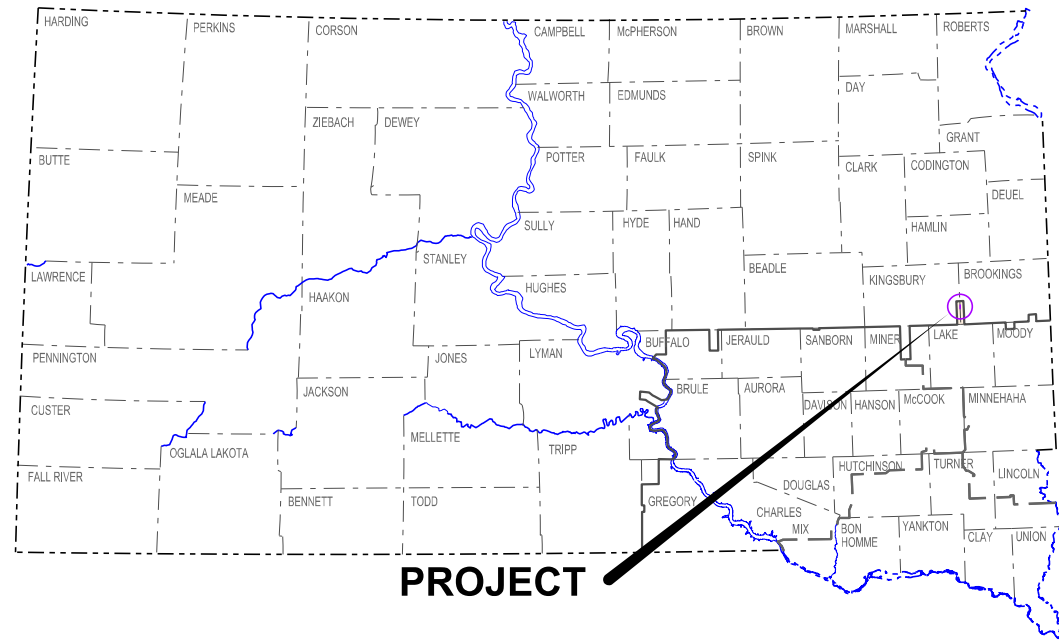


PLOT SCALE - 1:9333.33

PLOTTED FROM - TRM11NT15



STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

Rev. 8-2-19 MR

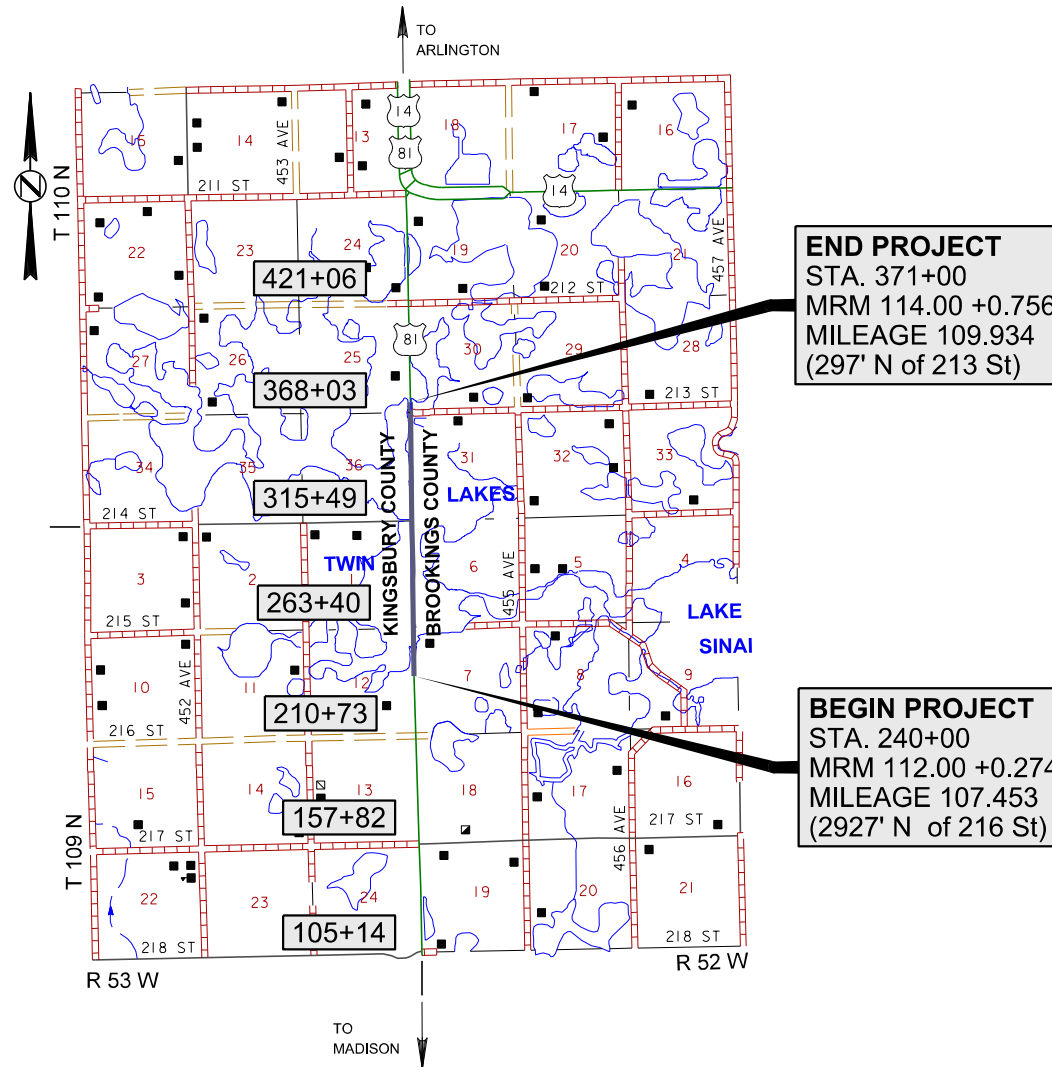
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	ER 0081(116)112	1	16

Plotting Date: 08/02/2019

INDEX OF SHEETS

Sheet 1	Title Sheet
Sheet 2	Estimate of Quantities
Sheets 3 & 4	Environmental Commitments
Sheets 5 - 7	Typical Sections
Sheet 8	Rates of Materials & Summary of Asphalt Concrete
Sheet 9	Table of Materials Quantities & Table of Additional Quantities
Sheets 10 & 11	Plan Notes
Sheets 12 & 13	Grade Raise Profile Tapers
Sheet 14	Typical Surfacing Material Tapers
Sheet 15	Pavement Marking
Sheet 16	Standard Plates

PLANS FOR PROPOSED
PROJECT ER 0081(116)112
US HIGHWAY 81
KINGSBURY & BROOKINGS
COUNTIES
GRADE RAISE, ASPHALT CONCRETE SURFACING,
PAVEMENT MARKING, SIGNING & GUARDRAIL REMOVAL
PCN 07FJ



END PROJECT
STA. 371+00
MRM 114.00 +0.756
MILEAGE 109.934
(297' N of 213 St)

BEGIN PROJECT
STA. 240+00
MRM 112.00 +0.274
MILEAGE 107.453
(2927' N of 216 St)

STORM WATER PERMIT
(None required)

PROJECT LENGTH
Length: 13,100' 2.481 Miles

FILE - ... \KINGS07F\NT1L07FJ.DGN PLOT NAME - 1

ESTIMATE OF QUANTITIES

Rev 8-2-19 MR

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	ER 0081(116)112	2	16

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
* 110E0130	Remove Traffic Sign	18	Each
110E0706	Remove High Tension 3 Cable Guardrail	21,700	Ft
120E6200	Water for Granular Material	741.0	MGal
120E7000	Select Granular Backfill	38,870.0	Ton
120E9000	Pit Run	37,080.0	Ton
260E1010	Base Course	21,730.0	Ton
* 320E0006	PG 64-22 Asphalt Binder	932.4	Ton
* 320E1050	Class E Asphalt Concrete	16,076.0	Ton
* 320E3000	Compaction Sample	6	Each
* 320E7008	Grind 8" Rumble Strip or Stripe in Asphalt Concrete	5.0	Mile
* 330E0010	MC-70 Asphalt for Prime	78.8	Ton
* 330E0100	SS-1h or CSS-1h Asphalt for Tack	34.1	Ton
* 330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	13.2	Ton
* 330E2000	Sand for Flush Seal	141.0	Ton
600E0200	Type II Field Laboratory	1	Each
* 632E2510	Type 2 Object Marker Back to Back	125	Each
* 632E3520	Remove, Salvage, Relocate, and Reset Traffic Sign	11	Each
* 633E1200	High Build Waterborne Pavement Marking Paint, White	276	Gal
* 633E1205	High Build Waterborne Pavement Marking Paint, Yellow	20	Gal
831E0200	Woven Separator Fabric	63,407	SqYd
831E0300	Reinforcement Fabric (MSE)	41,746	SqYd
831E1010	Geogrid Reinforcement	38,195	SqYd

* - Denotes Non-Participating

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	ER 0081(116)112	3	16

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: <http://www.sddot.com/resources/Manuals/EnvironProcManual.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 Office at 605-773-3098 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

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 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.

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 Aquatic Invasive Species in South Dakota can be accessed at: <http://sdleastwanted.com/maps/default.aspx>.

COMMITMENT D: WATER QUALITY STANDARDS

COMMITMENT D1: SURFACE WATER QUALITY

Twin Lakes is classified as fish and wildlife propagation, recreation, irrigation, and stock watering waters. Because of these beneficial uses, special construction measures may have to be taken to ensure that this water body is not impacted.

Action Taken/Required:

The Contractor is advised that the South Dakota Surface Water Quality Standards, administered by the South Dakota Department of Environment and Natural Resources (DENR), apply to this project. Special construction measures will be taken to ensure the above standard(s) of the surface waters are maintained and protected.

COMMITMENT D2: SURFACE WATER DISCHARGE

The DENR General Permit for Temporary Discharge is required for temporary dewatering and discharges to waters of the state. The effluent limit for total suspended solids will be 90 mg/L 30-day average. The effluent limit applies to discharges to all waters of the state except discharges to waters classified as cold water permanent fish life propagation waters according to the ARSD 74:51:01:45. For discharges to waters of the state classified as cold water permanent fish life propagation waters, the effluent limit for total suspended solids will be 53 mg/L daily maximum.

The permittee has the option of completing effluent testing or implementing a pollution prevention plan for compliance with this permit. If the permittee develops a pollution prevention plan instead of total suspended solids sampling, the plan must be developed and implemented prior to discontinuing total suspended solids sampling. Refer to section 3.0 of the permit. If any pollutants are suspected of being discharged, a sample must be taken for those parameters listed in section 2.2 of the permit.

Refer to Commitment D1: Surface Water Quality for stream classification.

Action Taken/Required:

If construction dewatering is required, the Contractor will obtain the General Permit for Temporary Discharge Activities from the DENR Surface Water Program, 605-773-3351. <http://denr.sd.gov/des/sw/swqformsandpermits.aspx>

The Contractor will provide a copy of the approved permit to the Project Engineer prior to proceeding with any dewatering activities. The approved permit must be kept on-site and as part of the project records.

Effluent monitoring, as a result of dewatering activities, will be summarized for each month and recorded on a separate Discharge Monitoring Report (DMR) and submitted to DENR monthly. Additional information can be found at <http://denr.sd.gov/des/sw/WhatisaDMR.aspx>

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.

ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	ER 0081(116)112	4	16

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 completely 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 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: 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 will immediately cease, and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office 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.

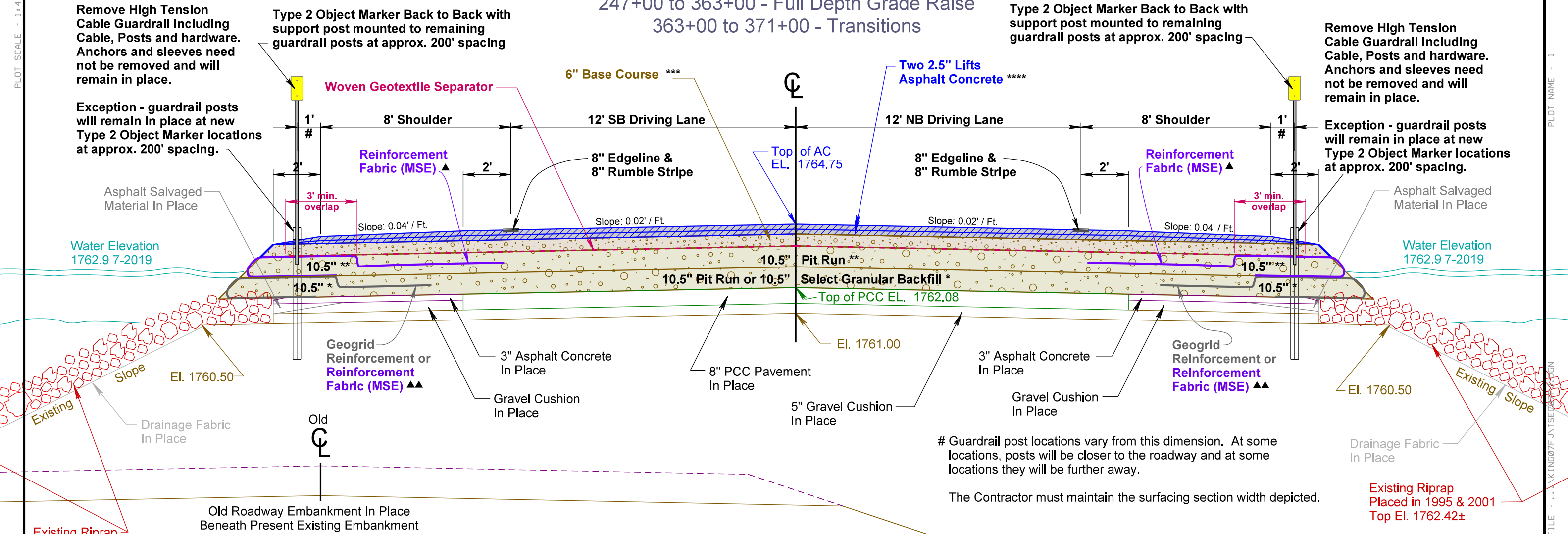
OPTION 1

TYPICAL GRADE RAISE & SURFACING SECTION

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	ER 0081(116)112	5	16

Plotting Date: 08/02/2019
Rev. 8-2-19 MR

US81
240+00 to 247+00 - Transitions
247+00 to 363+00 - Full Depth Grade Raise
363+00 to 371+00 - Transitions



Material Tapers:

Station to Station	Taper Length	* Pit Run or Select Granular Backfill Depth	** Pit Run Depth	*** Base Course Depth	**** Asphalt Concrete Depth
240+00 to 241+25	125'	-	-	-	0" to 5"
241+25 to 242+50	125'	-	-	0" to 6"	5"
242+50 to 244+75	225'	0" to 10.5"	-	6"	5"
244+75 to 247+00	225'	10.5"	0" to 10.5"	6"	5"
247+00 to 363+00	11600'	10.5"	10.5"	6"	5"
363+00 to 367+50	450'	10.5"	10.5" to 0"	6"	5"
367+50 to 369+50	200'	10.5" to 0"	-	6"	5"
369+50 to 370+25	75'	-	-	6" to 0"	5"
370+25 to 371+00	75'	-	-	-	5" to 0"

▲ Reinforcement Fabric (MSE) (depicted using 15' rolls):
Top Wrap Embedment for 10.5" Pit Run Top Lift - 9' Width
Bottom Wrap Underpinning for 10.5" Pit Run Top Lift - 5' Width

▲▲ Reinforcement Fabric (MSE) (15' rolls) or Geogrid Reinforcement (depicted using 13' rolls):

If water is not on/over the roadway at the time of placement, then:
Place the Bottom Lift as 10.5" Pit Run with edges wrapped in Reinforcement Fabric (MSE).

Top Wrap Embedment for 10.5" Bottom Lift - 9' Width
Bottom Wrap Underpinning for 10.5" Bottom Lift - 5' Width

If water is on/over the roadway at the time of placement, then:
Place the Bottom Lift as 10.5" Select Granular Backfill with edges wrapped in Geogrid Reinforcement.

Top Wrap Embedment for 10.5" Bottom Lift - 8' Width
Bottom Wrap Underpinning for 10.5" Bottom Lift - 4' Width

Note:

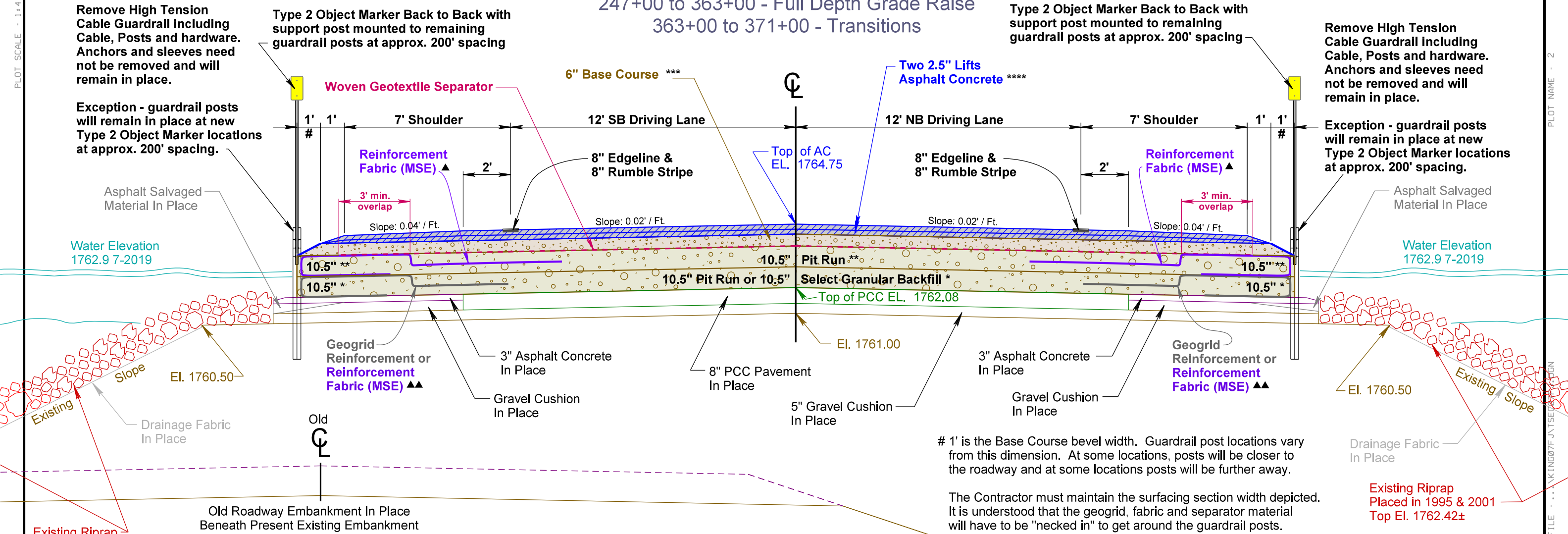
Slits must be cut in the Woven Separator Fabric, the Reinforcement Fabric (MSE) and the Geogrid Reinforcement in order to get the reinforcement material placed over the remaining guardrail posts being reused as mounting locations for the Type 2 Object Markers and Posts.

The slit length should be kept to a minimum so as to prevent surfacing material from escaping through the slit at the posts.

OPTION 2 TYPICAL GRADE RAISE & SURFACING SECTION

PLOT SCALE - 1"=4'

PLOT NAME - 2



Existing Riprap Placed in 1995 & 2001 Top El. 1762.42±

Existing Riprap Placed in 1995 & 2001 Top El. 1762.42±

Material Tapers:

Station to Station	Taper Length	*	**	***	****
		Pit Run or Select Granular Backfill Depth	Pit Run Depth	Base Course Depth	Asphalt Concrete Depth
240+00 to 241+25	125'	-	-	-	0" to 5"
241+25 to 242+50	125'	-	-	0" to 6"	5"
242+50 to 244+75	225'	0" to 10.5"	-	6"	5"
244+75 to 247+00	225'	10.5"	0" to 10.5"	6"	5"
247+00 to 363+00	11600'	10.5"	10.5"	6"	5"
363+00 to 367+50	450'	10.5"	10.5" to 0"	6"	5"
367+50 to 369+50	200'	10.5" to 0"	-	6"	5"
369+50 to 370+25	75'	-	-	6" to 0"	5"
370+25 to 371+00	75'	-	-	-	5" to 0"

▲ Reinforcement Fabric (MSE) (depicted using 15' rolls): Top Wrap Embedment for 10.5" Pit Run Top Lift - 9' Width Bottom Wrap Underpinning for 10.5" Pit Run Top Lift - 5' Width

▲▲ Reinforcement Fabric (MSE) (15' rolls) or Geogrid Reinforcement (depicted using 13' rolls):

If water is not on/over the roadway at the time of placement, then: Place the Bottom Lift as 10.5" Pit Run with edges wrapped in Reinforcement Fabric (MSE).

Top Wrap Embedment for 10.5" Bottom Lift - 9' Width Bottom Wrap Underpinning for 10.5" Bottom Lift - 5' Width

If water is on/over the roadway at the time of placement, then: Place the Bottom Lift as 10.5" Select Granular Backfill with edges wrapped in Geogrid Reinforcement.

Top Wrap Embedment for 10.5" Bottom Lift - 8' Width Bottom Wrap Underpinning for 10.5" Bottom Lift - 4' Width

Note:

The Contractor will be allowed to use the existing quadrail and posts as an aid to installation of the geogrid, fabric and surfacing, provided it can be demonstrated that the geogrid and fabric will not be damaged in the installation process.

The guardrail and posts will still need to be removed prior to project completion. It must also be demonstrated that the geogrid, fabric and surfacing will not be comprised or damaged during or following removal of the guardrail and posts.

Any geogrid, fabric or surfacing material damaged, comprised or settled due to the Contractor's operations will be replaced by the Contractor at no expense to the State.

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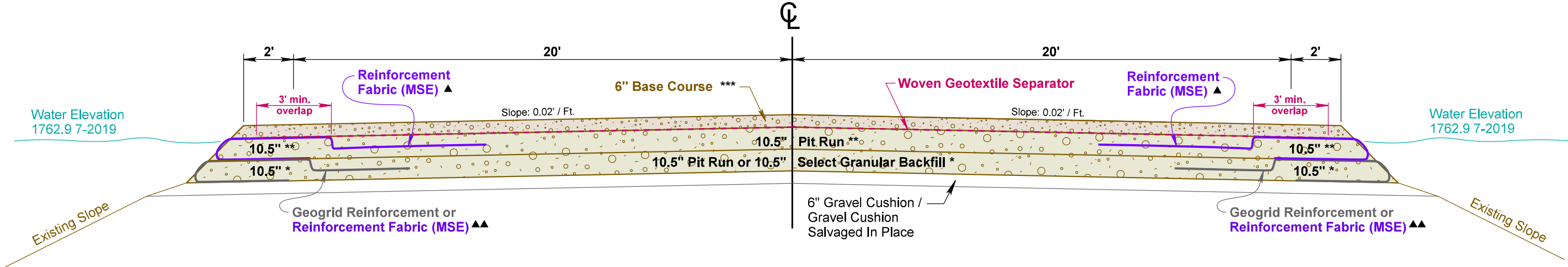
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TYPICAL GRADE RAISE & SURFACING SECTION

40' Double Field Entrance (25' Radius)
355+16 L

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	ER 0081(116)112	7	16

Plotting Date: 08/02/2019

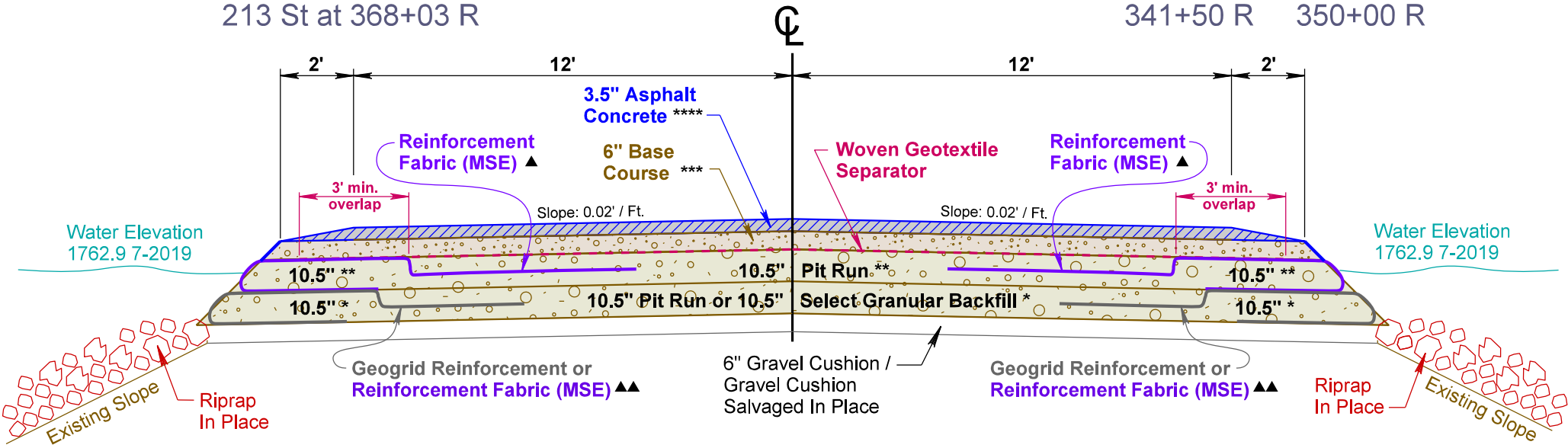


TYPICAL GRADE RAISE & SURFACING SECTION

24' Intersecting Roads
(35' Radius)
214 St at 315+49 L
213 St at 368+03 R

24' Farm Entrance
(25' Radius)
253+54 R

24' Field Entrances
(25' Radius)
245+50 L 253+54 L
341+50 R 350+00 R



▲ Reinforcement Fabric (MSE) (depicted using 15' rolls):
Top Wrap Embedment for 10.5" Pit Run Top Lift - 9' Width
Bottom Wrap Underpinning for 10.5" Pit Run Top Lift - 5' Width

▲▲ Reinforcement Fabric (MSE) (15' rolls) or
Geogrid Reinforcement (depicted using 13' rolls):

If water is not on/over the roadway at the time of placement, then:
Place the Bottom Lift as 10.5" Pit Run with edges wrapped in
Reinforcement Fabric (MSE).

Top Wrap Embedment for 10.5" Bottom Lift - 9' Width
Bottom Wrap Underpinning for 10.5" Bottom Lift - 5' Width

If water is on/over the roadway at the time of placement, then:
Place the Bottom Lift as 10.5" Select Granular Backfill
with edges wrapped in Geogrid Reinforcement.

Top Wrap Embedment for 10.5" Bottom Lift - 8' Width
Bottom Wrap Underpinning for 10.5" Bottom Lift - 4' Width

Intersecting Roads

Material Tapers		*	**	***	****
		Pit Run or Select Granular Backfill	Pit Run	Base Course	Asphalt Concrete
Shoulder Edge to	Location	Taper Length	Depth	Depth	Depth
End 35' Radius - 20' to 47' from US81	CL	27'	10.5"	10.5"	6"
					3.5"
47' to 58' from US81	CL	11'	10.5"	10.5"	9.5" to 6"
58' to 90' from US81	CL	32'	10.5"	10.5" to 0"	6"
90' to 122' from US81	CL	32'	10.5" to 0"	-	6"
122' to 140' from US81	CL	18'	-	-	6" to 0"

Entrances

Material Tapers		*	**	***	****
		Pit Run or Select Granular Backfill	Pit Run	Base Course	Asphalt Concrete
Shoulder Edge to	Location	Taper Length	Depth	Depth	Depth
End 25' Radius - 20' to 37' from US81	CL	17'	10.5"	10.5"	10" to 6"
					-
37' to 52' from US81	CL	15'	10.5"	10.5" to 0"	6"
52' to 67' from US81	CL	15'	10.5" to 0"	-	6"
67' to 74' from US81	CL	7'	-	-	6" to 0"

RATES OF MATERIALS & SUMMARY OF ASPHALT CONCRETE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	ER 0081(116)112	8	16

RATES OF MATERIALS

240+00.00 to 241+25.00	See Typical Section for applicable stationing for each type of surfacing material.
241+25.00 to 242+50.00	
242+50.00 to 244+75.00	
244+75.00 to 247+00.00	
247+00.00 to 363+00.00	
363+00.00 to 367+50.00	
367+50.00 to 369+50.00	
369+50.00 to 370+25.00	
370+25.00 to 371+00.00	

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

SELECT GRANULAR BACKFILL (LOCATIONS AND USE WILL VARY BASED ON WATER LEVEL)

Crushed Aggregate	309.16 Tons
Water for Granular Material	3.72 MGals

PIT RUN (BOTTOM LIFT LOCATIONS AND USE WILL VARY BASED ON WATER LEVEL)

	TOP LIFT	BOTTOM LIFT
Crushed Aggregate	297.59 Tons	309.16 Tons
Water for Granular Material	3.57 MGals	3.71 MGals

BASE COURSE

Crushed Aggregate	164.85 Tons
Water for Granular Material	1.98 MGals

2.5" CLASS E ASPHALT CONCRETE 1ST LIFT

Crushed Aggregate	56.35 Tons
PG 64-22 Asphalt Binder	3.47 Tons
TOTAL: 59.82 Tons	

The exact proportions of these materials w ill be determined on construction.

MC-70 Asphalt for Prime at the rate of 0.61 ton applied 46 feet w ide (Rate = 0.3 gallon per square yard).

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.13 ton applied 45 feet w ide (Rate = 0.06 gallon per square yard).

2.5" CLASS E ASPHALT CONCRETE 2ND LIFT

Crushed Aggregate	58.95 Tons
PG 64-22 Asphalt Binder	3.63 Tons
TOTAL: 62.58 Tons	

The exact proportions of these materials w ill be determined on construction.

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.13 ton applied 45 feet w ide (Rate = 0.06 gallon per square yard).

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 0.1 ton applied 44 feet w ide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 1.07 tons applied 24 feet w ide (Rate = 8 pounds per square yard).

SUMMARY OF ASPHALT CONCRETE

	CLASS E ASPHALT CONCRETE 1ST LIFT	CLASS E ASPHALT CONCRETE 1ST LIFT	CLASS E ASPHALT CONCRETE 2ND LIFT	CLASS E ASPHALT CONCRETE 2ND LIFT
	COMPACTION WITH SPECIFIED DENSITY TONS	COMPACTION WITHOUT SPECIFIED DENSITY TONS	COMPACTION WITH SPECIFIED DENSITY TONS	COMPACTION WITHOUT SPECIFIED DENSITY TONS
Section 1 24' Finished Roadw ay Surface Shoulders	4847 -	- 2989	4847 -	- 3351
Table of Additional Quantities				
Table of Additional Quantities	-	-	-	42
Additional Totals:	-	-	-	42
Totals:	4847	2989	4847	3393

9694 TONS ASPHALT CONCRETE COMPACTION WITH SPECIFIED DENSITY
6382 TONS ASPHALT CONCRETE COMPACTION WITHOUT SPECIFIED DENSITY
16076 TONS TOTAL

TABLES OF QUANTITIES

Rev 8-2-19 MR

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	ER 0081(116)112	9	16

TABLE OF MATERIALS QUANTITIES

	SELECT GRANULAR BACKFILL	PIT RUN	BASE COURSE	WATER FOR GRAN. MATER.	CLASS E ASPHALT CONCRETE	PG 64-22 ASPHALT BINDER	MC-70 ASPH. FOR PRIME	SS-1h/ CSS-1h ASPH. FOR TACK	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL	SAND FOR FLUSH SEAL
Mainline:	37911	36492	21101	727	16034	930	78.7	34.0	13.1	140
Table of Additional Quantities:	959	588	629	14	42	2.4	0.1	0.1	0.1	1
Totals:	38870	37080	21730	741	16076	932.4	78.8	34.1	13.2	141

TABLE OF ADDITIONAL QUANTITIES

	SELECT GRANULAR BACKFILL	PIT RUN	BASE COURSE	WATER FOR GRAN. MATER.	CLASS E ASPHALT CONCRETE	PG 64-22 ASPHALT BINDER	MC-70 ASPH. FOR PRIME	SS-1h/ CSS-1h ASPH. FOR TACK	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL	SAND FOR FLUSH SEAL
LOCATION	CuYd	Ton	Ton	MGal	Ton	Ton	Ton	Ton	Ton	Ton
Resurface to End of Radius										
2 Intersecting Roads	384	238	262	6	42	2.4	0.1	0.1	0.1	1
Entrances										
1 Double Field Entrance	130	80	87	2	-	-	-	-	-	-
1 Farm Entrance	89	54	56	1	-	-	-	-	-	-
4 Field Entrances	356	216	224	5	-	-	-	-	-	-
TOTALS:	959	588	629	14	42	2.4	0.1	0.1	0.1	1

NOTES: The tonnage shown above for Base Course is based on a compacted depth of 6 inches.

The tonnage shown above for Class E Asphalt Concrete is based on a compacted depth of 3.5 inches.

The above quantities are included in the Estimate of Quantities.

WOVEN SEPARATOR FABRIC

Separator fabric will be unrolled longitudinally to centerline. Rolls of separator fabric will be overlapped 2 feet laterally and longitudinally upon adjacent or continuing rolls. Separator fabric will also overlap the underlying reinforcement fabric a minimum of 3'.

TWIN LAKES WATER LEVEL

At the time of plans creation, the entire length of US81 specified for Grade Raise on this project was inundated. The water level will likely change by construction time. Therefore, the estimated quantities specified in the following notes may vary significantly from the actual quantities needed on construction.

REINFORCEMENT FABRIC (MSE)

Reinforcement Fabric (MSE) will be unrolled longitudinally to centerline. Rolls of fabric will be overlapped and positively connected by sewing in accordance with the plan details for Seam Types.

The Estimate of Quantities of quantities for Reinforcement Fabric (MSE) is based on placing 0% of the length of bottom lift out of water. Quantity will be adjusted based on actual conditions at construction time, at the direction of the Engineer. There will be no adjustment in the contract unit price due to increases or decreases in the quantity for Reinforcement Fabric (MSE).

PIT RUN

The Estimate of Quantities of quantities for Pit Run is based on placing 0% of the length of bottom lift out of water. Quantity will be adjusted based on actual conditions at construction time, at the direction of the Engineer. There will be no adjustment in the contract unit price due to increases or decreases in the quantity for Pit Run.

GEOGRID REINFORCEMENT (BOTTOM LIFT – IF PLACED IN WATER)

If the bottom lift is placed in water Geogrid Reinforcement will be used instead of reinforcement fabric. The grid will be Tensar GeoGrid BX1200 unrolled longitudinally to centerline. Rolls of grid will be overlapped 2 feet and positively connected with mechanical connectors such as heavy duty zip ties or hog rings as approved by the Engineer.

The Estimate of Quantities of quantities for Geogrid Reinforcement is based on placing 100% of the length of bottom lift in water. Quantity will be adjusted based on actual conditions at construction time, at the direction of the Engineer. There will be no adjustment in the contract unit price due to increases or decreases in the quantity for Geogrid Reinforcement. It is possible that no Geogrid Reinforcement will be used if water is not on roadway at the time of construction.

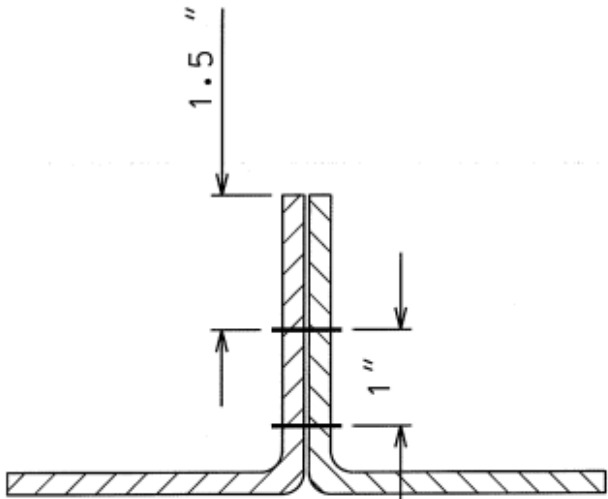
SELECT GRANULAR BACKFILL (BOTTOM LIFT – IF PLACED IN WATER)

The Estimate of Quantities of quantities for Select Granular Backfill is based on placing 100% of the length of bottom lift in water. Quantity will be adjusted based on actual conditions at construction time, at the direction of the Engineer. There will be no adjustment in the contract unit price due to increases or decreases in the quantity for Select Granular Backfill. It is possible that no Select Granular Backfill will be used if water is not on roadway at the time of construction.

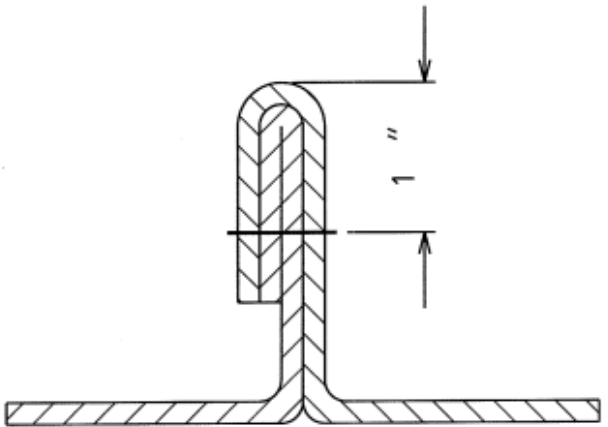
Select Granular Backfill will conform to the following gradation requirements:

Passing a 2½ Inch Sieve	100%
Passing a 2 Inch Sieve	90-100%
Passing a 1½ Inch Sieve	65-100%
Passing a 1 Inch Sieve	15-30%
Passing a ¾ Inch Sieve	5-10%
Passing a ⅜ Inch Sieve	0-5%
Passing a No. 4 Sieve	0-5%

All other requirements of the specifications for Select Granular Backfill will apply.



Flat or "prayer" seam
Type SSa-2



J seam
Type SSn-1

Seam Types

SURFACING THICKNESS DIMENSIONS

Plans tonnage 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, plans tonnage may be varied to achieve the required elevation.

SURFACING SECTION OPTIONS 1 & 2

Two options are provided for construction of the grade raise and surfacing. The primary difference between options is as follows:

	Bottom Width	Top Width
Option 1		
Grade Raise Material	48.5'	45'
Base Course	45'	44'
Asphalt Concrete	44'	40'
Option 2		
Grade Raise Material	42'	42'
Base Course	42'	40'
Asphalt Concrete	40'	38'

Refer to the typical sections for further details. The Contractor may elect to construct either option. The option selected must be built for the entire project.

The quantities for Option 1 are included in the Estimate of Quantities and in the Contract Proposal. Contractors bidding, must bid based on the quantities for Option 1, whether the Contractor elects to build Option 1 or 2.

The surfacing and woven separator fabric quantities for Option 2 will be less (Approximately 85% to 95% of those for Option 1).

Payment will be based on the contract unit prices bid for Option 1, and no adjustment in the contract unit prices will be made based on the Contractor's selection of Option 1 or 2. Payment will be based on the actual quantities of material placed for the option built on construction. The Contractor will notify the Engineer as to which option will be built, prior to beginning work.

MAINLINE ASPHALT PAVING BEYOND SEASONAL LIMITATIONS

1. If the Contractor anticipates the need to continue paving mainline asphalt concrete beyond the seasonal limitation in order to complete asphalt paving as required by the contract, the Contractor shall submit a request to pave past the seasonal limitation to the Project Engineer. The request shall include an Updated Paving Schedule and a Late Season Paving Plan as identified below:

- a. An Updated Paving Schedule that includes:
 - 1) A 14 day weather forecast from a nationally recognized source.
 - 2) The expected paving completion date.
 - 3) An estimate of the number of suitable weather paving days from the seasonal limitation to paving completion.
- b. A Late Season Paving Plan that includes:
 - 1) Acknowledgement that all other requirements of Section 320 and applicable contract special provisions will apply.
 - 2) A list of actions to be taken after the seasonal limit to facilitate compaction such as, but not limited to:
 - a) Tarping if weather conditions or haul distance warrant or if the asphalt concrete will not be incorporated into the work within 30 minutes of batching.
 - b) Proposed sequence of operations with contingencies if weather conditions do not allow paving to continue as planned.
 - c) Consideration of compaction enhancement admixtures and use guidelines (mix design approval by the Department's Bituminous Engineer will be required).

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	ER 0081(116)112	11	16

REMOVE HIGH TENSION 3 CABLE GUARDRAIL

Cable, posts (including mainline and anchor posts) and hardware will be removed. However, every tenth post (approximately) will be left in place as a mounting support for Type 2 Object Markers. The Engineer will specify which posts will remain in place in order that the resulting spacing through the entire grade raise section will be approximately 200’ alternating left and right. Concrete Anchors, bracketing and sleeves beneath posts need not be removed and will remain in place.

RUMBLE STRIPES

INSTALLATION:

Rumble stripes will be constructed according to the details of Standard Plate 320.20 along the entire length of the grade raised section.

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

Cost for asphalt concrete rumble stripes will be included in the contract unit price per mile for Grind 8” 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. 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 8” Rumble Strip or Stripe in Asphalt Concrete.

MAINTENANCE OF TRAFFIC

Traffic Control will be administered by the Department of Transportation (DOT) and accomplished by its appointed Contractor and DOT forces. US81 will remain closed for the duration of the grade raise and surfacing project.

COORDINATION BETWEEN CONTRACTORS

A separate contract for Project 081-272 - PCN I5RC has been awarded to Traffic Solutions, Inc., Phone 605-368-9765 for traffic control and detour signing with respect to the Twin Lakes.

The Contractor will schedule work so as not to interfere with or hinder the progress of the work performed by other Contractors or DOT forces on the traffic control and detour signing project.

TYPE 2 OBJECT MARKERS

Object Markers will be installed four feet above the outside edge of the edgeline.

At the grade raise transitions at each end of the project where markers are required but guardrail posts are not in place, the markers will be installed on the typical 1.12 Lb/Ft U-Channel Posts.

In the full depth grade raise section, Object Markers will be attached to 1.12 Lb/Ft U-Channel Posts which will be attached to the existing guardrail posts. The attachment will include three straps or clamps per post, the method and material used will be approved by the Engineer.

Object Marker spacing will be approximately 200’ alternating left and right. It is estimated there will be 125 installations.

Cost for posts, straps/clamps, labor, equipment and hardware required to erect the markers on posts and attach them to the existing guardrail posts will be incidental to the contract unit price per each for Type 2 Object Marker Back to Back.

HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

Material will be applied as per manufacturer’s recommendations.

This material will consist of a durable high build, low VOC, fast drying, waterborne traffic paint with a 100% acrylic polymer (Arkema DT-400, Dow HD-21A, or equivalent). The Contractor will provide certification that the material is one of the following products or an equivalent as approved by the Operations Traffic Engineer:

- Diamond Vogel’s Waterborne High Build Polymer Marking Paint
- Ennis-Flint’s High Build Polymer 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.

Pavement marking not conforming to the retro-reflectivity requirements will be removed and replaced. If replacement of marking cannot be applied within the same year, the Contractor will schedule subject work to be completed no later than June 15th in the following year. Upon replacement, the retro-reflectivity testing process will be done again requiring new readings.

The Department will randomly select one test location per mile of each edge line including ramps and one test location per mile of centerline (solid and/or skip line will be considered as one centerline). Three retro-reflectivity readings will be taken at each test location. The three readings will be averaged and become the reading for that test location.

Initial readings:

Pavement Marking Color	Minimum Value
White	350 mc/m²/lux
Yellow	275 mc/m²/lux

Pavement marking not conforming to the requirements provided in these plans will be considered deficient and will be removed and replaced. Additional retro-reflectivity readings will be taken by the Department to determine the limits of removal.

The removal will be accomplished using suitable sand blasting or grinding equipment unless the Engineer authorizes other means. The removal process will remove at least 90% of the deficient line, with no excessive scarring of the existing pavement. The removal width will be one inch wider all around the nominal width of the pavement marking to be removed. Removal and replacement of the pavement markings will be at the Contractor’s expense, with no cost incurred by the State.

Cost for material, labor and equipment necessary to furnish and install the pavement marking will be incidental to the contract unit prices per gallon for High Build Waterborne Pavement Marking Paint, White and Yellow.

RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAINT FOR CENTERLINE MARKING

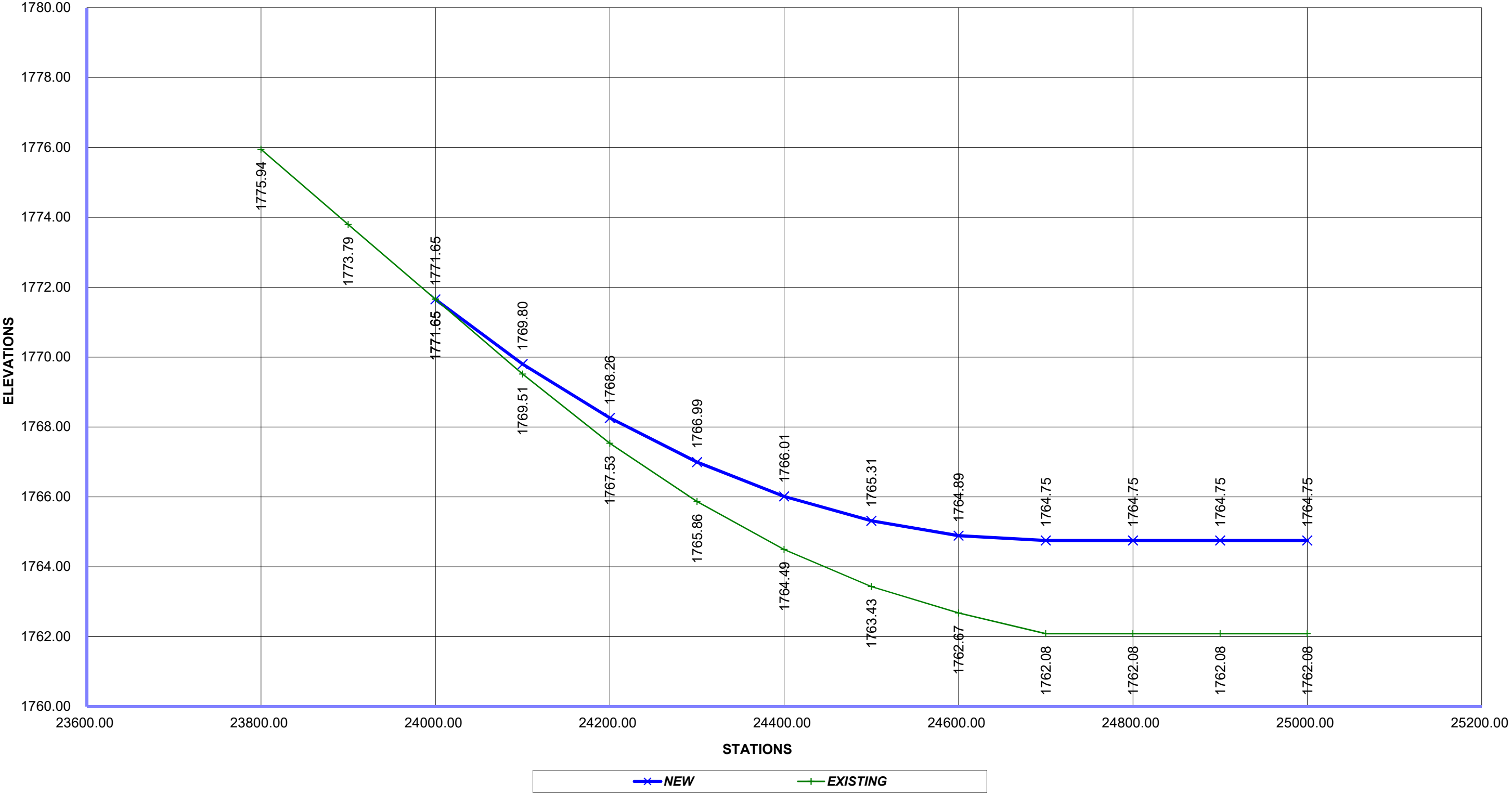
- Solid 4” line = 27.8 Gals/Mile
- Glass Beads = 5.3 Lbs/Gal.
- Composite Reflective Elements = 2.1 Lbs/Gal.

RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAINT FOR EDGELINE MARKING

- Solid 8” line = 55.6 Gals/Mile
- Glass Beads = 8.0 Lbs/Gal.

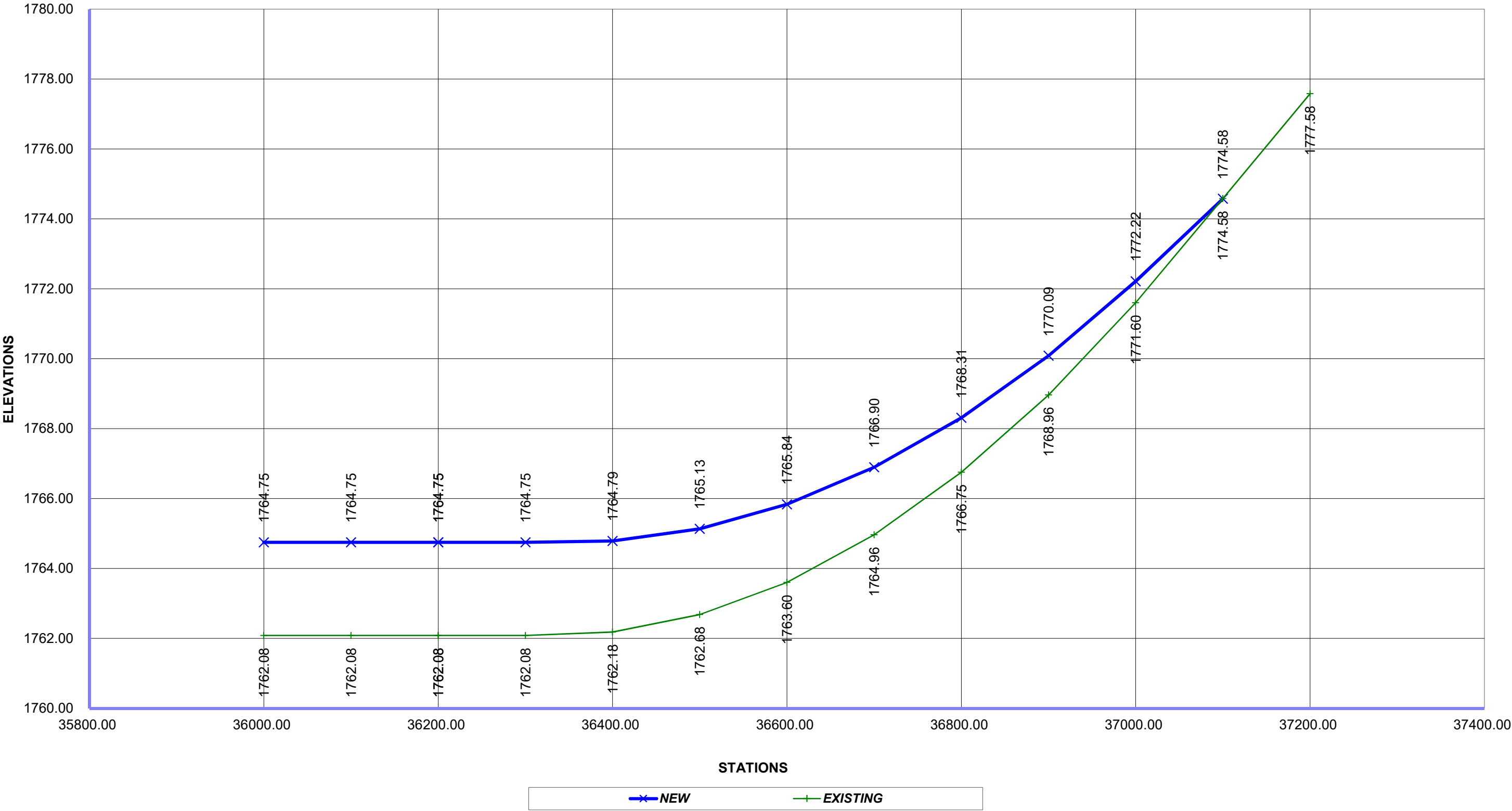
US81 GRADE RAISE PROFILE TAPER

AT BEGIN PROJECT FROM 240+00 TO 247+00



US81 GRADE RAISE PROFILE TAPER

AT END PROJECT FROM 363+00 TO 371+00



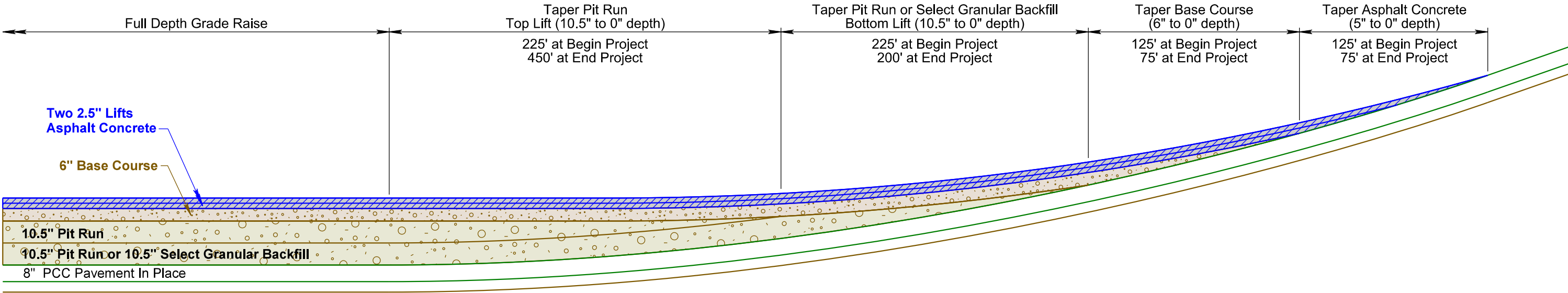
NOT TO SCALE

TYPICAL SURFACING MATERIAL TAPERS

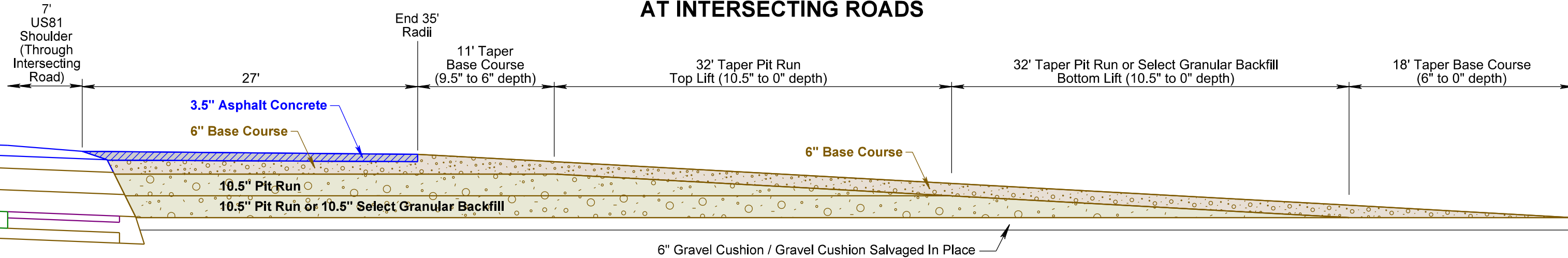
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	ER 0081(116)112	14	16

Plotting Date: 08/02/2019

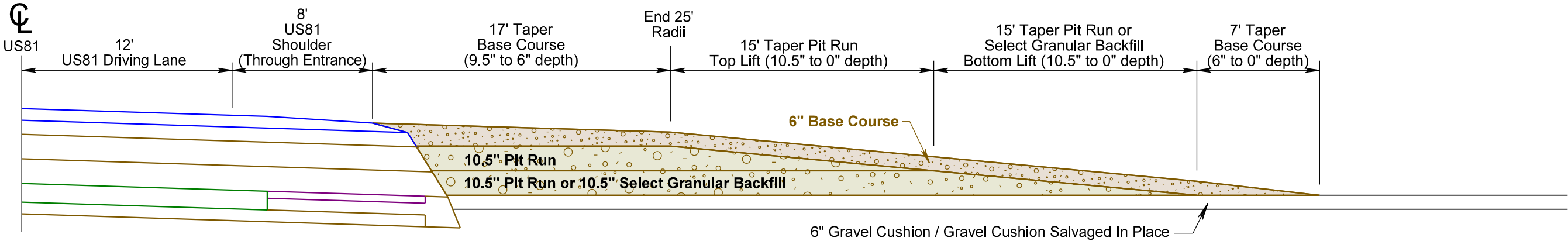
AT PROJECT TERMINI (END PROJECT SHOWN - BEGIN PROJECT REVERSED)



AT INTERSECTING ROADS



AT ENTRANCES



PAVEMENT MARKING

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

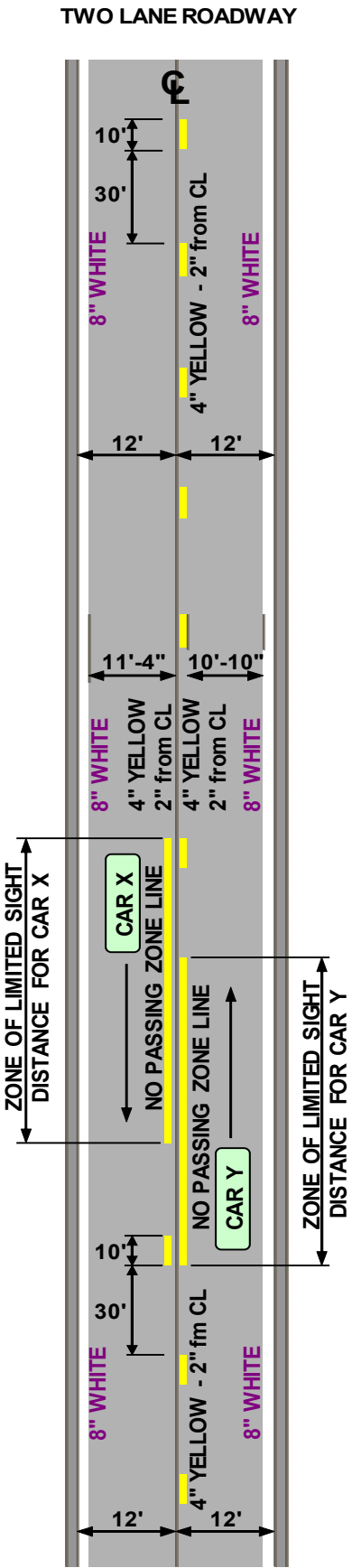
Traffic Control will be incidental to the cost of application. The striper and advance or trailing warning vehicle will be equipped with flashing amber lights and advance warning arrow board.

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 = 55.6 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.

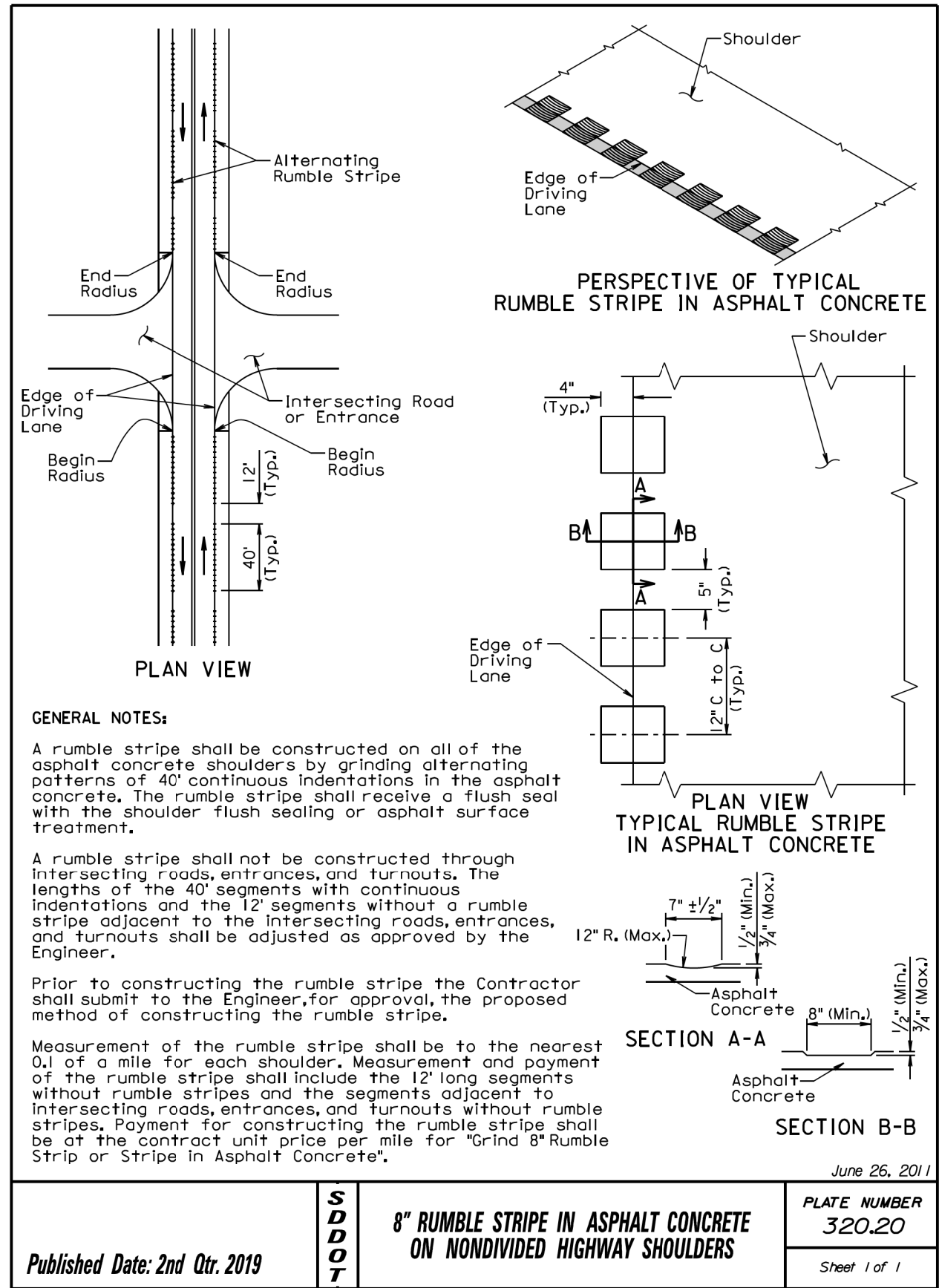
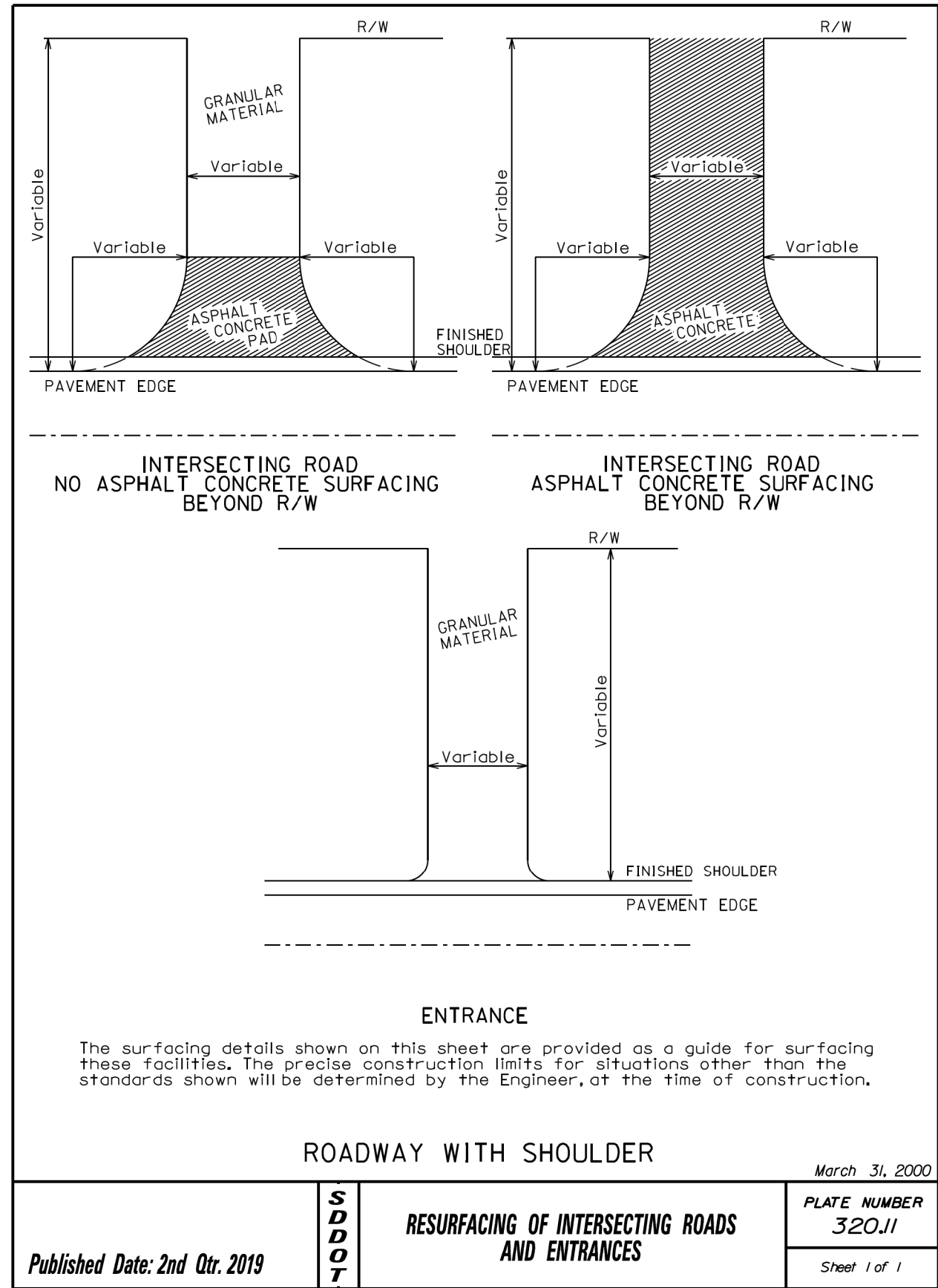
ESTIMATED QUANTITIES (BASED ON ONE APPLICATION)		
HIGH BUILD		QUANTITY
WHITE	8" Edgeline	276 GALLONS
YELLOW	Centerline	20 GALLONS



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

PLOT SCALE - 1:200

PLOTTED FROM - TRMLINT15



FILE - ... \KING07F\JUNSTD PLATES 07F J.DGN

PLOT NAME - 1