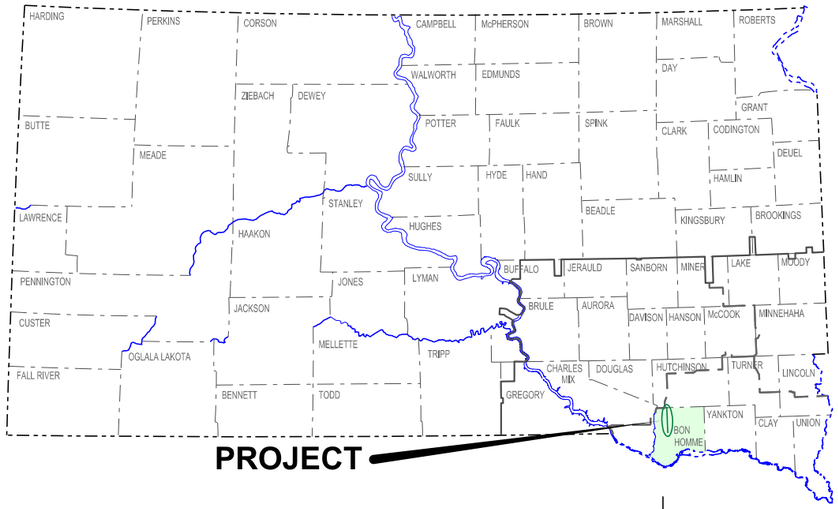


STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT NH 0037(164)24
SD HIGHWAY 37
BON HOMME COUNTY

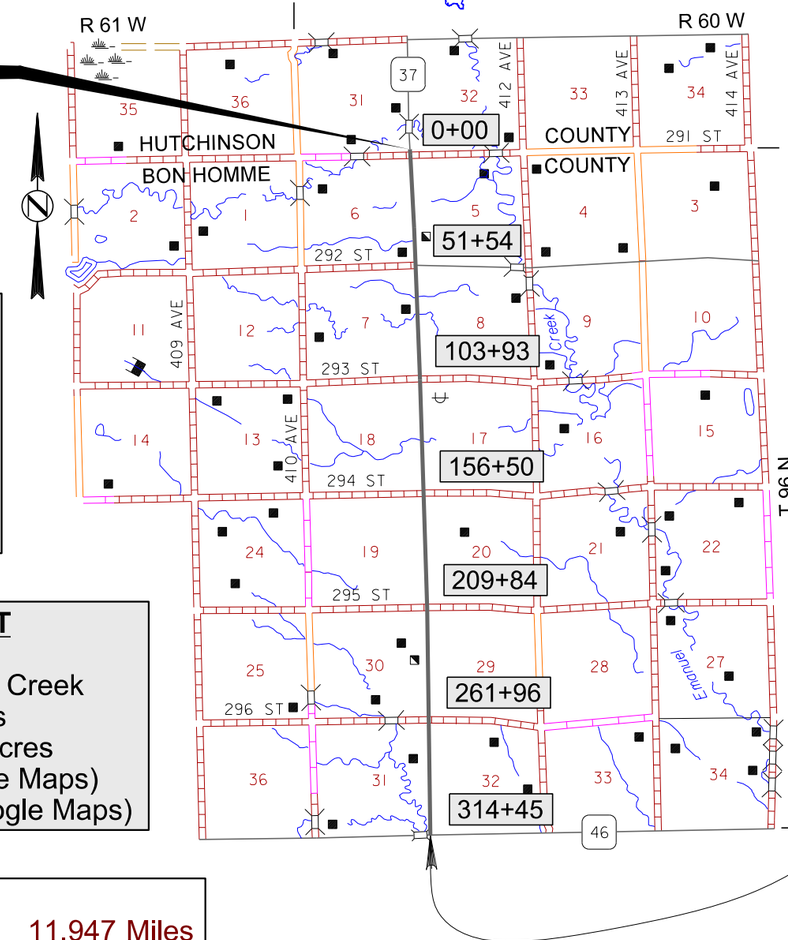
COLD MILLING ASPHALT CONCRETE,
ASPHALT CONCRETE RESURFACING,
BLEND, HAUL & STOCKPILE GRANULAR MATERIAL,
CULVERT WORK, PAVEMENT MARKING & GUARDRAIL
PCN 06PN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0037(164)24	1	63

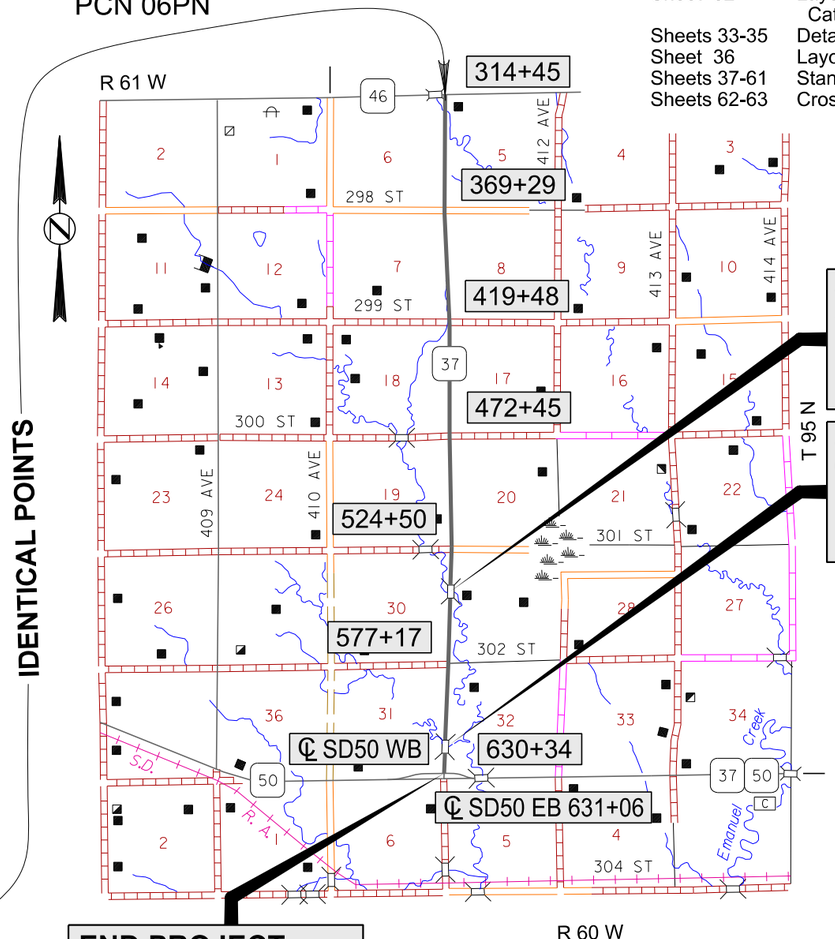
Plotting Date: 01/08/2024

INDEX OF SHEETS

BEGIN PROJECT
STA. 0+00 - 60'
MRM 36.00 +0.397
MILEAGE 32.509
(60' N of ℄ Jct 291 St)



IDENTICAL POINTS



STRUCTURE 05-100-104
543+97.25 to 545+02.75
Continuous Concrete Bridge
105'-6"=0.020 Mile
MRM 26.08

STRUCTURE 05-100-118
616+81.5 to 617+99.5
Continuous Concrete Bridge
118'-0"=0.022 Mile
MRM 24.70

END PROJECT
STA. 630+22
110' S of MRM 24.48
MILEAGE 20.571
(Edgeline of SD50W)

DESIGN DESIGNATION

ADT(2022)	1,308
ADT(2042)	1,922
DHV	222
D	51%
T DHV	14.2%
T ADT	31.2%
V	65 MPH

STORM WATER PERMIT
Receiving Waters:
Tributaries to Emanuel Creek
Area Disturbed: 2.5 Acres
Total Project Area: 290 Acres
Latitude: 43.1687 (Google Maps)
Longitude: -97.9714 (Google Maps)

PROJECT LENGTH

Gross Length:	63,082.0'	11.947 Miles
Bridge Length:	223.5'	0.042 Mile
Net Length:	62,858.5'	11.905 Miles

9

March 20, 2024

ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0037(164)24	2	63

Rev. 01/12/24 GAW

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0135	Remove Delineator	47	Each
110E0500	Remove Pipe Culvert	68	Ft
110E0510	Remove Pipe End Section	2	Each
110E0595	Remove Cattle Pass End Section	2	Each
110E0600	Remove Fence	174	Ft
110E0730	Remove Beam Guardrail	350.0	Ft
110E0800	Remove W Beam Guardrail End Terminal	8	Each
110E1010	Remove Asphalt Concrete Pavement	1,827.0	SqYd
110E7500	Remove Pipe for Reset	90	Ft
110E7510	Remove Pipe End Section for Reset	16	Each
120E0010	Unclassified Excavation	1,229	CuYd
120E0100	Unclassified Excavation, Digouts	595	CuYd
120E0600	Contractor Furnished Borrow Excavation	1,332	CuYd
260E1010	Base Course	2,624.0	Ton
* 260E6000	Granular Material, Furnish	7,682.0	Ton
* 270E0200	Blend, Haul, and Stockpile Granular Material	15,364.0	Ton
320E0005	PG 58-34 Asphalt Binder	1,443.1	Ton
320E1200	Asphalt Concrete Composite	346.0	Ton
320E1203	Class Q3R Hot Mixed Asphalt Concrete	28,163.0	Ton
320E1800	Asphalt Concrete Blade Laid	1,786.0	Ton
320E4000	Hydrated Lime	296.6	Ton
320E7008	Grind 8" Rumble Strip or Stripe in Asphalt Concrete	23.9	Mile
320E7040	Grind 6" Transverse Rumble Strip in Asphalt Concrete	408.0	Ft
330E0100	SS-1h or CSS-1h Asphalt for Tack	136.1	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	2.4	Ton
332E0010	Cold Milling Asphalt Concrete	247,461	SqYd
421E0100	Pipe Culvert Undercut	26	CuYd
450E0182	36" RCP Class 2, Furnish	74	Ft
450E0190	36" RCP, Install	74	Ft
450E2028	36" RCP Flared End, Furnish	2	Each
450E2029	36" RCP Flared End, Install	2	Each
450E3052	48" RCP Arch Class 2, Furnish	62	Ft
450E3060	48" RCP Arch, Install	62	Ft
450E4520	48" RCP Arch Flared End, Furnish	2	Each
450E4521	48" RCP Arch Flared End, Install	2	Each
450E8300	Culvert Joint Cleaning	308.0	Ft
450E8305	Repair Culvert Joint	308.0	Ft
450E8310	Chemical Grout Void Fill	22.0	Gal
* 450E8900	Cleanout Pipe Culvert	1	Each
450E9000	Reset Pipe	90	Ft
450E9001	Reset Pipe End Section	16	Each
464E0100	Controlled Density Fill	14.0	CuYd

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
600E0300	Type III Field Laboratory	1	Each
620E0020	Type 2 Right-of-Way Fence	142	Ft
620E1020	2 Post Panel	4	Each
620E1030	3 Post Panel	2	Each
630E0500	Type 1 MGS	750.0	Ft
630E1501	Type 1 Retrofit Guardrail Transition	8	Each
630E2017	MGS MASH Flared End Terminal	8	Each
632E2220	Guardrail Delineator	36	Each
632E2510	Type 2 Object Marker Back to Back	74	Each
633E1200	High Build Waterborne Pavement Marking Paint, White	542	Gal
633E1205	High Build Waterborne Pavement Marking Paint, Yellow	204	Gal
634E0010	Flagging	670.0	Hour
634E0020	Pilot Car	310.0	Hour
634E0110	Traffic Control Signs	1,023.6	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	2	Each
634E0630	Temporary Pavement Marking	35.7	Mile
720E1015	Bank and Channel Protection Gabion	74.0	CuYd
730E0204	Type C Permanent Seed Mixture	45	Lb
732E0100	Mulching	5.0	Ton
734E0102	Type 2 Erosion Control Blanket	1,783	SqYd
734E0103	Type 3 Erosion Control Blanket	1,800	SqYd
734E0510	Shaping for Erosion Control Blanket	1,105	Ft
831E0110	Type B Drainage Fabric	206	SqYd
900E0010	Refurbish Single Mailbox	6	Each
900E1980	Storage Unit	1	Each

*** - 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
	NH 0037(164)24	3	63

ENVIRONMENTAL COMMITMENTS

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

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

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

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

COMMITMENT A: AQUATIC RESOURCES

COMMITMENT A: WETLANDS

All efforts to avoid and minimize wetland impacts from the project have resulted in approximately 0.12 acres of wetlands (includes temporary and permanent) becoming impacted. Refer to plans for location and boundaries of the impacted wetlands.

Table of Impacted Wetlands

Wetland No.	Station	Perm. Impact Left (Acres)	Perm. Impact Right (Acres)	Temp. Impact Left (Acres)	Temp. Impact Right (Acres)	Total Impact (Acres)
1	0+60	0.00	0.00	0.001	0.001	0.002
2	18+66	0.008	0.003	0.00	0.00	0.011
3	39+63	0.005	0.00	0.00	0.00	0.005
4	65+74	0.002	0.00	0.00	0.00	0.002
5	73+84	0.015	0.00	0.00	0.00	0.015
6	87+79	0.00	0.00	0.002	0.002	0.004
7	104+53	0.00	0.00	0.001	0.00	0.001
8	122+59	0.00	0.00	0.001	0.00	0.001
9	133+00	0.00	0.00	0.042	0.00	0.042
10	149+51	0.00	0.00	0.001	0.00	0.001
11	190+95	0.00	0.00	0.001	0.00	0.001
12	208+63	0.00	0.00	0.001	0.00	0.001
13	238+27	0.00	0.00	0.001	0.001	0.002
14	289+29	0.00	0.00	0.00	0.001	0.001
15	294+85	0.00	0.00	0.003	0.003	0.006
16	302+00	0.00	0.00	0.001	0.001	0.002
17	313+00	0.00	0.00	0.001	0.00	0.001
18	338+50	0.00	0.00	0.002	0.00	0.002
19	350+25	0.003	0.00	0.00	0.00	0.003
20	368+29	0.00	0.00	0.00	0.001	0.001
21	370+19	0.00	0.00	0.001	0.001	0.002
22	468+06	0.00	0.00	0.001	0.00	0.001
23	495+00	0.00	0.00	0.00	0.001	0.001
24	529+12	0.00	0.003	0.00	0.00	0.003
25	557+23	0.00	0.00	0.002	0.00	0.002
26	581+62	0.00	0.00	0.001	0.00	0.001
27	587+04	0.00	0.00	0.00	0.001	0.001
28	594+39	0.00	0.00	0.00	0.001	0.001
29	623+10	0.00	0.00	0.001	0.001	0.002
30	628+38	0.00	0.00	0.00	0.001	0.001

COMMITMENT A: WETLANDS (CONTINUED)

Action Taken/Required:

Mitigation is required in accordance with the "*Statewide Finding Regarding Wetlands for South Dakota Federal-Aid Highway Projects (February 2018)*". Replacement of 0.04 acres of permanent wetland impacts will be completed through another wetland mitigation opportunity in a manner which considers FHWA's program-wide goal of 'net gain' of wetlands through enhancement, creation, and preservation.

Temporary impacts identified in the Table of Impacted Wetlands will not be mitigated as original contours and elevations will be re-established as designated in the plans. Prior to initiating temporary work in wetlands, the Contractor will submit a plan to the Project Engineer in accordance with Section 7.21 D of the Specifications.

The Contractor will notify the Project Engineer if additional easement is needed to complete work adjacent to any wetland. The Project Engineer will obtain an appropriate course of action from the Environmental Office before proceeding with construction activities that affect any wetlands beyond the work limits and easements shown in the plans.

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.

ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0037(164)24	4	63

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 (AIS) positive waters within South Dakota without prior approval from the SDDOT Environmental Office. To prevent and control the introduction and spread of invasive species into the project vicinity, all equipment will be power washed with hot water (≥140 °F) and completely dried for a minimum of 7 days prior to subsequent use. South Dakota administrative rule 41:10:04:02 forbids the possession and transport of AIS; therefore, all attached dirt, mud, debris and vegetation must be removed and all compartments and tanks capable of holding standing water must be drained. This includes, but is not limited to, all equipment, pumps, lines, hoses and holding tanks.

Action Taken/Required:

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

Additional information and mapping of water sources impacted by Aquatic Invasive Species in South Dakota can be accessed at:
< https://sdleastwanted.sd.gov/maps/default.aspx>

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

COMMITMENT D: WATER QUALITY STANDARDS

COMMITMENT D1: SURFACE WATER QUALITY

This project may be in the vicinity of multiple streams and wetlands. These waters are considered waters of the state and are protected under Administrative Rules of South Dakota (ARSD) Chapter 74:51. 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 Agriculture and Natural Resources (DANR), 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 E: STORM WATER

Construction activities constitute 1 acre or more of earth disturbance and/or work in a waterway.

Action Taken/Required:

The DANR General Permit for Stormwater Discharges Associated with Construction Activities is required for construction activity disturbing one or more acres of earth and work in a waterway. The SDDOT is the owner of this permit and will submit the NOI to DANR 15 days prior to project start in order to obtain coverage under the General Permit. Work can begin once the DANR letter of approval is received.

The Contractor must adhere to the “Special Provision Regarding Storm Water Discharges to Waters of the State.”

The Contractor will complete the DANR Contractor Certification Form prior to the pre-construction meeting. The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the permit for this project. Work may not begin on this project until this form is signed and submitted to DANR.

The form can be found at:
<https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/DANR_CGPAppendixCCA2018Fillable.pdf >

The Contractor is advised that permit coverage may also be required for off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

Storm Water Pollution Prevention Plan

The Storm Water Pollution Prevention Plan (SWPPP) will be developed prior to the submittal of the NOI and will be implemented for all construction activities for compliance with the permit. The SWPPP must be kept on-site and updated as site conditions change. Erosion control measures and best management practices will be implemented in accordance with the SWPPP.

The DOT 298 Form will be used for site inspections and to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents and retained for a minimum of three years.

The inspection will include disturbed areas of the construction site that have not been finally stabilized, areas used for storage materials, structural control measures, and locations where vehicles enter or exit the site. These areas will be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the SWPPP will be observed to ensure that they are operating correctly, and sediment is not tracked off the site.

Information on storm water permits and SWPPPs are available on the following websites:

SDDOT: < https://dot.sd.gov/doing-business/environmental/stormwater >

DANR:<https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/stormwater/default.aspx>

EPA: < https://www.epa.gov/npdes >

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 Agriculture and Natural Resources.

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

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

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

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.
Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs 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.

ENVIRONMENTAL COMMITMENTS

COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

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

Action Taken/Required:

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

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

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

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

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

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

COMMITMENT N: SECTION 404 PERMIT

The SDDOT has obtained a Section 404 Permit from the USACE for the permanent actions associated with this project.

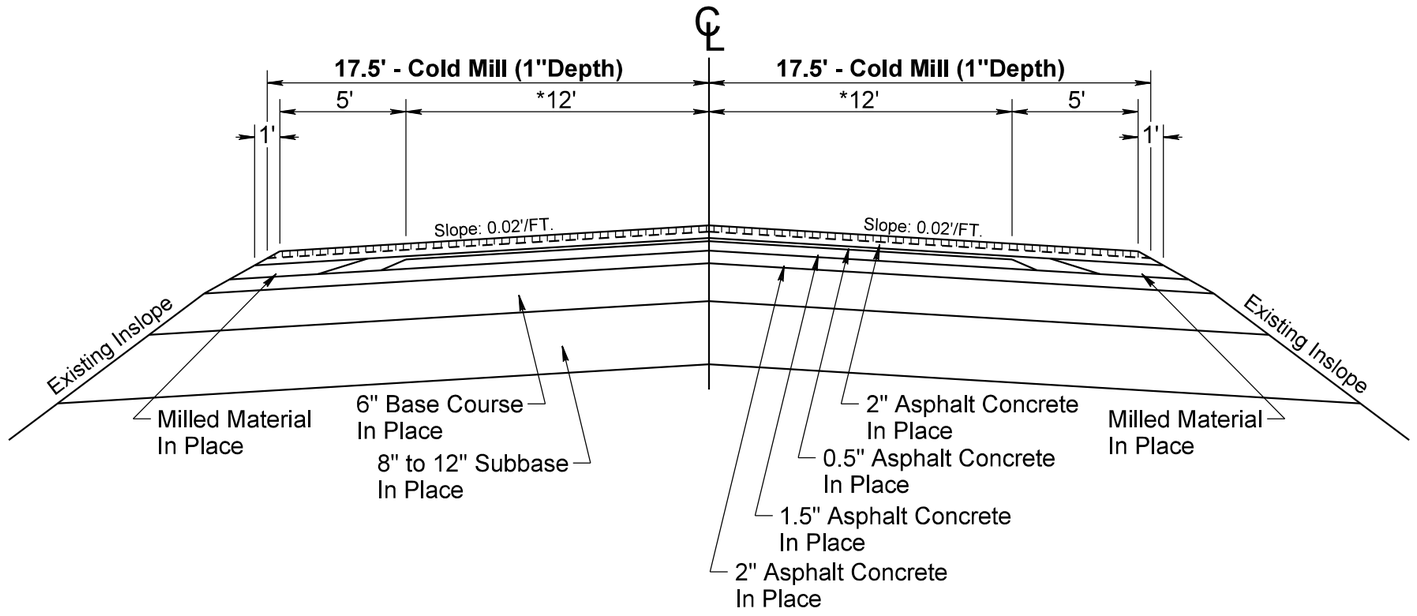
Action Taken/Required:

The Contractor will comply with all requirements contained in the Section 404 Permit.

The Contractor will also be responsible for obtaining a Section 404 Permit for any dredge, excavation, or fill activities associated with material sources, storage areas, waste sites, and Contractor work sites outside the plan work limits that affect wetlands, floodplains, or waters of the United States.

TYPICAL COLD MILLING SECTION

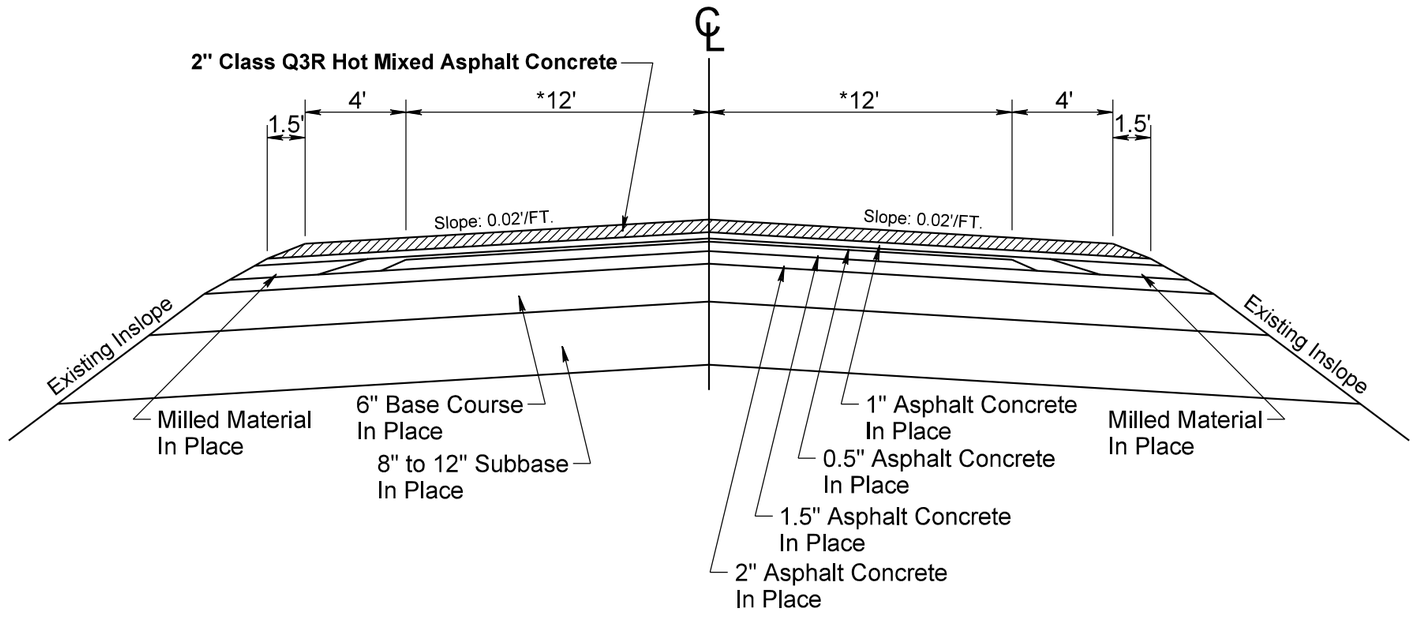
0+00 - 60' to 630+22



*Transition:
310+05 to 313+35 (12' to 18')
313+35 to 315+55 (18')
315+55 to 318+85 (18' to 12')

TYPICAL RESURFACING SECTION

0+00 - 60' to 630+22



*Transition:
310+05 to 313+35 (12' to 18')
313+35 to 315+55 (18')
315+55 to 318+85 (18' to 12')

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0037(164)24	7	63

RATES OF MATERIALS

-0+60.00 to 630+22.00 (less 223.5' for two bridges)

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

2" CLASS Q3R HOT MIXED ASPHALT CONCRETE

Salvaged Asphalt Concrete	416	Tons
Crushed Aggregate	1663	Tons
PG 58-34 Asphalt Binder	103	Tons
	TOTAL: 2182	**Tons**
Hydrated Lime	22	Tons
	TOTAL: 2204	**Tons**

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

SS-1h or CSS-1h Asphalt for Tack at the rate of 5.4 tons applied 36 feet wide (Rate = 0.06 gallon per square yard).

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 0.2 ton applied 2.4 feet wide (1.2 feet wide each shoulder) (Rate = 0.05 gallon per square yard).

TABLE OF ADDITIONAL QUANTITIES

N.A.B.I. = Not A Bid Item

LOCATION	REMOVE ASPHALT CONCRETE PAVEMENT SqYd	CONTRACTOR FURNISHED BORROW EXCAVATION CuYd	BASE COURSE Ton	COLD MILLING ASPHALT CONCRETE SqYd	ASPHALT CONCRETE COMPOSITE 1ST LIFT Ton	ASPHALT CONCRETE COMPOSITE 2ND LIFT Ton	CLASS Q3R HOT MIXED ASPHALT CONCRETE Ton	PG 58-34 ASPHALT BINDER Ton	HYDRATED LIME Ton	SALV. MAT'L. N.A.B.I. Ton	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL Ton
Mainline Transitions											
310+05 to 313+35	-	-	-	220	-	-	25	1.2	0.2	5	-
313+35 to 315+55	-	-	-	293	-	-	33	1.5	0.3	6	-
315+55 to 318+85	-	-	-	220	-	-	25	1.2	0.2	5	-
Other Locations											
Mainline Cross Pipe Replacement	168	-	236	-	24	24	-	-	-	-	-
Rumble Strips at SD37/SD50 Intersection	-	-	-	-	-	-	-	-	-	-	0.02
Radii at intersection of SD37 & SD50	-	-	-	304	-	-	34	1.6	0.3	6	-
Guardrail Locations											
See Guardrail Table	766	835	67	-	-	-	104	4.8	1.0	20	-
Turnouts											
5 Mailbox Turnouts	-	-	-	178	-	-	20	0.9	0.2	4	-
Resurface to ROW											
3 Intersecting Roads	-	-	-	504	-	-	174	8.1	1.7	33	-
Resurface to End of Radius											
20 Intersecting Roads	-	-	300	1292	-	-	318	14.8	3.1	60	-
Pads											
8 Double Approaches	-	-	160	-	-	-	-	-	-	-	-
11 Farm Entrances	-	-	110	-	-	-	-	-	-	-	-
56 Field Entrances	-	-	560	-	-	-	-	-	-	-	-
TOTALS:	**934**	**835**	**1433**	**3011**	**24**	**24**	**733**	**34.1**	**7.0**	**139**	**0.02**

NOTES: 2.0 tons of SS-1h or CSS-1h Asphalt for Tack are included in the Estimate of Quantities and will be applied at the rate shown on the plans as directed by the Engineer.

The tonnage shown above for Base Course is based on a compacted depth of 4 inches for Guardrail Locations and 2 inches for other locations.

The tonnage shown above for Asphalt Concrete Composite - 1st Lift is based on a compacted depth of 2.5 inches.
The tonnage shown above for Asphalt Concrete Composite - 2nd Lift is based on a compacted depth of 2.5 inches.
The tonnage shown above for Class Q3R Hot Mixed Asphalt Concrete is based on a compacted depth of 2 inches.

The above quantities are included in the Estimate of Quantities.

SUMMARY OF ASPHALT CONCRETE

	ASPHALT CONCRETE COMPOSITE 1ST LIFT COMPACTION WITHOUT SPECIFIED DENSITY TONS	ASPHALT CONCRETE COMPOSITE 2ND LIFT COMPACTION WITHOUT SPECIFIED DENSITY TONS	ASPHALT CONCRETE BLADE LAID COMPACTION WITHOUT SPECIFIED DENSITY TONS	CLASS Q3R HOT MIXED ASPHALT CONCRETE COMPACTION WITH SPECIFIED DENSITY TONS	CLASS Q3R HOT MIXED ASPHALT CONCRETE COMPACTION WITHOUT SPECIFIED DENSITY TONS
Finished Roadway Surface	-	-	-	18798	-
Shoulders	-	-	-	-	7441
Backfilling Digouts	-	298	-	-	-
Additional Quantities for spot leveling and tight blading totals	**-**	**-**	**1786**	**-**	**1191**

Table of Additional Quantities					
Mainline Transitions	-	-	-	83	-
Other Locations	24	24	-	-	-
Miscellaneous Nondensity Locations	-	-	-	-	138
Turnouts, Int Roads, Ents & Pads	-	-	-	-	512
Additional Totals:	**24**	**24**	**-**	**83**	**650**
Totals:	**24**	**322**	**1786**	**18881**	**9282**

18881	**TONS ASPHALT CONCRETE COMPACTION WITH SPECIFIED DENSITY**
11414	**TONS ASPHALT CONCRETE COMPACTION WITHOUT SPECIFIED DENSITY**
30295	**TONS TOTAL**

TABLE FOR REMOVAL AND INSTALLATION OF GUARDRAIL AND RELATED ITEMS

LOCATION	REMOVE BEAM GUARDRAIL	REMOVE W BEAM GUARDRAIL END TERMINAL	REMOVE ASPHALT CONCRETE PAVEMENT *	CONTRACTOR FURNISHED BORROW EXCAVATION *	BASE COURSE *	CLASS Q3R HOT MIXED ASPHALT CONCRETE *	TYPE 1 MGS	TYPE 1 RETROFIT GUARDRAIL TRANSITION	MGS MASH FLARED END TERMINAL
BRIDGE CORNER	Ft	Each	SqYd	CuYd	Ton	Ton	Ft	Each	Each
STRUCTURE 05-100-104 MRM 26.08									
Begin Bridge L	43.75	1	83	105	7	11	25	1	1
Begin Bridge R	43.75	1	115	45	12	15	162.5	1	1
End Bridge L	43.75	1	115	75	9	15	162.5	1	1
End Bridge R	43.75	1	72	15	6	11	25	1	1
STRUCTURE 05-100-118 MRM 24.70									
Begin Bridge L	43.75	1	75	325	10	11	25	1	1
Begin Bridge R	43.75	1	120	190	8	15	162.5	1	1
End Bridge L	43.75	1	117	45	7	15	162.5	1	1
End Bridge R	43.75	1	69	35	8	11	25	1	1
TOTALS:	**350**	**8**	**766**	**835**	**67**	**104**	**750**	**8**	**8**

* Quantities for these guardrail work items are also included in the Table of Additional Quantities.

TABLE OF GUARDRAIL DELINEATORS & OBJECT MARKERS

LOCATION	TYPE 2 OBJECT MARKER BACK TO BACK	TYPE 2 OBJECT MARKER	GUARDRAIL TERMINAL END OBJECT MARKER (ADHESIVE)	GUARDRAIL DELINEATOR			
			N.A.B.I.	BEAM		CABLE	
	(M) #	(M) #	[E] #	(B) #		(C) #	
BRIDGE CORNER				Yellow	White	Yellow	White
STRUCTURE 05-100-104 MRM 26.08							
Begin Bridge L			1		4		
Begin Bridge R			1		5		
End Bridge L			1		5		
End Bridge R			1		4		
STRUCTURE 05-100-118 MRM 24.70							
Begin Bridge L			1		4		
Begin Bridge R			1		5		
End Bridge L			1		5		
End Bridge R			1		4		
TOTALS	**-**	**-**	**8**	**-**	**36**	**-**	**-**
				36			

- For **KEY**, Refer to Standard Plate 632.40 - Sheet 1 of 4.

N.A.B.I. = Not A Bid Item - Cost is incidental to the contract unit prices for the various items.

TABLE FOR MAINLINE CULVERT WORK

CULVERT – LOCATION: SITE NO	CUL-VERT ID	MRM	STATION	PIPE DATA: NO of PIPE - SIZE (DIA or W x H) DIA = IN W x H = FT	LENGTH	TYPE	DRAINAGE AREA ACRES	DRAINAGE DIRECTION	CLEAR ZONE 15 FT**: SIDE OF ROAD Φ	ROW*	WORK DESCRIPTION	PIPE CLEANOUT	JOINT: CLEANING	JOINT: REPAIR	JOINT: FOAM / GROUT	REMOVE / RESET: REMOVE PIPE	REMOVE / RESET: REM PIPE FOR RESET	REMOVE / RESET: RESET PIPE	NEW RCP: CIR 36"	NEW RCP: ARCH 48"	CULVERT ENDS – TYPE: EXISTING	TYPE: NEW	REMOVE / RESET: REM PIPE END	REMOVE / RESET: REMOVE END FOR RESET	REMOVE / RESET: REMOVE CATTLE PASS END	REMOVE / RESET: RESET PIPE END	NEW RCP FLARED: CIR 36"	NEW RCP FLARED: ARCH 48"	EARTHWORK: UNCLASSIFIED EXCAVATION	PIPE UNDERCUT	CONTRACTOR FURNISHED BORROW	CDF: CONTROLLED DENSITY FILL	DITCH / CHANNEL – DITCH SHAPING / PROTECTION: DITCH / CHANNEL PROTECTION AREA W x L	EROSION CONTROL BLANKET: TYPE 2	EROSION CONTROL BLANKET: TYPE 3	DITCH SHAPING	RIPRAP / GABION PROTECTION AREA W x L	DRAIN-AGE FABRIC TYPE B	GABION ***	FENCE: REMOVE FENCE	BRACING: 2 POST PANEL	BRACING: 3 POST PANEL	NEW: TYPE 2	OBJ MARKER – OM-2 & POST: EXISTING	REMOVE	NEW: Bk-Bk
					FT					FT		EA	FT	FT	GAL	FT	FT	FT	FT	FT	Δ		EA	EA	EA	EA	EA	EA	CU YD	CU YD	CU YD	CU YD	FT	SQ YD	SQ YD	FT	FT	SQ YD	CU YD	FT	EA	EA	FT	EA	EA	EA
SD 37				NH 0037(164)24			PCN 06PN																																							
S1	4505	36.36	**0+60**	1 - 18 DIA	66	RCP	7	E	**E**	**100**	**Remove and Reset Flared End**										**FE**			**1**		**1**			**1**															**1**	**1**	**1**
									W	100	Remove and Reset Flared End										FE			1		1			1															1	1	1
S2	4504	36.02	**18+66**	1 - 42 DIA	56	RCP	184	E	**E**	**100**	**Remove Flared End + 28 ft of Pipe, Install a New Flared End + 33.6 ft of New 48" RCP ARCH, Install Gabion Channel Protection, Shape and Seed Ditch**					**28**				**33.6**	**FE**	**FE**	**1**					**1**	**142**	**14**	**211**						**12 x 18**	**34**	**12**					**1**	**1**	**2**
									W	100	Remove Flared End + 28 ft of Pipe, Install a New Flared End + 28.4 ft of New 48" RCP ARCH, Cleanout Ditch, Shape and Seed Ditch					28				28.4	FE	FE	1					1	253	12	13		30 x 100		334	100								1	1	2
S3	4503	35.62	**39+63**	1 - 54 DIA	54	RCP	367	E	**E**	**100**	**Remove and Reset Flared End, Cleanout Ditch to ROW Line, Fill in around End, Install Gabion Channel Protection, Shape and Seed Ditch**										**FE**			**1**		**1**			**47**				**30 x 40**		**100**	**40**	**12 x 18**	**34**	**12**					**1**	**1**	**2**
									W	100	No Work										FE																							1	1	2
S4	4502	35.41	**50+93**	1 - 18 DIA	60	RCP	10	E	**E**	**100**	**No Work**										**FE**																							**1**		
									W	100	No Work										FE																							1		
S5	4413	35.28	**57+81**	1 - 18 DIA	64	RCP	15	E	**E**	**100**	**No Work**										**FE**																							**1**		
									W	100	No Work										FE																							1		
S6	4411	35.13	**65+73**	1 - 24 DIA	68	RCP	36	E	**E**	**100**	**Remove and Reset Flared End + 18 ft of Pipe, Cleanout Ditch, Install Gabion Channel Protection, Shape and Seed Ditch**						**18**	**18**			**FE**			**1**		**1**			**101**				**30 x 40**	**119**		**40**	**9 x 9**	**15**	**4.5**					**1**	**1**	**1**
									W	100	Cleanout Ditch, Shape and Seed Ditch										FE								17				30 x 30	100		30								1		
S7	4410	34.98	**73+84**	1 - 84 DIA	84	RCP	1,068	E	**E**	**100**	**Remove and Reset Flared End, Clean and Grout 7 Pipe Joints, Remove 32 ft of Fence, Replace Two 2-Post Fence Panels, Repair and Seed Inslope, Install Gabion Channel Protection, Install New Fence**		**154**	**154**	**11**						**FE**			**1**		**1**			**7**								**21 x 27**	**70**	**27**	**32**	**2**		**32**	**1**	**1**	**2**
									W	100	Clean and Grout 7 Pipe Joints, Remove 32 ft of Fence, Cleanout Ditch, Shape and Seed Ditch		154	154	11						FE								17				30 x 30		100	30				32				1	1	2
S8	4409	34.71	**87+79**	1 - 4 x 6	54	CATTLE PASS	168	E	**E**	**100**	**Remove Flared End + 6 ft of Pipe, Install a New Flared End + 37 ft of New 36" RCP thru Cattle Pass, Plug and Fill Cattle Pass around New Pipe, Cleanout Ditch, Shape and Seed Ditch**					**6**			**37**		**FE**	**FE**			**1**		**1**		**5**		**151**	**7**												**2**	**2**	**2**
									W	100	Remove Flared End + 6 ft of Pipe, Install a New Flared End + 37 ft of New 36" RCP thru Cattle Pass, Plug and Fill Cattle Pass around New Pipe, Cleanout Ditch, Shape and Seed Ditch					6			37		FE	FE			1		1		5		122	6.7												1	1	2
S9	4408	34.38	**104+53**	1 - 18 DIA	74	RCP	17	E	**E**	**100**	**Cleanout Ditch to the South, Shape and Seed Ditch**										**FE**								**10**				**50 x 20**	**112**		**20**								**1**		
									W	100	No Work										FE																							1		
											TOTALS THIS SHEET	-	308	308	22	68	18	18	74	62			2	5	2	5	2	2	606	26	497	13.7		331	534	260		153	55.5	64	2	-	32		12	19

Δ - END TYPES: FE = FLARED END SL = SLOPED END SB = SAFETY or SLOPED END (w/BARS) SE = SAFETY END (NO BARS) DI = DROP INLET WW = WINGWALLS HW = HEADWALLS CN= CONNECTOR JT = JUNCTION TR = TRANSITION

* - RIGHT-OF-WAY MEASURED FROM ℄ ** - CLEARZONE FROM EDGELINE. Φ - (E)ast = LT, (W)est = RT

*** - See Standard Plates 720.01 and 720.02

TABLE 1 of 4

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0037(164)24	12	63

TABLE FOR MAINLINE CULVERT WORK

CULVERT																					CULVERT ENDS								EARTHWORK				DITCH / CHANNEL							FENCE				OBJ MARKER		
LOCATION				PIPE DATA									JOINT			REMOVE / RESET			NEW		TYPE		REMOVE / RESET				NEW					CDF	DITCH SHAPING / PROTECTION								BRACING		NEW	OM-2 & POST		
SITE NO	CUL-VERT ID	MRM	STATION	NO of PIPE - SIZE (DIA or W x H) DIA = IN, W x H = FT	LENGTH (FT)	TYPE	DRAINAGE AREA ACRES	DRAINAGE DIRECTION	CLEAR ZONE 15 FT** SIDE OF ROAD Φ	CLEAR ZONE 15 FT** ROW* (FT)	WORK DESCRIPTION	PIPE CLEANOUT (EA)	CLEANING (FT)	REPAIR (FT)	FOAM / GROUT (GAL)	REMOVE PIPE (FT)	REM PIPE FOR RESET (FT)	RESET PIPE (FT)	RCP CIR 36" (FT)	RCP ARCH 48" (FT)	EXISTING (Δ)	NEW	REM PIPE END (EA)	REMOVE END FOR RESET (EA)	REMOVE CATTLE PASS END (EA)	RESET PIPE END (EA)	RCP FLARED CIR 36" (EA)	RCP FLARED ARCH 48" (EA)	UNCLASSIFIED EXCAVATION (CU YD)	PIPE UNDERCUT (CU YD)	CONTRACTOR FURNISHED BORROW (CU YD)	CONTROLLED DENSITY FILL (CU YD)	DITCH / CHANNEL PROTECTION AREA W x L (FT)	EROSION CONTROL BLANKET TYPE 2 (SQ YD)	EROSION CONTROL BLANKET TYPE 3 (SQ YD)	DITCH SHAPING (FT)	RIPRAP / GABION PROTECTION AREA W x L (FT)	DRAINAGE FABRIC TYPE B (SQ YD)	GABION *** (CU YD)	REMOVE FENCE (FT)	2 POST PANEL (EA)	3 POST PANEL (EA)	TYPE 2 (FT)	EXISTING (EA)	REMOVE (EA)	NEW Bk-Bk (EA)
SD 37				NH 0037(164)24			PCN 06PN																																							
S10	4407	34.05	122+59	1 - 18 DIA	64	RCP	10	E	E	100	Cleanout Ditch Southeast from the Pipe to the ROW Line, Shape and Seed Ditch										FE								20				20 x 80	178		80								1		
									W	100	No Work										FE																							1		
S11	4406	33.87	133+00	2 - 7 x 7	66	RCBC	1,475	E	E	100	Remove 110 ft of Fence, Replace Two 2-Post Panels and Two 3-Post Panels, Install New Fence										WW																			110	2	2	110	2		
									W	100	No Work										WW																							2		
S12	4405	33.56	149+51	1 - 18 DIA	62	RCP	20	E	E	100	Cleanout Ditch from the Pipe to the ROW Line, Shape and Seed Ditch										FE								67				30 x 60	200		60								1		
									W	100	No Work										FE																							1		
S13	4404	33.41	157+10	1 - 18 DIA	58	RCP	6	E	E	100	No Work										FE																							1		
									W	100	No Work										FE																							1		
S14	4403	33.04	176+57	1 - 24 DIA	56	RCP	83	E	E	100	No Work										FE																							1	1	1
									W	100	No Work										FE																							1	1	1
S15	4402	32.77	190+95	1 - 24 DIA	80	RCP	45	E	E	100	Cleanout Ditch from the Pipe to the ROW Line, Shape and Seed Ditch										FE								56				30 x 50	167		50								1	1	1
									W	100	No Work										FE																							1	1	1
S16	4399	32.44	208+63	1 - 18 DIA	58	RCP	-	E	E	100	Remove and Reset Flared End + 6 ft of Pipe, Shape and Seed Ditch						6	6			FE			1		1			5															1		
									W	100	No Work										FE																							1	1	1
S17	4398	32.21	222+86	1 - 18 DIA	62	RCP	18	E	E	100	No Work										FE																							1		
									W	100	No Work										FE																							1		
S18	4397	31.88	238+27	1 - 18 DIA	58	RCP	-	E-W	E	100	Cleanout Pipe										FE																							1		
									W	100	Cleanout Pipe, Cleanout Ditch to the Northwest from the Pipe, Shape and Seed Ditch	1									FE								15				20 x 40	89		40								1		
S19	4396	31.45	261+36	1 - 18 DIA	62	RCP	20	W	E	100	No Work										FE																							1		
									W	100	No Work										FE																							1		
S20	4395	31.42	262+55	1 - 18 DIA	64	RCP	12	W	E	100	No Work										FE																							1	1	1
									W	100	No Work										FE																							1		
S21	4394	30.91	289+29	1 - 24 DIA	102	RCP	12	W	E	100	No Work										FE																							1	1	1
									W	100	Cleanout Ditch from the Pipe to the ROW Line, Shape and Seed Ditch										FE								25				30 x 45	150		45								1	1	1
S22	4393	30.83	294+85	1 - 42 DIA	68	RCP	145	W	E	100	Cleanout Ditch 60 ft North from the Pipe and Shape Ditch with a 6:1 Slope extending South from the Pipe, Shape and Seed Ditch										FE								56				30 x 100		334	100								1	1	2
									W	100	Cleanout Ditch to the South of the Pipe, Shape and Seed Ditch										FE								42				75 x 30		250	30								1	1	2
S23	4392	30.69	302+00	1 - 18 DIA	64	RCP	5	W	E	100	Cleanout Ditch to the North of the Pipe, Shape and Seed Ditch										FE								17				30 x 30	100		30								1		
									W	100	Cleanout Ditch and Shape into Flat Bottom Channel from the Pipe Southwest to the ROW Line, Shape and Seed Ditch										FE								34				30 x 60	200		60								1		
											TOTALS THIS SHEET	1	-	-	-	-	6	6	-	-			-	1	-	1	-	-	337	-	-	-		1084	584	495		-	-	110	2	2	110		10	12

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* - RIGHT-OF-WAY MEASURED FROM ℄ ** - CLEARZONE FROM EDGELINE. Φ - (E)ast = LT, (W)est = RT

*** - See Standard Plates 720.01 and 720.02

TABLE FOR MAINLINE CULVERT WORK

SITE NO	CUL-VERT ID	MRM	STATION	NO of PIPE - SIZE (DIA or W x H) DIA = IN W x H = FT	LENGTH FT	TYPE	DRAINAGE AREA ACRES	DRAINAGE DIRECTION	SIDE OF ROAD Φ	ROW* FT	WORK DESCRIPTION	PIPE CLEANOUT EA	JOINT CLEANING FT	JOINT REPAIR FT	JOINT FOAM / GROUT GAL	REMOVE PIPE FT	REM PIPE FOR RESET FT	RESET PIPE FT	NEW RCP CIR 36" FT	NEW RCP ARCH 48" FT	TYPE EXISTING Δ	TYPE NEW Δ	REM PIPE END EA	REMOVE END FOR RESET EA	REMOVE CATTLE PASS END EA	RESET PIPE END EA	NEW RCP FLARED CIR 36" EA	NEW RCP FLARED ARCH 48" EA	UNCLASSIFIED EXCAVATION CU YD	PIPE UNDERCUT CU YD	CONTRACTOR FURNISHED BORROW CU YD	CDF CONTROLLED DENSITY FILL CU YD	DITCH / CHANNEL PROTECTION AREA W x L FT	EROSION CONTROL BLANKET TYPE 2 SQ YD	EROSION CONTROL BLANKET TYPE 3 SQ YD	DITCH SHAPING FT	RIPRAP / GABION PROTECTION AREA W x L FT	DRAIN-AGE FABRIC TYPE B SQ YD	GABION *** CU YD	REMOVE FENCE FT	BRACING 2 POST PANEL EA	BRACING 3 POST PANEL EA	NEW TYPE 2 FT	OM-2 & POST EXISTING EA	OM-2 & POST REMOVE EA	OM-2 & POST NEW Bk-Bk EA
SD 37				NH 0037(164)24			PCN 06PN																																							
S24	318371	30.43	313+00	1 - 24 DIA	92	RCP	30	W	E	100	Remove and Reset Flared End + 12 ft of Pipe, Shape and Seed Ditch						12	12			FE			1		1			17															1	1	1
									W	100	No Work										FE																							1		
S25	3814	30.30	322 +11	2 - 8 x 7	66	RCBC	5,700	E	E	100	No Work										WW																							2		
									W	100	No Work										WW																							2		
S26	3813	30.15	330+16	1 - 24 DIA	108	RCP	10	E	E	100	No Work										FE																							-		1
									W	100	No Work										SE																							1		
S27	3812	29.98	338+50	1 - 30 DIA	100	RCP	47	E	E	100	Cleanout Ditch extending Northeast from Pipe to ROW Line, Shape and Seed Ditch										FE								34				30 x 60		200	60								1	1	2
									W	100	No Work										FE																							1	1	2
S28	3811	29.76	350+25	1 - 48 DIA	124	RCP	212	E	E	100	Remove and Reset Flared End + 12 ft of Pipe, Cleanout Ditch and Shape into Flat Bottom Channel from the Pipe to the ROW Line, Install Gabion Channel Protection, Shape and Seed Ditch						12	12			FE			1		1			51				30 x 30		66	30	12 x 18	34	12					1	1	2
									W	100	Cleanout Ditch and Shape into Flat Bottom Channel from the Pipe Southwest to the ROW Line, Shape and Seed Ditch										FE								20				30 x 35		117	35								1	1	2
S29	3810	29.41	368+29	1 - 18 DIA	64	RCP	-	W	E	100	No Work										FE																							1		
									W	100	Remove and Reset Flared End + 6 ft of Pipe, Shape and Seed Ditch						6	6			FE			1		1			5															1	1	1
S30	3809	29.37	370+19	1 - 18 DIA	66	RCP	15	W	E	100	Remove and Reset Flared End + 6 ft of Pipe, Shape and Seed Ditch						6	6			FE			1		1			5															1	1	1
									W	100	Remove and Reset Flared End + 6 ft of Pipe, Shape and Seed Ditch						6	6			FE			1		1			5															1	1	1
S31	3808	28.91	395+00	1 - 36 DIA	58	RCP	106	W	E	100	No Work										FE																							1	1	2
									W	100	No Work										FE																							1	1	2
S32	3807	28.51	416+19	1 - 30 DIA	52	RCP	45	W	E	100	No Work										FE																							1	1	2
									W	100	No Work										FE																							1	1	2
S33	3806	28.43	420+08	1 - 30 DIA	54	RCP	52	W	E	100	No Work										FE																							1	1	2
									W	100	No Work										FE																							1	1	2
S34	3805	27.99	443+33	1 - 24 DIA	88	RCP	36	W	E	100	No Work										FE																							1		
									W	100	No Work										FE																							1		
S35	3804	27.79	453+51	1 - 24 DIA	58	RCP	39	W	E	100	No Work										FE																							1		
									W	100	No Work										FE																							1		
S36	3803	27.51	468+06	1 - 24 DIA	78	RCP	28	W	E	100	Cleanout Ditch, Shape and Seed Ditch										FE								17				30 x 30	100		30								1		
									W	100	No Work										FE																							1		
S37	3802	27.41	471+85	1 - 18 DIA	64	RCP	-	W	E	100	No Work										FE																							1		
									W	100	No Work										FE																							1		
											TOTALS THIS SHEET	-	-	-	-	-	42	42	-	-			-	5	-	5	-	-	154	-	-	-		100	383	155		34	12	-	-	-	-	29	14	25

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* - RIGHT-OF-WAY MEASURED FROM ℄ ** - CLEARZONE FROM EDGELINE. Φ - (E)ast = LT, (W)est = RT

*** - See Standard Plates 720.01 and 720.02

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0037(164)24	14	63

TABLE FOR MAINLINE CULVERT WORK

SITE NO	CUL-VERT ID	MRM	STATION	NO of PIPE - SIZE (DIA or W x H) DIA = IN W x H = FT	LENGTH FT	TYPE	DRAINAGE AREA ACRES	DRAINAGE DIRECTION	CLEAR ZONE 15 FT** SIDE OF ROAD Φ	CLEAR ZONE 15 FT** ROW* FT	WORK DESCRIPTION	PIPE CLEANOUT EA	JOINT CLEANING FT	JOINT REPAIR FT	JOINT FOAM / GROUT GAL	REMOVE / RESET REMOVE PIPE FT	REMOVE / RESET REM PIPE FOR RESET FT	REMOVE / RESET RESET PIPE FT	NEW RCP CIR 36" FT	NEW RCP ARCH 48" FT	CULVERT ENDS TYPE EXISTING Δ	CULVERT ENDS TYPE NEW Δ	REMOVE / RESET REM PIPE END EA	REMOVE / RESET REMOVE END FOR RESET EA	REMOVE / RESET REMOVE CATTLE PASS END EA	REMOVE / RESET RESET PIPE END EA	NEW RCP FLARED CIR 36" EA	NEW RCP FLARED ARCH 48" EA	EARTHWORK UNCLASSIFIED EXCAVATION CU YD	PIPE UNDERCUT CU YD	CONTRACTOR FURNISHED BORROW CU YD	CDF CONTROLLED DENSITY FILL CU YD	DITCH / CHANNEL DITCH SHAPING / PROTECTION DITCH / CHANNEL PROTECTION AREA W x L FT	EROSION CONTROL BLANKET TYPE 2 SQ YD	EROSION CONTROL BLANKET TYPE 3 SQ YD	DITCH SHAPING FT	RIPRAP / GABION PROTECTION AREA W x L FT	DRAIN-AGE FABRIC TYPE B SQ YD	GABION *** CU YD	FENCE REMOVE FENCE FT	BRACING 2 POST PANEL EA	BRACING 3 POST PANEL EA	NEW TYPE 2 FT	OBJ MARKER OM-2 & POST EXISTING EA	OM-2 & POST REMOVE EA	OM-2 & POST NEW Bk-Bk EA
SD 37				NH 0037(164)24			PCN 06PN																																							
S38	3801	27.34	477+14	1 - 24 DIA	68	RCP	26	W	E	100	No Work										FE																							1		
									W	100	No Work										FE																							1		
S39	3800	27.00	495+00	1 - 24 DIA	96	RCP 35° Skew RHF	24	W	E	100	No Work										SE																							1		
									W	100	Cleanout Ditch, Shape and Seed Ditch										SE								8				20 x 20	45		20								1		
S40	3790	26.76	508+13	1 - 36 DIA	54	RCP	140	W	E	100	No Work										FE																							1	1	2
									W	100	No Work										FE																							1	1	2
S41	3789	26.46	523+90	1 - 18 DIA	58	RCP	-	W	E	100	No Work										FE																							1		
									W	100	No Work										FE																							1		
S42	3788	26.36	529+12	1 - 30 DIA	58	RCP	98	W	E	100	No Work										FE																							1	1	2
									W	100	Remove and Reset Flared End + 12 ft of Pipe, Cleanout Ditch, Install Gabion Channel Protection, Shape and Seed Ditch						12	12			FE			1		1			43				30 x 40		115	40	9 x 12	19	6					1	1	2
S43	3787	25.86	557+23	1 - 36 DIA	80	RCP	100	E	E	100	Cleanout Ditch to ROW Line, Shape and Seed Ditch										FE								31				30 x 55		184	55								1	1	2
									W	100	No Work										FE																							1	1	2
S44	3786	25.61	571+00	1 - 36 DIA	114	RCP	80	E	E	100	No Work										FE																							-		
									W	100	No Work										FE																							1	1	2
S45	3785	25.39	581+62	1 - 18 DIA	82	RCP	10	E	E	100	Cleanout Ditch to ROW Line, Shape and Seed Ditch										FE								23				30 x 40	134		40								1		
									W	100	No Work										FE																							1		
S46	3784	25.28	587+04	1 - 24 DIA	130	RCP	30	E	E	100	No Work										FE																							1		
									W	100	Cleanout Ditch to the North, Shape and Seed Ditch										FE								15				20 x 40	89		40								1		
S47	3783	25.14	594+39	1 - 24 DIA	112	RCP	12	E	E	100	No Work										FE																							1		
									W	100	Remove and Reset Flared End										FE			1		1			1															1	1	1
S48	3782	24.60	623+10	1 - 18 DIA	72	RCP	5	E	E	100	Remove and Reset Flared End + 6 ft of Pipe, Shape and Seed Ditch						6	6			FE			1		1			5															1	1	1
									W	100	Remove and Reset Flared End + 6 ft of Pipe, Shape and Seed Ditch						6	6			FE			1		1			5															1	1	1
S49	3781	24.49	628+38	1 - 18 DIA	80	RCP	6	E	E	100	No Work										FE																							1		
									W	100	Remove and Reset Flared End										FE			1		1			1															1	1	1
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											TOTALS THIS SHEET	-	-	-	-	-	24	24	-	-			-	5	-	5	-	-	132	-	-	-		268	299	195		19	6	-	-	-	-	23	11	18
											NH 0037(164)24 PCN 06PN TOTALS	1	308	308	22	68	90	90	74	62			2	16	2	16	2	2	1229	26	497	14		1783	1800	1105		206	74	174	4	2	142	52	47	74

Δ - END TYPES: FE = FLARED END SL = SLOPED END SB = SAFETY or SLOPED END (w/BARS) SE = SAFETY END (NO BARS) DI = DROP INLET WW = WINGWALLS HW = HEADWALLS CN= CONNECTOR JT = JUNCTION TR = TRANSITION

* - RIGHT-OF-WAY MEASURED FROM ℄ ** - CLEARZONE FROM EDGELINE. Φ - (E)ast = LT, (W)est = RT

*** - See Standard Plates 720.01 and 720.02

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.

SURFACING/SUBGRADE INVESTIGATION

A copy of the surfacing/subgrade investigation for this project is available from the Yankton Area and the Mitchell Region Offices.

SURFACING THICKNESS DIMENSIONS

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

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

COORDINATION BETWEEN CONTRACTORS

A separate contract for Project PH 0037(173)30 - PCN 09C9 will be awarded to another Contractor for changing the intersection of SD37 & SD46 to an all way stop. The project will also include adding transverse rumble strips to SD37.

The Contractor will schedule work so as not to interfere with or hinder the progress of the work performed by other Contractors on the intersection control, lighting and signing improvement project.

TYPE III FIELD LABORATORY

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

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

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".

INTERSECTING ROADS AND ENTRANCES

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

SHOULDER WORK

Prior to construction, Department of Transportation maintenance forces will spray the shoulders to kill existing vegetation. It is the Contractor's responsibility to notify the State a minimum of 30 days prior to starting work on the surface of the highway. The State assumes no responsibility for the effectiveness of the herbicide applied.

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

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

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor will provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining required permits and clearances for the borrow site. The borrow material will be approved by the Engineer. The plans quantity for Contractor Furnished Borrow Excavation as shown in the Estimate of Quantities will be the basis of payment for this item.

Prior to placement or removal of fill material, the Contractor will be required to remove four inches of topsoil and replace it following the placement of the new fill material. Removing and replacing topsoil will not be measured for payment but will be incidental to the contract unit price per cubic yard for Contractor Furnished Borrow Excavation.

The Contractor will be allowed to place topsoil in lieu of fill material if the fill depth is one foot or less. By doing this the Contractor will not be required to remove and replace the four inches of in place topsoil.

It is not anticipated that water for compaction will be required; however, if in the opinion of the Engineer the fill material is extremely dry, water may be ordered and placed to the satisfaction of the Engineer. Cost for water will be incidental to the contract unit price per cubic yard for Contractor Furnished Borrow Excavation.

Restoration of the Contractor furnished borrow excavation site will be the responsibility of the Contractor.

UNCLASSIFIED EXCAVATION

The plan shown quantity will be the basis of payment. No measurement will be made.

WATER FOR EMBANKMENT

Water for compaction of earth embankment will be applied at the rate of 10 gallons per cubic yard of Unclassified Excavation. Cost for water will be incidental to the contract unit price per cubic yard for Unclassified Excavation.

REMOVE ASPHALT CONCRETE PAVEMENT

Where existing asphalt concrete is to be removed at guardrail installations, the Contractor will remove enough material so that a 2" lift of new guardrail surfacing can be placed. This material will become the property of the Contractor for disposal.

UNCLASSIFIED EXCAVATION, DIGOUTS

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

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

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

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

WATER FOR COMPACTION

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

COLD MILLING ASPHALT CONCRETE

Cold milling will be done according to the typical sections. At intersecting roads, entrances, turnouts, pads and in areas where maintenance patches have raised and/or widened the road, additional milling will be done to provide a uniform typical section. Milling will be daylighted to the outside edge of the roadway. Quantities for milling additional width are included in the Table of Additional Quantities.

The Los Angeles Abrasion Loss value on the aggregate used for the in place asphalt concrete was 27. This value was obtained from testing during construction of the in place asphalt concrete.

Cold milling is estimated to produce 12997 tons of cold milled asphalt concrete material. An estimated 5315 tons of cold milled asphalt concrete material will be used on this project as RAP in the Class Q3R Hot Mixed Asphalt Concrete mixture. The Contractor is responsible to assure that enough cold milled asphalt concrete material is available for use as RAP in the Class Q3R Hot Mixed Asphalt Concrete.

RAP not reused on the project (estimated at 7682 tons) will be blended, hauled and stockpiled.

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

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

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

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

COLD MILLING TAPERS

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

The surface will be milled full roadway width.

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

Taper depth of Cold Milling at locations shown below:

STA	LOCATION	SIZE
0+00 -60’	Begin Project	80’ long X 35’ wide
543+97.25	Begin Bridge	240’ long X 35’ wide
545+02.75	End Bridge	240’ long X 35’ wide
616+81.5	Begin Bridge	240’ long X 35’ wide
617+99.5	End Bridge	240’ long X 35’ wide
630+22	End Project	60’ long X 35’ wide

GRANULAR MATERIAL, FURNISH

Granular Material for blending stockpile material will be Base Course meeting the requirements of Section 882 of the specifications except that if ledge rock is used, the Plastic Index will be between 2 and 6.

BLEND, HAUL AND STOCKPILE GRANULAR MATERIAL

Cold milled asphalt concrete material not reused on the project will be hauled to the State stockpile site located in Tripp in the NE ¼ of the SW ¼ of Section 17, T 97 N, R 60 W. The Contractor will have approval from the Engineer of the stockpile location prior to stockpiling the material.

A computerized scale, portable platform scale, stationary commercial scale, stationary commercial plant, portable plant scale, or a belt scale along with a scale operator will be provided by the Contractor at the stockpile site to weigh the milled material prior to blending.

The milled asphalt concrete material will be crushed to meet the requirements of Section 884.2 D.2 prior to blending into the stockpile.

Cold milled asphalt concrete material will be blended with Granular Material, Furnish at a rate of 50% milled material and 50% Granular Material, Furnish to obtain stockpile material. Material will be uniformly blended to the satisfaction of the Engineer.

No further gradation testing of the blended material will be required.

Cost for hauling, weighing, stockpiling, and blending milled material with Granular Material, Furnish will be included in the contract unit price per ton for Blend, Haul and Stockpile Granular Material.

ASPHALT CONCRETE COMPOSITE

Section 324 will apply except that Class Q3R 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.

Asphalt Concrete Composite will include MC-70 Asphalt for Prime placed at the rate of 0.30 gallons per square yard. The Asphalt for Prime will be applied to the Base Course for the full width of the bottom layer of Asphalt Concrete Composite plus one foot additional on the outside shoulder.

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

ASPHALT CONCRETE BLADE LAID

Included in the Estimate of Quantities are 150 tons of Asphalt Concrete Blade Laid, 11.1 tons of PG 58-34 Asphalt Binder, 1.5 tons of Hydrated Lime and 5.6 tons of SS-1h or CSS-1h Emulsified Asphalt for Tack (Rate = 0.09 gallon per square yard) per mile and will be tight bladed on the existing surface 25’ wide prior to the overlay.

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

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

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

CLASS Q3R HOT MIXED ASPHALT CONCRETE

Mineral Aggregate:

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

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

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

Mix Design Criteria:

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

Gyratory Compactive Effort:

	$N_{initial}$	N_{design}	$N_{maximum}$
Class Q3R	6	50	75

All remaining requirements for Class Q3 will apply.

ADDITIONAL QUANTITIES

Included in the Estimate of Quantities are 100 tons of Class Q3R Hot Mixed Asphalt Concrete, 4.7 tons of PG 58-34 Asphalt Binder and 1.0 tons of Hydrated Lime per mile for spot leveling, strengthening and repair of the existing surface and/or shoulders throughout the project.

Included in the Estimate of Quantities are 3 tons of SS-1h or CSS-1h Asphalt for Tack for surface repair and leveling areas throughout the project. (Rate = 0.09 gallon per square yard).

FLUSH SEAL

Application of the flush seal will be applied to cover the Rumble Stripes on each shoulder.

EDGELINE RUMBLE STRIPES

INSTALLATION:

Edgeline rumble stripes will be constructed according to Standard Plate 320.20.

Rumble stripes will be completed prior to application of the flush seal and permanent pavement marking.

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

ROADWAY CLEANING:

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

Cost for this work will be incidental to the contract unit price per mile for Grind 8" Rumble Strip or Stripe in Asphalt Concrete.

RUMBLE STRIPS AT SD37 & SD50 INTERSECTION

Rumble strips in the SBL will be grooved into the asphalt concrete surface prior to the flush seal application. The Contractor will remove excess aggregate from the rumble strips upon completion of the flush seal.

Refer to Standard Plate 320.45 for details.

Payment for rumble strips will be at the contract unit price per foot for Grind 6" Transverse Rumble Strip in Asphalt Concrete.

INSTALLING 36" RCP IN EXISTING RC CATTLE PASS

The Contractor will install 36" RCP through the existing 4' x 6' RC Cattle Pass at the location shown on the Layout for Pipe Insert in Existing RC Cattle Pass and in the Table for Mainline Culvert Work.

The 36" RCP, Controlled Density Fill and Contractor Furnished Borrow Excavation will be placed as shown in the Layout for Pipe Insert in Existing RC Cattle Pass.

Contractor Furnished Borrow Excavation will be placed and compacted to eliminate settlement and voids at the ends of the existing RC Cattle Pass End Section.

MAINLINE CROSS PIPE REPLACEMENT

All pipe culvert replacements will be installed one half at a time under traffic control conditions outlined in these plans and in accordance with the following notes and as shown on the Layout of Embankment and Surfacing for Culvert Replacement.

This work will be completed prior to beginning cold milling on the project.

After the existing pipe has been removed, the new pipe culvert will be undercut to a minimum depth of 1 foot. The depth of undercut is an estimate and the actual depth necessary will be determined during construction. The Engineer will determine how much undercut will be done in accordance with Section 421 of the specifications but will not reduce the undercut to less than 1 foot in depth.

Select fill material for backfilling the undercut area will conform to the gradation requirements of Base Course in Section 882. If groundwater is encountered during construction, the select fill material for backfilling the undercut area and Class B Bedding will conform to the gradation requirements of Section 421.2 A. until backfill placement is above the groundwater level. The Engineer will process a CCO to provide for compensation to the Contractor for the added cost of the changed material. All other requirements of Section 421 will apply.

Pipe culverts will be bedded in accordance with Section 450.3 F.2, Class B Bedding with the following exceptions. The excavated area will extend 2 feet from the outermost diameter on both sides of the pipe with the back of the excavated area being sloped 2:1 upward to the top of the roadway surface. Select fill material for Class B Bedding will conform to the gradation requirements of Base Course in Section 882.

After the minimum testing requirements of M.S.T.R Section 4.1.F.3.a.1 (SDDOT Materials Manual) have been met, the minimum density testing requirements will be one test per zone. Each zone from the top of the pipe to the top of the subgrade will be 2 feet in depth. Moisture testing will remain as per M.S.T.R.

The remainder of the pipe culvert excavation will be backfilled with soils taken from the pipe removal excavation or other suitable material as approved by the Engineer. The backfill will be benched into 2:1 excavation slope. Compaction of the backfill material will be governed by the Specified Density Method.

After the new pipe has been backfilled to the top of the subgrade, a 12" depth of Base Course and 5" (2-2.5" lifts) depth of asphalt concrete composite will be placed as a patch matching the existing asphalt concrete.

MAINLINE CROSS PIPE REPLACEMENT (CONTINUED)

All costs to remove and dispose of asphalt concrete pavement, including full depth saw cutting of the asphalt concrete pavement, will be incidental to the contract unit price per square yard to Remove Asphalt Concrete Pavement. All excavation necessary for Class B Bedding and the pipe installation will be incidental to the contract unit price per foot for the corresponding pipe installation contract items. The excavation of material for pipe culvert undercut will be paid for at the contract unit price per cubic yard for Pipe Culvert Undercut.

The select fill material used for backfilling the pipe culvert undercut and Class B Bedding will be paid for at the contract unit price per ton for Base Course. The 3" layer of bedding material to form the cradle in the pipe foundation will be incidental to the corresponding pipe installation contract items. The cost for asphalt concrete composite installed over the pipe replacement will be paid for at the contract unit price per ton for Asphalt Concrete Composite.

TABLE FOR MAINLINE CROSS PIPE REPLACEMENT

LOCATION	REMOVE ASPHALT CONCRETE (Sq.Yds)	SELECT FILL MATERIAL (Tons)	BASE COURSE (Tons)	1ST LIFT ASPHALT CONCRETE COMPOSITE (Tons)	2ND LIFT ASPHALT CONCRETE COMPOSITE (Tons)
18+66	168	103	133	24	24
Totals:	**168**	**103**	**133**	**24**	**24**

Quantities are included in the Table of Additional Quantities for Mainline Cross Pipe Replacement. The quantity for Select Fill Material will be added/included in the quantity for Base Course.

PIPE EXTENSIONS

For pipe extensions that are outside the new surfaced shoulder as shown in the typical sections, acceptance tests for pipe culvert backfill of pipe 48" or less in diameter may be performed by visual inspection to the satisfaction of the Engineer. All other MSTR pipe density testing requirements will apply.

REINFORCED CONCRETE PIPE JOINT REPAIR AND VOID GROUTING

The Contractor will provide a notarized statement, from the Manufacturer, that the products used for culvert joint repair meet the specified requirements, along with the Manufacturer's current product specification and installation instructions.

The Contractor will be an Approved Contractor of the Manufacturer of the specified product and will provide written certification from the Manufacturer attesting to their Approved Contractor status.

All product documentation and Contractor submittals must be submitted to the Engineer prior to or at the preconstruction conference. The Contractor must have the Engineer's approval prior to commencing any of this work.

The Contractor will follow the Manufacturer's installation instructions and specifications throughout the repair process.

Temperature of the specified products is critical from the point of pumping to the point of injection. All polyurethanes react faster at higher temperatures. Drum heaters and heated hoses are required when ambient or ground temperatures are below 70 degrees Fahrenheit. The optimum hose temperature will vary with the weather conditions and the particular job site conditions with the minimum hose temperature being 75 degrees Fahrenheit and the maximum hose temperature being 95 degrees Fahrenheit and the drum temperature not to exceed 90 degrees Fahrenheit.

The Contractor will provide worker and inspector safety protective gear in accordance with the manufacturer, including but not limited to chemical goggles, face shields, eye wash system and NBR gloves.

The Contractor will provide safe storage and handling of materials prior to delivery and at the project site. All material installation, handling and storage will be in accordance with the Manufacturer's recommendations.

The Contractor will visit the project to determine the extent of culvert joints to be cleaned and filled, prior to bidding.

Culvert Joint Cleaning and Repair Culvert Joint quantities will be based upon the following table showing circumference of joints based upon culvert size and shape.

Pipe Diameter	Round Pipe Circumference per Joint	Arch Pipe Circumference per Joint
(In)	(Ft)	(Ft)
36	9.4	
42	11.0	11.0
48	12.6	
54	14.1	
60	15.7	
66	17.3	
72	18.8	19.0
78	20.4	
84	22.0	

CULVERT JOINT CLEANING

This work will consist of cleaning of the culvert joints, washing the entire culvert and joints with a high-pressure washer, and if needed, wire brush cleaning of each joint to be repaired as directed by the Engineer. The entire culvert will be clean and dry and most notably the specified joints will be thoroughly cleaned to the satisfaction of the Engineer using a power washer with water pressure of at least 2500 psi. The culvert must be in a clean condition so that no deleterious material is trapped in the joints that are being repaired. The Contractor will dispose of all debris removed from the culverts during the cleaning operation as approved by the Engineer.

REINFORCED CONCRETE PIPE JOINT REPAIR AND VOID GROUTING (CONTINUED)

All costs for equipment, material and labor for the culvert joint cleaning work will be incidental to the contract unit price per foot for Culvert Joint Cleaning. Culvert Joint Cleaning will be measured to the nearest 0.1 foot of joint which is cleaned for joint repair.

REPAIR CULVERT JOINT

The culvert joints will be repaired in accordance with the Chemical Grout Manufacturer’s directions to prevent future infiltration/exfiltration of soils and water and to keep the chemical grout from expanding back into the structure during injection.

The culvert joint will be repaired with a sealant comprised of water reactive hydrophilic polyurethane resin and dry oil free oakum. All grout will be injected under such pressure so as not to damage the existing drainage structure or roadway structure.

The Contractor will submit to the Engineer for approval a detailed procedure for the installation of the polyurethane grout.

The work will include, but is not limited to sealing each pipe joint with a hydrophilic polyurethane grout meeting the following specifications:

GEL FOAM II (Saturated Oakum Rope Joint Packing) as manufactured by Green Mountain International, LLC or equal.

ULTRA (Single Component Grout for Joint Injection) as manufactured by Green Mountain International, LLC or equal.

Excess grout and oakum will be trimmed from the interior face of the joint prior to applying the UV Protection (Gel Coat). The epoxy gel coat compound will be as recommended by the Manufacturer for both surface sealing and protecting the hydrophilic grout from UV exposure. The epoxy gel compound will be mixed and handled in accordance with the Manufacturer's recommendations and will meet the following requirements:

Epoxy gel sealant compounds manufactured by Green Mountain Grouts, LLC or equal.

All costs for all equipment, material and labor required to complete the work will be incidental to the contract unit price per foot for Repair Culvert Joint. Completion of the work includes initial saturated oakum rope packing of each joint, follow up injection of grout into the back side of each joint, trimming the excess grout and oakum from the interior face of the joint, application of the epoxy gel coat and site clean-up. Payment will be made per 0.1 foot of culvert joint repaired.

DUAL COMPONENT CHEMICAL GROUT FOR VOID FILLING

The external voids surrounding the culvert will be filled with an injected high expansion chemical grout compound. Holes will be strategically drilled as required and grout injected throughout the structure to effectively fill all voids that have developed outside of the structure due to the infiltration of external soils and materials into the culvert and “piping” (water running outside and under the structure due to separated joints). It is the Contractor's responsibility to locate reinforcing bars and conduit prior to drilling any grout holes. All grout will be injected under such pressure so as not to damage the existing drainage structure or roadway structure. All joints will be appropriately cleaned and sealed, with appropriate recommended cure time, prior to the injection of the void grouting. After completion of the void filling, all holes will be properly sealed.

REINFORCED CONCRETE PIPE JOINT REPAIR AND VOID GROUTING (CONTINUED)

The typical method consists of placing a layer of chemical grout behind or around the structure. The Contractor will submit for approval by the Engineer a detailed grouting plan showing the spacing, orientation and depth of the grout holes, as well as type of polyurethane grout to be used, range of gel times, equipment, mixing procedures, recommended injection pressure, technique for monitoring grout travel and any other pertinent information. The grouting plan should address the prevention of overfilling and prevention of damage to structures or roadway. The Contractor will submit this detailed procedure for the installation of the expansion grout to the Engineer for approval. The holes are drilled with a rotary percussion hammer drill using a sharp masonry bit with a minimum diameter of 3/8 inch to a maximum diameter of 5/8 inch. Care must be taken to prevent holes from causing damage to reinforcing bars or utility conduits. Drilled holes should be vacuumed and flushed. Use injection grout and methods as recommended by Manufacturer.

Injection can be monitored by either applicator's visual inspection or by pumping a specific amount of injection grout into each hole. The work will start at the inlet end of the pipe and proceed downstream to the outlet. Inject bottom row every other hole. When material appears at the adjacent port, discontinue injection at entry port and begin injection at the adjacent port. Continue injection process section by section from bottom of pipe to top of pipe in a continuous manner to next pipe section. Injection pressure will vary from 200 psi to 3000 psi depending on the width of the joint, thickness of the structure, and condition of the concrete.

The Contractor must supply the Engineer with three (3) prior job references of projects where they have successfully injected urethane resin for subgrade void filling applications, or soil stabilization.

In lieu of three (3) prior job references the Contractor will:
a) Obtain hands on training from the supplier on the installation procedures, and
b) Have the supplier on site to provide training to Contractor’s staff. Supplier will be present for at least two complete pipe culvert repairs and until the Engineer is satisfied that Contractor’s staff is competent in performing this work.

The chemical grout will be a dual component hydrophobic polyurethane grout compound which is non-flammable and non-toxic when cured.

The chemical grout mixture will have expansion properties listed in the data sheets of greater than eighteen (18) times its original volume and cure to rigid closed cell polyurethane foam. The grout will expand to fill any voids and must bond to the exterior surface of the structure. The chemical grout will be Mountain Grout U 4.0 dual component polyurethane grouts as manufactured by Green Mountain International LLC or equal.

All costs for equipment, material, and labor required to fill external voids surrounding the culvert will be incidental to the contract unit price per gallon for Chemical Grout Void Fill. Any overfilling of voids that results in damage to overlying pavement, highway user ride quality, or drainage structure integrity will be corrected and paid for by the Contractor. All corrections will be approved by the Engineer. Payment will be to the 0.1 gallon of chemical grout used, prior to expansion of the material.

A calibrated metering device will be used to measure the chemical grout and to assure proper mixing ratio of components.

After the grout cures, excess material will be removed flush with the pipe interior wall and the pipe left clean.

CULVERT CLEANOUT

Material in existing culverts as listed in the Table for Mainline Culvert Work will be cleaned out by water flushing or other approved methods.

It is the responsibility of the Contractor to visit the site to determine the extent of culvert cleaning work required.

Cost for this work will be included in the contract unit price per each for Cleanout Pipe Culvert.

The Contractor will implement appropriate sediment control measures prior to water flushing in order to prevent discharges from project boundaries, and to comply with the Storm Water Permit.

DITCH RESTORATION

The ditches will be excavated for approximately 50 feet in each direction (or as directed by the Engineer) from the new/reset pipe ends to obtain proper water flow through the pipe. The excavated material may be used as fill material for culvert work, etc. as approved by the Engineer.

Cost for this work will be incidental to the contract unit price per cubic yard for Contractor Furnished Borrow Excavation.

CORRUGATED METAL PIPE

Corrugated metal pipes will have 2 ⅔-inch x ½-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans. Corrugated metal pipes will have 3-inch x 1-inch or 5-inch x 1-inch corrugations for 48-inch and larger round pipe and 54-inch and larger arch pipe unless otherwise stated in the plans.

The gauge of the corrugated metal ends will match the thickest gauge of corrugated metal pipe it is connected to.

TIE BOLTS FOR RCP/RCP ARCH CULVERTS

Tie bolts will conform to Standard Plate 450.18.

Tie Bolts will be installed at the inlet and outlet on the first three sections of new/reset culvert and on new/reset culvert ends (requires connection from existing culvert to new culvert / new end section).

For informational purposes:

> Field drilling will be required to install the tie bolts on reset culvert, on reset culvert ends and on existing culvert when installing a new/reset end section.

Cost for removing tie bolts, drilling tie bolt holes and furnishing and installing tie bolts will be incidental to the contract unit prices for installing or resetting RCP/RCP Arch Culverts and End Sections. Existing tie bolts may be salvaged and reused if condition is acceptable to the Engineer.

The Contractor will place culvert and end sections such that the installation does not cause existing culvert sections to separate at any of the existing joints. Any joint separation caused by the Contractor's operations will result in removal, resetting and re-tie bolting of said culvert sections at the Contractor's expense.

INSLOPE TRANSITIONS

Inslope transitions will be required at various culvert locations. Refer to Standard Plate 120.05 for details.

TABLE OF INSLOPE TRANSITIONS

Station	Side
18+66	L & R

EMBANKMENT ADJACENT TO CULVERTS

Earth embankment adjacent to the existing culverts/end sections shown in the Table of Mainline Culvert Work will be removed prior to removing the culverts/end sections. Upon installation/reset of the culvert/end sections, the earth embankment will be replaced and compacted adjacent to the culvert/end sections.

Cost for removing, replacing and compacting the earth embankment is included in the contract unit price per cubic yard for Unclassified Excavation.

REFURBISH SINGLE MAILBOXES

Existing mailboxes will be removed, turnouts constructed, and mailboxes reset on new posts with the necessary support hardware for single mailbox assemblies. The local Postmaster will determine the recommended mounting height. The Contractor will coordinate with the Engineer on the proper postal representative to contact.

STATION	CLASS Q3R HOT MIXED ASPHALT CONCRETE TONS	REFURBISH SINGLE MAILBOX EACH
45+00 Rt.	-	1
176+50 Lt.	4	1
275+25 Rt.	4	1
358+40 Rt.	4	1
513+35 Rt.	4	1
584+15 Rt.	4	1
TOTALS:	**20**	**6**

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

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

TYPE 2 OBJECT MARKERS AT ROADSIDE OBSTACLES

At locations shown in the Table for Mainline Culvert Work where Type 2 Object Markers will be removed, cost for removing the existing Type 2 Object Markers will be included in the contract unit price per each for Remove Delineator.

New Type 2 Object Markers and posts will be furnished and installed according to the details of Standard Plates 632.01, 632.03 and 632.04 by the Contractor at the locations shown in the Table for Mainline Culvert Work. Cost for new Type 2 object marker and post installation is included in the contract unit price per each for Type 2 Object Marker Back to Back.

PERMANENT SEEDING AND MULCHING

The areas to be seeded and mulched consist of disturbed areas within the right-of-way resulting from the work required by this contract.

Type C Permanent Seed Mixture will consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana, Walsh	16
Canada Wildrye	Mandan	2
	Total:	18

The areas to be seeded and mulched are estimated at 2.5 acres.

If the Contractor uses a no-till drill, mulch may be applied prior to seeding and the mulch can then be punched into the soil by the no-till drill. If the Contractor uses this process, the no-till drill seeding will be completed immediately following the mulch application and the mulch will be punched into the soil at a 3-inch depth.

EROSION CONTROL BLANKET

Erosion control blanket will be installed at the locations noted in the Table for Mainline Culvert Work.

The erosion control blanket provided will be from the approved product list. The approved product list for erosion control blanket may be viewed at the following internet site:

http://apps.sd.gov/HC60ApprovedProducts/main.aspx

SEQUENCE OF OPERATIONS

The Contractor will submit a sequence of operations for approval two weeks prior to the preconstruction meeting. If changes to the sequence of operations are proposed during the project, these must be submitted for review a minimum of one week prior to potential implementation. Approval for changes to the sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work.

GENERAL TRAFFIC CONTROL

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

All construction operations will be conducted in the general direction of traffic movement.

If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD, whichever is more stringent will be used, as determined by the Engineer.

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

Fixed location signing placed more than 4 calendar days prior to the start of construction will be covered or laid down until the time of construction. The covers must be approved by the Engineer prior to installation. The cost of materials, labor, and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

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

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

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

The Contractor will furnish, install, maintain, and remove TRUCK CROSSING (W8-6) signs daily. The TRUCK CROSSING signs will be displayed always when haul vehicles are hauling material. When hauling conditions no longer exist, the signs will be covered or removed from view. The exact number and location will be determined during construction. Payment for additional signs will be based on the contract unit price per square foot for "Traffic Control Signs".

GROOVED PAVEMENT (W8-15) signs with MOTORCYCLE (W8-15P) plaques are required in advance of areas that have been cold milled and are not resurfaced the same day. The GROOVED PAVEMENT sign assemblies will be installed a minimum of 1000 feet in advance of cold milled sections and remain in place until the sections have been resurfaced.

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

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

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

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

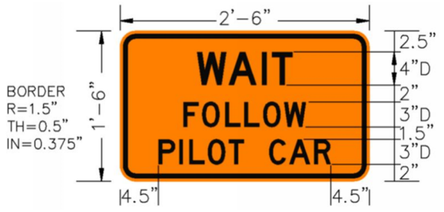
The Contractor will restore traffic to one lane each direction at the end of the day, prior to nightfall. Prior to opening the roadway to traffic the Contractor must clean the roadway surface each day.

The Contractor will provide a minimum traffic width of 12 feet for one-way operations and 24 feet for two-way operations during the daytime construction period. The Contractor will restore traffic to normal driving lanes at the end of the working day.

FLAGGING

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

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



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

TEMPORARY PAVEMENT MARKING

The total length of no passing zone on this project is estimated to be 4.34 miles.

It is estimated that 30 DO NOT PASS (R4-1) and 30 PASS WITH CARE (R4-2) signs will be required to mark the no passing zones, should the Contractor elect to use these signs.

Temporary pavement marking will be used to mark dashed centerline, No Passing Zones, and applicable lane lines. Paint will not be allowed for temporary pavement marking on the asphalt concrete wear course or after application of the flush seal.

Temporary pavement marking paint will not be allowed on the final lift of asphalt surfacing. Temporary pavement marking paint will not be allowed on the chip seal, fog seal, or flush seal. Temporary flexible vertical markers (tabs) must be used on the final lift of asphalt surfacing. The Contractor may use tabs with covers, uncovering them for the chip seal, fog seal, or flush seal. As an alternative, the Contractor may install new tabs for the fog seal or flush seal. Covers on the tabs will be sufficiently secured to prevent traffic from dislodging the cover and when removed, the covers will be properly disposed of.

The Contractor will remove and properly dispose of the tabs after permanent pavement marking is applied. Method of removal will be nondestructive to the road surface and will be accomplished within one week of completion of the permanent pavement marking.

Full reflectivity of all temporary flexible vertical markers (tabs) is required at all times. The Contractor will be required to replace any missing or non-reflective tabs after each installation as detailed below at no additional cost to the State.

Quantities of Temporary Pavement Markings consist of:

- One pass on top of milled surface
- One pass on the first lift of asphalt concrete
- One pass on top of the final lift of asphalt concrete

If the Engineer determines that an additional pass prior to the flush seal is not required, this application of the temporary pavement marking will be eliminated. If the flush seal is eliminated for the project, the application of the temporary pavement marking on top of the flush seal as well as the additional pass prior to the flush seal will be eliminated.

No adjustment in the contract unit price for "Temporary Pavement Marking" will be made because of a variation in quantities.

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

TEMPORARY PAVEMENT MARKING (CONTINUED)

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

PERMANENT PAVEMENT MARKING

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

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

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

HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

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

Reflective media will consist of glass beads.

RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

White Solid 4" line = 22.5 Gals/Mile
Dashed 4" line = 6.2 Gal/Mile
Glass Beads = 8 Lbs/Gal

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

RETROREFLECTIVITY FOR PAVEMENT MARKING PAINT

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

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

If the Department chooses to take readings, the minimum retro-reflectivity values will be 275 mc/m^2/lux for white and 170 mc/m^2/lux for yellow.

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

		CONVENTIONAL ROAD			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W3-4	BE PREPARED TO STOP	6	48" x 48"	16.0	96.0
W8-1	BUMP	6	48" x 48"	16.0	96.0
W8-6	TRUCK CROSSING	4	48" x 48"	16.0	64.0
W8-15	GROOVED PAVEMENT	8	48" x 48"	16.0	128.0
W13-1P	ADVISORY SPEED (plaque)	6	30" x 30"	6.3	37.8
W20-1	ROAD WORK AHEAD	16	48" x 48"	16.0	256.0
W20-4	ONE LANE ROAD AHEAD	6	48" x 48"	16.0	96.0
W20-7	FLAGGER (symbol)	8	48" x 48"	16.0	128.0
SPECIAL	WAIT FOLLOW PILOT CAR	6	30" x 18"	3.8	22.8
G20-1	ROAD WORK NEXT 1 MILE	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 6 MILES	2	36" x 18"	4.5	9.0
G20-1	ROAD WORK NEXT 11 MILES	1	36" x 18"	4.5	4.5
G20-1	ROAD WORK NEXT 12 MILES	2	36" x 18"	4.5	9.0
G20-2	END ROAD WORK	16	36" x 18"	4.5	72.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			1023.6

STORMWATER POLLUTION PREVENTION PLAN CHECKLIST

*(The numbers left of the title headings are **reference numbers** to the GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES (Stormwater Permit))*

5.3 (2): STAFF TRAINING/SWPPP IMPLEMENTATION

To promote stormwater management awareness specific for this project, the Contractor's Erosion Control Supervisor should provide correspondence of how the SWPPP will be implemented. The Contractor's Erosion Control Supervisor is responsible for providing this information at the preconstruction meeting, and subsequently completing an attendance log, which should identify site-specific implementation of the SWPPP and the names of the personnel who attended the preconstruction meeting. Documentation of the preconstruction meeting will be filed with the SWPPP documents.

5.3 (3): DESCRIPTION OF CONSTRUCTION ACTIVITIES

- **5.3 (3a): Project Limits** (See Title Sheet)
- **5.3 (3a): Project Description** (See Title Sheet)
- **5.3 (4): Site Map(s)** (See Title Sheet and Plans)
- **Major Soil Disturbing Activities** (check all that apply)
  - ☐ Clearing and grubbing
  - ☒ Excavation/borrow
  - ☐ Grading and shaping
  - ☒ Filling
  - ☐ Other (describe):
- **5.3 (3b): Total Project Area** 290 Acres
- **5.3 (3b): Total Area to be Disturbed** 2.5 Acres
- **5.3 (3c): Maximum Area Disturbed at One Time** 2.5 Acres
- **5.3 (3d): Existing Vegetative Cover (%)**
- **5.3 (3d): Description of Vegetative Cover**
- **5.3 (3e): Soil Properties:** AASHTO Soil or USDA-NRCS Soil Series Classification
- **5.3 (3f): Name of Receiving Water Body/Bodies** Tributaries to Emanuel Creek
- **5.3 (3g): Location of Construction Support Activity Areas**

5.3 (3h): ORDER OF CONSTRUCTION ACTIVITIES

The Contractor will enter the Estimated Start Date.

Description	Estimated Start Date
Install Mainline Pipe Replacement.	
Place temporary surfacing at Mainline Pipe Replacement.	
Perform remaining Pipe work.	
Perform Cold Milling operations.	
Perform surfacing operations.	
Install Guardrail.	
Reseed disturbed areas.	

5.3 (5): DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES

All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report. Include the technical reasoning for selecting each control. (check all that apply)

Perimeter Controls (See Detail Plan Sheets)

Description	Estimated Start Date
☐ Natural Buffers (within 50 ft of Waters of State)	
☐ Silt Fence	
☐ Erosion Control Wattles	
☐ Temporary Berm / Windrow	
☐ Floating Silt Curtain	
☐ Stabilized Construction Entrances	
☐ Entrance/Exit Equipment Tire Wash	
☐ Other:	

Structural Erosion and Sediment Controls

Description	Estimated Start Date
☐ Silt Fence	
☐ Temporary Berm/Windrow	
☐ Erosion Control Wattles	
☐ Temporary Sediment Barriers	
☐ Erosion Bales	
☐ Temporary Slope Drain	
☐ Turf Reinforcement Mat	
☐ Riprap	
☒ Gabions	
☐ Rock Check Dams	
☐ Sediment Traps/Basins	
☐ Culvert Inlet Protection	
☐ Transition Mats	
☐ Median/Area Drain Inlet Protection	
☐ Curb Inlet Protection	
☐ Interceptor Ditch	
☐ Concrete Washout Facility	
☐ Work Platform	
☐ Temporary Water Barrier	
☐ Temporary Water Crossing	
☐ Permanent Stormwater Ponds	
☐ Permanent Open Vegetated Swales	
☐ Natural Depressions to allow for Infiltration	
☐ Sequential Systems that combine several practices	
☐ Other:	

Dust Controls

Description	Estimated Start Date
☐ Tarps & Wind impervious fabrics	
☐ Watering	
☐ Stockpile location/orientation	
☐ Dust Control Chlorides	
☐ Other	

Dewatering BMPs

Description	Estimated Start Date
☐ Sediment Basins	
☐ Dewatering bags	
☐ Weir tanks	
☐ Temporary Diversion Channel	
☐ Other:	

Stabilization Practices (See Detail Plan Sheets)

(Stabilization measures will begin the following work day whenever earth disturbing activity on any portion of the site has temporarily or permanently ceased. Temporary stabilization will be completed as soon as practicable but no later than 14 days after initiating soil stabilization activities (**3.18**))

Description	Estimated Start Date
☐ Vegetation Buffer Strips	
☐ Temporary Seeding (Cover Crop Seeding)	
☒ Permanent Seeding	
☐ Sodding	
☐ Planting (Woody Vegetation for Soil Stabilization)	
☒ Mulching (Grass Hay or Straw)	
☐ Fiber Mulching (Wood Fiber Mulch)	
☐ Soil Stabilizer	
☐ Bonded Fiber Matrix	
☐ Fiber Reinforced Matrix	
☐ Erosion Control Blankets	
☐ Surface Roughening (e.g. tracking)	
☐ Other:	

Wetland Avoidance

Will construction and/or erosion and sediment controls impinge on regulated wetlands? Yes ☒ No ☐ If yes, the structural and erosion and sediment controls have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.

5.3 (6): PROCEDURES FOR INSPECTIONS

- Inspections will be conducted at least once every 7 days.
- All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
- Silt fence will be inspected for depth of sediment and for tears to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches $^1/_3$ of the height of the silt fence.
- Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
- Check dams will be inspected for stability. Sediment will be removed when depth reaches ½ the height of the dam.
- All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
- Inspection and maintenance reports will be prepared on form DOT 298 for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
- The SDDOT Project Engineer and Contractor's Erosion Control Supervisor are responsible for inspections. Maintenance and repair activities are the responsibility of the Contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298.

5.3 (7): POST CONSTRUCTION STORMWATER MANAGEMENT

Stormwater management will be handled by temporary controls outlined in "DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES" above, and any permanent controls needed to meet permanent stormwater management needs in the post construction period will be shown in the plans and noted as permanent.

5.3 (8): POLLUTION PREVENTION PROCEDURES

5.3 (8a): Spill Prevention and Response Procedures

➢ **Material Management**

- Housekeeping
  - Only needed products will be stored on-site by the Contractor.
  - Except for bulk materials the contractor will store all materials under cover and/or in appropriate containers.
  - Products must be stored in original containers and labeled.
  - Material mixing will be conducted in accordance with the manufacturer's recommendations.
  - When possible, all products will be completely used before properly disposing of the container off-site.
  - The manufacturer's directions for disposal of materials and containers will be followed.
  - The Contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal.
  - Dust generated will be controlled in an environmentally safe manner.
- Hazardous Materials
  - Products will be kept in original containers unless the container is not resealable and provide secondary containment as applicable.
  - Original labels and material safety data sheets will be retained in a safe place to relay important product information.
  - If surplus product must be disposed of, manufacturer's label directions for disposal will be followed.
  - Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during wet weather to prevent the release of contaminants onto the ground.
  - Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any stormwater system or stormwater treatment system.
  - Potential pH-modifying materials such as: bulk cement, cement kiln dust, fly ash, new concrete washings, concrete pumping, residuals from concrete saw cutting (either wet or dry), and mixer washout waters will be collected on site and managed to prevent contamination of stormwater runoff.

➢ **Spill Control Practices**

In addition to the previous housekeeping and management practices, the following practices will be followed for spill prevention and cleanup if needed.

- For all hazardous materials stored on site, the manufacturer's recommended methods for spill cleanup will be clearly posted. Site personnel will be made aware of the procedures and the locations of the information and cleanup supplies.
- Appropriate cleanup materials and equipment will be maintained by the Contractor in the materials storage area on-site. As appropriate, equipment and materials may include items such as brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for cleanup purposes.
- All spills will be cleaned immediately after discovery and the materials disposed of properly.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- After a spill a report will be prepared describing the spill, what caused it, and the cleanup measures taken. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, as well as clean up instructions in the event of reoccurrences.
- The Contractor's site superintendent, responsible for day-to-day operations, will be the spill prevention and cleanup coordinator.

➢ **Spill Response**

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into stormwater runoff and conveyance systems. If the release has impacted on-site stormwater, it is critical to contain the released materials on-site and prevent their release into receiving waters. If a spill of pollutants threatens stormwater or surface water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The Contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.
- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the Contractor at the site.
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The Contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SDDANR.
- Personnel with primary responsibility for spill response and cleanup will receive training by the Contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials.
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

5.3 (8b): WASTE MANAGEMENT PROCEDURES

➢ **Waste Disposal**

- All liquid waste materials will be collected and stored in approved sealed containers. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal and notices stating proper practices will be posted. The Contractor is responsible for ensuring waste disposal procedures are followed.

➢ **Hazardous Waste**

- All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the Contractor will be responsible for seeing that these practices are followed.

➢ **Sanitary Waste**

- Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units which must be secured to prevent tipping and serviced in a timely manner by a licensed waste management Contractor or as required by any local regulations.

5.3 (9): CONSTRUCTION SITE POLLUTANTS

The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the heading "POLLUTION PREVENTION PROCEDURES" (check all that apply).

- ☒ Concrete and Portland Cement
- ☒ Detergents
- ☒ Paints
- ☒ Metals
- ☒ Bituminous Materials
- ☒ Petroleum Based Products
- ☒ Diesel Exhaust Fluid
- ☒ Cleaning Solvents
- ☒ Wood
- ☒ Cure
- ☐ Texture
- ☐ Chemical Fertilizers
- ☐ Other:

Product Specific Practices

- **Petroleum Products**
  All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.
- **Fertilizers**
  Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to stormwater. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.
- **Paints**
  All containers will be tightly sealed and stored when not required for use. The excess will be disposed of according to the manufacturer's instructions and any applicable state and local regulations.
- **Concrete Trucks**
  Contractors will provide designated truck washout facilities on the site. These areas must be self-contained and not connected to any stormwater outlet of the site. Upon completion of construction, the area at the washout facility will be properly stabilized.

5.3 (10): NON-STORMWATER DISCHARGES

The following non-stormwater discharges are anticipated during the course of this project (check all that apply).

- ☒ Discharges from water line flushing.
- ☒ Pavement wash-water, where no spills or leaks of toxic or hazardous materials have occurred.
- ☐ Uncontaminated ground water associated with dewatering activities.

5.3 (11): INFEASIBILITY DOCUMENTATION

If it is determined to be infeasible to comply with any of the requirements of the Stormwater Permit, the infeasibility determination must be thoroughly documented in the SWPPP.

7.0: SPILL NOTIFICATION

In the event of a spill, the Contractor's site superintendent will make the appropriate notification(s), consistent with the following procedures:

- A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to SDDANR immediately **if any one of the following** conditions exists:
  - The release or spill threatens or is able to threaten waters of the state (surface water or ground water)
  - The release or spill causes an immediate danger to human health or safety
  - The release or spill exceeds 25 gallons
  - The release or spill causes a sheen on surface water
  - The release or spill of any substance that exceeds the ground water quality standards of ARSD Chapter 74:54:01
  - The release or spill of any substance that exceeds the surface water quality standards of ARSD Chapter 74:51:01
  - The release or spill of any substance that harms or threatens to harm wildlife or aquatic life
  - The release or spill is required to be reported according to Superfund Amendments and Reauthorization Act (SARA) Title III List of Lists, Consolidated List of Chemicals Subject to Reporting Under the Emergency Planning and Community Right to Know Act, US Environmental Protection Agency.
- To report a release or spill, call SDDANR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central Standard Time). To report the release after hours, on weekends or holidays, call South Dakota Emergency Management at 605-773-3231. Reporting the release to SDDANR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, you must also contact local authorities to determine the local reporting requirements for releases. A written report of the unauthorized release of any regulated substance, including quantity discharged, and the location of the discharge will be sent to SDDANR within 14 days of the discharge.

5.4: SWPPP CERTIFICATIONS

➢ **Certification of Compliance with Federal, State, and Local Regulations**

The Storm Water Pollution Prevention Plan (SWPPP) for this project reflects the requirements of all local municipal jurisdictions for storm water management and sediment and erosion control as established by ordinance, as well as other state and federal requirements for sediment and erosion control plans, permits, notices or documentation as appropriate.

➢ **South Dakota Department of Transportation**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

Authorized Signature (See the General Permit, Section 7.4 (1))

➢ **Prime Contractor**

This section is to be executed by the General Contractor after the award of the contract. This section may be executed any time there is a change in the Prime Contractor of the project.

I certify under penalty of law that this document and all attachments will be revised or maintained under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

Authorized Signature

CONTACT INFORMATION

The following personnel are duly authorized representatives and have signatory authority for modifications made to the SWPPP:

➢ **Contractor Information**:

- Prime Contractor Name: _____
- Contractor Contact Name: _____
- Address: _____
- _____
- City: _____State: _____Zip: _____
- Office Phone: _____Field: _____
- Cell Phone: _____Fax: _____

➢ **Erosion Control Supervisor**

- Name: _____
- Address: _____
- _____
- City: _____State: _____Zip: _____
- Office Phone: _____Field: _____
- Cell Phone: _____Fax: _____

➢ **SDDOT Project Engineer**

- Name: _____
- Business Address: _____
- Job Office Location: _____
- City: _____State: _____Zip: _____
- Office Phone: _____Field: _____
- Cell Phone: _____Fax: _____

➢ **SDDANR Contact Spill Reporting**
- Business Hours Monday-Friday (605) 773-3296
- Nights and Weekends (605) 773-3231

➢ **SDDANR Contact for Hazardous Materials.**
- (605) 773-3153

➢ **National Response Center Hotline**
- (800) 424-8802.

➢ **SDDANR Stormwater Contact Information**
- SDDANR Stormwater (800) 737-8676
- Surface Water Quality Program (605) 773-3351

5.5: REQUIRED SWPPP MODIFICATIONS

➢ **5.5 (1): Conditions Requiring SWPPP Modification**

The SWPPP must be modified, including the site map(s), in response to any of the following conditions:

- When a new operator responsible for implementation of any part the SWPPP begins work on the site.
- When changes to the construction plans, sediment and erosion control measures, or any best management practices on site that are no longer accurately reflected in the SWPPP. This includes changes made in response to corrective actions triggered by inspections.
- To reflect areas on the site map where operational control has been transferred (including the date of the transfer) or has been covered under a new permit since initiating coverage under this general permit.
- If inspections by site staff, local officials, SDDANR, or U.S. EPA determine that SWPPP modifications are necessary for compliance with the Stormwater Permit.
- To reflect any revisions to applicable federal, state, or local requirements that affect the control measures implemented at the site.
- If approved by the Secretary, to reflect any changes in chemical water treatment systems or controls, including the use of a different water treatment chemical, age rates, different areas, or methods of application.

➢ **5.5 (2): Deadlines for SWPPP Modification**

Any required revisions to the SWPPP must be completed within 7 calendar days following any of the items listed above.

➢ **5.5 (3): Documentation of Modifications to the Plan**

All SWPPP modification records are required to be maintained showing the dates of when the modification occurred. The records must include the name of the person authorizing each change and a brief summary of all changes.

➢ **5.5 (4): Certification Requirements**

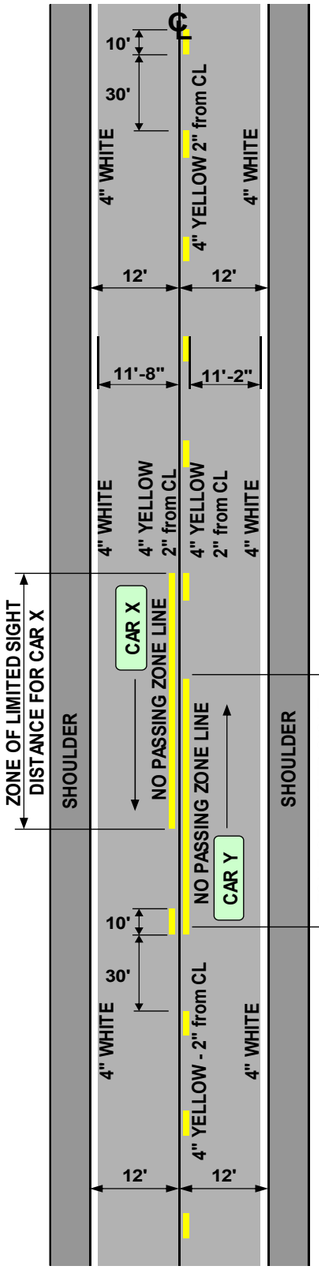
All modifications made to the SWPPP must be signed and certified as required in Section 7.4.

➢ **5.5 (5): Required Notice to Other Operators**

If there are multiple operators at the site, the Contractor's Erosion Control Supervisor must notify each operator that may be impacted by the change to the SWPPP within 24 hours.

When modifications as described above occur, the SWPPP will be modified to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP using the DOT 298 form and drawings on the plan will be modified to reflect the needed changes. Copies of the DOT 298 forms and the SWPPP will be retained on site in a designated place for review throughout the course of the project. A copy of the DOT 298 form will be given to the Contractor Erosion Control Supervisor and a copy will be emailed to the SDDOT Environmental Section in accordance with the DOT 298 Form.

TWO LANE ROADWAY



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 = 6.2 Gals./Pass-Mile
Solid Yellow Centerline Rate = 22.5 Gals./Pass-Mile
Solid White Edgeline Rate = 22.5 Gals./Pass-Mile

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

ESTIMATED QUANTITIES (BASED ON ONE APPLICATION)	
HIGH BUILD	**QUANTITY**
WHITE	**542 GALLONS**
YELLOW	**204 GALLONS**

Included in the above quantities are:

Additional White (1 Application)

Description		Gallons
4" Lines	240'	1
8" Lines	-	-
12" Gore Lines	-	-
Crosswalks	-	-
24" Stop Lines	-	-
24" Hatches	-	-
Solid Areas	-	-
Arrows		
Left Arrows	4 Ea	3
Right Arrows	-	-
Straight Arrows	-	-
Combo Arrows	-	-
Lane Drop Arrows	-	-
Messages		
STOP	-	-
STOP AHEAD	-	-
R X R w/ Stop Lines	-	-
SCHOOL X-ING	-	-
Additional White:		4

Additional Yellow (1 Application)

Description			Gallons
Transitions	2 Ea	1560'	9
4" Skip Lines		-	-
8" Lines		-	-
12" Lines		-	-
24" Hatches		360'	18
Solid Areas		-	-
Additional Yellow:			27

Additional Quantities

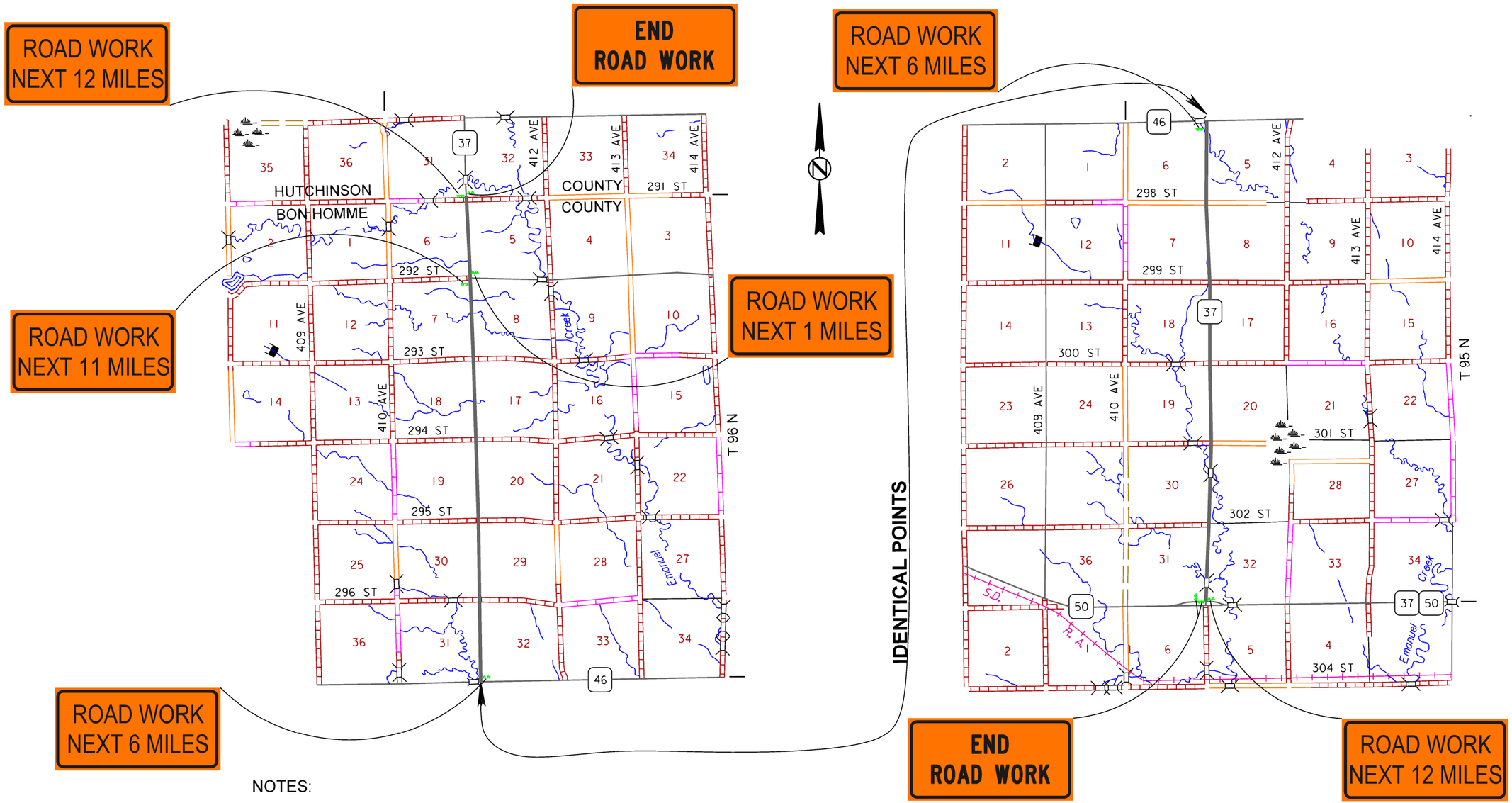
Rates of Coverage:	SqFt/Gal
4", 8" & 12" Lines -	60
24" Lines & Hatches -	40
Arrows, Messages and Solid Areas -	25

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0037(164)24	27	63

Plotting Date: 01/03/2024

TRAFFIC CONTROL
Fixed Location Signs
(Ground Mounted Support)



NOTES:

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

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

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

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

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

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

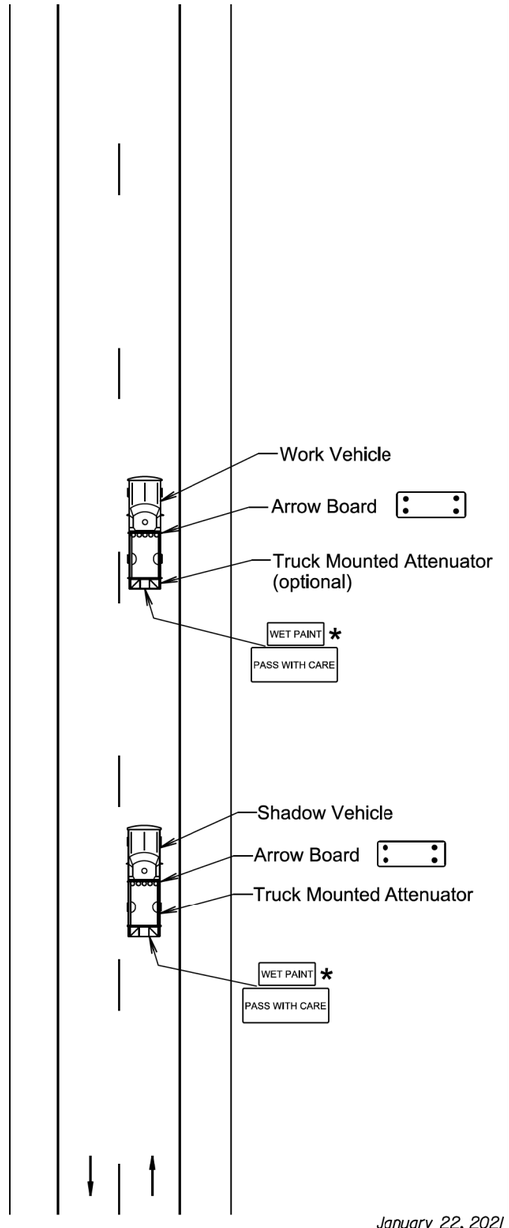
Shadow and Work vehicles will display high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow boards.

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

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

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

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



January 22, 2021

Published Date: 2024	SDDOT	MOBILE OPERATIONS ON 2-LANE ROAD	PLATE NUMBER 634.06
			Sheet 1 of 1

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

Flagger

Channelizing Device

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

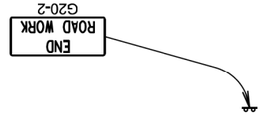
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

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

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

The channelizing devices will be drums or 42" cones.

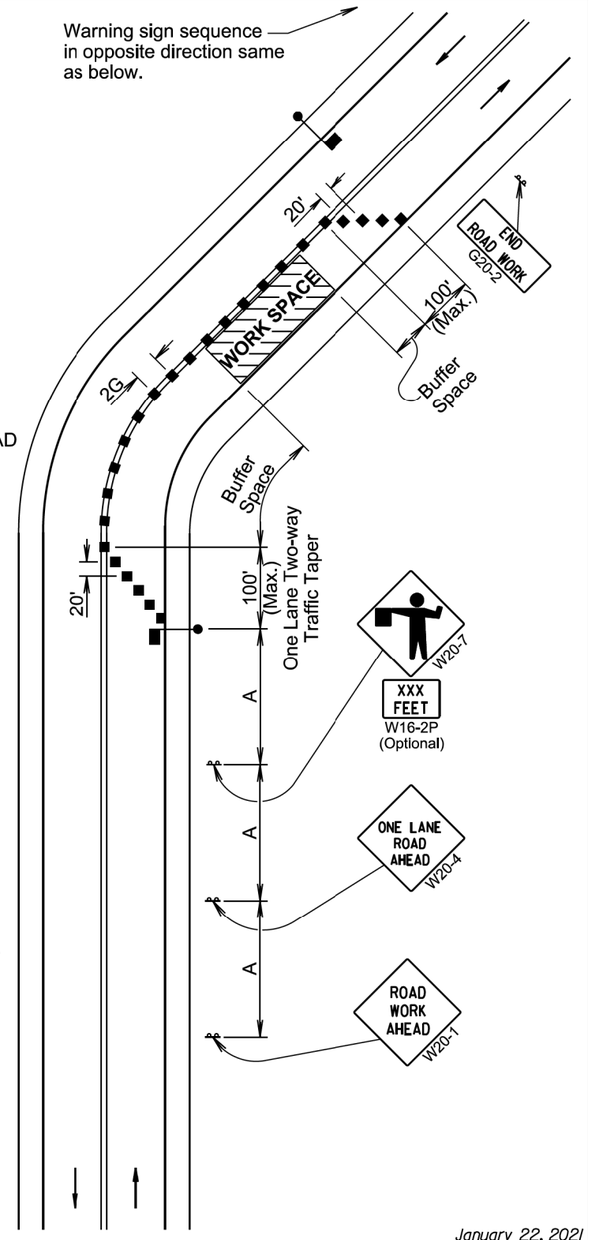
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



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

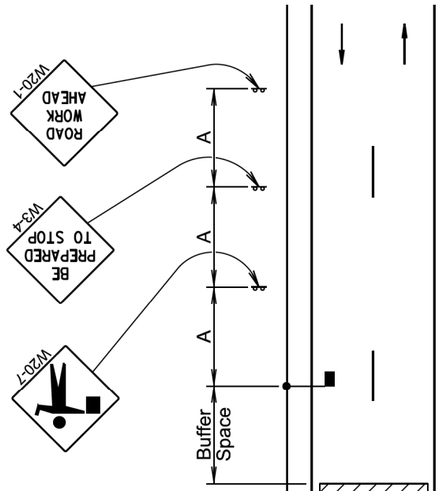
The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

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



January 22, 2021

Published Date: 2024	SDDOT	LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
			Sheet 1 of 1



Conditions represented are for work that requires closings during daytime hours only.

This application is intended for a planned temporary closing not to exceed 15 to 20 minutes.

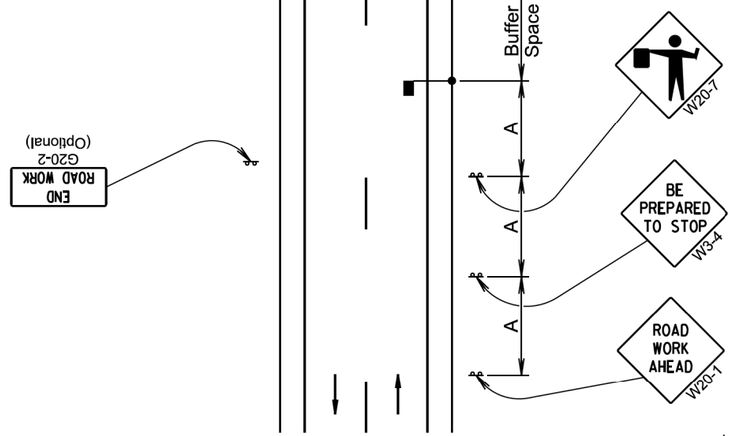
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000

Flagger

END ROAD WORK
G20-2
(Optional)

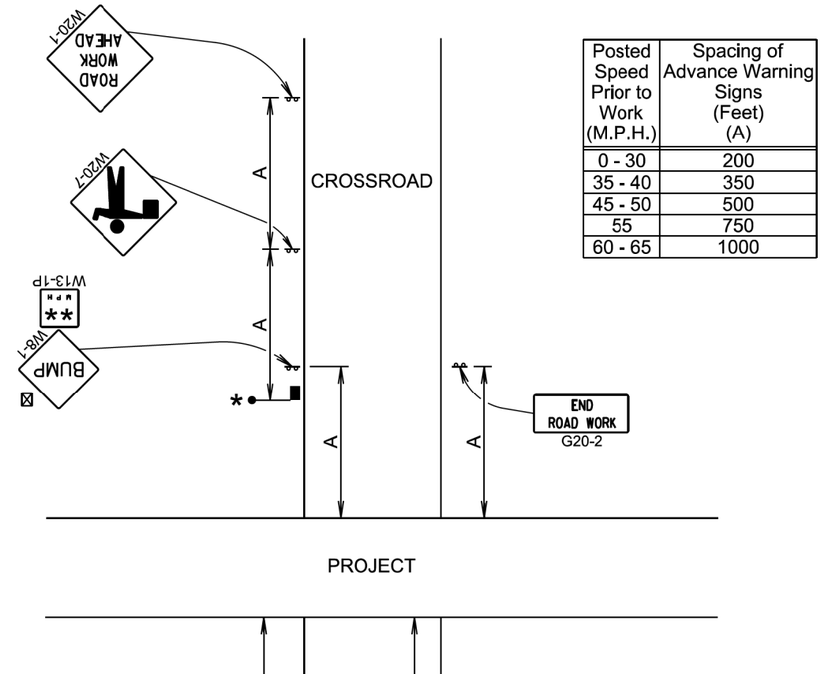
Posted Speed Prior to Work (M.P.H.)	Length of Longitudinal Buffer Space (Feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645

Buffer space dependent on work site limitations.



January 22, 2021

Published Date: 2024	SDDOT	TEMPORARY ROAD WORK	PLATE NUMBER 634.30
			Sheet 1 of 1



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

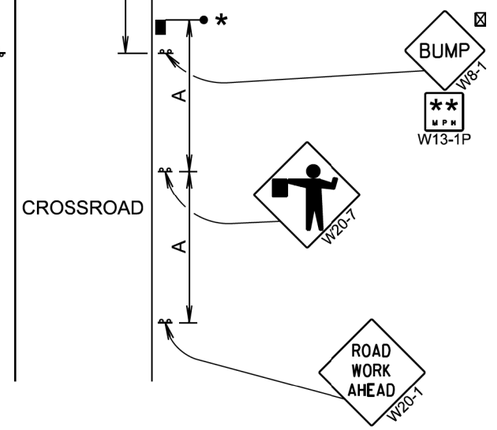
Flagger

** Need and safe speed to be determined on site by the Engineer.

* Need for flagger to be determined at the site by the Engineer. When flagger is used, the W20-7 sign will be installed.

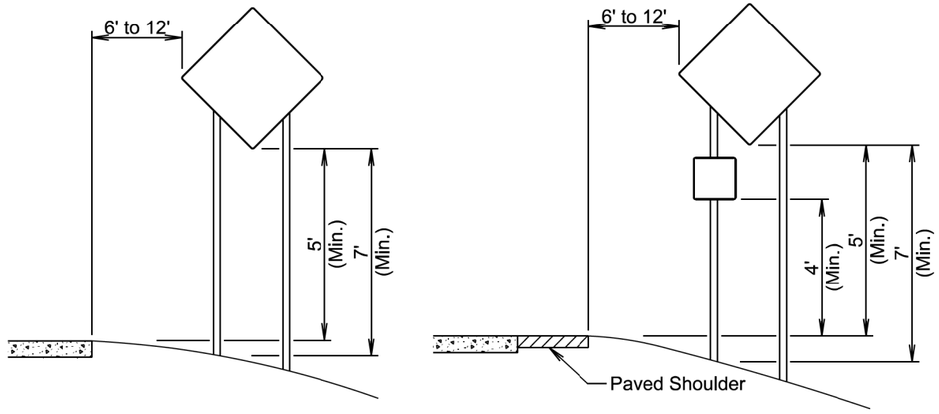
☒ Need for BUMP sign to be determined at the site.

The signing shown is applicable during that period when construction operations are in progress in the vicinity of the crossroad. Need for such signing at specific crossroad locations will be determined at the site by the Engineer.



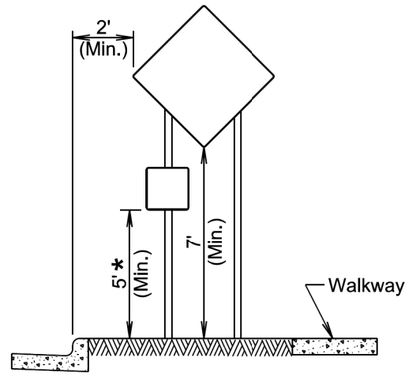
January 22, 2021

Published Date: 2024	SDDOT	PROJECT OPEN TO TRAFFIC FROM CROSSROAD	PLATE NUMBER 634.38
			Sheet 1 of 1

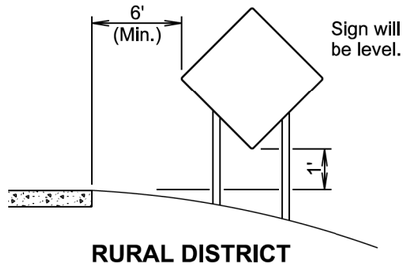


RURAL DISTRICT

RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

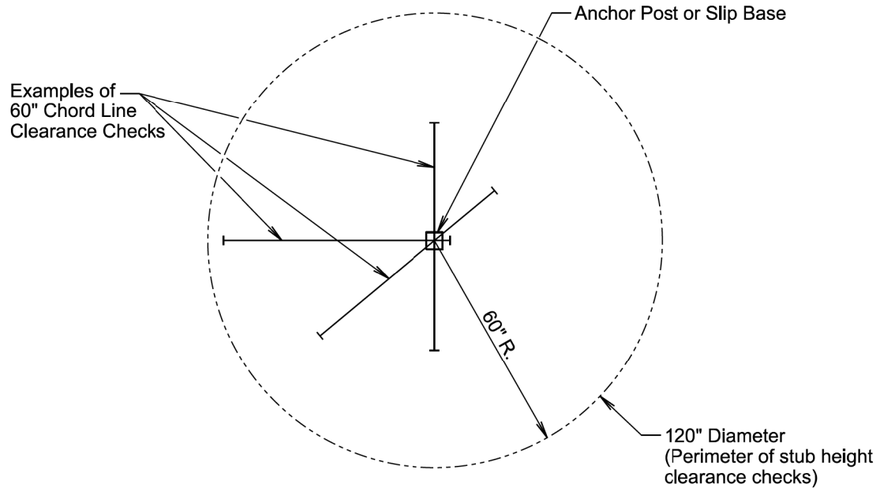


RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

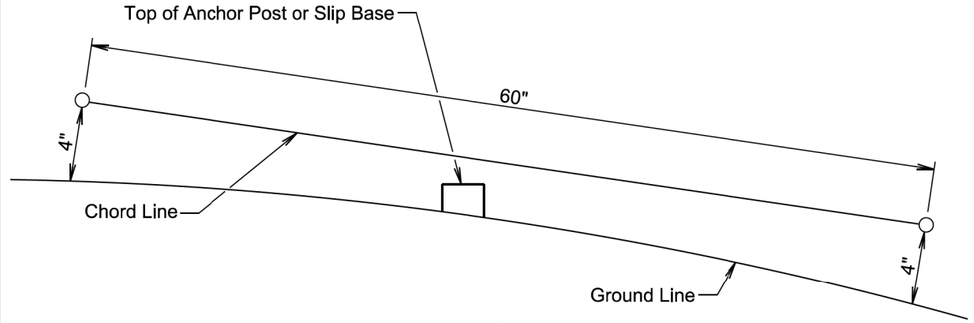
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

January 22, 2021

Published Date: 2024	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

The top of anchor posts and slip bases WILL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

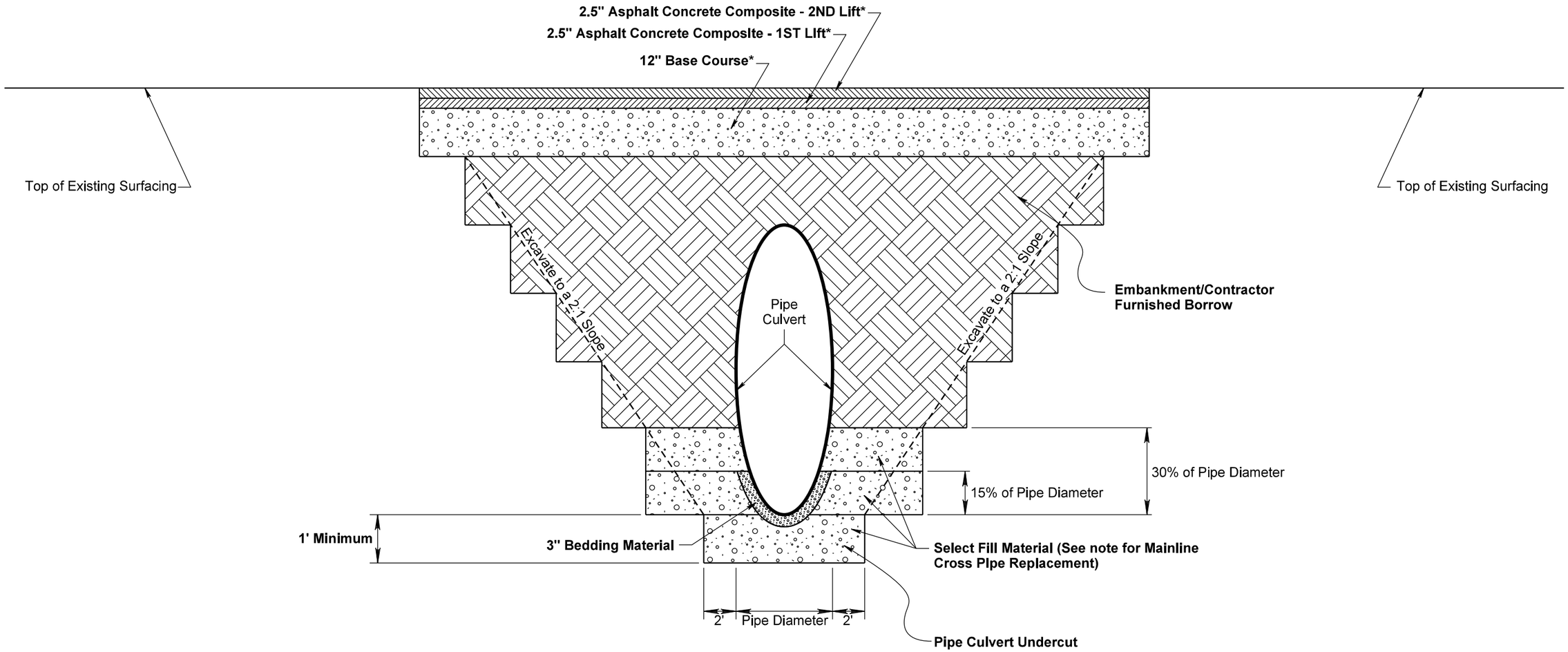
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

January 22, 2021

Published Date: 2024	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

LAYOUT OF EMBANKMENT AND SURFACING FOR CULVERT REPLACEMENT



* Quantity is included in the Table of Additional Quantities.

LAYOUT FOR PIPE INSERT IN EXISTING RC CATTLE PASS

Contractor Furnished Borrow

Controlled Density Fill

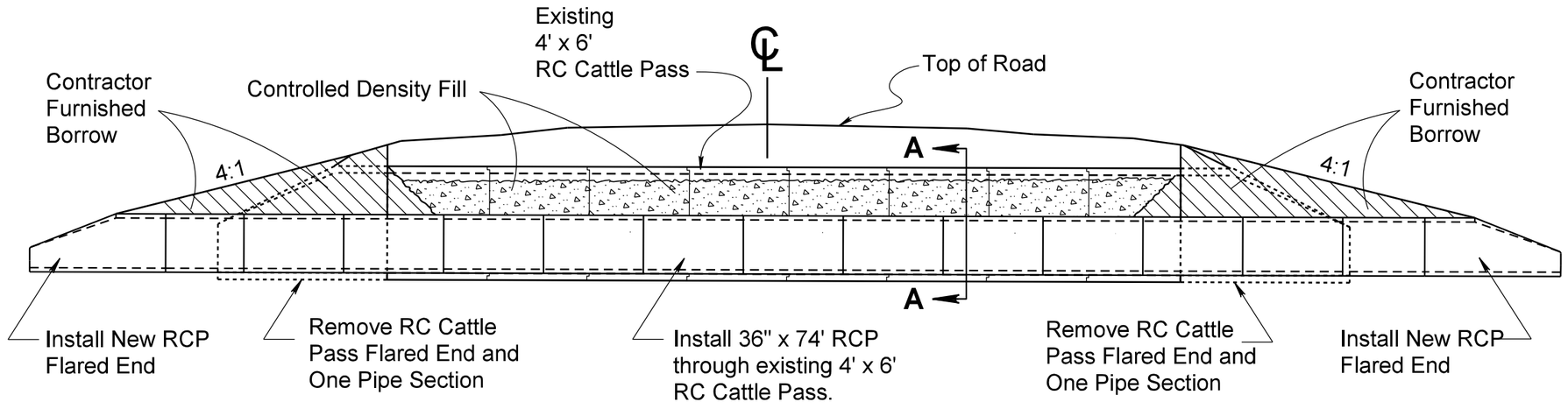
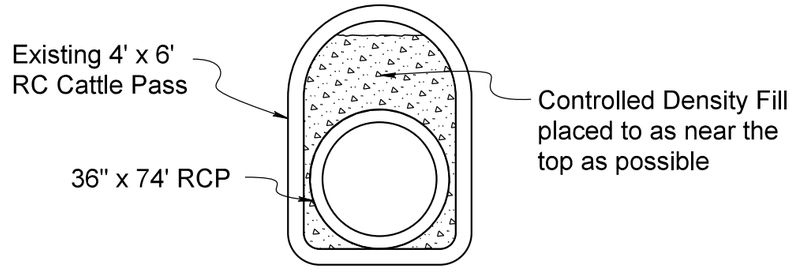


TABLE FOR EXISTING RC CATTLE PASS PIPE INSERTS

Project	Station	New RCP Size In	Contractor Furnished Borrow CuYd	Controlled Density Fill CuYd
NH 0037(164)24	87+79	36	^ 273	^ 13.7

^ Quantities are included in the Table for Mainline Culvert Work for NH 0037(164)24.

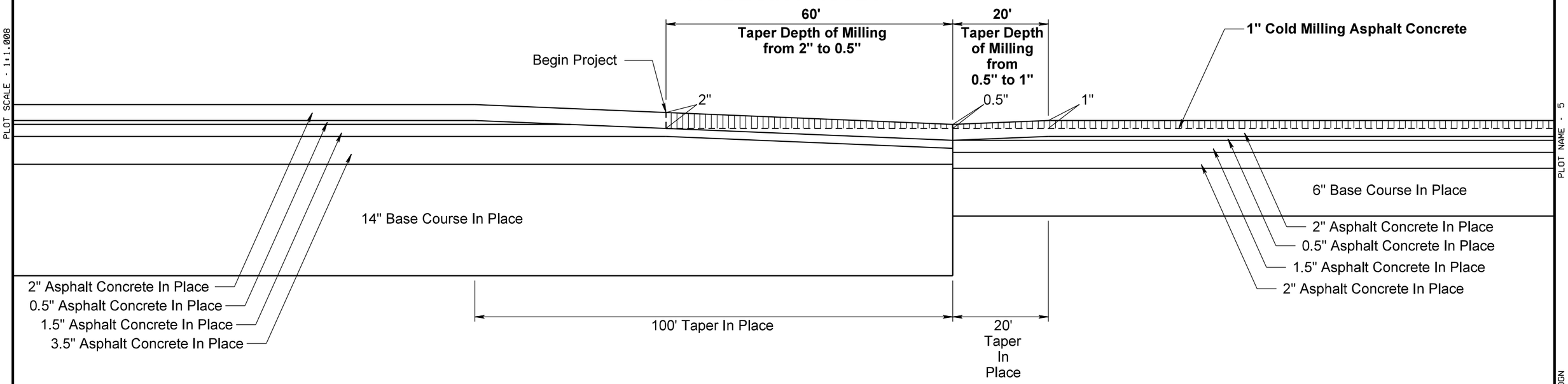
SECTION A-A



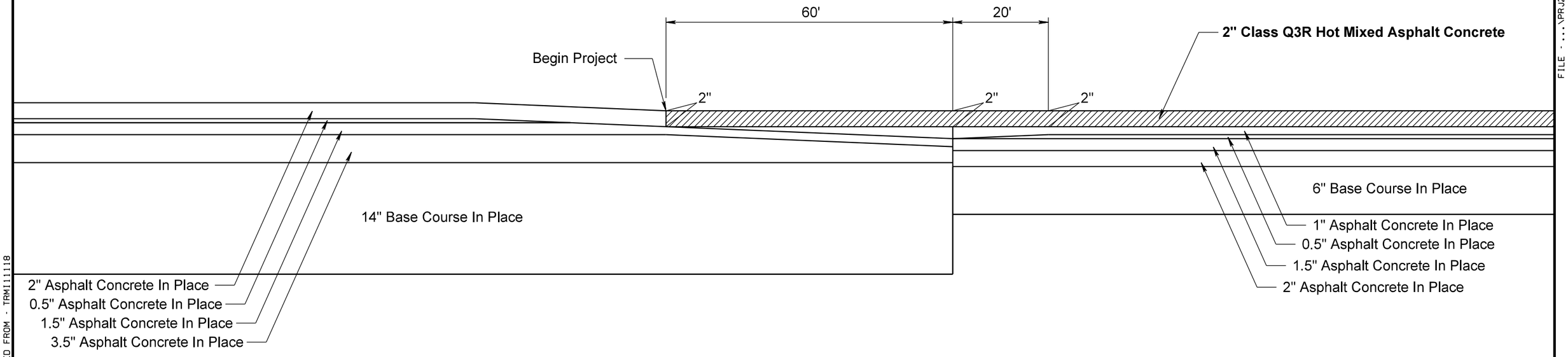
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0037(164)24	33	63

Plotting Date: 01/04/2024

DETAIL FOR COLD MILLING TAPER
AT BEGIN PROJECT



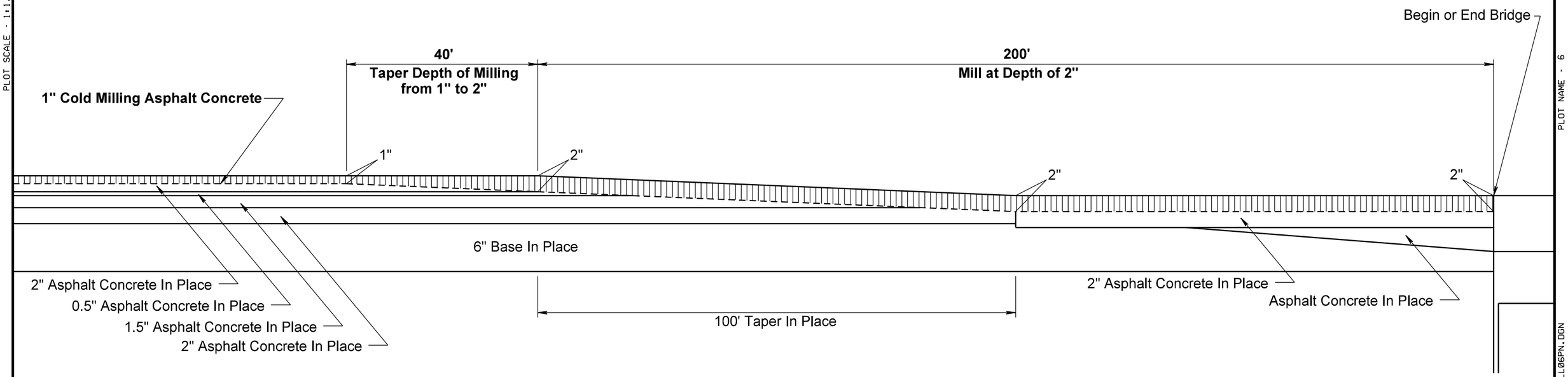
DETAIL FOR RESURFACING TAPER
AT BEGIN PROJECT



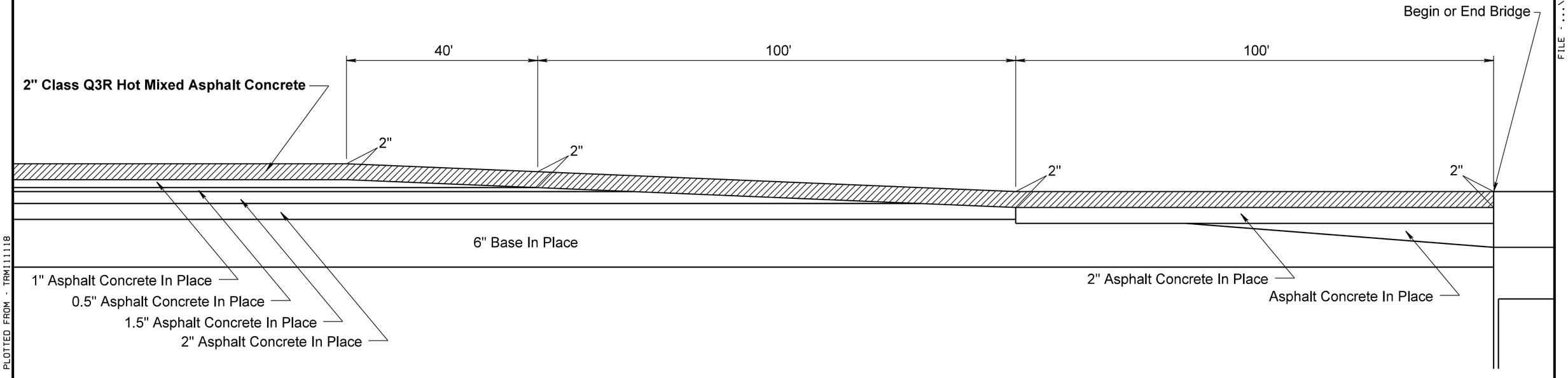
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0037(164)24	34	63

Plotting Date: 01/04/2024

DETAIL FOR COLD MILLING TAPER
AT BEGIN & END BRIDGES
(Str. No. 05-100-104 & Str. No. 05-100-118)



DETAIL FOR RESURFACING TAPER
AT BEGIN & END BRIDGES
(Str. No. 05-100-104 & Str. No. 05-100-118)



PLOT SCALE - 1:1.008

PLOT NAME - 6

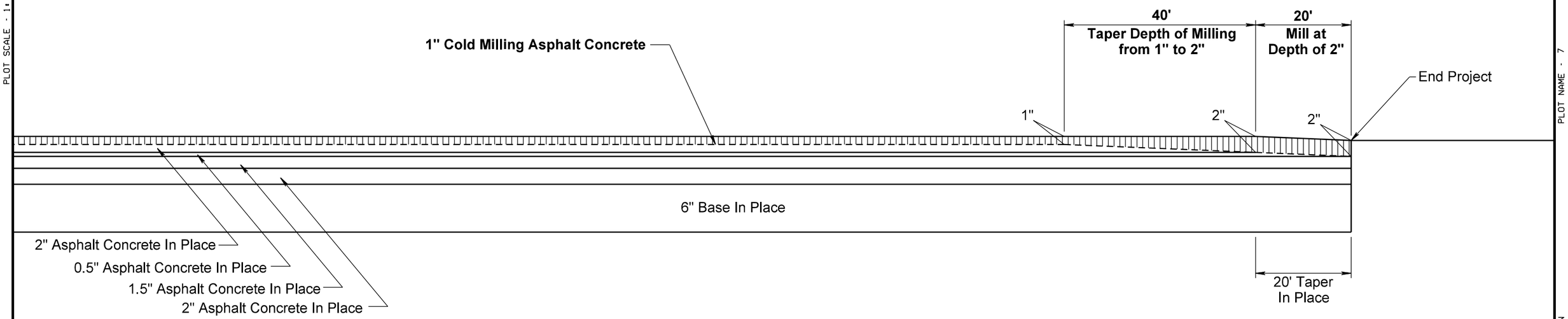
FILE - ...\PRJ2024\BONH06PN\M1LL06PN.DGN

PLOTTED FROM - TRM111118

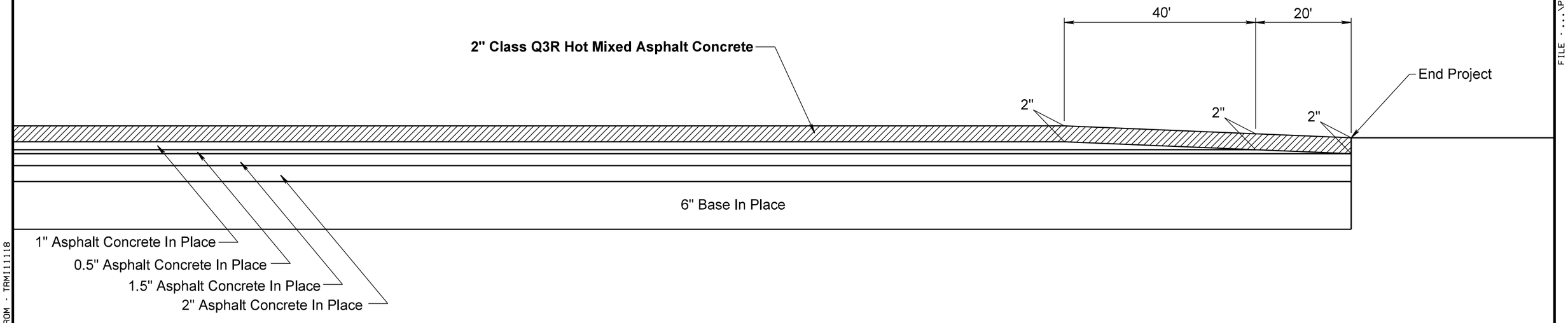
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0037(164)24	35	63

Plotting Date: 01/04/2024

DETAIL FOR COLD MILLING TAPER
AT END PROJECT



DETAIL FOR RESURFACING TAPER
AT END PROJECT



PLOT SCALE - 1:20

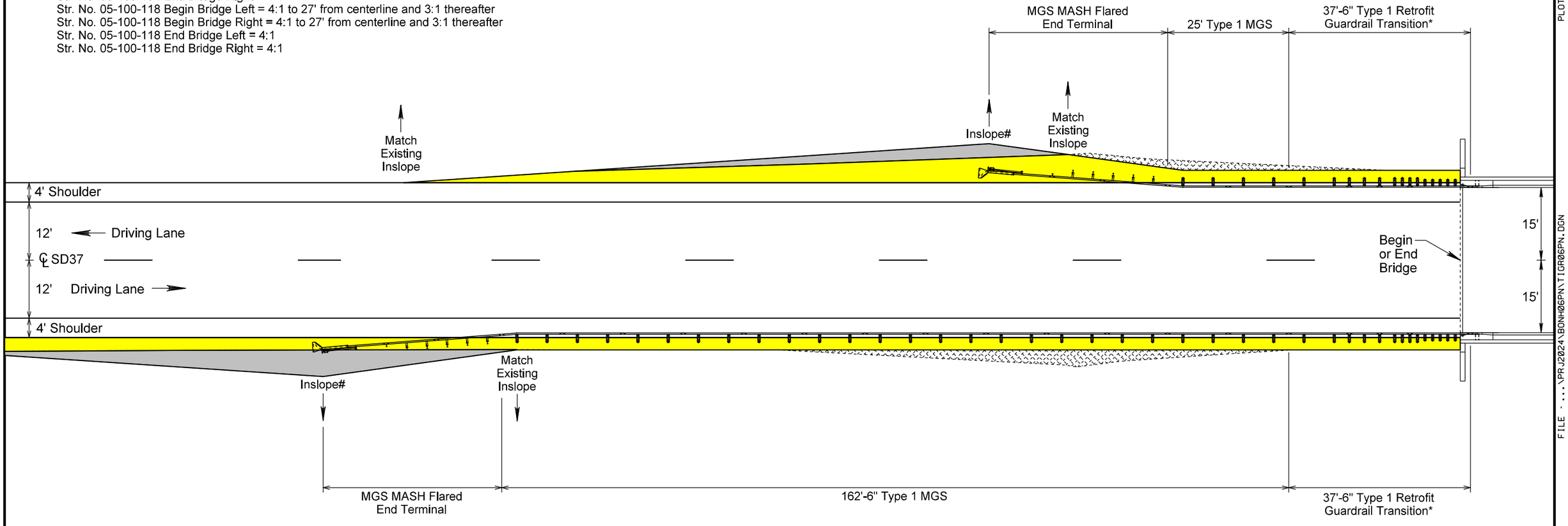
INSTALLATION OF GUARDRAIL

STR. NO. 05-100-104 SD37 MRM 26.08 &
STR. NO. 05-100-118 SD37 MRM 24.70

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0037(164)24	36	63

Plotting Date: 01/04/2024

Inslope:
Str. No. 05-100-104 Begin Bridge Left = 4:1
Str. No. 05-100-104 Begin Bridge Right = 4:1
Str. No. 05-100-104 End Bridge Left = 4:1
Str. No. 05-100-104 End Bridge Right = 4:1
Str. No. 05-100-118 Begin Bridge Left = 4:1 to 27' from centerline and 3:1 thereafter
Str. No. 05-100-118 Begin Bridge Right = 4:1 to 27' from centerline and 3:1 thereafter
Str. No. 05-100-118 End Bridge Left = 4:1
Str. No. 05-100-118 End Bridge Right = 4:1



Remove Asphalt Concrete Pavement

Remove Asphalt Concrete Pavement. Place 2" Class Q3R Hot Mixed Asphalt Concrete.

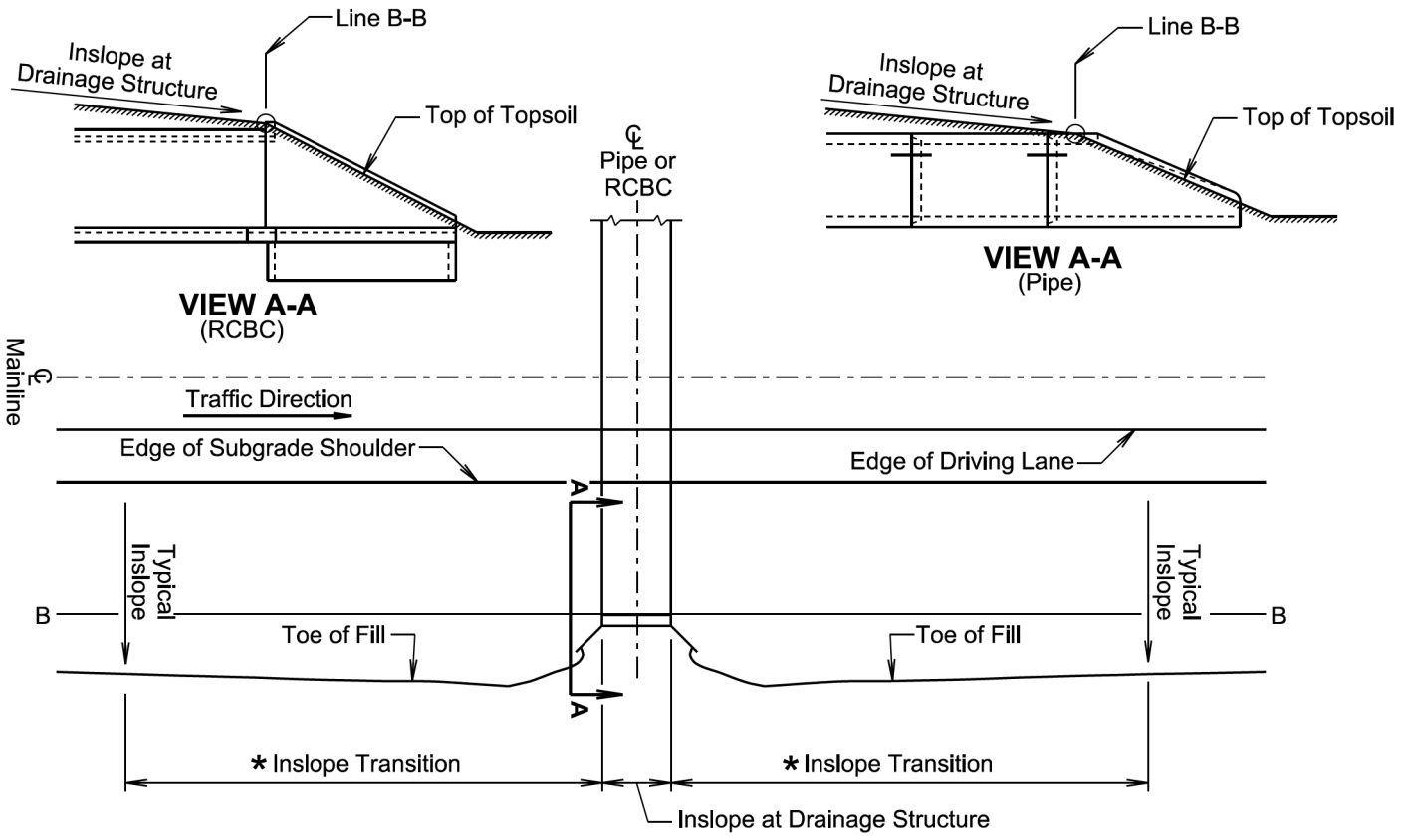
Place Contractor Furnished Borrow Excavation, 4" Base Course and 2" Class Q3R Hot Mixed Asphalt Concrete.

* 2'-1 1/4" of guardrail overlaps onto structure.

PLOTTED FROM - TRMI11118

PLOT NAME - 8

FILE - ...\PRJ2024\BONH06PN\TIGR06PN.DGN



TYPE 1 INSLOPE TRANSITION

GENERAL NOTES:

This Type 1 Inslope Transition is used when the specified inslope at the drainage structure is flatter than the typical inslope and the inslope at the drainage structure is between a 4:1 slope and 6:1 slope.

Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.

* Transition from the typical inslope to the inslope at the drainage structure. Within the clear zone (area from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change. Example: transition from a 4:1 to a 6:1 would require a 200' length transition. The typical inslope outside of the clear zone will be transitioned gradually to the slope necessary adjacent to the RCBC wing wall or pipe culvert end section within the transition length necessary for the transition within the clear zone.

Published Date: 2024

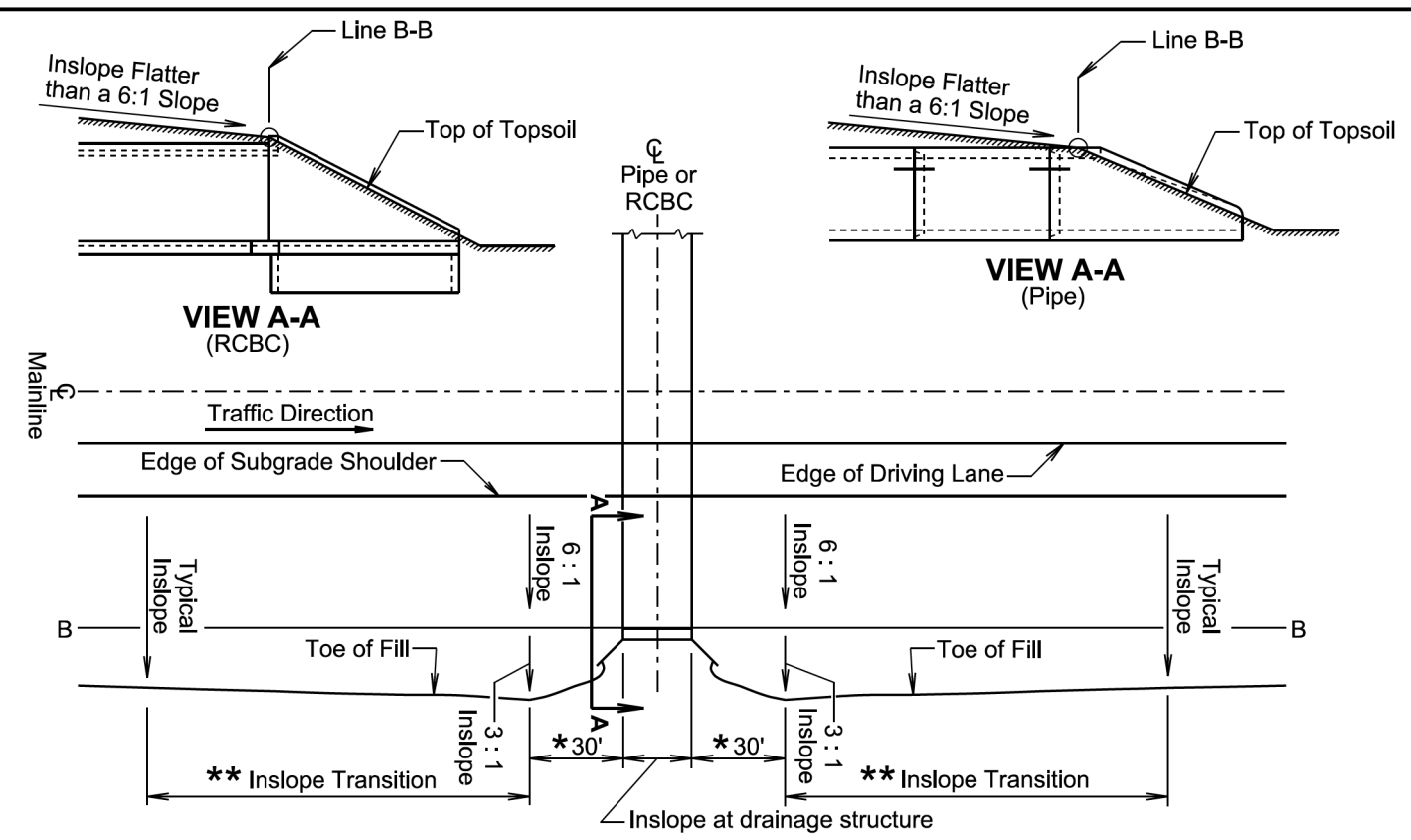
SDDOT

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER 120.05

Sheet 1 of 2

September 14, 2018



TYPE 2 INSLOPE TRANSITION

GENERAL NOTES:

This Type 2 Inslope Transition is used when the specified inslope at the pipe or RCBC is flatter than a 6:1 slope.

Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.

* Transition from Inslope at drainage structure to a 6 : 1 inslope and 3:1 inslope.

** Transition from typical inslope to the inslopes adjacent to the drainage structure. Within the clear zone (area from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change. Example: transition from a 4:1 to a 6:1 would require a 200' length transition. The typical inslope outside of the clear zone will be transitioned to a 3:1 inslope within the transition length necessary for the transition within the clear zone.

Published Date: 2024

SDDOT

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

PLATE NUMBER 120.05

Sheet 2 of 2

September 14, 2018

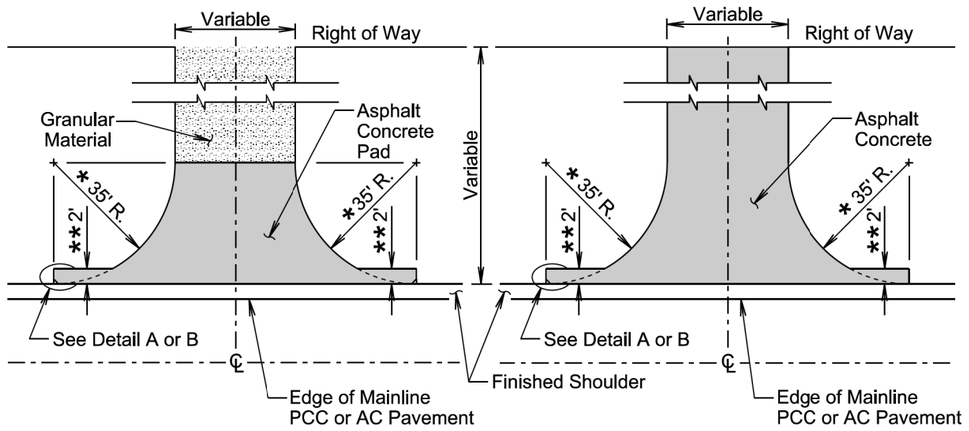
Plotting Date: 01/04/2024

STATE OF SOUTH DAKOTA

PROJECT NH 0037(164)24

SHEET 37

TOTAL SHEETS 63



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:

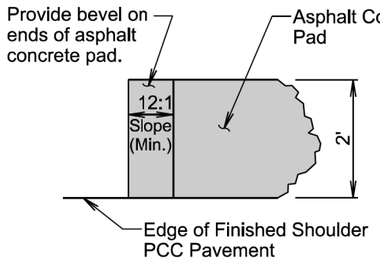
The precise construction limits for situations other than shown above will be determined by the Engineer during construction.

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

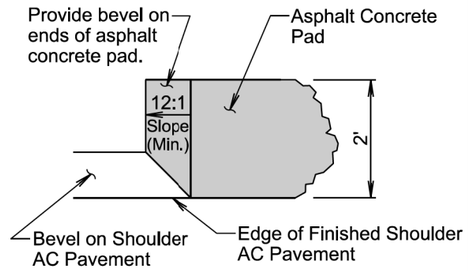
** The Contractor may adjust the screed of the paver during mainline paving operations to provide the 2-foot asphalt concrete pad or the Contractor may provide the 2-foot asphalt concrete pad during paving of the intersecting roads as shown above. The Engineer may eliminate the 2-foot asphalt concrete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

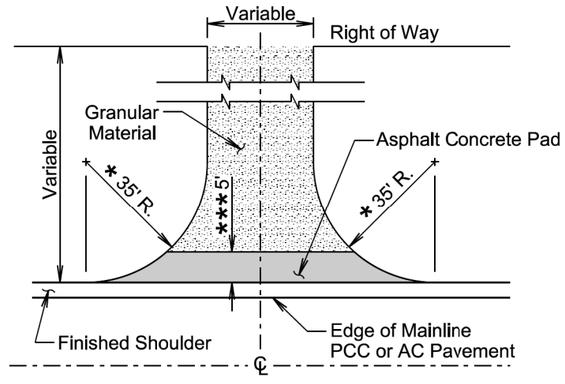
Published Date: 2024	SDDOT	SURFACING OR RESURFACING OF INTERSECTING ROADS AND ENTRANCES (MAINLINE AND SHOULDERS: PCC OR AC PAVEMENT)	PLATE NUMBER 320.04	Sheet 1 of 2



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



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

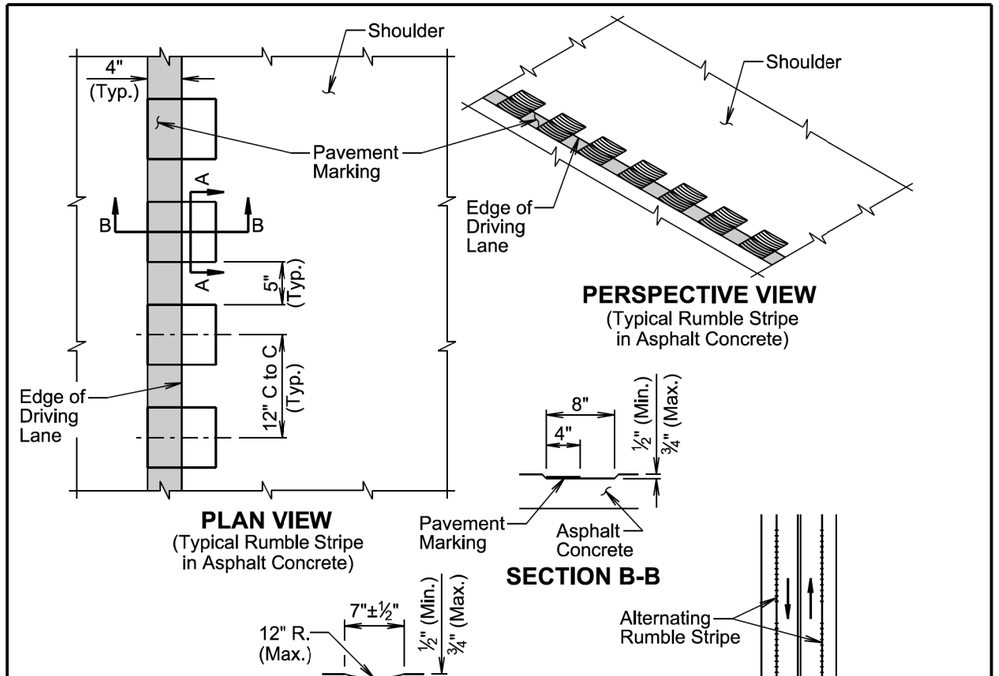


PLAN VIEW
(Entrance)

*** 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



GENERAL NOTES:

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

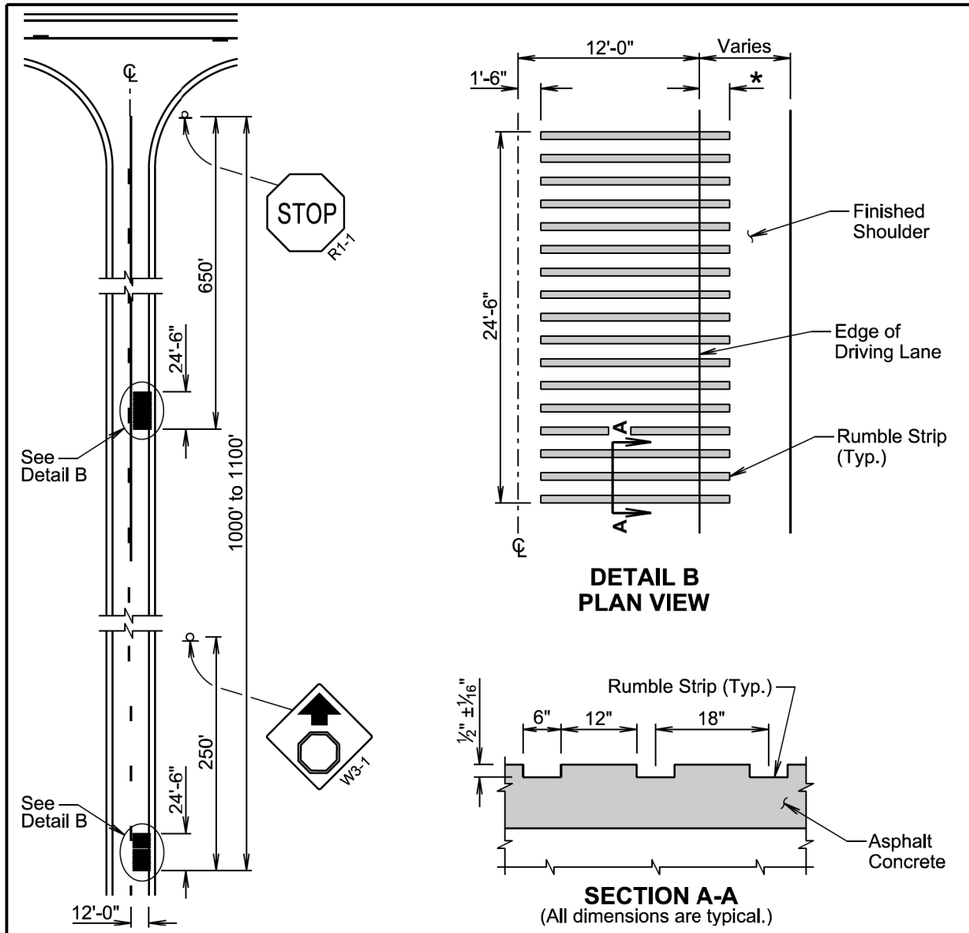
A rumble stripe will not be constructed through intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and railroad crossings. The lengths of the 40' segments with continuous indentations and the 12' segments without a rumble stripe adjacent to the intersecting roads, entrances,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

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

Measurement of the rumble stripe will be to the nearest 0.1 of a mile for each shoulder. Measurement and payment of the rumble stripe will include the 12' long segments without rumble stripes and the segments adjacent to intersecting roads, entrances, turnouts, bridge decks, bridge approach slabs, and railroad crossings without rumble stripes. Payment for constructing the rumble stripe will be at the contract unit price per mile for "Grind 8" Rumble Strip or Stripe in Asphalt Concrete".

September 14, 2019

Published Date: 2024	SDDOT	8" RUMBLE STRIPE IN ASPHALT CONCRETE ON NONDIVIDED HIGHWAY SHOULDERS	PLATE NUMBER 320.20
			Sheet 1 of 1



GENERAL NOTES:

Transverse rumble strips will be constructed by grinding, routing, or cutting recessed indentations into the asphalt concrete as approved by the Engineer. The transverse rumble strips will receive a flush seal or fog seal as specified in the plans.

* The transverse rumble strips will extend into the finished shoulder as approved by the Engineer.

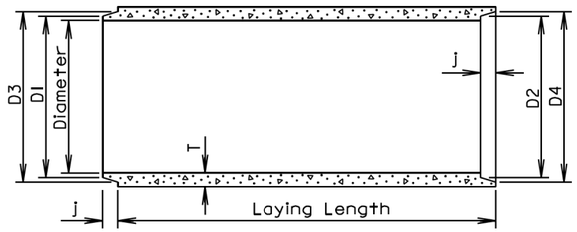
Measurement of the recessed transverse rumble strips will be to the nearest foot. Payment for constructing the recessed transverse rumble strips will be at the contract unit price per foot for "Grind 6" Transverse Rumble Strip in Asphalt Concrete".

January 22, 2021

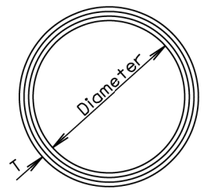
Published Date: 2024	SDDOT	TRANSVERSE RUMBLE STRIP IN ASPHALT CONCRETE HIGHWAY ADJACENT TO STOP CONTROLLED INTERSECTION	PLATE NUMBER 320.45
			Sheet 1 of 1

TOLERANCES IN DIMENSIONS

Diameter: ±1.5% for 24" Dia. or less and ±1% or 3/8" whichever is more for 27" Dia. or greater.
Diameters at joints: ± 3/16" for 30" Dia. or less and ± 1/4" for 36" or greater.
Length of joint (j): ± 1/4".
Wall thickness (T): not less than design T by more than 5% or 3/16", whichever is greater.
Laying length: shall not underrun by more than 1/2".



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

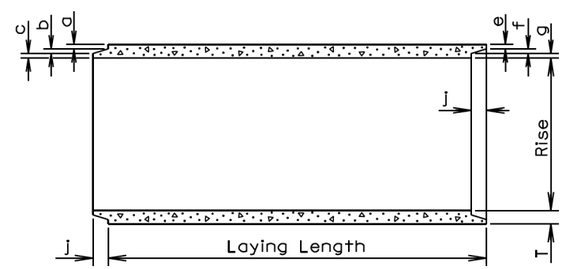
Construction of R. C. P. shall conform to the requirements of Section 990 of the Specifications.

Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

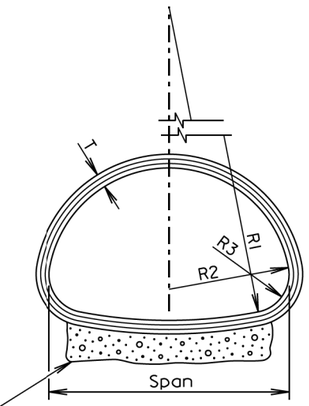
Diam. (in.)	Approx. Wt. /Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	3 1/4	3	29 1/4	29 5/8	30 1/4	30 5/8
30	384	3 1/2	3 1/4	32 3/8	32 3/4	33 1/2	33 7/8
36	524	4	3 3/4	38 3/4	39 1/4	40	40 1/2
42	685	4 1/2	4	45 1/8	45 5/8	46 1/2	47
48	867	5	4 1/2	51 1/2	52	53	53 1/2
54	1070	5 1/2	4 1/2	57 7/8	58 3/8	59 3/8	59 7/8
60	1296	6	5	64 1/4	64 3/4	66	66 1/2
66	1542	6 1/2	5 1/2	70 5/8	71 1/8	72 1/2	73
72	1810	7	6	77	77 1/2	79	79 1/2
78	2098	7 1/2	6 1/2	83 3/8	83 7/8	85 5/8	86 1/8
84	2410	8	7	89 3/4	90 1/4	92 1/8	92 5/8
90	2740	8 1/2	7	95 3/4	96 1/4	98 1/8	98 5/8
96	2950	9	7	102 1/8	102 5/8	104 1/2	105
102	3075	9 1/2	7 1/2	109	109 1/2	111 1/2	112
108	3870	10	7 1/2	115 1/2	116	118	118 1/2

June 26, 2015

Published Date: 2024	SDDOT	REINFORCED CONCRETE PIPE	PLATE NUMBER 450.01
			Sheet 1 of 1



LONGITUDINAL SECTION



END VIEW

TOLERANCES IN DIMENSIONS

Radial dimensions at joints: ± 1/8" for 65" span or less and ± 1/4" for longer spans.
Rise and Span: ±2% of tabular values.
Length of Joint (J): ± 1/4".
Wall thickness (T): not less than design T by more than 5% or 3/16", whichever is greater.
Laying length: shall not underrun by more than 1/2".

Gravel Bedding Material shall be supplied for 102" to 169" spans. It shall be placed to a thickness of 6" (Min.) x 85% of the Span x Length of culvert and shall conform to the gradation requirements for gravel surfacing except material may be screened or may be plan provided material.

* Size (in.)	Approx. Wt./Ft. (lb.)	Rise (in.)	Span (in.)	T (in.)	a (in.)	b (in.)	c (in.)	j (in.)	e (in.)	f (in.)	g (in.)	R1 (in.)	R2 (in.)	R3 (in.)
18	170	13 1/2	22	2 1/2	1 3/8	3/8	3/4	2	1 1/8	3/8	1	27 1/2	13 3/4	5 1/4
24	320	18	28 1/2	3 1/2	1 5/8	1/2	1 3/8	3	1 3/8	1/2	1 5/8	40 11/16	14 3/4	4 5/8
30	450	22 1/2	36 1/4	4	1 13/16	5/8	1 9/16	3 1/2	1 9/16	5/8	1 13/16	51	18 3/4	6 1/8
36	600	26 5/8	43 3/4	4 1/2	2	3/4	1 3/4	4	1 3/4	3/4	2	62	22 1/2	6 1/2
42	740	31 5/16	51 1/8	4 1/2	2	3/4	1 3/4	4	1 3/4	3/4	2	73	26 1/4	7 3/4
48	890	36	58 1/2	5	2 1/4	3/4	2	5	2	3/4	2 1/4	84	30	8 7/8
54	1100	40	65	5 1/2	2 1/2	3/4	2 1/4	5	2 1/4	3/4	2 1/2	92 1/2	33 3/8	10
60	1400	45	73 1/2	6	3 5/16	3/4	1 15/16	5	2 3/4	3/4	2 1/2	105	37 1/2	11
72	1900	54	88	7	3 13/16	1	2 3/16	6	3 1/4	1	2 3/4	126	45	13 5/16
84	2500	62	102	8	4 1/8	1	2 7/8	6	3 1/2	1	3 1/2	162 1/2	52	14 1/2
96	3300	78	122 3/8	9	4 1/2	1	3 1/2	7	4	1	4	218	62	20
108	4200	88	138 1/2	10	5	1	4	7	4 1/2	1	4 1/2	269	70	22
120	5100	96 7/8	154	11	5 1/2	1	4 1/2	7	5	1	5	301 3/8	78	24
132	5100	106 1/2	168 3/4	10		1	4	7	4 1/2	1	4 1/2	329	85 5/8	26 7/8

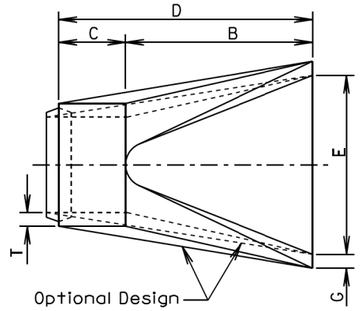
* Equivalent Diameter of Circular R. C. P.

GENERAL NOTES:

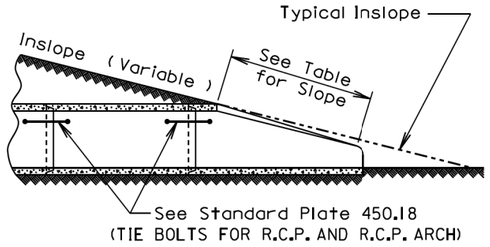
Construction of R.C.P. Arch shall conform to the requirements of Section 990 of the Specifications. Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

June 26, 2015

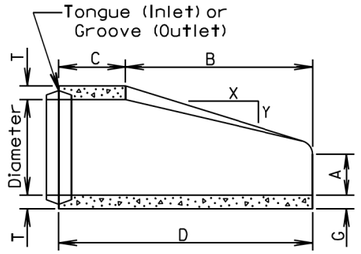
Published Date: 2024	SDDOT	REINFORCED CONCRETE PIPE ARCH	PLATE NUMBER 450.02
			Sheet 1 of 1



TOP VIEW



SLOPE DETAIL

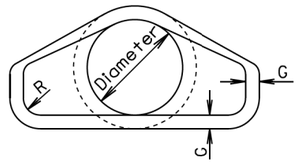


LONGITUDINAL SECTION

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.

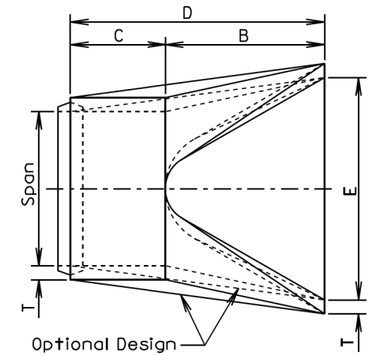


END VIEW

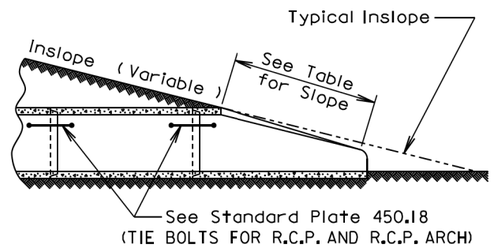
Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4:1	2	4	24	48 7/8	72 7/8	24	2	1 1/2
15	740	2.4:1	2 1/4	6	27	46	73	30	2 1/4	1 1/2
18	990	2.3:1	2 1/2	9	27	46	73	36	2 1/2	1 1/2
21	1280	2.4:1	2 3/4	9	36	37 1/2	73 1/2	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

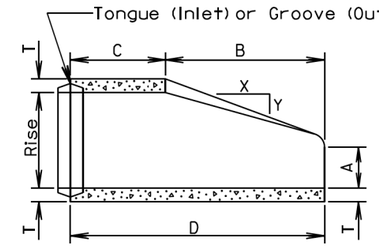
Published Date: 2024	SDDOT	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
			Sheet 1 of 1



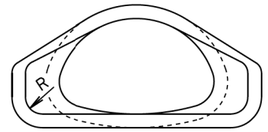
TOP VIEW



SLOPE DETAIL



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

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

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

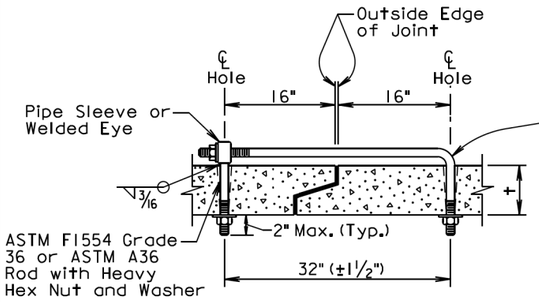
* Size (in.)	Approximate Weight of Section (lbs.)	Rise (in.)	Span (in.)	Slope (X:Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	R (in.)
18	1100	13 1/2	22	3:1	2 1/2	7	27	45	72	36	2
24	1750	18	28 1/2	3:1	3 1/2	8 1/2	39	33	72	48	3
30	3300	22 1/2	36 1/4	3:1	4	9 1/2	50	46	96	60	3
36	4350	26 5/8	43 3/4	3:1	4 1/2	1 1 1/8	60	36	96	72	6
42	5250	31 5/16	51 1/8	3:1	4 1/2	15 13/16	60	36	96	78	6
48	6400	36	58 1/2	3:1	5	21	60	36	96	84	6
54	7850	40	65	3:1	5 1/2	25 1/2	60	36	96	90	6
60	9500	45	73 1/2	3:1	6	31	60	36	96	96	6
72	13550	54	88	2:1	7	31	60	39	99	120	6
84	17950	62	102	2:1	8	28 1/2	83	19	102	144	6

*Equivalent Diameter of Circular R. C. P.

June 26, 2015

Published Date: 2024	SDDOT	R. C. P. ARCH FLARED ENDS	PLATE NUMBER 450.11
			Sheet 1 of 1

Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3¼	⅝	¾
3½-6½	¾	1
≥ 7	1	1¼



ADJUSTABLE EYE BOLT TIE

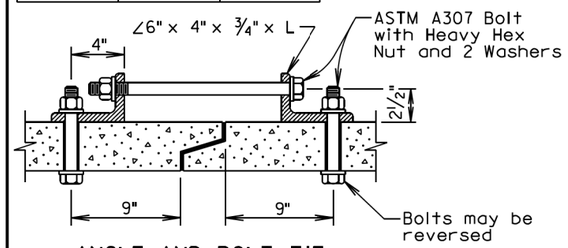
GENERAL NOTES:

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	¾
> 48	6	1



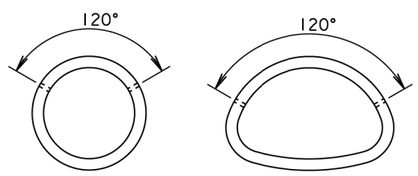
ANGLE AND BOLT TIE

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:

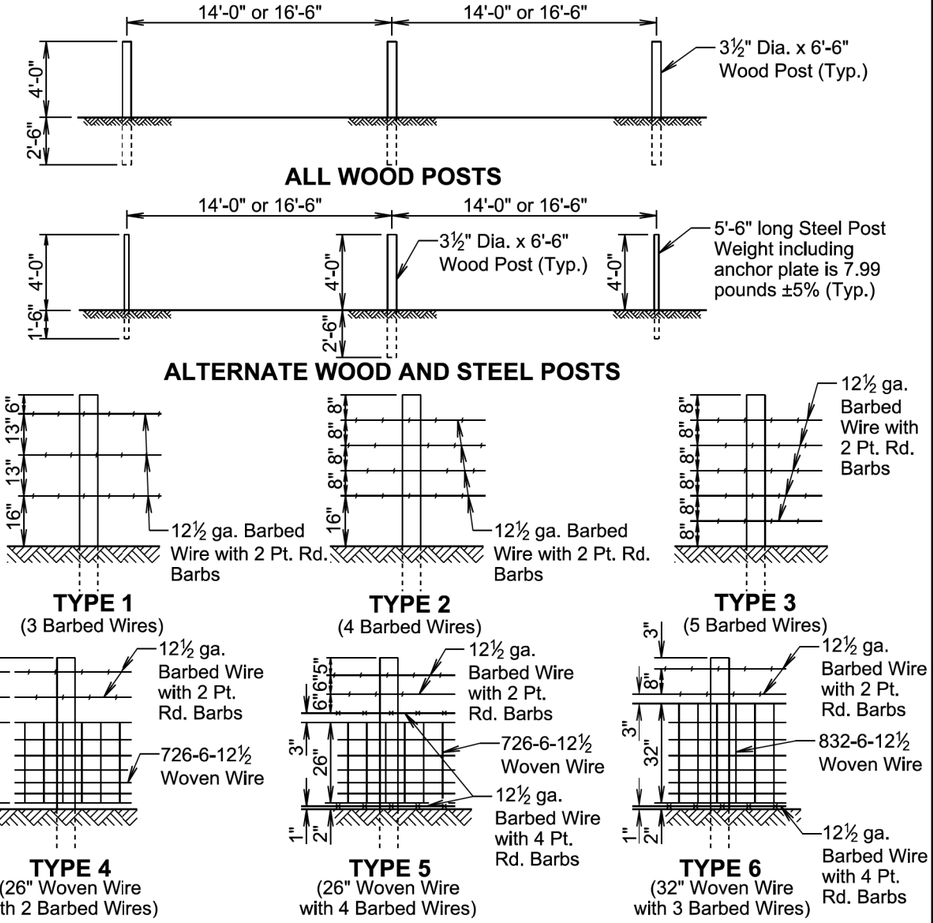
In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.

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



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:

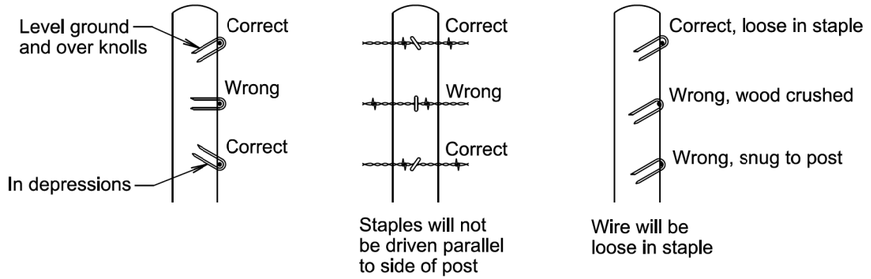
Fence types designated on the plans that are followed by the letter S will have smooth (barbless) wires.

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.

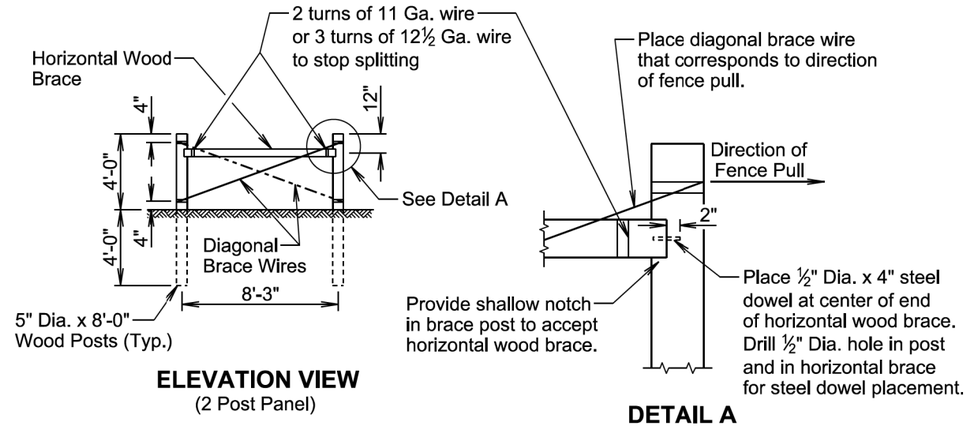
Right-of-Way fence other than on Interstate Projects will be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

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.

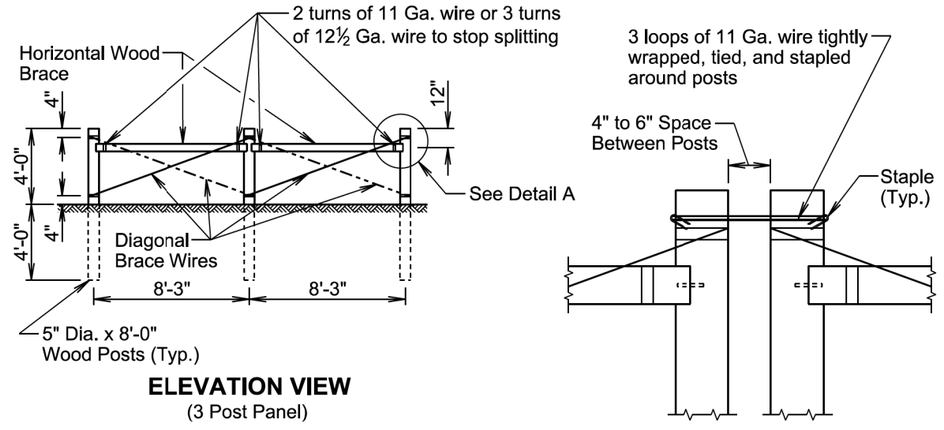
June 26, 2019

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.

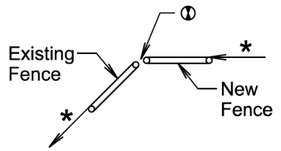
① See Detail B on Sheet 1 of 3.

GENERAL NOTE:

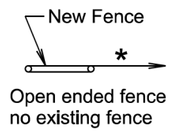
All degrees of curvature stated for fence are at centerline of roadway.

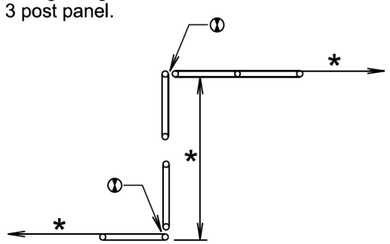
If fence length is less than 600' to next corner use a 2 post panel.

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

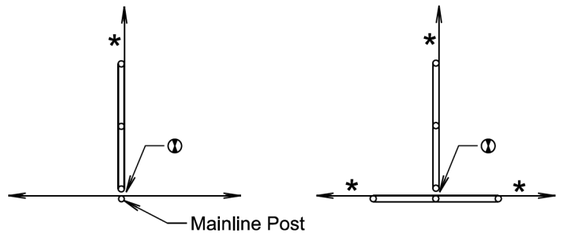


BEGIN OR END FENCE
(Where new fence ties into existing fence)

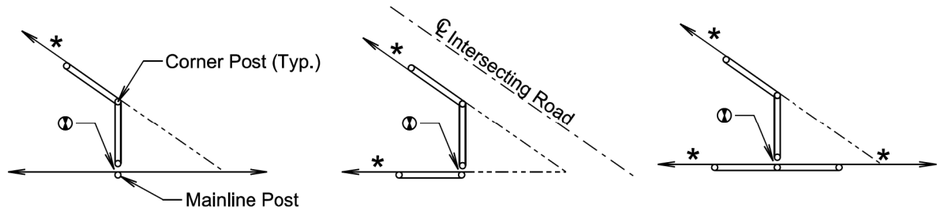




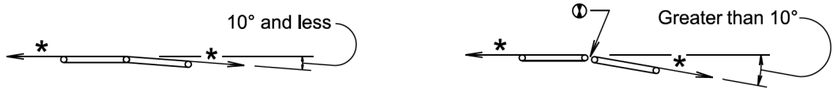
SHORT JOGS IN FENCE



CROSS FENCE



SHARP ANGLES IN CROSS FENCE



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

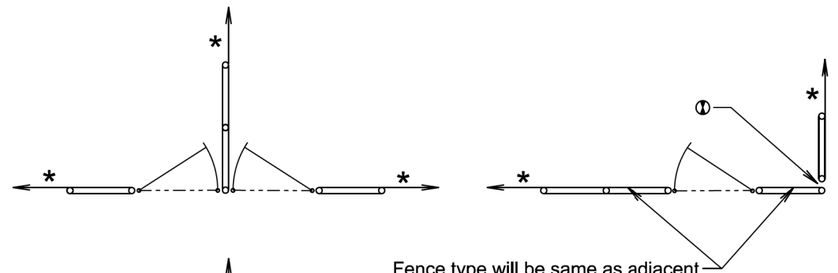
Additional fence panel is required when an angle in the mainline fence is greater than 10°.

ANGLES IN MAINLINE FENCE

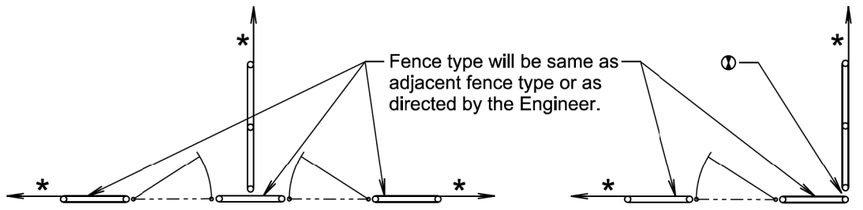
January 22, 2023

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.



DOUBLE ENTRANCES

ENTRANCES AT CORNERS

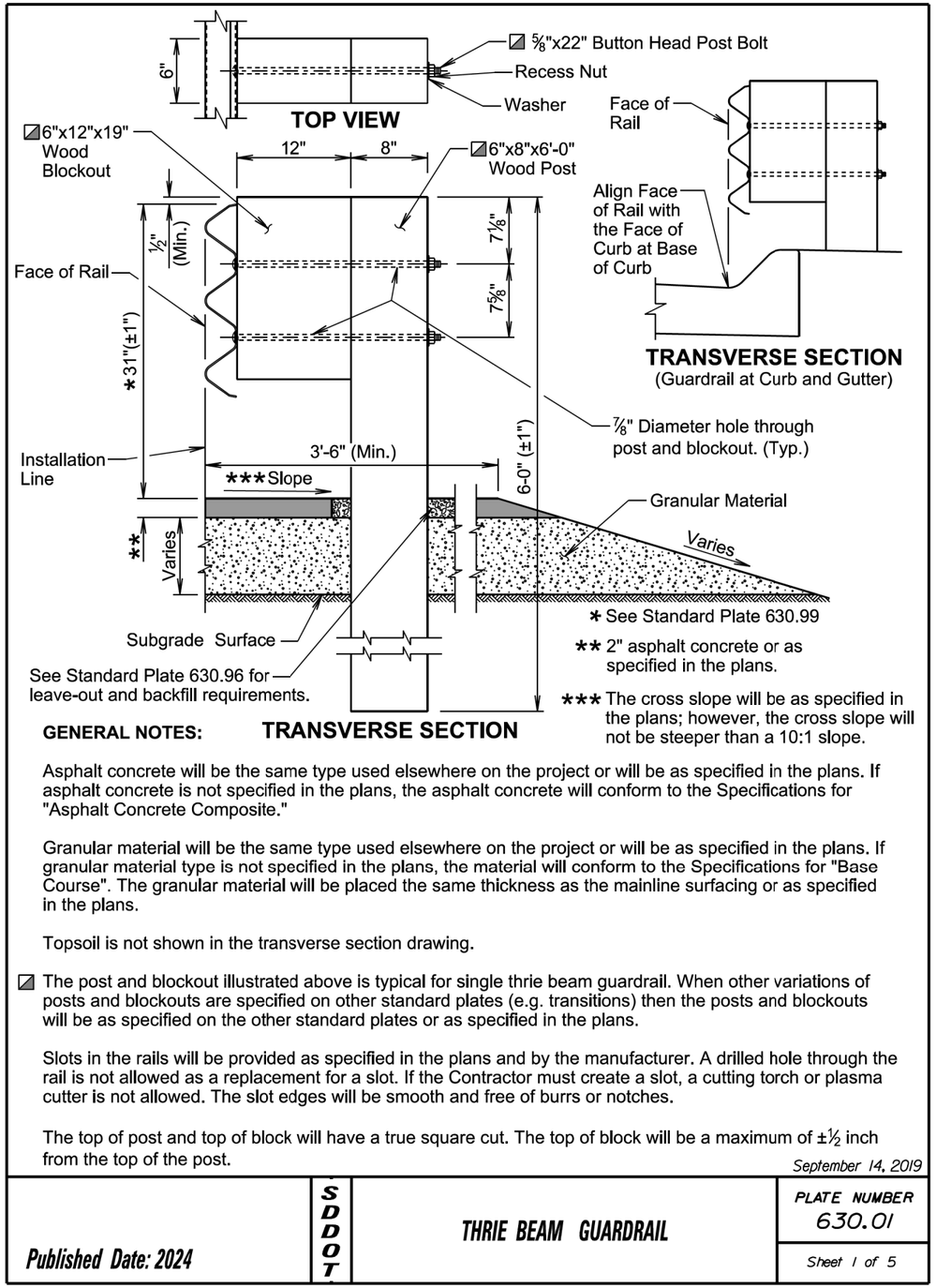
GATES

* 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



GENERAL NOTES:

Asphalt concrete will be the same type used elsewhere on the project or will be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete will conform to the Specifications for "Asphalt Concrete Composite."

Granular material will be the same type used elsewhere on the project or will be as specified in the plans. If granular material type is not specified in the plans, the material will conform to the Specifications for "Base Course". The granular material will be placed the same thickness as the mainline surfacing or as specified in the plans.

Topsoil is not shown in the transverse section drawing.

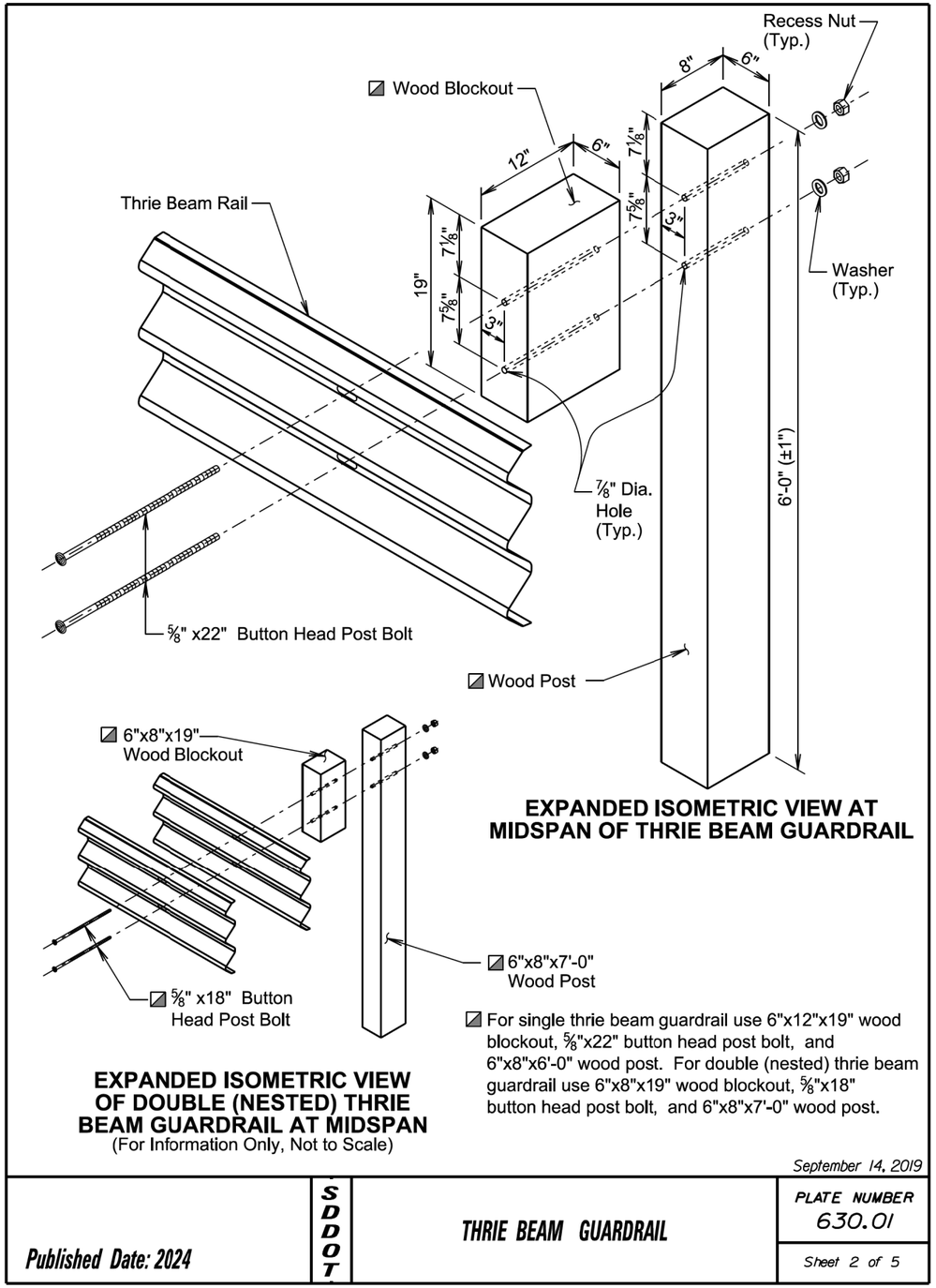
☑ The post and blockout illustrated above is typical for single thrie beam guardrail. When other variations of posts and blockouts are specified on other standard plates (e.g. transitions) then the posts and blockouts will be as specified on the other standard plates or as specified in the plans.

Slots in the rails will be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or notches.

The top of post and top of block will have a true square cut. The top of block will be a maximum of ±½ inch from the top of the post.

September 14, 2019

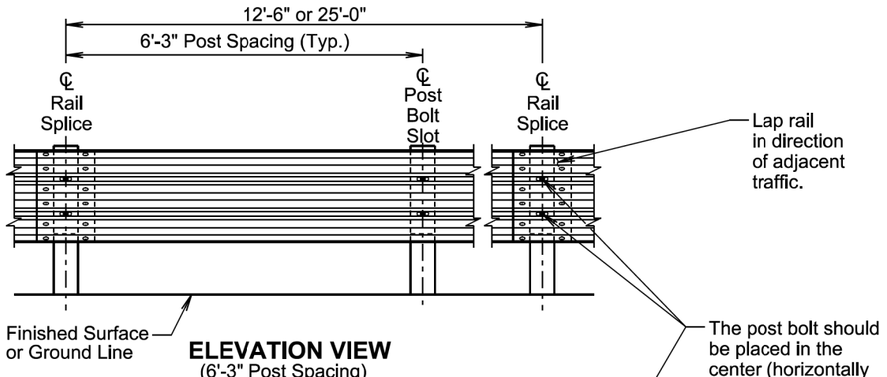
Published Date: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 1 of 5



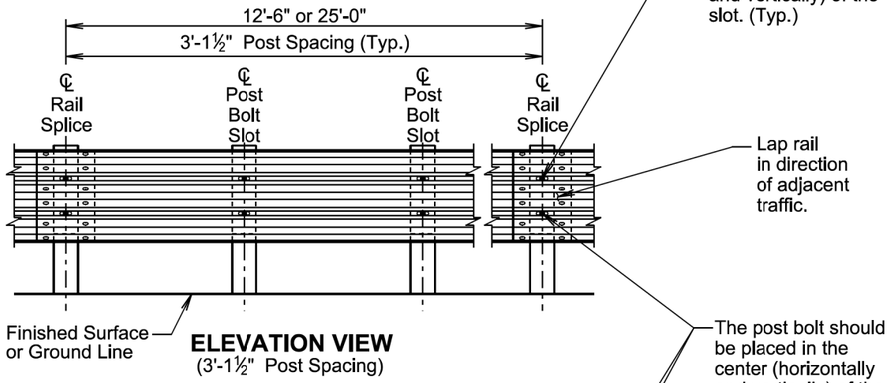
☑ For single thrie beam guardrail use 6"x12"x19" wood blockout, ⅝"x22" button head post bolt, and 6"x8"x6'-0" wood post. For double (nested) thrie beam guardrail use 6"x8"x19" wood blockout, ⅝"x18" button head post bolt, and 6"x8"x7'-0" wood post.

September 14, 2019

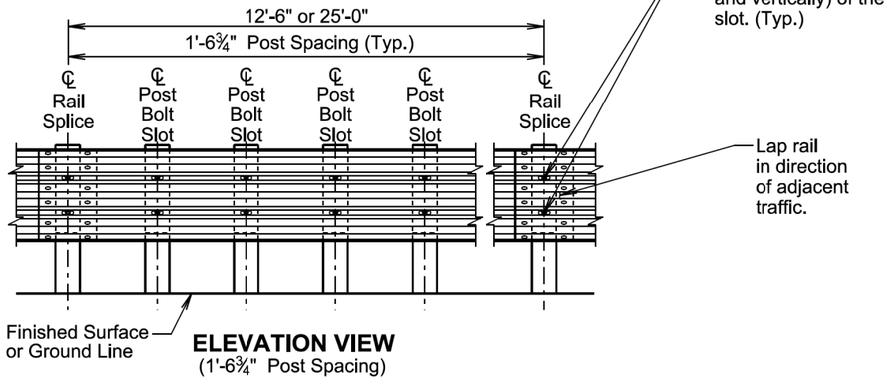
Published Date: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 2 of 5



ELEVATION VIEW
(6'-3" Post Spacing)



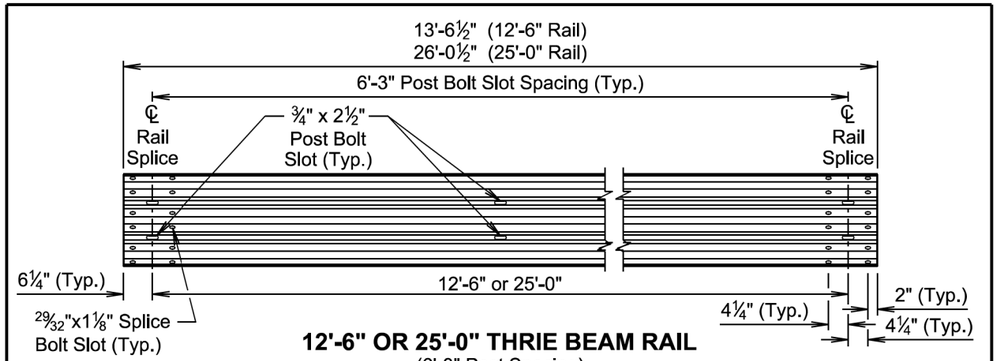
ELEVATION VIEW
(3'-1½" Post Spacing)



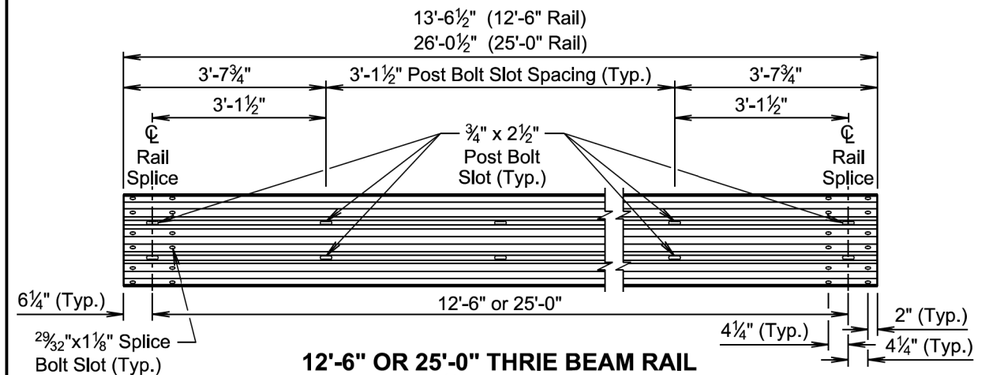
ELEVATION VIEW
(1'-6¾" Post Spacing)

September 14, 2019

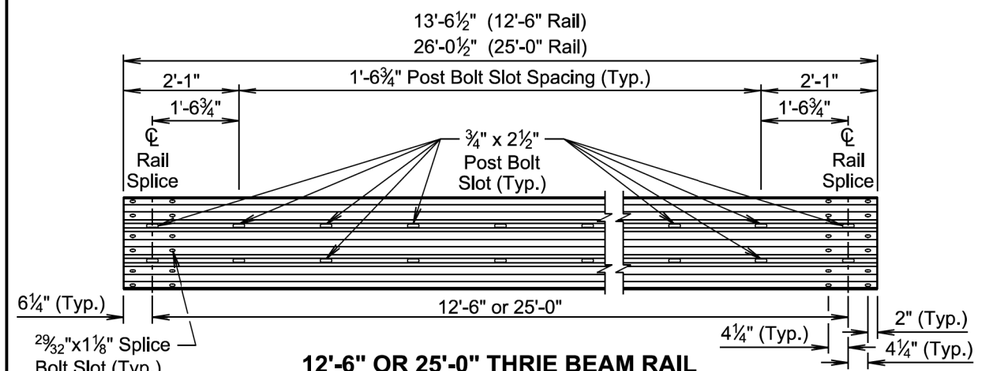
Published Date: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 3 of 5



12'-6" OR 25'-0" THRIE BEAM RAIL
(6'-3" Post Spacing)



12'-6" OR 25'-0" THRIE BEAM RAIL
(3'-1½" Post Spacing)

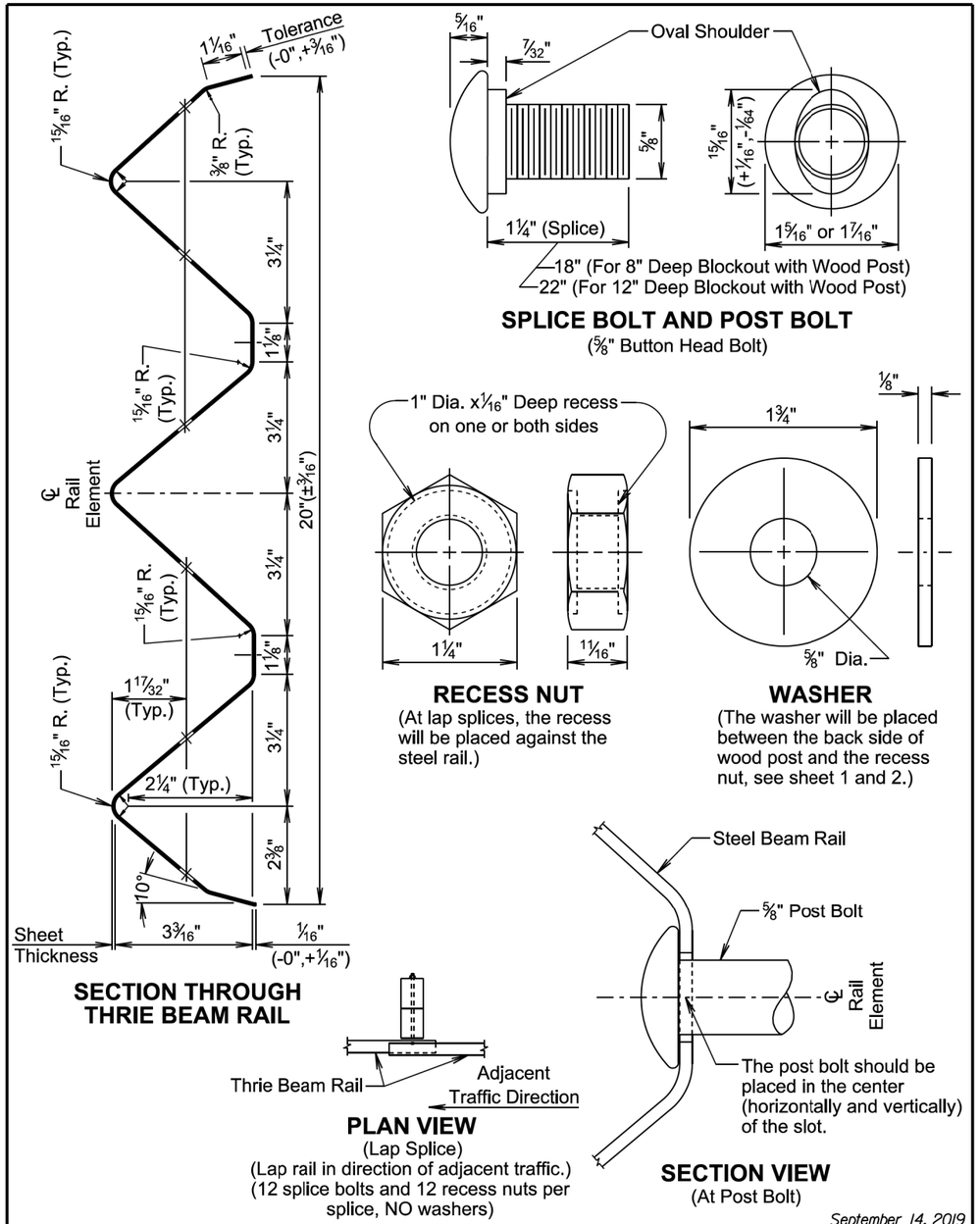


12'-6" OR 25'-0" THRIE BEAM RAIL
(1'-6¾" Post Spacing)

September 14, 2019

Published Date: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 4 of 5

PLOT SCALE - 1:200
PLOT NAME - 10
FILE - ...\STANDARDPLATES_06PN.DGN
_PLOTTED FROM - TRM111118



September 14, 2019

Published Date: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 5 of 5

TYPE AND DETAILS OF MGS

Type of MGS	W Beam Rail Single or Double (Nested)	Blockout Size	Blockout Material	Post Size	Post Material	Post Spacing
1	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	6'-3"
1C	Single	6"x12"x14"	Wood	6"x8"x7'-6"	Wood	6'-3"
2	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	3'-1½"
3	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	1'-6¾"
4	Double	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	6'-3"

STANDARD PLATE REFERENCE

Type of MGS	See Standard Plate(s)
1	630.20, 630.22
1C	630.20, 630.25
2	630.20
3	630.20
4	630.20

GENERAL NOTES:

Asphalt concrete will be the same type used elsewhere on the project or will be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete will conform to the Specifications for "Asphalt Concrete Composite".

Granular material will be the same type used elsewhere on the project or will be as specified in the plans. If granular material type is not specified in the plans, the material will conform to the Specifications for "Base Course". The granular material will be placed the same thickness as the mainline surfacing or as specified in the plans.

Topsoil is not shown in the transverse section drawing on sheet 2 of 6.

All W beam rail will be Type 1 and Class A (12 Ga.) unless specified otherwise in the plans.

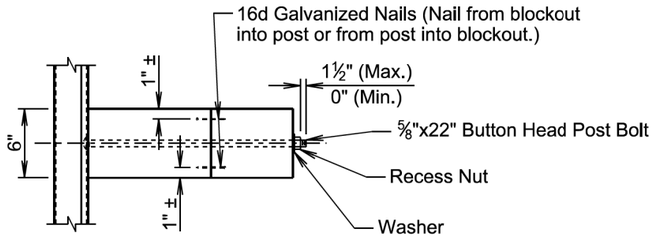
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used will be compatible with the total length of rail per site as shown in the plans.

Slots in the rails will be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or notches.

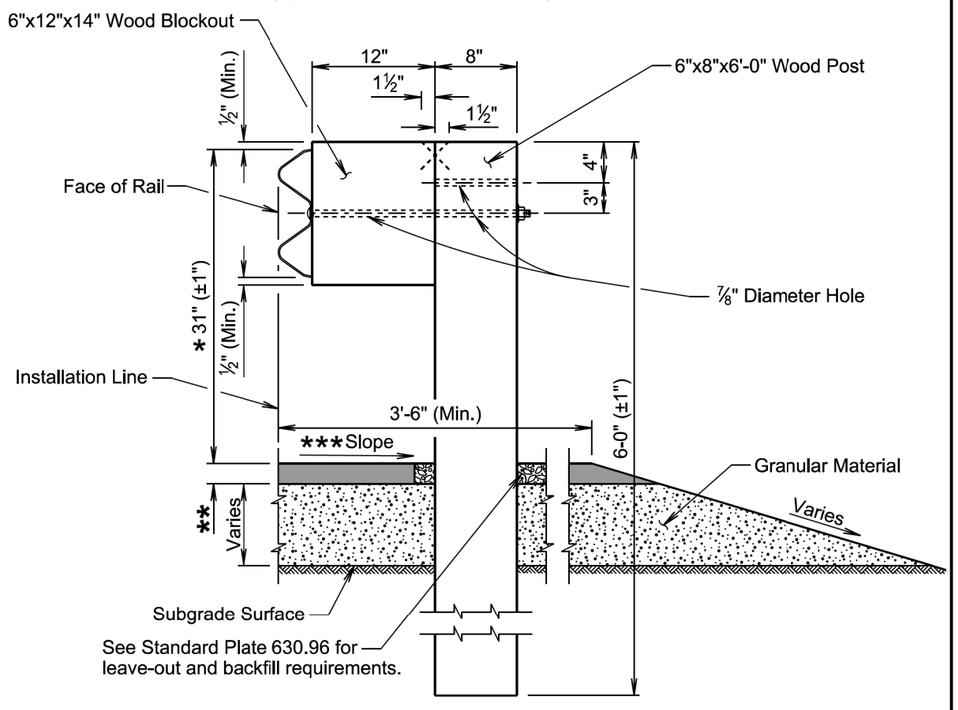
All costs for constructing the MGS including labor, equipment, and materials including all posts, blockouts, steel beam rail, and hardware will be incidental to the contract unit price per foot for the respective MGS contract item.

September 14, 2019

Published Date: 2024	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 1 of 6



TOP VIEW
(Type 1, 2, or 3 MGS Installation)



TRANSVERSE SECTION
(Type 1, 2, or 3 MGS Installation)

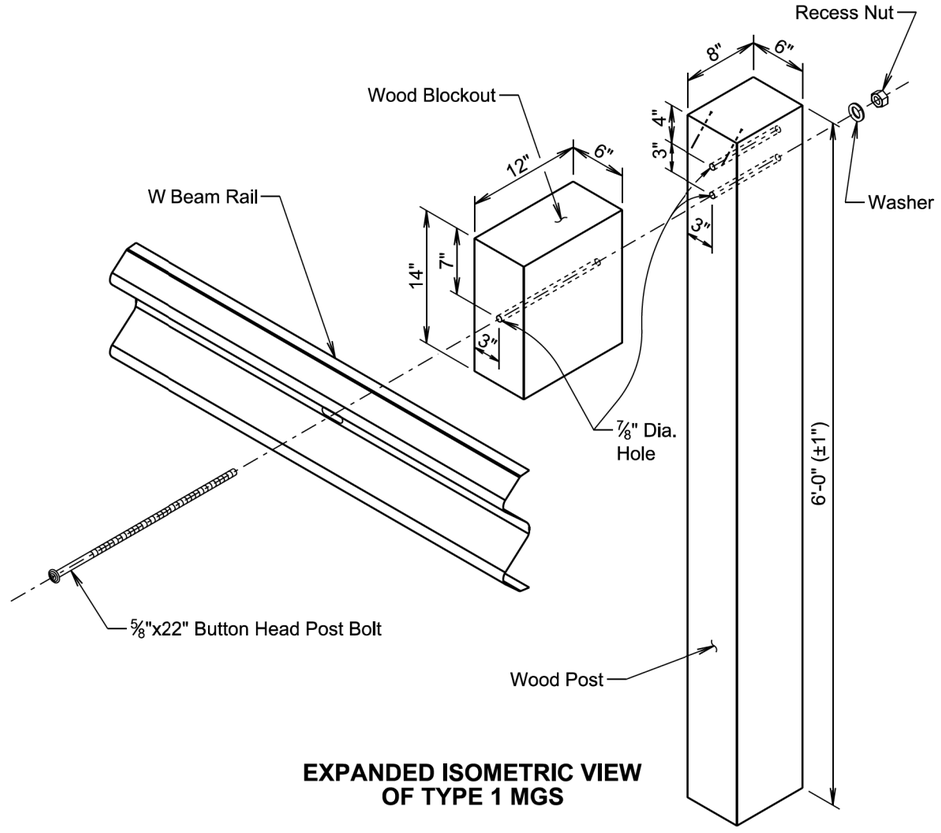
* See Standard Plate 630.99

** 2" asphalt concrete or as specified in the plans.

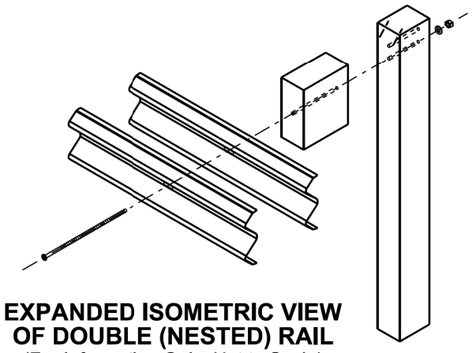
*** The cross slope will be as specified in the plans; however, the cross slope will not be steeper than a 10:1 slope.

September 14, 2019

Published Date: 2024	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20	Sheet 2 of 6



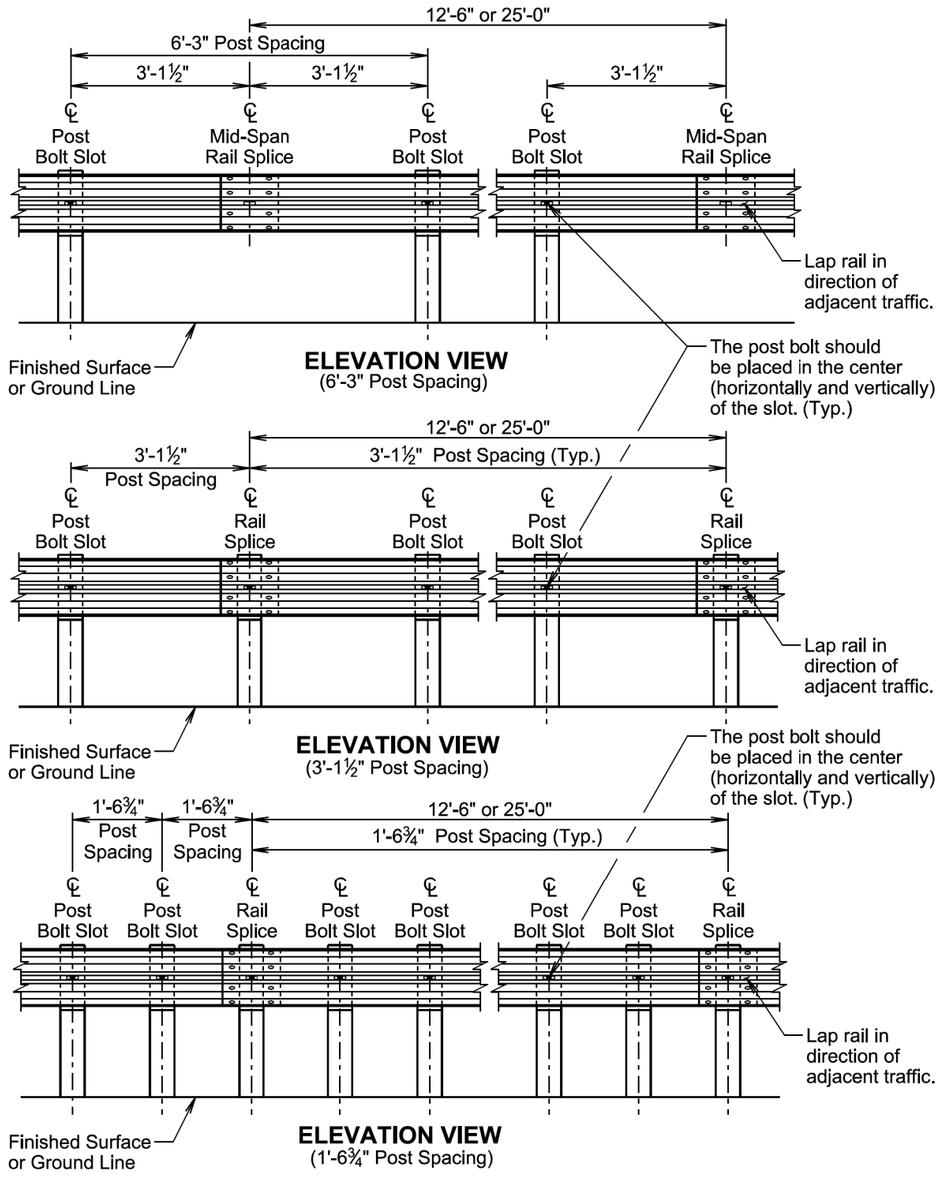
EXPANDED ISOMETRIC VIEW OF TYPE 1 MGS



EXPANDED ISOMETRIC VIEW OF DOUBLE (NESTED) RAIL
(For Information Only, Not to Scale)

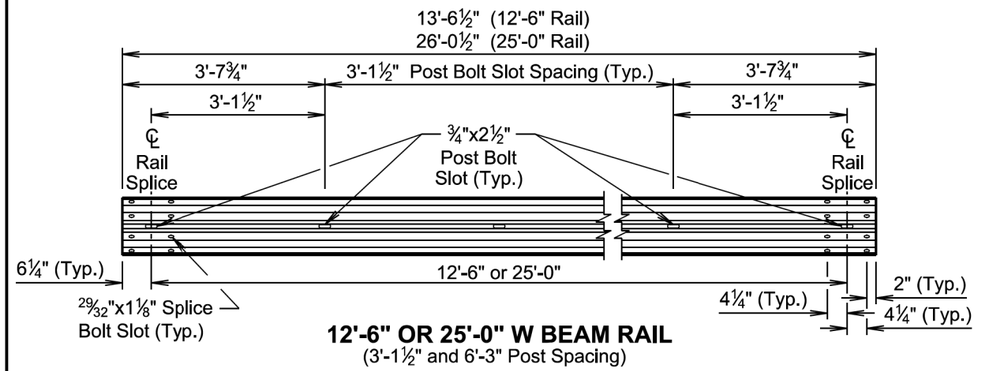
September 14, 2019

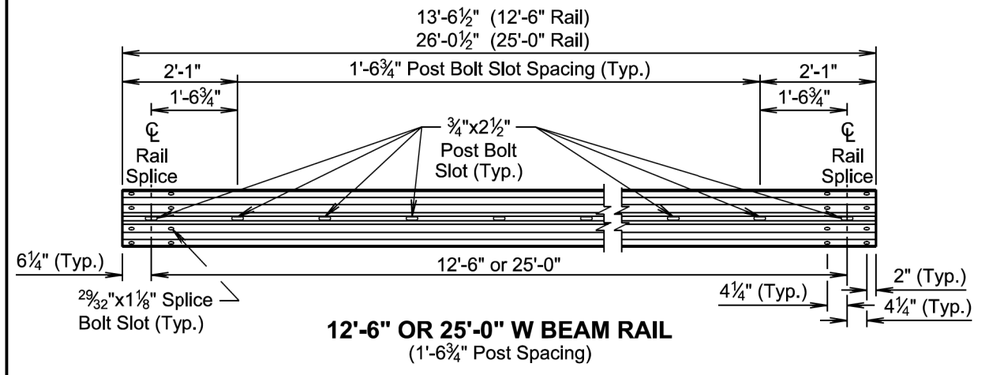
Published Date: 2024	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20	Sheet 3 of 6



September 14, 2019

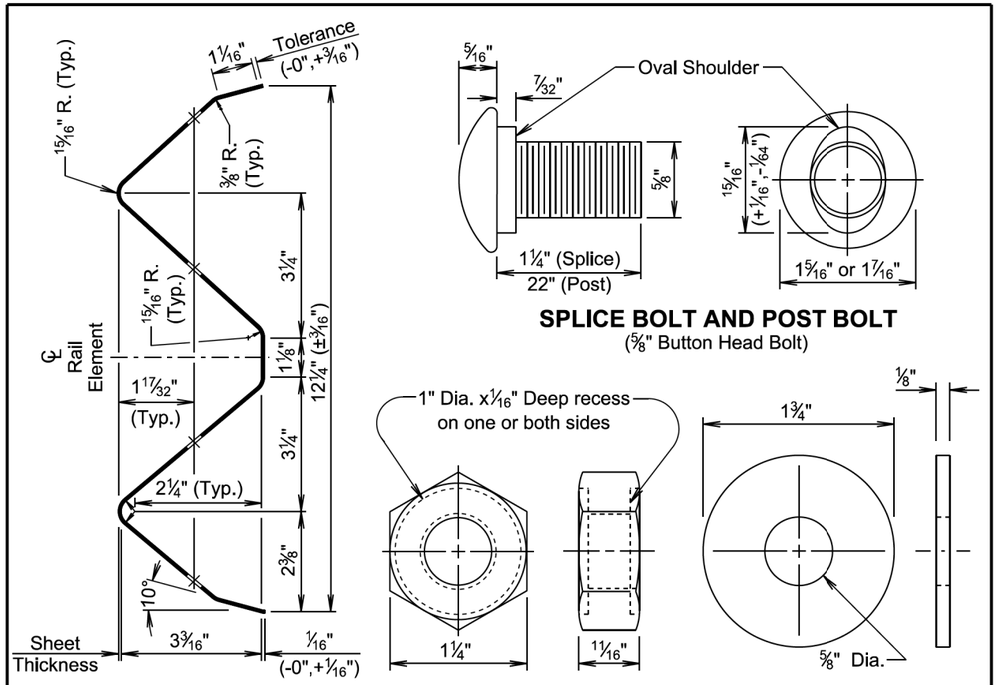
Published Date: 2024	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 4 of 6





September 14, 2019

Published Date: 2024	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 5 of 6



SECTION THROUGH W BEAM RAIL

SPLICE BOLT AND POST BOLT
(5/8" Button Head Bolt)

RECESS NUT
(At lap splices, the recess will be placed against the steel rail.)

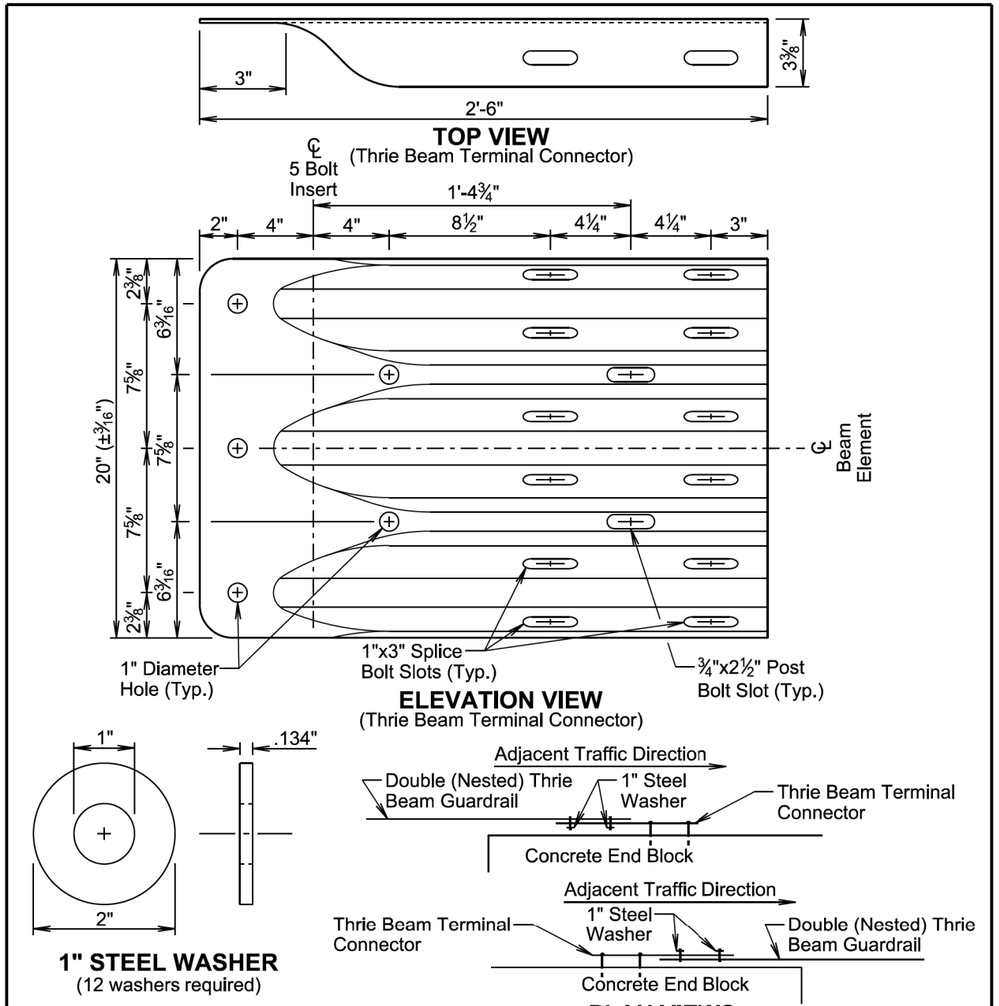
WASHER
(The washer will be placed between the back side of wood post and the recess nut, see sheet 2 and 3.)

PLAN VIEW
(Lap Splice)
(Lap rail in direction of adjacent traffic.)
(8 splice bolts and 8 recess nuts per splice, NO washers)

SECTION VIEW
(At Post Bolt)

September 14, 2019

Published Date: 2024	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 6 of 6



GENERAL NOTES:

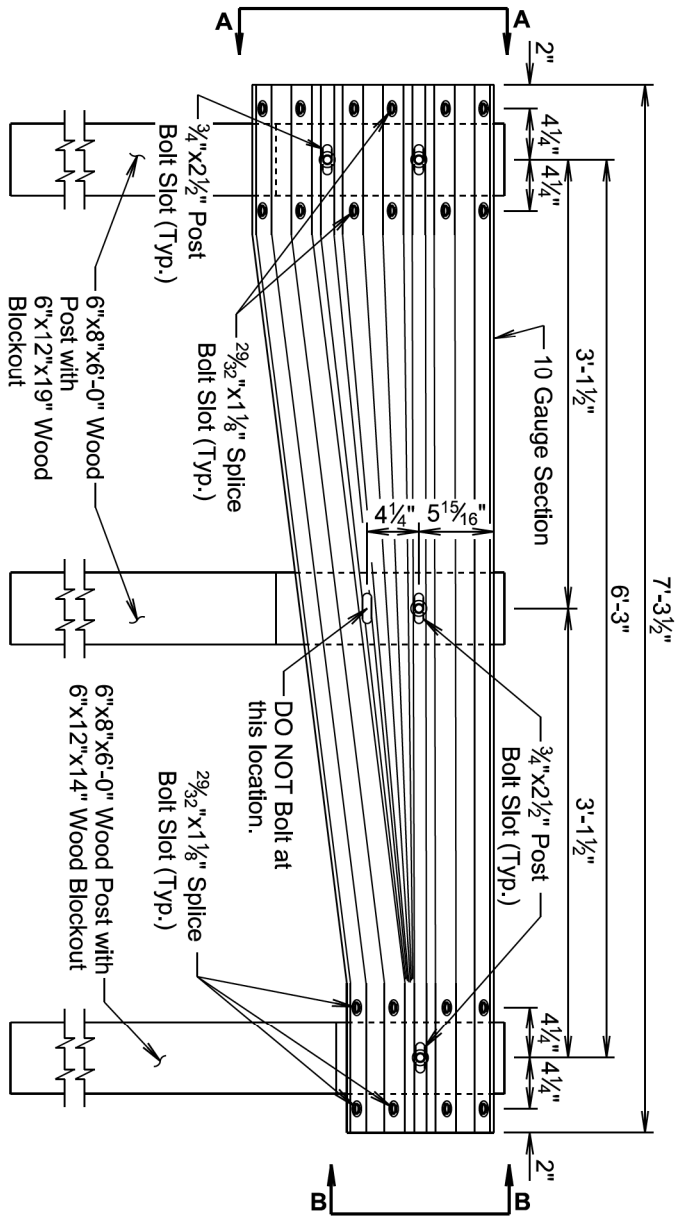
Thrie Beam Terminal Connectors will be 10 gauge.

When the thrie beam terminal connector is used to connect the rail to the bridge or concrete end block, 1" steel washers will be used at the lap splice and the washers will be in direct contact with the 3" slots of the thrie beam terminal connector. See the drawings above for the typical locations of the 1" steel washers.

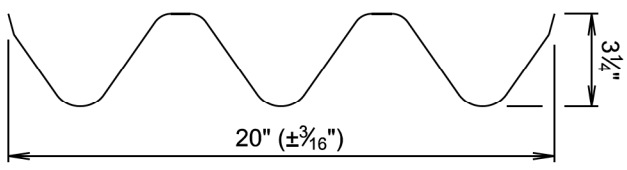
There will be no separate payment for furnishing and installing the thrie beam terminal connector. All costs for furnishing and installing the thrie beam terminal connector will be incidental to the contract unit price of the respective guardrail item it is attached to.

September 14, 2019

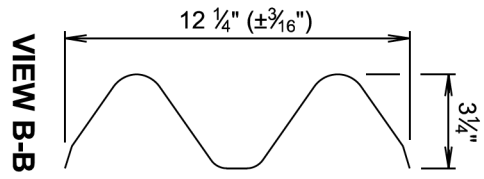
Published Date: 2024	SDDOT	THRIE BEAM TERMINAL CONNECTOR	PLATE NUMBER 630.47
			Sheet 1 of 1



ELEVATION VIEW



VIEW A-A



VIEW B-B

GENERAL NOTES:

All costs for furnishing and installing the asymmetrical W beam to thrie beam guardrail transition including labor, equipment, and materials including two posts, two blocks, asymmetrical W beam to thrie beam transition section, and hardware will be incidental to the contract unit price per each for the corresponding guardrail transition contract item.

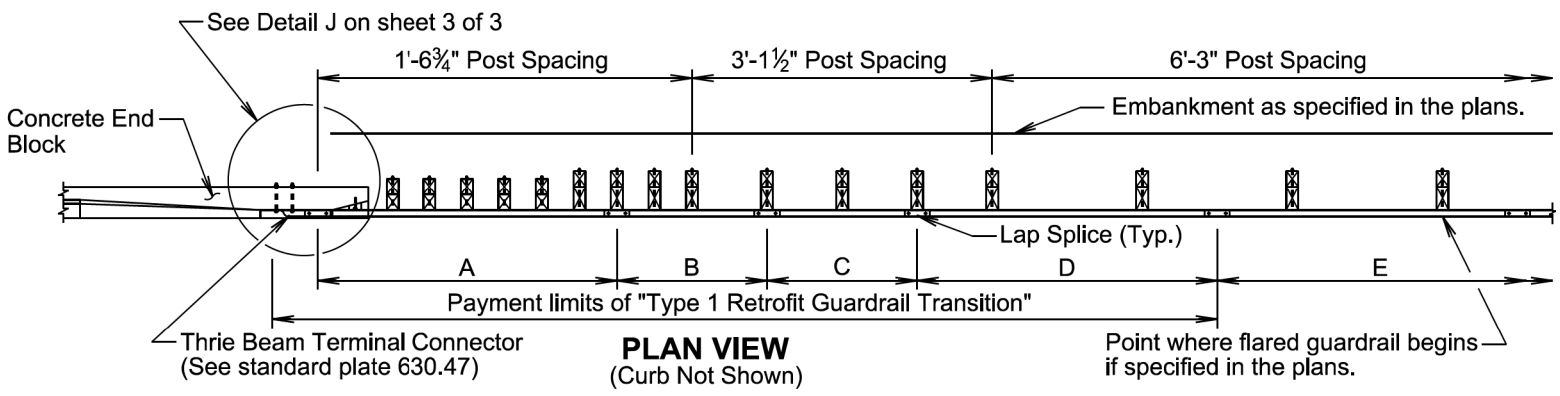
ASYMMETRICAL W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION

PLATE NUMBER 630.49

Sheet 1 of 1

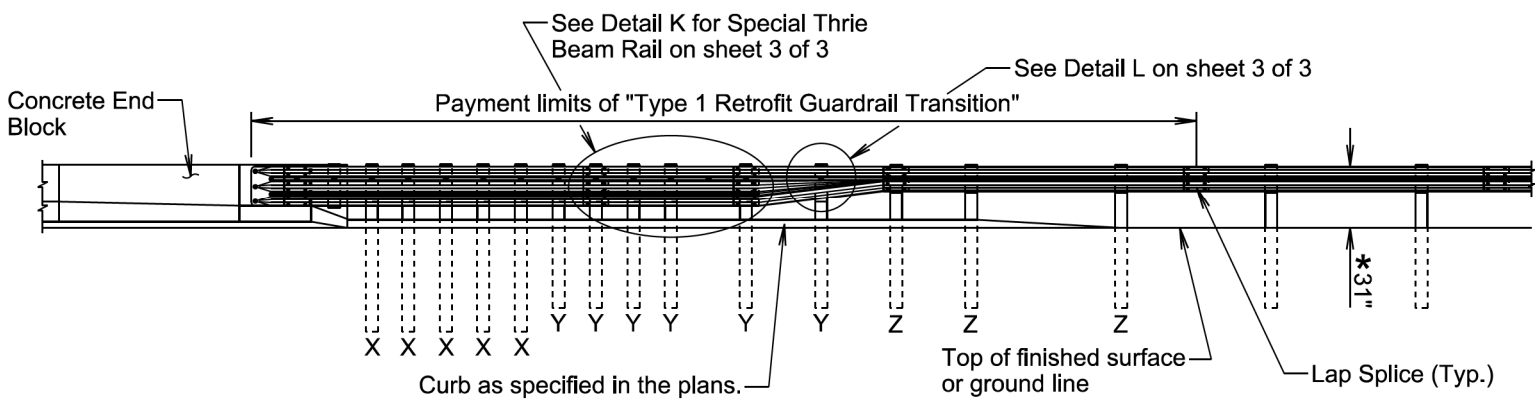
September 14, 2019

Published Date: 2024



PLAN VIEW
(Curb Not Shown)

A: 12'-6" Straight Double (Nested) Class A Thrie Beam Guardrail with Wood Posts (See standard plate 630.01)
B: 6'-3" Straight Single Class A Thrie Beam Guardrail with Wood Posts (See Detail K on sheet 3 of 3)
C: 6'-3" Asymmetrical W Beam to Thrie Beam Guardrail Transition Section with Wood Posts (See standard plate 630.49)
D: 12'-6" Straight Type 4 MGS (See standard plate 630.20)
E: Straight Type 1 MGS or as specified in the plans (See standard plate 630.20)



ELEVATION VIEW

X: 6"x8"x7'-0" Wood Post and 6"x8"x19" Wood Blockout
Y: 6"x8"x6'-0" Wood Post and 6"x12"x19" Wood Blockout
Z: 6"x8"x6'-0" Wood Post and 6"x12"x14" Wood Blockout

*See standard plate 630.99

TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))

PLATE NUMBER 630.51

Sheet 1 of 3

September 14, 2019

Published Date: 2024

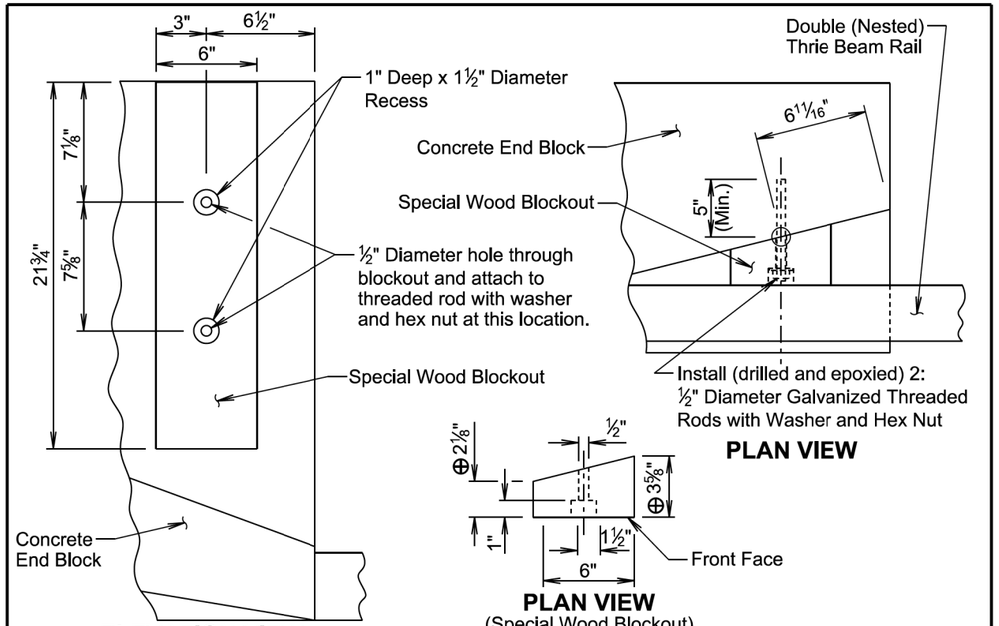
Plotting Date: 01/04/2024

STATE OF SOUTH DAKOTA

PROJECT NH 0037(164)24

SHEET 51

TOTAL SHEETS 63



DETAIL M
(See the 3 drawings above)

GENERAL NOTES FOR INSTALLING THREADED RODS INTO CONCRETE:

⊕ The dimensions shown are estimated based on original construction plans of the concrete end block. The special wood blockout will be cut as necessary such that the front face of the special wood blockout will align with the vertical front face of the concrete end block ±½".

The threaded rods will be ½" diameter and conform to ASTM F1554, Grade 55. The threaded rods will be embedded a minimum of 5" into the concrete.

The diameter of the drilled holes will not be less than ⅛" greater or more than ⅜" greater than the diameter of the threaded rods or as per the Manufacturer's recommendations. The holes will not be drilled using core bits. The drilled holes will be blown out with compressed air using a device that will reach the back of the hole to ensure that all debris or loose material has been removed prior to the epoxy injection.

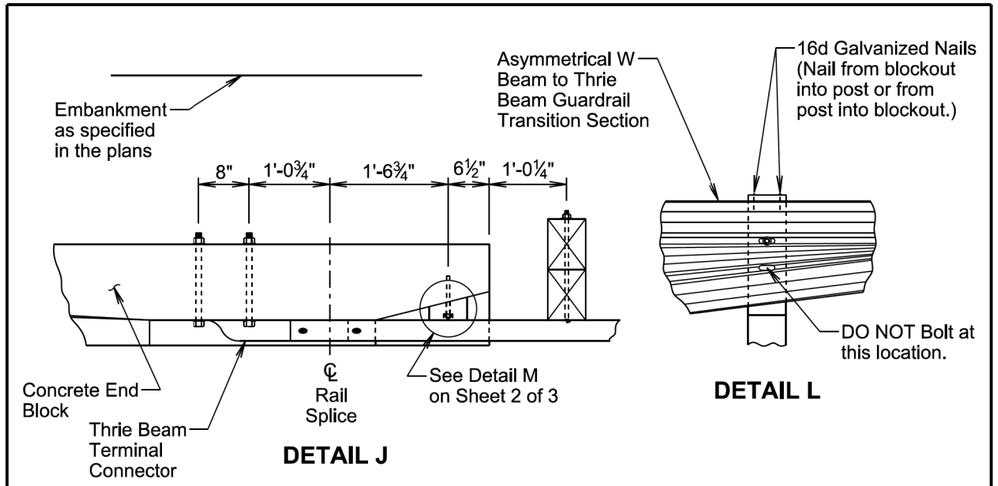
The epoxy resin mixture will be of a type for bonding steel to hardened concrete and will conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881, Type IV, Grade 3).

Mix epoxy resin as recommended by the Manufacturer and apply by an injection method as approved by the Engineer. Beginning at the back of the drilled holes, fill the holes ⅓ to ½ full of epoxy, or as recommended by the Manufacturer, prior to insertion of the steel rod. Rotate the steel rod during installation to eliminate voids and ensure complete bonding of the rod. Insertion of the rods by the dipping or painting methods will not be allowed.

Loads will not be applied to the epoxy grouted threaded rods until the epoxy resin has had sufficient time to cure as specified by the epoxy resin Manufacturer.

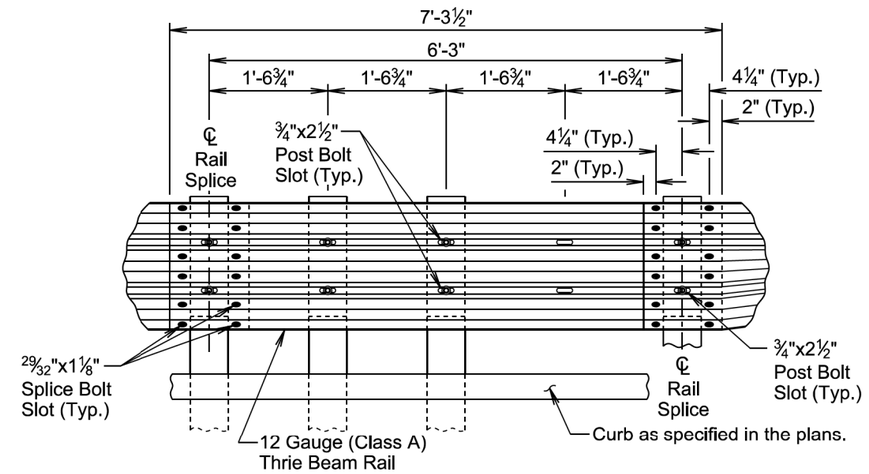
September 14, 2019

Published Date: 2024	SDDOT	TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.51 Sheet 2 of 3



DETAIL J

DETAIL L



DETAIL K
(Special Thrie Beam Rail)

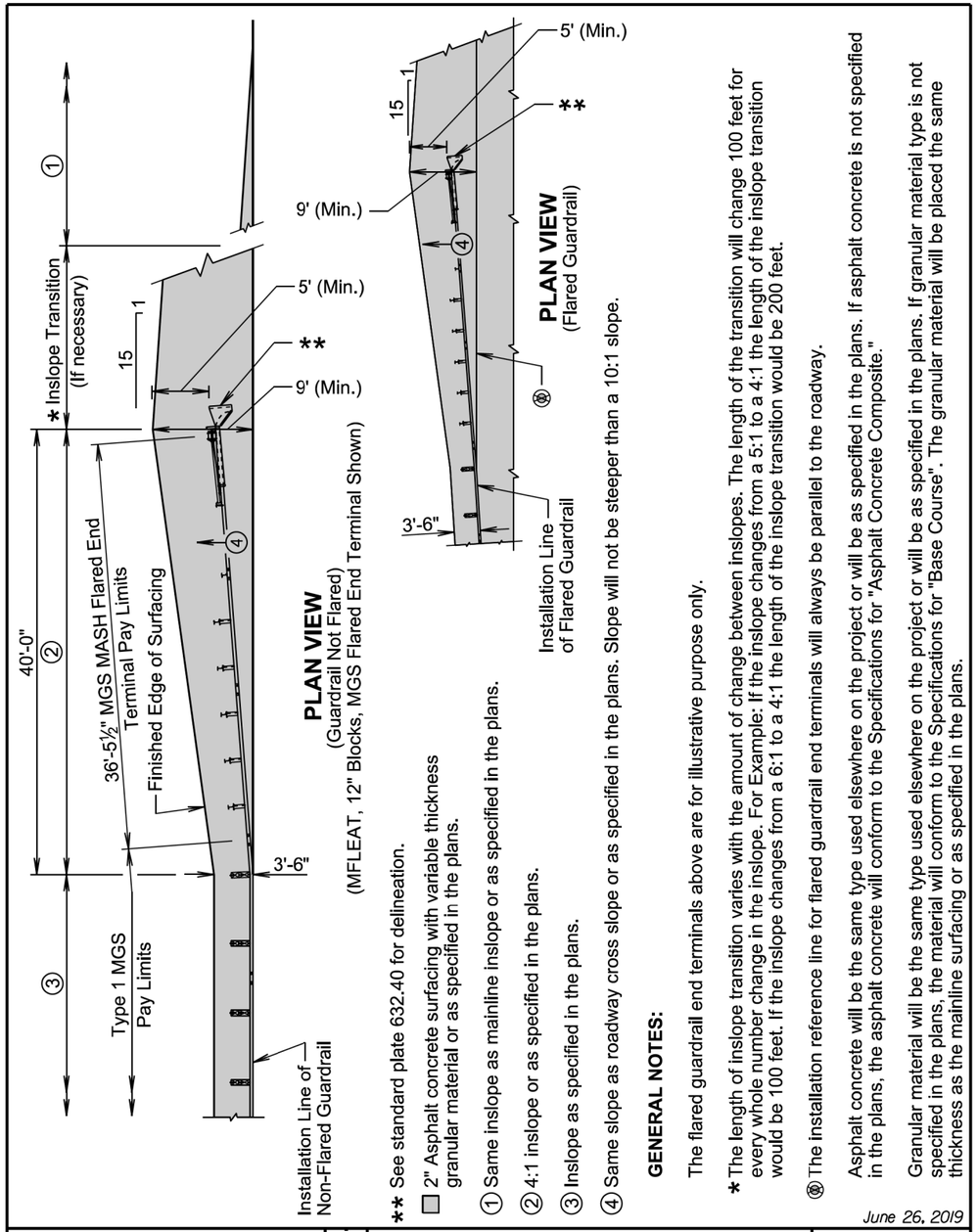
GENERAL NOTES:

Throughout the type 1 retrofit guardrail transition, slots in the rails will be provided as specified in the plans and by the Manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or notches.

All costs for furnishing and installing the type 1 retrofit guardrail transition including labor, equipment, and materials which includes all rail sections, posts and blockouts, special blockout, hardware, and incidentals will be included in the contract unit price per each for "Type 1 Retrofit Guardrail Transition".

September 14, 2019

Published Date: 2024	SDDOT	TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.51 Sheet 3 of 3



** See standard plate 632.40 for delineation.

□ 2" Asphalt concrete surfacing with variable thickness granular material or as specified in the plans.

① Same inslope as mainline inslope or as specified in the plans.

② 4:1 inslope or as specified in the plans.

③ Inslope as specified in the plans.

④ Same slope as roadway cross slope or as specified in the plans.

GENERAL NOTES:

The flared guardrail end terminals above are for illustrative purpose only.

* The length of inslope transition varies with the amount of change between inslopes. The length of the transition will change 100 feet for every whole number change in the inslope. For Example: If the inslope changes from a 5:1 to a 4:1 the length of the inslope transition would be 200 feet. If the inslope changes from a 6:1 to a 4:1 the length of the inslope transition would be 200 feet.

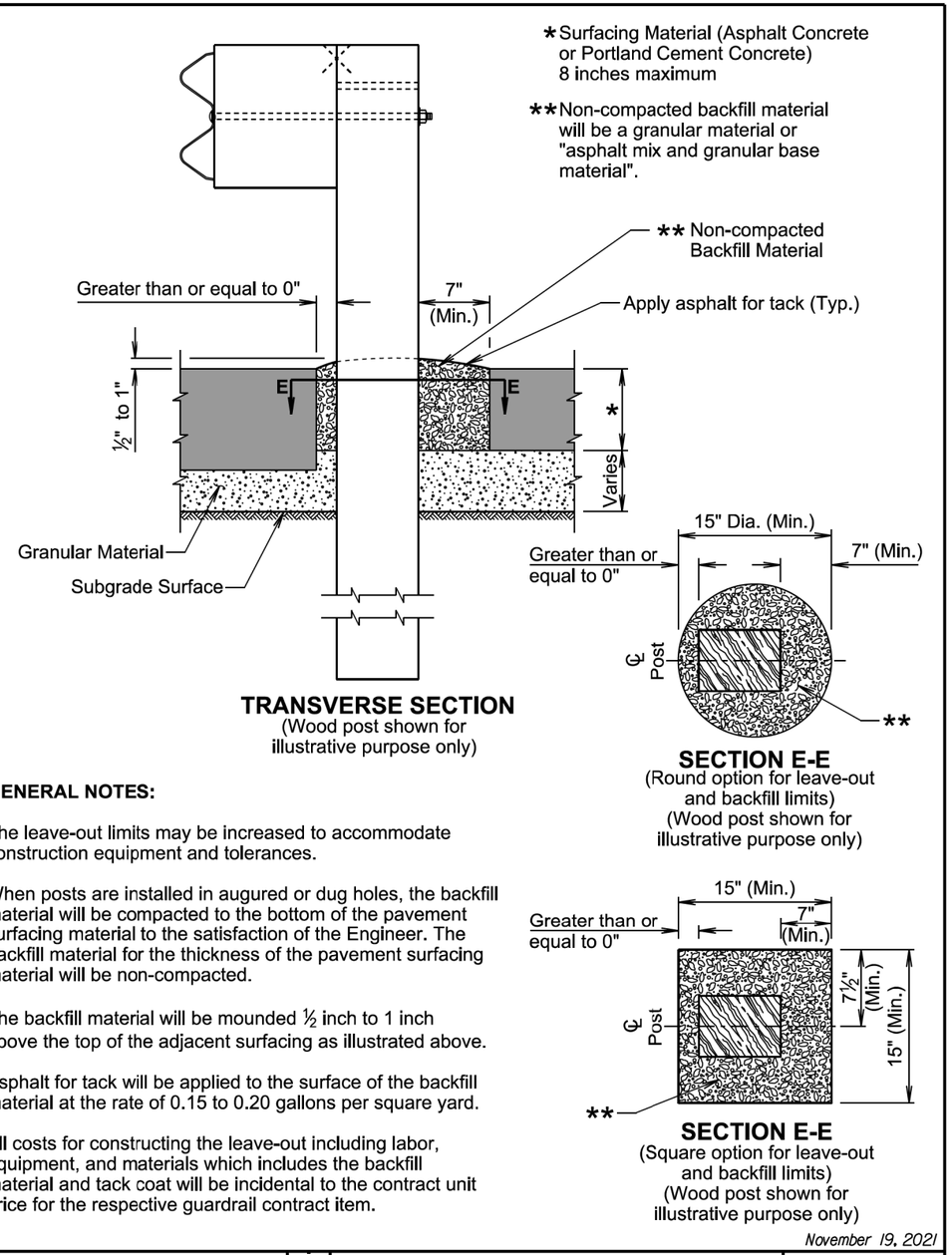
Ⓡ The installation reference line for flared guardrail end terminals will always be parallel to the roadway.

Asphalt concrete will be the same type used elsewhere on the project or will be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete will conform to the Specifications for "Asphalt Concrete Composite."

Granular material will be the same type used elsewhere on the project or will be as specified in the plans. If granular material type is not specified in the plans, the material will conform to the Specifications for "Base Course". The granular material will be placed the same thickness as the mainline surfacing or as specified in the plans.

June 26, 2019

Published Date: 2024	SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH FLARED END TERMINAL	PLATE NUMBER 630.87	Sheet 1 of 1



TRANSVERSE SECTION
(Wood post shown for illustrative purpose only)

SECTION E-E
(Round option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)

SECTION E-E
(Square option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)

GENERAL NOTES:

The leave-out limits may be increased to accommodate construction equipment and tolerances.

When posts are installed in augured or dug holes, the backfill material will be compacted to the bottom of the pavement surfacing material to the satisfaction of the Engineer. The backfill material for the thickness of the pavement surfacing material will be non-compacted.

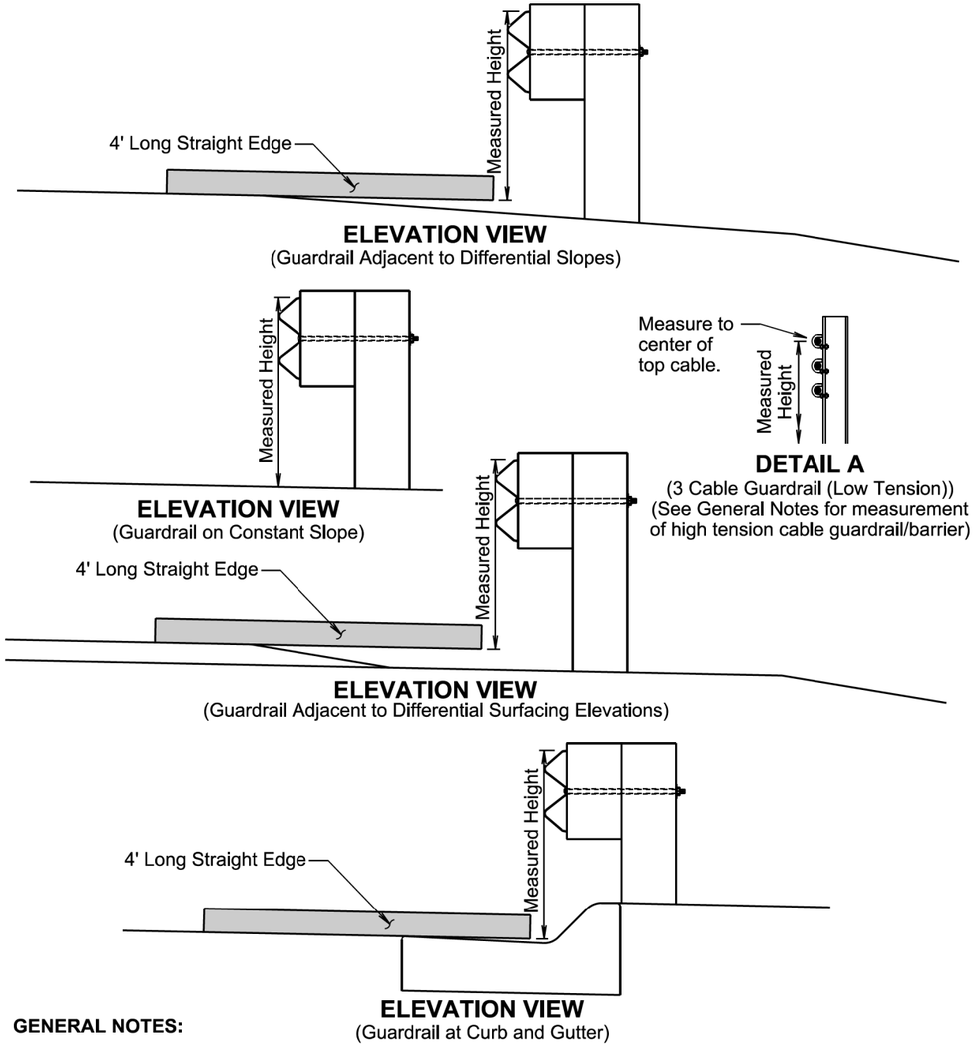
The backfill material will be mounded ½ inch to 1 inch above the top of the adjacent surfacing as illustrated above.

Asphalt for tack will be applied to the surface of the backfill material at the rate of 0.15 to 0.20 gallons per square yard.

All costs for constructing the leave-out including labor, equipment, and materials which includes the backfill material and tack coat will be incidental to the contract unit price for the respective guardrail contract item.

November 19, 2021

Published Date: 2024	SDDOT	GUARDRAIL POST INSTALLED IN ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE	PLATE NUMBER 630.96	Sheet 1 of 1



GENERAL NOTES:

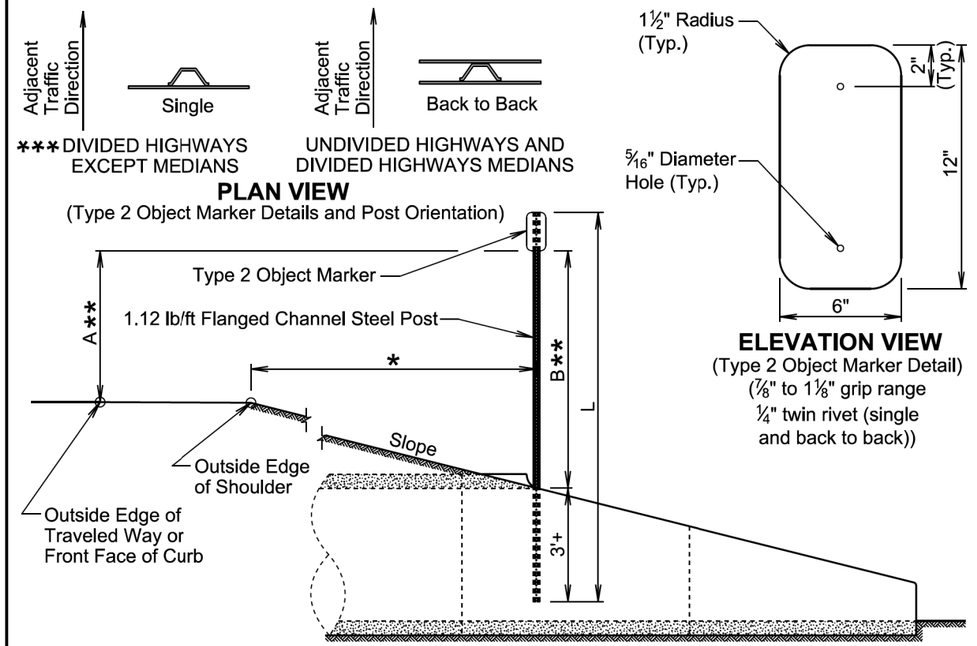
The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems except for high tension cable guardrail/barrier will be measured in accordance with this standard plate.

When measuring height of 3 cable guardrail (low tension) the height will be measured to the center of the top cable. See Detail A.

The height of high tension cable guardrail/barrier will be measured in accordance with the Manufacturer's installation instructions.

September 14, 2019

Published Date: 2024	SDDOT	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.99
			Sheet 1 of 1



TYPE 2 OBJECT MARKER POST LENGTHS

OFFSET (*)		1'	2'	3'	4'	5'	6'	7'	8'	Greater Than 8'
		POST LENGTH (L)								
SLOPE	3:1	8'-6"	8'-9"	9'-3"	9'-6"	9'-9"	10'-3"	10'-6"	10'-9"	8'-0"
	4:1	8'-6"	8'-9"	9'-0"	9'-3"	9'-9"	9'-9"	10'-0"	10'-3"	8'-0"
	5:1	8'-3"	8'-6"	8'-9"	9'-0"	9'-3"	9'-3"	9'-6"	9'-9"	8'-0"
	6:1	8'-3"	8'-6"	8'-9"	8'-9"	9'-0"	9'-3"	9'-3"	9'-6"	8'-0"

GENERAL NOTES:

*** The type 2 object marker may be installed back to back when specified in the plans.

Post Length L was calculated based on a shoulder width of 6 feet at a crosslope of 4 percent and L was rounded up to the nearest 3 inches.

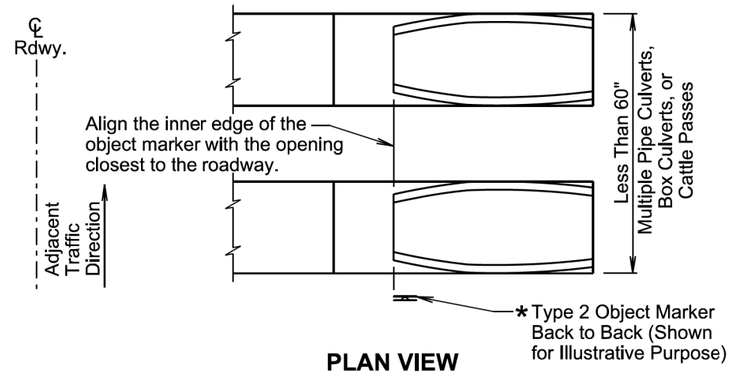
** Dimension A is 4 feet when the Offset * is 8 feet and less. Dimension B is 4 feet when Offset * is greater than 8 feet.

The type 2 object marker and the 1.12 lb/ft flanged channel steel post will be in conformance with Specifications Section 982.2 J.

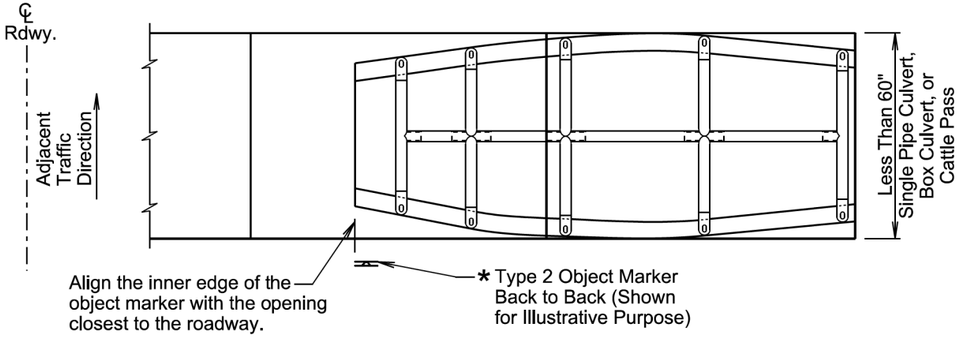
Payment for the type 2 object marker will be in conformance with Specification Section 632.5 B.

December 23, 2019

Published Date: 2024	SDDOT	TYPE 2 OBJECT MARKER (DIRECT DRIVE)	PLATE NUMBER 632.01
			Sheet 1 of 1



PLAN VIEW
(For Multiple Pipe Culverts, Box Culverts, and Cattle Passes)
(Pipe culverts shown for illustrative purpose.)
(Embankment is not shown.)



PLAN VIEW
(For Single Pipe Culvert, Box Culvert, and Cattle Pass)
(Pipe culvert shown for illustrative purpose.)
(Embankment is not shown.)

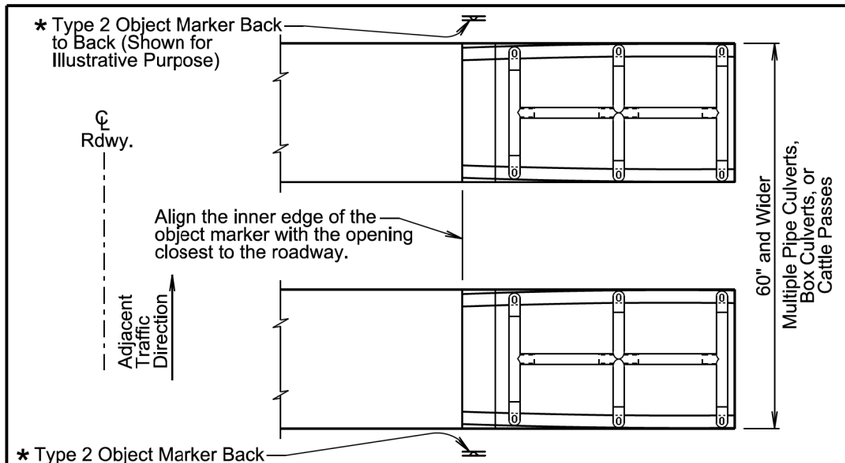
GENERAL NOTES:

This standard plate will be used in conjunction with standard plate 632.01.

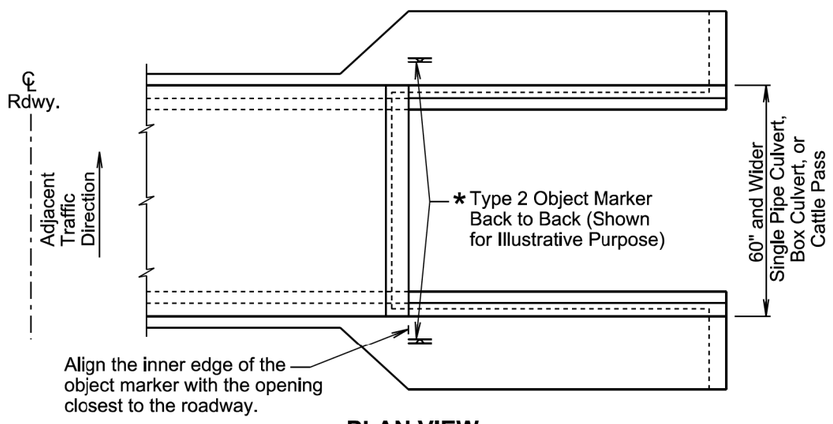
* The type 2 object markers will be installed at the locations shown above. The type 2 object markers, single faced or back to back, will be as specified in the plans.

December 23, 2019

Published Date: 2024	SDDOT	TYPE 2 OBJECT MARKER AT PIPE CULVERTS, BOX CULVERTS, AND CATTLE PASSES (Less than 60" Overall Width)	PLATE NUMBER 632.03 Sheet 1 of 1



PLAN VIEW
(For Multiple Pipe Culverts, Box Culverts, and Cattle Passes)
(Pipe culverts shown for illustrative purpose.)
(Embankment is not shown.)



PLAN VIEW
(For Single Pipe Culvert, Box Culvert, and Cattle Pass)
(Box culvert shown for illustrative purpose.)
(Embankment is not shown.)

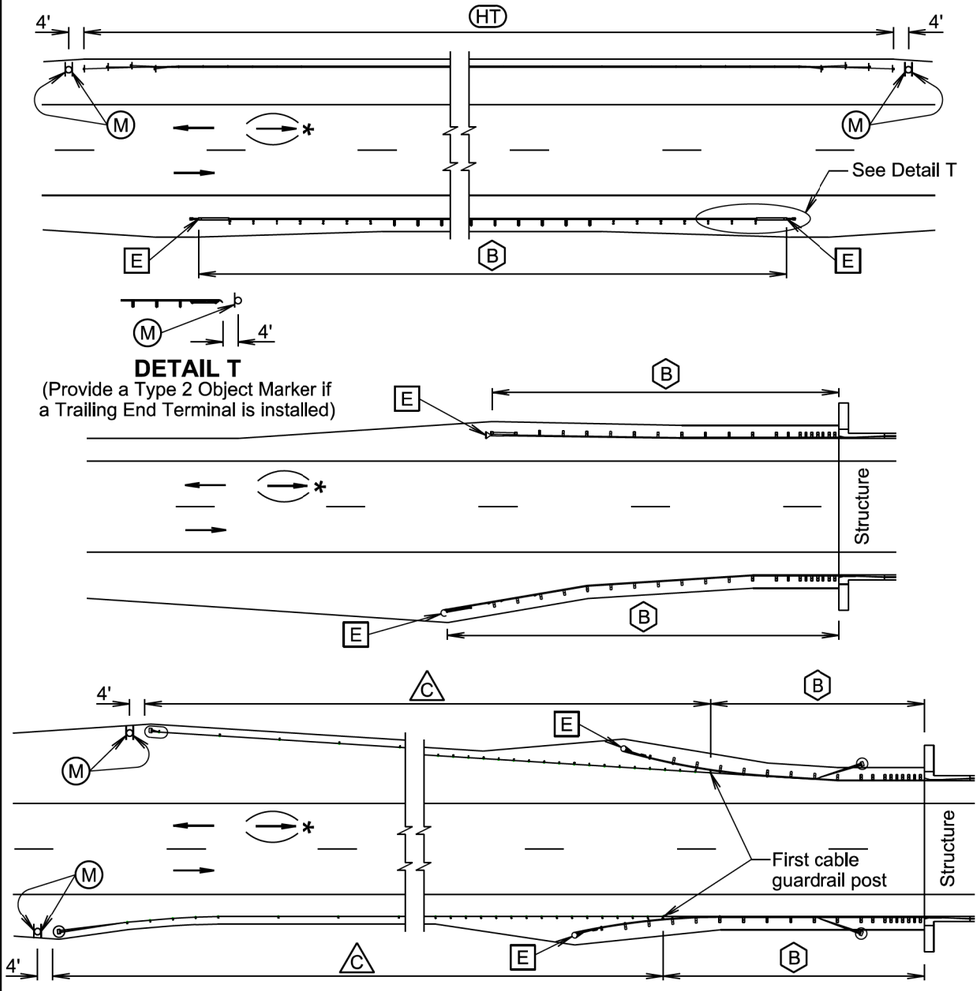
GENERAL NOTES:

This standard plate will be used in conjunction with standard plate 632.01.

* The type 2 object markers will be installed at the locations shown above. The type 2 object markers, single faced or back to back, will be as specified in the plans.

December 23, 2019

Published Date: 2024	SDDOT	TYPE 2 OBJECT MARKER AT PIPE CULVERTS, BOX CULVERTS, AND CATTLE PASSES (60" and Greater Overall Width)	PLATE NUMBER 632.04 Sheet 1 of 1



DETAIL T
(Provide a Type 2 Object Marker if a Trailing End Terminal is installed)

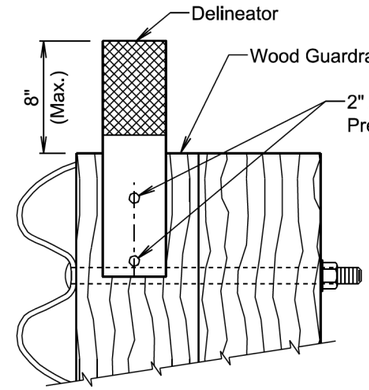
PLAN VIEW
(Typical Guardrail Layouts)

- (B) Steel Beam Guardrail Delineation
- [E] Guardrail End Terminal Object Marker
- <C> 3 Cable Guardrail (Low Tension) Delineation
- (HT) High Tension Cable Guardrail Delineation
- (M) Type 2 Object Marker

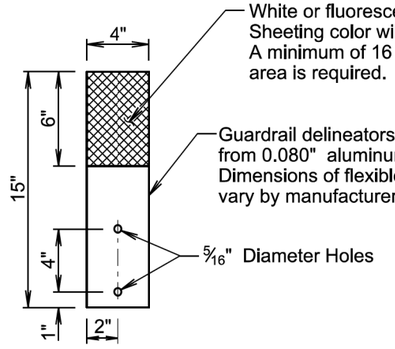
* For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

December 23, 2019

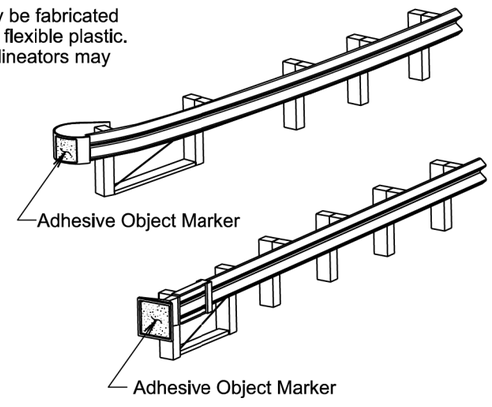
Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 1 of 4



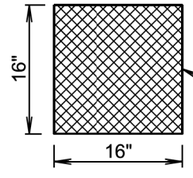
(B) STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)



[E] GUARDRAIL END TERMINAL OBJECT MARKER

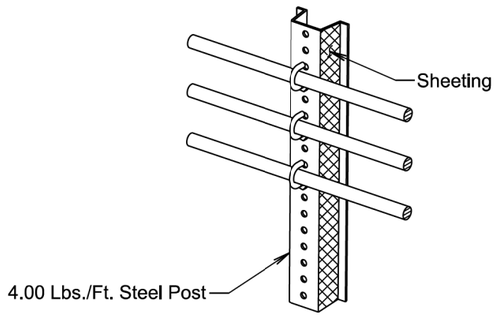


ADHESIVE OBJECT MARKER

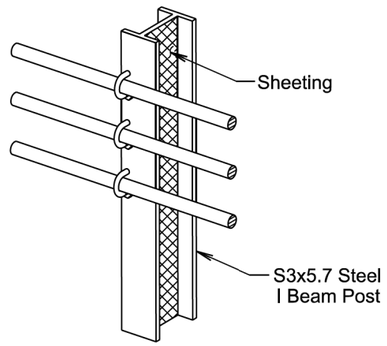
Adhesive object marker dimensions may vary due to shape of terminal end. A minimum of 256 square inches of object marker sheeting area is required. The sheeting will be fluorescent yellow.

December 23, 2019

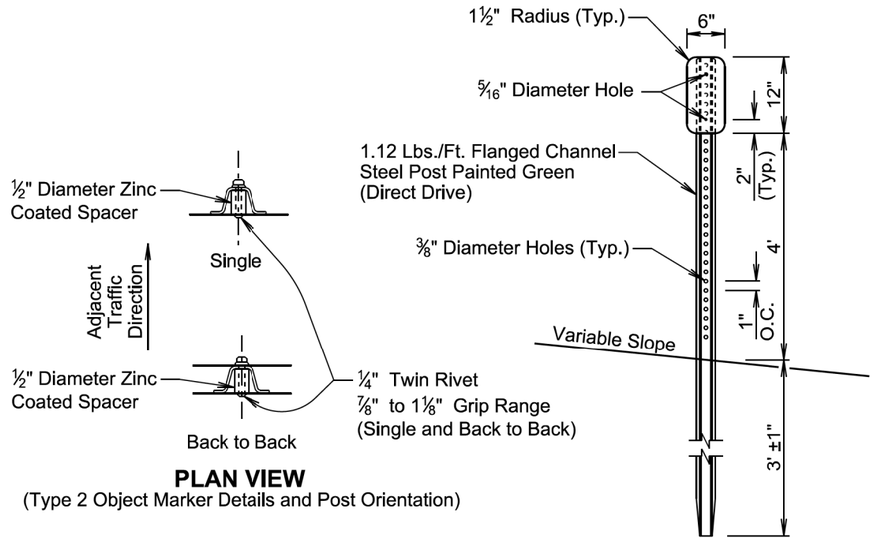
Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 2 of 4



C 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



C 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



PLAN VIEW
(Type 2 Object Marker Details and Post Orientation)

ELEVATION VIEW
Ⓜ (Type 2 Object Marker)
(For Marking 3 Cable Guardrail (Low Tension) Anchor, High Tension Cable Guardrail Anchor, and Trailing End Terminal)

December 23, 2019

Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 3 of 4

GENERAL NOTES:

The delineation of high tension cable guardrail will be reflective sheeting placed back to back on every other post cap or cable spacer. The sheeting will be type XI in conformance with ASTM D4956. The color of the reflective sheeting shall be the same as the nearest pavement marking.

The delineators for steel beam guardrail and sheeting on 3 cable guardrail (low tension) posts will be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting will be type XI in conformance with ASTM D4956. Along two-way roadways the sheeting will be on both sides of the delineators and guardrail posts and will be white in color. For one-way roadways the sheeting will only be required on the side facing traffic and the color will be the same as the nearest pavement marking, yellow on the left side of the roadway and white on the right side.

When steel beam guardrail is attached to a bridge the first delineator will be attached to the post nearest the bridge.

At bridges with guardrail less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object marker. The spacing between the delineators will be approximately one third of the length of the guardrail.

At bridges with guardrail 200 feet and greater in length, including bridges that have steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

Steel beam guardrail that is not attached to a bridge and is less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object markers. The spacing between the delineators will be approximately one third of the length of the guardrail.

Steel beam guardrail that is not attached to a bridge and is 200 feet and greater in length, including steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

All costs for furnishing and installing single or back to back guardrail delineation on 3 cable guardrail and steel beam guardrail will be included in the contract unit price per each for "Guardrail Delineator".

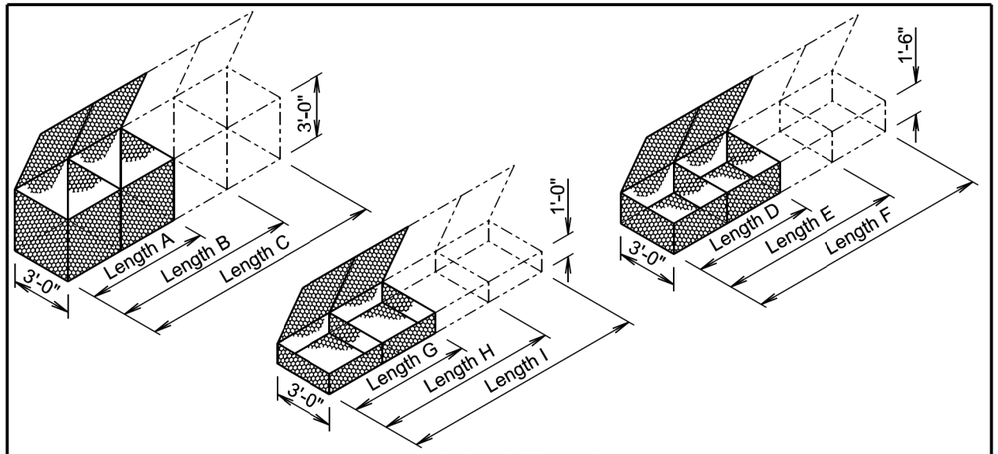
All costs for furnishing and installing the reflective sheeting on the cable spacers or post caps for the high tension cable guardrail will be incidental to the respective high tension cable guardrail contract item.

An adhesive object marker will be placed on the end of the W beam guardrail or MGS end terminal. The adhesive object marker dimensions may vary due to the shape of the terminal end. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting will be fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the adhesive object marker will be incidental to various contract items.

A type 2 object marker will be placed adjacent to the 3 cable guardrail (low tension) anchor, high tension cable guardrail anchor, and trailing end terminal at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") will have fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the type 2 object marker including the steel post, 6" x 12" reflective panel, and hardware will be included in the contract unit price per each for "Type 2 Object Marker" for single-sided and "Type 2 Object Marker Back to Back" for back to back type 2 object markers.

December 23, 2019

Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 4 of 4



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

Above dimensions subject to mill tolerances.

GENERAL NOTES:

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.

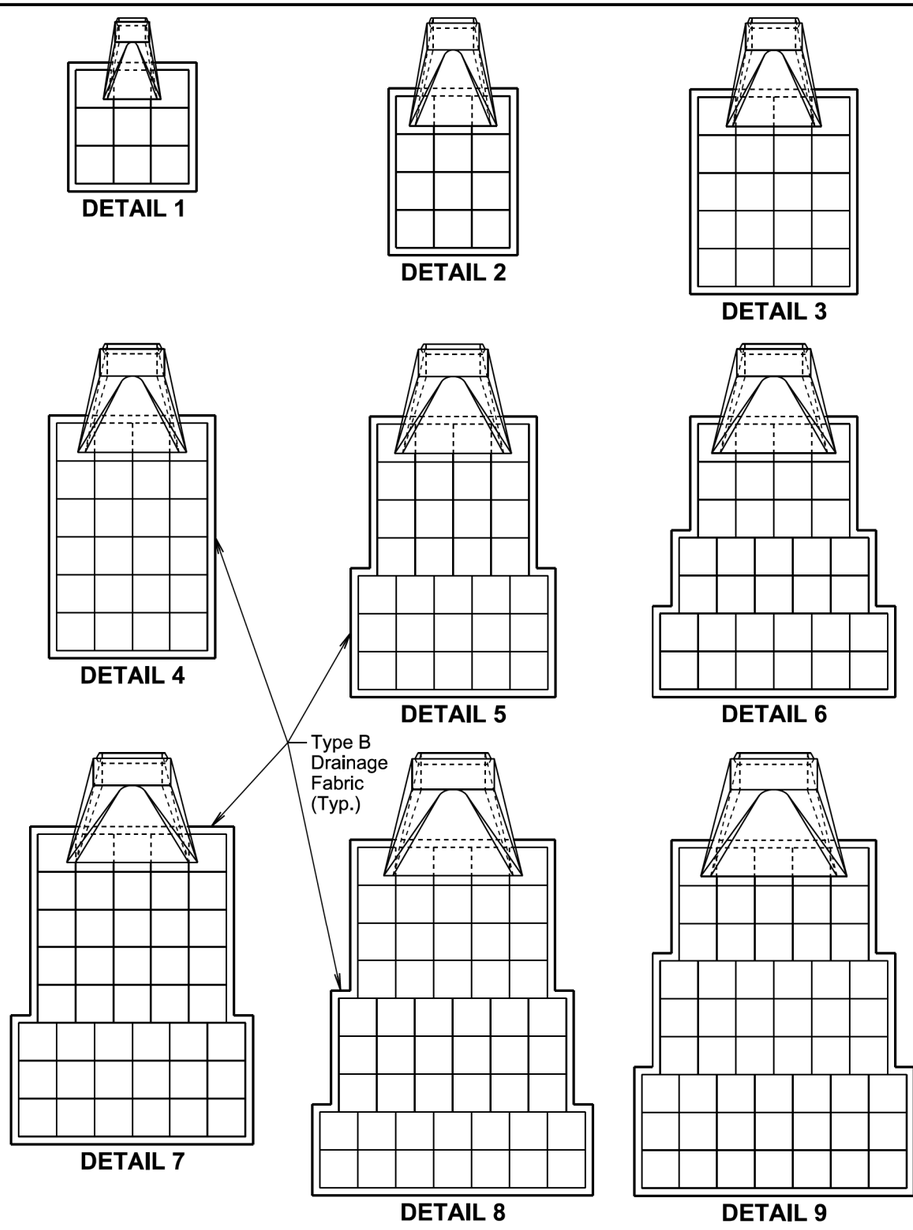
Wire lacing or interlocking type fasteners will be used for gabion assembly and final construction of gabion structures. Interlocking fasteners for galvanized gabions will be high tensile 0.120 inch diameter galvanized steel wire measured after galvanizing. The galvanizing will conform to ASTM A641-92, 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:

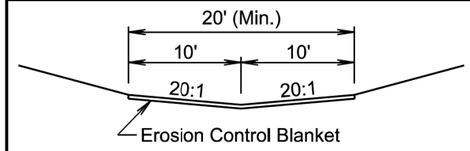
Gabions at outlets of CMP and RCP will be placed under the end section a distance of 2 feet from the outlet end. For CMP end section installations, the upper fabric of the gabions will be modified to accommodate the metal end section as approved by the Engineer.

* 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.

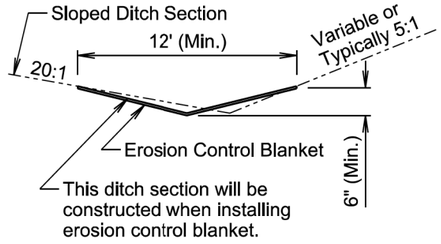
Type B drainage fabric will be placed under the gabions and around the exterior sides (perimeter) of the gabions as approved by the Engineer. The type B drainage fabric will be in conformance with Section 831 of the Specifications. Measurement and payment of the type B drainage fabric will be in conformance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

February 14, 2020

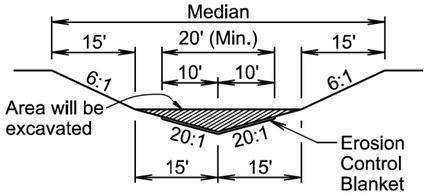
Published Date: 2024	SDDOT	BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS	PLATE NUMBER 720.03
			Sheet 2 of 2



STANDARD DITCH SECTION

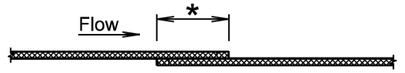


SLOPED DITCH SECTION



The median will be shaped to the limits shown in this detail where the erosion control blanket will be placed.

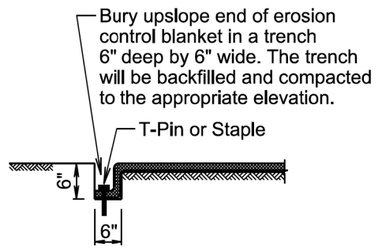
MEDIAN SECTION



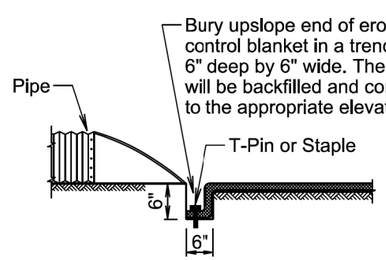
* Use a 4" (Min.) overlap wherever two widths of erosion control blanket are applied side by side.

* Use a 6" (Min.) overlap wherever one roll of erosion control blanket ends and another begins.

OVERLAP DETAIL



TRENCH DETAIL



PIPE END DETAIL

GENERAL NOTES:

Prior to placement of the erosion control blanket, the areas will be properly prepared, shaped, seeded, and fertilized.

Erosion control blanket will be unrolled in the direction of the flow of water when placed in ditches and on slopes. The upslope end of the erosion control blanket will be buried in a trench 6" wide by 6" deep. There will be at least a 6" overlap wherever one roll of erosion control blanket ends and another begins, with the upslope erosion control blanket placed on top of the downslope erosion control blanket.

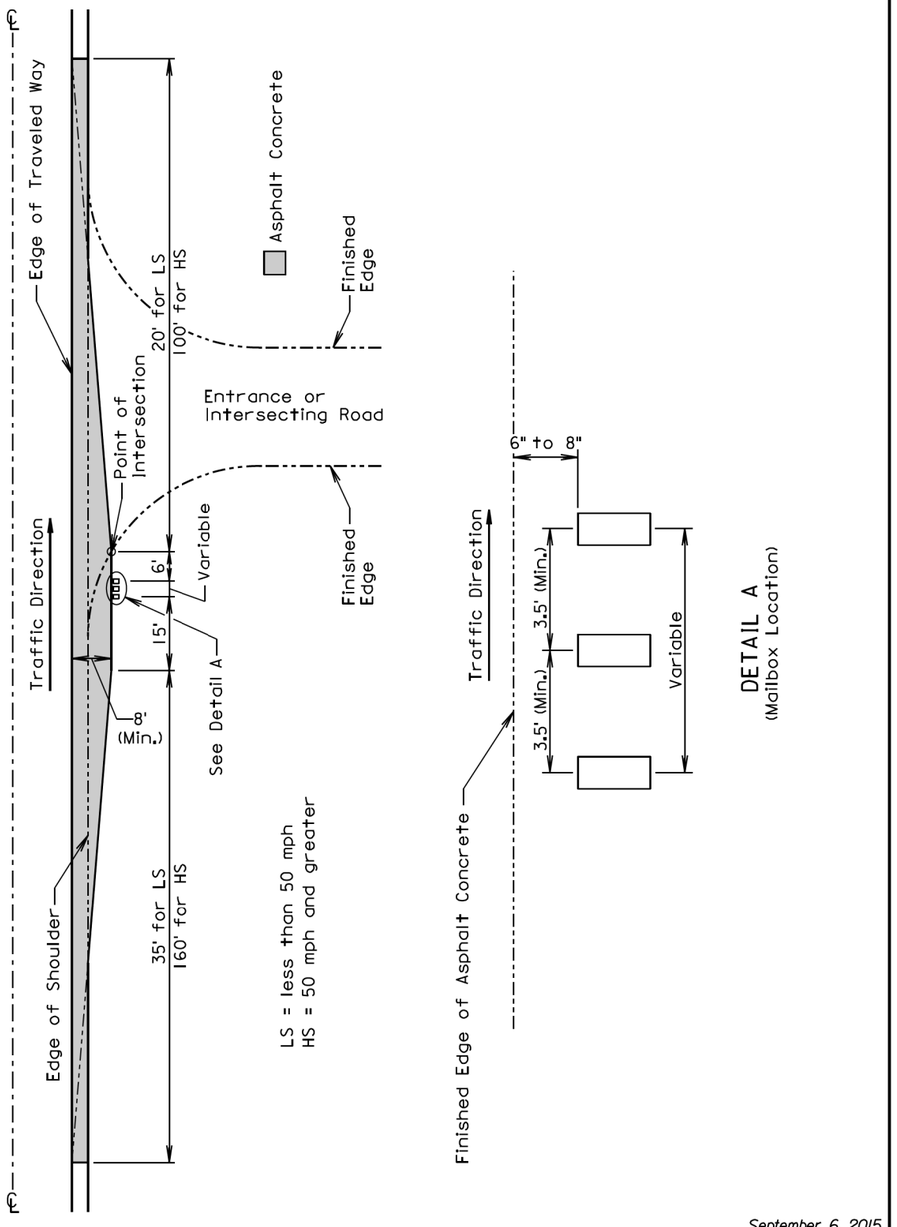
The erosion control blanket will be pinned to the ground according to the manufacturer's installation recommendations.

After the placement of the erosion control blanket, the Contractor will fine grade along all edges of the blanket to maintain a uniform slope adjacent to the blanket and level any low spots which might prevent uniform and unrestricted flow of side drainage directly onto the erosion control blanket.

All ditch sections will be shaped when installing the erosion control blanket. All costs for shaping the ditches will be incidental to the contract unit price per foot for "Shaping for Erosion Control Blanket".

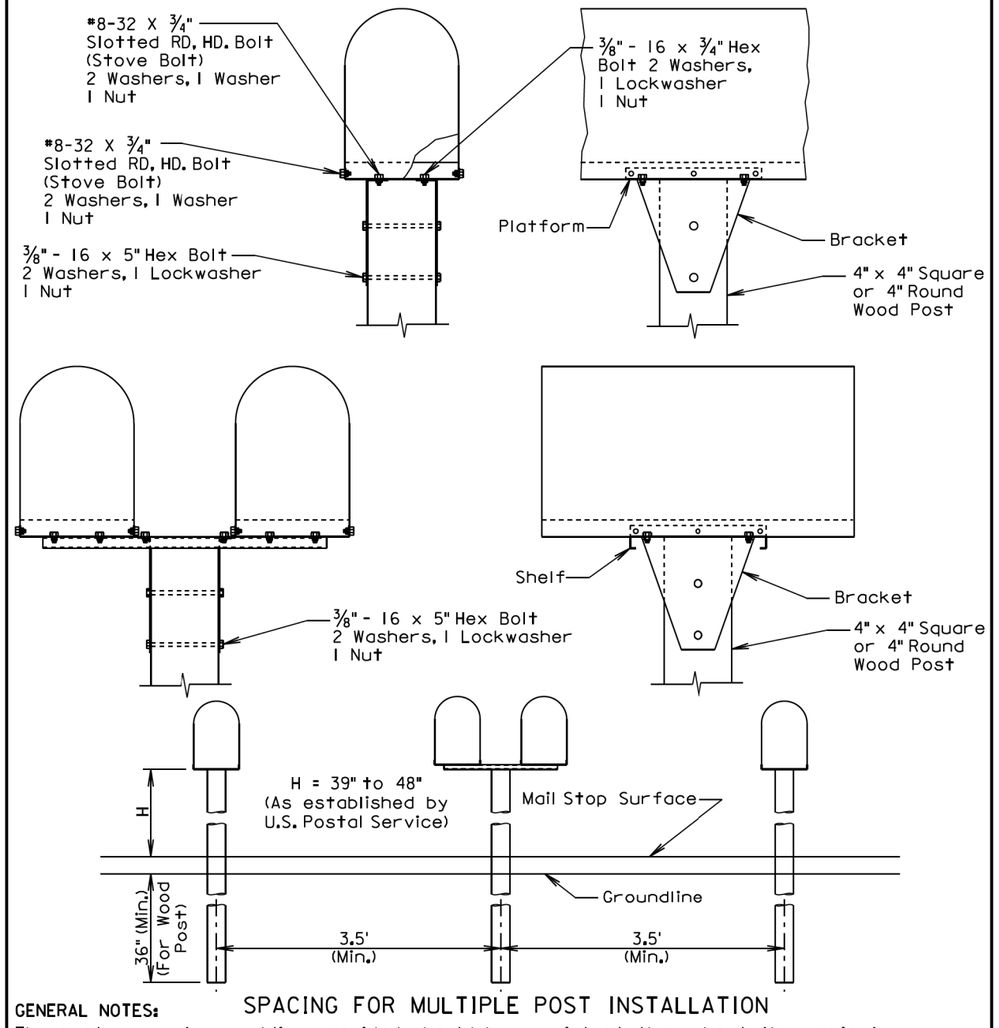
February 14, 2020

Published Date: 2024	SDDOT	EROSION CONTROL BLANKET	PLATE NUMBER 734.01
			Sheet 1 of 1



September 6, 2015

Published Date: 2024	SDDOT	MAILBOX TURNOUT	PLATE NUMBER 900.01
			Sheet 1 of 1



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

Published Date: 2024

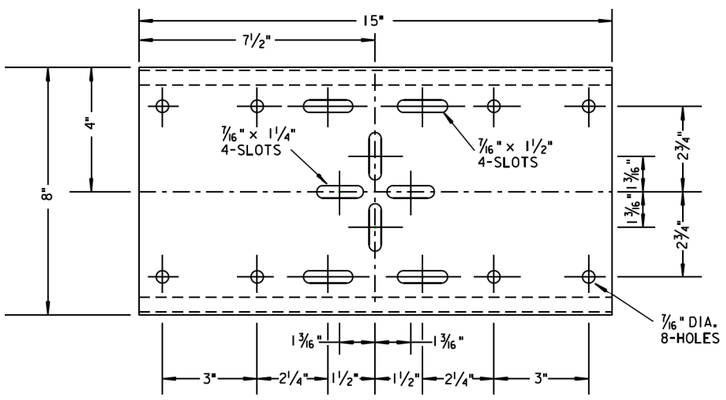
SDDOT

MAILBOX SUPPORT HARDWARE

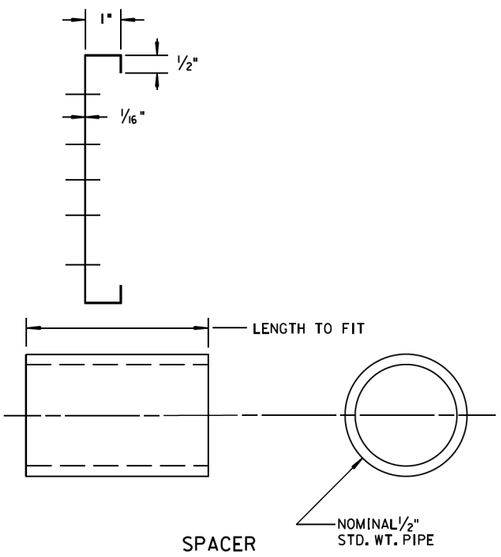
PLATE NUMBER 900.03

March 31, 2000

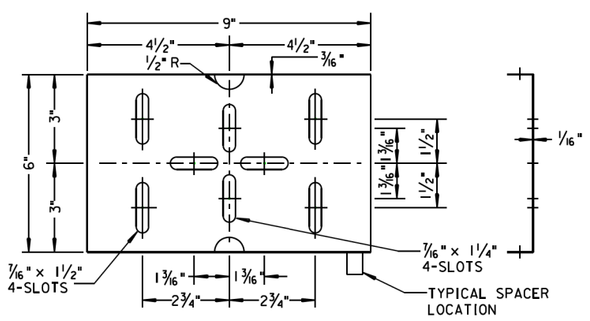
Sheet 1 of 1

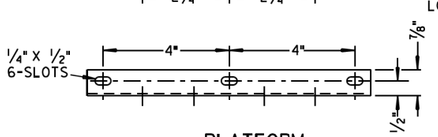


SHELF
(Double Assemblies)

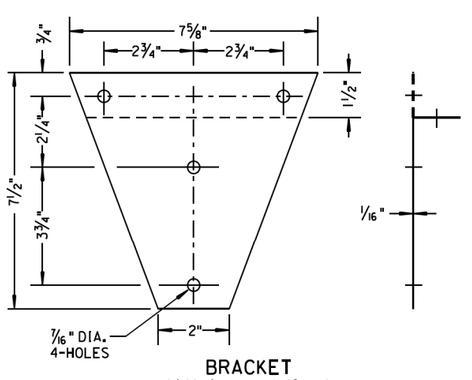


SPACER





PLATFORM
(All Assemblies)



BRACKET
(All Assemblies)

STATE OF SOUTH DAKOTA

PROJECT NH 0037(164)24

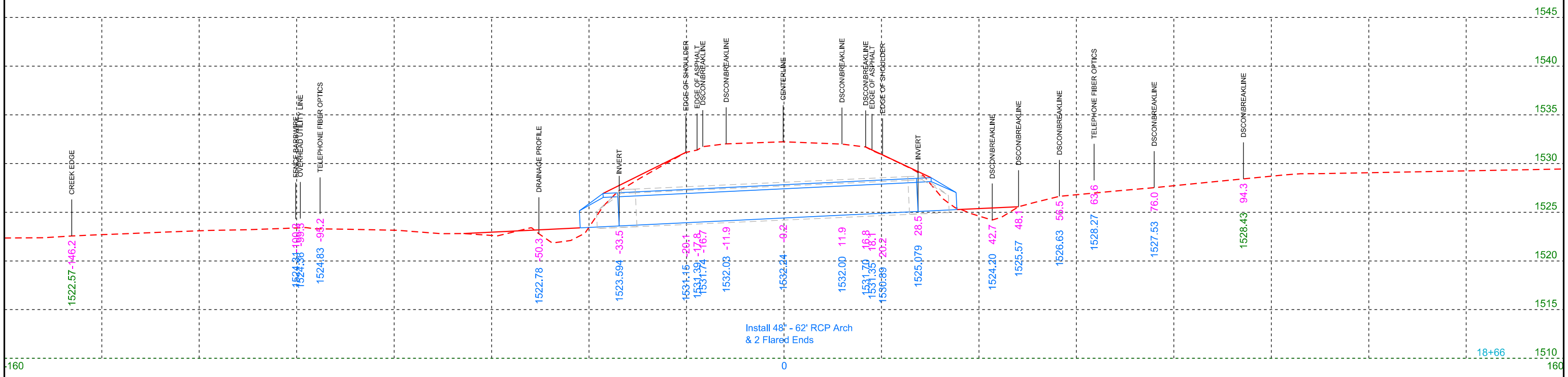
SHEET 61

TOTAL SHEETS 63

Plotting Date: 01/04/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0037(164)24	62	63

18+66



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0037(164)24	63	63

87+79