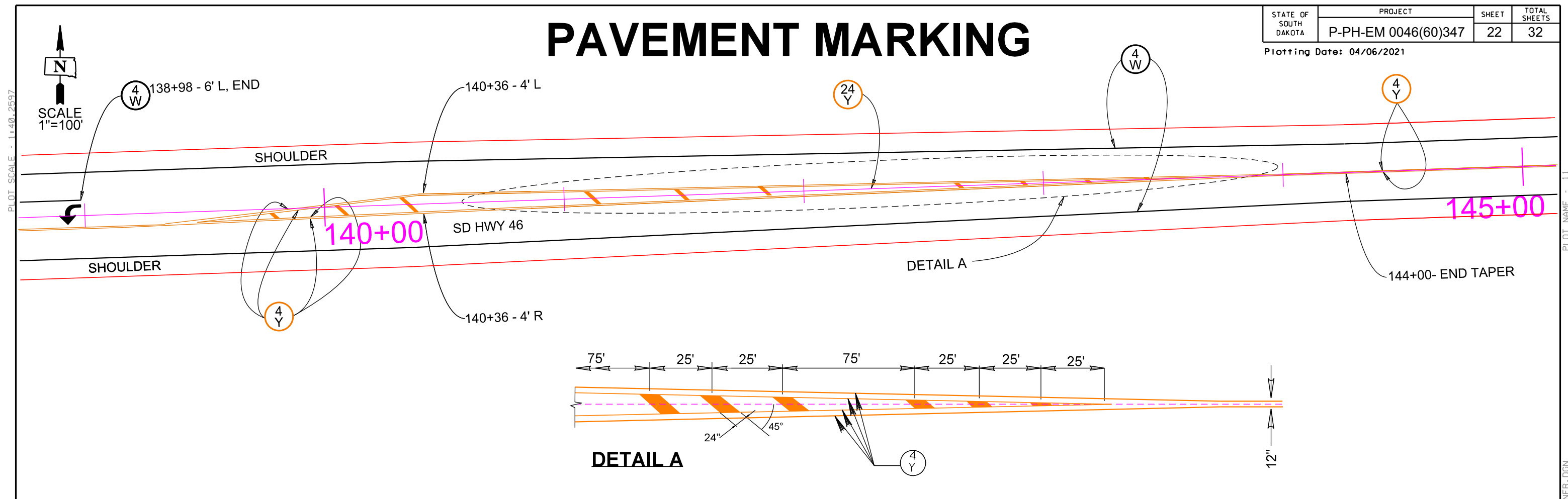
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-PH-EM 0046(60)347	22	32





Plotting Date: 04/06/2021

PLOT SCALE - 1"=40.2597'

PLOT NAME - 11

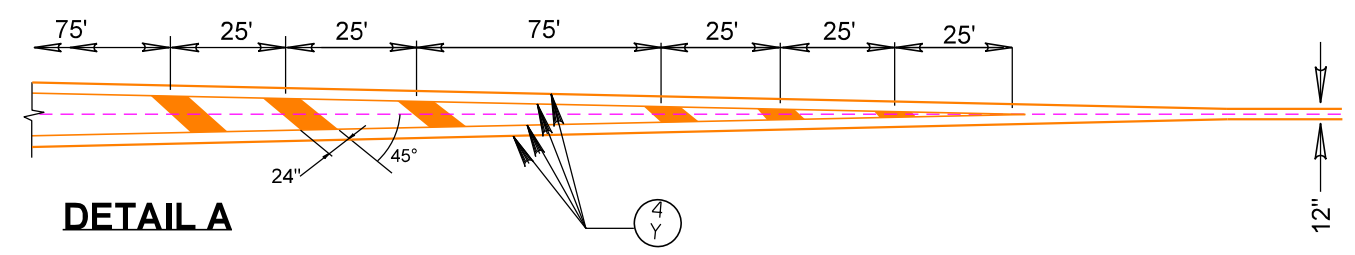
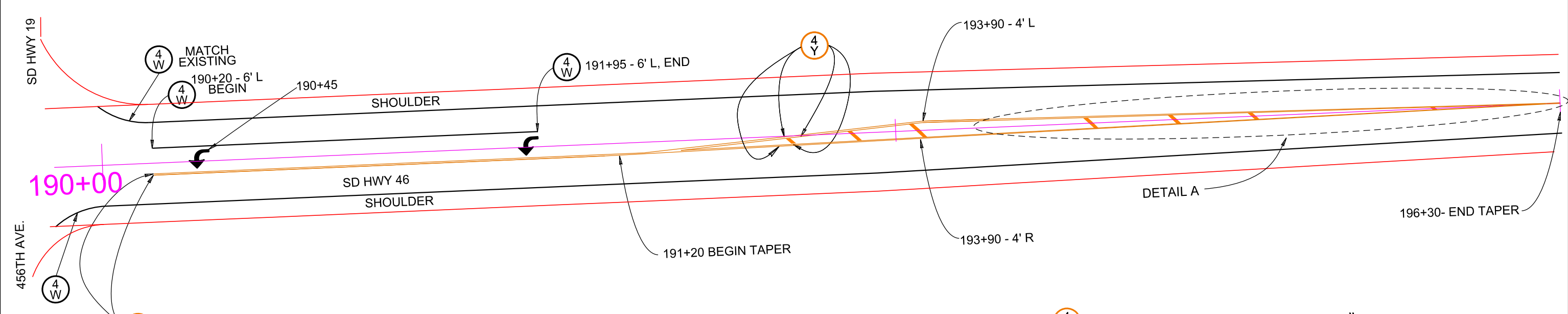
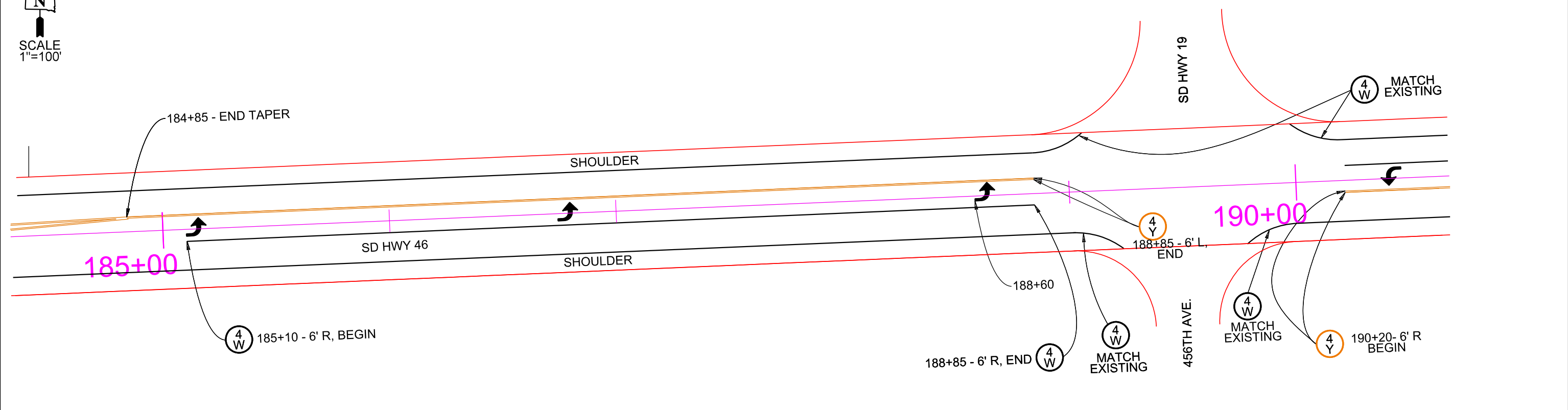
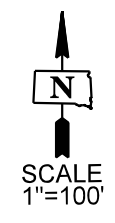
FILE - ... \04J5 MARKING CONTAINER.DGN



-  PAINTED PAVEMENT MARKING, 4" YELLOW
-  PAINTED PAVEMENT MARKING, 4" WHITE
-  PAINTED PAVEMENT MARKING, 24" YELLOW
-  THERMOPLASTIC PAVEMENT MARKING, ARROW

PLOTTED FROM - TRM113318

PAVEMENT MARKING



- PAINTED PAVEMENT MARKING, 4" YELLOW
- PAINTED PAVEMENT MARKING, 4" WHITE
- PAINTED PAVEMENT MARKING, 24" YELLOW
- THERMOPLASTIC PAVEMENT MARKING, ARROW

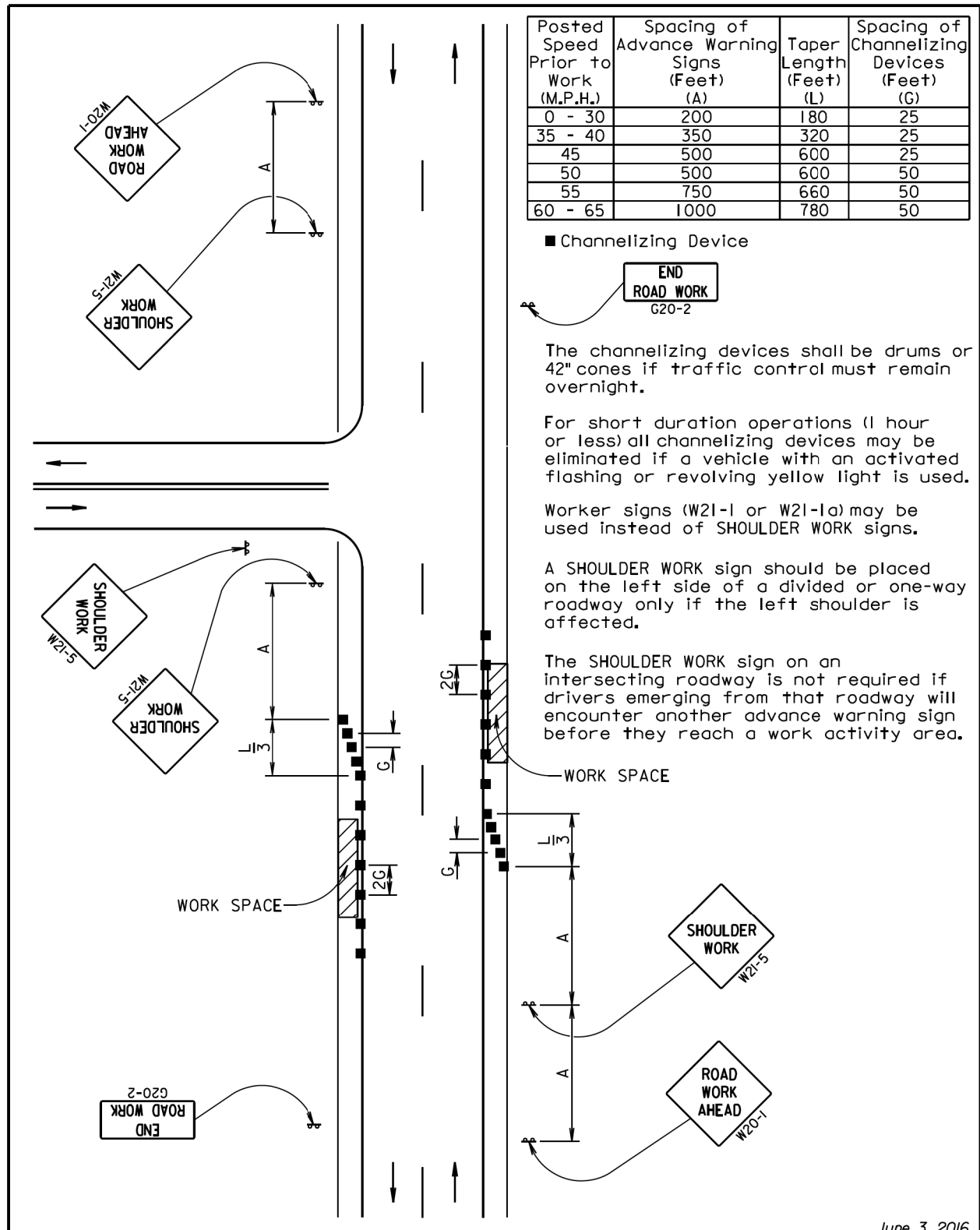
PLOT SCALE - 1:43,2403

PLOTTED FROM - TRM113318

PLOT NAME - 12

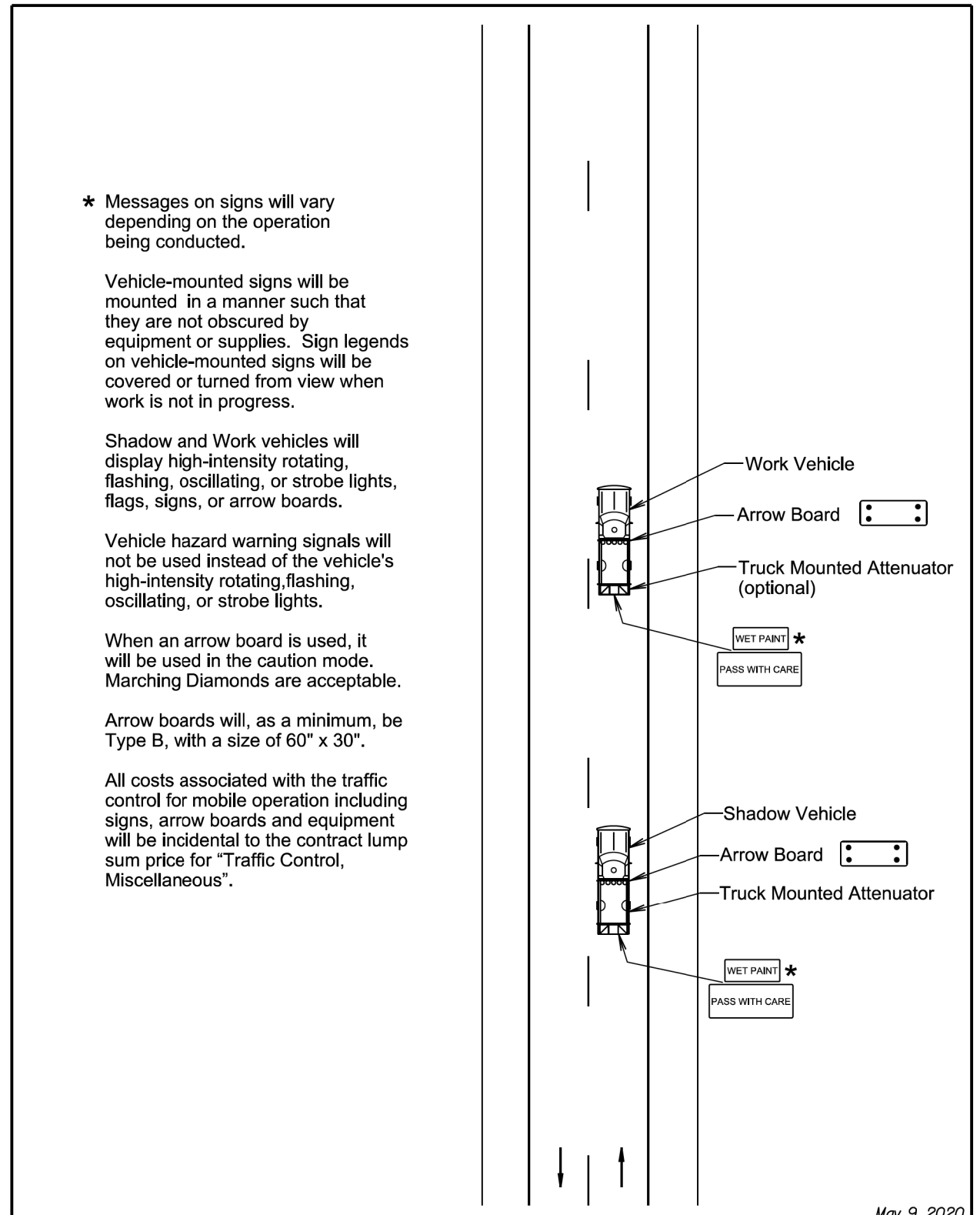
FILE - ... \04J5 MARKING CONTAINER.DGN

Plot Scale - 1:200



June 3, 2016

S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES WORK ON SHOULDERS	PLATE NUMBER 634.03
	Published Date: 1st Qtr. 2021	Sheet 1 of 1



May 9, 2020

S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES MOBILE OPERATIONS ON 2-LANE ROAD	PLATE NUMBER 634.06
	Published Date: 1st Qtr. 2021	Sheet 1 of 1

Plotted From - TRM113318

File - ...:\Standard Plates.dgn

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.

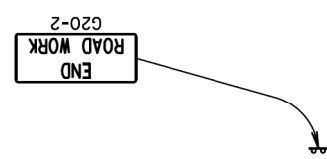
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) shall 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 shall be drums or 42" cones.

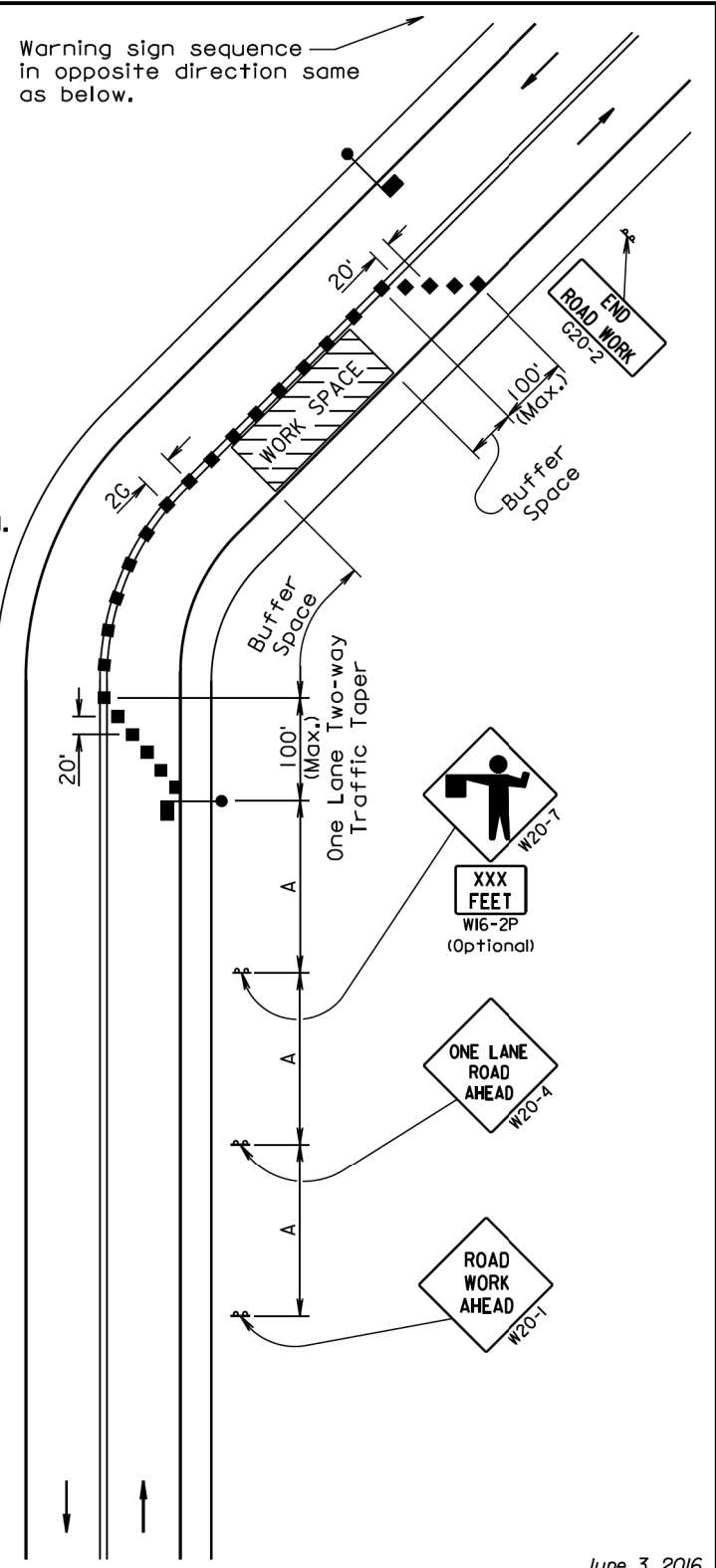
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



Channelizing devices and flaggers shall 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.



June 3, 2016

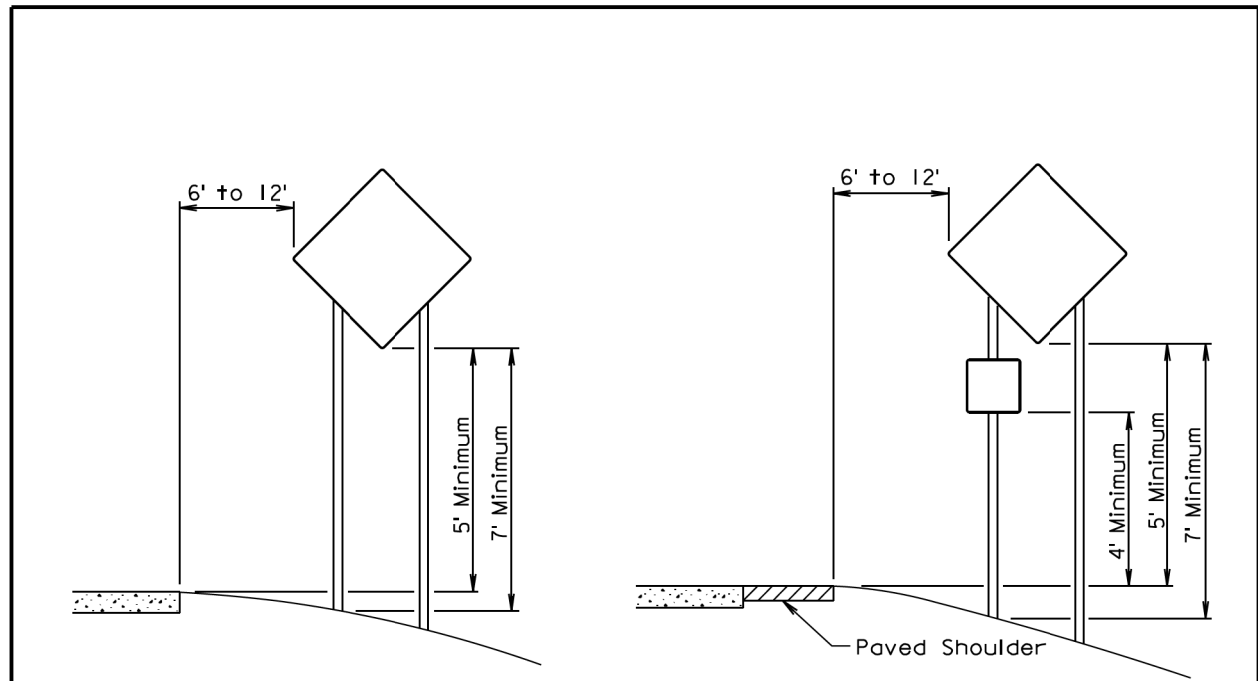
S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
	Published Date: 1st Qtr. 2021	Sheet 1 of 1

Plot Scale - 1:200

Plotted From - TRM113318

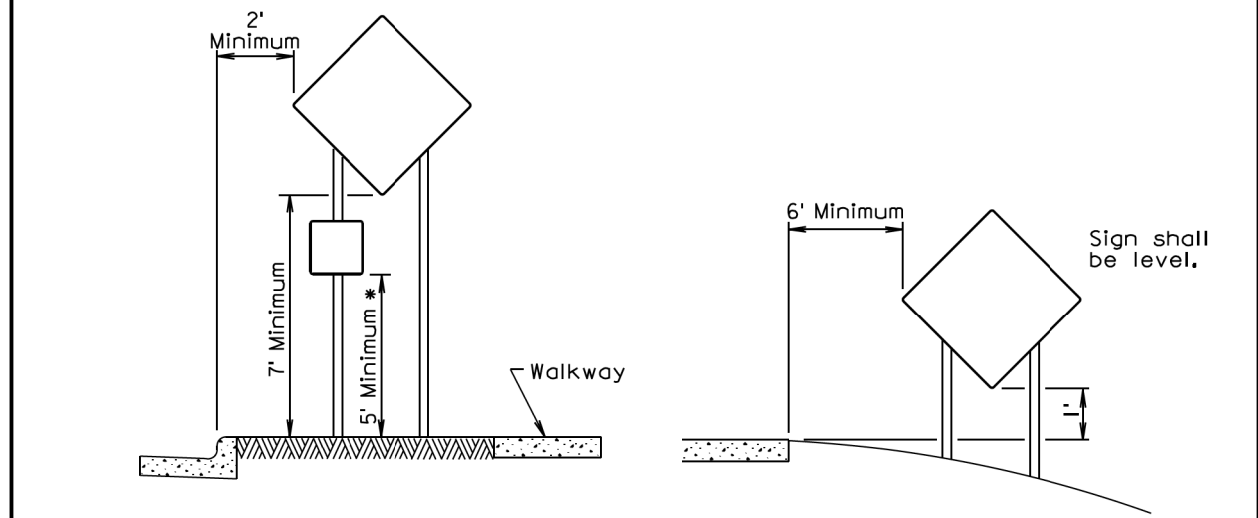
File - ...Standard Plates.dgn

Plot Scale - 1:200



RURAL DISTRICT

RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

RURAL DISTRICT 3 DAY MAXIMUM

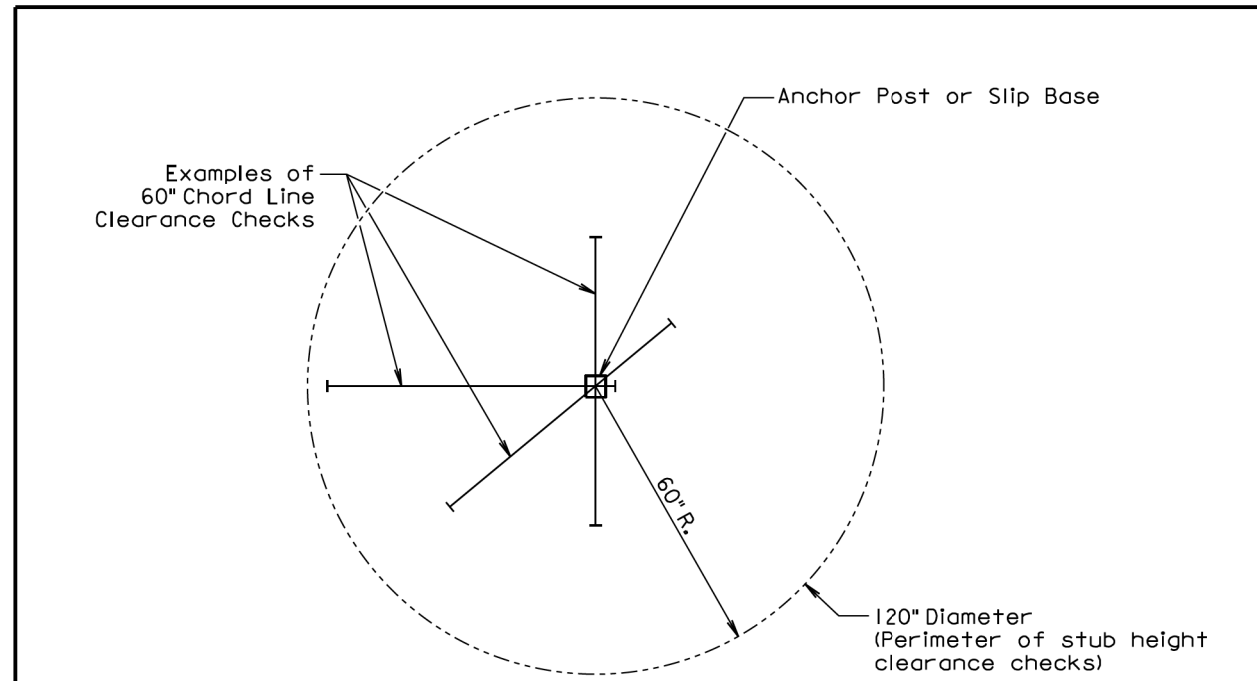
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

(Not applicable to regulatory signs)

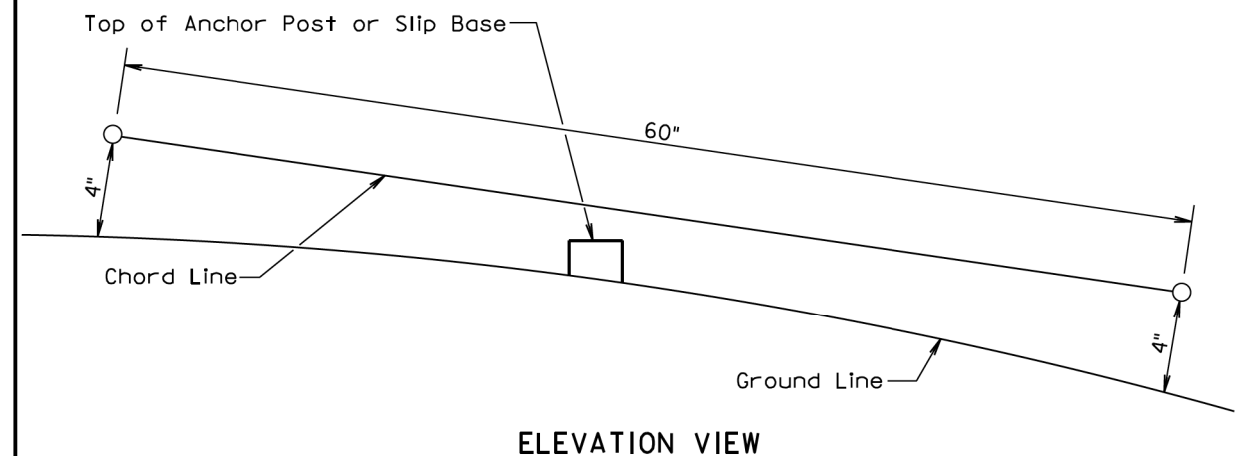
September 22, 2014

S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
		Sheet 1 of 1

Published Date: 1st Qtr. 2021



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.
 At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.
 The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
		Sheet 1 of 1

Published Date: 1st Qtr. 2021

File - ...:\Standard Plates.dgn

-Plotted From- TRM113318

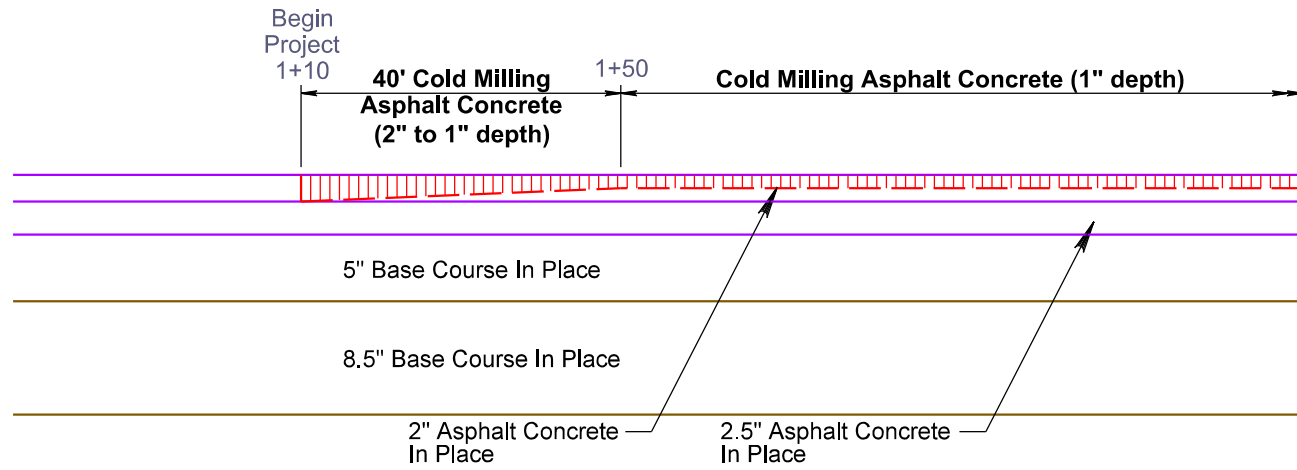
COLD MILLING ASPHALT CONCRETE TAPERS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-PH-EM 0046(60)347	27	32

Plotting Date: 04/12/2021

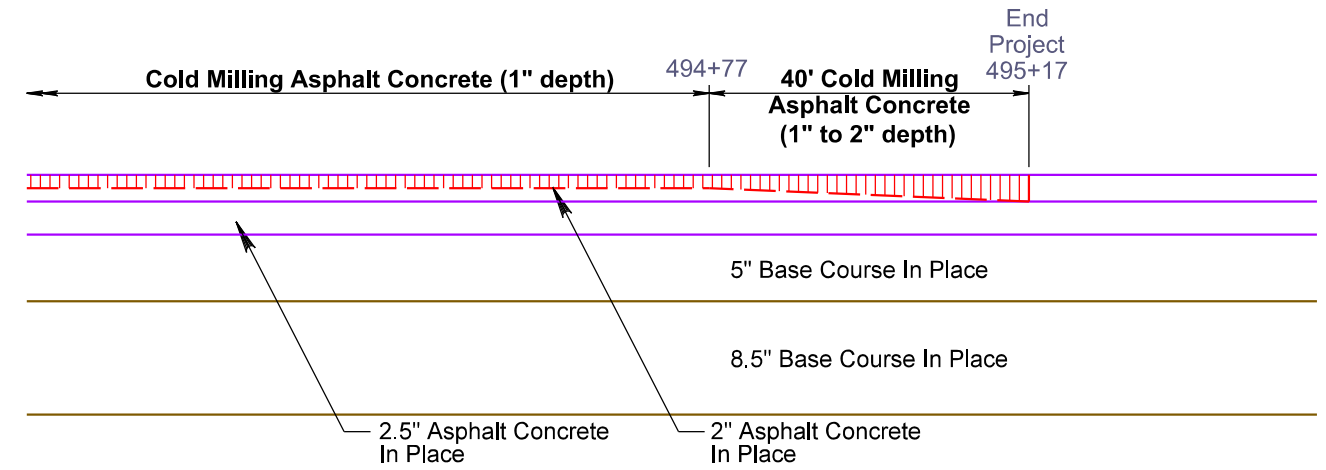
AT BEGIN PROJECT

Section 1 from 1+10 to 1+50



AT END PROJECT

Section 1 from 494+77 to 495+17

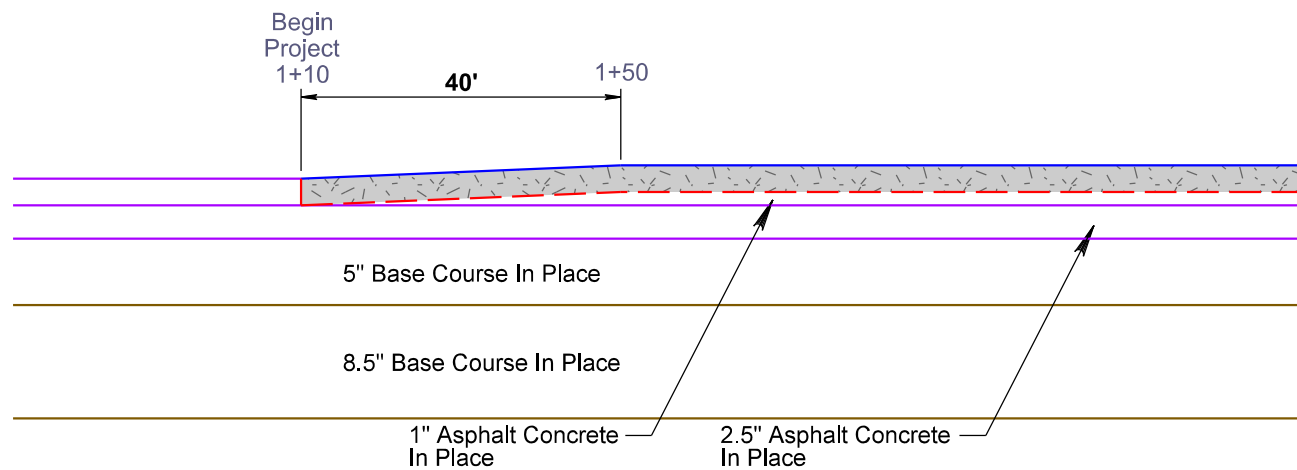


 Cold Milling Asphalt Concrete

ASPHALT CONCRETE RESURFACING TAPERS

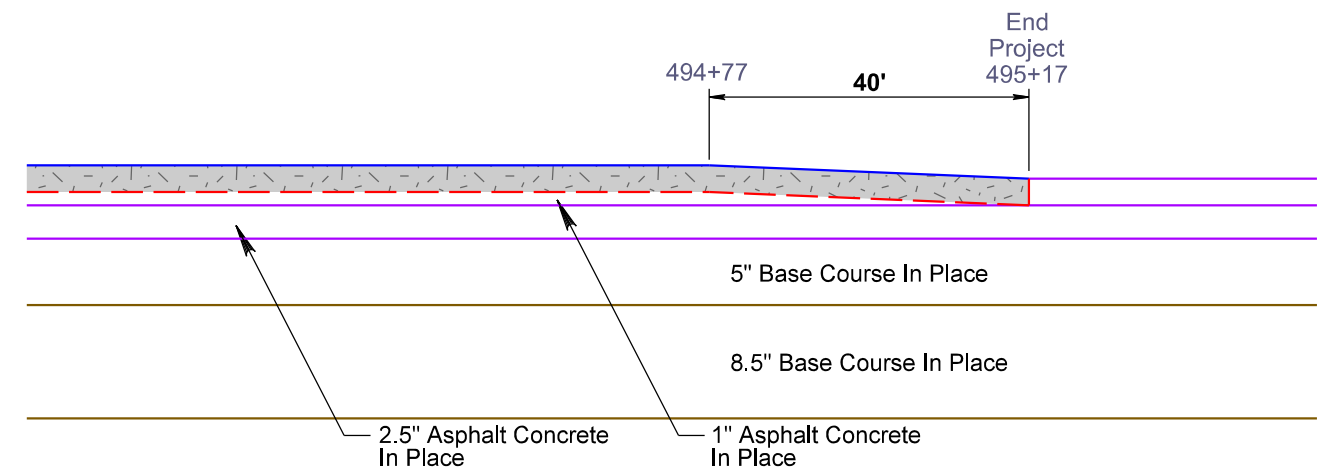
AT BEGIN PROJECT

Section 1 from 1+10 to 1+50



AT END PROJECT

Section 1 from 494+77 to 495+17



 2" Class Q3R Hot Mixed Asphalt Concrete

PLOT SCALE - 1:1.2

PLOTTED FROM - TRMLINT15

PLOT NAME - 8

FILE - ... \PRJ2022\CLAY07L2\MILL07L2.DGN

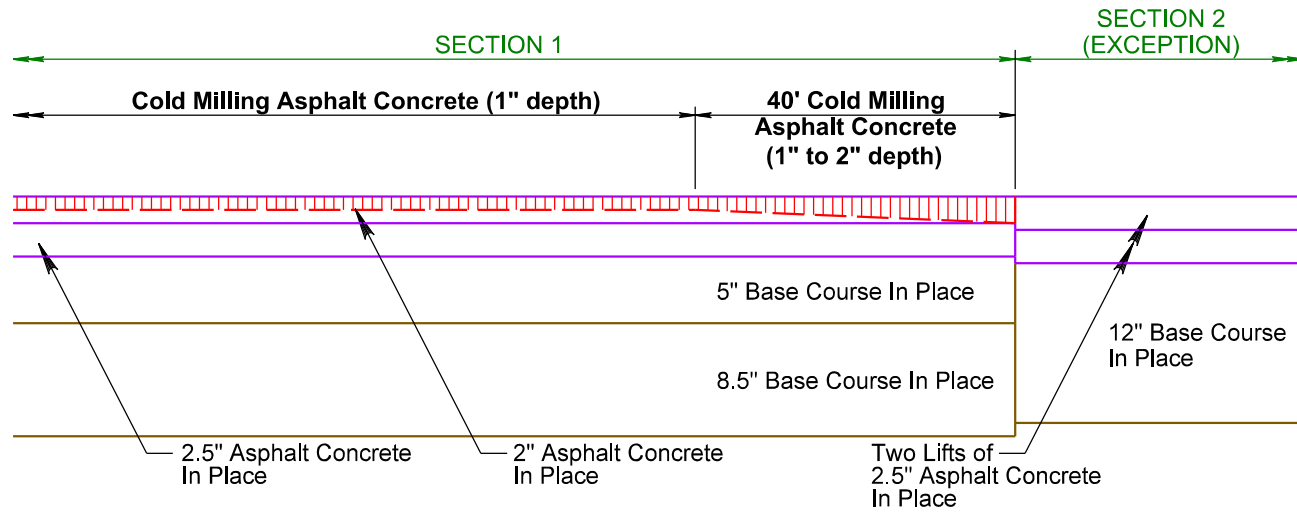
COLD MILLING ASPHALT CONCRETE TAPERS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-PH-EM 0046(60)347	28	32

Plotting Date: 04/12/2021

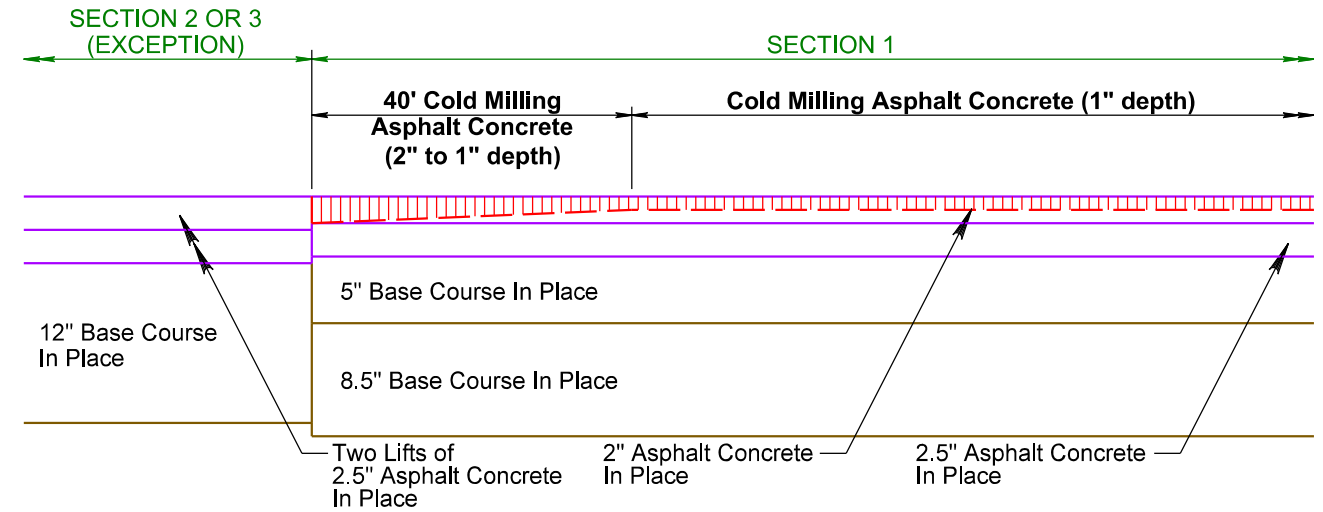
AT BEGIN EXCEPTION SECTION 2

- Section 1 from 51+06 to 51+46
- Section 1 from 111+96 to 112+36
- Section 1 from 206+05 to 206+45
- Section 1 from 280+60 to 281+00



AT END EXCEPTION SECTION 2 OR 3

- Section 1 from 94+12 to 94+52
- Section 1 from 134+68 to 135+08
- Section 1 from 251+90 to 252+30
- Section 1 from 328+00 to 328+40

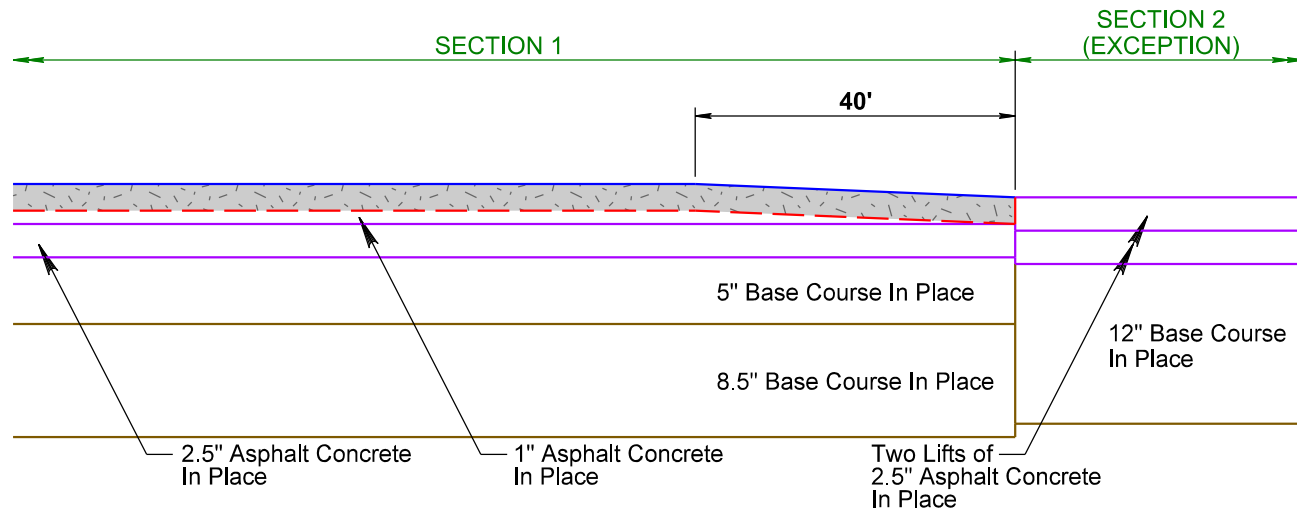


Cold Milling Asphalt Concrete

ASPHALT CONCRETE RESURFACING TAPERS

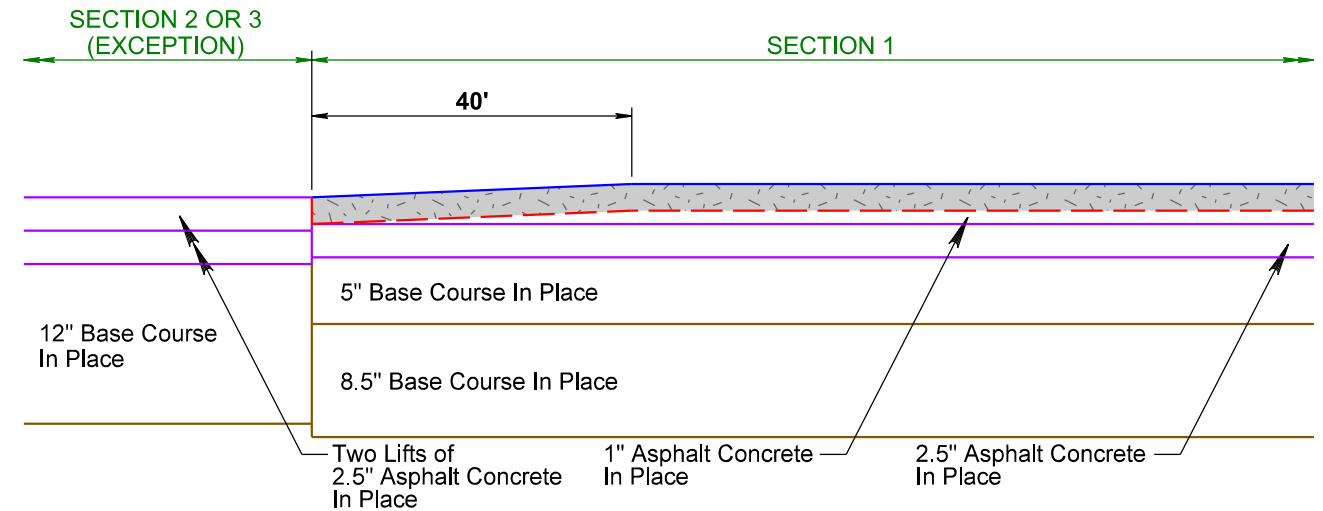
AT BEGIN EXCEPTION SECTION 2

- Section 1 from 51+06 to 51+46
- Section 1 from 111+96 to 112+36
- Section 1 from 206+05 to 206+45
- Section 1 from 280+60 to 281+00



AT END EXCEPTION SECTION 2 OR 3

- Section 1 from 94+12 to 94+52
- Section 1 from 134+68 to 135+08
- Section 1 from 251+90 to 252+30
- Section 1 from 328+00 to 328+40



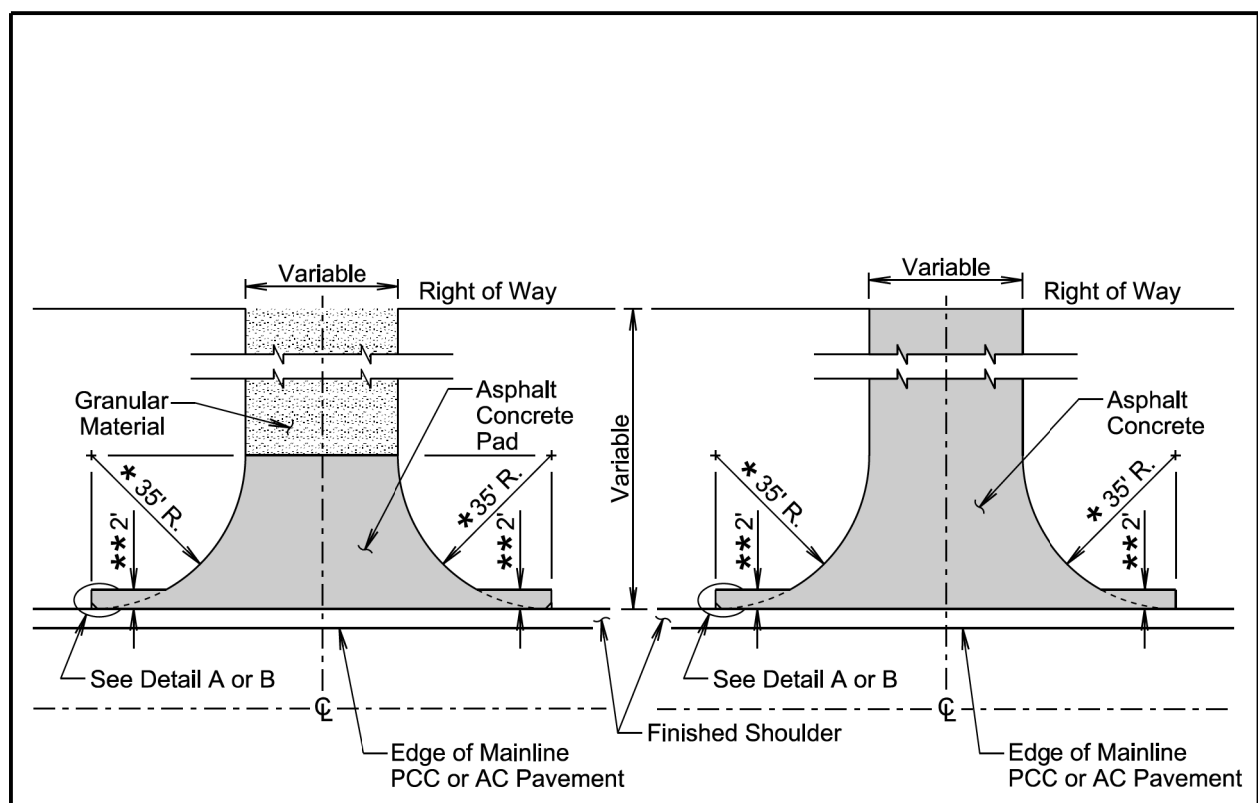
2" Class Q3R Hot Mixed Asphalt Concrete

PLOT SCALE - 1:1.2

PLOTTED FROM - IRMLINT15

PLOT NAME - 9

FILE - ... \PRJ2022\CLAY07L2\MILL07L2.DGN



PLAN VIEW
(Intersecting Road)
(No Asphalt Concrete Surfacing
Beyond Right of Way)

PLAN VIEW
(Intersecting Road)
(Asphalt Concrete Surfacing
Beyond Right of Way)

GENERAL NOTES:

The precise construction limits for situations other than shown above will be determined by the Engineer during construction.

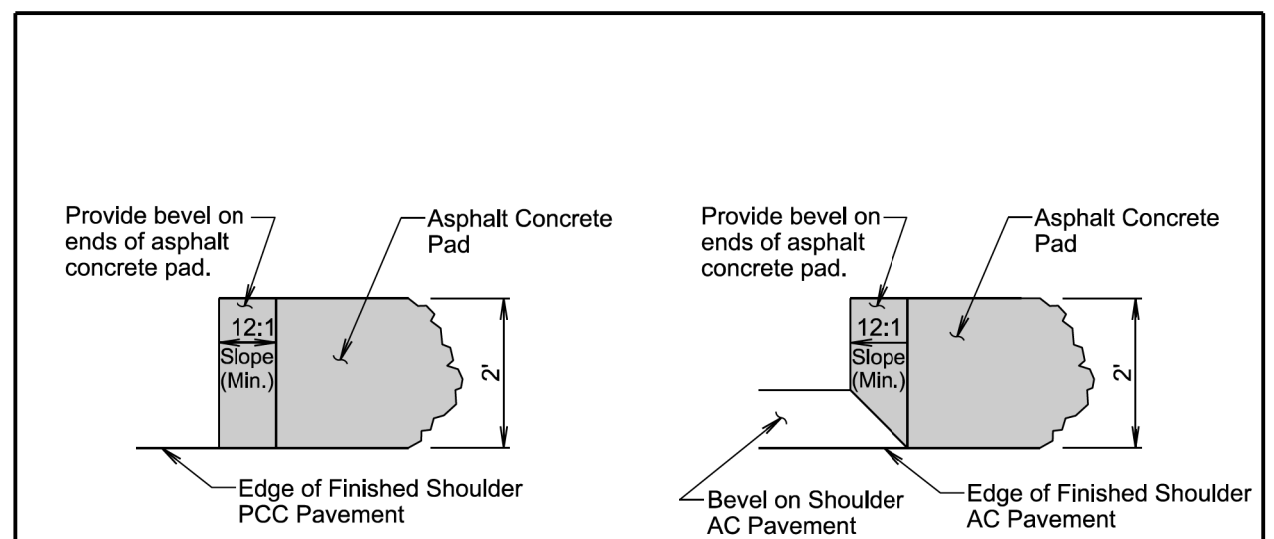
* For new construction, 35' radius typical or as specified in the plans. For resurfacing projects, radius is variable depending on existing conditions.

** The Contractor may adjust the screed of the paver during mainline paving operations to provide the 2-foot asphalt concrete pad or the Contractor may provide the 2-foot asphalt concrete pad during paving of the intersecting roads as shown above. The Engineer may eliminate the 2-foot asphalt concrete pads if the Engineer, in the Engineer's sole discretion, determines the pads are infeasible to construct due to site specific reasons including, but not limited to; existing inslope configuration, borrow and material availability, and right-of-way constraints.

August 27, 2020

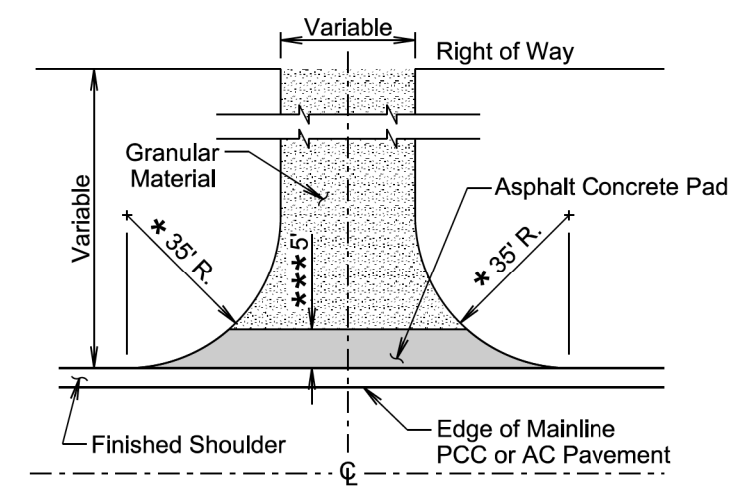
S D D O T	SURFACING OR RESURFACING OF INTERSECTING ROADS AND ENTRANCES (MAINLINE AND SHOULDERS: PCC OR AC PAVEMENT)	PLATE NUMBER 320.04
		Sheet 1 of 2

Published Date: 1st Qtr. 2021



DETAIL A
(Typ. for Projects with PCC Pavement on Shoulder)

DETAIL B
(Typ. for Projects with AC Pavement on Shoulder)



PLAN VIEW
(Entrance)

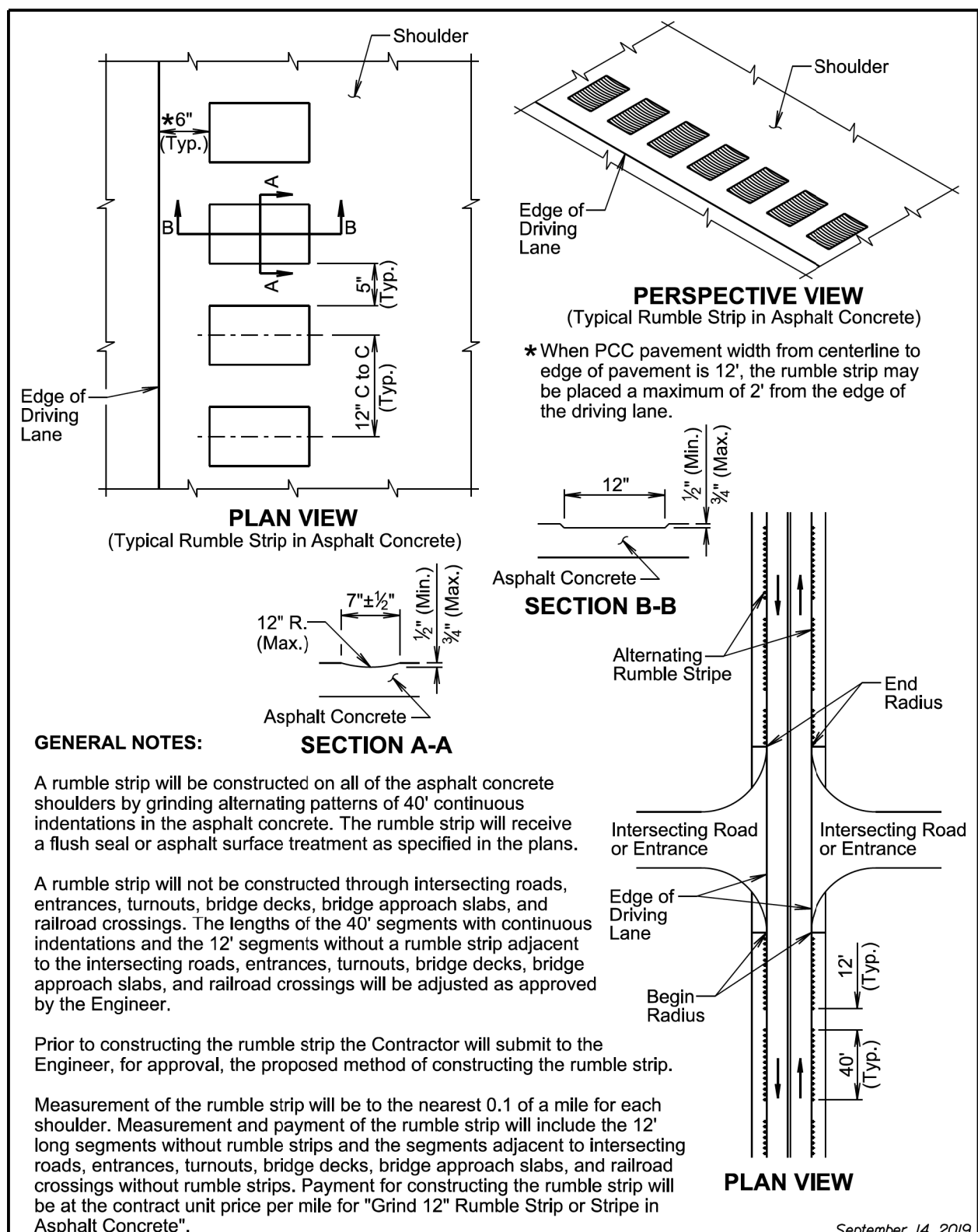
*** Not required if finished shoulder width is 4' or greater.

August 27, 2020

S D D O T	SURFACING OR RESURFACING OF INTERSECTING ROADS AND ENTRANCES (MAINLINE AND SHOULDERS: PCC OR AC PAVEMENT)	PLATE NUMBER 320.04
		Sheet 2 of 2

Published Date: 1st Qtr. 2021

PLOT SCALE - 1:200



GENERAL NOTES:

A rumble strip will be constructed on all of the asphalt concrete shoulders by grinding alternating patterns of 40' continuous indentations in the asphalt concrete. The rumble strip will receive a flush seal or asphalt surface treatment as specified in the plans.

A rumble strip will not be constructed through intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and railroad crossings. The lengths of the 40' segments with continuous indentations and the 12' segments without a rumble strip adjacent to the intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and railroad crossings will be adjusted as approved by the Engineer.

Prior to constructing the rumble strip the Contractor will submit to the Engineer, for approval, the proposed method of constructing the rumble strip.

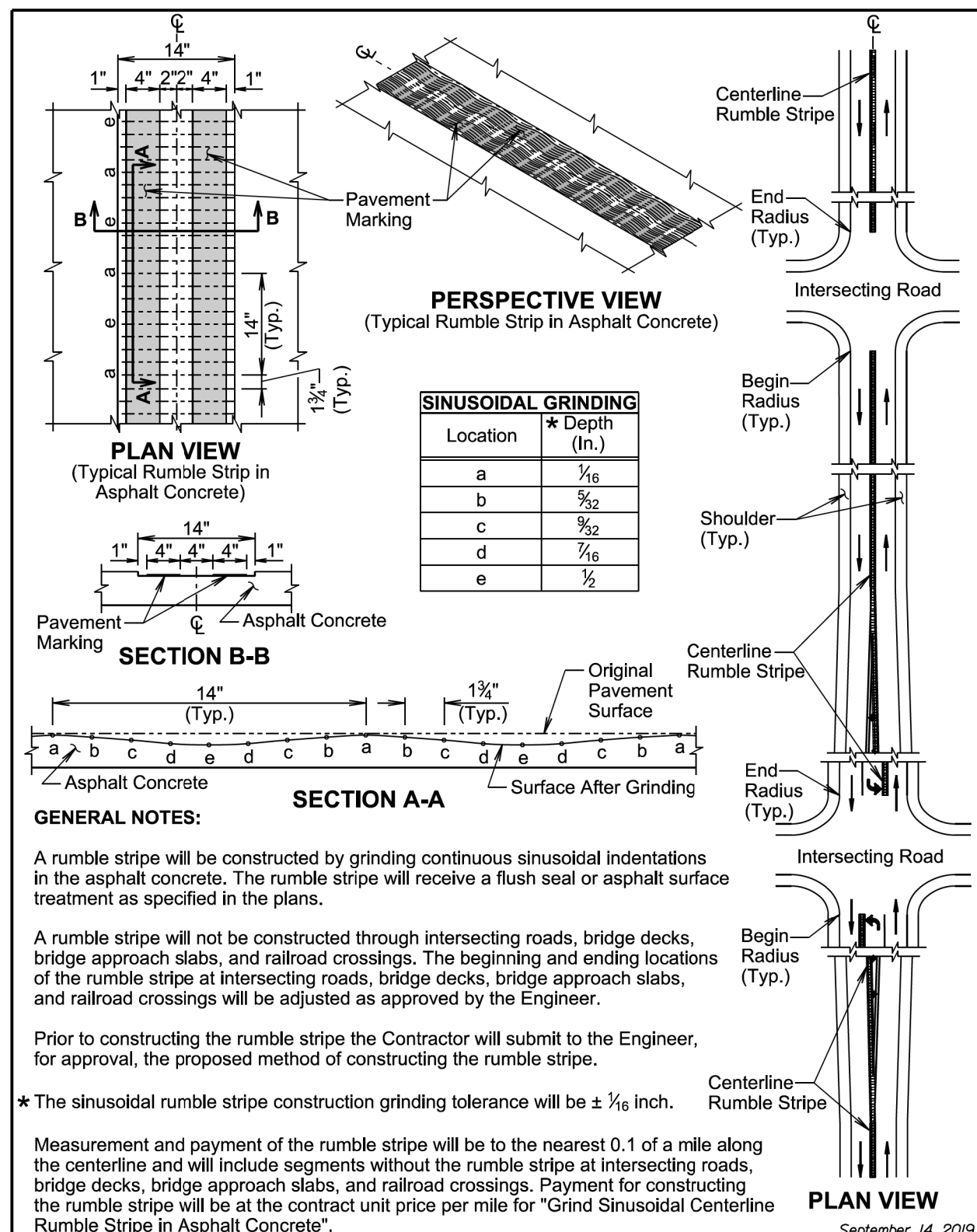
Measurement of the rumble strip will be to the nearest 0.1 of a mile for each shoulder. Measurement and payment of the rumble strip will include the 12' long segments without rumble strips and the segments adjacent to intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and railroad crossings without rumble strips. Payment for constructing the rumble strip will be at the contract unit price per mile for "Grind 12" Rumble Strip or Stripe in Asphalt Concrete".

September 14, 2019

S D D O T	12" RUMBLE STRIP IN ASPHALT CONCRETE ON NONDIVIDED HIGHWAY SHOULDERS	PLATE NUMBER 320.24
	Published Date: 1st Qtr. 2021	Sheet 1 of 1

PLOT NAME - 2

FILE - ... \CLAY\07L2\STD PLATES 07L2.DGN



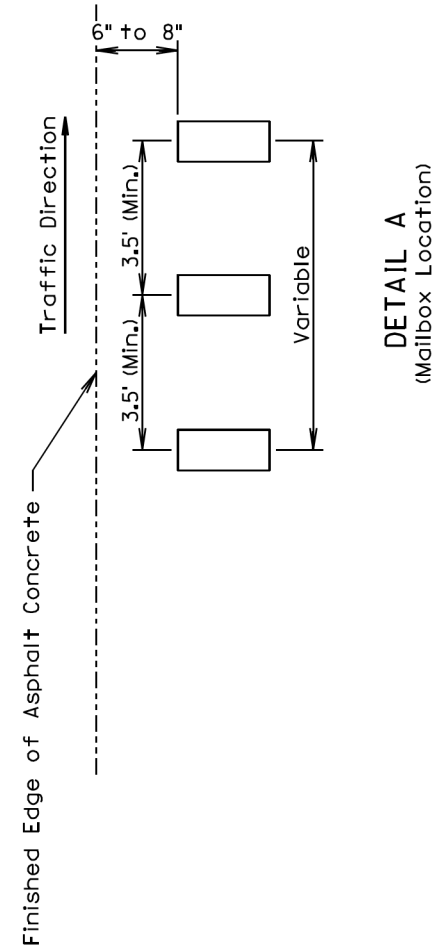
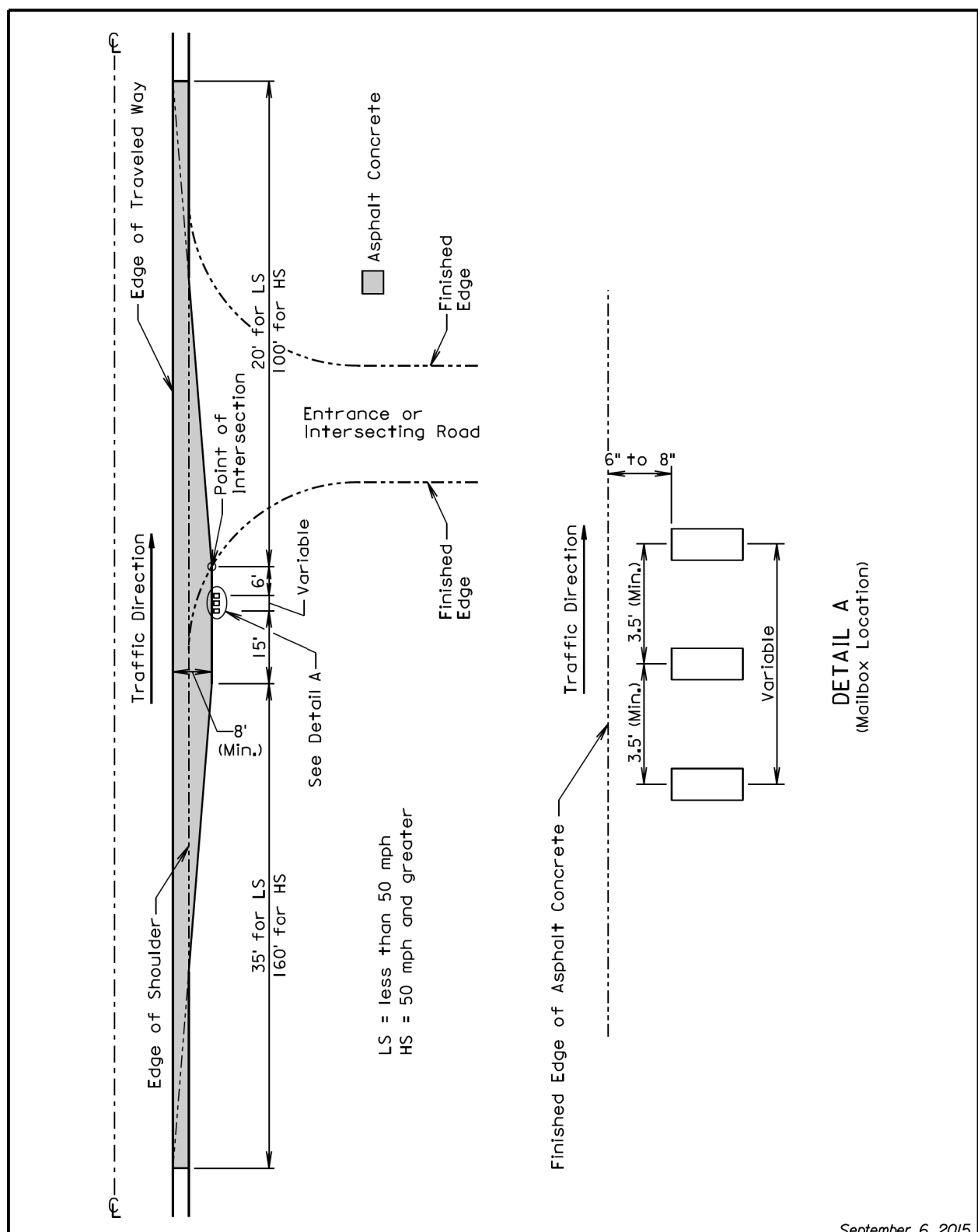
September 14, 2019

S D D O T	SINUSOIDAL CENTERLINE RUMBLE STRIPE IN ASPHALT CONCRETE	PLATE NUMBER 320.40
	Published Date: 1st Qtr. 2021	Sheet 1 of 1

PLOTTED FROM - TRMLINT15

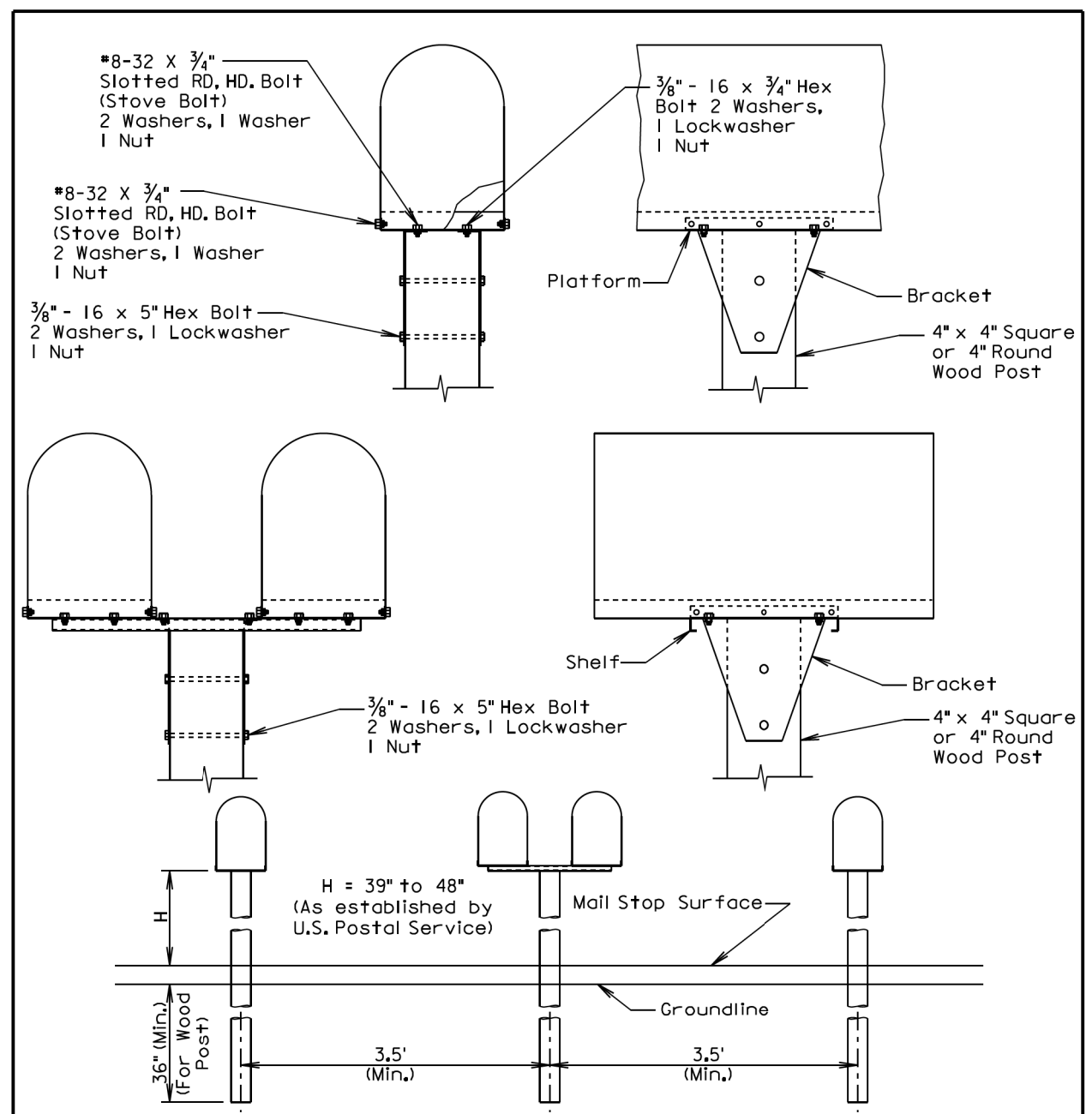
Plotting Date: 04/12/2021

PLOT SCALE - 1:200



September 6, 2015

Published Date: 1st Qtr. 2021	S D D O T	MAILBOX TURNOUT	PLATE NUMBER 900.01
			Sheet 1 of 1



GENERAL NOTES: SPACING FOR MULTIPLE POST INSTALLATION

The post support assemblies provided should be consistent throughout the project. Single and double mailboxes may be in any sequence.

Post support assemblies shall be one from the approved products list, a 4"x4" or 4" round wood post, or an alternate post support assembly that meets the test level 3 crash testing requirements of NCHRP 350 or MASH.

Alternate mailbox support assemblies shall be approved by the Engineer prior to installation. The Contractor shall provide the Engineer written certification that the mailbox support assembly has met the crash testing requirements and will be installed in accordance with the manufacturer's installation instructions.

September 6, 2013

Published Date: 1st Qtr. 2021	S D D O T	SINGLE AND DOUBLE MAILBOX ASSEMBLIES	PLATE NUMBER 900.02
			Sheet 1 of 1

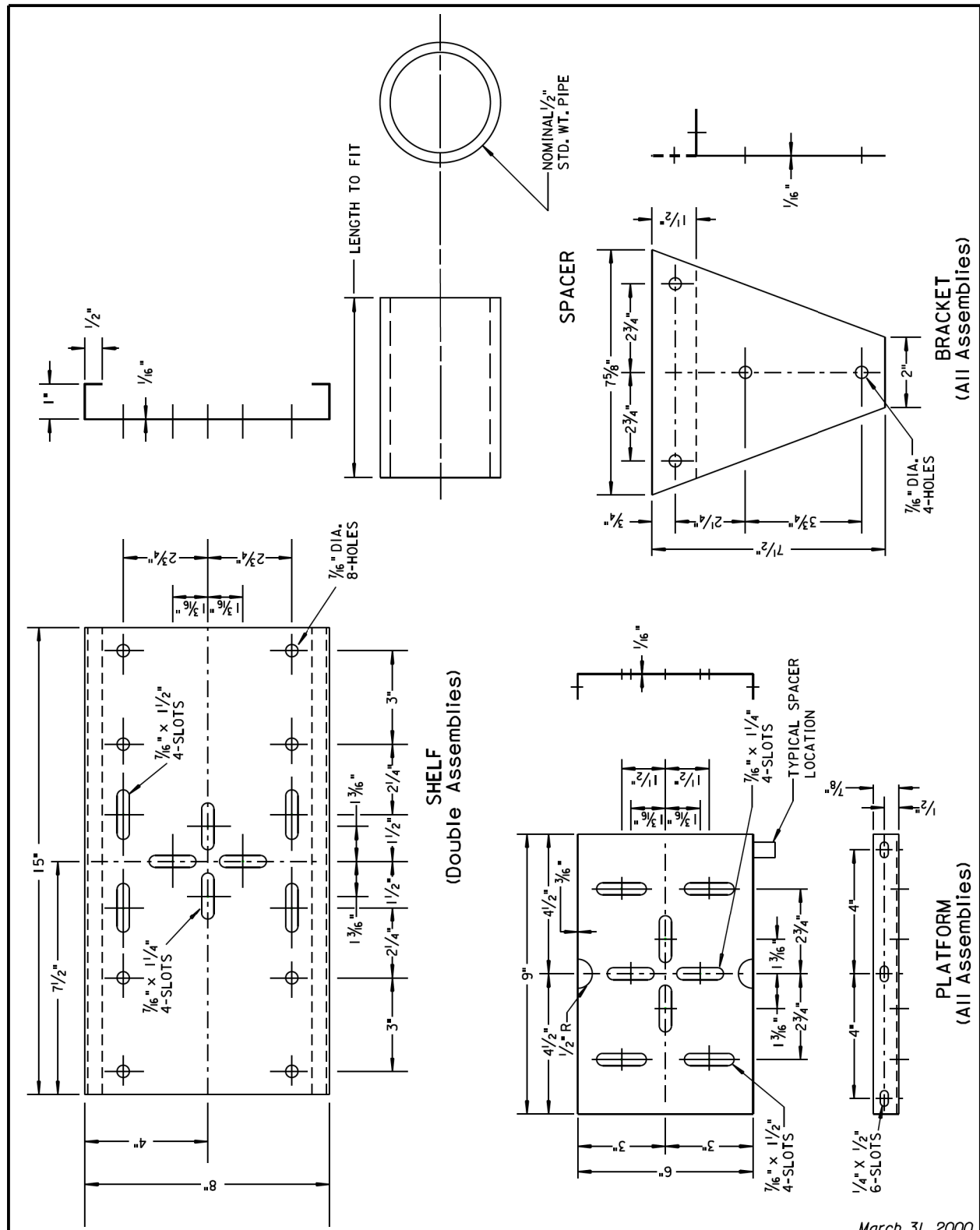
PLOTTED FROM - TRMLINT15

PLOT NAME - 3

FILE - ... \CLAY07L2\STD PLATES 07L2.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P-PH-EM 0046(60)347	32	32

Plotting Date: 04/12/2021



March 31, 2000

S D D O T Published Date: 1st Qtr. 2021	MAILBOX SUPPORT HARDWARE	PLATE NUMBER 900.03
		Sheet 1 of 1