DEPARTMENT OF TRANSPORTATION

Planning & Engineering
Office of Project Development
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
O: 605.773.3275 | F: 605.773.2614
dot.sd.gov

August 29, 2024

ADDENDUM NO. 2

RE: Item #3, September 4, 2024 Letting - IM 0902(18)101, PCN 035F, Pennington County - Replace Structure ((2) 394.5' Prestressed Girder Bridges), Approach Grading, Asphalt Surfacing

TO WHOM IT MAY CONCERN:

The following addenda to the plans shall be inserted and made a part of your proposal for the referenced project.

SPECIAL PROVISIONS: **PEN AND INK CHANGE:** change the completion date from November 21, 2025 to August 5, 2026 on the NOTICE TO CONTRACTORS.

Please remove the Index of Special Provisions and replace with attached Index of Special Provisions revised 8/29/24.

Please remove the "Special Provision for Contract Time", dated 7/8/24 and replace with the "Special Provision for Contract Time", dated 8/29/24.

SDEBS BID PROPOSAL: *The electronic bid proposal for this contract has been revised to include the changes associated with this addendum. Bidders must log in to the SDEBS to retrieve and incorporate these changes into their bid.*

Quantities for Bid Items were changed:
Bid Item 480E0511 "No. 11 Rebar Splice" changed from 216 to 432 Each
Bid Item 633E1201 "High Build Waterborne Pavement Marking Paint with Reflective Elements, White" changed from 2,710 to 22 Gal
Bid Item 633E1206 "High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow" changed from 2,710 to 22 Gal

PLANS: Please destroy sheets A2, A3, E2, E4, E14, E34, E44, M2, and M3 and replace with the enclosed sheets, dated 8/29/24.

Sheets A2 & A3: **Quantities for Bid Items were changed:**
Bid Item 480E0511 "No. 11 Rebar Splice" changed from 108 to 216 Each
Bid Item 633E1201 "High Build Waterborne Pavement Marking Paint with Reflective Elements, White" changed from 2,710 to 22 Gal
Bid Item 633E1206 "High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow" changed from 2,710 to 22 Gal

Sheets E2, E4, E14, E34 & E44: Quantities for Bid Item 480E0511 “No. 11 Rebar Splice” changed from 108 to 216 Each.

Sheet M2: Quantities for Bid Item 633E1201 “High Build Waterborne Pavement Marking Paint with Reflective Elements, White” changed from 2,710 to 22 Gal and
Bid Item 633E1206 “High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow” changed from 2,710 to 22 Gal

Sheet M3: TABLE OF PERMANENT PAVEMENT MARKINGS was revised.

Sincerely,

Sam Weisgram
Engineering Supervisor

SW/cj

CC: Todd Seaman, Rapid City Region Engineer
Mike Carlson, Rapid City Area Engineer

REV 8/29/24

INDEX OF SPECIAL PROVISIONS

PROJECT NUMBER(S): IM 0902(18)101 PCN: 035F

TYPE OF WORK: REPLACE STRUCTURE ((2) 394.5' PRESTRESSED GIRDER BRIDGES), APPROACH GRADING, CLASS G ASPHALT SURFACING

COUNTY: PENNINGTON

The following clauses have been prepared subsequent to the Standard Specifications for Roads and Bridges and refer only to the above described improvement, for which the following Proposal is made.

The Contractor's attention is directed to the need for securing from the Department of Environment & Natural Resources, Foss Building, Pierre, South Dakota, permission to remove water from public sources (lakes, rivers, streams, etc.). The Contractor should make his request as early as possible after receiving his contract, and insofar as possible at least 30 days prior to the date that the water is to be used.

Kara Palmer is the official in charge of the Hot Springs Career Center for Pennington County.

THE FOLLOWING ITEMS ARE INCLUDED IN THIS PROPOSAL FORM:

Special Provision for Contract Time, dated 8/29/24.

Special Provision for Prosecution and Progress, dated 1/21/21.

Special Provision for Traffic Control Supervisor, dated 8/7/24.

Special Provision for On-The-Job Training Program, dated 3/10/16.

Special Provision Regarding Section 404 of the Clean Water Act, dated 9/29/21.

Fact Sheet #23.

Special Provision for Concrete Penetrating Sealer, dated 7/30/24.

Special provision for Drilled Shaft Construction, dated 3/25/24.

Special Provision for Stainless Reinforcing Steel, dated 2/21/24.

Special Provision for Contractor Staking with Machine Control Grading Option, dated 2/21/24.

List of Utilities.

Special Provision for Acknowledgment and Certification Regarding Article 3, Section 12 of the South Dakota Constitution, dated 8/24/23.

Special Provision for Buy America, dated 5/1/24.
Special Provision for Liability Insurance, dated 4/21/22.
Special Provision for Responsibility for Damage Claims, dated 4/21/22.
Special Provision for Restriction of Boycott of Israel, dated 1/31/20.
Special Provision for Contractor Administered Preconstruction Meeting, dated 12/18/19.
Fuel Adjustment Affidavit, DOT form 208 dated 7/15.
Standard Title VI Assurance, dated 3/1/16.
Special Provision For Disadvantaged Business Enterprise, dated 2/9/24.
Special Provision For EEO Affirmative Action Requirements on Federal and Federal-Aid Construction Contracts, dated 2/5/24.
Special Provision For Required Contract Provisions Federal-Aid Construction Contracts, Form FHWA 1273 (Rev. October 23, 2023), dated 10/18/23.
Required Contract Provisions Federal-Aid Construction Contracts, Form FHWA 1273 (Rev. 10/23/23).
Special Provision Regarding Minimum Wage on Federal-Aid Projects, dated 10/24/19.
Wage and Hour Division US Department of Labor Washington DC. - US Dept. of Labor Decision Number SD20230032, dated 3/10/23.
Special Provision for Supplemental Specifications to 2015 Standard Specifications for Roads and Bridges, dated 9/7/22.
Special Provision for Price Schedule for Miscellaneous Items, dated 12/6/23.

Special Provision Regarding Storm Water Discharge, dated 5/8/18.
General Permit for Storm Water Discharges Associated with Construction Activities, dated 4/1/18
https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/stormwater/StormWaterConstruction.aspx

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
CONTRACT TIME

PROJECT IM 0902(18)101; PCN 035F
PENNINGTON COUNTY

AUGUST 29, 2024

Phase 1 Work Restriction

The Contractor will not begin work on Phase 1 prior to March 3, 2025.

Single lane closures for temporary guardrail in the eastbound lanes and construction of the temporary retaining structures in the median will be allowed in each direction prior to March 3, 2025 with approval of the Engineer based a favorable weather forecast. The Contractor will be responsible for all costs to remove and reset all lane closures as directed by the Engineer if inclement weather arises during progress of the work. If work on the temporary retaining structures begins prior to March 3, 2025, the temporary retaining structure will be built such that no hazard exists when lane closures are removed.

Phase 1 Interim Completion Requirement

The Contractor will complete all work in the Phase 1 portion of the project by the July 30, 2025 interim completion date.

If the Contractor does not complete the work by the interim completion requirement, the Department will assess liquidated damages in accordance with Section 8.8 Table A. The Department will assess liquidated damages for each working day the work (project) is late until the Contractor completes the work.

In the event the Contractor does not complete the work on time, the Department will count working days in accordance with Section 8.6 C.

Phase 2 Interim Completion Requirement

Phase 2 in 2025 Option

If the Contractor elects to begin Phase 2 in 2025, all work on the project will be completed by the November 21, 2025 interim completion date.

If the Contractor does not complete the work by the interim completion requirement, the Department will assess liquidated damages in accordance with Section 8.8 Table A. The Department will assess liquidated damages for each working day the work (project) is late until the Contractor completes the work.

In the event the Contractor does not complete the work on time, the Department will count working days in accordance with Section 8.6 C.

Following the November 21, 2025 interim completion requirement, all lanes will have a hard surface in place and all unimpeded traffic restored. This requirement may include the Contractor placing temporary hard surfacing over any uncompleted portion of the project including, but not limited to, driving lanes, shoulders, and bridge approaches to tie partially completed work with the existing pavement.

The Department will define hard surfacing as new permanent surfacing, existing permanent surfacing, temporary surfacing, and any combination of new permanent surfacing, existing permanent surfacing, and temporary surfacing. For the hard surfaced roadway requirement, the temporary surfacing must consist of granular material topped with either asphalt concrete or PCC pavement. The Department will provide the surfacing thickness requirements. The temporary surfacing must bring the temporary surface to the final grade elevation and provide proper drainage throughout the project leaving no bumps, dips, or vertical drop offs throughout the project.

The Department will not make payment for any temporary surfacing necessary to meet the hard surfacing requirements. In addition, the Department will not make payment for any permanent surfacing placed under conditions not meeting the specifications (the Department will also consider this temporary surfacing) necessary to meet the hard surfacing requirements. The Department will also not make payment for the removal of any surfacing or the reshaping of any subgrade/granular material necessary due to meeting the November 21, 2025 interim completion requirement.

The Contractor will apply pavement markings as required to safely accommodate traffic prior to opening all lanes of the roadway to unimpeded traffic. The Department will not make payment for any additional temporary pavement markings or any additional traffic control required in the spring of 2026 due to meeting the November 21, 2025 interim completion date

The Contractor will provide maintenance of the project until unimpeded traffic is restored to all lanes of the roadway and will provide maintenance of any temporary surfacing through the winter months. This may include temporary stabilization of all exposed soils, maintenance of traffic control devices, or other work as determined necessary to safely maintain the existing roadway and slope.

The Contractor will not be responsible for snow removal. The Contractor will be responsible for any damage to traffic control items caused by the Department's snow removal operations after November 21, 2025 until the Department suspends the project for the winter of 2025/2026. Any damage to traffic control items caused by the Department's snow removal operations from the date the Department suspends the project for the winter of 2025/2026 until the Contractor resumes work in the spring of 2026 will be at the Department's expense.

Phase 2 in 2026 Option

If the Contractor elects to begin Phase 2 in 2026, work will not begin prior to March 2, 2026. Single lane closures for temporary guardrail in the westbound lanes will be allowed in each direction prior to March 2, 2026 with approval of the Engineer based a favorable weather forecast. The Contractor will be responsible for all costs to remove and reset all lane closures as directed by the Engineer if inclement weather arises during progress of the work.

Field Work Completion

The Contractor will complete the project by the August 5, 2026 field work completion date.

Failure to Complete on Time

The Contractor will complete all work on the project prior to the field work completion requirement. If the Contractor does not complete all work by the field work completion requirement, the Department will assess liquidated damages in accordance with Section 8.8. The Department will assess liquidated damages for each working day the work (project) is late until the Contractor completes all field work.

In the event the Contractor does not complete all field work on time, the Department will count working days in accordance with Section 8.6 C.

Expected Adverse Weather Days

The Department has provided Attachment 1 for information purposes only as a guide to bidders. Table 1 depicts the typical number of adverse weather days expected for any given month, based on historical records. The Department will consider this project a structural project in Zone 4.

The Department will consider expected adverse weather days cumulative in nature over the time period when the Contractor is actively pursuing completion of the work. The Department will not consider adverse weather days during an extended period of time when the Contractor is not pursuing completion of the work. When considering a time extension for field work completion of the project, the Engineer will compare the total number of expected adverse weather days against the total number of actual adverse weather days for the time period during which the work was being completed.

* * * * *

ATTACHMENT 1

Figure A - Expected Adverse Weather Days for South Dakota

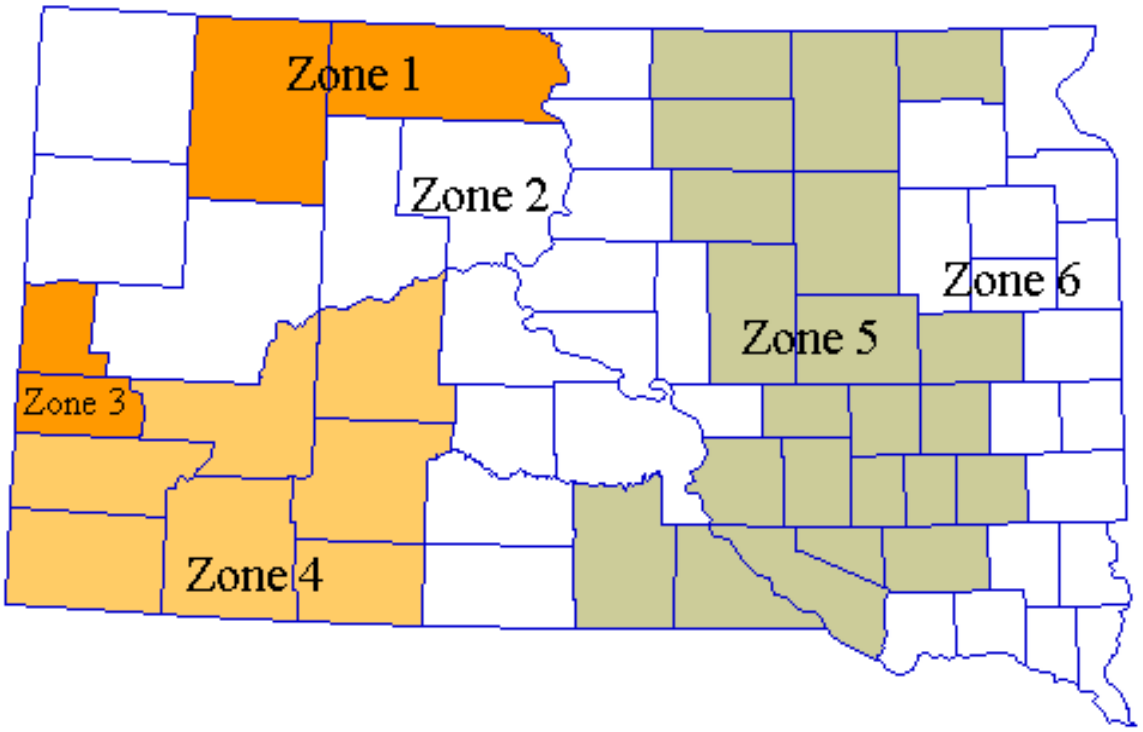


Table 1 - Expected Adverse Weather Days for South Dakota

	Grading Projects						Surfacing and Structural Projects					
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Jan	18	18	16	16	22	24	18	18	15	16	21	23
Feb	19	18	12	14	19	21	19	18	12	14	19	21
Mar	12	10	9	8	11	13	12	10	9	8	10	12
Apr	6	5	8	5	6	6	5	4	6	4	4	4
May	6	6	8	6	6	6	5	5	6	4	4	5
Jun	7	6	7	6	7	8	5	5	5	4	5	6
Jul	5	5	6	5	6	7	4	4	5	3	4	5
Aug	4	4	5	4	5	6	3	3	4	3	4	4
Sep	3	3	4	3	4	5	2	2	3	2	3	4
Oct	4	3	5	3	4	4	3	3	4	2	3	3
Nov	11	9	8	7	10	12	11	9	8	7	10	11
Dec	21	19	15	14	20	22	21	19	15	14	20	22

NOTE: Includes Holidays and Weekends.

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0902(18)101	A2	A6

Plotting Date: 08/29/2024 Rev 08/29/24 RU

Section D - Erosion and Sediment Control

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1690	Remove Sediment	4.1	CuYd
110E1695	Remove Sediment Filter Bag	128	Ft
110E1700	Remove Silt Fence	477	Ft
230E0010	Placing Topsoil	2,143	CuYd
730E0100	Cover Crop Seeding	3.0	Bu
730E0210	Type F Permanent Seed Mixture	104	Lb
731E0200	Fertilizing	3.00	Ton
732E0100	Mulching	12.0	Ton
734E0044	Soil Stabilizer	2.3	Acre
734E0103	Type 3 Erosion Control Blanket	11,922	SqYd
734E0154	12" Diameter Erosion Control Wattle	1,225	Ft
734E0165	Remove and Reset Erosion Control Wattle	307	Ft
734E0180	Sediment Filter Bag	128	Ft
734E0602	Low Flow Silt Fence	1,600	Ft
734E0604	High Flow Silt Fence	306	Ft
734E0610	Mucking Silt Fence	132	CuYd
734E0620	Repair Silt Fence	477	Ft
734E0845	Sediment Control at Inlet with Frame and Grate	5	Each
900E1310	Concrete Washout Facility	2	Each
900E1320	Construction Entrance	2	Each

Section E – Structure

Str. No. 52-831-309

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
009E5000	Concrete Penetrating Sealer	1,754.0	SqYd
120E7000	Select Granular Backfill	19.6	Ton
250E0030	Incidental Work, Structure	Lump Sum	LS
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
420E0100	Structure Excavation, Bridge	29	CuYd
430E0200	Bridge End Embankment	536	CuYd
430E0300	Granular Bridge End Backfill	119.4	CuYd
430E0510	Approach Slab Underdrain Excavation	9.5	CuYd
430E0700	Precast Concrete Headwall for Drain	2	Each
460E0030	Class A45 Concrete, Bridge Deck	605.2	CuYd
460E0050	Class A45 Concrete, Bridge	254.6	CuYd
460E0150	Concrete Approach Slab for Bridge	190.6	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	41.9	SqYd
460E0500	Deck Drain, Girder Bridge	3	Each
465E0100	Class A45 Concrete, Drilled Shaft	263.8	CuYd
465E0200	Drilled Shaft Excavation	259.4	CuYd
465E1056	56" Permanent Casing	151.1	Ft
480E0100	Reinforcing Steel	82,392	Lb
480E0200	Epoxy Coated Reinforcing Steel	2,883	Lb
480E0300	Stainless Reinforcing Steel	125,037	Lb
480E0511	No. 11 Rebar Splice	216	Each
510E0100	Extract Pile	5	Each
510E0300	Preboring Pile	180	Ft
510E3421	HP 12x74 Steel Test Pile, Furnish and Drive	140	Ft
510E3425	HP 12x74 Steel Bearing Pile, Furnish and Drive	1,040	Ft
560E8081	81" Minnesota Shape Prestressed Concrete Beam	2,345	Ft
680E0040	4" Underdrain Pipe	131	Ft
680E2500	Porous Backfill	18.0	Ton
700E0210	Class B Riprap	1,611.0	Ton
700E1100	Overburden Excavation for Riprap	950	CuYd
831E0110	Type B Drainage Fabric	1,922	SqYd
831E1030	Perforated Geocell	560	SqFt

Str. No. 52-831-310

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
009E5000	Concrete Penetrating Sealer	1,754.0	SqYd
120E7000	Select Granular Backfill	19.6	Ton
250E0030	Incidental Work, Structure	Lump Sum	LS
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
420E0100	Structure Excavation, Bridge	29	CuYd
430E0200	Bridge End Embankment	537	CuYd
430E0300	Granular Bridge End Backfill	119.4	CuYd
430E0510	Approach Slab Underdrain Excavation	9.5	CuYd
430E0700	Precast Concrete Headwall for Drain	2	Each
460E0030	Class A45 Concrete, Bridge Deck	605.2	CuYd
460E0050	Class A45 Concrete, Bridge	255.1	CuYd
460E0150	Concrete Approach Slab for Bridge	190.6	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	41.9	SqYd
460E0500	Deck Drain, Girder Bridge	3	Each
465E0100	Class A45 Concrete, Drilled Shaft	263.5	CuYd
465E0200	Drilled Shaft Excavation	259.1	CuYd
465E1056	56" Permanent Casing	151.1	Ft
480E0100	Reinforcing Steel	82,430	Lb
480E0200	Epoxy Coated Reinforcing Steel	2,883	Lb
480E0300	Stainless Reinforcing Steel	125,037	Lb
480E0511	No. 11 Rebar Splice	216	Each
510E0100	Extract Pile	5	Each
510E0300	Preboring Pile	180	Ft
510E3421	HP 12x74 Steel Test Pile, Furnish and Drive	140	Ft
510E3425	HP 12x74 Steel Bearing Pile, Furnish and Drive	1,040	Ft
560E8081	81" Minnesota Shape Prestressed Concrete Beam	2,345	Ft
680E0040	4" Underdrain Pipe	131	Ft
680E2500	Porous Backfill	18.0	Ton
700E0210	Class B Riprap	1,699.0	Ton
700E1100	Overburden Excavation for Riprap	1,028	CuYd
831E0110	Type B Drainage Fabric	2,020	SqYd
831E1030	Perforated Geocell	560	SqFt

Plot Scale - 1:200
Plotted From - TRPR17190
File - ...\prj\pemn035F\NotesSectionA.dgn

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0902(18)101	A3	A6

Plotting Date: 08/29/2024 Rev 08/29/24 RU

Section F - Surfacing

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3320	Checker	Lump Sum	LS
120E6200	Water for Granular Material	124.4	MGal
260E1010	Base Course	10,382.8	Ton
320E3000	Compaction Sample	8	Each
320E5020	Saw Joint in Asphalt Concrete	2,493	Ft
320E7012	Grind 12" Rumble Strip or Stripe in Asphalt Concrete	0.7	Mile
330E0010	MC-70 Asphalt for Prime	10.5	Ton
330E0100	SS-1h or CSS-1h Asphalt for Tack	5.2	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	1.6	Ton
330E1000	Blotting Sand for Prime	5.0	Ton
330E2000	Sand for Flush Seal	6.5	Ton

Alternate A

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
320E0008	PG 64-34 Asphalt Binder	166.1	Ton
320E1060	Class G Asphalt Concrete	2,891.6	Ton
320E4000	Hydrated Lime	28.6	Ton

Alternate B

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
320E0008	PG 64-34 Asphalt Binder	146.8	Ton
320E1060	Class G Asphalt Concrete	2,969.5	Ton
320E4000	Hydrated Lime	29.4	Ton

Section M - Pavement Marking

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
633E0015	Cold Applied Plastic Pavement Marking, 6"	670	Ft
633E1201	High Build Waterborne Pavement Marking Paint with Reflective Elements, White	22	Gal
633E1206	High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow	22	Gal
633E5002	Grooving for Cold Applied Plastic Pavement Marking, 6"	670	Ft
633E5102	Grooving for Durable Pavement Marking, 6"	5,420	Ft

Section S - Permanent Signing

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0130	Remove Traffic Sign	1	Each
110E7150	Remove Sign for Reset	3	Each
110E7152	Remove Delineator for Reset	6	Each
632E1340	2.5"x2.5" Perforated Tube Post	26.0	Ft
632E2100	Reset Delineator	6	Each
632E2220	Guardrail Delineator	50	Each
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	20.0	SqFt
632E3500	Reset Sign	3	Each

SPECIFICATIONS

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

Plot Scale - 1:200
Plotted From - TRPR17190
File - ...\prj\penn035F\NotesSectionA.dgn

SECTION E – ESTIMATE OF STRUCTURE QUANTITES

Str. No. 52-831-309

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
009E5000	Concrete Penetrating Sealer	1,754.0	SqYd
120E7000	Select Granular Backfill	19.6	Ton
250E0030	Incidental Work, Structure	Lump Sum	LS
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
420E0100	Structure Excavation, Bridge	29	CuYd
430E0200	Bridge End Embankment	536	CuYd
430E0300	Granular Bridge End Backfill	119.4	CuYd
430E0510	Approach Slab Underdrain Excavation	9.5	CuYd
430E0700	Precast Concrete Headwall for Drain	2	Each
460E0030	Class A45 Concrete, Bridge Deck	605.2	CuYd
460E0050	Class A45 Concrete, Bridge	254.6	CuYd
460E0150	Concrete Approach Slab for Bridge	190.6	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	41.9	SqYd
460E0500	Deck Drain, Girder Bridge	3	Each
465E0100	Class A45 Concrete, Drilled Shaft	263.8	CuYd
465E0200	Drilled Shaft Excavation	259.4	CuYd
465E1056	56" Permanent Casing	151.1	Ft
480E0100	Reinforcing Steel	82,392	Lb
480E0200	Epoxy Coated Reinforcing Steel	2,883	Lb
480E0300	Stainless Reinforcing Steel	125,037	Lb
480E0511	No. 11 Rebar Splice	216	Each
510E0100	Extract Pile	5	Each
510E0300	Preboring Pile	180	Ft
510E3421	HP 12x74 Steel Test Pile, Furnish and Drive	140	Ft
510E3425	HP 12x74 Steel Bearing Pile, Furnish and Drive	1,040	Ft
560E8081	81" Minnesota Shape Prestressed Concrete Beam	2,345	Ft
680E0040	4" Underdrain Pipe	131	Ft
680E2500	Porous Backfill	18.0	Ton
700E0210	Class B Riprap	1,611.0	Ton
700E1100	Overburden Excavation for Riprap	950	CuYd
831E0110	Type B Drainage Fabric	1,922	SqYd
831E1030	Perforated Geocell	560	SqFt

Str. No. 52-831-310

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
009E5000	Concrete Penetrating Sealer	1,754.0	SqYd
120E7000	Select Granular Backfill	19.6	Ton
250E0030	Incidental Work, Structure	Lump Sum	LS
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
420E0100	Structure Excavation, Bridge	29	CuYd
430E0200	Bridge End Embankment	537	CuYd
430E0300	Granular Bridge End Backfill	119.4	CuYd
430E0510	Approach Slab Underdrain Excavation	9.5	CuYd
430E0700	Precast Concrete Headwall for Drain	2	Each
460E0030	Class A45 Concrete, Bridge Deck	605.2	CuYd
460E0050	Class A45 Concrete, Bridge	255.1	CuYd
460E0150	Concrete Approach Slab for Bridge	190.6	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	41.9	SqYd
460E0500	Deck Drain, Girder Bridge	3	Each
465E0100	Class A45 Concrete, Drilled Shaft	263.5	CuYd
465E0200	Drilled Shaft Excavation	259.1	CuYd
465E1056	56" Permanent Casing	151.1	Ft
480E0100	Reinforcing Steel	82,430	Lb
480E0200	Epoxy Coated Reinforcing Steel	2,883	Lb
480E0300	Stainless Reinforcing Steel	125,037	Lb
480E0511	No. 11 Rebar Splice	216	Each
510E0100	Extract Pile	5	Each
510E0300	Preboring Pile	180	Ft
510E3421	HP 12x74 Steel Test Pile, Furnish and Drive	140	Ft
510E3425	HP 12x74 Steel Bearing Pile, Furnish and Drive	1,040	Ft
560E8081	81" Minnesota Shape Prestressed Concrete Beam	2,345	Ft
680E0040	4" Underdrain Pipe	131	Ft
680E2500	Porous Backfill	18.0	Ton
700E0210	Class B Riprap	1,699.0	Ton
700E1100	Overburden Excavation for Riprap	1,028	CuYd
831E0110	Type B Drainage Fabric	2,020	SqYd
831E1030	Perforated Geocell	560	SqFt

Temporary Retaining Structures

Temporary retaining structures will be necessary to maintain traffic on the existing alignment adjacent to the new abutments and berms during excavation, drilled shaft construction, and placement of riprap. The following soil parameters for the existing embankment and underlying soils will be used in the design of temporary retaining structures. See the Site Plan and Subsurface Profile in Section E for boring and testing information.

Soil Parameters for Temporary Retaining Structures

	Friction Angle, φ	Cohesion, C	Wet Unit Weight, γ_w
Brown Silt Clay (Existing Embankment)	18 degrees	100 psf	121 pcf
Black Clay	12 degrees	50 psf	106 pcf
Brown Clay with Gravel	24 degrees	50 psf	122 pcf
Dark Gray Silt Clay (Pierre Shale)	18 degrees	1,900 psf	125 pcf

The design of the temporary retaining structure is the responsibility of the Contractor. The Contractor will submit plans and calculations sealed by a Professional Engineer registered in South Dakota. Do not begin construction of the temporary retaining structure until the plans and calculations have been accepted by the SDDOT Bridge Construction Engineer. Allow a minimum of 15 days for review. The cost for the temporary retaining structure is incidental to the contract unit bid price for Structure Excavation, Bridge.

ESTIMATE OF STRUCTURE QUANTITIES

Description	Quantity	Unit	Remarks
Bridge Elevation Survey	Lump Sum	LS	
Concrete Penetrating Sealer	1754	Sq. Yd.	See Special Provision
Select Granular Backfill	19.6	Ton	
Incidental Work, Structure	Lump Sum	LS	
Structural Steel, Miscellaneous	Lump Sum	LS	
Membrane Sealant Expansion Joint	83.8	Ft.	
Structural Excavation, Bridge	29	Cu.Yd.	
Bridge End Embankment	536	Cu.Yd.	
Granular Bridge End Backfill	119.4	Cu.Yd.	
Approach Slab Underdrain Excavation	9.5	Cu.Yd.	
Precast Concrete Headwall for Drain	2	Each	
Class A45 Concrete, Bridge Deck	605.2	Cu.Yd.	
Class A45 Concrete, Bridge	254.6	Cu.Yd.	
Concrete Approach Slab for Bridge	190.6	Sq.Yd.	
Concrete Approach Sleeper Slab for Bridge	41.9	Sq.Yd.	
Deck Drain, Girder Bridge	3	Each	
Class A45 Concrete, Drilled Shaft	263.8	Cu.Yd.	See Special Provision
Drilled Shaft Excavation	259.4	Cu.Yd.	
56" Permanent Casing	151.1	L.F.	
Reinforcing Steel	82392	Lb.	
Epoxy Coated Reinforcing Steel	2883	Lb.	
Stainless Reinforcing Steel	125037	Lb.	See Special Provision
No. 11 Rebar Splice	216	Each	
Extract Pile	5	Each	
Preboring Pile	180	Ft.	
HP 12x74 Steel Test Pile, Furnish and Drive	140	Ft.	
HP 12x74 Steel Bearing Pile, Furnish and Drive	1040	Ft.	
81" Minnesota Shape Prestressed Concrete Beam	2345	Ft.	
4" Underdrain Pipe	131	Ft.	
Porous Backfill	18	Ton	
Class B Riprap	1611.0	Ton	
Overburden Excavation for Riprap	950	Cu.Yd.	
Type B Drainage Fabric	1922	Sq.Yd.	
Perforated Geocell	560	Sq.Ft.	

BRIDGE SPECIFICATIONS

1. Design Specifications: AASHTO LRFD Bridge Design Specifications, 9th Edition.
2. Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required provisions, supplemental specifications and special provisions as included in the proposal.

BRIDGE DESIGN LOADING

1. Girders are designed continuous for AASHTO HL-93 Live Load.
2. Dead Load includes 22 psf for future wearing surface on the roadway.

DESIGN MATERIAL STRENGTHS*

Class A45 Concrete	f'_c = 4,500 psi
Reinforcing Steel (ASTM A615, Gr. 60)	f_y = 60,000 psi
Stainless Steel (ASTM A955, Gr. 60)	f_y = 60,000 psi
Piling (ASTM A572 Grade 50)	f_y = 50,000 psi

*For prestressed beams, see notes regarding Prestressed Girders.

GENERAL CONSTRUCTION

1. All lap splices shown are contact lap splices unless noted otherwise.
2. All exposed concrete corners and edges will be chamfered 3/4-inch unless noted otherwise.
3. Use 2-inch clear cover on all reinforcing steel except as shown otherwise on plans.
4. The Contractor will imprint on the structure the date of new construction as specified and detailed on Standard Plate 460.02.
5. Barrier Curbs and End blocks will be built perpendicular to the roadway grade line.
6. Requests for construction joints or reinforcing steel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.
7. Bridge berms will be constructed to the plans template prior to any pile driving or construction of abutment footings. See Standard Plate 120.10. Berm slopes will not be disturbed after construction. Any alterations to the berm or slopes after berm construction will be submitted to the Bridge Construction Engineer for approval. Allow 30 days for review of proposals.
8. The elevation of the bridge deck is 24.5 inches above subgrade elevation.

DESIGN MIX OF CONCRETE

1. All structural concrete will be Class A45 Concrete unless otherwise indicated.
2. Type II cement conforming to Section 750 is required except Type III cement may be used for prestressed beams.
3. Grout design mix will be as specified in Section 460.2 K of the Construction Specifications. A compressive strength of 2000 psi will be attained by the grout prior to erection of any beams. Chamfer edges of grout pads 3/4-inch. The quantity of grout is included in and will be paid for at the contract unit price per cubic yard for Class A45 Concrete, Bridge.

INCIDENTAL WORK, STRUCTURE

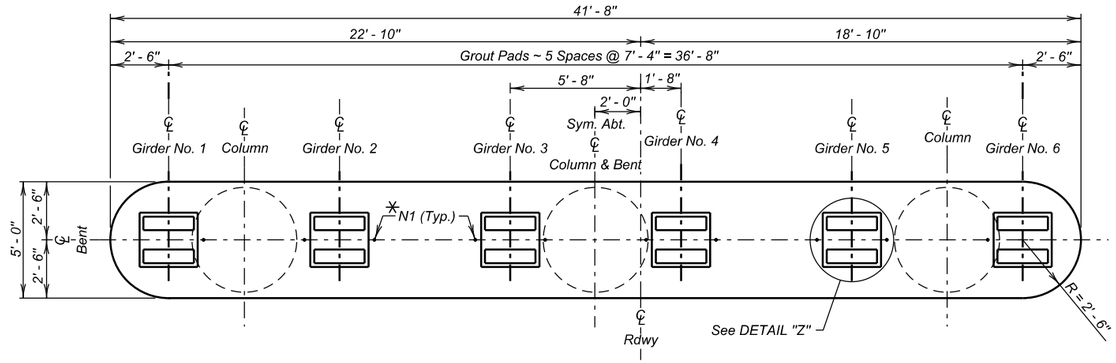
1. In place centerline Sta. 348+57.38 to centerline Sta. 350+46.88 is a 189.5-foot, 3 span prestressed concrete girder bridge with a 30'-0" clear roadway. The superstructure consists of a reinforced concrete slab with concrete barrier continuous across the bridge. The substructure consists of 2 column reinforced concrete bents and reinforced concrete vertical abutments. The bents are supported on spread footings on rock, and the abutments are supported on 10BP42 Steel Bearing Piles.
2. Break down and remove the existing bridge, and approach/sleeper slabs if applicable, to 1-foot below finished groundline, or as required to construct the new structure in accordance with Section 110 of the Construction Specifications. All portions of the existing bridge will be removed and disposed of by the Contractor on a site obtained by the Contractor and approved by the Engineer in accordance with the Environmental Commitments found in Section A.
3. During demolition of the structure, efforts will be taken to prevent material from falling into the creek. Under no circumstances is asphalt allowed to fall into the creek.
4. The foregoing is a general description of the in-place bridge and should not be construed to be complete in all details. Before preparing the bid, it is the responsibility of the Contractor to make a visual inspection of the structure to verify the extent of the work and materials involved. If desired by the Contractor, a copy of the original construction plans may be obtained through the Office of Bridge Design.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES
FOR
(WESTBOUND LANES)
394' - 6" PRESTRESSED GIRDER BRIDGE
STR. NO. 52-831-309
AUGUST 2022

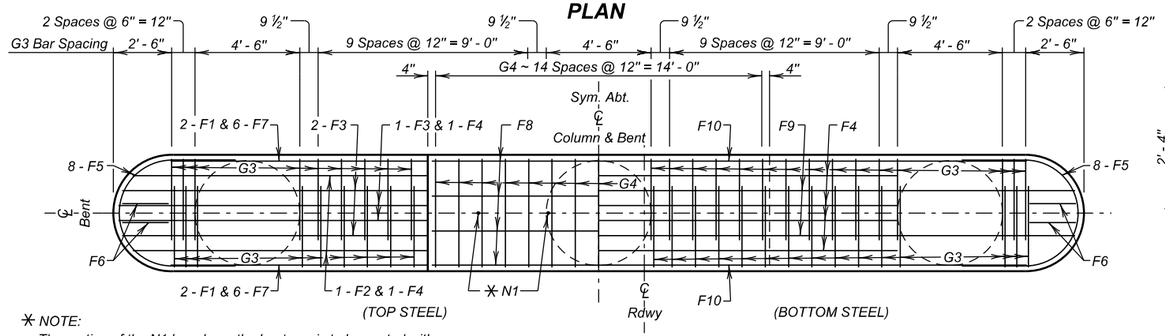
DESIGNED BY	CK. DES. BY	DRAFTED BY	
CL	SK	BT	Steve A Johnson BRIDGE ENGINEER
PENN035F	035FTA02		

Revised July 2, 2024 SK/CL
Revised August 22, 2024 SK/CL
Revised August 29, 2024 PW

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(18)101	E14	E62

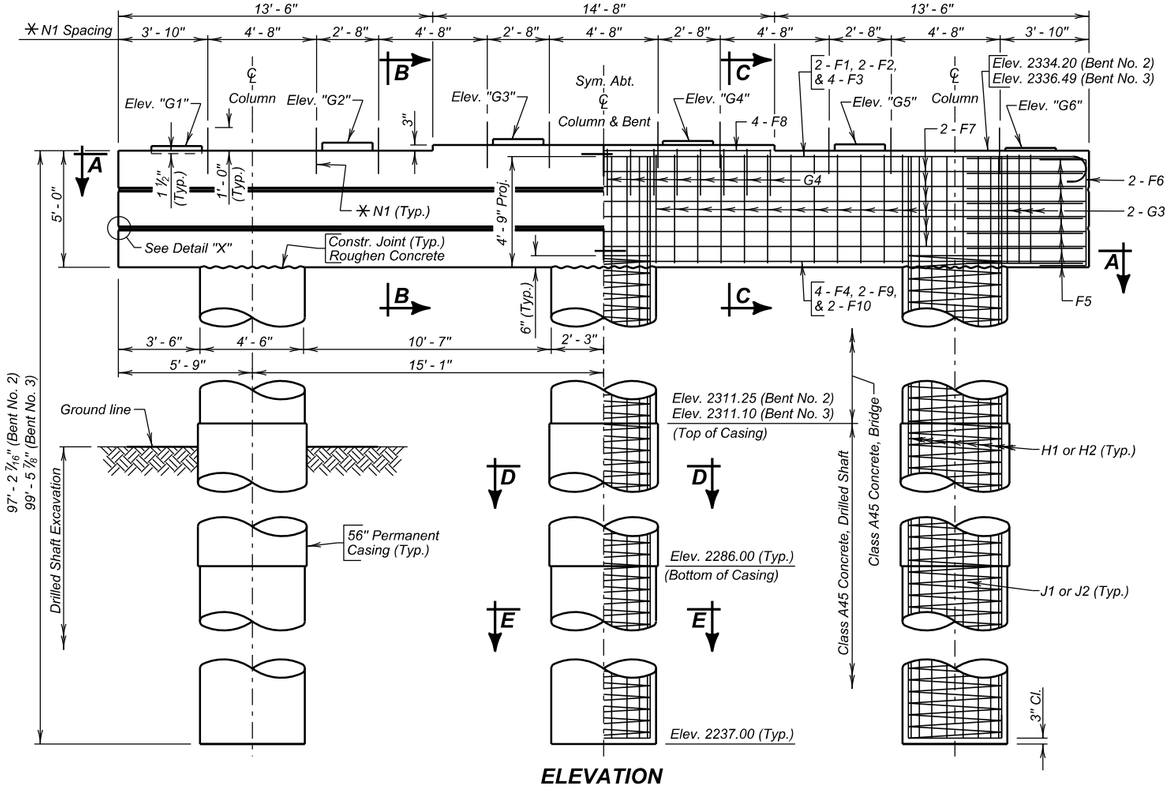


PLAN



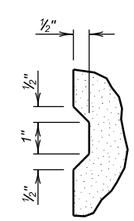
SECTION A - A

✳ NOTE:
The portion of the N1 bar above the bent cap is to be coated with asphalt paint or wrapped with tar paper to a minimum thickness of 1/16".

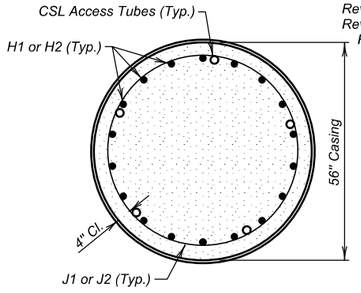


ELEVATION

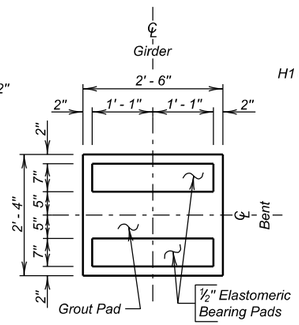
INCREASING STATIONS



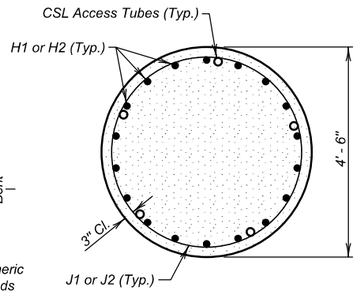
DETAIL "X"



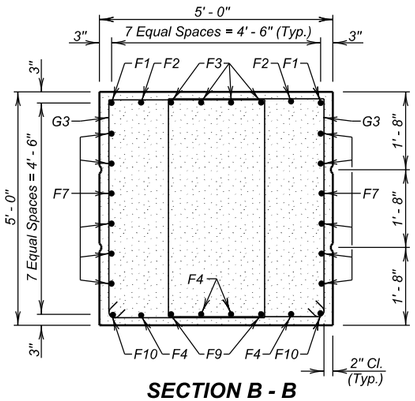
SECTION D - D



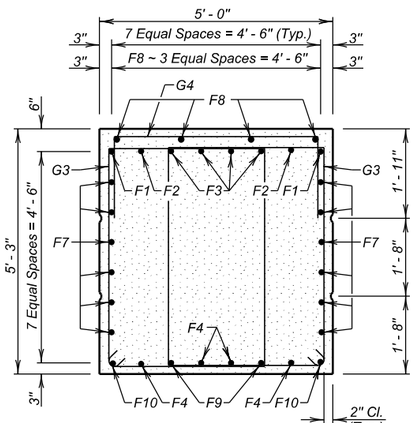
DETAIL "Z"



SECTION E - E



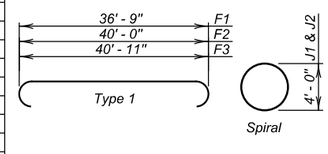
SECTION B - B



SECTION C - C

REINFORCING SCHEDULE
(For 1 Bent)

Mk.	No.	Size	Length	Type
F1	2	8	38' - 7"	1
F2	2	8	41' - 10"	1
F3	4	8	42' - 9"	1
F4	4	8	25' - 8"	Str.
F5	16	6	12' - 8"	S11
F6	4	6	8' - 6"	17
F7	12	4	36' - 9"	Str.
F8	4	6	14' - 5"	Str.
F9	2	8	40' - 11"	Str.
F10	2	8	36' - 9"	Str.
G3	60	5	16' - 9"	T1
G4	15	6	8' - 8"	17
N1	10	8	2' - 0"	Str.
Bent No. 2				
H1	54	11	96' - 8"	Str.
J1	3	4	1172' - 0"	Spiral
Bent No. 3				
H2	54	11	99' - 0"	Str.
J2	3	4	1200' - 0"	Spiral



NOTES:
All dimensions are out to out of bars.
Spirals - Use 6" pitch and 1 ½ extra turns at each end. Use 1 ½ turns for lap at splice as required or weld as approved by the Office of Bridge Design. Use 4 vertical spacer bars per column. Spirals may be smooth bars. Bar length shown does not include splices.

℄ Length shown is full length required. The Contractor must submit a splice plan for approval. Mechanical splices must be staggered and not placed side by side. Splices will not be placed within 10 feet of the point of fixity or top and bottom of casing. Two splices per bar are anticipated.

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY Bent No. 2	QUANTITY Bent No. 3
⍁	Class A45 Concrete, Bridge	Cu. Yd.	70.0	74.4
△	Reinforcing Steel	Lb.	33691	34417
	Drilled Shaft Excavation	Cu. Yd.	129.4	130.0
	Class A45 Concrete, Drilled Shaft	Cu. Yd.	131.2	132.6
	56" Permanent Casing	L.F.	75.8	75.3
	No. 11 Rebar Splice	Each	108	108

⍁ Includes 0.3 Cu. Yds. for Grout Pads.
△ Includes 551 lbs. for Spacer Bars.
Each bar is computed at ¾ lbs per linear foot regardless of type furnished.

TABLE OF ELEVATIONS

Bent No.	★Elev. "G1"	★Elev. "G2"	★Elev. "G3"	★Elev. "G4"	★Elev. "G5"	★Elev. "G6"
2	2234.33	2334.47	2334.62	2334.70	2334.55	2334.41
3	2336.62	2336.76	2336.91	2337.00	2336.84	2336.70

NOTE: Top of Grout Pad shall be level and smooth.
★Elevations are Top of Grout Pad at centerline of bent.

BENT DETAILS
FOR
(WESTBOUND LANES)

394' - 6" PRESTRESSED GIRDER BRIDGE

40' - 0" ROADWAY — 0° SKEW
OVER BULL CREEK — SEC. 1-T1N-R14E
STA. 347 + 32.71 TO 351 + 27.21 — IM 0902(18)101
STR. NO. 52-831-309 — HL-93

PENNINGTON COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2022

12 OF 30

DESIGNED BY	CK. DES. BY	DRAFTED BY	
CL	SK	BT	Steve A. Johnson BRIDGE ENGINEER
PENN035F	035FTA12		

ESTIMATE OF STRUCTURE QUANTITIES

Description	Quantity	Unit	Remarks
Bridge Elevation Survey	Lump Sum	LS	
Concrete Penetrating Sealer	1754	Sq. Yd.	See Special Provision
Select Granular Backfill	19.6	Ton	
Incidental Work, Structure	Lump Sum	LS	
Structural Steel, Miscellaneous	Lump Sum	LS	
Membrane Sealant Expansion Joint	83.8	Ft.	
Structural Excavation, Bridge	29	Cu.Yd.	
Bridge End Embankment	537	Cu.Yd.	
Granular Bridge End Backfill	119.4	Cu.Yd.	
Approach Slab Underdrain Excavation	9.5	Cu.Yd.	
Precast Concrete Headwall for Drain	2	Each	
Class A45 Concrete, Bridge Deck	605.2	Cu.Yd.	
Class A45 Concrete, Bridge	255.1	Cu.Yd.	
Concrete Approach Slab for Bridge	190.6	Sq.Yd.	
Concrete Approach Sleeper Slab for Bridge	41.9	Sq.Yd.	
Deck Drain, Girder Bridge	3	Each	
Class A45 Concrete, Drilled Shaft	263.5	Cu.Yd.	See Special Provision
Drilled Shaft Excavation	259.1	Cu.Yd.	
56" Permanent Casing	151.1	L.F.	
Reinforcing Steel	82430	Lb.	
Epoxy Coated Reinforcing Steel	2883	Lb.	
Stainless Reinforcing Steel	125037	Lb.	See Special Provision
No. 11 Rebar Splice	216	Each	
Extract Pile	5	Each	
Preboring Pile	180	Ft.	
HP 12x74 Steel Test Pile, Furnish and Drive	140	Ft.	
HP 12x74 Steel Bearing Pile, Furnish and Drive	1040	Ft.	
81" Minnesota Shape Prestressed Concrete Beam	2345		
4" Underdrain Pipe	131	Ft.	
Porous Backfill	18	Ton	
Class B Riprap	1699.0	Ton	
Overburden Excavation for Riprap	1028	Cu.Yd.	
Type B Drainage Fabric	2020	Sq.Yd.	
Perforated Geocell	560	Sq.Ft.	

BRIDGE SPECIFICATIONS

1. Design Specifications: AASHTO LRFD Bridge Design Specifications, 9th Edition.
2. Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required provisions, supplemental specifications and special provisions as included in the proposal.

BRIDGE DESIGN LOADING

1. Girders are designed continuous / simple for AASHTO HL-93 Live Load.
2. Dead Load includes 22 psf for future wearing surface on the roadway.

DESIGN MATERIAL STRENGTHS*

Class A45 Concrete	f'_c = 4,500 psi
Reinforcing Steel (ASTM A615, Gr. 60)	f_y = 60,000 psi
Stainless Steel (ASTM A955, Gr. 60)	f_y = 60,000 psi
Piling (ASTM A572 Grade 50)	f_y = 50,000 psi

*For prestressed beams, see notes regarding Prestressed Girders.

GENERAL CONSTRUCTION

1. All lap splices shown are contact lap splices unless noted otherwise.
2. All exposed concrete corners and edges will be chamfered 3/4-inch unless noted otherwise.
3. Use 2-inch clear cover on all reinforcing steel except as shown otherwise on plans.
4. The Contractor will imprint on the structure the date of new construction as specified and detailed on Standard Plate 460.02.
5. Barrier Curbs and End blocks will be built perpendicular to the roadway grade line.
6. Requests for construction joints or reinforcing steel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.
7. Bridge berms will be constructed to the plans template prior to any pile driving or construction of abutment footings. See Standard Plate 120.10. Berm slopes will not be disturbed after construction. Any alterations to the berm or slopes after berm construction will be submitted to the Bridge Construction Engineer for approval. Allow 30 days for review of proposals.
8. The elevation of the bridge deck is 24.5 inches above subgrade elevation.

DESIGN MIX OF CONCRETE

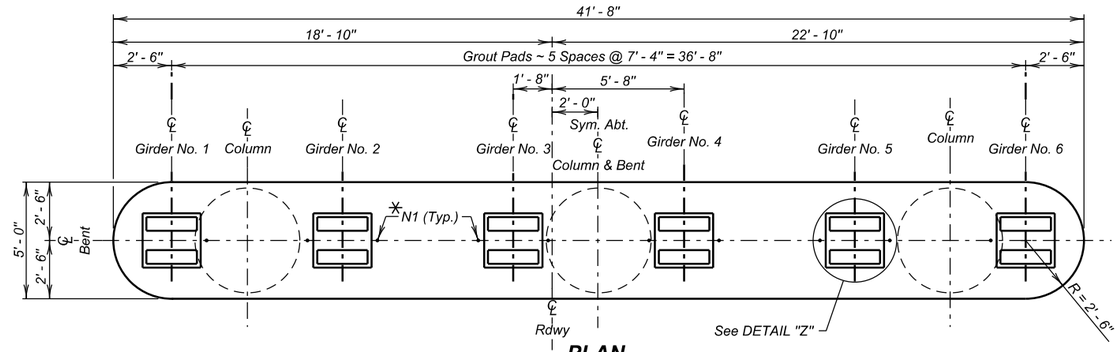
1. All structural concrete will be Class A45 Concrete unless otherwise indicated.
2. Type II cement conforming to Section 750 is required except Type III cement may be used for prestressed beams.
3. Grout design mix will be as specified in Section 460.2 K of the Construction Specifications. A compressive strength of 2000 psi will be attained by the grout prior to erection of any beams. Chamfer edges of grout pads 3/4-inch. The quantity of grout is included in and will be paid for at the contract unit price per cubic yard for Class A45 Concrete, Bridge.

INCIDENTAL WORK, STRUCTURE

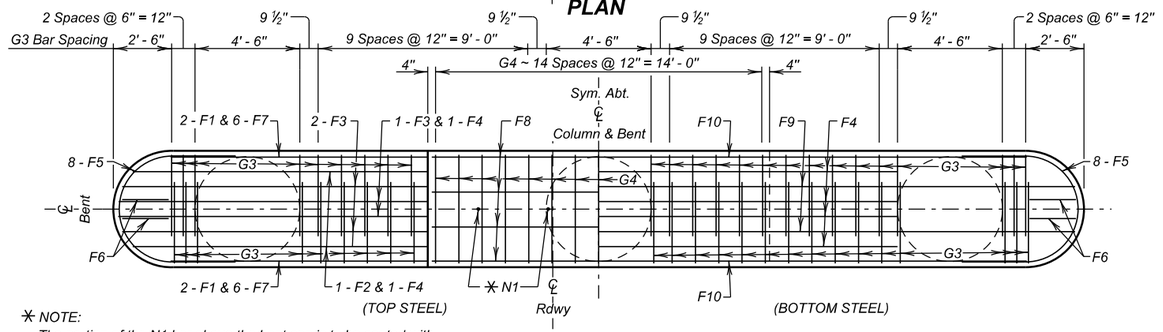
1. In place centerline Sta. 348+57.38 to centerline Sta. 350+46.88 is a 189.5-foot, 3 span prestressed concrete girder bridge with a 30'-0" clear roadway. The superstructure consists of a reinforced concrete slab with concrete barrier continuous across the bridge. The substructure consists of 2 column reinforced concrete bents and reinforced concrete vertical abutments. The bents are supported on spread footings on rock, and the abutments are supported on 10BP42 Steel Bearing Piles.
2. Break down and remove the existing bridge, and approach/sleeper slabs if applicable, to 1-foot below finished groundline, or as required to construct the new structure in accordance with Section 110 of the Construction Specifications. All portions of the existing bridge will be removed and disposed of by the Contractor on a site obtained by the Contractor and approved by the Engineer in accordance with the Environmental Commitments found in Section A.
3. During demolition of the structure, efforts will be taken to prevent material from falling into the creek. Under no circumstances is asphalt allowed to fall into the creek.
4. The foregoing is a general description of the in-place bridge and should not be construed to be complete in all details. Before preparing the bid, it is the responsibility of the Contractor to make a visual inspection of the structure to verify the extent of the work and materials involved. If desired by the Contractor, a copy of the original construction plans may be obtained through the Office of Bridge Design.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES
FOR
(EASTBOUND LANES)
394' - 0" PRESTRESSED GIRDER BRIDGE
STR. NO. 52-831-310
AUGUST 2022

DESIGNED BY	CK. DES. BY	DRAFTED BY	
CL	SK	BT	Steve A Johnson BRIDGE ENGINEER
PENN035F	035FTB02		

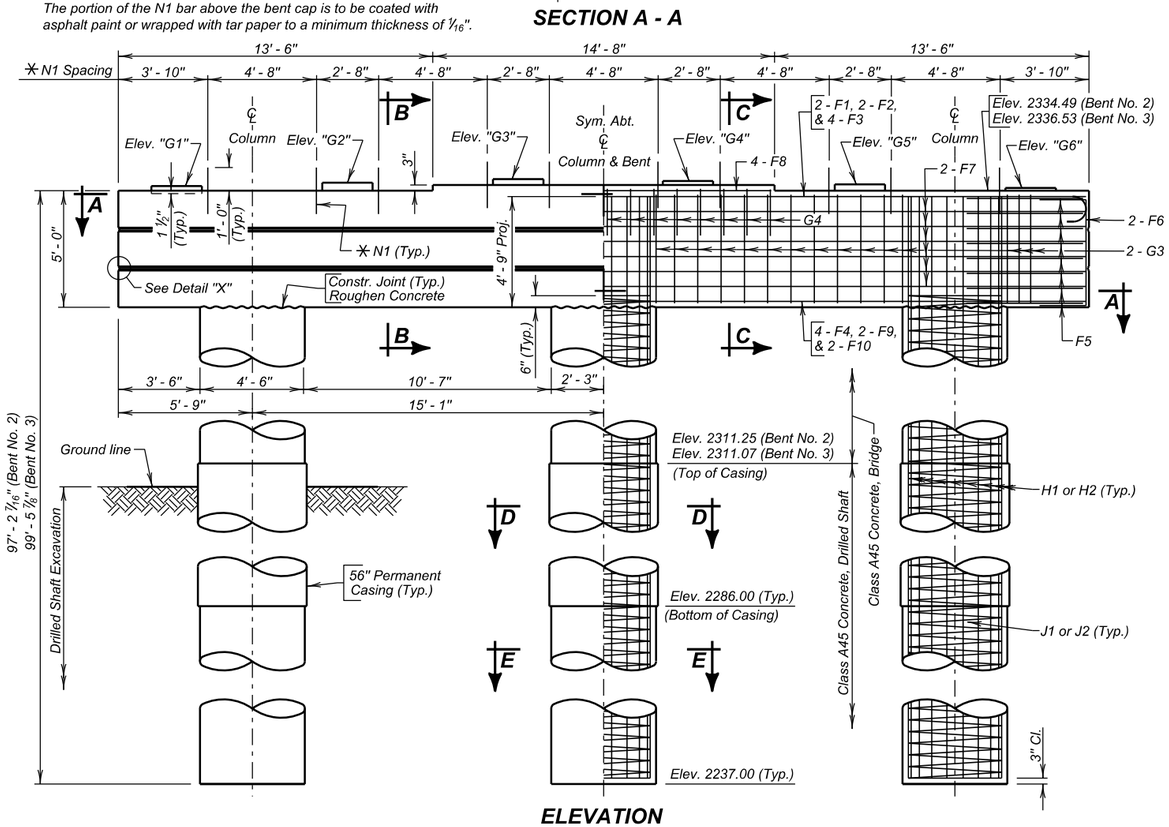


PLAN



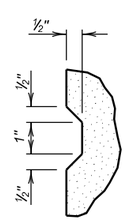
SECTION A - A

✳ NOTE:
The portion of the N1 bar above the bent cap is to be coated with asphalt paint or wrapped with tar paper to a minimum thickness of 1/16".

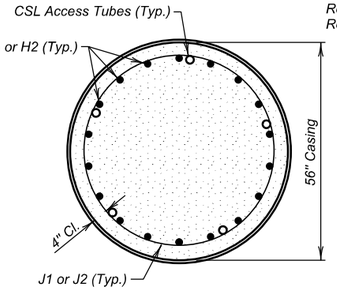


ELEVATION

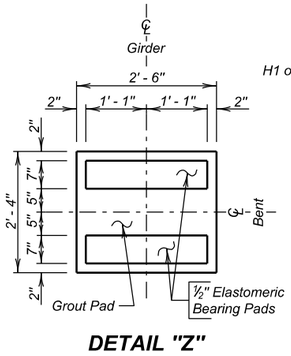
INCREASING STATIONS



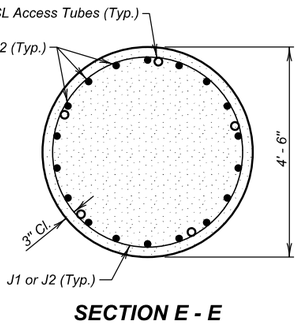
DETAIL "X"



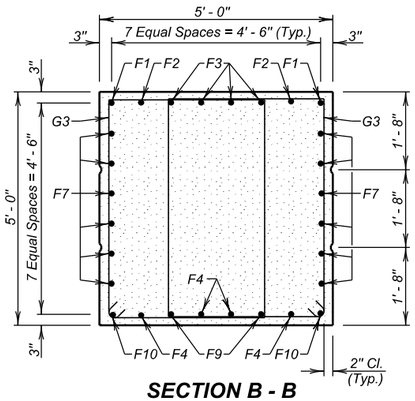
SECTION D - D



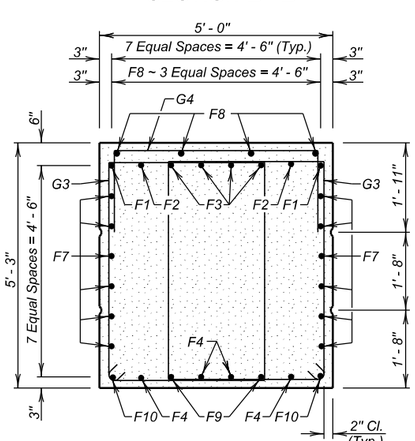
DETAIL "Z"



SECTION E - E



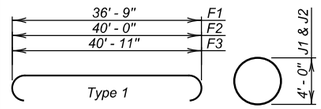
SECTION B - B

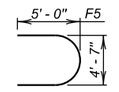


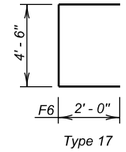
SECTION C - C

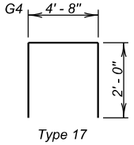
REINFORCING SCHEDULE
(For 1 Bent)

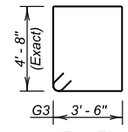
Mk.	No.	Size	Length	Type
F1	2	8	38' - 7"	1
F2	2	8	41' - 10"	1
F3	4	8	42' - 9"	1
F4	4	8	25' - 8"	Str.
F5	16	6	12' - 8"	S11
F6	4	6	8' - 6"	17
F7	12	4	36' - 9"	Str.
F8	4	6	14' - 5"	Str.
F9	2	8	40' - 11"	Str.
F10	2	8	36' - 9"	Str.
G3	60	5	16' - 9"	T1
G4	15	6	8' - 8"	17
N1	10	8	2' - 0"	Str.
Bent No. 2				
H1	54	11	97' - 0"	Str.
J1	3	4	1143' - 3"	Spiral
Bent No. 3				
H2	54	11	99' - 0"	Str.
J2	3	4	1200' - 1"	Spiral











NOTES:
All dimensions are out to out of bars.
Spirals - Use 6" pitch and 1 ½ extra turns at each end. Use 1 ½ turns for lap at splice as required or weld as approved by the Office of Bridge Design. Use 4 vertical spacer bars per column. Spirals may be smooth bars. Bar length shown does not include splices.

℄ Length shown is full length required. The Contractor must submit a splice plan for approval. Mechanical splices must be staggered and not placed side by side. Splices will not be placed within 10 feet of the point of fixity or top and bottom of casing. Two splices per bar are anticipated.

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY Bent No. 2	QUANTITY Bent No. 3
℄	Class A45 Concrete, Bridge	Cu. Yd.	70.5	74.4
△	Reinforcing Steel	Lb.	33729	34417
	Drilled Shaft Excavation	Cu. Yd.	129.1	130.0
	Class A45 Concrete, Drilled Shaft	Cu. Yd.	130.9	132.6
	56" Permanent Casing	L.F.	75.8	75.3
	No. 11 Rebar Splice	Each	108	108

℄ Includes 0.3 Cu. Yds. for Grout Pads.
△ Includes 551 lbs. for Spacer Bars.
Each bar is computed at 3/4 lbs per linear foot regardless of type furnished.

TABLE OF ELEVATIONS

Bent No.	★Elev. "G1"	★Elev. "G2"	★Elev. "G3"	★Elev. "G4"	★Elev. "G5"	★Elev. "G6"
2	2234.70	2334.84	2335.00	2334.91	2334.76	2334.62
3	2336.74	2336.88	2337.03	2336.95	2336.80	2336.66

NOTE: Top of Grout Pad shall be level and smooth.
★Elevations are Top of Grout Pad at centerline of bent.

BENT DETAILS
FOR
(EASTBOUND LANES)

394' - 6" PRESTRESSED GIRDER BRIDGE

40' - 0" ROADWAY — 0° SKEW
OVER BULL CREEK — SEC. 1-T1N-R14E
STA. 347 + 33.43 TO 351 + 27.93 — IM 0902(18)101
STR. NO. 52-831-310 — HL-93

PENNINGTON COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2022

DESIGNED BY	CK. DES. BY	DRAFTED BY	
CL	SK	BT	Steve A. Johnson BRIDGE ENGINEER
PENN035F	035FTB12		

Revised July 2, 2024 SK/CL
Revised August 22, 2024 SK/CL
Revised August 29, 2024 PW

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(18)101	E44	E62

Revised: 29 August 2024 - KV

SECTION M ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
633E0015	Cold Applied Plastic Pavement Marking, 6"	670	Ft
633E1201	High Build Waterborne Pavement Marking Paint with Reflective Elements, White	22	Gal
633E1206	High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow	22	Gal
633E5002	Grooving for Cold Applied Plastic Pavement Marking, 6"	670	Ft
633E5102	Grooving for Durable Pavement Marking, 6"	5,420	Ft

PAVEMENT MARKING PAINT

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.

COLD APPLIED PLASTIC PAVEMENT MARKING

All materials will be applied as per the manufacturer's recommendations.

Cold Applied Plastic Pavement Markings will be 3M Series 380 IES.

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 consisting of glass beads as well as bonded core reflective elements will be adhered to the paint.

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

The Department will take retroreflectivity readings on the pavement marking lines no sooner than 3 days and no later than 30 days after the completion of all line applications required for an individual highway route using a portable retroreflectometer conforming to 30-meter geometry. Retroreflectivity readings will be taken on a test location with cleaning being limited to light hand brooming.

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

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

Initial readings:

Pavement Marking Color	Minimum Value
White	350 mc/m^2/lux
Yellow	275 mc/m^2/lux

All pavement markings not conforming to the requirements provided in these plans will be considered deficient and will be removed and replaced. Additional retroreflectivity readings will be taken by the Department to determine the limits of removal. The removal will be accomplished using suitable sand blasting or grinding equipment unless the Engineer authorizes other means. The removal process will remove at least 90% of the deficient line, with no excessive scarring of the existing pavement. The removal width will be one inch wider all around the nominal width of the pavement marking to be removed. Removal and replacement of the pavement markings will be at the Contractor's expense, with no cost incurred by the State.

RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

Solid 6" line = 41.7 Gals/Mile
Dashed 6" line = 11.4 Gal/Mile
Glass Beads = 5.3 Lbs/Gal.
Composite Reflective Elements = 2.1 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.

GROOVING FOR COLD APPLIED PLASTIC PAVEMENT MARKING

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

GROOVING FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

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

Unless otherwise specified in the plans, the Contractor will groove the surface for High Build Waterborne Pavement Marking Paint as specified in these plans and as per the manufacturer's instructions.

The grooving will be completed within the following tolerances:

Description	Specification	Tolerance
Depth of Groove	Marking Thickness[1] + 15 mils	+ 5 mils
Width of Groove	7 to 8 inches	
Length of Skip Lines[2]	10 foot 6 inches	± 3 inch
Tapers at ends of lines	6 to 9 inches	
Between Double Lines	4 inches	± 1/2 inch

[1] Marking thickness will include the thickness of marking material and reflective media.
[2] Additional length may be required as specified in the plans.

The equipment will be capable of the following:

- Grooving the total width of the groove in one pass or uniform depths with multiple passes.
- Grooving without causing damage to the pavement joints or joint sealant material.
- Provide uniform alignment and depth.
- Moving continuously to permit a mobile traffic work operation.

If damage occurs, including, but not limited to, joints, joint sealant material, and backer rod, the grooving operation will be stopped and modifications will be made to the grooving operation to prevent further damage. The Contractor will be required to use specially prepared circular diamond blade cutting heads to prevent damage at the joints. Damage caused will be repaired or replaced by the Contractor, as directed by the Engineer. No additional payment will be made for the repair work or any reapplication of the pavement marking in the area of the repair.

Grooving will start and stop a sufficient distance from the expansion joints so no damage occurs in these areas.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0902(18)101	M3	M4

Revised: 29 August 2024 - KV

TABLE OF PERMANENT PAVEMENT MARKINGS

LOCATION	START STA	END STA	High Build Waterborne Pavement Marking Paint, 6" White	High Build Waterborne Pavement Marking Paint, 6" Yellow	Cold Applied Plastic Pavement Marking, 6" White	Grooving for Durable Pavement Marking, 6"	Grooving for Cold Applied Plastic Pavement Marking, 6"
			Gal	Gal	Ft	Ft	Ft
EB I90	342+28	354+00	9.3	9.3	290	19	290
WB I90	344+00	359+38	12.2	12.2	380	24	380
		Total:	**21.5**	**21.5**	**670**	**43**	**670**