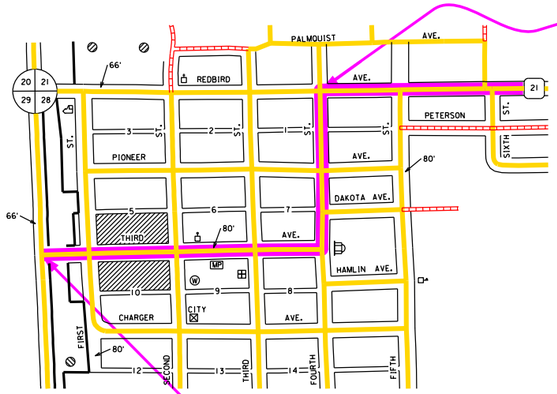
SECTION F: SURFACING

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	F1	F29
Plotting Date: 01/05/2024			

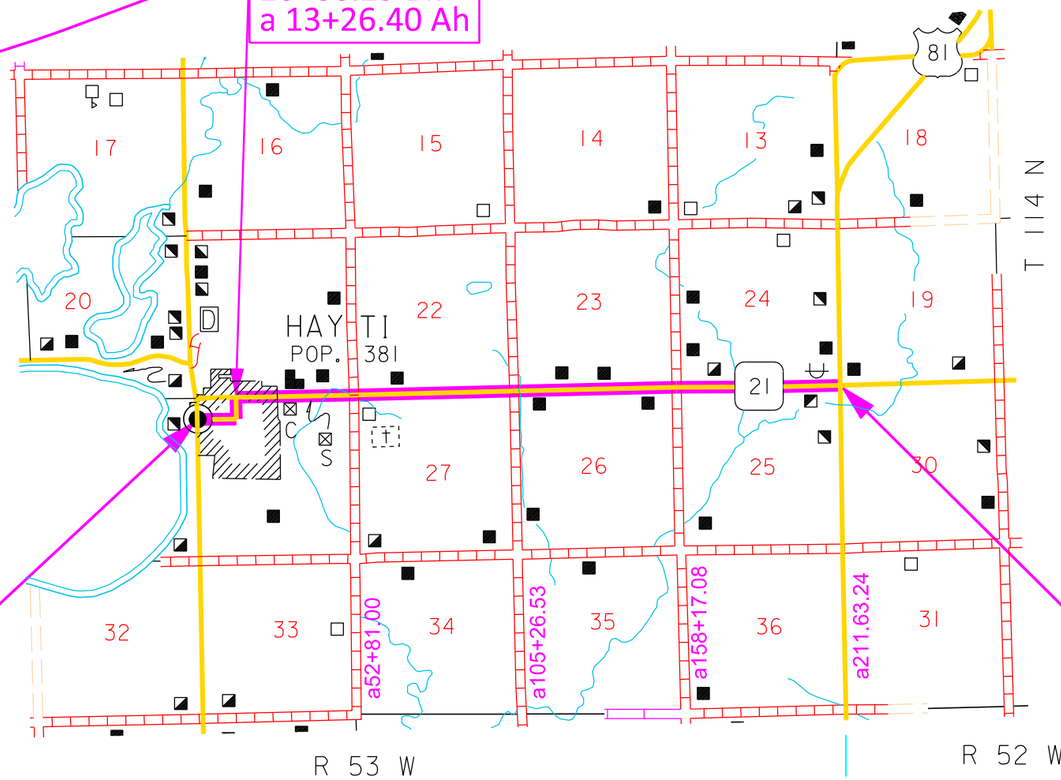
Rev 2/2/2024 TDL

INDEX OF SHEETS

Enlarged View of Beginning of Project in Hayti



Equation
20+66.29 Bk =
a 13+26.40 Ah



Begin Project
Sta. 0+00.0
MRM 127.34 +0.000

End Project
Sta. a 211+65.00
MRM 131.00 +0.448

SECTION F – ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3320	Checker	Lump Sum	LS
110E0510	Remove Pipe End Section	1	Each
110E1010	Remove Asphalt Concrete Pavement	41.0	SqYd
110E7500	Remove Pipe for Reset	14	Ft
110E7510	Remove Pipe End Section for Reset	3	Each
110E7802	Remove Fence for Reset	60	Ft
120E0100	Unclassified Excavation, Digouts	206	CuYd
210E3500	Heavy Roadway Shaping	0.100	Mile
250E0010	Incidental Work	Lump Sum	LS
260E1010	Base Course	691.8	Ton
280E0010	Full Depth Reclamation	82,372	SqYd
320E0005	PG 58-34 Asphalt Binder	900.6	Ton
320E1200	Asphalt Concrete Composite	13.3	Ton
320E1202	CLASS Q2R HOT MIXED ASPHALT CONCRETE	19,228.1	Ton
320E1800	Asphalt Concrete Blade Laid	79.7	Ton
320E4000	Hydrated Lime	193.0	Ton
320E7012	Grind 12" Rumble Strip or Stripe in Asphalt Concrete	6.4	Mile
320E7035	Grind Sinusoidal Transverse Rumble Strip in Asphalt Concrete	392.0	SqFt
330E0010	MC-70 Asphalt for Prime	54.1	Ton
330E0100	SS-1h or CSS-1h Asphalt for Tack	48.9	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	20.9	Ton
330E1000	Blotting Sand for Prime	261.0	Ton
330E2000	Sand for Flush Seal	217.6	Ton
332E0010	Cold Milling Asphalt Concrete	101,209	SqYd
450E2028	36" RCP Flared End, Furnish	1	Each
450E2029	36" RCP Flared End, Install	1	Each
450E4699	Tie Bolts for RCP	26	Each
* 450E8900	Cleanout Pipe Culvert	1	Each
450E9000	Reset Pipe	14	Ft
450E9001	Reset Pipe End Section	3	Each
600E0300	Type III Field Laboratory	1	Each
620E1020	2 Post Panel	2	Each
620E4100	Reset Fence	60	Ft
720E1010	PVC Coated Bank and Channel Protection Gabion	60.0	CuYd
831E0110	Type B Drainage Fabric	90	SqYd
900E0010	Refurbish Single Mailbox	9	Each
900E1980	Storage Unit	1	Each

*** - Denotes Non-Participating**

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. These items will be incidental to the contract unit price per each for Type III Field Laboratory.

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.

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 Engineer to determine modifications that will be necessary to avoid utility impacts.

COLD MILLING ASPHALT CONCRETE

The Los Angeles Abrasion Loss value on the aggregate used for the in-place asphalt concrete was 26. This value was obtained from testing during construction of the in-place asphalt concrete.

Cold milling asphalt concrete will be done according to the typical section(s). In areas where maintenance patches have raised and/or widened the road, additional asphalt concrete will be milled to provide a uniform typical section from centerline to the edge of the finished shoulder. These areas also include farm, residential, field entrances and intersecting roads. Milling will be daylighted to the outside edge of the roadway. Any additional costs associated with this additional cold milling will be incidental to the contract unit price per square yard for Cold Milling Asphalt Concrete.

Cold milling asphalt is estimated to produce 13799 tons of cold milled asphalt concrete material. An estimated 3807 tons of cold milled asphalt concrete material will be used on this project as RAP in the Class Q2R Hot Mixed Asphalt Concrete mixture. The Contractor is responsible to assure enough asphalt concrete salvage is available for the Class Q2R Hot Mixed Asphalt Concrete.

The remainder of the salvaged asphalt concrete material will become the property of the Contractor for disposal and may not be reused on the project.

Cold milled material will be placed at curb ramps to provide a transition from the ramp to the pavement that is no steeper than 5%.

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 for Sections 1, 2, 3, and 4. The depth of asphalt will match the in-place thickness. The backfilling material for digouts will be Base Course for Section 5.

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 for Sections 1, 2, 3, and 4.

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 for Sections 1, 2, 3, and 4.

Included in the Estimate of Quantities are 50 cubic yards of Unclassified Excavation, Digouts per mile for the removal unstable material for Section 5.

Included in the Estimate of Quantities are 100 tons of Base Course per mile for backfill of Unclassified Excavation, Digouts for Section 5.

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

A copy of the surfacing/subgrade investigation for this project is available from the Aberdeen Region and Watertown Area offices.

BASE COURSE (FOR DIGOUTS)

Aggregate for Base Course will meet the requirements of Base Course and must be compacted as per Section 260 of the Specifications. Material compaction will be to the satisfaction of the engineer.

CHECKING SPREAD RATES

The Contractor will be responsible for checking the spread rates and taking the weigh delivery tickets as the surfacing material arrives on the project and is placed onto the roadway.

The Contractor will compute the required spread rates for each typical surfacing section and create a spread chart prior to the start of material delivery and placement. The Engineer will review and check the Contractor's calculations and spread charts. The station to station spread will be written on each ticket as the surfacing material is delivered to the roadway.

CHECKING SPREAD RATES CONT.

At the end of each day's shift, the Contractor will verify the following:

- All tickets are present and accounted for,
- The quantity summary for each item is calculated,
- The amount of material wasted if any,
- Each day's ticket summary is marked with the corresponding 'computed by',
- The ticket summary is initialed and certified that the delivered and placed quantity is correct.

All daily tickets and the summary by item will be given to the Engineer no later than the following morning.

If the checker is not properly and accurately performing the required duties, the Contractor will correct the problem or replace the checker with an individual capable of performing the duties to the satisfaction of the Engineer. Failure to do so will result in suspension of the work.

The Department will perform depth checks. The Contractor will be responsible for placement of material to the correct depth unless otherwise directed by the Engineer. If the placed material is not within a tolerance of ±1/2 inch of the plan shown depth, the Contractor will correct the problem at no additional cost to the Department. Excess material above the tolerance will not be paid for. Achieving the correct depth may require picking up and moving material or other action as required by the Engineer. All costs for providing the Contractor furnished checker and performing all related duties will be incidental to the contract lump sum price for the CHECKER. No allowances will be made to the contract lump sum price for CHECKER due to authorized quantity variations unless the quantities for the material being checked vary above or below the estimated quantities by more than 25 percent. Payment for the Checker will then be increased or decreased by the same proportion as the placed material quantity bears to the estimated material quantity.

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 Gyratory 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.

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

FULL DEPTH RECLAMATION (FDR)

The Contractor may perform initial rolling with a sheepsfoot roller until the roller pads walk out of the reclaimed mix. The sheepsfoot roller will weigh at least 25,000 pounds. The maximum lift thickness may be increased to 8" if a sheepsfoot roller is utilized and good compaction results are obtained. Moisture and density requirements throughout the full depth of processing as required in Section 280.3 C will be adhered to; moisture testing will be completed behind the processing unit and prior to compaction.

Shaping of the surface to repair ruts, potholes, wash-boarding, sheepsfoot roller marks, and other distortions will be accomplished by scarifying to a depth of 2 inches below the deepest distortion and shaped and compacted to the typical section.

Repeated reclaiming and rolling may be required within two calendar days after the initial processing and rolling to achieve the target density on the completed in-place recycled surface. The Contractor will discontinue any type of rolling that results in cracking, movement, or other types of distress until such time that the problem can be resolved. If there is a significant change in mix proportions, weather conditions, or other controlling factors, the Engineer may require construction of test strips to check target density.

All other requirements for Full Depth Reclamation will apply.

INTERSECTING ROADS AND ENTRANCES

In areas where granular material has been placed adjacent to the existing asphalt concrete, the Contractor will be required to remove the granular material to a depth below the existing asphalt concrete to allow for the placement of the new asphalt concrete. New asphalt concrete will be placed flush with the existing asphalt concrete. The existing granular material removed will be placed on the entrances, intersecting roads or other locations as directed by the Engineer.

All costs to remove and place the granular material including labor, equipment and incidentals will be incidental to the various related contract items.

ASPHALT CONCRETE BLADE LAID

Included in the Estimate of Surfacing Quantities are 150 tons of Asphalt Concrete Blade Laid, 1.5 tons of Hydrated Lime, and 11.1 tons of PG 58-34 Asphalt Binder per mile and will be tight bladed on the existing surface 24 feet wide prior to the overlay of Sections 1, 2, 3, and 4.

Mineral Aggregate for tight bladed material will use only the fine aggregate components combined in the same proportions as the Class Q2R 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%.

ASPHALT CONCRETE COMPOSITE

Section 324 will apply except that Class Q2R Hot Mixed Asphalt Concrete as specified elsewhere in the plans may be used as Asphalt Concrete Composite.

Plans specified locations for Asphalt Concrete Composite will be paid for at the contract unit price per ton for Asphalt Concrete Composite regardless of the class of asphalt concrete used at such locations.

CLASS Q2R HOT MIXED ASPHALT CONCRETE

Mineral Aggregate:

Asphalt concrete aggregates will consist of reclaimed asphalt pavement (RAP) and virgin aggregate.

Virgin mineral aggregate for Class Q2R Hot Mixed Asphalt Concrete- will conform to the requirements of Class Q2.

The Class Q2R Hot Mixed Asphalt Concrete will include 20 percent RAP in the mixture. RAP will be obtained from the material produced by cold milling on this project.

Mix Design Criteria:

Gyratory Controlled QC/QA Mix Design requirements for the Class Q2R Hot Mixed Asphalt Concrete will conform to the requirements of Class Q2.

All remaining requirements for Class Q2 will apply.

ADDITIONAL QUANTITIES

Included in the Estimate of Quantities are 100 tons of Class Q2R Hot Mixed Asphalt Concrete, 1.0 tons of Hydrated Lime, 4.7 tons of PG 58-34 Asphalt Binder, and 0.2 tons of SS-1h or CSS-1h Asphalt for Tack (Rate = 0.09 Gal./Sq.Yd.) per mile for spot leveling, strengthening, and repair of the existing surface for Sections 1, 2, 3, and 4.

FLUSH SEAL

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

Application of flush seal may be eliminated by the Engineer. If the paved surface remains tight, the Engineer will notify the Contractor as soon as possible that the flush seal is unnecessary.

FLEXIBLE PAVEMENT SMOOTHNESS PROVISION

All sections, not excluded by the Special Provision for Flexible Pavement Smoothness, will be evaluated as 3 opportunity.

HEAVY ROADWAY SHAPING

Heavy Roadway Shaping shall be performed in accordance with the Standard Specifications.

Included in the Estimate of Quantities are 0.1 miles of Heavy Roadway Shaping to be used within the FDR section as determined necessary by the Engineer.

If Heavy Roadway Shaping is utilized, NO payment will be made for the same area under the bid item Ordinary Roadway Shaping.

BLOTTING SAND FOR PRIME

Included in the Estimate of Quantities are 10 tons of Blotting Sand for Prime to be used where necessary for maintenance of traffic as directed by the Engineer. (Rate = 10 pounds per square yard)

RCP AND CMP CULVERTS

The Contractor is encouraged to thoroughly investigate the culvert repair sites prior to bidding. Prior to working on the sites that are inundated with water, a complete dewatering plan will be submitted for approval to the Engineer. No separate payment for dewatering will be made.

All pipe and end treatments designated for removal will become the property of the Contractor for his disposal.

Tie bolts will be installed at all joint locations where existing pipe sections and end treatments are being reset or installed new. This may require drilling holes into the existing pipe sections and end treatments. Tie bolts will be installed in accordance with Standard Plate No. 450.18. New RCP culvert installations will have all the joint locations tied together with tie bolts.

When necessary to remove end sections of CMP culverts, they may be cut with a torch. If the culvert is cut the damaged area will be painted with a galvanizing paint approved by the Engineer. All costs associated with cutting and painting will be incidental to the various contract items.

The Contractor is advised of the risk of lead exposure when cutting galvanized paint. The Contractor should plan his/her operations accordingly and inform employees of hazards of lead exposure.

Prior to culvert repair work the Contractor will remove and stockpile all of the in place topsoil from the construction areas. On completion of construction operations this salvaged topsoil will be spread evenly over the newly constructed embankment inslopes. Removal and replacement of topsoil will be incidental to the various culvert contract items.

Culvert barrel and culvert end treatments that are to be removed and reset will be cleaned prior to resetting. There will be no payment of the contract item Cleanout Pipe Culvert to clean sections of culverts that are removed and reset.

BRACE PANELS FOR ROW FENCE

The E-Z Brace or an approved equal may be utilized as an alternate horizontal brace in the brace panels if approved by the Engineer. The E-Z Brace will be attached to each wood post utilizing two 5/16” x 3” lag screws. Holes of appropriate diameter, based on wood post condition, will be drilled before placement of lag screws. The following is the contact regarding the E-Z Brace:

Charlie Mack
Macksteel E-Z Braces
415 20th Ave. SE.
Watertown, SD 57201
605-882-2177

RUMBLE STRIPES

Rumble Stripe installation will be completed prior to application of the Flush Seal and Permanent Pavement Markings. In the event the Flush Seal is eliminated from the contract, the Contractor will still be required to apply a Flush Seal to the newly installed 12” Rumble Stripes at a width of 1.0’ and at the same rate as specified in this plan set. No adjustment in the contract unit price will be made and SS1h or CSS-1h will be paid at the contract unit price per ton.

All costs associated with the work will be incidental to the contract unit price per mile for GRIND 12" RUMBLE STRIP OR STRIPE IN ASPHALT CONCRETE.

Rumble Strip Start: Sta. a 40+75
Rumble Strip Stop: Sta. a 210+70

GRIND SINUSOIDAL TRANSVERSE RUMBLE STRIP IN ASPHALT CONCRETE

Advance intersection warning sinusoidal transverse rumble strips will be constructed on the mainline pavement, as detailed in the plan set. Sinusoidal transverse rumble strips will be paid for at the contract unit price square foot for Grind Sinusoidal Transverse Rumble Strip in Asphalt Concrete. It is estimated that 392 square feet of sinusoidal transverse rumble strips will be required.

Sinusoidal transverse rumble strips will be completed prior to application of the flush seal and permanent pavement markings. In the event the flush seal is eliminated from the contract, the Contractor will still be required to apply a flush seal to the newly installed sinusoidal transverse rumble strips at a width of 10.5’ and at the same rate as specified in this plan set. No adjustment in payment will be made and SS-1h or CSS-1h Asphalt for Flush Seal will be paid at the contract unit price per ton.

INCIDENTAL WORK

The intersection of Redbird Ave and 4th St S in Hayti, a 5' wide Asphalt valley pad is to be laid to assist with drainage at this location. See details located elsewhere in the plans. All costs for excavation, shaping, and granular backfill will be incidental to the contract lump sum for "Incidental Work".

MAILBOXES

The Contractor will reset the existing mailboxes on new posts with the necessary support hardware for single mailbox assemblies. The local Postmaster will determine the recommended mounting height of the mailboxes throughout the project. The Contractor will coordinate with the Engineer on the proper postal representative to contact.

All costs for removing existing mailboxes, providing temporary mailboxes, and resetting mailboxes with new posts and necessary support hardware will be incidental to the contract unit price per each for "Refurbish Single Mailbox".

TABLE OF REFURBISH MAILBOX

Station	Lt/Rt	Single (Each)
30+92	Rt	1
38+93	Rt	1
68+77	Rt	1
108+69	Rt	1
120+32	Rt	1
133+61	Rt	1
146+62	Rt	1
164+43	Lt	1
200+90	Lt	1
	Total:	9

RATES OF MATERIALS

The Estimate of Quantities is based on the following quantities of material per **Station.**

Section 2

Sta. 2+39 to Sta. 10+08

CLASS Q2R HOT MIXED ASPHALT CONCRETE – 2" LIFT

Crushed Aggregate..... 51.26 Tons

Salvaged Asphalt Concrete ..... 12.82 Tons

PG 58-34 Asphalt Binder..... 3.16 Tons

Total without Lime 67.24 Tons

Hydrated Lime..... 0.67 Tons

Total with Lime 67.91 Tons

The exact proportion of these materials will be determined on construction.
(Laid 2" Compacted depth at 56' bottom, 56' top.)

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **0.10** tons applied **25** feet wide prior to Asphalt Concrete Blade Laid.
(Rate = 0.09 Gal./Sq.Yd.)

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **0.07** tons applied **16** feet per side of blade laid prior to mainline lift.
(Rate = 0.09 Gal./Sq.Yd.)

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **0.07** tons applied **25** feet wide on blade laid prior to mainline lift.
(Rate = 0.06 Gal./Sq.Yd.)

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **0.13** tons applied **56** feet wide.
(Rate = 0.05 Gal./Sq.Yd.).

Sand for Flush Seal at the rate of **0.98** tons applied **22** feet wide.
(Rate = 8 Lb./Sq.Yd.).

RATES OF MATERIALS

The Estimate of Quantities is based on the following quantities of material per **Station.**

Section 4

Sta. a 13+26.4 to Sta. a 21+34

CLASS Q2R HOT MIXED ASPHALT CONCRETE – 2" LIFT

Crushed Aggregate…..... 45.15 Tons

Salvaged Asphalt Concrete ….... 11.29 Tons

PG 58-34 Asphalt Binder…..... 2.78 Tons

Total without Lime 59.22 Tons

Hydrated Lime…..... 0.59 Tons

Total with Lime 59.81 Tons

The exact proportion of these materials will be determined on construction.
(Laid 2" Compacted depth at 48' bottom, 48' top.)

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **0.10** tons applied **25** feet wide prior to Asphalt Concrete Blade Laid.
(Rate = 0.09 Gal./Sq.Yd.)

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **0.05** tons applied **12** feet per side of blade laid prior to mainline lift.
(Rate = 0.09 Gal./Sq.Yd.)

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **0.07** tons applied **25** feet wide on blade laid prior to mainline lift.
(Rate = 0.06 Gal./Sq.Yd.)

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **0.11** tons applied **48** feet wide.
(Rate = 0.05 Gal./Sq.Yd.).

Sand for Flush Seal at the rate of **0.98** tons applied **22** feet wide.
(Rate = 8 Lb./Sq.Yd.).

RATES OF MATERIALS

The Estimate of Quantities is based on the following quantities of material per **Mile.**

Section 5 – BOTTOM AND TOP LIFT (PER LIFT)

Sta. a 21+34 to Sta. a 210+70

CLASS Q2R HOT MIXED ASPHALT CONCRETE – 2" LIFTS

Crushed Aggregate..... 1814 Tons

Salvaged Asphalt Concrete ..... 453 Tons

PG 58-34 Asphalt Binder..... 112 Tons

Total without Lime 2379 Tons

Hydrated Lime..... 24 Tons

Total with Lime 2403 Tons

The exact proportion of these materials will be determined on construction.
(Laid 2" Compacted depth at 39' bottom, 34' top.)

MC-70 Emulsified Asphalt for Prime at a rate of **15.1** tons applied 41 feet wide as directed by the Engineer.
(Rate = 0.15 Gal./Sq.Yd)

Blotting Sand for Prime at the rate of **70** tons applied **24** feet wide as directed by the Engineer.
(Rate = 10 Lb./Sq.Yd.).

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **5.9** tons applied **40** feet wide prior to each asphalt lift.
(Rate = 0.06 Gal./Sq.Yd.)

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **4.8** tons applied **39** feet wide.
(Rate = 0.05 Gal./Sq.Yd.).

Sand for Flush Seal at the rate of **52** tons applied **22** feet wide.
(Rate = 8 Lb./Sq.Yd.).

SUMMARY OF ASPHALT CONCRETE

LOCATIONS:	Class Q2R Hot Mixed Asphalt Concrete with Specified Density Compaction TONS	Class Q2R Hot Mixed Asphalt Concrete without Specified Density Compaction TONS	Asphalt Concrete Blade Laid without Specified Density Compaction TONS
Section 1 - Mainline lift (24' wide)	60.7	-----	-
Shoulder (6' wide)	-----	19.0	
Section 2 - Mainline lift (24' wide)	230.1	-----	-
Shoulder (16' wide)	-----	306.8	
Section 3 - Mainline lift (24' wide)	293.4	-----	-
Shoulder (5' wide)	-----	57.7	
Section 4 - Mainline lift (24' wide)	241.7	-----	-
Shoulder (12' wide)	-----	241.7	
Section 5 - Mainline lift (24' wide)	11277.4	-----	-
Shoulder (5' wide)	-----	5873.7	
Spot leveling, strengthening, and repair of existing surface	-	53.1	-
Table of Additional Quantities	-	572.7	-
Asphalt Concrete Blade Laid	-	-	79.7
TOTAL	**12103.38**	**7124.76**	**79.7**

Total Class Q2R Hot Mixed Asphalt Concrete: **19228.13** ***Tons***

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	F8	F29

SD 21 Project Length

SECTION	START	END	LENGTH	MILES
Section 1	+12.00	2+15.00	203.00	0.038
Section 2	2+39.00	10+08.00	769.00	0.146
Section 3	10+08.00	20+34.00	1026.00	0.194
Section 4	a 13+26.40	a 21+34.00	807.60	0.153
Section 5	a 21+34.00	a 210+70.00	18936.00	3.586

SD 21 - PCN 06CW - TABLE OF MATERIAL QUANTITIES

	COLD MILLING ASPHALT CONCRETE	UNCLASSIFIED EXCAVATION, DIGOUTS	BASE COURSE	ASPHALT CONCRETE COMPOSITE	CLASS Q2R HOT MIXED ASPHALT CONCRETE	HYDRATED LIME	PG 58-34 ASPHALT BINDER	SALVAGED ASPHALT CONCRETE (RAP) (NABI.)	VIRG. AGGR. (NABI.)	ASPHALT CONCRETE BLADE LAID	HYDRATED LIME	PG 58-34 ASPHALT BINDER	VIRG. AGGR. (NABI.)	CLASS Q2R HOT MIXED ASPHALT CONCRETE	PG 58-34 ASPHALT BINDER	HYDRATED LIME	SALVAGED ASPHALT CONCRETE (RAP) (NABI.)	VIRG. AGGR. (NABI.)	SS-1h/ CSS-1h ASPH. FOR TACK	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL	SAND FOR FLUSH SEAL	FULL DEPTH RECLAMATION
					<----------Spot Leveling---------->					<----------Blaid Laid---------->				<----------Main Line---------->								
SECTION	SqYd	CuYd	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	SqYd
1	687.9	1.9	3.8	1.0	3.8	0.0	0.2	0.7	2.9	5.8	0.1	0.4	5.3	79.7	3.7	0.8	15.8	63.2	0.3	0.1	2.0	0
2	4784.9	7.3	14.6	3.6	14.6	0.1	0.7	2.7	11.0	21.8	0.2	1.6	20.0	537.0	25.0	5.4	106.3	425.3	1.9	1.0	7.5	0
3	3961.5	9.7	19.4	4.9	19.4	0.2	0.9	3.7	14.7	29.1	0.3	2.2	26.7	351.1	16.3	3.5	69.5	278.1	1.7	0.8	10.0	0
4	4307.2	7.6	15.3	3.8	15.3	0.2	0.7	2.9	11.5	22.9	0.2	1.7	21.0	483.4	22.5	4.8	95.7	382.9	1.8	0.9	7.9	0
5	82371.6	179.3	358.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17151.1	798.0	171.5	3396.3	13585.0	42.9	17.5	185.2	82371.6
Sub totals	96113.1	205.9	411.8	13.3	53.1	0.5	2.5	10.0	40.1	79.7	0.8	5.9	73.0	18602.3	865.6	186.0	3683.6	14734.5	48.7	20.4	212.6	82371.6
Additional Quantities	5096.0	-	280.0	-	-	-	-	-	-	-	-	-	-	572.7	26.7	5.7	113.4	453.7	0.2	0.5	5.0	0
Totals	101209.1	205.9	691.8	13.3	53.1	0.5	2.5	10.0	40.1	79.7	0.8	5.9	73.0	19175.0	892.2	191.7	3797.0	15188.1	48.9	20.9	217.6	82371.6

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	F9	F29

TABLE OF ADDITIONAL QUANTITIES

LOCATIONS: SD 21, PCN 06CW	BASE COURSE TON	CLASS Q2R HOT MIXED ASPHALT CONCRETE TON	PG 58-34 ASPHALT BINDER TON	HYDRATED LIME TON	SALVAGE ASPHALT CONCRETE (RAP) N.A.B.I. TON	VIRGIN AGGREGATE N.A.B.I. TON	COLD MILLING ASPHALT CONCRETE SQYD
Begin Project at SD 21 Jct (Additional Asphalt included is to surface thru radius.)	-	28.6	1.3	0.3	5.7	22.6	256
End Project at US81 Intersection. (Additional Asphalt included is to surface thru radius.)	-	116.0	5.4	1.1	23.0	91.9	1039
19 Intersecting Roads and Entrances Surfaced to ROW with Asphalt (Cold Mill as detailed elsewhere in these plans)	-	202.3	9.4	2.0	40.1	160.3	1812
6 Intersecting Roads and Entrances Surfaced to Radius Point with Asphalt	60.0	148.8	6.9	1.5	29.5	117.9	1333
Transition Areas 2+15 to 2+39 and 20+34 to 20+66.29	-	13.0	0.6	0.1	2.6	10.3	116
22 Farm / Residential / Unimproved Section Line Road / Field Entrances / Alleys Surfaced with new 5' wide pad (see standard plate 320.04, paved in one lift at 2" thick)	220.0	60.3	2.8	0.6	11.9	47.8	540
Incidental Work Sta. 19+25 (Hayti Driveway)	-	3.7	0.2	0.0	0.7	3.0	0
TOTALS (SD 21)	**280.0**	**572.7**	**26.7**	**5.7**	**113.4**	**453.7**	**5096.0**

The tonnage shown in the Table of Additional Quantities for Class Q2R Hot Mix Asphalt Concrete is based on an average compacted thickness of 2 inches.
Included in the Estimate of Quantities are 0.5 tons of SS-1h or CSS-1h Asphalt for Flush Seal and 5 tons of Sand for Flush Seal for the intersections, intersecting roads, and other areas throughout the project on SD 21.
Included in the Estimate of Quantities are 0.2 tons of Asphalt for Tack SS-1H or CSS-1H for the intersecting roads and other areas throughout the project on SD 21.
Application will be at the rate shown on the plans or as directed by the Engineer.
The above quantities are included in the Estimate of Quantities.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	F10	F29

SD21 TABLE OF MAINLINE CULVERT WORK

Culvert #	Pipe Inventory #	MRM	+ Disp		Station	Side	Per Original Plans: In Place Culvert Size and Type		Culvert Length (Ft)	Culvert End Type	Direction of Flow	Drainage Area Acre	Remove Pipe: for Reset (Ft)	End Section (Each)	End Section for Reset (Each)	Furnish and Install: 36" RCP Flared End (Each)	Reset Pipe (Ft)	Reset Pipe End Section (Each)	Tie Bolts for RCP (Each)	Clean-out Pipe Culvert (Each)	Bank and Channel Protection Gabion (PVC Coated) (CuYd)	Type B Drainage Fabric (SqYd)	Repair Comments
1	None	127.95	0.00	a	26+25	L	24"	RCP	94	Flared	?	?											No Work Required.
						R				Flared													
2	27630	128.00	0.27	a	44+00	L	36"	RCP	194	Flared	?	130											No Work Required.
						R				Flared													
3	27631	128.00	0.91	a	77+30	L	24"	RCP	112?	Flared	?	?								1			Clean Culvert
						R				Flared													
4	27632	129.00	0.47		106+73	L	36"	RCP	74	Flared	?	?											No Work Required.
						R				Flared													
5	27633	129.00	0.61		113+70	L	5'X7'	Cattle Pass	96	Flared	?	?							26				Tie 13 untied joints
						R				Flared													
6	27633	129.00	0.77		121+93	L	30"	RCP	186	Flared	?	?											No Work Required.
						R				Flared													
7	27634	130.00	0.16		142+46	L	24"	RCP	98	Flared	?	10											No Work Required.
						R				Flared													
8W	27635	130.00	0.87		179+40	L	90"	**RCPA**	80	Flared	South	?			1			1			60	90	Place gabions on left side. (12' x 45' x 3') See Plan Sheet
						R				Flared													
8E	27635	130.00	0.87		179+40	L	90"	**RCPA**	80	Flared	South	?			1			1					
						R				Flared													
9	27636	131.00	0.11		192+23	L	24"	RCP	80	Flared													No Work Required.
						R				Flared													
10	27637	131.00	0.36		206+30?	L	36"	RCP	?	Flared	?	?	14	1		1	14						Replace FE & Reset 14'
						R				Flared					1			1					Reset FE
											TOTAL		**14**	**1**	**3**	**1**	**14**	**3**	**26**	**1**	**60**	**90**	

Left and Right based upon project station, thus Left is North side and Right is South side.

Culvert type and size obtained from a combination of visual inspection and original construction plans. Additional repair may be required at time of construction.

In place Culvert Markers shall be removed and reset when performing Culvert Work. Cost to remove and reset Culvert Markers shall be incidental to the various culvert contract items.

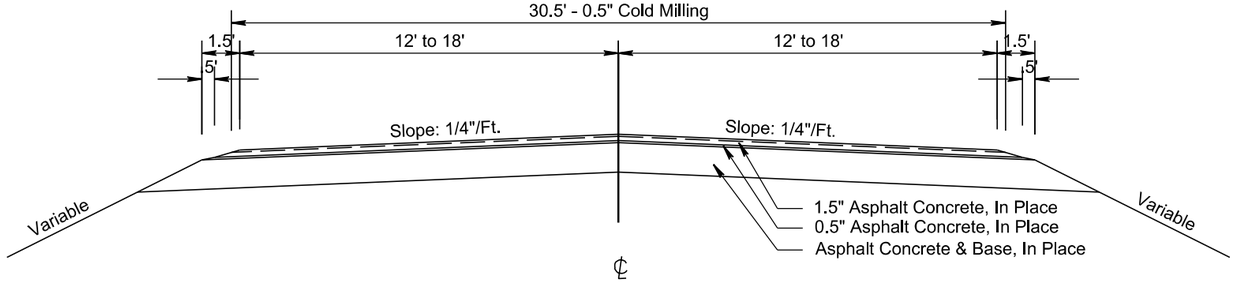
Initial Inspection held on 9-25-19. Above table produced from that inspection.

TYPICAL SURFACING SECTIONS

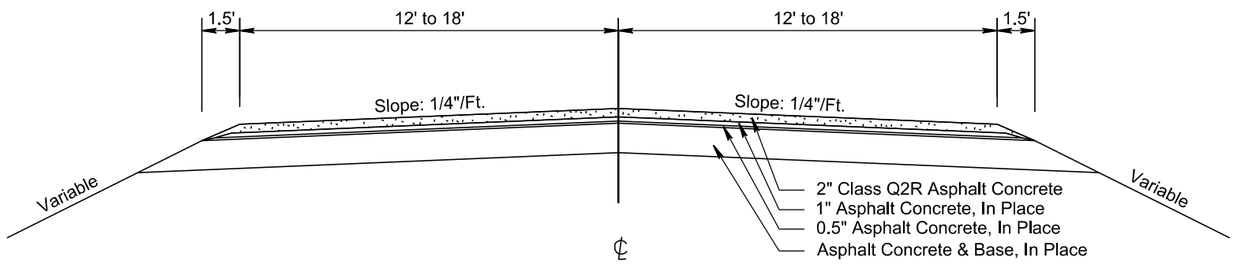
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0021(174)127	F11	F29

Plotting Date: 09/09/2022

Section 1
Sta. 0+12 to Sta. 2+15 (Main Ave.)
In Place Section
30.5' - 0.5" Cold Milling



Section 1
Sta. 0+12 to Sta. 2+15 (Main Ave.)
Resurfacing Section

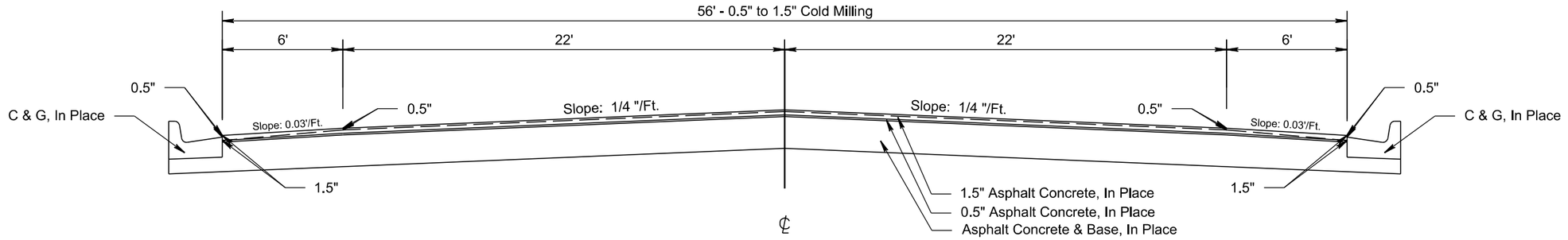


TYPICAL SURFACING SECTIONS

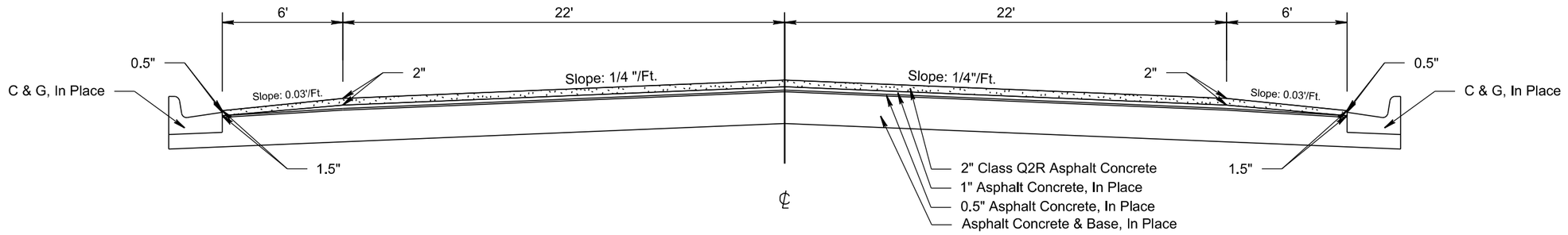
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0021(174)127	F12	F29

Plotting Date: 09/09/2022

Section 2
Sta. 2+39 to Sta. 10+08
In Place & Cold Milling Section



Section 2
Sta. 2+39 to Sta. 10+08
Resurfacing Section



PLOT SCALE - 1:6.00001

PLOTTED FROM - TRPR12283

PLOT NAME - 2

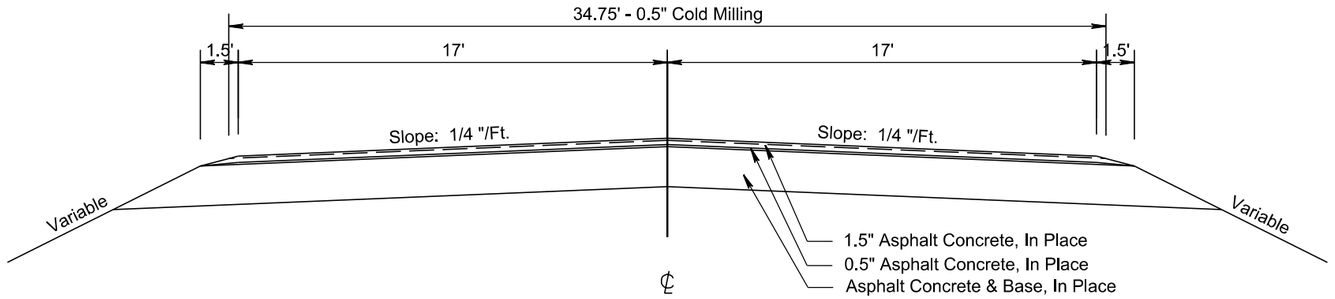
FILE - ...\06CW_TYPSECT_TJ03.DGN

TYPICAL SURFACING SECTIONS

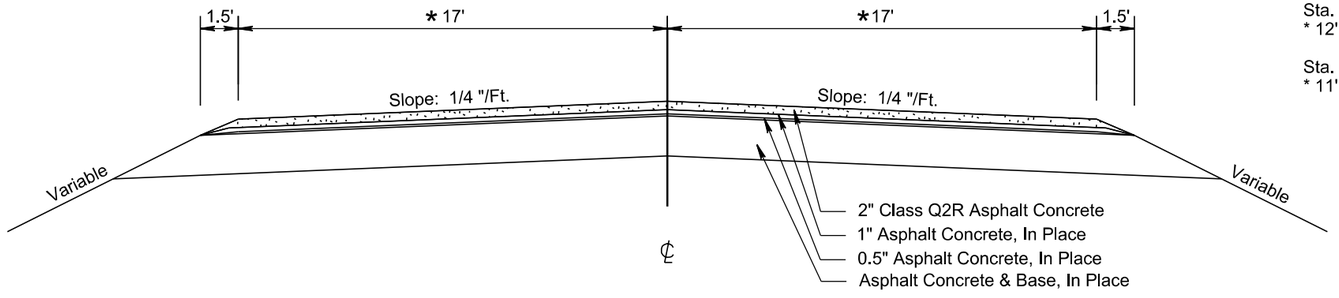
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0021(174)127	F13	F29

Plotting Date: 09/09/2022

Section 3
Sta. 10+08 to Sta. 20+34
In Place & Cold Milling Section



Section 3
Sta. 10+08 to Sta. 20+34
Resurfacing Section



Transitions:

Sta. 10+08 to Sta. 13+17
* 17'

Sta. 13+17 to Sta. 14+86
* 12'

Sta. 14+86 to Sta. 20+34
* 11'

PLOT SCALE - 1:6.00001

PLOT NAME - 3

FILE - ...\06CW_TYPSECT_TJ03.DGN

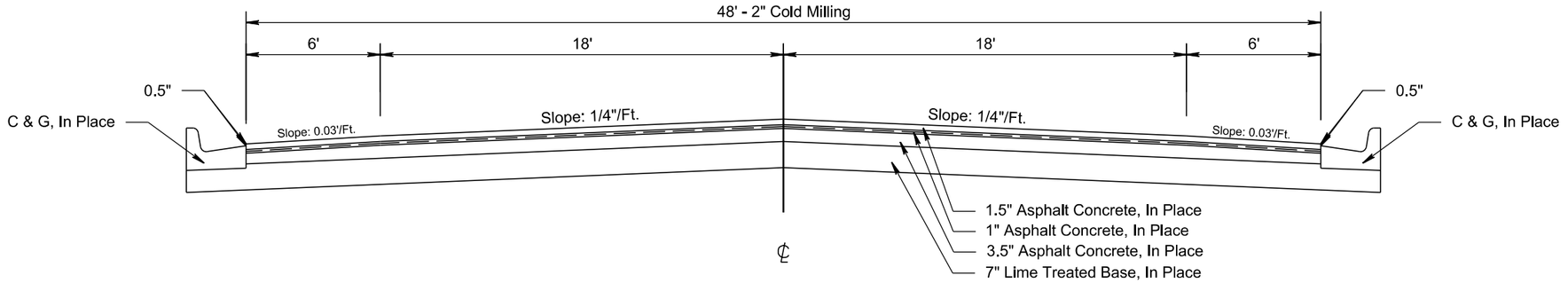
PLOTTED FROM - TRPR12283

TYPICAL SURFACING SECTIONS

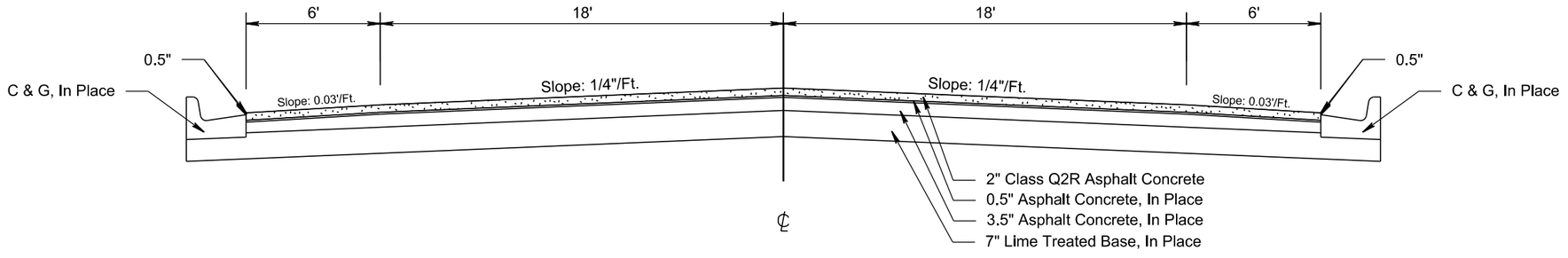
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0021(174)127	F14	F29

Plotting Date: 09/09/2022

Section 4
Sta. a 13+26.4 to Sta. a 21+34
In Place & Cold Milling Section



Section 4
Sta. a 13+26.4 to Sta. a 21+34
Resurfacing Section



PLOT SCALE - 1:6.00001

PLOT NAME - 4

FILE - ...\06CW_TYPSECT_TJ03.DGN

PLOTTED FROM - TRPR12283

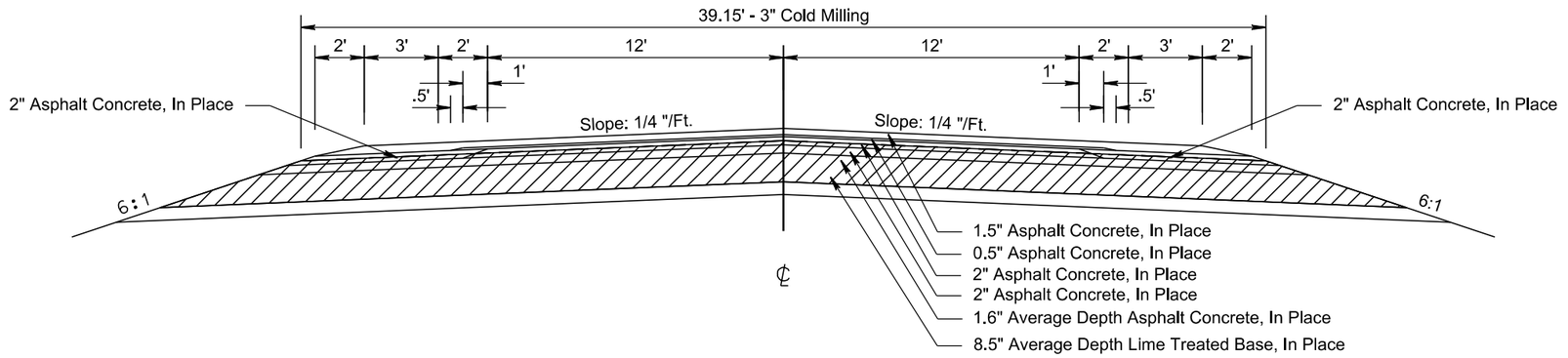
TYPICAL SURFACING SECTIONS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0021(174)127	F15	F29

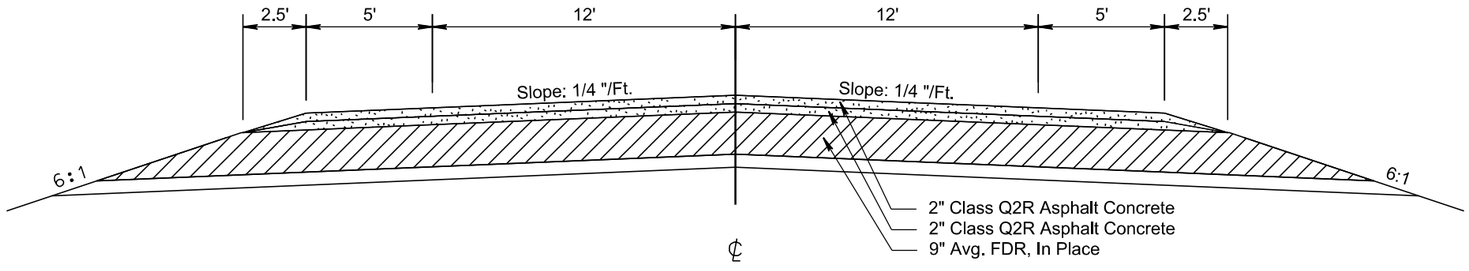
Plotting Date: 09/09/2022

10" Full Depth Reclamation (FDR)

Section 5
Sta. a 21+34 to Sta. a 210+70.0
In Place Section



Section 5
Sta. a 21+34 to Sta. a 210+70.0
Ultimate Surfacing Section



PLOT SCALE - 1:6.00001

PLOT NAME - 5

FILE - ...\06CW_TYPSECT_TJ03.DGN

PLOTTED FROM - TRPR12283

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	F16	F29
Plotting Date: 03/28/2023			

179+40 L (Twin 90" RCPA)
Remove Flared Ends for Reset

179+40 L
Reset Flared End

179+40 L
Install Bank and Channel
Protection Gabions (60.0 CuYd)
(12' x 45' x 3')
and Type B Drainage Fabric
(90 SqYd)

179+00 to 179+60 L
Remove Fence for Reset

179+00 to 179+60 L
Reset Fence
(Install new 2 Post Panel at PI point in Fence)

N

Sec 24 - T114N - R53W

Assumed ROW Line

2 PP

Present SD Hwy 21

176+00 177+00 178+00 179+00 180+00 181+00 182+00 183+00

Assumed ROW Line

Sec 25 - T114N - R53W

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	F17	F29

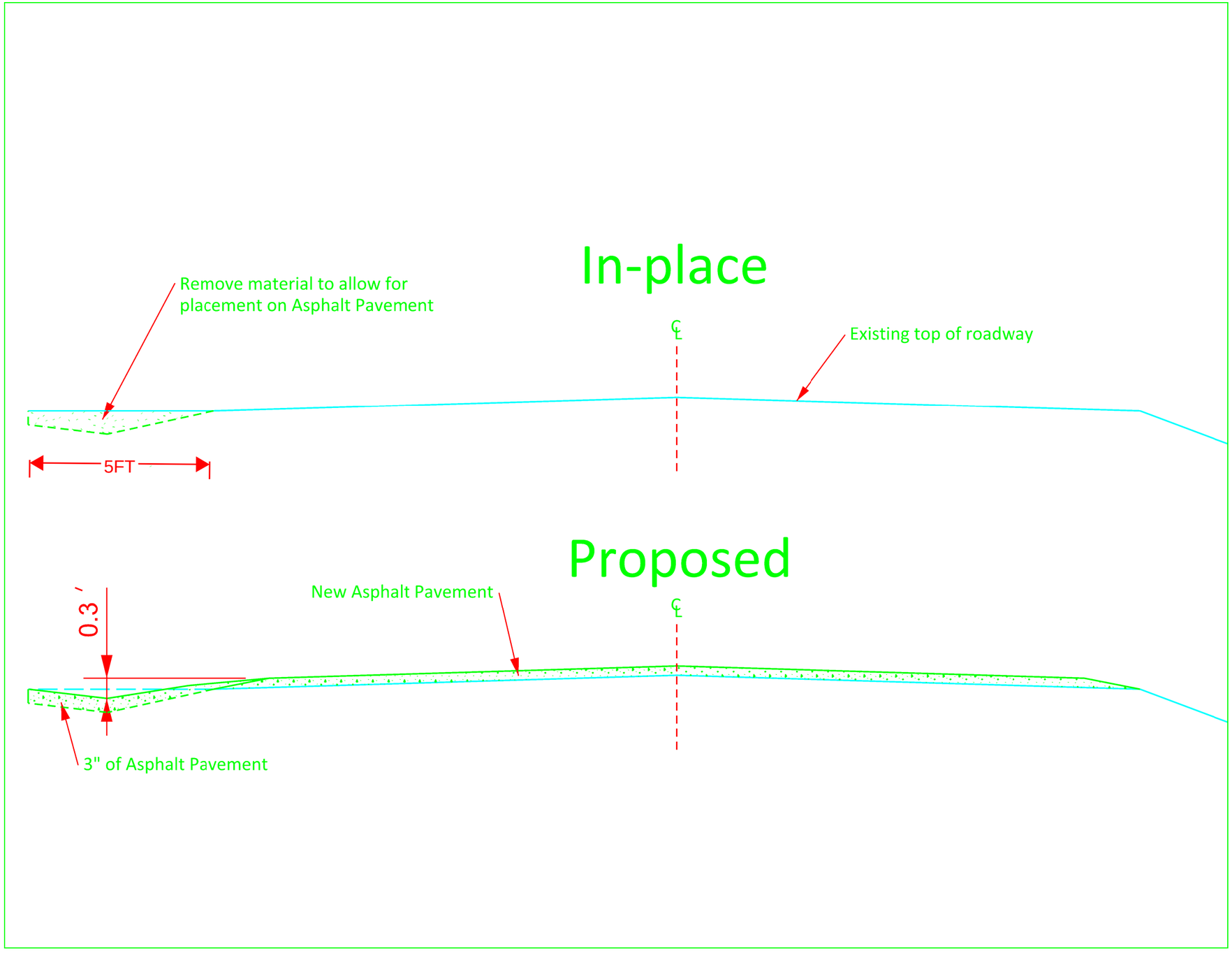
INCIDENTAL WORK LOCATION

*10" of Unclassified Excavation will be required to allow for 3" of backfill, 3" of Asphalt Concrete, and a 0.3' channel to allow water to flow south.

The Asphalt pad will be 5' in width and 40' in length running along the front of the residence at the intersection of Redbird Ave and 4th St S in the Southeast corner.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	F18	F29

INCIDENTAL WORK DETAIL



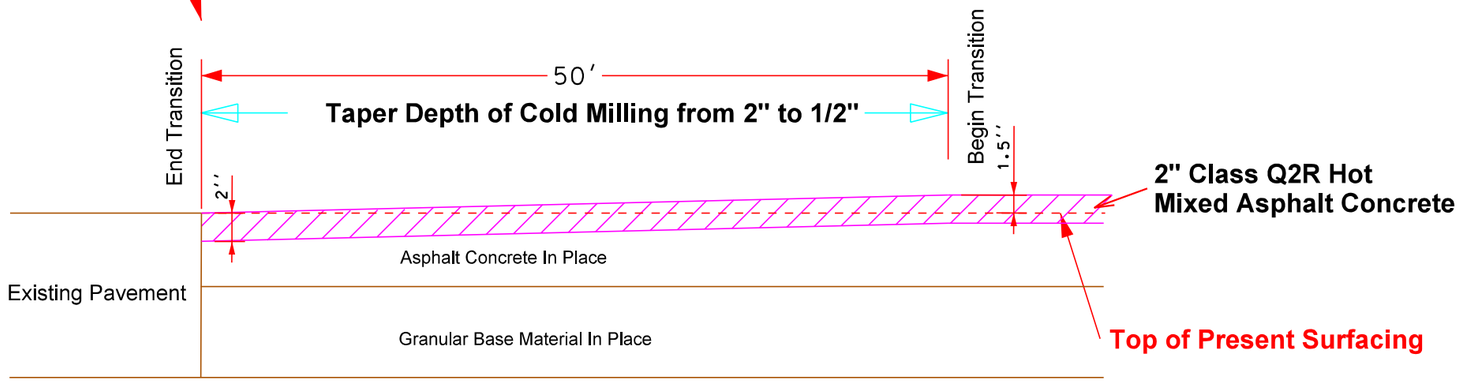
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	F19	F29
Plotting Date: 01/09/2024			

TRANSITION DETAILS FOR PROJECT LIMITS

0+00

TRANSITION SECTION

Begin Resurfacing Project

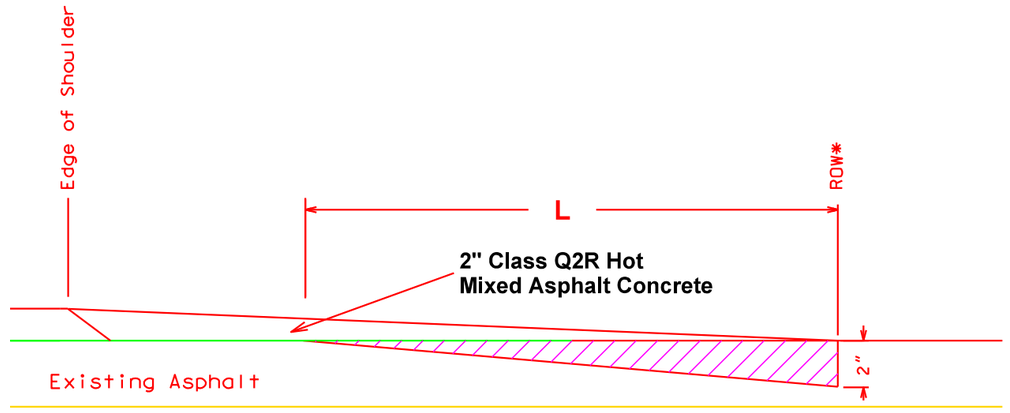


STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	F20	F29
Plotting Date: 03/28/2023			

TRANSITION DETAILS FOR INTERSECTING ROADS & ENTRANCES

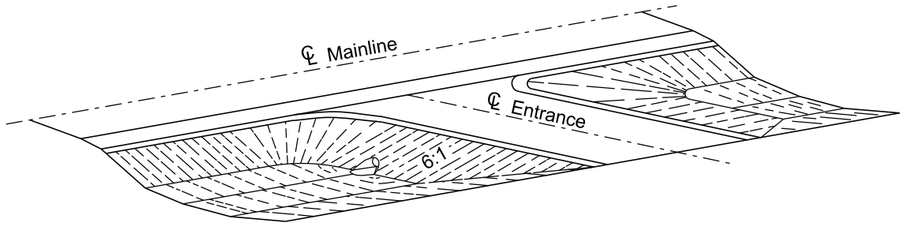
TRANSITION SECTION

Approaches, Entrances, Intersecting Roads

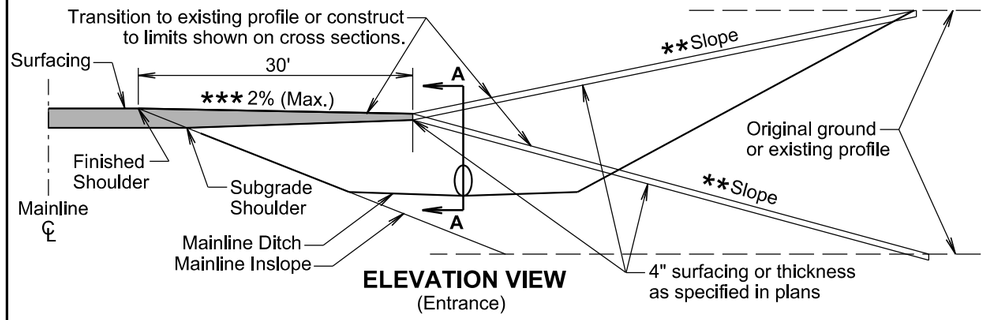


Cold Milling Asphalt Concrete

Note: Width of Cold Milling Asphalt Concrete will match adjacent surfacing width.
Length of Cold Milling Asphalt Concrete will be to end of existing asphalt pad, to ROW, or as directed by the Engineer



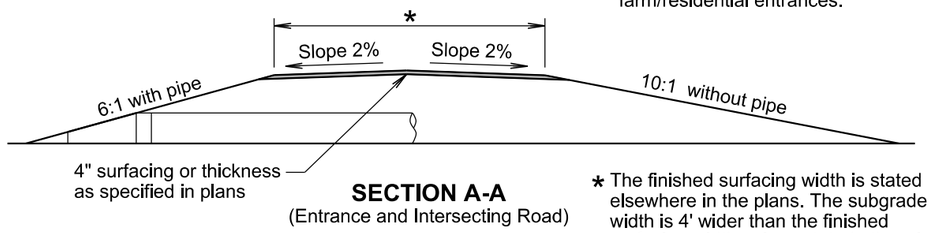
PERSPECTIVE OF ENTRANCE



ELEVATION VIEW
(Entrance)

*** 2% When on the inside of superelevation and 0% or flat when on outside of superelevation.

** Entrance maximum slope is typically 10:1 for field entrances and 15:1 for farm/residential entrances.



SECTION A-A
(Entrance and Intersecting Road)

* The finished surfacing width is stated elsewhere in the plans. The subgrade width is 4' wider than the finished surfacing width unless stated otherwise in the plans.

GENERAL NOTES:

The ditch section shown above in the perspective view is only for illustrative purpose.

The elevation view above is typical for either a ditch cut or fill section. Entrances that vary from above should be specified in the plans.

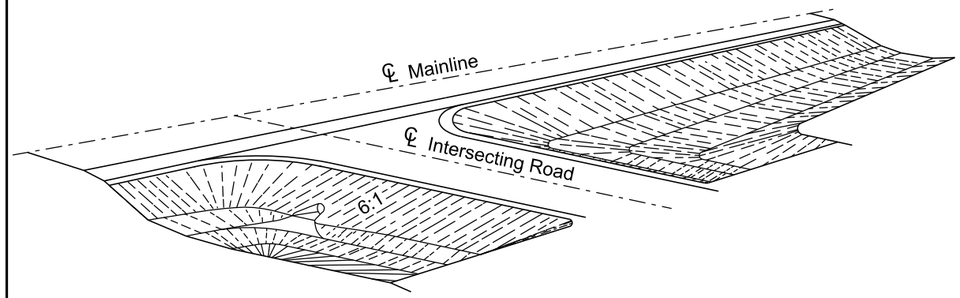
Pipe length will be adjusted if necessary during construction to obtain the 6:1 slope. For grading projects, the pipe length is estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

The transition area between the mainline inslope and the entrance or intersecting road inslope will be rounded to eliminate an abrupt transition.

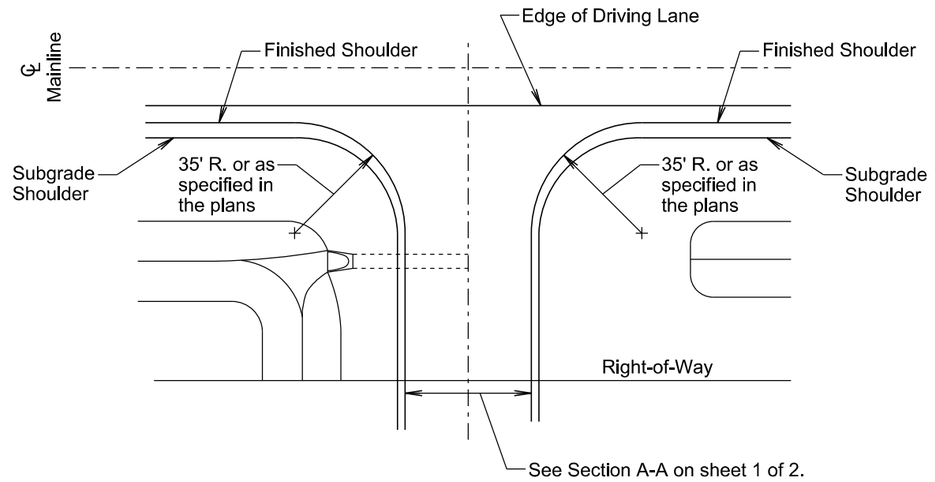
The turning radii will be 35' for intersecting roads and entrances unless stated otherwise in the plans.

November 19, 2021

Published Date: 2024	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 1 of 2



PERSPECTIVE OF INTERSECTING ROAD



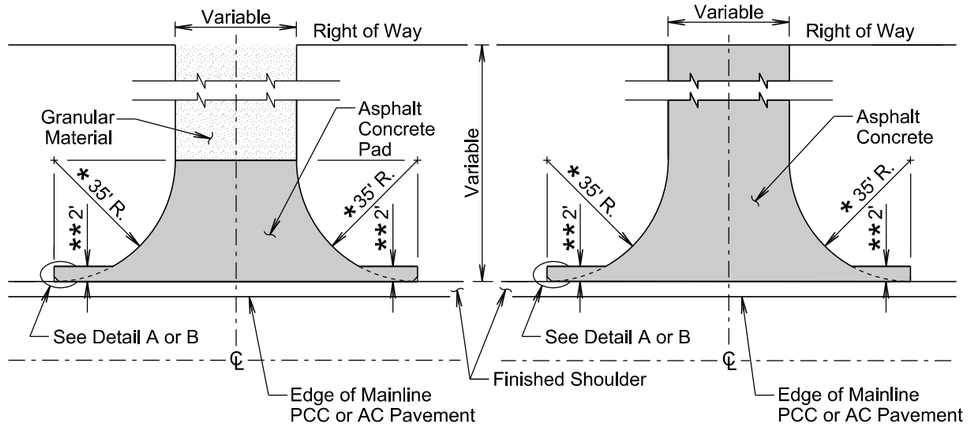
PLAN VIEW

GENERAL NOTES:

The 6:1 or 10:1 intersecting road inslope will transition to the existing intersecting road inslope near the right-of-way or at a location as determined by the Engineer.

November 19, 2021

Published Date: 2024	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 2 of 2



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:

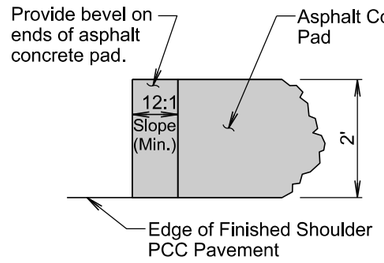
The precise construction limits for situations other than shown above will be determined by the Engineer during construction.

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

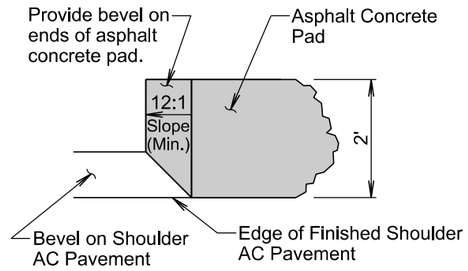
** The Contractor may adjust the screed of the paver during mainline paving operations to provide the 2-foot asphalt concrete pad or the Contractor may provide the 2-foot asphalt concrete pad during paving of the intersecting roads as shown above. The Engineer may eliminate the 2-foot asphalt concrete 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

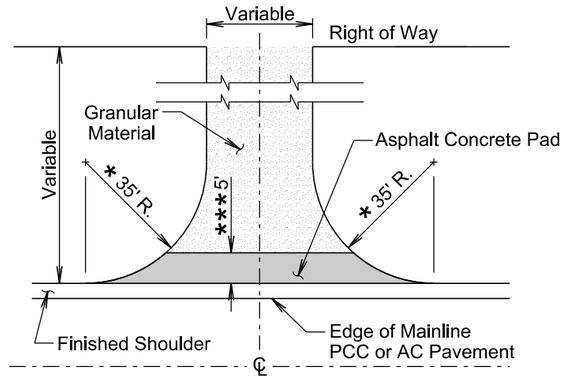
Published Date: 2024	SDDOT	SURFACING OR RESURFACING OF INTERSECTING ROADS AND ENTRANCES (MAINLINE AND SHOULDERS: PCC OR AC PAVEMENT)	PLATE NUMBER 320.04
			Sheet 1 of 2



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



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



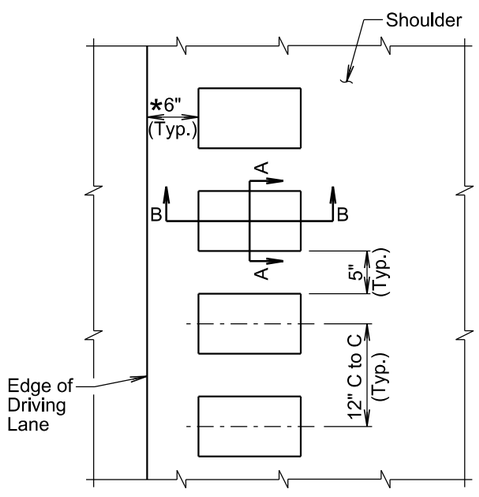
PLAN VIEW
(Entrance)

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

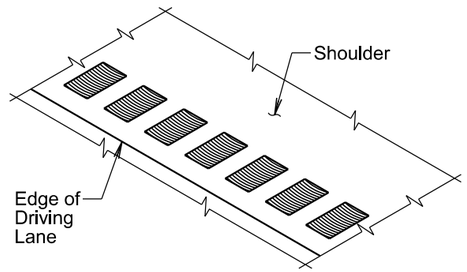
August 27, 2020

Published Date: 2024	SDDOT	SURFACING OR RESURFACING OF INTERSECTING ROADS AND ENTRANCES (MAINLINE AND SHOULDERS: PCC OR AC PAVEMENT)	PLATE NUMBER 320.04
			Sheet 2 of 2

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	F23	F29

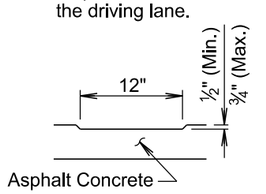


PLAN VIEW
(Typical Rumble Strip in Asphalt Concrete)

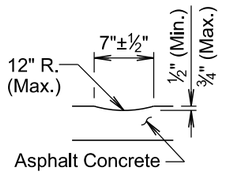


PERSPECTIVE VIEW
(Typical Rumble Strip in Asphalt Concrete)

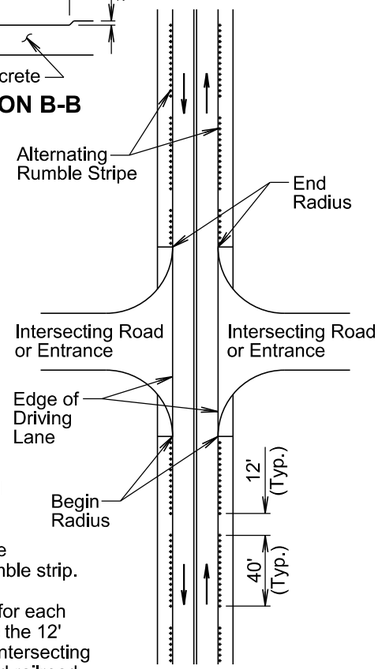
* When PCC pavement width from centerline to edge of pavement is 12', the rumble strip may be placed a maximum of 2' from the edge of the driving lane.



SECTION B-B



SECTION A-A



PLAN VIEW

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.

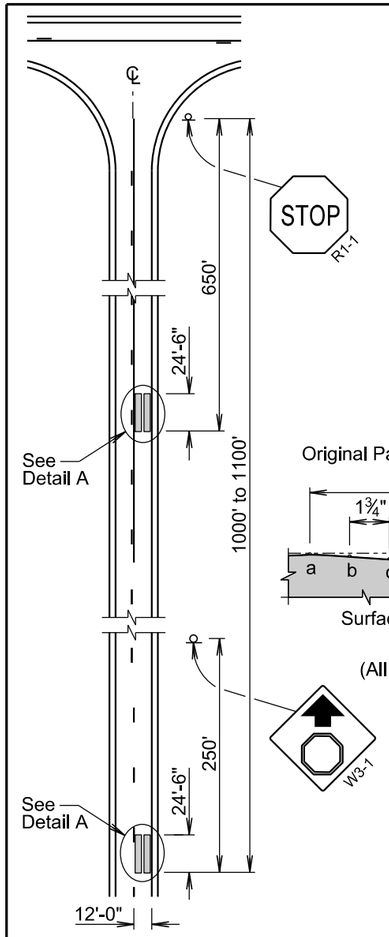
A rumble strip will not be constructed through intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and railroad crossings. The lengths of the 40' segments with continuous indentations and the 12' segments without a rumble strip adjacent to the intersecting roads, entrances,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

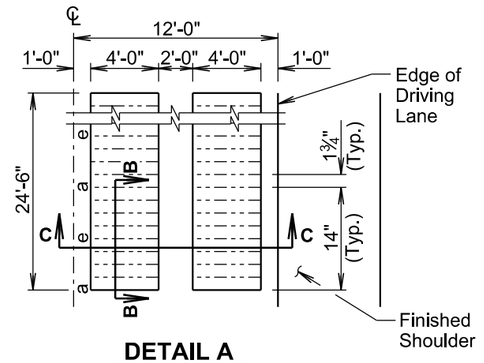
Measurement of the rumble strip will be to the nearest 0.1 of a mile for each shoulder. Measurement and payment of the rumble strip will include the 12' long segments without rumble strips and the segments adjacent to intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and railroad 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

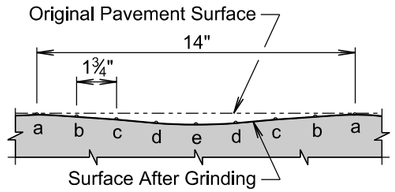
Published Date: 2024	SDDOT	12" RUMBLE STRIP IN ASPHALT CONCRETE ON NONDIVIDED HIGHWAY SHOULDERS	PLATE NUMBER 320.24
			Sheet 1 of 1



PLAN VIEW

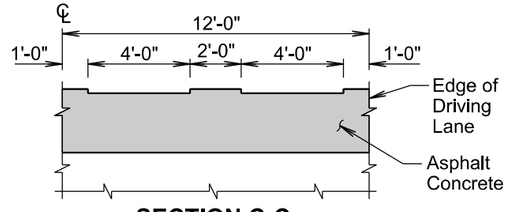


DETAIL A
PLAN VIEW
(Not to Scale)



SECTION B-B
(All dimensions are typical.)

SINUSOIDAL GRINDING	
Location	⌀ Depth (In.)
a	1/16
b	5/32
c	9/32
d	7/16
e	½



SECTION C-C
(All dimensions are typical.)

GENERAL NOTES:

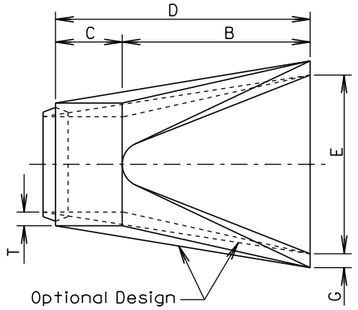
Transverse rumble strips will be constructed by grinding continuous sinusoidal indentations in the asphalt concrete pavement as approved by the Engineer. The transverse rumble strips will receive a flush seal or fog seal as specified in the plans.

⌀ The sinusoidal transverse rumble strips construction grinding tolerance will be ± 1/16 inch.

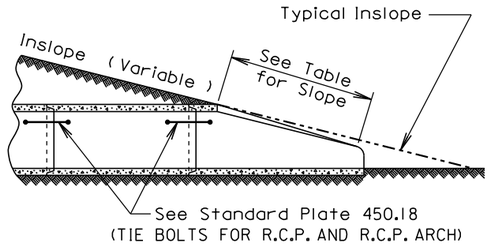
Measurement of the sinusoidal transverse rumble strips will be to the nearest square foot. Payment for constructing the sinusoidal transverse rumble strips will be at the contract unit price per square foot for "Grind Sinusoidal Transverse Rumble Strip in Asphalt Concrete Pavement".

January 22, 2021

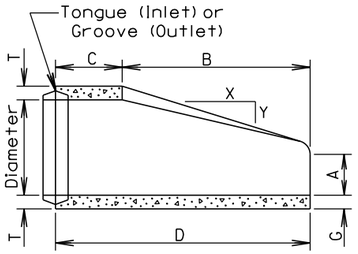
Published Date: 2024	SDDOT	SINUSOIDAL TRANSVERSE RUMBLE STRIP IN ASPHALT CONCRETE HIGHWAY ADJACENT TO STOP CONTROLLED INTERSECTION	PLATE NUMBER 320.46
			Sheet 1 of 1



TOP VIEW



SLOPE DETAIL

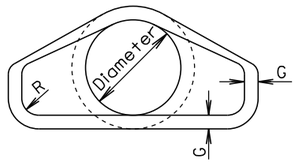


LONGITUDINAL SECTION

GENERAL NOTES:

Lengths of concrete pipe shown on plan sheets are between flared ends only.

Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Specifications.



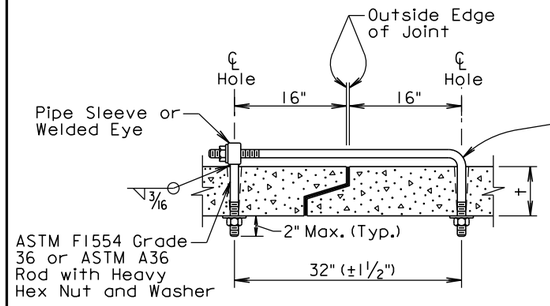
END VIEW

Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4:1	2	4	24	48 7/8	72 7/8	24	2	1 1/2
15	740	2.4:1	2 1/4	6	27	46	73	30	2 1/4	1 1/2
18	990	2.3:1	2 1/2	9	27	46	73	36	2 1/2	1 1/2
21	1280	2.4:1	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	1 1/2
24	1520	2.5:1	3	9 1/2	43 1/2	30	73 1/2	48	3	1 1/2
27	1930	2.5:1	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	1 1/2
30	2190	2.5:1	3 1/2	12	54	19 3/4	73 3/4	60	3 1/2	1 1/2
36	4100	2.5:1	4	15	63	34 3/4	97 3/4	72	4	1 1/2
42	5380	2.5:1	4 1/2	21	63	35	98	78	4 1/2	1 1/2
48	6550	2.5:1	5	24	72	26	98	84	5	1 1/2
54	8240	2:1	5 1/2	27	65	33 1/4	98 1/4	90	5 1/2	1 1/2
60	8730	1.9:1	6	35	60	39	99	96	5	1 1/2
66	10710	1.7:1	6 1/2	30	72	27	99	102	5 1/2	1 1/2
72	12520	1.8:1	7	36	78	21	99	108	6	1 1/2
78	14770	1.8:1	7 1/2	36	90	21	111	114	6 1/2	1 1/2
84	18160	1.6:1	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2
90	20900	1.5:1	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	6

June 26, 2015

Published Date: 2024	SDDOT	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
			Sheet 1 of 1

Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3 1/4	5/8	3/4
3 1/2-6 1/2	3/4	1
≥ 7	1	1 1/4



ADJUSTABLE EYE BOLT TIE

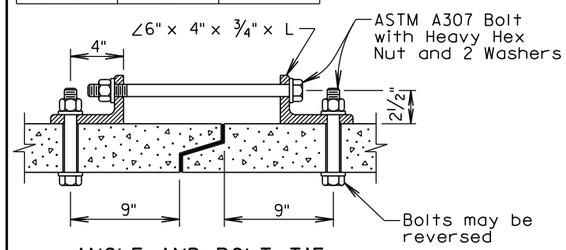
GENERAL NOTES:

Tie bolts shall conform to ASTM F1554 Grade 36 or ASTM A36. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.

Pipe Sleeve shall conform to ASTM A500 or A53, Grade B.

Galvanize adjustible eye bolt tie assembly in accordance with ASTM A153.

Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
≤ 48	4	3/4
> 48	6	1



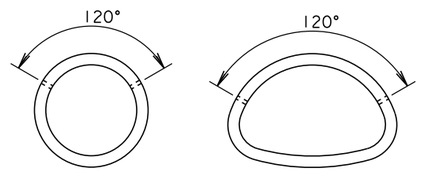
ANGLE AND BOLT TIE

GENERAL NOTES:

Angles shall conform to ASTM A36.

Bolts shall conform to ASTM A307. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.

Galvanize angles, bolts, nuts, and washers in accordance with ASTM A153.



END VIEW "CIRCULAR"

END VIEW "ARCH"

GENERAL NOTES:

In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.

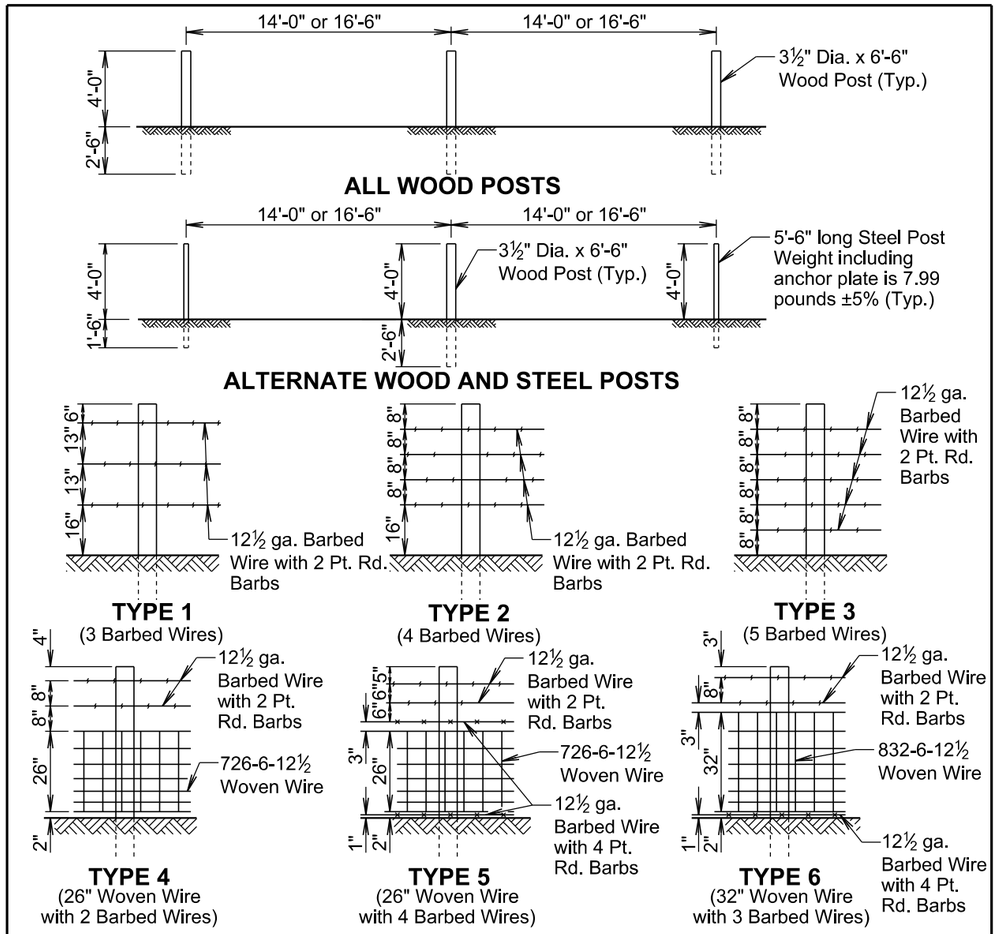
All pipe sections of R.C.P. and R.C.P. Arch shall be tied with tie bolts except for pipe located between drop inlets, manholes, and junction boxes. All pipe sections of pipes that only enter or exit drop inlets, manhole, and junction boxes shall be tied with tie bolts.

There will be no separate measurement or payment for the tie bolts. The cost for furnishing and installing the tie bolts shall be incidental to the contract unit price per foot for the corresponding bid item for R.C.P. or R.C.P. Arch.

February 28, 2013

Published Date: 2024	SDDOT	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	F25	F29



TYPE OF FENCE		LINE POST SPACING	BARBED WIRE		WOVEN WIRE
TYPE	DESCRIPTION		WIRE GAGE	NUMBER AND SHAPE OF BARBS	STYLE OR DESIGN NO.
1	3 Barbed Wires	16'-6"	12½	2 Point Round	—
2	4 Barbed Wires	16'-6"	12½	2 Point Round	—
3	5 Barbed Wires	16'-6"	12½	2 Point Round	—
4	26" Woven Wire with 2 Barbed Wires	14'-0"	12½	2 Point Round	726-6-12½
5	26" Woven Wire with 4 Barbed Wires	14'-0"	12½	2 wires with 2 Pt. Rd. 2 wires with 4 Pt. Rd.	726-6-12½
6	32" Woven Wire with 3 Barbed Wires	14'-0"	12½	2 wires with 2 Pt. Rd. 1 wire with 4 Pt. Rd.	832-6-12½

GENERAL NOTES:

Fence types designated on the plans that are followed by the letter S will have smooth (barbless) wires.

When type 5S or 6S is designated the bottom wire may be barbed, smooth, or left off.

All degrees of curvature stated for fence are at centerline of roadway.

June 26, 2019

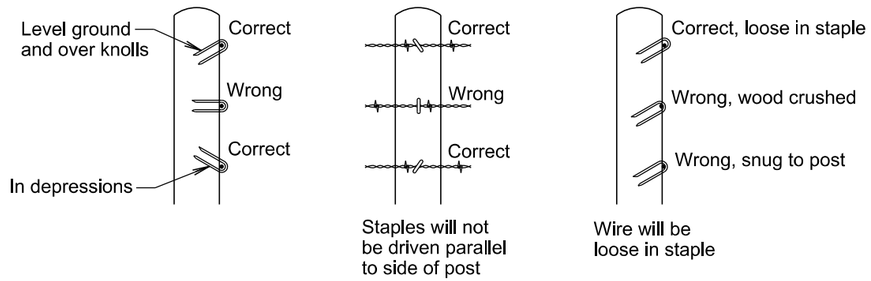
Published Date: 2024

SDDOT

RIGHT-OF-WAY FENCE

PLATE NUMBER 620.01

Sheet 1 of 1



STAPLE INSTALLATION

GENERAL NOTES:

The Right-of-Way fence will consist of barbed wire or a combination of woven wire and barbed wire. The barbed wire and/or woven wire will be fastened to all wood posts or fastened to alternating wood and steel posts. Only wood posts will be used for brace panels. Gates will be of the type designated in the plans or as otherwise directed by the Engineer. Fence will be constructed conforming to the details on the standard plates and in the plans unless otherwise directed by the Engineer.

Right-of-Way fence on Interstate Projects will be constructed one foot within the Interstate Right-of-Way lines except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

Right-of-Way fence other than on Interstate Projects will be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

Barbs will be fabricated from zinc coated 14 ga. wire. Two point barbs will be wrapped twice around one main strand at four-inch spacings and the four point barbs will be interlocked and wrapped around both main strands at five-inch spacings.

The gages of wire and wood post lengths and sizes are the minimum acceptable unless otherwise specified in the plans. The tolerances for steel posts will be as stated in AASHTO M281. Woven wire will conform to design and specifications of ASTM A116 and barbed wire will conform to ASTM A121.

June 26, 2019

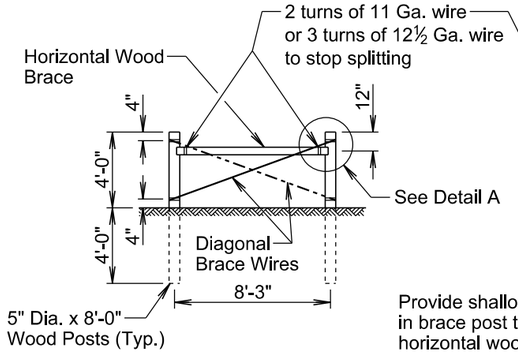
Published Date: 2024

SDDOT

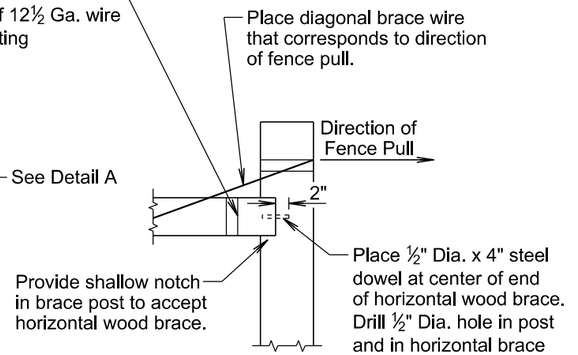
STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES

PLATE NUMBER 620.02

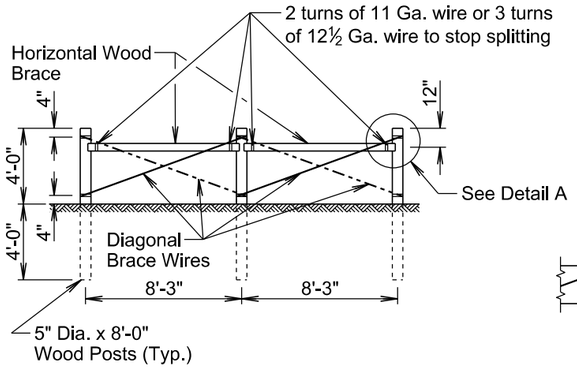
Sheet 1 of 1



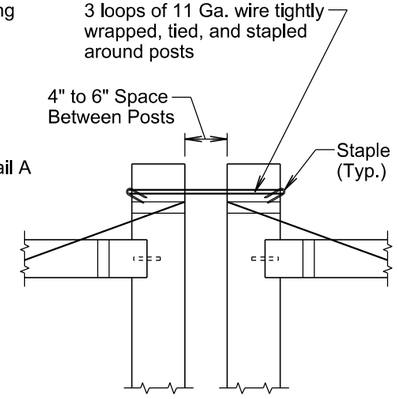
ELEVATION VIEW
(2 Post Panel)



DETAIL A



ELEVATION VIEW
(3 Post Panel)



DETAIL B

GENERAL NOTES:

Two Post Panels will be installed at least every 1320' between corners.

Two Post Panels will be installed at any sharp vertical angle crest points and as directed by the Engineer.

Horizontal wood braces will consist of 4" dia. x 8' wood posts or rough 4" x 4" x 8' timbers.

Diagonal brace wires will be fabricated with 4 strands of 9 Ga. galvanized wire twisted tight. The diagonal brace wires will be installed in accordance with the direction of the fence pull. Two diagonal brace wires are required if fence pull is in both directions.

January 22, 2023

Published Date: 2024	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 1 of 3

SPACING OF 2 POST PANELS WITHIN CURVES	
RADIUS OF CURVE	SPACING OF 2 POST PANEL
Greater than 1800 Ft.	** 1320'
Less than 1800 Ft.	** At P.C., P.T., and at every 1320' between P.C. and P.T.

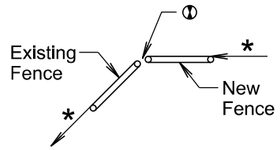
** Fence lengths greater than 1320' and less than 2640' place 2 Post Panel approximately at midpoint.

① See Detail B on Sheet 1 of 3.

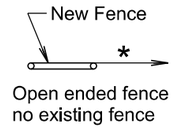
GENERAL NOTE:

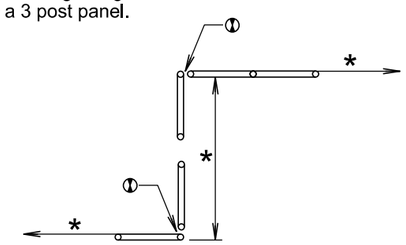
All degrees of curvature stated for fence are at centerline of roadway.

If fence length is less than 600' to next corner use a 2 post panel.
* If fence length is greater than 600' to next corner use a 3 post panel.

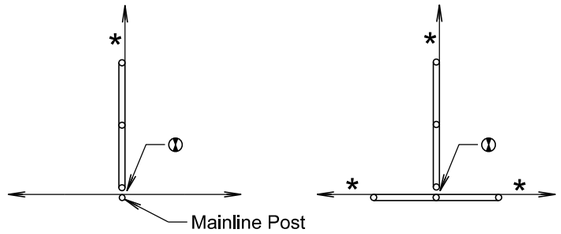


BEGIN OR END FENCE
(Where new fence ties into existing fence)

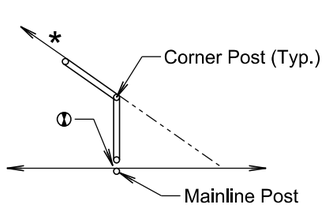


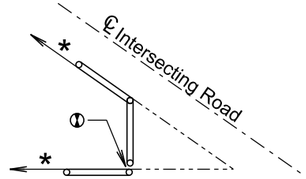


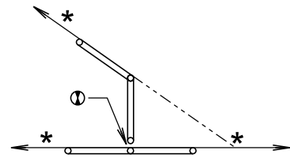
SHORT JOGS IN FENCE



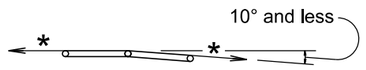
CROSS FENCE



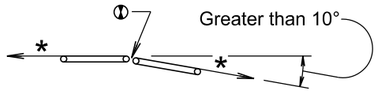




SHARP ANGLES IN CROSS FENCE



Additional fence panel is NOT required when an angle in the mainline fence is 10° and less.

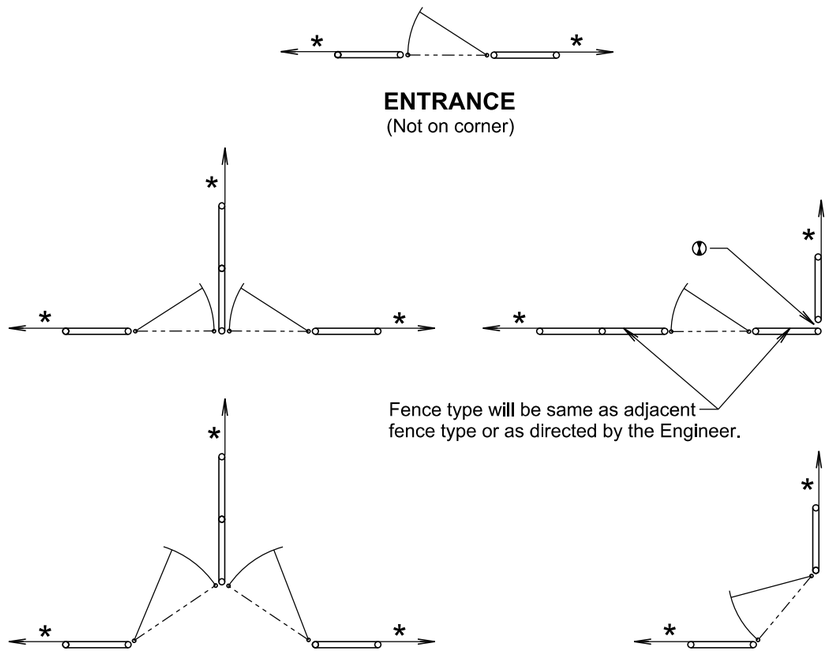


Additional fence panel is required when an angle in the mainline fence is greater than 10°.

ANGLES IN MAINLINE FENCE

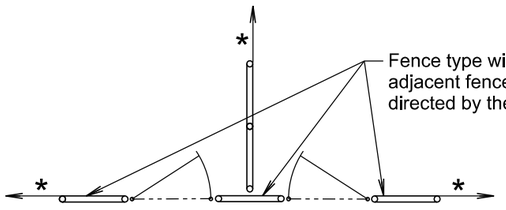
January 22, 2023

Published Date: 2024	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 2 of 3

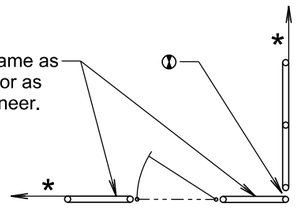


ENTRANCE
(Not on corner)

Fence type will be same as adjacent fence type or as directed by the Engineer.



Fence type will be same as adjacent fence type or as directed by the Engineer.



DOUBLE ENTRANCES

ENTRANCES AT CORNERS

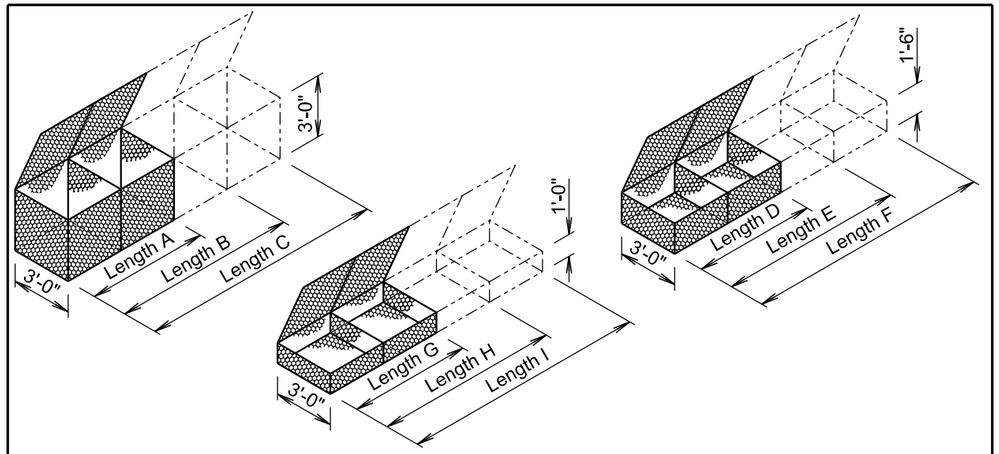
GATES

* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

① See Detail B on Sheet 1 of 3.

January 22, 2023

Published Date: 2024	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 3 of 3



GABION DETAILS

STANDARD SIZES					
SIZE	LENGTH	WIDTH	HEIGHT	NUMBER OF CELLS	CAPACITY (Cu. Yd.)
A	6'-0"	3'-0"	3'-0"	2	2.0
B	9'-0"	3'-0"	3'-0"	3	3.0
C	12'-0"	3'-0"	3'-0"	4	4.0
D	6'-0"	3'-0"	1'-6"	2	1.0
E	9'-0"	3'-0"	1'-6"	3	1.5
F	12'-0"	3'-0"	1'-6"	4	2.0
G	6'-0"	3'-0"	1'-0"	2	0.7
H	9'-0"	3'-0"	1'-0"	3	1.0
I	12'-0"	3'-0"	1'-0"	4	1.3

GENERAL NOTES: Above dimensions subject to mill tolerances.

Lacing and internal connecting wire will be 0.0866 inch diameter steel wire ASTM A641, Class 3 soft temper measured after galvanizing and for PVC coated gabions will be 0.0866 inch diameter steel wire measured after galvanizing but before PVC coating.

The lacing procedure is as follows:

1. Cut a length of lacing wire approximately 1½ times the distance to be laced but not exceeding 5 feet.
2. Secure the wire terminal at the corner by looping and twisting.
3. Proceed lacing with alternating single and double loops at a spacing not to exceed 6 inches.
4. Securely fasten the other lacing wire terminal.

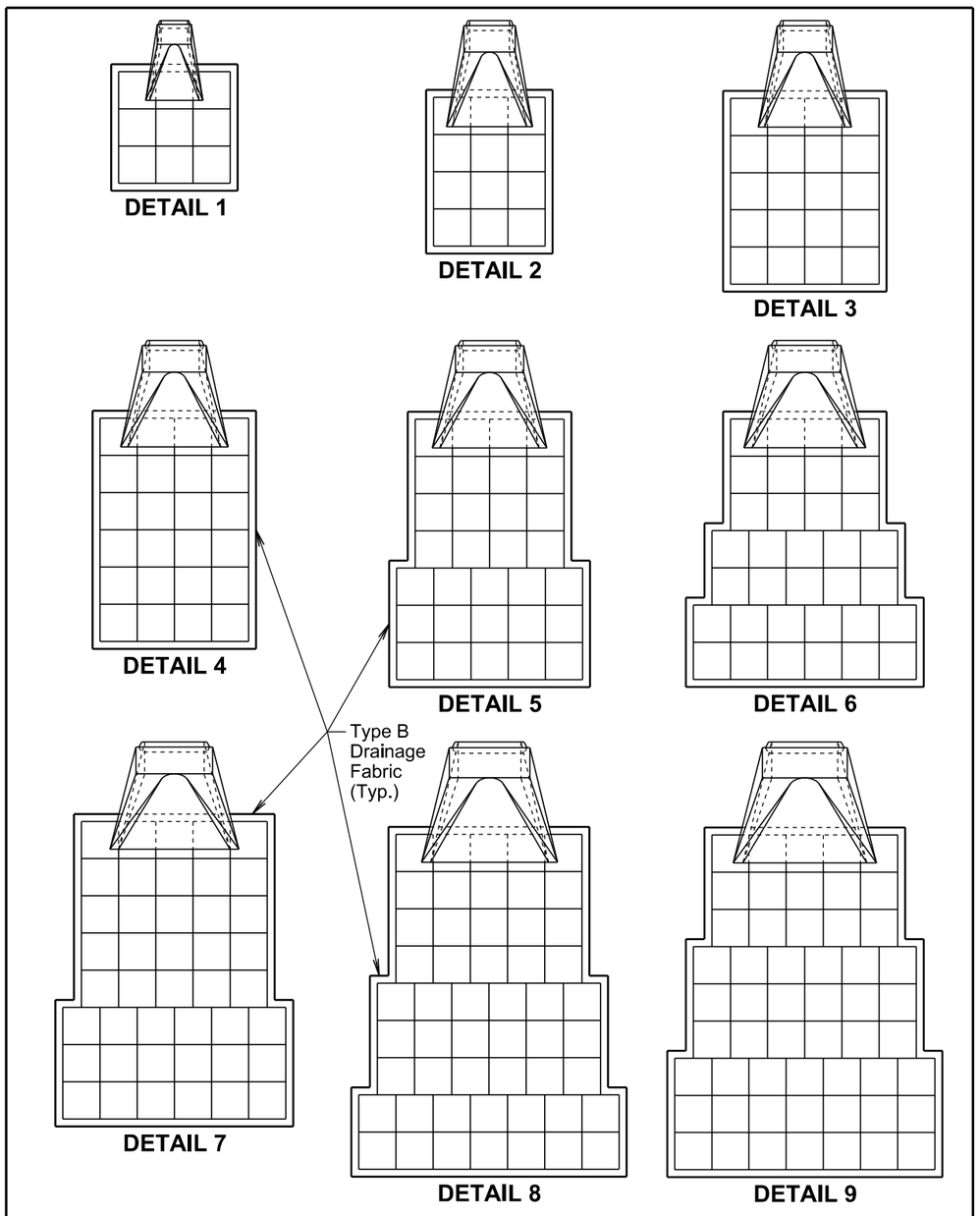
Wire lacing or interlocking type fasteners will be used for gabion assembly and final construction of gabion structures. Interlocking fasteners for galvanized gabions will be high tensile 0.120 inch diameter galvanized steel wire measured after galvanizing. The galvanizing will conform to ASTM A641-92, Class 3 coating. Fasteners will also be in accordance with ASTM A764, Class II, Type III.

Interlocking fasteners for PVC coated gabions will be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class 1. The spacing of the interlocking fasteners during all phases of assembly and construction will not exceed 6 inches.

All fasteners will be placed where the mesh weaves around the selvage wire at the vertical and horizontal joints.

February 14, 2020

Published Date: 2024	SDDOT	BANK AND CHANNEL PROTECTION GABIONS	PLATE NUMBER 720.01
			Sheet 1 of 1



February 14, 2020

Published Date: 2024

SDDOT

BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS

PLATE NUMBER 720.03

Sheet 1 of 2

*** ESTIMATED QUANTITIES**

	Detail	Pipe Diameter (Inches)	Gabion (Cu. Yd.)	Type B Drainage Fabric (Sq. Yd.)
RCP, RCP Arch, CMP, and CMP Arch	1	12, 18, and 24	4.5	15
	2	30 and 36	6.0	19
	3	42	10.0	29
	4	48 and 54	12.0	34
	5	60	15.5	43
	6	66	17.0	47
	7	72	21.5	57
	8	78	26.0	68
	9	84	27.0	70

GENERAL NOTES:

Gabions at outlets of CMP and RCP will be placed under the end section a distance of 2 feet from the outlet end. For CMP end section installations, the upper fabric of the gabions will be modified to accommodate the metal end section as approved by the Engineer.

* Gabion and type B drainage fabric quantities on this standard plate are based on standard gabion sizes D, E, and F as depicted on standard plate 720.01.

Type B drainage fabric will be placed under the gabions and around the exterior sides (perimeter) of the gabions as approved by the Engineer. The type B drainage fabric will be in conformance with Section 831 of the Specifications. Measurement and payment of the type B drainage fabric will be in conformance with Section 720 of the Specifications.

February 14, 2020

Published Date: 2024

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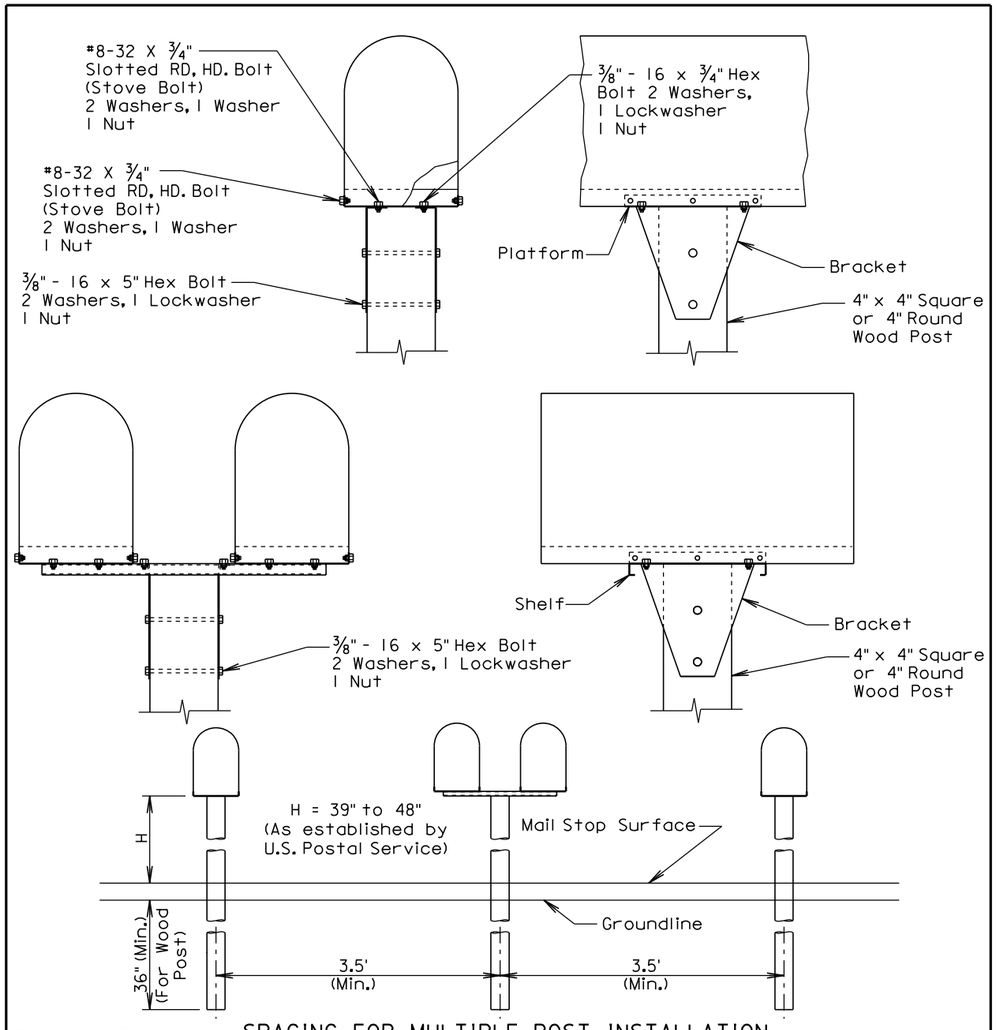
BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS

PLATE NUMBER 720.03

Sheet 2 of 2

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0021(174)127	F29	F29



SPACING FOR MULTIPLE POST INSTALLATION

GENERAL NOTES:

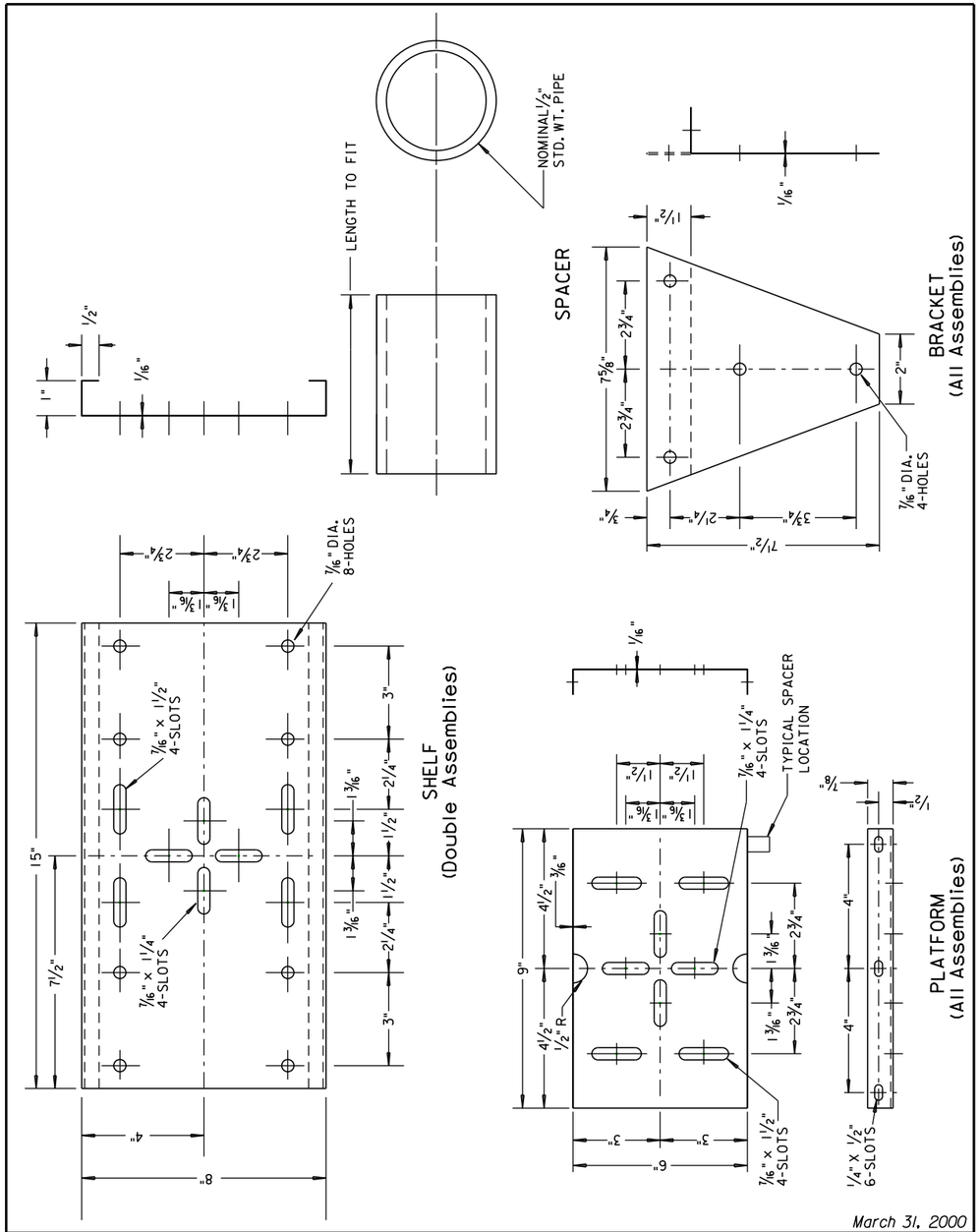
The post support assemblies provided should be consistant throughout the project. Single and double mailboxes may be in any sequence.

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: 2024	SDDOT	**SINGLE AND DOUBLE MAILBOX ASSEMBLIES**	PLATE NUMBER 900.02 Sheet 1 of 1



March 31, 2000

Published Date: 2024	SDDOT	**MAILBOX SUPPORT HARDWARE**	PLATE NUMBER 900.03 Sheet 1 of 1